BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 8, 1966

Examiner HEARING

IN THE MATTER OF:

Case No. 2844 being reopened pursuant to the provisions of Order No. R-2627, which order established temporary 320-acre gas proration units for the Teas-Pennsylvanian Gas Pool, Lea County, New Mexico, for a period of one year from the date of the first pipeline connection.

Case No. 2844

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order. The next case is No. 2844.

MR. HATCH: In the matter of Case No. 2844 being reopened pursuant to the provisions of Order No. R-2627, which order established temporary 320-acre gas proration units for the Teas-Pennsylvanian Gas Pool, Lea County, New Mexico, for a period of one year from the date of first pipeline connection.

MR. UTZ: Are there any appearances for Case No. 2844? There being no appearances this case will be taken under advisement and, of course, the decision of the advisement is already made, since this case is temporary 320-acre spacing for gas pool below Pennsylvanian and since the initial order the State-wide Order allows 320-acre spacing, so the spacing in the Teas-Pennsylvanian Gas Pool will be automatic.

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, KAY EMBREE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand this 22nd day of June, 1966.

Kay Embree
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2844, heard by me on June 8, 1966.

....., Examiner
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 26, 1963

EXAMINER HEARING

IN THE MATTER OF:	
Application of Sinclair Oil & Gas Company for the creation of the Teas Pennsylvanian Gas Pool and for special temporary rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Pennsylvanian Gas Pool for its Mahaffey-Federal (ARC) Well No. 1, located in Unit C of Section 14, Township 20 South, Range 33 East, Lea County, New Mexico, and for the establishment of temporary pool rules therefor, including a provision for 640-acre spacing units.	Case 2844

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 2844.

MR. DURRETT: Application of Sinclair Oil & Gas Company for the creation of the Teas Pennsylvanian Gas Pool and for special temporary pool rules, Lea County, New Mexico.

MR. KELLY: Booker Kelly, of Gilbert, White and Gilbert, representing Sinclair Oil & Gas Company, and I have one witness and ask that he be sworn.

(Witness sworn.)

(Whereupon, Applicant's Exhibit No. 1 was marked for identification.)

DOUGLAS W. CUNNINGHAM

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, please?

A My name is Douglas W. Cunningham.

Q By whom are you employed and in what capacity?

A Sinclair Oil and Gas, as Petroleum Engineer.

Q Have you previously testified before this Commission as an expert witness?

A Yes, I have.

MR. KELLY: Are the witness's qualifications acceptable, Mr. Examiner?

MR. NUTTER: Yes, sir.

Q Would you please state what Sinclair seeks by this application?

A Sinclair is seeking the creation of a new gas pool for Pennsylvanian production, to be designated the Teas Pennsylvanian Gas Pool. Sinclair also seeks the promulgation of temporary special rules and regulations for governing the production from

the said pool which would include provisions for 640-acre proration units to consist of one governmental section.

We're also asking that the temporary rules should, in order to insure orderly development and protect correlative rights, the rules should provide that each new well completed in the subject pool **shall** be located no nearer than 1650 feet from the section line and no nearer than 330 feet to any governmental quarter, quarter section line.

Now, the existing well, our Mahaffey-Federal (ARC) No. 1, would be in violation of those spacing rules. We are also asking that the temporary rules should be established for a one-year period beginning with the date that a pipeline connection for sale of the gas well gas is obtained. That during this temporary period all operators in the subject pool should gather all the available information relative to drainage and recoverable reserves.

Q I take it Sinclair wishes to except their present well from the proposed rules and this would be applied to all future drilling in the area?

A Yes. The spacing rules for the well would apply to all new wells which would be in this pool. We drilled that well on a statewide oil well spacing and encountered this gas.

Q Could you tell the Commission the present status of the

discovery well and refer to Exhibit No. 1?

A Exhibit 1 shows the area that the Mahaffey-Federal Well No. 1 is located in, it's shown approximately in the middle of the plat and encircled with a red circle. Presently this well is a dual oil well completion in the Bone Springs formation and a shut-in gas well in the Pennsylvanian gas formation. We have in the past run a multi-point back pressure test which showed that the well has a calculated absolute open flow of 3,628 MCF per day, so we do not consider that the well is a very good gas well for a well this deep.

