CASE 5405: RESERVE OIL, INC., FOR DUMBELL COMMINGLING OR POOL CONTRACTION AND EXTENSION, LEA COUNTY, NEW MEXICO.

Case Number

6085

Application

Transcripts.

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 16, 1977

EXAMINER HEARING

IN THE MATTER OF:

Application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico.

CASE 6085

BEFORE: Richard L. Stamets, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: A. J. Losee, Esq.
LOSEE & CARSON
Attorneys at Law
300 American Home Building
Artesia, New Mexico

I N D E X

EXHIBIT INDEX

MR. STAMETS: Call the next case, Case 6085.

MS. TESCHENDORF: Case 6085, application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico.

MR. LOSEE: Mr. Examiner, A. J. Losee, Losee & Carson, Artesia, appearing on behalf of the applicant and I have one witness, Mr. Johnson.

(THEREUPON, the witness was sworn.)

ERD M. JOHNSON

was called as a witness by the applicant, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. LOSEE:

Q. Would you state your name, please?

A. Erd M. Johnson, E-r-d.

Q. And your residence?

A. Midland, Texas.

Q. And you occupation?

A. I am the District Manager for Reserve Oil and Gas Company -- Reserve Oil, Inc., I am sorry.

Q. It used to be Reserve Oil and Gas?

A. Yes, sir.

Q. Have you previously testified before the Commission

and had your qualifications as an expert accepted?

A. Yes, sir.

MR. LOSEE: Are Mr. Johnson's qualifications acceptable?

MR. STAMETS: What area of expertise?

A. Petroleum Engineering.

MR. STAMETS: Mr. Johnson is considered qualified.

Q. (Mr. Losee continuing.) Would you explain briefly the purpose of this application?

A. Reserve Oil, Inc., seeks contraction of the vertical limits of the Jalmat Gas Pool underlying the Cooper Jal Unit area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie-Mattix Pool to include said formations.

In the alternate, Reserve seeks approval for downhole commingling of Jalmat and Langlie-Mattix production in the well bore of seven wells in the Cooper Jal Unit and an administrative procedure for such approval for future wells.

Q. When was the Cooper Jal Unit formed?

A. Following an Oil Conservation Commission hearing held August 19, 1970, the Commission issued Order Number R-4018 approving the Cooper Jal Unit agreement.

Order Number R-4019 approving the water flood project in the Langlie-Mattix Pool and Order Number R-4020 approving the water flood project in the Jalmat Pool.

The unit was formed on October 1st, 1970, and pool-scale water injection was commenced during November of 1971.

MR. LOSEE: We would ask the Examiner to take administrative notice of the testimony and the exhibits in Case Numbers 4018, 19, and 20.

MR. STAMETS: The Examiner will note these cases.

Q. (Mr. Losee continuing.) Are the Jalmat and Langlie-Mattix Pools both unitized in one unit with common ownership in the area?

A. Yes, all of the working interests and royalty interests in the unit are unitized.

Q. Would you turn to what has been marked as Exhibit A and explain what is shown on this exhibit?

A. This is a map of the Cooper Jal Unit. The one hundred series wells are Langlie-Mattix completions and the two hundred series wells are Jalmat oil completions and the three hundred series wells are Jalmat gas completions.

Q. Now, you mentioned Jalmat gas, is the Jalmat Gas Pool, or completions, unitized with the same ownership as both of these oil zones?

A. Yes. The two oil zones and the one gas zone are all in a common unit with a common ownership.

Q. Are you requesting permission to downhole commingle the Jalmat Gas Pool with the Langlie-Mattix Oil Pool?

A. No, sir. We are requesting permission to downhole commingle the Jalmat oil pool and the Langlie-Mattix oil pool.

Q. Now, does the Jalmat produce oil in some locations and only gas in other locations within the Cooper Jal Unit?

A. Yes. As was explained in detail at the hearing for the water flood project the Jalmat pool containing the Yates formation is structurally a closed lower syncline in which most of the unit is located.

The Yates formation is progressively higher structurally in all directions such as the oil accumulation in the Yates formation which was at one time virtually surrounded by wells producing dry gas from the Yates formation.

Exhibit Three of the water flood hearing is a structure map contoured on top of the Yates formation.

Q. How many Jalmat gas wells are presently producing within the unit?

A. Three Jalmat gas wells are presently producing. These wells are Well No. 301, located in D, 18, 24, 37; 303, located in K 13, 24, 36; and 306, located in J 18, 24, 37.

Well 306 is a dually completed well with the Langlie-Mattix pool. The Langlie-Mattix producing well is designated as Well 149.

Q. How many of these Jalmat gas wells are shut in,

presently?

A. Two Jalmat gas wells are shut in. These wells are Wells No. 302, located in G 18, 24, 37; and Well No. 304, located in J 13, 24, 37.

Well 302 is a dually completed well with the Langlie-Mattix pool injection well being designated as Well 145.

The locations of the producing and shut in Jalmat gas wells are shown on Exhibit A.

Q. Now, how many Jalmat gas wells were there in this unit when it was formed in 1970?

A. Originally, there were thirteen gas wells. The present status is that five of these gas wells have been discussed. The current status of the remaining eight wells is listed below.

Well 233 located in I 13, 24, 36 is a Jalmat water injection well, now.

Well No. 234 located in O 13, 24, 36 is also a Jalmat water injection well.

Well 243 located in D 24, 24, 36 is a Jalmat oil producer.

Well 242 is located in C 19, 24, 37 is a Jalmat water injector.

Well 240 located in K 19, 24, 37 is a Jalmat water injector.

Well 237 located in O 23, 24, 36 is a Jalmat water

injector.

Well 241 located in G 25, 24, 36 is a Jalmat water injector.

Well 239 located in E 30, 24, 37 is a Jalmat water injector.

Q. Now, I notice one of those wells, Well No. 243, which was originally a gas well is now an oil well and would you please explain?

A. Yes. This well had been classified as a Jalmat gas well and it had been shut in for two years. That well is located in D 24, 24, 36.

After the water flood was -- after the water injection had been going for a few months we took periodic flood level surveys in the shut in gas well.

When flood was detected in the well the well swab tested a small amount of oil.

The necessary forms were then filed with the Commission and the classification was change in this well from a Jalmat gas well to a Jalmat oil well and then the well was then placed on the pump.

Q. Do you know, approximately, by your last test how much oil this well has produced in the Jalmat?

A. It is in the neighborhood of five or six barrels of oil a day plus fifteen to twenty barrels of water, which is a small producer compared to the other wells.

Q. Now, as you have mentioned you are not requesting permission to downhole commingle oil with gas but how do you propose to produce a gas well that may be productive of oil if it is deepened to the Langlie-Mattix?

A. In such a situation we would request permission to dually complete the Jalmat gas well with the Langlie-Mattix oil well.

This is what occurred in Well 306 which is a dual completion in the Jalmat gas and the Langlie-Mattix oil pool.

Q. Now, in your water flood project, have the wells responded favorably to this injection program?

A. Yes. Exhibit B is a performance curve of the Cooper Jal Unit that indicates that the total production and injection from both zones, both the Jalmat oil and the Langlie-Mattix oil zones.

Exhibit C is a performance curve of the Jalmat oil pool and Exhibit D is a performance curve of the Langlie-Mattix pool.

Q. How many wells are there in the Cooper Jal Unit?

A. As of August 1st, 1977, there were forty-five producing wells, two shut in wells, and forty-eight injection wells as follows:

The Jalmat oil zone had nineteen producers and twenty-three injectors for a total of forty-two.

The Langlie-Mattix zone had twenty-three producers and twenty-five injectors for a total of forty-eight.

The Jalmat-Yates gas pool had three producers and two shut ins for a total of five.

So, in the total unit we have forty-five producing wells, forty-eight injector wells, and two shut in wells for a total of ninety-five wells.

Q. As of August 1, what was the cumulative oil production from the unit?

A. For the Jalmat oil pool the cumulative oil was four million nine hundred and fifty-one thousand five hundred ninety-four barrels.

The cumulative oil from the Jalmat pool since the unitization was nine hundred and ninety-three thousand forty-seven barrels.

From the Langlie-Mattix pool the cumulative oil was three million four hundred sixty-six thousand eight hundred and eighty-seven barrels.

The cumulative oil from the Langlie-Mattix zone since unitization was one million four hundred twenty thousand four hundred forty-three barrels.

The total cumulative oil from the unit was eight million four hundred and eighteen thousand four hundred eighty-one barrels.

The cumulative oil from the unit since unitization

was two million four hundred and thirteen thousand four hundred and ninety barrels.

Q. What is the cumulative water injection in the unit?

A. As of August 1st, 1977, the cumulative water injection in the Cooper Jal Unit was for the Jalmat zone fifteen million three hundred five thousand seven hundred and thirty-six barrels.

For the Langlie-Mattix zone seventeen million five hundred forty-three thousand six hundred seventy-eight barrels for a total water injection into both zones of thirty-two million eight hundred forty-nine thousand four hundred fourteen barrels.

Q. Is the production from the Jalmat oil and Langlie-Mattix pools commingled on the surface?

A. Yes. Order Number R-663 authorized commingling on the surface of production from these pools.

Q. Why are you requesting the Commission to give you authorization to downhole commingle these wells?

A. Please refer to Exhibit Number E which is a map of the Cooper Jal Unit which indicates the Jalmat oil pool flood pattern.

The arrows indicate wells presently completed in the Langlie-Mattix pool -- that well is 115, 117, 121, 134, and 150, which if perforated in the Jalmat oil pool would result in an improved water flood pattern for the Jalmat oil pool and

should result in the increase in the ultimate recovery from the Jalmat oil pool without decreasing the ultimate recovery from the Langlie-Mattix pool.

Q. Would you refer to Exhibit F and explain what is shown on this exhibit?

A. This is a map of the Cooper Jal Unit which indicates the Langlie-Mattix flood pattern.

The arrows indicate wells 209 and 221 which are presently completed in the Jal Mat oil pool which if deepened and completed in the Langlie-Mattix pool would result in an improved water flood pattern for the Langlie-Mattix pool and should result in an increase in the ultimate recovery from the Langlie-Mattix pool without decreasing the ultimate recovery from the Jalmat oil pool.

Q. Has Reserve investigated the possibility of dualling these wells?

A. Yes. It would be possible to dual these wells by installing two strings of two and a sixteenth tubing, one packer, and one string of one inch tubing to serve as gas vent for the lower zone.

However, these wells are equipped with five and a half casing or seven inch casing with four and a half in liners.

The clearance of the three strings inside five and a half casing is such that it would be neceesary to run the

tubing strings simultaneously in order to lift the necessary volumes of fluid and it would be necessary to utilize tubing pumps.

With this type of installation the pooling of all strings of tubing would be necessary to make routine pump barrel changes.

Furthermore, although such an installation is possible it is my opinion that such a installation is highly undesirable due to the possibility of long fishing jobs which could occur should any of the three tubing strings part.

Also, in some of the Jalmat oil pool wells very fine sand grains sometimes accompany the fluid production. Having three strings of tubing in the well bore would be a very unsound practice under such conditions in my opinion.

Q. What about wells that are equipped with liners?

A. On wells equipped with seven inch casing and four and a half inch liners the four and a half inch liner extends to above the upper completion which precludes the use of three strings of tubing since the pump would be set a considerable distance above the upper zone's production.

Q. Assuming that the Commission should see fit to grant this downhole commingling how do you plan to pump the well?

A. We have calculated that wells with one string of

two and three-eighths tubing, a one and three quarters tubing pump and a four hundred fifty-six thousand inch pound pumping unit could lift approximately three hundred twenty barrels of fluid per day.

That if a six hundred forty inch pound unit were installed approximately four hundred and eighty barrels of fluid could be produced.

If two and seven-eighths tubing and a a two inch pump were installed -- a four hundred fifty-six inch pound pumping unit we could lift four hundred and eighty barrels of fluid a day.

If a six hundred and forty thousand inch pound unit were installed we could lift six hundred and forty barrels of fluid per day.

Q. Do you feel like that would be sufficient pumping capacity to pump the wells down if downhole commingling was authorized?

A. Since we have not completed the second zone in the wells in question we do not know what the actual capacity of the commingled zones will be.

However, based on individual well performance to date we believe that this would be adequate lifting capacity.

As a normal operating procedure we checked the fluid levels in all producing wells at least on a monthly basis. Should a high fluid level be detected in any of these

wells pumping equipment with a greater capacity would be installed.

Q. Do you make every effort to keep all of these wells pumped down?

A. Yes. We believe that in keeping the producing wells pumped down increases the production rate which is the reason for the periodic fluid level determination.

Q. How do you determine the fluid levels in these wells?

A. We have an acoustic well sounder which is in use almost every day.

Q. Do you have any alternative to downhole commingling?

A. In some cases it would be necessary to drill a new well. In other cases it would be necessary to wait until one zone had reach its economic limit before recompleting the well in another zone.

We do not believe that either alternative will result in a significantly greater recovery than will be obtained by the downhole commingling.

Q. Of course, if you had to drill new wells that would be additional expense?

A. Yes, sir.

Q. Are both zones to be commingled classified as oil zones and do they both require artificial lift?

A. Yes.

Q. Are the fluids in each zone compatible with fluids from the others so that combining the fluids will not result in the formation of precipitation that might damage the reservoir?

A. Yes. Please refer to Exhibit Number G, which is a detailed chemical analysis prepared by Martin Water Laboratories.

In addition as we have previously stated the production from both zones is presently commingled on the surface with no apparent detrimental effects.

Q. Will the value of the crude oil be reduced by commingling?

A. No. The average A.P.I. gravity of the Jalmat oil is appxoimately thirty-seven point five degrees A.P.I.

For the Langlie-Mattix zone approximately thirty-seven point seven degrees A.P.I.

Since the gravity and other characteristics are essentially the same the crude oil prices are the same and as I presently stated -- previously stated -- the crudes are presently commingled on the surface.

Q. Is the ownership of the two pools common throughout?

A. Yes, the ownership of the working interest, royalty interest, and the royalty ownership is common for both pools over the entire unit.

Q. Will commingling jeopardize the efficiency of the

secondary recovery operations?

A. No. As we have previously stated it is our practice to keep the fluid levels in all producing wells pumped down.

The fluid levels are checked periodically to be sure that the fluid levels are kept pumped down. Keeping the wells pumped down should prevent any significant cross flows between the reservoirs.

Q. Now, you have contraction of the vertical limits of the Jalmat oil pool by deleting the Yates and Seven Rivers and the extension of the vertical limits of the Langlie-Mattix by including said formations throughout the Cooper Jal Unit.

Where the Jalmat produces both oil and gas how would you propose to the Commission that it contract the limits of the Jalmat pool?

A. Although it is possible to segregate by legal description that portion of the unit which is presently producing gas from the Jalmat this might not be practical because as I earlier mentioned one of the original Jalmat gas wells has now become an oil well.

Even though the Jalmat oil pool and the Jalmat gas pool produce from the same formation they are separately classified and are each covered by a different allowable.

Under these circumstances we propose that the order

contracting the vertical limits within the Cooper Jal Unit by deletion of the Yates and Seven Rivers formation be limited to the Jalmat oil pool.

The formation within the Cooper Jal Unit producing gas continues to be a part of the Jalmat oil pool.

Q. Okay. If you were to segregate the Jalmat gas by legal description would you explain to the Examiner what portion you would exclude from the entire Cooper Jal Unit and would you refer to your map?

A. It would be the south half of Section 13 -- I am sorry -- the north half of the southwest of 13, 24, 36, and the north half and southwest quarters of 18, 24, 37.

Q. Now, that would exclude all of the Jalmat gas leases presently producing Jalmat gas wells?

A. Yes, sir.

MR. STAMETS: Let me just double check that -- the north half of the southwest quarter of Section 13?

A. Yes, sir.

MR. STAMETS: And that is 24, 36 -- and the north half and the southwest quarter of Section 18, 24, 37?

A. I am sorry, the southeast.

MR. STAMETS: All right, and we are talking about Section 18?

A. Yes, sir.

MR. LOSEE: Instead of the southwest, it's the

southeast.

Q. (Mr. Losee continuing.) Do you understand that contraction of the Jalmat oil pool and the extension of the Langlie-Mattix by a vertical deletion of the Seven Rivers has heretofore been approved by the Commission?

A. Yes. It is my understanding that this has been accomplished on page 4924 in the Langlie-Jal Unit located just south a few miles from the Cooper Jal Unit.

Q. Now, Mr. Johnson, in the alternative you have asked for authority to downhole commingle these seven wells. Have you prepared any individual well data for each of these wells for the Commission if this approval is granted?

A. Yes, Exhibit H contains the following data for each of these wells -- lease name, well number, and well location.

Secondly, a current twenty-four hour productive tests showing volumes of oil, gas and water produced from the present zone of completion.

A production curve from the well indicating the production from the present zone of completion and a schematic well bore diagram indicating present completion intervals and the proposed completion intervals.

Q. Now, Mr. Johnson, in the event the Commission sees fit to grant your alternative request, that is, to downhole commingle in these seven specified wells do you also request

a procedure, approval of a procedure, for administrative approval of downhole commingling of further wells within the unit?

A. Yes. If only our alternative request is granted we would like for future requests for exception to Rule 303 (a) in the Cooper Jal Unit be considered for administrative approval upon submission of the required data without notice or hearing.

Q. Mr. Johnson, were Exhibits A through H prepared by you or under your supervision?

A. Yes, they were.

MR. LOSEE: Mr. Stamets, we move the introduction of Exhibits A through H.

MR. STAMETS: These exhibits will be admitted.

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

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Johnson, looking at your Exhibits B, C, and D, it would appear to be an older project with water started in the ground back in 1971?

A. Yes, sir, November of '71.

Q. So, we do have production history on individual pools both primary and secondary at this point?

A. Yes, sir, the graphs started -- the plots started

upon unitization and then you can see on the graph when water injection commenced and roughly a year and a half later is when we started to see the results of the injection.

Q. It also appears from Exhibits C and D that both of the projects are making something like twenty thousand barrels a month?

A. Yes, sir.

Q. Okay.

A. Well, no, we are making in the neighborhood of thirty-six thousand barrels a month on the combined.

Q. I was just looking at the performance curves shown on these two exhibits --

A. One of them is from one zone -- the Cooper Jal Unit total is on Exhibit B and we were around thirty-seven thousand five hundred barrels in August.

Q. Is that shown on the upper graph or the lower graph?

A. On the lower -- actually, the oil production in August of 1977, was thirty-eight thousand seventy-four barrels.

Q. Right. From the next two graphs though it appears that it is roughly fifty percent from the Jalmat and fifty percent from the Eumont?

A. In August, the Jalmat oil was eighteen thousand, roughly, and the Langlie-Mattix oil was twenty thousand,

roughly.

Q. If your downhole commingling proves successful on these wells how many more wells to you anticipate that you might want to try it on?

A. Well, there would be several more. I am not -- I don't have an exact number for you but it appears to us where we have an upper zone well that it is not real close to -- I mean, where we have a lower zone well that is not real close to an upper zone injector that we always have the possibility of picking up additional reserves by perforating the upper zone well in -- I mean, the lower zone well in the upper zone and the other way around for the upper zone by deepening them.

So, what it is, is that we would have -- this would give us the option to greatly increase our well density in certain areas where we think that it would be beneficial.

Q. Under downhole commingling -- that situation -- is it possible that one of the zones might get watered out and pumping costs get so high that you would leave oil in the other zones?

A. Well, that's a possibility. However, in such an event before we would abandon anything we would certainly test each zone individually. As a matter of fact, for economic reasons we would do that.

You know, if the flood level determinations indicated

that we weren't getting all of the fluid and it appeared to be uneconomical to install some of the newer type units to lift a greater amount of fluid we would check each one individually and if it was ninety-nine percent water that zone would be abandoned and we would cease the commingling.

Q. Then, if downhole commingling were authorized would you be willing to work with the District Supervisor of the Hobbs District Office to determine an allocation formula for the production between the Jalmat and the Langlie-Mattix zones?

A. Yes, sir, that would be fine.

Q. Have you had any water break-through problems with either of these two zones?

A. Well, we have had as you can see from our graph the water production has increased significantly but we have not abandoned any wells so far.

MR. STAMETS: Any other questions of the witness?

MR. LOSEE: Nothing further.

MR. STAMETS: He may be excused. Anything further in this case? We will take the case under advisement.

(THEREUPON, the witness was excused and the case was concluded.)

REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 6085, heard by me on 11-16, 1977.

Richard L. Stamets, Examiner
New Mexico Oil Conservation Commission

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 6085
Order No. R-5590

APPLICATION OF RESERVE OIL, INC.
FOR DOWNHOLE COMMINGLING OR POOL
CONTRACTION AND EXTENSION, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on November 16, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 22nd day of November, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Reserve Oil, Inc., seeks approval for the downhole commingling of Jalmat and Langlie-Mattix production in the wellbore of its Cooper Jal Unit Wells No. 115 in Unit P of Section 13 and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico, and an administrative procedure for such approval for future wells.

(3) That, in the alternative, applicant seeks the contraction of the vertical limits of the Jalmat Gas Pool underlying said Cooper Jal Unit Area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie-Mattix Pool to include said formations.

(4) That the applicant has been conducting separate secondary recovery operations in the Jalmat and Langlie-Mattix Pools within said Cooper Jal Unit Area.

(5) That the proposed commingling will permit the applicant to achieve improved drainage in each of said projects which may result in the recovery of additional hydrocarbons from each of the subject pools, thereby preventing waste, and will not violate correlative rights.

(6) That the reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed commingling provided that any such commingled well is not shut-in for an extended period.

(7) That to afford the Commission the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Hobbs district office of the Commission any time any well downhole commingled under provisions of this order is shut-in for 7 consecutive days.

(8) That said Cooper Jal Unit secondary recovery projects have been in operation approximately 6 years and that separate production statistics have been maintained on each of said projects for this same period.

(9) That approval of the alternative application, in this case, would result in the loss of identity of production from the individual projects during their mid-life and should therefore be denied.

(10) That an administrative procedure should be established whereby additional Cooper Jal Unit Wells may be recompleted in such a manner as to permit the downhole commingling of Jalmat and Langlie-Mattix oil production therein.

(11) That in order to allocate the commingled production to each of the commingled zones in the wells, applicant should consult with the supervisor of the Hobbs District Office of the Commission and determine an allocation formula for each of the production zones.

IT IS THEREFORE ORDERED:

(1) That the applicant, Reserve Oil, Inc., is hereby authorized to commingle Jalmat oil and Langlie-Mattix oil production within the wellbore of its Cooper Jal Unit Wells No. 115 in Unit P of Section 13 and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico.

(2) That the supervisor of the Commission's district office at Hobbs is hereby authorized to grant approval for the downhole commingling of Jalmat oil and Langlie-Mattix oil production within the wellbore of additional wells within said Cooper Jal Unit.

(3) That the applicant shall consult with the supervisor of the Commission's district office at Hobbs and determine a formula for the allocation of production to each zone of any well downhole commingled under provisions of this order.

(4) That the downhole commingling authority granted by this order shall terminate upon abandonment of secondary recovery operations in the Jalmat and Langlie-Mattix Pools within said Cooper Jal Unit.

(5) That the application of Reserve Oil, Inc., for contraction of the vertical limits of the Jalmat Gas underlying said Cooper Jal Unit Area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the Langlie-Mattix Pool to include said formations is hereby denied.

(6) That to afford the Commission the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Hobbs district office of the Commission any time any well commingled under authority granted by this order is shut-in for 7 consecutive days.

(7) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

APPLICATION OF

RESERVE OIL, INC.

TO NEW MEXICO OIL CONSERVATION COMMISSION

FOR AN EXCEPTION TO RULE 303A

COOPER JAL UNIT

JALMAT (OIL) AND LANGLIE MATTIX (OIL) POOLS

LEA COUNTY, NEW MEXICO

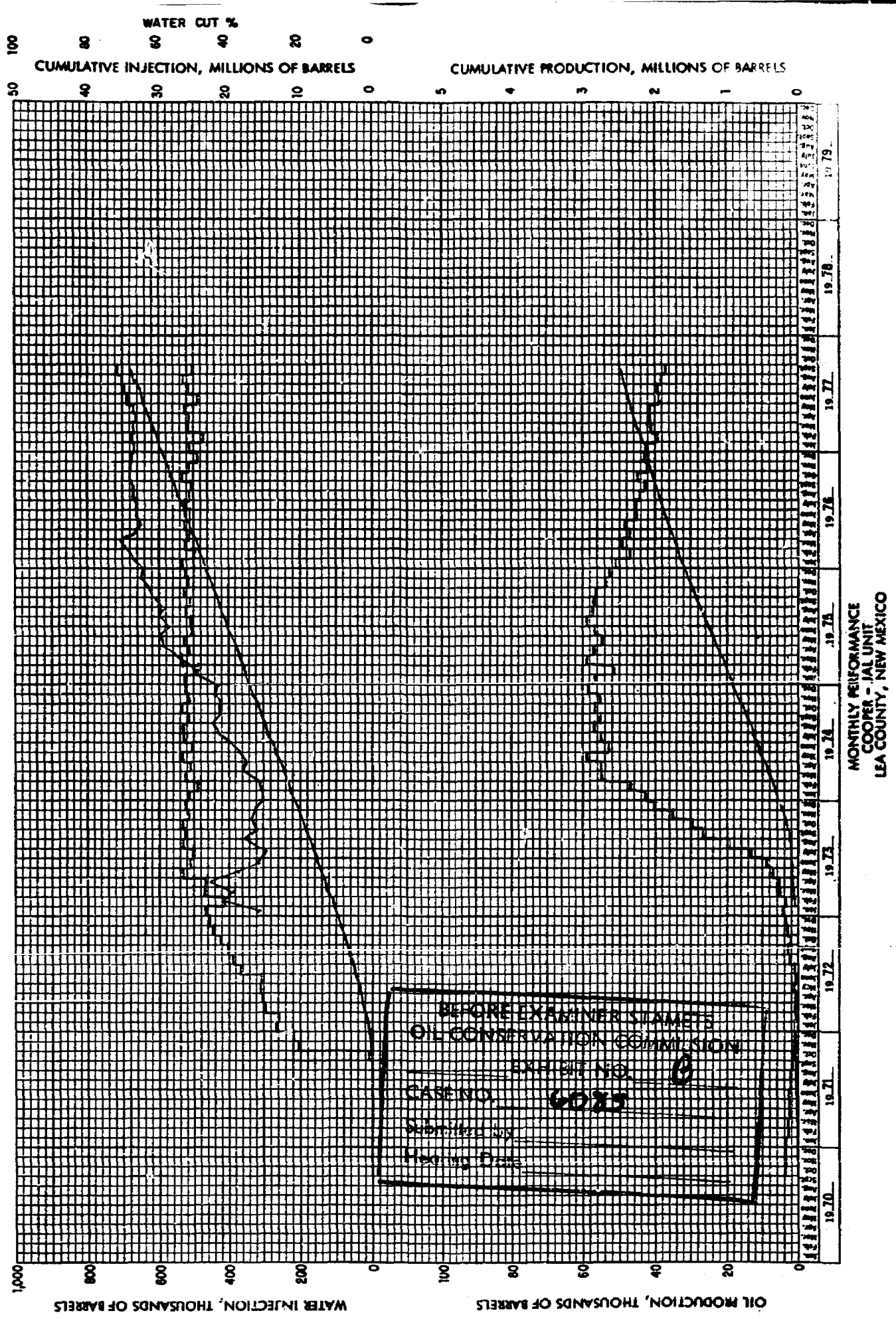
NOVEMBER 16, 1977

PREPARED BY:

E. M. JOHNSON AND C. R. CHANDLER

RESERVE OIL, INC.

MIDLAND, TEXAS


WATER CUT %
100
80
60
40
20
0
CUMULATIVE INJECTION, MILLIONS OF BARRELS
50
40
30
20
10
0
CUMULATIVE PRODUCTION, MILLIONS OF BARRELS
5
4
3
2
1
0
19.79
19.78
19.77
19.76
19.75
19.74
19.73
19.72
19.71
19.70
MONTHLY PERFORMANCE
COOPER - JAL UNIT
LEA COUNTY, NEW MEXICO
BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 8
CASE NO. 6035
Submitted by
Hearing Date
1,000
800
600
400
200
0
WATER INJECTION, THOUSANDS OF BARRELS
100
80
60
40
20
0
OIL PRODUCTION, THOUSANDS OF BARRELS

MONTHLY PERFORMANCE
COOPER JAL UNIT
JALMAT (GAS) POOL
LEA CO, NEW MEXICO

WATER INJECTION

GROSS FLUID

OIL

WATER %

46 6693

KEUFFEL & ESSER CO. MADE IN U.S.A.

