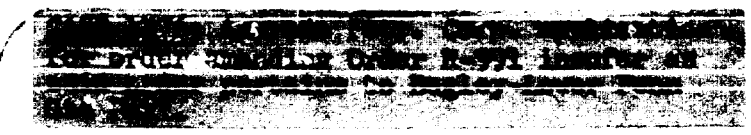

Case No.

1276

Application, Transcript,
Small Exhibits, Etc.

REPORT OF 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
Santa Fe, New Mexico
July 17, 1957

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 [illegible], 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 feet, on 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 reccmplete a present well?

A Yes, barring any unforseen difficulty.

Q Are there any wells presently available that could be re-completed 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 tha 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 proration-ing 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 Caudille 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 Amereda 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 20,381 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 Caudills 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 Caudills 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. [redacted] 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 Cundiff 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. Turonie, 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. MORRIS: That's all.

MR. PORTER: Anyone else have a question of Mr. Turonie? He may be excused.

(Witness excused.)

MR. GURLEY: 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 1120, 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, [redacted], 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:

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico
July 16, 1958

TRANSCRIPT OF HEARING

Consolidated Cases

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1325
1384

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

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NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE July 16, 1958 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
[illegible]	Shell Oil Co.	Shell Bldg. Houston Tex
E.J. FISCHER	OCC	SANTA FE.
M.T. Smith	Shell Oil Co	Midland, Tex
R.E. Powers	[illegible]	[illegible]
DAVID W. STEPHENS	GULF OIL CORP.	FORT WORTH
[illegible]	"	Roswell
K.J. Kenney	[illegible]	[illegible]
J.L. [illegible]	Indiana Oil Purch Co	Midland Tex.
[illegible]	Shell Oil Co	Houston, Tex
[illegible]	" " "	" "
H.L. B[illegible]	Gulf Oil	Ft Worth,
J.W. McClure	Shell P.L.	Farmington
R.E. Brusckat	Amerada	Hobbs
O.C. McBryde Jr.	Amerada	Midland
[illegible]	Indiana Oil Purch. Co.	"
[illegible]	The Texas Co	"
Bill McComb	Malco	Roswell
[illegible]	[illegible] Stockman	Santa Fe

ILLEGIBLE

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NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE July 14, 1958 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
J. L. Hadney	Humble Oil & Ref. Co	Midland, Texas
[illegible] Davis	Humble	Midland
[illegible]	"	Roswell
Bill Sullivan	E.P.N. Gas Products Co	Farmington
[illegible]	McWood Corp	Abilene
[illegible] McAlpin	McWood Corp.	Midland
[illegible]	E.P. Nat. Gas Prod. Co.	El Paso
[illegible] W. Runyan	O.C.C.	Hobbs
E. P. [illegible]	OCC	Aztec
V. C. [illegible]	Amerada	Tulsa
[illegible]	Amerada	Monument, N.M.
[illegible] Jr.	Tenneco Oil	Hobbs
[illegible]	El Paso Natural Gas Co	El Paso
[illegible]	Amerada Pet. Corp.	Monument N.M.
R. L. Denton	Magnolia	Midland Tex
[illegible] Moore	Continental	Roswell, N.M.
[illegible]	Continental	Artesia, N.M.
C. T. [illegible] Jr.	Cactus Pet., Inc.	Midland Texas

ILLEGIBLE

NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE July 16, 1958 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
[illegible]	U.S.G.S.	Roswell
[illegible]	USGS	"
Tom McClain	Sinclair [illegible]	"
[illegible] Kellough	Gulf Oil Corp	Denver
[illegible]	[illegible]	[illegible]
[illegible]	Shell Oil	Los Angeles.
R.R. Robison	" "	Farmington
F.C. Hunt	" "	Los Angeles
[illegible] Baker	OSO	Midland
[illegible]	Shell	Midland
J.W. Brown	Pan Amer. Pet. [illegible]	Roswell
E.C. [illegible]	NMOCC	Aztec
W.S. Mitchell	Gulf [illegible]	[illegible]
R.S. [illegible]	Amerada	Tulsa Okla
[illegible], Jr.	El Paso Natural Gas	[illegible] N.M.
[illegible] W. Kellahin	Kellahin & Fox	Santa Fe
[illegible]		Hobbs
[illegible]	Great Western Drilling Co.	Midland.
[illegible]	OCC	[illegible]

ILLEGIBLE

NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE July 16, 1958 TIME: 9:00 a.m.

NAME	REPRESENTING	LOCATION
[illegible]	[illegible]	Roswell
[illegible]	Cooley & Holcomb	Midland
[illegible]	Standard Oil of Texas	Houston
[illegible]		
[illegible]	Continental Oil Co	Ponca City, Okla
[illegible]	OCC	Artesia

ILLEGIBLE

INDEX

ORVILLE R. PHELPS

HAROLD C. KIDD

E. C. MEHER

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico
July 16, 1958

IN THE MATTER OF:	
The hearing ordered to be called by Order No. R-1031 to permit Amerada Petroleum Corporation and other interested operators to appear and show cause why 320-acre spacing and the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool in Lea County, New Mexico, as set forth in Order R-1031 should be continued in effect beyond August 31, 1958.	Case 1276
In the matter of the hearing ordered to be called by Order No. R-1091 to permit Amerada Petroleum Corporation and other interested operators to appear and show cause why 320-acre spacing and the Special Rules and Regulations for the Bagley-Upper Pennsylvanian Gas Pool in Lea County, New Mexico, as set forth in Order R-1091 should be continued in effect beyond August 31, 1958.	Case 1325
In the matter of the hearing ordered to be called by Order No. R-1136 to permit Amerada Petroleum Corporation to appear and present additional evidence as to the proper designation of the oil producing intervals in its State BTO No. 1 Well located 990 feet from the South line and 2310 feet from the East line of Section 34, Township 11 South, Range 33 East, in the Bagley-Pennsylvanian area of Lea County, New Mexico, and to show cause why the above-described well should be permitted to continue to produce as a dual completion.	Case 1384

BEFORE:

Mr. A. L. Porter
Mr. Murray Morgan

TRANSCRIPT OF HEARING

DEARNLEY · MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE NEW MEXICO
Phone CHapel 3-6691

MR. PAYNE: In the matter of the hearing ordered to be called by Order No. R-1031 to permit Amerada Petroleum Corporation and other interested operators to appear and show cause why 320-acre spacing and the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool in Lea County, New Mexico, as set forth in Order R-1031 should be continued in effect beyond August 31, 1958.

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In the matter of the hearing ordered to be called by Order No. R-1136 to permit Amerada Petroleum Corporation to appear and present additional evidence as to the proper designation of the oil producing intervals in its State BTO No. 1 Well located 990 feet from the South Line and 2310 feet from the East line of Section 34, Township 11 South, Range 33 East, in the Bagley-Pennsylvanian area of Lea County, New Mexico, and to show cause why the above-described well should be permitted to continue to produce as a dual completion.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox representing Amerada Petroleum Corporation. At this time I would like to move for the consolidation of the hearing 1276, 1325 and 1384, all of which

appear on the docket for today. The reason for the consolidation being that the technical information involved in these three cases is similar and the exhibits to be used have been prepared in order that the Commission might have a full and complete picture of all of the producing intervals involved in the area. I believe it would be clearer and would certainly save a considerable amount of time if the three cases were consolidated for purposes of the hearing.

MR. PORTER: Is there objection to the consolidation of Cases 1276, 1325 and 1384? The cases 1276, 1325 and 1384 will be consolidated for the purpose of testimony.

MR. KELLAHIN: We will have three witnesses, Mr. Phelps, Mr. Kidd and Mr. Winger.

MR. PORTER: Let's stand and be sworn at this time.

(Witnesses sworn.)

MR. KELLAHIN: I would like to call as the first witness, Mr. Phelps.

ORVILLE E. PHELPS

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

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Would you state your name, please?

A Orville E. Phelps.

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

A I am employed by the Amerada Petroleum Corporation as

geologist.

Q Where are you employed?

A I'm employed at the Monument Office, Monument, New Mexico.

Q Have you ever testified before this Commission in the past and had your qualifications accepted?

A No, sir, I haven't.

Q Mr. Phelps, would you state briefly for the benefit of the Commission your educational qualifications and experience as a geologist?

A I have a B. S. Degree from the University of Kentucky, Class of 1950, I have been employed under the supervision of Amerada Petroleum since June of '51 to the present time.

Q Where have you worked during that period, Mr. Phelps?

A During that period I have worked two and a half years at the Tatum Office, Tatum, New Mexico and Midland Office, Midland, Texas, and the Monument Office in Monument, New Mexico.

Q Have you had any particular experience in the area involved in the three cases now being heard, Mr. Phelps?

A Yes, sir, I have. At the time that I was at Tatum, New Mexico, the Bagley Field was being defined and I was sitting on the wells that were drilled at that time there.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. PORTER: Yes, sir, they are.

Q Now, Mr. Phelps, have you made a study of the questions

involved in the Bagley-Upper Pennsylvanian and Bagley-Lower Pennsylvanian Pools? A Yes, I have.

Q As well as the area involved in the Amerada State BTC Well No. 1?

A That is correct, sir, I have.

Q Now, referring to what has been marked as Exhibit No. 1, You have the Exhibits before you, do you not?

A Yes, sir, I have.

Q Will you state what that is?

A The Exhibit No. 1 is a plat of the Bagley-Upper Pennsylvanian Gas Pool. It shows with the dotted bandr the horizontal limits of the Bagley-Upper Pennsylvanian Gas Pool. The red lines show the individual gas units, the gas wells circled in red are unit gas wells. There's a dashed line running approximately north, in a north-south direction to indicate the line that the cross section was made that will be used later on as an exhibit in this hearing.

Q You said that the gas wells are circled in red. By that, does that refer to wells completed in the Upper-Pennsylvanian Gas Pools?

A That's right. The wells that have been completed in the Upper Pennsylvania Gas Pool.

Q Now, referring to what has been marked as Exhibit No. 2, would you state what that shows?

Exhibit No. 2 is a plat of the Bagley Field showing the Bagley-Lower Pennsylvanian Gas Pool. Again we have a dotted band outlining the horizontal limits of the pool, the red lines indicate the individual gas units, the wells circled in red indicate unit gas wells.

Q Now, referring to what has been marked as Exhibit No. 3, Mr. Phelps, would you state what that is?

A Exhibit No. 3 is a structure map on the top of the Pennsylvanian which is also the top of the Bagley-Upper Pennsylvanian Gas Pool.

Q Is this structure map substantially the same as the structure map which was previously offered in the case involving the Upper Pennsylvanian Gas Pool? A Yes, sir, it is.

Q There have been, however, some changes, is that correct?

A Yes, sir, there has been some minor changes made on it.

Q For what reason?

A Well, different, in two different people contouring and probably a slight difference in the electric log points that could have been picked for it.

Q Did you have some more recent development on which you made some changes too?

A Yes, sir, we have had, a recent well has been drilled since the other maps were made that gave us additional information to make this map on.

Q What are these contours based on, Mr. Phelps?

A Contours are based on correlative points from electric logs or gamma ray neutron logs that are correlated over the entire field.

Q Have you also been able to pick this marker from sample cuttings?

A Yes, sir, this is a point that can be picked from sample cuttings.

Q Now, Mr. Phelps, do these contours indicate the horizontal limits of the pool?

A No, sir, they do not indicate the horizontal limits of the Bagley-Upper Pennsylvanian Gas Pool.

Q They are based them on the structure alone?

A That's correct.

Q Is it productive on the east side of the pool or do you know?

A To my knowledge there's not any production on the east side of the pool in the Bagley-Upper Pennsylvanian Gas Zone.

Q Now, referring to the Exhibit 2, it appears that you show at least partially a separate structure in the northwest portion of the exhibit, what do you base that on?

A I did show a separate structure in the northwest portion of this map, and that's based on two wells that's not shown on this map, one well being the Amerada No. 1 Kelsy which is located in Section 28, Township 11 South, Range 33 East.

Now the point in question here, the top of the Pennsylvanian, or the top of the Bagley-Upper Pennsylvanian Gas Zone, is approximately flat with Mathers No. 1-B Well in the northwest portion of the map. The second well that I used to point was Moss No. 1 State that's located in the section due west of 33 which is Section 32 in the southwest of the southwest quarter, that well was approximately 25 feet low on top of the Pennsylvanian to the Mathers B No. 1 Well.

Q Now, is there another well drilling in the vicinity of this Mathers B No. 1 Well?

A That is correct. The Amerada No. 2 State BTM is at the present time drilling.

Q What is the location of that well?

A That well is located in the southeast of the northeast Section 33, Township 11 South, Range 33 East.

Q It is not shown on this exhibit?

A Yes, sir, it is shown as a drilling well on this exhibit.

Q Now, have any tests been made of the Upper Bagley Pennsylvanian Zone in this well?

A Yes, sir, a test was made on the Bagley-Upper Pennsylvanian Zone and that test gave up 877,000 cubic feet of gas per day on a four hour test. I might also state that the top of the Pennsylvanian was flat to the Mathers B No. 1 Well to the west of the BTM No. 2.

Q You mean then that the structural position of your BTM No. 2

Well is substantially the same as the Mathers B No. 1, is that right?

A That is correct.

Q The Mathers B No. 1 is an oil well, is it not?

A That is correct, the Mathers B No. 1 is an oil well out of the same zone.

Q Now, referring you to what has been marked as Exhibit No. 4, will you state what that is, Mr. Phelps?

A Exhibit No. 4 is a structure map on top of the BTO Oil Zone.

Q Is the BTO Well No. 1 marked in red?

A No, sir, the BTO Well is not marked in red, but it is located in the southwest of the southeast of Section 34, Township 11 South, Range 33 East.

Q That shows as a dual completion, does it not?

A That is correct.

MR. KELLAHIN: I believe it's marked on the other exhibits.

MR. PORTER: Circled in red?

MR. KELLAHIN: Circled in red.

A I'm sorry.

Q What is the basis of your contours in this exhibit, Mr. Phelps?

A The basis of the contours on this structure map are picked from electric logs on a correlative point that can be carried over the entire field.

Q This Exhibit would indicate that the structure of the BTO

Oil Zone is present over the entire area, is that correct?

A That is correct.

Q Have you any comment to make as to its characteristics throughout the zone?

A Well, the zone is present but porosity is not developed throughout the zone. From the information we have, the only well that porosity has been developed in within that zone is the BTO No. 1.

Q Have you examined cuttings of sample logs in connection with that question? A That is correct.

Q Then you did not find porosity development anywhere except in that one well?

A That's the only well we found it developed in. Now, on our BTM 2, the well that is now drilling, we tested the same zone in that well, we recovered 20 feet of drilling mud with no shows of oil or gas or water.

Q Where would you say then the productive area in the BTO Zone is located in reference to the area shown on the exhibit?

A Just immediately around the BTO No. 1 Well.

Q In your opinion it's not present on any of the offsetting acreage to any extent?

A No, sir, it's not.

Q Now, referring to what has been marked as Exhibit No. 5, Mr. Phelps, could you state what that is?

A Exhibit No. 5 is a structure map on top of the Bagley-Lower Pennsylvanian Gas Zone.

Q Is this exhibit substantially the same as the contour map presented in the previous hearing on the Bagley-Lower Pennsylvanian Oil Pool case? A Yes, sir, it is.

Q There are, however, some changes in it?

A There are some minor changes due to the difference in the contouring and probably some minor changes, one being the recent well that has been completed since the other maps were made that have additional information to use on this one.

Q What well would that be?

A That would be the BTO No. 1 Well.

Q What is the basis of your contours on this map?

A Contours are based on correlative electric log points that can be carried over the entire field.

Q Do you find a definite marker on which you can base that?

A By electric logs you can, yes, sir.

Q Now, does this indicate that the entire area is productive, Mr. Phelps?

A No, sir, this map will indicate on the north, west and south partial limits of the production where to the east production is based partially on structure and porosity pinchout.

Q But primarily the productive area of the Bagley-Lower Pennsylvanian, with the exception of the east side, is a structural

area, is it not?

A That is correct, on the western side of it.

Q Now, Mr. Phelps, referring to Exhibit No. 6 which is the cross section, would you state what that shows? If you like you can refer to the one that has been placed on the board.

A All right. Exhibit No. 6 is a north-south cross section across the Bagley Field as indicated on Exhibit 1 by the dashed line.

Q Does that indicate to you that there is separation of the various zones involved in these hearings?

A Yes, sir. If you would like we will take these zones as they come. The top zone shown in green is the Bagley-Upper Pennsylvanian Gas Zone; as you can see, that's a correlative point that is carried all the way across the field from north to south. The second zone is the BTO Oil Zone, and as we have colored in around the BTO Well it shows that that is the only place that that is productive across there. The separation between the top of the Pennsylvanian, Upper Pennsylvanian Gas Zone and the BTO Oil Zone remains fairly constant and it has a minimum of 78 feet separation with a maximum of 135.

Now the third band colored in brown is the main pay in the Bagley Pennsylvanian Field. The fourth band colored in green is the Bagley Lower Pennsylvanian Gas Zone.

Q Now, in your opinion is there a complete separation

between the upper gas zone and the zones shown on the BTO Well?

A Yes, sir, there is. There's, as I stated before, there's a minimum of 78 feet separation and a maximum of 135, that interval being a dense line with shale stringers in it.

Q You show on that exhibit again that the BTO Oil Zone is a continuous structural formation. Have you examined the micrologs to see if there is any microlog porosity in the other wells?

A Yes, sir, I have. From micrologs the porosity is not defined within that zone in the other wells in the field.

Q Now, in your opinion is there a separation of the BTO Oil Zone and the Pennsylvanian Oil Zone shown on the exhibit?

A Yes, sir, there's separation between those two zones. However, that separation is not quite as great as it is between the Bagley-Upper Gas Zone and the BTO Oil Zone.

Q Do your sample logs verify your pics on the wells?

A What?

Q Do your sample wells verify your picks as shown on your electric logs?

A It does on top of the Pennsylvanian and on your regular Bagley Oil Zone your sample logs will verify those points.

Q Were they also verified by drill stem tests in some instances?

A Yes, sir, those zones have been drill stem tested, show where you do have porosity deposited and also where it gives up

fluid.

Q In your opinion are the upper and lower gas zones continuous throughout the section? A Yes, sir, they are.

Q Would they, as a geologist, is it your opinion that development on a basis of 320 acres would result in a full development of the area? That is, based on the continuity of the formation and your information available to you.

A Which zone are you speaking of?

Q Well, let's take first, in your opinion would 320 acre development of the Bagley-Upper Pennsylvanian Gas Zone be efficient and economical?

A Yes, sir, it would. You do have continuity all across there.

Q Would your answer be the same as to the Bagley-Lower Pennsylvanian Gas Zone? A That is correct.

Q Does that exhibit likewise show the microlog pay, Mr. Phelps?

A Yes, sir, our microlog pay is shown in black on each well opposite the porous zone.

Q And that has been shown also on the BTO Oil Zone, is that correct?

A Yes, sir, it shows it on the BTO Oil Zone, on the BTO No. 1 only. It is not present on other wells shown in that cross section.

Q Mr. Phelps, in preparing for this hearing did you examine the cross sections which were presented in the previous hearings in these cases? A Yes, sir, I did.

Q Have you also examined the transcript presented in those cases? A Yes, sir.

Q Are you in agreement with the testimony which was offered in that connection in those hearings? A Yes, sir.

Q With the exception, of course, with the changes that you state that you have made? A That is correct.

Q Were Exhibits 3, 4, 5 and 6 prepared by you?

