STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	
APPLICATION OF ST. MARY LAND AND EXPLORATION COMPANY FOR STATUTORY UNITIZATION, EDDY AND LEA COUNTIES, NEW MEXICO	CASE NOS. 12,207
APPLICATION OF ST. MARY LAND AND EXPLORATION COMPANY FOR APPROVAL OF A WATERFLOOD PROJECT AND TO QUALIFY THE PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, EDDY AND LEA COUNTIES, NEW MEXICO	and 12,208 (Consolidated)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

August 5th, 1999

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, August 5th, 1999, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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August 5th, 1999
Examiner Hearing
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* * *

WHEREUPON, the following proceedings were had at 10:31 a.m.:

EXAMINER CATANACH: At this time we'll call Case 12,207, which is the Application of St. Mary Land and Exploration Company for statutory unitization, Eddy and Lea Counties, New Mexico.

Call for appearances in this case.

MR. BRUCE: Mr. Examiner, Jim Bruce from Santa Fe, representing the Applicant. I have four witnesses, and I would ask that this case be consolidated with 12,208, which is the waterflood portion of the case.

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 Intoil, Inc., in this matter, and I have one witness.

I would also concur in the request to consolidate the cases for purpose of hearing.

EXAMINER CATANACH: At this time I'll call Case 12,208, which is the Application of St. Mary Land and Exploration Company for approval of a waterflood project and to qualify the project for the recovered oil tax rate pursuant to the Enhanced Oil Recovery Act, Eddy and Lea Counties, New Mexico.

Any additional appearances in either of these cases?

Will the five witnesses please stand to be sworn in at this time?

(Thereupon, the witnesses were sworn.)

MR. CARR: Mr. Catanach, I have a brief opening statement. I don't know if Mr. Bruce wants to make an opening or not.

MR. BRUCE: I would let Mr. Carr go ahead, and if I have any comments I'll state them.

EXAMINER CATANACH: Mr. Carr?

MR. CARR: May it please the Examiner, we represent Intoil, Inc., and I think it's important to note at the outset that Intoil does not oppose the formation of the East Shugart (Delaware) unit nor the implementation of a waterflood project therein.

Our concern is with the participation formula in the unit agreement. What is proposed, we believe, and we believe we can show, is not fair, reasonable or equitable to the interests of Intoil.

The evidence will show that we've expressed our concern, and St. Mary's has, in response, assured us that they have sufficient working interest and royalty interest to obtain ratification of the orders that result from this hearing, thereby putting them into effect.

That is the very reason we come to you. That is why the OCD is involved. Because before an order can be

entered, before ratification can occur, we come to you and you are to determine whether or not what is proposed by a majority of the interest owners is fair to all interest owners. You stand to protect the minority interest owner from having a unit plan forced upon them that dilutes their interest.

We will show that the parameters that are being used in the allocation formula work to the benefit of St. Mary's and others at the expense of Intoil, that they violate the correlative rights, for they deny us our fair share of the benefits of the unit effort.

To take the Intoil interest and force it into the unit, as you know, requires an exercise of the police power of the State. And as a precondition to the exercise of that power, you must find that the formula is fair, reasonable and that it is equitable.

We will present evidence to show it does not meet this test. We will ask you to find that it does not. And then based on the evidence presented, we will ask you as you are required to do by statute, to determine the relative value of each tract in the unit and then develop and approve an allocation formula which will, in fact, protect the correlative rights of all interest owners in the proposed unit area.

EXAMINER CATANACH: Mr. Bruce, any response?

MR. BRUCE: Mr. Examiner, the East Shugart (Delaware) Pool is an excellent candidate for waterflooding, and St. Mary has worked for over a year to unitize the pool. It brings before you a unitization proposal which is fair and equitable to all interest owners involved and which will result in the recovery of substantial amounts of oil.

In particular, St. Mary has met with Intoil and has worked to address its concerns. The result of those meetings was an increase in St. Mary's [*sic*] participation formula, and we believe we will show the reasons why the formula used by St. Mary is fair and reasonable and that --

MS. ELLISON: In Intoil's, increase in Intoil's.

MR. BRUCE: But we have worked, and we will show that it is fair and equitable to all involved.

And with that, I'd just begin presentation of my case.

EXAMINER CATANACH: Okay, proceed.

BARBARA LYNNE ELLISON,

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

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Barbara Lynne Ellison. I live in Lakewood, Colorado.

Q. What is your occupation, and who is your employer?

A. I'm a landman for St. Mary Land and Exploration Company.

Q. Have you previously testified before the Division?

A. No, sir.

Q. Would you outline your educational and employment for the Examiner?

A. I have a master's degree from the University of Illinois. I previously taught high school English. During the past 19 years I've worked in the oil and gas industry. I worked for Anderman Smith Operating Company for ten years, and for the last years I've worked for St. Mary Land and Exploration Company.

Q. Does your area of responsibility at St. Mary include southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the land matters involved in these Applications?

A. Yes, sir.

MR. BRUCE: Mr. Examiner, I'd tender Ms. Ellison as an expert petroleum landman.

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: Ms. Ellison is so qualified.

Q. (By Mr. Bruce) Ms. Ellison, would you summarize what St. Mary seeks in these two cases?

A. In Case 12,207, St. Mary seeks to statutorily unitize all of the interests in the Brushy Canyon formation underlying the lands described in Exhibit 1, which is behind me. The unit area covers 604.12 acres of federal land.

Case 12,208, St. Mary seeks approval of a secondary recovery waterflood project for this unit and certification of the project for the enhanced oil recovery tax rate.

Q. What is the proposed injection interval?

A. The injection interval is the Brushy Canyon member of the Delaware Mountain Group. The unitized interval is the top of the Brushy Canyon at 5007 feet subsurface to 5600 feet subsurface, as found in the Geronimo Federal Well Number 3. That well is located 890 feet from the north line -- this is that well -- and 990 feet from the east line in Section 24, Township 18 South, Range 31 East.

The unitized formation will include all subsurface points throughout the area correlative to these

depths.

Q. Would you identify Exhibit 1 for the Examiner and further describe its contents?

A. Sure. Exhibit 1 outlines the unit area and the various tracts within the unit area. There are six tracts in the unit area.

The map also shows the federal lease number and the amount of acreage that is attributable to each tract.

There are 16 wells in the unit area. Fourteen of them are operated by St. Mary, two of them are operated by Heyco, Harvey E. Yates Company.

The exhibit also shows the well that we intend to convert from a producer to an injector.

Q. And the other green dots are the producing wells?

A. Right, and the numbers above the wells indicate the number that will be assigned to that well after the unitization. The red triangles are the other injection wells that we plan to drill later on.

Q. Very briefly, what is Exhibit 2?

A. Exhibit 2 is simply a smaller version of Exhibit 1. It shows all of the other wells within the unit area with black dots, and wells out -- all of those wells and the wells surrounding the unit area are to other formations besides the Brushy.

Q. Okay, so it includes all wells within that half-

mile area of review?

A. Exactly.

Q. Would you move on to your Exhibit 3 and identify that for the Examiner?

A. Sure. Exhibit 3 is the proposed unit agreement. It's in a standard form, and it's similar to agreements approved previously by the Division.

The unit agreement describes the unit area and the unit formation. The unitized substances will include all oil and gas produced from the unitized formation, and the agreement designates St. Mary Land and Exploration Company as the operator.

Q. What is Exhibit 4?

A. Exhibit 4 is the unit operating agreement that sets out the authorities and duties of the unit operator, as well as apportioning the expenses, the unit expenses, among the working interest owners.

Q. Does the unit agreement contain a provision for carrying interest owners?

A. Yes, that is Section 14 of the unit agreement.

Q. And does the unit operating agreement contain a provision for a penalty against nonconsenting working interest owners?

A. Yes, sir, Section 11 of the unit operating agreement provides a 200-percent nonconsent penalty.

Q. From a landman's standpoint, is this a fair penalty?

A. Yes, sir.

Q. And why is that?

A. Other operating agreements in this area carry penalties of 300 to 350 percent, generally. That's in addition -- That includes the 100-percent recovery of the initial cost, plus 200-percent nonconsent penalty.

Q. So in short, most other operating agreements provide for equal or higher penalties?

A. Yes, sir.

Q. Let's discuss the ownership of tracts in the unit area. Would you please describe the tract ownership and how you determine the names of the working interest and royalty owners in the unit?

A. Yes, sir. The unit tracts are formed according to common leasehold or working interest ownership.

Exhibit 5 is a copy of the Exhibit D to the unit agreement, which is a tract-by-tract listing of all of the interest owners. The names of these parties and their interests were obtained from current division of interests for these wells or from title opinions on the tracts that St. Mary operates. Relative to the two Heyco tracts, Heyco provided that information based on their own files.

Q. Now, when we filed the Application, we attached

the unit agreement to the Application. Since that Application was filed, have there been any changes to this unit on Exhibit D?

A. There have been several changes. St. Mary acquired the interests of several small working interest owners. In addition, there were a few other interests that changed hands, mostly from one family member to another.

Q. So this is the most current listing?

A. Yes, it is.

Q. How many interest owners are there in the proposed unit?

A. There are 46 working interest owners and 103 royalty and overriding royalty interest owners. That includes 22 royalty interest owners -- override owners, actually, that we have termed "carried working interest owners", and the only reason we use that terminology is because that's what they were called under the initial farmout agreements.

Q. Now, let's speak first of the working interest owners. Who are they, and who do you seek to unitize?

A. If you'll look at Exhibit 6, it lists all of the working interest owners with their 100-percent working interest by tract. The parties that are in yellow are those parties who have not ratified the unit agreement or the unit operating agreement, and it is these parties that

we wish to unitize.

Q. What is the total percentage of working interest owners who have voluntarily ratified the unit?

A. We have over 89 percent that have approved the unit. The exact percentage is 89.098551 percent.

Q. And of course, if any of these parties ratify later, you will consider them consenting parties?

A. Yes, sir. As a matter of fact, we have advised all of the working interests that we will get back to them after we have approval, assuming we get approval for this unit, and offer them another chance to ratify the unit so that they will not necessarily be subject to the 200-percent nonconsent penalty unless that is their wish.

Q. Now, let's move on to the royalty owners. Would you identify your Exhibits 7A and 7B, which is one exhibit stapled together, and discuss royalty owner voluntary participation?

A. Yes. Exhibit 7A is a listing of all the royalty interest owners for oil production, and Exhibit 7B lists the royalty owners for gas production.

Q. And why is there the difference between oil and gas?

A. In this unit, gas production is at 12.5-percent royalty interest for the federal government. However as to oil production, they have acquired the reduced royalty rate

that is available through federal regulations for stripper wells on a number of these wells, so that the mineral interest -- the royalty interests for the mineral management services is 11.6 in this unit. So we just wanted to show that difference.

Other than the Minerals Management Service, all of the other royalty owners are the same.

Q. And which royalty owners do you week to unitize?

A. Again, the parties that have not signed the ratification for the unit agreement are in yellow.

Q. And I don't know if you mentioned it, but what percentage of royalty participation do you have at this time, including the Bureau of Land Management?

A. It's approximately 93 percent, 92.946 under the 7A exhibit, and under 7B it's 93.217.

Q. Does Exhibit 8 contain copies of all ratifications from working and royalty interest owners you have received to date?

A. Yes, sir.

Q. And has the Bureau of Land Management preliminarily approved unitization?

A. Yes. A copy of the BLM's letter of designation for this unit is Exhibit 9.

Q. Now, let's discuss the efforts to obtain voluntary unitization among the interest owners in the

proposed unit. Would you identify Exhibit 10 for the Examiner?

A. Yes, Exhibit 10 contains copies of correspondence and notes relative to telephone conversations that we had with various working interest and royalty interest owners during the course of unitization, prior to this hearing.

The first six pages of the exhibit is a summary of what follows, so that you can kind of glance through that and decide which of the correspondence you want to look at and identify it that way.

Q. And then the remainder is just copies of the correspondence and your handwritten notes?

A. Yes, sir.

Q. Rather than going through the correspondence document by document, would you outline St. Mary's contacts with the interest owners?

A. St. Mary first began considering unitization in the spring of 1998. We had informal discussions with a number of the individual working interest owners at about that time, just to get a sense of whether or not they supported unitization.

In July of 1998, we had our first letter to all of the working interest owners, which simply advised them that we were going to try to unitize this area, gave them a map of the unit area, which the unit area has no change.

In October of 1998, we sent another letter to all of the working interest owners proposing the unit again, giving them their individual working interests -- I think it was net revenue interests, actually, that we gave them in that letter -- the planned expenditures in the unit, and we polled them for their support at that time.

Then on March 1st of this year, we formally proposed the unit to all of the royalty and overriding royalty interest owners. That letter contained a copy of the unit agreement and also ratification forms for them to sign and invited them to join the unit.

On the 5th of March of this year, we sent out another letter to all of the working interest owners proposing -- formally proposing the unit, and that letter included both the unit agreement and the unit operating agreement, and again ratification for their joinder in the unit.

On April 12th, we sent a letter to all of the working interest owners again. That letter included some revisions to the unit operating agreement, which had been suggested by a couple of the working interest owners. We sent those changes to all of the working interest owners and informed them what the change was in our letter and asked them, if they had any problems or questions with our changes, to let us know right away.

All during this period, from the spring of 1998 until the current date, we've had a number of contacts with the working interest owners, both personal contacts and correspondence to and from them, and also a number of phone calls from various interest owners, royalty and working interest owners. We attempted to respond as thoroughly as we could to each one of those.

Q. Did Intoil also have personal meetings -- excuse me, St. Mary also have personal meetings with Intoil on some of the other larger working interest owners in the unit?

A. Yes, sir, we did.

Q. Okay. Now, you mentioned some changes were made to some of the documents. Who requested those changes?

A. Five States Energy Corporation and Heyco requested a few changes in the operating agreement, and we were able to make most of those changes, and those changes were submitted to the working interest owners.

Q. Now, there were also meetings with Intoil, were there not?

A. Yes, separate meetings with Intoil individually.

Q. And perhaps our next witness, Mr. Bachman, could detail those?

A. Yes, it was Mr. Bachman who met with Intoil.

Q. But briefly, the last meeting with Intoil

resulted in an increase in Intoil's interest, did it not?

A. Yes, sir.

Q. I think I misspoke earlier.

Now, are any of the interest owners in the unit unlocatable?

A. We were able to locate William Nickey and William J. Casey. Those were the only two that we were unable to locate.

Q. What efforts did St. Mary make to locate these interest owners?

A. When the letters proposing the unit were initially sent out in March, we sent those by certified mail, return receipt requested, so that we could track who we did not find with the address that we had. There were a number of those parties. We tried to check their addresses through the Internet.

We also contacted -- We used the original assignments into them, contacted the party that had assigned into them, and also other people on those assignments, trying to get current information on those particular owners. In most cases, it worked. With these particular two parties, it did not work. We were unable to locate them.

Q. In your opinion, has St. Mary made a good faith effort to secure voluntary unitization?

A. Yes, sir.

Q. Has written notice of the unitization hearing been given to all of the interest owners in the unit?

A. Yes.

Q. And does Exhibit 11 contain your notice materials?

A. Yes, sir, it's an affidavit of notice regarding the hearing, and it attaches to it a copy of the letter that went out to everyone, as well as the certified mail return receipts.

Q. Now, with respect to the unlocatable interest owners, did you publish notice in the newspapers?

A. Yes, we did. We published that notice in both the Carlsbad and the Hobbs newspapers.

The affidavits of publication are marked as Exhibits 12 and 13.

Q. And those notices specifically named Mr. Casey and Mr. Nickey, I believe?

A. Yes, they did.

Q. Now, one of them also names a Mr. Folkner?

A. Yes, we did locate Mr. Folkner. These were published on June 1st and June 2nd, and Mr. Folkner did respond, after quite a while, to his certified mail. So we did reach Mr. Folkner.

Q. Okay. Now, regarding the waterflood project, was

notice of that case given to all proper parties as required by the Form C-108?

A. Yes, sir, Exhibit 14 is my affidavit concerning the notice letter that was sent to the surface owners and to the offset operators.

It also contains copies of the certified mail return receipts.

Q. And finally, what is Exhibit 15, Ms. Ellison?

A. Prior to this hearing we requested letters of support from a few of the working interest owners, and Exhibit 15 is copies of those letters.

Q. In your opinion will the granting of these Applications be in the interests of conservation and the prevention of waste?

A. Yes.

Q. And were Exhibits 1 through 15 prepared by you or under your direction or compiled from company business records?

A. Yes, sir.

MR. BRUCE: Mr. Examiner, at this time I'd move the admission of St. Mary Exhibits 1 through 15.

MR. CARR: No objection.

EXAMINER CATANACH: Exhibits 1 through 15 will be admitted as evidence.

Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Ms. Ellison, you're the person at St. Mary's responsible for obtaining ratification of the unit agreement and the operating agreement --

A. Yes, sir.

Q. -- is that correct?

A. Yes.

Q. And if I understand from looking at Exhibit 6, at this time you have slightly over 89 percent of the working interest committed to the unit?

A. That is true.

Q. If the Oil Conservation Division was to enter an order which would change the participation formula, you would have to go back and get re-ratifications from all the people, would you not?

A. Yes, we would.

Q. And when you sought the ratification, did you send out the unit agreement in the form that's set forth in Exhibit Number 3?

A. Yes, except -- The unit agreement, yes.

Q. And did the exhibits that are attached in this exhibit -- were they also mailed out?

A. The Exhibit D with the various interests has changed since then, because there were a number of

acquisitions.

Q. If I'm trying to determine who owns what in this unit for the purposes of ratification, would it be appropriate for me to look at Exhibit Number 6? That sets out the total percentage?

A. That's right.

Q. And that is not part of the unit agreement, is it?

A. Well it is a part of unit -- Exhibit D to the unit agreement.

Q. So was this page actually included in the unit?

A. No, that grosses the interests up to 100 percent.

Q. Okay, it's just a compilation of what was there?

A. Yes.

Q. If I look at Schedule B to the unit agreement, or Exhibit B to the unit agreement, this is a breakdown of the ownership in the tracts?

A. Exhibit B to the unit agreement is a listing of the federal leases within the unit.

Q. My concern is really with the column on the right-hand side of this exhibit, where it says working interest owner and percentage.

A. Uh-huh.

Q. And I look down at, say, Tract 3A, the Conoco Number 1 --

A. Let me get to that.

Q. Okay. It's the first page of Exhibit B.

A. You're in Exhibit 3, and the first page of Exhibit D to the unit agreement?

Q. Exhibit B.

A. B.

Q. The first long page.

A. Okay.

Q. Okay?

A. Yes, sir.

Q. Now, I look at Tract 3A --

A. Uh-huh.

Q. -- and I come over to the column, second to the right, that says "Working Interest Owner and Percentage". Is the Higgins Trust, Inc., the holder of 100 percent of the working interest in that?

