

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. 12,838  
)  
APPLICATION OF ENERGEN RESOURCES )  
CORPORATION FOR POOL EXTENSION, SPECIAL )  
POOL RULES AND AMENDMENT TO THE DEPTH )  
BRACKET ALLOWABLE FOR THE SAUNDERS-SAN )  
ANDRES POOL, LEA COUNTY, NEW MEXICO )

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

March 21st, 2002

Santa Fe, New Mexico

02570-4 AM 10:39  
MEX

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, March 21st, 2002, 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.

\* \* \*

## I N D E X

March 21st, 2002  
Examiner Hearing  
CASE NO. 12,838

	PAGE
EXHIBITS	3
APPEARANCES	3
APPLICANT'S WITNESSES:	
<u>DAVID CROMWELL</u> (Geologist)	
Direct Examination by Mr. Hall	4
Examination by Examiner Stogner	14
<u>BARNEY I. KAHN</u> (Engineer)	
Direct Examination by Mr. Hall	22
Examination by Examiner Stogner	34
REPORTER'S CERTIFICATE	39

\* \* \*

## E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	6	14
Exhibit 2	9	14
Exhibit 3	11	14
Exhibit 4	12	14
Exhibit 5	24	34
Exhibit 6	26	34
Exhibit 7	27	34
Exhibit 8	28	34
Exhibit 9	32	34
Exhibit 10	34	34

\* \* \*

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

## FOR THE DIVISION:

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

## FOR THE APPLICANT:

MILLER, STRATVERT and TORGERSON, P.A.  
 150 Washington  
 Suite 300  
 Santa Fe, New Mexico 87501  
 By: J. SCOTT HALL

\* \* \*

1           WHEREUPON, the following proceedings were had at  
2           9:37 a.m.:

3           EXAMINER STOGNER: This hearing will come to  
4           order. At this time I'm going to call Case Number 12,838,  
5           which is the Application of Energen Resources Corporation  
6           for pool extension, special pool rules and amendment to the  
7           depth bracket allowable for the Saunders-San Andres Pool in  
8           Lea County, New Mexico.

9           At this time I'll call for appearances.

10          MR. HALL: Mr. Examiner, Scott Hall with the  
11          Miller Stratvert Torgerson law firm in Santa Fe, appearing  
12          on behalf of the Applicant, Energen Resources Corporation,  
13          with two witnesses this morning.

14          EXAMINER STOGNER: Any other appearances?

15          Will the witnesses please stand to be sworn at  
16          this time?

17          (Thereupon, the witnesses were sworn.)

18          MR. HALL: At this time, Mr. Examiner, we would  
19          call Dave Cromwell.

20                         DAVID CROMWELL,

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

23                         DIRECT EXAMINATION

24          BY MR. HALL:

25                  Q. Mr. Cromwell, if you would, state your name for

1 the record and your place of residence.

2 A. David Cromwell, I reside in Birmingham, Alabama.

3 Q. And by whom are you employed and in what  
4 capacity?

5 A. I'm the district geologist for the Permian Basin  
6 area for Energen Resources Company.

7 Q. And you've previously testified before the  
8 Division and before Examiner Stogner and had your  
9 credentials accepted as a matter of record, have you not?

10 A. Yes, I have.

11 Q. And you're familiar with the Application and the  
12 lands that are the subject Application [sic] in this case?

13 A. Yes, I am.

14 MR. HALL: At this point, Mr. Examiner, we would  
15 offer Mr. Cromwell as a qualified expert petroleum  
16 geologist.

17 EXAMINER STOGNER: Mr. Cromwell, let me get this  
18 straight. You're in Birmingham, Alabama, and you're over  
19 the San Juan District?

20 THE WITNESS: No, sir, Permian Basin.

21 EXAMINER STOGNER: Permian Basin district.  
22 That's a big district to include Alabama, isn't it?

23 THE WITNESS: Yes, sir.

24 EXAMINER STOGNER: Some similarities between Lea  
25 County and Alabama, I understand that.

1           So qualified, Mr. Cromwell, thank you.

2           Q.    (By Mr. Hall)  If you would, Mr. Cromwell,  
3 explain to the Examiner what it is Energen seeks by this  
4 Application.

5           A.    Sir, we seek to expand the horizontal limits of  
6 the Saunders-San Andres field in Lea County and also to  
7 increase the allowable from 180 barrels a day to 160  
8 barrels a day.

9           Q.    And what are the current horizontal boundaries of  
10 the pool?

11          A.    The current boundaries are 160 acres, right now,  
12 that exist in the southwest quarter of Section 4 of 15  
13 South, 33 East.

14          Q.    Are the pool boundaries reflected on your Exhibit  
15 1?

16          A.    Yes, sir.

17          Q.    Why don't we look at that, please, sir?  If you'd  
18 identify Exhibit 1 for the record --

19          A.    Yes.

20          Q.    -- and explain what that's intended to reflect.

21          A.    I'll take a minute, Mr. Examiner.  This is  
22 Exhibit 1.  In the lower right-hand corner is the map,  
23 structure map, on the top of the San Andres marker.  I call  
24 it a marker, because it is about 50 feet above the pay in  
25 the San Andres in this interval.  The scale of the map is

1 one inch equals 1000 feet. The area that it encompasses is  
2 roughly the south one-third of Township 14 South and the  
3 north one-third of 15 south, both in Range 33 East.