A Yes, sir, they were.

MR. KELLAHIN: At this time we would like to offer in evidence Exhibits 3, 4, 5 and 6. There will be further testimony offered as to Exhibits 1 and 2 and we will offer them later.

MR. PORTER: Is there objection to the admission of these exhibits? It will be received.

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

MR. PORTER: Any questions of Mr. Phelps?

MR. CAMPBELL: I assume there will be a witness who will testify as to the producing history of the BTO No. 1 Well. I have no questions.

CROSS EXAMINATION

By MR. UTZ:

Q Mr. Phelps, are you recommending any change in the vertical limits of the upper and lower and the middle oil zone from the present limits as stated by the Commission?

A I think the engineers have the information or data on that.

Q They will testify as to that?

A It will be taken up later, yes.

MR. UTZ: That's all I have.

MR. PORTER: Anyone else have a question? Mr. Phelps may be excused.

(Witness excused.)

MR. KELLAHIN: I call as the next witness Mr. Harold Kidd.

HAROLD C. KIDD

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

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Would you state your name, please?

A Harold C. Kidd.

Q By whom are you employed and in what position, Mr. Kidd?

A Employed as a petroleum engineer by Amerada Petroleum Corporation in Tulsa, Oklahoma.

Q Have you testified before this Commission in the past?

A Only at Examiner Hearings. I have never testified at a Commission Hearing.

Q For the benefit of the Commission, Mr. Kidd, would you state briefly your education and experience as a petroleum engineer?

A Yes, sir. I'm a graduate petroleum engineer with a degree, a B. S. Degree in petroleum engineering from the University of

Tulsa, I graduated in 1948 and have been employed since as a petroleum engineer, oh, approximately six years I have been employed by Amerada.

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

MR. PORTER: Yes, sir.

Q Mr. Kidd, would you refer to Exhibit 1, which has already been discussed, and describe the location of the producing wells and the units shown on that exhibit?

A Yes, sir. Exhibit 1 is a plat of the Bagley-Upper Pennsylvanian Gas Pool, and as mentioned before, the gas units are outlined in red while the producing well on the unit is circled in red. The first unit or BTK Unit which includes the south half of Section 34 and our BTK No. 1 is the unit well. There's another unit in the field, a 320 acre unit of Texas and Pacific State C, Ac/2 Well No. 1. Their unit now covers the north half of Section 4 and it's 320 acre unit. Our Mathers 2 unit is a 320 acre unit, covers the southeast quarter of Section 3 and the northeast quarter of Section 10. We have one other unit in the field. It's our Caudle No. 7 unit. We show it here in a dotted red line as a 320 acre unit.

The royalty interest under that unit have signed, it's a part Federal lease and has been proved locally by the Federal Government and been sent to Washington for final approval. We expect that back at any time, and at that time it will be a 320 acre unit.

Q Referring to Exhibit No. 2, would you give the same information?

A Exhibit No. 2 is a plat of the Bagley-Lower Pennsylvanian Gas Pool. It shows our State BTO Unit covering the south half of Section 34 with the State BTO No. 1 as the unit well. It shows the Shell Amerada State A Unit which covers the southeast quarter of Section 33, a 160 acre unit, and the well shown is the unit well. It shows Texas and Pacific's State Ac/2 C No. 1 Well, it's 160 acre unit. It covers the northeast quarter of Section 4 and it shows our Caudle 7 Unit again as a dotted outline in a dashed red line. It is shown here as a 320 acre unit.

Now, we have been producing this unit on 80 acres, but the royalty interests have signed and this unit too has been sent to Washington for final approval, and we would produce it in a short while as a 320 acre unit.

Q Now, referring to what has been marked as Exhibit No. 7, will you state what that is, Mr. Kidd?

A Yes, sir, Exhibit No. 7 is an isopachous map showing the net gas pay in the Bagley-Lower Pennsylvanian Gas Pool. The microlog pay picks of each well are shown by the well and the map has been contoured on ten foot interval.

Q Is that based on microlog pay? A Yes, sir, it is.

Q Does that, in your opinion, outline the productive limits of the Lower Pennsylvanian Gas Zone in the Bagley Pool?

A Yes, sir, it does. The zero isopack line to the southwest, and to the north is located and controlled by structure while the zero line on the east side represents a porosity pinchout. An examination of logs in the area show the wells to the east of the zero line have no microlog pay, and while the wells to the west do have microlog pay.

Q Now, have you calculated the number of productive acres as shown by this exhibit?

A Yes, sir, I have. The productive area covers approximately 2,000 acres and represents 40,000 acre feet of net gas pay. This is in very close agreement to pressure volume calculations which will be presented later for this zone.

Q Now, have you prepared a similar exhibit showing the net pay in the Bagley-Upper Pennsylvanian Gas Zone?

A No, sir, I have not. I have attempted to prepare one, but the microleg pay in the Bagley-Upper Pennsylvanian Zone is so erratic that it's almost impossible to make an isopachous map of it. It's not based on structure, it appears to be solely a porosity development and you have wells with six feet of pay surrounded with wells with 14 to 20 feet of pay. It was so erratic that I didn't attempt to prepare it, or I attempted to, but I didn't prepare it.

Q Now, have you prepared the productive data on the Bagley-Upper Pennsylvanian Gas Zone? A Yes, sir, I have.

Q Referring to Exhibit No. 8, would you state what that shows?

A Yes, sir. Exhibit No. 8 is a tabulation of gas and distillate production by months and by years for each of the producing wells from the Upper Pennsylvanian Gas Zone.

Q The Exhibit includes several sheets which are numbered 8 through 11. Are those different exhibits?

A Yes, sir, there are a series of exhibits that have been stapled together, but they have been marked by their exhibit number. Exhibit 8 is two pages, the first page showing gas production in MCF and the second page showing distillate production in barrels.

Q And then the Exhibits 8, 9, 10, and 11 are put together?

A Yes.

Q Will you give us a summary of the information on Exhibit No. 8?

A It can be summarized by saying that gas production to July 1, 1958 totaled 2,161,759 MCF while distillate production to that date totals 72,943 barrels. The pool has been produced continuously since April, 1951. There are three wells now on production and an additional well will be added as soon as the 320 acre is approved for the Caudle No. 7.

Q The Caudle No. 7 has not been produced from this zone?

A No.

Q Now, referring to Exhibit No. 9 which is attached to the exhibit, will you state what that is?

A Exhibit 9 is a bottom hole pressure history of the Amerada wells completed in the Bagley-Upper Pennsylvanian Gas Pool. Pressures shown here are taken at a subsea datum of minus 4445 feet.

Q What is the reason for the subsea datum of 4445?

A That sets up the mid portion of the producing interval in the Upper Pennsylvanian Gas Zone.

Q Do you have any comment in regard to the pressures?

A Yes, sir, I would like to just describe the pressures. The last pressure run on each well, Mathers No. 2, 6-27-58 was 2513 pounds. Candle No. 7 at the same date was 2404 pounds. State [illegible] No. 1 on June 20, 1958 was 2377 pounds, and Mathers "B" 1 on the same date had a bottom hole pressure of 1959 pounds.

Q Is that, in your opinion, a fairly uniform pressure in the gas zone?

A Yes, sir, I believe that the pressures are reasonably uniform in the gas zone and would indicate that the drainage is occurring throughout the reservoir.

Q Can you account for the differences that do appear to exist on those wells?

A Well, the higher pressure for the Mathers No. 2 can be attributed to the fact that the well has been off production for the last eight months. We haven't produced it for that period and has been shut in continuously since.

Q In your opinion as an engineer, would that indicate that drainage is occurring throughout the reservoir?

A Yes, sir, it does.

Q What is the significance of the pressure shown on the

Mathers "B" No. 1 Well?

A Well, the Mathers "B" No. 1 Well is the oil well completed in what has been called the Bagley-Upper Pennsylvanian Zone. The pressure on that well was 1959 pounds after 69 hours of shutin, which is approximately 500 pounds lower than the average pressure of the gas reservoir.

Q That is completed at approximately the same structural position as the gas well, is it not? A Yes, it is.

Q It would seem to indicate a higher pressure than the initial pressure, is that correct?

A Yes, it does. We just ran a buildup test on the well and we found that it required almost 69 hours for the well to build up to true reservoir pressure. You can note that the earlier pressure on Mathers "B" 1 had only been shutin 48 hours at the time that we ran it and didn't give us a true reservoir pressure at that date. I think too that the difference in pressure here between the Mathers "B" 1 and the other gas wells in the pool is, on further confirmation of the fact, that the well is structurally separated from the main gas pool.

Q Now, referring to what has been marked as Exhibit No. 10, will you state what that is?

A Exhibit No. 10 is a tabulation showing reservoir pressure minus 4445 datum, cumulative gas production in MCF, cumulative distillate production, total withdrawals in equivalent to MCF of

gas, and the calculated drainage area in acres.

Q That is for the Bagley-Upper Pennsylvanian?

A Yes, sir, it is.

Q How did you arrive at these pressures?

A Well, inasmuch as the early pressure points represented only a small portion of the actual reservoir, I prepared a pressure versus time decline curve for each of the other Pennsylvanian wells that we had any pressure history at all on. From these curves I went back to our pressure points where we had a pressure and calculated what the pressure would have been at the other wells in the pool at that date. These pressures were then averaged together to give what I would consider a more representative reservoir pressure.

Q Now, the final column on the exhibit shows the calculated drainage area in acres. How do you arrive at that figure?

A The last column represents a material balance calculation to determine the volumetric area of the reservoir being drained, and it is based on the pressure-production history of the reservoir. The calculations have been converted to area in acres by assuming an average reservoir porosity of 6%, a water saturation of 20%, and average pay thickness of 15 feet.

Q That then totals a calculated drainage area of 2257 acres?

A Yes, sir, it does.

Q That is the figure that you referred to in connection

with your testimony on the preceding exhibit?

A Yes, sir, it is. I believe maybe I misunderstood you then.

Q I stand corrected, you do not have an isopack on the upper zone?

A No, I don't.

Q What is the significance of the uniformity in pressures shown on the last eight points on this exhibit, Mr. Kidd?

A I would say that the uniformity of the last eight points would indicate that the data and calculations used here are reliable and that the productive area of the field is approximately 2257 acres.

Q Based on that calculation, does this indicate to you that one well completed in the Bagley-Upper Pennsylvanian Gas Pool will drain not less than 320 acres?

A Yes, sir, it does, inasmuch as three wells are all that's producing from the reservoir at the present time, and during this period where we have drainage area calculations, that would give an average drainage area per well of, oh, in excess of 700 acres.

Q Now, referring to what has been marked as Exhibit No. 11, would you state what that shows?

A Exhibit No. 11 is a graph on which bottomhole pressure has been plotted versus reservoir withdrawals. The data presented here is, was taken from part of the data in Exhibit 10. Here again the graphs show the uniformity of our last eight pressure points and is indicative of the behavior that might be expected from a

normal gas reservoir.

Q Is the behavior you have found there consistent with what you would expect from a normal gas reservoir?

A Yes, it is.

Q Does this give an indication of the future performance of the reservoir?

A Yes, it does. You could use this as a basis for determining your future reserves.

Q As I understood you, in effect you have stated that in your opinion one well would efficiently and economically drain 320 acres. Do you have any additional evidence to support that opinion?

A Yes, sir, we have. We have good interference data using shut in pressure in Caudle #7 while only Mathers #2 was producing from the reservoir. Caudle #7 declined 17 pounds from February, 1957 to October, 1957, while Mathers #2 was the only well producing from the reservoir.

Q What is the distance between those two wells?

A The Mathers #2 is located approximately 4500 feet from Caudle #7.

Q If that indicates drainage, what area will one well drain?

A I haven't calculated, but it would be approaching 2,000 acres on the 40 foot radius. We have additional information on Caudle 7, an additional drop of 271 pounds has occurred in the last eight months with Mathers #2 shut in and Texas-Pacific's well being

the only well producing from the reservoir for seven of the eight months. Texas and Pacific's well is 2500 feet away, indicating it is draining an area of at least 450 acres.

Q Now, what was the initial pressure on this State M #2 Well in this zone?

A Well, we have additional information taken from the drill stem test on our State BTM #2. It was drill stem tested in the Upper Pennsylvanian and flowed at a rate of 877 cubic feet per day. The initial shutin pressure was 2400 pounds, which is identical to the reservoir pressure in the remainder of the field. State BTM No. 2 is 3600 feet from the nearest producing well in the gas reservoir.

Q That would, in your opinion, indicate that drainage had occurred in the vicinity of the location of State "M" No. 2 Well?

A Yes, sir, it would.

Q Now, referring to what has been marked as Exhibit No. 12, will you state what that shows?

A Exhibit No. 12 is a tabulation of gas production in MCF and distillate production in barrels by months and by years for each of the wells producing from the Bagley-Lower Pennsylvanian Gas Zone.

Q Likewise attached to that exhibit are Exhibits 13, 14 and 15, is that correct?

A Yes, sir, they are all stapled to it, but have been marked with their proper exhibit numbers.

Q Would you give us a summary of the information contained on Exhibit 12?

A Yes, sir. Gas production to July 1, 1958 totaled 3,650,814 cubic feet of gas while distillate production totaled 229,876 barrels. The pool has been producing continuously since June, 1954, and there are now four producing wells in the pool.

Q Now, referring to Exhibit No. 13, would you state what that is?

A Yes, sir. Exhibit 13 is a bottom-hole pressure history of the Amerada wells in the Bagley-Lower Pennsylvanian Gas Pool. Pressures here are shown at minus 5500 foot datum, which again represents the approximation of the mid point in the producing interval.

Q Could you give us the latest pressures on that as shown by that exhibit?

A Yes, Amerada Shell State "A" No. 1, pressure shown as 6-30-58 was 2813 psig. Caudle No. 7 on 6-20-58 had a pressure of 2551 pounds. The State BTO No. 1 on 6-20-58 had a pressure of 2665 pounds.

Q In your opinion is that a fairly uniform pressure?

A Yes, sir, I believe these pressures are reasonably uniform, and here again do indicate that drainage is occurring throughout the reservoir.

Q How do you account for the difference on the Caudle No. 7

Well?

A There are two factors that could account for the factors. I don't know which one is correct. Caudle No. 7 has a dual completion tool in the hole that prevents us from running to all run depths, so we have to calculate our pressure to actual run depth. It is possible that the Caudle 7 is completed in a tighter area of the reservoir and has a lower permeability than the rest and would require a longer time to build up and actually reach true reservoir pressure.

Q On the basis of the information obtained on the pressure history, does that indicate to you that drainage is occurring throughout the reservoir?

A Yes, sir, it does. I would like to point out the pressure performance of our State BTO No. 1 Well. At completion a pressure was run on Jan. 27, 1958 and we had obtained a bottom-hole pressure of 3,030 pounds. The well was left shut in and was not produced from January until April 22nd when we went in and obtained another pressure. We got a pressure of 2917 pounds. This represents a decrease in pressure for the well of 113 pounds while it had been shut in.

The nearest producing well to our BTO was the Caudle No. 7 located approximately 1900 feet away. If you would assume a drainage area, or take a drainage area from that, it would give you a minimum drainage area for Caudle No. 7 of 260 acres.

Q Now, referring to Exhibit 14, would you state what that shows?

A Exhibit No. 14 is a pressure production summary for the Bagley-Lower Pennsylvanian Gas Pool, shows pressure at a minus 5500 feet. Shows cumulative gas production in MCF, cumulative distillate in barrels, and total withdrawals equivalent or expressed as MCF gas, and it shows the calculated drainage area in acres.

Q What are your pressure figures based on on this exhibit?

A Here again, pressure versus time curves were prepared for each well in the field that we had any pressure history on at all, and at the dates where we had pressures on say one well, why we would calculate from the graphs what the pressure would have been at the other wells in the pool and then average those pressures together to obtain what we considered a more representative or true reservoir pressure.

Q What is the significance of the drainage area calculation?

A Here again the drainage area calculation is a material balance calculation to determine the volumetric area of the reservoir that is being drained and is based on pressure production history of the reservoir. The calculations again have been converted to area in acres by using a reservoir porosity of 6%, water saturation of 20%, and an average pay thickness of 20 feet.

Q That results in a total calculated drainage area of some

1900 acres?

A Yes, it does. You might point out here that the 1900 acres compares to 2,000 acres obtained from the isopack map. We had 14,000 acre feet of the isopack map using this while we would have slightly in excess of 38,000 acre feet of gas pay.

Q Does this indicate that the wells are draining not lower than 320 acres?

A Yes. Inasmuch as four wells are now producing from the reservoir that we have defined as being productive over the 1900 acres It gives an average of 475 acres to the current well in the field.

Q Referring to Exhibit 15, would you state what that shows?

A Exhibit No. 15 is a graph of bottom-hole pressure versus reservoir withdrawals for the Bagley-Lower Pennsylvanian Gas Pool. Here again the data used on the plot was taken from Exhibit No. 14 and shows the uniformity of pressures that have been obtained over the production or producing life of the field. The behavior again is typical of what would be expected of a normal gas reservoir.

Q Does it give an indication of the future performance of this reservoir? A Yes, it does.

Q Now, referring to what has been marked as Exhibit No. 16, state, before we get to that, Mr. Kidd, I would like to ask you this question. You have indicated that in your opinion, and based on your examination, one well is draining in excess of 320 acres. Do you have any additional information to support your conclusion

on that?

A Yes, I do. We have an interference test which was reported at the previous hearing on the Bagley-Lower Pennsylvanian Gas Reservoir, and the interference test was run between our Caudle No. 7 and Shell State "A" No. 1 run in July, 1957. The Shell State "A" No. 1, after being shut in and reaching a stabilized reservoir pressure, declined a total of 26 pounds in 90 hours as a result of gas production at a rate of four million cubic feet per day from Caudle No. 7. The two wells are 2750 feet apart, indicating Caudle No. 7 was draining a minimum area of 545 acres.

I think, too, that the pressure data presented earlier pertaining to decline of State BTO while being shut in only showing a minimum drainage area of 260 is indicative that drainage can and does occur in excess of over 320 acres.

Q In connection with the previous hearings in these three cases, and the members of the Commission Staff asked for additional information, do you have any production test data available?

A Yes, sir, I do. It has been submitted as Exhibit No. 16. Exhibit No. 16 is production test of the Bagley-Pennsylvanian wells, and it has been separated to Bagley-Upper Pennsylvanian Gas Zone, Bagley State BTO Oil Zone, and the Bagley-Lower Pennsylvanian Gas Zone. Then for each well we show the date of test, oil production during test, water production in barrels, gas production in MCF producing GOr, tubing pressures where available, and gravity in

degrees API where available. The first column is oil or distillate production. We haven't made any distinction.

Q There would be in effect two oil wells shown on that exhibit?

A Yes, Mathers "B" No. 1 and State BTO No. 1. I would like to point out the performance of the wells, Mathers "B" No. 1 we have shown three tests here. I have an additional test which may be of interest, a test taken July 12, 1958, which shows the well producing 38, a trace water, 389.2 MCF gas. A GOR of 10,054, tubing pressure of 160 pounds. The way that well is performing by the test you can see it is declining in both oil and gas. However, the gravity of the oil produced by the well is 44.8 as shown, which is a typical oil gravity in the field.

Q Has the gas-oil ratio been performing as was anticipated on this well?

A Yes, sir, it is going up, but actually the performance indicates that the well will never be probably a large gas producer. Now the State BTO Well, BTO No. 1, we have three tests shown here. These tests also show that production has declined from 66 barrels per day in January of '58 to 31 barrels per day in June, 1958. Gas volume, produced gas volume from the wells is also declining, GOR therefore is declining. And here again the gravity is a typical oil gravity of 46.7.

