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:	CASE NO. 12,250
APPLICATION OF THUNDERBOLT PETROLEUM, L.L.C., INC., FOR APPROVAL OF A WATERFLOOD PROJECT AND TO QUALIFY THE PROJECT FOR THE RECOVERED OIL TAX RATE, EDDY COUNTY, NEW MEXICO	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MARK ASHLEY, Hearing Examiner

October 21st, 1999

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MARK ASHLEY, Hearing Examiner, on Thursday, October 21st, 1999, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

October 21st, 1999
Examiner Hearing
CASE NO. 12,250

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E X H I B I T S

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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 9:30 a.m.:

EXAMINER ASHLEY: At this time the Division calls Case 12,250, Application of Thunderbolt Petroleum, L.L.C., Inc., for approval of a waterflood project and to qualify the project for the recovered oil tax rate, Eddy County, New Mexico.

Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe, representing the Applicant. I have two witnesses to be sworn.

EXAMINER ASHLEY: Call for additional appearances.

Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

ROBERT LEE,

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence for the record?

A. Robert Lee, Midland, Texas.

Q. What is your occupation?

A. I'm an engineer and the owner of Thunderbolt

Petroleum.

Q. Have you previously testified before the Division as a petroleum engineer?

A. Yes, I have.

Q. And were your credentials as an expert accepted as a matter of record?

A. Yes, they were.

Q. And are you familiar with the engineering matters related to this Application?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Lee as an expert petroleum engineer.

EXAMINER ASHLEY: Mr. Lee is so qualified.

Q. (By Mr. Bruce) Mr. Lee, what does Thunderbolt seek in this Application?

A. Thunderbolt is seeking the authority to institute a waterflood project in the Loco Hills-Queen-Grayburg-San Andres Pool on the Calmon lease, which covers the southwest quarter of Section 16, Township 20, Township 18, Range 29 East, in Eddy County, New Mexico, and we're also seeking certification of the project for the recovered oil tax rate.

Q. Mr. Lee, could you identify Exhibit 1 and also identify the existing -- or I should say the initial injection and producing wells for the project?

A. Yes, Exhibit 1 is a land map of the area. The Calmon lease has been shaded in yellow. The proposed injection wells are marked with red triangles. The Calmon Number 1 is the most northern well on the lease, and the Calmon Number 3 is the southerly well marked on the lease.

Q. And how many producing wells will there be?

A. Currently, there are five producing wells and one shut-in well. Once the project is instituted, I'll have two injection wells, three producing wells and one shut-in well.

Q. Is Thunderbolt the only working interest owner in this lease at this time?

A. Yes, I am.

Q. Are the injection wells, or the proposed injection wells, currently producing wells?

A. Yes, they are.

Q. Let's move on to your Exhibit 2. Would you identify that and discuss the geology briefly in this area?

A. Yes, Exhibit 2 is a structure map on the top of the Penrose formation, and what this is showing is just regional dip to the southeast.

Exhibit 3 is a cross-section, and I've put that up on the well here, but it's a cross-section through the six wells on the lease. It shows that the zones are continuous across the property. Perforations are marked on

the logs on that cross-section. It shows the main producing sands are the Penrose, the Loco Hills and the Metex.

Q. Those zones are all in the same pool, however, are they not?

A. That's correct, it's all in the same pool.

Q. Okay. The injection formation is continuous across your proposed injection interval?

A. Yes, it is.

Q. Let's get back to your Exhibit 2 for a minute. Exhibit 1 is kind of cramped in the numbering system. On this Exhibit 2 it also marks the injection wells, does it not?

A. That's correct, they're marked with the red triangles. Once again, the Calmon Number 1 is the most northern well. The Calmon Number 3 is the southern well in the middle of the other four producers.

Q. Okay, the other four producers are Numbers 2, 4, 5 and 6?

A. That's correct.

Q. And which one did you say at this point will remain shut in?

A. Number 4.

Q. Which number --

A. And that is the -- Number 4 is the well with the

top of plus 1283. It's kind of in the upper right-hand corner of those four wells.

Q. Okay, thank you.

A. That's my shut-in well.

Q. Now, let's discuss your proposed injection operations. Could you identify Exhibit 4 for the Examiner?

A. Exhibit 4 is copy of the C-108.

Q. Could you -- Without me leading you through it, could you go down and describe the injection wells and the zone you're seeking to inject into and maybe summarize the injection operations?

