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. 12,132 |
| APPLICATION OF NEARBURG EXPLORATION COMPANY, L.L.C., FOR POOL CREATION AND SPECIAL POOL RULES, LEA COUNTY, NEW MEXICO | ORIGINAL |

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MARK ASHLEY, Hearing Examiner

April 1st, 1999

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MARK ASHLEY, Hearing Examiner, on Thursday, April 1st, 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.

* * *

I N D E X

April 1st, 1999
Examiner Hearing
CASE NO. 12,132



* * *

E X H I B I T S

| Applicant's | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 7 | 9 |
| Exhibit 2 | 8 | 9 |
| Exhibit 3 | 12 | 19 |
| Exhibit 4 | 14 | 19 |
| Exhibit 5 | 17 | 19 |
| Exhibit 6 | 24 | 32 |
| Exhibit 7 | 25 | 32 |
| Exhibit 8 | 25 | 32 |
| Exhibit 9 | 26 | 32 |
| Exhibit 10 | 26 | 32 |
| Exhibit 11 | 27 | 32 |
| Exhibit 12 | 28 | 32 |
| Exhibit 13 | 29 | 32 |
| Exhibit 14 | 30 | 32 |

* * *

A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
Legal Counsel to the Division
2040 South Pacheco
Santa Fe, New Mexico 87505

FOR THE APPLICANT:

CAMPBELL, CARR, BERGE and SHERIDAN, P.A.
Suite 1 - 110 N. Guadalupe
P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 8:41 a.m.:

EXAMINER ASHLEY: The Division calls Case 12,132.

MR. CARROLL: Application of Nearburg Exploration Company, L.L.C., for pool creation and special pool rules, Lea County, New Mexico.

EXAMINER ASHLEY: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent Nearburg Exploration Company in this matter, and I have three witnesses.

EXAMINER ASHLEY: Any additional appearances?

Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

MR. CARR: May it please the Examiner, this morning I discovered that the acreage which is the subject of this case is located within the boundaries of the Anderson Ranch Pennsylvanian Pool. The case focuses on the Strawn, and we are seeking an increase in the spacing for Strawn wells in the pool. We would request permission that we be permitted to go ahead and put the case on and that it be continued at the end of the hearing.

Following the hearing, we will meet with Mr. Kautz in the District Office in Lea County and determine exactly how we should handle this, whether it would be an

amendment to the pool rules as a whole or whether we should adjust the pool boundary.

But in any event, we'd like to do that because we believe that following an amended application and additional notification, that the case probably could be decided on the record we'd make today, if there is no objection following readvertisment and the notifications.

EXAMINER ASHLEY: That sounds fine with me. Just for your information, Mr. Kautz is in the process of changing the vertical limits in that pool right now, but you need to talk to him about that.

MR. CARR: All right, and we will coordinate with him and report to you as soon as we do talk to him.

EXAMINER ASHLEY: That sounds fine.

MR. CARR: All right. At this time I'd call Mr. Mike Gray.

MICHAEL M. GRAY,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Michael M. Gray.

Q. Where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. Nearburg Producing Company.

Q. And what is your position with Nearburg?

A. Senior landman.

Q. Mr. Gray, have you previously testified before this Division and had your credentials as a landman accepted and made a matter of record?

A. Yes, I have.

Q. Are you familiar with the Application filed in this case on behalf of Nearburg Exploration Company?

A. Yes.

Q. Are you familiar with the status of the lands in the subject area?

A. Yes.

Q. Have you prepared exhibits for presentation here today?

A. Yes.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER ASHLEY: Yes, they are.

Q. (By Mr. Carr) Mr. Gray, initially would you just briefly summarize for Mr. Ashley what it is that Nearburg Exploration Company seeks in this case?

A. Nearburg proposes the creation of a new pool in the Strawn formation, in the northeast quarter of Section

15, Township 16 South, Range 32 East, in Lea County, and adoption of temporary field rules which would provide for 80-acre spacing for Strawn production, with location requirements no closer than 330-foot quarter-quarter setbacks.

