

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

19 March 1986

DIVISION HEARING

IN THE MATTER OF:

Application of Exxon Corporation,
USA, for downhole commingling,
Eddy County, New Mexico.

CASE
8858

and

Application of Exxon Corporation,
USA, for an unorthodox gas well
location, Eddy County, New Mexico.

CASE
8842

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

CARTER D. COPELAND

Direct Examination by Mr. Bruce 5

Cross Examination by Mr. Catanach 16

JIM BARTEL

Direct Examination by Mr. Bruce 17

JOHNNY W. JORDAN

Direct Examination by Mr. Bruce 21

Cross Examination by Mr. Catanach 29

E X H I B I T S

Exxon Exhibit One, Land Plat 7

Exxon Exhibit Two, Wellbore Diagram 8

Exxon Exhibit Three, Cement Bond Log 8

Exxon Exhibit Four, Temperature Survey 10

Exxon Exhibit Five, Assessment 11

Exxon Exhibit Six, Document 13

Exxon Exhibit Seven, Wellbore Sketch 15

Exxon Exhibit Eight, Cross Section 18

I N D E X CONT'D

1		
2		
3		
4	Exxon Exhibit Nine, Geologic Summary	20
5	Exxon Exhibit Ten, Horner Plot	22
6	Exxon Exhibit Eleven, C-122	23
7	Exxon Exhibit Twelve, Gas Analysis	24
8	Exxon Exhibit Thirteen, Form C-116	24
9	Exxon Exhibit Fourteen, Return Receipts	26
10	Exxon Exhibit Fifteen, Document	26
11	Exxon Exhibit Sixteen, Plat	27
12	Exxon Exhibit Seventeen, Plat	27
13	Exxon Exhibit Eighteen, Waivers	28
14	Exxon Exhibit Nineteen, Return Receipts	29

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MR. CATANACH: Call next Case
8858.

MR. TAYLOR: The application of
Exxon Company, USA, for downhole commingling, Eddy County,
New Mexico.

MR. CARTANACH: Are there
appearances in this case?

MR. BRUCE: Mr. Examiner, my
name is Jim Bruce from the Hinkle Law Firm in Santa Fe,
representing Exxon Corporation.

I have three witnesses to be
sworn.

Before we begin this case I
would request that Case 8842 be consolidated for hearing
with Case 8858, since they are interrelated.

MR. CATANACH Okay, Case 8842
will be consolidated.

Are there other appearances in
this case?

Will the witnesses stand and be
sworn?

(Witnesses sworn.)

1
2 MR. BRUCE: Before we begin,
3 Mr. Examiner, in Case 8858 the applicant is named Exxon
4 Company, USA, and that should be Exxon Corporation.

5 I don't know if that will have
6 to be readvertised or not.

7 MR. CATANACH: I'll look into
8 that, Mr. Bruce, and I'll let you know about that.

9
10 CARTER D. COPELAND,
11 being called as a witness and being duly sworn upon his
12 oath, testified as follows, to-wit:

13
14 DIRECT EXAMINATION

15 BY MR. BRUCE:

16 Q Mr. Copeland, will you please state your
17 full name, city of residence, occupation, and employer?

18 A My name is Carter D. Copeland. I'm from
19 Andrews, Texas. I'm an engineer for Exxon Corporation.

20 Q And have you previously testified before
21 the OCD?

22 A No.

23 Q Will you please state your educational
24 and work background?

25 A I have a Bachelor of Science in mechani-

1 cal engineering from the University of Michigan in 1982.

2 Since then I've worked for Exxon for ap-
3 proximately 2-1/2 years as a reservoir engineer, mostly in
4 southeast New Mexico and the area surrounding Andrews,
5 Texas.

6 For the last year I've been a subsurface
7 completion engineer, again for those same two primary areas,
8 and in particular, I'm a completion engineer for the Mary
9 Federal No. 5.

10 Q And are you familiar with Case 8858 and
11 the engineering matters related to that case?

12 A Yes.

13 MR. BRUCE: Mr. Examiner, is
14 the witness considered qualified?

15 MR. CATANACH: Mr. Copeland is
16 considered qualified.

17 Q Mr. Copeland, will you please briefly
18 state what Exxon seeks in Cases 8858 and 8842?

19 A In Case 8858 Exxon seeks authority for
20 the downhole commingling of production from the Upper Penn
21 and Cisco Canyon formations in the Undesignated Sheep Draw
22 Strawn Gas Pool in the wellbore of the Mary Federal Well No.
23 5, which is located 790 feet from the south line, 1829 feet
24 from the west line of Section 11, Township 23 South, Range
25 25 East.

1 In Case 8842 Exxon seeks authority to
2 reorient the proration unit of the Mary Federal Well No. 1,
3 which is located is 1924 feet from the north line, 651 feet
4 from the east line of Section 11, Township 23 South, Range
5 23 East, -- excuse me, the east half of Section 11 is cur-
6 rently dedicated to the Mary Federal No. 1 and Exxon desires
7 to dedicate the north half of Section 11 to the well.

