NEW MEXICO OIL CONSERVATION DIVISION

STATE OF NEW MEXICO

CASE NOS. 10515 & 10516

IN THE MATTER OF CASE NO. 10515:

The Application of Texaco Exploration & Production, Inc., for statutory unitization, Lea County, New Mexico.

[CONSOLIDATED]

IN THE MATTER OF CASE NO. 10516:

The Application of Texaco Exploration & Production, Inc., for a waterflood project, Lea County, New Mexico.

BEFORE:

DAVID R. CATANACH

Hearing Examiner

State Land Office Building

July 23, 1992

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

FOR THE TEXACO EXPLORATION & PRODUCTION, INC.:

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I N D E X

E X H I B I T S

EXAMINER CATANACH: At this time we'll call Case 10515, the application of Texaco Exploration & Production, Inc., for statutory unitization, Lea County, New Mexico.

Are there appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm, Campbell, Carr, Berge & Sheridan. We represent Texaco Exploration & Production, Inc., in this matter. I would request at this time that this case be consolidated with Case 10516, which is the application of Texaco for a waterflood project in the unit area.

EXAMINER CATANACH: At this time let me call Case 10516, which is the application of Texaco Exploration & Production, Inc., for a waterflood project, also in Lea County, New Mexico.

Are there any additional appearances in either of these cases?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing today on behalf of Marathon Oil Company.

EXAMINER CATANACH: Any other

appearances? Okay. The witnesses, Mr. Carr?

MR. CARR: I have three witnesses.

EXAMINER CATANACH: Do you have any witnesses, Mr. Kellahin?

MR. KELLAHIN: No witnesses, Mr. Examiner.

EXAMINER CATANACH: Can I get the witnesses to stand and be sworn in?

[The witnesses were duly sworn.]

MICHAEL R. MULLINS

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

EXAMINATION

BY MR. CARR:

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

A. It's Michael R. Mullins.

Q. Where do you reside?

A. In Midland, Texas.

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

A. I'm employed by Texaco Exploration & Production, Inc. I'm a landman in the enhanced oil recovery department of the Midland Division.

Q. And have you previously testified

before the Oil Conservation Division?

A. No, sir, I have not.

Q. Would you summarize your educational background and then review your work experience for the Examiner?

A. Yes, sir. I graduated from Texas Tech University in 1974 with a degree in business administration. Also in 1974 I was hired by Texaco to work as a landman in their Midland Division Office.

I left Texaco late in 1976, but continuously worked as a landman in Midland, Texas, with and for various companies until I was rehired by Texaco in 1987.

During my 18 years as a landman, I have worked predominantly in the Permian Basin in southeast New Mexico.

Q. Are you familiar with the status of the lands involved in the proposed Vacuum-Glorieta West Unit?

A. Yes, sir, I am.

Q. Are you familiar with the applications filed in each of these consolidated cases?

A. Yes, sir, I am.

MR. CARR: We tender Mr. Mullins as an

expert witness in petroleum land matters.

EXAMINER CATANACH: Mr. Mullins is so qualified.

Q. (BY MR. CARR) Would you briefly state what Texaco seeks in this hearing?

A. Yes, sir. We seek the statutory unitization of the proposed Vacuum-Glorieta West Unit located in Lea County, New Mexico and approval of a waterflood project in this unit. We will seek certification of this enhanced recovery project for the incentive severance tax credit as soon as the rules are issued by the Division.

Q. Let's go to what has been marked as Texaco Exhibit No. 1. I'd ask you to identify that and then review this for Mr. Catanach.

A. Okay. Exhibit No. 1 is an area map, and it's also displayed on the wall for your convenience. This is what we're calling our area map. And basically this is an area that approximately covers about eight miles north to south and twelve miles east to west.

The proposed Vacuum-Glorieta West Unit is located in the center of the map and is outlined entirely in red. Covers approximately

2,000 -- well, covers exactly 2,778.86 acres. The proposed Vacuum-Glorieta West Unit is located approximately 20 miles west-northwest of the city of Hobbs in central Lea County, New Mexico.

We are located right on the border of four townships and ranges. We're located on the borders of Township 17 South, 34 East, 17 South, 35 East, 18 South, 34 East, and 18 South, 35 East.

I'd like to point out that the Vacuum-Glorieta West Unit is included within the Vacuum-Glorieta Pool. The Vacuum-Glorieta Pool itself consists of 7,000 acres, and the remainder of the pool is in the hachured red lines.

And we have noted it as being within the proposed Vacuum-Glorieta East Unit, of which Phillips Petroleum is the expediter. The proposed Vacuum-Glorieta East Unit contains 4,240 acres approximately.

Q. What is the character of the lands in this particular pool?

A. This particular pool -- in our proposed Vacuum-Glorieta West Unit we have all state lands except for one 40-acre tract. The proposed Vacuum-Glorieta East Unit is entirely state

lands.

Q. Are you ready to move to Exhibit No. 2?

A. Well, I'd like to point out on this map also we have highlighted numerous secondary recovery units in this area, many of which overlap.

The existing secondary recovery units that have been outlined and highlighted on the map cover the Grayburg-San Andres Formation or the Abo Formation. There are no other units on this plat that produce from the Glorieta or Paddock Formations, which is what our proposed unit will produce from.

In later exhibits I'll point out -- there again we talked about the character of the land. It's an area heavily concentrated in state lands and an area heavily concentrated in secondary recovery projects.

Q. Let's move now to Exhibit No. 2, your ownership plat. Will you identify and review that?

A. Yes, sir. The Exhibit No. 2, which we're calling the ownership plat, is basically a blowup of Exhibit A to the unit agreement. It identifies the outline of the proposed

Vacuum-Glorieta West Unit. There are 21 tracts noted within the unit. It covers 2,778.86 acres.

Of the 21 tracts, 20 of those are state lands, which comprise 98.56 percent of the unit area. There is the one fee tract which covers 40 acres, or 1.44 percent. That one fee tract is Tract 21, being noted by the hatched lines. And it's in the northeast quarter of the southeast quarter of Section 25 in 17 South, 34 East.

Q. The operator of each tract is also identified?

A. Yes, sir. The operator of each tract and the lease name of the tract is identified. And it's also interesting to point out there are no federal lands.

Q. Could you identify for Mr. Catanach what has been marked as Texaco Exhibit No. 3?

A. Exhibit No. 3 is a copy of our unit agreement for the proposed unit. What we have done, we have used the standard State of New Mexico form of unit agreement for the state/fee lands with very minor modifications, which modifications were approved by the State Land Office.

