NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10431

IN THE MATTER OF:

The Application of Texaco Exploration & Producing, Inc., for special pool rules, Lea County, New Mexico.

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

December 19, 1991

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

ROBERT G. STOVALL, ESQ.
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State Land Office Building
Santa Fe, New Mexico 87504

FOR THE APPLICANT:

CAMPBELL, CARR, BERGE & SHERIDAN, P.A.
Post Office Box 2208
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BY: **WILLIAM F. CARR, ESQ.**

I N D E X

E X H I B I T S

EXAMINER STOGNER: Call the next case, No. 10431.

MR. STOVALL: Application of Texaco Exploration & Producing, Inc., for special pool rules, Lea County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm, Campbell, Carr, Berge & Sheridan of Santa Fe. We represent Texaco Exploration & Producing, Inc., and I have one witness.

EXAMINER STOGNER: Are there any other appearances?

There being none, will the witness, please, stand.

MR. STOVALL: Will the cowboy, please, rise and be sworn in.

ROBERT HART

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. CARR:

Q. Will you state your name for the record, please.

A. My name is Robert Hart.
Q. Where do you reside?
A. In Hobbs, New Mexico.
Q. By whom are you employed?
A. By Texaco.
Q. And in what capacity?
A. I'm a petroleum engineer.
Q. Mr. Hart, have you previously testified before this Division and had your credentials as a petroleum engineer accepted and made a matter of record?
A. Yes, I have.
Q. Are you familiar with the application filed in this case on behalf of Texaco?
A. Yes.
Q. Are you familiar with the subject area?
A. Yes, I am.
MR. CARR: Are the witness' qualifications acceptable?
EXAMINER STOGNER: Mr. Hart is so qualified.
Q. (BY MR. CARR) Would you briefly state what Texaco seeks with this application.
A. We are seeking an increase in the limiting GOR for Weir Blinebry East Pool from

2,000 to 10,000 standard cubic feet per barrel.

Q. Have you prepared exhibits for presentation in this hearing?

A. Yes, sir, I have.

Q. Could you refer to what has been marked for identification as Texaco Exhibit No. 1, identify that for Mr. Stogner, and review it, please.

A. Exhibit No. 1 is a plat of the Weir Blinebry East Pool. The hachured marks there indicate the pool boundaries as defined by the New Mexico Oil Conservation Division. The field is located approximately four-and-a-quarter miles southeast of Monument, New Mexico, in Lea County. And the pool was established in 1962. And it currently consists of 1600 acres; all but 480 of those acres are operated by Texaco. There are presently two other operators that have producing wells at this time. They are Conoco and Dewey Sparger.

Q. How many wells are currently producing from the Blinebry?

A. There are seven producing wells at this time. The legend indicates that the well symbols with a slash through them are inactive wells, and

then the others are active wells. And this plat does include every well that has produced from this pool.

Q. What are the current rules governing development of this pool?

A. They are statewide rules. We have a depth bracket oil allowable of 107 barrels of oil per day. At the present time we have a limiting GOR of 2,001, and that results in a gas allowable of 214 Mcf per day.

Q. Let's go to the Texaco Exhibit No. 2. Identify that and review it, please.

A. Exhibit No. 2 is a total production plot for the entire Weir Blinebry East Pool. It includes gas, production, water production, and oil production.

The gas production is the red curve. The green curve depicts oil production. And the blue curve at the bottom depicts water production. I've also added to this curve a plot of the GOR, and that is depicted as the aqua or blue-green curve at the top of the production plot.

You can see on here that the historical GOR for this pool has been above 10,000. And, in

fact, if you calculate the cumulative produced GOR from the numbers in red over there on the right-hand side of your graph, the cumulative produced GOR is 11,145 to 1.

Q. Why is this higher, this gas-oil ratio higher than 2,000 to 1?

A. Because the GOR limit is really tied to allowables in this pool, not to produced GOR. And the produced GOR is really a function of reservoir characteristics.

Q. Let's go to Texaco Exhibit No. 3. Would you identify that for Mr. Stogner?

A. Yes. This is a compilation of individual well production plots for every well, almost every well in the pool.

There are two that aren't included here. One of them is a newly drilled well that we drilled in May of this year. There wasn't sufficient production data to put on this plot. And the other well, I believe, had production history prior to 1970, and that's why it's not on here.

