PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

P. O. BOX 661 · TULSA 2, OKLAHOMA

GYPSY DIVISION

March 30, 1948

New Mexico Conservation Commission
Santa Fe, New Mexico

Attention: Mr. R. R. Spurrier

Gentlemen:

Attached is a memorandum summarizing the dual completion of our West Grimes No. 4 located in the Bowers Pool. Since it was necessary to repair a casing leak and some mechanical difficulty was encountered with the special Baker packer, etc., the completion time extended from September 16, 1947, to January 23, 1948. For the sake of clarity, we have summarized the completion procedure. A diagrammatic sketch illustrating the mechanical installation used, a radioactivity log, three bottom-hole pressure charts and six recorder charts are also included herein.

We have attempted to comply with all of the conditions as set forth in your Order No. 731 effective July 16, 1947. The well was dually completed on January 23, 1948, in the Bowers oil sand (upper zone) and the Byers gas sand (lower zone). At the present time, the well is producing its top allowable of 44 barrels of oil per day from the Bowers sand through the annular space between the tubing and casing. Approximately 79,000 cu.ft. of gas per day from the Byers gas sand is being produced through the tubing.

The mechanical installation as illustrated on the sketch shows a Lane-Wells packer set at 3563'.

Results of the three-day segregation tests offer sufficient data to prove that a seal does exist between the two producing zones. Also, a production test of the Byers sand and a production and gas-oil ratio test of the Bowers sand were made during the segregation tests, which data show that production from the two zones is not being commingled in the well bore.

Yours very truly,

S. G. Sanderson
Manager of Production

WEB:JHR
Att.

DUAL COMPLETION OF GULF-WEST GRIMES NO. 4

Gulf Oil Corporation's West Grimes No. 4, located in the NE NE NW of Section 32-18S-38E, Lea County, New Mexico, was dually completed from the Bowers oil sand (upper zone) and the Byers gas sand (lower zone) on January 23, 1948. Prior to September 16, 1947, when the dual completion procedure was started, the well had been producing from only the Byers gas sand through perforations in the 7" OD casing from 3630-3700'. In the New Mexico Oil Conservation Commission's Order No. 731, it is required that the State be furnished with the following information:

1. A diagrammatic sketch of the mechanical installation used.

2. A radioactivity log showing the location and extent of each producing zone and perforations.

3. Data on production, gas-oil ratio, and bottom-hole pressure tests at time of completion.

4. Results of segregation tests conducted to determine that a seal exists between the two producing formations.

A brief summary of the procedure used in dually completing the well is submitted below:

Completion Procedure

1. Well was killed with oil and Dia-Log Casing Survey was run to determine general condition of the 7" OD casing.

2. A Lane-Wells radioactivity log was run from 2500-2864'.

3. Byers gas sand reperforated from 3604-17', 3628-33', 3646-53', and 3662-81' to expose all possible sand and to clean old perforations from 3630-3700'. See attached log.

4. Set Baker size 87, #415-B, continuous double-seal, double-slip production packer with tubing at 3589'. This special packer was used in an attempt to protect the Byers gas sand from mud used to kill the Bowers oil sand, since the formation pressure of the Byers was considerably lower than that of the Bowers.

5. Swabbed and flowed well through tubing to revive the Byers gas sand for test purposes. Casing remained full of oil indicating that the Baker packer was holding.

6. Ran BHP gauge and recorded static bottom-hole pressure of Byers gas sand at 3589'. See BHP Chart No. 1.

7. Killed well with oil through tubing, pulled tubing, leaving packer in place, and spotted mud, plastic and Calseal on top of the Baker packer to protect it from foreign matter.

8. Repaired leaks in 7" OD casing and satisfactorily tested casing at 2000 psi pressure for one-half hour.

9. Perforated Bowers sand section from 3147-65' with six holes per foot and 3186-95' with four holes per foot. See attached log.

10. D.S.T. with packer at 3123' and tool open 6-1/4 hours with 30-minute build-up. Well flowed 2.8 barrels of 39.5° API oil with 1,450 Mcf gas. Recovered 126' of oil, 50' slightly salty water and 5' of clean sand. Bottom-hole flowing pressure 400 to 900 psi with 1500 psi build-up.

