BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 17, 1957

TRANSCRIPT OF HEARING

Case 1276

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE - SANTE FE
3-6691 2-2211

BEFORE THE
OIL CONSERVATION COMMISSION
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IN THE MATTER OF: Application of Amerada Petroleum Corporation for an order amending Order No. R-991 insofar as said order pertains to the Bagley-Lower Pennsylvanian Gas Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order amending Order No. R-991 to extend the horizontal limits of the Bagley-Lower Pennsylvanian Gas Pool to include the S/2 Section 34, Township 11 South, Range 33 East, and the NE/4 Section 3, Township 12 South, Range 33 East, Lea County, New Mexico, and to increase the size of the standard drilling unit for said pool from 160 acres to 320 acres and to enter such other rules and regulations for said pool as the Commission may deem necessary.	Case 1276

BEFORE:

Mr. Murray Morgan
Mr. A. L. Porter
Governor Edwin L. Mechem

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The meeting will come to order. Next case on the docket will be 1276.

MR. COOLEY: Case 1276. Application of Amerada Petroleum Corporation for an order amending Order No. R-991 insofar as said order pertains to the Bagley-Lower Pennsylvanian Gas Pool, Lea County, New Mexico.

MR. KELLAHIN: If the Commission please, Jason Kellahin,

Santa Fe, New Mexico, appearing on behalf of the Applicant, Amerada Petroleum Corporation. I would like also to enter the appearance of H. D. Bushnell, attorney for Amerada Petroleum Corporation.

Before presenting the testimony in this case, I would like to make a brief statement. The Commission has heretofore entered its Order 991, which was entered in Case 1220, and in that case, as the Commission will recall, the Bagley-Lower Pennsylvanian Gas Pool was created. This case is a sequel to the preceding case 1220, and in its presentation, it will be necessary for us to present at least some of the testimony which was presented in Case 1220. In the interest of clarity, we would prefer not to incorporate the record in the present case from 1220; we would have no objection to doing so if the Commission so desires, but I believe we would be better able to present our case in the instant matter by reviewing some of the testimony which was presented in the preceding case, and we have additional information which was not available at the time that case was heard which will be presented. We propose to show in the presentation of this case that one well will drain not less than 320 acres, that if the pool is not developed on 320 acres, the correlative rights of royalty owners will be impaired, that the development on 320 acres will prevent waste and protect correlative rights, and that anything less than 320 acres will result in the drilling of unnecessary wells and waste, and would not make for uniform development of the pool.

We will have one witness, Mr. R. S. Christie.

(Witness sworn.)

R. S. CHRISTIE

a witness, of lawful age, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Will you state your name, please?

A R. S. Christie.

Q By whom are you employed, Mr. Christie?

A Amerada Petroleum Corporation.

Q In what position?

A Petroleum Engineer.

Q Have you heretofore testified before this Commission as a Petroleum Engineer and had your qualifications as an expert accepted by the Commission?

A Yes, sir, I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. PORTER: They are.

Q Mr. Christie, have you made a study of the Bagley-Lower Pennsylvanian Gas Pool?

A Yes, sir.

Q And in connection with that study, have you prepared a structure map?

A Yes, sir. I have had one prepared.

Q Was it prepared under your direction and supervision?

A Yes, sir.

(Amerada's Exhibit No. 1 marked for identification.)

Q Referring to Exhibit No. 1, which is on the board, would you state what that is?

A Exhibit No. 1 is a structure map contoured on top of the Pennsylvanian 9800 foot zone, a contour interval of 20 feet.

Q Now, Mr. Christie, did you testify in Case 1220?

A Yes, I did.

Q And in that case, did you also offer a structure map as Exhibit No. 2?

A Yes, sir.

Q How does this present Exhibit No. 1 compare with that exhibit?

A Since that case was heard, we have drilled two additional wells up in the northwest part of the area. The one well is not shown on this map, which was known as the Amerada Kelsey No. 1, as it was a dry hole in both the 9800 and the 8600, which was up for discussion at that time. Following that well, Amerada's Mathers V No. 1 in the southeast of the northwest of Section 33, Township 11 South, Range 33 East, has been completed. This particular well found the 9800 foot zone dry, or at least contained water, and the well was completed in the 8600 foot zone.

Q Does the information obtained from that well give you better control on your structure map?

A Yes, it did. The contours, based on the completion of the Mathers V-1, have been drawn eastward to limit the size of the field to a smaller area.

Q And in other respects is the exhibit substantially the same as the exhibit offered in the preceding case?

A Yes, it is. Also shown on Exhibit 1 is a North-South and East-West red line which indicates the line of cross sections which will be Exhibits 3 and 4.

Q Now, have you prepared an isopachous map showing the Bagley-Lower Pennsylvanian Gas Pool?

A Yes, Exhibit No. 2 is an isopachous map of the lower Pennsylvanian Gas Pool drawn contour interval of ten feet. The outer limits of the contour is zero contour, which would outline what we think are the productive limits of the 9800 gas reservoir.

Q When you refer to the 9800 gas reservoir, you are referring to the Bagley-Lower Pennsylvanian Gas Pool as defined by the Commission throughout, are you not?

A Yes.

Q On what information did you base your isopachous map?

A The isopachous map was based primarily on microlog picks. In fact, on microlog picks, on those wells that were drilled through or to the 9800 foot or the Lower Pennsylvanian Gas Formation.

Q And how many logs to you have available for that purpose?

A We had approximately, approximately twelve, twelve to

thirteen.

Q What does that exhibit show in regard to the net pay according to your information, Mr. Christie?

