STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING)
CALLED BY THE OIL CONSERVATION)
DIVISION FOR THE PURPOSE OF)
CONSIDERING:) CASE NOS. 10845 and 10846

APPLICATION OF PHILLIPS PETROLEUM COMPANY

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: David R. Catanach, Hearing Examiner

October 7, 1993

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on October 7, 1993, at Morgan Hall, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Deborah O'Bine, RPR, Certified Court Reporter No. 63, for the State of New Mexico.

ORIGINAL

I N D E X

October 7, 1993
Examiner Hearing
CASE NOS. 10845 and 10846

E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION: ROBERT G. STOVALL, ESQ.
General Counsel
Oil Conservation Commission
State Land Office Building
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

FOR THE APPLICANT: KELLAHIN AND KELLAHIN
117 N. Guadalupe
Santa Fe, New Mexico
BY: W. THOMAS KELLAHIN, ESQ.

EXAMINER CATANACH: At this time we'll call Case 10845, Application of Phillips Petroleum Company for a unit agreement, Lea County, New Mexico.

Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin appearing on behalf of the applicant.

At this time we would ask that you call the next case, 10846, and consolidate it with the first case.

EXAMINER CATANACH: At this time we'll call Case 10846, which is the Application of Phillips Petroleum Company for approval of a waterflood project, and to qualify said project for the recovered oil tax rate pursuant to the New Mexico Enhanced Oil Recovery Act, Lea County, New Mexico.

Are there additional appearances in either of these cases? There being none --

MR. KELLAHIN: I have three witnesses to be sworn, Mr. Examiner.

EXAMINER CATANACH: Okay. Will the witnesses please stand to be sworn in.

(Witnesses sworn.)

MR. KELLAHIN: Mr. Examiner, my first witness is Mr. Keith Maberry. Mr. Maberry is the

project engineer for this project.

KEITH MABERRY,

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

EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation.

A. Keith H. Maberry, and I am a reservoir engineering specialist with Phillips Petroleum Company in Odessa, Texas.

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

A. No, I have not.

Q. Summarize for us your education.

A. Graduate with a bachelor's in mechanical engineering from Georgia Institute of Technology in 1982. I've been a practicing petroleum engineer for the last 11 years with Phillips Petroleum, seven years experience in the Permian Basin and five years in the Texas Panhandle.

The past two years I've been a reservoir engineering specialist in our EOR operations group, and my primary project for that length of time has been the Vacuum Glorieta unitization.

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

EXAMINER CATANACH: Mr. Maberry is so qualified.

Q. (BY MR. KELLAHIN) Mr. Maberry, let's take Exhibit No. 1, if you will unfold that display. Before we talk about your project specifically, give us an idea of where you're located within the Vacuum field of the Glorieta Pool, if you will.

A. Exhibit No. 1 is a plat that shows all the major EOR projects going on in the Vacuum field. There are quite a number of them. The proposed Vacuum Glorieta East Unit is the solid yellow outlined in red. And also for reference, we have the red hatched Texaco Vacuum Glorieta West Unit. We share a common boundary or will share a common boundary with Texaco's Vacuum Glorieta West.

This unit lies beneath Phillips-operated East Vacuum Grayburg-San Andres unit, and it lies above the Phillips-operated Vacuum Abo Unit.

MR. KELLAHIN: Mr. Examiner, the Texaco project was approved by the Division pursuant to statutory unitization. That case was heard by you back on July of '92. It's Case 10515. The unitization order is R-9710. And then the waterflood

approval for that project is Case 10516. It is order No. R-9714.

Q. As this project for Phillips has evolved, has it been necessary at this point to ask the Division to implement the statutory unitization procedures in order to organize the interest owners for the project?

A. No. We seek voluntary unitization.

Q. Let me have you turn to Exhibit No. 2. Identify this display for us.

A. Exhibit No. 2 is a base map or plat, if you will, of the proposed unitized interval. It was Exhibit A to our unit agreement, unit operating agreement. It shows all the 47 tracts that will be contributed to the unit, the proposed tract number, and the sequential numbering of the wells within the tracts.

Presently, the unit -- excuse me.

Q. I was going to ask you to explain to us the type of well symbols we're seeing on this display.

A. The solid dot is present active Glorieta completion. There are 74 of them. The dot with the, I guess diagonal hatch through it are shut-in wells. There are 18 of those. The vertical hatch represent T & A'd wells; there are eight of those. And the

crosshatched over the dot is plugged and abandoned wells; there are 15. And for the purposes of this plat, plugged and abandoned meant plugged and abandoned from the Glorieta interval. These wells may be active in other formations.

Q. When we talk about the unitized interval in a vertical sense to describe the area that you want to operate under the unit plan, can you give us an illustration of what that interval is?

A. Yes. Exhibit 3 is a type log of the Vacuum Glorieta Unit or, excuse me, the Vacuum Glorieta Pool. It is the Mobil Bridges State #95, and that is the type log for this pool. And we have duplicated just a portion of the log that shows the unitized interval.

The unitized interval is from the top of the Glorieta, which correlates to 5838 on this log, and continues down to the top of the Blinebry, which correlates to 6235 on this log.

There are also three delineations of pay, the Glorieta, Upper Paddock, and Lower Paddock. The Upper Paddock is the continuous formation within the unitized interval that we intend to waterflood.

Q. Have you reached a recommendation as to which portion of the unitized interval is the best

candidate for the waterflood project? What portion of the pool do you propose to inject water into?

A. The Upper Paddock.

Q. Let's try to get a sense of the position of the proposed unit as it overlies the reservoir. Do you have an illustration that shows us how that relationship exists?

A. Yes. Exhibit 4 is a net isopach pay map on the Upper Paddock versus the floodable pay, and this is of the entire pool; so it does include the Texaco Vacuum Glorieta West Unit, which is outlined in blue, and then our proposed Vacuum Glorieta East Unit, which is outlined in red.

As you can see, the zero contour interval corresponds quite well with the proposed unit boundaries, and then we'll share the common boundary with Texaco's unit to our west.

Q. Can you give us a summary of what have been the efforts by Phillips and the other operators within the unit area to recover primary oil production in a conventional way from this portion of the reservoir?

A. Yes. Every operator out there has individually produced their wells as they would in a prudent manner through primary depletion. The western half of this reservoir is primarily dominated by

solution gas drives.

