NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10428

IN THE MATTER OF:

The Application of Enron Oil & Gas Company for Designation of a Tight Formation, Lea County, New Mexico.

BEFORE:

DAVID R. CATANACH

Hearing Examiner

State Land Office Building

January 9, 1992

REPORTED BY:

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

ORIGINAL

A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

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

FOR THE APPLICANT:

CAMPBELL, CARR, BERGE & SHERIDAN, P.A.
Post Office Box 2208
Santa Fe, New Mexico 87504-2208
BY: **WILLIAM F. CARR, ESQ.**

EXAMINER CATANACH: Call this hearing to order this morning for Docket No. 1-92. First thing we'll do is call the continuances and dismissals.

[And there were proceedings had off the record.]

EXAMINER CATANACH: Call Case No. 10428.

MR. STOVALL: Application of Enron Oil & Gas Company for designation of a tight formation, Lea County, New Mexico.

EXAMINER CATANACH: Any appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell, Carr, Berge & Sheridan of Santa Fe. We represent Enron Oil & Gas Company in this case.

This case was heard before Examiner Stogner on December 20th at the BLM in Albuquerque. There was an error in the legal advertisement. The township was incorrectly carried in the legal advertisement. Accordingly, when it was discovered, the case was readvertised and continued to this date.

The record is complete, and we would

request the case be taken under advertisement.

EXAMINER CATANACH: Are there any other appearances or statements in this case at this time?

There being none, Case 10428 will be taken under advertisement.

(And the proceedings concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10428, heard by me on January 8 1998.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL January 20, 1992.

Carla Diane Rodriguez

CARLA DIANE RODRIGUEZ, RPR
CSR No. 4

NEW MEXICO OIL CONSERVATION DIVISION

STATE OF NEW MEXICO

CASE NO. 10428

IN THE MATTER OF:

The Application of ENRON Oil & Gas Company for designation of a tight formation, Lea County, New Mexico.

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

Bureau of Land Management Building
435 Montano Road, Northeast
Albuquerque, New Mexico
December 20, 1991

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter

ORIGINAL

A P P E A R A N C E S

FOR THE NEW MEXICO OIL CONSERVATION DIVISION:

**ROBERT G. STOVALL, ESQ.**
General Counsel
State Land Office Building
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UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ALBUQUERQUE DISTRICT OFFICE:

**ALLEN F. BUCKINGHAM**, MINERALS DIVISION
**ROBERT KENT**, PETROLEUM ENGINEER
**JANE CLANCY**, GEOLOGIST

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Post Office Box 2208
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BY: **WILLIAM F. CARR, ESQ.**

# I N D E X

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EXAMINER STOGNER: The hearing will come to order. Call the next case, No. 10428.

MR. STOVALL: Application of ENRON Oil & Gas Company for designation of a tight formation, Eddy County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm of Campbell, Carr, Berge & Sheridan of Santa Fe. We represent ENRON Oil & Gas Company, and I have three witnesses.

EXAMINER STOGNER: Are there any other appearances in this matter?

Will the witnesses, please, stand and be sworn.

(The witnesses were duly sworn.)

MR. CARR: At this time we call Mr. Tower, the landman for ENRON.

**PATRICK J. TOWER**

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

EXAMINATION

BY MR. CARR:

Q. Will you state your full name for the

record, please.

A. Patrick J. Tower.

Q. Where do you reside?

A. Midland, Texas.

Q. By whom are you employed and in what capacity?

A. By ENRON Oil & Gas Company as a project landman.

Q. Could you briefly summarize your educational background and then review your work experience.

A. Yes. I graduated with a bachelor's in business administration degree in petroleum land management from the University of Oklahoma in 1979. Proceeded to work for Gulf Oil Corporation in Houston, working the Gulf Coast, East Texas and state offshore waters until 1981, at which time I was employed by Santa Fe Energy Company in Tulsa working mid-continent in Arkansas. And subsequently transferred to Amarillo and Midland with Santa Fe Energy Company till April of 1990, working the Permian Basin.

From April of 1990 I have been employed by ENRON Oil & Gas Company working the Permian Basin.

Q. Are you familiar with the application filed in this case on behalf of ENRON?

A. Yes, I am.

Q. Are you familiar with land matters as they relate to the application area?

A. Yes, I am.

MR. CARR: Are the witness' qualifications acceptable?

EXAMINER STOGNER: Are there any objections?

Mr. Tower is so qualified.

Q. (BY MR. CARR) Would you briefly state what ENRON seeks with this application.

A. Yes. ENRON Oil & Gas Company seeks approval through Section 107 of the Natural Gas Policy Act of a tight gas formation designation for the Morrow formation in the area that we've described.

Q. And you've prepared exhibits for presentation here today?

A. Yes, I have.

Q. Have your exhibits previously been submitted to the Oil Conservation Division and to the Bureau of Land Management with the statement setting forth the meaning and purpose of each as

required by the rules of these agencies?

A. Yes, I have.

Q. Let's go to what has been marked as ENRON Exhibit No. 1, and I would ask you to identify that and then review it.

A. Okay. Exhibit No. 1 is a land map on the scale of 1 to 2,000 feet. The area in dark stipple in Township 25 South, Range 33 East and 25 South, 34 East, in Lea County, identifies the area of the application.

Also, the map in the shaded area to the north represents an area that has previously been designated as a tight formation for the Morrow. In addition, the acreage in yellow represents ENRON's acreage position within the area with the solid yellow representing ENRON's full interest lease hole, the partial outline representing our partial interest.

In addition, there is some smaller stipples which you will know designate the Vaca Draw Morrow Gas Field, the Red Hills Morrow Gas Field, and the Pitchfork Morrow Gas Pool, which are affected by this application.

In some additional stipples -- and all these are noted in the index on the bottom of the

map -- in Township 25 South, 33 East, we have also outlined a couple windows in this application. There are two wells that are anomalous to the application, and the justification for these wells will be supported later in engineering testimony.

In addition, on the eastern edge of the application, specifically in the south half of Section 6 of Township 25 South, 34 East, we have changed the border to exclude 320 acres there, which is where ENRON's Half 6 well is located.

Initially, we just -- we included that 320 acres in the application; however, there was some concerns by the BLM that this well had some high production rates and permeability yet still within the guidelines, however, not to endanger the application.

ENRON was agreeable to excluding this. However, I will point out if it is included -- and again the data will be supported later -- it does not affect the average permeability of the application. If we did include it, it still meets under the NGPA guidelines.

Therefore, our plans are to leave it to the discretion of the BLM, OCD, FERC as to

whether we include that 320 acres or exclude it.

EXAMINER STOGNER: What's that 320 acres again?