A Well, indicates the net pay is not very thick, but actually averages about twenty feet. That can probably be better described by an inspection of Exhibit No. 3 which is a cross section from East to West and includes the following wells: Texas Pacific Coal and Oil Company No. 1 State, C; Continental No. 2, in Section 4, 12 South, 33 East, Amerada Caudille No. 2 in Section 3, 12, 33, Amerada Caudille No. 7, Section 3, 12, 33, Amerada Mathers A-1, Section 3, 12 South, 33 East, Amerada Caudille No. 5 in Section 3, 12, 33, Amerada B.T.I. No. 1 in Section 3, 12, 22, and Amerada B.T.C. No. 1 in Section 35, 11 South, 33 East, and Amerada's B.T.D. No. 3 State in Section 35, 11 South, 33 East.

Q In reference to Exhibit No. 3, that shows a continuous zone of porosity across the area covered by the cross section?

A Yes, it does. This is the same exhibit that we presented in Case 1220, which also shows the Upper Pennsylvanian Gas zone and which we are not concerned with today. A Lower Pennsylvanian gas zone is shown at the lower part of the exhibit, and shows the vertical limits of the Pennsylvanian 9800 foot zone, with the microlog interpretation shown in these little blocks. Also shown on the cross section is what we have determined to be the approximate water-oil contact.

Q And approximately what level is that, Mr. Christie?

A It's approximately 9865 feet.

Q Now, referring to Exhibit No. 4, what does that show?

A Exhibit No. 4 is a North-South cross section containing wells, Caudille No. 1, Amerada Caudille No. 1, Section 10, 12, 33, Amerada's Caudille 3 in Section 10, 12, 33, Amerada's Mathers No. 2 in Section 3, 12, 33, and Amerada's Mathers No. 1 in Section 3, 12, 33, and Amerada's Caudille No. 5 in Section 3, 12, 33, Amerada's State BTN No. 1-T in Section 34, 11 South, 33 East, and Amerada's State BTN No. 1, Section 34, 11 South, 33 East. Exhibit No. 4 also shows the vertical limits of the 9800 foot lower gas pay, Pennsylvanian pay, and also the water-oil contact.

Q Now, is the --

A (Interrupting) Also included are the microlog picks that we have picked from our microlog electric logs.

Q And does that show a continuous zone of porosity across the area covered by the cross section? A Yes, it does.

Q Now, Mr. Christie, based on Exhibits 2, 3 and 4, is the area which is proposed to be included in the Bagley-Lower Pennsylvanian Gas Pool productive of gas, in your opinion?

A Yes, it is.

Q Now, have you made any comparisons of your sample logs to the electrical logs and the market logs as shown by Exhibits 3 and 4?

A Yes, Exhibit No. 5 is a tabulation showing the microlog pay and compares it with the sample description pay. The purpose of that is to show that even though some micrologs do not indicate pay, the sample descriptions do. And the microlog, therefore, or the sample pay, I should say the sample pay, is therefore used to substantiate the pay that was picked by micrologs, or in case there's none there, why the samples would be used.

A And do the sample logs substantiate the interpretation made of the micrologs? A Yes, I believe they do.

Q Now, have any tests been run in this area since the last hearing, Mr. Christie, or the hearing in Case 1220, Mr. Christie?

A Yes, we have conducted a buildup test and an interference test on the Shell Amerada State No. 1A No. 1, and on the Amerada Caudille No. 7.

Q When was that test made?

A The test was started on July 8 of this year.

Q And would you describe just how the test was made?

A With the two wells in question, that is the Amerada Shell State No. 1A No. 1, and the Caudille 7, both flowing, the Shell well at the rate of 1,650,000 cubic feet per day, and the Amerada's Caudille No. 7 at a rate of 2,000,290 MCF per day, the bottomhole pressure was run to run depth and the well closed in and --

Q (Interrupting) Which well was closed in?

A Well, in the first case we ran buildup tests on the

Amerada State No. A1. That is Amerada Shell State No. 1. The bottomhole gauge was run to run depth, and a pressure buildup was reported for thirty-eight hours. The bottomhole pressure at the time the bomb was run to the bottom was 3,056 pounds, with the well still flowing.

The well was then shut in and after thirty-eight hours the shut in buildup pressure was 3126 pounds. That information will be found on Exhibit No. 6, which is the bottomhole pressure report form that we use for our operations and records.

Q What do these interference tests indicate, Mr. Christie?

A Well, I might continue with our over-all operation.

Q All right.

A We then pulled the gauge after thirty-eight hours, pulled the gauge out of the Amerada State, Amerada Shell State A No. 1, and ran it in the Amerada's Caudille No. 7, with the well still flowing. The well, after getting to bottom, was shut in and the pressure build up was recorded for forty-two hours. Unfortunately in this particular well we were unable to get to bottom and had to stop about 1100 feet from our datum point because of a dual completion equipment in this particular well, and we couldn't get below approximately 1100 feet from bottom.

Based on the gradient that we obtained, we estimate that the pressures were comparable in this well to the Shell well. The pressure in the Caudille No. 7 before the well was shut in

still flowing was 2649 pounds. After closing the well in for forty-two hours, the pressure was 2963 pounds per square inch.

I might add in both cases, in both wells, the bottomhole pressure built up rather rapidly and we think reached a maximum in very short time in a matter of hours. After taking these buildup pressures on these two wells, we then went back to the Shell Amerada Well and ran a bomb to bottom, and then opened up the Amerada's Caudille No. 7. At this point, after the State A Unit No. 1 had been shut in for ninety-six hours, the Caudille No. 7 was reopened and produced at a rate of four million per day. The pressure in the Shell State Amerada State A Unit No. 1 was recorded continuously for sixty-five hours with the bomb still at the bottom of the hole. During that time it appeared that the well had reached its maximum buildup and had started to decline at the end of this sixty-five hours. We had a seventy-two hour clock in the instrument and we had to pull it and wind the clock, and run it back in the hole. The shutin pressure found after the ninety-six hour shutin was 3147 pounds, and after No. 7 was open, the pressure in the Shell State A No. 1 declined nine pounds at the end of that first sixty-five hours. And following pulling the gauge and rerunning it declined an additional fifteen pounds per square inch.

