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

ORIGINAL

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

CASE NO. 14325

APPLICATION OF CHESAPEAKE OPERATING,
INC. FOR APPROVAL OF A PILOT PROJECT
IN THE SEVEN RIVERS FORMATION TO STUDY
THE FEASIBILITY OF IMPLEMENTING ENHANCED
RECOVERY OPERATIONS IN THIS POOL,
LEA COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

June 2, 2009
Santa Fe, New Mexico

BEFORE: WILLIAM JONES: Hearing Examiner
TERRY WARNELL: Technical Advisor
DAVID BROOKS: Technical Advisor

This matter came for hearing before the New Mexico
Oil Conservation Division, David Brooks Hearing Examiner,
on June 2, 2009 at the New Mexico Energy, Minerals and
Natural Resources Department, 1220 South St. Francis
Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: Peggy A. Sedillo, NM CCR NO. 88
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A P P E A R A N C E S

19	FOR THE APPLICANT:	WILLIAM F. CARR, ESQ.
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21		110 N. Guadalupe St.
		Santa Fe, NM 87501
22	FOR NEARBURG PRODUCING	
	COMPANY AND NEARBURG	
23	EXPLORATION COMPANY, LLC.:	JAMES BRUCE, ESQ.
		Attorney at Law
24		P. O. Box 1056
		Santa Fe, NM 87501
25		

1 HEARING EXAMINER: We'll call Case 14325,
2 Application of Chesapeake Operating, Inc. for Approval of
3 a Pilot Project in the Seven Rivers Formation to Study the
4 feasibility of Implementing Enhanced Recovery Operations
5 in this Pool, Lea County, New Mexico. Call for
6 appearances.

7 MR. CARR: May it please the Examiner, my name
8 is William F. Carr with the Santa Fe office of Holland and
9 Hart, LLD. We represent Chesapeake Operating in this
10 matter, and I have three witnesses.

11 MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe
12 representing Nearburg Producing Company and Nearburg
13 Exploration Company, LLC.

14 HEARING EXAMINER: Other appearances? All
15 right. Will the witnesses please stand and state your
16 name?

17 MR. ADAMS: Greg Adams.

18 MR. MARTIN: Robert Martin.

19 MR. FROHNAPFEL: Terry Frohnapfel.

20 MR. CARR: At this time we would call Terry.
21 Frohnapfel.

22

23

24

25

1 TERRY FROHNAPFEL,
2 the witness herein, after first being duly sworn
3 upon his oath, was examined and testified as follows:

4 DIRECT EXAMINATION

5 BY MR. CARR:

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

8 A. Terry Frohnafel.

9 Q. And would you spell your last name?

10 A. F-r-o-h-n-a-p-f-e-l.

11 Q. Mr. Frohnafel, by whom are you employed?

12 A. Chesapeake Operating, Inc.

13 Q. And what is your current position with
14 Chesapeake Operating, Inc.?

15 A. Senior petroleum landman.

16 Q. Mr. Frohnafel, have you previously testified
17 before the Oil Conservation Division?

18 A. Yes, I have.

19 Q. At the time of that testimony, were your
20 credentials as an expert in petroleum land matters
21 accepted and made a matter of record?

22 A. Yes, they were.

23 Q. Are you the land person responsible for the
24 proposed pilot project in the Tanto Seven Rivers pool?

25 A. Yes.

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

3 A. Yes, sir, I am.

4 Q. And are you familiar with the status of the
5 lands and the ownership of those lands involved in this
6 application?

7 A. Yes.

8 MR. CARR: Are the witness' qualifications
9 acceptable?

10 HEARING EXAMINER: Any objections, Mr. Bruce?

11 MR. BRUCE: No objection.

12 HEARING EXAMINER: Mr. Frohnapfel is qualified
13 as an expert in petroleum land matters.

14 Q. Mr. Frohnapfel, would you briefly state what
15 Chesapeake Operating, Inc. seeks in this case?

16 A. To approve a pilot project in the Tonto Seven
17 Rivers pool on a 520 acre federal lease.

18 Q. And what is the purpose of this?

19 A. To study the reservoir to determine the
20 feasibility of implementing enhanced recovery operations
21 in the pool.

22 Q. Could you briefly review for the Examiners the
23 history of Chesapeake's efforts to develop or determine
24 whether or not water flood operations in this reservoir
25 are feasible?

1 A. Okay, we originally looked at unitizing a larger
2 area for water flood operations and there were some
3 questions raised by Nearburg, one of the larger partners.

4 And that kind of delayed us, and so we started
5 looking at cutting back and downsizing it just to a power
6 plug to see if we could expand it later to a larger. So
7 that's where we're at now.

8 Q. And this is a smaller project that you decided
9 to go with first?

10 A. That's correct.

11 Q. Would you refer to what has been marked as
12 Chesapeake Exhibit No. 1 and identify that and review it
13 for the Examiners?

14 A. Okay. It shows the boundary area of the
15 project. It's 520 acres, the dark outline, and Chesapeake
16 is using the well that Chesapeake has ownership in.

17 Q. And this is the 520 acre lease in the dark
18 outline?

19 A. Correct.

20 Q. What is the character of the land in the project
21 area?

22 A. It's 100 percent federal.

23 Q. Have you discussed your plans, Chesapeake's
24 plans, with the Bureau of Land Management?

25 A. Yes.

1 Q. Has the BLM actually been out on the location
2 helping you locate various pipelines and things of that
3 nature?

4 A. Yes, they've been out there with several of the
5 Chesapeake reps trying to figure out the best route.

6 MR. CARR: May it please the Examiners, we stand
7 before you today without what we hoped to have, which is a
8 letter waiving objections supporting this application from
9 the BLM.

