BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

Pg 57 Dil vs Hanville Const
78 Pet v Pecos Valley
91 " " "

IN THE MATTER OF:

Special Continuation of

CASE NO. 696 - Regular Hearing

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

COURT REPORTERS

ROOMS 105, 106, 107 EL CORTEZ BUILDING

TELEPHONE 7-9546

ALBUQUERQUE, NEW MEXICO

July 14, 1954

I N D E X

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico

July 14, 1954

REGISTER

Name	Representing	Address
E. H. Foster	Phillips "66"	Amarillo, Texas
Jason Kellahin	James D. Hancock	Santa Fe, New Mexico
A. R. Greer	Benson-Montin	Farmington, N. M.
R. G. Hiltz	Stanolind	Ft. Worth, Texas
C. L. Kelley	Stanolind	Roswell, New Mexico
Jim Townsend	Stanolind	Ft. Worth, Texas
F. Norman Woodruff	El Paso Nat. Gas.Co.	Houston, Texas
J. M. Stricklin	El Paso Nat. Gas.Co.	Farmington, N.M.
A. S. Grenier	Southern Union Gas.Co.	Dallas, Texas
A. M. Wiederkehr	Southern UnionGas. Co.	Dallas, Texas
A. L. Hill	El Paso Natural Gas	Houston, Texas
F. C. Barnes	Independent	Santa Fe, New Mexico
J. K. Smith	Stanolind	Ft. Worth, Texas
Jack London, Sr.	Benson-Montin	Okla. City, Okla.
Warren W. Mankin	The Texas Co.	Ft. Worth, Texas
H. P. Logan	El Paso Nat. Gas	Farmington, N.M.
W. M. Rodgers	El Paso Nat. Gas	Farmington, N.M.
Ben R. Howell	El Paso Nat. Gas	El Paso, Texas
Ross Madole	Magnolia Pet. Co.	Dallas, Texas
M. H. Cullender	Phillips "66"	Bartlesville, Okla.
Elvis A. Utz	N.M.O.C.C.	Santa Fe, New Mexico

Name	Representing (Cont.)	Address
Ben H. Parker	Frontier Ref. Co.	Denver, Colorado
T. P. Stockman, Jr.	Frontier Ref. Co.	Denver, Colorado
E. C. Arnold	N.M.O.C.C.	Aztec, New Mex.

IN THE MATTER OF:

The application of James D. Hancock and Company, Ltd., for an order requiring ratable take of gas in the West Kutz - Pictured Cliff Pool, San Juan County, New Mexico, or for proration of gas production in said Pool.

Case 696

Before: E. S. (Johnny) Walker, Commissioner of Public Lands

R. R. Spurrier, Secretary and Director

TRANSCRIPT OF HEARING

MR. SPURRIER: The meeting will come to order please.

This is a continuation of Case 696. That is the only case which we will consider today. Before we begin the case, Commissioner Walker has something he would like to say.

(Discussion off the record.)

MR. SPURRIER: Mr. Smith.

MR. SMITH: Stanolind Oil and Gas is ready to go forward. I might state for the record that I am appearing on behalf of Stanolind Oil and Gas Company and Benson and Montin and Mr. J. R. Townsend, attorney for Stanolind Oil and Gas Company is also appearing.

MR. TOWNSEND: I will call first Mr. Greer.

A L B E R T R. G R E E R

having first been duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. TOWNSEND:

Q Will you please state your name?

A Albert R. Greer.

Q By whom are you employed, Mr. Greer?

A Benson and Montin.

Q You have previously testified before the Commission, have you not? A Yes, I have.

Q And you have testified as an engineer?

A That is correct.

Q And your qualifications have been accepted by the Commission on previous occasions? A Yes, they have.

Q Are you testifying in this case on behalf of both Benson and Montin and Stanolind Oil Company? A That is correct.

Q I will ask you, Mr. Greer, if you are familiar with the gas field known as the West Kutz-Pictured Cliff Pool?

A I am familiar with this field and have followed it's development since it's discovery in 1950.

Q We will ask the reporter to mark the map there as Stanolind and Benson and Montin Exhibit No. 1.

(Marked Stanolind's and Benson and Montin's Exhibit No. 1, for identification.)

Q Directing your attention to that map, will you please identify the field and give the Commission any general information concerning it's development which you think is pertinent to this case?

A The outline of the West Kutz-Pictured Cliff Field are shown on this map with a green line. This field was first discovered, or was discovered in 1950 and has been rather rapidly developed until this time, at which time there are now 166 wells in the field and a total

of 39,840 acres have been developed. Of the 39,840 acres, two-thirds, or 26,560 acres has been drilled by wells on 320 acre spacing. This is indicated by the area colored in red on the map. The other one-third of the field has been developed on 160 acre spacing and this area is colored in blue on the map.

We have shown by this Exhibit that both the northwest end of the field and the southeast quarter of the field, together, of which comprises about two-thirds of it have been developed on 320 acre spacing. Within the middle of the field there have been wells drilled, perhaps the tendency of the operator was to drill them on 160, but there could be 320 acres assigned at this time.

Q Does the field include what is known as the Gallegos Canyon unit?

A The Gallegos Canyon Unit is included in the northwest end of the field.

Q Is any other unit included in the field?

A Part of the Huerfano Unit is included in the southeast part of the field.

Q What is the average well depth for the well in that field?

A The wells vary in depth from about 1200 feet to somewhat a little over 2,000 feet. The average depth is probably about 1800 feet.

Q For the benefit of the Commission and those present now, will you give a brief statement or history of the rules relative to spacing in this field? We are talking about spacing now and not prorationing.

A The first order of the Commission covering spacing in this field was order R-46, December 22, 1950, which established 160

acre spacing for the West Kutz Field. One other Order, R-397 of December 17, 1953 was entered relative to the distance from boundary lines which wells could be drilled, but did not affect spacing. Then, Order R-172 of July 24, 1952 was a temporary order granting 320 acre spacing to approximately the northwest end of the field. Then, Order R-172B of December 17, 1953 denied application for permanent 320 acre spacing.

Q Those last two orders affect the Gallegos Canyon Unit, is that correct? A That is correct.

Q Were you present at the hearing which resulted in Order No. R-46 December 19, 1950? A Yes, sir, I was.

Q I will ask you whether or not any evidence was presented at that hearing to support the order which established 160 acre spacing, to the best of your recollection.

A At this hearing, and at which the Commission established 160 acre spacing, there was no engineering data or other evidence entered into the record to support spacing of 160 acres or any other spacing pattern.

Q Moving along now tc the orders covering the Gallegos Canyon Unit which, by the way, about what percentage of the field does the Gallegos Canyon Unit cover?

A I haven't figured that exactly.

Q Roughly?

A About thirty percent of the field.

Q Would you state for the record the findings of the Commission in Order No. 172, R-172?

A The findings from which order R-172 was established was the first hearing in which there was any engineering data or evidence

relative to spacing presented to the Commission. One of the Commission's findings which appears in Order R-172 was that the wells drilled to the Pictured Cliffs formation would efficiently and economically drain 320 acres.

Q Are you suggesting at this time that the Commission change the spacing pattern in the West Kutz Field?

A No, we are not suggesting that the Commission change the spacing pattern.

Q Do you intend to recommend to the Commission the establishment of 320 acre proration unit?

A Yes, we intend to recommend to the Commission the establishment of 320 acre proration units.

Q Do you intend to show in the testimony which you will give that the 160 acre spacing rule and the proposed 320 acre proration unit are compatible and consistent with each other?

A Yes. As long as there is a proper allocation formula, it is possible to have wells drilled on 320 acres and wells drilled on 160 acres in the same common source of supply which will allow production from each well in such a fashion that the correlative rights would be protected and the field can be efficiently and economically produced.

Q There have been no hearings or no testimony in any of the cases thus far relative to proration units or the size that they should be, is that correct? A That is correct.

Q Does the testimony that you have given us thus far, bring us up-to-date to the date of the present application for proration for the West Kutz Field?

A Yes, this brings us up-to-date.

Q I will ask if you have made or caused to be made, certain studies regarding the proration of gas in this field with particular reference to the size which these proration units should be?

A Yes, I have.

Q Directing your attention now to Section 13B of the Conservation Statute which reads as follows: "The Commission may establish a proration unit for each pool, such being the area which may be efficiently and economically drained when developed by one well, and in so doing the Commission shall consider the economic loss caused by the drilling of unnecessary wells, the protection of correlative rights, including those of royalty owners, the prevention of waste, the avoidance of the augmentation of risks arising from the drilling of an excessive number of wells, and the prevention of reduced recovery which might result from the drilling of too few wells". I will ask you whether or not these studies which were made by you were made with reference to this statutory provision?

A Yes, they were.

Q Have you available information which will show the area in this field which can be efficiently and economically drained by one well? A Yes, I have.

Q What is the nature of that data?

A We have conducted a number of interference tests which definitely establish the area or the minimum area which wells in this field will drain.

Q Do you have the results of those tests with you?

A Yes, I have. These tests are exact duplicates of tests which were -- let me reword that -- these tests have been entered into the record before in one of the other cases, and we have those

Exhibits on file here now.

Q I will ask the reporter to mark the results of these tests as Stanolind and Bentor and Montin Exhibit 2 in this case.

(Marked Stanolind's and Benton and Montin's Exhibit No. 2, for identification.)

A This Exhibit is broken into five separate tests.

Q Let's take up each test one by one and try briefly to summarize the results of the test and what is shown by each one and how they are related to each other. Let's take first, Test No. 1.

A In test No. 1 we have on page 1 a description of the area of the test and the wells included in the test, the date of first production into the pipeline. On page 2 is identified the shut-in well in the test area and the distances to the nearest producing well. Page 3 shows the pressure measurements made on the subject shut-in well. Page 4 is an explanatory note and page 5 is a map showing the area of the test and approximate reproduction of this map which is the one on the wall.

Q Can you point out where the area of the first test on the map on the wall is?

A The area of the test is shown colored in yellow. The producing wells that were completed at that time were colored in green, and a well which was shut-in and on which pressure measurements were made during the test is colored in red. That particular well was Hancock No. 11, Hancock.

Q What is the next page?

A The next page is a graph showing the pressure history of this well during the time of this test and while it was shut-in. This is also shown by the graph just above the map on the wall.

Q What conclusions do you draw from this test?

A This test shows that this particular well, after being completed and before putting on the production in the pipeline, was shut-in for the length of time adequate for it to build up to it's maximum shut-in pressure. Now, we know from other wells which were drilled in the immediate area that the original shut-in pressure in this area was about 465 pounds. The maximum pressure to which this well built up was 446½ pounds. That indicates to me that adjoining wells had produced gas out from under this particular well's tract before this well was complete.

As further definite evidence that gas was migrating away from this particular tract to the other wells in the area, we have the additional pressure maintenance which was shown in green on this graph and which shows that the pressure decreased in this well although it was shut-in all the time of the test, no production was taken from the well. Nevertheless, it's gas reserves were being produced by off-set wells.

Q Turning now to test No. 2.

A I would like to add one more remark. The nearest off-set well to this particular one was Danube No. 3 Thompson, which was a distance of 2,160 feet. That is the closest well which could have been draining this particular test well. The drainage radius of 2,160 feet is equivalent to a circular drainage area of 336 acres. This means to me that the minimum drainage area which a well in this part of the field could drain would be 336 acres.

Q Now, Test 2, please.

A Test No. 2, we have the same comparative information in our Exhibit which shows the area of the test, the wells in the test,

the exact pressure measurements, and on page 9 we have the map which shows the area of this test.

Q Can you point out the well in the area of this test on the map on the wall?

A This test was conducted on Benson-Montin No. 18, Gallegos Canyon Unit, and it is colored in red on the map, and the producing wells within this test area are colored in green.

This particular well was drilled on Indian land, and the pipeline company, it took them several months to get authority to cross the land with pipeline and tie the well in, so we had a comparatively long interference test on this particular well. It lasted for 244 days. On this well the same as test No. 1, we found well shut-in pressure built up to a maximum and the increase in pressure measurements as colored in red on the graph on the wall.

This graph is on page 10 of our Exhibit. After reaching the maximum pressure, this well also declined as gas was produced from adjoining wells, and pulled gas out from under the tract on which this well was drilled. The maximum pressure to which the well had built up was approximately 463 pounds; at the end of the test it had dropped 6 pounds to 457 pounds.

Now, although that is only a 6 pound drop, the pressure measurements were made with an instrument which was sensitive to one-tenth of a pound. It is apparent from the slope of the curve and the fact that it does not jump up and down, that the trend of the drop in pressure was very definite.

Q There is no doubt in your mind that if the test had been conducted for a longer period the drop in pressure would have continued and been reflected by the graph?

A That is correct. The test was conducted for a period of about eight months, and I would see no reason why it would change.

Q Are your conclusions the same with reference to this test as they were with reference to test No. 1?

A The general conclusions are about the same, that the offset wells were draining gas under this particular wells' tract. In this case the nearest producing well to No. 18 was Gallegos Canyon Unit No. 6, a distance of 3,050 feet. The draining radius of 3,050 feet is equivalent to circular drainage area of approximately 670 acres, which means to me that wells in this area could drain a minimum of 670 acres per well.

Q Let's turn now to Test No. 3.

A Under Test No. 3 in our Exhibit, we have again the same type of information, the area of the test identified, wells within the test area, the distance to the nearest producing well, the exact pressure measurements made on the test well, and on Page 13, the map identifies the area of the test.

Q Will you indicate the area of the test on the map on the wall?

A The area of the test is colored in yellow on the map on the wall and the producing wells are colored in green, and the shut-in test well is colored in red. Now, this particular test well which is Gallegos Canyon Unit No. 13 was drilled almost directly between two wells which had been completed at an earlier date, and on which we had shut-in pressures from which we could tell what the original shut-in pressure in that area, or what the original shut-in pressure was.

On Gallegos Canyon Unit No. 17 it had a maximum pressure of 468.1 pounds. We feel that that is a good and accurate pressure of

that particular area, and that the well had probably built up to the maximum reservoir pressure when that test was taken. Just across Well No. 13 to the Gallegos Canyon Unit No. 4 we had a shut-in pressure after I believe about twenty days, of 464 pounds. We feel that well probably would have built up to 468 pounds had it been shut-in long enough. Even so, we have minimum pressures to which the original wellsbuilt up of 464 pounds and 468.1 pounds in that yellow area when they were first completed.

Now we will go to Well No. 13 which is the test well and was drilled between those two wells No. 4 and No. 17. It's pressure history during the time of the test is shown on the graph on page 14 and the graph above the map on the wall.

Q What does that show?

A That shows that this well built up to a maximum pressure of only 461 pounds. This indicates to me that that well's tract had been partially depleted by the off-set producing wells at the time number 13 was drilled. After building up to it's maximum pressure, it's pressure commenced falling off and this indicates to me that the wells which had drained gas originally from under this well's tract were continuing to drain gas from it during the time of this test. The nearest producing well to No. 13 at the time of this test was Gallegos Canyon Unit No. 4, a distance of 3,750 feet. Now drainage radius of 3,750 feet is equivalent to a circular drainage area of 1,020 acres. This means to me that in this area, wells would have a minimum drainage area of 1,020 acres per well.

Q Turning now to test No. 4.

A For Test No. 4 we have the similar data, the area of the test, location of the wells, shut-in wells within the test area,

pressure measurements on the test well, and on Page No. 18 a map showing the area of the test.

Q Is that the map on the wall?

A That is the map shown on the wall. This particular test well is about a mile from the well shown in our interference Test No. 1. The difference now being that whereas in the original test there were only a few wells completed within the test area, we now have a large number of producing wells within the test area with consequently higher withdrawals from the field, and as a result you have more marked pressure decline from the test well.

The pressure history of this test well is shown on Page 19 and on the graph on the wall above the map, the maximum pressure to which this well, which is Benson-Montin No. 31 Gallegos Canyon, built up to was 443 pounds. This was about 20 to 25 pounds less than the original pressure of the area, and during the course of the test the well dropped about 12 pounds to 431 pounds. The pressure measurements are shown by the little green circle on the graph. This means that before this well was turned into the pipeline, it's pressure was approximately 35 pounds less than the original reservoir pressure, and as such, approximately 10% of that well's recoverable reserves had been produced by adjoining wells.

Q What was the nearest producing well to that?

A The nearest producing well to No. 31 was Gallegos Canyon Unit No. 30, a distance of 1920 feet, and the circular drainage area equivalent to a drainage radius of 1920 feet is 323 acres.

Q What conclusion do you reach from that?

A This means that the wells in this area can efficiently drain a minimum area of 320 acres per well.

MR. SPURRIER: In what period of time, Mr. Greer? I notice you said awhile ago a well would drain a thousand and twenty acres.

A It would take longer, of course, for wells to drain gas on 320 acres as compared to 160 acres. Just exactly how much time, approximate comparison shows that if the wells were not prorated but were producing wide open, that in about a ten-year period wells on 320 acres would produce about 90 to 95% as much gas as wells drilled on 160 acre spacing. Then, of course, in additional length of time practically all of the gas that could be recovered by the 320 acre wells. If there is any proration or any restriction in production, then the time that it takes to produce the gas will be very nearly the same on the 160 acres or 320 acres.

Q Turning now to Test No. 5.

A Test No. 5 is, in my opinion, one of the most impressive interference tests yet published. In our Exhibit we have identified the area of this test, the shut-in in well within the test area, producing wells, the producing wells on the boundary and specific pressure measurements for wells within the test area which was shut-in.

Q Will you indicate on the map on the wall the area tested in the well?

A The area of the test was colored in yellow on the map and the producing wells along the boundary of the test area and within the test area are colored in green. Here again we have two wells on which we had very accurate initial reservoir pressure maintenance, or rather wellhead pressure measurements. Those two wells are identified by the dashed circles, one on the east side and one on the west side. One of the pressures was 4681 pounds on Gallegos

No. 17 and the other 467.5 pounds on Gallegos Canyon No. 7. The initial pressures of these first wells in this area checked within six-tenths of a pound. I feel that the original pressure in the area was very close to 468 pounds. The area of this test is approximately eight square miles, and within this eight square mile area there were only four producing wells. Of those four producing wells at the time of the test, three of them had been on production approximately one year, and one of them had been on production just a couple of months.

Q What does that show?

A That the difference in this interference test as compared to the majority of intereference tests is that we had instead of just one shut-in well within the test area, we had four wells within the test area on which we took pressure measurements. The pressure performance of these four wells as shown on Page 27 of our Exhibit and on the graph above the map on the wall, now with only a short production period for the time of this test we necessarily had small pressure drops. Nevertheless, they were measureable, and with the instrument we were using, I am certain that the trend of decrease in pressure to reach the maximum represents the actual pressure behavior in the reservoir at that time.

Q What is your conclusion as a result of this?

A We might point out that Well No. 33 which is shown on the lower part of the graph is close to what we call the fairway field in the most permeable part of it, and has pressure drops more rapidly than any of the other wells. Nevertheless, the pressure on the other test wells reached the maximum and then dropped off, which indicates to me that with only three producing wells within the

on eight square mile area and five producing wells/ the boundary that these wells caused movement of gas in the reservoir away from these subject test wells. I would like to point out that one of the wells, Gallegos Canyon Unit No. 40, the closest producing well to it was No. 17 Gallegos Canyon Unit, a distance of 5,000 feet. The circular drainage area equivalent to a radius of 5,000 feet is about 1,800 acres.

This indicates to me that wells in this area could drain 1,800 acres per well.

Q What conclusions, summarizing the testimony that you have given with reference to each of these tests, what conclusions do you reach as a result of them as far as the entire field is concerned?

A These tests mean to me that wells in this area will efficiently and economically drain at least 320 acres per well.

MR. TOWNSEND: We would like -- excuse me.

A And that inasmuch as two-thirds of the field has been drilled on approximately 320 acres, that proration units of 320 acres should be established in the allocation of gas production.

MR. TOWNSEND: We would like at this time to offer the map which is on the wall as Stanolind and Benson-and Montin Exhibit 1, and to offer the results of the five interference tests as their Exhibit No. 2.

MR. SPURRIER: Is there objection? Without objection they will be admitted.

Can we take a short recess here?

(Recess.)

MR. SPURRIER: We will proceed with the hearing.

By MR. TOWNSEND:

Q In conducting these interference tests and using the surface pressure gauge, did you make any additional tests to see whether fluid in the holes in the bottom of the hole may have some effect upon these tests?

A Yes, we were concerned in knowing whether the surface pressures were representative of the reservoir pressures, and in order to check this since some of the wells make water in that area, before and after each test, we blew the wells through the tubing to make certain there was no water in the hole. Therefore, a column of gas existed from the casing head to the producing formation, and as a result, the surface pressure was a direct indication of the reservoir pressure, or rather the difference in pressure measurements was exactly reflected by difference in reservoir pressures.

Incidently, we found that wells that make water in this field on shuting them in, there is a tendency for the water to go back into the sand and we have often shut a well in that had quite a bit of water in the hole, and after being shut-in from a few hours to a couple of days, all the water has been driven back into the sand.

Q So you consider your test as accurate as could have been made under the circumstances?

A I am positive that our surface measurements directly reflected reservoir pressure, and of course, since we could measure them to one-tenth of a pound, we had far more accurate pressure measurements than we could have obtained by running bottom-hole pressure bombs.

Q Based on the result of these tests, in your opinion, will there be any significant difference in the ultimate recovery of the tract unless developed to a density of one well to each 160 acres as compared

to that which would be obtained if it were marked to a density of one well to 320 acres?

A For the same producing rate at abandonment, it takes a slightly higher reservoir pressure on 320 acre spacing as compared to 160 acre spacing. This slightly higher pressure represents a small additional volume of gas that would not be recovered on 320 acres as compared to 160 acres. This amount of gas, however, is quite small being on the order of three-tenths to four-tenths of one percent of the total volume of gas, and we have found in drilling and completing wells in this area that we often lose more than this three-tenths to four-tenths of one percent in the course of completion of the additional well due to the fact that the well has to be opened to the air while we are completing, and I believe that even more gas would be recovered on 320 acre spacing as compared to 160 acre spacing in view of the gas that would be wasted in drilling the second well on 320 acre tract.

Q What about the cost of drilling an additional well on a 320 acre tract? Would the amount of the cost justify the additional expenditure from the standpoint of the oil recovered?

A Definitely not, since I don't believe we would recover any additional volume of gas at all by drilling the second well. That is additional gas that can be saved in the market. It cost oh, $18,000 to $19,000 for the average well in the entire field, and I think the additional drilling cost would be entirely wasted, as well as the additional materials that it takes to complete the well with.

Q Then you would say that the drilling of an additional well would not be sound from an economic standpoint forgetting the engineering factors involved? A That is correct.

Q Based upon these conclusions, what is your recommendation as to the size that the proration units in this field should be?

A 320 acres.

Q What is another factor besides the size of the unit to be considered in the proration of gas?

A An allocation formula.

Q Let me read to you a portion of the Conservation Statute, Sections 12-C and Section 13A, part of 12C says that "Whenever the Commission finds it necessary to prorate gas, they should do so on a reasonable basis and recognizing correlative rights." Then this sentence appears, "In protecting correlative rights, the Commission may give equitable consideration to acreage, pressure, open flow, porosity, permeability, deliverability, and quality of the gas, and to such other pertinent factors as may from time to time exist, and insofar as is practicable, shall prevent drainage between producing tracts in a pool which is not equalized by counter drainage." Section 13A reads as follows: "The rules, regulations and order of the Commission shall insofar as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil or gas, or both, in the pool being an amount so far as can be practicably determined, and so far as such can be practicably obtained without waste, substantially in the proportion that the recoverable oil or gas or both under such property bears to the total recoverable oil or gas or both in the pool, and for this purpose to use his just and equitable share of the reservoir energy".

In the allocation formula which you will recommend, did you take into consideration the factors that these provisions of the

statute mentions and covers?

A Yes, I did.

Q In your opinion, is there a relationship between the ability of a well to produce and the amount of recoverable reserves?

A Yes there is a relationship between the deliverability of wells in this field to reserves under their tracts.

Q Will you enumerate the factors that determine such relationship and give us your observations upon each one, and well, discuss each one separately.

A I would like to point out first that the productive limits of this field are definitely defined by changes in permeability. This occurs in a large number of fields, but is more pronounced in this particular field than any I have ever studied before. By this I mean that the entire area surrounding the field and through the field, exhibits a gross Pictured Cliff sand thickness on the order of 100 to 120 feet. This sand is present in the productive part of the field and is also present in the non-productive parts of the area around the field. Drilling of wells in the field and outside the limits of production, show that this sand is very definitely sand without shale bodies in it and that even in the areas considered to be dry in which we cannot complete producing wells, the sand is still present and carries porosity and porosity may be just as high in the non-productive parts of this area as compared to the productive part of the field.

The only difference in the producing area and the non-producing area is determined by the change in the permeability and the resulting differences in connate water content. The dry areas have lower permeability and higher connate water saturation and to the extent

that the well will not produce gas.

Q Have you prepared a chart or exhibit to indicate this variation?

A We have made a study of the relation of permeability to connate water which gives us a relation of permeability to total pore space available for the storage of gas.

MR. TOWNSEND: I will ask the reporter to mark these studies as Stanolind and Benson and Montin Exhibits No. 3 and 4.

(Marked Stanolind's and Benson and Montin's Exhibits No. 3 and 4, for identification.)

A A part of our work relative to the relation of permeability to connate water has been filed with the Commission in one of the other hearings on this field, and I will not go into detail about that particular information other than to say that it tends to confirm the Exhibit No. 3 which shows a relation of connate water to permeability on Gallegos Canyon Unit No. 35. It shows this particular well because it was cored with oil, and we feel that the water saturations are therefore more accurate than we might have obtained otherwise. Although this represents only one well, it is confirmed by the capillary pressure measurements which were made on the five other wells, and to which I referred awhile ago in the records of the Commission.

Q Do you know what case that was in?

A That was Case 377. In the files of the Commission, those are in the files of the Commission.

Q What does Exhibit No. 4 mean?

A I might explain Exhibit 3 a little more fully. It shows that for a permeability on the order of one millidarcy, that we

probably have a connate water saturation approximating 80%. As the permeability increases, the water saturation decreases, and for a permeability approximating ten millidarcies, we have approximately 40% water saturation. This means that for higher permeability we have lower water saturation, and hence a greater void space available for the storage of gas.

I might point out that this additional void space and additional gas reserves which would be in place in the same unit volume of sand for sand carrying the higher permeability, shows a definite relation between reserves, recoverable gas reserves and productivity. The pore feature of this particular Exhibit in which it is necessary to understand the performance of the field, is that the permeabilities in this particular formation have been found from core analyses and also by comparison with other wells to be in this range of one to two millidarcies up to ten and twenty millidarcies. The average permeability probably lies between two and ten millidarcies for wells throughout the field. This is important because this is a range in which the water saturation varies the greatest and makes the relation between productivity and recoverable reserves. By this I mean that if the permeabilities in the field were all, say in excess of 40 millidarcies, then there would be very little variation of water saturation throughout the field and there would then be very little difference in reserves as compared to productivity. For that reason this particular field can very easily differ from the majority of the gas fields in which we ordinarily consider that permeability or productivity has very little relation to reserves.

Q Do you consider this chart representative of the wells throughout the field?

A Yes, although it was taken on one well since it was confirmed by capillary pressure measurements on five others scattered throughout other parts of the field, I think is quite representative of this field.

Q Do you have anything further to add with reference to Exhibit 3? A No.

Q What is Exhibit 4 and what does it show?

A Exhibit No. 4 shows the total void space in the reservoir as compared to permeability resulting from the combination of the relation of permeability to connate water and permeability to porosity. We have also found a slight increase in porosity with increase in permeability for this particular well. That range is indicated by a permeability of one millidarcy showed porosity approximating 18%, and with increased permeability up to twenty millidarcy and porosity increased up to about twenty and a half percent.

It is a very slight increase in porosity with permeability, but there is an apparent increase. Now, by combining the relation of connate water to permeability and porosity to permeability, we are able to determine total reservoir pore space as related to permeability and that is shown by Exhibit No. 4. I might point out on this Exhibit about the magnitude of that relation. For example, a well having an average permeability of two millidarcies would probably have a net effective pore space of six percent of the bulk volume of reservoir as shown by this Exhibit No. 4.

A well having a permeability of five times that much, or ten millidarcies, will have the net effective pore space of approximately twelve percent of the bulk volume of the reservoir. That shows that for a five to one ratio in permeability which would correspond approximately

to five to one ratio in productivity or deliverability, that we have about a two to one ratio in pore space or recoverable reserves.

That variation depends somewhat on the wells that we are considering. In other words, we cannot use exactly that relationship for comparing all wells in the reservoir. To explain that a little more clearly, I would like to point out that the well that has a permeability of one millidarcy could have a net effective pore space of three and a half percent, and a well with two millidarcy will again have about six percent, by comparing those two wells twice the permeability gives very nearly twice as much reserve, so it is not a definite relation throughout the range of productivities that we have in the field. But in each instance there is an increase recoverable reserve occurring under wells that have increased deliverabilities.

Q You are simply saying then that it is not a directly proportionate increase but that there is a consistent increase, whenever you have an increase in permeability, then you have some increase in the pore space or the recoverable reserves?

A That is correct.

Q What other factor might determine the relationship between the deliverability and the recoverable reserves?

A There are some parts of the field which in my mind I am certain that the sand has relatively the same characteristics, but it is merely thicker in one place as compared to another. In those parts of the field there is a direct relation between productivity and reserves. In other words, there is twice as much sand, twice as much deliverability and twice as much reserves. That does not occur throughout the field and we cannot use that as a definite

relationship, but it does occur in parts of the field.

Q Are there any other factors that --

A (Interrupting) Yes, there is another very important factor and that is wells with lower deliverability have higher abandonment pressures. In other words, a well that has a deliverability which has a productivity near it's economic limit can produce only a small amount of gas before it's productivity will be decreased to the point that it would not be profitable to operate it. Wells with extremely low deliverabilities could have abandonment pressures as high as one hundred, one hundred fifty, or two hundred pounds higher than the field average. Those wells that have higher abandonment pressures definitely need more gas percentagewise than wells that have higher deliverabilities. So that is another relation, although it is not direct, it is a relation between deliverability and recoverable reserves.

Q Do you think of any other factors that shows that relationship?

A There is one other factor that definitely should be considered and that is the fact that there is no fracturing whatsoever in this producing formation. We have cored a number of wells in the field and obtained 100% recovery and in no instance have we found fracturing which would indicate that the reservoir is in a fracture condition.

Q Mr. Greer, considering these factors that you have been testifying about which you say shows relationship between deliverability and reserves and based upon your experience, what is the range of variation from deliverability among the wells in the field having a deliverability of say 100,000 cubic feet per day or more?

A The range of deliverability for most of the wells is on the

order of ten to one, and I believe about 20 to 1 would include all of the wells.

Q In considering these factors that you have testified about, based upon your experience, what would you say is the range of variation in the recoverable reserves in the field?

A I believe the variation in recoverable reserves for wells of deliverability of 100,000 or more would be on the order of 10 to 1.

Q Before I ask you about the formula that you recommend, is it your testimony that there is to be direct relationship between the permeability in the field and the deliverability of the wells in the field?

A It is very nearly in direct relationship.

Q Does the formula that you recommend take these variations that you have just mentioned into consideration? The varying of 10 to 1 and the deliverability for the average and approximately 10 to 1 as to reserves?

A Yes.

Q What allocation formation do you recommend for the Pictured Cliffs Field?

A I recommend 75% of the gas be allocated on the basis of acreage times deliverability, and 25% of the gas be allocated on the basis of acreage.

Q Do you have a recommendation to go along with that as to the matter of minimum allowable?

A Yes. We recommend a minimum allowable of 100,000 cubic feet per well per day.

Q Why do you choose that particular figure?

A We have based that on economics. We feel that in the event of a reduced production from the entire field, that the smaller

wells should be given an opportunity to pay out rather than to take the cutback in production directly as the larger wells do. The reason for this is that we feel there are a large number of wells that might be producing in this area with comparatively low initial production. A well with a deliverability of 100,000 feet a day, if produced at that rate, would take about 6½ years to pay out the cost of drilling. In the event of restricted productionwe would prefer that our larger wells take the brunt of the cutback; for example, a well that pays out in six or seven months, a reduced allowable for that well which would cause it to pay out in ten months and be supported by the operator much easier than one of his wells which would pay out in 6½ years, and he would be cut back to the point that it would pay out in only ten or 11 years. A man whose well was cut back from six months payout to ten or eleven months payout, we feel is not subject to prorationing.

Q Did you say how long it would take a well with 100,000 M.C.F. to pay out?

A It would pay out it's drilling costs in approximately six or seven years.

MR. TOWNSEND: I think that is all at this time.

MR. SPURRIER: Does anyone have a question of Mr. Greer?

MR. KELLAHIN: Representing J. T. Hancock and Company, Ltd.

CROSS EXAMINATION

By MR. KELLAHIN:

Q Mr. Greer, in your testimony in regard to the present existing spacing in the West Kutz Pool, it is my understanding that you said two-thirds of the area was on 320 and approximately one-third on 160 acres, is that correct?

A Yes, sir, that is approximately correct.

Q You are putting it on an acreage basis?

A Yes, I talked about acreage.

Q Are you including in that all the area within the Gallegos Canyon Unit?

A Only the tracts which are drilled.

Q You are including alloting three hundred twenty acres to each well drilled in the area I assume on a 320 acres?

A The ones that were drilled on the 320.

Q You are including in that figure only your actually drilled acreage?

A Yes, sir, only the actual drilled acreage.

Q That is likewise true of the acreage drilled on 160?

A Yes, sir, only the drilled acreage.

Q I understood you to say that Order No. 172 issued in 1952 made a finding that one well would drain 320 acres?

A Yes, sir, that is correct.

Q I would like to call your attention to paragraph 3 of Order R-172 which reads as follows: "That apparently one gas well in the Pictured Cliffs formation, would efficiently and effectively and economically drain an area of 320 acres, and that testimony indicated that the drilling wells in the pattern of greater density is unnecessary and not to the best interests of conservation and could result in wasteful use of critical materials". In your opinion is that your finding that one well will drain 320 acres?

A Yes, I believe that is what it says.

Q It says that it could result in waste, does it not? I would like to call your attention to paragraph 4 of Order R-172, "That in

an effort to determine whether such measures will insure orderly development, protect correlative rights and prevent possible waste, the above lands should be developed on a 320 acre spacing pattern for a period of one year from the date of this order and at the end of one year the applicant should present testimony to show why 320 should be retained". You presented testimony at the end of the one year period or approximately thereafter?

A Yes, sir.

Q That resulted there in finding that one well to 320 would not result in an ord rly development of the pool, did it not?

A No, sir, that was not the finding.

Q Wasn't the finding in paragraph 8 of Order R-172-B, I call your attention to the following language, "That for the prevention of waste and protection of correlative rights, a uniform spacing pattern should be established for the ~~ordering~~ orderly development and production of the West Kutz-Pictured Cliffs Gas Pool."

A Yes, sir, and it is, the apparent intent of that order was not to allow two different spacings or not to have two different spacing patterns in one common source of supply, but it does not say that wells will not drain 320 acres.

Q Mr. Greer, referring to your test No. 3 up there, I believe you said the low pressure showed that the acreage had been drained prior to the drilling of that well, is that correct?

A Yes, sir.

Q Can you give me the dates when the different wells were drilled?

A Yes, sir. That is Test No. 3?

Q Yes.

A In test No. 3 we had a total of five wells of which four

were producing and one was shut-in. The four producing wells were, the dates of first production are as follows: No. 4 Gallegos Canyon Unit, February 1952; No. 11, November 1952; No. 16, September 1952; and No. 17, September 1952.

Q What was your shut-in well, the one that you said the low pressure indicated prior drainage?

A It was No. 13.

Q When was it drilled?

A It was shut-in November 9th, 1952 and pressure, this pressure test then included from that time up until March 1st of 1953 at which time we made our last pressure measurement on it.

Q Well, perhaps I don't quite understand you. It was my understanding that you said that these wells had drained this area prior to that, is that correct?

A Well, as of the time that the well was completed it had been drained by the amount of gas represented by the difference in pressure from approximately 468 pounds to 461 pounds.

Q Well now, did you ever encounter that in any of the wells that were drilled approximately at the same time, that situation? Where there could have been offsetting drainage, I mean?

A I don't believe I understand your question.

Q Are you familiar with Hancock's No. 8 well?

A I know it is in the field there.

Q Are you familiar with the initial potential of that well?

A I don't have it before me.

Q Would 115 M.C.F. sound right to you as the initial potential for that well?

A Yes, that wells in that area were drilled --

Q (Interrupting) How about the Mudge No. 9, are you familiar with it?

A Yes, sir, I believe that was drilled in about the same area.

Q Is that a direct offset? A Yes, sir.

Q You know what the initial potential of that well was?

A I don't have it before me.

Q Would 1,000,350 M.C.F. sound right to you?

A Yes, sir.

Q How about Hancock's No. 9 well, is that in the same area?

A Yes, sir, it is about a mile from it.

Q Do you know what the initial potential on that well was?

A I believe we show it about two and a half million.

Q And the Mudge No. 7 well?

A Yes, sir.

Q Does that show the initial potential on it?

A About half a million.

Q And the Hancock No. 10?

A Yes, sir, it is in the same area.

Q Does that have the initial potential on it?

A About eight hundred thousand.

Q Mudge No. 6?

A About two and three quarter million.

Q The Mudge No. 1?

A We show about 300,000.

Q Three million, is it not?

A Is it three million? Perhaps we have it. I will accept it.

Q Developed three million I believe. The Mudge No. 3, do you have that one?

A We show here 360,000.

Q Assuming that you were drilling on a basis of 320 acres, those wells were all drilled approximately the same time, were they not? A Yes.

Q Assuming that you were drilling on 320 and drilled for example, the Mudge No. 7 well first, that would have resulted in waste, would it not, to allocate 320 acres to that well?

A I think not. The problem of high productivity wells and low productivity wells which a man might obtain by drilling on different parts of his tract is something that is going to occur regardless of the spacing.

Q To what factors do you attribute that?

A High permeability to one well.

Q Actually there is a variation in permeability in the West Kutz Pool? A There certainly is.

Q You get quite a variation in the direct offsets on the 160 acre spacing?

A That is true. You could get a wide variation on 80 acres or 40.

Q In the event you drilled on 320 the variation in permeability would be a factor in the total recovery from that well, would it not?

A Upon the well, yes, in the field, no.

Q In the field, no? A Yes.

Q What do you mean by that?

A I mean that gas might not be recovered by one well in one spot but would be recovered by another well in another field.

Q Wouldn't that be denying the man under whose land the reserves were located the right to recover those?

A Not necessarily, we could go even further than that on the particular low well that you might, low productivity well which you might choose now that has been drilled on 160 acres, it is possible that we could go to 80 acres on the same tract to give the man a high productivity well.

Q It is your testimony, as I understood it, that in the drilling of additional wells on 320 acres, more than one well would be uneconomical?

A That is correct, it would be.

Q Under those circumstances do you think that the man who has complied with Commission's regulation and drilled 160 could claim the same allowable as the man who drilled on 320?

A Yes, if we gave the 160 more than half the allowable than the 320 acre well he would be recovering more per acre than the well drilled on 320 acres. I feel per acre recovery should be approximately balanced. In other words, if he takes out more per acre under his 160 acres, it is going to have to come from under the 320 acre well. I do not believe that would protect correlative rights.

Q I believe your testimony is that if one well on 320 acres would not recover the well, then it would go to some other well, that is migration?

A Yes. But that could happen on any spacing pattern. We could go from 320 to 160/if that does not cure that problem.

Q Increasing the size of the unit aggravates the problem, does it not?

A Well, I believe as a man drills more wells he increases the odds that he will finally get an average well on his tract, yes, sir.

Q It increases it?

A In other words, if he drilled four wells on 160 acres, he would come twice as close to getting an average well for that 160 acres as if he drilled one well on it.

Q In all your testimony about the ultimate recovery of gas, Mr. Greer, I don't believe you said anything about the element of time. Is that a factor in economic well?

A Yes, sir.

Q What would be your estimate as to the time required for one well on 320 acres to drain the 320 as compared with the one well on 160 acres?