Q. This Application is the result of a discovery in the Strawn formation in the Yates Petroleum Corporation Ruby "ASV" State Com Well Number 1, is it not?

A. That's correct, that well was drilled by Yates with Nearburg as a partner, was drilled to the Morrow formation, was unsuccessful in the Morrow and was plugged back to make a Strawn discovery in the northeast quarter of Section 15.

Q. What is Nearburg's percentage ownership interest in the Ruby State Com Well Number 1?

A. Nearburg and Yates are co-owners of a working interest unit whereby Nearburg owns 37 1/2 percent and Yates owns 62 1/2 percent.

Q. And that working interest unit would include all of the east half of Section 15?

A. That's correct.

Q. Let's go to what has been marked for identification as Nearburg Exhibit Number 1. I'd ask you to refer to that and explain what it shows to Mr. Ashley.

A. This is an ownership map, depicting the

surrounding ownership within a mile of the proposed new field. The location of the well is actually shown as a location in the southeast quarter of the northeast quarter of Section 15. This map shows the surrounding operators and ownership in the Strawn formation.

Q. Is Exhibit Number 2 a notice affidavit confirming that notice of this hearing has been provided in accordance with OCD rules?

A. Yes, sir.

Q. And to whom was notice provided?

A. This notice was provided to all of the working interest owners and operators within a mile of the proposed pool.

Q. And what response did Nearburg receive to the notification?

A. We generally received no objections. Our original application was for the northeast quarter, and we received some waivers for the original application. We had an objection from Grand Banks Energy Company at one point where we had begun to try to apply for temporary field rules on 160 acres. Grand Banks Energy Company and their partner Brian H. Scarborough agreed to not object to an 80-acre application.

Q. And so we amended the application?

A. That's correct.

Q. Are you aware of any objection to this Application?

A. No, there are no objections that I'm aware of.

Q. Will Nearburg call geological and engineering witnesses to review the technical portions of the case?

A. Yes.

Q. Were Nearburg Exhibits 1 and 2 either prepared by you or compiled under your direction?

A. Yes.

MR. CARR: At this time, Mr. Ashley, we would move the admission of Nearburg Exhibits 1 and 2.

EXAMINER ASHLEY: Exhibits 1 and 2 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Gray.

EXAMINATION

BY EXAMINER ASHLEY:

Q. Mr. Gray, when was this drilled?

A. This well was drilled in -- I believe it was spud in October of 1998 and was TD'd, I think -- the geologist can speak better to this -- I think in December or early January, in the Morrow. And the well was recently finalized as a Strawn completion.

Q. Who drilled this well?

A. Yates.

Q. How come Yates drilled this well?

A. Well, Yates owned the majority interest. We're in an operating agreement with Yates. Yates is the operator. We're here because Yates had some more cases to put on today and asked us to do it because we had more time than they did, I guess.

EXAMINER ASHLEY: Okay. I have no further questions. Thank you, Mr. Gray.

THE WITNESS: Thank you.

MR. CARR: Mr. Examiner, at this time we call Mr. Jerry Elger.

EXAMINER ASHLEY: Excuse me?

MR. CARR: Jerry Elger, E-l-g-e-r.

JERRY B. ELGER,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. My name is Jerry Elger.

Q. Where do you reside?

A. In Midland, Texas.

Q. By whom are you employed?

A. By Nearburg Producing Company.

Q. Mr. Elger, what is your position with Nearburg?

A. Exploration geologist.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Application filed in this case on behalf of Nearburg Exploration Company?

A. Yes, I am.

Q. Have you made a geological study of the area which is the subject of this case?

A. Yes, I have.

Q. And are you prepared to share the results of that study with the Examiner?

A. Yes.

MR. CARR: Are the witness's qualifications acceptable?