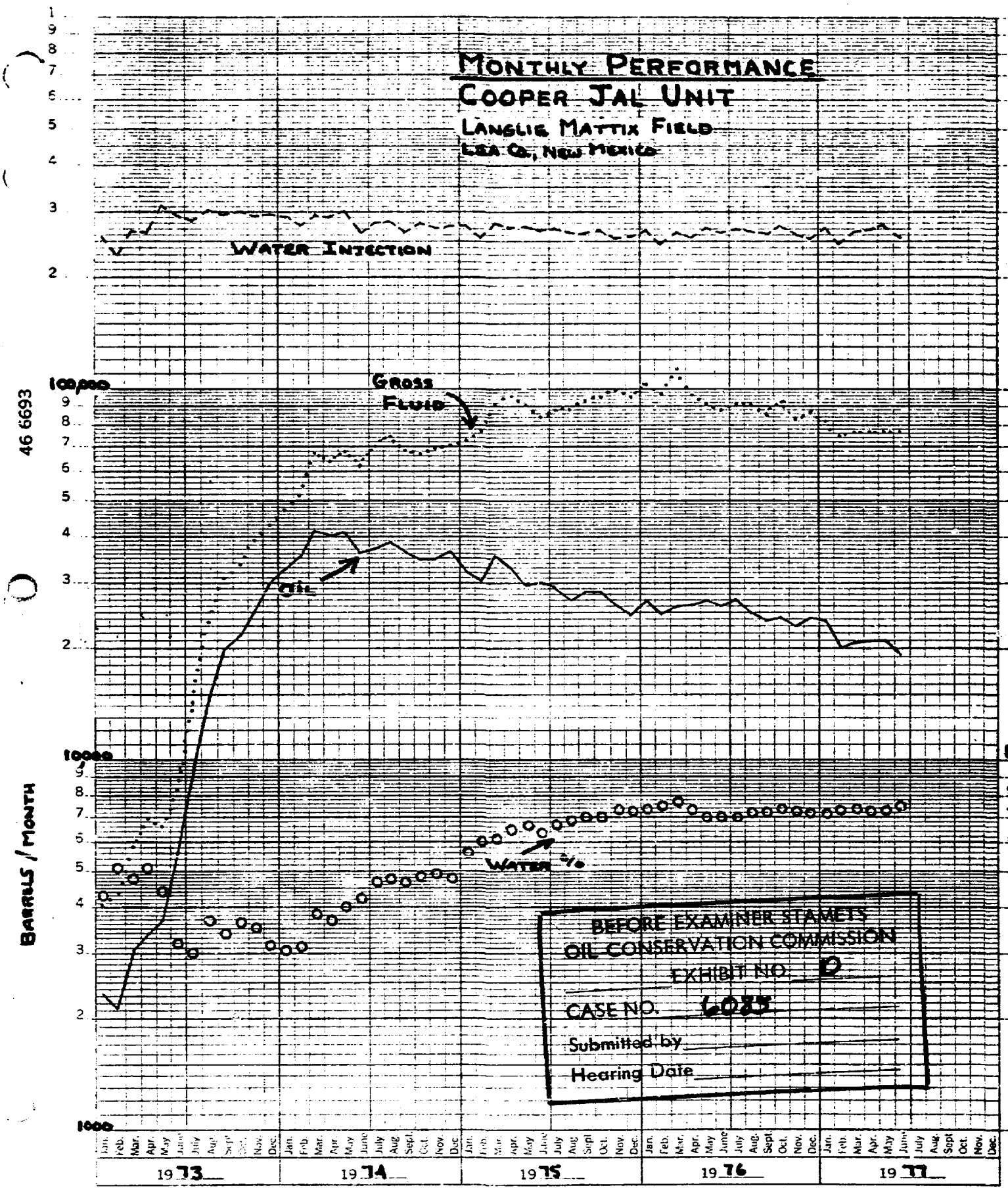
5 YEARS BY MONTHS X LOG CYCLES

100,000
10,000
1000

1973 1974 1975 1976 1977

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 6015
Submitted by
Hearing Date

MONTHLY PERFORMANCE
COOPER JAL UNIT
LANGLIE MATTIX FIELD
LEA CO., NEW MEXICO



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 10
CASE NO. 6085
Submitted by
Hearing Date

RECEIVED

Martin Water Laboratories, Inc

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 OR 563-1040

406 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 777266
SAMPLE RECEIVED 7-27-77
RESULTS REPORTED 1-1-77

TO: Mr. Erd. Johnson
312 MBP Building, Midland, Texas

COMPANY Reserve Oil, Inc. LEASE Cooper Jal Unit
FIELD OR POOL
SECTION BLOCK SURVEY COUNTY Lea STATE New Mexico
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from Cooper Jal Unit #117.
NO. 2 Produced water - taken from Cooper Jal Unit #121.
NO. 3 Produced water - taken from Cooper Jal Unit #128.
NO. 4
REMARKS: Langlie - Mattix (Lower)

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0328	1.0318	1.0199	
pH When Sampled				
pH When Received	8.1	8.2	7.85	
Bicarbonate as HCO_3	1,232	1,165	1,104	
Supersaturation as $CaCO_3$	188	185	150	
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	10,400	10,000	6,000	
Calcium as Ca	900	580	448	
Magnesium as Mg	1,980	2,078	1,186	
Sodium and/or Potassium	13,257	13,147	8,310	
Sulfate as SO_4	3,518	1,591	1,374	
Chloride as Cl	24,502	23,969	15,411	
Iron as Fe	0.92	2.1	0.96	
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	45,389	41,530	27,833	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide	350	275	350	
Resistivity, ohms/m at 77° F.	0.174	0.193	0.270	
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Calcium Sulfate Scaling Tendency	None	None	None	
Calcium Carbonate Scaling Tendency	Marginal	Marginal	Marginal	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks	Well No.	Oil Gravity, °API
	#125	37.6
	#126	37.8

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. C
CASE NO. 6085
Submitted by
Hearing Date

Form No. 3

By

Waylan C. Martin, M. A.

Martin Water Laboratories, Inc

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 OR 563-1040

RESULT OF WATER ANALYSES

406 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

LABORATORY NO. 777266 (Page 2)
SAMPLE RECEIVED 7-27-77
RESULTS REPORTED 1-1-77

TO: Mr. Krd Johnson
312 HBP Building, Midland, Texas

COMPANY Reserve Oil, Inc. LEASE Cooper Jal Unit
FIELD OR POOL
SECTION BLOCK SURVEY COUNTY Lea STATE New Mexico
SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Cooper Jal Unit #202.
NO. 2 Produced water - taken from Cooper Jal Unit #206.
NO. 3 Produced water - taken from Cooper Jal Unit #219.
NO. 4

REMARKS: Injection (water)

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0456	1.0512	1.0251	
pH When Sampled				
pH When Received	8.1	7.8	8.0	
Bicarbonate as HCO_3	1,293	909	1,000	
Supersaturation as $CaCO_3$	70	75	80	
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	19,200	21,000	8,600	
Calcium as Ca	800	1,720	464	
Magnesium as Mg	4,180	4,058	1,008	
Sodium and/or Potassium	15,622	18,482	9,470	
Sulfate as SO_4	2,915	4,188	1,776	
Chloride as Cl	34,799	39,771	18,020	
Iron as Fe	0.60	4.8	1.7	
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	59,609	69,128	33,366	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide				
Resistivity, ohms/m at 77° F.	525	400	525	
Suspended Oil	0.139	0 12	0.234	
Filterable Solids as mg/l				
Volume Filtered, ml				
Calcium Sulfate Scaling Tendency	None	None	None	
Calcium Carbonate Scaling Tendency	None	None	None	
Results Reported As Milligrams Per Liter				

Additional Determinations And Remarks

Well No.	Oil Gravity, °API
#206	37.1
#221	37.9

Letter of recommendation attached.

Form No. 3

By

Waylan C. Martin, M. A.

Martin Water Laboratories, Inc.

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

WATER CONSULTANTS SINCE 1953
BACTERIAL AND CHEMICAL ANALYSES

406 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

August 1, 1977

Mr. Ed Johnson
Reserve Oil, Inc.
312 MBF Building
Midland, TX 79701

Subject: Recommendations relative to analysis #777266.

Dear Mr. Johnson:

A careful examination of these analyses reveal no evidence of any incompatibility between the Langlie-Mattix (lower zone) water and the Jalmat (upper zone) water. The results reveal a slight concern about the possibility of calcium carbonate scaling potential from the Langlie-Mattix water, but we consider this inconclusive as these are results that warrant confirmation.

It should be pointed out that the fluctuations between wells of water characteristics from both zones are not uncommon in this field and therefore is not considered to carry any significance at this time.

Yours very truly,

Waylan C. Martin, M. A.

WCM/md

INDIVIDUAL WELL DATA

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. H
CASE NO. 6085
Submitted by
Hearing Date

NEW MEXICO OIL CONSERVATION COMMISSION

GAS - OIL RATIO TESTS

C-116
Revised 1-1-65

Operator	Pool	County
Reserve Oil, Inc.	Langlie Mattix	Lea

Address	TYPE OF TEST - (X)	Scheduled ☐	Completion ☐	Special ☒
312 HBF Building, Midland, Texas 79701				

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL
Cooper Jal Unit	115	P	13	24	36	8-2-77	P	-	35	W.F. Unit Allow	24	119	37.6	51	10	196
	117	N	18	24	37	8-1-77	P	-	35	W.F. Unit Allow	24	242	37.8	36	35	972
	121	B	24	24	36	7-13-77	P	-	35	W.F. Unit Allow	24	133	57.6	40	7	175
	134	N	24	24	36	8-2-77	P	-	30	W.F. Unit Allow	24	78	37.5	34	12	353
	150	L	19	24	37	8-7-77	P	-	55	W.F. Unit Allow	24	169	37.8	94	25	266

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

(Signature)

District Engineer

NEW MEXICO OIL CONSERVATION COMMISSION
GAS – OIL RATIO TESTS

C-116
Revised 1-1-65

Operator	Pool	County
Reserve Oil, Inc.	Jalmat (Oil)	Lea

Address	TYPE OF TEST – (X)	Scheduled ☐	Completion ☐	Special ☒
312 HBF Building, Midland, Texas 79701				

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS – OIL RATIO CU.FT/BBL.
Cooper Jal Unit	209	L	24	24	36	5-19-77	P	-	50	W.F. Unit Allow.	24	0	37.1	21	4	190
	221	N	19	24	37	7-19-77	P	-	45	W.F. Unit Allow.	24	59	37.9	79	18	228

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Clarence R. Chandler
(Signature)
District Engineer

COOPER JAL UNIT

WELL NO. 115

UNIT P, SEC. 13, T24S, R36E

COOPER JAL UNIT, WELL #115

Oil
Wtr.
Total Fluid

BBLS./mo.

10,000
9
8
7
6
5
4
3
2
1,000
9
8
7
6
5
4
3
2
100
9
8
7
6
5
4
3
2
10

1973 Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1974 Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1975 Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1976 Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1977 Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

46 6693

K&E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

COOPER JAL UNIT, WELL #115

(FORMERLY ARCO's, MAGGIE DUNN, #1)

LANGLIE MATTIX FIELD

LEA CO., NEW MEXICO

DF ZERO. 8' A.G.L.

GROUND LEVEL = 3327'

CTC 6/6/77

9 5/8", 36# SET TO 1182' →

(CMTD. W/550 SXS. WITH SURFACE RETURNS)

HOLE SIZES

0 - 1182', 11 1/4"

1182 - 3015', 8 3/4"

3015 - 3668', 6 1/4"

EST. CMT. TOP BEHIND 7" = 1980'

(USED 1.1 FT³/SK. YIELD + 112% WASHOUT)

7", 24# SET TO 3015' →

(CMTD. W/300 SXS.)

POTENTIAL ADDITIONAL PAY FOR FUTURE BOREHOLE COMPLETION

3020 - 3230'

4 1/2", 10.6#, H-40 LINER

FROM 2942 - 3668'

(CMT'D. W/750 SXS. CEMENT CIRCULATED)

PRESENT COMPLETION

SELECTED POROSITY: 3426 - 3519'

(34 holes)

* DIAGRAM NOT TO SCALE

COOPER JAL UNIT

WELL NO. 117

UNIT N, SEC. 18, T24S, R37E

COOPER JAL UNIT, WELL #117

OIL

WTR.

TOTAL FLUID

BBLS./mo.

46 6693

K+E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

10,000 9 8 7 6 5 4 3 2 1000 9 8 7 6 5 4 3 2 100 9 8 7 6 5 4 3 2 10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 73 | 19 74 | 19 75 | 19 76 | 19 77

COOPER JAL UNIT, WELL #117

(Formerly Cities Service Oil Co., Jack "A", #2)

LANGLIE-MATTIX FIELD

LEA CO., NEW MEXICO

CRC 7/26/77

DG ZERO = 12' Above G.L.

GL = 3308'

8 5/8", 24# to 320'

(Cmtd. w/150 sxs. with Surface Returns)

HOLE SIZES — UNKNOWN,

HOWEVER, ASSUMED NOMINAL HOLE SIZES FOR FIELD.

0-320' = 11"

320-3341' = 7 7/8"

EST. CMT. TOP = 1845'

(USED 1.1 ft³/SK YIELD & 112% WASHOUT)

POTENTIAL ADDITIONS FOR FUTURE DOWNHOLE COMMINGLING 2945-3185'

5 1/2", 14# SET to 3341'

(Cmtd. w/500 sxs.)

PRESENT COMPLETION

4 3/4" OPEN-HOLE 3341-3648'

DIAGRAM NOT TO SCALE

TD = 3648'

COOPER JAL UNIT

WELL NO. 121

UNIT B, SEC. 24, T24S, R36E

COOPER JAL UNIT, Well #121

Oil

Wtr.

Total Fluid

BBLS./mo.

46 6693

5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

1973 1974 1975 1976 1977

Log Zero = 8' Above G.L.

GL = 3308.5'

13 3/4" to 30'
(Cmtd. w/ 30 sxs.)

9 5/8" set to 1179'
(Cmtd. w/ 550 sxs. with surface returns)

Hole Sizes
0 - 1179', 12 1/2"
1179 - 3017', 8 3/4"
3017 - 3560', 6 1/4"

7", 20# Set to 3017'
(Cmtd. w/ 350 sxs.)

Est. Cmt. Top = 1918'
(Used 1.1 ft³/sk. Yield + 112% Washout)

4 1/2", 10.6#, H-40 Liner
from 2966-3560'
(Cmtd. w/ 400 sxs. out btm. + Sqzd. Top w/ 300 sxs.

TD = 3560'

COOPER JAL UNIT, WELL #12
(Formerly ARCO's, Maggie Dunn Unit, #1
LANGLIE MATTIX FIELD
LEA Co., New Mexico

7/31/77

*

DIAGRAM NOT TO SCALE

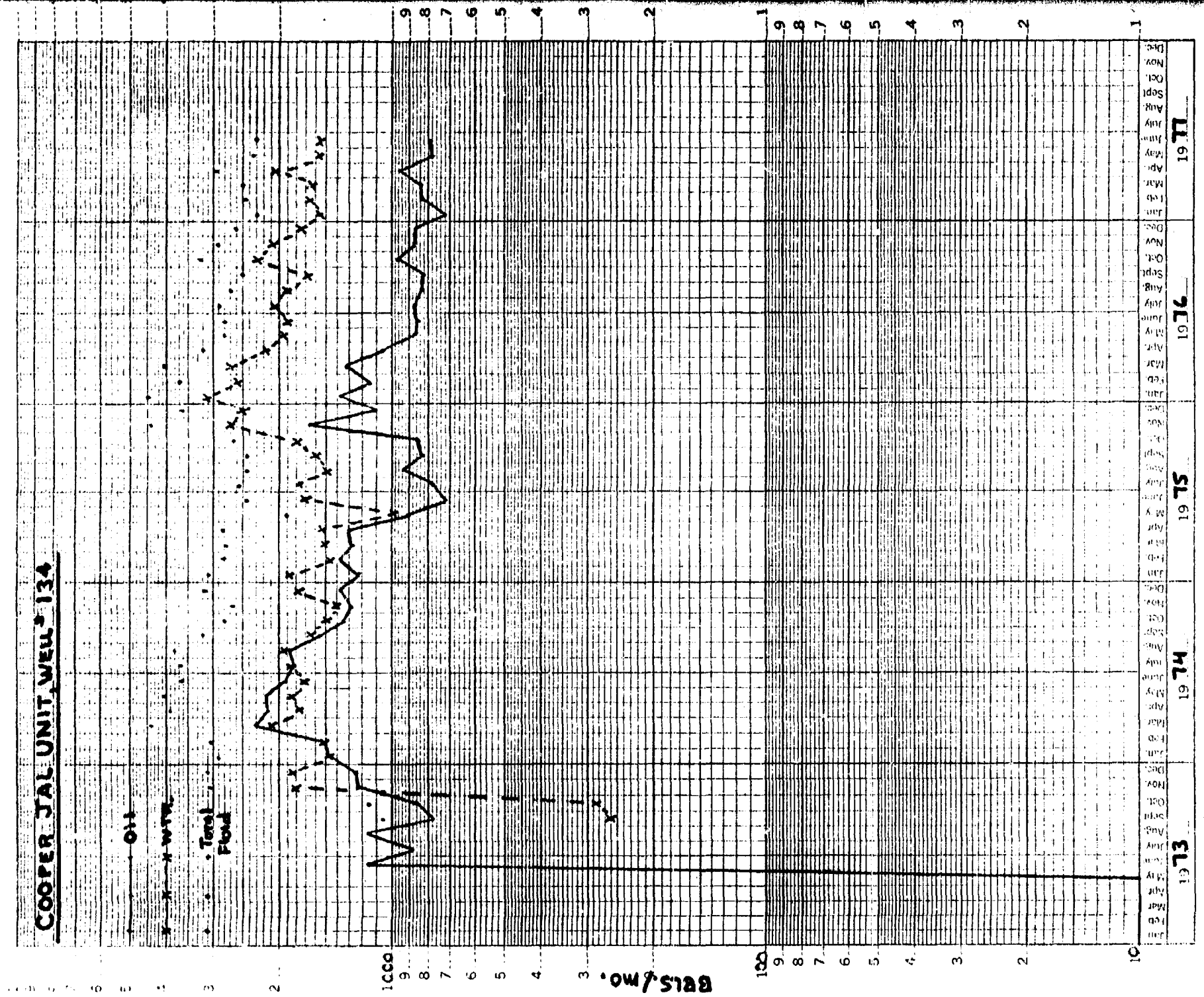
POTENTIAL ADDITIONS FOR FUTURE DOWNHOLE COMMINGLING
3020 - 3185

PRESENT COMPLETION
SELECTED POROSITY
3423 - 3522' (37 holes)

COOPER JAL UNIT

WELL NO. 134

UNIT N, SEC. 24, T24S, R36E



KE 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 6693

Log Zero = 1' Above R.T.

COOPER JAL UNIT, WELL #134

(Formerly Petco's, Thomas, #8)

LANGLIE-MATTIX FIELD

LEA Co., NEW MEXICO

CRC 7/26/77

8 5/8" SET TO 280'

(Cmtd. w/ 150 sxs. with surface returns)

HOLE SIZES - UNKNOWN,

Assumed 7 7/8" for 5 1/2" pipe.

OPEN-HOLE = 4 3/4"

EST. CEMENT TOP = 2571'

(Used 1.1 ft³/sk. yield + 112% washout)

POTENTIAL FUTURE DUAL COMMINGLING ADDITION

3030-3200'

5 1/2" Csg. to 3462'

(Cmtd. w/ 300 sxs.)

PRESENT COMPLETION

"7 RIVERS" OPEN-HOLE

(108')

DIAGRAM NOT TO SCALE

TD = 3570'

COOPER JAL UNIT

WELL NO. 150

UNIT L, SEC. 19, T24S, R37E

COOPER JAL UNIT, WELL 150

Oil

WTR.

Total Fluid

46 6693

K&E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

BBLS./MO.

10,000
9
8
7
6
5
4
3
2
1000
9
8
7
6
5
4
3
2
100
9
8
7
6
5
4
3
2
10

1973	1974	1975	1976	1977
Jan.	Jan.	Jan.	Jan.	Jan.
Feb.	Feb.	Feb.	Feb.	Feb.
Mar.	Mar.	Mar.	Mar.	Mar.
Apr.	Apr.	Apr.	Apr.	Apr.
May	May	May	May	May
June	June	June	June	June
July	July	July	July	July
Aug.	Aug.	Aug.	Aug.	Aug.
Sept.	Sept.	Sept.	Sept.	Sept.
Oct.	Oct.	Oct.	Oct.	Oct.
Nov.	Nov.	Nov.	Nov.	Nov.
Dec.	Dec.	Dec.	Dec.	Dec.

COOPER JAL UNIT, WELL # 150

(Formerly AMERADA, A.G. FALBY, #1)

JALMAT (OIL) FIELD

LEA CO., NEW MEXICO

CRC 8/16/77

Log Zero = 9' Above G.L.

Ground Level = 3284'

8 5/8", 32# to 314'

(Cmtd. w/ 175 sxs. with Surface Returns)

HOLE SIZES

0 - 314', 12 1/4"

314 - 3824', 7 7/8"

POTENTIAL ADDITIONAL PAY FOR FUTURE DOWNHOLE COMMINGLING

3085' - 3190', 150 holes

BAKER Model 'AD-1' Pkr @ 3249'

PKR USED TO ISOLATE ZONES.

5 1/2", 15.5#, J-55 to 3350'

(Cmtd. w/ 450 sxs. 84 Temp. Survey, TOC = 2126')

PRESENT COMPLETION

3350 - 3714'

PBTD = 3714'

TD = 3824'

* Diagram Not to Scale

COOPER JAL UNIT

WELL NO. 209

UNIT L, SEC. 24, T24S, R36E

COOPER JAL UNIT, WELL #209

Oil
Wtr.
Total Fluid

BBLS./MO.

10,000 9 8 7 6 5 4 3 2 1000 9 8 7 6 5 4 3 2 100 9 8 7 6 5 4 3 2 10

1 9 8 7 6 5 4 3 2 1 9 8 7 6 5 4 3 2 1 9 8 7 6 5 4 3 2 1

Jan. Feb. Mar. Apr. May June July Aug. Sept Oct. Nov. Dec.

19 73 | 19 74 | 19 75 | 19 76 | 19 77

46 6693

K&E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

Log Zero = 10' Above G.L.

G.L. = 3329'

COOPER JAL UNIT, WELL #209

(Formerly Exxon's, Thomas, Well #5)

JALMAT (OIL) FIELD

LEA CO., NEW MEXICO

CEC 7/26/77

8 5/8", 24# + 29.75# SET FROM 0-1215'

(Cmtd. w/ 500 sxs. WITH SURFACE RETURNS)

* DIAGRAM NOT TO SCALE

HOLE SIZES

0-1215', 11"

1215-3680', 7 7/8"

EST. CEMENT TOP = 1885'

(USED 1.1 ft³/SK. YIELD + 112% WASHOUT)

3160-95' } 11" PRESENT COMPLETION "YATES"

3224-47' }

POTENTIAL ADDITIONAL PAY FOR FUTURE DOWNHOLE COMMINGLING.

PBTD = 3492', Bridge Plug w/ 8' cement on Top.

PLUG SET IN 1956 WHEN PLUGGED BACK FROM "QUEEN"

5 1/2", 14#, SET TO 3680'

(Cmtd. w/ 600 sxs.)

3542-48', 4 SPF

3623-29', 4 SPF } INITIAL COMPLETION 10-5-54

OLD PBTD = 3645' (CEMENT)

TD = 3681'

COOPER JAL UNIT

WELL NO. 221

UNIT N, SEC. 19, T24S, R37E

COOPER JAL UNIT, WELL # 221

OIL

WATER

TOTAL FLUID

46 6693

K&E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

BBLS./MO.

1000 9 8 7 6 5 4 3 2

100 9 8 7 6 5 4 3 2

10 9 8 7 6 5 4 3 2 1

Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

1973 1974 1975 1976 1977

COOPER JAL UNIT, WELL #221

(Formerly Amerada's A.G. Falby, #2)

JALMAT (OIL) FIELD

Lea County, New Mexico

CRC 7/21/72

Log Zero = 10' Above B.H.

G.L. = 3274' D.F. = 3283'

8 5/8", 32# to 314'
(Cmt'd. w/175 sxs. with surface returns)

Hole Sizes

0 - 314', 11"

314 - 3320', 7 7/8"

Est. Cmt. Top Above Shoe = 1974'
(Used 1.1 ft³/sk. Yield @ 112% washout)

★ Diagram Not To Scale

5 1/2", 15.5# to 3320'
(Cmtd. w/450 sxs out Btm. + 1200. 450 sxs out Perfs at 1200')

1200'

1200. 3 perfs w/450 sxs. to get cement behind 5 1/2" csg. above salt section. By Temp. Log, TOC = 450'.

Potential Additional Pay for Future Downhole Commingling Exist From 3400 - 3600' - Will Have to Drill Out.

"Yates" Present Completion

3045-68'

3078-90'

3105-20'

PBTD = 3236'

TD = 3320'

LAW OFFICES
LOSEE & CARSON, P.A.
300 AMERICAN HOME BUILDING
P. O. DRAWER 239
ARTESIA, NEW MEXICO 88210

A. J. LOSEE
JOEL M. CARSON
CHAD DICKERSON

AREA CODE 505
746-3508

NOV 7 1977

4 November 1977

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Enclosed, please find three copies of application of Reserve Oil, Inc. for an exception to Rule 303A, or in the alternative, for contraction of the vertical limits of the Jalmat (Oil) Pool and enlargement of the vertical limits of the Langlie Mattix Pool, Cooper Jal Unit Area. Lea County, New Mexico, which I understand has been set for hearing before an examiner on November 16.

Very truly yours,

LOSEE & CARSON, P.A.

A. J. Losee

AJL:jw
Enclosures

cc: Mr. Erd Johnson

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF RESERVE OIL, INC. FOR AN EXCEPTION TO RULE 303A, OR IN THE ALTERNATIVE, FOR CONTRACTION OF THE VERTICAL LIMITS OF THE JALMAT (OIL) POOL AND ENLARGEMENT OF THE VERTICAL LIMITS OF THE LANGLIE MATTIX POOL, COOPER JAL UNIT AREA, LEA COUNTY, NEW MEXICO.	:	CASE NO. 6085

APPLICATION

COMES RESERVE OIL, INC., by its attorneys, and states:

1. Applicant is the operator of the Cooper Jal Unit for the secondary recovery of oil and gas from the Tansill, Yates, Seven Rivers and Queen formations, underlying the following lands in Lea County, New Mexico:

Township 24 South, Range 36 East, N.M.P.M.

Section 13: S/2
Section 14: SE/4 SE/4
Section 23: S/2 SE/4
Section 24: All
Section 25: N/2
Section 26: E/2 NE/4

Township 24 South, Range 37 East, N.M.P.M.

Section 18: All
Section 19: W/2
Section 30: NW/4

containing 2,581 acres, more or less.

2. Applicant proposes to downhole commingle oil production from the Jalmat and Langlie Mattix Pools through the hereinafter described wells which are presently completed in the Langlie Mattix Pool, by perforating the same in the Jalmat Pool, to-wit:

Well No.	Unit No.	Sec.-Twp.-Rge.
115	P	13-24-36
117	N	18-24-37
121	B	24-24-36
134	N	24-24-36
150	L	19-24-37

3. Applicant also proposes to downhole commingle oil production from the Jalmat and Langlie Mattix Pools by deepening and completing in the Langlie Mattix Pools the hereinafter described wells which are presently completed in the Jalmat Pool, to-wit:

Well No.	Unit No.	Sec.-Twp.-Rge.
209	L	24-24-36
221	N	19-24-37

4. Applicant also seeks an order authorizing a procedure for administrative approval, without notice and hearing, to downhole commingle oil production from additional wells in the Jalmat and Langlie Mattix Pools within the Cooper Jal Unit, pursuant to Rule 303C, except that the facts required by 303C(1)(b) and (d) shall not be required of applicant.

5. In the alternative, applicant seeks an order, applicable only to the Cooper Jal Unit, contracting the vertical limits of the Jalmat Pool by deleting the Yates formation and the upper and middle zones of the Seven Rivers formation, and by enlarging the vertical limits of the Langlie Mattix Pool with the addition of the said upper and middle zones of the Seven Rivers formation and the Yates formation.

6. The ownership of the unitized Jalmat and Langlie Mattix Pools throughout the Cooper Jal Unit is common, including working interests, royalty and overriding royalty interests.

7. The downhole commingling will not jeopardize the efficiency of present or future secondary recovery operations in any of the zones to be commingled.

WHEREFORE, applicant prays:

A. That this matter be set for hearing before an examiner appointed by the Commission and that due public notice be given as required by law.

B. That the Commission approve an exception to Rule 303A to permit downhole commingling of oil production in the Jalmat and Langlie Mattix Pools through the seven above numbered wells, and establish a procedure for administrative approval for further downhole commingling in the Cooper Jal Unit.

C. In the alternative, the Commission contract the vertical limits of the Jalmat Pool and add to the vertical limits of the Langlie Mattix Pool the upper and middle Seven Rivers formation and the Yates formation.

D. And for such other and further relief as may be just in the premises.

DATED this November 4, 1977.

RESERVE OIL, INC.

By: _____
A. J. Losee

LOSEE & CARSON, P.A.
P. O. Drawer 239
Artesia, New Mexico 88210

Attorneys for Reserve Oil, Inc.

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF RESERVE OIL, INC. FOR AN EXCEPTION TO RULE 303A, OR IN THE ALTERNATIVE, FOR CONTRACTION OF THE VERTICAL LIMITS OF THE JALMAT (OIL) POOL AND ENLARGEMENT OF THE VERTICAL LIMITS OF THE LANGLIE MATTIX POOL, COOPER JAL UNIT AREA, LEA COUNTY, NEW MEXICO.	:	CASE NO. 6085

APPLICATION

COMES RESERVE OIL, INC., by its attorneys, and states:

1. Applicant is the operator of the Cooper Jal Unit for the secondary recovery of oil and gas from the Tansill, Yates, Seven Rivers and Queen formations, underlying the following lands in Lea County, New Mexico:

Township 24 South, Range 36 East, N.M.P.M.

Section 13: S/2
Section 14: SE/4 SE/4
Section 23: S/2 SE/4
Section 24: All
Section 25: N/2
Section 26: E/2 NE/4

Township 24 South, Range 37 East, N.M.P.M.

Section 18: All
Section 19: W/2
Section 30: NW/4

containing 2,581 acres, more or less.

2. Applicant proposes to downhole commingle oil production from the Jalmat and Langlie Mattix Pools through the hereinafter described wells which are presently completed in the Langlie Mattix Pool, by perforating the same in the Jalmat Pool, to-wit:

Well No.	Unit No.	Sec.-Twp.-Rge.
115	P	13-24-36
117	N	18-24-37
121	B	24-24-36
134	N	24-24-36
150	L	19-24-37

3. Applicant also proposes to downhole commingle oil production from the Jalmat and Langlie Mattix Pools by deepening and completing in the Langlie Mattix Pools the hereinafter described wells which are presently completed in the Jalmat Pool, to-wit:

Well No.	Unit No.	Sec.-Twp.-Rge.
209	L	24-24-36
221	N	19-24-37

4. Applicant also seeks an order authorizing a procedure for administrative approval, without notice and hearing, to downhole commingle oil production from additional wells in the Jalmat and Langlie Mattix Pools within the Cooper Jal Unit, pursuant to Rule 303C, except that the facts required by 303C(1)(b) and (d) shall not be required of applicant.

