STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

ORIGINAL

APPLICATION OF KC RESOURCES, INC., FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT IN EDDY COUNTY, NEW MEXICO

Case 14907

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Presiding Examiner
WILLIAM V. JONES, Technical Examiner

December 13, 2012

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Presiding Examiner, and WILLIAM V. JONES, Technical Examiner, on Thursday, December 13, 2012, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: Jacqueline R. Lujan, CCR #91
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A P P E A R A N C E S

FOR THE APPLICANT:

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WITNESSES: PAGE

John Maxey:

INDEX PAGE

EXAMINER BROOKS: Okay. At this time we call Case Number 14907, application of KC Resources, Inc., for approval of a pressure maintenance project in Eddy County, New Mexico. Call for appearances.

MR. PADILLA: Mr. Examiner, Ernest L. Padilla, of Santa Fe, New Mexico, for the applicant. I have one witness to be sworn.

EXAMINER BROOKS: Any other appearances?

Very good. Will the witness state your name, please?

MR. MAXEY: John Maxey.

EXAMINER BROOKS: Please swear in the witness.

JOHN MAXEY

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Maxey, for the record, would you please state your name?

A. John Maxey.

Q. And you live in Roswell?

A. Yes.

Q. And what is your connection with the applicant here today?

A. I'm a consulting petroleum engineer, and

they've asked me to review this application for pressure maintenance in their field and present testimony at the hearing.

Q. Have you prepared certain exhibits for introduction today in connection with this hearing?

A. Yes, I have.

Q. Mr. Maxey, have your credentials as a petroleum engineer been accepted by the Oil Conservation Division and are a matter of record?

A. Yes, they have.

MR. PADILLA: Mr. Examiner, we tender Mr. Maxey as a petroleum engineer.

EXAMINER BROOKS: He is so qualified.

Q. (By Mr. Padilla) Mr. Maxey, let's have you tell the Examiner briefly what the purpose of this hearing is.

A. This is an application for pressure maintenance for KC Resources in their Atoka Field on their Jones D lease. They would like to inject water in the downdip portion of the reservoir.

Q. Is this pressure maintenance -- does that involve injection of water from the producing formation?

A. Yes. They would like to re-inject on-lease water that's being produced right now.

Q. Let's turn to Exhibit 1 and have you tell the

Examiner what that is.

A. Exhibit 1 is the C-108 application for authorization to inject. It includes, on page 3, a two-mile radius circle, just to show the leases within a two-mile radius of the applicant well.

The next page is the half-mile radius around the applicant well, showing in yellow the KC Resources acreage within that area of review. Then there are two plugged wells you'll see schematics on. The remaining wells are producing. They're in tabular form.

There is one well there that was not required. I put it in. It was an application for a horizontal well that Devon had made that hadn't been drilled. And then the remaining portion is answering the questions on the application page and the injection well schematic.

Q. Let's go through each of those wells, and briefly tell us what -- first, for the injection well, and where the plugs and the injection interval is going to be.

A. Okay. The injection interval is in the San Andres formation, approximately 1,750 feet to 1,900 feet. Going through each one of those schematics, the first two wells have been plugged in a way that isolates the San Andres formation from any communication to other zones.

The remaining wells have been cemented

adequately, most every one of them cemented to the surface on the production string, even. So the San Andres is very well isolated for injection.

Q. In general, what kind of production do you see here?

A. The lease was originally drilled up in the late '60s. They've had a couple of wells that they drilled just recently this year. One of them has a couple of months of production. The other one has no history yet. It's in the process of completing.

And this reservoir is in an advanced stage of depletion. And in one of the exhibits I'll show you -- you'll see, from the GOR, it certainly looks like solution gas drive is the primary mechanism. There may be some help from a little bit of a water drive or aquifer drive.

Q. What kind of injection rates are intended for the well?

A. The intent is to initiate injection with 80 barrels of water a day, maximum of 300 barrels a day.

Q. And what kind of pressures?

A. Pressures will be no higher than a .2 psi per foot.

Q. So in terms of water compatibility --

A. No issues. We're re-injecting produced water

from the lease.

Q. Let's go to Exhibit 2 and have you tell us what that is.

A. That's just a locator map to familiarize you with where we're located. The Atoka Field is just updip from the Abo shelf margin. We're in the northern part of Eddy County. You can see the City of Carlsbad.

One thing that's significant is we're definitely well north of the Capitan Reef trend.

Q. Why is that significant?

A. The Capitan Reef is a very important fresh water source, so we're well north of that. It's not a concern in this particular application.

