STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	CASE NO. 11,985
APPLICATION OF SAGA PETROLEUM, L.L.C., FOR AN UNORTHODOX WELL LOCATION, EDDY COUNTY, NEW MEXICO	)	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

July 9-10, 1998

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday and Friday, July 9-10, 1998, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

July 9th, 1998
Examiner Hearing
CASE NO. 11,985

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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 3:24 p.m.:

EXAMINER STOGNER: Okay, I'll go back to page 3 and at this time call Case Number 11,985.

MR. CARROLL: Application of Saga Petroleum, L.L.C., for an unorthodox well location, Eddy County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent Saga Petroleum, L.L.C., in this matter, and I have one witness.

EXAMINER STOGNER: Any other appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing in opposition to the Applicant. I represent OXY USA, Inc. I have three witnesses to be sworn.

EXAMINER STOGNER: Any other appearances?

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe. I represent John Huffman. Mr. Huffman is appearing today in opposition to the Application of Saga Petroleum.

EXAMINER STOGNER: Do you have any witnesses?

MR. BRUCE: I have no witnesses.

EXAMINER STOGNER: Any other appearances?

Okay, I believe there's four witnesses to be

sworn at this time. Will they please stand to be sworn?

(Thereupon, the witnesses were sworn.)

EXAMINER STOGNER: Is there any need for opening remarks at this time?

MR. CARR: I don't intend to make an opening statement.

MR. KELLAHIN: Nor do I, Mr. Examiner.

EXAMINER STOGNER: Okay. Mr. Carr?

LORIN RULLA,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. My name is Lorin Rulla.

Q. How do you spell your last name?

A. R-u-l-l-a.

Q. Where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. Saga Petroleum.

Q. And what is your position with Saga?

A. I'm the geologist.

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

A. No, sir, I have not.

Q. Could you briefly summarize for Mr. Stogner your educational background?

A. I have a BS in geology from the University of Nebraska in 1958, and I have one semester of graduate work.

Q. Following graduation, for whom have you worked?

A. I worked 11 years for Pan American Petroleum Corporation, seven of it here -- seven of it in Midland, three in Houston, one in Anchorage. I worked three years for MGF Oil Corporation in Midland. I worked 26 years as an independent consulting geologist. And I've been employed by Saga Petroleum for the last -- Since January 1 of 1998.

Q. And in this 40 years of experience --

A. That's a total of 40 years.

Q. -- have you at all times during this period been employed as a petroleum geologist?

A. Yes, I have.

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

A. Yes, I am.

Q. Are you familiar with the proposed unorthodox well location, which is the subject of today's hearing?

A. Yes, I am.

Q. Have you made a geological study of the area

which is the subject of this case?

A. Yes, I have.

Q. And are you prepared to now share the results of that study with the Oil Conservation Division?

A. Yes, I am.

MR. CARR: Mr. Stogner, we tender Mr. Rulla as an expert witness in petroleum geology

EXAMINER STOGNER: Are there any objections?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Mr. Rulla is so qualified.

Q. (By Mr. Carr) Could you briefly summarize what Saga Petroleum seeks in this case?

A. We seek approval of an unorthodox well location proposed for our Dero Federal Number 3, 1980 feet from the south line and 660 feet from the west line of Section 35, Township 19 South, Range 28 East, Eddy County, New Mexico.

Q. And to what well do you propose to dedicate this -- What acreage do you propose to dedicate to this well?

A. The south half of Section 35. And this includes all the following horizons: the Winchester-Morrow Gas Pool, Undesignated Winchester-Atoka Pool, Winchester-Strawn Gas Pool, the Undesignated Winchester-Upper Pennsylvanian Gas Pool, and the Undesignated Winchester-Wolfcamp Pool.

Q. What rules govern the development of this

acreage?

A. Statewide rules, which include 320-acre spacing and wells located 1650 feet from the end boundary and 660 feet from the side boundary of the spacing units.

Q. And what are the primary objectives in your proposed well?

A. The lower Strawn, the Morrow formation and the Wolfcamp formation.

Q. Have you prepared exhibits for presentation here today?

A. Yes, I have.

Q. And these exhibits are contained in the exhibit book that we've just passed out?

A. That's correct.

Q. Let's go to what has been marked as Saga Exhibit Number 1, and I'd ask you to identify this and review it for Mr. Stogner.

A. This exhibit shows a portion of Eddy County, New Mexico, with Saga acreage outlined in yellow, the south half of Section 35.

Producing horizons are noted by a color code and by a symbol. For instance, the Wolfcamp is noted by a pink hexagon.

Cumulative production for each well is noted in MMCF of gas or thousands of barrels of oil.

Each designation is also noted by a letter or a short-word designation, like WC for Wolfcamp, M for Morrow.

The current status of each well is shown as either abandoned or producing. And the word "abandoned" means permanently abandoned or can mean shut in. There's no designation separation.

Oil wells are shown in the white pentagons and are not -- The oil production is not shown on there. That's the Bone Spring production.

Q. If we look at the south half of Section 35, there appear to be two Morrow well symbols on that acreage. Could you explain the status of those wells?

A. The well in the southeast southeast of 35 is shut in at this time. And the well in the southwest quarter is currently producing gas from the Morrow.

Q. And about what rates -- At what rates is it producing?

A. About 30 MCF a day.

Q. If you make a Morrow well on this laydown south-half unit, do you intend to produce more than one Morrow well at any one time on that acreage?

A. No, sir, we do not.

Q. And would Saga propose that the order that results from this hearing so provide?

A. Yes.

Q. On what operator does the proposed unorthodox well location encroach?

A. The location is 660 feet from the end boundary of the south half of the spacing unit and is closer to this boundary than allocated by state rules. And we offset OXY Petroleum on the east.

Q. And what does OXY operate east of -- I'm sorry, west of you?

A. OXY operates the east half of Section 34 to the west, with a well completed in the Strawn at a standard location 660 feet from the common boundary with the Saga tract.

Q. So you're proposing to be 660 from the common boundary, and they currently have a well that distance from the common boundary; is that right?

A. That's correct.

Q. Has OXY proposed additional wells in Section 35?

A. They have proposed an additional well located 1980 from the north and 660 from the west of Section 35, a nonstandard location.

Q. So that well would be due north of your proposed location?

A. Yes, it would.

Q. It would also be 660 from the western boundary of Section 35?

A. That's correct.

Q. And it would be the same distance from the common boundary on the north end of this south-half unit, as your well would be?

A. That's correct.

Q. What is the principal zone of interest? Is it the Strawn formation?

A. Yes, it is.

Q. Let's go to the Strawn first, and I would ask you to first explain when the OXY well was completed and what it has produced.

A. The OXY well was completed in 1966, and it has produced 2.3 BCF of gas and 75,000 barrels of oil as of June 1, 1977.

Q. Can you generally describe for me the nature of the Strawn formation in this area?

A. This lower portion of the Strawn is represented by a facies of algal mounds, which are known to have a very localized development and rapid facies changes within short distances.

Q. In your mapping of the Strawn, have you isolated it into several separate lenses?

A. Yes, I mapped it into three separate lenses, separated by thin tight streaks.

Q. And will you show the exact location of these

lenses when we get to the cross-section?

A. Yes, I will.

Q. All right, let's go to the Saga Exhibit Number 2, your isopach map of the net clean carbonate sand in this Strawn Unit Number 1.

A. The Strawn Unit Number 1 is the lowermost of the three units I mapped, and in the absence of porosity in the surrounding wells, I used a net clean carbonate, which means -- which I took any carbonate with a gamma ray reading of less than 40 API units.

Q. And what does this show you?

A. This shows a northwest-southeast-trending thin zone of good porosity which occurs in the OXY well and is predictably present at our proposed location.

Q. Does this exhibit also contain a trace for a subsequent cross-section?

A. Yes, it does.

Q. All right, let's go to Saga Exhibit Number 3. Would you identify that first and then review it?

A. Exhibit Number is an isopach of net clean carbonate Zone 2, which is the middle zone. And again, it shows a north -- northeast-southwest trend, with a very thin area of potential at the OXY well and projected over into our proposed location.

Q. Were these isopach maps prepared from well-

control data only?

A. Well control and some sample analysis.

Q. All right, let's go to Exhibit Number 4. Would you identify and review this?

A. Exhibit Number 4 is an isopach of the net clean carbonate of Zone 3, which is the topmost zone that has algal mound indications. And it again shows a trend that extends northwest-southwest, to be very narrow.

Q. Let's go to cross-section A-A', which is shown on Exhibit Number 4.

The cross-section is marked Exhibit Number 5, and I would ask you to take that out and review it for the Examiner.

A. Cross-section A-A' is a stratigraphic section on the zone above the Canyon, and the indicated algal mounds are shown in blue, with color code -- with colored red porosity zones.

If you look carefully, you can see that there are thin zone that penetrate beyond and through the algal mounds and can be carried back into the facies that extend on either side of the mounds.

The -- What I call the shell facies has high radioactive material in it, and as you come in at the mounds it becomes low radioactivity, indicating high-energy carbonates.

And each of the thicknesses from Zones 1, 2 and 3 were isopached on the maps that I've already shown you.

Q. What is the blue zone below these three lenses on the log for the OXY well?

A. This is another potential algal mound that occurs down in the Atoka. It hasn't really developed any porosity yet, but it's probably pretty close.

Q. Mr. Rulla, what would be the impact on Saga if it was required to drill a well at the standard location back 1650 feet from the west line of Section 35?

A. We'd miss most of the main pay, and we would be drained by Saga's well to the west.

Q. By OXY's well to the west?

A. I mean by OXY's well to the west.

Q. If this well is penalized or if you were required to drill at a standard location, moving it to the east, would the reserves under the western portion of the southwest quarter of Section 35 be drained by the OXY well, in your opinion?

A. Yes, it would.

Q. Would you be denied the opportunity to produce the reserves that are under your acreage?

A. Yes, we would.

Q. You indicated, I think, that other zones of interest include the Morrow and Wolfcamp?

A. That's correct.

Q. Let's go to the Morrow. I'd like you to go to what has been identified as Saga Exhibit Number 6 and review that for Mr. Stogner.

A. Exhibit Number 6 is an isopach of the net porosity above 5 percent of the lower Morrow section, a portion of the lower Morrow section.

In my opinion, the lower Morrow contains two different zones, the bottommost one being water-wet from all the wells that it's been noted in, and an upper portion that produces in three wells on this map, particularly our Number 2 well located in the southwest quarter of 35 and the south offset drilled by Hillin in Section 2 of 20 South, 28 East, and also our Number 1 well located in the southeast quarter of Section 35.

Q. Have you shown the cumulative production on this map for the Morrow wells?

A. No, I haven't, but I can give it to you by referring back to the Exhibit Number 1.

Our Number 2 well has made a total of 1,828,000 cubic feet of gas, MM cubic feet of gas.

The Hillin well has made 1.6 BCF of gas from the Morrow.

Q. And where is that well located?

A. It's located in the north half of Section 2, 20

South, 28 East.

And our Number 1 well, located in the southeast quarter of 35, has produced two million -- 2.46 BCF of gas from the Morrow.

Q. Would a proposed location 660 feet from the west line of 35, 1980 from the south line, be in a favorable location to encounter additional Morrow pay?

A. Yes, it would.

Q. And this again shows a trace for cross-section B-B'; is that right?

A. That's correct.

Q. Is the zone that you're mapping here, the lower Morrow, in your opinion is that present on the OXY tract?

A. It's present and very thin in a couple of the wells to the west that are now abandoned from the Morrow and is absent in or very thin in the Number 6 well. It has not been drilled to, in the Number 6 well -- It was stopped short of the lower Morrow.

Q. Let's go to the next exhibit, Exhibit Number 7, the net porosity map on the middle Morrow formation, and I'd ask you again to review this for the Examiner.

A. This is an isopach of the net porosity in the middle Morrow and shows a well-developed area which our Well Number 2 is part of, with a very thick unit down in Section 2 of 20 South, 28 East, and thin units in Section

34.

Q. Was the offsetting OXY well in Section 34 drilled to this portion of the Morrow?

A. Yes, it was.

Q. And you're proposing to drill a well in this zone to the Morrow equidistant from the common lease line between the OXY location and your --

A. That's correct.

Q. -- location?

A. Let's go to the cross-section for the Morrow, Exhibit B-B', and I'd ask you to review this for Mr. Stogner.

A. Section B-B' is a stratigraphic cross-section running from the OXY University "S" 1 in Section 3, to the "S" Number 9 in Section 3, to our well, now Saga's Well Number 2 in Section 35, to Saga's Well Number 1 in Section 35, to the OXY Number 6 well in Section 34 and the former Dorchester well in the north half of Section 35.

And it shows the porosity development in each of the wells, with the middle Morrow being mapped, the cumulative production from our well, at 1,266 MCF of gas in the middle Morrow, and 562 MMCF of gas from the lower Morrow.

Q. And this shows that the zone, this particular zone, is present on the OXY acreage; is that correct?

A. Yes.

Q. And you're proposing to drill a well equidistant from their wellbore -- that is equidistant from the common lease line?

A. That's correct.

Q. All right. How much has been produced from the Morrow in the south half of 35 to date? You talked about the Saga Petroleum Number 2 well, which is in the southeast of the southwest. What about the well in the southeast southeast?

A. It has produced 2.46 BCF of gas, and that is from both the upper -- the middle and lower Morrow. And I have no way of knowing how much came from either zone, because it was completed commingled, as was the well in Section 2 to the south, the Hillin well.

Q. And in your opinion, is this location in the Morrow a location which would enable you to access and produce the remaining reserves under your acreage in the south half of 35 in the Morrow formation?

A. Yes, it would.

Q. In your opinion, should a Morrow well at this location be penalized because of location if, in fact, you complete in the Morrow interval?

A. No --

Q. And why is that?

A. -- it should not be penalized, because Saga Petroleum will be drained.

Q. But you're proposing, Mr. Rulla, is to be equidistant from the common lease line as the offsetting OXY well; is that correct?

A. That's correct.

Q. And OXY has a well in the Strawn with a potential in the Morrow, and you want to have the same thing?

A. That's correct.

Q. If your well was penalized or had to be moved back 1650 feet from the west line of Section 35, what impact would that have on your ability to produce the remaining Morrow reserves under the south half of 35?

A. It would impair us because we would be away from the main porosity trends in the lower Morrow, and off the porosity trends in the middle Morrow.

Q. In your opinion, if your well is either penalized or drilled at a standard location, would there be uncompensated drainage from your acreage to the OXY tract to the west?

A. Yes, there would.

Q. Another primary objective in the well, I believe you testified, was the Wolfcamp?

A. That's correct.

Q. The location would be standard in the Wolfcamp,

would it not?

A. Yes, it would.

Q. And that's because the pool is created, it is on 160-acre spacing with 660-setbacks?

A. That's correct.

Q. Are there secondary objectives in the well?

A. There are secondary objectives in the Atoka, the Strawn sands, the Bone Spring and the Delaware.

Q. This location would be a standard location in the Bone Spring and the Delaware; is that right?

A. That's correct, yes.

Q. Let's go to Saga Exhibit Number 9. Would you identify that, please?

A. That's a structure map on top of the Atoka, which shows that our proposed location would be favorably located structurally, and the isopach -- the structure map is meant to represent the structure at the Morrow and Strawn levels.

Q. Is the Atoka also present in the OXY well --

A. It has not been present there, but it produces down in the OXY Number 1 A in or has produced there. It's not abandoned.

Q. Let's go now to Exhibit Number 10. Will you identify and review that?

A. This is an isopach map of the net porosity in the Wolfcamp and shows the cumulative production in the little

boxes.

The color code, green represents producing wells, red represents wells that were tight or were not produced, the orange represents wells that had some porosity but were not tested.

Q. Your proposed location is in a position whereby you might be able to reserves from the Wolfcamp formation?

A. That's correct.

Q. Let's go, then, to Exhibit Number 11. Would you identify this and review it?

A. This is an isopach of the net porosity of what I call the Strawn sand, which occurs on cross-section A-A' and is shown by the yellow outlines and is not present in the OXY Number 6 well.

Q. What are the chances of actually making a commercial well in the Strawn sand?

A. The risk is relatively high because the porosity changes very quickly, but our well, the Number 2, produced 1.1 BCF of gas from this zone.

Q. Recently has Chi Energy completed a well in this interval?

A. Yes, it completed a well up in Section 26, about a mile north of our location, and it appears to have the same detrital material in it as our well.

Q. So basically it's -- there's a possibility of

completing in the Strawn sand, but --

A. Yes, there is.

Q. What is it that Saga is requesting in this case?

A. We're requesting a nonstandard location 1980 from the south, 660 from the west of Section 35, with no penalties in any of the formations.