Q During what period was this fifteen pound decline, Mr. Christie?

A Well, that was from the sixty-fifth hour, or rather the sixty-eighth hour, from the time we got back in there through the ninety-sixth hour.

Q Now, how far apart are these wells that you tested?

A Well, the radius between the two wells was approximately 2950 feet.

Q And is the pressure drop, which you recorded, in your opinion, an appreciable drop?

A I think it is in such a short time as it was.

Q In your opinion, does that indicate interference?

A Yes, I think it does.

Q And on that basis, what would be the minimum distance that a well completed in that zone, would drain?

A Well, using the 2950 foot radius, that particular well would drain at least 635 acres. Of course, if you add the two declines, that is the nine pounds and the fifteen pounds, you would have a twenty-four pound decline in that time, and obviously the drainage influence would be well beyond that Shell well with a 2400 pound decline.

Q Now, have you prepared --

A (Interrupting) I would like to point out, before we get off these pressures, that if anybody starts to analyzing these, there was one particular thing that occurred that probably the Commission should be aware of: When we pulled the gauge after the sixty-fifth hour,

after getting nine pounds decline, and after running the gauge back in, we had an increase in pressure showing on the gauge. Well, obviously the pressure didn't increase in the reservoir. I think it was an error in the instrument, because, and that's not uncommon, after pulling out and running back in, the characteristics of your element and so forth change so you can't go back and get the exact pressure you had when you pulled out of the hole. So it looks as though we had an increase while we had the bomb out of the hole, but that, of course, is not a fact, but as soon as we got to bottom we picked up the decline again and it declined fifteen pounds from that high we got after running back in the hole. So that is something that you will have to remember if you try to analyze these pressures.

Q Referring to Exhibit No. 7, Mr. Christie, what does that show?

A Exhibit No. 7 is an area map, and it's rather small, probably hard to see. The hash line on the outside is what we would consider to be the unit outline of the productive limits of the field.

Q On what do you base that, now, Mr. Christie?

A Well, that's based primarily from our isopack map. In other words, you can't have a unit following the isopack, you more or less have to have a square unit, and that is the outline shown as the hashed line.

Inside the hash line is a dotted line which we think which is either included now in units presently on production, or includes units that we think will be on production very shortly. That would be the present Texas Pacific Well, Shell Amerada Well, the Amerada Caudille No. 7, the Northeast quarter of Section 3, and the South half of Section 34.

We anticipate that those will all be upon production, and the units formed, in a short time. In addition to that outlined in green is the outline of the present units that are on production.

Q Then the green outline shows the present limits of the Bagley-Lower Pennsylvanian, is that correct?

A As defined by the Commission, yes, sir.

Q And the red outline shows the same pool as it is proposed in this application to be extended, isn't that correct?

A Yes, sir. That isn't intended to show that we think this will be the final limits of the unit production. There's a possibility, of course, other units can be formed later on.

Q Which would be extended then into the area you designated as the productive, your interpretation of the productive area, is that correct?

A Yes, sir. The reason we didn't show the outer lines of the pool in our application and as part of the producing, actual producing area, the Commission I believe has a policy of delineating the area just as the wells are brought in production and not by

any geological interpretation of the productive area.

Q Now, Mr. Christie, assuming that if this area is developed on the basis of 160 acre drilling and spacing units, how many new wells would be required to develop the acreage?

A There would be a well in the Northeast Quarter of Section 3, a well in the Southwest of Section 34, and the Southeast of Section 34, and possibly a well in the Southwest of Section 35, in Township 11 South, Range 33 East, and possibly a well might be completed in the Northwest Quarter of Section 2, in Township 12, 33 East, which would make five wells. Certainly there would be four and possibly five.

Q Now, if the area were developed on the basis of 320 acre drilling and spacing units, how many wells would be required?

A Well, it would require two wells to take in the most productive areas, and at the most, three wells which would include that, this 330 on the East side of the field here, which would be the Southwest of Section 35, and the Northwest of Section 2.

Q And what is the cost of a new well in this particular zone?

A Well, a new well to 9800 foot, or the Lower Pennsylvanian Gas Pool, would be approximately $190,000 to $200,000.

Q Now, in your opinion, would it be economical to drill these wells on 320 acre spacing and drilling units?

A Yes, it would be on a 320.

Q And if it were developed on 160 acres, in your opinion,

would that be economical?

A Well, if you consider the gas in place under each 160 acre unit, some of them would not pay out. Of course, you could drill some wells on those 160's, and if you didn't assign acreage on the outside, you would probably drain a much greater area than the 160. In that case you would probably consider it profitable because you are getting more gas than is under that 160 acre tract.

Q Would it be cheaper to recomplete a present well?

A Yes, barring any unforseen difficulty.

Q Are there any wells presently available that could be recompleted in order to develop this acreage on 160 acre units?

A Well, the first place, our deep wells in the Devonian, majority of them either do or will produce large volumes of water, and it wouldn't be very practical and feasible, I don't believe, to dual those with the 9800 foot gas zone, or Lower Pennsylvanian gas zone. At the present time, the wells that have already been drilled to the 9800 foot zone are on production, and we wouldn't want to take them off production to complete them as a gas well at this time. I think some time in the future there would be some present wells in the field that could be recompleted.

Q What is the net productive area of the 9800 foot zone, Mr. Christie?

A Within the outer limits of the contour shown on Exhibit 2, the productive area is 1890 acres.

Q And are you familiar with the distribution of the royalty ownership in that area?

A Yes, based on our calculations, the State owns 63.9% within that area. The Federal acreage is 13.4%, and the Fee acreage is 22.7%.