5. In the alternative, applicant seeks an order, applicable only to the Cooper Jal Unit, contracting the vertical limits of the Jalmat Pool by deleting the Yates formation and the upper and middle zones of the Seven Rivers formation, and by enlarging the vertical limits of the Langlie Mattix Pool with the addition of the said upper and middle zones of the Seven Rivers formation and the Yates formation.

6. The ownership of the unitized Jalmat and Langlie Mattix Pools throughout the Cooper Jal Unit is common, including working interests, royalty and overriding royalty interests.

7. The downhole commingling will not jeopardize the efficiency of present or future secondary recovery operations in any of the zones to be commingled.

WHEREFORE, applicant prays:

A. That this matter be set for hearing before an examiner appointed by the Commission and that due public notice be given as required by law.

B. That the Commission approve an exception to Rule 303A to permit downhole commingling of oil production in the Jalmat and Langlie Mattix Pools through the seven above numbered wells, and establish a procedure for administrative approval for further downhole commingling in the Cooper Jal Unit.

C. In the alternative, the Commission contract the vertical limits of the Jalmat Pool and add to the vertical limits of the Langlie Mattix Pool the upper and middle Seven Rivers formation and the Yates formation.

D. And for such other and further relief as may be just in the premises.

DATED this November 4, 1977.

RESERVE OIL, INC.

By: A. J. Losee

A. J. Losee

LOSEE & CARSON, P.A.
P. O. Drawer 239
Artesia, New Mexico 88210

Attorneys for Reserve Oil, Inc.

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF RESERVE OIL, INC. FOR AN EXCEPTION TO RULE 303A, OR IN THE ALTERNATIVE, FOR CONTRACTION OF THE VERTICAL LIMITS OF THE JALMAT (OIL) POOL AND ENLARGEMENT OF THE VERTICAL LIMITS OF THE LANGLIE MATTIX POOL, COOPER JAL UNIT AREA, LEA COUNTY, NEW MEXICO.	:	CASE NO. 6085

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Section 13: S/2
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Section 23: S/2 SE/4
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Section 25: N/2
Section 26: E/2 NE/4

Township 24 South, Range 37 East, N.M.P.M.

Section 18: All
Section 19: W/2
Section 30: NW/4

containing 2,581 acres, more or less.

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D. And for such other and further relief as may be just in the premises.

DATED this November 4, 1977.

RESERVE OIL, INC.

By: A. J. Losee

A. J. Losee

LOSEE & CARSON, P.A.
P. O. Drawer 239
Artesia, New Mexico 88210

Attorneys for Reserve Oil, Inc.

RESERVE OIL, INC.

312 H B F BUILDING • MIDLAND, TEXAS 79701

APPLICATION FOR

EXCEPTION TO RULE 303A

COOPER JAL UNIT
JALMAT & LANGLIE MATTIX FIELDS
LEA COUNTY, NEW MEXICO

NOVEMBER 16, 1977

APPLICATION OF

RESERVE OIL, INC.

TO NEW MEXICO OIL CONSERVATION COMMISSION

FOR AN EXCEPTION TO RULE 303A

COOPER JAL UNIT

JALMAT (OIL) AND LANGLIE MATTIX (OIL) POOLS

LEA COUNTY, NEW MEXICO

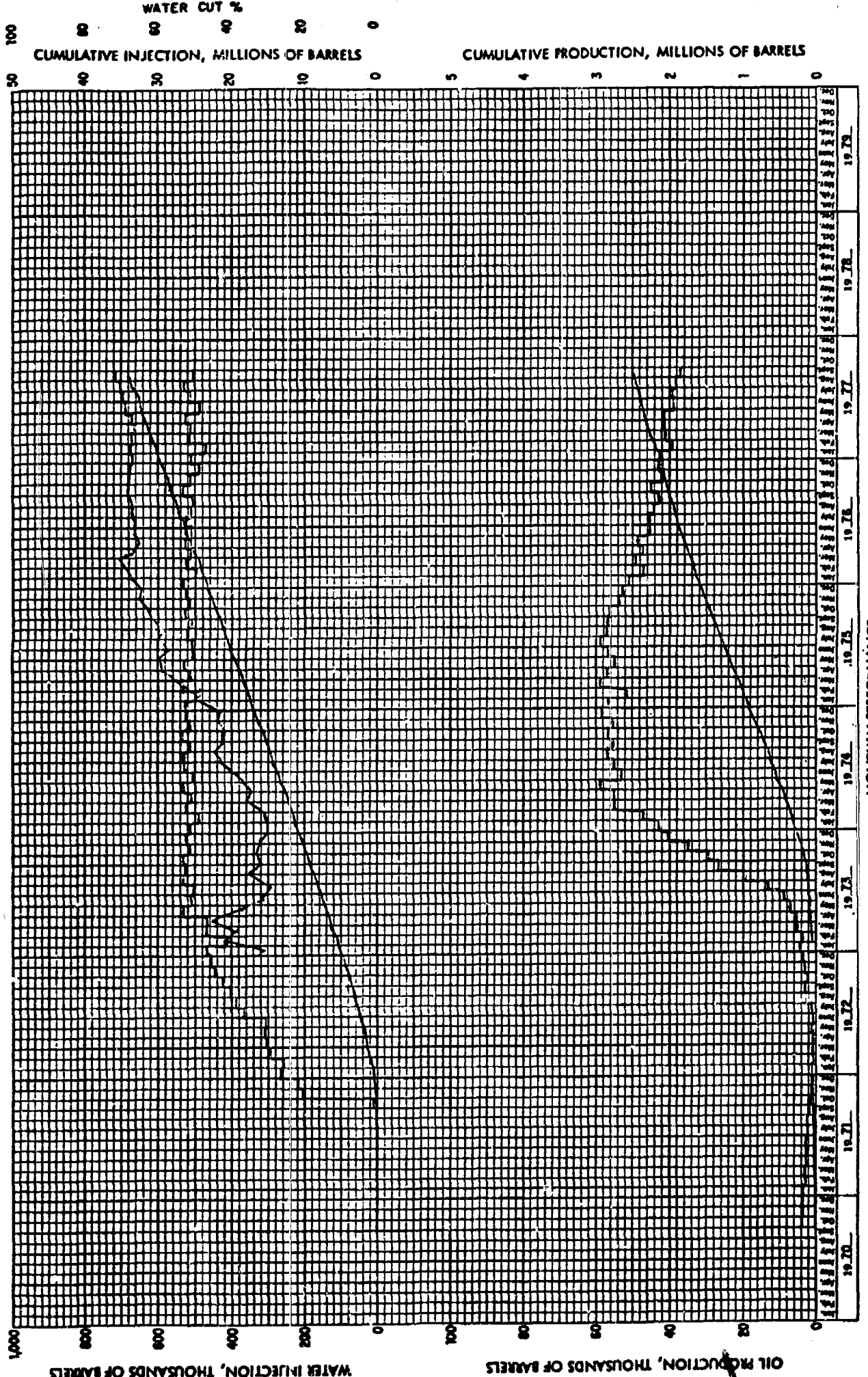
NOVEMBER 16, 1977

PREPARED BY:

E. M. JOHNSON AND C. R. CHANDLER

RESERVE OIL, INC.

MIDLAND, TEXAS



MONTHLY PERFORMANCE
COOPER - JAL UNIT
LEA COUNTY, NEW MEXICO

MONTHLY PERFORMANCE
COOPER JAL UNIT
JALMAT (OIL) POOL
LEA CO, NEW MEXICO

46 6693

WATER INJECTION

GROSS FLUID

OIL

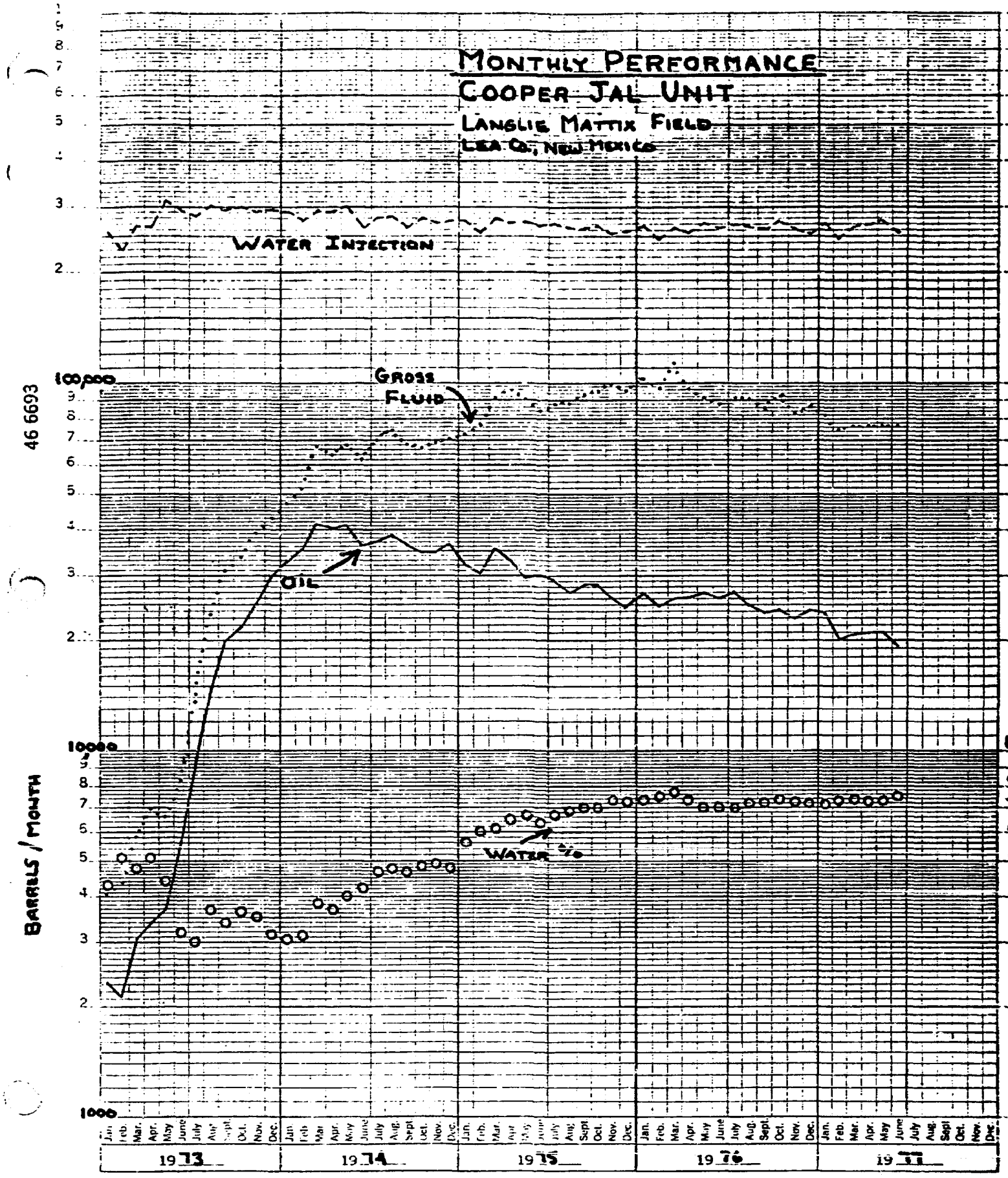
WATER %

MONTHLY RATE IN BARRELS/MONTH 5 YEARS BY MONTHLY CYCLES

100,000
10,000
1000

19 73 | 19 74 | 19 75 | 19 76 | 19 77

MONTHLY PERFORMANCE
COOPER JAL UNIT
LANGLIE MATTIX FIELD
LEA CO., NEW MEXICO



46 6693

RECEIVED

Martin Water Laboratories, Inc

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 or 563-1040

406 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 777266

TO: Mr. Erd. Johnson
312 HBF Building, Midland, Texas

SAMPLE RECEIVED 7-27-77

RESULTS REPORTED 1-1-77

COMPANY Reserve Oil, Inc. LEASE Cooper Jal Unit

FIELD OR POOL

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE New Mexico

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Cooper Jal Unit #117.

NO. 2 Produced water - taken from Cooper Jal Unit #121..

NO. 3 Produced water - taken from Cooper Jal Unit #128.

NO. 4

REMARKS: Langlie - Mattix (Lower)

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0328	1.0318	1.0199	
pH When Sampled				
pH When Received	8.1	8.2	7.85	
Bicarbonate as HCO_3	1,232	1,165	1,104	
Supersaturation as $CaCO_3$	180	185	150	
Undersaturation as $CaCO_3$	--	--	--	
Total Hardness as $CaCO_3$	10,400	10,000	6,000	
Calcium as Ca	900	580	448	
Magnesium as Mg	1,980	2,078	1,186	
Sodium and/or Potassium	13,257	12,147	8,310	
Sulfate as SO_4	3,518	1,591	1,374	
Chloride as Cl	24,502	23,969	15,411	
Iron as Fe	0.92	2.1	0.36	
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	45,389	41,530	27,833	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide	350	275	350	
Resistivity, ohms/m at 77° F.	0.174	0.193	0.270	
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Calcium Sulfate Scaling Tendency	None	None	None	
Calcium Carbonate Scaling Tendency	Marginal	Marginal	Marginal	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks	Well No.	Oil Gravity, °API
	#125	37.6
	#132 -	37.8

Form No. 3

By _____
Waylan C. Martin, M. A.

RECEIVED

Martin Water Laboratories, Inc

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 or 563-1040

RESULT OF WATER ANALYSES

406 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

LABORATORY NO. 777266 (Page 2)

TO: Mr. Erd Johnson
312 HBF Building, Midland, Texas

SAMPLE RECEIVED 7-27-77

RESULTS REPORTED 1-1-77

COMPANY Reserve Oil, Inc. LEASE Cooper Jal Unit

FIELD OR POOL

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Lea STATE New Mexico

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Cooper Jal Unit #202.

NO. 2 Produced water - taken from Cooper Jal Unit #204.

NO. 3 Produced water - taken from Cooper Jal Unit #219.

NO. 4

REMARKS: Jalmat (upper)

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0456	1.0512	1.0251	
pH When Sampled				
pH When Received	8.1	7.8	8.0	
Bicarbonate as HCO_3	1,293	909	1,000	
Supersaturation as $CaCO_3$	70	75	80	
Undersaturation as $CaCO_3$	--	--	--	
Total Hardness as $CaCO_3$	19,200	21,000	8,600	
Calcium as Ca	800	1,720	464	
Magnesium as Mg	4,180	4,058	1,808	
Sodium and/or Potassium	15,622	18,482	9,478	
Sulfate as SO_4	2,915	4,188	1,776	
Chloride as Cl	34,799	39,771	18,820	
Iron as Fe	0.60	4.8	1.7	
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	59,609	69,128	33,346	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide	525	400	525	
Resistivity, ohms/m at 77° F.	0.139	0.122	0.234	
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Calcium Sulfate Scaling Tendency	None	None	None	
Calcium Carbonate Scaling Tendency	None	None	None	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks

Well No.	Oil Gravity, °API
#206	37.1
#221	37.9

Letter of recommendation attached.

Form No. 3

By

Waylan C. Martin, M. A.

Martin Water Laboratories, Inc.

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

WATER CONSULTANTS SINCE 1953
BACTERIAL AND CHEMICAL ANALYSES

408 W. ILLINOIS
MIDLAND, TEXAS 79701
PHONE 683-4521

August 1, 1977

Mr. Erd Johnson
Reserve Oil, Inc.
312 HBF Building
Midland, TX 79701

Subject: Recommendations relative to analysis #777266.

Dear Mr. Johnson:

A careful examination of these analyses reveal no evidence of any incompatibility between the Langlie-Mattix (lower zone) water and the Jalmat (upper zone) water. The results reveal a slight concern about the possibility of calcium carbonate scaling potential from the Langlie-Mattix water, but we consider this inconclusive as these are results that warrant confirmation.

It should be pointed out that the fluctuations between wells of water characteristics from both zones are not uncommon in this field and therefore is not considered to carry any significance at this time.

Yours very truly,

Waylan C. Martin, M. A.

WCM/md

INDIVIDUAL WELL DATA

NEW MEXICO OIL CONSERVATION COMMISSION
GAS-OIL RATIO TESTS

C-116
Revised 1-1-65

Operator	Pool	County
Reserve Oil, Inc.	Langlie Mattix	Lea

Address	TYPE OF TEST - (X)		
312 HBF Building, Midland, Texas 79701	Scheduled [ ]	Completion [ ]	Special [X]

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL.
Cooper Jal Unit	115	P	13	24	36	8-2-77	P	-	35	W.F. Unit Allow	24	119	37.6	51	10	196
	117	N	18	24	37	8-1-77	P	-	35	W.F. Unit Allow	24	242	37.8	36	35	972
	121	B	24	24	36	7-13-77	P	-	35	W.F. Unit Allow	24	133	57.6	40	7	175
	134	N	24	24	36	8-2-77	P	-	30	W.F. Unit Allow	24	78	37.5	34	12	353
	150	L	19	24	37	8-7-77	P	-	55	W.F. Unit Allow	24	169	37.8	94	25	266

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Clarence R. Church
(Signature)
District Engineer

NEW MEXICO OIL CONSERVATION COMMISSION

GAS-OIL RATIO TESTS

C-116
Revised 1-1-65

Operator	Pool	County
Reserve Oil, Inc.	Jalmat (Oil)	Lea

Address	TYPE OF TEST - (X)	Scheduled ☐	Completion ☐	Special ☒
312 HBF Building, Midland, Texas 79701				

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL.
Cooper Jal Unit	209	L	24	24	36	5-19-77	P	-	50	W.F. Unit Allow.	24	0	37.1	21	4	190
	221	N	19	24	37	7-19-77	P	-	45	W.F. Unit Allow.	24	59	37.9	79	18	228

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Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

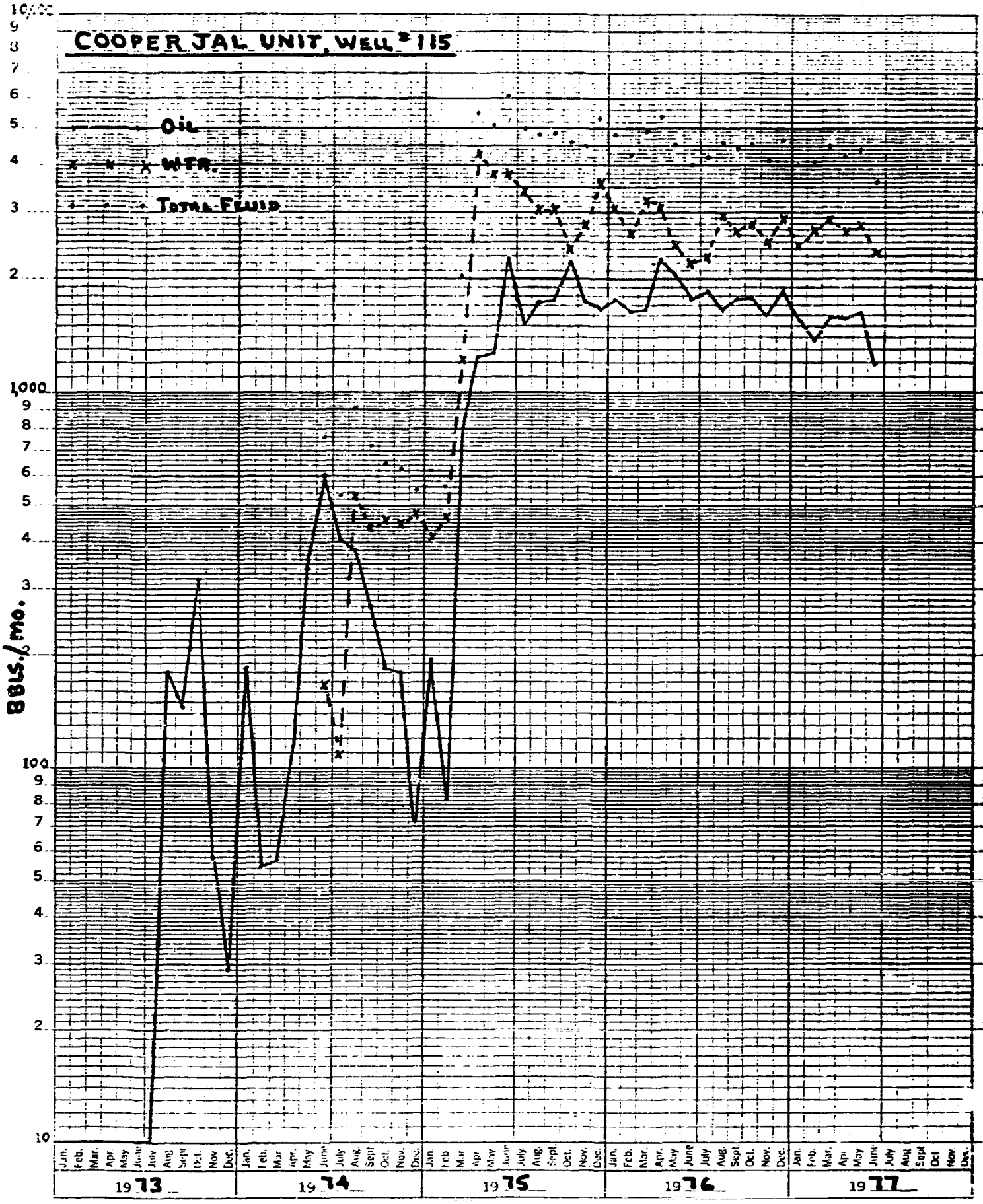
Vivienne L Chandler
(Signature)
District Engineer

COOPER JAL UNIT

WELL NO. 115

UNIT P, SEC. 13, T24S, R36E

COOPER JAL UNIT, WELL #115



46 6693

K·E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

COOPER JAL UNIT, WELL #115

(FORMERLY ARCO's, MAGGIE DUNN, #1

LANGLIE MATTIX FIELD

LEA CO., NEW MEXICO

ZERO = 8' A.G.L.

GROUND LEVEL = 3327'

CMC 6/6/77

9 5/8", 36# SET TO 1182' →

(CMTD. W/550 SXS. WITH SURFACE RETURNS)

HOLE SIZES

0 - 1182', 11 1/4"

1182 - 3015', 8 3/4"

3015 - 3668', 6 1/4"

EST. CMT. TOP BEHIND 7" = 1920'

(USED 1.1 ft³/SK. YIELD + 112% WASHOUT

7", 24# SET TO 3015' →

(CMTD. W/300 SXS.)

POTENTIAL ADDITIONAL PAY FOR FUTURE DOWNHOLE COMMINGLING

3220-3230'

4 1/2", 10.6#, H-40 LINER

FROM 2942 - 3668'

(CMTD. W/750 SXS. CEMENT CIRCULATED)

PRESENT COMPLETION

SELECTED POROSITY: 3426 - 3519'

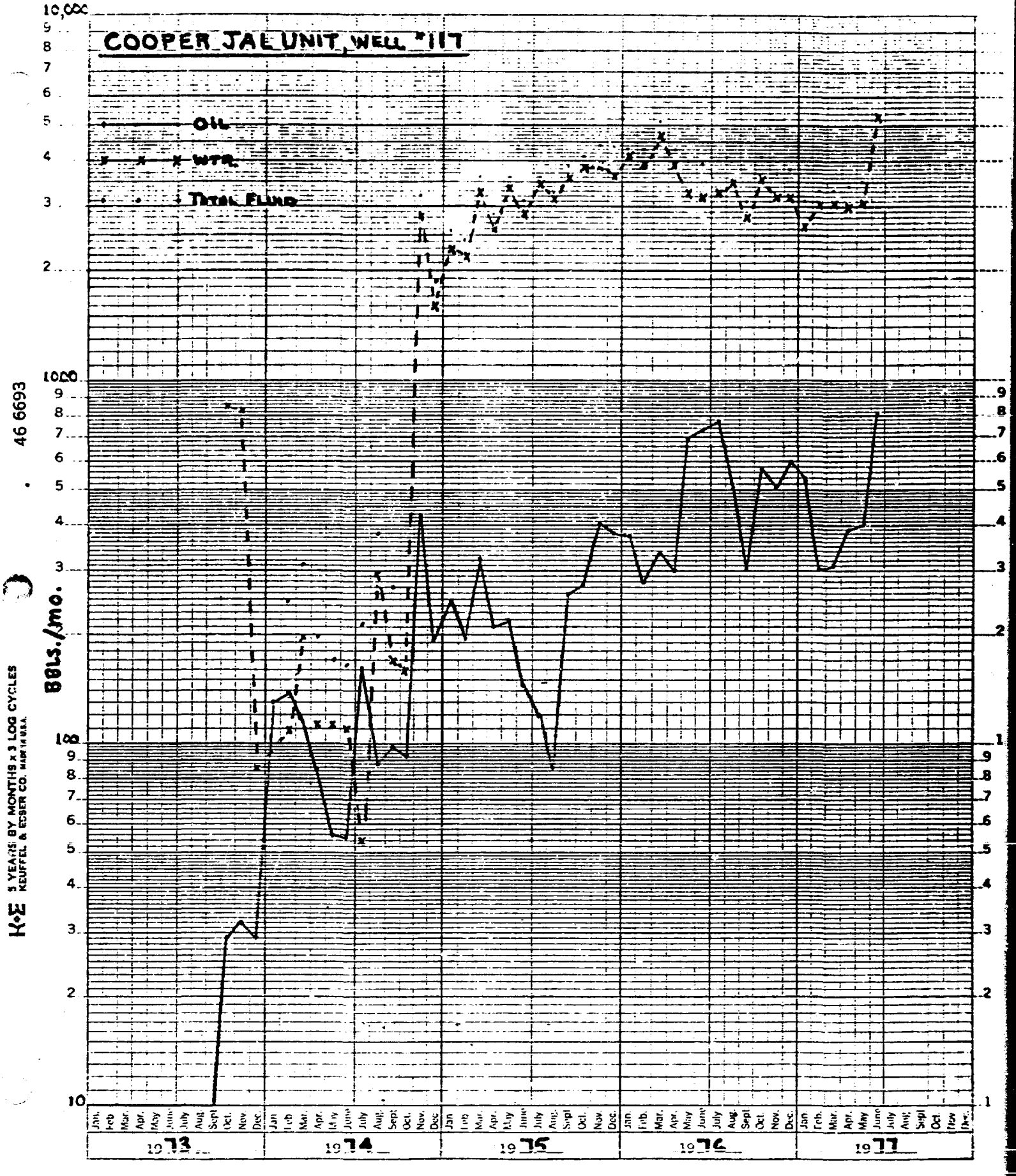
(34 holes)

NOT Diagram Not to Scale

COOPER JAL UNIT

WELL NO. 117

UNIT N, SEC. 18, T24S, R37E


COOPER JAL UNIT, WELL #117
OIL
WTR.
TOTAL FLUID
BBLS./MO.
46 6693
K·E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.
Jan Feb Mar. Apr. May June July Aug Sept Oct. Nov Dec
19 73
19 74
19 75
19 76
19 77

COOPER JAL UNIT, WELL #117

(Formerly Cities Service Oil Co., Jack "A", #2)

LANGLIE-MATTIX FIELD

LEA CO., NEW MEXICO

CRC 7/26/17

DF Zero = 12' Above G.L.

GL = 3308'

$8\frac{5}{8}$", 24# to 320'

(Cmtd. w/150 sxs. with Surface Returns)

HOLE SIZES — UNKNOWN, HOWEVER, ASSUMED NOMINAL HOLE SIZES FOR FIELD.

0-320' = 11"

320-3341' = $7\frac{7}{8}$"

EST. CMT. TOP = 1845'

(USED 1.1 ft³/SK YIELD + 112% WASHOUT)

POTENTIAL ADDITIONS FOR FUTURE DOWNHOLE COMMINGLING 2945-3185'

$5\frac{1}{2}$", 14# SET to 3341'

(Cmtd. w/500 sxs.)

PRESENT COMPLETION

$4\frac{3}{4}$" OPEN-HOLE 3341-3648'

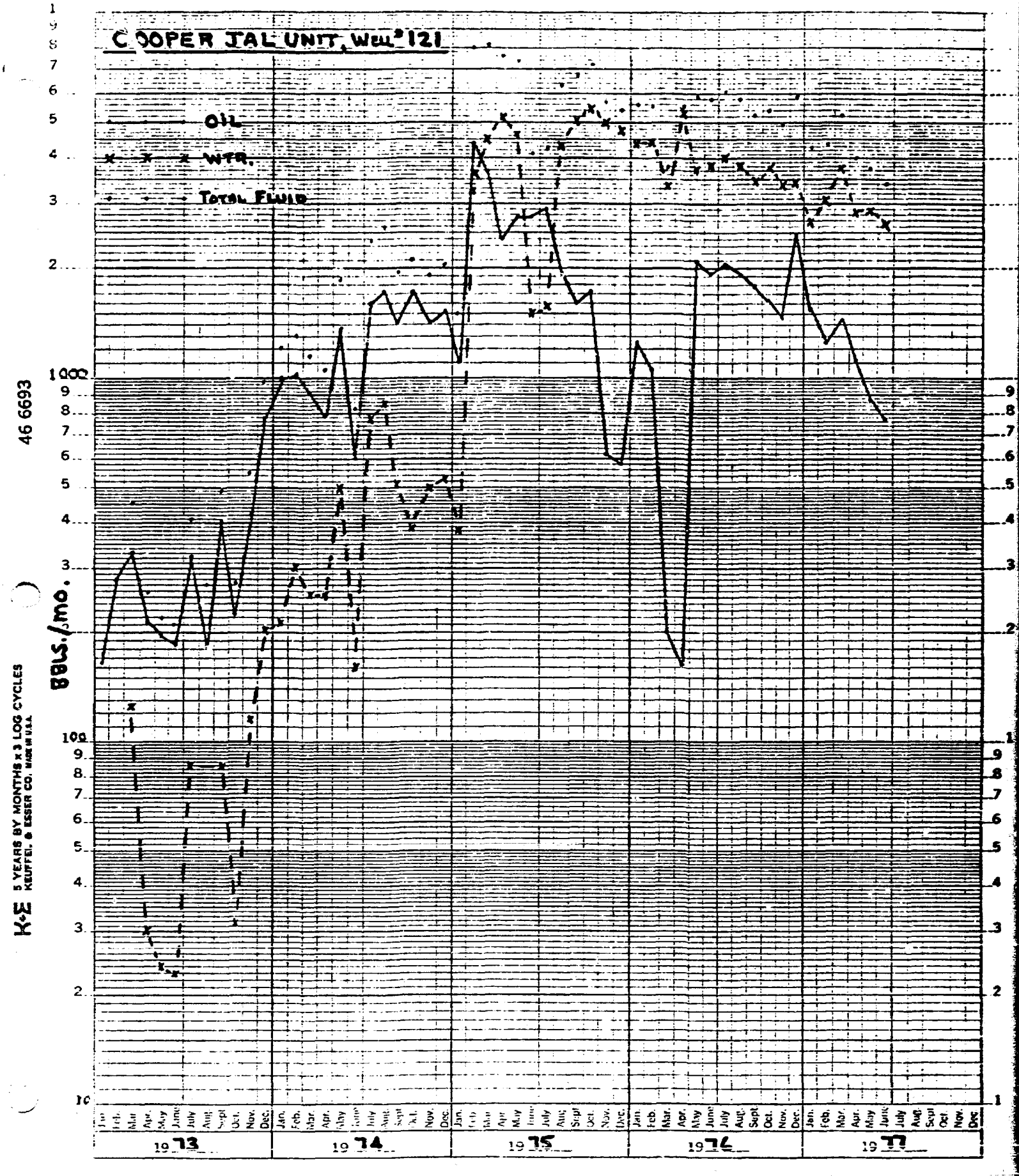
DIAGRAM NOT TO SCALE

TD = 3648'

COOPER JAL UNIT

WELL NO. 121

UNIT B, SEC. 24, T24S, R36E


COOPER JAL UNIT, WELL #121
OIL
WTR.
TOTAL FLUID
BBLS./MO.
46 6693
1973
1974
1975
1976
1977
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
K+E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

COOPER JAL UNIT, WELL *12

(Formerly ARCO's, Maggie Dunn Unit, *1

LANGLIE MATTIX FIELD

LEA CO., NEW MEXICO

7/31/77

Log Zero = 8' Above G.L.

