

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

4 25 July 1984

5 EXAMINER HEARING

6
7
8 IN THE MATTER OF:

9 Application of ARCO Oil and Gas Com- CASE
pany for downhole commingling, Lea 8276
County, New Mexico.

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11
12 BEFORE: Michael E. Stogner, Examiner
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14 TRANSCRIPT OF HEARING
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17 A P P E A R A N C E S
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20 For the Oil Conservation W. Perry Pearce
Division: Attorney at Law
21 Oil Conservation Commission
State Land Office Bldg.
22 Santa Fe, New Mexico 87501

23 For the Applicant:
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MR. STOGNER: Call next Case
Number 8276.

MR. PEARCE: That case is on
the application of ARCO Oil and Gas Company for downhole
commingling, Lea County, New Mexico.

Mr. Examiner, that case is to
be readvertised and continued until August the 8th, 1984.

MR. STOGNER: Case Number 8276
will be so continued to a Division Hearing scheduled for
August 8th, 1984.

(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 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 correct and true copy of the transcript in the file number 8276 heard by me on July 25 1984.

Michael P. Stogner Examiner
Oil Conservation Division

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

6 9 August 1984

7 EXAMINER HEARING

8 IN THE MATTER OF:

9 Application of ARCO Oil & Gas Com-
10 pany for downhole commingling, Lea
11 County, New Mexico.

CASE
8276

12 BEFORE: Richard L. Stamets, Examiner
13

14 TRANSCRIPT OF HEARING
15

16 A P P E A R A N C E S
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18
19 For the Oil Conservation
20 Division:

W. Perry Pearce
Attorney at Law
Oil Conservation Commission
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22 For the Applicant:

William F. Carr
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CAMPBELL AND BLACK P. A.
P.O. Box 2208
Santa Fe, New Mexico 87501
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I N D E X

JACK LOWDER

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E X H I B I T S

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MR. STAMETS: Okay, we'll go ahead now with Case 8276.

MR. PEARCE: This case is on the application of ARCO Oil and Gas Company for downhole commingling, Lea County, New Mexico.

MR. CARR: May it please the Examiner, my name is William F. Carr, with the law firm Campbell and Black, P. A., of Santa Fe, appearing on behalf of ARCO Oil and Gas Company.

I have one witness who needs to be sworn.

MR. PEARCE: Are there other appearances in this matter?

(Witness sworn.)

JACK LOWDER,
being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q Will you state your full name and place of residence?

A Jack Lowder of Midland, Texas.

Q By whom are you employed and in what capacity?

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A I'm employed by ARCO Oil and Gas Company as an Operations Analytical Engineer in Midland.

Q Have you previously testified before this Commission or one of its examiners?

A No, I have not.

Q Would you review for Mr. Stamets your educational background and your work experience?

A I graduated from Texas State University with a BS in chemical engineering in May of 1979.

I have worked for ARCO for five years, two years in Midland, Texas, and three years in Tulsa, Oklahoma.

Q Does your area of responsibility with ARCO include southeastern New Mexico?

A Yes, it does.

Q Are you familiar with the application filed in this case on behalf of ARCO?

A Yes.

Q Are you familiar with the subject wells?

A Yes, I am.

MR. CARR: We tender Mr. Lowder as an expert witness in petroleum engineering.

MR. STAMETS: He is considered qualified.

Q Mr. Lowder, will you briefly state what ARCO seeks with this application?

A We plan to triple downhole commingle the

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Blinebry, Drinkard, and Wantz-Abo Pools in the S. J. Sarkeys No. 4, the Roy Barton No. 2, and the Roy Barton No. 3, all located in Section 23, Township 21 South, Range 37 East of Lea County, New Mexico.

Q Have you prepared certain exhibits for introduction in this case?

A Yes, I have.

Q Would you please refer to what has been marked for identification as ARCO Exhibit Number One, identify this and review it for Mr. Stamets?

A Exhibit Number One consists of nine pages. The first three pages concern the Sarkeys No. 4. The middle three concern the Roy Barton No. 2 and the last three pages concern the Roy Barton No. 3.

Page one shows the location of the Sarkeys No. 4, as indicated by the red arrow. The area outlined in red is a 40-acre spacing unit. The offset operators and offset wells are also shown on this page one.

Page two shows a clearer plat of the offset operators and it also shows the 40-acre spacing unit that the well is located in.