THE WITNESS: It is the south half of Section 6, Township 25 South, Range 34 East, and it's the northeastern edge of our boundary. We have simply just changed the boundary on that quadrant.

Q. (BY MR. CARR) Mr. Tower, subsequent calculations being presented by the engineering witness --

A. Yes.

Q. -- will be submitted in the alternative showing that the stabilized flow rate and also permeabilities remain below the required levels with this in as well --

A. That is correct.

Q. -- if it's excluded?

A. And this individual well, I believe, meets the criteria; however, it is somewhat higher than the other wells within the application area.

Q. How many acres are included in the proposed tight formation application?

A. I will refer you at this time to

Exhibit No. 7.

MR. CARR: Exhibit No. 7, Mr. Stogner, is the stapled packet of material. And as you will note, there are tabs on this indicating the various subparts. We'll be going to that, which is Exhibit No. 7, in the material behind the tab marked "Land Exhibits."

A. That first yellow tab on the exhibit, I have a breakdown that somewhat summarizes the land on the land plat that we presented a minute ago. But roughly there are 28,800 acres within the area of application if the south half of Section 6 is excluded.

Of this area approximately 81 percent represents federal acreage; 16 percent, state of New Mexico acreage; and 3 percent represents fee acreage.

Q. Have the other operators in the area that you're seeking designated as the tight gas formation been notified of this application?

A. Yes, they have.

Q. And is Exhibit No. 2 a copy of a letter provided to each of these other operators giving them notice of the application in the hearing?

A. Yes.

Q. Has ENRON caused notice of this application to be published in a newspaper of general circulation in Lea County, New Mexico?

A. Yes, we have. It was a publication in the Hobbs Daily News Sun.

Q. And is Exhibit No. 3 an affidavit of publication from that newspaper confirming that notice was published on, I believe, the 4th of December of this year?

A. This is correct.

Q. Have you reviewed the notice provided of this hearing by the Oil Conservation Division?

A. Yes, I have.

Q. And did that notice inaccurately indicate the township involved?

A. Yes, it did.

Q. Has a revised notice been provided by the Oil Conservation Division indicating that the case will be continued to January 9, 1992?

A. Yes, it has.

Q. Mr. Tower, were Exhibits 1 through 3 either prepared by you or compiled under your direction and supervision?

A. Yes, they were.

Q. And did you prepare the portion of

Exhibit No. 7 behind the tab, "Land Exhibits"?

A. Yes, I did.

MR. CARR: At this time, Mr. Stogner, we move the admission of ENRON Exhibits 1 through 3. And that concludes my direct examination of Mr. Tower.

EXAMINER STOGNER: Exhibits 1 through 3 will be admitted into evidence at this time.

Now, this legal publication was in addition to the one --

MR. CARR: Yes, sir.

EXAMINER STOGNER: -- that the Oil Conservation Division issues in its procedures; is that correct?

MR. CARR: Yes, sir.

EXAMINATION

BY EXAMINER STOGNER:

Q. Okay. Mr. Tower, have you had any correspondence with any of the operators out here either in support or any objections or otherwise?

A. There was, I believe, one conversation. UNOCAL had contacted our attorney just concerning the time of the hearing. However, no indication either way of their thoughts on it. No other company has contacted

us in support or in objection.

Q. Okay. When I look at your Exhibit No. 1, the plat, the south half of 6 and 25-34 is excluded, is that correct, from your original application?

A. Yes. And we supplemented this and sent -- the actual application as it went out from the OCD, I believe, left this out. The preliminary material we submitted included it. And again, ENRON is receptive to either including it or excluding it depending on the discretion of the agencies.

And again, there will be data submitted in the engineering text to support this a little clearer.

MR. STOGNER: Mr. Carr, it appears I might have goofed on my legal ad. I showed Township 24 South, Ranges 33 and 34 East, containing 17,280 acres, more or less. That's not true; is that correct?

MR. CARR: That's not true, Mr. Stogner. We caught the township portion of this error in the ad and advised the Division, and they included it in the legal advertisement for the January 9th hearing.

EXAMINER STOGNER: Okay.

MR. CARR: We did not catch the discrepancy in the number of acres involved. That would appear to me to be not a significant error because this is only designed to provide notice that the application is pending. It does correctly set forth the townships and ranges.

And anyone who is interested in that area in this particular formation would have been advised that an application was pending and they would have received all notice. I don't think just an error in the number of acres is significant.

EXAMINER STOGNER: And inasmuch as ENRON has put a publication, I believe, you advertised in the Hobbs paper?

MR. CARR: Yes, sir, we did. We advised -- that notice is modeled after other NGPA notices that we've published. And as you will note, it did provide that any interested party had 15 days to contact the supervisor at the BLM concerning this matter.

That notice does not address a particular hearing date, and for that reason we will at the end request that the case be

continued to the 9th so that we have that portion of the notice requirements covered.

EXAMINER STOGNER: I apologize about our error.

Q. (BY EXAMINER STOGNER) Back to Exhibit No. 1 again, just for clarification. I look over on section -- Township 25-33, the east half of 15, that's excluded from your request; is that correct?

A. That is correct.

Q. And the south half of 21 in 25-33, that's excluded; correct?

A. That is correct.

Q. You show a tight formation designation in the bluish tint just north of your area. What's that designation; do you know the New Mexico?

A. For the OCD it was OCD Case No. 7750, Order No. R-7589, issued in 1982. And for the submission to FERC, it was NM-27.

MR. STOGNER: 27. Okay. I have no further questions of Mr. Tower.

Are there any other questions of this witness?

You may be excused.

Mr. Carr.

MR. CARR: At this time we call Mr. Zinz.

**BARRY ZINZ**

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

EXAMINATION

BY MR. CARR:

Q. Will you state your name for the record, please.

A. Barry Lynne Zinz.

Q. How do you spell your last name?

A. Z-i-n-z.

Q. Where do you reside?

A. 4510 Cimarron in Midland, Texas.

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

A. Employed with ENRON Oil & Gas Company.

Q. And in what capacity?

A. Geologist.

Q. Could you briefly summarize your educational background.

A. Yes. I have a master's degree -- a BS, bachelor's degree, and a master's degree from Texas Tech University.

Q. When did you receive your master's?

A. In 71.

Q. Following graduation for whom have you worked?

A. I worked for about four-and-a-half years with Union of California in Midland and then I went to work for at that time it was Northern Natural Gas, but there have been several mergers and changes. And it is now ENRON Oil & Gas.

Q. And at all times have you been employed as a petroleum geologist?

A. Yes, that's correct.

Q. Are you familiar with the application filed in this case on behalf of ENRON?

A. I am.

Q. Have you made a geologic study of the area for which you we are seeking designation of a tight formation?

A. I have.

MR. CARR: We would tender Mr. Zinz as an expert witness in petroleum geology.