Q. When we talk about the primary development of the reservoir at this point in time, please continue.

A. Yes. Again, each individual operator has depleted their tracts through primary depletion. These wells primarily are being dominated by solution gas drives and have very low bottom hole pressures. Most of the wells have been on pump for a number of years. Several of them are uneconomic to operate.

As you head towards the southeast flank, there is a water influx which is given some pressure support and there are still a few top allowable wells in that area.

Q. Do you have an engineering opinion as to whether it is appropriate at this point in time to commence secondary recovery with an EOR project?

A. Yes. It's definitely time. The far majority of the proposed unit interval is very depleted.

Q. Give us a summary of what Phillips and the other operators and interest owners in the proposed unit have done in order to come to a consensus on a plan to implement for the secondary recovery. What did we do?

A. Do you want to go back to 1987?

Q. Yes, sir.

A. Or more recent history?

Q. No, '87.

A. In 1987, the 11 operators of the pool got together and formed a technical committee to characterize geologically and in a reservoir sense the Vacuum Glorieta Pool and make recommendations for enhanceable recovery. They published a report in November of '90, which is referred to as the Technical Committee Report, and it outlined the unit parameters, both geologically and reservoir and production parameters.

At that time, a decision was made to split the unit in half. Texaco would operate the west half. Phillips was the proposed operator of the east half. There were several reasons, but primarily Phillips-operated facilities that overlaid and underlaid the east half from Texaco, the same on the west half.

Texaco then went on with their unitization effort, and the nine operators on the east half then formed a technical committee to study just the east half. And at that time we underwent about two years of defining the project scope and coming upon

agreement for unit participation.

Q. Did that process result in any engineering and geologic conclusions about the feasibility of taking this area and subjecting it to a waterflood project?

A. Yes. That technical committee did publish a report, which is an exhibit coming up, did an engineering study and did make the recommendation to waterflood the Upper Paddock within the unitized area.

Q. What has been your involvement as a project or a reservoir engineer for studying the feasibility of waterflooding this particular project?

A. I was involved at the outset. I did not participate in the original Technical Committee Report that was published in 1990, but we took their data, updated the production data. We generated a reservoir model to model the area, and then used it to predict waterflood response. And I was the technical coordinator and the engineer in charge of that project.

Q. Describe for us in a summary fashion the type of model that you utilized to make the simulation.

A. We used an in-house, fully implicit, 3D black oil model. It's a very common type of

reservoir model. It was laid out in 95 x 55 grids and three layers deep. We used the technical data compiled that is in the 1990 Technical Committee Report to characterize each one of these grids within the waterflood. And we also used data that was acquired through special core analysis of a Texaco well to give us real perm data and our end points.

We incorporated all that into the model or then used the model to -- or actually verified the model by running it and having it match the production history of the unit from 1963 to 1992.

Once we were comfortable that the model verified the -- was verified by a history match, then it was used to make waterflood predictions.

Q. And what were the predictions generated from that effort?

A. The model forecast projected that we would recover an additional 16.4 million barrels of oil that would not be recovered through primary depletion of the individual tracts.

Q. Do you have a recommendation to the Division as to what pattern you will implement in the waterflood project in order to have the opportunity to recover that volume of additional oil?

A. Yes. We modeled three separate patterns,

and we found that the 40-acre five spot was the most efficient. It will require drilling infill, 20-acre infill injectors, and it will essentially be a continuation of Texaco's waterflood to our west.

Q. Let's turn to Exhibit No. 5, Mr. Maberry. Describe for us what this shows.

A. Exhibit No. 5 is a plat of the proposed unitized interval. Superimposed on top of that in red is the outline of the waterflood project area. It's 3,080 acres. The triangles show the locations of the infill injection locations, and then along the west boundary, there are hexagonal wells that indicate the locations of the lease line injectors that we will cooperatively drill with Texaco.

There are 34 separate 40-acre patterns to be developed.

Q. Is this an illustration of the 40-acre five spot pattern that you have recommended to the examiner based upon the simulation?

A. Yes, it is.

Q. The unit boundary is also shown on this display, is it not?

A. Correct. It is the thinner black outline, which is just a reproduction of our Exhibit A.

Q. The initial waterflood project area

boundary is less than the entire unit area, is it not?

A. That's correct.

Q. What's the reason for that?

A. The paddock -- there are actually two separate reasons. On the east half, the paddock has experienced some water encroachment, and the residual oil to water is quite low, and it's not economic to waterflood. So that acreage is being held for an anticipated CO_2 flood.

The portion that's on the south and to the west, the paddock there is not of the same quality as what's in the original waterflood area, and there is some question as to whether it would be economic to waterflood. Again, that is going to be held for CO_2 flood, and we will carefully monitor that area. It will be surrounded by injection wells, and if it does show response, we intend to develop it.

Q. Have the interest owners within the unit area agreed upon participation parameters and a participation formula for each of the tracts within the unit?

A. Yes, they have. We have unanimous approval of the participation formula.

Q. Does that formula take into account the varying degrees of contribution or effect of each

individual tract as it is contributed to the unit?

A. Yes, it does.

Q. Let's go to the Technical Committee Report. It's Exhibit 6. Tell us how the technical report is organized, Mr. Maberry.

A. Okay. This was a report that the Engineering Technical Committee prepared and presented to the working interest owners. It was prepared March of '93, and it was approved unanimously in May of '93. It is essentially the document that we used to base the unitization waterflood.

The first section is simply an introduction to the unit area. The next couple of tabs show the proposed reservoir development plan that's illustrated in Exhibit 5, a description of the reservoir model that I have talked about previously, and the outcome of our waterflood forecast result.

The balance of it is essentially the details as to the facility design, development schedule, and costs, which I won't go into in detail. However, briefly, the project will require $24.9 million investment. It will require an additional $87.7 million in operating cost, for a total capital outlay of $112.6 million in 1993 dollars.

Q. Have you made a calculation to give us an

idea of what the 16.4 million barrels of incremental oil are worth in terms of present value?

A. Yes. In present value at a 0 percent discount rate, we estimate it's worth $109.8 million.

Q. Let's turn now to Exhibit No. 7. This is a summary of the production history for the wells producing out of this formation within the project area?

A. That's correct.

Q. Describe for us what it shows.

A. It shows that development of the pool started in 1963. It was characterized by several top allowable wells, many of which continued on into the present. There are still a number of top allowable wells.

