

EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 9, 1958

IN THE MATTER OF: Case No. 1409

TRANSCRIPT OF PROCEEDINGS

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INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

MR. UTZ: We will swear the witnesses for Cases 1409, 1410, and 1411.

(Witnesses sworn.)

MR. UTZ: Are there any other appearances in this Case 1409? If not, you may proceed.

GERALD J. SAVAGE

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

DIRECT EXAMINATION

By MR. KASTLER:

Q Will you please state your name and position?

A Gerald J. Savage, production geologist with the Gulf Oil Corporation at Roswell, New Mexico.

Q Have you previously testified as a qualified expert witness before this Commission?

A Yes, sir, I have.

Q Are you familiar with the geology of the area surrounding Gulf's well known as Lea State "CL" A No. 1?

A Yes, sir, I believe I am.

Q Have you prepared or caused to be prepared location plat showing this general area, the surrounding operators, and the wells completed in respective pay zones pertinent to this case?

A Yes, sir, and I have labeled this Exhibit No. 1.

Q Will you please describe what is shown on Exhibit No. 1, giving the lease location and so forth?

A On Exhibit No. 1 I have shown by means of a dashed line Gulf's Lea State "CL" Tract A lease, consisting of Lots 7 and 8 of Section 2, Township 16 South, Range 32 East. This tract is approximately 80 acres. Also shown is the No. 1 Lea State "CL" Tract A Well, encircled and shown in red.

Q Have all offset operators been notified of this application by copy of the letter and location plat?

A Yes, sir, they have.

Q Will you now please give the history of the well which Gulf proposes to dually complete?

A The Lea State "CL" A Well No. 1 was drilled to a depth of 13,368 feet where 7-inch casing was set. The well was then taken to a depth of 13,395 feet in the Devonian formation, where commercial production was established. During the drilling of that well, the Wolfcamp formation was drill stem tested and commercial production was found. It is proposed to perforate the Wolfcamp zone in four short intervals between the depths of 9,638 feet, to 9,842 feet. It is the purpose of this case to request the dual completion of the Wolfcamp and the Devonian zones.

Q Was the oil potentialized or was the well potentialized in the Devonian zone as well?

A Yes, sir, the Devonian zone is producing at this time.

Q Do you know the date of completion or testing in the Devonian zone?

A I believe the date of the completion in the Devonian zone

was on January 18, 1957.

Q On page 1 at item or paragraph 2 of the Application of Gulf Oil Corporation, it is shown that this well was potentialed in the Devonian zone on January 18, 1958. Is that in error, was the date January 18, 1957?

A I believe the January, 1957, date is the correct one.

MR. KASTLER: If the Examiner please, we would like to request that our application be so amended to conform to the facts.

MR. UTZ: Where was that on your application?

MR. KASTLER: It's at paragraph number 2, about half-way down on the left margin.

MR. UTZ: Change that to '57?

MR. KASTLER: Yes, sir.

MR. UTZ: If there is no objection, the application will be so amended.

Q Have you prepared or caused to be prepared a contour map showing the location of the subject well on the Wolfcamp?

A Yes, sir, I have a contour map on top of the Wolfcamp main pay, which I have labeled Exhibit No. 2.

Q Would you explain No. 2 at this time?

A Exhibit No. 2 is a contour map on top of the Wolfcamp main pay, with a contour interval of fifty feet; also shown is the pertinent Gulf lease and the No. 1 Lea State "CL" Tract A, encircled and shown in red. This map shows that the No. 1 Lea State "CL" is located on the north flank of the Anderson Ranch field structure.

Q Have you prepared or caused to be prepared a contour map showing the location of the subject well on the Devonian?

A Yes, sir, I have, contour map on top of the Devonian formation, which shows essentially the same information as the information on the contour map on the top of the Devonian.

Q The Devonian?

A I believe I said that it shows the same information as shown by the contour map on top of the Devonian formation. It shows the pertinent Gulf lease and the pertinent Gulf well, and shows the well to be on the north flank of the Anderson Ranch structure, on top of the Devonian.

Q Are the other wells in the surrounding tracts shown in the plat here completed in either the Wolfcamp or the Devonian?

A Yes, sir, they are.

Q Have you prepared or caused to be prepared a log showing the intervals perforated in this well?

A I have copies of the electro-log on the subject well, which I have labeled Exhibit No. 4.

Q Will you please explain what is shown on this log which is pertinent to Case No. 1409?

A I have specifically shown the top of the Wolfcamp limestone at a depth of 8,900 feet, and the proposed Wolfcamp formation -- I beg your pardon, the proposed Wolfcamp perforations, four short intervals between the depths of 9,638 and 9,842 feet. Also shown is the top of the Devonian formation at a depth of 13,354 feet,

the producing open hole interval from 13,368 feet to 13,395 feet. This Devonian formation, on a 24-hour test on 1/18/57, I wish to insert here that this exhibit is in error inasmuch as it notes the date was 1/20/57; the January 18th date is the correct one. On this date, through 2-3/8 inch tubing and 45/64 inch choke it flowed 373 barrels of oil with a GOR of 338 cubic feet per barrel, a gravity of 52.2.