GL = 3308.5'

13 3/8" @ 30'

(Cmtd. w/ 30 sys.)

9 5/8" SET TO 1179'

(Cmtd. w/ 550 sys. with surface returns)

* DIAGRAM NOT TO SCALE

HOLE SIZES

0 - 1179', 12 1/2"

1179 - 3017', 8 3/4"

3017 - 3560', 6 1/4"

7", 20# SET TO 3017'

(Cmtd. w/ 350 sys.)

EST. CMT. TOP = 1918'

(USED 1.1 ft³/sk. YIELD = 112% WASHOUT)

4 1/2", 10.6#, H-40 Liner

from 2966-3560'

(Cmtd. w/ 400 sys. out btm. + 5420. TOP w/ 300 sys.)

TD = 3560'

POTENTIAL ADDITIONS FOR FUTURE BOREHOLE COMMINGLING

3020 - 3185'

PRESENT COMPLETION

SELECTED POROSITY

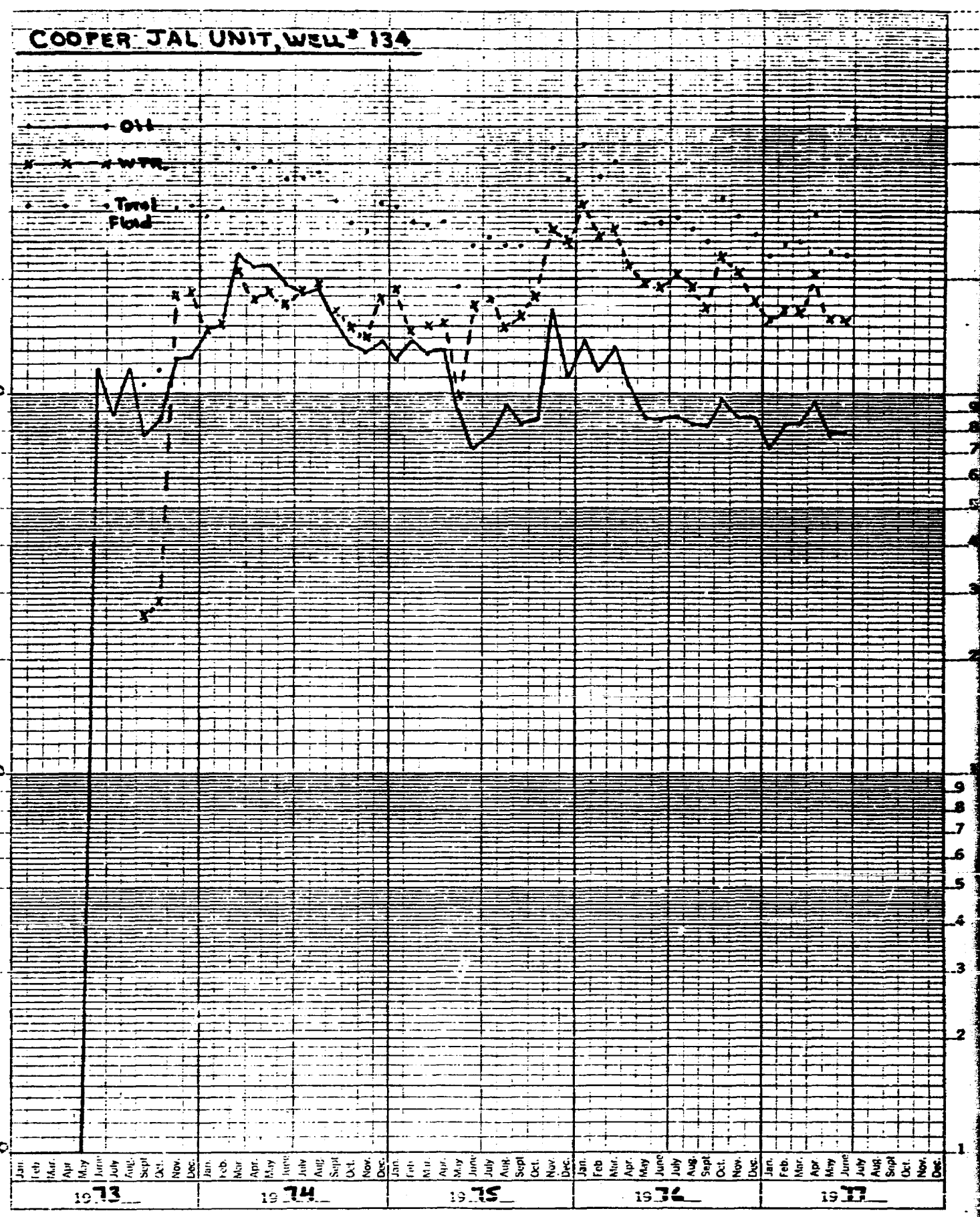
3423 - 3522' (37 holes)

COOPER JAL UNIT

WELL NO. 134

UNIT N, SEC. 24, T24S, R36E

COOPER JAL UNIT, WELL # 134



46 6693

K·E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

LOG ZERO = 1' ABOVE R.T.

COOPER JAL UNIT, WELL #134

(Formerly Petco's, THOMAS, #8)

LANGLIE-MATTIX FIELD

LEA CO., NEW MEXICO

CTC 7/26/77

8 5/8" SET TO 280'

(CMTD. W/ 150 SXS. WITH SURFACE RETURNS)

HOLE SIZES - UNKNOWN,

ASSUMED 7 7/8" Dia 5 1/2" PIPE.

OPEN-HOLE = 4 3/4"

EST. CEMENT TOP = 2571'

(USED 1.1 ft³/SK. YIELD + 112% WASHOUT)

POTENTIAL FUTURE DUAL COMMINGLING ADDITION

3030-3200'

5 1/2" CSG. to 3462'

(CMTD. W/ 300 SXS.)

PRESENT COMPLETION

"7 RIVERS" OPEN-HOLE

(108')

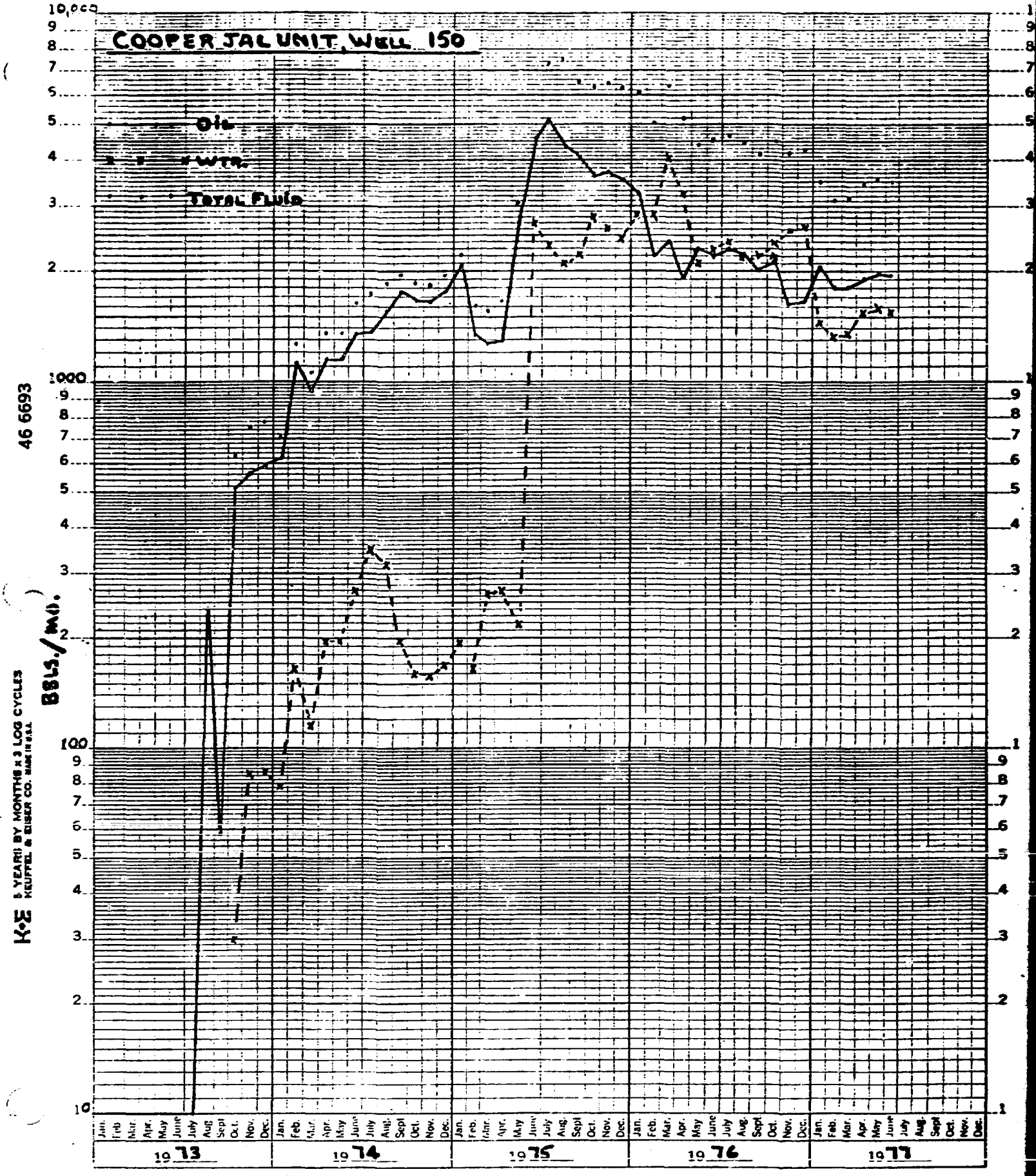
DIAGRAM NOT TO SCALE

TD = 3570'

COOPER JAL UNIT

WELL NO. 150

UNIT L, SEC. 19, T24S, R37E


COOPER JAL UNIT, WELL 150
Oil
WTR.
Total Fluid
BBLS./MO.
46 6693
10,000
1000
100
10
1973
1974
1975
1976
1977
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
K•E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO.

COOPER JAL UNIT, WELL # 150

(Formerly AMERADA, A.G. FALBY, #1)

JALMAT (OIL) FIELD

LEA CO., NEW MEXICO

CRC 8/16/77

Log Zero = 9' Above G.L.

Ground Level = 3284'

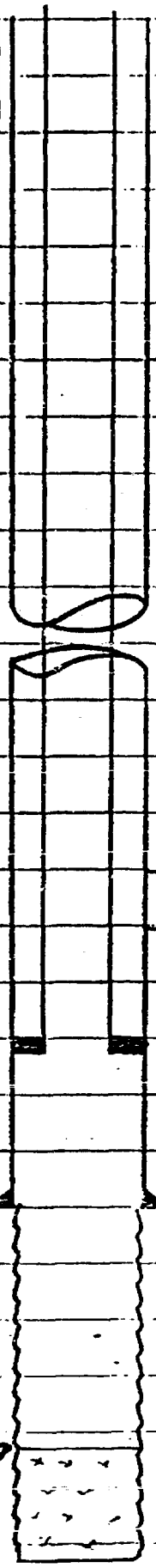
8 5/8", 32# to 314'

(Cmtd. w/ 175 sxs. with Surface Returns)

Hole Sizes

0 - 314', 12 1/4"

314 - 3824', 7 7/8"



Potential Additional Pay for Future Downhole Commingling

3085' - 3190', 150 holes

Baker Model 'AD-1' Pkr @ 3249'

Pkr used to isolate zones.

5 1/2", 15.5#, J-55 to 3350'

(Cmtd. w/ 450 sxs. 84 Temp. Survey, TOC = 2126')

Present Completion

3350 - 3714'

PBTD = 3714'

TD = 3824'

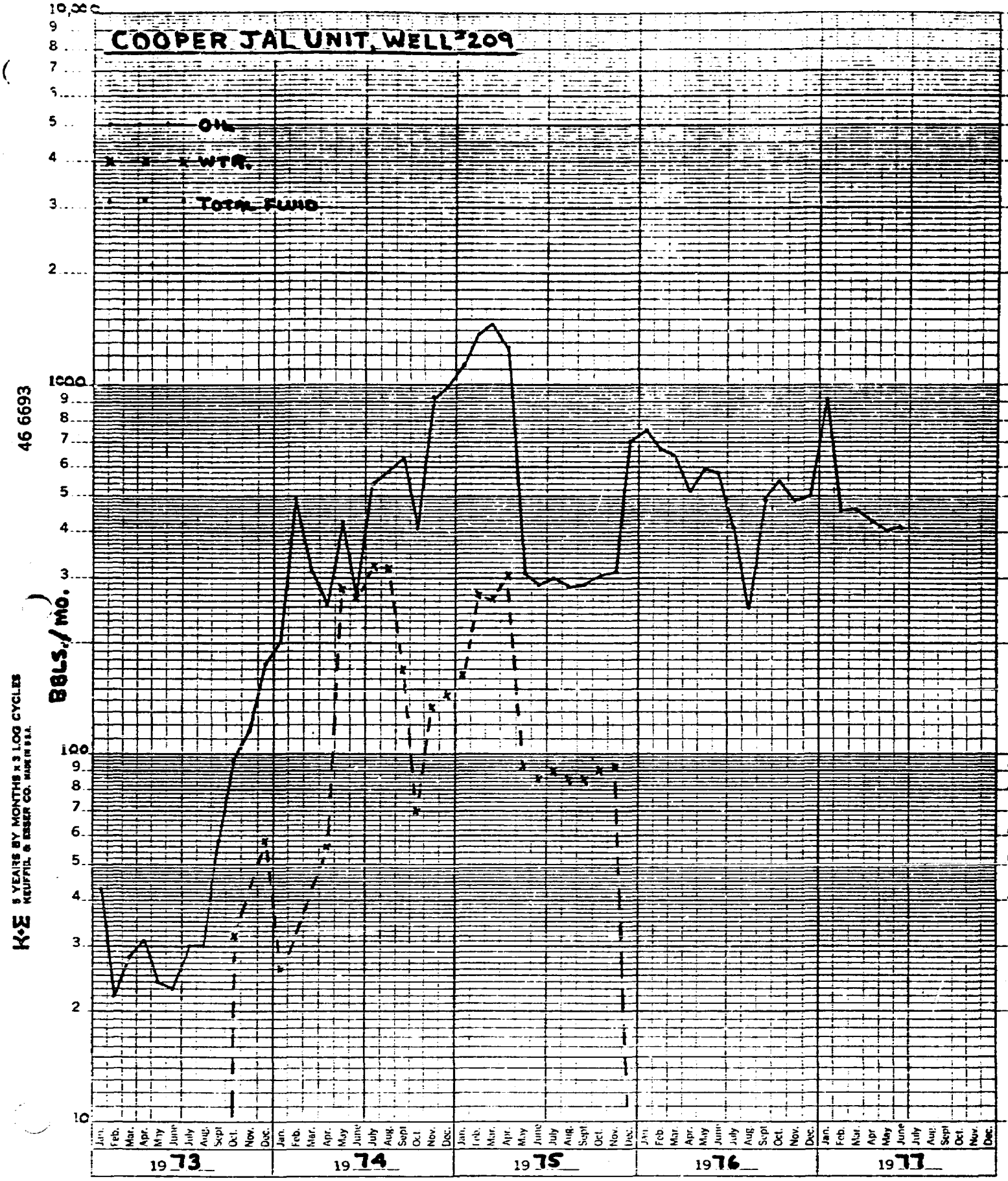
* Diagram Not to Scale

COOPER JAL UNIT

WELL NO. 209

UNIT L, SEC. 24, T24S, R36E

COOPER JAL UNIT, WELL #209



K-E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

Log Zero = 10' Above G.L.

G.L. = 3329'

COOPER JAL UNIT, WELL #209

(Formerly Exxon's, Thomas, Well #5)

JALMAT (OIL) FIELD

LEA CO., NEW MEXICO

CRC 7/26/77

8 5/8", 24# + 29.75# SET FROM 0-1215'

(Cmtd. w/ 500 sks. with surface returns)

* Diagram Not To Scale

HOLE SIZES

0-1215', 11"

1215-3680', 7 7/8"

3160-95' "

3224-47' "

PRESENT COMPLETION

YATES

EST. CEMENT TOP = 1885'

(Used 1.1 ft³/sk. yield

+ 112% washout

POTENTIAL ADDITIONAL PAY FOR FUTURE DOWNHOLE COMMINGLING

PBTD = 3492', Bridge Plug w/ 8' cement on top.

Plug set in 1956 when pulled back from "Queen"

5 1/2", 14#, SET TO 3680'

(Cmtd. w/ 600 sks)

3542-48', 4 SPF

3623-29', 4 SPF

INITIAL COMPLETION 10-5-54

OLD PBTD = 3645'

(Cement)

TD = 3681'

COOPER JAL UNIT

WELL NO. 221

UNIT N, SEC. 19, T24S, R37E

COOPER JAL UNIT, WELL # 221

Oil

Water

Total Fluid

46 6693

K+E 5 YEARS BY MONTHS x 3 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

Bbls./mo.

1973 1974 1975 1976 1977

COOPER JAL UNIT, WELL #221

(Formerly AMERADA'S A.G. FALBY, #2)

JALMAT (OIL) FIELD

LEA County, NEW MEXICO

CRC 7/21/77

G Zero = 10' Above B.H.

G.L. = 3274' D.F. = 3283'

8 5/8", 32# to 314'

(Cmt'd. w/175 sxs. with surface returns)

HOLE SIZES

0 - 314', 11"

314 - 3320', 7 7/8"

EST. CMT. TOP ABOVE SHOE = 1974'

(USED 1.1 ft³/SK. YIELD + 112% WASHOUT)

* DIAGRAM NOT TO SCALE

5 1/2", 15.5# to 3320'

(Cmt'd. w/450 sxs OUT STM. + 3020. 450 sxs OUT PERFS AT 1200')

1200'

3020. 3 PERFS w/ 450 SXS. to get cement behind 5 1/2" CSG ABOVE SALT SECTION. BY TEMP. LOG, TOC = 450'.

POTENTIAL ADDITIONAL PAY FOR FUTURE DOWNHOLE COMMINGLING EXIST FROM 3400 - 3600' — WILL HAVE TO DRILL OUT.

"YATES" PRESENT COMPLETION

3045 - 68'

3078 - 90'

3105 - 20'

PBTD = 3236'

TD = 3320'

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 16, 1977

EXAMINER HEARING

IN THE MATTER OF:

Application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico.

CASE 6085

BEFORE: Richard L. Stamets, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: Lynn Teschendorf, Esq
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: A. J. Losee, Esq.
LOSEE & CARSON
Attorneys at Law
300 American Home Building
Artesia, New Mexico

I N D E X

EXHIBIT INDEX

MR. STAMETS: Call the next case, Case 6085.

MS. TESCHENDORF: Case 6085, application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico.

MR. LOSEE: Mr. Examiner, A. J. Losee, Losee & Carson, Artesia, appearing on behalf of the applicant and I have one witness, Mr. Johnson.

(THEREUPON, the witness was sworn.)

ERD M. JOHNSON

was called as a witness by the applicant, and having been first duly sworn, testified upon his oath as follows, to-wit:

DIRECT EXAMINATION

BY MR. LOSEE:

Q. Would you state your name, please?

A. Erd M. Johnson, E-r-d.

Q. And your residence?

A. Midland, Texas.

Q. And you occupation?

A. I am the District Manager for Reserve Oil and Gas Company -- Reserve Oil, Inc., I am sorry.

Q. It used to be Reserve Oil and Gas?

A. Yes, sir.

Q. Have you previously testified before the Commission

and had your qualifications as an expert accepted?

A. Yes, sir.

MR. LOSEE: Are Mr. Johnson's qualifications acceptable?

MR. STAMETS: What area of expertise?

A. Petroleum Engineering.

MR. STAMETS: Mr. Johnson is considered qualified.

Q. (Mr. Losee continuing.) Would you explain briefly the purpose of this application?

A. Reserve Oil, Inc., seeks contraction of the vertical limits of the Jalmat Gas Pool underlying the Cooper Jal Unit area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie-Mattix Pool to include said formations.

In the alternate, Reserve seeks approval for downhole commingling of Jalmat and Langlie-Mattix production in the well bore of seven wells in the Cooper Jal Unit and an administrative procedure for such approval for future wells.

Q. When was the Cooper Jal Unit formed?

A. Following an Oil Conservation Commission hearing held August 19, 1970, the Commission issued Order Number R-4018 approving the Cooper Jal Unit agreement.

Order Number R-4019 approving the water flood project in the Langlie-Mattix Pool and Order Number R-4020 approving the water flood project in the Jalmat Pool.

The unit was formed on October 1st, 1970, and pool-scale water injection was commenced during November of 1971.

MR. LOSEE: We would ask the Examiner to take administrative notice of the testimony and the exhibits in Case Numbers 4018, 19, and 20.

MR. STAMETS: The Examiner will note these cases.

Q. (Mr. Losee continuing.) Are the Jalmat and Langlie-Mattix Pools both unitized in one unit with common ownership in the area?

A. Yes, all of the working interests and royalty interests in the unit are unitized.

Q. Would you turn to what has been marked as Exhibit A and explain what is shown on this exhibit?

A. This is a map of the Cooper Jal Unit. The one hundred series wells are Langlie-Mattix completions and the two hundred series wells are Jalmat oil completions and the three hundred series wells are Jalmat gas completions.

Q. Now, you mentioned Jalmat gas, is the Jalmat Gas Pool, or completions, unitized with the same ownership as both of these oil zones?

A. Yes. The two oil zones and the one gas zone are all in a common unit with a common ownership.

Q. Are you requesting permission to downhole commingle the Jalmat Gas Pool with the Langlie-Mattix Oil Pool?

A No, sir. We are requesting permission to downhole commingle the Jalmat oil pool and the Langlie-Mattix oil pool.

Q Now, does the Jalmat produce oil in some locations and only gas in other locations within the Cooper Jal Unit?

A Yes. As was explained in detail at the hearing for the water flood project the Jalmat pool containing the Yates formation is structurally a closed lower syncline in which most of the unit is located.

The Yates formation is progressively higher structurally in all directions such as the oil accumulation in the Yates formation which was at one time virtually surrounded by wells producing dry gas from the Yates formation.

Exhibit Three of the water flood hearing is a structure map contoured on top of the Yates formation.

Q How many Jalmat gas wells are presently producing within the unit?

A Three Jalmat gas wells are presently producing. These wells are Well No. 301, located in D, 18, 24, 37; 303, located in K 13, 24, 36; and 306, located in J 18, 24, 37.

Well 306 is a dually completed well with the Langlie-Mattix pool. The Langlie-Mattix producing well is designated as Well 149.

Q How many of these Jalmat gas wells are shut in,

presently?

A Two Jalmat gas wells are shut in. These wells are Wells No. 302, located in G 18, 24, 37; and Well No. 304, located in J 13, 24, 37.

Well 302 is a dually completed well with the Langlie-Mattix pool injection well being designated as Well 145.

The locations of the producing and shut in Jalmat gas wells are shown on Exhibit A.

Q Now, how many Jalmat gas wells were there in this unit when it was formed in 1970?

A Originally, there were thirteen gas wells. The present status is that five of these gas wells have been discussed. The current status of the remaining eight wells is listed below.

Well 233 located in I 13, 24, 36 is a Jalmat water injection well, now.

Well No. 234 located in O 13, 24, 36 is also a Jalmat water injection well.

Well 243 located in D 24, 24, 36 is a Jalmat oil producer.

Well 242 is located in C 19, 24, 37 is a Jalmat water injector.

Well 240 located in K 19, 24, 37 is a Jalmat water injector.

Well 237 located in O 23, 24, 36 is a Jalmat water

injector.

Well 241 located in G 25, 24, 36 is a Jalmat water injector.

Well 239 located in E 30, 24, 37 is a Jalmat water injector.

Q Now, I notice one of those wells, Well No. 243, which was originally a gas well is now an oil well and would you please explain?

A Yes. This well had been classified as a Jalmat gas well and it had been shut in for two years. That well is located in D 24, 24, 36.

After the water flood was -- after the water injection had been going for a few months we took periodic flood level surveys in the shut in gas well.

When flood was detected in the well the well swab tested a small amount of oil.

The necessary forms were then filed with the Commission and the classification was change in this well from a Jalmat gas well to a Jalmat oil well and then the well was then placed on the pump.

Q Do you know, approximately, by your last test how much oil this well has produced in the Jalmat?

A It is in the neighborhood of five or six barrels of oil a day plus fifteen to twenty barrels of water, which is a small producer compared to the other wells.

Q Now, as you have mentioned you are not requesting permission to downhole commingle oil with gas but how do you propose to produce a gas well that may be productive of oil if it is deepened to the Langlie-Mattix?

A In such a situation we would request permission to dually complete the Jalmat gas well with the Langlie-Mattix oil well.

This is what occurred in Well 306 which is a dual completion in the Jalmat gas and the Langlie-Mattix oil pool.

Q Now, in your water flood project, have the wells responded favorably to this injection program?

A Yes. Exhibit B is a performance curve of the Cooper Jal Unit that indicates that the total production and injection from both zones, both the Jalmat oil and the Langlie-Mattix oil zones.

Exhibit C is a performance curve of the Jalmat oil pool and Exhibit D is a performance curve of the Langlie-Mattix pool.

Q How many wells are there in the Cooper Jal Unit?

A As of August 1st, 1977, there were forty-five producing wells, two shut in wells, and forty-eight injection wells as follows:

The Jalmat oil zone had nineteen producers and twenty-three injectors for a total of forty-two.

The Langlie-Mattix zone had twenty-three producers and twenty-five injectors for a total of forty-eight.

The Jalmat-Yates gas pool had three producers and two shut ins for a total of five.

So, in the total unit we have forty-five producing wells, forty-eight injector wells, and two shut in wells for a total of ninety-five wells.

Q As of August 1, what was the cumulative oil production from the unit?

A For the Jalmat oil pool the cumulative oil was four million nine hundred and fifty-one thousand five hundred ninety-four barrels.

The cumulative oil from the Jalmat pool since the unitization was nine hundred and ninety-three thousand forty-seven barrels.

From the Langlie-Mattix pool the cumulative oil was three million four hundred sixty-six thousand eight hundred and eighty-seven barrels.

The cumulative oil from the Langlie-Mattix zone since unitization was one million four hundred twenty thousand four hundred forty-three barrels.

The total cumulative oil from the unit was eight million fo[illegible]ndred and eighteen thousand four hundred eighty-one barrels.

The cumulative oil from the unit since unitization

was two million four hundred and thirteen thousand four hundred and ninety barrels.

Q What is the cumulative water injection in the unit?

A As of August 1st, 1977, the cumulative water injection in the Cooper Jal Unit was for the Jalmat zone fifteen million three hundred five thousand seven hundred and thirty-six barrels.

For the Langlie-Mattix zone seventeen million five hundred forty-three thousand six hundred seventy-eight barrels for a total water injection into both zones of thirty-two million eight hundred forty-nine thousand four hundred fourteen barrels.

Q Is the production from the Jalmat oil and Langlie-Mattix pools commingled on the surface?

A Yes. Order Number R-663 authorized commingling on the surface of production from these pools.

Q Why are you requesting the Commission to give you authorization to downhole commingle these wells?

A Please refer to Exhibit Number E which is a map of the Cooper Jal Unit which indicates the Jalmat oil pool flood pattern.

The arrows indicate wells presently completed in the Langlie-Mattix pool -- that well is 115, 117, 121, 134, and 150, which if perforated in the Jalmat oil pool would result in an improved water flood pattern for the Jalmat oil pool and

should result in the increase in the ultimate recovery from the Jalmat oil pool without decreasing the ultimate recovery from the Langlie-Mattix pool.

Q Would you refer to Exhibit F and explain what is shown on this exhibit?

A This is a map of the Cooper Jal Unit which indicates the Langlie-Mattix flood pattern.