Q. Is Saga Exhibit Number 12 an affidavit confirming that notice of this Application has been provided in accordance with Oil Conservation Division rules?

A. Yes, it is.

Q. There was one interest owner, a Mr. Hudson, in the southwest of this acreage, who was not notified, but we have obtained a waiver from him; is that correct?

A. Yes, it is.

MR. CARR: Mr. Stogner, I have that with me, and after the hearing I will tender to you the waiver from Mr. Hudson.

Q. (By Mr. Carr) To whom was notice provided, Mr. Rulla?

A. It was provided to the list of the people in Exhibit A.

Q. Yes, and who are they? The offset operators --

A. Yes.

Q. -- and working interest owners?

A. Yes.

Q. And from whom were these names obtained?

A. From OXY.

Q. In your opinion, will the approval of this Application and the drilling of the proposed well protect the correlative rights of Saga?

A. Yes, it will.

Q. Would it impair the correlative rights of OXY?

A. No.

Q. Will approval of this Application otherwise be in the best interest of conservation and the prevention of waste?

A. Yes, it will.

Q. Were Exhibits 1 through 12 either prepared by you or compiled at your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Stogner, I'd move the admission of Saga Exhibits 1 through 12.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Exhibits 1 through 12 will be admitted into evidence.

MR. CARR: And that concludes our direct examination.

EXAMINER STOGNER: Mr. Kellahin, your witness.

MR. KELLAHIN: Thank you, sir.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Rulla, would you turn to your Exhibit Number 7, please? It's your net porosity middle Morrow map.

A. Okay.

Q. It says in the legend it was -- It's dated January 29th of 1998.

A. Yes.

Q. Have you revised it since that date?

A. I revised it to include the Well Number 9, which I didn't have at that time.

Q. Which on is Well 9?

A. Number 9 is the OXY well located 660 from the north and east of Section 3, 20 South, 28 East.

Q. Okay. In Section 34 there are two green dots?

A. Yes.

Q. Those are not now currently producing Morrow wells, are they?

A. No, they're not.

Q. They are producing in the Bone Springs, are they not?

A. Yes, they are.

Q. When we look in the south half of 33, the Dero Number 1 well is the one in the southeast southeast of 33. Do you see that? It's got 18 feet of net porosity in the

middle Morrow?

A. Yes.

Q. How did you get the net --

EXAMINER STOGNER: Excuse me, Mr. Kellahin. Did you say south half of 33?

MR. KELLAHIN: South half of 33, the southeast southeast of that section.

EXAMINER STOGNER: I show --

MR. KELLAHIN: I'm sorry, 35, Mr. Examiner.

EXAMINER STOGNER: Okay.

MR. KELLAHIN: Wrong section. Thirty-five.

Q. (By Mr. Kellahin) In the Saga spacing unit --

A. Yes.

Q. -- your Dero Number 1 --

A. Yes.

Q. -- it's got 18 feet of net porosity?

A. Yes.

Q. How did you get the net?

A. I calculated from sonic log.

Q. Yes, sir. And what did you use for a cutoff?

A. Five percent.

Q. Okay. With 18 feet of net pay, it's produced 2.4 BCF of gas, right?

A. That's correct.

Q. Okay. And you move over to the Dero 2 with 24

feet, there in the southwest of 35, and it produced 1.8 BCF of gas?

A. That's correct.

Q. Okay. As to the middle Morrow, I think I heard you tell Mr. Carr that you needed the unorthodox location approved to protect yourself from drainage? Did you say that, sir?

A. That's correct.

Q. If there is no Morrow production occurring in Section 34, where is this drainage coming from?

A. I presume that OXY at some point will complete their Morrow well in Section --

Q. Which one would be the Morrow well?

A. The Number 6.

Q. The Number 6 well is currently producing in the Strawn.

A. They won't produce from the Strawn forever.

Q. Yes, sir. Have you forecasted what the remaining production is for that Number 6 OXY well?

A. I have not.

Q. Do you know what the current rate is?

A. I do not.

Q. But that's the drainage you're talking about. It's not current drainage; it's potential future drainage that may occur if that well is recompleted in the Morrow,

right?

A. That's correct.

Q. Okay. When we look at the north half of 35, you made reference to the fact that OXY has got the approval of an unorthodox well location for their Number 7 well?

A. That's correct.

Q. Are you aware, sir, that that well has been approved at a location that's 990 feet from the common boundary with the south half of Section 35?

A. No, sir.

Q. And your well is proposed to be 660 from that common boundary?

A. That's correct.

Q. It is not a mirror location, is it, sir?

A. It's very close.

Q. All right. The OXY Strawn well is a standup spacing unit, right?

A. That's correct.

Q. And so its well is at a standard location, is it not, sir?

A. That's correct.

Q. And your well is at an unorthodox location?

A. Proposed location, yes.

Q. All right. When you look at the Dero Number 2 well, what is your plan? If you're successful with the

Number 3, are you simply going to produce the Morrow from the Number 3 well?

A. Probably, since the Number 2 is marginally economical now.

Q. Are you aware that Saga has polled the interest owners in the south half of 35, which include OXY, and that for an expenditure of $20,000 Saga proposed to institute gas lift on that well, and by their own calculation estimate an additional 1.3 BCF of gas to be produced out of the Number 2 well? Are you aware of that, sir?

A. No, sir, I'm not.

Q. When you look at your proposed location for the Number 3 well, you have mapped a net porosity middle Morrow that would be connected with the Number 2 Dero well, would it not?

A. That's correct.

Q. So as far as this map is concerned, you would be accessing the same middle Morrow that was accessed by the Dero Number 2; is that not true?

A. Some of it.

Q. Okay. In terms of footage it appears to be more than at the Dero Number 2, the way you've got it mapped.

A. In the middle Morrow?

Q. Yes, sir. You've got 24 feet for the Dero 2, and for the Number 3 you've got something in excess of 30.

A. I think that makes sense geologically.
Q. Well, you're going to get all of it, not just some of it; is that not true?
A. You're going to get your share, based on your --
Q. Have you not already had your share in the south half of 35?
A. Not necessarily.
Q. All right. Have you calculated with the assistance --
A. We are --
Q. -- of an engineer the volumetrics of the gas in place in the Morrow that could be recovered from 35, the south half of 35?
A. I have not calculated it. That's not my position.
Q. Okay. The Wolfcamp, sir -- You're at a standard location in the Wolfcamp, are you not?
A. That's correct.
Q. Yeah, you don't need approval for the Wolfcamp?
A. No.
Q. Why don't you show a Wolfcamp map?
A. I thought it was in the interest of good geology.
Q. Okay.
A. It also helps establish trends above and below the Strawn pay.

Q. Let's turn to your Strawn maps, Mr. Rulla, please.

A. Okay.

Q. I'm going to take them from the bottom up. I'm going to start with --

A. Okay.

Q. -- what you've called the Strawn zone 1. It's on your Exhibit Number 2.

A. Correct.

Q. That reflects the lowest of these three Strawn intervals?

A. That's right.

Q. Again, it was prepared on January 29th of 1998. Have you revised this since that date?

A. I added well Number 9, the Oxy Number 9 well in the northeast quarter of Section 3.

Q. By adding that well in Section 3, did it change the contouring of this first zone Strawn interval with regards to the south half of 35?

A. Very little.

Q. I'm going to hand you my copy of your Exhibit Number 2 and ask you to put a red dot on what you -- where we would be at the closest standard location, in the south half of 35 for the Saga well.

A. Okay. Need a scale.

Q. And I'll ask you to do that on Exhibit Number 3 and on Exhibit Number 4 as well, sir.

A. Okay.

Q. We're looking at the closest standard location, which would be a position 1650 from the west line and 660 from --

A. It's approximately right there.

MR. KELLAHIN: All right, sir. Do you have all three maps marked?

MR. CARR: No.

THE WITNESS: Okay.

MR. KELLAHIN: Mr. Examiner, I'm going to show you what Mr. Rulla has marked on my copies of Exhibits 2, 3 and 4 as the closest standard location for Saga in the south half of 35 if -- for comparison purposes.

THE WITNESS: I'd like to add that the well in the northwest quarter of Section 35 had 26 feet of net clean carbonate in Unit 1, but no porosity.

MR. KELLAHIN: Yes, sir.

THE WITNESS: It had 15 feet in zone 2 but not porosity, and it had 24 feet in zone 3 with no porosity. And that this tool merely designates the trend, possible trend, of the porosity development occurring in the OXY number 6 well.

Q. (By Mr. Kellahin) Yes, sir, you've anticipated

my problem, is that I want you to explain to me how we get a net clean carbonate and how that relates to net pay or porosity.

A. Net clean carbonate has been used, and I have used it for 30 years, to map porosity and facies-analysis trends in practically every formation in west Texas. It's a workable tool to define stratigraphic trends.

And this points to -- When you get net clean carbonate, you can anticipate porosity nearby. It does not say that it's right there.

Q. Have you -- You have not, then, constructed a net-pay map of the Strawn intervals, have you?

A. A net-pay map of the Strawn interval would be -- consist of one well.

Q. And that currently is the OXY Well Number 6, because --

A. That's correct.

Q. -- the only that has been produced or found to be productive in the Strawn in any of these three zones.

A. That's -- In any of those three zones, yes.

Q. Okay. When you look at each of these exhibits that we're describing here, 2, 3 and 4, other than the addition of the well in the northeast of 3, the Number 9 well --

A. Uh-huh.

Q. -- have you made any changes to the map?

A. As far as I know, I have not.

Q. Okay. And did the introduction of that well and the data change in any way the thickness and the location of the clean carbonate as you had previously mapped it in the south half of 35?

A. Very little.

Q. When I look at --

A. -- thought I did well to predict it.

Q. When I look at the closest standard location that you've marked on Exhibit Number 4, it is between the 20- and the 30-foot contour line for zone 3.

A. Okay.

Q. Is there any porosity there, in that zone, at that location?

A. It would be really hard to say, but I would a lot rather be over closer to your well where there could be porosity development.

Q. Does saga have any other geologist that works on this particular area for them besides you?

A. No, they do not.

Q. You're the one?

A. I'm the one.

Q. When they prepared their administrative application for filing with the Division in April of this

year, were you the geologist involved in looking at that proposed location?

A. As far as I know, I was.

Q. All right. You signed off on the C-102 that was attached to the Application?

A. I think so.

Q. All right. So you're the man that's done the work on the geologic components?

A. Yes.

Q. When I look at zone 2 on Exhibit 3 and look at the point where you have located the closest standard location -- it's within the 20-to-30-foot contour line on this map -- is that a location where we'll find porosity?

A. I don't think so. You've got three wells there that have thickness very little less than that, and they don't have porosity.

Q. Okay. And then finally, on the Exhibit Number 2, the closest standard location is again between the 20- and 30-foot contour line, that a position on the reservoir that's going to have porosity?

A. Probably not.

Q. So when we look at your clean carbonate map, in each instance we are seeing an area of carbonate that is greater in extent than the porosity is going to be which stores the gas that's being produced currently by the OXY

well?

A. That's correct.

Q. When we look at the Dero Number 2 well, in the southeast southwest of 35, in each instance you have it mapped on here as being clean Strawn carbonate, right?

A. That's correct.

Q. You are aware, sir, that the Dero 2, in fact, did produce Strawn gas, did it not?

A. Yes, it did.

Q. Did it -- And you show it connected with this Strawn carbonate at the proposed unorthodox well location?

A. It didn't produce gas from the Strawn carbonate; it produced gas from the detrital section at the top of the Strawn, an entirely different stratigraphic formation --

Q. All right.

A. -- deposited in a different stratigraphic environment, completely.

Q. Okay. So the Strawn produced out of the Number 2 well is Strawn sand gas?

A. That's correct.

Q. Not out of the carbonate. It came out of an interval much higher?

A. That's correct.

Q. And we can find that interval by looking at Exhibit 5, your cross-section?

A. That's correct.

Q. Let's do that.

The former Penroc well, that's now the Saga well, is the fourth well over -- In fact, it's the one in the center of the cross-section, it's the fourth from either direction. Right?

A. The --

Q. The fourth well over.

A. Yes.

Q. All right. And the Strawn produced in that well is above the carbonate section in the OXY well, and that's what you're talking about to be this Strawn sand interval?

A. That's correct.

Q. All right. Do you know if the Strawn was fully depleted in the Dero 2 well before the Strawn was abandoned and the well recompleted as a Morrow well?

A. The Strawn was abandoned by Penroc before OXY -- before Saga acquired the acreage. We have no way of knowing exactly what their production was.

Q. When I look at the Dero 2 well and come down to the carbonate section, you have not connected it in any way or shown any carbonate value in that wellbore to be correlative to the carbonate found in the OXY Number 6 well, have you?

A. Except that it has net clean carbonate.

Q. All right, so when I look at the OXY well and I see the three zones colored in red and then the extensions in blue --

A. Yes.

Q. -- what are you representing?

A. That's a very general representation of an algal mound. It's not meant to be that specific. It merely indicates where the algal mound occurs and that it pinches out before it gets to the surrounding wells, so that the algal mounds are not present in any of the surrounding wells.

Q. So when I look at the cross-section and see what you're indicating to be zones 2 -- 1, 2 and 3, how do I relate that back to the isopachs?

A. The isopach is shown by the net clean carbonate that occurs within that zone, regardless of whether there are algal mounds associated with it.

Each of the wells on the cross-section has some net clean carbonate --

Q. And yet none of those --

A. -- and those net clean --

Q. I'm sorry, go ahead.

A. -- and those net clean carbonate zones carry through and over the algal mounds so that you can correlate back each zone in the platform facies, through the algal

mound, to a platform facies on the other side, and you get a background count on all the wells because there is net clean carbonate in each of the wells --

Q. So when I look at the --

A. -- and it amounts to 15 to 20 feet.

Q. I understand. What we're trying to access, though, is the porosity interval that is being produced in the OXY Number 6 well.

A. Okay.

Q. And you have not mapped for us the size and the extent of that porosity, have you?

A. I've shown the trend that it will probably occur, and it occurs as porosity in the Number 6 well, and there is a small amount of porosity in the Number 9 well south of it. There is no algal-mound porosity in any of the other wells.

And if you try to make an isopach of that, you end up with the same stratigraphic trend that has been established with what I've done.

Q. You've also recommended to the Examiner that the Strawn interval not be penalized in the Saga well, despite the fact that you're 60-percent closer to the common boundary than you're supposed to be. Describe for me why that should not be subject to a penalty.

A. Because the porosity trend, as we have just

discussed, has been shown to be very narrow. If we are not in that porosity trend, we cannot produce the reserves from our location.

Q. How are you able to determine what the reserves are in terms of the extent in volume within the south half of 35?

A. We don't -- We cannot, we haven't drilled the well yet.

Q. So we don't know, or -- by your study, whether or not there is sufficient Strawn carbonate gas reserves in your spacing unit to justify any well?

A. We certainly have justification to try.

Q. But we know by your own admission that there is not going to be Strawn carbonate gas contribution east of the closest standard location?

A. That's correct.

Q. So there's a substantial portion of the south half of 35 that is not going to be productive acreage in the Strawn carbonate gas interval?

A. There will also be a substantial portion of the east half of 34 that will not contribute to Strawn gas production from the algal mounds.

Q. When we look at the south half of 35, what percentage of that spacing unit is nonproductive acreage in this interval?

A. We haven't drilled our well, there's no way to determine that.

Q. We know at least in the relative position for the Dero 2, which is 1980 from that western boundary --

A. That's correct.

Q. -- that virtually everything east of 1980 is nonproductive acreage?

A. That's correct.

Q. And we also know by standing up its spacing unit in the east half of 34, the OXY well has an orientation that has greater reservoir volume in the Strawn than you're going to have with the south half of 35?

A. That's unproven.

MR. KELLAHIN: Thank you, Mr. Examiner.

EXAMINER STOGNER: Mr. Kellahin.

Mr. Carr?

MR. CARR: No redirect.

EXAMINATION

BY EXAMINER STOGNER:

Q. I had a question about the Morrow production presently --

A. Okay.

Q. -- going on in the south half of 35.

A. Okay.

Q. Both wells 1 and 2 are -- and I'm referring now

to Exhibit Number 7 -- those are currently producing?

A. The Number 1 well in the southeast southeast is not producing; it's shut in.

Q. How long has that been shut in?

A. It was shut in when we acquired it from Penroc in 1996. I'm not sure of the exact date.

Q. Is it still completed in the Morrow or --

A. Yes, it is.

Q. What's the current plans for that Number 1 well?

A. We have been discussing putting it back and attempting a completion in another zone. Either that or -- We have not gone into it. We need to determine what the status of the Morrow is currently, whether it is -- whether there are any remaining reserves in there.