A It depends upon the extent of proration. If there is no proration at all, it takes longer for a well on 320 acres to produce all of the gas from under it's tract as compared with a well on 160 acres. That is under conditions of unrestricted volume of flow. Under conditions of proration it depends upon the agreed proration. It could be the allowables would be restricted to the point that the total depletion would be exactly the same under 320 acres as under 160 acre tracts.

Q That is assuming that the allowables are the same, that is on an acreage basis? A Yes, sir.

Q If the allowables per well were the same, in other words, a well on the 320 acre tract receives the same allowable as a well on 160 acre tract, the ultimate recovery would still be the same, would it not? A What?

Q The well on the 320 acres would recover it's reserves just as well as the well on 160 acres, only it would take ----.

A That is provided they are, there is no offset drainage between the two particular wells.

Q How could you have offset drainage?

A If we have an allocation formula which does not give credit to acreage, then we could have 160 well getting the same allowable as the 320 acre well. In that case, if they are offset wells, the 160 acre well will drain gas from the 120 acre tract.

Q Well, the reserves --

A (Interrupting) Under proper allocation formula, that will not occur.

Q Well, the allocation formula which you proposed, would it occur?

A Under the allocacion formula that we proposed there would be no offset drainage or it would be minimized.

Q Because that takes acreage into consideration?

A Yes, sir, because it takes acreage into consideration.

Q The only element involved then would be the element of time?

A Yes, sir.

Q Have you any difficulty with water up there? I believe you said you had.

A A lot of the wells make water.

Q You have had? A (Interrupting) You --

Q (Interrupting) You had considerable problem with water, as a matter of fact, in some areas, haven't you?

A Beg pardon.

Q You had a considerable problem with water in some areas?

A Yet it did not materially affect our production. It takes a little more care in the field.

Q Have you reached the point where you considered putting them on the pumps?

A Oh, no, sir. The total volume of water is comparatively

small, it is on the order of two or three barrels a well a day.

Q There are some wells in the area where water has been more serious than that, is there?

A Yes, I think some of the operators have had quite a bit of water trouble.

Q Now, a well located on 320 acre tract, if we assume it is going to get twice the allowable as the well on 160 acre tract, is there any danger in your opinion, of water encroachment as a result of the higher allowable?

A I don't believe there is any water encroachment in this field as we ordinarily think of water encroachment.

Q Is there any danger of the loss of gas as a result of water due to high production of these wells?

A Do you mean that might drown a well out such as we couldn't produce it?

Q Or trapping gas by water?

A No, sir, I think there is no by-passing of gas in trapping of gas as we ordinarily think of it in a field in which there is water encroachment. I believe the water that we produce is high connate water almost immobile connate water.

Q You detected no movement of the water?

A I think there is no movement of water such as we think of in a water drive field.

Q There is movement of water as a result of production?

A Yes, I believe there is water which I referred to, is almost immobile connate water.

Q But with a higher production rate, it moves, does it not?

A It moves at any production rate.

Q And with that situation, there is danger that the gas would be trapped, is there not?

A No, sir, I think not. I see no reason.

MR. SPURRIER: Let's take a short recess.

(Recess.)

MR. SPURRIER: Proceed, Mr. Kellahin.

Q Mr. Greer, referring back to our discussion of the Mudge wells, can you explain to the Commission how one well will drain 320 acres when there is a permeability barrier or area of low permeability between wells on 160 acres?

A I think there are no permeability barriers which will prevent the ultimate recovery of gas from the field such as necessary to drill the field on 160 acres. There are unequitable tight streaks and low permeability zones, but those zones are not so small that it is necessary to drill a well on 160 acres. If that were true, then we would have not one main reservoir, we would have reservoirs approximating 160 acres with no communication between them. I think that is not the case in this field.

Q I think we are agreed that is not the case in this field. The testimony in your answer does show there is a wide variation in permeability? A Yes.

Q My question is, how can one well drain 320 with that wide variation in permeability which is sufficiently close to show up in a 160 acre unit?

A Well, the wells we were talking about will in time drain 320 just like they will in time drain 160. Some of the wells are so small it would take a long time to drain 160. We wouldn't certainly want to go to 320 to find a spot in the 160 acre tract where a man

could get the gas out faster.

Q That if it were located of low permeability would not drain an area where it is offset by wells in a high permeability, would it?

A It depends again on our, the relation of deliverability to reserves. In my own mind, I am certain, I feel certain that there is less gas in place under the wells that have the low deliverability as compared with the offset well with the high deliverability.

Q Have you made any examination of the permeability in various areas in the pool, Mr. Greer?

A Have I made an examination of what?

Q Of the core analysis on the permeability?

A Yes, sir, we have one exhibit here this morning.

Q How many wells are involved? How many cores did you have available to you?

A We had cores, I believe, on six wells. And in the exhibit which we presented this morning, was seven wells.

Q Was there a wide variation in permeability on those wells?

A The permeability seemed to range from on the order of about one millidarcy to 20 or 30 millidarcies.

Q How are the wells located in the West Kutz areaas to distance from the drilling unit, contrary to the drilling unit?

A The most recent rule called for a minimum distance of 990 feet from the corner. Some of the wells were drilled under different rules in which they could be 660 feet from the other well's tract.

Q As a matter of fact, a great number of your wells located on 320 acre tracts are drilled on 660 locations, aren't they?

A They are drilled 660 feet from one of the lines. Yes, sir, we took advantage of whatever distances we could in order to come as

close to uniform spacing as possible, and also to take advantage of terrain in keeping our costs down.

Q The wells are not centered on the drilling unit, isn't there danger of drainage across property lines?

A Oh, I think it is not material.

Q You say it is not material. Wouldn't this give a well that had a double allowable an unfair advantage over the other wells?

A I think not, if the well is assigned 320 acres in the field and 320 acres doesn't, then any gas that well takes from the field based on it's 320 acres, will surely be somewhat in proportion to it's proportionate share of the reserves in the field.

Q That would depend entirely on what the offset wells were and a good many other factors, would it not?

A Yes, I believe it is almost impossible to make an exact analysis of the reserves under each well in the field and prorate accordingly. That would be fine if it were practical, but I believe it would be impractical to try and do that.

Q I am a little confused. How can you prevent drainage under your formula the wells located as they are in the West Kutz, if some of the wells are given a double allowable?

A By double allowable, I suppose you are referring to 320 acre wells getting twice the allowable as a 160 acre well, providing it has the same deliverability.

Q That is right.

A No, sir, all other conditions being the same, if it has twice the area allocated to the well, then it's per acre withdrawal would be the same as the per acre withdrawal of the well on 160.

Q The point I am making, Mr. Greer, is that wells located on

660 location is nowhere near the center of 320 acre units?

A That I think is not material. If it were material --

Q (Interrupting) I assume that you believe the conditions being normal, the drainage is radial, more or less radial drainage?

MR. SMITH: I would like to object to the question in that it does not conform to the statute which specifically provides for taking into consideration counter drainage. I think, Mr. Kellahin, question could certainly embrace that factor.

MR. KELLAHIN: There has been no testimony about counter drainage in here.

MR. SMITH: I am talking about the statute.

MR. KELLAHIN: I am talking about the testimony.

MR. SPURRIER: Objection overruled.

A I believe I understand what you are trying to get at. If the distance that a well should drain were limited to a radius equivalent to 320 acres. For example, say that is 1800 feet, then you feel if there is a greater distance than 100 feet for any one well, particular radius of drainage, then it could not drain it's tract, is that what you are referring to?

Q In effect.

A Well, sir, wells will actually drain more than 320 acres as we demonstrated here earlier this morning. I think the Commission recognizes the fact that any of it's spacing orders, that it is not necessary for the well's drainage to be restricted to that radius set up by spacing only. For instance, the Commission nearly always gives us a certain leeway in locating a well on a tract. If it were, if the production of gas and oil were such that the wells would only drain that distance and no further, then I think the Commission

would set spacing rules which would require an exact center location on each well's tract. That is not the petition.

Q You are assuming in your answer that you have a uniform spacing pattern throughout the pool, are you not, with variation in location of wells?

A In our recommendation for an allocation formula we assumed that where a well is assigned 160, that the 160 were productive and where a well is assigned 320, the 320 is productive.

Q What is the pay size of the assumption?

A If that well's area as compared to the total field area, and that well's recoverable reserves as compared to the fields total reserves.

Q Did you assume that before you drilled a well?

A I believe that in all of our allocation formulas, that we go on the basis that the well is drilled on the tract. I don't believe the Commission ever assigns an allowable --

Q (Interrupting) Mr. Greer, do you know of any pool that has been drilled on a non --

A I didn't understand your question.

Q Do you know of any common source of supply developed on a uniform spacing pattern that exists in the West Kutz Pool?

A Yes, there are many fields developed like that.

Q Are there any in New Mexico?

A Yes, sir, the Fulcher Kutz has been developed on that uniform spacing.

Q Been drilled on what?

A Drilled on the different spacing pattern. That is the next closest field.

Q To what extent has it been developed on a non uniform pattern?

A There are a number of wells drilled according to Commission Regulation of 40 acres and subsequently a well has been drilled on a spacing order of 160.

Q There is no 320?

A Not in that particular field.

Q Do you feel that those wells drilled on 40 acres should be penalized due to the fact that they complied with the regulations of the Commission at the time they were drilled, in any way?

A Well, sir, we are getting out of the field we are talking about now, but I do have a definite opinion in that respect, I question if this is the place to put it in or not.

MR. KELLAHIN: I won't press it. That is all we have.

MR. SPURRIER: Anyone else?

MR. STOCKMAR: T. P. Stockmar. Frontier Refining Company.

CROSS-EXAMINATION

By MR. STOCKMAR:

Q I think you have stated the essentials of the following here that there is a wide variation in permeability throughout the field. That the deliverability and permeabilities with respect to any well are in more or less a direct relationship?

A No, sir, I didn't state direct. There is a definite relationship, but not a direct relationship.

Q I think you said a nearly direct relationship?

A When I said nearly direct relationship, I think we were talking about permeability and deliverability.

Q That is what I am talking about.

A I beg your pardon.

Q In other words, the deliverability is a measure of the permeability?

A It is a function of it.

Q Function of it? A Yes. Nearly direct.

Q I think you also stated that the permeability is a function or probably vice versa, the daily recovery of a particular well would be a function of the permeability of the sand penetrated by that well?

A The productivity of the well, yes, sir.

Q You also stated that the ultimate recovery from a particular well would also be a function of the permeability?

A Well, sir, that would depend on how the well is produced, whether it is prorated or allowed to produce unrestricted.

Q Under proration, a well encountering sands of a low permeability would then have a low ultimate recovery?

A There again it depends on the proration formula, but the chances are that under the type we are recommending it would have a lower recovery in that event.

Q I think either directly or by implication, you have said that the drainage of any particular well, drainage area of any particular well is also a function of the permeability?

A No, sir, I don't believe I said that.

Q I gather the reverse then, that without respect to the permeabilities on a particular well, the area of drainage would be the same?

A Wells in this field would drain a comparatively wide area as compared to the current spacing pattern, and the low productivity

well would drain this area just as a high productivity well would, only that it might take longer. There again --

Q (Interrupting) The difference as you see it then, is a measure of time?

A Partly a measure of time. I would like to point out --

Q (Interrupting) In a given period of time, the well of low permeability will not have the same effective drainage as the well of high permeability?

A Since we are talking about that, just a minute. Let me get some reasonable figure. For the wells we are concerned with in the West Kutz Field, we have the average deliverability on the order of five millidarcies --

Q (Interrupting) Deliverabilities, you say?

A Average permeability of five millidarcies, I would judge it would take something on the order of 60 days for the radius, the so-called radius of drainage for an average well to reach it's outer drainage area.

Q You are talking about the six wells that were cored?

A I am talking about the average well in the field.

Q You are basing your permeability averages on the six wells that were cored?

A Yes, sir, and it is a pretty good average. They were scattered over the field and they had average productivity and average net pay thickness comparable to the average well in the field. I believe it is a pretty good field.

Q Your answer to my original question then I gather, is that the difference in the period of time is not material without respect to the variation in permeability. You are only talking about 60

days that is not a material factor.

A I just don't know what you mean now.

Q I profess I didn't know what you meant by your reply. My original question was that in a given period of time a well with low permeability will not effectively drain the same area as a well with a high permeability?

A Yes, sir, that is true, but as you say, I don't believe that it is material as far as production or recovery of gas from this field is concerned.

Q I didn't say that. I think you said that.

A Yes.

Q It is hard for me to understand here if the permeability is in somewhat of a direct relationship to deliverability. If we are then talking about deliverabilities of these respective wells, I can't quite come around to your conclusion that a well with a low deliverability is going to have the same effective drainage as a well with a high deliverability.

A Do you mean that perhaps a well with a low deliverability would not recover it's share of the gas from the field during the time that the field is produced, is that what you mean?

Q Well, is that a fair statement?

A Since the productivity of the well is somewhat related to deliverability, a well that has a low pr uctivity will have a comparatively lower reserve, and although it produces at a lower rate, it will get it's fair share of the gas providing of course that there is a relation say we choose an allocation formula that exactly fits that well's tract in the field.

Q I wish you would clarify that formula, how the deliverability

of the well is the direct measure of the reserves of the tract on which the well is.

A I didn't say it was a direct measure. I said there was a relation between them.

Q What is the relation?

A The main fact has to do with the relation of permeability to connate water content. With lower permeability we have higher connate water content, which leaves a smaller void space for the storage of gas.

Q But there is a wide variation in permeabilities across any one section, there, I think you have indicated, or the probability of it?

A There could be, and of course for the purpose of allocation --

Q (Interrupting) The productivity of a particular well is not really a measure of the permeability of the entire tract on which it is drilled, but on the permeability of the sands in the immediate vicinity of the well, is it not?

A Yes, sir, I agree with you. But for the purpose of allocation formula, I think it would be very difficult for us to try to determine what the average deliverability of a tract might have been if we had the average sand characteristic of the whole tract. I think it is almost necessary to use that particular well's actual productivity. The operator drilled it in a poor part of the tract, why it is just unfortunate.

Q But that somewhat minimizes your statement that it is a direct, or some measure of reserves under that tract?

A It is true if the particular spot where the well was drilled is not exactly, does not have exactly average sand conditions for the

entire tract, the well does not represent the reserves under the entire tract.

Q You have stated on a 160 acre tract?

A I would like to add to that.

MR. SPURRIER: Pardon?

A I would like to add to that. That is one of the reasons why we include the 25% factor based on acreage, because a well might not be drilled to the spot that is actually representative of it's entire tract, and by adding acreage in as another factor in the allocation formula, we tend to equalize that sort of thing which might unfairly treat some of the wells.

MR. SPURRIER: We will recess until 1:15.

(Whereupon, the hearing was recessed until 1:15 p.m.)

AFTERNOON SESSION

July 14, 1954

MR. SPURRIER: Proceed, Mr. Stockmar.

A L B E R T G R E E R

CROSS EXAMINATION

(Continued)

By: MR. STOCKMAR:

Q I am interested in these interference tests that you have spelled out here. As I recall your testimony with respect to Test No. 5, the wells which are listed on the upper diagram or graphically shown in the other diagrams are the shut-in wells?

A That is correct. They were shut-in.

Q I think you also testified that those wells were shut-in for approximately one year after the time when the producing well that you testified caused the pressure drop herewith placed on production?

A I believe that is approximately right. They were drilled and completed and shut-in and tested about a year--

Q (Interrupting) After the wells which you say, caused the pressure drop were put on the production?

A Yes, it is a year to a year and a half.

Q I think you also indicated that the original reservoir pressure in that area was approximately 468 as maximum, something like that, didn't you?

A Yes, sir, that is about right.

Q It is difficulty to read the chart from here but we find that after a year to a year and ahalf, the best of those wells,

when shut-in reached a pressure of 463 and a half, one, 463 and one, 462 and a half, then you say that production for the two or two and a half months of the test caused a significant pressure drop. How do you account for the absence of any noticable pressure drop over the period of a year to a year and a half?

A I think if we project the drop in pressure which these tests reflect back over the previous months that it will show a reasonable time element for which the pressure drop was caused.

I might point out that it was not just the production during the time of the test that caused that pressure drop. I am sure that there was part of the gas which was produced, say a year earlier and caused a low pressure area around the wells which the gas was taken from, started gas migrating toward those wells. Even if we shut in the producing wells during the time of this test, there would be a tendency for pressure equalization so that the gas would be flowing toward the wells on the boundary of the area, although they were shut-in and that a pressure drop would continue to occur in the test wells due to this pressure equalization, so we can't say that the pressure drop was caused from production during the time of the test. But it definitely was caused by production from the period of a year and a half prior to the time that the test started.

Q That is partially academic but those wells were actually producing. Either way you are saying that a pressure differential will ultimately be reflected throughout the entire reservoir, aren't you?

A That is correct.

Q You held that particular test out as the most significant

test that you have ever seen published?

A One of the most.

Q Is that rather modest pressure decline an indication of a serious drainage?

A I pointed out earlier that the modest pressure decline, as you refer to it, is due to the fact that the tests were conducted early in the life of the field and there was a comparatively small pressure drop throughout the field. Even though the field was young with production of only a year or year and a half, the pressure drop was nevertheless reflected.

Q Early in the life of the field when the pressures are the highest, would you not expect the most significant equalization of pressures when the pressure differentials are at the greatest?

A I believe the pressure equalization will vary approximately as the square root of the pressure, the time of pressure equalization.

Q Well, as the overall field pressures reduce as time goes on here, would you not expect the slope of that pressure decline if you do another interference test to be substantially more level?

A Possibly it would be a little more level for the same amount of production.

Q Following that one step further then, as the pressure, as the general reservoir pressure does decline, you will have less significant drainage factor for any particular well, will you not?

A No, sir, it just takes a little longer for the pressures to equalize.

Q We are back to time again. Did you take a position with respect to the effect of one well drilled in this field, assuming as we probably have to here that it is a connected reservoir, would

that, then in time drain the entire field?

A Yes, sir, one well could probably drain all of the, or most of the recoverable reserves in any one common source of supply.

Q Then, your testimony with respect to the, and youropinion with respect to the drainage pattern which any well might establish, really has some element of time in it when you specify so many acres or radius of so many feet?

A Yes, sir, I believe I said earlier that under conditions of wide open flow that it would take longer for a well on 320 acres to produce its reserves than it would a well on 160 acres, but under the conditions of proration and depending upon the amount of restricted production and under a proper allocation formula we could have depletion of tracts drilled on 160 acres at the same rate as depletion of tracts drilled on 320 acres. It depends on your allocation formula.

Q Getting back to this efficient spacing. That is quite a problem we all recognize. In the last analysis, is it an economic problem if one well would drain the entire field given enough time. Aren't you measuring time against money?

A Yes, sir, that is,very definitely has to be considered.

Q Isn't that decision--

A (Interrupting) I would like to point out, I would not recommend that the field be produced with one well.

Q Pardon?

A I would not recommend that the field be produced with just one well.

Q The point is, you want to see the production sometime within a reasonable time, do you not?

A That is true.

Q That decision, that economic decision really is made by the independent operators and one of the factors which they take into account, is the permeabilities as they find them in their own wells, is it not?

A That is true.

Q Or in a particular area, if they should find an area of low permeabilities, whether reflected by core analysis or low initial potential, would it be sound for them to determine that their well should be drilled on a closer spacing than some other area where the potentials are higher and the permeabilities better?

A Well, sir, I don't believe in this field there is any area large enough to warrant its being considered as a separate field. The permeability varies through the field and from well to well but I don't think we could pick out any part of the field and--

Q (Interrupting) You said that deliverability or some function of permeability, have you examined the deliverability, the relative deliverabilities of all the wells in the field?

A Have I done what?

Q Have you investigated the relative deliverabilities of all the wells in the field?

A Well, yes, I have reviewed their productivities. We don't have deliverability tests this year on all of them.

Q For 1953 or 1954?

A For 1954.

Q From your examination of those, did you discover some average deliverability for the field?

A I am sure there is an average, I hadn't calculated it.

Q Were you able to form any conclusions as to whether the deliverabilities in the areas generally blocked out as the 320 spacing were higher than the average of the field or not?

A I imagine the deliverabilities there are higher.

Q By inference then, the deliverabilities in the area covered by the 160 spacing are lower?

A It is possible. I am not certain what the average would be, but it is possible, yes. I would like to point out though, that one of the reasons for the lower deliverabilities in the 160 acre spaced area is, because they have depleted their tracts at a faster rate than the wells drilled on 320 acres and thereby have a lower pressure and as a result have a lower deliverability. So, that is one of the reasons why the wells on 160 acres can have a lower deliverability than the others.

Q You say deliverability and permeability are related and permeability and, or rather daily production are related. The well with the low permeability then should produce its reserves as you spell it out at a faster percentage, should it?

A You are speaking in terms of its reserves?

Q Pardon?

A You are speaking in terms of reserves when you say percentage?

Q I am speaking in what you call the measure of reserves, I think that the records of the Commission will show that some of the higher deliverability wells have produced more gas per acre than some of the lower deliverability wells even though they are brought on the line much later.

MR. SMITH: I would like to ask if Counsel is testifying or asking a question.

MR. STOCKMAR: Some of each.

MR. SMITH: If he is going to testify, I would like to suggest that he be put under oath.

MR. STOCKMAR: It wouldn't change the testimony. I will stop testifying.

Q On the basis of your agreement with me that the average deliverability in the 320 spacing area is higher, any use of the deliverability factor in the formula you propose will benefit the 320 spacing area to a greater extent than it would benefit the 160 spacing area, will it not?

A Not necessarily. I believe that the 320 spaced area has higher reserves than the 160 spaced area per acre. It is therefore entitled to higher per acre allowable.

Q Maybe you can tell me how you arrived at 75 - 25 as a fair division?

A We have shown that there is a relation between deliverability and reserves.

Q A what, a relation?

A There is a relation, yes, sir. In some cases and in comparing some wells, it could be a direct proportion. In some cases, in comparing other wells, it may be that for twofold increase in deliverability there may be only a 20 percent increase in reserves. There is absolutely no formula that could be applied to the field which would exactly allow each well to produce its recoverable reserves. The formula we recommend, I believe, is a practical one and to the best of my knowledge and from my experience in the field, I believe that the formula we recommend will give each operator his fair share of the gas as close as it can be, practicably be done.

Q You feel it is a matter of reaching an approximate justice here?

A I believe it is as close as anybody can work out.

Q Why is it not a better approach, 50 - 50 arrangement?

A I don't believe 50-50 gives enough credit to deliverability.

Q That is your opinion based on these imponderable factors that we can't really assess at this time?

A It is my opinion, based upon my study of the field, yes, sir.

Q Getting back to this drainage of the field, you stated before lunch that without respect to time, the drainage area of any well, high deliverability or low deliverability ought to be the same again without respect to time?

A Yes, sir, any one well in that common source of supply could eventually effect the entire reservoir.

Q Interjecting the time factor, a low deliverability well will not produce as much gas in the given period of time as a high deliverability well?

A That is correct.

Q You stated with respect to your interference tests that those test wells drained singular patterns of from five thousand feet to a conservative 1920 feet, as demonstrated by the test as you analyzed it?

A That is correct.

Q Then, assuming that we have 320 acre spacing here, if we have two wells of substantially different deliverabilities offsetting each other, the high deliverability well would drain the lands under the low deliverability well, would it not in a given period of time?

A Well, it just depends. If the reserves under the respective

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tracts are approximately or bear approximately the same relation to the total reserves in the field as their respective allocation formulas bear to the total, then one well will not drain the other because this just produces its own gas and although it produces a higher rate--

Q (Interrupting)On your own statement, each well would be draining the same area actually, wouldn't it? Each well would drain the whole field if you let it alone?

A If you have a proper allocation formula each well will just about drain its respective tract.

Q In fact, you have some arrangement for compensating for any differential in drainage?

You have two wells on adjoining tracts, different deliverabilities, both draining the same area at the same time, the high deliverability well is going to produce more gas in the same period of time than the low deliverability well and producing from the same lands, so you do have significant drainage between wells of that nature?

A Not necessarily. If the wells reserves are somewhat in proportion to their productivities and there are some other factors such as 25 percent acreage taken into account in the allocating formula, it is just possible that each well would percentage wise produce its own reserves each month and there would be no cross drainage, there would be no differential in pressure.

Q Your statement then, that this formula you propose is one which will with approximate justice protect correlative rights here in the final analysis comes down to your opinion that deliverability is a measure of reserves?

A I said that deliverability related to reserves.

Q The whole basis of your holding forth/ the formula is based on that being an accurate representation of the reserves in this field?

A No, sir, it is based partly on the premise that the reserves are also related to the acreage under a well. We are suggesting that 25 percent of the gas be allocated on the basis of acreage alone. So, we do not consider deliverability, we also considered acreage.

Q You would have to remove deliverability entirely to permit equivalent production from 160's and 320's?

A I don't believe I understand your question.

Q Leaving only the acreage factor in the formula, assuming equal deliverabilities, you would then have a perfectly fair scheme, would you not?

A You mean--

Q (Interrupting) 320 acres gets twice as much as the fellow with the 160 acre reserve?

A I definitely feel that all other factors being the same such as deliverability, one well that has a deliverability of a million feet on a 160 acres and one well with a deliverability of one million feet per day on 320 acres, the well with the 320 acres should get twice the allowable of the well on the 160 acres because all other factors being the same, it has twice as much reserves and is entitled to twice as much allowable.

Q Getting back to your picture, however, though that the acreage in the present 320 spacing unit has substantially higher deliverability average than the area in the 160, I am running into

the dilemma here of finding where we have the equivalent deliverabilities throughout the field, you ought to be on a straight acreage basis, on your theory. You say that isn't so, so we will have to add in some element of deliverability. We find that your area has a significantly better deliverability average than ours does, so by adding any part of it in our respective position is being made worse instead of better than it would be on a straight acreage basis?

A Well, you aggravated that particular situation by drilling your wells too close together and dropping the reservoir pressure too fast. Therefore you don't have the deliverabilities that you would otherwise have.

Q We are back to the proposition there, our particular area the Frontier had relatively low initial potentials, having gotten into play--may I testify a little bit more--

MR. SMITH: Swear him.

Q Did you previously respond yes to my question that in areas of low permeability that bringing the economic factor into the picture as closer spacing might be perfectly appropriate?

A No, sir, I don't believe I said that.

Q Will you say it?

A No, sir.

Q To make a venture realistic, a party investing his money has to have a pay out within a reasonable period of time?

A That is true.

Q What do you consider a reasonable pay out period for a well of that nature?

A Well, we would like for them to pay out in two or three years

but, of course, sometimes it takes longer.

Q What is your--

A (Interrupting) Once they get past six or seven years, we are very reluctant to drill additional wells.

Q After six or seven years--

A (Interrupting) In other words--

Q (Interrupting) You are just trading dollars?

A In other words, if we think it is going to take six or seven years for a well to pay out, we certainly don't, we probably wouldn't drill it.

Q You would probably drill somewhere else?

A We would probably drill somewhere else.

Q You are now asking us to divide our return by 50 percent and approximately extend by twice the pay out time which we now are facing?

MR. SMITH: I don't believe there is any testimony in the record to predicate his question.

MR. SPURRIER: I don't either, if you want to cross examine the witness, you cross examine the witness. If you want somebody to testify, get a witness that you can swear.

MR. STOCKMAR: I really meant to frame that question--

MR. SPURRIER: I am sure you meant to all along but you sure haven't done that.

MR. STOCKMAR: I realize that.

Q Do you think it is fair, Mr. Greer, to approximately double the pay out period of some of the wells drilled on 160 acre spacing?

A You increase your pay out period when you go from 320 acres to 160 acres all other factors being the same because you deplete

the reservoir faster, the pressure drops off faster and your production rate drops off faster and the reason your 160 acre wells now have such low productivities is because you drilled them too close together and at the time that you drilled your wells, your company was advised about how the pressures would drop off and the production would drop off by drilling them too close together.

Q Mr. Greer, I want to ask you a few more questions here, if I may?

A I would like to add if you are concerned about your pay out time that shouldhave been considered at the time that I told your people that the pay out time would be longer when you drilled the wells too close together.

MR. STOCKMAR: That is all, Mr. Greer.

MR. SPURRIER: Mr. Howell.

MR. HOWELL: Ben Howell representing El Paso Natural Gas Company.

By: MR. HOWELL:

Q Mr. Greer, did I understand you correctly in recommendation of a minimum allowable of 100,000 cubic feet?

A Yes, sir, we recommend a minimum allowable of 100,000 cubic feet per well per day.

Q Suppose that a well is not able to make that minimum?

A We were concerned about that particular feature and we prepared some suggested rules in which we identify a marginal well because we realized that we can not ask for an allowable which a well could not physically make. We realize unless the minimum allowable on a marginal well is properly defined that it could put an undue obligation upon the pipeline company to try to take gas

from a field which it is physically impossible to do and we definitely do not have that in mind.

Q You would not advocate then giving any well an allowable of more than the well can produce, would you?

A That is true and in order to define that we have suggested as a starting point in defining this deliverability that we use to determine a minimum well or marginal well, not the individual wells shut-in pressure, such as is used in the deliverability test but use a pressure which is equal to one half of the field average shut-in pressure. That might best be explained by an example: supposing that the field average pressure is 500 pounds, then half of that is 250 pounds and a well which could produce a hundred thousand feet a day at the 250 pounds or less, could produce one hundred thousand or less at the 250 pounds, would be a marginal well and then it would be allowed to produce one hundred thousand feet a day or whatever amount it would produce at that one half of the field average shut-in pressure.

Q Well, I think you have answered the question. You are not advocating the grantings of allowable in excess of the wells ability to produce in any instance, are you?

A That is true, we would certainly not expect the pipeline company to install individual compressors to take gas that couldn't produce, say, against half the field shut-in pressure.

MR. HOWELL: That is all.

MR. SPURRIER: Mr. Wiederkehr.

MR. WIEDERKEHR: Mr. Wiederkehr, Southern Union.

By: MR. WIEDERKEHR:

Q Mr. Greer, I am somewhat interested in the method you arrived

at to determine your 75 - 25 allocation formula. I believe, in your graphs up here, first, let me ask you, what do you consider the average permeability in the West Kutz Field to be from the core analysis which you have taken which are representative, as you say of the wells in the field?

A I believe the average is on the order of five or six millidarcies. Definitely, I believe is between two and ten.

Q Between two and ten. Assuming then that it is say, five millidarcies, your net effective pore space then, from your graph would be around nine and a half percent, would it not?

A That is correct, for an average.

Q Your maximum permeability in the field is what?

A I don't recall what maximum permeabilities were but it appears to me that we had some permeabilities on the order of 60 and 70 millidarcies but there were not a lot of them.

Q What would you say or rather than say the uttermost, but say something that could be considered average in your upper level. In other words, what I am getting at, do you find many wells with a permeability of in excess of 20 millidarcies?

A I think probably an upper level for an entire well, I mean average for the entire pay section of the well probably would not exceed oh, 30 millidarcies.

Q At 30 millidarcies, your net effective pore space then, I believe would be about 16 percent?

A That is correct.

Q So, actually, then, when you go from 5 to 30, you have increased your permeability and therefore in part, your deliverability in a ratio of about 601 and at the same time you have increased

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your net effective pore space which we shall call reserve on a ratio of about two to one?

A That is correct.

Q That would seem to indicate using that criteria alone, that may be your allocation formula should be reversed and be, say, 60 percent acreage or 66 percent acreage and 33 percent deliverability, wouldn't it?

A If all the wells were within, just that particular range it could be.

Q Yes. Now, you do have some other factors that enter into reserves which we don't consider when we use permeability alone and that might be the variations in sand thickness throughout the field?

A That is true.

Q You have done considerable work in the field, what would you consider to be the maximum productive sand?

A Around 60 feet, I believe, is about the most we have had, of what I would consider effective producing sand.

Q Now, you have set a limit of a minimum limit of 100 MCF per day. From your experience, how much net sand would it take to give a 100 MCF a day deliverability, would you venture a guess on that?

A Of course, there again it depends on the permeability.

Q Yes.

A I don't have the figures in front of me now, but I believe, we have some wells with around 15 feet of sand that probably have around 100,000 deliverability.

Q I was going to use something in that neighborhood. Say,

we used 15 feet of sand then, your relationship between your sand, minimum and your maximum in so far as your allowables are concerned would be in the vicinity of four to one?

A I believe that is a good ratio, four to one.

Q That would indicate then, that using sand alone that your formula was exactly correct then, of 75 deliverability and 25 percent acreage then?

A Yes, I believe it would.

Q So, if we use one factor alone we get 75 percent deliverability and 25 percent acreage and turned around and use the other factor, we get somewhere around 33 percent one way and about 66 percent the other way. So, if we average those out assuming they both have equal weight, I wonder why we don't come up with an allocation formula of approximately 50 - 50?

A I don't make the same assumption, you do, that they have equal weight?

Q You don't?

A No, it has been my experience that the well that has, say, the 15 feet of sand is on the edge of the field and it also has a lower permeability and as such--

Q Has a lower net--

A (Interrupting)Has a higher connate water and higher effect of pore spacing so that it could be eight to one in difference in reserve for edge wells compared to center of the field wells.

Q I wanted that brought out. I am not arguing with you. One other question that has been brought up here is the effect of drainage between wells completed on 160 acre spacing and wells completed on 320 acre spacing. I think we have come to the conclusion that if

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they had the same deliverability then there would be no drainage, probably be no drainage involved?

A You mean if we give the 320 wells twice the allowable?

Q Twice the allowable, right?

A Yes, then the chances are there would be no drainage between tracts.

Q But, if they didn't have the same deliverability that would mean that, well, let's assume that the smaller tract had a lower deliverability--

A (Interrupting) Okay.

Q (Continuing)--and assuming the small tract had a lower deliverability with the same reserve then, they would be draining, wouldn't they?

A If that existed, of course, there would be. Of course, it is my thought that ordinarily with the lower deliverability there is a lower reserve.

Q You just beat me to it. So, then, you think then that due to the fact that the lower deliverability is also an indication of lower reserve that there would be no appreciable drainage even though the 320 acre well had twice the allowable of the 160 acre well?

A That is correct.

MR. SPURRIER: We will take a short recess.

(RECESS)

MR. SPURRIER: Anyone have a question of Mr. Greer?

RE-DIRECT-EXAMINATION

By: MR. SMITH:

Q How many wells in the field at present have been developed

on 320 spacing?

A 83 wells.

Q How many wells have been developed on 160 spacing?

A 83 wells.

Q In the event, the Commission should see fit to enter a proration order setting up a proration unit of 160 acres, would the operator who has developed on 320 acres be required, in order to protect his interests to offset to 160 acre density?

A In order to get his fair share of the gas out of the reservoir at the same rate, he would have to drill, there would have to be 83 additional wells drilled.

Q In other words, the area that has been developed on 160 acre spacing pattern would have ability to drain gas from 320 acre area over the ultimate life of the field? Well, what I am getting at, in order to protect the interest of the operators that developed on 320 acre spacing, he would of necessity have to drill additional wells, isn't that correct?

A Yes, sir.

Q I believe you testified that the wells out there cost approximately $20,000.00?

A That is correct, I think I said 19.

Q 19 to 20 thousand. If the proration order is entered 160 acre basis, it would probably require or could require the other operators in the field, that is the ones who have developed on 320 acre spacing to spend a $1,600,000 or a $1,500,000 in additional capital to protect their interest?

A That is correct, about a $1,500,000.

Q Would you consider that those additional wells are necessary in order to adequately get all the gas in this reservoir?

A Oh, no, sir. They are definitely not needed.

Q Under this order that you are proposing or being proposed by Stanolind and Benson and Montin, the privilege is granted to the operators, if they see fit to continue to produce the wells on 160 or drill additional wells on the 160 spacing, isn't that correct?

A That is correct.

Q If an operator is not satisfied with the deliverability of a well in a particular location and thinkshe wants to move over on 160, he can improve his lot in that manner, can't he?

A That is correct.

Q Well, I believe that you are recommending that the minimum allowable be assigned on a per well basis and not by proration units?

A That is correct. I believe the minimum allowable should be on the basis of per well.

Q Thus, the operator who has drilled 160 acres would be assured of a pay out in the event that he should drill the additional well?

A That is correct.

MR. SMITH: We would like, at this time, to offer our Exhibit 3 and 4, which were not formerly offered in evidence.

MR. SPURRIER: Without objection, they will be admitted.

MR. SMITH: No further questions.

MR. SPURRIER: Anyone else have a question of Mr. Greer, Mr. Kellahin.

RE-CROSS EXAMINATION

By: MR. KELLAHIN:

Q I have just one question, Mr. Greer, as I understood on re-

direct, you said if the unit were set at 160 acres, your company would be required to drill 83 additional wells, how do you arrive at that?

MR. SMITH: I would like to object to that. It was not his testimony. The Counsel shouldn't attempt to mislead the witness.

MR. KELLAHIN: I didn't intend to. It was my understanding that the answer--

MR. SMITH: Let the record speak for itself. I still say that wasn't his testimony.

Q As I understood your testimony, correct me if I am wrong, in the event the prorationing units were set at 160 acres, I understood you to say in order to protect the interest of the operators drilling on 320 acres, it would require the drilling of 83 additional wells at a cost of approximately one and a half million dollars, is that correct?

A We arrive at that by this manner. If 320 acre wells are not allowed, there, 320 acres in an allocation formula ,then, the 160 acre wells under conditions of proration would drain gas from the 320 acre spaced areas. That being the case, the only recourse an operator would have to prevent drainage from his lands would be to develop the land on 160 acre spacing and to develop the entire field to a density of 160 acres, would require the drilling of 83 additional wells, or the expenditure of a million and a half dollars, in order to protect correlative rights in the field.

Q Mr. Greer, you testified in Case 377, did you not?

A Yes, I did.

Q Did you not testify at that time that such drainage would not occur?

A I testified at that time that drainage would not occur from the Gallegos Canyon unit to the denser spaced area due to the drilling of a buffer zone of wells on 160 acres. This was under conditions, in which there was no proration and all the wells would then be produced against the comparatively same line pressure and under those conditions a buffer zone of two rows of wells will prevent drainage from one area to another. It will not prevent drainage from one offset well to another. But, under the conditions at which we were discussing it at that time, which are conditions of production of wells into the same line pressure unrestricted, then, a buffer zone of two rows of wells will prevent drainage from one area such as the Gallegos Canyon Unit into another area. If there is proration such t[illegible] the wells are not permitted to have an allowable consistent with their acreage then, the wells on 160 acre spacing will take the gas out faster than the wells on 320 acre spacing and there will be no possible room for compensation for the 320 acre wells ever to catch up because they will be restricted below their capacity to produce and they will not then havethe fair chance that a buffer zone would provide.

Q Well, the buffer zone, as you defined it, would still exist, would it not?

A Yes, sir, but it would be not as effective as under conditions where the wells produce against the same line pressure.

Q But it would serve as a buffer?

A It would, partially protect a large area.

RE-DIRECT EXAMINATION

By: MR. SMITH:

Q You testified only with respect to Gallegos Canyon Unit in

the North West part of the field. You did not testify with respect to the Southeastern part of the field. I will ask you if there is any such buffer zone existing in the Southeastern part of the field?

A I think the area of 160 spacing, where it joins wells of 320 is one where there is not a unit and there could not be considered a buffer zone there because there is a difference in the property rights and property ownership that we do not have in the north part of the field. Even though we were partially protected in the Gallegos Canyon area, the operators in the south end of the field would not be protected.

Q In order to clarify this business of partial protection from the buffer zone as I interpret your testimony, it is that the gas from the north west part of the field and from the south east part of the field, would pass through the buffer zone on its way to the area which had been developed on 160 acre spacing, am I correct in my interpretation?

A That is correct, that is what would happen.

MR. SMITH: That is all.

RE-CROSS EXAMINATION

By: MR. KELLAHIN:

Q Actually, Mr. Greer, you could expand your buffer zones with the drilling of a few additional wells without the necessity of drilling 83 more wells, could you not?

A We might pretty well protect the owners in the Gallegos Canyon area without drilling the entire area of 260 areas, the people in the south part of the field though have no such benefit of a unit that we have in the north part.

By: MR. MACEY:

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Q If this Commission were to adopt your proposed formula, let's assume that there is an operator in the field that has drilled his wells on 160 acre spacing and for the purpose of this example, he has two wells on the same basic lease adjacent to each other within the same north half of the section, one of the wells is a good well from the deliverability standpoint, the other well is a well that will deliver a 150,000 cubic feet a day. Wouldn't it be to his advantage to plug the small well and dedicate the 320 acres to the big well?

