CASE 2480: Applic[illegible] [illegible] SHELL for temporary 80-acre proration units, HENSHAW-WOLFCAMP POOL, Eddy County.

Ida –
Be sure Kaptuia
gets a copy of
this order – nomenclature

Case No.

2410

pplication, Transcript,

mall Exhibits, Etc.

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. 2480
Order No. R-2182-B

APPLICATION OF SHELL OIL COMPANY
FOR TEMPORARY SPECIAL RULES AND
REGULATIONS FOR THE HENSHAW-
WOLFCAMP POOL, EDDY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on February 5, 1964, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 13th day of April, 1964, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 by Order No. R-2182, dated February 12, 1962, temporary special rules and regulations were promulgated for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico.

(3) That by Order No. R-2182-A, dated February 27, 1963, said temporary special rules and regulations were continued in full force and effect for an additional one-year period.

(4) That pursuant to the provisions of Order No. R-2182-A, this case was reopened to allow the operators in the subject pool to appear and show cause why the Henshaw-Wolfcamp Pool should not be developed on 40-acre proration units.

(5) That the evidence establishes that one well in the Henshaw-Wolfcamp Pool can efficiently and economically drain and develop 80 acres.

(6) That to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk

arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Order No. R-2182 should be continued in full force and effect until further order of the Commission.

(7) That the Special Rules and Regulations promulgated by Order No. R-2182 have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil in the pool.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Henshaw-Wolfcamp Pool promulgated by Order No. R-2182 are hereby continued in full force and effect until further order of the Commission.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M Campbell

JACK M. CAMPBELL, Chairman

E S Walker

E. S. WALKER, Member

A. L. Porter, Jr.

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

esr/

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

State of New Mexico
Oil Conservation Commission

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

April 13, 1964

Mr. Richard Morris
Seth, Montgomery, Federici & Andrews
Attorneys at Law
Post Office Box 2307
Santa Fe, New Mexico

Re: Case No. 2480
Order No. R-2182-B
Applicant:
Shell Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC
OTHER

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 4/3/64

CASE 2480 Hearing Date 9am 2/5/64
DSN @ SF

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

Enter an order making the temporary 80-acre pool rules for the Henshaw Wolfcamp Pool effective until further order of the Commission. Some of the wells in the pool have demonstrated the ability to efficiently drain 80 acres and in areas where this is not so well demonstrated, the economics of closer drilling are poor. There will probably be little if any additional development in this pool.

Staff Member

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. 2480
Order No. R-2182-A

APPLICATION OF SHELL OIL COMPANY
FOR TEMPORARY SPECIAL RULES AND
REGULATIONS FOR THE HENSHAW-
WOLFCAMP POOL, EDDY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on February 21, 1963, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 27th day of February, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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 by Order No. R-2182, entered in Case No. 2480 on February 12, 1962, temporary special rules and regulations were promulgated for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico.

(3) That this case was reopened pursuant to Order No. R-2182 to allow all interested parties to show cause why the subject pool should not be developed on 40-acre proration units.

(4) That development of the Henshaw-Wolfcamp Pool since the entry of Order No. R-2182 has not been sufficient to yield any substantial additional information concerning the reservoir characteristics of the pool.

(5) That the temporary special rules and regulations promulgated by Order No. R-2182 should be extended for an additional

one year period in order to prevent the possibility of economic loss resulting from the drilling of unnecessary wells, and in order to allow the operators in the subject pool additional time in which to gather information concerning the reservoir characteristics of the pool.

(6) That this case should be reopened at an examiner hearing in February, 1964, at which time the operators in the subject pool should appear and show cause why the Henshaw-Wolfcamp Pool should not be developed on 40-acre proration units.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Henshaw-Wolfcamp Pool, promulgated by Order No. R-2182, shall remain in full force and effect for an additional period of one year.

(2) That this case shall be reopened at an examiner hearing in February, 1964, at which time the operators in the subject pool shall appear and show cause why the Henshaw-Wolfcamp Pool should not be developed on 40-acre proration units.

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell

JACK M. CAMPBELL, Chairman

E. S. Walker

E. S. WALKER, Member

A. L. Porter, Jr.

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

esr/

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. 2480
Order No. R-2182

APPLICATION OF SHELL OIL COMPANY
FOR TEMPORARY SPECIAL RULES AND
REGULATIONS FOR THE HENSHAW-
WOLFCAMP POOL, EDDY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 24, 1962, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 12th day of February, 1962, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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 applicant, Shell Oil Company, seeks the promulgation of temporary special rules and regulations for the Henshaw-Wolfcamp Pool in Eddy County, New Mexico, to provide for 80-acre proration units.

(3) That the evidence presented concerning the reservoir characteristics of the Henshaw-Wolfcamp Pool justifies the establishment of 80-acre proration units in said pool for a temporary one-year period.

(4) That the information presently available and presented as evidence indicates that the Henshaw-Wolfcamp Pool can be efficiently and economically drained on 80-acre proration units.

(5) That during the one-year period in which this order will be in effect, the applicant should gather all available information relative to drainage and recoverable reserves in the subject pool, including core data and interference tests.

(6) That this case should be heard again by a duly appointed examiner of the Commission at an examiner hearing in February, 1963, at which time the applicant should be prepared to prove by a preponderance of the evidence the proration unit size on which the subject pool can be most efficiently drained and developed.

(7) That the Henshaw-Wolfcamp Pool should be created for the production of oil from the Wolfcamp formation. Said Henshaw-Wolfcamp Pool was discovered by the applicant's Henshaw Deep Unit Well No. 1, located in the NE/4 NW/4 of Section 24, Township 16 South, Range 30 East, NMPM, Eddy County, New Mexico. The top of the perforations is 8822 feet.

IT IS THEREFORE ORDERED:

(1) That a new pool in Eddy County, New Mexico, classified as an oil pool for Wolfcamp production is hereby created and designated as the Henshaw-Wolfcamp Pool, consisting of the following-described area:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
Section 24: NW/4 and S/2

(2) That special rules and regulations for the Henshaw-Wolfcamp Pool are hereby promulgated as follows, effective March 1, 1962.

SPECIAL RULES AND REGULATIONS FOR THE
HENSHAW-WOLFCAMP POOL

RULE 1. Each well completed or recompleted in the Henshaw-Wolfcamp Pool or in the Wolfcamp formation within one mile of the Henshaw-Wolfcamp Pool, and not nearer to nor within the limits of another designated Wolfcamp Pool shall be spaced, drilled, operated and prorated in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well completed or recompleted in the Henshaw-Wolfcamp Pool shall be located on a unit containing 80 acres, more or less, which consists of the N/2, S/2, E/2 or W/2 of a single governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. For good cause show, the Secretary-Director may grant exception to the requirements of Rule 2 without notice and hearing when the application is for a non-standard unit comprising a single quarter-quarter section or lot. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application if, after a period of 30 days, no offset operator has entered an objection to the formation of such non-standard unit.

The allowable assigned to any such non-standard unit shall bear the same ratio to a standard allowable in the Henshaw-Wolfcamp Pool as the acreage in such non-standard unit bears to 80 acres.

RULE 4. The initial well on any 80-acre unit in said pool shall be located within 150 feet of the center of either the SW/4 or NE/4 of the quarter section on which the well is located. Any well which was drilling to or completed in the Henshaw-Wolfcamp Pool prior to January 24, 1962, is granted an exception to the well location requirements of this rule.

RULE 5. An 80-acre proration unit (79 through 81 acres) in the Henshaw-Wolfcamp Pool shall be assigned an 80-acre proportional factor of 4.00 for allowable purposes, and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

(3) That operators who propose to dedicate 80 acres to a well in the Henshaw-Wolfcamp Pool must file an amended Commission Form C-128 with the Artesia District Office of the Commission by February 15, 1962, in order that the well may be assigned an 80-acre allowable on the March proration schedule.

(4) That this case be reopened at an examiner hearing in February, 1963, at which time the operators in the subject pool shall appear and show cause why the Henshaw-Wolfcamp Pool should not be developed on 40-acre proration units.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

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

1r/

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 5, 1964

EXAMINER HEARING

IN THE MATTER OF:

In the matter of Case No. 2480, being reopened pursuant to the provisions of Order No. R-2182-A, which continued for a period of one year the temporary 80 acre proration units established by Order No. R-2182, Henshaw-Wolfcamp Pool, Eddy County, New Mexico

Case No. 2480

BEFORE: DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 5, 1964

EXAMINER HEARING

IN THE MATTER OF:

Case No. 2480 being reopened pursuant to the provisions of Order No. R-2182-A, Eddy County, New Mexico.

CASE NO. 2480

BEFORE: DANIEL S. NUTTER, EXAMINER

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case 2480.

MR. DURRETT: In the matter of Case No. 2480 being reopened pursuant to the provisions of Order No. R-2128-A, Eddy County, New Mexico.

MR. MORRIS: If the Examiner please, I am Richard Morris of Seth, Montgomery, Federici and Andrews, of Santa Fe, appearing on behalf of the applicant, Shell Oil Company.

MR. DURRETT: Let the record show that Mr. Stokes has been sworn.

DANA D. STOKES,

called as a witness herein, having been first duly sworn on oath,

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Stokes, are you the same Mr. Stokes that testified in Case 2986?

A I am.

Q Shell is an operator in the Henshaw-Wolfcamp Pool; is that correct, Mr. Stokes?

A That's correct.

Q And as an interested party, Shell is appearing in response to the reopening of Case 2480?

A Yes, sir.

Q Are you familiar with the exploration and development of the Henshaw-Wolfcamp Pool?

A Yes,sir, I am.

Q What is Shell's position at this time with respect to the reopening of Case Number 2480?

A Shell is here as an operator of the Henshaw-Deep Unit, and to request that the temporary rules established by Order No. R-2182 be made permanent.

Q To bring the Commission and the Examiner up to date a little bit on this pool, Mr. Stokes, do you have a plat showing the Henshaw-Wolfcamp Pool?

A Yes, sir. Exhibit One is a plat of the Henshaw-Wolfcamp Pool area, showing the Henshaw Deep Unit outlined in green. It

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

shows the location of the three wells that have been drilled in the pool since our last hearing in February of 1963. These three wells resulted in the completion of one producing well, No. Eight, which is located in the Southwest Quarter of Section 23, and two dry holes, No. Seven in the Northeast Quarter of 24 and No. Nine in the Northwest Quarter of 23.

Q Do you have an exhibit showing the completion data on the two wells completed in this pool since the last hearing?

A Yes, Exhibit Two shows the completion data on Wells No. Six and No. Eight, which have been completed since our February hearing. Well No. Six was in the process of completion at that time, but it was testing another zone. We did make a satisfactory completion in that well in a zone which is just below the porous interval producing in Well No. One, but which tested water in that well. We obtained a very satisfactory potential of 261 barrels of oil per day on a 13/64ths choke, out of Well No. Six, with only a thousand gallon acid treatment. We also completed Well No. Eight, which is directly west of Well No. Six. We had a potential there of 380 barrels a day on a 14/64ths choke, after treatment of 300 gallons of acid. This well is possibly structurally, or I should say it is completed in an interval almost equivalent to that that produces in Well No. Six. However, the zones do not correlate between the two wells.

Q That is the story of just about all the wells in this pool, isn't it, Mr. Stokes?

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

A That's correct.

Q If you would refer now to Exhibit Number Three, concerning the pressure performance of the wells in this pool, would you explain that, please?

A Exhibit Three is a plot of bottom pressure versus accumulative production of the wells in the Henshaw-Wolfcamp Pool. This graph shows the pressure performance between the wells in the pool, and also has a dashed line which is our calculated pressure performance for a well draining only 80 acres. This line being based on the average thickness of pay encountered in the field to date, average porosity and so on. The graph shows that only one well, Well No. Three-A, is draining less than 80 acres. We feel this well is draining 40 to 50 acres. It is a non-commercial well. The ultimate recovery would be on the order of 40 to 50 thousand barrels. I believe the well recovered about 35 barrels of oil to date, and is currently producing only 700 barrels of oil per month. The rest of the wells in the pool are performing very satisfactorily. All of them are indicated to be draining more than 80 acres. Some of them quite a bit more than that. Well No. Two is the next poorest performer, however, it is a commercial well, and certainly capable of draining far more than 80 acres. Well Six and Eight appear to be very good wells. Well No. Five is performing very well, and Well No. One has made 150,000 barrels of oil without any decline of pressure from a zone that is only ten feet thick. You will note that Wells Six and Eight were completed with pressures

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

considerably below the initial pressure of the rest of the wells in the field. This could indicate that these two wells are in the same poreous interval, however, we have quite a bit of other data that tends to discount this. We actually have only the single pressure point on Well No. Eight. We won't have any data to confirm this until we do take another pressure measurement probably in the middle of this year.

Q Do you have an exhibit showing the reservoir data on each of these six wells?

A Yes, Exhibit Four shows our reservoir data from all of the completions in the pool, both core data and data calculated from performance. We have core data on a producing interval of two wells, Well No. 3-A and Five. Here our porosity from cores and logs are in close agreement and our permeability from core data and permeability calculated from pressure build-up curves are also in very good agreement, being two and 2.8 millidarcies with respect to Well No. 3-A, and 68 and 41 millidarcies in Well No. 5. We have calculated from - - permeability from performance of wells in the pool, from 2.8 millidarcies in Well 3-A to 350 millidarcies in Well No. 8. All of the wells exhibit satisfactory permeability except Well No. 3-A. Also, I would like to point out the difference in the gravities of the oil and H2S content of gas. This, in addition to difference in correlating from well to well, leads us to believe, with the exception of Wells Two and 3-A, all of the rest of the wells are completed in separate zones

of porosity.

Well No. 5 has properties quite similar to Wells Two and 3-A, however, it produces from a well that correlates to be 75 feet low to the zone producing in Well No. One, while Wells Two and 3-A correlate with a zone 100 feet high to the one producing in Well No. One.

MR. NUTTER: In other words, Mr. Stokes, I don't want to interrupt, but you feel here in the Wolfcamp you have just got a whole bunch of individual stringers and these various wells may be completed in different stringers with the exception of two wells?

A Yes, sir. Yes, sir. Yes, sir.

MR. NUTTER: You think are producing from the same one?

A Yes, sir.

Q (By Mr. Morris) Actually, Mr. Stokes, you have pretty good structural control in this area, just a question of where you are going to pick up your porosity, isn't that right?

A That's correct. We have our structure outlined fairly well, but the porous development has absolutely nothing to do with the present day Wolfcamp structure.

Q Have you made a calculation concerning the difference in abandonment pressures that would be caused by development on 80 rather than 40 acre density?

A Yes. Exhibit Five shows a calculation of the difference in abandonment pressure we would expect on 40 and 80 acre spacing

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

with the type of permeability that we have in this pool. We averaged the data from the four intermediate wells, dropping out the lowest well and the highest well as not representative of the field. We obtained an average permeability of 23 millidarcies, and average pay thickness of 12 feet, which gives us about 250 millidarcy-feet of permeable capacity. The flow equation is basic Darcies law modified to radial flow. Our terms of TP minus PF would be difference in the pressure of a drainage radius of a given well to the well core. The equation shows that function of oil producing rate, oil viscosity, the permeability and the formation thickness and the logs of ratio of drainage radius to the well bore, and this equation shows that for any well having satisfactory or adequate permeability at all, the difference in abandonment pressure on 40 and 80 acre spacing is bound to be small because the difference in the log of the drainage radius ratio is only- - well, 3.35 for 40 acres, and 3.497 for 80 acres. Unless your permeability is quite small, any well should be capable of draining more than 40 acres without a significant loss of reserves. Our material balance calculation indicates that the difference in the oil to be recovered through lowering the abandonment pressure from 520 pounds to 500 pounds is less than one-tenth of one percent.