Q. And Exhibit 3?

A. Exhibit 3 is a type curve in that area of -- within the area of review, and I've got a cross-section a little later that's scaled down to the producing zone. So I wanted to give you a type curve so you could see that basically this is a very thick carbonate section.

The correlative pay to the actual injection well is in red. It's about 150-feet thick. And the intervals within all the producing wells is selectively perforated, just perforating some of the more porous intervals. In the zone itself, water saturations vary quite a bit across the entire interval. They're hitting

lenses of oil production within that 150 foot.

Q. Okay. Exhibit 4?

A. Exhibit 4 is the area of review. And what I've done, I've gathered all the logs I could in the area. I've got three wells that I couldn't get logs on.

As you can imagine, most of this production is older. So basically, I had a lot of old neutron count logs, which really aren't reliable for any type of quantitative log analysis. I did have a couple of newer logs that I utilized for some water saturations later.

This is a structure map on top of the San Andres porosity or just above the top of the San Andres porosity on a marker that I had located or identified. You'll see quite a bit of dip in this area, approximately 150 to maybe 200 feet per mile from northwest to southeast.

The highest producing well in the structure is the Jones D Number 1. You'll see it on the far northeast part of the area of review. The injection well, the proposed injection well, is in the center of the radius, the D5. And to the far southeast is a control well that I had. It's a dry hole. You can see that the subsurface depth of that was plus 1,457 feet. So within the area of review, we go from plus 1,671 to plus 1,457, so there's quite a bit of structural change.

Also, the red line, A to A prime, is a three-well cross-section that will be the next exhibit.

Q. What are the wells shown in red?

A. The wells shown in red are control points that actually penetrated the San Andres and are not producing. The green wells are producing.

I might add at this time that the wells to the northeast in the area of review, those four wells, the B6, B7, B5 and B9, are wells operated by Lime Rock Resources. The remaining green wells are wells operated and under the control of KC Resources.

Q. How about Exhibit Number 5?

A. Exhibit 5 is a cross-section that I described off of the previous map. The Jones D Number 5 is in the center, and the Kaiser B7 is to the northeast. It's a Lime Rock Resources well. The Higgins Trust was the far northwest, which is not producing from the San Andres.

This is hung on stratigraphic equivalent. This is not a structural cross-section. I wanted to give you an idea of a close-up of the section. You'll see that the entire perforated interval on the injection well is in blue, and it is selectively perforated. There's quite a few various perforations in there, approximately 50 holes in that entire interval.

All these wells are acidized and then frack

stimulated with anywhere from 150- to 220,000 pounds of sand. So that entire interval is probably communicating.

Q. Are you ready for Exhibit 6?

A. Yeah.

Q. Okay.

A. Exhibit 6, it's kind of a busy exhibit. And really, it's the key to the proposed injection in the D5. I'll start with the -- basically what this is the same map you saw earlier, the structure map. I've left the structural contours on here.

But I've gone in and given you some description on some of the offset wells. Now, to the northwest, the blue box around the B6 and the B7, that's the Lime Rock wells. Those are the two lowest producing wells on the structure, and they have the lowest, structurally speaking; and they have the lowest -- excuse me, the highest water cut. This is basically an oil cut map. And so 8 and 9 percent oil cut is what you see on those Lime Rock wells.

The proposed injection well is about 30 feet updip and has about a 15 percent oil cut. If you move up structure, you go from 15 to 16 to 31 percent up on the very top of the structure. That's what I wanted to point out with the blue box to the northeast. Those are the two lowest wells with the highest water cuts.

As you move around the circle clockwise, you'll notice the next box on the south side of the area of review penetrated the San Andres. No completion attempt on those two red wells.

The northernmost was a producer from a deeper horizon, around 9,000 feet. They plugged back. They tried the Wolfcamp and also made another the attempt to approximately 6,000 feet, and eventually that well was plugged. There was no attempt in the San Andres.

The well to the south was a clean, dry hole, no casing run. There was no San Andres completion attempt in that particular well, either.

Now, if you move around to the southwest corner of the area of review, there's another blue box that describes another red dot, red well. That well is a producing well out of the Yeso, which is around 2,800 feet to just over 3,000 feet. There was no San Andres completion attempt in this well, either.

This is a Lime Rock Resources well. They could have completed the San Andres, as they did to the northeast. They can commingle those zones. But they did not complete in the San Andres.

If you move all the way around to the northwest part of the circle and look at that box --

EXAMINER JONES: I'm sorry, John. That

last box you were talking about, where is that located?

THE WITNESS: To the southwest, down here.