10 We actually approached them with a letter about
11 a larger project. And when we moved to the smaller
12 project, we didn't go back to them. We don't anticipate
13 any problem obtaining that, but you're going to see that
14 we didn't give them notice and we don't have that letter.

15 And so with your permission, we will go ahead
16 and present the case, but at the end of the hearing, I'm
17 going to request that it be continued to the Examiner
18 Hearing scheduled for June 11th, and at that time we'll
19 provide a full notice affidavit and the waiver letter from
20 the BLM, if that's agreeable to you.

21 HEARING EXAMINER: Sounds good.

22 Q. Mr. Frohnapfel, let's go to what has been marked
23 Chesapeake Exhibit No. 2. Would you identify that,
24 please, and review it?

25 A. That's the ownership of all the interest owners

1 that would be affected by this project. They were all
2 given notice. It shows the BLM's 100 percent of the
3 mineral interests, and two working interest owners,
4 chesapeake having nine and a half percent, and William
5 James Ball, Junior as having half of 1 percent, and then
6 the overriding royalty owners that have a small interest.
7 And they were also notified.

8 Q. This is all the ownership in the 520 acre lease,
9 correct?

10 A. Right.

11 Q. BLM has not been notified but the others have
12 been?

13 A. Correct.

14 Q. And all of the working interests have been
15 committed? Have you visited with Mr. Ball?

16 A. Yes.

17 Q. And he's a former landman, in fact, with
18 Chesapeake, is he not?

19 A. Yes.

20 Q. And he's in support of the project?

21 A. Yes, he is.

22 Q. And you've also given notice to all of the other
23 royalty interest owners?

24 A. Yes.

25 Q. Would you identify what has been marked

1 Chesapeake Exhibit No. 3? Is Exhibit No. 3 a copy of a
2 notice affidavit?

3 A. Yes, it is.

4 Q. And does this affidavit have attached to it the
5 list of all interest owners within a half mile of the
6 injection well which is the subject of this application?

7 A. Yes. There's no operators outside of
8 Chesapeake. These are all leasees within a half mile.

9 Q. And attached to that are notice letters and
10 return receipts; is that correct?

11 A. That's correct.

12 Q. And was a copy of the application for this
13 hearing and the entire C102 application provided to each
14 of these interest owners?

15 A. Yes.

16 Q. Were Chesapeake Exhibits 1 through 3 prepared by
17 you or compiled under your direction or supervision?

18 A. Yes.

19 MR. CARR: May it please the Examiners, at this
20 time we move admission of Chesapeake Exhibits 1 through 3.

21 HEARING EXAMINER: Exhibits 1 through 3 will be
22 admitted.

23 MR. CARR: And that concludes my examination of
24 Mr. Frohnapfel.

25 HEARING EXAMINER: Now, say one more time, this

1 was the notice for the lease water flood or was this the
2 notice for the half mile around the --

3 MR. CARR: Everything was provided to everyone,
4 the application for the hearing and the C102.

5 HEARING EXAMINER: Okay.

6 MR. BROOKS: No questions.

7 MR. CARR: At this time I'd call Robert Martin.

8 ROBERT MARTIN,

9 the witness herein, after first being duly sworn.

10 upon his oath, was examined and testified as follows:

11 DIRECT EXAMINATION

12 BY MR. CARR:

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

15 A. Robert Martin.

16 Q. By whom are you employed?

17 A. Chesapeake Operating in Oklahoma City.

18 Q. And what is your current position with
19 Chesapeake?

20 A. Senior geologist with the Permian North Group.

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

23 A. Yes, I have.

24 Q. At the time of that testimony, were your
25 qualifications as an expert in petroleum geology accepted

1 and made a matter of record?

2 A. Yes.

3 Q. Have you conducted a geological study of the
4 portions of the Tonto Seven Rivers pool that is involved
5 in this case?

6 A. Yes, I have, I've worked with the Chesapeake
7 geologist on this.

8 Q. And are you prepared to share the results of
9 Chesapeake's work with the Examiners?

10 A. Yes.

11 MR. CARR: We tender Mr. Martin as an expert in
12 petroleum geology.

13 HEARING EXAMINER: Any objection?

14 MR. BRUCE: No objection.

15 HEARING EXAMINER: Mr. Martin is qualified as an
16 expert.

17 Q. Mr. Martin, have you prepared exhibits for
18 presentation here today?

19 A. Yes, I have.

20 Q. Let's go to what has been marked as Chesapeake
21 Exhibit No. 4. Would you identify that and review it for
22 the Examiners?

23 A. Exhibit 4 is the original open-hole log that was
24 drilled by Texaco in 1990. What I wanted to show on this
25 particular exhibit is, if you'll draw your attention to

1 the depth curve, you'll see the red bars. Those are the
2 perforations within the Seven Rivers that we'd like to
3 inject into.

4 Q. And Mr. Martin, this is the well into which
5 Chesapeake is proposing to inject?

6 A. That is correct, this is the well.

7 Q. If we look at Exhibit 1, it is indicated by the
8 triangle in the center of Exhibit 1; is that right?

9 A. That's correct.

10 Q. What is the current status of this well?

11 A. It's currently plugged.

12 Q. And you're going to be injecting into the Seven
13 Rivers formation?

14 A. That's correct.

15 Q. Could you summarize the characteristics of this
16 formation for the Examiners?

17 A. The Seven Rivers consists of several northwest
18 to southeast turning sandstones to pinch out. There's a
19 lot of inner fingering of carbonates and evaporites
20 between these sandstones. The pay can get up to 10 to 12
21 feet with porosities ranging from 14 to 25 percent.