A. That's the record title interest owner.

Q. That's only record title?

A. Yes, sir.

Q. So when we look at that, St. Mary's also owns in that tract --

A. Yes, sir.

Q. -- do they not?

A. Yes.

Q. And the same would apply to Tract 6, the tract on

which the Jade Number 1, if elected, what you're showing as working interest owner is only a record title with 100 percent in St. Mary's?

A. That's correct.

Q. And actually the ownership of Intoil is reflected on the "Lessee of Record" column: They have 50 percent in that tract?

A. The lessee of record, yes.

Q. Okay. And so in terms of the ownership of Intoil in this proposed unit, that's where we would find the reference in the unit agreement to their interest?

A. Yes, there and also in Exhibit D. In Exhibit D, page 2 of 4, both the gas exhibit and the --

Q. And the oil?

A. -- oil shows Intoil in that.

Q. When I look at the percentage --

A. I'm sorry, excuse me. It's at the bottom of page 1, I'm sorry.

Q. Okay. When I look at Exhibit Number 6, it sets out the total gross -- I guess GWI, gross working interest?

A. Yes, sir.

Q. And it shows that St. Mary's owns 58.25 percent of the gross working interest in the unit?

A. That's correct.

Q. So in terms of unit benefits, they would get the

bulk of the benefit of the unit program --

A. That's true.

Q. -- is that not right?

The second largest owner is River Hill, the one immediately above. That's six percent?

A. Yes.

Q. And then Intoil is, in fact, the third largest owner in this unit, is it not?

A. I believe that's true.

Q. When you were soliciting letters in support of this Application, you've received letters from River Hill, Nortex and Barker, right?

A. Yes, sir.

Q. Did you seek letters of support from all of the working interest owners --

A. No.

Q. -- or just selected --

A. No, they were just selected working interest owners.

Q. You didn't receive a letter of support from Intoil, did you?

A. No, I did not.

Q. You knew the result, didn't you?

A. Yes, sir.

Q. You have a letter, but you didn't include it,

from Intoil, right?

A. It is not a letter of support.

Q. That's all I have, thank you.

A. Sure.

EXAMINATION

BY EXAMINER CATANACH:

Q. I'm sorry, on Exhibit Number 6 I don't see Intoil's interest. Where is that?

A. It's towards the bottom of that exhibit. It's on page 2, the third from the top.

Q. Okay.

A. In yellow.

Q. Approximately 4.5 percent working interest?

A. Yes.

Q. Ms. Ellison, what is the status of your negotiations with these parties? Is it ongoing at this point?

A. With "these parties" being -- ?

Q. Some of the working interests and the remaining royalty interests that haven't ratified. Are you still talking to them or --

A. Oh, sure. Oh, sure. In fact, just last week we got an approved ratification from one party. We just didn't act on it yet. I understand we asked one of the companies where theirs was, thought they were going to

support us. Oh, yeah, sure. But it just hasn't come yet.

Q. So you anticipate getting some additional ratifications prior to unitization, or after unitization?

A. Well, probably after unitization. My understanding is that the party that we called and asked for their ratification just really doesn't sign anything until they absolutely have to.

Q. The interests that you couldn't locate, could you go over the efforts that you made to find those interests again?

A. Sure. We looked on the Internet for their names and addresses, current addresses, found a number of them that way, but not those particular two that were still outstanding.

We went to the original assignments into those parties, how they acquired their interest in the wells that are going to be part of the unit, went to the assignor of that interest and also to other assignees in those assignments, and we were able to locate some of the other parties by that method, but we were not able to locate these parties. They just simply didn't keep track of them after they made assignment.

Q. And you did try and publish notice, or you did publish notice to try and reach those entities in the newspaper in Lea and Eddy Counties?

A. Yes, Carlsbad and Hobbs newspapers.

Q. And no response?

A. No response.

Q. Are those royalty interest owners?

A. William Nickey is a working interest owner. William Casey is a royalty owner.

Q. The working interest owner you didn't notify or couldn't notify was --

A. William Nickey, uh-huh, about halfway down that first page.

Q. And the royalty interest owner?

A. William J. Casey.

Q. Where might he be?

A. He's on the second page, about two-thirds of the way down, you see where there are two lines together, George Shannon and then William Casey in yellow.

Q. You testified that these interest owners, even after the order may be issued in this case, you're going to still give them the opportunity to join?

A. Absolutely.

Q. Is there a deadline you guys have thought about giving these people?

A. Well, once your order is issued, we do need to work fairly quickly. We'll probably give them two weeks, three weeks maybe, to respond.

Q. And your unit agreement does have the penalty provision in it?

A. Yes, the unit agreement. Actually, the penalty provision is in the unit operating agreement.

EXAMINER CATANACH: That's all I have of this witness, Mr. Bruce.

MR. BRUCE: Call Mr. Bachman to the stand.

Mr. Examiner, some of the exhibits in this exhibit package are smaller, so some of the -- We've blown up some of the exhibits and put them on the wall, in case they might be a little easier to see.

ROBERT L. BACHMAN,

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

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Robert L. Bachman.

Q. And where do you reside?

A. Elizabeth, Colorado.

Q. Who do you work for and in what capacity?

A. I work for Saint Mary Land and Exploration. I'm a geologist responsible for the Permian Basin and some smaller Rocky Mountain basins.

Q. Have you previously testified before the

Division?

A. No.

Q. Would you outline your educational and employment background for the Examiner?

A. I have a bachelor of science degree in petroleum geology from Metropolitan State College in Denver. I've worked four years with Champa Petroleum Company, Union Pacific Resources; two years with Donald F. Todd -- he's an independent out of Indonesia -- three years with Clayton Williams, Jr.; three years with BHP Petroleum out of Australia; eight years with Anderman Smith Operating Company, and five years with St. Mary.

Q. And you say your area of responsibility does include southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the geologic matters involved in these cases?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Bachman as an expert petroleum geologist.

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: The witness is so qualified.

Q. (By Mr. Bruce) Mr. Bachman, would you identify Exhibit 16 and discuss the zones you are seeking to flood

in this unit?

A. Certainly. Exhibit 16 is a type log of the upper Brushy Canyon formation in the Geronimo Number 3 well in the northeast northeast of Section 24 of 18 South, 31 East. It shows the unitized -- proposed unitized interval in the upper Brushy Canyon. Porosity greater than 14 percent is colored in the yellow. Current perforated intervals are in red.

The color coding on the gamma-ray indicates my interpretation of the different pulses of deposition, different zones of production in the East Shugart.

Q. How many Brushy Canyon zones, pay zones, are there in the proposed unit?

A. There are ten.

Q. And you would attempt to, over time, flood all of these?

A. Yes.

Q. Would you identify Exhibit 17 -- or -- Yes, excuse me, identify Exhibit 17 and discuss the geology in the general area of the zones you seek to unitize in the flood.

A. The Brushy Canyon sands are a fine-grained deep-water low-energy deposit deposited extensively throughout the Basin, certainly. They're characterized by high porosity and low permeability. In the East Shugart area

the Brushy Canyon is approximately 1700 feet thick, and the upper 400 feet constitutes pay and commercial hydrocarbons. Traps are typically stratigraphic, have a little structural overprint due to differential compaction.

Exhibit 17 here is an area map, structure map on the top of the Brushy Canyon. It shows a high in the Tamano area, a high in the Young North area to the northeast, and there's part closure at the East Shugart field.

Q. Now, would you refer to your Exhibit 18? And the ones given to certain parties are individual, sheet by sheet, but Exhibit 18 on the wall is a composite structure map. Would you identify that and discuss in a little more detail the productive zones in this area?

A. Yes. Exhibit 18 is a computer-generated map. It's a structure map of all 10 zones. There are certain wells, and I have to clarify so I don't confuse anybody. If the wells do not penetrate a particular zone, they are cut out of the map, and the computer contours only to the last control point, so it does not extrapolate out. So it's for display purposes only.

The green area indicates potentially productive zones within these ten zones, and the blue denotes a high water saturation. And then of course we have the proposed unit outline on all maps superimposed.

The oil-water contacts are difficult to define, as I'm sure everybody is aware, in the Delaware, because of the transition, but we used a 60-percent water-saturation cutoff, as well as well productivity. For instance, in zone 7, the Inca Federal Well is in the northeast, northwest of Section 19. Perforated zones have been swabbed at six- to 12-percent oil cut. The Mohawk federal well in the northeast of the southwest is 40 feet structurally lower and calculates 67-percent water saturation.

And of course water saturation increases as you move off of structure, and you'll notice that the structure drops off pretty rapidly as we go from zone 1 up higher, down to zone 10. It gets pretty significant.

Q. What is the porosity and permeability in this reservoir?

A. Porosity probably averages 18. Eighteen, 19 percent. Permeability is probably three to five millidarcies.

Q. Okay. While we're on this map, is there a freshwater zone in this area?

A. Yes, the Capitan Reef.

Q. Okay.

A. Mr. Lee will show a map in his testimony as to the locations of the zones.

Q. Okay. Are there any faults in this area which connect the freshwater zone with the injection zone?

A. Not to my knowledge.

Q. Okay. Let's move on to your Exhibit 19. What does that show, for the Examiner?

A. Exhibit 19, again, is a computer-generated map. This is a net-thickness isopach map greater than 14 percent. Again, we're showing the proposed unit boundaries. The darker yellow area is thicker sand, and conversely the lighter is thinner sands.

The porosity cutoff, 14 percent, that we've used is similar to what we used at Parkway-Delaware field, which is a flood that we currently have 15 miles southwest of the East Shugart.

Q. Okay.

A. And again, I apologize if there's any confusion, but wells that did not penetrate certain zones are again cut out of the interpretive maps.

Q. Mr. Bachman, let's move this one up a little bit higher so people can see it. Could you identify your Exhibit 20 and discuss it for the Examiner?

A. Exhibit 20 is a west-to-east and also a north-to-south composite cross-section here across the field. It shows all 10 zones, the estimated oil-water contacts for each zone. Porosity, again, greater than 14 percent is

colored in yellow. Current perforations are in red. And then the high water saturation sands are in blue.

Q. Now, when you're looking at that, structure starts dropping off as you get to the edge of the productive reservoir; is that correct?

A. Yes. And again, you can see how rapidly, you know, in the north-south, and also east-west orientation, that it drops off pretty rapidly.

Q. And as you go deeper, the dropoff is more extreme?

A. Yes, sir.

Q. Do you have anything further on that map, Mr. Bachman?

A. No, I just might add that it really depends on the porosity that we're seeing on here, as far as well productivity. Some of these zones, even down in zone 7 here, produce 140 barrels a day initially, as well as some of the upper zones, 200, 250 barrels a day. So it all is productive.

Q. Okay. Let's put the last map up here. What does Exhibit 21 show?

A. Exhibit 21 is a cumulative production map, as of July 1st of 1998. It's a larger-scale map showing the proposed unit outline and the individual producing wells in green with the cumulative production to point underneath.

And then contours, so you can see that the better wells are in the center of the field, which coincide with the structurally highest point.

Q. Now, you used production as of July 1, 1998. Was that the cutoff used in the unit agreement?

A. Yes.

Q. Okay. From a geologic standpoint, has this reservoir been reasonably defined by development?

A. Yes, sir, it has.

Q. And is the Brushy Canyon reservoir continuous across the proposed unit area?

A. Yes.

Q. Geologically, is this a good candidate for waterflooding?

A. I think it's going to be very similar to Parkway-Delaware, 15 miles southwest, that we're having a lot of success with right now.

Q. And our next witness will discuss that?

A. Right.

Q. Were Exhibits 16 through 21 prepared by you or under your direction?

A. Yes.

Q. And in your opinion, is the granting of this Application in the interests of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I'd move the admission of St. Mary Exhibits 16 through 21.

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: Exhibits 16 through 21 will be admitted as evidence.

Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Bachman, if we could go to Exhibit 16 --

A. Yes.

Q. -- if I understood your testimony, you have in the center of this log indicated zones 1 through 12 as zones that you have been able to identify here?

A. Yes, those are just correlative zones.

Q. When I look at the log, have you indicated like a top of one where it runs into two, or can we tell from this where one zone ends and the next one begins?

A. You know, I apologize on the reduction on those, but yes, on here I have zone 1, zone 2, and then the actual breakdown.

Q. Have you included the entire section 1 through 12? Are there zones within this gross interval that you have eliminated from your geological interpretation as not

being zones that ultimately can be waterflooded?

A. They're mostly all well -- They correlate completely across the field. Some may get extremely thin, but for the most part you can correlate completely across the field.

Q. There are not intervals -- I'm asking this. You haven't included intervals within this gross interval that are not included in, say, zone 1, 2, 3, 4, that are just outside of one of the defined zones, is -- Or is the entire interval within a zone 1 through 12?

A. The zone -- I apologize. The zones that are potentially productive are only zones 1 through 10 --

Q. Okay.

A. -- that I've identified.

Q. Do you have gaps between those zones where you've identified areas within the reservoir that are not productive and not capable --

A. Yeah, there are zones that are extremely tight.

Q. And is that interval omitted or -- I'm just trying to see if we've included the entire --

A. Yeah, it's --

Q. -- interval on the exhibit.

A. -- all included.

Q. Okay.

A. Everything is mapped.

Q. And some of the intervals, the lower ones, would contain only water, isn't that correct?

A. Yes, high water saturation.

Q. If I go to Exhibit 18, I think I understood your testimony, the reason the exhibit ends on the right with a vertical line is that your program just didn't go that far?

A. Right, that's a computer cutoff.

Q. You weren't saying that the Jade was not in the reservoir?

A. Absolutely not.

Q. And basically, this exhibit shows interval by interval from a structural point of view where you would hit the water contact; is that fair to say?

A. The estimated water contact.

Q. And you've gone through 10 because 11 and below are wet?

A. Calculate very high water saturation. I don't think they'd contribute.

Q. If I look at Exhibit -- Do you have any core data to support any of this information?

A. No, there is no core data, unfortunately, in the field.

Q. If I go to Exhibit Number 19, what we have here is a net isopach on each of these zones; is that correct?

A. Correct.

Q. If I look at these, it looks like what we have here basically is a blanket deposit in each of these zones, 1 down through 10. Is that what you were intending to show?

A. Fairly continuous across the field.

Q. You would agree with me, would you not, that what this portion of the Delaware is actually comprised of is basically lenticular sands that run across, and they're not necessarily continuous across the entire interval.

A. Across the field, as far as I can correlate, they appear to be continuous across the field.

Q. You don't see erratic patterns in the sand?

A. Everything, again, appears to be pretty correlative.

Q. Let's go to the first of the cross-sections, A-A'.

A. Uh-huh.

Q. Look at that, and if we go to -- Let's take the Jade well on the right-hand side of the cross-section. If we look at the Jade, there is a yellow-shaded area at the top of that log.

A. Yes.

Q. What zone would that be in?

A. That is the zone 3.

Q. Zone 3. If we move to the next well to the left,

zone 3 is also present, is it not?

A. Yes.

Q. What does the yellow indicate?

A. Porosity greater than 14 percent.

Q. And if we get to zone 3 on the next level, we don't see porosity, do we?

A. It's relatively tight, that's correct.

Q. That wouldn't suggest to you that you've got an erratic formation here or that you've got variations in these lenticular sands?

A. Well, I think there's a few variations in the porosity. It does get tighter across the field, but --

Q. Would you perforate in zone 3 in the Inca Number 1?

A. There's a possibility that I would, through the plug, uh-huh.

Q. But if I look at this exhibit and I try and correlate porosity across the reservoir on cross-section A-A', you would agree with me that you've got porosity in individual wellbores that does not appear in the offsetting well?

A. Right.

Q. And yet you still would interpret this as basically a blanket deposit?

A. I think that these sands are correlative across.

There are variations in the porosity, but I think that they're --

Q. And when you talk about correlative sands, within those correlative sands you can have lenticular zones or sands that pinch out and reappear, and pinch out and reappear, can you not?

A. I'm sure there's a possibility of that.

Q. And wouldn't you think that, looking at Exhibit A where you've got porosity over -- Did you say 14 percent was your cutoff?

A. Yes.

Q. Over 14 percent in zone 3 in the Jade 1, and you don't find that in the offsetting well to the west, wouldn't that suggest to you that the sands are variable throughout this area in terms of their porosity?

A. Somewhat variable, yes.

Q. When you were preparing Exhibit Number 19, were you only looking across the cutoffs, or did you factor in a water saturation in mapping?

A. It is porosity.

Q. Only?

A. Uh-huh.

Q. And do you know what water saturation St. Mary's would use in terms of evaluating whether or not you've got a productive reservoir here?

A. We used a 60-percent water saturation.

Q. Sixty?

A. Sixty percent.

Q. But you didn't factor that into Exhibit 19?

A. No, that's strictly a net-pay isopach.

Q. If I look at the cross-section A-A', the blue on this exhibit shows water, I believe; is that right?

A. High water saturation, uh-huh.

Q. When you drill a well out here and you get sufficient porosity and water saturations, that's when you perforate, correct?

A. Yeah, coupled with mud logs.

Q. But you get sufficient data, I mean, these various factors you look at --

A. Yes.

Q. -- and you'd pick an interval -- Did you say the red indicates the zones that, in fact --

A. Currently perforated intervals.

Q. Those are?

A. Yes.

Q. I have a fan behind me, which Mr. Bruce turns on every time I -- and it's hard to hear you.

All right. If you go in and -- Let's go to Exhibit -- cross-section B-B' --

A. Uh-huh.

Q. -- and look at the third well from the right, being the Inca Number 2.

A. Uh-huh.

Q. If I come down that wellbore to the second set of perforations -- I think it says "perf frac" and then "screened out" or "squeezed" or -- what --

A. Screened out.

Q. What does "screened out" mean?

A. I'm going to defer that to Mr. Lee.

Q. Is that a producing interval?

A. Beg pardon?

Q. Is that a producing interval? Do you know that, in that well?

A. I'm not sure that actually is or not.

Q. And you would like -- I should ask Mr. Lee that question, perhaps?

A. Yes.

Q. If I look at the log on the Conoco Federal Number 1, and we go down and in the green, top to bottom, the green area, the second set of perforations there, the log indicates next to that that they were squeezed; isn't that right?

A. Yes, that's the information I got.

Q. And that shows those perforations to be in an area with porosity in excess of 14 percent; is that right?

A. Yes.

Q. And to have perforated there, you would also -- that zone must have met the other criteria for thinking that was a zone potentially productive, right?

A. Yes.

Q. And that area would be on these other maps shaded as being within the porous interval?

A. Yes.

Q. And yet that was apparently squeezed; isn't that right?

A. Yes, and that could be for a number of reasons. I'm not sure.

Q. Would you agree with me when you take this geological interpretation, before you know if you've got an interval that actually can produce or not, you really need to integrate production information?

