STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

17 August 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg Producing Company for an unorthodox oil well location, Lea County, New Mexico, and — CASE 9467

Application of Nearburg Producing Company for an unorthodox oil well location, Lea County, New Mexico. — 9469

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
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I N D E X

E X H I B I T S

MR. CATANACH: Call next Case Number 9467.

Application of Nearburg Producing Company for an unorthodox oil well location, Lea County, New Mexico.

Are there any appearances in this case?

MR. HALL: Mr. Examiner, Scott Hall from the Campbell & Black law firm on behalf of the applicant.

We would also like request that this case be consolidated with Case 64 -- correction, 9469.

MR. CATANACH: At this time we'll call Case 9469, the application of Nearburg Producing Company for an unorthodox oil well location, Lea County, New Mexico.

MR. CATANACH: Do you have the same witnesses, Mr. Hall, as the previous case?

MR. HALL: Yes, plus an additional.

MR. CATANACH: Was the additional witness sworn?

MR. HALL: Were you sworn?

MR. DURHAM: No, I was not.

MR. HALL: You'll need to be sworn.

MR. DURHAM: Okay.

(Mr. Durham sworn.)

MARK NEARBURG,

being called as a witness and being previously sworn and remaining under oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HALL:

Q For the record please state your name, by whom you're employed and in what capacity?

A Mark Nearburg, Nearburg Producing Company, Land Manager.

Q And, Mr. Nearburg, are you familiar with the combined applications and the subject wells and subject lands here today?

A Yes.

Q Have you previously testified before the Examiner and had your credentials accepted?

A Yes.

Q Mr. Nearburg, please explain what it is the applicant seeks in both of these cases.

A We seek approval of two unorthodox Strawn well locations, one located -- Case 9467 is for a well located 400 feet from the north and east lines of Section 25, Township 16 South, Range 33 East, to test the Strawn formation in the Undesignated Northeast Lovington Pennsylvanian Pool, with the north half northeast quarter dedicated to that well.

The Case 9469 is the application for an unorthodox Strawn well location, located 400 from the north line and 2560 feet from the west line, Section 30, Township 16 South, Range 37 East, to test the Strawn formation on an 80-acre unit consisting of the east half northwest quarter, also in the Undesignated Northeast Lovington Pennsylvanian Pool.

Q All right, let's look at Exhibit One. Are those locations reflected on that exhibit?

A Yes, they are.

Q And what else does that exhibit show?

A That exhibit shows all offset ownership applicable to these applications. It shows producing wells in green; a dry hole in blue; and the test wells in red. It shows the ownership of the various units and percentages and the -- at the bottom of Section -- of the northwest quarter of Section 30, it indicates that the west half northwest quarter of Section 30 is an oversized lot due to

survey, being 1659 feet east to west.

The rest of Section 30 is correctly surveyed. This well, due to the -- the Soledad State 30-C, due to the over survey, is actually 420 feet from the centerline of Section 30.

Q All right. Now, are you familiar with the present pool rules for the Northeast Lovington Penn?

A Yes. This pool requires 80-acre proration units with wells located no more than 150 feet from the center of any governmental quarter quarter section.

Q All right, so is it the irregular lot that compels you to seek an exception to those rules for the well located in Section 30?

A No. That's a geologic request. We only presented the additional footage so that the -- it's obvious that the 2560 feet, if you look at that without knowing your oversized lots, it would be quite confusing.

Q All right. Let's look at the offsets to the 80-acre staked location.

A Yes.

Q What is the identification of that offset?

A Okay. The original well that set up the drilling in here is in the west half southwest quarter of Section 19. That's the Soledad 19-M Well, drilled by Near-

burg and completed as a Strawn producer.

We then, based on seismic and subsurface data, drilled the Doubloon State 24-P Well, which is the offset to the 88 State Well requested in Case 9467. Subsequent to drilling the Doubloon State 24-P we shot additional seismic and re-evaluated our subsurface work to pick the location for the 88 State.

Q All right, what is the present status of the Doubloon State 24-P?

A The Doubloon State 24-P is currently producing with about 75 -- 75 pounds flowing tubing pressure and approximately 240 barrels a day of oil, and 3-to-400 MCF of gas a day.

Q All right, does it appear that the Doubloon State is presently draining the acreage to be dedicated to the 88 State?

A Yes.

Q Is there a penalty imposed on the production from the Doubloon 24-P?

