Case No.

269+

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Application, Transcript,
Small Exhibits, Etc.

BEFORE THE

OIL CONSERVATION COMMISSION

May 22, 1951

TRANSCRIPT OF PROCEEDINGS

IN

CASE NO. 269

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
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BEFORE THE

OIL CONSERVATION COMMISSION

May 22, 1951

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CASE No. 269: This is an application by Phillips Petroleum Company for 80 acre spacing for the Siluro-Devonian production found in the J. M. Denton No. 1-A, Section 11, T. 15 S, R. 37 E.

MR. E. H. FOSTER: Mr. Commissioner, we have three more exhibits we would like to place there on the wall. May we continue that before we get started?

MR. SPURRIER: Yes, sir.

MR. FOSTER: Mr. Commissioner, on our application we would like to make a little amendment to it from the operational feature as to the location of the wells to the requirement that they be located northwest and southeast on the 40 acre tracts of each quarter section. We want to provide for the uniform spacing of the wells in the center and northwest and southeast.

MR. SPURRIER: Does everyone understand the proposed amendment? Is there any objection to it?

MR. FOSTER: Here is a drafted amendment. I just ask that it be inserted in the present application in lieu of the last sheet. I might say that I believe there have been some additional wells that have been drilled and some additional wells that have been located since this application was filed that are not described in the application itself. But as the

facts are developed regarding those wells, I would like to have it considered that those wells are described and included in the application as of today.

MR. W. A. SCOTT: Mr. Chairman?

MR. SPURRIER: Yes.

MR. SCOTT: We object to the northwest southeast proration units. We are in favor of operational development on the 40 acre tract until the structure is defined and the limits of production are established.

MR. FOSTER: You don't have any objection to making the amendment, you just object to the fact that is the way we want to do it?

MR. SCOTT: Yes.

MR. FOSTER: I want to make a little short statement here. We worked with most of the operators regarding the proposed 40 acre spacing in this field. I believe that most of the operators are favorable toward the 80 acre spacing. I am not attempting to speak for anybody but Phillips. I know we are favorable to it. We do have some opposition here from one operator at least. Whether there will be any opposition from others, I don't know. I want the Commission here to regard our request for the 80 acre spacing as a sincere effort on our part to show the pattern on which this field really should be developed. We are certainly not motivated by any desire to injure or hurt any other operator in the field or royalty owners. If we are mistaken about our position that 80 acre spacing should

be adopted in the field and if as a result of that position any oil should be lost, of course, we stand more chance to suffer loss in that respect than any of the royalty owners would, since every time they lose a barrel of oil we are losing several. So, I don't believe anybody could very well accuse us of attempting to do something that would be against the royalty owners interest.

We will stress in this hearing--I thought I would outline briefly for the record--we are going to stress the steel shortage. Of course, I think everyone is familiar with the fact that there is a serious steel shortage due to the National emergency and we will attempt to show that by going to 80 acre spacing that great quantities of steel, which is very critical at this time, can be saved. We are asking that this order be for a period of one year. That is what I would call a temporary order. However, I do regard every order that is entered by this Commission as being a temporary order. Temporary at least to the extent that this Commission always retains jurisdiction over the production of oil and gas in the various fields in this state and temporary to the extent that any order that is entered, whether it specifies that it is for one year or longer or shorter period can always upon anybody's motion, any interested party's motion, or upon the motion of the Commission itself be amended.

We have a number of exhibits here that have been prepared

and our first witness will be Mr. Nicola, O. P. Nicola. I am not going to try to drag this hearing out. I am going to let the witness do most of the talking and I am not going to try to direct the whole current of the examination just on questions and answers. I am going to ask him to take them in the order in which he desires, to present them, explain them to the Commission and Identify them and we will offer them for the record. Then, after that, if any one wants to cross examine, and I suppose there will be some cross examination, then they may do so. I am going to try and shorten the matter as much as I can since I understand there are some other hearings here that will take some considerable time. I am sure that everybody wants to get through today.

JACK M. CAMPBELL: I think it is proper for me to make a statement here at this time in order that the Commissioners may understand our position in the matter.

MR. SPURRIER: Proceed.

MR. CAMPBELL: I am Jack M. Campbell representing McAlester Fuel Company. As the Commissioner knows, McAlester Fuel drilled the discovery well in this field some 18 months ago. For this company particularly, it was a major discovery and the Commissioner can be assured that they have paid close attention to the production history in this filed during that 18 months period.

McAlester Fuel Company feels that where reservoir

conditions and fluid characteristics and the recovery, reservoir recovery mechanism provides adequate history and economics are suitable in the field and the rights of all the property owners in the field can be protected, that there should be a maximum spacing pattern under accepted practices, with proper restrictions to the rate of production. We are opposed to 80 acre spacing in this field particularly because the temporary period for which this order is now set has already elapsed. The field has been on 40 acre spacing.

Generally, the locations that are now drilling and have been established have, in the most part, been on a 40 acre offset basis.

As I view the northwest southeast fixed pattern program now proposed by Phillips they, at the outset, have to seek eight exceptions in this field from this order if issued. I do not know if they contemplate asking for those exceptions at this time or asking for them at the future hearing. But eight of the present locations, as I view the situation, locations of wells are now off pattern and would require exceptions and special hearings on the allowable given in those cases where the wells are not drilled on the pattern.

At this time, we understand that there are 7 wells in this field that have been completed, the 7th well, I guess has not been completed, it has been drilled to a water-oil contact. There are 12 locations for wells and there are several state. I say, generally speaking, those have been on 40 acre basis. Mention was made of the steel shortage. I

think everybody in the oil business is naturally concerned about that. It is our position that the evidence here will show that the nature, the thickness, the formation, the pay section in this field from the point of view of national defense and the proper allocation of steel both, from economics of the company and security of the country could not be better placed than in this pay section in the Denton Field.

We, too, will undertake to make this testimony as brief as possible but we consider that this is a matter of considerable importance to the State and the operators in this field and we hope that we can present as briefly as possible a record of the production that we have in the production field.

(Witness sworn.)

O. P. NICOLA,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. FOSTER:

Q For the purpose of the record, will you state your name please?

A O. P. Nicola.

Q You reside at Bartlesville, Oklahoma?

A That's correct.

Q You are employed by the Phillip's Petroleum Company?

A Yes.

Q In what capacity?

A As a proration engineer.

Q What is your educational training and background?

A I graduated from Lee High University in 1925 with a degree of Engineer of Mines. I specialized in geological studies. Since that time I have been engaged entirely in the oil business in different capacities.

Q Have you had an occasion to become familiar with the field that is under consideration here this morning?

A Yes, I have. I have made a study of the reservoir information available in this field.

Q And does that include all of the wells that are in the field in your study?

A That includes all the wells that have been completed and on which information is available.

Q The purpose of your study has been to determine whether or not the Commission should adopt an 80 acre spacing in the field?

A That's correct.

Q And you are prepared at this time to explain the information that you have gathered and make your recommendations here to the Commission?

A Yes, sir.

Q All right. Now, Mr. Nicola, I don't want to take time asking you a lot of questions. You have placed here on the wall a number of exhibits. I am going to ask you to go to these exhibits and make your explanation as to what is represented by these exhibits and the source of your information reflected by these

exhibits and to just narrate as quickly as possible the facts reflected by each one of these exhibits. At such time as I think proper, I will break in and ask you some questions about it. As you go to your exhibits there, please number them beginning with number one, refer to them as Phillip's Exhibits No. 1, 2, and so forth.

A My first exhibit is a plat showing the area surrounding the Denton field and is simply constructed with a red outline showing the area which we have asked the Commission to space.

Q In other words, that is the territory, extent of the field, as indicated thereon?

A That is in our opinion the limits of the field as far as we can tell and possibly includes some land which is outside of the productive limits. But we have tried to make it as feasible as possible.

Q Everybody knows this, but for the purpose of the record, I want to get into the record there the number of wells that are in this field at this time that have been completed and are now producing.

A To our knowledge there are six wells presently completed in the Denton Devonian Field and 16 wells either drilling or as locations.

Q Will you indicate the names of the operators that are in that field?

A The Ralph Lowe, Phillips Petroleum Company, Ohio Oil Company, McAlester Fuel Company, and Gulf Refining Company. Atlantic

Refining Company is in partnership with Phillips.

Q Those that you name include all the operators that are in the field that are interested in the question that is before the Commission of 80 acre spacing?

A Those are all the operators that have wells now completed and producing. Skelly has a well about to go on production.

Q Are there other operators that have wells about to be completed?

A I think the Atlantic has a well that is about to be completed, their No. 1-T well.

Q Any others?

A I don't know of any offhand right now.

Q Now go to your next exhibit.

A Exhibit No. 2 is a Bar Graph showing first the tons of steel required to complete each of four devonian wells in this field and the average tonnage is 258½ tons. Using a very conservative area of approximately 3360 acres out of the entire spaced area of 8640 acres, we find that on 80 acres spacing as compared with 40 acre spacing we would save 42 wells or a total of ten thousand eight hundred fifty-seven tons of steel.

The lower part of this exhibit shows the cost of drilling four wells in the Devonian reservoir and the average cost is $273,000.

Q Just a minute. Before you leave that exhibit No. 2. There is a steel shortage is there not?

A That is what I understand.

Q And steel is regarded as being critical?

A Yes, sir.

Q And would you say that the effort to save the tonnage of steel there would be one that would result in a benefit to the operators in the field?

A In my opinion, yes.

Q All right. Go ahead.

A Phillips Exhibit No. 3, is production summary not shown on the wall, a tabulation of the entire pool by months from October 1949 to March 1951, showing monthly oil and gas production, cumulative production of each and the weighted average gas-oil ratios.

Q Will you just state what those figures are so that everybody here may know?

A The total accumulated production of the entire reservoir as of March 31, 1951, was 280,000 barrels of oil and 353 million cubic feet of gas. The gas-oil ratio during March 1951 weighted average was 1211 cubic feet per barrel.

Q All right.

A Phillip's Exhibit No. 4 is a tabulation of bottom lhole pressure data. On four wells in the field the Gulf Chamberlain No. 1, The Ralph Lowe Dickinson No. 1, the McAlester Denton No. 1 and the Phillip's Denton No. 1. There are five pressures shown on Gulf's well, two on McAlester's well, and one each on the other two wells. All pressures are corrected to a datum of minus 77hundred feet subsea.

Q Mark that as four please.

A The shut-in time prior to taking these static bottom hole

pressures is also shown on this statement.

Q Now, Exhibit No. 5.

A Just a second. I would like to direct the Commission's attention to the pressure measurement on the Phillip's No. 1 Denton, taken on the completion date of this well, March 31, 1951, and which was 48 hundred and seven pounds per square inch. This measure is about one hundred and eleven pounds per square inch below the estimated original reservoir pressure but is identical with the latest pressures of the Gulf No. 1 Chamberlain and McAlester's No. 1 Denton wells. Since Phillip's No. 1 Denton well is over one half mile from the nearest of these other wells it is evident that the reservoir underlying these three wells is the same and that drainage and loss of energy has occurred over a distance considerably greater than the eighteen hundred sixty-seven feet between wells which will result when wells are drilled on an 80 acre alternate 40 acre spacing pattern.

Phillip's Exhibit No. 5 is a graph showing field data plotted against time. It shows number of wells completed, oil production, bottom hole pressure, and gas-oil ratio. The flat oil, gas-oil ratio cover is indicative of an under-saturated reservoir which is operating at a pressure above the bubble point and the gas-oil ratios of 1100 cubic feet per barrel is the same as the soluable gas in it.

The graph also reveals a small drop in the bottom hole

pressure while oil production is increasing, which indicates that the formation is highly permeable.

Q Having a highly permeable formation would that lend itself to 80 acre spacing?

A Yes, sir.

Q Phillip's No. 6.

A Phillip's Exhibit No. 6 is a graph on which we have plotted bottom hole pressures against the accumulated production of the entire pool. The almost negligible decline in this curve illustrates the extremely efficient operation of a large volume reservoir of high permeability.

Q Before you leave that Exhibit No. 6, the information reflected on that Exhibit No. 6 as reservoir conditions in the field lend itself to 80 acre spacing?

A Yes, sir.

Q All right.

A The next Exhibit No. 7 is a conventional solubility-shrinkage curve prepared from laboratory investigation of the behavior of the bottom hole sample of reservoir fluid from the Phillip's Denton No. 1 well. The sample in the closed cell is subjected to gradual reduction of pressure from 5550 pounds per square inch, which sample was obtained at 12,300 feet or a datum of minus 8510 subsea down to zero pounds per square inch. The following information was obtained: Saturation pressure or bubble point where the first free gas comes out of solution, is 2540

pounds per square inch. The reservoir now contains no free gas and the reservoir fluid will remain entirely a liquid until the bottom hole pressure declines from 5050 per square inch to 2540 pounds per square inch, a drop of 2510 pounds per square inch from the present pressure, during which time large volumes of oil will be produced.

There are 1066 cubic feet of gas dissolved in each barrel of reservoir oil.

As the pressure declines from 5050 pounds to 2540 pounds per square inch, each barrel of oil will expand 1.547 times ten to the minus fifty power fraction of the barrel. And the expansion of this oil and the connate water of the reservoir plus any water drive is the only source of energy by which oil is now being produced.

This curve also indicates that the formation volume factor at saturation pressure is 1.64.

Q Now, as regards 80 acre spacing, what conclusions do you arrive at from that exhibit and the information on it?

A Simply from that exhibit that in conjunction with future exhibits, I would like to add that before making a comment.

Q Go ahead.

A Phillips Exhibit No. 8 is a core analysis summary obtained by Core Laboratories of Dallas from a core from the Ohio Oil Company Denton No. 3 well which well is a diagonal southeast offset to Phillip's No. 1 Denton well.

The information obtained by this core analysis, conventional number of feet of permeability productive formation recovered,

permeability, porosity and oil and connate water saturation.

Phillip's Exhibit No. 9 is a graph on which we have plotted the bottom hole pressure measurements on three individuaL wells against the accumulated oil production of each well at the time each pressure measurement was taken. The curve in black was then drawn through theplotted points to show how pressures behave as oil was withdrawn. It is found that initially, until a pressure differential had been established, each well performed as if it were producing from a separate reservoir of not exceeding 80 acres in size. However, after some ten thousand barrels had been produced from each well and the pressure had dropped about 70 pounds per square inch, the curve begins to flatten out with less and less pressure drop per barrel of oil produced. This indicates that the inertia of the reservoir fluid had been finally overcome, the pressure differential extending farther and farther back into the reservoir, with more and more liquid expanding and contributing this energy of larger and larger volumes toward the maintenance of pressures at the wells under consideration.

Also, on this graph will be noted a straight red line dipping steeply with respect to the original curve. This red line represents the way the curve would be expected to behave if either of the three wells would drain no more than 80 acres. This prediction is based on the following calculation.

The calculation is Exhibit No. 10.

Q Before you get started, I want you to tell first how that calculation was made, that is, the source of information.

A Yes, sir. I intend to do that.

Q All right.

A This calculation is for the purpose of finding out the number of barrels of stock tank oil produced, which would be expected to be produced from a well in the Devonian Reservoir, Denton, per square inch drop in bottom hole pressure, assuming the well could drain only 80 acres. The calculation is based upon porosity, oil and water saturation, and productive thickness obtained from Exhibit No. 8, The Ohio Denton No. 3 core analysis, and also upon the compressibility, or expansibility, of oil and salt water and the formation volume factor which would be obtained from laboratory determinations, and for the oil compressibility we refer to Exhibit No. 7. The connate water compressibility or expansibility has been obtained by other laboratory work.

I won't attempt to go through the entire calculation.

Q No, I understand.

A But, it reveals that one well could be expected to produce only 98 barrels of stock tank oil per pound square inch drop in pressure if that well were able to draw its energy and its oil from only an 80 acre tract.

I would like to compare this with the performance of Gulf's No. 1 Chamberlain, for which five pressure--performance points are shown on Exhibit No. 9. This well has produced 851.7 barrels of stock tank oil per barrel of pound drop in reservoir pressure.

Q Right there let me interject a thought. In other words, that Ohio well there that you are talking about, the Gulf well I mean, that you are talking about, has produced considerably more oil than you would expect it to produce if it was draining from less than 80 acres?

A That's right, considerably more. Several times as much oil.

Q And the conclusion from that is that, of course that one well there will drain as much or more than 80 acres?

A In my opinion, one well would drain the entire reservoir.

Q I understand, but at least it will efficiently drain 80 acres?

A Yes, sir. The high permeability, the large connected volume of this reservoir leads us to recommend that an allowable for each well on an 80 acre unit should be established by the Commission at twice the top unit allowable for 40 acres with deep well adaptations.

Q That, as stated in barrels would be what?

A That would be 590 barrels per day per 80 acre unit. Which is twice the present unit allowable per day.

Q In your opinion would the adoption of that allowable result in waste in the field?

A No, sir. Certainly not at the present time, from the information that we have on the reservoir.

Q All the information that you have at the present time indicates that you could maintain that rate of production

from these wells in this field without correction of under gound or abcve ground waste?

A Well, certainly for a considerable length of time.

Q At least for a year?

A At least for a year.

Q All right.

A Since it is now apparent that the Lowe No. 1 Dickinson well is producing from the same common source of supply as the other Devonian wells in the Denton Pool, it is recommended that the allowable of the Lowe No. 1 Dickinson well, with 80 attributed acres, beassigned the same allowable as the remaining wells in this reservoir and that same be based upon twice the 40 acre allowable with the deep well adaptations heretofore assigned to such other wells and based upon the depth of the discovery well in the McAlester Fuel Company Denton No. 1-A.

Q That would be 590 barrels, would it?

A Yes, sir. In further support of the requested allowable we offer the following productivity index tests of two widely separated wells in this reservoir in which tests reveal that such allowable rates are justified and can produce without waste.

Productivity Index Test, Phillip's Petroleum Company Denton No. 1 well. At a flowing rate of 650 barrels per day through a one-quarter inch choke, the productifity index was 2.5 barrels of oil per day per pound drop. At a flowing rate

of 214 barrels per day through a 1/8th inch choke the productivity index was 2.4 barrels of oil per day per pound drop. The other test is on the Lowe No. 1 Dickinson well flowing at a rate of 387 barrels of oil per day through a 14/64th inch choke. This well had a productivity index of 2.556 barrels of oil per day per pound drop.

Before any allowable is assigned, I recommend that the Commission require the operator to furnish a plat showing the 80 acres attributed to such well and which 80 acres can be reasonably shown to be productive.

Finally, I would like to offer Phillip's Exhibit No. 11.

MR. CAMPBELL: If the Commission please, may I ask a question about the allowable. Are you seeking that allowable at this time?

A Yes, sir.

MR. CAMPBELL: I don't believe it was in the notice.

A I think we asked to establish an allowable.

MR. McCORMICK: To be determined by the Commission.

A To be determined by the Commission. This is a recommendation. Finally, we offer a plat, Exhibit No. 11, showing suggested 80 acre units. It is not intended that these suggested units be required by the Commission but the exhibit is designed to show that even with wells clustered as they are in certain

areas, it is possible to assign 80 acres to each such well. It is also recommended that exceptions be granted as to location for all wells heretofore completed or now drilling in the Denton devonian field with further exceptions due to the suggested units on Gulf's Chamberlain lease that Devonian wells be permitted upon the attribution of 80 acres to each well, the same to be located in the northeast quarter of the southwest quarter of Section 14 and in the southwest quarter of the southwest quarter of Section 14, Township 15 South, Range 37 East.

Q Regarding that Exhibit No. 11, that is just a suggestion on behalf of Phillips Petroleum Company as to how the 80 acres unit can be formed, is it not?

A The idea of introducing the exhibit was simply to show that it can be done.

Q I understand. You are not saying that is the way it ought to be done?

A No, sir. That will be up to the operators themselves.

Q It just illustrates that 80 acres can be assigned to each well in the field?

A Yes, sir.

MR. FOSTER: That is all.

MR. SPURRIER: We will take a five minute recess.

(Recess.)

MR. SPURRIER: Mr. Foster, are you ready or are you through with your direct examination?

MR. FOSTER: I am through with my direct examination.

MR. Spurrier: You willing to stand for cross?

MR. SELLINGER: I have one question. I am with Skelly Oil Company.

Q (By Mr. Sellinger) Referring to your Exhibit No. 11, Mr. Nicola, that is your suggestion as to the workings out of the 80 acre units on existing wells that are producing and drilling and locations, is that correct?

A Yes, we have taken each well as already located and tried to establish a possible unit pattern which could be followed.

MR. SELLINGER: Your recommendation of a pattern of wells of the northwest and southeast applies insofar as your Exhibit 11 is concerned except where the producing, drilling and locations differ than the northwest southeast pattern and along with your recommendation you are asking for an exception to those wells that differ to that pattern?

A Yes.

MR. SELLINGER: I believe that is all.

MR. CAMPBELL: Mr. Nicola, I understand your application now is that the Commission issue a temporary order for a period of one year for fixed pattern drilling on an 80 acre basis in the northwest quarter and the southeast quarter of each quarter section in the Denton Pool.

A That's correct.

Q You are not now undertaking to have the Commission pass upon the exceptions to existing wells and establishing an allowable based on the exception allocations, are you?

A No, I am recommending that they pass on the exceptions now.

Q Isn't it correct that in the event of an exception to a location on this drilling program that there may be cases where there likewise must be an exemption to the allowable granted.

A That wasn't my recommendation.

Q You recommend that each and every well irrespective of the location in the reservoir be given the double allowable?

A Provided the operator files with the Commission a plat showing 80 attributed acres to that well.

Q This is the only basis on which that could be done, isn't it, the recommended proposition here?

A No.

Q You have done it the only way possible.

A No, that recommendation could be changed somewhat. In some areas it possible couldn't.

Q You have some recommended applications on acreage here which doesn't contain either a northwest quarter or southeast quarter?

A That's right.

Q There certainly would have to be some adjustment of allowables where they are off-setting closely drilled wells?

A Those exceptions are due to the present drilling in the field. They were made necessary by the present drilling even though no wells have been started on those two. You are referring to the two locations of the Gulf?

Q No, I am referring to the general exhibit No. 11. All of your adjustment, diagonal and eastwest and northsouth adjustment of 80 acres.

A Would you mind repeating the question?

Q My question is simply this, that in the event the Commission were to accept this recommendation on existing wells and on drilling wells, isn't it true that the Commission would probably have to make exceptions in connection with the allowables?

A They would not have to make exceptions in connection with the allowable.

Q Reduce the allowable?

A No, that wasn't our recommendation. We recommended that in order to obtain any allowable and operator must file a plat showing that he has 80 acres behind that well.

Q That is irrespective of the engineering conditions in the field?

A Well, I don't know what you mean by that.

Q In other words, you want to attribute 80 acre allowable to

these geographical locations that you are recommending here irrespective of the reservoir conditions, is that correct?

A No, if the acreage is not, if the acreage that an operator designs to attribute to his well cannot be reasonably presumed productive, then, of course, he would have to take a reduced allowable. It would be expected to.

Q You are speaking now of the interior boundaries of the pool?

A That's right. I don't know that that is involved, however, in this particular arrangement.

Q In connection with the exceptions that you are seeking relative to the southwest quarter of Section 14, what is the basis for that exception in the case of Gulf?

A Well, that was the only way in which I saw that Gulf's acreage could be so arranged as to attribute 80 acres to each well.

Q In other words, you are not recommending an 80 acre fixed pattern spacing program? You are recommending that so long as an operator can attribute 80 acres to his present wells or present drilling wells, he is entitled to an 80 acre allowable.

A For all wells heretofore drilled or now drilling.

Q These 20 wells you referred to?

A That's right. We can't do anything about them, it would be unreasonable to expect to.

Q You stated, I believe, in your direct testimony that you made

a study of the reservoir in the field and all the wells, when was your Phillips well completed?

A On March 31, 1951.

Q Then your information insofar as your own well is concerned your PI tests and so forth are based on two months production experience, is that correct?

A They didn't even have that when we took our P.I. tests.

Q How much time had elapsed between your completion and P.I.?

A We took the P.I. on the day we took the official potential test of the well. We were very rushed to obtain our information, for the date we thought that this haring was going to be held at that time.

Q In connection with your Exhibit No. 2, the amount of steel required to complete these wells, how does your company allocate its available steel?

A That is not within my province as to how they do that. I don't know.

Q Do you have any - based upon your experience in the oil business do you have any ideas as to how they would?

A Well, I assume that they determine what wells they desire to drill and then allocate the steel to those wells.

Q On a basis of economics?

A Yes, or they might allocate it to wild-cat wells.

Q Is your company now contemplating the construction of a pipe line in west Texas?

A I don't know.

Q Do you know whether they have allocated any steel for that purpose?

A You mean from Berger in the Panhandle? I think not in West Texas.

Q Based upon the cost, estimated cost, of your wells at 275 thousand dollars, what do you estimate your payout period would be in the Devonian and Denton fields?

A That allowable of 295 barrels per day, it would require some 438 days or one and two-tenths years to pay out.

Q Then if wells were drilled on 40 acre pattern with the 295 barrels allowable each well would pay out in a little over one year, is that correct?

A That's right.

Q Referring to your exhibit No. 4, I believe you stated that based upon the bottom hole pressure data and the tests which you have made in that field it is your opinion that one well in that field will drain at least 80 acres, is that correct?

A Yes, sir.

Q Why are you asking for a temporary order?

A Well, it was understood that we were to have some opposition and since the Commission has heretofore issued orders for a temporary period of one year we saw no reason why we should request something different. In view of the fact that before that year is out we feel sure we can come before the Commission

again and present good evidence to get an extention of time.

Q But so far as your company is concerned, you are satisfied that you have sufficient evidence now to obtain a permanent order for 80 acre spacing.

mr. FOSTER: I don't believe there is such a thing as a permanent order for any type of spacing. I believe these are all temporary orders.

MR. SPURRIER: Let the witness answer if he cares to.

MR. FOSTER: I can't see how you can answer as to what the Commission is going to do. I don't see that is the province of the Commission. Of course, he can give his opinion about what you ought to do but as to whether it is really a permanent or temporary order, I don't see how this witness could answer that.

Q (by Mr. Sellinger) There is no particular point in the amendment in amending your application then.

MR. FOSTER: Yes, I think there is a good point in amending the application. We don't think we are infallible and we certainly wouldn't want to be in the position of saying to the Commission that you could write an 80 acre spacing order in the field and never have to look back. I think you ought to take it a little at a time. Look at the whole part as you go along. We are not here advocating that you should just set this thing at 80 acres and say that will be it. I don't know what will develop in a year. We may be in here 12 months from now saying you ought to go to 40. If we

thought the facts justified it, that is what we would be doing. We do know this, that if you continue on 40 acre pattern that you are trying to establish in the field you will never be able to get the 80. You can now start on the 80 and justifiably so in our opinion, and if later on the facts warrant it, you can go from 80 to 40. If you stay with 40 you won't be able to get back to 80.

MR. CAMPBELL: That is exactly our position.

Q Referring to your Exhibit No. 8, which is, I believe the core analysis summary of Denton No. 3.

A That's right.

Q What does that show as to the variation in permeability in the core analysis? Can you refer to that and state what it shows?

A It shows that the horizontal permeability is greater than the vertical permeability.

Q What does it show as to the extent of the variation?

A Well, in one section, the horizontal is 48 millidarcys versus 19 vertical. In another 33 versus 7, that is quite a thin section. In another 34 versus 10.

Q Do you know whether that core analysis showed any completely densed areas in the pay section?

A I think that is true that it did. I don't think you can find a core of any reservoir, any limestone or dolomite reservoir such as this that doesn't have some completely dense section.

Q In other words there is not a continuous and uniform permeability in this reservoir?

A No, I wouldn't say that. I am talking about the core from one well.

Q What is your opinion as to whether there is a continuous or uniform permeability in this reservoir?

A I think it is continuous. It may not be uniform but I think it is continuous.

Q I believe you based yourstatement that the 590 barrels per day allowable would not be wasteful upon the tests taken in your well and Lowe No. 1 Dickinson well.

A Yes, and that is correct and it is partly, also, based on the thought that we have a small section open in our well only one hundred feet ofthe section out of a total of some 1130 feet per section is open. If we opened up a larger section I am sure we would have a larger productivity index.

Q Do you have any information on the draw down tests in any of the wells in the field that have been producing for a longer period of time in your Phillips weil, other than the Lowe?

A No, those are the only two productivity index tests I have been able to obtain.

MR. CAMPBELL: I think that is all.

MR. SPURRIER: Any further questions of this witness?

MR. SCOTT: I am W. A. Scott. If the Commission please,--

MR. SPURRIER: Come forward please.

MR. SCOTT: I would like to ask a few questions.

CROSS EXAMINATION

By MR. SCOTT:

Q Mr. Nicola, did you state or am I correct in saying that you stated that you were asking for exceptions to Gulf locations in Section 14, being the northeast quarter of the southwest quarter and the southwest quarter of the southwest quarter?

A That's correct.

Q Have these locations been established?

A No, they have not.

Q And again, what was the reason for that?

A The reason was that in order to follow the suggested units it was necessary first to establish a diagonal 80 acre unit here consisting of the northeast quarter of the southwest and the southwest quarter of the southwest quarter of 14, and neither of the tracts is a prescribed location for a hereafter drilled well. Then, the Gulf pointed out that it would be better in that case to drill the other well that they contemplate in a southwest quarter of the southwest quarter of Section 14 rather than to drill it as a direct west 40 acre offset to the previously mentioned well. That is the reason that we suggested or requested that those exceptions be granted.

MR. SCOTT: Thank you.

MR. CAMPBELL: Have you made an effort to obtain-- how many exceptions would be required from a fixed basing

pattern.

A No, but I can count them. Would you like me to do it?

Q I would like to know. There would be two in Section 35.

A I count 12.

Q 12 exceptions?

A Yes.

Q Out of the 20 drilled wells or locations?

A Out of the 20 drilled wells.

Q Or drilling?

A And, however, that is 12 out of possibly 42 wells that may be drilled in the field.

Q How do you--

A (Interrupting) Pardon me. Those are 12 wells now drilling their locations in addition to the two Gulf locations, that makes 14, or approximately one-third of the 42.

MR. CAMPBELL: That is all.

MR. McCORMICK: Have you made a study of the other Devonian pools in New Mexico?

A No, I have not.

Q You don't have any basis to compare this Denton with the other Devonian pools?

A No, we have a geological witness here, I think perhaps he could do that.

MR. McCORMICK: That is all.

MR. CAMPBELL: One more question.

Q (by Mr. Campbell) In connection with this recommended

pattern have you made any effort to determine whether or not the lease ownership and mineral ownerwhip under these units is common?

A No, I have not except wherever it appeared that way on the map, I have tried to follow the common ownership.

Q Let me give an example on a lease ownership situation in the southeast quarter of Section 11, the south half of the southeast quarter is set aside there as a proposed 80 acre proration unit.

A Yes, sir.

Q I believe you will find that the lease ownership in the southwest of the southeast and the southeast of the southeast is not common.

A That's right.

Q What do you propose that the Commission do with reference to the oil that has already been produced in that well?

A I have no recommendation.

Q And is it your recommendation that the cost of that well be allocated between the lease owners, if the leases are set up?

A Yes, I think on some basis. I don't know what it would be.

Q If there is not common ownership of minerals under any of these recommended units is it your recommendation to the Commission that they require the pooling of those mineral interests? Do you know?

MR. FOSTER: He says he doesn't know what the power of the Commission is. I don't either.

MR. CAMPBELL: We don't either. I think that is all.

REDIRECT EXAMINATION

By MR. FOSTER:

Q There is one question I would like to ask you about the exceptions. It is true the longer that you put off the 80 acre spacing, the more exceptions you are going to have to have?

A Yes.

Q If you put it off long enough, the exceptions will become the rule?

A That's right.

MR. FOSTER: That is all.

MR. CAMPBELL: Don't you think that has already happened in that field?

A No. I think that you have a lot of exceptions but I think the end that we are attempting to reach here justifies some effort to get there.

MR. CAMPBELL: That is all.

MR. FOSTER: That is all.

MR. R.S. BLYMN: Just for the record, you made a statement that when you observed that bottom hole pressure in your No. 1 pressure that the pressure was off approximately 100 pounds from what you deemed to be virgin pressure for

that reservoir?

A That's correct.

Q You attributed that to some drainage from offset wells or from other wells in the reservoir?

A Yes.

Q Do you have any information on what the pull down pressure of any of these wells are that had pulled your No. 1 Denton down one hundred pounds? The point I am trying to make is that one hundred pounds of draw down in a reservoir, the order of the Denton, is a tremendous draw down if you took it on out of the well itself and took two or three years to do it. And, you have stated here for this record that you think that your well had been pulled down one hundred pounds by other wells in that reservoir. Do you want that in the record?

A I think I said approximately. The observing drop may partly be due to errors in, not errors, but the limits of measurements.

Q I think that is very, very possibly where your whole hundred pounds comes from in my opinion.

A I think you are correct about that.

Q Well, that was just for the record.

A That is what we observed. I don't know what actually might have happened but since we observed such a large pressure draw down, we assumed that that well had been effected by other wells and--

Q (Interrupting) But not one hundred pounds, you don't think?

A In view of the condition it may be some kind of porous channels running between the wells and our well, I don't know, is more porous perhaps and more convenient channel for communication than toward some other well. But in our opinion, obviously, some influence, something had influenced that pressure to be that low in our Denton well, initially.

Q Couldn't be you got two reservoirs there could it?

A No, I don't think so.

MR. BLYMN: That is all.

MR. SPURRIER: Are there any further questions of this witness? If not, the witness may be excused.

(Witness excused.)

MR. SPURRIER: Mr. Foster, in view of the time, I think we will recess until one-fifteen before you start with this witness.

(Noon Recess.)

MR. SPURRIER: The meeting will come to order. Mr. Foster will you proceed? Mr. Smith, please come around and take the witness chair and bring those logs with you.

STANLEY SMITH

HAVing been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. FOSTER:

Q Will you state your name please?

A Stanley L. Smith.

Q Where do you live, Mr. Smith?

A Roswell, New Mexico.

Q By whom are you employed?

A Atlantic Refining Company.

Q In what capacity?

A As District Geologist for New Mexico.

Q Have you testified here before the Commission before in New Mexico?

A I have not.

Q Will you state what your educational qualifications as a geologist are?

A I received a bachelor of arts from the University of Colorado in 1941. My major was geology with a minor in minerology. Since that time I have been employed as a geologist by the Atlantic Refining Company.

Q Have you had any occasion in the course of your employment to make a study here of the field that we have under question? The Devonian pool?

A I have.

Q I ask you if you have some well logs that you have collected from the various producers in the field?

A Yes, I have. Exhibit No. 12 is purely a statistical

exhibit showing wells drilled, locations where they were completed and so forth. It also lists the wells now drilling.

Exhibits 13, 14, 15, 16 and 17 and 18 are Schlumberger electrical logs run in the wells in the pools. Copies of these logs were used on the cross section.

Number 19 is a lane wells radio activity log on the Ohio Denton No. 1 well. These logs have marked up on them the drill stem test taken, the tops of the formations and the completion interval and data.

Q Have you prepared some other exhibits for us as evidence in this hearing, Mr. Smith?

A I have.

Q I wish you would go to those exhibits and take them up in whatever order you desire and without too much questioning from me, just explain to the Commission what they are and what they reflect and what conclusions or deductions you draw from them.

A Exhibit No. 20 is a northsouth cross section of electrical logs from the southeastern end of the pool to the northeastern end of the pool. The lines denote corellative horizons. This line is the top of the Wolfcamp formation of the lower permia. This is a uniformity, is the top of the Mississippi. The lower most line here is the top of the Siluro Devonian. The highest well on the Siluro Devonian is the Ohio Denton No. 3. To date the lowest is the Ralph Lowe No. 1. These wells are in the process of completion. The Atlantic State No. 13

and the Skelly Mexico 1F. This section shows that we have a north dip extending from the Ohio Denton No. 3 as far north as the Ralph Lowe No. 1. The pay section ofthe Siluro Devonian is from here to here (indicating) in the Phillips Denton No. 1. Approximately 1100 feet of section altogether within the pay zone.

This exhibit No. 21 is a structural contour map on top of a Siluro Devonian formation. Colored in red on the map are those wells producing from the Devonian; colored in green are those producing from the Wolfcamp, the blue is the well that did produce from the Mississippi. You will note that our eastwest control is not plentiful. The wells drilled to date are in this band here (indicating.) It could be described as the northsouth elongated anticlinal with a dip closure in excess of 1700 feet. I think that about takes care of the structure correlative phase.

Lithologically, the Siluro Devonian can be described as a crystal dolomite varying from fine crystaline to corydaline crystaline in which there is intergranular and vugglar fracture porosity. To date we have approximately 1673 feet of oil column in the hight point in the No. 3 to where the Skelly State 1F recovered water on the drill stem basis.

Q Now, from your study, have you found any conditions here that would indicate that 80 acre spacing could not be safely adopted in this field?

A In my opinion, no.

Q Have you found any indications here that would warrant the conclusion that the Commission would be justified in adopting 80 acre spacing?

A I think it would.

Q Is it your opinion that the Commission and your recommendation that 80 acre spacing should be adopted in this field?

A Yes, it is.

MR. FOSTER: I believe that is all.

CROSS EXAMINATION

By MR. CAMPBELL:

Q Referring to your Exhibit 21, your contour on top of the Devonian, what does that reflect inso far as the dip of structure on the east and west flank is concerned?

A The only way you can arrive at a dip, a true dip on the east and west flanks is by interval.

Q What do the intervals reflect then? What dip is there on your contour there from the center of your structure down to your water-oil contact on the west, say? That is about three-quarters of a mile, isn't it?

A On the west here?

Q Yes.

A Roughly, 14hundred feet.

Q 14 hundred feet and isn't that three-quarters of a mile?

A About.

Q Would you consider that to be a sharply dipping structure

or not?

A Probably is.

Q Would you say the same general condition is probably true on the east?

A That is difficult to say.

Q You don't have enough information to base an opinion on that?

A Actually we don't have much information to base a dip either way. Except by using intervals of these two. Neither one of them have been a contributing part.

Q The best estimates that you could make where presently available information is that the structure may dip rather sharply on the flank?

A It may.

Q Considering that situation, I believe, your statement was that you felt that this field could be developed on 80 acre spacing considering that situation, in the light of the possibility of east west acreage being combined as 80 acre proration units, isn't it possible that you may have the allocation of allowables to nonproductive acreage on the east west side of the pool.

A You always come to the edge of the oil field.

Q That is quite true on 10 acre or any other spacing. Wouldn't it be more pronounced the wider your proration unit was?

A Possibly. However, if you have enough data, you can arrive at the limits fairly accurate.

Q You don't have the data at this time?

A Today we don't have it.

Q Isn't it true that in order to obtain the data, you have to drill wells at or near the edge of the pool?

A The only way you can drill it is to drill wells.

Q Isn't it possible if you have 80 acre spacing where it is necessary to jump over a 40 acre tract and drill your outside location in the field that you might be reluctant to do that where if you were drilling on 40 acres you might more readily define the exterior limits of the pool?

A If you will notice, if you have a producing well here--

Q (Interrupting) What well is that, Mr. Foster?

A Any well. Say you have a producing well in this acre would you have any more risk moving down here than moving down here on the 40.

Q That is probably true. But we are assuming a fixed spacing pattern outside of the presently situated wells in the field.

A Actually along the edge roughly, the north south strip you would be taking no more risk drilling here than you would here (indicating).

MR. SPURRIER: Mr. Smith, you will have to define for the purpose of the record, the area you are talking about because here it doesn't mean anything in the record.

A This is purely an illustration. If you drill in the--say,

section 10, if you drill in the center of the southeast quarter and the southwest quarter and get an oil well, then you are required to drill an 80 acre offset in the northwest quarter of the southwest quarter you would be moving away from the structure the same distance approximately if you were drilling a direct 80 acre offset.

Q Mr. Smith, you stated that in your opinion the spacing of wells in this reservoir on an 80 acre pattern could be done with safety to the field. On what productive rate do you base that statement?

A Why, I think at twice the rate now being produced for the 40 acres no harm would result to the reservoir.

Q Would your opinion on that be changed any if it were developed that any particular wells now drilled in the reservoir could not produce at that rate?

A I would sure like to know the details on that well completion with all the pays on them before I answer that question.

MR. SPURRIER: Would you mind coming back to the witness seat please?

Q You also stated that 80 acre spacing in your opinion should be adopted in this field. You base that opinion on the testimony you have given here?

A Yes. That and my experience with similar type production.

Q Where has that experience been?

A In New Mexico.

Q Which field?

A I am thinking comparatively of the other Devonian production in southeastern New Mexico.

Q And you consider that this--

A (Interrupting) I consider that this--

Q (Excuse me.

A (Continuing) I consider that this field is and will be much more productive than any other devonian pool now producing.

Q I think the thickness of the pay section would indicate that but in the other pools isn't it true that they have it fairly well established that they have water drive of sufficient force in those fields which has not been established here?

A In my opinion we will have the water drive established.

Q On what basis do you base that?

A The fact that almost anywhere you drill into the Devonian you get substantial amounts of water.

Q You have no reservoir information here that indicates that do you?

A No. There is no conclusive proof of it here yet.

Q MR. FOSTER: That is all.

MR. SPURRIER: Any one have any further questions of this witness? If not, the witness may be excused.

(Witness excused.)

MR. FOSTER: At this time we would like to offer for the record, Mr. Commissioner, all of the exhibits which we have identified here.

MR. SPURRIER: They will be accepted.

MR. FOSTER: That is our case.

(Discussion off the record.)

MR. SPURRIER: Mr. Campbell, do you have anything more?

MR. CAMPBELL: I have some witnesses. We will need to put up some exhibits.

MR. SPURRIER: Will you need any of these for reference?

MR. CAMPBELL: No. I have copies of the ones I need to refer to. We will need to put up some exhibits here.

(Off the record.)

MR. SPURRIER: Let's have your attention please. I have a telegram here which was addressed to Guy Sheppard and which Mr. Sheppard asked me to read into the record.

"Undersigned royalty owners in area Denton Pool Lea County, wish to go on record as opposing eighty acre spacing. When original leases were executed in this area forty acre drilling was customary and implied. Development to date in this field provided for forty acre spacing and undersigned believe should continue. Eighty acre spacing will force compulsory pooling of royalty owners interests and cause injustice in edge wells. Eighty acre spacing disappointing to royalty owners Sawyer pool and royalty checks decreasing at serious rate Ammada Hamilton pool under eighty acre spacing.

Your consideration appreciated. Signed by: J. M. Denton, J. L. Reed, Granville Dickinson, Trustee for Candace Dickinson, Walter E. Dickinson and W. Gordon Dickinson, Bernice Dickinson, Mrs. Johnnie Fort, J. E. Simmons, Jean Simmons Felfe, W. W. Carter, Sylvester P. Hooper, Betty Lou Pope by Fonzo E. Fort, Guardian, Audie Pope, Johnnie Fort Rutherford, Fannie Mae Gardner, Claude A. Fort, Edd Fort."

Mr. Campbell, you may proceed.

MR. CAMPBELL: Will you swear the witness, please?

(Witness sworn.)

MR. McKELLAR: Mr. Chairman.

MR. SPURRIER: Mr. McKellar.

MR. McKELLAR: I would like to put a note in the record for the Commission to consider, that it doesn't state the truth as to the, all the facts.

Number one, the Sawyer's checks, royalty checks, in the Crossroads pool which apparently it referred as being, no Sawyer pools in the state as far as I know are increasing along with production.

Number two, is, there is no implied obligation in any oil and gas lease that I have ever seen signed in the State of New Mexico to operate on 40 acre spacing. You simply obligate yourself to develop your lease in accordance with good production practice.

MR. SPURRIER: Mr. McKellar, your remarks are well taken. However, I believe that perhaps I didn't make this clear. It is a little bit hard to make clear.

Let me read that sentence again.

"Eighty acre spacing disappointing to royalty owners Sawyer pool and royalty checks decreasing at serious rate Amerada Hamilton pool under eighty acre spacing."

MR. McKELLAR: Even so, of course, one of the largest royalty owners in the Crossroads pool which happens to be the Santa Fe Pacific Railway joined in the application. It is not disappointing to them. I simply want to point that a out to the Commission.

MR. SPURRIER: Proceed Mr. Campbell.

M. C. JONES,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name please.

A M. C. Jones.

Q Where do you live?

A Magnolia, Arkansas.

Q By whom are you employed?

A McAlester Fuel Company.

Q In what capacity?

A Landman.

Q How long have you been employed by that company?

A Since December 1945.

Q Since that time have you been responsible for land and leasing activities for the company?

A Yes, sir.

Q Are you acquainted with the lease ownership by McAlester Fuel Company and other operators in the Denton pool in Lea County, New Mexico?

A I am.

Q I refer you to the exhibit on the left, marked Exhibit M-1, Case 269, and ask you to state what that is.

A That is a lease ownership map of the Denton pool, Denton area.

Q Are you acquainted with the mineral ownership in the Denton pool?

A Yes, sir, I am.

Q What is the basis of your information as to mineral ownership in that pool?

A The information was compiled by Elliott, Waldren and Strack Company in Lea County, New Mexico.

Q At your request?

A At my request.

Q I refer you to the exhibit second from your left there, marked Exhibit M-2, Case 269, and ask you to state what that is?

A That is a mineral ownership map of the Denton area, Lea County.

Q What are the numbers on the map?

A The numbers designate the tracts owned by the royalty owners

in the area and you will find attached to the plat corresponding with the numbers shown on the plat a list of mineral owners, designated for each tract.

Q I hand you what I have marked as Exhibit A to Exhibit M-1, in Case 269, and ask you if that is the reference that you referred to?

A Yes, sir, it is.

Q Now referring to Exhibit M-1, will you state where the discovery well inthe Denton pool is located?

A Located near the center of the southwest quarter of the southeast quarter of Section 11, Township 15 South, Range 37 east.

Q Referring to Exhibit 11, will you state what the lease ownership is in the 40 acre tract immediately east of the discovery well 40 acre tract?

A Southeast southeast of Section 11 the lease ownership is as follows:

Ohio Oil Company one-half, Atlantic Refining Company one-fourth, McAlester Fuel Company, et.al., one-fourth.

Q In other words, the lease ownerships in those two 40 acre tracts is not the same?

A No, sir, it is not.

Q Referring again to Exhibit M-1, will you state whether or not McAlester Fuel Company owns any isolated 40 acre leases

on that?

A They do. They own the southeast quarter of the northeast quarter of Section 2, Township 15 South, Range 37 East. It is owned by the minerals, the lease was purchased from the State of New Mexico.

Q In other words, that is a State lease,40 acre tract in the state lease which you own?

A That's right.

Q Referring again to Exhibit 11, what is the recommended procedure in connection with an 80 acre proration unit in so far as the 40 acre state lease is concerned?

A It is recommended under this Exhibit 11 that our state lease description of which was just given be unitized with the east 40 which would be the southwest quarter of the northwest quarter of Section 1.

Q And so far as you know, that is owned in fee?

A Yes, sir, it is.

Q Then in the event that 80 acre proration units were established in this pool referd to that isolated 40 acre tract and to your 40 acres upon which the discovery well was drilled, if these recommendations were to be adopted by the Commission, it would be necessary to pool the lease-owned interests, is that correct?

A That's correct.

Q Referring to Exhibit M-2, can you state whether--and referring to Exhibit 11--

MR. FOSTER: That is Phillip's Exhibit No. 11.

Q Phillips Exhibit 11, the suggested pattern for units where wells are already drilled, can you state whether mineral ownership under these proposed units is common?

A It is not.

Q In what instances is the mineral ownership there?

A It is suggested on Phillips Exhibit 11 that the southwest quarter of the northeast quarter of Section 14 and the northeast quarter of the southeast quarter of Section 14, comprise one 80 acre unit. The royalty ownership under the southwest quarter of the northeast quarter of 14 is different from the northeast quarter of the southeast quarter of 14. By the same token, the southeast quarter of the southwest quarter and the west half of the southwest quarter of the southeast quarter of Section 14 has a different royalty ownership than the east half of the southwest quarter of the southeast quarter of 14. That 60 acre tract and the 80 acre tract they propose to comprise one unit.

Q Does McAlester Fuel Company own some lease owned interest in some of the areas you have referred to?

A Yes, sir, they do.

Q In the event this suggested pattern on existing wells and drilling wells were adopted, it would be necessary to pool royalty interests to create those proration units, is that correct?

A It would, yes.

MR. CAMPBELL: That is all.

MR. SPURRIER: Do you care to cross examine?

MR. FOSTER: I want to ask just one or two questions.

CROSS EXAMINATION

By MR. FOSTER:

Q This diversity of ownership you have pointed out of these various tracts, do you think that that offers any valid objections to 80 acre spacing?

A It would necessitate the unitization by the royalty owners in order to form one 80 acre unit. That would be the matter for the Commission.

Q Would that be any valid objection to adopting a correct spacing pattern?

A If the Commission has the power to unitize those tracts, no, sir.

MR. FOSTER: That is all.

REDIRECT EXAMINATION

By MR. CAMPBELL:

Q In connection with the pooling of lease holders interests that situation that there are property rights involved are there not?

A That's right. Under the south half of the southeast quarter of Section 11, Township 15 south, Range 37 East, McAlester Fuel Company has been operating a Devonian well on the southwest southeast since October 1949, and the lease ownership under the southeast quarter of the southeast quarter of Section 11 is different.

Q The result then would be that you would be taking on some new partners, is that correct?

A That's correct.

MR. CAMPBELL: That is all.

RECROSS EXAMINATION

By MR. FOSTER:

Q Do you think that is a valid objection to adopting a correct spacing pattern?

A I would say it would be extremely difficult to work out some acceptable formula both in back production and in material on the ground.

Q Well, but you wouldn't, if 80 acre spacing should be adopted, that wouldn't, bthe fact that you would have difficulty in working out somebody's property wouldn't cause you to condemn it, would it?

A I can't answer that, that being out of my catagory.

Q Then what is the purpose of your calling our attention to the diversity of ownership?

MR. CAMPBELL: I don't see any point in arguing with the witness. I tell you the point. The Commission is entitled to know what ultimate results and problems may be faced in the event that the first step in 80 acre units is taken.

MR. FOSTER: I think you always have diversity in ownership in any field. You have that problem anyway. I wonder if you were advancing that as a valid reason why the 80 acre spacing should not be adopted.

MR. CAMPBELL: In this field it is correct.

MR. FOSTER: If it is true in this field it would be in others.

MR. CAMPBELL: This field has been developed on 40 acre pattern at this time. This is hardly the time for argument.

MR. SPURRIER: Any further questions of this witness? If not, the witness may be excused.

(Witness excused.)

KEM E. MERREN,

having been first duly sworn, testified as follows.

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name please.

A Kem E. Merren.

Q Where do you live?

A Magnolia, Arkansas.

Q By whom are you employed?

A McAlester Fuel Company.

Q For how long?

A Three and a half years.

Q What capacity?

A As Petroleum geologist.

Q In connection with your duties of that company, have you made a study of the geology of the Denton Pool in Lea County, New Mexico?

A I have.

Q I refer you to the map, the third from your left, which is marked Exhibit M-3, in Case No. 269, and ask you to state what that is?

A That map is a structural map on the top of the Devonian formation and the dash lines are where we do not have positive control, the solid lines are where we do have control, the wells circled in red are those that have penetrated the Devonian or scheduled to go to the Devonian.

Q Was that prepared in your geology department?

A It was.

Q Did you assist in the preparation?

A I did.

Q In your opinion is that, from the available information, is that a reasonable interpretation of the structure on the top of the Devonian?

A It is.

Q Would you come over to the exhibit here and explain the nature of the structure on your interpretation?

A Well, the general nature of the structure is a generally north south anticlinal with what we think is a very steep dip on the flank. Using the interval, the top of the Devonian on our discovery well, McAlester No. 1 Denton to our point on the water of the northeast northeast of Section 15, shows a dip of 1644 feet. That figures at a rate of 2140 feet combined.

Using the interval on the top of the Devonian in McAlester's Denton A-1 to the estimated top to the Atlantic A-1, northwest northwest of Section 13, that is a dip of 1,044 feet and figures at a rate of 1900 feet.

Q Have you examined Phillips Exhibit 21, which is a contour map of their interpretation of the contour of the top of the Devonian in that field?

A I have.

Q Is there any essential difference in the general geological interpretation between the two exhibits?

A No.

Q In both cases you have used the estimated points in Section 13 and 15 for your information on the flank of the structure, is that correct?

A That's correct.

Q Referring to your contour map, do you have any opinion as to what the possible effect could be of proration units of 80 acres extending east and west in that field?

A Yes, I do. I believe that in that case where you have an 80 acre unit running east and west it would be possible for one party to be productive and the other party to be dry.

Q Have you had experience in that respect in moving out of the flank of that structure?

A Yes, we have. We drilled our McAlester A-1 in northeast northeast of Section 15 and got the only dry hole in the field and we have had ample evidence of the steep dip.

Q How far is that from the nearest inside production?

A Well, it is approximately three-quarters of a mile.

Q That is from the Gulf well in the northeast of the northwest ofSection 14?

A That's right. From the Gulf Chamberlain No. 1.

Q Now, referring to Phillips Exhibit 11, in that area where your dry hole was drilled in Section 14, and referring to the suggested pattern for existing wells, can you state whether the Gulf well referred to will be the only well situated inthe 160 acres in the northeast northwest quarter of Section 14?

A Well, I believe that according to the way of our structure that that well will be the only well in that quarter that would be productive in the Devonian with that 80 acre unit running east and west.

Q The way the units are set up now the well in the northwest of the northeast of 14 would come over and refer to this in the northwest of the northeast of 14 is combined with the 40 in the southeast of the northwest. A well is already drilled on that unit. The completion by the applicant in connection with the Gulf wells in the southwest quarter would put the well for that unit in the southwest quarter of Section 14 so the only well in the northwest quarter would be the Gulf well?

A That's correct.

Q I now refer you to what has been marked Exhibit M-4, Case 269, and ask you to state what that is?

A Well, this Exhibit M-4, is a micro-log cross section on the top of the Devonian and the Devonian is the only formation shown there on the cross section.

Q Let's get the other. Do you have the core analysis? I also refer you here to Phillips No. 8, in Case No. 269, which is the core summary of the Ohio Denton No. 3 using the information on the summary of the Ohio Denton No. 3, the micro-log cross section and the core analysis of that well, state what conclusions you were able to draw as to the porosity and permeability in this pool.

A We have reached the conclusion that the core analysis and drill stem tests are more in agreement with those two together than in any combination of micro-log. I would like to cite some examples on the core analysis of the wide variation in permeability. Through two intervals in the Ohio Denton No. 3, the first interval is 11554 to 11603 and in that interval the permeability ranges from one millidarcys to a maximum of 600 millidarcys and porosity varies from two and seven-tenths per cent to ten per cent. Now, on the micro-log on the Ohio Denton No. 3, through this same interval it shows good continuous permeability throughout. The second interval is 11,790 to 11,860, the core and all the permeable ranges from less than one millidarcy to a maximum of fifty millidarcys porosity varies from two and eight-tenths per cent to six and eight-tenths per cent and larger percentage of the interval shows low values. On the micro-log again,

this interval shows that 80 per cent had good continuous permeability. On the core analysis there are five different terms used to describe the cores and various combinations of those terms they are densed, fractured, porous, vugglar, and styolitic .

Now, I have three examples of it. Demonstrating the ragged nature of the permeability in the producing formation. I will point those out on the micro-log cross section. The first one is the comparison of the micro-logs for the Ohio No. 3 and Phillips Denton No. 1. Through these two zones where approximately four hundred fifty feet of continuous permeability is shown on Phillips Denton No. 1, there is a coring zone in the Ohio Denton No. 3 where considerably less permeability is shown. We feel that that is a good illustration of the erratic nature of the permeability. As shown by the micro-log.

No. 2 is a comparison df the first and third drill stem tests for Phillips Denton No. 1. The first drill stem test is in the upper section where the micro-log shows very little permeability. On that test the well flowed at the rate of three barrels an hour. The third drill stem test which is right here through this section showing good solid permeability, the well flowed at the rate of 27 barrels for the first hour and 32 for the second. There are two zones there; comparing this one has hard permeability; this one has good continuous permeability and yet there is very little difference in the flowing rate of the wells.

Number 3, in comparison with the dfirst drill stem test, McClure A-1, right here, and the first drill stem test of the Phillips Denton No. 1, right here, both of those tests on the upper most part of the Devonian, and I would like to add that there is only about 50 feet difference between the subsea top in the Devonian of those two wells.
On the McAlester McClure A-1, on the three hour test, the recovery was 270 of oil and gas and 1500 feet of oil and gas through this section right here. On the Phillips Denton No. 1, referring to the same drill stem test again, in two hours and 20 minutes, the well flowed at the rate of 31 barrels an hour.

Going back to the McAlester A-1, the shut-in pressure was 1660 on this test; on the first test on the Phillips well was 4950. Again showing a very wide variation.

We feel that there are other examples but that these three give ample evidence of the erratic nature of the producing formation.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q Mr. Merren, taking that well on the east flank there, on Exhibit--I can't tell what that exhibit is.

A That is Exhibit M-3.

Q On the west flank of the structure there, you testified

about that well, I want to ask you, was that well completed in the Devonian?

A No, that well never reached the Devonian.

Q What happened to it?

A It was plugged and abandoned at a total depth of twelve thousand fifteen feet--

Q Your testimony indicated that it marked the outer limits of the field there as to the outer limits of the Devonian pool. A That is my opinion.

Q How can you say that when it never got down.

A We went to a total depth of twelve thousand fifteen at which point we felt we never penetrated the Mississippian which was top at ten four nine five, we went at twelve thousand fifteen feet that section 11,410 to--drilled at an average rate of six and seven minus per foot. We had continued loss of circulation all through that zone and we had nothing to indicate that we had ever penetrated the Mississippian.

Q Of course, you know that you got to reach the edge of an oil field sometime, don't you?

A Yes.

Q If there is some acreage on the edge of the field there that is not productive and there is no indication it is productive, well, of course, that just wouldn't be allocated to a well would it?

A No, I don't believe that it would.
Q Doesn't indicate that you shouldn't have 80 acre spacing does it?
A Well, the purpose of this map is to show the steep dip on the top of the Devonian and it is possible there in the northwest quarter of Section 14 to have 1100 feet of depth to one 60. On 40 acre spacing you would have only five hundred fifty feet of depth.
Q Are you of the opinion that one well wouldn't adequately drain 80 acres in this field.
A I am.
Q That is based on present information that you have?
A Yes, sir.
Q If you wanted to go to 80 acres you had better start with 80 acres, hadn't you, in any pool?
A I believe that would be correct.
Q You can't get back to 80 acre spacing when you start with 40 very well, can you?
A No, sir.
Q But you can go from 80 to 40?
A That would be possible.
Q It is possible that later information here may indicate that you ought to have 80 acre spacing even to your company, isn't that possible?
A That may be possible, but as of now, we are not of that opinion.

Q I understand that. Are you just constitutionally opposed to 80 acre spacing?
A No, sir, I am not. I do not believe that in this reservoir that one well to 80 acres will adequately drain the reservoir.
Q You don't believe there is any question about that?
A That is my opinion.
Q Yes. You don't believe you could be wrong about that?
A I could be wrong, but that is my opinion as of now.
Q You mentioned up there where you found very little difference in the flow rate in a couple of the wells there that you called our attention to. How do you account for that?
A Well, I was using that example to demonstrate that the micro-log was not necessarily giving us a true picture of those sections. That in the upper section the micro-log showed very little permeability, the lower section it showed good continuous permeability and the result of the drill stem tests were nearly identical.
Q There is quite a bit of fractures through there, too?
A In some places.
Q That would have something to do with the area which one well would drain, would it not?
A Yes, sir, it certainly would.
Q In most of these fields you found relatively speaking, at least wide variations in permeability and porosity throughout the field, did you not?

A I believe that is correct.

Q That is just characteristic of fields generally, isn't it?

A Well, there seems to be more of a variation here than any I have known of.

Q Well, now when you say more, that doesn't mean very much to me. All these things are relative and--but in all of these fields you found a wide variation in permeability and porosity. I never heard of one where that wasn't so, have you?

A I believe that I have heard of fields where there was not as much variation as we have here.

Q In comparing fields. But in all fields there is a wide variation in permeability and porosity. That is true in every oil field or pool.

A Not necessarily.

Q And you wouldn't comdemn wider spacing on just that fact alone would you, because there is some variation in the field of permeability and porosity?

A If I thought there was enough variation to prevent one well in an 80 acre spacing from adequately draining a reservoir, that would be my opinion.

Q You think you find enough variation here to justify that conclusion?

A I think I have.

MR. FOSTER: That is all.

MR. CAMPBELL: That is all.

MR. SPURRIER: Anyone have any further questions of this witness? If not, the witness is excused.

(Witness excused.)

VERNON TURNER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name please.

A Vernon Turner.

Q Where do you live?

A Magnolia, Arkansas.

Q By whom are you employed?

A McAlester Fuel Company.

Q How long have you worked for them?

A Three and a half years.

Q In what capacity?

A Chief Engineer.

Q Are you acquainted as engineer for the company with the Denton oil pool in Lea County, New Mexico?

A Yes, sir, I am.

Q You were acquainted with the operations which resulted in discovery well in that pool?

A That's right.

Q Since the discovery well, when was that discovery well completed?

A In October of 1949.

Q Approximately 18 months ago.

A Roughly 18 months.

Q What has been the spacing program generally followed in this field to this time?

A Well, to date all the wells have been drilled on a 40 acre spacing pattern. I believe that has been brought out in previous testimony, that on the south end of the field there is a cluster of 40 acre locations and also on the north end of the field.

Q Is it correct that four Devonian wells have been completed and a fifth is now drilling, which are 40 acre step outs from the discovery well?

A That's right.

Q In other words, the field is in a position now where there are clusters of 40 acre wells, is that right?

A Yes, sir, definitely.

Q From an engineering point of view, what in your opinion might be the result of changing at this time the pattern to an 80 acre wider space pattern?

A Well, it would certainly leave a lot to be desired as far as the drainage pattern is concerned if an effort should be made to change to an 80 acre pattern. It would be necessary to include a number of diagonal offsetting 40 acre tracts. As Mr. Merren has testified, we have ample evidence

of the steeply dipping nature of the Devonian information and it is our concern under the applicants proposed procedure that considerable dry acreage would be included with producing units for which it would be granted allowable for which there is no justification.

Q Are you familiar with the core analysis in the Ohio Denton No. 3 well?

A Yes, sir.

Q Have you studied that core analysis?

A Yes.

Q Are you acquainted with the micro-log?

A That's right.

Q Based upon those, what is your opinion as to the range of permeability, or average permeability, in this field?

A The core analysis data from Ohio Denton No. 3, the interval cored from 11,125 feet to 12,103 feet, or a total of 970 feet of section, the over all recovery was 96.5 per cent. The porosity range maximum of ten per cent to a minimum of four-tenths of one per cent. The average was 3.6 per cent. That average was obtained from five hundred sixty-five samples and listed.

Q What is the situation as to permeability?

A The maximum permeability recorded on the core graph was 1,020 millidarcys. The mimimum permeability was one-tenth of one millidarcy. The average horizontal permeability was 33.3 millidarcys and at 90 degrees, ten point eight millidarcys.

Q In your opinion are those variations indicative of an erratic formation?

A Yes, sir, it is.

Q Based on your experience in other areas in which you operate would you say that is average or below average or above average in variation?

A In our opinion, those values are rather low at least in our areas of operation.

Q Permeability in itself is low?

A Yes, sir.

Q With regard to the variations from the high to the low permeable area?

A I would say that the variation is greater in this particular field than in the fields in which we operate.

Q What is the effect of that condition on reservoir drainage and spacing in your opinion?

A Well, we think that possibly, might say probably, there are a number of those zones that constitute essentially a closed system due to low permeability. We do not feel that one well to 80 acres will adequately develop such a section of that nature.

Q I hand you what has been marked Exhibit M-5, Case No. 269, and ask you to state what that is?

A This is a productive measurement on the three wells in the Denton Field.

Q Referring to that exhibit and pointing out which wells are included, state what it reflects as to producing capacity of the wells shown on it.

A Well, in addition to the draw down tests that are already submitted, we have two other wells on which we have draw down tests data. The Phillip's draw down tests have already been submitted, so I won't go into that. Gulf Chamberlain No. 1 located in the northwest northeast quarter of Section 14, draw down test was run on March the first, 1950, with 18 feet of pay exposed following a 24 hour period of operation producing at the rate of 337 point-- 338.5 barrels per day, a bottom hole pressure of 4,304 pounds was recorded. That represented at that rate a draw down of 577 pounds over static conditions, with an indicated P. I. of .58665.

