BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 11, 1962

EXAMINER HEARING

IN THE MATTER OF:	
Application of Marathon Oil Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Atoka-Pennsylvanian Gas Pool at a point 990 feet from the North line and 990 feet from the East line of Section 30, Township 18 South, Range 26 East, Eddy County, New Mexico.	Case 2628

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2628.

MR. DURRETT: Application of Marathon Oil Company for an unorthodox gas well location, Eddy County, New Mexico.

MR. MALONE: May it please the Commission, Charles Malone of Atwood and Malone for the applicant.

MR. KELLAHIN: If it please the Examiner, Jason Kellahin of Kellahin and Fox, Santa Fe, appearing in behalf of Martin, Williams and Judson.

MR. UTZ: Are there other appearances? You may swear

the witness.

(Witness sworn.)

MR. MALONE: Mr. Examiner, we have two exhibits and we might ask that they be marked at this time.

(Marked Applicant's Exhibits Nos. 1 and 2 for identification.)

THOMAS O. WEBB

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

DIRECT EXAMINATION

BY MR. MALONE:

Q Will you state your name, please?

A Thomas O. Webb.

Q By whom are you employed and where?

A I'm employed by Marathon Oil Company in the capacity of area petroleum engineer in Hobbs, New Mexico.

Q Mr. Webb, have you on various occasions previously testified before this Commission, with your qualifications in petroleum engineering accepted by the Commission?

A Yes, sir, I have.

MR. MALONE: Are the qualifications of this witness acceptable?

MR. UTZ: Yes, sir, they sure are.

Q (By Mr. Malone) In connection with your duties as

area petroleum engineer for Marathon Oil Company at Hobbs, do the leases held by Marathon in Eddy County, New Mexico fall under your supervision?

A Yes, sir, they do.

Q For how many years have you worked in matters of petroleum geology or petroleum engineering in this area?

A Approximately six and a half years.

Q Referring now to what has been marked as Exhibit No. 1, was that exhibit prepared by you or under your direct supervision and control?

A Yes, it was.

Q Would you please state what that exhibit shows?

A Exhibit No. 1 is a plat of the G. W. Nixon lease and the surrounding area. All offset operators at the subject lease are indicated thereon to the best of my knowledge. Also shown are all producing wells currently completed in the Atoka-Pennsylvanian Pool within one mile of the G. W. Nixon lease, along with all dry holes that have been drilled to the Pennsylvanian horizon in this vicinity.

The proposed location of the G. W. Nixon Well No. 1, the subject of this application, is shown on the exhibit and is circled in red. It may be noted that we request authority to drill this well at a location 990 feet from the north line and

990 feet from the east line of Section 30, Township 18 South, Range 26 East.

Now, the special rules and regulations for the Atoka-Pennsylvanian Pool as set forth in Order R No. 1670-E require that wells completed in this pool be located in either the Northwest Quarter or the Southeast Quarter of a section, and further, that these wells shall be located no nearer than 990 feet to the section line nor nearer than 330 feet to any governmental quarter quarter section line.

Now, the proposed location for the G. W. Nixon Well No. 1 complies with the footage requirements of this order, but is located in the Northeast Quarter of the section and is therefore unorthodox.

Q Located in the Northeast rather than the Northwest or Southeast, is that correct?

A That's correct.

Q All right.

A Now, Order No. R-1670-E also specifies that each well completed in the Atoka-Pennsylvanian Pool shall be located on a tract of land consisting of 320 acres comprising any two contiguous quarter sections of a single governmental section. We propose to dedicate to the subject well the North Half of Section 30, in which Marathon Oil Company owns a one hundred percent working

interest. The North Half of Section 30 comprises 317.7 acres and will constitute a standard proration unit as defined by the pool rules for the Atoka-Pennsylvanian Pools.

Q Going now to what has been marked as Exhibit No. 2, would you please describe what this exhibit shows and first state whether the exhibit was prepared by you or under your direct supervision and control?

A Yes, sir, it was.

Q What does it show?