Q. Okay. When you say "another zone", you're talking about spaced on 320, or shallower --

A. I'm talking about the Strawn sand.

Q. Also 320?

A. Yes.

Q. Okay. How about Well Number 2?

A. Well Number 2 produces from the Morrow.

Q. Okay. And you said that's producing what? About 30 MCF a day?

A. Yes.

Q. If your Number 1 well -- I mean, I'm sorry, if

the proposed well that you're requesting today is productive, then would that Number 2 be shut in?

A. Yes, it would. It's only making about $60 a month -- $60 a day.

Q. Now, is that Number 2 also productive in the Strawn, or has that been abandoned? I'm referring now to Exhibit --

A. That's been abandoned.

Q. It has been. So the only production from the south half of Section 35 at this time is the 30 MCF a day coming out of Well Number 2?

A. That's correct.

EXAMINER STOGNER: Any other questions of this witness?

MR. CARR: No questions.

EXAMINER STOGNER: Thank you, you may be excused.

MR. CARR: Mr. Stogner, that concludes our presentation.

MR. KELLAHIN: Mr. Doty, up to bat.

EXAMINER STOGNER: Mr. Kellahin, before we do I'm going to take a five-minute recess.

(Thereupon, a recess was taken at 4:15 p.m.)

(The following proceedings had at 4:25 p.m.)

EXAMINER STOGNER: Mr. Kellahin, let's go back on the record and get started.

MR. KELLAHIN: Mr. Examiner, our first witness is Bob Doty. Mr. Doty is a petroleum geologist.

ROBERT L. DOTY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your name and occupation?

A. Yes, sir, my name is Robert Doty. I'm a petroleum geologist with OXY, USA, in Midland.

Q. On prior occasions have you testified as an expert witness in the field of petroleum geology before the Division?

A. Yes, sir.

Q. And part of your employment with OXY included a review and a study of the OXY Number 6 well that we've talked about earlier this afternoon and Saga's proposed Dero Number 3 well?

A. Yes, sir.

Q. As part of that study, did you make a comprehensive investigation of the Strawn interval, the carbonate interval that's being produced in your well?

A. Yes, sir.

Q. In addition, did you make a comprehensive

geologic study of the various Morrow intervals being produced by wells in this area, including the two Dero wells, the Number 1 and the Number 2?

A. Yes, sir.

Q. Based upon that entire collective effort, have you come to certain conclusions, opinions and recommendations for the Examiner?

A. Yes, sir, I have.

MR. KELLAHIN: I tender Mr. Doty as an expert petroleum geologist.

MR. CARR: No objection.

EXAMINER STOGNER: So qualified.

Q. (By Mr. Kellahin) What are those opinions, conclusions and recommendations, Mr. Doty?

A. If I might begin with Exhibit 1 --

Q. Let's do that.

A. Okay. Mr. Examiner, Exhibit 1 is a 12-section area around the proposed Saga Dero Federal Number 3 which includes only those penetrations Wolfcamp and deeper. Also included is the producing zones from those deep-gas penetrations.

If you'll note, on the south half of 35, the Dero Fed spacing unit, the south half has produced from a nonstandard location in the Morrow in the southeast portion of the lease -- that's the Dero Fed Number 1 -- and it also

produced from a standard location in the south central part of the lease, Dero Fed Number 2, from Strawn Wolfcamp and simultaneously dedicated Morrow. That well is still active and does have substantial remaining reserves left in the Morrow.

And also spotted on this map is the proposed Number 3 nonstandard location, which is up in the northwest portion of the spacing unit. You can see that it does encroach on the OXY DW Federal Number 6 well completed in the Strawn as an east-half standup, as a standard location in the east half.

Our primary concern is with encroachment from that well on our Strawn, Morrow and upper Penn reserves. I have produced maps, and our reservoir engineer has produced associated calculations on the Strawn and the Morrow. The Upper Penn at this point is pay behind pipe in the DW Number 6. I don't have any maps on that zone, but we are concerned about encroachment on that. Atoka in this area is very spotty, and we have very little say about that.

If I may begin with the Strawn first, since it appears to be the primary --

Q. Let's do that. If you'll turn to Exhibit Number 2, let's have you identify and describe this display.

A. Yes, sir. If I may ask if we can lay out Exhibit Number 2 and Number 3 simultaneously, it kind of gels a

little quicker.

Exhibits Number 2 and 3 summarizes my geological analysis of the Strawn, which, along with the reservoir engineering testimony to follow, concludes that the Dero Federal Number 3 nonstandard location is not justified in the Strawn because the well does encroach on the Strawn limestone reservoir in the OXY DW Number 6 and will unfairly affect its recovery.

The well in the south half of 35 spacing unit has already enjoyed Strawn production, and there may be remaining Strawn reserves in the Number 2 wellbore. Only a small portion of the Strawn limestone reservoir that's producing in the Number 6 is present on the Dero Number 3 spacing unit, and if drilled the Dero Number 3 will recover an unfair portion of the remaining Strawn reserves in that Strawn limestone reservoir.

Exhibit Number 2 is a Strawn Structure map, and also included is the estimated limits of the reservoir size for the producing reservoir in the DW Number 6.

Exhibit Number 3 is associated cross-section A-A', which includes the DW Federal Number 6 in the center. That has 62 feet of pay in the limestone portion of the reservoir.

This is a very unique reservoir. Entrapment for this area in a very large area. I know of no other Strawn

well with this magnitude of pay.

There's also two producing wells outlined in red on the map. These produce from the Strawn sandstone at the top of the section.

The reservoir outline is based on Mr. Kovarik's reservoir engineering material-balance solution, from a pressure buildup of 274 productive acres. This is based on an average of 30 feet of net pay throughout the entire area. We derive that 30 feet of net pay. We have one data point of 62 net pay. We took about half, assuming that over the entire area it goes from a high of 62 down to zero.

The shape of the reservoir is based on, again, Mr. Kovarik's pressure-buildup analysis and his curve matching, which provides the best match with a rectangular solution.

Also, there's dense well control to the west, east and south of the DW Number 6, which severely constrains where that producing reservoir can be.

Based on these data, I know the size of the reservoir; it's about 274 acres. I know it's shape; it's rectangular in shape. And the orientation of the reservoir is severely constrained by the well control, so I feel like this is a fair representation of the producing Strawn reservoir.

You note the area to the north has been dashed. The mapped area that we see in Sections 34 and 35 constitute about 231 acres of that 274, so it's possible that the reservoir does extend up into Sections 26 and 27 by 40-some-odd acres.

So in conclusion from these exhibits, I've defined the size, shape and position of the producing Strawn reservoir, which I then gave to Mr. Kovarik for additional calculations of oil and gas in place and his recoveries.

Q. Let's look at Exhibit 2 and examine some of the specific details.

Of the various wells in this vicinity, your Number 6 well is the only one to be able to produce Strawn gas out of this algal mound carbonate?

A. For the most part, yes.

Q. Let's look how many penetrations have had an opportunity to be in communication or contribution from that same interval.

Looking first in the south half of 35, find us the well control and show us what happened in this interval.

A. There's no porosity in the Strawn limestone interval in the Dorchester DW Federal Number 2 in the north half of 35, nor in the Saga Dero Federal Number 2 in the

south half. So it's constrained on the east.

Q. Would you be in agreement with Mr. Rulla, then, that the porosity contribution available for the south half of 34 must be west of the line drawn between those two wells? South half of 35, I mean.

A. Yes, sir.

Q. You see what I'm saying?

A. Yes, sir, absolutely.

Q. Dero Number 2 has no porosity?

A. No, sir.

Q. Mr. Rulla said the closest standard location for him had no porosity. And so the porosity has got to be west of the closest standard location. It's got to be west of some point 1650 from that western boundary?

A. Following that logic, yes.

Q. All right. When we look at your OXY Number 6 well, that has got how many feet?

A. Sixty-two feet of pay.

Q. Sixty-two feet. We go 62 feet to zero?

A. Yes, sir.

Q. By the reservoir engineering calculation, he has by his methodology determined the size of the reservoir container, has he not?

A. Yes, he has.

Q. By his calculation, the -- he knows it's got to

at least be 274 productive acres, right?

A. That's a good estimate for the size of the outline on the area, yes.

Q. Once he give you the size of the container, he's also provided you with a methodology by which he has calculated a shape?

A. Yes, sir.

Q. Taking the size and the shape, and knowing the data that you have available to you, you have positioned the reservoir as we see it on Exhibit Number 2?

A. That's correct.

Q. And so when we look at how it's positioned, you could have moved it farther west, could you not?

A. Yes.

Q. And that would have been less productive acreage for Saga than you have inferred?

A. Yes.

Q. Is it possible to move it much farther east?

A. Not very much, no.

Q. And why not?

A. Well, because then you would be moving the productive area out of the DW -- your one control point, the DW Number 6 well.

Q. And we know that control point has got 62 feet?

A. Yes.

Q. And at some point west of that it thins to nothing?

A. Yes.

Q. All right. When we look at the dimension north and south and look at the southern end of that football --

A. Yes.

Q. -- what is your control for positioning the size and the shape in that direction?

A. We have no producing porosity in the OXY Government S Number 9. There is no porosity in the well in the north half of 2 or in the other well in the north half of 3, the OXY Government AN.

Q. Well, Mr. Rulla's got some three-zone clean-carbonate maps here that connect all this together.

A. Yes, he does.

Q. And? Is that useful to you in --

A. Not very.

Q. -- determining the porosity, size and shape and location?

A. Not very. This is a very unique -- a unique deposit, and the reservoir engineering input is very valuable in defining the size of this reservoir.

Q. Is this type of feature typical of what we would see with an algal mound buildup in the Strawn?

A. Not in this area.

Q. This is unusual?

A. This is unusual for an entire maybe four-township area, yes. Typically, the porosity in the Strawn is quite a bit thinner.

Q. Is the depiction of the size, shape and orientation consistent with all available geologic data?

A. Yes, it is.

Q. On a localized and a regionalized basis?

A. Yes, it is.

Q. In your opinion, will Saga obtain an unfair advantage over OXY if it's permitted to drill its well location without a penalty?

A. Yes, it will.

Q. Let's turn to the topic of the Morrow reservoir.

A. Yes, sir.

Q. Let's start off with Exhibit 4 and have you show us on the type log the various Morrow intervals that you've examined in this vicinity.

A. Yes, sir, Exhibit 4 and the resulting -- following four exhibits constitute my analysis of the Morrow formation, along with the reservoir-engineering calculations.

This supports that the Morrow nonstandard location is not justified at the Dero Federal Number 3 because there have already been two wells that have

produced there from the Morrow on the spacing unit, and one is still active with remaining Morrow reserves.

Also, the Well Number 3 will not encounter any additional sands that haven't already produced in the Number 1 and the Number 2. So there's no unique reserves to be encountered at that location.

In addition, there's no existing Morrow offset drainage, so an infill provision is not justified.

And also, the Morrow gas that will be recovered by the two existing wells, both the nonstandard location to the east and the standard location in the center, far exceeds the volumetric recoverable gas on that spacing unit. So an additional nonstandard location to the west is certainly not justified.

Exhibit 4 is a type log, which will help us as a road map on the zones that I have mapped individually and I've provided to our reservoir engineer.

There's four producing packages of sand in the Morrow in this 12-section area. The lower Morrow has one producing package of sand. The middle Morrow has two, which I've designated upper B and lower B. And then the upper Morrow also has a producing package of sand and also some cherts.

I've made individual net-pay maps of the two middle Morrow packages, the upper B and the lower B, and I

also made a net-pay map of the upper Morrow. I have not made a net-pay map of the lower Morrow, but I'll get into that, why I didn't.

My purpose here is to offer the reservoir engineer a mechanism to measure the recoverable gas volumetrically under the south half-section of 35 and compare that to the actual recoveries to see if the existing wells have already produced their fair share.

Q. Let me make sure I understand the points.

When we look at all of your maps, what conclusion do you reach concerning the Number 3 location, in relation to either the Number 2 or the Number 1 well, in finding Morrow reservoirs that have not already been accessed and produced by the two existing wells on that spacing unit?

A. In my opinion, the Number 3 location will access sands that have already been depleted or have already produced from the Number 1 and the Number 2 locations.

Q. There are no unique Morrow reserves to be accessed at the Number 3 location?

A. No, sir.

Q. When we look at the maps, then, in every instance either the Number 3 is not going to have a Morrow interval, or if it does it's already going to have been accessed by the Number 2 well?

A. That's correct.

Q. In addition, you have prepared net-pay maps so that the reservoir engineer could calculate for you the total volume of original gas in place in the Morrow, in the south half of 35 --

A. That's correct.

Q. -- could use his methodology to tell you how much of that gas could be recovered, and to also determine how much, in fact, has been recovered?

A. That's correct.

Q. Why did you want to know that?

A. Well, the question was, was the Number 3 well justified in receiving and recovering those reserves that were underneath that tract, and our conclusions were that the tract has already produced more gas than exists underneath the tract.

Q. Do you have Morrow potential at the Number 6 location --

A. Yes, we do.

Q. -- that is currently not being produced because you're producing the Strawn gas?

A. That's correct, yes. And that -- the zone in the Number 6 is correlable to zones that will be encountered by the Dero Fed Number 3.

Q. All right. Let's turn, then, to the first of the maps. Let's look at Exhibit 5 and have you identify and

describe this display.

A. Exhibit 5 is a net-pay map of the middle Morrow upper B zone. This zone has been included in the perforated interval in the Dero Number 1 and Number 2. The red dots on this map designate the wells that have been included in the perforations in this specific interval.

So for example, the Number 2 well had middle Morrow upper B perforated, but it may also have had other zones perforated in addition.

Q. In the south half of 35, the red number next to the Dero Number 2 is what, sir?

A. That is the total Morrow cum to date, not just from that zone but the total Morrow from the -- from the well.

Q. And the "5" represents what, adjacent to that well?

A. That's net pay in the upper B package of the middle Morrow.

Q. And how did you determine net pay?

A. I used porosity maps and also primarily used a net cutoff based on resistivity separation on the shallow and deep curve, when available.

I had a mish-mash of logs. On the case of the Number -- of those two wells, I only had sonic logs available, so I used sonic porosity.

Q. Let's turn to Exhibit 6, turn to Exhibit 6 and have you identify and describe the lower B, which is the remaining portion of the middle Morrow pay.

A. Yes, this is the net-pay map for the lower B portion of the middle Morrow. This is the major producing zone in the area. A portion of that sand does indeed go across the south half of 35.

Q. When we look at Exhibit 6, this is an example of the Dero 3 not accessing any of the Morrow?

A. Yes, that's true.

Q. Mr. Rulla has taken a net porosity middle Morrow map, and I want to ask you some questions about what he's done. I'm going to give you the cross-section he prepared so that you can take a moment and see what interval he's isopaching, so we can compare it with what you did.

Here's his cross-section, if you'll take a moment, see what he's mapping in terms of the vertical interval, and then let's talk about...

A. It appears that Mr. Rulla's middle Morrow interval is equivalent to both my -- my middle Morrow interval, the combination of the lower B and the upper B.

Q. All right.

A. So I've broken it out into two separate intervals.

Q. When you take your two maps collectively and

compare it to his composite of the two, there's a substantial difference in the conclusions you've each made?

A. Yeah, but one of the main reasons is that Mr. Rulla's map is a net porosity map, not a net-pay map. For example, there's a number of wells that have porosity on his map that have failed in the Morrow, so his map does not represent where the producing Morrow should be.

Q. So what's the advantage of us looking at net-pay maps that you have prepared, as opposed to the porosity maps?

A. We have the ability to calculate volumetric gas in place from the net-pay maps, and also you can determine where the zero line is for producibility.

Q. What's the methodology to get from the net-sand map to a net-pay map like you've used?

A. Net sand map is a good place to start, because it defines a depositional system and guides the orientation of your net pay.

Q. And in fact, you prepared those kind of maps?

A. Yes, I did.

Q. And then taking those maps, you refined them and further detailed them so we have net-pay maps?

A. Yes, I did.

Q. And how did you do that?

A. Primarily through resistivity separation on

resistivity logs, and that's the best indicator for producible Morrow in this specific area.

Q. So when a reservoir engineer wants a map by which he can do volumetrics, he wants a net-pay map; he doesn't want the other one?

A. Yes.

Q. This is what you gave Mr. Kovarik?

A. Yes, it is.

Q. Let's go on to Exhibit 7, and look at the upper Morrow net-pay map. What have you done and what do you conclude?

A. This is a net-pay map for the upper Morrow. The pay in this interval is quite erratic and is really included in the perforated interval in just a few wells, but the Dero Federal Number 1 well does have significant net pay in this interval and probably contributed quite a bit to the volumes it produced.

