

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. 13,933  
APPLICATION OF BURLINGTON RESOURCES )  
OIL AND GAS COMPANY, LP, FOR APPROVAL )  
OF A PILOT SEQUESTRATION INJECTION WELL )  
PROJECT, SAN JUAN COUNTY, NEW MEXICO )  
 )

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EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Jr., Legal Examiner  
RICHARD EZEANYIM, Technical Examiner

June 21st, 2007

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Jr., Legal Examiner, and RICHARD EZEANYIM, Technical Examiner, on Thursday, June 21st, 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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June 21st, 2007  
Examiner Hearing  
CASE NO. 13,933

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

## FOR THE DIVISION:

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By: OCEAN MUNDS-DRY

## FOR KOCH EXPLORATION COMPANY:

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Santa Fe, New Mexico 87501  
By: J. SCOTT HALL

\* \* \*

## ALSO PRESENT:

Charlie Perrin  
District Supervisor  
Aztec District Office  
District 3, NMOCD

\* \* \*

1           WHEREUPON, the following proceedings were had at  
2 4:19 p.m.:

3           EXAMINER BROOKS: And at this time we will at  
4 long last call Case Number 13,933, the Application of  
5 Burlington Resources Oil and Gas Company, LP, for a pilot  
6 sequestration injection well project, San Juan County, New  
7 Mexico.

8           MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of  
9 the Santa Fe law firm of Kellahin and Kellahin, appearing  
10 on behalf of the Applicant, and we've revised our  
11 presentation so that we hopefully can bring to you just a  
12 single witness.

13           EXAMINER BROOKS: Okay, and --

14           MS. MUNDS-DRY: Mr. Examiner, Ocean Munds-Dry  
15 with the law firm of Holland and Hart, here appearing for  
16 BP America Production Company. We have no witness, we  
17 simply say we support the project and hope Burlington will  
18 share their information with us as this project progresses.  
19 We're all very keenly interested in it.

20           EXAMINER BROOKS: Any other appearances?

21           Very good. Would the witness identify himself  
22 for the record?

23           MR. SCHLABAUGH: Yes, my name is James Lee  
24 Schlabaugh.

25           EXAMINER BROOKS: Please swear the witness.

1 (Thereupon, the witness was sworn.)

2 EXAMINER BROOKS: You may proceed when ready, Mr.  
3 Kellahin.

4 MR. KELLAHIN: Thank you, Mr. Examiner.

5 We're going to attempt to do this with a  
6 PowerPoint presentation. Associated with that is a  
7 hardbound copy of the hearing exhibits. And because we  
8 have reorganized the presentation, I have prepared a crib  
9 sheet, if you will, that allows you to look at a slide and  
10 then later correspond the slide to the exhibit book,  
11 exhibit number. So our plan is to go through the slides,  
12 which are a little out of sequence, but with the engineer's  
13 help we'll get our way through that.

14 In addition, we have disc copies of the  
15 presentation so that we can leave you a disc of the data  
16 and all of the slides, if you care to see that, and we'll  
17 provide that data to other parties that appeared, Ms.  
18 Munds-Dry's client and others, if they care to have a copy  
19 of that.

20 EXAMINER BROOKS: Okay.

21 MR. KELLAHIN: If you'll give me a moment, I'll  
22 hand out the hard-copy books.

23 EXAMINER BROOKS: I'm sorry, Mr. Hall, you were  
24 out of the room when I called for appearances. Are you  
25 appearing in this case?

1 MR. HALL: Yes, Mr. Examiner, I apologize. Scott  
2 Hall, Miller Stratvert, PA, Santa Fe, on behalf of Koch  
3 Exploration Company. I have no witnesses.

4 EXAMINER BROOKS: No witnesses.

5 MR. HALL: No witnesses.

6 EXAMINER BROOKS: Thank you.

7 (Off the record)

8 JAMES LEE SCHLABAUGH,

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

11 DIRECT EXAMINATION

12 BY MR. KELLAHIN:

13 Q. All right, sir, would you please state your name  
14 and occupation?

15 A. My name is James Lee Schlabaugh, I'm a reservoir  
16 engineer.

17 Q. Mr. Schlabaugh, on prior occasions have you  
18 testified before the Division?

19 A. Yes, I have.

20 Q. Summarize for us your technical experience.

21 A. I graduated from the Colorado School of Mines in  
22 1974, I've worked for various companies and industries  
23 since then in Denver and Midland and finally Farmington  
24 areas.

25 Q. What has been your involvement in this project?

1           A.    I am an engineer that works -- a reservoir  
2 engineer that works the Fruitland Coal for Burlington  
3 Resources.

4           Q.    Is there a team associated with your effort?

5           A.    Yes, there is.  If you're referring to Burlington  
6 Resources we have a coal team, resource assessment team.  
7 If you're referring to this particular project there is an  
8 organization called the Southwest Partnership for Carbon  
9 Sequestration.

10          Q.    In terms of the Burlington technical people  
11 available today in the hearing room to answer questions, if  
12 there are any, would you go ahead and identify the other  
13 parties to the hearing team?  You have a drilling engineer,  
14 Mr. Frank Fernandez?

15          A.    That's correct.

16          Q.    Is there a geologist associated?

17          A.    David Clark.

18          Q.    And do you have a landman in the project?

19          A.    Yes, Brian -- Dart?

20                MR. DART:  Yeah.

21                THE WITNESS:  Yes.

22          Q.    (By Mr. Kellahin)  We're going to attempt to  
23 present this all through the engineering witness.

24                As part of this project, have you satisfied  
25 yourself that you have utilized the available data in order

1 to reach certain conclusions and opinion?

2 A. Yes, I have.

3 Q. Are you the spokesman for your company for this  
4 project?

5 A. Yes, I am.

6 MR. KELLAHIN: We tender Mr. Schlabaugh as an  
7 expert petroleum engineer.

8 EXAMINER BROOKS: Okay, are you a registered  
9 engineer in New Mexico or elsewhere?

10 THE WITNESS: No, I'm not.

11 EXAMINER BROOKS: He is so qualified.

12 Q. (By Mr. Kellahin) Let's use the first slide in  
13 the PowerPoint slide to give us a general orientation, Mr.  
14 Schlabaugh.

15 The green colors are associated with what, sir?

16 A. The green colors are the basins within the eight-  
17 state study area that the Southwest Partnership works in.

18 Q. How do we see the CO<sub>2</sub>-associated pipelines with  
19 that infrastructure for those Basins?

20 A. The CO<sub>2</sub> pipelines are the red lines here going  
21 generally from southwest Colorado, southern Colorado,  
22 through New Mexico and into the Permian Basin, and then  
23 there's also a small line up in Wyoming.

24 Q. You've identified on the slide a star associated  
25 with various portions of the area.

1 A. Yes, there are three stars.

2 Q. What do those mean?

3 A. The one star in the Paradox Basin is a project  
4 that the Southwest Partnership is pursuing for injection  
5 into the formations in the Aneth Unit. The other star down  
6 here in the Permian Basin is another injection project near  
7 the SACROC Unit. The third star here represents actually  
8 two projects. One is a surface mitigation project which  
9 I'm not representing today, the other is our injection  
10 project into the Fruitland Coal.

11 Q. When we specifically look at what we're asking  
12 Examiner Brooks to approve for you, what is the basic  
13 request? What are you trying to do?

14 A. We're requesting permission to drill a CO<sub>2</sub>  
15 injector and to inject CO<sub>2</sub> into the Fruitland Coal  
16 formation at that location.

17 Q. In order to accomplish that, have you had  
18 prepared a Division Form C-108?

19 A. Yes, we have.

20 Q. And you have followed the process associated with  
21 the filing of that information?

22 A. Yes, we have.

23 Q. What is your proposed purpose? What are you  
24 trying to do?

25 A. What we're trying to do is, in association with

1 the Southwest Partnership we wanted to look at two factors  
2 in this project. One is for Burlington Resources, we  
3 wanted to investigate the commercial potential of injecting  
4 CO<sub>2</sub> into the Fruitland Coal formation. For the Southwest  
5 Partnership interest in the project, we wanted to look at  
6 long-term CO<sub>2</sub> or carbon sequestration in the Fruitland  
7 Coal.

