### STATE OF NEW MEXICO

# ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

August 3, 1938

POST OFFICE BCX 2088 STATE LAND OFFICE BU LICING SANTA FE NEW MEXICO 87501 (505) 827-5800

Mr. William F. Carr Campbell & Black Attorneys at Law Post Office Box 2203 Santa Fe, New Mexico	Re:	CASE NO. 9427 ORDER NO. R-8711 Applicant: Nearburg Producing Company
		Mear Surg Producting Company
Enclosed herewith are two cop Division order recently enter		
Sincerely,		<u>-</u>
FLORENE DAVIDSON OC Staff Specialist		
Copy of order also sent to:		
Hobbs OCD x Artesia OCD x Aztec OCD x		
Other		

## CAMPBELL & BLACK, P.A.

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William J. LeMay, Director
Oil Conservation Division
New Mexico Department of
Energy, Minerals and Natural Resources
State Land Office Building
Santa Fe, New Mexico 87503

Re: OCD Case No. 9425

In the Matter of the Application of Nearburg Producing Company for an Unorthodox Gas Well Location, and Simultaneous Dedication, Eddy County, New Mexico

OCD Case No. 9426

In the Matter of the Application of Nearburg Producing Company for Compulsory Pooling and an Unorthodox Gas Well Location, Eddy County, New Mexico

OCD Case No. 9407

In the Matter of the Application of Nearburg Producing Company for an Unorthodox Gas Well Location, Eddy County, New Mexico

Dear Mr. LeMay:

I would appreciate the Division continuing the above-referenced hearings from the July 6, 1988 Examiner docket to the July 20, 1988 Examiner docket.

Your assistance in this matter is appreciated.

very truly yours

WILLIAM F\ CARR

WFC/mlh

cc: Mr. Mark Nearburg
Nearburg Producing Company

David Farmer
ARCO Oil & Gas Company

et Ç

1 2 3 4	STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO  20 July 1988				
5	EXAMINER HEARING				
6	IN THE MATTER OF:				
8 9	Application of Nearburg Producing CASE Company for an unorthodox gas well 9425 location and simultaneous dedication, Eddy County, New Mexico, and				
10	Application of Nearburg Producing 9426 Company for compulsory pooling and an unorthodox gas well location, Eddy County, New Mexico, and				
12 13 14	Application of Nearburg Producing  Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico.				
15 16	BEFORE: Michael E. Stogner, Examiner				
17	TRANSCRIPT OF HEARING				
18 19	APPEARANCES				
20 21	For the Division:  Robert G. Stovall Attorney at Law Legal Counsel to the Division				
22	State Land Office Bldg. Santa Fe, New Mexico				
<ul><li>23</li><li>24</li><li>25</li></ul>	For the Applicant:  William F. Carr Attorney at Law CAMPBELL and BLACK, P. A. P. O. Box 2208 Santa Fe, New Mexico 87501				

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MARK NEARBURG

Direct Examination by Mr. Carr 

Cross Examination by Mr. Stogner 

#### LOUIS MAZZULLO

Direct Examination by Mr. Carr 

Cross Examination by Mr. Stogner 

EXHIBITS

INDEX

Nearburg Exhibit One, Plat 

Nearburg Exhibit Two, Cross Section 

Nearburg Exhibit Three, Type Log 

Nearburg Exhibit Four, Map 

Nearburg Exhibit Five, Structural Map 

MR. STOGNER: We will call next Case Number 9425, which is the application of Nearburg Producing Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico.

Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell and Black, P. A., of Santa Fe. We represent Nearburg Producing Company.

Initially I would request that this case be consolidated with Cases 9426 and 9427, also on today's docket. They all involve wells offsetting one another in a Morrow stringer and the testimony will be very similar.

MR. STOGNER: Are there any

objections?

There being none, I will call Case Number 9426, which is the application of Nearburg Producing Company for compulsory pooling and an unorthodox gas well location in the same area in Eddy County, and I'll also call Case Number 9427, is that correct, Mr. Carr?

MR. CARR: That's correct, Mr.

Stogner.

