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I N D E X

MICHAEL BRIDGES

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3 MR. QUINTANA: We'll call next
4 Case 8381.

5 MR. TAYLOR: The application of
6 Anadarko Production Company for waterflood expansion, Eddy
7 County, New Mexico.

8 MS AUBREY: Karen Aubrey, Kel-
9 lahin and Kellahin, appearing for the applicant.

10 I have one witness to be sworn.

11 MR. QUINTANA: Are there other
12 appearances in Case 8381?

13 Would the witness please stand
14 and be sworn?

15
16 (Witness sworn.)

17 MICHAEL BRIDGES,
18 being called as a witness, and being duly sworn upon his
19 oath, did testify as follows, to wit:

20 DIRECT EXAMINATION

21 BY MS. AUBREY:

22 Q Would you state your name and by whom you
23 are employed?

24 A Michael Bridges. I'm a senior reservoir
25 engineer at Anadarko Production Company, Midland, Texas.

Q Mr. Bridges, have you previously testi-

1
2 fied before the Commission and had your qualifications made
3 a matter of record?

4 A Yes.

5 Q Are you familiar with the application of
6 Anadarko in Case 8381?

7 A Yes, I am.

8 Q Can you briefly state what Anadarko seeks
9 by that application?

10 A Seeks expansion of our Ballard Grayburg-
11 San Andres waterflood, which includes the conversion of
12 eight producers to water injection wells and the drilling of
13 two lease line injection wells.

14 MS. AUBREY: Mr. Examiner, are
15 the witness' qualifications acceptable?

16 MR. QUINTANA: Yes, they are
17 considered acceptable. He may testify.

18 MS. AUBREY: Thank you.

19 Q Let me refer you to Exhibit One, Mr.
20 Bridges. Will you look at that and tell the Examiner what
21 that describes?

22 A This is a--

23 MR. QUINTANA: Karen, we don't
24 seem to have the exhibits.

25 MS. AUBREY: Oh, I gave them to
you, Mr. Quintana--

MR. QUINTANA: Oh, is that--

MS. AUBREY: --and you stuck

1 them in this file--

2 MR. QUINTANA: --was that--

3 MS. AUBREY: --right there.

4 MR. QUINTANA: Oh, I'm sorry.

5 I thought that was a previous exhibit.

6 MS. AUBREY: There you go.

7 MR. QUINTANA: I thought that
8 was extra copies for the previous case.

9 MS. AUBREY: I wish we had
10 extra copies for the previous case.

11 Q Let me refer you now to Exhibit One, Mr.
12 Bridges. What does that describe?

13 A This is a map showing all wells and
14 leases within two miles of the proposed conversions, the in-
15 jection wells.

16 Q And this is in the Ballard Grayburg-San
17 Andres waterflood project, is this right? And this project
18 has been previously approved by the Oil Conservation Commis-
19 sion Order R-7000, is that right?

20 A That's right.

21 Q Let me refer you now to Exhibit Two,
22 which is a land plat. Can you look at that, sir, and ident-
23 ify for the Examiner what the red dots on the plat are?

24 A The red dots--the red dots are the ten
25 proposed water injection wells. And the map also shows the
26 half-mile area of review around each well.

27 Q Now let me have you look at Exhibit Num-

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ber Three. Looking at Exhibit Number Three, Mr. Bridges can you identify for the Examiner what the two blue dots represent?

A The two blue dots are the proposed injection wells to be drilled.

Q Okay. And those are the two lease line wells?

A Yes.

Q Is that right?

A They are.

Q And the yellow boundary, is that the boundary of the waterflood--

A The yellow boundary is the--

Q --project?

A --Ballard Unit boundary.

A And the red dots on the map, what are those?

A Those are the wells that we propose to convert to injection.

Q Would you look at Exhibit Three, Mr. Bridges, and explain for the Examiner what the lines drawn between the dots represent?

A Okay. In the southwest portion of the unit is the waterflood expansion as approved in 1982. Those are the solid, solid lines.

The dashed lines are 80-acre 5-spot patterns that will be constructed when these wells are con

1
2 verted. And this is our proposed work.

3 Q How did you pick those locations, Mr.
4 Bridges?

5 A Well, they're really just an extension of
6 the 1982 work and they're in conformance with the 80-acre
7 patterns.

8 Q Let me refer you to the two lease line
9 proposed wells shown in blue on Exhibit Three. Can you ex-
10 plain for the Examiner how you picked those two locations?

11 A Again those complete are consistent with
12 the patterns in the area and they're required to enlose that
13 area.

14 Q Do you have any kind of a lease line
15 agreement in connection with those two wells?

16 A Yes. We submitted lease line agreements
17 to Depco, as operator of the Federal 632 lease, and to Ana-
18 darko as operator of the H. G. Watson lease, which adjoins
19 the Ballard Unit on the east.

