Case No.

959

Application, Transcript,
Small Exhibits, Etc.

CASE 959: Southern Calif. Petr. Corp. -application to establish & operate pilot gas injection project, Langlie-Mattix & Cooper-Jal Pools

BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

September 15, 1955

IN THE MATTER OF:

CASE NO. 959

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

COURT REPORTERS

605 SIMMS BUILDING

TELEPHONE 3-6691

ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 15, 1955

IN THE MATTER OF:

Application of Southern California Petroleum Corporation for an order granting permission to establish and operate a pilot gas injection project in the Langlie-Mattix and Cooper-Jal Oil Pools, Lea County, New Mexico. Applicant seeks an order granting permission to inject gas into its A. E. Thomas Well No. 5, SW/4 SE/4 Section 24, Township 24 South, Range 36 East, and its S. W. Harrison Well No. 5, NE/4 NW/4 Section 25, Township 24 South, Range 36 East; both wells producing from the Seven Rivers Formation. Applicant further desires the establishment of rules to govern the use of make-up gas for injection wells and a revision of the 10,000 to 1 GOR limit on its leases in Section 24 and 25, Township 24 South, Range 36 East.

Case No. 959

BEFORE:

Honorable John F. Simms
Mr. E. S. (Johnny) Walker
Mr. William B. Macey

TRANSCRIPT OF HEARING

MR. MACEY: The next case on the docket is Case Number 959.

MR. [illegible]: Case 959 is the application of Southern California Petroleum Corporation, for authorization to establish and operate a pilot gas injection project.

[illegible], called as a witness, [illegible], testified as follows:

DIRECT EXAMINATION

By MR. GURLEY:

Q State your name for the purpose of the record.

A J. A. Warren, Division Engineer for Southern California Petroleum Corporation, Midland, Texas. I have testified before the Commission.

This is the application for authorization to establish and operate a pilot gas project involving the Seven Rivers Formation of the Langlie-Mattix and Cooper-Jal Oil Pools in Sections 24 and 25, Township 24 South, Range 36 East, Lea County, New Mexico, NMPM.

By the above application Southern California Petroleum Corporation has requested the New Mexico Oil Conservation Commission to consider its request for permission to operate a pilot gas injection project in a portion of the Langlie-Mattix and Cooper-Jal Oil Pools.

(Marked Southern California Petroleum Corporation's Exhibits 1, 2, 3 and 4, for identification.)

This map, submitted as Exhibit 1, shows the area of the proposed pilot gas injection project outlined in red and includes a block of five contiguous oil and gas producing leases owned and operated by Southern California Petroleum Corporation, comprising a total area of 680 acres and 14 oil and gas wells producing from the lower Seven Rivers formation. The specific leases involved are described as follows: The Maggie Dunn Lease, which is 120 acres, with three Seven Rivers Wells on it; the Phillips Lease with two Seven Rivers Wells, 80 acres; the Tonne Lease, [illegible] with four Seven Rivers Wells; the Van Zandt Lease, [illegible], three Seven Rivers Wells; the Harrison Lease, [illegible] with two Seven Rivers Wells.

The first proposed gas injection well is circled in red and is

approximately in the center of the proposed pilot area.

The map also shows all producing oil or gas wells and dry holes and the names of lessees and lessors within one-half mile of the boundary of the proposed pilot gas injection area. Cooper-Jal, Langlie-Mattix and Jalmat pool oil and gas wells are differentiated by symbols, as shown in the lower right corner of the map. The pool from which each offset operator's well is producing was determined from the August Proration Schedule.

This company has previously suggested the possible desirability of injecting gas in this area during the hearings on the ex-Falby-Yates Field (Case 841) which formerly encompassed the presently proposed pilot gas injection area. The possibility of maintaining the reservoir pressure and oil productivity of these Seven Rivers wells for a greater length of time by gas injection, was strongly indicated to us by the results of the first general Bottom Hole Pressure (BHP) survey in February 1955, only six months after the development of lower Seven Rivers production in this area was complete. This survey showed that the average BHP had dropped 397 psi - or approximately 1.5 psi per day - and that only 350 barrels of oil had been produced for each pound of BHP lost. This alarming drop in pressure has continued at only a slightly lower rate - pressures run September 12, 1955, showed an average loss of 231 psi in the last seven months, a drop of 1.1 psi per day, and only 317 barrels of oil have been produced for each pound of BHP lost. Oil production from the 14 wells has declined from the peak of 552 B/D in August 1954 to an average of 265 B/D in August 1955. The present low rate of production is, of course, the primary reason we are proposing to inject gas in this area. Only one well is now pumping but there are

at least four other wells that are ready for pumps, and at the present rate of production and BHP decline, the rest soon will be. We ffel that the installation of pumping units will hasten the rate of BHP decline and result in a low recovery of oil. Since we have thin, tight sands in these wells, it seems reasonable and probable that gas injection will result in longer flowing life and greater recovery of oil from these wells.

Exhibit II, consisting of a set of five graphs, one for each of tne producing leases before described as comprising the pilot gas injection area, is presented to show the production history of each lease. Each lease graph shows the results of BHP surveys on specific wells, the monthly production of oil for the lease, and the average GOR for the lease by months. Data for the preparation of these graphs was taken from the Operator's Monthly Report (Form C-115) as filed with the New Mexico Oil Conservation Commission.