EXAMINER STOGNER: Are there any objections or questions?

Mr. Zinz is so qualified.

Mr. Carr.

Q. (BY MR. CARR) Mr. Zinz, as part of your study you've prepared exhibits for presentation?

A. Yes, I have.

Q. Before we get into that, I think it would be helpful to provide some general orientation. Could you just explain where this application area is located.

A. Yes. The area is located about 45 miles southwest of Hobbs in Lea County, New Mexico.

Q. I think initially we should go to the material behind the tab in Exhibit 7, which is designated "Geologic Exhibits." And the second page behind that is a geologic province map. Could you go to that and review that for the Examiner, please.

A. Yes, I will. This is a regional geographic and geologic province map. There's a bar scale down there for distance. The area of application is outlined. It's the dashed outline in the southwest corner of Lea County, New Mexico, adjacent to the Pitchfork Ranch field, which is an Atoka Morrow gas field.

Superimposed on the geographic map are

these regionally recognized geologic features, being the Northwest Shelf, Central Basin Platform, and the Delaware Basin in which the area of application is located.

Q. Let's move to the next page in Exhibit No. 7. Would you identify that?

A. Yes. This is a log, a well log, that we're submitting as a type log. It's a neutron density log off of the BTA Rojo 7811 JV-P No. 1 well, which is located in Section 27 of 25 South, 33 East.

Q. Why was this well selected?

A. Well, it was selected basically because it is one of only three wells inside the area of application that actually penetrated the entire Morrow section. And there is also included on one of our exhibits the cross-section designated B-to-B prime.

Q. Is the reason so many wells don't penetrate the entire section because the primary producing zones are in the upper and middle Morrow?

A. That's correct.

Q. This also shows the relationship of the Morrow to the formations above and below it, does

it not?

A. That's correct. If you'll look, the Morrow formation is lower Pennsylvanian in age, and it lies above the Mississippian Shelf in this area and below the Atoka, the Pennsylvanian Atoka formation.

Q. Could you generally describe the characteristics of the Morrow in this area?

A. Yes. There's three regionally recognizable correlative units, being the Lower, Middle, and Upper, and they're designated on the log.

And go a little bit further to kind of summarize the depositional environments of these specific intervals, the Lower Morrow is -- consists of basinal shells. The Middle Morrow, you start having an influx of clastic material during that time.

And we have -- the clastic material is being sourced from the Central Basin Platform, which gives you these packages, sand packages, of lenticular clastics mixed in with the shells, basinal shells.

And then going on up to the Upper Morrow, we have a considerable increase in

limestones which alternate with shells as well as sands. And this is probably indicative of a regressive Morrow sea and a lot shallower water.

Q. Let's go to the next page in Exhibit No. 7. Would you identify that?

A. Yes. This is also a type log that we're submitting from the Superior No. 1 Ochoa Federal well, which is located in Section 15 of 25 South, 33 East.

Now, this log is being presented as a type log because it is common to both of our cross-sections that we are submitting, and it is also located near the center of our area of application.

And like you mentioned earlier, like the majority of the wells within the area of application, you can see that this well only went into the very uppermost part of the lower formation.

And we have the Lower, Middle, Upper designations on the log as well as additional designations within the Middle and Upper Morrow. These clastics have been broken out, and the nomenclature that you see on the log is taken from the Pitchfork Ranch field, which is located

adjacent to our area.

Q. You have prepared a structure map of the area?

A. Yes, I have.

Q. Would you take that out now -- that's marked ENRON Exhibit No. 4 -- and review that. In preparing this structure map, what sort of information did you utilize? Did you have well control data?

A. Yes. Used the well control that is on the map. One thing that is on the map are the Morrow penetrations, which are designated by a circle around the well symbol on the map.

Q. Did you also integrate seismic and production data into this interpretation?

A. Yes, we did.

Q. Okay. Would you go to this exhibit and review it for Mr. Stogner.

A. Okay. This is a structure map on the top of the Morrow sea sand. And this map shows some of the similar features that Pat pointed out on his land plat. The hachured area, our outline area of the application area is on the map.

The two windows that we mentioned are also on the map. The line of cross-sections that

I have up on the wall are also indicated on the map.

And there the trace for cross-section A-to-A prime is an east-west cross-section. The more or less north-south, actually northeast-to-southwest trace is also on there. And the well numbers correspond to the cross-sections. They're on top of the logs up there, and they're also by the wells on the map.

Also, the shaded area up here is the same as what Pat pointed out being the previously designated area. Our acreage is in yellow, that is, ENRON's acreage.

This, the contour interval here is 50 feet. And the dip of the Morrow in this area is south-southwest.

Let's see, also located on the map are the two type logs that we've just discussed. And like I mentioned just a while ago, the windows, these are, if you will, sweet spots. And they represent locally high-permeable Morrow reservoirs that have very limited areal extent.

Q. And the engineering testimony will present some volumetric information to confirm that?

A. Yes, they will back up that.
Q. Now, you have two cross-sections, an east-west and one that runs northeast-southwest?
A. That's correct.
Q. We put them up on the wall. I think it might be useful to review them both at the same time. I'd ask you to go up there and then just simply work through them.
A. Okay. These are both stratigraphic cross-sections and the datum that the cross-sections are hung on is this dashed line, if you can see it. It is the top of the, what has been designated the Morrow clastics. And this is a good correlative point common to all the wells in the area.

This correlation point across both cross-sections represents the top of the Morrow formation.

Q. That's indicated on --
A. Beg your pardon?
Q. It's indicated on the -- designated on the exhibit by top of the Morrow?
A. Yes, that's correct.
Q. And shaded blue?
A. That's right.

EXAMINER STOGNER: Before we go any further, do you want to refer so it will be clear on the transcript which exhibit is which?

THE WITNESS: Okay. This exhibit here is Exhibit 5, and it is the A-to-A prime cross-section, which is the east-west cross-section. This bedsheet is the northeast-to-southwest cross-section designated B-to-B prime.

EXAMINER STOGNER: Both exhibits have the top of the Morrow as you indicated on the dashed line; is that correct?

THE WITNESS: Yes. Every correlation, every line are the same as far as those particular tops. They're correlative with all the logs, yes, sir.

EXAMINER STOGNER: Thank you.

THE WITNESS: Okay. The scale for the cross-sections, we have a horizontal scale of 1 inch equal 2,000 feet. Vertical scale is 1 inch equals 40 feet.

Okay. As we have pointed out earlier, you can see that most all these logs or wells -- and by the way, most all of the wells in the area of application with the exception of a couple are

located on these cross-sections.