A No. When we drilled the Doubloon 24-P we worked -- there are major -- there are several farmouts in here from Cities Service, which is now OXY USA, Yates Petroleum Company, et al, Tenneco, and all of those parties agreed that it was in the best interest of the protection of correlative rights to have a drilling program and not to

oppose the unorthodox location.

We feel that for the protection of correlative rights the 88 State should be approved. This is -- this is further pointed out by the dry hole drilled on the Soledad State 30-B, which the geologic evidence will show the communication between the Doubloon and the 88 State.

Q All right, do you believe it's appropriate that a production penalty be imposed upon production from the 88 State?

A No, there was no penalty imposed on the Doubloon State 24-P and therefore we feel that no penalty should be imposed on the 88 State. They should be treated equally.

Q And likewise for the Soledad 30-C?

A The Soledad 30-C, I will not press that same requirement on that well which will be brought out by the geologic evidence.

Q All right. If a penalty were imposed, would that affect your plans for going forward with other new wells?

A It would definitely affect the plans on the 88 State. At this time we're not certain how it would affect the Soledad State 30-C because there is more evaluation to be done on the 30-C once the 88 State is drilled.

Q All right. With respect to the Soledad 30-C, would you please explain to the Examiner what your plans are for developing that acreage and point out whether or not you're under a lease with a farmout deadline for that well?

A Under the farmout from Tenneco we have to have a well drilling in late November in the east half northwest quarter of Section 30.

Whenever a well is drilled in this area all of the geologic and geophysical data has to be re-evaluated. Due to the time constraints for notification, the hearing, and the time required for the order subsequent thereto, the possibility of de novo hearings, we have to hold the hearing at this time for the State 30-C because if we waited until the 88 State was drilled, there would be no time for the notice, the hearing, and the subsequent time for protest for de novo hearing. There would be no way to have the hearing and drill the well by the farmout deadline.

Q All right, when you said 88 State, you were in fact referring to the Soledad State --

A Soledad State 30-C, yes.

Q All right. Let's look at Exhibits Two and Three. Are those exhibits affidavits from your counsel whereby you directed your counsel to send out notice to all

the offset operators and owners of interest affected by the application?

A Yes.

Q Were Exhibits One, Two and Three prepared by you or at your direction?

A Yes.

MR. HALL: We move the admission of Exhibits One, Two and Three.

MR. CATANACH: Exhibits One, Two and Three will be admitted into evidence.

Q Do you have anything further you wish to add?

A No.

MR. HALL: That concludes our direct of this witness.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Nearburg, the 88 State Well, is that the -- is that a mirror location of the Doubloon 24-P.

A In terms of spacing, yes, but there are geologic reasons for it. It just so happens it turns out to be the same distance out of the corners as the Doubloon State 24-P.

Also we recognize the Commission's feel-

ings on proximity to lease lines and we've tried to keep the well as far from the lease lines as is possible without totally condemning the economics of drilling it.

MR. CATANACH: No further questions. The witness may be excused.

LOUIS J. MAZZULLO,

being called as a witness and being previously sworn and remaining under oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HALL:

Q For the record please state your name, by whom you're employed and in what capacity .

A My name is Louis Mazzullo. I'm a geological consultant on retainer to Nearburg Producing Company out of Midland, Texas.

Q All right, Mr. Mazzullo, have you previously testified before the Division or one of its examiners and had your credentials made a matter of record?

A I have.

Q And are you familiar with the subject lands and the subject applications combined for hearing today?

A I am.

Q Have you prepared certain exhibits in connection with your testimony today?

A I have three exhibits, Four, Five and Six.

Q All right, let's start with Exhibit Four. Would you please explain that to the Hearing Examiner?

A Exhibit Number is a structure contour map drawn on top of the Strawn limestone in the area in which the wells, the proposed wells are located.

As you can see, I've included all of Section 19 and the north half of Section 30, 25, and most all of Section 24.

The proposed locations for the 88 State 25-A No. 1 is indicated by the yellow dot in the northeast quarter of 25, and for the 30-C No. 1 is in the northeast quarter of the northwest quarter of Section 30.

The narrow, solid lines that crisscross this map are seismic, indicate the locations of seismic record lines that were used in evaluating both the regional structure on top of the Strawn and on the location of Strawn anomalies, which will be discussed in a -- in another exhibit.

The structure map on top of the Strawn here was based primarily upon subsurface control, which

we've had quite a bit -- of which we have quite a bit in this area, and in addition to the seismic control that we've had.