A. Yes, the wells that I want to inject into is the Calmon State Number 1 and Number 3. In my C-108, about the third page in, I have the information pertinent to the Calmon State Number 1. This page contains the tabular information on the well, showing its location, casing design, the injection tubing and depth of setting that I'm anticipating running my injection tubing into.

I also show the injection formation as being the Queen-Grayburg-San Andres, Loco Hills field. I show where the perforations are and that the well was drilled as an oil well and there's no other tested intervals in the well.

The page after that is a schematic of the Calmon Number 1 showing its current completion, once again showing my casing, the perforated interval and the production

casing on there, the well's -- the location and other pertinent information.

The next page shows my proposed completion of the Calmon Number 1 with the injection tubing in place, once again running plastic-coated tubing to a depth of about 2176 and injecting from there.

After that I show the tabular information for the Calmon State Number 3, once again with all the tabular data required by the C-108.

After that I have a schematic of the current completion of the wellbore. Once again it's showing the information on casing, location, completion, all the other pertinent information there.

After that once again I have the proposed completion where I show a diagram with my packer set at about 2180, once again showing that I'm going to be using plastic-coated tubing and a plastic-coated packer to run it into my injection well for injection purposes.

Q. Mr. Lee, will the injection wells be cased and cemented so that no injected water can escape into any other zone?

A. Yes, they will be, they have been. These are fairly recent wells drilled in 1986 and 1987, and they have had cement circulated to surface on both the surface string and the production string.

Q. Okay. The next page of the C-108 is another land plat. What is the intent of that plat?

A. This plat once again shows the acreage in question shaded in yellow, the injection wells designated by red triangles. On this map, though, I have drawn a half-mile-radius circle around each of my injection wells, delineating the area of review for this project.

Q. How many wells are there in the area of review?

A. There are 16 wells within the half-mile radius of the injectors that penetrate the zone that I'm going to flood.

Q. Are they summarized on the next page of the C-108?

A. Yes, they are.

Q. Would you go through that briefly and describe them for the Examiner?

A. Yes. This is a list of all the wells and their construction data within my area of review.

Important things to point out on this sheet, under the "Status" column I'm showing which wells are producing, which wells have been TA'd and which wells have been P-and-A'd. There's four P-and-A'd wells within my area of review. I also show when the well was spud, completed, and what the TD of the wells were.

I show the casing program with the cement program

that was shown on the scout tickets for each of these wells.

And then the column labeled "TOC", another important column here, it stands for top of cement, I show where the top of cement is for these wells. Some of the wells, ones that I operate, I had the well file so I could see where the top of cement was. And as I said, they've all been circulated to surface except for the Number 2 on the long string. There is a cement bond log that showed the cement to be 750 feet in that well.

The offset wells, I show where the top of the cement is, and I'm calculating where the top of cement is based upon the estimated hole size and the cement volume that was pumped as shown on the scout ticket.

Then I also show the completion interval, the treatment and what kind of IP the wells had.

Q. In your opinion, are all of these wells either properly completed or properly plugged so that there will be no crossflow among the zones?

A. Yes, they have been. And all the tops of cement on the long strings calculate to be above the zone I'm going to be injecting into or will have a string of casing across that interval to protect the wellbore.

Q. Are the next several pages the wellbore sketches of the plugged and abandoned or drilled and abandoned

wells?

A. Yes, they are. And there's four of those, showing the plugging information that was available from Tim Gum, from the OCD office in Artesia. So that's the next four pages there.

After that I show the data required on the items 7 through 12 on the C-108, basically saying that the anticipated injection rate is going to be about 150 barrels per well per day, with a proposed maximum rate of about 300 barrels per well per day. The system will be a closed system.

I anticipate the maximum injection pressure to be around 450 pounds, and I derived that from the depth of completion of these wells. The wells were completed at about 2260, but I used for calculation purposes a depth of 2250 and have applied the .2-p.s.i.-per-foot gradient to calculate my maximum pressure, and that was to 450 pounds.

