

El Paso Natural Gas Company

El Paso, Texas

July 2, 1957

DIRECT REPLY TO:
P. O. BOX 997
FARMINGTON, NEW MEXICO



Mr. A. L. Porter
Secretary and Director
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Sir:

This is a request for administrative approval for a well dually completed in the Blanco Mesa Verde Pool and the Wildcat Pictured Cliffs Pool. The El Paso Natural Gas Company San Juan 28-7 Unit No. 72 (PM) is located 1650 feet from the South line and 1090 feet from the West line of Section 35, Township 28 North, Range 7 West, N.M.P.M., Rio Arriba County, New Mexico.

This well has been completed in the Point Lookout and Cliff House sections of the Mesa Verde formation and in the Pictured Cliffs formation. Completion has been accomplished in the following manner:

1. 10-3/4" surface casing set at 171' with 250 sacks of cement circulated to the surface.
2. 7-5/8" intermediate casing set at 2919' and cemented with 250 sacks of cement. Top of cement by temperature survey was 1600' which is above the top of the Pictured Cliffs at 2706'.
3. 5-1/2" liner set from 2904' to 5117' with 250 sacks of cement. The top of the liner was squeezed with 200 sacks of cement.
4. The casing and liner were tested for leaks before perforating.
5. The Point Lookout section was perforated in four intervals and fractured with water and sand.
6. The Cliff House section was perforated in four intervals and fractured with water and sand.
7. The Pictured Cliffs formation was perforated in one interval and fractured with water and sand.
8. All perforations were cleaned out after treatment and completion was accomplished by setting a Baker Model EGJ production packer on 2" EUE tubing at 2957' with the tubing perforations set opposite the Point Lookout perforation. 1-1/4" Grade "B" line pipe was landed, with the tubing perforations set opposite the Pictured Cliffs perforations, as a siphon string. The Mesa Verde gas will be produced through the 2" tubing and the Pictured Cliffs gas through the casing.

COPY

9. A Garrett circulating sleeve was installed in the 2" tubing string just below the Pictured Cliffs perforations. This will enable bottom hole pressure tests to be taken in the future if it be so required.
10. Initial potential tests have been run and commercial production has been found in both formations. A packer leakage test has been run and witnessed by the Aztec office of the Oil Conservation Commission. This test shows no communication in the well bore between the two producing formations.

Administrative approval is requested for this dual completion to allow production from both known producing formations, thus eliminating the high initial cost of drilling two separate wells.

Since El Paso Natural Gas Company is the sole operator of the San Juan 28-7 Unit the approval of any other operators has not been sought. Enclosed are:

- (a) Two copies of the schematic diagram of the mechanical installations.
- (b) Two copies of the affidavit from the packer setting company stating that the packer used was set at the depth shown.
- (c) Two copies of the packer leakage test as observed by a member of the Oil Conservation Commission.
- (d) Two copies of the initial potential test showing commercial production from the two formations.

It is intended to dedicate the W/2 of Section 35, Township 28 North, Range 7 West to the Mesa Verde formation and the SW/4 of Section 35, Township 28 North, Range 7 West to the Pictured Cliffs formation.

Any further information required will be furnished upon your request. Thank you for your consideration of the matter.

Yours truly,

ORIGINAL SIGNED E. J. COEL

E. J. Coel
Senior Petroleum Engineer

EJC/gks

Encl.

cc: Emery Arnold
R. L. Hamblin
Phil McGrath

1. The first step is to identify the problem. This involves understanding the situation and the goals that need to be achieved.

2. The second step is to analyze the problem. This involves breaking down the problem into smaller, more manageable parts.

3. The third step is to develop a plan. This involves determining the steps that need to be taken to solve the problem.

4. The fourth step is to implement the plan. This involves carrying out the steps that have been developed.

5. The fifth step is to evaluate the results. This involves checking to see if the problem has been solved and if the goals have been achieved.

