

CASE 2843: Application of GULF OIL
CORP. for a special gas well test,
Eddy County, New Mexico.

2843

him, Transcript,

Exhib. Etc.

DRAFT

JMD/esr
June 28, 1963

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. 2843

Order No. R- 2510

APPLICATION OF GULF OIL CORPORATION
FOR A SPECIAL GAS WELL TEST, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 26, 1963, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this day of July, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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, Gulf Oil Corporation, seeks authority to produce and flare approximately 3000 MCF of gas per day for a period of not less than six nor more than nine days from its Hackberry Hills Unit Well No. 1, located in Unit O of Section 1, Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico, to determine if the gas reserves in place justify the expense of a pipeline to the nearest market outlet.

(3) That the proposed flaring of gas will constitute beneficial use of natural gas.

(4) That approval of the subject application will prevent waste ~~and protect correlative rights~~ by enabling the operator

(2) Same

(3) That since discovery of the pool by the Hackberry Hills Unit Well No. 1, the applicant drilled an exploratory well approximately one mile southeast of the subject well in an attempt to develop the reservoir, but said well resulted in a dry hole.

(4) That the royalty interest owner has consented to the applicant's proposal to flare gas *as set out above.*

(5) Same as 3

(6) Same as 4

to evaluate the reservoir ~~and determine the most efficient and economic method of achieving maximum ultimate recovery of gas from the reservoir.~~

IT IS THEREFORE ORDERED:

(1) That Gulf Oil Corporation is hereby authorized to produce and flare not more than 3000 MCF of gas per day for a period ^{not to exceed} of nine days from its Hackberry Hills Unit Well No. 1, located in Unit O of Section 1, Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico.

(2) That Gulf Oil Corporation shall notify the District Supervisor, Oil Conservation Commission, District No. 2, Artesia, New Mexico, in writing, of the exact time and date the gas well test authorized by this order will begin.

(3) 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.

2843

11 11

Gulf Oil Corporation

ROSWELL PRODUCTION DISTRICT

W. B. Hopton
DISTRICT MANAGER
M. I. Taylor
DISTRICT PRODUCTION
MANAGER
F. O. Mortlock
DISTRICT EXPLORATION
MANAGER
H. A. Rankin
DISTRICT SERVICES MANAGER

1963 MAY 21 AM 11:17
May 21, 1963

P. O. Drawer 1938
Roswell, New Mexico

Oil Conservation Commission
State of New Mexico
Post Office Box 871
Santa Fe, New Mexico

Re: Application of Gulf Oil Corporation for
Approval to Flare Gas from a Gas Well
During the Running of a Reservoir Limit
Test

Gentlemen:

Gulf Oil Corporation respectfully requests that an Examiner Hearing be set to consider the granting of approval to flare gas from the Hackberry Hills Unit Well No. 1 for the purpose of conducting a reservoir limit test.

In support of this application, the following facts are submitted:

- (1) The Hackberry Hills Unit Well No. 1, located 880 feet from the south line and 2130 feet from the east line of Section 1, Township 22 South, Range 25 East, Eddy County, New Mexico, is completed as a gas well in the Pennsylvanian formation, Undesignated Pool.
- (2) The only possibility at this time for sale of gas from the well is to lay a line to a market outlet near the city of Carlsbad, New Mexico, which will require considerable expense.
- (3) Applicant proposes to conduct a reservoir limit test to determine if the gas reserves in place justify the expense of the line.
- (4) Applicant proposes to flare approximately 3,000 MCF per day for a minimum period of six days and a maximum period of nine days while conducting the test.

It is requested that this matter be set for Examiner Hearing at an early date.