So you notice the production is on a relatively flat decline, and it's a fairly typical pattern of a reservoir that is being depleted by solution gas drive in one portion and by water encroachment in the other. So you do see a fairly flat decline.

And this was the profile of production that we used to history match our reservoir model against.

Q. Were you able to forecast or project what would be the remaining ultimate primary recovery from

the project area?

A. Yes, we did. That's illustrated in Exhibit 8.

Q. How did you do that?

A. We performed individual decline curve analysis on all of the tracts that currently had production. There were several tracts that only had shut-in wells, but we performed routine decline curve analysis and then composited the individual decline curve analysis of all the producing tracts into a composite remaining primary.

Q. Let me have you turn to Exhibit 8. What have you prepared and illustrated on this exhibit?

A. Exhibit 8 shows the historical oil production from the unitized area in black through 1992. Then in red is the projected remaining primary forecast. That is the composite of the individual decline curves. The blue line is the forecasted waterflood response, and the hachured area shows the 16.4 million incremental barrels we anticipate to produce.

Q. How do you generate the change of slope to show the secondary incremental oil recovered within the area that's shown with the blue hatched line? How do you do that?

A. Can you repeat that, Tom?

Q. Yes, sir. When you look on Exhibit 8, the 16.4 million --

A. Yes.

Q. -- barrels of oil, that's generated how?

A. That is the profile that was forecasted from our black oil model of the reservoir.

Q. Let me have you now turn to Exhibit No. 9, Mr. Maberry. Identify and describe for us Exhibit No. 9.

A. No. 9 is a spreadsheet that shows how the participation formula for the unitization works. And it's laid out by tract, and it shows how each tract will participate in each of the six phases. The cover sheet is just a description of how the formula was put together and how it works.

Q. How many unit parameters are you using for the participation formula?

A. There are seven unit parameters, all of which were generated by the technical committee and agreed upon by the working interest owners to be used for unit participation.

Q. In your opinion, Mr. Maberry, is this still a feasible project by which you can recover a substantial amount of secondary oil if the Oil

Conservation Division will give you the necessary approvals?

A. Yes, it is.

Q. Let's turn to the subject of the C-108. Exhibit 10 represents your work, Mr. Maberry?

A. That's correct.

MR. KELLAHIN: Mr. Examiner, the white binder, three-inch binder, is the C-108.

Q. Describe for us how you organized the exhibit book that deals with the underground injection control approvals.

A. This binder is an expansion of the State Form C-108, which is included behind the first tab labeled C-108. Each subsequent tab contains the information that's required under each of the numbered exhibits on the State Form C-108, and they fall in behind. And some of those exhibits have been further sectioned off to help clarify the information.

Q. When we look at the plan of operation for the injection wells, what do you propose to do with regards to the pressure at which that water is injected into each of the injection wells?

A. At this time we anticipate maximum pressure to be 1,220 pounds, which corresponds to the 0.2 psi preferred state limit.

Q. Would it provide the operator flexibility under that plan of operation if the Division allowed you to increase the surface pressure limitation based upon separate tests?

A. Yes, it would.

Q. Would you desire to have an administrative procedure to accomplish increases in the surface pressure limitation?

A. Yes.

Q. The volume of water to be injected into each injection well, can you give us a general range?

A. We anticipate about 1,000 to 1,200 initially during fill-up, and that will taper off to about 750 barrels per well per day once fill-up is achieved.

Q. Give us a summary of how the plan of operation is supposed to work in order to begin to see a positive injection response that gets us additional secondary oil recovery.

A. Well, initially, we'll drill the infill injector locations, which will be on 20-acre infill. Then we will commence injecting water. We anticipate that will be on vacuum until we reach fill-up. Once fill-up is achieved and the reservoir starts pressuring up, then it will begin to displace oil

towards the producing well.

Q. In terms of a source for injection water to be used in the project, what sources will you take water from?

A. We will be reinjecting the water, produced water, from the unitized formation. In addition, we will be using makeup water from the Abo formation, from the San Andres formation, and also anticipate using a small portion of fresh water for makeup.

Q. The entire unit area consists of State of New Mexico oil and gas leases?

A. That is correct.

Q. There are no other kinds of properties involved in the unit?

A. That is correct.

Q. Have you personally met with the technical people at the Land Office and have subsequently obtained approval of the Commissioner of Public Lands to utilize a certain portion of makeup water as fresh water?

A. Yes, we have.

Q. Under the current plan of approval what is the volume of fresh water that can be used for makeup purposes?

A. Cumulative volume of 6.6 million barrels.

Q. Take us through some of the items that you have addressed and examined in terms of the C-108 review for your project.

A. Okay. Behind the first tab is the completed form of the State Form C-108 with the appropriate information and signature.

Next would be Exhibit 3, and it is further subdivided. We've included a proposed well-numbering scheme just to orient you to all the new well designations for all the wells being contributed.

Behind that is a table of the nine existing wells that we will be converting to water injection. The table identifies them, their former lease name and number, former operator, API number, and then some construction information.

That will be followed up by an individual injection well data sheet and a wellbore schematic on each of those nine wells which detail the construction of the wells.

Q. For each producer that is to be converted to an injector, that's contained within this section of the book?

A. Yes. They'll have an individual well data sheet and a schematic.

Q. Are they each unique unto themselves as to

change, or is there a general pattern?

A. They are unique. I mean, in general they are completed in the Glorieta, and there is sufficient cement behind each casing string to prevent migration, but each one is of unique construction.

Q. Continue then. What else do we find?

A. The next tab is a list of six wells that we will be drilling as infill wells that will initially be produced and then converted to injection in about two to three years. There's a table of those, and behind those are two typical data sheets and typical wellbore schematics.

And the reason that there are two, one will be a completion if we anticipate the well to be drilled in the Vacuum Waterflow area, and the other will be if it's anticipated to be drilled outside of the Waterflow area. If it is not within the Waterflow area, we will set two strings of pipe. Cement will be circulated to surface on both strings.

It's anticipated in the Waterflow area we will set three strings of pipe to further protect the fresh water and the Salado salt section. And, again, all three strings will be cemented back to the surface.

Q. Okay. The next section?

A. The next section is a list of the wells that will be drilled strictly for injection, the infill locations, and, again, behind them we have included typical injection data sheets and schematics that are similar to the ones I previously described.

