NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date FEBRUARY 17, 1988 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
W. T. Kellahin	Kellahin Kellahin Aubrey	Santa Fe
Bob Huber	Bozeman	Santa Fe
J. Bruce	Hinkle Law Firm	Santa Fe
William F. Carr	Campbell and Black	Santa Fe
Tim Hunt	Texaco	Midland, TX
Brad Burks	TEXACO	Hobbs
Dennis B Wehmeyer	TEXACO	Hobbs, NM
Jeff Hall	Campbell & Black	SF
LOUIS MAZZULLO	NEARBURG PRODUCING CO	MIDLAND.
MARK NEARBURG	"	DALLAS
Jerry Sexton	OCD	Hobbs.

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

17 February 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Texaco, Inc., for special pool rules, Lea County, New Mexico. CASE 9311

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division:

For Texaco, Inc.:

Scott Hall
Attorney at Law
CAMPBELL & BLACK, P. A.
P. O. Box 2208
Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. CATANACH: Call next Case 9311.

The application of Texaco, Incorporated, for special pool rules, Lea County, New Mexico.

Are there appearances in this case?

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

I have two witnesses to be sworn this morning.

MR. CATANACH: Any other appearances in this case?

Will the two witnesses please stand and be sworn in?

(Witnesses sworn.)

TIMOTHY HUNT,

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

DIRECT EXAMINATION

BY MR. HALL:

Q For the record, please state your name.

A Timothy Hunt.

Q Mr. Hunt, where do you live and by whom are you employed?

A I live in Midland, Texas. I'm employed by Texaco.

Q What do you do for Texaco?

A I'm a petroleum geologist.

Q All right. Have you previously testified before the Division?

A Yes, I have.

Q And are you familiar with Texaco's application and the subject lands?

A Yes, I am.

MR. HALL: Are the witness' qualifications acceptable?

MR. CATANACH: He is qualified.

Q All right, Mr. Hunt, if you would, please, state what it is that Texaco seeks by this application.

A We would like to increase the GOR limitations from the statewide rules of 2000-to-1 to 10,000-to-1

for the Monument-Abo Field, Lea County, New Mexico.

Q All right. Have you prepared certain exhibits in conjunction with your testimony?

A Yes, I have.

Q All right, let's look at Exhibit One; if you'd identify that and explain that to the Examiner, please.

A Exhibit One is a structure map of the Monument-Abo Field area. It contains only wells that penetrate the Abo formation. There are a number of wells drilled on mostly 40-acre spacing that penetrated the Grayburg-San Andres that are not shown on this map, so this is a rather densely drilled area.

The yellow acreage that's colored on the map is Texaco's J. R. Phillips Lease.

This exhibit was created to help establish a gas cap exists over this field.

The two wells indicated in the yellow colored acreage are the Texaco J. R. Phillips No. 6, indicated by a "6" above the well, and the Texaco J. R. Phillips No. 11, indicated by "11" above the (unclear).

The Texaco J. R. Phillips No. 5 also penetrated the Abo and is a twin to the -- the No. 11. Since they're so close together their subsea should be essentially identical and I didn't -- I didn't put the No. 5 on here;

however, it's an important well.

The J. R. Phillips No. 5, which is the twin to the 11, is in an up-dip position to the J. R. Phillips No. 6. The No. 5 produces essentially only gas while the No. 6 produces gas and oil, which indicates a gas cap.

The red line on this map is a trace of the cross section used as Exhibit Number Two.

Q All right, let's look at Exhibit Two, and if you'd explain that to the Examiner.

All right, would you identify Exhibit Two, please?

A This is a structural cross section which correlates the Glorieta through the Abo. This exhibit was made to help establish the fact of a gas cap by explaining the various tests in the Abo formation.

DST's are indicated on the logs as sort of a backwards Z on the left side of the footage column.

Perforations are indicated on the logs as rectangles for overall intervals or as just a line opposite where the perforation would be where those were available.

These are indicated on the right side of the footage column.

Because of tests indicating that oil was above gas, or water was above gas or oil, I separated the Abo into four zones.