Q Why have you presented this exhibit, Exhibit Five, Mr. Stokes?

A Well, we have presented this exhibit in lieu of interference test data since we can't possibly obtain them. The

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

only two wells that are completed in the same porous interval, and one of them is so tight and impermeable we couldn't possibly show interference with a well 80 acres away which indicates to be draining only 40 or 50 acres. We think the permeability average throughout the Henshaw field is sufficient to drain more than 80 acres. We have presented profitability data in previous - - in a previous hearing that shows the thin pays that we have encountered in all wells to date would not support development on 40 acres. In fact, the 80 acre profitability is marginal.

Q Your Number Eight well didn't change that picture appreciably, did it?

A We encountered 24 feet of pay in Well No. Eight, which is the best to date. However, that would not support 40 acre development. Out of the nine wells that we have drilled, we found that one with that much pay.

Q Would you summarize your testimony now, Mr. Stokes, pointing out the features of why we believe we can make a case for permanent rules at this time?

A Well, like to go into geology a little bit of what we have encountered here. We feel that the problems of development from a geological standpoint are very severe. It is our opinion that the porous intervals we have found to date are the result of low reef mound or reef build up that accumulated on a shallow sea floor during alternate periods of regression and transgression of the sea. Those mounds that had sufficient vertical relief to be

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

above the water level, during the regressive period, having porosity developed and the areas in between being filled with lime,mud and shale, and no porosity. So far we haven't been able to find any logical rythum to these developments. They are random in orientation and this is why we feel that our performance data suggests that some of them must extend for some distance, quite some distance. There are others we are sure are quite small. If you would refer to our figure one, you can see that our development to date has been one location out-step, resulting in the well, one well quarter section, or 160 acre spacing. At the present time, we intend to continue development on this pattern until we have defined the limits of the field. At that time we feel we will have enough production information on the wells that we have drilled that we will know where we can profitably drill on the alternate 80 acre locations to conform with our 80 acre spacing that we have under the temporary rules. We feel that any accumulation that we miss on this type of development pattern will be so small that it could not be justified economically. I feel that the temporary rules we have in effect should be made permanent now because our performance data to date show that the wells are capable of draining more than 80 acres. Our experience to date shows us that we are not going to be in a better position to prove interference a year from now than we are right now. We have drilled nine wells, we are not able to complete any of them in the same zone so far with the exception of Two and 3-A. Our

calculations show that average field permeability, that we have in the Henshaw, that 80 acre development is justified.

Q In other words, Mr. Stokes, even if you carry through on your plans for drilling additional wells in the next year, or so, you don't anticipate being able to run any interference tests, that the pressure information that we have presented, particularly on Exhibit Number Three, shows that except for one well, all of the wells in the pool are draining in excess of 80 acres and a year from now, we will, of course, have more production history, but we wouldn't be able to show any more conclusively than we do now the drainage that is taking place in this pool?

A That's correct. We could drill an infilling well, say, from between Wells Five and Six and obtain the same pay, that we are draining from, either one of the wells, and show a communication between that new well and, say, that Well No. Five, but still wouldn't establish communication with Wells Eight and Six, and One and so on. I believe we would just have a system of mound build up here that give us porosity development, but we are not going to find one zone that we are going to be able to produce in several wells, and establish communication between all of these wells.

Q Do you have anything further you would like to add?

A No.

Q Were Exhibits One through Five in this case prepared by you or under your direction?

A Yes, sir, they were.

MR. MORRIS: We offer those exhibits at this time, Mr. Examiner.

MR. NUTTER: Shell's Exhibits One through Five will be admitted in evidence.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Stokes, what is the basis for believing that the Number Two and 3-A are producing from the common reservoir?

A In testimony that we presented at the last hearing in February, we showed an exhibit that showed the pressure versus time and given interval in time, the pressure that we had measured in Two and 3-A were the same, and they also started out with the same reservoir pressure and they have the same characteristics of oil and H2S content of gas in the zones that they are producing from. We also gave that testimony in the first hearing on the cross section which we presented at that time.

Q Even from examination of logs, these evidently are the only two wells that have the same correlative pays?

A Yes, sir.

Q I see. And their original pressure was the same, 3390?

A Yes, sir.

Q There is evidently even a difference in the permeability of this stringer, though, from one well to the other?

A Yes, sir. We think that Well Number 3-A is out on the

very edge of this fairly small accumulation. The pay was only seven feet thick, which is only half that encountered in Number Two, and the permeability is only 1/5th as much. We just believe we are out to the edge of the thing. This well is not a commercial well.

Q Now, these gravities that you have here- -

A Yes, sir.

Q - -do you have a variation in gravity, one being 36 and the Number Six being 66?

A Number Six was completed with a gas-oil ratio of twenty two hundred something to one, because of the GOR- -

Q Because of GOR. Is there considerable difference in the GOR from one well?

A Most of them have been 1500 to 1700 feet, cubic feet per barrel. Well No. Six is the only one we have encountered- -

Q What are the producing capabilities?

A Well No. Three-A is capable of 20 or 25 barrels a day. Well No. One at the present will make about 155 barrels a day, which is just about our allowable. This well,from pressure build up data, indicates considerable formation damage. If it were to drop below top allowable, we would work it over, bring it back up. The rest of the wells are capable of making far in excess of allowable.

Q In excess of the allowable?

A Well No. One is the one that has exhibited no pressure

drop over the productive history. As I said, it does have a considerable formation damage or skin.

MR. NUTTER: Are there any other questions of Mr. Stokes? He may be excused.

MR. MORRIS: Mr. Examiner, we, of course, would ask that you take notice of all the other matters that have been presented in previous versions of this case, including the economic data.

MR. NUTTER: Do you have anything further, Mr. Morris?

MR. MORRIS: No, sir.

MR. NUTTER: Does anyone have anything to offer in this case?

MR. DURRETT: If the Examiner please, I would like to state for the record that the Commission has received telegrams from the following operators, who state that they support the application to make the rules permanent. Those operators are Delhi-Taylor, Texaco, Humble and Carper Drilling Company. These telegrams will be in the Commission file.

MR. NUTTER: If there is nothing further in the case, we will take the case under advisement.

The hearing is adjourned.

** * * *

STATE OF NEW MEXICO)

COUNTY OF BERNALILLO)

I, ROY D. WILKINS, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill, and ability.

WITNESS my Hand and Seal of Office, this 24th day of February, 1964.

NOTARY PUBLIC

My Commission Expires:

September 6, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2480 heard by me on Feb 2, 1964

....., Examiner
New Mexico Oil Conservation Commission

DEARNLEY, MEIER, WILKINS and CROWNOVER
General Court Reporting Service
Suite 1120 Simms Building Albuquerque, New Mexico Phone 243-6691

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

(123) (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

1964 FEB 5 PM 12 02

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA059 SSA093

L ARA011 PD= ARTESIANMEX 3 1121A MST=
NEW MEXICO OIL CONSERVATION COMMISSION ,
ATTN A L PORTER= STATE LAND OFFICE BLDG SANTA FE NMEX=

CARPER DRILLING CO INC REGARDING HENSHAW WOLFCAMP
FIELD (CASE NO 2480) BELIEVES ORDER NO R-2182
SHOULD BE MADE PERMANENT=
CARPERSDILLING CO INC MARSHALL ROWLEY=

2480 R-2182

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA085 DA389

D MDA104 PD=FAX MIDLAND TEX 4 200P CST=
NEW MEXICO OIL CONSERVATION COMMISSION=
LAND OFFICE BUILDING SANTA FE NMEX=

ATTENTION: MR. A. L. PORTER, JR.

IN REFERENCE TO CASE 2480 SCHEDULED FOR HEARING ON FEBRUARY 5, 1964, HUMBLE RECOMMENDS THAT THE EXISTING TEMPORARY RULES PROVIDED UNDER ORDER R-2182-A BE MADE PERMANENT=

HUMBLE OIL AND REFG CO R R MCCARTY=

=2480 5 1964 R-2182-A=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM
W. P. MARSHALL, PRESIDENT

(45)

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA023 DB039

D MDA014 PD=FAX MIDLAND TEX 5 844A CST=

DANIEL S NUTTER=

NEW MEX OIL CONSERVATION COMM SANTA FE NMEX=

=REFERENCE CASE NO 2480 FEBRUARY 5 1964. TEXACO INC CONCURS WITH SHELL OIL COMPANY IN THEIR REQUEST THAT TEMPORARY RULES FOR HENSHAW WOLFCAMP POOL ORDER NO R-2182 BE MADE PERMANENT=

TEXACO INC J H MARKLEY DIV MGR=

=2480 5 1964 R-2182=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

(106)

1964 FEB 4 PM 1 44

LA059 DA248

D LLT101 PD=FAX DALLAS TEX 4 1151A CST=
=NEW MEXICO OIL CONSERVATION COMMISSION=
P O BOX 2088 SANTA FE NMEX 87501=

RE NMOCC CASE NO. 2480 FEBRUARY 5, 1964 REOPENED
PURSUANT TO PROVISIONS OF NMOCC ORDER NO. R-2182-A
DELHI-TAYLOR OIL CORPORATION A WORKING INTEREST OWNER
IN THE HENSHAW WOLFCAMP POOL UNIT SUPPORTS SHELL OIL
COMPANY, THE UNIT OPERATOR, IN ITS REQUEST TO MAKE
PERMANENT THE TEMPORARY RULES PROVIDED BY ORDER NO.
R-2182.=

J H DOUGHMAN DELHI-TAYLOR OIL CORPORATION=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CASE 2986: Application of Shell Oil Company to establish a GOR limit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a special gas-oil ratio limitation of 5,000 cubic feet of gas for each barrel of oil produced in the Mesa-Queen Pool, Lea County, New Mexico.

CASE 2987: Application of Shell Oil Company for a waterflood project, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pilot waterflood project in the South Bitter Lake-San Andres Pool, by the injection of water into the San Andres formation through three wells at unorthodox locations in Sections 27 and 34, Township 10 South, Range 25 East, Chaves County, New Mexico.

CASE 2480 (Reopened):

In the matter of Case No. 2480 being reopened pursuant to the provisions of Order No. R-2182-A which continued for a period of one year the temporary 80-acre proration units established by Order No. R-2182, Henshaw-Wolfcamp Pool, Eddy County, New Mexico. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2988: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit George E. Willett and all other interested parties to appear and show cause why the SDD Hare Well No. 7, located 600 feet from the South line and 1360 feet from the East line of Section 14, Township 29 North, Range 11 West, San Juan County, New Mexico, should not be plugged in accordance with a Commission-approved plugging program.

og

-2- Case 2980 continued from page 1

North, Range 13 West, and authorizing the drilling of a well for said unit at an unorthodox location 1625 feet from the South line and 1250 feet from the West line of said Section 15, Town of Farmington, San Juan County, New Mexico.

CASE 2981: Application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Northwest Eumont Unit Area comprising 2,760 acres, more or less, of State and fee lands in Township 19 South, Range 36 East, Lea County, New Mexico.

CASE 2982: Application of Gulf Oil Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Eumont Gas Pool by the injection of water into the Queen formation through 15 wells in Sections 11, 14, 15, 22 and 23, Township 19 South, Range 36 East, Lea County, New Mexico.

CASE 2983: Application of The Pure Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Brinninstool Unit Area comprising 17,237 acres, more or less, of Federal and State Lands in Townships 23 and 24 South, Ranges 32 and 33 East, Lea County, New Mexico.

CASE 2984: Application of The Pure Oil Company and Continental Carbon Company to utilize natural gas in a carbon black plant, Lea County, New Mexico. Applicants, in the above-styled cause, seek authority to utilize approximately 7 MCF of Devonian gas per day in the Continental Carbon Company carbon black plant near Eunice, New Mexico, said gas to be produced from The Pure Oil Company Wilson Deep Unit Well No. 1, located in the SE/4 NW/4 of Section 13, Township 21 South, Range 34 East, Lea County, New Mexico.

CASE 2985: Application of Shell Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Bootleg Ridge Unit Area comprising 10,818 acres,more or less, of State and Federal lands in Townships 22 and 23 South, Ranges 32 and 33 East, Lea County, New Mexico.

DOCKET NO. 4-64

DOCKET: EXAMINER HEARING - WEDNESDAY - FEBRUARY 5, 1964

9:00 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 2976: Application of Midland Production Corporation for directional drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to directionally drill its Hill & Meeker Phillips Cryer Well No. 34-2 located 2310 feet from the South and West lines of Section 34, Township 10 South, Range 36 East, to bottom in the Devonian formation 1980 feet from the North and West lines of said Section 34, Lea County, New Mexico.

CASE 2977: Application of Cities Service Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Brunson C Well No. 4, located in Unit J of Section 3, Township 22 South, Range 37 East, Lea County, New Mexico, to produce oil from the Blinebry and Drinkard Oil Pools through parallel strings of 1 1/2 inch and 2 1/16 inch tubing, respectively.

CASE 2978: Application of Union Oil Company of California for a waterflood expansion, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its South Caprock Queen Unit Waterflood Project, Caprock Queen Pool, Chaves County, New Mexico, by the conversion of nine additional wells located in Sections 28, 29, and 33, Township 14 South, Range 31 East, and Sections 3 and 4, Township 15 South, Range 31 East, to water injection.

CASE 2979: Application of Pan American Petroleum Corporation for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Abo formation through its U. S. A. Malco Refineries 'G' Well No. 13, located 2302 feet from the South line and 1650 feet from the West line of Section 10, Township 18 South, Range 27 East, Empire Abo Pool, Eddy County, New Mexico.

CASE 2980: Application of Pioneer Production Corporation for force-pooling and an unorthodox location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Basin-Dakota Pool underlying the W/2 of Section 15, Township 29

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

February 27, 1963

Re: Case No. 2480
Order No. R-2182-A
Applicant:
Shell Oil Company

Mr. Richard S. Morris
Seth, Montgomery, Federici & Andrews
Attorneys at Law
Box 828
Santa Fe, New Mexico

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC
OTHER

Case 2480
Heard 2-21-63
Rec. 2-22-63.

1. Grant Shell a 1-year extention to their 80 Ac. spacing order for the Henshaw-Wolfcamp Pool, order R-2182.

2. ~~Evidence~~ Evidence at the hearing indicates ~~that~~ current development has not been sufficient to determine whether the ~~pool~~ formation can drain 80 acres. Applicant should be given another year in which to gather data.