The purpose of this exhibit is to show that on top of the Strawn the regional structure is very subtle northeasterly dip with very little nosing and very little apparent indication of what's going on within the Strawn section in terms of the build-up of the Strawn reef units, which constitute the reservoir in this area.

The build-ups of the Strawn reservoir are very subtle; are not easily expressed structurally, but are expressed in other ways, which we have to deal with.

Q All right, let's look at Exhibit Five. Could you identify that, please, and explain what that's intended to reflect?

A Exhibit Number Five is an isopach of the Strawn limestone; that is, it's the thickness of the Strawn section between the top of the Strawn, which was mapped in the previous exhibit, and the top of the underlying Strawn sandstone, which is at the base of the Strawn limestone unit in this area.

So it's the total limestone section in which the various reef units which constitute the reservoir as a belt (sic). The map shows that the Strawn varies in thickness from about 100 feet on the west side of the

mapped area to over 225 feet proceeding eastward, and within this subtle change in thickness are local anomalies, which are very subtle and they show up very subtly within the section.

The various colors that you see refer to individual reefal units which develop within the Strawn section at various places stratigraphically within the section.

So the green area that we see on the lefthand side of the map refers to an upper reef unit which developed very localized porosity.

The red unit refers to a more extensive, laterally extensive reefal unit which develops productive porosity over the area.

And the blue area refers to a Lower Strawn reefal unit which develops porosity in the extreme eastern part of the map area and well into Section 20.

These little reefal areas were based upon a combination of subsurface sample control which I had done, and certain wavelet. certain seismic wavelet anomaly character changes that you see, which will be discussed by our geophysical witness after I'm done here.

The outline, the colored, natural color outlines refer to the maximum build-up of productive, what we consider to be productive Strawn porosity at various

levels in the section.

The -- calling your attention to the location indicated by 25-A No. 1, that's the 88 State location in Case Number 9467, this is shown to lie on the edge of a very small, area -- areally limited upper Strawn reefal unit, which is productive in the Doubloon State, the Nearburg Doubloon State 24-1 in the southeast quarter of Section 24. Within the limits of resolution of the seismic data we show this location for the 88 State Well to be at the very edge, very marginal and extremely risky, in terms of that unit alone. If we were to move that location any further to the south, we would probably run the risk of running out of that limiting reef development.

The size of this -- of this reef development is not unusual in the Strawn play. The Strawn reefal units vary in size anywhere from a one-well unit, one-well reef, to a multi-well unit, as I've shown by the red area, for example, on this map, and they vary in size across the Lovington Field, the Shipp Field, the Casey, and the Humble City areas. Those are not unusually sized features for this area.

In terms of the location for the Soledad No. 1, I have shown this location to be very marginal, extremely risky, in terms of its penetration into the middle reefal unit, the red unit, as I've shown it on the map.

Within the limits of the resolution of the seismic data, this location appears to be very risky. As Mr. Nearburg has previously stated, this actual drilling is going to depend entirely upon what we see developing when we drill the 25-A No. 1, the 88 State Well, and combine the data that we receive from that well with data that we have -- that we are presently looking at from our dry hole that was drilled in the northwest quarter of the northwest quarter of Section 30.

Q All right, let's look at Exhibit Six. Would you identify that and explain what that's intended to reflect?

A Exhibit Number Six is a stratigraphic cross section A-A', a west-to-east cross section which I've indexed on the preceding Exhibit Number Five, going from the Nearburg Doubloon State No. 24-P eastward into their No. 1-19 Soledad in Section 19, down to the dry hole that was just completed in the northwest quarter of Section 30, across the proposed -- the area of the proposed location of the 30-C Soledad No. 1, and then eastward to a Strawn dry hole and then a productive Strawn well.

This cross section is designed essentially to show you how these various reefal units relate to one another stratigraphically in a section, and also to give you some idea of the size and lateral magnitude that

you can sometimes run into on each one of these units.

Taking a look at the Doubloon State 24-P on the west side of the cross section, we see that production from that well is primarily from a porous, reefal facies near the top of the Strawn unit, top of the Strawn limestone indicated by the dashed line that's the datum the section is hung on.

You'll also notice that we've gotten some good pressure, good shut-in pressure readings on RFT tests in that unit of over 3350 pounds, but when you proceed over to the Soledad State 19-1, which is producing from a reefal unit that is stratigraphically lower in the section and which has been on-stream for a few more months, we notice that RFT pressures in that particular unit are averaging around 3,030 pounds. over 300 pounds less than the unit that's producing out of the Doubloon State.