11. Cleaned up casing, drilled out Calseal and plastic, and flowed Bowers pay through casing and tubing.

12. Ran BHP gauge and recorded static bottom-hole pressure of Bowers sand at 3550'. See BHP Chart No. 2.

13. Due to mechanical failure of Baker packer, set Lane-Wells circulating type BOC packer at 3563' with tubing. Swabbed and flowed tubing to revive Byers gas sand. Bowers zone being produced through annular space between tubing and casing.

Mechanical Installation

The mechanical installation which was actually used to effect a seal between both zones showing the packer, casing perforations, and the name and depth of each producing horizon is shown on the attached diagrammatic sketch. The well is equipped in such a manner that recording meters can be installed at the surface at any time to measure the gas, oil and/or oil and gas from each separate producing zone.

Production, GOR and BHP Tests

	Bowers Sand		Byers Sand
Date Taken	12-24-47	1-22-48	1-23-48
Oil - B/D	49	37.8	-
Water - B/D	0	0	-
Gas - Mcf/D	668.4	401.10	436.69
GOR - CF/B	13,641	10,620	-

The tests taken 1-22-48 and 1-23-48 were made during the segregation tests. The Bowers sand has produced its allowable of 44 bpd since the well was completed and the current production from the Byers sand is approximately 79 Mcf gas per day.

Static bottom-hole pressure determinations of the two producing formations are tabulated below:

	Bowers	Byers
Date	11-18-47	10-6-47
Depth of Gauge	3550'	3589'
Static BHP	1818 psi (BHP Chart No. 2)	720 psi (BHP Chart No. 1)

The Byers subsurface pressure was recorded before the Bowers sand was tested. The bottom-hole pressure of the Bowers sand was determined just prior to reviving the Byers gas sand.

Segregation Tests

Dual recorders were installed on the casinghead connections at the surface in order to measure the oil and gas produced. The segregation tests as conducted at the completion of the mechanical installation illustrated, prove that a seal does exist between the two producing zones. The procedure followed in making these segregation tests is as follows:

1-20-48 - Both tubing and casing shut-in and dual surface pressure recorder installed at 9:00 AM. Within approximately four hours, the tubing pressure had leveled off at 560 psi and within approximately three hours, the casing pressure had leveled off at 1025 psi to 1035 psi. See attached Dual Recorder Chart No. 1.

1-21-48 - Both zones shut-in until 3:30 PM, at which time the casing was opened to produce the Bowers zone. Shut-in casing pressure 1045 to 1050 psi, tubing pressure 550 to 570 psi. After opening the casing, the tubing pressure varied from 550 to 525 psi which was probably due entirely to a small surface leak in the testing equipment. The casing pressure dropped from a static pressure of 1050 psi to a flowing pressure of approximately 930 psi for a short period and then varied from 890 to 960 psi. See attached Dual Recorder Chart No. 2. Gas-oil ratio test started at 4:30 PM on Bowers zone (casing) with a 3/4" Orifice Well Tester Plate and a recording meter. See attached Chart No. 5.

1-22-48 - Tubing remained closed. Casing remained open until 4:30 PM, at which time it was closed. Shut-in tubing pressure varied from 525 to 550 psi. Flowing casing pressure varied from 890 to 935 psi. Casing pressure raised rapidly from 915 to 1025 psi after closing the casing. Shut-in casing pressure remained fairly constant at 1030 psi. See attached Chart No. 3. During gas-oil ratio test, Bowers sand produced 37.80 barrels of oil in twenty-four hours with 401.10 Mcf gas (3/4" plate w/28 psi). See attached Chart No. 5.

1-23-48 - Casing remained closed to completion of segregation test at a fairly uniform pressure of 1040 psi. At 9:00 AM, the tubing was opened with a very rapid decrease in pressure to approximately 25 psi. See attached Chart No. 4. After flowing the Byers gas sand (tubing) for approximately five hours, it produced gas at the rate of 436.69 Mcf per day (1" plate - 12.5 psi). See attached Chart No. 6.