The unit agreement permits secondary and/or enhanced oil recovery operations including waterflooding. It defines among other items the unit area and the unitized formation. It defines the character of the lands that are included in the unit area, identifies the royalty and working interest ownership of each tract.

It provides a method of allocation of unitized substances and sets out the basis for participation of each of the parties. In fact, the Vacuum-Glorieta West Unit has a two-phase tract participation formula as set forth in Section 12 of the unit agreement.

Q. And that formula will be reviewed primarily by our engineer?

A. Yes, sir, it will. And further the unit agreement provides for periodic plans of development that will be furnished to the working interest owners, the Commissioner, and the Division.

Q. Let's move now and identify what has been marked as Texaco Exhibit No. 4.

A. Our Exhibit No. 4 is the unit operating agreement for the proposed unit. What it is is a fairly standardized form of unit operating

agreement customized for use in the Vacuum-Glorieta West Unit through negotiations between the working interest owners.

The agreement provides for the agreement with working interest owners controlling the supervision and management of unit operations. It defines the rights and duties of the working interest owners and the unit operator. It establishes voting procedures for decisions to be made by the working interest owners. It defines how investments and costs are to be shared. It sets forth the accounting procedures and how costs will be allocated and paid among other standard provisions.

Q. You have not reviewed this application with the BLM because there are no federal lands involvement; is that correct?

A. That is correct.

Q. Have you reviewed this application with the State Land Office?

A. Yes, we have. Met with the State Land Office several times and have received their preliminary approval of the Vacuum-Glorieta West Unit.

Q. And a copy of their preliminary

approval letter is what has been marked as Texaco Exhibit No. 5?

A. Yes, sir, it is.

Q. Does the unit operating agreement contain a list of working interest owners in the unit showing the participation of each of those owners?

A. Yes, it does. We have made Exhibit 6 a copy of Exhibit D to the unit operating agreement. And it's a summary of the working interest ownership of the owners in the unit, just to list the owners in the unit. The Amerada Hess, Conoco, Marathon, Mobil, Phillips, and Texaco are the six owners within the Vacuum-Glorieta West Unit.

And this particular exhibit identifies the tract in which they own an interest and their Phase 1 and Phase 2 participation within the unit.

Q. What percentage of the working interest ownership in this unit is presently supporting this unit application?

A. We have prepared as Exhibit 7 a summary of working interest owner approval. We have listed the companies, their Phase 2 participation

in two separate columns: Approval of the development plan and indications of their support of unitization.

In both categories we have 84.79 percent of the working interest owners that have approved the development plan and have supported unitization.

Q. And the only company to date that hasn't indicated their support is Marathon?

A. Yes, sir. And the reason we did this is because we did not seek pre-ratification of the agreement by the parties. So we got a level of indication of support from our parties, and we have written confirmation of their support.

Q. Could we go now to what has been marked Texaco Exhibit No. 8? Would you identify that and review it for Mr. Catanach?

A. Yes, sir. Exhibit No. 8 is a summary of the royalty interest ownership within the Vacuum-Glorieta West Unit. This information basically summarizes information that is also available in Exhibit B to the unit agreement.

But what it does is summarizes the interest that each royalty owner within the unit owns. It lists the royalty owner, their tract

number in which they own their royalty interest, their percentage of royalty in that tract, the tract participation of that tract, and finally, the final two columns, it multiplies their royalty interest times the tract participation, which results in their unit participation.

You'll note the small number of royalty interest owners in the unit. In fact, there's two overriding royalty interest owners listed to make the list as long as it is. The only royalty owner that owns in more than one tract, of course, is the State of New Mexico, which owns in 20 of the 21 tracts.

Q. What percentage of the royalty interest ownership is presently committed to the unit?

A. Because we have preliminary approval from the State of New Mexico, they have 98 percent of the Phase 1 royalty interest and 96.7 percent of the Phase 2 royalty interests. So although we have not sought pre-ratification by their preliminary approval, we have 98 percent and 96.7 percent of the royalty committed.

Q. Mr. Mullins, are Exhibits 9 and 10 copies of affidavits from Campbell, Carr, Berge & Sheridan confirming that the people identified on

the attached list have actually received notice of these applications and today's hearing?

A. Yes, sir, they are.

Q. As to the statutory unitization application, has notice been given to all interest owners, working royalty, and overriding royalty interest owners?

A. Yes, sir, it has.

Q. As to the waterflood application, has notice been provided to the leasehold operators within a half mile of each injection well and to the owner of the surface of the land for each of those wells?

A. Yes, sir. In addition, we provided those to working interest owners as well.

Q. Were Exhibits 1 through 10 prepared by you or compiled under your direction?

A. Yes, sir, they were.

MR. CARR: At this time, Mr. Catanach, we move the admission of Texaco Exhibits 1 through 10.

EXAMINER CATANACH: Exhibits 1 through 10 will be admitted as evidence.

MR. CARR: That concludes my examination of Mr. Mullins.

EXAMINER CATANACH: Mr. Kellahin?

MR. KELLAHIN: No questions, Mr. Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Mullins, the reason that Texaco is proceeding with statutory unitization is due to the Marathon interest?

A. Not only the Marathon interest, but we have a slight title problem in one of our tracts that has not been rectified at this time. So we're trying to go statutory unitization.

Q. What problem is that?

A. We have a problem on one of our leases with the definition of the unitized interval that was conveyed and previous conveyances before Texaco acquired it in 1988. And trying to obtain title to cure it doesn't matter at this time, and it only affects the working interest.

Q. Okay. You've stated that Texaco will seek the EOR tax credit when the rules come out. Does that mean Texaco is going to come back to hearing to do that?

MR. CARR: May it please the Examiner, if that's what the rules require, we will be

back. Since the rules are not final, we didn't feel like we were prepared today to come in and seek certification of the project. If it's required that we come back for hearing, we will.

If we can do it based on the record made in this case, we certainly would request that it be certified based on today's presentation. But it depends on what the rules actually say.

EXAMINER CATANACH: Okay.

Q. (BY EXAMINER CATANACH) Mr. Mullins, why was the Vacuum-Glorieta Pool, why did Texaco and Phillips choose to split it and to do different units?

A. That will be brought out further in the geologist and engineering testimony later on.

Q. So it's primarily based on geology?

A. Geological and engineering reasons, yes.

Q. Okay. Is Phase 2 of the project, does that consist of CO_2 injection?

A. No. There's a certain duration of Phase 1, and it's defined in Section 12 of the unit agreement. It's calculated on how many barrels have been produced. In fact, Phase 1

barrels started being counted as of July 1 of this year.

So when 2 million -- "X" amount of barrels have been produced, then Phase 2 will commence.