8 Q. To the best of your knowledge, has there been a  
9 prior injector to be utilized as a CO<sub>2</sub> sequestration well,  
10 approved by the Division?

11 A. Not strictly for that purpose, no.

12 Q. There have been approval for injection of CO<sub>2</sub> for  
13 flood purposes, have there not?

14 A. Yes, for enhanced recovery.

15 Q. Are you familiar with any enhanced oil recovery  
16 projects that have attempted to introduce CO<sub>2</sub> into the  
17 reservoirs?

18 A. I am not personally, no.

19 EXAMINER EZEANYIM: Who is Southwest Partnership?

20 THE WITNESS: The Southwest Partnership is -- I  
21 can go through it a little bit. And actually, should I go  
22 to the --

23 MR. KELLAHIN: Yeah, that's the next question.  
24 Let's go to that slide.

25 THE WITNESS: Okay. In essence, it's a

1 partnership of some governmental and nongovernmental  
2 organizations that covers about an eight-state area in the  
3 Southwest, as we state, and that partnership includes  
4 several major universities, some geologic surveys, state  
5 agencies, the Western Governors Association, some  
6 utilities, energy companies such as Burlington Resources,  
7 federal agencies such as the NETL, Navajo Nation and other  
8 private and public partners.

9           And the purpose of the Partnership is to  
10 investigate the potential for identifying and controlling  
11 greenhouse gases in the region.

12           Q.    (By Mr. Kellahin) We're working with a group of  
13 slides associated with Exhibit Number 4, but let's turn to  
14 Slide 37 and see that slide.

15           A.    Okay. Yeah, this is the chronology of the  
16 formation and the work that the Southwest Partnership has  
17 done.

18           Q.    Take your time, and let's go through the pieces  
19 of the chronology.

20           A.    Okay, in essence, the original Partnership was  
21 put together in 2003, in order to characterize the eight-  
22 state region, both the carbon emissions, the pipeline  
23 network and the carbon sinks or potential sinks. They did  
24 that work during the period 2003-2005. They came up with  
25 four pilot -- potential pilot projects that they

1 identified, and in 2005 the Partnership approached  
2 Burlington Resources -- in a meeting in February of 2005,  
3 actually -- and proposed the project in the San Juan Basin  
4 to inject into the Fruitland Coal.

5 After that meeting Burlington Resources agreed to  
6 be the implementer of the project, and an application was  
7 made to the DOE for a contract. A contract was awarded in  
8 June of '05, and since then we've had several meetings and  
9 quite a bit of planning work to try to implement the  
10 project, and we are now at this hearing to try to go  
11 forward with the project itself.

12 Q. If you'll turn to Slide 38, please.

13 A. Okay. This slide here represents the work  
14 product for Phase 1 of the partnership, and it is a general  
15 map of the sources and pipelines in the San Juan -- or  
16 actually in the Southwest Partnership area. You can look  
17 at the San Juan Basin here.

18 The two large red dots here represent the two  
19 major sources of CO<sub>2</sub> in the area, which are both coal-fired  
20 power plants.

21 If you look at this blue-green dot up here, this  
22 is a natural source of CO<sub>2</sub>, the McElmo Dome, in the Paradox  
23 Basin. And then from that McElmo Dome there's an  
24 interstate transmission line that runs down to the Permian  
25 Basin and carries CO<sub>2</sub> down here. And the partnership

1 wanted to utilize both this natural source and the existing  
2 pipeline in their project.

3 Q. Let's go to Slide 39, please.

4 A. Okay. This again is just a copy of the first  
5 slide we showed, that shows the four pilot projects in the  
6 inventory of the Southwest Partnership. Again, the Paradox  
7 Basin Project at Aneth, the Permian Basin project near  
8 SACROC, and the two projects in the San Juan Basin.

9 Q. Let's go now to Exhibit 5 in the exhibit book,  
10 which is going to be Slide 41.

11 A. Okay. Okay, here what I'd like to do for you is  
12 provide you our project definition, the objectives and  
13 requirements of the project. The objectives, we had three  
14 main objectives. One is to investigate the injectivity  
15 rates that we might obtain in the -- or might be able to  
16 obtain in the Fruitland Coal formation.

17 One of the issues that we have seen in previous  
18 projects of this type has been a problem with coal swelling  
19 and other issues in the coal that has restricted our  
20 injectivity, and we feel that this project area probably is  
21 the most likely area to get maximum injectivity.

22 We also wanted to take a look at methane  
23 production and confirm that we can produce methane from the  
24 coal in response to the injection.

25 And we also wanted to look at the long-term CO<sub>2</sub>

①  
3 objectives

1 storage capabilities of the Fruitland Coal.

2 As far as our requirements for the project, the  
3 main requirement was that the project be in the Fruitland  
4 Coal fairway. We feel that based on historical production  
5 here and the data that we have, this is probably the pre-  
6 eminent coalbed methane producing formation in the world,  
7 and it is probably our best shot at being able to sequester  
8 CO<sub>2</sub> in coal.

9 We wanted to use existing lines to keep our costs  
10 under control.

11 We wanted the project to be operated and  
12 controlled by BR for purposes of simplicity.

13 We wanted the project to be environmentally  
14 acceptable.

15 And we also wanted the project to be acceptable  
16 to our offset operators.

17 We've gone through all of these requirements,  
18 have had to change our locations several times in order to  
19 come up with a location that will satisfy all five of these  
20 requirements, and that is -- that's the location we're  
21 applying for today.

22 Q. Let's go to Slide 42 and look at the locator.

23 A. Okay, this is a locator map. This is a map that  
24 we use quite a bit internally. It shows the current  
25 production rate for the coal wells in-basin. The highest

1 production rates are represented by these warmer colors,  
2 the yellows, greens and oranges, and you can see that is  
3 predominantly in the Fruitland Coal fairway.

4 You can also see that there's a green outline on  
5 here. That shows the extent of the coal to the outcrop.

6 There's also a red outline on here, and that  
7 delineates the boundary between the Fruitland Coal fairway,  
8 which we internally call the overpressured coal, and the  
9 non-pressured coal, -overpressured coal, or non-fairway  
10 coal outside of it.

11 Q. And that would be what we characterize the  
12 underpressure?

13 A. Yes, that's correct.

14 Q. Now where's the proposed injector site in  
15 relation to the overpressured coal line?

16 A. The proposed site is here on the edge of the  
17 fairway. Actually, it is just north of the high-  
18 productivity area outline that was defined by the State  
19 previously. It's in Section 32 of 31 North, 8 West.

20 Q. What of your requirements are you satisfying with  
21 a well at that location?

22 A. At this location we are within about a mile and a  
23 half of our existing CO<sub>2</sub> source line. We are just inside  
24 the Fruitland Coal fairway. We have again satisfied offset  
25 operators, we have seen no objection from any environmental

③  
Loc  
satisfied  
requirements

1 groups on it. So I think we've satisfied all five of our  
2 requirements.

3 Q. Let's skip back to Slide 23 now.

4 A. Okay. This slide is a slide showing the leases  
5 within the project area.

6 Q. When you mean project area, what are we  
7 specifically saying?

8 A. I'm looking specifically at Section 32. That  
9 would be an area that would be within a half a mile of the  
10 proposed injector. And then also there would be a sliver  
11 of the south portion of Section 29 within that half-mile  
12 radius.

13 Q. If Section 32 is designated as the project area,  
14 will that give you an area large enough that you can drill  
15 your injector well and have sufficient monitoring wells  
16 offsetting that, so that you can do your appropriate  
17 studies and tests?

18 A. That's correct, we have -- the injector well is  
19 at roughly the center of the section, and we have three  
20 offset coal producers, one in the northwest, one in the  
21 southwest, and the other one I believe is in the northeast,  
22 but it's very close to the center of the drill block here.