Q. Again, here's an example of the Dero 3 being drilled in a location that won't access the lower Morrow?

A. Yes -- Or the upper Morrow, yes. It's unlikely.

Q. I'm sorry, the upper Morrow?

A. Yes.

Q. Let's look at the lower Morrow. You've got a structure map this time; it's Exhibit 8.

A. Yes. For the lower Morrow I didn't attempt a

net-pay map, reason being there's quite a bit of sand throughout the entire interval. It's often water-bearing.

Occasionally, and on six occasions which are the red dots on this map, there are some gas-charged sands that do produce in the lower Morrow.

There is a lot of inconsistent fluid relationships where you go from downdip gas to updip water, so clearly the stratigraphy is quite a bit more complex to be able to produce a reliable net-pay map.

What we did here, if I can get kind of back to the purpose, the other three zones I gave to our reservoir engineer, and he calculated volumetric recovery from those three zones. Both of the Dero Federal wells produced from the lower Morrow.

So our attempt was to compare the volumetric gas in place with the actual recovered gas.

In order to compensate for not giving Mr. Kovarik net pay maps in the lower Morrow, we had to subtract out that portion of the gas that was produced from the lower Morrow in those two wells, in order to balance everything.

Fortuitously on the Dero Number 2, the lower Morrow was completed separately, and we know how much that well made from that zone, because that zone was abandoned before additional Morrow was perforated, and that's on the order of 540-some-odd million cubic feet. So we were able

to subtract that volume out from the ultimate recoveries in Mr. Kovarik's evaluation.

We didn't have that luxury in the Dero Federal Number 1, but we estimated that it probably produced about the same as the Dero Federal Number 2. We felt that might be a little bit optimistic since it is downdip. From Mr. Rulla's mapping, he has produced a net-pay map for the lower Morrow which shows no net pay for that Dero Federal Number 1, so there's a probability we've fairly -- more than fairly accommodated any production that might have come from that lower Morrow.

Q. Did you do any additional work in this generalized area to validate the volumetric work that you were preparing for Mr. Kovarik?

A. Along with the estimates of gas in place and recoveries in the south half of Section 35, Mr. Kovarik and I also analyzed the entire 12-section area as a validation point, and we did get an excellent comparison between gas in place and recoveries, which I feel is important to validate the method that we used.

Q. Let's turn to your last display, Exhibit 9. Would you identify and describe this?

A. Yes, sir, this is a reservoir data sheet for the Morrow and the Strawn which summarizes the parameters that Mr. Kovarik used in his analysis.

The shaded parameters are those parameters which I provided to him, along with the net-pay maps, and these are based from average numbers, average log-analysis numbers, from the DW Federal Number 6, where I had excellent log data, which was backed up with sidewall core data.

MR. KELLAHIN: That concludes my examination of Mr. Doty.

We move the introduction of his Exhibits 1 through 9.

MR. CARR: No objection.

EXAMINER STOGNER: Exhibits 1 through 9 will be admitted into evidence.

Mr. Carr, your witness.

MR. CARR: Thank you, Mr. Stogner.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Doty, let's go to your Exhibit Number 2, your Strawn map.

A. Yes, sir.

Q. If I understood your testimony, you stated that at this time the OXY DW Federal Number 6 well was the only well producing from this Strawn mound; is that correct?

A. No, sir, this is the only well producing significant volumes from the Strawn limestone -- Well, it

might be. Yeah, it might be. The OXY Government S Number 1 produced minor volumes from that Strawn limestone, about 100 million cubic feet.

Q. Is there any other well today producing from this Strawn reservoir as you've depicted on this exhibit?

A. Not to my knowledge.

Q. Okay. I then understood that you were concerned that a well 660 from the common boundary would be a well that, in your opinion, would encroach on that OXY well; is that right?

A. Yes, sir.

Q. And it's encroaching on what basis? It's as close to that common lease line as you are?

A. Yes, sir, it is.

Q. What do you base your statement that it's encroaching on?

A. It's encroaching as to its legal location.

Q. It's closer than the 1650 set by pool?

A. Yes, sir.

Q. Okay. Now, you would agree with me that based on this map there are Strawn reserves under the south half of Section 35?

A. Yes, sir.

Q. And if there is no well drilled in that Strawn reservoir as you've mapped it in the south half of Section

35, those wells will never be produced by the owners in the south half; isn't that fair to say?

A. Yes, sir.

Q. And if there is no well ever drilled, isn't it fair to say that the reserves in the south half of 25 would, in fact, be drained by offsetting wells, both to the west and to the north?

A. Yes, sir.

Q. Now, you're proposing also to drill a well to the north; isn't that right?

A. Yes, sir.

Q. When you drill that well, do you plan to take that well down to the Morrow formation?

A. Yes, sir, we do.

Q. And you will attempt to make a Morrow completion in that well?

A. Our strategy is to complete in the zone which will give us the quickest payout.

Q. And that's why you completed your Number 6 well in the Strawn first --

A. Yes, sir.

Q. -- isn't that right?

Now, do you happen to be familiar with the ownership in the west half of 34?

A. Roughly, yes.

Q. Is it identical to the ownership in the north half of 35?

A. No, sir.

Q. You're proposing an unorthodox well location in the north half of 35, 660 from that common line; is that not right?

A. You asked me about the west half of 34, if it's identical to the north half of 35.

Q. All right, I'm talking about the east half of 34 being identical to the north half of 35.

A. Okay.

Q. Are they the same?

A. I don't know.

EXAMINER STOGNER: Mr. Carr, I'll tell you, you've got me confused. Do you want to ask those questions again?

Q. (By Mr. Carr) My question, simply, is, do we have common ownership through the east half of 34 and the north half of 35?

A. I don't know.

Q. Okay. You are, however, proposing a well that is in the north half of 35, only 660 feet off the common boundary; is that not true?

A. That's true -- yes, off --

Q. Is it your opinion that the well in the north

half of 35 encroaches on OXY's spacing unit in the east half of 34?

A. Yes, sir, it does.

Q. And is it -- wouldn't that well also affect the ability of the well in 34 to produce reserves from these intervals?

A. If it was completed in the Strawn limestone, yes.

Q. And do you intend to test the Strawn limestone in the well you're proposing in the north half of 35?

A. We don't really have our plans firmed up for the north half of 35. That location was selected primarily as a Wolfcamp location, but our strategy is that we need to penetrate all the deep gas zones, including Morrow, Strawn and Atoka, in order to maximize the chance of payout.

Our intention was not to encroach upon the DW Federal Number 6. If that was our intention, we would have moved the location farther south, 660. Instead it's 990 off of that south line.

Q. You are, however, 60 percent too close to the west line of that spacing than is allowed by the rules?

A. Yes, sir.

Q. But that isn't objectionable to you?

A. No, sir.

Q. That isn't objectionable to the other owners in the spacing unit, apparently?

A. No, sir.

Q. Has Mr. Huffman, Mr. Bruce's client who's objecting to the location in the south half of 35, expressed an objection that you're aware of concerning the location in the north half of 35?

A. Not that I'm aware of.

Q. Now, I believe you testified -- and correct me if I'm wrong -- that a well at the proposed Saga location would affect the recovery in the OXY DW Federal Number 6 well?

A. Yes, sir, that's correct.

Q. It would be competing for the same reserves; is that not true?

A. Yes, sir.

Q. I mean, we assume that it is; we won't know until we drill it and see. Isn't that fair to say?

A. I think we have pretty good data right now to make that estimate.

Q. It would affect the reserves because it would be competing for the same reserves, correct?

A. Yes, it would.

Q. Now, you have pretty good data, you say, on that acreage?

A. Yes, sir.

Q. Wouldn't you anticipate the well that is being

proposed by Saga to encounter the Strawn, and wouldn't it be similar to what you've encountered in your DW Number 6 well?

A. Yes, sir.

Q. And if we moved it off to a standard location, you would agree it wouldn't be in the reservoir?

A. That's right.

Q. And so what we would do is, we would have a comparable Strawn zone in the Number 6 well which you have drilled, and also probably a comparable Strawn zone in the well at the Saga location; is that right?

A. Yes, sir.

Q. If those wells were both producing, wouldn't you expect them to offset drainage with counterdrainage across that line?

A. I think that's probably best handled by our reservoir engineer.

Q. But you would agree that you'd have comparable zones and you'd have wells equidistant from a common boundary?

A. Yes, sir.

Q. And geologically, it is your opinion that it would be comparable?

A. Yes, sir.

Q. You talked about the orientation of your Strawn

channel. You said you couldn't move it to the west. I'm not a geologist. It looks to me like you could maybe draw it perhaps more northeast-southwest?

A. Actually, you could move that little football around. In my opinion, the constraint of the well control concludes that this is a reasonable assessment of that reservoir shape and position.

Q. Is your engineering witness going to talk about a penalty for the well?

A. Yes, sir.

Q. If we look at your maps on the Morrow -- Let me see. Exhibits 5, 6 and 7. As you have mapped the Morrow, Exhibit 6 being the middle Morrow lower B and Exhibit 7 the upper Morrow net pay -- As you have mapped it, the proposed Saga location is not in either of these pools; isn't that right? Or either of these Morrow sands?

A. It is in the middle Morrow upper B, probably not in the middle Morrow lower B, and probably not in the upper Morrow.

Q. And so in the upper Morrow and the middle Morrow lower B, if the well isn't in those Morrow sands you're not really concerned about it; isn't that right?

A. I think probably most of the reserves. If there any -- If it does encounter any sands in those zones, those sands would probably have been drained by the existing

wells, or will be drained by the remaining reserves in Number 2.

Q. But as you've mapped it, the sands aren't even there --

A. Right.

Q. -- and the -- And we have a pretty good handle on the geology, don't we?

A. No, sir, I think the middle Morrow upper B is a significant contributor in that area.

Q. But I'm talking now only about the lower B and the upper Morrow net pay, Exhibits 6 and 7.

A. That's true.

Q. And in both of those, the way you've mapped it, you shouldn't have any concern because the well won't be in those sands?

A. For two out of three of the sands that I've mapped.

Q. Okay. But let's look at, now, the middle Morrow upper B. All right?

A. Yes, sir.

Q. When you drill the well in the north half of 35, do you intend to drill through the middle Morrow upper B and test that zone?

A. We intend to log it, yes, sir.

Q. And that will be one of the zones you evaluate to

determine which one to complete first so you can --

A. Yes, sir.

Q. -- recover as much, as fast, like we all do?

A. Yes.

Q. The well, the OXY, USA, DW 6 Federal well in 34, is that drilled into this zone.

A. Yes, it is. Into the upper B?

Q. Yes.

A. Yes, it had eight feet of pay in that zone.

Q. And is it fair to say that at some point you intend to go back and produce a well in the upper B?

A. Yes, sir.

Q. Now, if we look at the reservoir as it stands today -- and I'm not talking about what was drained by Penroc or somebody in the past -- is it fair to say that there are Morrow reserves under the southwest quarter of Section 35 in the middle Morrow upper B net pay as you've mapped it?

A. There are Morrow reserves remaining in the Dero Number 2 wellbore, yes, recoverable in the Dero Number 2 wellbore.

Q. I'm asking at the location for the 3 Dero Federal Com, at the proposed location, based on your map, there would also be reserves there, as of --

A. There and the Number 2 wellbore, yes, sir.

Q. -- today?

Now, you understand I'm asking about the Number 3 location?

A. They're both, yeah.

Q. But I'm asking about the Number 3.

A. Yes, sir.

Q. All right. And if we look at the well locations in this upper Morrow -- or in the -- I'm sorry, in the -- When we look at the Dero 3 and we look at the OXY, USA, 6 DW Federal, the offset well to the proposed location, is it your opinion the reserves have been drained from under the Dero 3, that we're proposing?

A. I have no idea.

Q. You just know the reservoir is present in both of those?

A. Yes, sir.

Q. And if we drilled a well to the middle Morrow at that location, we'd be equidistant from the common spacing unit boundary as your offsetting well in 34; isn't that right?

A. Could you ask the question again? I'm getting a little confused.

Q. In this interval, the middle Morrow upper B --

A. Yes.

Q. -- our location is equidistant from the common

line as your well?

A. Yes.

Q. And there has been nothing that would have prevented OXY from going out and drilling to this particular Morrow sand in the past that you're aware of, is there?

A. No, sir.

MR. CARR: That's all I have.

EXAMINER STOGNER: Thank you, Mr. Carr.

Mr. Bruce, do you have --

MR. BRUCE: No questions, Mr. Examiner.

EXAMINATION

BY EXAMINER STOGNER:

Q. You made a statement in your cross-examination about OXY's Number 7 well. What was the primary zone of interest for that well?

A. The primary zone of interest for that well -- for the drilling of the well, was the Wolfcamp zone, which is standard location. The primary zone of interest for the nonstandard location was the Strawn.

If you'll note on the Application, we have primary zone of interest as Strawn, but for the overall drilling of the well I felt like the Wolfcamp had the best promise for a Wolfcamp completion.

But again, our strategy is, we need to drill all

the way down to the Morrow. For example, the DW 6, the primary objective is the Bone Spring. And we encountered Strawn well.

Q. Were you involved in the granting or the Application for that Number 7's unorthodox location?

A. Yes, sir.

Q. Okay, I'm still a little confused here. You're telling me that the primary zone now is the Wolfcamp, but at the time the Application was made it was the Strawn?

A. I think I can -- if I can differentiate. I selected the location based on the best Wolfcamp location. However, our strategy requires us, in order to maximize our chance for payout, to penetrate all the producing 320-acre gas zones.

The Strawn was also a very favorable zone in that area, but our primary purpose was not to encroach on the DW Number 6 and get as close to that well as possible and get a second Strawn in that pool. That's why we're 990 off the south line, as opposed to 660 off the south line.

I think what I'm trying to say is, if our main purpose was to encroach on the Number 6, we would have located that well closer to the Number 6, 330 feet farther south. The Strawn is a viable objective, along with the Wolfcamp, but I selected the location based on the Wolfcamp mapping.

Q. Our primary zone of interest right now is the information you provided me for a nonadministrative application, and it seems to be contradictory information here.

When the geological interpretation submitted with that Application was for the primary zone of interest for the Strawn. What you're telling me today, that is not true; it is the Wolfcamp?

A. No, sir, the primary zone of interest for the nonstandard objectives was the Strawn. The Wolfcamp is standard at that location.

Q. Okay, beef me up. When were you aware that this was a standard location in the Wolfcamp?

A. We were always aware that it was a standard location in the Wolfcamp.

EXAMINER STOGNER: At this time I'm going to take administrative notice on Administrative Order NSL-4032.

At this time I'm going to take a five-minute recess.

(Thereupon, a recess was taken at 5:05 p.m.)

(The following proceedings had at 5:10 p.m.)

EXAMINER STOGNER: Okay, let's go back on the record.

Mr. Kellahin?

MR. KELLAHIN: Yes, sir.

EXAMINER STOGNER: Before I cross-examine this witness further concerning the Strawn and the Wolfcamp, would you like to ask a few questions, perhaps pull another witness up?

MR. KELLAHIN: Well, I -- Unfortunately, I don't have David Stewart, who actually signed off on the administrative application.

During the break Mr. Doty and Mr. Foppiano and I have read the correspondence. I understand what your issue is, and I think I understand what Mr. Doty was saying.

Unfortunately, Mr. Doty's emphasis on the necessity for the Wolfcamp is not fully and completely described for you in Mr. David Stewart's letter. I recognize that he has put emphasis on the Strawn location.

And I think maybe both of you are saying perhaps the same thing in a different way. Mr. Doty has indicated that the Wolfcamp is a viable primary target in his mind, and perhaps he didn't communicate that very well to David, because David's letter to you puts emphasis on the Strawn.

I think what Mr. Doty was trying to say was that with this location for a Wolfcamp, it gives him a great opportunity in the Wolfcamp but it is unorthodox in the Strawn, which is also a favorable position for him, for whatever reserves are in the north half of 35.

But I don't have David here to tell you what he

had in mind, and we apologize if it appears to you we're saying inconsistent things, because it was not our intent.

EXAMINER STOGNER: Well, there's another issue here about the Wolfcamp, about OXY's knowledge that that was even a standard location.

MR. KELLAHIN: Yes, sir.

EXAMINER STOGNER: Do you have anything to say on that?

MR. KELLAHIN: Yes, sir. Mr. Doty knew it was a standard location. Mr. Foppiano says he believes that David did not recognize that to be a standard location, so the analyst that filed the Application and refers to it as needing a Wolfcamp unorthodox location is mistaken, and we apologize. We didn't need that.

EXAMINER STOGNER: Well, Mr. Doty, I applied your knowledge of our rules and regulations, and perhaps a couple of other people at OXY should maybe consult with you on the rules and regulations.