22 Q. Let's go to Exhibit No. 5. Would you review
23 that?

24 A. Yes. Exhibit 5 is a structure map on top of the
25 Yates, which is just above the Seven Rivers, and conforms

1 very well with the Seven Rivers in this particular area,
2 so the structure would be the same.

3 I just wanted to show the different producing
4 zones within the area. And you can see the number of
5 Seven Rivers wells indicated there in yellow.

6 And then I've also marked the Federal USA L-4
7 for you in the center of Section 14.

8 Q. And basically what we have here is just the
9 geological background for the engineering presentation?

10 A. That's correct.

11 Q. Now, you've indicated on this exhibit a number
12 of Seven Rivers producing wells?

13 A. Yes.

14 Q. Will our engineering witness review the status
15 of those wells and Chesapeake's plans for this water flood
16 project in this area?

17 A. Yes, he will.

18 Q. Basically, what have you been able to conclude
19 from your geological study of this portion of the Seven
20 Rivers formation?

21 A. That we do have correlatable and continuous
22 Seven Rivers sands and that the reservoir is adequately
23 defined within this area.

24 Q. Does this reservoir from a geologic perspective
25 look like a good candidate for the proposed pilot plug?

1 A. Yes, sir, it does.

2 Q. Were Exhibits 4 and 5 prepared by you?

3 A. Yes.

4 MR. CARR: I would move the admission,
5 Mr. Examiner, of Chesapeake's Exhibits 4 and 5.

6 HEARING EXAMINER: Any objection, Mr. Bruce?

7 MR. BRUCE: No objection.

8 HEARING EXAMINER: Exhibits 4 and 5 will be
9 admitted.

10 MR. CARR: And that concludes my direct
11 examination of Mr. Martin.

12 MR. BRUCE: I have no questions.

13 HEARING EXAMINER: Is this a sand development in
14 the Seven Rivers?

15 THE WITNESS: Yes, it is.

16 HEARING EXAMINER: What would the lithology of
17 this sand be?

18 THE WITNESS: It would be mostly quarts but
19 there is some dolomite intermingled with the sandstones.

20 HEARING EXAMINER: You always run your logs on a
21 water matrix?

22 THE WITNESS: Yes.

23 HEARING EXAMINER: So you kind of know what to
24 look for. And this interval below it, 3,760 down to
25 3,810, that wasn't an area of concern?

1 THE WITNESS: No.

2 HEARING EXAMINER: Because --

3 THE WITNESS: Well, I mean, we don't -- Are you
4 asking is it productive?

5 HEARING EXAMINER: Yeah.

6 THE WITNESS: No, it's not productive. It's
7 been tested in several wells out here and it's wet.

8 HEARING EXAMINER: It's wet?

9 THE WITNESS: Yes.

10 HEARING EXAMINER: But it must have had some
11 residual oil in it, it was just too wet to produce under
12 primary production?

13 THE WITNESS: That would be my understanding in
14 just looking back at the records.

15 HEARING EXAMINER: And you did your structure
16 map on top of the Yates. Is the bottom of Taniel real
17 easy to see out here or something?

18 THE WITNESS: The bottom of the Taniel?

19 HEARING EXAMINER: Yeah.

20 THE WITNESS: Okay. Well, yeah. Let me explain
21 that the Yates -- within our data base, we have a really
22 nice Yates that we keep up with. It always stays current.
23 And I just happen to draw that up when I probably should
24 have gone through and done Seven Rivers, but because it
25 does conform very well with Seven Rivers out here, I just

1 went ahead and used it.

2 HEARING EXAMINER: Okay. And on this structure
3 map, those are sections; is that correct?

4 THE WITNESS: Yes, those are sections lines.

5 HEARING EXAMINER: So this entire leased pilot
6 would be contained in that one section?

7 THE WITNESS: Correct, Section 14.

8 HEARING EXAMINER: From the looks of this,
9 though, from a geologic viewpoint, if this turns out to
10 be -- to move some oil to the surrounding wells -- Does it
11 look like from your viewpoint that it could be expanded?

12 THE WITNESS: Yes.

13 HEARING EXAMINER: And how would you expand it?

14 THE WITNESS: I'll leave that up to Greg to
15 answer. He's the one that's done most of the reservoir
16 study on that particular portion of it.

17 HEARING EXAMINER: But even from a geologic --
18 From looking at these -- It's your logs and your
19 mapping --

20 THE WITNESS: I like it.

21 HEARING EXAMINER: You like it?

22 THE WITNESS: I like it.

23 HEARING EXAMINER: For expansion in the future?

24 THE WITNESS: Yes.

25 HEARING EXAMINER: Okay. This is north of the

1 reef, I noticed, it's about 2 miles north of the boundary
2 of the reef, and -- Does that mean you got your Queen
3 underneath this?

4 THE WITNESS: That's correct.

5 HEARING EXAMINER: But when you hit the reef you
6 would just -- you would be Seven Rivers on top of the
7 reef; is that right?

8 THE WITNESS: When you go further south?

9 HEARING EXAMINER: Yes.

10 THE WITNESS: Yes.

11 HEARING EXAMINER: Okay. And that's because the
12 reef ages the same as the Queen; is that correct?

13 THE WITNESS: I don't know if I can answer that
14 correctly.

15 HEARING EXAMINER: That's fine. I don't have
16 any more questions. Any questions?

17 MR. BROOKS: No questions.

18 MR. CARR: May it please the Examiners, at this
19 time we would call Greg Adams.

20 GREG ADAMS,

21 the witness herein, after first being duly sworn
22 upon his oath, was examined and testified as follows:

23 DIRECT EXAMINATION

24 BY MR. CARR:

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

1 please?

