NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10924

IN THE MATTER OF:

The Application of GECKO, Inc., for Directional Drilling and Unorthodox Oil Well Surface and Bottomhole Locations, Lea County, New Mexico.

BEFORE:

DAVID R. CATANACH

Hearing Examiner

State Land Office Building

March 3, 1994

REPORTED BY:

CARLA DIANE RODRIGUEZ
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

ROBERT G. STOVALL, ESQ.
General Counsel
State Land Office Building
Santa Fe, New Mexico 87504

FOR THE APPLICANT:

KELLAHIN & KELLAHIN
Post Office Box 2265
Santa Fe, New Mexico 87504-2265
BY: **W. THOMAS KELLAHIN, ESQ.**

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EXAMINER CATANACH: We'll call the hearing back to order at this time and call Case 10924, the application of GECKO, Incorporated, for directional drilling and unorthodox oil well surface and bottomhole locations, Lea County, New Mexico.

Are there appearances in this case?

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

EXAMINER CATANACH: Additional appearances? Okay. Will the witness please stand to be sworn in.

MR. KELLAHIN: Mr. Examiner, this is an attempt by GECKO to drill a well in the Casey-Strawn pool. Casey-Strawn is an oil pool on 80-acre oil spacing.

For your reference, I made a copy of the pool rules. In addition, there's a copy of order R-10040, which is the prior order in this matter.

The subject well was originally located at a nonstandard surface location. Casey-Strawn oil pool rules require that wells at standard

location be located within 150 feet of the center of a 40-acre tract. This well was located too far north to the north half of the northeast of its spacing unit. It was commenced, and then we had a hearing before Examiner Morrow.

As of the date of the hearing, we advised Examiner Morrow that the well was not commercial as drilled, at that location, so the application was dismissed.

Since then, GECKO has decided to reenter this well and to directionally drill it to a proposed bottomhole location in the same spacing unit. However, in this instance, we will still be outside of the 150-foot drilling window. We're going to be located too far to the south of the spacing unit. We're about 386 feet away from the south side of the 80-acre tract.

We're asking for a drilling/producing window that gives us the tolerance to complete this well with a hundred-foot radius bottomhole within a target area, as defined in the application.

My witness is Steve Thompson. Mr. Thompson is a petroleum engineer. He also has credentials in geology. He is the president,

managing officer, if you will, of this company, and I tender him as an expert.

STEVE L. THOMSON

Having been first duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

Q. For the record, Mr. Thomson, would you please state your name and occupation?

A. My name is Steve Thomson. I'm president of GECKO, Incorporated, in Midland, Texas.

Q. Summarize for us your education, sir.

A. I received a B.S. in chemical engineering in 1979, from the University of Texas, a B.S. in geology in 1984, from the University of Texas, and an MBA in finance in 1989, from the University of Texas.

Q. Is this proposed well and the spacing unit, a well that is under the operation of GECKO, Inc.?

A. Yes, sir.

Q. Are you directly responsible for and have knowledge about the technical aspects of this case?

A. Yes, sir.

MR. KELLAHIN: We tender Mr. Thomson as an expert geologist and engineer.

EXAMINER CATANACH: Mr. Thomson is so qualified.

Q. Let me have you start, sir, by taking Exhibit No. 1, a copy of the Division Form C-102, and, for the record, describe for us what your plan is.

A. Okay. As Mr. Kellahin said, Exhibit No. 1 is a copy of C-102, surface location plat, that shows the surface location as the well was originally drilled, and 500 feet due south from the surface location shows the proposed bottomhole location.

Showing the proposed bottomhole location 500 feet due south of the surface location, really surmizes what the plans are for this well; that is, to kick the well 500 feet to the south of the present location.