A I believe that would depend on the extent of proration. If the market were so greatly reduced that each well's allowable would be small enough that an operator would then benefit in such manner as you just pointed out, then, he could get a higher allowable from just one well on 320 acres as he could from the two wells on 160 acres. I don't believe that would result in reduced recovery because the well on 320 acres probably would drain the entire tract just as efficiently as the two wells would have drained it.

Q Did I understand you to say, under a reduced market condition, that that would be aggravated? You are sure it isn't the opposite?

A Well, if the market is so increased that each well can't make its allowable and each well then produced at close to capacity then, he would get more gas from the two wells because each well would be producing at capacity.

Q Do you have any idea what the total capacity of the field is now?

A I believe last winter that it was producing on the order of 40 million feet a day.

Q It was producing at more or less capacity at that time?

A I believe so.

MR. MACEY: That is all I have.

MR. SPURRIER: Anyone else?

RE-DIRECT EXAMINATION

By: MR. SMITH:

Q With reference to the question Mr. Macey asked you, that condition would be available to all the operators in the field if they wanted to improve their deliverability by plugging a commercial well, would it not?

A Yes, sir.

Q And a person having drilled one and ultimately made his investment in that particular well, would be unfair or unfair practice on his part to act in that particular manner?

A No, sir, I think not. The other well was an unnecessary well in the first place.

Q The same proposition would apply if the man had a weak well, low deliverability well on 160 and wanted to run the calculated risk of drilling on the other 160 acres in order to get a better well?

A Yes, sir.

Q Do you think that a man that would spend his money on that risk would be entitled to that benefit?

A Yes, sir.

MR. SMITH: That is all.

MR. SPURRIER: If no further questions, the witness may be excused.

(Witness excused.)

MR. TOWNSEND: We have just one other witness who will present the rules.

R O B E R T G. H I L T Z

the witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By: MR. TOWNSEND:

Q Will you state your name to the Commission, please?

A Robert G. Hiltz.

Q By whom are you employed?

A Stanolind Oil and Gas.Company.

Q Have you previously testified before the Commission?

A Yes, I have.

Q As an expert witness? A Yes.

Q Have you heard the testimony of Mr. Greer in this case concerning the proposed rules for prorationing in this field?

A Yes, I have.

Q Are you substantially in agreement with all of the testimony which he has given?

A Yes, I have had an opportunity to review his data and I am in agreement with his conclusions.

Q Based upon that, have/you caused to be prepared a set of proposed rules for the West-Kutz Field?

A Yes, I have prepared such a set of rules embodying the principles that he recommended.

Q Let's run through those rules, just a minutes so that we can, so that the audience can have the benefit of your recommendation.

A Rule 1, as proposed inthis form of order we are submitting

to the Commission makes reference to the size of the proration unit which we would recommend that the Commission adopt. (2) provides as Mr. Greer recommended for a standard proration unit of 320 acres but, because of minor deviations from normal surveys, it would permit any proration unit varying between 315 and 325 acres to be considered a standard unit for proration purposes. Under paragraph B of that rule, we have made a provision whereby an operator might have the option of drilling to either density to which he prefers in the field. That is, if he desires to maintain his density of development to one well to each 320 acres, he may do so, or if he elects to drill a second well on a standard proration unit of 320 acres, he may do so in conformance with the existing spacing rules in effect at this time.

Paragraph B also provides that an operator who now has more than one well now producing on a standard proration unit of 320 acres, may continue to produce those wells provided as the provision is made below that his allowable shall be determined in accordance with the applicable allocation formula. It also provides that any wells that are existing as of the date of this order on less than the standard proration unit of 320 acres, that he shall be permitted to produce those wells provided their is insufficient acreage available to attribute to the well for allocation purposes as a standard proration unit. In each one of the cases, of course, the allowable assigned to the individual well would be determined in accordance with the allocation formula recommended.

Q What does Paragraph C of thatRule 1 recommend?

A In any case, an operator would be permitted to drill a well on less than a standard proration unit without notice and hearing

if certain provisions are met. If those conditions do exist, authority to drill a well on less than a standard proration unit could be obtained by filing certain information with the Commission. The requirements that must be met in this case include the fact that the non-standard unit would consist of less acreage than a standard proration unit of 320 acres and that the acreage comprising that non-standard unit lie wholly within a legal quarter section and, of course, contains a well capable of producing gas into a transportation facility.

In addition, it would require that he must have waivers from all offset operators if such is to be obtained under the provision of Paragraph C.

Q What does Rule 2 provide?

A Rule 2 is a more or less standard provision which provides for the filing of nominations by the purchasers of gas in order to establish a market demand upon which the Commission can prorate gas.

Q Can you summarize the contents of Rule 3?

A Rule 3 makes additional provisions related to the system of nominations and provides for the filing of supplementary nominations each month. Rule 3 also provides a definition of a marginal well as previously referred to by Mr. Greer. I would like to read an excerpt from Rule 3.

"Marginal wells are defined as wells not capable of producing in excess of 100 MCF per day," but as Mr. Greer pointed out in order to give that any meaning we must establish a definition of a marginal well in terms of some of the other physical factors in the field. So, we have made this further provision that, "in calculating the capacity of a well to produce, the average shut in

pressure of all of the wells in the pool,as determined by the preceding years deliverability test, shall be divided by two, and each well's ability to produce against such pressure shall establish its capacity to produce." The further provision is made that, "all wells capable of producing in excess of 100 MCF per day," as determined above,"shall receive an allowable of at least 100 MCF per day." The further provision of Rule 3 relates to the allocation formula which would be employed by the Commission for allocating among the non-marginal wells that an allowable or that portion of the market demand remaining after the reduction of allowables which would be assigned to marginal wells, that provides for the distribution of that allowable to non-marginal wells onthe basis of 75 percent deliverability times acreage plus 25 percent acreage.

Q What does Rule 4 provide?

A It simply makes provisions for underproduction and Rule 5 covers the matter of over production. In effect, these two rules provide a period of balancing which will permit flexibility in producing allowables into the pipe line in accordance with expected fluctuation in demand. I would like to point out in Rule 4, we specify that balancing date shall be January 1st and July 1st. However, we are not wedded to those particular dates and since that is primarily a concern of the purchasers we would have no objection to those dates being altered to conform more to the requirements or desires of the purchasers.

Q Rule 6, 7, 8, and 9, what do they cover?

A They simply cover more or less standard provisions for the filing of the necessary information with the Commission in order that they will have the proper records which will permit them

to assign an allowable to a well.

Q It is your recommendation that these rules as you have outlined be adopted by the Commission?

A Yes, that is correct.

MR.TOWNSEND: I ask the reporter to mark a copy of that as Stanolind and Benson and Montin's Exhibit No. 5. We would like at this time to offer it in evidence.

MR. SPURRIER: Is there objection? Without objection, it will be admitted.

MR. TOWNSEND: That is all we have of the witness at this time.

MR. SPURRIER: Anyone else have a question of Mr. Hiltz? Mr. Kellahin.

MR. KELLAHIN: I would like to ask a couple of questions, if I may.

CROSS EXAMINATION

By: MR. KELLAHIN:

Q Mr. Hiltz, do these rules, would you interpret them as meaning wells now drilled on 160 acre spacing could be pooled into a 320 acre and the deliverability of the two wells be added in determining the allowable for that unit?

A When I prepared these rules, that was not contemplated.

Q Is that what you intended? You say it was not contemplated?

A It was not contemplated.

Q Calling your attention to Section B, sub-paragraph 3, I ask you if that would make such a provision?

A Was that paragraph 3 under B?

Q I will read it to you if you wish. Under Paragraph B, sub-

paragraph 3; "Produce all wells existing as of the date of this order on a standard proration unit."

A What is your question again?

Q My question is, where your wells have been drilled on 160 acre spacing, would that allow you to pool the two 160 then as 320 acre units and add your deliverability in determining the allowable to be assigned to that unit?

A Well, as I stated when we prepared the rules, we did not contemplate that additional tracts would be pooled for that purpose. I believe that is a matter that would require further consideration.

Q Wouldn't it be automatic under the provisions of these rules, Mr. Hiltz?

A Not necessarily, but I can't see that it would make any particular difference.

Q It would be merely a matter of adding the deliverability of two wells to determine your allocation, would it not?

A The rules as I prepare them so long as there would be two wells producing on a 320 proration unit each well would be assigned an individual allowable based on the acreage attributable to that well and a deliverability as measured by the annual deliverability test and in effect the wells would be assigned on an individual basis.

Q I don't think that is material. I just wanted your thinking on it. One other question. Under Paragraph C, sub-section 2, would seem to provide that you could secure a unit without notice and hearing provided that you filed waivers and so forth only if your acreage to be assigned was less than 160, was that your intention?

A No, sir.

Q It says legal quarter section, do you mean legal half section?

A If it said legal quarter, it should have read legal half, which would have been a standard proration unit.

MR. KELLAHIN: Yes, sir, thank you.

MR. SPURRIER: Mr. Grenier.

MR. GRENIER: A. S. Grenier, Southern Union.

By: MR. GRENIER:

Q I believe it was in Paragraph 1 - C, Mr. Hiltz, where you were talking about these non-standard units which we just found would be anything less than a legal half section. Is that the correct paragraph reference?

A Yes, that is correct.

Q You said, I believe, that provision was made that certain physical conditions had to be made and in addition to that, waivers needed to be obtained and submitted to the Commission from offsetting operators, is that correct?

A Yes, sir.

Q In your opinion, is the waiver procedure preferable to a notice procedure which would become effective in the absence of objection. That is to say, would you not feel that the same purpose would equally be well served if the operator desiring the non-standard unit were to show to the Commission's satisfaction that he had noticed the operators in the adjoining tracts and that they, within a reasonable period of time to be specified by the rules had not voiced an objection to the Commission?

A I think if a reasonable period of time were provided, there would be no objection to that procedure.

Q Would that be, in your opinion, more or less of a burden upon the operator than the waiver procedure, which do you think, would be easier for the operator to live with?

A The furnishing of a waiver, of course, would require a little bit more work. There is no doubt about that. I don't think it is significant.

Q The giving of a notice might be a little less work than another?

A Yes, administratively, it is a little less work.

Q I wasn't quite clear on this point of nominations and supplemental nominations, I gather that you are recommending that nominations be filed the beginning of each of the six months balancing period by each of the takers from the pool, is that correct?

A Yes, sir, that is correct.

Q And that thereafter, as and if they find that their demands are different that they will file supplemental nominations?

A I believe that the intent of this rule is identical with that, that is in effect in the southeastern part of the state.

Q Those make mandatory, the filing of supplemental nominations, do they not?

A That is correct.

Q Do you see any worthwhile purpose to be achieved through the filing of supplemental nominations if they are in fact the same as the original nominations? In other words, why should the supplemental nominations, in your opinion, be mandatory rather than optional?

A I think it gives a more current picture on a monthly basis of the exact requirements of the operator. I believe that the filing

of the original nominations requires that the operator express his desires to purchase gas by months.

Q So, that gives a picture by months, is that correct, as well as the total for the six month balancing period?

A Yes, that is correct.

Q So, that if, assuming that supplemental nominations were optional, if he failed to file a supplemental nomination, wouldn't that be a current indication that he thought he had been right to begin with?

A I assume that if any change were made, he would comply with the requirement that he file a supplemental nomination.

Q What I am getting at is this, why if your original estimate is right or so nearly right that you can't make a better one, should you have to go to additional administrative effort of your pipeline company, file a useless piece of paper just echoing what you said the first time, or is it a useless piece of paper?

A My feeling is this, that if the original nomination is filed by months and the operator in affidavit form affirms that is his desire to purchase by months for the ensuing balancing period and there is no change, then administratively the filing of a supplemental nomination serves no useful purpose.

Q So, you would have no objection to such a rule that made the filing of supplemental nominations requisite only if it were desired to change what the original nominations had been for a particular month?

A So long as there is to be no change, the balancing periods are adopted and current monthly records of actual production are filed with the Commission, at the moment, I see no absolute necessity

for requiring that a supplemental nomination indicating no change be filed.

Q I was talking about no other change except the one as between mandatory and optional, so your answer to the question would be yes, I gather within that frame of reference?

A Yes, I think so.

MR. GRENIER: That is all.

MR. SPURRIER: Anyone else have a question of Mr. Hiltz?

MR. STOCKMAR: Mr. Stockmar, Frontier, I would like to ask one. I did not understand the question or answer of Mr. Kellahin.

By: MR. STOCKMAR:

Q Where you have two wells on 160, which might be called a proration unit, did I understand you to say that the deliverabilities of the two wells could be added?

A No, sir, I did not testify to that effect.

Q Would you clarify that for me?

A Well, I don't believe first that we made reference to a case where you would have in this field, two wells drilled on 160. We were referring to a standard proration unit of 320 acres and the fact that as the field is now developed, you have many cases where a standard proration unit could be formed and there would be two wells in existence on that unit. I believe I testified that when these rules were prepared we did not contemplate the adding of deliverability on the two tracts and assign a single allowable to the proration unit, rather it was my thought that allowables would be assigned on individual well basis. That way, the Commission can much more readily maintain a current record of the actual production which is obtained from each well, so long as that well is maintained

on the proration unit as a producing well.

Q You contemplate then, proration units of 160 acres in part?

A We would provide that the standard proration unit be 320 acres but in light of the fact that development in a portion of the field has been less than that to this date, we would permit the operator to continue to produce both of those wells on a standard unit if the acreage could be assigned. His allowable would be determined for each well in conformance with the allocation formula.

Q As if each one was a separate 160?

A That is correct.

MR. STOCKMAR: That is all.

MR. SPURRIER: Any one else?

RE-DIRECT EXAMINATION

By: MR. SMITH:

Q In order to further clarify the point last discussed. In effect what you are recommending is that within a standard proration unit, that acreage will be allocated to whatever number of wells may be in that standard proration unit?

A That is right.

Q And each one treated separately?

A That is right, the total acreage in the proration unit would be allocated to the individual wells. If you had two wells on 320 then you would have to assign 160 acres to each well in order to be able to determine its allowable.

Q Then, you would apply the deliverability of the respective well to that particular well to determine its allowable?

A Yes, sir, that is right.

MR. SMITH: That is all.

MR. SPURRIER: If no further questions, the witness may be excused.

(Witness excused.)

MR. TOWNSEND: That is all we have.

MR. SPURRIER: Does any one else have testimony they wish to introduce?

MR. BARNES: Frank Barnes, representative for British American, before the next case goes on, I would like to make a brief statement that ties in with Mr. Greer's testimony.

MR. SPURRIER: Let's see if there is any further testimony then, we will take these statements.

MR. BARNES: It actually isn't a statement. We would like to tie our information in with Mr. Greer and Benson and Montin. I thought now might be an appropriate time to do it.

MR. SPURRIER: Does any one have any more testimony to introduce? Mr. Barnes--

MR. HOWELL: We have some testimony, Mr. Spurrier.

MR. SPURRIER: Mr. Barnes, you are on.

MR. BARNES: If you prefer, I could wait until all the rest of the testimony is in and make one brief statement when it is all over if that will speed it.

MR. SPURRIER: We will let you do that. Mr. Howell.

F. N O R M A N W O O D R U F F

the witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By: MR. HOWELL:

Q Will you state your name to the Commission, please?

A F. Norman Woodruff.

Q You testified before the Commission as an expert witness previously, as an engineer?

A I have.

MR. HOWELL: Are the witness's qualifications accepted by the Commission?

MR. SPURRIER: They are.

Q Mr. Woodruff, please state to the Commission what studies you have made with reference to reserves in this West-Kutz Field?

A My company makes continuing studies of reserve evaluation for the pools in which it takes gas. The West-Kutz Field is included in this group. I have taken the reserve evaluation prepared by my company for the West-Kutz Field or that portion of the reserve evaluation which has to do with net effective sand pay and similar to the manner in which I employed, testified to in the Blanco-Mesaverde Pool. I have determined a relationship between net effective pay and the initial potential of the wells in the pool upon which electric logs, gamma ray, neutronic logs are available.

Q Mr. Woodruff, does El Paso Natural Gas Company, your employer, operate any of the wells in the West-Kutz Field?

A No, sir.

Q How many wells did you find logs available on?

A 56 wells.

Q Are your studies based upon the wells only upon which logs were available?

A It is.

Q And please state what variations you found in your net sand pay within the field?

A Our variations varies from zero net effective pay sand thickness

to between 60 and 70 feet of thickness.

Q What do you count as net sand thickness?

A We have established a manner of evaluating net sand thickness from electric logs based on interpretation of the core analysis available and used that in a consistent manner on all logs which are available in a pool, in an effort to determine for each well, the net effective sand thickness.

Q Have you analyzed the, 46, did you say?

A 56.

Q The 56 well logs and prepared a graph showing the relationship between the sand thickness and the initial potentials?

A Such an analysis has been made under my supervision and with my help and I do have an exhibit showing my investigation.

Q I will ask if you will mark that as El Paso Natural Gas Company's Exhibit No. 1 and place it on the wall.

(Marked El Paso Natural Gas Company's Exhibit No. 1, for identification.)

Q Now, please state briefly what this chart shows as to the relationship between the initial potentials and the sand thickness, the net sand thickness in the wells studied by you.

A This exhibit shows that within reasonable limits, there is a straight line relationship between net effective sand pay and the initial potential of the wells.

Q As I understand the first marker, which appears on the left hand corner, that reflects the average of 6 wells that had a sand thickness between zero and ten feet, is that correct?

A That is correct.

Q And the average initial production from each well is less

than 250,000 initial potential?

A The average initial potential for those six fell, was 156 MCF per day.

Q Then, in the next group, is sand thicknesses from ten to twenty feet?

A That is correct.

Q How many wells did you average in that?

A There were 20 wells with an average initial potential of 976 MCF per day.

Q Just state each sand thickness that you took there and the results.

A The next isopachus interval was from 20 to 30 feet with an average thickness of 25 feet, we had 15 wells with an average initial potential of 1,424,000 cubic feet. The next interval was from 30 to 40, average 35 feet, ten wells average initial potential of 2,331,000 cubic feet. The next was from 40 to 50, average of 45 feet, two wells average initial potential 4,235,000 cubic feet. The next from 50 to 60 average of 55 feet, two wells average initial potentials 3,345,000 cubic feet. The next was 60 or better, one well average for the initial potential was 3,400,000.

Q Have you studied the relationship between the initial potential and the deliverabilities of these wells?

A Yes, I have.

Q What is that relationship? Is it a direct relationship or is there substantial differences?

A There is a substantial difference between individual wells, generally, over a field wide basis there is very little difference.

Q As to the average of the wells, is there a direct relationship

between the average deliverabilities and the average initial potential of wells in these isopachus intervals?

A Yes, sir, there is.

Q What do you conclude with reference to the factor which most accurately and fairly represents the recoverable reserves under the tracts in this particular field?

A The deliverability of the well.

Q The deliverability of the well does what?

A Well, it reflects the effect of the various factors which enter into the reserve calculations. All of the reserve factors except acreage, therefore, it is an indication of the variations of reserves between an acreage and acre underlying one well and an acre underlying another well.

Q What have you concluded as to the formula which would be fairest in giving to each operator or owner the right to recover his fair share of the recoverable reserves?

A Yes, I have considered such a formula.

Q What formula would you recommend?

A I would recommend a formula of 100 percent acres times deliverability.

Q Now, there has been testimony with reference to the small producing wells. What, if any, consideration would you recommend should be given to those wells?

A I think it would be proper for the Commission to determine that any well with a deliverability of 100 MCF per day or less be a marginal well and that it be permitted each and every day to produce its producing ability.

Q Now, as an approximal matter, would that let the smaller wells

with the longer pay out make all the production they were going to make any way?

A It would.

Q How would the mechanics work in handling these marginal wells? How would you recommend that the marginal wells actually be handled?

A First, a matter for determining marginal wells should be set up, which I consider, should be its actual producing ability. Then, the actual producing ability of each marginal well should be added together to get a total volume of gas which should be deducted from the total market demand for that pool. The remaining allocation should be divided among the remaining wells, non-marginal wells. However, by the application of the formula should other wells receive allowables in excess of their actual producing ability, they should then be placed in a limited or marginal catagory for that particular month, that allowable added to the allowable of the other marginal wells subtracted from the total market demand and the market demand then be allocated among the non-marginal wells by application of the allocation formula.

Q Now, in practice, is there actually a difference between any theoretical deliverability of a given well and its actual deliverability under field conditions?

A Yes, sir, there is.

Q What are some of the reasons for that?

A Well, the calculated deliverability is taken at a pressure equal to one half of the wells shut in pressure, which may be less than the actual pressure experienced in the field in production. Consequently, the well would be capable of producing less gas than its calculated deliverability. In addition to that the deliverability

calculated is based on a theoretical condition by that, I mean it is based on the casing pressure experienced flowing through the tubing or vice versa, where the actual production would be reflected by its actual flowing relative pressure.

Q Were wells in the marginal category that are shut in for any reason for repairs or for any reason that the operator should shut them in, does that well ever have an opportunity to make up the production it lost while it was shut in?

A Did you say a marginal well?

Q Yes.

A It would not.

Q Did you hear Mr. Greer's testimony with reference to the recommended 320 acre proration unit?

A I did.

Q Do you have any comment or recommendations to make to the Commission on that?

A I would concur with the recommendations of Mr. Greer in permitting the operator to assign 320 acres, if he so desired, to wells in this pool.

Q Are there any other points, Mr. Woodruff, in connection with the proration of this particular field that I haven't asked you about that you would like to make a recommendation to the Commission on?

A I recall none at this time. Except that, Mr. Howell, I would request that we be permitted to file rules, proposed rules for this pool as we did in the Blanco-Mesaverde Pool subsequent to this hearing.

MR. HOWELL: That is all.

MR. SPURRIER: Take a short recess.

(RECESS)

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MR. SPURRIER: Any one have a question of Mr. Woodruff?

CROSS EXAMINATION

By: MR. STOCKMAR:

Q Mr. Woodruff, you testified that you had examined 56 logs of wells in the field?

A That is correct.

Q Give me some idea of the distribution of the wells as to which logs were examined.

A The distribution wasn't over the complete pool as presently designated.

Q It was not?

A No, it was all the wells that were available and I assume all the logs that have been taken on the wells in the West-Kutz Pool.

Q Can you give me some idea whether there was concentration or not of the logs you examined?

A What is that?

Q Can you give me some idea if there was a concentration in the field of the logs that you examined? For example, how many wells of the Frontier Refining Company, did you examine logs on?

A I have no recollection of the logs as by company designations. I do seem to recall that we had quite a concentration of logs in the center area which is the area in which Frontier has their wells.

Q How about the Hancock area?

A I do not recall positively which company's logs we had but if you had logs in the area and they were available to us, I am sure we considered those logs.

Q Has your examination of the logs in the north west and south east portions of the field been substantial?

A It is my recollection that there was a scarcity of the logs in the north west portion of the pool.

Q I gather, none the less, that it is your opinion that the logs that you did examine are representative of the whole field?

A Yes, I considered that to be the case.

Q How do you arrive at the net effective pay which you used to break down the wells into classifications?

A As I testified, we set up a basis for evaluating net effective pay by the various logging means. That has been based on the information available from core analysis, from all information that has been given to us.

Q Were you able here to acquaint these logs with the core analysis?

A To a certain extent.

Q How many cores on the core analysis?

A My recollection, there were five cores.

Q In determining net effective pay, did you consider the factor of permeability? Did you set some minimum permeability?

A Permeability entered into the determination but not necessarily as such in that we attempted to pick that portion which we considered would be effective gas pay as interpreted from the log, all the indications on the log.

Q But you did not have an effective cross check of all logs against equivalent cores, core analysis?

A What do you mean by a cross check?

Q Well, some verification of the net effective pay section as you determined it on your log as against a core?

A Well, many of the cores were of just partial sections and,

of course, wouldn't cover the whole interval of the electric log. We found, my recollection, general correlation between electric logs, various types of logs and the core analysis, we also had--

Q (Interrupting) Did you--

A (Continuing)-- we also had some, the micro-logs which we consider effective means of determining net effective pay. That was a great help to us.

Q Is that part of the formation that you excluded from the net effective pay, in your opinion, sand that will never give up gas?

A We think it is a reasonable assumption that it will never give up any pressurable volume of gas.

Q Then, you are saying that you were able from those logs to pin down an area of zero permeability?

A I am sure that it would be approaching zero permeability. As I said, we did not use permeability alone in picking it out but certainly since productivity is related to permeability, the indication would be such as you indicated it.

Q I am sure that you know what the testimony of Mr. Greer has been to the effect that we have very low permeabilities in the field. I am trying to arrive at the point where you sawed off the permeability to give net effective pay?

A I can't point that point out to you.

MR. STOCKMAR: Excuse me a minute.

Q I think you went along with Mr. Greer in saying that deliverabilities are actually a rather effective measure of reserves?

A That is correct.

Q Would you list for me the factors that you consider in determining the reserves that are in the particular body of sand?

A Yes, sir, I use thickness, porosity, interstitial water content, pressure--

Q Pressure?

A And for the whole field, acreage.

Q The initial pressure of the whole field?

A If I am wanting initial reserves, the initial pressure of the whole field and I said acreage.

Q Permeability wasn't listed there?

A That is correct.

Q On that premise, Mr. Woodruff, if over a period of one year, you discovered that the deliverability of a well had been reduced to one half of what it was, the prior test, you would say that one half of the reserves would have been given up?

A I believe that one half of the reserve recoverable to that well would have been given up.

Q Aren't you injecting into that a factor of time?

A That was what the question was premised on, I believe, one year.

Q What are the factors which under the Commission's rules for determining deliverabilities are taken into consideration?

A What are the factors used in determining?

Q What are the factors which you consider in determining the deliverability of a particular well?

A You mean in the present state designated test?

Q Yes.

A Pressure and volume.

Q How are those related to the factors which you have listed as considering in the standard approach to determine your reserves?

A Did you say, how are they?

Q Yes, how are those factors related to those other factors which you listed as being considered in determining reserves?

A Of course, pressure was one of the factors which I indicated was used in determining reserve. The other factors enter into the ability of the well to produce gas.

Q Is that a measure of porosity?

A Measure of porosity.

Q I am trying to educate myself a little here. I have had some difficulty this afternoon in tying deliverability into reserves. I still fail to convince myself, at least, when looking at the deliverability sheet the factors that are considered here are the same as the factors which you list as considering in your consideration of the initial reserve.

MR. HOWELL: Is that a question or a statement?

MR. STOCKMAR: I am asking for assistance here to educate. I do not see the relationship.

MR. SPURRIER: Was it a clarification?

MR. STOCKMAR: It is a clarification of my prior question actually, as to the relationship between the factors considered on the one hand and those considered on the other.

MR. HOWELL: Has Counsel asked a question?

MR. STOCKMAR: I am asking for more clarification than he gave me in answer to the prior question in relationship to these factors.

A This deliverability test required by the State is a reflection of the formations ability to deliver gas into the well bore. That ability to deliver gas into the well bore is determined by the

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factors which influenced deliverability.

Q Well, in deliverability of a well is permeability a factor?

A Deliverability?

Q Yes.

A Yes.

Q The higher the permeability the higher the deliverability?

A That is correct.

Q Yet, permeability was no factor which you listed previously as determining reserves assuming some permeability?

A That is correct.

Q Then, we have that distinct difference in the factors that we are considering on one hand and the other?

A Well, you have the factor in that the word "permeability" was not used, but the factors upon which permeability are determined are included in the reserve estimate.

Q Assuming some permeability you must, under the reserve calculations, give some effect to the existence of the reserve?

A If you have permeability, did you say? Assuming it is a gas bearing reservoir?

Q Yes.

A Yes.

Q Without respect to whether it is high or low permeability, in your calculation of reserve, you give credit to that fraction of the reservoir as a permeable fraction, one which would give up gas ultimately?

A I believe your statement is correct.

Q You have stated that a well with high permeability will have a high deliverability, a well with a low permeability will have a low deliverability, assuming all other factors equal with respect to those two wells?

A What other factors?

Q Assuming every other factor that you have listed as being equal with respect to those two wells except the permeabilities, will you then be able to change the reserve picture?

A The other factors would not be equal and have variations in permeability first.

Q You listed acreage which could be the same, pressure which could be the same, porosity which could be the same, thickness which could be the same and interstitial water could be the same. What are the factors which could not be the same if the permeabilities were different?

A Interstitial water content and porosity.

Q You can not imagine the situation where the permeabilities of two sections of zone could be the same and the different interstitial water content?

A There may be a possibility if you had a certain range of porosity which would permit it.

Q Back to your statement that high permeability well will have a high deliverability. A low permeable will have a low deliverability and then your next statement that there is a rather direct relationship between those two deliverabilities and reserves, you are saying on theone hand that the low permeability has a low reserve, the high permeability has a high reserve. Are you saying that that is true as to a producable reserve in a particular period of time? Is that the distinction?

A Certainly, it wouldhave to be a recoverable reserve to the well.

Q Disregarding time as a factor and assuming that each parcel

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was sealed off from the others, would you still have a distinctly different reserve picture?

A You mean, between the well with high permeability and the well with low permeability, yes, sir.

Q Yet, there was nó factor in your original calculation of reserve?

A As I stated, you couldn't have had that without the factors differing in the reserve calculation.

MR. STOCKMAR: I think that is all.

MR. SPURRIER: Mr. Grenier.

By: MR. GRENIER:

Q Mr. Woodruff, did I understand that El Paso was submitting proposed rules at this time? Was that what you were talking about or were you just talking in terms of recommendations, generally? I wasn't quite clear on that point.

A You are referring to the portion of the testimony that I recall I indicated we would like to have the privilege of submitting rules subsequent to the time of this hearing.

Q I was correct that you are not putting them in at this time, is that correct?

A That is correct.

Q In recalling back to my questioning of Mr. Hiltz a few moments ago, you were present and heard that?

A Yes, sir.

Q On this question of waivers for setting up of non-standard units, do you feel that the waiver procedure is necessary or that a notice procedure satisfying the Commission that notice had been given with say, an adequate period of response, somewhere, 15 to 30 days,

would that work equally well, in your opinion?

A I think it would work equally well.

Q Do you think it would result in any saving of effort on the part of operators, not having to solicit waivers and being able to handle it by notice and procedure?

A I think it would.

Q On the matter of supplemental nominations as being mandatory or optional, do you feel that mandatory supplemental nominations are necessary?

A I do not.

Q Turning, if we may to, I would like to turn you to Exhibit No. 1 for a moment, if I may. At what point does the line which you have drawn there, intersect the level of wells in the 40 to 50 foot sand thickness, approximately?

A Approximately, 2.8 million per day.

Q What was the average initial potential of the well in that group, actual as opposed to theoretical for your line?

A 4.235 million per day.

Q In other words, the actual was about 50 percent higher than the theoretical, is that correct?

A That is, I believe, correct.

Q That represents a rather substantial variance, does it not, Mr. Woodruff? That is not what you would call a very close direct relationship, is it?

A For those two individual wells, I would say, no.

Q In other words, there was a rather material variance as to those two wells from your average, is that correct?

A Yes, sir, that is correct.

Q Have you made studies, respecting the basic data from which this study, of yours was prepared as to what the average deviation from the normal is per well in this field?

A No, sir, I have handled my evaluation on a field wide basis.

Q You didn't attempt to see how closely on the average wells came to your theoretical line, is that correct?

A Not on individual wells.

Q So, you do not know whether they are in a rather narrow band or in a rather broadly spread out band tracking this line, is that correct?

A I believe that is correct in that there may be individual wells which would deviate appreciably from the line, but the normal conditions for the major portions of the wells in the field would fall essentially along this line.

Q Then, as to the average, then your wells would fairly well adhere to the line but from well to well there might be rather substantial variations, is that correct?

A There may be.

Q Would a hundred percent deliverability formula tend, in any way, to compensate or correct for possible individual well deviations from that normal line?

A Well, as your deliverability, of course, is influenced by other than the net effective pay, it may. It may vary.

Q In other words, there are factors other than the net effective pay that cause the variances from your theoretical line, is that right?

A That may well have been the case.

Q Does deliverability give effect to those factors?

A It does.

Q To all of them?

A I would consider that it does.

Q Well, let me put it to you in this fashion. Taking a well having a certain initial potential, you assign it on the basis of that on your curve line here, a certain sand thickness for the area assigned to it as if it were a proration unit, is that correct?

A If I understand your question properly, that is not correct.

Q Well, is this chart of yours based on reserves per acre or per 160 acres or per 320 or per what?

A My chart reflects the net effective pay picked for those wells for which we had logs in the West-Kutz Pool and that is compared with the initial potentials of those wells.

Q Is that net sand thickness merely at the point of the well bore or is it your opinion that that condition should hold true throughout the proration unit?

A It is at the point of the well bore, of course.

Q Yet, if you make use of your formula, you are applying it across the entire proration unit, is that not a fact?

A That is correct. I think by the relationship that we have been able to establish that it is a reasonable approach to it.

Q Yet, we have seen some rather substantial variations there from this theoretical line of yours, would not the introduction of at least supplement of acreage component tend to alleviate and adjust those deviations which you have encountered in individual wells?

A I do not consider that it would.

Q In this field, is it or are you sufficiently familiar with it to know whether or not it is the general practice of operators to shut their wells or to sand-frac them or use other similar techniques

designed to increase their deliverability after they have first been drilled in?

A It is the practice to stimulate a well.

Q Do those practices customarily have any beneficial result?

A Customarily, yes.

Q By so increasing the deliverability, have these practices increased the reserves?

A They may well have increased the recoverable reserves to those wells.

Q Well, now, the recoverable reserves were there already, were they not?

A If it increased it, no.

MR. GRENIER: That is all.

MR. SPURRIER: Anyone else have a question? Mr. Kellahin.

By: MR. KELLAHIN:

Q You adopted Mr. Greer's testimony in recommending unit proration unit of 320 acres, is that correct?

A Yes, sir, that is correct.

Q You are familiar with the fact, of course, that part of the West-Kutz pool has been drilled on 320 acres and part of it on 160?

A Yes, I am.

Q Assuming that you set up your 320 acre proration unit and in the area where you have wells drilled on 160 acres on two adjacent tracts, one well with a very high deliverability and the adjacent well on a very low deliverability, wouldn't that result in a lower allowable for those two tracts than one achieved, if you had only one well of a high deliverability well on the 320 acres?

A May I restate that statement as I understood it?

Q You want me to restate my question? I got a little confused myself.

A You had two 160 acre tracts, one with a high deliverability and one, a low deliverability well?

Q Yes.

A Would you get the same allowable as the same 320 acres assigned just to the well with the high deliverability?

Q Yes.

A No, you would get less for the two wells on--

Q (Interrupting) It would be less?

A For the two wells, yes.

Q Wouldn't that possibly result in the plugging of the well of low deliverability in order to allocate to the high deliverability well?

A That would be to the discretion of the operator.

Q It is a possibility, is it not?

A It certainly is.

Q It is a matter of economics whether it was done or not done?

A It would be to the discretion of the operator.

Q Wouldn't it result in a premature abandonment of a well resulting in waste which is--

A (Interrupting) I don't feel it would be, result in economic waste because it is established that the one well would recover all the recoverable reserves.

Q Do you think it would recover all the recoverable reserves to the extent that the two wells would recover them?

A There would be some depreciable difference.

Q There would be a difference? A Yes.

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Q It would result in a premature abandonment of a well?

A If the operator desired it so be done. It wouldn't force it.

Q Are you familiar with the statute covering the premature abandonment of the well?

A Generally so.

Q Isn't that defined as waste?

A I recall that it is.

MR. KELLAHIN: I believe that is all. Thank you.

MR. SPURRIER: Anyone else have a question of Mr. Woodruff?

By: MR. SMITH:

Q Mr. Woodruff, with reference to the last matter discussed, would it be your opinion that if some person did see fit to plug the well at lower deliverability that the measure of deliverability of that 320 acres has been determined on the average deliverability of the two wells and that the Commission should consider limiting the full allowance of the high deliverability well in assigning allowables to that 320 acre proration unit?

A That they should consider the average between the two.

Q That is right, maintain the differential, in other words?

A I wouldn't recommend that.

Q You think that the party should be entitled to plug the well if he saw fit to do so?

A I think that certainly it should be a matter for consideration, both by the operator and both by the Commission as to whether that should be done.

Q Do you think that a differential having been established between two areas in a proration unit that the operator should be entitled to take the higher deliverability when it has been established

that another area in the same proration unit that he probably doesn't have the same amount of reserves?

A Well, if he didn't have the same reserve under the whole tract as indicated by the larger well, his pressure probably would drop faster and his recovery would be influenced because of that. I think that is probably an administrative procedure as to what is the proper manner of determining the deliverability of a well which under such conditions should be plugged if it should be permitted.

Q In other words, it is your recommendation that the Commission before permitting the assignment of a high deliverability for the entire 320 acres should take into consideration whether or not a well of lower deliverability on the same proration unit has been abandoned?

A I think that would be proper.

MR. SMITH: That is all.

By: MR. KELLAHIN:

Q You are familiar with the fact there is wide variation in permeability in the West-Kutz, are you not?

A Yes, sir.

Q The fact that you have a well of high deliverability located on 320 acre tract, does not necessarily reflect that the reserves under that tract are the same throughout, does it?

A No, it doesn't.

Q The same situation as was outlined by Mr. Smith could well exist on that tract without any information being available by which you could establish it, is that correct? In other words, if it were then drilled on 160 acres, the offset could well be a well of

low deliverability according to the experience in the West-Kutz Pool, is that not correct?

A Are you asking me if an additional well was drilled on 320 acres that the additional well might be a low deliverability well?

Q Yes.

A Yes, it might.

MR. KELLAHIN: Thank you.

MR. SPURRIER: Mr. Grenier.

By: MR. GRENEIR:

Q I don't mean to press this point but since I sat down, a suggestion was made to me that possibly you misunderstood my last question. I want to be sure that you did understand it and that your answer really was an accurate reflection of your views. I wonder if the reporter would be able to find it.

MR. SPURRIER: Restate it.

Q The question I asked you was, whether or not the reserves which were present after the artifical stimulating of the well, either by shooting or sand-fracing or some similar process, were there before the stimulatory process was applied?

A Were the reserves?

Q Were the reserves there before the stimulating was applied?

A The gas was in place prior to the stimulation.

Q And were the recoverable reserves there prior to the stimulation?

A No, not all of them.

Q Not all of the recoverable reserves were there, that is the particular point. Thank you.

MR. SPURRIER: Anyone else? Mr. Macey.

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By: MR. MACEY:

Q Do I understand your question, your answer in and to Mr. Grenier's question that the only way that you can recover all of the reserves under a tract is by artificially stimulating that well, each well?

A All the gas in place, is that what you have reference to?

Q The recoverable reserve is what I am talking about?

A I believe that your recoverable reserves are increased by stimulating of the well or portions of the gas in place which may not be and probably will not be recovered without the stimulation.

MR. SPURRIER: Any one else have a question of Mr. Woodruff?

By: MR. WEIDERKEHR:

Q On that same line, do you think that you can double the amount of gas that is under a well by stimulation that we have talked about the recoverable reserve. Do you think that you can double it or triple it?

A I would hesitate to set a figure but there have been wells that have been produced practically non or no gas that have produced sizable volumes of gas after having been stimulated.

Q If you think the well was making a million feet of gas naturally and you shot it to make four million, that you would have increased the gas under that tract, the recoverable gas by four to one ratio?

A I wouldn't say that.

Q In other words, then you, by answering that question, you have admitted, I believe, that deliverability then is not a straight line function of recoverable reserves?

MR. HOWELL: That is an argumentative question, drawing an

inference that the witness has not admitted, we object to the question.

MR. WEIDERKEHR: If I may, he did say that he did not think it would increase on the ratio of four to one. If that is so, if it won't increase on the ratio of four to one, I must draw the conclusion that recoverable reserves--

MR. HOWELL: (Interrupting) If we want to argue the point rather than question the witnesses, if every operator stimulate production in there as is generally the practice, your deliverability is between wells in which the same thing has been done. Your deliverability reflects the results of the same sort of stimulation.

MR. WEIDERKEHR: Identical.

Q If you had two wells, both of them making naturally a million cubic feet a piece, if you shot both of them, would you expect both of them to respond to that identically?

A Not necessarily.