Q. How many of these plots do you have?

A. Fourteen out of the 16 producing wells.

Q. Do you want to review this information

now for the Examiner?

A. Yes. What this shows is that most of the wells out there in the pool have historically produced at a GOR at or above 10,000 to 1. Eleven of the 14 wells shown here have had substantial production either at or above a producing GOR of 10,000.

It also shows that produced GOR is virtually independent of rate. If you look at the first page of Exhibit No. 3, especially in the early part of this production plot, it's on CH Weir A No. 10 at the top on the first page, you can see that even though this well has a relatively high producing oil and gas rate, that the produced GOR is still 10,000.

And that's also substantiated by tests on our MB Weir B No. 14. That is the well that we drilled in May of this year. Initially we tested that well at about 790 Mcf per day and 60 oil. And that closely agrees with what the historical GOR has been in the pool.

Q. That well is currently experiencing curtailment because of the gas-oil ratio limit; is that not correct?

A. Yes, sir, it is, the new well is.

And then further on the second page of Exhibit No. 3, I've just put this well in here to show that even though you have relatively low production, both gas and oil there, you are still producing at a GOR in the neighborhood of 10,000 to 1.

Q. So wells at low rates as well as high rates are still experiencing this high gas-oil ratio?

A. Yes, sir, that's true.

Q. All right. Are you ready to move to the next exhibit?

A. Well, I would add one more thing. The rate is -- the produced GOR is independent provided that a mechanism exists to bring produced fluids to the surface. That just kind of qualifies it a little bit.

You can actually bleed gas off of those wells and produce at a GOR of much higher than 10,000, and I'll refer to that later.

Q. Okay. Let's go to your material balance equation. That's marked Exhibit No. 4. Would you review that for Mr. Stogner?

A. Yes. This is a material balance equation for solution gas-drive reservoir below

the bubble point. And it's got some assumptions here, and really those assumptions are in there for simplification of writing the equation, although I think they are valid assumptions for this reservoir.

But what you can see in equation No. 1 is a recovery factor -- well, I won't read all that, but that's the material balance equation. For any given set of reservoir properties and a given abandonment pressure, Bo, Boi, Rsi, Rs, and Bg are all constant, and I do have the nomenclature at the bottom. I would also point out that Bo, Rs, and Bg in this particular instance would be evaluated at the abandonment pressure.

So for any given reservoir, those particular parameters are constant, so the recovery factor equation can be reduced to recovery factor equals a constant over produced cumulative GOR, which is Rp plus a constant.

So you can see here that the only thing that affects recovery factor is the produced GOR. And we've seen by Exhibit No. 3 that produced GOR is independent of rate. So your recovery factor would therefore not be affected

with a higher rate.

And also Riddings, et al., did a study of laboratory results versus a solution gas-drive simulation. And he concluded that ultimate recovery in a solution gas-drive reservoir is not dependent on rate. And I took that from a petroleum engineering handbook published by the Society of Petroleum Engineers. And that does substantiate what I've shown here.

Q. Have you done anything in the field to confirm this conclusion?

A. Well, we -- the conclusion that can be drawn here is that recovery factor is not affected by the rate. And again I refer to what I said before, that the produced GOR is not dependent on rate provided there is a mechanism to produce the liquids out of the wellbore.

We did in fact choke our new well back to 200 Mcf per day. And at that produced gas rate, it only brought with it two barrels of oil per day. So by choking it back we were actually producing at a 100,000 GOR.

And if you plug that back in to the second equation here, you have a higher produced GOR, which decreases with your recovery factor.

So in effect we can actually produce this particular reservoir more efficiently by increasing the gas rate, which brings with it more oil and decreases the GOR.

Q. So basically what you're saying is a higher gas-oil ratio in the pool will not cause waste but in fact may prevent it?

A. That's exactly right.

Q. If this application is approved, in your opinion will oil be produced from this pool that otherwise would remain in the ground?

A. Yes, sir. That's done by two ways. First of all, as I mentioned previously, we can produce the reservoir more efficiently, and also it will economically allow us to do additional development drilling in that particular field.

