STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CASES 10,780, 10,781, 10,782

EXAMINER HEARING

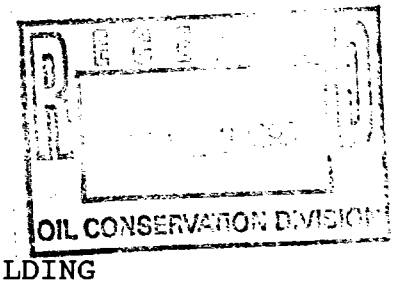
IN THE MATTER OF:

Application of Marathon Oil Company for an unorthodox coal gas well location, San Juan County, New Mexico

TRANSCRIPT OF PROCEEDINGS

BEFORE: MICHAEL E. STOGNER, EXAMINER

ORIGINAL



STATE LAND OFFICE BUILDING

SANTA FE, NEW MEXICO

July 29, 1993

A P P E A R A N C E S

FOR THE DIVISION:

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I N D E X

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E X H I B I T S

APPLICANT'S EXHIBITS:

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WHEREUPON, the following proceedings were had at 1:00 p.m.:

EXAMINER STOGNER: Hearing will come to order. I'll call now Case Numbers 10,780, 10,781 and 10,782.

MR. STOVALL: Each of these cases is the Application of Marathon Oil Company for an unorthodox coal gas well location, San Juan County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant, and I have one witness to be sworn.

EXAMINER STOGNER: It appearing there's no other appearances in any of these three cases which have been consolidated for purposes of testimony at the Applicant's request, would the witness please stand to be sworn?

(Thereupon, the witness was sworn.)

MR. KELLAHIN: As Mr. Kent and I go through the presentation, Mr. Examiner, there -- of the three cases, Case 10,783 --

EXAMINER STOGNER: I'm sorry, what?

MR. KELLAHIN: There are three cases. The first case I want to discuss with you in terms of

notice is Case 10,783. Marathon offsets that case, and so there was no other notification provided.

EXAMINER STOGNER: Hold it. 10,783 is nomenclature.

MR. KELLAHIN: I'm sorry, it was 10,780, is the one in which Marathon offsets itself as to that well.

MR. STOVALL: Mr. Kellahin, before we get started --

MR. KELLAHIN: Yes.

MR. STOVALL: -- I was sort of half listening and I heard you say the exhibits are all the same for each case. So --

MR. KELLAHIN: Yes.

MR. STOVALL: -- what we have here is a stack labeled 10,780, but they are all for all three cases?

MR. KELLAHIN: That's right.

MR. STOVALL: That's what you meant?

MR. KELLAHIN: And I meant to give you enough copies so that that exhibit set will go in each case file, so that you'll have --

MR. STOVALL: Got you. Okay, now I'm less confused than moments ago.

MR. KELLAHIN: All right.

EXAMINER STOGNER: Thank you for your

consideration, Mr. Kellahin.

(Off the record)

MR. KELLAHIN: Case 10,780 is the well in the west half of 9. It's the Bolack 9-3. Marathon offsets itself on all sides and corners, so there was no notification.

Case 10,781 in the east half of 17, the Schwerdtfeger -- Is that how you say it?

MR. KENT: Schwerdtfeger.

MR. KELLAHIN: Schwerdtfeger 17-2, I've submitted an affidavit of notification in that case.

And the last case is Case 10,782. It's for the Bolack 9-4 well in the east half of 9, and there's a separate notification affidavit for that case.

CRAIG T. KENT,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation?

A. My name is Craig Kent, and I'm a reservoir engineer.

Q. Mr. Kent, on prior occasions have you testified before the Division as a reservoir engineer?

A. Yes, I have.

Q. As part of your duties as a reservoir engineer, have you made yourself knowledgeable about the coal gas wells in this particular area of the Basin Fruitland Coal Gas Pool?

A. Yes, I have.

Q. Does your company currently operate vertical wells in this area that have penetrated and produced coal gas from the Basin Coal Gas Pool?

A. Yes, we do.

Q. Based upon your studies, do you have reservoir engineering conclusions with regards to how now to develop the three spacing units that are in question today?

A. Yes, I do.

MR. KELLAHIN: We tender Mr. Kent as an expert reservoir engineer.

EXAMINER STOGNER: Mr. Kent is so qualified.

Q. (By Mr. Kellahin) Let me have you take Exhibit Number 1, Mr. Kent. Identify for us the three wells that are the subject of this Application and tell us what it is that has caused you to reach the ultimate conclusion to replace the original well in each of the spacing units.

A. Okay. In general, this is a plat of a 12-

section area of the San Juan Basin that's located approximately nine miles south of the town of Bloomfield.

