

1 STATE OF NEW MEXICO
2 ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
3 OIL CONSERVATION DIVISION
4 STATE LAND OFFICE BUILDING
5 SANTA FE, NEW MEXICO

6 18 January 1989

7 EXAMINER HEARING

8 IN THE MATTER OF:

9 In the matter of Case No. 9270 being CASE
10 reopened pursuant to the provisions 9270
11 of Division Order No. R-8586, which
12 promulgated temporary special rules
13 and regulations for the North Bluit
14 Siluro-Devonian Pool in Roosevelt
15 County, New Mexico.

16 BEFORE: Victor T. Lyon, Examiner

17 TRANSCRIPT OF HEARING

18 A P P E A R A N C E S

19 For the Division:

20 Robert G. Stovall
21 Attorney at Law
22 Legal Counsel to the Division
23 State Land Office Bldg.
24 Santa Fe, New Mexico

25 For H. L. Brown, Jr.

Ernest L. Padilla
Attorney at Law
PADILLA & SNYDER
P. O. Box 2523
Santa Fe, New Mexico 87504

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I N D E X

RONALD OWEN DIVINE

Direct Examination by Mr. Padilla 3

Cross Examination by Mr. Lyon 14

E X H I B I T S

Brown Exhibit One, Plat 5

Brown Exhibit Two, Plat 6

Brown Exhibit Three, Structural Map 6

Brown Exhibit Four, Sketch Cross Section 7

Brown Exhibit Five, Pressure Data 7

Brown Exhibit Six, BHP Data 8

Brown Exhibit Seven, BHP Data 8

Brown Exhibit Eight, Graph 9

Brown Exhibit Nine, Calculations 10

Brown Exhibit Ten, Production Curve 11

Brown Exhibit Eleven, Graph 11

1 MR. LYON: Call Case 9270.

2 MR. STOVALL: In the matter of
3 Case Number 9270 being reopened pursuant to the provisions
4 of Division Order No. R-8586, which promulgated temporary
5 special rules and regulations for the North Bluitt Siluro-
6 Devonian Pool in Roosevelt County, New Mexico, including a
7 provision for 80-acre spacing units.

8 MR. PADILLA: Mr. Examiner, my
9 name is Ernest L. Padilla for the -- for H. L. Brown, Jr..
10 I have one witness to be sworn in this case.

11 MR. LYON: Would you stand the
12 raise your right hand, please?

13
14 (Witness sworn.)

15
16 RONALD OWEN DIVINE,
17 being called as a witness and being duly sworn upon his
18 oath, testified as follows, to-wit:

19
20 DIRECT EXAMINATION

21 BY MR. PADILLA:

22 Q Mr. Divine, for the record would you
23 please state your name, your full name, please?

24 A Ronald Owen Divine.

25 Q Where do you live, Mr. Divine?

1 A At 3814 Holiday Hill Road, Apartment
2 Number 418, Midland, Texas.

3 Q Who do you work for Mr. Divine?

4 A H. L. Brown, Jr.

5 Q What do you do for H. L. Brown?

6 A I'm a production engineer.

7 Q Have you previously testified before the
8 Oil Conservation Division?

9 A No, sir.

10 Q Mr. Divine, where were you educated?

11 A I received my Bachelor of Science degree
12 from Oklahoma State University in 1982.

13 Q What have you done since 1982 with re-
14 gard to petroleum engineering?

15 A I worked for Standard Oil Production
16 Company in Midland, Texas, since 1982 until November of
17 1987.

18 Q Since then what have you done?

19 A I was employed by H. L. Brown, Jr., in
20 May of '88 and am currently employed at that firm.

21 Q Mr. Divine, did you make a study of the
22 North Bluit Devonian Pool as it currently exists in pre-
23 paration for this hearing?

24 A Yes, I did.

25 Q Did you make -- did you prepare certain

1 exhibits for introduction at this hearing?