To the best of our knowledge, all wells within the scope of the proposed project are producing only from the Yates or Seven Rivers formations, and the lower Seven Rivers sands are the only zones that this project is proposed to affect. In the 14 Southern California Petroleum Corporation wells within the pilot gas injection area, which were completed from February to July 1954, the lower Seven Rivers sands that are open to the bore holes occur between the approximate depths of 3390 and 3350 feet (-105 to -230 feet sub-sea). All of these 14 wells are within the horizontal and vertical limits of the specific portions of the Cooper-Jal and Langlie-Mattix oil pools covered by Commission Order No. R-640, which became effective July 1, 1955 - i.e. the intervals open to the bore holes are within 250 feet above the base of the Seven Rivers formation.

The work of the New Mexico Oil Conservation Commission Stratagraphic Nomenclature Committee was followed in making this determination.

The first proposed gas injection, Thomas No. 5, was chosen because of its central ocation in the pilot area, its mechanical condition is satisfactory, the zone open to the bore hole is typical of the other wells in the pilot area, and the well needs a pumping unit. Exhibit III, a Schlumberger Laterolog and Microlaterolog are submitted to show the depth and character of the formations penetrated. These logs show that the well was drilled to a total depth of 3575 feet on February 23, 1954, and indicates the three sand intervals that are typical of this company's 14 completions in the pilot area. These intervals are: 3473-3486, 3505-3514, and 3524-3538 feet. The base of the lower sand is at a sub-sea depth of -220 feet. Of the total of 36 feet of oil sand in these three intervals, it is estimated, from logs and cores, that 9 feet were affected by fracture treatment and have been producing most of the oil. This is further indicated by the results of analyses on core samples from these sand intervals, a copy of which is admitted as Exhibit IV. The averages of the analyses show an effective porosity of 17.0%, permeability of 18.6 md, residual oil saturation of 14.0%, and water saturation of 47.8%.

5½", 14# and 15.5#, J-55 new seamless casing was cemented at 3472 feet with 150 sax at the shoe and 150 sax through perfs at 1211 feet. The casing was pressure-tested to 1000 psi at the time cement was drilled out and 1500 psi at the time the formation was fractured. 2-3/8" OD, 4.70#, J-55 new seamless tubing was landed at a depth of 3339 feet with a Guiberson "G-2" production Packer at [illegible] feet.

it is believed that gas can be injected into this well satisfactorily in its present mechanical condition.

The gas for injection into Thomas No. 5 is to be procured from the casinghead gas produced on the Thomas lease from the three other Seven Rivers wells. The volume presently available is approximately 180 MCF oer day, and it would first be attempted to inject this amount during a test period to determine the susceptibility of the formation to gas injection. The compressor equipment to be installed is capable of injecting approximately 500 MCF per day at 1000 psi. If the formation takes this amount of gas, 180 MCF at reasonable pressure, we would propose to gradually increase the rate of injection up to a tentative maximum of about 500 MCF per day. The additional make-up gas required under these conditions we would propose to take from the Thomas Jalmat pool wells, and if more were needed, from one or more of the remaining leases within the pilot gas injection area.

We further request that if this gas injection project is found to be practical, and this operator should desire to extend the injection to other wells within the pilot gas injection area, that such expansion could be allowed by administrative approval; provided, of course, that offset operators have full knowledge of the results of the project and that we have their cooperation.

Further, we request the order to include approval to transfer the present allowable (or potential at the time of conversion) of a well converted to gas injection to [illegible] wells [illegible] [illegible] [illegible] would become effective only if [illegible] [illegible] successful to increase the [illegible]

to above top allowable. It has no meaning now, since all wells within the pilot gas injection area are sub-allowable.

Since it is quite possible that gas injection would increase the producing GOR of one or more wells within the pilot gas injection Langlie-Mattix oil pools, it is requested that the Commission consider a net GOR rule which would give the operator allowable credit by reason of gas injected. No change in the limiting GOR is advocated, but we are suggesting that if the producing GOR of a well becomes greater than 10,000:1 on a lease where produced gas is being injected the operator should be allowed credit for gas injected so that well can produce the oil it is capable of up to top allowable. One rule under which this company is operating in Texas would apply to this project as follows:

"The permitted GOR of each well shall be 10,000 cu. ft. per bbl. of oil produced. Any well producing with a GOR in excess of 10,000:1 shall be allowed to produce a daily volume of gas equal to the top daily oil allowable multiplied by 10,000 cu. ft. This volume is the daily gas limit for such well. If gas is returned to the producing formation the permitted net GOR shall be 10,000:1. Net gas is defined as the difference between the monthly produced gas volume and the volume of gas returned to the producing formation in that month. [illegible]

[illegible]

Southern California Petroleum Corporation submits that the approval of this pilot gas injection project will not cause waste or injure correlative rights, but will in all probability result in more efficient and complete recovery of oil and gas from this reservoir.

We ask the cooperation and consultation of offset operators in order that all producing wells in the vicinity of a gas injection well may be watched closely for signs of gas channelling or increasing GOR's. If and when favorable results of this project should occur, we would hope for the cooperation of our offset operators in expanding the affected area.

MR. MACEY: Is that all you have?

A Yes.

MR. MACEY: Do you wish to offer the exhibits?

A Yes, I offer the exhibits 1, 2, 3 and 4.

MR. MACEY: Were these exhibits prepared by you?

A Yes.

MR. MACEY: Prepared by you and under your direction?

A Yes, under my direction.

MR. MACEY: Without objection they will be received. Any questions?

CROSS EXAMINATION

By Mr. [illegible]:

Q You indicate that you may wish to expand this, and use gas from the Southern California oil wells, which under the Thomas [illegible] number 1, 3 and 4. There would be no difficulty in expanding the project, using the same [illegible], would there?