Page three shows the offset operators. It's a list of the offset operators for the S. J. Sarkeys Lease, along with the addresses.

In a similar fashion page four shows the location of the Roy Barton No. 2, as indicated by the orange arrow. Outlined in red is the 40-acre spacing unit.

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Page five is a clearer plat showing the location of the Roy Barton No. 2 along with its offset operators.

Page six is a list of the offset operators for the Roy Barton Lease, showing their addresses.

Page seven shows the Roy Barton No. 3 location and its 40-acre spacing unit.

Page eight shows a clearer plat of the -- where the Roy Barton No. 3 is located, along with its spacing unit.

And the last page also shows the list of and addresses of the offset operators.

Q What is the status of the land, State, Federal or fee?

A The land is fee.

Q Now, Mr. Lowder, are there other wells in the area for which downhole commingling has been approved in each of these zones?

A Okay. There are three wells, as seen on page one of Exhibit Number One.

Acoma's Sarkeys, S. J. Sarkeys No. 2, located in Unit B of Section 26, which is a southwest offset to the S. J. Sarkeys No. 4, was approved for triple downhole commingling of the Drinkard, Blinebry, and Wantz-Abo by Order No. R-7069 on September 27th, 1982.

Also to the southeast Petro Lewis' Art Yeager No. 1, located in Unit J, Section 25, was approved

1
2 for triple downhole commingling of the same three zones by
3 Order No. R-7159 on January 3rd, 1983.

4 There's also a third well, which is not
5 shown on this plat, but it's to the southwest in the -- in
6 the range to the -- to the west. It was triple -- quadruple
7 downhole commingled in the Blinebry, Drinkard, Wantz-Abo,
8 and the Wantz Granite Wash by Order R-7209, which was ap-
9 proved on February 21st, 1983.

10 MR. CARR: May it please the
11 Examiner, we would request that you take administrative no-
12 tice of Orders R-7069, R-7159, and R-7209.

13 MR. STAMETS: I will.

14 Q Now, Mr. Lowder, the Petro Lewis well to
15 which you referred, that is the well in the southeast quar-
16 ter of Section 25?

17 A It is in, excuse me, it is not in the --
18 it is -- the Sarkeys is in the southeast -- southeast, the
19 southeast quarter; however, the Acoma Well is located in
20 Unit B, which is -- it is the northwest of the northeast of
21 Section 26.

22 Q The Petro Lewis Well --

23 A Excuse me.

24 Q -- is the well in the southeast of 25?

25 A Yes, it is.

Q And it has "dual" under it and that is an
incorrect --

A That's correct.

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Q Okay. It's correct that it's incorrect.

A That's correct that it's a triple downhole commingling. This is incorrect.

Q Is the ownership common in each of the zones to be commingled?

A Yes, it is.

Q Is production in any of the three subject wells currently being downhole commingled?

A Yes. Two of the wells are downhole commingled in the Blinebry and the Drinkard, the S. J. Sarkeys No. 2 and the Roy Barton No. 2. Excuse me, the S. J. Sarkeys No. 4

Q And the Roy Barton No. 2.

A Yes.

Q Will you please refer to the exhibits --
MR. STAMETS: Do you have the order number that authorized that downhole --

A Yes.

MR. STAMETS: -- commingling?

A The Sarkeys No. 4 was approved for downhole commingling by Order No. DHC-346, August, 1981, and the Roy Barton No. 2 was approved for downhole commingling the Blinebry and the Drinkard by Order No. R-6783 in September of '81.

MR. STAMETS: Thank you.

Q Mr. Lowder, would you now refer to Exhibit Number Two and review this for the Examiner?

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A Okay. Exhibit Number Two consists of five pages.

The first page is a diagrammatic sketch of the -- of the Sarkeys No. 4 under the present conditions. It shows the current -- the current conditions and the casing program that is present.

The well is currently downhole commingled in the Blinbry and Drinkard with 2-3/8ths inch tubing.

The Wantz-Abo is temporarily abandoned with a 7-inch cast iron bridge plug, which below it has a Model D packer.

The second page is a diagrammatic sketch of the Sarkeys Well No. 4, showing the proposed work to be done on the well. It shows that we plan to drill out the bridge plug and the packer, acidize the Wantz-Abo and run 2-3/8ths inch tubing down to the Wantz-Abo zone.

The final three pages show the well history of -- all the history of the well.