23 Q. Let's go to the next slide, I think it's 43.

24 A. Okay, the next slide is --

25 Q. What is this now? It's an aerial photograph?

24  
Project  
design

1 A. This is an aerial photograph of the project area.  
2 This area right here is Section 32, this --

3 Q. Stop again now.

4 A. Yes.

5 Q. The area for Section 32 has got the legend that  
6 shows "Injector Location"?

7 A. Yes, that's correct.

8 Q. And outside that area there's a square, and the  
9 square you track with your pointer is the outline of the  
10 section?

11 A. That's correct, this area right here.

12 Q. Now explain that display to us.

13 A. Okay, the display shows again the proposed  
14 location of our injector, which is roughly in the center of  
15 the section.

16 They're a little difficult to see, but there are  
17 three green dots, here, here and -- or actually here in the  
18 northwest, here in the southwest, and here east of our  
19 proposed injector. Those represent existing Fruitland Coal  
20 producers.

21 Q. What is your plan for those producers?

22 A. Our plan for those producers is to continue  
23 producing them as we currently do, to monitor both the  
24 injection rate, the pressures, and the gas compositions of  
25 those wells over the life of the project.

1 Q. And Burlington operates all those wells?

2 A. Yes, we do. Burlington operates the two here --  
3 Actually ConocoPhillips operates the one in the east, but  
4 that would be associated with our current -- the current  
5 company situation.

6 Q. You mentioned earlier a tie into a -- a CO<sub>2</sub> line  
7 tie-in?

8 A. That's correct.

9 Q. How do we see the line?

10 A. The line is this red line on the map here, going  
11 from the northeast of the map to the southwest, down  
12 through a draw here. This is the original CO<sub>2</sub> line that  
13 supplied the Allison Unit project. Portions of this are  
14 now being used for saltwater disposal. The area -- or the  
15 line from this area here in Section -- northwest of Section  
16 7 to the north is currently being used for saltwater  
17 disposal. Our plans are to run a 2-inch line parallel to  
18 this existing line, back down to a tie-in point here at  
19 which we can again gain access to Kindermorgan's CO<sub>2</sub>  
20 transmission line.

21 Q. And so you acquire the CO<sub>2</sub> at that point?

22 A. We will acquire the CO<sub>2</sub> -- actually, we have a  
23 tie-in at their transmission point, and that's where we  
24 will change custody of the CO<sub>2</sub>.

25 Q. Is that CO<sub>2</sub> produced from coalbed gas wells?

1 A. That CO<sub>2</sub> actually comes from McElmo Dome, which  
2 is a natural source of CO<sub>2</sub>.

3 Q. Okay, I think we're ready to look at the geologic  
4 displays --

5 A. Okay.

6 Q. -- if you'll turn to Slide 45.

7 A. This slide is a net coal thickness map for the  
8 lower coal zone. There are actually three coal packages  
9 within the area of interest. This one represents only the  
10 lower coal zone. You can see that the coal within Section  
11 32 area here on the map is roughly 25 to 30 feet thick.  
12 This little red triangle -- this little red triangle is the  
13 proposed injector location. I lost my projector.

14 Q. Yes, you did. Are there hard copies of the  
15 geologic displays in the book?

16 A. Yes, they are.

17 Q. Let's do that. Turn us to the tab that's got  
18 the --

19 A. That would be Exhibit 6, and it would be the  
20 first slide in Exhibit 6.

21 Q. Okay, let's turn to the exhibit book, Exhibit 6.  
22 The first slide is the isopach that we've just looked at?

23 A. Yes, it is.

24 Q. Give us a general understanding of the geology.  
25 What are the important geological components --

5  
Lower  
of CO<sub>2</sub>

6  
Geology

1 EXAMINER BROOKS: Excuse me, I don't have any  
2 labels on anything in this book.

3 MR. KELLAHIN: Well then, you've got the wrong  
4 book. That was on purpose.

5 Q. (By Mr. Kellahin) Exhibit 6?

6 A. Yes, first slide in 6.

7 EXAMINER BROOKS: Thank you.

8 THE WITNESS: I apologize. Okay, looking at this  
9 slide you can see again, the little red triangle is the  
10 approximate location of our proposed injector. There is  
11 also a blue line on here, and that represents a log cross-  
12 section that I can show you next.

13 Q. (By Mr. Kellahin) Let's take a moment before we  
14 move past this --

15 A. Yes.

16 Q. -- and give us a general geologic description of  
17 the geologic components that are relevant to the project.

18 A. In this immediate area we have a Fruitland Coal  
19 zone that is roughly 25 to 30 feet thick. It's very high  
20 quality. It has a density in the range of about 1.5 to 1.6  
21 grams per centimeter, per cubic centimeter, and it has very  
22 high permeability. It has been very -- extremely  
23 productive over time. And it is the target of our project.

24 Q. What are the driving parameters, then, for making  
25 this suitable for the injector well?

1           A.    What we'd like to do is, there are three packages  
2    in the area, and what we'd like to do is isolate the very  
3    basal coal -- that is the highest quality coal -- and  
4    inject into it.

5           Q.    Are your current offsetting producing wells,  
6    those three wells, are they completed in such a fashion  
7    that you have access to all the coal members throughout the  
8    pool?

9           A.    Yes, the three offsets are open-hole completions,  
10   and they have all three of those members open, particularly  
11   the basal coal.

12          Q.    Where do you stand in the dewatering component of  
13   the project area?

14          A.    Right now we're -- this area has been dewatered.  
15   It actually did not produce a lot of water originally. We  
16   had very high rates for the wells even to start with, in  
17   the range of 4 to 5 million cubic feet a day. Currently  
18   the bottomhole pressure in the area is very low. We  
19   believe it to be under 100 p.s.i.

20          Q.    And the range again on your permeabilities?

21          A.    The range of permeabilities is probably in the  
22   10s to 100 millidarcies.

23          Q.    Let's go to the next slide, which is the cross-  
24   section.

25          A.    Okay.

1 Q. We've seen the line of cross-section. Now show  
2 us the wells.

3 A. Okay, the cross-section is the next slide, and  
4 again there are four logs on here represented, the four  
5 points on our little blue line. And you can see that there  
6 are three coal packages through here. And if you look at  
7 them closely, the basal coal is again the highest quality  
8 coal, it has the best gamma-ray signature, the best  
9 density. It is the thickest of the three, and it is the  
10 most consistent of the three in the project area.

11 Q. Mr. Schlabaugh, let's use one of those slides  
12 from the cross-section, and give us an understanding of the  
13 separation that we'll have within the pool between the  
14 basal coal and anything below the basal coal.

15 A. Yes, in the -- I guess in the slide just to the  
16 left of our proposed injector, that would be the southeast  
17 northwest -- northwest of Section 32. Well, if you look at  
18 that, the distance between the base of that main package of  
19 our basal coal and the top of the Pictured Cliff is  
20 roughly, I believe, about 30 feet. There is a small stray  
21 coal in there, but we have no plans to drill below that  
22 main-package coal there.

23 Q. Describe for me how you'll maintain the  
24 separation between the basal coal and the Pictured Cliff.

25 A. What we plan on doing is to topset right above

1 that basal coal, drill through the basal coal, and only  
2 penetrate the clastics below the coal by one or two feet.

3 Q. Above the upper coal, is there production above  
4 the top of the Fruitland Coal?

5 A. Of the very upper --

6 Q. Uh-huh.

7 A. -- Fruitland Coal, there is no production there,  
8 as far as I'm aware.

9 Q. Within the coal members themselves, your project  
10 intends to inject the CO<sub>2</sub> into the basal coal?

11 A. That's correct.

12 Q. And how will you monitor how that is affected in  
13 the offsetting wells?

14 A. In the offsetting wells, as I mentioned earlier,  
15 what we plan on doing is again monitoring the gross  
16 production rates from the wells. We will probably do some  
17 pressure work with them, and then we'll also be looking at  
18 the gas components -- gas composition of the gas that's  
19 coming out of those wells, and we'll be looking for the  
20 composition and the portion of CO<sub>2</sub> that's coming out of  
21 those wells.