Q If they didn't respond with corresponding volumes, would deliverability be a straight line function of reserve?

A If they didn't?

Q Yes. You said you didn't expect that they would respond correspondingly. You said in that instance if they did not respond in the same manner, would you think then that the reserves under these two tracts were proportional to their deliverability?

A I believe they very well might be.

Q Did you state that reserves were directly in proportion to deliverability?

A I said I have established the almost direct relationship between net effective sand thickness and initial potential and I think

that we have a very close relationship, almost straight line relationship in this pool between reserves and deliverability.

Q Mr. Woodruff, did you prepare the graph, yourself?

A I had help on it.

Q Did you see the data from which these various category of wells were averaged, the sand thickness and the initial potentials?

A Yes, I saw the data. I have not studied each individual well myself.

Q Do you have the data from which the curve was prepared?

A Only the final answer arrived at in each instance without regard to individual wells.

Q In other words, you don't have anything on individual wells?

A No.

Q You couldn't say then truthfully that if you had plotted these wells individually that you might not have had points all over your sheet of paper up there?

A I think I have so indicated previously to cross examination that I thought there would be variations from that line but I consider, Mr. Weiderkehr, that we are prorating this gas on a field-wide basis which, I think, is a proper manner for evaluating an allocation formula.

Q You consider the 56 wells out of the 166 to be average?

A I think it is the best indication of average conditions that we have available to us.

Q Did you consider in preparing this graph all wells that you had logs on regardless of the ability of the wells to produce?

A I believe that is correct.

Q Now, you did use the initial potential, do you know whether

those were all wells that had been stimulated or whether they might be some natural gauges and some stimulated gauges?

A It was a final reported initial potential. I would not definitely state that there might not be a well that was not completed naturally that had not been stimulated. I could not say positively as to that.

MR. SPURRIER: Anyone else have a question of Mr. Woodruff?

MR. UTZ: I would like to clarify one point.

By: MR. UTZ:

Q I believe you stated that you would recommend or did recommend a hundred MCF minimum?

A No, I did not state that. I would elaborate, if you care that I do so on what I did state?

Q I wish you would.

A I recommended that the Commission place in a marginal capacity any well that has a producing capacity less than 100 MCF per day.

Q That would be determined how, what kind of a flow test would you run to determine that? Would it be on production?

A That would be determined by actual production performance of each individual well.

Q Regardless of line pressure?

A That is correct.

Q Then, the minimum well could be varied by how you kept your line pressure?

A It could be.

MR. UTZ: That is all I have.

MR. STOCKMAR: Stockmar, Frontier.

By: MR. STOCKMAR:

Q I have labored under the apprehension that the chart was deliverability versus reserves. Do I understand it is initial potential?

A Yes.

Q What control do you have over taking initial potential?

A None whatever.

Q Arent they subject to wide variations in terms of the mechanics of taking?

A They were taking under the method and procedure prescribed by the Commission.

Q Were each of these so taken?

A I presume that they were.

Q You do not know it of your own knowledge?

A No, sir, I do not.

Q You do not know that there was a stabilized condition reached with respect to each of these wells?

A I doubt that they were because it was a three hour determination.

Q Was any Pitot tube taken? A Yes.

Q Are they subject to error? A Yes, they are.

MR. CRUMM: Did he answer Mr. Utz's question, I couldn't hear the answer.

MR. SPURRIER: Yes, he did.

MR. UTZ: He answered it.

MR. CRUMM: I couldn't hear it, my back was turned.

MR. SPURRIER: Is this a matter of personal information, can he tell you after the hearing?

MR. CRUMM: Yes, it is a matter of personal information. He

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can tell me afterwards.

By: MR. YOST: This is in connection with an answer that you gave to a question asked by Mr. Kellahin. Do you still feel that one well can efficiently drain 320 acres?

A I know nothing to the contrary. I believe it will.

. . .

Q I have a hard time in my analysis of that to reconcile that statement with the answer to Mr. Kellahin, regarding the two wells on 320 acres. Some of the gas would, which would other wise be ultimately recovered would not be recovered?

A My answer to that is based on efficient drainage of the 320 acres. With greater density of development, you can usually get a little more gas but it is not a pressurable volume.

Q Then, you don't feel that the pressurable volume of gas would be lost in the situation set forth here by Mr. Kellahin?

A No, I do not.

MR. YOST: That is all.

MR. SPURRIER: No further question, the witness may be excused.

(Witness excused.)

MR. HOWELL: We failed to introduce the Exhibit. May we introduce Exhibit 1.

MR. SPURRIER: Without objection, it will be admitted. Any one have further testimony? There being no further testimony, Mr. Barnes.

MR. BARNES: I am representing the British American. British American has a half interest in nine Pictured Cliff Wells in the West-Kutz Field of the Chambers Hancock. Time did not permit British

American to prepare any formal testimony or Exhibits on their own, however, we were kept informed of the progress of Mr. Al Greer's study and the work being done by Benson and Montin. We feel that the testimony and the work that was done by Mr. Greer parallels the interest of British American. At this time, we would like to adopt the testimony and the views of Mr. Al Greer as those of British American. Further than that, British American believes that the testimony that was presented previously by Mr. Fred Crumm for James Hancock has definitely indicated the need for some type of proration in the West-Kutz Pool.

We would like to ask the Commission in considering the various proration formulas that they try to keep the allocations and the nominations to the point, so they won't raise above the deliverability of the average well in the pool and in effect cancel out the prorationing. We would like to see a real prorationing in there and not just a nomination that the wells can't meet, so, that in effect the wells are all making whatever they are capable of into the line and the same inequality continues to exist as we have at the present time. That is all.

MR. SPURRIER: Mr. Kellahin.

MR. KELLAHIN: If the Commission please.

MR. SPURRIER: May I interrupt.

MR. KELLAHIN: I was just going to make a suggestion is all.

MR. SPURRIER: Go ahead.

MR. KELLAHIN: It now being a quarter of four and James D. Hancock would like to make a rather lengthy statement, I would suggest that we do the same thing we did in the Blanco-Mesaverde Case and permit us a certain time to submit the statements rather than

prolong the hearing.

MR. SPURRIER: That is exactly what I was going to say. We have no objection and we can not stop any one from making whatever statement they want to. However, we find that these summary statements are pretty well done. Apparently, you have more time and can give it more thought. Admittedly, it does save time for all of us. We don't want to be in the position of stopping any one from making a closing argument in case they want to do it. We do like these statements. We also not only accede to Mr. Woodruff's request to submit rules but we would like for you all to submit proposed rules as you see them for this particular proration and ratable take problem.

MR. KELLAHIN: Thank you. Are you going to set a time limit for the statements?

MR. SPURRIER: Yes. We are now discussing that. The Commissioner that you are going to submit them too here suggests August 1st. I think that is the date we will set. We will give you until August 1st to submit the statements and your proposed rules and regulations. Does any one have anything further?

MR. GRENIER: I would like to ask one clarifying question on these written rules, I don't want to burden the Commission with a lot of extra paper. I would like to give them enough copies to satisfy their own administrative needs on these statements. How many copies are used and useful?

MR. SPURRIER: Two. If no one has anything further in this case then it is taken under advisement and the meeting is adjourned.

(Meeting adjourned)

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

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 29th day of July, 1954.

Ada Dearnley
Notary Public, Court Reporter

My Commission Expires:

June 19, 1955

BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 696

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

COURT REPORTERS

ROOMS 105, 106, 107 EL CORTEZ BUILDING

TELEPHONE 7-9546

ALBUQUERQUE, NEW MEXICO

NEW MEXICO OIL CONSERVATION COMMISSION
MABRY HALL - STATE CAPITOL
SANTA FE, NEW MEXICO

REGISTER

HEARING DATE May 19, 1955 (Case 696 TIME: 9 am

NAME:	REPRESENTING:	LOCATION
R. G. Hiltz	Stanolind	Fort Worth, Texas
J. W. Eaton, Jr.	Stanolind	Roswell, N. M.
Ben H. Parker	Frontier Refining Co	Denver Colo
Ted P. Stockmar, Jr	" " "	" "
Howard C. Bratton	George J. Darneille	Roswell NM
George J. Darneille	Self	Houston, Texas
E W Nestor	Shell Oil Co	[illegible] N M
H. M Girner	" "	" "
A. S. Grenier	So. Un. Gas Co.	Dallas, Tex
A. R. Green	Benson - Montin	Farmington
E. B. GRANVILLE	The British-American Oil Producing Co.	Dallas, Texas
[signature]	[signature]	[illegible] City
[signature]	O C C	[illegible]
Lewis D. Galloway	El Paso Natural	Farmington, N. Mex
F. Norman Woodruff	" "	El Paso, Texas
[signature]	OCC	Hobbs, N. M.
Foster Morrell	Independent	Roswell, N. M.

NEW MEXICO OIL CONSERVATION COMMISSION
MABRY HALL - STATE CAPITOL
SANTA FE, NEW MEXICO

REGISTER

HEARING DATE CASE 696 TIME: 9 am

NAME:	REPRESENTING:	LOCATION
W. Rudy	OCC	Santa Fe
[illegible]	OCC	Santa Fe
Emery C. [illegible]	O.C.C.	Santa Fe
D. W. Rucker	Pubco Pet., Inc.	Albuquerque
Bill A. Street	Pubco Pet. Inc.	Aztec
Trevor Rees-Jones	NM Oil & Gas Co.	Dallas, Texas
R. A. Montgomery	OCC	Hobbs
Bruce T. Howell	EPNG Co	El Paso
E. C. Arnold	OCC	Santa Fe
J. M. Anderson	Shell	Hobbs
R. E. Campbell	U.S.G.S.	Roswell
J. J. Coots	So. Union	Dallas
William E. Wilson	So. Union Prod.	Dallas

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico

May 19, 1955

IN THE MATTER OF:

Request of Stanolind Oil and Gas Company, seeking an order requiring ratable take or proration of gas production in the West Kutz-Pictured Cliffs Gas Pool, San Juan County, New Mexico. Case No. 696

Rehearing to be limited to a reconsideration of the provisions of Order R-566 performing to the establishment of proration units and to matters raised by petitioner's application for rehearing.

Before: Honorable John F. Simms, E. S. (Johnny) Walker, and William B. Macey.

TRANSCRIPT OF HEARING

MR. MACEY: The first case on the docket is the rehearing in Case 696. Mr. Smith.

MR. SMITH: We are ready.

MR. KELLAHIN: Before we start on the hearing, I would like to enter the appearance of Western Development Company as successor in interests to James D. Hancock and Company, Limited. In that connection, ask that the Commission take notice of its own records in regard to the transfer of the wells formerly held by James D. Hancock, Limited, in the West Kutz-Pictured Cliffs Pool.

MR. BRATTON: I would like to enter an appearance for Mr. George J. Darneille as successor to the interest of Benson-Montin in the Gallegos Canyon Unit in the West Kutz Pool.

MR. MACEY: Mr. Smith, as applicant, are you ready to proceed?

MR. SMITH: We are. At this time I should like to enter an appearance on behalf of Seth and Montgomery on behalf of Stanolind Oil and Gas Company. Mr. Frederici is here from that firm. This is a rehearing of Case No. 696, application for which was made by Stanolind Oil and Gas Company.

I believe that the Commission might be apprised of some of the history leading up to this presentation, since it embraces quite a few hearings and quite a few orders in several cases. In this West Kutz Field, the first information with respect to action taken by the Commission, or the first case, is Case 237 in which was entered Order R-46. The date is November 21, 1950. This was a general order covering several pools in the San Juan Basin, setting up 160-acre spacing in the West Kutz-Pictured Cliffs Pool. There is nothing of record with the Commission to show that any evidence was entered at that time with respect to proper spacing. This order was amended in Case 598 by Order R-397, dated 12-17-53. This amendment is of no significance with respect to this proceeding, as it related to the location of wells.

On June the 19th, 1952, in Case 377, Benson and Montin's application was made for an order establishing uniform 320-acre spacing of gas wells in the Pictured Cliffs formation of the Gallegos Canyon Unit Area and adjacent lands in Township 28, 29 north, Range 12 and 13 west. On July 24, 1952, in the same case, Order No. R-172 was entered, finding that apparently one well will efficiently, effectively and economically drain an area of 320 acres. The testimony in that case which was before the Commission, indicates that more than 320 acres could and probably was being drained by one well. The order, however, provided that the 320-acre spacing

would be in effect for one year from that date, and that a year from that date cause should be shown why the area should not be developed on 160 acres.

On June 23, 1953, in Case 377, Order R-172-A was entered, which was a mere continuance providing that the case should be heard not later than September 17, 1953. On September 17, 1953, under the terms of Order R-172, the Oil Conservation Commission requested Benson and Montin to appear to show cause why 160-acre spacing pattern should not be instituted for Pictured Cliff wells in the Gallegos Unit Area, to supersede the temporary 320 spacing order earlier granted.

On December 17, 1953, Order R-172-B, we find that the Commission made certain findings that the Gallegos Canyon Unit Area developed on 320 acre spacing pursuant to Order R-172, and that the balance of the West Kutz-Pictured Cliffs was developed on 160 acre well spacing and producing units. That development of the pool on two different spacing patterns is not in the best interest of conservation, and will impair correlative rights. Order R-172 was terminated and lands embraced are to be developed on 160-acre spacing pattern providing that the Gallegos Unit shall be subject to the terms of the Unit Agreement. On May 3, 1954, new case 696, we find the application of J. D. Hancock for an order requiring ratable take of gas in the West Kutz-Pictured Cliffs, or in the alternative for the prorationing of gas production in the pool. This case was continued on several occasions, and on July 14, 1954 a hearing was conducted on Mr. Hancock's application.

On December 23, 1954 in Case 696, Order R-566, we find first issued the special rules for the West Kutz-Pictured Cliffs Pool

which sets up 160-acre proration units; provide for an allocation formula which was 75% acreage times deliverability plus 25% acreage, and sets out the limits of the pool and provides for certain other miscellaneous rules which are not pertinent to this inquiry.

On January 7, 1955, Order R-566-A in Case 696 amended Rule 3 of the basic rules, field rules, regarding the location of wells which also is not pertinent to this hearing.

On January 19, 1955, Stanolind Oil and Gas Company made application for a rehearing and the order was granted limiting the rehearing to a reconsideration of the provisions of Order R-566 performing or relating to establishment of proration units, and to the matters raised by Stanolind's application for rehearing. That gives the Commission a very brief outline of the proceedings which have lead up to this rehearing.

At this time I should like to move the Commission to adopt all the proceedings in the cases which I have enumerated so that they may be made a part of this record. I believe that all the interested parties were there at the time and have had occasion and opportunity to be fully familiar with those proceedings, and it will avoid the necessity of duplicating that testimony at this time.

MR. MACEY: Would you mind naming the case numbers?

MR. SMITH: The proceedings in Case 237, 377 and 696.

MR. MACEY: Is there objection? Without objection the testimony and exhibits in Case 237, and 377, and 696 will be introduced in the record in this case.

MR. SMITH: With respect to the matters under particular review at this time which has to do with the proper amount of acreage that may be assigned to a well in the West Kutz Field, I

should like to state to the Commission that I have examined the various transcripts of testimony in the cases which have just been enumerated. It is difficult for me to visualize the entrance by the Commission of the order that it did enter in this case, restricting the development on a hundred sixty acre basis. I find nothing in any of the cases enumerated, of an affirmative nature of any substance whatsoever which supports the entry of 160 acre prorationing. To the contrary, we find any number of references in the testimony which is indisputed, that indicate that wells in the West Kutz Field will efficiently and adequately drain more than 320 acres.

It is indisputed in the record that there is communication throughout the entire field, and that production from any point in the field has an effect upon production elsewhere in the field, and it is also indisputed in the record that the amount of gas that would be recovered by drilling two wells on 320 acres is negligible. I believe the testimony at present as to the effect that it is on the order of three-tenths to four-tenths of one percent, and there is further testimony that that quantity of gas would probably be dissipated during the process of drilling an additional well.

So that under the circumstances, it may well be said that the requirement of the Commission that an additional well be drilled in order to protect the applicant's correlative rights, would result in actual physical waste. In addition to that, we have the circumstance that if the gas may be recovered on 320 acre proration units, that would be recovered by the one well, then it is a requirement on the part of the applicant who has developed on 320 acre spacing that he spend money unnecessarily bringing the case, as I view it, squarely within the provisions of the act governing the

proceedings of the Oil Conservation Commission.

I should like to direct the Commission's attention to what I consider to be the pertinent provisions of the Statute. I will not attempt to read them into the record since the Commission is fully familiar with them, but I direct their attention to the provisions of Section 12-C and Section 13-B, as Section 13-B has been amended. I call your attention to the provisions of 12-C and the sentence which reads as follows: "In protecting correlative rights, the Commission may give equitable consideration to acreage, pressure, open flow, porosity, permeability, deliverability, and quality of the gas and to such other pertinent factors as may from time to time exist as insofar as practicable prevent drainage from producing tracts in a pool which is not equalized by counter drainage."

I should like to direct the Commission's attention to the fact that before you get to the question of drainage, the language is permissive, it uses the word "may". When it gets to the question of preventing drainage it is mandatory. It says it shall, any such order is to prevent that situation to occur. With respect to 13-B, the Commission is fully familiar with that provision, it has been discussed in other cases. It provides specifically that the Commission shall take into consideration in determining proration orders, the necessity or the requirement directly or indirectly on the part of the Commission's order to require the drilling of unnecessary wells.

It is our position that the record as it now stands, it is undisputed that the effect of limiting the proration units to 160 acres when development has been 320 acre basis, certainly that is ~~the effect of indirectly requiring the drilling of that well in~~

order to prevent the movement of gas into an area which has been more closely developed. With that brief statement, I should like to proceed to call Mr. Greer as a witness.

MR. KELLAHIN: If the Commission please, if the Commission please, we want to object to the introduction of any further testimony in this case and as grounds therefore, refer the Commission to the applicant's application for the rehearing. I do not have a copy of it, the only pertinent provision in the application for rehearing which sets forth any matter to be presented at said rehearing is contained in paragraph 4 of the application which reads as follows:

"Movement would show the Commission that no evidence was offered by any party at any of the hearings in said case, which showed or tended to show that the proration units in this pool should be 160 acres. That on the contrary, the only evidence which was offered by any party on this question as to the size which the proration unit should be, was the evidence of Stanolind Oil and Gas Company and Benson and Montin to the effect that the proration units in this pool should be approximately 320 acres. That under the state of the evidence in the record in this case, the standard gas proration unit should therefore be fixed at approximately 320 acres."

There is nothing else presented in the petition for rehearing except a reference to the record which has already been made in this case which Stanolind saw fit to limit themselves to that extent, that is their privilege.

In connection with our argument against the introduction of any testimony, I would like to refer the Commission to New Mexico Statute covering rehearings and appeals from the orders of this Commission. The section being Section 65322 of the 1953 compilation,

and it is set out as Section 19 in the Chapter 168 of the 1949 compilation. That section provides the procedure for securing a rehearing which must be filed within twenty days and so forth. Under Section B it provides the method by which you obtain a court review and among other things it reads as follows: "Providing, however, that the request reviewed on appeal shall be only request presented to the Commission by the application for rehearing".

If the Commission is to proceed at this time and receive additional testimony upon which they could conceivably base a new order and we were forced into the position of taking the appeal, we would then be precluded by this Statute from presenting anything which was not presented in their application for appeal. The application for appeal covers an attack on the record, as it now exists they cannot now come back and supplement that record and thereby evade the provisions governing appeals from this Commission. Had they seen fit to do so, they could have asserted in their application for appeal that we have additional testimony to present on this subject, or this or this, and certainly under the Statute they would have been entitled to do so. They failed to do that. They have, therefore, limited themselves to the record as it now exists. They are at liberty to argue the record. We are at liberty to argue the record, and whoever sees fit can take an appeal within conformance of the Statute. If the Commission follows the policy of permitting additional testimony, then we nor Stanolind would be in a position to take an appeal according to the Statute.

We object to the introduction of further testimony in this case.

MR. SMITH: May it please the Commission, I believe that Mr. Kellahin's statements are perhaps a little bit more narrow than are

contemplated by the Statute or the application for rehearing. It is fundamental that you make an application for rehearing, and if the Commission turns you down then you go up on the record as it then stands. It is discretionary with the Commission as to whether or not it shall or shall not grant a rehearing. Our right of appeal is contingent upon the action of the Commission in denying the motion. This was a motion that was filed. In the discretion of the Commission it has come forward and said, "Yes, sir, we will have a rehearing" and set forth the terms and circumstances under which the rehearing will be conducted, it being a discretionary act and the action of the Commission being set forth in the order granting the rehearing. The subject matter of this proceeding is the subject matter set forth in the order set forth by the Commission which Mr. Kellahin referred to. It is necessary that you have a denial of a motion before you can go up. It is necessary precedent if the rehearing is granted that you go up on appeal based on the testimony and the evidence that was brought forth at the rehearing, and all the proceedings that may have been incorporated in that rehearing by reason of the earlier action. It is fundamental that a rehearing is a hearing and that the door is open to everything that was in the record in the original case.

MR. STOCKMAR: T. B. Stockmar appearing for Frontier Refining Company. I think Mr. Smith's response to Mr. Kellahin's objection is accurately enough stated, but I think it begs the fundamental question of the scope of the rehearing which is the matter that was within the discretion of Stanolind to apply for.

They seem to have clearly limited the scope of this rehearing to the one issue of whether or not there is evidence in the record

which supports the order. On behalf of Frontier, I would like to concur heartily in the objection made by Mr. Kellahin and make it for Frontier.

MR. REES-JONES: Trevor Rees-Jones, representing New Mexico Western Oil and Gas Company. I would also like to concur in Mr. Kellahin's motion. We came here for New Mexico Western Oil and Gas Company knowing only of the petition for rehearing which was entered in this case by Stanolind. As Mr. Kellahin and Mr. Stockmar have said, that petition for rehearing hinges on whether or not the record to date has any testimony which will support the Commission's order. There was nothing in that petition to indicate that we were to be faced with new testimony. There was nothing in the petition to indicate that we would come forward with testimony of our own.

MR. SMITH: May I have a copy of the order?

MR. MACEY: The original order?

MR. BRATTON: I would like to make a statement on behalf of Darneille supporting Mr. Smith's position in presenting further testimony at this hearing. I believe the order of the Commission entered there, it calls for a reconsideration of the provisions of Order R-566 pertaining to the establishment of proration units. Mr. Kellahin rises to the point that on appeal to the District Court either the proponents or opponents would be limited to the record based at the original hearing that the record now made could not now then be entered. If he has a valid objection, which I doubt, I think he is making it prematurely. He can make it at the time that the appeal is made to the District Court. He can move to strike what record is made at this time. The Commission has entered an order calling for testimony. Mr. Rees-Jones rises to the point

that he is not prepared at this time. It is a serious matter to his client. It is very definitely a serious matter to my client. If he is not adequately prepared, he could move for postponement or continuance.

I think very definitely Mr. Darneille desires to be heard. I think the matter is of sufficient importance to the Commission and to the industry to be fully considered as the Commission has so decreed in its order. I support Mr. Smith's position.

MR. FEDERICI: I concur with the statements made by Mr. Bratton and further call attention of this Commission to the particular matters that he was talking about in the orders of the Commission. It provides that matters to be considered on rehearing shall be limited to a reconsideration of the provision of Order 566 pertaining to the establishment of proration units and to matters raised by petitioner's application. It is double-barreled in that particular order. How can this Commission reconsider its order unless it does have some testimony which might differ from what has been introduced before? The purpose of the rehearing is to give the Commission something new, something additional to go on. In addition to what it had before. It is not an appeal. Mr. Kellahin is trying to make an appeal to you where you would review the record. Mr. Kitts and Mr. Kellahin know that the purpose of a rehearing is to have additional evidence that might bear on the question in point.

I really frankly feel that it would be error for the Commission to deny a rehearing by reason of the statements made, or the contents of the application.

MR. SMITH: I would like to inquire of Mr. Rees-Jones if he doesn't have a witness here to testify?

MR. REES-JONES: May it please the Commission, Mr. Bratton didn't quote me right. My point is the legal point that in the state of this record, we are not under notice that we are supposed to appear to give testimony. Stanolind has made quite a point of the fact that the record to date has no testimony in it which supports the Commission's order, that is the one legal point on which they can rely. They are faced with a dilemma since they now have appeared and want to put testimony on themselves. If the testimony is cumulative, then I say the Commission need not hear the testimony. If they have new testimony to offer, then in their petition for rehearing why was that point not made? I am not making the statement, however, on behalf of New Mexico Western Oil and Gas Company that I do not have a witness here. I state that on the state of the record, I am not on notice that I should bring testimony to this hearing.

MR. SMITH: I should like to make inquiry of Mr. Stockmar if he does not have a witness here.

MR. STOCKMAR: We came here to reconsider the provisions or the language of Order R-566. I feel certain that the application and the order of the Commission would permit arguments to be made as to the weight to be given to the evidence that was in the order. We have present Dr. Glenn Barker, an official of the Frontier Refining Company, who would be prepared to participate in such an argument. He could be called as a witness if testimony were given. Our purpose in coming here, however, is to argue with you as to the issue raised by your application for rehearing which is, in our view, very strictly limited to whether or not the evidence now of record supports the order of the Commission.

MR. SMITH: I should like to ask Mr. Kellahin if he does not have a witness available.

MR. KELLAHIN: The question, I think, is highly improper. It has no bearing on the question before the Commission on the basis of my objection. It is immaterial to this Commission at the present time in ruling upon this objection, whether anybody in this room has a witness prepared to testify or not. The question is going to be the ruling of the Commission. Then it is incumbent upon any operator to put on any testimony in the event it is necessary to do so. Whether you have a witness to testify or not is immaterial to the ruling on my objection to this testimony.

Mr. Federici and Mr. Bratton have brought in the question of this order granting the rehearing. The language of the order says they were going to reconsider the portion of the rule pertaining to proration units. That reconsideration is based upon Stanolind's application for a rehearing which is based exclusively upon the record which is made. The Commission can, under the terms of the application, reconsider the provisions of the rule governing proration units as provided in their order based upon the record, which is already before the Commission, and any argument that may be made for or against such units as may be determined taken from the record as it now exists.

It has no, there is nothing in the language in that order which would indicate in any way that additional testimony is going to be received by this Commission, and as Mr. Stockmar has pointed out, they are without notice, the New Mexico Western is without notice insofar as the legal aspects of the case are concerned, that additional testimony would be received or would be required.

MR. FEDERICI: The very fact that the parties who are making objections have witnesses is very important for this reason. They claim now, we are surprised; therefore, we can't go ahead with the hearing. It goes to show that these parties knew what was coming up and therefore there is no reason for disallowing the rehearing at this time.

MR. KELLAHIN: I would like to point out that I did not say I had brought a witness here. I am entitled to any engineering or geological counsel I have.

MR. BRATTON: Do you wish to ask for time or produce witnesses?

MR. KITTS: I didn't know anyone was surprised.

MR. STOCKMAR: We are not very much surprised. We are strongly of the opinion that the attempt should be denied. They should be limited to arguments as to the record as it now stands. I don't know anyone was claiming surprise, that is the point.

MR. MACEY: Gentlemen, Mr. Kellahin's motion is sustained. Any argument in this case will be limited to the argument of the record as it exists.

MR. SMITH: May it please the Commission at this time, I make tender of proof of the evidence which has been excluded by the Commission. I would like to call Mr. Greer as a witness for the purpose of making my bill of exceptions.

MR. MACEY: Proceed.

A. R. GREER

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. SMITH:

Q Mr. Greer, you testified in Case 696 on the original hear-

ing, I believe?

A That is correct.

Q At this time I should like to ask you if you have available information with respect to the stage of depletion of the reservoir at the time of the original hearing. What was the stage of depletion of the reservoir with respect to the initial reserves in place?

A This has to be as of the time of the hearing?

Q You can testify as to the time of the hearing and bring it on up to date.

MR. REES-JONES: As I understand the ruling of the Commission, there was not to be the introduction of any new evidence and the argument would be solely concerned with the record prior to today. Is that not correct? This is for clarification.

MR. MACEY: That is correct.

MR. REES-JONES: Then I object to the introduction of any evidence by Stanolind Oil and Gas Company through Mr. Al Greer, the witness, who is now on the stand. As I understand it, Mr. Greer is an engineer whereas we are today going to be limited to legal argument as to whether or not the record to date supports the Commission's order. There is no place for the introduction of any testimony by an engineer.

MR. SMITH: Perhaps you didn't understand the purpose of putting the testimony on. I am preserving my bill of objections.

MR. REES-JONES: I am objecting to introduction of any testimony. I understand what you are doing.

MR. HOWELL: May I suggest in the interest of time and all, that it would be proper for Mr. Smith to make his bill of exceptions before the reporter later on if necessary, and make a complete bill

at that time without taking the time now to go into the testimony which he wishes to tender and which has been excluded.

MR. KELLAHIN: I agree with Mr. Howell and the matter of proof should be made by Mr. Smith himself by virtue of statement to the Commission as to the purpose. There is no need to call Mr. Greer as a witness now in order to make the offer.

MR. FEDERICI: I don't know if that is a proper way to preserve the exceptions or not. The Supreme Court says you go into the testimony you are going to bring out and the offer of the attorney would not be considered sufficient. That is the point I would have to discuss with my attorney here. If the Commission will give me just a second here.

MR. MACEY: We will take a short recess.

(Recess.)

MR. SMITH: I believe there was a question asked and the objection, and the Commission hasn't ruled as yet.

MR. KITTS: What was the question?

MR. SMITH: I asked the question and Mr. Rees-Jones objected, and I don't believe there was a ruling yet.

MR. STOCKMAR: Prior to any ruling, I would like to make the same objection on behalf of Frontier.

MR. KELLAHIN: I would like to make the same objection on behalf of Western Development Company.

(Testimony and objection read.)

MR. MACEY: The objection is sustained.

MR. KITTS: The Commission, in sustaining Mr. Kellahin's motion, the effect of that ruling is that no new evidence will be heard at this hearing in this case and that the matter for consid-

eration here is confined to the record as made. We feel that under the scope of our ruling, that any tender or offer of evidence which pertains to new matter is therefore improper, and that the applicant has an appealable ruling of the Commission by our sustaining of Mr. Rees-Jone's motion. The applicant, however, wishes to make this tender to preserve its record on appeal, if appeal is taken. For that reason the applicant may make his tender to the reporter.

So far as the question goes of sustaining or denying the tender, we are assuming that the offer of proof relates to new matter. However, there is a slight possibility that the tender could include matters of argument on the record which would be properly in the scope of this rehearing, and therefore, we do not want to be in the position of denying it, denying some matter that might be properly within the scope of the rehearing. For instance, if it were a matter of argument or pointing out claimed deficiencies in the record. We understand the tender will pertain to new evidence which could not be heard in this rehearing. We will not rule on that until we see that perhaps there is some matter of argument properly within the scope.

MR. STOCKMAR: If there is such a tender, it can properly be tendered at this time.

MR. KITTS: We could not wish to deny the tender sight unseen where there might be something in there where the Commission might be in error on the scope of its own ruling.

MR. STOCKMAR: It is within the power of the proponents to make such arguments at this time. I object to the permitting of the tender simply because it might be something they are properly authorized to give at this time. If there is something within the

rehearing which they may argue about now, they should do it now. We object strenuously to there being in the record, evidence or testimony and arguments which are not properly subject to cross examination and rebuttal testimony.

MR. KITTS: Perhaps we might be able to clear this matter up by asking the applicant at this point if there is anything in the tender which is argument on the record as we now hav it.

MR. REES-JONES: I will object, if the Commission please. I will hold my objection if Mr. Smith wants to answer.

MR. KITTS: I don't mean pertaining to the subject.

MR. REES-JONES: My point is that we object to the introduction of any testimony in this hearing today. There are two matters which the Commission can consider. It can consider testimony which comes from witnesses sworn and placed on the stand. It can consider argument which is generally here made by counsel, but can be made by others and properly so. In today's hearing if Stanolind Oil and Gas Company wants to argue through Mr. J. K. Smith or Mr. Bratton or anyone else as to the testimony heretofore taken by the Commission, I think they should have the right to make such an argument and be heard.

However, New Mexico Western Oil and Gas Company here and now objects to the introduction of any testimony. I cannot see that the introduction of any testimony from any witness sworn and placed on the stand would be proper. You made the point that some of the testimony is in the nature of argumentative testimony. I believe any argument can come in unsworn through attorneys or engineers who want to get up now and speak to the Commission, no evidence should come in at this hearing through sworn testimony from the

stand. We are limited to the record as it now stands and can make argument on the record as it now stands.

MR. KITTS: The objection was to hearing any new testimony.

MR. REES-JONES: The word "new". I object to the hearing of any testimony. I think it is in accord with the Commission ruling this morning on Mr. Kellahin's motion that no testimony be taken. We are limited to the record to date and no new testimony or no testimony of any nature whether new, whether pertaining to matters already in the record, should be introduced today. We object to the introduction of any testimony.

MR. KITTS: Can representatives of the applicant answer the question I asked before the objection?

MR. SMITH: Ask the question again.

MR. KITTS: Does any of the evidence contained in the tender, is it argumentative, is any of it argumentative material or material by way of argument on the record as it now stands?

MR. SMITH: I may answer that question by saying it is both.

MR. MACEY: Mr. Rees-Jones' objection is sustained. This Commission will hear no new testimony in this matter.

MR. SMITH: Do I understand from the Commission ruling that our tender of testimony is also refused?

MR. MACEY: Yes, sir.

MR. BRATTON: I would like to offer the testimony of Mr. George J. Darneille and do I understand that the Commission will make the same ruling and reject the tender of his testimony in this matter?

MR. MACEY: Yes, sir.

MR. SMITH: I would like also to tender the testimony of

Mr. R. J. Hiltz, the same ruling on that, I assume?

MR. MACEY: Yes, sir.

MR. BRATTON: To clarify the record, do I understand that we are not allowed to tender into the record their testimony as they would testify to if permitted?

MR. MACEY: That is right.

MR. BRATTON: On behalf of Mr. Darneille, we except.

MR. SMITH: On behalf of Stanolind we except to the ruling.

MR. FEDERICI: To clarify the record, the word tender as used here means offer of proof, correct?

MR. KITTS: Proof of what?

MR. FEDERICI: Offer of the proof that we intended to put on.

MR. WALKER: You are referring to new testimony or testimony that you intend to argue on the record?

MR. FEDERICI: Both.

MR. WALKER: In other words, you intended to argue the record as well as introduce new testimony?

MR. FEDERICI: I think so. Perhaps a little bit of both, as Mr. Smith said.

MR. MACEY: We are in no way forestalling any arguments that anyone might want to put on here today as far as any type of argument, but there will be no testimony. If anyone wants to stand up and be heard in the matter, let's proceed.

Gentlemen, the Commission is reversing its decision regarding Mr. Jones' objection to Mr. Greer's testimony. This Commission will hear any testimony concerning matters which are contained in the original record. Any counsel directing questions toward any witness shall confine his questions to evidence which is contained

in the original record. Does everyone understand?

MR. SMITH: No, sir.

MR. WALKER: What don't you understand?

MR. SMITH: I don't understand the statement meaning that additional testimony can be put on yet it can't be.

MR. WALKER: There is no misunderstanding on the part of the Commission. We mean you are not going to introduce any new evidence, that does not pertain to the original record.

MR. SMITH: If the point was in the original record, additional testimony can be put in on that point. Just what testimony can we put in, I would like to know, because I have to ask the questions. What is the nature of the testimony that we could put in under the ruling?

MR. WALKER: What testimony did you intend to put in when you asked for the rehearing?

MR. MACEY: You didn't intend to put any new evidence in?

MR. SMITH: I think we did.

MR. MACEY: Your application doesn't say so.

MR. SMITH: It isn't necessary.

MR. STOCKMAR: It seems to me that the existing record contains the evidence and is the evidence which may be again weighed or reconsidered. Any testimony would have to be limited to strict repetition of the language that is already in the record, and therefore completely useless.

MR. KITTS: Let me make one statement here. This was of primary concern to the Commission a minute ago. We had ourselves in the position of refusing to hear any testimony. Now, perhaps the applicant, this would put us in this position, perhaps the

applicant could put on a witness who is an expert in examining and discussing records. Have you studied this record? Yes, sir, I have studied it for forty-five hours. Do you find on the basis of your study, do you find any reference at all to, say, 160 acre proration units? Yes, sir, I do. Are there many? No, there are a few. That would be the gist of it.

MR. SMITH: Are you talking about the record in the case?

MR. KITTS: Yes. Would you review the testimony, and these are the questions that might be asked, would you review the testimony and give it in some reasonable form to the Commission, that evidence pertaining to 320 and 160 proration units? The applicant could very likely put that on and that would be his testimony.

MR. STOCKMAR: Isn't that testimony in the realm of determining a legal question as distinguished from a factual question?

MR. KITTS: I don't see what would prevent them from calling a witness for that purpose. I think that type of testimony, I don't know what the applicant has in mind. That type of testimony would be pertinent in the nature of a comment on the record and a pointing out to the Commission what references there were to, say, 160 acre units and what to 320 acre units. That - we would be in a position by a previous ruling a few minutes ago of denying that, even that. That is the Commission's fear.

MR. STOCKMAR: Isn't that an appropriate denial where the question is a question of law and not a question of fact which can be adduced by testimony? We can have opinions with respect to what the law might be, and those might be stated by counsel. But it is not a pertinent question as to whether or not the evidence supports your order. That is a legal question. I think the comments ought

to be limited to legal opinions.

MR. KITTS: When a Commission such as this is as concerned with the record of the parties to the hearing, they are naturally interested in preserving as perfect a record as they can. I agree with you that that knowledge certainly is commonly in the realm of legal argument.

On the other hand, can that always be anticipated what turn certain lines of testimony might take? I think quite possibly that a witness without arguing the legal point could point out here and there just confining his comments to the record, not arguing, when the evidence is substantial, but merely pointing out the evidence in summary form.

MR. STOCKMAR: We have no objection to statements to that effect. It seems outside the realm of testimony.

MR. KITTS: Well, the question also, could you properly deny the right of an applicant to put it in that form if that is the way that they state that they can most beneficially produce their case?

MR. STOCKMAR: You could deny the engineer a position of an expert what the legal question is.

MR. KITTS: I think we have explained our reluctance to cut off all testimony whatsoever. We have ruled there shall be no new evidence pertaining to the matters brought out in the last hearing. That this hearing should be confined to the record as it exists, and to determine the question whether or not that record, the record sustains the order as entered by the Commission. I don't know how we can put it any more clearly than that.

MR. WALKER: I think we can clear this up one way or the

other. It is the decision of the Commission to reverse itself on the ruling of Mr. Jones, also Mr. Smith, Mr. Bratton, Mr. Federici. We reversed ourselves to you and anyone else who has any testimony or witnesses you wish to put on. We will take it as it comes, either deny it or what have you. We will take it just as it comes, Mr. Smith, if you wish to continue with Mr. Greer.

MR. KELLAHIN: I would like to note for the record an exception to the Commission's ruling in regard to the testimony.

MR. STOCKMAR: Same on behalf of Frontier Refining Company.

MR. REES-JONES: New Mexico Western Oil and Gas Company excepts.

MR. MACEY: The record will so show.

MR. SMITH: I assume that the Commission ruling on the question asked Mr. Greer still stands?

MR. MACEY: We would appreciate if you would start from scratch.

(Original question read.)

MR. STOCKMAR: I think right with the first question might be the time to get a clarification of the status under which we are proceeding. Is it the Commission will accept any testimony without reservation, any testimony offered, or it will review each phase of testimony and determine if it is new testimony or not?

MR. WALKER: Each phase, you have a perfect right to object to any question that counsel puts.

MR. STOCKMAR: Then we object to this particular question covering matters outside the scope of the record.

MR. KELLAHIN: We join in the objection.

MR. SMITH: I think the subject matter is covered in the

question. The reserves were covered in the record as before the Commission now.

MR. STOCKMAR: Would you point that out to us?

MR. KELLAHIN: The question goes further than that, it includes the status of depletion at the time of the hearing, and I do not think there was any testimony in the record on that phase.

MR. SMITH: May it please the Commission, the record is before the Commission. It is not my duty to point out a specific place.

MR. STOCKMAR: That is my precise point. That is, all the evidence that is admissible is before the Commission and can be read by the Commission at its leisure.

MR. WALKER: The Commission puts the burden of proof on you, Mr. Smith.

