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:	
APPLICATION OF YATES PETROLEUM CORPORATION FOR THE PROMULGATION OF SPECIAL RULES AND REGULATIONS FOR THE SOUTH PECOS SLOPE-ABO GAS POOL, CHAVES COUNTY, NEW MEXICO	CASE NO. 11,421
APPLICATION OF YATES PETROLEUM CORPORATION FOR THE PROMULGATION OF SPECIAL RULES AND REGULATIONS FOR THE WEST PECOS SLOPE-ABO GAS POOL, CHAVES COUNTY, NEW MEXICO	CASE NO. 11,422
IN THE MATTER OF CASE NOS. 10,793, 10,981 AND 11,004 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NOS. R-9976 and R-9976-A	CASE NOS. 10,793 10,981, 11,004

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER Hearing Examiner

November 2nd, 1995
Roswell, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, November 2nd, 1995, at the Roswell City Hall, 425 North Richardson Street, Roswell, 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

November 2nd, 1995
Examiner Hearing
CASE NOS. 11,421, 11,422, 10,793, 10,981 and 11,004
(Consolidated)

* * *

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A P P E A R A N C E S

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By: WILLIAM F. CARR

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and GREAT WESTERN DRILLING COMPANY:

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By: W. THOMAS KELLAHIN

ALSO PRESENT:

JAMES EAKIN and BILLIE L. EAKIN
Elephant Butte, New Mexico
Royalty Interest Owners

JIM WALKER
Plains Radio Petroleum Company
Amarillo, Texas
Royalty Interest Owner

* * *

WHEREUPON, the following proceedings were had at 10:18 a.m.:

EXAMINER STOGNER: At this time I'll call Case 11,421.

MR. CARROLL: Application of Yates Petroleum Corporation for the promulgation of special rules and regulations for the South Pecos Slope-Abo Gas Pool, Chaves County, New Mexico.

EXAMINER STOGNER: At this time I'll call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr and Berge.

We represent Yates Petroleum Corporation in this matter and would request that Case 11,421, which relates to special rules for the South Pecos Slope-Abo Gas Pool, be consolidated for purposes of hearing with the Application of Yates for similar rules for the West Pecos Slope-Abo -- that's Case 11,422 -- and also that these two cases be consolidated with the three cases, 10,793, 10,981, and 11,004, which have been reopened pursuant to Division Orders Numbers R-9976 and R-9976-A.

EXAMINER STOGNER: Are there any objections to consolidation of these matters?

Then at this time I will call Case Number 11,422

and the re-opened cases 10,793, 10,981 and 11,004.

MR. CARROLL: Application of Yates Petroleum Corporation for the promulgation of special rules and regulations for the West Pecos Slope-Abo Gas Pool, Chaves County, New Mexico; and in the matter of Case Numbers 10,793, 10,981 and 11,004 being reopened pursuant to the provisions of Division Order Numbers R-9976 and R-9976-A, which orders established a "pilot infill drilling program" in the Pecos Slope-Abo Gas Pool, Chaves County, New Mexico.

EXAMINER STOGNER: Okay. Other than Mr. Carr with Yates Petroleum, any other appearances in these matters?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Tide West Oil Company and Great Western Drilling Company.

EXAMINER STOGNER: Other appearances?

If you'll please stand and state your name and place of residence, if anybody would care to enter an appearance in this matter at this time.

JAMES EAKIN: We'd like to be recognized. We're royalty owners in this area, James Eakin and Billie L. Eakin, E-a-k-i-n. We're from Elephant Butte, New Mexico.

EXAMINER STOGNER: That's James, and what's the other name?

MR. EAKIN: Billie, B-i-l-l-i-e.

EXAMINER STOGNER: And you reside in Elephant Butte, New Mexico?

MR. EAKIN: At the present, yes. But we've ranched in this area out here since 1944.

EXAMINER STOGNER: And you are a royalty interest owner?

MR. EAKIN: Yes, sir.

EXAMINER STOGNER: Okay. There will be an opportunity for you later on to make a statement if you would care to. Thank you, sir.

Any other appearances? Or recognition?

JIM WALKER: Jim Walker, Plains Radio Petroleum Company, Amarillo, Texas.

EXAMINER STOGNER: Mr. Walker, are you a royalty interest owner, mineral interest or operator or all, or what?

MR. WALKER: Not as Plains Radio. Individually I have some royalty.

EXAMINER STOGNER: Okay. Any other appearances, or anybody like to be recognized?

Okay. In that case, are there any opening statements?

MR. CARR: May it please the Examiner, I don't have an opening statement.

I do have two witnesses.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: I have no witnesses to be sworn, Mr. Examiner.

EXAMINER STOGNER: Okay. With that, would the witnesses please stand at this time to be sworn?

(Thereupon, the witnesses were sworn.)

EXAMINER STOGNER: Mr. Carr?

MR. CARR: At this time, Mr. Stogner, we would call Mecca Mauritsen.

MECCA MAURITSEN,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. It's Mecca Mauritsen.

Q. And where do you reside?

A. In Artesia, New Mexico.

Q. By whom are you employed?

A. By Yates Petroleum Corporation.

Q. Ms. Mauritsen, what is your current position with Yates Petroleum Corporation?

A. I'm a landman.

Q. Have you previously testified before this

Division?

A. Yes.

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

A. Yes.

Q. Are you familiar with the Applications filed on behalf of Yates Corporation in each of the consolidated cases?

A. Yes.

Q. And are you familiar with the Pecos Slope-Abo Gas Pool, the West Pecos Slope-Abo Gas Pool and the South Pecos Slope-Abo Gas Pool and the status of the lands in and around those pools?

A. Yes.

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

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Ms. Mauritsen is so qualified.

Q. (By Mr. Carr) Ms. Mauritsen, would you initially summarize what Yates Petroleum Corporation seeks with these Applications?

A. Okay, the Cases 10,793, 10,981 and 11,004 were reopened pursuant to Division Orders R-9976 and R-9976-A,

and those established a pilot infill drilling program for the Pecos Slope-Abo Gas Pool. The order directed Yates to report the results of this pilot project, and we will present results of the project and make recommendations for the -- to the Division for special pool rules, which authorize infill drilling of these pools.

Then Case Number 11,421 seeks the adoption of the same rules for the South Pecos Slope-Abo Gas Pool, and Case 11,422 also seeks adoption of those rules for the West Pecos Slope-Abo Gas Pool.

Q. What are the current rules governing development of these pools?

A. The current rules are 160-acre spacing, you get one well per spacing unit, and the wells have to be 660 feet from the outer boundary of the spacing units.

Q. There's also a requirement, is there not, for a 330-foot setback from any inner boundary or quarter-quarter section line?

A. That's correct.

Q. When did Yates first propose a pilot project for the West Pecos Slope-Abo Gas Pool?

A. It was the summer of 1993. The hearing was on August 12th of 1993. We received Order Number R-9976, dated September 24th, 1993, which granted our application for the pilot project, and that is Yates Exhibit Number 1.

Q. What did the Division actually approve with that order?

A. It gave us the approval for the pilot project to drill six infill wells.

Q. And did that order actually require Yates to return in two years and report to the Division the results of their pilot project in the Pecos Slope-Abo Gas Pool?

A. Yes, it did.

Q. Was the project as approved by Order Number R-9976 subsequently expanded?

A. Yes, 1994 we asked for permission to expand the project, and we received Order Number R-9976-A, which is Exhibit 2 here, and authorized us to drill 20 additional infill wells in the Pecos Slope-Abo Pool.

Q. And that order did not change, however, the date that Yates was required to return and report to the Division the results of this pilot project?

A. No, the date stayed the same.

Q. Have you prepared certain exhibits for presentation here today?

A. Yes, I have.

Q. Let's turn to what has been marked for identification as Yates Petroleum Corporation Exhibit Number 3.

A. Exhibit Number 3 is a pool map that shows Chaves

County. It shows the outlines of each of the pools we're talking about. South Pecos Slope Pool is in the blue outline, Pecos Slope is in the purple, West Pecos Slope is shown with the green boundary.

The red boundary shows the infill pilot project area, and the wells that are highlighted in red are the infill wells that we actually drilled.

Q. This is offered for general orientation purposes at this time; is that right?

A. That's correct.

Q. Mr. Stallings will again refer to this and go into more detail about which wells have actually been drilled within the pilot project area?

A. Yes, he will.

Q. Would you identify what has been marked Yates Petroleum Corporation Exhibit Number 4?

A. Exhibit Number 4 is the lease map that we have hung on the wall over here. It's just for orientation also. The boundaries of each pool and the infill drilling project are marked on that map, and they'll correspond to this smaller computer-generated map.

Q. And this shows, actually, current operators of wells in tracts in the pool within a mile of the pool?

A. Yes, it does.

Q. And how current is Exhibit Number 4?

A. It's updated weekly, so it should be fairly current.

Q. Has notice of each of these Applications been provided to the affected interest owners as required by Oil Conservation Division rules?

A. Yes, it has.

Q. And to whom has notice actually been provided?

A. We gave notice to all operators in each of the pools, all unleased mineral owners in each of the pools, and all operators of an Abo well that were outside of the pool but within a mile of any of the boundaries.

Q. Is Yates Petroleum Corporation Exhibit Number 5 an affidavit signed by you with attached to it copies of the notice letters that were actually mailed out, a list of the parties to whom notice was provided, and then copies of any letters that were returned as -- or envelopes that were returned as undeliverable?

A. Yes, it is.

Q. Approximately how many interest owners were notified of this Application?

A. I think there was approximately 300 that were notified.

Q. Will Yates call an engineering witness to review the results of the pilot project and review the technical portions of this case?

A. Yes, we will.

Q. Were Exhibits 1 through 5 either prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, we would move the admission into evidence of Yates Petroleum Corporation Exhibits 1 through 5.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Exhibits 1 through 5 will be admitted into evidence at this time.

MR. CARR: That concludes my direct examination of Ms. Mauritsen.

EXAMINER STOGNER: Thank you, Mr. Carr.

Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Ms. Mauritsen, a point of clarification. If you'll turn to Exhibit Number 3 --

A. Yes.

Q. -- the Division's 1993 order for the original six-well pilot --

A. Yes.

Q. -- involved 6 South, 25 East, I believe, is that

not true?

A. That's correct, that's correct.

Q. So when we look at this display and find those six well symbols that are highlighted in red, those will represent the drilling of the first six wells for the first pilot in 1993?

A. That's correct.

Q. All right. Subsequently, the second pilot, if you will --

A. Right.

Q. -- of which an additional 20 wells were authorized, would have been Townships other than 6 South, 25 East?

A. That's correct, the other ones are outlined, that's correct.

Q. And for those that you have drilled, there's a gas-well symbol that shows a red outline?

A. Right, uh-huh.

Q. And if you had approval for but did not drill those second pilot wells on an infill basis, they are still shown, then, as open red circles?

A. That's correct.

Q. All right. And neither one of those orders addressed or approved or otherwise allowed infill drilling to take place in the West Pecos Slope or in the South Pecos

Slope Pools?

A. That's correct.

MR. KELLAHIN: Okay, no further questions, Mr. Examiner.

EXAMINER STOGNER: Thank you, Mr. Kellahin.

EXAMINATION

BY EXAMINER STOGNER:

Q. Exhibit A on Number 4, this was your notification -- I'm sorry, Exhibit Number 5 -- that was your notification.

A. Yeah.

Q. This represents the royalty interest owners in all three pools?

A. It's the operators in all three pools and the unleased mineral owners, and then all the operators within -- of an Abo well within a mile of the boundaries, that are outside the actual pools.

Q. Okay. Is the Bureau of Land Management and State Land Office included in that list?

A. I believe so. I'm not sure what page that would be on.

Q. Is that in alphabetical order or --

A. No, I don't believe it is. It's about -- about the eighth page. It has the BLM and the OCD, is listed.

Q. Could you give me a little brief detail of how

you compiled this list?

A. We started with our lease maps, and from those we checked the county records for unleased mineral owners or anything that didn't have a well on it at that time.

We also had a list of operators that was given to us from the Oil Conservation Division, I think, a couple of years ago when we initially asked for the pilot project. And once we compiled all the names of operators and unleased mineral owners, we then checked phone records and county records for old leases or anything that would give us an address that we could use.

We also checked our computer system, which had, you know, quite a few of these people on there.

Q. Do you have a breakout of how many operators, actual operators, there are in each of the three pools?

A. I don't have that. I'm sure we can furnish that to you.

EXAMINER STOGNER: Mr. Carr, just for the record, I would like a list of that by operator and pools and perhaps the number of wells. Your other witness may cover the number of wells but --

DARRICK STALLINGS: I have an exhibit that covers that.

EXAMINER STOGNER: Okay.

MR. CARR: Mr. Stogner, we will check that with

you following the hearing and be certain that if you would like it, we can certainly provide that and --

Q. (By Examiner Stogner) Okay. Do you know what number of acreage there is in each pool?

A. I believe that's in our Application.

Q. Okay.

A. I don't -- The Pecos Slope-Abo Pool has approximately 199,000 acres, the West Pecos Slope has approximately 92,480 acres, South Pecos Slope 73,440 acres.

EXAMINER STOGNER: I have no other questions of this witness at this time. She may be excused.

MR. CARR: At this time I would call Mr. Darrick Stallings.

DARRICK STALLINGS,

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. Darrick Stallings.

Q. And where do you reside?

A. In Artesia, New Mexico.

Q. By whom are you employed?

A. Yates Petroleum Corporation.

Q. And what is your current position with Yates

Petroleum Corporation?

A. I'm a petroleum engineer.

Q. Have you previously testified before the New Mexico Oil Conservation Division?

A. Yes, sir.

Q. At the time of that prior testimony, were your credentials as a petroleum engineer accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the applications filed on behalf of Yates Petroleum Corporation for the initial infill pilot project in the Pecos Slope-Abo Gas Pool?

A. Yes, I am.

Q. Are you also familiar with the Applications that have been filed on behalf of Yates, seeking the establishment of special pool rules for the West Pecos Slope-Abo Gas Pool and the South Pecos Slope-Abo Gas Pool?