Respectfully submitted,

GULF OIL CORPORATION

M. I. Taylor
M. I. Taylor

JHH:sz

cc: New Mexico Oil Conservation Commission
Drawer DD
Artesia, New Mexico
Commissioner of Public Lands
State of New Mexico
Post Office Box 791
Santa Fe, New Mexico
United States Geological Survey
Post Office Box 1857
Roswell, New Mexico



DOCKET MAILED

6/14/63
[Signature]

Gulf Oil Corporation

ROSWELL PRODUCTION DISTRICT

W. B. Hopkins
DISTRICT MANAGER
M. I. Taylor
DISTRICT PRODUCTION
MANAGER
F. O. Mortlock
DISTRICT EXPLORATION
MANAGER
H. A. Rankin
DISTRICT SERVICES MANAGER

May 21, 1963

P. O. Drawer 1938
Roswell, New Mexico

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Post Office Box 871
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Gulf Oil Corporation

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May 21, 1963

P. O. Drawer 1938
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Oil Conservation Commission
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Post Office Box 871
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cc: New Mexico Oil Conservation Commission
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Artesia, New Mexico
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Post Office Box 791
Santa Fe, New Mexico
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Roswell, New Mexico



GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
E. B. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

July 2, 1963

Mr. Bill Kastler
Gulf Oil Corporation
Post Office Box 1938
Roswell, New Mexico

Re: Case No. 2842
Order No. R-2510
Applicant:
GULF OIL CORPORATION

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ix/

Carbon copy of order also sent to:

Hobbs OCC x

Antonia OCC x

Astec OCC

OTHER

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. 2843
Order No. R-2510

APPLICATION OF GULF OIL CORPORATION
FOR A SPECIAL GAS WELL TEST, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 26, 1963, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 2nd day of July, 1963, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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, Gulf Oil Corporation, seeks authority to produce and flare approximately 3000 MCF of gas per day for a period of not less than six nor more than nine days from its Hackberry Hills Unit Well No. 1, located in Unit O of Section 1, Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico, to determine if the gas reserves in place justify the expense of a pipeline to the nearest market outlet.

(3) That since discovery of the pool by the Hackberry Hills Unit Well No. 1, the applicant drilled an exploratory well approximately one mile southeast of the subject well in an attempt to develop the reservoir, but said well resulted in a dry hole.

(4) That the royalty interest owner has consented to the applicant's proposal to flare gas as set out above.

(5) That the proposed flaring of gas will constitute beneficial use of natural gas.

-2-

CASE No. 2843

Order No. R-2510

(6) That approval of the subject application will prevent waste by enabling the operator to evaluate the reservoir.

IT IS THEREFORE ORDERED:

(1) That Gulf Oil Corporation is hereby authorized to produce and flare not more than 3000 MCF of gas per day for a period not to exceed nine days from its Hackberry Hills Unit Well No. 1, located in Unit 0 of Section 1, Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico.

(2) That Gulf Oil Corporation shall notify the District Supervisor, Oil Conservation Commission, District No. 2, Artesia, New Mexico, in writing, of the exact time and date the gas well test authorized by this order will begin.

(3) 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

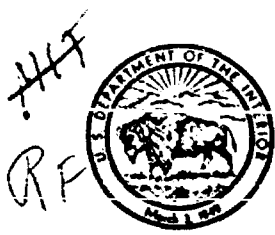


JACK M. CAMPBELL, Chairman


E. S. WALKER, Member


A. L. PORTER, JR., Member & Secretary

esr/

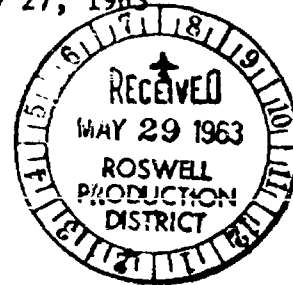


IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Drawer 1857
Roswell, New Mexico

May 27, 1963



Gulf Oil Corporation
P. O. Drawer 1938
Roswell, New Mexico

Attention: Mr. M. I. Taylor

Gentlemen:

By letter of May 17, you request to be advised as to any objection this office may have to the flaring of gas produced during a reservoir limit test to be conducted on Hackberry Hills unit well No. 1 to determine whether sufficient reserves are available to justify the cost of a pipe line to a sales outlet for the unit gas. You estimate the stabilized flow rate of the well during the test will be approximately 3,000 MCF of gas per day.

This office has no objection to the flaring of the gas produced from the Hackberry Hills unit well No. 1 during the proposed reservoir limit test.