Thos. A. Wg

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM (26)

1201 (4-00)

W. P. MARSHALL, PRESIDENT

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA114 DB089

1963 FEB 19 AM 10 36

1963 FEB 19 PM 1 13

D MDA086 PD=FAX MIDLAND TEX 19 1115A CST=
OIL CONSERVATION COMMISSION=
SANTA FE NMEX=

Case file

=REFER TO CASE 2480 DOCKETED FOR FEBRUARY 21, 1963.
HUMBLE CONCURS WITH SHELL'S REQUEST THAT EXISTING
RULES FOR THE EDDY COUNTY HENSHAW-WOLFCAMP POOL REMAIN
IN EFFECT ON A TEMPORARY BASIS FOR ANOTHER YEAR AND
APPROVAL BY THE COMMISSION IS RESPECTFULLY URGED=
HUMBLE OIL AND REFINING CO R R MCCARTY BY
H L HENSLEY=

=2480 21 1963=

IT WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA232 =

1963 FEB 20 PM 4 42

=L L ARA032 NL PD= ARTESIA NMEX 20=
:NMEX OIL CONSERVATION COMMISSION=
ATTN A L PORTER SANTA FE NMEX=

REGARDING CASE NO 2480 WE SUPPORT SHELL OIL CO IN ITS REQUEST FORTHE TEMPORARY FIELD RULE NOW IN EFFECT FOR THE HINSHAW WOLF CAMP POOL BE CONTINUED FOR ONE MORE YEAR=

CARPER DRILLING CO MARSHALL ROWLEY=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

DELHI-TAYLOR OIL CORPORATION
FIDELITY UNION TOWER
DALLAS 1, TEXAS

February 19, 1963

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

Re Case No. 2480
February 21, 1963

Please be advised that Delhi-Taylor Oil Corporation as a working interest participant in the Henshaw Deep Unit supports Shell Oil Company, Unit operator, in its request that temporary field rules now in effect for the Henshaw Wolfcamp Pool be continued for one additional year.

Yours very truly,

J. H. Doughman

JHD/HRP/ge

cc: Shell Oil Company
P. O. Box 1858
Roswell, New Mexico

TEXACO
INC.

PETROLEUM PRODUCTS

1963 FEB 19 PM 1:27

DOMESTIC PRODUCING DEPARTMENT
MIDLAND DIVISION

W. C. LENZ, ASSISTANT DIVISION MANAGER

P. O. BOX 3109
MIDLAND, TEXAS

February 15, 1963

REFERENCE CASE NO. 2480
HENSHAW (WOLFCAMP) POOL
EDDY COUNTY, NEW MEXICO

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.

Gentlemen:

The above referenced case will be reopened at the February 21, 1963, Examiner hearing for the purpose of allowing all interested parties to appear and show cause why said pool should not be developed on 40 acre proration units.

At the present time all of the wells completed in and producing from the Henshaw (Wolfcamp) Pool are operated by the Henshaw Deep Unit. The Henshaw Deep Unit is operated by the Shell Oil Company and Texaco owns in excess of 32 per cent of this unit. It is our understanding that Shell plans to request that the temporary field rules now in effect be continued for one more year.

Texaco Inc. concurs with Shell's request and respectfully urges the Commission to continue the existing rules for a twelve month period.

Yours very truly,

CRB-MM

cc: Shell Oil Company
P. O. Box 1858
Roswell, New Mexico

No. 7-63

DOCKET: EXAMINER HEARING - THURSDAY - FEBRUARY 21, 1963

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter as Alternate Examiner:

CASE 2755: Application of General American Oil Company of Texas for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Queen formation, High Lonesome Pool, Eddy County, New Mexico, through 16 wells in Sections 11, 12, 13 and 14, Township 16 South, Range 29 East.

CASE 2756: Application of Humble Oil & Refining Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its State "S" Well No. 24, located in Unit J, Section 2, Township 22 South, Range 37 East, Lea County, New Mexico, as a triple completion (tubingless), to produce oil from the Blinebry and Drinkard Pools and from a third zone, either lower Drinkard or Abo, through parallel strings of 2 7/8-inch casing cemented in a common well bore.

CASE 2757: Application of Cabot Corporation for an unorthodox location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the unorthodox location of its New Mexico State L Well No. 1 at a point 1970 feet from the North line and 330 feet from the West line of Section 23, Township 11 South, Range 33 East, North Bagley-Wolfcamp Pool, Lea County, New Mexico.

CASE 2758: Application of Odessa Natural Gasoline Company for a unit agreement Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Getty Deep Unit Area comprising 1,680 acres, more or less, of Federal land in Township 20 South, Range 29 East, Eddy County, New Mexico.

CASE 2759: Application of Continental Oil Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the triple completion (conventional) of its Skaggs B-12, Well No. 5, located in Unit C of Section 12, Township 20 South, Range 37 East, Lea County, New Mexico, to produce oil from the Skaggs Glorieta, East Weir Blinebry, and Skaggs-Drinkard Pools through parallel strings of tubing.

CASE 2760: Application of Gulf Oil Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Scarborough Estate Well No. 7, located in Unit K of Section 31, Township 22 South, Range 38 East, Lea County, New Mexico, as a dual completion (conventional) to produce oil from the Blinebry Oil Pool and from the Ellenburger formation through parallel strings of tubing.

CASE 2761: Application of Compass Exploration, Inc. for the creation of a Gallup Gas Pool, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order deleting certain acreage from the South Blanco-Tocito Pool and redesignating portions of said acreage to comprise a new Gallup gas pool for its Northwest Lindrith Well No. 1-3, located in Unit K of Section 3, Township 26 North, Range 7 West, Rio Arriba County, New Mexico.

CASE 2314: (Reopened)
In the matter of the hearing called in accordance with Order No. R-2191, to permit Shell Oil Company to appear and show cause why its State Well No. 1-A, located in Unit D, Section 36, Township 24 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico should not be reclassified as an oil well in said pool.

CASE 2480: (Reopened & Continued)
In the matter of Case 2480 being reopened pursuant to the provisions of Order No. R-2182, which order established temporary 80-acre proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2762: Application of Pan American Petroleum Corporation for a dual completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion of its USG Section 19 Well No. 17, located in Unit I of Section 19, Township 29 North, Range 16 West, San Juan County, New Mexico, to produce oil from the Hogback-Pennsylvanian Pool through tubing and to dispose of produced salt water into the Chinle formation through the intermediate casing annulus.

CASE 2763: Application of Sunray DX Oil Company for the creation of a Strawn Gas Pool and for Special Temporary Pool Rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Strawn Gas Pool for its New Mexico State "AH" Well No. 1, located in Unit K of Section 30, Township 18 South, Range 23 East, Eddy County, New Mexico, and the establishment of temporary pool rules therefor, including a provision for 640-acre proration units.

CASE 2764: Application of Skelly Oil Company for the creation of a Strawn Gas Pool and for Temporary Special Pool Rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Strawn Gas Pool for its West Jal Unit Well No. 1, located in Unit H, of Section 20, Township 25 South, Range 36 East, Lea County, New Mexico, and the establishment of temporary special pool rules therefor, including a provision for 640-acre proration units.

CASE 2746: (Continued)
In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit Continental National Insurance Group and all other interested parties to appear and show cause why the Kenneth V. Barbee Well No. 1, located 1980 feet from the South line and 660 feet from the East line of Section 9, Township 11 South, Range 25 East, NMPM, Chaves County, New Mexico, should not be plugged in accordance with a Commission-approved plugging program.

CASE 2747: (Continued)
Application of El Paso Natural Gas Company for cancellation of a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks cancellation of a non-standard gas proration unit comprising the SW/4 of Section 23 and the NW/4 of Section 26, Township 31 North, Range 7 West, Blanco-Mesaverde Gas Pool, San Juan County, New Mexico, said unit having been established and designated Block "N" by Order No. R-1066.

iqg/

No. 7-63

SUPPLEMENTAL DOCKET: EXAMINER HEARING - THURSDAY - FEBRUARY 21, 1963

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following case will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, as alternate examiner:

CASE 2765:

Application of Perry R. Bass for an unorthodox gas well location, Lea County, New Mexico.

Applicant, in the above-styled cause seeks an exception to the Special Rules and Regulations for the Lusk-Morrow gas pool to permit the drilling of a gas well 1980 feet from the North line and 660 feet from the West line of Section 28, Township 19 South, Range 32 East.

JOSEPH I. O'NEILL, JR.
OIL PROPERTIES

410 WEST OHIO
MIDLAND, TEXAS

TELEPHONE
MUTUAL 3-2771

Case 248

February 6, 1963

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Temporary Field Rules
Henshaw Wolfcamp Pool
Eddy County, New Mexico

Gentlemen:

This is to advise that we, as a working interest owner, support Shell Oil Company's request for a one-year extension of temporary field rules on the above cited field.

Very truly yours,

E. T. Anderson

ETA/nb

CC: Shell Oil Company
Attention: R. L. Rankin
P. O. Box 1859
Roswell, New Mexico

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 6, 1963

EXAMINER HEARING

IN THE MATTER OF:

Case 2480 being reopened pursuant to the provisions of Order No. R-2182, which order established temporary 80-acre proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

Case No. 2480
(Reopened)

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will go next to Case 2480.

MR. DURRETT: In the matter of Case 2480 being reopened pursuant to the provisions of Order No. R-2182, which order established temporary 80-acre proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico.

MR. MORRIS: I am Richard Morris, of the Santa Fe law firm of Seth, Montgomery, Federici and Andrews, appearing for Shell Oil Company in this case. Shell Oil Company was the proponent of the 80-acre rules established by Order Number R-2182 for the Henshaw-Wolfcamp Pool approximately one year ago. As such Shell Oil Company would be the proper one to take the lead in this

case having been reopened to reconsider the special rules and regulations. Shell Oil Company has recently completed a well in the Henshaw-Wolfcamp Pool and at present is evaluating the results of the tests that have been taken and are being taken on that well.

Shell believes that it will be able to present a much better case and give the Commission much more information if the case would be continued until the last Examiner Hearing in February, which I understand is to be on the 21st, and at this time I move that the case be continued until that time.

MR. NUTTER: Case 2480 will be continued to February 21st.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2480, heard by me on 2/6, 1963.

....., Examiner
New Mexico Oil Conservation Commission

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 871
SANTA FE

February 13, 1962

Re: CASE NO. 2480
ORDER NO. R-2182
APPLICANT:
SHELL OIL COMPANY

Mr. Oliver Seth
Seth, Montgomery, Federici & Andrews
Box 828
Santa Fe, New Mexico

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

OTHER

Case. 2480
Heard. 1-24-62
Rec. 1-26-62

1. Grant 80 spacing for the Henshaw-Wolfcamp pool. for a period of 1 yr. from date of order.
2. Order should become effective 1st of month following date of order.
3. Recommend the order be patterned after R-1472 - Blinebry Penn. Pool. Drilling should be SW/4 + NE 1/4 1/4 of each quarter section.
4. As compromise I would recommend that administrative approval be allowed for non Std. locations on the edge of the pool after a showing of good cause but in such case the allowable should be adjusted according to the spacing of production acreage. to as low as 40 acres.
5. Amended C-128 forms by Feb 15, 62.
6. The pool Henshaw-W.C. shall consist of:
165 - 30E,
24 - NW/4, S/2
Vertical limits - Wolfcamp.

[signature]

Discovery well was App - Henshaw.
Unit #1, NENW sec. 24-16-30.
Top of perfs. 8897
Shell also needs C-104 - C-110 + C-103 as well as C-128. in well file.

JOSEPH I. O'NEILL, JR.
OIL PROPERTIES

410 WEST OHIO
MIDLAND, TEXAS

TELEPHONE
MUTUAL 3-2771

January 22, 1962

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Proposed Field Rules for the Henshaw Wolfcamp Pool, Henshaw Deep Unit, Eddy County, New Mexico

Gentlemen:

As a non-operating working interest owner in the above cited pool, we wish to support the proposed special rules and regulations as applied for by Shell Oil Company, Operator.

Very truly yours,

E. T. Anderson

E. T. Anderson

ETA/nb

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

MAIN OFFICE OCC

LA042 DB080

1962 JAN 24 AM 11:12

1962 JAN 24 AM 10 21

D LLN111 PD=FAX DALLAS TEX 24 1110A CST=

NEW MEXICO OIL CONSERVATION COMMISSION=

STATE LAND OFFICE BLDG COLLEGE AVE SANTAFE NMEX=

PLEASE INCORPORATE IN HEARING RECORD THAT DELHI-TAYLOR APPROVES AND RECOMMENDS ADOPTION OF SPECIAL RULES AND REGULATIONS FOR HENSHAW WOLFCAMP POOL SUBMITTED IN HEARING NO. 2480 BY SHELL OIL COMPANY=

J H DOUGHMAN MANAGER OFPRODUCTION DEPT

DELHI TAYLOR OIL CORP DALLAS TEXAS

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on telegrams is STANDARD TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

MAIN OFFICE OCC

LA021 SSL002

1962 JAN 24 AM 8 55

1962 JAN 24 AM 8:29

L ARA003 PD= ARTESIA NMEX 24 828A MST=

A L PORTER JR, TECH DIRECTOR =

NEW MEXICO OIL CONSERVATION COMMISSION LAND

OFFICE BLDG SANTA FE NMEX=

CARPER DRILLING CO IS IN CONCURRENCE WITH THE PROPOSED SPECIAL RULES AND REGULATIONS FOR THE HENSHAW WOLFCAMP POOL EDDY COUNTY AS EXPRESSED ON EXHIBIT NO 8 N M OCC C HEARING NUMBER 2480 DATE JAN 24 1962=

CARPER DRILLING CO MARSHALL ROWLEY VICE PRESIDENT==

8 N M O C C 2480 24 1962.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

TENNECO OIL COMPANY · P. O. BOX 1031 · 1800 WILCO BUILDING · MIDLAND, TEXAS

March 9, 1962

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

ATTENTION: Ida Rodriguez

I am returning the Transcript of Examiner Hearing, Case 2480, received in this morning's mail. Thank you very much for sending this to us.

Very truly yours,

TENNECO OIL COMPANY

Warren E. Bart

Warren E. Bart
District Geologist

WEB:bw
Enc.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 24, 1962
EXAMINER HEARING

IN THE MATTER OF:

Application of Shell Oil Company for temporary 80-acre proration units, Henshaw-Wolfcamp Pool, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a temporary order establishing 80-acre oil proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico. Applicant further seeks the establishment of special rules for said pool including a provision assigning the 80-acre proportional factor of 4.00 for allowable purposes.

BEFORE:

Elvis Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 2480.

MR. WALKER: Application of Shell Oil Company for temporary 80-acre pro-ration unit, Henshaw-Wolfcamp Pool, Eddy County, New Mexico.

MR. SETH: Oliver Seth for the applicant, and we have one witness.

MR. MORRIS: Let the record show that the witness was sworn in the previous case.

MR. UTZ: Are there any other appearances? You may proceed.

D. D. STOKES,

called as a witness herein, having been previously duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SETH:

Q Would you state your name, please, Mr. Stokes, and your position?

A I am D. D. Stokes, employed by Shell Oil Company in Roswell, New Mexico as a Division Reservoir Engineer.

Q And in that capacity are you familiar with the application of Shell Oil Company in this case?

A Yes, sir.

Q Are you generally familiar with the reservoir conditions in the area in question?

A Yes, sir.

Q Have you testified previously before this Commission?

A Yes, sir.

MR. SETH: May he be qualified as a Reservoir Engineer?

MR. UTZ: Yes, sir.

Q (By Mr. Seth) Would you tell us what is the purpose of the application in this case?

A We are applying for a temporary 80-acre proration unit, and the establishment of special rule including a provision of assigning the 80-acre proportional factor four for allowable purposes.

Q In what area?

A This is the Henshaw-Wolfcamp Pool, I believe will be the designation of it. We have not received notice as yet of the Commission's action on the pool nomenclature.

Q Do you have a plat showing the location of the area?

A Yes, sir, that is Exhibit No. 1.

Q Now, referring to Exhibit 1, would you tell us, please, what that shows?