8 This reorientation will result in an un-
9 orthodox well location for which Exxon also seeks approval.

10 My testimony relates to Case 8858. A
11 subsequent witness will address Case 8842.

12 Q Will you now please refer to the land
13 plat marked Exhibit Number One and discuss it for the Exam-
14 iner?

15 A Exhibit Number One is a 1-to-4000 base
16 map of the Sheep Draw area of Eddy County, New Mexico.

17 Exxon's acreage is noted in yellow. The
18 production map indicates the zones of last production in the
19 Pennsylvanian formation.

20 The orange are Morrow completions; the
21 blue are Strawn completions; and the green are Upper Penn,
22 what we refer to as Cisco Canyon.

23 The Mary Federal No. 5 in particular is
24 in Unit N of Section 11, Township 23 South, Range 25 East.

25 Q Would you please now refer to the well-

1 bore diagram marked as Exhibit Number Two and the cement
2 bonding log marked as Exhibit Three and discuss that?

3 A All right. Exhibit Number Two is a
4 current wellbore configuration of the Mary Federal No. 5 and
5 I'd like to give a chronology of how we arrived at this
6 configuration.

7 This well was originally proposed as a
8 Morrow well; however, we experienced significance gas influx
9 when we reached the depth of approximately 9800 feet. We
10 were unable to increase mud weight because of lost return
11 problems in shallower horizons.

12 Drilling continued to a depth of approxi-
13 mately 10,395 feet. By this depth the gas influx became
14 severe enough to create a serious well control problem.

15 Because of the worsening well control
16 safety hazard, we elected to set 7-inch casing at 10,395 and
17 test the interval currently producing gas into the wellbore.
18 The well would later be deepened to test the Morrow.

19 Because of the gas influx a cement bond
20 log was run to check the cement integrity. The log indi-
21 cated that there may be insufficient bonding to contain com-
22 pletion treatments.

23 Our reservoir engineers and geologists
24 decided to test the Strawn interval from 9916 to 10,349
25 based on similar Strawn completions and cased hole log ana-

1 lysis.

2 This interval was perforated with 261
3 shots and tested 750 MCF a day at 440 pounds flowing tubing
4 pressure.

5 The well was then acidized with 13,050
6 gallons of 15 percent hydrochloric acid. Our diversion
7 technique was not successful and the acid evaluation logs
8 indicated that a significant part of the interval was not
9 stimulated.

10 To help improve the current load
11 recovery, the well was treated with liquid CO2 and a surfac-
12 tant.

13 The well was then reacidized with 13,000
14 gallons of 15 percent hydrochloric acid with a slightly dif-
15 ferent diversion technique. Although the diversion techni-
16 que was more successful, the acid evaluation logs indicated
17 there may be a channel from the Strawn to the Upper Penn.

18 A temperature survey was run after a 48-
19 hour shut-in period. A temperature anomaly from the Penn
20 confirmed the channel.

21 I'd now like to present and discuss the
22 cement bond log, Exhibit Number Three. I believe you all
23 have one in your packet.

24 The bond log is a sonic tool that induces
25 a ringing sound in the pipe. This ringing sound, where the

1 pipe is well bonded it does not ring.

2 Where you have low amplitude of this
3 ringing noise, you have better bonding. Bonding is noted on
4 the log in the middle of the log in the dark colored
5 sections, as an example, from 10,040 feet to approximately
6 10,070 feet there may be good cement bonding; however, the
7 bulk of the wellbore does indicate that there is poor
8 bonding to the wellbore.

9 The temperature surveys that we ran are
10 Exhibit Number Four. What you see in Exhibit Number Four in
11 the lower half of the logs is an after acid log evaluation
12 two hours after we ran the acid treatment.

13 You will note that at approximately 9900
14 feet there is a packer anomaly, a packer anomaly that is
15 typical of these log evaluations. The bulk of the
16 treatment, we feel, was in the lower third of the
17 perforations at approximately 10,300 feet with some minor
18 treatment at approximately 9950.

19 The second log in the lower half is the
20 second after acid log evaluation, again two hours after the
21 second treatment.

22 You will notice here that there is no
23 packer anomaly at approximately 9900 feet and that there is
24 a significant break in the curve at approximately 9800 feet.

25 Based on this we feel that there was a

1 channel created by the second acid treatment up to 9800
2 feet.

3 You'll notice on the upper section of
4 your log there is a base temperature log and a 48-hour shut-
5 in temperature log. You'll notice significant cooling in
6 the lower portion of the wellbore at approximately 10,300
7 feet. This -- this cooling effect is because of gas enter-
8 ing the wellbore. The base temperature log was run just af-
9 ter the well was perforated. The 48-hour shut-in was after
10 both completion treatments.

