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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1970

EXAMINER HEARING

IN THE MATTER OF:)

Case No. 3993 being reopened)

pursuant to the provisions of)

Order No. R-3644, which order) Case No. 3993

established 160-acre spacing)

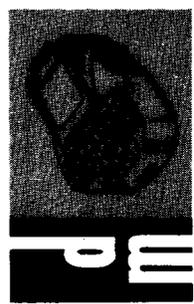
units for the North Baum-Upper)

Pennsylvanian Pool, Lea County,)

New Mexico.)

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING



MR. NUTTER: The hearing will come to order, please. We were on Case 3993.

MR. HATCH: Case 3993. In the matter of Case No. 3993 being reopened pursuant to the provisions of Order No. R-3644, which order established 160-acre spacing units for the North Baum-Upper Pennsylvanian Pool, Lea County, New Mexico.

MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant and Christy, appearing on behalf of Costal States Gas Producing Company.

We have one witness I would like to have sworn.

(Witness sworn).

(Whereupon, Applicant's Exhibits 1 through 8 were marked for identification).

JACK MCGRAW

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your residence, by whom you are employed.

A My name is Jack McGraw. I work for Costal

States Gas Producing Company in Midland, Texas, as division petroleum engineer.

Q Have you previously testified before the Oil Conservation Commission?

A Yes, sir, I have.

Q Your qualifications as petroleum engineer are a matter of record with the Commission?

A Yes, sir.

Q Did you testify in this Case, 3993, approximately a year ago --

A Yes, sir, I did.

Q -- for the adoption of temporary one-year rules?

A Yes, sir.

Q Have you made a continuing study of the North Baum-Upper Penn Pool since that time?

A Yes, sir, I have.

Q Familiar with all of the wells that have been drilled?

A Yes, sir.

Q Have you prepared or has there been prepared under your direction certain exhibits for introduction in this case?

A Yes, sir, there have.

Q Refer to Exhibit 1 and explain what it is and what it shows.

A Exhibit No. 1 is a structure map constructed on top of the Bough C Formation in the immediate vicinity of the North Baum-Upper Penn Field.

This also extends over the Lazy J Field, the Baum Field, as well as the North Baum Field.

Q The legend shows the outlines here of the North Baum.

A Yes. Outlined on the plat is the boundary of the Lazy J Field and also the boundary of the North Baum-Upper Penn Field.

Q Does this show all the wells that have been drilled in these two fields?

A Yes, sir, it does.

Q Now, the portion that is shown in Sections 23, 24 and 26: is that still part of the North Baum or is that the separate pool?

A This is a portion of the North Baum Field. However, in this area there is a separation of the reservoir.

Q Now, what wells had been drilled in the North

Baum Pool at the time of the original hearing approximately a year ago?

A At the time of our original hearing, when we requested temporary rules, the two Costal States Wells in the south half of Section 20 were completed and producing.

The south -- the well in the southeast quarter of Section 19, Apache Corporation State No. 1, 19 No. 1, was completed and producing and there were two wells over in Section 21, the Hannigan State No. 1 and the Texaco State "DM" No. 1 which are -- both wells are in the southeast quarter of Section 21.

Q Now, what wells have been drilled since the hearing a year ago?

A Since that hearing, Costal has drilled two additional wells in the north half of Section 20. Apache has drilled one additional well in the northwest -- northeast quarter of Section 19 and then Pan American, Sun, Union Texas and Bobby Holt: all those wells have been completed since that hearing.

Q They are all producing from the same pool?

A Yes, sir. They are all in the North Baum-Upper Penn Pool.

Q Is there anything else that you would like to show by this exhibit?

A This exhibit plainly shows the structure in the area and it also shows that we have what we refer to as a ditch, a low place, which separates the North Baum-Upper Penn Pool from the major portion of the Lazy J Pool.

Also, it separates the reservoir in the North Baum Pool itself. The wells completed in Sections 23, 26 and 24 are separated by another ditch, which is shown by the contour lines here.

Also, the wells in Sections 13, 18 and portions of Section 19. Now, this is brought out much more clearly on the cross section that we will go to following this exhibit.

MR. NUTTER: Mr. McGraw, while you were on the subject of wells that have been treated; in Section 21, there appears to be a new well there in the southwest quarter, that No. 2 well?

THE WITNESS: Yes, sir.

MR. NUTTER: Is that well completed in the Bough C?

THE WITNESS: Yes, sir.

MR. NUTTER: That is in the Lazy J, however, is it not?

THE WITNESS: That is right.

MR. NUTTER: That is the third well on that 160, but this is a 40-acre pool here?

THE WITNESS: That's right.

MR. NUTTER: What kind of potential do they get on this well; do you know?

THE WITNESS: Yes, sir, I have that. This well is the McGrath and Smith Hannigan State No. 2 and it is located in Unit L, Section 21, 13 South, 33 East.

It was potentialized flowing for 228 barrels of oil and no water; 110 MCF on 2264 choke with 25 pound tubing pressure.

MR. NUTTER: What was the date on that, please?

THE WITNESS: That date is November 17, '69.

MR. NUTTER: Thank you. Go ahead. I'm sorry.

Q (By Mr. Hinkle) The well just testified to, is it capable of making its allowable, then?

A Yes, it is. I understand it is top allowable.

Q Anything else you have with respect to Exhibit No. 1?

A Not at this time. It might be handy to refer back to this, though, during the cross section that we will be discussing.

Q Now, refer to Exhibit No. 2.

A Exhibit No. 2 is the north-south cross section in this field. It begins in a dry hole that was drilled by Costal States down in Section 32; extends up through Section 29, Costal States Chambers No. 1.