Q What was the situation on the McAlester well?

A The McAlester Denton A-1, draw down tests were run on that well, the first part of the month. The draw downs were run at four different rates of production, but I will only use the minimum and maximum rates. On May 3, 1951, at 130 feet of pay exposed a shut-in bottom hole pressure of 4,726 pounds was recorded at 11,290 feet. The following day, the well was opened up on a two hundred twenty-nine barrels per day rate, the bottom hole pressure of 4,208 pounds per square inch was recorded. Gave a draw down over static conditions of 518 pounds, with an indicated P. I. of .518.

Then, going to the highest rate of withdrawal on May 7, 1951, and producing at the rate of 679 barrels per day, bottom hole pressure of2105 pounds was recorded. At the same depth.

That represented a draw down of 2575 pounds over static conditions, with indicated P. I. of .264.

Q Considering your own well there, what is the effect of that draw down at that high rate on the capacity of the well to produce and the effect on the reservoir?

A Well, I would seriously question the effect on the reservoir producing that well at that rate over a long period.

Q Would it tend to create an artificial gas cap in your opinion?

A I am afraid it would. The saturation pressure for the crude is 2665 pounds, the flowing bottom hole pressure at that high rate is 2151 pounds or--

Q Based on you tests there, assuming a production of five hundred and ninety barrels a day, is it true that you would be approaching a saturation on your well?

A I am afraid you would.

Q What is the effect of that?

A Well, you would create a low pressure area adjacent to that well. Solution gas would be released and you would create an artificial gas cap and dissipate the reservoir energy

that is availbale.

Q In other words, based on your production experience of your discovery well and the test you made, you feel that caution should be exercised in increasing the allowable?

A I certainly do. I think I would be opposed to any increase in the allowable above the present rate or something slightly above that.

Q Based upon your experience in this field and your knowledge of this reservoir and the production history of your wells, is it your opinion that the reservoir will be more efficiently drained by the uniform pattern of 40 acre spacing on the state wide pattern than by the proposal of the applicant here?

A Yes, sir, I do. You have already a cluster of 40 acre locations and if those wells are granted the high allowable as has been requested, you are going to recreate a low pressure area in that part of the field.

Q To your knowledge is your company prepared to develop the acreage in this field upon a 40 acre bases?

A Yes, sir, we are.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q You only have one core analysis for the whole field?

A That's right.

Q You don't know what a core analysis from other wells might indicate with respect to permeability or porosity?

A As far as I know there have been no other cores taken.

Q That is what I am saying.

A Yes.

Q As far as I know there has only been one taken. That is one out of how many wells in the field.

A Six completed so far.

Q Six completed. So far based on that one core analysis you would be willing to condemn 80 acre spacing?

A On the basis of the information which we now have available.

Q I understand that.

A The fact that you only have one core analysis available I don't think you would just discard it as not being of any benefit. We have nothing further to go on.

Q Would you accept it as being representative of the entire field?

A Until we have more representative information, I have no alternative but to accept it.

Q From this one core analysis you just assume that the same permeability and same porosity would be reflected if you had core analysis from all the other wells?

A I think Mr. Merren's testimony that he presented is ample evidence of the erratic nature of the formation.

MR. FOSTER: I believe that is all.

MR. SPURRIER: Anyone else have a question of the witness?

MR. BLYMN: Yes, I do.

Q (by Mr. Blymn) Mr. Turner, I believe you testified that in order for your Denton No. 1 to produce at the rate of approximately 600 barrels a day, it was necessary through a differential on that well of approximately one-half of static, was that correct? You had to draw that well down about 2500 pounds to produce?

A Almost 2600 pounds.

Q You stated that order of draw down was conducive to breaking solution gas out in the formation of gas cap, is it also conducive to coning of water?

A I think it would be.

Q Would you consider that possible coning an edge water cone or a bottom water cone?

A Well, I believe it would be an edge water cone. Probably along zones of high permeability.

Q In the event that coning was seriously aggravated what effect would that tend to have upon the production of those wells?

A Well, it would result in by-passing of oil in places which would never be recovered I am afraid.

MR. BLYMN: That is all.

MR. SPURRIER: Anyone have a further question?

MR. CAMPBELL: THat is all.

MR. FOSTER: That is all.

MR. SPURRIER: The witness may be excused.

(Witness excused.)

MR. FOSTER: I don't know that it is necessary to make any particular argument here in this case. I don't see what an argument would add to it. The facts are those that anybody can draw their conclusion.

I think the record supports the contention that if you choose to do so you would be supported on the record in adopting the 80 acre spacing here, if you want to adopt it.

MR. CAMPBELL: I don't want to argue the thing. I do want to be certain that the record makes clear the position of McAlester Fuel Company in this matter.

The principal concern of that company is that the development of the field to date and the present development in drillingin their opinion 80 acre spacing either on a fixed pattern basis or on an alternate 40 acre basis is going to adversely effect the correlative rights of the lease owners and the reservoir itself. As pointed out in the testimony, you have clusters of 40 acre wells in one place, in the northwest quarter of Section 14. The result of the recommended pattern of the applicant would have one well in 160 acres situated in the northeast quarter in the northeast 40 of the 160 acre quarter section.

It seems to us it is quite apparent that the situation

here will be that there is no uniformity rather than any uniform 80 acre spacing pattern.

It appears further to us that in view of the number of wells that have been drilled and are drilling that the only way you can get to the northwest southeast pattern is to get off the structure. We don't feel that is a proper way to develop a field or to properly drain the reservoir. I also, want to make one brief comment about the shortage of steel.

As I said, we are all concerned about that. But the testimony has shown that there is 1700 feet of pay in this Denton pool, if these wells are drilled on 80 acre spacing with 590 barrels allowable would take the position that they had much left in reserve. If steel is so utilized for national defense, it occurs to us that there could be no better place to put it than in a field with this kind of a pay section and produce the wells at half the rate and leave available some productive capacity in the event of a national emergency.

MR. SMITH: I would like to correct that statement about 1700 feet of pay. There is 1673 feet of oil column. The amount of pay varies somewhat from well to well. There being a maximum thickness of Siluro Devonian in one well of about 1100 feet which is pay.

MR. CAMPBELL: I appreciate the correction. I think it is obvious that it is an excellent reservoir from the point of view of pay section.

MR. FOSTER: The 160 acres is the northwest quarter rather than the northeast where there is one proposed well.

MR. CAMPBELL: It is in the northeast quarter of the northwest quarter of Section 14.

MR. SPURRIER: Does anyone have anything further in this case?

MR. PAUL COLLISTON: Continental Oil Company wishes to go on record in support of 80 acre spacing in New Mexico where reservoir characteristics and economics justify that spacing; however, since all allowables in New Mexico are determined on a statewide basis, we respectfully request the Commission to forego the granting of additional allowables to 80 acre deep wells until a statewide policy in this regard has been established. It is our recommendation that a special hearing be called by the Commission to permit all operators in the state to make recommendations toward the adoption of some statewide rule on this matter.

MR. SPURRIER: Anyone have anything else?

MR. SCOTT: I would like to make a statement in behalf of Shell. Insofar as Shell is concerned, we would not object to 80 acre proration of rectangular, but all of the units being within the same section and with operational development on the 40 acre tract on the proration unit until the structure is defined and limits of production established. We are opposed to 80 acre proration which would comprise

diagonal 40 acre tracts included in those shown in plats in Phillip's Exhibit No. 11. Our reasons are as follows. One, such units are contrary to the Commissions policy as laid down in its rules which is for compact units as nearly in the form of a square as possible. Two, unless units are confined to a particular section the problem of unitizing royalties is apt to be particularly difficult. Three, under the proposed plan as set forth on Phillips plat which is Exhibit 11, Section 2 would eventually have one more well than would be the case if it were developed on a rectangular 80 acre pattern. Four, the proposed plan on the Phillip's No. 11 would prevent formation of regular units in both sections, one and three to the east and west of section 2, if and when these sections are developed. At the present time we have no objections to Phillips proposal of the allowable rate of production for the Siluro Devonian reservoir. However, we do feel that the matter should be reviewed at the end of the year and provisions made for adequate engineering data at the end of this period. We would be in opposition to any regulation which would prohibit development of a 40 acre tract in the event this 40 acres could not be included in 80 acre proration unit of rectangular shape within the same section. We have no objection to 80 acre proration units and we are ready and willing to unitize our 40 acre tract in Section 2 with another operator's 40 acres adjoining in the same section so as to form a rectangular 40 acre proration unit.

MR. SPURRIER: Anyone else?

MR. TURNER: I am the owner of mineral interests in the Southeast quarter of Section 14 and north half of Section 23, and the owner of oil payments in Sections 15, 21, 23 28 and 35 in Township 15 South, Range 37 East, and minerals in NE¼, Section 26, 14 South, 37 East, in Lea County, New Mexico and I wish to protest the proposed 80 acre spacing plan in the Dentol Pool, a part of which is in this area. I would like for this protest to be entered as a part of the record in both cases involving the Wolf-Camp and the Devonian formations.

It appears that part of my holdings are definitely at the edge of the presently known boundaries of the field. I have had previous experience on the edge of fields where 80 acre spacing was adopted and I know the results. I own minerals in the Bagley field and in the Knowles field, both of which have been on 80 acre spacing. In each case, as here, I have been unfortunate enough to be on the edge of the pool.

In the Knowles field a well was drilled on the 80 acre pattern and it was dry. The royalty owners finally got the operator to drill on the other 40 acres but if we get a well we will get one-half the allowable allocated to offset wells which are on the 80-acre pattern. In the Bagley field, with a water drive, we will probably have our edge acreage washed out before drilling will be risked by the operator who must jump over one 40 acre tract to maintain the pattern. I have made a mistake by not protesting these previous applications and I do not intend to make the same

mistake again. If oil moves through these reservoirs with the efficiency and the speed which the engineers for the operators indicate I certainly want to preserve my right to 40 acre offsets and 330 foot locations, particularly when my holdings are on the edge of the pool.

I have bought minerals and sold leases in New Mexico for a long time and particularly where the field starts out, as here, on 40 acre spacing, I want it to continue that way. I doubt that all the recoverable oil can be drained from the reservoir without some sort of uniform pattern. I believe that the Commission, representing the citizens of New Mexico should also consider this matter most carefully.

I suppose that if 80 acre proration units were established it would be necessary to pool interests of royalty owners. I would like to say now that I will resist the pooling of any of my interests for 80 acre spacing.

I have heard something said about shortage of pipe. Now I do not know how much pipe is available to the operators in this pool but It would seem to me that whatever is available could not be put to better use than to place it in 1700 feet of pay section.

I protest against 80 acre spacing, temporary or permanent.

MR. SPURRIER: Anyone else?

MR. MOFFATT: I have a statement for Gulf Oil. My

name is Murray C. Moffat with the Gulf Oil Corporation.

Gulf concurs in the recommendation of the Phillips Petroleum Company for 80-acre spacing and proration units in the Denton Pool. We also join in the request for double allowables for wells on 80-acres within the provision that exceptions for the two future locations, Gulf feels, these being in the southwest southwest of the southwest are agreeable to the Commission.

If the Commission is not inclined to grant these exceptions as shown on Phillips 11, it will be necessary for Gulf to support 40-acre spacing in the pool in order to protect our interest and those of our royalty owner.

MR. SPURRIER: Anyone else?

MR. WHITE: I have a statement. My name is Emmett D. White and I am Vice-president of Leonard Oil Company of Roswell, New Mexico.

Leonard Oil Company owns minerals in Sections 3 and 4, Township 15 South, Range 37 East, Lea County, New Mexico. This area is not within the presently defined limits of the Denton Oil pool, but its location on the western edge of the north portion of this pool makes any well spacing program of importance to our company.

We wish to protest the establishment of 80-acre proration units in this pool as requested by Phillips Petroleum Company in Case No. 269 involving the Siluro Devonian zone of

of production and in Case No. 270 involving the Wolfcamp zone of production.

As the Commission knows, and as it has confirmed by its statewide rules and regulations for the purpose of conserving our natural resources, the drilling and proration unit for New Mexico for many years has been 40 acres. Minerals and leases have been bought and sold with this program in mind.

Our objections to the proposed 80-acre spacing in the Denton field are based upon the following:

1. This pool has been developed to date under the statewide rules providing for 40-acre drilling and proration units. There are approximately 20 wells, drilling wells, or locations in the field at present, and with a possible few exceptions, these have been located upon the assumption that the statewide rules would apply. A spacing pattern, we believe, should be as uniform as possible in order to provide maximum efficient use of the reservoir energy. The proposal of the applicant in this case makes such uniformity impossible.

2. The establishment of 80 acre proration units and double allowables would be in our opinion have a serious effect upon the ultimate recovery of oil and would particularly affect the wells on the edge of the pool. It is apparent that the area under which we own an interest may be on the edge of the structure. Production of wells up-structure at an excessive rate would tend to wash out the edge properties prematurely.

3. Under an 80 acre spacing program it is quite possible for a productive 40 acre unit to be forced to share its oil with an adjoining 40 acre unit which may subsequently be proved non-productive. While we recognize that this condition may exist in any spacing program, we feel that the wider the spacing the more aggravated the situation becomes and the more adverse will be the effect upon correlative rights.

4. The establishment of 80 acre proration units, it seems to us, is but the first step to compulsory pooling of interests as it would appear to be wholly impractical to adjust the units in such a manner that royalty ownership under each of the 80 acre tracts would be common. The Commission, we feel, should consider the ultimate effects of the establishment of 80 acre proration units upon the rights of royalty owners who have acquired their property upon the reasonable assumption that statewide 40 acre spacing rules would apply. We are inclined to consider the long-standing practice of 40 acre spacing in New Mexico as approaching the nature of an implied covenant in our leases.

5. The Denton pool appears to be one of the most potentially prolific oil pools discovered to date in New Mexico. It seems to us that from the point of view of national defense and the proper use of critical materials that there could be not better place to drill than in such a pool. One well on an 80 acre proration unit produced at twice the rate of a 40 acre spaced well has little to offer in the event of any emergency. Two

wells upon an 80 acre tract produced at half the rate offer possibilities of increased production in the event of a national emergency. There is little doubt as to the economics of the matter since these wells will pay out within a relatively short time, and we believe that this field offers a profitable place for the investment of money and critical materials.

We respectfully submit our views to the Commision as royalty owners in the Denton area.

MR. SPURRIER: Anyone else.

MR. HOWARD: I have a statement for the Atlantic. My name is R. E. Howard. The Atlantic Refining Company wishes to concur with Phillips Petroleum Company in their request for 80-acre spacing with the well to be located on alternate 40-acre tracts, in the center of the northwest and southeast quarter of each quarter section, and also the request for a double 40-acre allowable with deep well adaptation. We also join in their request that this be based on a temporary order.

MR. SPURRIER: Anyone else?

MRS. CLAYTON: I have a statement I would like to give. My name is Mary D. Clayton from Lovington.

I am one of three trustees of a portion of the Dickinson Estate. We hold in trust for certain of the heirs a considerable amount of property, including mineral interests in Lea County, New Mexico. This property includes approximately 3800 mineral acres in Townships 14 and 15 South, Range 37 and 38 East, much of which immediately surrounds the presently developed

area in the Denton oil field. I also individually own approximately 1100 mineral acres lying to the South of this presently developed Denton area. I wish to enter a protest against the application in this case for myself individually and on behalf of the other trustees of the trust estate.

As we understand the application of Phillips Petroleum Company it is to establish 80-acre proration units in both the Wofl-camp and Devonian zones of production in the Denton field. We understand that the statewide spacing and proration unit has always been 40 acres in New Mexico and we see no reason why it should be changed in this field.

When 40 acre spacing was adopted in New Mexico by rules and regulations of the Conservation Commission many years ago we presume that the Commission had before it engineering testimony and the facts concerning the rights of lease and mineral owners and that it arrived at the conclusion that 40 acre spacing was fair to all concerned. On the basis of its conclusion a great deal of money has been invested in mineral properties and we have sold leases in this field upon the assumption that spacing of wells and the allocation of production would be upon at least a 40 acre basis.

Our situation in the area around the Denton pool is particularly dangerous from the well spacing point of view because our acreage could very well be on the edge of the structure. It is possible that we may have ownership in areas

where part of an 80 acre tract would be productive and part would not be productive. It is also possible that a well drilled on our property near the edge of the pool and producing at a rate in excess of the single allowable of 40 acres would be washed out by water if this is a water-drive field. We are further concerned that 80 acre spacing will delay the drilling of outside locations in this field because it will require a greater step-out for the drilling of wells to ultimately define the outer boundaries of the pool.

We have noted for example that one of the tracts in Section 35 under which we own minerals has a producing well drilled upon it in the $SE\frac{1}{4}SW\frac{1}{4}$ Section 35, Townsship 14 South, Range 37 East. Instead of drilling an offset well to the north it is now proposed that the 40 acres immediately north of this well be thrown into an 80 acre proration unit with an allowable yet to be determined. If the allowable is not greater than for one 40 acre tract it is certainly most unfair to us as mineral owners. If the allowable for this well is increased to compensate for the situation than it is quite possible, it seems to us, that the well would be producing at too rapid a rate and some of the oil underlying our property will not be recovered. This same situation will apply to our wells producing from the Wolf-Camp in Sections 12 and 13 and will undoubtedly be true in other areas surrounding this oil pool where we own mineral interests.

As royalty owners we do not have available the technical information available to the operators but it occurs to us that

if one oil well will drain 80 acres then there is a lot of drainage taking place which calls for offset drilling by the oil companies.

We have not had an opportunity of determining whether it is recommended that any of our interests be pooled with other interests to make up a proposed 80 acre unit but for the reasons we have stated we must advise the Commission that if such is the case we will find it necessary to resist compulsory pooling of these areas owned by us for the purpose of creating 80-acre proration units.

We wish to protest 80 acre spacing, either temporary or permanent.

MR. SPURRIER: Thank you. Is there anyone else?

MR. McKELLAR: Mr. Ed McKellar for Magnolia. We concur in the recommendation of Phillips that a temporary 80-acre spacing be established for this pool our theory being that there is very little technical data yet determined in this field and should it later prove the better part of wisdom to develop on 80-acre, we could. We would already be on it and should it then prove that we need to go to 40 that door would still be open. It is still physically possible and legally possible to establish 80-acre spacing in the field. It won't be very much longer, so I think that they are going to have some definite program established as a result of this hearing.

It is our thought it might be the better approach to establish 80 acres for a temporary measure. The thought being that if it proved unwise we could always go then to 40-acres.

Of course, the Commission is bearing in mind that there has been a precedent set for 40-acre spacing in this State. There is also provisions in the rules to grant exceptions. The Commission is also under statutory duty to see that no unnecessary wells are drilled. Should the reservoir data later prove that one well will effectively drain 80 acres then, of course, it would be unwise if we let more than one well be drilled to 80-acres. I don't want to prolong the hearing. We just join with Phillips in the request for temporary 80-acre spacing with a fixed pattern, northwest southeast I think or whatever arrangements they have proposed here. We do want to fix the spacing. Whichever way the Commission decides to run it, we want it to be fixed and not flexible.

MR. SPURRIER: Anyone else?

MR. WHEELER: My name is J. D. Wheeler, representing the Ohio Oil Company. We concur with Phillips in their recommendations for 80-acre spacing. Some of our reasons for concurring with them; we believe that this is a field in which pipe can be saved at the present time and still have the field producing the same amount of oil that it would produce on 40-acre spacing.

The McAlester information on their draw down on their

well, I believe, would be applicable to a number of the wells in the field.

We have considered the direct offset to that well and the section from which McAlester well is producing had low permeabilities. We think that with the well drilled clear through the section the draw down would be much less. Insofar as the point that Mr. Colliston brought up about the tract which they have in the southeast of 11, they already have Ohio, Atlantic as partners in the remaining tract which would have to be unitized, and I believe it would be possible for those operators to get together on that unitization. Certainly, Ohio wouldn't expect to share in any of the oil that McAlester has already produced and I believe that particular obstacle could be overcome.

MR. SPURRIER: Anyone else.

MR. SELINGER: My name is Selinger with Skelly Oil Company. It became very apparent from the outset that there are two problems involved. One is the question of proration units and the other is the question of allowable. Also, from the testimony presented here it is quite evident that the information on the reservoir is very meager.

You have the discovery well, the McAlester on production some 18 months. You have the Gulf No. 1, Dickinson an offset on production for approximately a year or more. Outside of those two wells all the other remaining producing wells, the information on them have been disclosed from production of this year.

In our opinion that is a very comparatively short time to promulgate any spacing program. We think that the 80-acre spacing as a temporary measure would probably be the most advisable for the reason that the lack of information makes it necessary for the Commission to proceed very cautiously. If no spacing program is allowed to continue at this time within a very relatively short time, it would be impossible to work out any sort of program other than the 40-acres. As long as a reasonable doubt exists in the minds of the Commission with respect to the drilling of unnecessary wells, we believe that the Commission should take into consideration the statutory provision of Section 12 which provides that no owner of a property, and, incidentally, owner is described by the legislative act as the working interest, no owner of a property in a pool shall be required by the Commission directly or indirectly to drill more wells than are reasonably necessary to secure his proportionate part of the production. To avoid the drilling of unnecessary wells a proration unit for each pool may be fixed, such being the area which may be efficiently and economically drained and developed by one well.

The drilling of unnecessary wells creates fire and other hazards conducive to waste and unnecessarily increases the production cost of oil or gas or both to the operator, and thus also unnecessarily increases the cost of the product to the ultimate consumer.

It is our view that as long as a reasonable doubt

exists that it would be wise for the Commission to establish on a temporary basis the 80-acre units. Now, it is true that all operators advocating 80-acres would much prefer the old established policy of the Commission in following governmental quarter section or quarter quarter sections. The condition that we find the field in today makes that impossible. Therefore, the proponent relying on the actual realities that exist in the field today have to fall back on the density program. They must of necessity disregard the quarter quarter section government subdivisions. As long as that exists it is necessary for the Commission to permit a discretion of the operators to formulate their 80-acre units.

We believe that the Commission as a temporary measure in order to avoid the drilling of unnecessary wells should promulgate an 80-acre unit only on a temporary basis and we believe that they were wise in issuing the Bagley order by letting it die of its own terms, that is the respective and specific limit of one year.

It is also quite evident that the productive limits of this field have not been ascertained and ordinarily the wider spacing units gives that information much quicker than a closer density of 40-acre units as compared to 80-acre units. Now, with respect to the allowable which is the second part of the hearing, we believe that McAlester Fuel and Mrs. Clayton and some of the others have a valid reason for being disturbed about a too rapid rate of withdrawal.

Our experience in Devonian production and also the

experience of Devonian production in this state seems to indicate that a too heavy withdrawal in Devonian should be something that should be avoided. While we are unhappy with the 590 barrel recommended allowable, we believe that in order to get this program off center, we wouldn't have any objection at this time provided that the reservation is contained in the order to permit any operator, whether it be Skelly or any royalty owner the right to come immediately before the Commission to reduce such an exhorbitant allowable if such seems to be the case.

Therefore, we believe that the recommendations of the Phillips and the proponents for an 80-acre unit should be permitted on a temporary basis.

And, incidentally, with respect to a little history if I may be permitted a few seconds, the 40-acre proration unit as probably a few of us know in 1935 was established for production from zero to five thousand feet. At that time we had no production below five thousand feet. In setting up the statewide system of allowables for 40-acres, it was felt that would be adequate to take care of an allowable for the state. Subsequently, when production was found below five thousand feet, the Commission as well as the operators were faced with the question of permitting some incentive for such deeper drilling, so we came up with Rule 505 based on depth.

I believe that the recommendation or the suggestion of the Continental is worth considering now for the reason that not only in New Mexico, but in all other oil states

operators are forced to go deeper and deeper with the resultant greater increase in the cost of drilling.

I believe that this Commission like other state commissions is going to have to be reconciled to the fact that there is deeper drilling, that it takes greater spacing, it takes considerable amount of capital expenditure and the states must give recognition to that fact.

Knowing now that our statewide system of proration seems to be inadequate to cope with the situation, I think the time is now ripe for the plan to come up by joint action of the operators and the Commission for some sort of incentive for such deeper drilling. The question of allowables doesn't necessarily affect the question of proration or development units. I think one is entirely different from the other, but they necessarily come together with somewhat the deeper drilling at the same time with a larger spacing drilling unit, at the same time, they don't want to heavy withdrawal from within that well bore. So, I believe the time is now ripe for the state as well as the operators to put their heads together to work out some incentive for the deeper drilling and the heavy capital expenditures in connection with it.

MR. SPURRIER: Anyone else to be heard. If not, we will take a five minute break and continue with the next case following that.

(Recess.)

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MR. CAMPBELL: At this time we wish to offer our exhibits in evidence.

MR. SPURRIER: They will be received. Anything else? If not, we will proceed with the next case.

- - - -

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

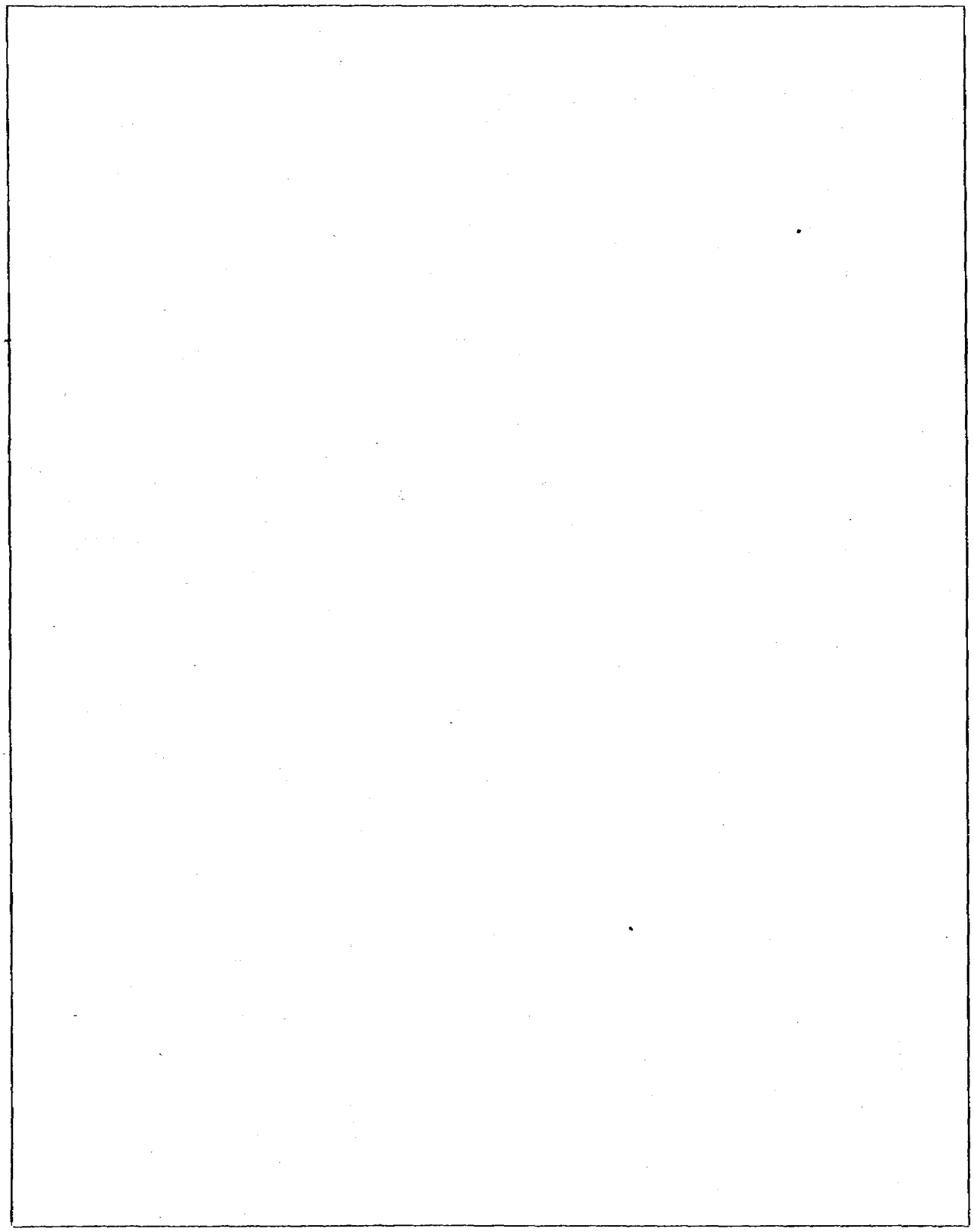
I HEREBY CERTIFY that the foregoing and attached transcript of hearing in Case No. 269, before the Oil Conservation Commission on May 22, 1951, at Santa Fe, is a true record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, this 7th day of June, 1951.

Ada Dearnley
ADA DEARNLEY, Reporter

My Commission Expires:

June 18, 1955



E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-0672
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

TRANSCRIPTION OF HEARING

CASE NO. 269-270

August 7, 1951
(DATE)

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-0672
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

In re: Rehearing and argument continued from July 24 to August 7, 1951. Phillips Petroleum Company is applicant. Case 269 relates to proration units and allowables for Siluro-Devonian common source of supply discovered in McAlester Fuel Company's J. M. Denton Well No. 1-A (SWSE 11 - 15S - 37E); Case 270 relates to Phillips' application for 80 acre proration units and allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B (NWSW 12 - 15S - 37E.)

Cases No. 269 & 270

TRANSCRIPT OF HEARING

August 7, 1951

R E G I S T E R

BEFORE:

Honorable Guy Shepard,
Member and Chairman, O.C.C.

Honorable R. R. Spurrier
Member and Secretary, O.C.C.

R. L. Hughston
Shell Oil Company

W. A. Scott
Shell Oil Company

Cecil R. Buckles
Sinclair Oil and Gas Company

D. D. Dale
Sinclair Oil and Gas Company

Roy O. Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

O. P. Nicola, Jr.
Phillips Petroleum Company

E. H. Foster
Phillips Petroleum Company

C. P. Dimmitt
Phillips Petroleum Company

D. K. Spellman, Jr.
The Ohio Oil Company

J. D. Wheeler
The Ohio Oil Company

R. E. Howard
The Atlantic Refining Company

N. B. Winter
The Atlantic Refining Company

W. P. Tomilson
The Atlantic Refining Company

Stanley L. Smith
The Atlantic Refining Company

Glenn Staley
New Mexico Oil and Gas Engineering Commission

S. T. Silverstein

S. S. Schoerstein
Idaho Springs, Colorado

Jack M. Campbell
McAlester Fuel Company
Roswell, New Mexico

Vernon Turner
McAlester Fuel Co mpany
Magnolia, Arkansas

Kem E. Merren
McAlester Fuel Company
Magnolia, Arkansas

Travis R. Rowe
McAlester Fuel Company
Lovington, New Mexico

Jack W. Marshall
McAlester Fuel Company
Lovington, New Mexico

R. G. Carlin
Delhi Oil Corporation
Dallas, Texas

Alfred E. McLane
Delhi Oil Corporation
Dallas Texas

Elwin C. Hale
Piedmont, California

J. H. Crocker
Mid Continent Petroleum Corp.
Tulsa, Oklahoma

E. R. Burton
McAlester Fuel Company
Magnolia, Arkansas

Vilas P. Sheldon
Artesia, New Mexico

J. L. Briscoe
Roland Rich Wooley
Artesia New Mexico

G. E. Kendrick
El Paso Natural Gas Company

G. D. Simon
R. DeChicchis Consulting Firm

Jack Shier
Aurora Gasoline Company

H. H. Kaveler
Phillips Petroleum Company

E. L. Shafer
Continental Oil Company
Hobbs, New Mexico

Emmett D. White
Leonard Oil Company
Roswell, New Mexico

G. M. Andreen
Magnolia Petroleum Company
Dallas, Texas

Ollie J. Ford, Jr.
Magnolia Petroleum Company
Kermit, Texas

Foster Morrell
U.S.G.S
Roswell, New Mexico

E. E. Kinney
New Mexico Bureau of Mines
Artesia, New Mexicp

George Graham
Oil Conservation Commission

L. C. White
Oil Conservation Commission

E. C. Iden
Continental Carbon Company
Albuquerque, New. Mexico

Harold B. Seligman
Continental Carbon Company
Amarillo, Texas

H. L. Ericson
Continental Carbon Company
Amarillo, Texas

M. F. Shafer
Continental Carbon Company
Amarillo, Texas

Riss Madole
Aurora Gasoline Company

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Mr. SHEPARD: The meeting will please come to order. The next case is Cases 267 and 270. Will you read please, Mr. Graham?

(Mr. Graham reads the advertisement of the cases.)

MR. FOSTER: I would like to give the appearances that are here for the Phillips Petroleum Company. Mr. C. P. Dimmitt, Vice President in charge of production; Mr. H. H. Kaveler, Assistant to the Manager of the Production Department; Mr. O. P. Nicola, Proration Director; and myself E. H. Foster and Mr. R. N. Williams of Bartlesville, Oklahoma; G. R. Wright would have made an appearance here but he is ill, but I want the record to note his connection with the case in any event.

If the Commission please, it will not be our purpose this afternoon to attempt in any way to rehash the former testimony in this case. We think that the record as we made it in the original hearing was sufficient to support the Commission in finding that 80 acre spacing was desirable in the Wolfcamp and in the Devonian Pool, if the Commission chose to do so. Before I get under way here, I have got a little memorandum I would like to read to the Commission here that will, I think, fully outline our position on the motion for re-hearing in the two fields. And in that connection I might point out so far as the Wolfcamp is concerned, there seems to be very little controversy about it. There is no one here that oppose that. So, our main remarks will be addressed to the spacing that we think ought to be applied to the Devonian.

Now, we are in real earnestness about this situation

2. here. We think we ought to have 80 acre spacing in the field. Before I read a prepared statement here, I would like to introduce Mr. C. P. Dimmitt who is our Vice President of the Production Department, and in charge of all the production. He might have a few words he would like to say at this time. Mr. Dimmitt.

MR. DIMMITT: Thank you. To the Commission members I would like to say this. I think the case involved, which you are studying here now, involves a very basic principle that the industry must give more consideration to, and also, our regulatory bodies, regardless of whether it is about the Denton Pool of the State of New Mexico or any other state. It is one of the factors of developing structures, oil pools, in a scientific manner, and should be given more consideration than we have in the past. And, we are pleased to bring this to your attention here because we believe that it is one principle that you are not only interested in, that you are interested in from a hearing standpoint, but it is one principle that will result in better methods of operation and better ultimate recovery, in oil pools. Thank you.

MR. FOSTER: I have here with me Mr. R. N. Williams who is our Chief Proration Attorney out of the Bartlesville Office. I just want the Commission to see him. I don't want to call him as an expert or anything of that sort, but I do want you to know he is here.

In this statement I am going to read to the Commission, I have used the term "operators", in the pool down there, but I don't want anybody to get the impression I am attempting to

3.m

speak for any of the operators except Phillips Petroleum Company. As I view it, I think it would be beneficial for us to try and get an accurate picture of the nature of this hearing.

The Nature of this Hearing:

Neither the original application for 80-acre spacing in the Denton Pool nor the rehearing of that application now being considered should be looked upon as a contest between those in favor of the 80-acre spacing and those opposed to 80-acre spacing. This proceeding should be regarded as a conference represented by the oil and gas industry of the State, on the one hand, and the Oil Conservation Commission as the regulatory authority of the State of New Mexico, on the other hand, meeting in an effort to work out the problem of how to get more oil and gas from a pool for less money and with the use of less steel and by the drilling of fewer wells.

Now of course everybody has to play their part in this sort of thing so here is the role of the operator, and this proceeding is:

No one operator in a pool or field should be permitted to set a spacing pattern in the field best suited to his individual needs or desires. The best interests of all the operators, of all the royalty owners, including the State of New Mexico as a royalty owner, and of the public must be the criteria for determining a spacing pattern in any field. The producer is the

4.m man who takes the stockholder's dollar and digs an oil well with it. He has the expectation of getting that dollar back, plus a profit. The producer acts in a dual capacity. He is, in a sense, a private and a public trustee. He is a private trustee in the sense that he must represent the best interests of his stockholders in seeing to it that the undertaking returns a profit. He is a public trustee in the sense that he must increase production at reduced cost in order to keep down the cost of the product to the ultimate consumer. One need not be a technical man, such as an engineer or a geologist, to understand these facts.

Therefore, I would like to say this, that we are not going to offer any highly technical testimony, we are trying to take a more practical approach to this problem, and see if we can't sell the Commission here on the idea that it is to the best interest of everyone to adopt a wider spacing pattern in the Denton field.

The royalty owner is one to whom a portion of the production is payable, either in kind or value. His role should be the same as that of the operator, that is, a public and a private trustee. The royalty owner should be regarded as a private trustee to the extent only of seeing that the ultimate in the recovery of oil and gas from the pool is had. He has the same duties and the same obligations as the operator in his capacity as a public trustee in that he should not insist upon a

5.m

program or a method of development of a field for its oil and gas content that leads to high cost of production which must be passed on by the operator to the consuming public.

In every prodeeding having for its purpose the obtaining of wider well spacing, the royalty owner is generally found arrayed against the producer. The royalty owner generally feels that his best interest is served by closer well spacing. Nothing could be farther from the truth. If the royalty owner cannot profit by wider well spacing, neither can the producer. This fact is obvious, since any method of well spacing advocated by the producer which results in the loss of oil to the royalty owner results in a proportionately higher loss of oil to the producer. The self-interest of an operator would dictate that he not advocate a spacing pattern that would bring about a loss to himself or the royalty owner. It may therefore be reasonably assumed that when an operator advocates wider well spacing he is honest in his convictions about the matter and believes that wider spacing is to the best interests of himself and all others similarly situated, including the royalty owner.

I would like to add right there to the Commission that we don't plan to appear here in the role of being opposed to royalty owners. What we are going to try and do is convince this commission that the program we are advocating will be to the best interest to everyone in the field.

6.m Economic Factors and Desires

The operator in a pool is usually guided in his efforts in the production of oil and gas, and in the fixing of a spacing pattern, by the economics of the case. An operator cannot drill wells and produce oil or gas at a loss. The adoption of any spacing pattern which inures to the economic benefit of the producer likewise inures to the economic benefit of the royalty owner. However, in most instances, the royalty owner is motivated by a desire for more and more royalty payments, and is less and less concerned with the science and the economics necessary to be applied by the producer to the orderly and proper development of a pool. The producer should not be permitted to dictate a course of action by the regulatory body that is inimical to the royalty owner. Every producer should recognize that the interest of himself and the royalty owner is mutual, and most producers do recognize this. Any action on the part of the royalty owner which increases the cost of production to the operator directly contravenes the provisions of the Statute of the State of New Mexico, Section 69-213, which will later be quoted. Such action necessarily increases the cost of the products of the oil and gas to the ultimate consumer. Likewise, any evidence of a selfish attitude on the part of the royalty owner by way of securing smaller spacing of wells requires the drilling of unnecessary wells, creates fire and other hazards conducive to waste, and this violates the provision of

7.m the Statute. It is the duty of the regulatory authority to bring into proper focus all conflicting interests in a pool or field. This can best be done by considering the problem objectively and without regard to the desires or emotions of the parties.

It is the duty of the regulatory body to see that no producer profits at the expense of the royalty owner or the general public. And it is the duty of the regulatory body to see that no royalty owner profits at the expense of the producer or the general public. The interest of the royalty owner and the producer is mutual to the extent that they should seek the best methods by which a pool or field may be efficiently and economically drained and developed. This point is concerned with more than just the primary methods for the recovery of oil and gas.

Now their statements there are based upon a declaration of public policy contained in the Statutes and I will quote the Statute a little bit later, I don't want to inject any legalistic angles in our presentation of evidence in this request for rehearing, but I do want to call to the Commissions' attention the declaration of public policy of this State, as contained in the Statute, and to say to the Commission what we are trying to do we think is in keeping with that declaration of public policy. In other words, I want to get some of the bug-bears out of this 80-acre spacing problem. Our experience is, as soon as you mention 80-acre spacing to most people, they just start running. They think there is something inherently bad about it. We are

8.m going to try and break down that theory.

Most producers regard pressure maintenance in the production of oil and gas as the long-range view. Primarily, recovery methods are regarded as the short-range view. Here again the interest of the royalty owner and the producer is mutual. At best, primary methods of recovery obtain only a small percentage of oil in the pool, less than 30% in most instances. Pressure maintenance methods substantially increase this percentage. The application of pressure maintenance is directly related to well spacing. That is, it is now conceded that wider well spacing more readily lends itself to pressure maintenance methods than does smaller well spacing. In deep pools, such as the Denton Pool, and under the reservoir conditions which obtain in this pool, the recovery of oil by primary methods is shortlived. If the ultimate in recovery of oil and gas in this pool is to be obtained, pressure maintenance must be resorted to. Since well spacing is directly related to the best results to be obtained by pressure maintenance, it is timely to consider the spacing pattern for the field. The field should not be allowed to be developed on 40-acre spacing under primary recovery methods with the expectation that the best results can be obtained in the application of pressure maintenance. If, for any reason, those now advocating 80-acre spacing in the Denton pool should be mistaken, this does not condemn the adoption of 80-acre spacing. This for the simple reason that resort to 40-acre

9.m spacing can always be had, if, as and when it becomes evident that 80-acre spacing skhould not be the pattern in the field. On the other hand, if those who are advocating 40-acre spacing for the field, and there is only one producer who is doing this, should for any reason be mistaken, a resort to 80-acre spacing could never be had.

Therefore, I would like to say to the Commission it seems to me we are trying to get the cart before the horse, when we want to stand on this so-called 40-acre spacing, because whenever you once adopt the 40-acre spacing then if that should not have been the pattern in that field, and if the pattern should have been a wider one, you are then precluded from going into the proper pattern or wider pattern.

No spacing pattern gets oil out of the ground. All that a spacing pattern does is to determine the distance between wells, based upon some reasonable hypothesis. Rule 104 (b) of the Rules of the Oil Conservation Commission of the State of New Mexico provides:

"Each well drilled within a defined oil pool shall be located on a tract consisting of approximately 40 surface contiguous acres substantially in the form of a square in accordance with the legal subdivision of the United States Public Land Surveys or on a governmental quarter section or lot * * *."

This rule is of statewide application and applies only in the event the Commission does not fix a smaller or larger spacing pattern for the pool.

10.m This statewide rule does not take precedence over the statutory provisions relating to well spacing. Section 69-213, New Mexico Statutes 1941, Annotated, contains this provision:

"No owner of a property in a pool should be required by the Commission, directly or indirectly, to drill more wells than are reasonably necessary to secure his proportionate part of the production. To avoid the drilling of unnecessary wells, a proration unit for each pool may be fixed, such being the area which may be efficiently and economically drained and developed by one (1) well. The drilling of unnecessary wells creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator, and thus also unnecessarily increases the cost of the products to the ultimate consumer."

While the rule fixes 40-acre spacing as a statewide spacing pattern, the Statute recognizes that conditions may exist which will require, in the protection of public and private interests, a wider spacing pattern. And, in order to implement the spacing pattern in a pool or field, the same section of the Statute quoted above further provides:

"The pooling of properties or parts thereof shall be permitted, and if not agreed upon, may be required in any case when and to the extent that the smallness or shape of a separately owned tract would, under the enforcement of a uniform spacing plan or proration unit, otherwise deprive or tend to

11.m deprive the owner of such tract of the opportunity to recover his just and equitable share of the crude petroleum and natural gas in the pool; provided, that the owner of any tract that is smaller than the drilling unit established for the field, shall not be deprived of the right to drill on and produce from such tract, if same can be done without waste; but in such case, the allowable production from such tract, as compared with the allowable production therefrom if such tract were a full unit, shall be in ratio of the area of such tract to the area of a full unit."

Every operator must recognize that there is no virtue in any spacing pattern as such. Spacing is only one of many factors to be used in regulating the production of oil and gas from a given pool. Some pools or fields more readily lend themselves to development on 40-acre spacing than on 80-acre spacing, and vice versa. The chief difficulty in fixing a spacing pattern for a pool is that it can rarely be determined with any degree of accuracy what the pattern should be until after the pool has been fully developed. The matter of determining well spacing, therefore, becomes largely a matter of policy. It is true that the proper spacing can be determined under any set of assumed conditions. In the past in New Mexico, well spacing has been geared largely to production from shallow pools. A shallow pool is defined by Rule 55:

"Shallow pool shall mean a pool which has a depth range from 0 to 5000 feet."

12.m Production of oil from a deep pool in the State of New Mexico is of fairly recent origin. In fact, the first production that you had from a deep pool in this state, was on March 1st of 1948, that is from a depth below 5000 feet. A deep pool is defined by Rule 18:

"Deep pool shall mean a common source of supply which is situated 5000 feet or more below the surface."

It must be self-evident to any producer that the definitions of a shallow pool and a deep pool are more or less arbitrary. And, of course, as to the matter of well spacing it must be still more evident to a producer that the enforcement of a 40-acre spacing pattern in every pool would be arbitrary and without excuse or justification on any ground.

I call the Commissions' attention to the fact that we are not asking for any permanent order for 80-acre spacing in this Denton pool, we are simply asking for a temporary order for a period of one year, and why anybody can object to that, I don't know.

The operators in the Denton Pool are not asking that the Commission adopt a permanent 80-acre spacing pattern for the field. Good faith requires that the spacing pattern be placed upon a temporary basis. In fact, there is no such thing as a permanent spacing pattern in an oil and gas field under the present regulatory setup. The Commission may, and in fact, it would be its duty to, if conditions required it, change the spacing pattern in any

13.m field or pool. But, in order that there may be no misunderstanding about the position of the operators in this pool, a specific request for 80-acre spacing for a temporary period of one year has been made. The temporary nature of the order requested meets the argument made by the operator opposed to 80-acre spacing that once 80-acre spacing is adopted, always 80-acre spacing. Nothing could be farther from the truth. The operators who are sponsoring 80-acre spacing in this field do not want it, if, in fact, it should be adopted. But, as we have pointed out, the field will be completely developed before one gets that answer.

Now there are other questions here, such as the steel shortage, so we have a proposed solution.

Steel Shortage vs. 40-Acre Spacing in This Pool or Any Other Pool.

I don't want the Commission to get the idea my remarks are confined to the Devonion Pool, what I am saying here applies to any pool in the State.

A National emergency has been declared by the President of the United States. With the declaration of a National emergency came a declaration of a shortage of certain critical materials. Steel is on this list. There is no doubt that there is a shortage of oil field tubular materials. This situation calls for conservation of steel and the adoption of practices in the oil fields that will implement the conservation of steel. One way to save steel is to adopt wider well spacing. Eighty-acre

14.m spacing requires the drilling of only one-half as many wells as is required by 40-acre spacing. The adoption of 80-acre spacing for the Denton Pool has been requested on a temporary basis. If, at the end of the one year temporary period requested, it can be demonstrated from additional information obtained in the development of the field that the reservoir conditions in the field are better adapted to 40-acre spacing than to 80-acre spacing, then the Commission can impose 40-acre spacing and no one will have been hurt, and, in the meantime, at least a temporary savings of steel will have been effected. On the contrary, if, at the end of the one year temporary period, it is then the judgment of the Commission that 80-acre spacing should be continued for another temporary period or made permanent, then to the extent that 80-acre spacing is perpetuated in the pool, a savings in steel will have been effected. If the deep pay in the Denton Pool proves to be as prolific as it is now thought to be, and if the National emergency should demand additional oil, then it will have been developed that the Denton Pool will be a good place to expend steel in satisfaction of meeting the additional requirements for oil for the National emergency.

Now we come to another very important point that is involved in this controversy, and that is the development of future reserves verses 40-acre spacing, and I think this directly concerns the State of New Mexico and any other state as far as that is concerned, where the matter is at issue.

15.m When drilling is comparatively shallow, development costs are relatively low. On the other hand, costs tend to climb with the development of deep reserves. It is shown in this record that the average cost for the drilling of four wells was $273,000 per well. This is a lot of money to put in a hole in the ground. It is true that these costs are determined on present-day inflated prices. It is likewise true that the relatively short term of payout is determined on the present-day inflated price which the producer receives for his product. It would be a short-range view to assume that present income can continue at the present inflated rates. In talking about development costs one is not just talking about the Denton Pool. On any basis deeper drilling will be expensive, and the cost of developing a field is directly related to the spacing pattern. This is an obvious fact because the more wells an operator drills, the more money he must spend in drilling the wells. If, by enlarging the spacing pattern, the number of wells to be drilled to develop the field can be decreased, then drilling costs can be decreased. With a decrease in drilling costs will come a more rapid discovery of reserves. The best thought of the industry now is that future reserves will be found at increasing depths and, likewise, at increasing costs. Therefore, it is to the best interest of the State of New Mexico and of its people that drilling costs be held to a minimum in order to encourage the discovery of additional oil reserves at

16.m

greater depths. The adoption of 80-acre spacing will do this. And, likewise, the adoption of 80-acre spacing will more quickly determine the outer limits of production of a pool after discovery of production.

Now we are not so much concerned here with the adoption of 80-acre spacing. The application which the Commission has before it merely offers it as a means or way of adopting 80-acre spacing over here in a designated pool, but there are other ways this Commission can do it if they want to do it. All you have got to do is change Rule 104 and make it provide for 80-acre spacing in deep pools, that is all in the world you have got to do, so we don't care how you do it, we are not interested in the means this Commission may adopt to get the results we are asking; but you can amend Rule 104 and simply provide for 80-acre pattern in those deep pools.

Now I am going to say this to the Commission, we have been operating over here under a kind of an antiquated system it seems to me. About sixteen years have gone by here since there has been any change in the rules here of regards to deep drilling. Now there hasn't been any need for changing, of course, up until you began to get deep production; but surely after this deep production development has started in this state, surely as a matter of policy, we think the Commission could very well adopt for deep pools 80-acre spacing for all deep pools to start with. Just like you have adopted 40-acre spacing for all pools in the state up to the present time.

17.m

Now that concludes my prepared statement, and I want to leave a copy of it here for the record, and if the Commissioners would like a copy of it to take with them and read, I have some extra copies I would like to pass around to the Commission.

Now with reference only to our witnesses, if the Commission please, Mr. Shepard.

MR. SHEPARD: You have witnesses?

MR. FOSTER: We will have one witness, that will be Mr. Kaveler, and we will put him on and have him sworn.

MR. CAMPBELL: May I make a preliminary statement before you start, Mr. Foster?

MR. FOSTER: Surely.

MR. CAMPBELL: I am Jack N. Campbell, representing the McAlester Fuel Company. I would like to state on behalf of the McAlester Fuel Company, which is the operator actively opposing 80-acre spacing in the Devonion zone of the Denton pool, with no appearance in case 270, relating to the Wolfcamp zone, that they do not carry the torch for 40-acre spacing, neither do they consider there is any magic about 80-acre spacing. We feel each common source of supply must be considered as a separate problem and we are sincere in our belief and our testimony at the last hearing and at this hearing will be intended to convince the Commission that in the Devonion formation of the Denton Pool, the eratic nature of the formation and the development of the field to date on a 40-acre spacing pattern will have -- changing to 80-acre spacing at this time -- will have an adverse effect

18.m upon both the proper use of reservoir energy, and correlative rights of the lease or mineral owners in the field. We are particularly leery of 80-acre spacing with a double allowable in this field. Our testimony has indicated, and future developments in the field have convinced us further that to produce these wells at double allowable as sought in the application on an 80-acre pattern after the field has been developed to date on a 40-acre pattern would have an adverse affect upon reservoir energy and that in the last analysis is the job this Commission has before it, to prevent waste of oil and protect correlative rights of owners in the field.

I would also like to make one comment about the steel shortage. That is a matter of concern to every one in the oil business. As I stated at the last hearing McAlester Fuel Company and apparently a great many others in this field are willing to expend steel in 40-acre drilling because they are doing it. New wells have been started almost every week in that field on a 40-acre spacing.

The McAlester Fuel Company drilled the discovery well in this field. They spent well over three/hundred thousand dollars in drilling the wildcat well. It was money that really went into a hole in the ground because they didn't know whether there was oil there or not. That company I am sure, just as surely as the Phillips Company believes to the contrary feels it would be improper in this field at this time to change

19mm the spacing pattern to an 80 acre pattern, because as the Commission found after the original hearing, it would adversely effect drainage in the pool, and adversely effect reservoir energy in the field, and adversely effect correlative rights of owners in the fields.

The only testimony we will introduce today will be an effort to bring the record up to date insofar as the testimony of the original hearing relative to wells which have been started since the last hearing.

H. H. KAVELER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. FOSTER:

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

A My name is H. H. Kaveler, spelled K-a-v-e-l-e-r.

Q Where do you reside, Mr. Kaveler?

A I am residing in Bartlesville, Oklahoma. I am an employee of the Phillips Petroleum Company.

Q In what capacity?

A My present capacity is Assistant Manager of the Crude Oil Production Department.

Q And what is your occupation or profession?

A I am a graduate of the Missouri School of Mines in 1927 with a degree in Technical Engineering. I am a graduate of the University of Maryland, College Park, where I was granted the degree of Ph.D. in Chemistry. From 1927 to 1935 I was

20mm

a member of the faculty at the University of Missouri, at the University of Maryland, at the George Washington University, Washington D. C., and from 1935 to 1936 I was employed by the United States Bureau of Mines in Pittsburg, Pennsylvania. From 1936 to the present I have been an employee of the Phillips Petroleum Company, acting in various capacities as a Research Engineer, dealing with oil production problems as an Evaluation Engineer in their Department of Economics. And since 1941 I have occupied various positions in connection with crude oil production operations, leading to my present capacity as Assistant Manager of the Crude Oil Production Department. I might further state as a qualification that for the past 16 years my principle interest has been in the scientific proration of oil fields, and particularly dealing with the problems of waste, well spacing, pressure maintenance and unit operation.

Q Now, have you had occasion to become familiar with the Denton Pool?

A I have, Mr. Foster.

Q I believe we have two formations in that pool, the Wolfcamp and the Siluro-Devonian?

A That is true.

Q And just as a preliminary step here for the record, at what depth is the Wolfcamp?

A About 11,000 feet.

Q And the Devonian?

A About 15,000.

21mm

Q And do you regard that as deep productions?

A In my opinion, those are deep pools.

Q Do you know when the--bear in mind the definition of what is a deep pool and what is a shallow pool in this state--you heard me read that awhile ago--do you know when the first deep production was discovered in this state?

A According to the records I have seen, the first so-called deep production in New Mexico occurred about the year 1948.

Q And since that time has there been an increase in deep production in this state?

A There has been. To my recollection there are four or five so-called deep pools in New Mexico at the present time.

Q Now, with regard to deep production in this state, Mr. Kaveler, is it your opinion that the unit designated as 40 acres in this state should, as applied to deep production, be changed?

A I think that the well spacing in each pool should stand upon facts developed in respect to each pool, and in particularly, referring to the Denton Pool, I think the facts dictate now there should be 80 acre spacing in both the Wolfcamp and the Devonian. If not on the permanent basis at least on a temporary basis until we have facts well determined which would lead to an intelligent, scientific basis of ultimate spacing.

Q How many wells are there in the Denton Pool now?

A My best recollection is about fourteen.

MR. SHEPARD: Producing wells?

22mm

MR. FOSTER: Producing wells.

Q Do you know how many present locations there are for other wells?

A To my knowledge about two or three.

Q Just two or three. Do you see any adverse effect that would be had as a result of the adoption of 80 acre spacing in the Denton Pool at this time?

A I can see no adverse effect whatever to the adoption of an 80 acre spacing program at this time. Simply by virtue of the outstanding fact if 80 acre spacing should be found to be improper from a conservation point of view, then always additional wells could be drilled. It would be my recommendation to this Commission that an 80 acre spacing order be promulgated at least on a temporary basis.

Q It is true that if you adopted 80 acre spacing in the field at this time, the way the field has developed, there will have to be some exceptions?

A That is true. And that occurs in the application of any well spacing program by any commission.

Q Would you say it would be better to have the exceptions than to have the field all developed in a 40 acre pattern?

A I would say it would be much better to grant the exceptions. Now, it might appear that the number of exceptions to be granted at this moment were large percentage-wise. But we must recognize this field may be large and there will be many more wells drilled.

Q How many wells?

23mm

A I don't know.

Q What approximately?

A I have no idea. The principal idea is a field has to be drilled before you determine its size?

Q Yes.

A So that in regard to the number that will ultimately be drilled, the number of exceptions now to be granted might in all probability be a small percentage of the total wells drilled.

Q Now, Mr. Campbell a moment ago in his statement--I want to pull this up a little bit-- referred to this so-called double allowable that might be had here in the Denton Pool in the event of 80 acre spacing. Do you see any relationship between the allowable and what the proper spacing pattern in the field should be?

A I think they are entirely separate and distinct issues and all Commissions recognize that in their regulations.

Q The allowable is determined on one basis, and what the proper spacing should be is determined on an entirely different basis, is that true?

A The allowable is to be determined from time to time on the basis of facts developed after the field is operated.

Q As a matter of fact market demand determines what an allowable should be?

A Yes, it does.

Q I mean other than what the reservoir condition is?

A Yes, that is true.

24mm

Q Now, Mr. Kaveler, you have over there on the table a machine set up. Will you tell us briefly what that is?

A Well, that is a mechanical demonstration of certain technical principles applied to the operation of oil fields which we have constructed in our company for the education of our own people, and which we have on occasion used to demonstrate certain technical principles to others interested in oil and gas.

Q I take it you are not one of those subscribing to the theory that the more wells you drill the more oil you get?

A That is true. It does not follow that more wells will produce more oil. There are abundant examples where many wells have led to decreased recovery rather than increased recovery.

Q Is that more likely to be true in deep production than in shallow production?

A It is.

Q Then what you are saying, there are many examples where a fewer wells are drilled the more oil you get?

A That is true, Mr. Foster.

Q That may sound a little paradoxical but it is true?

A That is true, yes, sir.

Q By the use of that machine can you demonstrate that fact to this Commission?

A I could if I might be permitted to make a few explanatory remarks before I demonstrate the machine. I think it would help

25mm

in its understanding.

Q You go right ahead.

A My recommendation in regard to the temporary 80 acre spacing order in the Denton Field is based upon some technical conclusions as well as on some certain practical considerations that apply to a conservation program. I am mindful of the fact that while Mr. Spurrier has a technical background, the Land Commissioner and the Governor may not have had an opportunity to investigate certain technical aspects of the production operation of oil, and my remarks may seem to go far a-field for the moment. I would like to take a layman's approach to the discussion of this problem to attempt to convey to you what in my opinion are the basic technical concepts. If one should ask what is the principal difficulty in bringing about a proper spacing in any oil field, I think one would be entitled to the opinion that the principal difficulty lies in a wide-spread misunderstanding of the technical problem, and a rather general misconception of what is involved. So, that a layman finds great difficulty in grasping what it is the technologists appear to be carrying on a great argument about. I should like to base this statement entirely on what is considered to be the most outstanding technical discovery in respect to oil production operation in the last twenty-five years. Surprisingly enough that proved technical conclusion is very simple. It simply involves this statement: That oil does not produce itself from the earth. Oil does not produce itself from the earth. Now, I think many

26mm know that oil is found in rock. And I have brought with me here a piece of rock from Oklahoma which is the Shellback Sandstone, which is a typical example of the kind of rock in which oil is found. You may look at this and assume it is a solid piece of rock, but it isn't. It is a conglomeration, aggregation of sandstone. If you look in this apparently solid piece of rock--just imagine that it is bin of oranges or a basket of potatoes. Between the oranges or potatoes is empty space. In like manner, between these millions of sand grains is empty space. We call that a pore space of the rock. And in this pore space the oil accumulates. I have brought with me a piece of rock, the first being a sandstone and the other a limestone. You notice here a substantially different structure. The porosity developed in the limestone has an entirely different aspect than the porosity associated with the sand grains. Nevertheless, it is in the pore space of rocks like that in which oil is found.

Now, I have brought with me a bottle of crude oil, oil which is found by boring holes in rocks that have the property of porosity. Oil cannot be discovered except by the process of drilling.

Q That porosity. As familiar as I am with it, it kind of throws me. It is just holes in the rock, isn't it?

A Yes. Now, I have with me here a bottle of crude oil. Most people think of crude oil in terms of a 'gusher', the Hollywood notion of an oil field, where the oil spurts out

27mm

through the derrick and over the country side. That is what everyone wants, of course. It is from the notion of the 'gusher' that the layman draws the conception that crude oil produces itself out of the earth. But the fact is that oil doesn't produce itself out of the earth.

I can show you the equivalent of producing oil from the earth by taking the top off the bottle. And, lo and behold, oil doesn't spout forth from the bottle. I could recover it by tipping the bottle over and tipping out the oil, but it would be an entirely impractical matter to attempt to lift the earth up and pour the oil out of the rocks. Crude oil is incapable of pushing itself from this bottle. And in the same manner, it is incapable of pushing itself from the rocks. It follows, wells do not produce oil. That strikes the layman as an idiotic statement, but that is the fact.

You ask, how is the oil recovered? And the answer is that nature, in her wisdom, has placed with the crude oil a quantity of natural gas associated with the oil in the pore space of these rocks. In some cases nature has supplied a body of water associated with the oil. And it is the gas and the pressure of the water associated with the oil that is responsible for the production of oil. And that is all the proved technological conclusion amounts to.

Were it not for the pressure of gas or were it not for the pressure of water associated with the oil in these rocks, there could be no crude oil production. The function of a

28mm

well then is simply to provide the mechanical means whereby the gas associated with the oil has an opportunity to expand to a point of lower pressure. It is the expansion of the gas and the movement of the gas through the rock that causes the oil to be drifted into the well and produced. And having been drifted into the bottom of the well, the oil can be recovered from that point either by pumping or by natural flow.

Q That gas does not function as a result of the number of wells drilled in the pool, does it?

A The number of wells drilled has no relationship except--

Q To the force that produces oil?

A Another function of the gas in expelling oil from rock. Now, it is true wells are capable of draining a large area of the pool. One well, given sufficient time, could drain all of the gas energy or water energy from the pool and accomplish the production. There are no barriers in this rock. There are no fence posts which place limitations on the extent with which the influence of any one well could extend itself. The same manner with this rock. There are property lines on the surface of the earth, but those property lines extend only to the depth of the fence post.

Q What you are saying is there are no partitions down there like there are in a building or wing?

A There are no partitions in a common source of supply. It leaves us finally with this conclusion, which a layman

29.mm can arrive at, and that is simply this: When the pressure of the gas is gone from a pool, the oil production is gone; and if the pool be dependent upon water for its source of energy, when the pressure of the water is gone, the oil production is gone.

The Commission has undoubtedly had called to its attention the great East Texas Field where the energy which expels the oil from the rocks is due to a large body of water west of the pool. The Texas Railroad Commission, recognizing that as the source of energy, has for the past ten years fostered a program whereby the water produced from the formation has been returned to the formation. And the whole idea centered upon this important technical conclusion is that as long as there is pressure from the water or the gas only so long can there be production.

As we travelled through the oil-producing states and see the wells on the pump or stripper stage, we see those wells that have reached that point of low production only because the pressure necessary for the production is exhausted. In these fields great quantities of gas was wasted in years past and the result has been that the recovery of the oil from the reservoir has been a matter of only 30 per cent or less production.

Q I want to peg that down there, Mr. Kaveler., You mean if you had a hundred barrels in the reservoir, you get just thirty of it out?

30.mm

A If you rely simply on the natural force there.

Q That is what I am talking about.

A Without any effort to restore pressure or maintain it, the recovery is about 30 per cent or less and 70 per cent or more of the oil is left and not recovered. That has been the history of oil production in this country up until recent years.

Q Are you more likely to dissipate the producing energy of a reservoir by the drilling of more wells?

A It frequently happens that when too close a well spacing program is adopted, that operators having found it necessary to recover their investment to drill unnecessary wells-- because the production of oil in excessive oil-gas ratios there leads to waste. And there are many examples where the drilling of unnecessary wells have dissipated the reservoir structure to the point where less actual, ultimate recovery has been obtained.

A few years ago I wrote a paper on the subject which was published in the 1950 volume of the Petroleum Institute and the examples are there given.

Q All right. Go ahead.

