STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISON
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

26 August 1987

EXAMINER HEARING

IN THE MATTER OF:

Application of Horizontal Recoveries Specialist, Inc. for a horizontal directional drilling pilot project, special operating rules therefor, and two unorthodox gas well locations, Rio Arriba County, New Mexico. CASE 9205

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

E X H I B I T S

MR. CATANACH: Call next Case Number 9205.

MR. TAYLOR: Application of Horizontal Recoveries Specialist, Inc., for a horizontal directional drilling pilot project, special operating rules therefor, and two unorthodox gas well locations, Rio Arriba County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: If the Examiner please, I'm Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant.

In association with me is Mr. Richard Ellis, an attorney and a member of the Colorado Bar. Mr. Ellis, with your permission, is going to make the presentation on behalf of the applicant.

I believe there's one witness to be sworn.

MR. CATANACH: Okay. Any other appearances?

Will the witness please stand to be sworn in?

(Witness sworn.)

MR. CATANACH: You may proceed.

MR. ELLIS: Mr. Catanach, Horizontal Recoveries Specialist, Inc., is seeking an order approving unorthodox locations and a deviated drilling program so that they can develop economic natural gas reserves in the Fruitland Coal.

At the present time we consider this program to be a pilot project. There are certain things, such as the eventual bottom hole locations of these wells and the surface locations that are necessarily tentative at this point. The application, therefor, seeks approval for a surface and bottom hole location geometry that represents the minimum setbacks that are going to occur in this situation. In other words, that would be the maximum unorthodox position that we expect these wells to occupy within those proration units that we'll speak about in a moment.

I'd like to refer, first of all to Exhibit Number One. It's entitled the Ownership Map, prepared by Horizontal Recovery Specialists, Inc.

I've highlighted on that ownership map the proration units that Horizontal will set up to drill these two holes, one of which is the southeast quarter of Section 20; the other is the northwest quarter of Section 28.

Horizontal has given notice to all the offset owners, these offset owners being Meridian in Section 29. I apologize for not marking the individual section numbers, but Section 29, Meridian; McHugh and Associates in Denver, who also operates under the name of Kindermac Partners. Those would be the offset owners in Section 27. The BLM, who has unleased mineral interests in the west half of Section 22, and then Dugan Production Corp., which has the offset interest in Section -- east half of Section 28.

Now, we have two offset parties that were not notified within the actual 20 day period prior to the hearing and we've requested -- excuse me, one. We've requested a waiver of the notice requirement from them and they're included in the case file. We'd like to request that administrative notice be taken of those -- of that particular waiver at this time.

We'd also request that administrative notice be taken of a letter that was written on behalf of Dugan Production Corp. by John Roe, their Engineering Manager. It was mailed to the Commission supporting our application, and --

MR. CATANACH: Administrative notice will be taken of the waiver letters taken from the case file.

MR. ELLIS: Thank you.

We'd like to call our first witness, Mr. Bernard J. Mahoney, Senior.

BERNARD J. MAHONEY, SR.,

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

DIRECT EXAMINATION

BY MR. ELLIS:

Q Mr. Mahoney, can you state your name and occupation, please?

A My name is Bernard J. Mahoney. I am a petroleum engineer.

Q In what connection or what is the connection you have between Horizontal Recovery Specialists and yourself?

A I created Horizontal Recovery Specialists and the -- I operate Horizontal Recovery Specialists.

Q Are you familiar with the application that we have put before the Commission on behalf of Horizontal Recovery Specialists, Inc.?

A Yes, I am, uh-huh.

Q When and where did you obtain your degree in petroleum engineering, Mr. Mahoney?

A I obtained my degree through the New Mexico School of Mines in 1952, a Bachelor of Science in petroleum engineering.

Q Have you previously testified before this Commission and have you been qualified as an expert petroleum engineer?

A Yes. Yes, I have.

MR. ELLIS: I would tender Mr. Mahoney as an expert petroleum engineering witness.

MR. CATANACH: He is so qualified.

Q Mr. Mahoney, I'd like to go through with you why you've, you know, made the application to the Commission for approval of the unorthodox locations and the directional drilling program, and in that connection I'd like to refer to Exhibit Number Two.

Okay, could you please for the Commission describe the proration units that you'll attempt to set up?

A Well the first proration unit will be in the southeast quarter of Section 20 and this will be 160 acres. We would like to drill this well in a southeast -- the horizontal portion of the well in the southeast direction of approximately 135 degrees from north.

We would like to extend this well 15 feet or 100 feet horizontally into the Fruitland Coal formation.

In order to do this we would have to locate the vertical well in the northwest corner of this southeast quarter.

Also, another reason for having it up there is because of the terrain. It offers us a rather flat spot to drill the well.