Q Now, assuming that this application is approved and 320 acre units are authorized, what would be the probable gas units that would be formed?

A Well, fortunately the distribution doesn't change very radically. If you assume, we have these two 160 acres, that is the Southeast Quarter of Section 33, and the Northeast Quarter of Section 4, the North half of Section 3, and the South half of Section 4, and the Southwest Quarter of Section 35 as producing gas units, the State percentage of those units would be 64.3%, which is just a fraction above what they have in the total area.

So that by the development of just those two wells on those 320's, it would change the distribution very little. In fact, they would gain just a fraction of a percent. The Federal acreage is decreased slightly from 13.4 to 10.7, but they had an acreage down around here that is not very prolific looking anyway, and from an actual operational standpoint, and production standpoint, they probably wouldn't recover more than that 10.7% anyway. The fee acreage would increase slightly over 2% in the various units.

Q Would that result in a close distribution of the royalty

ownership? A Well, I don't --

Q As compared to the total area?

A I don't see how you could get much better distribution unless you drill it up on 10 acres or something like that, which would be, of course, rediculous.

Q In your opinion, would a 320 acre unit protect the correlative rights of those royalty owners?

A I think it actually would protect them better than the 160 acres. The reason for that is if we consider it not profitable to drill a well on this 160, for example, in the Southeast Quarter of 34, and then the royalty interest would have no gas attributed to any well. If you have a 320 acre unit in the South half of 34 and assign the Southeast Quarter to a well on the Southwest Quarter, then all the royalty interest participate in that production. So in looking at it from that standpoint, the royalty interest would be better off with a large unit.

Q Would you identify that section, please?

A That's in Section 34, Township 11 South, Range 33 East. It's obvious that this outside acreage is not going to be developed because it's unequal, the larger units you could have and assign acreage to that unit, the more people that are going to participate in it.

Q In your opinion, would approval of this application result in prevention of waste?

A Well, certainly it would prevent economic waste.

Q By that, what do you mean?

A Well, you can't afford to drill unnecessary wells in this particular reservoir, it's too expensive. And any unnecessary well, is in my opinion, economic waste.

Q Would it protect correlative rights?

A Yes, I think definitely it would protect correlative rights.

Q And would it, in your opinion, be in the interest of conservation?

A Yes, I believe it would. I don't see any reason why it shouldn't be. This field will be subject to gas proration, presumably like all other fields, and you will only have certain market demand and the fewer wells you have, why the higher levels those particular wells will have. And the more you have, you have the same allowable for the field, but less per well.

MR. KELLAHIN: At this time we would like to offer in evidence our Exhibits 1 through 7 inclusive.

MR. PORTER: Without objection, Exhibits 1 through 7 will be admitted. Are you through, Mr. Kellahin?

MR. KELLAHIN: That's all the questions we have.

MR. PORTER: Anyone have a question of Mr. Christie?

MR. CAMPBELL: Jack M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing on behalf of Texas Pacific Coal and Oil Company.

CROSS EXAMINATION

By MR. CAMPBELL:

Q Mr. Christie, I didn't quite understand from your testimony what you proposed to do in the event this application is granted, with regard to the attributing of acreage to the proposed 320 acre units, and the drilling or recompletion of any wells in the area. Would you please go over that again?

A Well, I don't believe I specifically set out what we would do.

Q Well, would you do that, please?

A Of course, we have our Caudille No. 7 in the Northeast of the Northwest of Section 3, Township 12 South, Range 33 East, which we would assign to the 320 acres of the North half of Section 3. In the South half of Section 34, Township 11 South, Range 33 East, we would either recomplete our State BTK No. 1 in the present Pennsylvanian zone and the lower Pennsylvanian gas zone, as a dual completion, and assign that 320 acres to that well, or if we didn't do that we would drill a new well and in all probability, for the purpose, the reason for the new well would be so we could dual it in the eighty-six and the ninety-eight. That would probably be in the Southwest of the Southeast of Section 34, 11, 33.

Q What would you do with your well, your Shell well, Shell State No. 1?

A Well, based on the isopack map, there's very little more

acreage that could be attributed to that particular well.

Q So that you would be intending to produce under prorationing or not, twice the, approximately twice the amount of gas from your Caudille No. 7 and the BTK No.1 if you recompleted it, that you produced from your Shell State, or that Texas Pacific Coal and Oil Company could produce from its gas well offsetting those?

A Yes, assuming an allocation based on straight acreage.

Q You feel that adequately protects the correlative rights of the, all working interest owners?

A Yes.

Q Both of your wells appear from your contour and isopack to be, at least the isopack, to be in a better area of the field, do they not?

A We think so, yes.

Q Don't you think that would result in drainage of gas toward your wells producing at a higher rate?

A Well, they would only be producing at a higher rate because they have more acreage assigned to them.

Q That's what I am getting at. Do you feel that protects the correlative rights of owners who happen to have acreage on the outer edges of the field?

A We would have the same situation if we had two wells there with the same allowable as one well, if we didn't drill any wells around the edge.

Q If you drill wells in the Southeast Quarter of Section 34, recompleted the well in the Southwest Quarter, and drilled a well in the Northeast Quarter of Section 3, you would have more uniform distribution of wells and allowables, would you not?

A We would have the same allowables presumably, but based on our interference test, I don't think we need worry about the drainage or distribution. I think the one well would drain the 320 just as easily as two of them would 160.

Q Do you think, Mr. Christie, as a matter of fact in a gas reservoir if you ignore correlative rights and property rights, that one well would probably drain the whole reservoir given enough time if it is relatively continued?

A Yes, I think it would be mighty fine if we could unitize that whole thing inside that isopack and just drill one well.

Q So that you, as well as other working interest owners, have to consider other factors in the drainage area of gas wells to determine the proper spacing, do you not?

A Well, we, I don't know what you mean by other factors.