EXAMINER ASHLEY: They are.

Q. (By Mr. Carr) Now, Mr. Elger, in this case the Strawn zone is the principal zone of interest; is that correct?

A. That is correct.

Q. Are there additional zones in this well which may

be productive?

A. Yes, there are. Specifically, the Wolfcamp and potentially the Queen sands.

Q. Have you prepared exhibits to make correlations between the subject well and other Strawn wells in pools in this area that are developed 80-acre spacing?

A. Yes.

Q. Let's go to what has been marked Nearburg Exhibit Number 3, and I'd ask you to identify and review it for the Examiner.

A. Exhibit Number 3 is a display of Strawn -- of open-hole log Strawn sections, including the Yates Ruby "ASV" Number 1, which is in the center portion of this montage. The perforation set in the Strawn which was production-tested is indicated in red in the depth column. Several other key wells in this area are also displayed.

Each of the three wells has a display of the open-hole porosity log sections, as well as the resistivity log sections. The top of the Strawn has been indicated by the yellow-shaded high gamma-ray event, and the base of the Strawn, which is the datum for this montage, is the minus-7200-foot interval.

On each of the porosity logs the light blue shading indicates Strawn reef section, which the logs indicate is tight. The darker blue sections indicate

portions of the Strawn where porosity appears to be developed by either the porosity logs or the resistivity log sections.

As you can tell on the Ruby "ASV" well, there's four basic porosity sets that have been perforated opposite the dark blue porous log indicators, and the well was production tested from those perforations.

At the base of that log is indicated or annotated some of the pressure information and some of the production testing that was associated with the completion of this well in the Strawn.

I would point out the well to the left of that, the Ruby well, which has been identified as the ARCO West Anderson Ranch State Number 1 well, the Strawn has indicated porosity section between 11,650 and 11,750. That well was production tested in that porosity section, that well having been drilled in the 1980s. And that production testing of that porosity indicated that the reservoir at that location was water-bearing.

The well to the right of the Ruby "ASV" well was also a well that was drilled in 1998 by Texaco as the Anderson Ranch Unit Number 201. That particular well is within a half a mile of the Ruby well. And a completion in the Pennsylvanian Morrow sands, which is a deeper objective, was effected in the Strawn, remains untested at

that location.

I would point out that the Ruby "ASV" porosity log and resistivity logs both indicate that the reservoir that was encountered in the Yates well, reservoir characteristics are very similar to Strawn production in other parts of Lea County, in particular the Lovington-Strawn area, the nature of the porosity, 4 to 7 percent, is typical of productive reservoir in that area.

And the apparent invasion profiles that you see relative to the resistivity or the lateral log indicate permeability in conjunction with the porosity that is also comparable to wells that are productive in the West Lovington area, in the eastern part of Lea County.

Q. All right. Let's now, Mr. Elger, go to what has been marked as Nearburg Exhibit Number 4, the two-well montage, and I'd again ask you to review the information on these logs for Mr. Ashley.

A. The two-well log montage are the same -- similar types of log presentations that were on the Exhibit Number 3. They are -- Again, the top of the Strawn is marked with the yellow-shaded areas, and the base is hung on the base of the Strawn carbonate package. The same parameters apply here, with the light blue shading indicating basically tight section and the darker blue shading indicating areas where some sort of reef event is occurring.

Both of these log sections were productive, and again, the perforation set is indicated in the red, in the depth columns.

The similarities -- These two wells are located in 17 South, 37 East, in Lea County, which is a considerable ways to the east of the Yates Ruby well, where the Yates Ruby well was drilled. But there are certain similarities with these two wells, which were both drilled by Nearburg Producing Company as part of the Humble City South Strawn development, and I'd like to point those similarities out.

