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

3 August 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Pennzoil Exploration & Production Company for directional drilling and an unorthodox oil well location, Lea County, New Mexico. CASE 9450

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
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I N D E X

E X H I B I T S

MR. STOGNER: Call next Case Number 9450.

MR. STOVALL: Application of Pennzoil Exploration & Production Company for directional drilling and an unorthodox oil well location, Lea County, New Mexico.

MR. STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin and Aubrey. I'm appearing on behalf of the applicant and I have two witnesses to be sworn.

MR. STOGNER: Are there any other appearances?

Will the witnesses please stand and be sworn?

(Witnesses sworn.)

MR. KELLAHIN: Mr. Examiner, may the record reflect that Mr. Barr is already qualified as an expert geologic witness and continues to be so qualified in this case?

MR. STOGNER: The record will so reflect.

JIM L. BARR,

being called as witness and being previously sworn and remaining under oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Barr, let me have you take a moment and first of all orient the Examiner as to where the subject unorthodox location for Case 9450 is in relation to the previous case that we just completed discussing.

A Okay, this particular location her is approximately one mile west of the last case and the location that we were proposing in that case.

This well was drilled and TD'ed on Christmas Day of the past year. It is still in the Shipp Strawn Field.

Q When we look at Exhibit Number One, is this your work product?

A Yes, sir, it is.

Q And is this your recommendation to your management with regards to how to test and further develop the spacing unit that's the subject of this application?

A Yes, sir, it is.

Q Let's go and have you describe for the Examiner what you propose to do by way of a re-entry into

the State No. 2 Well to further test for Shipp Strawn production.

A This map that we have before you is like in the previous case. It's an isopach map of the Lower Strawn Lime. We're moving westward, so consequently, our regional thickness in the Lower Strawn Lime is getting thinner.

We drilled the well, the Pennzoil No. 1 State 2 and we encountered nothing but tight limestone in the Lower Strawn section. We did not even encounter a mound facies.

What we have on here, I've drawn three lines on here; it shows the seismic lines that we used in deciding the location of this well.

Now, there's a sequence to these lines. The line that runs northeast/southwest, more east than north, and the line that runs through the bottom or the -- target location, that runs southeast/northwest, those two lines were used in selecting the location of the Pennzoil No. 1 State 2.

After we encountered the dry hole the line that runs a little bit north, east of north, that goes through the well itself, was shot and it is that seismic used in connection with the other two lines that we have decided that we need the sidetrack and move this --

essentially sidetrack the well to the southwest.

Q So we're not confused by your explanation, Mr. Barr, would you take an extra copy of Exhibit One and simply number them in the sequence in which the lines were run?

A Okay.

Q What has been the sequence of the drilling among the three wells that are shown within the immediate area of this mound, being the Byers Pennzoil Well, the TXO well, and then the Pennzoil State 2 Well?

A The Pennzoil No. 1 Byers was drilled first.

Pennzoil No. 1 State 2 was drilled second and the third and most recent well was the TXO Producing No. 1 Penron Byers.

Q When we look at the TXO well, I see from the surface dot that there's a difference between the surface location and the bottom hole location for that well?

A Correct. It was deviated. It was controlled deviation to the north.

Q Where is that bottom location approximately in relation to the north line of its spacing unit?

A Excuse me, let me measure and make sure. It's going to be about 1050 feet.

Q So the distance to the spacing unit line

is about 330 feet?

A Correct. Maybe a little bit less than 330; about 300.

Q Somewhere between 300 and 330 feet?

A Correct.

Q That would put us at the bottom hole location for the TXO Well?

A Correct.

Q As best you know, where is the bottom hole location for the Byers well?

A Pretty much directly under the surface location.

Q Has that well been surveyed?

A No, it has not been. Looking at the deviation surveys taken by the contractor, we see no reason to think it's any appreciable distance off the surface location.

Q I know we have an engineer to talk about the directional drilling in a moment, but summarize for the Examiner at this point what is going to be the process for the re-entry into the State No. 2 Well and the directional drilling to an unorthodox bottom hole location.