A. Yes.

MR. CARR: That's all I have, thank you.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Bachman, how were the reservoir boundaries for this unit -- or the unit boundaries, determined?

A. Again, by the well's producibility, water-saturation cutoffs. Tighter rocks that are on the flanks have low oil cuts and high water cuts.

Q. Is this a large portion of the East Shugart field, or is it -- I don't know. How big is the East Shugart?

A. East Shugart encompasses a couple sections. This is the section off to the east. The field off to the west is a shallow Penrose Grayburg, so it's shallow production. The Delaware production is only in this area right here.

Q. So this basically encompasses the entire East Shugart (Delaware) Pool?

A. Right, right. Right.

Q. And within the East Shugart, is it just the Brushy Canyon that's productive? Any zones higher?

A. There is some potential in the Cherry Canyon, although I'm not aware of how well it will produce, and then some of the shallow Penrose and Grayburg that's produced over the field.

Q. But you're not seeking to unitize --

A. We're seeking to unitize --

Q. -- any of the shallower zones?

A. No, sir, just the Brushy Canyon.

Q. And is it from the top of the Brushy Canyon, essentially, to the base of the Brushy Canyon you're unitizing?

A. No, it's just the upper 400 feet or so.

Q. Why is that?

A. Well, that calculates pay, for instance, down here in what I call zone 10 on the Inca Number 1, perf and frac'd, this zone right here, it pumped 150 barrels a day with 65 barrels of water a day. So that is my deepest production here, correlative zone 10. So everything deeper was either not tested or calculates very high water saturation.

Q. So the unitized interval just goes to -- Does it include 11 and 12?

A. Well, we have --

Q. Or it does in some wells?

A. Yes, it does, we took it all the way down to 5600 feet, although there is no production down through here.

Q. And there's no production below that point?

A. No, sir.

Q. On your Exhibit Number 21, that's the -- You've got the cumulative production, and that's from all zones?

A. Yes.

Q. What's the typical procedure out here for completing a well in these zones? Are they typically anything that looks good, is perforated and produced?

A. Yeah, you know, a lot of these wells are drilled by Siete. I think when they got into financial problems their criteria changed. They were trying to perforate zones that were 100-percent oil, or they thought were 100-

percent oil. But there are a lot of zones that will produce a lot of water, but a lot of oil as well.

Q. And are those typically not perforated?

A. No, there are a lot that are. There are a lot that are.

Q. So what would be the average -- say the average number of these sands that are perforated in any given well in this unit?

A. It can range anywhere from three to four to five zones.

Q. Okay. Is there plans to go in after unitization occurs and try and perforate some of these additional --

A. We will open up all zones, that's correct.

Q. All ten zones will be open in all wells?

A. Yes, we plan on flooding it all.

Q. And all ten --

A. And --

Q. I'm sorry, go ahead.

A. I'm sorry. We're currently flooding approximately 200 feet of Delaware sands at Parkway, and it appears to be very efficient. This one will take a little more monitoring, but we do plan to flood all zones.

Q. All ten zones will be flooded?

A. Yes.

Q. At what depth does the Capitan Reef occur in this

area, Mr. Bachman?

A. I'm going to have to defer that to Mr. Lee in his testimony.

EXAMINER CATANACH: I have nothing further of Mr. Bachman.

MR. BRUCE: I have nothing further of Mr. Bachman.

EXAMINER CATANACH: Mr. Bachman may be excused.

(Off the record)

ROBERT LEE,

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

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. Robert Lee.

Q. What is your occupation?

A. I'm a consulting engineer.

Q. And are you consulting with St. Mary's in this matter?

A. Yes, I am.

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

A. Yes, I have.

Q. And were your credentials as an expert accepted

as a matter of record?

A. Yes, they were.

Q. And are you familiar with engineering matters related to these Applications?

A. Yes, I am.

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

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: Mr. Lee is so qualified.

Q. (By Mr. Bruce) Mr. Lee, would you describe your involvement in the proposed unit and in this East Shugart (Delaware) Pool?

A. Yes, I was -- Prior to working with St. Mary's as a consultant here, I was employed by Siete Oil and Gas since about 1990 and was involved in several of the Siete Oil and Gas properties, including the Shugart area and Parkway.

Since St. Mary's acquired Siete in June of 1996, they have kept me on as a consultant for a few of their projects there, some of the old Siete stuff.

Q. Have you made calculations regarding secondary recovery in this pool and the economics of the waterflood project?

A. Yes, we have.

Q. What materials did you examine in preparing your study of the reservoir?

A. We used production data, logs, some pressure buildups, information from analogous floods, plus the computer model performed by Raj Prasad.

Q. And Mr. Prasad is here today and will testify about his model?

A. Yes, he will.

Q. Referring back -- I don't know if it's on the map, anyway, but Exhibit 2, which was the land plat of the unit, would you describe briefly the history of the East Shugart (Delaware) Pool?

A. Yes, Exhibit Number 2 was a plat of the unit. The East Shugart Pool was discovered in 1985 by Siete Oil and Gas by drilling the Geronimo Number 3.

Since then, 24 wells have been drilled within the pool and within the area of review that we'll examine today. Nineteen of those wells were productive, and then five were completed in shallower horizons.

Within the proposed unit area, some of these Delaware producers were completed in zones not within the proposed unit. For instance, the South Taylor 13-3 produced out of the -- a little bit out of the Cherry Canyon.

Currently, there's 15 active wells within the

proposed unit area and one inactive well. The operators in the pool are St. Mary's with 15 wells and Heyco with two wells.

Q. Would you identify your Exhibit 22 and describe production from the wells in the pool?

A. Yes, Exhibit Number 22 is a plot of the oil and gas production. On this plot we show the -- You can see the discovery there in 1985, showing that the current cumulative primary production is about 2.2 million barrels, and the remaining primary reserves from this proposed project is about 600,000 barrels.

And then you can also see the anticipated increase from the workover and the waterflood, which will add an incremental 3.7 million barrels.

Q. Okay. On average, what is the current production from wells in the pool?

A. The current production is about 12 barrels a day per well and 21 barrels of water per day per well. These wells are in a stripper state, and they are reaching their economic limit, which I would estimate to be three barrels a day.

Q. Was the waterflood project proposed as a method of extending the life of this reservoir?

A. Yes, it was, and also to recover substantial additional reserves.

Q. What is Exhibit 3 -- Excuse me, 23?

A. Exhibit 23 is a reserves table, showing that the cumulative production for the proposed unit area, as of February, 1999, is 2.2 million barrels, nearly 5 BCF of gas, and 2.1 million barrels of water.

The information also contained on this exhibit shows that we anticipate recovery in an incremental 822,000 barrels from the proposed work, which would be to open up behind-pipe zones and re-frac'ing existing zones, giving us a total primary reserves of 3.6 million barrels.

The incremental waterflood reserves is 2.9 million barrels. So the total remaining reserves for this project is 4.3 million barrels, with an ultimate recovery of 6.5 million barrels for the entire area, over 20 percent of the original oil in place.

Also on this table we show the original oil in place, estimated to be 31,645,000 barrels, and also the calculated secondary-to-primary ratio, which is .8.

Q. Okay. Before we move off of this exhibit, a question was asked of Mr. Bachman about the workover reserves. Now, regarding re-entering these wells and opening up new zones, unitwide all ten zones will be tested; is that correct?

A. That's correct.

Q. But not all ten zones will be opened up in each

and every well?

A. That's true. Zone 10 in some wells is not penetrated by all the wells. Also, if it's shown to be very wet and our model study shows that it has no benefit to the project, we wouldn't open up that zone. If the model study shows that a zone has potential and will benefit the waterflood, we'd open that zone up, even though it may have something of a high water cut.

Q. What is the drive mechanism of this pool, Mr. Lee?

A. This is a solution gas drive reservoir.

Q. What does Exhibit 24 show?

A. Exhibit 24 is a plot of oil production and GOR over time. And what I'd want to point out here is that when the field was discovered back in 1986, the GOR was around 1400 to 1500 cubic feet per barrel, and it has increased steadily over time to nearly 4000 or a little over 4000 cubic feet per barrel.

Q. Is this common with solution gas drive reservoirs?

A. Yes, it is.

Q. What injection pattern will St. Mary use in this waterflood?

A. For the most part it's going to be an inverted fivespot.

Q. And how many producing and injection wells will there be?

A. Initially, there will be two injection wells, the South Taylor 13-3 -- or on the map it may be shown as the ESD Number 1 -- will be converted to injection.

And there will be another injection drilled, the ESD Number 20. When that well is drilled, we plan -- St. Mary's plans to go into the four surrounding wells and perforate the additional zones, re-frac some of the existing zones, performing that work at that point in time. Ultimately, there will be 15 producing wells and nine injection wells in this project.

Q. Are all of these wells listed on Exhibit 25?

A. Yes, they are.

Q. Producers and injectors?

A. Producers and injectors, with their current status and proposed status.

Q. Okay. And again, you predicted a .8-to-1 recovery, secondary to primary?

A. Yes, I did.

Q. Based on that, what would be the estimated life of this project?

A. Twenty-nine years.

Q. How does your estimate of reserves and project life compare with any other analogous Delaware waterfloods?

A. There's very few comparable projects at this time because waterflooding in the Delaware is still in its initial stages. The most comparable property flood would be the Delaware -- Parkway-Delaware Unit, which is located in Township 19 South, Range 29 East, about 15 miles southwest of Shugart.

We have attached a curve, Exhibit 26, of the Parkway-Delaware production, and you can see that this property was discovered in 1988. This plot shows the oil production, the GOR, the water production, the number of wells and the water injection kind of down there at the bottom.

Injection started on a limited basis in 1993, injecting between 800 to 1000 barrels of water a day. In 1997 St. Mary's drilled some additional injection wells in the unit and substantially increased the water injection to 6000 barrels a day. You can see on the oil plot up above that oil has gone from 300 barrels a day to just right at 700 barrels a day at this time.

The estimated secondary-primary ratio for the Parkway field is 1.26.

Q. Now, keeping on this, even when it was more limited, on Exhibit 26, a more limited injection, it still had the effect of arresting the production decline, did it not?

A. Yes, it did.

Q. And when the did the more substantial injection begin?

A. Towards the end of 1997.

Q. Of course, if you can equal the results in Parkway you can have an even longer project life; is that right?

A. That's exactly right.

Q. Will the East Shugart add to the knowledge base on Delaware waterfloods?

A. Yes, it will. Everybody out there is going to benefit from the knowledge we gain from these projects.

Q. What is shown on Exhibit 27?

A. Exhibit 27 is a table of capital showing the amounts of money anticipated to be spent for the drilling of the eight injection wells, adding the facilities, converting the 13-3 and adding pay and re-frac'ing the wells currently existing there in the proposed unit.

And the total capital outlay of this project is projected to be $5.6 million.

Q. And will this project be economic?

A. Yes, it will. Exhibit 28 is an economics table showing what the value and economics of the current operations and the proposed incremental project will generate for the property.

You can see on the left-hand column there, the current operations are anticipated to recover another 600,000 barrels, a little over 2 BCF of gas. It has an undiscounted income of $5.8 million and a present worth of $3 million.

The incremental proposed unit is anticipated to recover 3.7 million barrels and another 1.2 BCF of gas. It's going to cost $5.6 million and generate an undiscounted income of a little over $50 million. This is a 9-to-1 return on the investment.

The present worth profit at 10 percent is $14.5 million for the project, and down below we show what price scenario these economics were ran at. The price per barrel was $15.87 for the first two years and escalated thereafter. Gas was $2.41 an MCF and escalated thereafter.

Q. Is the portion of the pool being unitized suitable for waterflooding?

A. Yes, it is.

Q. Is the project area so depleted that it's prudent to apply an enhanced recovery program at this time?

A. Yes, it is.

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

A. Yes, it is.

Q. Will the value of the oil and gas recovered by

unit operations exceed unit costs plus a reasonable profit?

A. Yes, it will.

Q. And will waterflood operations result in the recovery of substantially more hydrocarbons from the pool than will otherwise be recovered?

A. Yes, it will.

Q. In your opinion, will unitization and secondary recovery benefit the working interests and royalty owners in the unit?

A. Yes, it will.

Q. And is unitized management and operation of this Delaware reservoir reasonably necessary to effectively carry on waterflood operations?

A. Yes, it is.

Q. Finally, because of the estimated additional production, does St. Mary request that wells in the proposed unit qualify for the recovered oil tax rate?

A. Yes, it does.

Q. Now, let's discuss the tract-allocation formula, Mr. Lee. That formula is set forth in Section 13 of the unit agreement.

Do you believe this formula allocates produced and saved hydrocarbons to each tract on a fair, reasonable and equitable basis?

A. Yes, I do.

Q. Would you discuss for the Examiner the reasons for selecting the participation parameters in Section 13 of the unit agreement and why you think that formula is fair?

Exhibit 3 is the unit agreement, Mr. Examiner.

EXAMINER CATANACH: Where is that participation formula?

MR. BRUCE: Section 13 -- Go to page 11, Mr. Examiner.

EXAMINER CATANACH: Okay.

Q. (By Mr. Bruce) Okay, Mr. Lee, go ahead and discuss the parameters.

A. Okay. When it comes to choosing parameters for a secondary project like this, it becomes quite a balancing act sometimes, and in a perfect world, you know, we want to try to keep everybody whole from the standpoint of current cash flow, and also to allocate the future waterflood reserves to the tracts that those reserves and benefits are derived from.

And we examined several potential parameters, and of course you realize that some parameters deserve a higher weighting factor in the unit formula than others do. This is because some of the parameters are more indicative of keeping people whole or to allocate future waterflood reserves. And we need to give credit for the waterflood reserves that come from our tract and not necessarily the

neighbors' tract.

Now, some parameters, it's going to be easier to define and agree upon than other parameters, where there's more interpretation involved. Not that those parameters are going to be in error, but it's just that everybody's going to look at that data a little bit differently.

Now, St. Mary has attempted to choose several parameters and to blend them in a way that's going to be fair to all parties. One of the parameters that they're using is acres, and they give that five-percent-of-the-unit formula. And acres provides a number that, you know, may not be indicative of current cash flow or waterflood potential.

In this particular project all the acreage is developed. The wells are drilled on every tract there. And since it's not indicative of waterflood potential, it's been given a very small percentage of the unit, only five percent. It was included to satisfy some owners who may feel that the area that they're involved in needs to be compensated to them in a project like this.

The cumulative oil was included because cumulative oil produced, you know, can sometimes be indicative of future waterflood recovery. The better the reservoir is, the more oil it will produce on primaries and should also therefore produce more secondary reserves.

Now, this is not always true in circumstances where reservoirs -- its pressure has been dropping dramatically during primary development or the development occurs over a very long period of time. But that's not the case here. All these wells were drilled over a period of about two, two and a half years, and therefore we feel that cumulative oil is a parameter that should carry a fairly good part of the unit formula here, and we give it 15 percent.

The oil rate was given 25 percent of the proposed unit formula. The oil rate is going to be important to protect people's current cash flow. And it may or may not be indicative of future secondary potential, such as a situation where you have some recent wells drilled and compared to wells of a much older vintage. Once again, that's not the case here at Shugart.

And for the most part, we feel that the wells with the higher rates have the better cums and generally will have the better remaining reserves, and this should be indicative of better secondary reserves. The oil rate is the second-largest parameter in the formula.

Original oil in place was given a 40-percent weighting factor in the formula. We feel that oil in place is the most important single factor that's indicative of future waterflood potential, particularly where there are

adequate modern logs to analyze and a reservoir simulation that was ran to -- that utilized and matched all the historical production. Based on the log and simulation analysis, we feel very confident with our oil-in-place number.

Oil in place is also the factor where people with behind-pipe reserves that are not open to the wellbore at this point in time will get some credit for those reserves.

The last parameter that we used was the remaining primary reserves, and we gave that 15 percent of the weighting factor of the formula. Remaining primary reserves may not necessarily reflect the future secondary potential, but it does reflect the current primary value of each tract. At Shugart, the remaining primary reserves are generally indicative of the future reserve potential, and that's why we gave it the 15 percent there, in the formula.

MR. BRUCE: Mr. Examiner, just for your information, Exhibit C to the unit agreement carries a calculation or contains a calculation of each factor as it's attributed to each tract.

Q. (By Mr. Bruce) Mr. Lee, in your opinion does the weighting of these factors, as set forth in the unit agreement fairly allocate production for this reservoir?

A. Yes, it does.

Q. Now, let's go over the injections. Would you

identify Exhibit 29 for the Examiner?

A. Exhibit 29 is the C-108 for the proposed East Shugart (Delaware) flood.

Q. Would you please describe how the injection wells will be completed for the project?

A. Yes, the well that we're going to convert, the South Taylor 13-3, is shown in Section III of the C-108. It's the first well there. What I present for each well is a table showing the information tabular, and then a wellbore diagram. The South Taylor 13-3 has two diagrams, one its current configuration, and then a proposed configuration.

Currently, the 13-3 is completed in the Delaware and the Grayburg. It's TA'd right now, has a cast-iron bridge plug set at 4781. The plan would be to go in and squeeze off the existing perfs and to perforate the Delaware horizon from 5090 to 5420.

The rest of the sheets in Section III contain the tabular data and a wellbore diagram of the proposed injection wells. Also, I'd like to point out that on the South Taylor 3, the cement was circulated both on the surface string and on the long string.

The rest of the injection wells that were going to be drilled out here, we anticipate setting 8-5/8-inch pipe at about 350 feet, circulating that to surface, and

then run 5 1/2 to TD, which is probably going to be around 5500 to 5550. Once again, we're going to circulate cement to surface on the long string. Then we'll put in some injection tubing generally, to a depth of about 5000 feet. Most of the top perforations are going to be from 5050 to 5090. The injection tubing will be set within 100 feet of the top perf, and it will be either plastic or PVC-lined pipe.

Q. Moving on to your Section V, how many wells are there in the area of review?

A. Section V is a map of the area with a half-mile radius drawn around each proposed injection well. There's 24 wells within the half-mile radius of the injectors, which penetrate the Delaware. A listing of those wells and their completion information is found at Section VI.

Q. Are any of these wells plugged and abandoned?

A. No, they're not. There are some TA'd wells, but no plugged and abandoned wells.

Q. Are the wells in the area of review properly completed, and will they prevent the movement of fluids to other zones?

A. Yes, they will. These wells typically have surface pipe set down to 350 to 900 feet, cemented to surface, and then the production casing is normally set from 5500 to 6500 and once again cemented to surface.

These are all new wells, drilled since 1984.