2 A Yes, sir.

3 MR. PADILLA: Mr. Lyon, we
4 tender Mr. Divine as an expert petroleum engineer.

5 MR. LYON: Mr. Divine is qual-
6 ified.

7 Q Mr. Divine, let me have you refer first
8 of all to what we have marked as Exhibit Number One and
9 tell the Examiner what that is.

10 A Exhibit Number One shows H. L. Brown's
11 ownership situation in the North Bluit Siluro-Devonian
12 Field.

13 Q And is that shown in yellow on that
14 exhibit?

15 A Yes, sir, it is.

16 Q Tell us where the wells owned by H. L.
17 Brown that are completed in the Siluro-Devonian Pool are
18 located in that exhibit.

19 A Okay. There are three wells located in
20 the field currently. Well No. 127, located in the south-
21 west quarter of the northwest quarter; Well 27 "A" No. 1,
22 located in the northeast quarter of the northwest quarter,
23 and -- of Section 27, pardon me.

24 Q Are these wells shown on Exhibit Two, as
25 well?

1 A Yes, sir, they are.

2 Q Please refer to Exhibit Two and and tell
3 us in more detail the history of the wells and their loca-
4 tions.

5 A Okay. Exhibit Number Two shows the re-
6 lationship in distance for the three wells that are cur-
7 rently producing from the North Bluit Siluro-Devonian
8 Field.

9 In Section 27, the 1-27 Well was the
10 discovery well. The confirmation well is in Section 28 and
11 it's labeled as 1-28. And our third well, which was cur-
12 rently drilled in August of '88 is the 1-27 "A".

13 Q Mr. Divine, I take it that the proration
14 units assigned to the wells are shown on Exhibit Number
15 Two, is that correct?

16 A That is correct.

17 Q Let's go on now to what we have marked
18 as Exhibit Number Three and have you tell the Examiner what
19 that is.

20 A This is the structure map that was sub-
21 mitted in the original hearing and our geological staff
22 feels that with the development of the field by the three
23 wells that the structure map has not changed.

24 Q And so you're re-submitting that, in
25 essence.

1 A Yes, sir.

2 Q Okay. Let's go on now to what we have
3 marked as Exhibit Number Four and tell us what that is.

4 A Exhibit Number Four is a rough sketch of
5 the cross section of the structure on a cross section from
6 28 No. 1 on the east side -- or, pardon me, on the west
7 side of the field, to the -- through the 27 No. 1, and to
8 the 28 -- or 27 "A" No. 1 to the northeast, and it shows
9 that the 27 "A" No. 1 is the lowest on structure with the
10 28 No. 1 being highest on structure, and it is -- it also
11 shows that the producing interval is within the Devonian
12 structure.

13 Q Is that all you have concerning Exhibit
14 Number Four?

15 A I believe so.

16 Q Let's go on now to what you have marked
17 as Exhibit Number Five and have you tell the Examiner what
18 that is.

19 A Exhibit Number Five is a pressure, re-
20 servoir pressure relationship versus time for the Federal
21 27 No. 1 and the 27-8 No. 1 -- pardon me, 28 No. 1. It
22 shows that on initial completion of the 27 No. 1 we had a
23 reservoir pressure of 3238 from build-up, pressure build-up
24 data, and that approximately 3 to 4 months after the 27 No.
25 1 was drilled the 28 No. 1 was completed and a pressure

1 build-up obtained on it.

2 The build-up information indicated that
3 we had a drop of 180 psi in reservoir pressure in the 28
4 No. 1 or in the reservoir itself, and that the pressure
5 within the 28-1 was 3058. And the 27 "A" No. 1 is a pump-
6 ing well and no bottom hole pressure build-up data has been
7 obtained on that particular well.

8 Q Mr. Divine, let's discuss this pressure
9 on the Federal 27 No. 1 and the 18 No. 1 and in that regard
10 I would like to know what the significance of the pressure
11 decline is.

