

MR. BIRDSEYE: No, it is not.

MR. MORRIS: And you are one of the partners in the company?

MR. BIRDSEYE: Yes. I would like to present some exhibits here. These should be numbered in sequence Exhibit 1, 2, and 3.

(Whereupon, Applicant's Exhibits Nos. 1, 2, and 3 marked for identification.)

MR. UTZ: Are there other appearances in this case?

MR. BIRDSEYE: No, sir, not on behalf of Chaco Oil Company.

MR. UTZ: You may proceed, Mr. Birdseye.

(Witness sworn.)

HENRY S. BIRDSEYE,

the witness, having been first duly sworn on oath, testified as follows:

MR. BIRDSEYE: My name is Henry S. Birdseye, Consulting Geologist, of Albuquerque, New Mexico; also a co-owner of Chaco Oil Company. We seek in this application to amend Commission Order R-1533, which originally established unorthodox locations, for the purpose of a waterflood in the Red Mountain Field in McKinley County, New Mexico.

The Chaco Oil Company lease covers the South Half of Section 20 and the North Half of Section 29 in Township 20 North, Range 9 West, McKinley County. It is a lease from the Santa Fe



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Railroad. Under Order R-1533, unorthodox locations for eleven injection wells were granted to permit the institution of a peripheral waterflood in the Red Mountain Field. At that time, the lease had been developed on unorthodox locations by previous owners and to an additional extent by ourselves.

The Order R-1533 provided that in the event that any of the eleven unorthodox locations for injection wells should prove to be oil-productive, that an administrative procedure was thereby established to permit the drilling of offset injection wells to replace the original ones in the pattern, and to provide for an efficient and thorough sweep of the field. As we developed the field to the west on the western portion of the field, referring to Exhibits 1, 2, and 3, it developed that the productive area was considerably more extensive than we had originally anticipated, which resulted in oil productivity being found in the wells originally scheduled as No. I-2, I-3 and I-4. On the east side of the field, the well at location No. I-9 also proved to be oil productive. All of those four wells are now producing oil wells.

Wells No. I-2, I-3, and I-4 were replaced in the pattern with Wells No. I-13, I-14, and I-15. Well No. I-14, which has subsequently been renumbered No. 25 Santa Fe, also proved to be oil productive. We are conducting pump tests on Well No. I-15, tentatively renumbered 26 Santa Fe, and it appears that that well will be oil productive. We are also testing Well No. I-13 which we think will also prove to be oil productive.



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The locations for those wells were granted under an administrative procedure as set up under Rule 1533; however, inasmuch as those last three wells which I have mentioned, No. I-13, I-14, I-15, appear all to be oil productive, we will be required to complete the peripheral pattern by extending locations still further to the west, which are shown on the exhibits as Wells I-16, I-17, I-18, and further to the south I-20, I-21.

We have drilled Well No. I-19, which is shown on the map as also renumbered No. 27, and it is likewise oil productive. We are severely hampered in locating either injection or producing wells on the south limits of the field by topography. There's a high mesa some 400 feet high which pretty well controls the accessibility of drilling locations.

To refer to Exhibit 3, which is a structural map of the Red Mountain Field, we believe that the locations for the most westerly injection wells, I-16, 17, and I-20 and 21, to the southwest will as efficiently as possible complete the encirclement of the productive area and provide for an efficient and thorough sweep of the field, in conjunction with the wells which have already been drilled along the southeast, east, and northeast periphery of the field; and which have been taking water in some cases for over a year now.

We are here today to seek an order which will authorize the utilization of locations I-16, I-17, I-18, I-20, and I-21 for water injection, and to qualify as produceable locations, I-13,



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I-19; and further to seek authorization for additional injection and producing wells at unorthodox locations chosen to efficiently close the periphery of this flood to the southwest and west should such locations be deemed necessary.

We think that a testing program for several months will be advisable before we actually choose such unorthodox locations. Insofar as the matter of correlative rights is concerned, we do not think that such a problem exists, inasmuch as the producing area of the Red Mountain Field is close to the center of our 640-acre lease, and it is a distance of some 1300 feet from the most easterly producing well to the eastern boundary of our property.

It is a distance of over 2,000 feet to the north line of our property, and a distance of nearly 2,000 feet to the south boundary of our property from the nearest producing well, and a distance of approximately 2600 feet from the west line of our property to the nearest producing well. So we do not believe that we would be impairing any other operator's correlative rights.

That is the essence of our testimony, Mr. Utz.

MR. UTZ: Do you wish to submit Exhibits 1, 2, and 3?

MR. BIRDSEYE: Yes, sir.

MR. UTZ: Exhibits 1, 2, and 3 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits
Nos. 1, 2, and 3 entered in
evidence.)



CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Birdseye, let's run those unorthodox locations by once more which you are requesting to be approved by this case. If you would give the unit letter in which these wells are located, I believe I could find them a little easier.

A Well No. I-16 in Unit N of Section 20, the most north-westerly well, located 945 feet from the south line, 2590 feet from the east line.