A Exhibit 1 is the location plat of the Henshaw Deep Unit area outlined in green. It also gives our pre-structural interpretation of the Wolfcamp in the Henshaw lower Wolfcamp Pool and the location of wells completed in our drilling of this lower formation.

Q Will you point out the wells that will be considered in the testimony?

A Well No. 1 is located in the northwest quarter of Section 24, Well No. 2 is located in the southeast quarter of 24, Well No. 3A is in the southwest quarter of 24.

Q Are there three wells that are presently completed in the unit?

A Yes, sir, these are the three.

Q Is there an additional one drilling at this time?

A Well No. 4, in the southwest corner of Section 13 is now drilling.

Q Now, give us a little background on Well No. 1, if you

would?

A Well No. 1 was originally completed as a Devonian gas well but after six months production it was completed and then the well was then recompleted in the Wolfcamp where it now is producing.

Q That was the well first drilled?

A Yes, sir.

Q What about No. 2?

A It was originally drilled and completed in Pennsylvanian. This well seeks production after about three months and was then recompleted in the Wolfcamp Pool. Zone 3A was drilled too, and recompleted Wolfcamp.

Q As a Wolfcamp well?

A Yes, sir.

Q Now, do you have an exhibit which is a cross section of these three wells?

(Marked Applicant's Exhibit No. 2 for identification.)

A Yes, Exhibit 2 is a northwest, southeast, cross section through the Henshaw lower Wolfcamp Pool.

Q Now, these wells appear No. 1, No. 3A and No. 2 from left to right, is that correct? A Yes, sir.

Q Did you testify that generally they run in what direction?

A From the northwest to the southeast.

Q Tell us what this Exhibit shows in a general way first?

A Well, this Exhibit shows a section of the Wolfcamp

formation and the part of Pennsylvanian in the Henshaw field. We feel that this Exhibit shows that Wells No. 2 and 3A are completed in the same stratigraphic section and Well No. 1 is completed in a different layer just below this section that 2 and 3A were completed in. We feel that this evidence is confirmed by our pressure behavior in the well and by the difference in the crude oil in the wells. The crude in Wells 2 and 3A is 41 gravity crude and will sweep and the crude in Well No. 1 is 36 and slightly sour.

Q Do you have any opinion as to the areal extent of the development which was indicated in Wells 1 and 2, I mean, excuse me, Wells 2 and 3A?

A In my opinion the zone that Wells 2 and 3A are completed in is quite small, it probably covers 140 acres.

Q What about No. 1?

A Well No. 1 appears to completed in a fairly large zone from pressure behavior.

Q Do you have any data or exhibits that show this reservoir data?

(Whereupon Exhibits 3,4,5 and 6 marked for identification.)

A That data is shown on Exhibits 4, 5 and 6.

Q What is No. 3?

A Exhibit 3 gives the completion.

Q Do you want to refer to Exhibit 3 or do you want to go to 4?

A I believe I prefer to take them in order.

Q Let's refer to Exhibit No. 3, this is a tabulation of well completion and reservoir data?

A Yes, sir, it shows the Wolfcamp completion data for each of the three wells in the field. It shows the completion date, completion interval, the treatment necessary and the initial potential data is pointed out on here. The fact is that gravity in Well No. 1 was 36 degrees API the gravity in Wells 2 and 3A was 41.

Q Do you have any core data shown on this Exhibit?

A Yes, sir, we have core from Well No. 3A. There is core indicated, Porosity of $12\frac{1}{2}$ per cent, Permeability 2 millidarcies and Water Saturation of 25%.

Q Is this the only well that was cored through this productive interval?

A This is the only core. We do feel, however, that this permeability on Well No. 3A is not representative since calculations from the bottom well hole pressure show that Well 1 and 2 have 1720.

Q I think the 3A gravity is unusually low.

A Yes, sir, I believe it is located in the edge of the core's development in the zone it is completed in and it is not representative of the zone.

Q You reached that conclusion from the pressure built up in the other wells?

A Yes, sir, that is correct.

Q Do you have any other comment on Exhibit No. 3? Is this

original pressure data of any significance?

A Yes, sir, the pressure data shows that the original pressure in Well No. 1 is 3410 pounds. Well No. 2 and 3A is 3390 pounds. These pressures have been obtained from extrapolated build up periods and are believed to be quite accurate.

Q Do you have any performance history on these wells?

A Yes, sir, Exhibit No. 4 shows the performance history, across the top we have pressure behavior per each well versus time and at the bottom we have cumulative production and the number of wells below against time. The significant thing is I believe, the pressure behavior of Wells 2 and 3A. You will note that initial pressure on Well 3A was about the same as the pressure after four months of production on Well No. 2.

Q Now, this shows Well No. 2, that was completed about what date?

A In early June of '61.

Q Well No. 1?

A In the previous year, in December of 1960.

Q How about Well 3A?

A Completed early in November of '61.

Q Give us a little more complete description as to your conclusions from this exhibit.

A Well, the exhibit shows that the pressure in Well No. 1 has not declined although the well has produced for a little over a year, while the pressure in Well 2 and 3A shows a definite de-

cline of around 300 pounds after only a few months of production. This indicates that wells 2 and 3A have a limited reservoir, Well No. 1 must be in a larger reservoir.

Q Now, roughly, is the cumulative production as of the end of 1961?

A The total for the field is 66,000 barrels.

Q And there are just these three wells in the field?

A Yes, sir, they produced about 9,000 barrels in the month of December.

Q Do you have any other conclusions from this Exhibit No. 4?

A Not from No. 4, no, sir.

Q Now, referring to Exhibit No. 5, what pressure data does this exhibit show?

A This is the extrapolated build up pressure for each well. The top curve is Well No. 1. It shows pressure, now, after recovery of 26,000 barrels of oil is about equal to the original reservoir pressure. It also shows that Wells 2 and 3A have declined signifocantly since completion.

Q Do you have any data on the gas production?

A No, sir, we did not plot gas production. Our latest GOR test showed an average producing GOR in the field of 1795 cubic feet per barrel. We are not at this time selling gas from Wells 2 and 3A but we are negotiating for such.

Q Now, referring to Exhibit No. 5, what were the times in

volved, the shut-in times?

A For Well No. 1, the shut-in times on the successive pressure was 24 hours, 68 hours, 69, and 71 hours and 91 hours. For Well No. 2 it was 66 hours and 70 hours and Well No. 3, 71 hours. The pressure in Wells 1 and 2 after this period, were pretty well built up. The last ten hours build up only amounted to about six pounds.

Q Does this exhibit again show the contrast in the pressure behavior of No. 1 as against 2 and 3A?

A Yes, sir, it shows that No. 1 has not declined although it has produced 36,000 barrels while Well 2 and 3A have declined, are significantly poor. Well No. 2 about 15,000 barrels, Well 3A only 3,000 barrels.

Q And what conclusions do you draw?

A This again points to the fact that Wells 2 and 3A are in a very small reservoir and Well No. 1 is apparently in a large one.

Q Is there anything further on No. 5?

A I don't believe so.

MR. UTZ: How much decline does No. 1 show?

A Mr. Utz, on extrapolated build up pressure it doesn't show any decline, the pressure now, after a little over a year, is still the same as it was initially, purely on a static without the extrapolating through 17 pound indication pressure drop indicated over that period.

MR. UTZ: What did you say these pressures, the time of set-in pressures, was?

A Well, No. 1, the first test 24 hours, the second 68, the third 69 the fourth 71 and the fifth 91.

MR. UTZ: Did you say that last one was stabilized?

A Well, the pressure was not at it's maximum, however, in the last 24 hours it only built up, I believe 15 pounds, so it is fairly well stabilized.

MR. UTZ: Thank you.

Q (By Mr. Seth) Do you have an exhibit showing the pressure performance of the three wells?

A Well, Exhibit No. 6 shows the actual performance of Well No. 1, pressure versus cumalative compared to a calculated pressure performance for a well that is draining 48 and 80 and 160 acres.

Q How is this computed?

A We used volumetric analysis in determining the reserve for each of the spacing patterns assuming many pattern pressures were 500 pounds per square inch.

Q Now, would you state those factors again that you used?

A In determining the reserves for each spaced we used a Porosity of 12 1/2 per cent, Permeability of 2 millidarcies, Water Saturation of 25% and a Formation Volume Factor of 1.67 and 30% Recovery Efficiency.

MR. UTZ: What was the percentage?

A Recovery Efficiency 30%.

Q ~~(By Mr. Seth) Now, you used an estimated Permeability,~~ is that a factor?

A No, sir, that is not a factor.

Q Now, were any other factors used in this calculation in addition to those that you mentioned?

A No, sir, that is all.

Q What does this Exhibit show or what conclusions do you draw from it?

A Well, from this exhibit I draw the conclusion that the Henshaw, No. 1, must be draining well over 160 acres and if so we would have had drop in pressure of 500 pounds with a recovery of some 36 barrels of oil. Since we have not a significant pressuro drop then obviously the well has been draining more than 160 acres.

Q What causes, in your opinion, the pressure behavior in No. 1?

A Well, I feel that the pressure behavior is caused by fluid entry into the vicinity of the well. I believe that this fluid is oil and in order for pressure to behave in that manner the well must be in contact with an extremely large reservoir.

Q Why do you believe it is oil rather than water?

A Geologically, there is none in the Wolfcamp to provide a well camp, it is just water. It seems more reasonable in view of the lack of evidence of any water in the Wolfcamp.

Q Do you have any other comments on No. 6?

A No, sir, I don't believe so.

Q Have you prepared or had prepared an economic analysis

of various spacing patterns in this pool?

(Marked Shell's Exhibit 7 for Identification)

A Yes, sir, I have Exhibit 7. It presents our economic analysis and various well spacings. The reserves here for each different spacings are based on the same perimeters that were used in determining the pressure drop, that is Porosity 12 1/2 per cent, Permeability 2 md, and 25 per cent Water Saturation, 1.67 formation of volume factor and 30 per cent Recovery Effeciency.

Q And you used a well cost as indicated here as of how much?

A One hundred Fifty Seven Thousand per well in each case and we used operating net income of $2.00 a barrel in each case.

Q Now, if you will take us through this exhibit a little bit more in detail, if you would, from the beginning?

A We show a price of oil at 36 degrees, $2,830. We estimated a Gas-Oil Ratio over life as 3.0 MCF of barrels for Gas Income Average over life of .30 as barrels which gives a total gross income of $3.130 a barrel. Our Royalty and Overriding amounts are estimated as 0.548 per barrel, Production and Property Taxes 0.193 and Operating Costs of .205 which gives a total cost of $1.130 and leaves an operating net income of $2.000 a barrel.

Q Now, do you use this net operating figure of $2.000 for all spacing in all departments?

A Yes, sir, we use the same figure for all departments.

Q That is based on your belief that on either 40 or 80 acre

spacing the biggest part of the life of each well would be on a decline so that allowable would not be a factor, therefore the life on 80 acre spacing would be about double the life on 40 acre? There would be no given operating cost?

A On 160 acres you would expect a smaller operating cost per barrel. We feel there is a longer life offset through having more maintenance and repairs to lift equipment.

Q And you feel that is a realistic way of handling this?

A Yes, I do.

Q Referring to your paragraph 2 there, 40-Acre Spacing, give us that again.

A On 40-acre spacing we have estimated reserve volumetrics of 52,000 barrels which would give us a working net income of 104,000 and Loss per well of $53,000. On 80-acre spacing our Reserves would be 104,000 barrels. We have a working Net Income of $208,000 and a Profit of $51,000.00 or 32 per cent profit on the investment. On 160-Acre Spacing we have Reserves of 208,000 barrels, a Working Net Income of $416,000.00, a Profit of $259,000.00 and 165 per cent profit.

Q Now, in your opinion, based on this data and the studies that you have made, I believe you have testified that one well will drain more than 80 acres, is that correct?

A Yes, sir, it is my opinion that a well in the Henshaw-Wolfcamp Pool efficiently drain more than 80 acres.

Q And will development made on 40 acres be economically sound?

A No, sir, we cannot justify definitely on a 40 acre

spacing.

Q And what is your recommendation to the Commission?

A My recommendation is that the Commission formulate the temporary rules to provide for 80 acre spacing during the development of the Henshaw lower Wolfcamp Pool.

Q Do you believe that such a spacing would be in the interest of conservation and prevent waste?

A Yes, sir.

Q And will correlative rights be protected?

A Yes, sir.

Q Now, in connection with the application, have you prepared some proposed field rules?

A Yes, sir, we have prepared five rules for the Henshaw lower Wolfcamp Pools.

Q Are these set out on your Exhibit 8? A Yes, sir.

(Marked Shell Oil Company's Exhibit 8 for identification.)

Q Would you mind reading these rules?

A "Rule 1, each well completed or recompleted in the Henshaw-Wolfcamp Pool," that should read "lower Wolfcamp, or in the Wolfcamp formation within one mile of said pool, and not nearer to nor within the limits of another designated Wolfcamp Pool, shall be spaced, drilled, operated, and prorated in accordance with the Special Rules and Regulations hereinafter set forth."

Q Now, that is just a standard preliminary paragraph?

A Yes. "Rule 2. Each well completed or recompleted in the

Henshaw-Wolfcamp Pool shall be located in the unit containing 80 acres, more or less, which consists of the S/2, N/2, E/2 or W/2 of a single governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

Q Is that what you call a flexible 80 acre?

A Yes, sir, that provides that the unit can run either north, south, or east, west.

Q Now, Shell is the operator of this unit, is that correct?

A That is correct.

Q Have some of the other working interest owners disagreed with this particular ruling?

A Yes, sir, there are five working interest owners, four of them have agreed to the flexible spacing and one opposes it.

Q They would rather have a fixed location?

A They would rather have a fixed location.

Q Yes, sir, and No. 3?

A Rule 3. Each well completed or recompleted in the Henshaw-Wolfcamp Pool shall not be drilled closer than 330 feet to any quarter-quarter section line.

Q Now, all the operators agree with this ruling?

A All except the same one.

Q No. 4, is there anything unusual about that?

A No, sir, Rule 4 just makes provisions for granting the

exception to the spacing rules.

Q And is that an administrative procedure?

A Yes, sir, the only thing about it is that the provision for the allowable assigned to any such non-standard unit shall bear the same ratio to a standard allowable in the subject pool at the acreage in such non-standard unit bears to 80 acres.

Q Do you have any comment on that?

A Well, that would just mean that a well drilled on 40 acres would have half an 80 acre allowable.

Q No. 5?

A Rule 5. An 80-acre proration unit (79 through 81 acres) in the subject pool shall be assigned an 80-acre prorational factor of 4.00 for allowable purposes and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit in any proportion.

Q To any proportion between or among the several wells?

A Yes, sir, if there are two wells, the allowable can produce 50-50 on them.

Q Do you have any particular comments on Rule 5?

A No, sir.

Q How about the rules as a whole, do you believe that they are covering the reasonable way of the operation of the pool?

A I believe they will provide for orderly development in the pool and have sufficient flexibility and that well location may be changed for needed reasons.

Q And you recommend the adoption of the rules if the application is approved? A Yes, sir, I do.

Q Do you have anything further on the matter as a whole?

A No.

MR. SETH: We would like to, Mr. Utz, to offer our Exhibits 1 through 8.

MR. UTZ: Exhibits 1 through 8 will be entered into the record.

(Whereupon Shell Oil Company's Exhibits 1 through 8 entered in evidence.)

MR. SETH: That is all the direct testimony we have.