Q Would the gas-oil ratio and the produced gas figures

indicate to you that that well is in any way connected with the Bagley-Upper Pennsylvanian Gas Zone?

A No, sir, it would not. It indicates to me that the well is producing from just a localized zone of porosity and that we are rapidly depleting the reservoir and will not recover much additional oil from the well. The only other thing I might point out here, Caudle No. 7 has a distillate gravity of 57.8 which is the lowest and considerably below the other gravities of the distillate wells in the area. We attribute the lower distillate in Caudle No. 7 to be caused by obtaining most of the gas production from the perforated interval in the well from a lower section than we're getting production in the other wells in the field. Actually the well is just as high as any other well.

Q Now, the Commission Staff likewise requested information be furnished on the Mathers "B" No. 1 Well. Do you have an exhibit showing that?

A Yes, sir, I do. Exhibit No. 17 shows production data for Mathers "B" No. 1. It's the well that is now classified as producing from the Bagley-Upper Pennsylvanian Zone. This exhibit shows monthly oil production in barrels, monthly gas production in MCF, and the producing GOR of the well by months during its producing life.

Q Has that well been produced at capacity?

A Yes, sir, it is. Production performance is poor and the

decline in oil production and the increase in GOR, well, the decline in oil production and the slight increase in GOR indicates that the well is not in communication with the gas reservoir in my opinion.

Q That would be with the Upper Bagley-Pennsylvanian gas?

A Yes.

Q It's not in your opinion --

A (Interrupting) Not in communication with the regular Bagley-Upper Pennsylvanian Gas Pool, but we are producing.

Q What do you think the situation is in regard to that well then?

A I believe the production performance substantiates the geological testimony presented earlier showing that the well is located structurally separated from the Bagley-Upper Pennsylvanian Gas Pool.

Q Now, on the last figures shown on your production data for May, 1958, you show an increase in the producing gas-oil ratio. What do you attribute that to? Could that be to gas coming out of solution?

A Well, yes, it is, although I can't really say why that we obtain such a sharp increase for that one month. It should have been increasing gradually over the period. The produced gas from this well is all metered gas and sold to Warren, so our gas figure should be reasonably correct, and we are producing at capacity, so the produced GOR should be correct.

Q Now, referring to Exhibit No. 18, would you state what that shows?

A Exhibit No. 18 shows production data of our State BTO No. 1 Well. Here again it shows monthly oil production in barrels, monthly gas production in MCF, and the producing GOR and as listed by months for the producing life of this well.

Q Does that support your conclusion previously stated that this is a small, separate reservoir?

A Yes, sir, it does. Here again we are producing at capacity and have always produced at capacity for this well. It shows a decline in produced oil. It also shows a decline in produced gas which is all sold to Warren. It shows, therefore, a decline in the producing GOR. You can actually plot the decline in oil production on graph paper and it's almost a straight line decline, indicating we are going to obtain very low ultimate recovery from the well; that is it's just, oh, very close to being depleted right now.

Q That again would support your conclusion that there is no communication between the producing oil zone and the Bagley-Upper Pennsylvanian Gas Zone?

A Yes, sir, and all the production of this zone right now just amounts to a salvage operation.

Q Have you any pressure information on BTO Well No. 1?

A Yes, sir, I do. We obtained a bottom-hole pressure in the

well of 1441 pounds, which is 950 pounds below the reservoir pressure of the Upper Pennsylvanian Gas Zone.

Q Does that indicate anything to you in connection with the communication between the two zones?

A Well, here again, it would indicate that the zone is definitely separated from the Upper Pennsylvanian Gas Zone.

Q Now, referring to what has been marked as Exhibit No. 19, would you state what that is?

A Well, Exhibit No. 19 is a marked electric log of Caudle No. 7. I think probably I should clarify something before we actually discuss the marked electric log here. It was prepared as a possible solution to handling the vertical limits situation that has come up in the pool. Now we have two suggestions as to how the vertical limit situation can be handled.

Our first suggestion is to ignore the BTO Oil Zone and actually consider it as an isolated zone of production, and it will only be defined or it is confined say to the immediate area surrounding the BTO Well. If we ignore that and consider it that way, why we can define the limit of the, on the various zones as was previously submitted to the Commission.

In other words, leave the vertical limits just as they are. Those vertical limits are minus 4250 to minus 4510 for the upper zone, minus 4600 to minus 5200 for the oil zone, and the lower zone is minus 5400 to minus 5620. The only conflict that has

come up on vertical limits is the fact that the BTO Oil Zone was productive within about five to seven feet, I believe, of the base of the lower vertical limit for the Upper Bagley-Pennsylvanian Zone. We have shown that the zone is definitely separated from the reservoir in previous testimony, but due to a structural change in the area there are points where the BTO Oil Zone will overlap what is now known as the vertical limit for the upper gas zone.

Our first suggestion would be to just ignore that the BTO oil well is an oil well and producing close to the vertical limits as defined, and treat the vertical limits as they are.

Now, our other suggestion would be to define the limits on the basis of the Caudle No. 7 electric log where we have marked here the tops and bottoms of each of the producing zones in the field. In other words, we could describe the zone not by vertical limit, but by comparison of section to what we have marked here in Caudle No. 7.

Q Now, Mr. Kidd, that producing oil zone is close to the defined vertical limit of the upper zone?

A Yes, sir, it is within ten feet of it.

Q But your actual separation amounts to approximately what?

A Oh, between 78 and 125 feet, as has been testified to.

Q Have you found any evidence whatever that the upper gas zone and the oil zone in State BTO No. 1 are connected?

A No, I have not.

Q You have found evidence to indicate to you that they are not connected?

A I have, and I have also found evidence that that zone probably will not be productive anywhere else than in the BTO well.

Q Now, in connection with these cases, have you made any further study of the economics of developing the gas zones and the oil zones involved here?

A Yes, sir, I have, but maybe I would like to enter two more recommendations that we have on handling the situation here. Now, we recommend that Mathers "B" 1, which is the oil well and is producing from the Bagley-Upper Pennsylvanian Gas Zone, be classified as a separate reservoir and continued on the schedule, or shown in the producing schedule as a wildcat well, or undesignated.

Then, two, we suggest that the BTO Zone be classified as a separate reservoir, or for purposes of prorationing, inasmuch as it's a marginal well and is rapidly declining, just be carried as a Pennsylvanian oil well on the Pennsylvanian proration schedule. That was all I had on that.

Q You have no intention of seeking any dual dedication of acreage as a result of that oil zone there, do you?

A No, we do not.

Q Now, have you made a further study of the economics of developing the gas zones and the oil zones?

A Yes, sir, I have. My findings still indicate that

development on 160 acres would be uneconomical.

Q Based upon your study of the reservoir performance and the engineering information available to you, in your opinion will one well effectively and economically drain 320 acres in the Bagley-Upper Pennsylvanian Gas Zone?

A Yes, sir, I believe it will, and I believe that the evidence we have presented here shows that.

Q Based upon the same study and information as to the Bagley-Lower Pennsylvanian Gas Zone, in your opinion will one well effectively drain and develop 320 acres?

A Yes, sir, in my opinion it will.

Q Would an order setting the spacing in the Bagley-Upper Pennsylvanian Gas Zone and the Bagley-Lower Pennsylvanian Gas Zone at 320 acres be in the interest of preventing waste?

A Yes, sir, it would, and I would recommend that a permanent order be granted, granting 320 or establishing 320 acre spacing units for both the Bagley-Upper Pennsylvanian and Bagley-Lower Pennsylvanian Gas Zones.

Q Would such an order, in your opinion, protect correlative rights? A Yes, sir, it would.

Q In your opinion would any appreciable amount of gas remain unrecovered in the reservoir as the result of such a spacing program?

A No, sir, I feel that the loss in gas production would

only be negligible.

Q Were Exhibits 1, 2 and 7 through 19, inclusive, prepared by you or under your direction and supervision?

A Yes, sir, they were.

MR. KELLAHIN: We would like to offer in evidence Exhibits 1, 2 and 7 through 19.

MR. PORTER: Without objection they will be received.

Q Have you any other comments you would like to make, Mr. Kidd?

A No, sir.

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

MR. PORTER: We will take a ten minute recess.

(Recess.)

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

MR. KELLAHIN: If the Commission please, I have one further point I would like to clear up of this witness.

Q Mr. Kidd, Case No. 1384 has to do with the dual completion of Amerada State BTO Well No. 1. That is a dual completion at the present time, is it not? A Yes, sir, it is.

Q In what zones is it completed?

A Our State BTO No. 1 Well is producing from what we testified to here today, or referred to, as the BTO Oil Zone, and is also producing from perforations in the Bagley-Lower Pennsylvanian Gas Zones. The well is completed with a Baker Model D Packer and two strings of two and a sixteenth inch Hydril tubing.

Q What is your recommendation in regard to status of this well?

A I recommend that the status be left as it is. In other words, the dual completion be approved, and to permit depletion of this BTO Oil Zone which we believe and have shown as a salvage operation to permit simultaneous production from the Bagley-Pennsylvanian Zones.

Q Would it be practical, in your opinion, or economical, to drill for the production of the BTO Oil Zone oil?

A No, sir, absolutely not.

Q Unless the dual completion is continued as to production from that zone, what would happen to that oil?

A It would be left in the reservoir, you couldn't afford to

attempt to recover it in any other way than the way we have done it now.

MR. KELLAHIN: That's all the questions I have now.

MR. PORTER: Anyone have a question of the witness?

MR. CAMPBELL: I have one or two.

CROSS EXAMINATION

By MR. CAMPBELL:

Q With regard to BTO No. 1 Well, are you now producing that gas by gas lift? A Yes.

Q You maintain any separate metering or record of the gas lift, gas production and the reservoir gas production?

A We do for test purposes, yes, sir.

Q And the tests that are reflected on your Exhibit No. 18 as to monthly gas production are exclusively gas production, is that correct?

A The tect part would be, yes, sir. On the production that is reported, there is some calculation involved there, inasmuch as the produced gas and the gas lift gas goes to -- I stated that gas goes to Warren, but it does not, it goes into our low pressure gathering system, but we, through meters, balance out the gas in the field and actually determine how much gas goes to any one well, so that the figure we use is a reliable figure and actually would give you a true formation gas production figure.

Q You do not consider that the figures vary in any measurable

degree by the fact it is being gas lifted?

A No, sir.

Q At the original hearings in connection with this area, you had requested, as I recall, 640 acre units for the two gas zones?

A Yes, sir.

Q You are now requesting permanent order for 320 acre units for each of the gas zones?

A Yes, sir, that's right.

MR. CAMPBELL: I think that's all.

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

MR. PORTER: Mr. Nutter.

By MR. NUTTER:

Q Mr. Kidd, would you indicate on your cross section there the top, with reference to the BTO No. 1 Well, the top and bottom of each of the three pools as defined by the Commission?

A On the BTO?

Q Yes, sir, on the BTO Well.

A I'll have to — you mean now the vertical limits?

Q Yes, sir, the vertical limits.

A I'll have to do a little calculating here.

Q In the interest of time, Mr. Kidd, perhaps you could just give us, or indicate on the exhibit the top of the Bagley-Upper Pennsylvanian Gas Zone and the bottom of it, and the top of the oil zone.

A All right. Well, the top of it, minus 4250, will fall actually on this line right here. You won't be able to see that, that is the upper vertical limit. The lower vertical limit falls right here. Now, the top of the oil zone vertical limit is almost right at the base of the BTO oil line, and the lower would be down here.

Q Would you label those on there, please, Mr. Kidd?

A All right.

Q Now, Mr. Kidd, in other words, the section shown in brown as the upper or the oil productive zone for this BTO No. 1, which is the well that is not encountered in any other well here, is actually in between the lower limits of the upper Pennsylvanian Gas Pool and the upper limit of the oil zone, the recognized oil zone?

A It is.

Q Do you concur in the opinion of Mr. Phelps that the upper part of this oil zone is separated from the lower part of the gas zone by an impervious line member?

A Yes, sir, I do.

Q And that there is no connection between those zones?

A No, sir.

Q Do you feel there is any connection whatsoever between the bottom of this oil zone, the small oil zone and the lower main portion of the Bagley Oil Pool?

A Actually, I do not believe there is. There is shale

stringers in between here and also dense line stringers, and as you can see, just looking across here, it looks fairly uniform.

Q So you believe that this section is separated from the main body of the oil zone by the same type of impervious line with shale stringers that you have separating it from the gas zone above?

A That's right.

Q Was any oil encountered in the BTO No. 1 in the main oil zone?

A I do not believe it was, no, sir.

Q Were any drill stem tests made, or any perforations made in that section at all?

A I am not sure, I would have to check, I do not believe there was.

Q That well is presently completed as an oil-gas dual completion in this upper small oil section, and as a gas well in the Lower Bagley?

A The perforations through here, and through here. As you can see, there is very little pay in that zone compared to a good Pennsylvanian producer.

Q Well, now, Mr. Kidd, you gave us one alternative that the Commission could take, to just ignore this little pool. What was the other alternative that you suggested?

A To ignore it or to, and do away with vertical limits and actually define the zones on electric logs of a representative well

of the pool.

Q You mean for each well in the pool?

A Well, actually you would refer each well back to one log which described that zone. Now, that's done on quite a few places. In fact, that is how you actually end up correlating these things any way when you do produce. We've described on that log what we call the top of the gas zone and the bottom. And we show also the BTO Oil Zone on there, top and bottom, and the main oil zone, and then the lower gas zone defined the same way.

Q And then the vertical limits of the pool would actually fluctuate? A Yes.

Q From well to well?

A They would. Actually in a multi-zone reservoir with any structure, vertical limits most of the time wouldn't work.

Q What do you think we have here now, four separate pays?

A Yes, sir.

Q In this multi-zone pool?

A Yes, sir. You would be fortunate if you, if the condition existed where you could set up vertical limits and not have them overlap.

Q Well, now, some of these pool rules that have been established so far prohibit simultaneous dedication of acreage. Would this sytem interfere with that move in any way?

A I'm not sure, I can't see where it would, where we are

dually producing, we are dually producing gas, or oil and gas, we are not dually producing any oil and we do not anticipate any oil duals at Bagley, so there wouldn't be any simultaneous dedication of acreage in the oil zone and there isn't in the gas, I mean each well is designated for a zone and the acreage is designated for that zone.

Q Mr. Kidd, in compiling the pressure production summary on your Exhibit No. 10, and also on your Exhibit No. 14 for the upper and lower gas pool, are these the total production from all of the wells that are completed in the pool?

A Yes, sir, with the exception of Mathers "B" 1, we ignored that.

Q And in the case of the pressures that are reported, are they the average pressure of all the wells?

A They are the average of the pressures of our wells. Now, we didn't have a complete pressure history on Texas-Pacific, and didn't get any pressure information from them until right at the very last, which was too late to change this or to put it into this, but actually it went along with what we had determined, and fit in good.

Q And the pressures that they furnished you would not have changed the average pressures that you have used?

A In the case of the Bagley-Upper Pennsylvanian Gas Pool, it would have raised it some, and, which would have made it an even

better reservoir than what the calculations show it to be.

Q How are you able to determine the average pay thickness in the case of the Upper Pennsylvanian Gas Pool? Didn't you say you had some difficulty in attempting to draw an isopack map of that pool?

A I did, and what I did, I actually attempted to draw one and in the area where we had any control at all, why I simply took that area and I calculated what the average pay thickness was over that area. Now, there is an additional area where we have no control where you can't tell what the pay would be, so I simply assumed that the pay there, since it is not a structural feature, would average out approximately the same as in the area where I did have some control, even though it was erratic.

Q Even though the thickness or porosities are erratic?

A Yes.

MR. NUTTER: I believe that's all, thank you.

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

By MR. UTZ:

Q Mr. Kidd, can you tell me what well is dedicated to the south half of Section 34?

A The south half of Section 34, now in the Bagley-Upper Pennsylvanian Gas Pool the State BTK No. 1 is the producing well, and it is located in the southeast quarter of the southwest quarter of Section 34.

Now, in the Bagley-Lower Pennsylvanian Gas Pool, the unit well is our State BTO No. 1, which is located in the southwest quarter of the southeast quarter of Section 34.

MR. UTZ: Thank you.

MR. CAMPBELL: May I ask another question, please?

MR. PORTER: Mr. Campbell.

By MR. CAMPBELL:

Q Mr. Kidd, I believe one of your suggested alternatives was to treat the BTO Well No. 1 as an oil well?

A Yes, sir, for proration purposes and record purposes.

Q And that zone is the zone, the wide zone indicated in brown on that particular cross section, is it not?

A Yes, sir, it is.

Q Wouldn't that be the simplest method of handling this situation?

A I believe it would, rather than set up a separate zone for one well, why since it is a marginal well and is declining rapidly and will be depleted soon, I think the simplest would be, for proration purposes, to call it a Pennsylvanian oil well.

Q And this acreage on which it is situated is not presently dedicated to any well producing from that zone, is it?

A No, sir, it is not.

MR. CAMPBELL: I think that's all. One other question.

Q Your definition of zone is the same as they are at the present time?

A Yes, sir.

MR. PORTER: Any further questions of Mr. Kidd? The witness may be excused.

(Witness excused.)

MR. KELLAHIN: We will call as our next witness Mr. Wenger.

E. C. WENGER

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

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Will you state your name, please?

A Mr. E. C. Wenger.

Q Spell that. A W-e-n-g-e-r.

Q By whom are you employed and in what position?

A Amerada Petroleum Corporation in the Tulsa Gas Department.

Q Are you a petroleum engineer or —

A (Interrupting) I am a petroleum engineer.

Q Have you ever testified before this Commission?

A I have not.

Q Will you state briefly your educational qualification and experience as a petroleum engineer?

A Graduated from Tulsa University in 1941 with a Bachelor of Science Degree in petroleum engineering; for the first two years thereafter was employed by Pan American Petroleum Corporation in

the Gasoline Department as a gas engineer. For two years following that, employed by the Cotton Valley Operators Committee, Cotton Valley, Louisiana, was in charge of gas condensate and sampling. In 1945 was employed by Amerada Petroleum Corporation as a petroleum production engineer, working on various problems in connection with the sampling and analysis of oil and gas. In 1952 I believe, I became the chief engineer of the Gas Department, I worked on various engineering problems in association with the production, selling, analysing the gas, and continued to work on oil and gas analysis.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. PORTER: Yes, sir.

Q How, Mr. Wenger, in connection with the previous hearings in the three cases which are now before the Commission, some questions were raised as to the fluid characteristics in the various zones involved. Have you made a study and compilation of crude oil distillation affecting these cases? A I have.

Q Referring to what has been marked as Exhibit No. 20, will you state what that shows?

A Exhibit No. 20 is a curve showing the ASBM distillation on four liquid samples from the areas involved in this case. The Exhibit No. 20 shows distillations for three oil samples and one condensate sample.

Q What wells were those samples taken from?

A The oil samples were taken from the Mathers "B" 1, the

Chambers No. 2 and the BTO No. 1, and the distillate sample was taken from the BTK No. 1.

Q Now, do you know where the Chambers No. 2 well is completed?

A Chambers No. 2 was completed in the main Pennsylvanian oil zone.

Q And, other wells?

A That have been identified previously?

Q Have been identified. The State BTK is in the upper gas zone, is it not?

A That is correct.

Q Now, can you make a comparison between the Mathers fluids and the BTK fluids? The basis of your analysis.

A You said the Mathers, is that what you meant?