A Exhibit No. 2 is an isopach map of the Atoka-Pennsylvanian Pool and illustrates the net thickness of the pay in this reservoir. All Marathon properties in this area are shown in yellow and the present horizontal limits of the Atoka-Pennsylvanian Pool are illustrated with a red line.

Now, the available subsurface data indicates that the Atoka-Pennsylvanian Pool is a stratigraphic trap with gas accumulation resulting from localized permeability development. Production is from the lower Pennsylvanian sands at an average depth of approximately 9100 feet. These sands are described as coarse to very coarse, angular to subrounded clear quartz grains, almost in some cases approaching the consistency of a conglomerate.

The productive limits of this reservoir are controlled by a porosity and permeability development within this sand. All

producing wells and dry holes that have penetrated the lower Pennsylvanian sands in this area are shown on Exhibit 2, to the best of my knowledge. The net pay thickness values utilized in the preparation of this exhibit are shown in parentheses at each individual well and were determined from an examination of sample cuttings and electric logs along with a study of the available cores in this area.

Q In that connection, what method did you follow in examining cuttings, logs and cores?

A The logs on all wells in this area, including the dry holes, were examined. We examined core analyses on seven separate wells in this area.

Q Seven separate wells?

A That is correct. Now, when the pay thickness was not determined from logs and when cores were not available, we examined the actual sample cuttings from the wells when they were available with respect to cementation of the sands in an effort to determine whether or not permeability actually did exist.

Q All right.

A The isopach contours appearing on Exhibit 2 illustrate the total thickness of Pennsylvanian sand with sufficient permeability development to permit the production of gas in commercial quantities. Exhibit No. 2, therefore, represents my

interpretation of pay distribution in this reservoir based upon the information that is available to me at the present time. It may be noted that the permeability trend lies in a northeast-southwest direction and that the configuration of the permeability trend is very erratic and there is considerable fluctuation in pay thickness; rapid thinning of the pay interval is evidenced in several instances.

Marathon Oil Company has drilled five wells in the Atoka-Pennsylvanian area, three of which were commercial producers and two of which were dry holes. Marathon's first well in this area, the Ralph Nix Well No. 1, located in the Southeast Quarter of Section 29, 18, 26 was drilled as a Devonian test. The Devonian zone tested salt water and the well was subsequently completed as a gas well in the Pennsylvanian sands. The total cost for drilling and completing this well was $321,000. This, of course, includes the Devonian test.

The E. V. Noel Well No. 1, located in the Southeast Quarter of Section 20, 18, 26 and the Andrew Arnquist Well No. 1, located in the Northwest Quarter of Section 29, 18, 26 were then drilled and completed as gas wells in the Atoka-Pennsylvanian Pool. Now, the average cost for drilling and completing these wells was $192,000 each.

Q You are still speaking of wells which Marathon has

drilled, is that correct?

A That is correct.

Q Go ahead, please.

A Of course, we drilled those wells under the name of the Ohio Oil Company.

Q At that time you were the Ohio Oil Company, is that right?

A That is correct.

Q Go ahead.

A In October, 1960 Marathon Oil Company drilled the Nix Curtis Well No. 1, located in the Northwest of 32, 18, 26; the Pennsylvanian section was perforated and treated with a total of 2,000 gallons of acid and 20,000 gallons of sand oil. Commercial production was not attained from this well and the well was subsequently plugged and abandoned. The total cost of this well including the cost of the attempted completion was $228,000.

Now, it may be noted that Nix Curtis Well No. 1 is a diagonal offset to the Ralph Nix No. 1, which contained the thickest pay section of any well drilled to date in the Atoka-Pennsylvanian Pool. This certainly illustrates the characteristic of the pay section to thin rapidly.

In September, 1961 Marathon drilled the Culpepper Unit Well No. 1, located in the Southeast Quarter of Section 30, 18, 26.

The entire lower Pennsylvanian section was cored in this well and the sands were found to contain very low porosity and extremely poor permeability development. In view of that fact, the well was plugged and abandoned. The cost for drilling this well, which includes no completion costs, of course, was $132,000.