The first zone is from the top of the Abo down to the next solid line and it looks argillaceous. The gamma ray is reading hotter than usual for a dolomite.

The second zone is a cleaner looking, although still has some argillaceous streaks in it, and the third zone has -- is similar to the first zone, the gamma rays again reading hotter than normal for a dolomite.

The fourth zone is similar to the second zone.

Tests in these zones, except the third zone, indicate each has an oil/water contact, and that the first and the second zones have a gas/oil contact.

Zone Three had no tests in it so I couldn't make any assumptions from those.

Because of the gamma ray readings in Zones Two and Four, I think that those zones are continuous within the zone and I drew an oil/water contact and a gas-oil contact across the zone on the cross section.

Because of the argillaceous nature of readings on Zone One, I believe that these are discontinuous lenses.

Perhaps Zone Three would be similar to that, although again we don't have tests to indicate that lenses exist there or not.

Only one of these lenses has been tested

in Zone One and is being produced, and that's indicated across the four wells on the cross section there in Zone One.

The extent of this lens is difficult to determined because of the poor quality of logs and the lack of tests. The gas/oil contact in this lens is indicated by Texaco J. R. Phillips No. 5, which on a production test showed that the gas is only coming from the footage at 6,994 feet; that's indicated on the log as just a -- just a line, while the Texaco Phillips No. 6 produces oil and gas from perforations at 7,015 feet to 7,046 feet, which is down dip.

Q If I understand you correctly, the horizontal extent of the upper lens, as shown on the cross section, is determines solely by the quality of the well logs.

Do you have any reason to believe that the -- that that lens does not exist throughout, further throughout the Abo-Monument Pool?

A No, I can't really say that it doesn't exist, but I believe that -- I believe that these lenses are somewhat discontinuous.

Q Are Texaco's plans for future development dependent upon the ability to produce that gas cap interval at a higher GOR limit?

A Yes. The GOR would affect the -- the economics of drilling further wells out here.

We do at this time have a proposed well that would twin the Skelly State "D" No. 3, which is on this cross section. It's the second well from the right. We intend to drill it down to a depth of about 70,000 -- 7725 feet, to test all the Abo formation with this -- this first lens in Zone One being our primary objective.

Q If the higher GOR limit is permitted, does Texaco plan to drill additional wells?

A I expect that we'd be able to drill somewhere between two and six additional wells if we -- if we would get the higher GOR.

Q All right. Mr. Hunt, in your opinion will the granting of Texaco's application be in the interest of conservation, the prevention of waste, and protection of correlative rights?

A Yes, it would.

Q And were Exhibits One through Two prepared by you?

A Yes.

Q Do you have anything further you wish to add?

A No.

Q All right.

MR. HALL: At this time we'd move the admission of Exhibits One and Two and that

concludes our direct of this witness.

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

CROSS EXAMINATION

BY MR. CATANACH:

Q As I understand it, Mr. Hunt, you're saying that the Abo has four different producing zones.

A Yes. Well, Zone Three, I don't know if it will produce or not, so there's three producing zones.

Q Okay, and you're saying that Zone One is the zone that has the gas cap.

A Zone One has a gas cap and Zone Two has a -- has a gas cap, I think. I didn't color it red all the way up to the top. I think it probably extends to the top of Zone Two.

I guess I should say that the gas is red, the oil is green, and the water is blue.

Q Are there two distinct gas caps?

A I believe so.

Q And you also said that the -- the gas cap in Zone One wouldn't extend horizontally to a large area.

A It would extend as large as that lens is and I'm -- I think that that lens is somewhat limited, although I don't have real solid evidence of that. It could

be. It could go all the way across the field. I tend to think, because of the argillaceous nature of the logs that it doesn't.

Q Okay, the No. 5 Well is located just northwest of the No. 11 Well, is that correct?

A That's correct.

MR. HALL: Mr. Examiner, I believe his testimony was that he doesn't know more about the extent of the gas cap interval but because of the poor nature of the logs he simply can't tell; doesn't have any reason to believe that the gas cap zone doesn't exist further throughout.

Q So it might exist further throughout?

A Yes.

Q I see the number -- Well No. 5 and 6 were both producing from -- well, the No. 6 is producing from both zones, both Zones One and Two, is that correct?