Q Yes, sir, the Mathers "B" 1, they are, as I understand it, from the same reservoir insofar as the vertical limits as defined by the Commission.

A That is correct, in the same zone. The Mathers "B" 1 distillation shows that it is of an oil reservoir nature whereas the distillation on the BTK, No. 1, shows that, what is commonly considered as a gas condensate reservoir.

Q Now, as to the other analysis which you made, can you make a comparison on them?

A Only to the extent that the distillations of the BTO No. 1 and the Chambers No. 2 are also in the zone which normally would be

considered as an oil reservoir, and that in general they show what you would expect from any oil distillation, that the higher gravity oils show lower distillation temperatures.

Q On the basis of the type of examination which has been made, is it possible to determine where the fluids came from, whether a gas reservoir or an oil reservoir?

A That would be impossible.

Q On the basis of that type of analysis, or examination, can you predict whether an oil well will go to gas or vice versa?

A You can not make such a prediction. The analysis of the fluids sampled from any particular well shows the characteristics that -- of the fluids that were produced by that well, but it is not possible to use that information to predict the characteristics of the fluid that you would get from any other portion of the same reservoir.

Q Now, as I understand, these are not based on a bottom-hole sample, is that correct? A They are not.

Q Would a bottomhole sample give better indications as to the character of the reservoir?

A The bottom-hole sample would simply reflect the information that is shown on this curve, instead of breaking it down in temperature implements, it would break it down by components, but you would have the same difficulty in making identification with bottom-hole samplings as you would have with these installations.

Q Was Exhibit No. 20 prepared by you or under your supervision, Mr. Wenger? A It was.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibit No. 20.

MR. PORTER: Without objection it will be received.

Q Is there anything you care to add to your comments?

A I might mention this, that previous testimony has shown in this case as well as in the previous cases today that for any given reservoir you can have wide variation in oil gravities and gas variations which are not ascertainable by samples from any one well. You have to sample the various wells to determine whether you have that variation present.

Q And then you take an average of that?

A And bottom-hole samples are usually employed for the purpose of determining what that variation is and what the average is, not in trying to predict what is present in some other part of the reservoir, but trying to evaluate the total composition of a reservoir after it is defined.

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

CROSS EXAMINATION

By MR. CAMPBELL:

Q Using only the testimony of reservoir fluid characteristics and ignoring the geological circumstances for the moment, would you say that your study would make it possible that the BTO No. 1 Well is,

or could be, considered as producing from the Pennsylvanian Oil Zone considering the differences that exist on your Exhibit 20, that that is a possibility?

A I would have to say that the samples themselves would not indicate that one way or the other, that the samples are similar enough so that they could come from the same reservoir, but the samples as such do not indicate it because there would be any number of samples which would come from another state.

Q Would you say it would not be unreasonable should the Commission treat that as an oil zone?

A It would not be unreasonable.

MR. PORTER: Mr. Utz.

By MR. UTZ:

Q Mr. Wenger, were these distillation curves which you have shown on Exhibit 20, changed to any degree with the depletion of the reservoir?

A With the depletion of the reservoir?

Q Yes.

A Yes, particularly the one on the ETK. It could change, depending on the type of depletion that occurred, and by type of depletion, I mean by the bottom-hole pressure history that might accompany the depletion of the reservoir. Also it could change if the production came from a different section of the reservoir such as was indicated by Mr. Kidd in Caudle No. 7.

Q Then classifying a reservoir by distillation curve might cause it to go from gas to an oil reservoir. Do you use such a criteria? In other words, your BTK No. 1 in the later stages of depletion, would that curve show an oil reservoir rather than a gas reservoir?

A I am not exactly sure what you would define as an oil reservoir in your opinion, but I would say that in later stages of depletion if the pressure declines sufficiently that you might have a liquid phase as well as a gas phase present. However, I would not expect the reservoir to ever become 100% liquid phase, which would be my definition of an oil reservoir.

MR. UTZ: That's all.

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

By MR. NUTTER:

Q Mr. Wenger, there were no liquids available from the Bagley-Upper Pennsylvanian Zone on the BTO No. 1 to compare with the oil produced from that small oil zone, were there?

A I do not think I understood your question exactly.

Q Are there any liquids available from the Bagley-Upper Pennsylvanian Gas Zone in the BTO No. 1?

A Are you speaking of this zone?

Q Yes, sir, the green zone, the BTO No. 1.

A The only liquids that were available from there would be from the Methane "B" 1, is that right?

Q In other words, that oil is not perforated in that section and no liquids are available to compare with the oil in that same well?

A In that same well, no, sir.

MR. NUTTER: Thank you. That's all.

MR. PORTER: Anyone else have a question?

MR. KELLAHIN: I would like to ask one.

RE-DIRECT EXAMINATION

By MR. KELLAHIN:

Q Mr. Wenger, are you familiar with the location of these wells?

A In the field.

Q Is BTK a direct offset to the BTO?

A I am not that familiar with the field.

Q I believe the exhibit will show the location of the wells.

MR. KELLAHIN: That's all I have.

MR. PORTER: If there are no further questions, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: That's all we have, except I would like to make a brief statement.

If the Commission please, that completes our presentation of these three cases, Case No. 1325 is based upon a temporary order setting up a 320 acre spacing in the Bagley-Upper Pennsylvanian Gas Pool. Case 1276 created temporary 320 acre spacing in the

Bagley-Lower Pennsylvanian Gas Zone, and at this time we urge the Commission to adopt permanent 320 acre spacing for these three pools. In that connection we have merely attempted at this hearing today to supplement the testimony which was heretofor offered in those two cases, and we urge the Commission to take into consideration that testimony with the changes and supplemental material which we have offered today.

As you will note, there was very very little in the way of economic information, feeling that it was fully covered in the preceding cases, and there is also additional testimony and exhibits in the cases showing that one well will efficiently and economically drain and develop 320 acres, and that it would be uneconomical and would result in economic waste to develop those two pools on 160 acres.

Now, Case 1384 is concerned with the dual completion of the State BTO Well No. 1. At the time of the original hearing there was some confusion and some questions raised as to just exactly where this oil was coming from, the possibility being pointed out that it might be a gas zone connected with the Pennsylvanian, Upper Pennsylvanian Gas Zone. I believe that the testimony which we have offered here today conclusively shows that there is no possibility of any connection between those two zones and that, in effect, this is a separate zone found only in the vicinity of this one well, and should be so treated. For that reason we urge a permanent order

approving the dual completion of the State BTO Well No. 1.

MR. PORTER: Anyone else have anything further in this case, in these cases?

MR. KASTLER: Bill Kastler, representing Gulf Oil Corporation. Gulf has interest in both the Bagley-Upper and the Bagley-Lower Pennsylvanian Gas Pools and, however, we have no data to present at this time, but it is our conclusion that based on the interference test and other data presented here by Amarada, that there is being a uniform withdrawal made in both gas pools, and we therefore urge that Order R-1031 and R-1091 be made permanent.

MR. PORTER: Anyone else have a statement?

MR. CAMPBELL: If the Commission please, on behalf of the Texas-Pacific Coal and Oil Company I would simply like to state that at this time we offer no objection to making it a 320 acre permanent in the upper and lower Pennsylvanian Gas Zones, nor do we object to the dual completion, but it does occur to us that the vertical limits of these various pools having once been defined in arriving at the treatment of the BTO No. 1 Well, the Commission could perhaps avoid more confusion by treating that well as an oil well in the Pennsylvanian Gas Zone inasmuch as that acreage is not dedicated to that zone and is not producing what would be a top allowable from that zone and is rapidly becoming depleted. To redefine the zones on the basis of that single situation, it might seem to us further confusing, in an already somewhat confusing

situation in this area, and we can't see how anybody could be hurt by simply describing that well on the schedule as a Pennsylvanian Oil Well.

MR. KELLAHIN: I understood you to say that it should be describe/ as a well completed in the Pennsylvanian Gas.

MR. CAMPBELL: Oil zone, whatever they call that big brown wide strip.

MR. PORTER: In other words, it should remain in the Bagley-Pennsylvanian Oil Pool. Does anyone have anything further? 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)

WE, ADA DEARNLEY AND JOSEPH A. TRUJILLO, Court Reporters, 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 our knowledge, skill and ability.

IN WITNESS WHEREOF we have affixed our hand and notarial seal this 31st day of July, 1958.

Ada Dearnley
Notary Public-Court Reporter

Joseph A. Trujillo
Notary Public-Court Reporter

My Commission expires:

June 19, 1959.

My Commission expires:

Oct. 5, 1960

Exhibits
for July 16
hearing,
Bagley Upper
& Lower Penn
Spacing cases

PRODUCTION DATA

STATE [illegible] #1

Year	Month	Monthly Oil Production - Bbl's	Monthly Gas Production - M.C.F.	Producing G.O.R.
1957	December	1,602		
1958	January	1,813	5,442	3,002
	February	1,713	6,055	3,535
	March	1,440	5,112	3,550
	April	1,173	2,728	2,326
	May	1,025	2,442	2,382
Cumulative		8,766		

MAIN OFFICE OCC

PRODUCTION DATA

19[redacted] 8 : 11

		Monthly Oil Production - Bbl's	Monthly Gas Production - M.C.F.	Producing G.O.R.
1957	May	1,077		
	June	3,045		
	July	2,483	5,765	2,322
	August	2,375	7,032	2,961
	September	2,109	6,215	2,947
	October	2,013	6,550	3,254
	November	1,835	7,640	4,163
	December	1,798	6,942	3,861
1958	January	1,692	7,461	4,410
	February	1,423	5,879	4,131
	March	1,488	5,414	3,638
	April	1,263	5,798	4,591
	May	1,308	8,274	6,326
Cumulative		23,909		

PRODUCTION TESTS

BAGLEY PENNSYLVANIAN WELLS

Well	Date Of Test	Daily Production Oil-Dist. Bbls	Water Bbls	Gas MCF	GOR	Tubing Pressure	Gravity Deg-API
Bagley Upper Pennsylvanian Gas Zone							
Mathers "B" #1	1-20-58	58	Tr.	357.9	6,170		
	3-27-58	47	Tr.	332.9	7,083		
	5-22-58	44	Tr.	220.7	5,015	180	44.8
Mathers #2	7-12-58	30	Tr.	791.4	26,380		63.4
State BT "K" #1	6-10-58	26	0	855.4	32,900	1710	71.0
Caudle #7	Not on production						
Bagley State BT "O" Oil Zone							
State BT "O" #1	1-23-58	66	Tr.	427.3	6,474		
	4-8-58	41	Tr.	184.5	4,499		
	6-10-58	31	0	59.7	1,926	60	46.7
Bagley Lower Pennsylvanian Gas Zone							
Caudle #7	6-12-58	119	5	1,950.3	16,389	1600	57.8
APC-Shell State "A" #1	6-12-58	99	2	2,445.9	24,706	2100	69.3
State BT "O" #1	6-10-58	37	0	873.2	23,600	1885	67.7

BAGLEY (UPPER) PENNSYLVANIAN GAS POOL

GAS PRODUCTION - MCF

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	ACCUM. TOTAL
1951														
W. E. Mathers #2	-	-	-	5,423	31,134	15,987	13,688	13,822	12,154	8,103	6,160	11,915	118,386	118,386
1952														
W. E. Mathers #2	47,731	39,040	41,349	37,965	24,110	31,406	36,267	38,146	20,041	41,817	15,550	30,273	403,695	522,081
1953														
W. E. Mathers #2	26,722	26,858	37,910	24,908	26,388	30,164	29,788	19,183	20,609	29,175	9,158	15,022	295,925	818,006
1954														
W. E. Mathers #2	18,264	9,838	13,422	16,823	10,428	8,709	16,204	17,289	11,350	21,924	28,948	28,502	201,701	1,019,707
1955														
W. E. Mathers #2	28,072	15,480	8,291	11,077	8,633	10,839	9,377	9,291	8,624	11,101	12,582	13,743	147,110	1,166,817
1956														
W. E. Mathers #2	14,134	11,799	9,839	8,554	8,259	6,890	7,903	10,392	12,541	11,372	13,333	10,971	125,987	1,292,804
1957														
W. E. Mathers #2	10,922	9,461	13,181	11,177	18,330	15,440	17,823	17,770	17,598	11,412	0	0	143,114	1,435,918
State "C" Ac/2 #1	-	-	-	-	-	-	-	-	-	27,810	60,656	56,944	145,410	145,410
1957 TOTALS	10,922	9,461	13,181	11,177	18,330	15,440	17,823	17,770	17,598	39,222	60,656	56,944	288,524	1,581,328
1958														
State "C" Ac/2 #1	88,361	91,074	105,105	81,517	95,783									
State BTK #1				7,330	11,168									
1958 TOTALS	88,361	91,074	105,105	98,847	106,951									

BAGLEY (UPPER) PENNSYLVANIAN

DISTILLATE PRODUCTION - BBL'S

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	ACCUM. TOTAL
1951														
W. E. Mathers #2	-	-	-	4,353	3,344	1,909	1,414	938	937	992	487	1,663	16,037	16,037
1952														
W. E. Mathers #2	1,147	1,131	992	958	307	852	732	961	545	561	286	558	9,030	25,067
1953														
W. E. Mathers #2	558	504	558	540	558	540	558	558	540	558	510	527	6,509	31,576
1954														
W. E. Mathers #2	527	476	527	510	527	510	527	527	480	496	482	535	6,124	37,700
1955														
W. E. Mathers #2	539	490	537	515	531	512	436	432	423	400	461	494	5,770	43,470
1956														
W. E. Mathers #2	437	408	438	418	405	392	400	407	385	377	355	360	4,782	48,252
1957														
W. E. Mathers #2	400	365	402	396	408	348	372	376	330	197	-	-	3,594	51,846
State "C" Ac/2 #1	-	-	-	-	-	-	-	-	-	1,940	1,145	2,010	5,095	5,095
1957 TOTALS	400	365	402	396	408	348	372	376	330	2,137	1,145	2,010	8,689	56,941
1958														
State "C" Ac/2 #1	2,545	2,506	2,524	2,062	2,756									
State BTK #1				240	348									
1958 TOTALS	2,545	2,506	2,524	2,302	3,104									

BOTTOM-HOLE PRESSURE HISTORY

BAGLEY UPPER PENNSYLVANIAN GAS POOL

Date	Pressure @ -4445	Change	Date	Pressure @ -4445	Change
Mathers #2					
5-8-51	2475	Initial	12-19-55	2438	- 86
6-5-51	2323	-152	6-4-56	2463	25
11-26-51	2181	-142	12-13-56	2505	42
12-18-52	2440	259	2-12-57	2506	1
6-1-53	2028	-412	10-7-57	2333	-273
12-4-53	1958	- 70	4-24-58	2499	166
12-6-54	2059	101	6-27-58	2513	14
7-7-55	2524	465			
Caudle #7					
2-5-57	2692	Initial			
8-29-57	2657	- 35			
10-1-57	2675	18			
6-27-58	2404	-271			
State BT "K" #1					
5-5-58	2430	Initial			
6-20-58	2377	- 53			
Mathers "B" #1					
4-24-58	1649 (48 hrs)	Initial			
6-20-58	1959 (69 hrs)	310			

PRESSURE - PRODUCTION SUMMARY
BAGLEY - UPPER PENNSYLVANIAN GAS POOL

DATE	PRESSURE @ 4445'	PRESSURE CHARGE	CUMULATIVE GAS PRODUCTION - MCF	CUMULATIVE DISTILLATE PRODUCTION	TOTAL WITHDRAWALS MCF GAS	CALCULATED DRAINAGE AREA ACRES*
	3008 PSI	Original	Pressure from DST			
5- 8-51	2873"	135	13,207	5,189	17,903	79
6- 5-51	2831"	177	36,557	8,174	43,857	148
11-26-51	2776"	232	106,471	14,374	119,069	307
12-18-52	2797"	211	506,945	24,788	528,924	1,497
6- 1-53	2676	332	664,867	27,785	688,454	1,239
12- 4-53	2638"	370	802,984	31,049	829,024	1,338
12- 6-54	2622"	384	998,330	37,165	1,029,439	1,593
7- 7-55	2715"	293	1,104,443	40,933	1,140,030	2,324
12-19-55	2676"	332	1,159,946	43,223	1,197,026	2,153
6- 4-54	2662"	346	1,219,402	45,576	1,258,369	2,172
12-13-56	2651"	357	1,287,318	48,072	1,328,345	2,222
2-12-57	2644"	364	1,308,457	48,832	1,350,036	2,215
10- 7-57	2589"	431	1,434,312	52,183	1,477,809	2,107
4-24-58	2466"	542	1,954,715	66,818	2,007,780	2,213
6-27-58	2421"	587	2,161,666	72,522	2,218,266	2,257

*Calculated drainage area = 2257 acres

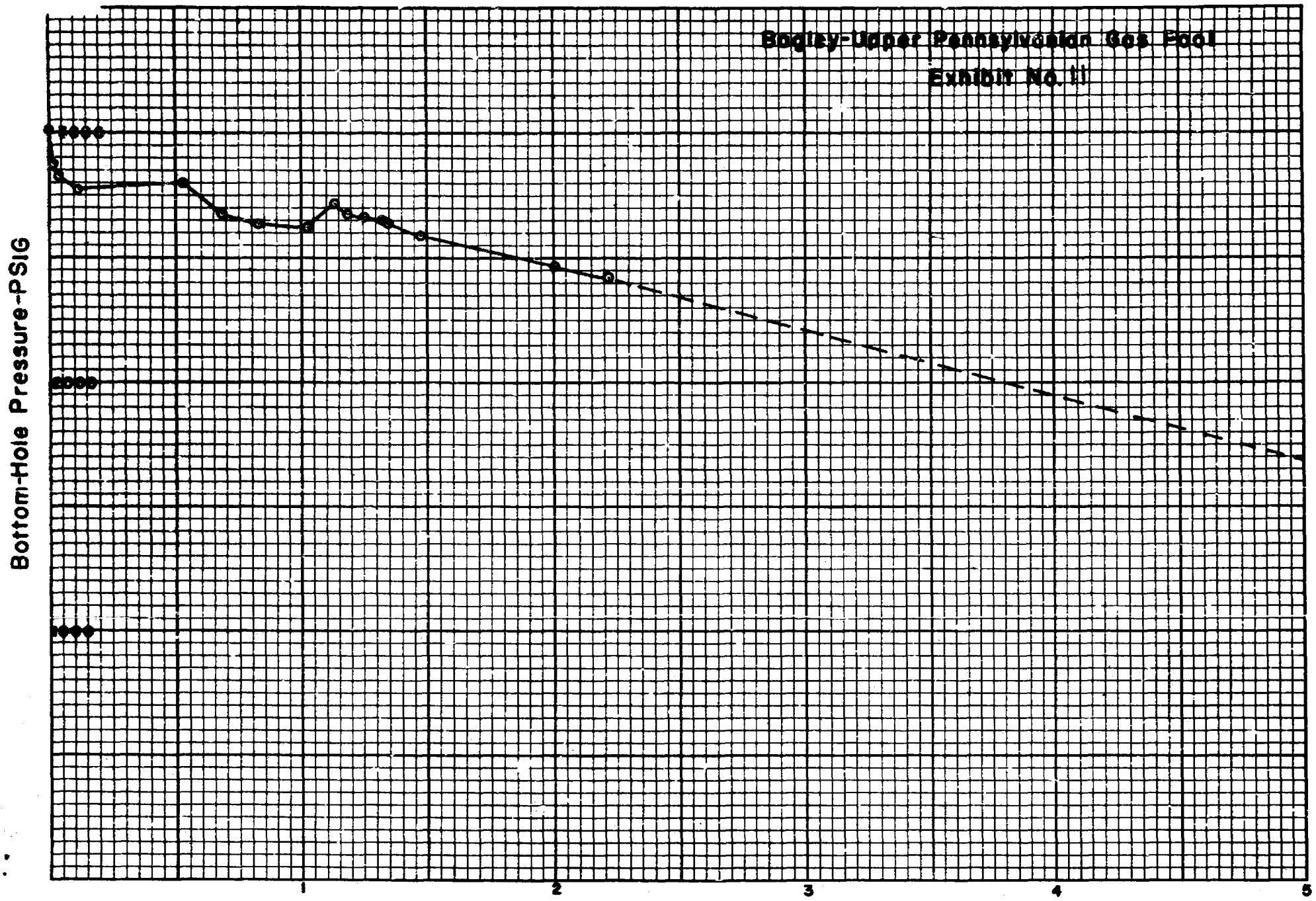
Based on:

Porosity = 6%
Water saturation = 20%
Average pay thickens = 15'

Bottom-Hole Pressure Vs. Reservoir Withdrawals

Bagley-Upper Pennsylvanian Gas Pool

Exhibit No. 11



BAGLEY (LOWER) PENNSYLVANIAN GAS POOL

GAS PRODUCTION - MCF

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	ACCUM. TOTAL
1954														
Shell St. "A" #1	-	-	-	-	-	15,692	45,237	48,907	46,895	9,296	8,252	35,649	209,928	209,928
1955														
Shell St. "A"#1	33,972	23,029	53,379	48,326	60,209	53,771	55,121	52,506	42,401	20,964	7,577	23,480	474,736	684,663
1956														
Shell St. "A" #1	18,323	50,252	53,231	69,848	72,745	54,118	60,501	66,951	66,090	61,413	64,153	64,661	702,286	1,386,949
State "C" Ac/2 #1	-	-	-	-	-	-	21,544	24,726	24,936	28,273	26,942	27,205	153,626	153,626
1956 TOTALS	18,323	50,252	53,231	69,848	72,745	54,118	82,045	91,677	91,026	89,686	91,095	91,866	855,912	1,540,575
1957														
Shell St. "A" #1	51,852	47,479	51,726	42,256	43,698	43,595	37,937	47,778	43,843	60,107	49,501	52,578	572,350	1,959,299
Caudle #7	-	-	-	106,808	57,637	12,954	69,797	55,088	46,650	74,048	65,222	70,894	559,098	559,098
State "C" Ac/2 #1	15,038	23,030	26,550	26,933	25,555	23,635	21,618	22,030	15,329	5,717	1,686	4,385	211,506	355,132
1957 TOTALS	66,890	70,509	78,276	175,997	126,890	80,184	129,352	124,896	105,822	139,872	116,409	127,857	1,342,954	2,883,529
1958														
Shell St. "A" #1	51,515	49,430	60,424	36,481	56,324									
Caudle #7	66,706	56,802	67,502	47,930	71,546									
State BT"C" #1	-	7,265	-		42,392									
State "C" Ac/2 #1	8,525	7,265	8,260	7,573	8,475									
1958 TOTALS	126,746	120,762	136,186	91,984	178,737									

No. 12

BAGLEY (LOWER) PENNSYLVANIAN

DISTILLATE PRODUCTION - BBL'S

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	ACCUM. TOTAL
1954														
Shell St. "A" #1	-	-	-	-	-	1,166	3,374	3,650	3,650	637	504	2,596	15,577	15,577
1955														
Shell St. "A" #1	2,660	1,755	3,951	3,567	4,275	3,723	4,001	3,880	3,071	2,097	1,350	1,940	36,270	51,847
1956														
Shell St. "A" #1	1,569	2,139	4,089	3,261	3,877	3,645	4,183	4,544	4,258	4,021	4,314	4,356	44,256	96,103
Caudle #7	-	-	-	-	-	-	-	-	-	-	-	320	320	320
State "C" Ac/2 #1	-	-	-	-	-	-	2,208	2,144	1,908	2,046	1,680	1,523	11,509	11,509
1956 TOTALS	1,569	2,139	4,089	3,261	3,877	3,645	6,391	6,688	6,166	6,067	5,994	6,199	56,085	107,932
1957														
Shell St. "A" #1	3,198	3,384	3,574	3,133	2,865	2,758	2,031	2,233	2,516	2,686	2,595	2,456	33,429	129,532
Caudle #7	91	-	-	5,848	3,521	703	4,126	3,584	3,812	3,919	4,128	3,899	33,631	33,951
State "C" Ac/2 #1	850	1,487	1,481	1,685	1,615	1,458	1,497	1,379	1,117	897	624	596	14,683	26,192
1957 TOTALS	4,139	4,871	5,055	10,666	8,001	4,919	7,654	7,196	7,445	7,502	7,347	6,948	81,743	189,675
1958														
Shell St. "A" #1	2,694	2,472	2,913	1,803	2,622									
Caudle #7	4,002	3,615	3,649	2,352	3,227									
State BT"C" #1	97	516	-	61	2,037									
State "C" Ac/2 #1	586	516	569	495	462									
1958 TOTALS	7,379	7,119	7,131	4,711	8,348									

BOTTOM-HOLE PRESSURE HISTORY
BAGLEY LOWER PENNSYLVANIAN GAS POOL

Amerada-Shell State "A" #1

DATE	PRESSURE @ -5500'	CHANGE
10-51	3604	Initial
1-16-56	3558	- 46
2-4-57	3161	-397
7-8-57	3122	- 39
7-12-57	3143	- 21
4-24-58	2835	-308
6-30-58	2813	- 22

Caudle #7

DATE	PRESSURE @ -5500'	CHANGE
2-4-57	3229	Initial
7-10-57	3085	-144
4-24-58	2649	-436
6-20-58	2551	- 98

State BT"O" #1

DATE	PRESSURE @ -5500'	CHANGE
1-27-58	3030	Initial
4-22-58	2917	-113
6-20-58	2865	- 52

PRESSURE - PRODUCTION SUMMARY
BAGLEY - LOWER PENNSYLVANIAN GAS POOL

DATE	PRESSURE @ 5500'	PRESSURE CHARGE	CUMULATIVE GAS PRODUCTION - MCF	CUMULATIVE DISTILLATE PRODUCTION	TOTAL WITHDRAWALS MCF GAS @ 15Bbls.	CALCULATED DRAINAGE AREA - ACRE*
10- 5-51	3604psi	Initial				
1-16-56	3558"	46	693,825	52,632	714,091	
2- 4-57	3222"	382	1,607,465	112,071	1,723,601	1,892
7-10-57	3128"	476	2,181,102	148,055	2,330,072	2,053
4-27-58	2913"	691	3,010,275	197,054	3,194,983	1,939
4-24-58	2800"	804	3,236,211	214,837	3,429,820	1,789
6-20-58	2743"	861	3,707,944	232,363	3,913,820	1,902

*Calculated drainage area = 1902 acres.

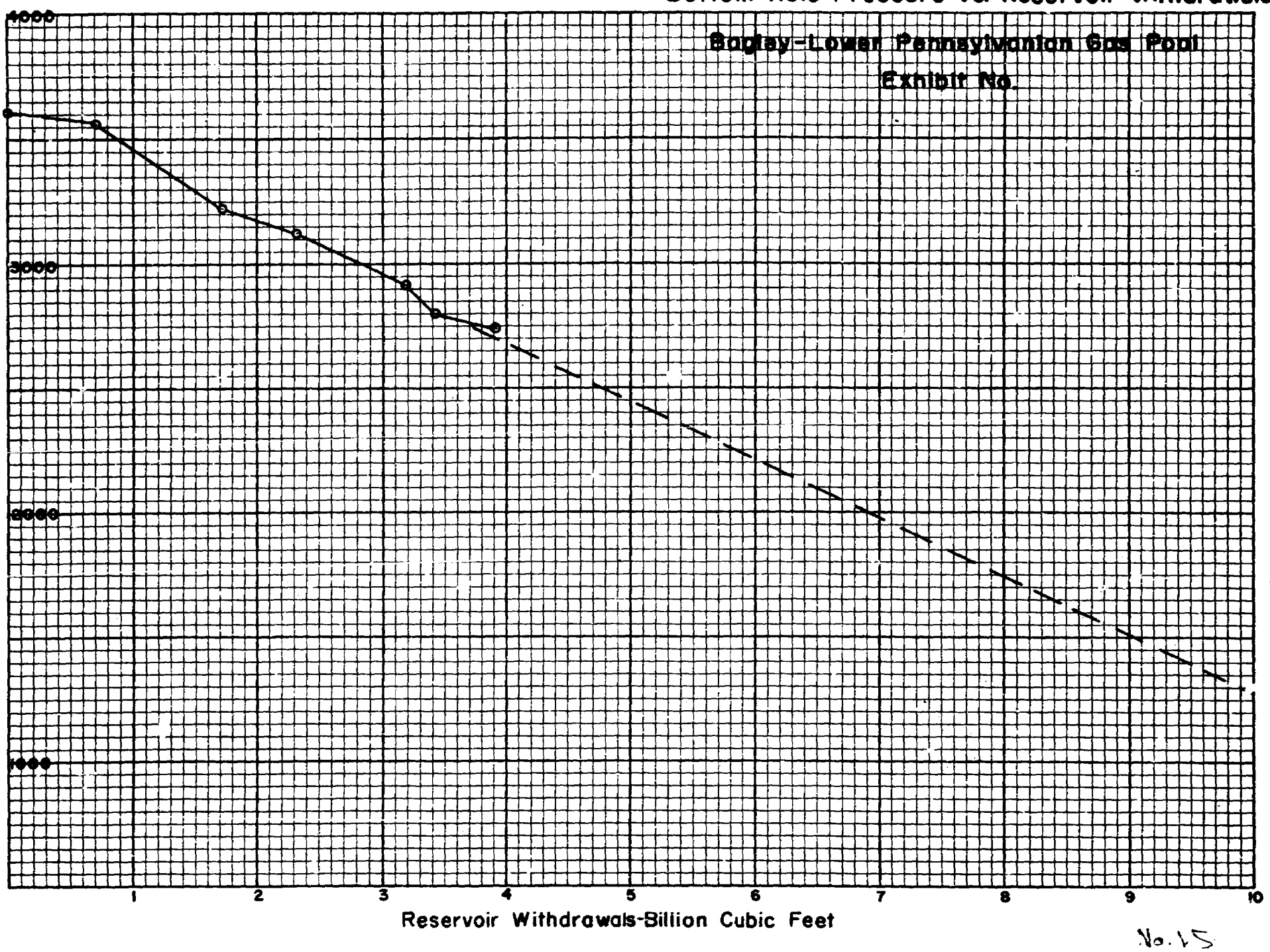
Based on: Porosity = 6%
Water Saturation = 20%
Average Pay thickens = 20'

No. 14

Bottom-Hole Pressure Vs. Reservoir Withdrawals

Bagley-Lower Pennsylvanian Gas Pool

Exhibit No.



No. 15

BHP BUILD-UP AND INTERFERENCE TESTS

Started on July 8 - With Shell State A Unit No. 1 flowing at a rate of 1,660 MCF per day and Caudle No. 7 flowing at a rate of 2,200 MCF per day.

(1) Bottom hole pressure gauge was run in Shell State A Unit No. 1. The well was then shut-in and the pressure build-up recorded for 38 hours.
BHP was 3,056 psi with the well flowing and after the 38 hours of shut-in had built up to 3,126 psi.

(2) The gauge was pulled from Shell State A Unit No. 1 and run in Caudle No. 7. The well was then shut-in and the pressure build-up recorded for 42 hours.
Pressures were taken about 1100 feet above the producing formation because of an obstruction in the tubing. Based on the gradient the pressure in this well would be comparable to that found in Shell State A Unit No. 1.
The flowing pressure at that point was 2649 psi, after two hours shut-in the pressure was 2966 psi and at the end of the 42 hours recorded the pressure was 2963 psi.

(3) The gauge was pulled from Caudle No. 7 and re-run in Shell State A Unit No. 1. At this point, after the State A Unit No. 1 had been shut-in for 96 hours, Caudle No. 7 was reopened and produced at a rate of

4,000 MCF per day. The pressure in Shell State A Unit No. 1, was recorded continuously for 65 hours. The gauge was then pulled and re-run to record the pressures from the 65th to the 90th hour after production was started from Caudle No. 7.

The shut-in pressure found after the 96 hour shut-in was 3147 psi after Caudle No. 7 was opened, the pressure in Shell State A Unit No. 1 declined 9 lbs. The gauge was pulled and re-run and an additional decline of 15 psi was recorded.

Memo

From

8-6-58

To

2 copies of Order
R-1831-A given to
Jason Kellahin

1 copy mailed to:
Jack Campbell &
Bill Kaeller

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. 1276
Order No. R-1031-A

APPLICATION OF ARRADA PETROLEUM
CORPORATION TO MAKE PERMANENT THE
SPECIAL RULES AND REGULATIONS FOR
THE BAGLEY-LOWER PENNSYLVANIAN GAS
POOL, LEA COUNTY, NEW MEXICO, AS
SET FORTH IN ORDER NO. R-1031.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 17, 1957, and again on July 16, 1958, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 6th day of August, 1958, the Commission, a quorum being present, having considered the application and the evidence adduced 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 this cause and the subject matter thereof.

(2) That the preponderance of the evidence presented in this case indicates that one well will efficiently and economically drain 320 acres in the Bagley-Lower Pennsylvanian Gas Pool, Lea County, New Mexico.

(3) That the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool as set forth in Order No. R-1031 should be continued in effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool, Lea County, New Mexico, as set forth in Order No. R-1031, be and the same are hereby continued in effect until further order of the Commission.

(2) That this order shall become effective September 1, 1958.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

ir/

NATURAL GAS ENGINEERING SERVICE

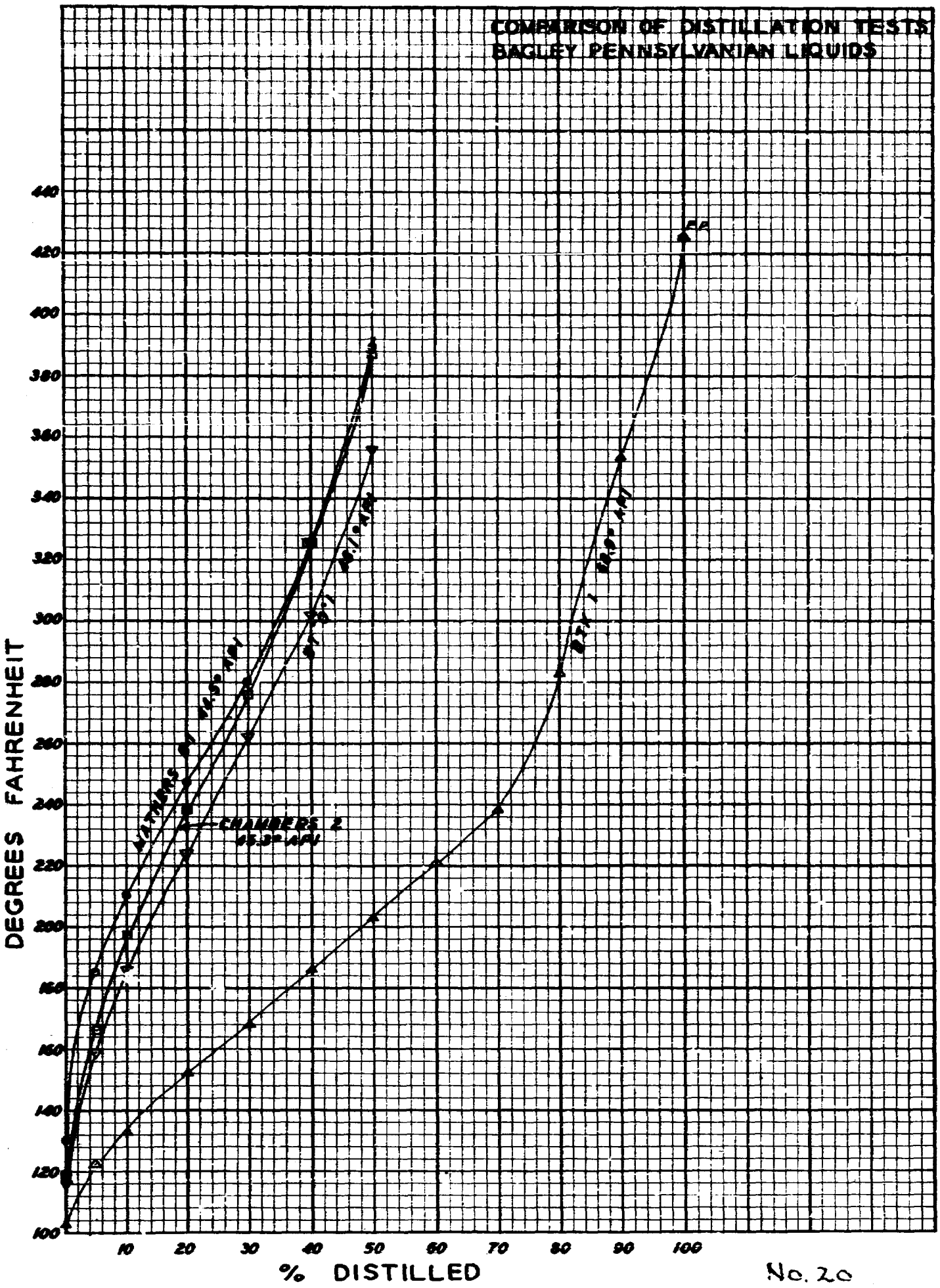
MAIN OFFICE OCC ... Hwy. — MU 3-3652

MIDLAND, TEXAS

1958 AUG 6 AM 8:29

LABORATORY DATA

TEST NO.	DT-58-339	DT-58-340	DT-58-341	DT-58-342
Sample	B T K No.1 Gas Zone	B T O No.1 Oil Zone	Mathers B - 1	Chambers No.2
I.B.P.	103°F	116°F	130°F	118°F
5%	122	159	185	166
10%	133	186	210	197
20%	152	224	247	238
30%	168	262	280	276
40%	186	302	325	325
50%	203	356	389	387
60%	221			
70%	238			
80%	283			
90%	353			
End Point	425			
Recovery	93.5%	50.0%	50.0%	50.0%
Residue	0.5	46.0	48.5	47.0
Loss	6.0	4.0	1.5	3.0
Gravity, API	68.9°	48.1°	44.5°	45.3°


COMPARISON OF DISTILLATION TESTS
BAGLEY PENNSYLVANIAN LIQUIDS
DEGREES FAHRENHEIT
% DISTILLED
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
10
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30
40
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90
100
CHAMBERS 2

No. 20

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF THE STATE OF NEW
MEXICO FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 1276
Order No. R-1031

APPLICATION OF AMERADA PETROLEUM
CORPORATION FOR AN ORDER AMENDING
ORDER R-991 INSOFAR AS SAID ORDER
PERTAINS TO THE BAGLEY-LOWER PENNSYL-
VANIAN GAS POOL, LEA COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 17, 1957, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 14th day of August, 1957, the Commission, a quorum being present, having considered the application and the evidence adduced 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 this case and the subject matter thereof.

(2) That the applicant, Amerada Petroleum Corporation, proposes the establishment of 320-acre gas well spacing in the Bagley-Lower Pennsylvanian Gas Pool and such other rules and regulations as the Commission may deem necessary.