Also attached is a bottom-hole pressure chart indicating the subsurface tubing pressure during the segregation tests. See BHP Chart No. 3.

WEB:JHR
March 30, 1948

Att. 11:
1 Radioactivity Log
3 BHP Charts
6 Recorder Charts
1 Diagrammatic Sketch

Phillips

STATEMENT OF PHILLIPS PETROLEUM COMPANY

ON

The Subject of Dual - Completions in New Mexico

Under ordinary competitive peace-time operations we believe the production of two oil reservoirs by means of a dual-completion is in general unwise and should be definitely discouraged in almost all future instances. There is little doubt but that in a vast majority of cases such practice will lead to smaller ultimate recovery of oil from at least one of the reservoirs involved. In addition we feel that added operating problems are numerous and dangerous and far out-weigh any savings that might be realized in the initial development costs. It is likewise perfectly obvious to us that producing oil through the annulus is inefficient and will certainly result in shortening the flowing life of wells.

We further believe that with proper well spacing it is entirely possible to economically develop each producing oil reservoir in a field on an individual well basis, thus mostly eliminating the need for dual-completions. There are some instances where extremely thin sand sections or lean reservoirs cannot be spaced in a manner to permit individual well development of each oil reservoir. Under such circumstances, if segregation of production is considered necessary, dual-completions might rightly be the solution to the problem.

When development is being carried on in conjunction with a plan of controlled pressure maintenance there are undoubtedly certain other instances where dual oil completions might be amply justified.

Dual oil-gas and dual gas-gas completions are not so susceptible to the many problems consistently found in the dual completion of oil-oil wells. We, therefore, feel that the range of application is considerably broader and should be looked upon with greater general favor. However, it is suggested that even in this type of dual-completion, each case should stand on its own merits.

In conclusion, we would like to urge the Commission to adopt a policy of holding hearings and carefully checking each individual well application for all types of dual-completions and that permits be issued only after suitable evidence has been received.

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

P. O. BOX 661 · TULSA 2, OKLAHOMA

GYPSY
DIVISION

April 25, 1947

Case #92
file

New Mexico Conservation Commission
Santa Fe, New Mexico

Attention: Mr. R. R. Spurrier

Gentlemen:

Attached is a sample order covering the proposed dual completion of the Gulf West Grimes No. 4 in the Hobbs Pool. It is believed that this sample order may be used as a guide in issuing additional future orders of this nature.

We have attempted to include in the order the conditions which must be satisfied before the dual completion is permitted as well as the data which will be needed to definitely prove that production from the two horizons is not being commingled in the well bore.

For your information we are attaching the various forms used by the operators in submitting data to the Texas Railroad Commission before and after the wells are dually completed. We can see no objection to the employment of forms of this nature but believe that development of the forms can be deferred until a later date. However, we do intend to submit all pertinent data to you upon completion of the well. Further, since other operators are interested in this experimental installation, it is planned to insert the following data in the Lea County Operators Committee engineering report:

1. Mechanical features of installation.
2. Pressure test of casing before perforating the Bowers.
3. Production, gas-oil ratio, and reservoir pressure tests of each zone at time of completion.
4. Any other data which may become pertinent.

Subsequent to the hearing in Santa Fe you inquired as to dual completions in Oklahoma. Since adoption of rules and regulations governing dual completions in Oklahoma approximately two years ago, in only one instance has there been any objection offered by offset operators to the applications and none have been denied. During this period approximately thirty applications have been approved.

Yours very truly,

S. G. Sanderson
Manager of Production

EH:MDW
Encls

NEW MEXICO
OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

Box 1545
Hobbs, New Mexico
March 29, 1947

Mr. Carl B. Livingston
Box 871
Santa Fe, New Mexico

file with case 92

Dear Carl,

Enclosed is clipping from the Hobbs Daily News Sun of Legal Notices as of March 27, 1947.

I was down at the News Sun this morning and they said they were mailing you a printers affidavit.