It goes on into Section 20, Costal States Federal 20 No. 2 and up through the 20 No. 4 and then shows the pinch-out of the reservoir in the old well that was drilled by Trigg, Federal Trigg No. 1 in the northeast quarter of the northeast quarter of Section 20.

This exhibit shows the trapping mechanism in the North Baum-Upper Penn reservoir. It shows that we have a pinch-out of the porosity in the up-dip direction and it extends into the water-oil contact in the lower end of the reservoir.

The blue represents water in the section. The yellow represents the oil portion of the reservoir. You could see that the Chambers No. 1, which was completed by Costal States Pipe, was set. We pumped the well for approximately two months in an effort to pull in some oil.

We never were successful at this time. However, pipe is still set in the well and it was used in our interference test that we will be discussing in a few moments.

This plat shows the three well bores of the three wells that were used in the interference test that we conducted, being the Chambers No. 1, Federal 20 No. 2 and the Federal 20 No. 4.

Q Now, refer to Exhibit No. 3 and explain what that shows.

A Exhibit No. 3 is an east-west cross section through the North Baum Field and it shows the continuity of the reservoir on into the Lazy J Field in Section 21.

It also shows the separation of the North Baum reservoir into actually two separate reservoirs in Section 19, due to this ditch that was referred to earlier. The formation dropping off, getting below the oil-water contact and actually pinching out -- the porosity more or less disappears in the Pan American State "DN" No. 1 in Section 19.

I understand that well is not producing at this time, but it is producing further to the west as it comes back up again and gets high enough to produce.

The main thing that we want to show with this exhibit is the continuity of the pay from Section 20 into Section 21 and through these new wells that have been drilled in Section 21.

Now, it also shows that the pay does pinch-out on the farthest end of this cross section in Section 21. There is a lack of porosity in this C zone and this particular well was completed from the A and B zone in the old Lazy J pay period.

Q Now, you referred to making interference tests. I believe you did that in connection with Exhibit No. 2 and explained the wells that were used. Have you prepared any exhibits with respect to the interference tests?

A Yes, we have.

Q Refer to Exhibit 4 and explain that to the Commission.

A On February 17, 1969, Costal States conducted an interference test in the North Baum-Upper Penn Field to determine if one well could effectively drain 160 acres.

Exhibit No. 4 shows the conditions that existed in the field at the time of this test. Just the wells that were completed at that time are shown and the --

whether they were pumping, flowing or used as observation wells, is indicated on this plat.

The Federal 20 No. 2 and the Federal 20 No. 4 were shut in for extended periods in order to determine the true static reservoir pressure. The Chambers No. 1 was also chosen for an observation well because of its condition as a temporarily abandoned producer that had been shut in for approximately thirty days.

A bottom hole pressure was run in these three wells with the following results. The Federal 20 No. 2 was shut in for 291 hours. The pressure at a depth of 9710 was found to be 2493.

The Federal 20 No. 4 was shut in for 289 hours; the pressure at 9710 was found to be 2474. The Chambers No. 1, shut in approximately thirty days, had a pressure of 2517, at 9710.

Now, this is an average bottom hole pressure of 2494 and the maximum variation is only 43 pounds between all three of these pressures. We feel that this proves conclusively that they are all in a common reservoir.

Q Due to the fact that the pressures are approximately the same?

A Approximately the same and, of course, -- back

at our initial hearing in this case, we showed that the initial bottom hole pressure on these wells varied from 2900 down to 2850, along in that range and, at this time, then they had dropped to 2494.

Q Have you made a tabulation of the bottom hole pressures?

A Yes, we have. And this is reported on the next exhibit.

Q Exhibit No. 5?

A Yes. After obtaining the static reservoir pressure on the Federal 20 No. 4, it was opened and produced at a stabilized rate of 274 barrels of oil per day and 25 barrels of water per day. A bottom hole pressure bomb was then run in the 20 No. 2 and left on bottom for forty-seven hours while all the other producing wells were being produced at their normal rates.

Exhibit No. 5 is a tabulation of the bottom hole pressure as recorded by the bottom in this well. You will note that the pressure shows a continual decline throughout the test from 2494 to 2483 at the end of forty-seven hours.

The bomb was then pulled and run in the Chambers No. 1. The Federal 20 No. 2 was placed on

production at a stabilized rate of 274 barrels of oil per day and no water. Exhibit No. 6 shows the average producing rates for all the wells that were producing during the test period.

Q Do you have any further comments with respect to Exhibit No. 6?

A No, sir; not at this time.

Q Refer to Exhibit No. 7 and explain that to the Commission.

A Exhibit No. 7 is the tabulation of the pressure recorded in the Chambers No. 1, while the bomb was on bottom. The bomb was left on bottom for twenty-six hours with the pressure declining from 2517 to 2510 in twenty-six hours.

Q What does that show?

A We feel that this shows conclusively that one well can drain far in excess of 160 acres in this reservoir. This is extremely good communication, pressure communication within the reservoir.

MR. NUTTER: This is the dry hole; isn't it?

THE WITNESS: Yes, sir; this is the water well.

Q (By Mr. Hinkle) Now, refer to Exhibit 8 and explain that to the Commission.

A Costal States is also requesting that the proportional factor for allowable purposes be increased from 4.77 to 6.77 or whatever is the normal factor for 160 acres in this area. Costal States feels that this is necessary in order to protect the correlative rights of the operators and royalty owners in Section 20.

You will note that the field boundary line separating the North Baum from the Lazy J Field is the section line between Section 20 and 21. Since the separation in the Lazy J Field is 40 acres per well, two additional wells have recently been drilled and completed in the south half of Section 21 and completed in the common reservoir with the wells located in Section 20.