A. Yes.

Q. Mr. Stallings, are you actually the person at Yates Petroleum Corporation who's primarily responsible for this infill pilot project in the Abo formation?

A. Yes.

Q. And are you prepared to report the results of this pilot project to the Oil Conservation Division as required by Division Orders R-9976 and R-9976-A?

A. Yes.

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

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: So qualified.

Q. (By Mr. Carr) I think initially, Mr. Stallings, if you would, it would be helpful if you could briefly summarize the purpose of your testimony here today.

A. We're here to report on our findings from the infill drilling pilot project in the Pecos Slope-Abo Gas Pool and to recommend that the field rules be amended to permit an optional second well on each 160-acre spacing unit.

We recommend that these special pool rules apply to the Pecos Slope-Abo Pool, as well as the South Pecos Slope-Abo Pool and the West Pecos Slope-Abo Pool.

Q. Why are you here reporting at this particular time?

A. We received approval for the infill drilling pilot project in September of 1993, and as part of that approval we were required to report back to the Oil Conservation Division in two years to report our findings for the pilot and to make any recommendations concerning amendments to field rules, and so we're here at this time

to fulfill that requirement.

Q. At the August, 1993, hearing, Yates advised the Division that it expected to gather additional geological data on the pilot project area. Initially, would you describe for Mr. Stogner the general nature of the Abo formation in this area?

A. The Abo in this area produces from sandstones. They are channel fill deposits and point bar deposits. Generally in the field area, they have a northwesterly to southwesterly trending direction, although individual channels are highly tortuous and results of meandering streams, we suspect.

And so what comprises the pool is actually several if not hundreds of individual channels which act as individual reservoirs. They have limited lateral extent. They're generally less than a mile wide. They are vertically separated, encased in shales. In a given wellbore we may encounter several of these sands vertically stacked on top of each other.

And we complete the wells out there, all the zones together, and produce as one reservoir, but there actually can be multiple reservoirs in a given well.

Q. And what we basically have are individual packages, sand packages, within the formation, and these are highly variable in their lateral extent; isn't that

fair to say?

A. That's true. Another key characteristic that I forgot to mention is, these are tight gas sands. The average permeability is variable because there are so many individual packages, but the average permeability is about .05 millidarcies, average porosity is about 13 percent.

Q. Let's go back to Exhibit Number 3 that Ms. Mauritsen introduced a few minutes ago, and I would ask you to refer to this and generally describe the Pecos Slope area, talking about the field boundaries and the number of square miles and acres involved.

A. The area within the pools, as shown here, is -- roughly covers about 600 square miles, or about 400,000 acres. I think those exact -- the exact acreage was in our Applications.

There have been almost 1100 wells drilled to the Abo in this area since development began in 1980. Of those almost 1100 wells, almost 1000 of them have been completed as Abo gas wells, and almost 900 of those are still producing Abo gas wells. Cumulative production from the Abo here is about 340 BCF.

Q. Ms. Mauritsen mentioned the approvals that Yates has obtained from the Division for this pilot project. Looking at Exhibit Number 3, could you describe the initial efforts of Yates to test this area for infill development?

A. Yes, the Oil Conservation Division approved a six-well infill drilling pilot in September of 1993. Those six wells are located in Township 6 South, 25 East. That's kind of in the upper left-hand corner of the red outline on this map. The six wells are highlighted as red gas-well symbols, and the well name is spotted there by the well.

We picked this area for our initial study of the feasibility of infill drilling for a couple of main reasons. One was, this was one of the best producing areas in the field. Another reason is that Yates Petroleum has a strong acreage position in this township.

And we drilled those wells, those six wells, in November and December of 1993. We've come to refer to those wells as Phase I pilot wells, and I may use that terminology again because there was a second phase to the project. But we drilled those Phase I wells at the end of 1993.

And the results -- We were encouraged by the results. We had mixed results, not all successes, but we did encounter gas reserves that we feel were not going to be drained by the existing wells.

Q. Now, Mr. Stallings, those were located in One township. Were these initial wells, in your opinion, typical of the Abo formation through the area which is the subject of today's hearing?

A. Well, we couldn't be sure because, like I said, this is one of the best producing areas in the field, and we -- one township in a field that encompasses several townships -- we weren't sure if it was representative of the field as a whole.

And -- combined with the fact that we had mixed success in those six wells -- we came back to the OCD in April of 1994 and requested an expansion of that original pilot project to include permission to drill 20 additional wells in four additional townships, in order to get more data over a wider, more representative area of the field. Those four townships are the remaining four townships that are shown inside the red outline on this map.

Those 20 wells are the 20 red symbols that fall inside the red boundaries, but outside of Township 6 South, 25 East.

We received approval for the expansion of the project, and beginning in March of 1994, through April -- through March, excuse me, of this year, we drilled nine additional infill wells that we will refer to as the Phase II infill wells.

Q. And that drilling took place when? August of --

A. August of 1994 to March of 1995.

Q. Okay.

A. And then in March of 1995 our management made the

decision to defer further drilling in the Abo gas field until the gas market and the gas price improves.

Q. Now, when your management decided to defer drilling, at that time you still had approval to drill certain wells, did you not?

A. Yes.

Q. And how did you go about selecting those wells at that time?

A. We had actually drilled about five of the Phase II wells when our management said that we would not drill all 20. At that time we changed the order of our drilling and changed which wells we were going to drill next so that the wells that we ended up with drilled and get data from would cover a representative area within the pilot area.

So we drilled to date 15 infill pilot wells, six from the Phase I, which are in 6 South, 25 East, and nine wells in the other four townships.

I'd like to review today the results of the -- and the data that we gathered from those 15 wells, and we feel that this data will show that infill drilling can result and will result in significant additional gas recovery in the Pecos Slope-Abo.

Q. Is it also your opinion that infill drilling would result in significant additional recovery from the West and South Pecos Slope-Abo Gas Pools?

A. Yes, we feel that the results from this pilot can be extrapolated to those other pools as well.

Q. And why do you recommend that allowing infill drilling in the South Pecos Slope-Abo Gas Pool and the West Pecos Slope-Abo Gas Pool will be appropriate and efficient and just be confined to Pecos Slope?

A. Well, they're all the same formation, all three pools have the same depositional environment.

Specifically referring to the South Pecos Slope, there's no -- It's contiguous with the Pecos Slope Pool, there's no geological boundaries, no geological evidence that I'm aware of, to separate these pools. It's just a southern extension of some of the channel sands that exist up in the Pecos Slope Pool.

As far as the West Pecos Slope, that pool lies about five miles to the west of the Pecos Slope-Abo. However, the channel sands that we see in West Pecos Slope look the same as the pay zones that we see over in the Pecos Slope. There's just an area between the two fields of poor sand development. I think that they're equivalent depositionally.

And the main difference between those two pools is that the West Pecos Slope wells in general are poorer wells, and that would indicate to me that the drainage area for those wells is less than Pecos Slope wells.

And so if 160 acres is not adequate, which I think I'll be able to show, for wells in the Pecos Slope-Abo, then it's certainly not adequate in the West Pecos Slope-Abo to recover the remaining gas reserves.

Q. If we look at the average cumulative production in the Pecos Slope-Abo and compare that to West Pecos Slope, what kind of a comparison, generally, can you make?

A. The average of all the wells completed in the Pecos Slope-Abo and the South Pecos Slope-Abo, average cumulative production to date, 430 million cubic feet.

By comparison, average cumulative production from the average West Pecos Slope well is 140 million cubic feet.

Q. And this would confirm a smaller drainage area in West Pecos Slope?

A. That's what it indicates to me, yes, sir.

Q. Okay. Let's turn to the pilot project specifically. What did Yates set out to learn with this pilot project?

A. Early in 1993, we began a reservoir study to determine whether we were going to recover all of the gas reserves from our properties at Pecos Slope-Abo with our existing wells.

As part of that study, we developed geological and engineering tools that in fact showed us some places

where the existing wells were apparently not going to recover all the existing gas reserves. These tools indicated that a second well was needed on some spacing units in order to maximize economic gas recovery.

It was with that information that we proposed this pilot project. The pilot project had two goals primarily in mind.

The first was to determine if in fact there were significant incremental gas reserves that were not being drained by the existing wells on 160-acre spacing.

Our second objective was to see if our engineering and geological tools were adequate to predict where we could drill economic infill wells to recover these reserves.

Each of the infill prospects had to meet three criteria, and those were: We had to -- We expect to encounter good sand thickness, based on our isopach maps; they had to be in an area and on trend with good cumulative production from existing wells; and they had to fall far enough away from existing wells to be outside the drainage area and not be depleted by the existing wells.

Q. Could you generally describe the geological and engineering tools that you've been referring to?

A. We had isopach maps and cross-sections which indicated to us where we could expect to encounter good

sand thickness.

We had isocum maps, based on -- showing us where the best cumulative production from the existing wells was, which we used to indicate sweet spots in the reservoir, highly productive areas of the field.

We also had a drainage map that we showed in the form of a circle map that showed the calculated drainage areas around all of the existing wells, and thereby show areas that were apparently undrained.

Those maps were all discussed in some detail at the two hearings that we've had on this pilot, and the copies of those maps were entered into evidence.

Q. What geologic data did you gather from the pilot, and what specifically did you learn geologically from the pilot project?

A. The data that we gathered primarily was log data. We ran a standard suite of density neutron logs and dual lateral logs in each of the wells that we drilled. That shows us the sand thickness and the location of the sands that we encountered in each well.

We used that data to go back and revise our geological maps and therefore get a better picture of what the reservoir looks like.

Q. So you were able, with this data, to compare the actual thickness to what you had been predicting, and based

on that, maps were revised?

A. That's correct, yes, sir.

Q. Let's go to what has been marked Yates Petroleum Corporation Exhibit Number 6, an isopach map. This is in zone A, and it's limited to Township 6 South, 25 East, and I'd ask you to take that exhibit and review that for the Examiner.

A. All right. As I said earlier, the Abo pay in this field consists of channel sands and point bar sand deposits. There can be several of those, and they're of varying areal extent, so that it's -- we have not been successful in mapping individual sand channels.

The way we've historically mapped in the area and the way that we've mapped on the maps presented here is, we break the entire Abo section into three zones and group the channels that fall into those zones and consider it one package for mapping purposes.

This first map is an isopach map of the top zone, the A zone pay sand, on Township 6-25. This is the map that we presented in the original hearing and that we used to justify to ourselves that we would encounter good sand thickness in proposed wells. However, it has been updated with the data from the six wells. The six wells are supposed to be shown as bold red gas symbols.

I need to make a couple of drafting corrections.

On all three of these maps, for 6-25, this Exhibit and the following two, I have two corrections. In Section 1, up in the northeast corner of the map, the red gas well symbol located in Unit A of Section 1 is not the pilot well. The pilot infill well is the well located in Unit D. That's a -- we just -- The numbers, the pay sand thickness, is right. We just highlighted the wrong well. That happened on all three of these maps.

Q. Would that pay thickness be 20 feet? Is that what you --

A. No, the pay thickness in the infill well, which is located in Unit D, is nine feet. The contouring is correct. We just highlighted the wrong well.

There's another case where we made the same mistake. The well in Section 12, one section below where we just were, highlighted as a red gas well symbol is not the infill well. The infill well is located in Section 11, in Unit I, or in the northeast of the southeast of Section 11. That correction needs to be made on all three maps, please. I apologize for the mistake.

Q. And what is the thickness at that well?

A. The thickness on the A sand is five feet --

Q. Okay.

A. -- of the pilot well.

EXAMINER STOGNER: Are those the only

corrections?

THE WITNESS: Yes. Yeah, those are the only corrections that --

EXAMINER STOGNER: Before we move on, Mr. Carr, let's see, refer down to Section 26 and refer to the big map --

THE WITNESS: Yes, sir.

EXAMINER STOGNER: -- on 3, and then these maps, the highlighted ones. I believe there's a discrepancy there.

THE WITNESS: You're right, those are not the only corrections. The big map is correct.

EXAMINER STOGNER: The big map is correct?

THE WITNESS: Yes, sir.

EXAMINER STOGNER: Okay.

THE WITNESS: In Section 26, the infill well is located in Unit B, and its thickness in the A zone is 28 feet.

MR. KELLAHIN: Point of clarification. Is the well that's incorrectly marked in red -- is that an existing well, or do we remove any reference to a well at that wrong location?

THE WITNESS: It is the existing well on that spacing unit.

MR. KELLAHIN: So the original --

THE WITNESS: There is a well there, we just highlighted the wrong well.

MR. KELLAHIN: I got you.

EXAMINER STOGNER: While we were on that, Mr. Carr, I just wanted to bring that out, so...

THE WITNESS: What we learned from these wells, geologically speaking, is that even on less than 160-acre spacing, these sands are very hard to predict. Channel sands are tortuous enough that there's going to be significant risk in drilling even infill wells in this field.

In general, we encountered less pay thickness than we predicted. However, in almost every case we encountered -- in every case except one in this township, we encountered enough sand thickness that the well is going to be -- is considered a success geologically.

The lone exception to that is the pilot well in Section 11. It's called the Cleo "ANC" Number 1. That well encountered much less sand than was predicted and will not pay out.

Q. (By Mr. Carr) Now, we've looked at Exhibit Number 6. That's the A sand. We've got exhibits for both the B sand and the C sand?

A. Yes, sir, and those are -- those go from -- The A sand is the shallowest, and the B sand is next, and the C

sand is the deepest group of sands. They all provide the same information.

Q. And in your initial mapping of the Phase I area, you divided the formation into these three sand groups; is that correct?

A. That's correct. And this is just an updated version of those original maps.

Q. Okay, let's go to what has been marked for identification as Yates Exhibits 9 through 13. First, explain what these are and how they differ from the three isopach maps we've just examined.

A. Okay. Well, the similarity is that these also are isopach maps. They are -- They cover the Phase II area of the pilot. You can see there that Township 6 South, 25 East, has been omitted from these maps.