Q Economic factors, drainage factors.

A Well, that's what --

Q Position factors.

A That's what we have been trying to do, consider economics and drainage and correlative rights.

Q Now, with regard to economics, what seems to be the

principal question, inasmuch as I understand there have been no new wells completed in this zone since the last hearing, do you have any pay-out statistics on your two wells in the 9800 foot zone in this field? A No, sir.

Q You have no production records with you?

A No, sir.

Q What?

A I think we probably could furnish you with the production from the Shell Amerada well, perhaps.

Q You know how much gas the Caudill well has produced in the months of April and May? A No.

Q You know how much distillate has been produced from this particular zone? A No, sir.

Q Do you know that there is a considerable amount of distillate production in addition to the gas? A Yes, sir.

Q Have you considered that in relation to your determination that it's not economically feasible to --

A (Interrupting) Yes.

Q (Continuing) -- drill a well on a 160 acres in this area?

A Yes, sir.

Q What do you estimate the cost of recompletion would be if you were to recomplete your well in the South half of Section 34?

A Dual completion, approximately $33,500, and recompletion, approximately the same.

Q Thirty to thirty-five thousand dollars?

A Yes, sir.

Q Do you believe, now, that if this order is granted, application is granted, you will try to recomplete your well, or will you drill a new one, if you know at this time?

A I don't know. As soon as this order is granted, I do know we are going to do one or the other.

Q Do you know what you would do if the order were not granted?

A No, I don't.

Q Am I correct, that since the last hearing in this matter, with the exception of the interference test, you have no additional information or new information as to the reservoir except you have found the outer limits somewhere between your production and your dry hole, is that correct? A Yes, sir.

Q You were asking the Commission, as I understand it, to extend the limits of this pool without the drilling of additional wells or recompletion of existing wells, and you are asking them to, in effect, set up an allowable arrangement without the drilling of those wells. What objection do you have to waiting until there is some additional development here other than the three wells for that spacing pattern to be determined?

A Well, we find, usually it's too late if you don't set some kind of spacing pattern early in the life of the field.

Q You are the ones that have the control here, are you not?

A Yes, but we don't know whether, if we don't get 320, which one are we going to drill on or complete.

Q You want the Commission to assure you in advance of the drilling what allowable you are going to get, in effect, that is what it is?

A Well, I don't think we know anything about what the allowable is going to be, that's going to be determined by market demand.

Q You know you will sell twice as much gas as you would from a 160 acre unit?

A Well, presumably if it would make it.

Q You would undoubtedly be able to satisfy development as to particular leasehold interest?

A Yes, sir. We have no question in our mind, the South half of Section 34 in 11, 33 is productive of gas. And whether the Commission waits to extend the limits of that pool until we drill a well, I think it's a matter for the Commission to decide if they want to wait until the well is completed, but we still, I think it would make some difference to us whether we would recomplete a well or drill a new one, depending on whether we got 320 acres or not.

MR. CAMPBELL: I believe that's all.

MR. PORTER: Mr. Mankin.

By MR. MANKIN:

Q Mr. Christie, there's been quite a bit of questioning going

on in regard to possible recompletion of Section 34. I ask you if on the Amerada's BTK No. 1 and the Southeast of the Southwest of 34, that presently is completed as a fairly good Bagley-Pennsylvanian oil well, is it not? A Yes, sir.

Q A hundred or more barrels production per day. Would it. if that well was dually completed, would it not require that the oil be produced to the casing tubing annulus and is that not a less efficient method of production?

A I think we might be able to drill it with two strings of tubing or gas strings.

Q Have sufficient casing to be able to parallel the string?

A Yes.

Q You also mentioned the possibility in the BTN No. 1 making so much water it possibly would not be advisable to dually complete that due to the great quantity of water and oil per day for some 700 barrels per day would be required out of that at the present time, is that correct? A That's correct.

Q So it would be your recommendation that as far as the 9800, the lower zone, that possibly could be best handled out of BTN No. 1 rather than drill a new well, which would be costly?

A The only advantage of drilling a new well, I think, is if we get this 8600 foot zone on production, then we can make a dual gas, gas dual, which would be some advantage. And then we wouldn't have the operating problems with the dual and our oil, gas and water,

Q On Exhibit 7 it was shown that the well has been referred to as the Shell State A; that actually is operated by Amerada, isn't it, in Section 33? A Yes.

Q It's a unit? A Yes.

Q And the same way with the BTN No. 1 shown as Gulf, actually is operated by Amerada, in the unit Devonian, is that correct?

A Yes, sir, it is.

Q Do you feel any unequitable withdrawals would take place if this application is authorized from the Lower Pennsylvanian Gas Pool, particularly as concerns the Amerada State, Shell State A Well and the Texas Pacific Well?

A No, I don't believe so.

Q You don't feel those wells with only 160 acres would, there would be some of the gas pulled out by the larger units to the East of it?

A No. I don't see how it could be. I am rather positive there would be none in the Texas Pacific well because of their permeability, the block that they apparently have. And based on the permeability of our Caudille No. 7, it shouldn't drain any more to the West than it should to the East.

Q You do have knowledge, do you not, that presently the Texas and Pacific well, production from it has been approximately half of what it has been, the gas production has been approximately half than what it has been from both the Shell State well and the

Caudille No. 7 well, you have knowledge of that?

A I understand from the last hearing that it was about that ratio. I haven't gotten any information on it lately.

Q I was relating mainly to the May production on takes from your wells. I believe that's all.

By MR. UTZ:

Q Mr. Christie, when you ran these interference tests you referred to, was the Texas and Pacific No. 1 to the Northeast Quarter of Section 4 producing?

A I believe it was, Mr. Utz. I couldn't say for sure, but the information we got from the field is that it was producing.

Q That well is completed in the lower zone, isn't it?