MR. STOGNER: Which is the application of Nearburg Producing Company for an unorthodox

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١ gas well location and simultaneous dedication in the same 2 area in Eddy County, New Mexico. 3 Call for appearances in those 4 cases, other than Mr. Carr. 5 There being none, will the 6 witness please stand and be sworn at this time? 7 8 (Witnesses sworn.) 9 10 MR. CARR: Mr. Stogner, there 11 is one other initial matter. In Case 9426 Nearburg Produc-12 ing Company was seeking an order pooling a 320-acre gas 13 spacing and proration unit. An agreement was been reached 14 with ARCO, the interest owner who was subject to pooling, 15 and therefore that portion of Case 9426 can be dismissed. 16 MR. STOGNER: Thank you, Mr. 17 Carr. 18 19 MARK NEARBURG, 20 being called as a witness and being duly sworn upon his 21 oath, testified as follows, to-wit: 22 23 DIRECT EXAMINATION 24 BY MR. CARR:

Will you state your full name and place

1 Α Yes, in Case 9425 and Case 9427 we're 2 seeking simultaneous dedication. 3 What pool are we talking about? Q Α The Boyd Morrow Pool. 5 Let's go to what has been marked as your 6 Exhibit Number One and let's review the development as de-7 picted on this exhibit. 8 First, would you just note the South 9 Boyd No. 1 and advise the Examiner as to the acreage that 10 is dedicated to that well? 11 The South Boyd No. 1 is a Morrow well Α drilled by Nearburg in about 1983. The well is on a north 12 13 half proration unit in Section 27. 14 Is it currently producing? 15 Α Yes. 16 Now, would you go down to the south half Q 17 of 26 and just briefly identify the Boyd State 26 M No. 1 18 and review the status of that well. 19 Α That's a well, an oil well that was com-20 pleted two weeks ago. It was approved at a hearing about a 21 month ago. It is a producing well, not yet -- it is com-22 pleted, it's not yet tied into a pipeline; produces on a 23 south half unit. 24 And what is the producing capability of that well, in your opinion?

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A In terms of volume?

Q Yes.

A Into the pipeline we're not sure yet, but it looks like that it should produce approximately a million to a million and a half cubic feet a day.

Q All right, Mr. Nearburg, now let's go up to the spacing unit that is shaded in yellow, the east half of Section 22. Would you identify the existing well on that unit?

A This is Case 9425. It's the east half of Section 22. Shown with the green dot is the B & B No.

1, which is a currently producing oil well that is a marginal producer.

Q Now, in that spacing unit you've also placed the names Anadarko and Yates Petroleum. Would you explain why their names are included there?

A When this exhibit was prepared we had worked with Anadarko and Yates in this area. We simply wanted to show the operators that were -- being active in this area, they are -- they were consulted and have agreed to the development plans for these wells.

Q At this time --

A And Nearburg now has -- controls 100 percent of the interest in the east half of 22 in cooperation with Anadarko and Yates.

All right. Now, in the southeast corner

of that unit is a red spot. That's the proposed well?

Yes.

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1 Α This location is being moved toward 2 Nearburg production and all of the units it is moving to-3 ward are currently producing. Is there any existing production from 5 the Morrow formation on that spacing unit? 6 No. Α 7 Will you now go to the area shaded or Q 8 outlined in green and review your development plans in that 9 area? 10 Α This is Case 9427 in which we are seek-11 ing to drill a new well at a nonstandard location to the 12 Morrow formation and simultaneously dedicate the unit to 13 the currently producing Perino No. 1 Well, indicated by the 14 green dot, which is also a marginal producer. 15 We are only moving toward, again, pro-16 ducing units that Nearburg controls 100 percent. 17 Q Now, as to the existing wells in the 18 south half of 23 and in the east half of 22, are you pre-19 pared to plug and abandon those wells at this time? 20 Α No. 21 And why not? Q 22

A They are marginal producers. They are holding the units, in effect. We seek the simultaneous dedication to drill the new wells. We do not want to plug the existing wells due to the potential for marginal wells

with the new drilling.

If we incur -- if we find that the new wells are marginal, we will want to produce both wells from the unit.

Q What are your current plans for drilling the wells which are the subjects of these cases?

A I'll start with the B & B Well, Case 9425. That well will be drilled following completion of the Perino 23 Well, located in Section 23. The Perino Well is currently drilling. We were in touch with the Commission and had detailed conversations about extending this case from July 6th docket and we received approval from the Commission to go ahead and begin drilling.

Q And when will you drill the 9-Lives?

A The 9-Lives will be the third well drilled and it will be drilled following the B & B, the new well on the east half of Section 22.

Q Mr. Nearburg, do you plan to use the same rig for drilling each of these wells?

A Yes, we do.