Q Now, this common reservoir is shown on your cross section No. 3?

A Yes, sir. These wells are located on Exhibit 8. Also shown is the potential test as reported to the Oil Conservation Commission by the operator.

The first well was drilled by Texas American. It was their Sinclair State No. 1. It was completed August 29, 1969, and potentialled for 370 barrels of oil per day and zero barrels of water per day, flowing on

2464 choke.

The second well was drilled by McGrath and Smith. Their Hannigan State No. 2, which was completed on November 16, 1969, and potentialled for 228 barrels of oil and zero barrels of water, flowing on 2264 choke.

The present allowable producing capacity in the southwest quarter of Section 21 is as follows. McGrath and Smith operate both Hannigans. They now own the Hannigan -- or operate the Hannigan tract; operate both wells; the Hannigan State No. 1, I understand, is producing 29 barrels of oil and 230 barrels of water.

The No. 2, according to the potential test, is 228 barrels of oil and no water and Texaco State "DM" No. 1 is producing 235 barrels of oil and 303 barrels of water.

This gives a total producing capacity of 492 barrels. This is also within the allowable, 492 barrels of oil and 533 barrels of water from the southwest quarter of Section 21.

The present allowable for 160 acres in the North Baum Field is 4.77 times 70 or 335 barrels of oil per day. If the portional factor is changed to 6.77,

the allowable would be 474 barrels per day and would allow the operators in Section 20 to recover a more equitable share of the remaining primary reserves.

Q Is that the only way, in your opinion, that you can protect correlative rights in this instance?

A This is one way of doing it. There might be others.

Q What are your recommendations to the Commission with respect to these rules and allowable?

A Costal States respectfully request that the allowable be increased in the North Baum Field in order to protect correlative rights of the operators and royalty owners, but we do not ask for any changes in the other field rules.

We would like for them to remain the same.

Q And be made permanent?

A Be made permanent.

MR. HINKLE: We would like to offer in evidence Exhibits 1 through 8.

MR. NUTTER: Applicant's Exhibits 1 through 8 will be admitted in evidence.

MR. HINKLE: That's all of direct.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. McGrath, referring to your cross section AA Prime, which is Exhibit No. 3, it would appear that the sixth well from the left shows oil and water both in that well; is that correct?

A Yes, sir; that is true.

Q Which well is that?

A Are you referring to this one?

Q No, the sixth one from the left.

A This is the Costal States Federal 20 No. 1, which does produce oil and water. It would be this well right here.

Q It's in the southeast southeast of Section 20; is that correct?

A That's true.

Q Now, that would be one of the wells that you would have to increase the production on in order to protect the interest in Section 20, I would think. I am wondering if it might not be rate sensitive since you have water and oil both in there. Isn't there a danger of more water coming in if you increase the rate of production?

A In the Bouch C interval throughout this area, has not been the case. In fact, the larger the pumping equipment the more water you can move, the more you are likely to increase the oil.

Q I know in many places in the Northern Lea County, in the Pennsylvanian Formation, there isn't a direct water-oil contact. The water and the oil are intermixed with each other throughout the formation but it would appear from your cross section that you do have water-oil contact and that the water is below the oil?

A We feel this is true. We feel this is true in the other areas, also. There is not enough structural relief -- what you actually do in producing a well like this is cone the water down.

You pull it hard enough and you will actually pull the water level down and increase the amount of oil that you are able to pull into this reservoir, it being a very thin reservoir.

Now, if it were a thick zone you would probably cone water up from the bottom. It just doesn't work that way in this particular reservoir.

Q This isn't different than the other Bouch
C reservoirs in Lea County?

A No, sir.

Q I see. It appears so from the cross section.

A Well, I think that a lot of times people have not -- maybe they have felt like the water and oil are intermingled; but, it is my opinion that over geologic time that this oil has separated from the water and it does actually lay in the reservoir.

The logs don't detect this in every case. Now, they do in this particular well. The logs indicate that this would be wetter down here. But, you don't always see this on a log being so thin.

But, you have oil -- you have a column of oil and a column of water and if you can pull on that zone by reducing the pressure in the well bore, then you get a greater percentage of oil.

This has happened many times. I am sure you have heard people refer to this where a well -- that was the reason for us pumping this Chambers well here. We felt like that we might actually cone oil into the well bore rather than coning water. It's happened before.

Q Well, now, is the well there in the southeast

southeast of Section 20 capable of producing more fluids that you are presently producing?

A Yes, it is. We are pumping it now at about thirty strokes a minute, with a cobe high volume pump and we could increase this to a fifty-four.

Q What is the percent of oil, percent of water that the well presently makes?

A It makes about fifty-fifty. It makes about twenty-six or seventy barrels of oil and probably five hundred barrels of water.

Q While you were conducting your interference test, that well was pumping 274 barrels of oil and 514 barrels of water?

A Yes; that's true. That's just about what -- both of those wells along this line down here are able to make at about thirty strokes a minute.

Q Now, what is the present depth portional factor in the pool?

A Four point seventy-seven.

Q By going to 160-acre allowable factor, it would be 6.77?

A Yes, sir.

Q What's top allowable for a well in the Lazy J

Penn?

A Their factor is 3.77, I believe. I think it's about 235.

MR. NUTTER: Are there any further questions of Mr. McGrath? He may be excused.

Do you have anything futher, Mr. Hinkle?

MR. HINKLE: That's all I have.

MR. NUTTER: Does anyone have anything they wish to offer in Case 3993?

MR. HATCH: The Commission has received a telegram from Union Texas Petroleum and a letter from Pan American Corporation supporting the Applicant.