A Yes, sir.

Q Is part of the fifteen pound drop attributed to production from that well?

A I doubt it.

Q You have indication between your No. 7 and your Shell State No. 1, would there be, do you feel there would be communication between the Shell State 1 and the Texas Pacific 1?

A Well, when we had our well shut in for a number of hours, the buildup didn't show any decline in the Texas Pacific well producing, we got a continual buildup on both those wells until we opened the Amerada Caudille No. 7. I say continual up to a maximum.

Q Well, was that indication of some sort of permeability barrier between the two wells then?

A Well, it could be a permeability barrier or it could be a permeability block within the well bore, which is not uncommon in oil field practice to get a permeability block.

MR. UTZ: That's all I have.

A You compare the log of that Texas Pacific well, it looks as good as the Shell or Amerada Caudille practically.

MR. PORTER: Anyone else have a question? Mr. Cooley.

By MR. COOLEY:

Q Mr. Christie, I believe you testified that interference tests proved the drainage radius was at least 2950?

A Yes, sir. In this particular instance.

Q That's the distance between the Caudille 7 and the Amerada Shell 1? A Yes, sir.

Q Do you have any evidence that it is substantially in excess of 2950?

A Certainly if we get an, if we consider we got a twenty-four pound drop in the Shell well, it would have to extend clear out to where you get just zero drop, which would be probably to the edge of the reservoir.

Q You think that any particular well location would increase the drainage efficiency of a 320 acre proration unit?

A Well, I think it would be preferable to have it in the center, probably, but I don't think in this small a reservoir the kind of permeability we have, it makes too much difference.

Q You mean you would, you think a 660 location, making the well 4,620 feet from the fartherest boundary of the unit would be authorized or justified?

A I don't know that it would be justified, but I wouldn't see any objection to it particularly.

Q You think one of the standard locations in a 660, 190, 1980, any of those particular locations would serve as a more efficient manner in draining this reservoir?

A I think if you were going to drill a new well you should have some kind of spacing to locate the well nearer the center of the tract within limits, but inasmuch as some of these wells at least will be recompletions from old wells, I think you should have a rather flexible spacing pattern to take advantage of the old well.

Q Are you going to drill a new well, you think, something like on a 1980? A Yes, I think so.

MR. PORTER: Anyone else have a question? Mr. Nestor.

By MR. NESTOR:

Q Mr. Christie, could I ask roughly what the distance is between the Amerada Caudille 7 and the Texas Pacific well?

A Well, not particularly rough, it's 2640 is what it should be, 2640.

Q It's somewhat less than that between the Caudille 7 and the Amerada Shell State, isn't it? A Yes.

Q I might ask then if the communication between wells are so

good, why should there be such a tremendous pressure differential between the Texas Pacific well and the Amerada Caudille No. 7 and the Amerada State A No. 1?

A Well, I believe the Texas Pacific testified they thought it was a permeability block. That's the only thing I can --

Q (Interrupting) You have any proof for that, or is that just a supposition?

A Well, I haven't any proof, no.

MR. PORTER: Anyone else have a question of Mr. Christie? Mr. DuPont.

MR. DuPONT: Harry DuPont, United States Geological Survey.

By MR. DuPONT:

Q If it is possible for a permeability block between those two wells, would it not be possible for a permeability block, say if you recompleted a well in the Southwest of Section 34, would it not be possible for there to be a permeability block between that well and say the Southeast, some of that acreage in the Southeast of 34?

A Well, anything is possible I guess. You could have.

Q What I mean, can you just take two wells and say the whole field is continuous? In other words, has that one test on those two wells proved that for the whole area, in your opinion?

A Well, my opinion, I think the reservoir is continuous. You may have varying degrees of permeability, but somewhere in the

reservoir they are all connected.

MR. PORTER: Anyone else have a question? Mr. Christie, you may be excused.

(Witness excused.)

MR. CAMPBELL: I would like to put on some testimony.

MR. PORTER: Mr. Kellahin, have you completed your witnesses?

MR. KELLAHIN: Yes, sir.

MR. PORTER: Mr. Kellahin, would you offer your exhibits?

MR. KELLAHIN: Yes, sir. If I didn't offer them, I will now offer them.

JOHN YURONKA

a witness, of lawful age, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

By MR. CAMPBELL:

Q State your name, please. A John Yuronka.

Q By whom are you employed?

A Texas Pacific Coal and Oil Company.

Q Where? A Midland, Texas.

Q What capacity? A Petroleum engineer.

Q Have you testified on previous occasions before this Commission? A I have.

MR. CAMPBELL: Are the witness's professional qualifications

acceptable?

MR. PORTER: Yes, sir, they are.

Q Mr. **Yuronka**, I hand you what's been identified as Texas Pacific Exhibit No. 1. Will you please state what that is?

A It is a contour map or structure map on the ninety-eight, of the 9800 foot pool. Essentially it is the same structure map we submitted for Case 1220, and it agrees essentially with what Mr. Christie has in his Exhibit No. 1.

Q What difference is there?

A The only difference is the fact that there has been a well completed up here and we have been able to tie some of this in here. Before that we weren't able to.

Q Does your contour, that you have prepared since the completion of that well, differ in any substantial respect from that previously offered at the prior hearing?

A No, it does not.

Q And does it differ in any substantial respect from the contour interpretation presented by Amerada?

A No, it does not.

Q I hand you what has been identified as Texas Pacific Exhibit 2 and ask you to state what that is.

A It is an **isopack** of net porosity in the Bagley-Lower Pennsylvanian Pool, plus an outline in yellow of the present gas proration units in this pool. Essentially we are somewhat similar

to Amerada in their Exhibit No. 2. However, on, as is the case on a great many of these net porosity determinations, there is somewhat of a difference of opinion as to the net porosity in certain wells, but essentially it is the same exhibit that was submitted in Case 1220.