Figure 1. The effect of the concentration of the Ca^{2+} solution on the Ca^{2+} concentration in the Ca^{2+} solution. The concentration of the Ca^{2+} solution was 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9, 11.0, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 12.0, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 13.0, 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9, 14.0, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 15.0, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8, 15.9, 16.0, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 17.0, 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 18.0, 18.1, 18.2, 18.3, 18.4, 18.5, 18.6, 18.7, 18.8, 18.9, 19.0, 19.1, 19.2, 19.3, 19.4, 19.5, 19.6, 19.7, 19.8, 19.9, 20.0, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9, 21.0, 21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7, 21.8, 21.9, 22.0, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 22.9, 23.0, 23.1, 23.2, 23.3, 23.4, 23.5, 23.6, 23.7, 23.8, 23.9, 24.0, 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.9, 25.0, 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 25.9, 26.0, 26.1, 26.2, 26.3, 26.4, 26.5, 26.6, 26.7, 26.8, 26.9, 27.0, 27.1, 27.2, 27.3, 27.4, 27.5, 27.6, 27.7, 27.8, 27.9, 28.0, 28.1, 28.2, 28.3, 28.4, 28.5, 28.6, 28.7, 28.8, 28.9, 29.0, 29.1, 29.2, 29.3, 29.4, 29.5, 29.6, 29.7, 29.8, 29.9, 30.0, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 30.8, 30.9, 31.0, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6, 31.7, 31.8, 31.9, 32.0, 32.1, 32.2, 32.3, 32.4, 32.5, 32.6, 32.7, 32.8, 32.9, 33.0, 33.1, 33.2, 33.3, 33.4, 33.5, 33.6, 33.7, 33.8, 33.9, 34.0, 34.1, 34.2, 34.3, 34.4, 34.5, 34.6, 34.7, 34.8, 34.9, 35.0, 35.1, 35.2, 35.3, 35.4, 35.5, 35.6, 35.7, 35.8, 35.9, 36.0, 36.1, 36.2, 36.3, 36.4, 36.5, 36.6, 36.7, 36.8, 36.9, 37.0, 37.1, 37.2, 37.3, 37.4, 37.5, 37.6, 37.7, 37.8, 37.9, 38.0, 38.1, 38.2, 38.3, 38.4, 38.5, 38.6, 38.7, 38.8, 38.9, 39.0, 39.1, 39.2, 39.3, 39.4, 39.5, 39.6, 39.7, 39.8, 39.9, 40.0, 40.1, 40.2, 40.3, 40.4, 40.5, 40.6, 40.7, 40.8, 40.9, 41.0, 41.1, 41.2, 41.3, 41.4, 41.5, 41.6, 41.7, 41.8, 41.9, 42.0, 42.1, 42.2, 42.3, 42.4, 42.5, 42.6, 42.7, 42.8, 42.9, 43.0, 43.1, 43.2, 43.3, 43.4, 43.5, 43.6, 43.7, 43.8, 43.9, 44.0, 44.1, 44.2, 44.3, 44.4, 44.5, 44.6, 44.7, 44.8, 44.9, 45.0, 45.1, 45.2, 45.3, 45.4, 45.5, 45.6, 45.7, 45.8, 45.9, 46.0, 46.1, 46.2, 46.3, 46.4, 46.5, 46.6, 46.7, 46.8, 46.9, 47.0, 47.1, 47.2, 47.3, 47.4, 47.5, 47.6, 47.7, 47.8, 47.9, 48.0, 48.1, 48.2, 48.3, 48.4, 48.5, 48.6, 48.7, 48.8, 48.9, 49.0, 49.1, 49.2, 49.3, 49.4, 49.5, 49.6, 49.7, 49.8, 49.9, 50.0, 50.1, 50.2, 50.3, 50.4, 50.5, 50.6, 50.7, 50.8, 50.9, 51.0, 51.1, 51.2, 51.3, 51.4, 51.5, 51.6, 51.7, 51.8, 51.9, 52.0, 52.1, 52.2, 52.3, 52.4, 52.5, 52.6, 52.7, 52.8, 52.9, 53.0, 53.1, 53.2, 53.3, 53.4, 53.5, 53.6, 53.7, 53.8, 53.9, 54.0, 54.1, 54.2, 54.3, 54.4, 54.5, 54.6, 54.7, 54.8, 54.9, 55.0, 55.1, 55.2, 55.3, 55.4, 55.5, 55.6, 55.7, 55.8, 55.9, 56.0, 56.1, 56.2, 56.3, 56.4, 56.5, 56.6, 56.7, 56.8, 56.9, 57.0, 57.1, 57.2, 57.3, 57.4, 57.5, 57.6, 57.7, 57.8, 57.9, 58.0, 58.1, 58.2, 58.3, 58.4, 58.5, 58.6, 58.7, 58.8, 58.9, 59.0, 59.1, 59.2, 59.3, 59.4, 59.5, 59.6, 59.7, 59.8, 59.9, 60.0, 60.1, 60.2, 60.3, 60.4, 60.5, 60.6, 60.7, 60.8, 60.9, 61.0, 61.1, 61.2, 61.3, 61.4, 61.5, 61.6, 61.7, 61.8, 61.9, 62.0, 62.1, 62.2, 62.3, 62.4, 62.5, 62.6, 62.7, 62.8, 62.9, 63.0, 63.1, 63.2, 63.3, 63.4, 63.5, 63.6, 63.7, 63.8, 63.9, 64.0, 64.1, 64.2, 64.3, 64.4, 64.5, 64.6, 64.7, 64.8, 64.9, 65.0, 65.1, 65.2, 65.3, 65.4, 65.5, 65.6, 65.7, 65.8, 65.9, 66.0, 66.1, 66.2, 66.3, 66.4, 66.5, 66.6, 66.7, 66.8, 66.9, 67.0, 67.1, 67.2, 67.3, 67.4, 67.5, 67.6, 67.7, 67.8, 67.9, 68.0, 68.1, 68.2, 68.3, 68.4, 68.5, 68.6,