Two wells did not have their long string circulated to surface. One is the Geronimo 1, the second from the top. The top of cement on the long string there is 2100 feet. It's currently producing out of the Penrose-Grayburg. And the other well is the Geronimo Number 4, which had top of cement at about 2200 feet. It is completed in the Delaware at 5016 feet, so we've got about 2800 feet of cement above our Delaware zones that we feel like -- that will prevent the movement of fluids.

Q. Moving on to Sections VII through XII of your exhibit, would you summarize the proposed injection operations?

A. We anticipate an average injection rate of 150 barrels of water a day per well in this area, with a maximum rate of about 300 barrels of water a day per well. We're going to have a closed system. The anticipated maximum injection pressure is 1000 pounds. Once again, all these wells will be completed with a top perf just below 5000 feet, so the 1000-pound maximum pressure complies with the .2-p.s.i.-per-foot gradient recommended by the OCD. The average injection pressure we anticipate to be about 700 pounds, though.

Q. But you won't be higher than the maximum?

A. That's correct.

Q. Is there a proposed stimulation program for the injection wells?

A. Currently, the operator is going to drill the wells and perforate them and see what kind of injection rates they can achieve. After perforating and acidizing, eventually they may frac all the proposed injection wells.

Q. Moving on to the next tab in your exhibit, could you identify where the freshwater wells are in this area?

A. Yes, this is a map of the area, with a one-mile radius drawn around each proposed injection well, and the red hexagons are the freshwater wells of record in the Shugart area.

Q. What is the source of the injection water?

A. We're going to get our injection water -- It's going to be produced water from the Shugart field, and we will acquire makeup water from the Heyco's Young Deep Prospect, Project, over to the east and also the Tamano Bone Spring flood operated by Marathon a little bit northwest of our project there at Shugart.

The water analysis shown in the next tab indicates that mixing of these waters will generate some scaling tendencies between the injection waters and the formation waters, but the operator is aware of that scaling tendency and has chemical company recommendations to prevent those scales from forming. The water can be

treated.

Q. And that treating will take care of any problems?

A. That's correct.

Q. Were Exhibits 22 through 29 prepared by you or under your direction?

A. Yes, they were.

Q. And in your opinion is the granting of these Applications in the interests of conservation and the prevention of waste?

A. Yes, they are.

MR. BRUCE: Mr. Examiner, I'd move the admission of St. Mary Exhibits 22 through 29.

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: Exhibits 22 through 29 will be admitted as evidence.

Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Lee, Mr. Bachman passed the question to you --

A. Yes, he did --

Q. If you could look at Exhibit -- cross-section -- There are a couple of these. I think it's B-B' --

A. Yes.

Q. -- and on the log section for the Inca Number 2 there area a couple of entries where it says, "perf, frac screened out". What does that mean?

A. The frac screened out during the frac procedure, for various reasons. Either there wasn't enough pad in front of the job where there was leakoff to the point that the pressure, the injection pressure to surface reached a point where it was unsafe and the frac was shut down prematurely, before getting it all away. But these were -- did get some sand into them, I don't know how much, and they are open and producing.

Q. These are producing intervals?

A. Yes.

Q. If we look at the log on the Conoco Federal Number 1, the second to the left, and we come down on the log to zone 9, and it says "perf and squeeze", what does that mean?

A. That would mean that the well was perforated and then it looks like it indicates that it was squeezed with cement for some reason.

Q. Is that a producing interval on that well, to your knowledge?

A. I don't know, maybe I can tell you here. Bill, I think it is. I'm not going to be positive. I do show it as a completion interval on my table of wells.

Q. "Squeeze" doesn't suggest to you it's not now producing?

A. "Squeeze" would indicate to me that it's not producing, so I need to check on that and see.

Q. Is there any way, do you know, Mr. Lee, to determine in the Conoco Federal Number 1, whether the production would be coming from that lower interval or the other one that's open?

A. I'd have to go look at the well file, Bill, and see what was done and see if it was, you know, recompleted or restimulated after that squeeze job. Maybe that didn't get on the cross-section or --

Q. But you don't know, is the answer? You don't --

A. I don't know, that's correct.

Q. It says "squeeze", and that's it?

A. That's what it says.

Q. All right, let's go to A-A' and look at the Geronimo Number 9, the second well from the left. And the lower entry on that log says "perforate and frac", and I can't read the next thing, but it says then "plugged off".

A. Yes, it says "frac FM". I'm assuming "formation".

Q. Okay, formation plugged off. Is that lower zone, in your opinion, producing in that well?

A. I don't know. It says its plugged off on the --

Q. Do you think it's fair for me --

A. -- cross-section.

Q. -- to suspect that if the formation is plugged off, it's not producing?

A. That's probably a fair assumption. That zone, though, it does sit right underneath a wet zone right here too, and once again I just need to go back and look at the original completion, but if it was perforated, frac'd, we may have frac'd into the water there, and maybe that's what was plugged off.

But I don't have a recollection of that well. It was before I worked at Siete.

Q. Were you involved in the selection of the parameters for the unit agreement?

A. Bob and I discussed the parameters, what should be used and --

Q. "Bob" is who?

A. Bob Bachman, I'm sorry, Bob Bachman.

-- discussed the parameters to be used, the -- kind of the merits and pros and cons of each one, and kind of agreed on these five parameters. And then the weighting factor was assigned by St. Mary. And we talked about what was important and what wasn't. But the final numbers was done by Bob.

Q. You indicated that you would put more weight on

the factors that you think would be, or anticipate would be a more reliable indicator of what? Future performance?

A. Yes, and at also trying to keep people whole, though, on their current cash flow. It's kind of a tightrope, sometimes, you walk there.

Q. And when you were trying to develop a formula and keep people whole, are you developing the allocation before you look at the factors?

A. No. No, what was done is, these factors were put in place, and then I've made a couple of calculations on a couple of owners after that, to see if their current production was about the same, what it would be in the unit, which is what it was before unitization.

Q. Were the factors adjusted to keep the cash flow of the individual interest owners constant?

A. No.

Q. There were no adjustments for cash flow?

A. There was no jockeying the parameters around once it was proposed.

Q. But when it was developed, prior to being proposed, did you adjust the factors to accommodate current cash flow?

A. No, it kind of came out that way, Bill, to where once the factors were in place, I ran some calculations, and the current production net was pretty close to what the

unitized production would be net, and it just kind of fell out that way. It wasn't necessarily done on purpose, we just kind of got lucky.

Q. You said there was a balancing involved?

A. Uh-huh.

Q. And I'm just trying to find out -- you indicated, you know, you tried to keep people whole, and based on that, I assume there was some balancing to accommodate current cash flow, and I'd like to know if you adjusted any factor, focusing on cash flow instead of reservoir characteristics.

A. No, we didn't. What I meant by that, Bill, I was saying that in a perfect world you try to do that as best you can.

Q. But it's your testimony here that that did not occur?

A. It did not occur, that's right.

Q. That was not considered?

A. That was not considered, that's correct.

Q. When I look at the factors, acreage, cum oil, well rate, I mean, those don't require interpretation, you just go and get those numbers?

A. That's correct.

Q. When we look at original oil in place, there is an interpretive aspect to that, is there not?

A. That's correct.

Q. And there is an interpretive aspect to remaining primary, correct?

A. Yes, there is.

Q. Now, in trying to determine original oil in place, what methods did you utilize? Did you simply rely on a model?

A. Yes, we took the logs, and they were digitized and they were -- you know, a very -- a lot of time went into getting that data into the model. But yes, the oil-in-place number was based on the model reserves.

Q. Is it basically a material-balance calculation that you're using, or is it independent of that?

A. I'm going to have to let Raj answer that.

Q. And he will be able to identify what factors you utilized --

A. Yes.

Q. -- in input into the model?

A. Yes.

Q. Based on the fact that 40-percent weight in the formula was placed on original oil in place, is it fair for me to assume that St. Mary's believes that is the most reliable way to predict future performance of this unit?

A. Yes, it is. You know, what I would tell you, Bill, yes, yes, it is. The two most important things in

predicting the secondary performance is going to be ultimate primary and oil in place, and here the oil in place comprises 40 percent, and if I take my cumulative oil with my 15-percent factor and my remaining reserves with the 15-percent factor, well now my ultimate primary has a 30-percent weight.

So that's kind of the way that was thought through. Both of those factors are important to predicting secondary potential, and so that's why both of them added together have a fairly substantial part of the unit formula. We just broke apart that ultimate primary into the cumulative and then to the remaining reserves.

Q. Typically, when I would look at an oil-in-place study or calculation --

A. Uh-huh.

Q. -- I would anticipate a methodology being used, either a material-balance approach or a volumetric calculation. And I just want to be sure I understand. That is not the way St. Mary's got to these numbers? They used a model instead?

A. That's correct, the model was used, and Raj --

Q. Okay, the model will predict future performance, correct?

A. Yes, he matches the --

Q. And you also use that to determine original oil

in place; is that correct?

A. That's correct.

Q. So, I mean, I usually -- the thing of a model being to project forward, but you're also using it to -- that model to determine original oil in place?

A. That's correct.

Q. And that model will account for behind-the-pipe pay?

A. That's correct.

Q. Can you tell me if the model will also be able to tell us, if you have the reserves there, whether or not they will be producible?

A. Yes, Raj will address that.

Q. Okay.

A. Raj is going to address that.

Q. I thought you indicated that you were going to test all ten zones, and some of those might or might not be open.

A. Some of the -- You know, based upon what the model indicates, log and mud logs show, some of the stuff -- if it's a wet zone, way over here, there's no need of opening that, if I'm not going to be able to derive any reserves from it.

If the model says that this zone may have a high water saturation but you're going to get some oil swept to

it, in that case it would be opened.

Q. And you're going to go in and actually test each of these zones; is that correct?

A. That's my understanding of what the operator is going to do.

Q. And based on St. Mary's study and modeling of the reservoir, each of those zones will at least have potential, correct?

A. That's correct.

Q. But you're not really going to know if it's going to produce until you go down there and test it; isn't that fair to say?

A. They are saying that the zones that are potential, based upon log analysis and what the model indicates will be tested. But you're right, you won't know exactly until we go test those zones.

Q. Now, when I heard Mr. Bachman testify, he indicated that potentially all ten sands could be the subject of a waterflood effort.

A. That's correct.

Q. Are you suggesting that that would occur at one time?

A. Yes. Yes all sands would be --

Q. How, if you're waterflooding ten zones, are you going to be able to assure that you're, in fact, watering

each of those ten zones?

A. Yes, after -- What I've recommended is, once injection starts, to initiate a fairly regular program of tracer surveys monitoring where the water is going, trying to identify any potential thief zones. That's one of the reasons to go in with this first well by itself, let's put some waterway, let's see what happens here, and that's going to give us some information that will assist us in the future.

And that's one of the things that -- you know, as this project and other projects come to life, where people will benefit from some of the things that we're going to find out here.

But there's thief zones, you know. We'd go in and try to block them off with some column or something like that. We just need to see how bad it is and what the model says the effects may be.

Q. All right. Have you been involved with waterflood projects where, in fact, at one time there's active waterflooding in ten separate intervals in a formation?

A. I've never been involved in anything that big, no, I have not.

Q. If you have no water going into a zone, how would you go about correcting it?

A. If we had no water going into a zone, what I'd suggest is to go in and try to -- some sort of a p.p.i. tool or maybe a plug and a packer, whatever would work best, go in and try to isolate that zone, try to put some sort of a stimulation on it and see if I couldn't enhance the injectivity of it.

Q. You would agree with me, wouldn't you, Mr. Lee, that if you're going to effectively waterflood a reservoir, you have to have communication across the reservoir?

A. That is correct.

Q. That's an essential to an effective waterflood?

A. That's correct.

MR. CARR: That's all I have.

THE WITNESS: Okay. Bill, you give Roy too much paper, is all I can say. He's sitting there --

MR. CARR: You're giving him too much paper.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Lee, the weighted percentages for your allocation formula, those were determined by -- How were those determined?

A. Bob Bachman and I talked about -- and Bob may have discussed with other people also -- parameters to be utilized trying to form a unitization formula and, you know, what's useful and what's not.

For instance, we talked about wellbores. We said, Well, let's not include the wellbores, because everything's active wellbores, and we're putting acreage in. That kind of washes that out.

So we talked about parameters that would be, once again, indicative of the secondary potential and the -- trying to keep people -- not -- well -- it wasn't, you know, specifically saying, Ah, we're going to try to keep people whole, but that is one of the considerations. I guess if we would have gone through these calculations and we found that people were getting squashed on current cash flow, things may have been done differently.

But like I say, the percentages were put on there by St. Mary and, just, you know, calculated a few out and they appeared to, you know, keep people pretty whole.

Q. So none of the other interest owners participated in determining the weight of these factors?

A. Not to my knowledge. I don't know if Bob talked to Heyco or anybody else when it came to determining the actual percentages or not.

Q. With over 90-some percent of the working interest owners agreed, I assume that most of the interest owners have agreed to this allocation formula?

A. Yes, that would be true.

Q. Is it your knowledge that Intoil is the only

interest owner who has not agreed to the participation formula, or is there others?

A. I don't know. I don't know. To my knowledge, Intoil is the only one, but I don't know if there's other people or not.

Q. Okay. Are you trying to permit all of the injection wells at this time --

A. Yes.

Q. -- that will ever be drilled? You're initially going to start out with two injection wells?

A. That's correct. I'd envision trying to get all of them permitted right now. And on the exhibit where I listed the wells, Exhibit Number 25, starting at the bottom third there with the ESDU Number 17, if you come over and look at the location, you can see that these footages are pretty squirrely for the most part, and we would anticipate approval to drill these wells in an unorthodox location.

The reason that these footages are like this is that we're trying to center those injection wells in the middle of the surrounding producing wells, and so it doesn't give you a nice standard location.

Q. So have those locations already been staked?

A. No, they have not.

Q. So you don't know at this point in time whether or not those footages are going to be correct?

A. That's correct. That's my estimate of where I envision to the well to be placed.

Q. Are you guys conducting the same kind of operation down in Parkway? Does it involve multiple sands within that Delaware?

A. The Parkway flood at this point in time is just in one sand, the C sand, down there. I don't know, you may remember there was two other sands. There was an A sand and a B sand above that C sand that's currently being flooded right now.

The C sand was selected because it was open in all zones, and it's my understanding that St. Mary at some future date is going to probably have Raj do some modeling to see what happens when you open the A and the B sand up in that, and then there will be additional zones open there. But it's basically one pretty thick sand there, the Parkway.

Q. With ten zones, are you going to be able to inject sufficient water into these things to get some results?

A. That's one of the reasons, once again, to drill that first injection well. I anticipate we will be able to, because we seem to be able to do that at Parkway with just one zone open there. But that's why we're going to drill the one well, do some studying on it, catch a core

out of it and kind of see what that tells us, watch our injection, and if it's necessary to frac the well, to go in and try to frac it to get our water volumes up to a volume that we can, you know, have an effective flood.

Q. What's the time frame on drilling the additional injection wells?

A. I don't know. That's going to be up to the operator.

Q. On your Exhibit Number 23, the reserve tables, some of these reserves were determined by simulation; is that correct? The original oil in place?

A. The original oil in place is determined by simulation, the waterflood reserves were determined by simulation, the workover and behind-pipe reserves, the 822,000 barrels, was also determined by simulation.

Q. Okay, and those results are going to be presented?

A. Yes, Raj is going to present those.

Q. And all of these were essentially brought on line all around the same period of time, so cumulative production is a fairly accurate --

A. Yes.

Q. -- a fairly fair factor?

A. Yes. I think it was all within about a 2-1/2-year period.

EXAMINER CATANACH: I don't have any questions, any more questions of this witness.

MR. CARR: Mr. Catanach, could I ask just one question to be sure -- I think it's probably for the next witness.

FURTHER EXAMINATION

BY MR. CARR:

Q. Have you calculated the percentage participation, I mean your share of the unit production, the share of unit production that would be attributed to each of these interest owners?

A. No, I have not.

Q. Would that be the next witness who would have done that?

A. The --

Q. Have you taken St. Mary's interest and applied it to this formula to see what percent of produced and saved hydrocarbons out of this unit you would get?

A. Current production or ultimate reserves?

Q. Ultimate. I mean, you're going to, if you run these numbers, I assume, have a share of the produced and saved hydrocarbons that will be paid to St. Mary's once you get the unit up and going.

A. Well, the economics that I presented was for 100 percent of the unit, so you could take the working interest

in the formula and kind of ratio that. But I have not made an economic forecast for each person for the --

Q. Have you done it on St. Mary's?

A. Actually, no.

Q. So you have a formula that you developed and set these parameters, and it's your testimony that you don't know if St. Mary's, when the unit is up and going, if they produce 100 units, they get 60 percent of it or 28 percent of it?

A. Well, they'll get 58 percent. They'll get their unit working interest.

Q. Is that all they get?

A. You're saying of the actual reserves, not what --

Q. Once you apply the formula to the production, there is a percentage that is paid to St. Mary's. What is that? Do you know?

A. It's going to be what's in the unit formula.

Q. Yeah, but when you run that number, don't you get a percentage? I mean, I get 100 barrels of oil, and that is divided based on a participation formula.

A. Right.

Q. And that is so much original oil in place, so much cum, so much remaining. And my question is, of that 100 barrels, how many of those barrels would St. Mary's get under this participation formula that you're proposing?

A. They'd get 58 percent of the barrels.

Q. Is that because that's what their working interest ownership is?

A. Yes.

Q. Well, then why would you need a formula?

A. No, no. Okay, I'm sorry. I'm sorry, okay.

Q. You see, I'm saying --

A. Okay.

Q. -- you've got X-percent ownership, and I'm just asking, have you compared that to what you get when you run a hundred barrels through your formula?

A. Okay, I see what you're saying. You're saying, is 100 barrels with the current interest comparable to what it would be after --

Q. If this unit is approved --

A. -- if this unitization is --

Q. -- and if you're paying under your recommended participation formula?

A. Okay. Actually, Bill, no, I haven't. I looked at Intoil and I looked at Heyco, the Heyco properties.

Q. Does anyone at St. Mary's know that, do you know?

A. I don't know if they have ran through that calculation or not.

MR. CARR: That's all I have --

THE WITNESS: Yeah, I --

MR. CARR: -- thank you.

THE WITNESS: -- sorry.

MR. BRUCE: I have nothing further.

EXAMINER CATANACH: Let's excuse this witness.

Why don't we take a 30-minute break here before we proceed?

(Thereupon, a recess was taken at 12:26 p.m.)

(The following proceedings had at 1:06 p.m.)

EXAMINER CATANACH: Okay, let's call the hearing back to order, and I'll turn it over to Mr. Bruce at this point.

RAJ K. PRASAD,

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 please state your name for the record?