Does that answer the question?

Q Well, what -- could you make the same kind of description then for Section 28?

A Yes, the same things, and there in 28 we're wanting to drill in the northwest quarter of Section 28, and we're wanting to drill a 1500 foot horizontal hole there, also.

In order to get to the point where we can drill horizontal, we will have a deviated hole 470 feet out from the true vertical. In other words, we'll have a 470-foot radius of curvature to get out to 90 degrees where we can drill a horizontal hole. So that pretty well requires that we -- we drill it in the southeast direction.

Q What are the proposed footages on your two surface locations and also on your two bottom hole locations that you've put in your application?

A The surface locations?

Q Surface and bottom hole footages that you've put in your application.

A Surface and bottom hole.

Q The actual footages.

A You're talking about footages from the lease lines?

Q Yeah.

A Oh, well, in our application we originally wanted to have 660 from the north and west lines of this southwest -- or southeast quarter in Section 20. That would allow us to drill out in the 135 degree asimuth to within -- given our 1500 foot, we would still be within 600 feet of the bottom of the hole, that is the end of the horizontal hole would be within 600 feet of the southeast lease line there.

Q And how about in Section 28?

A In Section 28 we would like to be 660 from the north and 660 from the east line of Section 28 to facilitate the same type of operation and we could drill at 135 degree azimuth.

Q Okay. Based on your current knowledge of the situation in there, if there's a need to adjust the surface and bottom hole locations at some future point, perhaps because of archaeology or some additional topographic problem we're not aware of, will that adjustment result in the locations being more or less unorthodox than is proposed in this?

A It would result in them being more

orthodox than the -- than the requested 660 from each line.

If we have to move the locations because of archaeology we will come closer to the required 790-foot lease line spacing.

Q Okay.

MR. ELLIS: Mr. Catanach, we'd request an administrative procedure to incorporate some new footages other than the ones that are specified in the application, you know, as long as they're less unorthodox at the point at which we are able to, you know, actually get the locations staked.

MR. CATANACH: What affect will that have on the bottom hole locations if you have to move the surface locations?

A If we have to move the surface location, it shouldn't have any affect on the bottom hole location. We'll just have to shorten it.

MR. CATANACH: Okay, we could probably put a provision in the order whereby you could probably get administrative approval if you had to change those.

MR. ELLIS: As long as it's less unorthodox. Okay. Thank you.

Q What's the significance of the dotted line between the surface and bottom hole locations on

Exhibit Number Two?

A That's the approximate path of the horizontal hole and the deviated hole from the vertical well.

Q If we could refer to Exhibit Number Three at this point, could you describe, first of all, what this exhibit is?

A Figure Number Three is a schematic well diagram of the well as we hope to drill it.

We have here -- we would like to drill a 17-1/2 inch hole to approximately 300 feet and set and cement 13-3/8ths casing.

Then we would like to drill down to approximately 2550 feet with a 12-1/4 inch hole in which we would run and set 9-5/8ths casing at 2500 feet and cement the outside of this casing back up to approximately 1500 feet from the surface.

Then we would like to drill out with an 8-1/2 inch hole and drill a 470-foot radius of curvature hole out from under the 9-5/8ths to a point where it would be at 90 degrees in the -- in the Fruitland, which would be at approximately 3050 feet.

Now, this horizontal hole I have on this sketch is not to scale, but it gives you a general idea of what we do.

And then when we drill this hole out ap-

proximately 1500 feet horizontally, we would like to run a 5-1/2 inch slotted liner and hang this liner in the bottom of the 9-5/8ths.

We would not cement the liner. We would not, possibly not, treat the well.

Q Okay. Is this wellbore diagram you put into Exhibit Number Three also applicable in form, although not in exact depth, to the --

A Yes, it's applicable --

Q -- well you're going to place in Section --

A It's applicable in form but I understand our surface location is much higher, so we'll have to drill deeper before we set the 9-5/8ths and, of course, our Fruitland target will be deeper, too, but it's just because we have so much more overburden on that next location in 28.

Q The approval by the Commission, therefor, of your unorthodox locations and your directional drilling program is necessary to accomplish the objectives of this project.

A Yes, it is. We may be able to, for all I know right now, be well inside of your regulated limits of 790 feet from lease lines. We -- we want to, however, have the option in the event we're not within those regulated distances, to be able to go ahead and get your approval to

drill the well at something besides regulated distances.

Q In your opinion, Mr. Mahoney, at this time is there any evidence that the approval of the unorthodox locations and the directionally drilled bottom holes will adversely affect the correlative rights of any offset owners or create waste of any kind?

A No, in my opinion it will not affect the correlative rights of offset operators, not will it affect -- nor will it incur waste.