20 Q And do you have any kind of agreement
21 with Depco as to the payment of the well cost for those two
22 lease line wells?

23 A We've submitted to them--it would be a 50
24 percent of the completed cost of the well.

25 Q Let me refer you now to Exhibit Number
Four. Which well is this a type log for?

A This is the 23-4, located in the center
of the unit. It's a water injection well drilled in 1982.

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A Was that pursuant to the previous Commission order --

A Yes, it was.

Q Order R-7000, is that right?

A R-7000, yes.

Q And does your type log, which is Exhibit Four, show the proposed injection interval?

A Yes, it does. It shows our unitized interval as well as the producing interval.

Q Let me refer you now to Exhibit Number Five. Will you describe that, please?

A This is data on the proposed operations.

Q What is your proposed injection rate?

A Okay, approximately 200 barrels of water per day per well.

Q And what proposed injection pressures do you predict?

A Well, we will ask for .2 psi per foot injection pressure and then we'll test the well and subsequent to that we'll submit justification for increasing the pressure if we need it, if we need to.

Q So you're asking for the order to follow the Commission guidelines?

A Yes. Yes, we are.

Q Exhibit Five also contains the geologic data required by the Form C-108, is that correct?

A Yes, it does.

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Q Let me refer you now to Exhibit Six.
Exhibit Number Six is a tabulation of the plugged and abandoned wells within the area of review, is that correct?

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A Yes, that's correct.

5

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Q In examining these, Mr. Bridges, have you noticed or do you have any wells in the area of review in which you have an opinion or have not been able to get complete data on the tops of the cement?

7

8

9

A Yes, we have three wells, the Ballard Unit 10-2, 10-3, and the 26-2, all located in Section 4.

10

11

Q Okay, those are pages two, three, and four of this exhibit, is that right?

12

13

A Yes. No, I think it's on their exhibit, it may be one, two, and three.

14

15

Q My first one is 23-1.

16

17

MR. TAYLOR: Our first one is 10-3. What were the three numbers again?

18

19

A It's 10-3, 26-2, and 10-2, and that would be in order on your exhibit.

20

21

MR. TAYLOR: Okay.

22

23

Q Have you been able to complete your research with the Commission files, District files, and the USGS to see whether or not you have received all of the plugging information on these three wells?

24

25

A No. We've gone to the District and we've -- we've tried to find everything we can. We haven't had

1
2 any success. We still have the USGS and whatever sources of
3 information we can come up with, so we're still looking.

4 MS. AUBREY: Mr. Examiner, Ana-
5 darko would ask that they be permitted to meet with the Dis-
6 trict Director after they have completed their record search
7 and either satisfy the District Director that these three
8 wells are adequately plugged, or go in and re-plug them.

9 MR. QUINTANA: That will be ac-
10 ceptable.

11 Q As to the remaining wells in this exhi-
12 bit, Exhibit Six, Mr. Bridges, are there any other wells in
13 here which you believe are inadequately plugged?

14 A No.

15 MR. QUINTANA: May I intervene
16 here just a second?

17 MS. AUBREY: Why, certainly.

18 MR. QUINTANA: When you do meet
19 with the District would you go through the whole list with
20 them?

21 A Certainly.

22 Q Now your next exhibit, which is a packet
23 of logs marked as Exhibit Seven, can you describe that for
24 the Examiner?

25 A These are the logs on the wells that we
plan on converting to water injection and there are five
logs and we're still looking for three of the logs.

Q So you have logs on five of the eight

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wells?

A Yes.

Q Okay.

MR. QUINTANA: You probably submitted these to the Division prior to this, haven't you?

A Yes, sir.

MR. QUINTANA: Okay.

A Some of these are old wells and I can't vouch for how they've -- or when they've been submitted or if they've been submitted, but from what we can find, we can find five wells.

MR. QUINTANA: All right. Usually, when the wells have been drilled in past years and submitted to the OCD and if they have been submitted to the OCD in the past you're not required to submit them at this time. We can -- we can forego the other three that you haven't found.

A Okay, thank you.

MR. QUINTANA: We'll assume that they have been submitted since this is a waterflood that has -- extension of a waterflood that has been in operation for awhile and we are familiar with that type of producing formation which is proposed.

Q Let me refer you to your well tabulation now, which we've marked as Exhibit Eight. Does this contain a well -- a tabulation of all producing and plugged and abandoned wells within the area of review?

1
2 A Yes, it does. This includes, as shown on
3 the maps and some of these wells have been submitted in the
4 Order R-7000 in 1982.

5 Q In examining the well data which you have
6 put together, do you know whether or not there are any pro-
7 ducing wells within the half mile area of review which pro-
8 ducer from lower formations that do not have adequate
9 cementing?

10 A No, all wells in the lower formations do
11 have adequate cement.

12 Q Let me refer you now to your water analy-
13 sis, which is Exhibit Nine. I notice that there is water
14 from two windmills referred to on the first page of that ex-
15 hibit. Can you tell the Examiner where those windmills are
16 located in relationship to the waterflood project?

17 A Okay, if you'll look at Exhibit Number
18 One, one windmill is located in Section 10, which is appro-
19 ximately two miles east of the unit and the other well is
20 located in Section 29, 17, 29, which is about two miles
21 north of the unit, and these are the closest windmills.

22 Q The closest sources of any fresh water?

23 A Yes.

24 Q What's the source of your produced water,
25 Mr. Bridges?

 A Produced water is the Grayburg-San Andres
water.

 Q What the source of the fresh water? You

1 show a 50/50 mixture here.

2 A Ogallala fresh water supply in the area
3 from Double Eagle.

4 Q Let me refer you now to your Exhibit Ten,
5 which consists of two parts, a letter and photocopies of re-
6 turn receipt cards. Is this the notification that went out
7 to surface owners and offset operators?

8 A Yes, it is.

9 Q Have you received any objection from any
10 of those people to the conversion of eight of your wells to
11 waterflood wells and the drilling of the two new wells?

12 A No objections.

13 Q Now, your last exhibit, Number Eleven,
14 contains schematic drawings of the proposed eight conversion
15 wells and I believe a type schematic of the two new wells,
is that correct?

16 A Yes, that's correct.

17 Q Referring to this exhibit can you explain
18 to the Examiner how you intend to complete the wells as in-
19 jection wells, including a description of the tubing size,
20 packer, annulus fluid, and the type of surface monitoring?

21 A Okay. We'll run 2-3/8ths inch soft plas-
22 tic-lined tubing set it in a 4-1/2 inch tension packer (not
23 understood.) We will fill the tubing casing annulus with
24 treated water and as far as the surface monitoring, we'll
leave the bradenhead valve open.

25 Q Mr. Bridges, did you examine the area and

1
2 have you found any evidence of open faulting or any other
3 hydrologic connection between your injection well -- your
4 injection formation and sources of fresh drinking water?

5 A No.

6 Q No, you --

7 A No, I'm sorry, okay. No, there is no
8 problem.

9 Q Mr. Bridges, do you know whether or not
10 this waterflood project has been a successful one and has
11 resulted in the recovery of additional oil?

12 A It's been very successful.

13 Q In your opinion will the granting of this
14 application protect correlative rights, promote conservation
15 and prevent waste?

16 A Yes, it will.

17 Q Were these exhibits, Exhibit One through
18 Eleven prepared by you or under your supervision and
19 direction?

20 A Yes, they were.

21 MS. AUBREY: Mr. Examiner, I
22 tender Exhibits One through Eleven.

23 MR. QUINTANA: Exhibits One
24 through Eleven will be admitted into evidence.

25 MS. AUBREY: I have no more
questions.

CROSS EXAMINATION

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3 BY MR. QUINTANA:

4 Q Mr. Bridges.

5 Q Yes, sir.

6 Q On the Ballard Unit Well No. 5-14, the
7 proposed injector --

8 A Yes.

9 Q -- the schematic on Exhibit Number
10 Eleven.

11 A Okay, yes, sir.

12 Q The bridge plug that's placed between the
13 Premier zone and the Jackson zone.

14 A Yes.

15 Q Has that been tested for its --

16 A Okay, that is proposed. We'll do that
17 upon conversion.

18 Q Okay, upon conversion, I see. So it's
19 not been at this time.

20 A No.

21 Q I see. I take it that the Jackson is
22 still capable of production. That's why you wish to place a
23 cement plug there instead of just filling it with cement,
24 right?

25 A Yes.

Q I see.

MR. QUINTANA: I have no fur-
ther questions of Mr. Bridges.

1
2 MR. TAYLOR: I have one.

3 CROSS EXAMINATION

4 BY MR. TAYLOR:

5 Q In your opinion will approval of this
6 application protect fresh water sources?

7 A Yes, it will.

8 MR. TAYLOR: That's all.

9 MR. QUINTANA: Are there any
10 further questions of Mr. Bridges?

11 MS. AUBREY: No, sir.

12 MR. QUINTANA: Mr. Bridges may
13 be excused.

14 If there is nothing further in
15 Case 8381 it will be taken under advisement.

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25 (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 Con-
servation Division was reported by me; that the said tran-
script 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 hearing in
the Examiner's office. 8386
heard by me on Oct. 17 1984.
Robert P. Quintana - Examiner
Oil Conservation Division