Now, I've presented this well data not only to illustrate the cost for drilling in the Atoka-Pennsylvanian Pool, both from a standpoint of drilling commercial producers, but also from a standpoint of drilling dry holes, but I have also presented this data to show that our success ratio in this pool has been relatively low. The last two wells which we drilled in this area were dry holes for a total cost of $360,000.

Q Is it correct, then, that Marathon, Ohio has drilled a total of five wells of which two were dry?

A That is correct.

Q Go ahead.

A The isopach contours on Exhibit No. 2 indicate that a well drilled to our proposed location in the Northeast Quarter of Section 30, 18, 26 on Marathon's G. W. Nixon lease should encounter approximately 30 feet of total net pay. Now, on the other hand, a well drilled at a standard location in the Northwest Quarter of Section 30 would encounter only 10 to 15 feet of total net pay for a possible loss of 50% or more of the pay

section. Also it will be noted that the permeability trend has been extended to include the Gulf A-C Well No. 1, located in Section 36, 18, 25. However, it's quite possible that this well is separated from the Atoka-Pennsylvanian Pool by permeability barriers. Now, if these barriers do exist, it would then be necessary to close the isopach contours between the Gulf well and the Atoka-Pennsylvanian trend.

Q That would remove from the isopach contours shown on Exhibit 2 the neck which sticks out to the southwest in the left-hand lower corner of the chart, would it not?

A Yes, sir. It surely would.

Q Go ahead, please.

A Closing these contours would, of course, possibly result in extending the zero pay contour directly through the Northwest Quarter of Section 30. If this were true and in this event the drilling of a well at a standard location in the Northwest Quarter of Section 30 would result in the drilling of another dry hole. The contours on Exhibit No. 2, however, do show that the North Half of Section 30 would contain Pennsylvanian sands with sufficient permeability development to permit the production of gas.

Q Is it your opinion that the entire North Half of Section 30 would be productive of gas in the Atoka-Pennsylvanian?

A Yes, it is.

Q Go ahead.

A However, in that we are dealing with a relatively thin pay section in Section 30 at best, and in view of the erratic configuration of the permeability trend in this reservoir, it is felt that the drilling of a well in the Northwest Quarter of Section 30 at a standard location would incur excessive economic risk. It is, therefore, my opinion that the approval of the proposed unorthodox location in the Northeast Quarter of Section 30 will protect correlative rights of Marathon Oil Company and, in fact, in my opinion it is felt that approval of this application is necessary in order that we may be permitted to drain our fair share of the gas from this reservoir.

It is also my opinion that a well drilled at the proposed location will effectively and efficiently drain the acreage dedicated to it. I feel that approval of this application will certainly not cause waste and will definitely not injure the correlative rights of others.

Q Has Marathon come before this Commission at any time in the past with the request for approval of an unorthodox location in this pool?

A No, sir. To date all five of the wells drilled by Marathon Oil Company have been located on standard locations.

Q And two of those were dry?

A Yes, sir, they were.

Q In that connection, has Marathon, Ohio taken a position in the record of any prior cases before this Commission with respect to some application by someone else for an unorthodox location?

A Yes, sir, we have.

Q Was that in Case 2224, the application of Lynn Meyer?

A Yes, sir, it was.

Q And in that record was there included a telegram from Ohio, Marathon to the Commission which among other things stated, "If evidence at this hearing establishes to the satisfaction of the Commission that the proposed unorthodox location is justified and that correlative rights of interested parties will not be adversely affected, we would have no objection to either the unorthodox location or the dedication of the entire South Half of Section 28 to the well without restriction of the allowable below the allowable of wells on other standard units in the pool."?

A Yes, sir. The telegram was worded in that manner. I might add that that proposed well is located 990 feet from our Ralph Nix Unit boundary.

MR. MALONE: At this time the applicant offers Exhibits 1 and 2 in evidence.

MR. UTZ: Without objection the Exhibits 1 and 2 will be entered into the record.

(Whereupon, Applicant's Exhibits 1 and 2 were entered into the record.)