12 A The drop in pressure is primarily the
13 result of the two wells, the 27-1 being the original or the
14 discovery well, seeing original reservoir pressure, and
15 during the depletion of the -- of the reservoir by the
16 production of the 27 No. 1, to the time that the 28 No. 1
17 was drilled, the recovery of the (unclear) and gas had al-
18 lowed the reservoir to deplete by 180 psi.

19 Q In terms of drainage what does that
20 mean?

21 A That means that we are seeing reservoir
22 pressure communication between the 27 and 28.

23 Q Let's go on now to what we have marked
24 as Exhibits Six and Seven and have you discuss those with
25 the Examiner, please.

1 A Okay, Exhibit Number Six is the bottom
2 hole pressure build-up data for the Federal 27 No. 1, con-
3 sisting of 118 hours of build-up data. The build-up ex-
4 trapolated to a P* of 3238 psia.

5 Exhibit Number Seven is the pressure
6 build-up data for the Federal 27 -- 28 No. 1, consisting of
7 168 hours of build-up data, and the pressure build-up on it
8 reached a pressure of 3058 psia.

9 MR. LYON: Excuse me, what was
10 the P* on your first one?

11 A P* on the first one was 30 --3238.

12 MR. LYON: Thank you.

13 Q Where is that shown, Mr. Divine?

14 A It's shown on the last -- last page of
15 Exhibit Number Six.

16 Q Okay, let's go on now to what we have
17 marked as Exhibit Number 8 and have you identify that for
18 the Examiner.

19 A Exhibit Number Eight is a graphical re-
20 presentation of the build-up data on the Federal 28 No. 1.

21 Q What -- what significance does that
22 exhibit have to this hearing?

23 A It shows that the build-up is relatively
24 shallow increasing pressure over time and that pressure
25 reached a value of 3058. It's not marked on this exhibit

1 but it should be.

2 And also that the slope of the line was
3 .7 psi per cycle.

4 Q Let's go on now to Exhibit Number Nine
5 and have you identify what that is.

6 A Exhibit Number Nine is a page of calcu-
7 lations to determine certain -- certain data necessary for
8 the determination of drainage radius for the Federal 28.

9 From Exhibit Number Seven the slope of
10 .7 psi per cycle was necessary in determining the perme-
11 ability value. The calculation shows a value of 180 milli-
12 darcies. The information from that calculation was used in
13 the drainage radius determination and it was determined to
14 have a value of 4300 feet using a total compressibility of
15 .0002 psi to the -1.

16 We do not believe that the total com-
17 pressibility value is the correct value, but we do not
18 believe -- we also believe that it is within range. We've
19 determined a radius, maximum drainage radius, of 6082 feet
20 using a compressibility of .0001 and also a minimum drain-
21 age radius of 1923, using a total compressibility of .001,
22 and we feel that using our minimum value that we are well
23 within an 80-acre drainage radius, or could exceed an
24 80-acre radius.

25 Q Do you have anything further regarding

1 this exhibit, Mr. Divine?

2 A No.

3 Q Let's go on to Exhibit Number Ten and
4 have you tell the Examiner what that is and what it con-
5 tains.

6 A Exhibit Number Ten is a production curve
7 for the field indicating each well completion at the res-
8 pective time.

9 At the lower righthand corner of the --
10 of the exhibit it shows each well's cumulative production
11 to November 30th, '88, and also has a field cum recovery,
12 which shows that we've recovered in excess of 85,000 bar-
13 rels of oil and 330,000 MCF of gas in, let's see, it's
14 slightly over a one year period.

15 Q Mr. Divine, on the 28 and 27-1 Wells you
16 have a -- what kind of a drive do you have?

17 A We feel that we're -- the producing
18 mechanism is from a solution gas drive.

19 Q Go on, let's go on to what we have
20 marked as Exhibit Eleven and have you tell the Examiner
21 what that is and what it contains.

22 A Exhibit Number Eleven is a graphical
23 representation of the ASTM distillation process for each of
24 the three wells. It plots temperature versus the percent
25 recovery from the crude oil. It also provides information

1 of the API gravity, the amount of gasoline net, the
2 kerosine fuel recovered from this process, and it also give
3 information on the gas analysis and the BTU content of the
4 gas.