11 The major anomaly in the 48-hour shut-in
12 shows significant cooling in the lower part of the well at
13 approximately 10,300 feet.

14 The next most significant anomaly again
15 is at 9800 feet.

16 We feel that this confirms the channel
17 that we suspected from our first after acid evaluation.

18 At this point in the completion we do not
19 feel there is a reasonable chance to repair the channel be-
20 cause of the cement bonding that we see in the well.

21 We'd like to now present our risk assess-
22 ment of what we feel we could possibly expect. This is Ex-
23 hibit Number Five.

24 If we squeezed the channel we feel there
25 may be a 25 percent chance of squeezing the channel, reper-

1 forating the Strawn, reacidizing, and the survey indicates
2 that we have successful isolation. no further stimulation
3 work at that time would be necessary.

4 There is another 25 percent chance that
5 we squeeze the well that we squeeze the well, survey indi-
6 cates successful isolation after reperforating and reacidiz-
7 ing, but because of the cement squeezing operations we feel
8 we have may have the problem of having to fract the well.

9 If we have to frac the well, we don't
10 feel that the cement job from the repair work would be able
11 to contain the frac, and you'll notice that that results in
12 approximately a 20 percent chance of breaking down this
13 channel again, except this time we will now have propped it
14 with a sand, thereby creating a downhole commingled situa-
15 tion that we will not be able to repair.

16 There is a 5 percent chance that the
17 fract will be successfully contained.

18 We also feel that there's no better than
19 a 50 percent chance that a squeeze will not be successful in
20 any way, shape, or form, and that we will be exactly where
21 we are today after spending approximately \$145,000.

22 At the bottom of the page you'll notice a
23 summary of the successful isolation of the Strawn, which
24 equals 30 percent and the unsuccessful isolation of the
25 Strawn, which is 70 percent.

1 As an example of reservoir damage that we
2 feel we have seen in the past from squeeze operations, we'd
3 like to discuss Exhibit Number Six. The following is an ex-
4 ample of Exxon unsuccessfully attempting to restore produc-
5 tion from a zone which was squeezed. This example shows how
6 waste can result from squeeze operations. These same
7 squeeze operations would be required in the Mary Federal No.
8 5 to repair the channel if commingling is not approved.

9 The well is the New Mexico DC State No. 1
10 in Section 18, Township 19 South, Range 29 East, Eddy Coun-
11 ty, New Mexico.

12 The New Mexico DC State No. 1 was com-
13 pleted in May, 1982, for 531 barrels of oil per day, 65 bar-
14 rels of water per day, from perforations Exxon believed to
15 be in the Cisco Canyon formation.

16 The NMOCD disagreed with the selection of
17 formation tops and found the top eleven feet of the perfora-
18 tions were actually in the Wolfcamp formation, thereby com-
19 mingling two formations in the wellbore.

20 A production log was run in the hope that
21 it would show an insignificant amount of production coming
22 from the perforations in question. Had this been the case
23 the NMOCD would likely have given administrative approval to
24 commingle the wellbore.

25 However, the log showed that 8 percent of

1 the total flow stream was coming from the interval in ques-
2 tion.

3 After reviewing the log, the NMOCD Chief
4 Engineer advised that he could not support administrative
5 approval for downhole commingling; therefore, an attempt was
6 made to isolate the Wolfcamp by lowering the packer assembly
7 in the well below the Wolfcamp perfs to temporarily abandon
8 the Wolfcamp zone until the Cisco Canyon depleted. This at-
9 tempt failed due to behind pipe communication.

10 An attempt was then made to squeeze the
11 Wolfcamp perforations. During the squeeze operations, perfs
12 below the bridge plug communicated with the Wolfcamp perfs.
13 After drilling out, the Cisco Canyon had to be reperforated
14 and acidized, the well produced only 44 barrels of oil per
15 day and 54 barrels of water per day after the acid job.

16 It is unlikely that the majority of the
17 production was coming from the Wolfcamp perfs as a spinner-
18 type production log indicated only about 8 percent of the
19 total flow coming from the Wolfcamp perfs.

20 Also, the well did not produce any
21 significant volume prior to the squeeze job so it is
22 unlikely that the Cisco Canyon was depleted.

23 In addition, the better porosity zones
24 are in the Cisco Canyon. It is suspected that the Cisco
25 Canyon interval was damaged during the squeeze operation and

1 the acid job failed to clean it up.

2 An acid frac was then attempted to frac
3 through the formation damage. The well produced only 65
4 barrels of oil and 113 barrels of water after the acid frac.

5 The acid frac did improve the productiv-
6 ity but did indicate that there was still substantial reser-
7 voir damage based on the production rates.