A [illegible]

Q I mean from the purchasers.

A No, they just wouldn't be getting it, for the time being anyway.

Q Would you be agreeable, if the project worked satisfactorily, to other operators joining the project and expanding at a later date?

A Yes, we would welcome anyone joining us.

Q You are not really suggesting that the gas-oil ratio 10,000 to 1 be changed in any manner; all you are asking is for gas credit?

A Gas credit only, on the specific lease and the specific zone where gas is being returned to the zone.

Q The reason I mentioned that, the call of the hearing, say -- shows maybe a change --

A No.

Q Your application didn't so state.

A No.

By MR. NESTOR:

Q I have a question. I think it is a matter of understanding. I am not quite sure I understand the last formula for determining the allowable of the well. I wonder if you could explain that again, please? Will this formula permit the well to get an allowable higher than the top that would be normally assigned?

A No, I said the daily allowable is limited to top. Your calculation may come out more than that.

MR. [illegible]: Anyone [illegible] of the witness? If [illegible].

([illegible])

MR. [illegible]: Anyone [illegible]

MR. HINKLE: Mr. Hinkle, of Roswell, representing the Humble Oil and Refining Company. The Humble is interested in this case to the extent that they have two top allowable oil wells in the immediate area that may be affected by this secondary recovery program. The Humble is not opposed to the application as a conservation measure and a secondary recovery program, but the Humble does have some reservations as to the probable results of the injecture of gas in this particular area because it may cause channel and may affect other wells. For that reason the Humble would like to request that if an order is granted in this case, that it be placed on a temporary basis and after six months that the Southern California Petroleum Corporation report to the Commission, and the case be set down for hearing at that time, rehearing, so as to give an opportunity to any operators, who may be adversely affected by the injection of the gas in the area, to be heard.

MR. WHITE: Charles White, appearing for the Texas Company. We also concur in what Mr. Hinkle has just stated. The Texas Company is one of the offset operators to the east, being the lease-owner in the northwest quarter of Section 30. It is to be noted that the Harrison Well for the gas injection program is in the northwest quarter of Section 29 and they are, and the applicant is the owner of a leasehold interest in the northeast quarter. The Texas Company has no objection to the gas injection program in the Harrison Well, nor in the Thomas Well. However, we do object to any expansion of this gas injection program into any other leases, especially the north half, [illegible] without there first being a hearing, and [illegible] gas injection program. The [illegible]

Number 5 be practical, that it is proposed to extend the gas injection to other leases and wells in the area. Before any extension is granted, we request that the order limit the injection program merely to Harrison Well Number 5 and the Thomas Well, and before any expansion is carried on that we first have a hearing, after due notice.

MR. MACEY: Anyone else have a statement they wish to make? If nothing further we will take the case under advisement.

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 9th day of October, 1955.

Ada Dearnley
Court Reporter, Notary Public

My Commission Expires:
June 19, 1959.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 959
Order No. R-708

THE APPLICATION OF SOUTHERN
CALIFORNIA PETROLEUM CORPORATION
FOR THE APPROVAL OF A PILOT PRESSURE
MAINTENANCE PROGRAM BY GAS INJECTION
INTO THE LOWER SEVEN-RIVERS FORMATION
IN ONE OR BOTH OF TWO WELLS, SAID INJECTION
WELLS LOCATED IN SW/4 SE/4, SECTION 24, AND
NE/4 NW/4 SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 36 EAST, IN THE LANGLIE-MATTIX OIL
POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 15, 1955, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 13th day of October, 1955, the Commission, a quorum being present, having considered the records and testimony adduced, and being fully advised in the premises,

FINDS:

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

2. That applicant's request to institute a pressure maintenance program in the Lower Seven-Rivers Formation of the Langlie-Mattix Oil Pool, Lea County, New Mexico, by gas injection, utilizing one or both of two proposed injection wells, is in the interests of conservation, will tend to retard the drop of reservoir pressure, and will tend to result in an increased production of oil that might otherwise be lost, thereby preventing waste; that the correlative rights of others with interests in the pool will be protected and that the application should be granted.

3. That a pressure maintenance program by gas injection into the Lower Seven-Rivers formation of the Langlie-Mattix Oil Pool is of an experimental nature, and after a reasonable test period the results should be reviewed at another public hearing before this Commission.

4. That the pressure maintenance program should be limited during the pilot stage of the program to the applicant's leases which cover the following area:

TOWNSHIP 24 SOUTH, RANGE 36 EAST, NMPM
E/2 NE/4, SW/4 NE/4, SE/4, E/2 SW/4 of Section 24
N/2 of Section 25

5. That under the applicant's program, gas injection should be limited to the following two wells of applicant: the A. E. Thomas Well No. 5 (SW/4 SE/4 Section 24, Township 24 South, Range 36 East) and the S. W. Harrison Well No. 5 (NE/4 NW/4 Section 25, Township 24 South, Range 36 East).

6. That the applicant has requested that they be allowed to transfer the present oil allowable from wells converted to gas injection to other oil wells on the lease producing from the Lower Seven-Rivers formation, but since the applicant does not desire allowables above the top allowable, no purpose at present would be served in granting such a transfer, therefore a future hearing may consider any allowable increases above top allowables.

7. That it is quite probable that the producing gas-oil ratio of some of producing oil wells from the Lower Seven-Rivers formation within the pilot gas injection area will in the future exceed the limiting GOR of 10,000:1, due to the gas injection program and therefore a net GOR rule should be established that would give the applicant an allowable credit by reason of gas injected.