MR. NUTTER: Thank you. If there's nothing further --

MR. HINKLE: I might ask Jack one more question. Have you had any protest from any of the offset operators with respect to make these rules permanent or increasing the allowables?

THE WITNESS: No, sir, we have not.

(Witness excused).

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

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter 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.

Glenda Burks
Notary Public

My Commission Expires:

March 12, 1973

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3993 heard by me on 17 1970.

William, Examiner
New Mexico Oil Conservation Commission

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SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 11, 1968

EXAMINER HEARING

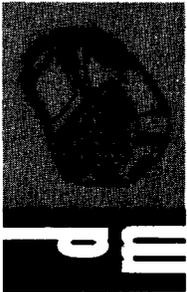
IN THE MATTER OF:)
)
Application of Coastal States)
Gas Producing Company for the)
creation of a new oil pool and)
for special pool rules, Lea)
County, New Mexico.)

CASE NUMBER
3993

BEFORE:

ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING



MR. UTZ: Case 3993.

MR. HATCH: Case 3993, application of Coastal States Gas Producing Company for the creation of a new oil pool and for special pool rules, Lea County, New Mexico.

MR. HINKLE: Mr. Examiner, Clarence Hinkle, of Hinkle, Bondurant and Christy, appearing on behalf of Coastal States Gas Producing Company. We have two witnesses, Mr. Jack McGraw and Mr. Carl Slayton.

MR. UTZ: Any other appearances?

MR. RYAN: For Pan American Petroleum, Gordon Ryan and Guy Buell.

MR. HINKLE: Mr. Examiner, I would like to call your attention to an error in connection with the notice for publication. At the end of it, it states that applicant further seeks contraction of the Lazy J-Pennsylvanian Pool by the deletion from such pool to the east half of Section 20 and the west half and southeast quarter of Section 21, both in Township 13 South, Range 37 East. Now, we didn't intend that the southeast quarter of 21 be deleted from the Lazy J Pool.

It doesn't make any difference as far as Coastal States is concerned, but the testimony will be introduced, I think, to indicate that probably the southeast quarter of

Section 21 should stay in the Lazy J, rather than be deleted. I don't think this makes any difference as far as the Commission's jurisdiction of this case is concerned, but I call that to your attention.

(Whereupon, Applicant's Exhibits 1-7 were marked for identification.)

(Witness sworn.)

CARL SLAYTON

called as a witness by the applicant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q Will you state your name, your residence, and by whom you are employed?

A I am Carl Slayton. I am employed by Coastal States Gas Producing Company in Midland, Texas, as senior geologist.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A I have.

Q And your qualifications as a geologist are a matter of record with the Commission?

A Yes, sir.

Q Are you familiar with the application of Coastal

States in this case?

A Yes, sir.

Q What is Coastal States seeking to accomplish in this case?

A Coastal States is seeking the establishment of a new pool in Lea County, New Mexico, for Pennsylvanian oil production, and temporary rules for this pool to provide for 160-acre spacing in proration units with assignment of 80-acre allowables.

Q Have you made a study of this area as a geologist?

A Yes, I have.

Q You are familiar with all the wells drilled in this particular area, and in the adjoining pools?

A Yes, I am.

Q Have there been prepared under your direction certain exhibits for introduction in this case?

A Yes, I have, with the exception of one, Exhibit 3, which is a Xerox copy of the published information that we will rely on for portions of our testimony.

Q Refer to Exhibit Number 1, and explain what this is, and what it shows.

A Exhibit Number 1 is a regional map of Southeast New Mexico, showing the geographic location of the producing

areas of that portion of the State. We have outlined in red the producing areas of the proposed new pool as indicated by the green arrow.

Q Will you now refer to Exhibit Number 2, and explain what this exhibit shows?

A Exhibit 2 is a diagrammatic cross-section of selected wells in the area of the proposed new pool, beginning on the south end with the Wolfcamp Pool, and extending northerly through the Tulk-Pennsylvanian Pool, into the Baum-Pennsylvanian Pool, and ending with Coastal States Number 1 Federal 20 in the central part of this proposed new pool. It was designed primarily to establish the age of the production in the Coastal States Number 1-20 Federal Well, relating it with known producing areas which have been previously designated as Pennsylvanian in age.

Q Does this show the continuity of the zone through the area in which this cross-section is drawn?

A Yes, it does. It shows that production from the proposed new pool is in the C Zone of the Bough, which has been determined elsewhere as Pennsylvanian in age.

Q Does this include any of the wells that are in the Lazy J Pool?

A No, sir, it does not. It is a line that is

approximately two miles west of the Lazy J Pool. We are prepared to show in our other exhibits the producing age in the Lazy J Pool, itself.

Q Do you have any further comments you have with respect to Exhibit 2?

A No, sir. It was designed strictly to show the age of the production.

Q Now, refer to Exhibit Number 3, and explain what this shows.

A Exhibit 3 is a Xerox copy of a map presented by Mr. Henry Krusecopf, who was at the time with Pubco Petroleum. It is a reproduction of pages 228 and 229 of the publication entitled, "A Symposium of Oil and Gas Fields of Southeastern New Mexico," published by the Roswell Geological Society in 1956.

I have taken the liberty of showing in the upper right margin, across from Mr. Krusecopf's typed log, a brief correlation of the Bough Sections. As you will note, this map is contoured on what is called the top of the solid line. I would chose to call that top of the Bough A, and then subdivide the lower portions of the typed log into the B and C Zones. As you will note on this typed log, Mr. Krusecopf determines that the pay is in particular in the Lazy J, in what I would term the Bough A and Bough B.

Q What is the purpose of this exhibit?