MR. UTZ: Are there any questions of the witness?

MR. PORTER: I have a few questions.

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Stokes, what is included in the well cost here, does that include the cost of the tank batteries?

A It includes each well's share of the lease facilities.

Q Is it about an average cost of Shell's wells of this Department, would you say, for this particular area, for the southeast New Mexico area?

A Well, it varies a bit within southeast New Mexico, this is pretty cheap I think.

Q You'd say this is lower than the average?

A Yes, sir, I think so.

Q Did you state how you calculated your reserves?

A Yes, they are based on volumetric analysis using 12 1/2 porosity, 2 millidarcies of permeability and 25 per cent water saturation, 1.67 formation of volume factor and 30 per cent recovery effeciency.

Q Now, did Shell in the matter of nomenclature, Mr. Stokes, I believe this was to be considered at the regular January hearing?

A Yes, sir.

Q And for your information the Commission dismissed that particular paragraph pending the gathering of further information. And maybe you could help us on that score. Did Shell request a designation of lower Wolfcamp when they applied for this pool designation or did they just ask for the Wolfcamp?

A I believe that lower Wolfcamp was requested.

Q Now, you already have two stringers open in the lower Wolfcamp according to your testimony?

A Yes.

Q Is there any indication that there may be other productive stringers in the Wolfcamp here above these stringers?

A Yes, sir, we think there is a near the top of the Wolfcamp which if developed sufficiently for exploration, would be classified as upper Wolfcamp.

Q And is Shell aware of the fact that if this were limited to the lower Wolfcamp and another pool was created there would be

offset obligations for each particular pool designation?

A Yes, sir.

Q Do you think it might be better, Mr. Stokes, to go ahead and designate this as the Wolfcamp and then deal with the other situation if it arises, that is if it obtains production above this?

A If we could still classify it as upper Wolfcamp as opposed to just Wolfcamp, I think it would be satisfactory. The lower Wolfcamp designation does --

Q I wouldn't have any idea what action the Commission might take on it but in the past the Commission has been cautious in splitting the formation, so to speak.

MR. PORTER: I believe that is all the questions I have.

MR. SETH: Mr. Porter, do you want the Company to provide additional information that will assist in this pool designation lineation?

MR. PORTER: Well, I don't know exactly what information they could give at the present time since it is not known whether the stringers are there.

CROSS EXAMINATION

BY MR. UTZ:

Q You haven't run into any of this?

A I think we made some drill stem tests and recovered some oil and quite a bit of mud.

Q You don't have any pressure information?

A Not adequate, no, sir.

MR. UTZ: Mr. Morris.

CROSS EXAMINATION

BY MR. MORRIS:

Q You stated that you had some opposition to your Rule 2 and 3 as you proposed them. What source did that opposition come from?

A From Texaco.

Q Texaco. Now, I noticed from your Exhibit No. 1 that the three wells that are drilled in this unit so far appear to be in the exact center of the 40 acre tract on which they are located.

A Yes, sir, they are all at present located in such a manner that we could have fixed spacing in the pool without disturbing any of the presently completed wells.

Q Do you feel that you would have a better drainage pattern if the well location requirements were fixed as being say within 150 feet of the center of the quarter-quarter section?

A Well, we feel that might be necessary in some cases to go to the alternate 40.

Q Necessary for geologic reasons?

A For geologic reasons.

Q For topographic reasons?

A Not for topographic, for geologic. As far as there being within 150 feet of the center or 330 feet from the quarter-quarter section we have no strong feeling on the same.

Q You don't believe that a fixed pattern would result in a better drainage of this reservoir?

A We plan to continue development on a fixed pattern for as long as we can but we have a provision in our field rules for non-standard location, if we feel it is necessary later.

MR. UTZ: You mean for each well?

A Yes, sir.

Q (By Mr. Morris) Mr. Stokes, you stated that you in estimating the reserves, you used a 30 per cent efficiency recovery, does that mean that you estimate a recovery of 30 per cent of the oil in place?

A Yes, sir.

Q From what you know of the reservoir so far, does it appear that secondary recovery might be feasible in this area?

A It is a little early to tell but if our primary recovery ranges between 30 and 40 per cent as I predict it does in the Wolfcamp there wouldn't be very much left for secondary.

Q At the present time do you believe it to be a solution gas drive reservoir?

A Yes, sir, I do.

Q Do you feel that a 30 per cent recovery factor in a solution gas drive reservoir is an appropriate factor to use in determining reservoirs?

A In Permian-Penn, I believe it is, there are quite a few in southern New Mexico that are far enough along that we can make a

good reservoir estimate and it appears that within 30 and 40 per cent is a reasonable one.

MR. PORTER: By the Permian-Penn you mean usually what is referred to as Wolfcamp and Pennsylvanian?

A Yes, sir, in the lower part of the Wolfcamp there is quite a bit of difference of opinion between geologists as to where it becomes Pennsylvanian and where it ceases to be Permian.

MR. MORRIS: I believe that is all the questions I have.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Stokes, as an engineer, eliminating the possible outside the wells, or edge structure wells, in your opinion the fixed pattern appears to recover more oil or less?

A I think it provides for more effective drainage, yes, sir.

Q To the more uniform pattern?

A It would be more uniform pressure structure in the reservoir and I believe it should promote efficiency.

Q Now, would you recommend that the flexible pattern would enhance the possibility of dedicated dry acres drainage on this well?

A That could happen but a fixed pattern could also prevent somebody who had productive acreage from getting full credit from that productive acreage. We feel that flexible pattern has a better chance of protecting correlative rights as you approach the limit to the field.

Q Do you feel that possibility of dedication of dry acres

is full of productive correlative rights in the pool?

A No, I could hardly say that but it is just a matter of which is worse dedicating some possible non-productive acreage or possibility of not getting credit for some productive acreage. I feel that as you approach the lines of a field it is awfully hard to determine what is productive and non-productive.

Q It is pretty hard to determine without drilling the well outside the limit.

A Well, where the edge might fall between your standard and non-standard locations, if the standard location were dry within the unit, we wouldn't be concerned.

Q If it is all inside the unit then it wouldn't make any difference?

A Yes, sir.

Q You feel this unit boundary does include all productive acreage?

A Well, it would be awfully hard to say at the present time all the evidence from the Well No. 1 indicates that the reservoir should be fairly large and that it probably does extend outside the unit boundary.

Q You are not requesting the pool delineation?

A We requested that previously and I believe the hearing was held on January 17th and continued according to what Mr. Porter just said.

Q I understand it was dismissed.

MR. PORTER: It was dismissed, however, I feel that as a result a pool could be delineated.

MR. MORRIS: In fact it would be also to create a delineated pool in order to establish pool rules.

MR. SETH: We would be glad to furnish any additional data to the Commission that will assist in this area.

MR. UTZ: Well, I believe Mr. Stokes has testified to the fact that he believes No. 1 is in a different pool than 2 and 3A.

A Well, it is in a different zone of Porous development, however, the vertical distance is less than 100 feet between the zones and I don't believe we could very well classify it as a different pool. It would be similar to the Saunders Field where you have four different productive zones, fairly thin zones, that are all classified as Saunders.

Q Do you have any vertical communication between these pools?

A Not here, no, sir, apparently the zones don't overlap; the porour development on 2 and 3A is not present in Well No. 1 and of course development in Well 1 is not present in 2 and 3A.

Q Then, as I recall from your Exhibit, the pressure between the two zones is very slight?

A I know, it was initially. Now, there is about 400 pounds difference between the two.

Q First let me ask you, do you believe that in some of these wells, both of these zones will be present for the same allowable?

A No, sir, I believe that the zones in which Well [illegible]2 and

and 3A are completed covers about 140 acres. It can't profitably support the two wells that are in it though I think our development plans will be towards finding the same zone that is productive in Well No. 1, since we know that it doesn't exist in Wells 2 and 3A, So we are now drilling to the north of Well No. 1 in an effort to locate that same zone.

MR. SETH: Are these the same wells?

A Yes, sir, Well 1 is ten feet, Well 3A was seven feet, Well No. 2, I believe, was about fourteen feet, fourteen feet.

Q (By Mr. Utz) By delineating the vertical limit of the pool to both the zones do you feel there will be any waste involved?

A I don't believe I understand that.

Q I say, by delineating this pool, the vertical limit of this pool to include both of these zones, do you feel that there would be any waste involved?

A No, sir, I don't believe there would be.

Q Now, on your Exhibit No. 5, you may have given me the shut in times for your 2 and 3A, I wish you would give it to me again, please.

A All right, sir. For Well No. 2 the first test was 66 hours, the second test 70 hours, Well No. 3A tested with 71 hours.

Q The first was 66?

A Well No. 3A has only had one test, No, 2 was 66 hours for the first test and 70 hours for the second.

Q Do you know whether or not the Pennsylvanian is likely to

be productive in this area?

A We had a porous zone about 35 feet thick in Well No. 2. The well was initially completed in that zone and after three months it was recompleted so apparently it doesn't extend very far and will not be anticipated Pennsylvanian. As a primary objective, we will probably drill other wells to the Penn hoping for development.

MR. UTZ: Are there any other questions of the witness? The witness may be excused.

(Witness Excused.)

MR. UTZ: Are there any statements in this case?

MR. BLACK: I am C. R. Black, Texaco, Inc. out of Midland, Texas, Texaco owns an excess of 32 per cent of Henshaw Deep Unit and therefore we are a major interest holder and second only to Shell in the amount of interest held in the unit. Texaco does wish to concur with Shell in the application for temporary 80-acre proration units and we feel that certainly, completed in this recess is capable draining an excessive of 80 acres, however, Texaco does not concur with Shell's recommendation and rules governing the spacing of wells to be drilled and recompleted in this reservoir. Texaco believes that on 80-acre proration unit well should be drilled on what you would call staggered 40 acre. This would provide for orderly development of reservoir and will normally provide for the maximum efficient drainage of the reservoir. We also believe that in most instances the protection of correlative rights is normally insured if wells are drilled on this orderly development and staggered spacing, therefore, Texaco would like to reco-

mmend to the Commission that the field rules governing spacing of wells in this pool include the following things: 1, a well must be drilled in either the northeast or southwest quarter of any single governmental quarter section. This would conform to the present spacing pattern. No well presently drilled would be in violation of this well. 2, that no well may be drilled nearer than 660 feet to any lease or quarter-quarter section line. This would provide for an orderly development of the reservoir. Texaco also realizes that the rules do provide or contained provision that would permit an operator to obtain an exception to this rule if it was deemed necessary by the Commission.

MR. MORRIS: Mr. Black, may I ask you if Texaco has any opinion on what the vertical limits of the proposed pool should be?

MR. BLACK: No, sir, at this time I am not qualified to answer that. I have no information on that.

MR. MORRIS: Thank you.

MR. UTZ: Are there any other statements?

MR. MORRIS: If the Examiner please, I have a telegram from Carter Drilling Company, Marshall Rawley, Vice President, addressed to New Mexico Oil Conservation Commission: Carter Drilling is in concurrence with the proposed special rules and regulations for Henshaw-Wolfcamp in Eddy County as expressed on Exhibit No. 8, Commission's Hearing No. 2480, dated January 24, 1962.

MR. UTZ: Are there any other statements? The case will be taken under advisement.

I N D E X

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, KATHERINE PETERSON, 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.

Katherine Peterson
COURT REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2480, heard by me on Jan. 24, 1962.

....., Examiner
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 21, 1963

IN THE MATTER OF:

Case 2480 being reopened pursuant to the provisions of Order No. R-2182, which order established temporary 80-acre proration units for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre proration units.

Case No. 2480

BEFORE:

Elvis A. Utz, Examiner
A. L. (Pete) Porter, Secretary and Director

TRANSCRIPT OF HEARING

MR. UTZ: We will now take Case No. 2480.

MR. DURRETT: Application of Shell Oil Company for temporary special rules and regulations for the Henshaw-Wolfcamp Pool, Eddy County, New Mexico.

MR. UTZ: Who is appearing in the Henshaw Case No. 2480?

MR. DURRETT: Shell Oil Company is, Mr. Examiner.

MR. MORRIS: If the Examiner please, I am Richard Morris of the Santa Fe law firm of Seth, Montgomery, Federici and Andrea, appearing for Shell Oil Company. I wonder if I

might inquire at this time if we are going to have any help or opposition in this matter?

MR. UTZ: I will ask for appearances. I don't hear any pro or con.

MR. MORRIS: Then we are prepared to carry the burden with one witness, Mr. Stokes, who I believe the record will show has been sworn in the previous case.

MR. DURRETT: Mr. Stokes was sworn in the previous case and is still under oath in this case.

D. D. STOKES

called as a witness, having been previously sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Stokes, state your name and position for the record, please.

A My name is D. D. Stokes. I am Senior Reservoir Engineer for Shell Oil Company in Roswell, New Mexico.

Q Mr. Stokes, are you familiar with Case No. 2480 and the previous hearing that was held in this matter?

A Yes, sir, I am.

Q And are you familiar with the characteristics of the wells that are now completed in the Henshaw-Wolfcamp Pool and are you prepared to testify with respect to them at this time?

A Yes, sir.

Q Mr. Stokes, what is the purpose of your appearance here in this case today?

A This case was reopened by the Commission to permit Shell to appear and show cause why the Henshaw-Wolfcamp Pool should not be developed on 40 acres. I am here to request that the temporary rules in effect be continued for one more year.

Q Then at the outset, we are not going to ask at this time that the rules be made permanent at this time, just asking that they be continued in effect for one more year?

A That is correct.

Q Do you have any exhibits prepared to substantiate your request?

A Yes, I have six exhibits to present.

Q Referring to Exhibit No. 1, would you explain that to the Examiner?

A Exhibit 1 is the location of the Henshaw-Wolfcamp Pool and has the Henshaw Deep Unit outlined in green and it shows our current interpretation of the Wolfcamp structure in the area. You can see from the plat that we have drilled three wells since our original hearing last January. These wells are 4, 5, and 6. Well No. 4 was completed temporarily and abandoned. We tested several thin zones in the Wolfcamp, but none of them were commercial. Well No. 5 was completed as a top allowable Wolfcamp Well with ten feet of net pay. Well No. 6 is now in the process of completion.

Q It has not been completed and tested at this time?

A That is correct. We tested a zone about 60 feet thick in that well which we thought would be productive and we would have data when we came to this hearing; however, this zone produced about 80 percent water so we have now abandoned that zone and are coming up the hole to test a higher zone.

Q Wells 1, 2, and 3-A were completed at the time of the hearing a year ago?

A Yes, that is correct.

Q Would you now refer to Exhibit No. 2 and explain that to the Examiner?

A Exhibit 2 is a cross section, showing the correlation of porous zones in the Henshaw Deep Unit No. 1, No. 5, and No. 6. We showed the correlation of No. 1 with 2 and 3-A at the previous hearing. You can see that Well No. 5 is completed in a porous zone that is about 75 feet lower than the zone producing in Well No. 1. This zone produces oil with a gravity of over 40 degrees, as well as gas having a H2S content of only 18 grams per hundred cubic feet. Whereas, Oil Well No. 1 produced, having a H2S content of 750 grams per hundred cubic feet, had a gravity of 36 degrees. Wells 2 and 3-A are produced in a zone about a hundred feet higher than the zone producing in Well No. 1. These two wells also produce gas, having a low H2S content and having gravities greater than 40 degrees. The zone that we tested in Well No. 6 is around 50

feet lower than the producing zone in Well No. 5. This well also produced very sour gas, having H2S content of more than 1100 grams per hundred cubic feet. This data indicates that except for Wells 2 and 3-A, none of the other wells in the Henshaw Deep Unit have as yet been completed in the same zone or reservoir. The characteristics of the oil are different in each case and the pressure performance is different in each case.