8. That no specific objection has been made to the granting of this application.

IT IS THEREFORE ORDERED:

1. That the application of Southern California Petroleum Corporation for permission to institute a pilot pressure maintenance program in the Langlie-Mattix Oil Pool by the injection of gas into either or both their A. E. Thomas Well No. 5, SW/4 SE/4 Section 24, and S. W. Harrison Well No. 5, NE/4 NW/4 Section 25, both in Township 24 South, Range 36 East, NMPM, be, and the same hereby is, approved.

2. That permission is hereby granted to inject gas in said injection wells, gas to enter only the Lower Seven-Rivers formation, the producing horizon in the pressure maintenance area of the Langlie-Mattix Oil Pool, Lea County, New Mexico.

3. That the pilot pressure maintenance program is hereby limited to the applicant's leases as follows:

TOWNSHIP 24 SOUTH, RANGE 36 EAST, NMPM
E/2 NE/4, SW/4 NE/4, SE/4, E/2 SW/4 Section 24
N/2 Section 25

4. That applicant is hereby granted oil allowable credit by reason of gas injected. The permitted GOR of each well shall remain at 10,000 cubic feet per barrel of oil produced. Any well producing with a GOR

in excess of 10,000:1 shall be allowed to produce a daily volume of gas equal to the top daily oil allowable multiplied by 10,000 cubic feet. This volume is the daily gas limit for such well. If the gas is returned to the Lower Seven-Rivers formation, the permitted net GOR shall be 10,000: 1. Net gas is defined as the difference between the monthly produced gas volume and the volume of gas returned to the producing formation in that month. The net gas volume divided by the barrels of oil produced in the same period equals the net GOR. The daily gas limit shall be divided by the net GOR to give the adjusted daily oil allowable. The adjusted oil allowable will never exceed the top allowable for a particular month.

5. That the commission will on its own motion call a hearing as soon as possible after June 10, 1956, to receive testimony on the effect of the pilot gas injection program in this area and determine if the project should be expanded or discontinued.

6. That the Petitioner, Southern California Petroleum Corporation, will submit monthly reports to the Commission showing the monthly oil production and gas production on each well producing from the Langlie-Mattix Oil Pool within the area outlined in paragraph 3 above, and the amount of gas injected into the reservoir through each injection well bore.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN F. SIMMS, Chairman

E. S. WALKER, Member

W. B. MACEY, Member and Secretary

ir/

SOUTHERN CALIFORNIA PETROLEUM CORP
P. O. BOX 1071, MIDLAND, TEXAS
AUGUST 23, 1955

APPLICATION OF SOUTHERN CALIFORNIA PETROLEUM CORP. FOR AUTHORIZATION TO ESTABLISH AND OPERATE A PILOT GAS INJECTION PROJECT INVOLVING THE SEVEN RIVERS FORMATION OF THE LANGLIE MATTIX AND COOPER-JAL OIL POOLS IN SECTIONS 24 AND 25 TOWNSHIP 24 SOUTH, RANGE 36 EAST, NMPM.

By this application Southern California Petroleum Corp. respectfully requests the Oil Conservation Commission to set a date for hearing to consider this request for authorization to operate a pilot gas injection project and for consideration therefor states:

THAT Southern California Petroleum Corp. is the operator of oil and gas producing properties described as follows:

TOWNSHIP 24 SOUTH, RANGE 36 EAST, NMPM
SW¼NE¼, E½NE¼, E½SW¼, W½SE¼, E½SE¼ of section 24
N½ of section 25

Which may be described by leases as follows:

S. W. Harrison Lease	NW¼ sect 25,
Van Zandt Lease	NE¼ sect 25
A. E. Thomas Lease	E½SW¼ and W½SE¼ sect 24
Phillips Federal Lease	E½SE¼ sect 24
Maggie Dunn Lease	SW¼NE¼ and E½NE¼ sect 24

THAT the above described area is within the horizontal limits of the Cooper-Jal and Langlie Mattix oil pools heretofore delineated by Order R-640.

THAT a plat is hereto attached showing the acreage involved, offset ownership, and wells located thereon.

THAT because of rapid production decline and bottom hole pressure drop it is proposed to install a compressor on the A. E. Thomas lease and to start injection of gas into the Seven Rivers formation within the vertical limits of the Langlie Mattix oil pool through well No 5, and at a later date to extend the injection to the S. W. Harrison lease well No 5 completed within the vertical limits of the Cooper-Jal oil pool.

THAT the A. E. Thomas well No 5 is producing from the horizontal and vertical limits of the Langlie Mattix oil pool as heretofore delineated and described by Order R-640.

THAT the S. W. Harrison well No 5 is producing from the horizontal and vertical limits of the Cooper-Jal oil pool as heretofore delineated and described by Order R-640.

THAT it is proposed to extend the gas injection to other leases and wells in the area described above if found to be practical by the above initial injection procedure.

THAT it is proposed to use principally the gas produced from the Seven Rivers formation for injection but, if necessary, to also use make-up gas produced from the Yates formation.

THAT it is requested that the allowable from a injection well may be transferred to another well on the same lease producing from the Cooper-Jal and Langlie Mattix Oil Pools.

THAT by reason of gas being injected into this reservoir it is proposed that a net GOR rule be put into effect for wells producing from subject reservoirs at such time as gas-oil ratios exceed the 10,000 to 1 limit set for these pools.

THAT the granting of this application will not affect adversely the correlative rights of offset owners and will not cause waste but will in all probability increase the recovery of hydrocarbons from this reservoir.

THAT all offset operators as listed below have been notified of this proposal by copy of this application by registered mail.