MR. MALONE: That completes our testimony, Mr. Examiner. I understand that there will be a statement and at sometime before the closing of this hearing I would like to make a closing statement, please.

MR. UTZ: You'll have that opportunity.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Webb, the Lynn Meyer well that you were discussing was in the Southwest Quarter of 28?

A Yes, sir, that is correct.

Q And that is marked, well, is that a Mallard well now?

A Yes, sir, I believe the well is operated by Mallard Petroleum Company.

Q What acreage is dedicated to that well, the South Half?

A The South Half of Section 28.

Q Your contour map being accurate, considerable amount of dry acreage dedicated to it?

A Of course, this is strictly a matter of interpretation, you'll note that that well only attains seven feet of permeable

pay so I had no choice but to place the zero contour line where I did.

Q Over in Section 30, North Half in particular, you admitted that there might be a possibility that the zero contour was unduly influenced by the Gulf A. C. 1, did you not?

A Yes, sir.

Q If we did bring that contour across, that would render approximately 80 acres to the North Half of 30 below or outside the zero contour, would it not?

A Yes, sir, it would.

Q Actually, in this area where you show on your original lines, show a bending to the west, you actually don't have any control to show that bending to the west, do you?

A No, sir. Unfortunately there are no control points in that area. However, I do feel, Mr. Utz, that the interpretation that I have applied to pay distribution in this reservoir is a reasonable interpretation. Certainly it's strictly a matter of interpretation.

Q Yes, but at the same time you admit that the bending out there was just a matter of interpretation?

A Yes, sir.

Q And you had no control to do so?

A Actually, that is correct.

Q Suppose for a moment that your interpretation is correct, then, right down the middle of the North Half of Section 30 would be the ten-foot contour, would it not?

A Yes, sir.

Q And actually using your contours, what would you say would be the average pay thickness of the North Half, somewhere around 10 to 15 feet?

A The average pay thickness, I believe, for wells in this reservoir is approximately 20 to 25 feet. Now, I might add if there were any assurance of obtaining 10 feet of permeable pay, I would not hesitate to recommend that we drill a well on a standard location in the Northwest Quarter of Section 30. However, in view of the erratic configuration of this permeability trend, I certainly feel that it would involve excessive and extreme economic risk.

Q You don't have too much confidence in these contours yourself, do you?

A As you pointed out yourself, Mr. Utz, there's no control in this area.

Q Well, if you were to move this well, oh, say midway on the quarter section line, how would you feel about such a location there slightly off of the quarter section line?

A You mean and still locating the well in the Northwest

Quarter of Section 30?

Q Yes.

A I feel that the drilling of a well at any location in the Northwest Quarter of Section 30 would incur excessive economic risk.

MR. UTZ: Are there other questions of the witness?

MR. MALONE: Just one, I believe, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. MALONE:

Q You stated during your direct examination that the permeability trend in this pool is northeast and southwest, did you not?

A Yes, sir, that's correct.

Q Did that established fact have any effect upon your extending the isopach contours to include the Gulf well in Section 36?

A Yes, sir. It certainly did. The fact that the Gulf well lies on this trend did have some bearing upon the fact that I did connect it to the trend. Also, by log correlation the Gulf well is producing from the same correlative interval as are the wells in the Atoka-Pennsylvanian Pool. I did, therefore, connect this well to the trend and feel that it is part of the Atoka-Pennsylvanian reservoir until and if further development in this

pool indicates that it is in fact separated by permeability barriers.

MR. UTZ: Well, actually you could have brought your ten-foot contour down inside on that same interpretation, could you not?

A Yes, sir.

MR. UTZ: Any other questions?

MR. KELLAHIN: In view of the question just asked --

MR. UTZ: Mr. Kellahin.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q You say you based the inclusion of the Gulf well on the fact that the general trend is on a northwest-southeast axis?

A It had some bearing.

Q Actually on your contours as shown through 29, 30 and 19, you show a trend through a northeast-southwest axis, do you not?