ORIGINAL SIGNED 1-1-68

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EL PASO NATURAL GAS COMPANY

P. O. Box 997
Farmington, N.M.

June 3, 1957

Mr. E. C. Arnold
Oil Conservation Commission
120 East Chaco
Aztec, New Mexico

Re: Packer Leakage Test on the El Paso Natural
Gas Company Well, San Juan 28-7 Unit No. 72,
Rio Arriba County, New Mexico.

Dear Mr. Arnold:

This well was dually completed in the Pictured Cliffs and Mesa Verde formations. A production packer was set at 2946 feet. The Pictured Cliffs zone was tested on May 24, 1957 and the following information was obtained:

SIPC and SIPT (Pictured Cliffs) - 1071 psig- shut-in 24 days.
SIPT (Mesa Verde) - 1106 psig

The three hour open flow test through a 3/4" choke was started at 10:25 A.M.

<u>Time</u>	<u>Casing Choke Pressure Psig</u>	<u>Tubing Pressure (Mesa Verde) Psig</u>	<u>Temp. °F</u>
10:25	Opened Casing	1106	
10:40	490	1106	
10:55	304	1106	
11:10	220	1106	
11:25	176	1107	
12:25	105	1108	
1:25	82	1109	62

The calculated choke volume was 1131 MCF/D and the A.O.F. was 1139 MCF/D.

On May 31, 1957 the Mesa Verde zone was tested and the following information was obtained:

SIPC (Pictured Cliffs) 1048 psig
SIPT (Mesa Verde) - 1113 psig: shut-in 7 days.

The three hour open flow test period through a 3/4" choke was started at 11:26 A.M.

<u>Time</u>	<u>Tubing Choke Press. (MV) Psig</u>	<u>Casing Pressure (P.C.) Psig</u>	<u>Temp. °F</u>
11:26	Opened tubing		
11:41	530	1053	
11:56	468	1054	
12:11	435	1055	
12:26	414	1054	
1:26	376	1052	
2:26	353	1049	75

The calculated choke volume was 4307 MCF/D and the A.O.F. was 6191 MCF/D.