Q. So you will be below the Division standard?

A. Yes, I will be, but I hope the injection pressure will be more than the 300-pound range.

Q. Okay.

A. On this sheet I also show that the proposed injection fluid is going to be produced water from my lease, as well as makeup water from the Yates Petroleum-operated West Loco Hills Unit, which is located about three

miles to the east of me.

I have a water analysis attached on the next page showing the analysis of these two waters. They show to have some slight to moderate scaling tendencies. But knowing this, we'll be able to treat the water and take care of that problem.

Q. Are there any freshwater sources within a mile of the injection wells?

A. No, there are not.

Q. What are the average producing rates for wells within the project area?

A. About one barrel per day per well.

Q. So these are definitely stripper wells?

A. Yes, that is correct.

Q. What is Exhibit 5?

A. Exhibit 5 is a plot of the historical production for the lease. Once again, this shows that the lease was initially drilled back in 1986. You can see the wells coming on line, the jigsaw pattern of the production, as well as the stairstep pattern of the well count shown on the bottom there. It shows that the last producing rates are around 150 barrels a month, once again, about five barrels a day.

Q. What is Exhibit 6?

A. Exhibit 6 is my projected production increase

from the waterflood. This plot shows that I'm expecting a peak rate of about 50 barrels a day, after about two years of injection.

Q. Will the pressure-maintenance project result in an increase in the amount of crude oil ultimately recovered from this reservoir?

A. Yes, it will.

Q. Could you move on to Exhibit 7 and discuss what you believe will be recovered as a result of this project?

A. Yes, Exhibit 7 is a table of the reserves, both cumulative and remaining primary, as well as my anticipated waterflood reserves. You can see that currently the property has made about 99,000 barrels and only has 7000 barrels remaining reserves left.

The incremental waterflood reserves that I anticipate to recover is 115,000 barrels. So ultimately, the project will recover 221,000 barrels.

I calculate that the original oil in place is about 810,000 barrels, so this recoverable will be 27 percent of the original oil in place and will give me a secondary-to-primary ratio of 1.08.

Q. What will be the cost of the project?

A. $125,000.

Q. And are those costs set forth on Exhibit 8?

A. Yes, they are. This table breaks out my cost for

injection lines, facilities, conversions and miscellaneous expenses.

Q. Okay. And the project area for this project will be solely the southwest quarter of Section 16?

A. That is correct.

Q. What does Exhibit 9 show?

A. Exhibit 9 shows the economics for the project. As I said, under current operations I'm only going to recover about another 7000 barrels. With the flood, the incremental recoverable reserves should be about 115,000 barrels.

I also show that my capital cost will be $125,000. My undiscounted income from the project will be $783,000, showing that I will recover additional money from this investment. The price scenario that I ran was $18 flat, and gas price was 2.50 an MCF, flat.

Q. In your opinion, is it prudent to apply enhanced recovery techniques to maximize ultimate recovery of oil from this pool?

A. Yes, it is.

Q. In your opinion, is the waterflood project economically and technically feasible at this time?

A. Yes, it is.

Q. And in your opinion is the granting of this Application in the interests of conservation and the

prevention of waste?

A. Yes, it is.

Q. The next exhibit, Mr. Lee --

MR. BRUCE: Mr. Examiner, I marked that 9. If you could mark that 9A --

EXAMINER ASHLEY: 9A?

MR. BRUCE: Yes, I used two Exhibit Numbers 9.

Q. (By Mr. Bruce) Mr. Lee, what is shown on Exhibit 9? 9A, excuse me?

A. Yes, this is a map showing the acreage of the project, once again, being the southwest quarter of Section 16, with the names of the offset operators highlighted in green.

Q. And these are the offset operators in this specific pool?

A. That is correct.

Q. It wouldn't include Morrow rights or anything like that?

A. That's correct.

Q. Okay. And this was taken from current records showing operators in this area?

A. That is correct.

Q. And all of these parties were notified of this hearing?

A. Yes, that is correct.

Q. And is Exhibit 10 my affidavit of notice with the notice letter and certified return receipts?

A. Yes, it is.

Q. Mr. Lee, were Exhibits 1 through 10 prepared by you or under your direction or compiled from company business records?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, at this time I'd move the admission of Exhibits 1 through 10.

EXAMINER ASHLEY: Exhibits 1 through 10 will be admitted as evidence at this time.