Sincerely yours,

CARL C. TRAYWICK
Acting Oil and Gas Supervisor

Case No. 2843
Exhibit No. 4
June 26, 1963

PROPOSED
RESERVOIR LIMIT TEST
HACKBERRY HILLS UNIT NO. 1

Procedure For Test

1. With well shut-in measure tubing pressure by DWT.
2. Run Amerada bomb to bottom equipped with a 72-hour clock and allow to remain on bottom 15 minutes before opening well.
3. Open well to 16/64-inch choke and flow through a calibrated orifice meter leaving bomb on bottom. Based upon previous test data, this choke setting should permit a producing rate of approximately 3.0 MMCF/D. It is very important that the rate remain constant during the entire test. This will probably require occasionally adjusting the choke setting.
4. Measure by DWT the flowing tubing pressure - hourly if possible. This may be supplemented by installation of a pressure recorder.
5. At the end of the 72-hour flow period, pull bomb with well flowing; replace chart and rerun. Measure tubing pressure w/DWT before pulling and after rerunning bomb.
6. Continue flowing for a second 72-hour period, maintaining constant rate and periodically measuring tubing pressure w/DWT.
7. Evaluation of the first pressure chart will be made during the second 72-hour flow period to determine necessity of continuing the test.
8. At the end of the test, measure tubing pressure w/DWT and close well in for 72-hour buildup.
9. After 72-hour buildup, measure tubing pressure w/DWT and pull bomb.

375,000 cost of well
30,000 net
98,500 Gain
405,500 Gain + well

1.15 Profit to invest.

3,000 6
181,500
30,000 9
27,000

Case No. 2843
Exhibit No. 3
June 26, 1963

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Revised 12-1-55

Pool Wildcat Formation Penn County Eddy
 Initial X Annual _____ Special _____ Date of Test Aug. 14-15, 1961
 Company Gulf Oil Corporation Lease Hackberry Hills Unit Well No. 1
 Unit 0 Sec. 1 Twp. 22S Rge. 25 E Purchaser None
 *Casing 7 5/8 Wt. 26.40 I.D. 6.969 Set at 8373 Perf. 9622 To 9654
 Tubing 2 3/8 Wt. 4.70 I.D. 1.995 Set at 9622 Perf. _____ To _____
 Gas Pay: From 9622 To 9654 L 9622 xGMix .754 -GL 7255 Bar.Press. 13.2
 Producing Thru: Casing _____ Tubing X Type Well Single
 Date of Completion: Aug. 15, 1961 Packer 9599 Single-Bradenhead-G. G. or G.O. Dual
 Reservoir Temp. _____

*Liner 5 1/2 17.0# 8241-9723 OBSERVED DATA

Tested Through (~~800000~~) (~~000000~~) (Meter) Type Taps Flange

No.	Flow Data					Tubing Data		Casing Data		Duration of Flow Hr.
	(Pressure) (Line) Size	(Pressure) (Orifice) Size	Press. psig	Diff. h _w	Temp. °F.	Press. psig	Temp. °F.	Press. psig	Temp. °F.	
SI	Choke					2884				166.0
1.	10/64	2.00	520	4.0	68	2643				2.25
2.	13/64	2.00	560	12.5	88	2140				1.50
3.	16/64	2.00	585	23.0	72	2183				2.00
4.	20/64	2.00	620	37.0	76	1900				2.00
5.	17/64	2.00	568	21.0	75	2156				21.00

FLOW CALCULATIONS

No.	Coefficient (24-Hour)	$\sqrt{h_{wpf}}$	Pressure psia	Flow Temp. Factor F _t	Gravity Factor F _g	Compress. Factor F _{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	25.58	46.18	533.2	.9924	.9682	1.053	1195
2.	25.58	84.65	573.2	.9741	.9682	1.049	2142
3.	25.58	117.30	598.2	.9887	.9682	1.055	3030
4.	25.58	153.06	633.2	.9850	.9682	1.059	3954
5.	25.58	110.48	581.2	.9859	.9682	1.053	2841

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio 22,100 cf/bbl.
 Gravity of Liquid Hydrocarbons 61.5 deg.
 ρ_c 9.936 ($1-e^{-s}$) 0.393

Specific Gravity Separator Gas .640
 Specific Gravity Flowing Fluid .7332
 P_c 2897.2 P_c^2 8393.8