A To show that the majority of the production in the Lazy J, proper, is from the A and the B Zones of the Bough Complex.

Q Do you have any further comments with regard to Exhibit 3?

A No, sir.

Q All right, refer to Exhibit Number 4, and explain what this shows.

A Exhibit Number 4 is a structural map of the areas of the North Baum proposed new pool, the Lazy J Pool, and the Baum Pool to the south. I have chosen to contour this on the top of the Bough C Zone, whereas we have just looked at a structural map, Exhibit Number 3, contoured on the top of the Bough A. It shows merely the structural configuration in the subsurface at that depth.

Q Throughout the whole area?

A Throughout the area we are looking at the present, yes.

Q Refer to Exhibit 5, and explain what this is.

A Exhibit 5 is a map entitled, "Isopatch Map of the Baum Field." At the time I prepared this exhibit, as you will notice, 11-6-68, we were thinking in terms of a continuous reservoir into this area from the Baum Field. I determined

a net porosity figure for the Bough C Zone over this area, and contoured the map accordingly.

What in particular I would like to bring out at this point is that the area of our proposed new field is in the southern portions of the Sections 19, 20 and 21 of Township 13 South, Range 37 East. And that, as you will notice, in an eastward direction from Section 20, there is a reduction in the amount of net porosity in the Bough C Reservoir. What I am trying to show in this particular case is that between the Texaco Well in the southeast of the southwest of Section 21, there is a reduction in net porosity to the Sinclair Well in the southeast, southeast, of the same section from twenty-five feet net pay in the Texaco Well, to none in the Sinclair Well. And as you will notice in a southeast direction, there is the similar phenomena in this particular reservoir rock, in the direction of the Sinclair Wells in the northeast quarter of Section 28. What I am showing is a lateral deterioration of the reservoir character of the Bough C.

Q What does this show with respect to the Lazy J and your proposed new field?

A It shows that they are separated by virtue of a disappearance of the same porosity in the proposed new pool as

opposed to the Lazy J Field, proper. In other words, the reduction in the reservoir character separates it in an eastward direction from the Lazy J Field.

Q In other words, it would show horizontal separation?

A That is it.

Q Between the proposed new pool and the Lazy J Pool?

A Yes, sir, in an eastward direction.

Q Do you have any further comments with respect to Exhibit 5?

A No, sir.

Q Now, referring to Exhibit 6, explain what this shows.

A Exhibit 6 is entitled, "North Baum Field Type Logs," and shows portions of the logs in two wells drilled by Coastal States. The one on the left entitled, "Producer," is Coastal States Gas Producing Company Number 2 Federal 20 in the southeast, southwest of Section 20. The one on the right entitled, "Dry Hole," is Coastal States Gas Producing Company Number 1 Chambers 29, which is due south of the 2-20 Federal, a distance of one-half mile.

What I am showing in this particular instance is a southern limit to the proposed new pool, one that is not a matter of disappearance of porosity, but one that is a matter of one producing quantities of oil and water, and the other

producing nothing but water.

Our Number 2 Federal 20 was completed as a very good well, and our attempt to extend this new pool in a southerly direction has resulted in a drill stem test over the same producing interval, some twenty-four feet lower structurally, that was entirely water bearing. Coastal States has run the pipe on this particular well, and for the past two weeks and maybe more, we have been producing water at high rates to test a theory.

Q What have these tests shown as to date?

A That we are producing high volumes of water without hydrocarbons.

Q Without any indication of oil?

A None at the present time.

Q Then this exhibit shows what?

A Shows a limit of the producing area of the proposed new field to the south.

MR. UTZ: I don't find the location on these graphs here, the logs. If you will give me the location?

A The location of the one to the left, the Coastal States Number 2 Federal 20, is in the southeast, southwest of Section 20, Township 13 South.

Q I think that would be better shown by the next

exhibit, the location of these wells.

A The Coastal States Number 1 Chambers 29 is in the southeast, northwest Section 29, Township 13 South, Range 33 East.

MR. UTZ: That is the one that is shown the location on your map that you sent in?

A It is shown as a location. It has been drilled, pipe has been run, and it is currently in limbo. We are producing water at high volumes at the present time.

Q Now, refer to Exhibit 7, and explain what this shows.

A Exhibit 7 is a plat of the same area designed to more or less wrap up everything that we have set previously.

Q Will you point out on this exhibit the wells that are on Exhibit Number 6?

A Yes. You will notice in Section 20 in the southeast of the southwest of that section, Coastal States Number 2 Federal 20 due south one-half mile in Section 29 in the southeast of the northwest, and Number 1 Chambers 29.

Q Are there any other wells there that produce water to the south?

A Dry holes, yes, you will notice one, Section 25-F, entitled the Hoat Well, the same productive interval that we

are producing in a proposed new pool, by drill stem tests recovered water and oil. Due east of that one mile is the Delaware-Apache Number 1 State in Section 30, southeast quarter of the northeast quarter. Drill stem tests over the productive interval in the North Baum-Pennsylvanian Pool recovered 100 per cent water, as did our Chambers 29.

You will notice in Section 28, the Hanogan Number 1, which also recovered in the upper zone of the C, 100 per cent water, less than a half mile south of the Texaco Number 1-DM State in Section 21, southeast quarter of the southwest quarter.

Q Are there any other dry holes or wells producing water?

A Not at the moment. Of course, producing this reservoir anywhere is a matter of handling volumes of water and oil.

Q I mean exclusively water.

A No, sir, there are not. At the present time, there are five producing wells in the proposed new pool.

Q What conclusions did you draw from Exhibit 7?