From the time that we mapped and drilled the wells in 6 South, 25 East, we decided to change our mapping philosophy slightly. We divided the reservoir into five zones, rather than three. And so that's why there's five maps here. Rather than having three zones, we have five zones in the Phase II area of the pilot, designated from top to bottom, the A zone, the B zone, C zone, C lower, and the D zone.

Q. Now, by going to a -- or dividing the Abo into more intervals, what did you hope to achieve?

A. We felt like that that would allow us to more accurately predict the sand thickness at a given location.

Q. And so if we look at these five exhibits, 9 through 13, we have the isopachs on each of the five intervals in the Phase II area?

A. Yes, sir, and these are the same maps, again, that we presented in the August, 1994, hearing, but -- and they've been updated with data from the wells that have been drilled.

Q. And basically what did they show you, just in summary?

A. Well, the results of the Phase II wells geologically are very similar to the Phase I wells. It's still very difficult to map these channel sands accurately and to accurately predict where you're going to find good sand thickness.

In fact, of the nine Phase II wells that we drilled, two were dryholes, encountered inadequate sand thickness to even attempt a completion.

Q. Let's take a look at those two dryholes.

A. The first one is located in Section 5 of 6 South, 26 East, and it's designated by a red dryhole or drilled-and-abandoned symbol. This well, called the Spring Fed Number 4, encountered only two feet of gas sand. Its offsets in four directions have an average of 32 feet of

sand.

The second well that was drilled, that we drilled and abandoned, is down towards -- it's down at the bottom of the map, Section 27 of 7 South, 25 East, again designated with a drilled-and-abandoned symbol. That well, the Papalote "OI" State Number 5, encountered nine feet poor gas sand, and its four offsets have an average of 51 feet of pay.

So again, we relearned, it's very hard to accurately predict the sand thickness, even when drilling on less than 160-acre spacing. I think the geological risk is significant to infill drilling in this field.

We hope and intend that by continuing to upgrade and refine our geological tools and mapping techniques, that we'll be able to manage that risk and hopefully reduce it.

Q. And the geological risk is just simply finding adequate sand thickness in this reservoir at these locations to make an economic well?

A. That's correct.

Q. Let's move to what has been marked for identification as Yates Petroleum Corporation Exhibit Number 14. Would you identify this first and then review it for Mr. Stogner?

A. This is a table that I feel summarizes all the

pertinent engineering data that we've gathered from this pilot project.

Let's go over what's included here. I won't go over all the numbers.

Down the left-hand side of the page we have the 15 well names that have been drilled. They are grouped by Phase I wells, which were the first six wells that were drilled in 6 South, 25 East. I've then included some averages of those six wells.

Below that are the Phase II wells, which were drilled in the other four townships included in the pilot.

Across the top I show the well name; the location of the well; the initial bottomhole pressure that we measured from pressure-buildup tests upon initial completion of that well; the bottomhole pressure of the offsets, the average bottomhole pressure of the four offsets, at the time that the infill well was drilled; the initial rate of the infill well; and then we can compare that to the offsets rate, current rate at the time that the well was completed; and then my calculation of reserves that we will recover from those infill wells and the reserves that we have remaining to recover at the time the well was drilled from the offsets.

I have maps. The following exhibits will be maps that show a lot of this data posted by the wells in map

form, so I won't go over all of these numbers in detail here.

I would like to point out that when we talk about the pressure data, it helps to know that the original virgin reservoir pressure in this field was 1125 p.s.i.

So if we go down to the bottom of the page and just look at the total pilot averages, it says that of the 15 wells we drilled -- excluding the dryholes, we didn't measure pressures in those -- the average pressure encountered in the infill wells is 779 p.s.i.

At that time, the offsets had an average bottomhole pressure of 269 p.s.i.

To me, that's the single most convincing piece of data that says we are encountering new reserves that are not being drained by the offset wells.

In addition, the average initial rate from the new wells is 744 MCF per day. The offsets at that time were producing an average of 87 MCF per day.

Now, that 744 includes zeroes from the two drilled and abandoned wells. If you take out the dry wells plus the uneconomic wells, which I'll point out, you end up -- We drilled 10 successful wells. Those 10 wells had an average initial rate of 1.1 million cubic feet per day. And we estimate that those infill wells will recover an average of 544 million cubic feet.

Let me just point out the wells that we consider unsuccessful, and that's based on the economic criteria. We just don't think those wells are going to pay out at expected gas prices.

Up in Phase I there were two unsuccessful wells.

The Cleo "ANC" Number 1, that well encountered inadequate sand thickness to produce at economic rates.

The Hobbs Fed Number 3 in Phase I, we consider uneconomic primarily because we drilled into a depleted part of the reservoir.

And then down in Phase II, the Spring Fed Number 4, I already mentioned, was a dryhole because of poor sand development, as was the Papalote "OI" Number 5.

And then the fifth unsuccessful well is the Paulette "PV" State Number 5. We completed that as a gas well, but you can see there the initial rate was about 100 MCF per day, and we don't expect that to extrapolate out to economic reserves.

Q. Are you ready to go now to the individual maps?

A. Yes.

Q. Let's go to what has been marked for identification as Yates Petroleum Corporation Exhibits 15 through 17. And have you given the general background that you feel is necessary to the individual maps?

A. Let me just state, the way these maps are

constructed, the base maps underlying the data here for the next three exhibits are all the same. This is a -- First of all, this is a blow-up of the pilot area, the red outline.

What I've shown here are the 20 pilot wells that were -- the 26 pilot wells that were approved. Around the wells that we've actually drilled, the 15 wells that have been drilled, I've colored in the spacing unit in purple. And the four nearest offsets to the infill well I've colored in green, and I'll be referring to some numbers from those wells.

That's the general construction of all three maps.

Q. All right. Let's go to Exhibit Number 15. This is your pressure data map --

A. Okay.

Q. -- and I would ask you to review the information on this exhibit for the Examiner.

A. This is the pressure data posted by each well. The red number is the bottomhole pressure we measured initially in the infill well. The green number is the average bottomhole pressure in the four offset wells at the time that the new pilot well was drilled. These numbers are the same as the numbers on the table that we just discussed.

I'd like -- I won't go through all those numbers but I would like to point out a couple of cases that I think typifies what we found out here.

Q. And these are the numbers that need to be reviewed in the context of a virgin reservoir pressure of 1125?

A. That's right.

Q. Okay.

A. That's right. Twelve of the wells, 12 of the 15 wells, encountered what I consider significantly higher reservoir pressure than is found in the offset wells. However, none of those wells encountered virgin reservoir pressure of 1125. This indicates to me that there is some partial communication between the new well and the pre-existing wells. I think this is explained by the geology in the field.

Again, these are stacked pay sands, individual reservoirs, if you will. However, we'd perforate and complete those zones all together in these new wells. Some of those pay sands that were completed are present in offset wells, and some aren't.

I think that the zones that are not in offset wells have higher pressure than what we measured, possibly even virgin pressure. The zones that are in good communication or that exist in offset wells have lower

pressure that what we measured.

So what we're measuring is one pressure of several reservoirs, some aggregate of each of those.

Q. It's not possible to go down and get the individual sand stringers and provide pressure information on each of those?

A. Not with the way we complete the wells, that's not available.

Q. Now, do you want to go over this data individually, or do you want to do it in summary fashion?

A. I'd like to just point out a couple of examples of what we found.

The first example is down in Section 22 of 7 South, 25 East. Referring to the bottomhole pressure data there, the Thorpe "MI" Fed Number 15, we measured bottomhole pressure of 1089 p.s.i. At the time that was measured, those four offsets to that well, which are shown as green gas-well symbols, had an average bottomhole pressure of 189 p.s.i. We feel that the fact that this well encountered near virgin reservoir pressure when its offsets were at less than 200 p.s.i. indicates that this well will recover incremental gas reserves.

On the other extreme, the other example I can point out is up in Township 6 South, 25 East, Section 8, the Hobbs Fed Number 3. That had reservoir pressure of 479

p.s.i. The offsets at that time had pressure of 249, on the average. We don't think this well is ever going to pay out, and we feel like it was unsuc- -- now, it encountered adequate sand thickness, similar sand thickness to the offset wells, but it encountered reservoir in such a depleted state that I don't think it's ever going to produce enough gas to pay out.

And this is an indication of the drainage risk or the depletion risk, which is the second big risk in drilling wells out here, next to the geological risk of finding sand.

Q. Doesn't this also tell you that it would be uneconomic in this field to drill a second well on each proration unit in the field --

A. I think that --

Q. -- or spacing unit?

A. I think that would be uneconomic, to do that.

Just in summary, on the average out here, the wells that we drilled encountered almost 800 p.s.i. at the time that their offsets averaged less than 300 p.s.i., and again I think that that pressure data is the strongest evidence that we have that these wells are encountering new gas reserves that were not being effectively drained by the existing wells.

Q. Let's go now to Exhibit Number 16. That contains

the production rate.

A. Okay. This map is constructed very similar to the previous one. The only difference is, on this map we've posted in red numbers the initial production rate in MCF per day of the infill pilot well. In green we have posted the average current production rate of the four offset wells at the time that the pilot well was completed.

I think that the data here is consistent with the bottomhole pressure data in that wells that produced at rates much higher than the offsets -- it tells me that they encountered new reserves, whereas wells that produced at rates similar to the offsets encountered reservoir that was already in communication with the existing wells.

I would like to point out just a couple of -- the same two examples of the wells that we talked about previously, down again in Section 22 of 7-25.

The Thorpe Number 15, that well initially tested for 1.3 million cubic feet per day. At that time, those four offsets noted there in green were producing an average of 70 MCF per day.

On the other end of the spectrum, again, is the Hobbs Fed Number 3, up in Section Number 8 of 6 South, 25 East. That well produced a maximum rate of 100 MCF per day at the time that its offsets were producing about 70 MCF per day. Again, consistent with the bottomhole pressure

data we interpret that to be in that well, is encountering practically no new reserves.

Q. On the contrary, however, the Thorpe "MI" Federal 15 would be an example of a well that was able to recover reserves that otherwise were not going to be produced?

A. Yeah, I think that's correct. I think the reserves that will be produced will be incremental reserves that would not have been recovered otherwise.

Q. Okay. On an average, what do you see when you look at these production figures?

A. Well, I mentioned on the table -- It's shown on the table, but on the average, the infill wells can be producing 750 MCF per day, approximately.

The surrounding wells have been on line for, in general, 15 years in this field. They're down to less than 100 MCF per day.

This indicates to me that the new wells are producing gas that was not going to be produced by the offset wells.

Q. All right, Mr. Stallings, let's go to Exhibit Number 17 and review the data shown on that exhibit.

A. Posted on the same base map, the -- our calculated total reserves from the infill wells in red, and the remaining reserves, the average remaining reserves of the four offset wells, in green numbers.

These reserves were calculated using decline-curve analysis. And the average -- Again, the average infill well will recover 544 million cubic feet of gas. That's based on all 15 wells. The 10 successful wells will recover almost 800 million cubic feet of gas, compared to the average remaining reserves in the offsets of less than 200 million cubic feet.

Q. Could you generally summarize the results of the pilot project for Mr. Stogner?

A. Over the last two years, Yates Petroleum Corporation has spent about $4.5 million to drill 15 infill wells covering a five-township area in the Pecos Slope-Abo Gas Pool. We feel these 15 wells cover a broad enough area to be representative of the entire field.

As I mentioned earlier, ten of those wells were successful. Each of -- And by that, we feel that each of those wells will recover enough new gas reserves to be profitable.

Five of the wells we drilled are unsuccessful, either because they did not encounter adequate pay sand thickness or because they didn't encounter adequate reservoir pressure.

Overall, the 15 wells, we expect to recover about 8 BCF of gas reserves, which would have been left in the ground if these wells had not been drilled.

I think that with that pilot we've shown that there are significant gas reserves remaining in the field which will not be recovered by the existing wells. We've shown that there's risk associated with drilling these reserves but that if you pick your spots carefully you can drill for these remaining gas reserves profitably.

I don't think we're going to be able to overcome the inherent risks completely, at least not with the tools that we've developed to date.

In the pilot project, one-third of our wells were dry or uneconomic. This seems like an awfully high percentage for an infill drilling program to me, but we think that with continued emphasis and concentration on our good engineering and good geology, we can reduce those numbers of uneconomic wells and hopefully improve the profitability of infill drilling out here beyond what we've seen so far.

Q. What do you think the ultimate potential is for a fieldwide infill drilling in each of the pools in the hearing today?

A. In the total area, we've estimated that on Yates's acreage, there could be as many as 200 spacing units, which could benefit from a second well.

I think the average reserves that we'll recover from those 200 wells is about 500 million cubic feet per

well. So the potential to Yates is about 100 BCF of gas reserves.

Q. These are reserves that would, in fact, otherwise not be recovered from these pools?

A. That's correct.

Q. And what is your recommendation to the Division?

A. We recommend that special pool rules be adopted authorizing the optional second well on each spacing unit n the Pecos Slope-Abo Gas Pool, the West Pecos Slope-Abo Gas Pool and the South Pecos Slope-Abo Gas Pool.

Q. Is there any potential in this area for development uphole, above the Abo?

A. There is some San Andres production within these field boundaries. It's scattered and marginal, but it's always -- there is some potential there.

Q. Are you making any recommendation concerning any change in the well-location requirements for these infill wells?

A. No, we recommend that the 660 feet from the spacing unit boundary be maintained.

Q. Mr. Stallings, is there a potential, if this proposal is approved by the Division, for one spacing unit with one well on it to be offset by another spacing unit or multiple spacing units, where there is more than one well?

A. Yes.

Q. And why would that occur?

A. I think the geology would dictate that. You can tell from the isopach maps that we've looked at that there very well could be a good economic channel sand in one spacing unit, and a neighboring spacing unit might be -- have no sand. We found that out with the dryholes we drilled.

Q. And this variation in the development pattern could be a necessary result of just the geological characteristics of the reservoir; is that not right?