Todd Aaron
1901 W. Michigan St.
Midland, Texas

Amerada Petroleum Corp.
Drawer D
Monument, New Mexico

Carper Drilling Co.
200 Carper Bldg
Artesia, New Mexico

Gulf Oil Corp.
Box 1667
Hobbs, New Mexico

Haynes & V. T. Drilling Co.
1725 N. Grant
Odessa, Texas

Humble Oil & Refining Co.
Box 2347
Hobbs, New Mexico

John M. Kelly
Box 5671
Roswell, New Mexico

Magnolia Petroleum Co.
Box 633
Midland, Texas

R. Olsen Personal
Box 2
Jal, New Mexico

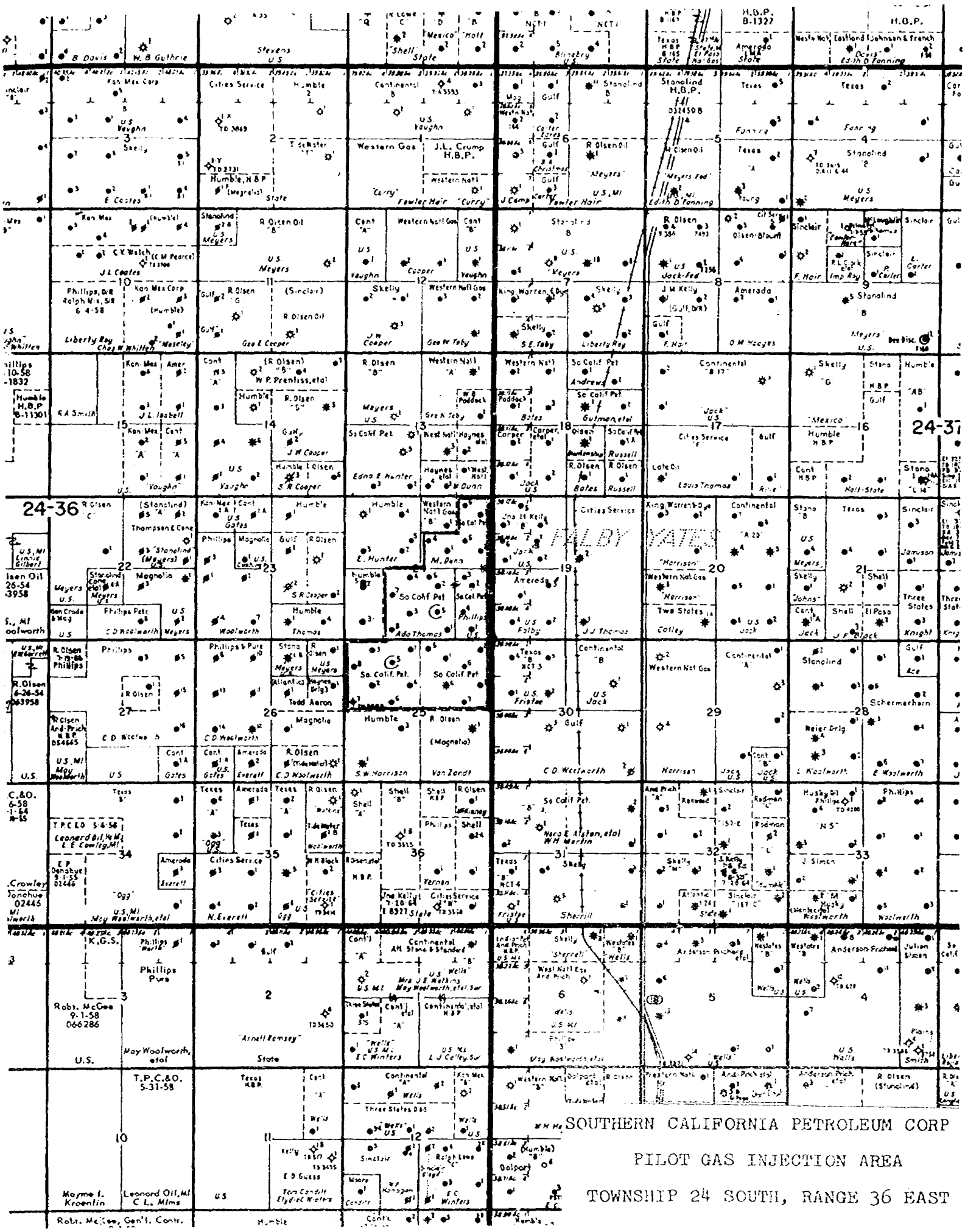
R. Olsen Oil Co.
2811 Liberty Bank Bldg.
Oklahoma City, Oklahoma

The Texas Co.
Box 1270
Midland, Texas Attn: Vernon Dullnig

Western Natural Gas Co.
823 Midland Tower Bldg.
Midland, Texas

SOUTHERN CALIFORNIA PET CORP

By J. A. Warren
District Engineer


FELBY
YATES
24-36
24-37
SOUTHERN CALIFORNIA PETROLEUM CORP
PILOT GAS INJECTION AREA
TOWNSHIP 24 SOUTH, RANGE 36 EAST

SOUTHERN CALIFORNIA PETROLEUM CORPORATION
Box 1071, Midland, Texas

September 15, 1955

RE: APPLICATION OF SOUTHERN CALIFORNIA PETROLEUM CORP. FOR AUTHORIZATION TO ESTABLISH AND OPERATE A PILOT GAS INJECTION PROJECT INVOLVING THE SEVEN RIVERS FORMATION OF THE LANGLIE-MATTIX AND COOPER-JAL OIL POOLS IN SECTIONS 24 AND 25 TOWNSHIP 24 SOUTH, RANGE 36 EAST, NMPM.