4 The thing that strikes you right off the bat is,  
5 there's a lot of yellow acreage colored in here. This is  
6 the acreage that is controlled by Energen. Most of it is  
7 acreage that Energen acquired from the estate of Charles  
8 Gillespie a year ago, and other acreages that we have  
9 acquired from the State of New Mexico on a lease basis.

10 The other thing that you'll notice on this map is  
11 that there are a lot of red dots here representing  
12 wellbores. The important point to remember in this area is  
13 that the Saunders was a Pennsylvanian pool discovered in  
14 the mid-1950s, and it is at a depth of 10,000 feet, and it  
15 wasn't until 1991 when the recompletion of the State "Q" 1  
16 well was done that the San Andres became productive.

17 The other thing I'd like to call your attention  
18 to is, we have a big green dot indicating the San Andres  
19 production, and for future reference there are three wells  
20 that are currently producing from the San Andres. If  
21 you'll follow along with me, the first well on the west is  
22 the State "S" 1 well, which we completed a month ago for  
23 160 barrels a day from the San Andres.

24 The next well over, the middle of those three  
25 dots, is the State "Q" 1 well, which was discovered, as I

1 mentioned earlier, in 1991 from this San Andres pay zone.

2 And the other well that I'll talk about also is  
3 the State Number 2 "Q" well, which is also producing from  
4 the San Andres.

5 Also on this map I'll have three cross-sections,  
6 A, B and C, which are identified by different colors, that  
7 we will talk about in a few minutes.

8 Also on this map you'll see a squiggly brown/blue  
9 line in here. That represents what I think might be the  
10 limits of the San Andres reservoir from the data that I  
11 know right now.

12 Also on this map you will see at the top it says,  
13 "Existing San Andres Pool Area", and that highlights the  
14 160 acres that I aforementioned to in the southwest quarter  
15 of Section 4.

16 What we seek today is to increase the horizontal  
17 limits and include that to the well to the west, which  
18 would include the southeast quarter of Section 5 and the  
19 north half of the northeast quarter -- I mean, sorry, the  
20 south half of the southeast quarter of Section 5, all that  
21 in 15-33.

22 As I mentioned, we just recently completed the  
23 Number 1 State "S" well, located roughly 1980 feet from the  
24 south line and 660 feet from the east line of that Section  
25 5. We have three proposed locations in there that are the

1 little white circles that you see to the north, west and  
2 south of that well. We are currently drilling the State 2  
3 well right now; we spud that well on Monday.

4 So we have plans to do additional drilling in  
5 here, and that is the situation as this map depicts.

6 Q. Now, under the existing nomenclature order  
7 establishing the Saunders-San Andres Pool, the vertical  
8 limits of the pool are the entirety of the San Andres;  
9 isn't that correct?

10 A. Yes, sir, they are.

11 Q. What's the actual producing interval in that  
12 vertical extent?

13 A. The actual producing interval is only about 20  
14 feet thick in the middle of the San Andres. Do you want  
15 to --

16 Q. Yes, let's refer to Exhibit 2, please, sir.

17 A. If you'll open Exhibit 2, which is my cross-  
18 section A-A', this is essentially a north-south cross-  
19 section through some of the wells in the field. It's done  
20 on a vertical scale of one inch equals 100 feet and a  
21 relative horizontal scale.

22 The well on the right-hand side, the old Amerada  
23 State 5 "SC" well, is the only well that has penetrated the  
24 entire San Andres interval, and if you'll note, the depths  
25 on that are roughly from 4290 down to 5700 feet. And the

1 producing interval is marked on this map at roughly 5000  
2 feet, just above 5000 feet.

3 Q. All right, let's refer -- Are you finished with  
4 Exhibit 2?

5 A. I would like to also -- on this map, if you'll  
6 note, that we have writing to the right-hand side of the  
7 wellbore schematic in here, and that is the DST interval,  
8 and the writing in green is the completion data. The  
9 writing at the bottom of each designated well is when it  
10 was completed and the potential for that wellbore.

11 If you'll notice also on this cross-section, that  
12 it goes from the State "SC" well on the extreme right-hand  
13 side to the State "Q" Well Number 1, which was a whipstock  
14 well, an old well in there, and did not penetrate the  
15 entire porosity section of the San Andres, and that's why  
16 it is an open-hole completion. It was originally completed  
17 for 30 barrels of oil a day and 130 barrels of water, and  
18 since that time the production has steadily increased.

19 The next well over is an SDX well that was  
20 completed last month as a dry hole, also attempting to make  
21 a completion in the San Andres, and the San Andres was  
22 basically -- the porosity zone was nonexistent through  
23 there, it was very tight.

24 And also there's another dry hole that's on the  
25 extreme left-hand side of the cross-section, and old

1 Charles Gillespie well, the State "R" well. That was  
2 completed and plugged in October of 1991.

3 So those are the four wells on that cross-  
4 section, sir.

5 Q. Let's refer to your B-B' cross-section, Exhibit  
6 3.

7 A. Exhibit 3 is cross-section B-B', which is also a  
8 structural cross-section, but the scale on this cross-  
9 section is one inch equals 40 feet. And it also goes  
10 basically from the northern end to the southern end of the  
11 production. It includes all three wells that are producing  
12 from the San Andres interval, as I have indicated on this  
13 cross-section.