A. That's correct.

Q. In your opinion, will correlative rights be protected if this proposal is in fact adopted?

A. Yes.

Q. Will it, in your opinion, result in uncompensated drainage that cannot be offset -- offset development?

A. No, I mean, by allowing any spacing to drill an optional well, that allows you to put a well on any spacing unit that you want, if the engineering and geology can dictate that it would be profitable.

Q. If in fact these Applications are approved, will that provide an opportunity to operators in the pool to effectively produce the reserves under their own tracts?

A. Yes.

Q. If it's approved, will unnecessary drilling

result?

A. I think that if it's approved, necessary drilling will result. I think that waste would occur without the ability to drill infill wells in this pool.

Q. Is the implementation of prorationing in this pool necessary if, in fact, correlative rights are to be protected?

A. I don't think prorationIng is necessary here. I'm not a proration expert, but it's my understanding that prorationing is appropriate when there is a market constraint or a pipeline constraint whereby all the producers in a given area can't sell all the gas capacity that's available. To my knowledge, there's pipeline capacity and markets to sell all the gas that can be produced in this area, if you're willing to sell it for the going price.

Q. If producing allowables are set for spacing units in this field, would that have the tendency or the potential for defeating what you're seeking here with an infill drilling program?

A. I think it could harm the economics to the point that it might not be economic to drill wells. I think we have to be able to produce these wells at their maximum capacity to realize an adequate return on our investment.

Q. Aren't you really talking about rules that in

fact will honor the geology and the engineering data on this reservoir?

A. I think by allowing a second -- optional second well, that's correct, you'd let the technical data dictate whether and where you place the second well.

Q. And in effect, what you're doing is permitting or giving an operator an opportunity to produce his share of the reserves if in fact he has, because of the complicated nature of this reservoir, more in the way of reserves under his tract than may be under an offsetting tract?

A. Yes, sir.

Q. In your opinion, should these rules be adopted on a permanent basis?

A. That's our recommendation, yes.

Q. Are you prepared to make any recommendation to the Commission concerning any kind of numbering system that ought to be employed to designate infill wells within these pools?

A. Yes, I understand that there is a system in place in some San Juan Basin fields whereby you place a letter designation -- an E, maybe -- at the end of the well name, the well number, to designate it as an infill well. I think that would be appropriate here.

Q. In your opinion, will approval of these Applications and the establishment of special pool rules

for the Pecos Slope-Abo Gas Pool, the South Pecos Slope-Abo Gas Pool and the West Pecos Slope-Abo Gas Pool that would permit the drilling of an optional infill well -- would those rules be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Were Exhibits 6 through 17 either prepared by you, or have you reviewed these exhibits and can you testify to their accuracy?

A. Yes.

MR. CARR: At this time, Mr. Stogner, we would move the admission into evidence of Yates Petroleum Corporation Exhibits 6 through 17.

EXAMINER STOGNER: Any objections?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Exhibits 6 through 17 will be admitted into evidence at this time.

MR. CARR: And that concludes my examination of Mr. Stallings.

EXAMINER STOGNER: Thank you, Mr. Carr.

It looks like it's 11:30. I think now would be a good time to take a lunch break.

Let's reconvene at 12:45.

(Thereupon, a recess was taken at 11:27 a.m.)

(The following proceedings had at 12:45 p.m.)

EXAMINER STOGNER: Hearing will come to order.

Are you ready for cross-examination of your second witness, Mr. Carr?

MR. CARR: Yes, sir.

MR. KELLAHIN: All right, sir. Are you ready, Mr. Stogner?

EXAMINER STOGNER: Yes.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Stallings, if you'll pull out Exhibit Number 15, let me ask you some questions about your analysis of the pressure data.

A. All right.

Q. Let's just take one of these as an example. Let's look at the Catterson Federal over in 7 South, 26 East. The top number in red is the initial bottomhole pressure?

A. Yes, measured in the new well.

Q. Okay. And how is that test taken?

A. In all of these wells, we measure that by running a five-day pressure buildup test after the well is completed and flowed back and stabilized at a stabilized rate, then we shut the well in and measure pressure buildup for five days, and then we analyze that pressure buildup

test with transient analysis to come up with an average reservoir pressure.

Q. At what point in the life of completing the well and getting it ready to produce do you take the test?

A. The sequence of events is, we perforate the well, hydraulically fracture the well, establish flow from the well and recover as much of the frac fluids as we can, establish a stabilized gas production rate. It may take a week of flow testing, and then we'll shut the well in as the final step in the completion. And then after the pressure buildup test is run, we put the well -- we're able to put the well on production down the line.

Q. When we look at the distribution of the bottomhole pressure information on the map, there appears to be a range of pressure differences; is that not true?

A. That's true.

Q. Is part of the explanation to the change in pressure as you move from area to area explained by the proximity of the infill well to existing wells?

A. Yes.

Q. So when you look at the Catterson well, the fact that its initial bottomhole pressure is 438 is going to be reflective of the fact that the existing wells that you've averaged -- which are the four, apparently, that are shaded in green? Am I understanding this right?

A. Yes.

Q. That average, then, is simply the relationship of the effect of the original wells on the infill well.

A. Right.

Q. Is part of this pressure differential in the reservoir explained by the low permeability of the reservoir?

A. I don't know that -- I don't attribute a large part of it, but I guess a part of it, I would say a small part of it, is due to the low permeability in the reservoir.

Q. When we're looking at the concept of infill drilling, as I understand it, there's two possible analyses. One is to contend geologically that the reservoir is separated into multiple stringers of short lateral extent, and thereby you need additional wellbores, because those sands don't go very far, all right?

A. (Nods)

Q. Is that what you were talking about when you were talking about a geologically justified well? I'm not sure I remember the phrasing exactly. A geologic success is what you said?

A. Well, the way we define geologic success was, there was good sand thickness encountered in that wellbore, whether or not it was apparently present in the offset

wells.

Q. Let me ask you the question, then. Do you see, based upon your analysis, the predicate for infill being based upon the fact that the infill well is going to encounter new sands?

A. Partially, yes.

Q. That's not the driving factor, apparently, though, is it?

A. We really didn't -- That was not one of our objectives --

Q. Okay.

A. -- was to encounter this. And the reason was because we had mapped this on an individual-sand basis. It's complex enough that I think we find new sands sometimes.

Q. Well, D'Nese Fly, when she did the first geologic isopachs and had the three zones back in August and September of 1993, had subdivided it into A, B and C.

Later on when -- Leslie Bence, I think it was --

A. Yes.

Q. -- did it in May of 1994, she now has five different packages for the pool. That's apparently what I saw a while ago.

A. (Nods)

Q. When you look at that combination of package,

then, what is the minimum total thickness criteria by which you're deciding to justify the infill wells?

A. There's not a hard and fast answer to that question, and I'm not sure that those two geologists would answer it this way.

I think -- general rule, very general rule -- you need 20 feet, minimum. You try to drill for 30 feet, minimum. If you get 20, then we would run pipe and test that.

But the reason I say it's very general is because you have to take into consideration how much sand thickness in the offset wells locally, in that particular area -- what's the sand-thickness-to-production relationship? Some areas of the field, thinner sands are more productive, and in some areas of the field thicker sands are more productive.

We didn't -- I don't have a table I can show you that answer. It's just a case-by-case basis. We try to take all of that into consideration.

Q. When we looked at 6 South, 25 East, which was, as I understand it, one of the very best portions of the pool for the first pilot project, first phase, what kind of generalizations can you make about the thickness of the sand package within that section?

A. What kind of generalizations can I make? That

it's variable even in that area of the field.

Q. Can you characterize the range of variation? Are we dealing with hundreds of feet here?

A. We could add up the thicknesses in a given well off of the isopach maps in that township to give you an answer, and I guess that's the way I'd need to do, what I'd need to do. I don't know.

Q. All right. Is that not what you --

A. It's not hundreds of feet. It's less than a hundred feet, is the maximum sand thickness in a given well.

Q. All right. When you did the volumetrics in August of 1993, is that what you did, is, you counted up in the individual wellbore the total thickness for the volumetric calculation?

A. Yes.

Q. As part of that calculation of footage, was there a porosity cutoff?

A. No, the way that we defined pay sand was with density neutron log crossover. So there really was no minimum for any crossover porosity we counted as pay.

Q. All right. So you didn't use a cutoff on porosity?

A. There was no minimum porosity cutoff, no, sir.

Q. All right. When you move from 6 South, 25 East,

to a thicker portion in here, over to the West Pecos Slope, there's a substantial reduction in the reservoir in terms of thickness, is there not?

A. I wouldn't be surprised if that's true. I have not studied West Pecos Slope in nearly the detail, but I've studied the pilot area for this project.

Q. When you get to West Pecos Slope, do you know how many of these sand packages can be identified? Can they still be put in the five?

A. I don't know the answer to that.

Q. What was your basis for arguing for infill drilling in the West Pecos Slope?

A. I feel like that depositional environment was the same, that the sand channels look similar, from what I've seen, to what we see in the main Pecos Slope, and that the ultimate recovery per well is lower in the West Pecos Slope than it is in the Main Pecos Slope, and therefore I am assuming -- having not done the calculations, I'm assuming that a portion of that is due to smaller drainage areas.

Q. Would it also not equally be as likely to be attributable to the fact that the reservoir is substantially thinner?

A. That's correct.

Q. And if that's true, then, infill well drilling in West Pecos Slope may not yet be justified?

A. I couldn't justify it to my management without doing a study of the area.

Q. And you don't yet have that --

A. I have not done that study. I think -- well, yeah.

Q. When we look at the part that you have studied, tell me, when I look at Exhibit 15, what I am seeing when you identify in the offsetting wells to Catterson, for example, in the green symbols, what you characterize to be the average current bottomhole pressure.

Now, my question is, for each of those wells, are you taking a current bottomhole pressure and then averaging among the four? Is that what you did?

A. That's correct.

Q. What is the approximate date of the data of the bottomhole pressure tests for those offset wells?

A. In the case of Township 6-25, I believe the date was October of 1993. And the reason we had the opportunity to gather that data was because the wells in the field had been shut in -- I don't remember how long now -- many days, if not over a month. And we felt like that we had reached a stabilized bottomhole pressure, and so we were able to use that as the estimate. These sands are tight enough that it takes a long time to get -- for the pressure to build up to a stabilized point. So it's in --

Q. I'm losing track here, Mr. Stallings.

A. Okay.

Q. I'm looking at the vintage of the bottomhole pressure data. I think you've moved me into Township 6 South, 25 East?

A. Yeah, so the vintage of those bottomhole pressures was approximately October of 1993.

Q. Okay. So the other wells, then, within Phase II, the vintage of the offset bottomhole pressure test, in relation to the infill well, has got an approximate time period of what?

A. It does, and it must have been -- I don't recall. February of 1994 rings a bell.

Again, it was a similar situation where, due to low gas prices, we had shut in those wells just because we weren't selling gas from the field at that time, and a side effect of that was that it allowed us to go get pressure data, after having had an extended shut-in period.

Q. How confident are you of the reliability of that shut-in pressure data for the offset wells?

A. We're very confident in it.

Q. You looked at that stuff; is it influenced by fluid volumes or anything in the well, any kind of issue with regards to that point?

A. We don't -- These wells, dry gas producers, we

don't see any fluid, as a general rule, there's no liquid column in those wells.

Q. Let me go back to my first questions, then. When we look at Catterson, it appears that the infill Catterson well's bottomhole pressure is explained because of the proximity of the existing offset wells. And had there not been an influence from the existing offset wells, there would be no other way to explain the fact that the Catterson well did not come in at virgin pressure. Are you following me?

A. I agree with that.

Q. So if the reservoir is not depleting the infill location for Catterson, we could expect to see pressures of the 1125, give or take?

A. Yes.

Q. So over time that gas is being depleted by the offset wells?

A. I believe it's being partially depleted by the offset wells.

Q. Okay, let's go up now to the north end of the display, and it's the Dee -- I think that's a zero Q?

A. Yeah, OQ, yes, sir.

Q. It's an OQ. The Dee OQ State well, which is in Township 5 South, 25 East -- it's down there in Section 32 -- do you see that one?

A. Yes, sir.

Q. All right, it's got an initial pressure of 992. We're twice what we were seeing in Catterson. Is the fact that we're getting a higher pressure in that infill well explained by the fact that for that well the offsets are substantially farther away from the Dee OQ State well than in the Catterson example? Do you see what I'm saying?

A. I do see what you're saying. That has a lot to do with it, yes.

One of our three criteria for picking these locations was to, on the one hand -- two of our criteria -- on the one hand, be close enough to good wells to be in a sweet spot of the reservoir, but at the same time be far enough away from the existing wells to not drill a depleted well.

So when we can maximize the distance from a producing well and still feel like we're in a -- encounter good sand thickness, that's the ideal situation.

Q. Well, look at Section 32 with me. You can find within the area where the infill well exists 160 acres that does not yet contain a well. So in effect, the Dee well is the first well in 160 acres, and does that not explain what's happening with the pressure?

A. Oh, I think that has a lot to do with what's happening with the pressure, yes, sir.

Q. When you look at -- I see how you've analyzed it. You've looked at the opportunities for the infill wells and drilled some of those.

Did you correspondingly look to see if you already had examples in the pool, where you had existing wells in close proximity, which would be a spacing pattern equivalent to what you would have if the Division allowed infill drilling?

A. Yes, I did, and part of our original analysis back in 1993 covered that, and I can show you some examples in Township 6-25 that I recall. Down in Section 25 and 26 of 6-25, where those two sections meet, there were actually four wells drilled on a 160.

Q. Yeah, you've got 40-acre spacing on some of them?

A. Yeah, effectively 40-acre spacing there.

I studied, though -- In that township, I studied every case where there were more than two wells I could draw in a 160-acre area, and I did not see evidence of interference from the decline curves. I didn't see one well adversely affected when another well in that close a proximity started producing.