Q. All right, sir. Identify for the record what we gave marked for introduction as Exhibit No. 2.

A. Exhibit No. 2 is an internal memorandum from a staff geologist that works for me, Don

Mozynski's his name. It's written to Benny Barton, who is the principal of GECKO and not to me, but this is his description and attempt to model the stratigraphy of the well as it was drilled, based on some rotary side wall cores that were extracted from this wellbore.

MR. KELLAHIN: Mr. Examiner, Exhibit 3 is a photocopy reproduction of a composite display we're about to generate for you. The photocopy shows a structural interpretation, and then an isopach superimposed upon that, that gives you the interpretation as to the dimensions of the reservoir.

What Mr. Thomson and I propose to do is start with a larger copy of that display on the board, and walk you through the technical aspects of why he's proposing to try to target in the reservoir approximately 500 feet to the south.

Q. (BY MR. KELLAHIN) If you'll refer to the display, which is the base map for Exhibit 3, Mr. Thomson, identify for us what we're looking at.

A. I'll start out with the exhibit. This is a map of what we call our Love East Prospect Area. Section 35, where the well operations are,

is centered in the middle. The surrounding sections are shown on the map. The base of the map shows the leasehold position at this time.

The cross-hatched area is the leasehold of GECKO, incorporated. The only other operators in the area you can see in Section 26. The west half of the southeast quarter is held by production by Yates, Incorporated. The northwest quarter of 35 is a state lease, that PG&E Resources has the leasehold.

Q. When we look at the northeast quarter of 35, the north half of the northeast is proposed as the spacing unit for the well?

A. Yes, it is.

Q. Is there any difference in ownership, between the north half and the south half of that northeast quarter?

A. No, sir.

Q. It's all the same?

A. It's all the same.

Q. So the well is moving towards common ownership with the spacing unit for the well?

A. Yes, sir.

Q. I notice on the base map that there are a number of black dots. What do those represent?

A. There are a number of dots, period. The dots on the map are all wellbore locations.

There are three classes of wellbore locations. The solid black dots--excuse me. First of all, all of the wellbore locations are Strawn penetrations only. The shallower wells are not on this map.

The solid black dots are currently producing from the Strawn. There are solid black dots with a cross-hatch through them that have produced from the Strawn but currently are TA'd or abandoned. And there are open dots with a dry hole symbol on them that were drilled and abandoned, but not produced.

The significance to us is, as you can see in Section 35, the well control in the Strawn is sparse, and not real helpful for our geologic interpretations.

Q. Because of the absence of immediate well control data, have you applied any other type of geologic data in order to make an interpretation of where best to locate the well?

A. The emphasis for our prospect is a series of seismic lines that we shot across this acreage and we have interpreted in a structural

sense.

Q. Can you approximate, for the Examiner, the degree of data that you have for the seismic information, in terms of the location of the seismic lines and the grid size for the runs?

A. The seismic lines are plotted on the isopach map, and probably would be helpful to talk with them at that time.

Q. When we look at the isopach, then, it will show the lines of the seismic run?

A. Yes, it will.

Q. Are you satisfied, as a geologist and an engineer, that the seismic data was adequate from which to make a determination of the best optimum place in which to now deviate this well? Do we have sufficient seismic information from which to make an interpretation?

A. Yes, we do. Actually, the seismic information, as we'll see when we look at the structure map, was adequate when we drilled the first well.

Q. Let's start at that point, then, and I'm going to put the overlay up that shows the structural interpretation.

All right, sir. What have we put on

the base map at this point, Mr. Thomson?

A. Okay. The overlay that we've put over the base map is a structure map on the top of the Strawn formation. It's contoured on 10-foot intervals. It shows a gradual dip to the east, it shows a pretty severe dip to the west, and basically a flattening and a structural high over the original drill site and the prospect.

The well, as it was drilled, that surface location matched the seismic structure map within about 10 feet at the top of the Strawn, and basically is a real valid structural interpretation, and still is a structural interpretation. What the problem was, is there was no reservoir encountered in the vertical wellbore.