EXAMINER JONES: Okay. That one -- say again. That one could have been completed, but --

THE WITNESS: It's been completed in the Yeso, and they did not make an attempt in the San Andres.

EXAMINER JONES: Like Paddock or something?

THE WITNESS: In the northeast part, up here, they did complete Yeso and San Andres. They commingled, because you can do that in this field.

So what I'm implying there is you've got those three red dots, no completion attempt was made in the San Andres, okay?

So if you move on around to the northwest side, there's a box in the far northwest corner. I did have good logs on -- where the arrows are drawn to those two wells, I had more modern logs. I calculated some water saturations on those. I compared them to the B7 lease up in the northeast that's an actual San Andres producer. The lowest well on the structure, I looked at that log and calculated water saturations, compared it to these two red dots. And the two red dots, their average water saturation was 30 percent higher than the lowest well, its highest water cut in the San Andres.

So I think there's a very strong implication with this information that just to the southeast, on structure, based on this structure map, just to the southeast of the Number 5, there is an oil/water -- you can call it a contact, but I think what this map illustrates in this tight formation, you have a transition. You're going from high water cut to low water cut to a high percent water further downdip.

Q. (By Mr. Padilla) What does that mean in terms of the effect of the injection?

A. So they would like to inject -- convert the D5, which is now uneconomic to produce. It's making about one barrel a day, barely. They would like to convert the D5 and inject at this point in the reservoir.

All their producing wells are -- all the producing wells in the -- virtually all the wells are updip from this point, other than the two to the northeast that are downdip. They'll be injecting at a point in the reservoir that's very close to the oil/water contact. So they would like to inject at this point, attempt to drive somewhat upward, and they'll lose some water to the aquifer down to the southeast.

Q. Okay. Exhibit 7?

A. Exhibit 7 is a plot of production on the Jones D lease, total production. That's the KC Resources

wells, six producing wells. Actually, six wells, and there's four producing on the lease right now.

One thing I wanted you to notice is the GOR. Initially the first -- this is monthly data, and it's back to '69. This is when the production started with the first well.

The first GOR point is just over 700 standard cubic feet per barrel of oil, increasing GOR to 3,400 and then declining. It looks very much like solution gas drive. You will notice the water cut did increase. That's the top curve I have labeled, the very top curve on that chart, from approximately 70 percent to 90 percent over time. So there is mobile water. It could be moving up from -- you know, there could be some movement up from the aquifer, but I'm sure there's plenty of water within this reservoir that moves, too.

So basically solution gas drive, you produce -- if you look in the box in the upper right, you've got a cumulative oil production of 175,000 barrels of oil, 45,000 barrels of oil remaining on primary, and that's projected to two barrels of oil a day on this lease. And that's optimistic, because the charges would really make that uneconomic at this point.

Cumulative water production has been 688,000 barrels of water. So you've had more like 900,000

barrels of total fluid removed from the reservoir from these particular wells, combined with 318 million cubic feet of gas. So you have a huge voidage in this reservoir.

So they would like to take this water, approximately 80 barrels of water a day that's being produced right now, and start re-injecting in this downdip play and look for any response in the offsets.

Q. Anything else on Number 7?

A. No.

Q. Would approval of this application be, in your opinion, in the best interest of conservation of oil and gas and protective of correlative rights?

A. Yes. I believe that injection in the reservoir at this time in the downdip limit of the reservoir would prevent waste and would protect -- there would be no impairment of correlative rights.

I might add that the client has talked to Lime Rock Resources, and they have no issues with the application, as long as there's not any kind of an overpressured situation developing.

MR. PADILLA: Mr. Examiner, Exhibits 8 and 9 -- well, let me talk about Exhibit 8. It is an affidavit of James Spillane, who is in charge of all phases of exploration activities for KC Resources. He's

been a landman for 29 years.

The affidavit states that the only offsetting owner and operator is Lime Rock Resources. The surface owners are Wade and Virginia Starr, who have, through execution of an oil and gas lease, consented to this type of operation on the lease.

Number 9 is my Affidavit of Service. And I'll direct your attention to some emails that I had with Lime Rock some time back in July of this year. At that time, I was doing quite a bit of work with Lime Rock, and I'm still doing some work for Lime Rock, and I had to make sure that I didn't have a conflict with this application in representing KC Resources. And they essentially have -- in that series of emails, they have told me that they didn't have any problem with it, as long as it was not an overpressured situation where they would increase beyond the testimony.

EXAMINER BROOKS: Lime Rock had notice; right?

MR. PADILLA: Yes, they have notice. Not only in my series of emails with them in July, but again on October 23rd, I did send them Certified Return.