No.	P_w P_t (psia)	P_t^2	$F_c Q$	$(F_c Q)^2$	$(F_c Q)^2$ ($1-e^{-s}$)	P_w^2	$P_c^2 - P_w^2$	Cal. P_w	$\frac{P_w}{P_c}$
1.	2656.2	7055.4	11.87	140.9	55.4	7110.8	1283.0	2667	.92
2.	2153.2	6018.2	21.28	452.8	178.0	6196.2	2197.6	2189	.86
3.	2201.2	4845.3	30.11	906.6	356.3	5201.6	3192.2	2281	.79
4.	1913.2	3660.3	39.29	1543.7	606.7	4267.0	4126.8	2065	.71
5.	2169.2	4705.4	28.23	796.9	313.2	5018.6	3375.2	2240	.77

Absolute Potential: 6,800 MCFPD; n .960COMPANY Gulf Oil CorporationADDRESS Box 2167, Hobbs, New MexicoAGENT and TITLE H. L. Smith Independent Gas Tester, Box 763, Hobbs, New Mexico

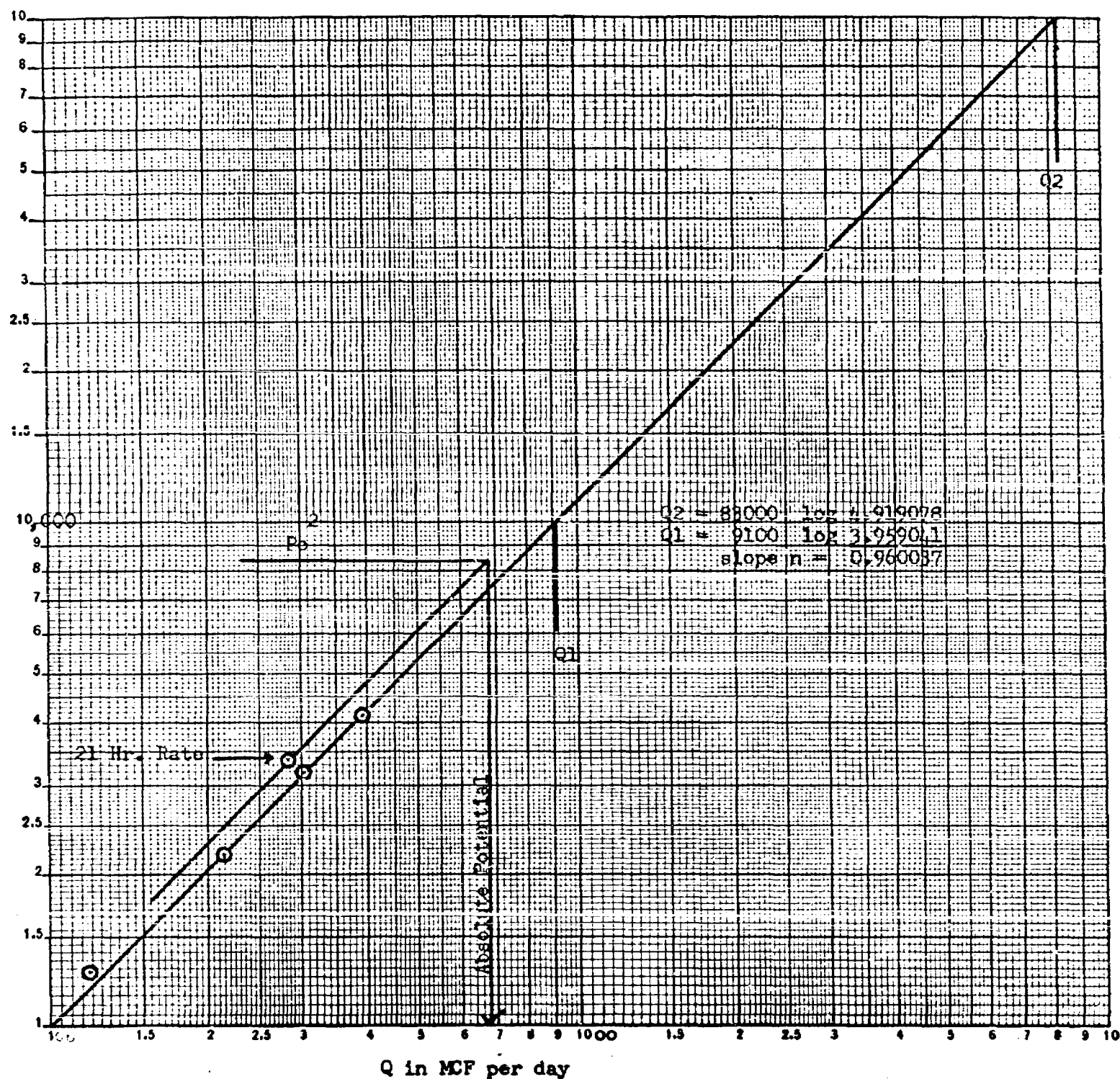
WITNESSED _____

COMPANY _____

REMARKS

Case No. 2843
 Exhibit No. 2
 June 26, 1963

Gulf Oil Corporation
 Hackberry Hills Unit No.1
 Unit 0 Sec.1 T22S R25E
 Eddy Co. N.M.
 August 14-15, 1961
 Absolute Potential 6800 MCF



BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 26, 1963

EXAMINER HEARING

IN THE MATTER OF:

Application of Gulf Oil Corporation for
a special gas well test, Eddy County,
New Mexico. Applicant, in the above-
styled cause, seeks authority to pro-
duce and flare approximately 3000 MCF
of gas per day for a period of not less
than 6 nor more than 9 days from its
Hackberry Hills Unit Well No. 1,
located in Unit O of Section 1, Township
22 South, Range 25 East, Eddy County,
New Mexico, to determine if the gas re-
serves in place justify the expense of
a pipeline to the nearest market outlet.

Case 2843

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will take up Case 2843.

MR. DURRETT: Application of Gulf Oil Corporation for
a special gas well test, Eddy County, New Mexico.

MR. KASTLER: Bill Kastler, appearing on behalf of
Gulf Oil Corporation, from Roswell. Our witness will be John H.
Hoover. Before commencing the case I would like to make a brief
statement by reading, if you please, a slight excerpt from the
statutory definition of waste.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

SANTA FE, N. M.