Q I understand this well is open hole producing in the Devonian and the perforations in the Wolfcamp are merely proposed at this time, is that correct?

A That is correct.

MR. KASTLER: If the Examiner please, I would like at this time to move that Exhibit Nos. 1, 2, 3, and 4 be admitted into evidence in this case.

MR. UTZ: In the absence of objections, they will be so admitted.

MR. KASTLER: That's all the questions I have of this witness. I might add that I have the second witness, Mr. Hoover, who will present a schematic diagram and the engineering phases. Mr. Savage has presented the geological.

MR. UTZ: Are there questions of the witness?

CROSS EXAMINATION

By MR. UTZ:

Q Which of these two zones, in your opinion, has the better reserves, the Devonian or the Wolfcamp?

A I haven't done any work on that specific detail, but I would estimate that the reserves in the Devonian are greater.

Q Will both of these zones have top allowable wells?

A Yes, sir, they will. It is assumed they will be, inasmuch as we haven't potentialized the Wolfcamp zone.

Q What would you -- or would you have an estimate as to the pay-out time for a Wolfcamp completion?

A I do not have any specific information on the pay-out time for a Wolfcamp well.

Q You made no studies in regard to twinning these two zones?

A I specifically have made no studies as to the economics of the twinning. I believe Mr. Hoover is prepared to give that information.

MR. UTZ: Are there any other questions? Mr. Nutter.

By MR. NUTTER:

Q Have you testified to the GOR, the gravities, and the bottom-hole pressures in these two zones, or will another witness testify to that?

A I do not have any information on the bottom-hole pressures. I have the GOR for the Devonian formation, but no tests have been made other than drill stem tests in the Wolfcamp zone. Perhaps Mr. Hoover will have available the bottom-hole pressures for the Wolfcamp zone from the drill stem tests.

Q There are other wells in the Wolfcamp zone in this area, are there not?

A Yes.

Q The GOR's and gravities would be available?

A They would be available.

MR. UTZ: Any further questions? Mr. Stamets.

By MR. STAMETS:

Q Do you know the drive mechanism of the two reservoirs?

A I believe they are both a water drive.

MR. STAMETS: That's all.

By MR. UTZ:

Q What was the discovery well for the Devonian Pool here?

A I believe the discovery well for both the Devonian and the Wolfcamp Pools is the Continental Oil Company No. 1, an Anderson Ranch unit, although that well is completed as a Devonian producer only. That well is located 1980 feet from the north and east lines of Section 11, Township 16 South, Range 32 East.

Q Are there any other Wolfcamp completions in this area?

A Yes, sir, there are.

Q Would you state those, please?

A The nearest Wolfcamp completion to Gulf's No. 1 Lea State "CL" is Gulf's No. 1 Lea State "CR", which is located in the center of Lot 16, Section 2, Township 16 South, Range 32 East. Also located nearly the same distance away is Gulf's No. 3 Lea State "CR", located in Lot 14 of that same Section 2.

There are a number of other Wolfcamp wells located farther south, and I can delineate them if you so desire.

Q I think that will be satisfactory. Are the other two Gulf wells dual completions?

A No, they are not.

Q They are just single Wolfcamp wells?

A Single Wolfcamp completions.

Q The Wolfcamp Pool is not a designated pool at this time, is that correct?

A To my knowledge there is designated an Anderson Ranch-Wolfcamp Pool.

MR. UTZ: Are there any other questions of the witness? If not, the witness will be excused.

(Witness excused.)

JOHN HOOVER

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

DIRECT EXAMINATION

By MR. KASTLER:

Q Would you please state your name and your position?

A My name is John Hoover, petroleum engineer with Gulf Oil Corporation in Roswell, New Mexico.

Q As a Gulf engineer, have you previously testified and qualified as an expert witness before this Commission?

A Yes, I have.

Q Are you familiar with Gulf's application to dually complete its Lea State "CL" Well No. 1?

A Yes.

Q Have you prepared or caused to be prepared a schematic diagram explaining the features of this proposed dual completion?

A Yes, we have labeled it Exhibit No. 5.

Q You may now refer to Exhibit No. 5 and please state what is shown there.

A This is a schematic drawing of the proposed mechanical installation by which we wish to make an oil-oil dual completion in the Wolfcamp and Devonian Pools. This diagram shows that we have 13-3/8 inch casing set at 1603 feet and the cement was circulated to the surface. We have 9-5/8 set at 4,199 feet, and the cement was circulated to the surface. We have 7-inch casing set at 13,368 feet and by temperature survey the top of the cement was at 7,535 feet. This drawing shows in pink the Devonian flow, in green the Wolfcamp flow. We propose to install two strings of 2-3/8 inch tubing. The Devonian string, which will be the long string, will be set through a Baker Model "D" Retainer Production Packer, which is set at 13,219 feet. We will have a Baker parallel string anchor run in this tubing string at a depth of approximately 9,860 feet. The Wolfcamp string of 2-3/8 inch OD will be set into this Baker parallel string anchor.