Q Essentially, the hearing in Case 1220, do you have any evidence with regard to this reservoir to cause you to change your position as to the present advisability of 320 acre units?

A Position is still the same.

Q Do you feel that the completion of three wells in this particular zone, two of which have been producing for about a year, and the other for a few months, is sufficient to make a determination of this nature at this time?

A No, I do not, especially since our well is in, the difference in pressure between our well and the Caudille 7 and the Amerada Shell State A1.

Q Do you have, at the present time, any opinion as to what may cause that pressure differential?

A Well, as I testified last time, we do believe that some sort of permeability barrier is there, but we don't know what it is.

Q What is the approximate difference in pressure between your well and the Caudille No. 7?

A Well, we took the bottomhole pressure in March, I believe, just prior to the Case 1220, and the bottomhole pressure on that

Amerada State A well was 3170 and ours was 2627, which is a difference of 543 pounds.

Q Do you have with you any production figures on the three wells producing from this zone in that field?

A Yes, I do.

Q Would you, where did you obtain those figures?

A I obtained them from the New Mexico Oil and Gas Engineering Monthly Reports, in turn taken from the C-115 submitted every month to the Commission.

Q Without referring to the specific amounts for each month, but only generally stating what the production has been, will you give that figure for your well on gas?

A Well, I started in June '56, which was the time El Paso started taking gas from our well. During that time from June 1956 through May 1957, we produced 20,881 barrels of distillate. We also produced 289,782 M.C.F.

Now, of that, all of that is not high pressure gas. A portion of that is low pressure gas which we have sold to Warren Petroleum Company.

Q During that same period of time will you give the comparable figures for the Shell State No. 1?

A Shell State No. 1, during the same period, produced 45,475 barrels of distillate and 677,898 M.C.F.

Q During that period of time Shell State No. 1 produced in

excess of twice the amount of gas that your well produced?

A Oh, it's more than twice.

Q Do you know of any reason, particular reason for that?

A No, I don't.

Q Now, with regard to the Caudille No. 7, will you state how much gas was produced from that well in May of 1957?

A In May 1957 it was 57,637 M.C.F. and 3,521 barrels of distillate.

Q And what in the other month that --

A (Interrupting) In the month of April, which was the first month it produced, it produced 106,808 M.C.F. and 5,848 barrels of distillate.

Q Well, in the first two months that well produced 163,000 M.C.F. of gas, is that correct? A Yes, approximately.

Q During that same period of time, how much gas did your, do you have the figure on your well for that same period?

A It would be about 52,500 M.C.F., and for the Amerada Shell State A well, it would be about 89,000 M.C.F.

Q Do you know of any reason for the differential in takes of gas from those wells? A No, sir, I don't.

Q Have you made any study of the economic factors involved in this particular zone insofar as payout is concerned?

A Well, Mr. Christie's estimation was for drilling the well, was it was fairly close to ours when we drilled our State C, Account 2

it cost us $168,000 to drill the well. During this course of one year that I have taken the production, our gross income was 90,000 barrels, $90,000. Considering that gross income, that's a payout of less than two years.

Now, for the Amerada well, the gross yearly income for that well during this period was $201,000. For the Amerada Caudille No. 7, which is a dual completion, and I think Mr. Christie's estimate of cost is somewhat conservative, I would say more 50,000 than 35,000. This well in just a two month period, the gross income from it would be $45,000.

Q Based upon that, is it your opinion that it is necessarily an uneconomic venture to drill a new well or recomplete a well to this zone on a 160 acre basis?

A On this basis I would say it would not be. Evidently your payout period of approximately two years or less can be realized very easily.

Q Do you have any further information you want to give to the Commission in connection with this case at this time?

A Well, the only thing I can say, or add, is the fact that the Texas Pacific is not very definitely opposed to 320 acres. It may be the solution to the problem. However, with the situation existing in our well as compared to the other two wells, it's very, we would like to see some more development before any unit is established. And we feel that three wells set up pool rules or units

is not, is no basis for such a ruling at the time.

Q Were the Exhibits No. 1 and 2 that I referred you to prepared by you? A Yes, they were.

MR. CAMPBELL: I would like to offer Exhibits 1 and 2 in evidence.

MR. PORTER: Without objection they will be admitted.

MR. CAMPBELL: That's all.

MR. PORTER: Anyone have a question of Mr. **Yuronka?** Mr. Kellahin.

CROSS EXAMINATION

By MR. KELLAHIN:

Q Mr. **Yuronka,** if one well were completed on each of the other 320 acre tracts as Mr. Christie testified, in your opinion, would that have any effect on your Texas and Pacific well on production?

A Well, I don't know whether it would or not. There is some sort of barrier between our well and the Amerada Shell State well **and Caudille** 7, and until further development occurs in that zone, I can't see how you can say the rest of it is productive.

Q Well, if there were two wells on each of those 320's, would that, in your opinion, have any effect on your well?

A Well, right now I would say it wouldn't with the permeability barrier in there.

Q In fact, what ever one well or two wells on the 320 would

make no difference then, in your opinion, as far as your well is concerned?

A At the present time, at the present flowing conditions, it would not, no, sir.

Q Is your well capable of producing any more than the 52,500 M.C.F. you testified it produced in May?

A Well, I don't know. That's another thing, our absolute open flow on that well is very definitely lower than it should be for the, as in comparison with the Amerada wells. Now, whether it can produce more, I don't know. It has averaged something like 700 M.C.F. per day I believe.

Q That, then, could account for the lower production in that well, couldn't it?

A It could very likely.

Q How much productive acreage do you feel there is in this pool, in Bagley-Lower Pennsylvanian?

A Well, it could be that the entire acreage is productive. that Mr. Christie has shown by net porosity, it could very well be. But I repeat, if I may, the fact that 320 acres under the existing conditions seems an abnormal size unit.