2 A. Gregory Adams.

3 Q. Mr. Adams, where do you reside?

4 A. In Oklahoma City.

5 Q. And by whom are you employed?

6 A. Chesapeake Energy.

7 Q. And what is your current position with
8 Chesapeake Energy?

9 A. I am a senior reservoir engineer. I work in the
10 Permian North Group.

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

13 A. Yes, I have.

14 Q. At the time of that testimony, were your
15 credentials as an expert as a well bore engineer accepted
16 and made a matter of record?

17 A. Yes, they were.

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

20 A. Yes.

21 Q. Have you conducted an engineering study of the
22 portion of the Seven Rivers formation that's the subject
23 of this case?

24 A. Yes, I have.

25 Q. And are you prepared to review the results of

1 your work with the Examiners?

2 A. Yes.

3 MR. CARR: I tender Mr. Adams as an expert in
4 reservoir engineering.

5 MR. BRUCE: No objection.

6 HEARING EXAMINER: Mr. Adams is qualified as an
7 expert.

8 Q. Mr. Adams, I think at this point I'd like to
9 start by asking you to why Chesapeake is seeking a pilot
10 project in this area, what are you trying to learn about
11 this reservoir?

12 A. We initially looked at this entire area, the
13 Seven Rivers area, as a water flood candidate and went so
14 far as to have a working interest owners meeting with some
15 of the other operators that operate in this area.

16 And I ran into a little bit of trouble with
17 Nearburg as far as the interests that we were going to
18 unitize and what the TPSs were, and that sort of thing.

19 And we negotiated with them for several months,
20 it might have even gone into years, and -- trying to buy
21 their interest. And we weren't able to come to a mutually
22 agreeable price.

23 And so, basically, this -- The big project has
24 been in limbo for about three years now and we decided to
25 focus on this particular 520 acre lease, because we had a

1 majority of it interest wise.

2 And we had some questions as to how much water
3 this tight Seven Rivers zone would take and we didn't know
4 whether it would take up to 200 barrels of water per day,
5 which is a minimum, in my mind, that you would need in
6 order to get a good idea of what kind of water flood
7 candidate this Seven Rivers zone would be.

8 Q. Let's go to Chesapeake Exhibit No. 6. Would you
9 identify this and review the information on this?

10 A. This is the executive summary that was put
11 together for just this Federal USA L lease 520 acre pilot
12 area. It shows there's been quite a bit of drilling in
13 this particular section.

14 In fact, there's been 15 wells drilled and 8 are
15 currently still producing. There's one saltwater disposal
16 well, there's four plugged and abandoned wells, and
17 there's two dry holes all encompassed within this pilot
18 area.

19 Q. And to what formation is the disposal occurring?

20 A. The disposal in this current SWD well is in the
21 Delaware formation which is below the Seven Rivers, and
22 we're, of course, looking to inject into the Seven Rivers
23 formation.

24 Also, there's shown on the executive summary,
25 Exhibit 6, the daily production from the three different

1 formations that are producing and active in this
2 particular pilot area.

3 The Seven Rivers wells, as you can see, six of
4 them produce 13 barrels of oil, and 40 MFC of gas, and 26
5 barrels of water, which shows a pretty advanced stage of
6 completion for these wells, and none of them -- and you'll
7 see on the next exhibit -- make over about three barrels
8 of oil per day each.

9 The Wolf Camp well that's existing on this
10 particular pilot area also makes 8 barrels of oil, and the
11 Delaware well makes 8 barrels of oil.

12 The formation depth is about 3,650 feet. I
13 won't go into all the reservoir data, but suffice it to
14 say, initial reservoir pressure was 1,680 PSI and it's
15 currently less than 400 pounds based on a bottom hole
16 pressure test that we received back in 2003 on one of the
17 pool wells.

18 Bubble point pressure is 920 PSI, and the
19 initial solution GOR is 250 standard cubic feet per
20 barrel.

21 Our cumulative recovery from the wells in the
22 Seven Rivers here in this lease is 314,000 barrels of oil.
23 The remaining primary developed based on decline curve
24 analysis is about 42,000 barrels. And we have some
25 approved behind pipe of about 140,000 barrels. And the

1 ultimate primary, if you add those up, will be about a
2 half million barrels.

3 Q. When was this initial pressure reading taken,
4 how long ago?

5 A. Well, the initial discovery well was drilled as
6 a deep test, and they didn't find anything deep. They
7 came uphole to the Seven Rivers back in 1975 in the Little
8 Rita No. 1 and completed it in the Seven Rivers. And
9 that's the one where the initial bottom hole pressure was
10 estimated from.

11 Q. Let's go into the Chesapeake Exhibit No. 7, your
12 production map. Again, I would ask you to identify what
13 this shows and then review it for the Examiners.

14 A. This is just a techno from the structure map
15 that you've already seen developed by Robert Martin, our
16 geologist.

17 And as you can see, we do have a northwest to
18 southeast trending Seven Rivers formation. And by the
19 number of yellow circles that you see, you can see that
20 it's fairly well developed in the Seven Rivers.

21 There's also several other formations that are
22 productive in the immediate area, including the ones that
23 are shown with the different colors on this map, Delaware
24 and Atoka and Marro and Bone Springs and Wolf Camp
25 production in the area.

1 You see the highlighted pink areas is the 520
2 acre pilot area that we're wishing to get approved today
3 with the Chesapeake Federal USA L No. 4 located roughly in
4 the center of this pilot area, and a good surrounding of
5 wells that we'll be able to -- to have already created
6 pressure sinks and hopefully will accept oil that would
7 might be moved by this injection hole location.

8 Q. You've got a couple of plugged and abandoned
9 wells to the east and the northeast of the injection well.
10 Do you have plans for those?