Q Your testimony in this regard, Mr. Stokes, is about the same as it was a year ago, where you felt that your Wells 1, 2, and 3-A were completed in different stringers at that time?

A We felt that 2 and 3-A were probably in the same stringer, but that Well No. 1 was in a different one and our data now confirms this, and we have two more wells that haven't managed to find the same zone.

Q I refer now to what has been marked as Exhibit No. 3 and explain that please.

A Exhibit 3 shows completion of reservoir data for the Henshaw Deep Unit No. 5. We gave the data for Wells 1, 2, and 3 at the previous hearing and the data for Well No. 6 is not available yet. We had a core through a pay zone in Well No. 5 which indicated 10 feet of pay, also 9 per cent porosity and 68 millidarcies permeability. The performance of this well to date compares favorably with Wells 1 and 2 and gives indication that the well does have a good permeability, as indicated by core analysis.

Q Have you anything else to show from Exhibit 3 that is not self-explanatory, Mr. Stokes?

A No, I don't think so.

MR. UTZ: Excuse me, Mr. Morris, we will recess until 1:15. I can see we are going to run 20 or 30 minutes past twelve.

(Whereupon, the hearing was recessed.)

AFTERNOON SESSION

MR. UTZ: The hearing will come to order to continue with Case No. 2480.

DIRECT EXAMINATION
(Continued)

BY MR. MORRIS:

Q Mr. Stokes, will you refer now to what has been marked Exhibit No. 4 and state what that shows?

A Exhibit 4 presents a graphical picture of the performance history of the Henshaw Wolfcamp Pool. The exhibit shows reservoir pressure, monthly oil production, cumulative oil production, and number of wells related to time, pressure data against the individual wells identified on the graph. Cumulative oil production January 1st, 1963, 205,789, production increase amounted to 134,823 barrels. Looking at the pressure chart at the top of this page, you can see that Wells 2 and 3-A show very similar pressure measured at any given time. The pressure in these two wells has declined to about 2400 pounds

in this over a year that the two wells have been producing. Well No. 5 has only been producing a short time, does show a definite pressure drop. Well No. 1 has been producing for more than two years and has exhibited no pressure decline at all.

Q That is why you are still looking for the formation that Well No. 1 is completed in?

A That is correct. It is fairly apparent from this exhibit that Wells 2 and 3-A are probably draining the same reservoir. However, we haven't been able to conduct interference tests in these wells. Because of the poor performance characteristics of Well No. 3-A, we cored the zone that is producing in this well. It had an average permeability of only 2 millidarcies. The performance has borne out the tightness indicated by the core analysis. We expect to recover only 40 or 50 thousand barrels from this well.

Q In other words, you hope that Well No. 3 is not a typical well in this pool?

A It certainly hasn't performed as well as the rest of the wells and we will certainly lose money on it.

Q I refer now to what has been marked Exhibit 5 and state what that shows?

A Exhibit 5 is a plot of the extrapolated build up pressure of the cumulative oil recovery for each well. The exhibit shows that contrast in performance between the Wells 2, 3-A and 5 and Well No. 1. We also show on this graph cal-

culated pressure performance for well draining 80 acres, there is a dashed line identified as such on the graph. From this it would appear that Well No. 3-A is only draining 40 to 50 acres, probably more in the order of 40, where Wells 2 and 5 are draining in excess of 160 acres; it would be possibly what Well No. 1 might be draining but from the lack of pressure decline, it is either associated with a very large oil reservoir or connected to a large aquifer.

Q Have you had any showing of water production in your Well No. 1?

A It has produced a small quantity of water but never more than 3 or 4 barrels a day and that has dried up at the present time. The only two wells that encountered the zone that is producing in Well No. 1, other than Well No. 1, were Wells 5 and 6. We cored that zone in both of these wells and the zone was tight with permeability less than 1 millidarcy throughout.

Q I refer now to what has been marked Exhibit 6 and ask you state what that shows?

A Exhibit 6 shows the economics for 40-, 80- and 160-acre well spacing. We base the reserves on volumetric analysis ten feet of pay, 12½ per cent porosity, 25 per cent water saturation, 1.67 Formation Volume Factor, 30 per cent Recovery Efficiency; well cost, $157,000, which lease facility includes pumping equipment when required. On 40 acres we would

recover 52,000 barrels of oil and have a net loss of $53,000. If wells were drilled on 80 acres, we would recover 104,000 barrels and have a profit of $51,000 or 32 per cent on the investment. On 160-acre spacing, we would recover 208,000 barrels of oil and have a profit of $259,000 or 165 per cent.

Q So even on 80 acres, Mr. Stokes, your proposition is not extremely attractive economically?

A We wouldn't consider that satisfactory profit.

Q Is this information, as shown on Exhibit No. 6, approximately the same as presented to the Commission in the original hearing of this case a year ago?

A Yes, this information is identical.

Q Identical?

A Yes.

Q And the additional information that you have obtained from the past year, with respect to your recoverable reserves, has just borne out your original estimation?

A The only thing that would be different is the price of the oil. We used 36 degrees gravity price of $2.83. Actually the oil that we are selling right now is over 40 gravity and would have a $2.95 price. That would not significantly affect the economic showing here.

Q What conclusions then can you draw from these six exhibits to which you have just testified?

A It is my opinion that the data presented here shows

that Wells 1, 2 and 5 are capable of draining more than 80 acres and have not suffered damage from producing with an 80-acre allowable during the past year. Well No. 3-A is not capable of producing even 40-acre allowable and I feel should be classified as non-commercial. I further believe that development of 40 acres is not economically feasible.

Q Then what would your recommendations be to the Commission at this time?

A I would recommend that the Commission extend the temporary field rules now in effect for one more year, during which time, we hope to accumulate sufficient data to justify an establishment of a permanent ruling.

Q During that period of an additional year, Mr. Stokes, will additional wells be drilled in this pool?

A Yes, we are now completing one well and have plans to drill another one immediately, and I imagine we will drill at least one more besides that one during the year.

Q And if these additional wells that are to be drilled appear to be in the same reservoir or in the same stringer as some of the wells previously drilled, then would it be feasible to conduct interference tests?

A Yes, it would and we would have those tests available by the time we come back next year.

Q Now, the special rules and regulations that were adopted for this pool by Order No. R-2182, are you recommending

that those rules be continued in effect for the coming year?

A Yes, that is correct.

Q Were Exhibits 1 through 6 prepared by you or under your direction?

A Yes, sir.

MR. MORRIS: We offer Exhibits 1 through 6 in evidence and that concludes the direct examination of Mr. Stokes at this time.

MR. UTZ: Without objection, Exhibits 1 through 6 will be entered into the record of this case. Are there any questions of Mr. Stokes?

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Stokes, I believe that your information here shows that you might have two reservoirs here, is that true?

A I believe at least three to date.

Q Have you been able to correlate those zones through two or more of your wells?

A The only one that we can correlate through two wells that is productive is the zone that Wells 2 and 3-A are producing from. We can correlate the zone that is producing Well No. 1 through Wells 5 and 6, but it's too tight to be productive in those wells.

Q And you are now drilling Well No. 6, did I understand you to say that?

A Yes, we are in the process of completing Well No. 6, it has been drilled and cased.

Q On your Exhibit No. 6, I note that for your 40-, 80- and 160-acre examples of net income, your 40-acre reserves or rather your 80-acre reserves are exactly twice your 40-acre reserves and your 160 acres are exactly twice your 80-acre reserves?

A Yes, sir.

Q Is it your opinion that a well can drain as much oil from a 660-acre radius as it can from a 1320-acre radius in this type of formation?

A Yes, sir.

Q Even though it is as tight as this?

A The only well that is indicated to be tight is No. 3-A, only going to make 40 or 50 thousand barrels of oil. It is a non-commercial well. The permeability measured in core data in Well No. 5 was 86 millidarcies and in lime stone is very good and I don't believe it could be considered tight. The range in that well, by the way, was from 8 millidarcies to over 300.

Q What kind of net pay did you have in that well?

A Ten feet.

Q And that 10 feet didn't have any tight streaks?

A That is ten net feet. Gross interval was about 16 feet.

Q Did 16 feet have any tight streaks or any shale breaks?

A Dense streaks, yes, sir.

Q Do you have any proposed plans to drill after Well No. 6 is completed?

A We are now planning Well No. 7. We have to receive the approval of, I believe, five partners in this test before we can commence drilling.

Q Do you have a location for that well yet?

A It hasn't been established as yet, no, sir.

MR. UTZ: Are there any other questions of the witness? The witness may be excused. Are there any statements in this case?

MR. MORRIS: Mr. Examiner, I would like to point out something with regard to a question that you asked of Mr. Stokes concerning the different reservoirs that might be encountered in this pool. At the original hearing of this case, a year ago, this point was discussed and I have been looking at the transcription of that case in front of me now and see that it was the testimony at that time that at least two stringers were open in the lower Wolfcamp. At that time, that was the testimony then. Now, the witness has stated that there may be two or three such stringers, but that it should all be considered within the classification of lower Wolfcamp. That is all I have to offer.

MR. UTZ: Any other statements?

MR. DURRETT: If the Examiner please, I would like to

state for the record that the Commission has received several communications concerning this case, all of these communications are in support of the application. I do not propose to read them in their entirety. I will state the names of the companies who communicated with us concerning this matter. One is Humble Oil and Refining Company, next one is Kara Drilling Company, Delhi-Taylor Oil Corporation, and Texaco, Inc. These letters will be in the Commission file in case anyone would desire to read them.

MR. UTZ: Are there any other statements? The case will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ELAINE J. BUCHANAN, Court Reporter, do hereby certify that the foregoing and attached transcript of hearing 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 9th day of April, 1963.

Elaine Buchanan
NOTARY PUBLIC

My Commission Expires:

October 14, 1966.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2480, heard by me on Feb. 21, 1963.

....., Examiner
New Mexico Oil Conservation Commission

I N D E X

EXHIBITS

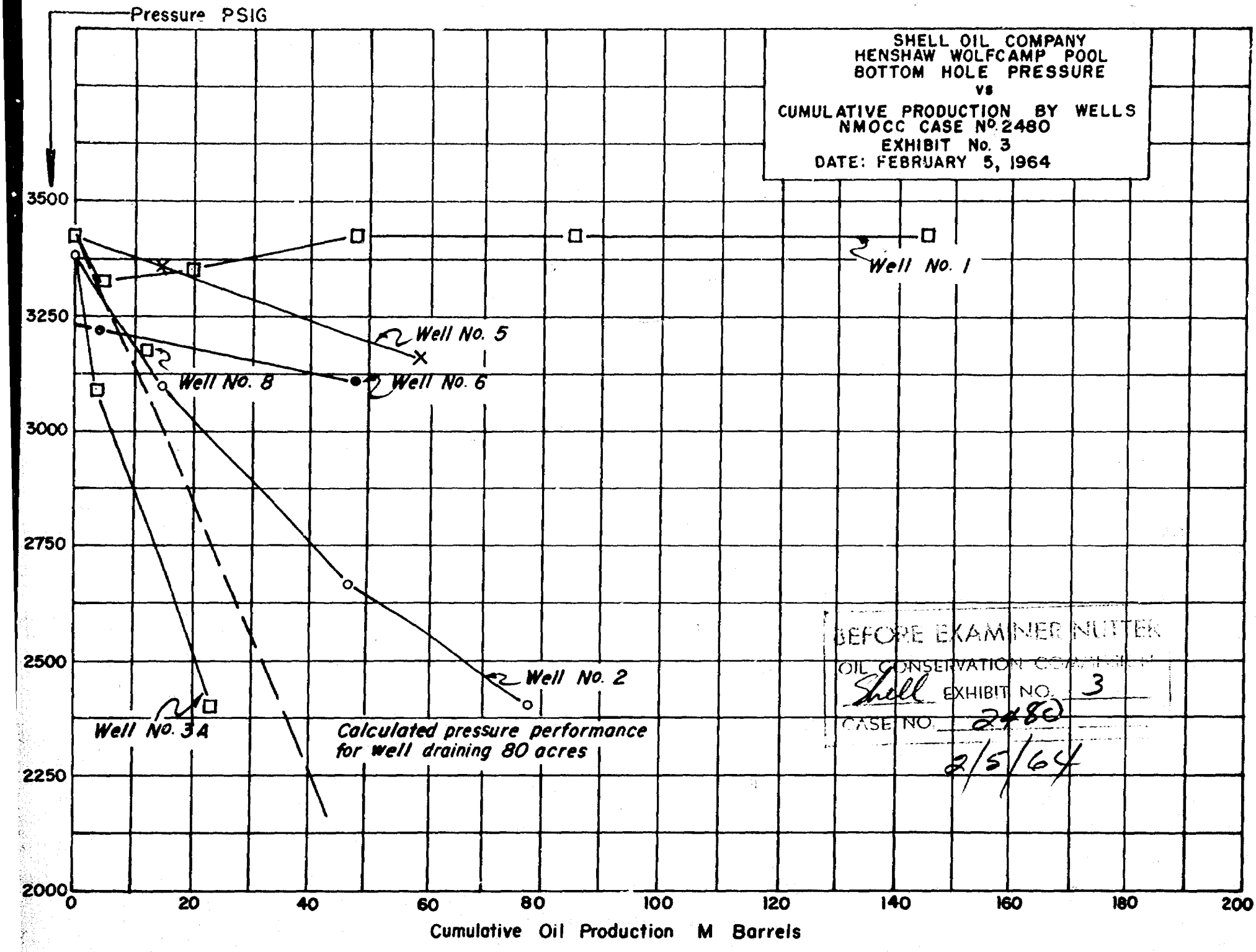
NUMBER	MARKED FOR IDENTIFICATION	OFFERED	ADMITTED
Exhibit 1	4	12	12
Exhibit 2	5	12	12
Exhibit 3	6	12	12
Exhibit 4	7	12	12
Exhibit 5	8	12	12
Exhibit 6	9	12	12

SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
COMPLETION DATA WELL NOS. 6 AND 8
NMOCC CASE NO. 2480
EXHIBIT NO. 2
DATE: FEBRUARY 5, 1964

	Well No. 6	Well No. 8
Formation	Wolfcamp Limestone	Wolfcamp Limestone
Total Depth	9500 feet	9036 feet
Top Wolfcamp	7683 feet	7702 feet
Completion Date	2-22-63	8-2-63
Completion Interval	8697-8714 feet	8733-8743 feet
Treatment	1000 gallons acid	400 gallons acid
Initial Potential		
Potential BOPD	261	380
Choke Size	13/64"	14/64"
GOR	2235	1661
Tubing Pressure	1380	1200
Casing Pressure	Packer	Packer
Oil Gravity	44.2°	42.5°

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Shell EXHIBIT NO. 2
CASE NO. 2480
2/5/64

SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
BOTTOM HOLE PRESSURE
vs
CUMULATIVE PRODUCTION BY WELLS
NMOCC CASE Nº 2480
EXHIBIT No. 3
DATE: FEBRUARY 5, 1964



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Shell EXHIBIT NO. 3
CASE NO. 2480
2/5/64

SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
RESERVOIR DATA
NMOCC CASE NO. 2480
EXHIBIT NO. 4