8 The production after the initial comple-
9 tion was 531 barrels of oil per day. After the squeeze
10 cementing operations, reacidizing, and acid fracing, we ob-
11 tained only 65 barrels of oil per day production.

12 We conclude from this that substantial
13 reservoir damage occurred from cement squeezing the Cisco
14 Canyon. Considerable expense was incurred with several un-
15 successful attempts to repair this damage. Waste of hydro-
16 carbons occurred due to the cement squeezing operations.

17 Q What will be the proposed wellbore con-
18 figuration if downhole commingling is approved?

19 A Exhibit Number Seven is what we -- how we
20 propose to downhole commingle the Upper Penn with the
21 Strawn.

22 As you will see, we propose to set an-
23 other permanent packer in the well at approximately 9600
24 feet. The lower permanent packer will be open. We will
25 perforate the Upper Penn and produce both zones from beneath

1 the one permanent packer.

2 Q In your opinion, Mr. Copeland, will the
3 granting of the application in Case Number 8858 be in the
4 interest of conservation, the prevention of waste, and
5 protection of correlative rights?

6 A Yes, I do.

7 Q And were Exhibits One through Seven
8 prepared by you or taken from Exxon's company files?

9 A Yes, they were.

10 MR. BRUCE: At this time, Mr.
11 Examiner, I move the admission of Exhibits One through
12 Seven.

13 MR. CATANACH: Exhibits One
14 through Seven will be admitted in evidence.

15 MR. BRUCE: I have no further
16 questions of the witness at this time.

17

18 CROSS EXAMINATION

19 BY MR. CATANACH:

20 Q Mr. Copeland, how did the gas influx
21 problem originate? Was there fluid in the hole (not clearly
22 understood?

23 A As you'll notice on Exhibit Number Two,
24 there's a note there that the mud weight at TD was 10.4
25 pounds per gallon. That's in the drill pipe. The gas, we

1 believe, was bleeding in from the formation. We were unable
2 to get it any higher than that to contain the gas influx be-
3 cause of lost return problems that we suspected up the hole
4 in either the Bone Spring or, you know, in the Bone Spring.

5 Q Mr. Copeland, are you prepared to address
6 how the production figures will be arrived at for both
7 zones?

8 A A later witness will address this.

9 Q That's fine.

10 MR. CATANACH: We have no fur-
11 ther questions at this time.

12
13 JIM BARTEL,
14 being called as a witness and being duly sworn upon his
15 oath, testified as follows, to-wit:

16
17 DIRECT EXAMINATION

18 BY MR. BRUCE:

19 Q Would you please state your name, city of
20 residence, occupation, and employer?

21 A My name is Jim Bartel. I live in An-
22 dreds, Texas. I work as a geologist for Exxon Corporation.

23 Q And have you previously testified before
24 the OCD as a geologist?

25 A No.

1 Q Would you briefly describe your educa-
2 tional and work background?

3 A I received a Bachelor of Science degree
4 in 1977 in earth science from Central Missouri State Univer-
5 sity.

6 I received a Master of Science degree in
7 1981 in geology from Western Michigan University.

8 I've been employed by Exxon since 1981 as
9 a production geologist. For the past one and a half years
10 I've worked as a production geologist in Eddy County, New
11 Mexico, mapping prospects primarily in Pennsylvanian forma-
12 tions.

13 Q And are you familiar with the geology in
14 the Mary Fed No. 1 and the Mary Fed No. 5 Wells?

15 A Yes.

16 MR. BRUCE: Mr. Examiner, is the
17 witness considered qualified?

18 MR. CATANACH: Mr. Bartel is
19 considered qualified.

20 Q Would you please refer to Exxon Exhibit
21 Number Eight and describe the Pennsylvanian geology in the
22 area of interest?

23 A Exhibit Number Eight is a cross section.
24 The attached cross section shows two wells, the Exxon Mary
25 Federal No. 1 to the far left, was formerly the Hanagan

1 Sheep Draw No. 1, and it's on the NMOCD Pennsylvanian
2 stratigraphic cross section, Eddy County, New Mexico, B-B',
3 as Well No. 18.

4 Three formation tops were taken from the
5 NMOCD cross section, Upper Penn, Strawn, and Atoka.

6 The well on the right is the subject
7 well, the Exxon Mary Federal No. 5. The three formation
8 tops are correlated from the Mary Federal No. 1 and the Mary
9 Federal No. 5, all of which -- excuse me -- current
10 perforations are indicated on the Mary Federal No. 5, all of
11 which are within the Strawn formation.

12 The proposed additional perforations are
13 also indicated located stratigraphically within the Upper
14 Penn formation.

15 Deposits of the Strawn formation are
16 composed of interbedded limestones, shales, and sandstones.
17 Most of the gas production that has been established has
18 been from the limestones which were deposited as carbonate
19 shelf sediments.

20 The Upper Penn sediments reflect a
21 continuation of limestone and shale deposition similar to
22 the Strawn formation.

