

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY )  
THE OIL CONSERVATION DIVISION FOR THE )  
PURPOSE OF CONSIDERING: )  
)  
APPLICATION OF MARBOB ENERGY CORPORATION ) CASE NOS. 13,385  
FOR AUTHORIZATION TO CONDUCT WATERFLOOD )  
OPERATIONS IN THE DODD FEDERAL UNIT AREA )  
THROUGH EXISTING AND FUTURE INJECTION )  
WELLS, EDDY COUNTY, NEW MEXICO )  
)  
APPLICATION OF MARBOB ENERGY CORPORATION ) and 13,386  
FOR CONTRACTION OF THE EAST EMPIRE-YESO )  
POOL AND EXTENSION OF THE HORIZONTAL )  
BOUNDARIES AND THE VERTICAL LIMITS OF A )  
PORTION OF THE GRAYBURG-JACKSON (SEVEN )  
RIVERS-QUEEN-GRAYBURG-SAN ANDRES) POOL, )  
EDDY COUNTY, NEW MEXICO ) (Consolidated)  
)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

November 18th, 2004

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, November 18th, 2004, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

\* \* \*

STEVEN T. BRENNER, CCR  
(505) 989-9317

2004 DEC 2 AM 11 44

## I N D E X

November 18th, 2004  
Examiner Hearing  
CASE NOS. 13,385 and 13,386 (Consolidated)

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Additional submission by the Applicant, not offered or admitted:

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\* \* \*

## A P P E A R A N C E S

FOR THE APPLICANT:

HOLLAND & HART, L.L.P., and CAMPBELL & CARR  
 110 N. Guadalupe, Suite 1  
 P.O. Box 2208  
 Santa Fe, New Mexico 87504-2208  
 By: WILLIAM F. CARR

\* \* \*

1 WHEREUPON, the following proceedings were had at  
2 8:54 a.m.:

3 EXAMINER CATANACH: Call Case 13,385, the  
4 Application of Marbob Energy Corporation for authorization  
5 to conduct waterflood operations in the Dodd Federal Unit  
6 area through existing and future injection wells, Eddy  
7 County, New Mexico.

8 Call for appearances.

9 MR. CARR: May it please the Examiner, my name is  
10 William F. Carr with the Santa Fe office of Holland and  
11 Hart, L.L.P. We represent Marbob Energy Corporation in  
12 this matter.

13 At this time we request that you also call Case  
14 Number 13,386. This is a related application, and we would  
15 request that the cases be consolidated for the purpose of  
16 testimony.

17 EXAMINER CATANACH: At this time I'll Case  
18 13,386, the Application of Marbob Energy Corporation for  
19 contraction of the East Empire-Yeso Pool and extension of  
20 the horizontal boundaries and the vertical limits of a  
21 portion of the Grayburg-Jackson (Seven Rivers-Queen-  
22 Grayburg-San Andres) Pool, Eddy County, New Mexico.

23 At this time I'll call for appearances in either  
24 of these cases, additional appearances.

25 MR. CARR: Mr. Examiner, I'd request that the

1 record note my appearance in the second case, and we have  
2 one witness who needs to be sworn.

3 EXAMINER CATANACH: Okay, and there are no  
4 additional appearances in these cases.

5 Will the witness please stand to be sworn in?

6 (Thereupon, the witness was sworn.)

7 RAYE P. MILLER,

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

10 DIRECT EXAMINATION

11 BY MR. CARR:

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

13 A. Yes, my name is Raye Paul Miller.

14 Q. Mr. Miller, where do you reside?

15 A. Artesia, New Mexico.

16 Q. By whom are you employed?

17 A. Marbob Energy Corporation.

18 Q. And what is your position with Marbob Energy  
19 Corporation?

20 A. I'm a corporate officer, I'm titled  
21 secretary/treasurer.

22 Q. Have you previously testified before the Oil  
23 Conservation Division?

24 A. Yes.

25 Q. And how were you qualified at the time of that

1 testimony?

2 A. I was qualified as a practical oilman.

3 Q. Are you familiar with the Applications filed in  
4 these consolidated cases?

5 A. Yes.

6 Q. Are you familiar with the status of the lands in  
7 the subject area and Marbob's plans for the development of  
8 the Dodd Federal Unit area?

9 A. Yes.

10 Q. Mr. Miller, you were in fact the witness who  
11 testified in the hearing that resulted in the Division  
12 approving a statutory unitization order for the Dodd  
13 Federal Unit; is that not correct?

14 A. That's correct.

15 MR. CARR: Mr. Catanach, at this time we tender  
16 Mr. Miller as a practical oilman.

17 EXAMINER CATANACH: Mr. Miller is so qualified.

18 Q. (By Mr. Carr) Would you briefly summarize for  
19 the Examiner what it is that Marbob seeks with this  
20 Application?

21 A. By Order R-12,228 dated November 1st, 2004, the  
22 Division approved statutory unitization for the Dodd  
23 Federal Unit comprised of 2400 acres of all federal land  
24 located in portions of Township 17 South, Range 29 East.

25 The order directed Marbob to do several things.

1 They asked that we expand the pool boundary for the  
2 Grayburg-Jackson Pool, which includes the Seven Rivers-  
3 Queen-Grayburg-San Andres, to actually include the  
4 northeast quarter of Section 11 of 17-29, and also to  
5 expand the vertical limits of the Grayburg-Jackson Pool  
6 within the unit area to actually include the Glorieta and  
7 Yeso formations, and to obtain authorization to expand the  
8 waterflood operations to be conducted within the formations  
9 Seven Rivers, Queen, Grayburg, San Andres, Glorieta and  
10 Yeso within the unit area.

11 Q. Does Case 13,385 seek authorization to conduct  
12 waterflood operations in the unit area?

13 A. Yes.

14 Q. And is Case 13,3- -- I guess -86 -- our  
15 Application to conform the horizontal and vertical limits  
16 of these pools as directed by the Oil Conservation Division  
17 in Order 12,228?

18 A. Yes, it's a desire to get all of the lands inside  
19 the unit into one pool.

20 Q. Okay, let's go to what's been marked Marbob  
21 Exhibit 1. Would you identify and review this for Mr.  
22 Catanach?

23 A. Marbob Exhibit 1 is basically just a map of the  
24 entire township and range. It shows the unit area in  
25 orange there and surrounded by several other units in this

1 particular area. The map is obviously taken from Midland  
2 Map Company. It shows all of the well locations, shallow,  
3 deep, plugged, injection, that exist in this area.

4 Now, when you look at the map the things that it  
5 does not show is that basically down in the very southern  
6 portion of Section 22 the wells there, like the Pinon  
7 Federal 1 and 2, and some of Marbob's Dodd A wells, are  
8 actually completed in the Glorieta-Yeso, and so there's an  
9 overlap of pool boundaries.

10 In Section 27 to the south, there are several  
11 wells there that are in leases called the Barnsdall  
12 Federal, the BR 549, which might have something to do with  
13 Hee Haw, and the B 440, and those are Yeso wells only and  
14 are included in the East Empire Pool area.

15 Q. Are we therefore requesting that the East Empire-  
16 Yeso Pool be contracted to exclude these lands; is that  
17 correct?

18 A. Yes, we're asking that it be contracted to  
19 exclude the lands that would fall within the unit boundary.

20 Q. Are there temporarily abandoned wells within the  
21 unit area?

22 A. I don't know why you ask that question, but I  
23 actually did look, and it winds up being a thing where all  
24 of the wells on the September C-115, both for the Dodd A,  
25 the Dodd B, the Pinon Federal, the Boyd Dodd and the Raper



1 Federal showed to be active with the exception of one well,  
2 and that well was the Dodd B -- I believe Number 19 -- and  
3 it showed zeroes in the way of production.

4 I called the field supervisor and he informed me  
5 that that well has been plugged and it is in a permanent  
6 plugged and abandoned condition and will fall off of our  
7 C-115.

8 Q. So there are no --

9 A. There are no TA, shut-in or abandoned wells  
10 within the unit area.

11 Q. You're not expecting any T-and-A'd wells to show  
12 up on an OCD list?

13 A. No, sir.

14 Q. Okay.

15 A. Well, I guess you ask that because the last time  
16 when we did the Burch Keely, we had 55 TA shut-in wells  
17 when we unitized that. But this one is in a little better  
18 shape.

19 Q. All right, let's talk about waterflood  
20 operations. What is the project area for the Dodd Federal  
21 Unit Waterflood Project?

22 A. The project area is actually the entire unit  
23 area. The key becomes the current waterflood is only being  
24 done in the very northern part of the section and only in  
25 one specific horizon.

1 Q. How many injection wells are currently located  
2 within the project area?

3 A. Currently there are 12 injection wells.

4 Q. Have you filed applications for approval,  
5 individual well approval, for each of these injection wells  
6 on Division Form C-108?

7 A. Those wells were applied, not all at the same  
8 time, and along with other wells they were all approved for  
9 injection in the horizons that they're injecting into, and  
10 yes, they all have been approved previously.

11 Q. Is Marbob Exhibit Number 2 a list of the current  
12 injection wells and the order numbers that approved  
13 injection in each of these wells?

14 A. Yes.

15 Q. What is Exhibit Number 3?

16 A. Exhibit Number 3 basically is a listing in the  
17 same order which shows the current injection interval in  
18 each one of these wells. That would largely be a Grayburg  
19 formation and primarily what is known in this area as the  
20 Metex formation.

21 Q. And the Division has on file a C-108 application  
22 with all the appropriate data for each of the wells?

23 A. Yes.

24 Q. Let's go to what has been marked Marbob Exhibit  
25 Number 4. And before we get there, I want to first discuss

1 with you a little bit about the source of the water that  
2 you plan to inject. What is that?

3 A. The water that will be utilized in the operations  
4 is actually produced water from this unit and adjacent  
5 properties. If we need more makeup water, we have several  
6 deep disposal wells in this area that we believe could be  
7 put on pump and utilized for makeup water if it's needed,  
8 but it will actually be produced water and disposal water  
9 pumped back out if it is needed.

10 Q. And what is Marbob doing to evaluate or determine  
11 the potential effectiveness of the waterflood project in  
12 this unit area?

13 A. The honest truth is, we don't believe this  
14 waterflood is very effective in its current status. It  
15 needs more producers in the area, and primarily we believe  
16 that there are other flood targets within the horizons  
17 within this unit area that should be considered for  
18 flooding, as well as more work in the Metex.

19 Q. How many additional wells do you anticipate will  
20 be required to reach full development?

21 A. That's a scary question for us. We like to drill  
22 wells. I don't like to scare partners, but realistically  
23 we believe that between 80 and 120 wells may be drilled in  
24 this unit area.

25 Q. Let's talk for a minute about the expansion of

1 the vertical limits of the Jackson-Grayburg Pool. How much  
2 of the Jackson-Grayburg-Seven Rivers-Queen-Grayburg-San  
3 Andres Pool is covered by the Application?

4 A. There's only 2400 acres, and the unit that's  
5 actually covered in the Pool is an extremely large pool.  
6 You know, the legals cover a portion of Section 10, all of  
7 Section 11, all of Section 14, the east half of 15 and then  
8 portions of Section 22. If you remember from Exhibit 1,  
9 part of the oddness of the shape is because of the boundary  
10 by other existing units offsetting it.

11 We are proposing to do a very similar operation  
12 as to what was done or proposed to be done in the Burch  
13 Keely Unit, which is the southeast offset unit that was  
14 approved in 1993 and 1994. The Burch Keely was a  
15 cooperative waterflood project in the Grayburg-San Andres.  
16 It was statutorily unitized, and the vertical limits were  
17 expanded.

18 Q. To include the same intervals we're asking for  
19 today?

20 A. Yes.

21 Q. How are these vertical -- are the vertical limits  
22 of this unitized formation defined?

23 A. The vertical limits are actually defined as the  
24 top of the Seven Rivers formation to the base of the Yeso-  
25 Paddock formation, or 5000 feet, whichever is less. And

1 that's as reflected on the Dodd B Deep Number 2 log in  
2 Section 14 of 17-29.

3 Q. And that's the definition of the unitized  
4 interval from the unit agreement; is that correct?

5 A. Yes.

6 Q. Okay, now let's go to Exhibit Number 4, and I'd  
7 ask you to identify and explain what this shows.

8 A. Exhibit Number 4 is basically what we would be  
9 looking at, and not necessarily in these specific  
10 locations, but we might be looking at a pilot waterflood  
11 pattern that would be used to determine the expected  
12 waterflood performance and to see if there's premature  
13 water breakthrough in a given direction. The final desired  
14 waterflood pattern will be determined based on the  
15 waterflood pilot projects.

16 There are shown here two possible patterns. The  
17 southeast of Section 22 is an inverted ninespot in the  
18 Grayburg-San Andres, utilizing -- like the Dodd A 45 is an  
19 injector with offset producers, being the Pinon Number 1,  
20 Dodd A 23, 40, 49, 38, 25, 42 and 50.

21 The second pattern over there is in the southeast  
22 quarter of Section 14. It's an inverted fivespot with one  
23 additional producer in the Grayburg-San Andres. The  
24 injector would be like the Dodd B 59 in the center, and the  
25 producers would be the B 37, 39, 35, 36 and 64.

1           It's possible that in reality we may actually  
2 want to drill some new wells and create the desired  
3 waterflood pilot pattern and position it in the different  
4 spots within the unit than the two shown here, but these  
5 are the types of things that we'd be doing.

6           Also maybe want to modify and actually drill  
7 wells to deep enough depths to actually target the pilot  
8 waterflood for Yeso and all horizons up. But we do plan to  
9 do a ninespot pilot inverted in the Yeso. Unfortunately,  
10 the location hasn't been determined because, as you would  
11 see if you reviewed the records, on that ninespot there in  
12 22, all those wells don't go deep enough to actually create  
13 a ninespot in the Yeso, and casing-size constraints may not  
14 allow it in those particular wells.

15           Q. Will waterflood operations be conducted in the  
16 Glorieta or Yeso-Paddock formations?

17           A. We want to evaluate all horizons in the unit,  
18 including the Yeso. I don't believe the Glorieta, we  
19 actually see, is productive, but the Yeso, which is right  
20 below the Glorieta, will be evaluated to determine if it is  
21 a good flood candidate.

22           Q. And Burch Keely, we expanded the pool to include  
23 the Yeso and the Glorieta; is that not true?

24           A. That's true, and what we were actually -- what we  
25 are trying to do with both of these units is, these are in

1 old, fairly depleted fields, and we're trying to have the  
2 opportunity to maximize the potential reserves recovered in  
3 each wellbore.

4 Q. As we move into the Dodd Federal Unit we're, in  
5 fact, seeing a better performance for the wells in the  
6 Glorieta and Yeso; is that not correct?

7 A. Yeah, some of our testimony when we did the Burch  
8 Keely made it sound like the Yeso would never be a  
9 productive formation, and there has certainly been  
10 considerable development that has occurred since, and some  
11 of it has been quite successful.

12 Q. In that unit we did establish a precedent for  
13 expanding the waterflood project into these areas; isn't  
14 that right?

15 A. That's correct.

16 Q. And that was by Order Number R-10,067; is that  
17 correct?

18 A. Right.

19 Q. That order also identified -- a number of other  
20 orders were similar expansions of the vertical interval  
21 were, in fact, identified; is that correct?

22 A. Right. This type of extension has been done  
23 several times. That case identified three additional  
24 orders where it had been expanded in different areas not in  
25 this immediate vicinity.

1 MR. CARR: Mr. Catanach, we'd like to just  
2 provide you with copies of all the orders that have been  
3 referenced, both Burch Keely and the other orders that were  
4 referenced in that case when a vertical interval of a pool  
5 has been expanded in a fashion similar to what we're  
6 seeking here today.

7 Q. (By Mr. Carr) Mr. Miller, I'd like to now talk  
8 about expansion of the horizontal limits of the Grayburg-  
9 Jackson Pool. Are you going to expand the vertical limits  
10 of the Grayburg-Jackson Pool? When you do that, do you  
11 also have to contract the Empire-Yeso Pool?

12 A. Right, we need to -- Most of the wells already  
13 lay in the Grayburg-Jackson Pool. We need to have the  
14 wells in Section 22 that are in the South Empire-Yeso --  
15 take them out and actually have those lands added into the  
16 Grayburg-Jackson Pool for this specific area where we can  
17 report them all together.

18 MR. CARR: Mr. Examiner, we have checked the pool  
19 descriptions in the books here at the OCD, and the records  
20 here indicate that the area we need to contract out of the  
21 pool would include the southeast quarter and the southeast  
22 of the southwest of Section 22.

23 THE WITNESS: Right. I would also note that you  
24 may want to look at the northeast -- or the southeast of  
25 the northeast, because I believe there's a well producing



1 that's being reported under the pool, even if it hasn't  
2 been actually shown -- or the boundaries shown correctly,  
3 but there is a producing -- the Pinon Number 2 there is in  
4 the southeast of the northeast. It is completed in the  
5 Yeso.

6 MR. CARR: Carr) And that's the reason we've  
7 checked the pool boundaries as defined here, but there may  
8 be that discrepancy that needs to be checked. It may be  
9 still that one well as an undesignated well outside the  
10 boundary of that pool, but there is that one well.

11 Q. (By Mr. Carr) All right, Mr. Miller, let's go to  
12 what has been marked as Marbob Exhibit Number 5. Would you  
13 identify and review that for me?

14 A. Yes, that's a type log, and on the -- if you go  
15 to the bottom portion of the log, we have identified tops  
16 for the different formations. The Seven Rivers top is  
17 roughly 1184 feet subsurface. It shows the Queen top at  
18 roughly 1782.

19 You will note that we actually didn't include a  
20 Grayburg pick top on this log. The geologist and I sat  
21 down, and he tried to explain to me how many different  
22 geologists have argued about exactly where the Grayburg top  
23 is in this particular area, and as a result, rather than  
24 make it confusing, the San Andres top is down at 2468, the  
25 Glorieta top is actually -- or the Keely marker inside the

1 San Andres is 3158, and then the Glorieta top is at 3947  
2 and the Yeso at 4017.

3 And of course there are several, in this area,  
4 well-identified intervals of pay in the Grayburg. That  
5 Keely marker obviously is localized to this area. In the  
6 Grayburg there is the Premier that lays directly on top of  
7 the San Andres top. There's above that a Loco Hills  
8 section, and then above that the Metex, which was  
9 identified as the intervals in those current injection  
10 wells.

11 Q. If we look at the history of the Grayburg-Jackson  
12 Pool, it's been expanded from time to time. Do you know  
13 what has been really driving that?

14 A. The pool is a very old pool, and there has been a  
15 lot of development that occurred, and the expansion just  
16 was driven by the fact that more wells and more area was  
17 determined to be productive, and it was included in the  
18 pool. It's -- They told me how many thousand wells are in  
19 it, but it's a large pool, and it's a long history.

20 Q. Let's go to Exhibit Number 6. Would you identify  
21 that, please?

22 A. Exhibit Number 6 is a cross-section which  
23 actually shows the Grayburg -- or the Glorieta and Yeso  
24 sections in four logs from left to right. It goes from  
25 north to south, and you can see that the section thickens

1 to the south, and it also appears that the porosity and the  
2 pay sections thicken.

3 The intervals on the far right two logs that are  
4 identified are actually perforated pay intervals in the  
5 Yeso section in those logs, and you'll note that things are  
6 not as prolific to the north.

7 Q. Let's go to the structure map, Exhibit Number 7.

8 A. Exhibit 7 is just basically a structure map which  
9 is based on the top of the Glorieta formation. It shows  
10 that in this particular area our structure is relatively  
11 flat. We have a gentle east-southeast dip at about 50 feet  
12 per mile dip.

13 You can see probably to the south here there's  
14 some influence and much more radical dipping off of the  
15 unit area that's probably based on some of the underlying  
16 Abo structures and then falling off into the Basin.

17 Q. Let's look at the production performance of wells  
18 in there. Would you refer to Exhibit Number 8?

19 A. Exhibit Number 8 is basically a history of the  
20 production performance curve for the two Pinon wells  
21 operated by Mack Energy in Section 22. They're the only  
22 wells that go into the battery, they're Yeso-only wells,  
23 and so it's, you know, not a commingled, confusing type of  
24 situation. That's why we utilized those.

25 It identifies, or it just shows the curves

1 associated with the wells, and the cum to date is about  
2 69,000 barrels of oil, and our engineer predicts that the  
3 ultimate recovery out of these wells will be about 87,000  
4 barrels per well.

5 Q. The information we have on the unit area shows  
6 that there is significant oil to be produced from the  
7 Glorieta and Yeso-Paddock formations; is that correct?

8 A. What has developed since 1994 when the other unit  
9 was applied for is, there has been a lot of Yeso  
10 development that has occurred both east and west of this  
11 area.

12 There is what I call a fairway type of area where  
13 some of the wells have been extremely prolific. We have  
14 wells to the south, which I referenced earlier. The  
15 Barnsdall, the B 440, BR 549. The Barnsdall wells in  
16 Section 27 are Yeso-only, and they are expected to have  
17 ultimate recoveries of 186,000 barrels per well, and there  
18 are 13 wells in that lease there in Section 27.

19 What we have found is that outside of the fairway  
20 there are still reserves available inside the Yeso  
21 formation, but as you go -- or particularly to the north.  
22 I don't believe that's the case to the south; you get into  
23 water to the south. But as you go to the north, the  
24 porosity and the thickness of the zone thins to where,  
25 while there may be reserves, they may not be justifiable to

1 drill as a stand-alone.

2 Q. You're going to evaluate these horizons and see  
3 if waterflood operations can be effectively conducted in  
4 them?

5 A. That is correct, we want to actually drill wells,  
6 determine the extent of their productive capacities, and  
7 then look to see if they're suitable, or the formations are  
8 suitable, for flood.

9 Q. And if they're not suitable for flood, you still  
10 intend to produce them. And is it your testimony that the  
11 most efficient way to do it, since you can't justify it,  
12 perhaps, on a stand-alone basis, would be to actually  
13 commingle the production from these zones with the  
14 production from the other horizons?

15 A. We believe, and still believe, as was testified  
16 in the early 1990s, that in these old unit areas, the more  
17 horizons that can be completed in a single wellbore, the  
18 longer life the field actually has, and that by fixing the  
19 allocations and the royalties and the overrides, that then  
20 every party benefits, and we don't have to worry about, you  
21 know, different batteries, different lifting costs to  
22 account for different batteries and maintenance, and  
23 ultimately we believe we'll recover more oil by that type  
24 of operation.

25 Q. And the Burch Keely Unit, you are commingling

1 production from these lower horizons with the unitized  
2 production from the waterflood area?

3 A. Yes.

4 Q. If you do this, are you going to have any  
5 problems with the compatibilities of the waters?

6 A. We actually have commingled facilities, like we  
7 said, there in the Burch Keely with San Andres, Grayburg  
8 and Yeso waters, and we have had no problems with  
9 compatibility. We actually are utilizing some deep  
10 disposal wells. We've had no indication of scaling. In  
11 fact, the waters seem to be extremely compatible.

12 To the east, in Section 20 of 17-31, it used to  
13 be Devon, now Merit, has a shallow waterflood. They were  
14 utilizing freshwater there. We talked to them about some  
15 of our Yeso production there, as to would they want the  
16 produced water.

17 They were actually de-oxygenating, having  
18 problems with freshwater in their flood, and we've worked a  
19 deal with them were we actually deliver our produced water  
20 from the Yeso for utilization in their San Andres and  
21 Grayburg flood operations, and they've found no  
22 compatibility problems at all with that.

23 You also have Devon currently back to the west in  
24 the Red Lake area that has applied for commingling of  
25 Grayburg, San Andres and Yeso formations, and they've

1 indicated no evidence of any problems with compatibility  
2 between the different formations.

3 We don't believe there's any problem with the  
4 compatibility of the water.

5 Q. And is it your intention to use the water that is  
6 produced in these formations in your waterflood project in  
7 the unit area?

8 A. Yes, we would anticipate that we would need all  
9 of the water from produced wells to actually utilize in  
10 waterflood, and we'll probably need any water that we can  
11 acquire from the adjacent leases, ultimately, to institute  
12 flood operations.

13 Q. Could you summarize for the Examiner the  
14 conclusions you have reached from your study of the area?

15 A. Primarily the evidence that we have currently is  
16 that the Yeso formations are likely to produce less  
17 recovery the further north that we go. We also -- and I  
18 did not mention it earlier, but there is substantial water  
19 production that does occur from these wells.

20 If you look back on Exhibit 8, Mack's wells, the  
21 Pinon, which are extremely good wells, show current  
22 recovery of 100,000 barrels and 222,000 barrels of water,  
23 so there it's about a 2-to-1 ratio. We believe that as we  
24 north we'll probably be closer to a 4-to-1 ratio. Some of  
25 the wells that we have to the east actually have a 10-to-1

1 water-to-oil ratio.

2 But that water, as long as we have good use for  
3 it, does not actually bother us. We believe that we can  
4 recover substantial volumes of oil if the limits were  
5 expanded to actually allow for the deeper horizons to be  
6 added to the pool.

7 Q. So we're seeking authority to conduct waterflood  
8 operations, but each additional injection well will be --  
9 you will submit an independent C-108 application for  
10 approval?

11 A. Yes.

12 Q. And we are simply asking that the boundaries in  
13 the area be adjusted to actually conform to the way we're  
14 going to be producing the reserves from these lands?

15 A. The pool or the formations don't know that we've  
16 segregated things. As a result, all we're asking is to be  
17 able to actually produce all of the depths in the unit into  
18 a particular pool for simplicity of reporting.

19 Q. Would you identify Exhibit 9, please?

20 A. Exhibit 9 is a plat showing the offset operators  
21 who are around this particular unit area.

22 Q. And is Exhibit 10 an affidavit confirming that  
23 notice of these applications -- or two affidavits, and that  
24 notice of these applications have been provided to each of  
25 these owners in accordance with Division Rules?



1 A. That is correct.

2 Q. There's also attached copies of the legal  
3 advertisements that were run in Eddy County for each of  
4 these cases?

5 A. Yes.

6 Q. Were Exhibits 1 through 10 provided by you or  
7 compiled under your direction and supervision?

8 A. Yes.

9 Q. In your opinion, will approval of this  
10 Application be in the best interest of conservation, the  
11 prevention of waste, and the protection of correlative  
12 rights?

13 A. Yes.

14 MR. CARR: May it please the Examiner, at this  
15 time we'd move the admission into evidence of Marbob  
16 Exhibits 1 through 10.

17 EXAMINER CATANACH: Exhibits 1 through 10 will be  
18 admitted.

19 MR. CARR: That concludes my direct examination  
20 of Mr. Miller.

21 EXAMINATION

22 BY EXAMINER CATANACH:

23 Q. Mr. Miller, development of the Yeso and the  
24 Paddock has essentially been limited to the southern  
25 portion of the unit down in Section 22?

1           A.    Yes.

2           Q.    Okay, have you tested up in the other parts of  
3 the unit?

4           A.    We have -- There are wells in the Burch Keely who  
5 have actually been tested north and south. The northern  
6 wells are not as prolific. We are also involved at Loco  
7 Hills with Premier Production Company and have developed  
8 wells, you know -- and David, the fairway appears to almost  
9 lay just right on the flank of the Abo Reef.

10                   In other words, if you had -- and I should have  
11 brought a larger map -- if you have a map that shows the  
12 Empire-Abo Unit and then as it becomes the -- I believe  
13 Jackson-Abo, and then on over the Cedar Lake-Abo field and  
14 that reef structure that underlays, then you have these  
15 shallower formations, Yeso, San Andres and Grayburg that  
16 almost flank right on top of that.

17                   What we've found -- and I mean, we have Yeso  
18 wells now that we're developing in 17-28, Section 25, 26.  
19 Mack has done a lot of development of Yeso further west of  
20 here, right around -- I call it Okay Hot Oil's yard, but  
21 that probably doesn't help you. Then we have done a lot of  
22 development, and Mack has as well, in Yeso on east of this  
23 Burch Keely Unit.

24                   It appears that there is about -- typically in  
25 what we call the fairway, about a mile, mile-and-a-half

1 boundary, and then as you progress to the south you fall  
2 off radically and the wells become all water.

3           The reason I know that so well is because Mr.  
4 Gray, who passed away, and I were developing what's called  
5 the EL Federal lease, and his son was out of town and  
6 Johnny and I decided to just jump down south and drill the  
7 south well, because we had an approved federal APD, instead  
8 of marching down south. And we went down there and we  
9 drilled our Yeso well, and it's now an approved disposal  
10 well. We put a sub pump on it and pumped it for a long  
11 time, and we couldn't make an MCF or a barrel of oil.

12           And his son came back and, you know, he threw a  
13 fit. He goes, you know, I mean -- well, it's now his and  
14 his sister's inheritance, so maybe I understand.

15           But, you know, we also in that same area with  
16 Premier worked down in our Yeso development to the south.  
17 The very southern well that we finally drilled with them  
18 was also very wet, and it now is actually a disposal well  
19 for their Yeso waters.

20           As we have gone to the north in most of these --  
21 or in the development that has occurred like in the Burch  
22 Keely and these areas to the east, over in 17-31, we have  
23 the Coffey lease, I believe, in Section 18, the Tony in 19,  
24 and then the Lee in 20. And we have found a very definite  
25 southern boundary.

1 I believe the Lee Number 3 in Section 20 has had  
2 a sub pump in it ever since the well was drilled, and  
3 that's probably been in excess of two years now, but we've  
4 never been able to pull the sub pump.

5 The Coffey lease is -- I think the total  
6 production out of like nine wells today is like 167  
7 barrels.

8 The Tony lease, while it has a few more wells, is  
9 actually like 1000 barrels a day production. And so the  
10 porosity in all intervals just do not exist.

11 As you -- You know, and everything is relative.  
12 You know, I mean, as you look at this in the days when we  
13 were developing the Burch Keely, we identified that, you  
14 know, the northern stuff was not as prolific as what we  
15 found in what we call this fairway area. And so as a  
16 result we focused all of our development in the fairway.

17 When the development occurred in 27, then we  
18 recognized that it probably extended over into 22. Mack  
19 drilled the two Pinon wells.

20 Mack actually staked originally on that Pinon  
21 lease, and if you look at the last exhibit, 9, that I gave  
22 you, Mack's Pinon wells are shown there in red, the Number  
23 1 and the Number 2. Well, he had Yeso rights in that  
24 entire 320, and Mack is obviously -- I worked for him, and  
25 he's a very aggressive independent operator.

1 Well, he drilled the Number 1 first, was very  
2 pleased with it, drilled the Number 2, actually built the  
3 locations for the Pinon Number 3 and 4, and because of his  
4 perceived economics, because all of that interest was  
5 common in that 320 acres that he owned with several  
6 partners in the Yeso horizon, he could have put it into the  
7 same battery and developed the Number 3 and 4, but he  
8 actually never drilled those wells.

9 Now, I believe at today's price scenario those  
10 wells probably should be drilled. And in fact, I believe  
11 we will drill quite a few wells in this area.

12 But that, to me, is the best evidence, you know,  
13 by the fact that I see him as a very aggressive developer  
14 that, you know, he felt as he was going north, and what  
15 he's experienced in his other leases, that going north did  
16 not justify the Yeso development at that time and with that  
17 price scenario, and that's really one reason that he has  
18 actually agreed to the unit, because he has a loss of  
19 control of operatorship, but he sees, you know, the wells  
20 make more sense if they have a secondary or the additional  
21 potential of recovering not only Yeso but San Andres,  
22 Grayburg, all in the same wellbore.

23 Q. The wells in Section 22 that are producing from  
24 the Yeso, those are still producing primary production,  
25 right?

1           A.    The two wells on the Pinon are primary  
2           production, that is correct; and the, I believe, four wells  
3           that Marbob has drilled are all primary production, yes.

4           Q.    Okay, do you anticipate waiting a period of time  
5           before you actually put any water into those formations?

6           A.    What we anticipate as far as the Yeso is, we  
7           would probably want to drill additional wells in the unit,  
8           not all in the same area, to try to determine the extent of  
9           what we see as the potential. We tend to start bottom up,  
10          and as a result, if the wells are drilled to the Yeso,  
11          we'll actually evaluate the Yeso first.

12                One of the questions that the engineer has  
13          visited -- or our engineer has visited with our geologist  
14          about is whether or not -- Yeso wells, while they may not  
15          be as productive to the north, the formations, at least on  
16          the few logs that we have, appear almost to be a little  
17          more contiguous, to where it actually may be more suitable  
18          for a flood candidate. And that's one of the reasons that  
19          while I showed the inverted ninespot and fivespot, I really  
20          anticipate that we'll probably want to drill some wells and  
21          then actually do that five- and ninespot in the Burch  
22          Keely.

23                And I didn't want to give you too much testimony,  
24          but in the Burch Keely we've actually run some tiltmeter  
25          work that we did. We placed a network of 31 surface

1 tiltmeters. We recorded the fracture azimuths on five  
2 wells that were acid-frac'd in the Yeso. The generated  
3 fracture azimuth was generally running east-west direction.  
4 Assuming that's a preferential path for water movement from  
5 injection well, we probably wouldn't want to place our  
6 producers in that same alignment.

7 But anyway, if you would like a copy of some of  
8 that stuff, I have that here also. But that's some of the  
9 preliminary stuff that we've started doing to the east,  
10 looking at the Yeso to see what we believe might actually  
11 be potential out of it.

12 Q. Okay, the wells that you're going to drill, the  
13 additional wells in the northern part of the unit, are  
14 those going to be -- are all of them going to be drilled  
15 deep enough to test the Yeso, or are you going to --

16 A. Yes.

17 Q. -- is it going to be hit and miss?

18 A. We believe that -- well, at least initially,  
19 every well should be drilled to test all of the horizons,  
20 because you only have an additional 1000 foot, and the  
21 ideal situation would be to have a solid pattern of wells  
22 that were built for an efficient flood operation, and then  
23 to determine what horizons should actually be flooded in  
24 which areas at which time.

25 I honestly envision that we actually are running

1 on all of the new wells that we're drilling in the Burch  
2 Keely, we run a 5-1/2 string of pipe, new casing, and  
3 attempt to circulate cement all the way to the surface on  
4 those wells, such that over time we hope to have the  
5 ability to actually look at waterfloods in multiple  
6 horizons in these unit areas.

7 Quite honestly, Johnny and I believe that his  
8 kids and grandkids may actually still be receiving benefit  
9 from these federal leases, if the federal government will  
10 allow us to continue to operate, because we believe there's  
11 a lot of oil still left in these horizons.

12 Q. You mentioned something in the Glorieta you don't  
13 think is productive in this area?

14 A. In this particular area the production -- and you  
15 can see it here on the cross-section map, the actual  
16 productive interval in Mack's Pinon Federal Number 2, and  
17 then in our Dodd A 49, is actually below the Glorieta sand.  
18 It's not the sand that's actually productive, it's the -- I  
19 believe what they would refer to as a dolomite section  
20 right below there, in the Yeso.

21 And yet, you know, over in the Burch Keely, we  
22 looked -- you know, and to the east -- we've looked at  
23 depths below to see if there is anything below this initial  
24 -- you know, and that's why by limiting our unit to 5000  
25 feet, yes, there is Yeso formation below that, but we



1 believe, you know, if you look there -- and this is on the  
2 southern end -- the depths of those perforations are 3200,  
3 3300 feet, and so we believe that all of the productive  
4 interval in the Yeso is clearly above the 5000-foot depth  
5 limit.

6 Q. Okay. Basically what you're talking about within  
7 this unit is a kind of learn-as-you-go scenario where you  
8 don't implement anything on a wide scale until you gather  
9 some more data?

10 A. No, the first thing that really needs to be done  
11 is, some new wells need to be drilled.

12 Certainly some of the wells that need to be  
13 drilled in the north need to be perforated in the Metex to  
14 see if there's been some banking. You know, I mean, we've  
15 been injecting water up there for years, and a lot of that  
16 area has no producers around it, so there may very well be  
17 some extremely good potential wells with some banked Metex  
18 reserves up there.

19 We need to go in and establish some pilot  
20 waterfloods in the various horizons. I think certainly,  
21 just because of the bottoms-up type of approach, we would  
22 probably look at a pilot waterflood in the Yeso first, just  
23 to see if the deep actually affords that opportunity,  
24 because that then helps drive how much development you  
25 actually need, because some of the wells, old wells, may

1 have some 7-inch in them, but a lot of them are 4-1/2 and  
2 all, and if they are, then new wells will have to be  
3 drilled to make an effective drainage or efficient flood  
4 pattern.

5 The other question that came up by one of the  
6 nonoperators is a question of capital expenditures, because  
7 in doing the waterflood, a lot of times OXY Permian will  
8 come in and spend huge amounts of capital on the front end.

9 The approach that we've worked by actually  
10 developing some of these new reserves and establishing the  
11 primary production, we anticipate that after the first 10  
12 to 15 wells are drilled, that the rest of the expenditures,  
13 including the ultimate development of the flood operations  
14 themselves will probably be generated by internal cash flow  
15 generated from the unit.

16 And that tends to work particularly -- there are  
17 a lot of small, little working interest owners in this. If  
18 they're not -- come up with money out of their pocket, that  
19 tends to work a lot better for them.

20 I did get one call since our statutory unit, just  
21 questioning how much money we were going to spend next  
22 year, so... And I told them I thought they would be  
23 pleased, and particularly if oil prices stayed where they  
24 are.

25 EXAMINER CATANACH: Okay, I think that's --

1 MR. CARR: That concludes our presentation in  
2 this case.

3 EXAMINER CATANACH: Okay, there being nothing  
4 further, Cases 13,385 and 13,386 will be taken under  
5 advisement.

6 And let's break for about 15 minutes.

7 (Thereupon, these proceedings were concluded at  
8 9:41 a.m.)

9 \* \* \*

10  
11  
12  
13 I do hereby certify that the foregoing is  
14 a complete record of the proceedings in  
the Examiner hearing of Case No. 13385, 13386  
15 heard by me on November 18, 2004.

16 Daniel R. Catanach, Examiner  
Oil Conservation Division

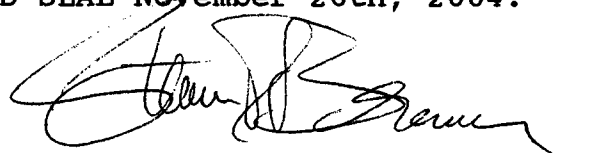
## CERTIFICATE OF REPORTER

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

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

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

WITNESS MY HAND AND SEAL November 26th, 2004.



STEVEN T. BRENNER  
CCR No. 7

My commission expires: October 16th, 2006