Q. All these new injection wells are to be drilled and completed in a fashion that will protect fresh water sources?

A. That is correct.

Q. And will provide an opportunity to allow the injected fluids to remain confined to the injected interval?

A. That's correct.

Q. Please continue. What do we find in the next section?

A. The next is Exhibit 5. It's two plats. The first plat shows an outline of the proposed unit and the one-half mile radius that delineates our area of review.

The second plat is a plat that shows, identifies all the wells and lease ownership. Again, the unit boundary is highlighted in red, and it has a two-mile radius that shows the land ownership and identifies the wells within a two-mile radius of our proposed unit.

Q. For each and every of the wells within the area of review, have you provided to the Division the necessary details required by the Division in order to make an investigation of the integrity of those wellbores?

A. Yes, I have. Those are included in Exhibit 6.

Q. And have you personally as an engineer made that investigation?

A. Yes. I've investigated every wellbore.

Q. Have you applied the criteria that the Division uses for wellbore integrity as you make your own investigation?

A. Yes, sir.

Q. As part of that review, did you find any, what the Division might characterize, problem wells that would cause you as an engineer to say I need to go out and fix that well?

A. No, I have not, but I did identify three wells that I believe require some clarification.

Q. Apart from the wells that require clarification, then, there is -- including those wells, there is no well within the area of review that would constitute a problem well?

A. That's correct.

Q. Have you provided a -- let me ask the source of the information. When you look at the area of review wells, what's the source of the data that you've utilized to make your investigation?

A. Each individual contributing operator submitted the completion data and subsequent work-over data for all their wells. We compiled the base data from that and then confirmed that with the NMOCD files here in Santa Fe.

Q. Continue through the book and tell us what the next section is.

A. Exhibit 6 is split up in, I believe, six sections, hopefully to make it a little more clear.

The first section are all the wells that are being contributed to the Glorieta Unit that are either active, shut in, or temporarily abandoned. There is, again, a table listing the wells, their locations, API numbers, and some construction data. The construction of each individual well will be detailed in the subsequent wellbore schematics. And there are 101 wellbore schematics in this section.

That's followed up by the plugged and abandoned wells that are being contributed as part of the unit. There are four of those. We've separated those because they probably require a little bit more

scrutiny. Again, there's a table of all four wells and then individual well schematics follow those up.

We separated the wells that were within the area of review but not being contributed to the unit. They're in the following section. Again, we separated between active wells and P & A'd wells.

So next is a table of all the wells that are within the area of review but not being contributed to the unit. There are 123 of those. Again, each one will have a schematic.

Q. Let me ask you about the P & A'd wells within the project area.

A. Yes.

Q. You have provided individual well schematics for the P & A'd wells?

A. Correct.

Q. Do you find any of those wells to be plugged and abandoned in such a way that they pose a risk?

A. No, I do not.

Q. They would not be a source of migration of injection fluids either to fresh water sands or to other producing formations?

A. All four have been properly sealed.

Q. When we go to the P & A'd wells outside of

the unit area but still within the area of review, do you find any P & A'd wells that are not adequately plugged and abandoned?

A. No, I do not. They're all properly sealed.

Q. All right, sir, continue through the book.

A. Again, the next section are the plugged and abandoned wells that are within the area of review. There are 11 of those, and, again, there's a table and subsequent wellbore schematics on each of those.

I've also included just a table of the wells that were currently permitted at the time that I performed the review up here in Santa Fe, just to provide a list of wells that were anticipated to be drilled in the near future. Some of those may be currently being drilled.

Do you wish me to continue on?

Q. Yes, sir, please.

A. The next is Exhibit 7. It is a summary of the proposed operation. It goes through our anticipated rate and pressure and describes where the makeup water will come from. It provides chemical analysis for the makeup water and a discussion as to its compatibility with the reservoir.

I guess I'd make the statement we do find that the makeup waters will be compatible.

Q. Do you find any indication that there is any faulting or other hydrologic connections by which fluids would migrate out of the injection zone or area into fresh water sands?

A. No, we do not.

Q. All right, sir. Anything else in the C-108 book?

A. The rest of it is just information that's requested as part of the application form.

Q. Let's turn now to Exhibit No. 11 and talk about the specific location and the deepest known depth of fresh water within the area.

A. Yes. This is an exhibit that I prepared. It is a list of all the fresh water locations within the area of review, giving its surface location, the aquifer name, which in every case is the Ogallala, and the deepest occurrence of that is 234 feet. That information was compiled by Mr. O'Hare of the State Engineer's Office in Roswell.

Q. What is the vintage of the information compiled on here? When did you contact him?

A. Within the last month.

Q. With the reported fresh water in the area being -- what's the deepest depth, 234?

A. Yes.

Q. Do you see any opportunity for exposing fresh water sources to a risk if this project area is approved?

A. No, I do not.

Q. You said that you had identified three wells within the area of review that required of you further investigation and study?

A. That's correct.

Q. Have you reduced that study information to displays and information shown on an exhibit?

A. Yes. It's Exhibit No. 12.

Q. Okay. Let's turn to the plat that is the first page of that study and have you locate for us the three wells that you've described as wells that you thought bore further study as a reservoir engineer.

A. The three wells are located on the plat. Again, this is a reproduction of the unit boundary and area of review.

MR. STOVALL: Mr. Kellahin, that's supposed to be in the book?

MR. KELLAHIN: No, it's outside the book. It's the next -- it will look like this.

EXAMINER CATANACH: Here it is.

Q. (BY MR. KELLAHIN) All right, Keith.

You've identified the three wells on the display?

A. Yes. From northeast to southwest, they are the Vacuum Abo Well No. 5-02, Vacuum Abo Well No. 11-05, and Vacuum Abo Well No. 14-01. All three wells lie within the area of review but outside the unit boundary. All three wells are operated by Phillips Petroleum Company.

Q. In going through your area of review investigation, using the criteria of the Division to identify potential problem wells, what caused you to further investigate these three wells?

A. In the case of these three wells, there was no record of a measured top of cement; so I had to calculate the top of cement. When I used the NMOCD method, which is using a slurry yield of 1.32 cubic feet per sack and assuming 50 percent excess, the calculated top of cement on these three wells was below the top of the unitized formation.

Q. What then did you do?

A. I went back and investigated what actual slurries were used and the yield of those actual slurries. When I used the actual slurry yield instead of the 1.32, and still assuming that 50 percent of that slurry yield was excess, I then calculated tops of cement that are well above the unitized formation.

Q. How did you go about verifying or authenticating the correct or the accurate slurry yield by which to make the calculation?