A Now, the statements that I have made to the Commission are illustrated in principle by the model. Some may say this model doesn't represent an actual oil field and they may point an accusing finger at the fact that this is only a mechanical replica of an oil field. But the fact is that

31mm all the technical processes I have just stated are here represented in truth without any magic being employed. I ask the Commission to look at the top part for a moment, and assume you are driving through this oil field. Here is the county road that comes over the field. You see this fence line. And see a well drilled there on this property. And you pass through the gate in the fence and you are on another man's property. And there is another well, and a stock tank, and an oil and gas separator on that property; and then you pass through another gate and fence line onto another property, and observe there too is a well. That is what most laymen observe. And that is the limit of their understanding of what constitutes an oil field.

Q That is as far as they can see?

A That is as far as they can see.

Q You experts can see a little further.

A In a sense. But in the drilling of the wells it is possible to take cores of the sand and recover portions of the earth in the subsurface, and possible to get samples of the oil and gas produced. And it is possible to reconstruct rather faithfully and accurately what it is that occurs in the subsurface that is responsible for production. So, if one could take the earth, like a cantaloupe, and cut it in half so that you could look at it, one would find that the oil and the gas produced from these wells lies in a lens of sand that is tilted up in the earth. This lens of sand was once a dome that extended over in an anticline with both its halves intact. But there was a fault and the fault caused

32.mm

this half to slip down. The top of this half is 6,000 feet and the top of the other half is 14,000 feet and has been drilled into with a dry hole here. We find on further observation that the top part of this particular reservoir is filled with gas and this part underlying this gas-cap substantially is filled with oil, which has been colored red for the purposes of this demonstration.

Q What are you talking about, gas-cap?

A We classify this as a cap over an oil-bearing section. Then we observe that the sandstone for the remaining part of its distance is filled with water; so that this land owner had the misfortune of having his well drilled to a part that contained neither oil nor gas but only salt water.

Now, as we look at this section we can say to ourselves it is evident why this farmer suffered the dry hole because the pool terminates. This sand body is sealed off by that fault. And another thing evident is that this farmer suffers the misfortune of having only gas beneath his land. But the real situation that exists can be demonstrated best by showing what happens in this field in the event that the man owning the gas well takes production from it. I am going to produce this gas well at this point, and mark on here for a reference the location of that original line; and so those in back can see I will put one mark back here. This man having drilled his gas well wishes gas to be sold. If you listen you can hear the gas coming out. Gas is being sold from beneath this

33mm

this lease in the common source of supply, and I think it is evident to the Commission that as a result of that man selling gas from his separate lease, there is a general drainage condition set up through which the pressure is lower here now than it is here, and the full part of the oil starts to move in response to that lower pressure point. So there is migration accordingly. But I would like to call your attention to something else, that is substantially important, and that is that the gas dissolved in this oil is bubbling out. Is leaving this oil and moving to the point of low pressure. Now, it isn't likely that this man owning the oil-bearing portion is losing oil by migration to the gas producer, but what is typically more important to the oil owner is that the gas, the very life-blood of his oil production, is being taken from his oil. So that a conflict exists between the two owners. They have a diversity of interests that cannot be reconciled so long as this property line is a basis for attempting to divide what is in fact contents of the common source of supply.

Q I want to ask this. The gas in the gas-cap, that doesn't help produce the oil?

A It could.

Q But it doesn't under general methods of production?

A Under general methods of production it doesn't.

Q What is the energy that helps produce the oil?

Is it the gas in solution?

34mm A The gas in solution and it could be that gas in the gas-cap.

Q Yes.

A To show you this and as a real oil well, I will open this oil well and you can see the gas expands and lifts the oil to the surface.

Q Where is the gas shown to be expanding?

A You can see the bubbles here.

Q In that red tube.

A And you can see the gas-cap taking the oil and the oil is beginning to move below this original line. We will let the oil well run there for a minute and let it produce so that you can see that the production from this oil well is due to the pressure or expanding effect of the gas. That is the way oil fields function. There is nothing mysterious about this. There is nothing misrepresentative about it. That is the manner in which oil is recovered. This oil cannot produce itself from rock. Oil can be recovered only to the extent there is gas pressure or water pressure available to expel it from the well. And we can get quite nice production in the storage tank on this lease. The Commission will notice that not all the oil is recovered. Some is left back at this point. Now, in the usual oil field things don't operate this smoothly because this man owning the gas well is entitled to take something from the common source of supply, because while the oil man is producing oil this man is selling gas. I will open up some gas, and we will see what the consequence of that is.

35mm

The consequence of that man taking gas from that common source of supply is that this man's oil well ceases production as the gas bubbles out of the remaining oil and goes into this gas well. And there we have the usual type of American oil field. Not all of its recoverable oil is recovered. Substantially a large portion remains in the ground. Because the energy of production has been finished.

Q Are you saying the gas is going out of solution as a result of the production from the gas well?

A Yes.

Q Is that what stopped the oil well from producing?

A The taking of the gas from the gas cap and taking of the gas from solution in the oil together resulted in the killing of that oil well. Now, this well is an entirely unnecessary well in this field. All of the gas should have been taken from this well and more oil could have been ultimately recovered and all of the gas would have been recovered. Now, to show you more oil would have been recovered if the gas energy had been conserved I am going to put some gas back into this gas well, use it for an injection well; and to show you by pressure maintenance, this is the act of maintaining pressure, by putting gas into the ground it is possible to restore that oil well.

Q Let me ask you this. You have been talking about the primary methods of recovery in the field up to this point?

A Yes.

Q Now are you talking about pressure maintenance?

36mm

A This is the act of pressure maintenance, which is often done after a field is exhausted, but is best done from the beginning of production.

Q Which spacing is best adopted to pressure maintenance, a smaller or larger spacing?

A I think it is evident to the Commission that had we another dozen wells between these two wells, the result would have been the same because in nowise has this recovery operation been dependent upon the number of wells drilled. All we need is a sufficient number of wells to define the field. We have drilled a dry hole here and here, and have two producing wells. And they have defined the field in that respect. Any other wells that are not directly useful to this proposition of gas expelling the oil are wasteful wells.

Q How can you get the most oil out of the field for the least money?

A By drilling a number of wells that are necessary to define the limits of the field; by drilling the number of wells that are necessary to take on an efficient production operation. And I would say that by instituting pressure maintenance operations that would bring the greatest ultimate recovery.

Q Do you have any examples in your experience where it has been proven that too many wells were drilled in a field?

A Well there are a number of examples that I could cite to the Commission. Most of them are a matter of public record.

Q Well, I know. But for this record will you cite some of them?

37mm

A In the Schuler Field in Arkansas, one hundred and forty-five wells were drilled to the Jones Sand to a depth of 7500 feet.

Q That would be deep production in New Mexico?

A That would be deep production in New Mexico. The wells were drilled on a pattern of one well to each 20 acres because it was thought at that time, in 1937 in Arkansas, that you couldn't have any wider spacing.

Q You mean they thought then one well wouldn't bring more than 20 acres?

A We thought so but we weren't permitted under Arkansas law to put more than 20 acres to a well. The field was unitized and from the first day of operation in 1941 under unitization, 100 of those wells were shut-in and closed in completely and the 9,000 barrels per day was produced from 45 wells. And at no time since 1941 have we ever produced more than 50 of the 145 wells at any one time to get the daily allowable. Since then 50 wells have been permanently closed down. It has been estimated about eight million dollars was expended in drilling unnecessary wells.

Q Of course, that eight million dollars had to come out of somebody's pocket?

A Yes, sir.

Q Where did it come from?

A Well it came from the lessee.

Q Where did they get it?

38mm

A They got it from selling crude oil and the crude oil people got it by selling gasoline to the general public.

Q You and I paid for the drilling of those unnecessary wells.

A Yes, sir.

Q The question here is 80 acre spacing down here in this Denton Pool--will it be sufficient to get the oil out of the ground or whether you have got to have 40 acre spacing. Now, it is evident isn't it, Mr. Kaveler, that somebody in this state or somebody in some other states, if you drill too many wells in this Denton Pool, the public has got to pay it?

A That is true.

Q The lessee won't pay it?

A That is true.

Q He will get it back by adding to the price of his product.

A I would like to say in addition to that general question, to say this to the Commission: That the matter of getting the most oil out of the ground involves a production operation. It involves the method in which pools are operated. It doesn't in any manner have anything to do with the number of wells drilled. In this little oil field we could have drilled 100 wells and wouldn't have gotten any more or less than we got with the two. Because the distinguishing feature of this exhibit is the manner of operation.

Q It is the way you operate instead of the number of wells that counts.

A That's right.

39mm

In east Texas it is a matter of putting water back into the ground to maintain pressure that is responsible for the recovery of oil, not the fact that there is one well to every five acres.

Q Isn't it a popular conception that the more wells drilled the more oil you get?

A That is a popular conception.

Q Is there any truth in that?

A None whatsoever.

Q As a matter of fact, just the reverse is true?

A That is correct.

Q You have mentioned the Schuler field where you could have saved the drilling of a large number of wells. Now, can you give me any other example s?

A Well, I think the general policy which the Texas Railway Commission has adopted of limiting the take of gas from fields in Texas illustrates that some steps must be taken to eliminate the effect of drilling unnecessary wells. In many fields in Texas wells are drilled which are unnecessary wells and a severe limitation on their production must be taken.

MR. SHEPARD: Let's take a five-minute recess.

(Recess.)

THE WITNESS: Mr. Foster, I wish to correct one statement I made.

MR. FOSTER: Yes, sir.

40mm

THE WITNESS: I believe the Wolfcamp is approximately 9,000 feet deep and the Devonian approximately 11,000.

MR. FOSTER: All right.

THE WITNESS: I would like further to say about the model, to save time, whereas I spoke about the model only in respect to the relationship between gas and oil and illustrated how this maintenance of gas pressure was responsible for the production of additional oil, the identical same statement could have been made to the Commission had we considered the movement of water from the structurally lower part of the reservoir upward. Water advancing under pressure through this field can expel oil in exactly the same manner as gas does. In fact the power of water would result in a greater recovery because water is a more efficient means of recovering oil. So, I don't want you to fall in error. If the Denton Pool turns out to be a water-drive pool. In the movement of water and the production of oil from it, water wells on the edge of the field will occupy the same element of importance as in the example I gave you of the movement of gas and the waste of gas through gas wells. I would like to say to the Commission insofar as the technical conclusion is concerned, that if the Commission looks at the means of getting the greatest ultimate recovery from the oil fields of this state, that the important thing is how is the field operated. The big question is not how many wells are drilled, because wells, from a technical point of view, are only part of the machine that utilizes the energy of production to enable the recovery of the oil. Now, that is the technical

41mm

aspect. I think there are practical considerations which, if I may be permitted, I will state now.

The practical considerations are that if the number of wells do not determine the ultimate recovery. And there are many examples of experience inthe American Petroleum Industry where that technical conclusion is verified by actual experience. The method of operating a pool is more important in deep pools than it is in shallow pools by the very nature of the conditions. The State of New Mexico I think, should be interested in adopting a wide spacing policy at least on a temporary basis for deep pools in order that the resources of the industry, whether they be money or whether they be the tangible steel resources, could be utilized to discover other deep pools.

As a practical matter I think it is of more importance to this state to have a large number of pools discovered than to have a large number of wells drilled in one pool.

Q Let me ask you how this wider spacing in this state would adversely effect the interest of a royalty owner.

A It cannot.

Q Would you say it would be beneficial to the royalty owner to the same extent it is beneficial to the operator?

A I would think so. One way that suggests itself immediately is that there are undoubtedly many deep pools remaining to be discovered in this state that are simply awaiting the opportunity and the means for restoration.

Q You think wider well spacing will more readily bring about

42mm

development of the deeper reserves of the state?

A It demands the development of these deeper pools-- why, is the fact that from an investment standpoint and from the standpoint that with the limited steel resources and the limited dollars that the industry has to invest, the industry can afford to develop the deeper pools after they are discovered so that a wider spacing policy on deep pools would, in my opinion, go a long way to fostering the development of the industry in the state. Furthermore, after deep pools are discovered and brought on production, pipelines in greater number and capacity will come to the state. There will be an increase market demand. And in that regard the royalty owner and operators in the state generally will benefit from the expansion of the oil industry.

So, that in my opinion, the acceptance of 80 acre spacing for deep pools would have a very beneficial influence in every direction.

Q What reason can you see for any complaint against this proposed 80-acre spacing in the Denton Pool on a temporary basis?

A Well, of course, it is a little hard for me to see. There could not be any basis. I was impressed at the last hearing by some of the royalty owners who were of the opinion, were the Commission to grant 80 acre spacing the development of the pool would be delayed. I think exactly the opposite is true.

Q How do you think that?

A In my opinion, 80 acre spacing creates the opportunities for a man to drill an offset in exactly the same manner as if

43mm

the development was on 40.

Q Smaller spacing?

A So that operators drilling on 80 create offsets on the next 80, which brings about an extension of development much more rapidly than would otherwise occur.

Q They will get where they are going more quickly?

A That's right.

Q You find out how wide or how long their field is quickly, don't you?

A That's right. Many of the royalty owners appeared not to understand that phase at the previous hearing. One little thing that impressed me about the owners that spoke at the last hearing were some that appeared to be on the edge of this pool, and had had that misfortune on other occasions, and were afraid they would be washed out before the wells came to their lands.

Q What do you mean by washed out?

A The likelihood is that the Devonian reservoir will be water-drive. It is almost all over this particular area of New Mexico. The likelihood is as a barrel of oil is taken from the top of the Devonian structure that a barrel of water will move in in its place. So those who have the misfortune of being on the edge of the water-oil boundary, will suffer by migration from their lands to the other parts of the field from which oil is taken. Now, if this field is drilled on 40 acres, there would result the drilling of a larger number of wells on top of the structure. And a larger number of wells would take a larger

44mm

quantity of oil and a larger quantity of water going into the edge. Wide spacing would bring the well to his land sooner and would cause a distribution of the take through the water where he would have a chance to get some production before the water moved past his land.

Q It would be a more equitable distribution of pressure.

A Yes. I have heard no statement, nor do I have in my possession any knowledge that 80 acre spacing would work adversely to any party.

Q Suppose there had been 80 acre spacing and the later development would demonstrate there should be 40 acre? Can you go back to 40?

A Yes. You can always drill a few more on the 40. I might say to the Commission, in the State of Texas and in the State of Louisiana we have been parties to the drilling of pools on 80 acre spacing in five instances under a pretty bitter opposition. But once the pool was developed, a sane condition of operation was brought about such that the royalty owners never offered any complaint. The fact is that once we get 80 acre spacing we will never go to 40. I will say to you with all the experience I can command from my experience and knowledge that once the 80 acre field is developed there never develops any reason for changing it. Nobody in the industry has ever found that 80 acre spacing once adopted has done anything other than promote conservation.

It isn't new, it is long established in the industry. There are 80 acre spacing orders in deep fields in Texas, Louisiana

45mm

and Oklahoma.

Q Now, this is just not something new that somebody has thought up overnight is it?

A It isn't.

Q Now, the royalty owners apprehension here, you think that just comes from lack of real information on the matter?

A Lack of understanding.

Q Just a lack of understanding.

A Yes, sir.

Q And the only way to convince them would be to go to 80 acre and let them try it ones?

A That would be one way.

Q That would be one way to convince them. Do you see any objection to that?

A I do not.

Q If it doesn't work, you can go back to 40?

A That is true.

Q If you go to 40 and want to go to 80, you can never go on to 80?

A This is a oneeway street we travel.

Q You have got to have it developed right the first time?

A That is correct.

Q You can cut a wider pattern and then go back and drill wells on 40 if you wish to?

A Yes, sir.

Q Now there is a severe steel shortage, isn't there?

A There is a steel shortage so far as the oil industry is

46mm

concerned. I think it is generally known that Petroleum Administrator for Defense the next to the fourth quarter of this year, has allocated to the oil industry about 29 per cent of the tonage of steel which the industry stated it would need if 43,000 wells were to be drilled in this year.

Q How much allocation of steel do you get?

A We get 29 per cent along with all the rest of them.

Q Along with the rest of them.

A Yes, sir.

Q Let me ask this final question. In your opinion would one well on 80 acres in the Devonian Pool sufficiently drain the 80 acres?

A In my opinion, one well drilled on the 80 acres would be more than necessary, it would be adequate to bring about an efficient drainage,and to bring about an early definition of the limits of the pool, and bring about an early development of all the land that will be found to be productive.

Q Would you recommend to the Commission, Mr. Kaveler, that an 80 acre rule be put into effect in this state with respect to the deep pool, not only the Denton but all the other pools?

A I would make that recommendation to the Commission.

Q State why.

A As a matter of policy.

Q You have a 40 acre spacing rule here?

A Yes, sir.

Q There is no basis for just changing a flat 40 acre spacing

47mm

rule here that applies to both deep and shallow pools?

A No, but I didn't want to leave the impression that this Commission has done an outstanding job. One of the outstanding facts in the oil industry is that in New Mexico they have always had a spacing plan which is conducive to the development of the resources of the state. Now, since 1948, when pools deeper than 5,000 feet have been discovered, I think the Commission might with equal wisdom adopt the spacing pattern with respect to deep pools that was as useful and as good as the 40 acre pattern they adopted in 1935. The Commission might well recall in 1935 when the 40 acre state-wide pattern was launched in New Mexico, it was a revolutionary thing and attracted the attention of the whole industry.

Q It is still a rather revolutionary thing as compared to some of the other states?

A Some of the more backward states.

Q That is what I am talking about, like Arkansas.

A Like Arkansas.

(Laughter.)

MR. FOSTER: You may cross examine.

CROSS EXAMINATION

MR. CAMPBELL:

Q I wonder if you would mind repeating your answer to the last question.

A Like Arkansas.

Q Dr. Kaveler, I believe you stated at the outset you were acquainted with the size of the Denton Pool in the Devonian

48mm

formation. I wonder if you would mind correcting your statement for the record with reference to the number of wells in that pool?

A Yes, I would. If you will tell me the correct number, I will adopt your statement.

Q Would it surprise you to know there are approximately eleven producing wells and 14 wells either being drilled or located?

A No, it wouldn't surprise me.

Q In other words, 25 wells rather than the 17 you suggested.

A I will take your word for it.

Q I would like to ask you just a few questions about your theory as to drainage, not that I would want to argue with you about it, but isn't it correct that there are even among the technical men in the industry those who still feel that more wells will bring more oil in ultimate recovery?

A Yes, there are some that have not been able to maintain pace with the development of the true facts. A misunderstanding.

Q In other words, there is some division of opinion even among technical men as to that point?

A If you wish to call them technical men.

Q You have written several articles refuting their ideas on it, so I presume they are technical men. I believe you also stated in your theory of drainage, one well in a reservoir if given enough time would ultimately drain the reservoir?

A That is correct.

Q Then any other well would be an unnecessary well, wouldn't it?

49mm

A No. I don't know who your advisers are because it would be foolish to drill only one well to an oil field, and I will tell you why if you would like to know.

Q I would like to know if one well would drain a field if given enough time?

A That is true. But it is very foolish to drill only one well in an oil field and there are reasons for it.

Q The depletion time is a factor isn't it?

A Not necessarily. A number of wells should be drilled in ~~otery~~ fields. Which will establish the limits of production so that all parties that have production will have an opportunity to share in production. That number of wells which also should be drilled which will satisfy the reasonable market demand for oil because occasions might arise when the market demand for oil would be in excess of the productive potential of one well, so more wells are needed to be drilled to meet the existing market demand. A sufficient number of wells should be drilled in order that there may be a uniform distribution of wells over the field. So that a productive energy process can be utilized most efficiently, and to insure that every separate lens within the common source of supply holding oil will be penetrated by at least one well.

Q I am interested in the last two statements; first, that there should be a sufficient number of wells to establish some uniformity to the field. Is that what the statement is?

A The wells drilled should be drilled uniformly throughout the field.

50mm

Q Wouldn't you say the existence of 25 wells on top of a structure in essentially a 40 acre pattern, and to impose 80 acre spacing toward the edge of the formation would give you that uniformity?

A No. The Commission has this problem. A pool is discovered, and people immediately jump in and drill offsets. Each has his motives. Oftentimes the matter isn't brought before the commission, and the Commission doesn't act on its own motion to bring about an early determination what the spacing should be or development, and that is the thing that has occurred in this pool and in many others. With the occurrence, in this instance and in many others, this Commission and others have always stopped it before it was too late and have corrected this situation before it led to waste. That is what the proposals here advocate.

Q You take the position that situation hasn't yet arrived here?

A We take the position the Commission can still save this great and valuable pool.

Q I believe you testified with reference to this exhibit or model that there is a migration of oil to low pressure areas, is that correct?

A Yes, sir.

Q And the low pressure area is caused, is it not, by the drilling of a well into the reservoir, releasing pressure from the reservoir at the well.

51mm

A The taking of oil or gas or water.

Q And it is true, isn't it, that the more wells which are drilled in a particular area of a field--we are talking about well location not distance between wells--the more wells drilled in a particular area in the field, the lower the pressure becomes as the pressure is reduced from the wells in that area?

A That may be true.

Q Assuming it is true, more wells will not ultimately produce more oil, isn't it also true irregularity of the distance between wells, the location of the wells in the reservoir, is of the utmost importance in the distribution of energy?

A The distance between the wells?

Q The distance between the wells.

A It isn't critical. The Denton Pool, if it were a water-drive pool, as I suspect it will be, all the wells could be drilled along the model on the top here and it would accomplish the most conservative operation you could imagine.

Q You might have some difficulty with the people on the flank.

A No. We would give them credit for their oil. We would let them share in production.

Q You are talking about unitizing?

A No, I am talking about conserving the wells.

Q You are asking in this application a fixed pattern 80 acre spacing in a particular 40 in each quarter section.

A That would be my recommendation tothe Commission.

Q That isn't based upon what you feel would be the best way to develop this field?

52mm

A No, the best way to develop this field would be to drill in a wide pattern and then establish the limits, and then unitize the field and then use pressure maintenance operations.

Q How much surface area is covered by the long axis of this structure?

A This model?

Q Yes.

A That model is of the West Cement oil field in Oklahoma and it is a mile and a half from this point to this point ((indicating on the model.)

Q Then there would be a considerable number of wells even in 80 acre spacing drilled into this pay section?

A Yes. There is 2,000 acres in this field.

Q And if you are correct that oil tends to migrate to low pressure areas, if there were a particular portion of this pay section more densely drilled than another section, wouldn't the oil tend to migrate to that area?

A That depends on the allowable.

Q In your application you recommend a double allowable.

A I have recommended an 80 acre well be given twice the allowable of the 40 acre.

Q You want a double allowable for all wells in the field?

A All wells on 80 acres. I think the Commission will take into consideration that all wells with less than the attributable acreage--

Q You are adopting 80 acres to all wells now drilled or drilling?

53mm

A If they have the acreage to attribute to them.

Q And you did at the time of the last hearing?

A I think the plan could be worked out, yes.

Q Wouldn't the clustering of wells in the top of that structure cause the oil under a water-drive situation to migrate to that low pressure area?

A Not necessarily.

Q Why?

A I can explain it to you, Mr. Campbell, but I can't understand it for you. The proposition is simply this. That wherever a well is, and it withdraws oil and gas, there is a low pressure spot which is created in respect to the rest of the reservoir. And the oil will move in the direction of that low pressure spot. Now, there might be some wells clustered here, as you chose to speak of it. Wherever those wells are, the low pressure condition will be created, and the water will move up and the gas will move down and the oil will move to those points.

Q Then if you develop this field on 40 acres, as it has been up to this time essentially, and start at this point with wider spacing out toward the edge of the field, toward the water contact, isn't it true that the wells away from the top of the formation aren't going to get their fair sham of the oil in the reservoir?

A They will get their fair share. That depends on the allowables set by the Commission.

Q You recommend that the wells on the top of the structure

54mm

be given an 80 acre allowable?

A If they are entitled to it.

Q Now, another question about this model. It assumes doesn't it, there is a uniform porosity and permeability in the structure?

A The model is built on the principle, but the assumption you infer, if an oil field exists there is a variation in the permeability and the porosity of the rock , and that is true. The fact that rock is heterogeneous and not homogeneous--

Q What does that mean?

A Heterogeneous means mixed up and non-uniform. The fact that it is doesn't vitiate the principle we have tried to present here. We have tried to present a basic principle which this model illustrates.

Q But the nice manner in which this model drains the oil could be effected certainly by a lack of uniformity or by an erratic structure with permeability variations, for instance, couldn't it?

A Well, for instance, God made nature. The Denton Pool could drain just as nicely. Nicely, just doesn't have much meaning in the technical sense.

Q We are trying to use layman's terms, Doctor.

A The oil will drain out of the Denton Pool just as nicely as it will drain out of here (referring to the model.)

Q Regardless of the permeability and the porosity?

A Yes, sir. That term permeability and porosity is just something technical people use to confuse lawyers.

55mm

Q Isn't it true in a water-drive field, the water will tend to go in the direction of the highest permeability?

A That depends on circumstances, and for your benefit, I will say yes.

Q Thank you. Now a few questions with reference to the steel situation. I presume you were acquainted with the operation of I believe the Petroleum Administrator for War in World War II?

A I was reasonably so.

Q Isn't it true at the time when the emergency was at its height and the Petroleum Administrator for War had actually issued an order -- which they haven't done yet in this respect -- that it was based on 40 acres?

A That is true. But I don't think that establishes a precedent in this crisis. Nor should any action in Washington be of any greater wisdom than what the State Commissions could exercise.

Q Do you confirm the statement that the purpose of the allocation of steel is to obtain the maximum recoverable reserves with the minimum of steel?

A Generally. I think you can also say that the steel available to the industry today is to be used to develop the petroleum resources of our country to the greatest extent. Whether that means reserves or intensifying drilling in one field or going out to try and find many fields, I leave that up to the Government.

MR. CAMPBELL: I think that is all.

MR. FOSTER: I have a bulletin put out by the Petroleum Administrator for Defense. It contains the four-point program

56mm which they recommend on this steel matter. I would like to introduce that for the record. And just say it is an estimate of suggestion, they don't tell you what to do. They suggest that each state regulatory body extend the existing rules covering well spacing with a view toward reserves to permit drilling new wells farther apart where practicable and producing more from each well.

MR. SHEPARD: It will be admitted.

MR. FOSTER: I think that is all.

MR. SHEPARD: You have any further witnesses?

MR. FOSTER: No, that is all the witnesses we have.

MR. SHEPARD: Mr. Campbell, do you have any witnesses?

MR. CAMPBELL: I have a couple of Arkansas people.

MR. SCOTT: I would like to ask Mr. Kaveler a few questions, please.

MR. SHEPARD: Mr. Kaveler, we have someone to ask you a few questions.

CROSS EXAMINATION

By MR. SCOTT:

MR. SCOTT: My name is W. A. Scott of the Shell Oil Company.

Q Dr. Kaveler, we all appreciate the time and effort you took to explain this matter. It was very informative. But I would like to ask you one or two questions about it. First, wasn't this exhibit set up as a sand reservoir?

A No, sir. Not necessarily.

57mm

Q I thought you stated that--

A This exhibit was set up to explain a principle.

Q Yes.

A The principle that oil is produced only through the agency of compressed oil or compressed water associated with the oil in the rock. And you could put saw-dust in there and still control that principle.

Q Wasn't this model made on the assumption this reservoir was heterogeneous?

A No. It was made up on the proposition that it represented a common source of supply.

Q Well, when you manipulated your pressure there it appeared to me the way the model is made it was set up so you assumed even pressure interference, especially between the well up in the gas-cap and the oil well down structure.

A Of course, there is a pressure interference in all common sources of supply.

Q In other words, you assumed there was a good bit of pressure interference.

A I didn't assume, I simply demonstrated.

Q There is a good bit of communication between the two wells.

A Yes.

Q Is the Devonian reservoir composed of a dolomitic rock? Isn't it a limestone?

A Yes, there is a piece there.

58mm

Q Isn't it true in New Mexico and West Texas, in any limestone reservoir, you would find many variations in the limestone reservoirs?

A It is true all over the world.

Q Do you know conclusively that there is communication between the wells in the Denton-Devonian reservoir?

A Yes.

Q Do you know that conclusively beyond any doubt?

A Yes, in what we now recognize as the Denton-Devonian common source of supply.

Q I believe there has been some conflicting testimony as to that.

A That doesn't reflect upon my opinion.

Q Do you know what type of water-drive is now in effect in the Devonian reservoir?

A No.

Q Didn't your test,or exhibit, show more of what we call a solution gas drive type of reservoir?

A Yes, and the statements I made could have been made equally in respect to the function of water.

Q Do you think that the solution gas drive type of energy is in effect in the Denton-Devonian reservoir?

A I don't know.

Q Then, in effect this model isn't representative of the Denton-Devonian reservoir.

A It is representative of the Devonian and all other oil fields.

59mm

Q But the solution gas drive type of reservoir which it exhibits so well here, we don't know it is present in the Denton-Devonian reservoir.

A Mr. Commissioners, what Mr. Scott is getting at is, this model, if this model didn't have the gas-cap and had been just confined to an oil pay, then the only gas in the reservoir would be in the oil. There wouldn't be any gas-cap there. Then the production of oil would be due to the expansion of the gas like the gas comes out of a bottle of beer or Coco-Cola. Comes out of solution. Now, I don't know. We will have to wait awhile in the Devonian to get some history on the field to determine whether or not there is a gas-cap. To determine whether or not there is an extensive water-drive. So, the question you ask, Mr. Scott, is one that only the facts to be established in the future can establish.

Q Therefore, we don't know that the particular type of reservoir energy which you so ably showed us here is in fact-- I believe you did make the statement you thought water-drive might be in effect in the Devonian field but you have no prof.

A That is correct.

MR. SCOTT: That is all. Thank you.

MR. SHEPARD: Anyone else? If not we will hear from Mr. Campbell.

(Witness excused.)

60mm

VERNON TURNER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q Will you state your name?

A Vernon Turner.

Q By whom are you employed?

A By the McAlester Fuel Company.

Q You testified before this Commission at the original hearing in Case No. 269, did you not?

A That is true, Mr. Campbell.

Q I would like to get some information about this Denton field. Since the date of the last hearing has there been any additional well completions in the Devonian?

A Yes, sir, I believe there have been some five additional wells completed since the date of the last hearing.

Q Will you state briefly what wells have been completed?

A Atlantic Federal Jones No. 1, located in the SW SW OF Section 35; Atlantic State T-1, located in the SE SW of Section 2; McAlester-McClure B-1, located in the NW SE of Section 14; Ohio Denton No. 4 "D", located in the NE SW of Section 11; and Skelly State "F" No. 1, located in the NE NW of Section 2.

Q What then is the number of wells now completed in this field in the Devonian?

A I believe there are eleven.

Q Referring you now to the exhibit which is on the wall, on

61mm

left there, which has been marked Exhibit M-6, will you state what that is?

A That is an up-to-date north-south micro-log cross section showing the drill stem test results obtained on various wells in the field.

Q The wells completed since the last hearing are shown on the micro-log?

A Two of the wells.

Q Which are those?

A Atlantic State T-1 and McAlester McClure B-1.

Q Was one of the wells completed since the last hearing a well of the McAlester Fuel Company?

A Yes, sir.

Q Which well is that?

A The McAlester McClure B-1.

Q Where is it situated?

A On the edge of the south end of the field as presently developed.

Q Referring now to the exhibit in the center on the wall, which has been marked Exhibit M-7. Will you state what that is?

A That is a map of the Denton field area showing in red the proposed spacing pattern by Phillips Petroleum Company with the exceptions that will be necessary to that proposed spacing arrangement shown in blue. In other words, the blue shows the present location of drilling wells which are not in the southeast or northwest 40 of the quarter section.

62mm

Q Will you point out to the Commission on that exhibit the locations of wells that have been started or commenced since the last hearing?

A Gulf's Chamberlain D-3, which is a location of, I believe, now drilling.

Q That is a direct south offset to the Gulf Chamberlain No. 2, isn't it?

A It isn't a direct offset in that it isn't in the center of the 40.

Q But it is in the 40 immediately to the south of the Gulf Chamberlain No. 2. And it is also a 40 acre offset to a well to the east, isn't it?

A That is true. We have the location of the McClure B-1, which has been approved but actual drilling operations have not been commenced.

Q What other well has been commenced?

A Gulf State G-2 is located in the southwest southeast of Section 2.

Q That well immediately offsets to the south, the Gulf G-1-D well, and that well is now a drilling well.

A Yes, sir. This morning it was drilling 4,190 feet.

Q Now, what other well--is there an Ohio well in Section 13?

A Yes, sir. Ohio Denton No. 5, which is the west offset to the discovery well of the field.

Q 40 acre offset.

A This morning it was drilling below 380 feet.

63mm

Q That is also a 40 acre offset to the Ohio Denton No. 4 to the north?

A That is true.

Q And those wells have all been commenced since the original hearing?

A That is true.

Q And are there additional location to the north that have been approved but their wells have not as yet been commenced?

A Well, there is an approved location in the SE NE of Section 2 which is the McAlester State D-1.

Q And I believe there is a location in the SE of the NE of Section 14?

A That is true. McClure D-1.

Q And both of those are 40 acre offsetting well locations are they not?

A That is correct.

Q In other words, five wells, three of which have been commenced and two of which locations have been obtained for since the last hearing, all of them are 40 acre north, south or east offsets?

A That is correct. The total of the completed Denton wells, drilling wells, and location, twenty-five of those can be construed as direct offsets.

Q And not diagonals as the proposed pattern would suggest. Now, referring to Exhibit M-6, and to the McClure B-1, which has been completed since the last hearing, and is the well fartherest

64mm

south in the field, will you state what that micro-log shows as to permeability in that well?

A It shows a rather poor section in the Devonian pay, and the permeability is indicated to be rather erratic.

Q Was it necessary to acidize that well?

A Yes, sir. Following preparation, the well flowed only by head, wasn't capable of making its assigned allowable.

Q In your opinion, based on your present information and the production you have in that well so far, would it make a single allowable with a deep well adaptation?

A I question seriously whether it will make an assigned allowable from the present zone.

Q Now, what was the dip in structure from the well immediately north of that McClure B-1 to the McClure A-1 on top of the Devonian?

A From the McClure B-1 to the McClure A-1 there is a direct offset at 1330 feet and your dip is 636 feet.

Q In other words, 636 in a 1330 foot step up?

A That is correct.

Q If the dip continues at the same rate, what would be the effect if you step over the 40 and drill an 80 acre location?

A I question whether you would obtain a producing well at all. Probably be a dry hole.

Q And it still probably would have been necessary to go back and drill the location to the north?

A As a matter of self-protection.

65mm

Q Now, the wells you have previously had in the field, is there one well which you are now deepening?

A Yes, the McClure C-1, located in the NE NE of Section 14.

Q That is now producing from the Devonian, it was producing from the Devonian?

A No, sir. We drilled to the Devonian and ran a number of drill stem tests. We plan to take the well to the Ellenberger to 14,000 feet.

Q In other words, you are going to explore the possibilities of another producing zone?

A This morning it was drilling below 13,826 feet.

Q Considering the development in this field todate and assuming the application for fixed pattern, 80 acre spacing in the NE SW corner of each quarter section is approved, together with the double allowable which has been recommended with the deep well adaptation for the wells now producing in this field, what in your opinion will be the effect on this reservoir?

A Well, in spite of Dr. Kaveler's testimony, I would strongly feel that the permeability and pressure would be injurious to the reservoir.

Q In your opinion, would that cause waste of oil?

A It would cause underground waste.

Q Why would that be true?

A Well, you have high rates of flow in certain areas of the field which tend to create low pressure areas. A number of wells will not be capable of producing presently the double allowable in 40 acres without releasing so much gas and dissipating

66mm

the reservoir energy.

Q Do you know how long it takes a well on a 40 acre location with the present allowable and deep well adaptation, to pay out in that field?

A Approximately 15 months.

Q Even though it costs $270,000?

A That is correct.

Q In your opinion, is it necessary to have 40 acre spacing in that field to properly utilize the reservoir energy?

A As the field has been presently developed on 40 acre spacing, in order to allocate 80 acre units to each well already drilled, it will be necessary to include diagonal offsetting acres. And in my opinion, considerable dry acreage would be included in the field limits. Producing at double allowable would certainly dissipate the reservoir energy.excessively.

Q At the original hearing I believe you testified there were areas of low permeability in this reservoir that would not be drained by 80 acre spacing.

A I believe that is true. I think we have adequate evidence, at least in my opinion.

Q You also testified 40 acre spacing would result in more efficient drainage of the field? Is that still your opinion?

A Yes.

Q I believe you also testified the producing of these wells in a water drive field at a high rate could cause channeling, and by-passing of oil. Is that correct?

A I think that could be true. Or would probably travel in

the zones of high permeability, by-passing oil in the more dense streaks.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q Now, Mr. Turner, I want to ask you a question or two about this clustering up there. What is the point you are making about the clustering of these wells?

A Well, you have, I believe, those twelve either completed, drilling or locations in the north end of the field at the present time.

Q Yes.

A You have approximately the same number on the south end of the field. If you allocate acreage on which no well is now drilled, certainly this area in the middle here will not have a well drilled on it.

Q Well, all you are saying there is the wider the spacing the fewer wells you drill. We all agree with that. You were talking about a clustering of wells up there being of some injury or something, bringing about some injury to the field or reservoir, weren't you?

A That is true. I have two wells in point here, Mr. Foster. The evidence was presented at the last hearing on the draw down of those two wells. If you would like to go back into this again--

Q No, I am trying to find out about these so-called clusterings of these wells resulting in some injury to the reservoir. How

68mm

does that occur?

A All right. Under your proposal you plan to double the take from each of these wells that is now completed.

Q Let me correct you about that. We don't plan to double the take at all. We suggested to the Commission it give twice as much allowable to an 80 acre well as a 40 acre well. Whatever they fix it at, that would be it. That would have to depend on different considerations from the spacing pattern.

A But that was your recommendation.

Q Yes, sir. But what I am trying to find out about is how a clustering of these wells is injuring the reservoir?

A Well, the wells that are now completed, that is where you are going to take the oil out of the reservoir, is that true?

Q What is that?

A The wells that are now completed. That is where you are going to take the oil out of the reservoir?

Q Yes, that is true with respect to any well.

A All right. We think we have sufficient evidence to justify the opinion that a number of zones in the Devonian pay consists essentially of a closed system due to low permeability.

Q You are saying this is not all one common source of supply. That is what that language means, isn't it?

A I am saying, due to the variation in permeability and the erratic nature of the formation, I don't believe that one well to 80 acres will adequately develop it.

69mm

Q All right. Now just for the purpose of argument, I am going to agree with you but I want to get back to how the clustering of wells brings about any injury to the reservoir.

A All right. I believe certain zones in the reservoir are connected throughout the reservoir. Certain zones have high permeability. That is where your oil production is going to come from. If you have a zone that is essentially a closed system in one part of your field, and assuming you have a water-drive, and it is going to replace a barrel of oil which you take out of the reservoir, I believe the reservoir will encroach along the zones of high permeability and by-pass oil in the lower permeable veins.

Q Will that be caused by the so-called clustering of these wells?

A That would tend to aggravate that condition, yes, sir.

Q That would happen no matter where you drilled a well.

A If you have twice as many wells drilled into a reservoir, you certainly have less chance of leaving oil in the ground due to not developing a low permeability zone.

Q Well, that still don't satisfy my curiosity about the clustering of these wells. What do you mean by clustering of wells?

A Well, wells that have been drilled and developed on direct 40 acre offsetting tracts.

Q What?

A Wells that have been drilled and developed on direct 40 acre offsets.

Q You would have the same clustering on 80 acres wouldn't you?

70mm

A Well,--

Q You would have a clustering under that definition of it/under 80 acre spacing wouldn't you?

A Not withthe exceptions we now have.

Q What I am driving at, Mr. Turner, is this. Under any spacing pattern, you have a clustering of wells.

A Well, if you feel--

Q Whether 10 acres or 20 or 40 or 80, you still have a clustering of wells, don't you?

A If this field had been developed on your longer pattern, you still would have some clustering of wells. You might have to get off the structure in order to do it.

Q Why not develop it on 80 acre spacing until we find out more about what the reservoir conditions are?

A Judge Foster, it has already been developed on 40 acres.

Q Not all of it.

A Twenty-five wells or direct offsets.

Q I understand that. But what is the extent of this pool?

A I don't know.

Q Hasn't it been estimated about 42 wells can be drilled in the pool?

A That may be true. I am not familiar with it. The pool may be defined on the south as of right now.

Q Well, do you think that the pool is all one common source of supply?

A I think there are zones in that reservoir that are interconnected throughout the reservoir. I think there are other zones

71mm

of low permeability that maybe connect two or three wells and maybe close up.

Q Under that statement do you think it is one common source of supply?

A Well, under the ordinary conception of an oil and gas reservoir, I say it is, yes. That is a condition you find in any reservoir.

Q You find tight spots in any oil field?

A Yes, sir. I don't believe to the same degree we have here, however.

Q What does the spacing of wells have to do with the rate of production?

A Well, I have been going under assumption that your recommendation for 80 acre spacing was accompanied by the request for double the present allowable for deep well adaptation.

Q I understand that is our application. But what does spacing have to do with the rate of production?

A Well, sir, our McClure No. 1, which was the discovery well, will not produce much in excess of the present allowable. Now, as far as spacing itself, that is a separate problem.

Q That's right. In other words, spacing doesn't have any relation to the rate of production.

A No, sir.

Q All right. Now, you would determine what the spacing pattern in this field is to be on an entirely different basis from what you would determine the rate of production on any individual well should be, wouldn't you?

72mm

A Yes, sir. But my contention is it is already developed on 40 acre spacing.

Q That doesn't make any difference. What I am taking about is whatever spacing pattern you have in the field, whether 40 or 80, the considerations for that determination are entirely different from the factors that would go into the rate of production for the wells.

A That is true.

Q And for that reason there would be no relationship between the spacing pattern and the rate of production.

A Except your attempt to tie the two together in your original application.

Q I understand that. But the fact that we recommend a double allowable for wells on 80 acres doesn't condemn 80 acre spacing.

A No, sir.

Q Not at all?

A That is a separate problem entirely.

Q That is a separate problem entirely, and something the Commission can control whichever way it wants to control, can't it?

A That' s right.

Q Whatever the rate of production ought to be can't determine what the spacing pattern should be? Isn't that correct?

A That is correct

Q All right. Now, you say there has got to be a lot of exceptions allowed in this field if we adopt 80 acre spacing?

A Examples or exceptions.

Q Examples or exceptions to the way we propose to develop the field.

73mm

A Approximately half.

Q Let's say half of all wells drilled inthe field will have to be exceptions because of the present way the field has been developed. Would you say that would condemn the adoption of 80 acre spacing if otherwise it is shown?

A It would certainly bring into focus a number of problems, several of which I am not in a position--

Q I understand that, but does that condemn 80 acre spacing?

A No. But the effect of these other problems entering into consideration.

Q But there would be no relationship between the present pattern of develppment and what the proper pattern should be.

A Well, there is nothing that has happened since the last hearing that has changed my opinion on it, and what the spacing pattern should be.

Q I am not talking about that at all, Mr. Turner. I am sure of that. Your statement is correct. But what I am saying is, the fact that, you have developed the field, as you developed it, on 40 acre spacing doesn't within itself condemn the adopting of 80 acre spacing?

A No, sir. Except for these other factors--

Q Oh, I know there are other problems created.

A Yes, sir, and very important, too.

Q I understand that, but that doesn't condemn 80 acre spacing.

A I am sure it doesn't in your opinion.

Q I don't have any opinion about this. I am trying to get yours.

A I am trying to give it to you.

74mm

Q It doesn't condemn 80 acre spacing does it?

A That depends on the way you look at it.

Q Well, all right. Let me ask you this. If you adopt 80 acre spacing for this field and dif[illegible], as a matter of fact, one well won't sufficiently and adequately drain 80 acres, you can always go back and drill under 40, can't you?

A That would be true.

Q That is true, isn't it?

A Yes.

Q But if you develop this pool and continue to develop it on 40 acre spacing and then it should be determined that you should have been on 80 acre spacing, you can never drill 80 acre, can you?

A That would follow.

Q That is true isn't it?

A That would follow, yes.

Q All right. Now, I am not interested just in this Denton Pool. I am talking about a matter of principle in the application of it to spacing patterns an deep production. In other words, what you have got in this pool now is the result of the fact that probably you didn't have wider spacing provisions, is that correct?

A That is a problem for the Commission. I am not on the Commission.

Q No, that isn't a problem for the Commission in answering my question. But the problem we have got now in this field with the way it has been developed is due to the fact that you had only 40 acre spacing before.

A I assume that is true.

75mm

Q In other words, if you had started out developing this field on 80 acre spacing you wouldn't have the problems that you have mentioned.

A I think, roughly speaking, a number of problems would have arisen, yes, sir.

Q Not the ones you are talking about. Maybe some other problems but you wouldn't have these.

A The question would still arise whether one well would adequately drain 80 acres.

Q I agree with you. But if you had started out originally in this field with 80 acre spacing, then you would not have all this problem of making these exceptions for these 13 or 14 wells you have there?

A No.

Q It would have cured that. And it would have also cured all th other problems that result from those wells being drilled on 40 acres.

A What do you mean by all the other problems?

Q You mentioned them.

A There is a multitude of problems involved in this thing.

Q I understand that, but if you had properly started in this field with 80 acre spacing, then you would not have the problems that grow out of thefact that you have wells located in 40 acre patterns and therefore have to make exceptionsto them .

A Yes, sir, but--

Q That is true, isn't it?

76mm

A That is true. But we are not dealing in probabilities. We are dealing in realities and facts.

Q I know that. But it is a reality to look a little forward and not let the same thing occur again, if as a matter of fact we ought to go to 80 acre spacing. That is sound, isn't it?

A Yes, sir, I believe that is sound.

Q All right. With respect to applying 80 acres in this particular field, isn't the situation pretty much like this: It is a question whether you want to cut off both legs or just cut off one leg?

A I don't follow you there, I want to keep both of them.

Q Of course, you want to keep both legs. But suppose the Commission should decide they ought to adopt 80 acre spacing, in this field? Now, that brings about a large number of exceptions, that you spoke of. That is what I call cutting off one leg, is these exceptions; but if you want to adopt 80 acre spacing in this field then I'd adopt it and cut off one leg rather than amputate two or to cut off both by staying on 40.

A On this particular field I am not admitting--

Q I am not asking you to admit that. All I am doing is making an assumption here. We have a controversy between the parties as to whether we ought to adopt it or not. If you make the assumption you ought to adopt an 80 acre plan you would just be cutting off one leg.

A I am not making that assumption. You are making the assumption.

Q I am making the assumption. We could be right about this.

77mm

A You could be, but in our opinion--

Q That is what I am talking about. That is for the Commission to decide. But whether right about it or not, take this point, go ahead and adopt 80 acre spacing on a temporary pattern, how can you get hurt on that?

A The field is already developed on a 40 acre pattern.

Q I understand that. But how does it hurt you?

A Does Phillips want to unitize a productive 40 acre tract with a dry 40 acre tract?

Q Are you asking me that question?

A Well, I just made the statement. I don't believe you would.

Q It is obvious no one would want to do that, Mr. Turner.

A Geological testimony that will be presented later will adequately show the steep dips--

Q What adjacent 40 acre tracts are there there?

A Sir?

Q What dry tracts, 40 acre tracts, are there in this field?

A Going strictly on a dip basis, the 40 acre tract south of our McClure No. 1 is apt to be dry.

Q Is that the only basis?

A On what other basis would you go?

Q I don't know. I am asking you.

A There is an assumption.

Q Have you drilled any dry wells in that field?

A Yes, sir.

Q Where is it?

A The Walter A-1.

Q What offsets to the present wells are dry 40 acre offsets?

78mm

A Well, I can't call them to your attention at the present time.

Q You don't know, do you?

A This Atlantic D-1 may well be a marginal well.

Q What do you mean marginal well?

A It may be close to the oil-water contact.

Q That wouldn't be dry.

A For all practical purposes it would.

Q Give me a definition of a marginal well.

A One that penetrated a very limited section of the pay which would not pay for the amount of pipe that would be required to complete it.

Q Is that your definition of a marginal well?

A In general terms yes.

Q And you had that definition in mind in answering my question there about that well being--

A No, sir. That is just off-the-cuff, so to speak.

Q Mr. Turner, do you subscribe to the public policy of this state as announced by the legislature that an operator in an oil field shouldn't be required to drill more wells than is necessary an efficiently and economically drain the pool?

A Mr. Foster, can you assure me that by developing this field or continuing to develop it on a 40 acre basis that enough additional oil will not be recovered to pay for those 40 acre locations, would be less than what would be produced on 80 acre spacing?

79mm Q Mr. Turner, if we could answer those questions we wouldn't have this controversy.

A That is correct.

Q I am asking you if you subscribe to the public policy of this state as announced by the legislature that an operator of an oil field shouldn't be required to drill more wells than is necessary to efficiently and economically drain the field?

A Naturally I would, yes, sir.

Q You subscribe to that?

A Yes, sir. But I think the Commission is very much interested in obtaining maximum oil recovery from the reservoirs of this state.

Q You subscribe to this declaration of public policy found in the statutes of this state that the drilling of unnecessary wells creates fire and other hazards in an oil field?

A Judge Foster, that is a point which I consider of minor importance.

Q Well, whatever weight you may give to it, do you subscribe to that policy?

A Well, if the drilling of one well to each 40 acre tract instead of drilling one well to every 80 acre tract would aggravate that situation, I would subscribe to it then.

Q It says here, "An operator shall not be required directly or indirectly to drill more wells than necessary to economically and efficiently drain the pool." Do you subscribe to that public policy of this state?

A You say unnecessary wells.

80mm

I can't--we get back to the same point again. I don't know that one well to a 40 acre tract would constitute--

Q I don't either. But do you subscribe to this declaration of public policy?

A I have already stated I did.

Q Do you subscribe to the public policy of this state that the drilling of unnecessary wells "creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator"?

A That would certainly be true.

Q Do you also subscribe to the public policy of this state as declared in the Statute by the legislature that the increased cost to the operator also increases the cost of the product to the ultimate consumer?

A If the drilling of one well to each 40 acre tract constitutes that, yes, sir.

Q All right. Would you say that as a matter of public policy in this state you ought to drill only the necessary wells that have to be drilled in the field?

A I would subscribe to that, yes, sir.

Q Now, let me ask this question. If you can adopt a policy of this--strike that. This field here could have been developed on 80 acres, could it not, if you had started out in the inception with the discovery well?

A Well, then, the field could have been developed on 160 acre spacing or any other.

81mm

Q It could have been developed on 80, could it not?

A Yes, it could.

Q Tell me how if you had started out originally in this field to develop on 80 acre spacing, how it would have resulted in any injury to anybody in the field?

A Well, the fact remains that the field wasn't developed on 80 acre spacing--

Q I understand that, Mr. Turner. And my question implied that I understand that. But tell me how, if you started out with the original discovery well in this field on 80 acre spacing that anybody would have been injured in this field?

A Well, why not drill just one well, and get everybody to agree to allocate such and such a percentage of this reservoir to every one around there and work it out in that manner.

MR. FOSTER: Yes, sir. I believe that is all.

REDIRECT EXAMINATION

By MR. CAMPBELL:

Q Mr. Turner, Judge Foster made reference to the problems we are faced with in reference to this reservoir. Until this application for 80 acres spacing was filed, you didn't have problems in this field, did you?

A None that I know of.

Q That is not your problem?

A No.

Q You are satisfied with the way this field has been developed on 40 acre spacing?

A Yes, sir.

82mm Q Your company is willing to go ahead and develop on 40 acre spacing?

A Yes, sir.

MR. CAMPBELL: That is all.

MR. SHEPARD: Any further questions. Does anyone have a statement to make. Anyone else have a statement to make? You may be excused.

(Witness excused.)

KEM MERREN

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name please.

A Kem Merren.

Q By whom are you employed?

A McAlester Fuel Company.

Q Did you testify at the original hearing in Case No. 269?

A I did.

Q I refer you to the exhibit on the wall marked M-8 and ask you to state what that is.

A That is our interpretation of the structure, on top of the Devonian. The contour interval is 200 feet.

Q Does that structure map bring up-to-date, based on information obtained since the last hearing, your knowledge of the structure?

A Yes, sir, it does.

83mm

Q What additional control do you have now?

A On the east and the south.

Q Those are the wells--

A The Atlantic Dickenson A-2 and the McAlester McClure B-1.

Q State briefly what conclusions you draw from that structure map.

A Well the very steep dip on the south and the southeast. At the last hearing we had assumed the rate of dip to the southeast here to 1900 feet to the mile. Using an estimated top in this Atlantic Dickenson A-1 because at that time we had not reached the Devonian. We now have that top and it is lower than we estimated, and gives the rate of dip to the southeast to 2700 feet to the mile.

Q What in your opinion, would be the effect of 80 acre operational units, assuming in the situation we have here with the exception there would have to be some east-west or north-south operational units, what would be the effect on defining the exterior limits of the field?

A Take in 80 acre spacing and you would be very likely to have one 40 productive and the other dry.

Q As a geologist would you recommend to your company skipping over a 40 acre tract when the flanks dip so sharply?

A I certainly wouldn't.

Q At the original hearing you testified the information available indicated to you there was a wide variation in the permeability in the reservoir.

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A I still have that opinion and it is further borne out by our McClure B-1 the southern-most well, which at this time will not make the present allowable.

Q Is it still your opinion to properly develop this field to drill wells on 40 acre tracts?

A That is my opinion.

Q Is it your opinion that the drilling of wells on 80 acres tracts might cause waste in this field?

A It is.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q You say if you had 80 acre spacing you might drill out on an 80 acre tract and find one 40 dry and the other productive?

A That's right.

Q How do you know both wouldn't be dry?

A In that case I was referring--what Atlantic Dickenson A-2, suppose we had stepped out another 40 to the east. It would certainly be a dry hole because in all probability it is going to be a marginal well.

Q The Commission could handle that situation by just reducing the allowable if you had part of it dry.

A That's right. I feel certain at that depth, if you had half the present allowable, 295 barrels--

Q But after all the Commission decides what they are entitled to.

85mm

A Yes, sir.

MR. FOSTER: That's all.

BY MR. WHITE:

Q If a certain number of the present wells cannot produce their regular allowables, and 80 acre spacing is adopted and double allowable given them, would that be more likely to lead to coning of the wells than on 40 acre spacing at half the allowable?

A Yes, and I would also like to add in answer to the question, I think on the flanks of the field, both on the south and east sides, where it is so steep, that when the wells are drilled that fairly close to the water, we are going to have that same low permeability. And in all probability they will not make the present allowable.

MR. WHITE: That is all.

MR. SHEPARD: Any further questions? If not, you will be excused.

(Witness excused.)

MR. SHEPARD: Any more witnesses, Mr. Campbell?

MR. CAMPBELL: No. Do you wish to make another statement, Judge?

MR. FOSTER: No, sir.

MR. CAMPBELL: I want to say just a few words. It seems to me there has been essentially no information introduced by the applicant in this case at this re-hearing with reference to this particular field that wasn't introduced at the last hearing. The only evidence as to additional data on this field has come from the McAlester Fuel Company, who believe this field should continue

86mm to be developed on 40 acre spacing. And these witness have testified in their opinion the additional information substantiates our previous views. Since the Commission apparently felt in the first instance Phillips Company had not justified the acception to the 40 acre pattern, which has been started, and introduced no additional evidence today, it occurs to us the Commission ought to continue in effect the order which it issued at the end of the last hearing.

MR. SHEPARD: Any other statements?

MR. HUGHSTON: Like Mr. Foster, we think these hearings should be more or less conferences, and we have a few comments to make. Both concerning 80 acre spacing generally and concerning the application to this particular field.

As a matter of basic principle, Shell is not opposed to 80 acre spacing in those cases in which the evidence as to formation conditions clearly shows that one well will adequately drain 80 acres and where it is clearly shown that an 80 acre pattern can be carried out doing equity to all lessees and mineral owners. It has been suggested here that the Commission might limit 80 acre spacing to deep fields hereafter discovered by providing in its general spacing rule that in such fields early development should take place on such a spacing pattern. Such an application, entirely prospective in nature, appeals to your speaker as the most sensible approach to such a matter and while he is not authorized to speak on behalf of the Shell Oil Company on such an application which was not within the scope of this call and was therefore not discussed with him, he feels that Shell Oil Company would probably support the same.

87mm

What we are directly concerned with today is the application of 80 acre spacing to the Denton field. Let us therefore consider whether the evidence shows that in this particular field one well will adequately drain 80 acres and that an 80 acre pattern can be carried out so as to do equity to all lessees and mineral owners.

As to formation condition, we have acreage in this field, but as yet we have no producing wells. We thus have not accumulated any evidence of our own on which to base an opinion as to the adequacy, from a drainage standpoint, of 80 acre spacing in Denton. The evidence on this point has been conflicting, and it is, of course, for the Commission to decide such conflict.

We do direct attention to the fact that the evidence has shown that 40 acre wells show a high profitability so that 80 acre spacing is not required from this standpoint of economics in this particular field.

Since for years New Mexico has followed a 40 acre pattern as a standard, and since this field has been developed to date on such a pattern, it is our belief that no order should issue varying that pattern unless the evidence clearly shows that the purposes of conservation of oil and gas will thereby be promoted and protected, and unless it is also clearly shown that no inequity will result therefrom to lessees and mineral owners as regards their correlative rights. We feel that it has not been shown that the plan here proposed will not violate our correlative rights for the following reasons.

88mm

It was first proposed that 80 acre proration units be established by including in one such unit two diagonal 40 acre tracts. We oppose such radical departure from conservation practices both because such plan has no basis under sound conservation and because such plan would violate our correlative rights as lessees, the correlative rights of other lessees similarly situated, and the correlative rights of mineral owners under tracts affected.

(a) Such Diagonal units are definitely contrary to the Commission's well founded policy, as laid down in its rules, that proration units shall be compact and as nearly as possible in the form of a square. This long established policy is but a sound statement of the conservation principle that the acreage attributable to a well should, as nearly as possible, represent the drainage area of that well.

(b) Under the diagonal unit plan, Section 2 eventually would have one more well than it would have if developed on rectangular 80 acre pattern and the formation of regular units in Sections 1 and 3 if and when these sections are developed would be prevented.

(C) In some cases the suggested diagonal units are not covered by the same basic leases and the creation of the units would require royalty owner joinder. In our own case, our 40 acres in the NW/4 SW/4 of Section 2 would be joined under the diagonal proposal with our 40 acres diagonally northwest in the SE/4 NE/4 of Section 3. Our 40 acres in Section 2 is State Land, whereas our 40 acres in Section 3 is privately owned

89mm To create such a unit, it would be necessary for both the State and these private owners to join therein. At the present time structural control in the field is not established. The State owned land in Section 2 appears to be favorably situated, but little is as yet known as to the unitization under the diagonal plan could be effected, or that, if effected, the rights of all parties would be protected.

(d) To our knowledge such irregular, diagonal shaped units have no precedent in New Mexico, and justly so. Certainly the rights and investments of the various leasholders, royalty owners and mineral owners should not be jeopardized and discriminated against for the sake of a proration unit scheme which will not be equally just to every interested party, and which provides for units not representing the drainage area of the wells thereon.

If 80 acre spacing is adopted in this field the alternate to composing proration units of diagonal 40 acre tracts is to compose the units of two adjoining 40 acre tracts out of the same section so that the units will be rectangular in shape. If 80 acre spacing is adopted in this field, this is the proration unit plan that we favor. However, it is obvious that the fourteen (14) wells already drilled and the eleven (11) other wells already located have largely been located on a 40 acre spacing and that as to many of such wells, it is now impossible to form 80 acre rectangular units and that therefore many 40 acre exceptions would have to be obtained. We therefore think that 80 acre spacing in this field is now

impracticable. An instance of a 40 acre tract as to which it would be difficult if not impossible to form a rectangular 80 acre unit out of the same section is Shell's NW of the SW OF Section 2.

Reference to the plat of Section 2 shows that Skelly's SW of th e NW of Section 2 is the only 40 acre tract in Section 2 with which our 40 acre tract in that section could be joined to form a rectangular 80 acre unit. This is by reason of the drilling that has already taken place in the Section.

Unless Skelly would agree to such unit, we would be unable to put our 40 acre in that section in an 80 acre unit.

Skelly has been approached as to its willingness to form such unit. Skelly has sufficient acreage so located that it could drill and own its own wells on its own acreage without joining in a unit with our 40. To join with us would also give Skelly an extra 40 which would require the creation of another jointly owned unit with another operator. Skelly has stated that it is not interested in joining in the formation of a unit with our 40.

We are thus in the position of owning a forty acre lease on State land and of being unable to obtain another operator with other lands in Section 2 willing to unitize with it. This lease was acquired under a Statewide rule permitting a well on each 40 acre tract. If 80 acres is now required for a well, we will be denied the right to drill on our 40 acre tract. Both

91mm

Shell as Lessee and this State of New Mexico as Lessor will lose the benefits for which the lease was granted, and a drilling right of long standing will be denied.

Even if a well is permitted on a 40 acre tract, a similar inequity will result if the allowable of that well, by reason of the field being on an 80 acre basis, is cut below what it would have been on the regular standard 40 acre pattern. Forty acres has long been the basis of unit allowable and is the basis upon which investments have been made. To reduce such allowable at this late date would be most inequitable and violative of correlative rights.

We might add that we are not the only operator in the field confronted with this problem of single 40 acre tract in a section.

We also think that part of the Phillips proposal which would restrict future well locations to the NW/4 and the SE/4 of each quarter section in the field would in this particular field prove inequitable; that

(a) Inasmuch as the structure is not defined and the limits of production are not definitely established, such a development pattern would probably lead to gross inequities between presently completed wells, and those wells which eventually will be completed; that

(b) It is evident, beyond any doubt, that the development to date in Sections 2 and 14 has followed a pattern of 40 acre spacing. In addition, and as is prudent, the majority of these

92mm

wells were located so as to gain as much pay section as possible; and that

(c) If exceptions are to be granted to presently completed or drilling wells, many of which were located to gain structural position, then it would seem that similar exceptions should be given to any future wells so that they too might be located at the most favorable position on the structure.

(d) It is difficult to conceive of the Commission making mandatory any set pattern of well locations in this field which would cause some operators to drill the less desirable of two locations on an 80 acre unit. Such would be the case if the proposed spacing pattern were to be applied to acreage on the flanks of the structure.

For the reasons above stated, it is our position that the 80 acre proration units with specified locations, as proposed by Phillips, is inequitable, even if it be assumed (and we make no such assumption) that the evidence clearly shows that one well will adequately drain 80 acres.

We therefore respectfully submit:

1. That proration units composed of diagonal 40 acre tracts are violative of sound conservation practices and would result in gross inequities.

2. That the Phillips proposal as to designation of drill sites would violate the rights of operators as to future drilling.

3. That if 80 acre units are adopted, they should be rectangular in shape and confined to a particular section. If

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such plan is adopted, the owner of a 40 acre tract, upon showing that he cannot reasonably participate in the creation of an 80 acre unit, should be permitted to drill on his 40 acre tract, and the allowable of such well should not be reduced below what it would have been had a 40 acre spacing pattern prevailed.

What has been said so far is of particular application to the Denton Devonian field. As to the Denton Wolfcamp field our position is as stated at the first hearing on this matter. However, we wish to emphasize that if 80 acre spacing is adopted in the field, the owner of a 40 acre tract upon showing that he cannot reasonable participate in the creation of an 80 acre rectangular unit composed of lands within the same section, should be permitted to drill on his 40 acre tract, and the allowable of the well so drilled should not be reduced below what it would have been had a 40 acre spacing pattern prevailed.

MR. SHEPARD: Any other statements?

MR. BUCKLES: I represent the Sinclair Oil Company. The position of Sinclair in this 80 acre spacing has been heretofore announced to this Commission on other occasions. We are entirely in favor of 80 acre spacing where it can be done and the correlative rights of all parties adequately protected. In this present pod we do not believe correlative rights can be adequately protected should 80 acre spacing be ultimately granted by limiting the wells to the NW and SE of each quarter section. We think the operator should have the privilege of picking the better location on the 80 according to the structure, and thereby give

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both the royalty owner and the operator the benefit of protection of correlative rights, particularly in view of the fact that this pool being developed on a 40 acre spacing, that is flowing the wells in such a helter-skelter manner. Where these exceptions are allowed, that is throwing the offsets to a position where the correlative rights will not be adequately protected. So, with the allowance of such a spacing order on an 80 acre basis, we feel the operator should be given the right to select the position on the 80 for his location.