23 In the Mary Federal No. 5 limestons of
24 the Upper Penn formation locally thicken and are possibly
25 gas productive.

1 The index map shows the locations of both
2 wells on the cross section plus a third wells, the discovery
3 well for the White's City Pennsylvanian Gas Pool, the Gulf
4 Oil Corporation Federal Estel AD No. 1, located in Section
5 29, Township 24 South, Range 26 East.

6 This pool was formed by Case Number 2157,
7 Order No. R-1857, and classified as a gas pool for Pennsyl-
8 vanian production.

9 The Pennsylvanian in this case includes
10 the Upper Penn, Strawn, Atoka, and Morrow formations. The
11 discovery well, initially completed only in the Strawn for-
12 mation. It was later recompleted to the Atoka and Morrow
13 formations. Subsequent wells have completed in Strawn, Ato-
14 ka, or Morrow formations.

15 In the White's City Pennsylvanian Pool
16 Gas produced simultaneously from more than one Pennsylvanian
17 formation has not resulted in damage or waste. No damage or
18 waste is anticipated if gas production from the Upper Penn
19 and Strawn formations are commingled in the Mary Federal No.
20 5.

21 I'd like to submit this geologic summary
22 as Exhibit Number Nine.

23 Q In your opinion, Mr. Bartel, will the
24 granting of the applications bein the interest of conserva-
25 tion and the prevention of waste?

1 A Yes.

2 Q And were Exhibits Eight and Nine prepared
3 by you or under your direction?

4 A Exhibit Nine was prepared by me. Exhibit
5 Eight was prepared by another Exxon geologist. I have
6 reviewed the data and concur with his interpretation.

7 MR. BRUCE: At this time, Mr.
8 Examiner, I move the admission of Exhibits Eight and Nine.

9 MR. CATANACH: Exhibits Number
10 Eight and Nine will be admitted into evidence.

11 MR. BRUCE: No questions of
12 this witness.

13 MR. CATANACH: I have no ques-
14 tions of this witness.

15
16 JOHNNY W. JORDAN,
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. BRUCE:

22 Q Mr. Jordan, would you please state your
23 full name, city of residence, occupation, and employer?

24 A My name is Johnny W. Jordan. I work for
25 Exxon Corporation as a reservoir engineer in Andrews, Texas.

1 Q And have you previously testified before
2 the OCD as an engineer?

3 A Yes, I have.

4 Q And are you familiar with the engineering
5 matters involved in both Cases 8858 and 8842?

6 A Yes.

7 MR. BRUCE: Mr. Examiner, is
8 the witness considered qualified?

9 MR. CATANACH: Mr. Jordan, when
10 was the last time you testified before the Division?

11 A Four weeks ago.

12 MR. CATANACH: Thank you. Mr.
13 Jordan is considered qualified.

14 Q Mr. Jordan, please refer to Exhibit Num-
15 ber Ten and discuss its contents for the examiner.

16 A Exhibit Number Ten shows a Horner plot
17 that was used to calculate the bottom hole pressure on the
18 Mary Federal No. 5. The calculated bottom hole pressure in
19 the Strawn is 4201 pounds at a depth of 10,200 feet, based
20 on the build-up calculations in which this Horner plot was
21 used.

22 It should be noted that an isolated bot-
23 tom hole pressure measurement on the Strawn is not likely
24 due to communication problems; however, build-up analysis
25 indicates no cross flow between the two zones because no

1 anomalies were seen during the build-up test.

2 Also the build-up analysis indicates
3 there are not any abnormally high pressure stringers present
4 in either zone. If there were any abnormally high pressure
5 stringers present it would have been seen in the build-up
6 test.

7 Q Would you now refer to Exhibit Number
8 Eleven, the OCD Form C-122, and discuss its contents?

9 A Exhibit Number Eleven is Form C-122 for
10 the calculated absolute open flow test. The final flow rate
11 reported on this form was 912 MCF per day at a tubing pres-
12 sure of 2665 pounds. The calculated absolute open flow rate
13 is 3.73-million cubic feet per day.

14 At this time I'd like to address the
15 problem of determining a formula for the allocation of pro-
16 duction to each of the proposed commingled zones.

17 Exxon is unable to develop a formula for
18 the allocation of production because the Upper Penn has yet
19 to be perforated. Once the Upper Penn is perforated an al-
20 location formula will be developed from the difference be-
21 tween the absolute open flows.

22 The difference between the current CAOF,
23 which is Exhibit Number 11, and the COF taken after the Up-
24 per Penn is perforated will be assigned as a fraction of al-
25 located -- as a fraction allocated to the Upper Penn.