Very truly yours,

Roy

Oil & Gas Inspector

ROY:cg

GULF OIL CORPORATION

Case 9

LAW DEPARTMENT

TULSA 2, OKLAHOMA

December 20, 1946

RUSSELL G. LOWE
ASSOCIATE DIVISION ATTORNEY

ADDRESS ALL CORRESPONDENCE TO
P. O. BOX 661, LAW DEPARTMENT

Mr. Carl Livingston
Conservation Commission
State Capitol
Santa Fe, New Mexico.

Dear Carl:

Pursuant to telephone conversation, this will be your authority to insert in the caption and the application wherever necessary after the word "horizon" and before the word "through", the words "or pool".

This is in connection with Hobbs No. 92, Paddock No. 93 and General Order No. 94.

If the numbers I have given are not correct, this letter is in regard to the three applications of Gulf Oil Corporation for authority to produce through one or more horizons or pools.

Thanking you, and with kindest of personal regards, I am,

Yours very truly,

Russell G. Lowe

RGL:M
CC-Production Dept.

STATE OF NEW MEXICO
OFFICE OF STATE GEOLOGIST
SANTA FE, NEW MEXICO

March 26, 1947

Judge Russell G. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

IN RE: Cases 92,93 & 94 - Gulf Oil Corporation Petitions in connection with dual completions.

My dear Judge:

This is simply a precautionary notice to remind you that the hearing in the above captioned cases will be resumed, April 15th.

With kindest personal regards.

Cordially yours,

CARL B. LIVINGSTON
Administrator

CBL:bsp

cc: S. G. Sanderson
Manager of Production
Gulf Oil Corporation
Tulsa, Oklahoma

STATE OF NEW MEXICO
OFFICE OF STATE GEOLOGIST
SANTA FE, NEW MEXICO

March 26, 1947

Col. J. D. Atwood
c/o Atwood & Malone
Artesia, New Mexico

IN RE: Cases 92,93 & 94 - Gulf Oil Corporation Petitions in connection with dual completions.

My dear Colonel:

This is simply a precautionary notice to remind you that the hearing in the above captioned cases will be resumed, April 15th.

With kindest personal regards.

Cordially yours,

CARL B. LIVINGSTON
Administrator

CBL:bsp

COPY

HUMBLE OIL & REFINING COMPANY

POST OFFICE BOX 2180
HOUSTON 1, TEXAS

Cases 92-94 inc

Jan. 16, 1947

File 6-1
New Mexico
Dual Completions

Mr. R. R. Spurrier, State Geologist
Santa Fe, New Mexico

Dear Dick:

Attached please find a tabular analysis of the performance of Humble Company dual-completions as of April 1, 1946. This information will supplement Mr. Dewey's testimony at the hearing of January 10, and I ask that you allow it to be incorporated in the record.

Very truly yours,

W. E. Hubbard

WEH-AS
Attachment

'L CONSERVATION COMMISSIOI
SANTA FE, NEW MEXICO

COPY

December 20, 1946

The Artesia Advocate
Artesia, New Mexico

Gentlemen:

Re: Cases Nos. 90, 91 and 94 - Notice of Publication.

Please publish the enclosed notice once, immediately. Please proof-read the notice carefully and send a copy of the paper carrying such notice.

UPON COMPLETION OF THE PUBLICATION, PLEASE SEND PUBLISHER'S AFFIDAVIT.

For payment please submit statement in duplicate, accompanied by voucher executed in duplicate. The necessary blanks are enclosed.

Very truly yours,

Chief Clerk and Legal Adviser

CBL:mem
Encl

The Atlantic Refining Company does not believe that the Oil Conservation Commission of New Mexico should adopt any state-wide rule permitting the dual completion of wells in the State because conditions vary in the different fields.

Our experiences elsewhere with respect to dual completions have been varied in that in some instances we have met with considerable success while elsewhere the success of these operations is doubtful. It is for this reason that the Atlantic Refining Company does not favor the adoption of any state-wide rule with respect to dual completions.

The Atlantic Refining Company does, however, favor a policy with respect to dual completion whereby the dual completion of any well will be permitted by the Commission after the Commission shall have determined, at public hearing held after the issuance of notice to interested parties, that such dual completion is feasible as to such well.

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