A. I pulled the slurry, the reported slurry volume and design from the records and submitted that to Halliburton Cementing Services, and they provided me with a letter that is included at the back of this exhibit, giving me the engineering details including the yield, actual slurry yields.

Q. Why did you submit it to Halliburton?

A. Because they're a fairly widely recognized industry cementing company, and in fact the slurries were of Halliburton design.

Q. Let's go to the schematic for the Vac Abo Unit No. 2 well, which is the first schematic behind the locator map?

A. Yes.

Q. Let's use that to illustrate what you did, Mr. Maberry.

A. Okay. These are reproductions of the schematics that you'll find along the way.

Q. Let's go back to the schematic and have you show us then how you have made the calculation and what conclusions you've reached, and let's use this first schematic as an illustration then of your

method.

A. Okay. That is a schematic for the Vacuum Abo Unit, Tract 5-2, and the black hachured portion that is outside the production casing string represents the calculated top of cement that I would get if I would used the 1.32 cubic feet per sack yield and a 50 percent excess.

And you can see, it was calculated to be 6645 feet, which is below the unitized interval. If I use the actual cement slurry, and still assuming the 50 percent excess, my calculated top of cement is 4175 feet, which is nearly 2,000 feet above the unitized interval.

Q. Give us a sense on this illustration where the top of the unitized interval is.

A. The top of the unitized interval will be approximately 5800 feet, but the top of the injection interval is about 6100 feet.

Q. Using the calculation of the actual slurry yield number, and also still assuming a 50 percent excess safety adjustment, if you will, what is the vertical volume or distance between the top perforations and the injection interval and the top of the cement as calculated?

A. It's approximately 2,000 feet in this well.

Q. Using that same method, tell us where that relationship is on these other two wells.

A. It will be approximately 2100 feet in well 11-5, and about 800 feet in well 14-1.

Q. What does that information cause you to conclude as a reservoir engineer?

A. I conclude that we have sufficient cement behind the production casing to prevent migration of injected fluids out of the zone.

Q. Are these wellbores already in an area of review for an existing waterflood project in any other formation?

A. Yes, they are. All three penetrate the San Andres within the East Vac Grayburg-San Andres Unit which has been under pressurized waterflood since 1978.

Q. Where is that pressurized waterflood in relation to your flood?

A. It's in the San Andres, which is approximately 4,000 feet, about 2,000 feet above our unitized formation.

Q. Have any of these three wells ever displayed any kind of failure difficulty or source of migration as a result of being subjected to pressures from the other flood?

A. No, they have not.

Q. No indication of any kind of problem with these wells?

A. No, sir.

Q. What do you conclude?

A. I conclude empirically that we have sufficient cement across the San Andres also; so it's well above our unitized formation.

Q. Tell us what else is included in the exhibit package that's marked as No. 12.

A. Behind the sketches are my detailed calculations, showing the calculated top of cement for each well, using the NMOCD method and using the actual slurry calculations.

And then the last two sheets are a copy of the Halliburton letter showing the actual slurry yields.

Q. Have you contacted Texaco to see if they have had any kind of operational difficulty with the project area to the west of yours?

A. Yes, I have. I talked to Mr. Dan Dunham, who is their operations engineer. They have commenced injection approximately six months ago on their west unit. They have performed 12 radioactive tracer profiles, and all 12 show the injected fluid staying

within the unitized formation, no migration.

Q. Within the project area that you're proposing, are you aware of any kind of difficulty that would expose the fresh water sands to contamination?

A. No, I am not.

Q. What is the timing of the project, Mr. Maberry? What do you propose for a chronology here?

A. We would like to take over operation of the unit December the 1st, 1993.

MR. KELLAHIN: That completes my examination of Mr. Maberry, Mr. Catanach. We move the introduction of his exhibits 1 through 12.

EXAMINER CATANACH: Exhibits 1 through 12 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Maberry, within the unit, you said you had 47 different tracts?

A. That's correct.

Q. Do you know how many different working interest owners there were in the unit?

A. Originally, there were ten, and we subsequently acquired Mobil's interest; so there are now nine. Phillips had acquired Mobil's interest.

Q. All the royalty interest is the State of New Mexico?

A. That is correct.

Q. And as I understand, the state, the Commissioner of Public Lands has approved the project?

A. We have preliminary approval from the State Land.

Q. Do you have a letter to that effect?

MR. KELLAHIN: Yes, sir. The landman is going to present it.

EXAMINER CATANACH: Okay.

Q. The unitized interval, as I understand it, is the top of the Glorieta to the top of the Blinebry?

A. Correct.

Q. And you're going to use this as the type log, the Bridges State No. 95?

A. Yes, sir.

Q. Is the entire paddock productive in the unit?

A. The Upper Paddock is the only continuous formation that is productive across the unit interval.

There is limited productive interval in the Lower Paddock on the extreme west part of our unit, and the Glorieta sands are open in some of the wellbores, but my understanding is it's not

particularly productive, that those would be very isolated lenses.

Q. So you're going to focus all your efforts on the Upper Paddock formation?

A. That's correct.

Q. Are most of the wells -- most of the wells are just completed in the Upper, not the Lower?

A. Yes, that's true, in general. Again, on the extreme west side, there are a small number of wells that are completed in the lower also.

Q. Generally, do you know what the average production in the unit is?

A. That's a rather difficult question to answer because there is no average. We go from the range of having wells that have been depleted or watered out a number of years ago to top allowable wells.

If I had to pick an average, I would guess in the 20- to 30-barrel-a-day range, but it's a wide standard deviation from that.

Q. How many top allowable wells are there?

A. I believe I checked the data through May, which is the current data, and there were four at that time.

Q. Is there a pretty good range of producing

rates in the unit?

A. Yes. They go from stripper to top allowable.

Q. Aside from the top allowable wells, there's still a pretty good range below there, or they're not --

A. I would say the majority, especially as you head towards the west boundary, are of the stripper variety. There's an area surrounding a top allowable well where we still have fairly productive, but as you draw away from that one area, it's predominantly depleted and stripper status. The development of the waterflood will be to pressure up that depleted area first and then develop towards the top allowable wells.

Q. The estimated secondary recovery, 16.4 million barrels, that is solely based on a model?

A. Yes, that's solely based on the forecasted response of our 3D model.

Q. What kind of ratio is that, primary to secondary?

A. You're going to make me do math in my head. It would be -- we have 43 million cumulative barrels. So it's, I would guess, an additional third, if my math is correct.