A. My name is Raj K. Prasad.

Q. Could you spell your last name for the court reporter, please?

A. P like Paul, r-a-s-a-d.

Q. Where do you reside?

A. Midland, Texas.

Q. What is your occupation?

A. I'm a reservoir engineering consultant.

Q. And have you consulted with St. Mary's with respect to the proposed East Shugart unit?

A. Yes.

Q. Have you previously testified before the Division?

A. Yes.

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

A. Yes.

Q. And have you prepared or performed work on a reservoir simulation study used in calculating original oil in place?

A. Yes.

MR. BRUCE: Mr. Examiner, I'd tender Mr. Prasad as an expert engineer.

MR. CARR: No objection.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Bruce) Mr. Prasad, could you refer to your first exhibit, Number 30, and identify the data you used in preparing your model?

A. Yes, when I was contacted to do the model study, I was provided with a computerized analysis of the modern logs from 19 wells in this area, and then geological maps that had structure, gross thickness, net thickness and porosity for each ten layers.

I was also given the completion reports, well completion reports and acoustic buildup test data from Geronimo Number 4, Conoco Number 1 and the Inca Number 2 well, and production test data and allocated monthly production data by well.

Q. So you had quite a bit of data at hand?

A. Yes.

Q. Would you refer to Exhibit 31 and maybe just briefly go down the reservoir properties in this pool?

A. Yes. The East Shugart field, the Delaware zone, it was discovered on October of 1985 at an average depth of 5000 feet, and the productive area is about 300 acres. The gross thickness is 438 feet, with a net thickness of 174 feet.

Average porosity is about 17 percent, and average permeability is 3.9 millidarcies, with an average water saturation of 55 percent.

And the oil in place is calculated to be 31.645 million barrels, and per-acre basis is 478 barrels per acre foot.

Q. Let's discuss how you came up with those numbers. Would you identify Exhibit 32 for the Examiner?

A. Yes. Once I got the maps from St. Mary's on this reservoir, they were digitized and incorporated in a reservoir model, and then I got a grid map built for the

Delaware zone.

Originally, I had a larger area included in the model. That area was larger than -- and the whole area was included in this model. Subsequently, when I started history-matching, the outer area, outside the last rows of the wells that were drilled, they did not contribute much to the production performance. So they were cut down and thus we resulted in a smaller model area for the reservoir.

Q. That outer edge of the reservoir wasn't contributing anything to it?

A. No. In fact, if I had included that outer area, I would not be able to match the pressure data that they had collected. So the model told me that the outer area is not contributing to flow.

Q. What does Exhibit 33 show?

A. There was no porosity, permeability -- There was no cores collected from the East Shugart field, but I had early core data from Parkway that I also did the study earlier for St. Mary, so I used that Parkway data for the East Shugart data as a starting point.

And actually, we didn't have to do much changes in this correlation. When we input the permeability data based on this correlation in the East Shugart field, very little changes were made to match the performance, so I felt the Parkway pretty well represents the East Shugart

(Delaware) sand.

Q. And you had worked on the Parkway field on behalf of who? Siete, at the time?

A. At that time, Coastal Management asked me to do the work.

Q. Okay, let's move on to Exhibit 34 and discuss your history-match results.

A. Exhibit 4 [*sic*] shows the history matching results, and I'm presenting the match in terms of oil, gas and water production, cumulative matches, and then I will show you subsequently the performance match graphically.

The oil production, model-calculated oil production, cumulative production, was 2.2 million barrels, and the historical was 2.2, so there was very little error between the model and the historical data: about three percent.

And gas production model calculated 4.9 BCF. Historically, gas production was reported to be 4.7 BCF, and that also resulted at 3.3-percent error. The majority of the error was -- or the difference was in the water-production model. Calculated water production is 1 million barrels, whereas reported production was 1.8 million barrels, which calculates to be about 39.5-percent difference.

Q. And we'll discuss the reasons for that in a

minute, won't we?

A. Yes.

Q. Okay. Now, you said you made a few changes. You note one down at the bottom. What did you change in the model?

A. Okay, the -- Like I said earlier, the model was initiated with the geologic map prepared by Mr. Bachman, and -- but the only change that I made to match this performance volumetrically, the only change that I made to the log properties, which is thickness and the net pay and porosity, was that I changed 20 percent -- reduced the volume in the Geronimo lease by 20 percent. The other areas were not changed at all.

Q. To the best of your knowledge, Intoil does not have an interest in the Geronimo lease?

A. I don't think so.

Q. Now, is it unusual to make so few changes in a model?

A. Most of the time that I've run model study I've made more changes than this model. So I felt pretty comfortable about the results from this model.

Q. And the history match on the oil and gas, in your opinion, is that very good?

A. Yeah, but before I go to that, let me explain. There were other changes made in this model, which was

permeability-related. There were a few blocks where the permeability was changed, but there was no change in the volumetric data.

Q. Do you consider your match very good with the data?

A. I consider it excellent.

Q. And due to this excellent match, do you have confidence in the original oil-in-place numbers?

A. Yes, I do.

Q. Let's go just liquid by liquid and talk about the history match. Could you refer to your Exhibit 35 and inform the Examiner about that exhibit?

A. Exhibit 35 shows the oil production rate versus time. The red curve is the measured data for the entire field, and the black is the model-calculated oil production data.

And you'll see that the match is excellent up until 1995, and then the model calculates a little higher production than what the actual data was reported.

Q. Referring to your Exhibit 36, could you discuss a reason for that discrepancy just in the last couple years of the lives of these wells?

A. Yes, the reason for the fact that the actual data is calculating lower oil production than the model calculated is because there is a fracture healing taking

place in the wells in this area.

The majority of these wells were frac'd with about -- different frac jobs, different length of the frac jobs, but they were all frac'd. But a build-up test was run in May of 1997 in four -- three wells, Inca Number 1, Inca Number 2 and Jade Number 1, and they were analyzed, and the analysis shows that the fracture length is zero, which -- the fractures were created earlier, but now the fractures are not effectively -- not giving any benefit of the production. So that is one reason that the actual production has declined than the model calculated.

And the Geronimo Number 4 was tested in October 7th, which also shows a zero frac length, and a test which was run in July, 1994, which was prior to this test, at that time the fracture length was calculated to be anywhere from 77 to 146 feet.

Q. And that would reduce the actual oil production?

A. Right, yeah.

Q. Okay. Let's move on to your Exhibit 37 and discuss the gas production.

A. Exhibit 37 shows the gas production rate versus time. The red curve is for the actual measured data, and the black is the model-calculated, and I would consider the match to be excellent.

Q. Okay, let's move on to the next one, the water

match, Exhibit 38, and discuss the match and the reason why it's not so good.

A. The water match is excellent up to 1989 and 1990, and then the model-calculated production is much lower than the measured data. About -- During the last few years, the measured data is indicated to be about 600 barrels a day, and the model is indicated to be about 200 barrels a day.

And we started investigating why this difference is occurring, and we found that in the Inca lease, they were getting some water from another lease for disposal, and that water got misaccounted into -- as the lease production.

And if you look at the next page of this exhibit, you will see that there is about -- the water production is shown as a dashed line, and right after 1992-93, there's a big jump in the water production from this lease, and this water didn't come from the Delaware sand; it came from another lease that they were disposing from.

Q. And recently, in 1997 or 1998, that has been corrected?

A. That has been corrected.

Q. And that shows why the water volumes again decreased --

A. Right.

Q. -- significantly?

A. Exactly, exactly.

Q. And if it hadn't been for that misallocation, the match on your model would have been --

A. -- pretty good.

Q. -- pretty good.

What does Exhibit 39 show?

A. Exhibit 39 shows the pressure matches, the -- 1997 and 1994, the pressures that were collected from the Conoco Number 1, Inca Number 2 and Geronimo Number 4 were matched by the model-calculated value. The black line is the model calculated, and the pluses are the measured data. And I will say that the match is very good.

Q. There's not a lot of pressure data early in the life of this pool, is there?

A. No, we don't have.

Q. Okay. Let's move on to your Exhibit 40 and discuss the performance predictions that you ran for this proposed unit.

A. I ran several prediction runs, and then we optimized on the waterflood case, the best case that we wanted to do, which did not require excessive investment and also gave a good return on the investment.

So we have -- We're going to present you the four cases that are included in this for our presentation.

Number one is the primary depletion with existing

perforations. That will give us a baseline case.

The second case is primary depletion with the existing plus added perforations. As earlier mentioned by Mr. Bachman, quite a few zones have not been perforated yet, and I think if we open those zones we will get some additional production. So we ran the case in which we opened every zone that can be possibly opened, which will make oil, and ran a case for that case.

And the third case is a waterflood with the current perforations only, not opening any additional perf but doing the waterflood without any additional perforations, and by drilling nine injection wells and converting Taylor Number 3 to injector.

And the last case is a waterflood with existing and added perforations, using nine injection wells and converting Taylor 3 to injection.

Q. What were the results of your runs?

A. Results are graphically presented in Figure 41. The solid line shows the oil production based on the -- for the depletion case, under the current perforations. And then the dashed line shows the depletion case with added perforations.

And the dotted line is the secondary -- I mean the waterflood with the added perforations, existing plus added perforations. I didn't present the waterflood with

the current perforations, only because the curve will get very busy.

Q. Okay. One thing, regardless -- Certainly adding the waterflood with the nine wells, as your model showed, you would recover substantial additional oil from this unit?

A. Yes, that's correct.

Q. Now, you mentioned on Exhibit 4, it talks about drilling nine injection wells, and Mr. Lee stated that at this point only eight would be drilled. What's the difference in numbers?

A. Yes, we ran the model with the injector located on the west side of the lease in Tract 5G. That injector will be drilled only when the performance indicates that this conversion Taylor Number 3 is not adequate to provide support to the adjoining wells.

Q. So it would only be drilled if the Taylor Number 3 is not adequate?

A. Right. Yeah, exactly.

Q. Would you refer to your Exhibit 42 and discuss the conclusions of your reservoir study?

A. Yes, our study indicates that it is feasible to waterflood the Delaware zone of the East Shugart field.

Primary reserves for the existing perforations are calculated to be about a million barrels.

Primary reserves for the behind-pipe zone within the Delaware formation calculated to be about 360,000 barrels.

Secondary reserves using existing perforations are calculated to be 1.3 million barrels.

And secondary reserves for the behind-pipe zone are calculated to be also about 1.3 million barrels.

And the total results, including primary existing plus behind pipe and secondary existing plus behind pipe is about 4 million barrels.

Again, these numbers are based on my model study, which was run up to the year 2002. So this is not uneconomic reserves that I'm reporting here.

Q. Were Exhibits 30 through 42 prepared by you or under your direction?

A. Yes.

Q. In your opinion, is the granting of St. Mary's Applications in the interests of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I'd move the admission of Exhibits 30 through 42.

EXAMINER CATANACH: Exhibits 30 through 42 will be admitted as evidence.

Mr. Carr, your witness.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Prasad, if I understand your model, it was designed to, on the one hand, predict reservoir performance; is that correct?

A. Yes.

Q. And you also -- did you use -- you used the model to estimate behind-pipe reserves; that's also correct?

A. Yes.

Q. And you took -- As you approached the model, you built it on the geologic presentation that was given to you. You didn't independently go behind the mapping?

A. No, I sure didn't.

Q. The only adjustment, if I understand it, that you made was, you made an adjustment for the Geronimo Number 9.

A. Volumetrically.

Q. And you did that because some of it had been squeezed off; is that right?

A. No.

Q. Why was that?

A. The completion report that was provided to me was incorporated in the model --

Q. All right.

A. -- as it was. For example, if the zone was completed in 1, 2, 3, then the model also completed 1

through 3, and left 4 through 10 uncompleted. And if the zone was completed 1 through 6, and then subsequently the sixth zone was squeezed, then I squeezed that zone in the model.

Q. At that time?

A. At that time.

Q. For that one well?

A. For that well, yes.

Q. And that was all, just for that well?

A. No, and that was done for each and every well's completion history. I requested them to give me the completion history for each and every well.

Q. Okay.

A. And I incorporated the completion history data in the model.

Q. Okay. When you are doing that and you adjust for that wellbore, you're reacting to a bit of known information, correct?

A. Right.

Q. When you are projecting behind-pipe reserves, you can't calculate or account for things that you don't know yet, right?

A. I didn't follow your question.

Q. When you drill another well or when you perforate a zone that is now behind pipe --

A. Yes.

Q. -- if you have to, after you perforate it, squeeze it or do something else, you can't calculate or account for that until that happens, right?

A. Yes.

Q. Now, when you approach this and you take the geological presentation, were you assuming there was communication across the reservoir in each of the ten zones as mapped?

A. Within the layer, within the layer there is communication. But there areas of the model where the layer is not permeable or enough -- 14-percent porosity cutoff.

Q. And how did you allow for that?

A. That -- For example, I have the map which shows that in a certain area there is -- Zone 3 may be present in all the areas except this portion of the rock that the zone 3 is not present. That was incorporated in the model. So --

Q. And you --

A. -- so the area -- I mean, continuity of the layer will not be there actually, and it's not there in the model also.

Q. And that's based on actual data obtained when the well was drilled?

A. That's based on the geological interpretation of Mr. Bachman.

Q. And that was based on the well data and the things he presented earlier today?

A. Yes.

Q. And you're familiar with how geological interpretations are made, correct?

A. I'm only familiar that I know the maps and I can read the maps.

Q. And if there was additional drilling or some changes, that's something we only know once we drill?

A. Exactly, correct.

Q. When you developed your model, you included all ten zones?

A. Exactly.

Q. And did you have separate parameters for each of those zones?

A. Yes.

Q. And when you get down to the deeper zone, zone 10 --

A. Yes.

Q. -- did you assume that it was going to be producing or would produce?

A. A portion of it, not all of it.

Q. Not all of it? Did you assume that the portion

of zone 10 which was shaded green included within those geological structure maps above the oil-water contact, did you assume they would produce?

A. The geologic map is based on high water saturation. In the model that I create, we have to find the oil-water contact and calculate the water saturation by capillarity for the area above the oil-water contact.

In this model study I did vary the oil-water contact until I got a good match on the performance.

Q. So you didn't just draw a line at the oil-water contact: This is in, that's out?

A. No. No, that's -- No, we have a saturation gradation from the oil-water contact to the top of the zone.

Q. Did you assume that everything that had water saturation of less than 60 percent was going to contribute something?

A. The model kept -- it may -- less than 60 percent, it may make only one barrel, it may make 100 barrels of water. But I did not say that since it is 60-percent water saturation, then this thickness will be out. That thickness, that net-pay production data is still there in the model.

Q. And you assumed it would all contribute if it was within the -- at some level with the --

A. If you open that zone, yeah, it will produce. It will produce with a high water production.

Q. And if we do like Dr. Lee, or Mr. Lee, indicated, you go and you drill and you complete in zone 10, and it's too wet to produce, that still, in terms of the model, would be in?

A. If it's going to be uneconomical production, then I'm sure they will squeeze it and not produce it. There's not reason to produce something that's not economical.

Q. But you can't cut that out now until they do that, correct? It's still -- That reservoir is in the model?

A. Yes, but the model also produces zones on the basis of economical --

Q. Now, you --

A. -- perceived economical data.

Q. -- you took the data, you constructed your model, and you got a good match?

A. Right.

Q. And at that point in time, we're only looking at production that at this time is open in the reservoir? That match has nothing to do with behind the pipe, right?

A. That match -- Yes, exactly true.

Q. Because you don't have anything to match to except what is open?

A. Exactly true.

Q. And you are assuming as you go forward that you're going to open behind the pipe, and it's going to perform pretty much like what you've seen of the reservoir that's open?

A. Exactly. And the reason I feel comfortable doing that, because if the existing perf matches and the geologic work was not done -- was done the same for the existing perf as it was done for the behind-pipe, so if my model says the existing perf performance matches, then by inherent -- by conclusion I can say that there's a good probability that the behind-pipe reserves will come also, as predicted by the model.

Q. And you're assuming that for some reason they selected certain things to perforate now and others they perforate when they drilled the well?

A. If they were -- I mean, if -- Any Fruitland operator will perforate the zones which will be less water productive, because they don't have water injection wells, they will have to haul that water, and they will perforate zones which will make more water later on when they have water-handling facilities.

Q. And what you're doing, then, is assuming what's behind the pipe is going to perform like what you have that is open?

A. Yes. I mean, not in the same performance, but the performance that the model has calculated.

Q. When you construct your various models --

A. Performance is totally different for the behind-pipe versus what it is, the current perforations.

Q. When you're developing your different performance predictions and you have primary depletion with existing plus added perforations --

A. Right.

Q. -- were you assuming that everything behind pipe would be opened in that calculation?

A. Everything behind pipe that economically can be produced.

Q. Everything with more than 14-percent porosity, the yellow on these maps?

A. Everything that will make at least three -- there was some -- The well has to make about 3 barrels a day.

Q. All right.

A. That's the economics to be put in the model.

Q. And when you are estimating that you're going to add these perforations and you're going to add all of it, are you adding more than just those zones on these cross-sections that have 14-percent or more porosity?

A. No, we are adding only the 14-percent --

Q. All right, so you're assuming that all of this is

open to get --

A. No. No, no. Only the zones which are 14 percent --

Q. Right.

A. -- or more.

Q. All of those that are in yellow that show more than --

A. Yes.

Q. -- 14 percent --

A. Yes.

Q. -- you assume that every foot of that is open --

A. Right.

Q. -- when you run this model, adding this to the existing --

A. Exactly, yes.

MR. CARR: Thank you, that's all.

EXAMINATION

BY EXAMINER CATANACH:

Q. Once you had your model, your reservoir model, in place, you ran the calculations for each of the wells in this area?

A. Yes, I did.

Q. And are those results presented somewhere in this package, or did you not -- are we not presenting those actual numbers?

A. I have --

MR. BRUCE: We can submit them. If you would like copies, we would --

EXAMINER CATANACH: Well, I mean, those are the numbers that are used in the allocation formula, which ultimately determines the percentage; is that right? I mean, those numbers say the remaining primary and things like that. Those are the numbers that you plugged into the allocation formula, right?

MR. BRUCE: Yeah. Do you have those?

THE WITNESS: I think -- I've got the number, yes.

MR. BRUCE: Mr. Examiner, and Mr. Lee can testify to this matter. The remaining reserves come off decline-curve analysis, and the cumulative production is off of *Dwight's*.

EXAMINER CATANACH: The cumulative production is from *Dwight's*. And what was the other one?

MR. BRUCE: The remaining primary.

MR. LEE: The remaining primary came from decline-curve analysis, ran out on economics. The oil in place came out of the model. Acres and acres came off the tract map.

Q. (By Examiner Catanach) Well, what I'm asking, is the original oil in place, is that presented somewhere? Is

that data for each well presented somewhere?