The arrows indicate wells 209 and 221 which are presently completed in the Jal Mat oil pool which if deepened and completed in the Langlie-Mattix pool would result in an improved water flood pattern for the Langlie-Mattix pool and should result in an increase in the ultimate recovery from the Langlie-Mattix pool without decreasing the ultimate recovery from the Jalmat oil pool.

Q Has Reserve investigated the possibility of dualling these wells?

A Yes. It would be possible to dual these wells by installing two strings of two and a sixteenth tubing, one packer, and one string of one inch tubing to serve as gas vent for the lower zone.

However, these wells are equipped with five and a half casing or seven inch casing with four and a half in liners.

The clearance of the three strings inside five and a half casing is such that it would be neceesary to run the

tubing strings simultaneously in order to lift the necessary volumes of fluid and it would be necessary to utilize tubing pumps.

With this type of installation the pooling of all strings of tubing would be necessary to make routine pump barrel changes.

Furthermore, although such an installation is possible it is my opinion that such a installation is highly undesirable due to the possibility of long fishing jobs which could occur should any of the three tubing strings part.

Also, in some of the Jalmat oil pool wells very fine sand grains sometimes accompany the fluid production. Having three strings of tubing in the well bore would be a very unsound practice under such conditions in my opinion.

Q. What about wells that are equipped with liners?

A. On wells equipped with seven inch casing and four and a half inch liners the four and a half inch liner extends to above the upper completion which precludes the use of three strings of tubing since the pump would be set a considerable distance above the upper zone's production.

Q. Assuming that the Commission should see fit to grant this downhole commingling how do you plan to pump the well?

A. We have calculated that wells with one string of

two and three-eighths tubing, a one and three quarters tubing pump and a four hundred fifty-six thousand inch pound pumping unit could lift approximately three hundred twenty barrels of fluid per day.

That if a six hundred forty inch pound unit were installed approximately four hundred and eighty barrels of fluid could be produced.

If two and seven-eighths tubing and a a two inch pump were installed -- a four hundred fifty-six inch pound pumping unit we could lift four hundred and eighty barrels of fluid a day.

If a six hundred and forty thousand inch pound unit were installed we could lift six hundred and forty barrels of fluid per day.

Q Do you feel like that would be sufficient pumping capacity to pump the wells down if downhole commingling was authorized?

A Since we have not completed the second zone in the wells in question we do not know what the actual capacity of the commingled zones will be.

However, based on individual well performance to date we believe that this would be adequate lifting capacity.

As a normal operating procedure we checked the fluid levels in all producing wells at least on a monthly basis. Should a high fluid level be detected in any of these

wells pumping equipment with a greater capacity would be installed.

Q Do you make every effort to keep all of these wells pumped down?

A Yes. We believe that in keeping the producing wells pumped down increases the production rate which is the reason for the periodic fluid level determination.

Q How do you determine the fluid levels in these wells?

A We have an acoustic well sounder which is in use almost every day.

Q Do you have any alternative to downhole commingling?

A In some cases it would be necessary to drill a new well. In other cases it would be necessary to wait until one zone had reach its economic limit before recompleting the well in another zone.

We do not believe that either alternative will result in a significantly greater recovery than will be obtained by the downhole commingling.

Q Of course, if you had to drill new wells that would be additional expense?

A Yes, sir.

Q Are both zones to be commingled classified as oil zones and do they both require artificial lift?

A Yes.

Q Are the fluids in each zone compatible with fluids from the others so that combining the fluids will not result in the formation of precipitation that might damage the reservoir?

A Yes. Please refer to Exhibit Number G, which is a detailed chemical analysis prepared by Martin Water Laboratories.

In addition as we have previously stated the production from both zones is presently commingled on the surface with no apparent detrimental effects.

Q Will the value of the crude oil be reduced by commingling?

A No. The average A.P.I. gravity of the Jalmat oil is appxoimately thirty-seven point five degrees A.P.I.

For the Langlie-Mattix zone approximately thirty-seven point seven degrees A.P.I.

Since the gravity and other characteristics are essentially the same the crude oil prices are the same and as I presently stated -- previously stated -- the crudes are presently commingled on the surface.

Q Is the ownership of the two pools common throughout?

A Yes, the ownership of the working interest, royalty interest, and the royalty ownership is common for both pools over the entire unit.

Q Will commingling jeopardize the efficiency of the

secondary recovery operations?

A. No. As we have previously stated it is our practice to keep the fluid levels in all producing wells pumped down.

The fluid levels are checked periodically to be sure that the fluid levels are kept pumped down. Keeping the wells pumped down should prevent any significant cross flows between the reservoirs.

Q. Now, you have contraction of the vertical limits of the Jalmat oil pool by deleting the Yates and Seven Rivers and the extension of the vertical limits of the Langlie-Mattix by including said formations throughout the Cooper Jal Unit.

Where the Jalmat produces both oil and gas how would you propose to the Commission that it contract the limits of the Jalmat pool?

A. Although it is possible to segregate by legal description that portion of the unit which is presently producing gas from the Jalmat this might not be practical because as I earlier mentioned one of the original Jalmat gas wells has now become an oil well.

Even though the Jalmat oil pool and the Jalmat gas pool produce from the same formation they are separately classified and are each covered by a different allowable.

Under these circumstances we propose that the order

contracting the vertical limits within the Cooper Jal Unit by deletion of the Yates and Seven Rivers formation be limited to the Jalmat oil pool.

The formation within the Cooper Jal Unit producing gas continues to be a part of the Jalmat oil pool.

Q. Okay. If you were to segregate the Jalmat gas by legal description would you explain to the Examiner what portion you would exclude from the entire Cooper Jal Unit and would you refer to your map?

A. It would be the south half of Section 13 -- I am sorry -- the north half of the southwest of 13, 24, 36, and the north half and southwest quarters of 18, 24, 37.

Q. Now, that would exclude all of the Jalmat gas leases presently producing Jalmat gas wells?

A. Yes, sir.

MR. STAMETS: Let me just double check that -- the north half of the southwest quarter of Section 13?

A. Yes, sir.

MR. STAMETS: And that is 24, 36 -- and the north half and the southwest quarter of Section 18, 24, 37?

A. I am sorry, the southeast.

MR. STAMETS: All right, and we are talking about Section 18?

A. Yes, sir.

MR. LOSEE: Instead of the southwest, it's the

southeast.

Q (Mr. Losee continuing.) Do you understand that contraction of the Jalmat oil pool and the extension of the Langlie-Mattix by a vertical deletion of the Seven Rivers has heretofore been approved by the Commission?

A Yes. It is my understanding that this has been accomplished on page 4924 in the Langlie-Jal Unit located just south a few miles from the Cooper Jal Unit.

Q Now, Mr. Johnson, in the alternative you have asked for authority to downhole commingle these seven wells. Have you prepared any individual well data for each of these wells for the Commission if this approval is granted?

A Yes, Exhibit H contains the following data for each of these wells -- lease name, well number, and well location.

Secondly, a current twenty-four hour productive tests showing volumes of oil, gas and water produced from the present zone of completion.

A production curve from the well indicating the production from the present zone of completion and a schematic well bore diagram indicating present completion intervals and the proposed completion intervals.

Q Now, Mr. Johnson, in the event the Commission sees fit to grant your alternative request, that is, to downhole commingle in these seven specified wells do you also request

a procedure, approval of a procedure, for administrative approval of downhole commingling of further wells within the unit?

A Yes. If only our alternative request is granted we would like for future requests for exception to Rule 303 (a) in the Cooper Jal Unit be considered for administrative approval upon submission of the required data without notice or hearing.

Q Mr. Johnson, were Exhibits A through H prepared by you or under your supervision?

A Yes, they were.

MR. LOSEE: Mr. Stamets, we move the introduction of Exhibits A through H.

MR. STAMETS: These exhibits will be admitted.

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

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Johnson, looking at your Exhibits B, C, and D, it would appear to be an older project with water started in the ground back in 1971?

A Yes, sir, November of '71.

Q So, we do have production history on individual pools both primary and secondary at this point?

A Yes, sir, the graphs started -- the plots started

upon unitization and then you can see on the graph when water injection commenced and roughly a year and a half later is when we started to see the results of the injection.

Q. It also appears from Exhibits C and D that both of the projects are making something like twenty thousand barrels a month?

A. Yes, sir.

Q. Okay.

A. Well, no, we are making in the neighborhood of thirty-six thousand barrels a month on the combined.

Q. I was just looking at the performance curves shown on these two exhibits --

A. One of them is from one zone -- the Cooper Jal Unit total is on Exhibit B and we were around thirty-seven thousand five hundred barrels in August.

Q. Is that shown on the upper graph or the lower graph?

A. On the lower -- actually, the oil production in August of 1977, was thirty-eight thousand seventy-four barrels.

Q. Right. From the next two graphs though it appears that it is roughly fifty percent from the Jalmat and fifty percent from the Eumont?

A. In August, the Jalmat oil was eighteen thousand, roughly, and the Langlie-Mattix oil was twenty thousand,

roughly.

Q If your downhole commingling proves successful on these wells how many more wells to you anticipate that you might want to try it on?

A Well, there would be several more. I am not -- I don't have an exact number for you but it appears to us where we have an upper zone well that it is not real close to -- I mean, where we have a lower zone well that is not real close to an upper zone injector that we always have the possibility of picking up additional reserves by perforating the upper zone well in -- I mean, the lower zone well in the upper zone and the other way around for the upper zone by deepening them.

So, what it is, is that we would have -- this would give us the option to greatly increase our well density in certain areas where we think that it would be beneficial.

Q Under downhole commingling -- that situation -- is it possible that one of the zones might get watered out and pumping costs get so high that you would leave oil in the other zones?

A Well, that's a possibility. However, in such an event before we would abandon anything we would certainly test each zone individually. As a matter of fact, for economic reasons we would do that.

You know, if the flood level determinations indicated

that we weren't getting all of the fluid and it appeared to be uneconomical to install some of the newer type units to lift a greater amount of fluid we would check each one individually and if it was ninety-nine percent water that zone would be abandoned and we would cease the commingling.

Q. Then, if downhole commingling were authorized would you be willing to work with the District Supervisor of the Hobbs District Office to determine an allocation formula for the production between the Jalmat and the Langlie-Mattix zones?

A. Yes, sir, that would be fine.

Q. Have you had any water break-through problems with either of these two zones?

A. Well, we have had as you can see from our graph the water production has increased significantly but we have not abandoned any wells so far.

MR. STAMETS: Any other questions of the witness?

MR. LOSEE: Nothing further.

MR. STAMETS: He may be excused. Anything further in this case? We will take the case under advisement.

(THEREUPON, the witness was excused and the case was concluded.)

REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 6033, heard by me on 11-16, 1977.

Richard P. Stamets, Examiner
New Mexico Oil Conservation Commission

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

November 29, 1977

Re: CASE NO. 6085
ORDER NO. R-5590

Mr. A. J. Losee
Losee & Carson
Attorneys at Law
Post Office Box 239
Artesia, New Mexico 88210

Applicant:

Reserve Oil, Inc.

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other

EXHIBIT No. 1

DATA FOR
PROPOSED LANGLIE-JAL (Queen) UNIT
WATERFLOOD PROJECT

OIL CONSERVATION COMMISSION HEARING
CASE No. 4429 & 4430

September 30, 1970

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
CASE NO.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
9/30/70 EXHIBIT NO. #1
CASE NO. 4429 & 4430

UNION TEXAS PETROLEUM
MIDLAND DISTRICT

Case Number 4429 & 4430
Date 9/30/70

G E N E R A L

OPERATOR - Union Texas Petroleum

PROJECT - Langlie-Jal Unit Waterflood

POOL - Langlie-Mattix and Jalmat

LOCATION OF PROJECT - Located in Townships 24 and 25 South, Range 37 East, approximately one mile northeast of Jal, Lea County, New Mexico.

NUMBER OF WELLS IN PROJECT - 93 wells proposed, including 27 to be drilled, either as replacement wells or to develop undrilled tracts.

UNIT AND PROJECT AREA - 3708.06 acres

OTHER WATERFLOOD PROJECTS IN POOL - Amerada Woolworth Unit, Gulf Stuart Langlie-Mattix, Continental Langlie Jack Unit, Reserve South Langlie-Jal, Mobil Humphery Queen.

G E O L O G I C A L A N D R E S E R V O I R D A T A

RESERVOIR - Seven Rivers and Queen

DEPTH - Approximately 3270 to the top of the pay zones

PRODUCTIVE ZONES - Porous sands at the base of the Jalmat and top of the Langlie-Mattix Pools.

NET PAY - The average net pay thickness is approximately 23 feet.

DESCRIPTION OF RESERVOIR ROCK - The pay section is made up of a series of alternating layers of sand and anhydrite.

STRUCTURE - The Unit lies on the west flank of a northwest-southeast trending anticline, which is on the west flank of the Central Basin Platform. Dip is to the east-southeast in the unit area.

RESERVOIR LIMITS - Lower layers of the productive Queen zone dips into water on the west and south sides of the unit area, and the upper layers contain gas in the northwest part. On the southeastern side, the sand is impermeable.

AVERAGE POROSITY OF NET PAY - 12%

Case Number_____
Date _____

P R I M A R Y O P E R A T I O N S

DATE OF FIRST PRODUCTION - August, 1935

TOTAL NUMBER OF WELLS DRILLED - 89 in Unit Area

ACCUMULATIVE PRODUCTION - 7-1-70 - 4,448,699

REMAINING PRIMARY RESERVES - 7-1-70 - 180,995

AVERAGE DAILY OIL PRODUCTION PER WELL, June, 1970 - 3.4 bbls.

ORIGINAL RESERVOIR PRESSURE - 1450 psi

OIL GRAVITY 36° API

DRIVE MECHANISM - Solution gas drive

STAGE OF DEPLETION - The project area is approximately 96% depleted of primary oil reserves.

ESTIMATED OIL RECOVERY THROUGH PRIMARY OPERATIONS

W A T E R F L O O D O P E R A T I O N S

PROPOSED PATTERN - Five spot

NUMBER OF INJECTION WELLS - 46

INITIAL INJECTION RATE - 500 BWPD per well

ESTIMATED INJECTION PRESSURE - Maximum design pressure of 2000 psia, but initial pressure expected not to exceed 1000 psia.

PLAN OF INJECTION - Inject into pay zone through cement lined tubing and below a packer.

SOURCE OF INJECTION WATER - Skelly Oil Company's Jal Water System

TYPE OF WATER - Capitan Reef water and produced water - non potable

TREATMENT OF WATER - None anticipated

ADDITIONAL OIL RECOVERY ANTICIPATED - Secondary oil is estimated to be 4,500,000 barrels, or approximately equal to the primary production.

SKELLY OIL COMPANY
SHERRILL NO. 7
K.B. Elev. 3241'
LANGLIE-MATTIX FIELD
Sec. 31, T 24 S, R 36 E
LEA COUNTY, N.M.

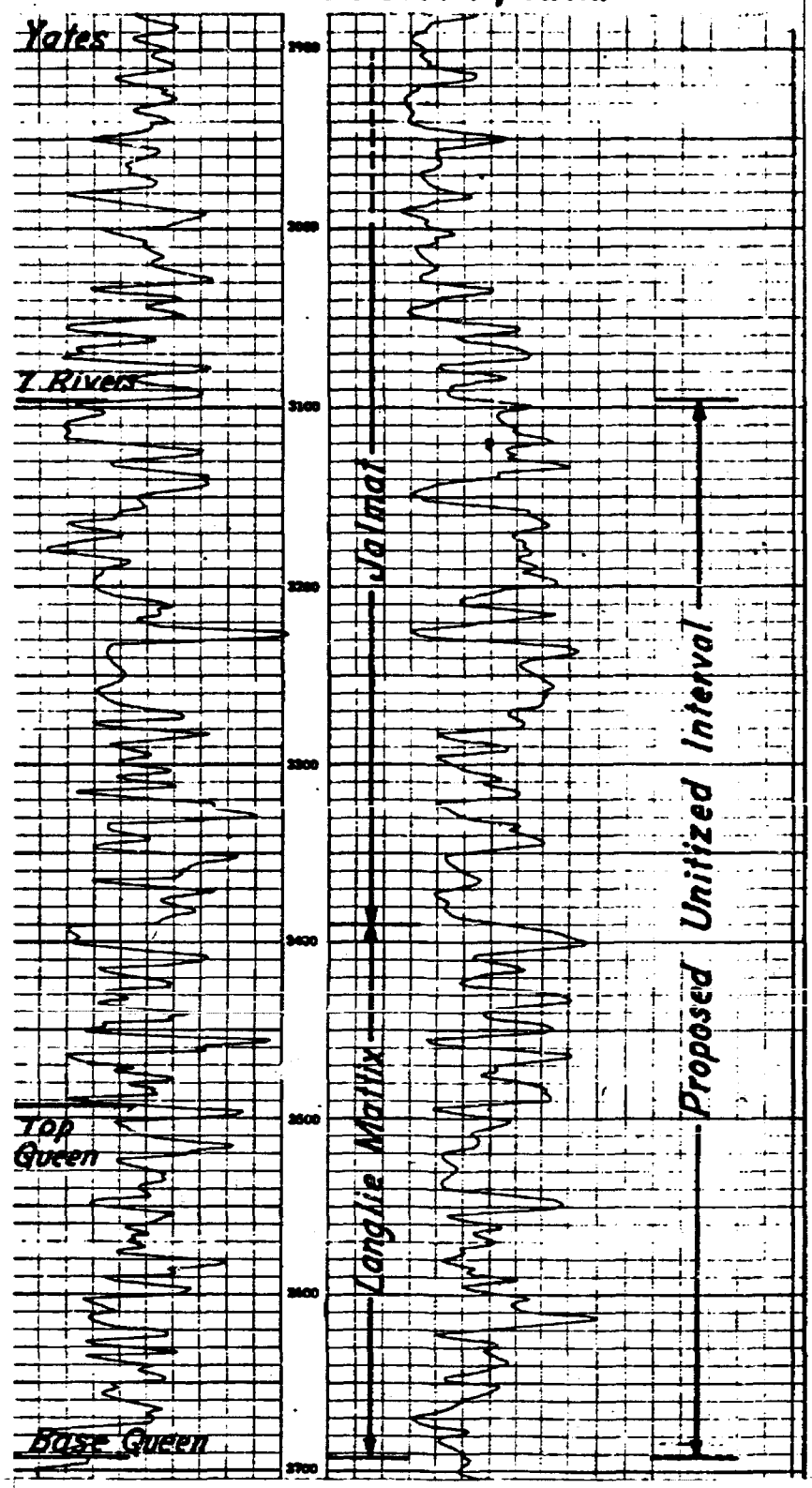


Exhibit 1-C

OLSEN
Phillips No. 4
Sec. 6-O, 25S - 37E
Elev. 3218

SKELLY
Sherrill No. 7
Sec. 31-J, 24S - 37E
Elev. 3241

PRODUCING HORIZON CORRELATION

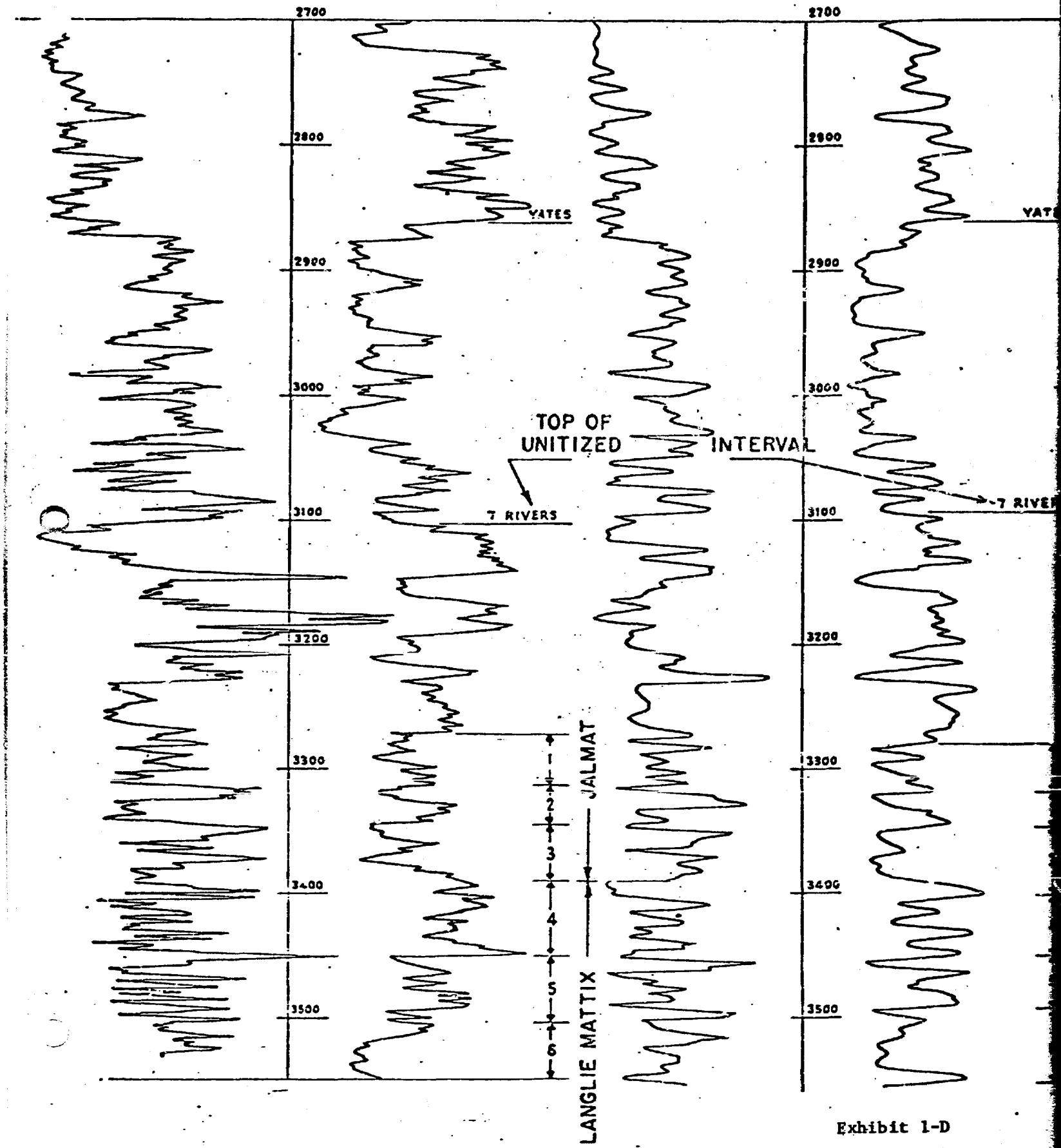


Exhibit 1-D

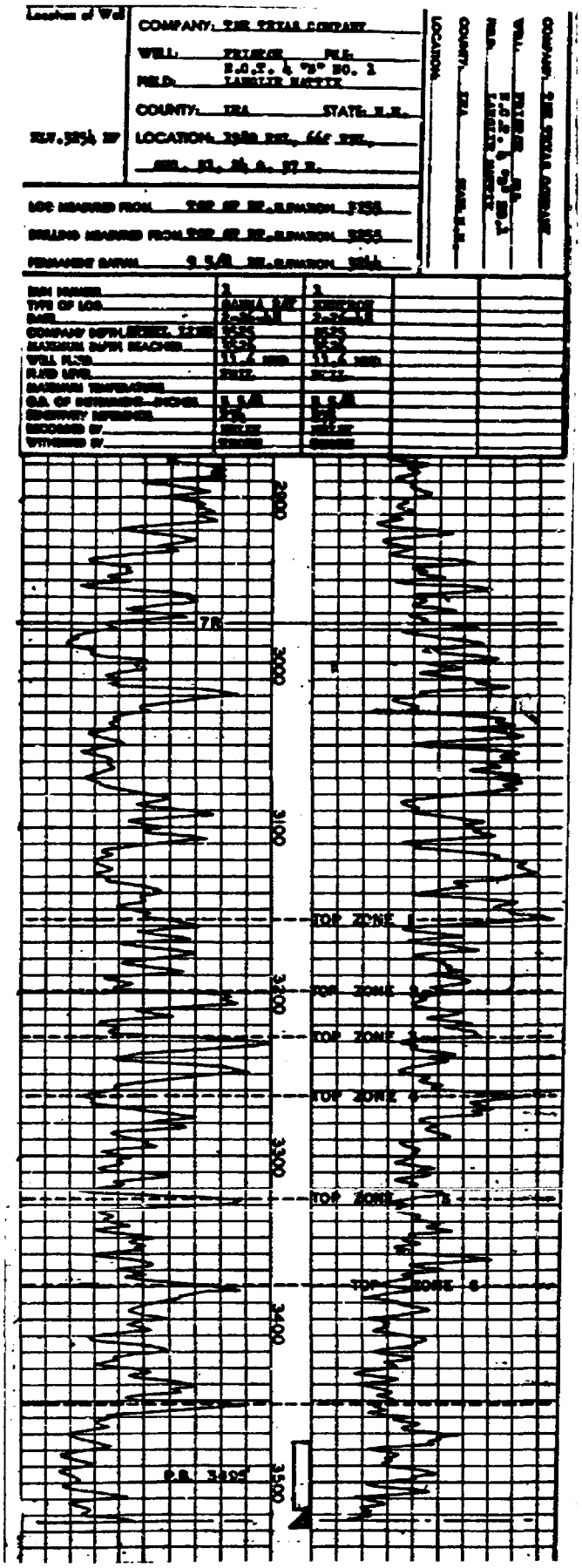

Location of Well
COMPANY: THE TEXAS COMPANY
WELL: TEXACO FEE
S.O.T. & "S" SO. 1
FIELD: LANGLIE MATTIX
COUNTY: LEA STATE: N.M.
LOCATION: 2080 FSL, 660 FWL,
SEC. 23, T-24-S, R-37-E.
ELEV. 3254 DF
LOG MEASURED FROM KB 12 FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM KB 12 FT. ABOVE PERM. DATUM
PERMANENT DATUM GL 3242 FT. ABOVE SEA LEVEL
RUN NUMBER
TYPE OF LOG
DATE
COMPANY DEPTH (DRILLER)
MAXIMUM DEPTH (REACHED)
WELL FLUID
FLUID LEVEL
MAXIMUM TEMPERATURE
GR. OF INSTRUMENT—SPIRAL
SENSITIVITY REFERENCE
RECORDED BY
WITNESSED BY
7R
2900
3000
3100
TOP ZONE
3200
TOP ZONE
TOP ZONE
3300
TOP ZONE
3400
P.B. 3456
3500

Exhibit 1-E

COMPANY R. OLSEN PERSONAL

WELL WELLS # 10

FIELD LANGLIE-MATTIX

COUNTY LEA STATE N.MEX.

LOCATION NW/SE

SEC. 6, T-23-S, R-37-E

LOCATION

PRE NO

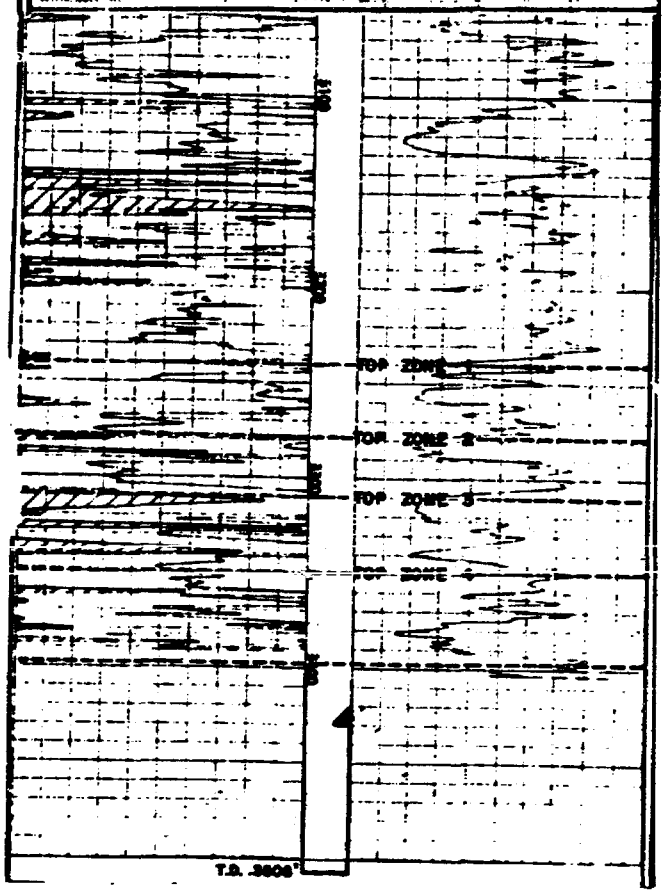
LOC NO C-765

LOG MEAS FROM TOP ROTARY TABLE ELEV 3456

DRLG MEAS FROM TOP ROTARY TABLE ELEV 3456

PERM DATUM GROUND LEVEL ELEV 3443

	G/R	C/N	N/D
TYPE OF LOG	G/R	C/N	N/D
RUN NO.	1-NW	1-NW	1-NW
DATE	6-21-57	6-21-57	6-21-57
TOTAL DEPTH (DRILLER)	3440	3440	3440
EFFECTIVE DEPTH (DRILLER)	3440	3440	3440
EFFECTIVE DEPTH (WESTERN)	3407.5	3407.5	3407.5
TOP OF LOGGED INTERVAL	[illegible]	[illegible]	2410
BOTTOM OF LOGGED INTERVAL	3393.5	3405	3405
TYPE OF FLUID IN HOLE	MUD	MUD	MUD
FLUID LEVEL	FULL	FULL	FULL
SOURCE OF SAMPLE & TYPE		SIDE	SIDE
DENSITY OF MUD		10.2	10.2
DETECTOR GLASS	SCINT.	SCINT.	SCINT.
DETECTOR TYPE	P-1	DGN1	DGN1
DIRECTION - HIGH	6	6	6
OD OF INSTRUMENT IN	3 5/8	3 5/8	3 5/8
TIME CONSTANT SEC	2.0	2.0	2.0
LOGGING SPEED FT/MIN	30	30	30
STATISTICAL VARIATION	RECORDED	RECORDED	RECORDED
SENSITIVITY REFERENCE	C-133	D-350	D-3 B
RECORDED BY	ROSS		
WITNESSED BY	MR. FRE...		