1 The remaining fraction will be assigned
2 to the Strawn.

3 It should be noted that the value of the
4 commingled production will not be less than the sum of the
5 values of the individual strings. The gas from either zone
6 is yet to be contracted. No NGPA effects are anticipated
7 due to the commingling of the production. Therefore the
8 value of the commingled production will not be less than the
9 value of the individual strings.

10 Q Will you now refer to Exhibit Number
11 Twelve and discuss it?

12 A Exhibit Number Twelve is a gas analysis
13 of the hydrocarbon gas from the Mary Federal No. 5. Exxon
14 does not anticipate any problem with the formation damage
15 from the commingling of the formation waters. No water pro-
16 duction is anticipated from either zone based on the fact
17 that no significant water production has been produced from
18 the Strawn or the Upper Penn in the area.

19 Currently the load water has yet to be
20 completely recovered in the Mary Federal No. 5.

21 Q Please now move on to Exhibit Thirteen.

22 A Exhibit Thirteen is a Form C-116, the
23 gas/oil ratio test. That was submitted to the NMOCD. The
24 water production that was made during this 24-hour test was
25 entirely load water. As stated before, the load water has

1 yet to be completely recovered.

2 The gas rate reported during this 24-hour
3 test was 1,000,067 cubic feet of gas at a 746 pounds tubing
4 pressure, and the water production reported was 63 barrels.

5 Q Would you please now refer back to the
6 land plat marked as Exhibit Number One and describe the
7 working interest ownership and the correlative rights in
8 Section 11 and the offsetting acreage?

9 A The acreage colored yellow is Exxon's ac-
10 reage. As can be seen, Exxon owns 100 percent of Section
11 11, where the Mary Federal No. 5 is located. This section
12 is 100 percent Federal acreage.

13 Exxon owns the acreage to the south,
14 southeast, east, northeast, and to the west.

15 Anadarko owns the acreage to the south-
16 west. HNG and Northern Natural Gas own the acreage to the
17 north.

18 Pogo Production owns the acreage to the
19 northwest.

20 All the offset acreage is Federal acreage
21 except to the west, northwest, and north, where it is State
22 acreage.

23 Because of Exxon's ownership to the
24 south, east, and west, and the acreage is 100 percent Exxon
25 and Federal, no party's correlative rights would therefore

1 be violated.

2 Q And have the offset owners, the Federal
3 government and the OCD District Office, been notified of
4 Exxon's proposed downhole commingling?

5 A Yes, they have.

6 Q And were they sent a copy of the February
7 12th, 1986 letter?

8 A Yes. These parties were sent copies of
9 our February 12th, 1986 letter with attachments, and copies
10 of certified return receipts are submitted as Exhibit Number
11 Fourteen.

12 Q Will you please now move forward to Exhi-
13 bit Number Fifteen and discuss the economics of the pro-
14 posed downhole commingling?

15 A Based on the costs and the risks pre-
16 sented on Exhibit Number Five, Exxon cannot economically
17 justify an attempt to repair the channel and return the
18 Strawn to production. The reserve estimate used in these
19 economics was .3 BCF of gas. The reserve estimate is based
20 on several equivalent Strawn completions in the area.

21 If downhole commingling is not approved,
22 Exxon plans to squeeze the current Strawn perforations with-
23 out attempting to restore the Strawn to production, and re-
24 complete it into the Upper Penn interval.

25 Downhole commingling has been requested

1 to prevent the waste of an estimated .3 BCF of gas of Strawn
2 reserves.

3 Q Would you please now refer to Exhibit
4 Number Sixteen and discuss the current orientation of the
5 units dedicated to the Mary Fed No. 1 and Mary Fed No. 5
6 Wells and the reasons for this orientation?

7 A Exhibit Number Sixteen shows how the Mary
8 Federal No. 1 and the Mary Federal No. 5 proration units are
9 currently oriented in Section Number 11.

10 The Mary Federal No. 5 was originally
11 drilled to be completed in the Morrow formation but because
12 of high gas volumes and lost circulation zones up in the
13 hole casing was set at the base of the Strawn.

14 It was not anticipate that Strawn would
15 be completed in the Mary No. 5 before it was depleted in the
16 Mary No. 1, therefore avoiding the problem of the proration
17 unit orientation.

18 The Mary Federal No. 1 is currently pro-
19 ducing 7 MCF per day.

20 The Mary Federal No. 5 was drilled in the
21 southern portion of the section for geological reasons. Its
22 proration unit was laid down so it would not be an unortho-
23 dox location.

24 Q Would you please refer to Exhibit Seven-
25 teen and discuss the proposed orientation of units sought by

1 Exxon?

2 A Exhibit Number Seventeen shows the
3 proposed proration unit orientation. It is being requested
4 that the proration unit for the Mary Federal No. 1 be
5 changed from the east half of Section 11 to the north half
6 of Section 11.

7 The Mary Federal No. 1 was drilled and
8 completed in 1973. This will make the location for the Mary
9 Federal No. 1 an orthodox location.