If you'll look at the -- Again, each of these log presentations incorporates an open-hole porosity log as well as a resistivity log and, in the case of these two wells, dual lateral logs. Reservoir porosity is indicated by the red-shaded areas on each of the two open-hole porosity log sections. And you'll notice that the porosity is really quite similar to that which was encountered in the Yates Ruby well. You'll also notice that on the resistivity profiles the amount of invasion that is indicated and has been shaded on each one of these log sections is again very similar to that that -- as indicated by the lateral log in the Yates Ruby well.

Several other similarities include the depth of the Strawn. If you'll notice, the depth of the Strawn in

the Humble City South area is roughly 11,600 to 11,700, and in the case of the Ruby well it's a little bit shallower, 11,300 to 11,550, somewhere in that interval.

You'll also notice that the overall thickness of the Strawn from the top to the base of the carbonate is very similar. The two wells in the Humble City South field were both developed on 80-acre spacing patterns, and both wells were commercial producers, the Wright Number 1 cum'ing 661,000 barrels and the Wright Number 2 cum'ing 353,000 barrels.

You'll also notice that the nature of the Strawn is as indicated by the Wright 1 and Wright 2. The porosity in the Wright 2 is developed in the upper part of the Strawn, the porosity in the Wright Number 1 developed partially in the upper, but mostly in the lower.

You'll notice a comparison of that with the Ruby well, in which there's actually three -- or four indicated porosity developments throughout the entire Strawn section. We feel like the nature of the reservoir in the Humble City South Strawn field, which is developed, again, on 80 acres, is very similar to the reservoir characteristics that were encountered in the Yates Ruby "ASV" well.

Q. Let's now go to your isopach map, your gross Strawn carbonate isopach map, which has been marked as Exhibit 5.

A. Exhibit 5 is a gross Strawn carbonate isopach map in the area of the Application. The proposed spacing unit for the Ruby "ASV" well, which was drilled, again, in the northeast quarter of Section 15 has been indicated with a green box.

Several of the wells -- All three wells that are on Exhibit Number 3, the Strawn log montage, are displayed on this map, the ARCO West Anderson Ranch State well being over in Section 9 to the west, the Ruby well again indicated in 15, and the Texaco well as indicated in the northwest quarter of Section 14.

Prior to Yates drilling this well, only one other well in this whole township and range had been production tested in the Strawn, and that was located in the southwest quarter of Section 11. That well had 192 feet of overall carbonate. I really couldn't tell, because of the nature of the washouts in the open-hole log sections, whether there was porosity in that well or not. It was production-tested between May and November of 1998 and was found to be noncommercial, although it did encounter -- that production testing encountered shows of oil and gas.

No other tests of the Strawn have been conducted in this area. You'll notice that the map indicates a rather expansive area where the Strawn is potentially prospective, and that includes a large portion of the north

half of Section 15, virtually all of Section 10, a large portion of the south one-third of Section 3 and a large portion of Section 9.

We would -- In order to develop in a manner which would not be conducive to waste, we are applying for temporary field rules, again, on an 80-acre spacing pattern, so that we really don't -- until we have a better grasp as to the nature of this reservoir, we don't go out here and get in an overdrilled situation in which we're drilling noneconomic wells.

Our reservoir engineer, Clyde Findlay, will testify as to some of the reservoir parameters and characteristics of the Yates Ruby well and will address more the overdrill possibilities by leaving this spacing unit on 40-acre spacing.

Q. Mr. Elger, does Nearburg have plans for additional drilling to the Strawn in this area?

A. Yes, we do, and we have a permit to drill a well that will penetrate through the Strawn, located in the west half of Section 10, which is in the center of this area of Strawn thick.

Q. And when do you plan to commence the well?

A. That well is scheduled to commence on or before the 1st of May.

Q. Could you just generally summarize the

conclusions you have reached from your work in this area?

A. The conclusions are that a comparison of the discovery well, the Yates Ruby well, with other Strawn wells in the Lovington area, including not just the Humble City South field, but the Shipp-Strawn, the Casey West-Strawn and other Strawn fields in the eastern part of Lea County, the characteristics of those wells, which for all intents and purposes were drilled on 80-acre spacing patterns at comparable depths, looks very similar to what was encountered in the Strawn and the Yates Ruby well.