PHONE 983-3971

ALBUQUERQUE, N. M.
PHONE 243-6631



DEARNLEY-MEIER REPORTING SERVICE, Inc.

FAIRMINGTON, N. M.
PHONE 325-1192SANTA FE, N. M.
PHONE 983-3971ALBUQUERQUE, N. M.
PHONE 243-6191

This is 65-3-3, annotated, "As used in this act, the term 'waste', in addition to its ordinary meaning, shall include:" and I skip to subparagraph "'Surface Waste' as those words are generally understood in the oil and gas business, and in any event to embrace the unnecessary or excessive surface loss or destruction without beneficial use, however caused, of natural gas of any type or in any form of crude petroleum oil, or any product thereof, but including the loss or destruction, without beneficial use, resulting from evaporation, seepage, leakage or fire --" and so forth.

I wish to state that if the Commission, in granting the application which Gulf is seeking to flare gas for a period of between six and nine days, if the Commission finds that the gas is not being flared without beneficial use, but is being flared to serve a beneficial use, then the Commission is actively engaged in preventing waste. So I want to point this up and tell you that in my questions from Mr. Hoover I intend to exhibit such facts and conditions which will authorize the Commission to find that there is a beneficial use being served if this application should be granted.

May Mr. Hoover be sworn, please?

MR. DURRETT: Yes.

(Witness sworn.)



JOHN HOOVER

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

DIRECT EXAMINATION

BY MR. KASTLER:

Q Will you please state your name, your position and by whom you are employed?

A John Hoover, employed by Gulf Oil Corporation, District Production Engineer, Roswell, New Mexico.

Q Have you frequently appeared before the New Mexico Oil Conservation Commission and testified as a petroleum engineer?

A Yes, sir, I have.

MR. KASTLER: Are Mr. Hoover's qualifications acceptable?

MR. NUTTER: Yes, they are.

Q What is Gulf seeking in this application?