But you can see that not many of the wells penetrated below the base of the Middle Morrow sands or Middle Morrow interval. And the Lower Morrow interval is represented in gray towards the bottom of each cross-section.

Okay. If you look at the cross-section, and again I don't know how much of this you can see from back there, but within the wellbore, center wellbore portion of each log, you see a lot of colored areas. These represent perforations, attempts at completing the various intervals within the Middle and Upper Morrow.

And as you can tell, that many of these sands have been attempted in these wells. And to clarify these perforated areas, the production information is included at the bottom of each log that corresponds to these particular intervals.

I guess that's really about it.

Q. (BY MR. CARR) Working from these, I would like you to generally review the nature of the Morrow formation and pay particular note of the average depth to the top of the Morrow and the average gross thickness of this.

A. Okay. You would like just to summarize

what we've found?

Q. Yes.

A. Okay. I'll just sit down for that.

Okay. What we have, the clastic sediments within the Upper and Middle Morrow are the dominant reservoir rocks within Pitchfork Ranch field and within the area of application. What we see here is the average depth to the Morrow in the area is 14,700 feet.

And as I said earlier, there's only three wells within that whole area that actually penetrated the entire Morrow section. And these wells verify that there the gross Morrow section is between 1800 and 1900 feet.

And the type log, the BTA type log, to be specific, the Morrow is actually 1872 feet thick in that particular well.

Q. Two Morrow zones that you have mapped, the Upper and the Middle, they're continuous across the entire area which is the subject of this application?

A. That's correct. The cross-sections illustrate that the Morrow is continuous throughout the area that we're applying for.

Q. Let's go to Exhibit No. 7. In Exhibit

No. 7 there is a tab in the geological section?

A. I hadn't exactly finish this first.

Q. All right.

A. Let me add a few things.

What I want to point out and stress is the fact that as you get away from the Pitchfork Ranch field, your clastics become poorly developed. And that direction would be southwest across the area of application. The sands are more limey, they're less homogeneous, and they have a greater amount of calcareous and siliceous cement in their makeup.

And it is these lithologic type changes that have resulted in a tighter rock, which is supported by our production data, the log calculations, and the permeability calculations that Randy Cate will cover.

Q. Are you ready to go to the material in the next exhibit?

A. Yes.

Q. Will you identify that for the Examiner, please?

A. Okay, what this is really is individual well data from the wells within our application area. And this is data that is presented

according to the guidelines of the BLM and OCD.

And what we have here are all the wells that are within the area. They're alphabetical. We have the operator designated, the depth to the top of the Morrow, spud date, completion dates, all of the Morrow perforations which correspond to what I pointed out on the cross-sections, and pay thicknesses, porosities.

Water saturations are calculated using certain figures off of logs. Indicated the producing status or nonproducing status of the wells and then the accumulation production, cum'd production of these intervals.

And really I'd just like to say that all that is taken from this data really is the pay thickness and the porosities which were used in the calculations for permeabilities.

Q. Do you have anything further to add to your geologic presentation?

A. I think that's it.

Q. Were Exhibits 4 through 6 prepared by you?

A. Yes, sir.

Q. Did you also prepare the portion of Exhibit 7 that covers the geological part of this

case?

A. I did.

MR. CARR: At this time, Mr. Stogner, we would move the admission of ENRON Exhibits 4 through 6.

EXAMINER STOGNER: Are there any objections? Exhibits 4 through 6 will be admitted into evidence at this time.

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

EXAMINER STOGNER: Ms. Clancy, do you have any questions of this witness at this time?

MS. CLANCY: No, I don't.

EXAMINER STOGNER: Mr. Kent.

MR. KENT: No, I don't.

EXAMINER STOGNER: Mr. Buckingham.

MR. BUCKINGHAM: No, I do not.

EXAMINER STOGNER: Well, I don't either.

Any redirect, Mr. Carr?

MR. CARR: If I'm limited only to cross, I think not.

MR. STOVALL: You don't have to be cross, Mr. Carr. It's close to Christmas.

EXAMINER STOGNER: How long is your

next witness?

MR. CARR: I think the direct presentation is 20, 25 minutes.

(A discussion was held off the record.)

EXAMINER STOGNER: Let's go back on the record and continue, Mr. Carr.

MR. CARR: At this time we call Randy Cate, C-a-t-e.

**RANDY CATE**

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

EXAMINATION

BY MR. CARR:

Q. Will you state your name for the record, please.

A. Yes. My name is Randall Stewart Cate.

Q. And where do you reside?

A. I live in Midland, Texas.

Q. By whom are you employed and in what capacity?

A. I'm employed by ENRON Oil & Gas as a Project Reservoir Engineer.

Q. Could you briefly summarize your educational background and then review your work experience?

A. Okay. I received a BS, a bachelor of science in mechanical engineering from the University of Texas in Austin in 1979. Went to work for Gulf Oil immediately out of school as a petroleum engineer, worked for them for two years in Odessa. Changed over to TXO Production Corp., worked there for almost ten years. And then I've been with ENRON Oil & Gas for almost one year.

About eight years of my experience has been strictly reservoir engineering, and the other four is a mixture of production and/or drilling operations.

Q. Are you familiar with the application filed in this case on behalf of ENRON?

A. Yes, I am.

Q. And have you made a study of the area that is the subject of this case?

A. Yes, I have .

MR. CARR: Are the witness' qualifications acceptable?

EXAMINER STOGNER: Are there any objections or questions?

Mr. Cate is so qualified.

Mr. Carr.

Q. (BY MR. CARR) Have you prepared

certain exhibits for introduction in this case?

A. Yes, I have.

Q. And in preparing these exhibits, has this been in conjunction with your study of the area to determine the average permeability and stabilized flow rates for the wells in the application area?

A. That's correct.

Q. Could you refer to the material behind the tab in Exhibit No. 7, refer to it -- or identified as "Engineering Exhibits." And go to the first tab behind that, identify and review that for Mr. Stogner.

A. All right. The tab is -- the first section behind the tab that says "Engineering Exhibits" is a summary of the well completion data and the bottomhole pressures.

For the wells inside the application area, we collected data from each completion attempt within the Morrow, whether productive or not. And what I used was drilling reports, state sundry notices, and back-pressure tests, any of the filings that the state had received, also scout tickets.

We were fortunate that most of the

wells in the application area at one time or another ENRON has owned an interest in or still does, and therefore we had very good data out of our files.

The important part on this summary of the well completion data, number one, it defines what is pre-stimulation test, also which that is what the criteria for the stabilized flow rate is and for the permeability calculations.

The breakdown upon completion is at a spot acid or is at a stimulation. And the breakdown will normally refer to an acid or a fluid that is solely used to open the perforations and is not considered a stimulation.