Q. In terms of pressure, though?

A. Well, in terms of production rate, because pressure data is a lot harder to come by than production data is.

Q. All right. So you didn't have pressure data to analyze whether there was an equivalent pressure in the well, but you could see by looking at the production data that you were higher in the life of one well versus the other in terms of production?

A. Yes, sir.

Q. Let me ask you that. What is the profile of a typical Pecos Slope-Abo well in terms of how you would see its production curve?

A. They exhibit hyperbolic decline, steep decline, in the first year to 18 months of continuous production, eventually leveling off to a shallow -- on the average, 12 percent per year exponential decline. And ultimately the wells are very long-lived, well life approximately 15 to 20 years.

Q. Is that profile consistent with all of the wells for Phase I pilot?

A. We looked at the production data that's available on those wells. Not one exhibited abnormally steep decline. Now, they're all steep, but the field characteristics is a steep decline initially.

Q. And that's what I'm asking you. Is that consistent with what you're seeing for a typical well?

A. Yes, they are consistent with the historical average decline in the field, and that was one of the

things that we were very interested in seeing, what the decline characteristics would be.

Q. All right. When you look at that signature well for Pecos Slope in terms of its hyperbolic decline, what is the signature of Phase II infill wells? Are they exhibiting the same characteristic?

A. There's not enough data, decline data, on the Phase II wells for me to give you a good answer on that. I mentioned that the field has been shut in for most of the last year and a half. So we don't have much decline data from those wells.

Q. All right. The criteria for deciding on the Phase II infill wells apparently had some kind of economic threshold --

A. Yes.

Q. -- that changed as of March of 1995, and thereby you stopped drilling the approved Phase II wells?

Prior to that occurrence, wasn't the criteria, if I remember your May, 1994, testimony, the fact that you were looking for 400,000 MCF of unique or new reserves as the threshold to justify the infill well?

A. 400 million cubic feet.

Q. That was it.

A. Yes, sir.

Q. All right. Did that continue to be the threshold

in March of 1995 when you stopped drilling the approved wells?

A. Yes.

Q. The price dropped in Pecos Slope-Abo, and that was the decision not to drill the rest of the infill wells?

A. The price dropped or just continued -- The price had dropped months prior, but continued low prices finally resulted in my management deferring the remainder of the wells.

Q. Okay. Is that volume still -- It was used, then, for the Phase I wells and those Phase II wells that were drilled; that was the threshold?

A. Yes.

Q. Okay. Let's look at Exhibit Number 17.

The infill drilling pilot area reserves, in red you're showing total reserves?

A. Total reserves.

Q. And let me make sure I understand. The total reserves are going to represent a combination of new reserves, plus reserves that might otherwise be produced by an offset well?

A. Yes.

Q. All right. So when I look at the Catterson well and I get 728, it's a combination of the two?

A. Yes.

Q. Did you continue to use the method by which you determined or allocated new reserves, based upon the methodology you set forth to the Division in the May, 1994, transcript?

A. We've -- No, we've really rethought our position on that, on the infill -- on how much of the reserves are new reserves and how much of the reserves are acceleration reserves, if you will. It's a very debatable point.

And my personal feeling is that most of the reserves, a large majority of the reserves in all these cases, are new reserves. And the reason I believe that is because the offset wells are generally at such low rates and approaching their economic limit that it's just -- we can't go -- they're not going to produce the gas that apparently is going to be produced from the new well.

Q. All right. Let's go through the process, because Examiner Stogner did not hear that case.

The methodology in March of 1994 by which you allocated between existing reserves and new reserves was a formula based upon -- I forgot if it was rate or pressure.

A. Pressure.

Q. It was off the pressure map, wasn't it?

A. Well, there were two parts. The total reserves were calculated using decline-curve analysis, which is production rate data --

Q. Yes.

A. -- which is what's been done here.

Q. And then you subdivided that based upon pressure?

A. And then at that time I had made an estimate of the percentage of reserves that were unique reserves, or new reserves, based on the bottomhole pressure as a percentage of original bottomhole pressure. That was an unproven relationship. There's some relationship there, but I --

Q. You're no longer comfortable with that method?

A. No.

Q. Okay. You had a bubble map that you showed in terms of drainage. Are you still using -- or did you use that bubble map as the basis to then locate and drill the Phase II infill wells?

A. Yes.

Q. That bubble map was constructed based upon decline-curve analysis, was it not? And then you backed into a drainage calculation using volumetrics?

A. Yes.

Q. Okay. When I look at the bubble map -- in fact, I may have some here and we can talk about it.

This is Exhibit 13, Mr. Stallings, from the August, 1993, hearing. But the method was the same as the bubble map shown in March of 1994, if I -- is that not

true?

A. That is correct.

Q. All right. Help me understand what you're doing here when you map or calculate drainage areas and we find an area in which the circles overlap. Is that meaning that the wells are competing for the same reserves, or does it mean something else?

A. I think it's a limitation of this model, if you will. Again, these wells are completed in multiple lenses of sand channels. Their drainage areas are not perfect circles. I don't know what shape they are. We modeled them as circles for lack of a better shape.

These maps would suggest more than competing, that they've actually drained the same reserves more than once, and that can't be possible. So --

Q. It's simply a reflection of the fact that you've got these multiple sand members crossing over the same areas?

A. I think that's true.

Q. When we take the Catterson well, then, and find total reserves of 728, how did you do that? It came from decline-curve analysis?

A. That's correct.

Q. Do you have the decline curves for all these infill wells?

A. No, I don't have those with me.

Q. You didn't bring them with you?

A. No, sir.

Q. Is that something that you're willing to provide to us? May we have those?

A. I'd have to ask my management. We've got a lot of experience in wells out here. We've got some -- what we might consider proprietary methods of evaluating reserves, so I don't feel at liberty to answer yes to that question.

MR. KELLAHIN: I'm going to make that request, Mr. Examiner.

What we're looking for, Mr. Stallings, is the documents to support the conclusion on your Exhibit 17 as to what you're testifying is the total reserves attributable to the infill well, and we would like -- we'll leave that on the agenda as a request item. We would like to have the Applicant in these cases provide us with the decline curves.

Q. (By Mr. Kellahin) When you look at the decline curve for the Catterson well now, Mr. Stallings, can you subject that to a volumetric calculation and at least calculate for us what you anticipate to be the acreage size if we don't necessarily know the shape?

A. Yes, we could do that.

Q. All right, and have you done so?

A. No, sir.

Q. We don't know, then, what you would calculate to be the drainage area for the Catterson well?

A. I don't have that answer, that's correct.

Q. Would you use the same volumetric analysis that you showed us in August of 1993 in terms of how you go about the methodology for the drainage calculation that was Exhibit 14? Let me show that to you and make sure that that's how you would go about the calculation.

A. That's the way I would do it.

Q. All right. So you take the decline curve, and then you would plug in the thickness for the Catterson well, and then you can back into a drainage area, if you will, in terms of acres?

A. Yes.

Q. All right. And you've not done that for the Catterson well or any of the infill wells?

A. I have not done that calculation for the infill wells, that's correct.

Q. All right, sir. You therefore do not know whether or not the infill wells are exhibiting a drainage area by which we then can compare it to the average of the existing wells?

A. No, don't know the answer.

Q. The existing wells, on average, are draining, if

I recall correctly, about 122, give or take, acres?

A. That's what I calculated, yes.

Q. Okay. So we at least know by your calculation that the existing wells are draining more than 80 acres, on average? You're nodding your head yes?

A. Yes, sir.

Q. All right. When you're looking at doing decline-curve analysis, how does the calculated absolute open flow potential of the well fit into that analysis?

A. That's one of the relationships that we've developed. Because we have so many wells, such a large database of wells in the field, we developed a relationship between initial potential and estimated ultimate recovery.

Q. Let's look at that example for a moment, Mr. Stallings. If you'll turn to Exhibit 16, let's look at the production-rate data.

A. Okay.

Q. Exhibit 16, in the green for the offsetting wells again, for the Catterson example, you've averaged current production rate, and you get 53 MCF a day? Is that what that is?

A. Yes -- Which well?

Q. On the Catterson example --

A. Okay, yes, sir.

Q. -- down there.

A. Yes, sir.

Q. All right. Again, what's the vintage when you mean current producing rates?

A. On the rates, it was the most recent full month's production for each well prior to the infill well being completed. In the case of the Catterson 7, I don't recall which month that was.

Q. If I want my engineer to verify and validate your work, is that production data reported to the Division now so that we can retrieve it on the ONGARD system, or is that data that we're going to have to get from you, because that's the only place we can get it?

A. No, it's the data that's reported -- It's the monthly production data that's reported to the Commission.

Q. The C-115s, I think we are -- That's all been reported for these --

A. I would assume so, yes.

Q. All right. I'm interested in the infill wells, but let's use the Catterson as an example.

What I'm seeing in red, then, is the initial producing rate, but that's really calculated absolute open flow, isn't it?

A. No.

Q. On the Catterson well, that million a day?

A. It's not a calculated absolute open flow. It is

a flow rate that was achieved by -- That was the single highest day's flow rate that was achieved by that well to the pipeline.

Q. At what point in time?

A. On initial completion, shortly after frac.

Q. All right. You see what concerns me about the way these wells perform, that in the first few months, whether it's initial absolute open flow or not, there's a substantial decline in rate as a signature for these wells, isn't it?

A. That's true.

Q. So if you're trying to decide based upon rate whether the infill well is truly recovering unique reserves, wouldn't it affect your assumption if you used the highest, earliest rate?

A. It might.

Q. Mr. Stogner heard a case between Tide West and Yates on the Catterson well. It's Case 11,283. And in that presentation, Mr. Fant, as your engineering witness, presented some production data on that Catterson well, and he demonstrated to us that in April of 1995 it was doing about 900 MCF a day. But by July of 1995 it's down to 345 a day. It looks like a substantial drop.

Is that unique to Catterson, or were the other wells doing the same kind of thing?

A. I don't know specifically about the Catterson well. I know that for the wells I looked at in detail -- over in 6 South, 25 East, because those are the wells we have the most data on -- those wells did not -- not one of those wells exhibited abnormally high declines.

I don't know about the Catterson well, what the situation was there specifically.

Q. When you're looking at the decline curve, are you plotting these decline curves on actual data and then you're forecasting in the future a decline?

A. Right.

Q. When you get to the point in this plot where you're forecasting the future decline, is that on a straight-line basis?

A. That's on -- Well, no, it's on a hyperbolic decline basis.

Q. So your methodology is consistent with the signature of this kind of well?

A. Yes.

Q. Okay. When we look at the Catterson example on Exhibit 17, you've calculated total reserves of 728 million? Yeah, three-fourths of a BCF --

A. Right.

Q. -- from the Catterson. All right.

If your economic threshold is going to be

400,000, and if the Catterson well is positioned in its spacing unit such that it would appear to get some of that contribution from the offsetting tracts -- Answer that for me. It appears to me that its drainage area is going to, in fact, be areas outside of its spacing unit, isn't it?

A. Yes, it does appear that way.

Q. All right. Without doing the calculation, it's easy to conclude that the 728 is going to come in part from area outside of the spacing unit?

A. Assuming that there's reservoir there, and I'd have to get out the sand maps, but yes, if there's reservoir there it will drain outside that area.

Q. When we look at infill drilling on a poolwide basis, when you see a 728, aren't you obligating, by the infill procedure, the offset in the northeast quarter of the section to now drill a protection well to the Catterson well?

A. I don't know about obligation. I think that -- I don't know what their obligation or our obligation would be.

Q. Well, Mr. Carr asked you a while ago whether or not approval of this request for poolwide infill drilling was going to protect correlative rights and not afford an opportunity for acreage to be drained without corresponding compensating drainage.

And you said, yeah, this is going to work, it's going to be okay for correlative rights.

I'm trying to give you a correlative-rights example.

A. Yeah.

Q. And if the example is, the economic threshold for an infill well is 400,000, there is not enough gas under your calculation to support two wells. So what happens to the share of gas that is off the Catterson spacing unit? It's going to be produced by Yates, isn't it?

A. In that example it looks like that would happen, yes.

Q. When we look at the rest of the infill wells, as we move through Exhibit 17 there are a number of these that have the Catterson problem in them, don't they?

You know, if you look at the Kilgore well up in section -- I think it's 24 of 6 South, 25 East -- the Kilgore well, by your calculation, has got total reserves of 652. Again, we don't have 800,000, so the offsets can't be drilled, and so drainage is going to occur from offsetting spacing units for which there is no corresponding compensation; isn't that right?

A. I don't necessarily agree that the offset can't be drilled.

Q. It can't be done economically under your

threshold, can it?

A. I wouldn't recommend a well there, based on these calculations.

Q. What the infill program would do, wouldn't it, because of the hyperbolic production nature of the wells, is that operator who gets the first infill well drilled in one of these sweet spots is going to drill the only well that recovers its cost?

A. I don't know that. I'm not sure that you couldn't compete for those reserves.

Q. All right. Tell me what bothers you about what I said.

A. Well, because the drainage area of an offset well is going to be different again. The geology is complex enough that another well -- there may be a whole 'nother channel system in the offsetting spacing unit, for example. Even if it were the same channel system, it's going to -- should be able to reach a different part of the reservoir than this well would.

Q. Do you see the problem I'm having? I can't reach that analysis until I see what you calculate to be the acreage drained by your infill well, and that's something you haven't presented. Do you see how hard that is to analyze it?

Let me ask you -- Isn't there another way to go

about this than having a straight infill program? Let me suggest something.

Couldn't you, as you've done here, on a case-by-case basis, find these areas for which there is support to justify the infill well, and on a case-by-case basis come in and ask for a second well? Isn't that a viable alternative for a solution for these 200 opportunities out of a thousand, to provide the necessary second well in those examples where it in fact is necessary?

A. It doesn't seem very efficient to me.

Q. What's wrong with it?

A. Because of having to run a show like this every time. Administrative approval would be much less cumbersome, if an operator wanted to become active and have an active drilling program. I think that presenting every location at hearing for 200 wells would be very cumbersome.