This equipment that we are using in the well is standard equipment and has been proved by other field installations. The equipment will prevent the commingling of oil within the well bore. We have 2-3/8 inch tubing which will permit the wells to be

pumped, if and when necessary. We can make adequate tests to determine if communication should exist, in that we have two different gravities of oil. The Wolfcamp oil is 42 gravity, the Devonian oil is 52 gravity. We also have a difference in the composition of the crude, in that the Wolfcamp oil is sour, running about one percent hydrogen sulphide; and the Devonian crude is sweet. We also have a differential pressure on our tubings, in that the closed in tubing pressure on the Devonian is approximately 13 -- or on the Wolfcamp is approximately 1300 pounds, on the Devonian approximately 300 pounds, closed. The pressure test would indicate if we had leakage in that we would get an equalization of pressure.

We have also investigated the differential pressure which we would have across the Baker packer and our calculations indicate that we will have less than 200 pounds differential pressure in both static and flowing conditions, the maximum would be 200 pounds, it would be less than 200 pounds.

Q That is at the packer?

A Yes, at the packer.

Q Is the capacity for each of the strings of tubing adequate to permit production from each zone independent of the other?

A Yes, it is.

Q Is it possible to tell if there is any commingling of pays or if the pays -- or if there should be any leakage, would that show up?

A Yes, very definitely.

Q In what way would it show up?

A As previously mentioned, we have the different gravities of crudes, the sour crude in the Wolfcamp and the sweet crude in the Devonian. If there was commingling, we would have a difference in composition, and by this crude, the gravity of it being run each time that the tank is put on the pipe line, we would have an almost constant indication of any change in gravity.

Q If this application is granted, will Gulf comply with the operating tests, reports and procedures required by the Commission?

A Yes, they would.

Q Is this application in the interest of prevention of economic waste?

A Yes, it is.

Q In what way?

A The cost of these wells is very high. To drill a Devonian well runs approximately \$314,000.00. A Wolfcamp well will run approximately \$190,000.00; or if we had to drill a Devonian well and a Wolfcamp well, it would require an expenditure of \$500,000.00, approximately. We can dual, make a Wolfcamp-Devonian dual, for approximately 350 to \$360,000.00. This will permit the economical production of oil, which otherwise might not be economical to produce, to develop.

Q Would Gulf be inclined to drill a separate well to the Wolfcamp in this instance if this application were not granted, or would Gulf be more inclined to defer producing from the Wolfcamp

until it went into more marginal wells?

A In all probability, not having examined the economics too close, we would probably defer it or look at it very closely.

Q In your opinion, will any correlative rights be adversely affected?

A No, sir, they will not.

MR. KASTLER: At this time I would like to move to admit Exhibit No. 5 in Case 1409.

MR. UTZ: Is there objection to the entrance of Exhibit 5? It is so entered.

MR. KASTLER: I have no further questions.

CROSS EXAMINATION

By MR. UTZ:

Q I believe I missed the bottom-hole pressure in the Devonian in this well. Did you state that?

A No, I gave what the differential pressure from our calculations would be, across the packer.

Q That was less than 200 pounds?

A Yes, less than 200 pounds. We don't have a bottom-hole pressure, but I used the bottom-hole pressures in Lea State "CR" 1 and 2, which are approximately half a mile south, and the bottom-hole pressures in those wells compare very close to the bottom-hole pressure that we tested in this well when it was drill stem tested. The bottom-hole pressure in the Devonian is approximately 4,858 pounds. The bottom-hole pressure in the Wolfcamp is 3,592 pounds.

I would like to mention in that respect that you will note that we will have a static column of oil from the Baker parallel string anchor down to the top of the packer, and the static column will exert a pressure there of approximately 1235 pounds, so we would have the Wolfcamp pressure plus the 1235.

Q There would be a difference in pressure, including the static column, of about 262 pounds -- no --

A No, sir.

Q It would be 1266?

A Those pressures that I gave you are on the Lea State "CR" No. 1 and 2. Those pressures were taken at a depth, and then we corrected the depth for the conditions that would be in this well. In other words, we had a static pressure of 4858 at 13,335 feet, and our packer in this well will be set at 13,318 feet, and correcting it to the same depth; then we come out with a pressure on the bottom of that packer of 4,426 pounds, this is shut-in; on top of the packer, 4,448 pounds, or differential of only 22 pounds under shut-in conditions. Under flowing conditions we would have a pressure on top of that packer of 4,637 pounds, on the bottom, 4,520 pounds, or a differential of 117. I think we can safely say that we will be below a differential of 200 pounds under flowing and shut-in conditions. The maximum pressure will be on top of the packer.

MR. UTZ: Any other questions of the witness? If no further questions, the witness may be excused.