With respect to Exhibit 1, the pink acreage there shown on the plat is a working interest unit that has been formed by Sinclair and other operators in there. It had no effect whatsoever on the royalty interest, but the working interest owners shared in the development of that first well in there. As far as the working interest owners are concerned, that well inasfar as it is allowed to do so dedicates all the acreage at the present time in there shown in pink.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q You have a structure map of the area, I refer you to Exhibit 2?

A Yes, Exhibit 2 is a structure map drawn on top of the

Morrow formation, which is Pennsylvanian in age, it's based on subsurface control and various places on the map there where there is shown a blue figure such as on the well which is colored red, which is Sinclair's Mahaffey-Federal No. 1 in Section 14 in the approximate middle of the map, the minus 2612 is the control point on the top of the Morrow.

And everywhere on the map, and there are eight others where a blue figure appears, that is a control point on the well that did penetrate the Morrow sediments of the Pennsylvanian. It shows that there is a small local high in the vicinity of Sinclair's Mahaffey-Federal No. 1. It shows down in the left-hand lower portion of the exhibit that there are three Morrow gas wells, which I think are classified as being South Salt Lake, Atoka, Morrow gas wells.

I have contacted Texaco about these wells and I was told that they had no field rules at this time on that particular field. It shows four dry holes. Texaco No. 1 Muse located in Section 7 of 20 South and 33 East, at minus 9840; up at the top of the map in Section 22, very probably 19 South, 33 East, a dry hole that penetrated the Morrow. Over in Section 4 of 20 South and Range 34 East, a Pure 1-Federal "C" at minus 9353, which penetrated the Morrow, and almost directly south of Sinclair's well a Phillips 1-Etz Federal at minus 10,033 feet, which was a

dry hole that penetrated the Morrow, so we feel like that it's possible that the maximum outer limits of this Morrow Gas Pool could be determined by drawing a straight line from each one of those four dry holes. That would be what we would consider the maximum productive Morrow in this area?

Also in line with what we have just shown on Exhibit 2 there we have Exhibit No. 3 which is a net sand thickness map. It shows the same area as was shown on the structure map. These Morrow picks here were determined from looking at the well logs of all these other wells and selecting the porous zones, and it was contoured here. It shows the average in the area where the Sinclair wells are located to be about 30 or 40 feet. We considered 36 feet of net pay in our own well there.

(Whereupon, Applicant's Exhibit No. 3 was marked for identification.)

Q So Exhibits 2 and 3 purport to show, based on Sinclair's available data, the possible outer limits or the extent of this proposed pool?

A Yes.

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)

Q Now, referring to Exhibit 4, would you explain this to the Commission?

A Exhibit No. 4 is a tabulation of the gas and condensate reserve and economic data for the Teas Pennsylvanian Pool as we presently presume that it might be present. Starting with Roman numeral I we have basic reservoir data that we have gained.

Item 1, the bottom hole pressure is 6,361 psig, which is a bomb pressure. It was taken after several days shut-in. Item 2 is the abandonment pressure that we used in making the reserve calculations, which is 2,000 psig. This was an assumed abandonment pressure. The bottom hole temperature is 168 degrees Fahrenheit or 628 degrees Reaumur. This was measured at the time of BHP measurement.

The average porosity is approximately 13%, that's based on sonic log calculation. The average water saturation, 27%, and that's based on electric log calculations. The net pay thickness of 36 feet, which is the log interpretation; the gas gravity is 68, that's .68 measured during the multi-point back pressure test. Item 8 is the condensate gravity, which was 53 degrees API. The gas-liquid ratio is 30,167 cubic feet per barrel which was measured during the multi-point test.

We considered standard conditions of 15.025 psi and 60 degrees Fahrenheit. The gas compressibility at initial reservoir conditions calculated at 1.1, at abandonment we calculated it at .84. This gave us a reserve data, initial gas in place, 1,325

MCF per acre. The gas in place at abandonment is 551,000 standard cubic feet per acre foot, a gas shrinkage factor of .976, which was calculated, and then a recoverable gas of 755 standard cubic feet per acre foot.

The condensate in place, 43 barrels per acre foot; assuming a recovery factor of 20% for the condensate in place, we would recover at 8.6 barrels per acre foot. This gave us a reserve for 160-acre spacing of 4,348,800 MSCF, a condensate reserve for 160 of 49,536 barrels. Then we assume that the reserve for 640-acre spacing would be four times the reserve of 160-acre spacing.