MR. SHEPARD: Anyone else?

MR. WHEELER: My name is J. D. Wheeler, representing the Ohio Oil Company. I should like to read a brief statement into the record outlining our position. The Ohio Oil Company would like to state to the Oil Conservation Commission of the State of New Mexico we are in support of Phillips application for 80 acre spacing with double allowable being granted to the well on 80 acre spacing. For wells in the Siluro-Devonian pool, for the reasons pointed out in the testimony, and particularly for the reasons that in this as in other deep fields to be discovered in the State of New Mexico, 80 acre spacing will enable field limits to be defined very rapidly. This is particularly desirable in order that reservoir engineering data and production statistics may be obtained from as large an area as possible in as short a time as possible; so that producing characteristics of the reservoir may be ascertained at the earliest possible time, enabling proper field rules and allowable schedules be set up for permanent operations. In these deep

95mm

fields where wells may cost in excess of a quarter million dollars, the State of New Mexico and individual royalty owners and operators all stand to benefit from an 80 acre spacing program. That will certainly carry more exploratory drilling and conserve steel and more quickly promote operators to assess their new reserves and make appropriate plans for their more efficient operation. If, subsequent to development on 80 acre spacing, it is deemed advisable for the Commission by the operators or by royalty interest to develop on 40 acres, a hearing may be called and the determination made whether 80 acre spacing is adequate for full development or whether additional drilling should be undertaken to develop on 40 acres. If one of these deep reservoirs is developed on 40 acre spacing and it later develops 80 acre spacing would have been adequate, it has cost the operator twice as much money as necessary and twice as much steel as necessary.

That has a real effect on many operator's exploratory program, which in turn effects royalty interest in New Mexico. For example, to drill the four remaining wells necessary to develop Ohio's lease to 40 acre spacing will cost one million dollars. With the same money and pipe, probably six wildcat wells could be drilled. It is obvious such a program could be highly beneficial to the state, and necessary since the result would be to uncover undiscovered oil reservoirs.

MR. CAMPBELL: Isn't it true, Ohio Oil Company since the last hearing has started an offset well which is a direct offset to the discovery well?

MR. WHEELER: We have started a well--

(96mm

MR. CAMPBELL: It is still a 40 acre direct offset to two other wells, isn't it?

MR. WHEELER: By virtue of the fact that--in other words, we wouldn't have any place to go even on 80 acres.

MR. CAMPBELL: That is what we are trying to bring out.

MR. WHEELER: It is a normal location on the proposed pattern.

MR. SHEPARD: Any further statements?

MR. ANDREEN: My name is G. M. Andreen, representing the Magnolia Petroleum Company. I will give my statement to the reporter and save him a little work.

MR. SHEPARD: Thank you very much.

MR. ANDREEN: Magnolia Petroleum Company believes that the proper and adequate spacing in any field should be determined by engineering studies of the reservoir performance. It is our desire, and we believe it the Commission's desire, to base permanent spacing orders on engineering testimony regarding the ability of one well to adequately and efficiently drain an area equivalent to the size unit requested. This is a sound policy, however, a certain amount of development and reservoir data must be available before the engineers can arrive at the proper well spacing. Reservoir Behavior History can only be acquired with the passage of time and development must continue during this time; therefore, there is a definite need for some policy concerning the establishment of temporary spacing orders to govern development whicle Reservoir Behavior Data are collected.

97mm It is a fact that it is always possible to go from a drilled density of one well per 80 acres to a density of one well per 40 acres. However, after development has progressed on one well per 40 acres basis for a period of time it is usually difficult and sometimes impossible to assign 80 acres to each drilled well, even though the reservoir studies indicate that complete development of the field on 40 acre spacing would cause overdevelopment and the drilling of wasteful wells.

The preceding indicates that in the initial phases of development of a field the spacing should be temporarily controlled on wide spacing until the reservoir studies can establish the spacing necessary to adequately drain the reservoir. From an engineering standpoint such a system should prevent the drilling of unnecessary wells. However, from an investment standpoint it is not reasonable to contend that the application of wide initial spacing to all reservoirs, regardless of depth is warranted. In the case of relatively low well costs, which are normally associated with the shallower depths, it is possible to overdevelop a field and still retain a favorable overall economic situation. However, when the normal well costs are high the margin of economic safety is greatly reduced. It is thought that the problem presented in the Denton Field could be avoided in future fields if some Statewide Policy perhaps on a depth bracket basis; were adopted to temporarily control on a wide spacing the initial development of deep fields. Such action would allow time for the collection and

analysis of reservoir performance history, and avoid overdevelop-
ment. The savings in time, money, and material that should
result could be used in the search for new fields. A well dis-
covering a new field adds to the States' potential oil production
and to its oil reserves both of which are necessary for any state
to maintain or increase its stature among the oil producing
states of this nation. An unnecessary well accomplishes nothing
and is a waste of material goods.

The unqualified idea of more wells more oil is not compatible
with modern engineering consideration of well spacing and
reservoir performance. The establishment of allowables
based on the ability of a reservoir to efficiently produce, plus
encouragement of necessary pressure maintenance projects are the
best methods available for increasing the ultimate oil production
from a reservoir. After all, it is the energy available and not
the number of wells that determines the amount of oil that will
be produced.

I wish to emphasize again that Magnolia believes that well
spacing in any reservoir should be based on engineering studies
of the reservoir behavior and the suggested temporary controls
are a means for gaining time to accomplish that purpose.

It is believed the preceding covers the background which
has led to the problem present in the Denton pool. At the original
hearing the Magnolia Petroleum Company supported the request for
a temporary 80 acre spacing order of one years duration with
drilling to be confined to the northwest and southeast quarters
of each quarter section. Magnolia still feels that such an order

98mm analysis of reservoir performance history, and avoid overdevelopment. The savings in time, money, and material that should result could be used in the search for new fields. A well discovering a new field adds to the States' potential oil production and to its oil reserves both of which are necessary for any state to maintain or increase its stature among the oil producing states of this nation. An unnecessary well accomplishes nothing and is a waste of material goods.

The unqualified idea of more wells more oil is not compatible with modern engineering consideration of well spacing and reservoir performance. The establishment of allowables based on the ability of a reservoir to efficiently produce, plus encouragement of necessary pressure maintenance projects are the best methods available for increasing the ultimate oil production from a reservoir. After all, it is the energy available and not the number of wells that determines the amount of oil that will be produced.

I wish to emphasize again that Magnolia believes that well spacing in any reservoir should be based on engineering studies of the reservoir behavior and the suggested temporary controls are a means for gaining time to accomplish that purpose.

It is believed the preceding covers the background which has led to the problem present in the Denton pool. At the original hearing the Magnolia Petroleum Company supported the request for a temporary 80 acre spacing order of one years duration with drilling to be confined to the northwest and southeast quarters of each quarter section. Magnolia still feels that such an order

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is warranted and again urges the Commission to issue such a finding. In our opinion the data presented in this case indicates a possibility that one well will drain 80 acres in the Denton Siluro-Devonian reservoir. However, as far as we are concerned, the evidence is not yet conclusive enough to say that one well will drain 80 acres. Additional development and production history will be necessary to prove or disprove 80 acres as the proper and adequate spacing plan for the Siluro-Devonian reservoir. Very little information is available on the Wolfcamp reservoir and in my opinion it is impossible, at this time, to determine from reservoir performance any indication of the proper spacing. However, from the economic standpoint it appears expedient to develop the Wolfcamp reservoir on a wide spacing until sufficient data is obtained to prove what the proper spacing should be.

Since additional reservoir and production history is needed for both reservoirs in order to establish the proper spacing it is thought essential that future development be temporarily controlled to one well per 80 acres to allow time for the accumulation of suffiecient data to definitely determine the area adequately drained by one well. It is our desire to avoid the drilling of what ultimately may prove to be unnecessary wells and in view of the current material shortage it would indeed be unfortunate should this field be overdeveloped when such a condition could be avoided.

In regard to confining locations to specific quarter sections,

100mm I would like to present the Commission with Exhibits 1 and 3. Exhibit 1 shows the recommended spacing program under which the distance between wells is 1867 feet. Exhibit 2 shows what could happen if future drilling on 80 acres is not confined to specific quarter sections. This situation would result if an operator attempted to make equi-distant offsets and as can be seen from Exhibit 2 it would be possible to have a distance of 3960 feet between wells. This is 226 feet further between wells than would exist on a regular spacing pattern of 320 acres per well. Exhibit 3 indicates what a regular 320 acre spacing plan would look like. Therefore in combination with a temporary 80 acre spacing order Magnolia recommends that drilling be confined to specific quarter quarter sections with provisions made for the granting of irregular locations after a hearing at which the testimony would prove that confiscation of property or waste would occur if the irregular well were not drilled.

It is possible that one of the reasons for the Commission denying the original application for temporary 80 acre spacing in the Denton Field was the abnormal units and the exceptions to off pattern wells that must be granted in order to establish temporary 80 acre development. I have already covered the reasons for the existence of this situation but it still remains a fact that the situation will not improve, and it is still possible to assign 80 acres to each well now in the field. Delaying or denying the application for a temporary 80 acre spacing order in the Denton Field could easily result in requiring unnecessary and wasteful wells.

101mm Magnolia is now drilling at approximately 11,000 feet on their Pope No. 1 well. This will be Magnolia's first well in the Denton Field. Because Magnolia has not had the benefit of production experience in this field, Magnolia has no comment to make on the allowables proposed for the wells on 80 acre units.

I would like to present the Commission with Exhibits 1, 2 and 3. They are attached to the copy of the statement there.

MR. SHEPARD: Any further statements? If not, this will be taken under advisement and we hope to hand down an order without any unusual delay.

Meeting is adjourned.

-o-

STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of proceedings before the Oil Conservation Commission, in Cases No. 269 and 270, held on August 7, 1951, is a true and correct record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, New Mexico, this 28 day of August 1951.

E. E. Greer
REPORTER

My Commission Expires: 8-4-52

NO	NAME
	Exhibits, Statements etc. Cases 269-270

FORM P-111A

PP #8
Case 269

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS

Page 1 of 1
File ML-396 S
Well Denton No. 3

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

CORE SUMMARY

FORMATION NAME	Devonian	Devonian	Devonian
DEPTH, FEET	11,125.0-11,399.5	11,440.0-11,521.0	11,521.0-12,039.9
% CORE RECOVERY	88	96	95
FEET OF PERMEABLE, PRODUCTIVE FORMATION RECOVERED	184.7	78.0	478.0
AVERAGE PERMEABILITY MILLIDARCYS	Max: 48 90° : 19	Max: 33 90° : 7.0	Max: 34 90° : 10
CAPACITY — AVERAGE PERMEABILITY X FEET PRODUCTIVE FORMATION	Max: 8866 90° : 3509	Max: 2574 90° : 546	Max: 16,252 90° : 4780
AVERAGE POROSITY, PERCENT	1.8	2.3	4.0
AVERAGE RESIDUAL OIL SATURATION, % PORE SPACE	22.0	21.1	16.4
GRAVITY OF OIL, °A.P.I.	43.8	43.8	43.8
AVERAGE TOTAL WATER SATURATION, % PORE SPACE	50.3	53.6	36.3
AVERAGE CALCULATED CONNATE WATER SATURATION, % PORE SPACE	50.3	53.6	36.3
SOLUTION GAS-OIL RATIO, CUBIC FEET PER BARREL (1)	1200	1200	1200
FORMATION VOLUME FACTOR—VOLUME THAT ONE BARREL OF STOCK TANK OIL OCCUPIES IN RESERVOIR (1)	1.72	1.72	1.72

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Resume of cases scheduled for special hearing at 10 A. M. August 7, 1951, in the Council Chambers of the City Hall, Santa Fe, New Mexico:

CASE 287: (Continued from July 24 hearing) Roland Rich Woolley's application for order approving unorthodox location NE NE NW Section 31, Township 17S, Range 30 E, NMPM, in Loco Hills Pool, Eddy County, New Mexico.

CASE 294: Similar application by Roland Rich Woolley, this case involving location SE SE 22, Twp. 17S, Rge. 30 E, Eddy County, New Mexico.

CASE 295: Application of Continental Carbon Company for an order and permit to extend its present permit (granted after hearing of Case 169) and increase permissible use of gas in the manufacture of channel carbon black in Lea County, New Mexico.

CASE 296: In the matter of the application of the Oil Conservation Commission upon its own motion for an order creating a new pool for or extension of an existing pool for certain wells in southeastern New Mexico, as presented by (1) Aztec Oil and Gas Company; (2) Shell Oil Company; (3) Ohio Oil Company; and (4) Tide Water Associated Oil Company.

CASE 297: In the matter of the application of Aurora Gasoline Company for an order authorizing an unorthodox well location and approval of a water-flooding program for secondary recovery in the NE/4 of Section 34, Township 22 S, Range 37 E, NMPM (Penrose Skelly pool), Lea County, New Mexico.

CASE 291: (Continued from July 24 hearing). The application of the Oil Conservation Commission upon its own motion for taking testimony on and considering extension of boundaries or consolidation of Mesaverde gas pools in San Juan County, New Mexico.

CASE 279: This case has been successively continued from hearings of June 21 and July 24. It is concerned with the Commission's application upon its own motion for an order directed to S. T. Silverstein, T. H. Donnelly, Sarah D. Ulmer and the Massachusetts Bonding and Insurance Company for plugging and abandonment of well in SE SE SW 11-12N-32E, NMPM, Quay County, New Mexico.

8

CASES 269 and 270: Rehearing and argument continued from July 24 to August 7, 1951. Phillips Petroleum Company is applicant. Case 269 relates to proration units and allowables for Siluro-Devonian common source of supply discovered in McAlester Fuel Company's J. M. Denton Well No. 1-A (SW SE 11-15S-37E); Case 270 relates to Phillips' application for 80-acre proration units and allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B (NWSW 12-15S-37E).

PHILLIPS PETROLEUM COMPANY

LEGAL DEPARTMENT
DON EMERY
VICE PRESIDENT
AND GENERAL COUNSEL
RAYBURN L. FOSTER
ASSISTANT GENERAL COUNSEL
HARRY D. TURNER
GENERAL ATTORNEY

MIDLAND, TEXAS

Box 791

April 22, 1951

MIDLAND DIVISION
RAYMOND A. LYNCH
CHIEF ATTORNEY
CARL W. JONES
ASSISTANT CHIEF ATTY
HORACE N. BURTON
JOHN T. FERGUSON
STAFF ATTORNEYS

Applications of Phillips Petroleum Company for 80-acre Spacing in the Siluro-Devonian and Wolfcamp Common Source of Supply in the Denton Field, Lea County, New Mexico

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico
Attn. Mr. R. R. Spurrier

Gentlemen:

The above applications are set for hearing before the Commission on May 1, 1951. Mr. Jack Campbell of Roswell, who represents McAlester Fuel Company in connection with these applications, has stated that the May 1st date will not afford him sufficient time for preparation and has requested Phillips Petroleum Company to agree to continue the hearings until a later date. On behalf of Phillips Petroleum Company, I have agreed to such a continuance on Mr. Campbell's assurance that McAlester will not stake any well locations or commence any drilling operations prior to the hearings which would have the effect of upsetting the proposed 80-acre spacing pattern.

It is therefore requested that the hearings on the above applications be continued from the May 1st date and that they be re-set for hearing on May 22nd, the date of the regular Statewide hearing. This date is satisfactory to Mr. Campbell.

Very truly yours,

Carl W. Jones

Carl W. Jones
Attorney

CWJ/o

cc: Mr. Jack Campbell
%Atwood, Malone, and Campbell
Attorneys at Law
Roswell, New Mexico

Mr. C. P. Dimit
Mr. Harry D. Turner

LAW OFFICES OF
HEIDEL & SWARTHOUT
LEA COUNTY STATE BANK BUILDING
LOVINGTON, NEW MEXICO

F. L. HEIDEL
A. M. SWARTHOUT

May 16, 1951

Mr. R. R. Spurrier
Secretary and Director
Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Applications in Cases 249 and 269

Dear Mr. Spurrier:

We wish to thank you for forwarding copies of the Applications in the above captioned cases. We have made copies of same for our files, and are returning herewith your copies.

Sincerely yours,

of Heidel & Swarthout

AMS:ma

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
RECEIVED
MAY 21 1951

BEFORE THE OIL CONSERVATION COMMISSION
OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR THE ESTABLISHMENT OF PRORATION
UNITS AND PROVIDING FOR THE ALLOWABLES
FOR THE SILURO-DEVONIAN COMMON SOURCE
OF SUPPLY DISCOVERED IN McALESTER FUEL
COMPANY ET AL J. M. DENTON WELL NO. 1-A,
SW/4 SE/4 SECTION 11 TOWNSHIP 15 SOUTH
RANGE 37 EAST, LEA COUNTY, NEW MEXICO,
KNOWN AS THE DENTON FIELD.

CASE 269
ORDER R-65

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, Oklahoma, and alleges and states:

1. The McAlester fuel Company, et al, El Dorado, Arkansas, has drilled and on October 4, 1949 completed a well known as "J. M. Denton No. 1-A" located in the center of the SW/4 SE/4 Section 11-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Siluro-Devonian, which common source of supply was found in said well at the depth of from 11,325 feet to 11,464 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled or are now being drilled to said common source of supply in the area:

(a) Ohio Oil Company - Denton No. 3, located in NW/4 SE/4 Section 11-15S-37E, which was completed on January 22, 1951 as a producing oil well from depth 11,916 feet to depth 12,044 feet.

(b) Atlantic Refining Company - Bettie C. Dickinson No. 1-A, located in NW/4 NW/4 Section 13-15S-37E, which was completed December 9, 1949 as a producing oil well from depth 11,272 feet to depth 11,324 feet.

(c) Gulf Oil Corporation - L. R. Chamberlain No. 1, located in NW/4 NE/4 Section 14-15S-37E, which was completed March 9, 1950 as a producing oil well drom depth 11,501 feet to depth 11,513 feet.

(d) McAlester Fuel Company - McClure No. 1-A, located in SW/4 NE/4 Section 14-15S-37E, which was completed March 5, 1951 as a producing oil well from depth 11,503 feet to depth 12,321 feet.

(e) McAlester Fuel Company - J. S. Waller No. 1, located in NE/4 NE/4 Section 15-15S-37E, which was completed as a dry hole on February 20, 1950 at total depth 12,015 feet.

(f) Ralph Lowe - Dickinson Estate No. 1, located in SE/4 SW/4 Section 35-14S-37E, which was completed December 11, 1950 as a producing oil well from depth 12, 360 feet to total depth 12,385 feet.

(g) Phillips Petroleum Company - Denton No. 1, located in SE/4 NW/4 Section 11-15S-37E, which encountered the Siluro-Devonian common source of supply from depth 11,445 feet to depth 12,555 feet which yielded flowing oil production on numbrous drill-stem tests, has reached total depth 12,623 feet, run casing, and will be completed as a producingjoil well.

(h) Atlantic Refining Company - Federal-Jones No. 1, located in SW/4 SW/4 Section 35-14S-37E, which was drilling at approximately 6690 feet on March 10, 1951.

(i) Atlantic Refining Company - State No. 1-T, located in SE/4 SW/4 Section 2-15S-37E, which was drilling at approximately 9800 feet on March 10, 1951.

(j) Skelly Oil Company - State No. 1-F, located in NE/4NW/4 Section 2-15S-37E, which was drilling at approximately 11,000 feet on March 10, 1951.

(k) Ohio Oil Company - Denton No. 4, located in NE/4 SW/4 Section 11-15S-37E, which was drilling at approximately 4750 feet on March 10, 1951.

(l) Atlantic Refining Company - Dickinson No. 2-B, located in NW/4 NW/4 Section 12-15S-37E, which was drilling at approximately 7500 feet on March 10, 1951.

(m) McAlester Fuel Company - McClure No. 1-B, Located in NW/4 SE/4 Section 14-15S-37E, which was drilling at approximately 3500 feet on March 10, 1951.

(n) McAlester Fuel Company - McClure No. 1-C, located in NE/4 NE/4 Section 14-15S-37E, which was drilling at approximately 375 feet on March 10, 1951.

3. A plat of the area showing the location of the wells referred to above, circled in red, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Siluro-Devonian formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration unit may, at the discretion of the operator, be in the center of either governmental quarter-quarter section comprising the unit, with a tolerance of 150 feet to avoid surface obstructions.

6. That in consideration of the thickness of the oil pay section of the common source of supply, the consequent ability of the wells to produce without waste, and the rights of lessees and royalty owners to receive their share of the total State allowable production, the Commission should

in its order provide that each well now producing or hereafter completed as a producer in the common source of supply shall have a top unit allowable to be fixed by the Commission, but not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

7. That the area which may at this time be reasonably considered to contain the probable productive limits of said common source of supply is: Sections 34, 35 and 36, Township 14 South, Range 37 East and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and the north halves of Sections 22, 23, and 24, all in Township 15 South, Range 37 East, Lea County, New Mexico; and that the Commission's order in this cause should be made applicable to and include all of this described area, subject to any future extensions or reductions thereof after notice and hearing.

WHEREFORE, applicate respectfully requests that the commission set this application for publi c hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming the pool, establishing proration units of 80 acres each, providing for the drilling of only of only one well on each proration unit with such well to be located in the center of either of the two governmental quarter-quarter sections comprising such proration unit with a tolerance of 150 feet in any direction to avoid surface obstructions, and providing for each such well an allowable of not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

DATED this 22nd day of March, 1951.

R. M. WILLIAMS

Raymond A. Lynch

Harry D. Turner,
Attorneys for Applicant

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

May 14, 1951

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P

Heidel & Swarthout
Lea County State Bank Building
Lovington, New Mexico

RE: Applications in Cases 249 and 269

e r
Gentlemen:

We are enclosing copies of applications in the two captioned cases. When these have served your purpose, we would appreciate your returning them for our permanent record.

Please pardon the delay in forwarding these to you.

Very truly yours,

Secretary and Director

bpw

MEMORANDUM:

Re: Eighty-Acre Spacing -
Denton Pool, Lea County,
New Mexico

1. The Nature of this Hearing.

Neither the original application for 80-acre spacing in the Denton Pool nor the rehearing of that application now being considered should be looked upon as a contest between those in favor of 80-acre spacing and those opposed to 80-acre spacing. This proceeding should be regarded as a conference represented by the oil and gas industry of the State, on the one hand, and the Oil Conservation Commission as the regulatory authority of the State of New Mexico, on the other hand, meeting in an effort to work out the problem of how to get more oil and gas from a pool for less money and with the use of less steel and by the drilling of fewer wells.

2. The Role of the Operator.

No one operator in a pool or field should be permitted to set a spacing pattern in the field best suited to his individual needs or desires. The best interests of all the operators, of all the royalty owners, including the State of New Mexico as a royalty owner, and of the public must be the criteria for determining a spacing pattern in any field. The producer is the man who takes the stockholder's dollar and digs an oil well with it. He has the expectation of getting that dollar back, plus a profit. The producer acts in a dual capacity. He is, in a sense a private and a public trustee. He is a private trustee in the sense that he must represent the best interests of his stockholders in seeing to it that the undertaking returns a profit. He is a public trustee in the sense that he must increase production at reduced cost in order to keep down the cost of the product to the ultimate consumer. One need not be a technical man, such as an engineer or a geologist, to understand these facts.

The Role of the Royalty Owner.

The royalty owner is one to whom a portion of the production is payable, either in kind or value. His role should be the same as that of the operator, that is, a public and a private trustee. The royalty owner should be regarded as a private trustee to the extent only of seeing that the ultimate in the recovery of oil and gas from the pool is had. He has the same duties and the same obligations as the operator in his capacity as a public trustee in that he should not insist upon a program or a method of development of a field or its oil and gas content that leads to high cost of production which must be passed on by the operator to the consuming public.

alty Owner vs. Producer.

Every proceeding having for its purpose the obtaining of wider well spacing, the royalty owner is generally found arrayed against the producer. The royalty

owner generally feels that his best interest is served by closer well spacing. Nothing could be farther from the truth. If the royalty owner cannot profit by wider well spacing, neither can the producer. This fact is obvious, since any method of well spacing advocated by the producer which results in the loss of oil to the royalty owner results in a proportionately higher loss of oil to the producer. The self-interest of an operator would dictate that he not advocate a spacing pattern that would bring about a loss to himself or the royalty owner. It may therefore be reasonably assumed that when an operator advocates wider well spacing he is honest in his convictions about the matter and believes that wider spacing is to the best interests of himself and all others similarly situated, including the royalty owner.

5. Economic Factors or Desire.

The operator in a pool is usually guided in his efforts in the production of oil and gas, and in the fixing of a spacing pattern, by the economics of the case. An operator cannot drill wells and produce oil or gas at a loss. The adoption of any spacing pattern which inures to the economic benefit of the producer likewise inures to the economic benefit of the royalty owner. However, in most instances, the royalty owner is motivated by a desire for more and more royalty payments, and is less and less concerned with the science and the economics necessary to be applied by the producer to the orderly and proper development of a pool. The producer should not be permitted to dictate a course of action by the regulatory body that is inimical to the royalty owner. Every producer should recognize that the interest of himself and the royalty owner is mutual, and most producers do recognize this. Any action on the part of the royalty owner which increases the cost of production to the operator directly contravenes the provisions of the Statute of the State of New Mexico, Section 69-213, which will later be quoted. Such action necessarily increases the cost of the products of the oil and gas to the ultimate consumer. Likewise, any evidence of a selfish attitude on the part of the royalty owner by way of securing smaller spacing of wells requires the drilling of unnecessary wells, creates fire and other hazards conducive to waste, and this violates the provisions of the Statute. It is the duty of the regulatory authority to bring into proper focus all conflicting interests in a pool or field. This can best be done by considering the problem objectively and without regard to the desires or emotions of the parties.

It is the duty of the regulatory body to see that no producer profits at the expense of the royalty owner or the general public. And it is the duty of the regulatory body to see that no royalty owner profits at the expense of the producer or the general public. The interest of the royalty owner and the producer is mutual to the extent that they should seek the best methods by which a pool or field may be efficiently and economically drained and developed. This point is concerned with more than just the primary methods for the recovery of oil and gas.

6. Pressure Maintenance vs. Primary Recovery Methods.

Most producers regard pressure maintenance in the production of oil and gas as the long-range view, while the primary recovery method is regarded as the short-range view. Here again the interest of the royalty owner and the producer is mutual. At best, primary methods of recovery obtain only a small percentage of the oil in the pool - less than 30% in most instances. Pressure maintenance methods substantially increase this percentage of recovery of the recoverable oil. The application of pressure maintenance methods is directly related to well spacing; that is, it is now conceded that wider well spacing more readily lends itself to efficient pressure maintenance methods than does smaller well spacing. In deep pools such as the Denton Pool, and under the reservoir conditions which obtain in this pool, the recovery of oil by primary methods is shortlived. If the ultimate in recovery of oil and gas in this pool is to be obtained, pressure maintenance methods must be resorted to. Since well spacing is directly related to the best results to be obtained under pressure maintenance recovery methods, it is timely to consider the spacing pattern for the field. The field should not be allowed to be developed on 40-acre spacing under primary recovery methods with the expectation that the best results can be obtained in the application of pressure maintenance methods. If, for any reason, those who are advocating 80-acre spacing in the Denton Pool should be mistaken, this does not condemn the adoption of 80-acre spacing for the simple reason that resort to 40-acre spacing can always be had - if, as, and when it becomes evident that 80-acre spacing should not be the pattern in the field. On the other hand, if those who are advocating 40-acre spacing for the field - and there is only one producer in the area who is doing this - should for any reason be mistaken in their view, a resort to 40-acre spacing can never be had.

7. Eighty-Acre Spacing vs. Smaller Spacing.

No spacing pattern gets oil out of the ground. All that a spacing pattern does is to determine the distance between wells, based upon some reasonable hypothesis. Rule 104 (b) of the Rules of the Oil Conservation Commission of the State of New Mexico provides:

> "Each well drilled within a defined oil pool shall be located on a tract consisting of approximately 40 surface contiguous acres substantially in the form of a square in accordance with the legal subdivision of the United States Public Land Surveys or on a governmental quarter quarter section or lot * * *."

This rule is of statewide application and applies only in the event the Commission does not fix a smaller or larger spacing pattern for the pool.

This statewide rule does not take precedence over the statutory provisions relating to well spacing. Section 69-213, New Mexico Statutes 1941, Annotated,

contains this provision:

> "No owner of a property in a pool should be required by the Commission, directly or indirectly, to drill more wells than are reasonably necessary to secure his proportionate part of the production. To avoid the drilling of unnecessary wells, a proration unit for each pool may be fixed, such being the area which may be efficiently and economically drained and developed by one (1) well. The drilling of unnecessary wells creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator, and thus also unnecessarily increases the cost of the products to the ultimate consumer."

While the rule fixes 40-acre spacing as a statewide spacing pattern, the Statute recognizes that conditions may exist which will require, in the protection of public and private interests, a wider spacing pattern. And, in order to implement the spacing pattern in a pool or field, the same section of the Statute quoted above further provides:

> "The pooling of properties or parts thereof shall be permitted, and, if not agreed upon, may be required in any case when and to the extent that the smallness or shape of a separately owned tract would, under the enforcement of a uniform spacing plan or proration unit, otherwise deprive or tend to deprive the owner of such tract of the opportunity to recover his just and equitable share of the crude petroleum and natural gas in the pool; provided, that the owner of any tract that is smaller than the drilling unit established for the field, shall not be deprived of the right to drill on and produce from such tract, if same can be done without waste; but in such case, the allowable production from such tract, as compared with the allowable production therefrom if such tract were a full unit, shall be in ratio of the area of such tract to the area of a full unit."

Every operator must recognize that there is no virtue in any spacing pattern as such. Spacing is only one of many factors to be used in regulating the production of oil and gas from a given pool. Some pools or fields more readily lend themselves to development on 40-acre spacing than on 80-acre spacing, and vice versa. The chief difficulty in fixing a spacing pattern for a pool is that it can rarely be determined with any degree of accuracy what the pattern should be until after the pool has been fully developed. The matter of determining well spacing, therefore, becomes largely a matter of policy. It is true that the proper spacing can be determined under any set of assumed

conditions. In the past in New Mexico, well spacing has been geared largely to production from shallow pools. A shallow pool is defined by Rule 55:

> "Shallow pool shall mean a pool which has a depth range from 0 to 5000 feet."

Production of oil from a deep pool in the State of New Mexico is of fairly recent origin. A deep pool is defined by Rule 18:

> "Deep pool shall mean a common source of supply which is situated 5000 feet or more below the surface."

It must be self-evident to any producer that the definitions of a shallow pool and a deep pool are more or less arbitrary. And, of course, as to the matter of well spacing it must be still more evident to a producer that the enforcement of a 40-acre spacing pattern in every pool would be arbitrary and without excuse or justification on any ground.

8. Temporary 80-Acre Spacing vs. Permanent 80-Acre Spacing.

The operators in the Denton Pool are not asking that the Commission adopt a permanent 80-acre spacing pattern for the field. Good faith requires that the spacing pattern be placed upon a temporary basis. In fact, there is no such thing as a permanent spacing pattern in an oil and gas field under the present regulatory setup. The Commission may, and in fact, it would be its duty to, if conditions required it, change the spacing pattern in any field or pool. But, in order that there may be no misunderstanding about the position of the operators in this pool, a specific request for 80-acre spacing for a temporary period of one year has been made. The temporary nature of the order requested meets the argument made by the operator opposed to 80-acre spacing that once 80-acre spacing is adopted, always 80-acre spacing. Nothing could be farther from the truth. The operators who are sponsoring 80-acre spacing in this field do not want it, if, in fact, it should not be adopted. But, as we have pointed out, the field will be completely developed before one gets that answer.

9. Steel Shortage vs. 40-Acre Spacing.

A National emergency has been declared by the President of the United States. With the declaration of a National emergency came a declaration of a shortage of certain critical materials. Steel is on this list. There is no doubt that there is a shortage of oil field tubular materials. This situation calls for conservation of steel and the adoption of practices in the oil fields that will implement the conservation of steel. One way to save steel is to adopt wider well spacing. Eighty-acre spacing requires the drilling of only one half as many wells as is required by 40-acre spacing. The adoption of

80-acre spacing for the Denton Pool has been requested on a temporary basis. If, at the end of the one-year temporary period requested, it can be demonstrated from additional information obtained in the development of the field that the reservoir conditions in the field are better adapted to 40-acre spacing than to 80-acre spacing, then the Commission can impose 40-acre spacing and no one will have been hurt, and, in the meantime, at least a temporary savings of steel will have been effected. On the contrary, if, at the end of the one-year temporary period, it is then the judgment of the Commission that 80-acre spacing should be continued for another temporary period or made permanent, then, to the extent that 80-acre spacing is perpetuated in the pool, a savings in steel will have been effected. If the deep pay in the Denton Pool proves to be as prolific as it is now thought to be, and if the National emergency should demand additional oil, then it will have been developed that the Denton Pool will be a good place to expend steel in satisfaction of meeting the additional requirements for oil for the National emergency.

10. Development of Future Reserves vs. 40-Acre Spacing.

When drilling is comparatively shallow, development costs are relatively low. On the other hand, costs tend toclimb with the development of deep reserves. It is shown in this record that the average cost for the drilling of four wells was $273,000. per well. This is a lot of money to put in a hole in the ground. It is true that these costs are determined on present-day inflated prices. It is likewise true that the relatively short term of payout is determined on the present-day inflated price which the producer receives for his product. It would be a short-range view to assume that present income can continue at the present inflated rates. In talking about development costs one is not just talking about the Denton Pool. On any basis deeper drilling will be expensive and the cost of developing a field is directly related to the spacing pattern. This is an obvious fact because the more wells an operator drills, the more money he must spend in drilling the wells. If, by enlarging the spacing pattern, the number of wells to be drilled to develop the field can be decreased, then drilling costs can be decreased. With a decrease in drilling costs will come a more rapid discovery of reserves. The best thought of the industry now is that future reserves will be found at increasing depths and, likewise, at increasing costs. Therefore, it is to the best interest of the State of New Mexico and of its people that drilling costs be held to a minimum in order to encourage the discovery of additional oil reserves at greater depths. The adoption of 80-acre spacing will do this. And, likewise, the adoption of 80-acre spacing will more quickly determine the outer limits of production of a pool after discovery of production.

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER		NIGHT LETTER	

WESTERN UNION

1206

W. P. MARSHALL, PRESIDENT

INTERNATIONAL SERVICE

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FULL RATE		LETTER TELEGRAM	
VICTORY LETTER		SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
			OIL CONSERVATION COMMISSION	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Case 269

APRIL 20 1951

MR GLENN STALEY
NEW MEXICO OIL AND GAS ENGINEERING COMMITTEE
HOBBS NEW MEXICO

PHILLIPS AGREED TO POSTPONE CASES 269 AND 270 UNTIL MAY 22 HEARING

R R SPURRIER

FILE

ACCTG

April 26, 1951

TO ALL MEMBERS NEW MEXICO OIL AND GAS ENGINEERING COMMITTEE:

Gentlemen:

A telegram has been received from Mr. R. R. Spurrier stating that Phillips agreed to postpone Cases 269 and 270 until May 22 hearing. These cases were originally schedule for a May 1 hearing.

GLENN STALEY

RS

N. M. OIL & GAS ENGINEERING COMMITTEE
HOBBS, NEW MEXICO
April 26, 1951

: NEW MEXICO
ATE GEOLOGIST
NEW MEXICO

, 1951

of the application of Phillips
tablishment of proration units
s for the Siluro-Devonian common
McAlester Fuel Company et al
E/4 11-15S-37E, Lea County.

COPY

Case 270 - In the matter of the application of Phillips Petroleum Company for the establishment of proration units and providing for the allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company, Bettie C. Dickinson No. 1-B, NW/4 SW/4 12-15S-R37E, Lea County, known as the Denton field.

Gentlemen:

An application for continuance of the two captioned cases before the Commission was received from Phillips Petroleum Company, dated April 22.

The Commission has met, and the case will be postponed until the regularly scheduled hearing for May 22.

Very truly yours,

OIL CONSERVATION COMMISSION

R. R. Spurrier

bpw

Secretary and Director

STATE OF NEW MEXICO
OFFICE OF STATE GEOLOGIST
SANTA FE, NEW MEXICO

April 24, 1951

C
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Y

RE: Case 269 - In the matter of the application of Phillips Petroleum Company for the establishment of proration units and providing for the allowables for the Siluro-Devonian common source of supply discovered in McAlester Fuel Company et al J. M. Denton No. 1-A, SW/4 SE/4 11-15S-37E, Lea County. known as the Denton field.

RE: Case 270 - In the matter of the application of Phillips Petroleum Company for the establishment of proration units and providing for the allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company, Bettie C. Dickinson No. 1-B, NW/4 SW/4 12-15S-R37E, Lea County, known as the Denton field.

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OIL CONSERVATION COMMISSION

bpw

Secretary and Director

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER	X	NIGHT LETTER	

WESTERN UNION

1206

W. P. MARSHALL, PRESIDENT

INTERNATIONAL SERVICE

Check the class of service desired; otherwise this message will be sent at the full rate

FULL RATE		LETTER TELEGRAM	
VICTORY LETTER		SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	FD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
			Oil Commission	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

OI SANTA FE, N. M. APRIL 25, 1951

OIL CONSERVATION COMMISSION.
HOBBS, NEW MEXICO

ATTENTION: ROY O. YARBROUGH

PENDING HEARING TO BE HELD MAY 22 CASES 269 AND 270 WHICH IS APPLICATION OF PHILLIPS FOR 80 ACRE SPACING IN THE DENTON AREA, ALL APPLICATIONS (C-101) TO DRILL IN THIS AREA WILL BE FORWARDED TO THIS OFFICE FOR APPROVAL.

R. R. SPURRIER

cc: Carl Jones, Phillips, Midland
Glenn Staley, Hobbs
Jack Campbell, Roswell

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1220

W. P. MARSHALL, PRESIDENT

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

LA48 SSE293

1951 MAY 21 PM 4 16

LHBA090 PD=LOVINGTON NMEX 21 300P=

NEW MEXICO OIL CONSERVATION COMMISSION=

CARE GUY SHEPHERD LAND COMMISSIONER=

Case 269
270.

UNDERSIGNED ROYALTY OWNERS IN AREA DENTON POOL LEA COUNTY WISH TO GO ON RECORD AS OPPOSING EIGHTY ACRE SPACING. WHEN ORIGINAL LEASES WERE EXECUTED IN THIS AREA FORTY ACRE DRILLING WAS CUTOMARY AND IMPLETED. DEVELOPMENT TO DATE I THIS FIELD PROVIDED FOR FORTY ACRE SPACING AND UNDERSIGNED BELIEVE SHOULD CONTINUE. EIGHTY ACRE SPACING WILL FORCE COMPLUSORY POOLING OF ROYALTY OWNERS INTERESTS AND CAUSE INJUSTICE IN EDGE WELLS. EIGHTY ACRE SPACING DISAPPOINTING TO ROYALTY OWNERS SAWYER POOL AND ROYALTY CHECKS DECREASING AT SERIOUS RATE AMARADA HAMILTON POOL UNDER EIGHTY ACRE SPACING. YOUR CONSIDERATION APPRECIATED =

J M DENTON, J L REED, GRANVILLE DICKINSON TRUSTEE FOR CANDACE DICKINSON, WALTER E DICKINSON AND W GORDN DICKINSON, BERNICE DICKINSON, MRS JOHNNIE FORT, J E SIMMONS, JEAN SIMMONS FELFE, W W CARTER, SYLVESTER P HOOPER, BETTY LOU POPE BY FONZO E FORT GAURDIAN, AUDIE POPE, JOHNNIE FORT RUTHERFORD, FANNIE MAE GARDNER, CLAUDE A FORT, EDD FORT=

Guy asked that this be read with the record of Case 269

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

TIDE WATER ASSOCIATED OIL COMPANY
MID-CONTINENT DIVISION
MELLIE ESPERSON BLDG. POST OFFICE BOX 1404
HOUSTON 1, TEXAS

May 31, 1951

Case 165
270

Mr. R. R. Spurrier, Secretary
Oil Conservation Commission
Santa Fe, New Mexico

Dear Dick:

It seemed to me you were surprised at the amount of allowable production Shell Oil Company was receiving for its dually completed wells in the Jordan Connell sand and Ellenberger fields in Ector County, and the Bedford Devonian and Ellenberger fields in Andrews County, when I mentioned it at our hearing May 22nd.

I did not have copies of the allowable schedules at the time to offer as exhibits, and do not ask now that same be made a part of the official record. For your own information, however, I would like for you to see what I was talking about. You will note that Shell dually completed its University "D" wells Nos. 9, 10 and 13 to produce from the Connell Sand and from the Ellenberger, and allowables are 122 B/D for each horizon.

In the Bedford Devonian and Ellenberger fields, Shell and The Texas Company, as a joint operation, have dually completed their Ratliff Bedford wells Nos. 1, 2, 4 and 5. For these they are allocated 325 B/D for each of the Ellenberger completions and as high as 250 B/D for their No. 1 well in the Devonian, which produces through the casing. Further, this field was discovered by them; they own all the wells.

I believe your inference of my thoughts in this matter will be more than adequate and need no additional comment.

Hope to see you June 21st at your next hearing and again enjoy that Santa Fe mountain air.

Yours very truly,

J. B. Holloway

JBH/pb

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO.
RECEIVED
JUN 1 1951

EXHIBIT "A"

PRORATION SCHEDULES LISTED BELOW ARE EFFECTIVE MARCH 1, 1951, 7 A. M., UNTIL FURTHER ORDERED

(8-207) JORDAN 4500' FIELD, CRANE COUNTY

Approx. Depth 4660' Disc. 8-18-47

Allocation: Per Well
Ratio: 2000-1

OPERATOR AND LEASE	WELL NO	GOR MCF-1	POTE	WELL ALLOW	LEASE ALLOW
THE TEXAS COMPANY					
Connell, W. E.	31		79	31 #	
	32		3	3 M	
	35		89	15 #	49
H.E. & W. E. Connell et al Unit					
	1		70	45 #	45
Jeenie Ann McKnight	1		258	55 #	
	2		153	55 #	110
FIELD TOTAL:	6		652	204	204

(8-233) JORDAN CONNELL SAND FIELD, ECTOR COUNTY

Disc. 4-28-48 Depth 8830'

OPERATOR AND LEASE	WELL NO	POTE	GOR MCF-1	WELL ALLOW	LEASE ALLOW
GULF OIL CORPORATION					
W. E. Connell "B"	20-C	233		105 #	
	22	305		105 #	
	25	202		105 #	
	27	138		105 #	420
University Fogelson	2-C	137		65 #	65
University Fogelson "A"	1-C	202		75	
	2-C	128		122	197
SHELL OIL COMPANY					
Connell "C"	2	70		70 #	70
University "E"	9	515		122	122
University "D"	9	339		122	
	10-T	325		122	
	13-T	157		122	366
SINCLAIR OIL & GAS COMPANY					
W. E. Connell	4	487		122	122
THE TEXAS COMPANY					
W. E. Connell NCT-7	36-C	287		122	
	39-C	145		122	244
W. E. Connell NCT-8	33	589		122	122
Ida McDonald	11-C	254		122	
	[illegible]	132		122	
	17-C	182		122	
	19-T	138		122	488
FIELD TOTAL:	20			2216	2216

JORDAN 4500' AND JORDAN CONNELL SAND FIELDS
DISTRICT NO. 8
PAGE 277
3-1-51
lbr

EXHIBIT "A" PRORATION SCHEDULE LISTED BELOW IS EFFECTIVE MARCH 1, 1951, 7 A. M., UNTIL FURTHER ORDERED

(8-191) JORDAN ELLENBERGER FIELD, ECTOR COUNTY
Disc. 2-21-47 Approx. Depth 8914'

OPERATOR AND LEASE	WELL NO	POTE	GOR MCF-1	WELL ALLOW	LEASE ALLOW
AMERADA PETROLEUM COMPANY					
Connell, Hattie E.	1	328		122	
	2	394		122	
	3	324		122	
	4	135		122	488
GULF OIL CORPORATION					
W. E. Connell "A"	5-E	173		122	
	6-E	181		122	
	7-E	173		122	366
W. E. Connell "B"	20	201		122	
	22	247		0	
	25	210		122	
	27	181		122	
	28-E	187		122	488
Connell Estate et al	7-E	563		122	122
University Fogelson	2-E	124		10 #	10
University Fogelson "A"	1	154		70#	
	2	185		122	192
SHELL OIL COMPANY					
University "D"	9	340		122	
	10-C	635		122	
	13	173		122	366
Connell "C"	1	179		122	
	2	333		122	244
SINCLAIR OIL & GAS COMPANY					
W. E Connell	4	412		122	
W. E Connell Tract "C"	5	234		122	122
THE TEXAS COMPANY					
W. E Connell NCT-1	40	196		122	
	41	127		122	
	43	141		122	
	46	175		122	488
W. E. Connell NCT-3	45	141		122	
	48	217		122	
	49	223		122	366
W. E. Connell NCT-5	42	140		122	122
W. E. Connell NCT-7	36-T	187		122	
	39-T	236		122	244
Ida McDonald	10	138		122	
	11	603		122	
	14	723		122	
	17-T	138		122	
	19-C	562		122	
	20	132		122	732
FIELD TOTAL:	39			4472	4472

JORDAN ELLENBERGER FIELD
DISTRICT NO. 8
PAGE 278
3-1-51

EXHIBIT "A"

PRORATION SCHEDULES LISTED BELOW ARE EFFECTIVE MARCH 1, 1951, 7 A. M., UNTIL FURTHER ORDERED

(8-151) BEDFORD DEVONIAN FIELD, ANDREWS COUNTY
Approx. Depth 8777' Disc. 9-17-45

Permissible GOR: 2000-1
Allocation: 75% Acreage 25% Per Well
Acreage Factor: 4.70 Per Well 62 barrels

OPERATOR AND LEASE	WELL NO	ACRG	GOR MCF-1	POTE	ACRG ALLOW	PER WELL ALLOW	TOTAL WELL ALLOW	LEASE ALLOW
SHELL OIL COMPANY AND THE TEXAS COMPANY								
Ratliff Bedford	1-C	40		1105	188	62	250	
	2-C	40		243			227 #	
	3	40		217			217 #	
	4-C	40		313			184 #	
	5-T	40		181			181 #	
	7	40		262			150 #	
	11	40		454			109 #	1318
FIELD TOTAL:	7	280		2775	188	62 (1068)	1318	1318

(8-153) BEDFORD ELLENBERGER FIELD, ANDREWS COUNTY
Approx. Depth 11018' Disc.10-26-50

OPERATOR AND LEASE	WELL NO	ACRG	POTE	GOR MCF-1	DAILY WELL ALLOW	DAILY LEASE ALLOW
SHELL OIL COMPANY AND THE TEXAS COMPANY						
Ratliff Bedford	1-T		1214		325	
	2-T		580		325	
	4-T		639		325	
	5-T		358		325	
	6-T		623		325	
	8		165		33 #	
	9		289		325	1983
FIELD TOTAL:	7		3868		1983	1983

STATE OF NEW MEXICO
OFFICE OF STATE GEOLOGIST
SANTA FE, NEW MEXICO

July 19, 1951

C
O
P
Y

Mr. Emmett D. White
Leonard Oil Company
Roswell, New Mexico

Dear Mr. White:

This will acknowledge your letter of June 29 relative to Case 269 and 270 of the Oil Conservation Commission. This is to advise that your comments have been included in the files of Cases 269 and 270. Thank you for your opinions.

Very truly yours,

R. R. Spurrier
Secretary - Director

RRS:nr

Case 269 (and 270)

Leonard Oil Company

Roswell, New Mexico

ROBERT J. LEONARD
PRESIDENT

June 29, 1951

EMMETT D. WHITE
EXECUTIVE VICE PRESIDENT

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
RECEIVED
JUL 2 1951

Mr. R. R. Spurrier
Secretary and Member
New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Re: Case 269, Phillips' Application - 80-acre Spacing
Denton-Devonian Field
Case 270, Phillips' Application - 80-acre Spacing
Wolfcamp Field.

Dear Mr. Spurrier:

Reference is made to the above cases which were heard before the Oil Conservation Commission May 22, 1951, and to Orders 74 and 75 which were handed down by the Commission June 5, 1951, in which the application of Phillips Petroleum Company for an order to establish 80-acre proration units and well spacing in the above field was denied.

We have seen a copy of Phillips' application for a re-hearing and note that Judge Wright has been added to Phillips' legal staff and that he has requested the Commission to deny approval of new well locations not on pattern suggested by Phillips pending such re-hearing and final disposition of the case.

Leonard Oil Company made an appearance before the Commission in both of these cases and protested the application filed by Phillips Petroleum Company. We are convinced that the applicant failed to present evidence which would justify a departure from our statewide spacing rules, and we believe the Commission was fully justified in its conclusions presented in the June 5th orders.

The typographical error as to the description of the lands involved is of no consequence since the transcript of the testimony correctly sets forth the proper lands and can be corrected by issuing an amended order. The applicant's objection to different allowables in the northern part of the pool is well taken. However, it has nothing to do with 80-acre spacing, and since the discrepancy in allowables grew out of a stenographic error in issuing the June 5th orders, it could certainly be corrected without bringing up again the spacing controversy.

While the shortage of steel may temporarily delay the orderly development of the pool on 40-acre spacing, the pool would ultimately be

drilled up and would result in each royalty owner securing his just proportion of the oil. During the process of developing the field, an operator may postpone drilling due to pipe shortage by either agreement with the royalty owner or by payment of compensatory royalty.

The applicant in this case is asking the Commission to authorize well spacing which could easily cause unfair withdrawal of oil from the reservoir, which would amount to confiscation of property rights of some owners whose oil would be taken without just compensation. The applicant has failed to present a formula for protecting the correlative rights of royalty owners, and the end result would be that the undrilled 40-acre tracts would be valued by testimony as to their probable value rather than by drilling.

We know of no science or technique which can determine the productive limits of an oil field in advance of the drill, and we doubt very much if any science can positively state that a well will or will not drain any given acreage.

Respectfully yours,

LEONARD OIL COMPANY

By Emmett D. White
Emmett D. White
Executive Vice President

EDW:R

cc to Honorable Edwin L. Mechem, Governor of New Mexico,
Mr. Guy Shepard, State Land Commission,
Mr. L. C. White, Attorney at Law,
Mr. George Graham, State Land Attorney.

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

W. P. MARSHALL, PRESIDENT

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.

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LA16 SSB632

1951 AUG 6 PM 5 35

L HBA161 NL PD LOVINGTON NMEX 6

STATE OIL COMMISSION, CARE GEO GRAHAM

STATE LAND OFC SANTAFE NMEX

WISH TO EMPHASIZE MY STATEMENTS MADE DURING PREVIOUS HEARING REGARDING EIGHTY ACRE SPACING OF WELLS IN DENTON FIELD

MRS JERRY CLAYTON

file cases 269-70

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER		NIGHT LETTER	

WESTERN UNION

W. P. MARSHALL, PRESIDENT

1206

INTERNATIONAL SERVICE

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FULL RATE		LETTER TELEGRAM	
VICTORY LETTER		SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
			OIL CONSERVATION COMMISSION	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

JULY 9 1951

MR JACK CAMPBELL
ATWOOD MALONE AND CAMPBELL
ROSWELL NEW MEXICO

COPIES ORDERS MAILED YOU TODAY RE CASES 269 AND 270 PETITIONS

SUBMITTED BY JUDGE WRIGHT JUNE 21 HEARING JULY 25

OIL CONSERVATION COMMISSION

(N.E.)

cc: Case 269 (270)

ATWOOD, MALONE & CAMPBELL
LAWYERS

JEFF D. ATWOOD
ROSS L. MALONE, JR.
JACK M. CAMPBELL

CHARLES F. MALONE

J. P. WHITE BUILDING
ROSWELL, NEW MEXICO

July 5, 1951

Mr. R. R. Spurrier,
Secretary and Member
Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Spurrier:

I have received copy of telegram to Phillips Petroleum Company advising that a re-hearing has been granted but the telegram does not specify in which cases. I presume that orders granting the re-hearing were entered in both Case No. 269 and Case No. 270.

I would appreciate it if your office would send me copies of the orders and advise me as to the date on which the Motions for Re-hearing were filed with the Oil Conservation Commission.

With kindest personal regards, I am

Very truly yours,
Jack M. Campbell
for ATWOOD, MALONE & CAMPBELL

JMC:hl

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JUL 9 1951

DOMESTIC SERVICE
Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER		NIGHT LETTER	

WESTERN UNION

JOSEPH L. EGAN, PRESIDENT

1206

INTERNATIONAL SERVICE
Check the class of service desired; otherwise this message will be sent at the full rate

FULL RATE		DEFERRED	
CODE		NIGHT LETTER	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
			OIL CONSERVATION COMMISSION	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

(nr)

THIS MESSAGE WAS TELEPHONED TO WU - JUNE 30 1951 4:30 PM

JUDGE EARL FOSTER
c/o PHILLIPS PETROLEUM COMPANY
AMARILLO TEXAS

ORDER FOR RE-HEARING SIGNED JUNE 29. HEARING DATE JULY 25.

R R SPURRIER

FILE: Acctg, CASE 269, 270

A NEW CURTIS SERVICE

Telegraph your order for America's favorite magazines—HOLIDAY, 1 yr., $5 • the Post, 1 yr., $6 • LADIES' HOME JOURNAL, 1 yr., $3. All prices U. S. only. No charge for wire. Pay Western Union clerk for subscription or when billed by publisher.

Publisher will, on subscriber's request, refund full amount paid for copies not previously mailed. Prices subject to change without notice.

Continental Oil Company wishes to go on record in support of 80-acre spacing in New Mexico where reservoir characteristics and economics justify that spacing; however, since all allowables in New Mexico are determined on a Statewide basis, we respectfully request the Commission to forego the granting of additional allowables to 80-acre deep wells until a Statewide policy in this regard has been established. It is our recommendation that a spacial hearing be called by the Commission to permit all operators in the state to make recommendations toward the adoption of some Statewide ~~policy~~ Rule on this matter.

Case 269-70

DEPARTMENT OF THE INTERIOR

Information Service

PETROLEUM ADMINISTRATION FOR DEFENSE
For Release March 13, 1951

FOUR-POINT PROGRAM TO CONSERVE TUBULAR GOODS ANNOUNCED

Urging petroleum producers to use "every practical method to stretch the available steel supply," Secretary of the Interior Oscar L. Chapman today made public a four-point program of the Petroleum Administration for Defense for stepping up oil and gas yeilds with minimum use of oil-country tubular goods.

Secretary Chapman's announcement followed yesterday's action of the National Production Authority in issuing order M-46, under which PAD is authorized to regulate the distribution of oil-country tubular goods. NPA recently directed the production, during the month of April, of 157,500 tons of oil-country tubular goods -- casing, tubing, and drill pipe used in oil and gas exploration and development.

Secretary Chapman pointed out that if steel is allocated to mills at this level in subsequent months, it would make possible the production of tubular goods at a rate equivalent to 1,890,000 tons annually. This is the amount certified by the Petroleum Administration for Defense to NPA as necessary to permit drilling of 43,400 new domestic wells during 1951 and to meet export requirements. PAD estimates that this is the minimum number of additional wells needed to maintain oil and gas supplies at levels adequate to meet civilian and military requirements.

"The action of the National Production Authority in making steel available in the recommended amount during April," Secretary Chapman said, "indicates recognition of the imperative necessity of developing supplies of crude oil and gas within the continental limits of the United States sufficient to meet emergency conditions and to sustain the development of petroleum reserves in friendly foreign countries.

"NPA's action, however, imposes on oil and gas producers an obligation to make use of every practical method to stretch the available steel supply in order to bring about the greatest possible recovery of oil and gas," the Secretary added.

Deputy Petroleum Administrator Bruce K. Brown said that PAD intends to distribute oil-country tubular goods, so far as possible, without explicit direction by the agency.

"Success of the program", Mr. Brown declared, "will depend largely on the industry itself as well as the regulatory bodies of the various States. "We believe that petroleum producers will cooperate with State regulatory bodies and the Production Division of PAD in working out methods of using tubular goods that will bring maximum returns of oil and gas with minimum expenditures of steel. Industry associations whose membership includes oil and gas producing units likewise can be of great assistance in making the plan work."

The Four-Point Program recommended to oil and gas producers and State regulatory bodies by the Petroleum Administration, through Richard G. Lawton, its Director of Production, is as follows:

1. Examination by State regulatory bodies of existing rules governing well spacing, with a view toward revision to permit drilling new wells farther apart, where practical, and producing more from each well. Such action, Mr. Brown said, will place greater petroleum reserves and productive capacity behind a given amount of tubular goods. Adjustments by State regulatory bodies in allowable production quotas from individual wells will be necessary, however, Mr. Brown added, in order to assure operators of equitable participation in the total allowable production from each field.

2. Increased use of pressure maintenance and repressuring operations in oil and gas reservoirs through operation of reservoirs as single units, in order to maintain maximum efficient rates of production at as high a level as possible for as long a period as possible, thus increasing ultimate recovery.

3. Careful examination of field rules and existing practices in the use of tubular goods for drilling wells, with a view toward reducing requirements for surface and intermediate-string casing by shortening or eliminating strings of this large-diameter pipe, or making use of smaller, lighter pipe.

4. Wider use of dual completions--the practice of tapping two or more petroleum reservoirs with a single well-bore.

A program along these general lines was discussed with representatives of regulatory authorities from 18 oil and gas producing States at a meeting held by PAD in Washington January 19, Mr. Brown said, and the State officials indicated general approval of the proposed measures.

EXHIBIT_____

SUMMARY OF PERTINENT VALUES FROM DEVONIAN CORE ANALYSIS REPORT
OHIO OIL COMPANY #3 J. M. DENTON -
NW-SE-Sec. 11-T15S-R37E, DENTON FIELD,
LEA COUNTY, NEW MEXICO.

Interval Cored:	11,125'-12,103' (Total 978' Section).
Overall Recovery:	96.5%
Porosity Range:	Maximum - 10.0%; Minimum - 0.4%. Average - 3.06% (565 Samples).
Permeability-Range:	Maximum - 1020 Md.; Minimum - 0.1 Md.; Average: Maximum 33.3 Md.; At 90° 10.8 Md. (532 Samples) (518 Samples).

Of the total samples analized, 157 samples possessed permeability less than 1 Md. (maximum) and at 90°, 239 samples showed permeability less than 1 Md. A dense barren limestone interval was found from 11,410.5' to 11,438.3' (28') and a shale zone was encountered from 12,041' to 12,045' (4').

For the purpose of evaluation, the cored interval was divided, principally upon the basis of porosity variation, into 4 sections as follows:

ITEM	FORMATION INTERVAL			
	11,125.0-11,399.5 (274.5')	11,440.0-11,521.0 (81')	11,521.0-12,039.9 (518.9')	12,047.0-12,101.5 (54.5')
FORMATION NAME	DEVONIAN	DEVONIAN	DEVONIAN	DEVONIAN
% Core Recovery	88	96	95	94
Average Permeability: Max.	48	33	34	7.3
(Millidarcys) At 90°	19	7	10	0.5
Average Porosity (%)	1.8	2.3	4.0	2.8
Oil Gravity (°API)	43.8	43.8	43.8	43.8
Solution Gas-Oil Ratio (Cu.ft./Bbl.)	1200	1200	1200	1200
Reservoir Volume Factor	1.72	1.72	1.72	1.72
Calculated Recoverable Oil (Bbls. per Acre Foot):				
By Natural or Gas Expansion	7	8	19	10
Increase due to Water Drive	3	3	45	18
Total after Complete Water Drive	10	11	64	28.

Case 269 & 270

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

I am the owner of mineral interests in the Southeast quarter of Section 14 and north half of Section 23, and the owner of oil payments in Sections 15, 21, 22, 23, 28 and 35 in Township 15 South, Range 37 East, and minerals in NE¼, Section 26, 14 South, 37 East, in Lea County, New Mexico and I wish to protest the proposed 80 acre spacing plan in the Denton Pool, a part of which is in this area. I would like for this protest to be entered as a part of the record in both cases involving the Wolf-Camp and the Devonian formations.

It appears that part of my holdings are definitely at the edge of the presently known boundaries of the field. I have had previous experience on the edge of fields where 80 acre spacing was adopted and I know the results. I own minerals in the Bagley field and in the Knowles field, both of which have been on 80 acre spacing. In each case,as here, I have been unfortunate enough to be on the edge of the pool.

In the Knowles field a well was drilled on the 80 acre pattern and it was dry. The royalty owners finally got the operator to drill on the other 40 acres but if we get a well we will get one-half the allowable allocated to offset wells which are on the 80 acre pattern. In the Bagley field, with a water drive we will probably have our edge acreage washed out before drilling will be risked by the operator who must jump over one 40 acre tract to maintain the pattern. I have made a mistake by not protesting these previous applications and I do not intend to make the same mistake again. If oil moves through these reservoirs with the efficiency and the speed which the engineers for the operators indicate I certainly want to preserve my right to 40 acre offsets and 330 foot locations, particularly when my holdings are on the edge of the pool.

I have bought minerals and sold leases in New Mexico for a long time and particularly where the field starts out, as here, on 40 acre spacing, I want it to continue that way. I doubt that all the recoverable oil can be drained from the reservoir without some sort of uniform pattern. I believe that the Commission, representing the citizens of New Mexico should also consider this matter most carefully.

I suppose that if 80 acre proration units were established it would be necessary to pool interests of royalty owners. I would like to say now that I will resist the pooling of any of my interests for 80 acre spacing.

I have heard something said about shortage of pipe. Now I do not know how much pipe is available to the operators in this pool but it would seem to me that whatever is available could not be put to better use than to place it in 1700 feet of pay section.

I protest against 80 acre spacing, temporary or permanent.

Very truly yours,

Charles R. Turner

CHARLES R. TURNER

I suppose that if 80 acre proration units were established it would be necessary to pool interests of royalty owners. I would like to say now that I will resist the pooling of any of my interests for 80 acre spacing.

I have heard something said about shortage of pipe. Now I do not know how much pipe is available to the operators in this pool but it would seem to me that whatever is available could not be put to better use than to place it in 1700 feet of pay section.

I protest against 80 acre spacing, temporary or permanent.

Very truly yours,

Charles R. Turner

CHARLES R. TURNER

Case 269- 70

My name is Emmett D. White and I am Vice President of Leonard Oil Company of Roswell, New Mexico.

Leonard Oil Company owns minerals in Sections 3 and 4, Township 15 South, Range 37 East, Lea County, New Mexico. This area is not within the presently defined limits of the Denton Oil pool, but its location on the western edge of the north portion of this pool makes any well spacing program of importance to our company.

We wish to protest the establishment of 80 acre proration units in this pool as requested by Phillips Petroleum Company in Case #269 involving the Siluro-Devonian zone of production and in Case #270 involving the Wolfcamp zone of production.

As the Commission knows, and as it has confirmed by its state-wide rules and regulations for the purpose of conserving our natural resources, the drilling and proration unit for New Mexico for many years has been 40 acres. Minerals and leases have been bought and sold with this program in mind.

Our objections to the proposed 80 acre spacing in the Denton field are based upon the following:

1. This pool has been developed to date under the statewide rules providing for 40 acre drilling and proration units. There are approximately 20 wells, drilling wells, or locations in the field at present, and with a possible few exceptions, these have been located upon the assumption that the statewide rules would apply. A spacing pattern, we believe, should be as uniform as possible in order to provide maximum efficient use of the reservoir energy. The proposal of the applicant in this case makes such uniformity impossible.

2. The establishment of 80 acre proration units and double allowables would in our opinion have a serious effect upon the ultimate recovery of oil and would particularly affect the wells on the edge of the pool. It is apparent that the area under which we own an interest may be on the edge of the structure. Production of wells up-structure at an excessive rate would tend to wash out the edge properties prematurely.

3. Under an 80 acre spacing program it is quite possible for a productive 40 acre unit to be forced to share its oil with an adjoining 40 acre unit which may subsequently be proved non-productive.

While we recognize that this condition may exist in any spacing program, we feel that the wider the spacing the more aggravated the situation becomes and the more adverse will be the effect upon correlative rights.

4. The establishment of 80 acre proration units, it seems to us, is but the first step to compulsory pooling of interests as it would appear to be wholly impractical to adjust the units in such a manner that royalty ownership under each of the 80 acre tracts would be common. The Commission, we feel, should consider the ultimate effects of the establishment of 80 acre proration units upon the rights of royalty owners who have acquired their property upon the reasonable assumption that statewide 40 acre spacing rules would apply. We are inclined to consider the long-standing practice of 40 acre spacing in New Mexico as approaching the nature of an implied covenant in our leases.