10 If you stood up or laid down the prora-
11 tion units in Section 11, either the Mary Federal No. 1 or
12 the No. 5 would be unorthodox. Both would be unorthodox to
13 Exxon, though.

14 Exxon owns 100 percent of the mineral
15 rights in Section 11 and the section is 100 percent Federal
16 acreage; therefore, since the lessee and the lessor of the
17 section are identical, no correlative rights will be vio-
18 lated.

19 Q Okay. Has Exxon notified the offset
20 operators to the north or the east of the proposed unortho-
21 dox location for the Mary Fed No. 1 Well?

22 A Yes. Copies of the waivers signed by Po-
23 go Producing Company and HNG in the north are submitted as
24 Exhibit Number Eighteen.

25 The certified return receipts by which

1 the waivers were sent to Pogo and HNG are submitted as Exhi-
2 bit Number Nineteen.

3 Q In your opinion will the granting of the
4 applications in both these cases be in the interest of con-
5 servation, the prevention of waste, and the protection of
6 correlative rights?

7 A Yes.

8 Q Were Exhibits Ten through Nineteen pre-
9 pared by you or compiled from Exxon's company records?

10 A Yes.

11 MR. BRUCE: At this time, Mr.
12 Examiner, I move the admission of Exhibits Ten through Nine-
13 teen.

14 MR. CATANCH: Exhibits Ten
15 through Nineteen will be admitted as evidence.

16 MR. BRUCE: I have no further
17 questions of the witness at this time.

18

19 CROSS EXAMINATION

20 BY MR. CATANACH:

21 Q Mr. Jordan, the proration unit for the
22 Mary Federal No. 5, why was that chosen to be a laydown pro-
23 ration unit as opposed to the west half? Is it because of
24 the location for the well?

25 A No. It was originally proposed as a Mor-

1 row completion. Since the Mary Federal No. 1 was a Strawn
2 completion, we had good geological reasons for trying to get
3 as far south as legally possible and so therefore to get a
4 legal location we laid down the proration unit.

5 Q Mr. Jordan, referring to Exhibit Number
6 Eleven, and Exhibit Number Thirteen, the bottom hole pres-
7 sure test and the multipoint back pressure test, when these
8 tests were done, was there not communication in the wellbore
9 at that time?

10 A Yes, there were.

11 Q You stated that none of the production
12 was coming from the Penn?

13 A No. There is production coming from the
14 Penn. The amount is unknown. You know, we can't get an iso-
15 lated pressure or a 4-point from the Strawn interval because
16 of the communication. It's hard to put a quantity number on
17 how much production is coming from the Penn. I don't feel
18 lilke it's a significant amount of gas volumes, and for --
19 as far as pressure goes, like I said before, if there was a
20 high pressure stringer present or some sort of cross flow in
21 the wellbore, it would have been seen in the build-up test.

22 Q So your recommended allocation formula
23 isn't really going to be accurate.

24 A It's going to be as accurate as possible
25 with what -- the situation that we have.

1 Q Mr. Jordan, are the royalty interest
2 owners and the overriding royalty interest owners the same
3 for both zones?

4 A That's correct, they are.

5 Q Mr. Jordan, are these prorated gas pools?

6 A I believe they are. I believe they are.

7 Q Mr. Jordan, are there any other wells
8 completed in the area that you may be able to obtain
9 production figures from that may -- that you may be able to
10 get a more accurate, say, allocation formula?

11 A There's other wells in the area that are
12 producing out of the Strawn. As far the Upper Penn goes,
13 it's pretty limited in the area. In fact, there's only one,
14 I believe, on the plat that we showed earlier and it was
15 very insignificant amount of gas.

16 We feel like our well's much better in
17 the Upper Penn. We hit some sort of isolated stringer
18 that's not in any other wellbores, so I don't feel like we
19 can use data from offset wells, at least within several
20 miles.

21 Q But you do have some production figures
22 from the Strawn formation.

23 A Yes, we do, and that's, you know, I've
24 used those production figures to come up with my reserve
25 estimates for my economics, so we do have a reasonable

1 amount of Strawn production figures.

2 Q Is the initial production figures that
3 you arrived at from these tests, are they anywhere near any
4 of the initial production figures on any of the other Strawn
5 wells in the area?

6 A Yes, I believe they are. You know,
7 there's a pretty big range of Strawn completions in the
8 area, you know. There's several quite a bit higher and
9 several quite a bit lower. Some of them had high COF's,
10 ended up not cuming a tremendous amount of gas volume so it
11 makes me believe that there are somewhat limited reservoirs
12 and we feel like, you know, we reasonably came up with a re-
13 serve estimate for the Strawn.

14 Q Mr. Jordan, can you possibly take a look
15 at some of the wells in the area and provide us with some
16 initial production figures from the Strawn formation?