Q What was that again?

A Well No. I-16 in Unit N of Section 20, 945 feet from the south line, 2590 from the east line. I should point out that Section 20 and 29, at least the East Half of 20 and 29 are not a full 2640 feet, so that Well No. I-16, for example, which is 2590 feet from the east line, is actually in the Southwest Quarter of Section 20.

Well No. I-17 is also in Unit N of Section 20; it is 442 feet from the south line, 2430 feet from the west line of Section 20.

Q All right.

A No. 18, I-18 is in Unit C of Section 29. It is 90 feet from the north line, 2410 feet from the west line of Section 29.

Q All right, sir.

A No. I-19, which was drilled as an injection location but which has proved to be oil productive, is in Unit B of Section



29; it is 730 feet from the north line, 2505 feet from the west line of Section 29.

Well No. I-20 is in Unit F of Section 29; it is 1344 feet from the north line, 2555 feet from the west line, of Section 29.

Well No. I-21 is in Unit C, Section 29, 834 feet from the north line, 2123 feet from the west line of Section 29.

Q 2134?

A 2123 from the west line, 834 from the east line.

MR. MORRIS: I believe you have given them all but your No. 13.

A Well, we have authorization for Well No. 13 under Order R-1533. I'll give you the footage if you would like.

MR. MORRIS: No, I don't need it.

Q (By Mr. Utz) You mentioned your No. 15 over in Unit P, did you not?

A Yes, sir.

Q Is that a standard location?

A No, sir, that is also an unorthodox location. I'm glad you brought that up. However, that was approved as an offset to Well No. I-2 authorized under R-1533. I believe we have an administrative order from the Commission authorizing locations I-14 and I-15, which is hidden in here. I will try to find it.

Q If you are sure it has been approved, it won't be necessary.



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A I am quite certain.

Q In addition to these wells mentioned here, you are requesting in this case administrative approval for any future non-standard locations, is that true?

A Yes, sir, that is true. Actually, what we would prefer to have is an order which would allow us to drill future necessary unorthodox locations without going through an administrative procedure, to save the Commission time and to save us time; however, inasmuch as the application did not request that, it may be inappropriate to request it now so we'll have to stand by our application, which is for administrative procedure to approve future unorthodox locations.

Q I would suspicion that the attorney's smile would indicate that you are correct.

MR.MORRIS: Mr. Birdseye, do you have in mind administrative procedure whereby locations could be approved for good cause shown, something general of that nature?

A Well, for locations to be approved for the same reasons as they were granted under the administrative procedure established by Order 1533, that the proposed relocation will place the injection well in a pattern which will result in a thorough and efficient sweep of the oil by the waterflood. This is in the event that an unorthodox location for an injection well should prove to be oil productive.

I think we should also provide for unorthodox producing



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locations, if such become advisable, principally for the prevention of waste. We don't presently anticipate that it will be necessary to drill more than two or three additional unorthodox locations to drain the producing area thoroughly and to complete the peripheral pattern of the flood. For the next several months, we hope to conduct a testing program and establish more thoroughly the advisability of future wells.

Q (By Mr. Utz) Mr. Birdseye, is Well No. I-20 as far south as you can go, due to the topography?

A Yes, No. I-20 and I-21 are actually right at the base of this mesa.

Q There's a mesa coming right around here?

A Our only alternative would be to move to the south side of the mesa, which would be so far away, close to half a mile, that it couldn't have any effect to flooding the field, or to build a road on top of the mesa, which would be prohibitively expensive.

Q Is the injection in these wells still by gravity?

A No, sir. We originally anticipated that this might be possible. However, from the institution of injection, we found that it was necessary to have a wellhead injection pressure which averages about 350 pounds in order to get an appreciable quantity of water injected. Our injection pressures have maintained that level quite steadily since then. There are slight variations from well to well, a minimum pressure of 200 pounds is adequate in one well and a maximum of about 450 pounds is required in two wells, but the balance



of them will average about 350 pounds at the wellhead in order to take what we consider a proper quantity of water.

Q Is your pump located -- you just have one pump for all wells?

A Yes, sir. We have one triplex injection pump which is located in the vicinity of the well shown as No. I-9 in P, I believe, of Section 20, which well incidentally is producing as an oil well, which we will continue to produce as an oil well until it declines to an uneconomic point. We would have set it to the east by an injection well, except that the well just to the southeast of I-9 about 250 feet, shown as No. 15 on the map, showed that the effective sand thickness at that location is close to zero.

Q So except for the expense of building a road on the mesa, you could put an injection well up there?

A We could, it would be, probably -- we estimate the cost of building a road up there would be in the vicinity of \$15,000, and that the well would be approximately 1,000 feet deep instead of the usual 450 to 500 feet deep.

MR. UTZ: Are there any further questions of the witness?

MR. MORRIS: No, sir.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements in this case? We will take the case under advisement and take a ten-minute recess.

(Whereupon, a short recess was taken.)