A We are seeking authority to produce and flare approximately three million cubic feet per day of gas from our Hackberry Hills Well No. 1 for a period of not less than six days, no more than nine days, to determine if the gas reserves in place justify the expense of a pipeline to the nearest market outlet.

Q Is this authority to flare gas needed as an exception to statewide Rule 404?

A Yes, sir, in my opinion it is. Rule 404, which is

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PHONE 243-6691



entitled "Natural Gas Utilization", reads in part that "After the completion of a natural gas well, no gas from such well shall be permitted to escape to the air."

(Whereupon, Applicant's Exhibit No. 1 was marked for identification.)

Q Will you please refer to Exhibit No. 1 and explain the case a little more fully?

A Yes, sir. Exhibit No. 1 is a plat of the Hackberry Hills Unit, and the unit is outlined by hashed marks. The Hackberry Hills Well No. 1 is colored in red and circled, and it is located 880 feet from the South line and 2130 feet from the East line of Section 1, Township 22 South, Range 25 East, Eddy County, New Mexico.

This well was completed August 15, 1961, within the interval of 9622 feet to 9654 feet in the Canyon formation of Pennsylvanian age. It has been shut-in since completion pending a market outlet. In our attempt to obtain a market outlet we received a proposal from a prospective purchaser that if the unit could develop a deliverability of 10 million cubic feet per day with reserves to support that deliverability, that they would provide a connection on the unit.

Well, this obviously called for additional wells. Therefore, in view of this prospective market, the Hackberry Hills

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PHONE 243-6691



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FARMINGTON, N. M.
PHONE 325-1182

SANTA FE, N. M.
PHONE 933-3971

ALBUQUERQUE, N. M.
PHONE 243-6691

Well No. 2 was spudded, and it is located in the Northeast Quarter of Section 7, Township 22 South, Range 26 East. This well was drilled to a total depth of 10,500 feet and it was completed dry, plugged and abandoned in February, 1963. This same prospective purchaser then offered to purchase the gas if the unit would lay a line to his gathering system.

We have an alternative of tying into his system on the center of Section 30 of 21 South, Range 27 East, that's just north of the town of Carlsbad or to the center of Section 5 in 22 South, 27 East, that is just to the east of the town of Carlsbad. The estimated cost to install a tank battery and a line to deliver gas to the center of Section 30 is estimated to cost \$98,500.

We have evaluated the economics of this thing and the Hackberry Hills Well No. 1, which was drilled to a total depth of 11,536 feet cost approximately \$375,000. Since the well was plugged back, \$68,000 was written off on the hole below the producing formation, which would leave a gross cost of approximately \$307,000. So, adding the cost of the line of \$98,500 to this gross cost, we come up with a gross investment of approximately \$405,500.

Evaluating this thing we find that if we can determine that there are only 320 acres of reserves which are being drained,



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PHONE 983-3971

ALBUQUERQUE, N. M.
PHONE 243-6631

the discounted cash flow rate of return after income tax will be approximately 7.4%. The profit to investment ratio, .15, which means that for a dollar spent you make fifteen cents. If we can determine that the well is draining 640 acres, the discounted cash flow rate of return jumps to 16.3%, the profit to investment ratio .88.

Based on these economic analyses, if only 320 acres of reserves are indicated, the economics are poor. On 640 acres the economics are acceptable, and anything over the 640 acres naturally improves the economics.

What I have shown on this Exhibit No. 1 is that we have a long line delay, we'll lay approximately eight miles of line at considerable expense, we have shown that an attempt to improve the productivity from the unit, we stepped out and drilled a well and got a dry hole, and what I will show in the next exhibits I hope will be the reason for this.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q What is shown on Exhibit No. 2?

A Exhibit No. 2 is merely a four point back pressure test that was taken on the Hackberry Hills Well No. 1, and I present it only to show that the well is capable of producing the three million a day, and I would like to call to the Examiner's



attention that the well produced 2841 MCF per day on a 21-hour stabilized flow rate with a tubing pressure of 2156 pounds; the absolute open potential was 6,800,000. The gas liquid hydrocarbon ratio on this test was 22,100 cubic feet per barrel. The well is capable of making the three million per day.