14 If you'll look at the little green boxes within  
15 the three well columns in the three center wells, you can  
16 see the approximate interval that the San Andres is  
17 productive in these three wells, and the potential of all  
18 three wells.

19 The State "Q" well was potentialed in February of  
20 1994 for 27 barrels of oil a day, and the gravity of the  
21 oil is 22.

22 As I mentioned earlier, the State Number 1 "Q"  
23 well was potentialed for 30 barrels a day and 130 barrels  
24 of water.

25 And our most recent completion is the Energen

1 Number 1 State "S" well, which was completed for 160  
2 barrels a day, very little gas and no water flowing.

3 This cross-section basically shows the marker  
4 that I used for my map, outlined in red. And also in red  
5 is what I consider the top of the San Andres porosity in  
6 here. And as you can see, if you look at the second well  
7 from the left, the State "S" Number 1, that the interval is  
8 only about 20 feet thick.

9 Q. Let's refer to your Exhibit 4, please, sir, if  
10 you would identify that.

11 A. Exhibit 4 is cross-section C-C'. It is basically  
12 also on a scale of one inch equals 40 feet. It entails two  
13 wells. The well on the left-hand side is our State "S"  
14 well with the productive interval outlined.

15 And then as you move towards the northeast, you  
16 have the SDX Well Number 1, the "CG" well, that had the  
17 zone -- found the zone tight through that well and was  
18 nonproductive and plugged last month.

19 Q. If you would summarize, Mr. Cromwell, what is the  
20 geologic justification for expanding the horizontal extent  
21 of the pool in this case?

22 A. The geologic justification is basically that we  
23 have found the porosity zone to extend beyond the existing  
24 pool limits as defined by the State -- in other words, it  
25 extends further to the west than originally thought -- and

1 as defined by the production that we have in the Saunders  
2 well, which I feel the zone is correlative to the Number 1  
3 "Q" and the Number 2 "Q", the wells to the east.

4 And based on that, and the basis that we are also  
5 going to be drilling three wells in here, that we would  
6 like to seek the expansion of the pool.

7 Q. All right. In your opinion, is the Saunders-San  
8 Andres common source of supply larger than the current 160-  
9 acre pool defined in Order Number R-10,091?

10 A. Yes, sir, I think the evidence based on my  
11 correlation of the wells that we've drilled over there  
12 indicates that.

13 Q. And will Energen present further engineering  
14 testimony relative to the size and producing capability of  
15 the reservoir?

16 A. Yes.

17 Q. In your opinion, Mr. Cromwell, as a geologist,  
18 will granting Energen's Application serve the interests of  
19 conservation, result in the protection of correlative  
20 rights and the prevention of waste?

21 A. Yes, it will.

22 Q. And were Exhibits 1 through 4 prepared by you?

23 A. Yes, sir, they were.

24 MR. HALL: At this time, Mr. Examiner, we would  
25 move the admission of Exhibits 1 through 4, and that

1 concludes our direct testimony of this witness.

2 EXAMINER STOGNER: Exhibits 1 through 4 will be  
3 admitted into evidence.

4 Mr. Hall, what's -- your next witness is going to  
5 be your engineer?

6 MR. HALL: Yes, sir.

7 EXAMINATION

8 BY EXAMINER STOGNER:

9 Q. Okay, I'm going to refer to Exhibit Number 1.  
10 That State "R" -- or is that the State "T" well? Okay, the  
11 State "R" Number 1, that was the old plugged and abandoned  
12 well; is that correct?

13 A. Yes, sir.

14 Q. Let's see, and that shows up on which cross-  
15 section?

16 A. Cross-section B-B'.

17 Q. B-B'. Okay, when I look at the cross-section  
18 B-B', Exhibit Number 3, now, was that a test in both of the  
19 indicated intervals when I look at the cross-section?

20 A. No, sir, the main indicated interval is the  
21 bottom of the -- where I've highlighted it in red, where I  
22 feel that is the porosity interval that is correlative to  
23 the State "Q" well. And they tested with a drill stem test  
24 in there, and they recovered 190 feet of mud-cut water.

25 Q. Now, the upper interval you have marked red also,

1 with the numbers 1360.

2 A. Yes, sir.

3 Q. Is that any indication? What does that tell us?

4 A. Basically, those are internal numbers indicating  
5 the porosity and the water saturation that I calculated on  
6 that particular porosity zone. In other words, I'm trying  
7 to correlate different porosity zones within the San  
8 Andres, because it's a lenticular dolomite, as you know.  
9 You know, you've got very pronounced pinchout of these  
10 various porosity zones, so I'm trying to correlate to see  
11 the continuity of those porosity zones, and that's why  
12 that's highlighted, sir.

13 Q. Now, when this well was tested -- when -- in  
14 1991; is that correct?

15 A. Yes, sir, at the bottom of the cross-section  
16 you'll see it was plugged there in 1991. It was drilled  
17 shortly after the discovery well was re-entered, the Number  
18 1 "Q".

19 Q. As far as you know, this is -- Now, this shows to  
20 be the only well over in Section 5 that even was drilled  
21 through the San Andres; is that correct?

22 A. It was drilled into the top of the porosity. It  
23 wasn't drilled through it, but it was drilled into the  
24 middle portion, yes, sir.