It should also be noted that on the diagrammatic sketches the acid and frac volumes shown are the sum of all the treatments, not an individual treatment. The individual treatments are shown in the well history.

Q Will you now refer to Exhibit Number Three?

A Okay. Exhibit Number Three consists of four pages and contains the same type of information as Exhibit Number Two, except it's for the Roy Barton No. 2.

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2 The first page is a diagrammatic sketch
3 of the Roy Barton No. 2 under the present conditions. It is
4 also downhole commingled in the Blinebry and the Drinkard.
5 The -- currently the Wantz-Abo zone is temporarily abandoned
6 with the use of two cement retainers -- excuse me, one --
7 one cast iron bridge plug, a cement retainer, and there are
8 also two Model D packers under the Drinkard.

9 The second page shows a diagrammatic
10 sketch of the Roy Barton No. 2 showing the proposed work.
11 We plan to remove both bridge plugs, excuse me, the cement
12 retainer and the bridge plug, the two packers, and add perfs
13 to the Blinebry, Drinkard and Wantz-Abo, and also acidize
14 the three zones.

15 The remaining pages show the well history
16 for the Roy Barton No. 2.

17 Q Will you now refer to ARCO Exhibit Number
18 Four?

19 A Exhibit Number Four consists of four
20 pages. It contains, it also contains the same information
21 as the same two exhibits.

22 The first page is a diagrammatic sketch
23 of the Roy Barton No. 3 under its present conditions. It is
24 a single Blinebry producer. The Drinkard and Wantz-Abo are
25 currently temporarily abandoned. There's a cement retainer
set right above the Drinkard perforations, which were
squeezed, and the -- there is a Model D packer with seal as-
sembly with ten feet of cement on top of that that segre-

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gates the Wantz-Abo from the Drinkard.

The second page of the diagrammatic sketch shows the Roy Barton No. 3. It shows the proposed work on the well, which we plan to remove the bridge plug and the cement retainer, excuse me, the packer, and also to add perforations to the Wantz-Abo and acidize; also add perforations to the Drinkard and acidize; also add -- acidize the Blinebry.

The remaining two pages of this exhibit show the well history for the Roy Barton No. 3.

Q Mr. Lowder, will you now identify Exhibit Number Five and review the information contained thereon?

A Okay. Exhibit Number Five consists of three pages.

Page 1 is a Form C-116 for the Sarkeys No. 5. It shows the allocation of oil and gas to each commingled zone, as noted at the -- below the -- below this first sentence which gives the -- the reason for this C-116.

The second page is a C-116 for the Roy Barton No. 2. It also shows the breakout between the commingled production of the Blinebry and the Drinkard.

The final page is a C-116 for the Roy Barton No. 3.

All of these tests were taken in the last week of June of 1984.

Q Mr. Lowder, will you now refer to Exhibit Number Six?

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A Okay. Exhibit Number Six shows the production decline curves for each zone that's currently producing in the three wells.

 Each graph shows the daily oil, gas and water production for each month and this is based on the same information that is supplied to the State.

Q And these are the average daily productions by month?

A Right, correct.

Q Are the zones to be commingled in the subject wells capable of only marginal production?

A Yes.

Q Are they currently flowing or being artificially lifted?

A All zones that are currently open are being pumped, rod pumped, and each well -- each well will be rod pumped once -- once the Wantz-Abo is opened up.

Q Would you now go to Exhibit Number Seven and review this for Mr. Stamets?

A Exhibit Number Seven is a summary of the bottom hole pressures for the Blinebry, Drinkard, and Wantz-Abo in nearby wells. This data was used instead of the data from the actual wells because two of the three subject wells are currently downhole commingled and this data was already available.

 It indicates that the bottom hole pressure for the Blinebry is 263; for the Drinkard is currently

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about 201; and from the Wants-Abo it's about 621 pounds.

Q What does this exhibit show as far as the pressures and the pressure differentials that you expect to experience across the perforated zones in each of the wells?

A That the differential pressures should not result in any sort of crossflow to the -- I believe, and there should not be any sort of gas migration.

Q Have you taken production data and calculated an average rate of production from each of the zones?

A Yes, I have.

Q Are you prepared to make a recommendation to the Examiner as to the allocation of production from each of these commingled zones?

A Yes, I am.

Q Would you review those, please?