22 Q. Do you have a general range in mind of what would  
23 be the surface pressure limitation associated with CO<sub>2</sub>  
24 injection that the Division can utilize?

25 A. Yes, I looked at the surface pressure limitations

6  
Monitoring

7  
Pressure  
gradient

1 based on some work that was done in the Allison Unit. My  
2 base premise was that we would use a pressure gradient,  
3 limiting pressure gradient, of .633 for this well. We  
4 actually have some frac logs in the overpressured area that  
5 indicates that the pressure gradient may be as high as .75.  
6 For this purpose here, we're requesting a gradient of .633.  
7 That calculates out to a bottomhole pressure in the middle  
8 of the formation, that basal coal, to about 1995 p.s.i.,  
9 1995.

10 Because we are -- and I calculated that because  
11 one of the things that we will -- are trying to line up for  
12 the project is a continuous surface readout of bottomhole  
13 pressure. If we have that capability after completing the  
14 well, we would like to utilize that 1995 pounds as our  
15 limiting pressure for the coal at depth.

16 But I also went and calculated a surface pressure  
17 based on some measurements that were taken -- again, at  
18 Allison Unit -- of surface pressure and BHP concurrently,  
19 and I used that data to try to calculate a potential  
20 surface pressure that would correspond to that 1995, and I  
21 came up with a pressure of -- I believe it was 1135 p.s.i.  
22 at the surface. And those would be our maximum pressures  
23 that we will be requesting from the State.

24 Q. Are you satisfied that that pressure range is  
25 appropriate for implementation of the project as a control

1 so that injected CO<sub>2</sub> will remain confined to the pool?

2 A. Yes, I do. What we do plan on doing when we  
3 start up is not starting up at maximum rate. We do also  
4 plan to start up at lower rates and increase our rates and  
5 our pressure over time. But I think the limiting pressure,  
6 I think, is probably a fairly conservative number.

7 Q. We're accustomed to using water for injection  
8 wells and having the ability to file step rate tests and  
9 obtain the Division's approval to increase the surface  
10 injection pressure. How do we make that work for CO<sub>2</sub>  
11 injection?

12 A. My estimation is that we would probably -- in  
13 this case, we would probably be looking at trying to  
14 measure the bottomhole pressure directly itself, if we have  
15 that capability in place, and then stepping our injection  
16 rates up and down in order to find our inflection point.

17 Q. Let's turn now -- I think the next slide behind  
18 Exhibit 6 is going to be a production curve?

19 A. Yes, it is.

20 Q. Let's turn to the production curve.

21 A. Yes, the production curve shows the three  
22 Fruitland Coal producers within Section 32.

23 The one in the southwest is the EPNM Com A 300.  
24 That well had an original peak production rate of about 4  
25 million cubic feet per day. It's produced somewhere in the

*7B  
step  
rate  
tests*

1 neighborhood of a little bit over 9 BCF of gas over its  
2 lifetime.

3 The one in the east -- to the east of our  
4 proposed injector is the FC State Com 1. That well is a  
5 little bit better. It had a peak rate of 5 million cubic  
6 feet per day. It's produced a little over 10 BCF of gas  
7 over its lifetime.

8 And we also have an infill well in the northwest  
9 of Section 32 called the EPNM Com A 300S. That well has  
10 come on -- I think it was about 300, a little -- roughly  
11 300 MCFD, peak rate. It's making about 200 a day right  
12 now, and it's cum'd about 165 million cubic feet of gas.

13 The range of current production for those three  
14 wells is between about 150 and 500 MCFD.

15 Q. Put that in perspective, Mr. Schlabaugh. Why are  
16 we showing that data? What's the relevance?

17 A. The data here is to indicate the quality of the  
18 production in the area, the permeability and the capability  
19 of these wells to respond to our CO<sub>2</sub> injection.

20 Q. Let's turn to your desorption curve. Do you have  
21 that?

22 A. Yes, that would be the next slide. Why I put  
23 this slide in was to try to demonstrate the reasons that we  
24 think that this project will work for us. This data, or  
25 actually these curves, were put together by taking actual

⑧  
Gas  
desorption  
curve

1 measurements from about 60 wells in the OPE area, and back-  
2 calculating that data and producing these desorption curves  
3 from that data. And what they depict is the amount of gas  
4 content that the coal would have at varying pressures.

5 And we have a curve for both the methane and the  
6 CO<sub>2</sub>. The importance of the curves is, if you'll notice,  
7 that roughly -- at about any pressure between what was the  
8 original bottomhole pressure of roughly 1700 pounds out  
9 here, down to zero, or very near zero, the CO<sub>2</sub> is about  
10 twice as likely to be adsorbed onto the coal as the methane  
11 is.

12 EXAMINER EZEANYIM: But both lines are the same  
13 color.

14 THE WITNESS: Yes, the colors didn't come out.  
15 The CO<sub>2</sub> curve would be the one on the top. The methane  
16 curve would be the one on the bottom. So at, say, 1500  
17 pounds we would have about 450 standard cubic feet per ton  
18 for the methane and about 800 for the CO<sub>2</sub>.

19 What we would like to do is take advantage of  
20 this relationship and inject close to pure CO<sub>2</sub> into the  
21 formation at our injection well, and this will displace the  
22 methane around the injection well and adsorb the CO<sub>2</sub> onto  
23 the coal preferentially. We will be able to produce the  
24 desorbed methane out of the offset producers, and the CO<sub>2</sub>  
25 would then be sequestered in the injection well area.

1 Q. (By Mr. Kellahin) Is this Langmuir curve  
2 associated with data specific to the area?

3 A. Yes, it is.

4 Q. And has that general concept or procedure proved  
5 reliable by people in your profession doing this kind of  
6 work?

7 A. Yes, it is, we rely on this data -- this type of  
8 data all the time.

9 Q. Give me as a layman a sense of what you're trying  
10 to accomplish when you talk about CO<sub>2</sub> sequestration.

11 A. With the CO<sub>2</sub> sequestration portion of the project  
12 what we want to do is be able to take CO<sub>2</sub> from any source  
13 on the surface, inject it into our well, inject it into the  
14 -- actually into the Fruitland Coal formation, and the  
15 Fruitland Coal formation, then, would adsorb the CO<sub>2</sub> onto  
16 the coal, its surface, and the CO<sub>2</sub> would remain there  
17 indefinitely. So...

18 Q. As opposed to simply filling the structural voids  
19 or spaces between the coal particles?

20 A. That's correct. Actually, the coal works in a  
21 little bit different manner than a traditional,  
22 conventional sandstone. The CO<sub>2</sub> or methane or whatever  
23 gases are in it are not -- they are not floating in pore  
24 space between the rock; they're actually adsorbed onto the  
25 surface of the coal itself. So in essence we're able to --

9  
CO<sub>2</sub>  
sequestration  
objective

1 at most pressures here we're able to hold significantly  
2 more of any gas, CO<sub>2</sub> or methane, than we would in a  
3 conventional reservoir of a reasonable porosity.

4 Q. Let's turn to the project time line.

5 A. Okay.

6 Q. I think you're going to find that behind Exhibit  
7 7.

8 A. That's it. I think it's the only -- actually the  
9 only slide in Exhibit 7. And this time line depicts the  
10 rough time line that we have come up with in the Southwest  
11 Partnership for our project. You can see the work started  
12 in 2005, planning and that phase of the project.

13 Our permitting we've been undertaking here in  
14 2007. We're hoping to have our permitting process  
15 completed by late third quarter, early fourth quarter, and  
16 be able to drill our well during that period of time.

17 And then after completing the well and laying our  
18 pipeline, we would like to start our injection sometime in  
19 the fourth quarter of this year. Our plans are to inject  
20 for either a one-year period of time or until we've  
21 injected 1.2 BCF of CO<sub>2</sub> into the ground, whichever comes  
22 first.