MR. SMITH: Thank you, Mr. Commissioner. In the interest of time I will proceed with other questions and at the first opportunity I will try to satisfy Mr. Stockmar.

MR. MACEY: The Commission goes ahead with its decision that Mr. Smith is ready to proceed. Proceed with other questions, Mr. Smith.

Q Mr. Greer, there has been testimony in this case with respect to the relative pressures of areas within the field developed on 320 acres and on 160 acres. By way of illustration of such testimony I will ask you if in your opinion there is a tract of land comprising 320 acres upon which are located two wells and offsetting it a tract of land comprising 320 acres upon which is located one well. Under the present proration formula which has been issued by the Commission, would there be drainage, assuming conditions of

deliverability be the same between two tracts of land?

MR. KELLAHIN: We object to the question as covering new matter in that it calls for the application to existing facts as of today, the proration formula which was adopted previously to the hearing, and is not in the record. Further, it calls for an expert opinion applied to existing facts which though they may have existed and be in the record of the original hearing, presents new testimony in that it is expert testimony offered for consideration of the Commission at this time and is not necessarily testimony reviewing the old record. It is new testimony.

MR. SMITH: I disagree with counsel based upon the record as made. The testimony now is to what the law is now.

MR. WALKER: Objection sustained.

Q Mr. Greer, it is my understanding that there is testimony in the record that there is a variance in pressures from one area of the field to another. I will ask you if from examination of the record, I believe you have testified that you have been present all through the preceding hearings and that you had occasion to examine the transcript of those proceedings?

A Yes, sir.

Q I will ask you from your examination of that transcript, if the fact that there exists a differential indicates to you that there is drainage from one area of the field to the area of the lower part of pressure.

MR. KELLAHIN: We object to the question in that it at this time calls for an expert opinion which would constitute new testimony.

MR. WALKER: Objection sustained.

MR. SMITH: I would like to state to the Commission that if the witness were permitted to testify, that he would have testified that the lower pressures indicate drainage to a particular area. I should like also to point out at this time to the Commission that the record is complete as to the fact as to lower pressures that have been developed on the 160 acres and I make the offer of proof at this time.

MR. MACEY: Any objection to counsels offer of proof?

MR. KELLAHIN: I object to the offer of proof for the same reason stated. I do not want the Commission to allow a pattern to be set for offering expert testimony at this rehearing in view of the Commission's ruling on the question of receipt of new testimony, any expert opinion offered would necessarily be new testimony which could have been offered at the prior hearing, but was not. It may have been, I don't know.

MR. MACEY: Objection sustained.

MR. SMITH: Do I understand the Commission's action with respect to the preceding question, it is to have the same effect as the one that I just stated? I don't know if I made myself clear or not, probably not. But I want it understood that the action of the Commission in sustaining the objection of Mr. Kellahin in each instance is the same.

MR. WALKER: As long as the Commission considers it new testimony, that is right.

MR. SMITH: I might state at this time I am having extreme difficulty in understanding the distinction that is being made with respect to what constitutes new testimony and what does not constitute testimony. In effect, as I understand the ruling of the

Commission, and I want them to correct me if I am in error, it is to say that any words that Mr. Greer utters over there is bound to be new testimony. I would like to be clarified in that point.

MR. WALKER: Would you like for the Commission to clarify it?

MR. SMITH: I would like for the Commission to set me straight on this. I have an honest desire to put before the Commission what I consider to be true facts and true arguments in the case. I made no attempt to stand on technicalities. I tried to get the entire case before the Commission, as I think it should be put. I think that the rather technical objections being urged have led the Commission, and I know it has led me into a great stage of confusion as to what type of testimony we can be permitted to put on and what type we can't be permitted to put on. I would like to help the Commission and I would like to have a little guidance.

MR. WALKER: As long as you put a question to the witness and there is objection, the Commission will base its decision upon whether or not we think it is new testimony. Would counsel think it would help matters if we had a ten minute recess?

MR. SMITH: I think it would

(Recess.)

Q Mr. Greer, I believe you testified on June 19, 1952 before the Oil Conservation Commission in Cases number 363 and 377 which were consolidated, as follows:

"I would like to go a little further with our reserve figuring that the line pressure will eventually be lowered to 150 pounds. We will ultimately recover about 95½ MCF per acre foot, which for 40½ feet of pay is about 3,850,000 cubic feet per acre. That is a, we feel, a quite reliable figure. We have behind it all of our

reservoir work, our net pay thickness, porosity and connate water and reservoir pressure, which we can measure quite accurately, and we feel that that figure is more accurate than can ordinarily be obtained in gas fields.

Now, the productivity of the wells that we have now completed indicate a capacity to produce into the line of about 550,000 cubic feet per day, which is on the order of 16,000,000 cubic feet per month. Now, with the reserve of 3,850,000 cubic feet per acre and a productivity into the line of 16,600,000 cubic feet per month, our wells will produce into the line at a rate which will deplete about 4 3/10 acres per month of ultimately recoverable reserves, or about 52 acres per year. That is a, that indicates a relatively high capacity to produce as compared to reserves. That is a figure that we think is important. 52 acres a year initial deliverability into the line, when we talk about 160-acre spacing is almost ridiculous."

Question: "As the area is drilled up that rate of production will, of course, drop off it, will it not?"

Answer: "That is true. The closer the spacing, the faster the pressure will drop off, and the faster the rate of production will accordingly drop off."

"MR. SPURRIER: Mr. Greer, do you mean 52 acres per well?"

Answer: "Yes, 52 acres per well, per year."

Q Do you recall giving that testimony?

A Yes, sir. I do.

Q Is it a reasonable conclusion that indicates a relatively or extremely rapid rate of depletion?

MR. REES-JONES: I object to that question as an attempt

to elicit new testimony.

MR. MACEY: The motion of Mr. Jones is sustained.

MR. SMITH: I should like to offer to the Commission that if Mr. Greer testified that he would have stated that is an extremely rapid rate of depletion. May it please the Commission, in view of the Commission's attitude and my attempt to exploit the realm of questions to ask this witness, it is my considered opinion that the Commission will not accept any testimony from the witness on the stand, it is my opinion that further proceedings in this connection by way of witnesses is futile and under the circumstances, I am going to excuse Mr. Greer from the stand; and I am still offering the tender of testimony of the other witness. But under the circumstances, I think that it is consuming time unnecessarily and not accomplishing the effect that I was trying to sell the Commission on, the idea that the argument was wrong to start with. The idea I had in mind of trying to sell this Commission on the idea.

MR. WALKER: Does anyone have any further questions to ask of Mr. Greer? If not the witness may be excused.

(Witness excused.)

MR. WALKER: Does anyone wish to offer objection to the testimony given by Mr. Smith, the offers that you have made here?

MR. SMITH: I was talking.

MR. MACEY: You tendered the offer of testimony to this Commission?

MR. SMITH: That is right.

MR. MACEY: We refuse the offer.

MR. SMITH: All right. I would like to call Mr. Hiltz.

R. G. HILTZ

having first been duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. SMITH:

Q Mr. Hiltz, you were present when Mr. Greer testified at the hearing on the original hearing in Case 696?

A Yes, sir, I was.

Q Do you recall Mr. Greer's testimony with reference to the amount of gas that would be made available by reason of drilling an additional well upon 320 acre tract?

A Yes, sir. It is my recollection that he testified that the additional well drilled on a 320 acre tract would recover an additional volume of gas less than one percent of that originally in place.

Q Have you made any calculations similar to those made by Mr. Greer?

MR. REES-JONES: I object to that question.

MR. MACEY: Sustained.

MR. SMITH: I asked if he made a calculation. It is not testimony yet. He is not testifying what the calculations are.

MR. REES-JONES: My objection goes to the question. The record speaks for itself. The testimony is already in. The witness cannot be permitted to introduce any new testimony.Whether or not he made any new calculations is immaterial.

MR. MACEY: I sustained the objection.

MR. SMITH: I would like to state to the Commission that if Mr. Hiltz were permitted to testify that his answer would be that he made such calculations and that they confirmed those that

were made by Mr. Greer, using a different approach from that used by Mr. Greer.

MR. STOCKMAR: We do not object to your tender of Mr. Greer's possible testimony on the basis of the assumption that he would testify in the same manner that he previously testified to. But I do object to your tender of possible testimony of Mr. Hiltz on the matter to which he has not previously testified.

MR. SMITH: I have no further questions of Mr. Hiltz.

MR. WALKER: Anyone else have any further questions of Mr. Hiltz? If not, the witness may be excused.

(Witness excused.)

MR. SMITH: That is all for Stanolind at this time.

MR. MACEY: Does anyone have anything further in this matter?

MR. BRATTON: I would like to call a witness, Mr. Chairman.

GEORGE J. DARNEILLE

having first been duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. BRATTON:

Q Will you state your name, please?

A George J. Darneille.

Q What is the nature of your interest in this proceeding, Mr. Darneille?

A I purchased what used to be the interest of Benson-Montin in the Gallegos Canyon Unit, and my interest is in the allowable that is given to each of the wells for the obvious economic factors involved.

Q Do you own the working interest previously owned by Benson

and Montin in the Gallegos Canyon Unit?

A I do.

Q What is the percentage of that in relation to the total area in the unit?

MR. REES-JONES: I object to any further questions from this witness on the ground it is an attempt to introduce new testimony. He did not even testify in the prior hearing in this matter. The most testimony that he could give would be cumulative, repetition.

MR. MACEY: The objection to that particular question is sustained.

MR. BRATTON: I offer to the Commission that if the witness were allowed to testify, he would testify that he owns 32% of the working interest in the Gallegos Canyon Unit.

Q Mr. Darneille, have you read the record in the proceedings in this matter previously?

A I have.

Q Can you state to the Commission, Mr. Darneille, the economic consequences to you of an order setting up 160 acre proration units in the West Kutz Field?

MR. REES-JONES: I must object to that question on the ground it is an attempt to elicit from this witness new testimony.

MR. WALKER: I will sustain the objection.

MR. MACEY: The objection is sustained.

MR. BRATTON: I offer to the Commission, he would have testified if allowed to testify, that under the order of the Commission requiring 160 acre proration units, it would be an economic loss to Mr. Darneille if he failed to drill wells on, additional wells, on tracts where there is now located one well to 320 acres, and that it

would be an even greater economic loss to him if he drilled additional wells to a density of 160 acres, one well to 160 acres. I have no further questions of Mr. Darneille in view of the Commission's ruling previously expressed.

MR. WALKER: Any further questions of the witness? If not the witness may be excused.

(Witness excused.)

MR. MACEY: Does anyone have anything further in this case?

MR. SMITH: Apparently the other counsel are expecting someone to lead off on the legal argument. Do you care to hear the legal argument at this time?

MR. MACEY: Is the stat ment that Mr. Smith made true, or is everyone prepared, or will they be prepared to go into legal argument at one o'clock? You have no testimony or witnesses?

MR. KELLAHIN: In view of the state of the record, we would not want to offer any witnesses. We want to present legal argument. I presume the proper procedure, the proponents of the application would have the right to open and close. We would present our argument following Stanolind's.

MR. STOCKMAR: Frontier is in exactly the same position.

MR. SMITH: I would like to make one inquiry. If you are planning to recess at this time, I don't know if it is a proper inquiry at this time. At this time I wonder if the Commission would express to me the basic reasons which motivated their setting the order up on 160 acres instead of 320 acres. The reason I make this inquiry, that having read the record completely through, it is my considered opinion that there is nothing in the record as it now stands to support the 160 acre. Under the circumstances, in

order to properly gauge my legal argument I should like to know what the factors were that influenced the Commission.

MR. KELLAHIN: I object to counsel inquiring into such a matter. I don't feel it is proper for anyone to inquire into the factors that motivated a Commission in entering an order. The weight given to any particular testimony and so forth, certainly cannot be inquired into. The record speaks for itself. Mr. Smith had the opportunity to examine it, and if it is his position that there is nothing in there to support the order, it is for him to present by argument, not by inquiry of the Commission and put them on the spot at this stage of the proceedings.

MR. KITTS: It is the Commission's feeling that in seeking the rehearing and review of the record, the burden is upon you to show to the Commission where that order is invalid or unsupported by the evidence, and to go to any extent you wish to in reviewing the record and making reference to the record to show that. We do not feel that is a burden upon us in any manner to give such a statement.

MR. SMITH: I didn't imply or mean to imply that it was a burden on the Commission. I was only making an honest inquiry so I could more intelligently gauge my argument without taking a lot of time to explore the record. I thought it might be a proper inquiry. I agree it is not to the burden of the Commission to explain their reasons for anything they do.

MR. MACEY: We will recess until 1:15.

AFTERNOON SESSION

MR. MACEY: The hearing will come to order please. The Commission would like the record to show in this case that all tenders of proof made this morning were rejected. There is a question as to whether or not the record will show that. We wanted to clarify the record in that matter.

Mr. Smith, are you ready to proceed?

MR. SMITH: May it please the Commission, at the outset of these proceedings I stated what I considered our legal position to be with respect to the Statute. I do not consider it necessary to repeat those arguments. I think the record is substantially clear as to our position so far as the authority of the Commission is concerned respecting the order that was entered.

At this time I should like to go into the record that has been made in this case in an attempt to point out the deficiencies with respect to the order that was entered insofar as it reflects support for 160 acre proration unit, and to point out the strength of the record insofar as it supports the 320 acres. Also I would like to make as strong an appeal as I can to the Commission's sense of fairness and equity in this matter. I have examined the several transcripts of testimony which have been introduced into evidence, and there is only one place in the record that I see any reference made to the desirability of 160 acre spacing. I will come to that later.

I would like to direct the Commission's attention, however, to certain excerpts of the testimony from the hearing on July 14, 1954, which is the hearing subject to this rehearing. On page 5 of

the transcript you will find the statement, which is unchallenged in the record, that at the hearing on December 19, 1950 on spacing in the San Juan Basin, there was no engineering data or other evidence entered into the record to support spacing of 160 acres or any other spacing pattern. Mr. Greer's testimony on that matter is unchallenged.

I direct the Commission's attention to its records to see if there is anything in there which would contradict Mr. Greer's testimony in that respect. The findings from which Order No. R-172 was established, was the first hearing in which there was any engineering data or evidence relative to spacing presented to the Commission. One of the Commission's findings which appears in Order R-172 was that the wells drilled to the Pictured Cliffs formation would efficiently and economically drain 320 acres. At that time apparently the Commission felt that the 320 acre spacing met the requirements of the Statute insofar as efficient and economic drainage is concerned. As long as there is a proper allocation formula, it is possible to have wells drilled on 320 acres, and wells drilled on 160 acres in the same source of supply which will allow production from each well in such a fashion that the correlative rights would be protected and the field efficiently and economically produced.

We recommended certain rules with respect to the application of the proration formula which was adopted by the Commission. I would like to direct the Commission's attention to the fact that application of the rule which we have proposed will not in any way take away any property belonging to the opponents. Those people who have developed their acreage on 160 acres. They have made their investment, they have made their election, they have drilled the wells at a time

when no spacing orders were in effect. They may argue, the opponents may argue that they drilled their wells under one set of rules and they should be permitted to reap the benefits of having drilled under that particular set of rules. During that period of time when they were making development there was also a 320 acre spacing rule which the Commission had adopted on a temporary basis, so a claim of having that right vested in them by the action of the Commission in its earlier rules, is without complete merit. They certainly realized that the Commission at one time thought and was of the opinion that 320 acres could be efficiently and economically drained by one well.

We have also the proposition of perpetuation of an inequitable situation. By reason of having two wells, and the record will support my statement, it is possible under the present proration formula, assuming deliverabilities to be equal, that the two wells will have twice the allowable of the one well because the one well can only be assigned 160 acres. It is undisputed in this record, and I challenge the opponents to point out the place where it is disputed, that 320 acres may be properly and efficiently drained by the one well. It is undisputed in the record that there is continuous communication throughout this entire reservoir, that one well, if given sufficient time, would drain the entire reservoir.

It naturally follows just as two and two make four, that if you have two wells producing the same amount of gas as one well, that is, each individual well producing the same amount as one well, that twice the volume of gas will be removed from the reservoir. Looking at the reservoir as if it were a bucket of water with no impediment to keep the water from going to one side or the other,

you may have a uniform pressure, uniform depth of water by analogy, which means, of course, that we remove all of the additional gas, and I think that the records of the Commission will show there has been a greater volume of gas produced in the area of 160 acre development than in the other area, that that being the case, that gas must come from somewhere and it is obvious to me from a logical standpoint, that the continuation of the order as presently set up by the Commission will result in the movement or migration of gas from the area developed on 320 acres to the area that has been developed on 160 acres.

In order to point up what I am talking about, referring to this map over here for illustration purposes, we find a rather anomalous situation in this field. We find in the Gallegos Canyon Unit in the northwest part of the field, that we have development on 320 spacing. We have an area in the middle of the field where it is developed on 160. We have an area in the southeast part of the field which is developed on 320, and examination of the Commission's files with respect to the location of the wells will support this statement.

I might, also I might mention incident to the southern part, that there is quite a volume of acreage down here which has not been developed at all. There is no production at all from several sections of land reflected in the southern part of the field. It naturally follows that if you sit in the middle with twice the allowable of a proration unit at either end of the field, you are playing the middle against both ends and taking the gas out. It is a logical conclusion from the physical facts in this field. What does that mean with respect to the situation of the people who de-

veloped on 320 acre spacing? It means that they are forced by reason of the Commission's order as it now stands, to either let the gas go to the wells, say it is not worth the investment of the money, or drill the additional well.

Now, it is obvious from a simple mathematical calculation, and it is supported by the record, Mr. Greer's testimony is undenied in that respect, that the drilling of the additional well in a particular area will result in less than one-tenth, less than one percent additional gas being recovered. That is undenied in the record. It is also undenied in the record that the average cost of a well is around $17,000 to as much as $20,000. You convert the reserve figures which are also reflected in the record, into the total volume of gas, it is my opinion, my calculation that you would acquire approximately $1,000 additional dollars revenue gross in return for drilling that additional well over your acquisition of gas in a situation where you had no proration at all. A thousand dollar investment, I mean a thousand dollar return on a $17,000 investment, I say return, I say that is the gross amount of money you are getting.

It doesn't make it economically attractive to a person to drill a well and it certainly is an unnecessary well in view of the economic factors which are included within the Statute.

I submit to the Commission that the requirements of some of these independent operators whose testimony was proferred but rejected at this time, can be supported by the record as it now stands by a simple analysis of the facts, to establish definitely that the parties are spending money for nothing. All we are asking is that we be given an even break in the field under the proration

formula.

I would like to direct the Commission's attention to certain other pieces of testimony of Mr. Greer; on page 14 of the transcript, you will find his statement, "It would take longer, of course, for wells to drain gas on 320 as compared to 160 acres. Just exactly how much time, approximate comparison shows that if the wells were not prorated, but were producing wide open, that in about a ten-year period wells on 320 acres would produce about 90 to 95% as much gas as wells drilled on 160 acre spacing. Then, of course, in additional length of time, practically all of the gas that could be recovered by the 320 acre wells. If there is any proration or restriction in production, then the time that it takes to produce the gas will be nearly the same on 160 or 320 acres."

On page 16, the statement Mr. Greer testified, "These tests mean to me that wells in this area will efficiently and economically drain at least 320 acres per well, and that inasmuch as two-thirds of the field has been drilled on approximately 320 acres, that proration units of 320 acres should be established in the allocation of gas production."

I might mention at that point that the Commission has precedence for a situation such as that we are requesting. In southeastern New Mexico the Commission has established an order which established a 640 proration unit. We have an analogous situation, that the wells were developed prior to the time of any spacing rules or any proration rules, and we have allocation within each of these proration units, based on the acreage assigned to the respective wells, so that we have a precedent situation for our request that 320 acres be set up and assignment of acres made to as many wells as the

operator cares to drill. If he thinks that two wells will produce more gas than one well, he has the privilege to drill the two wells and get an allowable based on the two wells. The allowable will be, of course, by proration unit. If he is convinced in his own mind that he can get more gas that way, he can drill the wells.

We have greater flexibility in the type of order we have proposed than you have in the order as it now stands.

Page 18 of Mr. Greer's testimony, he states, "For the same producing rate at abandonment, it takes a slightly higher reservoir pressure on 320 acre spacing as compared to 160 acre spacing. This slightly higher pressure represents a small additional volume of gas that would not be recovered on 320 acres as compared to 160 acres. This amount of gas, however, is quite small, being on the order of three-tenths to four-tenths of one percent of the total volume of gas, and we have found in drilling and completing wells in this area that we often lose more than this three-tenths to four-tenths of one percent in the course of completion of the additional well due to the fact that the well has to be opened to the air while we are completing, and I believe that even more gas would be recovered on 320 acre spacing as compared to 160 acre spacing in view of the gas that would be wasted in drilling the second well on 320 acre tract."

Then the question is asked, "What about the cost of drilling an additional well on a 320 acre tract? Would the amount of the cost justify the additional expenditure from the standpoint of the oil recovered?" They mean gas.

The answer, "Definitely not, since I don't believe we would recover any additional volume of gas at all by drilling the second

well. That is additional gas that can be saved in the market. It cost, oh, $18,000 to $19,000 for the average well in the entire field, and I think the additional drilling cost would be entirely wasted, as well as the additional materials that it takes to complete the well with."

Mr. Greer recommended 320 acre spacing as based upon his testimony. Cross examination in the transcript shows that his testimony was unshaken, the physical facts as to the amount of gas that would be recovered undisputed. There is no testimony in the record that disputes it whatsoever. It is undisputed as to the cost of the well.

Now, we find on page 33, under cross examination: "It is your testimony, as I understood it, that in the drilling of additional wells on 320 acres, more than one well would be uneconomical?"

Answer: "That is correct, it would be."

Question: "Under those circumstances do you think that the man who has complied with Commission's regulation and drilled 160 could claim the same allowable as the man who drilled on 320?"

Answer: "Yes, if we gave the 160 more than half the allowable than the 320 acre well he would be recovering more per acre than the well drilled on 320 acres. I feel per acre recovery should be approximately balanced. In other words, if he takes out more per acre under his 160 acres, it is going to have to come from under the 320 acre well. I do not believe that would protect correlative rights."

I think Mr. Greer is exactly right.

Another question, "I believe your testimony is that if one well on 320 acres would not recover the well, then it would go to

some other well, that is migration?"

Answer: "Yes. But that could happen on any spacing pattern. We could go from 320 to 160 if that does not cure the problem." I might mention in that, under-drilling a well, I might mention in that connection there is no such thing as under-drilling a well.

Page 36, Greer testifying on cross examination.

Question: "Now, a well located on 320 acre tract, if we assume it is going to get twice the allowable as the well on 160 acre tract, is there any danger, in your opinion, of water encroachment as a result of the higher allowable?"

Answer: "I don't believe there is any water encroachment in this field as we ordinarily think of water encroachment."

Question: "Is there any danger of the loss of gas as a result of water due to high production of these wells?"

Answer: "Do you mean that might drown a well out such as we couldn't produce it?"

Question: "Or trapping gas by water?"

Answer: "No, sir, I think there is no by-passing of gas in trapping of gas as we ordinarily think of it in a field in which there is water encroachment. I believe the water that we produce is high connate water almost immobile connate water."

Page 39, again I would like to direct your attention.

Question: -- again Greer testifying under cross examination-- "I am a little confused, how can you prevent drainage under your formula the wells located as they are in West Kutz if some of the wells are given a double allowable?"

Answer: "By double allowable, I suppose you are referring to 320 acre wells getting twice the allowable as a 160 acre well, pro-

viding it has the same deliverability."

Question: "That is right."

Answer: "No, sir, all other conditions being the same, if it has twice the area allocated to the well, then it's per acre withdrawal would be the same as the per acre withdrawal of the well on 160."

Cross examination,page 40, of Mr. Greer--Answer: "I believe I understand what you are trying to get at. If the distance that a well should drain were limited to a radius equivalent to 320 acres. For example, say that is 1800 feet, then you feel if there is a greater distance than 100 feet for any one well, particular radius of drainage, then it could not drain its tract, is that what you are referring to?"

Question: "Well, in effect."

Answer: "Well, sir, wells will actually drain more than 320 acres as we demonstrated here earlier this morning. I think the Commission recognizes the fact that any of its spacing orders, that it is not necessary for the well's drainage to be restricted to that radius set up by spacing only. For instance, the Commission nearly always gives us a certain leeway in locating a well on a tract. If it were, if the production of gas and oil were such that the wells would only drain that distance and no further, then I think the Commission would set spacing rules which would require an exact center location on each well's tract. That is not the petition."

I might mention that in the record about that point, at pages 41 and 42, Mr. Greer testified relative to other common sources of supply that were developed on a non-uniform spacing pattern such as

the West Kutz Pool. Mr. Greer testified the Fulcher Kutz was an example. That was the only example he quoted. I think the Commission probably recognizes, particularly in view of the situation in southeast New Mexico, that there are many situations where you have non-uniform spacing which have been recognized and recommended by the Commission.

Page 51, again cross examination, Mr. Greer.

Question: "Then, your testimony with respect to the--and your opinion with respect to the drainage pattern which any well might establish, really has some element of time in it when you specify so many acres or radius of so many feet?"

Answer: Yes, sir, I believe I said earlier that under conditions of wide open flow that it would take longer for a well on 320 to produce its reserves than it would a well on 160 acres, but under the conditions of proration and depending upon the amount of restricted production and under a proper allocation formula we could have depletion of tracts drilled on 160 acres at the same rate as depletion of tracts drilled on 320 acres. It depends on your allocation formula."

That is what we are talking about here. The allocation formula is all right, but restricting the acreage under the situation here is going to require the drilling of unnecessary wells. Or in the alternative, the loss of gas to people who have drilled on a denser pattern. I might digress momentarily to point out some historical facts with respect to proration. The discovery of oil and gas at the outset, we had the application of what is known as the rule of capture. That rule of law has never been repudiated so far as I know. It still is the law. The reason you don't find so many cases

on the law of capture is that we have had established regulatory bodies such as the Oil Conservation Commission here. The reason for the establishment is in the interest of conservation of natural resources to avoid the excessive drawdown of wells, the failure to get all the oil and gas out from under the ground, and it naturally follows when you put rules and regulations into effect, it impedes the freedom of choice, freedom of action on the part of the people who are for such regulation. Instead of the application of the rule of capture, we have interpretations by the Commission in respective states, and it is their duty, because of this abrogation of the rule of capture, to see to it that the parties are not put in a position of having their hands tied by reason of a very difficult economic choice or for any other reason, to the advantage of another person.

That is what we talk about when we talk about correlative rights. We say in this particular instance that the order as entered, which would require those parties having their acreage in the area developed to 320 acres, are constrained either to lose their gas or spend money unnecessarily, thus avoiding one of the primary duties, or two of the primary duties in effect of the Commission, which are to see to it that you give equal freedom of action, equal rules for all parties, and at the same time to see to it that one party does not have an unfair advantage.

I say that existence or continuance of the 160 acre rule in this particular instance will afford an unfair advantage to those parties who have developed to a 160 acre density. I say further that Mr. Greer's testimony in this record is undisputed, that he went to the parties that were developing on 160 and made available to them, but

prior to development, all the information that he had which was to the effect that on 160 acre spacing it would be uneconomic to drill those wells. Those parties went ahead despite his advice and developed on 160, and the gross production according to the record in this case at the period of time some two years prior to now, indicated that that particular area developed on 160 acres had at that time produced three to four times as much gas as the areas developed on 320 acres.

I say to the Commission, this: We are not asking this Commission to go back and correct an injustice. That was our business then. We made our election at that time how we were going to develop it. We had open flow at that time. We could drill our wells and produce them and we had our choice at that time, since we knew that we could take all the gas out we wanted to, or drill another well. Preservation of that situation in a situation where we cannot produce our wells full flow alters it completely. We had as much right to believe that the Commission would protect us in our development on 320 acres as the parties who drilled 160 acres had to expect that their vested rights would be protected by this Commission, and maintained that way by reason of restricting the size of the proration to 160 acres.

Getting back to the advice Mr. Greer gave, I think he also advised then what he considered to be total production on 160. I think the record will show that it was something in the order of seven or eight-year payout, and that the total volume of gas in this reservoir, examination of the entire record would indicate that the field now is in an advanced stage of depletion considering the relative short period of time within which it has been producing. I

believe that the testimony in the 1953 hearing, which was read to the Commission earlier today, indicated that the withdrawal was at the rate initially of 52 acres depletion a year.

Applying your decline curve to that, of course, it is obvious that you have at the end of the first year probably around the order of 120 acres, 160. Applying it on down it is obvious that the whole field will be depleted in the neighborhood of seven or eight years using the rough rule of thumb on it. It has been going a year and a half. We have lower pressure reflected at the end of the field than we have in the middle of the field. What does that mean? It means that there is an impairment or retrogradation of the flow of the gas by reason of the fact that the structure or the sands have relatively low permeability and the porosity is low, although not quite so low, which means with that drag it takes a little time for the gas to go across there.

It obviously follows that if the reservoir, the initial pressures on the order of 468 pounds, the virgin pressure in the field, which is undisputed, if you go and examine now and find that a certain area has pressures on equivalent tests which are several pounds lower than elsewhere, that you have a low pressure area that is going to cause the gas to come on down and migrate to it. So what, in effect, the essence of all that testimony amounts to is that by preserving the allocation formula on 160 acre basis, you are going to have that continuation of that low pressure area with a migration of gas. The result is that the gas is being captured from elsewhere. The Commission's duty, since they have abrogated the law of capture, is as to as closely as possible prevent that situation. The Statute says, as I pointed out in my opening argument, that anything

directly or indirectly which causes the drilling of unnecessary wells is proscribed.

I submit that the order, as it now stands, has the effect of indirectly requiring the drilling of unnecessary wells or abrogating the law of capture, I mean permitting the law of capture to apply without the corresponding privilege on the part of the parties to protect themselves in an economic manner. I might point out that at page 55 Mr. Greer testified on cross examination:

Question: "Getting back to this drainage of the field, you stated before lunch that without respect to time, the drainage area of any well, high deliverability or low deliverability ought to be the same again without respect to time?"

Answer: "Yes, sir, any one well in that common source of supply could eventually effect the entire reservoir.". . . . . .

Question: "You stated with respect to your interference tests that those test wells drained singular patterns of from five thousand feet to a conservative 1920 feet, as demonstrated by the test as you analyzed it?"

Answer: "That is correct."

Question: "Then, assuming that we have 320 acre spacing here, if we have two wells of substantially different deliverabilities offsetting each other, the high deliverability well would drain the lands under the low deliverability well, would it not, in a given period of time?"

Answer: "Well, it just depends. If the reserves under the respective tracts are approximately or bear approximately the same relation to the total reserves in the field as their respective allocation formulas bear to the total, then one well will not drain

the other because this just produces its own gas and although it produces a higher rate - -"

Question (interrupting) "On your own statement, each well would be draining the same area actually, wouldn't it? Each well would drain the whole field if you let it alone?"

Answer: "If you have a proper allocation formula each well will just about drain its respective tract."

I might point out that actually application of the proration formula that you have now is on straight one hundred percent acreage basis, everything else being equal.

Now, page 57 under cross examination, Mr. Greer testified,

Question: "Leaving only the acreage factor in the formula, assuming equal deliverabilities, you would then have a perfectly fair scheme, would you not?"

Answer: "You mean - -"

Question (interrupting): "320 acres gets twice as much as the fellow with the 160 acre reserve?"

Answer: I definitely feel that all other factors being the same such as deliverability, one well that has a deliverability of a million feet on a 160 acres and one well with a deliverability of one million feet per day on 320 acres, the well with the 320 acres should get twice the allowable of the well on the 160 acres because all other factors being the same, it has twice as much reserves, and is entitled to twice as much allowable."

Page 64, 65, under cross examination Mr. Greer testified,

Question: . . . . "One other question that has been brought up here is the effect of drainage between wells completed on 160 acre spacing and wells completed on 320 acre spacing. I think we

have come to the conclusion that if they had the same deliverability then there would be no drainage, probably be no drainage involved?"

Answer: "You mean if we give the 320 wells twice the allowable?"

Question: "Twice the allowable, right?"

Answer: "Yes, then the chances are there would be no drainage between tracts."

Question: "But if they didn't have the same deliverability that would mean that, well, let's assume that the smaller tract had a lower deliberability - -"

Answer: "Okay."

Question: "- - and assuming the small tract had a lower deliverability with the same reserve then, they would be draining, wouldn't they?"

Answer: "If that existed, of course, there would be. Of course, it is my thought that ordinarily with the lower deliverability there is a lower reserve."

Question: "You just beat me to it. So, then, you think then that due to the fact that the lower deliverability is also an indication of lower reserve that there would be no appreciable drainage even though the 320 acre well had twice the allowable of the 160 acre well?"

Answer: "That is correct."

Let's go into some further questions of economics. Mr. Greer testified at the time of his testimony that there were approximately 83 wells in 320 acre spacing, and the same number on 160 acre spacing. He then testified that if 160 acre proration units were established, that the operators that developed on 320 acre spacing would be required to drill 83 additional wells in order to get his

fair share of gas out of the reservoir at the same return.

Greer testified that the cost of that well in the field was approximately $19,000. In response to redirect examination, Mr. Greer stated on Page 66,

Question: . . . "If the proration order is entered 160 acre basis, it would probably require or could require the other operators in the field, that is the ones who have developed on 320 acre spacing to spend a $1,600,000 or a $1,500,000 in additional capital to protect their interest?"

Answer: "That is correct, about a million five hundred thousand dollars."

Question: "Would you consider that those additional wells are necessary in order to adequately get all the gas in this reservoir?"

Answer: "Oh, no, sir. They are definitely not needed."

Again on cross examination, page 68,

Question: "As I understood your testimony, correct me if I am wrong, in the event the prorationing units were set at 160 acres, I understood you to say in order to protect the interest of the operators drilling on 320 acres, it would require the drilling of 83 additional wells at a cost of approximately one and a half million dollars, is that correct?"

Answer: "We arrive at that by this manner. If 320 acre wells are not allowed there, 320 acres in an allocation formula, then the 160 acre wells under conditions of proration would drain gas from the 320 acre spaced areas. That being the case, the only recourse an operator would have to prevent drainage from his lands would be to develop the land on 160 acre spacing and to develop the entire field to a density of 160 acres, would require the drilling of 83

additional wells, or the expenditure of a million and a half dollars, in order to protect correlative rights in the field."

At this point I would like to revert to my statement a while ago that I have observed only one piece of testimony that could even vaguely support 160 acres. That is the testimony of Mr. Thomas Scott. However, Mr. Scott testified at the hearing held on September 17, 1953; at that time the Commission did not have before it the proposition of proration. They were considering at that time only the question of spacing, the development of the field on the uniform spacing pattern. Mr. Scott attempted to justify the uniform development of a field and the drilling of additional wells on the old proposition of more wells, more gas, more wells, more oil, which proposition, I think the Commission is thoroughly conversant with, having discussed it in other cases at great lengths.

I should like to point out to the Commission that Mr. Scott's testimony did not stand up very well under cross examination. We find, for instance, that he says to get additional 12½% of gas as a result of drilling the additional well. By cross examination he was led into the proposition, why not 80 acres and get another 12½%. He finally made the statement of bringing it down to one acre. I think it is an easy matter of mathematical calculation that that result leads to the idea that you get more gas out than you had to start up. You can't get out 12½% and expect to wind up with 100% as you get into units on down.

I put that before the Commission because, in the first place, I don't consider his testimony to have any substantial facts, it was an expression of an opinion on the part of a man who is attempting to justify his position and was trapped in the situation

I just discussed, but I would like to point out to the Commission that at the time Mr. Scott was an adverse witness.

He definitely testified that there was drainage from the Gallegos Canyon Pool into the middle of the field under conditions of open flow. I think that the testimony in this record is undisputed with the limitation of the flow. By dividing the market amongst the wells that exist in the field it becomes obvious that the rate of migration, which is another way of saying that the stabilization of the reservoir is going to be accelerated, it just naturally follows with the fact that you have additional volumes of gas coming out of the holes in the ground, everything else being equal.

So what Mr. Scott's testimony boils down to is a simple expression of a personal opinion unsupported by any facts of any credibility in connection with a spacing order which contemplated open flow production. At that time, at that hearing, in order to meet possible statements made by opposing counsel, Mr. Greer was asked the question whether or not or what steps were being taken to protect against that condition. At that time Mr. Greer indicated that there would be a buffer row of wells put across in the field immediately northwest of the area developed to 160 acres. The buffer wells to be developed on 160 acre spacing. The Gallegos Canyon Unit being operated the same as one lease would result in no offset drainage insofar as the owners of properties northwest of that line would be concerned.

Mr. Greer's entire proposition was thoroughly explained in the hearing that occurred in July. In connection with the proration hearing, inquiries made of him as to whether or not the same buffer

wells wouldn't afford the same protection as he testified to with respect to the early hearing, he stated that it was all right as long as you could produce your wells into the line and you didn't have restrictions or division of the market amongst the respective producers in the field. Once you did that, that you had the acceleration of migration that we are talking about into the area. Thus the inevitable conclusion is that we do not know what Mr. Scott's testimony would have been with respect to prorationing. Particularly how his testimony would have been with respect to proration if he had been here subject to cross examination. He did not appear at the proration hearing. I assume, I don't know whether he made a statement or not, as far as that is concerned. I assume if he made no statement that his contentions for 160 acres may have been satisfied if the proper proration formula had been issued for 320 acres. I don't know. He may still have the same ideas, but at least Mr. Scott didn't appear at that hearing.

I should like to state to the Commission that we have here perhaps in a frank analysis of the situation, a conflict of special interests. It is a matter for the Commission to resolve as to what is the fair and equitable way to see to it that the respective parties come out even. I submit that the fact that the parties who have developed the acreage on 160 acres have had that advantage for a period of a year and a half or two years, that the gas, it is undenied, has migrated during that period of time; that they have had some large slice of cake already. I think a reasonable compromise on this matter would be for the Commission to put the parties on the same basis now.

We are not asking that the Commission go back and give us com-

pensation for the gas that has already been drained. We want an opportunity to get what gas is left on the same basis as the parties who developed on 160 acres, without the necessity of our going out and spending our share of one million and a half dollars. That is all I have to say at this time, may it please the Commission.

MR. BRATTON: Mr. Chairman, I didn't come here this morning to get into a big legal argument over evidence, but I managed to get into one. I didn't come here this afternoon to make a speech and I am not going to make one. I do wish to state on behalf of Mr. Darneille that we support strongly Mr. Smith's excellent and excisive analysis of the testimony heretofore given in this cause. I speak for Mr. Darneille, who has, I am confident, the largest economic interest in this matter of anybody in the room, or probably in the area. He has come a long way and I am not going to make a speech on his behalf. He has come a long way to talk to this Commission and I would like at this time to ask permission for Mr. Darneille to address the Commission and make a few remarks on this matter.

MR. MACEY: Okay.

MR. DARNEILLE: Gentlemen, my position was pretty clearly stated by Mr. Smith, but I don't think he quite dramatized it enough because I am not a developer. I went in and bought an interest in a pool, that bucket of water that he was talking about, and I paid so much money for that, predicated upon reservoirs that could be measured, in which engineers said could be adequately drained and exploited with one well drilled to every 320 acres. Now, the effect of the Commission's ruling is that either someone else gets part of this reservoir that I bought, or that I must go in and drill

wells to protect myself from that drainage.

If I do that there is absolutely no conceivable way that I can get that money back. I am not quite like Stanolind, I can't talk about the gross recovery on that well will be $1,000. I have to talk about the fact that if I spend the money on that additional well, that before I recapture my investment that well will have created a complete loss to me, because I must pay for money just like I pay for pipe or any other thing that goes into any one of these wells. It is just very simply this, that if the Commission's ruling stands, I am only being permitted to produce on a basis of having half the reservoir that I thought I bought, and that I thought I bought on good engineering principles. Somebody else is getting the advantage of that because they are going to get that gas. Something that becomes, that was to me a good investment, becomes a net loss.

Whereas I believed, and I was led to believe, that the Commission and the statutes were such that my rights to those reservoirs would be protected and that I would certainly not be required by the action of New Mexico or its Commission to drill wells that can show absolutely no financial return to me, because I am not going to get one more dollar out of that reservoir if I drill that well than if I didn't drill the well. That seems to be what all this testimony shows.