Q. And Texaco has undrilled locations in this field?

A. Yes, sir, it does.

Q. Could you refer to what has been marked as Texaco Exhibit No. 5 and review that for the Examiner.

A. Exhibit No. 5 is just an economic summary for the current 2,000-to-1 limiting GOR and a 10,000-to-1 proposed GOR. What you can see

here is that for the 2,000-to-1 GOR additional development drilling is very marginal.

A 6.2-year payout is unacceptable because these funds do have to compete with other domestic projects as well as foreign projects. And the input parameters I've used here is on the 2,000-to-1 GOR. I've used a top allowable gas of 214 Mcf a day, coupled with a historical GOR, and that gives you 19 barrels of oil per day on the oil side.

$520,000 for drilling and completion costs. We have been, at least on the last well, putting rather large frac jobs, so that adds a substantial amount to the drilling and completion costs.

And then on the 10,000-to-1 GOR, I assumed a 750 Mcf per day. And that was based off of our new well, 60 oil, and I actually put the same reserves in for 10,000 as was generated for 2,000. And that's declined a little faster because you have a higher initial producing rate. But that makes sense because we are doing frac jobs, and you will accelerate recovery that way.

Q. How long is payout with a 10,000-to-1

GOR?

A. 1.9 years.

Q. Does that make this economic from Texaco's perspective to go forward with development in this pool?

A. Yes, sir, it does.

Q. Who was notified of this application?

A. All interest owners in this particular pool as well as all interest owners within a mile boundary of the pool.

Q. You given notice in an effort to comply with the New Mexico Supreme Court decision in Newton, have you not?

A. Yes, we have.

Q. Who identified the persons and the entities to whom notice needed to be given?

A. Our land department in the Denver region in Denver, Colorado, did the work.

Q. And how many notice letters were actually sent of this application?

A. Over 480 were sent.

Q. Is Exhibit No. 6 an affidavit with an attached list identifying all parties to whom notice was provided?

A. Yes, sir, it is.

Q. If this application is granted, will Texaco experience difficulty in marketing the additional gas that they anticipate producing?

A. No. Warren Petroleum is the purchaser of gas for all Texaco wells as well as, I think, the Dewey Sparger well.

And I talked with Mr. Bailey Blakemore, who is in Warren's Midland office, and he advises me that Warren Petroleum could handle any additional gas that would be generated as a result of this increased GOR, both from a facility standpoint and a marketing standpoint.

Q. In your opinion will granting this application be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes, it will.

Q. Were Exhibits 1 through 6 prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, we move the admission of Texaco Exhibits 1 through 6.

EXAMINER STOGNER: Exhibits 1 through 6 will be admitted into evidence.

MR. CARR: That concludes my direct examination of Mr. Hart.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Hart, now this is a total solution gas-drive reservoir; right?

A. Yes, I think it is.

Q. But no initial gas cap, and you made those assumptions, no water influx?

A. Right. And I did check the produced GOR in 1962, and it indicated an initial produced GOR of, I think, it was 4200. So it is exhibiting classical solution gas-drive characteristics, that is, start out with a lower GOR and steadily increase and then it falls off at some depletion stage.

Q. Of the seven producing wells presently out there in the pool, what is the average production rate at this time?

A. I don't have that information right offhand, but --

Q. Do you know if they're classified as stripper?

A. I think --- I'm pretty sure that, yes, all of them except for our new well are producing

under ten barrels of oil per day.

Q. And your new well, that being -- which new well?

A. It's MB Weir B No. 14. It's located in unit letter "N" of Section 12.

Q. And what's its production rate?

A. Currently it makes about 600 gas and 50 oil if it's opened up. I mean, we are restricted by allowables there, but that's what it's capable of making, which again agrees with the historical GOR in the field. I think that calculates to 12,000.

Q. The rates on the No. 14 well, has that been pretty indicative of what the older wells first produced when they were brought on line?

A. I really don't know the answer to that question. Those wells were completed, I think, for the most part in the 1960s, early-to-mid-1960s. And I don't have that information with me. I can get it for you.