A. I don't have --

MR. LEE: No. We can.

MR. BRUCE: Yeah, we do have that, Mr. Examiner.

EXAMINER CATANACH: Well, I mean in your -- When you calculate all the factors in your allocation formula, I mean, are each of these available somewhere, these numbers?

MR. BRUCE: Oh, yeah, I was going to recall Mr. Lee at some point if there's a couple clarification points, but he does have the original oil in place numbers by tract.

EXAMINER CATANACH: Okay, and that's what was used in the allocation formula?

MR. BRUCE: Yes.

EXAMINER CATANACH: Okay, that was my question, is that available at some point?

MR. BRUCE: Yes, we'll submit that to you.

EXAMINER CATANACH: Okay.

Q. (By Examiner Catanach) I guess I'm a little unclear about how you determine -- Say you've got a well that had four zones that were perforated --

A. Uh-huh.

Q. -- and six zones that were not perforated.

A. Right.

Q. How did you determine whether or not to include

the six zones in the model? Did you say anything with 14-percent porosity or above?

A. Yeah, if that zone doesn't have 14-percent porosity or above --

Q. Okay.

A. -- then the net pay in that model has been assigned zero --

Q. Okay.

A. -- so it will not produce, it will not complete that well.

Q. Okay, if it has -- Say it did qualify under the 14 percent, but it was below the oil-water contact. It was then not included?

A. The oil-water contact is pretty much below the tenth layer. There is high water saturation layers above the tenth layer --

Q. Okay.

A. -- and if it was making 100-percent water, we -- You know, even though we opened that in the model, then we shut it -- then we didn't use that as a prediction. But we kept the high water producing -- You know, even though the water production was maybe 30 times the oil production, we kept it open.

So the -- Based on the saturation, once I open that zone, that zone will make X barrels of oil and Y

barrels of water. And as long as the total well production was economical, I let it produce.

And that's why you will see that the -- on the behind-pipe case, even though we got a pretty good kick early on, but the results are only -- I mean, not much results. There are only 360,000 barrels of reserves that we have behind pipe primarily.

EXAMINER CATANACH: Okay, I think that's all I have for now. I may ask another question or two.

MR. BRUCE: Okay.

EXAMINER CATANACH: Are you going to recall Mr. Lee? Is that --

MR. BRUCE: I can have him -- Yeah, just to present that figure, those figures you want at this point.

Mr. Examiner, if the record could reflect that Mr. Lee has already been sworn in and qualified as an expert.

EXAMINER CATANACH: The record shall so reflect.

ROBERT LEE (Recalled),

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Lee, what does Exhibit 43 show?

A. Exhibit 43 is a table showing the wells there on

the left-hand side, and it's a spreadsheet with the waterflood parameters presented across to the right. The first three columns are for acres. The first column is the acres attributed to each of these wells. And I put well names, I didn't put the tract numbers on there, but it's just the well names.

Then I show what the percentage for each well, what percent of the acres each tract combines. Then I show what percent of the unit that percentage of acres contributes, based upon the parameter percent, which I show down here on the bottom, where I have "Parameter %" across each one of those.

Next one over would be oil in place. And these numbers were taken out of Raj's model for each tract. And then once again showing the percent that each well would have of the oil in place for the total unit and then, based on our 40-percent factor, the percent of the unit that each one of those wells would have attributed to it.

The cumulative oil is as of 6-98, and this was taken off of *Dwight's* and I think probably a few C-115s. I was putting this together in June, and *Dwight's* was lagging pretty much, but I had the C-115s and *Dwight's*. And kind of the same calculation, percent of the total and then the -- for the unit.

Remaining reserves is based upon an economic

calculation that was made based on projections made on 7-98, right after my cumulative oil went right up to, then, a projection was made of remaining reserves.

And then in the last column, or last set of data there, I have rate. And the rate is the barrels that was produced between January and up to 6-1 of 1998. It includes January through and including May, and that's the rate -- that's where I get my rate calculation, and once again, a percent of the rate, percent of the unit.

The very last column is the tract unit factor showing for each well what part of the unit it would have attributable to it based upon these parameters at these factors. And the way you get that is, you add up those acres percent of unit, oil in place percent of unit, cum oil percent of unit, remaining reserves percent of unit and rate percent of unit. That's what you add up, and that's how you get your total.

MR. BRUCE: Mr. Examiner, on Exhibit 1 you can see which tracts they are assigned to. The only difference is, the Inca 1, 2 and 3 are all on one tract.

THE WITNESS: Yes.

Q. (By Mr. Bruce) And Mr. Lee, this is how you came up with the percentages allocated to each tract --

A. Yes.

Q. -- under the unit agreement?

A. That's correct. And I provided this to St. Mary's for use in the unit agreements.

Q. And you prepared this?

A. Yes, I did.

MR. BRUCE: Mr. Examiner, I would move the admission of St. Mary Exhibit 43.

MR. CARR: No objection.

EXAMINER CATANACH: Exhibit Number 43 will be admitted as evidence.

Do you have any questions?

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Lee, if I look at Exhibit 43, what does -- can you tell me -- in the far right column is the percentage of the total unit production that will be allocated back to each of those tracts?

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

Q. Now, to take that one step farther --

A. Okay, one quick -- That will be the working interest.

Q. Right.

A. And then, you know, it will rated back by the royalty interest --

Q. And if --

A. -- that's -- Right.

Q. And if you wanted to know what percentage of the total unit production St. Mary's would receive, you would need to take that tract participation percentage, and then we would have to go back, I think, to Exhibit 6, which shows the gross working interest by tract, and multiply that out; is that right?

MR. BRUCE: It would be either Exhibit 6 or Exhibit 7.

MR. CARR: It's the exhibit that shows the gross --

MR. BRUCE: Exhibit 6 --

MR. CARR: And --

MR. BRUCE: -- and that would be the gross working --

Q. (By Mr. Carr) And so with --

MR. BRUCE: -- interest --

Q. (By Mr. Carr) -- that calculation we could determine how much of the unit production would be paid to St. Mary's?

A. Yes, yes.

Q. Have you done that?

A. Yes, we have.

Q. And what would that percentage be? Do you know?

MR. BRUCE: Are you talking percentage or barrels per day or what?

Q. (By Mr. Carr) I'd like to know the percentage of the unit production allocated to St. Mary's.

A. Okay. During our break we took some time and we did prepare that, and I have it on a handwritten sheet, Bill. I don't have it with me right here. I have it back there. Do you want me --

Q. Could you just give me the --

A. -- to grab that now, or --

Q. Could you just give me the total?

A. I could calculate it, except I forgot my calculator.

I was concerned about net barrels a day, and we used the royalty interest, and adding up the rates from some decline curves that I had there, I calculated the -- picking the numbers off of just, you know, the decline curves, about 166, 167 barrels a day for the unit. And St. Mary's would receive 73 of those barrels based upon, like you were saying, netting out, their interest on each one of these wells.

And then if you take the unit revenue interest, which was 44 percent -- a little over 44 percent for St. Mary's, took it times the 167 barrels a day that I calculated picking numbers off those decline curves, it came up to -- I think the difference was about a half barrel. One was 73.5 and the other was about 73. They

were real close.

Q. All right, and what percentage does that give you of the saved -- produced and saved working interest share that goes to St. Mary's?

A. It would be 73 divided by 167.

MR. BRUCE: I believe in Exhibit 6 it would be some 58-plus percent.

THE WITNESS: 43.7 percent.

MR. BRUCE: Bill, one of those exhibits has the net -- or the gross working interest, which I believe is around 58 percent, and the net revenue interest after deducting the royalty and overrides would be about that. It's on one of those exhibits.

MR. CARR: Net would be 43?

MR. BRUCE: 43 or 44.

MR. CARR: And the gross working interest...?

MR. BRUCE: 58-plus percent.

MR. CARR: Okay, thank you.

EXAMINER CATANACH: Anything further of this witness?

MR. CARR: Nothing.

EXAMINER CATANACH: This witness may be excused.

MR. BRUCE: Mr. Examiner, that's all I have at this time.

EXAMINER CATANACH: Thank you.

Mr. Carr?

MR. CARR: Mr. Examiner, at this time we'd call Roy Williams.

ROY C. WILLIAMSON,

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. Roy C. Williamson.

Q. Mr. Williamson, where do you reside?

A. I live in Midland, Texas.

Q. By whom are you employed?

A. I am president and chief executive officer of Williamson Petroleum Consultants, and I have been hired in this case as a consultant to Intoil.

Q. Would you briefly summarize your educational background for the Examiner?

A. I graduated from the University of Oklahoma in 1956 with bachelor of science degrees in petroleum engineering and geological engineering, and then in 1964 I took an advanced engineering short course at Texas A&M.

Q. Generally review your work experience.

A. I got out of school and went to work for Uncle Sam and was in the Air Force for a couple of years. And

then I went to work for Gulf Oil Corporation in about 1959 through 1967. And while with Gulf I was involved doing reservoir studies, waterflood studies. I was Gulf's representative to most of their unitization studies and meetings, and I testified before the various railroad commissions on regulatory matters for Gulf.

I left Gulf and joined our predecessor consulting firm, which is now Williamson Petroleum Consultants. That company has been in business since about 1956, actually before I went to work for them. And since then I have continued to do reservoir studies, I've done expert testimony work in the courts, I've done testimony before the regulatory bodies, evaluated exploration projects, prepared reports for public companies, taken public companies public with their reserve analysis, and this sort of thing.

Q. Are you familiar with the Applications filed in these cases by St. Mary Land and Exploration Company?

A. Yes, I am.

Q. Are you familiar with the proposed East Shugart (Delaware) Unit?

A. Yes, I am.

Q. Have you made a technical study of the proposed unit area?

A. Yes, I have.

Q. And are you prepared to now share the results of that work with Mr. Catanach?

A. I am.

MR. CARR: Mr. Catanach, at this time we tender Mr. Williamson as an expert witness in reservoir engineering.

EXAMINER CATANACH: Any objection?

MR. BRUCE: No objection.

EXAMINER CATANACH: Mr. Williamson is so qualified.

Q. (By Mr. Carr) Mr. Williamson, would you briefly summarize what Intoil is seeking in this case?

A. Well, Intoil as a potential working interest owner in this unit, they support the formation of this unit and the implementation of a waterflood project in this proposed unit area. But they do propose the -- oppose the proposed allocation of the unitized substances within this unit because it is neither fair, reasonable nor equitable to intoil.

Q. When were you employed by Intoil?

A. It was probably late in 1998, probably December, mid-December of 1998.

Q. At the time you were employed, what were you asked to do?

A. To review the unitization allocation formula that

was being proposed for this unit, to determine if it was fair to Intoil and, if not, to suggest alternatives and reasons thereof.

Q. In your previous work, have you had experience with the Delaware formation in this area?

A. Well, for me with the Delaware formation in general, and specifically I am in this unit because we prepared a reserve estimate for Siete in 1995, and that reserve study included at that time this proposed unitized area.

Q. And in making that study, without getting into great detail, just summarize what you did.

A. Well, we looked at the remaining primary reserves, we looked at what our opinion was at that time of secondary reserves. We assumed that the unit would be formed at that time. The talk was, the unit would be formed in around 1996, and water injection would begin like in 1997. So that was the timetable that we were working with, with the operator Siete at that time.

Q. At that time were you able to determine a secondary-to-primary ratio, recovery ratio, in the reservoir?

A. We did. We looked at the other Delaware floods in the area, and at that time we felt like that the Amoco Old Indian Draw unit was the most logical. It had been

waterflood and had responded, and we were able to compare the expected recovery under primary operations with secondary operations, and we came up with a secondary-to-primary ratio of about .58 barrels of secondary oil per barrel of primary oil.

So we took that factor and applied it to the primary ultimate that we had determined for this proposed unitized area, under the economic conditions that existed at that time, in 1995.

Q. Mr. Williamson, let's initially look at the geology of the Delaware formation, and I would ask you to first identify and then review what we have marked as Intoil Exhibit Number 1.

A. Okay, I think in looking at a cross-section here, this is not anything that surprises me in the Delaware.

Q. What is this? Is this the cross-section A-A' that was presented earlier today by St. Mary?

A. That is correct.

Q. All right.

A. And I understand this was prepared by St. Mary's, and I presume it's the same A-A' that's on the board.

What this tells me is that we have zones -- Maybe the rock unit can be correlated across an area, as they have done with their various zones. But I think if you examine where the wells have been completed, where some of

the wells that have -- zones that have been tested and have been plugged off, it is not a uniform producing interval from top to bottom. And you can see -- In many cases, you can correlate from well to well the rock unit, but using their cutoff percentage of 14 percent you find some of these zones have indicated pay and some don't have indicated pay.

Also, I think it's indicative that a lot of these zones that look good on the cross-section have not been perforated. That may be a choice of the operator, to try to produce only those zones that are as water-free as possible, but I think that points out the potential error that can be created when you're trying to determine oil in place from zones that are not continuous in their porosity, and therefore are not going to contribute equally under waterflood operations. You've got to be able to move water through a reservoir from one zone in one well to that same zone in another well, in order to have secondary reserves.

So this tells me that an oil-in-place number here is probably subject to some error. I'm not saying that you shouldn't try to do it, but I am saying that it's such a subjective thing that I see it absolutely useless in trying to determine relative ownership between wells or between tracts.

Q. What is Intoil Exhibit Number 2?

A. Intoil Exhibit Number 2 is cross-section B-B'.

Q. And what does this show?

A. And it shows essentially the same thing that we have been talking about. I might call your attention to this Conoco Federal Number 1, which is the second well from the left, and an interval in zone 9 was perforated and squeezed.

Apparently -- in my opinion, if the squeeze is not productive -- although I think Mr. Lee said it might still be producing -- but I think this just points up the hazard that you have here in that these zones are not very predictable, vertically or horizontally.

Q. You are familiar with the participation formula set forth in the proposed St. Mary unit agreement, are you not?

A. That is correct.

Q. And you're aware that in the proposed unit agreement the participation factor is heavily weighted toward or based upon original oil in place?

A. That's correct.

Q. How accurate is valuing a -- or allocating production based on an original oil-in-place number, in your opinion?

A. Well, with this reservoir I think it could be highly inaccurate. You determine oil in place by using one

of two methods. One is a volumetric method. You calculate net pay and porosity and water saturations, and you isopach and create layers like you've done.

The other situation could be that you could get oil in place by a material balance if you've got good pressure history over the life of a field, and if all of the zones that are contributing to that production are indeed perforated and can contribute to the pressure and/or the production rate.

We don't have good pressure readings here. The pressures were not taken over the life of the field. And I think we see enough problems here with the volumetrics that I don't see how you could equitably assign value with a very large percentage of oil in place determined by this method.

Q. Let's go to what has been marked Intoil Exhibit Number 3. Would you identify that for Mr. Catanach?

A. Intoil Exhibit Number 3 is a decline curve that I prepared for each well in the unit area. The production information comes from *Dwight's*. I did not try to actually customize a decline rate for each of these wells. I was trying to get some relative value. And I looked at all of the production, and it seemed like that a 10-percent constant percentage decline seemed to fit most of the curves, and so that is what I used to prepare an exhibit

that we'll see later on for remaining reserves and primary ultimate.

Q. Let's go to Exhibit 4. Identify what this exhibit is and explain what it shows.

A. Okay, Exhibit 4 consists of two pages. The first page is just a redo of the tract participation factors for cum oil at 1-1-98, 6-1-98, the January-May rate, 1998, remaining primary, 7-1-98. These are the time periods that are proposed for the unit.

I used *Dwight's* information, and I get essentially the same number, but I do get a little bit different number from what is in the proposed unit agreement. I presume that that is probably a function of maybe some production differences that would create the different values.

The second page is the primary estimated ultimate recovery that I have calculated for each of these wells, and that is based on the cumulative to date, of course, and this 10-percent decline that I previously discussed.

Q. Mr. Williamson, in your opinion, how reliable is the use of a primary ultimate ratio in allocating production within the unit as proposed?

A. Well, it's sort of a Catch-22. If all the zones were open and all the wells were completed equally, it might be a pretty good factor. We know that that is not

the case here.

And neither do we know with a great degree of accuracy how productive these zones behind pipe are going to be. We've seen examples of zones that met all the criteria and yet produced water and had to be squeezed off.

I think it's useful to maybe be a part of the formula, but I don't think you can rely on it as heavily as you might because of the fact that we've got so many different zones here that unless you know for sure that these zones are going to produce, I don't know how you can base equity using behind-pipe or oil-in-place figures.

Q. Let's now go to your review of participation factors, and I'd like you to identify and just briefly explain what is set forth as Intoil Exhibit Number 5.

A. Okay, Exhibit Number 5 is right out of the unit agreement, and it is the participation formula that's been proposed by St. Mary's to unitize this unit.

Q. Again, this is the exhibit that places a 40-percent factor on original oil in place?

A. That is correct.

Q. Have you been able to determine what Intoil's share of the unit participation would be under this formula?

A. Right, under this formula Intoil's interest would be roughly 4.54525-percent interest in the unit.

Q. Let's go now to Exhibit Number 6, and I'd ask you to first identify this and then explain how this exhibit is set up and what it's designed to show.

A. Okay, Exhibit Number 6, the calculations here are based upon the St. Mary's proposed tract participation, the unit participation. I took the unit remaining primary as of 7-1-98, based on my calculations, 452,994 barrels of oil times Intoil's proposed interest of .0454525, came out with 20,590 barrels.

And then my estimate of the unit secondary ultimate, which was determined by my primary ultimate times the factor of .58 that I had determined from the old Indian Draw field -- And I might point out that that may or may not be an absolute number. I think it is a good relative number, which is what I was looking for. That secondary ultimate could be higher or it could be lower, but it serves a purpose to show what the relative values that are assigned to these tracts are.

So the secondary ultimate in my calculation, 1,486,682, times the interest of Intoil, gives us 67,573, for a total of 88,163 barrels of oil.

The Jade Federal 1 remaining primary as of 7-1-98 is 51,799 barrels of oil. From my calculations, half of that is Intoil's, about 25,900. So the remaining reserves, then, under unit operations, using this formula to Intoil,

are 88,163 barrels, compared to what they would get if the unit was not put in and they just moved ahead and produced their lease until it was at an economic limit.

That ratio, then, is about 3.4 to 1. In other words, they're going to get 3.4 barrels more than they would if they left everything as it is on the primary.

Q. You mean 3.4 times the remaining barrels?

A. 3.4 times the remaining primary barrels.

Now then, the next set of data are all the working interest owners except Intoil, and I just took 1 minus the .0454525. I go through the same calculations and create a ratio there, remaining reserves, unit operations, 1,851,513 barrels of oil, divided by the remaining primary if the unit was not put in, of 47,095 [*sic*], and that shows that the other working interest owners are getting a 4.34 barrel ratio times the remaining primary on their other leases.