Then we proceed to the economics of 160-acre spacing versus 640-acre spacing. Using a gross sale price of condensate of $2.83 per barrel. A gross sale price of gas of $0.16 per MCF on 160-acre spacing, we have a gross and a word left out there, that's gross value of gas and condensate for 160-acres of $836,000.

Then we have charges against the well development cost of $388,000; operating cost, $34,800; direct taxes of $94,200; royalty at $104,500, or total cost applied to the well of $571,500. This gives us an undeferred net profit of $264,500, and based on the life of the well of 29 years, we would have a deferred net profit of $50,000 in the red.

On 640-acre spacing, the gross value of gas and condensate would be $3,344,000. Then we have the charges against the well,

undeferred net profit of $2,022,000, and based on a well life of 96 years for 640-acre spacing, we would have a deferred net profit at 8% of $90,000, or a small net profit. Both of those net profits deferred are before income taxes. We haven't considered income taxes at all in this tabulation.

Q Based on the available information that Sinclair has, could Sinclair economically develop the proposed pool on 160-acre spacing?

A No, sir, we could not.

Q Would Sinclair be able to drill additional wells at all on 160-acre spacing?

A No, sir, we would not.

Q Is it possible that Sinclair would drill additional wells if the temporary 640-acre spacing was allowed?

A It is possible that we might drill another well, the economics are poor at best even for 640-acre spacing. If we felt that by drilling another well we could prove 640-acre drainage and tie up for ourselves 640-acre reserves with another well, then we might possibly in hopes of getting a better well than the present well, we might take the gamble and go ahead and drill another well. It's just a possibility and I would say no probability based on the poor economics of 640 even.

Q In your opinion as a petroleum engineer, the only way

that the acreage at least in red is concerned would be developed would be on 640-acre spacing?

A I would say so, yes.

Q Do you feel that based on the information that you have now that the drilling of this well would possibly deter others in the area which you have suggested that might be possibly the outer limits of the pool if this was a 160-acre spacing unit?

A I believe if they were prudent operators they could tell from the multi-point back pressure test this is not a good well. I am sure they could come up with the same reserves that I did for 160 acres. I don't think that a prudent operator would drill a well on 160-acre spacing at all.

Q So 160-acre spacing would be an economic waste as far as the drilling cost and very possibly an economic waste of leaving the gas in the ground?

A Yes.

Q You mentioned earlier that you requested a 640-acre spacing temporary for one year from the date that your well could be connected to a pipeline. What has Sinclair done about contacting potential pipeline operators?

A We have been in contact with four gas companies in the area. We have been in contact with Llano Gas Company, Phillips, Southern Union Gas Company and Warren. I believe it may be

possible that we could get a connection within a six-month period from the present.

MR. KELLY: I have no further questions except to get the exhibits in.

Q Were Exhibits 1 through 4 prepared by you or under your direction?

A Yes.

MR. KELLY: We introduce Exhibits 1 through 4.

MR. NUTTER: Sinclair's Exhibits 1 through 4 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 4 were offered and admitted in evidence.)

MR. NUTTER: Does anyone have any questions of Mr. Cunningham? Mr. Durrett.

CROSS EXAMINATION

BY MR. DURRETT:

Q Would you indicate how you come up with the mathematical computation of minus $50,000? Do you estimate the life of the well on the years, now how did you arrive at that estimation?

A Well, our reservoir engineers have made the determination. They thought that the well would probably produce a sustained rate for maybe a one or two-year period of 800,000

cubic feet per day. Then the well would decline at a certain specified rate, which I don't recall what it was. This is an average rate of 410,000 cubic feet per day. When you predict the daily flow rate and in turn the monthly flow rate, then the cash flow is forecast and then if that occurs over a 29-year period, then with the discount factors for an 8% investment rate, you never do show a net profit equal to the $388,000 that you spent the first year, which is non-deferrable. In essence, what it means is that money invested in this well would not return 8%. It returns something less than 8%.

Q Theoretically, $50,000 less than 8%?

A Yes.

Q Then when you estimate going over to the 640-acre spacing, that is the same computation to arrive at the 96 years. They used the same mathematical computation as far as --

A More than likely the decline rate was not quite the same because four times 29 is a little over 96 years. So evidently he used a faster producing rate for 640-acre spacing for some reason.

Q That's just his estimate, though?

A Yes. Right now the well is shut-in and we don't know what it will produce a day.

Q I noticed on direct examination that you said that

not considering income taxes you would have a minus $50,000?