25 Q. Okay, now --

1           A.    Other than the well that we just recently  
2 completed.

3           Q.    Other than the well just recently completed, and  
4 we're talking about the State "S" Number 1?

5           A.    Yes, sir.

6           Q.    Okay.  Now, are there deeper wells in Section 5  
7 that penetrate the San Andres?

8           A.    No, sir, there's no other wells in Section 5.

9           Q.    Now, on Exhibit Number 1, you're showing this  
10 reservoir limits out to the west.  Are you using seismic  
11 data to determine that?

12          A.    No, sir, I'm using geological license in that.  
13 We really don't know how far the reservoir continues to the  
14 west, and our plans are to continue to just drill one well,  
15 step out every 40 acres and move in the westerly direction,  
16 until we define the limits.

17                    So this data that you see here is based on the  
18 data that I've got -- this is my best estimate to date.

19          Q.    Okay, how far west do I need to go off this map  
20 before I run into a San Andres producer?

21          A.    Tens of miles.

22          Q.    Okay, so this is definitely the edge of a San  
23 Andres play?

24          A.    A little porosity zone.  As I mentioned earlier,  
25 the zone is only 20 feet thick here, and so you know it can

1 disappear very quickly. And as I've also noted, you know,  
2 the production continues to increase in some of the wells,  
3 and so that's one of the reasons also that we want to go  
4 ahead and seek a higher allowable in here. That will get  
5 into detail in the engineering testimony.

6 But basically we've got just the one well that's  
7 an extension of existing pool limits.

8 Q. Okay, let's talk about this porosity interval  
9 here, this 20-foot porosity interval. What is the  
10 depositional environment?

11 A. The depositional environment in here is a  
12 peritidal sequence in here where you've got carbonates  
13 being deposited on a very shallow shelf edge and you've got  
14 a fluctuating sea level that comes across here, and it  
15 percolates water through these carbonates, and it dissolves  
16 some of the material in there, and it's called secondary  
17 porosity development. In other words, you've got vugular  
18 development in this interval in the San Andres. It's very  
19 shallow water.

20 Q. Now, is this a true indication, are we having a  
21 dipping back to the east --

22 A. Yes, sir.

23 Q. -- a very slight dip; is that correct?

24 A. Yes, sir.

25 Q. Now, you show a possible oil-water contact line

1 marked in blue, and this is Exhibit Number 1.

2 A. Yes, sir.

3 Q. I assume your engineer will probably go into a  
4 little more detail on that?

5 A. Yes, sir. If you'll look there, as you go to the  
6 east you'll see there's a couple of triangles.

7 Q. Yes.

8 A. Those wells are old wells where water has been  
9 put into the San Andres, legally as disposal wells. And I  
10 feel that we need to come at least updip from that. And  
11 following my contour around, that's why I get into a  
12 possible oil-water contact, if you'll follow that structure  
13 around, yes, sir. That's why I've limited it to that  
14 aspect of it at this point.

15 And from the data that we've seen that the  
16 engineer will present to you, you'll understand that it --  
17 you know, it's a possible water-drive reservoir.

18 Q. And it appears you have indicated that oil-water  
19 contact on your maps on your cross-section; is that  
20 correct?

21 A. I don't believe that oil water contact is  
22 delimited on the cross-section, sir.

23 Q. Well, I mean the little map portion, the index  
24 map.

25 A. Oh, yes, sir. I'm sorry. Yes, sir, that's

1 correct. That index map was taken from this Exhibit 1,  
2 basically.

3 Part of the problem we ran into originally in  
4 here is that the first two wells in the existing pool had  
5 really not been drilled deep enough to see what the entire  
6 porosity interval looked like. So it's a little bit of  
7 speculation on my part as to what happens beneath the  
8 drilled interval at the two locations that are currently  
9 producing. As you can see on the cross-section, they were  
10 open-hole completions.

11 Q. Now, are you in charge of stimulating these  
12 wells?

13 A. No, sir.

14 Q. That would be the engineer?

15 A. Yes, sir. They really haven't needed very much  
16 stimulation, as you can see from the cross-section, where  
17 I've annotated the zone and what they've done to stimulate  
18 it.

19 For example, on cross-section C-C' you'll see  
20 that the well -- the Saunders Number 1 "S" well did not  
21 require any stimulation at all. And that green that's  
22 highlighted just to the right of the wellbore, it was  
23 perforated from 4940 to 4956, and it flowed eight barrels  
24 of oil an hour naturally.

25 Q. Now that we're talking about this Exhibit 4, the

1 C-C', what happens as I go further to the -- in this case,  
2 to the north and east? It shows it getting tighter.

3 A. Yes.

4 Q. What's the cause there?

5 A. I don't have all the data that the SDX may have  
6 had when they drilled this well, but my speculation, as  
7 oftentimes happens in the San Andres, you'll get infilling  
8 with anhydrite in the porosity sequence. And the porosity  
9 zone is infilled with anhydrite and is a denser material.  
10 And so you lose your good dolomite porosity, and you come  
11 into a zone that doesn't have as much porosity because  
12 you've got this secondary infilling of calcium sulfate.

13 Q. In fact, that's the only indication on that  
14 cross-section that you show this phenomenon; is that  
15 correct?

16 A. Yes, sir.

17 Q. Now, on that well that we're talking about on the  
18 northeast, I'm going to identify, that's the State Number  
19 1, "CG" State Number 1, of SDX's?