23 Q. In terms of reporting back to this agency or  
24 others within the partnership or elsewhere, what's the time  
25 frame for being able to have put this project in place, run

⑨  
Project  
plan  
- injectio  
reporting

1 it, reached conclusions and generated a report?

2 A. For a technical report, our plans are to inject  
3 for a year, to monitor for an additional year, and then at  
4 that point in time to put together all of our modeling  
5 work, all of our data and conclusions, and deliver a report  
6 to the DOE and other agencies.

7 Q. In terms of regulatory requirements to monitor  
8 the project --

9 A. Yes.

10 Q. -- will you follow the process set out in Rule  
11 701 about filing reports associated with injection?

12 A. Yes.

13 Q. There's a monthly report of injection rates  
14 and --

15 A. Yes.

16 Q. -- volumes associated with it?

17 And then you're going to monitor the pressure?

18 A. Yes, we plan on monitoring the pressure. As I  
19 said, hopefully we would like to monitor the pressure at  
20 bottomhole conditions. But lacking that, what we would do  
21 would be to monitor our bottomhole pressure with a bomb  
22 that is timed and pull it, and then monitor directly on a  
23 daily basis the surface pressure.

24 Q. Do you think there -- as an expert petroleum  
25 engineer are -- do you see a need for any specific

(10)  
Pressure  
Monitoring

1 requirements other than those that you just described?

2 A. The only other requirement that I can think of is  
3 probably related to the casing integrity, and because we do  
4 have the ability to monitor our pressures out there on a  
5 daily basis, we would probably include the casing pressure  
6 at the same time.

7 Q. Well, let's move into the transition to the C-108  
8 and look at the main parts of that, and then we'll talk  
9 about how the well is to be constructed and what the data  
10 is associated with the drilling completion and production.

11 Can you -- I think it should be under Exhibit 9.  
12 Somewhere you've got the C-108.

13 A. Yeah, Exhibit 9, yes.

14 Q. Exhibit 9. If you'll turn to Exhibit 9 and find  
15 the cover sheet for the C-108 --

16 A. Yes.

17 Q. -- let's start at that point and flip through  
18 that. And you're going to find a locator map. The copy  
19 of the C-108 filed with the Division has half-mile radius  
20 map --

21 A. Yes.

22 Q. -- and a two-mile radius map, and somewhere among  
23 all these you've got at least that map?

24 A. Yes.

25 Q. Within -- Can you turn the page to find the map?

1 A. I think it's -- I'm not sure that it's --

2 Q. You're familiar with what I'm trying to describe,  
3 Jim?

4 A. Yes. I think I found that in Exhibit 1,  
5 actually, if I remember correctly.

6 Q. Well, attached as one of the attachments in  
7 Exhibit 1, I think you'll see the original filed C-108.

8 A. Yes.

9 Q. And with the original filed C-108 there is the  
10 half-mile radius map.

11 A. Yes.

12 Q. Should be just ahead of the page you're on.

13 A. This one here, the lease map, or --

14 Q. I think there was a radius on that.

15 A. Yes, there's a two-mile radius on the lease map.

16 Q. Let me start at the beginning.

17 A. Okay.

18 Q. Have you reviewed the original C-108 that was  
19 filed with the Division when we filed the Application?

20 A. Yes.

21 Q. Are there some modifications to be made to that  
22 filing?

23 A. Yes.

24 Q. And those modifications are now contained in the  
25 exhibit book?

1 A. Yes, they're Exhibit 9.

2 Q. Okay, let's go to Exhibit 9 --

3 A. Yes.

4 Q. -- and as we find a modification, let's alert the  
5 Examiner as to what was changed.

6 A. Okay.

7 Q. First of all, when you look at the tabulation of  
8 the wellbore data --

9 A. Yes.

10 Q. -- for wells within the half-mile radius --

11 A. Yes.

12 Q. -- find that display.

13 A. I think that that actually was not one of the  
14 corrected ones. I think that the tabulation is still a  
15 portion of Exhibit 1.

16 Q. Okay, so when we look at the tabulation  
17 associated with Exhibit 1 --

18 A. That should be correct.

19 Q. We should have numbered the pages.

20 A. There it is.

21 Q. There you go. That's this one, isn't it?

22 A. Yes.

23 Q. When we look at the tabulation that was  
24 originally filed of wellbore data, have you and others  
25 under your control gone back and calculated cement tops for

10  
Wells  
in  
AOR

1 any of these wells for which there was simply a calculation  
2 made?

3 A. Yes, we did.

4 Q. Is there a change in the display that shows that  
5 information?

6 A. The display that we made is -- actually, we  
7 didn't make a change in the display. We did calculate  
8 those numbers and confirm what was already in the display.  
9 For those that did not have a calculation I think we do  
10 have that calculation available, and it is -- it's right  
11 here. Yes. There were two that had calculations and no  
12 tops --

13 Q. Okay, let's complete the record then. Going back  
14 to that spreadsheet --

15 A. Yes.

16 Q. -- let's find the wellbores for which you have  
17 supplemented them.

18 A. Yes, the State Com K Number 7R, when you look at  
19 the 7-inch casing there --

20 EXAMINER EZEANYIM: Page what?

21 THE WITNESS: We're on that tabulation still,  
22 that tabulation.

23 EXAMINER EZEANYIM: Exhibit?

24 THE WITNESS: That would be --

25 EXAMINER BROOKS: The tabulation is only in

1 Exhibit 1 --

2 THE WITNESS: It's only in Exhibit 1, yes.

3 EXAMINER BROOKS: -- Exhibit 9.

4 THE WITNESS: Yes.

5 EXAMINER BROOKS: The one you just handed Mr.  
6 Ezeanyim, is that the same as the one in Exhibit 1, or is  
7 that different?

8 THE WITNESS: I think that actually the one  
9 that's in Exhibit 1 right now may be a little bit  
10 different. It's about -- the one in Exhibit 1 is about  
11 four pages from the back of the exhibit.

12 EXAMINER BROOKS: Right, I have that one.

13 THE WITNESS: Yes.

14 EXAMINER BROOKS: Is that -- That's different,  
15 though, from the one --

16 THE WITNESS: I think that one may have been  
17 actually the one that was previously submitted, and the new  
18 one may have gotten into Exhibit 1, instead of into Exhibit  
19 9. I'm not sure. But that one is the one that has the  
20 most data on it, that is the most up-to-date.

21 EXAMINER EZEANYIM: Which one?

22 THE WITNESS: The one that's actually in Exhibit  
23 1 --

24 EXAMINER EZEANYIM: Oh, okay.

25 THE WITNESS: -- currently.

1 MR. KELLAHIN: Mr. Examiner, subsequent to the  
2 hearing we'll reconfirm this and make sure that you have a  
3 correct table so that --

4 EXAMINER BROOKS: Okay.

5 MR. KELLAHIN: -- Mr. Ezeanyim can work with the  
6 right table.

7 EXAMINER EZEANYIM: Yeah, that --

8 Q. (By Mr. Kellahin) Just for the record, then,  
9 let's verbally describe what you've done to add more  
10 information to that table.

11 A. Yes, what we've done is, for the -- again, for  
12 the State Com K Number 7R, if you look at the data for the  
13 7-inch casing, the record indicates that that was cemented  
14 with 470 sacks of cement --

15 EXAMINER BROOKS: And which well is this?

16 THE WITNESS: That would be the State Com K  
17 Number 7R.

18 EXAMINER BROOKS: State Com K Number 7R.

19 THE WITNESS: Yes.

20 EXAMINER BROOKS: That's number 8 on this list?

21 THE WITNESS: That's correct.

22 EXAMINER BROOKS: Okay, go ahead.

23 THE WITNESS: Okay. If you'll notice that -- the  
24 records that we had indicated the amount of cement that was  
25 put into the well, but it did not give us -- no one had

1 calculated any tops. What we did was go ahead and  
2 calculate a top for that cement. What we did was calculate  
3 the volume of the cement, the volume of the annulus. And  
4 then we used a factor of .5, and we came up with a probable  
5 cement top of about 1535 feet on that well.