5. The Denton pool appears to be one of the most potentially prolific oil pools discovered to date in New Mexico. It seems to us that from the point of view of national defense and the proper use of critical materials that there could be no better place to drill than in such a pool. One well on an 80 acre proration unit produced at twice the rate of a 40 acre spaced well has little to offer in the event of an emergency. Two wells upon an 80 acre tract produced at half the rate offer possibilities of increased production in the event of a national emergency. There is little doubt as to the economics of the matter since these wells will pay out within a relatively short time, and we believe that this field offers a profitable place for the investment of money and critical materials.

We respectfully submit our views to the Commission as royalty owners in the Denton area.

Very truly yours,

LEONARD OIL COMPANY

By Emmett D. White

Emmett D. White
Executive Vice President

Case 269-270

STATEMENT OF MARY D. CLAYTON - Case Nos. 269 and 270.

NEW MEXICO OIL CONSERVATION COMMISSION

I am one of three trustees of a portion of the Dickinson Estate. We hold in trust for certain of the heirs a considerable amount of property, including mineral interests in Lea County, New Mexico. This property includes approximately 3800 mineral acres in Townships 14 and 15 South, Range 37 and 38 East, much of which immediately surrounds the presently developed area in the Denton oil field. I also individually own approximately 1100 mineral acres lying to the South of this presently developed Denton area. I wish to enter a protest against the application in this case for myself individually and on behalf of the other trustees of the trust estate.

As we understand the application of Phillips Petroleum Company it is to establish 80 acre proration units in both the Wolf-Camp and Devonian zones of production in the Denton field. We understand that the statewide spacing and proration unit has always been 40 acres in New Mexico and we see no reason why it should be changed in this field.

When 40 acre spacing was adopted in New Mexico by rules and regulations of the Conservation Commission many years ago we presume that the Commission had before it engineering testimony and the facts concerning the rights of lease and mineral owners and that it arrived at the conclusion that 40 acre spacing was fair to all concerned. On the basis of its conclusion a great deal of money has been invested in mineral properties and we have sold leases in this field upon the assumption that spacing of wells and the allocation of production would be upon at least a 40 acre basis.

Our situation in the area around the Denton pool is particularly dangerous from the well spacing point of view because our acreage could very well be on the edge of the structure. It is possible that we may have ownership in areas where part of an 80 acre tract would be productive and part would not be productive. It is also possible that a well

drilled on our property near the edge of the pool and producing at a rate in excess of the single allowable of 40 acres would be washed out by water if this is a water-drive field. We are further concerned that 80 acre spacing will delay the drilling of outside locations in this field because it will require a greater step-out for the drilling of wells to ultimately define the outer boundaries of the pool.

We have noted for example that one of the tracts in Section 35 under which we own minerals has a producing well drilled upon it in the SE¼SW¼ Section 35, Township 14 South, Range 37 East. Instead of drilling an offset well to the north it is now proposed that the 40 acres immediately north of this well be thrown into an 80 acre proration unit with an allowable yet to be determined. If the allowable is not greater than for one 40 acre tract it is certainly most unfair to us as mineral owners. If the allowable for this well is increased to compensate for the situation then it is quite possible, it seems to us, that the well would be producing at too rapid a rate and some of the oil underlying our property will not be recovered. This same situation will apply to our wells producing from the Wolf-Camp in Sections 12 and 13 and will undoubtedly be true in other areas surrounding this oil pool where we own mineral interests.

As royalty owners we do not have available the technical information available to the operators but it occurs to us that if one oil well will drain 80 acres then there is a lot of drainage taking place which calls for offset drilling by the oil companies.

We have not had an opportunity of determining whether it is recommended that any of our interests be pooled with other interests to make up a proposed 80 acre unit but for the reasons we have stated we must advise the Commission that if such is the case we will find it necessary to resist compulsory pooling of these areas owned by us for the purpose of creating 80 acre proration units.

We wish to protest 80 acre spacing, either temporary or permanent.

Respectfully submitted,

Mary D. Clayton

Mary Clayton, Trustee
Dickinson Estate

PPC # 3 Case 710

DENTON WOLF CAMP POOL

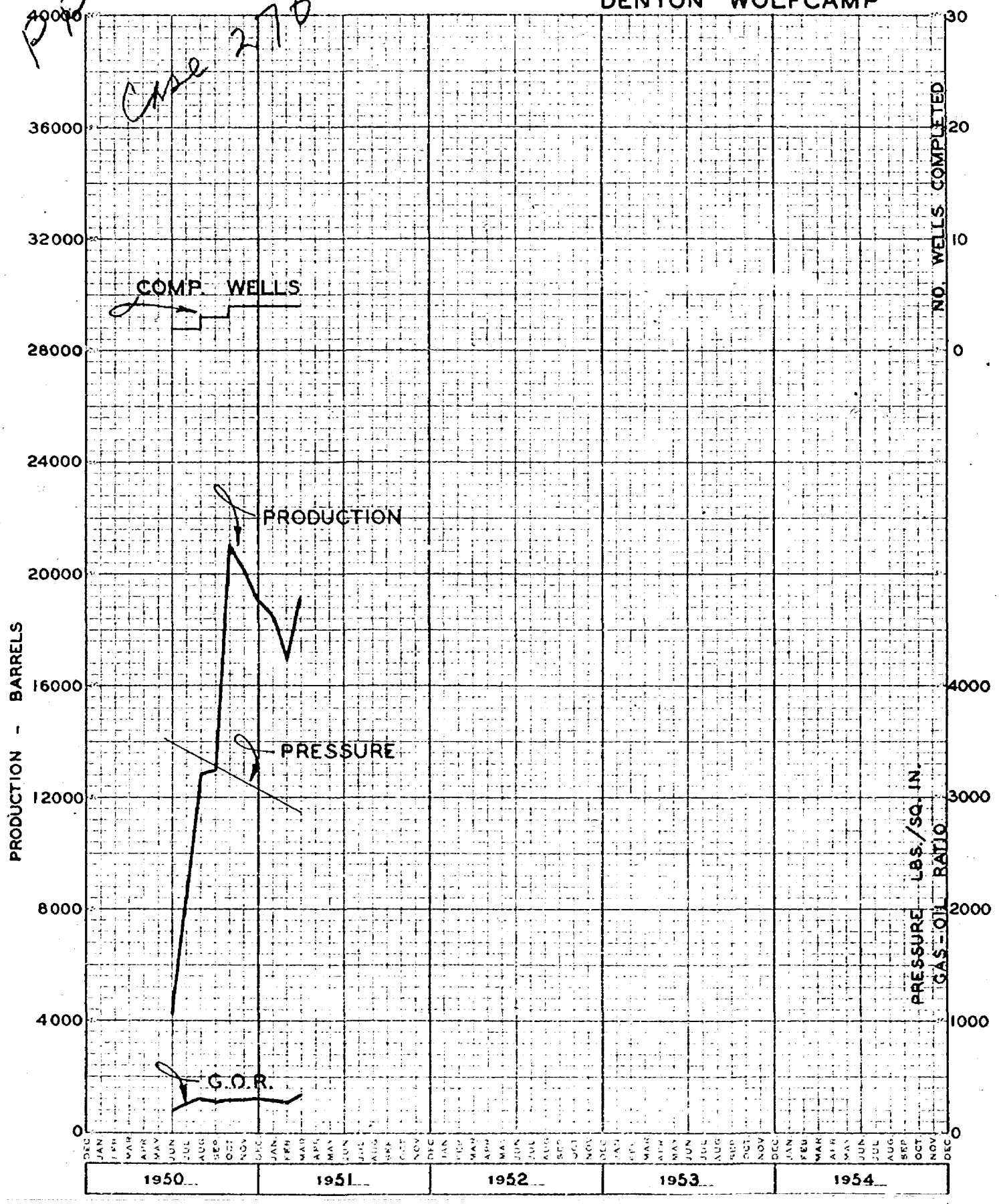
PRODUCTION

	Oil Prod. (Bbls.)	Cumulative Oil Prod. (Bbls.)	Water Prod. (Bbls.)	Cumulative Water Prod. (Bbls.)	Gas Prod. (MCF)	Cumulative Gas Prod. (MCF)	GOR cf/bbl.
1950							
June	4,224	4,224	8	8	912	912	216
July	8,298	12,522	84	92	2,186	3,098	263
Aug.	12,838	25,360	73	165	3,906	7,004	304
Sept	12,946	38,306	19	184	3,649	10,653	282
Oct.	20,911	59,217	21	205	6,210	16,863	297
Nov.	20,156	79,373	15	220	6,011	22,874	298
Dec.	19,041	98,414	235	455	5,731	28,605	301
1951							
Jan.	18,534	116,948	229	648	5,552	34,157	300
Feb.	16,549	133,497	205	889	4,502	38,659	272
Mar.	19,039	152,536	303	1,192	5,762	44,421	350

PP #4

Case 270

DENTON WOLFCAMP



CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.
NO. 51.157. FIVE YEARS BY MONTHS X 100 DIVISIONS.

NO. | NAME Legal Notice Case 269,270

STATE OF NEW MEXICO
OFFICE OF STATE GEOLOGIST
SANTA FE, NEW MEXICO

April 3, 1951

Editor,
Hobbs Sun
Hobbs, New Mexico

Re: Notices of Publication
Cases 269 and 270

Dear Sir:

Please publish the enclosed notice one time immediately on receipt of this request. Please proofread the notice carefully and send a copy of the paper carrying such notice to this office.

Upon completion of the publication, send publisher's affidavit in duplicate.

For payment, please submit statement in duplicate, and sign and return the enclosed voucher.

PLEASE PUBLISH NOT LATER THAN APRIL 10, 1951.

Very truly yours,

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

R. R. SPURRIER,
Secretary-Director

RRS/ir
Enclosure

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

The State of New Mexico by its Oil Conservation Commission hereby gives notice pursuant to law and the Rules and Regulations of said Commission promulgated thereunder, of the following public hearing to be held May 1, 1951, beginning at 10:00 o'clock a. m. on that day in the City of Santa Fe, New Mexico in the House of Representatives in the Capitol.

STATE OF NEW MEXICO TO:
All named parties in the following cases, and notice to the public:

Case 269

In the matter of the application of Phillips Petroleum Company for the establishment of 80-acre proration units and providing allowables therefor for the Siluro-Devonian common source of supply discovered in McAlester Fuel Company et al Denton No. 1-A, in the SW/4 SE/4 Section 11, T. 15 S, R. 37 E, N. M. P. M. in the Denton Pool, Lea County, New Mexico.

Case 270

In the matter of the application of Phillips Petroleum Company for the establishment of 80-acre proration units, and providing the allowables therefor, for the "Wolfcamp" common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson well No. 1-B, in NW/4 SW/4, Section 12, T. 15S. R. 37 E. N. M. P. M. in the Denton Pool, Lea County, New Mexico.

GIVEN under the seal of the Oil Conservation Commission of New Mexico, at Santa Fe, New Mexico, on this 3rd day of April, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
R. R. Spurrier
R. R. SPURRIER, Secretary

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, Robert L. Summers
Publisher

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not in a supplement thereof for a period of One time ~~weeks~~

beginning with the issue dated April 9, 1951

and ending with the issue dated April 9, 1951

Robert L. Summers
Publisher.

Sworn and subscribed to before me this 10 day of April 1951

Betty Lee
Notary Public.

My commission expires January 25, 1953

(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

LEGAL NOTICE
April 9, 1951

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

The State of New Mexico by its Oil Conservation Commission hereby gives notice pursuant to law and the Rules and Regulations of said Commission promulgated thereunder, of the following public hearing to be held May 1, 1951, beginning at 10:00 o'clock a. m. on that day in the City of Santa Fe, New Mexico in the House of Representatives in the Capitol.

STATE OF NEW MEXICO TO: All named parties in the following case, and notice to the public:

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Case 270

In the matter of the application of Phillips Petroleum Company for the establishment of 80-acre proration units, and providing the allowables therefor, for the "Wolfcamp" common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson well No. 1-B, in NW/4, SW/4, Section 12, T 15S, R. 37 E. N. M. P. M. in the Denton Pool, Lea County, New Mexico.

GIVEN under the seal of the Oil Conservation Commission of New Mexico, at Santa Fe, New Mexico, on this 3rd day of April, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
R. R. SPURRIER
Secretary.

(SEAL)

BEFORE THE OIL CONSERVATION COMMISSION OF
THE STATE OF NEW MEXICO

May 1

IN THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY BETTIE C. DICKINSON WELL NO. 1-B, NW/4 SW/4 SECTION 12 TOWNSHIP 15 SOUTH RANGE 37 EAST, LEA COUNTY, NEW MEXICO, KNOWN AS THE DENTON FIELD.

CAUSE NO. _____

ORDER NO. _____

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, Oklahoma, and alleges and states:

1. That Atlantic Refining Company, Dallas, Texas, has drilled and on February 26, 1950 completed a well known as "Bettie C. Dickinson No. 1-B" located in the center of the NW/4 SW/4 Section 12-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Wolfcamp, which common source of supply was found in said well at the depth of from 9,395 feet to 9,414 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled to said common source of supply in the area:

(a) McAlester Fuel Company - Denton No. 2-A, located in SW/4 SE/4 Section 11-15S-37E, which was completed October 2, 1950 as a producing oil well from depth 9055 feet to depth 9230 feet.

(b) Ohio Oil Company - J. M. Denton No. 1, located in NE/4 SW/4 Section 11-15S-37E, which was completed July 21, 1950 as a producing oil well from depth 8988 feet to depth 9250 feet.

(c) Ohio Oil Company - J. M. Denton No. 2, located in NE/4 SE/4 Section 11-15S-37E, which was completed July 17, 1950 as a producing oil well from depth 9070 feet to depth 9300 feet.

OIL CONSERVATION COMMISSION
MAR 26 1951

3. A plat of the area showing the location of the wells referred to above, circled in green, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Wolfcamp formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration unit may, at the discretion of the operator, be in the center of either governmental quarter-quarter section comprising the unit, with a tolerance of 150 feet to avoid surface obstructions.

6. That in consideration of the thickness of the oil pay section of the common source of supply, the consequent ability of the wells to produce without waste, and the rights of lessees and royalty owners to receive their fair share of the total State allowable production, the Commission should in its order provide that each well now producing or hereafter completed as a producer in the common source of supply shall have a top unit allowable to be fixed by the Commission, but not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

7. That the area which may at this time be reasonably considered to contain the probable productive limits of said common source of supply is: Sections 34, 35 and 36, Township 14 South, Range 37 East and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and the north halves of Sections 22, 23 and 24, all in Township 15 South, Range 37 East, Lea County, New Mexico; and that the Commission's order in this cause should be made applicable to and include all of this described area, subject to any future extensions or reductions thereof after notice and hearing.

WHEREFORE, applicant respectfully requests that the Commission set this application for public hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming the pool, establishing proration units of 80 acres each, providing for the drilling of only one well on each proration unit with such well to be located in the center of either of the two governmental quarter-quarter sections comprising such proration unit with a tolerance of 150 feet in any direction to avoid

surface obstructions, and providing for each such well an allowable of not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

DATED this 22nd day of March, 1951.

R. M. Williams

R. M. Williams

Raymond A. Lynch

Raymond A. Lynch

Harry D. Turner

Harry D. Turner

Attorneys for Applicant

T 37 E

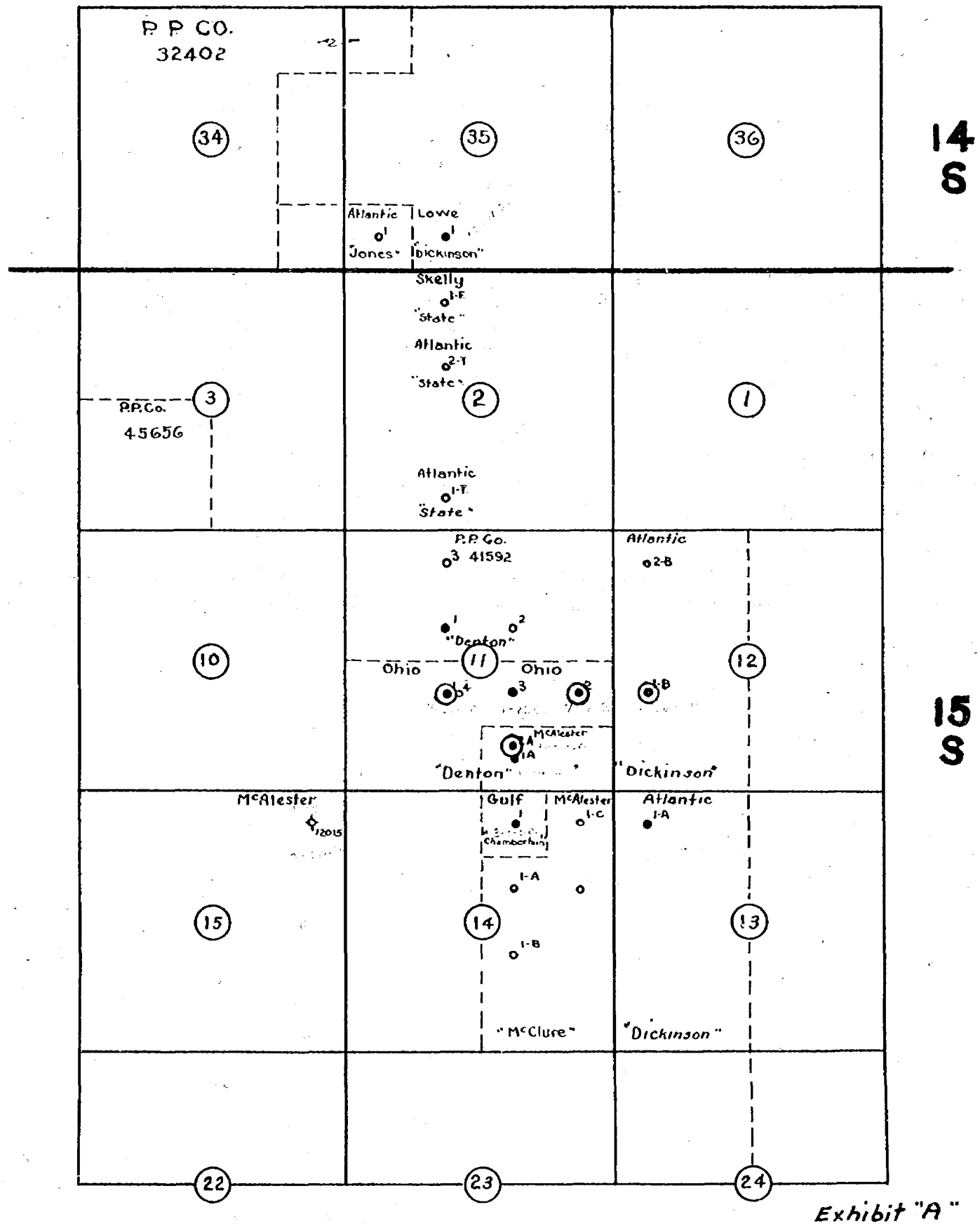
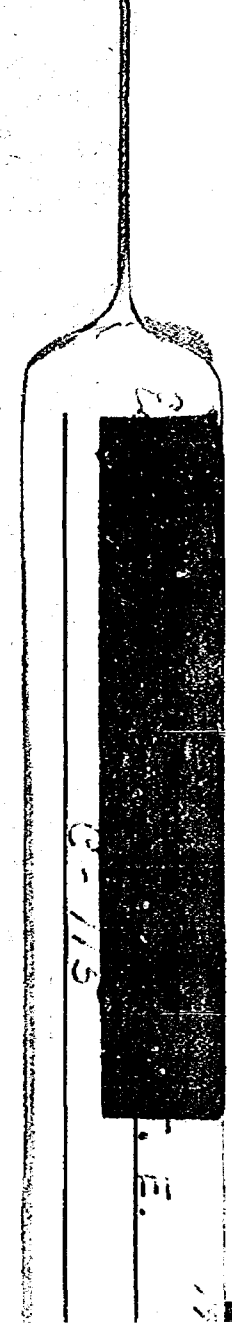


Exhibit "A"

DENTON POOL LEA CO. NEW MEXICO

2" = 1 MILE



MEMORANDUM

From: R. R. SPURRIER

To: George

See applications for probable pool limits — also plats. It is apparent that there is no extension of the Denton-Nev. but the Denton-Wolf

MEMORANDUM

From: R. R. SPURRIER

To: _____

should not be more than the 4 original sections (11, 12, 13, 14)

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY et al J. M. DENTON WELL NO. 1-A, SW/4 SE/4 SECTION 11, T. 15 S, R. 37 E, NMPM, DENTON POOL, LEA COUNTY, NEW MEXICO.

CASE NO. 269
ORDER NO. R-74

ORDER OF THE COMMISSION

BY THE COMMISSION:

This matter came on for hearing at 10 o'clock A. M. on May 22, 1951, at Santa Fe, New Mexico, pursuant to notice before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and the Commission having heard the evidence and being fully advised in the premises,

FINDS:

1. That due public notice having been given as required by law, the Commission has jurisdiction of the subject matter and of the interested parties.

2. That the Denton (Wolfcamp) Devonian pool as heretofore established, comprises:

Twp. 15 S, R. 37 E, NMPM

All of Sections 11, 12, 13 & 14

3. Evidence discloses that more than 500' of Devonian pay zone has been encountered in various wells in the pool, the actual productive area of which, however, is largely undetermined at the present time.

4. That the pool has reached its present satisfactory stage of development by wells drilled and drilling on the regular 40-acre spacing pattern, and any change to wider spacing would require numerous exceptions and adversely affect drainage and correlative rights.

Case No. 269
Order No. R-74

IT IS THEREFORE ORDERED THAT: The application of Phillips Petroleum Company for an order establishing 80-acre spacing for the Siluro-Devonian common source of supply in the Denton-Devonian pool, described as all of Sections 11, 12, 13 and 14 in Twp. 15 S, Range 37 E, NMPM, Lea County, New Mexico, be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

/s/ EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80-ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 Section 12, Twp. 15, S R. 37E, NMPM, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This matter came on for hearing at 10 o'clock A. M. on the 22nd day of May, 1951, at Santa Fe, New Mexico, pursuant to notice before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and the Commission having heard the testimony adduced at said hearing and being fully advised in the premises,

FINDS:

1. That due public notice having been given pursuant to law, and the rules and regulations of the Commission, this Commission has jurisdiction both of the subject matter and of the parties interested.

2. That the probable productive limits of the Wolfcamp common source of supply as discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B, located in NW/4 SW/4 Section 12, Twp. 15 S, Rge. 37 E, NMPM, and further corroborated by production from three other wells, are:

Twp. 14 S, R. 37 E. NMPM:
All Sections 34, 35 and 36

Twp. 15 S, R. 37 E, NMPM:
All Sections 1, 2, 3, 10, 11, 12
13, 14, 15; and N/2 Sec. 22,
N/2 Section 23, N/2 Section 24

Case No. 270
Order No. R-75

3. That the Denton (Wolfcamp) Devonian pool be extended to include the above-described area for Wolfcamp production from 8500' to 9500'.

4. That from limited exploration of the Wolfcamp formation, it appears that a considerable pay zone is characteristic, and that despite any shortage of tubular goods, the prospects for substantial production are excellent.

5. That for orderly development, the prevention of waste and protection of correlative rights the area should be developed upon the standard 40-acre spacing pattern.

IT IS THEREFORE ORDERED:

(1) That the Denton-Wolfcamp pool in Lea County, New Mexico, be, and it hereby is extended to include the area described as:

Twp. 14 S. R. 37E, NMPM:
All Sections 34, 35, 36

Twp. 15 S. R, 37E, NMPM:
All Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15; and N/2 Sec. 22, N/2 Sec. 23, and N/2 Sec. 24

(2) That that part of Phillips Petroleum Company's application relating to 80-acre spacing and proration units be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR THE ESTABLISHMENT OF PRORATION
UNITS AND PROVIDING FOR THE ALLOWABLES
FOR THE SILURO-DEVONIAN COMMON SOURCE
OF SUPPLY DISCOVERED IN McALESTER FUEL
COMPANY ET AL J. M. DENTON WELL NO. 1-A,
SW/4 SE/4 SECTION 11 TOWNSHIP 15 SOUTH
RANGE 37 EAST, LEA COUNTY, NEW MEXICO,
KNOWN AS THE DENTON FIELD.

CASE 269
ORDER ~~No. 65~~

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, Oklahoma, and alleges and states:

1. The McAlester fuel Company, et al, El Dorado, Arkansas, has drilled and on October 4, 1949 completed a well known as "J. M. Denton No. 1-A" located in the center of the SW/4 SE/4 Section 11-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Siluro-Devonian, which common source of supply was found in said well at the depth of from 11,325 feet to 11,464 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled or are now being drilled to said common source of supply in the area:

(a) Ohio Oil Company - Denton No. 3, located in NW/4 SE/4 Section 11-15S-37E, which was completed on January 22, 1951 as a producing oil well from depth 11,916 feet to depth 12,044 feet.

(b) Atlantic Refining Company - Bettie C. Dickinson No. 1-A, located in NW/4 NW/4 Section 13-15S-37E, which was completed December 9, 1949 as a producing oil well from depth 11,272 feet to depth 11,324 feet.

(c) Gulf Oil Corporation - L. R. Chamberlain No. 1, located in NW/4 NE/4 Section 14-15S-37E, which was completed March 9, 1950 as a producing oil well drom depth 11,501 feet to depth 11,513 feet.

(d) McAlester Fuel Company - McClure No. 1-A, located in SW/4 NE/4 Section 14-15S-37E, which was completed March 5, 1951 as a producing oil well from depth 11,503 feet to depth 12,321 feet.

(e) McAlester Fuel Company - J. S. Waller No. 1, located in NE/4 NE/4 Section 15-15S-37E, which was completed as a dry hole on February 20, 1950 at total depth 12,015 feet.

(f) Ralph Lowe - Dickinson Estate No. 1, located in SE/4 SW/4 Section 35-14S-37E, which was completed December 11, 1950 as a producing oil well from depth 12, 360 feet to total depth 12,385 feet.

(g) Phillips Petroleum Company - Denton No. 1, located in SE/4 NW/4 Section 11-15S-37E, which encountered the Siluro-Devonian common source of supply from depth 11,445 feet to depth 12,555 feet which yielded flowing oil production on numerous drill-stem tests, has reached total depth 12,623 feet, run casing, and will be completed as a producingjoil well.

(h) Atlantic Refining Company - Federal-Jones No. 1, located in SW/4 SW/4 Section 35-14S-37E, which was drilling at approximately 6690 feet on March 10, 1951.

(i) Atlantic Refining Company - State No. 1-T, located in SE/4 SW/4 Section 2-15S-37E, which was drilling at approximately 9800 feet on March 10, 1951.

(j) Skelly Oil Company - State No. 1-F, located in NE/4NW/4 Section 2-15S-37E, which was drilling at approximately 11,000 feet on March 10, 1951.

(k) Ohio Oil Company - Denton No. 4, located in NE/4 SW/4 Section 11-15S-37E, which was drilling at approximately 4750 feet on March 10, 1951.

(l) Atlantic Refining Company - Dickinson No. 2-B, located in NW/4 NW/4 Section 12-15S-37E, which was drilling at approximately 7500 feet on March 10, 1951.

(m) McAlester Fuel Company - McClure No. 1-B, Located in NW/4 SE/4 Section 14-15S-37E, which was drilling at approximately 3500 feet on March 10, 1951.

(n) McAlester Fuel Company - McClure No. 1-C, located in NE/4 NE/4 Section 14-15S-37E, which was drilling at approximately 375 feet on March 10, 1951.

3. A plat of the area showing the location of the wells referred to above, circled in red, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Siluro-Devonian formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration unit may, at the discretion of the operator, be in the center of either governmental quarter-quarter section comprising the unit, with a tolerance of 150 feet to avoid surface obstructions.

6. That in consideration of the thickness of the oil pay section of the common source of supply, the consequent ability of the wells to produce without waste, and the rights of lessees and royalty owners to receive their/fair share of the total State allowable production, the Commission should

in its order provide that each well now producing or hereafter completed as a producer in the common source of supply shall have a top unit allowable to be fixed by the Commission, but not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

7. That the area which may at this time be reasonably considered to contain the probable productive limits of said common source of supply is: Sections 34, 35 and 36, Township 14 South, Range 37 East and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and the north halves of Sections 22, 23, and 24, all in Township 15 South, Range 37 East, Lea County, New Mexico; and that the Commission's order in this cause should be made applicable to and include all of this described area, subject to any future extensions or reductions thereof after notice and hearing.

WHEREFORE, applicant respectfully requests that the commission set this application for public hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming the pool, establishing proration units of 80 acres each, providing for the drilling of only of only one well on each proration unit with such well to be located in the center of either of the two governmental quarter-quarter sections comprising such proration unit with a tolerance of 150 feet in any direction to avoid surface obstructions, and providing for each such well an allowable of not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

DATED this 22nd day of March, 1951.

R. M. WILLIAMS

Raymond A. Lynch

Harry D. Turner,
Attorneys for Applicant

T 37 E

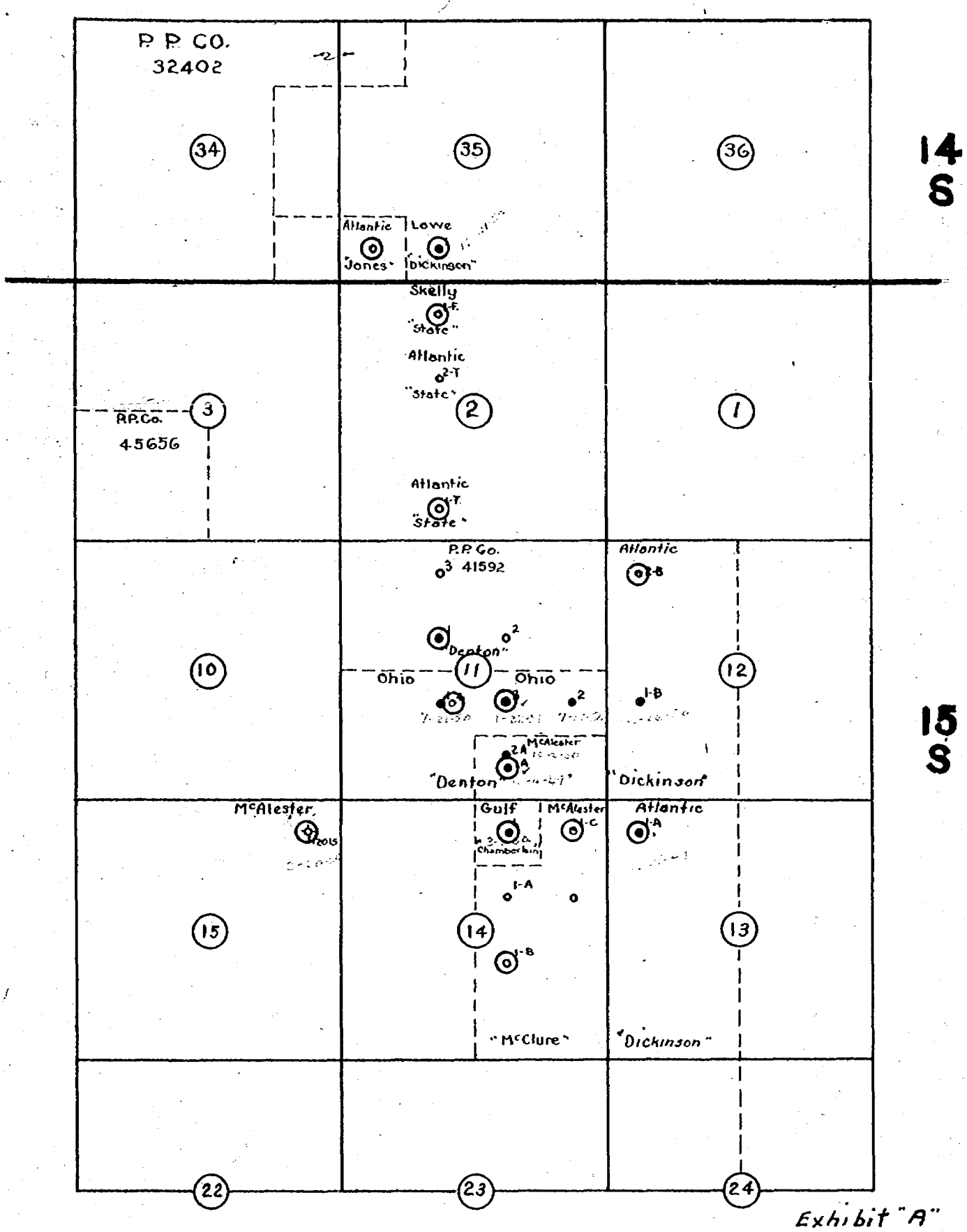


Exhibit "A"

DENTON POOL LEA CO. NEW MEXICO

2" = 1 MILE

KEUFFEL & ESSER CO., N. Y. NO. 370-3
6 × 8 to the inch.
MADE IN U.S.A.

SOLUBILITY - FORMATION VOLUME FACTOR RESERVOIR FLUID

PHILLIPS NO. 1 DENTON, DEVONIAN POOL, LEA COUNTY, N.M.

Curve #1 P.O. 269

FORMATION VOLUME FACTOR BASED ON RESIDUAL OIL AT 60 °F

1.70 1.60 1.50 1.40 1.30 1.20 1.10 1.00

RESERVOIR PRESSURE 5050 PSIG AT 178 °F

TEST CONDUCTED AT 178 °F

SATURATION PRESSURE 2540 PSIG

5000 4500 4000 3500 3000 2500 2000 1500 100 5

PRESSURE, LBS PER SQUARE INCH GAGE

0 200 400 600 800 1000 1200

SOLUBILITY, Cu. Ft. per Bbl, BASED ON RESIDUAL OIL AT 60 °F

EXHIBIT _____

PRODUCTIVITY INDICES MEASUREMENTS

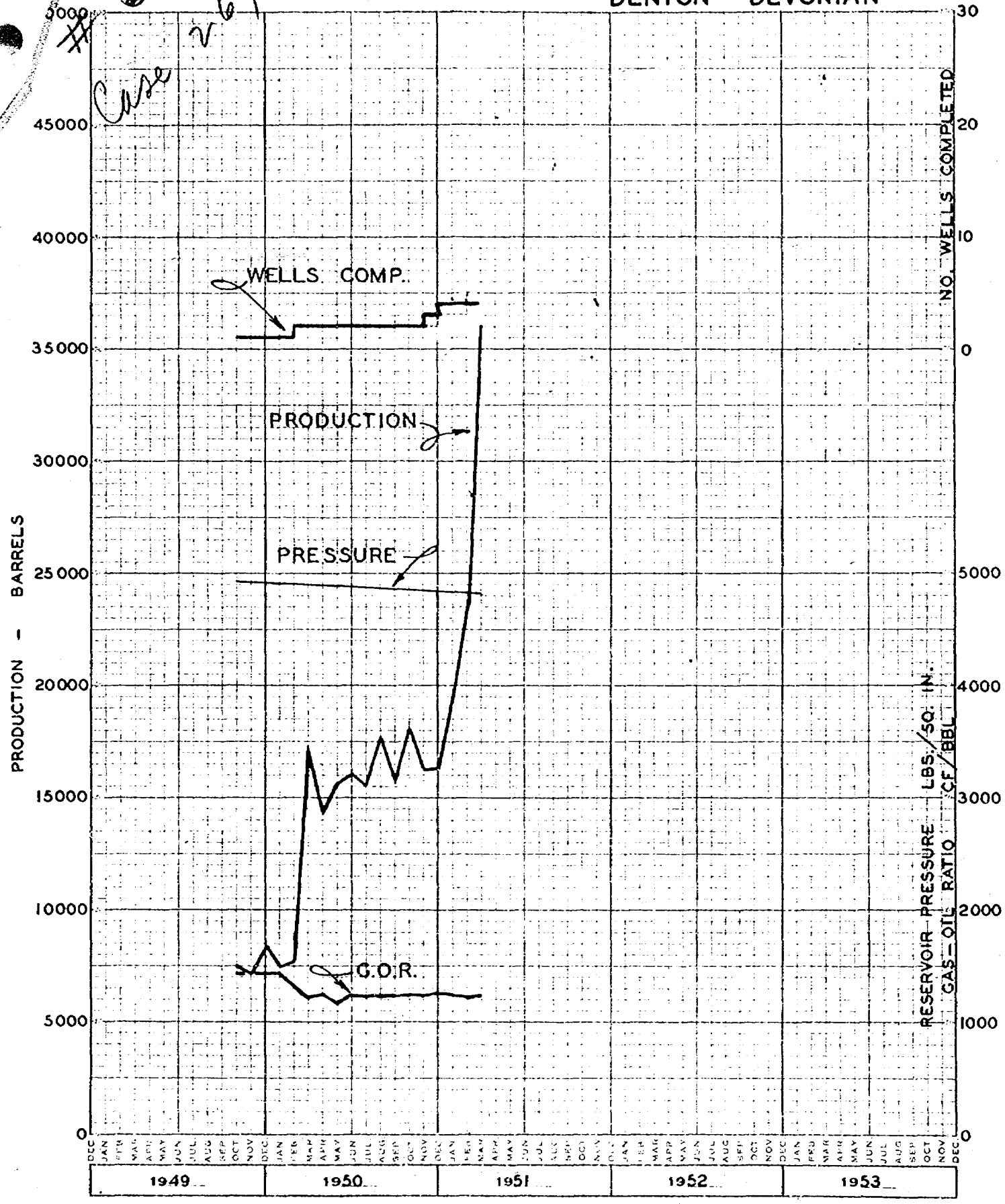
DENTON FIELD (DEVONIAN) WELLS - LEA COUNTY, NEW MEXICO

OPERATOR	LEASE & WELL NO.	LOCATION	DATE	EXPOSED PAY(FT.)	PERIOD (HRS.)	PRODUCING RATE(B/D)	BOTTOM HOLE PRESSURE (PSIG)	DEPTH (FT.)	PRESSURE DRAW-DOWN (PSIG)	PRODUCTIVITY INDEX (B/D/#DROP)	APPARENT CAPACITY (B/D)	TUBING PRESSURE (PSIG)	SIZE		
													Choke	Tbg.	Csg.
Gulf	Chamberlin #1	NW-NE-14, T15S-R37E, Lea Co.N.M.	3/1/50	18	24	338.5	4304	11,495	577	0.58665	2863	1175	13/64"	2-3/8"	7"
			3/3/50	"	48	Closed	4881	"	-	-	-	1500		"	"
Phillips	Denton #1	SE-NW-11-T15S-R37E, Lea Co.N.M.	4/8/51	100	24	214	5012	12,480	89	2.4	12,242	1420	8/64"	2-3/8"	5-1/2"
			4/9/51	"	24	650	4841	"	260	2.5	12,753	1260	16/64"	"	"
			4/11/51	"	48	Closed	5101	"	-	-	-	1430		"	"
Chesterfield	Denton A-1	SW-SE-11-T15S-R37E, Lea Co.N.M.	5/3/51	139	48	Closed	4726	11,290	-	-	-	1510	-	2-3/8"	5-1/2"
			5/4/51	"	24	229	4208	"	518	0.518	2248	1145	12/64"	"	"
			5/5/51	"	24	322	3844	"	882	0.365	1725	930	13/64"	"	"
			5/6/51	"	24	512	3020	"	1706	0.300	1418	518	21/64"	"	"
			5/7/51	"	24	679	2151	"	2575	0.264	1248	260	32/64"	"	"

Exhibit M-5
Case #29

Case 269

DENTON DEVONIAN

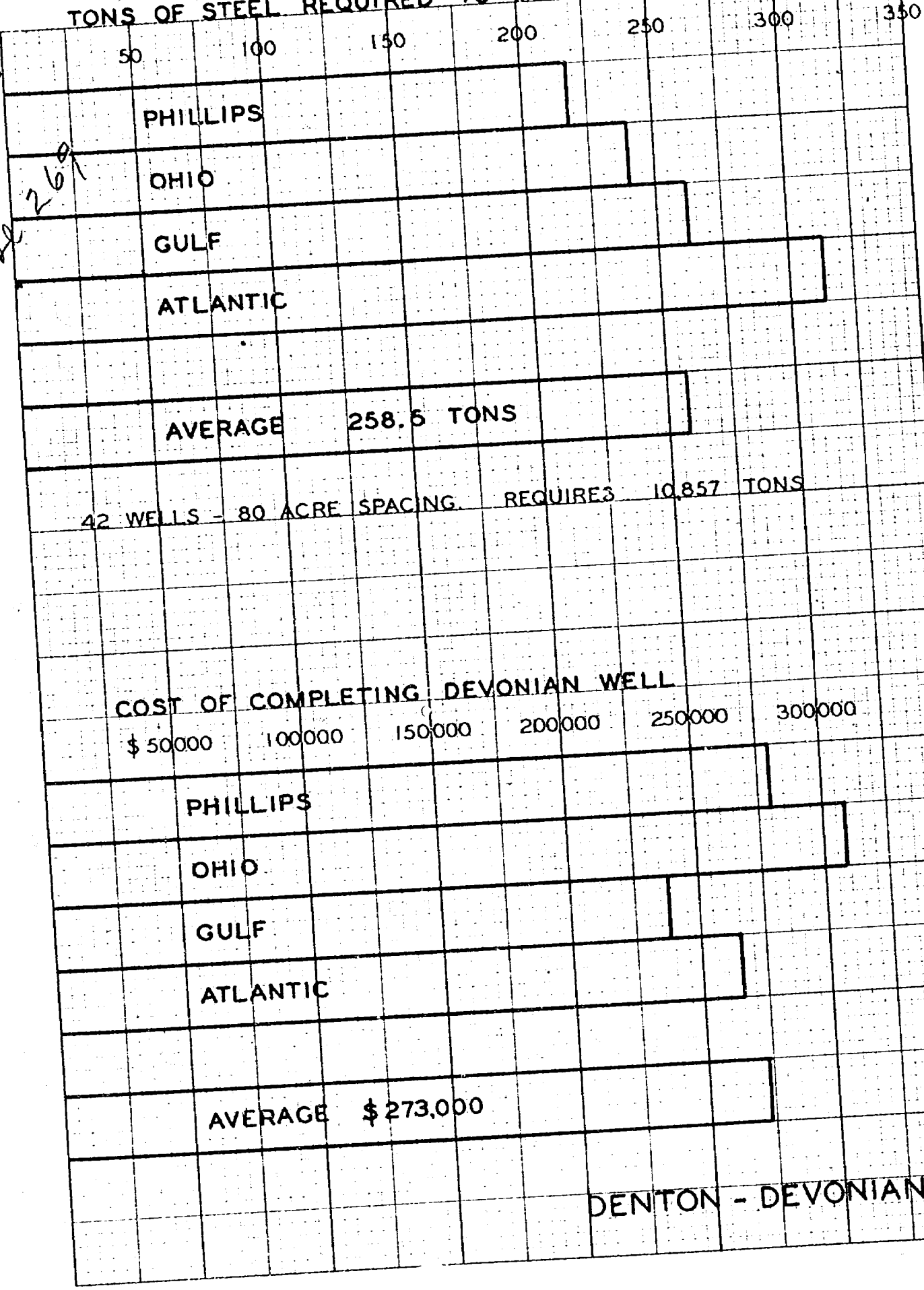


CODEX BOOK COMPANY, INC. NOR
NO. 31,157. FIVE YEARS BY MONTHS X 100 DIVISIONS.

P12 #2

Case 26

TONS OF STEEL REQUIRED TO COMPLETE DEVONIAN WELL



42 WELLS - 80 ACRE SPACING. REQUIRES 10,857 TONS

COST OF COMPLETING DEVONIAN WELL

DENTON - DEVONIAN

CODEX BOOK COMPANY, INC. NORWOOD, MASS. PRINTED IN U.S.A.

NO. 315 ON

PP #10
Case 269

DENTON SILURO-DEVONIAN POOL

Calculation of Expected Pressure-Production History

Assuming that one well will drain only 80 acres

Data: From Core Analysis, Ohio Oil Co. - Denton No. 3 Well NW¼ SE¼ Sec.11-15 S-37 E:

Average Porosity = 3.28%

Average Connate Water = 41.6%)
) Reservoir
Average Oil Saturation = 58.4%)

Productive thickness 741 feet

From Analysis of reservoir fluid, P.P.Co. Denton #1 SE¼ NW¼ Sec.11-15 S-37 E:

Oil Expansibility factor of 1.547×10^{-5} bbls/bbl/psi

Formation Volume Factor of 1.58 (at present condition of res. pressure)

Water Expansibility Factor of $.300 \times 10^{-5}$ bbls/bbl/psi (Assumed from other data)

7758 (bbls. in 1 acre foot) x por. x oil sat = bbls.res.oil per acre foot

$7758 \times .0328 \times .584 = 149$ bbls. res. oil per acre foot

$7758 \times .0328 \times .416 = 106$ bbls. con. wtr. per acre foot

$149 \times 1.547 \times 10^{-5} = 2.30 \times 10^{-3}$ bbls.exp.res.oil/psi/acre foot

$106 \times .300 \times 10^{-5} = .32 \times 10^{-3}$ " " water/psi/acre "

2.62×10^{-3} bbls.reservoir oil theoretically produced/psi/acre foot

$\frac{2.62}{1.58} \times 10^{-3} = 1.65 \times 10^{-3}$ bbls.S.T. oil theoretically produced/psi/acre foot

$1.65 \times 10^{-3} \times 741$ ft. x 80 ac = 98 bbls. S.T. Oil theoretically produced per 80 acre well per psi bHP drop

PPCo #3 case 209

DENTON DEVONIAN POOL

PRODUCTION

	Oil Prod. (Bbls.)	Cumulative Oil Prod. (Bbls.)	Gas (MCF)	Cumulative Gas (MCF)	GOR cf/bbl.
1949					
Oct.	7,478	7,478	10,940	10,940	1,463
Nov.	7,139	14,617	10,444	21,384	1,463
Dec.	8,315	22,932	12,165	33,549	1,463
1950					
Jan.	7,428	30,360	9,787	43,336	1,463
Feb.	7,647*	38,007	10,983	54,319	1,436
Mar.	17,364	55,371	21,281	75,600	1,226
Apr.	14,245	69,616	17,760	93,360	1,247
May	15,679	85,295	18,575	111,935	1,185
June	16,039	101,334	20,218	132,153	1,261
July	15,517	116,851	19,328	151,481	1,246
Aug.	17,737	134,588	22,208	173,689	1,252
Sept.	15,579	150,167	19,693	193,382	1,264
Oct.	17,861	168,028	22,260	215,642	1,246
Nov.	16,237	184,265	20,201	235,843	1,244
Dec.	16,372	200,637	20,487	256,330	1,251
1951					
Jan.	19,302	219,939	24,194	280,524	1,253
Feb.	23,562	243,501	28,369	308,893	1,204
Mar.	36,616	280,117	44,553	353,446	1,217

* Pipe Line Runs -- Prod. Figures Were Not Available.

P? #4
Case 269

DENTON-DEVONIAN POOL

Bottom Hole Pressures

Datum - 7700 Subsea

Operator	Well	Date	Pressure	Hours Shut In
Gulf	Chamberlin #1	3-8-50	4898	120
		6-13-50	4827	79
		9-8-50	4822	
		12-1-50	4810	
		4-2-51	4809	72
Ralph Lowe	Dickenson #1	1-16-51	4844	68
McAlester	Denton #1	11-4-49	4847	48
		11-5-50	4808	48
Phillips Pet. Co.	Denton #1	3-31-51	4807	48

2540# bubble point

NO. 416. 20 DIVISIONS PER INCH BOTH WAYS 100 BY 200 DIVISIONS.
CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.
PRINTED IN U.S.A.

Case #6

Phillips Deadwood #1 Sand

Sand - Chandler Unit I-B

Lower Dakota #1 Sand

Upper Dakota #1 Sand

DENTON-DENVER

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520

R-37-E

R-38-E

PRAIRIEVIEW

O. A. Pope

T 14 S

T 15 S

LEA CO.

ORIGINAL

NT-M

Province	Lease—Tract—Well No.	Field—Pool—Producing Zone	County	State
	Dickinson "B" #2	Denton (Wolfcamp)	Lea	New Mexico

DRILL STEM TESTS

Drill Stem Test No.	1	2	3	
Date	4-1-51	4-2-51	4-3-51	
Name of Test Tool	Taylor	Taylor	Taylor	
Kind of Packer	7-3/4" form.	7-3/4" form.	7-3/4" form	
Depth of Hole	9410	9450	9508	
Depth—Bottom of Packer	9501	9410	9448	
Name—Formation Tested	Wolfcamp	Wolfcamp	Wolfcamp	
Interval Tested (If Open Hole, so State; or if Perforated casing, Give Top and Bottom of Perforations)	9501-9410	9410 - 9450	9448 - 9508	
Water Load	none	none	none	
Chokes (Bottom and Top)	5/8" -- 1/2"	5/8" - 1/2"	5/8" - 1/2"	
Total Length of Time Tool Open	90 min	1 hour	1 hour	
No. of Times & Elapsed Time Tool Opened Each Attempt	once	once	once	
Surface Reaction: Type and Elapsed Time				
(1) Air	immed at blow	***	****	
(2) Gas	surf in 70 min	**	none	
(3) Water Load (Specify if Charged with Oil or Gas)	none	none	none	
(4) Drilling Mud (Specify if Cut with oil, Gas and/or Water)	none	none	none	
(5) Oil/Gas (Estimate or Guage Quantity; % B. S. & /or water)	none	none	none	
(6) Water (Specify kind and if cut with Oil and/or Gas or B. S.)	none	none	none	
Recovery Fluid in Feet from Drill Pipe				
(1) Water Load	none	none	none	
(2) Mud	*	930' O/G cut	none	
(3) Oil and Gas	3600' clean O	370' clean oil 200' gas		
(4) Water—Kind? (i.e. Salt or Sulphur, Fresh, etc.)	none	none	2730' hr O/G cut Sulp.	
BHP Flowing	1220	200#	1280#	
BHP Shut In	3420	3400#	3180#	
Rate Flow Oil and Gas	none	none	none	
Gas/Oil Ratio BS & W	none	none	none	

RECEIVED
APR 17 1951
OIL CONSERVATION COMMISSION
HOBBS-OFFICE

REMARKS: (Should Indicate Reaction after Tool Closed and While Coming out of Hole. Specify.)

* 560' heavily O&G cut mud and 490' slightly O&G cut mud.
** Gas hit surface in 70 min while taking shut-in pressure.
*** Strong blow for 18 min, decreased to fair blow.
**** St. blow decreasing to fair blow in 18 min, decreased to weak blow in 1 hour.

DRILL STEM TESTS

Drill Stem Test No.				
Date				
Name of Test Tool				
Kind of Packer				
Depth of Hole				
Depth—Bottom of Packer				
Name—Formation Tested				
Interval Tested (If Open Hole, so State; or if Perforated casing, Give Top and Bottom of Perforations)				
Water Load				
Chokes (Bottom and Top)				
Total Length of Time Tool Open				
No. of Times & Elapsed Time Tool Opened Each Attempt				
Surface Reaction: Type and Elapsed Time				
(1) Air				
(2) Gas				
(3) Water Load (Specify if Charged with Oil or Gas)				
(4) Drilling Mud (Specify if Cut with oil, Gas and/or Water)				
(5) Oil/Gas (Estimate or Guage Quantity; % B. S. & /or water)				
(6) Water (Specify kind and if cut with Oil and/or Gas or B. S.)				
Recovery Fluid in Feet from Drill Pipe				
(1) Water Load				
(2) Mud				
(3) Oil and Gas				
(4) Water—Kind? (i.e. Salt or Sulphur, Fresh, etc.)				
BHP Flowing				
BHP Shut In				
Rate Flow Oil and Gas				
Gas/Oil Ratio BS & W				

REMARKS: (Should Indicate Reaction after Tool Closed and While Coming out of Hole. Specify.)

Above Correct—Signature

Title District Superintendent

Date 4-13-51

IT IS RECOMMENDED THIS INFORMATION BE COMPILED ON DERRICK FLOOR AND ORIGINAL BE PERMANENTLY RETAINED IN

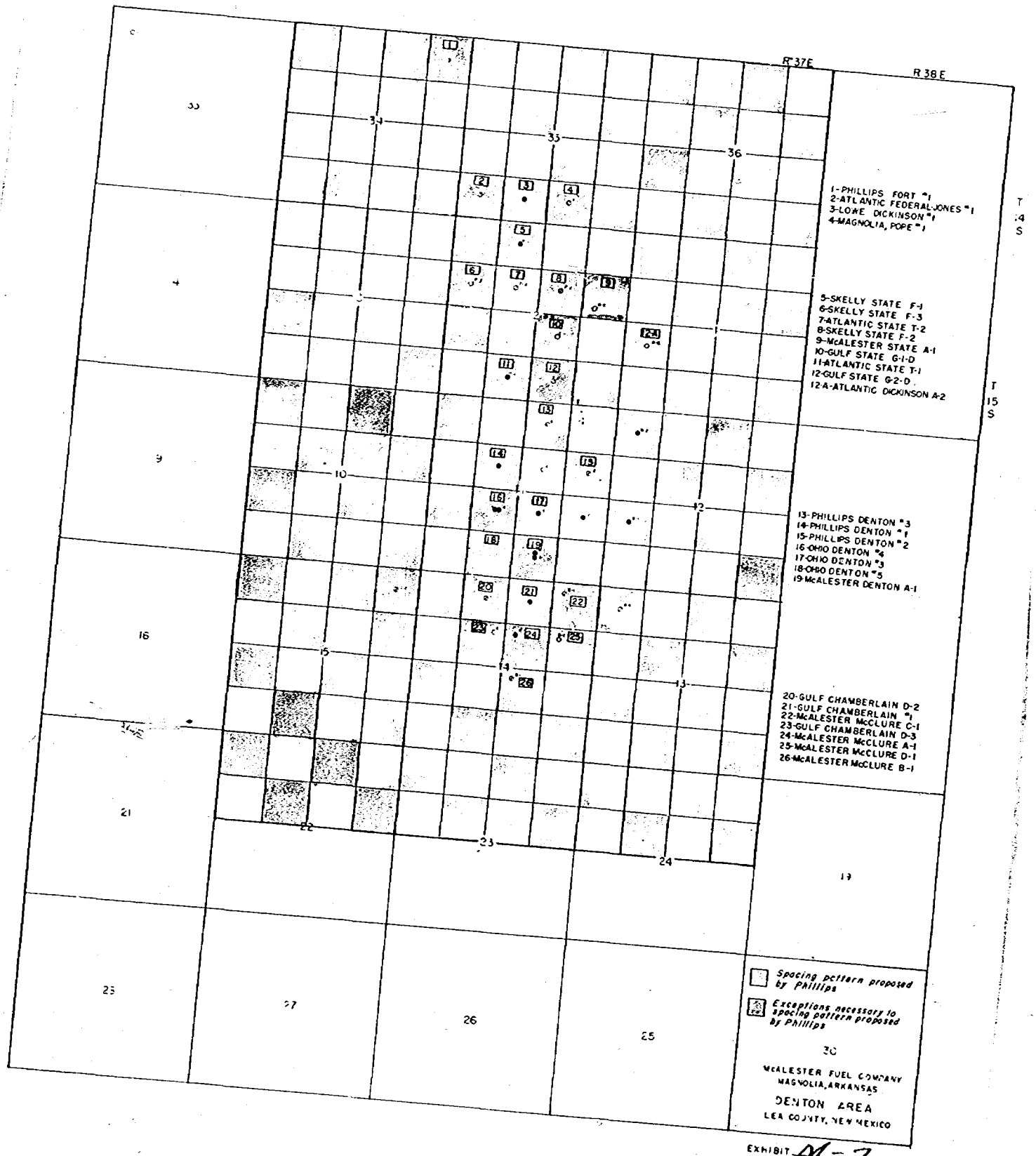


EXHIBIT A-7

Case 269-70

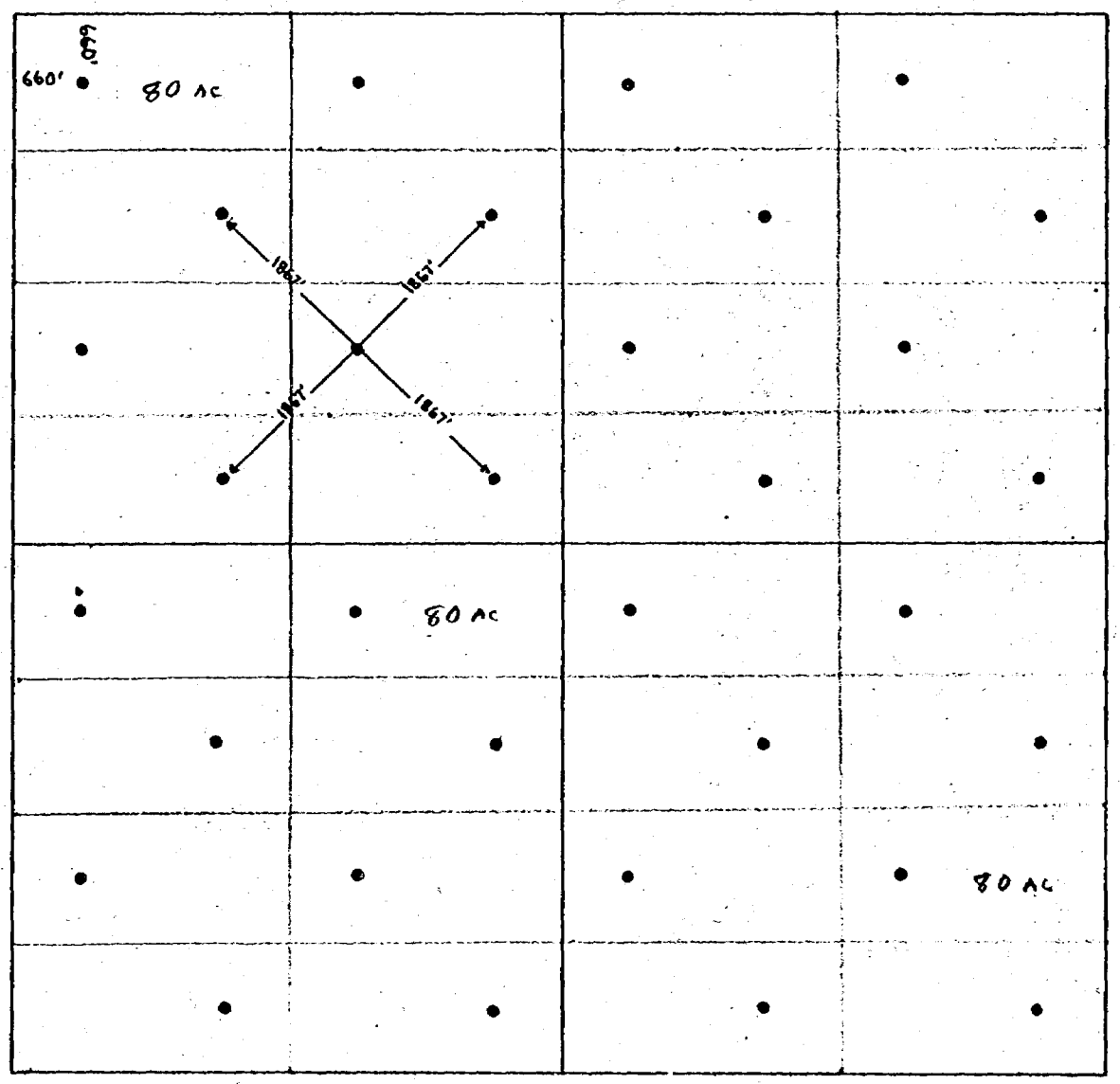
COMPARISON OF VARIOUS WELL SPACING PLANS

FIGURE I

EIGHTY ACRE SPACING PLAN

WELL LOCATIONS LIMITED TO DIAGONAL QUARTER QUARTER SECTIONS

SCALE 1" = 1600'



Case 269-70

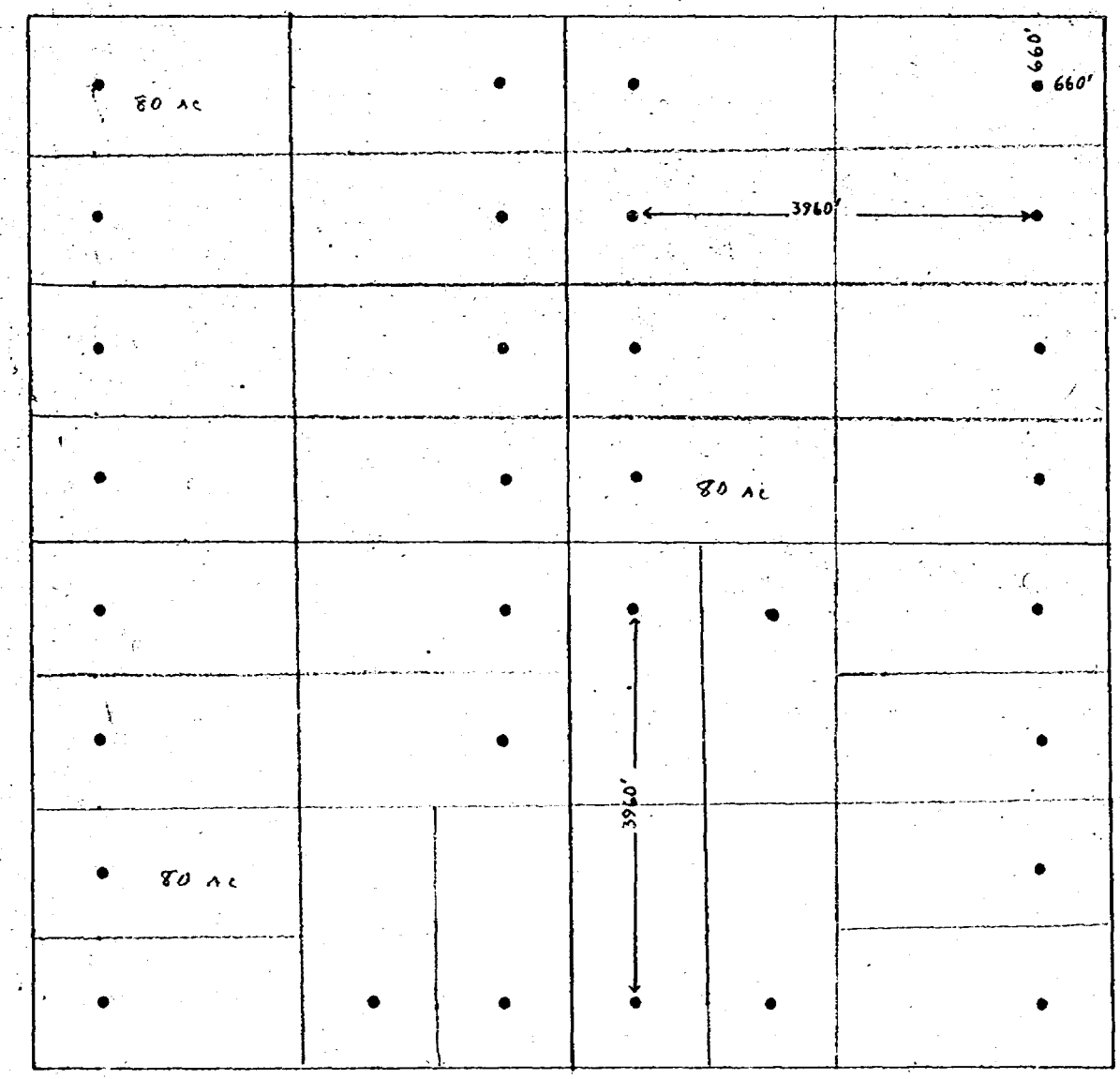
COMPARISON OF VARIOUS WELL SPACING PLANS

FIGURE II

POSSIBLE EIGHTY ACRE SPACING PLAN

WELL LOCATIONS NOT LIMITED TO DIAGONAL QUARTER QUARTER SECTIONS

SCALE 1" = 1600'



Cause 269-70

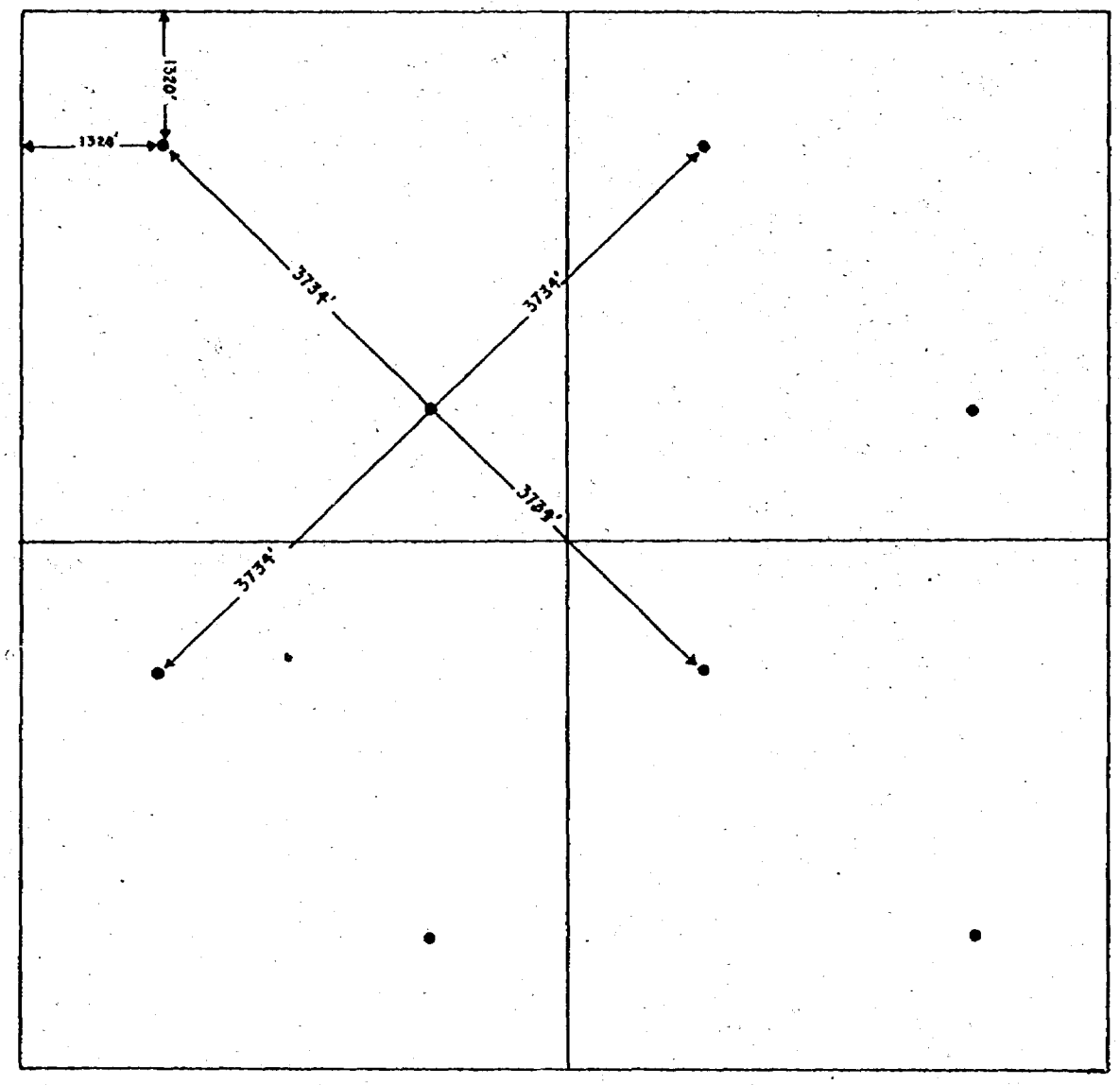
COMPARISON OF VARIOUS WELL SPACING PLANS

FIGURE III

THREE HUNDRED TWENTY ACRE SPACING PLAN

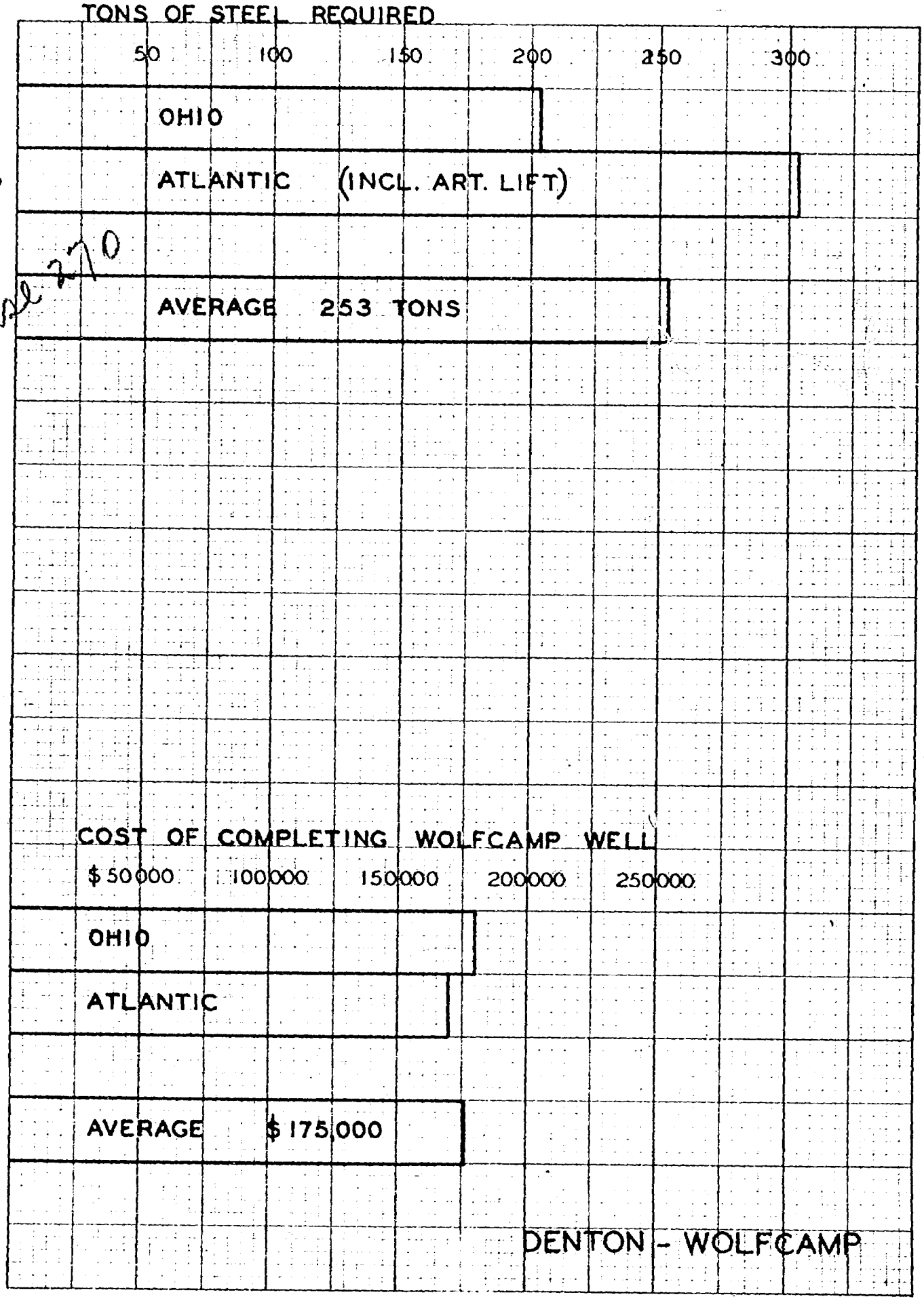
WELLS LOCATED IN CENTER OF DIAGONAL QUARTER SECTIONS

SCALE 1" = 1600'



269-70

TONS OF STEEL REQUIRED



Case 270

PP 5

COST OF COMPLETING WOLFCAMP WELL

DENTON - WOLFCAMP

CODEX BOOK COMPANY, INC., NORWOOD, MASSACHUSETTS
PRINTED IN U.S.A.