EXAMINER BROOKS: Yeah, I thought I saw that.

Are you offering the exhibits in?

MR. PADILLA: I'll offer Exhibits 1 through 9.

EXAMINER BROOKS: One through 9 are admitted.

Do you pass the witness?

(Exhibits 1 through 9 were admitted.)

MR. PADILLA: Yes.

EXAMINER BROOKS: My question is probably more for you than the witness. I'm not at all confident at this point of your theory that you don't have to give the surface owner notices under our rules merely because you have the right to conduct this type of operation under the terms of the lease.

There was some kind of case that sort of touched on that issue out of the Court of Appeals that I remember reading four or five years ago, but I don't remember the details of the case.

But it looks to me like one is an issue of consent or land ownership rights, and the other is a regulatory issue, and I'm not sure that one controls the other. Do you want to address that?

MR. PADILLA: Mr. Examiner, I caught this problem I think the day before yesterday. And we haven't -- my client hasn't obtained a formal consent. And I would be happy to supplement the record with some

kind of consent on this issue.

EXAMINER BROOKS: Okay. All we would need from a regulatory standpoint would be a waiver of notice.

Mr. Jones?

EXAMINATION

BY EXAMINER JONES:

Q. Well, Mr. Maxey, the lease itself, I think the first exhibit, does it show the --

A. Yes. That's the one that has the yellow square.

Q. Okay. And that's got a tract of land identified. Are all owners identical in that tract of land?

What I mean is, does that tract of land -- is that considered one common ownership?

A. You know, I could not answer that question. I know I discussed with the landman that they owned and controlled those four quarter/quarter sections. And he sent me a map, and I went back to him with the descriptions. And he said, "Your descriptions are accurate." I did not ask him about the ownership.

Q. And maybe we could get that later, also, along with -- basically, if you draw your half-mile circle around that well, every commonly-owned tract of land should be identified with the owners of those tracts and

the San Andres depths. And if there's no -- there should be a lessee. If you can find the lessees, provide them notice. And if there's no lessee, of course, the mineral owners.

MR. PADILLA: Mr. Examiner, Mr. Jones, my understanding is that Devon Energy used to own all this acreage at one time, and KC Resources and Lime Rock, at some point or another, acquired all the interests of Devon.

EXAMINER JONES: So Lime Rock and KC own everything within the circle?

MR. PADILLA: That's my understanding.

EXAMINER JONES: They control those minerals?

MR. PADILLA: Yes.

EXAMINER JONES: I think we would still need to know about --

Q. (By Examiner Jones) Because your application is to form a lease waterflood; is that correct?

A. It's a pressure maintenance application.

Q. You want it to be a pressure maintenance?

A. Yes.

Q. Okay. You have said that it's in an advanced state of depletion, the production in that area. But you're just re-injecting the water from that tract of

land in yellow?

A. Yes.

Q. And you want it to be limited to only waters coming from those tracts of land?

A. Yes.

Q. Because that's Lime Rock's limitation, also?

A. Their limitation was on no higher pressure or rate than is in the application. They did not have a limitation on which waters.

Q. And 300 was your maximum rate?

A. 200 was the maximum rate. I said 300 earlier. That's a different application. It's 200, as stated in the application.

There's two wells, the newer wells they drilled this year, so they're going to be bringing those into the injection well also.

Q. That plugged well that's in red in Exhibit 6 on the southeast, the furthest southeast plugged well on Exhibit 6, I think that well is the one that doesn't have plugs set really to confine the San Andres, unless you can tell me what the bottom of the San Andres is. Was that the first plugged well on your C-108 application?

A. Yes, it is.

Q. The Betty Sue Number 1?

A. Yes.

Q. Okay. That one has a plug at 13 -- or is the bottom of that plug 1,950 on the top plug?

A. The bottom of that plug is 1,330.

Q. 1,330 up to 950?

A. Yes. It's across the shoe.

Q. And at what point does the Glorieta start below in this well?

A. I don't have the top on the Glorieta.

Q. But they set a plug at 3,940, so --

A. 3,942.

Q. -- they're probably recovering the top of the Yeso?

A. Right. It's very close to the top of the Yeso.

Q. And there's no pipe in that well, so that's open. But is it correct that the water saturation in that well was so high that they didn't try the San Andres?

A. That's what I'm implying. The water saturation calculations are 30 percent higher than the B7, which is the lowest producer structurally with the highest water cut.

Q. Okay. So --

A. So the total data down there is where I'm strongly implying that it's wetter, very, very high

water.