Q. Okay. Has that allocation formula been agreed to by all the working interest owners with the exception of Marathon?

A. Yes, sir. Well, it was agreed to at the vote of the working interest owners. It was agreed to by 80 percent of the working interest owners.

Q. Now, your working interest owners, have they actually executed the unit agreement and the operating agreement?

A. No, sir. We have not sought pre-ratification. As soon as the Division issues its order, we are going to go for ratification. And everybody is primed and ready to go. We have 80 percent approval of the parties on the form of agreement. So the form of agreement has basically been agreed to by at least 80 percent of the parties.

Q. Do you anticipate the joinder of Marathon?

A. I'm not able to say. I really don't know.

Q. Do you have approval from the royalty interest owners and the overriding royalty interest owners that comprise the remainder of the royalty interests aside from the one the state has?

A. No. We have not contacted them yet. There again we will seek their ratification as soon as the Division issues its order. They are a very small number. I think there's eight royalty owners underneath that one fee tract. And there's two overriding royalty owners, one being Arco.

EXAMINER CATANACH: I believe that's all I have.

MR. CARR: At this time we would call Robert N. Goon.

ROBERT N. GOON

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

EXAMINATION

BY MR. CARR:

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

A. Robert N. Goon.
Q. And where do you reside?
A. Midland, Texas.
Q. By whom are you employed?
A. Texaco Exploration & Production, Inc., Midland Producing Division.
Q. And what is your position with Texaco?
A. I'm a geologist.
Q. Have you previously testified before this Division?
A. No.
Q. Would you review for Mr. Catanach your educational background and then summarize your work experience?
A. I have a bachelor of science degree in earth sciences from California State Universtiy, Bakersfield, plus 24 hours of graduate level geology courses.

Four of the past eleven years, I have worked for Texaco, Inc., in various capacities. I was hired on as a technician in the reservoir engineering group, Taft District, in Bakersfield, California, in March of 1981. I then worked as a geologic assistant from August 1982 until my promotion to a geologist in August of 1985.

While a geologist in California, I provided geologic support for properties in the San Joaquin Valley. With the reorganization in 1988, I was transferred to Ventura, California, where I worked as a property evaluation geologist until July of 1989. As a property evaluation geologist, I was responsible for determining the value of properties available for purchase and sale.

In July of 1989 I was reassigned to the reservoir group as a reservoir engineer where I was responsible for reserves, new well development, and assisting area offices and maintaining production of 4300 barrels of oil per day.

Since my transfer to Midland in February of 1991, I have worked as geologist in the enhanced oil recovery group.

Q. And your geographic area of responsibility with Texaco includes the portion of southeastern New Mexico involved in this case?

A. That is correct.

Q. Are you familiar with the applications that have been filed on behalf of Texaco in each of the consolidated cases?

A. Yes.

Q. And have you made a geological study of the portion of the Vacuum-Glorieta Pool which is involved in these applications?

A. Yes. I have reviewed and updated the data originally prepared for the proposed Vacuum-Glorieta Unit by the engineering committee report dated November of 1990.

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

EXAMINER CATANACH: He is so qualified.

Q. (BY MR. CARR) Have you prepared certain exhibits for presentation here today?

A. Yes, I have.

Q. Could you refer to what has been marked as Texaco Exhibit No. 11 and using this exhibit describe the unitized formation for Mr. Catanach?

A. Okay. Exhibit 11, if you'll note the type log up here on the wall, is a type log of the Vacuum-Glorieta Pool, which contains the Glorieta Formation and the Paddock Formation.

The Vacuum-Glorieta Pool is defined as that interval under the unit area between the top of the Glorieta at 5,838 feet to the base of the Paddock at 6,235 feet. This interval is defined

on the type log for the Vacuum-Glorieta Unit as Mobil-Bridges State well No. 95, Section 26, Township 17 South, 34 East.

Q. And this is the type log referenced in the unit agreement itself?

A. It is.

Q. Has the portion of this reservoir which you propose to unitize been reasonably defined by development?

A. Yes, it has.

Q. Let's go now to your structure map on the top of the Glorieta, which is marked Exhibit No. 12, and I'd ask that you review that for the Examiner.

A. Exhibit 12 is a structure map on top of the Glorieta, which corresponds on the type log to this horizon.

Q. Which is the uppermost?

A. Uppermost on the type log. The contour map was constructed using structural picks from the logs correlated to the type log, Exhibit 11. The contour interval is 10 feet. The shaded area represents the proposed unit. The contours show an asymmetric north to northeast anticline plunging down-dip from a north-south trending

dome on the west side of the field.

The north-south dome is centered on Section 36, Texaco "O" State lease. And the structure plunges off the dome in the west and east directions.

Q. Let's move now to the isopach maps, and first let's go to Exhibit 13, the isopach of the gross interval.

A. Okay.

Q. Could you review that?

A. Exhibit 13 is an isopach map of the net pay for the unitized interval. The net pay for the Upper and Lower Paddock were combined to make this map. This exhibit shows the net pay within the unit ranges from 20 feet to 140 feet. The 140-feet interval is in the Texaco State O-36 lease, Texaco O State, Section 36 lease, and also corresponds to the high in that same section.

Q. Now, this isopach in fact includes all floodable zones?

A. It does.

Q. Does it not?

A. Uh-huh.

Q. And this entire area which is indicated on this isopach can reasonably be expected to

contribute reserves to the unit; is that right?

A. Yes.

Q. Is there anything else you'd want to show with your Exhibit No. 13?

A. No. I think that covers it.

Q. Okay. Let's go to Exhibit No. 14. Could you explain what this is?

A. Exhibit 14 is also an isopach map strictly of the Lower Paddock Formation, which on the type log would be the third horizon. And the areal extent of the Lower Paddock, at least in floodable thicknesses, is limited to the west unit.

As you can see, on the west side off our -- or near the end of our unit, there is a zero producible interval. And also on the east side it drops down to where we couldn't flood it.

The highest -- the pay range is from 5 to 40 feet. And the high net pay occurs also in the Section 36, O State lease.

Q. So waterflood operations can be conducted in the Lower Paddock in this portion of the field?

A. Yes.

Q. But the floodable portion is only present and productive in the western part of the field?

A. Correct.

Q. And that is the primary reason for dividing the reservoir as it has been between you and Phillips, for the formation of two units as opposed to one?

A. That is correct.

Q. Now, let's go to your Exhibits 15 and 16.

A. Okay.

Q. The cross-sections. And if you could first identify them, note the trace, and then review them for Mr. Catanach.

A. Okay.

Q. Exhibits 15 and 16 -- I'll put 16 up in a minute -- are the cross-sections across the unit. The cross-sections were constructed from logs hung on a subsea depth of minus 1800 feet.