Q And by using the same rig and moving directly from one well to the other, will savings result?

A Yes. We've obtained significant savings by signing a contract to drill all three of these wells in sequence.

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1 Q What do the red arrows on this exhibit 2 indicate? 3 We had had some concern expressed to us 4 by the Commission about the proximity of wells to each 5 other. This is simply meant to indicate that we are far more than the standard distance required between wells in 7 this pool. 8 And if you were to develop wells, say, 9 the Perino tract in green and the -- a well in the 9-Lives 10 tract outlined in orange, how close could those wells be 11 drilled to one another under the existing statewide rules? 12 Α They could be drilled 1320 feet from 13 each other. 14 And what you're proposing is locating a Q 15 well substantially in excess of that. 16 Α Yes, at least twice the distance requir-17 ed by the Commission. 18 Q Mr. Nearburg, will locating the wells as 19 you have proposed result in an effective drainage pattern 20 for this Morrow channel? 21 Α We believe so. We do not believe that 22 there will be communication between these wells due to the 23 character of the Morrow sand. 24 Mr. Nearburg, inasmuch as Nearburg owns

100 percent of all the affected spacing and proration units

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Q Mr. Mazzullo, would you refer to the cross section which has been marked Exhibit Number Two, identify that and review it, please?

A Nearburg Exhibit Number Two is a cross section which is more or less perpendicular to the direction of flow of the various Morrow channel systems that comprise the Morrow reservoir section in this area.

The line of cross section is captioned in a structure map at the bottom of this exhibit and it's indicated in red.

The large circle on the index map indicates the circle within which the three locations referred to in Cases 9425, 26 and 27 are located. This section again is -- was put together to try to show the lateral discontinuity of the Morrow sandstones in this particular are of Eddy County.

The cross -- taking a look at the cross section, I've identified the top of the Middle Morrow, which is more or less the top of the highest stratigraphic reservoir zone in this particular area.

I've also indicated the top of the Barnett Shale, which is the base of the Morrow reservoir section in this area.

This is a structural cross section; it's hung on a subsea, reference subsea is given at 6000 feet on

the righthand side of the diagram.

What this cross section shows, that normal or perpendicular to the flow directions, which in this area are primarily north to south or northwest to southeast, that the middle to lower Morrow interval, that is the interval between the top of the middle Morrow and the top of the Barnett Shale, is characterized by a number of laterally moderate -- laterally discontinuous, moderately bedded sandstones, which oftentimes cannot be established -- you cannot establish stratigraphic equivalents from one well to the other.

For example, on this well the third log from the left -- on this cross section, rather, is the newly completed Nearburg No. 126 Boyd State. The producing zone, or the zone which has been perforated, is indicated by the perforation symbols below 9400 feet on this log. If you'll notice the RFT pressures indicated on the side of this log vary between 3864 and 4070 pounds. These are considered to be virgin formation pressures as they compare to some of the virgin pressures obtained on drill stem tests on surrounding wells. but were run several years prior to completion of this well. Virgin formation pressures in this area are around 3800 to 3900 pounds, including those in the Coquina well on the lefthand side of the cross section, which were -- which was completed in an upper part of

FORM 25C16P3

 a Morrow reservoir section within two major sand bodies. That well has made over 2-1/2 BCF of gas since it was completed in 1973. It showed virgin formation pressures of 3840 pounds on drill stem tests. Compare that to the similar pressures we have obtained on the Boyd State 26-1, it's clear -- and the fact that the zone that we're producing out of in the 26-1 is stratigraphically lower, this in my mind concludes that the zones are not in communication and that there is lateral discontinuity among the various sands in the area.

Q Mr. Mazzullo, will additional development in this area provide an opportunity to perhaps intercept stringers that are not currently being produced?

A Yes. The proposed location that I have indicated on this cross section is one example of what we might come across in any one of the three wells that we're proposing to drill. Every well is going to come up with a different section. We're not necessarily going to get the same sands, even though the wells are spaced the way they are. We're not necessarily going to intersect the same sands because there are numerous different thin bedded, moderately bedded packages depending on where you are in this part of the township.

Q Would you now refer to what has been marked as Nearburg Exhibit Number Three, a type log, and

review that for the Examiner?

A Let me preface Exhibit Number Three with a statement regarding the type of work that I've done in this area.

I've been involved for several years in mapping the Morrow. I've had numerous publications on the Morrow and I've found through an extensive amount of experience trying to work it that it's a very tough formation to deal with in terms of correlations.

