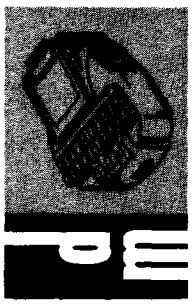

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 12, 1968

IN THE MATTER OF:

Application of Sinclair Oil Corporation for a waterflood project, Lea County, New Mexico.

Case No. 3935

BEFORE: D. S. NUTTER

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case 3935.

MR. HATCH: Application of Sinclair Oil Corporation for a waterflood project, Lea County, New Mexico.

MR. KELLY: Booker Kelly, of White, Gilbert, Koch and Kelly on behalf of the applicant. I have one witness and ask that he be sworn.

(Witness sworn.)

(Applicant's Exhibits 1 through 6 marked for identification.)

* * * * * * *

R. M. ANDERSON, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLY:

Q Now, Mr. Anderson, would you state your name, position and employer?

A R. M. Anderson, Region Regulatory Engineer, Sinclair Oil Corporation, Midland, Texas.

Q And you have previously qualified as an expert Petroleum Engineer in front of this Commission?

A Yes, I have.

Q Referring to what has been marked Sinclair's Exhibit No. 1, would you state what Sinclair seeks by their application?

A Sinclair's Exhibit No. 1 is an area plat in the

vicinity of Sinclair's B Davis Lease showing the producing status of all wells within a mile radius of the Lease. The wells that are colored solid red are current producers from the Jalmat Oil Pool. Wells that are colored solid yellow are current producers from the Jalmat Gas Pool. Wells that are colored solid blue are current producers from the Langlie-Mattix Oil Pool and wells that are circled in red, yellow or blue that are not filled in, are wells that are either plugged and abandoned or shut in and are not currently producing.

The proposed injection well is identified with an arrow and a yellow lable to that effect, the well is located in Unit M, of Section 34, Township 23 South, Range 36 East.

Q Now, if I understand your testimony, the Jalmat Pool, you have only two wells actually, or three wells that could be called offset of the proposed injection well?

A Yes, the proposed injection well has been depleted since 1962, it has not produced since January of '62. The only other well on our Lease that is completed in the same interval is our Well No. 3 which is colored with a solid red circle. Was that your question?

Q Yes. Well, there are other Jalmat wells that could be called offsets, but we will go into their completion zones later in this testimony. Now, what are the offset operators?

A The offset operator to the south is Argus Oil Company, the offset operator to the southwest is Aries Oil Company, to the west is two depleted Sun-Ray wells, either plugged or depleted, my area map shows them to be plugged and abandoned; to the north, we have an Atlantic well which is of off schecule, depleted, in the Jalmat and also Continental with two gas wells in the north half of Section 34, the offset operator to the east is Sinclair's Guthrie Lease.

Q Refer to what has been marked as Exhibit No. 2, the structure map; would you explain its significance to the Examiner?

A This is a structure map on the top of the Yates. It's a regional map, not particularly known for its accuracy in detail, but in general it shows the Yates to be a north-south trending anticline, shows this to be on the west edge of the anticline, and in the neighborhood of increasing dip to the west, in the vicinity of increasing dip to the west.

Q What is the drive mechanism of this reservoir?

A The drive mechanism is solution gas drive in both the Yates and Seven Rivers Zones. However, we are experiencing considerable water production by virtue of being located on that western flank and there is water associated with this

reservoir.

Q Can you give the Examiner a brief summary of the reservoir characteristics?

A Yes. The producing formations that we will be injecting into in the subject well are Yates and Seven Rivers formations. They're mostly sands and limey sands. The reservoir has,Yates and Seven Rivers have a common oil-water contact between minus 300 to minus 380 feet. They have a common gas-oil contact at minus 180 to minus 200 feet, somewhere in there. As I said before, they are both solution gas drive. The Yates has a porosity of 10%, the Seven Rivers has porosity of about 14%. The permeabilities range from 12 millidarcies in the Yates to about 20 millidarcies in the Seven Rivers. These are the reservoir averages, not averages taken from this well. Our connate water content is high, the water saturation is about 44% in the Yates and about 55% in the Seven Rivers, so we have water producing problems. Gravity oil is about 29 degrees.

Q At the present time, there's only one well producing on this Lease from the Jalmat, is that right?

A That is correct.

Q Do you have an exhibit that shows the cumulative oil production for the Lease?