CASE 959 - Prepared Statement

By the above application Southern California Petroleum Corp. has requested the New Mexico Oil Conservation Commission to consider its request for permission to operate a pilot gas injection project in a portion of the Langlie-Mattix and Cooper-Jal oil pools, situated within Sections 24 and 25, T24S, R36E, N.M.P.M., Lea County, New Mexico.

This map, submitted as Exhibit I, shows the area of the proposed pilot gas injection project outlined in red and includes a block of five contiguous oil and gas producing leases owned and operated by Southern California Petroleum Corp., comprising a total area of 680 acres and 14 oil and gas wells producing from the lower Seven Rivers formation. The specific leases involved are described as follows:

Maggie Dunn:	$SW\frac{1}{4}NE\frac{1}{4}$ & $E\frac{1}{2}NE\frac{1}{4}$ of Sec. 24,	120 acres,	3 wells.
Federal-Phillips:	$E\frac{1}{2}SE\frac{1}{4}$ of Sec. 24	80 "	2 "
A. E. Thomas:	$E\frac{1}{2}$ $SW\frac{1}{4}$ & $W\frac{1}{2}SE\frac{1}{4}$ of Sec. 24,	160 "	4 "
Van Zandt:	$NE\frac{1}{4}$ of Sec. 25	160 "	3 "
S. W. Harrison:	$NW\frac{1}{4}$ of Sec. 25	160 "	2 "

The first proposed gas injection well, Thomas No. 5, is located 1980 feet from the east line and 990 feet from the south line of said Section 24, and is indicated on the map by a red circle. It should be noted that this well is very nearly in the center of the proposed pilot gas injection area.

The map also shows all producing oil or gas wells and dry holes and the names of lessees and lessors within one-half mile of the boundary of the proposed pilot gas injection area. Cooper-Jal, Langlie-Mattix and Jalmat pool oil and gas wells are differentiated by symbols, as shown in the lower right corner of the map. The pool from which each offset operator's well is producing was determined from the August Proration Schedule.

This company has previously suggested the possible desirability of injecting gas in this area during the hearings on the ex-Falby-Yates Field (Case 841) which formerly encompassed the presently proposed pilot gas injection area. The possibility of maintaining the reservoir pressure and oil productivity of these Seven Rivers wells for a greater length of time by gas injection, was strongly indicated to us by the results of the first general Bottom Hole Pressure (BHP) survey in February 1955, only six months after the development of lower Seven Rivers production in this area was complete. This survey showed that the average BHP had dropped 397 psi - or approximately 1.5 psi per day - and that only 350 barrds of oil had been produced for each pound of BHP lost. This alarming drop in pressure has continued at only a slightly lower rate - pressures run September 12, 1955, showed an average loss of 231 psi in the last seven months, a drop of 1.1 psi per day, and only 317 barrels of oil have been produced for each pound of BHP lost. Oil production from the 14 wells has declined from the peak of 552 B/D in August 1954 to an average of 265 B/D in August 1955. The present low rate of production is, of course, the primary reason we are proposing to inject gas in this area. Only one well is now pumping but there are at least four other wells that are ready for pumps, and at the present rate of production and BHP decline, the rest soon will be. We feel that the installation of pumping units will hasten the rate of BHP decline and result in a low recovery of oil. Since we have thin, tight sands in these wells, it seems reasonable and probable that gas injection will result in longer flowing life and greater recovery of oil from these wells.

Exhibit II, consisting of a set of five graphs, one for each

of the producing leases before described as comprising the pilot gas injection area, is presented to show the production history of each lease. Each lease graph shows the results of BHP surveys on specific wells, the monthly production of oil for the lease, and the average GOR for the lease by months. Data for the preparation of these graphs was taken from the Operator's Monthly Report (Form C-115) as filed with the New Mexico Oil Conservation Commission.

To the best of our knowledge, all wells within the scope of the proposed project are producing only from the Yates or Seven Rivers formations, and the lower Seven Rivers sands are the only zones that this project is proposed to affect. In the 14 Southern California Petroleum Corporation wells within the pilot gas injection area, which were completed from February to July 1954, the lower Seven Rivers sands that are open to the bore holes occur between the approximate depths of 3390 and 3550 feet (-105 to -230 feet sub-sea). All of these 14 wells are within the horizontal and vertical limits of the specific portions of the Cooper-Jal and Langlie-Mattix oil pools covered by Commission Order No. R-640, which became effective July 1, 1955 - i.e. the intervals open to the bore holes are within 250 feet above the base of the Seven Rivers formation. The work of the New Mexico Oil Conservation Commission Stratagraphic Nomenclature Committee was followed in making this determination.

The first proposed gas injection well, Thomas No. 5, was chosen because of its central location in the pilot area, its mechanical condition is satisfactory, the zone open to the bore hole is typical of the other wells in the pilot area, and the well needs a pumping unit. Exhibit III, a Schlumberger Laterolog and Microlaterolog are submitted to show the depth and character of the formations penetrated. These logs show that the well was drilled to a total depth of 3575 feet on February 23, 1954, and indicates the three sand intervals that are typical of this company's 14 completions in the pilot area. These intervals are: 3473-3486, 3505-3514, and 3524-3538 feet. The base of the lower sand is at a sub-sea depth of -220 feet. Of the total of 36 feet of oil sand in these three intervals, if is estimated that 9 feet were affected by fracture treatment and have been producing most of the oil. This is further indicated by the results of analyses on core samples from these sand intervals, a copy of which is submitted as Exhibit IV. The averages of the analyses show an effective porosity of 17.0%, permeability of 18.6 md, residual oil saturation of 14.0%, and water saturation of 47.8%.