The logs shown on the cross-sections are gamma ray or sonic, logs converted to porosity log. Or if we have a neutron curve, they are plotted instead. The dark-filled lines indicate perforations. And the hachured line is

the unit border. If you look on here, that would be right here in the cross-section.

Q. You're showing that on the--

A. There is an index map on the cross-section which shows the line of the cross-section across the unit.

Q. What does this show you?

A. The Exhibit 15 shows the dome high on the west side of the property which corresponds to Section 36. And that the formations drop off sharply to the east. On the cross-sections are posted the tops which correspond to the type log, the top of the Glorieta, the top of the Upper Paddock, top of the Lower Paddock, and the base of the Lower Paddock, or the top of the Blinebry.

The perforations on this cross-section also indicate the fact that the Lower Paddock is only producible within the unit boundary. There's no perforations even in this well on the unit, inside the unit.

Q. And in that Lower Paddock in fact it shows you're losing both structure and quality as you move toward the east?

A. That is correct.

Q. Anything else with Exhibit 15?

A. No.

Q. Okay. Let's go to your other cross-section, Exhibit No. 16. Review that for the Examiner.

A. Exhibit No. 16 is a north-south cross-section through the unit. On the index map you can see it goes right through the entire unit towards the east side of the property. Again, the logs are hung on a subsea depth of minus 1800. The unit borders are the hachured lines, and the perforations are indicated on the solid lines.

This again shows how the structure plunges off the unit, actually plunges to the north and to the south. You can see where it drops off on either side here, starts as a low, comes up, peaks in this Section 36 property, and then drops off to the south.

Q. Anything further?

A. That's it.

Q. Mr. Goon, in your opinion can the portion of this particular pool, which is enclosed or included within the proposed unit area be efficiently and effectively operated

under a unit plan of development?

A. Yes. The Upper and Lower Paddock are both water-floodable within the Vacuum-Glorieta West Unit boundary. The Lower Paddock does not occur in sufficient quantity to flood in the east. However, both zones are continuous across the Vacuum-Glorieta West Unit and thus are prime candidates for waterflood.

Q. Were Exhibits 11 through 16 prepared by you?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we would move Texaco Exhibits 11 true 16.

EXAMINER CATANACH: Exhibits 11 through 16 will be admitted as evidence.

MR. CARR: That concludes my examination of Mr. Goon.

EXAMINATION

BY EXAMINER CATANACH:

Q. Am I correct in understanding that the Lower Paddock is present in the east portion of the unit but --

A. Well, if you look at the isopach, it drops down, Exhibit 14, the isopach of the lower Paddock. As you can see, it drops five feet of

net producible interval closely after going toward -- falling off our unit. The structure dips that direction, and it's just not producible over there.

Q. Is there any production in the east, proposed east unit in that Lower?

A. Lower Paddock? Most of the wells are not deep enough to be producible over there. But they have tested some of the wells on that side of the property, and they haven't produced.

Q. Okay. So you've got two main floodable zones, one being in the Upper Paddock?

A. Correct. If you look at the type log, both the Upper Paddock and the Lower Paddock, mainly the top 100 feet of each interval are floodable within the zone, within the unit.

Q. And those two zones are separated by what?

A. Well, there's actually just a tight zone in there. It's all carbonate and dolomites, and it's just a tighter interval in here.

Q. So they're not in communication?

A. I can't guarantee that they're not, but I don't believe that they are. We're not going to flood them separately.

Q. Do they exhibit the same characteristics in your proposed unit? Permeability?

A. The cutoffs used for determining net pay were the same. And I have not -- I haven't looked at the core. I haven't looked at the core to determine if there was significant lithologic difference. But generally the structure is more of a limestone up here and a dolomite sand to the south -- dolomite interval. I'm so used to saying sands. It's not a sand. I apologize. California.

Q. The proposed unit boundary generally on the northwest and south side generally correspond to field development where the field has been developed?

A. Run that by again. I didn't quite -- on the northwest side of the property?

Q. Well, let me just ask you how the northwest and south boundaries of the unit were determined or were derived.

A. I'll have to defer to Mr. Dunham, the engineer, on that.

Q. Well, does geology have a part in that?

A. Most of the wells here were drilled in

the 60s. And there are significant other flood units surrounding them, deeper and shallower. The Abo Unit is significantly deeper and so penetrated these zones on the way down. And they didn't have any -- they didn't produce hydrocarbons out of those zones.

So I guess the conclusion you can draw from that is that if they drilled through it and it wasn't producible, they didn't produce it.

Q. Is the unitized interval fairly easy to correlate across the proposed unit?

A. Yes. I had no problem. The engineering technical committee did the majority of the wells which were drilled in the 60s. Texaco over the last three years has drilled several wells. I had no trouble correlating those wells to the older wells at all.

EXAMINER CATANACH: That's all I have of the witness, Mr. Carr.

Oh, Mr. Kellahin. I'm sorry.

EXAMINATION

BY MR. KELLAHIN:

Q. I'm still confused by the boundary. Would you help me understand the geology as we go around the boundary?

A. Uh-huh.

Q. Let me start with the isopach of the Lower Paddock. It's simply easier for me to visualize. When you follow the political boundary, the configuration of the unit, and compare it to the reservoir as you've mapped it, looking at the net isopach on the Lower Paddock, when you follow that boundary around, are you looking at the zero contour line on the net isopach as an element of control for the political boundary?

A. Actually that's the way it worked out. The producible interval for the Lower Paddock is limited to the west side of the property. The dip on the east side is such that you get some water encroachment in the Lower Paddock, and it's not producible.

The technical committee that did the original report in 1990 did wrestle with this problem for a while and determined that there just was no way to map any producible interval in the Lower Paddock on the east side of the property.

Q. When you look at the west boundary --

A. Uh-huh.

Q. -- in the Lower Paddock, with the exception perhaps of the northeast quarter of 26, that boundary is a reasonable fit to the zero contour line in the Lower Paddock, this one over here?

A. Yes.

Q. Do you see what I'm saying?

A. Yes.

Q. You've got an 80-acre tract up here that's greater than the zero that's not the unit?

A. That's true, but there's only ten feet of producible interval. And you'll have to ask our engineer, but in my estimation that's not floodable.

Q. Okay. That sets me up for you to explain to me the eastern boundary of your unit and why you have selected to exclude, for example, the Marathon tract here that has value greater than ten that is not yet in the Western Unit.

Is there a geologic explanation to the eastern boundary when we look at the Lower Paddock?