11 A. Yes. The Federal USA L No. 3 to the northeast
12 of the No. 4 is plugged and abandoned. All of these wells
13 were plugged and abandoned with just cement plugs. No
14 casing has been pulled, so they should be relatively easy
15 to go back in, run out the plugs and just bring the Seven
16 Rivers perms back on production.

17 That's the case with the Federal USA L No. 3 and
18 the Federal USA L No. 1 just to the south. And then to
19 the southwest of our injection location is the Federal USA
20 L No. 9-Y. It also would have to be reentered and brought
21 back to a producing status.

22 Q. From the information you presented, it's fair to
23 conclude this reservoir is approaching the end of its
24 economic life, isn't that fair to say?

25 A. Yes. From a pressure standpoint, which we

1 verified and which I've mentioned already, and also from
2 the production figures that you see indicated with the
3 numbers below each well, you can see the daily oil, gas
4 and water production from these wells, and they're in
5 advance stage of depletion.

6 Q. Substantial oil is limited in the reservoir?

7 A. Yes.

8 Q. Unless enhanced recovery methods can be
9 developed and successfully implemented, isn't it fair to
10 say that oil will be left in the ground and wasted?

11 A. Yes, without a doubt.

12 Q. If the results of this project are successful,
13 is it reasonable to expect that water flood operations
14 could be conducted throughout this portion of this
15 reservoir?

16 A. Yes, and that is our intention. Of course,
17 we're lucky to have this smaller area that we can test it
18 on and use part of it, less capital dollars in the
19 constrained environment that we're in, and just kind of
20 microseis it here in this area to see if we get some good
21 results, and if we do, then we'll be able to justify
22 expanding it to a larger area.

23 Q. Mr. Adams, let's go to Chesapeake Exhibit No. 8,
24 the C108, the injection application.

25 A. Okay.

1 Q. Does this C108 application contain the
2 information required by this form?

3 A. Yes.

4 Q. Is this an expansion of an existing project?

5 A. No.

6 Q. How many injection wells are included in this
7 application?

8 A. Just the one.

9 Q. Now, I have numbered the pages in this exhibit.
10 Would you refer to Pages 15 and 16, the schematics, and
11 review how Chesapeake proposes to physically convert this
12 well for injection?

13 A. Yes. As Terry mentioned, this well is plugged
14 and abandoned currently. You can see that there's three
15 cement plugs above the cast iron bridge plug at 3,550 feet
16 that we'll have to drill out.

17 And then we'll also drill out the cement on the
18 cast iron bridge plug located at 3,550 feet exposing the
19 perfs, the Seven Rivers perfs that are currently there at
20 3,615 down to 3,694 feet.

21 We'll leave the cement bridge plug at 4,050 with
22 the 35 foot of cement on top and be able to isolate the
23 Seven Rivers perfs by blowing out that plug.

24 Q. You have a schematic for the proposed work?

25 A. Yes. And it is a proposed schematic that we

1 would have for this well as an injection well. Once we do
2 drill out those plugs, we'll run a 2 3/8 inch plastic-
3 coated tubing with a packer on the bottom of it and set it
4 at least a hundred feet above the perf and be able to
5 isolate the Seven Rivers perms and monitor the tubing and
6 the casing pressure and make sure we have good isolation
7 there without any leak off of pressure.

8 Q. Mr. Adams, does Chesapeake seek authority to
9 commit additional wells to injection in unorthodox
10 locations through the Division's administrative procedures
11 within this project area?

12 A. At the present time, we're just requesting the
13 one, the USA L No. 4. If you will refer back to Exhibit
14 No. 7, though, you will see that there's several wells
15 located very close to this proposed injection well, and we
16 do expect some of these in the future to perhaps water
17 out, and at that time we'll probably come back to the
18 Commission and try to get those approved for injection
19 wells.

20 Q. And that would depend of course on the
21 performance of the first well?

22 A. Yes.

23 Q. On Page 11 of Exhibit 8 is a plat. Would you
24 just briefly summarize what this plat shows?

25 A. This is the area of review that is required by

1 the C108. We examined all the wells within the half mile
2 radius to determine whether they were protected properly
3 by cement whenever they were drilled, or if they were
4 plugged and abandoned to make sure that we don't have any
5 cases where we might have some open Seven Rivers perms
6 that might have some cross-load between formations.

7 And it looks like all of them are currently
8 protected by cement behind pipe except for the one well
9 that we'll be discussing a little bit later.

10 Q. On Pages 12, 13, and 17 to 19 of this
11 application, have you included information required for
12 each of the wells in the area of review which penetrate
13 the injection interval?

14 A. Yes, we have.

15 Q. Are there plugged and abandoned wells within the
16 area of review?

17 A. Yes, there's three.

18 Q. And you have included some diagrammatic sketches
19 in this exhibit?

20 A. Yes. Those were dry holes. The No. 5 well and
21 the No. 9 well were dry holes. And then we have some
22 other exhibits that show the plugged and abandoned wells
23 that were just recently plugged and abandoned and how they
24 were plugged.

25 Q. So you have two additional exhibits.

1 MR. CARR: Those are marked, Mr. Examiner, as
2 Chesapeake Exhibits 9 and 10 and are attached right behind
3 the schematic.

4 Q. Perhaps, Mr. Adams, you could refer to those.
5 There were some additional schematics of recently plugged
6 and abandoned wells.

7 A. The Federal USA L No. 1, which was mentioned
8 earlier, is a plugged and abandoned well, and it has three
9 cement plugs in the well bore above a cast iron bridge
10 plug with 35 feet of cement on top of it.

11 And we'll, of course, like I mentioned, be
12 drilling out those plugs in order to return this well to a
13 producing status.