A I really would like to defer that to an engineer.

Q Well, approximately what are you going

to do? Are you going to re-enter the State 2 Well?

A We're going to re-enter this No. 1 State 2 and as I understand it, we'll kick it off somewhere around 8500 feet and drill to a target location at the top of the Strawn at 11,330.

At that target location we hope to be within a 75-foot radius circle at 330 feet from the west line and 1600 feet from the south line.

Q Using that basis of reference from the engineers, Mr. Barr, tell us where that puts us in terms of a location within the mound development you've identified in this portion of the section.

A The target location designated by the X on the map is the location that we feel that will put us in at least 200 feet of thickness of mound facies and, hopefully, will give us a better reservoir facies and production of this west half proration unit.

Q What is your understanding of the working interest percentages with regards to the 80-acre spacing unit in the State No. 2 Well?

A The State No. 2 Well, this is a 50/50 working interest unit between Pennzoil and Chevron.

Q And when we move over to the spacing unit for the Pennzoil Byers Well, does that working interest percentage remain the same?

A Yes.

Q When we move to the TXO well, that's a farmout by Chevron and Pennzoil to TXO?

A Correct.

Q So you have interests in that well?

A Correct.

Q All right. Describe for us why you have recommended the re-entry so that you can obtain a new bottom hole location as proposed.

A Well, to re-enter this hole we'd want to essentially produce the west half proration unit of this section, and by doing the sidetracked hole, based upon the seismic and the geologic data, especially the dipmeter survey, we feel that our best, optimum location is where we have the X on the map.

Q Where is the closest standard location?

A The closest standard location would be the circle around the Pennzoil No. 1 State 2. That is a 150-foot radius circle.

Q If we look to the closest standard location in the southern 40 of that stand-up 80 --

A Correct.

Q -- where would that place you on your isopach contours?

A It would place us below 180 feet.

Q And that would put you in a similar position on the pod as the dry hole, the State No. 2 Well?

A Where it would be in the tight facies.

Q Do you have an opinion, Mr. Barr, as to whether Pennzoil gains an unfair advantage over the other operations in the adjoining spacing units for the Byers and the TXO wells?

A I do not think that we're gaining unfair advantage. I think we are protecting the correlative rights and we're only encroaching upon ourselves.

Q The additional information, then, between the State No. 2 dry hole is the third seismic line --

A Yes, sir.

Q -- that runs more north and south than any of the other lines?

A Correct.

Q And what information did you get?

A Well, it showed us that we needed to change the location and we felt like it would be better to deviate the hole to the southwest, and this is based upon that new seismic line.

Q As a result of the notifications to all other interested parties, are you aware of and have you received any objections from any other participants?

A To the best of my knowledge we have no

objections.

MR. KELLAHIN: That concludes my direct examination of Mr. Barr.

We'd move the introduction of Exhibit Number One.

MR. STOGNER: Exhibit Number One will be admitted into evidence at this time.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Barr, in looking at that TXO well, was that well originally drilled vertically and then plugged back and directionally drilled, or was it intentionally directionally drilled in the first place?

A It was intentionally directionally drilled in the first in the first place and it was with our approval, meaning we, Pennzoil and Chevron, that they could deviate that well to the bottom hole location that it now occupies.

Q What does Chevron have to do with this application

A Chevron and Pennzoil formed a working interest unit consisting of the southeast quarter of Section 3 and the southwest quarter of Section 2. We have a working interest unit of that two quarter sections.

Q How does TXO fit in this unit?

A We gave them a farmout on the south half of the southeast quarter of Section 3 for the drilling of that well.

MR. STOGNER: I have no further questions of this witness.

He may be excused.

Mr. Kellahin?

RANDY HODGINS,

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

DIRECT EXAMINATION,

BY MR. KELLAHIN:

Q Would you please state your name and occupation?

A I'm Randy Hodgins. I'm an engineer, petroleum engineer, employed by Pennzoil Company.

Q Mr. Hodgins, have you previously testified as a petroleum engineer before the Oil Conservation Commission of New Mexico?

A Yes, I have.