(3) That there is sufficient evidence to justify the establishment of 320-acre spacing in the Bagley-Lower Pennsylvanian Gas Pool on a temporary basis.

(4) That the 320-acre spacing units should be comprised of any two contiguous quarter sections of a single governmental section being a subdivision of the United States Public Lands Survey.

(5) That no well should be drilled to or recompleted in the Bagley-Lower Pennsylvanian Gas Pool nearer than 660 feet to a section line nor nearer than 330 feet to a quarter-quarter section line; provided however, that the Secretary-Director of the Commission should have authority to grant exception to the foregoing well location requirements.

(6) That this case should be heard again by the Commission at the monthly hearing in July of 1958 to permit the applicant and all other interested parties to appear and show cause why the spacing provisions of this order should be continued in effect.

(7) That any well presently projected to or completed in the Bagley-Lower Pennsylvanian Gas Pool should be excepted from the 320-acre spacing requirements for said pool.

(8) That the horizontal limits of the Bagley-Lower Pennsylvanian Gas Pool should be extended to include therein certain acreage not presently included within said pool.

IT IS THEREFORE ORDERED:

1. That the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool, as set forth in Order R-991, be and the same are hereby superseded by the Special Rules and Regulations hereinafter set forth.

2. That any well which was projected to or completed in the Bagley-Lower Pennsylvanian Gas Pool prior to the effective date of this order be and the same is hereby granted an exception to Rule 2 (a) of the Special Rules and Regulations hereinafter set forth which requires that each well drilled or recompleted in the Bagley-Lower Pennsylvanian Gas Pool shall have dedicated to it a tract comprising 320 acres.

Further, that any increase in the acreage dedicated to any such excepted well shall become effective the first day of the month following receipt by the Commission of Commission Form C-128, Well Location and Acreage Dedication Plat, provided said C-128 indicates that the acreage dedication to such well has been increased in conformance with the Special Rules and Regulations.

3. That the horizontal limits of the Bagley-Lower Pennsylvanian Gas Pool as set forth in Exhibit "C" of Order R-991 be and the same are hereby extended to include therein:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 34: S/2

TOWNSHIP 12 SOUTH, RANGE 33 EAST, NMPM
Section 3: NE/4

4. That the Special Rules and Regulations hereinafter set forth shall be of no further force nor effect after August 31, 1958.

5. That this case shall be called for hearing before the Commission at the monthly hearing in July, 1958, to permit the applicant and all other interested parties to appear and present the results of bottom hole pressure tests, interference tests, and/or such other evidence as may be available to show cause why the Special Rules and Regulations hereinafter set forth should be continued in effect beyond August 31, 1958.

6. That special pool rules applicable to the Bagley-Lower Pennsylvanian Gas Pool be and the same are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS FOR THE BAGLEY-LOWER PENNSYLVANIAN GAS POOL

RULE 1. Any well drilled a distance of one mile or more outside the boundary of the Bagley-Lower Pennsylvanian Gas Pool shall be classified as a wildcat well. Any well drilled less than one mile outside the boundary of the Bagley-Lower Pennsylvanian Gas Pool shall be spaced, drilled, and operated in accordance with the Rules and Regulations in effect in said Bagley-Lower Pennsylvanian Gas Pool provided said well is projected to and/or completed in the so-called "9800-foot" zone.

RULE 2. (a) That each well drilled or recompleted in the Bagley-Lower Pennsylvanian Gas Pool shall be located on a tract consisting of approximately 320 acres comprising any two contiguous quarter sections of a single governmental section, being a legal subdivision of the United States Public Lands Survey.

(b) The Secretary of the Commission shall have authority to grant an exception to Rule 2 (a) without notice and hearing where application has been filed in due form and where the following facts exist and the following provisions are complied with.

1. The non-standard gas proration unit consists of contiguous quarter-quarter sections or lots.

2. The non-standard proration unit lies wholly within a single governmental section.

3. The entire non-standard gas proration unit may reasonably be presumed to be productive of gas.

4. The length or width of the non-standard gas proration unit does not exceed 5280 feet.

5. That applicant presents written consent in the form of waivers from all offset operators and from all operators owning interests in the section in which any part of the non-standard gas proration unit is situated and which acreage is not included in said non-standard gas proration unit.

6. In lieu of Paragraph 5 of this Rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered mail of his intent to form such non-standard gas proration unit. The Secretary of the Commission may approve the application, if, after a period of 30 days following the mailing of said notice, no operator has made objection to the formation of such non-standard gas proration unit.

RULE 3. (a) That no well shall be drilled to or recompleted in the Bagley-Lower Pennsylvanian Gas Pool nearer than 660 feet to a governmental section line nor nearer than 330 feet to a governmental quarter-quarter section line.

(b) The Secretary-Director of the Commission shall have authority to grant exception to the requirements of Rule 3 (a) without notice and hearing where a verified application therefor has been filed in due form and the necessity for the unorthodox location is based on topographical conditions or is occasioned by the recompletion of a well previously drilled to another horizon.

Applicants shall furnish all operators within a 5280-foot radius of the subject well a copy of the application to the Commission, and applicant shall include with his application a list of names and addresses of all operators within such radius, together with a stipulation that proper notice has been given said operators at the addresses given. The Secretary-Director of the Commission shall wait at least 20 days before approving any such unorthodox location, and shall approve such unorthodox location only in the absence of objection from any offset operators. In the event an operator objects to the unorthodox location the Commission shall consider the matter only after proper notice and hearing.

RULE 4. Each gas purchaser in the Bagley-Lower Pennsylvanian Gas Pool shall take ratably from all wells producing from said common source of supply, apportioning its takes during any given calendar year among said wells on the basis of the acreage dedicated thereto.

RULE 5. No natural gas nor casinghead gas produced from the Bagley-Lower Pennsylvanian Gas Pool shall be flared or vented unless specifically authorized by the Commission after notice and hearing.

RULE 6. The monthly gas production from each well and from each common source of supply shall be metered separately and the gas production and associated liquid hydrocarbon production therefrom shall be reported to the Commission in accordance with the applicable Commission Rules and Regulations.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

ir/

Case 1376

GENERAL OFFICES
120 BROADWAY NEW YORK

AMERADA PETROLEUM CORPORATION
BEACON BUILDING
P. O. BOX 2040
TULSA 2, OKLA.

ROBERT J. STANTON
GENERAL COUNSEL
JOHN S. MILLER
ASSISTANT GENERAL COUNSEL

LEGAL DEPARTMENT

H. D. BUSHNELL
HAROLD J. FISHER
ROBERT T. JAMES
ROBERT E. LEE
JAMES C. McWILLIAMS
VIRGIL C. MORELLE
ARDEN E. ROSS
ATTORNEYS

Regular June

May 24, 1957

Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Amerada's Application for an Order amend Order No. R-991, insofar as said order pertains to the Bagley-Lower Pennsylvanian Gas Pool, Bagley Pool, Lea County, New Mexico.

Gentlemen:

We enclose original and two copies of our Application on captioned matter, and ask that it be set for hearing, if possible, either at the general hearing to be had in June, or for an Examiner's hearing some time in June.

Very truly yours,

H. D. Bushnell

H. D. Bushnell

HDB:FC
Encls.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

Case 1276

June 4, 1957

COPY

Mr. H. D. Bushnell
Amerada Petroleum Corp.
P.O. Box 2040
Tulsa 2, Oklahoma

Dear Mr. Bushnell:

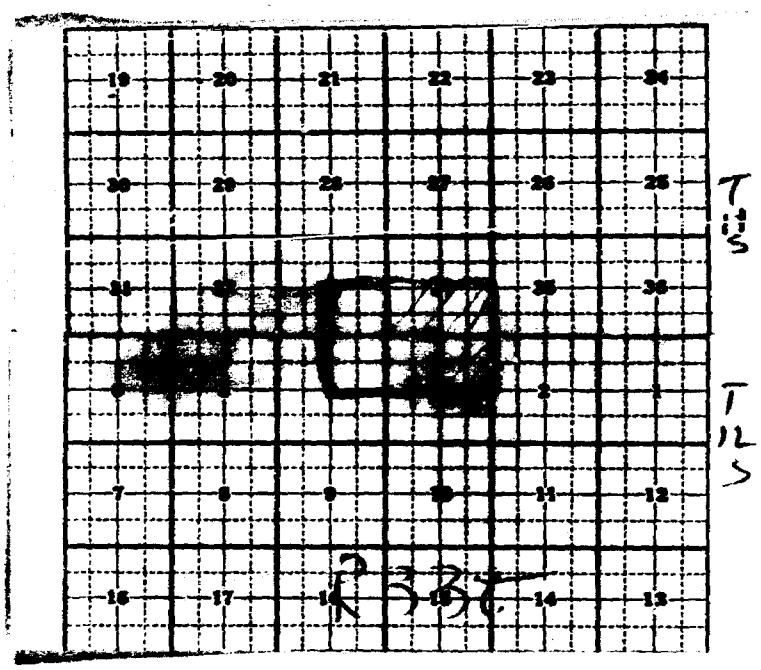
Your application for 320-acre spacing in the Bagley-Lower Pennsylvanian Gas Pool was received in this office on May 27th, but due to the fact that I was out of the office until May 31st we were not able to schedule a hearing on the case on the regular docket for June as you requested.

In the alternative, you requested an examiner's hearing sometime during the month of June, but it is my feeling that this is a matter which should be considered at a regular full Commission hearing. It will, therefore, be scheduled for hearing on the regular July docket.

Yours very truly,

A. L. Porter, Jr.
Secretary - Director

ALP:bp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T 33 E

HDB:FC 5-24-57 (7)

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE 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, BAGLEY POOL, LEA COUNTY, NEW MEXICO, TO EXTEND THE HORIZONTAL LIMITS OF SAID POOL TO INCLUDE THE SE/4 SECTION 33, S/2 SECTION 34-11S-33E; N/2 SECTION 3, AND NE/4 OF SECTION 4-12S-33E, LEA COUNTY, NEW MEXICO, AND TO PROVIDE FOR STANDARD DRILLING UNITS OF 320 ACRES.

CASE NO. 1276

APPLICATION

Comes now Amerada Petroleum Corporation, Tulsa, Oklahoma, and alleges and states:

1. That on May 1, 1957, this Commission, in Case No. 1220, after due notice and hearing nad on March 14, 1957, at Santa Fe, New Mexico, issued its Order No. R-991 defining the vertical and horizontal limits of the "9800-foot" or "Lower" zone, thereby defined and identified as the Bagley-Lower Pennsylvanian Gas Pool.

2. That the Commission by its order defined the vertical limits of the Bagley-Lower Pennsylvanian Gas Pool to be the interval between minus 5400 feet to minus 5620 feet subsea datum; that the horizontal limits of said Gas Pool shall be the SE/4 of Section 33-11S-33E, and the NW/4 of Section 3, and NE/4 of Section 4-12S-33E, Lea County, New Mexico; and that said Gas Pool shall be drilled, spaced and operated in accordance with the applicable provisions of Rule 104 of the Commission Rules and Regulations, which provides, as the statewide rule, that each well drilled within the defined limits of the Gas Pool shall be located on a designated drilling tract consisting of 160 surface contiguous acres, more or less, substantially in the form of a square which is a quarter section, being a legal subdivision of the U. S. Public Land Surveys.

3. That Applicant has evidence to show that the horizontal limits of said Cas Pool underlies all or a substantial portion of the SE/4 Sec. 33, S/2 Sec. 34-11S-33E; N/2 Sec. 3, and NE/4 of Sec. 4-12S-33E, Lea County, New Mexico, that one well will drain a minimum of 320 acres within said pool and that it is not economical to drill or recomplete wells in excess of one well for each 320 acres.

4. That Order No. R-991 should be amended to extend the horizontal limits of the Bagley-Lower Pennsylvanian Gas Pool to include the lands herein described; that Rule 2-A of said Order should be amended to provide for standard drilling units of 320 acres, more or less, consisting of 320 surface contiguous acres comprised of two quarter sections, said quarter sections being a legal subdivision of the U. S. Public Land Surveys; and that the authorized well shall not be drilled closer than 660 feet to any outer boundary line of any 320-acre tract, nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary, nor closer than 1320 feet to a well drilling to or capable of producing from the same pool.

5. That Order No. R-991 should be amended as herein provided in order to properly develop the Bagley-Lower Pennsylvanian Gas Pool source of supply, to avoid the completion of unnecessary wells and to protect the correlative rights of owners in said pool.

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 at the conclusion of said hearing the Commission make and enter its order defining the proper productive limits of the Bagley-Lower Pennsylvanian Gas Pool, referred to above, and enter such other rules and regulations as the Commission deems necessary for the purposes herein stated.

Dated this 24th day of May, 1957.

AMERADA PETROLEUM CORPORATION

By H. D. Bushnell

H. D. Bushnell, Attorney.

AMERADA P-274

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

8
CODE

R.P.G. 3 NO. 10775 CLOCK NO. 2149 SPEED 7D HR. LEASE J.T. Candle WELL NO. 7-T

ELEMENT NO. 106958 RANGE 0-4000 CORR. TO [redacted] °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY [redacted] CALCULATED BY LEK REPORTED BY OCK DATE RUN 7-10-57 TIME [redacted] PULLED 7-12-57 TIME [redacted]

WELL DATA

POTENTIA. [redacted] CHOKE [redacted] OIL [redacted] WATER [redacted] G.O.R. [redacted] ZONE Penn. TOP 9790 BOTTOM 9985 T.D. 9992

HOW PRODUCED Natural flow thru tbg. P.I. [redacted] CASING 5-1/2 DEPTH 9996 TUBING 2-3/8 DEPTH 9813

HOURS SHUT IN 48 WELL HEAD PRESS.: CAS. [redacted] TUB [redacted] TOP LINER [redacted] PERFORATIONS 9790-9813

LAST RESERVOIR PRESSURE 3830 DEPTH 9800 DATE 2-6-57 ELEVATION 4264 GRAVITY OF OIL [redacted] SP. GR. OF GAS [redacted]

This well is a gas-gas dual.

TEST RECORD

PURPOSE OF TEST To determine the build-up characteristics of the well.

[redacted]	DEPTH	[redacted] PRESSURE				REMARKS
0	9866 (-4602)	3849				Flowing pressure.
1		3929				Shut-in pressure.
2		3965				
3		3978				
4		3975				
5		3976				
6		3966				
7		3964				
8		3965				
10		3965				
[redacted]		[redacted]				
[redacted]		[redacted]				

EXPLANATIONS OR CHART

This well had been flowing at its normal rate prior to shut-in. The Amerada-Shell State "A" Unit #1 had been shut-in about 48 hours before the J.T. Candle #7 was shut-in, and the Amerada-Shell well remained shut-in during the build-up test on J.T. Candle #7.

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

CODE

R.P.G. 3 NO. 10775 CLOCK NO. HR74024 SPEED 48 HR. LEASE Amerada-Shell State A Unit WELL NO. 1

ELEMENT NO. 106852 RANGE 0-6000 CORR. TO - °F. LOCATION Eagley Lower Penn., Lea Co., N.M.

RUN BY LET CALCULATED BY LEK REPORTED BY OCH DATE RUN 7-15-57 TIME PULLED 7-16-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R.

ZONE Lower Penn. TOP 9005 BOTTOM 9815 T.D. 11,975

HOW PRODUCED Natural flow thru tbg.

CASING 5½ DEPTH 9009 TUBING 2-3/8 DEPTH 9818

HOURS SHUT IN WELL HEAD PRESS.: CAS. TUB

TOP LINER PERFORATIONS 9005-9815

LAST RESERVOIR PRESSURE DEPTH DATE

ELEVATION 4374 GRAVITY OF OIL - SP. GR. OF GAS -

TEST RECORD

PURPOSE OF TEST

[illegible]	DEPTH	TEMP. PRESSURE				REMARKS
68	9815 (-5441)	3168				
70		3168				
72		3168				
74		3162				
76		3159				
78		3162				
80		3163				
82		3156				
84		3156				
86		3156				
88		3153				
90		3153				

EXPLANATIONS OR CHART

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

8
CODE

R.P.G. 3 NO. 10775 CLOCK NO. 2349 SPEED [illegible] HR. LEASE Amerada-Shell State "A" Unit WELL NO. 1

ELEMENT NO. 10659 RANGE 0-6000# CORR. TO [illegible] °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY LEE/LEE CALCULATED BY LEE REPORTED BY OCE DATE RUN 7-12-57 TIME [illegible] PULLED 7-15-57 TIME [illegible]

WELL DATA

POTENTIAL: CHOKE [illegible] OIL [illegible] WATER [illegible] G.O.R. [illegible]

HOW PRODUCED [illegible] P.I. [illegible]

HOURS SHUT IN 161 WELL HEAD PRESS.: CAS. [illegible] TUB [illegible]

LAST RESERVOIR PRESSURE [illegible] DEPTH [illegible] DATE [illegible]

ZONE Perm. TOP 9805 BOTTOM 9815 T.D. 11,075

CASING 5-1/2 DEPTH 9859 TUBING 2-3/8 DEPTH 9810

TOP LINER [illegible] PERFORATIONS 9806-9815

ELEVATION 4474 GRAVITY OF OIL [illegible] SP. GR. OF GAS [illegible]

TEST RECORD

PURPOSE OF TEST To measure effect of Candle No. 7 flow on this wells BHP.

[illegible]	DEPTH	[illegible] PRESSURE				Hours	Pressure	REMARKS
0	[illegible]	5147				18	5138	
1/3	(-5334)	5144				19	5138	
2/3		5141				20	5141	
1		5141				21	5138	
2		5142				22	5136	
3		5141				23	5139	
4		5141				24	5138	
5		5141				26	5144	
6		5141				28	5142	
7		5142				30	5141	
8		5141				32	5142	
9		5139				34	5141	
10		5141				36	5141	
11		5141				38	5141	
12		5141				40	5141	
13		5138				44	5138	
14		5139				48	5136	
15		5139				52	5135	
16		5138				56	5138	
17		5138				60	5138	
						64	5138	
						65	5138	(Well had been shut-in 161 hrs. - see note below)

EXPLANATIONS OR CHART

Ran gauge back in Amerada-Shell State "A" Unit No. 1. Opened J.T. Candle No. 7 at estimated rate of 4,000 MCF/Day. The "Hours" column above represents hours after the J.T. Candle No. 7 had been opened. Actually, the Amerada-Shell well had been shut-in approximately 70 hours before the Candle No. 7 was opened.

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA - 204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

3
CODE

R.P.G. 3 NO. 10775 CLOCK NO. [illegible] SPEED 48 HR. LEASE Amerada-Shell State "A" Unit WELL NO. 1

ELEMENT NO. 10695 RANGE 0-6000 CORR. TO — °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY LEE/LEE CALCULATED BY LEE REPORTED BY [illegible] DATE RUN 7-8-57 TIME PULLED 7-10-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R. ZONE Penn. TOP 9805 BOTTOM 9815 T.D. 11,075

NOW PRODUCED Natural flow thru tbg. P.I. CASING 5-1/2 DEPTH 9889 TUBING 2-3/8 DEPTH 9810

HOURS SHUT IN 36 WELL HEAD PRESS.: CAS. TUB. TOP LINER PERFORATIONS 9805-9815

LAST RESERVOIR PRESSURE 3371 DEPTH 9824 DATE 1-18-56 ELEVATION 4274 D.F. GRAVITY OF OIL SP. GR. OF GAS

TEST RECORD

PURPOSE OF TEST To determine the build-up characteristics of the well.

