BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 25, 1961

EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil Company for a quadruple completion. Applicant, in the above-styled cause, seeks an order authorizing the quadruple completion of its Northeast Haynes-Apache 9 No. 1 Well, located in the NW/4 SW/4 of Section 9, Township 24 North, Range 5 West, Rio Arriba County, New Mexico, in such a manner as to permit the production of hydrocarbons from the Greenhorn formation through a string of 2 7/8-inch casing, the production of hydrocarbons from the Dakota formation through 2 3/8-inch tubing installed within a string of 4 1/2-inch casing, the production of hydrocarbons from the Mesaverde formation through the 2 3/8 x 4 1/2-inch annulus of the latter casing string, and the production of hydrocarbons from the Gallup formation through 2 3/8-inch tubing installed within a second string of 4 1/2-inch casing, the three strings of casing being cemented in a common well bore. Case 2160

BEFORE:

Elvin A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order. First case on the docket will be Case 2160.

MR. PAYNE: Application of Continental Oil Company for a quadruple completion.

MR. GRIFFITH: I am Bill Griffith, appearing for Continental Oil Company in this case. We have one witness, M. A. MacLennan. I would like to have him sworn.

(Witness sworn.)

MR. UTZ: Are there other appearances?

MR. PAYNE: Mr. Griffith, you have associated with you Mr. Jason Kellahin?

MR. KELLAHIN: I filed an appearance in the case, Mr. Payne.

MR. GRIFFITH: This is an application to amend the previous order of the Commission, Number R-1735, and I would like to ask that our original application and the finding of the Commission in Case 2019, and the order just referred to, be incorporated by reference into this application.

M. A. MAC LENNAN

called as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. GRIFFITH:

Q Would you please state your name?

A M. A. MacLennan.

Q By whom are you employed and in what capacity?

A I am employed by Continental Oil Company as District Engineer for the Durango District, Durango, Colorado.

Q Have you ever testified as a petroleum engineer before the New Mexico Conservation Commission before?

A Yes, I have.

MR. GRIFFIN: I'd like to request that the Commission

accept the witness's qualifications as an expert witness.

MR. UTZ: They are acceptable.

Q (By Mr. Griffith) Did you previously testify before the Commission in Case No. 2019, which was Continental's application for a triple completion of its Northeast Haynes-Apache 9 No. 1 well?

A Yes, I did.

Q From which formations did Continental originally plan to complete this well?

A The well was originally intended as a triple completion in the Mesaverde, Gallup and Dakota formations.

Q Would you please give a brief history of the well up to date?

A The Northeast Haynes-Apache 9 No. 1 was spudded September 9, 1960; drilled a 17-inch hole to 2020 feet, seven joints 13 and 3/8 surface pipe; 12 and 1/4-inch hole, 6,004 feet; nine-inch hole drilled from 6,004 feet to T.D. the well at 6,966. Then ran a long string of 4 and 1/2-inch O.D. casing through the Dakota formation, 2 and 7/8-inch tubing through the Greenhorn, 4 1/2-inch casing through the Gallup formation. The long string of 4 and 1/2-inch, Dakota string, was cemented with 80 sacks of cement mixed with 80 cubic feet of Stratocrete, followed with 140 sacks regular.

MR. UTZ: Do you have a diagrammatic exhibit, or do you want to use the one you presented with your application?

MR. GRIFFITH: We will have an exhibit which is identical to the one we presented with our application.

MR. UTZ: He is going through all this casing and cementing. I wonder if you will distribute that.

MR. GRIFFITH: We don't have an exhibit for that, sir.

MR. UTZ: Do you have some extras that you can give Mr. Nutter one of?

A (Continued) I will go back. A long string of 4 and 1/2 to the Dakota was cemented through a shoe in the Dakota string with 80 sacks regular cement mixed with 80 cubic feet of Stratocrete, followed with 140 sacks of regular; the Gallup 4 and 1/2-inch string cemented through the Gallup string with 90 sacks of regular cement mixed with 90 cubic feet of Stratocrete followed with 200 sacks of regular cement. The Mesaverde formation was cemented through a stage collar in the 4 and 1/2-inch Dakota string, the stage collar located at 4713, and the Mesaverde was cemented with 225 sacks regular, mixed with 225 cubic feet of Stratocrete, followed with 50 sacks regular. Pictured Cliffs formation was cemented through a stage collar in the 4 and 1/2-inch Gallup string, the stage collar located at 2458. Pictured Cliffs cemented with 125 sacks regular cement mixed with 125 cubic feet Stratocrete, followed with 50 sacks of regular.