Q. Okay. The participation formula has been agreed to by all working interest owners?

A. That is correct.

Q. As I understand it, this is going to be a phased project?

A. It will be implemented in three annual phases. We'll start development in the northwest portion of the field. That is the most depleted area. So we want to get water in there first and get the reservoir filled up. And then it will be developed back towards the south and east in three annual stages.

Q. You stated that you had a naturally occurring water influx. What direction was that from?

A. It's along the south and east flank, and then it curls around to the eastern portion of the north flank, almost in a horseshoe pattern.

Q. Exhibit No. 5, you've got the unit outline in the waterflood project outline, and I understand the reasons why they don't coincide. The red outline is in fact the waterflood?

A. That is the waterflood project area, yes.

Q. You've got some acreage in there, especially to the south and west, that really doesn't look like it's going to be affected by injection, but

you've still included that in the waterflood area?

A. The portion along the lease line?

Q. Correct.

A. Yes. There's a common lease line boundary with Texaco's West Unit. In their West Unit waterflood comes up to that boundary. My understanding of the project area was the immediate offset and diagonal offset producing wells to an injection well.

Q. In fact, does Texaco have injection wells offsetting those?

A. Yeah. Their pattern will come up and butt up against those lease lines. So our producing well is immediately inside. That line of lease line injector should be influenced by the flood.

Q. Can you submit some additional information on the location of the injection wells offsetting those producing wells?

A. On the Texaco side?

Q. Right.

A. Yes.

Q. I don't know if we have those readily accessible. And you might have those easier than we can get ahold of them.

A. I have a copy of their development plan. I

can provide that.

Q. What is the status -- or let me ask you this. What is the general location of the Waterflow area within the unit?

A. It is on the extreme southwest flank of our unit. It is primarily centered over on Texaco's Central Vac and Vac Glorieta West Unit. And, in fact, in our engineering premise, we only premised three of the infill injection wells to be within the waterflood area.

Q. That is in the salt section?

A. That is in the Salado salt section.

Q. Mr. Maberry, on the three problem wells that you identified, if the Division still has questions about those wells, is it possible to run bond logs on those wells to verify cement tops?

A. One of those wells is temporarily abandoned. One of them is a current injector. And one is a current producer.

We attempted to run a cement bond log on the temporarily abandoned well, and what it showed it was that there was no contact between the cement and the pipe anywhere across the interval that we logged, which was from 8,100 feet to 2,000 feet. That's not atypical for a well of that vintage because over time

what happens is the cement will separate ever so slightly from the production casing, and then that makes an ultrasonic tool such as a cement bond log ineffective because all it reads is the vibrations off the cement -- excuse me -- off the pipe, and it doesn't read the continuation of the signal through the cement. So a bond log may not be a good indicator.

Q. Did it in fact indicate the cement top?

A. No. It did not read cement anywhere along the entire interval. It's a phenomenon known as a micro annulus. It's somewhat common in wells of an older vintage.

Q. Is there another method that can be used?

A. The only remedy for that would be to pressure the casing up and in fact balloon it to where this annulus -- well, the casing is ballooned up to where the annulus is gone. You're now back in contact, which we anticipate would require about 3,000 pounds surface pressure.

Operationally, we feel that's pretty risky on wells that are 30, 35 years old and have had a long service. We may in fact create a problem just by trying to make that measurement.

Q. How many injection wells are you initially

trying to get through here?

A. There will be a total of 48.

Q. You mentioned something about the well being $24.9 million initial investment, and after that you said something about another figure, and I think I missed that.

A. That was the additional operating cost, $87.7 million.

Q. That's operating cost over the life of the project?

A. That's correct, and that's in 1993 dollars.

Q. How long was that projected to go on?

A. To the year 2020.

EXAMINER CATANACH: I think that's all I have of the witness at this time, Mr. Kellahin.

MR. KELLAHIN: We've got two more witnesses, do you want to take a break now, or did you want to go through those?

EXAMINER CATANACH: Let's roll on.

MR. KELLAHIN: Mr. Catanach, Phillips' geologic witness for this project is Mary Tisdale.

MARY TISDALE,

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

EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation.

A. Mary Grace Tisdale, and I am a geological specialist for Phillips Petroleum in Odessa, Texas.

Q. You're soft-spoken, Mary. You're going to have to speak up for us.

A. Okay.

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

A. No, I have not.

Q. Summarize for us your educational background.

A. I've got a Bachelor of Science Degree in geology in 1978 from the University of South Carolina and a Master of Science Degree in geology in 1981 from the University of South Carolina. I have 12-1/2 years of experience in the oil industry as a petroleum geologist, working both domestically and internationally.

I'm currently, as I said, a geological specialist with Phillips Petroleum in the Permian Basin region. My primary area of responsibility is the East Vacuum area which includes the San Andres-Grayburg Unit, our proposed Glorieta Unit, and

our Vac Abo Unit.

MR. KELLAHIN: We tender Miss Tisdale as an expert petroleum geologist.

EXAMINER CATANACH: Miss Tisdale is so qualified.

Q. (BY MR. KELLAHIN) Have you made an investigation of the geology for this project in association with Mr. Maberry's engineering work?

A. Yes. I have reviewed the geological engineering technical report, all the published information, all the work that was done internally at Phillips, and also a master's thesis that was done at the University of Texas Permian Basin on the stratigraphy of the area.

Q. Based upon that review and that source of information, were you able to reach geologic conclusions concerning this project?

A. Yes, I was.

Q. Were you able to reach any type of geologic conclusions about the feasibility geologically to take a portion of this pool and subject it to waterflood in order to recover additional oil out of that formation?

A. Yes, I was.

Q. And what did you conclude?

A. We concluded that the Upper Paddock, as

previously identified, is the primary reservoir within the eastern -- within the East Unit, and that it does have lateral continuity, and is a primary candidate for waterflood.

Q. Were you able also to reach any geologic conclusions about the size and shape of the unit and whether that shape and size has any logic to the underlying reservoir?

A. Yes, we were.

Q. What did you conclude?

A. We concluded that the unit boundaries coincide with the structural closure at the paddock interval and also your productive interval within the main paddock reservoir.

Q. Let's talk about some of the specific evidence and details that support those conclusions.

A. Sure.

Q. If you'll take us back to the type log, Mr. Maberry has already introduced that as Exhibit No. 3, but if you'll go back to that same exhibit for us, let's talk about what you see as a geologist.