Do I have a copy -- Is this a copy of Exhibit 3?

MR. BRUCE: Yes.

EXAMINER ASHLEY: Okay.

MR. BRUCE: The cross-section, yes.

EXAMINER ASHLEY: Cross-section, okay.

EXAMINATION

BY EXAMINER ASHLEY:

Q. Mr. Lee, I'm looking at Exhibit Number 2.

A. Okay.

Q. Could you review for me what the current status is of these six wells --

A. Yes.

Q. -- which ones are the injectors? I mean, you've got the two proposed injectors, but which ones will be the

producers and --

A. Yes.

Q. -- and Number 4 will be the one that's currently shut in and will remain shut in?

A. Yes.

Q. Okay.

A. That's correct. Once again, the northernmost injector is Number 1, the southern injector in the middle is Number 3.

Within Number 3, there's four wells around it. The well that is northwest of Well Number 3 is Well Number 2. It's currently producing, as my injectors, they're also currently producing now.

Q. The injectors are currently producing?

A. Yes,they are. Yes, they are.

The well located southwest of Number 3 is Well Number 5, and it's currently producing.

The well southeast of Number 3 is Well Number 6. It is currently producing.

The well northeast of Number 3 is Number 4, and it is currently shut in.

Q. Okay. So essentially everything is going to remain the same except for the two injectors?

A. That is correct.

Q. Okay. Exhibit 4, the C-108 --

A. Yes.

Q. -- it looks to me that both these wells are going to be injecting in the current perforations; you're not going to add anything?

A. No, sir.

Q. And I had some questions about the P-and-A diagrams.

A. Yes.

Q. The first one, the State Number 1 --

A. Yes.

Q. -- that was plugged in 1951?

A. That's correct.

Q. Is any of that open-hole section in the proposed injection zone?

A. Yes, it will be.

Q. Is all of it going to be in the open-hole zone, or is there --

A. It looks like it's all going to be in that open-hole interval, yes, it does.

Q. The same will be the case then, obviously, for the Malco Federal Number 1 too, correct?

A. Yes, that is correct.

Q. And then --

A. The Malco well, it was drilled and abandoned. It was plugged off the rig.

Q. Oh, it was? Okay.

A. Yeah. I said P and A, but it should have been D and A.

Q. And then the next one, the Far West Loco Hills San Unit Number 24?

A. Yes, once again, it looks like the interval which I'm going to be injecting into would be in the original open-hole section.

Q. And then also I guess -- What about the State L Number 16?

A. That's correct. On the last two, on the Far West 24 and the L 16, just kind of looking at the depths of my perforations compared to the portion that is cemented there, it looks like that the cement will cover the bulk of my injection interval. For the most part, my injection zone is going to run from 2260 down to about 2600, and both of those wells, at least, it looks like they have cement down to -- the Number 24 was 2540, and the Number 16 was 2455.

Part of it's going to be -- It looks like it will be blocked off, but part of my lower intervals looks like it will be still open in the open hole.

Q. And you feel that these four wells are plugged properly?

A. When I look at these, you know, with -- They all

will have cement, at least up around 900 feet, so I feel like if anything were to enter the wellbores here, the cement plug should prevent it from reaching any shallower depths.

Q. And you operate 100 percent of this lease; is that correct?

A. That's correct.

EXAMINER ASHLEY: Okay. I have nothing further. Thank you. Mr. Bruce?

MR. BRUCE: Mr. Examiner, I do have a landman available if there are any land questions, but other than that I didn't plan on calling him unless you had anything in particular that you were interested in.

EXAMINER ASHLEY: You've notified all the offsets and you haven't received any --

MR. BRUCE: We haven't received any objection from anyone.

EXAMINER ASHLEY: Okay.

MR. BRUCE: So with that I would just ask that the case be taken under advisement, Mr. Examiner.

EXAMINER ASHLEY: There being nothing further in this case, Case 12,250 will be taken under advisement.

(Thereupon, these proceedings were concluded at 10:00 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12250 heard by me on 10-21 1999

Oil Conservation Division

STEVEN T. BRENNER, CCR
(505) 989-9317

CERTIFICATE OF REPORTER

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

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL October 31st, 1999.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002