Following cementing the Dakota formation was perforated from 6,726 to 6,748, and 6,754 to 6,784 with four shots a foot with regular perforating equipment. In the Greenhorn formation it was perforated -- this is in the 2 and 7/8-inch string -- 6,522 to 6,594, two shots per foot using nuclear orientation equipment. The 4 and

1/2-inch Gallup string was perforated opposite the lower Gallup, from 5,815 to 5,760 with two shots per foot, with nuclear orientation perforating equipment.

Q What sort of stimulation did you use in the well?

A Dakota formation was water-fraced and the Greenhorn and Gallup were both oil-fraced.

Q Did you substantially comply with Order Number R-1735 of the Conservation Commission relating to the cementing and the use of centralizers and turbilizers?

A Yes, we did, with one exception. The Order provides for cement minimum of 200 feet above the top of each producing formation. This temperature survey was run in the Greenhorn string following the cementing program, and the cement tops as determined from the temperature survey are as follows: Above the Greenhorn, first cement top is at 6,100; the cement top above the Gallup, was at 5,400. The cement top above the Mesaverde is at 3,750, and Pictured Cliffs is 1,710, so, in the case of the Mesaverde formation we have only 113 feet above the geological top of the Mesaverde. However, the productive interval in the Mesaverde is in the Point Lookout section of the Mesaverde, 4,380. Therefore, we have approximately 500 feet of cement above our top perforation.

Q You feel this 113 of cement in the Mesaverde will adequately isolate that section?

A Yes, I do.

Q What is the present status of the well?

A At present we are producing only from the Gallup formation. It is completed as an oil well. The Dakota is entirely gas, and is presently shut in pending a gas sales contract. The Greenhorn formation is oil productive, also shut in pending approval of the Commission.

Q What do you anticipate the Mesaverde will produce?

A Based on DST data of the Point Lookout, we anticipate it to be entirely gas.

Q Could you elaborate on the production we have in the Gallup formation?

A We initialled the Gallup formation at 25 barrels of 42.3 gravity crude with a GOR of 620, and .004 water.

Q The original order of the Commission granted permission for Continental to produce the Dakota, Gallup and Mesaverde. Why are we now asking to produce through the Greenhorn?

A Well, based on DST of the Greenhorn formation while drilling we recovered free oil on that DST. Therefore, we ran the long string of 2 7/8 through the Greenhorn formation.

(Applicant's Exhibits Nos. 1 and 2 Marked for Identification.)

Q I show you what has been marked as Exhibit 1, and ask you if this was prepared by you or under your supervision?

A Yes, sir, it was.

Q What does Exhibit 1 show?

A Exhibit 1 is a DST data on the lower Mesaverde or Point

Lookout formation, DST for the Greenhorn, and geological description of the Greenhorn.

Q A copy of Exhibit 1 was included in the application. I now show you what has been marked Exhibit 2 and ask you if this was prepared by you or under your supervision?

A Yes, it was.

Q What does Exhibit 2 show?

A Exhibit 2 is a schematic diagram of the proposed quadruple completion, showing the formation tops and casing program.

Q Are there any corrections on Exhibit 2 which should be made?

A Yes. The actual formation top of the Pictured Cliffs should read 2,378 rather than 2,320, the actual top of the Mesaverde formation is at 3,863, and it is now for a quadruple completion rather than a triple completion.

Q What additional work is needed to complete this well as a quadruple completion?

A We propose to seat a Model D-A Baker packer in the long string of 4 and 1/2, through the Dakota, and perforate the Mesaverde formation, the Point Lookout section of the Mesaverde, and complete the Dakota formation through the 2 and 3/8-inch tubing, and complete the Mesaverde formation through the tubing casing annulus.

Q Will this manner of completion prevent commingling from the four formations?

A Yes, it will.

Q Will this well be completed and operated in accordance with the applicable provision of Section 112-A of the Rules and Regulations of the New Mexico Conservation Commission?

A Yes.

Q Will the correlative rights of all parties be protected by the proposed completion of this well?

A Yes.

Q I would like to move that Exhibits 1 and 2 be accepted in evidence.

MR. UTZ: Without objection Exhibits 1 and 2 will be accepted in the record.

MR. GRIFFITH: Does the Commission have any questions of the witness?

BY MR. NUTTER:

Q I missed your perforations there on the Dakota. What were they again, please?

A 6,726 to 6,748.

Q And that was four shots per foot, or two?

A Four shots per foot; also 6,754 to 6,784. I have the proposed for the Mesaverde: 4,382, 4,438, 4,462, 4,490, 4,526 to 4,564 and 4,584, 4,628.