So I will drop that line of questioning at this point.

MR. KELLAHIN: Thank you, Mr. Examiner.

Q. (By Examiner Stogner) Okay, I'm referring you now to Exhibit Number 2, and this is your geological interpretation of the productive interval as the blue egg, as we've been calling it, or football?

A. Yes, sir.

Q. Okay. How many -- Let's step back a little bit and take these arbitrary straight lines out of here. In your opinion, how many wells would be needed to adequately drain that Strawn interval if these horizontal and lateral, north-south, east-west lines weren't there to kind of foul things up a little bit?

A. I'd like to defer to our reservoir engineer.

Q. Okay.

A. He has some calculations in that regard.

Q. Good deal.

Okay, I need to make sure here. On Exhibit Number 6, the east half of Section 34 in which your Number 6 well is located, now you show previous Morrow production from the Number 1 and Number 4 --

A. Yes, sir.

Q. -- is that correct?

Now -- And those wells are presently producing from the Bone Springs?

A. Yes, sir.

Q. Okay. So they're no longer producing from the Morrow?

A. No.

Q. Okay. So those wells had previous Morrow production, as did the south half of Section 35. At least

that's what this exhibit is indicating.

A. Yeah, the east half of 34 produced about a half a billion. The south half of 35 produced over 4 billion from the Morrow.

Q. Okay. Now, you were asked by Mr. Carr about the ownership of 34 and 35. Is there going to be another witness that is going to be able to answer that question, that you know of?

A. No, sir.

EXAMINER STOGNER: Mr. Doty, you may be excused.

THE WITNESS: Thank you.

EXAMINER STOGNER: Gentlemen, we're approaching here 5:30. Is there any feedback on maybe a cutoff time for tonight and then reconvene for tomorrow?

MR. CARR: I'm at your disposal.

MR. KELLAHIN: It's your pleasure, Mr. Examiner. We could stop right now, if you like.

EXAMINER STOGNER: I'm beginning to lean toward that.

MR. KELLAHIN: We've had a long day, sir.

EXAMINER STOGNER: It's been a long day, I've had a long day and I know Mr. Carr has and you too.

So I'll tell you what. Why don't we -- Now's a good time to shut her down, and we'll reconvene at 8:15 tomorrow and --

MR. CARR: 8:15?

EXAMINER STOGNER: Yeah, 8:15. What did I say?

MR. CARR: No, I just didn't hear you.

EXAMINER STOGNER: Oh, 8:15. Abo, Atoka, whatever.

MR. CARR: Horizontal, vertical, I don't know.

EXAMINER STOGNER: East half, west half. That's the tendency. We're all getting a little punch-drunk.

Okay. With that, let's take a recess. We'll reconvene at 8:15 tomorrow morning.

With that, case adjourned for today.

(Evening recess taken at 5:20 p.m.)

(The following proceedings had on Friday, July 10th, 1998, at 8:15 a.m.)

EXAMINER STOGNER: This hearing will come to order. We will resume this hearing and taking testimony in Case 11,985, Application of Saga Petroleum, L.L.C., for an unorthodox well location, Eddy County, New Mexico.

Let's see, Mr. Kellahin, I believe you were on.

MR. KELLAHIN: Thank you, Mr. Examiner.

Our next witness is a petroleum engineer. His name is Mike Kovarik.

EXAMINER STOGNER: Mr. Kovarik, let me remind you that you're still under oath from yesterday.

MR. KOVARIK: Yes, sir.

MICHAEL KOVARIK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Kovarik, would you please state your name and occupation?

A. My name is Michael Kovarik. I'm a petroleum engineer employed by OXY, USA, in Midland, Texas.

Q. On prior occasions have you testified as a petroleum engineer before the Division?

A. Yes, I have.

Q. As part of your engineering duties, are you a team member with Bob Doty to evaluate the various reservoirs in the area in question that we discussed yesterday?

A. Yes, I am.

Q. As part of that team effort, have you analyzed the reservoir data, the production information that is relevant to your analysis of this issue?

A. Yes, I am.

MR. KELLAHIN: We tender Mr. Kovarik as an expert petroleum engineer.

EXAMINER STOGNER: Any objections?

MR. CARR: No objection.

EXAMINER STOGNER: Mr. Kovarik is so qualified.

Q. (By Mr. Kellahin) Mr. Kovarik, to aid us, as an illustration, I'd like you to take a copy of Mr. Doty's Exhibit Number 2, and the first topic for you and I to address is the Strawn reservoir that's being produced in the OXY Number 6 well in the east half of 34.

A. Okay.

Q. That is a topic that you have studied and investigated, have you not?

A. Yes, it is.

Q. Let's turn to look -- Let's keep Exhibit 2 as an illustration so we can see the location of the various wells and talk about the issues, but I would like to start with your conclusions about the Strawn.

A. Okay.

Q. Let's turn to your conclusions which are in the form of an exhibit, and it's marked as Exhibit 10, is it not?

A. Yes, it is.

Q. And these are your personal, professional conclusions concerning this topic?

A. Yes, they are, using data from the DW Number 6 well and surrounding wells, and also data I got from Mr. Doty.

Q. Let's talk before we describe and discuss the

conclusions, let's talk about the kinds of data you had on the OXY Number 6 well. What did you have?

A. We have historical production data, we have two bottomhole pressure-test analyses, we have rock and fluid data from the well, and we also have the geology that Mr. Doty spoke about yesterday.

Q. Are you satisfied as a professional engineer that you had sufficient reservoir engineering information by which to do material-balance calculations to determine the size of the reservoir, the Strawn carbonate reservoir that's being accessed by the Number 6 well?

A. Yes, I do.

Q. Are you also satisfied that you used conventional, standard engineering practices, techniques, technology, calculations to reach your conclusions?

A. Yes, I'm very satisfied with that.

Q. As part of that methodology, did you also use traditional engineering concepts and technology to forecast the predictable shape of the Strawn carbonate reservoir?

A. Absolutely.

Q. You were able, to your satisfaction, then, to determine not only its size but its shape?

A. Yes.

Q. Was that shape consistent with Mr. Doty's positioning of the size and shape as a result of his

geologic study?

A. Yes, it was. I gave him my estimate of the size and shape of the reservoir, which he used to make his map.

Q. Let's talk about the kind of reservoir we're in, in the Strawn carbonate that's being produced by the Number 6 well.

A. Okay.

Q. Give us a short summary.

A. The Strawn carbonate being produced by the Number 6 is a limestone mound. It's, as Mr. Doty stated yesterday, a very unique structure in this area. It's very contained and produces pretty much as a tank.

It is a very permeable reservoir, approximately 20 millidarcies, according to my calculations. Therefore, it's very high quality, and fluids can move through it rather readily.

Q. The fact that the Number 6 well has some 62 feet of net pay is also a unique circumstance, is it not?

A. Yes.

Q. Let's look at your conclusions.

A. Okay.

Q. Do you have an opinion as to whether this single well, alone, can produce the entire recoverable gas out of this Strawn pod?

A. Yes, I do. I believe that this one well is

sufficient to drain reserves in the limestone mound of the Strawn.

Q. All right, let's introduce another topic. If there is a second well, if a second well is placed in the reservoir -- For example, let's put it an equal distance from the common boundary. Let's put it at Saga's proposed location, and now there are going to be two wells in the reservoir, competing for the remaining gas. What's going to happen?

A. If a well is placed, especially, in a location pretty much mirroring the DW Number 6 well, as proposed by Saga, it's my estimate that both of those wells will share equally in the remaining reserves, and very soon after the completion of that well both wells will be producing at approximately the same rate, because of the high quality of the reservoir and the fact that the fluids can move through it very readily.

Q. All right, let me look at Exhibit 2 with you, Mr. Doty's exhibit, to look at the shape.

If we introduce the Dero 3 well at a mirror location --

A. Yes.

Q. -- there is going to be a position between the two wells at which they are competing for gas flow.

A. Right.

Q. There will be what I would characterize to be some no-flow boundary created between the two wells.

A. Okay.

Q. Is that circumstance sufficient to thereby limit the Number 3 well to produce only its share of remaining gas attributed to the south half of 35?

A. No, absolutely not. The gas produced from the Number 3 well will share not only in the gas underlying the south half of Section 35, but it will also produce gas underlying bordering proration units.

Q. The two wells are not going to recognize anything other than in competition both of them are going to take the remaining gas?

A. They're going to recognize the pressure regimes under which they're flowing. They're not going to recognize the section boundaries.

Q. And they will do so in an equal manner, so that whatever the remaining gas is, both those wells are going to get half of them?

A. Yes, sir.

Q. Were you able to satisfy yourself that you could accurately calculate the original recoverable gas in place in this pod?

A. Yes, I'm very confident that the value we came up with for original gas in place is accurate.

Q. And what is that number?

A. That number is 7 BCF, approximately, original gas in place.

Q. Now, is that recoverable gas --

A. That is --

Q. -- that you have calculated?

A. That is the volume of gas that was originally in place, not the recoverable gas.

Q. All right, so this is original gas in place?

A. Yes, sir.

Q. And how have you validated that calculation?

A. I used two methods to determine remaining reserves and essentially original gas in place, material balance, using the two pressure -- bottomhole pressure tests that we took and also decline-curve analysis, using historical production.

Q. All right, the material-balance calculation is going to give you an accurate engineering calculation for the original gas in place?

A. Yes, sir.

Q. And you'll use the pressure, P/Z, versus time analysis, to give you what you forecast to be the ultimate recovery from the Number 6 well?

A. P/Z versus cumulative production, yes, sir.

Q. All right. What is your forecast of the ultimate

recovery of gas from that well?

A. My forecast for ultimate recovery is approximately 5.2 BCF.

Q. When we look at the remaining recoverable gas, then, at this point in time if we introduce the Dero Number 3 well into the reservoir and it starts competing for remaining recoverable gas, what in your opinion is that volume?

A. The volume that will be produced by the Number 3 well will be approximately 1 BCF.

Q. Yes, sir, but what is the total remaining for the two wells to compete for at this point?

A. The total remaining to compete for is approximately 2.1 BCF.

Q. And if the Dero 3 well is not limited or penalized because of its unorthodox location, what portion of the remaining 2.1 BCF of gas will it take?

A. Approximately one-half, or 1 BCF.

Q. The next item in your conclusion refers to productive acreage. You have calculated 274 acres?

A. Yes, sir.

Q. What volume of gas fits within that size?

A. 7 BCF.

Q. When we look at Mr. Doty's pod on Exhibit Number 2 --

A. Yes, sir.
Q. -- if you extend and close the top of the pod --
A. Yes.
Q. -- using the same contouring technique that he's introduced, how many acres would be contained in the pod?
A. In the total pod --
Q. Yes, sir.
A. -- that Mr. Doty's mapped, approximately 274 acres.
Q. All right. When we look at east half of 34 --
A. Yes, sir.
Q. -- compared to the south half of 35 --
A. Okay.
Q. -- you have a 75-25 ratio or relationship?
A. Yes, I do.
Q. What does that mean?
A. We've developed a penalty situation for the Dero Fed Number 3, such that it would share in not 50 percent of the reserves, that it would get at -- if it produced at the same rate as the DW Number 6, but only 25 percent of the reserves remaining. Okay?

The DW Number 6 well will get 75 percent of the remaining reserves under our scenario.

Q. And that is based upon your estimate, along with Mr. Doty's estimate, of productive acres and the

apportionment of the remaining gas to those productive acres?

A. It's based on the relative size, the relative productive acreage, inside the two producing spacing units.

Q. So when we look at the east half of 34 and we look at its standup orientation, it has more of the Strawn pod than the south-half orientation in 35?

A. Yes, it does.

Q. And you have rounded off a relationship that is 75-25?

A. Yes, I have.

Q. And we'll look at the specific details in a moment and at the exact display.

A. Right.

Q. All right. If you apply that ratio so that the remaining recoverable gas is appropriately attributed to the spacing units that would compete for that gas, what volume of gas is each entitled to?

A. The east half of Section 34 would be entitled to 1.5 BCF, and the south half of Section 35 would be entitled to a half a BCF.

Q. In order to make a reliable, realistic penalty so that the Saga well does not take more than its opportunity to recovery its share of the remaining producible gas, how do you propose to penalize the well?

A. We propose a rate restriction of 530 MCF a day on the Dero Fed Number 3.

Q. And what will that allow to happen in the reservoir?

A. That will allow the Dero Fed 33 to produce its 25 percent approximate share of the reserves remaining in the Strawn limestone over the course of approximately 31 months from now. It will allow the well to produce at a rate such that those reserves will be produced when we forecast the DW Number 6 to be approximately the same rate.

Q. And you have production-decline forecasts and engineering exhibits to show the Examiner here in a moment that confirm your conclusions?

A. Yes, I do.

Q. Let's go to the next step.

A. Okay.

Q. Let's assume that the Number 3 Dero well is introduced in the reservoir, completed, and now is competing with the Number 6 well.

A. Yes.

Q. What happens if and when OXY drills the Number 7 well that they have proposed in the north half of 35? What do you propose to happen then?

A. Well, if OXY does decide to drill the Number 7 well and if it is completed in the same Strawn lime

accumulation, we propose to -- we propose that the rate restriction be lifted from the Dero Fed Number 3 well, such that each well will then be competing for the reserves on its own.

Q. All right. What, then, will happen with the remaining reserves?

A. The remaining reserves, all things being equal, will be split three ways between the three wells.

Q. Let's go through the specific details, then, to support the conclusions you've just expressed.

A. Okay.

Q. Let's start now with Exhibit 11. We turn to Exhibit 11, you have summarized some engineering information for us. Let's look to see what your summary shows.

A. Okay. As I mentioned before, I calculated reserves, remaining reserves, ultimate recovery and original gas in place, using two different methods: material-balance method and decline-curve analysis. Exhibit 11 summarizes the results of those two analyses with respect to volumes in the reservoir.

As -- With respect to ultimate recovery, the material-balance method shows approximately 5.4 BCF ultimate, decline-curve analysis shows approximately 5.2 BCF.

We've produced through April of 1998 a little over 3 BCF, giving remaining reserves in the material-balance case of 2.2 BCF and in the decline-curve analysis case, 2.1 BCF.

Please note the close agreement between the two methods, between the results of the two methods. This gives me a lot of confidence in the results of these analyses and a lot of confidence in not only remaining reserves but the size of the tank.

Q. Now that you know the size of the tank and you know that the Number 6 well has the ability to produce all of the recoverable gas in the pod --

A. Yes.

Q. -- were you able to use standard engineering calculations and methodology to forecast a shape for that reservoir?

A. Yes. The shape of the reservoir, I get from the pressure-transient analysis that I performed on the buildup tests that we ran on the well.

Q. Let's look at the summary. That's Exhibit 12?

A. Yes, sir.

Q. All right, let's do that. Summarize that for us.

A. Okay. These are some of the results from the pressure-transient analysis that I performed on the buildup tests that were taken on the DW Number 6.

First, if you note -- We were talking about the shape of the reservoir. The software that I used, part of the input for that software is a guess as to a reservoir model that will match the pressure behavior in the test.

Q. Well, let's talk about what you mean by a guess. The computer software program has multiple sizes and shapes of reservoirs that it can use its computer brain to calculate?

A. Yes.

Q. And so you input the data, and the computer then does the guessing by selecting the best-fit shape for the data?

A. The computer does several iterations using the input data that I give it to try to match the pressure behavior that occurred in the test.

Q. All right. And the program is such that the best-fit match of the pressure behavior is one that gives us this elliptical shape?

A. Yes.

Q. All right, describe the rest of the data on here. You've also established a permeability component?

A. I did. Permeability in the first test calculated to be 17 millidarcies, in the second test it calculated to be 25 millidarcies. I consider that a pretty close match for two separate buildup tests. And that's, again, very

good permeability for a gas-condensate reservoir that we've got here.

Also, skin factors in both tests were very close to a positive 10, indicating the potential for some damage around the wellbore.

The initial reservoir, extrapolated reservoir pressure from the pressure transient analysis was 4306 pounds in the first test, and 3604 pounds in the second test. So those are average reservoir pressures, not just 72-hour built-up pressures at the wellbore.

Q. All right, let's turn to Exhibit Number 13.

A. Okay.

Q. Would you identify and describe this display?

A. Exhibit 13 is a detail of the calculations that I made using the pressure-transient data to come up with original gas in place and ultimate recovery for material balance.

The left side of the page, it's a little busy but bear with me a second. The left side of the page describes the input data.

The first set of numbers, P1 [*sic*], Z1, (P/Z)1, are the data from the first test, and P2 [*sic*], Z2, accordingly, are the data from the second test.