Q. So the other interest owners are getting 20 to 25 percent more the benefit of unitization than Intoil?

A. That is correct.

Q. In your opinion, is this allocation or participation formula fair, reasonable and equitable to Intoil's interest in this unit?

A. No, it is not. I think you should use factors that can be measured with a great degree of accuracy, such

as current rate, cumulative, and remaining primary.

Q. And has Intoil done that?

A. No -- Oh, Intoil has done that, yes.

Q. And is that set forth on what has been marked as Intoil Exhibit Number 7?

A. That is correct.

Q. Would you review that, please?

A. This is a formula that Intoil has presented to St. Mary's, with apparently no avail. But they are proposing acreage, 5 percent; cumulative oil, 20 percent; remaining primary, 35 percent; January to May, 1998, oil rate, 35 percent; original oil in place, 5 percent.

What this formula does is place a very high value on things that can be measured that are not subject to considerable interpretation. Cumulative oil, remaining primary and the oil rate are things that can be measured much more accurately than determining what pay zones are potentially productive behind pipe.

So when you go through the calculation, then the Intoil working interest, or the interest in the unit, is 5.467 percent, using this formula.

Q. Mr. Williamson, is it reasonable to use things -- factors like an oil rate to determine the future production or performance of the unit?

A. What the oil rate does is gives you a protection

for your current earning power. In other words, just looking at the proposed formula, the percent of oil rate for the Intoil interest is 5.5 percent. In other words, they're getting 5.5 percent of the current oil rate. Well, they're being offered 4.5.

The percent of cumulative oil is 7.42. That's not as high, but the percent of remaining primary is 13.12 percent. 13.12 percent, and their half of that would be 6.56, and they're being offered 4.5 percent.

So the things that really relate to the value of this lease on things that we know, which are current rate and what the remaining primary is, shows that Intoil is not getting their fair and equitable share.

Q. Intoil's interest is in the Jade Number 1 well, correct?

A. Yes, it's only in one well.

Q. Is that a better than average well in this unit area?

A. It is a better than average well.

Q. Let's go to Exhibit Number 7. Would explain -- I mean, I'm sorry, Exhibit Number 8. Would you explain what that shows?

A. Okay, Exhibit Number 8 is a calculation as I previously discussed, taking the remaining oil, using the now proposed Intoil formula -- I've called it Formula 1 --

of .05468 percent. I've gone through the same calculations to come up with a ratio of remaining reserves in the unit operations to remaining primary, both as of 7-1-98, and you can see that that ratio, now, has increased to 4.1 barrels of oil per barrel of remaining primary.

Q. And that's for Intoil?

A. That's for Intoil.

Q. And what is the ratio for the other working interest owners in the unit?

A. And the other working interest owners, going through the same type of calculation, that ratio is 4.29 to 1.

Q. They still fare better than Intoil?

A. They still fare better. It's closer, but still they're ahead.

Q. All right, let's now go to Exhibit Number 9. Would you identify and review that, please?

A. Exhibit Number 9 is an Intoil Participation Formula Number 2. This is based upon 40 percent of remaining primary as of 7-1-98, and it's based on 40 percent of the January-May, 1998, oil rate, and it's based on 20 percent of the primary ultimate as I have calculated it.

Going through those calculations, Intoil's interest in the unit, proposed interest in the unit, would

be 5.65 percent.

Q. And that is a participation factor in the unit?

A. A participation factor in the unit.

Q. All right, let's go to Exhibit Number 10. What does that show?

A. Exhibit Number 10 is the same type of ratio calculation that I have described before. This is Intoil Formula Number 2, and that ratio for Intoil is 4.236 to 1. The ratio for all the working interest owners except Intoil is 4.285 to 1. So we've come a lot closer to creating a relative value between Intoil and the rest of the working interest owners in the unit.

Q. And you've presented three formulas: The one that's in the unit --

A. Right.

Q. -- Intoil 1. That's the formula that was originally proposed by Intoil?

A. And a formula, Intoil Number 2, which is one you have proposed that gets closer to giving -- sharing the benefits of unitization?

A. That is correct.

Q. In your opinion, if you're trying to equitably allocate the benefits of unitization, is a comparison of expected future recoveries under unit operation compared to expected future recoveries under primary operation a valid

way to reach an equitable allocation of the benefits of unitization?

A. I think it's a very good measure, because the remaining primary here, although you may get two engineers together and you shift the decline curve a little bit, it's a very good indication of what that lease is going to do. And that is the value from and after this point that the unit would be put together.

When you bring in other speculative or more uncertain factors and try to allocate values on those factors, I think it leads to inequitable and unreasonable assignment of values.

Q. Could you summarize for Mr. Catanach the conclusions you've reached from your study of the proposed East Shugart (Delaware) unit area?

A. Well, obviously the reservoir needs to be unitized. I have no doubt that there are secondary barrels to be recovered here. And to prevent underground waste, this reservoir should be unitized and waterflooded. Other Delaware fields have been successfully flooded.

But however, the proposed allocation formula is unfair to Intoil, because Intoil receives 25 percent less of the benefits of unit operations than the unit does as a whole.

The inequity results from a heavy reliance on a

unit participation formula using original oil in place, and that is the most subjective factor that could be used in determining equity in the unit.

Q. Are you prepared to make a recommendation to Mr. Catanach concerning the participation formula proposed by St. Mary's?

A. In my opinion, the Division should find that the proposed unitization formula in the unit agreement does not allocate unitized hydrocarbons on a fair, reasonable or equitable basis.

The Division should then determine the relative value of the separately owned tracts and allocate unitized hydrocarbons to each tract on the basis of the relative values as shown by the evidence presented in this hearing.

Some of my calculations on Exhibit 4 could be utilized in determining this calculation. And I have presented two ways that this can be accomplished, Intoil Formula 1, Intoil Formula 2, on Exhibit 7 for 1 and Exhibit 9 for Formula 2.

Q. In your opinion, will approval of the unit as proposed by St. Mary impair correlative rights?

A. Yes, it will.

Q. Will it deny Intoil the opportunity to produce and receive its fair share of the recoverable reserves in this reservoir?

A. I believe it will.

Q. If the recommendations of Intoil are accepted, what impact would this have on the correlative rights of all interest owners in the proposed unit?

A. All the owners will receive their fair share of the remaining reserves in this reservoir under unitized and waterflood operations.

Q. Mr. Williamson, in your opinion will approval of this Application as amended by the recommendations of Intoil be in the best interest of conservation and the prevention of waste?

A. Yes.

Q. Would you identify what has been marked as Intoil Exhibit Number 11?

A. Exhibit Number 11 is a three-page document that sort of summarizes what I've been talking about, and it's just a summary of my testimony.

Q. Were Intoil Exhibits 1 through 11 prepared by you or compiled under your direction?

A. Yes, they were.

Q. Can you testify as to the accuracy of the exhibits?

A. Yes.

MR. CARR: At this time I would move the admission into evidence of Intoil Exhibits 1 through 11.

EXAMINER CATANACH: Exhibits 1 through 11 will be admitted as evidence.

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

EXAMINER CATANACH: Mr. Bruce?

MR. BRUCE: Just a couple of questions.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Williamson, I think there's a couple of exhibits we could look at, but Exhibit 6 when you're doing the ratio --

A. Exhibit 6, okay.

Q. Obviously if the Jade Fed Number 1 remaining primary was lower than 25,900, then that ratio would increase, it would go above 3.4 to 1, would it not?

A. Well, anytime you change the numbers in these formulas it's going to change the answer, yes.

Q. So the answer is yes?

A. Yes.

Q. Could you explain to me how discontinuity affects original oil in place? How does it affect the calculation of original oil in place?

A. Well, as I stated earlier, original oil in place can usually be determined one of two ways, volumetrically or material balance. And I think, from what I understand

here, there are no pressures, so material balance is not a factor that can be utilized.

So you rely, then, on a volumetric calculation which has by nature -- has to take the thickness of the reservoir, it's got to take the porosity of the reservoir, it's got to take the water saturation of the reservoir. And then you've got to determine what a drainage area is.

So just because I've got a wellbore here that's got indicated productive zone in it, I don't really know how far that particular zone continues. The evidence here is that in many cases those zones do not continue between wells. So it makes it very hazardous to use a volumetric calculation of original oil in place.

Q. But there was pressure data from 1994 and 1997, was there not?

A. That's only one point in time. To get an accurate oil in place using material balance, you've got to have an pressure production history over the life of the field.

Q. So what you would rather use -- I think your quote was, you would use factors that can be measured with a great degree of accuracy, such as current rate, cumulative production and remaining primary; is that correct?

A. Correct.

MR. BRUCE: I have nothing further, Mr. Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Williamson, on your -- How did you determine what the remaining primary reserves are for the Jade Federal Number 1?

A. I took these decline curves, using *Dwight's Production Data*, and I extrapolated the indicated decline at the current time, and it's roughly a 10-percent or constant percentage decline for each of the wells, including the Jade.

Q. Okay, so you came out with 51,799?

A. That is correct. And I will say that, that I used an arbitrary cutoff point of three barrels per day of operating costs. I didn't have the actual operating costs. So to the extent that that three barrels a day could be two or four, it might vary that a little bit. But it's, I think, very close.

Q. Now, is that the same number that was calculated by St. Mary's on their Exhibit 43? Are you calculating the same thing as they are when they say remaining reserves, primary, for that well?

A. Correct, they've got a percent of remaining primary. I don't think I had a -- I don't think I had anything that showed me what the barrels were, but they're

calculating a percent of remaining primary.

Q. Well, I thought that -- They have a column there that says "Remaining Reserves Primary". I think they've got a number. Is that 93.3? Do you know if that's --

A. Okay, I may be looking at the wrong --

Q. On Exhibit Number 43.

A. Oh, this is their new exhibit? Yeah, I don't have that with me.

Q. I'm just wondering if that's the same thing that we're talking about?

A. It should be, if it's... Remaining primary reserves, and I presume this is as of the same date that mine is, 7-1-98. I'm not sure about what that -- what their effective date is.

Q. I'm just wondering why their number is so much higher than yours?

A. The only thing I can suppose is that they have taken a much flatter decline than I have. I mean, that's -- If you'll look at that curve, this is what the production curve looks like, and my 10-percent decline is coming through like this. If you take that and flatten it or take it out at a flat rate for a long period of time, I suppose you could get the additional reserves.

Q. Well, doesn't their calculation benefit Intoil tremendously in that -- as far as that factor goes, anyway?

A. Well, what I stated earlier is, I'm trying to get relative values. So I try to treat all the wells or the tracts the same. Yes, that is higher, but I would presume that their other remaining primary numbers for the other wells would also be higher.

I guess they've got a remaining primary reserve of 711,000 barrels. And my total remaining primary is 452,994. So I haven't had time to study this, but relatively speaking, it might be the same. I don't know.

Q. Now, you didn't calculate the ratio that you calculated there -- For instance, in the St. Mary's offer, was 3.4 to 1 for Intoil, compared to 4.34 to 1 for all other working interest owners. You didn't calculate that on a per-well basis, that ratio, did you?

A. No, I didn't.

Q. Could that number vary well to well?

A. It's possible. But it would have been a large task of getting the actual ownership of each well. That could be done. It's not an impossible task, but -- I was just trying to show the relationship between Intoil and the rest of the unit.

Q. So which formula are you recommending, Mr. Williamson?

A. Well, I would recommend either Intoil Formula 1 or Intoil Formula 2. They're both fairly close. I'm sure

Intoil would like the higher one, but I could certainly say that either one is -- to me, would be a much fairer representation of allocated equity in this unit.

EXAMINER CATANACH: Any other questions of this witness?

MR. BRUCE: Not of this witness.

MR. CARR: No, no further questions.

EXAMINER CATANACH: This witness may be excused.

MR. BRUCE: I do have some rebuttal testimony, Mr. Examiner.

EXAMINER CATANACH: Okay. I'm sorry, did you have anything further, Mr. Carr?

MR. CARR: No, I do not, Mr. Catanach. That concludes our presentation.

MR. BRUCE: Mr. Examiner, I call Mr. Bachman to the stand again. If the record could reflect he's been previously sworn and qualified.

EXAMINER CATANACH: The record shall so reflect.

ROBERT L. BACHMAN,

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. First off, Mr. Bachman, in response -- some questions came up about St. Mary's negotiations with other

interest owners regarding the participation formula. Could you just briefly state for the Examiner any discussions that you have had regarding that issue?

A. In September of 1998, I met with Intoil, went to their office, met with Joe Mazzola and Rolando Benavidez, completely went through all the geology. I brought a piece of core from offsetting Parkway Delaware, went through our proposed formula, everything, talked to them that I'd love to have them in the unit, so on and so forth. And I think subsequent to that it was numerous phone calls.

Q. Okay. Now, that -- You still stuck with the same participation formula there?

A. Yes.

Q. But did they request -- Subsequent to that meeting, were changes made that increased their interest, Intoil's interest?

A. Subsequent to that, we went ahead and conceded a change in the remaining primary for Intoil via decline-curve analysis, and I'll defer that to Robert, what he did.

But basically what that did was, it increased Intoil's interest from 4 percent of the unit to 4.5 percent, plus.

Q. Without changing the formula?

A. Without changing the formula.

Q. Okay.

A. It was simply changing the percent of remaining --

Q. Okay. Now, the second point is, regarding the factors in the participation formula, did any of the working interest owners call you or address you about that, or St. Mary's?

A. We sent a letter to all the working interest owners.

Q. January, 1999, I believe?

A. Yes, stating the formula that Intoil was proposing. We sent it to all the working interest owners, told them that basically their interests go down at the expense of Intoil on their change in the participation formula, and if they had any problem with it, or if they agreed with Intoil, to please let us know, and we'd be happy to listen to them. And there was no response whatsoever.

Q. Now, that letter, that January 13th, 1999, letter, is in the -- Ms. Ellison's correspondence --

A. Yes, it is.

Q. -- package?

A. Yes, it is.

Q. And other than Intoil, you never heard anybody complain about the participation formula?

A. No, not at all.

Q. Did Heyco or anyone ever call you about that?

A. No, we met with Heyco in July of 1998, met with Mr. Ray Noakes and went through everything with him, participation formula, so on and so forth. They had no problem with it whatsoever. And we never really heard anything subsequent to that.

Q. Okay. What does Exhibit 44 show?

A. Exhibit 44 -- I put together for -- on a tract-by-tract basis the percentage of the tract participation factors, with a list of the top 12 or so owners in the East Shugart unit represented. It's probably 80 to 84 percent, something like that.

Highlighted in yellow is St. Mary's formula that we're proposing, and then subsequent interests next to the working interest owner names.

The only change that Intoil has said to us is highlighted in green, changing the factor. That shows over in the right column, and how all --

Q. In green?

A. Excuse me, in green. -- how all the interests change via Intoil's formula. And if you notice on the far right, everyone else goes down at the expense of Intoil. Intoil increases their interest almost .8 of one percent.

Q. Now, this -- You used St. Mary's numbers on remaining primary, et cetera, when you plugged this --

A. Yes, after we --

Q. So --

A. -- reviewed it and re-evaluated it.

Q. So Intoil's number, 5.3 percent, may differ somewhat from Mr. Williamson's, but maybe some different numbers were used in there?

A. Right.

Q. But you used their Proposal 1?

A. Right, exactly.

Q. Okay. So in effect, Intoil's formula only benefits itself?

A. For the top 85 percent of the unit working interests, that's the only benefit.

Q. Was this exhibit prepared by you or under your direction?

A. Yes, it was.

MR. BRUCE: Mr. Examiner, I'd move the admission of St. Mary Exhibit 44.

MR. CARR: No objection.

EXAMINER CATANACH: Exhibit Number 44 will be admitted as evidence.

Any questions, Mr. Carr?

CROSS-EXAMINATION

BY MR. CARR:

Q. Yeah, Mr. Bachman, when you increase someone's

interest, others would naturally go down; isn't that right?

A. Well, we took a look after meeting with Intoil --

Q. My question was -- Maybe you don't understand it.

When you increase somebody's interest in terms of a percentage participation, isn't it natural to expect other people's interest to go down?

A. Yes.

Q. And if -- How many working interest owners are there in this unit?

A. There's about 45 or so.

Q. And to -- Did you look at the other working interest owners?

A. Yes.

Q. Were there others that derived some benefit?

A. There were, but they were much less than even one percent --

Q. Well --

A. -- just very minor.

Q. -- when we talk about less than one percent on this, there's no one here that has a one-percent change, is there?

A. No.

Q. They're just thousandths of a percentage point; isn't that correct?

A. Yeah, these are just sort of the top -- a random sampling of the top working interest owners.

MR. CARR: That's all I have, thank you.

EXAMINER CATANACH: Anything further, Mr. Bruce?

REDIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Bachman, you wouldn't expect virtually everyone to go down, would you?

A. Well, no.

MR. BRUCE: Thank you.

RECROSS-EXAMINATION

BY MR. CARR:

Q. And Mr. Bachman, you only showed those that did, other than Intoil? Yes or no?

A. Yes, but I have --

MR. CARR: Okay, thank you.

MR. BRUCE: I have to follow up.

FURTHER EXAMINATION

BY MR. BRUCE:

Q. These aren't the only people who went down in your calculations?

A. No, it is not.

Q. You just took the larger working interest --

A. The larger working interest owners, to represent the top 80 to 85 percent of the unit.

FURTHER EXAMINATION

BY MR. CARR:

Q. And other than St. Mary, nobody has more than 6 percent in this unit, right?

A. No.

Q. So when we look at the largest interest owners, we get down to NM&T Resources, and they have about -- is that 1/1000 of the unit?

A. Yes, they have 1.1 percent of the unit.

MR. CARR: Thank you.

EXAMINER CATANACH: Anything further?

This witness may be excused.

MR. BRUCE: Not of this witness.

EXAMINER CATANACH: Do you have another witness?

MR. BRUCE: I'm afraid I do. Recall Mr. Lee.

ROBERT LEE,

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

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Lee, I think when you were talking about the factors in the participation formula, you mentioned one of them was to keep the interest owner whole with respect to current cash flow?

A. That's correct.

Q. What does St. Mary Exhibit 45 show?

A. This is an exhibit where I look at the Intoil interest in the Jade 1 by itself, un-unitized, and then what their production would be in the unit.

I've got two columns here. One is for the unit showing their working and revenue interest in the unit, and then another column with just the Jade 1, showing what their working and revenue interest is in the Jade Number 1.

If I take the unit reserves times their interest, I show that they will derive 172,000 barrels. If you just produce the well as is, the Jade 1 only produces another 38,000 net barrels.

Then I looked at the production as of March of 1999 and said that the unit would have been making 174 barrels a day, gross, and they would have seven net barrels a day from that. And if you look at the Jade 1 as it is, it made in March about 16 barrels a day gross, and they have seven net barrels from that.