5 Q What kind of API gravity figures do you
6 have for each of these -- or for the oil produced from each
7 of the three wells?

8 A The 27 No. 1 has a 54.1 gravity at 60
9 degrees.

10 The 28 No. 1 has a 51.6 gravity at 60
11 degrees.

12 And the 27 "A" No. 1 has a 46.2 gravity
13 at 60 degrees.

14 Q In terms of migration through the reser-
15 voir, how do these API gravity figures correspond to drain-
16 age?

17 A The API gravity would indicate a low
18 viscosity oil which would tend to flow through the reser-
19 voir quite easily with the permeabilities that we've seen.

20 Q You have other attachments to Exhibit
21 Eleven. What are those?

22 A The additional attachments to the
23 Exhibit Number Eleven is just basically the hard data that
24 was used to generate this curve, including representative
25 gas analysis for each well in conjunction with the oil ana-

1 lyses.

2 Q Mr. Divine, have you studied other
3 Devonian pools or Siluro-Devonian pools in the State of New
4 Mexico with respect to 80-acre spacing and if so, can you
5 tell us about such study?

6 A The ones that we've found are the ones
7 that were submitted along with our original exhibits in
8 January of '88, those being the North Sawyer Devonian Pool,
9 which after -- which apparently received 80-acre spacing
10 units after the temporary rules were provided, and also on
11 the South Prairie Devonian Pool, which also took on 80-
12 acre spacing.

13 Q Mr. Divine, would -- would making the
14 rules permanent in this case be in the best interest of
15 conservation of oil and gas?

16 A Yes, sir, it would.

17 Q Will you tell us why?

18 A At this time we don't have sufficient
19 data to go toward 40 or greater than 80's. With the rela-
20 tively few number of wells that we have it may be better
21 to maintain 80's until we obtain such additional data.

22 Q Would approval of 80-acre spacing on a
23 permanent basis impair correlative rights in your opinion?

24 A I don't believe so.

25 MR. PADILLA: Mr. Examiner, we

1 offer Exhibits One through Eleven and we pass the witness
2 for cross examination.

3 MR. LYON: Exhibits One
4 through Eleven will be accepted.

5

6

CROSS EXAMINATION

7

BY MR. LYON:

8

9

Q Mr. Divine, what are the spacing rules
in your temporary rules?

10

A Currently 80's.

11

12

Q And what is the stand off distance from
the unit boundary?

13

14

A I believe that would be 990. I'm not
sure.

15

16

Q Is your Well No. 1-28 drilled in com-
pliance with the --

17

A No, it's an unorthodox location.

18

19

Q And why was it necessary to crowd the
line?

20

21

22

23

A The No. 1-27 was our discovery well and
the No. 1-28 was our confirmation well. The geologist felt
that any additional distance to the west may allow the well
not to even encounter the zone that we were approaching.

24

Q Did you encounter water in that well?

25

A We have encountered some water, yes.

1 Q So actually the -- your interference
2 test or your inferred interference from your pressure data,
3 because the wells are only 990 feet, does not give you a
4 strong indication that the wells are draining 80 acres, is
5 that right?

6 A I'm not sure I understand your question.

7 Q Well, what's your drainage radius for
8 80-acre spacing?

9 A In this particular case, the 1-28, our
10 drainage radius was -- we believe that we can drain as much
11 as 1920 -- let me get that calculation -- we believe that
12 we can drain as much as 1923 feet.

13 That may not be the same in the 28 -- or
14 pardon me, the 27 and the 28, due to possible changes in
15 permeability.

16 Q Referring to Exhibit Three, if I read
17 this map correctly, you've only shown the discovery well.

18 A Correct, yes.

19 Q Have the other two wells caused you to
20 reconsider that (unclear)?

21 A With the available information that
22 we've -- that we've been able to obtain so far, no changes
23 -- we don't feel any change should be made at this time.