A. Not as much so as there would be an engineering reason.

Q. Okay. Come up to the isopach Exhibit 13. It's a combination of Lower and Upper Paddock?

A. Uh-huh.

Q. Why did you do that as opposed to simply an isopach of the Upper Paddock?

A. Because we planned to flood the entire -- both intervals. And when you're working -- when you're figuring out the economics for a flood, you want to take the entire net pay interval. I have one of those.

Q. Why then do we have a net isopach of only the Lower Paddock?

A. Because it shows the limitations of the Lower Paddock. There really as much a limitation to the Upper Paddock zone as there is to the Lower Paddock.

Q. When we get to the Upper Paddock, is the Upper Paddock to be part of the floodable interval for Phillips' Eastern Vacuum-Glorieta Unit?

A. Yes, it is.

Q. So at least in that portion of the reservoir, even if that boundary is not precisely correct, geologically there is going to be floods

on both sides of that?

A. Yes. That's easy to explain if you look at the cross-section because the Upper Paddock is considerably up-dip of the Lower Paddock. As you drop down -- well, it shows, as you -- it shows better on these east-west cross-sections.

As you drop-off of the unit, you can see how the dip -- this is Section 36, our two wells. The cross-section goes right through here. You can see that the dip increases dramatically, and with that the water encroachment does at the same time.

So they have not been able to produce the Lower Paddock down here on this side because it's further down-dip than the Upper Paddock and therefore it is wet or tight or both.

Q. And the choice on the boundary separation between the east and the west when we get to the upper Paddock is based upon what?

A. The choice between the breakout of the west and east, at least geologically, is based on the Lower Paddock, not on the Upper Paddock.

MR. KELLAHIN: Okay. Thank you.

Thank you, Mr. Examiner.

MR. CARR: At this time, Mr. Catanach, we would call Dan Dunham.

DANIEL A. DUNHAM

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

EXAMINATION

BY MR. CARR:

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

A. Daniel Arthur Dunham.

Q. Where do you reside?

A. In Midland, Texas.

Q. By whom are you employed?

A. Texaco.

Q. And in what capacity?

A. I am a project team leader in the unitization group in the Midland Producing Division.

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

A. No, sir.

Q. Could you review your educational background and work experience for Mr. Catanach?

A. In 1982 I received two bachelor degrees from Purdue University, one in geology, one in

geological engineering. From 1928 to the present, I've been working with Texaco in the Permian Basin. I've worked five years as an operations engineer, two years in development, and in the past three years in reservoir engineering.

Q. Are you familiar with the application filed in this case?

A. Yes, sir.

Q. And have you made a study of the area which is involved in this application?

A. Yes, sir.

MR. CARR: At this time, Mr. Catanach, we tender Mr. Dunham as an expert witness in petroleum engineering.

EXAMINER CATANACH: Mr. Dunham is so qualified.

Q. (BY MR. CARR) Mr. Dunham, are you familiar with the Statutory Unitization Act?

A. Yes, sir.

Q. Has it been your responsibility to pull together this presentation for the Commission here today?

A. Yes, it has.

Q. Have you prepared certain exhibits for

presentation here today?

A. Yes, sir.

Q. Let me direct your attention to what has been marked as Texaco Exhibit No. 17, our well status map, and I'd ask you to review the information on that exhibit for Mr. Catanach.

A. Okay. This exhibit was originally presented in the development plan, which will be presented in this hearing as Exhibit 20, your Exhibit 17.

Again, the unit outlined is highlighted in yellow. The solid dots represent the producing wells in the proposed unit. At full development there will be a total of 69 producing wells. Up to 19 of these wells may require replacement due to operational and mechanical conditions. The injection wells are shown as triangles connected by the pattern lines here.

Along the eastern boundary we will be cooperatively drillling every other well with the east unit. Our wells are shown as the standard triangles. The wells -- the east unit we'll be drilling are inverted triangles. Each unit we'll be drilling six of those wells.

Again I would like to go ahead and

explain this situation of how the unit boundary was drawn. The primary reason, which has been stated, is that of the lower -- the development of the Lower Paddock Formation being situated on the west and absent in the east. The development of the two floods are going to be separate because of the existence of that zone.

When you get down to the north half of Section 6, the line was not continued down here. That would bisect this Marathon tract in the northwest quarter section of Section 6.

A second reason, an engineering reason that the west is being separated from the east is operational considerations. There's a lot of slim-hole completions most predominantly concentrated in the west hole. These are tubingless completions, duals, triple completions, such as that.

The New Mexico R State, which is in the northeast quarter section of Section 6, which is a Texaco operated tract, also has a large majority of slim holes in it. We wanted to go ahead and keep that so that the operators in the West Unit could handle this situation where it is absent from that in the east side.

Q. Now, Mr. Dunham, one other thing. There were questions asked about the determination not only of the eastern boundary, which you've just reviewed, but the boundaries to the north, south, and west. Why were those boundaries selected?

A. Well, there's a number of dry holes all around the perimeter of this, dry or wet tests. A number of other wells also penetrated this zone. And through log analysis it is determined that the formation was either absent or would be wet down-dip such as that. So that is how the pool development of this field has been established.

Q. Let's go now to what has been marked as your Exhibit No. 18. Would you identify that and review it for Mr. Catanach?

A. Again this exhibit was originally presented in the development plan as figure 5. This is the composite curve representing all the leases that will be contributing to the Vacuum-Glorieta West Unit.

The green curve is the production history. You can see that the field was discovered back in 1963. The purple curve shows

the continued primary operations, projected continued primary. Then the magenta will be the waterflood project.

As you can see listed on this exhibit, we anticipate fourteen-and-a-half million barrels of reserves will be recovered from the waterflood project.

Q. Now, have you estimated the additional costs that will be incurred in developing this waterflood project?

A. Yes, sir, I have.

Q. And what are those?

A. The incremental operating costs over the life of the project will increase by $45.2 million. Total investment for this project will be $37.7 million. That includes drilling up to 19 replacement wells that I discussed earlier. The anticipated present value of performing the project is $43 million discounted at 11.5 percent.

Q. Okay. So what you're saying is that, over and above the costs that you have identified, the value of the additional reserves should be $43 million?

A. Correct.

Q. What actual price was utilized in computing these figures?

A. We used $20 per barrel of oil held constant. And a detailed breakout of the project economics is provided in the development plan, again Exhibit 20 of this hearing.

Q. Mr. Dunham, previous exhibits have indicated that all working interest owners in the proposed unit area are prepared to commit their interests except Marathon. My question is why is it important to statutorily unitize this area thereby having all tracts included in the unit?