A I can show a separation from the proposed new pool in an eastward direction from the Lazy J Pool. And definitely I can show in a southerly direction a limit to production toward the Baum Field.

Q Does Exhibit 7 show the wells which have been completed and which are being drilled in the new field area?

A Yes, sir. As you will notice, there are five wells that are shown to be producers. There are three wells shown to be drilling, and if you would designate our Chambers 29 as drilling, so that would make four drilling wells in addition to the five producing wells at the present time.

Q Is there any further comment you would have with respect to Exhibit 7?

A No, sir.

MR. HINKLE: We would like to offer in evidence Exhibits 1 through 7.

MR. UTZ: Without objection, Exhibits 1 through 7 will be entered in the record.

(Whereupon, Applicant's Exhibits 1-7 were admitted in evidence.)

MR. HINKLE: That is all the direct examination from this witness.

CROSS EXAMINATION

BY MR. UTZ:

Q I have been trying to find five producing wells within the limits that you recommended here, and I only find three so far.

A In Section 21, the Hanogan Well in the southeast -- northeast, southwest. Look in the southwest quarter, there are two wells, the Hanogan and the Texaco Well. There are two there. In Section 20, Coastal States Number 1 Federal 20, and Coastal States Number 2 Federal 20.

Q I thought you were going to leave out those two wells to the east there.

A No. The southeast quarter.

Q The southeast quarter. Do you want to include the southwest quarter of 21?

A Include all of the west half. Another drilling well, the Delaware-Apache Number 2-19 in the northeast, northeast of Section 19. And in Section 20, Coastal States Number 3 Federal 20 in the southwest of the northwest, in addition to the Chambers.

Q What is the status of the drilling wells in the northeast, northeast 20?

A At the present time, Coastal States is re-entering that well to clean out to the Devonian, in order to take care of produced water in the area. It was originally completed in the Bough Complex, and subsequently it was abandoned.

Q What do you know about the Sinclair Well over in the southeast of 21?

A That is a plugged well at the present time.

Q It is plugged tight?

A Plugged tight. But it was tight in the C Zone, it produced some crude out of A and B.

Q Now, the Sinclair, the Number 2 Well in the northeast of 28, what is the status of that one?

A I have no specific knowledge about the current status of this well.

MR. McGRAW: I plan to cover that.

MR. UTZ: Any other questions of the witness? It is my understanding that you are asking for 160-acre spacing and 80-acre allowance?

THE WITNESS: Yes, sir, similar with other cases that have been presented in the recent past.

MR. UTZ: Any other questions? You may be excused.

(Witness excused.)

MR. HINKLE: I would like to call Mr. Jack McGraw.

(Witness sworn.)

JACK McGRAW

called as a witness by the applicant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q Will you state your name, your residence, and by whom you are employed?

A My name is Jack McGraw. I work for Coastal States Gas Producing Company in Midland, Texas, as division petroleum engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, I have.

Q Your qualifications as a petroleum engineer are a matter of record?

A Yes.

Q Are you familiar with the application of Coastal States in this case?

A Yes, I am.

Q Have you made the study of the proposed North Baum-Upper Pennsylvanian area?

A Yes, sir.

Q And all the adjoining areas, and are familiar with the wells that have been drilled in the area?

A Yes, sir.

Q Have you prepared certain exhibits for introduction in this case?

A Yes, Exhibits 8 through 10.

(Whereupon, Applicant's Exhibits 8-10 were marked for identification.)

Q Please refer to Exhibit Number 8, and explain what this is and what it shows.

A Exhibit Number 8 is a plat showing the proposed North Baum-Upper Pennsylvanian area outlined in yellow. This plat also shows the Baum-Upper Penn Field, which is outlined in red, and the portions of the Lazy J Field which are outlined in blue. It shows that the proposed North Baum-Upper Penn Pool overlaps portions of the Lazy J Pool. These portions that do overlap are the ones that we would like to delete from the Lazy J Pool.

Q This shows all the wells drilled in the area?

A Yes, it shows all the producing wells, the abandoned producers, the dry holes, and the current drilling wells.

Q Do you have any further comment with respect to Exhibit Number 8?

A Yes. While we are looking at that exhibit, I might go into a brief description of the wells and the time that they were drilled. For example, the first well drilled in the area was the Texaco State DM Number 1, which was completed in December, 1967. That well is located in the southeast quarter of the southwest quarter of Section 21, Range 33 East. The

well was completed in the Bough C Zone of the Upper-Penn Formation, and was potential flowing for 426 barrels of oil per day and 128 barrels of water per day. It is currently producing about 216 barrels of oil per day and nineteen barrels of water still flowing.

The second well drilled was the Hanogan State 21, Number 1, which is located in the northeast quarter of the southwest quarter of Section 21, Township 13 South, Range 33 East. This well was completed from the Bough C Zone of the Upper-Penn Formation, and was originally potential flowing for 426 barrels of oil per day, plus 120 barrels of water per day, and currently produces less than 100 barrels of oil per day and about 150 barrels of water per day, and it is pumping.

The third well drilled was the Coastal States Federal 20, Number 21, which is in the southeast quarter of the southeast quarter of Section 20. This well was drilled and completed in the Bough C Zone, and is currently producing approximately 190 barrels of oil per day, and 420 barrels of water per day.

The next well drilled was the Coastal States Federal 20, Number 2, and it is located in the southeast quarter of the southwest quarter of Section 20. It is producing 220

barrels of oil per day, no water flowing.

The next well drilled was the Delaware-Apache, State 19, Number 1, which is in the northeast quarter of the southeast quarter of Section 19. There are two wells, active wells now, Delaware-Apache Number 2-19 in the northeast, northeast of 19, and Coastal States Number 3-20, which is in the southwest of the northwest of 20.