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO 269
ORDER NO. R-74

THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR THE ESTABLISHMENT OF PRO-
RATION UNITS AND PROVIDING FOR THE
ALLOWABLES FOR THE SILURO-DEVONIAN
COMMON SOURCE OF SUPPLY DISCOVERED
IN McALESTER FUEL CO. et al J. M. DENTON
WELL No. 1-A, SW/4 SE/4 SECTION 11, T. 15 S,
R. 37 E, NMPM, DENTON POOL, LEA COUNTY
NEW MEXICO

ORDER OF THE COMMISSION

BY THE COMMISSION:

This matter came on for hearing at 10 o'clock a. m. on May 22, 1951, at Santa Fe, New Mexico, pursuant to notice before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and the Commission having heard the evidence and being fully advised in the premesis,

FINDS:

1. That due public notice having been given as required by law, the Commission has jurisdiction of the subject matter and of the interested parties.

2. That the Denton-Devonian pool as heretofore established, comprises:

Twp. 15 S R. 37 E, NMPM
All of Sections 11, 12, 13 & 14

3. Evidence disclosed that more than 500' of Devonian pay zone has been encountered in various wells in the pool, the actual productive area of which, however, is largely undetermined at the present time.

4. That the pool has reached its present satisfactory stage of development by wells drilled and drilling on the regular 40-acre spacing pattern, and any change to wider spacing would require numerous exceptions and adversely affect drainage and correlative rights.

Case No. 269
Order No. R-74

IT IS THEREFORE ORDERED THAT

The application of Phillips Petroleum Company for an order establishing 80-acre spacing for the Siluro-Devonian common source of supply in the Denton-Devonian pool, described as all of Sections 11, 12, 13 and 14 in Twp. 15S, Range 37E, NMPM Lea County, New Mexico, be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier

R. R. SPURRIER, Secretary

SEAL

Accumulative Production - Denton Wolfcamp Pool

1953-

		1950	1951	1952	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
Atlantic Refg Co.													
Dickenson A-13	1S 13-15-37	5723	min. 248	39489	2991	2335	1966	1289	1054	668	731	616	
" B-2	1N 35-14-37			apl 35153	1481	1632	65	1458	1737	5184	5127	4987 est	
" A-1	1L 1-15-37		17721	56298 est	5435	4650	5241	4648	3253	3019	5997	2927	
" C	1K 17-15-37		52991	30150	2826	3004	100	680	1764	2086	2490	2363	
" "	2N "		44722	20564	5272	4208	4279	4416	3465	2815	1390	965	
" "	4C "					4088	131	852	5330	5195	5270	4805	
" "	5M "									3271	1748	2412	
Jones	3M 35-14-37			new 7603	5367	4788	5213	4444	4000	4076	5420	5127	
	4P 26-14-37					297	5168	5160	4377	2914	3257	5432	
State T	5K 2-15-37						5223	5160	5363	5267	5103	5330	
	6C "			new 9693	5340	4761	4091	5025	5127	5267	4933	5330	
	7N "						5270	4240	5380	5270	5040	5320	
	8M "					1558	5312	4976	5063	4890	5202	5100	
Gulf Oil Corp.											Presumed		
Chamberlain	3F 12-15-37			new 39278	158	17	Read	Read	249	1091	4986	4900 est	
	4K "			July 27714	5414	4926	5184	4712	5248	4296	4827	4396	
	5E "			July 26670	5412	4926	5187	4610	5338	5029	4505	3033	
Sue Ann "B"	5J 2-15-37			new 5980	5298	4802	5191	5190	5292	5027	5101	5239	
	6F "				2269	4802	5191	5195	5383	5025	5186	5249	
	7P "					2437	5189	5194	5379	5031	4435	2411	
	8C "						1148	5195	5386	5030	5182	5240	
Simpson	4J 3-15-37								606	3077	3748	2340	
	5P "											546	
Ralph Jones													
Dickenson	7N 35-14-37				1					5291	4951	4723	
	8J "									2770	4952	4723	
	9C "										850	4723	
	10K "											3060	
Magnolia													
Maxwell	2P 27-14-37						4614	5075	5231	3762	4417	4942	
	4Z "											2433	
Pope	2O 35-14-37			new 5880	5345	4801	4359	5069	5474	5073	5300	5101	
	8M 26-14-37								4380	4856	5267	5257	
	11P 35-14-37								1191	5073	5299	5100	
	15J 26-14-37										3421	5054	
	18N "										1041	5257	
	19K "												
Texas Eastern Prod. Co.													
Denton A	2C 11-15-37	16443	70471	62637	5322	4597	4865	5071	5382	4902	5019	4902	
Mrs Claus A	2G 14-15-37					3412	3940	4019	3907	3651	5274	2978	

			1950	1951	1954	Jan	Feb	March	April	May	June	July	Aug
Ohio Co. &	2J	12-15-37			Dec 33278	3543	2815	4970	4667	4253	4076	4284	3970
" B	1H	"			Dec 2403	2111	1610	7111	2129	1937	1734	1507	1416
" A	2H	2-15-37			Nov 38535	5208	4855	5098	5196	5269	5059	5274	5264
Oil Co.													
Ohio Oil Co.	1K	11-15-37	23264	53496	56271	46246	46146	5030	4526	4811	4473	4690	4718
"	7L	"	23331	53494	56268	46246	46146	5030	4526	4811	4473	4690	4717
J.M.	8J	"			Sept 19544	46246	46146	5030	4526	4811	4473	4690	4717
	10L	"											1963
Ohio Oil Co.													
Ohio	6L	11-15-37			Nov 38986	5383	4750	5385	5016	5488	4837	5206	5259
	5A	"			June 28755	5383	4750	5385	5016	5488	4837	5206	5259
	8F	"			March 31467	5384	4750	5385	5016	5488	4837	5206	5259
	10H	"			April 39389	5384	4750	5385	5016	5488	4837	5206	5250
	11E	"			April 39325	5384	4750	5385	5016	5489	4837	5206	5259
	12C	"			Aug 27412	5384	4750	5385	5017	5489	4831	5207	5259
Ohio Co.													
Ohio	4H	3-15-37			Dec 4191	5131	4657	5141	4977	5137	4948	4255	1704
"	5H	"				7034	4770	2415	2323	2433	617	60	4778
													2380
Ohio Oil Co.	2I	10-15-37					4521	5158	5104	5257	5078	5286	5269
Ohio	4D	1-15-37			Oct 15249	5261	3150	5265	4674	4906	3088	3674	5270
Ohio Oil Co.													
Ohio No. 7	6C	2-15-37			April 41496	5095	4684	5365	4987	5317	5107	5206	4958
	7E	"			May 37475	5095	4684	5365	4987	5317	5107	5206	4936
	8D	"			Jan 29926	4966	4567	5134	4863	5317	5094	5185	4847
	9E	"			Jan 30984	5095	4684	5365	4987	5317	5107	5206	4958
	11B	"			Aug 26331	5095	4684	5365	4987	5317	5107	5206	4958
	12A	"								5317	5107	5206	4958
			68141	193153	949645	153575	156061	173647	188832	211987	216375	234034	249589

INTER-OFFICE TRANSMITTAL SLIP

TO Dick Spencer

FROM T. L. Mechem

( ) For Approval

( ) For Signature

( ) Note and Advise

( ) Note and Return

( ) For Your Files

(X For Your Handling

Remarks:

The Phillips case seems clear to me. They did not submit any evidence on condition of the reservoirs nor on the necessity for changing to 80 acres. All they talked about was a basic policy for all fields. How will it affect Crossroad?

CORRECTION ORDER

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 269
ORDER NO. R-74 A

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY, et al J. M. DENTON WELL NO. 1-A SW/4 SE/4 SECTION 11, T. 15 S. R. 37 E. NMPM, DENTON POOL, LEA COUNTY, NEW MEXICO

NUNC PRO TUNC ORDER OF THE COMMISSION

It appearing to the Commission that the order heretofore entered in the above entitled cause is not a correct memorial of the judgment as rendered and announced by this Commission, in that finding No. 2 of said order as rendered and announced, defined the Denton-Devonian pool as comprising:

Twp. 15 S. R. 37 E NMPM
All of Section 11, 12, 13 & 14

WHEREAS, through inadvertence and a clerical error said Denton-Devonian pool was defined as comprising:

Twp. 15 S. R. 37 E, NMPM
All of Sections 11, 12, 13 & 14

THEREFORE, IT IS HEREBY ORDERED that the order heretofore entered by this Commission in the above entitled cause on June 5, 1951, be and the same is hereby corrected to conform to the actual judgment and order announced and rendered by the Commission by modifying Finding No. 2 to read as follows:

Twp. 14 S., R. 37 E, NMPM
All Sections 34, 35, & 36

Twp. 15 S. R. 37 E, NMPM
All Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and N/2 Sec. 22, N/2 Sec. 23, N/2 Sec. 24

(Case No. 269
Order No. R-74-A)

and said order in all other respects is hereby ratified and confirmed; and

IT IS FURTHER ORDERED THAT THIS ORDER correcting the record of said order be entered nunc pro tunc as of the 5th day of June, 1951, that being the date when said order was originally made and entered.

DONE this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier

R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO. 269
ORDER NO. R-74 B

THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY FOR THE
ESTABLISHMENT OF PRORATION UNITS AND
PROVIDING FOR THE ALLOWABLES FOR THE
SILURO-DEVONIAN COMMON SOURCE OF SUPPLY
DISCOVERED IN McALESTER FUEL COMPANY,
et al J. M. DENTON WELL No. 1-A, SW/4 SE/4
SECTION 11, T. 15 S. R. 37 E, NMPM, DENTON
POOL, LEA COUNTY, NEW MEXICO

ORDER OF COMMISSION FOR REHEARING

This cause having come on for hearing upon the petition and motion of the Phillips Petroleum Company filed June 25, 1951, for a rehearing of Order No. R-74 heretofore rendered by this Commission denied the application of Phillips Petroleum Company for an order estab lishing an 80 acre spacing for the Siluro-Devonian common source of supply in the Denton-Devonian pool, and the Commission having considered said motion and application.

IT IS HEREBY ORDERED that the above entitled matter be reopened and that a rehearing in said cause be held July 25, 1951, at 10 o'clock A. M. at Santa Fe, New Mexico, at which time and place all interested parties may appear.

DONE this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem
EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier
R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO 269
ORDER NO. 74-A

THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY FOR
THE ESTABLISHMENT OF PRORATION
UNITS AND PROVIDING FOR THE
ALLOWABLES FOR THE SILURO-DEVONIAN
COMMON SOURCE OF SUPPLY DISCOVERED
IN McALESTER FUEL CO. et al J. M. DEN-
TON WELL No. 1-A, SW/4 SE/4 SECTION 11,
T, 15 S. R. 37 E. NMPM, DENTON POOL,
LEA COUNTY NEW MEXICO

* Twp. 15S R37E N.M.P.M. All Secs 1, 2, 3, 10, 11, 12, 13, 14, 15 and N/2 Sec 22, N/2 Sec 23, 24

NUNC PRO TUNC ORDER OF THE COMMISSION

It appearing to the Commission that the order heretofore entered in the above entitled cause is not a correct memorial of the judgment as rendered and announced by this Commission, in that finding No. 2 of said order as rendered and announced, defined the Denton-Devonian pool as comprising:

* Twp. 14S., R. 37E N.M.P.M. all Secs 34, 35, & 36 (~~set forth correct description~~);

and

WHEREAS, through inadvertence and a clerical error said Denton-Devonian pool was defined as comprising:

Twp. 15 S R. 37 E, NMPM
All of Sections 11, 12, 13 & 14

THEREFORE, IT IS HEREBY ORDERED that the order heretofore entered by this Commission in the above entitled cause on June 5, 1951, be and the same is hereby corrected to conform to the actual judgment and order announced and rendered by the

Commission by modifying Finding No. 2 to read as follows:

all pg. 1

* (insert correct description)

and said order in all other respects is hereby ratified and confirmed; and

IT IS FURTHER ORDERED THAT THIS ORDER correcting the record of said order be entered nunc pro tunc as of the 5th day of June, 1951, that being the date when said order was originally made and entered.

Done this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

By_____

Mary D.

Box 210, Magnolia, Ark.

, Box 871, Midland

, Box 1667, Hobbs & 787, Roswell

—— Box 832, Midland

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO 269
ORDER NO. 74 R

THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY FOR THE
ESTABLISHMENT OF PRORATION UNITS AND
PROVIDING FOR THE ALLOWABLES FOR THE
SILURO-DEVONIAN COMMON SOURCE OF SUPPLY
DISCOVERED IN McALESTER FUEL CO. et al
J. M. DENTON WELL No. 1-A, SW/4 SE/4
Section 11, T. 15 S. R. 37 E, NMPM,
DENTON POOL, LEA COUNTY NEW MEXICO

ORDER OF COMMISSION FOR REHEARING

This cause having come on for hearing upon the petition and motion of the Phillips Petroleum Company filed June 25 1951, for a rehearing of Order No. R-74 heretofore rendered by this Commission June 5, 1951, wherein this Commission denied the application of Phillips Petroleum Company for an order establishing an 80 acre spacing for the Siluro-Devonian common source of supply in the Denton-Devonian pool, and the Commission having considered said motion and application.

IT IS HEREBY ORDERED that the above entitled matter be reopened and that a rehearing in said cause be held July 25, 1951 at 10 o'clock A. M. at Santa Fe, New Mexico, at which time and place all interested parties may appear.

Done this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

By _____

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE No. 269
ORDER No. R-74-C

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY ET AL, J. M. DENTON WELL NO. 1-A, SW/4 SE/4 SECTION 11, TOWNSHIP 15 S, RANGE 37 E, NMPM, DENTON POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION ON REHEARING

BY THE COMMISSION:

This cause came on for hearing upon the petition of Phillips Petroleum Company on May 22, 1951, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and for rehearing on July 24, 1951, and August 7, 1951.

NOW, on this 15th day of October, 1951, the Commission, a quorum being present, having fully considered the record and the testimony adduced and the exhibits received at said hearing and rehearings, and being fully advised in the premises,

FINDS, (1) That due public notice having been given in accordance with law, the Commission has jurisdiction of this cause, the persons and subject matter thereof.

(2) That after due public notice and hearing on May 22, 1951, the Commission entered its orders numbered R-74 and R-74-A denying petitioners application for 80-acre spacing

(3) That upon motion duly filed, the Commission granted a rehearing by its Order No. R-74-B, for the purpose of taking additional testimony and hearing oral argument, and that such rehearing was held on July 24, 1951, and August 7, 1951.

(4) That no evidence was presented at such rehearings sufficient to justify an order granting petitioner's application.

IT IS THEREFORE ORDERED:

That Phillips Petroleum Company's application for 80-acre spacing in the Denton pool, Lea County, New Mexico, on rehearing, be, and the same hereby is denied, and the Commission's Order No. R-74, as amended and corrected by Order No. R-74-A, be, and the same hereby is affirmed.

DONE at Santa Fe, New Mexico, on the day and year hereinabove written.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem
EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier
R. R. SPURRIER, Secretary

LAW OFFICES
E. R. WRIGHT
SANTA FE
NEW MEXICO
TELEPHONE 740

June 25, 1951

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

Inclosed herewith find two extra copies of petition of Phillips Petroleum Company for re-hearing of Orders Nos.R-74 and R-75, in compliance with your phone request of this date.

Very truly yours,

E. R. WRIGHT

ERW/dl

Inclosures

1- Copy to Staley 7-3-51 (ak)
(OK will return)

Mr. Graham cc Bldg Complaint

Mail Delivery 25 date

Call & ask for two
more copies

Mr. Graham cc [illegible]

[illegible] date

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
OF NEW MEXICO FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 269
ORDER NO. R-74

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY, et al, J. M. DENTON WELL NO. 1-A, SW/4 SE/4, SECTION 11, T. 15S, R. 37E, N.M.P.M. DENTON POOL, LEA COUNTY, NEW MEXICO.

TO: STATE OF NEW MEXICO OIL
CONSERVATION COMMISSION.

REQUEST FOR HEARING AND ORAL ARGUMENT.

Now comes the Phillips Petroleum Company, petitioner in the above entitled matter, and requests the Commission to grant it a hearing and right to make oral argument and introduce additional testimony in support of its petition and motion for re-hearing, and requests the Commission to set the matter for hearing and argument upon the motion for re-hearing for July 25, 1951, immediately following the state-wide hearing heretofore set for July 24, 1951.

Respectfully requested,

Attorney for Phillips Petroleum
Company, Santa Fe, N. M.

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
RECEIVED
JUN 21 1951

STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO 269
ORDER NO. R-74

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLUEM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY et al J. M. DENTON WELL NO. 1-A, SW/4SE/4 SECTION 11, T. 15S, R. 37E, N.M.P.M., DENTON POOL, LEA COUNTY, NEW MEXICO.

MOTION FOR RE-HEARING OF ORDER NO. R-74 HANDED DOWN BY THE COMMISSION JUNE 5, 1951, DENYING THE APPLICATION OF PHILLIPS PETROLUEM COMPANY FOR AN ORDER ESTABLISHING 80 ACRE SPACING OF THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER ET AL, J. M. DENTON WELL NO. 1-A.

Now comes the Phillips Petroleum Company and moves the Commission, and by means of motion for re-hearing, petitions the Commission to re-open this proceeding for the purpose of reconsidering the order so entered by the Commission on June 5, 1951, and to permit petitioner to offer additional evidence and argument in support of this motion and petition for re-hearing, and for grounds thereof shows the Commission:-

1. In its application dated March 22, 1951, petitioner requested that Sections 34, 35 and 36, Township 14, South of Range 37 East, and Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15, and the north halves of Sections 22, 23 and 24, all in Township 15, South of Range 37 East, Lea County, New Mexico, be determined to be within the common source of supply for the Denton Siluro-Devonian field, which field is considered from present available information as lying at a depth of approximately 12,000 feet; that the order entered by the Commission on June 5, 1951, ignores all of the evidence offered at said hearing, and is contrary to the same, as to the Ralph Lowe Dickenson Well No. 1 located in the $SE\frac{1}{4}SW\frac{1}{4}$, Section 35, Township 14, South of Range 37 East, which definitely established that the production from said well came from the same common source of supply as wells in Sections 11, 12, 13 and 14 of Township 15, South of Range 37 East; and

that the wells drilling in Section 2 of Township 15, South of Range 37 East, at the time of said hearing all were projected to and will be completed in the same common reservoir as the wells in Sections 11 and 14, which are now producing from the Siluro-Devonian formation.

2. Notwithstanding the fact that all of said testimony introduced at said hearing established the fact that the well in Section 35, Township 14, South of Range 37 East, above referred to, produces from the same common source of supply as the other wells referred to herein, the Commission has, by ignoring this fact, granted an allowable of 351 barrels a day to the well in Section 35, as against an allowable of 295 barrels a day to wells in Sections 11 and 14, which action of the Commission results in unequal withdrawal between these wells, giving a preferential right to the well in Section 35, thereby preventing the owners of wells in Sections 11 and 14 from obtaining their just and equitable share of the oil and gas in the common pool, in violation of Section 69-213, New Mexico Statutes 1941 Annotated.

3. In denying the application of the petitioner for 80 acre spacing, the Commission, in its order of June 5, 1951, erred in that:-

(a) The owners of property within the pool are required to drill more wells than are reasonably necessary to secure their proportionate part of the production from the pool:

(b) The drilling of wells on the basis of 40 acre spacing tends to create fire and other hazards conducive to waste;

(c) 40 acre spacing in the Denton pool unnecessarily increases production cost of oil and gas to the operator;

(d) 40 acre spacing unnecessarily increases the cost of oil and gas products to the ultimate consumer;

(e) It directly violates the directives issued by the

Petroleum Administration for Defense (PAD), in that it requires the unnecessary use and waste of steel during the present national emergency;

(f) It renders impossible the utilization of 80 acre spacing in the event subsequent development of the pool should determine and prove that 80 acre spacing should be applied rather than 40 acre spacing; and

(g) It unnecessarily discourages development of the oil and gas resources of the State of New Mexico by requiring unnecessary use of steel and by requiring costly drilling of unnecessary wells.

4. The order of the Commission of June 5, 1951, by fixing well spacing at 40 acres tends to discourage deep drilling and the exploration for and development of deep reservoirs and reserves and the more rapid defining of the limits of a pool, all of which efforts are now being encouraged by the Petroleum Administration for Defense.

5. By the Commission's said order it has acted against the best interests of the royalty owners, including the State of New Mexico as a royalty owner, and the people of the State of New Mexico, in that it has disregarded the fact that there are better methods of securing greater ultimate recovery of oil and gas than simply by drilling more wells.

In submitting this petition and motion for re-hearing, and during the pendency of this motion for a re-hearing and until final determination by the Commission of Petitioner's application for 80 acre spacing, it is requested that the Commission, by an appropriate order or directive, restrict the location of wells to the northwest quarter and southeast quarter of each quarter section in the field.

Respectfully submitted,

Santa Fe, N. M.

June 29 - 1951 10 am

RRS: Re this letter: Miss Hawkins just called, said that the Governor had a copy of it and that he had made a personal notation to you saying "OK with me." She's retaining the copy for her files, but passed his comment along verbally. If you need it, she advises, you may obtain the written note....

NR

ATWOOD, MALONE & CAMPBELL
LAWYERS

JEFF D. ATWOOD
ROSS L. MALONE, JR.
JACK M. CAMPBELL

CHARLES F. MALONE

J. P. WHITE BUILDING
ROSWELL, NEW MEXICO

June 26, 1951

Case 269

Mr. R. R. Spurrier,
Secretary and Member
Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Spurrier:

Mr. E. R. Wright, attorney for Phillips Petroleum Company, has furnished us with copies of Motions for Re-Hearing in Cases Nos. 269 and 270 before the Oil Conservation Commission. We represent McAlester Fuel Company which appeared as an interested party in Case No. 269 only. Our sole interest in this matter is in Case No. 269.

In view of the fact that the present rules of the Commission do not provide for a procedure by which interested parties who have appeared in the original hearing may file responsive pleadings to motions for re-hearing, we are writing this letter to the Commission with copies to the attorney for Phillips Petroleum Company. We have no objection to this letter being made a part of the record in Case No. 269.

We consider the point in the Motion with reference to the description of the limits of the Siluro-Devonian common source of supply to be well taken. The orders in the cases apparently reverse the descriptions. This is a matter of clerical error and could be corrected, in our opinion, by a supplemental order without the necessity of a re-hearing upon the matter. The transcripts in the cases will clearly disclose the descriptions and the error which was made in the preparation of the orders.

We cannot see in the Motion any indication of any new evidence with reference to spacing or any new arguments which were not presented to the Commission at the original hearing. We see no advantage to be gained by a re-hearing in this case.

We have noted that the Commission has been requested, until final determination of this matter, not to approve any standard 40 acre drilling location except

upon a certain pattern in the NW¼ and the SE¼ of each quarter section. We strenuously object to this portion of the Motion. The Commission has entered its order denying an exception to the state-wide spacing pattern. Section 19 (c) of the Conservation statute specifically provides that the pendency of proceedings to review shall not suspend operation of the order but after the matter is in the District Court the Court may suspend operation of the order and in so doing may require the furnishing of bond by the parties seeking a suspension of the order. By seeking to have the Commission restrict drilling locations even prior to a hearing on this Motion, it appears to us that Phillips Petroleum Company is undertaking to supersede the statutory provision. We do not know at this time whether our client desires to make locations differing from the pattern suggested, but if it does then we must certainly take the position that the Commission should approve these drilling locations until such time as a Court properly suspends the existing order.

We make these comments since the Motion seeks affirmative action by the Commission even prior to a hearing on the Motion itself.

Respectfully yours,

Jack M. Campbell

for ATWOOD, MALONE & CAMPBELL

JMC:hl

cc. Gov. E. L. Mechem,
Mr. Guy Shepard, Land Commissioner,
Mr. L. C. White, Attorney at Law,
Mr. E. R. Wright, Attorney at Law,
Mr. George Graham, Attorney, Commissioner of Public Lands.

BEFORE THE OIL CONSERVATION COMMISSION OF
THE STATE OF NEW MEXICO

May 1 hearing

IN THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE ALLOWABLES FOR THE SILURO-DEVONIAN COMMON SOURCE OF SUPPLY DISCOVERED IN McALESTER FUEL COMPANY ET AL J. M. DENTON WELL NO. 1-A, SW/4 SE/4 SECTION 11 TOWNSHIP 15 SOUTH RANGE 37 EAST, LEA COUNTY, NEW MEXICO, KNOWN AS THE DENTON FIELD.

Case

CAUSE NO. 269

ORDER NO. _____

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, Oklahoma, and alleges and states:

1. That McAlester Fuel Company, et al, El Dorado, Arkansas, has drilled and on October 4, 1949 completed a well known as "J. M. Denton No. 1-A" located in the center of the SW/4 SE/4 Section 11-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Siluro-Devonian, which common source of supply was found in said well at the depth of from 11,325 feet to 11,464 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled or are now being drilled to said common source of supply in the area:

(a) Ohio Oil Company - Denton No. 3, located in NW/4 SE/4 Section 11-15S-37E, which was completed on January 22, 1951 as a producing oil well from depth 11,916 feet to depth 12,044 feet.

(b) Atlantic Refining Company - Bettie C. Dickinson No. 1-A, located in NW/4 NW/4 Section 13-15S-37E, which was completed December 9, 1949 as a producing oil well from depth 11,272 feet to depth 11,324 feet.

(c) Gulf Oil Corporation - L. R. Chamberlain No. 1, located in NW/4 NE/4 Section 14-15S-37E, which was completed March 9, 1950 as a producing oil well from depth 11,501 feet to depth 11,513 feet.

(d) McAlester Fuel Company - McClure No. 1-A, located in SW/4 NE/4 Section 14-15S-37E, which was completed March 5, 1951 as a producing oil well from depth 11,503 feet to depth 12,321 feet.

(e) McAlester Fuel Company - J. S. Waller No. 1, located in NE/4 NE/4 Section 15-15S-37E, which was completed as a dry hole on February 20, 1950 at total depth 12,015 feet.

OIL CONSERVATION COMMISSION
MAR 29 1951

(f) Ralph Lowe - Dickinson Estate No. 1, located in SE/4 SW/4 Section 35-14S-37E, which was completed December 11, 1950 as a producing oil well from depth 12,360 feet to total depth 12,385 feet.

(g) Phillips Petroleum Company - Denton No. 1, located in SE/4 NW/4 Section 11-15S-37E, which encountered the Siluro-Devonian common source of supply from depth 11,445 feet to depth 12,555 feet which yielded flowing oil production on numerous drill-stem tests, has reached total depth 12,623 feet, run casing, and will be completed as a producing oil well.

(h) Atlantic Refining Company - Federal-Jones No. 1, located in SW/4 SW/4 Section 35-14S-37E, which was drilling at approximately 6690 feet on March 10, 1951.

(i) Atlantic Refining Company - State No. 1-T, located in SE/4 SW/4 Section 2-15S-37E, which was drilling at approximately 9800 feet on March 10, 1951.

(j) Skelly Oil Company - State No. 1-F, located in NE/4 NW/4 Section 2-15S-37E, which was drilling at approximately 11,000 feet on March 10, 1951.

(k) Ohio Oil Company - Denton No. 4, located in NE/4 SW/4 Section 11-15S-37E, which was drilling at approximately 4750 feet on March 10, 1951.

(l) Atlantic Refining Company - Dickinson No. 2-B, located in NW/4 NW/4 Section 12-15S-37E, which was drilling at approximately 7500 feet on March 10, 1951.

(m) McAlester Fuel Company - McClure No. 1-B, located in NW/4 SE/4 Section 14-15S-37E, which was drilling at approximately 3500 feet on March 10, 1951.

(n) McAlester Fuel Company - McClure No. 1-C, located in NE/4 NE/4 Section 14-15S-37E, which was drilling at approximately 375 feet on March 10, 1951.

3. A plat of the area showing the location of the wells referred to above, circled in red, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Siluro-Devonian formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration

Case 269

(o) Gulf Oil Corporation - L. R. Chamberlain No. 2D, located in NE/4 NW/4 Section 14-15S-37E, which was drilling at approximately 400' on April 9, 1951.

5. That in order to bring about the orderly and proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well, and to provide for the uniform spacing of said wells in the center of the Northwest and Southeast forty-acre tracts of each quarter section, with a tolerance of 150 feet to avoid surface obstructions.

WHEREFORE, applicant respectfully requests that the Commission set this application for public hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming the pool, establish proration units of 80 acres each, providing for the drilling of only one well on each proration unit and provide for a uniform spacing of such wells, designating the location of said wells in the center of the Northwest and Southeast forty-acre tracts of each quarter section with a tolerance of 150 feet in any direction from said prescribed location to avoid surface obstructions, and to provide for exceptions in the cases of the wells heretofore completed or now being drilled to said common source of supply.

substitute for last page of application

BEFORE THE OIL CONSERVATION COMMISSION
OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR THE ESTABLISHMENT OF PRORATION
UNITS AND PROVIDING FOR THE ALLOWABLES
FOR THE SILURO-DEVONIAN COMMON SOURCE
OF SUPPLY DISCOVERED IN McALESTER FUEL
COMPANY ET AL J. M. DENTON WELL NO. 1-A,
SW/4 SE/4 SECTION 11 TOWNSHIP 15 SOUTH
RANGE 37 EAST, LEA COUNTY, NEW MEXICO,
KNOWN AS THE DENTON FIELD.

CASE 269
ORDER R-63

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, Oklahoma, and alleges and states:

1. The McAlester fuel Company, et al, El Dorado, Arkansas, has drilled and on October 4, 1949 completed a well known as "J. M. Denton No. 1-A" located in the center of the SW/4 SE/4 Section 11-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Siluro-Devonian, which common source of supply was found in said well at the depth of from 11,325 feet to 11,464 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled or are now being drilled to said common source of supply in the area:

(a) Ohio Oil Company - Denton No. 3, located in NW/4 SE/4 Section 11-15S-37E, which was completed on January 22, 1951 as a producing oil well from depth 11,916 feet to depth 12,044 feet.

(b) Atlantic Refining Company - Bettie C. Dickinson No. 1-A, located in NW/4 NW/4 Section 13-15S-37E, which was completed December 9, 1949 as a producing oil well from depth 11,272 feet to depth 11,324 feet.

(c) Gulf Oil Corporation - L. R. Chamberlain No. 1, located in NW/4 NE/4 Section 14-15S-37E, which was completed March 9, 1950 as a producing oil well drom depth 11,501 feet to depth 11,513 feet.

(d) McAlester Fuel Company - McClure No. 1-A, located in SW/4 NE/4 Section 14-15S-37E, which was completed March 5, 1951 as a producing oil well from depth 11,503 feet to depth 12,321 feet.

(e) McAlester Fuel Company - J. S. Waller No. 1, located in NE/4 NE/4 Section 15-15S-37E, which was completed as a dry hole on February 20, 1950 at total depth 12,015 feet.

(f) Ralph Lowe - Dickinson Estate No. 1, located in SE/4 SW/4 Section 35-14S-37E, which was completed December 11, 1950 as a producing oil well from depth 12, 360 feet to total depth 12,385 feet.

(g) Phillips Petroleum Company - Denton No. 1, located in SE/4 NW/4 Section 11-15S-37E, which encounterdd the Siluro-Devonian common source of supply from depth 11,445 feet to depth 12,555 feet which yielded flowing oil production on numerous drill-stem tests, has reached total depth 12,623 feet, run casing, and will be completed as a producing oil well.

(h) Atlantic Refining Company - Federal-Jones No. 1, located in SW/4 SW/4 Section 35-14S-37E, which was drilling at approximately 6690 feet on March 10, 1951.

(i) Atlantic Refining Company - State No. 1-T, located in SE/4 SW/4 Section 2-15S-37E, which was drilling at approximately 9800 feet on March 10, 1951.

(j) Skelly Oil Company - State No. 1-F, located in NE/4NW/4 Section 2-15S-37E, which was drilling at approximately 11,000 feet on March 10, 1951.

(k) Ohio Oil Company - Denton No. 4, located in NE/4 SW/4 Section 11-15S-37E, which was drilling at approximately 4750 feet on March 10, 1951.

(l) Atlantic Refining Company - Dickinson No. 2-B, located in NW/4 NW/4 Section 12-15S-37E, which was drilling at approximately 7500 feet on March 10, 1951.

(m) McAlester Fuel Company - McClure No. 1-B, Located in NW/4 SE/4 Section 14-15S-37E, which was drilling at approximately 3500 feet on March 10, 1951.

(n) McAlester Fuel Company - McClure No. 1-C, located in NE/4 NE/4 Section 14-15S-37E, which was drilling at approximately 375 feet on March 10, 1951.

3. A plat of the area showing the location of the wells referred to above, circled in red, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein, it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Siluro-Devonian formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration unit may, at the discretion of the operator, be in the center of either governmental quarter-quarter section comprising the unit, with a tolerance of 150 feet to avoid surface obstructions.

6. That in consideration of the thickness of the oil pay section of the common source of supply, the consequent ability of the wells to produce without waste, and the rights of lessees and royalty owners to receive their share of the total State allowable production, the Commission should

in its order provide that each well now producing or hereafter completed as a producer in the common source of supply shall have a top unit allowable to be fixed by the Commission, but not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

7. That the area which may at this time be reasonably considered to contain the probable productive limits of said common source of supply is: Sections 34, 35 and 36, Township 14 South, Range 37 East and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and the north halves of Sections 22, 23, and 24, all in Township 15 South, Range 37 East, Lea County, New Mexico; and that the Commission's order in this cause should be made applicable to and include all of this described area, subject to any future extensions or reductions thereof after notice and hearing.

WHEREFORE, applicate respectfully requests that the commission set this application for public hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming the pool, establishing proration units of 80 acres each, providing for the drilling of only of only one well on each proration unit with such well to be located in the center of either of the two governmental quarter-quarter sections comprising such proration unit with a tolerance of 150 feet in any direction to avoid surface obstructions, and providing for each such well an allowable of not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

DATED this 22nd day of March, 1951.

R. M. WILLIAMS

Raymond A. Lynch

Harry D. Turner,
Attorneys for Applicant

BEFORE THE

OIL CONSERVATION COMMISSION

MAY 22, 1951

Case No. 270

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
RECEIVED
JUN 1, 1951

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 3-0878
ALBUQUERQUE, NEW MEXICO

2-1547

BEFORE THE

OIL CONSERVATION COMMISSION

May 22, 1951

- -

Case No. 270: This is the application of Phillips Petroleum Company for 80-acre spacing for the Wolfcamp production discovered in the Bettie C. Dickinson No. 1-B well, Section 12, T.15 S, R.37 E.

MR. SPURRIER: The meeting will come to order. Case No. 270. MR. Graham, will you read the advertisement.

(Mr. Graham reads the notice of publication.)

MR. FOSTER: We are going to try to make this real short. I think we can run through it in a few minutes.

O. P. NICOLA,

having been previously duly sworn, testified as follows:

QUESTIONS BY MR. FOSTER:

Q Mr. Nicola, you prepared some Exhibits for us in this case, have you?

A Yes, sir.

Q You just go to the Exhibits and tell us what they are and what they represent?

A Phillips No. 1 is a plat showing the area surrounding the the Denton field and merely shows the outline of the proposed space area. Phillips Exhibit No. 2 simply shows that one unit involving different ownership would be required for the

for the formation in this field on the basis of present development. Exhibit No. 3 is a tabulation of the production history from the Wolfcamp reservoir beginning in June, 1950, and extending through March 1951, and as of March 31, 1951, this chart shows that there have been 152,000 barrels of oil produced, 333 barrels of water -- pardon me, change that to 1192 barrels of water and 44,421,000 cubic feet of gas. The gas oil ratio average for the field as of March, 1951 is 350 cubic feet per barrel.

Exhibit No. 4 is a graph on which has been plotted the number of producing wells, the total production of oil, the bottom hole pressures and the gas oil ratio. All of those factors plotted against time.

Exhibit No. 5 is a bar graph showing the tonnage of steel required for the drilling of two wells into this reservoir for an average of 253 tons per well.

Here also as in the Devonian we have estimated that by going to 80-acre spacing well, save the drilling of 42 wells for a total of 10,626 tons of steel. Also shown on the bar graph is the cost of completing two wells to the Wolfcamp for an average cost of $175,000.00 per well.

Q Trying to shorten this up, from your study and examination of the field, is it your opinion that one well will adequately drain and develop the 80-acres?

A In view of the small amount of information which we now have on this field, I would not wish to express an opinion

that one well will drain 80-acres. However, I think it is possible and it is our recommendation that the Commission establish an 80-acre pattern for a period of one year with a view to reviewing the data at the end of that time when more information is available.

We would also like to request exceptions as to location for all wells heretofore completed on a spacing pattern different from what we now advocate for this reservoir, namely, that wells be located in the northwest quarter and the southeast quarter of each quarter section. Also, we desire that the Commission grant exceptions as to locations for all wells now drilling to the Devonian on an off pattern location in case such wells may be plugged back and completed in the Wolfcamp reservoir.

Also for all wells, all Devonian wells which may be granted exceptions as to location by the Commission and I am referring to all Devonian wells which have now been completed it is requested that exceptions be granted for such locations as to Wolfcamp wells also.

The object of this request is in order that operators may take advantage of favorable Wolfcamp showings encountered in such twin Devonian wells.

We also request that in view of the information now available the Commission establish as an allowable for a well on an 80-acre unit the same allowable which is now granted for a 40-acre well with deep well adaptation. That is to say a

single allowable.

Q In barrels what would that be?

A 197 barrels a day.

Q For theWolfcamp?

A That is right.

MR. FOSTER: I believe that is all.

MR. SELINGER: Selinger with Skelly. I have one or two questions.

Q In recommending the pattern for Wolfcamp well it is your intention to permit the Wolfcamp wells to be on the same 40-acrs of each 80 acre unit as exists or will exist in the Devonian.

A That is oorrect.

Q And the same exceptions that will exist or exists for the Devonian will pass over to the Wolfcamp?

A That is right. That is my recommendation.

MR. SPURRIER: Anyone else wishes to question this witness.

MR. McCORMICK: I would like to ask Mr. Nicola what type of reservoir the Wolfcamp is?

A I would prefer - you mean what type of drive?

Q Yes.

A Well, I think right now it is similar to the Devonian. In other words, it is undersaturated. However, we don't have enough, really enough information.

Q It is not a water drive?

A I don't even have available any pressure information. I couldn't tell you. I don't know.

Q How big is the average producing section?

A Well, I would rather let our geologist -

MR. FOSTER: (Interrupting) The geologist can answer that.

MR. SMITH: The producing section varies somewhat from well to well from approximately 20 feet which has been shown on tests to the northern end of the pool. In the southern end of the pool there are streaks of pay occurring throughout about a 500 foot interval. Anyone of the streaks not exceeding 15 feet in thickness.

Q What would be the total affective pay in the south edge of the pool?

A The total effective pay.

MR. SMITH: The total effective pay in one well, the best well will not exceed one hundred feet.

Q What type of reservoir do you think it is?

MR. SMITH: Questionable if it is a water drive reservoir. The lithology in it varies from finely sucrose dolomite to a vugular limestone. We have no information yet to classify it as a water drive reservoir.

MR. McCORMICK: That is all.

MR. SPURRIER: Anyone have any further question? If not the witness may be excused.

MR. FOSTER: I WANT to ask one or two questions of Mr. Smith.

Q Would you recommend 80-acre spacing in this field?

MR. SMITH: I would, yes.

Q Do you have sufficient information at this time on which to base an opinion as to whether one well will adequately drain 80 acres in the field or not?

A That on the basis of present data is difficult to judge.

Q You can't say?

A Can't say. However, if drilled up on 80-acres -

Q (Interrupting) Sir?

A (Continuing) if drilled up on 80-acres we would soon have enough data to base a conclusion on.

Q But you would recommend that the Commission adopt the 80-acre spacing in this field?

A I would so recommend.

MR. FOSTER: I believe that is all.

MR. SPURRIER: Anyone have any further questions of this witness or either witness. If not the witnesses will be excused and we will take up case 274.

Do you have something, Mr. White:

MR. WHITE: I WANT to file an identical statement as we filed in the other case, 269.

(See Case 269 for copy of statement.)

MR. McKELLAR: Magnolia would like for the record

to show that we join in the Phillips 80-acre in the Wolfcamp. By going to 80-acres now we could possibly avoid confusion that we have in the Devonian. Go to 80 until we get enough data to justify some concrete educated conclusion to what we really have.

MR. SCOTT: I would like to make a statement for Shell. As far as Wolfcamp reservoir, we are favorable to 80-acre proration of rectangular shapes with the unit within the same section and with development on either 40-acre tract of the proration unit until the structure is defined and the limits of production established. We are agreeable to Phillips proposed allowable of single 40-acre allowable for each 40-acre proration unit for this reservoir. We would be opposed to any regulation which would prohibit development of a 40-acre tract in the event these 40-acres could not be included in a 40-acre proration unit of rectangular shape within the same section.

MR. HOWARD: R. E. Howard with Atlantic refining Company would like to concur in the recommendation of Phillips Petroleum Company for the 80-acre spacing in the Wolfcamp.

MR. BOSS: R. L. Boss, Gulf Oil Corporation. In regard to Gulf's attitude to the 80-acre spacing in the Denton Wolfcamp, Gulf is in accord with the proposed application provided the wells are drilled as twin locations in order to permit adequate evaluation of the Wolfcamp reservoir in the original well drilled on each unitl.

MR. SELINGER: We concur in the recommendation with respect to the Wolfcamp on the basis that Wolfcamp wells will be located on the same 40-acres that the Devonian wells are.

MR. SPURRIER: Anyone else?

MR. J. D. WHEELER: We would like to have the record show that Ohio supports Phillips recommendation for 80-acre in the Wolfcamp as has been proposed.

MR. SPURRIER: The record will aslo show that Mrs. Clayton's statement was also intended to be included in the record of this case.

(Statement copied in record of Case 269.)

Anyone else? We will take up the next case.

- - - - - - -

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of hearing in Case No. 270 before the Oil Conservation Commission on May 22, 1951, at Santa Fe, is a true record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, this 7th day of June, 1951.

Ada Dearnley
ADA DEARNLEY, Reporter.

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-4547
ALBUQUERQUE, NEW MEXICO

BEFORE THE

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

TRANSCRIPTION OF HEARING

CASE NO. 269 and 270

24 July 1951

(DATE)

Original

E. E. GREESON
ADA DEARNLEY
COURT REPORTERS
BOX 1302
PHONE 2-4547
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
July 24, 1951

CASES 269 and 270: (GENERAL NOTICE, Special Hearing July 25, 1951.) The Oil Conservation Commission by its orders R-74B and R-75-B, dated June 29, 1951, has granted a re-hearing in the applications of Phillips Petroleum Company in Cases 269 and 270. Case 269 relates to proration units and allowables for Siluro-Devonian common source of supply discovered in McAlester Fuel Company's J. M. Denton Well No. 1-A, SW SE 11-15S-37E, NMPM, and Case 270 relates to the application of Phillips Petroleum Company for an 80 acre proration units and allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B, NW SW 12-15S-37E, NMPM.

(Reporter's note: Proceedings in this matter were off the record, but the record should show that Cases 269 and 270 were continued, without objection, from July 25, 1951, until 10:00 o'clock August 7th.)

-o-o-

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of proceedings before the Oil Conservation Commission in Cases 269 and 270, held on July 24, 1951, is a true and correct record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, New Mexico, this 4th day of August, 1951.

G. G. Gleason
REPORTER

My Commission Expires: 8-4-52

Case No.

270

Application, Transcript,
Small Exhibits, Etc.

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80-ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 SECTION 12, Twp. 15,S R. 37 E, NMPM, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This matter came on for hearing at 10 o'clock A. M. on the 22nd day of May, 1951, at Santa Fe, New Mexico, pursuant to notice before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission", and the Commission having heard the testimony adduced at said hearing and being fully advised in the premises,

FINDS:

1. That due public notice having been given pursuant to law, and the rules and regulations of the Commission, this Commission has jurisdiction both of the subject matter and of the parties interested.

2. That the probable productive limits of the Wolfcamp common source of supply as discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B, located in NW/4 SW/4 Section 12, Twp. 15 S, Range 37 E, NMPM, and further corroborated by production from three other wells, are:

Twp. 14 S, R. 37 E. NMPM:

All Sections 34, 35 and 36

Twp. 15 S. R. 37 E. NMPM:

All Sections 1, 2, 3, 10, 11, 12, 13, 14, 15; and N/2 Sec. 22 N/2 Section 23, N/2 Section 24

3. That the Denton-Wolfcamp pool be extended to include the above-described area for Wolfcamp production from 8500' to 9500'.

4. That from limited exploration of the Wolfcamp formation, it appears that a considerable pay zone is characteristic, and that despite any shortage of tubular goods, the prospects for substantial production are excellent.

5. That for orderly development, the prevention of waste and protection of correlative rights the area should be developed upon the standard 40-acre spacing pattern.

IT IS THEREFORE ORDERED:

(1) That the Denton-Wolfcamp pool in Lea County, New Mexico, be, and it hereby is extended to include the area described as:

Twp. 14 S. R. 37 E, NMPM:
All Sections 34, 35, 36

Twp. 15 S. R. 37 E, NMPM:
All Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15; and N/2 Sec. 22, N/2 Sec. 23, and N/2 Section 24

(2) That that part of Phillips Petroleum Company's application relating to 80-acre spacing and proration units be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem
EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier
R. R. SPURRIER, SECRETARY

SEAL

5. That for orderly development, the prevention of waste and protection of correlative rights the area should be developed upon the standard 40-acre spacing pattern.

IT IS THEREFORE ORDERED:

(1) That the Denton-Wolfcamp pool in Lea County, New Mexico, be, and it hereby is extended to include the area described as:

Twp. 14 S. R. 37 E, NMPM:
All Sections 34, 35, 36

Twp. 15 S. R. 37 E, NMPM:
All Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15; and N/2 Sec. 22, N/2 Sec. 23, and N/2 Section 24

(2) That that part of Phillips Petroleum Company's application relating to 80-acre spacing and proration units be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem
EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier
R. R. SPURRIER, SECRETARY

SEAL

CORRECTION

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE - NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75-A

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR THE ESTABLISHMENT OF PRORATION UNITS AND PROVIDING FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING CO.'S BETTIE C. DICKINSON WELL NO. 1-B, NW/4 SW/4 SEC. 12, TWP. 15 S, RGE. 37 E, NMPM, LEA COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER OF THE COMMISSION

It appearing to the the Commission that the order heretofore entered in the abovesentitled cause is not a correct memorial of the judgment as rendered and announced by this Commission, in that Finding No. 2 of said order as rendered and announced defined the Denton-Wolfcamp pool as comprising:

Twp. 14 S, R. 37 E, NMPM

All Sections 34, 35 and 36

Twp. 15 S, R. 37 E, NMPM

All Sections 1, 2, 3, 10, 11, 12, 13, 14, 15; and N/2 Sec. 22, N/2 Sec. 23, N/2 Sec. 24

WHEREAS, through inadvertence and a clerical error said Denton-Wolfcamp pool was defined as comprising:

Twp. 14 S, R. 37 E, NMPM

All Sections 34, 35 and 36

Twp. 15 S, R. 37 E, NMPM

All Sections 1, 2, 3, 10, 11, 12, 13, 14, 15; and N/2 Sec. 22, N/2 Sec. 23, N/2 Sec. 24

THEREFORE, IT IS HEREBY ORDERED that the order heretofore entered by this Commission in the above entitled cause on June 5, 1951, be and the same hereby is corrected to conform to the actual judgment and order announced and rendered by the Commission by modifying Finding No. 2 to read as follows:

Twp. 15 S, R. 37 E, NMPM

All of Sections 11, 12, 13 and 14

and said order in all other respects is hereby ratified and confirmed, and

IT IS FURTHER ORDERED that this order correcting the record of said order be entered nunc pro tunc as of the 5th day of June, 1951, that being the date when said order was originally made and entered.

DONE this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem

Edwin L. Mechem, Chairman

Guy Shepard, Member

R. R. Spurrier

R. R. Spurrier, Secretary

SEAL

21

Before the Oil Cons Comm.
State of New Mexico

In the matter of the hearing
called by the oil cons Comm
of New Mexico for the purpose
of considering:

Case No. 270
~~269~~
Order No R-75A

The matter of the application of
Phillips Petroleum company
for the Establishment of Duration
units and providing for the
Wolfcamp common source
of supply discovered in
Atlantic Refining Company's
Bettie C. Dickinson Well No. 1-B
NW/4 SW/4 Sec. 12 Twp. 15 S.
R. 37 E N.M.P.M., Lea County,
New Mexico

Nunc Pro Tunc Order of the Comm

It appearing to the comm that
the Order heretofore entered in
the above entitled cause is not
a correct memorial of the
judgement as rendered and
announced by this comm, in
that finding No. 2 of said ord
as rendered and announced

defined the ~~two~~ Denton-Wolfcamp pool as comprising:

*

Whereas, through inadvertence and a clerical error said Denton-Wolfcamp pool was defined as comprising:

*

Therfore, ~~- - - -

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80-ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 Section 12, Twp. 15, S R. 37E, NMPM, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This matter came on for hearing at 10 o'clock A. M. on the 22nd day of May, 1951, at Santa Fe, New Mexico, pursuant to notice before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and the Commission having heard the testimony adduced at said hearing and being fully advised in the premises,

FINDS:

1. That due public notice having been given pursuant to law, and the rules and regulations of the Commission, this Commission has jurisdiction both of the subject matter and of the parties interested.

2. That the probable productive limits of the Wolfcamp common source of supply as discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B, located in NW/4 SW/4 Section 12, Twp. 15 S, Rge. 37 E, NMPM, and further corroborated by production from three other wells, are:

Twp. 14 S, R. 37 E. NMPM:
All Sections 34, 35 and 36

Twp. 15 S, R. 37 E, NMPM:
All Sections 1, 2, 3, 10, 11, 12 13, 14, 15; and N/2 Sec. 22, N/2 Section 23, N/2 Section 24

3. That the Denton-Wolfcamp pool be extended to include the above-described area for Wolfcamp production from 8500' to 9500'.

4. That from limited exploration of the Wolfcamp formation, it appears that a considerable pay zone is characteristic, and that despite any shortage of tubular goods, the prospects for substantial production are excellent.

5. That for orderly development, the prevention of waste and protection of correlative rights the area should be developed upon the standard 40-acre spacing pattern.

IT IS THEREFORE ORDERED:

(1) That the Denton-Wolfcamp pool in Lea County, New Mexico, be, and it hereby is extended to include the area described as:

Twp. 14 S. R. 37E, NMPM:

All Sections 34, 35, 36

Twp. 15 S. R, 37E, NMPM:

All Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15; and N/2 Sec. 22, N/2 Sec. 23, and N/2 Sec. 24

(2) That that part of Phillips Petroleum Company's application relating to 80-acre spacing and proration units be, and the same hereby is denied.

DONE at Santa Fe, New Mexico, this 5th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. 75-B

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80 - ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 SECTION 12, Twp. 15, S R. 37 E, N.M.P.M. LEA COUNTY, NEW MEXICO

ORDER OF COMMISSION FOR REHEARING

This cause having come on for hearing upon the petition and motion of the Phillips Petroleum Company filed June 25 1951, for a rehearing of Order No. R-75 heretofore rendered by this Commission June 5, 1951, wherein this Commission denied the application of the Phillips Petroleum Company for an order establishing 80 acre spacing of the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well 1-B, and the Commission having considered said motion and application.

IT IS HEREBY ORDERED that the above entitled matter be reopened and that a rehearing in said cause be held July 25, 1951 at 10 o'clock A. M. at Santa Fe, New Mexico, at which time and place all interested parties may appear.

Done this 29th day of June, 1951

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

By _____

_____

_____

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75-B

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80-ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 SECTION 12, Twp. 15, S R. 37 E, NMPM LEA COUNTY, NEW MEXICO

ORDER OF COMMISSION FOR REHEARING

This cause having come on for hearing upon the petition and motion of the Phillips Petroleum Company filed June 25, 1951, for a rehearing of Order No. R-75 heretofore rendered by this Commission June 5, 1951, wherein this Commission denied the application of the Phillips Petroleum Company for an order establishing 80 acre spacing of the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well 1-B, and the Commission having considered said motion and application.

IT IS HEREBY ORDERED that the above entitled matter be reopened and that a rehearing in said cause be held July 25, 1951, at 10 o'clock A. M. at Santa Fe, New Mexico, at which time and place all interested parties may appear.

DONE this 29th day of June, 1951.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L Mechem

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier

R. R. SPURRIER, Secretary

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE No. 270
ORDER No. R-102

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80-ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B, NW/4 SW/4 SECTION 12, T. 15 S, R. 37 E, N. M. P. M., LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION
ON REHEARING

BY THE COMMISSION:

This cause came on for hearing upon the petition of Phillips Petroleum Company on May 22, 1951, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and for rehearing on July 24, 1951, and August 7, 1951.

NOW, on this 10th day of October, 1951, the Commission, a quorum being present, having fully considered the record and the testimony adduced and the exhibits received at said hearing and rehearings, and being fully advised in the premises,

FINDS, (1) That due public notice having been given in accordance with law, the Commission has jurisdiction of this cause, the persons and subject matter thereof.

(2) That after due public notice and hearing on May 22, 1951, the Commission entered its orders numbered R-75 and R-75-A denying petitioner's application for 80-acre spacing.

(3) That upon motion duly filed, the Commission granted a rehearing by its Order No. R-75-B for the purpose of taking additional testimony and hearing oral argument, and that such rehearing was held on July 24, 1951, and August 7, 1951.

(4) That no evidence was presented at such rehearings sufficient to justify an order granting petitioner's application.

IT IS THEREFORE ORDERED: That Phillips Petroleum Company's application for 80-acre spacing in the Denton-Wolfcamp pool, Lea County, New Mexico, be, and the same hereby is denied, and the Commission's order No. R-75, as amended and corrected by Order No. R-75-A, be, and the same hereby is affirmed.

DONE at Santa Fe, New Mexico, on the day and year hereinabove written.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem

EDWIN L. MECHEM, Chairman

GUY SHEPARD, Member

R. R. Spurrier

R. R. SPURRIER, Secretary

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 270
ORDER NO. R-75

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80 ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 SECTION 12, TWP. 15, S. R. 37 E, NMPM, LEA COUNTY, NEW MEXICO.

TO: STATE OF NEW MEXICO OIL CONSERVATION COMMISSION.

REQUEST FOR HEARING AND ORAL ARGUMENT

Now comes the Phillips Petroleum Company, petitioner in the above entitled matter, and requests the Commission to grant it a hearing and right to make oral argument and introduce additional testimony in support of its petition and motion for re-hearing, and requests the Commission to set the matter for hearing and argument upon the motion for re-hearing for July 25, 1951, immediately following the state-wide hearing heretofore set for July 24, 1951.

Respectfully requested,

J. R. Wright

Attorney for Phillips Petroleum Company, Santa Fe, N. M.

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO.
RECEIVED
JUN 21 1951

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
SANTA FE, NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO 270
ORDER NO. R-75

THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80 ACRE PRORATION UNITS AND PROVIDING FOR ALLOWABLES FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B NW/4 SW/4 SECTION 12, TWP. 15, S R. 37E, NMPM, LEA COUNTY, NEW MEXICO.

MOTION FOR RE-HEARING OF ORDER NO. R-75 HANDED DOWN BY THE COMMISSION JUNE 5, 1951, DENYING THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AN ORDER ESTABLISHING 80 ACRE SPACING OF THE WOLFCAMP COMMON SOURCE OF SUPPLY DISCOVERED IN ATLANTIC REFINING COMPANY'S BETTIE C. DICKINSON WELL NO. 1-B.