LANE WELLS RADIOACTIVITY LOG COMPANY

FILE NO

Location of Well

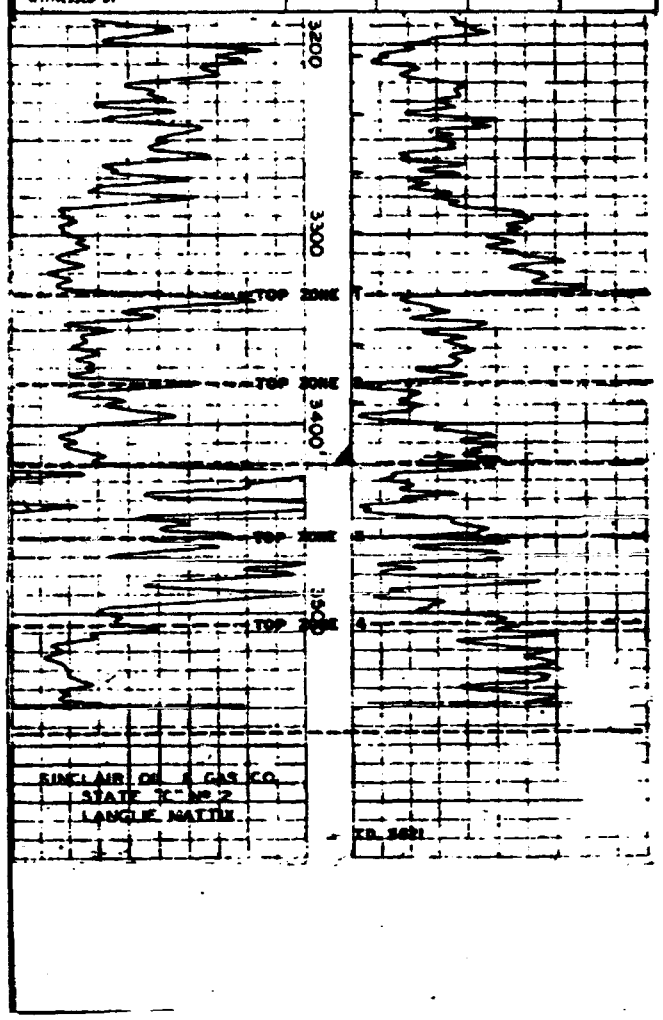
3261' G.L.

COMPANY: SINCLAIR OIL & GAS CO..
WELL: STATE "C" NO. 2
FIELD: L[illegible] MATTIX
COUNTY: [illegible] STATE N.M..
LOCATION: 330' [illegible] OF SE 1/4

COMPANY: [illegible]
WELL: [illegible]
FIELD: LANGLIE MATTIX
COUNTY: LEA
LOCATION: [illegible]
STATE N.M.

LOG MEAS. FROM [illegible] ELEV [illegible]
DR'G. MEAS. FROM [illegible] ELEV [illegible]
PERM. DATUM [illegible] ELEV. [illegible]

TYPE OF LOG				
RUN NO.	1			
DATE	[illegible]			
TOTAL DEPTH (DRILLER)	[illegible]			
EFFECTIVE DEPTH (DRILLER)	[illegible]			
TOP OF LOGGED INTERVAL	[illegible]			
BOTTOM OF LOGGED INTERVAL	[illegible]			
TYPE OF FLUID IN HOLE	[illegible]			
FLUID LEVEL	[illegible]			
MAXIMUM RECORDED TEMP.	[illegible]			
NEUTRON SOURCE STRENGTH & TYPE	[illegible]			
SOURCE SPACING — IN.	[illegible]			
LENGTH OF MEASURING DEVICE — IN.	[illegible]			
O.D. OF INSTRUMENT — IN.	[illegible]			
TIME CONSTANT — SECONDS	[illegible]			
LOGGING SPEED FT. /MIN.	[illegible]			
STATISTICAL VARIATION — IN.	[illegible]			
SENSITIVITY REFERENCE	[illegible]			
RECORDED BY	[illegible]			
WITNESSED BY	[illegible]			



COMPANY PAN AMERICAN PET. CORP.

WELL: P. J. LAWRENCE "A" NO. 2

FIELD: ALL ZONES

LOCATION: 2080' FEL & 660' FNL OF SEC. 2

COUNTY: [illegible] STATE: N. MEX.

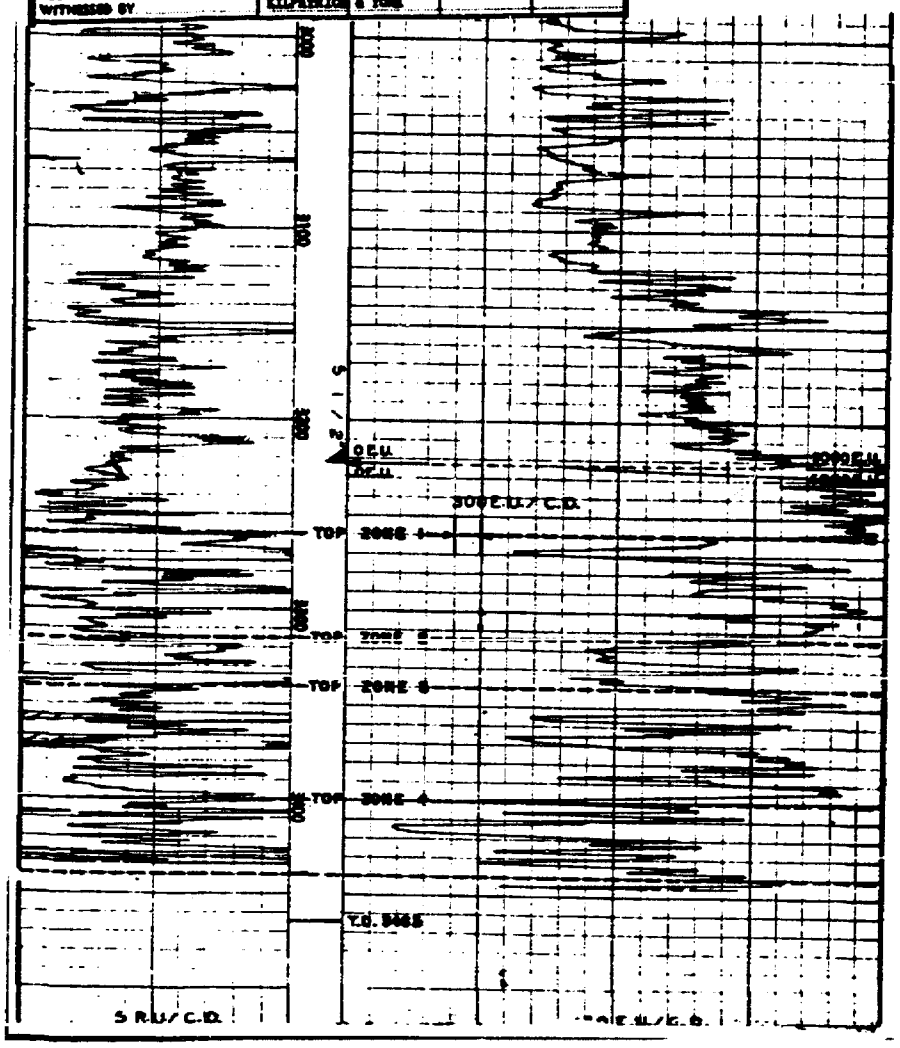
Well Location

TYPE OF LOG	GAMMA RAY NEUTRON
RUN NO.	ONE
DATE	7-28-58
TOTAL DEPTH (DRILLER) STRATA	9465
EFFECTIVE DEPTH (DRILLER)	9465
TOP OF LOGGED INTERVAL	SURFACE
BOTTOM OF LOGGED INTERVAL	9463
TYPE OF FLUID IN HOLE	WATER
FLUID LEVEL	FULL
MAXIMUM RECORDED TEMP.	
SOURCE STRENGTH & TYPE	50 MC
SOURCE SPACING — IN.	12"
DETECTOR CLASS	SCINT.
DETECTOR TYPE	5535
LENGTH OF MEAS. DEVICE — IN.	3' 6"
O.D. OF INSTRUMENT — IN.	3 5/8
TIME CONSTANT — SECONDS	1-2-5-10
LOGGING SPEED FT./MIN.	30-60
STATISTICAL VARIATION — IN.	RECORDED
SENSITIVITY REFERENCE	600
RECORDED BY	[illegible]
WITNESSED BY	[illegible]

LOG ZERO [illegible] ELEV. [illegible]

MEAS. ZERO [illegible] ELEV. [illegible]

PERM. DATUM [illegible] ELEV. [illegible]



LOCATION

COMPANY R. OLSEN PERSONAL

WELL OLSEN PHILLIPS NO. 2

FIELD LANGLIE MATTIX

COUNTY LEA STATE NEW MEXICO

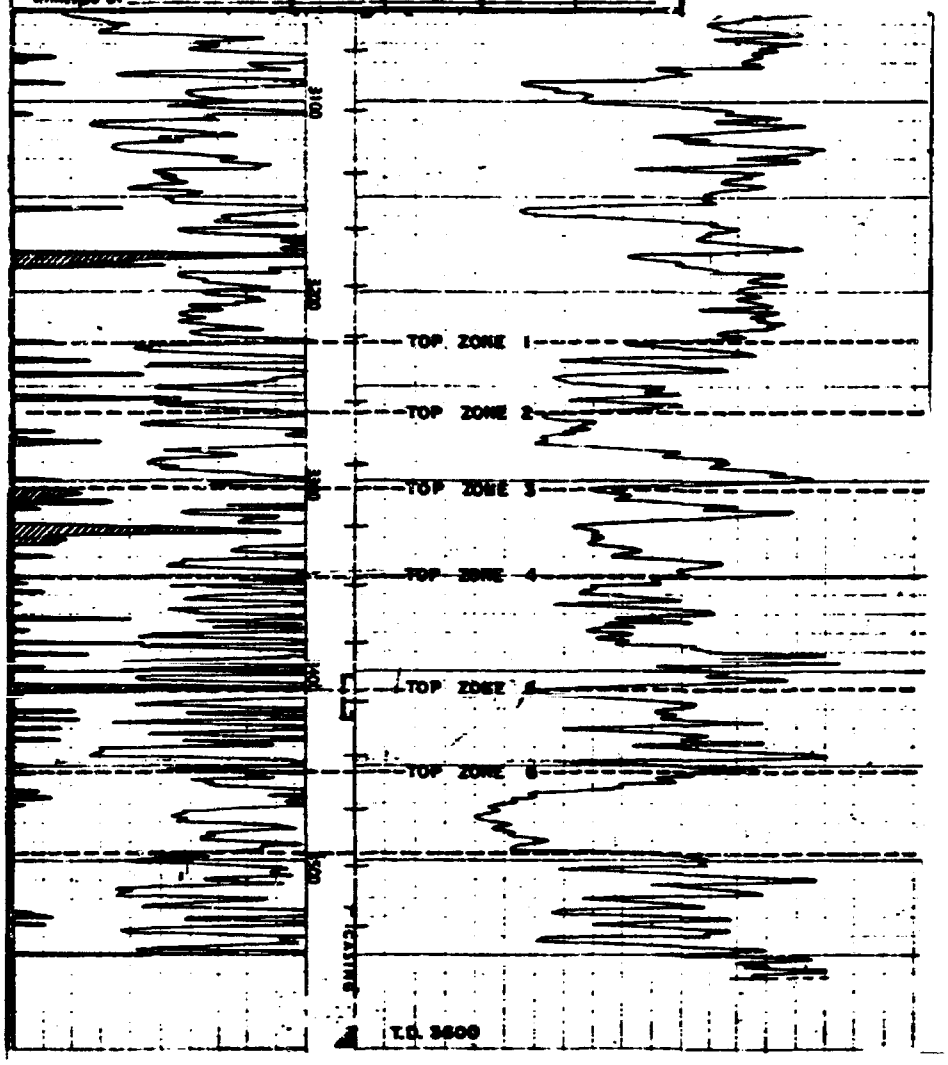
LOCATION 660' FNL & 2080' FEL SEC. 6, T25S-R37E

Elev.: K.B. 3223.9

D.F. 3222.9

G.L. 3211

	Run No. 1	Run No. 2
Type of Log	G/N	N/N
Date	7-13-58	7-13-58
Total Depth Reported	3600	3600
Effective Depth Reported	3565	3565
Effective Depth Recorded	3562.5	3562.5
Top of Logged Interval	2989'	2989'
Bottom of Logged Interval	3559.5	3561
Type of Fluid in Hole	MUD	MUD
Fluid Level	FULL	FULL
Neutron Source Type		RACS
Source Spacing		15.5
Length of Detector	SCINT.	SCINT.
O.D. of Instrument	3 5/8	3 5/8
Type Centralizer	---	---
Logging Speed	30-60	30-60
Statistical Variation		
Sensitivity Reference	1-853	1-868
Recorded By	CHAMBERS	CHAMBERS
Witnessed By	MR. PERSON	



COMPANY: R. OLSEN PERSONAL

WELL: OLSEN PHILLIPS # 3

FIELD: LANGLIE MATTIX

COUNTY: LEA STATE: N.M.

LOCATION: 660' FSL & 1980' FWL,
SEC. 6, T-23-S, R-37-E

LOCATION

FILE NO.

API NO. 30-025-

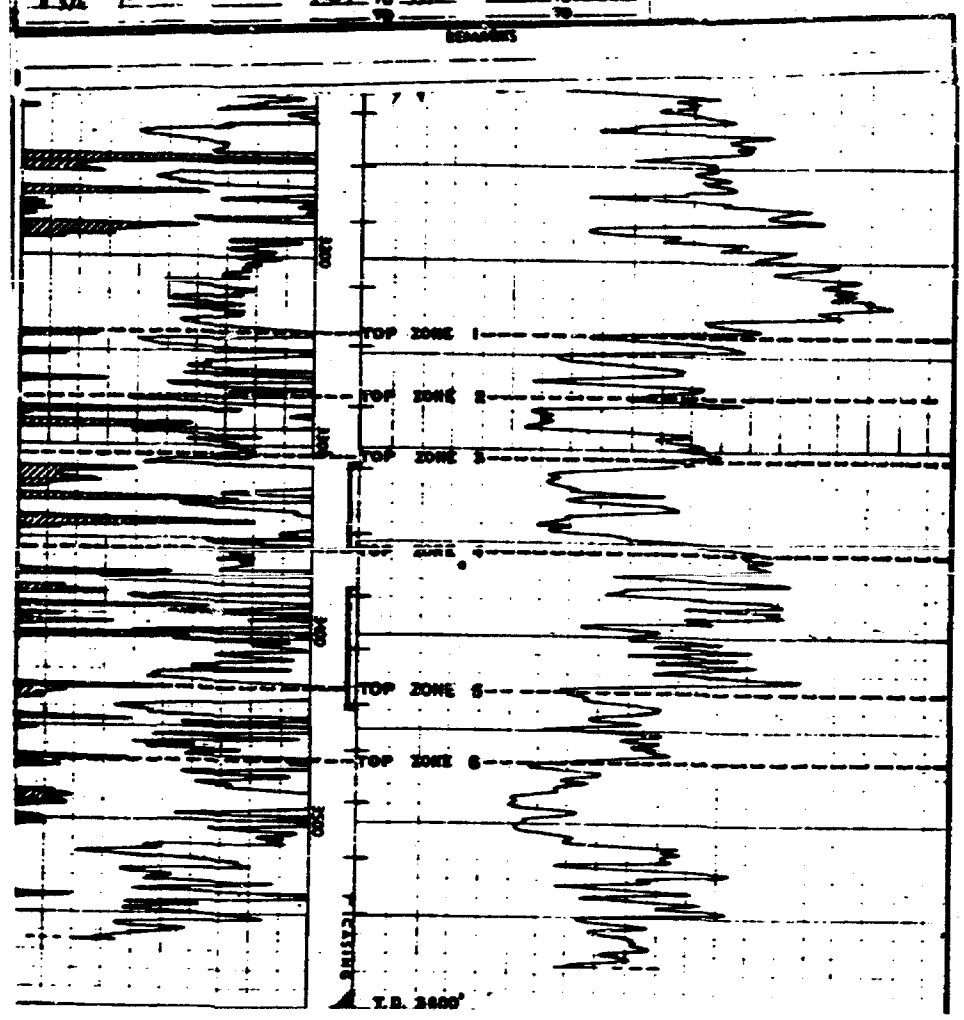
ELEV.: K.B. 3338 D.F. G.L.

TYPE OF LOG	G/R	G/N
RUN NO.	1-NW	1-NW
DATE	5-16-58	5-31-58
TOTAL DEPTH DRILLER	3700	3700
EFFECTIVE DEPTH DRILLED	3550	3550
EFFECTIVE DEPTH RECORDED	3577.5	3577.5
TOP OF LOGGED INTERVAL	SURF.	SURF.
BOTTOM OF LOGGED INTERVAL	3576.5	3576
TYPE OF FLUID IN HOLE	OIL	OIL
FLUID LEVEL	SOL	SOL
SOURCE STRENGTH & TYPE		51 MC
SOURCE SPACING		1-5
DETECTOR CLASS	SCINT.	SCINT.
DETECTOR TYPE	DUAL	DUAL
SIZE OF INSTRUMENT - IN.	3 5/8	3 5/8
TIME CONSTANT - SEC.	1.0	1.0
LOGGING SPEED - FT. PER MIN.	30-60	30-60
STATISTICAL VARIATION	RECORDED	RECORDED
RADIOACTIVITY REFERENCE	[illegible]	[illegible]
RECORDED BY	MC/KINZEY	
WITNESSED BY	MR. FRENCH	

CASING RECORD — INTERVAL

BIT SIZE	CASING	WT. LB.	FROM WELL RECORD	FROM LL LOG
	13 3/8		TO	TO
8 3/4	7"		SURF. TO 3288	TO
			TO	TO
			TO	TO

REMARKS



COMPANY R. OLSEN PERSONAL

WELL OLSEN PHILLIPS # 3

FIELD LANGLIE MATTIX

COUNTY LEA STATE NEW MEX.

LOCATION 660' FN & EL'S, SEC. 5

T-23-S, R-37-E

LOCATION

REC'D

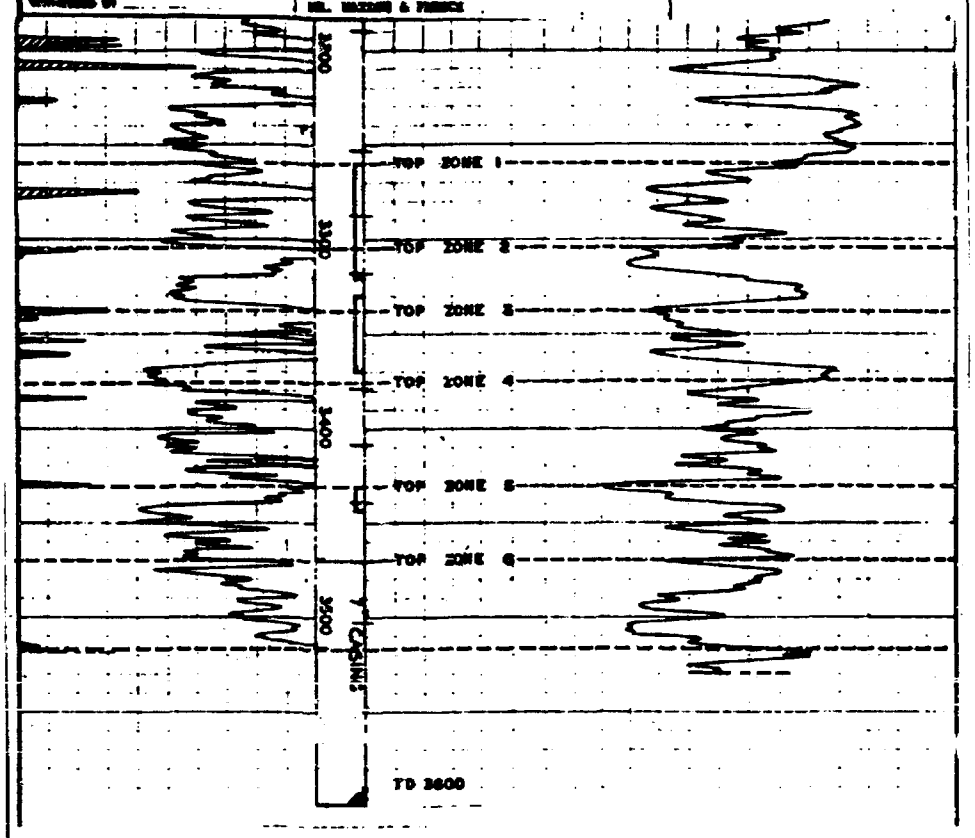
LOG NO. 125067

LOG MEAS FROM 30.5 ABOVE GROUND LEVEL ELEV

DRLG MEAS FROM 30.5 ABOVE GROUND LEVEL ELEV

PERM DATUM GROUND LEVEL ELEV

TYPE OF LOG	G/R	G/R
RUN NO	1-GR	1-GR
DATE	12-17-58	12-17-58
TOTAL DEPTH (DRILLER)		
EFFECTIVE DEPTH (DRILLER)	3535	3535
EFFECTIVE DEPTH (WIRELINE)	3530.5	3530.5
TOP OF LOGGED INTERVAL	SURF.	SURF.
BOTTOM OF LOGGED INTERVAL	3517.5	3529
TYPE OF FLUID IN HOLE	GEL	GEL
FLUID LEVEL	FULL	FULL
SOURCE STRENGTH & TYPE		50MG
SOURCE SPACING		13.5"
DETECTOR CLASS	SCINT.	SCINT.
DETECTOR TYPE	DMG1	DMG1
DETECTOR MS-DIST'N	6"	6"
O.D. OF INSTRUMENT IN	3 5/8	3 5/8
TIME CONSTANT SEC	2.0-2.0	2.0-3.0
LOGGING SPEED FT/MIN	25-60	25-60
STATISTICAL VARIATION	RECORDED	RECORDED
SENSITIVITY REFERENCE	C-933	D-360
RECORDED BY	MC/KINNEY	
WITNESSED BY	MR. WATSON & PEARCE	



Location of Well

COMPANY: [illegible]

WELL: [illegible]

FIELD: [illegible]

COUNTY: [illegible] STATE: [illegible]

LOCATION: [illegible]

LOG MEAS. FROM [illegible] ELEV. [illegible]

DRLG. MEAS. FROM [illegible] ELEV. [illegible]

PERM. DATUM [illegible] ELEV. [illegible]

TYPE OF LOG	[illegible]	[illegible]		
RUN NO.	[illegible]	[illegible]		
DATE	[illegible]	[illegible]		
TOTAL DEPTH (DRILLER)	[illegible]	[illegible]		
EFFECTIVE DEPTH (DRILLER)	[illegible]	[illegible]		
TOP OF LOGGED INTERVAL	[illegible]	[illegible]		
BOTTOM OF LOGGED INTERVAL	[illegible]	[illegible]		
TYPE OF FLUID IN HOLE	[illegible]	[illegible]		
FLUID LEVEL	[illegible]	[illegible]		
MAXIMUM RECORDED TEMP.				
NEUTRON SOURCE STRENGTH & TYPE		[illegible]		
SOURCE SPACING — IN.		[illegible]		
LENGTH OF MEASURING DEVICE — IN.	[illegible]	[illegible]		
O.D. OF INSTRUMENT — IN.	[illegible]	[illegible]		
TIME CONSTANT — SECONDS	[illegible]	[illegible]		
LOGGING SPEED FT./MIN.	[illegible]	[illegible]		
STATISTICAL VARIATION — IN.				
SENSITIVITY REFERENCE	[illegible]	[illegible]		
RECORDED BY	[illegible]	[illegible]		
WITNESSED BY	[illegible]	[illegible]		

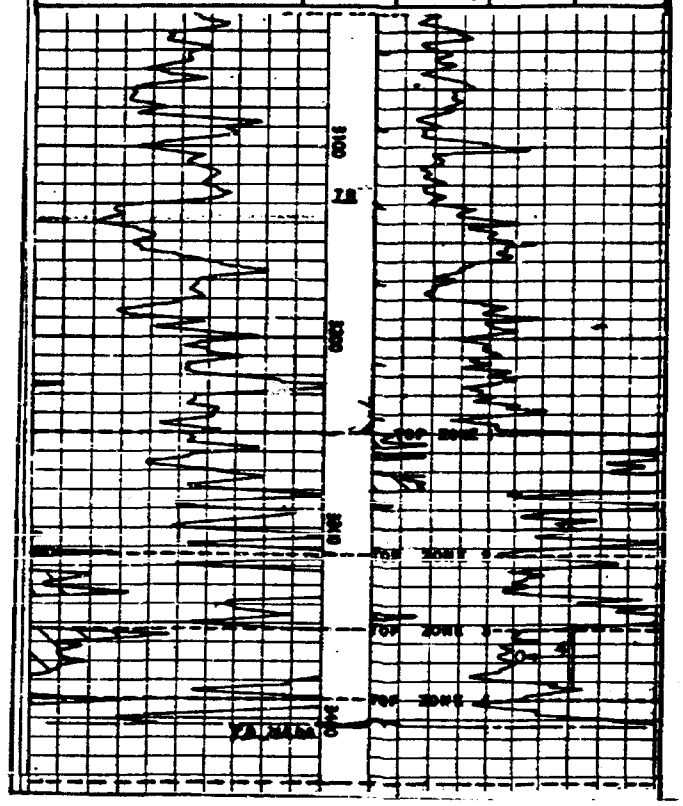
COMPANY: [illegible]

WELL: [illegible]

FIELD: [illegible]

COUNTY: [illegible] STATE: [illegible]

LOCATION:



Location of Well

SERVICES OF
S.L. 9340'

COMPANY: O.K. CORPORATION

WELL: LANGLIE MD. 6

FIELD: LANGLIE MATTIX

COUNTY: LEA STATE: N.M.

LOCATION: 1980' FSL, 2310' FEL,
SECTION 8, 24S, 37E.

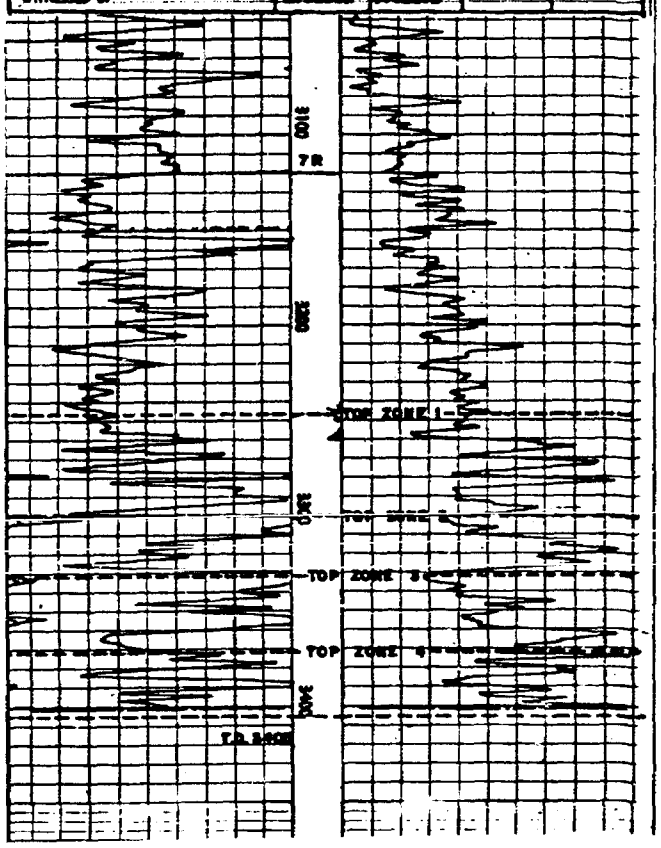
LOG MEAS. FROM KELLY BUSHING 12' A.G.L. 3340 A.S.L. 3.3 A.G.L.

DRLG. MEAS. FROM KELLY BUSHING 12' A.G.L. 3340 A.S.L. 3.3 A.G.L.

PERM. DATUM 0' BELOW KELLY BUSHING A.S.L. 3340 A.S.L. 3.3 A.G.L.