14 Likewise, the next exhibit is the plugged and
15 abandoned schematic of the Federal USA L No. 3. And it's
16 very similar. As you can see, there's three cement plugs
17 above the cast iron bridge plug in that well also that
18 will have to be drilled out to return this well back to
19 producing status.

20 Q. Mr. Adams, are all plugged and abandoned wells
21 within the area of review properly plugged so as to
22 prevent oil becoming vehicles for migration in injected
23 pools?

24 A. Yes, all the plugged wells are in good shape.

25 Q. A few minutes ago you indicated that you had

1 reviewed the available data on the wells in the area.

2 Have you satisfied yourself that no remedial work would be
3 required on any except one; is that right?

4 A. That's right.

5 Q. And is Exhibit 12 a schematic of the Texaco
6 Federal Well No. 3?

7 A. Yes.

8 Q. Is this the well that you believe needs to have
9 additional work on it?

10 A. Yes. By examining the cement program on this
11 well when it was completed -- and it was located due south
12 of our proposed injection well, it's currently a Delaware
13 producer making about 8 barrels of oil, and 50 MFC of gas,
14 and 50 barrels of water a day.

15 When they initially completed this well, they
16 ran the production string of 5 1/2 inch casing and
17 cemented sufficiently up to a top of cement at 5,150 feet,
18 as shown on the well bore diagram, which leaves the Seven
19 Rivers formation open and not protected by cement.

20 And therefore, we would propose -- Before we
21 would started injecting water into the Federal USA L
22 No. 4, we would have to work a rig on this well and
23 perforate below the Seven Rivers and try to circulate the
24 cement plug so we protect that formation.

25 Q. Do you recommend that the order entered in this

1 case require that you work out a satisfactory remedial
2 program for this well with the Hobbs district office
3 before you commence injection?

4 A. Yes, that would be expected.

5 Q. What injection volumes does Chesapeake propose
6 in the initial injection well?

7 A. As I mentioned earlier, we would like to get at
8 least 200 to 300 barrels of water per day into this well
9 in order to --

10 This is in advance stage of depletion, so
11 there's quite a bit of voidage in the area. And without
12 getting at least 200 to 250 barrels of water per day, we
13 wouldn't be able to fill up that voidage at a fast enough
14 rate in order to determine the feasibility of water
15 threatening this reservoir.

16 Q. What is the maximum rate that you would
17 consider?

18 A. I think 500 would be maximum rate, but we do
19 anticipate this being a tight reservoir. That's the whole
20 reason for trying to seek this pilot to be approved, is
21 because we know that it's tight, it's going to be tough to
22 get water into.

23 And therefore, I would expect a maximum rate of
24 500 barrels of day, but I really don't seriously expect to
25 see that.

1 Q. What is the source of the water you propose to
2 inject?

3 A. The current disposal well, the Texaco Federal
4 No. 2 which is located to the northeast of our proposed
5 injection location, it is a current disposal well. And
6 that's going to be -- the water that we currently dispose
7 into it will be the water source that we want to dispose
8 of into the Seven Rivers formation.

9 And it's comprised of several different waters
10 that produce off of different formations. As you can see,
11 this is a fairly prolific area with different formations
12 that are productive.

13 And so we would be looking at all of these
14 waters and getting compatibility tests on them in order to
15 make sure that it is compatible with the Seven Rivers
16 formation so we wouldn't cause any damage by injecting
17 those waters into this particular well.

18 Q. Have you also discussed this with the Hobbs
19 district office?

20 A. Yes.

21 Q. And would you, again, recommend that prior to
22 injection, that you work out -- that you run the
23 appropriate compatibility tests to satisfy the Hobbs
24 district office that, in fact, there would be no
25 compatibility problems by going forward with this

1 injection well?

2 A. Yes, we would.

3 Q. No fresh water is going to be used?

4 A. None at all, no.

5 Q. Is this an open or closed system?

6 A. It's a closed system.

7 Q. What pressure is Chesapeake proposing?

8 A. The maximum pressure that we're expecting would
9 be a thousand pounds. The pressure that we're seeing in
10 the current disposal well is about 1,400 pounds.

11 Of course, it's a different formation, a little
12 bit deeper. Using the .2 PSI per foot gradient that I
13 believe is standard out here, you would have a maximum
14 pressure of about 800 PSI..

15 We'll just start out and keep below that 800
16 PSI, but -- and if we do see that we can't get enough
17 water into the well using that pressure limitation, we'll,
18 you know, request an increase based on step-rate testing
19 that we'll perform on this particular well.

20 Q. And that would be witnessed at the testing?

21 A. Yes.

22 Q. How does Chesapeake propose to monitor this well
23 to ensure the integrity of the well bore?

24 A. We'll have pressure gauges on the tubing at all
25 times, and also on the casing.

1 Q. And you'll have the annular space filled with an
2 inner fluid?

3 A. Yes.

4 Q. And you'll otherwise comply with the provisions
5 of the Federal Underground Injection Control Program?

6 A. Yes, we will.

7 Q. In your opinion, would the proposed injection
8 pose any threat to groundwater?

9 A. No.

10 Q. Are there fresh water zones in the area?

11 A. We've done -- of course, as part of completing
12 the C108, we've done examination to see if there's any
13 fresh water wells in the area.

14 And there's none within the area that is
15 required by law to investigate, there's just not a whole
16 lot of fresh water out there.

17 Q. Are you aware of any fresh water zones in the
18 area either above or below the injection interval?

19 A. No, I'm not.

20 Q. So is it fair to conclude that what you're
21 proposing, you do not believe it will be a threat to any
22 fresh water?