Q Now, as I understand it you cemented through the Dakota string, which is set at 6,958, with T.D. being 6,966; you cemented that with 80 sacks of regular and then some Stratocrete followed by

140 sacks of regular, and the top of the cement is at 6,100?

A Yes.

Q So one cement job was used for the Dakota and the Greenhorn?

A For the Dakota and the Greenhorn. There was no cement placed through the 2 and 7/8 tubing. All cementing was done through the two strings of 4 and 1/2, either through the shoes or stage collars in these two strings.

Q You have an interval from the uppermost perforation in the Dakota, which is at 6,726 to the lowermost perforation in the Greenhorn, which is 6,594. You have an interval there of some 132 feet, is that correct?

A Yes, sir.

Q Then the lowermost perforation in the Gallup is at 5,815, and the uppermost in the Greenhorn is 6,500, so there are several hundred feet between the perforations in these two formations?

A Yes, sir.

Q Where do you expect the base of the cement which was used on the Gallup would fall?

A Base of the cement for the Gallup, approximately 5,956.

Q Was that cemented through the shoe or cemented through perforations?

A Cemented through the shoe in the Gallup string.

Q Through that 4 and 1/2-inch string length?

A Yes, sir.

Q Later you will run a 2 and 3/8-inch string of tubing through that?

A We now have a 2 and 3/8 in the Gallup.

Q Everything is going to be produced through 2 and 3/8-inch tubing with the exception of the Mesaverde, is that correct, and that will be produced through the annulus of the 4 and 1/2-inch casing and the 2 and 3/8-inch tubing to the Dakota?

A That's correct.

Q Does the Mesaverde in this area produce a relatively dry gas, or is it a wet gas, or what is the nature of the gas in this area?

A Relatively dry gas, very dry.

Q You don't anticipate any problem in producing that through the annulus?

A No, sir.

MR. NUTTER: I believe that is all I have. Thank you.

BY MR. UTZ:

Q What was the cementing on the Mesaverde; is that from 4,713 to 3,750?

A 4,713 to 3,750, yes, sir.

Q And the top of the Mesaverde is 3,863. That is a little over a hundred feet?

A 113 feet.

Q Is the top of the Mesaverde barren?

A We had a DST at the very top on that one application, the

DST No. 1, I believe, Cliffhouse.

Q 4,496 to 4,615?

A From 3,855 through 3,925. We had a fair blow, no gas to surface; recovered 360 feet of drilling mud and water.

BY MR. NUTTER:

Q You didn't perforate anything except Point Lookout?

A We have not perforated any of the Mesaverde; it will only be Point Lookout.

Q The base of the cement on the Pictured Cliff is from 2,458 to 1,710, is that correct?

A 2,458 to 1,710, yes, sir.

BY MR. UTZ:

Q I don't believe you gave the cement above the Pictured Cliffs. What is your cementing program from 1,710 up tothe surface?

A We have no cement from 1,710 up until the surface pipe, 220 feet.

Q Are there any potable waters in this area, 220 to 1,710?

A We have no knowledge of any, sir.

Q No gas zone?

A No, sir.

Q In your opinion, is the Greenhorn completely separated from the Dakota pay?

A Yes, sir. I believe it is. We recovered, on a three-hour test of the Dakota, 920 MCF and about 20 barrels of condensate and 500 pounds of back pressure, and on the Greenhorn we recovered

11 barrels of crude oil, and it is a lower gravity, 38.8, not the crude oil we recovered from the Dakota in the Jicarilla area.

Q What is the gravity on the Dakota fluid?

A I do not have a gravity on the gas.

Q I mean on the fluid; you said you recovered some distillate?

A On the condensate, I do not have it.

Q Would it be substantially higher than 38.8?

A Yes, sir, considerably higher.

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

BY MR. PAYNE:

Q You did use turbilizers and centralizers in completing this well, did you?

A Yes, sir.

MR. PAYNE: Thank you.

BY MR. UTZ:

Q You have not yet perforated the well, have you?

A We have perforated in all but the Mesaverde section.

Q These perforations were successful?

A Yes, with the orientation.

MR. UTZ: Any other questions? Witness may be excused. Any statements in this case?

MR. GRIFFITH: No, sir. That is all we have.

MR. UTZ: Case will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JUNE PAIGE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 31st day of January, 1961.

June Paige
Notary Public - Court Reporter

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EXHIBITS

NUMBER	EXHIBIT	IDENTIFIED	OFFERED	ADMITTED
Ex.#1	DST Data Sheet	6	8	8
Ex.#2	Schematic Diagram	6	8	8

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2160, heard by me on January 5, 1961.

....., Examiner
New Mexico Oil Conservation Commission