A. Again I would like to refer back to Exhibit 17. The two Marathon tracts are the southwest quarter section of Section 25 and the northwest quarter section of Section 6.

As you can see, the exclusion of the southwest quarter of Section 25 would leave a window in this unit. It would also isolate part of Mobil Bridges State over here as identified as the east half of the southeast quarter, Section 26.

The exclusion of the Marathon tract in the northwest quarter section of Section 6 would isolate Texaco's New Mexico R State NCT-1 lease

located in the northeast quarter section of Section 6.

It would be necessary to eliminate 14 injection wells in order to accommodate the removal of the Marathon properties. Not only would the recovery potential be lost on their tracts, but it would also be lost on all but one-half patterns which offset their tracts.

It would be necessary for the remaining partners to completely reevaluate the production schedule and attempt to agree to participation in a project that would exclude these tracts.

And from a technical viewpoint, you know, the exclusion of the tracts would waste and lose potential recovery. And from a business standpoint, going back to the renegotiations, it could drag out this project for years, if we could ever come to agreement again.

Q. So, Mr. Dunham, if in fact we are going to be able to obtain the projected fourteen-and-a-half million barrels of additional oil, it's necessary that the entire West Unit area be included within the unit; is that what you're saying?

A. Yes, sir.

Q. In your opinion is unitized management, operation, and further development of the portion of the pool covered by this application reasonably necessary to substantially increase the ultimate recovery of oil from the unitized area as you've indicated on Exhibit 18?

A. Yes, sir.

Q. In your opinion are the unitized methods of operation as you propose to apply to this unit area feasible?

A. Yes, sir.

Q. And what methods are we actually talking about here?

A. Waterflooding.

Q. Will the method of operation following unitization result in your opinion in a reasonable probability in the increased recovery of hydrocarbons?

A. Yes, sir.

Q. What is the basis of the participation formula set out in this unit agreement?

A. Okay. As stated earlier, this is a two-phased formula. Phase 1 is heavily weighted in remaining primary reserves and current production to ensure that all productive tracts

will recover their fair share of remaining primary production while maintaining their current revenue levels.

Phase 1 lasts until 2.175 million barrels of oil have been produced. It is anticipated that this will occur in 1995.

Phase 2 is heavily weighted in cumulative oil production and current rate, which are good indicators of the better quality reservoir which will be most conducive to waterflood operation.

Also, volumetric oil was included to ensure that all floodable pay that would benefit from waterflood operations has been included.

Q. In your opinion does this formula allocate production to the separately owned tracts in the proposed unit area on a fair, reasonable, and equitable basis?

A. Yes, sir.

Q. Is the unitization as proposed necessary to effectively carry on successful secondary recovery operations as you are proposing?

A. Yes, sir.

Q. Let's go for a few minutes to the

portion of this case which relates to the waterflood application. Are you familiar with the waterflood application for the unit?

A. Yes, sir.

Q. Could you identify what has been marked as Texaco's Exhibit No. 19?

A. That is the completed Form C-108.

Q. Let's go to that exhibit, and I would ask you to first refer to the material behind the tab marked "Proposed Injection Wells." Could you identify that material and review it for Mr. Catanach?

A. Yes. The first sheet here identifies the Bridges State Well No. 113, which is the farthest north well. This is the only well that will be converted from production to injection. Following that is a list of all the newly drilled injection wells that we proposed for this unit.

Q. And how many wells do you propose to drill?

A. There will be 59 new wells and 1 conversion for a total of 60 wells.

Q. Let's now go to the portion of the exhibit behind the tab marked Exhibit Roman Numeral V, identify that, and review it.

A. Okay. This shows the area of review. This is a one-half mile radius around all the proposed injection wells for the unit. There is an expanded version in the back pocket of the C-108.

Q. Does that enlarged version of this exhibit indicate the leasehold ownership within two miles of each injection well?

A. Yes, sir, it does.

Q. What injection pattern does Texaco propose to use?

A. If I could refer back again to Exhibit 17, we will develop on a 40-acre, 5-spot injection pattern by drilling injection wells on 20-acre spacing between the existing producing wells.

Q. Now, let's go to the wells that are within the unit area and also within the area of review and refer to those two tabs in Exhibit 19.

A. Okay. These are all the wells which penetrate our injection zone within the area of review. We've broken it out into those wells which reside in the unit area and those that reside outside but within the area of review.

This includes a wellbore diagram for each well showing the location, casing records, cement records, total depth, completion record, spud date, completion date and current status for each well.

Q. Does this exhibit also contain schematic drawings of all plugged and abandoned wells within the areas of review?

A. Yes, sir. If you refer to the two tabs identified as "P & A Wells Inside the Unit" and "P & A Wells Outside the Unit," here again, the same way it shows the wells within the unit area and between the unit area and area of interest. It shows all the plugging details and shows casing strings left in the wells.

Q. And how many plugged and abandoned wells are we actually talking about?

A. Total of fifteen, twelve inside the unit and three outside the unit.

Q. Are there any plugged and abandoned wells that need to be repaired or pose any problems in terms of the effective operation of this waterflood project or contamination of freshwater?

A. No, sir. All the wells were plugged in

accordance with state rules.

Q. Let's go now to the portion of this exhibit which refers to typical injection well. And I'd ask you to review the schematic drawings of the proposed injection well.

A. Okay. First, there's an injection well data sheet for the Bridges State well, which is the well we're going to be converting to injection from production. Following that is the wellbore diagram existing in that well.

As you can see, cement was brought to surface on both strings of casing. We intend to utilize 2-3/8 inch cement line tubing and a Baker 81 tension packer.

Following that are two examples of new drilled injection wells that we propose, one in what we call the water flow area and one in a non-water flow area.

Q. First, what are we talking about when we say in the water flow area?

A. As you drill through the salt sections above 3,000 feet, and we have experienced in the past water flows from this interval. When those water flows are great enough, it is necessary to run an additional string of casing as you get

through those, cement it, and then drill your production stream.

We anticipate approximately a quarter of the field may experience this, but past drilling has shown that this is actually abating and we may not see the severity of it as we have in the past.

Q. Okay. Let's go back to the schematic drawings and just review those for Mr. Catanach.

A. Here again we'll ensure that cement is brought to surface on all strings of casing. We will be using 2-3/8 inch cement line tubing and a Baker 81 tension packer. And we'll be setting that packer within 100 feet of perforations or openhole.

Q. Now, at full development you're anticipating 60 injection wells; correct?

A. Correct.

Q. And how many of those wells are actually going to be cooperative wells between the west and east units?

A. Six of those wells we will cooperatively operate, and then six the east will.

Q. And you're going to drill all of these

with the exception of the one well you have identified that you'll be converting from producing status to conversion?