23 A. That's right.

24 Q. Have you examined the available geologic and
25 engineering data on this reservoir, and as a result of

1 that examination, found any faults or other open
2 hydrological formation in the injection interval and any
3 source of drinking water?

4 A. No.

5 Q. In your opinion, would the approval of this
6 application and implementation of this project be in the
7 best interest of conservation and prevention of waste and
8 protection of correlative rights?

9 A. Yes, it would.

10 Q. How soon does Chesapeake anticipate commencement
11 of operations of this project?

12 A. I would say within six months is a good time
13 frame.

14 Q. And once you commence your operations, how long
15 do you think it would be before you actually are able to
16 obtain the information and tie it together and report back
17 to the Division?

18 A. Due to the tight nature that we're expecting,
19 there might be quite a bit of time before we would achieve
20 or get close to fill up the voidage gauge area that's in
21 the reservoir.

22 And so, I would think that within two years we
23 would see -- hopefully have some results that we might be
24 able to bring to the Commission or bring to the Board here
25 and determine whether it's a worthy project to go full

1 afield.

2 Q. And that would be two years after you actually
3 commence the injection?

4 A. Yes.

5 MR. CARR: I had a proposed order that was going
6 to be Chesapeake Exhibit 12, but until we get the notice
7 resolved, I think I'll present that when we sort that out.
8 That correctly identifies the property and contains, I
9 think, the conditions that Mr. Adams has discussed.

10 Q. And so with that, Mr. Adams, were Exhibits 6
11 through 11 prepared by you or compiled under your
12 direction?

13 A. Yes.

14 MR. CARR: I would at this time move the
15 admission into evidence of Chesapeake Exhibits 6 through
16 11.

17 MR. BRUCE: No objection.

18 HEARING EXAMINER: Exhibits 6 through 11 will be
19 admitted.

20 CROSS-EXAMINATION

21 BY MR. BRUCE:

22 Q. Mr. Adams, are there any other Seven Rivers
23 water floods in southeast New Mexico that you've checked
24 up on?

25 A. There's one that we looked at. The last Seven

1 Rivers is a field that has been flooded. It's about 5
2 miles to the north, and that's the only -- that's the
3 closest Seven Rivers.

4 But this is very similar in lithology and pay to
5 the Yates and also the Queen, and those two formations are
6 flooded in the area.

7 One is operated by Chesapeake, the Westige unit
8 to the south about 5 miles. The Westige unit is just to
9 the east of the Westige unit. It's an old water flood
10 that has been successful.

11 And so there's several successful plugs in the
12 area, but only the one in the Seven Rivers that I'm
13 familiar with.

14 Q. And those ones you mentioned, what is the -- did
15 you check out what the secondary primary recovery was?

16 A. Yeah, they're all between 1 and 1.5 secondary
17 primary ratio.

18 Q. Okay. Thank you.

19 HEARING EXAMINER: Mr. Adams, the Seven Rivers
20 sometimes -- I'm not an expert on Seven Rivers, obviously,
21 but I know that sometimes you get some KARST going on in
22 there, and I should have asked Mr. Martin about that.

23 But are you concerned about that in this area at
24 all, any kind of bugs and -- In other words, the reservoir
25 rock porosity and the way it's connected, are you

1 concerned about that affecting your water flood at all?

2 THE WITNESS: It's my understanding by talking
3 to the geologists that have worked on this project that
4 this is all fairly fine grained sand, and we're talking
5 about primary porosity for the most part.

6 I'm not familiar with any cores that have
7 determined in this area that there are secondary regular-
8 type porosity within the Seven Rivers. So I would expect
9 this to all be innergranular-type porosity.

10 HEARING EXAMINER: Okay. Well, maybe you're far
11 enough away from the reef that you don't have that issue.
12 But you'll know when you get into it, I'm sure. It will
13 change everything. This Well No. 9 and Well No. 9-Y, what
14 happened to those?

15 THE WITNESS: The No. 9 well was drilled several
16 years back and it was a dry hole and they plugged it. And
17 then the 9-Y was a replacement well for -- I think they
18 tried to reenter it when they wanted to drill a Seven
19 Rivers well. And they weren't able to reenter it so they
20 just moved over several hundred feet and drilled the 9-Y.

21 HEARING EXAMINER: So 9 cannot be reentered,
22 then, to the Seven Rivers?

23 THE WITNESS: That's correct.

24 HEARING EXAMINER: Okay. Does it have any
25 problems in the cementing of it?

1 THE WITNESS: I believe there's a sketch within
2 the C108 on Page 18.

3 HEARING EXAMINER: Okay. It says Federal USA L
4 No. 9 on top?

5 THE WITNESS: Yes.

6 HEARING EXAMINER: Okay. Yeah, it shows a plug
7 at 3,050 and then a plug at 4,100. Which formations would
8 be exposed there? Is that just the Yates above it?

9 THE WITNESS: Well, between 3,050, the plug
10 there, and the plug at 4,100 is the Seven Rivers for sure,
11 and I'm not sure if the Yates would be included in that
12 interval also or not.

13 HEARING EXAMINER: Is the Yates productive out
14 there, is there any reason to protect it?

15 THE WITNESS: It's not productive in this
16 particular area, but as I mentioned with Mr. Bruce's
17 question, there is a Yates production 5 miles to the
18 south. So not within this immediate area, but I know
19 within the general area there is Yates production.

20 HEARING EXAMINER: But the well file would have
21 all the history of trying to reenter that well, I take it.
22 And do you know where the problem was when they tried to
23 reenter it?

24 THE WITNESS: I'm sure I read that information
25 whenever I read the well file, but I sure don't recollect

1 it right now. It looks like they pulled some of the
2 casing at the surface, close to the surface, and they were
3 probably trying to stab back into that cut portion so they
4 could, you know, have a casing all the way to surface.