20 A. Yes, sir.

21 Q. It shows a completion date of February, 2002, and  
22 that's where it was completed or attempted completion?

23 A. Yes, that was the primary zone. If you'll look  
24 at the map, that was a direct north offset to the "Q" 1  
25 well on Exhibit 1, and they were attempting to offset our

1 well to the north.

2 Q. Okay. Now, as I understand it, the discovery  
3 well for this pool, was this the primary zone of interest,  
4 or was it going down to the Pennsylvanian or some of the  
5 deeper formations?

6 A. This well is a recompletion. It was drilled  
7 originally -- the "Q" 1 was originally drilled by another  
8 operator in the mid-1950s, and Mr. Gillespie re-entered  
9 this well in 1991 and whipstocked it over and made a  
10 completion in the San Andres interval.

11 Q. Have you been in contact with our geologist in  
12 the Hobbs District Office, Mr. Paul Kautz?

13 A. No, sir, I have not.

14 Q. Let's see, now. The producing well that's in the  
15 extension portion of it, that was completed exactly when,  
16 what date?

17 A. A month ago.

18 Q. A month ago?

19 A. Roughly.

20 Q. February of 2002?

21 A. Yes, sir.

22 EXAMINER STOGNER: I don't believe I have any  
23 other questions of this witness at this time. I may have  
24 something as we progress on in today's hearing. You may be  
25 excused.

1 THE WITNESS: Thank you.

2 MR. HALL: Mr. Examiner, we call Barney Kahn.

3 EXAMINER STOGNER: Oh, referencing my earlier  
4 comment, I'm from Lea County and I've drilled wells near  
5 Birmingham, Alabama.

6 THE WITNESS: Yes, sir.

7 EXAMINER STOGNER: So believe me, there's some  
8 similarities in the operations between the two areas, at  
9 home and in both places.

10 THE WITNESS: Was that in the Black Warrior Basin  
11 area?

12 EXAMINER STOGNER: Yes, sir, it was. Fond  
13 memories.

14 Mr. Hall?

15 BARNEY I. KAHN,  
16 the witness herein, after having been first duly sworn upon  
17 his oath, was examined and testified as follows:

18 DIRECT EXAMINATION

19 BY MR. HALL:

20 Q. For the record, please state your name and your  
21 place of residence.

22 A. Barney Kahn, Birmingham, Alabama.

23 Q. And Mr. Kahn, by whom are you employed and in  
24 what capacity?

25 A. Energen Resources Corporation as the chief

1 engineer.

2 Q. And you previously testified before the Division  
3 and this Examiner and had your credentials established as a  
4 matter of record; is that correct?

5 A. Yes.

6 Q. And you're familiar with the Application that's  
7 filed in this case?

8 A. Yes.

9 Q. And you're familiar with the lands that are the  
10 subject of the Application?

11 A. Yes.

12 MR. HALL: At this time, Mr. Examiner, we offer  
13 Mr. Kahn as an expert petroleum engineer.

14 EXAMINER STOGNER: Mr. Kahn, how do you spell  
15 your name?

16 THE WITNESS: K-a-h-n.

17 EXAMINER STOGNER: Mr. Kahn is so qualified.

18 Q. (By Mr. Hall) Mr. Kahn, is the current allowable  
19 for the Saunders-San Andres Pool the standard 40-acre depth  
20 bracket allowable?

21 A. Yes, it is.

22 Q. And what's the current gas-oil ratio limitation?

23 A. 2000 to 1.

24 Q. And does Energen seek to increase the GOR limit  
25 in this case?

1           A.    No, we do not.

2           Q.    And why not?

3           A.    This reservoir does not produce measurable  
4 quantities of gas with the oil.  It's basically a dead-oil  
5 reservoir with a bottom or edge water drive, and it's not a  
6 gas cap or gas expansion reservoir.

7           Q.    Energen seeks to increase the allowable from 80  
8 barrels a day to 160 barrels a day; is that correct?

9           A.    Yes.

10          Q.    And why is that?

11          A.    We request increase to more realistically reflect  
12 the productive capability of the reservoir, rather than the  
13 statewide depth limitation which is not reservoir-specific,  
14 set by the depth of the well alone.

15          Q.    All right.  Now, how did you establish the 160-  
16 acre barrel of oil per day rate?

17          A.    I've presented Exhibit Number 5, which tabulates  
18 the production from the State "S" Number 1.  It was  
19 actually completed in January of 2002, rather than in  
20 February of 2002.  It was perforated from 4940 to -56,  
21 tested for three days, and then shut in for a four-day  
22 bottomhole pressure test.  We ran a gauge in the hole and  
23 recorded a bottomhole pressure of 2337.

24                 We put the well back on production in mid-  
25 January.  And as you can see from the tabulation, it

1 produced between 125 and 160 barrels a day, no water, no  
2 measurable gas, on an 8/64 choke with a flowing tubing  
3 pressure ranging between 470 pounds and 475 pounds.

4 The tabulation of the daily February production  
5 shows that it produced up to a rate of 173 barrels a day,  
6 also on an 8/64 choke, with a 480-pound flowing pressure,  
7 and then we shut the well in for the remainder of the  
8 month, so as not to exceed the 80-barrel-a-day allowable  
9 limit.