Q Were Exhibits One through Three prepared by you or someone under your direction?

A They were prepared by someone under my direction.

MR. ELLIS: We'd move to introduce the Exhibits One through Three at this time.

MR. CATANACH: Exhibits One through Three will be admitted into evidence.

MR. ELLIS: Okay. That concludes our direct testimony of Mr. Mahoney.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Mahoney, is it my understanding that you're not sure what the bottom hole locations are going to be?

A Not exactly. It's a little difficult to say at this time because we, although we have tried to get out there several times, the weather has prevented it. We haven't been able to get an archaeologist out there and you're familiar with that problem.

In addition, the -- while we feel that we can hit a target with our deviated drilling technique, a lot of things can happen that would either prevent us from reaching that distance or possibly ending up with a slightly different azimuth.

Q So are you proposing that we be able to administratively approve a bottom hole location that's closer than the regulated?

A I don't believe we'll be any closer to those lease lines than 600 feet. We may be, and the answer to your question is yes.

Q Mr. Mahoney, is this -- is this your first attempt at this type of well completion?

A Yes, sir.

Q It is. How will that -- have you calculated how that will affect the ultimate recovery in those proration units? Is there any way to tell?

A Well, not really, there's no way to tell. I think you can -- if you have some idea what a vertical well would do, you can take a stab at extrapolating that

figure. Say, if you had, say, 70 feet of coal in a vertical well, compared with 1500 feet in a horizontal well, and with 70 feet you got a million cubic foot, why, with 1500 you could extrapolate it out, but we're not at all sure that it would work that way.

There have been, and these horizontal wells have gone out like 1400 feet from vertical, 1500 feet from vertical, there have been production increases as many as 20-fold in -- in oil reservoirs, and in tight gas sands I know of production increases of 5-fold. Generally you -- you will complete your -- the production life will not last as long in a well like this as it does on a vertical well but it will -- it will produce as much or more oil or gas in a much shorter time. So it prevents waste doing that.

There have been attempts by engineers other than myself to anticipate what their production would be and it's usually a guess because what everything depends on, one of the things that a great deal depends on, is how many vertical fractures you might cross in your horizontal hole, and as you cross these vertical fractures, why gravity -- a drive mechanism that we call gravity drainage begins to enter the picture and so it's rather difficult to tell how much production increase you're going to have, but I think it's a certainty that you're going to have a production increase.

Q Is it my understanding that you intend to produce it up the casing, is that correct?

A No, sir, you're looking -- we would -- I'm not sure how we would produce it. We would probably run tubing and a packer in there.

Q Say to the bottom of the 9-5/8ths or something?

A Well, somewhere around there, down below the cement top anyway.

We may even have to pump this well. As you know, the Fruitland Coals sometimes make water and that being the case we would have to have tubing all the way down into the -- to the end of the liner.

Q Has that been done before?

A I don't know for sure. A lot of companies that have done this haven't gone into the techniques they've used to produce the wells, but I know through my own experience that you can -- you can artificially lift a well when it's awfully crooked. While this is going to be a deviated hole, we hope it won't be crooked. We won't have doglegs or anything like that.

We may not be able to pump it with a conventional rod system but there's other ways of pumping.

Q This is not a prorated pool, is it?

A Not to my knowledge.

MR. CATANACH: Frank?

QUESTIONS BY MR. CHAVEZ:

Q Frank Chavez, Aztec Office of OCD.

Mr. Mahoney, from your drawing it appears that the entire horizontal portion of the hole will be open to the wellbore, is that correct? Your 5'1/2 slideover will not be cemented in, is that correct?

A That's correct.

Q So when we say bottom hole location on your Exhibit Number Two, that actually is only the end of the hole, it isn't necessarily where the production will come from. The production will be from the entire horizontal portion, is that correct?

A That's correct.

Q Is there any reason why your proposal on your Exhibit three does not show cement circulated to the top of the 9-5/8ths casing, is it, (unclear) do not circulate the cement?

A It's economic preference, that's all, just the cost of cementing it; possiblity you may want to go in there in a few years and recover the casing.

Q Would you have a conventional liner hanger -- conventional type of liner hanger for the 5-1/2 to the 9-5/8ths?

A No, sir, it would not be conventional. It would just be centralized casing just set right there in that and it would be centralized so it would be in the middle of the T. If you cement that pipe in there you've always -- always removed the option of completing the well vertically. And there's really no need to cement that pipe in there because there are other Fruitland stringers, Fruitland coal stringers up the hole that we can drain at the same time that we're draining the basal Fruitland section.

Q So you're looking at Fruitland gas within the area of curvature itself?

A Yes, sir.