A. That's correct.

Q. What is the status of your plans for a cooperative agreement along the eastern boundary of the proposed unit area?

A. As stated a cooperative injection agreement will be developed between the Vacuum-Glorieta West Unit and future waterflood operations to the east of our unit.

We also have an interest in the proposed east unit, so we are active in their negotiations. Their plan of development includes their obligation of the wells, and we have agreed tentatively that this is how the two units will be developed.

Q. And if something should happen and the east unit isn't formed, you would then be in a position to negotiate lease line agreements with the individual operators along that boundary?

A. Correct. That is the procedure we would follow.

Q. How soon do you need to have those agreements actually in place?

A. We anticipate it will be two years before we really need to drill those wells. And we anticipate that the east will be in an active unit by that period.

Q. How do you propose to stimulate wells in the West Unit?

A. We'll be doing selective perforation in small acid treatments.

Q. Now, in terms of the waterflood of this unit, you're actually proposing to flood with freshwater; is that correct?

A. Yes, sir, that is correct.

Q. What is the source of this water?

A. The Ogallala Formation.

Q. Have you reviewed this matter with the New Mexico Commissioner of Public Lands?

A. Yes, sir.

Q. And basically where do your negotiations with the Commissioner stand in terms of using freshwater to supplement waterflood operation in the unit?

A. We met with them on a number of occasions, and they have given us preliminary approval with the stipulation that we will revisit this issue in three years after the unit

is approved.

We'll at that time look at our freshwater requirements, look at what is available, and reevaluate it and submit our findings to them.

Q. In your meetings with the Commissioner of Public Lands, have you reviewed with him the demands for water for all the waterflood projects in the area as indicated on Exhibit No. 1?

A. Yes, sir, we have.

Q. Was it after that review that the Land Office was willing to approve the use of the injection of freshwater in this waterflood project?

A. Yes, sir.

Q. What will be the maximum daily injection rate per well?

A. One thousand barrels per day per well.

Q. Will this be a closed system?

A. Yes, sir.

Q. Are you going to be injecting by gravity or under pressure?

A. We will be initially injecting by gravity, but as we reach fill-up, we anticipate catching pressure.

Q. What would be the maximum pressure you would request be authorized in the order that results from hearing?

A. One thousand two hundred and twenty pounds PSIG.

Q. Is that a pressure that is consistent with a two-tenths pound per foot of depth limitation to the top of the injection interval?

A. Yes, it is.

Q. Does Texaco request authority to increase injection pressure without the necessity of further hearings if it can demonstrate to the Division that injection pressure increases will not cause injection fluid to escape in the injection interval?

A. Yes, sir.

Q. Does Exhibit 19 contain water analyses of the injection fluid?

A. Exhibit 7.

Q. In Exhibit 19?

A. Yes. Exhibit 7 of the C-108, on the section page we do have a sample recently taken of produced water from Vacuum-Glorieta.

Q. And you will be injecting some produced water?

A. We will be reinjecting all our produced water in this project. Following that is a number of freshwater analyses from the Ogallala.

Q. And the Ogallala is a freshwater zone in the area?

A. Yes, sir.

Q. Are there other freshwater zones?

A. No, sir.

Q. Are the wells throughout the proposed unit area going to be cased through this freshwater zone?

A. Yes, sir.

Q. Are there any freshwater supply wells within a mile of any proposed injection well?

A. Yes, sir.

Q. And are they identified in Exhibit 19?

A. Yes, they are.

Q. Whereabouts would they be found?

A. Under Exhibit 11. You can see on the second page there is a map of our area of review with the 16 freshwater wells identified on it. Following that again is the freshwater analysis for each one.

Q. And these are all producing from the Ogallala?

A. Yes, sir.

Q. Now, in terms of logs on wells in the unit area, the one well you're proposing to convert to injection, that log is on file with the Division, is it not?

A. Yes, sir.

Q. Then as you drill additional injection wells, those logs will be filed?

A. Yes, sir.

Q. Are you aware of similar applications for waterflooding which have been granted in the immediate area of this project area?

A. Yes. It's been pointed out in Exhibit 1 the number of active projects out there. I will list a few of them: The Vacuum-Grayburg-San Andres Unit, Central-Vacuum Unit, North Vacuum-Abo Unit, East Vacuum-Grayburg-San Andres Unit, Vacuum-Abo Unit, North Vacuum-Abo West Unit.

Q. Does Texaco request an administrative procedure whereby additional wells can be converted to injection without the necessity of additional hearing?

A. Yes, sir.

Q. In your opinion will approval of this

application for waterflooding result in the recovery of oil that otherwise will be left in the ground?

A. Yes, sir.

Q. Will approval of this application impair the correlative rights of any owner in the project area?

A. No, sir.

Q. As to the application for statutory unitization, do you believe approval of that application would also prevent waste and protect correlative rights?

A. Yes.

Q. Could you identify what has been marked as Texaco Exhibit No. 20?

A. Again we referred to it, this is the unitization and waterflood development plan, which has been discussed earlier and has been provided to all the working interest owners and to the State Land Office.

Q. And this contains the economic calculations that you referenced earlier and also several of the plats that you have utilized in your presentation?

A. Yes, sir.

Q. Were Exhibits 17 through 20 prepared by you?

A. Yes, sir.

MR. CARR: At this time, Mr. Catanach, we would move the admission of Texaco Exhibits 17 through 20.

EXAMINER CATANACH: Exhibits 17 through 20 will be admitted as evidence.

Q. (BY MR. CARR) Mr. Dunham, how soon would Texaco be prepared to go forward with the actual implementation of this project?

A. All of our partners are aware of our progress and are anxious to get this implemented this year. We would desire to begin injection in September of this year in order to spend ours and others' budgeted moneys and get this project going as fast as possible.

Q. And companies that are involved have been notified of this hearing and are ready to ratify as soon as we have an order?

A. Yes, sir.

Q. And you're hoping to be ready to go forward with the unit operations as early as September of this year?

A. Yes, sir.

MR. CARR: That's all I have of Mr. Dunham.

EXAMINER CATANACH: Mr. Kellahin.

EXAMINATION

BY MR. KELLAHIN:

Q. Give me a reference as to the manner in which the final participation formula was selected by the working interest owners and the support balloted for going forward with the project. Was that accomplished or undertaken at a working interest owners meeting?

A. Yes, sir.

Q. What was the approximate date of that meeting?

A. It was in the end of October.

Q. Of 91?

A. Of 1991. I may be corrected to say the end of November of 1991.

Q. Fall, November, early winter of 91, there's a working interest owners meeting in which the participants come together and take action on various recommendations for a participation formula?