Therefore, until more data is gathered about the nature of the reservoir in this area, we would recommend that a temporary 80-acre spacing pattern comparable to all of those other Strawn fields be granted in this case.

Q. Mr. Elger, were Nearburg Exploration Company Exhibits 3 through 5 prepared by you?

A. Yes, they were.

MR. CARR: At this time, Mr. Ashley, we would move the admission into evidence of Nearburg Exhibits 3 through 5.

EXAMINER ASHLEY: Exhibits 3 through 5 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of Mr. Elger.

EXAMINATION

BY EXAMINER ASHLEY:

Q. Mr. Elger, you said other Strawn pools in the area are currently spaced on 80 acres?

A. That's correct.

Q. Could you tell me which ones those were? You said -- Was one the Humble City-Strawn?

A. There will be an exhibit that's presented by Mr. Findlay that will precede my testimony here, and it will be --

MR. CARR: -- 14.

THE WITNESS: -- Exhibit Number 14.

Q. (By Examiner Ashley) Okay.

A. And it lists the individual fields to the east of this area that were developed on 80-acre spacing patterns.

Q. Okay. To the northeast of your prospect, like in Sections 2 and 11, what formation are those producing from?

A. Those wells were drilled -- The discovery well for the Anderson Ranch Devonian Field was drilled in the northeast quarter of Section 11 in 1952 by Conoco. That well was a -- resulted in the discovery of Devonian in this area. And most of the penetrations you see in Sections 1, 2 and 11 were drilled through the Strawn and into the Devonian where they were -- as development wells on this Anderson Ranch Structure. None of those wells to date have been found productive in the Strawn.

Q. Okay.

A. And you can see that by the thicknesses indicated on this map in the 120 to 140 foot of gross Strawn carbonate interval, that they're all -- most of those wells encountered much thinner Strawn sections, therefore did not encounter the Strawn in a reef-type environment, as did the key wells listed in Sections 3, 9, 14 and 15.

EXAMINER ASHLEY: I have no further questions, Mr. Elger. Thank you.

MR. CARR: At this time, Mr. Examiner, we would call Clyde Findlay.

CLYDE FINDLAY,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Clyde Findlay.

Q. Where do you reside?

A. Midland, Texas.

Q. Mr. Findlay, by whom are you employed?

A. Nearburg Producing Company.

Q. And what is your position with Nearburg?

A. I'm a petroleum engineer.

Q. Mr. Findlay, have you previously testified before

this Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in petroleum engineering accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Application filed on behalf of Nearburg Exploration Company in this case?

A. Yes.

Q. Have you made an engineering study of the Ruby "ASV" State Com Number 1 well in the surrounding area?

A. I have.

Q. Are you prepared to share the results of that work with the Examiner?

A. Yes.

MR. CARR: We tender Mr. Findlay as an expert witness in petroleum engineering.

EXAMINER ASHLEY: Mr. Findlay is so qualified.

Q. (By Mr. Carr) Initially, Mr. Findlay, could you just summarize for us what rules govern the development of the Strawn formation in this area?

A. Currently the statewide rules indicate 40-acre oil spacing. This particular well has a depth bracket allowable of about 365 barrels of oil per day and about a 2000-to-1 GOR.

Q. Could you review the history of the Ruby well?

A. Yes, it was drilled -- I think Jerry testified earlier, it was drilled in October, spudded in October. It was TD'd in December of 1998 and completed on about the 15th of January of this year.

The Ruby initially came on flowing -- it was a flowing oil well -- at about 200 barrels of oil per day, and continued to flow for -- oh, I believe two or three weeks, and died.

Following that, a pump was installed, a beam pump, with a pumping unit, and the production has ranged anywhere from 50 to 700 barrels of oil a day since it's been on pump. I would suggest that 700 barrels of oil per day may be some flush production, but it certainly has high permeability, just looking at the rates.