Very truly yours,

R. A. Ullrich

R. A. Ullrich

Gas Engineer

RAU/jla

cc- W. T. Hollis
W. M. Rodgers
E. J. Coel, Jr. (6)
File

EL PASO NATURAL GAS COMPANY
GAS WELL TESTTo: Mr. E. E. Alsup
From: Gas Engineering DepartmentDate: May 31, 1957
Place: Farmington, New MexicoDUAL COMPLETIONSubject: Test data on the El Paso Natural Gas Company Well,
SAN JUAN 28-7 UNIT NO. 72, Rio Arriba County, N.M.

Tested By: R. A. Ullrich

Location Sec. 35 T. 28 R. 7 , 1650'S, 1090'W

Shut-In Pressure P.C. SIPC 1048 psig ; (Shut-in 7 days)
M.V. SIPT 1113 psig0.750" Choke Volume 4307 MCF/D @ 14.7 psia and 60° F. for 0.6
gravity gas. Flow through for 3 hours.

Calculated 3 Hour Absolute Open Flow 6191 MCF/D

Working Pressure On Calculated = 685 Psig

Producing Formation Mesa Verde

Stimulation Method Sand Water Frac

Total Depth 5120 c/o 5050. Packer at 2946

Field Blanco

H₂S Sweet to lead acetate.

Final SIPC (Pictured Cliffs) - 1049 psig

cc: D. H. Tucker

~~W. T. Hollis~~

W. T. Hollis

~~W. M. Rodgers~~

W. M. Rodgers

~~W. J. Kennedy~~

Drilling Department

B. D. Adams

Roland Hamblin

Jack Purvis

~~W. J. Kennedy~~

C. C. Kennedy

E. J. Coel, Jr. (6)

A. J. Dudenhoeffer

File

H. H. Lines

Bill Parrish

Dean Rittmann

Lewis D. Galloway
L. D. Galloway

Well blew a heavy spray of distillate during entire test period.

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. E. E. Alsup

Date: May 24, 1957

From: Gas Engineering Department

Place: Farmington, New Mexico

DUAL COMPLETIONSubject: Test data on the El Paso Natural Gas Company Well,
SAN JUAN 28-7 UNIT NO. 72, Rio Arriba County, N.M.

Tested By: R. A. Ullrich

Location Sec. 35 T. 28 R. 7 1650'S, 1090'W

Shut-In Pressure	P.C. SIPC 1071 psig	
	P.C. SIPT 1071 psig	(Shut-in 24 days)
	M.V. SIPT 1106 psig	

0.750" Choke Volume	1131 MCF/D @ 14.7 psia and 60° F. for 0.6
	gravity gas. Flow through casing for 3 hours.

Calculated 3 Hour Absolute Open Flow	1139 MCF/D
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Working Pressure On tubing	84 Psig
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Producing Formation	Pictured Cliffs
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Stimulation Method	Sand Water Frac.
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Total Depth	5120 - c/o 5050. Packer at 2946
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Field	Wildcat
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H ₂ S	Sweet to lead acetate.
------------------------	------------------------

cc: D. H. Tucker

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W. T. Hollis

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W. M. Rodgers

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Drilling Department

B. D. Adams

Roland Hamblin

Jack Purvis

~~*****~~

C. C. Kennedy

E. J. Coel, Jr. (6)

A. J. Dudenhoeffer

File

H. H. Lines

Bill Parrish

Dean Rittmann

Lewis D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATADUAL COMPLETIONDATE May 31, 1957

Operator El Paso Natural Gas Company		Lease San Juan 28-7 Unit No. 72	
Location 1650'S, 1090'W, Sec. 35-28-7		County Rio Arriba	State New Mexico
Formation Mesa Verde		Pool Blanco	
Casing Diameter 7 5/8	Set At: Feet 2909	Tubing Diameter 2"	Set At: Feet 4856
Pay Zone: From 4408	To 5034	Total Depth: 5120 - c/o 5050. Packer at 2946	
Stimulation Method Sand Water Frac.		Flow Through Casing X	