So I am faced with the peculiar proposition that the Commission's order says that I can only have half the production out of that reservoir as the man who has drilled 160 acres; to protect myself I have to drill another well and I can't make five cents by drilling that other well, so the only thing I can do is surrender to the

proposition that I have to let the other people have part of my gas. I don't think that that is the intent of the Commission. I think the intent of the Commission is to see that everyone gets their fair share of this situation.

I think Mr. Smith has stated all of that, and I may be being redundant in saying what I am now saying, but as near as I can analyze it, there is no way that I can spend five cents to protect myself from being drained and have a chance of getting that five cents back. I think that is all.

MR. GRANVILLE: E. B. Granville. This is a statement by the British American Oil Producing Company. We own a 50% working interest in eight wells in the West Kutz-Pictured Cliffs Pool. We have studied the testimony presented at the various hearings on this pool and are familiar with the conditions and problems that exist. We believe it has been proved beyond reasonable doubt that 320 acres in this pool will be efficiently and economically depleted by one well. The present proration formula seems fair and equitable except that it should provide for 320 acre proration units instead of 160 acre units. With 320 acre units each operator would have a fair chance to produce his equitable share of recoverable gas reserves. Otherwise economic loss will result from the drilling of unnecessary wells caused by 160 acre spacing.

Therefore, we urge that the formula for proration in this pool be changed by substituting 320 in place of 160 in determining acreage factor.

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company. If it please the Commission, we are in the position probably the unenviable position of having some wells which we ex-

pect to acquire and have acquired on 160 acres, and some which we have acquired and expect to acquire on 320 acres. So that insofar as the proration rule that may be adopted as a result of this rehearing, it will probably affect us as much one way as it does the other way, but we do have a definite belief as to what is the better rule to be adopted, and we are anxious to make this statement that we think that the 320 acre spacing is preferable for the proration units.

I should say 320 proration units, because it does permit the flexibility of the individual who desires to drill a second well to do so. The operator who desires to drill that second well on 160 acres may do so. At the same time the operator who desires to develop on 320 acres under the record in this case will certainly recover and receive his fair share of the gas, the recoverable reserves, under his acreage and under the record as made in this case, and we believe it is a correct record and we believe those are the facts. Under those circumstances, unless the area that is developed on the 320 acre spacing gets an allowable on a 320 acre basis, there will be drainage from that area. Thank you.

MR. MACEY: Mr. Stockmar.

MR. STOCKMAR: On behalf of Frontier Refining Company. There is only so much gas in this reservoir and we have to divide it up on some basis that is fair and equitable. I think that is the undertaking of all of us. Every scrap of argument that has been made, every scrap of expert testimony in this case presented by the proponents for the 320 proration unit, seems to be based on a conclusion that those drilling on 160 acre locations are stealing gas, draining gas from those who drill on the other locations. That seems to be the foundation for the arguments that are being made.

It is our considered opinion that the facts which have been presented here and which are uncontroverted, deny that particular foundation. We believe that the Commission has previously considered the uncontroverted facts in the situation and has arrived at the formula, although we are not in entire accord with it, has arrived at a formula which on 160 acre proration units, does equitably distribute the production. These uncontroverted facts that I am talking about are items of information which have been gained from various tests and production records and things of that nature. To me, and I believe to any engineer, all that those facts provide is a basis upon which he, in considering a gas reservoir, can match it up to his own considerations of time of payout and other economic considerations.

The interference tests which have been run here and were fully disclosed in the testimony, to me only indicate that we have a connected reservoir. Other uncontroverted facts indicate that the reservoir we have is not a perfectly connected--you engineers say uniform and isotropic reservoir, with high permeabilities, permitting the free flow. The uncontroverted facts indicate that we have a low permeability reservoir and a reservoir which has characteristics that are extremely variable from location to location and from area to area in the field.

I can't subscribe in my own thinking to the argument proposed here, even on the basis of a very highly permeable reservoir where deliverabilities are the same throughout and pressure equalization will take place instantaneously. It is our belief that the inclusion of the very formula of the very substantial deliverable factor has already taken into account the things which the proponents of 320

acres are complaining of.

Those uncontroverted facts, as such, do provide a basis for opinion evidence. The testimony which has been called to your attention here, the testimony given, is opinion evidence based on those uncontroverted facts. As I think we must all recognize with respect to a gas reservoir, those opinions have no particular validity unless they are viewed in the light of some particular economic considerations. Those opinions given by proponents for 320 acre proration are opinions which reflect their consideration of their own economic considerations. Their own desired time for pay out. Their own desired return on their dollar.

We have other economic considerations in our area. I thoroughly enjoyed Mr. Smith's comment that a well cannot be undrilled. The talk which we have had here, I am sorry I have forgotten your name here, the talk we have had on getting the money back is a very real problem to those who have already spent their money.

It is my belief that the Commission need not accept the opinions of expert witnesses when it is clear that those opinions are a reflection of their individual economic considerations. It can weigh those opinions. It can weigh the effects of those economic considerations, but it must also view other economic considerations and arrive at those which are fair and equitable for the entire field. We believe that you have previously, in giving the order, done just that and by giving as much weight to deliverability as was done in the existing formula, full credit has been given to any drainage possibilities and so forth. There has been a full hearing here on the matter of spacing and subsequently on the matter of proration. It seems to me that there has been no realistic showing

of any reason for distinguishing between proration units and spacing units.

If a trial period was granted and terminated as not having established that 320 acre spacing was appropriate, it seems to me very clear that the proponents of 320 proration units have the full burden in establishing a clear preponderance of evidence and not just opinions based on their own economic considerations, but of evidence which shows that all of the statutory requirements will be satisfactorily met by 320 acre proration. I say that their own evidence when viewed and appraised in the light that the Commission must appraise it is adequate support for your finding that 160 acre proration units will meet the requirements of the Statute and will equitably distribute the gas which is being produced.

MR. KELLAHIN: If it please the Commission, the Commission has heard this case at great length, and I certainly do not want to repeat many of the statements which have been made at previous hearings. In part it will be necessary for me to cover some of the ground which we have already covered. I would like to point out, however, that the application in this case filed by Stanolind for rehearing, assumes that there was some burden upon the proponents of 160 acre proration units to support those units.

Now, in my opinion, that burden was rather upon Stanolind and the proponents of 320 acre units. The Commission well knows that there has been several hearings in regard to this matter, and the first being the general adoption of 160 acre spacing in the northwestern area of New Mexico, at which Mr. Smith has pointed out there was no testimony. It was the rule of thumb adopted to insure some orderly development. Subsequent to that, the operators of the

Gallegos Canyon Unit came into this Commission and asked for 320 acre spacing in the Gallegos Canyon Unit, which constitutes the north half of this pool. The Commission granted that on a one year temporary basis, and upon return to the Commission with a request to have that order made permanent, they failed to carry their burden of proof with sufficient force to convince this Commission that was a proper spacing pattern, and the Commission refused to renew the order.

The entire pool thereupon reverted to 160 acre spacing. They did not see fit to take an appeal from that order. They now contend that there is some testimony in the record to support it. They certainly had every opportunity to seek a rehearing, and if need be, a court appeal, but they did not follow it. They abided by it at least to the extent of taking no further action. When they proceeded to drill on 160 acre spacing, I do not know now. Then they came up with that situation in existence with an application for proration, in effect the Commission had already said that one well would efficiently and economically drain 160 acres as a result of its spacing order.

Before going into that to any extent, I would like to read briefly from the statutes, with which the Commission is, of course, familiar; but the ones which Mr. Smith read this morning I think should be fresh in our minds, and that is the first one, Section 65-3-10, covering the power of the Commission to prevent waste and protect correlative rights, which reads: "The Commission is hereby empowered, and it is its duty, to prevent the waste prohibited by this act and protect correlative rights". . . .

When they started creating a proration unit, or taking any

other acts affecting an operator, it is effective upon them to perform that duty imposed upon them by the statute.

Now then, under the section quoted earlier, 65-3-13 of the 1953 compilation regarding the allocation of production in the field or pool, the Statute reads in part, "In protecting correlative rights, the Commission might give equitable consideration to acreage, pressure, open flow, porosity, permeability, deliverability and quality of the gas and to such other pertinent factors as may from time to time exist, and insofar as is practicable, shall prevent drainage between producing tracts in a pool which is not equalized by counter-drainage.". . . . . .

There are many factors in this particular case which the Commission must, under those terms of the Statute consider among those being the factors which Mr. Stockmar has just pointed out in regard to a fact that the substantial part of the pool was drilled and developed on 160 acre spacing under a valid and existing order of this Commission, and without any questions in the minds of the operators at that time, but what their rights likewise would be protected. They invested their money and have every right to expect this Commission to protect them.

Now, under Section 65-3-15(b), governing the allocation of production and spacing regulations I do not need to read to this Commission, they are familiar with it. I do want to emphasize the point that the proration unit be that which can be efficiently and economically drained by one well.

Now, in considering what can be efficiently and economically drained by one well, the Statute does not mean the area which one well will drain. The testimony in the record on the part of Mr.

Greer was the effect that one well would drain the entire pool. No one would argue that would be efficient and economical. The question then boils down to just what is efficient and economic. The proponents of 160 acre spacing and proration units in this pool certainly are good men of good judgment, and they considered it economic and good judgment on that practice, and they expected to get a payout on the wells, and they are getting a payout on the wells under the present proration period. If it is changed the payout would be greatly prolonged and to their detriment.

The man who has drilled on 320 has no more investment as to his well costs than those who have drilled on 160 acres. There is some argument, of course, in regard to whether the Commission has made a determination by its spacing order to the effect that one well will efficiently and economically drain 160 acres. I would like to cite the Commission to the case of Humble Oil and Refining Company versus Bennett, found in 149 Southwestern Second on Page 220 under the provision of Rule 37 of the Texas Railroad Commission, which, as you are familiar, is a spacing regulation. We had a similar situation there in that an applicant was seeking an unorthodox unit consisting of ten and seven-tenths acres, whereas the spacing regulations under Rule 37 was ten acres. He was opposed by those who had drilled on adjacent territory in a spacing pattern of twenty acres. They contended, and offered testimony tending to show that one well would drain twenty acres of land. The court, in reviewing the case, had this to say. It said such a spacing fore-implies a finding by the Commission that a well would drain ten acres instead of twenty. The Commission has made its determination as to spacing. It has now made the determination as to proration

unit, and we feel it is the correct determination, and we would certainly oppose any effort to increase that to 320 acres.

There is considerable testimony in the record despite the contentions that have been made, which will support 160 proration units. The proponents of 320 are refuted by their own argument in that they have contended from the beginning that the best available index of reserves to be presented in this case is the deliverability of the well. At one stage, as I understand the record, they said there was a direct relationship. At another they said, no, there wasn't a direct relationship, but nearly direct relationship. In any event, they do contend there is a relationship between reserves and deliverability. The record clearly shows both as by testimony from Mr. Crum on cross examination of Mr. Greer, and by exhibits which were offered showing the I. P. on numberous wells, that we have a situation in the West Kutz where the deliverability of a well on 160 acre unit may be far exceeded by the deliverability on wells on immediately adjacent units.

In other words, you could have a well of extremely low deliverability sandwiched in between two wells of high deliverability. Those who have drilled and developed their acreage on 160 acres have spent their money, and to the extent of their 160 acres, have proved their reserves. If deliverability is any measure of the reserves, then certainly it cannot be contended that one well drilled on 320 acres reflects the reserves on the entire 320 acre tract.

The evidence in the record is directly contrary to that. The evidence in the record shows that it may well be considerably less or considerably more under the 320 acre tract if the additional well

is drilled. On cross examination, as I recall, Mr. Greer said that is true, you have the same situation on 80 acres or 40 or 20, and I am inclined to agree with him. But the point we are arguing here now is not whether we are going to go down to one acre spacing. The point is, are we going to aggravate that situation by increasing the size of the units to 320 whereas we feel that one well on 160 acre units will efficiently and economically drain that unit.

Mr. Stockmar has covered the economic aspects of this better than I have. I want to adopt his statement in that connection. The whole thing we are concerned with is that is the wide variation of permeability in the policy and the wide variation in deliverabilities and certainly you can't say that 320 acre units are justified in this case.

In connection with their arguing that an order of 160 acres would require the drilling of unnecessary wells refutes their argument in regard to the drilling patterns which they, in the prior cases as Mr. Smith pointed out, the testimony showed that this so-called buffer zone would protect themselves against drainage. It is a little bit difficult for me to understand how the buffer zone drilled immediately adjacent to the 160 acre spaced unit in the south end of the Gallegos Canyon Unit could adequately protect the Gallegos Canyon Unit against drainage under open flow, when theoretically you had twice as many wells to the south than you had to the north. As was pointed out in that and in this present case, the pipeline connections themselves had a considerable bearing on the situation at that time.

This question of drainage pattern which is presented in the record, I believe the record will reflect under the proposal of the

320 acres, one well would not necessarily capture the gas under its own tract but would double that granted to 160 acre tract. That situation would be further aggravated. The record clearly reflects that 160 acres is a justifiable proration unit. I don't think it is necessary for anybody to get up and in so many words say this and this and that factor supports 160 acres. After all, we are appearing before an expert Commission, a body which is able to receive testimony and evaluate it for itself, and that is its duty. The testimony is in the record. The evaluation has been made. The Commission has adopted its order, and we think it is sustained one hundred percent by the record.

MR. MACEY: We will take a short recess.

(Recess.)

MR. MACEY: Does anyone have anything further in Case 696?

MR. REES-JONES: Following Mr. Bratton's example, I don't believe I want to make a speech. However, on behalf of New Mexico Western Oil and Gas Company, I would like to adopt the well-reasoned and forcefully presented cases given by Mr. Kellahin and Mr. Stockmar.

MR. MACEY: Does anyone have anything further in Case 696?

MR. GREINER: A. S. Greiner on behalf of Southern Union Gas Company. This is a matter in which Southern Union Gas Company is not directly interested as a producer. We are connected to several wells in the field, and as a purchaser, line purchaser, but do not have any working interest in the fields. Nevertheless, this is a matter in which we are much interested because of our feeling as a pipeline purchaser, and a producer in other areas, that it is not for the best interest of the State and its people when unnecessary

wells are drilled in any area, and unnecessary pipelines must be built to connect those wells, which in the end must be paid for by the rate payers.

I therefore wish to express Southern Union Gas Company as being in accord with the views heretofore expressed by Mr. Smith in favor of a 320 acre proration unit for the West Kutz Field. Now, if I may, I would like to point out what seems to me the rather clear tenor of the arguments that have been presented on the opposite side of this matter. First of all, it seems to me that the proponents of the 160 acre rule are faced with this dilemma that either there is or is not drainage occurring at this time toward the 160 acre area from the 320 acre area. If there is drainage, then 160 acre area is draining the 320 acre area. If there is not drainage between the two, it can't make any difference to the 160 area people what the 320 acre area people are doing because it can have no effect on them. It seems to me that this may fairly be characterized as a "dog in the manger" situation. We have these 160 acre people who have spent their money and they are all drilled up on 160 acre basis, and they say to the 320 acre people, "Well, all right, we don't have any objection to your getting an equal allowable for your tracts. Make them on the same footing as our own, take out just as much as we are taking, but, by God, we are not going to let you get away with it without spending twice as much money as you have spent already."

What is the expenditure of that money going to benefit the 160 acre crowd? It wouldn't help them a bit unless they are in the drilling business or in the pipe business or in some other business that will enable them to profit out of this deal in some fashion by

selling something to them incident to the drilling of the wells. They won't be a nickel further ahead for it. All they will have had is the satisfaction of seeing some other people double their investment in this thing to catch up and be even. If that is not a "dog in the manger" situation, I have never seen one.

We have had much talk about uncontroverted facts, but we have also had some expert witnesses. If this Commission didn't think expert witnesses were a good thing, I don't think it would conduct its business as it has over the years. Most of the decisions of the Commission have been made upon the principles expressed by expert witnesses. Merely to say there are a lot of facts and uncontroverted facts in the Commission's files, tests, production reports, and so on, well logs and so on and so forth, cannot take away from the proposition very ably brought out by Mr. Smith, that of the people who sought to interpret that basic data, all of them, with the one minor exception that he mentioned in a collateral matter, expressed the opinion that a well in this field will adequately and efficiently drain 320 acres. I think it is also fairly clear that Section 13B of the Act is looking not toward the smallest area that may be efficiently and economically drained, but rather toward the largest so long as it does not do violence to some of the other standards that are set up in that particular Section of the Statute.

Thus, merely saying that there are a lot of other uncontroverted facts in the record just doesn't prove anything. The proof of the pudding is in the eating. You have to have an informed man to interpret the facts to this Commission, as the Commission is going to interpret them themselves, and it is the expert opinion upon which the Commission must necessarily rely.

In other words, there must be no need for the hearing at all. We might as well go on the basis of their records and forget the expert witness. I strongly urge the Commission on behalf of my company, to adopt the proposal as set forth by Stanolind in its application, that the present order be amended to make 320 acre the basis of the proration unit in the West Kutz Field.

MR. MACEY: Does anyone else have anything further?

MR. SMITH: May it please the Commission, since we are applicants in the case and Mr. Kellahin has stated that we should perhaps have the right to reply, I do have a few remarks I would like to make. I listened carefully to the analysis of Mr. Stockmar and Mr. Kellahin, because I asked them during my opening statement to point to the record, some point, some piece of testimony, some evidence which affirmatively supported 160 acre spacing. I didn't hear a reply. I heard some generalities. I heard some remarks made.

I might state also that Mr. Kellahin and Mr. Stockmar were both here during the proceedings. They had access to the same information that we had upon which our expert witnesses based their conclusions. I am satisfied that their companies, or the people they represent, are fully able to employ expert witnesses, and I believe that Mr. Stockmar, this morning, said he had a witness here who could testify. Yet at no time, at no time in these proceedings have either Mr. Stockmar or Mr. Kellahin on behalf of their clients submitted a single witness for the purpose of supporting 160 acre spacing. I point to that because it is a well accepted principle of law that failure to produce evidence in the face of other evidence which is undisputed and unchallenged is an admission on the part of the

parties that they can't get that evidence.

I submit that the uncontroverted evidence in this case supports the 320 acres. I have heard nothing to say anything to the contrary. Mr. Kellahin's statement that the Commission is an expert body that can draw its own conclusions is nothing that I accept as being probably true, but it overlooks completely the proposition that it is a fundamental proposition of administrative law that the action of the Commission must be based on evidence. We are all familiar with the substantial evidence rule, and it is perfectly true that the Commission may have and may take judicial notice of certain facts, but we are not privileged to call the members of the Commission to the stand to cross examine them, and the courts say that the Commission must have before it the facts on which they drew their conclusions, so that we can determine whether or not there were facts in applying the substantial evidence rule. If there are facts of credibility of any substance at all we don't weight the evidence, we affirm what the Commission has done. There must be facts there.

I say that so far as this particular record is concerned, there are no facts to support 160 acres. I challenge them to point to the record, to point it out, and I fail to hear any reference to the contrary. You may recall that I pointed to the specific pages in the transcript in my opening statement which supported 320 acres. I even went so far as to meet the proposition that there was some shadow of evidence in the record and discussed that in detail. I think in view of the fact that they failed to comment other than just to, I don't think they commented at all on the proposition of Mr. Scott's testimony that they accepted my statement to be true

that it was just a vague generalization on his part and did not constitute any testimony, particularly in view of the fact that on cross examination his basic facts were thoroughly put to flight.

I disagree with Mr. Stockmar that we are contending that gas is being stolen. I think perhaps Mr. Stockmar didn't fully understand my analysis when I put out my distinction between the law of capture and the duties of the Commission which regulate these matters to accept a rule of fair play, the protection of correlative rights, so as to protect capture to be taken away from someone while someone is holding his hands behind his back.

I submit that we are not saying that gas is being stolen. We are saying, if the Commission adopts the 160 acres, that their action in this respect will be arbitrary and capricious and without foundation in the record, and that it will not be a stealing of our gas at all. It will just be a taking of property without due process of law. That is what it amounts to. The fundamental facts with respect to drainage are unchallenged. Mr. Stockmar even pointed them out in his statement that we have a continuous reservoir, that it has been on a uniform reservoir, but there is communication throughout it, that there is a probability, not only a probability, but an absolute fact in my opinion, that there is drainage under existing proration rules which would require our protection, going back to the law of capture that we drill these wells.

The testimony is undisputed from a legal fact basis that the percentage of gas that will be received in addition by reason of drilling the additional wells, is of an insignificant order, less than one percent, which certainly makes the drilling of that well unnecessary in order to get that gas out. Particularly in view of

the undisputed testimony of Mr. Greer that less than one percent will be dissipated in the drilling of the well by reason of its being open to the air during the period of time it is being completed.

I think he went so far as to say there might be a waste of gas because more than the three-tenths to four-tenths of one percent would be blown off to the air and not put to any beneficial use.

With respect to the burden of proof referred to by Mr. Kellahin, he attempts to put upon Stanolind the burden of proving 320 acres. As I view a Commission's proceedings, there is no such thing as a burden of proof as is known in a court of law. It is the advancement by the proponent of certain ideas, certain facts, certain evidence on which an equilateral basis the Commission draws its own conclusion.

Going back to my original proposition that there must be evidence, I say that anyone who is contending for a particular situation, anyone who advances a particular proposition, has the burden of supporting it by evidence, otherwise the Commission has no evidence before it from which it may draw its conclusion.s

Mr. Kellahin seems to intimate from our failure to appeal the action of the Commission and revoking the temporary order for 320 acre spacing, to be acquisition on our part to 320 acre spacing. At that time the Commission may recall there was no gas prorationing. We didn't appeal the matter for reasons of our own, which are of no concern to the Commission, but I would like to state to the Commission definitely and unequivocally, we didn't believe that was a proper order to be entered. Our best evidence of that is the fact that we are here today making the contention that 320 acre proration units an entirely different matter is the proper one in this respect

to make the order of the Commission comply with the Statutes. The fundamental proposition of this case, I think, has been well stated by Mr. Greiner. It is the question of who is going to get an advantage, and I would like to state here that we are not attempting to get an advantage. We just want to get an even break. The advantage has already been had. The people who drilled the field to 160 acres, I think, the testimony is indisputed, and in the answering arguments it was denied, have produced volumes of gas greatly in excess of that produced by the areas on 320 acre development.

I say again that we are not asking any restoration of that lost gas. We are just asking that the Commission from now on put this proration, put this field on an equal basis so that each of the parties can get their fair share of the recoverable gas that is now left. I think a simple analysis of the figures in here will indicate to the Commission that in the year and a half that field has been producing, there is approximately, there has been approximately thirty percent of the recoverable reserves already produced. Certainly a fair compromise on this matter would be to put us in an equal position now. I say they have had their advantage. We are not going to ask them to give it back to us. We just want to have the thing put on equal basis now.

Now, with respect to the case that Mr. Kellahin cited, I guess that Mr. Kellahin isn't quite as familiar with the Texas Statutes as I may be, because the Texas Statutes have nothing in them whatsoever with respect to economics insofar as proration is concerned. It is altogether on a basis of physical waste. The Texas Court of Civil Appeals, I can't recall the case right now, but I can supply

it, has held if a person has a tract of land upon which there is no well, no matter how small it may be, and it is being offset by other tracts of land with wells upon them, a much larger area, then that person is entitled as a matter of law to have his one well. It doesn't make any difference about economics whatsoever. The Rule 37 he is talking about is the spacing rule in Texas which has to do with the spacing of wells on a state-wide basis . Twenty acres is your state-wide rule in Texas. Rule 37 is the modus operandi whereby the Commission follows the rule of law, I am talking about, so far as granting to a person his constitutional right to recover the oil and gas under his place.

The Commission has established several rules which have been supported by the court in connection with Rule 37 such as in the East Texas Field they have a rule of thumb that you can't drill to a closer density of five acres despite the density of that East Texas Field. You can't get any closer than five acres. The Courts have held in their administrative discretion that despite the fact of the rule of law as I have stated earlier, they have other frills on Rule 37 that I need not go into at this time which I could point out to the Commission if they are interested, in which Texas does, which I rather doubt, that more or less described to the proposition that you must have uniform spacing on a basis which will protect the correlative rights of the parties.

I might mention in the Consolidated versus Thompson case, that the Supreme Court of the United States held that despite the economic factors absent in the Texas Statutes, that the Commission may enter an order purely for the purpose of protecting correlative rights. That is what we are asking for, we want our correlative rights pro-

tected.

We turn to the New Mexico Statute which spells out and says that the Commission may not directly or indirectly require the drilling of an unnecessary well. The testimony of this case is absolutely undisputed that drilling that well won't get that, that extra well on that 320 acre tract won't get enough gas out to pay the cost of that well or come anyway close to it, and there may be actual physical waste as a result of drilling that well. Mr. Kellahin attempted to manufacture some testimony of Mr. Crum, but he did state it was on the cross examination of Mr. Greer. I fail to see how Mr. Crum's testimony could be testimony, particularly since Mr. Greer didn't agree with it.

I think that the further statements on my part would be repetitious and perhaps redundant. I want to thank the Commission for its extreme patience in this matter. I would like to state to the Commission that it is an important matter. It is a matter involving quite a bit of money. I would like to point to Mr. George Darneille's statement, an independent operator out there, that it is going to cost him some money. I am not making a plea on it costing Stanolind some money. We can afford it. I am saying that anything as fundamentally wrong as this should be scrutinized with great care by the Commission. There are principles involved, precedents that may be established that would have far-reaching effects, and the Commission may have to review this matter and eat it somewhere down the road if they are not careful in following the Statutes as set by the legislature which will not take property by due process of the law, and which will follow the mandates then of the Statutes.

He sure did slur over the word "shall"; he said it "shall" not

not set up proration units which will result in drainage, not offset by compensatory drainage. I think that the physical facts irrespective of the opinion testimony in this case, are of such a nature as to be conclusive that the 320 acre proration unit under the proposed rule that we have set out, will protect everybody's interest. You can drill as many wells as you want to. It is negligible. It doesn't put a person in a strait jacket. It doesn't require the unnecessary expenditures of money.

I submit to the Commission that the only order it can submit in this case is the one in support of 320 acre spacing.

MR. MACEY: Anyone have anything further?

MR. BRATTON: I retreat, not from any statement that I didn't come here to make a speech, however I wish to conclude with one observation which has been apparent to me throughout the course of the proceeding. It appears to me that the matter has been put into proper perspective by Mr. Ben Howell and Mr. Greiner to observers who have no direct economic interest in this matter and who view the matter on the equities of the situation in relation to the statute and relation to the clear mandate of the Statute, that the Commission shall not require the drilling of unnecessary wells. My client is not in the fortunate position of Stanolind. We worry about this case, not the one down the road, because any well which you require us to drill is going to be a tremendous cost to Mr. Darneille. He will not recover one additional iota of gas from that well and as we have pointed out before, he is the largest single operator in the field. I can't help but be impressed by the fact that the two very acute observers without any economic interest in this matter have come to the conclusion that the Commission would

be doing an unjust and inequitable thing in contravention of the Statute, by requiring the drilling of unnecessary wells on the part of the operators, and that the setting up of 160 acre proration units would be a violation of the statutory mandate.

We concur wholeheartedly with the excellent summary which Mr. Smith has made on behalf of Stanolind. We believe that the only equitable order the Commission can enter is the one setting up 320 acre proration units. Thank you for your kindness and consideration.

MR. MACEY: Anything else? If nothing further we will take the case under advisement. Before we proceed with Case 908 we will hear Case 909.

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C E R T I F I C A T E

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and seal this 25th day of June, 1955.

Ada Dearnley
Court Reporter

Statement of James D. Hancock and Co., Ltd.
New Mexico Oil Conservation Commission Case No. 696
Gas Prorationing--West Kutz-Pictured Cliffs
Pool, San Juan County, New Mexico

This case was heard on the application of James D. Hancock and Co., Ltd., filed with the Commission in May, 1954. In its petition the applicant sought an order enforcing ratable take of gas from all gas wells in the West Kutz-Pictured Cliffs Gas Pool, or, in the alternative, the prorationing of production in said pool.

As grounds for the relief sought, it was alleged that the petitioner's wells were being discriminated against, due to the fact line pressures of the system to which petitioner's wells were connected greatly exceeded the line pressure of the pipeline to which offset wells were connected; and that petitioner was not being allowed to utilize his fair share of the reservoir energy, or recover his fair share of the gas in the pool.

The application was first heard by the Commission at its May 19th hearing, and was subsequently continued until a final hearing was had, July 14th, thus giving all interested parties a full opportunity to offer testimony and state their position.

History of the Pool

The problems connected with prorationing in the West Kutz-Pictured Cliffs Gas Pool are somewhat complicated by the history of the development of this pool. Petitioner drilled the discovery well, and commenced development of the pool under the provisions of Rule 104, as later amended by Order No. R-169, which fixed the spacing and drilling unit requirements for gas wells within a defined gas pool, setting up a requirement of 160 acres substantially in the form of a square which shall be a legal subdivision, as the drilling unit. The West Kutz-Pictured Cliffs Pool was defined and first delineated by Commission Order R-42, and later extended to include additional lands.

As the pool was extended northward, a unit agreement for the development and operation of the northern portion of the pool was obtained, designated as the Gallegos Canyon Unit Agreement. Contrary to the usual policy of approving only unit agreements covering a known structure, or substantially all of a structure, this agreement was approved by the New Mexico Oil Conservation Commission by its Order No. R-68, although it covered only approximately one-half of a defined gas pool. Thereafter, on July 24, 1952, or approximately four years after development of the pool commenced, Benson & Montin as unit operators secured an order establishing 320-acre spacing in the area covered by the Gallegos Canyon Unit Agreement. This order, R-172 entered in Case No. 377, was temporary for a period of one year, at the end of which time it required the unit operator to appear and show cause why the unit area lands should not revert to 160 acre spacing.

Order R-172 was objectionable on numerous grounds: It set up a non-uniform spacing pattern in a defined gas pool or common source of supply, where there were no known geological or other barriers to prevent the migration of gas from one area to another; it was issued in derogation of statewide Rule 104 which provides that an exception will be granted to prevent waste by setting up different spacing and require greater acreage for drilling tracts "in any defined oil pool or any defined gas pool." (Rule 104 (1)). This rule implies, of necessity, that an exception will be granted only on a pool-wide basis, putting all operators on an equal footing, but Order R-172 attempted to change the size of drilling units only as to a portion of a defined pool.

To correct this situation the Commission on December 17, 1953, after a lengthy hearing, entered its Order R-172-B, rescinding Order R-172, and restoring 160 acre drilling units as a requirement for the entire West Kutz-Pictured Cliffs Gas Pool. The lands lying within the Gallegos Canyon unit have, however, continued on 320-acre spacing, for the most part, as originally developed. In its Order R-172-B the Commission found that the development of the West Kutz-Pictured Cliffs Gas Pool on two different spacing patterns was not in the best interests of conservation and would impair correlative rights, and that for the prevention of waste and protection of correlative rights a uniform spacing pattern should be established. There was, of course, no prorationing of gas in effect in the pool at the time.

Pipe Line Connections

Production of the West Kutz-Pictured Cliffs goes into two gathering and pipeline systems, one operated by the El Paso Natural Gas Co., and the other by Southern Union Gas Co. The Southern Union system serves principally New Mexico points, with low demand in the summer months, and relatively higher demand during the winter. El Paso's system serves points in New Mexico and to the West, extending to California, and, as a result, their demand is relatively more stable than that of Southern Union, enabling them to take gas at a comparatively higher, and at a fairly uniform rate.

Need for Prorationing

We feel that the need for prorationing has been well established beyond any doubt, in this case. The petitioner has shown, through the testimony of Mr. Fred Crum, that it holds substantial interests in the pool (Exhibit 1) and that as a result of extreme differences in pipeline pressures its wells of deliverability equal to or better than offset wells are being discriminated against, petitioner being connected to the Southern Union pipeline and its offset wells being connected to El Paso Natural Gas Company's lines. There is a differential in operating pressure between these two lines, the Southern Union line operating on an average of 150 to 200 lbs., higher pressure than the pressures maintained by El Paso Natural Gas Co. These facts are all reflected in petitioner's Exhibit 2, which shows production, and deliverability of Hancock and offset wells against various pipeline pressures.

Mr. Crum also testified that waste was occurring because of the frequent and rapid fluctuations in pipeline pressures in Southern Union's lines. This, he stated, has caused freeze-ups with resultant loss of production from individual wells of five days or more, waste of gas caused by the necessity of blowing the lines to clear them after they have frozen; and water encroachment in the well bore caused by rapid drops in pressure. The latter also necessitates frequent blowing down of wells to clear them, and creates a present and future danger of caving which would clearly constitute waste within the provisions of New Mexico's conservation statutes.

The well record attached shows these fluctuations on the Hancock Mudge A-9 well, about which Mr. Crum testified. The chart was not available at the time of the hearing, and is offered now, along with a tabulation of average delivery pressures about which Mr. Crum likewise testified, as a graphic illustration of matters already in the record, for the convenience of the Commission, and is not submitted as evidence in this case.

It is interesting to note that this testimony stands unrefuted on the record and there was no cross examination on any of the points involved in Mr. Crum's testimony, although he was available at each hearing in the case for that purpose. Further, no testimony was offered in opposition to prorationing in the West Kutz-Pictured Cliffs Gas Pool.

Proposed Rules

The only difference of opinion offered the Commission in this case goes to the proposed rules to be adopted in instituting prorationing in the pool. These differences go primarily to differences in proposed proration formulas and the size of proration units. Proration formulas range from 100% deliverability times acreage, proposed by El Paso Natural Gas Co., to 50% deliverability plus 50% acreage proposed by Southern Union, Other formulas will doubtless be proposed to the Commission in statements to be filed in this case. Units proposed are either 160 acre or 320 acre units, a difficulty arising from the history of the development of this particular pool.

Proration Formulas

James D. Hancock and Co., Ltd., the applicant in this case, favors a formula of 75% deliverability times acreage, plus 25% acreage if proration units of 160 acres are to be approved on a uniform basis in the pool. This should include a provision that wells capable of producing up to 100,000 cubic feet of gas per day against a stated line pressure would be treated as marginal wells and allowed to produce their full capacity unless the allowable for the pool resulted in a lower figure for non-marginal wells.

The testimony offered at the hearing would seem to indicate that deliverability of a well bears a relation to reserves, an examination of available cores showing an increase in porosity where there is an increase in permeability. Likewise there is lower water saturation with an increase in permeability. Sand

thickness is fairly uniform and there is no evidence of fracturing. For that reason deliverability would appear to be a fair means of giving consideration to the reserves underlying an individual drilling or proration unit. However, there is wide variation in permeability over comparatively short distances, and this reasoning could not be applied to large proration units.

Since there is a variation in permeability, as shown by all of the testimony presented on that point, in order to arrive at a fair formula consideration should also be given to acreage, to assure as equal an opportunity as possible for each operator to secure the reserves underlying his land.

A formula of 100% deliverability would clearly place too much emphasis on deliverability, whereas 50% deliverability, 50% acreage probably goes too far in cutting back production of those wells having a high deliverability, when the reserves of such wells are considered. For that reason we favor a midway point of 75% deliverability, 25% acreage.

Any proration formula that includes deliverability as a factor would be meaningless unless the order provides some definition or system of measuring a well's ability to produce, because of the difference in pressures of the pipelines operating in the pool. The proposal of Stanolind on this point would appear satisfactory, and, with modifications, is recommended in the proposed rules submitted with this statement.

Proration Units

Probably the most difficult question that the Commission must resolve is the size of the proration units. Problems that exist in this case are unusual because of the non-uniform development of the pool

Proration units of 320 acres have been proposed by Stanolind, with wells located on 160 acres receiving on e-half an allowable, if we assume deliverabilities are equal. Benson and Montin and British American joined in this proposal.

James D. Hancock and Co., Ltd., has recommended proration units of 160 acres, although Hancock is the operator of some wells located on 320 acre tracts. Frontier joins in this recommendation.

We feel, and strongly urge upon the Commission, that 160-acre proration units is the better recommendation, and is the only way to achieve uniform development and operation of the Pool for the protection of all rights which have become vested by past practices of the operators and the policies of the Commission, including the rights of royalty owners.

As has been previously pointed out the pool was originally drilled and development commenced on a 160-acre spacing pattern, as provided for by the rules and regulations of the Commission. The situation as it existed then, and as it has continued for the south half of the pool down to the present time, gave rise to offset obligations. Operators in the south half contributed the major part to the development of the pool. They have met their offset obligations and drilling commitments in good faith, according to the rules promulgated by the Commission. This has resulted in the expenditure of large amounts of money for wells drilled on 160-acre tracts.

To now set the proration unit at 320 acres would be to penalize those operators who have followed the rules and

regulations of the Commission and give approximately twice as much of the pool allowable to operators who have failed to fully develop their acreage, although they have invested in no more wells, solely on the basis of acreage assigned to the individual well.

The testimony and recommendations offered by Stanolind and Benson and Montin on this point show they are ready to carry this proposition to the extreme. It was their position that deliverabilities of wells on two adjacent tracts of 160 acres each should not be added for the purpose of arriving at the allowable for a 320-acre unit with two wells on it. While admitting that there were substantial differences in wells drilled on adjacent 160-acre tracts, they would not even want to allow the operator to plug his poorer well and assign 320 acres to his well of high deliverability, thus penalizing the operator who has spent his money to prove up all of his acreage. At the same time their testimony as to variations in permability and exhibits showing substantial differences in the deliverability of wells on adjacent 160-acre tracts would clearly show that the deliverability of any given well would not necessarily, and in fact probably would not, have any bearing on the reserves located under a tract as large as 320 acres.

In effect proponents of 320-acre units are not in reality asking for a uni form rule to apply to the entire pool. They are rather asking the Commission to create two different size units in the same pool -- 320-acre units for the Gallegos Canyon Unit and a small portion in the southeast portion of the pool, and 160-acre units for the balance of the pool. This would violate both the letter and the spirit of the Conservation Statute governing the creation of proration units.

If we assume, however, that the Commission would allow an operator to assign 320 acres to his better well, which we believe the statute would require the Commission to do, the result would be that poorer wells, though productive, would be prematurely abandoned and plugged, resulting the the waste the Commission is directed by law to prevent. The operator, naturally, is going to seek to obtain the greatest possible production of gas under the rules set up for the operation of this pool.

All of the testimony offered on the subject was to the effect that there is wide, and fairly rapid changes in the permability of the producing formation of the pool. There are substantial differences in the initial potential and deliverability of wells on adjacent 160-acre tracts, as was brought out on cross examination of Mr. Al Greer, witness for Benson and Montin, and as shown in the exhibits on deliverability offered by the petitioner, James D. Hancock and Co. Ltd. The testimony shows a well of low deliverability located between two wells of high deliverability, on adjacent 160-acre drilling units. From this we can only conclude that 320-acre spacing and proration units would fail to secure full development of the pool, and economic and reasonably rapid recovery of the greatest possible amount of gas in the reservoir. A spacing pattern of 320 acres assumes that permability is the same throughout the 320-acre unit -- an assumption that is refuted by the testimony. The testimony also shows that permability is the only factor affecting a change between producing and non-producing portions of the reservoir sand, according to Benson and Montin's witness.

While testimony offered would tend to show one well will possibly drain an area of at least 320 acres, in none of the testimony was the factor of time considered or even discussed in

connection. Further, such testimony would tend to show a well located on 320 acres and given a double allowable would drain gas from adjoining 160-acre units because the wells are located the same as though drilled on 160 acres. If the pool had been drilled initially on such a spacing pattern throughout, there could be no quarrel with the spacing pattern, but this is not the case. If the spacing pattern in the south end of the pool is wrong, it is now too late to correct it, and any attempt to do so can only result in an impairment of correlative rights.

Benson and Montin made light of the problem of water encroachment. However, that would appear to us to present a very real problem if there are excessive withdrawals of gas under any formula which in effect doubles the allowables for some wells over that given to others in the same pool. The testimony shows that there has been considerable difficulty due to the presence of water in the reservoir, both in the completion of wells and in their operation. Benson and Montin stated they have installed intermitters on all of their wells because of this problem. If withdrawals are allowed at an excessive rate to meet allowables on 320-acre units, it is a distinct possibility that gas may be trapped with resultant damage to the reservoir, a reduction in the ultimate recovery of gas from this reservoir and premature abandonment of a portion of the pool.