(Whereupon, Applicant's Exhibit No. 3 was marked for identification.)

Q Is Exhibit No. 3 a procedure for conducting the reservoir limit test that you are proposing, and will you please explain?

A Yes, it is. On this procedure, the first step will be with the well shut-in **measure**, the tubing pressure by dead weight tester. Two, we'll run an Amerada bomb to the bottom equipped with a 72-hour choke and allowed to remain on the bottom 15 minutes before opening the well. We will open the well to 16/64 inch choke and flow through a calibrated orifice meter, leaving the bomb on the bottom.

Based on previous test data, this choke setting should produce a producing rate of approximately three million cubic feet per day. It is important that the rate remain constant during the entire test. This will require occasionally **setting the choke** setting.

Step four, measure by dead weight tester the flowing tubing



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pressure hourly if possible. This may be supplemented by installation of a pressure recorder. At the end of the 72-hour flow period we will pull the bomb with the well flowing, replace the chart and rerun. We will measure the tubing pressure with a dead weight tester before pulling and removing bomb. Continue flowing for a second 72-hour period maintaining constant rate and periodically measure tubing pressure with dead weight test.

Evaluation of the first pressure chart will be made during the second 72-hour flow period to determine the necessity of continuing the test. At the end of the test measure tubing pressure with dead weight tester and close well in for 72-hour buildup. After the 72-hour buildup, measure tubing pressure with dead weight tester and pull bomb. This is our proposed procedure, and I might add that we will have facilities to separate and save the condensate produced and the condensate recovery will be sold.

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)

Q What is Gulf's Exhibit No. 4?

A Since the Hackberry Hills Well No. 1 is located on a federal lease, we advised the United States Geological Survey of our proposed test, and Exhibit No. 4 is a copy of their letter saying that they have no objection to flaring the gas.



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Q Have the other working interest owners in this well and unit approved the running of the test?

A Yes, sir. As of this date we have received 97.9% approval, which represents all approval except one, and this one party has not indicated that he objects, he just has not answered.

Q To sum up your testimony to this point, would you please state briefly what beneficial purpose would be served by flowing this gas?

A The primary purpose of conducting the test is to determine if the gas in this undesignated pool can be economically marketed at the present time. We also hope to determine whether further development is warranted.

Q You have plans of further development. **This is a** federal-type unit, and both federal and state lands are involved, and you are required as well as other things to submit twice a year a plan of further development, is that not correct?

A Yes, sir, that is correct.

Q And this would have some bearing on future development and plans?

A Yes, it would.

Q Do you have anything further to add in this case?

A Only one thing, we desire to start this test as soon as possible and we'd like to start it sometime during the first half



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of July. Since it's going to take considerable arrangements to set up the equipment to run this test, we're going to have to haul in test tanks and separators, and so forth, we'd like an indication from the Commission as soon as possible if our proposal is acceptable so we can at least proceed with the preliminary arrangements.

Q Will Gulf furnish any test data requested by the Commission?

A Yes, we would.

MR. KASTLER: This concludes the questions we have on direct examination. I would like to ask one more question to get the exhibits entered.

Q Were Exhibits 1 and 3 prepared by you or at your direction and under your supervision?

A Yes, they were.

Q Is Exhibit No. 2 a true reproduction of a back pressure test filed with the Oil Commission?

A Yes, it is.

Q Covering the Hackberry No. 1 well?

A Yes, sir.

Q And is Exhibit No. 4 a true reproduction of a letter received by Gulf from the United States Geological Survey dated May 27, 1963?



A Yes, it is.

MR. KASTLER: I would like at this time to move for the introduction of Exhibits 1, 2, 3 and 4.

MR. NUTTER: Gulf's Exhibits 1 through 4 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1, 2, 3 and 4 were offered and admitted in evidence.)

MR. NUTTER: Are you through with your witness, Mr. Kastler?

MR. KASTLER: I'm through.

MR. NUTTER: Does anyone have any questions of Mr. Hoover?

CROSS EXAMINATION

BY MR. NUTTER:

Q What will be the Item 7 on your procedure Exhibit 3, Item 7 is the evaluation of the first pressure chart will be made during the second 72-hour flow period to determine the necessity of continuing the test. Just what will you be looking for there?