Q In your opinion, are the three wells which are now in the pool producing from any area other than the 160 acres which are attributed to them? A Pardon?

Q In your opinion, are the three wells which are now producing

from acreage other than the 160 acres which are attributed to them?

A Well, I couldn't answer that question.

Q Could that account for the economic picture which you have drawn in regard to the production from the Caudille No. 7 and the Shell?

A Well, I couldn't answer the first, I don't know how I can answer the second one.

Q How many tracts do you have to develop, Mr. Yuronka?

A That would be, presently that is our only acreage; Mr. Christie mentioned something about the Northwest Quarter of Section 2, in that 160 acres we have an 80 acre tract in there, and I suppose there could be more development over here, I don't know.

Q Do you have that acreage over there that you referred to?

A Yes, sir. In fact, the only part of Section 4 that we do not have is the East half of the Southeast Quarter.

Q Do you feel that it would be economical to drill that acreage on the West?

A Not with the present producing conditions in our well, no, sir.

MR. KELLAHIN: That's all the question I have. Thank you, sir.

MR. PORTER: Mr. Mankin.

By MR. MANKIN:

Q Mr. Yuronka, a moment ago Mr. Kellahin asked you if your well was producing at capacity during May with an amount of some 52,000,000, I am wondering, and I believe you answered yes, I am wondering if the Engineering Committee report is not correct, that is, some twenty thousand, million during May rather than fifty-two million, which is correct?

A That was for the months of April and May.

Q Two months?

A Yes, the production for May was 25,500.

Q Well, in other words, I believe you answered the question that you didn't know what the producing capacity is, was that your answer?

A Well, I don't know what the producing capacity is. I don't know if they ever had the well wide open and just produced it for any length of time.

Q You did indicate the possibility of producing some 700 M.C.F. per day, did you not?

A At the average of what El Paso is obtaining, that is it, yes, sir.

MR. MANKIN: That's all.

MR. PORTER: Anyone else have a question of Mr. Yuronka? You may be excused.

(Witness excused.)

MR. CAMPBELL: I have no other witnesses. I would like to

make just a brief statement, if I may, and you can make yours. I would like to emphasize what the witness has stated, that our position is that conditions have not changed sufficiently since the last hearing on this matter to justify a change in the order of the Commission, that is now, as far as spacing is concerned, on a Statewide basis. We just feel there isn't sufficient information from our well or the other two wells to justify jumping to 320 units at this time.

As I indicated, Amerada, and the plat will show they have control of the acreage and the location of their own wells, and I assume they can in some manner drill additional wells or recomplete wells which would be, lend themselves to 320 acre spacing at a later date if it was justified.

Also, I would like to suggest to the Commission that in view of the portion of the order relating to rateable take of gas from this pool, that the Commission desist in making a determination whether there is rateable take insofar as these wells in the pool are concerned, and the extent to which it may be due to production difficulties and the extent to which it may be due to pipeline desires for gas in various wells.

MR. PORTER: Mr. Kellahin, do you have a statement?

MR. KELLAHIN: I would like to ask if there are other statements, if I may.

MR. PORTER: Anyone else have anything to offer in this case?

Any comments, any statements? Looks like you will be last.

MR. KELLAHIN: I will be last. If the Commission please, there has been some statements or testimony and questions in regard to this question of drainage. I would like to point out to the Commission that the witness for Texas and Pacific has testified that in his opinion he did not think there would be drainage from the units lying to the East of their well. Also, the question of whether one well located on 320 or two wells located on 320 are going to create the greatest drainage, I think is obvious. The question merely boils down to whether you are going to get the same amount of gas out of one well as two wells.

Further, the statutes of New Mexico provide that the operators shall be given the opportunity to recover the oil or gas, or both, underlying his acreage, which I think, with reference to the exhibit which has been offered in this case, clearly show that everyone in the pool would be afforded that opportunity. on a spacing pattern of 320 acres, and we submit that the best means of protecting the correlative rights, and particularly those of the royalty owners, would be for the Commission to institute 320 acre spacing and drilling units in this pool.

Now, the fact that one company might have control of the substantial part of the area within the pool gives no foundation for argument that an owner of a 160 acre tract should control less spacing in development of that pool. The position of the Commission

would seem to me should be to promulgate rules which will foster the most economical development of the pool with the ultimate recovery of gas to the greatest possible extent. And too, it seems that this is the present time when the spacing and the drilling units should be set rather than waiting until there's further development in the pool, particularly when the witness for Amerada testifies until the pattern has definitely been determined, they can't determine what to do with the wells they have now, or whether to drill new wells. For that reason, we submit the application should be approved, and we respectfully request it's approval.

MR. PORTER: Anyone have anything further in the case?

MR. SETH: Shell Oil Company would like to state that it takes the same position in this case as it did in the Case 1220, we feel there's still no, nothing persuasive to compel a change from 160 acre spacing. Further development, further studies or testing may show otherwise, but at this stage of the game, as far as Shell is concerned, there's no reason to depart from the 160 acre spacing.

MR. COOLEY: Are you exercising your right to vote?

MR. KELLAHIN: Yes, in view of the statement that has been made, I would like to call the attention of the statement made by Shell in the preceding case to the effect they recommended the spacing be either 160 or 320.

MR. SETH: I don't want to argue that point, particularly

that statement was made without the full data on the large pressure differential between the Texas Pacific well and the Shell and Amerada well of some four or five hundred pounds, and we said, I believe I have a statement of the previous hearing here, that we saw no reason at that time to depart from a 160 acre spacing, and we haven't been convinced today.

MR. PORTER: Anything further in this case? We will take the case under advisement.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, **MARIANNA MEIER**, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this day of August, 1957.

Notary Public-Court Reporter

My commission expires: