

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

IN THE MATTER OF THE HEARING CALLED BY )  
THE OIL CONSERVATION DIVISION FOR THE )  
PURPOSE OF CONSIDERING: )

CASE NO. 13,969

APPLICATION OF BP AMERICA PRODUCTION )  
COMPANY TO AMEND ORDER NO. R-12,658 TO )  
EXTEND THE AUTHORIZED TIME WITHIN WHICH )  
TO COMPLETE WORK ON WELLS LOCATED IN )  
THE AREAS OF REVIEW FOR INJECTION WELLS )  
IN THE WASHINGTON "33" STATE LEASE )  
WATERFLOOD PROJECT, EDDY COUNTY, )  
NEW MEXICO )

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: WILLIAM V. JONES, Jr., Technical Examiner  
DAVID K. BROOKS, Jr., Legal Examiner

August 9th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, WILLIAM V. JONES, Jr., Technical Examiner, DAVID K. BROOKS, Jr., Legal Examiner, on Thursday, August 9th, 2007, 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.

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## I N D E X

August 9th, 2007  
 Examiner Hearing  
 CASE NO. 13,969

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APPLICANT'S WITNESS:	
<u>ODELL ARNOLD</u> (Engineer)	
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\* \* \*

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

## FOR THE DIVISION:

DAVID K. BROOKS, JR.  
Assistant General Counsel  
Energy, Minerals and Natural Resources Department  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

## 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 8:28 a.m.:

3 EXAMINER JONES: Okay, at this time let's call  
4 Case 13,969, Application of BP America Production Company  
5 to amend Order Number R-12,658 to extend the authorized  
6 time within which to complete work on wells located in the  
7 areas of review for injection wells in the Washington "33"  
8 State Lease Waterflood Project, Eddy County, New Mexico.

9 Call for appearances.

10 MR. CARR: May it please the Examiner, William F.  
11 Carr with the Santa Fe office of Holland and Hart. We  
12 represent BP America Production Company in this matter, and  
13 I have one witness that needs to be sworn.

14 EXAMINER JONES: Any other appearances?  
15 Will the witness please stand to be sworn?  
16 (Thereupon, the witness was sworn.)

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

20 DIRECT EXAMINATION

21 BY MR. CARR:

22 Q. Would you state your name for the record, please?  
23 A. My name is Odell Arnold.  
24 Q. Mr. Arnold, where do you reside?  
25 A. I reside in Houston, Texas.

1 Q. By whom are you employed?

2 A. Petroleum Solutions International.

3 Q. And what is your position with Petroleum  
4 Solutions International?

5 A. I'm a contract petroleum engineer.

6 Q. And what is the relationship between Petroleum  
7 Solutions International and BP America Production Company?

8 A. Petroleum Solutions International provides  
9 contract petroleum engineers for BP. I'm one of them.

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

12 A. No.

13 Q. Could you summarize your educational background  
14 for the Examiners?

15 A. Sure. I've got a bachelor of science degree in  
16 electrical engineering from Brigham Young University. That  
17 was awarded in April of 1976.

18 I have a master's in electrical engineering from  
19 Brigham Young University, and that was awarded in August of  
20 1978.

21 Q. Since graduation, for whom have you worked?

22 A. Since graduation I've worked for several  
23 different companies. As you know, the consolidation of the  
24 industry -- I started out with Gulf Oil, worked for  
25 Chevron, worked for several years with Chevron, and then

1 went to work for Pennzoil, and then worked for Phillips  
2 Petroleum, and I've worked for a few independents, and then  
3 I've -- went contract with BP.

4 Q. And in all of these various positions have you  
5 been employed as a petroleum engineer?

6 A. The whole time I've been employed as a petroleum  
7 engineer in the industry.

8 Q. Have you testified as an expert witness in  
9 petroleum engineering in other states?

10 A. Yes, I have. I have testified before the Texas  
11 Railroad Commission and also the Montana Oil and Gas  
12 Commission.

13 Q. Are you familiar with the Application filed in  
14 this case on behalf of BP America Production Company?

15 A. Yes, I am.

16 Q. And are you familiar with BP's efforts to  
17 implement waterflood operations in the Artesia-Queen-  
18 Grayburg-San Andres Pool and its Washington "33" State  
19 Lease?

20 A. Yes.

21 MR. CARR: We tender Mr. Arnold as an expert  
22 witness in petroleum engineering.

23 EXAMINER JONES: Mr. Arnold is qualified as an  
24 expert in petroleum engineering.

25 Q. (By Mr. Carr) Mr. Arnold, would you briefly

1 summarize for the Examiners what it is that BP is seeking  
2 with this Application?

3 A. BP is seeking to get an amendment to the original  
4 order, which was Order R-12,658, dated November 7th, 2006.  
5 The case number was 13,750, which authorized BP America  
6 Production Company to institute a waterflood project within  
7 the Washington "33" State Lease. BP was authorized to  
8 inject water into the Artesia-Queen-Grayburg-San Andres  
9 Pool by converting six wells to injection for the purpose  
10 of water-enhanced oil secondary recovery operations. The  
11 order required that all wells be converted to injection by  
12 July 9th, 2007.

13 Q. Could you identify what has been marked BP  
14 Exhibit Number 1?

15 A. Yes, it is the order authorizing BP to have  
16 waterflood operations within the lease. It required a  
17 certain amount of remedial work on some wells outlying --  
18 outside the waterflood area, and they had to be done within  
19 six months of the order, and the deadline was July 9th,  
20 2007.

21 It also provided that if the required work was  
22 not completed within six months the wells should be shut in  
23 until the work was completed. That is per paragraph 5.

24 Q. All right, let's look at what has been marked BP  
25 Exhibit Number 2. Would you take that out, identify it and

1 review it for the Examiner?

2 A. Okay, this is the -- a map showing the waterflood  
3 and offsetting waterfloods in the area. It's in the -- The  
4 very center one in the red is the Washington Waterflood  
5 "33", State "33" lease flood.

6 And then on the outside of these is the  
7 waterfloods. It shows all the waterflood projects that  
8 have been in that area offsetting this waterflood. And  
9 some of them date back, '50s, '60s and '70s. So they're  
10 not brand-new.

11 Q. This plat indicates the injection wells with red  
12 triangles, but it shows seven of them instead of six. Why  
13 is that?

14 A. Okay, there's -- The six we're authorized by the  
15 order we're trying to amend. But the first one, the very  
16 initial one, which is in the very center, which is Number  
17 12, that one was authorized in the pilot flood that  
18 initiated this project.

19 Q. What is the status of the remedial work that's  
20 been undertaken by BP pursuant to the original order  
21 authorizing waterflood operations?

22 A. Okay, all of the work has been done by July 9th,  
23 2007, except the Hanover State Well Number 2, which is API  
24 Number 30-015-20355. This well is not operated by BP, it's  
25 operated by Marbob.



1           And the second well that hasn't been done by July  
2   9th was the Empire Abo Unit Well Number 29.

3           Q.   What is the current status of the Empire Abo Unit  
4   Well Number 29?

5           A.   It is currently plugged and abandoned. They  
6   started the plugging procedures July 9th, and they finished  
7   and it has been completed -- completely completed, July  
8   18th.

9           Q.   And could you just explain why it was that BP  
10   waited until July the 6th to request this extension?

11          A.   Well, it was our initial conversation with the  
12   Division that we would get an extension granted by  
13   administrative order, without a hearing.

14               And then on June 27th we were advised that,  
15   quote, the OCD said, Our legal staff have advised this  
16   order be amended in lieu of generating an administrative  
17   order, and since the original case was protested, albeit  
18   without an entry of appearance from the protestant, a brief  
19   Examiner Hearing should be held to consider this amendment  
20   request.

21               And at that time the next available hearing was  
22   August 9th, which is today.

23          Q.   And Mr. Arnold, we have looked at that protest  
24   letter from the original case, have we not?

25          A.   Yes.

1 Q. That letter didn't actually request anything in  
2 particular, did it?

3 A. No.

4 Q. And the individual protesting did not show up and  
5 participate in the original hearing?

6 A. They did not.

7 Q. What is the status of the other well, the Marbob  
8 well, the Hanover State Well Number -- What is it, 29?

9 A. 2.

10 Q. 2, okay.

11 A. Well Number 2. In negotiations -- BP is  
12 negotiating with Marbob to be able to take over operations  
13 -- in other words, take the well over and perform the  
14 remedial work -- and Marbob is seeking partner approval. I  
15 think they still lack one partner in the well of having  
16 everybody's approval to let BP take it over.

17 So we're in negotiations of finalizing an  
18 agreement so that BP can take it over and do that --  
19 perform that work.

20 Q. Do you have any reason to believe that the  
21 approvals will not be obtained and that you'll have any  
22 problem going ahead with this work?

23 A. No.

24 Q. When do you expect to have this work completed?

25 A. Well, it's a little out of my control, but I

1 would say within six months it should be done --

2 Q. The only --

3 A. -- just as soon as we have the agreement that  
4 we'll get on the well.

5 Q. And you're prepared to go forward as soon as you  
6 do get that --

7 A. Yes --

8 Q. -- agreement?

9 A. -- as soon as we have agreement.

10 Q. Has BP shut in wells in the area of review for  
11 the Hanover State Well Number 2?

12 A. No.

13 Q. Would you identify what's been marked as our  
14 Exhibit Number 3?

15 A. Sure. Okay, this was our request for being able  
16 to continue to inject while this work hadn't been  
17 completed.

18 Q. And were we advised by the Commission verbally  
19 that we could continue the injection pending the result of  
20 this hearing?

21 A. Yes, we were.

22 Q. Would you now go to BP Exhibit Number 4, another  
23 large exhibit, take that out and review it for the  
24 Examiner?

25 A. This is a map of the current water injection

1 flood. And as you can see, up in the upper right-hand  
2 corner the Hanover State well is marked. And in red it's  
3 got the distance from the nearest producer of the  
4 waterflood. And to the side of it there, it's got the  
5 distance it is from the nearest injector, which is 1,525  
6 feet.

7 Q. In your opinion, is there any risk that fluids  
8 being injected now in the Hanover State Well Number 2 could  
9 migrate out of zone because of the current status of the --

10 A. -- Hanover State?

11 Q. Right.

12 A. No, there's not -- there would be no problem  
13 because, as you can see, we've got -- that 41 foot right  
14 there, that's the fluid level right -- currently above that  
15 producer that's between the injector and Marbob's well.  
16 And it's only running 29 percent of the time.

17 We've got a POC, pumpoff controller, on it. As  
18 soon as it starts seeing more flood, that pumpoff  
19 controller will increase the run time on that well. We'll  
20 have great evidence showing that -- we'll see flood  
21 response there before we see any kind of fluids going  
22 beyond that point.

23 Q. Let's go to Exhibit Number 5. Take that out and  
24 explain that.

25 A. This exhibit shows the production curves for all

1 of the offset producers to that Number 2 injector. And at  
2 the very top is the Number 1, which is the key one.

3 As you'll notice in there, there's not really any  
4 major increase in production since we've started injection.  
5 It's relatively stable and flat. We still have -- in my  
6 opinion, it's still going to take a while to get enough  
7 water in the ground to start seeing response in that well.

8 Q. What does this tell you?

9 A. This tells me that it's going to be a while  
10 before we could ever get it over to Marbob's well.

11 Q. Does this further confirm your opinion that  
12 injection will not pose a problem or create a situation  
13 where fluids will migrate out of zone?

14 A. Yes, that is my intention, that it will not cause  
15 a problem.

16 Q. What is the voidage of the reservoir? Have you  
17 attempted to determine --

18 A. Well, in that -- in that upper pattern for the  
19 Number 2 injector, the voidage is about a million barrels.

20 Q. And how many cumulative injection barrels have  
21 there been to date?

22 A. To date has been about 60,000, a little less than  
23 60,000. And we're only injecting in that Injector Number 2  
24 about 313 barrels per day.

25 Q. In your opinion, can continued injection in the

1 Hanover Well Number 2 be safely done while the remaining  
2 remedial work is completed?

3 A. Yes.

4 Q. BP has requested an increase in injection  
5 pressure in this waterflood area, have they not?

6 A. Yes, they have.

7 Q. How could that impact what you're requesting here  
8 today?

9 A. It will not have any impact right now, because to  
10 increase the injection we're going to have to upsize the  
11 capacity of the injection system. And that's in the works  
12 to do that, but by the time we get it done it's going to be  
13 probably December or early 2008, which -- At my suggestion,  
14 hopefully that Marbob operation will be completed by then,  
15 because as soon as we get approval we'll work on it. So  
16 hopefully it should be done by then.

17 MR. CARR: Mr. Jones, I contacted you yesterday  
18 when I discovered that the notice letter we sent did not  
19 include -- it included the Application and the legal ad and  
20 a copy of the letter that went to the newspaper but did not  
21 include the notice letter, and we have corrected that and  
22 we have sent it out.

23 But because of that, I have to request that the  
24 case be continued for four weeks to let that notice period  
25 run.

1 EXAMINER JONES: Okay.

2 Q. (By Mr. Carr) Mr. Arnold, in your opinion will  
3 approval of this Application be in the best interest of  
4 conservation, the prevention of waste and the protection of  
5 correlative rights?

6 A. Yes.

7 Q. Were Exhibits 1 through 5 either prepared by you  
8 or have you reviewed them and can you confirm their  
9 accuracy?

10 A. Yes.

11 MR. CARR: May it please the Examiners, at this  
12 time we would move the admission into evidence of BP  
13 America Production Company Exhibits 1 through 5.

14 EXAMINER JONES: Exhibits 1 through 5 will be --

15 MR. CARR: And that concludes --

16 EXAMINER JONES: -- into evidence.

17 MR. CARR: -- my direct examination of Mr.  
18 Arnold.

19 EXAMINATION

20 BY EXAMINER JONES:

21 Q. Okay. Mr. Arnold, where's the water going out  
22 here, when you inject? Which one of these formations is  
23 taking the water?

24 A. We just did profile injections on that thing, and  
25 it varies.

1           Now like in Injection 2, about 50 percent of that  
2           is going into the dolomite, which is the San Andres, and  
3           the other 49 percent is kind of spread amongst those upper  
4           sands, which is Grayburg, Queen and the upper sand zones  
5           there.

6           Q.    So the San Andres is the best zone, at least --

7           A.    Well, that's the one that's taking it now.

8           Q.    Yeah.

9           A.    If you go to one of the other injectors on the  
10          other side of the waterflood, it's completely different.

11          Q.    Oh.

12          A.    There's going to be -- We're going to have to do  
13          some remedial work to make sure we're getting water going  
14          in each zone, because some of them -- most of them, the San  
15          Andres is taking it.

16                But some of them, you've got -- the upper zone is  
17          taking it and the San Andres is not taking anything. So it  
18          indicates to me we've got to go back there and open up some  
19          zones.

20          Q.    Okay.

21          A.    And that is in the process.

22          Q.    Okay. So do you think it was wise to try to  
23          flood the whole interval at once or start with the lower  
24          one and work up?

25          A.    I really don't have an opinion on that. I



1 couldn't say.

2 Q. That application off to the west to just  
3 concentrate, I think, on the San Andres, starting out.

4 A. Oh, is that right?

5 Q. But this -- wellbore problems kind of was because  
6 BP wanted to go so high, you know, on their -- if they  
7 would have stayed only in the San Andres, they probably  
8 would have had less wells to fix, but I'm glad BP is good  
9 about fixing wells and -- real responsible operator, seems  
10 like.

11 A. Well, if I may say on the 29, the only reason why  
12 it went beyond the deadline was, they were trying -- there  
13 was an attempt to put it back on and produce it  
14 economically, but --

15 Q. Oh.

16 A. -- because it was so marginal --

17 Q. Okay.

18 A. -- they deliberated on the decision a little too  
19 long, and so then --

20 Q. Okay.

21 A. -- one of the plugging operations started, that  
22 took beyond the scope -- I mean, beyond the deadline.

23 Q. Yeah. Well, trying to produce it was a good  
24 thing, I guess, but -- I mean, you guys got pumpoff  
25 controllers on all this stuff? You got SCADA systems?

1 A. Yes. Yes, BP is very good about that.

2 Q. Where's the field operation out here? Where's  
3 the field office?

4 A. It's just side out of [sic] Artesia, New Mexico.  
5 It's -- you're only about -- when I went out there, you're  
6 less than a half a mile from -- the office is about half a  
7 mile from the Number 2 injector.

8 Q. Okay.

9 A. So it's very close to the flood itself.

10 Q. So BP is right there with Mack and Marbob and all  
11 those --

12 A. Yes.

13 EXAMINER JONES: -- other Artesia people, Yates?  
14 I don't have any other questions.

15 David, do you have some?

16 EXAMINER BROOKS: No, I don't have any questions.

17 EXAMINER JONES: Okay. Well, with that, thank  
18 you very much, and we'll continue the case until September  
19 the 6th.

20 MR. CARR: Correct, and I'll be here with my  
21 notice affidavit.

22 EXAMINER JONES: Okay.

23 MR. CARR: I didn't think I was going to miss  
24 Katherine so much.

25 EXAMINER BROOKS: You and I have another

1 appointment on September 6th.

2 MR. CARR: Well, I'll have someone here. I'll be  
3 glad when it's September the 7th.

4 EXAMINER JONES: And since that's the last case  
5 of the docket, Docket Number 24-07 is concluded.

6 (Thereupon, these proceedings were concluded at  
7 8:45 a.m.)

8 \* \* \*

9  
10  
11  
12  
13 I do hereby certify that the foregoing is  
14 a complete record of the proceedings in  
15 the Examiner hearing of Case No. \_\_\_\_\_,  
16 heard by me on \_\_\_\_\_.

17 \_\_\_\_\_, Examiner  
18 Oil Conservation Division  
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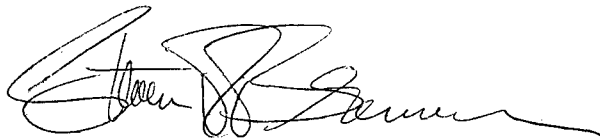
## CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL August 9th, 2007.



STEVEN T. BRENNER  
CCR No. 7

My commission expires: October 16th, 2010