[illegible] 1000 [illegible] are completed in a common string [illegible]

	Well Number					
	1	2	3A	5	6	8
Porosity (Core) - %	-	-	12.5	9	-	8.5
Porosity (Log) - %	6	12.5	11.5	9	5.5	-
Permeability (Core) - md.	--	--	2	68	--	350
Permeability (Calc) - md.	18	10	2.8	41	45	24
Feet of Pay	10	14	7	10	14	40
Water Saturation - %	35	25	20	31	44	3170
Original Reservoir Pressure - psig	3410	3390	3390	3410	3220	42.5
Gravity of Oil - ° API	36	41	41	41	44.2	500
H2S Content of Gas - gr/100 cu.ft.	810	15	5	50	1100	
current productivity	155 BPD	>TA	20-25 BPD	>TA	>TA	>TA

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Shell EXHIBIT NO. 4
CASE NO. 2480
2/5/64

SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
CALCULATION OF ABANDONMENT PRESSURE
40- AND 80-ACRE SPACING
NMOCC CASE NO. 2480
EXHIBIT NO. 5
DATE: FEBRUARY 5, 1964

Flow Equation:

$$P-P_f = \frac{q\,\mu\,Bo}{2\pi\,kh} \ln \frac{r}{r_w} \qquad \text{(Metric Units)}$$

where:
- P = pressure at drainage radius r
- P_f = well bore pressure = 50 psig at economic limit
- q = production rate = 5 BOPD at economic limit
- μ = viscosity = 0.7 cp.
- Bo = formation volume factor = 1.1 @ 500 psi
- k = permeability = 23 md.
- h = pay thickness = 12 feet
- r = drainage radius = 743 feet for 40 acres, 1052 feet for 80 acres
- r_w = well bore radius = 0.333 feet

Estimated total liquid saturation at abandonment = 56.5%
Relative permeability to oil at total liquid saturation of 56.5% = 0.034

Converting flow equation to oil field units:

$$P-P_f = \frac{14.65 \times 1.84 \times 2.303}{2 \times 3.14 \times .001 \times 30.48} \frac{q\mu\,Bo}{kh} \log \frac{r}{r_w} = \frac{325\,q\mu\,Bo}{kh} \log \frac{r}{r_w}$$

Abandonment Pressure - 40-acre spacing:

$$P-50 = \frac{325 \times 5 \times 0.7 \times 1.1}{12 \times 23 \times .034} \log \frac{743}{0.333}$$

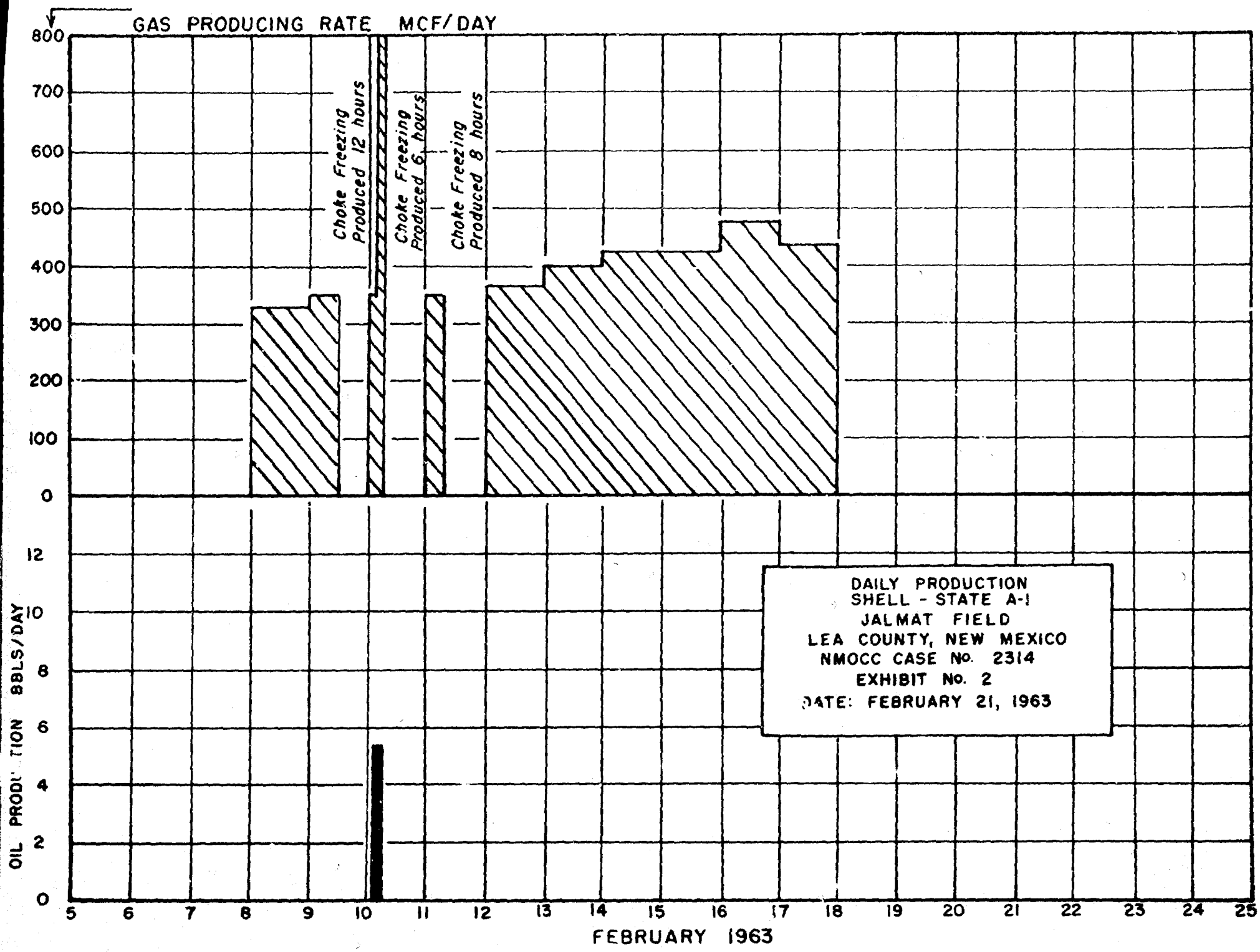
$$P-50 = 134 \times 3.35 = 450$$
$$P = 500 \text{ psig}$$

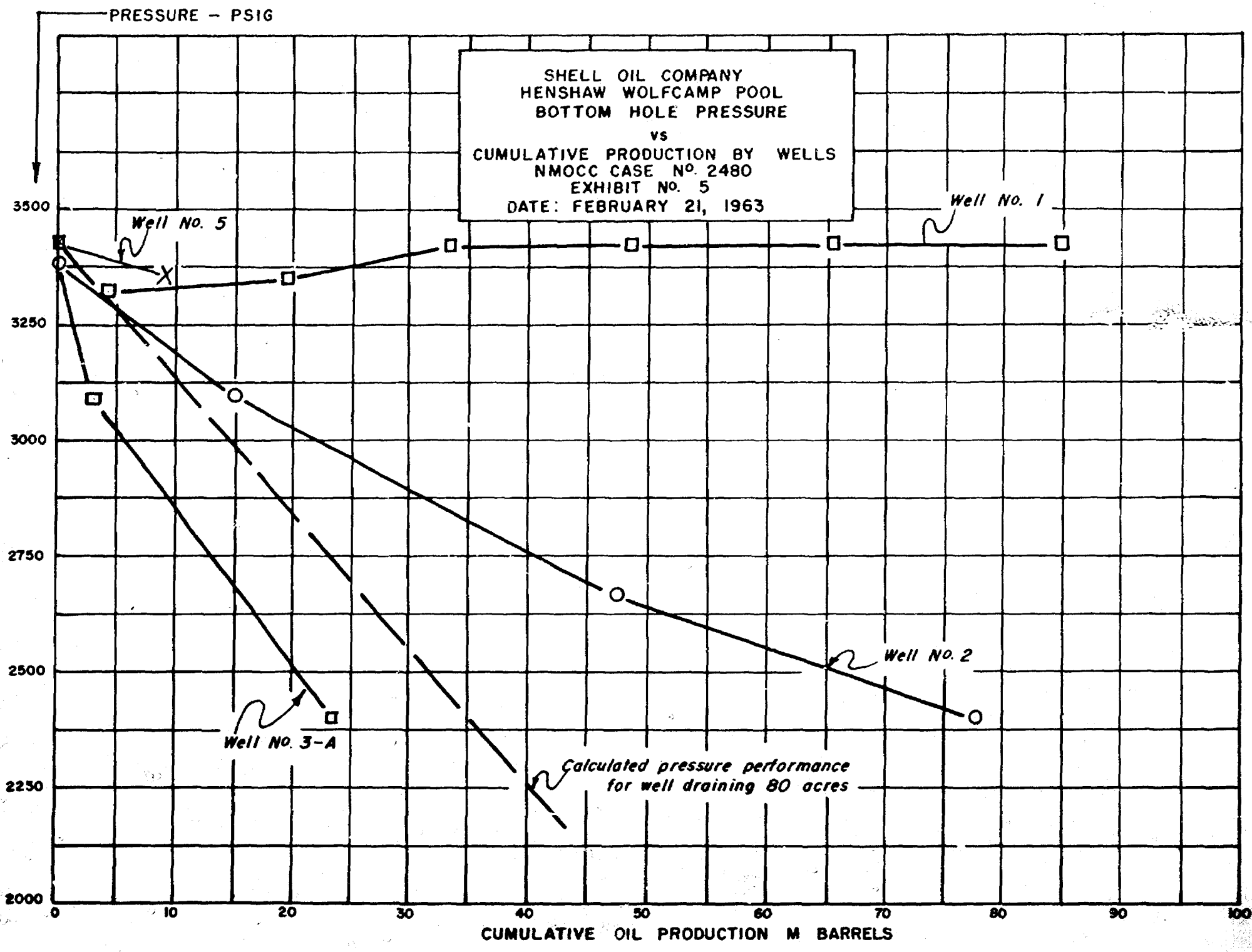
Abandonment Pressure - 80-acre spacing:

$$P-50 = \frac{325 \times 5 \times 0.7 \times 1.1}{12 \times 23 \times .034} \log \frac{1052}{0.333}$$

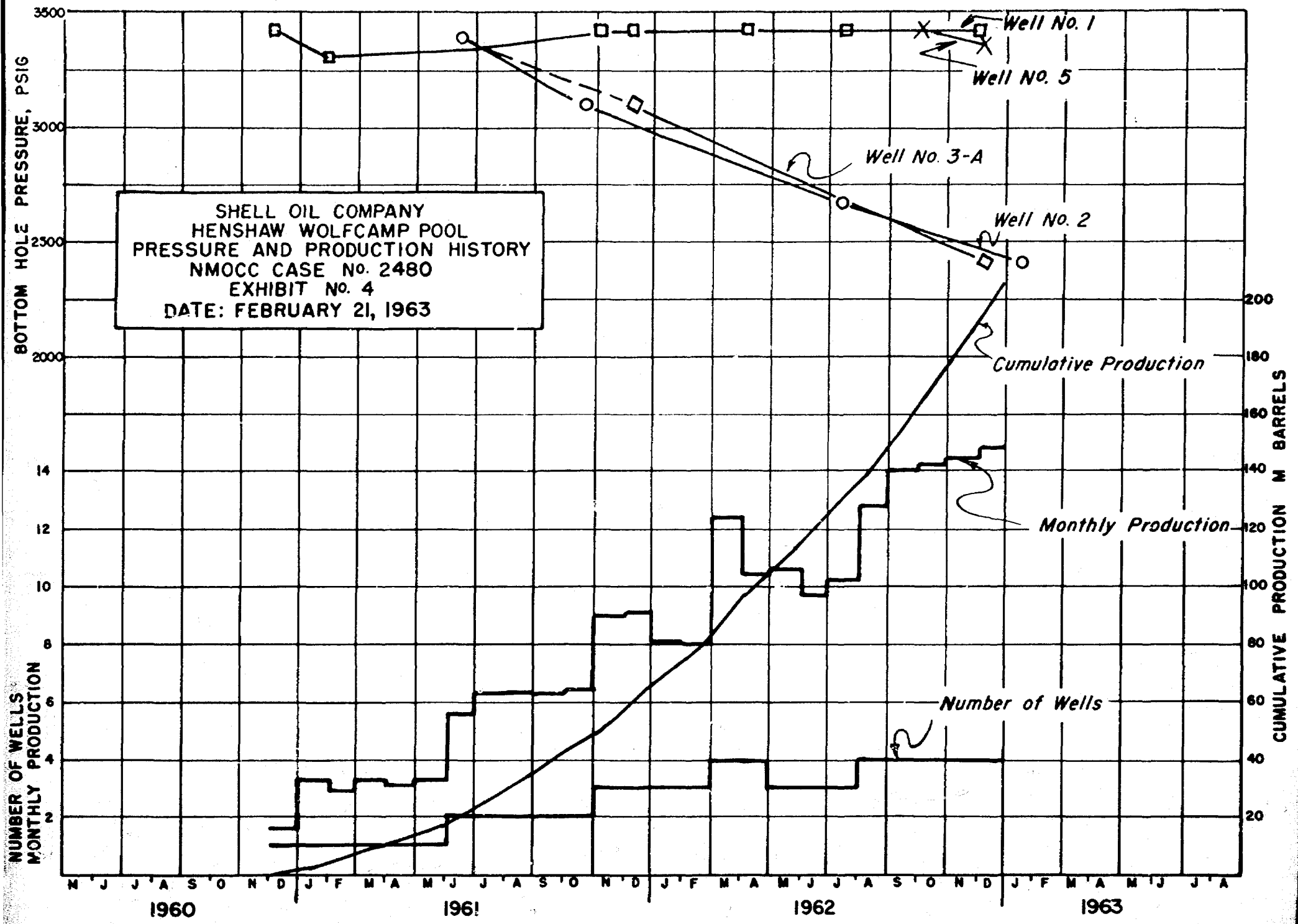
$$P-50 = 134 \times 3.497 = 470$$
$$P = 520 \text{ psig}$$

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Shell EXHIBIT NO. 5
CASE NO. 2480
2/5/64


GAS PRODUCING RATE MCF/DAY
800
700
600
500
400
300
200
100
0
Choke Freezing Produced 12 hours
Choke Freezing Produced 6 hours
Choke Freezing Produced 8 hours
OIL PRODUCTION BBLS/DAY
12
10
8
6
4
2
0
DAILY PRODUCTION
SHELL - STATE A-1
JALMAT FIELD
LEA COUNTY, NEW MEXICO
NMOCC CASE No. 2314
EXHIBIT No. 2
DATE: FEBRUARY 21, 1963
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
FEBRUARY 1963


PRESSURE – PSIG
SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
BOTTOM HOLE PRESSURE
vs
CUMULATIVE PRODUCTION BY WELLS
NMOCC CASE No. 2480
EXHIBIT No. 5
DATE: FEBRUARY 21, 1963
Well No. 5
Well No. 1
Well No. 2
Well No. 3-A
Calculated pressure performance
for well draining 80 acres
3500
3250
3000
2750
2500
2250
2000
0
10
20
30
40
50
60
70
80
90
100
CUMULATIVE OIL PRODUCTION M BARRELS

SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
PRESSURE AND PRODUCTION HISTORY
NMOCC CASE No. 2480
EXHIBIT No. 4
DATE: FEBRUARY 21, 1963