Benson and Montin state that the cost of additional wells is not justified by recoveries, yet approximately one-half the pool has been drilled and developed on the basis of 160-acre drilling units by operators who are just as interested in the pay-out period of a well as are the propone nts of 320-acre units. They have still been willing to put their money in wells on the spacing pattern required by the Commission's rules.

In substance, James D. Hancock and Co., Ltd., feels that it should be entitled to produce its fair share of the gas underlying the West Kutz-Pictured Cliffs Gas Pool. This opportunity has heretofore been denied to the petitioner in this case, as shown by the testimony offered. If the petitioner is to obtain any relief from the Commission, it can do so only if it is permitted to share in the allowable assigned to the pool on a fair basis, g overned by the reserves petitioner has proved by drilling in conformance with Commission regulations, and with consideration for the expense of so drilling. To approve a rule allowing those who have not conformed to the drilling pattern approved by the Commission a greater share of the pool allowable, we submit, is less than fair, and would in effect impose a penalty on those who have conformed to the Commission's rules and regulations.

We further submit that the testimony offered fails to show that one well will efficiently and economically drain and develop 320 acres, due to the varying characteristics of the reservoir, and approval of such units should be denied.

Hancock's Proposed Rules

Submitted with this statement are rules proposed by James D. Hancock and Co., Ltd., for the prorationing of gas in the West Kutz-Pictured Cliffs Gas Pool. It is felt these rules embody the ideas set out in this statement, including a provision for determining the ability of a well to produce, which we feel is essential to the success of any proration formula. These proposed rules are along the lines of the rules promulgated in the Southeastern New Mexico Pools, with some changes which we feel

are essential to the successful operation of prorationing in the West Kutz-Pictured Cliffs Gas Pool.

We wish to express our thanks to the Commission for its patience and promptness in hearing this case, and the fair-minded attitude shown throughout the hearing.

Respectfully submitted,

JAMES D. HANCOCK & CO., LTD.

By Jason W. Kellahin
Attorney

BEFORE THE OIL CONSERVATION COMMISSION OF

THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF JAMES D. HANCOCK AND CO., LTD., FOR AN ORDER REQUIRING RATABLE TAKE OF GAS IN THE WEST KUTZ-PICTURED CLIFFS POOL, SAN JUAN COUNTY, NEW MEXICO, OR FOR PRORATION OF GAS PRODUCTION IN SAID POOL.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This case came on for hearing at _____ o'clock A. M. on _____, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this _____ day of _____, 19___, the Commission, a quorum being present, having considered the testimony adduced, the exhibits received, the statements of interested parties, the official records of this Commission and other pertinent data, and being fully advised in the premises,

FINDS:

(1) That due public notice of the time and place of hearing and the purpose thereof having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the Commission, for the purpose of preventing waste and for the protection of correlative rights, should issue an order to provide for a definite method of allocating gas between proration units in the West Kutz-Pictured Cliffs Pool.

IT IS THEREFORE ORDERED:

That special pool rules applicable to the West Kutz-Pictured Cliffs Gas Pool, be, and the same hereby are, promulgated as follows:

RULE 1 -- PRORATION UNITS

A. For the purpose of gas allocation in the West Kutz Gas Pool, a standard proration unit shall consist of between 158 and 162 contiguous surface acres substantially in the form of a rectangle, which shall be a legal subdivision of the U. S. Public Land Surveys; provided, however, that a gas proration unit not conforming to the above requirements may be formed after notice and hearing by the Commission or as outlined in paragraph B. Any

proration unit containing less than 158 acres or more than 162 acres shall be a non-standard unit. Any standard proration unit consisting of between 158 and 162 contiguous surface acres shall be considered as containing 160 acres for the purpose of gas allocation.

B. The Secretary of the Commission shall have authority to grant an exception to paragraph 1 without notice and hearing where application has been filed in due form and where the following facts exist and the following provisions are complied with:

1. The non-standard unit consists of less acreage than a standard proration unit.

2. The acreage assigned to the non-standard unit lies wholly within a legal quarter section and contains a well capable of producing gas into a gas transportation facility on the date of this order.

3. The operator receives written consent in the form of waivers from all operators in the adjoining proration units.

RULE 2:

At least 30 days prior to the beginning of each gas proration period, the Commission shall hold a hearing after due notice has been given. The Commission shall cause to be submitted by each gas purchaser its "Preliminary Nominations" of the amount of gas which each in good faith actually desires to purchase within the ensuing proration period, by months, from the West Kutz-Pictured Cliffs Gas Pool. The Commission shall consider the "Preliminary Nominations" of purchasers, actual production, and such other factors as may be deemed applicable in determining the amount of gas that may be produced without waste within the ensuing proration period. "Preliminary Nominations" shall be submitted on a form prescribed by the Commission.

RULE 3:

Each month, the Commission shall cause to be submitted by each gas purchaser its "Supplemental Nominations" of the amount of gas which each in good faith actually desires to purchase within the ensuing proration month from the West Kutz Gas Pool. The Commission shall hold a public hearing between the 15th and 20th days of each month to determine the reasonable market demand for gas for the ensuing proration month, and shall issue a proration schedule setting out the amount of gas which each well may produce during the ensuing proration month. Included in the monthly proration schedule shall be a tabulation of allowable and production for the second preceding month, together with an adjusted allowable computation for the second preceding month. Said adjusted allowable shall be computed by comparing the actual allowable assigned with the actual production. In the event the allowable assigned is greater than the actual pool production, the allowables assigned the top allowable units shall be reduced proportionately, and in the event the allowable assigned is less than the pool production, then the allowables assigned the top allowable units shall be increased proportionately. "Supplemental Nominations" shall be submitted on a form prescribed by the Commission.

The Commission shall include in the proration schedule the gas wells in the West Kutz Gas Pool delivering to a gas transportation facility or lease gathering system, and shall include in the proration schedule of this gas pool any well which it finds is being unreasonably discriminated against through denial of access to a gas transportation facility, which is reasonably capable of handling the type of gas produced by such well. The total allowable to be allocated to the pool each month shall be equal to the sum of the supplemental nominations together with any adjustment which the Commission deems advisable.

Marginal units are defined as units not capable of producing in excess of 100 MCF per day. In calculating the capacity of a well to produce, the average shut-in-pressure of all the wells in the pool, as determined by the preceding year's deliverability test, shall be divided by two, and each unit's ability to produce against such pressure shall establish its capacity to produce. All units capable of producing in excess of 100 MCF per day shall receive an allowable of at least 100 MCF per day.

The allocation to a pool remaining after subtracting the capacity of marginal units and assigned minimum allowables shall be divided and allocated ratably among the non-marginal units in the pool on the following basis:

A. Seventy-five (75) per cent of such remaining allowable shall be divided and allocated ratably among the non-marginal wells in the proportion that the product of the deliverability and acreage assigned each well for proration purposes bears to the summation of the products of these factors for all such non-marginal wells in the pool.

B. Twenty-five (25) per cent of such remaining allowable shall be divided and allocated ratably among the non-marginal wells in the proportion that the acreage assigned each such well for proration purposes bears to the summation of acreage assigned all such non-marginal wells in the field.

RULE 4:

Underproduction: The dates 7:00 A. M., February 1, and 7:00 A. M., August 1, shall be known as balancing dates, and the periods of time bounded by these dates shall be known as gas proration periods. The amount of current gas allowable remaining unproduced at the end of each proration period shall be carried forward to and may be produced during the next succeeding proration period in addition to the normal gas allowable for such succeeding period; but whatever amount thereof is not made up within the first succeeding proration period shall be canceled. If at the end of the first succeeding proration period, a greater amount of allowable remains unproduced than was carried forward as underproduction, the amount carried forward to the second succeeding period shall be the total underproduction less the amount carried forward to the first succeeding period.

If it appears that such continued underproduction has resulted from inability of the well to produce its allowable, it may be classified as a marginal well and its allowable reduced to the well's ability to produce.

RULE 5

Overproduction: A well which has produced a greater amount of gas than was allowed during a given proration period shall have its allowable for the first succeeding proration period reduced by the amount of such overproduction and such overproduction shall be made up within the first succeeding proration period. If, at the end of the first succeeding proration period, the well is still overproduced, it shall be shut-in and its current monthly allowable charged against said overproduction until the well is in balance. If, at any time, a well is overproduced an amount equalling six times its current monthly allowable, it shall be shut-in until it is in balance.

The Commission may allow overproduction to be made up at a lesser rate than would be the case if the well were completely shut in upon a showing at public hearing after due notice, that complete shut-in of the well would result in material damage to the well.

RULE 6

No gas well shall be given an allowable until Form C-104 and Form C-110 have been filed together with a plat showing acreage attributed to said well and the locations of all wells on the lease.

RULE 7

Allowables to newly completed gas wells shall commence on the date of connection to a gas transportation facility, as determined from an affidavit furnished to the Commission by the purchaser, or the date of filing of Form C-104 and Form C-110 and the plat described above, whichever date is the later.

RULE 8

The monthly gas production from each gas well shall be metered separately and the gas production therefrom shall be submitted to the Commission on Form C-115 so as to reach the Commission on or before the twentieth day of the month next succeeding the month in which the gas was produced. The operator shall show on such report what disposition has been made of the gas produced. The full production of gas from each well shall be charged against the well's allowable, regardless of what disposition has been made of the gas; provided, however, that gas used on the lease for consumption in lease houses, treaters, combustion engines and other similar lease equipment shall not be charged against the well's allowable.

RULE 9

The term "gas purchaser" as used in these rules, shall mean any "taker" of gas either at the wellhead or at any point on the lease where connection is made for gas transportation or utilization. It shall be the responsibility of said "taker" to submit a nomination.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

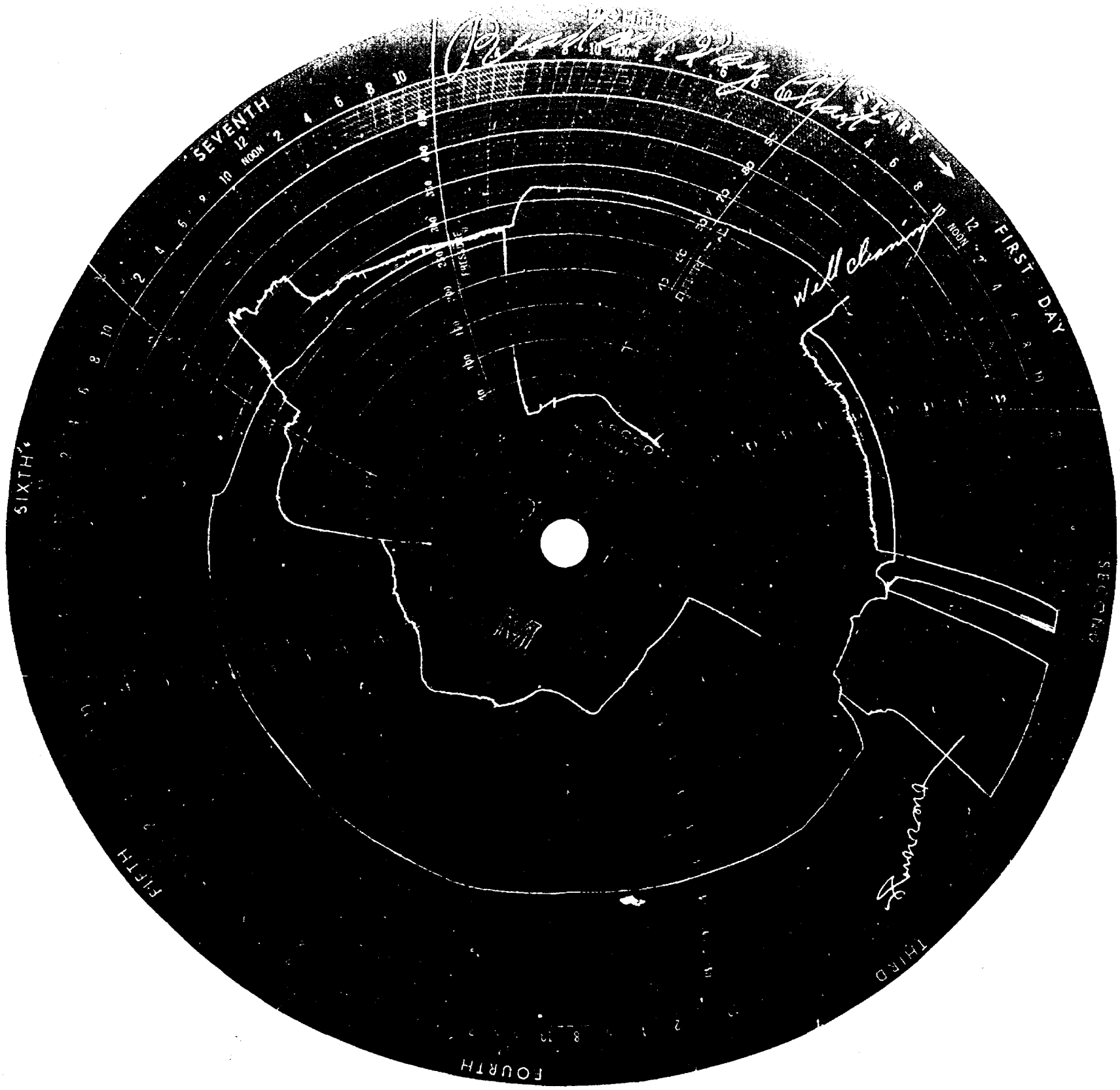
R. R. SPURRIER, Member and Secretary

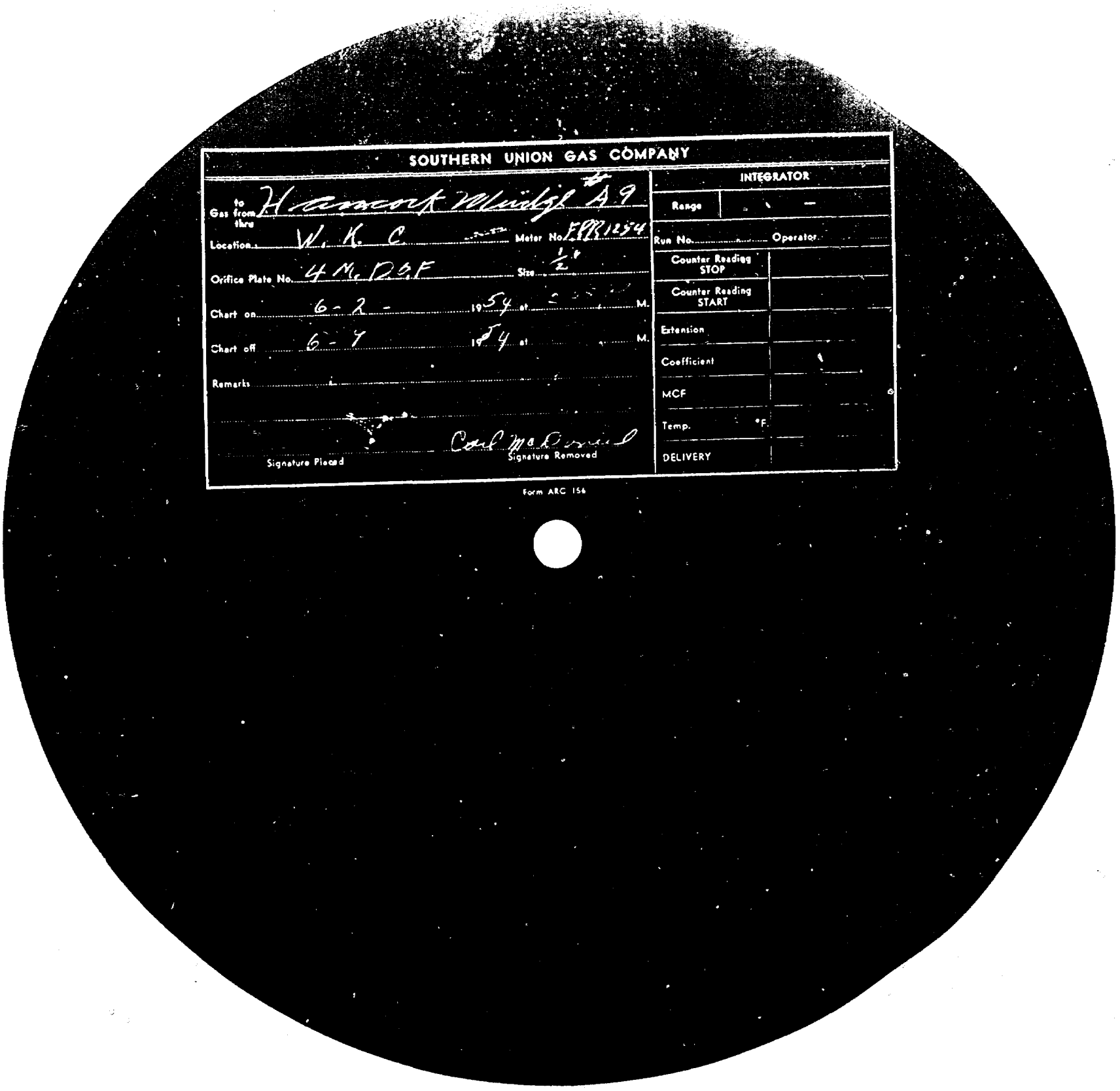
J. D. HANCOCK & CO. LTD.

AVERAGE DELIVERY PRESSURES-WEST KUTZ CANYON-NEW MEXICO

(OBTAINED FROM ORIFICE METER CHARTS)

Lease	Jan., 1954 P.S.I.G.	Feb., 1954 P.S.I.G.	Mar., 1954 P.S.I.G.
Fullerton #1	207	235	225
Fullerton #2	220	245	225
Edgar #3	218	248	230
Edgar #4	223	253	238
Edgar #5	205	243	235
Edgar #6	218	292	243
Edgar #11	238	283	248
Edgar #12	225	278	258
Mudge #3	225	243	238
Mudge #5	218	250	230
Mudge #A-8	208	253	230
Mudge #A-9	220	258	245
Mudge #A-10	208	243	228
Mudge #B-1	238	263	243
Douthit #2	235	250	253
AVERAGE	220	256	238


FIRST DAY
SECOND
THIRD
FOURTH
FIFTH
SIXTH
SEVENTH
12 NOON
START
Well done
Finished



SOUTHERN UNION GAS COMPANY

Gas from Hancock Middle A 9
to
thru

Location W. K. C. Meter No. FPR 1254

Orifice Plate No. 4 M. D.F. Size 1/2"

Chart on 6-2- 1954 at M.

Chart off 6-4 1954 at M.

Remarks

Signature Placed Carl McDonald Signature Removed

INTEGRATOR

Range

Run No. Operator

Counter Reading STOP	
Counter Reading START	
Extension	
Coefficient	
MCF	
Temp. °F.	
DELIVERY	

Form ARC 156

Case 696

DANUBE OIL COMPANY
FIRST NATIONAL BANK BUILDING
AMARILLO, TEXAS

MAIN OFFICE OCC

1954 JUL 29 AM 11 47

July 29, 1954

Oil Conservation Commission
State of New Mexico
P. O. Box 871
Santa Fe, N. M.

In re: Case No. 696 - James D. Hancock and Co., Ltd., for proration in West Kutz Pictured Cliffs Pool, San Juan County, New Mexico

Gentlemen:

We are enclosing herewith original and one copy of Statement of the Danube Oil Company in connection with the above captioned hearing.

If your rules require this statement to be given in the form of sworn testimony, please advise and we will have some one come over there and present the same.

Yours very truly,

DANUBE OIL COMPANY

By: Rip C. Underwood

RCU/lw

Rip C. Underwood

encls. - 2
Air Mail

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF JAMES D. HANCOCK AND CO., LTD., FOR AN ORDER REQUIRING RATABLE TAKE OF GAS IN THE WEST KUTZ-PICTURED CLIFFS POOL, SAN JUAN COUNTY, NEW MEXICO, OR FOR PRORATION OF GAS PRODUCTION IN SAID POOL.

CASE NO 696

STATEMENT OF THE DANUBE OIL COMPANY

It would appear that applicant James D. Hancock and Co., Ltd., the owner of certain small wells and acreage in the Pictured Cliffs section of the West Kutz area of the San Juan Basin, entered into a contract with the Southern Union Gas Co. to sell gas from such wells and acreage.

At the time such contract was made Seller, James D. Hancock and Co., Ltd., had the option of selling gas to either the El Paso Natural Gas Company or the Southern Union Gas Company. Both companies were offering the same price and the choice seemed to be which company would take the most gas. Our company had exactly the same problem that James D. Hancock and Co., Ltd. apparently had.

In considering such choice we took cognizance of the fact that the El Paso Natural Gas Company had developed an expanding market for gas, which seemed to be limited only by its ability to purchase and supply such gas; whereas it was apparent (or should have been) that the market for gas sold to Southern Union Gas Company was limited to, more or less, local (New Mexico) consumption, which, while it would no doubt be expected to continue to increase moderately, must also be expected to be reduced as additional gas was developed by them and their contractees from new and offset production.

It would appear that James D. Hancock and Co., Ltd. although, no doubt, thinking that by voluntarily choosing to sell to Southern Union they were making the best deal, in the light of the real situation made an ill advised choice in signing up to sell their gas to them.

In view of the high cost of such wells, both to drill and to maintain and produce, the James D. Hancock and Co., Ltd. has our deepest sympathy when it finds itself legally obligated to furnish reserves for the Southern Union but only able to sell proportionately with other producers similarily contracted to Southern Union, which happens to be slightly less than they would be selling if they were connected with El Paso's line.

Our wells have been delivering gas approximately three years and we estimate that on the present basis of take it will require four more years before they will be paid out. Anyone who takes the risk incident to drilling

and producing such wells is certainly entitled to a reasonable pay out, if they are successful.

We freely concede that the James D. Hancock and Co., Ltd. is in an unfortunate position as regards a reasonable pay out of its wells and even a fair return on its investment, but we cannot agree that their efforts to get this Commission to cut our wells back and El Paso's take down, thus causing them to require more unprofitable wells to be drilled to meet a demand which they have developed, is a solution to their problem.

Suppose that Southern Union or some of their favored connections developed gas in large quantities closer to their limited market and they arbitrarily reduced their take of James D. Hancock and Co., Ltd. even more, would they expect El Paso to abrogate its contract rights with us and our investment to become worthless because they were unable to sell the same amount of gas that we were asked to deliver.

While we do not question The Oil Conservation Commission's power to prorate the field, we do not believe that such power should be exercised except to prevent waste and to protect correlative rights. The protection of correlative rights does not include protecting producers from bad deals which they made with the same opportunities to make better deals that others had.

Suppose, if you will, that the James D. Hancock and Co., Ltd. decided that they were smarter than every other producer in the area and that, in their opinion, gas was worth more than any purchaser was willing to pay and they arbitrarily refused to sell it to anyone except on their terms which was 20¢ per thousand. Suppose they asked the Commission to shut down all producers in the area because they did not choose to sell any gas. We are sure the Commission would have no part of it.

Suppose they received 20¢ per thousand for their gas, and we received 10¢ for ours, would you entertain an application from us to permit us to sell twice as much gas so that we would receive the same amount that they did. We believe the Commission would have a hopeless job if it tried to use it's conservation powers to see that everyone got a fair deal economically.

We submit that where there are two purchasers in a field with different markets and hence different needs and requirements it would be an endless and impossible task to try to adjust financial equities between them

and it is certainly not within the scope or contemplation of this Commission to so attempt.

It is possible that the solution might be for El Paso to purchase from Southern Union in that area so that all wells might share the same market, but it is likely that Southern Union might prefer to keep that gas in it's reserves or that El Paso might say that they have developed their market for themselves and their own connections and refuse to share it with anyone.

We submit that if the James D. Hancock and Co., Limited chooses to limit it's sales of gas by making a contract with the wrong company and is thus imposed upon, it is a matter between them and that company and offers no just excuse for them to project their disappointment on those whose foresight in this case, at least, was better than theirs.

We do not believe this Commission needs additional and repetitive evidence that 160 acre spacing is the most equitable as a minimum for orderly development and production from the Pictured Cliffs formation. If such evidence would be helpful to this Commission, we would be glad to submit the testimony of our engineers because such evidence is of a technical nature.

Respectfully submitted,

DANUBE OIL COMPANY

By: Lyle Underwood

Managing Partner

JACK FROST
TOWER PETROLEUM BUILDING
DALLAS 1, TEXAS

September 17th
19 54

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

I hold various mineral and leasehold interests in the San Juan Basin. I do not believe that one Pictured Cliffs well would drain 320 acres and we would be very much opposed to any rule which changed the spacing pattern on Pictured Cliffs wells from 160 acres to 320 acres. If you would be kind enough to record me as being in opposition to any such proposed change we would very much appreciate the courtesy.

Sincerely,

Jack Frost

JACK FROST

JF/aa

Worm

File

September 17, 1954

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

It is my understanding that the Commission is presently considering whether to change the spacing on Pictured Cliffs gas wells from 160 acres to 320 acres. I own several thousand acres of royalties and leases in various parts of the San Juan Basin and am heavily interested in the West and East Kutz Fields. I am very much against any such change. I think it would be a breach of good faith with the operators. The 160 spacing pattern has been relied upon by all of us and it should not be changed. I respectfully urge and request that any application for such a change be denied.

Yours very truly,

Mike Abraham

Mike Abraham

BEAVER LODGE OIL CORPORATION
301 MERCANTILE COMMERCE BUILDING
RIVERSIDE-9091
DALLAS 1, TEXAS

CRITCHELL PARSONS
PRESIDENT

September 22, 1954

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

Beaver Lodge Oil Corporation has a very substantial number of mineral and leasehold interests in various parts of the San Juan Basin. We are very interested in seeing that the present spacing pattern is maintained and we would be opposed to any plan to change the spacing on Pictured Cliffs wells from 160 acres to 320 acres. We do not believe from our experience in the Basin that one Pictured Cliffs well would drain 320 acres, and we hope, therefore, that the Commission will not promulgate any such proposed rule setting the Pictured Cliffs spacing at one well per 320 acres.

With best wishes, we are

Very truly yours,

BEAVER LODGE OIL CORPORATION

Critchell Parsons

Critchell Parsons, President

CP:PS

L. CLARK MORGAN
ENGINEER & GEOLOGIST
7530 Midbury
DALLAS, TEXAS

September 21, 1954

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

It is my understanding that a movement is under way to try to get the spacing pattern on Pictured Cliffs gas wells changed in the San Juan Basin from 160 acres to 320 acres. I am very interested in seeing that the present spacing pattern is maintained. I do not believe that a spacing unit of 320 acres for a Pictured Cliffs well would be in the best interest of conservation because I believe that it would result in a waste of gas in that one Pictured Cliffs well would not drain 320 acres and large quantities of gas would be left under ground which would never be recovered by anyone. I am very much opposed to any such change in the 160 acre spacing pattern and I respectfully urge and request that any application for such a change be denied.

Very truly yours,

L. Clark Morgan

LCM:ed

TURNER, WHITE, ATWOOD, McLANE AND FRANCIS
ATTORNEYS AND COUNSELORS AT LAW
12TH FLOOR MERCANTILE BANK BUILDING
DALLAS 1, TEXAS

J. GLENN TURNER
W. D. WHITE
FELIX ATWOOD
ALFRED E. McLANE
EDWARD L. FRANCIS
JAMES B. FRANCIS
JULIAN M. MEER
TREVOR REES-JONES
HARRY S. WELCH
THOS. R. FARNETT III
H. L. HITCHINS, JR.
WILLIAM L. McINERNEY
WILLIAM G. WEBB
LEWIS CHANDLER
SNOWDEN M. LEFTWICH, JR.
WILLIAM C. HERNDON, JR.

September 20, 1954

New Mexico Oil Conservation Commission
State Capitol Building
Santa Fe, New Mexico

Re: Case No. 696, Application of J.D. Hancock, Jr., West Kutz Pictured Cliffs Pool, San Juan Basin, New Mexico;

Case No. 729, Application of the Oil Conservation Commission.

Gentlemen:

It is my understanding that the subject cases involve a proposal to increase the spacing on Pictured Cliffs wells from 160 acres to 320 acres. Being the owner of various royalty and leasehold interests in the San Juan Basin, I am interested in helping maintain an orderly and equitable well-spacing pattern to assure full recovery of reserves and an equitable distribution of reserves among the various owners.

My best geological advice has been to the effect that one Pictured Cliffs well will not drain 320 acres, and such a spacing would leave valuable reserves in the ground which would never be recovered. Moreover, a change in the well-spacing program would be unfair to lessees who have spent large sums of money in developing their leases in accordance with the well-spacing pattern existing at that time.

For the above reasons I should like to have my opposition to the proposed change of well-spacing placed of record.

Yours very truly,

Alfred E. McLane

AEM:bm

Alfred E. McLane

310 TOTAH THEATER BUILDING

TELEPHONE: DAVIS 5-2801

SAN JUAN DRILLING COMPANY
P. O. BOX 728
FARMINGTON, NEW MEXICO

September 21, 1954.

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

The San Juan Drilling Company is engaged in the business of drilling gas wells in the San Juan Basin and elsewhere; and is also the owner of very substantial mineral and leasehold interests.

We are strongly opposed to any plan to change the spacing on Pictured Cliffs wells from 160 acres to 320 acres.

In the first place, we do not believe that one Pictured Cliff well will drain 320 acres, and we are sure that the overwhelming majority of the operators in the Basin share our view.

Further, the 160 acre pattern has been the established one for a long time, and operations in the Basin have been on the assumption that this pattern would continue.

This company and others have made substantial investments in drilling equiptment suitable for drilling Pictured Cliff wells in anticipation of a demand for drilling predicated on drilling Pictured Cliff wells on a 160 acre pattern.

A change in this pattern would, therefore, very drastically interfere with our drilling business, and endanger the value of investments made in good faith.

Respectfully submitted

SAN JUAN DRILLING COMPANY

C. Beeson Neal
Secretary-Treasurer

CBN:pp

September 21, 1954

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

It is my understanding that the Commission is presently considering whether to change the spacing on Pictured Cliffs gas wells from 160 acres to 320 acres. I do not believe that a spacing unit of 320 acres for a Pictured Cliffs well would be in the best interest of conservation because I believe that it would result in a waste of gas in that one Pictured Cliffs well would not drain 320 acres. This would be ruinous to the operators and to the industry and I certainly hope that the Commission will deny any such application to change such spacing rule to 320 acres.

Yours very truly,

Claude R. Lambe

JOHNSTON OIL AND GAS COMPANY

1453 ESPERSON BLDG., HOUSTON 2, TEXAS

September 21, 1954

New Mexico Oil and Gas Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696
Application of J D Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan County, New Mexico

Case No. 729, Application of the Oil
Conservation Commission

Gentlemen:

We are informed that a movement is under way attempting to get the spacing pattern on Pictured Cliffs wells changed in the San Juan Basin from 160 acres to 320 acres. We did not know that any such change had been proposed and had we known of such proposal we would have actively contested the same. We do not believe that such a spacing pattern would be in the interest of conservation, and we believe that it would be very bad from a conservation standpoint and from the standpoint of all Pictured Cliffs operators.

Johnston Oil and Gas Company has substantial holdings in the San Juan Basin, including some 22,500 acres in and around the Rincon Unit. We have considerable Pictured Cliffs production which we have developed in good faith under the belief that we would not be penalized on 160 acre spacing. We think any attempt now to change the spacing pattern would be very unfair to us and that we should not be penalized on allowables by having drilled wells in accordance with the regular spacing pattern. Furthermore, we do not believe that a Pictured Cliffs well would drain 320 acres and we wish to be shown of record as being vigorously opposed to any such proposed change.

Very truly yours,

Ralph A. Johnston

President

RAJ:gw

DELHI OIL CORPORATION
CORRIGAN TOWER
DALLAS 1, TEXAS

September 17, 1954

Oil and Gas Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan Basin, New Mexico

Gentlemen:

Delhi Oil Corporation has been operating extensively in the San Juan Basin for many years. It has very large holdings of mineral and leasehold interests including Pictured Cliffs, Mesaverde and Dakota wells. We understand that an application has been made in the above cause to have the spacing on Pictured Cliffs wells changed from 160 acres to 320 acres. We would be very much opposed to any such change. We do not feel that such a change would be fair to the operators who have developed their properties in good faith in reliance upon the existing order and we do not believe that such an order would be in the interest of good conservation practice. We do not believe that one Pictured Cliffs well will drain 320 acres and we would greatly appreciate, therefore, if you would record us as being opposed to any such change.

Yours very truly,

DELHI OIL CORPORATION

By _____
Executive Vice President

Case 696

SQUIRE PRODUCTION COMPANY
1501 MERCANTILE BANK BUILDING
DALLAS 1, TEXAS

September 17, 1954

New Mexico Oil and Gas
Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan County, New Mexico

Gentlemen:

Squire Production Company is the owner of substantial mineral interests in the San Juan Basin, being the owner of royalty as well as leasehold interests. It is opposed from a conservation standpoint to any change in the Pictured Cliffs spacing pattern from 160 acres to 320 acres.

We do not believe that such a change would be in the interest of the operators or of the State of New Mexico and that great loss would result from any such order. We want to be recorded as being opposed to any such change.

Yours very truly,

William G. Wall
Vice President

WGW:ed

NEW MEXICO WESTERN OIL AND GAS COMPANY

1501 MERCANTILE BANK BUILDING
DALLAS 1, TEXAS

September 16, 1954

Mr. William Macey
State Geologist
Oil and Gas Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan County, New Mexico

Dear Mr. Macey:

New Mexico Western Oil and Gas Company has extensive holdings in the so-called Huerfano Unit in San Juan County, New Mexico. It has approximately 66% interest in oil and gas leases covering some 43,000 acres of such unit and has a like interest in some 20 wells now situated thereon. We understand that it has been proposed in the above cause to change the spacing pattern of 160 acres for Pictured Cliffs wells in the San Juan Basin in so far as certain acreage within the Huerfano Unit is concerned and that it is proposed that the spacing pattern be set at 320 acres. We are very much opposed to any such change. We are very sorry that we did not know of this application in sufficient time to actively contest the same but would like, if it is not too late, to express our views on the subject. We do not believe that a spacing unit of 320 acres for a Pictured Cliffs well would be in the best interest of conservation because we believe that it would result in a useless and needless waste of gas in that one Pictured Cliffs well would not drain 320 acres and it would result in the leaving of large quantities of gas under ground which would never be recovered by anyone. Instead of being a conservation measure we think it would be the worst kind of waste. We strongly recommend to the Commission that the present spacing pattern of 160 acres for Pictured Cliffs wells in the San Juan Basin be retained and that any application to change such spacing rule to 320 acres be denied.

Thanking you for such consideration as the Commission may wish to give to our thoughts on this matter, we are

Yours very truly,

NEW MEXICO WESTERN OIL AND GAS COMPANY

By _____
President

JGT:ed

Case 696

Three States Natural Gas Company

SEVENTEENTH FLOOR CORRIGAN TOWER

DALLAS 1, TEXAS

September 16, 1954

New Mexico Oil and Gas Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan County, New Mexico
Case No. 729, Application of the
Oil Conservation Commission

Gentlemen:

Three States Natural Gas Company has extensive leasehold interests covering several thousand acres of land in San Juan and Rio Arriba Counties, New Mexico. We own both Pictured Cliffs and Mesaverde production and we have invested heavily in the development of the San Juan Basin.

It has just come to our attention that a move is under way on the part of certain operators to try to change the 160 acres spacing unit for a Pictured Cliffs well to 320 acres for each Pictured Cliffs well. We would be strongly opposed to any such change and do not believe it would be fair to the operators and to those of us who have drilled wells in good faith on the 160 acre spacing pattern. Furthermore, our geologists tell us that they are confident that one Pictured Cliffs well will not drain 320 acres and hence it would be greatly against the best interest of the operators in general for any such change to be made. We wish to record our strong opposition to any change in the spacing pattern on Pictured Cliffs wells from 160 acres to 320 acres.

With best wishes, we are

Yours very truly,

THREE STATES NATURAL GAS COMPANY

By _____
President

Case 696

September 16, 1954

New Mexico Oil and Gas Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696
Application of J. D. Hancock, Jr.
West Kutz Pictured Cliffs Pool
San Juan County, New Mexico

Gentlemen:

It is my understanding that an attempt is being made in the above application, not on the part of the applicant J. D. Hancock, Jr., but perhaps on the part of others, to try to get 320 acre spacing for Pictured Cliffs gas wells. As a substantial royalty and lease holder in San Juan County, New Mexico I wish to protest against any change in the spacing pattern from 160 acres to 320 acres. I am confident from years of experience in San Juan and Rio Arriba Counties, New Mexico in the gas business that one Pictured Cliffs well will not drain 320 acres and I think it would be a great mistake and a tremendous blow to the State of New Mexico and the San Juan Basin operators for any such order to be entered.

Thanking you for such consideration as you may be kind enough to give to my views on this subject, I am

Yours very truly,

Paul B. English

Paul B. English

Case 696

CYRUS H. JONES, 1868-1952
THORNTON HARDIE
ALLEN R. GRAMBLING
BEN R. HOWELL
HAROLD L. SIMS
WILLIAM B. HARDIE
JOHN A. GRAMBLING
R. H. FEUILLE

JONES, HARDIE, GRAMBLING & HOWELL
ATTORNEYS AND COUNSELORS AT LAW
SEVENTH FLOOR BASSETT TOWER
EL PASO, TEXAS

July 30, 1954

Mr. William B. Macey

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696

Dear Bill:

On behalf of El Paso Natural Gas Company, we submit the attached Written Argument and proposed Rules for West Kutz Pictured Cliffs Field.

Yours very truly,

JONES, HARDIE, GRAMBLING & HOWELL

By Ben R. Howell

BRH/s
att.
c-Mr. H. F. Steen
c-Mr. Norman Woodruff
c-Mr. J. N. Stricklin

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

J. D. HANCOCK'S APPLICATION FOR PRORATION FOR WEST KUTZ PICTURED CLIFFS FILED IN SAN JUAN COUNTY, NEW MEXICO

CASE NO. 696

EL PASO NATURAL GAS COMPANY'S WRITTEN ARGUMENT

The evidence adduced upon the trial of this case is singularly free from conflict. All witnesses agree that a reasonable relationship exists between the recoverable reserves of gas and the deliverability of the well. The undisputed evidence is that no fracturing exists in this formation. The evidence supports the conclusion that the areas of higher permeability also contain greater volumes of recoverable gas. From all of these factors, it appears that the Commission's problem of allocating to each well its fair proportion of recoverable gas reserves can best be met by using as a formula deliverability times the acreage.

This Company again wishes to reiterate its position that recoverable reserves must be considered as the quantity of gas which can be recovered economically and marketed at the time gas production from the entire pool is marketed. This pool has relatively low reservoir pressures and many wells with low deliverability. This Company believes the low deliverability wells should be favored and submits a proposal for classifying and favoring marginal wells. The low deliverability wells will be protected by classifying as a marginal well any well having an actual deliverability of one hundred thousand cubic feet of gas per day or less. By adopting this

classification of marginal well, the owner of the marginal well is given the opportunity to recover his well costs and should have no particular concern with which formula is used in allocating production to non-marginal and non-limited wells. From the evidence before the Commission, a formula based upon deliverability will be the most equitable.

This Company owns and operates no wells in the West Kutz Field and has no financial interest in wells to be affected by the type of formula adopted. However, the Company sincerely believes that proration rules must be upon a pool-wide basis and that the Commission should consider the average well in making pool rules, reserving the right to correct inequities between abnormal wells through special hearings. The Company further believes that the practical operation of the pool will result in granting allowables in proportion to deliverability regardless of the basis used for initial allocation. If this be the end result, then the use of any other formula constitutes an unnecessary detour and waste of all parties' time.

In general, El Paso Natural Gas Company agrees with the position taken by Stanolind Oil and Gas Company and supports 320 acres as a standard proration unit. The undisputed evidence adduced upon the hearing indicates that one well will drain more than 160 acres and that imposition of an arbitrary 160 acre proration unit would cause waste by unnecessary drilling. The Company has prepared and attaches suggested rules which take into consideration the practical problems of operating this field.

Respectfully submitted,

EL PASO NATURAL GAS COMPANY

By Ben P. Stowell
Its attorney

EL PASO NATURAL GAS COMPANY

PROPOSED RULES AND REGULATIONS FOR
THE WEST KUTZ PICTURED CLIFFS GAS POOL
SAN JUAN COUNTY, NEW MEXICO

WELL SPACING AND ACREAGE REQUIREMENTS FOR DRILLING TRACTS.