24 Q And you were not able to take pressure
25 data on -- on your 27 "A".

1 A That is correct, yes. It's a pumping
2 well, and I might also add that over the course of trying
3 to complete this well into an economic producer, we've
4 stimulated the well four times and are still recovering
5 load water, so any attempt to obtain pressure information
6 would be influenced by that load water.

7 Q I think you showed on one of your ex-
8 hibits the cumulative production.

9 A Yes, sir.

10 Q On your Exhibit Nine. This was run on
11 your discovery well?

12 A This is a on -- pardon me, on Exhibit
13 Nine, no, this was run on our confirmation well, on Feder-
14 al 28 No. 1.

15 Q Yes. What -- what is the effect of your
16 compressibility in your drainage radius determination?

17 A The effect of compressibility is -- in
18 this particular case, has little effect unless it starts
19 decreasing by factors of 10 or more. The reason for the
20 maximum and minimum calculation is to show what effect the
21 compressibility has when we take this from a .0001 back
22 down to a .001, and we don't feel that these values for
23 total compressibility are out of range for this particular
24 pool; however, they are difficult to determine because of
25 the fact that the calculation consists of a formation

1 volume factor for water and even though we have encountered
2 some water, it's not sufficient to collect and measure the
3 -- the B_w in this case.

4 Q Now, your compressibility is combined
5 compressibility of the rock and water and oil.

6 A Of all fluids plus the rock, yes.

7 Q You porosity is -- is fairly high in
8 there. It seems to me that the compressibility that you
9 show here may be a little high also. They generally run in
10 the order of 10^{-5} .

11 A Well, there again, if you increase the
12 compressibility in that order, then we -- then the drainage
13 radius therefore also increases.

14 Q Based on Exhibit Ten, it appears that
15 your discovery well was -- was not very strong but your
16 confirmation well ^{was} very good.

17 A That is correct, and also 27 "A" No. 1
18 appears to be similar in oil production as does the 27 No.
19 1; however, the 27 No. 1 and the 27 "A" No. 1 vary substan-
20 tially in its gas production; therefore we feel that we're
21 probably seeing variations in permeability throughout the
22 reservoir.

23 Q Okay, now in regard to Exhibit Eleven,
24 there seems to be a considerable inconsistency in there on
25 the distillation and if I read this right, each successive

1 I have.

2 MR. PADILLA: We have nothing
3 further, Mr. Examiner.

4 MR. LYON: The witness may be
5 excused and the case will be taken under advisement.

6

7 (Hearing concluded.)

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C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9270, heard by me on Jan 18 1989.

W. Boyd, Examiner
Oil Conservation Division

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARINGSANTA FE, NEW MEXICOHearing Date JANUARY 18, 1989 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
Alan W. Bohling	Chevron, U.S.A. Inc.	Hobbs, N.M.
Don L. Lindsey	Chevron, USA Inc.	Hobbs, N.M.
W Kelobin	Kelobin Kelson Aubrey	Santa Fe
Charles H. Cill	Wendell Best Thelma Fisher	Roswell, NM
James Robinson	James Robinson Ltd	Roswell NM
Robert H. Bell	Harvey E Yates Co.	Roswell NM
Gordon Jahmay	Harvey E Yates Co	Roswell, NM
Bub Huler	Byram	Santa Fe
Clay F. Heron	Exxon Oil & Gas	Midland, TX.
Frank C. Clety	Exxon Oil & Gas	Midland, TX
Ronald Bartel	BLM	Santa Fe
Jim B. Thomas	EXXON	MIDLAND
William T. Duncan	"	"
JAMES M. KWOCER	"	MIDLAND, TX.
WILLIAM L. TATE	EXXON	
Ray Beck	Yates	Artesia
James Bruce	Kirkle Law Firm	Albq.

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date JANUARY 18, 1989 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
<i>Sam G. ...</i>	<i>Stevens Gas. Corp</i>	<i>Roswell, N.M.</i>