I might point out that the wells in the Lazy J Field that are nearest to the Texaco Well, which is the easternmost well in the proposed North Baum-Upper Penn Field did not produce from the same zone that we are completed in. Now, that was shown in previous testimony, they were completed in the Bough A and Bough B. They have been abandoned, they are abandoned producers. There was a well, the Sinclair Well, their Number 1 -- their State 2-45, Number 1, which is located in the southeast quarter of the northeast quarter of Section 28, Township 13 South, Range 33 East. This well produced from the Bough C Zone, and it recovered 102,468 barrels, and then reached the economic limit and was abandoned. I believe that is all on this exhibit.

Q Now, refer to Exhibit Number 9, and explain what this shows.

A Exhibit Number 9 shows the initial reservoir pressure

in the C Zone as obtained from drill stem tests on many wells completed in the proposed North Baum and the Baum-Upper Penn Fields. You will note that these pressures are relatively uniform in any given area, indicating that they do represent the static reservoir pressure in that area.

You will note in the Baum Field, it is somewhere near 3,000 pounds. In the North Baum area it is right near 2,900 pounds. And then by published information on the Lazy J Field, their original pressure was 3,546, so we see that we appear to have three separate reservoirs with different initial reservoir pressures.

Of course, the pressure in the Lazy J Field has since depleted.

Q This would seem to indicate that these three reservoirs are not connected?

A That is true. The fact that the Sinclair Well in Section 28 that recovered oil from the C Zone depleted, would indicate the presence of a barrier between that well and the Texaco Well in Section 21. And, of course, the dry hole that was drilled by Hanogan, Hanogan's Debco State in the northeast quarter of the northwest quarter of 28, proves the existence of this barrier. That being a 100 per cent water test would have to indicate that it is below the water-oil contact in the

zone that produces to the northwest, and is separate from the zone producing to the southeast.

Q Will Coastal States continue to make pressure tests or obtain information on pressure tests on the additional wells that are drilled in the area?

A Yes, we plan to gather all the available reservoir information in order to determine if one well can efficiently and effectively drain 160 acres in that area.

Q Refer to Exhibit 10, and explain what this shows.

A Exhibit 10 shows the economics of the drilling in this area on 40, 80 and 160-acre spacing. These economics have been presented in prior testimony in the Baum Field hearing, and also in the **Tulk** Upper Penn Field hearing. They also apply in this area because of the similarity between the producing areas. The depths are the same, gravity of the crude is the same, and the producing characteristics are the same, price of the crude, and so forth. In fact, they are all served by the same casing head contract.

Q Referring to Exhibit 10, would it be economical to drill wells either on 40 or 80 acres in that area?

A No, sir. According to our economic evaluation, it would not be. Our investment would not be returned on 80 acres, and certainly would not be returned on 40 acres. However, we do

make a profit -- not a profit, an income to investment ratio of 1.72.

Q On 160 acre?

A On 160-acre spacing, yes.

Q Do you have any particular rules, special rules that you would like to propose to the Commission for temporary adoption in this case?

A Yes, we would like to adopt rules for this pool that are exactly similar to the rules adopted on a permanent basis in the Baum-Penn Field, and on a temporary basis in the **Tulk-Penn** Field. These rules provide for 160-acre spacing, and a proportional factor of 4.77 for allowable purposes. They also include a provision for locating wells on any Governmental quarter section within 150 feet of the center. This allows flexibility in drilling the acreage.

Q In connection with the adoption of these special field rules, would you make any exceptions as to any existing wells?

A Yes, we would. The two wells that have already been drilled and have been on production for approximately a year, Texaco State DM Number 1, and Hanogan's State 21, Number 1, are drilled on 80-acre tracts, and it is not our intention to limit their allowable below what they now have. I believe they now

operate on 40-acre allowable, and, of course, half of an 80-acre would be less than a 40-acre allowable, and it is not our intention to reduce them below their current allowable.

I might also point out that the total capacity of both wells at this time is just about equal to the allowable for 160-acre tract.

Q In your opinion, would the adoption of the special field rules on a temporary basis for this area avoid the drilling of unnecessary wells?

A Yes, it certainly would.

Q Would the adoption of the special field rules then be in the interest of conservation and prevent waste?

A Yes.

Q During this one-year period that the special field rules would be adopted, do you intend to gather additional information with respect to drainage factors?

A Yes, sir, we would gather the next information to prove conclusively that one well could drain the necessary acreage.

Q Are you prepared to express an opinion as to whether or not one well would effectively and efficiently drain as much as 160 acres?

A Yes, sir, in view of the performance of the Baum

Field and other information gained throughout the Bough C Field, it does appear that one well will drain far in excess of 160 acres.

MR. HINKLE: We would like to offer Exhibits 8, 9, and 10.

MR. UTZ: Without objection, Exhibits 8 through 10 will be received in evidence.

(Whereupon, Applicant's Exhibits 8-10 were admitted in evidence.)

MR. HINKLE: That is all on direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. McGraw, this southeast southwest quarter of Section 21 is going to offer a bit of a problem, particularly since you want to include it and want to assign them different allowables than the rest of the pool. I believe you are aware of the fact that this just hasn't ever been done so far. I have no doubt that the Commission won't stand still for it. Do you have any other suggestions?

A We would not object if they were assigned allowables equal to the other wells in the field. It is our understanding that they are producing at their capacity at this time.

Q Do you know what they are producing?

A Yes, sir. According to the October New Mexico Engineering Committee Report, the Hanogan Well produced eighty-two barrels of oil and 150 barrels of water. The Texaco Well produced 216 barrels of oil and nineteen barrels of water.