Then I go to the stimulation fluid and amounts used, and the important thing here is that the amounts of acid over the breakdown are greatly increased. And the intent of this job is to stimulate the formation.

I show the maximum injection pressures, the average rates, and the pre-stimulation -- or the post-stimulation, excuse me, flow test after that stimulation job had been completed.

Also in what we need to calculate a

permeability is the bottomhole pressure of the reservoir that you start with and the flowing bottomhole pressure.

So this page here gives us three of the items that we need in our equation to calculate permeability. You have to have a flow rate of gas, plus an original bottomhole pressure, and then the existing bottomhole pressure at which you get this flow rate. And that's taken from this page.

This is all summarized -- like I said, this summarizes all the drilling reports, sundry notices, et cetera, that we gleaned the data from. And both the OCD and BLM have received copies of the back-up data, but for ease in this application, they're not all shown as exhibits.

Q. Mr. Cate, there were a couple of wells that you indicate you did not have information on. Could you explain that?

A. Okay. On the second page of the summary of well completions, at the very top, the Flagler Fed. No. 1 and the Gilla 4 Deep Com. No. 1, we had information from scout tickets and the NMOCD and state files.

But all that was on the reports was

that they swabbed water and no flow rates of gas, and therefore there's not enough data to make a permeability determination from that. And so you will not see a permeability determination for those wells.

Q. Let's go now to the permeability and stabilized flow rate information behind the next tab. Could you review that, please?

A. Yes. The next tab summarizes -- or the next section summarizes the permeability and stabilized flow rates for the wells within the application area. Of the eleven out of fifteen wells that penetrated the Morrow formation within the application area, eleven of them are shown here.

Now, there are two pages that are identical, this first and second page, except for the Half 6 Federal No. 1, which Pat Tower had previously mentioned. And I'll make the point there that at the very bottom of the page, we summarized the average permeability that was derived and the average stabilized flow rate at one atmosphere of pressure that was derived.

The first page, which includes the Half 6 Federal No. 1, has an average permeability

calculated at .07587 millidarcies, an average stabilized flow rate of 1,339 Mcf per day, which is 1,000 cubic feet per day.

On page 2, with the exact same data, except that the Half Federal 6 is left out, the average permeability is then calculated at .0499 millidarcies, and the average stabilized flow rate for these wells is 1,236 Mcf per day.

Q. What is the flow rate you need to stay below?

A. The maximum stabilized flow rate is 2,557 Mcf per day. And, of course, the maximum average permeability for the area would be .1 millidarcy. So in either case, the calculations are well within the guidelines.

And as Pat Tower previously mentioned, ENRON supports either way that the agencies decide is best for the application.

Q. Okay. Let's walk through the information on this exhibit.

A. Okay. The wells, again by perforated interval, and typically the completion within the Morrow would isolate a sand or set of sands, do a breakdown acid job on them, get a flow test, then come back and do a stimulation acid job on them.

And because our data was very good in the drilling reports, I was able to calculate pre-stimulation permeabilities and post-stimulation permeabilities.

And then I will show in the third column which permeability I used in deriving the average. And then the fourth column shows the calculated stabilized flow rate.

I would point out that within the permeability calculation columns if you see a D, that denotes the Dst. If you see a BU, that denotes bottomhole pressure buildup data was used.

In the cases where we had a bottomhole pressure buildup, they were all post-stimulation data, but besides core analysis, it is the best way to measure permeability that industry has right now as far as well testing goes.

So even if it's a post-stimulation number, I went ahead and used the derived permeability from the bottomhole pressure buildup.

The other method that I used to calculate permeability, if you see no other donations, is a Holditch & Lee method, which has

been used in previous tight gas formation applications.

It uses a flow rate and a flowing bottomhole pressure, the hours that this flow rate was tested at. And they calculate a radius for transient flow, and it's an iterative process. Then it comes back with that radius and goes into the transient flow equation that derives permeability.

And you converge it -- it converges. The permeability that you assumed will converge finally on itself to the permeability that's derived and then you know that you have the proper answer.

Also in the Holditch & Lee method, they use the number of acres. And the stabilized flow rate is then defined from the time it takes to reach the pseudo-steady state, which is assumed to be at the radius of 320 acres, that is when you would by definition reach stabilized flow rate.

And so that time is calculated at which to reach pseudo-steady state, and then the equation will tell you what your stabilized flow rate will be.

I will show a comparison of the Holditch & Lee method to the bottomhole pressure buildups that we have, and also the paper on the Holditch & Lee equations and method is presented here also.

Q. Okay. That's behind the next tab in this exhibit book?

A. That's correct.

Q. Are you ready to go to that now?

A. Yes.

Q. Let's go there now and turn to the second page behind that tab and review that.

MR. STOVALL: Mr. Carr, would you just state which tab it is.

MR. CARR: It's the tab that's indicated "Comparison of Holditch & Lee Method to Bottomhole Pressure Buildup Analysis."

THE WITNESS: Okay. What I did was compare the calculated permeabilities in the area, because primarily I used the Holditch & Lee method, but I wanted to see the validity of the method versus the bottomhole buildup pressure data, because as I mentioned before, that is probably the top or the most accurate method that the industry has to calculate or measure

permeability from oil tests.

And I had three wells that had bottomhole pressure buildups. The first column shows the resulting permeability from the buildup analysis and the resulting skin factor.

Now, the second -- I'll go ahead and show here -- a positive skin factor means that the well is damaged or that there is some kind of a restriction that could be removed by acid or stimulation. It possibly can be removed. There's a lot of things that can affect skin. But that's what a positive skin indicates.

The ones with negative skin indicate a stimulated formation. All bottomhole pressure buildups that we have are post-stimulation buildups. So even Andrikopoulos is post-stimulation, but it still showed that perhaps that stimulation was just not effective. That's why it's still showing a positive skin factor.

Now, the third column there, the H & L, Holditch & Lee method, skin equals zero is what they have to assume because you have no way to calculate skin unless you have buildup. So you you must assume skin equals zero.

That's a fair assumption after an acid breakdown. The general magnitude we've seen in the area is probably 500 gallons. The acid is set in the casing. Perforations were made through it. The acid is displaced near wellbore, and then it's allowed to flow out. So that should arrive in an approximate zero skin.

I went ahead and have put the Holditch & Lee equations into a computer spreadsheet, a Lotus spreadsheet, where it would calculate that for me. And I modified their equation to include the skin factor.

So as we go down these wells, we can see the agreement. If I use the Holditch & Lee calculations with a skin of zero, the Andrikopoulos is very close, .09 to .1081 actual. But anywhere that I have -- the rest of the three wells where I have a negative skin factor, then my calculated permeability using Holditch & Lee is much higher, sometimes a factor of 2.