Shown in red near the center of the plat are three dots. Those represent the three wells that are the subject of today's hearings.

The one located in the northwest corner of Section 9 is the Bolack well number 9-3.

Q. Stop there. On Section 9, give us the orientation of your spacing unit.

A. That is a west-half dedication.

Q. Okay.

A. In the southeast corner of that same section 9 is a red dot for the Bolack Well Number 9-4, which is an east-half dedication.

And then in the southeast corner of Section 17 is another red dot for the Schwerdtfeger Well Number 17-2, which is also an east-half dedication.

We have made studies of the original wells, which were located at standard locations for the Basin Fruitland Coal in both Section 9 and 17 and determined that the best course of action at this point is to drill three vertical replacement wells at our proposed locations.

Q. Are the original wells and the replacement

wells each standard as to the footage setbacks for their spacing units?

A. Yes, that's correct.

Q. In what way, then, are they unorthodox, then, as to the pool rules?

A. The pool rules call for a 320-acre spacing with wells to be drilled in the northeast and southwest quarter sections.

Our replacement wells will be drilled in either the northwest or southeast quarter sections, making them off-pattern.

Q. Let's turn to the notice question with regards to the east half of 17, the Schwerdtfeger 17-1.

Who are the offset operators to that spacing?

A. The offset operators on the north, northeast, east and southeast are all Marathon. There are no active Fruitland Coal wells in the west half of 17, nor in Section 20.

To my knowledge, the ownership is Southland Royalty in the west half of 17 and El Paso in Section 20.

Q. When you move up to the Bolack 9-3 in the west half of 9, who offsets that spacing unit?

A. In all cases, Marathon offsets that spacing unit.

Q. And the east half of 9 with the replacement well, Bolack 9-4, who offsets that spacing unit?

A. To the north, northwest, west, southwest, south and southeast are all Marathon.

Directly to the east there are two wells operated by R&G Drilling in Section 10.

And then in Section 3 there are no active Fruitland Coal wells, and there are several owners, including Arco, Conoco and Amoco and R&G Drilling, several others.

Q. Okay. So when you look at the notice list, after you exclude R&G drilling for the Bolack 9-4 well, all the other interest owners have interest in Section 3?

A. That's correct.

Q. Let's talk about the surface use. What kind of surface are we on? Is this federal, fee or state?

A. These are all federal leases. But in particular, this land lays on the Navajo Indian Irrigation Project.

Q. That is the NAPI project?

A. That's correct.

Q. What is the status of the surface approvals for each of the wells at their location?

A. All of the wells have been staked, and they

have had on-site inspections from both the BLM and representatives of the irrigation project. We've received verbal approval on the locations.

The APDs, if they haven't been filed already, are in the process of being filed.

Q. Are you aware of any surface limitation that will constitute a problem for you in drilling these locations?

A. No, there's no limitation.

Q. Okay. Let's turn now to Exhibit Number 2. Before we talk about the details, what is it that we're looking at?

A. Exhibit Number 2 is, again, the same 12-section area. What I've plotted on here is all the active Fruitland Coal wells.

To the right of each well symbol -- or near each well symbol, I should say -- are two numbers. On the top is the daily average rate as of March of 1993.

Below that number is the cumulative production through March of 1993.

And then located immediately below each well symbol is the date of first production for the well.

Q. What use have you made of this information to determine that you desire to replace the original of each of the three wells?

A. Well, each of the original three wells are poor producers, and what I wanted to look at was what the offsetting wells are doing.

And interestingly enough, you can draw a straight line from the northeast of Section 9 through the northeast of 17, and intersect all three of those wells, the original wells, and go either to the northwest or southeast of that line and find wells that are producing anywhere from 250 up to 700 MCF a day.

That caused us a little concern, showing that, you know, something evidently was wrong with these three wells to begin with, when the offsets are far better.

Q. When you identified a problem with the quality of these three existing wells, did you make an investigation of the pressure information that's available in this area?

A. Yes, I did.

Q. Let's turn to Exhibit Number 3 and have you identify and describe what your conclusions are about the pressure information.

A. Exhibit Number 3 is again the same 12-section area.

Next to several of the well symbols is a number representing the reservoir pressure in p.s.i.

Below the well symbol is the date that that pressure data was obtained.

Q. Is there a pressure relationship here to cause you as a reservoir engineer to explain poor performance in relation to reservoir pressure?

A. No, not really. The three wells range from -- The original three wells range anywhere from 194 pounds up to 470 pounds measured bottomhole pressure.

If you look at some of the offsets, we've got pressures ranging from 180 up to 539, indicating that there's really no correlation between low pressure and poor performance, or high pressure and poor performance, or high pressure and good performance.