A. Yes, sir.

Q. Have there been any formal working

interest owner meetings since the November meeting?

A. Yes. We had one.

Q. And what was the purpose of that meeting?

A. We called the parties in to basically update them on the progress that we were making towards unitization just as information.

Q. It was not to ballot on participation?

A. No, sir.

Q. When the working interest owners get together to negotiate, ballot for participation, it's generally done based upon parameters developed by a technical committee?

A. Correct.

Q. And was a technical committee formed, and they do technical work for this particular project?

A. Correct.

Q. All right. The reservoir parameters developed by the technical committee, I didn't find any of that in the exhibits presented in today's hearing. Did you have those presented here?

A. No, sir. The ones that were selected

were as far as the participation, but the actual values were not submitted here.

Q. All right. The technical committee report is not one of the exhibits here at the hearing?

A. No, sir.

Q. Okay. When the working interest owners got together and balloted in November, how many ballots were taken before you got the level of support that you have told us you have for the project?

A. Ballot No. 32 is the one that you see here presented.

Q. Okay. And what was the level of support from the working interest owners on this ballot that got us this participation formula?

A. Approximately 80 percent in both Phase 1 and Phase 2.

Q. Okay. This particular formula, has this been used in other waterflood projects in similar floods in this area, or is this particular formula unique to this project?

A. I would say that I can't answer that. I did not compare it to other projects.

MR. KELLAHIN: Okay. Thank you, Mr.

Examiner.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Dunham, let me just go over some figures with you again just to make sure I have them correct. Recoverable reserves under secondary operations, approximately fourteen-and-a-half million barrels?

A. Yes, sir. That is the incremental above waterflood, continued waterflood.

Q. Okay. A total investment of approximately $37.7 million --

A. Correct.

Q. -- for the whole project. And value of the secondary reserves is $43 million?

A. Net present value.

Q. Net present value. Were the reserves broken out in any fashion as to the Lower or Upper Paddock?

A. In the technical report the Lower and Upper Paddock have been broken out as far as original oil in place. But as far as the -- when we did our modeling, we were looking at flooding both zones simultaneously.

Q. So you don't have a figure on what

might be recovered from each of those zones?

A. No, sir. It could be developed, but I do not have it here.

Q. Okay. Mr. Dunham, did you look at area of review wells in and out of the unit area to determine if they were all constructed in a manner that would ensure a non-migration of injected fluid?

A. Yes, sir, I did. Every one of these wellbore diagrams was developed by me. So I looked at every one individually a number of times.

Q. Okay. What conclusion did you reach when you did that?

A. I did not identify one well that would be a problem.

Q. Approximately how many area of review wells are we talking about?

A. Approximately 200.

Q. Are these 200 wells, are they fairly new in terms of -- when were most of them drilled?

A. Yes, sir. I would say the majority of them were drilled in the mid- to late-60s and then some more recent drilling. But the majority

back in the 60s.

Q. Quite a few of these wells look like they have cement circulated on both strings or all three strings. Is that generally the practice back then?

A. Yes, sir. And in some events where that was not the case, many have reentered these wells and brought cement to surface through squeeze perforations.

Q. Is that due to the difficulty that you've encountered in the salt section?

A. I think that that is what initiated a lot of that work.

Q. You say that problem seems to be abating. What do you base that opinion on?

A. We've -- Texaco has done a considerable amount of drilling, I would say 12 wells plus or minus, over the last five years. And where areas, like, offset to where we might have seen a severe waterflood problem seems to be not as critical in these newer wells.

Q. It's still present; it's just not as bad as it was?

A. That's correct.

Q. In your participation formula where did

the figure 2.1 -- was it 2.175 million barrels produced?

A. Yes.

Q. And then Phase 2 kicks in?

A. Yes. That was agreed to by the parties in the Vacuum-Glorieta West Unit as to when to switch phases.

Q. What was that based on?

A. It was based on a compromise of what we projected the remaining primary reserves were to get people to participate to the formula, to agree to the formula.

Q. Okay. You stated that the Commissioner of Public Lands has approved the use of freshwater for injection?

A. Yes, sir.

Q. Is that contained in the unit agreement or the operating agreement? Where does it state that you're going to use freshwater?

A. In our plan of development we talk about using freshwater.

Q. Okay. And he has approved the plan of development?

A. Yes. That was submitted at the preliminary approval meeting.

MR. CARR: Mr. Catanach, we've discussed this as recently as a week ago today with Mr. Carson and since that time have talked with Pete Martinez.

And they have advised us that all their questions have been answered and they will be ready to give final approval as soon as we get the order. And the water issue will not hold that up, that they're satisfied on that point.

Q. (BY EXAMINER CATANACH) Okay. Mr. Dunham, are the majority of the wells within the proposed unit area, are they currently marginal producers?

A. I would say that the majority are under stripper status.

Q. Are there any top allowable wells?

A. No, sir, not in the Vacuum-Glorieta West Unit.

EXAMINER CATANACH: I believe that's all I have.

MR. CARR: Let me just follow up on one thing.

FURTHER EXAMINATION

BY MR. CARR:

Q. Mr. Dunham, we were talking about the

costs associated with this effort. And you stated that there were $37.7 million in additional costs. What are those for?

A. That is the capital investment in the project. On top of that there's also $45.2 million of additional operating costs.

Q. Okay. Above those two cost elements, does the value of the oil you hope to obtain exceed that amount?

A. By $43 million.

MR. CARR: That's all I have.

EXAMINER CATANACH: Okay. Anything further of this witness?

MR. KELLAHIN: May I have a brief meeting with Mr. Carr for just a second?

EXAMINER CATANACH: Sure.

MR. CARR: I don't know if I want to.

[A discussion was held off the record.]

MR. CARR: Mr. Catanach, I have one question for Mr. Dunham just to correct something that I think he may have misunderstood your question on.

Q. (BY MR. CARR) Mr. Dunham, you responded to a question from Mr. Catanach concerning the 14.5 million barrel figure in your

testimony. What is that? What does that number represent?

A. That is the incremental recovery above continued primary operations from the waterflood project.

MR. CARR: And other than that, that concludes our presentation, and we would -- I have prepared proposed orders granting both applications that I would like to submit to you with a request that the orders in the case be expedited.

That's all we have.

EXAMINER CATANACH: Okay. Anything further, Mr. Kellahin?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: There being nothing further, Cases 10515 and 10516 will be taken under advisement.

[And the proceedings were concluded at the approximate hour of 12:45 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, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

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

WITNESS MY HAND AND SEAL JULY 28, 1992.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3