So I have put in a skin factor which approximates that of the bottomhole pressure buildup. And you can see that the permeability then calculated by the Holditch & Lee comes much

closer to that of the buildup.

Now, in the previous exhibit, I'm still using an assumed skin of zero, and so therefore most of the time I'm probably going to end up with too high of a permeability. So that's the point that these numbers are probably conservative numbers that you've been seeing when I use a post-stimulation permeability.

Q. And this basically shows the validity of the bottomhole pressure buildup?

A. Right. This shows that there is very good comparison between the calculated method and the bottomhole pressure buildups.

Q. What is the information behind this page?

A. The information behind this page is the paper that Holditch & Lee published. It derives their methods and equations, which their equations are standard engineering equations used by the industry, such as transient radial flow equations, the diffusivity equations, the equations that calculate the time to pseudo-steady state.

We can go into these if you wish, but their findings and how they derive their final

equations are all submitted in the next approximately 20 pages. I would say that if you can turn to, let's see, it would be the fourth page, they use an example. There is an example.

Q. The top of that page starts with the word "permeability"?

A. That's correct.

Q. "Permeability can be estimated." Okay.

A. Okay. And then in the middle of the page there, it shows an example. Primarily what I want to touch on here is the data that is required, the input data that is required for the calculations. And I'll discuss where the data came from so you can find it in the rest of the exhibits.

Again, in the middle of the page the left-hand column there, gas gravity, we got that from gas analyses, back-pressure tests of that nature. That's fairly easy to determine.

The temperature is logged. Bottomhole temperature is on logs. "Pi" is the pressure of the reservoir, initial. We had measured bottomhole pressure, bottomhole pressures. And if not, then most of the time I would have a

shut-in surface pressure, and I can use a Cullander & Smith equation and correlation which will then give me the bottomhole pressure.

The porosities is the "phi-g" there. Barry Zinz, our geologist, determined those off of his log calculations. The "rw" is the radius of the wellbore. The "H" is the net pay height. Again Barry Zinz in his log analysis had determined that, and that's presented on a previous exhibit.

"Z," the gas compressibility factor, is gotten by several correlations, and we have computer programs for that. "Cgi" is gas compressibility, another gas compressibility factor. I'll show how I derived those. There is a page, an example I show.

"Mu-gi" is the viscosity of the gas. It will be at the original bottomhole pressure. And one of my examples shows where we arrive at that. The spacing for the Morrow out here is 320 acres. And the "B-gi" is a formation volume factor. I'll show in a second how we arrived at those.

Otherwise, the Holditch & Lee method, like I mentioned before, uses normally used

engineering calculations and equations.

If you go to the back of this section, approximately -- well, a fourth page from the back of this section is where I show an example of how the gas compressibility was evaluated at the initial reservoir pressure, and also the gas formation volume factors, how they are determined and calculated.

The next page shows the charts, correlation charts, that were used to determine the gas compressibility, which is referred to on this previous page. And the last two pages show where the "Z" factor and the gas viscosity, they are derived from a computer program that has the correlation charts were programmed within it.

And the last page shows a program that converts flowing rates and flowing surface pressures and/or shut-in pressures to bottomhole pressures. Again, all that data was required in the calculations, and that's where it all comes from.

Q. Mr. Cate, in this application area we have a couple of windows because of wells that demonstrate anomalous characteristics for the reservoir. Would you go to the material behind

the tab at which reads, "Support for 320-Acre Windows," identify that, and review it for the Examiner.

A. Okay. Yes, that's the next section. It is support for 320-acre windows on the Brinninstool 21 Fed. Com., Federal No. 1, and the Ochoa Federal No. 1. I'll summarize the permeabilities that were calculated and the calculated stabilized flow rates.

For the Brinninstool 21 No. 1, it had a calculated permeability of .4540 millidarcies and a corresponding calculated stabilized flow rate of 9,021 Mcf per day. Also the Ochoa Federal No. 1 has a calculated permeability of .4874 millidarcies and a corresponding stabilized flow rate of 8,662 Mcf per day.

These wells are not representative of what I found in going through the calculations for the area, and so I did a volumetric drainage, drainage area calculation, to determine the extent of these reservoirs. And that is summarized on the next page.

And what I found was that indeed they are small reservoirs that again are anomalous and do not fit the average that we had calculated for

the rest of the area.

As you can see, the Brinninstool calculates 169 acres. And the Ochoa Fed. only -- well, less than two acres, 1.7 to be exact. The 171 acres that these wells' sands represent is approximately six-tenths of 1 percent of the total application area.

Q. Are there any freshwater wells in the area of this application?

A. They're -- I'm not aware of any freshwater wells in the area of that application.

Q. Are you aware of any freshwater?

A. I'm not aware of any freshwater.

Q. Could you just explain what the materials with the tab on them, "Freshwater Protection," is designed to show.

A. Okay. The next section is the casing program that is used in the Pitchfork Ranch and the Vaca Draw area. It is required by the NMOCD. And it involves setting a surface casing at 650 feet, which is enough to cover any freshwater zone, if there was a zone present. Cement is then circulated to the surface so that there is a continuous string of cement from the bottom to the top.

Additionally, a string of ten-and-three-quarter-inch casing would be set at 5200 feet, also cement-circulated to the top or to the surface, because there is a salt section that is drilled below the surface.

Therefore, the area above 650 feet will have two strings of casing and two strings of cement circulated to the surface. And that will adequately protect any freshwater aquifer.

Q. If there is any.

A. If there is any.

Q. Let's go to the tab that is styled, "Liquid Hydrocarbon Recoveries of Morrow Wells," and I'd ask you to review that.

A. All right. That would be the next section. One of the requirements of the application for TG -- or tight gas formation is that no well produce more than five barrels per day of crude oil without stimulation.

And what I've shown here is a representative -- I picked three wells that were representative. Several of the wells in the area don't even test liquid hydrocarbons. I picked these just, like I say, at random and just to show that the gas is dry gas, that very little

liquids are recovered.

And you see the Half 6 Federal No. 1, it did recover one barrel of liquid on it's back-pressure test. The gravity of the liquid is 51 degrees, which corresponds to condensate, which drops out of the gas. Crude oil is liquid that is present in its form in the reservoir. Condensate is something that drops out of the gas itself due to the drop in pressure and temperature as the gas is produced.

I also show the yield, barrels of condensate per million cubic feet of gas. They are very low, and they are well below what is considered a statutory gas well. So the exhibit is used here to prove and to support that none of the wells in the application area are expected to produce five barrels or more of crude oil.