Q Your geological data shows these two wells to be on this North Baum Pool?

A Yes, sir, they are in our reservoir, we feel sure, so therefore we feel they should be included in this field, but we are agreeable to them coming in with an exception to the field rules.

Q The only well in the southeast of 19, which is Southern Minerals, I believe it is Number 1, did you ever say what the production was on that well?

A The southeast of 19, that is Delaware-Apache Number 1-19, and that well is currently producing 285 barrels of oil, and no water per day.

Q The three Sinclair Wells in Section 28, the northeast quarter, the Number 2 Well is plugged and abandoned?

A Yes, sir. That well, to my knowledge, is an abandoned producer. Now, the well to the south of it, the Number 5, has been deepened to some lower zone and is producing. According to the Engineering Committee Report, it was producing 118 barrels of oil, and 500 barrels of water. No logs were run

on this deepening operation, and it is not possible for us to determine just what zone that is coming from. However, we do have a dry hole between us and the wells, so we feel like it is definitely not in our reservoir.

Q I believe you stated that well was completed in the A-B Zone.

A It was originally, but I believe they did deepen it, so it is coming from some other zone. Now, the well south of it is still abandoned. And the well south of that, their Number 3, which is in the southwest of the southeast of 28, it was also deepened, and it makes thirty barrels of oil and 440 barrels of water, so they have been engaged in some recompletion operations in this area.

MR. UTZ: Any other questions of the witness? You may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case?

MR. RYAN: If it please the Examiner, I am appearing for Pan American Petroleum. I would like to make a statement. Do you have an expression in your files from Texaco, Incorporated, relating to this particular case?

MR. UTZ: Yes, we do.

MR. RYAN: I wonder if we could hear it for the

record.

MR. UTZ: Do you want to hear it before you make your statement?

MR. RYAN: Yes, sir.

MR. HATCH: This is addressed to the Commission, dated December 9th, Case 3993. "Texaco, Incorporated, is an operator in the above subject proposed oil pool, and has been duly notified by Coastal States Gas Producing Company of their application for the creation of a new Pennsylvanian Oil Pool to be designated the North Baum-Upper Pennsylvanian Pool, comprising an area that includes Texaco's New Mexico State DM Lease with one producing well. The applicant advises that 160-acre spacing and 80-acre allowables will be included in their application as recommendations for the proposed new pool. Texaco, Incorporated, does not object to the proposals outlined by Coastal States Gas Producing Company, provided that Texaco State of New Mexico DM Well Number 1, which is currently assigned to the Lazy J-Pennsylvanian Oil Pool, be assigned a full 80-acre allowable. The well is drilled on 80-acre tract, and an additional eighty acres contiguous to the tract are unavailable for assignment thereto. Darrow Smith, by C.L. Wigham."

MR. RYAN: Thank you very much, sir. Mr. Examiner,

Pan American is a 100 per cent operator of a well that is in the last stages of completion, as well as a 50 per cent owner in another well in this pool currently being completed. We have made an independent study of our own, and we have reached the same conclusions that the applicant, Coastal States, has reached. That is, one, that the North Baum-Upper Penn Oil Pool is a separate and distinct accumulation of oil from the Lazy J to the south and east, and from the Baum Pool to the south. Our study also revealed to us that it is completely impossible to economically drill wells to an 80-acre density in this pool. Our economic analysis reveals, as did theirs, that with 160, you might make a little money.

Our study also reveals that from a physical standpoint, one well will effectively and efficiently drain in excess of 160 acres. I think we, the operator, and the Commission are extremely fortunate in this case that we have so much data that we can present to you at a hearing where we are only asking for temporary rules. So in view of our independent investigation, we certainly concur in the recommendations of the applicant, Coastal States here. We strongly urge the adoption of the 160-acre oil proration units. We have no objection to their recommendation at this time, that the 160 oil units receive an 80-acre allowable.

Normally, Pan American feels that if a well is assigned 160 acres, it is entitled to 160-acre allowable. And when our interest wells are completed, if they are capable of producing 160-acre allowable, it will be my recommendation to Pan American that we apply to up the allowable in this pool to 160-acre allowable.

I would also suggest to the Commission that that might be one way of handling the peculiar and particular problem we have with the Hanogan Well and the Texaco Well, if we adopt 160-acre allowable for the 160-acre wells in this pool, that we will have no problem at all with the Hanogan and Texaco Well in that they will then receive more allowable than they are currently capable of producing, and it seems to me that would solve the entire problem. But we strongly support the recommendations of the applicant, Coastal States.

MR. UTZ: Any other statements?

BY MR. UTZ:

Q Mr. McGraw, there is a portion of the Lazy J, and you may have said this in your application, I am not sure, but I think we better clarify it right now. Of Section 20, the northeast quarter, Section 21, the northwest quarter, it is your recommendation to delete that also from the Lazy J?

A Since it would be noncontiguous with the rest of

the Lazy J, it really makes no difference. We do not intend to drill on that particular tract at this time. We feel that the drilling well tested that area, but at a later date if we did change our mind, we would definitely want it to be in this North Baum-Upper Penn. So from that standpoint, I assume my recommendation would be that you delete that.

MR. UTZ: All right, sir. Any other statements?

The case will be taken under advisement.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, SAM MORTELETTE, 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 this 30th day of December, 1968.

Sam Mortelette
NOTARY PUBLIC

My Commission Expires:

December 6, 1972

I do hereby certify that the foregoing is a complete record of the proceedings in the December hearing of Case No. 3993, heard by me on Dec. 11, 1968.

Theresa J. ...
New Mexico Oil Conservation Commission