Q And pursuant to your employment by your company have you made a study of certain of the engineering

facts surrounding the re-entry and the directional drilling or deviation of the wellbore for the State No. 2 Well in Section 2?

A Yes, I have.

MR. KELLAHIN: We tender Mr. Hodgins as an expert petroleum engineer.

MR. STOGNER: Mr. Hodgins is so qualified.

Q Let me direct your attention to Exhibit Number Two and before we describe and discuss in detail the information on the exhibit, tell us what we're looking at.

A This is a directional -- two plan views of our directional drilling program which I did not draw myself but I supervised.

Q When we look at the righthand portion of the display, we're looking at a plan view that looks horizontally down on the well?

A That's correct.

Q And we look at the plan view on the left of the display and that's a vertical section of the well?

A Yes.

Q Would you go through, and let's start with the plan view from -- the overview on the right?

A Okay.

Q Take you at the surface location, which

is 1980 from the south and 660 from the west, and describe for the Examiner what you propose to do, Mr. Hodgins.

A The plan view primarily shows the surface location and the direction required to get to our proposed bottom hole location.

It also shows the lease line to the left there, it's got the little hatched marks on it.

Q What is the horizontal scale at the bottom of that portion of the display?

A One inch is equal to 100 feet.

Q And so the zero footage line is at the surface location and we move from right to left and read the footages as you get to the bottom hole target?

A That's correct, and it also has along with that the distances relative to the surface location. It has distances relative to the base line.

Q When we look at the vertical scale on the left margin of the plane view portion of the display, stay with me now, move back to the right. On the righthand half of the display, those numbers running from zero down to 600?

A Yes, sir.

Q Yeah, what are those?

That's -- that's showing the distance from the surface location. It's a distance of 600 foot

towards the south line.

Q Again we're looking at surface numbers as opposed surface and subsurface numbers.

A Right.

Q We're looking the surface horizontally?

A That's correct.

Q Where would you propose to start the directional drilling of the well, at what vertical depth?

A There is an existing State 2 No. 1, which is plugged. We plan on re-entering this well, which was drilled just over a year ago, and drill out the plugs down to a depth of 8500 feet and start our directional program at 8500 feet, true vertical depth.

Q To see your directional program, then, we can look at the far left portion of Exhibit Number Two and see the vertical section?

A That's correct.

Q And when we find that information at 8500 feet, what are we looking at at that point?

A The vertical section is designed to show the angle required to accomplish the displacement needed to reach the proposed bottom hole target.

At the depth of 8500 foot it shows the KOP, which is the kick-off point where we intend to deviate from the existing wellbore and build our angle to approxi

mately 11.65, 12 degrees and hold that angle to TD to reach our target.

Q Describe for us the drilling mechanics of accomplishing the angle between 8500 feet down to where you continue to drill a straight hole again at that fixed angle, where you hit about 9300 feet? How do you accomplish that?

A We plan on using what's routinely done for a re-entry or a sidetrack like this, by picking up a downhole motor for the bent sub and kicking right off at 8500 feet and monitoring that -- monitoring that drilling with a steering tool which tells us the direction we're going, as dictated by plan view, and also our angle. Once we get our required angle, we will then go back to just conventional drilling, holding that direction and angle till we get to our target, which is going to be from the time you finish making your motor run, which we anticipate will be a 3 - 500 feet motor run, from there on down it will be just conventional drilling which will be 3000 more foot of just regular vertical drilling.

Q How do you monitor the, or survey the angle and location of your directional drilling?

A As I mentioned, while we have the -- during the critical part of the -- of kicking the well off, we have a steering tool in the hole, which is just a tool

run on wireline which monitors your azimuth direction angle on a continuous basis. Once we have our well kicked off we will then go to regular directional-type single shots while we're drilling, taking a picture every 2-to-300 feet.

Q When you hit the top of the Strawn formation what is your estimate of where you will be in terms of the true vertical depth of the well?

A We anticipate the top of the Strawn at a depth of 11,330 true vertical depth.

Q And what will be the total depth of the well?