TYPE OF LOG	GAMMA RAY	NEUTRON
RUN NO.	1	1
DATE	8-24-60	8-24-60
TOTAL DEPTH (DRILLER) 3760	3404.5'	3404.5'
EFFECTIVE DEPTH (DRILLER)	3404.5'	3404.5'
TOP OF LOGGED INTERVAL	SURFACE	SURFACE
BOTTOM OF LOGGED INTERVAL	3403'	3403'
TYPE OF FLUID IN HOLE	OIL	OIL
FLUID LEVEL	FULL	FULL
MAXIMUM RECORDED TEMP.		
NEUTRON SOURCE STRENGTH & TYPE		50MC
SOURCE SPACING — IN.		2.25
LENGTH OF MEASURING DEVICE — IN.	25	3
O.D. OF INSTRUMENT — IN.	3 3/8	3 3/8
TIME CONSTANT — SECONDS	3	3
LOGGING SPEED FT./MIN.	20-40	20-40
STATISTICAL VARIATION — IN.		
SENSITIVITY REFERENCE	274	272
RECORDED BY	SCHLUMBERGER	SCHLUMBERGER
WITNESSED BY	COMPANY	COMPANY

COMPANY: O.K. CORPORATION
WELL: LANGLIE MD. 6
FIELD: LANGLIE MATTIX
COUNTY: LEA STATE: N.M.
LOCATION:



R-37-E

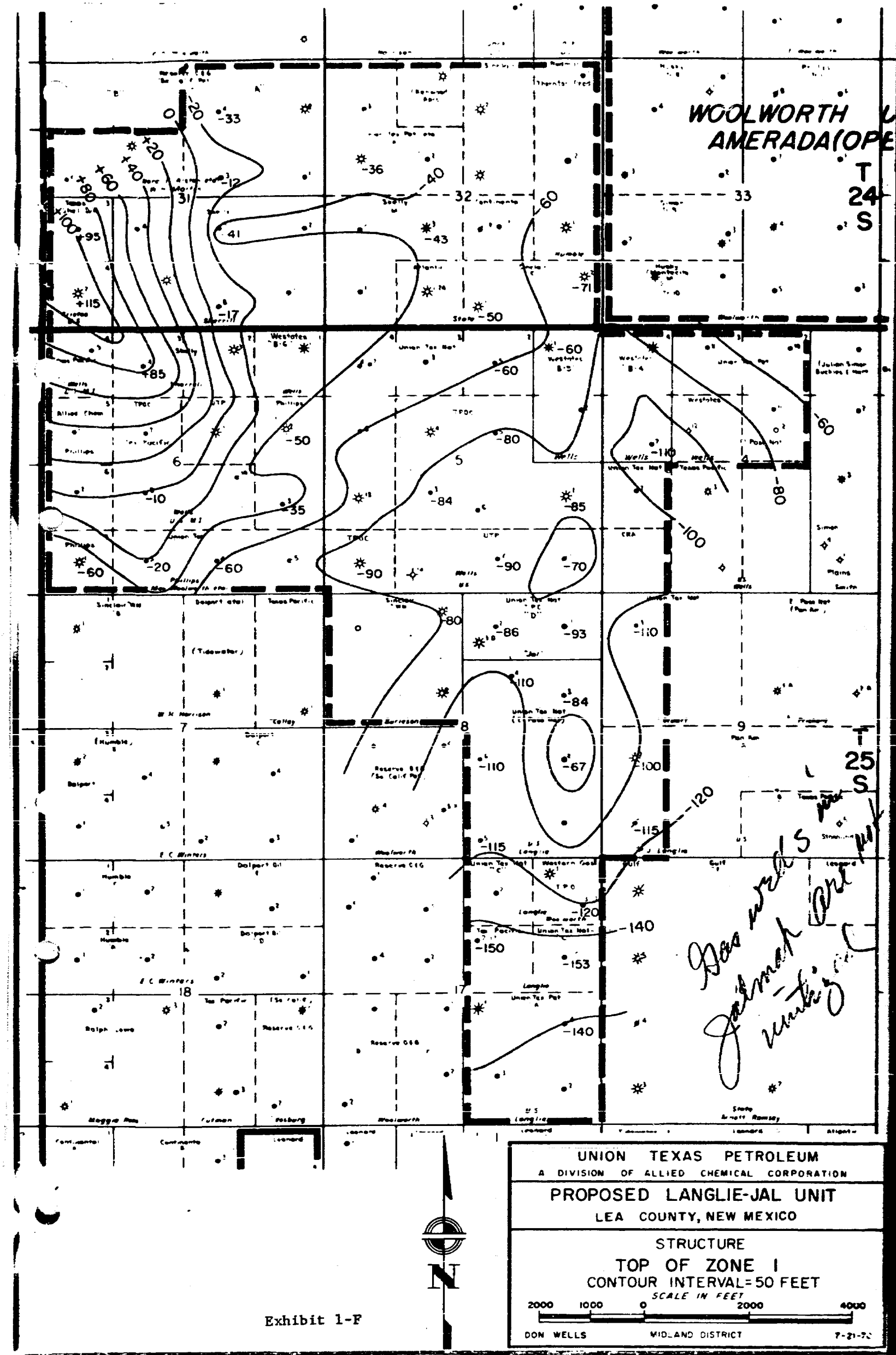


Exhibit 1-F

UNION TEXAS PETROLEUM
A DIVISION OF ALLIED CHEMICAL CORPORATION

PROPOSED LANGLIE-JAL UNIT
LEA COUNTY, NEW MEXICO

STRUCTURE
TOP OF ZONE I
CONTOUR INTERVAL=50 FEET
SCALE IN FEET
2000 1000 0 2000 4000

DON WELLS MIDLAND DISTRICT 7-21-7

DIAGRAMMATIC SKETCH

TYPICAL PROPOSED INJECTION WELL
PROPOSED LANGLIE-JAL UNIT

Lea County, New Mexico

SINGLE COMPLETION

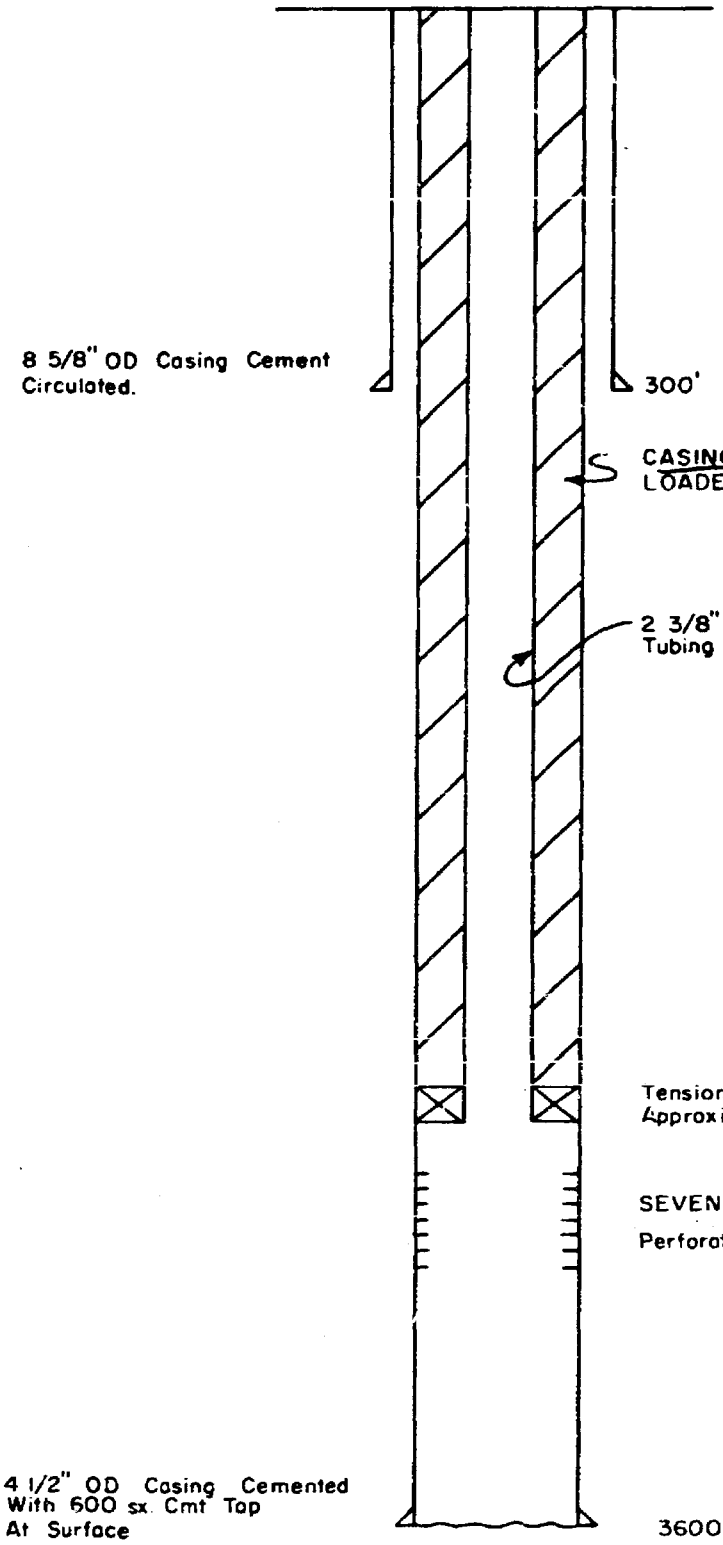


Exhibit 1-G

DIAGRAMMATIC SKETCH
PROPOSED INJECTION WELL
PROPOSED LANGLIE-JAL UNIT
Lea County, New Mexico
Pan American, Langlie "A" No.2
Dual Completion

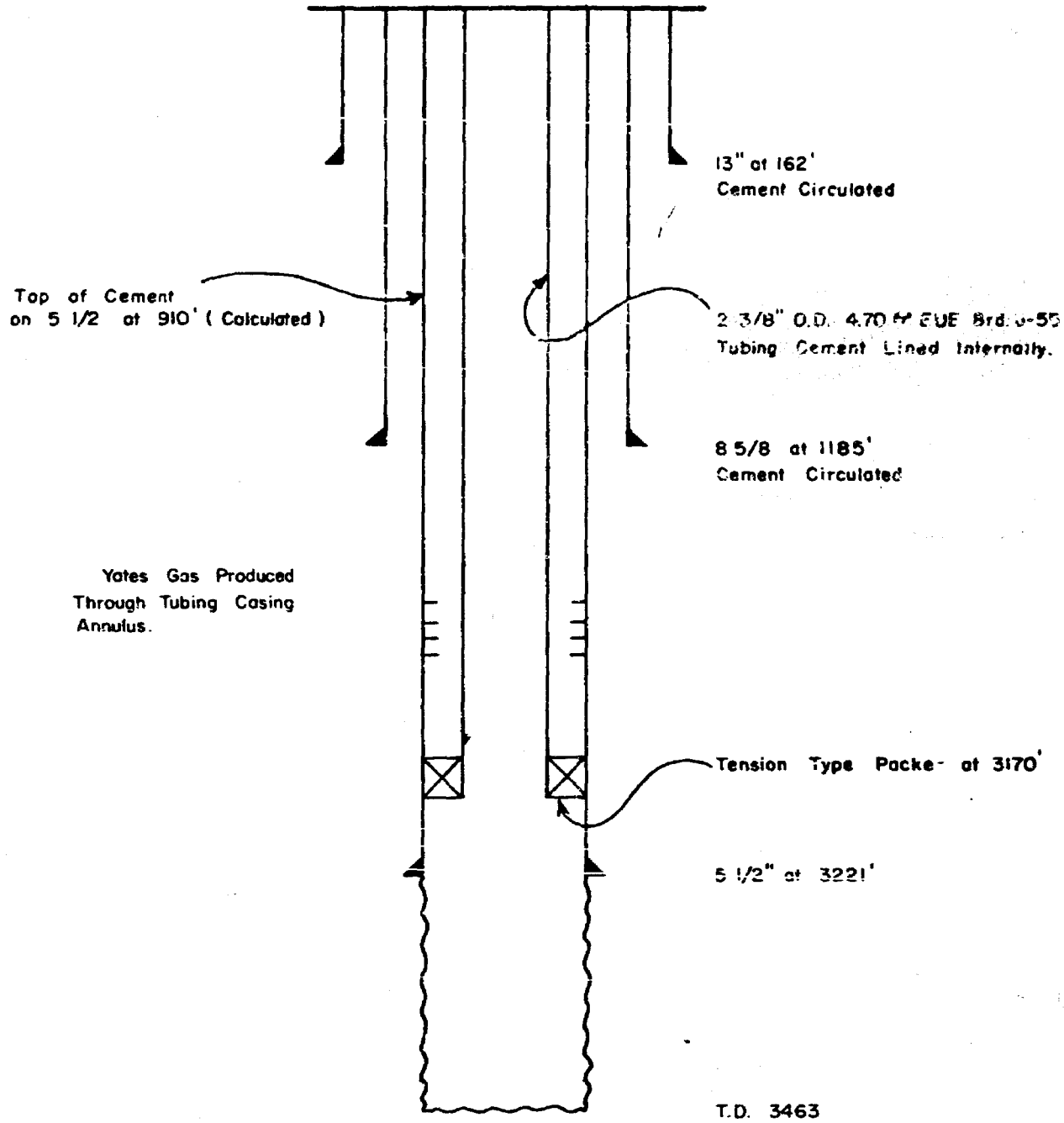
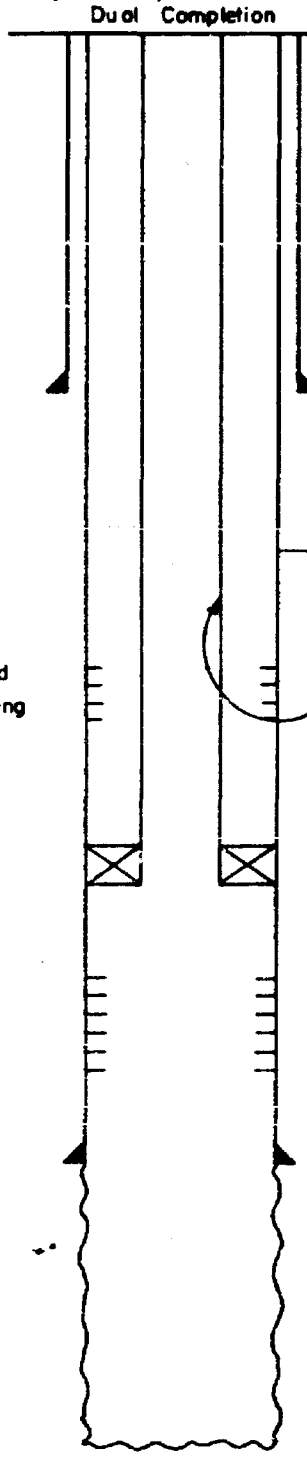


Exhibit 1-H

DIAGRAMMATIC SKETCH
PROPOSED INJECTION WELL
PROPOSED LANGLIE-JAL UNIT
Lea County, New Mexico
Skelly Sherrill, No. 3
Dual Completion



9 5/8" at 1192
Cement Circulated

Top of Cement at 1740' (Calculated)

Yates Gas Produced
Through Tubing-Casing
Annulus.

2 3/8" O.D. 4.70 # EUE 8rd. J-55
Tubing Cement Lined Internally.

Tension Type Packer at 3200'

Top of Production 3250'

7 1/2" at 3401' With 250 sx.

T.D. 3490'

Exhibit 1-I

TABLE No. 1
INJECTION WELL DATA
PROPOSED LANGLIE-JAL UNIT

COMPANY	LEASE AND WELL NO.	LOCATION S-T-R-U	SURFACE & INTERMEDIATE CASING SIZE	DEPTH	CEMENT SACKS	CEMENT TOP	PRODUCTION CASING SIZE	DEPTH	CEMENT SACKS	CEMENT TOP	TOTAL DEPTH	PROPOSED INJECTION INTERVAL TOP	BOTTOM	TUBING & PACKER SET @ APPROX.	DUAL COMPLETION	LOG CURRENTLY AVAILABLE
Atlantic Richfield	State 24 No. 1	32-24-37-N	7 5/8	2789	750	Surface(c)	5 1/2	3336	42	2750(c)	3546	3336	3546	3280	No	No
	** State 157 "E" No. 2	32-24-37-B	9 5/8	1202	500	Surface(c)	7	3122	250	1760(c)	3553	3300	3550	3250	No	Yes
	* State 157 "C" No. 3	32-24-37-P	8 5/8	300	300	Surface(c)	4 1/2	3600	600	Surface	3600	3320	3580	3270	No	No
	* Burleson No. 3	8-25-37-F	8 5/8	300	300	Surface(c)	4 1/2	3500	600	Surface	3500	3200	3475	3150	No	No
	* Burleson No. 4	8-25-37-D	8 5/8	300	300	Surface(c)	4 1/2	3500	600	Surface	3500	3240	3475	3190	No	No
Pan American	** Langlie "A" No. 2	9-25-37-L	13	162	100	Surface(c)										
			8 5/8	1185	360	Surface(c)	5 1/2	3221	400	910(c)	3463	3221	3463	3170	Yates Gas	Yes
Phillips	* Woolworth 3-4	6-24-37-H	8 5/8	300	300	Surface(c)	4 1/2	3500	600	Surface(c)	3600	3290	3560	3240	No	No
Reserve	** Martin No. 1	31-24-37-H	10 3/4	400	150	Surface(c)	7	3359	300	2140(c)	3540	3275	3540	3225	No	No
	** Martin No. 4	31-24-37-B	8 5/8	170	150	Surface(c)	5 1/2	3554	300	1820(c)	3554	3290	3554	3250	No	No
	* Martin "B" No. 3	31-24-37-F	8 5/8	300	300	Surface(c)	4 1/2	3600	600	Surface(c)	3600	3300	3590	3250	No	No
Skelly	** Sherrill No. 1	31-24-37-P	9 5/8	1182	200	Surface	7	3410	200	2080(c)	3540	3270	3540	3220	No	No
	** Sherrill No. 3	6-25-37-B	9 5/8	1192	250	Surface	7	3401	250	1740(c)	3490	3250	3490	3200	Yates Gas	No
	** Sherrill No. 7	31-24-37-J	8 5/8	1150	500	Surface	5 1/2	3551	200	2400(c)	4006	3280	3540	3230	No	Yes
	* Sherrill No. 9	31-24-37-N	8 5/8	300	300	Surface(c)	4 1/2	3600	600	Surface(c)	3600	3270	3590	3220	No	No
	** State "M" No. 2	32-24-37-L	16	136	50	Surface										
			8 5/8	1305	100	900(c)	7	3408	150	1300(c)	3553	3280	3540	3230	No	No
Texaco	** Fristoe NCT-4-"F" No. 1	31-24-37-L	13 3/8	136	150	Surface(c)										
			9 5/8	1173	100	850(c)	7	3525	1280	Surface	3525	3275	3525	3225	No	Yes
Texas Pacific	Wells No. 6	5-25-37-J	8 5/8	290	225	Surface	5 1/2	3180	300	1450(c)	3524	3180	3524	3130	No	No
	** Wells No. 7	6-25-37-F	8 5/8	260	250	Surface	5 1/2	3260	300	1530(c)	3337	3260	3550	3210	No	No
	** Wells No. 9	6-25-37-D	8 5/8	293	250	Surface	5 1/2	3375	600	Surface(c)	3470	3240	3470	3200	No	No
	** Wells No. 10	6-25-37-J	8 5/8	275	250	Surface	5 1/2	3478	300	1750(c)	3508	3250	3508	3200	No	Yes
	* Wells No. 12	5-25-37-F	8 5/8	300	300	Surface	4 1/2	3600	600	Surface(c)	3600	3350	3550	3300	No	No
Thornton Prod.	** Humble State "L" No. 2	32-24-37-C	16	138	150	Surface										
			8 5/8	1325	150	925(c)	7	3303	250	Surface(c)	3551	3275	3550	3225	No	No
Union Texas Petroleum	Jal "D" No. 2	8-25-37-B	9 5/8	1143	500	Surface(c)	7	3268	250	1600(c)	3479	3268	3479	3200	No	No
	Langlie No. 1	8-25-37-P	10	708	None	- -										
			8 1/4	1200	66	900(c)	5 1/2	3194	300	1450(c)	3485	3194	3485	3150	No	No
	Langlie No. 3	8-25-37-H	9 5/8	1191	500	Surface(c)	6 5/8	3265	350	1300(c)	3479	3265	3479	3200	No	No
	** Langlie No. 6	8-25-37-J	10 3/4	311	250	Surface(c)	7	3258	200	1930(c)	3405	3258	3500	3200	No	Yes
	** Langlie "A" No. 2	17-25-37-P	9 5/8	322	150	Surface(c)	7	2844	350	515(c)	3021	3250	3400	3200	No	No
	* Langlie "A" No. 5	17-25-37-J	8 5/8	300	300	Surface(c)	4 1/2	3450	600	Surface(c)	3450	3250	3400	3200	No	No
	Langlie "C" No. 1	17-25-37-H	10 3/4	304	250	Surface(c)	7	3098	200	1870(c)	3404	3198	3404	3150	No	No
	Langlie "C" No. 2	17-25-37-B	10 3/4	313	250	Surface(c)	7	3248	200	1920(c)	3404	3248	3404	3200	No	Yes
	Olsen Phillips No. 3	6-25-37-N	10 3/4	301	300	Surface(c)	7	3598	300	1600(c)	3600	3230	3450	3180	No	Yes
	Olsen Phillips No. 5	6-25-37-P	9 5/8	298	200	Surface(c)	7	3599	300	1600(c)	3600	3250	3470	3200	No	Yes
	** Phillips No. 2	6-25-37-L	9 5/8	314	250	Surface(c)	7	3598	300	1600(c)	3600	3260	3500	3210	No	Yes
	** State "A"-32 No. 2	32-24-37-F	9 5/8	535	225	Surface(c)	7	3407	300	1050(c)	3541	3290	3541	3240	No	No
	** State "A"-32 No. 3	32-24-37-D	9 5/8	643	325	Surface(c)	7	3447	300	1090(c)	3575	3300	3550	3250	No	No
	Stuart No. 1	9-25-37-D	7 5/8	1165	350	Surface(c)	5 1/2	3201	300	Surface(c)	3499	3202	3499	3230	No	No
	Wells No. 1	5-25-37-P	16	99	30	Surface										
			8 5/8	1170	100	776(c)	5 1/2	3270	300	1540(c)	3500	3270	3500	3220	No	No
	** Wells No. 4	5-25-37-D	7 5/8	1208	350	Surface(c)	5 1/2	3528	250	500(c)	3550	3310	3550	3260	No	No
	Wells No. 5	5-25-37-B	9 5/8	1200	500	Surface(c)	7	3350	200	2020(c)	3556	3350	3556	3300	No	No
	Wells No. 7	4-25-37-L	9 5/8	1203	500	Surface(c)	7	3307	300	3310(c)	3537	3307	3537	3250	No	No
	** Wells No. 10	4-25-37-B	9 5/8	1206	500	Surface(c)	7	3386	300	1390(c)	3529	3330	3529	3270	No	No
	* Wells No. 15	5-25-37-N	8 5/8	300	300	Surface(c)	4 1/2	3591	600	Surface(c)	3550	3275	3500	3225	No	No
	* Wells No. 16	5-25-37-L	8 5/8	300	300	Surface(c)	4 1/2	3591	600	Surface(c)	3550	3300	3500	3250	No	No
Westates	** Wells "B"-5 No. 2	5-25-37-H	13	171	100	Surface(c)	7	3401	300	1400						
			9 5/8	1254	300	300(c)	5 1/2	3538	-	-	3548	3350	3548	3300	No	No
	* Wells "B"-4 No. 3	4-25-37-B	8 5/8	300	300	Surface(c)	4 1/2	3500	600	Surface	3600	3240	3540	3290	No	No
	* Wells No. 13	4-25-37-F	8 5/8	300	300	Surface(c)	4 1/2	3500	600	Surface	3600	3240	3540	3290	No	No

* Wells to be drilled by Unit
** Wells to be deepened or worked over prior to injection

Exhibit 1-J

INITIAL PLAN OF OPERATION

The proposed injection pattern is an 80 acre five-spot. We propose to drill replacement wells and development wells to complete every five-spot pattern in the unit area. Strategic wells will be cored to obtain additional reservoir data. All wells drilled will be logged. After development is complete, injection will commence. Injection of 500 barrels of water per day per well is anticipated. Injection wells will be equipped with cement lined tubing and a packer. Singly completed injection wells will have inhibited fluid in the annulus above the packer. The injection water will be produced Seven Rivers water and Capitan Reef water purchased from Skelly Oil Company's Jal Water System. Water produced in unit operations will also be injected. To insure maximum recovery through cooperative waterflood operations and to protect the correlative rights of the unit, line well agreements will be negotiated with offset operators at the earliest possible date.

All work will be conducted in a prudent manner utilizing the best techniques and equipment deemed by the working interest owners to be most efficient.

L. C. CASE, P. E.
CONSULTANT, OIL FIELD WATER PROBLEMS
209 DUNBAR DRIVE
TULSA 14, OKLAHOMA
LUTHER 3-9307
LUTHER 3-3067

WATER ANALYSIS- Seven Rivers brine. Skelly Oil Company, Coates Lease. Sampled at supply tank, 7/29/66

	Milligrams/liter	E.P.L.%(R.V.%)
Sodium, Na	2,005	32.19
Calcium, Ca	520	9.61
Magnesium, Mg	266	8.10
Sulfate, SO_4	540	4.15
Chloride, Cl	3,595	37.55
Bicarbonate, HCO_3	1,366	8.30
Carbonate, CO_3	nil	0.00
Total	8,292	100.00%

Other determinations:

Sp.Gr. at 60°F 1.009
pH value 6.8
Hydrogen sulfide, H_2S - 408* (At supply tank, 7/29/66)

* Milligrams/liter

Hypothetical Combinations, milligrams/liter:

Calcium bicarbonate, $Ca(HCO_3)_2$	1,816
Magnesium bicarbonate, $Mg(HCO_3)_2$	0.0
Sodium bicarbonate, $NaHCO_3$	0.0
Calcium sulfate, $CaSO_4$	241
Magnesium sulfate, $MgSO_4$	462
Sodium sulfate, Na_2SO_4	0.0
Calcium chloride, $CaCl_2$	0.0
Magnesium chloride, $MgCl_2$	675
Sodium chloride, NaCl	5,098
Total	8,292

Definition of water character:

Primary salinity	64.58
Secondary salinity	18.82
Primary alkalinity	0.00
Secondary Alkalinity	16.60
Total	100.00%

Remarks:

Considerable time was spent in an attempt to count the bacteria in a sample of this brine taken from the supply tank. The count was not accurate due to the very high H_2S, which darkened the agar. Final results were indicated to be as follows: Aerobic bacteria— less than 500/ml in API agar. SO_4-reducers- 0 colonies in 18 days.

This brine shows no tendency to deposit gypsum, calculated from gypsum solubility data. This brine is incompatible with waters having appreciable dissolved iron or oxygen.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
9/30/70 EXHIBIT NO. 1-L
CASE NO. 4429 4430

Exhibit 1-L

ENJAY CHEMICAL COMPANY

ENJAY

Houston Chemical Plant
8230 Stedman, Houston, Texas 77029

April 21, 1969

WATER ANALYSIS

SAMPLE DESCRIPTION: Jal water supply well #2. 4-14-69

COMPANY: Skelly Oil Company
STSR NUMBER: #46986
REQUESTED BY: A. R. Bohannon

DATE RECEIVED: 4-15-69
ANALYZED BY: J. L. Johnson

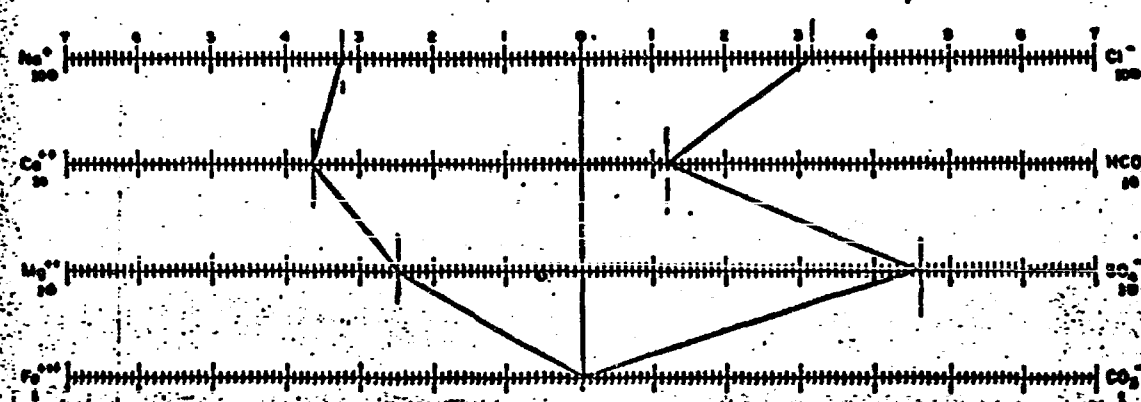
	Mg/L	Meq/L
Sodium	7,298	317.3
Calcium	724	36.2
Magnesium	301	24.8
Chloride	11,363	320.4
Sulfate	2,218	46.1
Bicarbonate	720	11.8
Carbonate	0	
Hydroxide	0	
TOTAL	22,624	
Dissolved Iron		
Total Iron	0.12	0.0

pH 6.8

Specific Gravity at 60 °F. 1.0076

	Mg/L
Oil Content	
Organic Matter	
Hydrogen Sulfide	313

WATER PATTERN (Stiff Method)



Meq/LITER

Remarks:

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 30, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Union Texas Petroleum Corporation for a unit agreement, Lea County, New Mexico.

Case No. 4429

and

Application of Union Texas Petroleum Corporation of a waterflood project, Lea County, New Mexico.

Case No. 4430

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

I N D E X

E X H I B I T S

MR. NUTTER: The Hearing will come to Order, please. We will call the next case No. 4429.

MR. HATCH: Case No. 4429, the Application of Union Texas Petroleum Corporation for a unit agreement, Lea County, New Mexico.

MR. NUTTER: And we will also call Case No. 4430.

MR. HATCH: Case No. 4430, the Application of Union Texas Petroleum Corporation for a waterflood project, Lea County, New Mexico.

MR. HINKLE: Clarence Hinkle, of Hinkle, Bondurant, Cox and Eaton, appearing on behalf of Union Texas.

We would like to move that these two cases be consolidated for the purpose of taking testimony.

MR. NUTTER: Cases 4429 and 4430 will be consolidated for Hearing purposes.

MR. HINKLE: We have two witnesses that we would like to have sworn.

(Whereupon, the witnesses were sworn.)

MR. HINKLE: We have one Exhibit which has been marked as Exhibit No. 1 and under one cover there are a number of parts, lettered from "A" to "K". Then, there is one other Exhibit which is not included under

the cover which we have marked Exhibit 1-L.

HOWARD PERDUE

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your residence and by whom you are employed?

A I am Howard Perdue. I live in Midland, Texas. I am District Petroleum Engineer for Union Texas Petroleum.

Q Have you previously testified before the Oil Conservation Commission?

A Yes, I have.

Q And your qualifications as a Petroleum Engineer are a matter of record with the Commission?

A Yes.

Q Are you familiar with the Applications which have been filed by Union Texas in these two cases?

A Yes, sir, I am familiar with them.

Q Have you made a study of this proposed unit area for the Langlie-Jal Unit Area?

A Yes, sir, I have.

Q What is Union Texas seeking to accomplish by Case No. 4429?

A Union Texas is seeking to accomplish the approval of the Unit Agreement for the Langlie-Jal Unit Area comprising 3748 acres, consisting of Federal, State and fee lands in Townships 24 and 25 South, Range 37 East, in the Langlie-Mattix Pool, Lea County, New Mexico.

Q Have you prepared or has there been prepared under your direction certain Exhibits for introduction in this case?

A Yes, they are included under Exhibit 1.

Q Refer to Exhibit 1-A and explain what this is and what it shows.