In my mind, based upon the stratigraphic locations of the two productive units across these two wells, these are two separate units. These are two different units. The Doubloon State is higher stratigraphically than the unit that's productive out of the Soledad.

The unit that is productive out of the Soledad is totally absent from the dry hole in the northwest quarter of Section 3, a location away we're totally out of it. There's no sign that the -- that we're even

close.

Proceeding across where I would -- where the 30-C No. 1 location is, I would hope to get into at least the marginal part of the same unit that the 19 Soledad Well was producing out of, but again it would be a very narrow track that we're shooting for over here in terms of that unit according to the seismic data that's going to be presented here in a minute.

As you go further eastward you notice again that the Yates Jacob State is totally out of the productive facies except for a possible thin-bedded porosity unit towards the base of the Strawn, where as you get further east into Section 20 you pick up a unit that is indeed stratigraphically a little bit lower, indicated in blue, and it's produced over a million barrels of oil out of the -- the Exxon No. 1 Monteith, or the Tidewater Exxon No. 1 Monteith.

So this cross section again just shows the lateral, both the lateral discontinuity that these reefal units are prone to and how difficult it may be to predict where these units are going to develop. It's easy to drill a dry hole just only a location away, or wet a location away.

It also shows the vertical separation among the Strawn reefal units, as indicated by the RFT

pressures.

Q Mr. Mazzullo, will the drilling of your well at locations other than the proposed location pose a risk that the well could be unsuccessful?

A Yes. Yes.

Q In your opinion will the granting of the two applications be in the best interest of conservation, the prevention of waste and protection of correlative rights?

A Yes.

Q Were Exhibits Four, Five and Six prepared by you or at your direction?

A They were both prepared by me and at my direction.

Q All right.

MR. HALL: We move the admission of Exhibits Four, Five and Six.

MR. CATANACH: Exhibits Four, Five and Six will be admitted as evidence.

Q Do you have anything further you wish to add?

A No.

MR. HALL: That concludes our direct.

MR. CATANACH: I have no

questions of the witness.

TERRY E. DURHAM,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HALL:

Q Please state your name, by whom you're employed and in what capacity.

A I'm Terry Durham. I'm an independent geophysicist from Littleton, Colorado, and I'm on a consulting basis for Nearburg Producing Company.

Q All right, Mr. Durham, have you previously testified before the Division or one of its examiners?

A Yes, I have.

Q All right, you've had your credentials accepted as matter of record?

A Yes, I have.

Q And, Mr. Durham, are you familiar with the subject lands and applications here today?

A Yes, I am.

Q All right, let's refer back to Exhibit Five, if you would, and please explain how you've used geo-

seismic information to define the location of the algal mounds.

A I've used the seismic data to prepare structure maps primarily in the search for algal mounds. As Mr. Mazzullo alluded, they are subtle in this area and do, in some cases, show a subtle nosing, which is indicative of areas of interest.

I also prepare isochron maps of the Strawn interval. This is a time interval, the Strawn, and that's also an indication of thickness differences or mound developments within the Strawn, and probably the most indicative is a subtle seismic attributes in the data, which are amplitude differences as well as phasing differences, and those are drawn on the map and I've made an outline which is shown in color on the Exhibit Number Five. The outline associated with the Soledad 19-M seems to cover quite a large area incorporating some four -- five other wells in the area.

The only seismic anomaly associated with the Doubloon Well seems to be isolated or separate from the anomaly associated with the 19-M, as is shown by the color difference on the map in Exhibit Number Five.

Q Do you have anything further you wish to add?

A I might add that there are certain

limits of resolution in the seismic data. Using the recording parameters that we have with frequencies in the range of 86 Hertz and the velocities, natural velocities of the rock that we're looking at, we're looking at limits of resolution in the order of 80 feet. That means that a particular horizon must be at least 80 feet thick in order to actually map the top and base and in this case we have no problem because it's at least 100 feet thick in here.

However, in some cases the mound growth is thicker than regional thickness. That's going to help out in showing the mound development.

That's all I have.

Q The seismic techniques you've utilized in helping to prepare Exhibit Five considered to be reliable by geophysicists?

A They're standard techniques that are used by other geophysicists, yes.

MR. HALL: All right. That concludes our direct of this witness.