A We'll be looking for a drawdown, ~~in~~ a constant drawdown. In other words, it's going to kind of determine past experience on running these things if we're getting a proper drawdown to show up on our calculation. Now, the test itself, I would like to just

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read a couple of sentences which kind of explains what this thing does. The actual calculation of the in place hydrocarbons is made with a logarithmic plot of change of reservoir pressure per reservoir volume of hydrocarbons produced from the pressure drop. When this rate of change of bottom hole pressure becomes constant, the limits of a closed reservoir have been reached and a steady **rate of** flow is occurring in the reservoir. With a constant rate of change in bottom hole pressure and a knowledge of the coefficient of the expanse of the reservoir fluid, the volume of hydrocarbons connected to the well can be estimated by formula.

Q So, unless you have a stabilization during the first 72 hours, you'll have to continue the test, won't you?

A That's right.

Q You might have had the stabilization during the second 72 hours, but you wouldn't have been able to evaluate it at the conclusion of the sixth day?

A We think that the three million a day is going to give us enough drop to show up, but what we will probably be looking for in that first 72 hours, if we get a big drawdown, we may stop her right then.

Q Whether it's stabilized or not?

A Yes, sir. In other words, it might indicate whether



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to go on or not. What we're looking for is to go on, and if it's, it's going to take a little reasoning, we're going to have to kind of feel our way on this thing.

Q The thing I want to establish, at the conclusion of the 72-hour, the second 72-hour period, you won't be able to evaluate that test in time to determine whether you want a six-day or nine-day test?

A No, sir.

Q It has to be based on the first three days?

A Yes, sir, we hope it's sufficient.

Q It will be either sufficient or insufficient?

A Yes, sir.

MR. KASTLER: In connection with that, isn't it true that you would need the order written in such a manner that you could use the nine-day period in the event that the stabilization has not occurred?

MR. NUTTER: Well, actually what you are seeking here is a nine-day authority, is it not?

MR. KASTLER: Yes.

A Yes, that's true.

Q (By Mr. Nutter) Now, I note on the reply to your letter to the United States Geological Survey that he authorizes the test at a rate of 3,000 MCF of gas per day, but he doesn't



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say anything about the length of the test. Did you advise them as to length of time you were going to be running this test?

A Yes, we did.

Q Do you have your letter to him of May 17?

A I'm sure I do, Mr. Nutter. No, I apparently do not have it. However, their letter is dated May 27, 1963, and they were furnished a copy of our application for this hearing on May the 21st, so I'm sure that they were notified in our letter of our proposal; however, I do not have the letter. They were on notice of the hearing prior to them giving approval of this to flare the three million per day.

Q Well, your application of May 21 certainly does show a copy going to the United States Geological Survey.

A Yes, it did.

Q I wonder if you could make a photostatic copy of it and submit it to the Commission after you get home?

A Yes, I certainly will. I want to check one more place right here. I have a letter, a copy of the letter in our well file here, and I will send it to you, but this was dated May 17, 1963, and we did not state in the letter of the actual time, but in the letter we explained the length of the line, the cost, and I would like to read the second paragraph, "In order to complete the evaluation study, this proposal, Gulf recommends



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that a reservoir limit test be made in this well to determine if sufficient reserves are present to justify the cost of laying a pipeline to the potential sales outlet. Attached is a copy of the proposed procedure to be used in making this test. A copy of all data will be furnished to you upon completion of the test," and our Exhibit No. 3 was the proposed test furnished to the United States Geological Survey as well as to our working interest owners.

Q And this contemplates a test of up to nine days?

A Yes, sir, it does.

Q We won't need a copy of the letter. Does anyone else have any questions of Mr. Hoover? He may be excused.

(Witness excused.)

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

MR. KASTLER: No.

MR. NUTTER: Does anyone have anything further to offer in Case 2843? If not, 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 at 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 8th day of July, 1963.

Ada Dearnley
 Notary Public-Court Reporter

My commission expires:
 June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2843, heard by me on 6/26, 1963.
Examiner
 New Mexico Oil Conservation Commission

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