Q. And if that's your concern, perhaps an administrative procedure could be developed as an alternative to infill on a blanket basis whereby you could send notice. If your offsets don't care, it would give you a vehicle by which the second well is approved, and you'll go about your business and you don't have to come to a hearing, necessarily?

In the alternative, you have not created blanket infill for a pool, to handle 800 spacing units for which

apparently it doesn't work?

EXAMINER STOGNER: Was that a question?

MR. KELLAHIN: Yes, sir.

Q. (By Mr. Kellahin) Comments, observation?

A. Our recommendation is to make this an administrative procedure, and we just feel like that's the most efficient way to develop these infill reserves.

Q. Well, you've already got approval for 11 more wells that are not yet drilled? You've got those taken care of, now, don't you? What's the schedule for getting those done?

A. To my knowledge, there's no plans to drill those wells. I would say that's a management decision. I would assume that it would be driven by -- That, along with any other gas-well drilling that we would do, would be driven by an improvement in gas price.

Q. Describe for me the criteria that was used in selecting the wells that were actually drilled, as opposed to the 11 that weren't under the Phase II program.

A. We wanted to get a representative areal sampling of wells, and we also wanted to drill wells that gave us the best opportunity of being economic.

Q. Would these that are actually drilled, then, represent the best of the 20?

A. No, we made some adjustments when we realized we

weren't going to drill all 20, so that we would get good areal coverage.

Q. Which ones were adjusted to give you areal coverage, as opposed to your best opportunity?

A. I don't remember that. I don't have that with me.

Q. As you drilled the additional Phase II infill wells, geologically, did you see anything different than what was testified to by Ms. Fly and Ms. Bence as to their geologic conclusions in the prior two hearings?

A. Oh, I think that we were optimistic on some of our calculations and our interpretations of the reservoir.

Q. Is there a change between the Phase I area and the Phase II in terms of thickness of reservoir?

A. I don't know. I don't think so. I mean, there are variations throughout the field. I don't think that -- I'm not sure that the Phase I area was the thickest part of the field. I don't know the answer to that.

Q. Then what, by your definition, made it one of the better areas?

A. Strictly based on cumulative production of existing wells. Some of the best producing wells are in that township.

Q. And your analysis onto the bubble map was to find infill locations that were outside the hypothetical

drainage circles of the existing wells?

A. Yes.

Q. And based upon that work, you have found that not to be a reliable methodology?

A. Oh, I think it's allowed us to drill some very successful wells. I would disagree that it's not reliable. I don't think it's perfect.

Q. My definition of "reliable" was the fact that in each instance, you thought you would be drilling an infill well that would be outside the drainage effect of existing wells by your bubble map, and yet when you complete the infill well, it's at less than virgin pressure. So it has been, in fact, drained by existing wells?

A. It's been partially depleted by offset wells, yes.

Q. Have you gone through a method by which you can analyze as an engineer a more refined method of drainage, other than using the bubble map?

A. We have not developed a better tool than that.

Q. In drilling the Phase II infill wells, did you find any geologic evidence that's contrary to the geologic conclusions made by Ms. Fly and Ms. Bence in their prior testimony?

A. I don't believe so.

Q. When we look at the performance of these infill

wells -- or let me -- Strike that.

When we look at the signature of a typical existing well in this hyperbolic performance profile, can you characterize what portion of its ultimate gas reserves are recovered in the first 18 months or two years of performance?

A. I'd have to calculate that. I don't know what that is.

Q. You wouldn't know whether it was 50 percent or 75 percent of the well?

A. I wouldn't know.

Q. When you look at pressure in all these packages of sands, your shallowest sand is what? About 2000 feet?

A. I'm not aware of any that shallow. Now, in general, it's shallower in the West Pecos Slope, and it dips steadily to the east southeast.

Q. All right. Let's do the 6 South, 25 East.

A. Okay.

Q. What's the shallow zone?

A. I believe the shallow zone there is approximately 3600 feet.

Q. And by the time we get to the deepest zone in that area, where are we working?

A. 3900, I think, 3900.

Q. But you're coming in with -- The reservoir

pressure, the initial reservoir pressure of 1125, was established with what well? Do you remember?

A. As I recall, it was established in a lot of wells --

Q. Okay.

A. -- early in the drilling and the development of the field.

Q. So no flaw in what we are working with as the initial reservoir pressure?

A. I've just read the literature and looked through the well files, and it seems to be pretty well accepted.

Q. All right. So there's no flaw with accepting that number as the right number?

A. Not in my mind, no, sir.

Q. All right. Do you see any pressure difference as we move vertically in these wells?

A. I'm not aware of any pressure testing we've done of individual zones in a given well.

Q. So you wouldn't know whether or not there is a pressure differential within the sand packages that's different from another sand package?

A. I would expect that they do vary, but we have not measured individual pressures.

Q. What's the criteria by -- which Yates is using to support its statement that there are 200 potential

opportunities for infill locations out of the thousand wells?

A. Really, that's 200 wells out of 600 Yates wells.

Q. Okay.

A. And that is strictly an estimate. We -- The pilot area is the extent of the detailed analysis that we've done. We have not mapped the other parts of the field yet, just because of the number of wells and -- the work that that entails has not been done yet.

So it's almost a statistical estimate of how many wells we have in other parts of the field, compared to how many wells we expect to be able to drill in this pilot area. It's just an estimate that I came up with.

Q. All right. I was trying to understand what the basis was for the 200.

A. Not a calculated number, just an estimate.

Q. All right, sir. Have you attempted to analyze the reservoir performance by computer simulation of the reservoir?

A. I have not done that.

Q. Has anyone within Yates attempted to do that?

A. As part of the Phase II evaluation, another engineer in the company did do some computer simulations, trying to calculate drainage areas with a different method. What we found was that the results in general were very

similar to the method that I've presented here, in hearing.

Q. Well, that method has the same inherent flaw, whether it's done by you or simulation, in that it's predicated on the geologic interpretation as to the size and shape of all these --

A. Yeah.

Q. -- multiple pays?

A. It draws circles too --

Q. Yeah, that's right.

A. -- and we know that the circles aren't exactly right.

Q. All right. So the computer isn't going to help us figure this out?

A. We found that it didn't give us a better answer.

Q. All right. As part of the Phase II program, did you do any type of advanced or sophisticated reservoir engineering testing of any of the wells? Proprietary information?

A. No, all the testing we did was standard. Flow testing, bottomhole pressure buildup.

Q. Okay, and they were all done within wellbores that were completed in such a fashion that they were accessing the multiple-sand packages within that wellbore?

A. That's right, every well was completed in all the pay sands before any pressure testing or flow testing was

done.

Q. So none of those Phase I or Phase II pilot infill wells was used as a science project, if you will, to individually test pressures of any of the sands?

A. We have not tried to do that.

Q. All right. Did you attempt to run any kind of pressure interference tests with the infill well or existing offsetting wells in some combination?

A. No.

Q. You provided some geologic isopachs, Mr. Stallings, and you made a comment I want to make sure I understand.

This represents Ms. Bence's presentation in March of 1994, but I thought you said it had been updated with the Phase II infill wells. Did you say that?

A. For the Phase II maps, that's correct.

Q. In what way are the maps modified?

A. They've been recontoured -- Well, the new well has been posted and the values for sand thickness of that zone have been posted by that well, and the isopachs have been recontoured to honor that data point.

Q. Okay. So when I look at the isopach exhibits you've given today, they in fact have put thickness values in this display for the infill wells?

A. Yes.

Q. And then recontoured?

A. Yes.

Q. Let's go to the summary sheet. There's a tabulation, Exhibit 14, we have a bunch of data spread out here.

A. Yes.

Q. All right. I want to understand how you've analyzed this with regards to a range of pressure differential.

First of all, when I see initial bottomhole pressure for -- within that column, is that the same number I'm seeing on Exhibit Number 15?

A. I sure hope so.

Q. All right, and that was --

A. It's intended to be, yes, sir.

Q. Okay. The last well in Phase I, it says the Hobbs Federal 3 well, you told me that that was unsuccessful, and it was attributable to the fact that, in your opinion, it had been subject to drainage, as opposed to the Cleo well, the one above it, which was unsuccessful because it simply didn't have enough sand. Is that --

A. Yes.

Q. -- an accurate recollection of what you said?

A. Yes, sir.

Q. All right. What determines whether the well is

successful?

A. I based my statement of successful or unsuccessful on what we project to be the ultimate recovery from that well, i.e., an economic success.

Q. All right, so --

A. It will recover more than 400 million cubic feet.

Q. I just want to make sure that that's how you did it. A success, by definition, then, is a well that's going to recover more than the 400,000?

A. (Nods)

Q. All right. When we look at the Hobbs Federal 3 well, there is a pressure differential between its initial bottomhole pressure and the average of the offsets by -- oh, I don't know, 230 pounds. Apparently that's not enough pressure differential between the initial -- the infill well and the offset wells whereby you consider that to be unique?

A. Well, it's not enough to make 400 million cubic feet. We've estimated the reserves there at 90 million cubic feet.

Q. Am I reading more into the display than you intended?

A. Well, I don't know. My intention was to say that that well was unsuccessful because its ultimate recovery is going to be less than 400 million cubic feet, and --

Q. All right. On one of these maps you're drawing a comparison between the bottomhole pressure of the infill well and the offset wells.

A. I think that primarily this well, the Hobbs Fed Number 3, the sand thickness in that well is similar to the offset wells. The offset wells have produced more than 400 million cubic feet. Therefore, if we would have encountered the Hobbs Fed Number 3 at higher reservoir pressure, it very well could have been an economic well.

Q. All right, let me make sure I'm not misunderstanding.

Are you contending that you can look at the average bottomhole pressure of the offset, get that number, and read over and find the initial bottomhole pressure of the infill well, and because there's a range of difference, thereby conclude that the reserves for the infill well are going to be new reserves? I'm not analyzing it right, then?

A. Well, I think that most of the reserves that any of these infill wells is going to produce -- can't quantify it. I think a vast majority of those reserves are going to be new reserves. Because with offsets, in the case of the Hobbs 3, offset wells producing 70 MCF per day, we just -- on their current decline rate, if that's 12 percent -- I don't remember in this case -- we just can't put very much

gas to recover from those wells.

Q. In terms of your EUR you're calculating based upon decline curve, what are you using for an abandonment pressure?

A. Generally we use -- It says on this sheet that you handed me, the drainage calculations, the abandonment pressure is 200 pounds, as a general rule. That was a fieldwide assumption that I made.

Q. Yes, sir. And are you continuing to make that same assumption?

A. For purposes of the bubble map --

Q. Yes, sir.

A. -- that is the way I calculated the drainage areas.

Q. For purposes of the EUR based upon decline-curve analysis for the volumes represented on Exhibit 17, I think it was, 15 --

A. Yeah, those are based on production rate decline.

Q. Yeah --

A. And so there really is no pressure in that -- It's a rate, economic limit of 15 MCF per day, approximately.

Q. What's the abandonment rate?

A. About 15 MCF per day, I believe, is what I used.

Q. Yates controls the gathering system for lots of

these wells, doesn't it, in this pool?

A. Yes.

Q. Are you able to handle the pipeline gathering pressure and to use that as an abandonment rate?

I didn't say that very well. Do you understand what I'm asking you?

A. No.

Q. Okay. Because you have the ability to gather the gas, can you also gather it in such a fashion that you're controlling the pressure differential in the pipeline so that the ultimate rate at abandonment for the well can be 15 MCF a day?

A. Well, it appears that 15 MCF per day is extrapolated, based on the current system pressure --

Q. Okay.

A. -- of the gathering system. And so I guess you could -- you know, if you -- Someday there may be potential to lower the system gathering pressure and get incremental reserves that -- get incremental reserves by lowering the system pressure. That's not been accounted for in these calculations.

Q. You've answered my question, is that we have the ability and, in fact, you have calculated based upon a rather small abandonment rate.

A. Yes.

Q. So we don't have to worry about that changing?

A. It can't change very much. That's pretty low.

Q. When you look at Exhibit 14, this spreadsheet, we're seeing examples in the Phase I and Phase II on initial bottomhole pressure. In all -- Perhaps Thorpe is an exception, but Thorpe and Paulette at least had rates that had somewhat depleted by something, right?

A. Yes.

Q. And in Paulette with a higher rate, we simply have not enough sand, apparently, and it's not going to be a successful well?

A. Yes, sir.

Q. All right. In terms of making comparisons for rates of the offset as to the infill well --

A. Uh-huh.

Q. -- have you looked to see if the offsetting wells during the time you've averaged their rate were producing against a pipeline pressure that was the same as the pipeline pressure used for the infill well when you took that rate?

A. I didn't look at that. I don't think -- I'm not aware that the system pressure varies greatly, so I assumed a consistent system pressure.

Q. So that we don't have to worry about that kind of thing, fudging the numbers? We shouldn't?

A. No. I've not heard my management mention wanting to drill those wells. I assume that's because of unacceptably low gas prices for a drilling project.

Q. Is that going to be unique to Yates, or is that going to be an issue for all operators in the pool in terms of going forward with infill drilling? They're all going to be exposed to the same kind of market conditions, I would think?

A. I think so.

Q. There's nothing unique about your operations that make price constraints on you for drilling any different than price constraints on other operators to initiate the infill project?

A. Not that I'm aware of.

MR. KELLAHIN: Thank you, Mr. Examiner.

EXAMINER STOGNER: Thank you, Mr. Kellahin.

Mr. Carr, redirect?

MR. CARR: Yes, sir.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Stallings, Yates has been working with the infill project now for two years, correct?

A. Yes, sir.

Q. And during that two years, there has been a decline in the gas market; is that not correct?

A. Not intentionally. I don't think -- I don't think that there's a wide variation.

Q. Okay. In terms of all of the Phase I and Phase II infill wells, the logs for those wells, are they on file with the OCD?

A. They should be. If they're not, we'll certainly -- we'll get them on file.

Q. What I'm looking for is the opportunity to --

A. Yeah.

Q. -- to have a third party look at the footage calculations so we can --

A. My intention is to have released them.

Q. All right.

A. Sure.

Q. So that's not a problem?

A. If you can't find them, call me.

Q. Yeah. And if I understood, you're not using a porosity cutoff. And, in fact, there was a cross-plot analysis and there was no cutoff attributed there?