Q. Are you ready to go to the material behind the last tab in this exhibit?

A. Yes, I am.

Q. Could you identify that material.

A. All right. This next section is a compilation of the data sheets that I generated with the Holditch & Lee computer program. And in them, you will find the input flow rates, the

hours at which the flow rate was tested, the flowing bottomhole pressure, which is calculated as shown previously, the set of input data which we discussed previously in the Holditch & Lee paper, the spacing radius, and then at the bottom is the assumed permeability and the calculated permeabilities.

There were several iterations that I had to make to get to this point. For example, I might have started at a .1 millidarcy on this Andrikopoulos in the assumed "K," and I would have had to maybe try two or three more iterations in order to get these two as a match. But I'm only showing the final product here, which is the matching assumed to the calculated permeability.

Also the stabilized flow rate at the very bottom of the page, which is the AOF, signifies the absolute open-flow stabilized flow rate, has also been summarized in the previous exhibits and is calculated here for each of the wells. So this is the back-up data that you have seen summarized in the previous exhibits.

Q. Mr. Cate, as a result of your engineering study, have you been able to

determine that the average in situ permeability in the area that is the subject of this application is less than .1 millidarcy?

A. Yes, that is my conclusion.

Q. Is the pre-stimulation stabilized production rate at atmospheric pressure or calculated against atmospheric pressure from the wells completed in this formation in the subject area less than 2,557 Mcf per day?

A. That's correct.

Q. That is the permitted rate for wells at this depth?

A. That's correct.

Q. Do you expect any well in the area that is the subject of this application prior to stimulation to produce in excess of five barrels of crude oil per day?

A. No, I do not.

Q. In your opinion based on your engineering study, does the area covered by this application meet the criteria for qualifications of tight gas formation under Section 107 of the Natural Gas Policy Act?

A. Yes, it does.

Q. Was the engineering portion of Exhibit

No. 7 prepared by you?

A. Yes, it was.

Q. In your opinion would the granting of this application result in the recovery of gas that otherwise would not be produced?

A. That's correct.

Q. And in your opinion is the approval of this application in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes, it is.

MR. CARR: At this time we move the admission of ENRON Exhibit 7.

EXAMINER STOGNER: Exhibit No. 7 will be admitted into evidence at this time.

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

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Cate, since we're back here on the data sheets, you used your spacing in acres at 320, but there's a few in here that you deviated from that, and how would that affect the permeability calculations? And refer in particular to Bell Lake 2 State No. 1 well -- oh,

I guess it's about --

A. About five -- well, it starts right after the Andrikopoulos. It would be about six pages back.

Q. About eleven.

A. About eleven. I went ahead and tested the program for sensitivity to the spacing radius. And they are shown here that there is virtually no effect on the calculated permeability for this example to change the spacing from 320 acres to 160 acres or even to 80 acres.

The permeability still calculated the same. And that was just my testing of the sensitivity to verify and check the validity of the program.

Q. So it appears that particular number really has not that great of effect to your calculations; is that correct?

A. That's correct. Again, it was something I was doing just as a validity and a sensitivity check. Now, it does affect the stabilized flow rate minutely. And let me just get that on the record here.

The 320-acre stabilized flow rate is

1618 Mcf per day on the example for 320 acres. The same set of data on an 80-acre spacing would result in 1766 Mcf per day. It's not appreciably different.

Q. Okay. In looking at some of your calculations here, in particular the liquid hydrocarbon recoveries of Morrow wells, you included the Half 6 Federal Well No. 1. But that well has actually been pulled out of your request; is that correct?

A. Well, it's included at the discretion of the agency. Like we've stated, ENRON will -- I guess, we would prefer that it remains in the area, but we don't oppose it being withdrawn either.

But it was the only well I could find within the area that we originally worked that had a recovered appreciable quantity of liquid that had a gravity determination on it. That's why I included it.

Q. So you wanted to get one of the worst-case scenarios or --

MR. STOVALL: Or best-case.

Q. (BY EXAMINER STOGNER) -- or a well that had some liquids?

A. Yes.

EXAMINER STOGNER: And that being the worst-case scenario.

MR. STOVALL: Isn't it amazing when your best well is a worst-case scenario?

EXAMINER STOGNER: It depends on how you look at it.

Mr. Kent, do you have any questions of this witness?

MR. KENT: No, I don't.

MS. CLANCY: One quick question.

EXAMINATION

BY MS. CLANCY:

Q. You said that there were two wells that you did not have enough data to calculate permeability on?

A. That's correct.

Q. Now, were those wells included in your field average permeability?

A. No, they were not.

Q. So you were being conservative?

A. Yes. I just didn't have enough data to make a proper determination, so I didn't feel it needed to be in there.

EXAMINER STOGNER: Which two wells were

those? I guess I'm looking at the tab "Permeability and Stabilized Flow Rates."

Is that what you're looking at, Ms. Clancy?

MS. CLANCY: It was -- it came up in a discussion earlier, and I've forgotten which two wells he actually cited. But the information from the scout cards indicated they were completed in the correct intervals and tested that there was enough flow.

MR. STOVALL: It's the summary of well completion data, isn't it?

MR. CARR: If you go to the tab, "Summary of Well Completion Data and Bottomhole Pressures," which is the first tab behind the engineering exhibits, the third page, the second page of well data at the top, the two wells are identified there, the first two wells.

EXAMINER STOGNER: Okay.

MR. CARR: The Flagler Federal No. 1 and the Gila 4 Deep Com. No. 1.

FURTHER EXAMINATION

BY EXAMINER STOGNER:

Q. There again, in this particular tab, the Brinninstool well, the Superior, Ochoa,

Federal No. 1, and the Half 6 Federal Well No. 1 were again submitted data in this particular tab for information only?

A. Yes. Well, they are included for information, and then that information is used later in the volumetric determinations that were shown for the Brinninstool and the Ochoa Fed. And it is used also in the permeability determinations for the Half 6 Federal.

Q. Going to your transient flow rate data, on your height it was -- the "H" value on each one of these -- was that the perforated interval, or was it another figure utilized?

A. No. It is the perforated interval that was open at the time of the test. If you're referring to the bottomhole buildups?

Q. Yes.

A. Yes.

EXAMINER STOGNER: Is that correct, Mr. Zinz?

MR. ZINZ: You're talking about the overall perforations?

EXAMINER STOGNER: Well, you tell me what the "H" is.

MR. ZINZ: Well --

EXAMINER STOGNER: I saw you shaking your head no, and he was answering the question yes.

MR. ZINZ: Well, what I did was go in there and figure out the clean sand that I thought was clean sand within the overall interval of that particular A sand, B sand, C sand, or whichever particular interval.

And I didn't think that the perforations were the same throughout that whole interval as what I might have picked as clean sand.

MR. STOVALL: Who picked the number? Did you provide him with the number for "H"?