5½", 14 and 15.5#, J-55 new seamless casing was cemented at 3472 feet with 150 sax at the shoe and 150 sax through ports at 1211 feet. The casing was pressure-tested to 1000 psi at the time cement was drilled out and to 1500 psi at the time the formation was fractured. 2-3/8" OD, 4.70#, J-55 new seamless tubing was landed at a depth of 3539 feet with a Guiberson "G-2" Production Packer at 3446 feet. It is believed that gas can be injected into this well satisfactorily in its present mechanical condition.

The gas for injection into Thomas No. 5 is to be procured from the casinghead gas produced on the Thomas lease from the three other Seven Rivers wells. The volume presently available is approximately 180 MCF per day, and it would first be attempted to inject this amount during a test period to determine the susceptibility of the formation to gas injection. The compressor equipment to be installed is capable of injecting approximately 500 MCF per day at 1000 psi. If the formation takes this amount of gas at reasonable pressure, we would propose to gradually increase the rate of injection up to a tentative maximum of about 500 MCF per day. The additional make-up gas required under these conditions we would propose to take from the Thomas Jalmat pool wells, and if more were needed, from one or more of the remaining leases within the pilot gas injection area.

We further request that if this gas injection project is found to be practical, and this operator should desire to extend the injection to other wells within the pilot gas injection area, that such expansion could be allowed by administrative approval; provided, of course, that offset operators have full knowledge of the results of the project and that we have their cooperation.

Further, we request the order to include approval to transfer the present allowable (or potential at the time of conversion) of a well converted to gas injection to one or more wells on the same lease producing from the same pool as the injection well. This rule would become effective only if the gas injection were sufficiently successful to increase the productive capacity of one or more wells to above top allowable. It has no meaning now, since all wells within the pilot gas injection area are sub-allowable.

Since it is quite possible that gas injection would increase the producing GOR of one or more wells within the pilot gas injection area to above the 10,000:1 limit now in effect in the Cooper-Jal and Langlie-Mattix oil pools, it is requested that the Commission consider a net GOR rule which would give the operator allowable credit by reason of gas injected. No change in the limiting GOR is advocated, but we are suggesting that if the producing GOR of a well becomes greater than 10,000:1 on a lease where produced gas is being injected the operator should be allowed credit for gas injected so that well can produce the oil it is capable of up to top allowable. One rule under which this company is operating in Texas could apply to this project as follows:

> "The permitted GOR of each well shall be 10,000 cu. ft. per bbl. of oil produced. Any well producing with a GOR in excess of 10,000:1 shall be allowed to produce a daily volume of gas equal to the top daily oil allowable multiplied by 10,000 cu. ft. This volume is the daily gas limit for such well. If gas is returned to the producing formation the permitted net GOR shall be 10,000:1. Net gas is defined as the difference between the monthly produced gas volume and the volume of gas returned to the producing formation in that month. The net gas volume divided by the bbls. of oil produced in the same period equals the net GOR. The daily gas limit divided by the net GOR gives the adjusted daily oil allowable".

Another suggested formula, is:

$$\text{Adjusted Allowable (Limited to top)} = \frac{\text{Top daily oil allow. x 10,000 / Vol. gas injected}}{\text{Producing GOR}}$$

Southern California Petroleum Corp. submits that the approval of this pilot gas injection project will not cause waste or injure correlative rights, but will in all probability result in more efficient and complete recovery of oil and gas from this reservoir.

We ask the cooperation and consultation of offset operators in order that all producing wells in the vicinity of a gas injection well may be watched closely for signs of gas channelling or increasing GOR's. If and when favorable results of this project should occur, we would hope for the cooperation of our offset operators in expanding the affected area.

Respectfully submitted,

SOUTHERN CALIFORNIA PETROLEUM CORP.

By: _____
Division Engineer

CASE NO. 959

APPLICATION OF SOUTHERN CALIFORNIA PETROLEUM CORP. FOR AUTHORIZATION TO ESTABLISH AND OPERATE A PILOT GAS INJECTION PROJECT INVOLVING THE SEVEN RIVERS FORMATION OF THE LANGLIE MATTIX AND COOPER JAL OIL POOLS IN THE SECTIONS 24 AND 25 TOWNSHIP 24 SOUTH, RANGE 36 EAST, N.M.P.M.

By this application Southern California Petroleum Corporation respectfully requests the Oil Conservation Commission to set a date for hearing to consider this request for authorization to operate a pilot gas injection project and for consideration therefor states:

That Southern California Petroleum Corporation is the operator of oil and gas producing properites described as follows:

TOWNSHIP 24 SOUTH, RANGE 36 EAST , N.M.P.M.
$SW\frac{1}{4}NE\frac{1}{4}$, $E\frac{1}{2}NE\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$ of Section 24
$N\frac{1}{2}$ of Section 25

Which may be described by leases as follows:

S. W. Harrison Lease	$NW\frac{1}{4}$ Section 25,
Van Zandt Lease	$NE\frac{1}{4}$ Section 25
A. E. Thomas Lease	$E\frac{1}{2}SW\frac{1}{4}$ and $W\frac{1}{2}SE\frac{1}{4}$ Section 24
Phillips Federal Lease	$E\frac{1}{2}SE\frac{1}{4}$ Section 24
Maggie Dunn Lease	$SW\frac{1}{4}NE\frac{1}{4}$ and $E\frac{1}{2}NE\frac{1}{4}$ Section 24

That the above described area is within the horizontal limits of the Cooper Jal and Langlie Mattix oil pools heretofore delineated by Order R-640.