A We are projecting a total true vertical depth of 11,850; a measured depth of 11,910.

Q At the top of the Strawn formation at approximately 11,330 feet, where will that put you in terms of the location to the south and west lines of your spacing unit?

A It will put us at our proposed bottom hole location of 330 feet from the west line and 1600 feet from the south line.

Q Around that point you have rcommended or requested a 75-foot radius target.

A Yes, we have.

Q What's the basis and reasoning for that request, Mr. Hodgins?

A For a well to this depth we feel like that's a reasonable target, and I would like to go back to our -- to further explain that I would like to go back to our use of our motor. Ideally, we'd like to get this thing kicked off with one motor run back up at 8500 feet to get your get your -- to get your required angle, to get your required direction. You hold those until you get to the target, so essentially what you're doing, you're pointing the hole to where you want to go 3000-foot away and we feel that a 75-foot radius target is reasonable.

Q To control the bottom hole location to a smaller radius target would require what magnitude of expenditure and effort on behalf of your company?

A Well, it's actually hard to say until you actually get there, but the smaller the target, the more possible operationally it's more difficult and it may require more motor runs, which in turn puts more doglegs in your hole which could not only be more expensive but that's the most expensive part of the directional drilling operation when you're drilling with a motor.

It could also give you problems later on down the line with -- considering this is an oil well, and one day it's going to be run on pump.

Q In terms of an expense can you approximate for us on a daily basis what it costs to monitor

survey and run a motor run to change the angle and direction of drilling?

A I would estimate that the cost of the motor, the cost of the required steering tools, survey equipment, cost of the rig, you're probably going to be looking at around $20-to-$25,000 a day.

Q In terms of budgeting money for the well, how many days have you budgeted for the downhole motor operations and the directional drilling portion of the -- of the re-entry?

A The actual on-bottom time with the motor we don't anticipate it to be more than -- having to drill more than 5, 3-to-500 feet, which would probably be around 48 hours, 2 days.

The actual drilling of the well we anticipate is probably going to be around 44 days.

Q Have you studied the production from the Byers well and the information available from the TXO well?

A Yes.

Q Are both those wells currently producing the 80-acre oil allowables that are assigned to those spacing units?

A Yes, they are. We consulted our buyers approximately a year ago. We drilled in August. Date of first production was in September. We come on line with

full top allowable for the Shipp Field at 445 a day.

And TXO just recently completed their well. Their well, just like ours, come on line, top allowable 445 a day.

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

We move the introduction of Exhibit Number Two, Mr. Stogner.

MR. STOGNER: Exhibit Number Two will be admitted into evidence.

CROSS EXAMINATION

Q Mr. Hodgins, do you know what true vertical depth that the production in this particular well in which you're proposing to hit?

A I would need to consult Mr. Barr, our geologist, on that for a moment.

Q All right, and I'll open the question up again.

MR. BARR: We drilled into the top of the Strawn and I think we were something like 3 feet into the Strawn Lime before we hit the actual facies, the reservoir facies. So I would say that we're probably on somewhat of the same order, so we will be around 30 feet into the top of the Strawn Lime from the top of the Lower

Strawn Lime. We should anticipate hitting the reservoir about 30 feet in.

Q Well, give me some true vertical --

MR. BARR: True vertical depths, let's see. The target is the top of the Strawn which is actually the top of the Lower Strawn Lime. The true vertical depth would be 11,330 feet, so true vertical depth on the reservoir, we'd add 30 feet to that, 11,360.

Q And what is the thickness you propose to see or plan to see?

MR. BARR: In this particular well here we had 226 feet, I believe, from my -- 226 feet of reservoir, and the reservoir in this particular case is (unclear) sand, and so we had porosity of 226 feet better than 4 percent porosity.

And you can see there as we get off the mound, from the core of the mound, looking at the TXO Penron Byers, you have 32 feet decrease in reservoir thickness, so we could probably be looking at the same amount of decrease in -- excuse me, excuse me, I have to back up.

226 feet is the total thickness of the -- of the Lower Strawn Lime, 194 feet. And within the Pennzoil No. 1 Byers the total reservoir thickness, that was 96 feet, if I remember correctly.