RULE 1. Any well drilled a distance of one mile or more from the outer boundary of the West Kutz Pictured Cliffs Gas Pool shall be classified as a wildcat well. Any well drilled less than one mile from the outer boundary of the West Kutz Pictured Cliffs Gas Pool shall be spaced, drilled, operated and prorated in accordance with the Regulations in effect in the West Kutz Pictured Cliffs Gas Pool.

RULE 2. Each well drilled or recompleted within the West Kutz Pictured Cliffs Gas Pool shall be located on a tract consisting of not less than a quarter section of approximately 160 surface contiguous acres substantially in the form of a square which shall be a legal subdivision (quarter section) of the U. S. Public Land Surveys.

RULE 3. Each well drilled within the West Kutz Pictured Cliffs Gas Pool shall not be drilled closer than 660 feet to any outer boundary line of such quarter section nor closer than 330 feet to a quarter-quarter section or subdivision inner boundary nor closer than 1320 feet to a well drilling to or capable of producing from the same pool.

RULE 4. The Secretary of the Commission shall have authority to grant exception to the requirements of Rules 2 and 3 where application has been filed in due form and such exception is required because of conditions resulting from previously drilled wells in the area or, in the case of Rule 3, the necessity of exception is based on topographic conditions.

Applicants shall furnish all operators of leases offsetting the lease containing subject well a copy of the application to the Commission, and applicant shall include with his application a list of names and addresses of all such operators, together with a written stipulation that all such operators have been properly notified. The Secretary of the Commission shall wait at least 20 days before approving any such exception and shall approve such exception only in the absence of objection of any offset operators. In the event an operator objects to the exception the Commission shall consider the matter only after proper notice and hearing.

RULE 5. The provision of Statewide Rule 104 Paragraph (k), shall not apply to the West Kutz Pictured Cliffs Gas Pool.

GAS PRORATION

RULE 6. The Commission after notice and hearing, shall consider the nominations of gas purchasers from the West Kutz Pictured Cliffs Gas Pool and other relevant data and shall fix

the allowable production in the West Kutz Pictured Cliffs Gas Pool, and shall allocate production among the gas wells in the West Kutz Pictured Cliffs Gas Pool delivering to a gas transportation facility upon a reasonable basis and recognizing correlative rights, and shall include in the proration of such pool any well which it finds is being unreasonably discriminated against through denial of access to a gas transportation facility which is reasonably capable of handling the type of gas produced by such well.

PRORATION UNITS

RULE 7. A. For the purpose of gas allocation in the West Kutz Pictured Cliffs Gas Pool a standard proration unit shall consist of approximately 320 contiguous surface acres consisting of the North, South, East or West half of a section and being a legal subdivision of the U. S. Public Land Surveys; provided, however, that a gas proration unit other than a legal half section may be formed after notice and hearing by the Commission, or as outlined in paragraph B. Any standard proration unit consisting of between 315 and 325 contiguous surface acres shall be considered as containing 320 acres for the purpose of gas allocation.

B. The Secretary of the Commission shall have authority to grant an exception to Rule 7 A without notice and hearing:

1. Where the unorthodox size or shape of the tract is due to a variation in legal subdivision of the U. S. Public Land Surveys; or

2. Where application has been filed in due form and where the following facts exist and the following provisions are complied with:

a. The acreage assigned the non-standard unit lies wholly within a legal section.

b. The acreage assigned the non-standard unit is adjacent to or contiguous with the acreage containing said well.

c. The operator making application for such exception to Rule 7 A includes with such application:

(1) waivers from (a) all operators owning interests in the half section in which any part of the non-standard gas proration unit is situated and which acreage is not included in said non-standard gas proration unit; and (b) all operators owning interests in acreage offsetting the non-standard proration unit; or

(2) a list of names and addresses of all operators outlined in paragraph (1), together with a stipulation that proper notice has been given said operators at the addresses given and no objection is received by the Commission from such operators within 20 days after the Commission receives such application.

d. The entire non-standard proration unit may reasonably be presumed to be productive of gas.

e. The length or width of the non-standard gas proration unit does not exceed 5280 feet.

C. The Secretary of the Commission shall have authority to grant an exception to Rule 7 A after notice and hearing, when the operator is unable to comply with the provisions of Rule 7 B.

GAS ALLOCATION

RULE 8. At least 30 days prior to the beginning of each gas proration period the Commission shall hold a hearing after due notice has been given. The Commission shall cause to be submitted by each gas purchaser its nominations of the amount of gas which each in good faith actually desires to purchase within the ensuing proration period, by months, from the West Kutz Pictured Cliffs Gas Pool.

When a purchaser of gas, after filing its nominations for the proration period shall find that its requirements for gas have increased or decreased from the amount nominated for any month during the proration period, such purchaser shall indicate its revised estimated requirements during such month by filing supplemental nominations with the Commission at least three days prior to the regular hearing of the Commission for the month preceding such changed requirements.

All nominations shall be filed on a form prescribed by the Commission.

RULE 9. The Commission shall hold a public hearing at least thirty (30) days prior to each gas proration period to determine the reasonable market demand for gas produced from the West Kutz Pictured Cliffs Gas Pool and shall issue a proration schedule for that proration period.

Also, the Commission shall hold a public hearing between the 15th and 20th days of each month to determine the reasonable market demand for gas produced from the West Kutz Pictured Cliffs Gas Pool for the ensuing proration month and shall issue a proration schedule for that pool allocating the amount of gas which each well may produce during the ensuing proration month.

The monthly proration schedule shall include a tabulation of allowable and production for the second preceding month, together with an adjusted allowable computation for the second preceding month, said adjusted allowable shall be computed by comparing the total pool allowable assigned with the total pool production. In the event the total pool allowable assigned is greater than the total pool production, the allowable assigned the non-marginal and non-limited wells shall be reduced proportionately; and in the event such allowable assigned is less than such production, then the allowable assigned the non-marginal and non-limited wells shall be increased proportionately.

The Commission shall include in each proration schedule each well in said pool delivering to a gas transportation facility or lease gathering system and any well which it finds is being unreasonably discriminated against through denial of access to a gas transportation facility which is reasonably capable of handling the type of gas produced by such well. The total allowable to be allocated to said pool for each proration period and each month shall be equal to the sum of the purchasers' nominations with any adjustment which the Commission may make. The Commission first shall determine and classify the marginal wells in said pool. A marginal well is any well whose producing capacity into existing gas transportation facilities is less than 100 m.c.f. per day. A marginal well shall be permitted to produce all its producing capacity into existing transportation facilities and while classified as a marginal well, shall accrue neither underproduction nor overproduction.

Any well that the Commission finds has an actual producing capacity less than its assigned allowable also shall be permitted to produce all its producing capacity into existing transportation facilities, restricted only by the allowable such well would have been assigned under application of the proration formula. While classified in this category, the well shall accrue neither underproduction nor overproduction.

The allocation to said pool shall be divided and allocated among the wells appearing on each proration schedule in the following manner: (1) the sum of the allowables for all marginal wells and of wells found by the Commission to have an actual producing capacity less than the assigned allowable shall be subtracted from the total pool allowable, (2) a tentative allocation to the non-marginal wells shall be made by dividing the remaining pool allowable among the remaining wells in said pool in the proportion that the product of each well's calculated deliverability multiplied by the acreage attributable to that well bears to the sum of such product for all such remaining wells to be prorated, (3) when the tentative allowable received by a well is in excess of its known producing ability, that well shall be classified as a limited well and shall have its allowable limited to its

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each month to determine the reasonable market demand for gas for the ensuing proration month, and shall issue a proration schedule setting out the amount of gas which each well may produce during the ensuing proration month. Included in the monthly proration schedule shall be a tabulation of allowable and production for the second preceding month, together with an adjusted allowable computation for the second preceding month, said adjusted allowable shall be computed by comparing the ~~actual~~ allowable assigned with the ~~actual~~ production. In the event the allowable assigned is greater than the ~~actual~~ production, the allowable assigned the ~~top allowable units~~ shall be reduced proportionately; and in the event the allowable assigned is less than the production, then the allowable assigned the ~~top allowable units~~ shall be increased proportionately.

The Commission shall include in the proration schedule the gas wells in the West Kutz Pictured Cliffs Gas Pool delivering to a gas transportation facility, or lease gathering system, and shall include in the proration schedule of the West Kutz Pictured Cliffs Gas Pool any well which it finds is being unreasonably discriminated against through denial of access to a gas transportation facility which is reasonably capable of handling the type of gas produced by such well. The total allowable to be allocated to the pool each month shall be equal to the sum of the nominations together with any adjustment which the Commission deems advisable. The allocation to a pool shall be divided and allocated among the wells appearing on the proration schedule in the following manner: (1) a tentative allocation shall be made by dividing the total pool allocation among said wells in the proportion that the product of each well's calculated deliverability multiplied by the acreage comprising the standard proration unit or approved non-standard unit upon which the well is located bears to the sum of such products for all the wells on the proration schedule; (2) when the tentative allowable received by a well is in excess of its known producing ability the well shall be classified

producing ability for the period of time covered by that proration schedule, (4) the allowable for the pool remaining after subtracting the sum of the limited allowables of all limited wells shall be reallocated to the remaining wells by application of the same formula, and (5) if such reallocation shall result in placing any other well within the limited classification, the allowable for the pool remaining after subtracting the limited allowables of all such additional limited wells shall be allocated among the remaining wells by application of the same formula until no well has received an allowable in excess of its known producing ability.

The calculated deliverability mentioned in the preceding paragraph shall be that deliverability as determined by a test taken in accordance with the provisions of Order No. R-333 or Order No. R-333A of the New Mexico Oil Conservation Commission or any amendments thereof. At the time of institution of proration, a connected well having no deliverability tests shall have its deliverability estimated as thirteen per cent (13%) of its three hour initial potential pending completion of its deliverability test. A temporary allowable shall be assigned such well using the estimated deliverability in the allocation formula until the deliverability test is taken, at which time those previous allowables granted the well by use of the estimated deliverability shall be revised by use of the actual calculated deliverability. In like manner the estimated deliverability for a well that is connected during the period between the end of one annual deliverability test and the beginning of the next annual deliverability test shall be determined and used for proration purposes pending the completion of the deliverability test for such a well. After the well is connected, the operator may elect to test the well in accordance with the procedure prescribed in Order No. R-333 or in Order No. R-333A for the annual deliverability test or to postpone such test until the next annual deliverability test period.

BALANCING OF PRODUCTION

RULE 10. Underproduction: The dates 7:00 A. M., March 1, and 7:00 A. M., September 1, shall be known as balancing dates and the periods of time bounded by these dates shall be known as gas proration periods. The amount of current gas allowable remaining unproduced at the end of each proration period shall be carried forward to and may be produced during the first succeeding proration period in addition to the normal gas allowable for such succeeding period. That portion of such cumulative underproduction carried forward into the first succeeding proration period, which is not made up during said period shall be deducted from the total underproduction at the end of the period, resulting in only that volume of underproduction accrued during said period being carried forward as cumulative underproduction into the next succeeding proration period.

If it appears that such continued underproduction has resulted from inability of the well to produce its allowable, it may be classified as a marginal well and its allowable reduced to the well's ability to produce. All underproduction accumulated to a well classified as marginal shall be added to the allocation for non-marginal wells and distributed thereto. While classified as a marginal well, the well shall accrue neither underproduction nor overproduction and its actual production shall be restricted only by the allowable it would have been assigned if it had been a non-marginal well.

RULE 11. Overproduction: An operator will be allowed to overproduce a well during a proration period and to accumulate and carry over such overproduction into the first succeeding proration period in an amount not in excess of the total allowable assignable to the well based on nominations for the first succeeding proration period. Should the allowable so calculated be less

producing ability for the period of time covered by that proration schedule, (4) the allowable for the pool remaining after subtracting the sum of the limited allowables of all limited wells shall be reallocated to the remaining wells by application of the same formula, and (5) if such reallocation shall result in placing any other well within the limited classification, the allowable for the pool remaining after subtracting the limited allowables of all such additional limited wells shall be allocated among the remaining wells by application of the same formula until no well has received an allowable in excess of its known producing ability.

The calculated deliverability mentioned in the preceding paragraph shall be that deliverability as determined by a test taken in accordance with the provisions of Order No. R-333 or Order No. R-333A of the New Mexico Oil Conservation Commission or any amendments thereof. At the time of institution of proration, a connected well having no deliverability tests shall have its deliverability estimated as thirteen per cent (13%) of its three hour initial potential pending completion of its deliverability test. A temporary allowable shall be assigned such well using the estimated deliverability in the allocation formula until the deliverability test is taken, at which time those previous allowables granted the well by use of the estimated deliverability shall be revised by use of the actual calculated deliverability. In like manner the estimated deliverability for a well that is connected during the period between the end of one annual deliverability test and the beginning of the next annual deliverability test shall be determined and used for proration purposes pending the completion of the deliverability test for such a well. After the well is connected, the operator may elect to test the well in accordance with the procedure prescribed in Order No. R-333 or in Order No. R-333A for the annual deliverability test or to postpone such test until the next annual deliverability test period.

BALANCING OF PRODUCTION

RULE 10. Underproduction: The dates 7:00 A. M., March 1, and 7:00 A. M., September 1, shall be known as balancing dates and the periods of time bounded by these dates shall be known as gas proration periods. The amount of current gas allowable remaining unproduced at the end of each proration period shall be carried forward to and may be produced during the first succeeding proration period in addition to the normal gas allowable for such succeeding period. That portion of such cumulative underproduction carried forward into the first succeeding proration period, which is not made up during said period shall be deducted from the total underproduction at the end of the period, resulting in only that volume of underproduction accrued during said period being carried forward as cumulative underproduction into the next succeeding proration period.

If it appears that such continued underproduction has resulted from inability of the well to produce its allowable, it may be classified as a marginal well and its allowable reduced to the well's ability to produce. All underproduction accumulated to a well classified as marginal shall be added to the allocation for non-marginal wells and distributed thereto. While classified as a marginal well, the well shall accrue neither underproduction nor overproduction and its actual production shall be restricted only by the allowable it would have been assigned if it had been a non-marginal well.

RULE 11. Overproduction: An operator will be allowed to overproduce a well during a proration period and to accumulate and carry over such overproduction into the first succeeding proration period in an amount not in excess of the total allowable assignable to the well based on nominations for the first succeeding proration period. Should the allowable so calculated be less

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than the accumulated overproduction at the beginning of the first succeeding proration period, the well must be shut-in until the overproduction has been reduced to such allowable. Should the well's cumulative status not be brought in balance during the first succeeding proration period, that overproduction accumulated at the end of the first succeeding proration period must be brought in balance during the second succeeding proration period or the well must be shut-in at the end of the second succeeding proration period until its cumulative status is in balance.

The Commission may allow overproduction to be made up at a lesser rate than would be the case if the well were completely shut-in upon a showing at public hearing after due notice that complete shut-in of the well would result in material damage to the well.

GRANTING OF ALLOWABLES

RULE 12. No gas well shall be given an allowable until Form C-104 and Form C-110 have been filed together with a plat showing acreage attributed to said well and the locations of all wells on the lease.

RULE 13. Allowables to newly completed gas wells shall commence on the date of connection to a gas transportation facility, as determined from an affidavit furnished to the Commission (Box 697, Aztec, New Mexico) by the purchaser, or the date of filing of Form C-104 and Form C-110 and the plat described above, whichever date is the later.

REPORTING OF PRODUCTION

RULE 14. The monthly gas production from each gas proration unit shall be metered separately and the gas production therefrom shall be reported to the Commission by the operator so as to reach the Commission on or before the twentieth day of the month next succeeding the month in which the gas was produced. The operator shall show on such report what disposition has been made of the gas produced. The full production of gas from each well shall be charged against the well's allowable regardless of what disposition has been made of the gas; provided, however, that gas used on the lease for consumption in lease houses, heaters, treaters, combustion engines and other similar lease equipment and that gas vented in testing or as required to maintain production shall not be charged against the well's allowable.

Copies of Form C-115, Monthly Production Report, submitted in compliance with Rule 14, shall be distributed by the operator as follows: Original to Oil Conservation Commission, Box 871, Santa Fe; two copies to Oil Conservation Commission, Box 697, Aztec, New Mexico.

Case 696

SOUTHERN UNION GAS COMPANY
BURT BUILDING
DALLAS 1, TEXAS

July 26, 1954

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Case No. 696

Gentlemen:

At the hearing held July 14, 1954 in the above matter, Stanolind Oil and Gas Company and Benson & Montin submitted for the Commission's consideration a set of proposed special rules for the West Kutz-Pictured Cliffs Gas Pool. Southern Union Gas Company is generally in accord with the recommendations embodied in such proposed rules, subject, however, to the following qualifications:

(1) We recommend that proposed Rule 1-C be modified so as to permit the use of either the waiver or the notice procedure, at the operator's option, in support of applications for approval without notice and hearing of non-standard proration units. (See in this connection the second paragrapn of Rule 4 proposed by Delhi Oil Corporation in Case No. 330-A.)

(2) We recommend that proposed Rules 2 and 3 be modified so as to require the filing of Supplemental Nominations only when they will effect a change in a pipe line company's Nominations as originally filed.

(3) We recommend that proposed Rule 3 be modified so as to make clear that when two wells are producing from the same 320 acre proration unit, 160 acres is to be assigned to each well for purposes of the allocation formula set forth in the rule.

(4) We recommend that proposed Rule 4 be modified so as to eliminate the possible implication of its present language that a well may not be classified as a "marginal" well until after it has remained in a state of under production for two full 6-months balancing periods.

At the hearing referred to above, two allocation formulas were suggested, the one based 100% on deliverability times acreage, the other based 75% on deliverability times acreage and 25% on acreage alone. As between the two suggested formulas, we believe the latter to be the more appropriate.

The testimony at the hearing indicated that there was a considerable degree of relationship between deliverability and economically recoverable reserves. Such testimony, however, also indicated that the relationship between deliverability and recoverable reserves was by no means identical in

all instances. Accordingly, in our opinion, the allocation formula for this pool should give at least some weight to acreage as an equalizing factor. Clearly, insufficient information is available regarding the pool to permit anyone to state what the acreage component should be with mathematical certainty. A 25% acreage factor, however, seems to us fairly reasonable in this instance in the light of present knowledge.

One further group of problems also seem worthy of mention, namely, those arising from the fact that a portion of the pool has been developed on a 160-acre spacing pattern and the remainder on 320-acre spacing. We strongly urge that no order be adopted by the Commission which would have the effect, either directly or indirectly, of requiring operators who have developed their properties on a 320-acre spacing pattern to shift over now to a 160-acre pattern in order to protect their economic interests.

Southern Union Gas Company is not a producer of gas from this pool, so that, unlike some of the operators, we are not faced with the possibility of having to drill wells to protect our position under proration which otherwise would not represent a worthwhile investment and are not necessary for the efficient recovery of underlying reserves. Our Company, however, is interested in the pool as a taker and gatherer of gas for public utility purposes. We thus are keenly aware of the fact that every gathering line which we are required to lay to a well, not truly necessary for the efficient recovery of the reserves in the pool, represents an unnecessary investment, the cost of which must ultimately be borne by our New Mexico utility customers. Surely some solution to the problem can be available which will not call for the making of such unnecessary investments both in well and gathering facilities.

Respectfully submitted,

SOUTHERN UNION GAS COMPANY

By A. S. Grenier

A. S. Grenier, Attorney

ASG:FG

FORM 1020 1-51

STANOLIND OIL AND GAS COMPANY

MAIN OFFICE OCC
OIL AND GAS BUILDING
FORT WORTH, TEXAS

1954 JUL 30 AM 11:46

JAMES K. SMITH
DIVISION ATTORNEY

July 27, 1954

Oil Conservation Commission of the State of New Mexico
Santa Fe, New Mexico

Attention: Mr. W. B. Macey, Secretary

Gentlemen:

Pursuant to the suggestion of the Commission at the hearing of Case No. 696 held on the 14th day of July, 1954, we are submitting a written statement with reference to the proration of gas and the allocation formula to be used in the West Kutz-Pictured Cliffs pool.

This case is before the Commission on the application of J. D. Hancock for an order requiring ratable take of gas or proration of gas production from this pool. At the first hearing of this application in May, 1954, the applicant introduced evidence purporting to show that waste was occurring in the West Kutz-Pictured Cliffs pool and that gas was not being taken ratably from the field. No evidence was placed in the record at that time by the applicant or any other interested party relating to a method or manner of proration, the evidence being directed solely to the necessity for regulating ratable takes or for proration of gas. The case was then continued until the hearing which was held on July 14, 1954.

When the case came on to be heard on the latter date, Stanolind Oil and Gas Company and Benson and Montin (Stanolind/B-M), who together are substantial operators in this field, collaborated in the presentation of evidence as to the method or system of proration to be established in the field. Before reviewing this evidence, it should be pointed out that no evidence other than corroboration of the evidence presented by Stanolind/B-M was introduced at the hearing on July 14, 1954, by any party to show that a system other than the one which these parties were recommending should be adopted.

The only evidence and testimony related to the size of proration units presented in this case was that of Stanolind/B-M. This evidence showed that one well will efficiently and economically drain an area of 320 acres. This evidence also showed that the drilling of one well on an area of 320 acres would prevent the drilling of unnecessary wells, and in fact, that waste would

occur by the drilling of an additional well on an area of 320 acres or one well to each 160 acres.

If the Commission should adopt a proration unit of less than 320 acres, viz. a unit of 160 acres, then the operators in this field whose acreage is presently developed on the basis of one well to 320 acres would have to drill approximately 83 additional wells to bring their acreage development of the field to a uniform density of one well to each 160 acres. This would be necessary in order to protect their correlative rights. The drilling costs of these additional wells would be a sum of at least $1,600,000.00 which investment would in no way increase the ultimate recovery of gas available for legal use. Hence, the drilling of these additional wells is unnecessary and would result in an economic loss.

It is submitted that the evidence adduced places before this Commission those considerations which the Commission is to take into account in establishing a proration unit according to Section 13(b) of the Conservation Act, as amended.

In the cross-examination of Stanolind/B-M's witness, Mr. A. L. Greer, the applicant, J. D. Hancock, Ltd., and Frontier Oil Company attempted to show that there exists in this field variations in reservoir characteristics which would require proration units of 160 acres. In response to these inquiries, however, it was pointed out that any such existing variations are compensated for in the allocation formula recommended by Stanolind/B-M. Accordingly Stanolind/B-M seriously urge that the basic size of the proration unit in the West Kutz-Pictured Cliffs pool be established at 320 acres.

The Commission's attention is directed to Order R-172 entered in Case No. 377, effective July 24, 1952, with particular reference to Finding #3 "That apparently one gas well to the Pictured Cliffs formation of the above lands will efficiently, effectively and economically drain an area of 320 acres, ***". At that time the Commission thought that sufficient evidence had been adduced to justify the establishment of a 320-acre spacing unit. Subsequently, this temporary order was rescinded because of the fact that earlier drilling had established a pattern of 160 acres for spacing units. There has been no testimony offered or evidence presented, either subsequent to the date of entry of Order R-172 or at the hearing recently concluded, which in any way challenges the fact that one well will efficiently and economically drain 320 acres, with respect to the West Kutz-Pictured Cliffs gas pool. There is a distinction between a spacing unit and a proration unit. Although it is not reasonable to establish two different spacing patterns in the same pool, it is not inconsistent to establish proration units permitting inclusion of more

than one well. As indicated hereinafter, entry of the Order recommended by Stanolind/B-M is entirely consistent and consonant with the orders heretofore entered by the Commission establishing 160 acres as the basic spacing pattern in the West Kutz-Pictured Cliffs pool.

Although existing spacing rules for this field provide for 160-acre spacing, the adoption of 320-acre proration units is in no way an attempt to change this spacing pattern. The rules which are recommended by Stanolind/B-M afford flexibility by giving an operator an option of drilling one or two wells to a standard 320-acre proration unit. Additional provisions are made for the formation of non-standard proration units.

The proration system which Stanolind/B-M recommend affords the Commission an opportunity to consider the factors enumerated in Article 12(c) of the Conservation Act, as amended, and relates these factors to the recoverable reserves as suggested by Article 13(a) of such Act. The testimony and evidence presented by Stanolind/B-M show that a definite relationship exists between the ability of a well to produce and the recoverable reserves attributable to that well. Accordingly, the allocation formula which these companies recomend gives proper weight to the current ability of a well to produce, as reflected by periodic deliverability tests, and includes an acreage factor, both of which, in conjunction with the proper proration unit, will permit equitable distribution of the market demand for gas among the proratable wells in the proportions contemplated by the Conservation Act. Recognizing the fact that because of the variations in reservoir characteristics, the relationship between deliverability and reserves is not an absolutely direct one, the additive feature of the formula which these companies recommend is designed to compensate for this fact.

The allocation for[illegible] of 75% deliverability times acreage plus 25% acreage as recommended by [illegible]/B-M in conjunction with a minimum allowable of 100 MCF per day will [illegible] in a proper equitable distribution of market demand and will assu[illegible]perator of a reasonable pay-out in gas wells completed in areas of relativ[illegible]w reserves wherein deliverability is correspondingly low. Other pertinen[illegible]s relating to the general administration of proration are recommended by [illegible]olind/B-M and a copy of these rules, including the recommendations hereina[illegible]ve discussed, have been introduced into evidence and are a part of the record of this case.

The attention of the Commission should be directed to the question raised at the hearing of allowing an operator with two existing wells on a standard proration unit of 320 acres, one of which wells is of high-deliverability and the other of which has a low deliverability, to shut-in the well having a

low deliverability and produce only from the well having a high-deliverability, the 320 acres being then assigned to the well of high-deliverability for allocation purposes. This would allow such operator to increase the allowable assigned to such proration unit by shutting-in the well with low deliverability. It appears to Stanolind/B-M that the inauguration of such a practice is inequitable, discriminatory and violates all of the principals and concepts of proper proration practice.

In this connection, it was implied, if not asserted, that an operator having one well with a high-deliverability on a 320-acre proration unit would have an unfair advantage. It should be recognized that the areas developed on a basis of 320 acres have thus far been developed in an orderly manner on a uniform pattern and, although there are known to be variations in reservoir characteristics, no attempt has been made to predict the relative deliverability of the two 160-acre tracts comprising a 320-acre unit. It is logical to conclude, therefore, that the deliverability of the undrilled portions of these units could be appreciably higher than the developed portion, or on the other hand, it might be lower. It is readily apparent, therefore, that 320-acre development has been without regard to the risks involved in the potential deliverabilities of the various portions of the 320-acre unit, and an operator developing his properties in this manner could not knowingly have any physical advantage. It goes without saying, that the only manner in which it could be determined which portion of such 320-acre unit has higher deliverability would be to drill the additional unnecessary wells for the sole purpose of making this determination.

If it should be decided by the Commission that an operator should be allowed to plug and abandon a well capable of producing gas in paying quantities with the result that the proration unit will receive an increased allowable as outlined above, it is our recommendation that the Commission require that the operator of the unit show cause why the unit should be entitled to the increased differential in allowable.

In conclusion, it is our recommendation that the Commission adopt 320-acre spacing unit, an allocation formula of 75% deliverability times acreage plus 25% acreage, with a minimum allowable of 100 MCF per day and all other rules recommended by Stanolind Oil and Gas Company and Benson and Montin.

Respectfully submitted,

James K. Smith

JAMES K. SMITH
Division Attorney
Stanolind Oil and Gas Company

JKS:rb

THE FRONTIER REFINING CO.

DENVER, COLORADO

CHEYENNE, WYOMING

410 BOSTON BUILDING
DENVER 2, COLORADO

July 28, 1954

Oil Conservation Commission
State of New Mexico
State Capitol Building
Santa Fe, New Mexico

Gentlemen:

The attached Statement of The Frontier Refining Company is filed in lieu of a closing statement at the hearing held July 14, 1954 in Case No. 696.

Very truly yours,

THE FRONTIER REFINING COMPANY

Ben H. Parker

BHP:sb
encl:
Registered Mail - RRR

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF JAMES D. HANCOCK AND CO., LTD., FOR AN ORDER REQUIRING RATABLE TAKE OF GAS IN THE WEST KUTZ-PICTURED CLIFFS POOL, SAN JUAN COUNTY, NEW MEXICO, OR FOR PRORATION OF GAS PRODUCTION IN SAID POOL.

CASE NO. 696

STATEMENT OF THE FRONTIER REFINING COMPANY

This case came on for hearing at 9:00 o'clock A.M. on July 14, 1954, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico as an adjourned hearing from prior hearings on the original Application.

Testimony in the case was limited to the testimony of Fred Krumm in behalf of the Applicant at the first hearing, the testimony of witnesses Greer and Hildts in behalf of Stanolind Oil and Gas Company and Benson and Montin, and of witness Woodruff for El Paso Natural Gas Company at the hearing of July 14, 1954.

This is the statement of The Frontier Refining Company, permitted to be filed in lieu of a closing statement at the hearing.

IS PRORATION REQUIRED OR PERMITTED?

The primary function of the Commission is to prevent waste as that term is defined in the New Mexico Conservation Statute. In aid of that function, the Commission has the power "to limit and prorate production of crude petroleum oil or natural gas, or both, as in this Act provided." The Commission has a secondary duty "to protect correlative rights, as in this Act provided;" a later provision of the Act limiting this duty to times when it is practicable to honor it.

The establishment of proration should not take place unless there is compelling evidence that proration will aid in the prevention of waste or, if practicable, it would protect correlative rights of parties against which they cannot or have

not protected themselves. It is undeniable that the establishment of proration will create substantial administrative burdens for the Commission, for every operator in the pool and for the gas purchasers, all of which extra burdens are not required in the absence of proration.

It is the contention of The Frontier Refining Company that none of the evidence adduced in this case supports the theory that proration of the West Kutz Pool would prevent any waste whatsoever or conversely lead to the recovery of more gas from the pool than would be recovered under the present system of operation. In fact, testimony has been introduced showing that proration on 320 acre proration units would result in the recovery of less gas than would be recovered under the existing 160 acre spacing rule.

In the absence of a finding that the present system of operation leads to waste, the Commission should not, and indeed may not have the power, to compel proration. If the Commission, in the absence of waste, nonetheless has the power to establish proration to protect correlative rights, consideration should be given to the following questions:

(a) If the denial of correlative rights is based solely upon the fact that applicant, Hancock, is producing its wells into a gas transportation facility different from all other operators in the field, is not Hancock responsible for its position because it contracted away its "opportunity to produce its just and equitable share of the * * * gas * * * in the pool?"

(b) Is the Commission required to protect the correlative rights of a party who has contracted himself into an unfortunate position when no other operator in the field is responsible for the unfortunate situation?

(c) Even if the Commission has the power to restore the correlative rights of a party which he himself has contracted away, where in the Conservation Act is the power given to the Commission to repair the unfortunate situation Hancock complains of?

It is apparent that the Conservation Act is primarily a waste prevention statute and that the extent of the protection of correlative rights contemplated is limited to giving each operator the "opportunity" to produce his share of the gas. Hancock, who originally had the same opportunity as other producers in the field, has simply contracted away its opportunity and should look for remedy to its gas purchaser instead of asking that the other producers in the field be compelled to share its misfortune by indirectly requiring a ratable taking of gas from the field by the two purchasers. In this regard, we find no provision in the Conservation Act which would permit the Commission to require the ratable taking of gas from a pool as between two purchasers and we suspect that the purchasers themselves would vigorously contest the exercise of such power. In what fashion then can the Commission protect the correlative rights of Hancock even if it is entitled to it? The Commission cannot compel Southern Union to take more gas from Hancock and it cannot compel Southern Union to transfer a fraction of its right to take gas from Hancock's properties to El Paso. It is contended that Hancock's relief from its unfortunate position can only come through a voluntary ratable taking of gas by the respective purchasers in the field. Since it is voluntary, why must the cumbersome mechanism of proration be established when any improvement in Hancock's position must, in either event, arise out of voluntary action between the gas purchasers in the field?

It is contended that the foregoing argument is materially strengthened by a reading of Section 69-213 (c) of the Conservation Act where, proration having been established and allocation found necessary, the Commission is restricted to allocating the allowable production among those gas wells in the pool delivering to a gas transportation facility. It is contended that the Act does not contemplate, and that it is beyond the powers of the Commission to allocate the allowable production among the gas wells in a pool delivering to separate gas transportation facilities. It seems quite clear that the Act, in simpler language, says:

> If a party, after considering his best interests, believes that his correlative rights' opportunities will be best served by selling his gas to this purchaser or that, the State of New Mexico will not attempt to pass judgment on his choice of purchasers or to grant him relief if he makes a wrong choice. As to all parties in the pool, however, who make the same choice and sell to the same purchaser, we will require ratable taking and a just and equitable allocation of that purchaser's take.

To give any other enforceable construction to Section 69-213 (c) is to read into it the power of the Commission to require the ratable taking of gas from a pool by the various purchasers in the pool.

IF PRORATION IS DEEMED NECESSARY IT MUST BE UPON A FAIR AND EQUITABLE BASIS.

If the Commission determines that proration of the West Kutz Field is permitted and necessary, then it must establish proration units and establish a formula for allocation of production upon a fair and equitable basis with full recognition of correlative rights. In so doing, the Conservation Act and considerations of reasonableness and equity require the consideration of the following matters:

Acreage

The determination of the acreage allotted to the proration unit is easily the most important item to be considered by the Commission, since it is such a strong factor in most common types of formulae for allocating production. Under Section 69-213½ (b) of the Act, "The Commission may establish a proration unit for each pool, such being the area that can be efficiently and economically drained and developed by one well, * * *." At prior hearings this Commission has made the same determination for well spacing purposes and has ruled that the field be developed on the basis of 160 acre drilling tracts. An interim order permitting the drilling on 320 acre spacing units was rescinded for the failure of the proponents thereof to establish

the justification therefor. It is our understanding that the evidence submitted at the hearing of July 14, 1954, is substantially the same as evidence previously submitted in support of 320 acre spacing units. It, therefore, seems apparent that having failed to demonstrate the need for 320 acre spacing units, the proponents of the 320 acre proration units have the burden of proof in support thereof and must show by a preponderance of the evidence that 320 acre proration units are required for the prevention of waste, the protection of correlative rights and the prevention of reduced recovery which might result from the drilling of too few wells.

It is contended that the proponents of 320 acre proration units have completely failed to carry their burden of proof and indeed have admitted that appreciably less gas will be produced under 320 acre proration units than would be produced under 160 acre proration units.

They have also clearly shown that on account of the wide variations in permeability in the pool and the wide variations in the deliverability of the various gas wells that to secure the recoverable gas from the pool under 320 acre proration units it will be necessary to produce gas from some wells which has been drained from beneath adjoining lands owned by other parties. Is this the protection of correlative rights on which their argument is based in the absence of a showing of waste?

The proponents of 320 acre proration units have contended that the establishment of 160 acre proration units will cause the drilling of a large number of unnecessary wells. This argument seems to be a rebuttal of their own testimony as to drainage patterns since the areas now developed on 320 acre spacing are amply protected from inequitable drainage by the "buffer zone" wells offsetting the area development on 160 acre spacing. More particularly, their own testimony indicates that there is no reason for them to drill any additional wells except such as are economically necessary to permit them to recover the maximum amount of gas from their properties.

Investment and Payout Period

Although not specifically covered by the Conservation Act, it seems only fair and equitable that each operator be permitted a return of his investment in drilling and operating costs within a reasonable payout period, if the same can be accomplished without incurring waste. There has been a showing that the drilling or production of wells on 160 acre spacing or proration units will give the greatest recovery of gas from the field. Therefore, it seems mandatory that 160 acre proration units be established to avoid inequitable and unjust treatment of parties who have previously developed their acreage on 160 acre spacing units, particularly where the wide variation in permeability shown to exist in the pool can lead and has led to honest differences in business judgment as to the spacing to be followed. There can be no serious argument against the proposition that to give the same payout period, wells in areas of lower permeability must be drilled on closer spacing. It seems amply clear from the evidence, that to permit the depletion of the entire reservoir at a rate which will give each operator a return of his investment within a reasonable time, the acreage must be drilled on 160 acre locations with the exception of those areas of higher permeability where 320 acre spacing units might prove economical. These areas should, however, be regarded as exceptions to the fundamental pattern of the whole field and drilling thereon should be left to the determination of the individual operators.

Reserves

To meet the requirements of the Conservation Act with respect to correlative rights, it would appear that a serious study of the recoverable reserves underlying each operator's lands must be made, and then an allocation worked out which will permit him to recover those reserves. The proponents of the 320 proration units have attempted to minimize this problem by taking the position that the reserves under any parcel bear a rather direct relation to the deliverability of a well on the

parcel. Deliverabilities may provide an adequate index for determining the day to day productivity of the various wells in a pool, but it has not been established that deliverability is any index to the proportion of the recoverable reserves in the pool underlying the parcel on which a well is drilled. It has been argued that deliverabilities and permeabilities bear some proximately direct relationship to each other. It has not been shown, however, that permeability itself is any measure of the reserves in place in a pool, nor can it be argued that in pools with low permeability the reserve in place is less than that of an otherwise similar pool with high permeability. When "recoverable" reserves are considered, then permeability becomes a factor because the elements of time and economics are brought into consideration. A clear analysis of these factors leads one directly to the conclusion that, to produce recoverable reserves, it may take a party in an area of low permeability a longer time and greater expense than his more fortunate neighbor, but this is far different from saying that permeability or deliverability is a direct measure of recoverable reserves.

The proponents of 320 acre proration units have created quite a smoke screen by their reserve argument but in its essence, their argument is that each operator is entitled to only that proportion of the reserves in a pool which are produceable by him under proration on the time schedule they have established for depleting the pool, and in considering only their economic position. This premise begs the question presented to this Commission which is: In what manner can we establish proration so that each operator will be permitted to produce that proportion of the recoverable reserve in the pool which underlies his land? In answer, it seems clear that correlative rights can only be protected by proration units based upon the existing 160 acre spacing units and an allocation of production based on a more realistic appraisal of recoverable reserves.

Permeabilities

It is probably true that the average permeability of a pool is a factor which must be given full weight in any estimate

of the recoverable reserve from the whole pool. In practice, however, the result of normal production practices must be that a larger share of the recoverable reserve will be produced from wells with high permeabilities or deliverabilities and a smaller share of the recoverable reserve will be produced from wells with low permeabilities or deliverabilities. Although this situation may at times be unfair, in the absence of proration it is accepted and tolerated as one of the "rules of the game". It is another thing, however, to worsen such a situation by a proration formula which on its face is a denial of correlative rights, particularly where it is the duty of and within the power of the Commission to protect correlative rights to the extent it can by excluding from consideration the permeability or deliverability factors. It was established upon cross examination at the hearing of July 14, 1954, that the average deliverabilities of wells in that part of the field now developed on 320 acre spacing is substantially higher than the average of the deliverabilities of the wells in that part of the field developed on 160 acre spacing. It is submitted, therefore, even if no weight is given to deliverabilities in a proration formula, that the parties favorably situated in the area of higher permeabilities will produce more than their fair share of the recoverable reserves in the pool. It is contended that this inequity should not be increased by making deliverabilities as a substantial factor in the proration formula as is suggested.

* * * * *

In conclusion, it is apparent that proponents of 320 acre proration units have built their case largely on the questionable foundation of equating deliverabilities to recoverable reserves. Only if this premise can be accepted in its entirety can their request be honored. Were we not concerned with the protection of correlative rights, any proration formula (or no proration at all) would work equally well in preventing waste. It is not enough to say that their formula will result in the recovery of nearly all of the

recoverable reserves from the pool. If we must have proration we should arrive at a formula which assures that each operator is entitled to recover that share of the total recoverable reserves in the pool which underlies his lands.

To accomplish a fair allocation, it seems mandatory that proration units of 160 acres be established. It seems equally mandatory that the factor of the deliverability of the well be substantially minimized even to the total exclusion of it as a factor. If the Commission nevertheless feels that the need for proration has been proven and that deliverabilities must be considered, then it is urged that far less weight than suggested be given to deliverabilities in allocating production. It is submitted that the fairest allocation formula is that based on 160 acre proration units with the least possible weight given to deliverabilities of the respective wells, in no event to be applied to any more than 25% of the production.

Respectfully submitted,

THE FRONTIER REFINING COMPANY

By Ben H. Parker

TPS:bf