Production before the first test was done was 98 million cubic feet, and production prior to the second test

was approximately 700 million cubic feet.

The first test was shut in for 72 hours, the second test was run for 135 hours. And the dates are here, when was -- in March, approximately three weeks after the well was completed, and the second test was performed approximately five months after the well was completed, or in September.

Q. Are you satisfied you have reliable pressure data to use in your material balance?

A. Yes, we had good test data, came out pretty well.

The calculation side, I calculated original gas in place, again using the slope of the P/Z curve, which is in the next exhibit. That's just for illustration.

The original gas in place was calculated at just over 7 BCF here.

For ultimate recovery I limited the bottomhole pressure to be 1000 pounds. The P/Z value for that is about 1200, such that ultimate recovery is approximately 5.4 BCF.

Q. All right, let's see how it's plotted out on the P/Z curve. Turn to 14. Let's see the illustration.

A. The two points on the P/Z curve from the bottomhole pressure tests are noted as dots on the upper left-hand corner of the plot. This is a plot of pressure over Z, versus cumulative recovery.

An extrapolation of a line drawn between those two points, down to the zero axis on the pressure axis, you can see, is just over 7 BCF. And if we use the abandonment P/Z value, taken over to the extrapolated line, we get approximately 5.4 BCF for remaining reserves -- or ultimate recovery, excuse me.

Q. Classic depletion gas reservoir characteristic?

A. Classic -- I consider this pretty much a textbook kind of case, as far as --

Q. Do you have enough separation in your pressure-data points to give you an accurate forecast of decline?

A. I believe so, yeah.

Q. All right. Let's turn now to the production data. Let's look at Exhibit 15 and review the production data.

A. Okay. Exhibit 15 is a log-rate-versus-time plot, a classic decline-curve plot, for the DW Number 6. The first line, the top line in the plot, is gas rate versus time.

The well was completed in May of 1996, early April -- May of 1996, produced at nearly a constant rate of about 5 million a day up until the first of 1997, when it started on its natural decline.

That decline continued till the first part of 1998. I used that trend between the first of 1997 and the

first of 1998 to extrapolate remaining production down to an economic limit of approximately 20 MCF a day.

The reserves calculated from this analysis are on the right side of the plot, kind of in the middle. Under "GAS" you see a value there for "Rem" or remaining reserves, and a value for "EUR" or estimated ultimate recovery, for gas of 5.17 BCF.

The oil production plot lies below the gas plot, and its forecast is there also. Condensate, excuse me.

You also notice there at the beginning of 1998 a drop in production that is not characteristic of the previous trend. We believe that to be due to scale near the wellbore. There's been some evidence of scale recently in our produced fluids. We plan to remediate that. And the forecast that I have predicted here is based on a successful remediation of the wellbore.

Q. You have made a forecast that is optimistic insofar as it would place a greater volume of gas available to be competed for by Saga and OXY?

A. A greater volume of gas to be competed for, yes.

Q. Let's turn to Exhibit 16 and look at your calculations of the extent of the 274 acres that was on the conclusion page. Let's see how you calculated that.

A. Okay. If we can refer to Mr. Doty's --

Q. It's Exhibit 9, and he had a --

A. Exhibit 9.

Q. -- a summary sheet.

A. There it is.

Mr. Doty's Exhibit 9, which is a Morrow-Strawn reservoir data sheet...

MR. KELLAHIN: Mr. Stogner, here's mine.

Q. (By Mr. Kellahin) Mr. Doty's data sheet is the part that's shaded in gray?

A. Mr. Doty's data that he supplied me with, his geological data, is shaded in gray, yes.

Q. And your engineering data is the balance of Exhibit 9?

A. Yes, sir.

Q. All right, show us what you did.

A. Okay, on the right side of the reservoir data sheet is the "Strawn Reservoir/Fluid Parameters". The shaded area, again, is the data provided by Mr. Doty. He gave me an average depth, an average porosity of 10 percent and an average water saturation of 28 percent.

Initial pressure of 4306 pounds was taken from the initial bottomhole pressure test that we did, pressure buildup.

Reservoir temperature is 620 degrees Rankine or 168 degrees Fahrenheit.

Z factor is .85, and standard pressures and

temperatures.

The recovery factor there is taken from the material-balance calculations. It's approximately 75 percent.

So my Bg, or gas-volume factor, calculated using these data is 279 standard cubic feet per reservoir cubic feet. I therefore have an original gas in place, using the porosity and water-saturation numbers, of 876 MCF per acre-foot.

Q. All right. Let's take the 274 acres that you've calculated to be the size, and let's introduce it into the shape that is displayed on Exhibit Number 2, and to do so, I'll ask you to turn now to your Exhibit Number 17.

A. Okay.

Q. If you complete the pod, you'll have a total reservoir size of 274 acres?

A. Yes, sir.

Q. And you have calculated the acres that are involved in each of the areas that are affected by that pod?

A. Yes, I have.

Q. Let's start with the east half of 34. What --

A. Okay, the east half of 34. Again, if we could refer to Mr. Doty's map, his Exhibit Number 2, the east half of Section 34 contributes 128 of the total 274 that we

have mapped.

Q. And that's 47 percent, then, of the total?

A. That's 47 percent of the total.

The north half of Section 35 contributes 64 acres out of the total 274, for 23 percent of the total.

Q. The south half of 35?

A. The south half of 35, then, contributes 39 acres out of a total of 274, or 14 percent.

Q. The balance is contained, then, when you finish the curve of the pod, in the top half of that pod in portions of 27 and 26?

A. That's correct.

Q. And that will give you the remaining 43 acres?

A. That's correct.

Q. I guess one way to construct a penalty, Mr. Kovarik, would simply be to allocate 14 percent --

A. That would be --

Q. -- to the Saga well?

A. Yes, that would be one way to do it, since that is the volume of gas that we -- or the area, the respective area of the total pod that we have calculated for the south half of Section 34.

Q. All right. That would be an option for the Examiner, should he choose that methodology?

A. Sure.

Q. Let's look at another way he might approach a penalty --

A. Okay.

Q. -- and that would be a comparison, I guess a ratio, of productive acreage between the OXY tract --

A. Uh-huh.

Q. -- and the Saga tract?

A. Right.

Q. Right?

A. Right.

Q. Show us what you're done in the bottom half of the display to give the Examiner that option.

A. In the bottom half, we are going to look at only the relative volumes between the south half of 34 and the east half of 35. We're going to look at the relative volumes of only the productive acreage. This assumes a well will be produced in the south half of 34 from the Strawn lime. Okay?

The proportionate share of the south half of 34 to the total area underlying the east half of 35 and the south half of 34 is approximately 23 percent.

Q. In this option, then, you're comparing the ration between the two spacing units --

A. Yes.

Q. -- as opposed to Saga's share of the total

reservoir site?

A. Yes.

Q. Okay. In this one you get 77-23?

A. Yes.

Q. And in our summary page, the conclusion page, you simply rounded it off to 75-25 to make the math easier, right?

A. That's correct, yes.

Q. All right. Let's see what happens when you take the 75-25 split, then, and apply it to the remaining recoverable gas.

If you'll turn to Exhibit 18 --

A. Okay.

Q. -- show us what you've done.

A. In Exhibit 18 I've taken the 75-25 split and applied it to the total remaining recoverable reserves of approximately 2.1 BCF, such that the east half of Section 34 would get approximately 1.5 BCF, and the south half of 35 would get approximately a BCF.

Q. Without the introduction of some kind of penalty that controls the rate on the Saga well, in the absence of that it's going to get 50 percent of the remaining gas by your calculation?

A. By my estimation, yes, sir.

Q. If they're entitled only to half a BCF, how do

you propose to restrict the well so that it achieves no more than its remaining relative share?

A. Well, again, they're entitled under this scenario to half a BCF, which is more than the 14 percent that is under their tract.

Q. Let's look at Exhibit 19 and see how to make the penalty work.

A. Okay. Exhibit 19 is a plot of production forecast, which is the same -- Let's look at the first line.

Q. The top -- the curve?

A. The top -- the top curve.

Q. Now, that's going to be a forecast on the OXY well.

A. That's going to be a forecast on the DW Number 6 well, which gives our 2.1 BCF remaining reserves from decline-curve analysis.

Q. What assumptions are in that? That it's the only well?

A. That's -- Yes, that's the case. That would be the case with the DW Number 6 producing to abandonment by itself.

Q. When we introduce the Dero 3 well --

A. Okay.

Q. -- what happens?

A. When we introduce the Dero 3 well, at a penalty of -- or, excuse me. If we introduce the Dero 3 well such that it produces a half a BCF, there's only a BCF and a half for the Number 6 well to produce.

The second curve is a plot of a forecast which is a half a BCF less than the forecast in the uppermost curve.

Q. What you're doing is, you're backing yourself into a rate for the Dero 3 well?

A. Yes.

Q. And doing that, you have subtracted half a BCF from the Number 6 well --

A. Yes.

Q. -- and replotted that decline?

A. Yes.

Q. The third thing you do is introduce this horizontal line at a daily rate of just above --

A. -- 500 MCF a day.

Q. -- half a -- 350,000?

A. 500 MCF a day.

Q. 500 MCF a day.

Okay, and that's the horizontal line?

A. That's the horizontal line with the triangles.

Q. Okay, describe what happens then.

A. In this time period between 5 of 1998 and January of 2001, in that time period of 31 months if the Dero 3

well worked to produce at that rate limit of 530 MCF a day, it would produce its half a BCF of reserves, as we have calculated previously.

Q. All right. So if you take the horizontal line, which is the fixed rate for the Dero 3 well --

A. Yes, sir.

Q. -- take it to the right till it intersects the decline of the OXY well --

A. Yes.

Q. -- that volume contained within that period is the half a BCF?

A. Yes, sir.

Q. The well doesn't stop producing at that time though?

A. The well doesn't stop producing, no.

Q. The Dero 3 continues to produce and will, then, share the remaining recoverable gas with the OXY well?

A. Yes, if there are any. It's a pretty simplistic method to calculate a way for the Dero 3 to get its share of the reserves.

Q. But it's an accurate way?

A. It's relatively accurate, yes.

Q. After the point where the horizontal line intersects the declining second line --

A. Yes.

Q. -- thereafter, there is continuing gas to be produced by the Dero 3 well --

A. Yes.

Q. -- that will be in excess of the half a BCF?

A. Yes.

Q. In your opinion, is this a fair and reasonable method to restrict the Dero 3 well so that it achieves only its share of the remaining recoverable gas under this option 2 penalty?

A. I think it's very fair, it's very reasonable. It's very monitorable also.

Q. What's the point, Mr. Kovarik, of removing the penalty on the Dero 3 well at such time as the OXY Number 7 well is completed and competes in the same reservoir?

A. Well, the Number 7 well is -- has a right to the opportunity to get its share of the reserves also, if it were to be drilled.

If it isn't going to be drilled, the two wells that are producing in the east half of 34 and the south half of 35 will share in the reserves that are in the north half of Section 34.

So therefore -- And that's basically the reason for our proposed penalty, is to apportion that share of the reserves in the north half of Section 34.

If the Number 7 well is drilled, then the removal

according to his maps, in the Morrow sections that he mapped.

I therefore took his maps, planimetered them, came up with the bulk volume of reservoir rock underneath -- or productive rock, underneath the south half of 34 -- or, excuse me, 35. I then used the gas-in-place numbers per acre-foot, calculated using reservoir parameters and rock properties provided by Mr. Doty, and came up with a volumetric ultimate recovery for each of the Morrow sections mapped by Mr. Doty.

Q. If you summarize those, then the recoverable gas originally available for the south half of 35 is the 1.68 BCF of gas?

A. Yes, it is.

Q. Did you then calculate what had actually been produced from the Morrow in the two wells in the south half of 35?

A. Yes, I did.

Q. In addition, did you add in Saga's forecast of what it is attempting to produce out of the Number 2 well if it goes in and uses gas lift to get additional gas recovery from the Morrow in the existing well?

A. Yes, I did.

Q. All right. Show us that calculation for the total production from the half section.

A. Okay. In the far right column, I've got a column called "Actual/Forecast Ultimate Recovery for the South Half of Section 35". And you'll notice that I have a total row for that column. That totals 5.6 BCF-plus.

That number is arrived at by adding -- If you look at the first asterisk at the bottom of the page, ultimate recovery to date from the Dero Fed Com Number 1 is 2463 million cubic feet, and ultimate recovery from the Dero Fed Com Number 2 is 1826 million cubic feet, and remaining reserves per the operator, per their AFE, for gas lift for the Dero Fed 2 is 1340 million cubic feet. If you add those three numbers together, you should come up with approximately 5.6 BCF that's shown as total production for the Morrow.

Q. The owners in the south half of 35 have already enjoyed the opportunity to recover their share of the Morrow gas, then?

A. They've enjoyed -- Yes.

Q. By how many more times?

A. Well, again, we'd have to take out the lower Morrow production.

Q. All right, let's talk about how you did that.

A. Okay.

Q. Mr. Rulla's map yesterday showed or attributed no lower Morrow gas production to the Number 1 well?

A. Yes.

Q. And he had what? Half a BCF on the Number 2 well in the lower Morrow?

A. The lower Morrow in the Dero Fed 2 produced about -- a little over half a BCF, 546,000 cubic feet.

We estimated the -- we didn't -- As Mr. Rulla pointed out yesterday, we didn't know what the Dero Fed 1 made in the lower Morrow. We made some kind of good-faith estimate, so -- such that the Dero Fed 1, we estimated, produced the same amount, same volume as the Dero Fed 2.

So if you add 546 plus 546, we come up with a little over a BCF, 1.1 BCF, and that's called lower Morrow, with the two asterisks in the row. That volume we subtracted from the total Morrow production.

However, as you noted, the operator has a zero line through that lower Morrow, so that in all probability it never did produce that half a BCF that we attributed to it.

Q. All right. You could have attributed more gas production, then, by your methodology, to the upper and -- the middle Morrow intervals, if you will?

A. One more time, please?

Q. Yeah. The gas that was taken away from the calculation is attributed to the lower Morrow?

A. Yes, sir.

Q. All right. So if you add it back in to the middle Morrow, we're at the same place?

A. Yes. Yes, that's a half a BCF extra that we're not counting here.

So if we look at the total volumetric ultimate recovery that I calculated in the south half of Section 35 versus the actual production with the forecast for the remaining in the Dero Fed 2, you note that even with that half a BCF taken out, the south half has produced approximately 2.7 times what was underlying it originally, or what it could have produced originally.

Q. In your opinion, is the Number 3 Dero well necessary?

A. No, sir, it's not.

Q. Is there still an opportunity remaining in the existing Number 2 well to produce Morrow gas?

A. Yes, there is.

Q. Let's turn to that topic.

A. Okay.

Q. Is OXY an interest owner in the south half of 35?

A. Yes, we are.

Q. Did Saga send you a proposal, including an AFE, for additional work on the Dero Number 2 well?

A. Yes, they did.

Q. Is that set forth as Exhibit 21?

A. Yes, it is.

Q. And by letter from Saga dated when, sir?

A. March 23rd, 1998.

Q. And for a cost of what?

A. $20,000 to install compression.

Q. And that $20,000 is total for the entire working interest ownership in the south half?

A. Yes, it is.

Q. That's not just OXY's share?

A. That's an 8/8 number.

Q. By Saga's report and calculation, what are they proposing to do?

A. They're proposing to install compression, to compress gas, inject it down the tubing casing annulus of the well and by doing so lift -- help to lift the liquids that are forming in the tubing. Because of the fact of -- Because of pressure depletion, there's not enough rate available to lift the fluids that are coming out in the wellbore.

Q. Let's look at the bottom paragraph of the cover sheet to the Exhibit 21. For a project cost of $20,000, based upon their attached economics, what do they forecast to be the payout period and the additional gas to be recovered from the current well?

A. The project -- I quote: The "...project will pay

out in approximately 1.6 months, while recovering an additional 1.34 BCF."

Q. What's your opinion?

A. My opinion is, there are remaining reserves in the Dero Fed 2. Whether or not the 1.3 BCF number is accurate, I'm not sure. I believe that even if this gas-cycling plan didn't work, there is potential for other ways to help lift those fluids that could possibly work.

Q. It looks very attractive?

A. I think so, yes.

Q. Was the well originally produced in such a way or configured in such a way that there's nothing wrong with the methodology to be applied here?

A. No, I don't think there's anything wrong with the methodology.

Q. Let's turn to the fourth page of the AFE submittal, and there is a summary page where Saga's technical people have documented for your review how they have forecasted the additional recovery. It's there in a block just above -- between the second and first paragraphs you see there.