A No. 6 produced from Zones Two and Four but those are plugged back now and it just produces from Zone One now, since July of '87.

Q Was Zone Two depleted?

A I assume it was. That's more of an engineering question.

MR. HALL: We have additional exhibits that will elaborate on it.

MR. CATANACH: Okay. That's -- that's all I have for now. I may have something later.

MR. HALL: Okay.

BRAD BURKS,

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

DIRECT EXAMINATION

BY MR. HALL:

Q For the record please state your name, please.

A Brad Burks.

Q Mr. Burks, where do you live and by whom are you employed and in what capacity?

A I live in Hobbs, New Mexico. I am employed by Texaco. I am a petroleum engineer.

Q And you've -- you've never testified before the Division before today.

A No, sir.

Q Why don't you give the Examiner a brief summary of your educational background and work experience?

A In 1983 I received a Bachelor's in petroleum engineering from the University of Tulsa in

Oklahoma and since that time I've been employed by Texaco and have strictly worked in southeast New Mexico.

Q All right, and you're familiar with Texaco's application in the subject pool?

A Yes, sir.

MR. HALL: Are the witness' qualifications acceptable?

MR. CATANACH: They are.

Q All right, let's look at Exhibit Three. Would you explain that to the Examiner, please?

A Mr. Examiner, Exhibit Three is a map of the Monument Abo Field and the Monument Abo Field itself is outlined by hatched marks. It covers approximately 4-1/2 sections.

Within those hatched marks are past and present Abo wells. They are so marked and also have current production and oil and gas cumulatives.

Q Are all those Abo locations classified as oil wells or gas wells?

A All but two are oil wells. The two gas wells that we do have are Texaco's J. R. Phillips No. 5, which was previously discussed, and also Texaco's E State No. 5, the most southwestern well in the field.

Q And are all of those locations at standard 40-acre oil well locations?

A Yes, they are.

Q Do -- what are the figures next to the locations? Are those cumulative production figures?

A Yes, sir, they are. The first line is for current production if the well is currently active. That is barrels of oil per day, with a slash, barrels of water per day, with a slash, and MCF per day.

Below that is the oil and gas cumulative.

Q All right. Let's look at Exhibit Four, if you'd explain that to the Examiner, please.

A Mr. Examiner, Exhibit Four is a production graph of production versus time for our J. R. Phillips No. 5, which was previously discussed as one of the two gas wells in the field.

The well was originally completed in the Abo in 1981 in the lower zones, Two and Four. It was very marginal.

In March of '83 we recompleted to the Zone One lens and after that point we recovered 100 percent gas.

Q All right. What does the plot show with respect to the GOR, the oil production?

A The second page of Exhibit Four is a plot of GOR versus time for the well. The GOR is indicated for years '81 through '83. Since that time no oil has been

produced; therefor, a GOR is not calculated.

Q All right. Let's look at Exhibit Five. Why don't you explain that, please?

A Exhibit Number Five is a production graph of production versus time for our J. R. Phillips No. 6, one location south of No. 5.

That well was originally completed in the lower oil zones, Zones Two and Four, of the Abo. After production declined to approximately 5 barrels of oil per day in July of '87, we recompleted to the upper Abo, the Zone One, and recovered a gas rate of 1000 MCF per day; an oil rate of 45 barrels; and a water rate of 2 barrels per day.

Q Now, for both the 5 and 6 wells are the GOR's for those wells increasing over time?

A Yes, sir, they are. As you will notice on page two of Exhibit Five, this is a GOR plot versus time of J. R. Phillips No. 6. The gas/oil ratio has steadily increased since 1983 and has been updated as of July, '87, to demonstrate the recent workover results.

Q All right, let's look at Exhibit Six, if you'd identify that and explain that, please.

A Exhibit Six is again a production graph of production versus time for the entire Monument Abo Field. This includes all past and present active Abo wells in the field.

More can be seen from the second page of Exhibit Six, the GOR plot. The GOR plot shows a steadily increasing GOR since early 1983, which corresponds to the date J. R. Phillips No. 5 was recompleted to the gas cap.