A I might reword my statement there and state that the predominant trend is in a northeast-southwest direction. There are some widening effects to this trend in certain areas, but the predominant trend is in a northeast-southwest direction.

Q You show a very sharp drop in the contour to the southwest?

A Yes, sir, indeed we did.

Q But you don't carry that forward up to the northwest part of the acreage involved?

A This rapid dropoff, of course, was based on a control point which indicated zero pay, and as I pointed out, this indicates the characteristic of this pay to thin rapidly. In the northwest portion of this area there are no control points, but it is quite possible that this rapid thinning, as evidenced in this area also, and it is for this reason that I feel that the drilling of a well at a standard location in the Northwest Quarter of Section 30 would incur excessive economic risk.

Q If you had the same rapid thinning you would have only approximately 160 acres of pay then?

A Yes, sir, that is true. However, I would like to repeat that it's my opinion, based on the available data, that this entire North Half of Section 30 is productive of gas.

MR. MALONE: Thank you.

MR. UTZ: Any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case?

MR. KELLAHIN: I would like to make a statement on behalf of Martin, Williams and Judson who own the acreage directly

offsetting the proposed location to the north. We are in opposition to the proposed location of Marathon Oil Company for the reason that in our opinion, and I think the evidence clearly shows, that the productivity of the western portion of this acreage is very, very doubtful. The witness has testified that he would not hesitate to recommend drilling in the orthodox location if he thought he had ten feet of net pay. His contours show ten feet of net pay, but he's certainly not willing to make the recommendation, and on the basis of the controls and the information available, I can't say that I blame him.

The question, then, is the effect of this proposed location on the correlative rights of Martin, Williams and Judson. In the first instance we opposed the location. But in the event that the location is approved, and in order that Marathon can obtain the gas which underlies its acreage in the Northeast Quarter, it should be approved then, and in that event we feel that the allowable should be curtailed to approximately one-half. Otherwise, the correlative rights of Martin, Williams and Judson will clearly be impaired because on the contours shown on the applicant's exhibit, the gas can only come from the south portion of the Martin, Williams and Judson tract, and from their own adjoining lands. Certainly there's little or no gas to be produced from their own tract to the west.

MR. MALONE: In behalf of Marathon Oil Company, and in closing, Marathon respectfully submits to the Commission the following: No. 1, Marathon Oil Company sincerely believes in orderly development of this pool. Marathon has drilled five wells on orthodox locations, of which two were dry. $360,000 has been expended by Marathon in drilling dry holes on orthodox locations. In fact, because as the records of this Commission will show, there are six dry holes in this immediate area, Marathon has drilled one-third of all the dry holes in the pool area.

It's respectfully submitted that this constitutes Marathon's share of the work in proving the productive limits of this pool.

Two, this Commission has previously granted two applications for unorthodox locations on essentially the same grounds which Marathon has presented today.

Three, although the applicant believes that the North Half of Section 30 is productive of gas in its entirety, the characteristics of the pay section raise the possibility that a well at the orthodox location would be dry, and thus excessive economic risk would be incurred in drilling at the orthodox location. In addition, because the Commission has previously found in establishing this field that one well will adequately drain 320 acres, this increased economic risk is unnecessary if, in fact, the entire North Half of 30 is productive.

The only technical and expert evidence in this record is that the entire North Half is productive.

Four, the granting of the application would protect the correlative rights of the applicant and prevent economic waste, and these grounds are respectfully submitted as justification for granting the application.

Five, Marathon certainly feels that if at any time in the future the allowable to be granted to a well drilled at the unorthodox location if this application is granted, any such penalty certainly should not be imposed until there is additional control to the west and northwest which would prove the so far relatively unfounded contention of Martin, Williams and Judson that the Northwest Quarter is unproductive, because the only technical and expert evidence in this record is that the entire North Half of 30 is productive.

That's all we have, Mr. Examiner.

MR. UTZ: Are there other statements? The case will be taken under advisement. We will take a ten-minute recess.

(Whereupon, a recess was taken.)

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 28th day of September, 1962.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2628, heard by me on Sept. 11, 1962.

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