A Okay, for the -- based upon the -- the current production of the Blinebry and Drinkard in the S. J. Sarkeys No. 4, and also upon the expected production from the Wantz-Abo, which had produced at one time before, we expect -- we would like to allocate the Blinebry oil production at 14 percent of the total oil production; Drinkard, 38 percent; and Wantz-Abo, 48 percent.

For the gas, we recommend 13 percent of the total gas for the Blinebry; 77 percent for the Drinkard; and 10 percent for the Wantz-Abo.

For the Roy Barton No. 2, we recommend for the Blinebry 50 percent of the oil; for the Drinkard 11

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percent; and for the Wantz-Abo, 39 percent.

For the gas production we would like to allocate 78 percent to the Blinebry; 14 percent to the Drinkard; and 8 percent to the Wantz-Abo.

In the Roy Barton No. 3 we recommend we allocate 35 percent of the oil to the Blinebry; 22 percent to the Drinkard; and 43 percent to the Wantz-Abo.

For the gas production we would like to allocate 36 percent to the Blinebry; 42 percent to the Drinkard; and 22 percent to the Wantz-Abo.

Q Do you anticipate any problems with compatibilitis of fluids produced from these zones?

A No, I do not. In fact, at the present time on the S. J. Sarkeys Lease we have approval to -- to surface commingle the Blinebry, Drinkard, and Wantz-Abo.

Q And do you have the order number approving that surface commingling?

A Yes, I do. It is commingling order PC-219, approved December 9th, 1983.

Based upon the results we've seen from surface commingling these three zones, we do not expect any sort of incompatibility because we have not seen any sort of incompatibility.

Q Mr. Lowder, in your opinion are the reservoir characteristics of these pools such that underground waste will not be caused by the proposed downhole commingling?

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A Excuse me, could you repeat that question again?

Q Are the reservoir characteristics of these pools such that underground waste will not be caused by the proposed downhole commingling?

A I do not expect any sort of underground waste caused by this downhole commingling.

Q In your opinion will granting the application result in the increased recovery of hydrocarbons?

A Yes.

Q Will the value of the commingled production exceed the sum of the values of the production from each of the individual zones?

A Yes.

Q Will economic savings result from the proposed downhole commingling?

A Yes, it will.

Q In your opinion will granting this application be in the best interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes.

Q Were Exhibits One through Seven compiled by you?

A Yes, they were.

Q Can you testify to their accuracy?

A Yes, I can.

MR. CARR: At this time, Mr.

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Stamets, we would offer into evidence ARCO Exhibits One through Seven.

MR. STAMETS: These exhibits will be admitted.

MR. CARR: That concludes my direct of Mr. Lowder.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Lowder, on Exhibit Number Two, the series of Two, Three and Four, I guess, you show on the second page the tubing being set near the lowermost perforations. Is that your intention?

A Yes, sir.

Q Okay. I notice that there's no depth tubing placed on the second --

A Yeah, that hasn't been determined yet.

Q Okay. What were the Abo rates when the wells were abandoned in the Abo?

A Okay, in the S. J. Sarkeys No. 4 the well was producing 10 barrels of oil per day.

In the Roy Barton No. 2 the Abo was producing 7 barrels of oil per day.

And in the Roy Barton No. 3 the Abo was producing 4 barrels of oil per day.

Q Is that flowing or pumping?

A Okay. On the -- the wells were flowing.

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Q And how much gas?

A I don't have that available at this time.
I could get -- I can get that for you.

Q Okay, I would appreciate that.

Now there is a substantial pressure difference between the Wantz-Abo and the Blinebry and Drinkard zones. How will you prevent crossflow between those zones?

A I've calculated, based upon this -- these -- the difference between the subsea depths and liquid gradient, assuming a common -- common datum of 3656, which is the subsea depth of the Wantz-Abo, I've calculated the Blinebry to have a pressure of 708 psi; the Drinkard 416 psi; and the Wantz-Abo, of course, will stay at 621, which is within the range.

Q Okay.

A We plan, we do plan to keep the well pumping as much as possible at 24 hours a day.

Q All right.

MR. STAMETS: Any other questions of the witness? He may be excused.

Anything further in this case?

MR. CARR: Nothing further.

MR. STAMETS: The case will be taken under advisement.

(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 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 at the Examiner hearing of Case No. 8276 heard by me on 8-8 1984.
Richard J. [Signature], Examiner
Oil Conservation Division