A Exhibit 1-A is a general plat of the area in which the proposed Langlie-Jal Unit is located. It also shows other unit areas in the immediate vicinity and all of the wells which have been drilled within the proposed unit area and within a radius of approximately two miles thereof, as well as the ownership of the acreage within and in the vicinity of the proposed unit area.

Q What zone or formations does Union Texas

propose to unitize?

A We propose to unitize the lower portion of the Jal-Mat in the Langlie-Mattix Pools which this consists of the Seven Rivers and Queen formations.

Q Now, refer to Exhibit 1-F and explain what that shows?

A Exhibit 1-F is a structural plat contoured at intervals of 50 feet on the top of the Langlie-Mattix producing zone. This plat also shows all of the wells which have been drilled within the proposed unit area, among which are certain wells indicated to be gas wells which are producing from the Jal-Mat Gas Pool and will not be a part of the unitized intervals. The gas wells are indicated by the usual symbol.

Q Does this indicate continuity of the producing zone and the zone which you intend to unitize throughout the proposed unit area?

A Yes, sir. This plat along with -- I will refer to Exhibit 1-D, if I might -- which is a two-well cross-section indicating that the overal productive interval is generally continuous throughout the unit area.

Q Are you familiar with the proposed unit agreement, copies of which have been filed with the

Application of these Cases?

A Yes, sir.

Q Is this substantially the same form of unit as heretofore approved by the Commission where both Federal, State and fee lands are involved?

A Yes, sir, it is.

Q Has this area been heretofore designated by the U.S.G.S. as an area suitable and proper for unitization?

A Yes.

Q For the purpose of carrying on waterflood projects?

A Yes. The Application for designation of the unit area was approved by the U. S. Geological Survey and the Unit Agreement was approved subject to some modifications. These modifications were made and the Agreement has since been approved, re-approved, by the U.S.G.S.

Q Has the Unit Agreement and the area also been approved by the Commissioner of Public Lands?

A The Agreement including the U.S.G.S. modifications was reviewed with representatives of the State Land Commissioner and was approved.

Q Are all of the wells within the proposed unit area in the category of stripped wells at the present time?

A Yes, sir. The average production per well is approximately 3 barrels per day.

Q Does the Unit Agreement contain a participating formula?

A Yes.

Q Has this formula been agreed to by all of the working interest owners within the unit area?

A Yes, it has. Actually, 97.35 percent of the working interest owners have ratified the Unit Agreement. Also 93.23 percent of the royalty interest have indicated approval and this would include both the State land royalty and the Federal royalty. There is only one tract that the working interest owner has not ratified, and I will refer again to Exhibit 1-A, and this is the little 40-acre tract outlined up in the northeast corner of the unit. We expect this tract to be negotiated into the unit very soon.

Q Who is that tract owned by?

A Continental is the operator of that tract.

MR. NUTTER: That is the only tract in which

the working interest has not either ratified the unit or indicated that he would ratify, is this correct?

THE WITNESS: Actually, Mr. Examiner, we have 100 percent ratification of all other tracts.

MR. NUTTER: Who have actually ratified?

THE WITNESS: 100 percent of all other tracts in the unit. This is working interest.

MR. NUTTER: Yes.

BY MR. HINKLE:

Q Do you want to state what the participating formula is or would you rather leave that for Mr. Wells?

A I will be happy to. The participation is based on 50 percent ultimate tract primary production, 35 percent usable wells and 15 percent tract acreage.

Q In the event of approval of the Unit Agreement by the Oil Conservation Commission, in your opinion, would the Agreement be in the interest of conservation, prevention of waste and tend to protect correlative rights?

A Yes, sir. We feel that by approval of this project that several million barrels of oil will be recovered that would otherwise stay in the ground.

Q And the primary purpose of the unit is a

waterflood project, is it not?

A Yes, it is.

Q In your opinion will the waterflood project promote the greatest recovery of unitized substances?

A We definitely feel that it will. It is the best scheme for additional recovery.

Q Do you have anything further you would like to offer?

A I believe that's all the testimony I have.

MR. HINKLE: We would like to offer into evidence -- well, I will wait on this because we will refer to this again with the other witness.

That's all I have on direct.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Perdue, you mentioned that the Jal-Mat gas well in the unit is not committed to the unit. Now, I was noticing from the Unit Agreement that the unitized formation is from the top of the Seven Rivers down through the base of the Queen, so I suppose all of these gas wells which are not unitized would be producing from above the top of the Seven Rivers?

A Yes, sir, this is true. I believe we can

refer to Exhibit 1-D again, or I believe 1-C might be a better one.

As you are aware, the Jal-Mat zone includes both Yates and a portion of the Seven Rivers, and the Langlie-Mattix includes the lower portion of the Seven Rivers and the Queen. Well, we are unitizing the Seven Rivers and the Queen as a unitized interval, so the gas wells are all completed above the unitized interval.

Q Above the top of the Seven Rivers?

A Yes, sir.

MR. NUTTER: The other witness will testify as to the injection wells?

MR. HINKLE: That's right.

MR. NUTTER: Are there any further questions of Mr. Perdue?

You may be excused.

(Witness dismissed.)

DONALD B. WELLS

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, where you reside, and by

whom you are employed?

A My name is Donald B. Wells. I live in Midland, Texas, and I am a Petroleum Engineer for Union Texas Petroleum in the Midland District Office.

Q Have you previously testified before the Oil Conservation Commission?

A No, sir, I have not.

Q State briefly your educational background as a Petroleum Engineer, and your experience.

A I graduated from Texas Tech in 1960 with a Bachelor of Science degree in Petroleum Engineering. At that time I went to work for Haliburton Company and worked for three years in southeastern New Mexico in various capacities. When I left Haliburton, I went to work for British-American Oil Producing Company as a Production Engineer and worked for a B.A. for three years. At the time they were taken over by Gulf, I went to work for Sinclair where I worked for three years as a Reservoir Engineer, advancing to Senior Reservoir Engineer. Then, approximately a year ago, I went to work for Union Texas Petroleum Company as a Petroleum Engineer. Part of my responsibility is included in engineering activities on wells in southeast New Mexico

of which this unit is a part.

Q Have you made a study of the Langlie-Jal proposed unit area?

A Yes, sir, I have.

Q And of the wells that have been drilled?

A Yes, sir.

Q Production history and all?

A Yes, sir.

Q Are you familiar with the Application of Union Texas in Case 4430?

A Yes, sir.

Q What is Union Texas seeking to accomplish with this Application?

A Union Texas Petroleum is the largest interest owner in the unit and as an operator, seeks approval to install a waterflood project in a portion of the Langlie-Mattix Pool in Lea County, New Mexico in order to inject water into the Queen and Seven Rivers formation for the purpose of recovering oil reserves which would otherwise be left in the ground.

Q Can you give a brief history of the Langlie-Mattix producing area which will be included in the unit area?

A Yes, sir. Interest in Pritchard Oil Corporation which is now Union Texas Petroleum drilled and completed the first well which was a discovery well in August of 1935. The Langlie No. 1 initially produced 70 barrels of oil per day after being shot from 3400 3450 feet. To open all possible pay, the Langlie No. 1 was drilled until water was encountered at 312 feet Sub-C which was the original oil and water contact. This well, like many subsequent field wells had the oil stream set in the Seven Rivers above the field gas-oil contact at approximately 100 feet Sub-C and was bothered by I. G. water. In 1937, actual field development started. By late 1939, the drilling activity was over and in 1952 when the field bottom-hole pressure was approximately 800 pounds per square inch, a lively in-field drilling program was begun. These wells were fracture stimulated and had large initial producing rates and experienced rapid decline in productivity. In-field drilling was economically disappointing. In 1941, a gas re-pressuring project was commenced. This project included 13 wells and part of Sections 5, 8 and 9. This project maintained a constant rate of production during a portion of the active

life by virtue of the removal of G.O.R. penalties. However, gas-oil ratios became too large and the project was abandoned. El Paso Natural Gas took over the operation of the project and found that re-pressuring had not occurred. Reservoir void each day would indicate the injection and withdrawals were practically the same. Producing performance of these wells is comparable to other Queen producing areas.

In 1940, the peak producing rate was 36 barrels of oil per day per well. Currently the average oil weight of the 23 wells that still produce is approximately 3 barrels per day.

The Queen Sand is in a late stage of depletion, approximately 96 percent. Accumulative production to July 1st, 1970 from the qualified tracts in the unit area was 4,448,699 barrels. We estimate this as approximately 11 percent of the oil in place. The oil was produced by solution gas drive.

Q Refer to Exhibit 1- and explain that to the Commission.

A Exhibit 1-B is a plat showing the outline of the proposed unit area, and it is also the outline of our proposed project. This plat also shows all wells

which have been drilled within the proposed unit area or project area within a radius of 2 miles, as well as ownership of the acreage surrounding the unit. Proposed injection wells are shown by triangles. The legend also shows the location of the Jal-Mat Gas Wells as well as oil wells producing from the Langlie-Mattix and Jal-Mat Pools. The numbers within the unit area are the same as shown on Exhibit A and B of the Unit Agreement.

Q Do you have anything further with respect to 1-B?

A No, sir.

Q Refer to 1-J and explain what that shows?

A Exhibit 1-J is a table showing all of our proposed injection wells. All together, we have 46 wells listed of which 34 are presently completed in the interval and will be converted to injection wells. It will be necessary to deepen some of these wells or work them over in one manner or another as indicated on the table. It is also contemplated that 12 new wells will be drilled and used for injection purposes.

The wells that will be drilled are shown on this table by one asterisk on the location at which they will be drilled.

Q Now, refer to Exhibits 1-C, D and E and the logs which are shown on Exhibit 1 and explain these.

A All right, sir. Exhibit 1-C is a typical log. It is of a well within the unit area and on it are shown the tops of various producing formations and the proposed unitized interval.

Exhibit 1-D as has been previously testified or mentioned is a two-well cross-section showing that the zones are continuous throughout the unit area.

Exhibit 1-E which consists of 9 logs of wells or the logs of the injection wells which we have logs of. These wells were drilled back in about 1935 and not many of them were logged, so we don't have --

Q (Interrupting) These are all of the logs, these 9 logs are all that are available?

A Yes, sir. The well that we have as Exhibit 1-C is also an injection well, so actually we have logs of 10 wells that will be injection wells.

We plan to log all the wells that we drill and will file them as we drill them.

Q Now, refer to Exhibit 1-G, H and I and tell us what they show?

A These three exhibits are diagrammatic sketches

of our proposed injection wells. Exhibit 1-G is a single completion. On it we show that we have our surface casing cemented to the surface. Our oil stream or the deep stream is also on wells that will be drilled will be cemented to the surface. We will perforate the unitized inverval from -- the gross interval will be approximately 3300 to 3600 with selected intervals within that interval.

We plan to inject water through cement lined tubing and belowa packer in the annulus between tubing and the casing where we plan to load the hole with inhibited fluid. We will have a guage at the surface.

Q You will use cement lined tubing in all of the injection wells?

A Yes, sir. Exhibit 1-H and 1-I are the only two wells that we propose to have a dual injection-producing wells. These are two wells which are not -- well, they are currently completed in the Jal-Mat Gas Pool and the operator has elected to keep these completions. On H-C we also have cement lined tubing and will be injecting through that below a packer.

Q From what source do you expect to obtain water for injection purposes?

A We plan to purchase our water from Skelly's Jal water system. This water is kept in reef water and produced Seven Rivers water. I have a water analysis of that.

Q And that is what?

A Exhibit 1-L.

Q The one that is loose?

A Yes. These water analyses were supplied by Skelly and it shows that the water is non-potable. This water has been used in other waterflood projects in the area.

Q You contemplate inaugurating the waterflood by putting all of the injection wells in at the same time or just a portion of them?

A No, sir, we plan to drill all of the wells -- if you notice on one of the plats, 1-B or 1-C, there are some undrilled locations within the unit area -- we plan to drill these wells and develope every five-spot. Of course, some of these wells will be injection wells, and we have a number of replacement wells to drill. These will all be drilled and injection into every well will start essentially at the same time.

Q In other words, you contemplate starting the

injection of water in all 46 wells at approximately the same time?

A Yes, sir.

Q What do you anticipate will be the initial rate of injection?

A Approximately 500 barrels per day per well.

Q What would that aggregate?

A 23,000 barrels a day.

Q Have you made a study or calculation as to the ultimate recovery by this waterflood project?

A Yes, sir, we anticipate that the secondary recovery will be approximately equal to primary or 4½ million barrels additional oil.

Q Over what period of time do you anticipate this will take place?

A Approximately 9 years.

Q Now, the unit plan calls for initial plan of operation. Are you prepared to present this plan?

A Yes, sir, that is presented as Exhibit 1-K. On this we state that our proposed pattern is an 80-acre five-spot. We propose to drill replacement wells for these Jal-Mat gas wells that aren't being included in the unit. We will complete every five-spot pattern

in the unitarea and core and log all of these wells to obtain as much data as possible. After our development is complete, we will start our injection at approximately 500 barrels per day per well. We will inject through cement lined tubing below a packer.

Q Would you like to obtain a project allowable as provided by Rule 701 of the Commission?

A Yes, sir, we would.

Q Would it be desirable in the Order of approving the waterflood project to provide that you could obtain administrative approval in case there is any changes in the injection wells or operations?

A Yes, sir. At the time we get the Continental tract included in the Agreement, that would save us having another Hearing to convert it to injection. It will be an injection well when it is included.

MR. HINKLE: We would like to offer in evidence Exhibits 1-A through L.

MR.NUTTER: Applicant's Exhibits 1-A through 1-L will be admitted into evidence.

(Whereupon, Applicant's Exhibits No. 1-A through 1-L were offered and admitted in evidence.)

MR. HINKLE: That's all we have.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Wells, you mentioned Exhibits G and H there as being a schematic diagram of the two wells. Are those the only two wells that will be dual completions?

A The only two injection wells.

Q That's what I mean, injection wells?

A Yes, sir.

Q All the others will be single completions and Exhibit G -- I said G and H, but I meant H and I -- and Exhibit G is a typical single-zone injection well, then?

A Yes, sir.

Q And this is the manner in which all the wells will be equipped?

A Yes.

Q Now, referring to Exhibit No. 1-J, Mr. Wells, which is a tabulation of all of the casing and cementing data on the 46 injection wells. Just a quick inspection indicates that there are about six wells, being the Pan American-Langley No. 2, the Texaco-Fristo B-1, the Skelly State M-2, the Thornton-Humble State L-2, the Union Wells No. 1 and the West States Wells B-5 No. 2;

those six wells are the only ones which have less than 200 feet or less than essentially 300 feet of surface casing in them. Now, each one of these appears to have an intermediate casing string. So could we state that in each instance of these injection wells that you have essentially 300 feet of surface pipe or an intermediate casing string?

A Yes, sir.

Q So that you've got at least 300 feet of pipe going through the fresh water sand in the area?

A Yes, sir.

Q Let's check the cement now. On the Pan American-Langlie No. 2, the surface pipe and the intermediate has been circulated to the surface?

A Yes, sir, the little "C" in parenthesis there indicates that that is calculated volume. I couldn't find any temperature surveys indicated. Our records are so sketchy in these old wells that it had to be calculated instead of actual.

Q But the volume of cement that was used was sufficient to come to the surface?

A Yes, sir.

Q Did you use a 100 percent factor?

A No, sir, I used about an 80.

Q 80 percent factor?

A Yes, sir.

Q Then the Skelly State M-2 has cement circulated on the 16-inch and it comes to about 900 feet on the 8 and 5, is this correct?

A Yes, sir. In that particular one, the 16-inch, we did have an indication in the record that that was circulated. Anywhere it doesn't have a "C" that was in the record that it did circulate. The "C" means calculated.

Q Then on the Texaco-Fristo B No. 1, you have cement to the surface on the big string and 850 feet on the intermediate?

A Yes, sir.

Q Likewise, on the Thornton you have cement circulated on the big string and to 925 on the intermediate?

A That's right.

Q Union Texas Wells has cement circulated on the big string and 776 on the intermediate?

A Yes, sir.

Q And the West States No. 2 has cement circulated

on the big string and to 300 feet on the intermediate?

A Yes.

Q Now, in each instance, with the exception of two wells, you will be loading the annulus with inhibited fluid and injecting down cement-lined tubing?

A That is proposed, yes, sir. We have had an indication that there are some of these wells that are completed in the Jal gas now. It is in our Agreement that they will either furnish us a well bore or we will make into such condition that we can adequately protect this. Some of these will involve squeezing off the Jal-Mat gas which will be the occasion on some of these wells. Right now, the two that I have indicated are the only two that we think will be dual completions.

Q The others that have perforations in the upper formations, say, in the Yates, those perforations would be squeezed?

A Yes, sir.

Q So that you can't load that annulus with inhibited fluid?

A Yes, sir. If not, if something comes up when we get ready to convert and if this operator elects to go ahead and keep that well, they will be completed as

we have shown here on H and I.

Q Can you tell me on Exhibit 1-J which of these two wells will be dual completed?

A Yes, sir, the Exhibit 1-I is the Skelly Sherrill No. 3 Well which is the second one listed there under Skelly. It has 9 and 5/8 casing set at 1192, cemented with 250 sacks of cement which circulated and then 7-inch at 3401 cemented with 250 sacks of cement and the top cement calculated at 1740. The Exhibit 1-H is the Pan American-Langlie A, No. 2 which is the only well listed there.

Q Fortunately, that is the one that has the short string of surface and that fortunately is one that had the cement circulated on the intermediate?

A Yes, sir.

Q So you do have a string of pipe which is cement circulated all the way to the surface on that one?

A Yes, sir.

Q Do you have any anticipated pressures at this time, Mr. Wells?

A It should be approximately 1000 pounds. We have had some indication from Amerada's flood which

is an offset which we plan to cooperate with. It will increase slightly, but we want to keep it below 1400 pounds. This is indicated as an approximate fracture pressure. It varies considerably over the area.

Q Is this the injection pressure at the well head?

A Yes.

Q What volume of water is expected to be required to achieve fill-up here?

A I am sorry. I will have to look that up.

Q How about in the sense of time; what length of time is expected?

A About two years.

Q About two years?

A Approximately that.

Q At this rate of 500 barrels?

A Yes.

MR. NUTTER: Are there further questions of Mr. Wells?

You may be excused.

(Witness dismissed.)

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

MR. HINKLE: That's all.

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 4429 or 4430?

We will take the case under advisement and we will call Case No. 4173.

STATE OF NEW MEXICO)
) SS.
COUNTY OF SANTA FE)

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

RICHARD L. NYE, Court Reporter

My commission expires April 8, 1971.

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 4029-30
heard by me on 9/30, 1970.

New Mexico Oil Conservation Commission

Dockets Nos. 38-77 and 39-77 are tentatively set for hearing on November 30 and December 14, 1977. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - NOVEMBER 16, 1977

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for December, 1977, from fifteen prorated pools in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(2) Consideration of the allowable production of gas for December, 1977, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 6079: Application of Dome Petroleum Corporation for a non-standard oil proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 80-acre non-standard oil proration unit comprising the E/2 SW/4 of Section 10, Township 26 North, Range 14 West, Bisti-Lower Gallup Pool, San Juan County, New Mexico.

CASE 6059: (Continued from October 12, 1977, Examiner Hearing)

Application of Dome Petroleum Corporation for pool creation, an oil discovery allowable, and a special depth bracket allowable, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the creation of the Leggs-Entrada Oil Pool in Section 11, Township 21 North, Range 10 West, San Juan County, New Mexico, the assignment of approximately 27,020 barrels of oil discovery allowable to its Santa Fe-Leggs Well No. 1 located in Unit C of said Section 11, and the establishment of a special depth bracket allowable of 750 barrels of oil per day for said pool.

CASE 6080: Application of Orla Petco, Inc., for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its R. K. Williams Well No. 1 to be located 1980 feet from the South line and 660 feet from the West line of Section 8, Township 19 South, Range 26 East, Eddy County, New Mexico, the S/2 of said Section 8 to be dedicated to the well.

CASE 6081: Application of Atlantic Richfield Company for directional drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the directional drilling in a northwesterly direction of its Lanehart 22 Well No. 1 from a surface location 660 feet from the North and West lines of Section 22, Township 25 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico, bottoming said well no closer than 280 feet from the North and West lines of said Section 22.

CASE 6082: Application of Gulf Oil Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for its Sand Well Unit Area comprising 3843 acres, more or less, of State, Federal, and fee lands in Township 23 South, Range 35 East, Lea County, New Mexico.

CASE 6083: Application of Sun Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Drinkard and Tubb production in the wellbore of its State 15 Well No. 4 located in Unit P of Section 16, Township 21 South, Range 37 East, Lea County, New Mexico.

CASE 6084: Application of Freeport Oil Company for a pressure maintenance project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance in the West Garrett-Devonian Pool by the injection of water into the Devonian formation through its Mattie Price Well No. 4 located in Unit O of Section 6, Township 17 South, Range 38 East, Lea County, New Mexico.

CASE 6085: Application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Jalmat and Langlie-Mattix production in the wellbore of its Cooper Jal Unit Wells No. 115 in Unit P of Section 13 and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico, and an administrative procedure for such approval for future wells. In the alternative, applicant seeks the contraction of the vertical limits of the Jalmat Gas Pool underlying said Cooper Jal Unit Area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie-Mattix Pool to include said formations.

Case 6085

Rec 16 Jerry Rose

Johnson Lang[illegible]] Reserve wants

surface commingling

Reserve Oil Inc

Downhole commingling

Langlie Mattix

Johnson

303-A

Coopers - Jal Unit Wells

LM
- V15 P 13-24-36
- 117 N 18-24-37
- x 121 B 24-24-36 Want to open in Johnson
- x 134 N 24-24-36
- 150 L 19 24 37

Johnson
- x 209 L 24 24 36
- 221 N 19-24-37 Want to change to LM

Admin Proc for additional Wells

115 P 13

121 B
134 N } 24 24 36
209 L

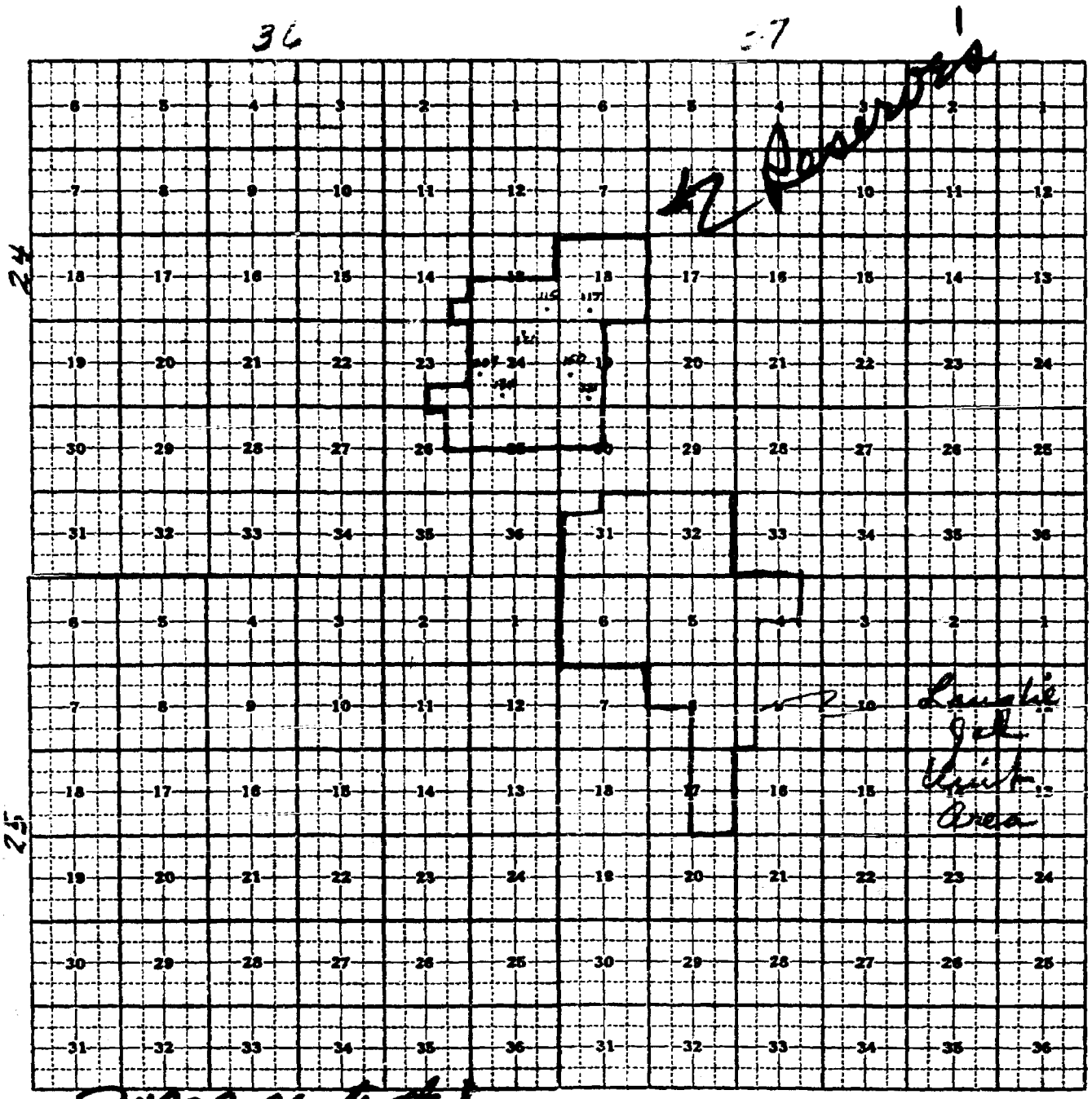
117 N 18

150 L
221 N } 19 24 36

Case 6085

Name
Address Ph.
Remarks:

Name
Address Ph.
Remarks:



T ..... R ..... State or County .....

T ..... R ..... State or County .....

R4929 contracted Jointly under Laundale Gas Unit Area

Nov. 16

Case 6085

Application of Reserve Oil, Inc., for downhole commingling or pool contraction and extension, Lea County, New Mexico.

Applicant, in the above-styled cause, seeks approval for the downhole commingling of Jalmat and Langlie Mattix production in the wellbore of its Cooper Jal Unit well No. 115 in Unit P of Section 13, ~~Unit N of Section~~ and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico, and an administrative procedure for ~~approval~~ for future wells. In the alternative, applicant seeks the contraction of the vertical limits of the Jalmat Gas Pool underlying said Cooper Jal Unit area by the deletion of the Upper and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie Mattix Pools to include said formations.

Called in by Jerry Lowe 10-25 & 10-26
Written application to follow

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 6085

Order No. R- 5590

APPLICATION OF RESERVE OIL, INC.
FOR DOWNHOLE COMMINGLING OR POOL
CONTRACTION AND EXTENSION, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on November 16, 19 77, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of November, 1977, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Reserve Oil, Inc., seeks approval for the downhole commingling of Jalmat and Langlie-Mattix production in the wellbore of its Cooper Jal Unit Wells No. 115 in Unit P of Section 13 and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico, and an administrative procedure for such approval for future wells.

, in the alternative, applicant seeks

(3) That/the contraction of the vertical limits of the Jalmat Gas Pool underlying said Cooper Jal Unit Area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the vertical limits of the Langlie-Mattix Pool to include said formations.

(4) That the applicant has been conducting separate secondary recovery operations in the Jalmat and Langlie-Mattix Pools within said Cooper Jal Unit Area

(5) That the proposed commingling will permit the applicant to achieve improved drainage in each of said projects which may result in the recovery of additional hydrocarbons from each of the subject pools, thereby preventing waste, and will not violate correlative rights.

(6) That the reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed commingling provided that ~~the~~ any such commingled well is not shut-in for an extended period.

(7) That to afford the Commission the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Hobbs district office of the Commission any time ~~the subject~~ any downhole commingled well is shut-in for 7 consecutive days.

(8) That said Cooper Jal Unit secondary recovery projects have been in operation approximately 6 years and that separate production statistics have been maintained on each of said projects for this same period.

(9) That approval of the ~~applicant's~~ alternative application, ~~as set out in Finding (3) above~~ in this case, would result in the loss of identity of production from the individual projects during their mid-life and ~~xxxxxxx~~ should be denied.

(10) That an administrative procedure should be established whereby additional Cooper Jal Unit Wells may be recompleted in such a manner as to permit the downhole commingling of Jalmat and Langlie-Mattix oil production therein.

(11) That in order to allocate the commingled production to each of the commingled zones in the wells, applicant should consult with the supervisor of the Hobbs District Office of the Commission and determine an allocation formula for each of the production zones.

IT IS THEREFORE ORDERED:

(1) That the applicant, Reserve Oil, Inc., is hereby authorized to commingle Jalmat oil and Langlie-Mattix oil production within the wellbore of its Cooper Jal Unit Wells No. 115 in Unit P of Section 13 and Nos. 121, 134, and 209 in Units B, N, and L of Section 24, Township 24 South, Range 36 East, and No. 117 in Unit N of Section 18, and Nos. 150 and 221 in Units L and N of Section 19, Township 24 South, Range 37 East, Lea County, New Mexico.

(2) That the supervisor of the Commission's district office at Hobbs is hereby authorized to grant approval for the downhole commingling of Jalmat oil and Langlie-Mattix oil production within the wellbore of additional wells within said Cooper Jal Unit.

(3) That the applicant shall consult with the supervisor of the Commission's district office at Hobbs and determine a formula for the allocation of production to each zone of any well downhole commingled under provisions of this order.

(4) That the downhole commingling authority granted by this order shall terminate upon abandonment of secondary recovery operations in the Jalmat and Langlie-Mattix Pools within said Cooper Jal Unit.

(5) That the application of Reserve Oil, Inc., for contraction of the vertical limits of the Jalmat Gas underlying said Cooper Jal Unit Area by the deletion of the Yates and Seven Rivers formations therefrom and the extension of the Langlie-Mattix Pool to include said formations is hereby denied.

(6) That to afford the Commission the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should ~~notify~~ notify the Hobbs district office of the Commission any time any well commingled under authority granted by this order is shut-in for 7 consecutive days.

(7) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.