A. As has been previously stated, Exhibit 3 is the type log for the Vacuum Glorieta Pool. It is the Mobil Bridges State No. 95 Well.

On this type log we've identified our

unitized interval, which is from the top of the Glorieta at 5838 measured depth, subsea depth of 1822 to the top of your Blinebry at 6235 feet measured depth, a subsea depth of 2219 feet.

Q. Do you know whether or not this type log is being utilized by the Division and other operators by which to tie in the vertical limits for the pool?

A. Yes. This is the designated type log for the Vacuum Glorieta Pool.

Q. Let's turn now to Exhibit No. 13. What are we looking at?

A. Exhibit 13 is a structure map on the top of the Glorieta formation, which is the top of the unitized interval. On this map you can see our proposed Vacuum Glorieta East Unit. It's highlighted in red. And the Texaco Vacuum Glorieta West Unit is in blue.

What this map shows is that the structure at both the Glorieta and Paddock formation is an asymmetrical anticline that trends northeast-southwest. On this map, the top of your Glorieta ranges from 1900 feet subsea to 2100 feet subsea within our unit area. And the paddock is approximately 150 feet below this.

On this map you also see the locations of a

cross-section C-C', which is a north-south cross-section, and cross-section A-A', which is an east-west cross-section.

Q. Let's turn to the C-C' cross-section, Exhibit No. 14, and see what the reservoir looks like when we go in that direction. It's the north-south dimension we're looking at.

Hang on just a minute. Let me unfold.

Let's start at the top and work down.

A. Okay. This is a structural cross-section, running north-south, and it's hung on a datum of minus 1,000 feet.

Q. Reliable marker for you to correlate logs so everybody agrees --

A. That's the structural depth.

Q. I understand.

A. This is the structural section that's hung on depth.

Q. The correlating markers, though, used for making the cross-section are well-identifiable?

A. Yes.

Q. There's not going to be disagreement among the geologists about how to construct the cross-section?

A. No, not at all. The cross-section shows

the top of our San Andres Unit, and it shows the top of the Glorieta formation, the top of your Paddock formation, which is our main reservoir in the East Unit, and also our waterflood candidate.

Below that you'll see the oil-water contact in the Paddock formation. And at the top of the cross-section you'll see our unit area designated.

What this shows is our northern and southern boundaries of the unit are delineated by structural closure and by your productive area within the Paddock formation.

Q. I see. It's the area defined within the dimensions of these two arrows at the top?

A. Yes.

Q. When you project that distance down on your structure map, you'll see a change in structure at both the north and the south ends of the unit?

A. Yes.

Q. Tell us something about this oil-water contact. You've marked that on the cross-section?

A. Yes. It's at approximately 2,215 feet subsea, and it was picked in all the wells. There were 180 wells that were used for log analysis. This is in the two units for the technical study that was done for both the East and the West Unit. It was

picked on those wells.

Q. The target zone for the waterflood is going to be what area then as shown on the cross-section?

A. It will be the area between the top of your Paddock and the oil-water contact in the Paddock formation.

Q. Let's see what this looks like when we go east-west, Exhibit 15.

A. Exhibit 15 is an east-west structural cross-section hung on the same datum of minus 1,000 feet. It has designated the same formations, your San Andres formation is designated at the top, the top of your Glorieta, the top of your Paddock formation, the oil-water contact. And at the top of this cross-section, you will see this extends through the proposed East Unit, through your West Unit, and off the structure to the west.

Q. Start on the far left at the A, which will be the west side of the structure?

A. Which will be the west side, yes.

Q. And take us to the point on the cross-section where we hit the political boundary between the Texaco-operated unit and the proposed Phillips unit. That's designated by the point on the cross-section where you have the arrows going in the

opposite directions. That's the point of the political boundary between the two operations?

A. Yes, that is. You start with your Continental State 35-11 Well, which was not productive in the Paddock. It was dry and abandoned, and it is offstructure in our Paddock formation.

Then as you come west, you come upstructure into Section 36, which you can see in the West Unit, Section 36 is the top of your structure.

Then --

Q. As you go then farther east, you come to a point of significance for you as a geologist in changing the structure?

A. No. The boundary is really not significant geologically.

Q. Not between you and Texaco?

A. Not between the Texaco unit and the proposed Phillips unit.

Q. When you go farther east, though, to get the other end of your boundary, is there a geologic boundary there?

A. Yes. As you go further east, you are, once again, going offstructure, and you will see that the boundary of the unit to the east coincides with the limit of your production in the Paddock or your

oil-water contact.

Q. Let's go now finally to the isopach that was already introduced. It's Exhibit No. 4. This is the isopach of what?

A. This is the net pay isopach of the Paddock reservoir, the main Paddock reservoir as seen in the East Unit.

Q. What is the criteria for determining net pay?

A. It is contributing to your production. It is across the impermeability that is actually contributing to your production.

Q. Did you use a net pay porosity cutoff of some number or some value?

A. Yes, we did. All that was determined by the geologic committee, and it's published in the November 1990 report.

Q. So there was widely accepted agreement about how to construct the map and what values to use in that construction?

A. Yes.

Q. What does this show you as a geologist?

A. What this shows -- once again, the unit outlines are designated on the map. What this shows is that the extent of the productive area coincides

with our unit boundary to the north, south, and east, within the East Unit.

It also shows the net pay within the East Unit ranges from 5 feet to 138 feet of pay with an average of 58 feet.

The other thing that it shows is the western boundary of our unit is our boundary with the Vacuum Glorieta West Unit.

Q. Do you have an opinion as a geologist as to whether it's geologically feasible to waterflood this particular portion of the pool within this boundary?

A. Yes. From the stratigraphic work that was done in the area and from the cross-sections, you can see that there is lateral continuity in your Upper Paddock formation. And we feel from that and from our isopach maps that we are going to be able to flood this reservoir.

MR. KELLAHIN: That concludes any examination of Miss Tisdale.

We move the introduction of her Exhibits 13 through 15.

EXAMINER CATANACH: Exhibits 13 through 15 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Miss Tisdale, did you examine the Lower Paddock within the unit?

A. I personally did not examine the Lower Paddock. It was examined in the technical report dated November 1990, and it was determined that the Paddock was primarily productive in the West Unit, and thus that production would be included in the West Unit and not the East Unit.