[illegible]	DEPTH	[illegible] PRESSURE				REMARKS
0	9810	3096				Flowing pressure.
1	(-5536)	3092				Shut-in pressures.
2		3099				
3		3106				
4		3111				
5		3114				
6		3114				
7		3117				
8		3114				
10		3114				
12		3117				
14		3120				
16		3120				
18		3117				
22		3115				
26		3120				
30		3123				
34		3126				
36		3126				

EXPLANATIONS OR CHART

Prior to shut-in, this well and the J.T. Caudle No. 7 had been flowing at normal rates. The J.T. Caudle No. 7 remained flowing during the build-up test on the Amerada-Shell State "A" Unit No. 1.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Amerada EXHIBIT No. 6
CASE 1276

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

LOWER PENNSYLVANIAN GAS PAY DETERMINATIONS
FROM
MICROLOG AND GEOLOGICAL SAMPLE DESCRIPTIONS

Company	Well	Microlog Pay - Feet Gross Good	Medium	Net(1)	Sample Pay(2) Gross	Net
Amerada	Caudill #2	28	--	28	108	47
Amerada	Caudill #4	5	--	5	38	13
Amerada	Caudill #5	34	10	39	94	40
Amerada	Caudill #7	45	--	45	66	29
Amerada	Mathers #1	19	8	23	106	29
Amerada	Mathers "A" #1	13	28	27	114	54
Amerada	Mathers "A" #2	--	35	17	89	43
Amerada	State BF "C" #1	--	--	14(est)	85	19
Amerada	State BF "C" #3	21	42	42	48	24
Amerada	State BF "I" #1	--	--	13(est)	71	26
Amerada	State BF "X" #1	27	8	31	64	17
Amerada	State BF "N" #1	19	38	38	80	40
Amerada	State BF "Y" #1	23	26	36	62	29
[illegible]	State "C" Ac/1 #5	--	--	14(est)		
[illegible]	State "C" Ac/2 #1	29	--	29		
Amerada-Shell	State "A" #1	32	--	32		

(1) Medium microlog pay has been been discounted 50%

(2) Gross sample pay has been discounted according to porosity description

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Amerada EXHIBIT No. 5
CASE 1476

GENERAL OFFICES
120 BROADWAY NEW YORK

AMERADA PETROLEUM CORPORATION
BEACON BUILDING
P. O. BOX 2040
TULSA 2, OKLA.

July 25, 1957

Mr. E. A. Utz
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Sir:

During the course of our discussion on the interference test conducted on the Shell-Amerada State "A" No. 1 and Amerada Caudle No. 7, I promised to send you our calculated reserves under the Shell-Amerada tract.

As you know, the data on this test were obtained just prior to the hearing; in fact, the last part of the test was phoned to me in Santa Fe the day before the hearing. We really had little time to analyze the data thoroughly before the hearing; therefore, the delay in forwarding this information was to give us additional time to review the data. A critical review has not altered my opinion as expressed at the hearing.

Using the isopachous map (Exhibit 2 in Case No. 1276) to determine the net acre-feet of pay: A porosity of 6%; water saturation 20%; and an original reservoir pressure of 3617 psia; the total hydrocarbons originally in place and converted to surface conditions were 1,292 MMSCF of gas and 97,538 barrels of distillate. The production from the Shell-Amerada State "A" No. 1 to June 1, 1957 amounts to 1,626 MMSCF and 112,257 barrels of distillate. The fact that the reservoir pressure on the Shell-Amerada State "A" No. 1 was 3160 psia on the date of the most recent test would indicate the well is capable of draining the entire productive area. It can be seen from these volumes that the Shell-Amerada well has produced 334 million cubic feet and 14,719 barrels of distillate in excess of the volumes originally in place.

The data we have obtained to date on this reservoir is conclusive in my opinion that one well, properly completed, will effectively and efficiently drain in excess of 320 acres.

I trust this information will be useful. If there is additional information you need, please feel free to call on us.

Yours very truly,

R. S. Christie

RSC:mt

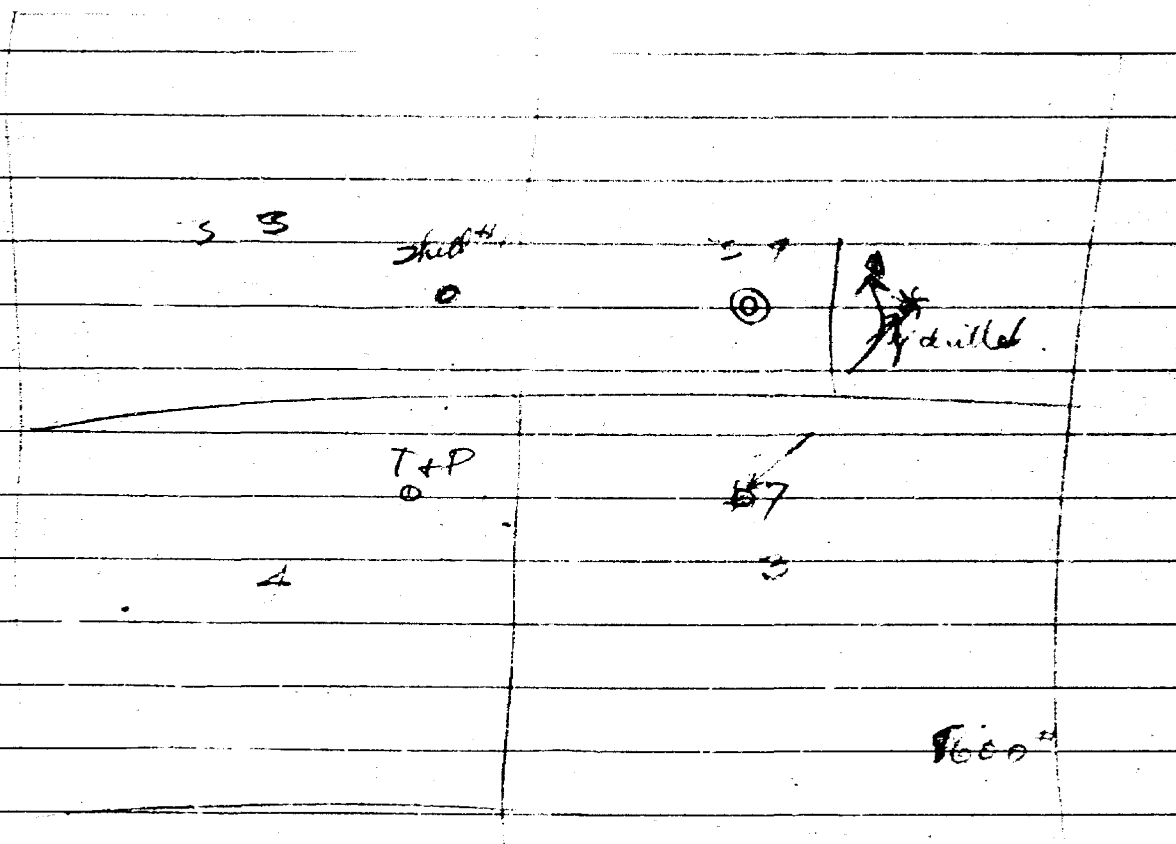
[illegible] - [illegible] [illegible]

[illegible] — Bombed flowing @ 1,650,000

7-8 " " 38 hr ~~flowing~~ S.I. 3126#

7-10 Pulled B[illegible] & moved to Caudle #7
Bombed flowing @ 2,290,550
72 hr S.I. [illegible] 2963#

7-12-57 Pulled bomb on Caudle #7
[illegible] [illegible] well [illegible].
7-8 to 7-12 (?) Built from 3126 to 3147.
7-16-57 161 hr SI 3138# (4 hr stabilization)
Caudle #7 produced at rate of 9000 MCF



[illegible]
[illegible]
Caudle #7 [illegible] = 1,054,000 MCF ([illegible])

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

S

CODE

R.P.G. 3 NO 10775 CLOCK NO HK74824 SPEED 48 HR. LEASE Amerada-Shell State "A" Unit WELL NO. 1

ELEMENT NO. 10655H RANGE 0-6000 CORR. TO — °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY LET/LEK CALCULATED BY LEK REPORTED BY OCM DATE RUN 7-8-57 TIME PULLED 7-10-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R. ZONE Penn. TOP 9805 BOTTOM 9815 T.D. 11,075

HOW PRODUCED Natural flow thru tbg. P.I. CASING 5-1/2 DEPTH 9889 TUBING 2-3/8 DEPTH 9810

HOURS SHUT IN 38 WELL HEAD PRESS.: CAS. TUB TOP LINER PERFORATIONS 9805-9815

LAST RESERVOIR PRESSURE 3371 DEPTH 9024 DATE 1-18-56 ELEVATION 4274 d.f. GRAVITY OF OIL SP. GR. OF GAS

TEST RECORD

PURPOSE OF TEST To determine the build-up characteristics of the well.

Hours Shut-In	DEPTH	BHBK PRESSURE				REMARKS
0	9810	3056	(a)			Flowing pressure.
1	(-5536)	3092				Shut-in pressures.
2		3098				
3		3104				
4		3111				
5		3114				
6		3114				
7		3117				
8		3114				
10		3114				
12		3117				
14		3120				
16		3120				
18		3117				
22		3123				
26		3120				
30		3123				
34		3126				
38		3126	7-8-57			

EXPLANATIONS OR CHART

Prior to shut-in, this well and the J.T. Caudle No. 7 had been flowing at normal rates. The J.T. Caudle No. 7 remained flowing during the build-up test on the Amerada-Shell State "A" Unit No. 1.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No.
CASE

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

3
CODE

R.P.G. 3 NO. 10775 CLOCK NO. 2149 SPEED 72 HR. LEASE Amerada-Shell State "A" Unit WELL NO. 1

ELEMENT NO. 10655 RANGE 0-6000# CORR. TO °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY LET/LEK CALCULATED BY LEK REPORTED BY OCM DATE RUN 7-12-57 TIME PULLED 8-15-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R. ZONE Penn. TOP 9805 BOTTOM 9815 T.D. 11,075

HOW PRODUCED P.I. CASING 5-1/2 DEPTH 9889 TUBING 2-3/8 DEPTH 9810

HOURS SHUT IN 161 WELL HEAD PRESS.: CAS. TUB TOP LINER PERFORATIONS 9805-9815

LAST RESERVOIR PRESSURE DEPTH DATE ELEVATION 4274 GRAVITY OF OIL SP. GR. OF GAS

TEST RECORD

PURPOSE OF TEST To measure effect of Caudle No. 7 flow on this wells BHP.

~~XXX~~ Hours	DEPTH	~~XXX~~ PRESSURE	REMARKS
0	9810	3147 - 47 Gauged. (a)	
1/3	(-5536)	3144	
2/3		3141	96 hrs from (a) & 4-)
1		3141	
2		3142	
3		3141	
4		3141	
5		3141	
6		3141	
7		3142	
8		3141	
9		3139	
10		3141	
11		3141	
12		3141 99a	
13		3138 ✓	
14		3139	
15		3139	
16		3138	
17		3138	
18		3138	
19		3138	
20		3141	
21		3138	
22		3138	
23		3139	
24		3138	
26		3144	
28		3142	
30		3141	
32		3142	
34		3141	
36		3141	
38		3141	
40		3141	
44		3138	
48		3138	
52		3135	
56		3138	
60		3138	
64		3138 Pulled bomb.	
65		3138	(Well had been shut-in 161 hrs. - see note below)

EXPLANATIONS OR CHART

Ran gauge back in Amerada-Shell State "A" Unit No. 1. Opened J.T. Caudle No. 7 at estimated rate of 4,000 MCF/Day. The "Hours" column above represents hours after the J.T. Caudle No. 7 had been opened. Actually, the Amerada-Shell well had been shut-in approximately 96 hours before the Caudle No. 7 was opened.

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

CODE

R.P.G. 3 NO. 10775 CLOCK NO. EK74824 SPEED 48 HR. LEASE Amerada-Shell State A Unit WELL NO. 1

ELEMENT NO. 10655N RANGE 0-6000 CORR. TO - °F. LOCATION Bagley Lower Penn., Lea Co., N.M.

RUN BY LET CALCULATED BY LEK REPORTED BY OCM DATE RUN 7-15-57 TIME PULLED 7-16-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R. ZONE Lower Penn. TOP 9805 BOTTOM 9815 T.D. 11,075

HOW PRODUCED Natural flow thru tbg. CASING 5½ DEPTH 9889 TUBING 2-3/8 DEPTH 9810

HOURS SHUT IN WELL HEAD PRESS.: CAS. TUB TOP LINER PERFORATIONS 9805-9815

LAST RESERVOIR PRESSURE DEPTH DATE ELEVATION 4274 GRAVITY OF OIL - SP. GR. OF GAS -

TEST RECORD

PURPOSE OF TEST

MINS	DEPTH	TEMP. PRESSURE				REMARKS
68	9810 (-5536)	3168				
70		3168				
72		3165				
74		3162				
76		3153				
78		3162				
80		3162				
82		3156				
84		3156				
86		3156				
88		3153				
90		3153				

EXPLANATIONS OR CHART

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET

AMERADA P-204

AMERADA BOTTOM-HOLE PRESSURE-TEMPERATURE REPORT

S
CODE

R.P.G. 3 NO. 10775 CLOCK NO. 2149 SPEED 72 HR. LEASE J.T. Caudle WELL NO 7-T

ELEMENT NO. 10655N RANGE 0-6000 CORR. TO — °F. LOCATION Bagley Area, Lea County, New Mexico

RUN BY LST/LEK CALCULATED BY LEK REPORTED BY OCM DATE RUN 7-10-57 TIME PULLED 7-12-57 TIME

WELL DATA

POTENTIAL: CHOKE OIL WATER G.O.R. ZONE Penn. TOP 9758 BOTTOM 9925 T.D. 9952

HOW PRODUCED Natural flow thru tbg. P.I. CASING 5-1/2 DEPTH 9956 TUBING 2-3/8 DEPTH 9813

HOURS SHUT IN 42 WELL HEAD PRESS.: CAS. TUB TOP LINER PERFORATIONS 9758-9813

LAST RESERVOIR PRESSURE 3250 DEPTH 9800 DATE 2-4-57 ELEVATION 4264 GRAVITY OF OIL SP. GR. OF GAS

This well is a gas-gas dual.

TEST RECORD

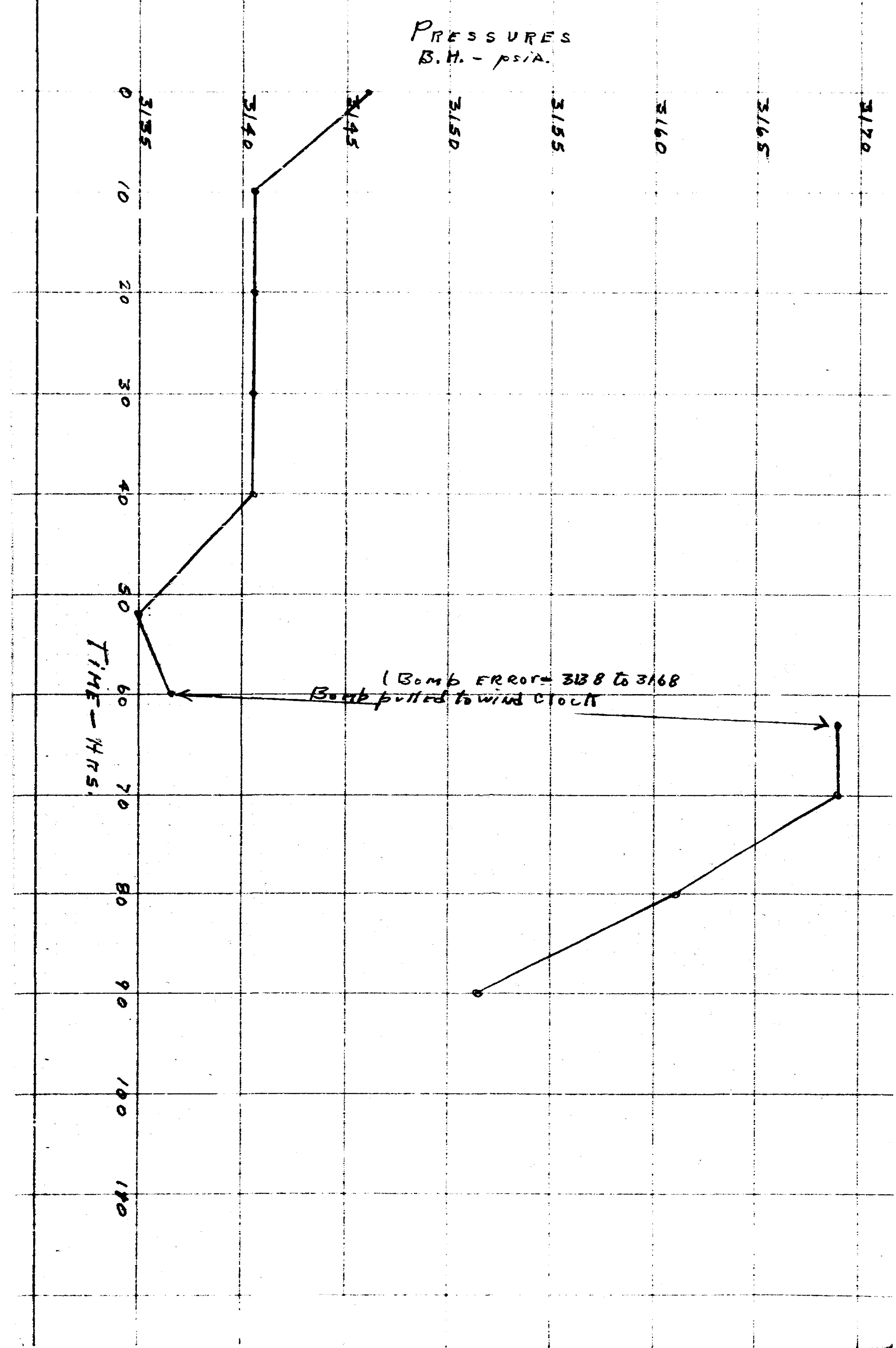
PURPOSE OF TEST To determine the build-up characteristics of the well.

Hours Shut-In	DEPTH	PRESSURE				REMARKS
0	8686	2649				Flowing pressure.
1	(-4422)	2939				Shut-in pressures.
2		2906				
3		2972				
4		2975				
5		2972				
6		2966				
7		2966				
8		2963				
10		2963				
12		2966				
14		2975				
16		2978				
18		2972				
22		2981				
26		2981				
30		2772				Accumulated oil prior to B.U. (approximately)
34		2969				
38		2966				
42		2963	→ 110°	#1 Bottom		

EXPLANATIONS OR CHART

This well had been flowing at its normal rate prior to shut-in. The Amerada-Shell State "A" Unit #1 had been shut-in about 48 hours before the J.T. Caudle #7 was shut-in, and the Amerada-Shell well remained shut-in during the build-up test on J.T. Caudle #7.

MAKE FURTHER EXPLANATIONS ON BACK OF SHEET


PRESSURES
B.H. - psia.
3135
3140
3145
3150
3155
3160
3165
3170
0
10
20
30
40
50
60
70
80
90
100
110
TIME - HRS.
(Bomb error 3138 to 3168
Bomb pulled to wind clock

Case 1276

Bagley Penn. 9800' zone.
20' net Pay
6% Porosity.
20% H_2O
Origonal B.H.P. 3617 psig
May 1957 BHP 3160 "

Pressure - Reserve analysis on Amerada
Shell St #1, SESE - 30 - 11S - 33E.
Completed in Bagley Penn. - 9800 Gas
Zone.
Volume of gas produced since completion
10-23-51 - 1,626,000 MCF & 112,257
Barrels Distillate.
Origonal gas in Place per lb. Pressure:

Orig Reserves for 160 Ac, MCF 1,292,000 (357.2) MCF
Origonal B.H.P., psia 3617

Pressure drop 10-23-51 to 5-20-57:
Origonal 3617
5-20-57 3160
457 #

Production MCF 1,626,000 = (3,557.9) MCF
Pressure Drop 457

Based on reserves:
Well should produced: 457 x 357.2 = (163,149) MCF
instead of 1,626,000 MCF for pressure
drop.
Well has drained: 1,626,000 / 1,292,000 = 1.258
1.258 x 160 = (201.28) Ac.