A. Uh-huh.

Q. Summarize for us what they are presenting to you.

A. In the table --

Q. Yes, sir.

A. -- at the top of the page.

Saga has broken out upper and lower Morrow production and then totaled them for the production to date or cumulative production, remaining reserves and estimated ultimate recovery.

Their -- We'll just talk about the gas. Their cumulative gas production from the upper Morrow is 1.28 BCF, from the lower Morrow 546 million cubic feet, for a total of 1.8 BCF and change.

Their remaining production out of the upper Morrow is 1.34 BCF, for a total estimated ultimate recovery from the upper and lower Morrow of a little under 3.2 BCF.

Q. Has OXY approved this AFE on behalf of their interest in the south half of 35?

A. Yes, it has.

Q. When you look at Mr. Doty's map as a locator map, Exhibit Number 2, if the Dero 3 well is drilled at its proposed unorthodox location --

A. Okay.

Q. -- is there currently any offsetting competing Morrow gas production for the Dero 3 location? None's occurring in the east half of 34, is it?

A. No, there isn't.

Q. And there's none in the north half of 35?

A. No, there isn't. So no, there's no competing

production right now.

Q. The only drainage that would be occurring from the Number 3 Dero location would be by current and future production from the Number 2 well, Dero 2?

A. Yes, that's correct.

Q. Let's turn to the last exhibit, Mr. Kovarik. It's Exhibit Number 22. You have presented reservoir data to provide a method for allocating remaining recoverable gas in the Strawn?

A. Yes.

Q. You're not able to construct such a calculation for the Cisco, upper Penn or the Morrow, are you, sir?

A. No.

Q. In the absence of the ability to provide that kind of engineering information for the Examiner, do you have a proposed standard penalty to apply in any other formation for which this well is unorthodox?

A. Yes, I do. We have a standard penalty based on encroachment distance.

Q. And it's simply the closest legal location from the end line, divided by the 660 number, and it gives you a 60-percent penalty?

A. You get a 60-percent penalty of deliverability, yes, sir.

Q. In the absence of having the sufficient data to

allocate recoverable gas, in your opinion is this an appropriate penalty to apply against the Saga well?

A. Yes, it is.

MR. KELLAHIN: That concludes my examination of Mr. Kovarik.

We move the introduction of his Exhibits 10 through 22.

EXAMINER STOGNER: Any objections?

MR. CARR: No objection.

EXAMINER STOGNER: Exhibits 10 through 22 will be admitted into evidence.

Thank you, Mr. Kellahin.

Mr. Carr, your witness.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Kovarik, I'd like to start with a couple things that I think we agree on.

A. Okay.

Q. You would agree with me that there are in the Strawn and in the Morrow, at this time, reserves under the south half of Section 35?

A. Yes, I agree with that.

Q. And that if Saga and the other owners in the south half of 35 were to produce those reserves, they would have to have a well over there. Isn't that right?

A. I think that's about the only way to produce reserves, yes, sir.

Q. And without that well, the reserves under that tract would be produced by the current OXY well in the east half of 34?

A. Yes, I would agree with that. Without that well, the Strawn reserves --

Q. Yes.

A. -- the Strawn reserves --

Q. Yes.

A. -- would be produced by that well?

Q. Yes.

A. The Morrow reserves may not be produced by that well. I don't know, I can't answer that question.

Q. Can you answer it as to the Strawn

A. Yes, I can answer as to the Strawn.

Q. And they would be produced by the existing well? I thought that was your testimony?

A. Yes, sir, yes.

Q. That in the Morrow -- Now, you'd have to first complete your well in the Morrow, I guess --

A. That would help, yeah.

Q. -- to produce the reserves?

Your concern is really with what's going to happen in the reservoir if there is an additional well in

the Saga location; isn't that correct?

A. Yeah, my concern is that if there's an additional well in this -- in the Saga location, that it would produce half the remaining reserves, and OXY -- I don't feel that that's a fair situation, given the size and shape of the reservoir as we've mapped it.

Q. Now, you know I'm going to ask you about the no-flow boundary.

A. Okay.

Q. I want to be sure I understand or that we agree what a no-flow boundary actually is.

A. Where the no-flow boundary actually is?

Q. Yeah, what is a no-flow boundary?

A. Well, if two wells are competing and are in approximately the same -- let's call it a mirror location, in a volumetric reservoir, then reserves will be produced by each of those wells from volumes that are basically symmetrical to each other, such that volumes on one half will be produced by one well and one half will be produced by the other well.

Q. In this situation, if Saga drills a well at a mirror location on its acreage to the existing OXY well in Section 34 --

A. Yes, sir.

Q. -- wouldn't we have a situation where between

those two wells we would be able to anticipate where we will place a no-flow boundary?

A. Approximately.

Q. And wouldn't that be, if the reservoir is the same, once we drill the Saga well, halfway between those wells?

A. That's where -- Yes.

Q. And wouldn't that be on the west line of Section 35?

A. If the two wells are equidistant, yes, sir.

Q. And at that point, drainage should be offset with counterdrainage.

A. Drainage will be offset with counterdrainage.

Q. You shouldn't have -- That's the no-flow boundary; you shouldn't have more drainage on one side of that line than on the other?

A. All things being equal, that's probably a good estimate.

Q. And then if we look at the development of Section 35 --

A. Okay.

Q. -- let's assume the Number 7 well is drilled.

A. Is drilled.

Q. Uh-huh, let's assume that.

A. Okay.

Q. And OXY is the operator of that acreage, correct?
A. And you could drill it, actually, equidistant from the southern boundary of your spacing unit, as the offsetting well to the south, the Saga tract?
A. Equidistant to the Saga well?
Q. Right.
A. To the Dero Fed 3?
Q. Yes.
A. I'm not sure if I know the distance between the Saga well and the --
Q. I understood you were going to be 100 feet farther from the line --
A. Okay.
Q. -- than the Saga well.
A. Okay.
Q. But for the purpose of this question just assume --
A. Okay.
Q. -- they're the same distance.
A. Okay.
Q. We again could have a no-flow boundary virtually on the spacing unit boundary; isn't that right?
A. Between the north and south half?
Q. Yes.
A. Probably, yes. Again, all things being equal.

Q. And in that situation we would have no-flow boundaries north and west, we'd have three wells in the reservoir, and then we'd be at what you are recommending: All the wells would just compete with one another?

A. Yes. I'm not going to testify to no flow boundaries in three directions when we have three wells producing --

Q. Sure.

A. -- but in essence, the three wells will be and should be competing for their fair share of the reserves at unrestricted rates.

Q. Now, do you understand that correlative rights, as is defined in this state, simply gives you an opportunity to produce your reserves? You're not given a right to what's under your tract, you just have the right to drill a well?

A. That's the way I understand it.

Q. Okay. And to take advantage of that opportunity, OXY has drilled a well in the east half of 34 and completed it in the Strawn?

A. Yes, sir.

Q. And Saga is now proposing to drill a well equidistant across the lease line in the south half of 35?

A. Yes, sir.

Q. And OXY has the right to drill a well in the

north half of Section 34?

A. Yes, sir.

Q. Now, you're recommending that if OXY doesn't drill a well in the north half of 35 --

A. Yes, sir.

Q. -- that there would be a restriction on what the Saga well could produce; is that right?

A. We are proposing a restriction. We think that there should be a restriction on the reserves that the Saga well should produce.

Q. And that restriction applies only until you drill a well in the north half of 35?

A. Yes, sir.

Q. And so our well will be restricted, based on whether or not you decide to drill a well?

A. I guess that's a fair statement.

Q. Are you aware of any situation where anyone's correlative rights are dependent on whether the offset operator exercises its rights to produce its reserves?

A. I'm not sure if I understand that question, sir.

Q. Are you aware of any situation where operator A --

A. Okay.

Q. -- in this case, Saga, one operator's rights, are dependent on whether or not the offset operator drills a

well?

A. No, I'm not aware of any, no.

Q. So our correlative rights will be restricted until you exercise yours; isn't that what you're saying?

A. No, I don't believe that's true. I believe --

Q. Go ahead.

A. You're next, go ahead.

Q. In other words, we're going to be penalized until you decide to develop --

A. You're not going to be penalized. The rate will be restricted, such that the Saga well will have the same chance to produce the reserves in the north half of Section 34 as the DW 6 well will have in the west -- east half of 35 -- of 34, excuse me.

Q. I have that same problem.

A. 34, 35, it's...

Q. And the rights of Saga in the south half of 35 are going to be adjusted -- I mean, we're going to be penalized until you decide to go forward with plans for the north half of the section?

A. Well, the Saga well will have -- Each of those wells should have a right to share, in the absence of a well in the north half of 34 -- 35. Each of the wells should have a right, an equal right, to the reserves that will be produced from the north half of 35. Our method

allows that to happen. Okay?

Q. Are you not trying to penalize the Saga well so that it receives only what you estimate or calculate as under that acreage today?

A. Using our best estimates, we've come up with a volume of gas that are under -- that is in the reservoir today, and yes, we think that it should be apportioned based on the relative area of the reservoir --

Q. Okay.

A. -- in both sections.

Q. You're not looking at what it would it would be entitled to in the Strawn reservoir before you drilled your well; is that right?

A. No, we're not, we're just looking at what's remaining from day one.

Q. You had a right to that production in the Strawn, and whatever you've drained you've been able to get to date because you drilled a well; is that fair to say?

A. Because we took the risk to drill the well, yes, sir.

Q. Okay. Wouldn't the same thing apply in the Morrow to those who went forward and developed the south half of the section? I mean, they had a right to do that; isn't that right? South half of Section 35?

A. Yes.

Q. And they may have produced more than was originally there, but everyone around them always had an opportunity to offset that production, did the not?

A. Yes.

Q. And so when we start looking at penalties in this area, we really can't factor in what has gone on before. We have to look at it today, don't we?

A. Well, as we go forward -- in the case of the Morrow we don't -- It's not a bound reservoir, okay? It's spread out quite a bit more than the Strawn reservoir is.

But -- I contend that the south half of 35 has produced its Morrow reserves.

Q. So you're concerned about past production from the Morrow in the south half of 35, right?

A. I'm concerned about what has been produced and what was originally underlying it.

Q. And you're not concerned about what has previously been produced in the east half of 34 in the Strawn?

A. We are not attempting an additional completion in the east half of 34, sir. If we were going to attempt an additional well in the east half of 34, I'd say -- or -- No, we didn't need it.

Q. Is your concern with what's been drained, or whether or not a well is necessary?

A. Pardon me?

Q. Is your concern about the Morrow with the volumes that have previously been drained, or is it with just the necessity or need for another well?

A. The necessity for an additional well.

Q. You would agree with me that if you complete your well in the east half of 34 in the Morrow --

A. Okay.

Q. -- and if we only do work on the Number 2, the existing well in the south half of 35 --

A. Okay.

Q. -- that the no-flow boundary would extend far onto Section 35, between those two wells in the Morrow?

A. If you complete your -- I'm sorry.

Q. If you do the work that you were saying you'd sign an AFE on --

A. In the Number 2 well?

Q. -- in the Number 2 well --

A. Yeah, okay.

Q. -- that's in the Morrow. And if you then take your well, your existing Strawn well, in the east half of 34 down and open up the Morrow --

A. Okay.

Q. -- and they're competing in the Morrow --

A. If they are the same reservoir.

Q. -- and if they are the same reservoir, and we won't know that till we do all those things, correct? --

A. Sure.

Q. -- you'd have a no-flow boundary that would extend substantially into the south half of Section 35?

A. Potentially, if -- Again, if we're comparing Strawn and Morrow and production characteristics of the two, I think we're going to have some problems there.

Q. Well, let's just look at the Morrow.

A. We'll just look at the Morrow, yes. I mean, we're talking no-flow boundaries --

Q. Yes.

A. -- so I don't like to get the two confused.

Q. Sure.

A. The reservoir characteristics in the Morrow are not as -- You can't compare the two.

Q. If you were asked as an engineer --

A. Uh-huh.

Q. -- to pick the location to offset a well in the Morrow at your location, current location in the east half of 34, to protect that acreage from drainage, wouldn't you want a mirror location?

A. Would I want a mirror location --

Q. Yeah.

A. -- to -- ?

Q. -- protect the south half of 34 from drainage to the west?

A. As it stands now --

Q. At any --

A. -- would I want a mirror --

Q. At any point in time. If your objective was to protect that from drainage.

A. If my objective was to protect drainage, I would imagine so.

Q. Now, your recommendations are based on your calculations?

A. Yes, sir.

Q. You've used the best data available to you?

A. Yes, sir.

Q. You've assumed a 30-foot thickness for the Strawn reservoir?

A. Yes, sir.

Q. And if the Saga well is drilled, it's possible it wouldn't get 30 feet, correct?

A. It's possible it wouldn't get 30 feet, it's possible it would get more than 30 feet.

Q. And if it got more than 30 feet, there's a chance you might have to adjust your calculations.

A. We -- Our calculations are based on surface acreage, not on net volumes. We have only got one control

point.

Q. And so you --

A. We thought that was as fair as --

Q. When you're doing your volumetric work and all, you were using an average of 30 feet, correct?

A. Yes, sir.

Q. If that, say, was 90 feet in the Saga well, wouldn't your calculations have to be adjusted?

A. Well, my calculations are my calculations. I think these are --

Q. Conclusions might change.

A. The conclusions as to the volume of gas attributed to each of the sections would change, but my conclusions with respect to the area underlying each of the sections may not change.

Q. And the allocation to those various tracts in the reservoir are based on the geology, correct?

A. They're -- Yeah, they're based on -- basically all things, again, being equal on the geology.

Q. Yesterday Mr. Doty indicated that you might be able to orient that Strawn reservoir slightly more northeast-southwest?

A. Sure.

Q. If that happened, then of course the allocation would have to be adjusted accordingly, would it not?

A. Sure, if that was the case, yes. And if it was -- and you could move that reservoir the other way. The allocations would have to be adjusted similarly.

Q. Do you happen to have any knowledge as to the ownership in the east half of 34? My question is, do you know if it's identical to the north half of 35?

A. I don't know that for a fact, so I can't testify to that.

Q. When we look at the potential for a well in the north half of 35 --

A. Okay.

Q. -- as long as the OXY -- or, I'm sorry, the Saga well remains penalized, if it is, as you recommend, would there be any reason to drill and complete that well in the Strawn?

A. Sure, of course.

Q. Is it your intention to drill and complete a well in the Strawn at that location?

A. It's our intention to drill that well through the Morrow section and complete it in the best reservoir that we find, the one that can make us the most money quickest.

Q. And so your decision on what's going to make you the most money the quickest is going to control whether or not there's a penalty on our well?

A. I wouldn't put it that way.

Q. I thought you just did.

A. Well, when we're talking about a penalty we're talking about, again, a fair share of the reserves. But yes, if we do complete that well in the Strawn, which we may or may not, we propose that the rate restriction -- If we do not complete the well in the Strawn, we propose that the rate restriction remains at 530 MCF a day.

MR. CARR: Okay. I think that's all I have. Thank you.

THE WITNESS: Okay, thank you.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Nothing further, Mr. Examiner.

EXAMINATION

BY EXAMINER STOGNER:

Q. When will OXY know if it's going to drill that Well Number 7?

A. When will OXY know when we're going to drill? We currently have two rigs running in Eddy County. We have a, quote, unquote, rig schedule that changes, at times weekly, depending on the necessity to drill wells, whether for lease exploration or other reasons.

I can't give you a firm date as to when we would drill the Number 7, sir. It depends on a lot of factors, many of which are way out of OXY's control.

I'm not trying to evade the question, I just --

I'm telling you the reality of the situation.

MR. KELLAHIN: Mr. Examiner, I'm happy to ask OXY management what their best estimate of that wellbore commencement date is, if you desire that information. I don't think Mr. Kovarik is in a position to tell you, but I'm happy to try to respond to your question.

Q. (By Examiner Stogner) Is the Strawn interval out here rate-sensitive?

A. Is the Strawn rate-sensitive? To -- I'm sorry.

Q. In other words, will I have with three wells in there producing in there at full throttle --

A. Right.

Q. -- will it produce just as much gas over a shorter period as that one well would over a longer period?

A. I would imagine that the rates would drop with each additional well, such that they -- at some point -- I mean, it's a very good quality reservoir, and you've seen that in the testimony and the evidence, and I would expect that at some point they would reach a point of equilibrium where they would all produce basically at the same rate.

Q. But as far as the ultimate recovery, would that be affected?

A. I would think, again, that due to the quality of the reservoir, that the ultimate recovery would be shared at -- you know, at the point where additional wells are

drilled. Or, I'm sorry, remaining reserves. Would ultimate recovery be affected?

Q. Yeah.

A. I don't think so, because, as I've stated before, I think that this one well is sufficient to efficiently drain the reservoir.