Q. So is it also your opinion that the Lower Paddock is probably not continuous over the East Unit?

A. Yes, it is not continuous. It is not present in the far eastern portion, or it does not have porosity and permeability in the far eastern portion. In the western portion, it does not appear to be continuous.

EXAMINER CATANACH: I don't have any further questions, Mr. Kellahin.

MR. KELLAHIN: Call at this time Mr. Hall.

Mr. Hall is Phillips' landman in charge and responsible for the documentation of the unit.

PAUL HALL,

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

EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Paul Hall. I'm an area landman for Phillips Petroleum Company.

Q. On prior occasions have you testified before the Division in that capacity?

A. No, sir, I have not.

Q. Give us a summary of your educational background and your employment experience as a petroleum landman.

A. I have a degree in business administration from Central State University in Edmond, Oklahoma. I am a Certified Professional Landman through the American Association of Petroleum Professional Landmen. I have worked for 17 years as a landman for Phillips Petroleum Company. I have extensive experience in dealing with federal and state lands in the Rocky Mountain area.

Q. Is it your responsibility to handle the land title matters with regards to this particular unit for your company as the proposed operator?

A. Yes, sir.

Q. And have you done that?

A. Yes, sir.

MR. KELLAHIN: We tender Mr. Hall as an

expert petroleum landman.

EXAMINER CATANACH: Mr. Hall is so qualified.

Q. (BY MR. KELLAHIN) Let me turn your attention, sir, to Exhibit No. 16. Identify that for us.

A. This is the unit agreement as has been negotiated with the working interest owners in the proposed Vacuum Glorieta East Unit.

Q. Attached to that unit agreement have you provided tabulations or exhibits that set forth the ownership of each individual tract?

A. The ownership in Exhibit B shows the ownership of the working interest owners by tract within the unit area. The Exhibit C that is attached to there is a schedule of tract participation through all phases of the unit.

Q. Have you used a unit form, Mr. Hall, that is accepted by the Commissioner of Public Lands for the unitization of state oil and gas leases?

A. It is the statutory unit form.

Q. Is this a format used for voluntary unit agreements consisting of all State of New Mexico oil and gas leases?

A. Yes, sir, it is.

Q. Have you had this agreement and the supporting documentation submitted to the Commissioner of Public Lands in order to obtain their preliminary approval of the project?

A. Yes, sir, it has been.

Q. Have they done so?

A. They have approved it.

Q. What is the status of ratification or the commitment of the interest owners to the unit?

A. Currently at this date and time, we have, out of the nine working interest owners, we have eight of them that we have signature pages in hand, and we have a letter of assurance of execution from the remainder. We also have executed signature pages from the overriding royalty interest.

Q. Is the method of tract participation consistent with the participation formula adopted and approved by the working interest owners that Mr. Maberry has discussed with us earlier this morning?

A. It is the same.

Q. Let's turn now to Exhibit No. 17. Identify and describe what this document is.

A. This instrument is the unit operating agreement for the Vacuum Glorieta East Unit which has been negotiated with the working interest owners.

Q. What is the current status of commitment of the interest owners to the operating agreement?

A. It is uniform with the unit agreement.

Q. The unit agreement and this unit operating agreement then have been integrated in such a fashion that they will function together?

A. Yes, they have.

Q. What is the status of the interest owners' commitment to the operating agreement?

A. The status there again is we have executed signature pages from eight of the working interest owners, and we also have received letter assurance from the remainder that it will be executed in the near future.

Q. Let's turn now to Exhibit 18 and have you identify and describe Exhibit 18.

A. This is the letter of approval granting preliminary approval for the Vacuum Glorieta East Unit from the Commissioner of Public Lands for the State of New Mexico.

Q. The preliminary approval letter shows changes to be made in the documentation beginning on page 2. It sets forth lettered paragraphs to make certain changes in the documents?

A. All of the requests insofar as Exhibit A

and B are involved with the unit agreement have been made and corrected and submitted so in the instrument here as Exhibit 16.

Q. Those simply amounted to clerical changes in the document?

A. Just clerical.

Q. Let's go now to the last exhibit, Exhibit 19. Identify and describe that display for us.

A. We are indicating on this schedule here of the parties that are working interest owners and the overriding royalty interest owners. It is meant to indicate the parties that have executed the agreements to date, being the unit and unit operating agreements for the Vacuum Glorieta East Unit.

And as you'll note, Marathon has sent us written confirmation they will execute in the near future.

Q. Give us a summary or a sense of the time and effort that was expended in order to reach the point of unanimous agreement to the project area.

A. Just solely insofar as the agreements itself are involved, it has taken approximately, I would say, 12 -- well, about 10 months, since the last part of December last year.

MR. KELLAHIN: That concludes my

examination of Mr. Hall.

We move the introduction of his Exhibits 16 through 19.

EXAMINER CATANACH: Exhibits 16 through 19 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Hall, a letter of assurance is not binding on anybody, is it?

A. We have been assured that they will execute. They have had a problem insofar as number of their management, and employees have been tied up working on their budgeting for next year, and they have assured us that it will be executed and submitted prior to the approval by the OCD of the unitization.

EXAMINER CATANACH: I have nothing further, Mr. Kellahin.

MR. KELLAHIN: That concludes our presentation of this case, Mr. Examiner.

EXAMINER CATANACH: We didn't really go over the EOR part of the case, but I assume that's just part of the request?

MR. KELLAHIN: Yes, sir. It should be a matter of routine for a new project like this where there is no expansion of existing project. That is

part of our request. It's contained in detail in the application, but we thought that was not necessary to devote our energies to that topic. We think that is a given at this point.

EXAMINER CATANACH: Okay. Can I get a rough draft on both units and waterflood orders in this case?

MR. KELLAHIN: Yes, sir. They will be pretty smooth.

EXAMINER CATANACH: Is there anything else? There being nothing further, Cases 10845 and 10846 will be taken under advisement.

CERTIFICATE OF REPORTER

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

I, Deborah O'Bine, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that I caused my notes to be transcribed under my personal supervision, and that the foregoing transcript is a true and accurate record of the proceedings of said hearing.

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, October 16, 1993.

Deborah O'Bine

DEBORAH O'BINE
CCR No. 63

OFFICIAL SEAL
Deborah O'Bine
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: Oct. 19, 1994

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10445 and 10446, heard by me on October 7 1993.

David R. Catanach, Examiner
Oil Conservation Division