So --

Q. Is this a pressure-depleted reservoir for these wells?

A. No, pressure depletion is not the cause of the poor performance.

Q. Okay. Did you, in your investigation to try to find an explanation to the poor performing character of these three wells, did you make an investigation of how these wells were drilled, completed and stimulated?

A. Yes, I did.

Q. Let's turn to Exhibit Number 4. Before you tell us your conclusion, who us what's tabulated on the

display.

A. Exhibit Number 4, entitled "Fruitland Coal Completion Data", is a tabulation of basically the completion procedure and design for all of the Marathon-operated wells in this 12-section area.

Our standard procedure in this area was to drill and case and cement casing through coal, perforate the coal section, break down the perforations using 15-percent hydrochloric acid solution, and then fracture stimulate the wells.

Q. Is there any difference between the productivity of the wells and how they were drilled and completed?

A. No, there's not. For all intents and purposes, we used almost an identical fracture stimulation program on all the wells, and we still see a great variability in the productivity.

Q. Is this an area where there's a difference that is explained by the fact that certain wells were open-hole completed versus cased-hole stimulated?

A. No, to my knowledge all of the Fruitland Coal wells in this area are cased-hole and fractured.

Q. And were other operators in addition to Marathon using the same procedure?

A. Yes, there were.

Q. So that didn't give you an answer?

A. No, that's correct.

Q. All right. Let's turn to a geologic investigation. Did you and the geologists that studied this project make a geologic investigation, trying to find an explanation for the poor quality of these three wells?

A. Yes, we did.

Q. Did you have an isopach prepared of the gross Fruitland Coal thickness?

A. Yes, I did.

Q. Identify and describe for us, then, Exhibit Number 5.

A. Exhibit Number 5 is a gross isopach map of the Fruitland Coal in the same 12-section area we've been looking at.

As you can see, the contour interval on here is five feet. And this does not just pertain to any one particular seam; this is the entire thickness of all the coals that are present in the section.

Q. Identify for us the well code on that display.

A. The active Fruitland Coal producers are shown by gas well symbols.

The Fruitland Coal penetrations, which

include Pictured Cliffs, Gallup and Dakota producers as Xs. And then our proposed drill sites are shown as open red colored circles.

Q. It appears that you have a wealth of geologic information to control a determination of coal thickness in this area.

A. Yes, we do.

Q. Did coal thickness provide an explanation as to the quality of the wells?

A. No, for the most part the wells that we operate have thicknesses anywhere from 20 to 30 feet. There's no real great variability in the thickness in any of our producing wells, and that just really didn't go to explain why the original wells were such poor producers.

Q. Let's turn to the first geologic cross-section. It's the A-A' cross-section, marked as Exhibit 6.

What is the coal member that you're trying to access with these wells? What's the producing formation?

A. The producing formation is the Fruitland Coal, and specifically two or three seams that are located right at the base of the Fruitland.

Q. Does it appear to you that the explanation

and the poor character of these wells is explained by where the wells are completed?

A. No, it doesn't.

Q. All the wells are accessing the greatest opportunity for coal gas production with adequate perforations?

A. That is correct.

Q. Is that true on the other two cross-sections when we look at them?

A. Yes, it is.

Q. So that doesn't give you the answer?

A. Correct.

Q. You've studied the coal gas reservoir for other issues, have you not, Mr. Kent?

A. Yes, yes, I have.

Q. And you're familiar with the general literature on this topic?

A. Yes, I am.

Q. What is your best engineering judgment as a reservoir engineer as to the explanation for the poor quality of these three wells?

A. As I see it, one of two possibilities exist here.

Either there is no cleat development in the coal in a localized area which runs generally from the

northeast of Section 9 to the northeast of Section 17, or there has been some localized secondary mineralization of the cleat system, which has reduced the permeability in that same general area.

Q. Is it your belief as a reservoir engineer that there's sufficient gas in place in the reservoir, in these spacing units, to make it profitable to recover that gas?

A. Yes.

Q. What is your best opportunity for doing that, recognizing the limited success of the original well?

A. I believe our best opportunity is to drill vertical wells in the opposite quarter sections from where the original wells were located to recover those reserves.

Q. Have you received any objection from any of the other interest owners in this area that received notification?

A. No, I have not.

Q. In your opinion, will approval of these three Applications be in best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes, it will.

MR. KELLAHIN: That concludes my examination

of Mr. Kent.

We move the introduction of his Exhibits 1 through 6, plus the notification certificate that's marked as Exhibit 7 for Case 10,781 and 10,782.

EXAMINER STOGNER: All applicable exhibits will be admitted into evidence at this time.

MR. KELLAHIN: That concludes my examination of Mr. Kent.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Kent, all of these are cased-hole completed; is that correct?