There may be additional reserves out, you know, on the flanks of the structure, that there may be additional deposits that aren't contacted by the DW 6 that would be produced by other wells.

Q. So we're not going to see an influence of watering that's going to affect this by having three wells in the reservoir?

A. An influence of watering?

Q. Yeah, or other influences like reservoir energy being depleted or --

A. Oh. Oh, no. No, there's absolutely no evidence of a water leg here at all.

Q. Okay. Or any kind of environment that might occur in the reservoir that would decrease the ultimate recovery by having three wells in this production zone?

A. I don't think so, sir.

Q. Now, on Exhibit Number 22 you propose -- or you talk about a standard penalty calculation. What would that be based on?

A. It would be based on distance of the new well from -- well, the closest legal distance from the west line of 35 is 1650 feet, the actual distance from the west line is 660 feet.

Q. Okay.

A. And then encroachment would be the difference, and that percentage would be the penalty.

Q. Okay. Now, what would that be applied to?

A. That would be applied to the Atoka and Penn reservoirs, specifically. The Morrow we would ask to be taken out of the Application, and the Strawn lime we would ask to be restricted as we noted before.

Q. Now, in the Atoka-Penn, what rate of production -- or how would that 60-percent penalty be applied to the production on that well?

A. That would be applied based on annual deliverability tests.

Q. Should this 60-percent penalty on the annual deliverability test also be applied to the proposed DW Federal Number 7, since it sort of mirrors the same aspect of what you're requesting, to make everything equal?

A. Should the same methodology be applied to the DW Number 7? All things -- Again, all things being equal, I wouldn't -- I suppose it should.

Q. Is OXY proposing that this -- whatever penalty is

applied here, be applied to the Number 7 well, or either do it voluntarily? And I ask that assuming that you know that there is an NSL order out --

A. Yeah.

Q. -- that does not restrict in any way any of the production from any of the zones in which you're requesting -- this particular well, Saga's --

A. Well, since that -- I mean, you know, the NSL was approved, and it wasn't opposed by anyone. Therefore -- It's been through its due process and --

Q. Okay, I'm going to ask you as an engineer now --

A. Okay.

Q. -- if you think that should also apply.

A. I suppose it should. Again, I haven't done any calculations to see exactly how far or -- from adjoining spacing units, and I haven't done the calculations for the penalty, but...

Again, there are, I believe, nonstandard locations that aren't penalized in New Mexico.

EXAMINER STOGNER: Are there any other questions of this witness?

MR. KELLAHIN: No, sir, I have none.

MR. CARR: No questions.

EXAMINER STOGNER: You may be excused.

THE WITNESS: Thank you.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: That concludes our presentation, Mr. Examiner. We're ready to make a closing statement if you're prepared to hear it.

EXAMINER STOGNER: I thought you had three witnesses?

MR. KELLAHIN: I had them listed in the anticipation that Mr. Clement would testify on behalf of Saga, and he's chosen not to testify, and therefore I'm prepared to rest my case at this point.

EXAMINER STOGNER: Oh, okay.

Mr. Carr, do you propose to reintroduce any --

MR. CARR: No --

EXAMINER STOGNER: -- witnesses?

MR. CARR: -- we've concluded our presentation. I also have a closing.

EXAMINER STOGNER: Okay. Well, with that, I'm going to allow Mr. Kellahin first closing statement, and then you can follow, Mr. Carr.

MR. CARR: Thank you, sir.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, for more than a decade you have been involved in dealing with unorthodox well locations in the deep gas zones in New Mexico. We are faced with a dilemma that we continue to resolve in a

particular way.

The fact that we have rectangular-sized spacing units is a dilemma for all of us, because historically and consistently the Division allows a well to be 660 from a side boundary and thereby to be standard.

However, if the circumstances are such that the owners in an adjoining spacing unit have chosen a laydown spacing unit as they have done in the south half of 35, and should they choose to encroach upon an end boundary, in the presence of opposition the Division penalizes it.

And when we look at the Morrow reservoir, the practice of the Division has been, in the absence of definitive geologic and engineering data, the Division applies in the last several years this footage-encroachment penalty. And it does so for a number of historic reasons. It is that by moving closer to the end boundary you are conceding that a substantial portion of your spacing unit is not contributing potential production from that zone.

When we look at the Morrow in the south half of 35, we have a unique circumstance It's interesting to note that by Mr. Kovarik's calculation that the owners of that spacing unit have already enjoyed 2.7 times the amount of gas that was originally attributed to that spacing unit.

What's more important, however, is a problem that they're creating for you to resolve, and it's one that

ought not to be before you. And that is, the existing Number 2 well, by their own admission and by their own AFE, has the opportunity to produce another 1.3 BCF of gas.

It is premature for you to consider a replacement well for that current well, when they by their own work can show you for an additional investment of $20,000 we have a wonderful opportunity to take that existing wellbore and produce another 1.3 BCF of gas.

You are aware, and you remind all of us, that the Division has established by memorandum the practice of not allowing multiple gas wells in the same pool to be produced concurrently. But that's what they're really seeking. They're seeking an opportunity to yet have a third well in the south half to produce Morrow gas reserves, and they're doing so prematurely.

There is no drainage occurring to require the Number 3 well. The Number 3 well is an unnecessary well, Mr. Examiner, and we would ask that you deny them the opportunity to replace it with the Number 3 well.

If you accept OXY's Morrow evidence, then you can deny the -- Saga's Application concerning the Number 3 well, because they are not accessing any Morrow pay zones that they're not -- already have available to them in the Number 2 well. We believe that they've had their opportunity, and they continue to enjoy that opportunity by

working over their Number 2 well.

When you look at the Strawn reservoir, if you reject OXY's technical case and its geologic and engineering evidence and accept Saga's Strawn geology, then what is it about their case, when you look at their case alone, that justifies no penalty? I contend there is nothing, sir, about their presentation that justifies not having a penalty.

What you have when you look at their case and their case alone is the same type of case as you have heard for more than a decade. You see an operator coming in here where they admit they don't have a standard location.

They admitted that in their administrative application. When you look at the cover page, they said they had no porosity in the Strawn at a standard location. Mr. Rulla admits in his own exhibits when I ask him questions that they don't have porosity at the closest standard location. By that admission they give up 60 percent of their spacing unit. Sixty percent is not going to contribute production.

What they have is the opportunity to crowd the OXY well. And in those circumstances, for years we have used Rule 104, which says that if you're closer to the end boundary than allowed, you are subject to a penalty.

What Saga seeks to do by this case is to amend

Rule 104. They're seeking a circumstance whereby your decision in their behalf, should you grant their Application, we can use this case as an example by which we will never have a penalty again for any well closer than permitted.

Saga argues to erase the footage setback rule. Saga argues that they need to share the Strawn pod. Well, the only evidence to support that is to look at the OXY evidence. That's what they're looking at. The only evidence as to the size, the shape and the location is the OXY evidence.

Thus if you accept that they have a share of the Strawn pod, it's based upon your acceptance of the OXY data. And by that acceptance of the OXY data, the only evidence available to you is to show what we have shown you with our engineering work and our geologic presentation, is that Saga's share of that remaining recoverable gas is half a BCF of gas.

As hard as Mr. Carr would like you to believe that the penalty is based simply upon when and if the north half of 35 has a well, in fact, this penalty is founded on the definition of correlative rights, and that definition is simply the opportunity for Saga to recover their share of the remaining gas in the Strawn pod.

And it tells you how to calculate their share.

It says as far as practicable can be determined without waste, substantially in the proportion that the quality -- quantity of recoverable gas underlying their tract bears to the total recoverable gas in the pool.

If you want to apply strictly the definition, then you'd go back to Saga's Exhibit 17 and we would apply a penalty based upon 14 percent of the productive acreage. That's how you could do it to strictly comply with the definition set forth in the Division rules.

What we're saying is that we have presented you the only evidence as to what their remaining recoverable share of that gas is. It's the half a BCF.

If you accept the OXY geologic and engineering evidence, then you have rejected Saga's geology, and it's necessary evidence that we have provided you, that you can craft a solution that is fair to all parties.

We are suggesting to you that you craft a solution based upon the comparison of productive acreage in the east half of 34 and the south half of 35. Mr. Kovarik has done it in a way that makes it easy to monitor and to apply. We're recommending a daily maximum allowable of 530 MCF a day on the Saga location if it is drilled. It's an opportunity, then, for them to recover their share.

This question of the no-flow boundary has been addressed by Mr. Kovarik. I think it's a red herring. He

tells you in a container such as this, in a solution gas drive reservoir, where they're not rate-sensitive, where one well can drain it all, we're going to have two wells competing. And over time Saga's well is going to get 50 percent of the remaining gas. They're going to get 1 BCF of gas, and they're only entitled to half a BCF. That is the way you adjust the equity. You do it as we propose to do it.

The fact that the Number 7 well has not yet been drilled is of no consequence. It's the owners in the north half of 35 that need to decide when they're going to exercise that opportunity.

What is occurring now, though, is, Saga is seeking the opportunity to encroach upon OXY's well in the east half of 34. If you grant Saga's Application without a penalty, you are establishing a precedent that's unique for the Division, and we contend respectfully, Mr. Examiner, that it would -- it will be a wrong decision.

We would appreciate it if you would afford us the opportunity to provide you a draft order. We believe our solution solves all the issues we have before you about Saga's share of the Strawn.

And if that Strawn share is insufficient gas for them to drill their well, then that's Saga's fault for waiting so long, because correlative rights is simply their

opportunity to have a share of the Strawn gas. It's not an absolute right, it's an opportunity, and they have allowed that opportunity to slip away.

And if its share is only half a BCF, and if that's not enough, then it's simply too late for them.

We think they have an opportunity in the Morrow, they've told us they've had that. We would ask that you deny the Morrow Application, impose the footage penalties on the other reservoirs and provide the rate penalty we propose for the Strawn, and allow us time to provide you a draft order.

Thank you, Mr. Examiner.

EXAMINER STOGNER: Mr. Kellahin.

Mr. Carr?

MR. CARR: Mr. Stogner, Mr. Kellahin and I agree that this is a correlative-rights case. But I think it's important that when you start looking at how correlative rights is defined and what is meant by Rule 104, that you apply it uniformly to all operators and to all pools that are involved in the case.

Correlative rights is, as we know, the opportunity to produce your share. It's the opportunity to drill a well. It isn't a guarantee that you're going to recover anything.

And where we stand today is, Saga before you

seeking an opportunity to produce the reserves that it can recover by drilling a well on its tract. It isn't appropriate to try and suggest or make adjustments for what has gone on before, because with correlative rights we do, in fact, wake up in a new work each day. If an operator fails to drill a well for a period of time, its opportunity for that period of time is waived, it is lost.

We admit we're closer to the end boundary of the spacing unit, obviously, than required by the rules. But we submit that when you evaluate this case you must look at not where we are on the surface but what is going on in the reservoir and what we will be able to obtain by placing the well where we propose to place it.

We have to drill at this location to be in the reservoir, we have to drill at this location in the Strawn and in the Morrow, to offset drainage with counterdrainage. A well at this location enables us to receive our fair share of the reserves in the pool.

Mr. Kovarik admits that a no-flow boundary is the point at which drainage is offset by counterdrainage. He admits that our well in the Strawn at this location -- and you evaluate it in the context of their well in the shadow location on the other side of the line -- will result with a no-flow boundary being on the spacing-unit boundary.

We also have a situation where if they decide to

develop the northern part of Section 35 we have the same circumstance. They complain, they say, Oh, dear, there are two wells in the pool, and each will get half. Well, that might even be true. Looking at their data, that isn't, but I mean it could argue that it would be true. But that only happens, Mr. Stogner, when they fail to exercise their correlative right, when they fail to drill a well in the north half of Section 7.

They're asking you to play games with the definition of correlative rights and impose a penalty so, in fact, the don't have to develop the north half of this section.

The simple fact of the matter is, a well at the location we propose in the Strawn will let us produce what is under our tract on a point-forward basis. And to penalize it moves that no-flow boundary from the common line between the two tracts, dramatically on to the Saga acreage and is nothing more than an authorization by this Division for OXY to drain reserves from its neighbor.

They say, Oh, don't approve the well in the Morrow; they've had one in the Morrow. Well, what happens if the workover is unsuccessful in the Morrow? And even if it is, doesn't it result in a situation where they are dramatically closer to their neighbor than their neighbor can be to them? And doesn't it result in a situation in

the Morrow where if there are two wells there, there is substantial drainage from Saga to their tract?

We're entitled to have a well on the spacing unit under the rules. We are entitled to have it here, because if we don't, we are denied the opportunity to produce what's under our tract.

And so now we have to look at what happens when you have a well too close to the end line. And Mr. Kellahin generally says, Well, under Rule 104 you penalize. Well, let me read you what Rule 104.G actually says.

It says, Whenever an exception is granted, the Division may -- it's discretionary -- the Division may take such action as will offset any advantage which the person securing the exception may obtain over other producers by reason of the unorthodox location.

It's a discretionary thing. You don't have to penalize.

And if you do penalize, you must first determine that we're gaining an advantage on our offset. We're gaining an advantage by being equidistant from their well in the same formation where their own engineering witness says the no-flow boundary will be on the lease line to the west? Are we gaining an advantage where their engineer admits that they could drill and offset us to the north, take advantage of their opportunity, take advantage of

their correlative rights, and we wouldn't have any drainage that isn't offset by counterdrainage to the north? Where is the advantage? It very simply isn't there.

No penalty is required, and in this case no penalty is appropriate, because a penalty would, in fact, be an outright authorization for OXY to drain Saga.

They suggest, well, maybe we'll tie the penalty to when they decide to develop their acreage. I submit to you that tying a penalty to when they drill injects a new and unique factor into the implementation of correlative rights. It means correlative rights must be adjusted when your neighbor exercises its rights.

And if so, if you apply that here to Saga, maybe we should apply it to OXY and we should say, well, maybe their penalty should be -- their production on their existing well off to the west ought to be adjusted and penalized until Saga drills its well in the reservoir. It's absurd.

Time is not an appropriate factor. Every day we stand on an equal footing before you in a world where we all have an opportunity to go out and drill a well, and our right and our right to produce isn't contingent on whether or not OXY decides that they can more economically get their well paid off by completing in the Strawn or the Morrow or the Wolfcamp or the Atoka or anything else.

On the 25th of June, Mr. Stogner, you had a letter addressed to you by Mr. Kellahin. The letter involved a dispute between Yates and Ocean. And I read this letter, and after I read it I was confused because I couldn't tell for sure whether Mr. Kellahin was talking to you about the Yates-Ocean matter or whether perhaps he'd become confused about this case and the parties, because he was complaining in that case that the proposal of Yates had only certain objectives, and I wonder if they weren't really the objectives of OXY in this case.

He said Yates was trying to delay the drilling of an offsetting well so they could drain the acreage.

He said that Yates was attempting to set up a situation where perhaps the offset well will be drilled farther away from their well so they could continue to drain.

I submit to you here today that it appears that OXY is continuing to fight this, delaying the drilling of an offsetting well while it drains the reservoir, that they suggest that you either penalize us or tell us to move away so that our opportunity to produce our reserves is dramatically reduced.

Mr. Stogner, we have a right to drill. We do not gain an advantage on our offset neighbor if they go out and exercise their correlative rights.

The Application of Saga must be approved, and it should follow the statute.

No penalty is appropriate.

EXAMINER STOGNER: Mr. Carr.

Does anybody else have anything further in Case Number 11,985?

I will welcome and accept rough-draft orders. I'm not going to request them, so I won't set a time limit. That's up to you if you all want to -- if either one of you want to provide me one.

Since there's nothing else further, Case Number 11,985 will be taken under advisement.

And with that, this matter is adjourned, as is this hearing.

(Thereupon, these proceedings were concluded at 9:48 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11985, heard by me on 9 Jul. 1998.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL July 22nd, 1998.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

of the rate restriction will allow each of the wells to compete fairly for their share of the reserves under their respective tracts.

Q. You're going to have to round off the percentages, but the three wells, then, will each get a third of the remaining gas at the point in time when three wells compete?

A. Sure. I think that's a good conclusion. Again, it's simplistic, but it's real.

Q. To do otherwise, you would have to construct a rather sophisticated rate, some kind of prorationing among the three wells?

A. Yes.

Q. Let's turn to the Morrow topic. When we look at the Morrow in the south half of 35, Mr. Doty provided you with his various net pay maps in the Morrow, and he asked you to make some calculations?

A. Yes.

Q. Did you do that?

A. I did.

Q. Let's look at Exhibit 20, and describe for us what calculations you made and what conclusions you reached.

A. I got Mr. Doty's net-pay maps from him, and my charge was to determine the original gas in place,