A. Right.

Q. All right. I wanted to make sure that my geologist is using the same method that you used.

Tell me one more time, Mr. Stallings, what's the plan, if there is a plan, on the remaining nine infill wells? Is there any schedule to get those drilled?

A. In general, yes.

Q. And the effort that you initiated back two years ago is not as far along as you had anticipated; isn't that also fair to say?

A. That's true.

Q. You have been looking at the Abo formation. Is it fair to characterize that as a mature reservoir?

A. Yes.

Q. We are looking at a reservoir where most of the 160-acre spacing units and the better parts of the fields have been developed, have they not?

A. That's correct.

Q. And what we're looking at now are wells, the existing wells, that, if you look down the road, are only going to drain a small area in addition to what's already been drained; isn't that true?

A. Yes.

Q. We're talking about a highly complex reservoir, are we not?

A. That's correct.

Q. A number of channels, and tract by tract they vary; isn't that correct?

A. Yes.

Q. And no matter how long we study it, we're always going to be able to find a tract where there's something

new or something different; isn't that also a fair characterization?

A. Yes.

Q. Haven't you been attempting to come up with a proposal whereby rules can match the flexibility of the reservoir?

A. Yes.

Q. And is that what you believe you have done?

A. Yes.

Q. When we look at portions of this field where we have developed bubble maps that are in gross, can that possibly be an accurate interpretation of what is in fact being drained?

A. We know it has limitations. It's the best balance we've had between practicality and precision.

Q. Some sands may have been depleted in the area, some -- when you go out and drill an infill well, some may not; isn't that right?

A. Yeah. I mean, the data shows that it's not foolproof.

Q. And so there's nothing, in fact, that you can do to accurately determine tract by tract exactly what has been drained; isn't that fair to say?

A. At this time, we cannot accurately -- we would like to be able to do that.

Q. With all these doubts, though, is there any doubt in your mind that there are reserves that are being left behind if additional wells are not drilled?

A. No doubt.

Q. When we look at the Catterson well, do you know whether or not that well has been choked back since it was initially produced or initially tested?

A. I know that in general it has been choked back. Specifically how many days, I can't really recall.

Q. Catterson well, you testified, you believe would be draining outside the existing spacing unit, did you not?

A. I said that, based on that picture, it seemed pretty obvious.

Q. Do you have any doubt that the Catterson well is, in fact, necessary if those reserves under that tract are ultimately to be recovered in a timely and economic fashion?

A. No, I think that it is necessary.

Q. So what -- The well is a necessary well, if we're going to produce the reserves in this reservoir?

A. For Yates to recover the gas under our lease, yes, sir.

Q. And what in fact you're seeking here with these rules is an opportunity for you to go out and drill additional wells so that you're not leaving production

behind; isn't that fair?

A. Yes.

Q. And don't you also, by proposing these rules, afford to each and every other operator in the pool the very same opportunity to go out and drill wells and develop their reserves?

A. Yes.

Q. And isn't it true that we could study this reservoir forever and never be in a position where we could accurately develop rules that would apply to every single tract?

A. I think that's true.

Q. Even if you studied every single tract, you really don't know, due to the nature of the reservoir, what you've got under it?

A. That's right.

Q. Do you have any doubt whatsoever that if these rules are adopted and infill drilling is permitted, that ultimately there will be an increased recovery from the Pecos Slope-Abo Pool?

A. I have no doubt, that's true.

Q. Do you have the same confidence that there will be additional reserves recovered from the South Pecos Slope-Abo Pool?

A. Yes.

Q. Do you have any doubt that there could be additional reserves recovered from the West Pecos Slope-Abo Pool?

A. No, there certainly could be additional reserves recovered there too.

Q. Now, you haven't conducted a study of West Pecos Slope, have you?

A. That's correct.

Q. But even if you were to perform that study, do you have any doubt that your -- what you'd be recommending would be any different? That is, an opportunity to drill additional wells that would meet the complexities of the formation?

MR. KELLAHIN: Objection to the form of the question, Mr. Examiner. That's highly speculative, particularly of a witness who has admitted that he has not studied the pool. How could he possibly answer that question?

EXAMINER STOGNER: Do you want to reform your question, Mr. Carr?

Q. (By Mr. Carr) You have studied the West Pecos Slope-Abo, have you not?

A. I've looked at the West Pecos Slope-Abo.

Q. And when you've looked at the West Pecos Slope-Abo, what do you see?

A. I see well logs that indicate similar characteristics to well logs that I see in the Pecos Slope-Abo.

Q. Do you find a highly complex reservoir?

A. Yes.

Q. Do you believe that additional flexibility to permit optional wells would be appropriate in that field?

A. Yes.

Q. Do you believe if that is authorized, additional recovery could be obtained therefrom?

A. I believe it could, yes.

Q. What do you believe could be accomplished by coming forward with an administrative procedure that would require applications to be reviewed on a well-by-well basis, for infill drilling?

A. Like we've recommended?

Q. Like has been suggested by Mr. Kellahin. Do you see an increase in administrative burden?

A. Certainly.

Q. Do you see, in fact, that even if you had reviewed these well by well, that you couldn't come up with the kinds of doubts and questions that have been raised here this afternoon on a poolwide basis?

A. There's risk and uncertainties in every one of these wells.

Q. Do you believe that that would be any more efficient or result in a -- prevent waste of resources any better than coming forward and adopting rules that would let the development of this pool follow the characteristics of the formation?

A. No, I think it would promote administrative waste.

MR. CARR: That's all I have, Mr. Stogner.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Yes, sir.

RECROSS-EXAMINATION

BY MR. KELLAHIN:

Q. When you characterized, in response to Mr. Carr's question, that this is a mature reservoir --

A. Uh-huh.

Q. -- you testified back in August of 1993, and I think you repeated it again in March of 1994, that the pool initially commenced development in the Eighties?

A. Early Eighties.

Q. And the projected life of the pool was approximately 15 years, I think?

A. Yes.

Q. Eighties plus 15. We're moving into the last few years of this pool, are we not?

A. It would seem that way.

Q. Why couldn't you simply execute your opportunity for these additional reserves, if in fact you're correct, with replacement wells that would replace existing wells that are now about to be abandoned, and thereby not only ultimately recover this gas, but do so in a fashion that doesn't disrupt the method by which it's currently being depleted?

MR. CARR: Well, I'd object to the question if it's suggesting that this witness testified that these wells were about to be abandoned, because I don't believe that was his testimony.

Q. (By Mr. Kellahin) You've agreed that this is a mature reservoir?

A. Yes.

Q. All right. What is wrong with waiting until these wells are abandoned and replacing the existing well with the infill well within that spacing unit?

A. Well, the main thing I see wrong with that is that -- economic opportunity. We're not ready to drill now because of poor gas prices. But if gas prices improve, my company feels like this is one of the best prospects we have for adding gas reserves to our company's base.

Q. How many undrilled 160-acre spacing units are left in the pool?

A. I'm not aware of any that are prospective to us.

There are some in the limits, but --

Q. I'm just looking at the pool map, and there appears to be an easy way to identify those --

A. Yeah, we could count them. I don't know how many there are. A lot of times there's not a well there because the maps say there's no sand there.

Q. Let's go back to Exhibits 17 and 14, and let's look at the Crandall example.

On Exhibit 17, the Crandall well appears in 7 South, 26 East. It's up in Section Number 6. Its spacing unit is the northeast quarter.

The Crandall well, by your calculation, has total reserves of 652. The offset existing wells have 308. Are you with me?

A. Yes.

Q. When we look at the reserves for the Crandall well, is it your contention that the 652 now represents 100-percent new reserves?

A. I wouldn't say 100 percent. I would say that it is a vast majority of the reserves that will recover or new, is what I believe, and that the percentage of that we're not able to accurately calculate.

Q. And that's true of all these. We cannot, by your analysis thus far, determine the volume of new reserves attributable to the infill wells? You can't give me a

number, can you?

A. No.

Q. When you look at Exhibit 14 and you find on the spreadsheet below Phase II the entry which is the fifth one down, we find the Crandall well.

A. Uh-huh.

Q. And we read over and we find its initial bottomhole pressure to be 773 pounds. It's 400 pounds less than original virgin pressure, isn't it?

A. Yes.

Q. That well has already experienced depletion by offsetting wells, hasn't it?

A. It has -- Yes.

Q. And there is no method by which you can provide us today, at this hearing, what extent of drainage will continue to occur with regards to that well and its offsets?

A. That's right.

MR. KELLAHIN: No further questions.

EXAMINER STOGNER: Thank you, Mr. Kellahin.

Mr. Carr?

MR. CARR: No further questions.

EXAMINER STOGNER: Let's take a ten-minute recess.

(Thereupon, a recess was taken at 2:02 p.m.)

(The following proceedings had at 2:12 p.m.)

EXAMINER STOGNER: Hearing will come to order.

I know I've already asked, but Mr. Carr, is there any redirect of this witness?

MR. CARR: No redirect at this time.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Nothing further.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Stallings, going back to the prorationing issue, because I did want to touch on that a little bit more, some of the reasons for prorationing is nonstandard units. i.e., the Jalmat and the Eumont is a good example, over in Lea County.

Is that a potential, or do you know of any 80-acre proration units or any sections that would lend itself to interfering with the development or the natural order of the 160 out here?

A. I'm not aware of any.

Q. Okay. Then of course there's the well locations in multi-well units, is always an issue, like the Basin-Dakota and Blanco-Mesaverde up in the southeast and of course, there again, the Eumont and the Jalmat, in which a proration unit is given the allowable, and then the number of wells produce it in proportion to that.

Other than the infill drilling, have you had an opportunity to see -- Because I believe historically there are a few proration units out here that have more than one well on them; is that correct?

A. I can't think of any before the infill pilot wells, where the first well was not abandoned prior to the second well in the proration unit.

Q. Okay. In your Exhibit Number -- oh, 17 -- the well symbols, are they accurate and up to date as far as showing active wells and plugged and abandoned wells?

A. According to our database, I think they generally are, yes.

Q. Okay. If you look over in Section 20 of 6 South, 25 East --

A. Uh-huh.

Q. -- how many wells you've got platted -- plotted there?

A. You're right.

Q. Okay. And there's a weird phenomenon too, over in 6 South 22 East. I'm referring now to Exhibit Number 3. If you look over in the north half of Section 23 -- that's the east half of Section 23 of 6 South, 22 East -- it should be two 160-acre units put together. I count four wells in there, total. That would mean that each one of those proration units, if the symbols are correct -- That's

Section 23 of 6 South, 22 East, the east half.

A. Either the well symbols are incorrect or, in fact, there are two wells on that spacing unit. I'm not sure in that particular case what the situation is.

Q. You had given an example earlier of four wells bunched up together and that you felt that there wasn't any interference that you had noticed in the study of those wells or those areas; am I correct?

A. That's correct.

Q. Did you take the opportunity to go into the West Pecos Slope-Abo and when you were looking at your proposal and find an example there, like in section 8 of 6 South, 23 East, where there were four wells grouped up together?

A. I have not looked in any detail at the West Pecos Slope-Abo.

Q. Okay.

A. My detailed study was confined to the pilot area.

Q. Other than the case that is pending in 11,283, I believe, and 11,355, are you aware of any other unorthodox locations that have become an issue in any of these pools, where there was some objection?

A. I'm not sure what those case numbers refer to.

Q. Oh, it's one that's pending between Tide West and Yates Petroleum --

A. Oh, okay, the --

Q. -- that was heard back --

A. I believe that's the Catterson Number 7 well.

Q. Yes.

A. I don't know of any others that are in issue.

Q. But you had mentioned earlier that the present well-location requirements, 660, 330 from the intern- -- or 660 from the outer boundary and 330 from the inner boundary, should be abided by.

A. That's our recommendation, yes.

Q. And how about if that is breached? Do you have any feeling on that, and which --

A. Well, I think that normal -- the existing rules whereby you apply for an unorthodox location, we'd recommend that that procedure continue in place.

Q. Even for the infill well?

A. Yes.

Q. Okay. Now, how about the gas marketability -- the gas marketability of the production out here? Is all the gas that can be produced from a well being taken?

A. I think so. I'm not an expert on the marketing out here. I believe that there's opportunity to sell all the gas that you can produce.

Q. Do you know how many transporters of gas are in these pools?

A. No, I don't.

Q. Is there more than one?
A. I'm only aware of one.
Q. And who is that?
A. Agave Energy Company.
Q. I'm sorry, who?
A. Agave. Formerly it was the Transwestern Pipeline System.
Q. Now, is that a subsidiary of Transwestern, or did somebody --
A. No, it's a subsidiary of Yates.
Q. Okay. But that main line feeds into the Transwestern main system?
A. I believe that's the way it works, yes.
Q. Okay. Now, does that hold true for all three pools, only Agabe?
A. Agave --
Q. Agave.
A. -- which would be -- Yeah.
I think so. I'm just not aware of any other gatherer out here, but I'm not an expert on that.
Q. Should a second well -- Okay, let's talk about multi-wells. Are you suggesting only one additional well or a multitude of wells?
A. I haven't seen potential where I would recommend to my management more than one well on a spacing unit.

What we're suggesting and what we're recommending for pool rules is one additional well.

Q. Okay. And the placement of that well, I think you had covered it, but I want to make sure I'm reading it right. Should that be in a different quarter-quarter section as the initial well, or is that still left up to geology?

A. We would recommend that that flexibility be retained, that it could be in any quarter-quarter, as long as the distance from the boundaries be honored.

Q. Should there be a minimum requirement on the distance from wells?

A. I don't think so. I think that the geology and the technical data would dictate that, would be our recommendation.

Q. If the present requirements are followed, and that's 660 from the outer boundary, then the maximum distance would be 1320 between wells?

A. If the current well is on a regular spacing. I guess there's a diagonal case where it could be a little more than that.