Well has lowered the pressure on:

Prod. MCF/# $\frac{3552}{357.2} = 9.958$

160 Ac. Res MCF/#

$9.958 \times 160 = 1593.28$ Acres.

The only questionable data is reserves?

$\frac{1593.28}{320}$ Acres. = .4978

"

Therefore the reserve figure would have to be five times too low for the Shell St. not to drain 320 Acres.

Calculated reserves/Ac = 8.075 MCF

Reserves could be as high as 40,197. M and still drain 320 Ac.

(4) That the special pool rules applicable to the Bagley-Upper Pennsylvanian Gas Pool and the Bagley-Lower Pennsylvanian Gas Pool be and the same are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
BAGLEY-UPPER PENNSYLVANIAN GAS POOL
AND THE
BAGLEY-LOWER PENNSYLVANIAN GAS POOL

copy

RULE 1. Any well drilled a distance of one mile or more outside the boundary of ~~either the Bagley-Upper Pennsylvanian Gas Pool or~~ the Bagley-Lower Pennsylvanian Gas Pool shall be classified as a wildcat well. Any well drilled less than one mile outside the boundary of ~~the Bagley-Upper Pennsylvanian Gas Pool or~~ the Bagley-Lower Pennsylvanian Gas Pool shall be spaced, drilled and operated in accordance with the rules and regulations in effect ~~in said Bagley-Upper Pennsylvanian Gas Pool provided said well is projected to and/or completed in the so-called "9600-foot" zone, or in accordance with the regulations in effect~~ in said Bagley-Lower Pennsylvanian Gas Pool provided said well is projected to and/or completed in the so-called "9800-foot" zone.

insert (1) Rule 2

RULE 2. (a) Each well drilled or recompleted within the limits of the Bagley-Upper Pennsylvanian Gas Pool or the Bagley-Lower Pennsylvanian Gas Pool shall be drilled, spaced and operated in accordance with the applicable provisions of Rule 104 of the Commission Rules and Regulations; provided, however, that a non-standard drilling unit may be formed after notice and hearing by the Commission or under the provisions of Paragraph (b) of this rule.

(b) The Secretary of the Commission shall have authority to grant an exception to Rule 2 (a) without notice and hearing where application has been filed in due form and where the following facts exist and the following provisions are complied with.

1. The non-standard gas proration unit consists of contiguous quarter-quarter sections or lots.

2. The non-standard proration unit lies wholly within a single governmental section.

3. The entire non-standard gas proration unit may reasonably be presumed to be productive of gas.

4. The length or width of the non-standard gas proration unit does not exceed 5280 feet.

5. That applicant presents written consent in the form of waivers from all offset operators and from all operators owning interests in the ~~quarter~~ section in which any part of the non-standard gas proration unit is situated and which acreage is not included in said non-standard gas proration unit.

6. In lieu of Paragraph 5 of this Rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered mail of his intent to form such non-standard gas proration unit. The Secretary of the Commission may approve the application, if, after a period of 30 days following

the mailing of said notice, no operator has made objection to the formation of such non-standard gas proration unit.

RULE 4. Each gas purchaser in the ~~Bagley-Upper Pennsylvanian or the~~ Bagley-Lower Pennsylvanian Gas Pool shall take ratably from all wells producing from ~~said~~ common source of supply, apportioning its takes during any given calendar year among said wells on the basis of the acreage dedicated thereto.

RULE 5. No natural gas nor casinghead gas produced from ~~either the Bagley-Upper Pennsylvanian Gas Pool or~~ the Bagley-Lower Pennsylvanian Gas Pool shall be flared or vented unless specifically authorized by the Commission after notice and hearing.

RULE 6. The monthly gas production from each well shall be metered separately and the gas production and associated liquid hydrocarbon production therefrom shall be reported to the Commission in accordance with the applicable Commission Rules and Regulations.

IT IS FURTHER ORDERED:

That no natural gas nor casinghead gas produced from the Bagley-Pennsylvanian Oil Pool shall be flared or vented unless specifically authorized by the Commission after notice and hearing.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

ga

Findings:

2. That the applicant, Amerada Petroleum Company, proposes the establishment of 320-acre spacing in the Bagley-Lower Pennsylvanian Gas Pool and such other rules and regulations as the Commission may deem necessary.

3. That there is sufficient evidence to justify the establishment of 320-acre spacing in the Bagley-Lower Pennsylvanian Gas Pool.

4. That the 320-acre spacing units should be comprised of two contiguous quarter sections of the United States Public Lands Survey.

5. That no well should be drilled to or recompleted in the Bagley-Lower Penn. Gas Pool nearer than 660 feet to a section line nor nearer than 330 feet to a quarter-quarter section line; provided however, that the Secretary-Director of the Commission should have authority to grant exceptions to the foregoing well location requirements to avoid topographical obstructions.

6. That the provisions of this order

6. that this case should be heard again by the Commission at the monthly hearing in July of 1958 to permit the applicant and all other interested parties to appear and show cause why the provisions of this order should be continued in effect.

It is therefore ordered:

1. That the Special Rules and Regulations for the Bagley-Lower Pennsylvanian as set forth in Order R-991 be and the same are hereby superseded by the Special Rules and Regulations hereinafter set forth.

2. That the Special Rules and Regulations hereinafter set forth shall be of no ~~further~~ force nor effect after Aug 31, 1958.

3. That this case shall be ~~[redacted]~~ called for hearing before the Commission at the monthly ~~[redacted]~~ hearing in July, 1958, to permit the applicant and all other interested parties to appear and present the results of bottom hole pressure tests, interference tests, and/or such other evidence as may be available to show cause why the Special Rules and Regulations hereinafter set forth should be continued in effect beyond Aug 31, 1958.

Special Rules and Regulations
for the
Bagley-Lower Pennsylvanian Gas Pool

Rule 1. (see attached sheet for rules)

Insert No. 1

Rule 2. (a) That each well drilled or recompleted in the Bagley - Lower Penn. G.P. shall be located on a tract ~~consisting~~ comprising of approximately 320 acres ~~consisting~~ of any two contiguous quarter-sections of a single governmental section, being a legal subdivision of the United States Public Lands Survey.

(b) (copy 2 (b) of Order R-99, as corrected)

Rule 3. (a) That no well ~~shall~~ shall be drilled to or recompleted in the Bagley - Lower Pennsylvanian Gas Pool nearer than 660 feet to a governmental section line nor nearer than 330 feet to a governmental quarter-section line.

b. The ~~Secretary~~ Director of the Commission shall have authority to grant exception to the requirements of Rule 3 (a), without notice and hearing, where a verified application therefor has been filed in due form, and the necessity for the unorthodox location is based on topographical conditions or is occasioned by the recompletion of a well previously drilled to another horizon.

OK to approve as indicated below 8/5/57 [initials]

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 7-2-57

CASE 1276 Hearing Date 6-17-57

My recommendations for an order in the above numbered cases are as follows:

1. That the Bagley lower Penn. gas Pool ~~spacing~~ Drilling ~~units~~ and Proration units be 320 acres for a period of one year from date of order [initials] & to be heard again in July 1958. [initials]

2. The wells should be not less than 660 from a section line or a proration unit boundary.

3. Rateable take ← similar to R-991 [initials]

4. Set out as provision for ~~an~~ interference test to be specified by the Commission after ~~the~~ a ~~[illegible]~~ well is completed in ~~Sec. 34~~ the S/2 of Sec. 34, -11S-33E.

5. Require a Stabilized B.H.P. and an explaination as to the gravity of liquids in the [illegible] State - AC-2 #1, NE NE-4-12S-33E.

separate letter [initials] not in order [initials]

[signature]

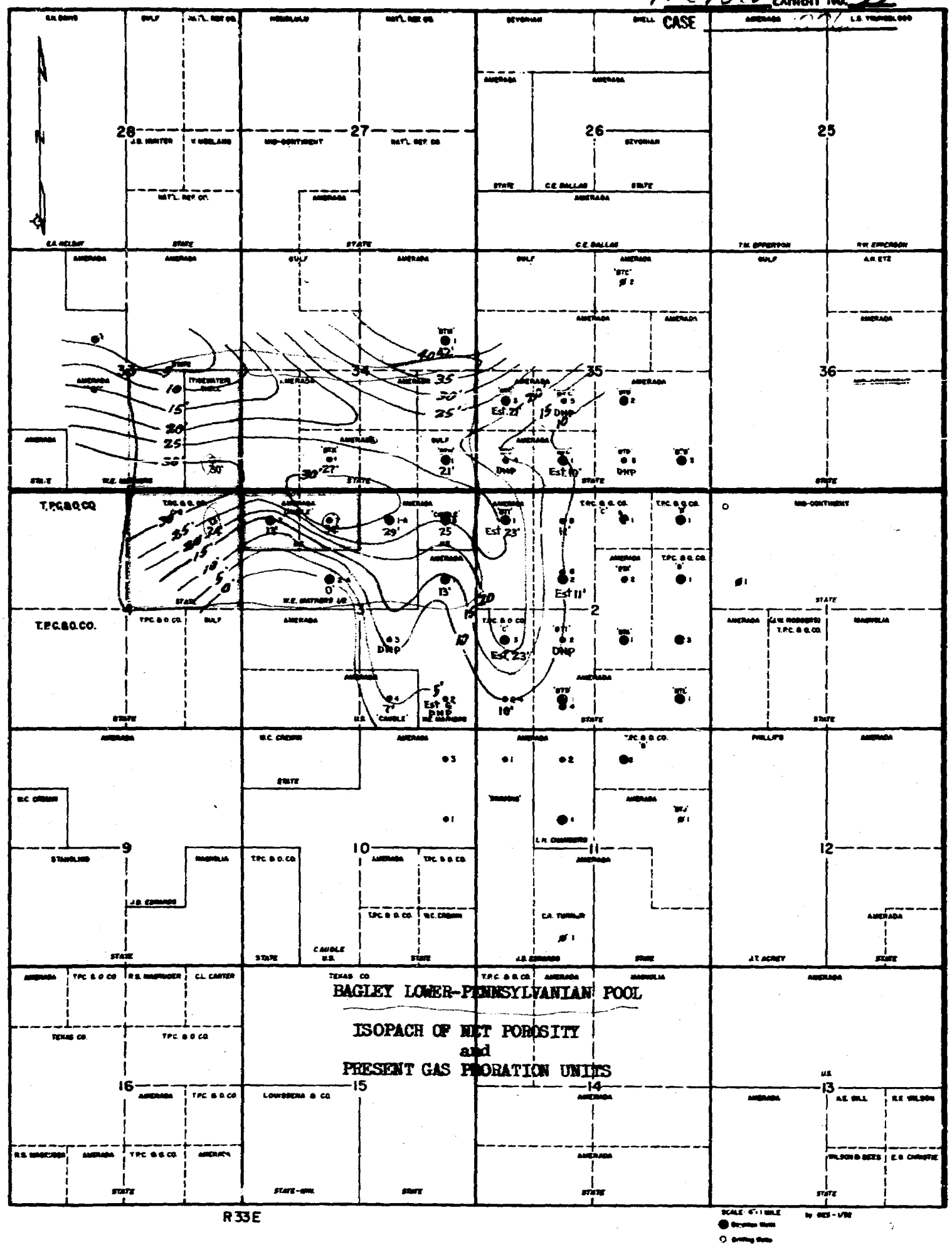
Staff Member

TEXAS PACIFIC COAL AND OIL COMPANY

BAGLEY-PENNSYLVANIAN FIELD

LEA COUNTY, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
TPC 100 EXHIBIT No. 2
CASE



TEXAS PACIFIC COAL AND OIL COMPANY
BAGLEY-PENNSYLVANIAN FIELD
LEA COUNTY, NEW MEXICO

CASE
EXHIBIT NO.
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
TPC & OS EXHIBIT No. 4
CASE 1276

T 11 S

STRUCTURE MAP ON 9800' POOL

R 33 E

T 12 S

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

August 19, 1957

COPY

Mr. Jack Campbell
Campbell & Russell
P.O. Box 721
Roswell, New Mexico

Dear Sir:

On behalf of your client, Texas Pacific Coal & Oil Company, we enclose a copy of Order R-1031 issued August 14, 1957, by the Oil Conservation Commission in Case 1276, which was heard on July 17th.

Very truly yours,

A. L. Porter, Jr.
Secretary - Director

bp
Encl.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

August 19, 1957

COPY

Mr. Jason Kellahin
P.O. Box 597
Santa Fe, New Mexico

Dear Sir:

On behalf of your client, Amerada Petroleum Corporation, we enclose two copies of Order R-1031 issued August 14, 1957, by the Oil Conservation Commission in Case 1276, which was heard on July 17th.

Very truly yours,

A. L. Porter, Jr.
Secretary - Director

bp
Encls.

Memo

From

To

DUPLIMATED COPIES OF ORDER R-1031 MAILED TO:

Harry DuPont, USGS, Hobbs
Ed Nester, Shell
Oliver Seth, Santa Fe

8-20-57
BP.

No. 20-58

DOCKET: REGULAR HEARING JULY 16, 1958

Oil Conservation Commission 9 a.m. Mabry Hall, State Capitol, Santa Fe, NM

ALLOWABLE: (1) Consideration of the oil allowable for August, 1958.

(2) Consideration of the allowable production of gas for August, 1958, from six prorated pools in Lea County, New Mexico; also consideration of the allowable production of gas from seven prorated pools in San Juan and Rio Arriba Counties, New Mexico, for August, 1958.

NEW CASES

CASE 1276: In the matter of the hearing ordered to be called by Order No. R-1031 to permit Amerada Petroleum Corporation and other interested operators to appear and show cause why 320-acre spacing and the Special Rules and Regulations for the Bagley-Lower Pennsylvanian Gas Pool in Lea County, New Mexico, as set forth in Order R-1031 should be continued in effect beyond August 31, 1958.

CASE 1325: In the matter of the hearing ordered to be called by Order No. R-1091 to permit Amerada Petroleum Corporation and other interested operators to appear and show cause why 320-acre spacing and the Special Rules and Regulations for the Bagley-Upper Pennsylvanian Gas Pool in Lea County, New Mexico, as set forth in Order R-1091 should be continued in effec beyond August 31, 1958.

CASE 1384: In the matter of the hearing ordered to be called by Order No. R-1136 to permit Amerada Petroleum Corporation to appear and present additional evidence as to the proper designation of the oil producing intervals in its State BTO No. 1 Well located 990 feet from the South line and 2310 feet from the East line of Section 34, Township 11 South, Range 33 East, in the Bagley-Pennsylvanian area of Lea County, New Mexico, and to show cause why the above-described well should be permitted to continue to produce as a dual completion.

CASE 1480: Southeastern New Mexico nomenclature case calling for an order for the creation of new pools and the extension and reclassification of existing pools in Lea, Eddy and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for Devonian production, designated as the Dickinson-Devonian Pool, and described as:

TOWNSHIP 10 SOUTH, RANGE 36 EAST, NMPM
Section 34: SW/4

(b) Create a new oil pool for Queen production, designated as the East Millman-Queen Pool, and described as:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 14: SE/4

(c) Create a new oil pool for Bone Springs production, designated as the South Vacuum-Bone Springs Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 22: NW/4

(d) Change the pool limits of the Artesia Pool to Queen, Grayburg, and San Andres.

(e) Extend the Jalmat Pool to include:

TOWNSHIP 22 SOUTH, RANGE 35 EAST, NMPM
Section 10: NE/4
Section 11: NW/4 & W/2 NE/4

(f) Extend the Justis Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 13: NE/4

(g) Extend the Justis-Fusselman Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 24: SW/4

(h) Extend the Milnesand-Pennsylvanian Pool, to include:

TOWNSHIP 8 SOUTH, RANGE 34 EAST, NMPM
Section 14: SE/4

(i) Extend the Vandagriff-Keyes Gas Pool to include:

TOWNSHIP 16 SOUTH, RANGE 28 EAST, NMPM
Section 33: SE/4
Section 34: SW/4

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 4: NE/4

(j) To consider the reclassification of the Four Lakes-Devonian Pool, from an oil pool to a gas pool upon the application of Humble Oil & Refining Company. The present horizontal limits of said pool are as follows:

TOWNSHIP 11 SOUTH, RANGE 34 EAST, NMPM
Section 35: SE/4

TOWNSHIP 12 SOUTH, RANGE 34 EAST, NMPM
Section 1: NW/4
Section 2: NE/4

CASE 1481: Northwestern New Mexico nomenclature case calling for an order for the extension of existing pools in Rio Arriba and San Juan Counties, New Mexico.

(a) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 28 NORTH, RANGE 8 WEST, NMPM	
Section 15:	SW/4
Section 16:	S/2
Section 17:	S/2

TOWNSHIP 29 NORTH, RANGE 10 WEST, NMPM	
Section 1:	All

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM	
Section 21:	SW/4
Section 28:	NW/4

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM	
Section 1:	NW/4

(b) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 4 WEST, NMPM	
Section 8:	SE/4

(c) Extend the Blanco-Mesaverde Pool to include:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM	
Section 5:	All
Section 17:	All
Section 18:	E/2
Section 29:	All
Section 31:	E/2
Section 32:	N/2

TOWNSHIP 32 NORTH, RANGE 13 WEST, NMPM	
Section 35:	N/2

(d) Extend the Bisti-Lower Gallup Oil Pool to include:

TOWNSHIP 26 NORTH, RANGE 13 WEST, NMPM	
Section 18:	S/2
Section 19:	NE/4

TOWNSHIP 26 NORTH, RANGE 14 WEST, NMPM	
Section 13:	SE/4

(e) Extend the Horseshoe-Gallup Oil Pool to include:

TOWNSHIP 31 NORTH, RANGE 16 WEST, NMPM	
Section 33:	SE/4 SW/4, S/2 SE/4
Section 34:	SW/4 SW/4

(f) Extend the Otero-Gallup Oil Pool to include:

TOWNSHIP 25 NORTH, RANGE 5 WEST, NMPM
Section 32: SE/4

(g) Extend the Verde-Gallup Oil Pool to include:

TOWNSHIP 30 NORTH, RANGE 15 WEST, NMPM
Section 6: SE/4

TOWNSHIP 31 NORTH, RANGE 15 WEST, NMPM
Section 33: SW/4
Section 34: NW/4

CONTINUED CASES

CASE 1451: Application of Amerada Petroleum Corporation for a non-standard gas proration unit. Applicant, in the abpve-styled cause, seeks an order establishing a 280-acre non-standard gas proration unit in the Justis Gas Pool consisting of the W/2 SW/4 Section 24, NW/4 and SW/4 NE/4 of Section 25, all in Township 25 South, Range 37 East, Lea County, New Mexico, said unit to be dedicated to the applicant's proposed well to be drilled in the NE/4 NW/4 of said Section 25.

CASE 1473: Southeastern New Mexico Nomenclature case.

(1) To reconsider the designation and limits of the South Sawyer-San Andres Pool.

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