A Yes, sir.

Q Well, if you considered income taxes there wouldn't be any income taxes on minus $50,000?

A That's true.

Q You might have a tax advantage?

A We would have a tax advantage there.

MR. DURRETT: Thank you.

BY MR. NUTTER:

Q I take it, then, that you didn't prepare this Exhibit 4, it was prepared by your reservoir engineers?

A I did do the reserve computations. They did do the cash flow.

Q Back up here on the reserve computations, then, why did you select an abandonment pressure of 2,000 psi?

A Mr. Nutter, that is just my guess. I know that some gas companies use, I think, a hundred for each hundred pounds for each thousand foot of depth, which would make it around maybe 1300 pounds instead of 2,000 pounds, but I just assumed it.

Q That abandonment pressure being as high as 2,000 pounds has a direct and important effect upon the amount of gas that's going to be in place at the time of abandonment?

A Yes, sir.

Q Which is more than a third of the total gas that you compute is in the reservoir at the present time?

A If you use a lower abandonment pressure you would get more gas recovery, that's right.

Q As a matter of fact, you are assuming here that you are only going to produce slightly more than 50% of the gas?

A Yes, sir. I think it figures out about 58%.

Q And 20% of the condensate?

A Yes, sir. That again is kind of a guess.

Q Also when you get down here into the computation of the economics you are assuming here on a 160-acre well that that's all of the gas that that well would produce?

A Yes, sir.

Q And yet you said that Sinclair probably wouldn't drill this on 160 acres and you doubted if the other operators around there would, where would the remaining gas on the other 440 acres go then?

A Regardless of what spacing rules are subsequently determined for the field, I mean the well will go ahead and produce whatever it will bring, which at this time we don't know what it is. If it would drain even 640 acres, I don't think it would be a very good economic prospect for drilling other wells in there.

Q But for making your 160-acre computation, you have assumed that there would be three additional wells there, I presume?

A Well, I can see that somebody might come in and force us to drill an offset well or lose the acreage, one or the other. More than likely if someone came in and offset our acreage and we were forced to drill 160 acre, we would let the acreage go rather than drill another well. If the four wells drained the 640, then this would be the reserves that they would recover.

Q Requesting 640 spacing wouldn't be an acreage holding device anyhow, would it?

A No, sir. We just want to get them for a year. If we can't prove after a year that it can drain 640, then we will revert to 160.

Q Do you feel if you could establish that it was capable of draining 640 acres and that an order was entered by the Commission that wasn't a temporary order, at the end of a year that you would drill more wells then?

A Based upon our present figures, I doubt that we would, really. It's possible, but I just don't know.

Q You stated that the reservoir engineers had used a sustained rate of production for the first year or so of 800 some MCF?

A Yes, sir, 800.

Q Is that limited by the well itself or limited by a contract that you expect you might negotiate?

A I really don't know how he determined the 800 per day. I think that he thought it would be about all the well would produce at a sustained rate. Now, the calculated absolute open flow was only 3600, and during the time that was taken they did produce it at rates in excess of 2,000 MCF per day.

Q What rate of fluid is that well producing when it made that 3600 a day?

A The gas-liquid ratio?

Q Yes.

A It was 30,000 to 1, approximately.

Q How many barrels did it make?

A That is about 33 barrels per million, I believe.

Q This area that's shaded pink on your Exhibit No. 1, in this Mahaffey-Federal Unit, it says "rights to 4,000 feet only." Does this mean that it's unitized to 4,000 feet?

A What it means is it's unitized below 4,000 feet.

Q This is from the bottom up to 4,000 feet?

A Yes, sir, that's right. It covers from 4,000 deeper.

MR. NUTTER: Any further questions of Mr. Cunningham?

MR. DURRETT: I have one additional question.

BY MR. DURRETT:

Q Mr. Cunningham, I neglected to ask you, I believe I missed this on your direct examination, what is your well location requirements that you are asking?

A 1650 feet from the nearest section line and no nearer than 330 feet to the quarter section line.

MR. DURRETT: Thank you.

MR. NUTTER: Any further questions? The witness may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kelly?

MR. KELLY: Nothing further.

MR. NUTTER: Does anyone have anything they wish to offer in Case 2844? The case will be taken under advisement.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 8th day of July, 1963.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the examiner hearing of Case No. 2847 heard by me on 6/26, 1963.

..... Examiner
New Mexico Oil Conservation Commission