Recently there's been some pump problems downhole. As you can guess, moving that type of fluid from that depth can be hard on equipment. So there have been some pump changes, and the well has fluctuated, oh, I would say in the 50- to 100-barrel-a-day range currently.

Q. Is this well allowable-restricted?

A. No, it is not. Certainly for a few days it had the capacity to produce above allowable, but not at this time.

Q. The purpose of the Application is really to avoid

drilling on too dense a spacing pattern until you have some additional information on the reservoir and can make a recommendation to the Division on permanent spacing rules; is that right?

A. That's correct.

Q. Let's go to what has been marked for identification as Nearburg Exhibit Number 6, the porosity log section, and I'd ask you to review that for Mr. Ashley.

A. The porosity log, Exhibit Number 6, is the log section, CNL/LDT porosity log section of the Ruby well. You've seen this, a piece of this, on Jerry's montage. I went through and calculated log properties.

There are four zones that are perforated that is also the net pay for this well. So starting with that, we have about 58 feet of net pay in the carbonate section.

Porosity ranges from 4 percent to 8 percent in these four zones, with an average of 6 percent when you weigh that based on thickness.

The water saturations range from 23 to 43 percent, and I've estimated the average water saturation for this entire well to be about 36 percent.

Q. Have you used this information in subsequent calculations?

A. That's correct.

Q. All right, let's go to Exhibit Number 7. Will

you identify and review that?

A. Yes, Exhibit Number 7 is a bottomhole pressure that was run not too long after the well was completed -- I guess about six days. And in 48 hours the bottomhole pressure built up to 2230 pounds. There were indications that the pressure was still climbing at the time the survey was taken. So I have made a conservative estimate of reservoir pressure at 2500 pounds. It indeed could be a little higher, but for the sense of conservatism I have estimated it at 2500 pounds.

Q. Let's now go to the flowing bottomhole pressure information on Exhibit 8.

A. On Exhibit 8, I actually calculated this, once the well was on pump, by looking at the wellhead pressure, which was 50 pounds, and knowing that the entire back side of the well in the annulus section between the tubing and casing was full of gas. I took the gas rate at that point in time, which was 300 MCF a day, and used this program to back-calculate the bottomhole flowing pressure or producing pressure in this well. This incorporates both friction and -- What else does it use? That's about it. It uses friction and hydrostatic head, I'm sorry.

So now we've established a static reservoir pressure, static bottomhole pressure, and now we have the flowing bottomhole pressure. So static is 2500 and flowing

is 64 pounds.

Q. Let's go now to the Darcy flow equation on Exhibit 9.

A. Exhibit 9 is the Darcy's flow equation. This, of course, is the standard of petroleum engineering for determining permeability. Sometimes it's not used because there's not enough data to calculate the full equation. In this case there is. We've been able to estimate pressure drops, porosity, that type of thing.

In this particular equation, when we input all the variables that we have seen in that well, the 40-API oil, an oil rate of approximately 205 barrels a day, which is what the well was producing when it initially flowed, I come up with a permeability, using Darcy's method, of about 1.25 millidarcies. That's pretty high for a carbonate in southeast New Mexico. I have some experience in other areas with both dolomite and limestone, and an average permeability of 1.25 millidarcies is relatively high.

This started giving me a hint that this well might be possible to drain more than 40 acres, when I started seeing these high perm numbers.

Q. Let's go on to Exhibit Number 10, the permeability numbers. Are you using initial flow rates?

A. Exhibit Number 10 is a method to estimate permeability. I felt it was important to try to estimate

permeability two different ways, since it can be a nebulous number.

This is a method that Erliger documented in the SPE -- Society of Petroleum Engineers -- monograph called "Well Testing", back in the early Eighties. And this method is similar to what we saw in Darcy's.