A. That's correct.

Q. Now, in your Exhibit Number -- whatever your cross-section is.

A. Exhibit 6.

MR. STOVALL: Which cross-section? There are three of them.

MR. KELLAHIN: The A-A' should be --

EXAMINER STOGNER: A-A'?

MR. STOVALL: The unmarked A-A' cross-section.

Q. (By Examiner Stogner) In the exhibit, A-A', the perforated interval shown here -- and these are all Marathon wells except that one Frontier well -- the

perforations are in the -- what has been marked as coal.

Do these accurately represent all the perforations, or were there some in the -- And I take it that that is a sand in between these coals?

A. That's a shale in between the coal. There is one that is not on this exhibit -- it's on B-B' -- that has some perforations that are not in the coal. It's the rightmost well. The story behind -- In fact, that was our initial well that we drilled in 1989 in this area.

The original perforations were from 1900 to 1910. Our thoughts at that time were that we were extremely worried about screenout on fracture stimulations.

So our attempt was to perforate the shale in between the coal, fracture-stimulate the shale with the hopes that the frac would extend both out horizontally and then break into the coal to provide a conduit for gas to go from the coal into the fracture.

Earlier this year we went into that well, perforated the coal itself, and restimulated that well. We saw a production increase of roughly 100 MCF a day after performing that treatment.

There was only two wells in this whole area

that we used that original technique on. The second well, it failed completely.

Q. And no acidization or any kind of stimulation?

A. We've gone into a couple of the wells and acidized them.

Two of the wells that are the subject of the hearing, the Bolack Number 9-1, Schwerdtfeger 17-1, both were refracture-stimulated with no success, one immediately after completion, that being the Schwerdtfeger 17-1. The Bolack 9-1 was restimulated this spring, and we saw no increase in production.

We had plans to do the third well, but we couldn't justify it.

Q. Now, once these wells are completed is there any water production associated with them?

A. There is some water production. Some of the wells produce up to 70 to 80 barrels a day. For the most part, after they've been producing for a couple of years, that drops down to five to ten barrels a day.

Some of the wells that we operate are on a pumping unit. We've got gas assist on a few, and some of them produce a low enough amount of water that they flow with no lift.

Q. And again on these three proration units or

spacing units, what is the plan for the original wells?

A. We're asking that we be allowed to leave the original wells as is, to monitor them -- or to use them as pressure-monitor wells. They will not be produced after the completion of the original wells.

Q. What time interval were those three wells on the existing proration units drilled and completed?

A. All three of those were drilled and completed in the fall of 1990.

Q. That's also the same time that many of the other wells were being completed; is that correct?

A. That's correct. The bulk of our drilling program in this area ran basically from June through October of 1990.

Q. Any possible connection with the use of drilling fluids, or was it drilled the same way?

A. They used the exact same drilling fluid system, cements were identical. There's nothing that stands out on these three wells that causes them to be different from a completion or drilling standpoint from any of the other wells in this area.

Q. Is production still going into the same line?

A. Yeah. In fact, we've got -- We operate well-head compression on all of our wells. We're drawing well-head pressures down to 15 to 30 pounds.

Gathering-line pressures are somewhere on the order of 100 to 150 pounds. The Schwerdtfeger 17-1 was never connected to sales. All the tests we have on that are 15- to 30-pound backpressure.

EXAMINER STOGNER: Any other questions?

MR. STOVALL: Yeah, I do have one on the Schwerdtfeger.

EXAMINATION

BY MR. STOVALL:

Q. The notice -- I think you made a statement that to the best of your knowledge those were the interests in Section 20 and 21 -- or no, I'm sorry, 20 and the west half of 17?

A. That's correct.

Q. What is the best of your knowledge based on?

A. It's a takeoff we had done, land takeoff.

Q. Okay, recently?

A. Yes, done by Schutz Abstract.

Q. You mean in preparation for this case?

A. That's correct.

Q. Okay, and you're satisfied you've notified everybody that has an interest in those undeveloped units?

A. Yes.

MR. STOVALL: No further questions.

EXAMINER STOGNER: You may be excused.

Mr. Kellahin?

MR. KELLAHIN: Nothing else in these three cases.

EXAMINER STOGNER: If nobody else has anything further in these three cases, Case Numbers 10,780, 10,781 and 10,782 will all be taken under advisement.

(Thereupon, these proceedings were concluded at 1:26 p.m.)

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CERTIFICATE OF REPORTER

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

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; 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 August 17th, 1993.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994

I do hereby certify that the foregoing is a complete record of the proceedings in the examiner hearing of Case No. 10780, 10781, 10782 heard by me on 29 July 1993.

, Examiner
Oil Conservation Division