6 And we also had the same situation with the State  
7 Com AL Number 36, and that is actually 9 and 10 on the  
8 table here. That well has two completions in it, so it got  
9 duplicated in this table.

10 And you'll notice that the 7-5/8-inch casing in  
11 that has -- and actually, they had a calculation on that,  
12 for that particular well, and we confirmed -- or we did our  
13 own calculation, and we think rather than 500 feet, using  
14 the formula that I just described, we have a cement top of  
15 986 feet.

16 EXAMINER EZEANYIM: Do you have those correct --  
17 because it's not what is here. Do you have those --  
18 information?

19 THE WITNESS: That's -- we've got the -- we've  
20 got the calculations that we've done. And actually what we  
21 did was -- our calculation differs from the calculation  
22 that was done by the original engineer, but we wanted to  
23 confirm and make sure that our cement top was above the  
24 Fruitland Coal in this case.

25 MR. KELLAHIN: Again, Mr. Examiner, with your

1 permission we'll provide the calculation and the  
2 spreadsheet --

3 EXAMINER BROOKS: Yes, thank you.

4 MR. KELLAHIN: -- so that you won't have to do  
5 our homework for us.

6 EXAMINER EZEANYIM: Okay.

7 THE WITNESS: And I believe that was the only one  
8 that -- Most of the other wells in here either circulated  
9 to surface or they had a temperature cased bond log to  
10 confirm the cement line.

11 Q. (By Mr. Kellahin) When you review the wellbores  
12 within the half-mile radius, do you have any wellbore that  
13 you would characterize as being a problem wellbore? By  
14 that I mean a wellbore in that area that is not properly  
15 cemented across the injection interval?

16 A. Based on the records and research we've done, no,  
17 we don't see any problems.

18 Q. Is there adequate cement above and below the  
19 injection interval so that it's not a conduit of injection  
20 fluids to that offsetting well --

21 A. Again, based --

22 Q. -- that could migrate somewhere else?

23 A. Yes, based on our calculations and the records  
24 that we have available to us, that's correct.

25 Q. Let's turn to Exhibit 9 and that portion of the

10A  
Conclusion  
- no  
problem

1 summary sheet that talks about searches for freshwater  
2 sources. There's a typed sheet of several pages that has  
3 that data in it.

4 A. Yes.

5 Q. Help us find that page in the exhibit book.

6 A. That would be item -- that would be what, about  
7 the -- I think about the eighth page, and it would be item  
8 number 11 on that sheet. Actually two from the back.

9 Q. You've reviewed all that information and  
10 satisfied yourself that it's correct?

11 A. Yes.

12 Q. And what's the conclusion about the depths of  
13 known freshwater sources in the area?

14 A. The freshwater sources in the area are actually  
15 fairly shallow. We have no active wells, freshwater wells,  
16 right now. We have one abandoned well that was drilled for  
17 purposes of oil and gas, and we have one that we believe is  
18 still active that was drilled for oil and gas. Both of  
19 those tested, if I remember correctly, over 10,000 parts  
20 per million. They were drilled, I believe, to the -- one  
21 of them, at least, the deepest, was drilled to the base of  
22 the Ojo Alamo, if I'm correct.

23 Q. Can you conclude that the proposed injector and  
24 the producing and plugged wells in the area of review have  
25 surface casing down through the deepest known freshwater so

⑪  
Fresh  
water  
sources

1 that it protects the freshwater sources?

2 A. Yes.

3 Q. Let's turn to the wellbore schematic for the  
4 injector well.

5 A. That would be the slide that is about fifth from  
6 the back.

7 Q. Okay, associated with that wellbore schematic is  
8 a data sheet --

9 A. Yes.

10 Q. -- just after that, that shows information on the  
11 construction of the well, the surface casing, intermediate,  
12 et cetera?

13 A. Yes.

14 Q. It was my understanding that Mr. Perrin in the  
15 District had looked at that and was concerned about how  
16 this well was going to be drilled, cased and cemented.

17 A. Yes.

18 Q. Let's walk through the wellbore. If you'll start  
19 with the schematic --

20 A. Yes.

21 Q. -- show us why you think that can be done in a  
22 prudent and safe manner.

23 A. Yes, our surface casing will be 9-5/8 set at 200.  
24 We plan to cement that back to surface. We'll drill out  
25 from there down to roughly -- somewhere around 10 feet

(12)  
Casing  
Program

1 above the basal coal, and we will set 7-inch casing at that  
2 point and cement that back to surface.

3 Then our intent is to go in and drill out from  
4 that production casing down to, again, a point about a foot  
5 or two below that main basal coal package, into that  
6 clastic, and then to under-ream that portion of the hole.  
7 And then we will from there run and hang a 5-1/2-inch liner  
8 in that portion of the hole.

9 From there what we will do is go in with our  
10 tubing, which will be 2-7/8-inch J-55 tubing, and a packer.  
11 We would set the packer just above that tubing -- or that  
12 casing liner.

13 And then we would be at that point prepared to  
14 inject.

15 Q. Talk to me about the production casing. It's  
16 cemented above the coal, is it?

17 A. That would be correct, we would -- our plans are  
18 to cement back to surface.

19 Q. And that production casing does not penetrate  
20 through the base of the basal coal?

21 A. No, it does not. It would stop at the top of the  
22 basal, or the -- yes, at the top of the basal coal. And we  
23 would have an open hole with a liner through the basal coal  
24 itself.

25 Q. How would you further explain the data sheet when

1 you turn it over and part of the data sheet says production  
2 casing, it says cemented with, and it says none? Do you  
3 see that?

4 A. Where is that? Oh, excuse me, that would be -- I  
5 guess I'm confusing terms here. The casing, the 7-inch  
6 casing, we would consider intermediate casing. The actual  
7 production casing, we would consider that to be our liner.

8 Q. Okay. Is there any evidence of open faulting or  
9 hydrologic connections between the basal coal and  
10 production outside of the coal?

11 A. Not that I'm aware of.

12 Q. And you don't find any plugged or abandoned wells  
13 that are problem wells?

14 A. None that are problem wells. We do have one  
15 plugged well in the section. That would be, if I remember  
16 correctly, the -- what was it, the --

17 Q. We've added to the --

18 A. Yes. Yeah, the State Com K Number 7, and that  
19 well had a fish at the bottom of the hole and has been  
20 cemented back to -- over the Fruitland Coal producing  
21 formation, so we don't consider it a problem well.

22 Q. So you're supplementing the original filing with  
23 a schematic with a plugged and abandoned well?

24 A. That's correct.

25 Q. And that's what you're talking about now?

10C  
Plugged  
wells

1 A. Yes.

2 Q. Are there any other revisions that you've made to  
3 the C-108 that you want to explain to Mr. Ezeanyim and Mr.  
4 Brooks?

5 A. I believe that is mostly it. The one that I  
6 haven't specifically mentioned but inferred is the fact  
7 that we intend to drill only to the base of that main coal,  
8 and we will have a maximum rathole below that coal of only  
9 a foot or two, rather than -- I think in the original  
10 application we had a significantly larger rathole that  
11 actually would have gone and penetrated the PC. We have no  
12 intention of doing that.

13 MR. KELLAHIN: Mr. Examiner, Mr. Alexander was  
14 not able to come down, and he's in possession of the notice  
15 information. So if you'll allow me, after the hearing I  
16 will submit our certificate of notification.

17 EXAMINER BROOKS: Okay, we'll allow you to  
18 supplement the record with that information.

19 Q. (By Mr. Kellahin) Let's go to the summary slide  
20 or the summary discussion, and there's two ways to find  
21 that. If you'll turn to the last page -- if you'll look at  
22 Exhibit 1, look at the Application and look at the third  
23 page of the Application in paragraph (10), I think it is.

24 A. Yes.

25 Q. Paragraph (10) of the Application is the pleading

1 that talks about the summary.