That a plat is hereto attached showing the acreage involved, offset ownership and wells located thereon.

That because of rapid production decline and bottom hole pressure drop it is proposed to install a compressor on the A. E. Thomas lease and to start injection of gas into the Seven Rivers formation within the vertical limits of the Langlie Mattix Oil Pool through well No. 5, and at a later date to extend the injection to the S. W. Harrison lease well No. 5 completed within the vertical limits of the Cooper Jal Oil Pool.

That the A. E. Thomas well No. 5 is producing from the horizontal and vertical limits of the Langlie Mattix oil pool as heretofore delineated and described by Order R-640.

That the S. W. Harrison well No. 5 is producing from the horizontal and vertical limits of the Cooper Jal oil pool as heretofore delineated and described by Order R-640.

That it is proposed to extend the gas injection to other leases and wells in the area described above if found to be practical by the above initial injection procedures.

That it is proposed to use principally the gas produced from the Seven Rivers formation for injection but, if necessary, to also use make-up gas produced from the Yates formation.

CASE NO. 959 Cont'd.

That it is requested that the allowable form a injection well may be transferred to another well on the same lease producing from the Cooper Jal and Langlie Mattix Oil Pools.

That by reason of gas being injected into this reservoir it is proposed that a net GOR rule be put into effect for wells producing from subject reservoirs at such time as gas-oil ratios exceed the 10,000 to 1 limit set for these pools.

That the granting of this application will not affect adversly the correlative rights of offset owners and will not cause waste but will in all probability increase recovery of hydrocarbons from this reservoir.

That all offset operators as listed below have been notified of this proposal by copy of this application by registered mail.

Todd Aaron
1901 W. Michigan St.
Midland, Texas

Amerada Petroleum Corp.
Drawer D.
Monument, New Mexico

Carper Drilling Co.
200 Carper Bldg.
Artesia, New Mexico

Gulf Oil Corp.
Box 1667
Hobbs, New Mexico

Haynes & V. T. Drilling Co.
1725 N. Grant
Odessa, Texas

Humble Oil & Refining Co.
Box 2347
Hobbs, New Mexico

John M. Kelly
Box 5671
Roswell, New Mexico

Magnolia Petroleum Co.
Box 633
Midland, Texas

R. Olsen Personal
Box 2
Jal, New Mexico

R. Olsen Oil Co.
2811 Liberty Bank Bldg.
Oklahoma City, Oklahoma

The Texas Co.
Box 1270
Midland, Texas Attn: Vernon Dullnig

Western Natural Gas Co.
823 Midland Tower Bldg.
Midland, Texas

SOUTHERN CALIFORNIA PET. CORP.
/s/ J. A. Warren
District Engineer

NOTE: The above mentioned Plat is on file in the CCC office in Santa Fe, N.M.

New Mexico Oil & Gas Engr. Committee
P. O. Box 127
Hobbs, New Mexico
August 30, 1955

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

October 19, 1955

COPY

Southern California Petroleum Corp.
P.O. Box 1071
Midland, Texas

ATTENTION: Mr. J. A. Warren

Gentlemen:

We enclose a copy of Order R-708 issued October 13, 1955, by the Oil Conservation Commission in Case 959, which was heard at the September 15th hearing.

Very truly yours,

W. B. Macey
Secretary - Director

WBM:brp
Encl.

CHEMICAL & GEOLOGICAL LABORATORIES
OF TEXAS
1700 W. North Front
Midland, Texas

CORE ANALYSIS REPORT

Field Langlie-Mattix County Lea State New Mexico

Well No. 5 Thomas Location 990 FSL 1980 FEL Sec 24-24s-36e

Formation Lower Seven Rivers Depths 3426-3534

Operator Southern California Petroleum Corp. Date February 26, 1954

LAB. NO. 183

SAMPLE NO.	DEPTH FEET	EFFECTIVE POROSITY	PERMEABILITY MILLICARCIES	Residual Oil Saturation % PORE SPACE	Residual Oil Saturation BBLS./ ACRE FOOT	Water Saturation % PORE SPACE	Water Saturation BBLS./ ACRE FOOT
SS NF 82	3426-27	10.3	0.65	3.9	31	75.7	605
Dol NF 83	3444-45	7.4	0.01	8.1	47	44.6	256
Dol NF 84	3463-64	1.0	0.01	13.6	31	81.4	186
		$5\frac{1}{2}$" Cmt. @ 3472'					
SS NF 85	3483-84	16.0	7.1	18.1	225	45.6	566
Dol NF 86	3491-92	0.5	0.01	22.3	31	72.7	101
Dol NF 87	3501-02	10.0	0.12	21.0	163	17.0	132
SS NF 88	3508-09	18.3	17	9.3	132	51.4	729
SS NF 89	3509-10	21.5	78	8.4	140	42.3	706
SS NF 90	3522-23	16.6	1.2	11.4	147	51.2	659
SS NF 91	3530-31	23.6	36	8.9	163	57.2	1047
SS NF 92	3531.5-32.5	19.3	8.4	16.1	240	48.7	729
SF NF 93	3532.5-33.5	10.6	0.66	18.9	155	68.9	560
	Ave.	17.0	18.6	14.0		47.8	

Dol Dolomite
NF No Fractures
SS Sandstone