MR. CATE: There's always going -- not always, but normally will be a difference in the amount of feet perforated versus the pay height that may be calculated off the logs.

MR. STOVALL: Let me stop you for a minute because Mr. Zinz actually nodded the answer to my question but didn't answer it. Let me ask the question again, and I will ask you.

Did you use in making the calculation the height -- what, the number you plugged in there, was that number provided to you by Mr.

Zinz?

MR. CATE: Yes, it was.

MR. STOVALL: Now, Mr. Zinz, would you tell us what that number was -- the method you used to define the number, did I understand you correctly that it is the number of feet of clean sand within a perforated interval; is that more accurately --

MR. ZINZ: It's the number of feet within an interval, a sand interval, be it the A sand, the B sand, the C sand. I used a 50 API unit cutoff to determine what my clean sand was, and I went through there and counted up the feet.

Q. But not between just the perforations but within the whole interval perforated or that was clean there?

MR. ZINZ: Uh-huh. That's the way I did it.

MS. CLANCY: So that in general could give you more net pay than just the perforated interval which would then reduce your drainage radius. So if I'm understanding this right, you used a number that was smaller than perhaps --

MR. CATE: No. I could have used a number that was higher than the actual net pay

which could result then in a falsely lower permeability calculation on the buildups. But I believe -- at least I believe that most, if not all, of the interval that was perforated from the work that we did together and in our double-checking each other, I believe that most of the pay that was used in these calculations was in fact perforated and open and did contribute. We can --

MS. CLANCY: Looking at the Brinninstool, their perf'd interval is more like about 20-or-something feet. I believe you used 7.

MR. CATE: That's right. That is the initial zone. If you look at the Brinninstool, you'll see it's the initial zone that made all the gas. Since then I have come in and added the other few feet and with very little increase in the reserves. So I applied it all to the smaller interval actually.

MR. STOVALL: In other words, you are satisfied -- if I'm correct, the bigger the interval, the lower it would make the permeability appear. The bigger "H" --

MR. CATE: That's correct.

MR. STOVALL: And you are satisfied that you did not use an unrealistically large "H" based upon the actual access to hole sands?

A. That's right, yes.

MR. STOVALL: Okay. Mr. Zinz, would you concur in that?

MR. ZINZ: I concur with that, yes.

MR. STOVALL: Since you calculated it.

EXAMINER STOGNER: So you both would shake your head yes at this point?

MR. ZINZ: What I should say is that most of the perforated intervals matched up with the height that I picked, but there were a few that did not, if I'm making myself clear.

MR. STOVALL: If I understand you correctly, you might perforate an interval, but you might actually have a little more sand contributing to what's going into that interval because it's clean; is that correct?

MR. ZINZ: That's correct.

EXAMINER STOGNER: And also at that point some of these wells -- most of these wells were probably perforated by other parties in which you might not have chosen those perforations; is that correct?

MR. ZINZ: Yes, that's correct.

EXAMINER STOGNER: Some get gun-happy, don't they, on their perforation guns?

MR. STOVALL: Or they're scared of them because they don't pan by the shot.

EXAMINER STOGNER: What is the oldest well out here in this area?

MR. ZINZ: Probably the Pure Red Hills.

EXAMINER STOGNER: Just the name of that one would make it somewhat old. When did Pure go out of business?

MR. STOVALL: Before you went in, I think.

MR. ZINZ: When Union acquired them, I think, 65.

MR. CATE: 1963 is what you show as the spud date for the Red Hills Unit No. 1. And that appears to be the earliest one.

MR. STOVALL: Let me back you up here and clarify this again. I think you were talking to Mr. Zinz when you said what you will show; is that right? The records show it was 63; is that what you're saying --

MR. CATE: Yes.

MR. STOVALL: -- Mr. Zinz has

generated.

MR. CATE: Yes. Maybe I ought to let him answer it.

MR. ZINZ: The Pure Red Hills is the one with the dark strip on the log right there.

EXAMINER STOGNER: What do you have as your "H" on the Pure Red Hills Unit No. 1?

MR. ZINZ: Okay. What I determined to be actual perforations within the Morrow, the Upper Morrow was 10 feet, which is that interval through there.

MR. STOGNER: That's about 14,850.

THE WITNESS: That's correct.

MR. ZINZ: And there again, the A sand and Warren sand was perforated. I showed that to have five foot of clean sand in there.

EXAMINER STOGNER: That appears to be 15-1030, somewhere like that.

MR. ZINZ: Uh-huh. And the B sand was also perforated, and I show that to have seven feet of good, clean sand.

EXAMINER STOGNER: Okay. Now, I'm referring to Exhibit No. 6. I do not show that C sand interval as perforated.

MR. ZINZ: Well, there may be -- let's

see.

EXAMINER STOGNER: But that's just a discrepancy.

MR. ZINZ: No. Excuse me. You're right. It wasn't perforated. It was the B sand. The Upper Morrow A sand and Warren and the B sands were all that were perforated. I read that wrong.

EXAMINER STOGNER: Are there any other questions of this witness, or Mr. Zinz for that matter?

MR. STOVALL: Or anybody else in the room that wants to answer a question.

EXAMINER STOGNER: Any questions? Okay.

MR. CARR: If not, Mr. Stogner, this case will need to be continued to the hearing scheduled before the Division on the 9th to correct the advertisement.

EXAMINER STOGNER: But I do not anticipate any additional comments, or I should say, appearances at that time. I would like to ask Mr. Carr that you provide me a rough -- me and Mr. Buckingham -- a rough draft order.

MR. CARR: Okay.

EXAMINER STOGNER: -- for the Commission.

MR. STOVALL: Mr. Carr, just a question procedurally. If you were to provide that order prior to that January 9 date and give the agencies a chance to look at it, if there were some questions that arose that could be responded to at that time, would that be helpful to you perhaps?

MR. CARR: Let me tell you that I will provide that before the January 9 hearing. We will not plan to have witnesses present on January 9.

MR. STOVALL: Unless we request it.

MR. CARR: Unless you request that we have people present, and we can do that if you desire.

MR. STOVALL: But I think that might be helpful to have that ahead of time, and again in the effort to try to be a little more efficient to be prepared to do that if we in fact tell you we need it.

MR. CARR: We'll do.

EXAMINER STOGNER: There again, a lot of information to be digested by several

parties. So the record will remain open, but I'll leave it at your timing to get us both a copy. And, Mr. Stovall, that was a good idea, the quicker the better.

If not, then that will be all for this particular case. And we'll take a 45-minute lunch break and reconvene at 2:00 o'clock.

(The proceedings were concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10428, heard by me on 20 December 1991.

_____, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

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

WITNESS MY HAND AND SEAL DECEMBER 22, 1991.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3