Q. But the bare minimum would be 1320 if they were side by side with each other?

A. Yeah, you could move them closer, you could move them more than 660 from the boundary, you could move them

closer together.

Q. Yeah, but the bare minimum would be 1320 if you abided by the outer boundary rules?

A. I believe that's correct.

Q. And then closer internally, but you would be on the same proration unit, correct?

A. Yes.

Q. On your abandonment rates, I believe you testified that 15 MCF a day was --

A. I believe that's what we used. Yeah, I think that's standard, what we used.

Q. Have you seen any relationship between pressure and abandonment rate?

A. We've calculated all our abandonment -- or all our projections, on the gathering pressure being the same, being the same as it is now, and what it's been historically, and so I have not made any relationship comparison between those two.

Q. I know this bubble map was presented showing or depicting at least -- What? Geometrically a drainage rate or a drainage area?

A. Area, yeah.

Q. Have you had any experience or observation with a channel sand such as this? And I believe the initial production method is to go ahead and run a frac; is that

correct?

A. Yes, all these well have been frac'd.

Q. And how has your completion methods been as far as perforating intervals? Have all intervals in the Abo stringers been perforated, or have you went in and isolated certain zones?

A. Our standard technique is to perforate every sand with a few holes and then frac all those zones in one stage with one frac job, using limited entry rates sufficient to frac each of the sands.

Q. Now, will each of the sands be fractured -- this is realistically speaking -- fractured homogeneously, or will one fracture, say, be bigger than another because of its thickness or, say, its permeability, porosity and --

Q. We design the fractures to end up with the same frac length in each sand. Now, realistically, there's a lot of uncertainty to that approach as well. But our intent and our design is to end up with a consistent frac length in each zone.

Q. With these sand members in a channel deposition, does the fracs usually traverse or go in the same direction of the channel, or do they traverse, or does it make any difference?

A. I bet it does make some difference, and I don't have any data -- That's something I'd like to know, one of

the many things about this field that I don't know, just what the frac orientation is.

Q. And have you had the opportunity to study, say, along a channel where there are two wells or two perforated intervals that, say, match up in the same channel, if you've had interference or noticed any interference either in production rates or pressures, as opposed to those that would, say, on either bank of the old channel?

A. Uh-huh. Like I said, I have not found -- and I looked fairly exhaustively in the Township 6-25, and there I found no evidence of interference, based on production data, and there wasn't enough pressure data through time to make an analysis. So in that one area I can say that there was no interference.

In the larger area I have not looked in as much detail.

Q. None at all? No interferences at all?

A. I found no evidence of interference in that township.

Q. But you have found pressure depletions?

A. Yes.

Q. Or -- that would indicate that there was --

A. There's some communication.

Q. Do you know how many wells that Yates has abandoned out here in the Pecos Slope-Abo Pool, roughly?

A. In the Pecos Slope-Abo Pool, my records show that Yates has 470 producing gas wells and that currently active we have 454. So we've abandoned -- what? Sixteen wells out of 470.

Q. Has that just been recently, or spread out between 1980 and --

A. It must have been spread out. We've not abandoned any recently, to my knowledge.

Q. Now, if I remember your earlier testimony, the Pecos Slope-Abo and the South Pecos Slope-Abo, they do abut each other; is that right?

A. Yes.

Q. But there is several miles' distance between the West Pecos Slope and the Pecos Slope, and what is the barrier there that is separating those two pools?

A. There is just an area between the two of poor sand development, is the way it's been described in the literature, and that's my only explanation, is what I've been able to read and talk to geologists who have worked this area, that roughly five-mile strip running north to south between two fields is just a shale section with poor sand development.

EXAMINER STOGNER: Any other questions of this witness?

You may be excused at this time.

Mr. Carr, do you have anything further?

MR. CARR: I have just a very brief statement.

EXAMINER STOGNER: Mr. Kellahin, I suppose you have a statement?

MR. KELLAHIN: I have some preliminary matters, Mr. Examiner --

EXAMINER STOGNER: Okay.

MR. KELLAHIN: -- and perhaps it's now time to address those.

First issue is, we would request that this matter be continued for 60 days. I'm renewing my earlier request, filed with the Division.

The basis is to afford us an opportunity to examine Mr. Stallings' work product and to determine what position my clients will be taking with regards to making this Application on a poolwide basis, available to all operators. We are currently concerned that there is not enough data to support it.

In addition, we are asking the Division to require the Applicant to provide us the decline curves that Mr. Stallings has for all the infill wells, so that we may determine and check his work product insofar as it is relevant to the Exhibit 17 which he has introduced, and upon which he has calculated estimated ultimate reserves for the pilot wells, the infill pilot wells. And that

certainly is predicated on the decline curves which were not introduced and which we think are an essential component of validating the exhibit that has been admitted.

And those are my preliminary matters, Mr. Examiner.

EXAMINER STOGNER: As far as the decline curves that you're seeking, would you be satisfied with the raw, say, production data, and which that data can be interpreted by your clients?

MR. KELLAHIN: You've asked me a technical question that I'm not capable of responding to.

I simply need the information by which I can validate his reserves. I believe he's done it with a decline curve. I think it will be necessary to see how he has forecast the hyperbolic curve. And so there's a judgment he's made that I need to see, as opposed to the raw data, which I think may not serve the purpose of what I'm trying to accomplish.

So I think I would need to see the decline curve, but I'm not an engineer and I can't tell you.

EXAMINER STOGNER: Mr. Carr?

MR. CARR: Well, as to the decline curve, it seems to us that the appropriate thing to do is to provide the raw data, and Mr. Kellahin's engineering experts can then interpret it, and thereby we stay out of what may be

proprietary methods utilized by Yates.

If there is a substantial difference when they've looked at the data, that is something that could be explored at another time if, in fact, there is another time.

As to a continuance, we -- In fact, we're opposed to the continuance, and with your permission I would address that very briefly right now.

EXAMINER STOGNER: Go ahead and address it.

MR. CARR: In 1993 we came before you in the full light of Oil Commission hearings, and in 1994, with notice to the industry, we undertook at our expense to try and determine whether or not something better had to be done to develop the remaining reserves in the Pecos Slope-Abo Pool, and at our expense with fairly substantial effort in a situation where the gas market has been down and the economic advisability of conducting some of these things at this time -- or these tests at this time.

In view of all of that, we have come forward with what we believe is an appropriate presentation that, in fact, we believe justifies infill rules that would provide the flexibility to allow operators to go forward with infill development.

Now, we can sit here today and come back in 60 days, and then in 60 days again, and I think it's very

clear that due to the complex nature of this reservoir, that there is, in fact, never going to be an end to the kinds of questions that could be raised, the kinds of additional data that could be sought.

But what we've come in and done is reported to the Division as the Division told us to do. You directed us to come back, we have come back.

We have come back, and we have proposed an additional optional infill well on each spacing unit. And what we've done is, we've come before you with a proposal that we believe clearly addresses the complexities of the geology and the formations that we're talking about.

Yes, we haven't studied the West Bravo Dome -- I'm sorry, that takes me back to my other life -- the West Pecos Slope-Abo like we have studied the Pecos Slope-Abo. But I think we've showed you that the characteristics are sufficiently similar.

We're not asking you to direct anyone to spend one cent, we're not asking you to order that an infill well be drilled. We're simply asking you for flexibility which, when we look at this complex reservoir, is necessary if we're really going to have the opportunity to produce the remaining reserves that can be economically and efficiently covered from the Abo formation in this area.

Lots of things aren't clear today, lots of things

won't be clear 60 days from now or probably six years from now. But one thing is clear: Without infill drilling, reserves will be left in the ground. And we think the time to face that fact, to recognize it, to recognize that operators need additional flexibility, is now, and we'll oppose a continuance and request that an order be entered based on the record made here today.

If, in fact, you decide to continue the case -- and that decision is certainly yours -- we would be opposed to providing the decline-curve analysis, as opposed to the raw data on the infill wells that we have drilled and developed at our expense, trying to not only figure out what has to be done with the reservoir but come back and satisfy you that we have done and tried to do what we represented we wanted the opportunity to do in 1993.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Mr. Carr has failed to provide you an answer to my request for continuance.

Mr. Stallings has said there is no plan by his client or his company to complete drilling the wells already approved. There is simply nothing that's going to occur in the next 60 days that's an adverse consequence to Yates or anyone else. I think that a continuance is appropriate.

The data is essential. It's highly irregular for

an applicant to provide you a summary conclusion in the display and then tell us at hearing that the reservoir engineer has not calculated the drainage area for the infill wells. We need the decline curves as he's analyzed them so that we can make that calculation.

The presentation is incomplete, and without that information it appears to me that you have no opportunity for agreeing with Yates. At this point the proof of the case is, it's simply unable to determine whether this is anything more than rate acceleration, or in fact recovering unique reserves.

The important issue is that the offset operators are going to be compelled on a poolwide basis to drill what, as of this afternoon at three o'clock, appears to be unnecessary wells.

The economic threshold for these infill wells is 400,000 MCF of gas. And if you'll look at his Exhibit 17, you'll find multiple examples where his calculation of recoverable gas reserves is not in excess of the 800,000 necessary for the offset well to be drilled and produced economically.

And when you look at the hyperbolic decline curves of these wells, the opportunity for a violation of these correlative rights is very obvious. If Yates goes forward with this project and drills the first infill well,

So there's -- I've forgotten the total.

EXAMINER STOGNER: And that essentially would be those wells that are represented on Exhibit -- What is that, 14?

MR. KELLAHIN: Yes, sir, and as repeated on Exhibit 17. I think it's essential for some engineer to take the reserve calculations, look at them, and then calculate the drainage calculations and, in fact, see if they can agree that these reserves are new reserves. The substantial issue before you is whether these are new reserves or simply rate-acceleration.

MR. CARR: Mr. Stogner, I would point out as to the questions whether or not these are new reserves or not, those questions have been addressed by a fully competent witness.

Mr. Kellahin is seeking, I guess, a delay so that now, two and a half years after we started this, they can start. I would suggest that -- He talks about what is highly irregular. It would seem to me that it is somewhat irregular for someone with an issue pending for two years to wait until the final hearing and not even attempt to acquire data through subpoena, but to come in and basically fish around and then decide that after the fact they can continue the case and reopen it later, so they can take issue with what we have, I think, in good faith brought to

it will be the only well drilled. Early time production benefits the operator that drills first.

I think it's an incredible leap in the procedure to add infill drilling at this time. We would like to reserve judgment on that issue for 60 days with the additional data, and to come back at that time and complete this case.

I've heard nothing from Mr. Carr that will show any adverse consequences to that period of time being afforded so that we may continue to study the data that they've presented today.

EXAMINER STOGNER: Mr. Kellahin, at the end of the 60 days what are you proposing? Reconvene this hearing and present testimony? Or in the form of motions or --

MR. KELLAHIN: That would be the option of the parties, is -- It would be back to on the docket and, either at that hearing or prior that hearing, decide what position to take, either support or in opposition to Yates, and to provide testimony. I think there's nothing wrong with that. But that would be my request, if I'm responding to your question, Mr. Examiner.

EXAMINER STOGNER: Now, as far as the decline curves, the information you're seeking, that would be on all -- What is that? Eleven infill wells?

MR. KELLAHIN: And the original Phase II wells.

you in the form of a report on our activities.

I also want to take issue here and now with the statements that what we're seeking will result in unnecessary wells being drilled. All we're asking is for flexibility so that necessary wells can be drilled to prevent waste.

EXAMINER STOGNER: Mr. Carr, this is somewhat of a unique case inasmuch as an infill request in an unprorated pool of this magnitude. I believe this will be somewhat precedent-setting in the future, especially as gas reserves dwindle in the northwest and in the coal gas area and in other portions of southeast New Mexico.

This is a unique opportunity to address certain issues, as we're not prorating pools anymore, and why not, and because of the uniqueness of this case, I am going to continue this matter for 60 days and schedule it again at the January 11th, 1996, hearing.

And prior to that time I would expect, Mr. Kellahin and Mr. Carr, since we're all in Santa Fe, perhaps a prehearing meeting with myself and Mr. Carroll to discuss, perhaps, Mr. Kellahin's plans, does it need to come back to hearing, does additional testimony need to be presented, or is there enough technical information that can be provided in other means to satisfy us and make a determination?

Also, I am going to require Yates to provide -- there again, it being a unique case -- the decline curves, in full, to myself and Mr. Kellahin, showing the information that he so desires.

And what kind of a time frame, Mr. Carr, do you think would be appropriate?

MR. CARR: I can't tell you on that today, but I can report first of the week to you.

EXAMINER STOGNER: Okay. Just be in contact with Mr. Carroll, any communications on that.

Gentlemen, anything further?

MR. KELLAHIN: Not from me, Mr. Examiner.

EXAMINER STOGNER: Because this is a unique case, I was wishing there would be more operators here.

Oh, there's one other matter, too, that I had requested earlier, Mr. Carr.

MR. CARR: A list of the operators by pool?

EXAMINER STOGNER: Yes, and perhaps a number of wells apiece, the number of wells in each pool.

MR. CARR: In each pool?

EXAMINER STOGNER: Yeah. So I can sort of see what the percentages are.

What we might be able to do -- Maybe we can meet with Mr. Ed Martin and see if there's an easier way to get this out of ONGARD or how this information is best

obtainable. I don't even know anymore what kind of information is obtainable.

But perhaps either you can provide it or we can get together and figure out what's the best way to get that information available to us.

Again, I wish there was more operators represented here today, because this is a unique situation, and we did come down to Roswell.

The hearing for the 11th of January is up in Santa Fe, and so that's where it will be reconvened or taken under advisement at that time.

If there's nothing further at this point in any of these five cases, then this matter is adjourned, and we enjoyed our stay in Roswell.

(Thereupon, these proceedings were concluded at 2:41 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case Nos. 11421, 11422, and heard by me on 2 November 1995.

, Examiner
Oil Conservation Division

Reopened Case Nos. 10793 10981 11804

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 November 12th, 1995.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998