2 A. Yes.

3 Q. Take us through the pieces of the summary.

4 EXAMINER EZEANYIM: Where are you talking about?

5 MR. KELLAHIN: In Exhibit 1, there's an  
6 application.

7 THE WITNESS: The fourth page from the front.

8 EXAMINER EZEANYIM: Okay.

9 THE WITNESS: And it's page 3 of the Application.

10 EXAMINER BROOKS: Okay.

11 THE WITNESS: And at the top it says, Approval of  
12 a pilot project will afford an opportunity to --

13 EXAMINER BROOKS: Okay.

14 Q. (By Mr. Kellahin) Okay, go ahead.

15 A. Are we set?

16 Q. Yes, sir.

17 A. At the top it says, Approval of a pilot project  
18 will afford an opportunity to: -- and in essence, what  
19 we're stating is that this project would allow us to  
20 achieve the objectives that I have earlier indicated for  
21 the project.

22 First of all, it would allow us to determine our  
23 maximum injectivity and what reservoir properties will  
24 affect that injectivity over time, such as coal swelling  
25 and changes in fracture gradient over time.

(12)  
Summary  
- cover

1           And the second item here, item b, is again a  
2 repetition of what I've indicated earlier. It will allow  
3 us to evaluate the sequestration potential of the Fruitland  
4 Coal. That will give us an idea of how much methane is  
5 released, again, by the CO<sub>2</sub> injection, what our injection  
6 conformance is on an areal basis and how that is working  
7 for us, and then the adsorption capacity of the coal at the  
8 pressures that we will be delivering in the reservoir.

9           Q.    Would you turn to Tab 2 now? It should contain  
10 two letters over Mr. Alexander's signature.

11           A.    That's correct.

12           Q.    What was the purpose of the letters behind  
13 Exhibit Tab Number 2?

14           A.    These letters are a notification of the project  
15 to the -- I think the first one is the Commissioner of  
16 Public Lands for New Mexico, and the second one is to BP  
17 America Production Company, and they notify those  
18 individuals of the project.

19           Q.    I think the only exhibit we haven't talked about  
20 is behind Tab 3, and I'm not sure what that --

21           A.    Okay.

22           Q.    Tab 3 was simply what?

23           A.    Let's see, Tab 3, I believe -- This one is just a  
24 locator map showing the location of the project in relation  
25 to some of the towns and other federal units in the area.

1 Q. After the project has been implemented and you've  
2 established the data, what is your plan for issuing some  
3 type of technical report?

4 A. The technical report will be issued, I believe,  
5 at the conclusion of the project, which right now is  
6 planned for 2009, and it will be a product of the Southwest  
7 Partnership.

8 Q. Is that Southwest Partnership pursuing other CO<sub>2</sub>  
9 sequestration wells in other states?

10 A. Yes, they have a project again in -- that would  
11 be in Utah, in the Aneth field, and then one in Texas near  
12 SACROC.

13 Q. And the one here in New Mexico is part of that  
14 partnership?

15 A. That's correct.

16 Q. And they're all being coordinated through this  
17 partnership concept?

18 A. That's correct. Actually, New Mexico Tech is the  
19 lead partner in the partnership.

20 MR. KELLAHIN: Mr. Examiner, that concludes our  
21 presentation on behalf of Burlington. We would move the  
22 introduction of Exhibits 1 through 9.

23 EXAMINER BROOKS: Exhibits 1 through 9 will be  
24 admitted.

25 This is a highly technical case, so I will invite

1 the Technical Examiner to lead off with the questions here.

2 EXAMINATION

3 BY EXAMINER EZEANYIM:

4 Q. Okay. First of all, let's examine -- How do you  
5 come up with your -- this pressure gradient of .633? How  
6 do you come up with that number?

7 A. Actually what I did was, I went back to the  
8 testimony that was given in the Allison Unit case. And in  
9 that case Burlington Resources and the Examiner agreed to  
10 use a gradient of .433, which will be the water gradient,  
11 plus a factor of .2 on top of that.

12 There was, again, some testimony given in that  
13 case that indicated that the actual gradient in several  
14 wells that were frac'd in the area was as high as .75 or  
15 .77, so the Examiner and the engineer that testified agreed  
16 that .633 would be a reasonable gradient to start with.

17 Q. Now what case are you talking about? What case  
18 is that?

19 A. I don't have the case number with me, but it  
20 was --

21 Q. The number --

22 A. -- it would be the case for the Allison unit CO<sub>2</sub>  
23 injection project.

24 Q. Do you know what year we issued that?

25 MR. KELLAHIN: Mr. Examiner, I think I can help

⑦  
Pressure  
gradient

1 you. I'm not sure this exhibit book is available on line  
2 with the files. This is the only one I was able to find,  
3 and it's the exhibit book from the case that we're talking  
4 about, along with the order, and I'm happy to present that  
5 to you for your research.

6 EXAMINER EZEANYIM: Yeah, I --

7 MR. KELLAHIN: It has all the data.

8 EXAMINER EZEANYIM: I just wanted to make sure we  
9 are giving the appropriate gradient. Is that --

10 MR. KELLAHIN: This is the exhibit book, and the  
11 order is in there too.

12 EXAMINER EZEANYIM: Oh, okay, thanks. Okay.

13 Q. (By Examiner Ezeanyim) And you will be injecting  
14 in the -- I think it's the lower coal, right?

15 A. Yes, that's correct.

16 Q. And your tubing will be plastic-lined tubing?

17 A. At this point we're anticipating we'd like to use  
18 just normal J-55 steel tubing.

19 Q. Steel tubing?

20 A. Yes, uh-huh.

21 Q. Okay, that's --

22 A. What we did, we've looked at -- we have talked  
23 with both our operations people in the area. We have a  
24 corrosion engineer that I've talked to, and we are  
25 producing about 20- to 25-percent CO<sub>2</sub> out of our producing

*Steel tubing*

1 wells in the area. We're not having issues with corrosion  
2 when the gas is produced dry. The places that we do have  
3 issues with corrosion are where the gas is in association  
4 with water, and we do have some issues there.

5           What we are planning to do with our injector is,  
6 we will be injecting almost pure dehydrated CO<sub>2</sub> down into  
7 our injector. Our plans are to inject only, and if we do  
8 have shut-ins we would spot a pill of corrosion protection,  
9 inhibitor, at that time. And the -- because the project is  
10 a short-term project, we only plan to have the project in  
11 place for a maximum of two to three years. We're hoping  
12 that we can deal with our injection tubing as steel.

13           Q. Don't get me wrong, why I'm asking a lot of  
14 questions. This is a good project. But we want to make  
15 sure that it's done right.

16           A. Yes.

17           Q. Okay. This is a -- if you're going to give me a  
18 supplement -- the top of cement --

19           A. Yes, we can supplement that to give you our  
20 calculations for those two wells specifically.

21           Q. And these are all the area review wells in that  
22 area?

23           A. Yes, those are all the wells, with the exception  
24 of the plugged well, which is the diagram that is --

25           Q. Okay, it's --

1 A. -- behind --

2 Q. -- plugged and abandoned?

3 A. That's plugged and abandoned.

4 Q. If it's plugged and abandoned and we approved it,  
5 I don't want to see that. You know, one that I actually  
6 need to look at.

7 A. Okay.

8 Q. Okay. Did you check the casing integrity in  
9 these wells? The casing?

10 A. At this point, basically all I have is the data  
11 that's available in those wells and the fact that we're not  
12 aware of any issues with leaks or anything.

13 Q. But you haven't just checked? You haven't  
14 checked?

15 A. We have not gone out and done any pressure tests  
16 that I'm aware of, no.

17 Q. Now let's talk about water. You talked about  
18 water. I may have missed -- what -- tell me about -- you  
19 have water that's very shallow? And do you have any water  
20 that is from the other well?

21 A. We have -- if I remember correctly, we have water  
22 analyses from the two wells that were drilled for oil and  
23 gas injection purposes -- or -- and production purposes.  
24 Both of those -- or I think both of those, the analyses  
25 indicated that the TDS was greater than 10,000 parts per

1 million.