Now comes the Phillips Petroleum Company and moves the Commission, and by means of motion for re-hearing, petitions the Commission to re-open this proceeding for the purpose of reconsidering the order so entered by the Commission on June 5, 1951, and to permit petitioner to offer additional evidence and argument in support of this motion, and for grounds thereof shows the Commission:-

1. In its application dated March 22, 1951, petitioner requested that Sections 34, 35 and 36, Township 14, South of Range 37 East, and Sections 1, 2, 3, 10, 11, 12, 13, 14 and 15, and the north halves of Sections 22, 23 and 24, all in Township 15, South of Range 37 East, Lea County, New Mexico, be determined to be within the common source of supply for the Denton Wolfcamp field; that by its order of June 5, 1951, the Commission defined the limits of the Wolfcamp common source of supply as discovered in the Atlantic Refining Company's Bettie C. Dickinson well;

2. It appears from the evidence offered in this proceeding that the Denton Wolfcamp pool overlies the Denton Siluro-Devonian pool at least to a large extent so far as present explorations disclose; that drilling to the Denton Siluro-Devonian pool necessarily requires drilling through the Denton Wolfcamp pool, and that the Commission did not at the time of the hearing, and does not now have sufficient information to justify Finding of Fact No. 4 made by the Commission;

3. In denying the application of the petitioner for 80 acre spacing, the Commission, in its order of June 5, 1951, erred in that:-

(a) The owners of property within the pool are required to drill more wells than are reasonably necessary to secure their proportionate part of the production from the pool;

(b) The drilling of wells on the basis of 40 acre spacing tends to create fire and other hazards conducive to waste;

(c) 40 acre spacing in the Denton pool unnecessarily increases production cost of oil and gas to the operator;

(d) 40 acre spacing unnecessarily increases the cost of oil and gasproducts to the ultimate consumer;

(e) It directly violates the directives issued by the Petroleum Administration for Defense (PAD), in that it requires the unnecessary use and waste of steel during the present national emergency;

(f) It renders impossible the utilization of 80 acre spacing in the event subsequent development of the pool should determine and prove that 80 acre spacing should be applied rather than 40 acre spacing; and

(g) It unnecessarily discourages development of the oil and gas resources of the State of New Mexico by requiring unnecessary use of steel and by requiring costly drilling of unnecessary wells.

4. The order of the Commission of June 5, 1951, by fixing well spacing at 40 acres tends to discourage deep drilling and the exploration for and development of deep reservoirs and reserves and the more rapid defining of the limits of a pool, all of which efforts are now being encouraged by the Petroleum Administration for Defense.

5. By the Commission's said order it has acted against the best interests of the royalty owners, including the State of New Mexico as a royalty owner, and the people of the State of New Mexico, in that it has disregarded the fact that there are better methods of securing greater ultimate recovery of oil and gas than simply by drilling more wells.

In submitting this petition and motion for re-hearing, and during the pendency of this motion for a re-hearing and until final determination by the Commission of Petitioner's application for 80 acre spacing, it is requested that the Commission, by an appropriate order or directive, restrict the location of wells to the northwest quarter and southeast quarter of each quarter section in the field.

Respectfully submitted,

Santa Fe, N. M.

BEFORE THE OIL CONSERVATION COMMISSION
OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR THE ESTABLISHMENT OF PRORATION
UNITS AND PROVIDING FOR THE ALLOWABLES
FOR THE WOLFCAMP COMMON SOURCE OF SUPPLY
DISCOVERED IN ATLANTIC REFINING COMPANY
BETTIE C. DICKINSON WELL NO. 1-B, NW/4 SW/4 SECTION
12 TOWNSHIP 15 SOUTH RANGE 37 EAST, LEA COUNTY,
NEW MEXICO, KNOWN AS THE DENTON FIELD.

Case No. ~~270~~
Order No. ~~R-66~~

APPLICATION

COMES, NOW, Phillips Petroleum Company, Bartlesville, OKlahoma, and alleges and states:

1. That Atlantic Refining Company, Dallas, Texas, has drilled and on February 26, 1950 completed a well known as "Bettie C. Dickinson No. 1-B" located in the center of the NW/4 SW/4 Section 12-15S-37E, Lea County, New Mexico, and discovered a new common source of supply of oil known as the Wolfcamp, which common source of supply was found in said well at the depth of from 9,395 feet to 9,414 feet, the probable productive limits of said common source of supply to be determined by the Commission.

2. That in addition to the discovery well referred to above, the following wells have been drilled to said common source of supply in the area:

(a) McAlester Fuel Company - Denton No. 2-A, located in SW/4 SE/4 Section 11-15S-37E, which was completed October 2, 1950 as a producing oil well from depth 9055 feet to depth 9230 feet.

(b) Ohio Oil Company - J. M. Denton No. 1, located in NE/4 SW/4 Section 11-15S 37E, which was completed July 21, 1950 as a producing oil well from depth 8988 feet to depth 9250 feet.

(c) Ohio Oil Company - J. M. Denton No. 2, located in NE/4 SE/4 Section 11-15S-37E, which was completed July 17, 1950 as a producing oil well from depth 9070 feet to depth 9300 feet.

3. A plat of the area showing the location of the wells referred to above, circled in green, is attached hereto and marked EXHIBIT "A".

4. That in order to bring about the proper development of said common source of supply, prevent waste and to avoid the drilling of unnecessary wells, and to secure the greatest ultimate recovery therefrom, and to protect the correlative rights of the interested parties therein it is necessary and proper for the Commission to enter its order providing for proration units of 80 acres each with one well for each unit, such being the area which may be efficiently and economically drained by one well.

5. That in view of the relatively narrow structure and the steeply-dipping attitude of the Wolfcamp formation containing the common source of supply herein referred to, in the interest of obtaining the greatest ultimate recovery of oil the Commission should provide in its order that the required location for the well on each 80-acre proration unit may, at the discretion of the operator, be in the center of either governmental quarter-quarter section comprising the unit, with a tolerance of 150 feet to avoid surface obstructions.

6. That in consideration of the thickness of the oil pay section of the common source of supply, the consequent ability of the wells to produce without waste, and the rights of lessees and royalty owners to receive their fair share of the total State allowable production, the Commission should in its order provide that each well now producing or hereafter completed as a producer in the common source of supply shall

have a top unit allowable to be fixed by the Commission, but not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

7. That the area which may at this time be reasonably considered to contain the probable productive limits of said common source of supply is: Sections 34, 35 and 36, Township 14 South, Range 37 East and Sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and the north halves of Sections 22, 23 and 24, all in Township 15 south, range 37 East, Lea County, New Mexico; and that the Commission's order in this cause should be made applicable to and include all of this described area, subject to any future extensions or reductions thereof after notice and hearing.

WHEREFORE, applicant respectfully requests that the Commission set this application for public hearing at the time and place to be fixed by the Commission, that due and proper notice be given as required by law, and that at the conclusion of said hearing the Commission make and enter an order determining and defining the probable productive limits of the common source of supply referred to above, naming for the ppol establishing proration units of 80 acres each, providing for the drilling of only one well on each proration unit with such well to be located in the center of either of the two governmental quarter-quarter sections comprising such proration unit with a tolerance of 150 feet in any direction to avoid surface obstructions, and providing for each such well an allowable of not to exceed twice the top unit allowable for a 40-acre unit with deep well adaptation.

DATED this 22nd day of March, 1951.

R. M. Williams

RAYMOND A. LYNCH

HARRY D. TURNER

Attorneys for Applicant

Case # 270

My name is Emmett D. White and I am Vice President of Leonard Oil Company of Roswell, New Mexico.

Leonard Oil Company owns minerals in Sections 3 and 4, Township 15 South, Range 37 East, Lea County, New Mexico. This area is not within the presently defined limits of the Denton Oil pool, but its location on the western edge of the north portion of this pool makes any well spacing program of importance to our company.

We wish to protest the establishment of 80 acre proration units in this pool as requested by Phillips Petroleum Company in Case #269 involving the Siluro-Devonian zone of production and in Case #270 involving the Wolfcamp zone of production.

As the Commission knows, and as it has confirmed by its statewide rules and regulations for the purpose of conserving our natural resources, the drilling and proration unit for New Mexico for many years has been 40 acres. Minerals and leases have been bought and sold with this program in mind.

Our objections to the proposed 80 acre spacing in the Denton field are based upon the following:

1. This pool has been developed to date under the statewide rules providing for 40 acre drilling and proration units. There are approximately 20 wells, drilling wells, or locations in the field at present, and with a possible few exceptions, these have been located upon the assumption that the statewide rules would apply. A spacing pattern, we believe, should be as uniform as possible in order to provide maximum efficient use of the reservoir energy. The proposal of the applicant in this case makes such uniformity impossible.

2. The establishment of 80 acre proration units and double allowables would in our opinion have a serious effect upon the ultimate recovery of oil and would particularly affect the wells on the edge of the pool. It is apparent that the area under which we own an interest may be on the edge of the structure. Production of wells up-structure at an excessive rate would tend to wash out the edge properties prematurely.

3. Under an 80 acre spacing program it is quite possible for a productive 40 acre unit to be forced to share its oil with an adjoining 40 acre unit which may subsequently be proved non-productive.

While we recognize that this condition may exist in any spacing program, we feel that the wider the spacing the more aggravated the situation becomes and the more adverse will be the effect upon correlative rights.

4. The establishment of 80 acre proration units, it seems to us, is but the first step to compulsory pooling of interests as it would appear to be wholly impractical to adjust the units in such a manner that royalty ownership under each of the 80 acre tracts would be common. The Commission, we feel, should consider the ultimate effects of the establishment of 80 acre proration units upon the rights of royalty owners who have acquired their property upon the reasonable assumption that statewide 40 acre spacing rules would apply. We are inclined to consider the long-standing practice of 40 acre spacing in New Mexico as approaching the nature of an implied covenant in our leases.

5. The Denton pool appears to be one of the most potentially prolific oil pools discovered to date in New Mexico. It seems to us that from the point of view of national defense and the proper use of critical materials that there could be no better place to drill than in such a pool. One well on an 80 acre proration unit produced at twice the rate of a 40 acre spaced well has little to offer in the event of an emergency. Two wells upon an 80 acre tract produced at half the rate offer possibilities of increased production in the event of a national emergency. There is little doubt as to the economics of the matter since these wells will pay out within a relatively short time, and we believe that this field offers a profitable place for the investment of money and critical materials.

We respectfully submit our views to the Commission as royalty owners in the Denton area.

Very truly yours,

LEONARD OIL COMPANY

By Emmett D. White

Emmett D. White
Executive Vice President

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W. P. MARSHALL, PRESIDENT

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R R SPURRIER=

NEW MEXICO OIL CONSERVATION COMM SANTA FE NMEX=

RETEL DENTON POOL SPACING APPLICATION. KINDLY SET THIS MATTER FOR HEARING MAY 1=

PHILLIPS PET CO C P . JIMIT=

Case ——

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO.
RECEIVED
APR 3 1951
9:10 a.m.

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APRIL 2 1951

MR C P DIMIT
PHILLIPS PETROLEUM CO
BARTLESVILLE OKLAHOMA

RE YOUR APPLICATIONS ON DENTON POOL; NOT RECEIVED EARLY ENOUGH FOR APRIL HEARING. DO YOU WISH TO BE HEARD MAY 1 OR MAY 22?

R R SPURRIER
OIL CONSERVATION COMMISSION

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R R SPURRIER=

NEW MEXICO OILSCONSERVATION COMMISSION SANTA FE NMEX=

ON MARCH 22 WE MAILED TWO APPLICATIONS CONCERNING DENTON POOL LEA COUNTY BY AIR MAIL SPECIAL DELIVERY TO THE COMMISSION AT SANTA FE. THESE APPLICATIONS NATURALLY NOT LISTED YOUR ORDER MARCH 22, 1951 SETTING OUT HEARINGS FOR APRIL 24. WE TRUST OUR APPLICATIONS RECEIVED IN TIME TO BE HEARD APRIL 24=

PHILLIPS PETROLEUM CO C P DAMITT=

OIL CONSERVATION COMM. APR 2 1951

9 a.m.

22 22 1951 24 24=

WE APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

BEFORE THE

OIL CONSERVATION COMMISSION

MAY 22, 1951

Case No. 270

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-0872
ALBUQUERQUE, NEW MEXICO

BEFORE THE

OIL CONSERVATION COMMISSION

May 22, 1951

- -

Case No. 270: This is the application of Phillips Petroleum Company for 80-acre spacing for the Wolfcamp production discovered in the Bettie C. Dickinson No. 1-B well, Section 12, T.15 S, R.37 E.

MR. SPURRIER: The meeting will come to order. Case No. 270. MR. Graham, will you read the advertisement.

(Mr. Graham reads the notice of publication.)

MR. FOSTER: We are going to try to make this real short. I think we can run through it in a few minutes.

O. P. NICOLA,

having been previously duly sworn, testified as follows:

QUESTIONS BY MR. FOSTER:

Q Mr. Nicola, you prepared some Exhibits for us in this case, have you?

A Yes, sir.

Q You just go to the Exhibits and tell us what they are and what they represent?

A Phillips No. 1 is a plat showing the area surrounding the the Denton field and merely shows the outline of the proposed space area. Phillips Exhibit No. 2 simply shows that one unit involving different ownership would be required for the

for the formation in this field on the basis of present development. Exhibit No. 3 is a tabulation of the production history from the Wolfcamp reservoir beginning in June, 1950, and extending through March 1951, and as of March 31, 1951, this chart shows that there have been 152,000 barrels of oil produced, 333 barrels of water -- pardon me, change that to 1192 barrels of water and 44,421,000 cubic feet of gas. The gas oil ratio average for the field as of March, 1951 is 350 cubic feet per barrel.

Exhibit No. 4 is a graph on which has been plotted the number of producing wells, the total production of oil, the bottom hole pressures and the gas oil ratio. All of those factors plotted against time.

Exhibit No. 5 is a bar graph showing the tonnage of steel required for the drilling of two wells into this reservoir for an average of 253 tons per well.

Here also as in the Devonian we have estimated that by going to 80-acre spacing well, save the drilling of 42 wells for a total of 10,626 tons of steel. Also shown on the bar graph is the cost of completing two wells to the Wolfcamp for an average cost of $175,000.00 per well.

Q Trying to shorten this up, from your study and examination of the field, is it your opinion that one well will adequately drain and develop the 80-acres?

A In view of the small amount of information which we now have on this field, I would not wish to express an opinion

that one well will drain 80-acres. However, I think it is possible and it is our recommendation that the Commission establish an 80-acre pattern for a period of one year with a view to reviewing the data at the end of that time when more information is available.

We would also like to request exceptions as to location for all wells heretofore completed on a spacing pattern different from what we now advocate for this reservoir, namely, that wells be located in the northwest quarter and the southeast quarter of each quarter section. Also, we desire that the Commission grant exceptions as to locations for all wells now drilling to the Devonian on an off pattern location in case such wells may be plugged back and completed in the Wolfcamp reservoir.

Also for all wells, all Devonian wells which may be granted exceptions as to location by the Commission and I am referring to all Devonian wells which have now been completed it is requested that exceptions be granted for such locations as to Wolfcamp wells also.

The object of this request is in order that operators may take advantage of favorable Wolfcamp showings encountered in such twin Devonian wells.

We also request that in view of the information now available the Commission establish as an allowable for a well on an 80-acre unit the same allowable which is now granted for a 40-acre well with deep well adaptation. That is to say a

single allowable.

Q In barrels what would that be?

A 197 barrels a day.

Q For theWolfcamp?

A That is right.

MR. FOSTER: I believe that is all.

MR. SELINGER: Selinger with Skelly. I have one or two questions.

Q In recommending the pattern for Wolfcamp well it is your intention to permit the Wolfcamp wells to be on the same 40-acrs of each 80 acre unit as exists or will exist in the Devonian.

A That is oorrect.

Q And the same exceptions that will exist or exists for the Devonian will pass over to the Wolfcamp?

A That is right. That is my recommendation.

MR. SPURRIER: Anyone else wishes to question this witness.

MR. McCORMICK: I would like to ask Mr. Nicola what type of reservoir the Wolfcamp is?

A I would prefer - you mean what type of drive?

Q Yes.

A Well, I think right now it is similar to the Devonian. In other words, it is undersaturated. However, we don't have enough, really enough information.

Q It is not a water drive?

A I don't even have available any pressure information. I couldn't tell you. I don't know.

Q How big is the average producing section?

A Well, I would rather let our geologist -

MR. FOSTER: (Interrupting) The geologist can answer that.

MR. SMITH: The producing section varies somewhat from well to well from approximately 20 feet which has been shown on tests to the northern end of the pool. In the southern end of the pool there are streaks of pay occurring throughout about a 500 foot interval. Anyone of the streaks not exceeding 15 feet in thickness.

Q What would be the total affective pay in the south edge of the pool?

A The total effective pay.

MR. SMITH: The total effective pay in one well, the best well will not exceed one hundred feet.

Q What type of reservoir do you think it is?

MR. SMITH: Questionnable if it is a water drive reservoir. The lithology in it varies from finely sucrose dolomite to a vugular limestone. We have no information yet to classify it as a water drive reservoir.

MR. McCORMICK: That is all.

MR. SPURRIER: Anyone have any further question? If not the witness may be excused.

MR. FOSTER: I WANT to ask one or two questions of Mr. Smith.

Q Would you recommend 80-acre spacing in this field?

MR. SMITH: I would, yes.

Q Do you have sufficient information at this time on which to base an opinion as to whether one well will adequately drain 80 acres in the field or not?

A That on the basis of present data is difficult to judge.

Q You can't say?

A Can't say. However, if drilled up on 80-acres -

Q (Interrupting) Sir?

A (Continuing) if drilled up on 80-acres we would soon have enough data to base a conclusion on.

Q But you would recommend that the Commission adopt the 80-acre spacing in this field?

A I would so recommend.

MR. FOSTER: I believe that is all.

MR. SPURRIER: Anyone have any further questions of this witness or either witness. If not the witnesses will be excused and we will take up case 274.

Do you have something, Mr. White:

MR. WHITE: I WANT to file an identical statement as we filed in the other case, 269.

(See Case 269 for copy of statement.)

MR. McKELLAR: Magnolia would like for the record

to show that we join in the Phillips 80-acre in the Wolfcamp. By going to 80-acres now we could possibly avoid confusion that we have in the Devonian. Go to 80 until we get enough data to justify some concrete educated conclusion to what we really have.

MR. SCOTT: I would like to make a statement for Shell. As far as Wolfcamp reservoir, we are favorable to 80-acre proration of rectangular shapes with the unit within the same section and with development on either 40-acre tract of the proration unit until the structure is defined and the limits of production established. We are agreeable to Phillips proposed allowable of single 40-acre allowable for each 40-acre proration unit for this reservoir. We would be opposed to any regulation which would prohibit development of a 40-acre tract in the event these 40-acres could not be included in a 40-acre proration unit of rectangular shape within the same section.

MR. HOWARD: R. E. Howard with Atlantic refining Company would like to concur in the recommendation of Phillips Petroleum Company for the 80-acre spacing in the Wolfcamp.

MR. BOSS: R. L. Boss, Gulf Oil Corporation. In regard to Gulf's attitude to the 80-acre spacing in the Denton Wolfcamp, Gulf is in accord with the proposed application provided the wells are drilled as twin locations in order to permit adequate evaluation of the Wolfcamp reservoir in the original well drilled on each unitl.

MR. SELINGER: We concur in the recommendation with respect to the Wolfcamp on the basis that Wolfcamp wells will be located on the same 40-acres that the Devonian wells are.

MR. SPURRIER: Anyone else?

MR. J. D. WHEELER: We would like to have the record show that Ohio supports Phillips recommendation for 80-acre i the Wolfcamp as has been proposed.

MR. SPURRIER: The record will aslo show that Mrs. Clayton's statement was also intended to be included in the record of this case.

(Statement copied in record of Case 269.)

Anyone else? We will take up the next case.

- - - - - - -

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of hearing in Case No. 270 before the Oil Conservation Commission on May 22, 1951, at Santa Fe, is a true record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, this 7th day of June, 1951.

Ada Dearnley

ADA DEARNLEY, Reporter.

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-0823 1547
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

TRANSCRIPTION OF HEARING

CASE No. 269 and 270

24 July 1951
(DATE)

Copy

E. E. GREESON
ADA DEARNLEY
COURT REPORTERS
BOX 1302
PHONE 2-4547
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
July 24, 1951

CASES 269 and 270: (GENERAL NOTICE, Special Hearing July 25, 1951.) The Oil Conservation Commission by its orders R-74B and R-75-B, dated June 29, 1951, has granted a re-hearing in the applications of Phillips Petroleum Company in Cases 269 and 270. Case 269 relates to proration units and allowables for Siluro-Devonian common source of supply discovered in McAlester Fuel Company's J. M. Denton Well No. 1-A, SW SE 11-15S-37E, NMPM, and Case 270 relates to the application of Phillips Petroleum Company for an 80 acre proration units and allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B, NW SW 12-15S-37E, NMPM.

(Reporter's note: Proceedings in this matter were off the record, but the record should show that Cases 269 and 270 were continued, without objection, from July 25, 1951, until 10:00 o'clock August 7th.)

-o-o-

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of proceedings before the Oil Conservation Commission in Cases 269 and 270, held on July 24, 1951, is a true and correct record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, New Mexico, this 4th day of August, 1951.

E. E. Treeza
REPORTER

My Commission Expires: 8-4-52

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

TRANSCRIPTION OF HEARING

CASE NO. 269-270

August 7, 1951
(DATE)

E. E. GREESON
COURT REPORTER
UNITED STATES COURT HOUSE
TELEPHONE 2-0672
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

- - - - - -

In re: Rehearing and argument continued from July 24 to August 7, 1951. Phillips Petroleum Company is applicant. Case 269 relates to proration units and allowables for Siluro-Devonian common source of supply discovered in McAlester Fuel Company's J. M. Denton Well No. 1-A (SWSE 11 - 15S - 37E); Case 270 relates to Phillips' application for 80 acre proration units and allowables for the Wolfcamp common source of supply discovered in Atlantic Refining Company's Bettie C. Dickinson Well No. 1-B (NWSW 12 - 15S - 37E.)

Cases No. 269 & 270

- - - - - -

TRANSCRIPT OF HEARING

August 7, 1951

R E G I S T E R

BEFORE:

Honorable Guy Shepard,
Member and Chairman, O.C.C.

Honorable R. R. Spurrier
Member and Secretary, O.C.C.

R. L. Hughston
Shell Oil Company

W. A. Scott
Shell Oil Company

Cecil R. Buckles
Sinclair Oil and Gas Company

D. D. Dale
Sinclair Oil and Gas Company

Roy O. Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

O. P. Nicola, Jr.
Phillips Petroleum Company

E. H. Foster
Phillips Petroleum Company

C. P. Dimmitt
Phillips Petroleum Company

D. K. Spellman, Jr.
The Ohio Oil Company

J. D. Wheeler
The Ohio Oil Company

R. E. Howard
The Atlantic Refining Company

N. B. Winter
The Atlantic Refining Company

W. P. Tomilson
The Atlantic Refining Company

Stanley L. Smith
The Atlantic Refining Company

Glenn Staley
New Mexico Oil and Gas Engineering Commission

S. T. Silverstein

S. S. Schoerstein
Idaho Springs, Colorado

Jack M. Campbell
McAlester Fuel Company
Roswell, New Mexico

Vernon Turner
McAlester Fuel Co mpany
Magnolia, Arkansas

Kem E. Merren
McAlester Fuel Company
Magnolia, Arkansas

Travis R. Rowe
McAlester Fuel Company
Lovington, New Mexico

Jack W. Marshall
McAlester Fuel Company
Lovington, New Mexico

R. G. Carlin
Delhi Oil Corporation
Dallas, Texas

Alfred E. McLane
Delhi Oil Corporation
Dallas Texas

Elwin C. Hale
Piedmont, California

J. H. Crocker
Mid Continent Petroleum Corp.
Tulsa, Oklahoma

E. R. Burton
McAlester Fuel Company
Magnolia, Arkansas

Vilas P. Sheldon
Artesia, New Mexico

J. L. Briscoe
Roland Rich Wooley
Artesia New Mexico

G. E. Kendrick
El Paso Natural Gas Company

G. D. Simon
R. DeChicchis Consulting Firm

Jack Shier
Aurora Gasoline Company

H. H. Kaveler
Phillips Petroleum Company

E. L. Shafer
Continental Oil Company
Hobbs, New Mexico

Emmett D. White
Leonard Oil Company
Roswell, New Mexico

G. M. Andreen
Magnolia Petroleum Company
Dallas, Texas

Ollie J. Ford, Jr.
Magnolia Petroleum Company
Kermit, Texas

Foster Morrell
U.S.G.S
Roswell, New Mexico

E. E. Kinney
New Mexico Bureau of Mines
Artesia, New Mexicp

George Graham
Oil Conservation Commission

L. C. White
Oil Conservation Commission

E. C. Iden
Continental Carbon Company
Albuquerque, New. Mexico

Harold B. Seligman
Continental Carbon Company
Amarillo, Texas

H. L. Ericson
Continental Carbon Company
Amarillo, Texas

M. F. Shafer
Continental Carbon Company
Amarillo, Texas

Riss Madole
Aurora Gasoline Company

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Mr. SHEPARD: The meeting will please come to order. The next case is Cases 267 and 270. Will you read please, Mr. Graham?

(Mr. Graham reads the advertisement of the cases.)

MR. FOSTER: I would like to give the appearances that are here for the Phillips Petroleum Company. Mr. C. P. Dimmitt, Vice President in charge of production; Mr. H. H. Kaveler, Assistant to the Manager of the Production Department; Mr. O. P. Nicola, Proration Director; and myself E. H. Foster and Mr. R. N. Williams of Bartlesville, Oklahoma; G. R. Wright would have made an appearance here but he is ill, but I want the record to note his connection with the case in any event.

If the Commission please, it will not be our purpose this afternoon to attempt in any way to rehash the former testimony in this case. We think that the record as we made it in the original hearing was sufficient to support the Commission in finding that 80 acre spacing was desirable in the Wolfcamp and in the Devonian Pool, if the Commission chose to do so. Before I get under way here, I have got a little memorandum I would like to read to the Commission here that will, I think, fully outline our position on the motion for re-hearing in the two fields. And in that connection I might point out so far as the Wolfcamp is concerned, there seems to be very little controversy about it. There is no one here that oppose that. So, our main remarks will be addressed to the spacing that we think ought to be applied to the Devonian.

Now, we are in real earnestness about this situation

here. We think we ought to have 80 acre spacing in the field. Before I read a prepared statement here, I would like to introduce Mr. C. P. Dimmitt who is our Vice President of the Production Department, and in charge of all the production. He might have a few words he would like to say at this time. Mr. Dimmitt.

MR. DIMMITT: Thank you. To the Commission members I would like to say this. I think the case involved, which yuu are studying here now, involves a very basic principle that the industry must give more consideration to, and also, our regulatory bodies, regardless of whether it is about the Denton Pool of the State of New Mexico or any other state. It is one of the factors of developing structures, oil pools, in a scientific manner, and should be given more consideration than we have in the past. And, we are pleased to bring this to your attention here because we believe that it is one principle that you are not only interested in, that you are interested in from a hearing standpoint, but it is one principle that will result in better methods of operation and better ultimate recovery, in oil pools. Thank you.

MR. FOSTER: I have here with me Mr. R. N. Williams who is our Chief Proration Attorney out of the Bartlesville Office. I just want the Commission to see him. I don't want to call him as an expert or anything of that sort, but I do want you to know he is here.

In this statement I am going to read to the Commission, I have used the term "operators", in the pool down there, but I don't want anybody to get the impression I am attempting to

3.m

speak for any of the operators except Phillips Petroleum Company. As I view it, I think it would be beneficial for us to try and get an accurate picture of the nature of this hearing.

The Nature of this Hearing:

Neither the original application for 80-acre spacing in the Denton Pool nor the rehearing of that application now being considered should be looked upon as a contest between those in favor of the 80-acre spacing and those opposed to 80-acre spacing. This proceeding should be regarded as a conference represented by the oil and gas industry of the State, on the one hand, and the Oil Conservation Commission as the regulatory authority of the State of New Mexico, on the other hand, meeting in an effort to work out the problem of how to get more oil and gas from a pool for less money and with the use of less steel and by the drilling of fewer wells.

Now of course everybody has to play their part in this sort of thing so here is the role of the operator, and this proceeding is:

No one operator in a pool or field should be permitted to set a spacing pattern in the field best suited to his individual needs or desires. The best interests of all the operators, of all the royalty owners, including the State of New Mexico as a royalty owner, and of the public must be the criteria for determining a spacing pattern in any field. The producer is the

4.m

man who takes the stockholder's dollar and digs an oil well with it. He has the expectation of getting that dollar back, plus a profit. The producer acts in a dual capacity. He is, in a sense, a private and a public trustee. He is a private trustee in the sense that he must represent the best interests of his stockholders in seeing to it that the undertaking returns a profit. He is a public trustee in the sense that he must increase production at reduced cost in order to keep down the cost of the product to the ultimate consumer. One need not be a technical man, such as an engineer or a geologist, to understand these facts.

Therefore, I would like to say this, that we are not going to offer any highly technical testimony, we are trying to take a more practical approach to this problem, and see if we can't sell the Commission here on the idea that it is to the best interest of everyone to adopt a wider spacing pattern in the Denton field.

The royalty owner is one to whom a portion of the production is payable, either in kind or value. His role should be the same as that of the operator, that is, a public and a private trustee. The royalty owner should be regarded as a private trustee to the extent only of seeing that the ultimate in the recovery of oil and gas from the pool is had. He has the same duties and the same obligations as the operator in his capacity as a public trustee in that he should not insist upon a

program or a method of development of a field for its oil and gas content that leads to high cost of production which must be passed on by the operator to the consuming public.

In every prodeeding having for its purpose the obtaining of wider well spacing, the royalty owner is generally found arrayed against the producer. The royalty owner generally feels that his best interest is served by closer well spacing. Nothing could be farther from the truth. If the royalty owner cannot profit by wider well spacing, neither can the producer. This fact is obvious, since any method of well spacing advocated by the producer which results in the loss of oil to the royalty owner results in a proportionately higher loss of oil to the producer. The self-interest of an operator would dictate that he not advocate a spacing pattern that would bring about a loss to himself or the royalty owner. It may therefore be reasonably assumed that when an operator advocates wider well spacing he is honest in his convictions about the matter and believes that wider spacing is to the best interests of himself and all others similarly situated, including the royalty owner.

I would like to add right there to the Commission that we don't plan to appear here in the role of being opposed to royalty owners. What we are going to try and do is convince this commission that the program we are advocating will be to the best interest to everyone in the field.

6.m Economic Factors and Desires

The operator in a pool is usually guided in his efforts in the production of oil and gas, and in the fixing of a spacing pattern, by the economics of the case. An operator cannot drill wells and produce oil or gas at a loss. The adoption of any spacing pattern which inures to the economic benefit of the producer likewise inures to the economic benefit of the royalty owner. However, in most instances, the royalty owner is motivated by a desire for more and more royalty payments, and is less and less concerned with the science and the economics necessary to be applied by the producer to the orderly and proper development of a pool. The producer should not be permitted to dictate a course of action by the regulatory body that is inimical to the royalty owner. Every producer should recognize that the interest of himself and the royalty owner is mutual, and most producers do recognize this. Any action on the part of the royalty owner which increases the cost of production to the operator directly contravenes the provisions of the Statute of the State of New Mexico, Section 69-213, which will later be quoted. Such action necessarily increases the cost of the products of the oil and gas to the ultimate consumer. Likewise, any evidence of a selfish attitude on the part of the royalty owner by way of securing smaller spacing of wells requires the drilling of unnecessary wells, creates fire and other hazards conducive to waste, and this violates the provision of

7.m

the Statute. It is the duty of the regulatory authority to bring into proper focus all conflicting interests in a pool or field. This can best be done by considering the problem objectively and without regard to the desires or emotions of the parties.

It is the duty of the regulatory body to see that no producer profits at the expense of the royalty owner or the general public. And it is the duty of the regulatory body to see that no royalty owner profits at the expense of the producer or the general public. The interest of the royalty owner and the producer is mutual to the extent that they should seek the best methods by which a pool or field may be efficiently and economically drained and developed. This point is concerned with more than just the primary methods for the recovery of oil and gas.

Now their statements there are based upon a declaration of public policy contained in the Statutes and I will quote the Statute a little bit later, I don't want to inject any legalistic angles in our presentation of evidence in this request for rehearing, but I do want to call to the Commissions' attention the declaration of public policy of this State, as contained in the Statute, and to say to the Commission what we are trying to do we think is in keeping with that declaration of public policy. In other words, I want to get some of the bug-bears out of this 80-acre spacing problem. Our experience is, as soon as you mention 80-acre spacing to most people, they just start running. They think there is something inherently bad about it. We are

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going to try and break down that theory.

Most producers regard pressure maintenance in the production of oil and gas as the long-range view. Primarily, recovery methods are regarded as the short-range view. Here again the interest of the royalty owner and the producer is mutual. At best, primary methods of recovery obtain only a small percentage of oil in the pool, less than 30% in most instances. Pressure maintenance methods substantially increase this percentage. The application of pressure maintenance is directly related to well spacing. That is, it is now conceded that wider well spacing more readily lends itself to pressure maintenance methods than does smaller well spacing. In deep pools, such as the Denton Pool, and under the reservoir conditions which obtain in this pool, the recovery of oil by primary methods is shortlived. If the ultimate in recovery of oil and gas in this pool is to be obtained, pressure maintenance must be resorted to. Since well spacing is directly related to the best results to be obtained by pressure maintenance, it is timely to consider the spacing pattern for the field. The field should not be allowed to be developed on 40-acre spacing under primary recovery methods with the expectation that the best results can be obtained in the application of pressure maintenance. If, for any reason, those now advocating 80-acre spacing in the Denton pool should be mistaken, this does not condemn the adoption of 80-acre spacing. This for the simple reason that resort to 40-acre

spacing can always be had, if, as and when it becomes evident that 80-acre spacing skhould not be the pattern in the field. On the other hand, if those who are advocating 40-acre spacing for the field, and there is only one producer who is doing this, should for any reason be mistaken, a resort to 80-acre spacing could never be had.

Therefore, I would like to say to the Commission it seems to me we are trying to get the cart before the horse, when we want to stand on this so-called 40-acre spacing, because whenever you once adopt the 40-acre spacing then if that should not have been the pattern in that field, and if the pattern should have been a wider one, you are then precluded from going into the proper pattern or wider pattern.

No spacing pattern gets oil out of the ground. All that a spacing pattern does is to determine the distance between wells, based upon some reasonable hypothesis. Rule 104 (b) of the Rules of the Oil Conservation Commission of the State of New Mexico provides:

"Each well drilled within a defined oil pool shall be located on a tract consisting of approximately 40 surface contiguous acres substantially in the form of a square in accordance with the legal subdivision of the United States Public Land Surveys or on a governmental quarter section or lot * * *."

This rule is of statewide application and applies only in the event the Commission does not fix a smaller or larger spacing pattern for the pool.

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This statewide rule does not take precedence over the statutory provisions relating to well spacing. Section 69-213, New Mexico Statutes 1941, Annotated, contains this provision:

"No owner of a property in a pool should be required by the Commission, directly or indirectly, to drill more wells than are reasonably necessary to secure his proportionate part of the production. To avoid the drilling of unnecessary wells, a proration unit for each pool may be fixed, such being the area which may be efficiently and economically drained and developed by one (1) well. The drilling of unnecessary wells creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator, and thus also unnecessarily increases the cost of the products to the ultimate consumer."

While the rule fixes 40-acre spacing as a statewide spacing pattern, the Statute recognizes that conditions may exist which will require, in the protection of public and private interests, a wider spacing pattern. And, in order to implement the spacing pattern in a pool or field, the same section of the Statute quoted above further provides:

"The pooling of properties or parts thereof shall be permitted, and if not agreed upon, may be required in any case when and to the extent that the smallness or shape of a separately owned tract would, under the enforcement of a uniform spacing plan or proration unit, otherwise deprive or tend to

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deprive the owner of such tract of the opportunity to recover his just and equitable share of the crude petroleum and natural gas in the pool; provided, that the owner of any tract that is smaller than the drilling unit established for the field, shall not be deprived of the right to drill on and produce from such tract, if same can be done without waste; but in such case, the allowable production from such tract, as compared with the allowable production therefrom if such tract were a full unit, shall be in ratio of the area of such tract to the area of a full unit."

Every operator must recognize that there is no virtue in any spacing pattern as such. Spacing is only one of many factors to be used in regulating the production of oil and gas from a given pool. Some pools or fields more readily lend themselves to development on 40-acre spacing than on 80-acre spacing, and vice versa. The chief difficulty in fixing a spacing pattern for a pool is that it can rarely be determined with any degree of accuracy what the pattern should be until after the pool has been fully developed. The matter of determining well spacing, therefore, becomes largely a matter of policy. It is true that the proper spacing can be determined under any set of assumed conditions. In the past in New Mexico, well spacing has been geared largely to production from shallow pools. A shallow pool is defined by Rule 55:

"Shallow pool shall mean a pool which has a depth range from 0 to 5000 feet."

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Production of oil from a deep pool in the State of New Mexico is of fairly recent origin. In fact, the first production that you had from a deep pool in this state, was on March 1st of 1948, that is from a depth below 5000 feet. A deep pool is defined by Rule 18:

"Deep pool shall mean a common source of supply which is situated 5000 feet or more below the surface."

It must be self-evident to any producer that the definitions of a shallow pool and a deep pool are more or less arbitrary. And, of course, as to the matter of well spacing it must be still more evident to a producer that the enforcement of a 40-acre spacing pattern in every pool would be arbitrary and without excuse or justification on any ground.

I call the Commissions' attention to the fact that we are not asking for any permanent order for 80-acre spacing in this Denton pool, we are simply asking for a temporary order for a period of one year, and why anybody can object to that, I don't know.

The operators in the Denton Pool are not asking that the Commission adopt a permanent 80-acre spacing pattern for the field. Good faith requires that the spacing pattern be placed upon a temporary basis. In fact, there is no such thing as a permanent spacing pattern in an oil and gas field under the present regulatory setup. The Commission may, and in fact, it would be its duty to, if conditions required it, change the spacing pattern in any

13.m

field or pool. But, in order that there may be no misunderstanding about the position of the operators in this pool, a specific request for 80-acre spacing for a temporary period of one year has been made. The temporary nature of the order requested meets the argument made by the operator opposed to 80-acre spacing that once 80-acre spacing is adopted, always 80-acre spacing. Nothing could be farther from the truth. The operators who are sponsoring 80-acre spacing in this field do not want it, if, in fact, it should be adopted. But, as we have pointed out, the field will be completely developed before one gets that answer.

Now there are other questions here, such as the steel shortage, so we have a proposed solution.

Steel Shortage vs. 40-Acre Spacing in This Pool or Any Other Pool.

I don't want the Commission to get the idea my remarks are confined to the Devonion Pool, what I am saying here applies to any pool in the State.

A National emergency has been declared by the President of the United States. With the declaration of a National emergency came a declaration of a shortage of certain critical materials. Steel is on this list. There is no doubt that there is a shortage of oil field tubular materials. This situation calls for conservation of steel and the adoption of practices in the oil fields that will implement the conservation of steel. One way to save steel is to adopt wider well spacing. Eighty-acre

spacing requires the drilling of only one-half as many wells as is required by 40-acre spacing. The adoption of 80-acre spacing for the Denton Pool has been requested on a temporary basis. If, at the end of the one year temporary period requested, it can be demonstrated from additional information obtained in the development of the field that the reservoir conditions in the field are better adapted to 40-acre spacing than to 80-acre spacing, then the Commission can impose 40-acre spacing and no one will have been hurt, and, in the meantime, at least a temporary savings of steel will have been effected. On the contrary, if, at the end of the one year temporary period, it is then the judgment of the Commission that 80-acre spacing should be continued for another temporary period or made permanent, then to the extent that 80-acre spacing is perpetuated in the pool, a savings in steel will have been effected. If the deep pay in the Denton Pool proves to be as prolific as it is now thought to be, and if the National emergency should demand additional oil, then it will have been developed that the Denton Pool will be a good place to expend steel in satisfaction of meeting the additional requirements for oil for the National emergency.

Now we come to another very important point that is involved in this controversy, and that is the development of future reserves verses 40-acre spacing, and I think this directly concerns the State of New Mexico and any other state as far as that is concerned, where the matter is at issue.

15.m When drilling is comparatively shallow, development costs are relatively low. On the other hand, costs tend to climb with the development of deep reserves. It is shown in this record that the average cost for the drilling of four wells was $273,000 per well. This is a lot of money to put in a hole in the ground. It is true that these costs are determined on present-day inflated prices. It is likewise true that the relatively short term of payout is determined on the present-day inflated price which the producer receives for his product. It would be a short-range view to assume that present income can continue at the present inflated rates. In talking about development costs one is not just talking about the Denton Pool. On any basis deeper drilling will be expensive, and the cost of developing a field is directly related to the spacing pattern. This is an obvious fact because the more wells an operator drills, the more money he must spend in drilling the wells. If, by enlarging the spacing pattern, the number of wells to be drilled to develop the field can be decreased, then drilling costs can be decreased. With a decrease in drilling costs will come a more rapid discovery of reserves. The best thought of the industry now is that future reserves will be found at increasing depths and, likewise, at increasing costs. Therefore, it is to the best interest of the State of New Mexico and of its people that drilling costs be held to a minimum in order to encourage the discovery of additional oil reserves at

16.m

greater depths. The adoption of 80-acre spacing will do this. And, likewise, the adoption of 80-acre spacing will more quickly determine the outer limits of production of a pool after discovery of production.

Now we are not so much concerned here with the adoption of 80-acre spacing. The application which the Commission has before it merely offers it as a means or way of adopting 80-acre spacing over here in a designated pool, but there are other ways this Commission can do it if they want to do it. All you have got to do is change Rule 104 and make it provide for 80-acre spacing in deep pools, that is all in the world you have got to do, so we don't care how you do it, we are not interested in the means this Commission may adopt to get the results we are asking; but you can amend Rule 104 and simply provide for 80-acre pattern in those deep pools.

Now I am going to say this to the Commission, we have been operating over here under a kind of an antiquated system it seems to me. About sixteen years have gone by here since there has been any change in the rules here of regards to deep drilling. Now there hasn't been any need for changing, of course, up until you began to get deep production; but surely after this deep production development has started in this state, surely as a matter of policy, we think the Commission could very well adopt for deep pools 80-acre spacing for all deep pools to start with. Just like you have adopted 40-acre spacing for all pools in the state up to the present time.

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Now that concludes my prepared statement, and I want to leave a copy of it here for the record, and if the Commissioners would like a copy of it to take with them and read, I have some extra copies I would like to pass around to the Commission.

Now with reference only to our witnesses, if the Commission please, Mr. Shepard.

MR. SHEPARD: You have witnesses?

MR. FOSTER: We will have one witness, that will be Mr. Kaveler, and we will put him on and have him sworn.

MR. CAMPBELL: May I make a preliminary statement before you start Mr. Foster?

MR. FOSTER: Surely.

MR. CAMPBELL: I am Jack N. Campbell, representing the McAlester Fuel Company. I would like to state on behalf of the McAlester Fuel Company, which is the operator actively opposing 80-acre spacing in the Devonion zone of the Denton pool, with no appearance in case 270, relating to the Wolfcamp zone, that they do not carry the torch for 40-acre spacing, neither do they consider there is any magic about 80-acre spacing. We feel each common source of supply must be considered as a separate problem and we are sincere in our belief and our testimony at the last hearing and at this hearing will be intended to convince the Commission that in the Devonion formation of the Denton Pool, the erratic nature of the formation and the development of the field to date on a 40-acre spacing pattern will have -- changing to 80-acre spacing at this time -- will have an adverse effect

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upon both the proper use of reservoir energy, and correlative rights of the lease or mineral owners in the field. We are particularly leery of 80-acre spacing with a double allowable in this field. Our testimony has indicated, and future developments in the field have convinced us further that to produce these wells at double allowable as sought in the application on an 80-acre pattern after the field has been developed to date on a 40-acre pattern would have an adverse affect upon reservoir energy and that in the last analysis is the job this Commission has before it, to prevent waste of oil and protect correlative rights of owners in the field.

I would also like to make one comment about the steel shortage. That is a matter of concern to every one in the oil business. As I stated at the last hearing McAlester Fuel Company and apparently a great many others in this field are willing to expend steel in 40-acre drilling because they are doing it. New wells have been started almost every week in that field on a 40-acre spacing.

The McAlester Fuel Company drilled the discovery well in this field. They spent well over three/hundred dollars in drilling the wildcat well. It was money that really went into a hole in the ground because they didn't know whether there was oil there or not. That company I am sure, just as surely as the Phillips Company believes to the contrary feels it would be improper in this field at this time to change

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the spacing pattern to an 80 acre pattern, because as the Commission found after the original hearing, it would adversely effect drainage in the pool, and adversely effect reservoir energy in the field, and adversely effect correlative rights of owners in the fields.

The only testimony we will introduce today will be an effort to bring the record up to date insofar as the testimony of the original hearing relative to wells which have been started since the last hearing.

H. H. KAVELER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. FOSTER:

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

A My name is H. H. Kaveler, spelled K-a-v-e-l-e-r.

Q Where do you reside, Mr. Kaveler?

A I am residing in Bartlesville, Oklahoma. I am an employee of the Phillips Petroleum Company.

Q In what capacity?

A My present capacity is Assistant Manager of the Crude Oil Production Department.

Q And what is your occupation or profession?

A I am a graduate of the Missouri School of Mines in 1927 with a degree in Technical Engineering. I am a graduate of the University of Maryland, College Park, where I was granted the degree of Ph.D. in Chemistry. From 1927 to 1935 I was

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a member of the faculty at the University of Missouri, at the University of Maryland, at the George Washington University, Washington D. C., and from 1935 to 1936 I was employed by the United States Bureau of Mines in Pittsburg, Pennsylvania. From 1936 to the present I have been an employee of the Phillips Petroleum Company, acting in various capacities as a Research Engineer, dealing with oil production problems as an Evaluation Engineer in their Department of Economics. And since 1941 I have occupied various positions in connection with crude oil production operations, leading to my present capacity as Assistant Manager of the Crude Oil Production Department. I might further state as a qualification that for the past 16 years my principle interest has been in the scientific proration of oil fields, and particularly dealing with the problems of waste, well spacing, pressure maintenance and unit operation.

Q Now, have you had occasion to become familiar with the Denton Pool?

A I have, Mr. Foster.

Q I believe we have two formations in that pool, the Wolfcamp and the Siluro-Devonian?

A That is true.

Q And just as a preliminary step here for the record, at what depth is the Wolfcamp?

A About 11,000 feet.

Q And the Devonian?

A About 15,000.

Q And do you regard that as deep productions?

A In my opinion, those are deep pools.

Q Do you know when the--bear in mind the definition of what is a deep pool and what is a shallow pool in this state--you heard me read that awhile ago--do you know when the first deep production was discovered in this state?

A According to the records I have seen, the first so-called deep production in New Mexico occurred about the year 1948.

Q And since that time has there been an increase in deep production in this state?

A There has been. To my recollection there are four or five so-called deep pools in New Mexico at the present time.

Q Now, with regard to deep production in this state, Mr. Kaveler, is it your opinion that the unit designated as 40 acres in this state should, as applied to deep production, be changed?

A I think that the well spacing in each pool should stand upon facts developed in respect to each pool, and in particularly, referring to the Denton Pool, I think the facts dictate now there should be 80 acre spacing in both the Wolfcamp and the Devonian. If not on the permanent basis at least on a temporary basis until we have facts well determined which would lead to an intelligent, scientific basis of ultimate spacing.

Q How many wells are there in the Denton Pool now?

A My best recollection is about fourteen.

MR. SHEPARD: Producing wells?

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MR. FOSTER: Producing wells.

Q Do you know how many present locations there are for other wells?

A To my knowledge about two or three.

Q Just two or three. Do you see any adverse effect that would be had as a result of the adoption of 80 acre spacing in the Denton Pool at this time?

A I can see no adverse effect whatever to the adoption of an 80 acre spacing program at this time. Simply by virtue of the outstanding fact if 80 acre spacing should be found to be improper from a conservation point of view, then always additional wells could be drilled. It would be my recommendation to this Commission that an 80 acre spacing order be promulgated at least on a temporary basis.

Q It is true that if you adopted 80 acre spacing in the field at this time, the way the field has developed, there will have to be some exceptions?

A That is true. And that occurs in the application of any well spacing program by any commission.

Q Would you say it would be better to have the exceptions than to have the field all developed in a 40 acre pattern?

A I would say it would be much better to grant the exceptions. Now, it might appear that the number of exceptions to be granted at this moment were large percentage-wise. But we must recognise this field may be large and there will be many more wells drilled.

Q How many wells?

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A I don't know.

Q What approximately?

A I have no idea. The principal idea is a field has to be drilled before you determine its size?

Q Yes.

A So that in regard to the number that will ultimately be drilled, the number of exceptions now to be granted might in all probability be a small percentage of the total wells drilled.

Q Now, Mr. Campbell a moment ago in his statement--I want to pull this up a little bit-- referred to this so-called double allowable that might be had here in the Denton Pool in the event of 80 acre spacing. Do you see any relationship between the allowable and what the proper spacing pattern in the field should be?

A I think they are entirely separate and distinct issues and all Commissions recognise that in their regulations.

Q The allowable is determined on one basis, and what the proper spacing should be is determined on an entirely different basis, is that true?

A The allowable is to be determined from time to time on the basis of factsdeveloped after the field is operated.

Q As a matter of fact market demand determines what an allowable should be?

A Yes, it does.

Q I mean other than what the reservoir condition is?

A Yes, that is true.

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Q Now, Mr. Kaveler, you have over there on the table a machine set up. Will you tell us briefly what that is?

A Well, that is a mechanical demonstration of certain technical principles applied to the operation of oil fields which we have constructed in our company for the education of our own people, and which we have on occasion used to demonstrate certain technical principles to others interested in oil and gas.

Q I take it you are not one of those subscribing to the theory that the more wells you drill the more oil you get?

A That is true. It does not follow that more wells will produce more oil. There are abundant examples where many wells have led to decreased recovery rather than increased recovery.

Q Is that more likely to be true in deep production than in shallow production?

A It is.

Q Then what you are saying, there are many examples where a fewer wells are drilled the more oil you get?

A That is true, Mr. Foster.

Q That may sound a little paradoxical but it is true?

A That is true, yes, sir.

Q By the use of that machine can you demonstrate that fact to this Commission?

A I could if I might be permitted to make a few explanatory remarks before I demonstrate the machine. I think it would help

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in its understanding.

Q You go right ahead.

A My recommendation in regard to the temporary 80 acre spacing order in the Denton Field is based upon some technical conclusions as well as on some certain practical considerations that apply to a conservation program. I am mindful of the fact that while Mr. Spurrier has a technical background, the Land Commissioner and the Governor may not have had an opportunity to investigate certain technical aspects of the production operation of oil, and my remarks may seem to go far a-field for the moment. I would like to take a layman's approach to the discussion of this problem to attempt to convey to you what in my opinion are the basic technical concepts. If one should ask what is the principal difficulty in bringing about a proper spacing in any oil field, I think one would be entitled to the opinion that the principal difficulty lies in a wide-spread misunderstanding of the technical problem, and a rather general misconception of what is involved. So, that a layman finds great difficulty in grasping what it is the technologists appear to be carrying on a great argument about. I should like to base this statement entirely on what is considered to be the most outstanding technical discovery in respect to oil production operation in the last twenty-five years. Surprisingly enough that proved technical conclusion is very simple. It simply involves this statement: That oil does not produce itself from the earth. Oil does not produce itself from the earth. Now, I think many

26mm know that oil is found in rock. And I have brought with me here a piece of rock from Oklahoma which is the Shellback Sandstone, which is a typical example of the kind of rock in which oil is found. You may look at this and assume it is a solid piece of rock, but it isn't. It is a conglomeration, aggregation of sandstone. If you look in this apparently solid piece of rock--just imagine that it is bin of oranges or a basket of potatoes. Between the oranges or potatoes is empty space. In like manner, beteen these millions of sand grains is empty space. We call that a pore space of the rock. And in this pore space the oil accumulates. I have brought with me a piece of rock, the first being a sandstone and the other a limestone. You notice here a substantially different structure. The porosity developed in the limestone has an entirely different aspect than the porosity associated with the sand grains. Nevertheless, oil is in the pore space of rocks like that in which oil is found.

Now, I have brought with me a bottle of crude oil, oil which is found by boring holes in rocks that have the property of porosity. Oil cannot be discovered except by the process of drilling.

Q That porosity. As familiar as I am with it, it kind of throws me. It is just holes in the rock, isn't it?

A Yes. Now, I have with me here a bottle of crude oil. Most people think of crude oil in terms of a 'gusher', the Hollywood notion of an oil field, where the oil spurts out

through the derrick and over the country side. That is what

27mm everyone wants, of course. It is from the notion of the 'gusher' that the layman draws the conception that crude oil produces itself out of the earth. But the fact is that oil doesn't produce itself out of the earth.

I can show you the equivalent of producing oil from the earth by taking the top off the bottle. And, lo and behold, oil doesn't spout forth from the bottle. I could recover it by tipping the bottle over and tipping out the oil, but it would be an entirely impractical matter to attempt to lift the earth up and pour the oil out of the rocks. Crude oil is incapable of pushing itself from this bottle. And in the same manner, it is incapable of pushing itself from the rocks. It follows, wells do not produce oil. That strikes the layman as an idiotic statement, but that is the fact.

You ask, how is the oil recovered? And the answer is that nature, in her wisdom, has placed with the crude oil a quantity of natural gas associated with the oil in the pore space of these rocks. In some cases nature has supplied a body of water associated with the oil. And it is the gas and the pressure of the water associated with the oil that is responsible for the production of oil. And that is all the proved technological conclusion amounts to.

Were it not for the pressure of gas or were it not for the pressure of water associated with the oil in these rocks, there could be no crude oil production. The function of a

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well then is simply to provide the mechanical means whereby the gas associated with the oil has an opportunity to expand to a point of lower pressure. It is the expansion of the gas and the movement of the gas through the rock that causes the oil to be drifted into the well and produced. And having been drifted into the bottom of the well, the oil can be recovered from that point either by pumping or by natural flow.

Q That gas does not function as a result of the number of wells drilled in the pool, does it?

A The number of wells drilled has no relationship except--

Q To the force that produces oil?

A Another function of the gas in expelling oil from rock. Now, it is true wells are capable of draining a large area of the pool. One well, given sufficient time, could drain all of the gas energy or water energy from the pool and accomplish the production. There are no barriers in this rock. There are no fence posts which place limitations on the extent with which the influence of any one well could extend itself. The same manner with this rock. There are property lines on the surface of the earth, but those property lines extend only to the depth of the fence post.

Q What you are saying is there are no partitions down there like there are in a building or wing?

A There are no partitions in a common source of supply.

It leaves us finally with this conclusion, which a layman

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can arrive at, and that is simply this: When the pressure of the gas is gone from a pool, the oil production is gone; and if the pool be dependent upon water for its source of energy, when the pressure of the water is gone, the oil production is gone.

The Commission has undoubtedly had called to its attentin the great East Texas Field where the energy which expels the oil from the rocks is due to a large body of water west of the pool. The Texas Railroad Commission, recognizing that as the source of energy, has for the past ten years fostered a program whereby the water produced from the formation has been returned to the formation. And the whole idea centered upon this important technical conclusion is that as long as there is pressure from the water or the gas only so long can there be production.

As we travelled through the oil-producing states and see the wells on the pump or stripper stage, we see those wells that have reached that point of low production only because the pressure necessary for the production is exhausted. In these fields great quantities of gas was wasted in years past and the result has been that the recovery of the oil from the reservoir has been a matter of only 30 per cent or less production.

Q I want to peg that down there, Mr. Kaveler.. You mean if you had a hundred barrels in the reservoir, you get just thirty of it out?

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A If you rely simply on the natural force there.

Q That is what I am talking about.

A Without any effort to restore pressure or maintain it, the recovery is about 30 per cent or less and 70 per cent or more of the oil is left and not recovered. That has been the history of oil production in this country up until recent years.

Q Are you more likely to dissipate the producing energy of a reservoir by the drilling of more wells?

A It frequently happens that when too close a well spacing program is adopted, that operators having found it necessary to recover their investment to drill unnecessary wells--because the production of oil in excessive oil-gas ratios there leads to waste. And there are many examples where the drilling of unnecessary wells have dissipated the reservoir structure to the point where less actual, ultimate recovery has been obtained.

A few years ago I wrote a paper on the subject which was published in the 1950 volume of the Petroleum Institute and the examples are there given.

Q All right. Go ahead.

A Now, the statements that I have made to the Commission are illustrated in principle by the model. Some may say this model doesn't represent an actual oil field and they may point an accusing finger at the fact that this is only a mechanical replica of an oil field. But the fact is that

31rm all the technical processes I have just stated are here represented in truth without any magic being employed. I ask the Commission to look at the top part for a moment, and assume you are driving through this oil field. Here is the county road that comes over the field. You see this fence line. And see a well drilled there on this property. And you pass through the gate in the fence and you are on another man's property. And there is another well, and a stock tank, and an oil and gas separator on that property; and then you pass through another gate and fence line onto another property, and observe there too is a well. That is what most laymen observe. And that is the limit of their understanding of what constitutes an oil field.

Q That is as far as they can see?

A That is as far as they can see.

Q You experts can see a little further.

A In a sense. But in the drilling of the wells it is possible to take cores of the sand and recover portions of the earth in the subsurface, and possible to get samples of the oil and gas produced. And it is possible to reconstruct rather faithfully and accurately what it is that occurs in the subsurface that is responsible for production. So, if one could take the earth, like a cantaloupe, and cut it in half so that you could look at it, one would find that the oil and the gas produced from these wells lies in a lens of sand that is tilted up in the earth. This lens of sand was once a dome that extended over in an anticline with both its halves intact. But there was a fault and the fault caused

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this half to slip down. The top of this half is 6,000 feet and the top of the other half is 14,000 feet and has been drilled into with a dry hole here. We find on further observation that the top part of this particular reservoir is filled with gas and this part underlying this gas-cap substantially is filled with oil, which has been colored red for the purposes of this demonstration.

Q What are you talking about, gas-cap?

A We classify this as a cap over an oil-bearing section. Then we observe that the sandstone for the remaining part of its distance is filled with water; so that this land owner had the misfortune of having his well drilled to a part that contained neither oil nor gas but only salt water.

Now, as we look at this section we can say to ourselves it is evident why this farmer suffered the dry hole because the pool terminates. This sand body is sealed off by that fault. And another thing evident is that this farmer suffers the misfortune of having only gas beneath his land. But the real situation that exists can be demonstrated best by showing what happens in this field in the event that the man owning the gas well takes production from it. I am going to produce this gas well at this point, and mark on here for a reference the location of that original line; and so those in back can see I will put one mark back here. This man having drilled his gas well wishes gas to be sold. If you listen you can hear the gas coming out. Gas is being sold from beneath this

33mm

this lease in the common source of supply, and I think it is evident to the Commission that as a result of that man selling gas from his separate lease, there is a general drainage condition set up through which the pressure is lower here now than it is here, and the full part of the oil starts to move in response to that lower pressure point. So there is migration accordingly. But I would like to call your attention to something else, that is substantially important, and that is that the gas dissolved in this oil is bubbling out. Is leaving this oil and moving to the point of low pressure. Now, it isn't likely that this man owning the oil-bearing portion is losing oil by migration to the gas producer, but what is typically more important to the oil owner is that the gas, the very life-blood of his oil production, is being taken from his oil. So that a conflict exists between the two owners. They have a diversity of interests that cannot be reconciled so long as this property line is a basis for attempting to divide what is in fact contents of the common source of supply.

Q I want to ask this. The gas in the gas-cap, that doesn't help produce the oil?

A It could.

Q But it doesn't under general methods of production?

A Under general methods of production it doesn't.

Q What is the energy that helps produce the oil?

Is it the gas in solution?

34mm

A The gas in solution and it could be that gas in the gas-cap.

Q Yes.

A To show you this and as a real oil well, I will open this oil well and you can see the gas expands and lifts the oil to the surface.

Q Where is the gas shown to be expanding?

A You can see the bubbles here.

Q In that red tube.

A And you can see the gas-cap taking the oil and the oil is beginning to move below this original line. We will let the oil well run there for a minute and let it produce so that you can see that the production from this oil well is due to the pressure or expanding effect of the gas. That is the way oil fields function. There is nothing mysterious about this. There is nothing misrepresentative about it. That is the manner in which oil is recovered. This oil cannot produce itself from rock. Oil can be recovered only to the extent there is gas pressure or water pressure available to expel it from the well. And we can get quite nice production in the storage tank on this lease. The Commission will notice that not all the oil is recovered. Some is left back at this point. Now, in the usual oil field things don't operate this smoothly because this man owning the gas well is entitled to take something from the common source of supply, because while the oil man is producing oil this man is selling gas. I will open up some gas, and we will see what the consequence of that is.

35mm

The consequence of that man taking gas from that common source of supply is that this man's oil well ceases production as the gas bubbles out of the remaining oil and goes into this gas well. And there we have the usual type of American oil field. Not all of its recoverable oil is recovered. Substantially a large portion remains in the ground. Because the energy of production has been finished.

Q Are you saying the gas is going out of solution as a result of the production from the gas well?

A Yes.

Q Is that what stopped the oil well from producing?

A The taking of the gas from the gas-cap and taking of the gas from solution in the oil together resulted in the killing of that oil well. Now, this well is an entirely unnecessary well in this field. All of the gas should have been taken from this well and more oil could have been ultimately recovered and all of the gas would have been recovered. Now, to show you more oil would have been recovered if the gas energy had been conserved I am going to put some gas back into this gas well, use it for an injection well; and to show you by pressure maintenance, this is the act of maintaining pressure, by putting gas into the ground it is possible to restore that oil well.

Q Let me ask you this. You have been talking about the primary methods of recovery in the field up to this point?

A Yes.

Q Now are you talking about pressure maintenance?

16mm

A This is the act of pressure maintenance, which is often done after a field is exhausted, but is best done from the beginning of production.

Q Which spacing is best adopted to pressure maintenance, a smaller or larger spacing?

A I think it is evident to the Commission that had we another dozen wells between these two wells, the result would have been the same because in nowise has this recovery operation been dependent upon the number of wells drilled. All we need is a sufficient number of wells to define the field. We have drilled a dry hole here and here, and have two producing wells. And they have defined the fidd in that respect. Any other wells that are not directly useful to this proposition of gas expelling the oil are wasteful wells.

Q How can you get the most oil out of the field for the least money?

A By drilling a number of wells that are necessary to define the limits of the field; by drilling the number of wells that are necessary to take on an efficient production operation. And I would say that by instituting pressure maintenance operations that would bring the greatest ultimate recovery.

Q Do you have any examples in your experience where it has been proven that too many wells were drilled in a field?

A Well there are a number of examples that I could cite to the Commission. Most of them are a matter of public record.

Q Well, I know. But for this record will you cite some of them?

37mm

A In the Schuler Field in Arkansas, one hundred and forty-five wells were drilled to the Jones Sand to a depth of 7500 feet.

Q That would be deep production in New Mexico?

A That would be deep production in New Mexico. The wells were drilled on a pattern of one well to each 20 acres because it was thought at that time, in 1937 in Arkansas, that you couldn't have any wider spacing.

Q You mean they thought then one well wouldn't bring more than 20 acres?

A We thought so but we weren't permitted under Arkansas law to put more than 20 acres to a well. The field was unitized and from the first day of operation in 1941 under unitization, 100 of those wells were shut-in and closed in completely and the 9,000 barrels per day was produced from 45 wells. And at no time since 1941 have we ever produced more than 50 of the 145 wells at any one time to get the daily allowable. Since then 50 wells have been permanently closed down. It has been estimated about eight million dollars was expended in drilling unnecessary wells.

Q Of course, that eight million dollars had to come out of somebody's pocket?

A Yes, sir.

Q Where did it come from?

A Well it came from the lessee.

Q Where did they get it?

A They got it from selling crude oil and the crude oil people got it by selling gasoline to the general public.

Q You and I paid for the drilling of those unnecessary wells.

A Yes, sir.

Q The question here is 80 acre spacing down here in this Denton Pool--will it be sufficient to get the oil out of the ground or whether you have got to have 40 acre spacing. Now, it is evident isn't it, Mr. Kaveler, that somebody in this state or somebody in some other states, if you drill too many wells in this Denton Pool, the public has got to pay it?

A That is true.

Q The lessee won't pay it?

A That is true.

Q He will get it back by adding to the price of his product.

A I would like to say in addition to that general question, to say this to the Commission: That the matter of getting the most oil out of the ground involves a production operation. It involves the method in which pools are operated. It doesn't in any manner have anything to do with the number of wells drilled. In this little oil field we could have drilled 100 wells and wouldn't have gotten any more or less than we got with the two. Because the distinguishing feature of this exhibit is the manner of operation.

Q It is the way you operate instead of the number of wells that counts.

A That's right.

39mm

In east Texas it is a matter of putting water back into the ground to maintain pressure that is responsible for the recovery of oil, not the fact that there is one well to every five acres.

Q Isn't it a popular conception that the more wells drilled the more oil you got?

A That is a popular conception.

Q Is there any truth in that?

A None whatsoever.

Q As a matter of fact, just the reverse is true?