Q. What new data do you now have that caused you to believe that, by reentering this well and directionally drilling it to a bottomhole location 500 feet to the south, is going to put you in the reservoir?

A. There are two additional, I guess, pieces of information that, in our interpretation, give us a lot of confidence that 500 feet to the south from the surface location,

we can encounter reservoir. Those two things are: The wellbore logs through this interval give us a lot more understanding of what the rock fabric and texture is, and there are some things, seismically, we can infer in our data, at this point, that we really couldn't before.

The major help, though, is the rotary side wall cores that we talked about before that we've extracted, the detail of which is in Exhibit 2. Basically, we can summarize what our geologic model says at this point, which is starting from the base of the wellbore we drilled and moving to the top of the Strawn.

In the base of the wellbore, we encountered, basically, just a low energy shelf environment. As we moved up in the section, we see, in the rotary side wall cores, we see some algal fragments, we see some oil staining of those fragments.

We see some other indications, through some fossiliferous material, that we are near a reef environment. This material really cannot be transported very far at all and be preserved still. And, based on some modeling that we've done in the area, our interpretation is that we

are qualitatively 400 to 600 feet from an algal mound-type reef.

Q. Do you have an illustration that represents the conclusions from studying that data?

A. What we've done is, we've gone back in with our well logs and the fabric and texture information we have from the rock, and we have isopached a rock unit, if you will. It's not reservoir at this point because we have not encountered porosity. We're Inferring where porosity will be encountered.

But, if we isopach the rock unit that we are overlying on top of the structure, we can see that the surface location was drilled on a structural advantageous point on that crossing seismic line. We can see that when we isopached the rock unit, the thickening is to the south.

Our belief is, and our knowledge in the area, tells us that that thickening will be where the reservoir will be encountered. These type reservoirs can go from zero net feet of porosity, to 60 to 80 feet of porosity, literally, in just a few hundred feet, and that's what we believe the case to be here.

Q. Is this typical of the steep-sided algal mounds that we're seeing in this area for Strawn oil production?

A. It is real typical of the mounds. It may be more severe than some mounds that have been encountered in the past, simply because the bigger mounds have been discovered already. What we're doing, we're searching now for the smaller ones that may have been overlooked, and they're just going to be tougher to find.

Q. In looking at the composite display, Exhibit 3, why would you not want the bottomhole location more centered to the east of the reservoir thickness, as it's been interpreted? You're on the western edge, if you will. What causes you to believe that you want to be at that point?

A. We're honoring all the dip that is in the well, we're honoring our seismic interpretation, and we're honoring the thickest part of our isopached interval.

These reservoirs have tremendous vertical and horizontal permeability. So, really, all we have to do is get in the thickest part of that reservoir and we will find porosity,

and that's plenty to drain the reservoir.

Q. Having decided upon this plan, based upon the current, technical data, do you have an illustration to show us the mechanics of how you're going to do it?

A. Yes, sir, we do.

MR. KELLAHIN: That's marked as Exhibit No. 4, Mr. Examiner.

Q. Would you identify for us Exhibit No. 4?

A. Exhibit No. 4 is a directional drilling plan. It's presented in horizontal and vertical planes. We'll walk through it, starting with the vertical section, from top to bottom.

We've designed this well, we designed a kickoff point at 9000 feet. The designed kickoff point is designed for a couple of reasons: One, the original wellbore down to this point, at least by surveys, had very little deviation in it. We believe it to be almost true vertical, if not tru vertical. It has not been surveyed, as far as directional survey at this point.

All of these wells in this pool end up on artificial lift, primarily by rod pump. So, we have tried to create as little wellbore

deviation as we have to, but still achieve our objective of getting 500 feet to the south. So, we've tried to build a real gradual angle, and then hold a constant angle and hit the window, as you can see in the horizontal plane of a 50-foot radius, being 50 feet to the north of our objective, when we enter the top of the Strawn formation, and 50 feet to the south, when we hit the base of the Strawn formation.