5 And that's probably where they had trouble was
6 in the red bed sloughing off and just went over to stab
7 back into that cut piece of casing.

8 HEARING EXAMINER: Okay. There there's no fresh
9 water out here at all?

10 THE WITNESS: No, and that's one of the
11 problems. Back a long time ago whenever New Mexico
12 allowed -- or readily allowed injection of fresh water,
13 there's just not a whole lot of fresh water available in
14 this area, and therefore, you have to get your source of
15 water from other formations.

16 HEARING EXAMINER: The notices -- I should have
17 already gotten this, but the notices that went out, if you
18 want to expand this in the future to more injection wells,
19 did the notices include all wells within a half mile of
20 the lease boundary as far as the -- So we would have to
21 look at that again.

22 MR. CARR: That would have to be part of a
23 subsequent C108.

24 HEARING EXAMINER: Okay.

25 MR. CARR: This was the half mile radius around

1 the injection.

2 HEARING EXAMINER: Okay. And the pattern that
3 you've got here is -- which wells would be producing wells
4 right around that well?

5 THE WITNESS: Well, starting at the east
6 location, the No. 1, the No. 3. As we move
7 counterclockwise now, the No. 3, the No. 2 is a producing
8 well, the No. 7 is producing, the No. 6 is producing, the
9 No. 9-Y will be reentered and will be producing, and the
10 No. 8 to the southwest.

11 HEARING EXAMINER: Okay, straight to the south
12 it's a problem well that needs some squeezing.

13 THE WITNESS: That's a Delaware completion and
14 it does not have proper cement across the Seven Rivers.
15 So yes, we would have to perforate and try to circulate
16 cement in the Seven Rivers in that well.

17 HEARING EXAMINER: You've got yourself a chicken
18 wire or something pattern there.

19 THE WITNESS: Yeah, inverted something spot.

20 HEARING EXAMINER: Okay. Because it's pretty
21 well contained and you shouldn't affect anybody outside
22 this area, I wouldn't think.

23 THE WITNESS: That's correct. We have pressure
24 sinks all around this particular injection location, so it
25 should be confined within this pilot area.

1 HEARING EXAMINER: Okay. And I noticed there
2 were 28 sidewall cores cut in this well in 1990, and some
3 of those are in the -- Did that help your decision any?

4 THE WITNESS: I don't recall examining those
5 sidewall cores. I don't know if some of the geologists
6 that have worked on this have looked at that or not, or
7 even if they're available anymore.

8 Because this well was drilled in the '80s and we
9 purchased it some several years back, and I'm sure that
10 sidewall cores would be hard to locate.

11 HEARING EXAMINER: Okay. On your C108, I didn't
12 see cement tops of the producing wells and the producing
13 perfs, but I heard some testimony about that. Is it your
14 testimony, except for this one well, that everything else
15 is cemented above the 3,600 feet?

16 THE WITNESS: Yes. And if you'd like, we can
17 provide the well bore sketches on those also.

18 HEARING EXAMINER: No, that's okay. The water
19 analysis of your injection interval, what do you think
20 about that, is that hard to come by? I didn't see -- I
21 don't think I have that one in here.

22 THE WITNESS: No, I don't have a water analysis
23 as an exhibit or in the C108, but it is easy to come by.
24 As you can see from the production rates on these Seven
25 Rivers wells out here, they do make small amounts of

1 water. And so it wouldn't be very difficult at all to
2 perform that compatibility testing of the waters that
3 we're talking about.

4 HEARING EXAMINER: What about the salinity of
5 it, is it a pretty high salinity?

6 THE WITNESS: To my recollection, yes, it's
7 100,000 parts per million or greater.

8 HEARING EXAMINER: Okay. Anything else?

9 MR. CARR: Just one question.

10 REDIRECT EXAMINATION

11 BY MR. CARR:

12 Q. Just one question, Mr. Adams. On the well in
13 the area of review that you're going to have to reenter,
14 was that the Texaco Federal No. 3?

15 A. Yes.

16 Q. And that's Exhibit 11?

17 A. Yes.

18 Q. And can you tell me once again what you plan on
19 doing with that well?

20 A. Well, the current top of cement is at 5,150 feet
21 behind the production string, and therefore, we would have
22 to pull the production tubing and rods out of this well
23 and run in with a perf and perforate below the Seven
24 Rivers and try to circulate cement either to surface or
25 sufficiently to get it above the top of the Seven Rivers

1 formation so we'd have that protected.

2 Q. Thank you.

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

4 MR. BRUCE: No questions.

5 HEARING EXAMINER: Thank very much.

6 MR. CARR: At this time, Mr. Examiner, we would
7 request that the case be continued to June 11.

8 HEARING EXAMINER: All right, Case 14325 will be
9 continued to June 11th.

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I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. _____,
heard by me on _____.
_____, Examiner
Oil Conservation Division

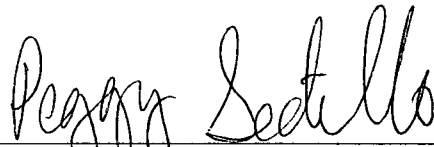
* * *

1 STATE OF NEW MEXICO)
 2 COUNTY OF BERNALILLO) ss.
 3)
 4)

5 REPORTER'S CERTIFICATE

6
 7 I, PEGGY A. SEDILLO, Certified Court
 8 Reporter of the firm Paul Baca Professional
 9 Court Reporters do hereby certify that the
 10 foregoing transcript is a complete and accurate
 11 record of said proceedings as the same were
 12 recorded by me or under my supervision.

13 Dated at Albuquerque, New Mexico this
 14 10th day of June, 2009.

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