10 And you see a partial month. The latest dailies  
11 that I had was through March 17th. Once again, it achieved  
12 a rate of 174 barrels a day, no water, no measurable gas,  
13 on an 8/64 choke, with a 480-pound flowing tubing pressure.

14 And so the 160-barrel-a-day request is in line  
15 with the capability of this well on an 8/64 choke.

16 Q. In your opinion, Mr. Kahn, can the reservoir be  
17 more efficiently produced at the 160-barrel-per-day rate?

18 A. Yes, a 160-barrel-a-day rate will expedite the  
19 development of the reservoir, based on the economics and  
20 the time value of money. The higher rate that we can  
21 produce at, the greater the present worth of those reserves  
22 will be to the company and to the State of New Mexico,  
23 which has the royalty.

24 This reservoir appears to be supported by an  
25 active water drive, and an increased allowable will not

1 result in premature dissipation of the reservoir energy.  
2 Improved economics will accelerate the development of the  
3 reservoir and result in higher ultimate recovery.

4 Q. Let me ask you a brief question about ownership.  
5 The Exhibit 1, Energen's acreage holdings -- in the pool,  
6 anyway, are all of those State of New Mexico leases?

7 A. In the existing pool and in the expanded portion,  
8 that's all State of New Mexico leases.

9 Q. All right. What's the drive mechanism for this  
10 reservoir?

11 A. I believe the drive mechanism is a water drive.

12 Q. Okay, let's refer to Exhibit 6, please, sir, if  
13 you'll identify that for the Hearing Examiner.

14 A. Okay, Exhibit 6 also is a plot, and a tabulation  
15 on the second page. The tabulation shows that in June of  
16 1991 when the State "Q" 1 well was completed, it had a  
17 drill stem test of 2440 pounds.

18 The State "Q" 2 was completed in February of  
19 1994. It had a drill stem test of 2385 pounds. But during  
20 that time from June, 1991, to February of 1994, the State  
21 "Q" 1 had produced a cumulative oil of 32,426 barrels.

22 Then I'm showing in January of 2002, when the  
23 State "S" 1 was completed, we had a measured bottomhole  
24 pressure of 2340. By that time, the cumulative production  
25 for the State "Q" 1 and the State "Q" 2, the cumulative

1 production had reached 266,481 barrels.

2 This shows up on a plot, where on the Y axis I  
3 have bottomhole pressure, and on the X axis I have  
4 cumulative oil in stock tank barrels. And the points that  
5 you see reflected are -- the first point, which is at 2440,  
6 is the drill stem test from the "Q" 1. The next point  
7 which you see on the plot is the drill stem test from the  
8 "Q" 2 at 2385, and 32,426 barrels. And then the last point  
9 that you see over there is the bottomhole pressure recorded  
10 on the State "S" 1, which was 2340 pounds after the  
11 reservoir had produced a cumulative of 266,000 barrels.

12 I believe from this indication that there's only  
13 a 100-pound pressure drop between the initial bottomhole  
14 pressure and the State "S" 1 bottomhole pressure, after  
15 266,000 pounds, indicates that there has to be significant  
16 pressure support from water drive.

17 In a dead-oil reservoir, without pressure  
18 support, the pressures would have exhibited much more than  
19 a 100-pound pressure drop after this amount of production.

20 Q. Okay. Let's refer to Exhibit 7, if you'd  
21 identify that for the record, please.

22 A. Exhibit 7 is a rate-time plot of monthly oil  
23 production versus monthly time. And this is for the State  
24 "Q" 1 well, which shows the production history from its  
25 initial completion in 1991 to late 2001.

1           Basically what that shows is that the production  
2 remained under the 80-barrel-a-day limit. There was a  
3 short period during the last half of 1998 and the first  
4 half of 1999 where Gillespie overproduced a very small  
5 amount. They made up for that overproduction after that.  
6 Energen took over operations in March of 2001, and you see  
7 a spike in the production there. That's when the pump  
8 speed was increased.

9           Q. So this shows that the well, the "Q" 1, is  
10 capable of producing in excess of the 80-barrel-per day --

11           A. Yes, this well is capable of producing in excess  
12 of 80 barrels a day. Currently it's able to produce at  
13 about 100 to 120 barrels a day, on the current speed.

14           Q. All right, let's look at Exhibit 8. Identify  
15 that, please, sir.

16           A. Okay, Exhibit 8 is the State "Q" Number 2 well,  
17 which began production in 1994. It's also the same plot of  
18 monthly production in barrels versus time.

19                   After Energen took over operations in March of  
20 2001 we acidized the well and got a big spike in the  
21 production, but it was still less than the 80 barrels a  
22 day. It's currently producing at about 25 barrels a day on  
23 pump.

24           Q. All right. Now, does the historic production  
25 data for the wells, the current producing rates, indicate

1 that the reservoir is larger than the current 160 acres?

2 A. Yes, in December, 2001, the State "S" well was  
3 drilled in Section 5, approximately 1200 feet to the west  
4 of the State "Q" Number 1, and it encountered the San  
5 Andres reservoir. There are currently three wells  
6 producing in the reservoir, and geology indicates that  
7 there are potentially 400 acres within the reservoir, which  
8 would include the current pool and the requested extension  
9 of the pool into the east half of Section 5.