Choke Size, Inches 0.75	Choke Constant: C 12.365		5 1/2" liner - 2904 to 5117	
Shut-In Pressure, Casing, PSIG P.C. 1048	12 - PSIA 1060	Days Shut-In 7	Shut-In Pressure, Tubing, PSIG 1113	12 - PSIA 1125
Flowing Pressure, P 353	12 - PSIA 365		Working Pressure: Pw Calculated	12 - PSIA 697
Temperature: T 75	F .75		Fpv (From Tables) 1.038	Gravity .690

Final SIPC (Pictured Cliffs) - 1049 psig


CHOKE VOLUME: $Q = C \times P_c \times F_c \times F_g \times F_{pv}$
 $Q = 12.365 \times 365 \times .9859 \times .9325 \times 1.038 = 4307 \text{ MCF/D}$

$$\text{OPEN FLOW } Aof = Q \left(\frac{P_c^2 - P_w^2}{P_c^2 - P_w^2} \right)^n$$

$$Aof = \left(\frac{1,265,625}{779,816} \right)^{.75} \times 4307 = 1.4375 \times 4307$$

Aof 6191 MCF/D

Well blew heavy spray of distillate during entire test period.

TESTED BY R. A. UllrichWITNESSED BY
cc: E. J. Coel, Jr. (6)

L. D. Galloway

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATADUAL COMPLETIONDATE May 24, 1957

Operator El Paso Natural Gas Company		Lease San Juan 28-7 Unit No. 72	
Location 1650'S, 1090'W, Sec. 35-28-7		County Rio Arriba	State New Mexico
Formation Pictured Cliffs		Pool Wildcat	
Casing: Diameter 7 5/8	Set At: Feet 2909	Tubing: Diameter 1 1/4	Set At: Feet 2725
Pay Zone: From 2704	To 2736	Total Depth 5120 /c/o/ - 5050. Packer at 2946	
Stimulation Method Sand Water Frac.		Flow Through Casing X	Flow Through Tubing

Choke Size, Inches 0.75		Choke Constant: C 12.365	
Shut-In Pressure, Casing, PSIG 1071	- 12 = PSIA 1083	Days Shut-In 24	Shut-In Pressure, Tubing, PSIG 1071
Flowing Pressure: P, PSIG 82	- 12 = PSIA 94	Working Pressure: P _w , PSIG 84	- 12 = PSIA 96
Temperature: T, F 62	F 85	F _{pv} (From Tables) 1.007	Gravity .640

SIPT (MV) - 1106 psig; Final SIPT (MV) - 1109 psig

CHOKE VOLUME = $Q = C \times P_1 \times F_1 \times F_g \times F_{pv}$

$$Q = 12.365 \times 94 \times .9981 \times .9682 \times 1.007$$

1131

MCF/D

$$\text{OPEN FLOW } A_{of} = Q \left(\frac{P_c^2}{P_c^2 - P_w^2} \right)^n$$

$$A_{of} = \left(\frac{1,172,889}{1,163,673} \right)^n \cdot 1.0079^{.85} \times 1131 = 1.0067 \times 1131$$

A_{of} 1139 MCF/DTESTED BY R. A. Ullrich

WITNESSED BY

cc: E. J. Coel, Jr. (6)

L. D. Galloway
L. D. Galloway

STATE OF NEW MEXICO

COUNTY OF SAN JUAN

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I, Mack M. Mahaffey, being first duly sworn upon my oath
depose and say as follows:

I am an employee of Baker Oil Tools, Inc., and that on
April 30, 1957, I was called to the location of the El Paso
Natural Gas Company San Juan 28-7 Unit No. 72 (PM) Well located
in the NW/4 SW/4 of Section 35, Township 28 North, Range 7 West,
N.M.P.M. for the purpose of installing a production packer.
Under my direct supervision a Baker Model "EGJ" production
packer was set at 2957 feet. The production packer was
properly set in accordance with the usual practices and customs
of the industry.


Mack M. Mahaffey

SCHEMATIC DIAGRAM OF DUAL COMPLETION
 EPNG SAN JUAN 28-7 UNIT NO. 72 (PM)
 (SW 35-28-7)

Measurement reference point is
 10' above top of tubing hanger