CROSS EXAMINATION

BY MR. CATANACH:

Q Do you know if seismic -- seismic has been used in this area before to define structures and determine well locations?

A Yes, it has. It's been used more probably in the last five or six years because of recent techniques in recording higher frequencies and increasing resolution of seismic data.

It's been used very successfully in the area. I think using seismic data increases the chance for virtually a 1-in-2 success ratio.

Q Now, you said you didn't have any problems with the resolution because these structures were greater than 80 feet thick, is that what you said?

A Yes, in this area they are greater than that. I might add that there may be some stringers of porosity that are thinner than the resolution limits that I mentioned and those -- I want to backtrack and mention that this outline would represent a maximum, maximum area, if you will, of resolution.

So then the actual outline may be slightly larger than what's indicated beyond the limits of the resolution of the seismic data.

Q So the smaller stringers wouldn't -- just wouldn't show up.

A Right.

MR. CATANACH: I have no further questions of the witness. He may be excused.

TIMOTHY R. MacDONALD,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. HALL:

Q For the record, please state your name, by who you're employed, and in what capacity.

A Timothy R. MacDonald, employed by Nearburg Producing Company as Engineering Manager in Dallas, Texas.

Q Mr. MacDonald, have you previously had your qualifications made a matter of record before the Division or one of its examiners?

A Yes.

Q And are you familiar with the subject application and subject lands here for both combined applications?

A Yes.

Q Have you prepared an exhibit in connection with your testimony here today?

A Yes, I have.

Q All right, let's look at Exhibit Seven and would you explain what that's intended to reflect?

A Exhibit Seven, what I've tried to do again is show a potential radius from the Devonian well based on the pay taken off the logs, the porosities taken off the log. the water saturation taken off the log, and using 18 percent recovery, which is high to typical for a solution gas drive reservoir like we're looking at here.

I based my reserves on 150,000 barrels of oil, which actually gives you a drainage radius that corresponds with what the seismic and geologic data is showing as far as the potential extent of the reservoir, and based on all those calculations what I've come up with is a drainage area of about 77 acres and that gives a drainage radius of 1031 feet which is shown by a red circle on the exhibit.

One of the questions that has to be answered is the red circle is larger than what they've shown geologically and some of that may be due to what Mr. Durham and Mr. Mazzullo commented to as the resolution problems with the seismic, is you get off the center of the structure you'll get stringers which will contribute some production possibly to the well which wouldn't be seen and therefore not able to be mapped as far as their mapping techniques.

Q All right. Let me establish for the record, is Exhibit Seven an isopach of the Strawn?

A Yes.

Q Okay. Will you explain how drilling at the proposed location serves to protect correlative rights of all the affected interest owners?

A Well, based on this data that I've looked at, I feel like that the Doubloon State Well will definitely, without question, drain a portion of the reserves that are under the unit designated to the 88 State Well.

Q Okay, so the 88 State location was necessary to protect the correlative rights of the interest owners in that proration unit?

A Yes.

Q Will the drilling of each of the wells at your proposed locations enable Nearburg to recover additional reserves that they would otherwise not recover?

A Yes.

Q Do you have anything you wish to add with respect to Exhibit Seven?

A No.

Q In your opinion, Mr. MacDonald, will the granting of the applications be in the best interest of conservation, the protection of correlative rights, and prevention of waste?

A Yes.

MR. HALL: We move the admission of Exhibit Seven.

MR. CATANACH: Exhibit Seven will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. MacDonald, you said that the Doubloon Well will produce approximately 150,000 barrels of oil?

A Well, that's -- that's the area that's in the red circle. Based on a constant, you know, homogeneous reservoir, based on the characteristics in the actual Doubloon wellbore.

This is all the control that we have at this point.

Q So the drilling of the proposed well in Section 25 will sharply reduce the recovery of the Doubloon Well.

A Yes.

Q Okay. With the drilling of that proposed well, how much do you think that the Doubloon Well will produce, do you have an opinion?

A It's very hard to say because in the Strawn reefs the reservoir quality is -- to do these calcu-

lations you have to base it on homogeneous reservoir but when an interval is not truly homogeneous -- so without more control it's really -- really impossible to say at this point.

MR. CATANACH: That's all I have of the witness.

He may be excused.

MR. HALL: We have nothing further in the case.

MR. CATANACH: Being nothing further in Case 9467 and 9469, they will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

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.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9467 9468 heard by me on August 17 19 84.

David R. Catanach, Examiner
Oil Conservation Division