10 Q. All right, what's the estimated oil in place and  
11 the recovery factor for the pool?

12 A. I have estimated approximately 659 stock tank  
13 barrels per acre-foot in place, and that results in  
14 approximately 2,570,000 barrels of oil in place. And I've  
15 estimated that with this type of a drive mechanism that the  
16 recovery factor would be approximately 40 percent of the  
17 oil in place.

18 Q. And what's the estimated ultimate recoverable oil  
19 if the reservoir is produced at the current 80-barrel-per-  
20 day rate?

21 A. Well, if the additional wells were not drilled,  
22 then we'd only have recovery from the three wells. And I'm  
23 estimating that the recovery from the three existing wells  
24 would be about 556,000 barrels, which is about 22 percent  
25 of the oil in place.

1 Q. And what's your estimate for the recoverability  
2 if the wells are produced at the increased rate, 160?

3 A. Well, if the three additional wells are drilled  
4 on the state leases, the estimated recovery for six wells  
5 would be approximately 1,027,000 barrels, or 40 percent of  
6 the oil in place.

7 Q. Now, what effect does the accelerated recovered  
8 oil have on reservoir economics?

9 A. Using a 10-percent discounted future net revenue  
10 for the State "S" 1 well and the current oil prices for the  
11 remaining life of the well, it's estimated that it would  
12 generate a present worth of \$327,000 with a hundred --  
13 greater than with an 80-barrel-a-day allowable. By using a  
14 160-a-day allowable, it would accelerate the present worth  
15 at 10 percent and generate an additional \$327,000 present  
16 worth.

17 And coincidentally, that additional value is  
18 approximately equal to the cumulative drilling and  
19 completion costs of the State "S" Number 1 well.

20 Q. Now, if produced at the increased rate, do you  
21 anticipate any change to the gas-oil ratio?

22 A. No, this -- It's estimated that the abandonment  
23 pressure would be well above the bubble-point pressure of  
24 this reservoir.

25 Q. All right. In your opinion, will production at

1 the 160-barrel-per-day rate result in the recovery of  
2 additional reserves that would otherwise remain unproduced?

3 A. Well, only indirectly, in that there's an  
4 economic incentive to drill additional wells with a 160-  
5 barrel-a-day allowable. And also, the "Q" 2 well, which is  
6 only completed in the very top of the San Andres, there  
7 would be economic incentive to deepen that well and  
8 hopefully encounter additional porosity there to increase  
9 the productive capacity of that well.

10 Q. If the "Q" 2 is recompleted, is it possible that  
11 that well may produce in excess of the current 80-barrel  
12 rate?

13 A. Yes, we believe it would if we could encounter  
14 additional porosity.

15 Q. In your opinion, Mr. Kahn, will the increased  
16 rate of production adversely affect correlative rights?

17 A. No.

18 Q. And why not?

19 A. The entire reservoir is on state lands, and  
20 Energen operates all of the tracts within the reservoir  
21 limits.

22 Q. And you're recommending that the reservoir  
23 continue to be developed on current 40-acre spacing?

24 A. Yes, with the 40-acre spacing that we currently  
25 have, Energen could drill three additional wells in that

1 east half of Section 5.

2 Q. Now, why does Energen seek to make the new pool  
3 rules, if adopted, retroactive?

4 A. Well, Energen acquired these properties from a  
5 previous operator, and we began operating on March 1st, and  
6 we would like to make the increased allowable retroactive  
7 to prevent having to shut in the State "Q" Number 1 to make  
8 up for the excess production.

9 Q. And that's March 1st of 2001, correct?

10 A. Yes, March 1st of 2001.

11 Q. Okay, let's look at Exhibit 9 briefly.

12 A. Okay, Exhibit 9 is a tabulation starting March  
13 1st, when we took over operations, through January 2nd,  
14 which shows the barrels of oil reported for the State "Q" 1  
15 well on the State Form C-115 by month, and it also shows  
16 what the allowable would be for that month using the 80-  
17 barrel-a-day current allowable limit.

18 The next column shows the overage by month, and  
19 the next column shows the cumulative overages by month for  
20 the State "Q" 1. And through the end of January, which was  
21 our last C-115 that we've filed, the cumulative  
22 overproduction is standing at 5250 barrels.

23 Below that tabulation is another tabulation  
24 representing the State "Q" 2 and the oil reported on the  
25 Form C-115 and its allowable. It shows that its -- its

1 underage, and its cumulative underage for the period is  
2 19,539 barrels.

3 Q. Now, did the overproduction occur as the result  
4 of mistake or error?

5 A. Yes, there was a miscommunication between the  
6 pumper in the field and the office staff filing the C-115  
7 reports, and the pump speed was increased, increasing the  
8 production, and there was a miscommunication about the fact  
9 that we were overproducing.

10 Q. Was the error in allocating production?

11 A. Allocating between the "Q" 1 and the "Q" 2?

12 Q. Yes, sir.

13 A. Not as much a misallocation as much as just a  
14 miscommunication.

15 Q. I see. In the Division's Rules, at Rule  
16 502.C.(1).(a) provides an exception to the monthly  
17 allowable limits where overproduction results from a  
18 mistake or error of that nature, do they not?

19 A. Yes, they do.

20 Q. Did the overproduction result in any harm to the  
21 reservoir or impairment of correlative rights in any way?

22 A. No, we don't believe so. There are no other  
23 operators or royalty interests within the reservoir limits.

24 Q. And making the rules retroactive would cure the  
25 overproduction issue?

1 A. Yes, yes, it would.

2 Q. Mr. Kahn, in your opinion would granting the  
3 Application serve the interests of conservation, result in  
4 the protection of correlative rights and the prevention of  
5 waste?