Q Okay, then why are you proposing to drill past 11,586 feet? That's what you're proposing to bottom out of your producing zone, is that correct?

MR. BARR: Yes. We also would like to go down and look at the Atoka Sand to see if it has any potential down the road, you might say.

Q Okay, what is the top of the Atoka?

MR. BARR: I'm going to estimate -- I'm going to estimate because I'm having some variance in thicknesses, and there is some variance in this, I'll say the top of the Atoka Sand is going to be 11,666, plus or minus, true vertical depth.

Q Okay, according to your Exhibit Number Two, then, what you're proposing, your Strawn test would be, if you hit the center of your 75-foot target area, would be within the 75-foot tolerance through the whole vertical extent of the Strawn, is that correct?

MR. BARR: Correct.

Q And the Atoka is a whole different matter.

MR. BARR: Yes. We did not take it -- the original hole through the Strawn sand and it was a mistake, hindsight shows us now. We should have taken it on down even though we knew we had a dry hole. We should have taken it on down.

Q Okay, thank you, Mr. Barr.

Mr. Hodgins, do you propose to determine what your kickoff point actually is in this hole before you do kickoff?

A The kickoff point is a predetermined point which we can decide that now before we actually start the directional drilling operation. There is an existing plug, a cement plug, at 8500 feet. We intend to use that plug to kickoff from .

Q Okay, well, what -- what is the location? What is the true location of that particular kickoff point now?

A We feel that it's right under the surface location.

Q How long have you been a drilling engineer, Mr. Hodgins?

A Eight years.

Q Have you ever seen a true vertical hole?

A I haven't seen very many past the rotary table.

Q Is that correct? Okay. So you will determine what the true position of that hole is, is that correct?

A Mr. Stogner, the first operation will be to run a survey on the existing hole and this plan here is

the zoning plan and it will be revised to get to that location we're asking for.

Q Okay.

A The drilling records from the contractor, the TOPCO, which are not magnetic surveys, they showed the hole to be relatively straight, and we've assumed that it is straight.

Q We all like to assume that they're straight. Okay.

A I would also add that if we knew where a lot of these holes are in the Shipp Area we might be surprised. We make it a routine part of our drilling operation now to survey our holes.

Q What have you seen as the natural tendency of a hole to drift in this area, Mr. Hodgins?

A In this particular area?

Q Yeah, when I say this particular, the Shipp Strawn area. You all have drilled 16 wells out there, is that correct?

A It varies within the Shipp Strawn area, but this location, we anticipate the well will have a natural tendency due north.

Q Do you find that to be over the whole Northeast Lovington and Shipp Strawn area?

A No.

Q To the north?

A No, we do not.

Q Do you find it to be --

A It varies. It varies from well to well, but this one, we drilled several wells right in this immediate area and we -- we feel comfortable that it will try -- it will try to go north.

Q And if that be the case, then your -- you're looking at a more deviated hole with your downhole motor, is that correct?

A Let me further clarify that. There's a depth that we have a problem with this deviation. That depth is in the Abo-Wolfcamp, down in that area, and we don't usually have any problems until we get to a depth of around 8800 feet. That's -- that's where the wells always go north in this immediate area.

Q Oh, so you -- okay. That's usually where you find the severe or the pronounced deviation portion.

A Yes, sir.

MR. STOGNER: I have no further questions of Mr. Hodgins.

MR. BARR: Mr. Examiner.

MR. STOGNER: Yes, sir.

MR. KELLAHIN: Mr. Barr mis-

spoke. It's 16 wells in the Shipp and Lovington areas. There are two areas.

MR. STOGNER: Okay. I have no further questions of either witness.

Are there any other questions of Mr. Barr or Mr. Hodgins?

They be excused.

Mr. Kellahin, do you have anything further in this case?

MR. KELLAHIN: No, sir.

MR. STOGNER: Case Number 9450 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. 9450, heard by me on 3 August 1988.

Michael E. Stogner, Examiner
Oil Conservation Division