A Yes, I have Exhibit 3, which indirectly shows the cumulative, it shows the production from the lease by years, the monthly average oil production by years through 1959 and then commencing in 1960, I've shown the monthly oil production by months. Now, prior to 1956, all three wells on subject Lease were classified as Cooper Jal wells, Cooper Jal oil wells. Around the end of '55, the first of '56, one of the wells, the well that is colored in blue was reclassified, redesignated in the Langlie-Mattix Pool as a matter of nomenclature and the other two wells, the No. 1 Well, the subject well of this application, and the No. 2 well were put in the Jalmat Oil Pool and my curves reflect the production from that time on, separated by Pools. The cumulative production for the Jalmat, the two Jalmat wells, is the No. 1 Well, 155,190 barrels, that's the proposed injection well, the producing well, No. 2 Well, No. 3 Well, correction, the No. 3 well, the producing well in the Jalmat currently has recovered 183,614 barrels of oil, for a total oil from the Jalmat Oil Pool, and from the Cooper Jal Pool before, being 338,804 barrels. The No. 2 Well, which is a Langlie-Mattix well, has recovered 366,996 barrels of oil.

Q How long has the proposed injection well been shut in?

A Since January, 1962.

Q What is the present daily rate of production in the other Jalmat well?

A On the other Jalmat Well, we are currently producing 18 barrels of oil per day.

Q Do you feel that this well is reaching its advanced state of depletion?

A Yes, I believe that the Lease is in a late primary stage of depletion.

Q Now, Exhibit No. 4 is the tabular production history, is that correct?

A That is correct, that is the tabular data that is plotted on Exhibit No. 3.

Q Is there anything you want to bring to the Examiner's attention on Exhibit No. 4?

A No, sir.

Q Referring to what has been marked as Exhibit No. 5, your sketch of the proposed injection well, would you explain the diagram?

A The Exhibit No. 5 reflects the condition that the well will be in when it is used as an injection well. At the present time, there is a cast iron bridge plug at 3490 which is between the two sets of perforations that are shown on the well. We will drill out that cast iron bridge plug which is

not shown on the sketch, opening both sets of perforations to the well bore as reflected by the sketch.

Q Now, you are going to have plastic-coated tubing?

A Yes. This exhibit shows that we will run plastic-coated tubing set in a packer, the packer to be located some 60 feet above the uppermost perforation and we will fill the annulus with corrosion inhibited fluid and make some provision at the surface for observing pressure.

Q What is the source of the water?

A The source of the water is produced water from the subject lease, the two producing wells on subject lease and Sinclair's Guthrie Lease which offsets the Lease to the east.

Q Do you know the ownership of the two leases involved, are they Federal, State or fee?

A Well, the Davis Lease, the subject lease, is a fee lease. I do not know the status of the Guthrie Lease, it shows to be a fee lease on my Exhibit 1.

Q What will be your initial injection rates?

A We are currently producing 1,000 barrels of water a day on the two leases and that will be our initial injection rate.

MR. NUTTER: A thousand barrels a day?

THE WITNESS: Yes, sir.

Q (By Mr. Kelly) How about the pressure?

A We feel that the well will take this thousand barrels a day by gravity; however, we will be prepared to go up to six or eight hundred pounds of pressure, if necessary.

Q Do you think the injection of that amount of water will have any adverse affect on any adjoining Jalmat Pools of your Lease?

A No, sir, I do not.

Q Referring to what has been marked Exhibit No. 6, your log, could you explain the relative perforated zones between the injection well and wells adjoining this injection well?

A Yes, sir. I have marked Exhibit No. 6 with an orange pencil, the uppermost area of perforations, and that was perforated in 1951. That was acidized twice and tested and gave up no shows of oil or gas. It was tight and non-productive. The present perforations will be found marked in red, from 3468 to 78. Those are the present perforations that are opened in the well bore along with the non-productive orange ones up the hole there, but those were the perforations that were producing from 1951 until 1962, until the well was finally depleted.

MR. NUTTER: What happened to the perforations that are marked in orange, Mr. Anderson, were they squeezed?

THE WITNESS: No, they were left open.

MR. NUTTER: They are tight and they are still open?

THE WITNESS: They're tight and open. We are asking for permission to inject into them although I personally don't think they will take any water.

MR. NUTTER: They will be subject to the injection, though?