Q. Our production -- we do have production figures here. I'll take note of that. I just thought you might know offhand.

Has there been any -- of the 16 wells that you show on your Exhibit No. 1, has there

been any other wells that were drilled but tested dry, or are those showing up on this map also?

A. Those wells are not shown on this map. The wells shown on this plat are our own wells that have produced out of the Weir Blinebry.

Q. So it's safe to say that there have been some other tests in here but not to any commercial rates?

A. Well, I wouldn't necessarily say that.

Q. It looks somewhat spotty?

A. Well, this field is drilled up pretty heavily. But these are only the Blinebry producers. There are several wellbores out there, but they're producing from different zones.

But these, the indicated wells here, are actually the ones that have only produced from the Blinebry. It doesn't indicate previous tests.

Q. Now, what I understand from solution gas-drive reservoirs, one wants to keep the GOR, the limit down not to produce the gas because essentially that is your reservoir drive mechanism. You wouldn't want to deplete that.

Isn't this going against the grain, or

has it been depleted so much already that that no longer holds true?

A. Well, your understanding is correct. Ideally you do want to keep the produced GOR as low as possible. But from Exhibit No. 3, we've had an existing 2,000-to-1 GOR limit since the pool was established in 1962, but that hasn't limited the actual produced GOR of these wells.

You can flip through here and see that virtually every one of them have produced at some time or another at a GOR of 10,000 or much greater in some instances.

So what I'm saying is that the limiting GOR really doesn't affect the produced GOR, as evidenced by these curves and as the total field curve, Exhibit No. 2.

Q. Because these wells are non-restrictive anymore, the ones that show up on Exhibit No. 3?

A. You're right. I mean, that GOR limit really applies only to a top allowable well, and these are marginal wells. So they can -- there's a margin in there that they can, even though the GOR limit is 2,000, they can actually produce at a higher GOR than that. And that's shown on the production plots.

Q. What kind of stimulation did you have on the No. 14?

A. I believe it was about 4- or 5,000 gallons of acid, and we put a pretty large frac job on. It was, I'm estimating here, but I think it was in the neighborhood of 60,000 gallons and roughly 180-, 190,000 pounds of sand.

Q. Now, is that normal for these other wells?

A. No, it's not. That's really the first time that a large frac job was put on a well out there. And really the reason that we haven't done it on some other wells is virtually all of the Texaco-operated Blinebry wells are slim-hole completions, and that severely limits what you can do in the way of stimulation.

Q. Why are they slim-hole?

A. Well, I wish I knew the answer to that. I wish they weren't. It causes a lot of headaches.

Q. And your No. 14, what do you have, seven-inch casing?

A. I believe it's five-and-a-half.

Q. Five-and-a-half. Do you have the production history on Exhibit No. 3 for your

wells No. 7 and 10 down there in that MB Weir B?

A. Yeah, the second and third page.

Q. The No. 14 well, when did it come on line, and when was it stimulated?

A. It was actually completed in May of this year, and I think they got it hooked up the first of June 1991.

Q. Did you notice any effect on the No. 10 or 7 well? It looks like the No. 7 well is shut in, though, isn't it?

A. Well, we had -- on that particular well we had a downhole problem. There was some communication between strings, and we just brought that -- we got that repaired and just brought that well back on line just a month or two ago. And that's why it doesn't show up as being produced here, although it is.

Q. How about on the No. 10 well, did you see any effect from that frac job?

A. No, not that I can tell. You can see a pretty large drop in gas production there in about the middle 90. But again that was a year before the MB Weir B No. 14 was ever drilled.

So I think that was probably some type of operational problem again because it is a

slim-hole. And that well was on a plunger lift, and there may have been some kind of problem there as far as operationally.

Q. So have you had any communications with Conoco or Sparger?

A. No, sir, we have not had direct communication, although they did receive notice.

EXAMINER STOGNER: Is there any other question of this witness?

MR. STOVALL: Not me.

EXAMINER STOGNER: If not, Mr. Hart, you may be excused.

Anything further, Mr. Carr?

MR. CARR: Nothing further, Mr. Stogner.

EXAMINER STOGNER: Does anybody else have anything further in Case No. 10431?

This case will be taken under advisement.

(The proceedings were concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10431, heard by me on 19 December 1991.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL DECEMBER 28, 1991.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3