Q. As targeted on this display, it shows a 50-foot radius target. Both the application and the notice of hearing request additional flexibility for you, of using 100-foot radius target. What's the reason to request the additional radius?

A. We requested the additional radius simply because our drilling plan assumes, as you can see on the diagram at 9000 feet, that we're at 00. We don't know that.

These operations are very successfully done by just setting a cement kickoff plug, going in with a bent sub, creating your angle, and then just drilling with a fixed angle.

If we have to make a corrective motor run, we don't want to dog-leg the hole. We don't

want to create that type of wellbore path because, in the future, you get into all kinds of problems with rod cutting your tubing, wearing out your rods, which is higher operating costs, which will, I guess, shorten the economic life of the well.

So, we're just trying to create a gradual wellbore path, and still hit our target.

Q. Is there anything special or unusual about the application of the directional drilling technology in this particular case?

A. No, sir. This is pretty plain vanilla type directional work.

MR. KELLAHIN: That concludes my examination of Mr. Thomson. We move the introduction of his Exhibits 1 through 4.

In addition, Exhibit 5 is our notice to the offset operators. I'm not aware of any objection to the approval of the application, Mr. Examiner.

So, at this time we would move the introduction of Exhibits 1 through 5.

EXAMINER CATANACH: Exhibits 1 through 5 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Thomson, as I understand it, your seismic told you where to drill to hit the highest structural position?

A. Yes, sir, that's correct.

Q. Just didn't have enough sufficient reservoir rock present at that location?

A. No, sir. If you really, I guess, looked at the logs and tried to do a net feet, there might have been two feet that were above a four percent cutoff, and they were tight.

Q. And, as I understand it, you're using the side wall core data to project which direction you should drill the well, among other things?

A. Yes. We used the side wall core information to really understand what the fabric of the rock was.

From there, looking at some impedence contrast on the seismic data, we really can infer, we believe, which direction dip is. And that, really, what you do from there is, you go to the analogies in the area, and it shows pretty strongly that, when you can predict that

direction of dip, you can be real successful in finding oil.

In the past, the mounds were a lot bigger, and the structural picture was really all you needed. And that's why we drilled, you know, the well, just based on structural interpretation.

Q. What's the current status of the well? Shut in?

A. It was actually drilled and abandoned as a dry hole.

Q. Plugged and abandoned?

A. Yes, sir. To get back to where our drilling plan starts is pretty simple. We just put the wellhead back on, nipple up. We have two plugs to drill out, no pipe to pull. The 7-7/8 hole was drilled originally with packed hole assembly. It's very straight; should be very clean. It really should be just plain vanilla.

Q. Did you say that the whole northeast quarter of that Section 35 was commonly owned?

A. Yes.

Q. Is there a specific reason for orienting the proration unit the way you did, as opposed to a stand-up 80?

A. If you back up to when we drilled the well, we drilled it just on the structural interpretation that you have in front of you. If you look at that interpretation, it was our belief that two wells could be drilled in this reservoir. That's why we propose it as a lay-down 80.

Q. The point 934 feet from the north line, 1762 feet from the east line, that is your target location?

A. Would you mind repeating that for me?

Q. 934 from the north, 1762 from the east.

A. Yes, sir.

Q. That's the target, and that's the point you want the 100-foot radius keyed off of?

A. Yes. As you can see, our drilling plan really plans on the 50-foot radius, and we've asked for the additional flexibility of a hundred foot.

EXAMINER CATANACH: I don't have anything else of the witness. He may be excused.

MR. KELLAHIN: That concludes our presentation.

EXAMINER CATANACH: There being nothing further, Case 10924 will be taken under advisement.

(And the proceedings concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10924, heard by me on March 3 1994.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Carla Diane Rodriguez, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; 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 April 11, 1994.

Carla Diane Rodriguez

CARLA DIANE RODRIGUEZ, RPR
CSR No. 4