17 A Yeah, we can -- I've got that information
18 here now.

19 Q Do you have it?

20 A I have some. If you take a look at Exhi-
21 bit Number One, I believe, that plat of production. Okay,
22 the blue dots are the Strawn production. In Section Number
23 6 the Strawn was completed in 8-75; had an IP of a CAOF of
24 15-million cubic feet per day. Its cum was 300,000,000
25 cubic feet of gas. Currently the well is shut in.

1 Section Number 12 --

2 Q Sorry, would you back up a second?

3 A Okay, sure.

4 Q The initial potential was 15-million a
5 day?

6 A That's correct, CAOF.

7 Q Okay, go ahead.

8 A In Section Number 12 the Strawn was per-
9 forated in 11-84. Its IP was 1.4-million cubic feet of gas
10 per day. Its cum is 127-million cubic feet of gas per day
11 and its current production is 1 -- 109 cubic feet per day.

12 Okay, in Section Number 11, the Mary No.
13 1 that we have, the Strawn was shot 1-85. It's IP flowing
14 was 1.4-million cubic feet of gas. Its cum is 15-million
15 cubic feet of gas and its current production is 7 MCF per
16 day.

17 And in Section 22 the Strawn was shot in
18 11-77. Its IP, its calculated absolute open flow was 4.2-
19 million cubic feet of gas per day. Its cum was 223-million
20 cubic feet of gas. Its current production is 52 MCF per
21 day. This is the one I feel like is the most representative
22 of a look-alike case in our situation.

23 Q It looks to me like the AOF on your Mary
24 Federal No. 5 may be a little high for that -- for that
25 area.

1 A We, you know, because of the gas problems
2 we had while we were drilling the well, feel like we have a
3 much better well than some of the offset wells. You know,
4 the Strawn production can come and go very quickly in this
5 area, the reservoir, and -- but we really can't say how good
6 ours is compared to offset wells because of logs. We had to
7 set pipe before we get to run open hole logs, so we did not,
8 we just got a cased hole neutron and because of gas effect,
9 we -- we really don't know what kind of porosity we have.

10 If there's a big problem with the alloca-
11 tion, I think it would be found out as soon as we perforated
12 that upper interval, ran another CAOF test, and if there was
13 a considerable amount of difference, then you'd feel like
14 there was not a significant amount of production from that
15 Upper Penn, but if they ended up being the same, then you'd
16 feel like that yes, you were in -- you know, there was a
17 substantial amount of communication between the two zones.

18 I think once we get the second CAOF we
19 would know, you know, if -- what kind of situation we had.

20 Q If the test on the Upper Penn indicates
21 that there's not a substantial difference between the two,
22 how do you then propose to allocate?

23 A Well, something we've considered and it's
24 required by the Commission once we have that situation, I
25 think a production log would be run because both zones will

1 be flowing. We would have to get approval by our management
2 but if it is required by the Commission, we could run a pro-
3 duction log and we feel like we could get a reasonable allo-
4 cation from that.

5 MR. CATANACH: I have no
6 further questions of this witness.

7 MR. BRUCE: I have one last
8 thing, Mr. Examiner.

9 As I mentioned at the outset in
10 Case 8858, the proper name of the applicant was Exxon
11 Corporation rather than Exxon Company, USA.

12 The application for Case 8858
13 was made to the OCD by a letter from Exxon dated February
14 12th, 1986. In attachment to the letter Exxon's name is
15 given as Exxon Corporation and therefore Exxon hopes and
16 believes that readvertisement of these cases is not
17 necessary.

18 MR. CATANACH: Thank you.

19 Is there anything further in
20 Case 8858 or Case 8842?

21 If not, they will be taken
22 under advisement.

23

24 (Hearing concluded.)

25

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY
CERTIFY 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 and correct transcript of the hearing in
the Commission Case No. 858 8842
heard by me on March 19, 86.

David R. Catamb Secretary
Oil Conservation Division

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARINGSANTA FE, NEW MEXICOHearing Date MARCH 19, 1986 Time: 8:15 A.M.

NAME	REPRESENTING	LOCATION
Bill Duncan	EXXON	Midland
Johnny Jordan	EXXON	Andrews TX
Jim Bartel	EXXON	Andrews TX
Carter Copeland	"	"
W. Perry Pearce	Montgomery & Andrews, P.A.	Santa Fe
Jim Pearce	Hinkle Law Firm	Santa Fe
Karen Aubrey	Kellahan + Kellahan	Santa Fe
Bah Haker	Byrum	Santa Fe
Steve Strunk	Tenneco	Denver
Kevin C. Heringer	Tenneco	Denver
Greg Davis	Pennzoil	Midland
W. V. Kellahan	Kellahan + Kellahan	Santa Fe
Ernest L. Padilla	Padilla + Snyder	Santa Fe
K. J. Pack	Tenneco Oil	Denver
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