Q. So that well is not in danger of not confining the injection, because the injection is not going to go to that well because the water saturation is so high there?

A. Right.

Q. And the pore pressure should be higher?

A. Yes. It's way downdip. The pore pressure should be higher. And with the depletion you've got to the northwest and the northeast, I don't see the water migrating.

Q. The water should move toward the points of --

A. Where you've got the pressure sync. And like I said, you've got 900,000 barrels of voidage plus gas.

Q. So that well should not be a problem, the way it's completed, the way it's plugged?

A. Right.

Q. Now, if you look at the San Andres, you must have looked over this interval in the San Andres for water saturations? Is it --

A. I used, basically, the three good logs I had. The rest of them are old neutron counts, basically, and there were no -- some had some micrologs, but I didn't even attempt calculations on those. They're just neutron count logs. I don't have any confidence in obtaining

porosity from those.

Q. But --

A. Maybe a sidewall, but they weren't sidewall neutrons. They were just neutron counts.

Q. So you have to put your logarithmic scale on there and hope for the best?

A. Yes, sir.

Q. But the water saturation goes up in the San Andres as you go down; is that correct?

A. Yes.

Q. For this operator, are they in compliance with Rule 5.9 as far as inactive wells and financial assurance?

A. As far as I know. I did not ask the question.

MR. PADILLA: I can answer that, Mr. Jones. We recently -- or KC Resources entered into a compliance order with the OCD about a month ago.

We have, with the State Land Office, recently settled a lease issue where there were four wells, and those four wells created a problem. We then entered into an agreed order, a compliance order, and so they're fine at this point.

And we're going to be fine with the Land Office also. It was a Catch 22 between the OCD and the State Land Office, the State Land Office saying you need

to comply with the OCD before we can settle, and vice versa. So we finally got it done.

EXAMINER JONES: Okay. So we should be able to check and see --

MR. PADILLA: I can get you a copy of that order.

EXAMINER JONES: To Mr. Brooks?

MR. PADILLA: Yes.

EXAMINER JONES: I don't have any more questions.

EXAMINER BROOKS: Okay. Mr. Jones' question raised on this issue of whether or not the appropriate notices have been given within the area of review, of course, I was looking at your affidavit. The affidavit says that KC Resources is the only --

MR. PADILLA: Exhibit 8.

EXAMINER BROOKS: That's what I'm looking for. Here it is.

EXAMINATION

BY EXAMINER BROOKS:

Q. The only offsetting owner or operator, other than the applicant, in the area of interest is Lime Rock.

Now, of course, the rule on injection wells requires that all tracts within the area of review -- and because the words, "area of interest," is different from,

"area of review," I don't know whether or not it means the same thing. From your responses to Mr. Jones, I understand you're basing that statement on your conversations with the landman.

A. My area of review that I'm referring to is a half-mile radius.

Q. When you say, "the area of interest," you mean the half-mile area of review?

A. Yes. I may use those interchangeably.

Q. That includes the tracts in the adjoining section down to the south, as well as the ones in Sections 13 and 18 here?

A. Yes. Because the half-mile radius circle does just barely cross over into it.

Q. Right. That's what I was raising. And those tracts would be brought in.

And what you're telling us then is that either Lime Rock or KC is the owner of 100 percent of the working interest in all those tracts. But we have some other names on here on this map.

A. I cannot tell you if they're 100 percent working interest owners.

EXAMINER BROOKS: Okay. Well, we need to get that clarified. We're going to have to continue this case anyway to get notice to the surface owner or a

waiver of notice.

We will also need to get clarified that those tracts of which KC is the operator, that they own 100 percent of the working interest or that they've given notice to other people who own working interests in those tracts where Lime Rock is the operator and they actually have wells. But that's only one tract. There, of course, you don't have to give notice to other working interest owners because you have another operator.

Okay. If there's nothing further, then we will continue Case Number 14907 until January 24th, 2013, in order to get clarification on these notice issues.

MR. PADILLA: Okay.

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 14907 heard by me on 12-13-12

David K. Brooks Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

I, JACQUELINE R. LUJAN, New Mexico CCR #91, DO HEREBY CERTIFY that on December 13, 2012, proceedings in the above captioned case were taken before me and that I did report in stenographic shorthand the proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability.

I FURTHER CERTIFY that I am neither employed by nor related to nor contracted with any of the parties or attorneys in this case and that I have no interest whatsoever in the final disposition of this case in any court.

WITNESS MY HAND this 24th day of December, 2012.

Jacqueline R. Lujan, CCR #91
Expires: 12/31/2012