But if you may notice, if you'll look in some of these columns here, you'll see a time of 12, 36 and 60 hours. What this does is take initial flow rates when you initially test a well, and estimate permeability based on the change in flow rates in the first 72 hours of production. And to make a long story short, it's another way of calculating permeability to check Darcy's equation. I calculated permeability about 1.73 millidarcies using this method.

So in summation, I believe the permeability of this reservoir to be between 1 and 2 millidarcies, which is fairly high for a carbonate, and again may indicate the capacity to drain larger areas than 40 acres.

Q. Let's now got to the recovery factor exhibit, Exhibit 11.

A. Exhibit 11 is a recovery factor calculation. When you calculate recovery factors, the first thing you have to determine is the drive mechanism of the reservoir. The Ruby indicates every indication of being a solution gas

drive reservoir, as do the other Strawn wells in other fields that we'll talk about in a minute.

We're using the permeability we calculated. Here I used a 1 millidarcy number. As you can see, I inputted the water saturation that we got off the open-hole logs, the porosity average, the reservoir and flowing pressure. And in using the oil-recovery factor -- I'm sorry, using solution gas drive as the primary recovery factor, we come up with a recovery factor of about 18.9 percent for this particular reservoir. And that's in the range of solution gas drive. They'll range anywhere from 10 or 12 all the way to 25. So I believe that 18.9 percent is a very reasonable number for recovery factor.

Q. All right, Mr. Findlay, let's go to Exhibit 12 and look at the estimated ultimate recovery estimates on 40-acre spacing.

A. Well, I'm not able to calculate the drainage -- the areal extent of drainage in this well. It's far too early in the life to be able to extrapolate any graphical data to do that.

But what we can do, by taking both the known reservoir data and the calculated data which we've just demonstrated, we can figure out what you can recover with those parameters off of a 40-acre drainage area. So in other words, we're backing into this. We're saying, if we

had 40 acres to work with, with standard state pool rules, how much oil could we recover out of this?

When we input everything that we've gone through here -- and this is just a volumetric equation -- it shows a recovery of about 98,000 barrels. 98,000 barrels, at this depth of about 11,500 feet, would not provide economic payback for development in this field. And that's one of the points I wanted to make with this particular graph, that the reserves just aren't there on 40-acre spacing.

Again, earlier, we have seen permeability that is high enough, and initial flow rates that indicate permeability high enough, to quite possibly drain at least 80 acres, if not larger.

Q. All right, let's now go to Exhibit 13 and look at the estimated recovery on 80-acre spacing.

A. When we increase our spacing size to 80 acres and use the exact same method we just discussed, then numbers start to look a little more reasonable for development of this field. This provides a recovery of almost 200,000 barrels, which in my opinion would provide economic payback for a drilling program, and it would not promote waste, which I think would happen with the 40-acre drilling plan.

Q. Mr. Findlay, there are no other Strawn pools in the immediate area of the well; is that correct?

A. That's correct.

Q. Let's go to Exhibit 14, and I'd ask you to review the information on that exhibit. But first perhaps you should indicate where the Ruby well is located on this exhibit.

A. I apologize for not spotting the well on there. But anyway, if you'll look on this exhibit -- and it says "80-acre Strawn pools" at the top -- the Ruby is over in Section 16-32, which would be right in the middle, all the way on the left, and that's where we are now.

The closest fields that have analogous reservoir characteristics and performance characteristics to the Ruby appear to be these five fields which I've identified on this map. Obviously the closest one is the West Lovington-Strawn which had 80-acre spacing applied for and granted in 1992, the Casey-Strawn in 1975, Shipp-Strawn in 1986, Humble City-Strawn in 1972, and the South Humble City-Strawn in 1982.

And as Jerry testified earlier, these are the fields that most closely resemble what we see in the Ruby. There are other Strawn fields, obviously. The closest one I know of besides these is a Strawn field down in the Lusk area, about 20 miles south of the Ruby, but those are gas wells down there, and they're on 160-acre spacing, I believe. So I did not use that as an analogous comparison.