If you look at it from an undiscounted cash flow basis, with the unit, they make nearly $3 million, versus a little less than $600,000 with the Jade 1 by itself.

Q. So as of March, 1997, whether it's unitized or they're just looking at their per-well interest, they're receiving the same cash flow?

A. That's correct.

Q. Mr. Lee, could you identify St. Mary Exhibit 46, please?

A. Exhibit Number 46 is three decline curves put in here, the Jade Number 1, the adjacent well, the Jade Number 2 -- actually, it's on the same location but produces out of the Penrose Grayburg formation -- and a decline curve on the Geronimo Number 9.

Q. Okay. Now, let's go through this. On the first page we've highlighted some production figures starting, oh, about the beginning of January, 1992, and going on for about four years, three and a half, four years.

A. Four and a half years.

Q. What is indicated by that highlighted portion?

A. The Jade Number 1 produces out of the Delaware. The Jade Number 2, as I said, produces out of the Penrose Grayburg. They have common interests between the two wells. They're twinned, drilled on the same pad. There's only on facility on the tract, so the production is allocated between the two wells.

And it looks like that -- in 1992, that more barrels were getting allocated to -- there's a jump in production there, indicating possibly more barrels were getting allocated to the Jade 1 than was getting allocated before that.

And then in June of 1996 you see a drop. The

increase prior to that is about eight, nine barrels a day, and then the drop there is, you know, eight, nine, ten barrels a day, in that range, at that point in time.

What the drop in 1996 reflects, if you look at the Jade Number 2 well, production starts -- you can see that along -- in conjunction with that production drop on the Jade 1, you see a production increase on the Jade 2. The reason that was done is that St. Mary's had ran some tests, had to shut a well in, had to shut a well in to get an accurate measurement.

But the Jade Number 1 turned out not to be making as much oil as previously thought. And it appears that the Jade Number 2, which is offset a shallow waterflood, the East Shugart waterflood -- it's a waterflood that's in the Penrose-Grayburg. There's a well -- It's about one location to the west. It's the Inca 4. It's an injection well. At Siete, we always thought the Jade 2 was in a separate zone. We didn't think it was in the same penrose zone that was being waterflooded and produced over in the East Shugart Unit.

Based on this information, what we see -- current well tests and looking at the curve on the Jade 2, obviously it looks like it's getting some response from something, so it looks like that some of the sands in the Jade 2 are in connection with that waterflooding, was

seeing some waterflood response.

Q. So in short, Mr. Lee, for about four and a half years, production was allocated -- more production was allocated to the Jade Federal Well Number 1 than it was entitled to?

A. That's correct. That's what it looks like here.

Q. So its cumulative production figure is actually incorrect?

A. Yes, and --

Q. And -- But, you have used that higher cumulative production figure in your calculations for tract participation?

A. Yes, we did.

Q. So St. Mary's has already given Intoil a pretty big benefit, just using the cumulative production figures, even though it's based on production they weren't entitled to?

A. Not entitled to out of that well, that's right.

Q. Not entitled to.

A. Out of the Delaware, that's correct.

Q. So when you use that -- now -- So in other words, that cumulative production figure that Mr. Williamson referred to as a hard and fast number ain't so hard and fast here?

A. That's correct.

Q. Now, the issue has come up about remaining reserves. You looked at Mr. Williamson's decline curve. Now, he used an exponential decline, did he not?

A. That's correct.

Q. What type of decline curve did you use?

A. I used a hyperbolic decline curve.

Q. You think that's the more accurate?

A. Based on the production characteristics that you see in the production here in this field, they behave in a hyperbolic nature, so I feel like hyperbolic is a better way to go.

Q. Now, as far as the current rate or -- I forget how exactly it's used in the participation formula, but the rate of oil production January through May, 1998 --

A. Yes.

Q. -- you used that, and at Mr. Bachman's request you went back and altered that number some number of months ago, did you not? You recalculated it for all wells in the -- You didn't?

A. No. The remaining reserves.

Q. The remaining reserves, excuse me.

A. Yes, the remaining reserves.

Q. And without going into detail, you did increase Intoil's remaining reserves?

A. Yes, I did.

Q. And was that based on decline curve analysis?

A. Yes, it was. The first curve here, the Jade Number 1, the solid black line that extends out to the future and starts kind of at the end of 1998 is the projection that I made for the Jade Number 1 after we -- We spoke with Bob prior to that. I had a projection that was some -- more pessimistic.

At the time that I made the projection, I didn't have the data, really, from, you know, the last three months of 1998 or the beginning of 1997. You know, this projection is made back last July or August. So I didn't have a lot of the recent data. I had projected a little bit harder based upon the production just prior to that for about a year. It was kind of a tough call, I didn't have a lot to project off of. But I had it at a lower -- a little steeper rate and a little lower rate.

After Bob and I talked we said, You know, the production has dropped here this month, but there's a pretty good chance it may pop back up. So let's go ahead and use our hyperbolic factor, more in line with what we see in other wells in the field and give it a higher rate, kind of assuming that, you know, drop in production will come back.

And as it turns out, as you can see in those subsequent six, seven, eight months -- Production popped up

one month because the well was down for a couple of days, and they caught some flush there in January. But for the most part, the production has fallen below my projection and at a steeper than I projected. That's why there's a discrepancy between what Mr. Williamson showed and the numbers we're showing here on our --

Q. But even just looking at remaining reserves now, if you excluded that production that we highlighted in yellow and looked at the more recent production, which we'll get to in a minute, you would not give Intoil as much remaining reserves today as you would have six, nine months ago; is that correct?

A. That's correct.

Q. But you have left it, for purposes of unitization, at that higher figure?

A. Yes, we have.

Q. So once again, that's a benefit to Intoil?

A. That's correct. In fact, the remaining reserves that I calculated was -- you know, was about 13 percent of the remaining reserves, the Jade, as compared to the 11.4 percent that Roy had calculated.

Q. Then finally on this exhibit, Mr. Lee, there's been some recent well tests in this are, haven't there?

A. Yes, there have.

Q. And if you could refer to the first page and the

third page, could you discuss those briefly for the Examiner?

A. This is just an example to show you what was seen in some of the other wells across the field, is that some of the wells were outperforming my projections. So if you were to have reprojected those wells today, they would get higher reserves remaining, and the Jade 1 would probably take a hit. It would take a hit.

Q. But once again, you're willing to let it back what it was in June of 1998?

A. That's correct, when we did the first analysis.

Q. An all of these items where you're leaving it like it is without altering any of the numbers are benefits to Intoil?

A. That's correct.

Q. And if you looked at it today, they wouldn't get 4 1/2 percent, would they?

A. No, they would not.

Q. Finally, Mr. Lee, looking at the Jade Number 1 tract, Mr. Lee, that tract isn't uniformly productive, or probably not fully productive from the Delaware, is it? Comparing that with the cross-section?

A. No, it's not. Based on the cross-section and structure map and isopach maps also, we show the features following the -- going downdip as you move to the east. So

as you move over onto this eastern part of the tract proration unit, the production would be getting poorer and poorer.

Q. So for instance, in your opinion, if that well was located in the center of the proration unit, would it have performed as well as it did?

A. No, it would not have.

Q. Based on its location -- what? The Delaware is spaced on 40 acres; is that correct?

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

Q. And without any other information, you just assume 40-acre drainage?

A. Yes.

Q. More or less, radial?

A. Uh-huh, yes.

Q. Now, if you do that and draw a 40-acre radius around the well, where does a lot of that production from the Jade well come from

A. It will come from the Inca lease, some of the better reservoir that's going to be updip and thicker, headed this direction. That's why the Jade Number 1 has such good cums. It has good rate, and it has decent remaining reserves because of that good rate. It's skewed over towards the better part of the reservoir.

Q. Based on all these factors, Mr. Lee, is it your

opinion that the Intoil acreage is fairly treated in the proposed unitization formula?

A. Yes, I believe they are.

Q. Were Exhibits 45 and 46 prepared by you or under your direction?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I'd move the admission of St. Mary Exhibits 45 and 46.

EXAMINER CATANACH: Any objection?

MR. CARR: No objection.

EXAMINER CATANACH: Exhibits 45 and 46 will be admitted as evidence.

Mr. Carr, do you have any questions.

MR. CARR: Just a few.

CROSS-EXAMINATION

BY MR. CARR:

Q. Mr. Lee, if we go to the exhibit behind you on the wall, what is the number of that exhibit?

A. This is Exhibit Number 21.

Q. And what is that? Can you describe it?

A. Yes, this is a map prepared by St. Mary. It's contoured on cumulative production.

Q. Is that what the contour lines are on that exhibit?

A. Yes, it is, going from 300,000 barrels a well

down to zero.

Q. And there isn't really any information east of the Jade Number 1 well, is there?

A. No, there's not.

Q. So those lines have got to be just an interpretation, correct?

A. That's correct.

Q. If I understood your testimony, it was that when you look at reservoir and cumulative production, other data, that you think that the Jade well is being fairly treated; is that not right?

A. Including oil in place, yes.

Q. And isn't it fair to say that all of that should have been considered in your modeling that was done?

A. That the parameters should have been considered?

Q. Yes. You're not complaining about allocations and interpretations really addressed by your modeling, are you?

A. No, we're just stating that oil in place should bear a large part of the unit formula.

Q. If you go around the edge of this, in fact, there are a lot of wells that you would find didn't exactly have 40 acres that were contributing; isn't that correct?

A. That's correct.

Q. When you go due south, I mean, there's an obvious

example, the south offset, correct?

A. That's correct. These are very poor wells, also showing that as you move towards the edge of the reservoir it's getting poor.

Q. And that should have been taken into account in the modeling that was done of this reservoir?

A. Yes, it was, yes.

Q. Have you seen Exhibit 44 that was presented a few minutes ago by Mr. Bachman?

A. Yes.

Q. Have you seen it -- do you know -- Have you seen this before, or is this new to you today?

A. I saw this yesterday.

Q. Did you understand when I asked you what St. Mary's percentage interest would be under their unit formula, that it is the number that is -- the first number in the vertical column in yellow?

A. I didn't notice that, but yeah, okay.

Q. And that's the number I asked you for before and after lunch and you couldn't give me?

A. That's correct.

Q. All right. Now, if we go to the second -- we go to Exhibit Number 45, you do understand, do you not, that Intoil isn't here complaining about current cash flow?

A. I understand that.

Q. And with the implementation of unitization, everybody's cash flow should not be adversely impacted, correct?

A. That's true.

Q. And do you understand that the complaint that Intoil has relates to the share of the benefits of unitization that it believes it gets under the proposed St. Mary plan?

A. Yes, I understand that.

Q. If I look at Exhibit Number 46, was it your testimony that there was an over-reporting of production to the Delaware in the Jade Number 1?

A. It looks like that's probably the case.

Q. Now, did you discover that?

A. Myself or talking with St. Mary's, it kind of came out after they acquired the Siete properties and ran some well tests. Once again, like I said, there's no test facilities that shut a well in to see what it was making. They found that the Jade 2 was actually making substantially more, you know, eight to ten barrels more.

Q. And this information -- This well is operated by St. Mary's, correct?

A. That's correct.

Q. Are you aware of any correction made by St. Mary's in the production that was reported to the Oil

Conservation Division for the well?

A. No, I'm not aware of any correction.

Q. And have you looked at other wells to determine if St. Mary has also other inaccuracies in the data that's been reported?

A. No, I have not.

Q. And you understand, when trying to determine what a well should be allocated under a unitization formula, we have to work with the data we've got?

A. That's right, that's why we let it stand.

MR. CARR: That's all I have.

EXAMINER CATANACH: Any further questions? This witness may be excused.

Anything further, Mr. Bruce?

MR. BRUCE: Nothing further, Mr. Examiner.

EXAMINER CATANACH: Anything further, Mr. Carr?

MR. CARR: I have a closing statement.

EXAMINER CATANACH: Please proceed.

MR. CARR: I think it's important at the end of this case, Mr. Examiner, to step back and take a look at what is presented to you and how you should approach resolution of the issues presented.

As I tell you over and over again, and as you cringe every time one of the lawyers tells you this, you need to remember that this Division is a creature of

statute. Its powers are defined and limited by the statue which creates your agency and empowers you to act. And when a case comes before you like this, there's an awful lot of stuff at the end you have to sort through.

But it really is not that complicated if you remember your decision must be made, as this case should have been presented, within some sort of a statutory framework.

You've got to remember what your role is. This is not a case where the majority wins. 99.9 percent of the working interests can agree on one thing, that they have to come to you. And the reason they come to you is, you look after the other interest owners. And if you don't, there's no purpose in coming here.

St. Mary is before you today seeking to commit an interest of intoil to a unit, and they want to submit that interest and then have it -- the proceeds and the production allocated in accordance with a contract.

Now, before that can happen, you need to realize and remember that the only way that happens is through an exercise of the police power of the State of New Mexico. And this action is, in fact, when you force someone's interest into a unit, a taking.

Now, percentage ratification is important, but that issue only really properly comes up after this agency

has acted, entered an order in compliance with statutory safeguards.

I think it's important that you remember that before you grant this Application, you have to comply with the requirements of the Statutory Unitization Act. And if you fail to do that, your order, no matter what it is, and no matter what ratifications are obtained, is simply voidable, will be voided.

So what do you have to find? Look at the statute. It says you have to find the participation formula is fair, reasonable and equitable to all interest owners in the unit. These words have meaning. "Equitable" is a term with a meaning, and you cannot ignore it.

I went and I borrowed Ms. Davidson's *Webster's College Dictionary*, and you look at the term "equitable", and what does it say? "Dealing fairly and equally with all concerned". "Dealing equally with all concerned".

You have to find whether or not the formula proposed by St. Mary's deals equally with all of us. We have shown you that their formula, when you measure it against the benefits of unitization -- and that is what we're talking about, not working-interest ownership -- When you measure their allocation formula against the benefits of unitization, Intoil comes up 20 to 25 percent behind the other working interest owners in this unit. That is not

equal treatment for Intoil.

And we submit that on that alone, you must find that this formula does not allocate unitized hydrocarbons on a fair, reasonable and equitable basis.

And when you do that, the statute tells you what you have to do. You have to look at the evidence, our Exhibit 4, and then you have to determine the relative value of the tracts. And the relative value is the value of that tract compared to the relative values of all the tracts in the unit area. And we've shown you how you can do that, with either our Exhibits 7 or 9.

It's a simple case. You have to look at the evidence presented, you have to determine if the treatment is equal. And if it's not, you have to act. And if you don't act, you violate the Statutory Unitization Act, you fail to meet the statutory safeguards that spring from statute before you can take our property, your action impairs our correlative rights, and the order you entered, even if ratified, is voidable.

EXAMINER CATANACH: Mr. Bruce?

MR. BRUCE: Mr. Examiner, this pool should be unitized and waterflooding commenced. No one questions that.

The question is whether St. Mary's participation formula treats Intoil -- and, for that matter, all interest

owners -- fairly and equitably. The answer to that question is yes.

Now, what is fair is hard to define. In the Commission's order approving the Avalon (Delaware) Unit, the Commission stated that there could be dozens of formulas in any one case which could be considered fair. But so long as that formula was fair, the Commission would approve the formula.

The fact of the matter is that St. Mary's formula is fair to everyone, while Intoil's formula only benefits itself, as shown by St. Mary's Exhibit 44.

Intoil says, Let's use the hard numbers. All you have to do is go to the last exhibit we presented, Mr. Examiner, Exhibit 46. They want to use cumulative production. They've gotten more than they're entitled to. We'll let it drop, we don't care. But they've already received the benefit of that. If we were looking at it today, they wouldn't get near as much cumulative production.

Remaining reserves, using that same decline curve, taking out those excess barrels, looking at the well test a few months ago, if you look at the well test a few months ago, if you look at Exhibit 6 [*sic*], that well is -- that Jade Number 1 well on 46, Exhibit 46, is producing about 14 barrels a day. We wouldn't attribute it as much

remaining reserves as we did.

But we said, Fine, we'll go with the June 1, 1998, dates. Once again, for the second time, they get a benefit from these so-called hard numbers.

As I said, the problem is, these hard numbers have already been altered to the benefit of Intoil, and adopting Intoil's formula, which only uses those numbers, will unduly and unfairly increase Intoil's interest in production. As shown on Exhibit 46, those figures are skewed in Intoil's favor.

For instance, if you took the current rate today, 14 barrels of oil per day on the Jade Number 1 lease, and allocated that to Intoil, it would have about 4.1 percent of current unit production, assuming the unit was in effect today. St. Mary's is giving it 4.5 percent of unit production. We think that's fair.

As shown on that map, Exhibit 21, the Jade Number 1 well is an edge tract. Mr. Carr asked Mr. Lee, Well, there's no data to the east. You know, the reason for that is, nobody's had the guts to drill to the east because they don't think the Delaware is there. Clearly, it's an edge tract, and it's benefitted only by the placement of its well up in the corner of that well unit.

Looking at all the factors together, St. Mary's formula is fair, it gives everyone their proportionate

share of production in the unit. The original-oil-in-place numbers used by St. Mary have been calculated out with very high accuracy under the model, and we think it should be approved.

Other interest owners in the unit -- If you look at the combined Heyco entities, they own over nine percent, they have no problem with it. If you look at the combined Five States interests, they have over five percent. They've approved it. Everybody who's looked at this has approved it, well over 90-percent approval, and we think the Division should go ahead and approve the tract participation formula as proposed by St. Mary.

EXAMINER CATANACH: Thank you, gentlemen.

Mr. Carr, I would like you to submit, under your scenarios, your Formula 1 and Formula 2, what the tract participation formulas would be under your proposals. And gentlemen, I would like you both to submit draft orders, just statutory unit draft orders with not so much emphasis on anything else but the problem at hand, the allocation formula. If you can focus your findings on that issue, that would greatly benefit us.

MR. BRUCE: When would you like it, Mr. Examiner?

EXAMINER CATANACH: That's always the --

MR. BRUCE: Mine's prepared. You know, Bill's not ready by the close of the day...

MR. CARR: He's just taken the West Lovington-Strawn unit and changed the name. It's not a very good order.

(Laughter)

MR. BRUCE: What unit is that?

MR. CARR: I don't think it will help you very much. You can file this today; we'll do something that's useful.

EXAMINER CATANACH: Two weeks --

MR. CARR: That would be fine.

EXAMINER CATANACH: -- will be sufficient time, gentlemen? Okay, let's do that, then.

Is there anything further in this case, these two cases?

There being nothing further, Case 12,207 and 12,208 will be taken under advisement.

And this hearing is adjourned.

(Thereupon, these proceedings were concluded at 3:06 p.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ 19____.

_____, 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 August 18th, 1999.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002