Q All right, let's look at Exhibit Seven. Would you identify that, please?

A Exhibit Seven is a Commission form, Form C-116, submitted by Texaco to the Commission, of Texaco's three Monument Abo wells. This just demonstrates the current GOR or the most recent test for New Mexico E State 5 and J. R. Phillips 5 and 6.

Q And what were the results of those tests?

A The results of those tests indicated that we have the capability of producing more gas but at the current allowable of 2000-to-1 we are -- are cut back on our gas rate and this just demonstrates where we are at this time.

Q All right. Let's look at the production log, Exhibit Eight, if you could explain what that shows to the Examiner, please.

A Exhibit Eight is a log, it's a production log, from J. R. Phillips No. 5.

To the left of the title page, putting the title page to your right and then turning several pages until you see the 7000 foot interval on the scale, this pro-

duction log was run on our Texaco J. R. Phillips No. 5 in December of 1986. It was an attempt to find the location of the gas entry in this well since it was 100 percent gas productive.

The results of the production log indicated that 100 percent of the gas was entering the wellbore via a perforation at 6994 and it's so marked by a small circle on the lefthand column of the footage mark.

Several mothods were used to determine this gas entry, temperature and capacitance both indicated oil and gas entry at 6994.

I might add that approximately one barrel of oil per day is produced with this gas well, or less.

Q All right. In your opinion can Texaco's wells in the pool be efficiently produced under the current limit, 2000-to-1?

A I don't feel that they can efficiently be produced. An example of this, in July of '87 we subsequently went to J. R. Phillips No. 6, opened up the correlative interval to what was open in J. R. Phillips 5, producing the gas.

After we brought the well in, it was 100 percent gas at the current allowable, but when we opened the well up for testing following the workover, we received 45 barrels of oil per day, approximately 1200 MCF per day and 2

barrels of water per day. So by opening the well up we were able to recover oil that would not otherwise be recovered.

Q All right. Do you -- in your opinion is Texaco likely to recover additional hydrocarbons and if so, do you have an estimate of the volumes?

A Yes, sir, I feel we can recover additional volumes of oil from this gas cap.

An example is our Skelly D State No. 4, which Mr. Hunt previously mentioned is our proposed drilling well out there. We estimate at the current allowable that we will recover 37,000 barrels of oil over the life of the well and 700-million cubic feet of gas.

If the allowable were increased to, say, 10,000-to-1, we would recover an additional 20,000 barrels of oil and 300-million cubic feet of gas.

Q All right. Who is the gas purchaser in the area?

A The gas purchaser in this area is Warren Petroleum Company, or Warren Gas Company.

Q Have they indicated a willingness to accept the increased volumes if the GOR is increased?

A Yes, they have. In conversation with Mr. Don Valentine with Warren in Monument last August of '87, we discussed the potential gas that we have the J. R. Phillips lease, and he was willing to take all that -- that we could

supply.

Q All right. Let me show you what's been marked as Exhibit Nine. Is Exhibit Nine your affidavit indicating that you've directed your counsel to provide notice to all affected interest owners and offset operators in the pool?

A Yes, sir, it is.

Q Do you have anything further you wish to add in this case?

A No, sir.

MR. HALL: We'd move the admission of Exhibits Three through Nine and that continues our -- concludes our direct of this witness.

MR. CATANACH: Exhibits Three through Nine will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q How many interest owners are in the Monument Pool, do you know?

A Approximately eight. The major interest owners are Amerada, Chevron, Texaco, and Superior Oil; Amerada and Chevron holding more acreage than Texaco.

Q Are the majority of the wells in the pool producing from the lower zones?

A Yes, sir, they are, Zones Two and Four.

Q And have the majority of the wells not been tested in the upper zones?

A No, sir. With the exception of our two wells, J. R. Phillips No. 6 and No. 6, Amerada has perforated that upper interval in their J. R. Phillips No. 7. I believe it -- it's the third log from your right, I believe. They are also open in that interval. Due to their down-structure location when they perforated that interval in July of '87 they recovered oil and gas. Their current rate right now is 7 barrels of oil per day, 46 MCF per day.