SHELL OIL COMPANY
HENSHAW WOLFCAMP POOL
COMPLETION AND RESERVOIR DATA - WELL NO. 5

Completion Data

Formation	Wolfcamp Limestone
Total Depth	12,100
Top Wolfcamp	7727
Completion Date	8-26-62
Completion Interval	8785-8801
Treatment	450 Gallons Acid
Initial Potential	
Potential BOPD	305
Choke Size	16/64
GOR	1650
Tubing Pressure	800
Casing Pressure	Packer
Oil Gravity	40.8°

Reservoir Characteristics

Porosity	9%
Permeability	68 md.
Water Saturation	31%
Net Pay	10 feet
Reservoir Temperature	126° F
Original Reservoir Pressure	3420 psig
Probable Reservoir Drive	Solution Gas

NMOCC Case No. 2480
Exhibit No. 3
Date: February 21, 1963

SHELL OIL COMPANY
HENSHAW WOLFCAMP FIELD
ECONOMICS FOR 40, 80 AND 160-ACRE
WELL SPACING

1. Cost and Income Data

Operating Net Income Per Gross Barrel		
Price of Oil (36° API)		$ 2.830
Gas Oil Ratio Over Life MCF/bbl		3.0
Gas Income $/bbl		$ 0.30
Gross Income Per Barrel		$ 3.130
Royalty and ORRI/bbl	$ 0.548	
Production and Property Taxes/bbl	0.193	
Overhead/bbl	0.184	
Operating Cost/bbl	0.205	
Subtotal		$ 1.130
Operating Net Income Per Gross Barrel		$ 2.000
Well Cost		$157,000

2. 40-Acre Spacing

Reserves	52,000 bbls.
WI Net Income	$104,000
Loss Per Well	$ 53,000
Per Cent Profit	0

3. 80-Acre Spacing

Reserves	104,000 bbls.
WI Net Income	$208,000
Profit	$ 51,000
Per Cent Profit	32

4. 160-Acre Spacing

Reserves	208,000 bbls.
WI Net Income	$416,000
Profit	$259,000
Per Cent Profit	165

NMOCC Case No. 2480
Exhibit No. 6
Date: February 21, 1963

SHELL OIL COMPANY
HENSHAW WOLFCAMP FIELD
WELL COMPLETION AND RESERVOIR DATA

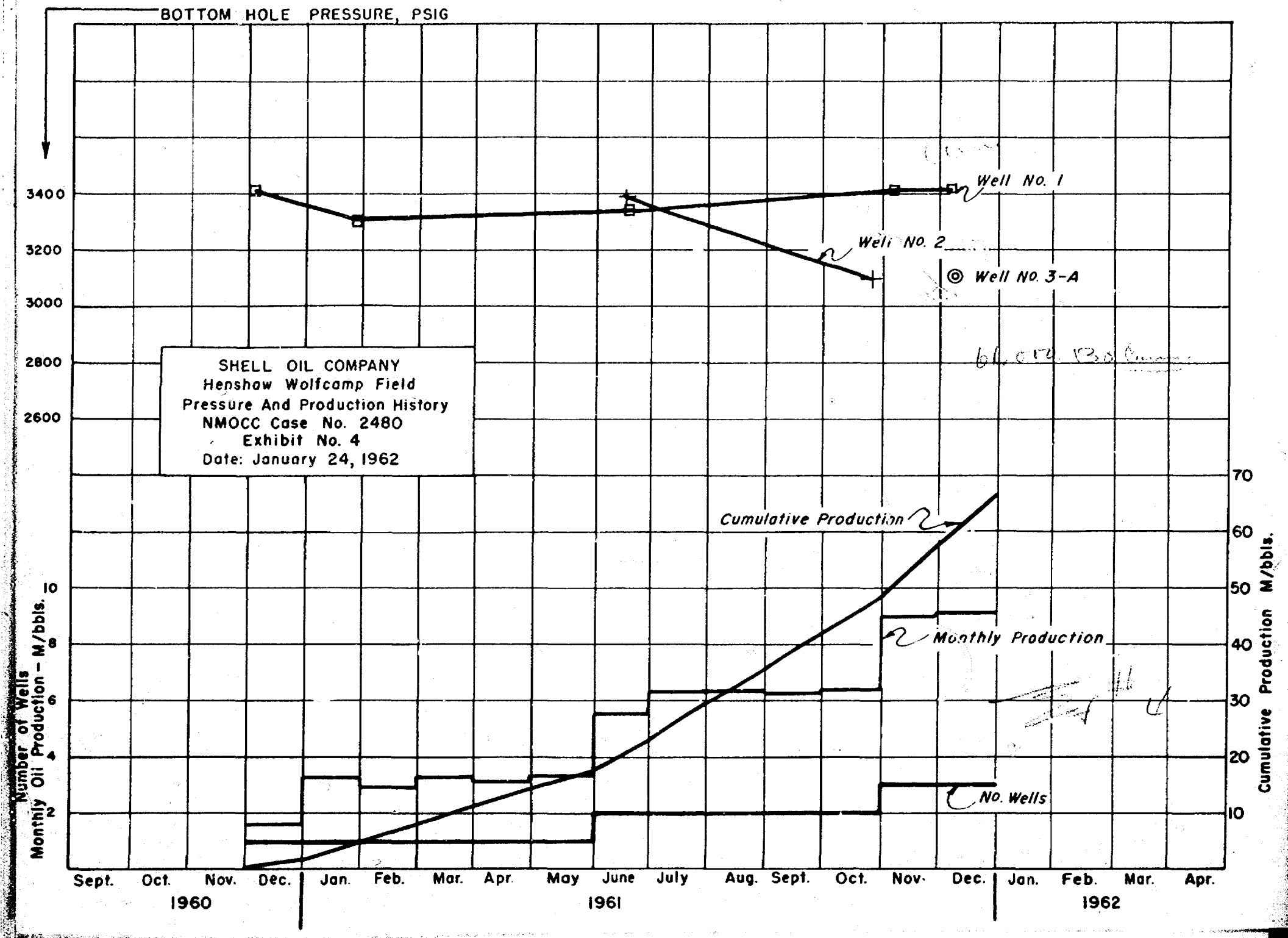
Completion Data

Formation	Permian Wolfcamp Limestone		
Well No.	1	2	3A
Total Depth	13,072	10,000	9,610
Top Wolfcamp	7795	7792	7807
Completion Date	12-2-60	6-21-61	11-4-61
Completion Interval	8822-8830	8753-8763	8711-8740
Treatment	250 Gal Acid	500 Gal Acid	3500 Gal Acid
Initial Potential			
Potential (BOPD)	171	127	136
Choke size	18/64	11/64	20/64
GOR	1377	1770	1501
Tubing Pressure	360	875	225
Casing Pressure	Packer	Packer	Packer
Oil Gravity (°API)	36	41°	41°

Reservoir Characteristics

Porosity	- - -	- - -	12 1/2
Permeability	- - -	- - -	2 md
Water Saturation	- - -	- - -	25
Net Pay	10	14	7
Reservoir Temperature	126°	126°	126°
Original Reservoir Pressure	3410	3390	3390 est.
Probable Reservoir Mechanism	Solution Gas	Solution Gas	Solution Gas

NMOCC Case No. 2480
Exhibit No. 3
Date: January 24, 1962


BOTTOM HOLE PRESSURE, PSIG
3400
3200
3000
2800
2600
Well No. 1
Well No. 2
Well No. 3-A
SHELL OIL COMPANY
Henshaw Wolfcamp Field
Pressure And Production History
NMOCC Case No. 2480
Exhibit No. 4
Date: January 24, 1962
Cumulative Production
Monthly Production
No. Wells
Number of Wells
Monthly Oil Production – M/bbls.
Cumulative Production M/bbls.
10
8
6
4
2
70
60
50
40
30
20
10
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr.
1960
1961
1962

SHELL OIL COMPANY
Henshaw Wolfcamp Field
Bottom Hole Pressure
Vs
Cumulative By Wells
NMOCC Case No. 2480
Exhibit No. 5
Date: January 24, 1962

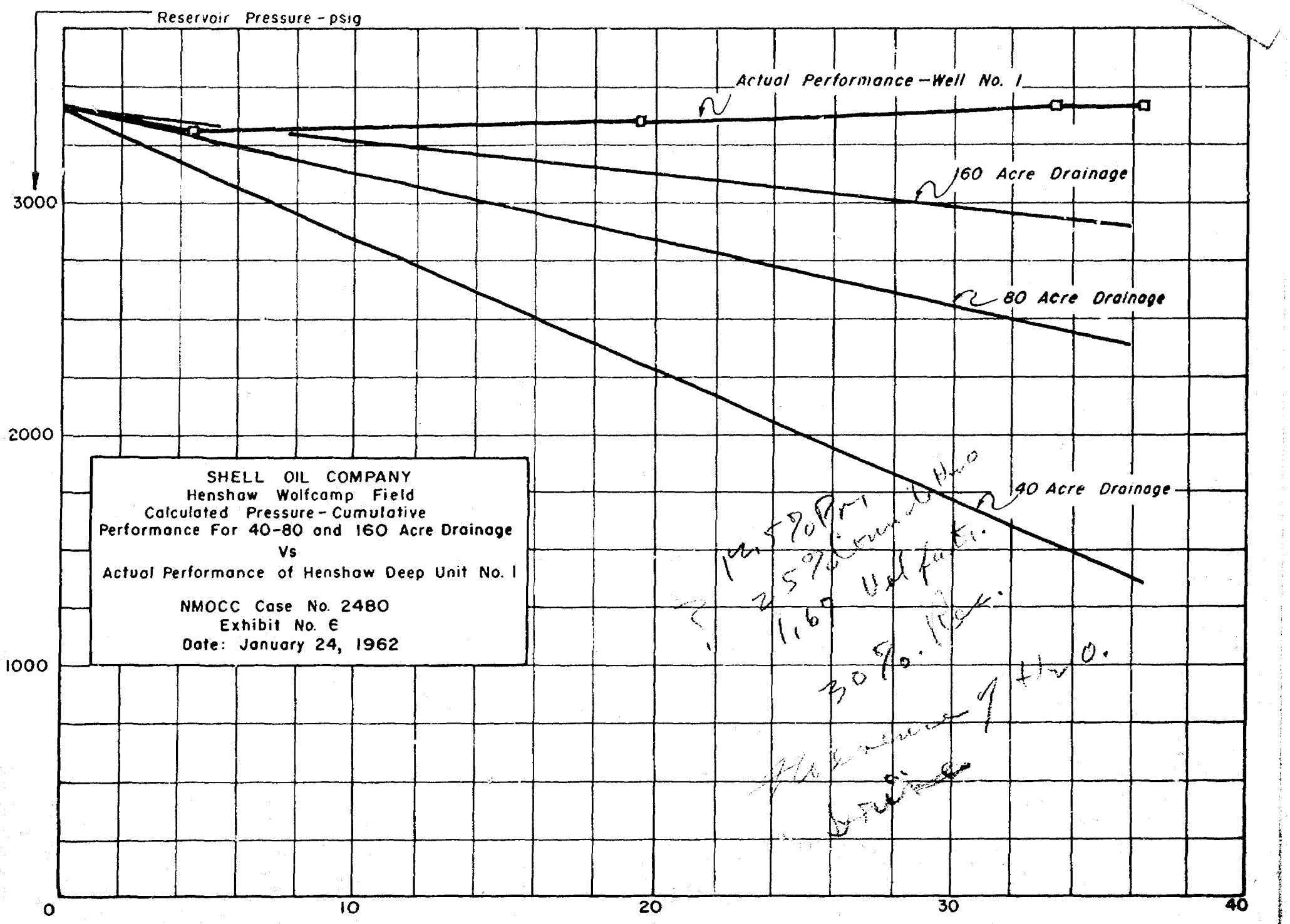
3750
3500
3250
3000

Well No. 3-A
71 Feb.

Well No. 2
70 Aug.

10
20
30
40

Cumulative Oil Production – M/bbls.


Reservoir Pressure - psig
3000
2000
1000
0
10
20
30
40
Cumulative Recovery — M/bbls.
Actual Performance — Well No. 1
160 Acre Drainage
80 Acre Drainage
40 Acre Drainage
SHELL OIL COMPANY
Henshaw Wolfcamp Field
Calculated Pressure - Cumulative
Performance For 40-80 and 160 Acre Drainage
Vs
Actual Performance of Henshaw Deep Unit No. 1
NMOCC Case No. 2480
Exhibit No. E
Date: January 24, 1962

SHELL OIL COMPANY
HENSHAW WOLFCAMP FIELD
ECONOMICS FOR 40, 60 AND 80-ACRE
WELL SPACING

1. Cost and Income Data

Operating Net Income Per Gross Barrel

Price of oil (36° API)		$ 2.830
Gas Oil Ratio over life MCF/bbl		3.0
Gas income $/bbl		$ 0.30
Gross income per bbl		$ 3.130
Royalty and ORRI /bbl	$ 0.548	
Production and Property Taxes/bbl	0.193	
Overhead/bbl	0.184	
Operating cost/bbl	0.205	
Subtotal		$ 1.130
Operating net income per gross barrel		$ 2.000
Well cost		$157,000

2. 40-Acre Spacing

Reserves	52,000 bbls
WI net income	$104,000
Loss per well	$ 53,000
Percent Profit	0

3. 80-Acre Spacing

Reserves	104,000 bbls
WI net income	$208,000
Profit	$ 51,000
Percent Profit	32

4. 160-Acre Spacing

Reserves	208,000 bbls
WI net income	$416,000
Profit	$259,000
Percent Profit	165

30% recovery efficiency

Recovery factor? % of oil in place?

Judge recovery

operating cost/bbl should decrease as size of proration unit increases

NMOCC Case No. 2480
Exhibit No. 7
Date: January 24, 1962

Special Rules and Regulations
for the Henshaw Wolfcamp Pool.

Rule 1. Each well completed or recompleted in the Henshaw (Lower) Wolfcamp Pool or in the Wolfcamp formation within one mile of said pool, and not nearer to nor within the limits of another designated Wolfcamp Pool, shall be spaced, drilled, operated, and prorated in accordance with the Special Rules and Regulations hereinafter set forth.

Rule 2. Each well completed or recompleted in the Henshaw Wolfcamp Pool shall be located in a unit containing 80 acres, more or less, which consists of the S/2, N/2, E/2 or W/2 of a single governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

Rule 3. Each well completed or recompleted in the Henshaw Wolfcamp Pool shall not be drilled closer than 330 feet to any quarter-quarter section line.

Rule 4. For good cause shown, the Secretary-Director may grant exception to the requirements of Rule 2 without notice and hearing when the application is for a non-standard unit comprising a single quarter-quarter section or lot. All operators offsetting the proposed non-standard unit shall be notified of the application by registered mail and the application shall state that such notice has been furnished. The Secretary-Director may approve the application if, after a period of 30 days, no offset operator has entered an objection to the formation of such non-standard unit.

The allowable assigned to any such non-standard unit shall bear the same ratio to a standard allowable in the subject pool as the acreage in such non-standard unit bears to 80 acres.

Rule 5. An 80-acre proration unit (79 through 81 acres) in the subject pool shall be assigned an 80-acre proportional factor of 4.00 for allowable purposes and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit in any proportion.

Texaco

(1) NE or SW/qq

(2) 660 ft to qq sec. line

NMOCC Hearing No. 2480
Exhibit No. 8
Date: January 24, 1962