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The best way that I have found to represent the formation and its producing capabilities is to take a gross isopach of net sand and what I consider to be productive porosity in the Morrow interval and try to -- and to generate a map based upon that.

In other words, the cross section doesn't tell the whole story. Just because you have a lot of
sands doesn't -- doesn't imply that you're going to have a
lot of reservoir rock. There are a lot of other factors
that go into making a Morrow reservoir, not the least of
which are secondary plugging of porosity, structure to a
certain extent, things like that.

So what I've attempted to do with the type log is to show you how I've gone about mapping the area.

This is a type log from the 26-1 Boyd

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State, which we just completed last week. It shows the same interval that I've captioned on the cross section from the top of the Middle Morrow to the top of the Barnett Shale.

It also shows in the lefthand column the gamma ray curve. It shows a 50 unit API gamma ray cutoff that I used to establish a -- what is a clean sand in this area, so anything below 50 units API is considered clean sand. These clean sands are indicated by the color yellow on the gamma ray log.

On the righthand side of this log is a compensated neutron formation density log and because of the affects of neutron crossover with the presence of gas in these sands, I take the density porosity as a measure of reservoir quality and I use a cutoff of 8 percent density porosity. It's arbitrary to a certain extent; the 8 percent cutoff seems to be what is the best producing -- anything above 8 percent seems to produce best in this area and anything over 8 percent porosity in those same clean sands is indicated by red on the density log. So you can see that although there are something on the order of 38 feet of clean sand, that there's only about 16 feet of what I consider to be potentially productive porosity in this well, and that 16 feet is confined more or less to the interval that we've actually perforated in this well from

9420 to 9435, approximately.

A

I've done a similar type of log analysis on every Morrow well in this area. As a matter of fact, I've done it in an area comprising approximately four townships around this area and have taken each well in turn and figured net clean sand, as shaded in yellow on this log, and net porosity over 8 percent, indicated by the red, and have mapped a data point for each well based on these cut-off criteria.

Q All right, would you now go to Exhibit Number Four and identify that, please?

A Exhibit Number Four is a portion of the net sandstone porosity quality map that I've generated as a result of this type of log analysis I've just described from the previous exhibit.

It shows the total net sand from each well, the value -- each value on each well is the total net sand in the Lower to Middle Morrow interval.

The dotted pattern on the map indicates those areas where there is greater or -- greater than 10 feet of 8 percent porosity in that same net sand package in each well.

The blue dot and blue arrow point to the proposed location for the No. 2 B & B Well, which I believe is Case 9425.

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FORM 25CIEPS

The red dot with the flaming orange arrow points to the 9-Lives 26-1 Well, which is believe is 9426, is that right, Mr. Carr?

MR. CARR: Yes.

A And the black arrow pointing to the open triangle signifies the currently drilling No. 2 Perino Well which Mr. Nearburg has said is drilling somewhere below 4000 feet at the current time.

The proration units assigned to each one of these proposed or drilling wells are indicated by the yellow outlines. The arrows, the blue arrows that you see, indicate the throw directions of the various -- the primary flow directions of the various sands that make up the middle to lower Morrow interval. These flow directions are based on dipmeter data that we've acquired at least two of the wells in this area, including the No. 26 (unclear).

What this shows is that in each case, each proposed location is assumed to be located within the potentially productive fairway, porosity, net sand fairway defined by the dotted pattern, and that movement of any one of these locations away from the location -- away from the proposed locations, may result in getting out of the fairway and into an adverse situation where we'd get into either thin sands or tight sands.

For example, in the case of the No. 20

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FORM 25CIGPS

-- the well in Section 22, the No. 2 B & B, if we were to move that well any -- to the west any distance at all, we'd risk the chance of being completely out of the porosity fairway.

If we moved the 9-Lives 26-1 to the east, we'd not only be out of the fairway but we'd be getting into a down dip position, regional dip being to the east, where we might chance -- risk the chance of getting into the water, as these reservoirs do contain water.

The same situation applies to the No. 2 Perino in Section 23.

Q Now, Mr. Mazzullo, if we look at those exhibits there are triangles in Section 22 and 23 for the existing Nearburg wells on those --

A Right.

Q -- spacing units, and both of those would be outside the Fairway, as you had interpreted.