Q In your opinion is there no communication between the upper and the lower zones?

A No, sir. An example of such would be when the lower zone was recompleted in J. R. Phillips No. 6 last July or August, J. R. Phillips 6 was basically depleted in the lower interval with a shut-in tubing pressure of approximately 600 pounds.

After the workover the shut-in tubing pressure out of the Zone One, the gas cap lens only, shut-in tubing pressure was 1800 pounds, so we do not feel that there was any vertical continuity between the lens in Zone One and the production in Zones Two and Four.

Q By increasing the GOR, how is that going to help you produce more gas and more oil out of that zone?

A How it will help us is by dropping the pressure the mobility of the oil will become such that we'll be able to produce oil that would not otherwise be recovered and by producing that oil we will also have gas flashing off of the oil itself. It's approximately a 41 degree crude, and we will obtain more gas and more oil by opening the well up.

Again, we are -- those -- those volumes of those cumulatives that I previously gave you are based on just 40-acre spacing.

Q You don't feel by increasing the GOR that you would -- you would utilize too quickly all the reservoir energy?

A We don't believe so. Again, I go back to J. R. Phillips No. 6, if we produce at the current allowable of 374 MCF per day, we produce approximately one barrel of oil per day with that.

By producing it at 1000 MCF per day we make 20 barrels of oil, 20 to 45 barrels of oil per day.

So we feel that what we are doing is recovering more oil using the gas energy. We do not feel that if we deplete the gas, we do not feel that we can recover the oil effectively. We can put it on pump at a later date but will not recover what we could using the gas energy that we have now.

Q So you're saying in this case that it

would be -- it would be more beneficial to produce the gas more quickly.

A Yes, sir, and we are not afraid of any water coning or water influx.

Q It looks like this is going to affect a very, very few number of wells in the field, maybe. How many would you estimate?

A Again based on what we have available for log data, which is poor, we can estimate that approximately one section is covered by this lens, per se. We -- we are not writing off the possibility that this lens is continuous throughout the field. We have not seen any production data to verify this nor can we tell from our logs.

As Mr. Hunt stated in his testimony, the log appears very shaly in that interval and it's very difficult to trace whether it's productive or not from the log.

So at this time it would only affect approximately two or three wells, but we would be required in the future to have a higher GOR limit to justify further drilling to this zone.

Q Is the higher GOR limit going to affect any -- any of the wells producing from the other zones?

A No, sir, it will not.

Q Do -- do you know if any of those wells even have the capability of producing at that high a GOR?

A From that upper or --

Q From the lower zones?

A No, sir, they do not. I might add that those lower zones have been produced since as early as the 1950's and are currently nearing their depletion stage.

Q Now, how much production history do you have producing at that high a rate, at that higher rate? You don't have any production history?

A No, just through testing. We've tested approximately once a month at the high rate for about two or three days per month, again just as a test to see.

The lastest test was a couple of months ago. We flowed it at approximately 1200 MCF per day, currently making 22 barrels of oil per day with that rate.

Q Now how did you project from the test that you would have a substantial increased recovery if you don't know that you can maintain that production rate, that high production rate? I'm -- what I'm trying to get at is how do you know that you're going to increase your ultimate recovery producing at that high a rate?

A Okay. Through the test, the tests are indicating oil recovery that -- that we are not seeing in the J. R. Phillips No. 5, nor are we seeing in J. R. Phillips No. 6 when we flow it at low rates of around 374 MCF per day. We see no oil and J. R. Phillips No. 5 has been

producing for approximately four years now, four or five years. We see no oil rate to speak of.

Q Do you have the results of those tests anywhere that you --

A I do have them in our office in Hobbs.

Q Okay. Why don't you send a copy of those tests to us.

A Okay, sure will.

Q Did any of the operators in the pool voice any objections or intend to?

A No, sir, they did not.

Q Okay.

MR. CATANACH: Okay, I think that's all I have of the witness at this time.

He may be excused.

MR. HALL: We have nothing further.

MR. CATANACH: Okay, there being nothing further, then Case 9311 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. 9311, heard by me on February 17, 1988.

David R. Catanach, Examiner
Oil Conservation Division