A That is correct.

Q You have mentioned the Schuler field where you could have saved the drilling of a large number of wells. Now, can you give me any other examples?

A Well, I think the general policy which the Texas Railway Commission has adopted of limiting the take of gas from fields in Texas illustrates that some steps must be taken to eliminate the effect of drilling unnecessary wells. In many fields in Texas wells are drilled which are unnecessary wells and a severe limitation on their production must be taken.

MR. SHEPARD: Let's take a five-minute recess.

(Recess.)

THE WITNESS: Mr. Foster, I wish to correct one statement I made.

MR. FOSTER: Yes, sir.

40nm

THE WITNESS: I believe the Wolfcamp is approximately 9,000 feet deep and the Devonian approximately 11,000.

MR. FOSTER: All right.

THE WITNESS: I would like further to say about the model, to save time, whereas I spoke about the model only in respect to the relationship between gas and oil and illustrated how this maintenance of gas pressure was responsible for the production of additional oil, the identical same statement could have been made to the Commission had we considered the movement of water from the structurally lower part of the reservoir upward. Water advancing under pressure through this field can expel oil in exactly the same manner as gas does. In fact the power of water would result in a greater recovery because water is a more efficient means of recovering oil. So, I don't want you to fall in error. If the Denton Pool turns out to be a water-drive pool. In the movement of water and the production of oil from it, water wells on the edge of the field will occupy the same element of importance as in the example I gave you of the movement of gas and the waste of gas through gas wells. I would like to say to the Commission insofar as the technical conclusion is concerned, that if the Commission looks at the means of getting the greatest ultimate recovery from the oil fields of this state, that the important thing is how is the field operated. The big question is not how many wells are drilled, because wells, from a technical point of view, are only part of the machine that utilizes the energy of production to enable the recovery of the oil. Now, that is the technical

aspect. I think there are practical considerations which, if I may be permitted, I will state now.

The practical considerations are that the number of wells do not determine the ultimate recovery. And there are many examples of experience inthe American Petroleum Industry where that technical conclusion is verified by actual experience. The method of operating a pool is more important in deep pools than it is in shallow pools by the very nature of the conditions. The State of New Mexico I think, should be interested in adopting a wide spacing policy at least on a temporary basis for deep pools in order that the resources of the industry, whether they be moneyor whether they be the tangible steel resources, could be utilized to discover other deep pools.

As a practical matter I think it is of more importance to this state to have a large number of pools discovered than to have a large number of wells drilled in one pool.

Q Let me ask you how this wider spacing in this state would adversely effect the interest of a royalty owner.

A It cannot.

Q Would you say it would be beneficial to the royalty owner to the same extent it is beneficial to the operator?

A I would think so. One way that suggests itself immediately is that there are undoubtedly many deep pools remaining to be discovered in this state that are simply awaiting the opportunity and the means for restoration.

Q You think wider well spacing will more readily bring about

development of the deeper reserves of the state?

A It demands the development of these deeper pools-- why, is the fact that from an investment standpoint and from the standpoint that with the limited steel resources and the limited dollars that the industry has to invest, the industry can afford to develop the deeper pools after they are discovered so that a wider spacing policy on deep pools would, in my opinion, go a long way to fostering the development of the industry in the state. Furthermore, after deep pools are discovered and brought on production, pipelines in greater number and capacity will come to the state. There will be an increase market demand. And in that regard the royalty owner and operators in the state generally will benefit from the expansion of the oil industry.

So, that in my opinion, the acceptance of 80 acre spacing for deep pools would have a very beneficial influence in every direction.

Q What reason can you see for any complaint against this proposed 80-acre spacing in the Denton Pool on a temporary basis?

A Well, of course, it is a little hard for me to see. There could not be any basis. I was impressed at the last hearing by some of the royalty owners who were of the opinion, were the Commission to grant 80 acre spacing the development of the pool would be delayed. I think exactly the opposite is true.

Q How do you think that?

A In my opinion, 80 acre spacing creates the opportunities for a man to drill an offset in exactly the same manner as if

Q Smaller spacing?

A So that operators drilling on 80 create offsets on the next 80, which brings about an extension of development much more rapidly than would otherwise occur.

Q They will get where they are going more quickly?

A That's right.

Q You find out how wide or how long their field is quickly, don't you?

A That's right. Many of the royalty owners appeared not to understand that phase at the previous hearing. One little thing that impressed me about the owners that spoke at the last hearing were some that appeared to be on the edge of this pool, and had had that misfortune on other occasions, and were afraid they would be washed out before the wells came to their lands.

Q What do you mean by washed out?

A The likelihood is that the Devonian reservoir will be water-drive. It is almost all over this particular area of New Mexico. The likelihood is as a barrel of oil is taken from the top of the Devonian structure that a barrel of water will move in in its place. So those who have the misfortune of being on the edge of the water-oil boundary, will suffer by migration from their lands to the other parts of the field from which oil is taken. Now, if this field is drilled on 40 acres, there would result the drilling of a larger number of wells on top of the structure. And a larger number of wells would take a larger

quantity of oil and a larger quantity of water going into the edge. Wide spacing would bring the well to his land sooner and would cause a distribution of the take through the water where he would have a chance to get some production before the water moved past his land.

Q It would be a more equitable distribution of pressure.

A Yes. I have heard no statement, nor do I have in my possession any knowledge that 80 acre spacing would work adversely to any party.

Q Suppose there had been 80 acre spacing and the later development would demonstrate there should be 40 acre? Can you go back to 40?

A Yes. You can always drill a few more on the 40. I might say to the Commission, in the State of Texas and in the State of Louisiana we have been parties to the drilling of pools on 80 acre spacing in five instances under a pretty bitter opposition. But once the pool was developed, a sane condition of operation was brought about such that the royalty owners never offered any complaint. The fact is that once we get 80 acre spacing we will never go to 40. I will say to you with all the experience I can command from my experience and knowledge that once the 80 acre field is developed there never develops any reason for changing it. Nobody in the industry has ever found that 80 acre spacing once adopted has done anything other than promote conservation.

It isn't new, it is long established in the industry. There are 80 acre spacing orders in deep fields in Texas, Louisiana

45mm

and Oklahoma.

Q Now, this is just not something new that somebody has thought up overnight is it?

A It isn't.

Q Now, the royalty owners apprehension here, you think that just comes from lack of real information on the matter?

A Lack of understanding.

Q Just a lack of understanding.

A Yes, sir.

Q And the only way to convince them would be to go to 80 acre and let them try it once?

A That would be one way.

Q That would be one way to convince them. Do you see any objection to that?

A I do not.

Q If it doesn't work, you can go back to 40?

A That is true.

Q If you go to 40 and want to go to 80, you can never go on to 80?

A This is a one-way street we travel.

Q You have got to have it developed right the first time?

A That is correct.

Q You can cut a wider pattern and then go back and drill wells on 40 if you wish to?

A Yes, sir.

Q Now there is a severe steel shortage, isn't there?

A There is a steel shortage so far as the oil industry is

46mm

concerned. I think it is generally known that Petroleum Administrator for Defense the next to the fourth quarter of this year, has allocated to the oil industry about 29 per cent of the tonage of steel which the industry stated it would need if 43,000 wells were to be drilled in this year.

Q How much allocation of steel do you get?

A We get 29 per cent along with all the rest of them.

Q Along withothe rest of them.

A Yes, sir.

Q Let me ask this final question. In your opinion would one well on 80 acres in the Devonian Pool sufficiently drain the 80 acres?

A In my opinion, one well drilled on the 80 acres would be more than necessary, it would be adequate to bring about an efficient drainage,and to bring about an early definition of the limits of the pool, and bring about an early development of all the land that will be found to be productive.

Q Would you recommend to the Commission, Mr. Kaveler, that an 80 acre rule be put into effect in this state with respect to the deep pool, not only the Denton but all the other pools?

A I would make that recommendation to the Commission.

Q State why.

A As a matter of policy.

Q You have a 40 acre spacing rule here?

A Yes, sir.

Q There is no basis for just changing a flat 40 acre spacing

rule here that applies to both deep and shallow pools?

A No, but I didn't want to leave the impression that this Commission hasn't done an outstanding job. One of the outstanding facts in the oil industry is that in New Mexico they have always had a spacing plan which is conducive to the development of the resources of the state. Now, since 1948, when pools deeper than 5,000 feet have been discovered, I think the Commission might with equal wisdom adopt the spacing pattern with respect to deep pools that was as useful and as good as the 40 acre pattern they adopted in 1935. The Commission might well recall in 1935 when the 40 acre state-wide pattern was launched in New Mexico, it was a revolutionary thing and attracted the attention of the whole industry.

Q It is still a rather revolutionary thing as compared to some of the other states?

A Some of the more backward states.

Q That is what I am talking about, like Arkansas.

A Like Arkansas.

(Laughter.)

MR. FOSTER: You may cross examine.

CROSS EXAMINATION

MR. CAMPBELL:

Q I wonder if you would mind repeating your answer to the last question.

A Like Arkansas.

Q Dr. Kaveler, I believe you stated at the outset you were acquainted with the size of the Denton Pool in the Devonian

48mm

formation. I wonder if you would mind correcting your statement for the record with reference to the number of wells in that pool?

A Yes, I would. If you will tell me the correct number, I will adopt your statement.

Q Would it surprise you to know there are approximately eleven producing wells and 14 wells either being drilled or located?

A No, it wouldn't surprise me.

Q In other words, 25 wells rather than the 17 you suggested.

A I will take your word for it.

Q I would like to ask you just a few questions about your theory as to drainage, not that I would want to argue with you about it, but isn't it correct that there are even among the technical men in the industry those who still feel that more wells will bring more oil in ultimate recovery?

A Yes, there are some that have not been able tomaintain pace with the development wofh the true facts. A misunderstanding.

Q In other words, there is some division of opinion even among technical men as to that point?

A If you wish to call them technical men.

Q You have written several articles refuting their ideas on it, so I presume they are technical men. I believe you also stated in your theory of drainage, one well in a reservoir if given enough time would ultimately drain the reservoir?

A That is correct.

Q Then any other well would be an unnecessary well, wouldn't it?

49mm

A No. I don't know who your advisers are because it would be foolish to drill only one well to an oil field, and I will tell you why if you would like to know.

Q I would like to know if one well would drain a field if given enough time?

A That is true. But it is very foolish to drill only one well in an oil field and there are reasons for it.

Q The depletion time is a factor isn't it?

A Not necessarily. A number of wells should be drilled in every field. Which will establish the limits of production so that all parties that have production will have an opportunity to share in production. That number of wells which also should be drilled which will satisfy the reasonable market demand for oil because occasions might arise when the market demand for oil would be in excess of the productive potential of one well, so more wells are needed to be drilled to meet the existing market demand. A sufficient number of wells should be drilled in order that there may be a uniform distribution of wells over the field. So that a productive energy process can be utilized most efficiently, and to insure that every separate lens within the common source of supply holding oil will be penetrated by at least one well.

Q I am interested in the last two statements; first, that there should be a sufficient number of wells to establish some uniformity to the field. Is that what the statement is?

A The wells drilled should be drilled uniformly throughout the field.

50mm

Q Wouldn't you say the existence of 25 wells on top of a structure in essentially a 40 acre pattern, and to impose 80 acre spacing toward the edge of the formation would give you that uniformity?

A No. The Commission has this problem. A pool is discovered, and people immediately jump in and drill offsets. Each has his motives. Oftentimes the matter isn't brought before the commission, and the Commission doesn't act on its own motion to bring about an early determination what the spacing should be or development, and that is the thing that has occurred in this pool and in many others. With the occurrence in this instance and in many others, this Commission and others have always stopped it before it was too late and have corrected this situation before it led to waste. That is what the proposals here advocate.

Q You take the position that situation hasn't yet arrived here?

A We take the position the Commission can still save this great and valuable pool.

Q I believe you testified with reference to this exhibit or model that there is a migration of oil to low pressure areas, is that correct?

A Yes, sir.

Q And the low pressure area is caused, is it not, by the drilling of a well into the reservoir, releasing pressure from the reservoir at the well.

51mm

A The taking of oil or gas or water.

Q And it is true, isn't it, that the more wells which are drilled in a particular area of a field--we are talking about well location not distance between wells--the more wells drilled in a particular area in the field, the lower the pressure becomes as the pressure is reduced from the wells in that area?

A That may be true.

Q Assuming it is true, more wells will not ultimately produce more oil, isn't it also true irregularity of the distance between wells, the location of the wells in the reservoir, is of the utmost importance in the distribution of energy?

A The distance between the wells?

Q The distance between the wells.

A It isn't critical. The Denton Pool, if it were a water-drive pool, as I suspect it will be, all the wells could be drilled along the model on the top here and it would accomplish the most conservative operation you could imagine.

Q You might have some difficulty with the people on the flank.

A No. We would give them credit for their oil. We would let them share in production.

Q You are talking about unitizing?

A No, I am talking about conserving the wells.

Q You are asking in this application a fixed pattern 80 acre spacing in a particular 40 in each quarter section.

A That would be my recommendation tothe Commission.

Q That isn't based upon what you feel would be the best way to develop this field?

52mm

A No, the best way to develop this field would be to drill in a wide pattern and then establish the limits, and then unitize the field and then use pressure maintenance operations.

Q How much surface area is covered by the long axis of this structure?

A This model?

Q Yes.

A That model is of the West Cement oil field in Oklahoma and it is a mile and a half from this point to this point ((indicating on the model.)

Q Then there would be a considerable number of wells even in 80 acre spacing drilled into this pay section?

A Yes. There is 2,000 acres in this field.

Q And if you are correct that oil tends to migrate to low pressure areas, if there were a particular portion of this pay section more densely drilled than another section, wouldn't the oil tend to migrate to that area?

A That depends on the allowable.

Q In your application you recommend a double allowable.

A I have recommended an 80 acre well be given twice the allowable of the 40 acre.

Q You want a double allowable for all wells in the field?

A All wells on 80 acres. I think the Commission will take into consideration that all wells with less than the attributable acreage--

Q You are adopting 80 acres to all wells now drilled or drilling?

53mm

A If they have the acreage to attribute to them.

Q And you did at the time of the last hearing?

A I think the plan could be worked out, yes.

Q Wouldn't the clustering of wells in the top of that structure cause the oil under a water-drive situation to migrate to that low pressure area?

A Not necessarily.

Q Why?

A I can explain it to you, Mr. Campbell, but I can't understand it for you. The proposition is simply this. That wherever a well is, and it withdraws oil and gas, there is a low pressure spot which is created in respect to the rest of the reservoir. And the oil will move in the direction of that low pressure spot. Now, there might be some wells clustered here, as you chose to speak of it. Wherever those wells are, the low pressure condition will be created, and the water will move up and the gas will move down and the oil will move to those points.

Q Then if you develop this field on 40 acres, as it has been up to this time essentially, and start at this point with wider spacing out toward the edge of the field, toward the water contact, isn't it true that the wells away from the top of the formation aren't going to get their fair sham of the oil in the reservoir?

A They will get their fair share. That depends on the allowables set by the Commission.

Q You recommend that the wells on the top of the structure

be given an 80 acre allowable?

A If they are entitled to it.

Q Now, another question about this model. It assumes doesn't it, there is a uniform porosity and permeability in the structure?

A The model is built on the principle, but the assumption you infer, if an oil field exists there is a variation in the permeability and the porosity of the rock , and that is true. The fact that rock is heterogeneous and not homogeneous--

Q What does that mean?

A Heterogeneous means mixed up and non-uniform. The fact that it is doesn't vitiate the principle we have tried to present here. We have tried to present a basic principle which this model illustrates.

Q But the nice manner in which this model drains the oil could be effected certainly by a lack of uniformity or by an erratic structure with permeability variations, for instance, couldn't it?

A Well, for instance, out in nature. The Denton Pool could drain just as nicely. Nicely, just doesn't have much meaning in the technical sense.

Q We are trying to use layman's terms, Doctor.

A The oil will drain out of the Denton Pool just as nicely as it will drain out of here (referring to the model.)

Q Regardless of the permeability and the porosity?

A Yes, sir. That term permeability and porosity is just something technical people use to confuse lawyers.

55mm

Q Isn't it true in a water-drive field, the water will tend to go in the direction of the highest permeability?

A That depends on circumstances, and for your benefit, I will say yes.

Q Thank you. Now a few questions with reference to the steel situation. I presume you were acquainted with the operation of I believe the Petroleum Administrator for War in World War II?

A I was reasonably so.

Q Isn't it true at the time when the emergency was at its height and the Petroleum Administrator for War had actually issued an order -- which they haven't done yet in this respect -- that it was based on 40 acres?

A That is true. But I don't think that established a precedent in this crisis. Nor should any action in Washington be of any greater wisdom than what the State Commissions could exercise.

Q Do you confirm the statement that the purpose of the allocation of steel is to obtain the maximum recoverable reserves with the minimum of steel?

A Generally. I think you can also say that the steel available to the industry today is to be used to develop the petroleum resources of our country to the greatest extent. Whether that means reserves or intensifying drilling in one field or going out to try and find many fields, I leave that up to the Government.

MR. CAMPBELL: I think that is all.

MR. FOSTER: I have a bulletin put out by the Petroleum Administrator for Defense. It contains the four-point program

56mm

which they recommend on this steel matter. I would like to introduce that for the record. And just say it is an estimate of suggestion, they don't tell you what to do. They suggest that each state regulatory body extend the existing rules covering well spacing with a view toward reserves to permit drilling new wells farther apart where practicable and producing more from each well.

MR. SHEPARD: It will be admitted.

MR. FOSTER: I think that is all.

MR. SHEPARD: You have any further witnesses?

MR. FOSTER: No, that is all the witnesses we have.

MR. SHEPARD: Mr. Campbell, do you have any witnesses?

MR. CAMPBELL: I have a couple of Arkansas people.

MR. SCOTT: I would like to ask Mr. Kaveler a few questions, please.

MR. SHEPARD: Mr. Kaveler, we have someone to ask you a few questions.

CROSS EXAMINATION

By MR. SCOTT:

MR. SCOTT: My name is W. A. Scott of the Shell Oil Company.

Q Dr. Kaveler, we all appreciate the time and effort you took to explain this matter. It was very informative. But I would like to ask you one or two questions about it. First, wasn't this exhibit set up as a sand reservoir?

A No, sir. Not necessarily.

57mm

Q I thought you stated that--

A This exhibit was set up to explain a principle.

Q Yes.

A The principle that oil is produced only through the agency of compressed oil or compressed water associated with the oil in the rock. And you could put saw-dust in there and still control that principle.

Q Wasn't this model made on the assumption this reservoir was heterogeneous?

A No. It was made up on the proposition that it represented a common source of supply.

Q Well, when you manipulated your pressure there it appeared to me the way the model is made it was set up so you assumed even pressure interference, especially between the well up in the gas-cap and the oil well down structure.

A Of course, there is a pressure interference in all common sources of supply.

Q In other words, you assumed there was a good bit of pressure interference.

A I didn't assume, I simply demonstrated.

Q There is a good bit of communication between the two wells.

A Yes.

Q Is the Devonian reservoir composed of a dolomitic rock? Isn't it a limestone?

A Yes, there is a piece there.

58mm

Q Isn't it true in New Mexico and West Texas, in any limestone reservoir, you would find many variations in the limestone reservoirs?

A It is true all over the world.

Q Do you know conclusively that there is communication between the wells in the Denton-Devonian reservoir?

A Yes.

Q Do you know that conclusively beyond any doubt?

A Yes, in what we now recognize as the Denton-Devonian common source of supply.

Q I believe there has been some conflicting testimony as to that.

A That doesn't reflect upon my opinion.

Q Do you know what type of water-drive is now in effect in the Devonian reservoir?

A No.

Q Didn't your test,or exhibit, show more of what we call a solution gas drive type of reservoir?

A Yes, and the statements I made could have been made equally in respect to the function of water.

Q Do you think that the solution gas drive type of energy is in effect in the Denton-Devonian reservoir?

A I don't know.

Q Then, in effect this model isn't representative of the Denton-Devonian reservoir.

A It is representative of the Devonian and all other oil fields.

59mm

Q But the solution gas drive type of reservoir which it exhibits so well here, we don't know it is present in the Denton-Devonian reservoir.

A Mr. Commissioners, what Mr. Scott is getting at is, this model, if this model didn't have the gas-cap and had been just confined to an oil pay, then the only gas in the reservoir would be in the oil. There wouldn't be any gas-cap there. Then the production of oil would be due to the expansion of the gas like the gas comes out of a bottle of beer or Coco-Cola. Comes out of solution. Now, I don't know. We will have to wait awhile in the Devonian to get some history on the field to determine whether or not there is a gas-cap. To determine whether or not there is an extensive water-drive. So, the question you ask, Mr. Scott, is one that only the facts to be established in the future can establish.

Q Therefore, we don't know that the particular type of reservoir energy which you so ably showed us here is in fact-- I believe you did make the statement you thought water-drive might be in effect in the Devonian field but you have no proof.

A That is correct.

MR. SCOTT: That is all. Thank you.

MR. SHEPARD: Anyone else? If not we will hear from Mr. Campbell.

(Witness excused.)

60mm

VERNON TURNER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q Will you state your name?

A Vernon Turner.

Q By whom are you employed?

A By the McAlester Fuel Company.

Q You testified before this Commission at the original hearing in Case No. 269, did you not?

A That is true, Mr. Campbell.

Q I would like to get some information about this Denton field. Since the date of the last hearing has there been any additional well completions in the Devonian?

A Yes, sir, I believe there have been some five additional wells completed since the date of the last hearing.

Q Will you state briefly what wells have been completed?

A Atlantic Federal Jones No. 1, located in the SW SW OF Section 35; Atlantic State T-1, located in the SE SW of Section 2; McAlester-McClure B-1, located in the NW SE of Section 14; Ohio Denton No. 4 "D", located in the NE SW of Section 11; and Skelly State "F" No. 1, located in the NE NW of Section 2.

Q What then is the number of wells now completed in this field in the Devonian?

A I believe there are eleven.

Q Referring you now to the exhibit which is on the wall, on

61mm

left there, which has been marked Exhibit M-6, will you state what that is?

A That is an up-to-date north-south micro-log cross section showing the drill stem test results obtained on various wells in the field.

Q The wells completed since the last hearing are shown on the micro-log?

A Two of the wells.

Q Which are those?

A Atlantic State T-1 and McAlester McClure B-1.

Q Was one of the wells completed since the last hearing a well of the McAlester Fuel Company?

A Yes, sir.

Q Which well is that?

A The McAlester McClure B-1.

Q Where is it situated?

A On the edge of the south end of the field as presently developed.

Q Referring now to the exhibit in the center on the wall, which has been marked Exhibit M-7. Will you state what that is?

A That is a map of the Denton field area showing in red the proposed spacing pattern by Phillips Petroleum Company with the exceptions that will be necessary to that proposed spacing arrangement shown in blue. In other words, the blue shows the present location of drilling wells which are not in the southeast or northwest 40 of the quarter section.

62mm

Q Will you point out to the Commission on that exhibit the locations of wells that have been started or commenced since the last hearing?

A Gulf's Chamberlain D-3, which is a location of, I believe, now drilling.

Q That is a direct south offset to the Gulf Chamberlain No. 2, isn't it?

A It isn't a direct offset in that it isn't in the center of the 40.

Q But it is in the 40 immediately to the south of the Gulf Chamberlain No. 2. And it is also a 40 acre offset to a well to the east, isn't it?

A That is true. We have the location of the McClure B-1, which has been approved but actual drilling operations have not been commenced.

Q What other well has been commenced?

A Gulf State G-2 is located in the southwest southeast of Section 2.

Q That well immediately offsets to the south, the Gulf G-1-D well, and that well is now a drilling well.

A Yes, sir. This morning it was drilling 4,190 feet.

Q Now, what other well--is there an Ohio well in Section 13?

A Yes, sir. Ohio Denton No. 5, which is the west offset to the discovery well of the field.

Q 40 acre offset.

A This morning it was drilling below 380 feet.

63mm

Q That is also a 40 acre offset to the Ohio Denton No. 4 to the north?

A That is true.

Q And those wells have all been commenced since the original hearing?

A That is true.

Q And are there additional location to the north that have been approved but their wells have not as yet been commenced?

A Well, there is an approved location in the SE NE of Section 2 which is the McAlester State D-1.

Q And I believe there is a location in the SE of the NE of Section 14?

A That is true. McClure D-1.

Q And both of those are 40 acre offsetting well locations are they not?

A That is correct.

Q In other words, five wells, three of which have been commenced and two of which locations have been obtained for since the last hearing, all of them are 40 acre north, south or east offsets?

A That is correct. The total of the completed Denton wells, drilling wells, and location, twenty-five of those can be construed as direct offsets.

Q And not diagonals as the proposed pattern would suggest. Now, referring to Exhibit M-6, and to the McClure B-1, which has been completed since the last hearing, and is the well fartherest

4mm

south in the field, will you state what that micro-log shows as to permeability in that well?

A It shows a rather poor section in the Devonian pay, and the permeability is indicated to be rather erratic.

Q Was it necessary to acidize that well?

A Yes, sir. Following preparation, the well flowed only by head, wasn't capable of making its assigned allowable.

Q In your opinion, based on your present information and the production you have in that well so far, would it make a single allowable with a deep well adaptation?

A I question seriously whether it will make an assigned allowable from the present zone.

Q Now, what was the dip in structure from the well immediately north of that McClure B-1 to the McClure A-1 on top of the Devonian?

A From the McClure B-1 to the McClure A-1 there is a direct offset at 1330 feet and your dip is 636 feet.

Q In other words, 636 in a 1330 foot step up?

A That is correct.

Q If the dip continues at the same rate, what would be the effect if you step over the 40 and drill an 80 acre location?

A I question whether you would obtain a producing well at all. Probably be a dry hole.

Q And it still probably would have been necessary to go back and drill the location to the north?

A As a matter of self-protection.

65mm

Q Now, the wells you have previously had in the field, is there one well which you are now deepening?

A Yes, the McClure C-1, located in the NE NE of Section 14.

Q That is now producing from the Devonian, it was producing from the Devonian?

A No, sir. We drilled to the Devonian and ran a number of drill stem tests. We plan to take the well to the Ellenberger to 14,000 feet.

Q In other words, you are going to explore the possibilities of another producing zone?

A This morning it was drilling below 13,826 feet.

Q Considering the development in this field todate and assuming the application for fixed pattern, 80 acre spacing in the NE SW corner of each quarter section is approved, together with the double allowable which has been recommended with the deep well adaptation for the wells now producing in this field, what in your opinion will be the effect on this reservoir?

A Well, in spite of Dr. Kaveler's testimony, I would strongly feel that the permeability and pressure would be injurious to the reservoir.

Q In your opinion, would that cause waste of oil?

A It would cause underground waste.

Q Why would that be true?

A Well, you have high rates of flow in certain areas of the field which tend to create low pressure areas. A number of wells will not be capable of producing presently the double allowable in 40 acres without releasing so much gas and dissipating

66mm

the reservoir energy.

Q Do you know how long it takes a well on a 40 acre location with the present allowable and deep well adaptation, to pay out in that field?

A Approximately 15 months.

Q Even though it costs $270,000?

A That is correct.

Q In your opinion, is it necessary to have 40 acre spacing in that field to properly utilize the reservoir energy?

A As the field has been presently developed on 40 acre spacing, in order to allocate 80 acre units to each well already drilled, it will be necessary to include diagonal offsetting acres. And in my opinion, considerable dry acreage would be included in the field limits. Producing at double allowable would certainly dissipate the reservoir energy excessively.

Q At the original hearing I believe you testified there were areas of low permeability in this reservoir that would not be drained by 80 acre spacing.

A I believe that is true. I think we have adequate evidence, at least in my opinion.

Q You also testified 40 acre spacing would result in more efficient drainage of the field? Is that still your opinion?

A Yes.

Q I believe you also testified the producing of these wells in a water drive field at a high rate could cause channeling, and by-passing of oil. Is that correct?

A I think that could be true. Or would probably travel in

67mm the zones of high permeability, by-passing oil in the more dense streaks.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q Now, Mr. Turner, I want to ask you a question or two about this clustering up there. What is the point you are making about the clustering of these wells?

A Well, you have, I believe, those twelve either completed, drilling or locations in the north end of the field at the present time.

Q Yes.

A You have approximately the same number on the south end of the field. If you allocate acreage on which no well is now drilled, certainly this area in the middle here will not have a well drilled on it.

Q Well, all you are saying there is the wider the spacing the fewer wells you drill. We all agree with that. You were talking about a clustering of wells up there being of some injury or something, bringing about some injury to the field or reservoir, weren't you?

A That is true. I have two wells in point here, Mr. Foster. The evidence was presented at the last hearing on the draw down of those two wells. If you would like to go back into this again--

Q No, I am trying to find out about these so-called clusterings of these wells resulting in some injury to the reservoir. How

68mm

does that occur?

A All right. Under your proposal you plan to double the take from each of these wells that is now completed.

Q Let me correct you about that. We don't plan to double the take at all. We suggested to the Commission it give twice as much allowable to an 80 acre well as a 40 acre well. Whatever they fix it at, that would be it. That would have to depend on different considerations from the spacing pattern.

A But that was your recommendation.

Q Yes, sir. But what I am trying to find out about is how a clustering of these wells is injuring the reservoir?

A Well, the wells that are now completed, that is where you are going to take the oil out of the reservoir, is that true?

Q What is that?

A The wells that are now completed. That is where you are going to take the oil out of the reservoir?

Q Yes, that is true with respect to any well.

A All right. We think we have sufficient evidence to justify the opinion that a number of zones in the Devonian pay consists essentially of a closed system due to low permeability.

Q You are saying this is not all one common source of supply. That is what that language means, isn't it?

A I am saying, due to the variation in permeability and the erratic nature of the formation, I don't believe that one well to 80 acres will adequately develop it.

Q All right. Now just for the purpose of argument, I am going to agree with you but I want to get back to how the clustering of wells brings about any injury to the reservoir.

A All right. I believe certain zones in the reservoir are connected throughout the reservoir. Certain zones have high permeability. That is where your oil production is going to come from. If you have a zone that is essentially a closed system in one part of your field, and assuming you have a water-drive, and it is going to replace a barrel of oil which you take out of the reservoir, I believe the reservoir will encroach along the zones of high permeability and by-pass oil in the lower permeable veins.

Q Will that be caused by the so-called clustering of these wells?

A That would tend to aggravate that condition, yes, sir.

Q That would happen no matter where you drilled a well.

A If you have twice as many wells drilled into a reservoir, you certainly have less chance of leaving oil in the ground due to not developing a low permeability zone.

Q Well, that still don't satisfy my curiosity about the clustering of these wells. What do you mean by clustering of wells?

A Well, wells that have been drilled and developed on direct 40 acre offsetting tracts.

Q What?

A Wells that have been drilled and developed on direct 40 acre offsets.

Q You would have the same clustering on 80 acres wouldn't you?

70mm

A Well,--

Q You would have a clustering under that definition of it/under 80 acre spacing wouldn't you?

A Not withthe exceptions we now have.

Q What I am driving at, Mr. Turner, is this. Under any spacing pattern, you have a clustering of wells.

A Well, if you feel--

Q Whether 10 acres or 20 or 40 or 80, you still have a clustering of wells, don't you?

A If this field had been developed on your longer pattern, you still would have some clustering of wells. You might have to get off the structure in order to do it.

Q Why not develop it on 80 acre spacing until we find out more about what the reservoir conditions are?

A Judge Foster, it has already been developed on 40 acres.

Q Not all of it.

A Twenty-five wells or direct offsets.

Q I understand that. But what is the extent of this pool?

A I don't know.

Q Hasn't it been estimated about 42 wells can be drilled in the pool?

A That may be true. I am not familiar with it. The pool may be defined on the south as of right now.

Q Well, do you think that the pool is all one common source of supply?

A I think there are zones in that reservoir that are interconnected throughout the reservoir. I think there are other zones

71mm

of low permeability that maybe connect two or three wells and maybe close up.

Q Under that statement do you think it is one common source of supply?

A Well, under the ordinary conception of an oil and gas reservoir, I say it is, yes. That is a condition you find in any reservoir.

Q You find tight spots in any oil field?

A Yes, sir. I don't believe to the same degree we have here, however.

Q What does the spacing of wells have to do with the rate of production?

A Well, I have been going under assumption that your recommendation for 80 acre spacing was accompanied by the request for double the present allowable for deep well adaptation.

Q I understand that is our application. But what does spacing have to do with the rate of production?

A Well, sir, our McClure No. 1, which was the discovery well, will not produce much in excess of the present allowable. Now, as far as spacing itself, that is a separate problem.

Q That's right. In other words, spacing doesn't have any relation to the rate of production.

A No, sir.

Q All right. Now, you would determine what the spacing pattern in this field is to be on an entirely different basis from what you would determine the rate of production on any individual well should be, wouldn't you?

12mm

A Yes, sir. But my contention is it is already developed on 40 acre spacing.

Q That doesn't make any difference. What I am talking about is whatever spacing pattern you have in the field, whether 40 or 80, the considerations for that determination are entirely different from the factors that would go into the rate of production for the wells.

A That is true.

Q And for that reason there would be no relationship between the spacing pattern and the rate of production.

A Except your attempt to tie the two together in your original application.

Q I understand that. But the fact that we recommend a double allowable for wells on 80 acres doesn't condemn 80 acre spacing.

A No, sir.

Q Not at all?

A That is a separate problem entirely.

Q That is a separate problem entirely, and something the Commission can control whichever way it wants to control, can't it?

A That' s right.

Q Whatever the rate of production ought to be can't determine what the spacing pattern should be? Isn't that correct?

A That is correct

Q All right. Now, you say there has got to be a lot of exceptions allowed in this field if we adopt 80 acre spacing?

A Examples or exceptions.

Q Examples or exceptions to the way we propose to develop the field.

73mm

A Approximately half.

Q Let's say half of all wells drilled inthe field will have to be exceptions because of the present way the field has been developed. Would you say that would condemn the adoption of 80 acre spacing if otherwise it is shown?

A It would certainly bring into focus a number of problems, several of which I am not in a position--

Q I understand that, but does that condemn 80 acre spacing?

A No. But the effect of these other problems entering into consideration.

Q But there would be no relationship between the present pattern of development and what the proper pattern should be.

A Well, there his nothing that has happened since the last hearing that has changed my opinion on it, and what the spacing pattern should be.

Q I am not talking about that at all, Mr. Turner. I am sure of that. Your statement is correct. But what I am saying is, the fact that, you have developed the field, as you developed it, on 40 acre spacing doesn't within itself condemn the adopting of 80 acre spacing?

A No, sir. Except for these other factors--

Q Oh, I know there are other problems created.

A Yes, sir, and very important, too.

Q I understand that, but that doesn't condemn 80 acre spacing.

A I am sure it doesn't in your opinion.

Q I don't have any opinion about this. I am trying to get yours.

A I am trying to give it to you.

74mm

Q It doesn't condemn 80 acre spacing does it?

A That depends on the way you look at it.

Q Well, all right. Let me ask you this. If you adopt 80 acre spacing for this field and diffit, as a matter of fact, one well won't sufficiently and adequately drain 80 acres, you can always go back and drill under 40, can't you?

A That would be true.

Q That is true, isn't it?

A Yes.

Q But if you develop this pool and continue to develop it on 40 acre spacing and then it should be determined that you should have been on 80 acre spacing, you can never drill 80 acre, can you?

A That would follow.

Q That is true isn't it?

A That would follow, yes.

Q All right. Now, I am not interested just in this Denton Pool. I am talking about a matter of principle in the application of it to spacing patterns an deep production. In other words, what you have got in this pool now is the result of the fact that probably you didn't have wider spacing provisions, is that correct?

A That is a problem for the Commission. I am not on the Commission.

Q No, that isn't a problem for the Commission in answering my question. But the problem we have got now in this field with the way it has been developed is due to the fact that you had only 40 acre spacing before.

A I assume that is true.

75mm

Q In other words, if you had started out developing this field on 80 acre spacing you wouldn't have the problems that you have mentioned.

A I think, roughly speaking, a number of problems would have arisen, yes, sir.

Q Not the ones you are talking about. Maybe some other problems but you wouldn't have these.

A The question would still arise whether one well would adequately drain 80 acres.

Q I agree with you. But if you had started out originally in this field with 80 acre spacing, then you would not have all this problem of making these exceptions for these 13 or 14 wells you have there?

A No.

Q It would have cured that. And it would have also cured all th other problems that result from those wells being drilled on 40 acres.

A What do you mean by all the other problems?

Q You mentioned them.

A There is a multitude of problems involved in this thing.

Q I understand that, but if you had properly started in this field with 80 acre spacing, then you would not have the problems that grow out of thefact that you have wells located in 40 acre patterns and therefore have to make exceptionsto them .

A Yes, sir, but--

Q That is true, isn't it?

76mm

A That is true. But we are not dealing in probabilities. We are dealing in realities and facts.

Q I know that. But it is a reality to look a little forward and not let the same thing occur again, if as a matter of fact we ought to go to 80 acre spacing. That is sound, isn't it?

A Yes, sir, I believe that is sound.

Q All right. With respect to applying 80 acres in this particular field, isn't the situation pretty much like this: It is a question whether you want to cut off both legs or just cut off one leg?

A I don't follow you there, I want to keep both of them.

Q Of course, you want to keep both legs. But suppose the Commission should decide they ought to adopt 80 acre spacing, in this field? Now, that brings about a large number of exceptions, that you spoke of. That is what I call cutting off one leg, is these exceptions; but if you want to adopt 80 acre spacing in this field then I'd adopt it and cut off one leg rather than amputate two or to cut off both by staying on 40.

A On this particular field I am not admitting--

Q I am not asking you to admit that. All I am doing is making an assumption here. We have a controversy between the parties as to whether we ought to adopt it or not. If you make the assumption you ought to adopt an 80 acre plan you would just be cutting off one leg.

A I am not making that assumption. You are making the assumption.

Q I am making the assumption. We could be right about this.

17mm

A You could be, but in our opinion--

Q That is what I am talking about. That is for the Commission to decide. But whether right about it or not, take this point, go ahead and adopt 80 acre spacing on a temporary pattern, how can you get hurt on that?

A The field is already developed on a 40 acre pattern.

Q I understand that. But how does it hurt you?

A Does Phillips want to unitise a productive 40 acre tract with a dry 40 acre tract?

Q Are you asking me that question?

A Well, I just made the statement. I don't believe you would.

Q It is obvious no one would want to do that, Mr. Turner.

A Geological testimony that will be presented later will adequately show the steeptdips--

Q What adjacent 40 acre tracts are there there?

A Sir?

Q What dry tracts, 40 acre tracts, are there in this field?

A Going strictly on a dip basis, the 40 acre tract south of our McClure No. 1 is apt to be dry.

Q Is that the only basis?

A On what other basis would you go?

Q I don't know. I am asking you.

A There is an assumption.

Q Have you drilled any dry wells in that field?

A Yes, sir.

Q Where is it?

A The Walter A-1.

Q What offsets to the present wells are dry 40 acre offsets?

A

78mm

A Well, I can't call them to your attention at the present time.

Q You don't know, do you?

A This Atlantic D-1 may well be a marginal well.

Q What do you mean marginal well?

A It may be close to the oil-water contact.

Q That wouldn't be dry.

A For all practical purposes it would.

Q Give me a definition of a marginal well.

A One that penetrated a very limited section of the pay which would not pay for the amount of pipe that would be required to complete it.

Q Is that your definition of a marginal well?

A In general terms yes.

Q And you had that definition in mind in answering my question there about that well being--

A No, sir. That is just off-the-cuff, so to speak.

Q Mr. Turner, do you subscribe to the public policy of this state as announced by the legislature that an operator in an oil field shouldn't be required to drill more wells than is necessary an efficiently and economically drain the pool?

A Mr. Foster, can you assure me that by developing this field or continuing to develop it on a 40 acre basis that enough additional oil will not be recovered to pay for those 40 acre locations, would be less than what would be produced on 80 acre spacing?

79mm

Q Mr. Turner, if we could answer those questions we wouldn't have this controversy.

A That is correct.

Q I am asking you if you subscribe to the public policy of this state as announced by the legislature that an operator of an oil field shouldn't be required to drill more wells than is necessary to efficiently and economically drain the field?

A Naturally I would, yes, sir.

Q You subscribe to that?

A Yes, sir. But I think the Commission is very much interested in obtaining maximum oil recovery from the reservoirs of this state.

Q You subscribe to this declaration of public policy found in the statutes of this state that the drilling of unnecessary wells creates fire and other hazards in an oil field?

A Judge Foster, that is a point which I consider of minor importance.

Q Well, whatever weight you may give to it, do you subscribe to that policy?

A Well, if the drilling of one well to each 40 acre tract instead of drilling one well to every 80 acre tract would aggravate that situation, I would subscribe to it then.

Q It says here, "An operator shall not be required directly or indirectly to drill more wells than necessary to economically and efficiently drain the pool." Do you subscribe to that public policy of this state?

A You say unnecessary wells.

80mm

I can't--we get back to the same point again. I don't know that one well to a 40 acre tract would constitute--

Q I don't either. But do you subscribe to this declaration of public policy?

A I have already stated I did.

Q Do you subscribe to the public policy of this state that the drilling of unnecessary wells "creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator"?

A That would certainly be true.

Q Do you also subscribe to the public policy of this state as declared in the Statute by the legislature that the increased cost to the operator also increases the cost of the product to the ultimate consumer?

A If the drilling of one well to each 40 acre tract constitutes that, yes, sir.

Q All right. Would you say that as a matter of public policy in this state you ought to drill only the necessary wells that have to be drilled in the field?

A I would subscribe to that, yes, sir.

Q Now, let me ask this question. If you can adopt a policy of this--strike that. This field here could have been developed on 80 acres, could it not, if you had started out in the inception with the discovery well?

A Well, then, the field could have been developed on 160 acre spacing or any other.

81mm

Q It could have been developed on 80, could it not?

A Yes, it could.

Q Tell me how if you had started out originally in this field to develop on 80 acre spacing, how it would have resulted in any injury to anybody in the field?

A Well, the fact remains that the field wasn't developed on 80 acre spacing--

Q I understand that, Mr. Turner. And my question implied that I understand that. But tell me how, if you started out with the original discovery well in this field on 80 acre spacing that anybody would have been injured in this field?

A Well, why not drill just one well, and get everybody to agree to allocate such and such a percentage of this reservoir to every one around there and work it out in that manner.

MR. FOSTER: Yes, sir. I believe that is all.

REDIRECT EXAMINATION

By MR. CAMPBELL:

Q Mr. Turner, Judge Foster made reference to the problems we are faced with in reference to this reservoir. Until this application for 80 acres spacing was filed, you didn't have problems in this field, did you?

A None that I know of.

Q That is not your problem?

A No.

Q You are satisfied with the way this field has been developed on 40 acre spacing?

A Yes, sir.

82mm

Q Your company is willing to go ahead and develop on 40 acre spacing?

A Yes, sir.

MR. CAMPBELL: That is all.

MR. SHEPARD: Any further questions. Does anyone have a statement to make. Anyone else have a statement to make? You may be excused.

(Witness excused.)

KEM MERREN

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name please.

A Kem Merren.

Q By whom are you employed?

A McAlester Fuel Company.

Q Did you testify at the original hearing in Case No. 269?

A I did.

Q I refer you to the exhibit on the wall marked M-8 and ask you to state what that is.

A That is our interpretation of the structure, on top of the Devonian. The contour interval is 200 feet.

Q Does that structure map bring up-to-date, based on information obtained since the last hearing, your knowledge of the structure?

A Yes, sir, it does.

83mm

Q What additional control do you have now?

A On the east and the south.

Q Those are the wells--

A The Atlantic Dickenson A-2 and the McAlester McClure B-1.

Q State briefly what conclusions you draw from that structure map.

A Well the very steep dip on the south and the southeast. At the last hearing we had assumed the rate of dip to the southeast here to 1900 feet to the mile. Using an estimated top in this Atlantic Dickenson A-1 because at that time we had not reached the Devonian. We now have that top and it is lower than we estimated, and gives the rate of dip to the southeast to 2700 feet to the mile.

Q What in your opinion, would be the effect of 80 acre operational units, assuming in the situation we have here with the exception there would have to be some east-west or north-south operational units, what would be the effect on defining the exterior limits of the field?

A Take in 80 acre spacing and you would be very likely to have one 40 productive and the other dry.

Q As a geologist would you recommend to your company skipping over a 40 acre tract when the flanks dip so sharply?

A I certainly wouldn't.

Q At the original hearing you testified the information available indicated to you there was a wide variation in the permeability in the reservoir.

84mm

A I still have that opinion and it is further borne out by our McClure B-1 the southern-most well, which at this time will not make the present allowable.

Q Is it still your opinion to properly develop this field to drill wells on 40 acre tracts?

A That is my opinion.

Q Is it your opinion that the drilling of wells on 80 acres tracts might cause waste in this field?

A It is.

MR. CAMPBELL: That is all.

CROSS EXAMINATION

By MR. FOSTER:

Q You say if you had 80 acre spacing you might drill out on an 80 acre tract and find one 40 dry and the other productive?

A That's right.

Q How do you know both wouldn't be dry?

A In that case I was referring--what Atlantic Dickenson A-2, suppose we had stepped out another 40 to the east. It would certainly be a dry hole because in all probability it is going to be a marginal well.

Q The Commission could handle that situation by just reducing the allowable if you had part of it dry.

A That's right. I feel certain at that depth, if you had half the present allowable, 295 barrels--

Q But after all the Commission decides what they are entitled to.

35mm

A Yes, sir.

MR. FOSTER: That's all.

BY MR. WHITE:

Q If a certain number of the present wells cannot produce their regular allowables, and 80 acre spacing is adopted and double allowable given them, would that be more likely to lead to coning of the wells than on 40 acre spacing at half the allowable?

A Yes, and I would also like to add in answer to the question, I think on the flanks of the field, both on the south and east sides, where it is so steep, that when the wells are drilled that fairly close to the water, we are going to have that same low permeability. And in all probability they will not make the present allowable.

MR. WHITE: That is all.

MR. SHEPARD: Any further questions? If not, you will be excused.

(Witness excused.)

MR. SHEPARD: Any more witnesses, Mr. Campbell?

MR. CAMPBELL: No. Do you wish to make another statement, Judge?

MR. FOSTER: No, sir.

MR. CAMPBELL: I want to say just a few words. It seems to me there has been essentially no information introduced by the applicant in this case at this re-hearing with reference to this particular field that wasn't introduced at the last hearing. The only evidence as to additional data on this field has come from the McAlester Fuel Company, who believe this field should continue

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to be developed on 40 acre spacing. And these witness have testified in their opinion the additional information substantiates our previous views. Since the Commission apparently felt in the first instance Phillips Company had not justified the acception to the 40 acre pattern, which has been started, and introduced no additional evidence today, it occurs to us the Commission ought to continue in effect the order which it issued at the end of the last hearing.

MR. SHEPARD: Any other statements?

MR. HUGHSTON: Like Mr. Foster, we think these hearings should be more or less conferences, and we have a few comments to make. Both concerning 80 acre spacing generally and concerning the application to this particular field.

As a matter of basic principle, Shell is not opposed to 80 acre spacing in those cases in which the evidence as to formation conditions clearly shows that one well will adequately drain 80 acres and where it is clearly shown that an 80 acre pattern can be carried out doing equity to all lessees and mineral owners. It has been suggested here that the Commission might limit 80 acre spacing to deep fields hereafter discovered by prevoiding in its general spacing rule that in such fields early development should take place on such a spacing pattern. Such an application, entirely prospective in nature, appeals to your speaker as the most sensible approach to such a matter and while he is not authorized to speak on behalf of the Shell Oil Company on such an application which was not within the scope of this call and was therefore not discussed with him, he feels that Shell Oil Company would probably support the same.

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What we are directly concerned with today is the application of 80 acre spacing to the Denton field. Let us therefore consider whether the evidence shows that in this particular field one well will adequately drain 80 acres and that an 80 acre pattern can be carried out so as to do equity to all lessees and mineral owners.

As to formation condition, we have acreage in this field, but as yet we have no producing wells. We thus have not accumulated any evidence of our own on which to base an opinion as to the adequacy, from a drainage standpoint, of 80 acre spacing in Denton. The evidence on this point has been conflicting, and it is, of course, for the Commission to decide such conflich.

We do direct attention to the fact that the evidence has shown that 40 acre wells show a high profitability so that 80 acre spacing is not required from this standpoint of economics in this particular field.

Since for years New Mexico has followed a 40 acre pattern as a standard, and since this field has been developed to date on such a pattern, it is our belief that no order should issue varying that pattern unless the evidence clearly shows that the purposes of conservation of oil and gas will thereby be promoted and protected, and unless it is also clearly shown that no inequity will result therefrom to lessees and mineral owners as regards their correlative rights. We feel that it has not been shown that the plan here proposed will not violate our correlative rights for the following reasons.

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It was first proposed that 80 acre proration units be established by including in one such unit two diagonal 40 acre tracts. We oppose such radical departure from conservation practices both because such plan has no basis under sound conservation and because such plan would violate our correlative rights as lessees, the correlative rights of other lessees similarly situated, and the correlative rights of mineral owners under tracts affected.

(a) Such Diagonal units are definitely contrary to the Commission's well founded policy, as laid down in its rules, that proration units shall be compact and as nearly as possible in the form of a square. This long established policy is but a sound statement of the conservation principle that the acreage attributable to a well should, as nearly as possible, represent the drainage area of that well.

(b) Under the diagonal unit plan, Section 2 eventually would have one more well than it would have if developed on rectangular 80 acre pattern and the formation of regular units in Sections 1 and 3 if and when these sections are developed would be prevented.

(C) In some cases the suggested diagonal units are not covered by the same basic leases and the creation of the units would require royalty owner joinder. In our own case, our 40 acres in the NW/4 SW/4 of Section 2 would be joined under the diagonal proposal with our 40 acres diagonally northwest in the SE/4 NE/4 of Section 3. Our 40 acres in Section 2 is State Land, whereas our 40 acres in Section 3 is privately owned

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To create such a unit, it would be necessary for both the State and these private owners to join therein. At the present time structural control in the field is not established. The State owned land in Section 2 appears to be favorably situated, but little is as yet known as to the unitization under the diagonal plan could be effected, or that, if effected, the rights of all parties would be protected.

(d) To our knowledge such irregular, diagonal shaped units have no precedent in New Mexico, and justly so. Certainly the rights and investments of the various leasholders, royalty owners and mineral owners should not be jeopardized and discriminated against for the sake of a proration unit scheme which will not be equally just to every interested party, and which provides for units not representing the drainage area of the wells thereon.

If 80 acre spacing is adopted in this field the alternate to composing proration units of diagonal 40 acre tracts is to compose the units of two adjoining 40 acre tracts out of the same section so that the units will be rectangular in shape. If 80 acre spacing is adopted in this field, this is the proration unit plan that we favor. However, it is obvious that the fourteen (14) wells already drilled and the eleven (11) other wells already located have largely been located on a 40 acre spacing and that as to many of such wells, it is now impossible to form 80 acre rectangular units and that therefore many 40 acre exceptions would have to be obtained. We therefore think that 80 acre spacing in this field is now

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impracticable. An instance of a 40 acre tract as to which it would be difficult if not impossible to form a rectangular 80 acre unit out of the same section is Shell's NW of the SW OF Section 2.

Reference to the plat of Section 2 shows that Skelly's SW of th e NW of Section 2 is the only 40 acre tract in Section 2 with which our 40 acre tract in that section could be joined to form a rectangular 80 acre unit. This is by reason of the drilling that has already taken place in the Section.

Unless Skelly would agree to such unit, we would be unable to put our 40 acre in that section in an 80 acre unit.

Skelly has been approached as to its willingness to form such unit. Skelly has sufficient acreage so located that it could drill and own its own wells on its own acreage without joining in a unit with our 40. To join with us would also give Skelly an extra 40 which would require the creation of another jointly owned unit with another operator. Skelly has stated that it is not interested in joining in the formation of a unit with our 40.

We are thus in the position of owning a forty acre lease on State land and of being unable to obtain another operator with other lands in Section 2 willing to unitize with it. This lease was acquired under a Statewide rule permitting a well on each 40 acre tract. If 80 acres is now required for a well, we will be denied the right to drill on our 40 acre tract. Both

Shell as Lessee and this State of New Mexico as Lessor will lose the benefits for which the lease was granted, and a drilling right of long standing will be denied.

Even if a well is permitted on a 40 acre tract, a similar inequity will result if the allowable of that well, by reason of the field being on an 80 acre basis, is cut below what it would have been on the regular standard 40 acre pattern. Forty acres has long been the basis of unit allowable and is the basis upon which investments have been made. To reduce such allowable at this late date would be most inequitable and violative of correlative rights.

We might add that we are not the only operator in the field confronted with this problem of single 40 acre tract in a section.

We also think that part of the Phillips proposal which would restrict future well locations to the NW/4 and the SE/4 of each quarter section in the field would in this particular field prove inequitable; that

(a) Inasmuch as the structure is not defined and the limits of production are not definitely established, such a development pattern would probably lead to gross inequities between presently completed wells, and those wells which eventually will be completed; that

(b) It is evident, beyond any doubt, that the development to date in Sections 2 and 14 has followed a pattern of 40 acre spacing. In addition, and as is prudent, the majority of these

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wells were located so as to gain as much pay section as possible; and that

(c) If exceptions are to be granted to presently completed or drilling wells, many of which were located to gain structural position, then it would seem that similar exceptions should be given to any future wells so that they too might be located at the most favorable position on the structure.

(d) It is difficult to conceive of the Commission making mandatory any set pattern of well locations in this field which would cause some operators to drill the less desirable of two locations on an 80 acre unit. Such would be the case if the proposed spacing pattern were to be applied to acreage on the flanks of the structure.

For the reasons above stated, it is our position that the 80 acre proration units with specified locations, as proposed by Phillips, is inequitable, even if it be assumed (and we make no such assumption) that the evidence clearly shows that one well will adequately drain 80 acres.

We therefore respectfully submit:

1. That proration units composed of diagonal 40 acre tracts are violative of sound conservation practices and would result in gross inequities.

2. That the Phillips proposal as to designation of drill sites would violate the rights of operators as to future drilling.

3. That if 80 acre units are adopted, they should be rectangular in shape and confined to a particular section. If

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such plan is adopted, the owner of a 40 acre tract, upon showing that he cannot reasonably participate in the creation of an 80 acre unit, should be permitted to drill on his 40 acre tract, and the allowable of such well should not be reduced below what it would have been had a 40 acre spacing pattern prevailed.

What has been said so far is of particular application to the Denton Devonian field. As to the Denton Wolfcamp field our position is as stated at the first hearing on this matter. However, we wish to emphasize that if 80 acre spacing is adopted in the field, the owner of a 40 acre tract upon showing that he cannot reasonable participate in the creation of an 80 acre rectangular unit composed of lands within the same section, should be permitted to drill on his 40 acre tract, and the allowable of the well so drilled should not be reduced below what it would have been had a 40 acre spacing pattern prevailed.

MR. SHEPARD: Any other statements?

MR. BUCKLES: I represent the Sinclair Oil Company. The position of Sinclair in this 80 acre spacing has been heretofore announced to this Commission on other occasions. We are entirely in favor of 80 acre spacing where it can be done and the correlative rights of all parties adequately protected. In this present pool we do not believe correlative rights can be adequately protected should 80 acre spacing be ultimately granted by limiting the wells to the NW and SE of each quarter section. We think the operator should have the privilege of picking the better location on the 80 according to the structure, and thereby give

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both the royalty owner and the operator the benefit of protection of correlative rights, particularly in view of the fact that this pool being developed on a 40 acre spacing, that is flowing the wells in such a helter-skelter manner. Where these exceptions are allowed, that is throwing the offsets to a position where the correlative rights will not be adequately protected. So, with the allowance of such a spacing order on an 80 acre basis, we feel the operator should be given the right to select the position on the 80 for his location.

MR. SHEPARD: Anyone else?

MR. WHEELER: My name is J. D. Wheeler, representing the Ohio Oil Company. I should like to read a brief statement into the record outlining our position. The Ohio Oil Company would like to state to the Oil Conservation Commission of the State of New Mexico we are in support of Phillips application for 80 acre spacing with double allowable being granted to the well on 80 acre spacing. For wells in the Siluro-Devonian pool, for the reasons pointed out in the testimony, and particularly for the reasons that in this as in other deep fields to be discovered in the State of New Mexico, 80 acre spacing will enable field limits to be defined very rapidly. This is particularly desirable in order that reservoir engineering data and production statistics may be obtained from as large an area as possible in as short a time as possible; so that producing characteristics of the reservoir may be ascertained at the earliest possible time, enabling proper field rules and allowable schedules be set up for permanent operations. In these deep

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fields where wells may cost in excess of a quarter million dollars, the State of New Mexico and individual royalty owners and operators all stand to benefit from an 80 acre spacing program. That will certainly carry more exploratory drilling and conserve steel and more quickly promote operators to assess their new reserves and make appropriate plans for their more efficient operation. If, subsequent to development on 80 acre spacing, it is deemed advisable for the Commission by the operators or by royalty interest to develop on 40 acres, a hearing may be called and the determination made whether 80 acre spacing is adequate for full development or whether additional drilling should be undertaken to develop on 40 acres. If one of these deep reservoirs is developed on 40 acre spacing and it later develops 80 acre spacing would have been adequate, it has cost the operator twice as much money as necessary and twice as much steel as necessary.

That has a real effect on many operator's exploratory program, which in turn effects royalty interest in New Mexico. For example, to drill the four remaining wells necessary to develop Ohio's lease to 40 acre spacing will cost one million dollars. With the same money and pipe, probably six wildcat wells could be drilled. It is obvious such a program could be highly beneficial to the state, and necessary since the result would be to uncover undiscovered oil reservoirs.

MR. CAMPBELL: Isn't it true, Ohio Oil Company since the last hearing has started an offset well which is a direct offset to the discovery well?

MR. WHEELER: We have started a well--

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MR. CAMPBELL: It is still a 40 acre direct offset to two other wells, isn't it?

MR. WHEELER: By virtue of the fact that--in other words, we wouldn't have any place to go even on 80 acres.

MR. CAMPBELL: That is what we are trying to bring out.

MR. WHEELER: It is a normal location on the proposed pattern.

MR. SHEPARD: Any further statements?

MR. ANDREEN: My name is G. M. Andreen, representing the Magnolia Petroleum Company. I will give my statement to the reporter and save him a little work.

MR. SHEPARD: Thank you very much.

MR. ANDREEN: Magnolia Petroleum Company believes that the proper and adequate spacing in any field should be determined by engineering studies of the reservoir performance. It is our desire, and we believe it the Commission's desire, to base permanent spacing orders on engineering testimony regarding the ability of one well to adequately and efficiently drain an area equivalent to the size unit requested. This is a sound policy, however, a certain amount of development and reservoir data must be available before the engineers can arrive at the proper well spacing. Reservoir Behavior History can only be acquired with the passage of time and development must continue during this time; therefore, there is a definite need for some policy concerning the establishment of temporary spacing orders to govern development whicle Reservoir Behavior Data are collected.

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It is a fact that it is always possible to go from a drilled density of one well per 80 acres to a density of one well per 40 acres. However, after development has progressed on one well per 40 acres basis for a period of time it is usually difficult and sometimes impossible to assign 80 acres to each drilled well, even though the reservoir studies indicate that complete development of the field on 40 acre spacing would cause overdevelopment and the drilling of wasteful wells.

The preceding indicates that in the initial phases of development of a field the spacing should be temporarily controlled on wide spacing until the reservoir studies can establish the spacing necessary to adequately drain the reservoir. From an engineering standpoint such a system should prevent the drilling of unnecessary wells. However, from an investment standpoint it is not reasonable to contend that the application of wide initial spacing to all reservoirs, regardless of depth is warranted. In the case of relatively low well costs, which are normally associated with the shallower depths, it is possible to overdevelop a field and still retain a favorable overall economic situation. However, when the normal well costs are high the margin of economic safety is greatly reduced. It is thought that the problem presented in the Denton Field could be avoided in future fields if some Statewide Policy perhaps on a depth bracket basis; were adopted to temporarily control on a wide spacing the initial development of deep fields. Such action would allow time for the collection and

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analysis of reservoir performance history, and avoid overdevelopment. The savings in time, money, and material that should result could be used in the search for new fields. A well discovering a new field adds to the States' potential oil production and to its oil reserves both of which are necessary for any state to maintain or increase its stature among the oil producing states of this nation. An unnecessary well accomplishes nothing and is a waste of material goods.

The unqualified idea of more wells more oil is not compatible with modern engineering consideration of well spacing and reservoir performance. The establishment of allowables based on the ability of a reservoir to efficiently produce, plus encouragement of necessary pressure maintenance projects are the best methods available for increasing the ultimate oil production from a reservoir. After all, it is the energy available and not the number of wells that determines the amount of oil that will be produced.

I wish to emphasise again that Magnolia believes that well spacing in any reservoir should be based on engineering studies of the reservoir behavior and the suggested temporary controls are a means for gaining time to accomplish that purpose.

It is believed the preceding covers the background which has led to the problem present in the Denton pool. At the original hearing the Magnolia Petroleum Company supported the request for a temporary 80 acre spacing order of one years duration with drilling to be confined to the northwest and southeast quarters of each quarter section. Magnolia still feels that such an order

is warranted and again urges the Commission to issue such a finding. In our opinion the data presented in this case indicates a possibility that one well will drain 80 acres in the Denton Siluro Devonian reservoir. However, as far as we are concerned, the evidence is not yet conclusive enough to say that one well will drain 80 acres. Additional development and production history will be necessary to prove or disprove 80 acres as the proper and adequate spacing plan for the Siluro-Devonian reservoir. Very little information is available on the Wolfcamp reservoir and in my opinion it is impossible, at this time, to determine from reservoir performance any indication of the proper spacing. However, from the economic standpoint it appears expedient to develop the Wolfcamp reservoir on a wide spacing until sufficient data is obtained to prove what the proper spacing should be.

Since additional reservoir and production history is needed for both reservoirs in order to establish the proper spacing it is thought essential that future development be temporarily controlled to one well per 80 acres to allow time for the accumulation of sufficient data to definitely determine the area adequately drained by one well. It is our desire to avoid the drilling of what ultimately may prove to be unnecessary wells and in view of the current material shortage it would indeed be unfortunate should this field be overdeveloped when such a condition could be avoided.

In regard to confining locations to specific quarter sections,

I would like to present the Commission with Exhibits 1 and 3. Exhibit 1 shows the recommended spacing program under which the distance between wells is 1867 feet. Exhibit 2 shows what could happen if future drilling on 80 acres is not confined to specific quarter sections. This situation would result if an operator attempted to make equi-distant offsets and as can be seen from Exhibit 2 it would be possible to have a distance of 3960 feet between wells. This is 226 feet further between wells than would exist on a regular spacing pattern of 320 acres per well. Exhibit 3 indicates what a regular 320 acre spacing plan would look like. Therefore in combination with a temporary 80 acre spacing order Magnolia recommends that drilling be confined to specific quarter quarter sections with provisions made for the granting of irregular locations after a hearing at which the testimony would prove that confiscation of property or waste would occur if the irregular well were not drilled.

It is possible that one of the reasons for the Commission denying the original application for temporary 80 acre spacing in the Denton Field was the abnormal units and the exceptions to off pattern wells that must be granted in order to establish temporary 80 acre development. I have already covered the reasons for the existence of this situation but it still remains a fact that the situation will not improve, and it is still possible to assign 80 acres to each well now in the field. Delaying or denying the application for a temporary 80 acre spacing order in the Denton Field could easily result in requiring unnecessary and wasteful wells.

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Magnolia is now drilling at approximately 11,000 feet on their Pope No. 1 well. This will be Magnolia's first well in the Denton Field. Because Magnolia has not had the benefit of production experience in this field, Magnolia has no comment to make on the allowables proposed for the wells on 80 acre units.

I would like to present the Commission with Exhibits 1, 2 and 3. They are attached to the copy of the statement there.

MR. SHEPARD: Any further statements? If not, this will be taken under advisement and we hope to hand down an order without any unusual delay.

Meeting is adjourned.

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STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I HEREBY CERTIFY that the foregoing and attached transcript of proceedings before the Oil Conservation Commission, in Cases No. 269 and 270, held on August 7, 1951, is a true and correct record of the same to the best of my knowledge, skill and ability.

DATED at Albuquerque, New Mexico, this 28 day of August 1951.

E. E. Greer
REPORTER

My Commission Expires: 8-4-52