2 Q. What is the depth of those waters?

3 A. Those were -- let's see, go back to that.

4 EXAMINER BROOKS: It looks like you only gave  
5 from one well here --

6 EXAMINER EZEANYIM: Yeah.

7 EXAMINER BROOKS: -- the Pump Mesa water well.

8 THE WITNESS: Okay, I have to go back to --

9 Q. (By Examiner Ezeanyim) Approximately what the  
10 depth is.

11 A. Yeah, we have -- Let's see. Yeah, the Pump Mesa  
12 water well is as deep as 2034 feet, which is in the Ojo  
13 Alamo, and those -- yeah, the water samples from those were  
14 10,000 parts per million.

15 Q. Okay --

16 A. I believe -- yes, I'm sorry, we did -- there was  
17 an old well that was drilled and abandoned, and I don't  
18 have an analysis on that.

19 Q. Okay. I don't know, the -- if you don't mind,  
20 the Examiner, the District Supervisor for District 3 is  
21 here. Do you mind if he asks you a question, if you have  
22 any questions? Mr. Perrin to ask questions? Because he  
23 might have some questions. I don't want to deny him the  
24 opportunity to ask you a question. Mr. Perrin, do you have  
25 anything to ask?

1 MR. PERRIN: I don't, Richard. I see the APD has  
2 been changed.

3 EXAMINER EZEANYIM: What do you say?

4 MR. PERRIN: I don't have any questions.

5 EXAMINER EZEANYIM: Okay. Okay, that's good. I  
6 just wanted to --

7 Do you have any more?

8 EXAMINATION

9 BY EXAMINER BROOKS:

10 Q. Do you have any conclusions as to how far this  
11 CO<sub>2</sub> will travel in the formation?

12 A. We made calculations ahead of time to try to come  
13 up with our proposed volume, and what we're hoping is that  
14 based on those calculations we'll be confined within the  
15 producing well pattern.

16 Q. Do you have -- Which means the three producing  
17 wells that are in Section 32, right?

18 A. The three, yes.

19 Q. Do you have any procedure to test, since this is  
20 an experimental project, to see if you detect it anyplace  
21 else?

22 A. Our plans are to -- at a minimum, to do analyses  
23 on a periodic basis of those three wells. And then we are  
24 also going to try to work with BP. They have a well in the  
25 southeast of Section 29. We will be looking at our well in

13  
Travel  
of CO<sub>2</sub>

1 the southwest of Section 29.

2 And right now those are the main wells that we  
3 wanted to do periodic analyses on, but we may also  
4 institute it in some of the secondary offset wells around.  
5 The most frequent analyses, of course, will be on the three  
6 direct offsets.

7 EXAMINER BROOKS: Right.

8 I believe I did not give the other attorneys who  
9 appeared in the case an opportunity to examine. Ms. Munds-  
10 Dry, did you have anything?

11 MS. MUNDS-DRY: No questions, Mr. Examiner.

12 EXAMINER BROOKS: Mr. Hall?

13 MR. HALL: Mr. Brooks, you asked my very  
14 questions, actually. One more question, though, Mr.  
15 Schlabaugh.

16 EXAMINATION

17 BY MR. HALL:

18 Q. Does BR have any plans to inject a tracer with  
19 the injection fluid?

20 A. I'm thinking that the -- one of the methods that  
21 we're looking at to try to trace is analysis of the CO<sub>2</sub>  
22 itself. There'll be some different -- There'll be  
23 different atomic characteristics of the CO<sub>2</sub> in our injected  
24 CO<sub>2</sub> versus the produced CO<sub>2</sub> naturally from the Fruitland  
25 Coal. We're working on that, I'm not involved directly

1 with that.

2 Q. Will that data be available to other operators in  
3 the area?

4 A. That data -- as far as I'm aware, anything that  
5 is collected will be part of the public record for the  
6 report itself.

7 MR. HALL: Thank you, Mr. Examiner.

8 FURTHER EXAMINATION

9 BY EXAMINER EZEANYIM:

10 Q. And on that note, do you have any idea -- will  
11 you collect some CO<sub>2</sub> from other operators in the area to  
12 put down in the sequestered -- or just voluntary sources?

13 A. Oh, you're talking about the produced CO<sub>2</sub>?

14 Q. Yeah, yeah, produced CO<sub>2</sub>, you -- some --  
15 operators, could they give it to you so you can put it down  
16 there?

17 A. I think BP is one -- I think BP may be the only  
18 operator that is outside of ConocoPhillips/BR, and at this  
19 point we haven't completely settled our sampling issues,  
20 you know, what our sampling procedures will be outside of  
21 Section 32, but we have talked specifically about Section  
22 29 at this point. And again, we -- one of the operating  
23 partners is going to contact BP and see if we can get  
24 analyses from them.

25 Q. Okay. And you are going to do some monitoring

1 for a year of this project, and give us feedback what's  
2 happening?

3 A. Yes, we'll monitor for a year during the  
4 injection period, and then the plans are to monitor for an  
5 additional year after the well is shut in. And during that  
6 period we will be doing modeling analysis of the data  
7 that's collected up to that point in time. And then at the  
8 end of that time frame there will be a report.

9 EXAMINER EZEANYIM: Okay.

10 FURTHER EXAMINATION

11 BY EXAMINER BROOKS:

12 Q. Now, CO<sub>2</sub> -- there will be some CO<sub>2</sub> produced from  
13 the producing wells along with the gas, will there not?

14 A. That's correct. In fact, they currently produced  
15 -- somewhere between 20 and 25 percent of their total  
16 production stream is CO<sub>2</sub>.

17 Q. And will that CO<sub>2</sub> be re-injected?

18 A. At this point that CO<sub>2</sub> is sold down -- or is  
19 transported down the line to the plants, and I think it is  
20 currently just separated and vented.

21 Q. So there are no plans to reinject the CO<sub>2</sub> that  
22 will --

23 A. Not that --

24 Q. -- come with the gas?

25 A. -- I'm aware of, no. The project is based -- the

1 essence of the project is to try to determine the  
2 sequestration potential, and then take those results and  
3 try to go forward with analyzing the economics and costs of  
4 that type of a project, where we would reinject.

5 EXAMINER BROOKS: Okay.

6 FURTHER EXAMINATION

7 BY EXAMINER EZEANYIM:

8 Q. See, that's one of the things I wanted to ask  
9 you, because you -- What is the economic incentive for  
10 doing this? What's the --

11 A. The economic incentive for Burlington Resources  
12 is, again, the fact that there will be methane released by  
13 the CO<sub>2</sub> in the formation, and we will be producing that out  
14 of the offset producers. And it's probably -- Again, this  
15 affords us an opportunity to do this work at a very minimal  
16 cost to us. So we think the project, you know, is good in  
17 all respects.

18 EXAMINER BROOKS: Anything further, Mr. Kellahin?

19 MR. KELLAHIN: No, sir.

20 EXAMINER BROOKS: Very good. Case Number 13,933  
21 will be taken under advisement.

22 And you're going to supplement the record on --

23 MR. KELLAHIN: Yes, I am. We're going to  
24 supplement it with the notice certificate. We'll get  
25 you --

1 EXAMINER BROOKS: Notice of hearing.

2 MR. KELLAHIN: We're going to get you a new  
3 tabulation that has all the calculations on cement tops.

4 EXAMINER BROOKS: Revised tabulation on area-of-  
5 review wells.

6 MR. KELLAHIN: Yes.

7 EXAMINER BROOKS: Anything else?

8 MR. KELLAHIN: I believe that was it.

9 EXAMINER BROOKS: Thank you very much.

10 If there's nothing further, then, this docket  
11 will stand adjourned.

12 (Thereupon, these proceedings were concluded at  
13 5:36 p.m.)

14 \* \* \*

15  
16  
17  
18 I do hereby certify that the foregoing is  
19 a complete record of the proceedings in  
20 the Examiner hearing of Case No. 13933  
21 heard by me on June 21, 2007.  
22 David K. Brooks Examiner  
23 Oil Conservation Division  
24  
25