Q. Would you summarize why it is Nearburg is seeking

80-acre spacing in the Strawn on a temporary basis?

A. Yes, obviously Yates recently completed the Ruby well, which has given us some initial data and indicates some high flow rates. We've done our calculations using the known reservoir properties, and we can see with good confidence that the well can drain in excess of 40 acres, given the high permeability we're seeing.

We don't believe we could economically develop the field on 40-acre spacing because of the limited reserves per 40-acre unit. I don't believe that you'll need additional wells to drain 80-acre spacing units, and I also believe that from an analogous point of view that the Ruby behaves similar to what we see in the 80-acre Strawn pools that were listed on the previous exhibit.

Q. Mr. Findlay, if this Application is approved, for what period of time does Nearburg seek temporary rules?

A. We would like to have temporary rules for one year. Then at that point I believe we would have sufficient data from the Ruby well and maybe some additional development to be able to make a better recommendation for permanent pool rules.

Q. Will the requested increase in spacing result, in your opinion, in an efficient well development pattern for this pool?

A. Yes, I believe so.

Q. Will approval of 80-acre spacing on a temporary basis prevent waste?

A. Yes.

Q. And if the Application is granted, in your opinion, would it be in the best interest of conservation and the protection of correlative rights?

A. Yes, I believe it would.

Q. Were Exhibits 6 through 14 prepared by you?

A. Yes, they were.

MR. CARR: Mr. Ashley, at this time we'd move admission into evidence of Nearburg Exhibits 6 through 14.

EXAMINER ASHLEY: Exhibits 6 through 14 will be admitted as evidence.

MR. CARR: And I pass the witness.

EXAMINATION

BY EXAMINER ASHLEY:

Q. Mr. Findlay, Mr. Elger said that you had another location already approved --

A. Yes.

Q. -- to drill in this pool? And that's in Section --

A. I believe it's in the east half of Section 10; is that correct?

MR. GRAY: West half.

THE WITNESS: West half, I'm sorry, west half of

Section 10.

EXAMINER ASHLEY: Okay.

THE WITNESS: We will need to spud that by May 1st --

EXAMINER ASHLEY: Okay.

THE WITNESS: -- due to some limitations.

Q. (By Examiner Ashley) And it's currently approved for -- under statewide rules, 40 acres, right?

A. Yes, I believe that to be the case.

Q. Okay. On Exhibit 14 where you listed all the other 80-acre Strawn pools in the area, was the permeability similar as well in those to what you're seeing in the Ruby well?

A. I did not go through these type of calculations in those particular wells. But what I did observe were similar performance characteristics when the wells were completed, which indicates to me that the effect of permeability to oil of the reservoir in both those fields and the Ruby well are similar.

And I believe Jerry also showed what those porosities were, and if I look at the porosities of this Ruby log, then they're very similar. He saw 4 to 7 percent, we're seeing 4 to 8. So that, in turn, would probably give you confidence that the storage capacity of the reservoirs may be similar, although they had some

thicker pay developments, obviously, in the Nearburg wells, the ones over in the south Humble field, because they cum'd such a high amount.

EXAMINER ASHLEY: I have no further questions, Mr. Findlay. Thank you.

THE WITNESS: Thank you.

MR. CARR: Mr. Examiner, we would request that the case be continued to the April 29 Examiner Hearing. We might have to request an additional continuance, depending on how long it takes to meet with Mr. Kautz and work out the initial questions concerning the extent of the reservoir.

But in any event, at this time we would request continuance to the 29th.

EXAMINER ASHLEY: Case 12,132 will be continued to April 29th, 1999.

(Thereupon, these proceedings were concluded at 9:27 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 12132 heard by me on 4-1 1999.

Mark Ashley, Examiner
Oil Conservation Division

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 April 3rd, 1999.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002