6 A. Yes.

7 Q. And were Exhibits 5 through 9 prepared by you or  
8 at your direction?

9 A. Yes.

10 MR. HALL: At this time we move the introduction  
11 of Exhibits 5 through 9, as well as Exhibit 10, which is my  
12 notice affidavit.

13 And that concludes my direct examination of Mr.  
14 Kahn.

15 EXAMINER STOGNER: Exhibits 5 through 9 will be  
16 admitted into -- and Exhibit 10 will be included and  
17 admitted into evidence at this time.

18 EXAMINATION

19 BY EXAMINER STOGNER:

20 Q. Let's see, Mr. Kahn, in looking at the -- and Mr.  
21 Scott, in looking at the -- I'm sorry, Mr. Hall -- in  
22 looking at the ad, the retroactive date is described here  
23 as December 1st, 2000, but as I understand it we want to go  
24 back to March of 2001; is that correct?

25 MR. HALL: It's my understanding that the

1 property was acquired in January of 2001, but the effective  
2 date under the agreements was --

3 THE WITNESS: Well, let me put it this way: The  
4 effective date was December 1st of 2000, but we didn't  
5 actually finalize the purchase and sale agreement and take  
6 over operations until March 1st. So we weren't in control  
7 of the reservoir for that four-month period. It was just  
8 an accounting adjustment that was made.

9 MR. HALL: The March 1st date would be more than  
10 sufficient to cure the overproduction.

11 Q. (By Examiner Stogner) Okay, because that leads  
12 me up to another question here. What kind of production  
13 rates, historical production rates, on these wells did you  
14 see or know of prior to this March 1st date, or the time  
15 you inquired? Did they choke the well back, as far as  
16 production? What do you know about production?

17 A. No, I don't know how they were controlling their  
18 allowable, whether they were producing a limited number of  
19 days or just controlling it by the pump speed.

20 Q. Was it being controlled?

21 A. Yes, it appeared -- like I mentioned before, the  
22 only period that Gillespie overproduced was a short period  
23 in late 1998 to early 1999.

24 Q. And it was made up subsequent to that?

25 A. And they made it up subsequently, yes, sir.

1 Q. When Energen acquired the properties, did you ask  
2 the pumpers or the technical staff why they had not sought  
3 to have the allowable bumped then?

4 A. No, we did not.

5 Q. You probably said this, but I can't remember. Is  
6 the State "Q" and the "Q" 1, are they flowing or are they  
7 on pump?

8 A. They're both on pump.

9 Q. And that's on beam pump?

10 A. Yes, sir.

11 Q. It's the State "S" Number 1 that's still flowing?

12 A. Yes, sir, it's flowing at 480 pounds.

13 Q. Is there any plans on putting that on pump?

14 A. Well, we're hoping that the well will stay on --  
15 will be able to flow for more period of time and that --  
16 when it is unable to flow that 160-barrel-a-day rate, then  
17 we would put it on pump.

18 Q. I know Mr. Cromwell had mentioned plans to drill  
19 another well in the near future. Again, which one is going  
20 to be the next one?

21 A. The next well, or the well that we started  
22 drilling on Monday was the State "T" Number 2, which is  
23 directly west of the State "S" Number 1.

24 Q. And that's -- Whenever you filed for that, or  
25 when Energen filed for that, that was primarily a San

1 Andres test also?

2 A. Yes, sir.

3 Q. This absence of gas production in the San Andres,  
4 it's indicative to the other San Andres pools that you see  
5 back to the east?

6 A. I haven't investigated what the gas saturations  
7 are in any of the San Andres production that would be close  
8 to this.

9 MR. CROMWELL: Mr. Examiner, in my experience  
10 they are low-GOR reservoirs, yes, sir.

11 EXAMINER STOGNER: And you're talking about --  
12 Okay, now Mr. Cromwell is speaking at this point.

13 Mr. Cromwell, you're talking about the other San  
14 Andres pools that you have investigated that are, what,  
15 back to the east, back to the south?

16 MR. CROMWELL: Back to the west and back to the  
17 north, yes, sir, and there's some to the south. But like I  
18 said before, they're tens of miles away.

19 EXAMINER STOGNER: Thank you, Mr. Cromwell.

20 Q. (By Examiner Stogner) On your review of these  
21 "Q" 1 and "Q" 2 wells, were those on -- did those ever  
22 flow?

23 A. No, sir, they were put on pump originally.

24 EXAMINER STOGNER: In the original, okay.

25 I can't think of any other questions of Mr. Kahn

1 or Mr. Cromwell at this time, Mr. Hall.

2 MR. HALL: That concludes our case, Mr. Examiner.

3 EXAMINER STOGNER: Does anybody else have  
4 anything further in this matter?

5 If not, then you may be excused and this case  
6 will be taken under advisement.

7 (Thereupon, these proceedings were concluded at  
8 10:26 a.m.)

9 \* \* \*

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

*Michael J. Stogner* 12838  
March 2002  
Off. Conservation Director

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL March 25th, 2002.




---

STEVEN T. BRENNER  
 CCR No. 7

My commission expires: October 14, 2002