A Yes. Those -- those two wells, the No. 1 B & B and the No. 1 Perino, bracket the fairway. The No. 26 Boyd State, which is in the southwest quarter of Section 26, just defines the edge, or close to the edge of the fairway. As I've already stated, it's only got about 14 or 16 feet of porosity in it.

Q Would you now refer to what has been marked Nearburg Exhibit Number Five, the structure map, and

review that, please?

A Exhibit Number Five is a structure map that was drawn using the top of the Middle Morrow, as I have captioned it in the previous Exhibits Number Two and Three, the top of the Middle Morrow. The wells that are shown by the triangular symbols are wells that are operated by Nearburg Producing Company. All the other wells in the area are wells that have penetrated the Morrow. There are certain shallow wells that are not shown on this map; wells that did not TD in the Morrow.

Again the blue dot refers to the well referenced in Case 20 -- 24 -- 9425, the No. 2 B & B.

The red dot and flaming orange arrow, the 9-Lives 26 Well; and the black arrow open triangle, the Perino No. 2.

Again, structure is -- these are primarily stratigraphic traps that we're involved in in the Morrow. Structure's role, the role of structure in this area is to define the gas/water contacts which appear to be significant, a significant factor in several of the sands.

Movement of -- particularly the No. 23, the well in Section 23, the No. 2 Perino, the No. 1 9-Lives in Section 26, movement of those wells anywhere to the east of where we're proposing them increases the risk of being in wet reservoir. As it is right now, we might -- we might

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Two through Five.

MR. STOGNER: Exhibits Two through Five will be admitted into evidence at this time.

MR. CARR: That concludes my

direct examination of Mr. Mazzullo.

#### CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Mazzullo, the call in Case 9426 states to the Pennsylvanian formation. Is it your intent to check or test any of the other formations in the Pennsylvanian zone in this area or are they known to be productive, such as the Cisco?

A Yeah, the Cisco Canyon in this area is productive off to the west/northwest and there may or may not be potential in that particular formation, which we probably wouldn't test on the way down because it's an extremely porous formation and probably it would be very hard to test, but we are going to have a mudlogging unit on the well at that time.

We don't foresee any other potential in the Pennsylvanian between the Cisco Canyon and the Morrow.

I might add that the nearest Cisco Canyon producer is in the northeast quarter of Section 21.

It's operated by Anadarko and it's been a marginal producer

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    since it went on stream several years ago. That's the
 2
    nearest production. I don't know whether or not that's
 3
    going to help set up anything for us.
                                 MR.
                                      STOGNER:
                                                 I have no fur-
 5
    ther questions for this witness.
 6
                                 Is there anything further in
 7
    any of these three cases, Mr. Carr?
 8
                                 MR.
                                      CARR:
                                              Nothing further,
9
    Mr. Stogner.
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                                 MR.
                                      STOGNER:
                                                 Mr. Mazzullo,
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    you may step down.
12
                                 If there is nothing further in
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    these three cases, 9425, 9426, 9427, these cases will be
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    taken under advisement.
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16
                       (Hearing concluded.)
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ARON FORM 25C16P3 TOLL FREE IN CALIFORNIA 800:227 2434 NATIONWIDE 8

CERTIFICATE

BOYD, C. S. R. DO HEREBY I, SALLY W. CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case Nos, 9425, 9426, 9427 heard by me on 20 July

\_, Examiner

Oil Conservation Division

1 2	STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO				
3	6 July 1988				
4	<del>-</del>				
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5	EXAMINER HEARING				
6					
7					
8	IN THE MATTER OF:				
9	Application of Nearburg Producing CASE				
y	Company for an unorthodox gas well 9427 location and simultaneous dedication,				
10	Eddy County, New Mexico.				
11					
12					
13	BEFORE: David R. Catanach, Examiner				
14					
15	TRANSCRIPT OF HEARING				
16					
17					
18	APPEARANCES				
19					
	For the Division: Robert G. Stovall				
20	Attorney at Law Legal Counsel to the Division				
21	State Land Office Bldg. Santa Fe, New Mexico				
22					
23	For the Applicant:				
24					
25					

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Number 9427

MR. CATANACH: Call next Case

MR. STOVALL: Application of

Nearburg Producing Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico.

The applicant has requested

that Case No. 9427 be continued.

MR. CATANACH: Case No. 9427

will be continued to the Examiner Hearing July 20, 1988.

(Hearing concluded.)

CERTIFICATE

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sneeg W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in heard by me on

Conservation Division, Examiner