THE WITNESS: Yes, I mentioned earlier in talking about the diagrammatic sketch, that there was a cast iron bridge plug at 3490. I don't know whether I have marked that on the Examiner's copy of the log or not. The 3490, the location of the bridge plus presently in the well. Immediately below that bridge plug are perforations 3494 to 3408. These are marked on the Examiner's log. Those perforations, when tested in 1951, swabbed 40 barrels of water an hour with no show of oil or gas. This calculates nine hundred sixty some odd barrels a day and we feel that the majority of our injection will go into those perforations and that's why I feel that the well will take the water with very low surface pressure. Immediately below those perforations, the waterbearing perforations, we have the top of a cement plug at 3515 and everything below that point has been plugged off, both the cast iron bridge plug and cement and hydromite and several workovers

resulting in plugging the bottom of that hole. Now, the offset well to the south which is an Argus well, you asked about the offsetting wells?

Q (By Mr. Kelly) Yes.

A That might be affected. In my opinion, that well will not be affected in any way by this injection. The Argus B Well No. 2 located in Unit D of Section 3 is presently completed from the casing seat at 3592, in open hole to 3638, according to Commission files. The correlative zone in that Argus well, the zone in the Argus Well bore that we are going to be putting this water in, and I'm lumping here, our two red sets of perforations on our Exhibit 6, is found from 3492 to 3532 in the Argus well. So we are some, the bottom of our injection interval, some 60 feet above the top of their producing interval, so I feel that they will not be affected by the injection. On the other hand, Sinclair's B Davis Well No. 3, the other, the Jalmat producer on our Davis Lease, it is perforated from 2900 to 3326 and the comparable zone in it that compares with the red perforations in our No. 1 well is from 3246 to 3286, and our No. 3 Well is therefore open some 40 feet below the lowest perforations in our injection zone, so it is, well, the No. 3 Well is open in this same interval and then some,that we're injecting into, so I feel

there is a very good chance that we will see some effect on that well. That is the only well that I anticipate will be affected unless some additional well work is done in the area.

Q Therefore, in your opinion, there wouldn't be any adverse affect on the correlative rights of any adjoining operators by the granting of this application?

A Well, there will be no effect on them one way or another in my opinion. However, if they were open in our correlative zone, I would expect them to have a beneficial effect.

Q I don't think I asked you, going back to your sketch for a minute, in your opinion, would this proposed installation protect any fresh water that might be in the area or protect any other zones against migration of the injected fluid?

A Yes, it will, the only fresh water in the area is Ogalala and it's found at a depth above 289 feet and we have surface casing set at 289 and cement circulated to the top. For some reason, a 9 and 5/8ths intermediate string was run in this well and cemented with 425 sacks of cement which we estimate would bring the top of the cement up to 62 feet from the surface which would, of course, be over 200 feet up

into the 13-inch surface casing. So we have two strings of pipes cemented in a manner to protect the surface water.

Q In your opinion, would the granting of this application prevent waste by allowing you to recover oil that would otherwise be left in place?

A Yes, in my opinion, we have a very good chance of recovering quite a bit of additional oil. As I stated earlier our cumulative Jalmat oil production has been about 338,000 barrels. We're in a position here to sweep here, maybe about half of our lease and that would be 160,000 barrels. We probably, I would estimate that we might, if we're lucky, get as much as 100,000 barrels of additional oil,secondary oil, as a result of this test.

Q Of course, if this application is granted, it would also serve as a secondary purpose of disposing of salt water under ground?

A Yes, sir.

Q Were Exhibits 1 through 6 prepared by you or under your supervision?

A Yes.

MR. KELLY: I move the introduction of Sinclair's Exhibits 1 through 6.

MR. NUTTER: Sinclair's Exhibits 1 through 6 will be

admitted in evidence.

(Whereupon, Sinclair's Exhibits 1 through 6 offered and admitted in evidence.)

MR. KELLY: That's all we have on direct.

MR. NUTTER: Are there any questions of Mr. Anderson?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Anderson, I notice from your decline curve that the decline on your Langlie-Mattix has been upward. To what do you attribute this?

A I don't know, unless it's due to the increase in allowables in the State of New Mexico.

Q Is it a top allowable well?

A Yes.

Q It is, and this production curve here for the Jalmat would reflect only one well since 1962, is that correct?

A Yes.

Q It's presently producing 18 barrels a day?

A Yes, sir.

MR. NUTTER: Are there any other questions of Mr. Anderson? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kelly?

MR. KELLY: No, I don't.

MR. NUTTER: Anyone have anything they wish to offer in Case 3935? We will take the case under advisement and recess the hearing until 1:30.

I N D E X

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceeding before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand this 26th day of November, 1968.

Ada Dearnley

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3935, heard by me on 11/12, 1968.

, Examiner
New Mexico Oil Conservation Commission