Q Thank you. That's all I have.

MR. CATANACH: Are there any other questions of this witness?

RECROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Mahoney, what's the minimum distance that you would be, that you think you would be from the -- from the outer boundary of the lease, the bottom hole (unclear)?

A The minimum?

Q Yeah.

A Or the --

Q What's the closest you think you could get?

A That I think I could get?

Q That you think you would get.

A Oh, okay, that I would get. I'd control it so it would be no closer than -- than 600 feet. We have -- we will be surveying this thing every foot of the way.

Q So that's what you're really looking at, targeting?

A Yes, sir, and we have state of the art tools that can pretty well hit that target.

Q Okay.

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

MR. CHAVEZ: One, one more.

QUESTIONS BY MR. CHAVEZ:

Q Mr. Mahoney, are you aware that the standard setback for a gas well location in the San Juan Basin is 790 feet --

A Yes, sir.

Q -- from any of the boundaries? So you're asking for permission to go as close as 600 feet?

A 660 feet.

Q 660 from the end of the hole to the

boundary or from the surface location --

A From the surface location to the boundary.

Q Okay, now the end of the hole if it was drilled horizontally would be at what distance from the drill tract, the 160?

A I beg your pardon?

Q The bottom hole location or the end of the hole would be at what distance from the drill tract boundary?

A We're asking that we be allowed to drill within 600 feet of these lines. We don't have to. We can go to 660 and still get a 1500 foot hole in there.

What we're asking for is, you know, there are some things that are unforeseen and we're just asking for leeway to where if it's necessary to get within at least 1500 feet we can go within 600 feet of these lease lines.

I don't think that we're realy need to get that close.

I had the calculations and I don't have them with me now but we have plenty of -- of room out here, I think around 2100 or 2200 feet from the 790 location to -- to the 660 on the southeast corner here, to put our 470 degree radius of curvature and still get 1500 feet.

We're just, you know, there's a lot of

things that could happen in this sort of thing and we're just asking, for one thing, our surface location might be in such a position that we -- we're a lot further away from the north and west lines than we think we will be and we have no control over the surface location, and what we're doing is asking the Commission's indulgence and approval to go out there with the archaeologist and do the best we can about setting this location, but still be able, if necessary, if necessary, to be able to drill within 600 feet of the south and east lines of this quarter section. Or west -- yeah, east line there, if necessary. It may not be necessary.

Q Yes.

RECROSS EXAMINATION

BY MR. CATANACH:

Q Let me ask you this. What's the importance of 1500 feet in the well?

A 1500 feet could very well be a good economic incentive. If we had to shorten it to 1400 feet, it wouldn't make a whole lot of difference, but we believe that technically, that 1500 feet is achievable and when you -- you want to get as much as you can. You don't want to go out there and drill 1200 feet and quit if everything is going right. You want to do the best that you can, and we

feel like we can easily -- we can easily get 1500 feet and that we can do it within the confines of your rules and regulations; however, we are asking that you indulge us in the event it's necessary and we're asking for this leeway at this time before we -- we thought we would have the surveying done. We thought we would have the archaeology done, and we went out there to do it and the weather just prevented it. We just couldn't get out there.

Q What's run on that well, a directional survey, a continuous --

A I beg your pardon?

Q Is that a continuous directional survey that's run on the well?

A That's running the well?

Q That's run on the well while you're drilling?

A We use MWD equipment that every 15 seconds flashes the azimuth and deviation to the surface, and we have equipment on the surface that -- where this is digitized.

So you have a continuous survey. With that flashing that every 15 seconds, why, you begin to -- if you hit a soft spot and you begin to deviate, why, you can correct that immediately. You don't have to, like with a multi-shot you might not want to run it but every 30 or 60

feet, or something like that. You'd have to shut down your operations to run it. And if you had, if your bit had wandered off from the desired direction you'd have to start making -- you'd have to start doing other things to correct it and get it back where you want it.

But with the MWD we can more or less have a constant monitor on our azimuth and deviation.

Q Okay.

MR. CATANACH: I think that's all the questions I have at this time.

Are there any other questions of the witness?

He may be excused.

MR. ELLIS: One more question, if I may.

REDIRECT EXAMINATION

BY MR. ELLIS.

Q Mr. Mahoney, your -- your application before the Commission, then, is to seek the indulgence, their indulgence with respect to the approval of the bottom hole location at a point no closer than 600 feet from either the east or the south lines in denomination of the area.

A That's correct.

Q Okay.

MR. ELLIS: Thank you. That's all I have.

MR. CATANACH: Is there anything further in this case?

If not, Case 9205 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 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. 9205, heard by me on August 26, 1987.

David R. Catanach, Examiner
Oil Conservation Division