

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

Dual Completion

DATE July 17, 1958

Operator El Paso Natural Gas		Lease Bolack 13-C (P)	
Well No. 960S, 800W; 29-27-8		County San Juan	State New Mexico
Field Pictured Cliffs		Pool South Blanco	
Casing Diameter 7-5/8	Set At Feet 4417	Tubing Diameter 1-1/4	Set At Feet 2413
Perforation Depth 2378	Perforation Length 2420	Enter Depth 4830 x/o 4780	Shut-in 6/28/58 Flow Through Tubing
Completion Method Sand Water Frac.		X	

Shut-in Pressure (PSIA) .75	Flowing Pressure (PSIA) 12.365	Shut-in Pressure (PSIG) (PC) 677	Flowing Pressure (PSIG) 689
Flowing Pressure (PSIA) 80	Flowing Pressure (PSIA) 92	Flowing Pressure (PSIG) 82	Flowing Pressure (PSIG) 94
Temperature 66	Temperature .85	Temperature 1.007	Temperature .646

Initial (MV) SIPT = 1105 psig
Final (MV) SIPT = 1105 psig

Packer at 4441

CHOKE VOLUME $Q = C \times P_1 \times F_1 \times F_2 \times F_3$

$C = 12.365 \times 92 \times .9943 \times .9645 \times 1.007$

1100

MCF/D

OPEN FLOW $Q = C \times P_1 \times F_1 \times F_2 \times F_3$

Act

474721
465885

$1.0189^{.85} \times 1100 = 1.0160 \times 1100$

Act

1118

MCF/D

Frank Clark

Checked By Tom Grant

Lewis D. Galloway
L. D. Galloway



EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

DUAL COMPLETION

DATE May 15, 1958

Operator El Paso Natural Gas		Lease Bolack No. 13-C (M)	
Location 960S, 800W; 29-27-8		County San Juan	State New Mexico
Formation Mesa Verde		Pool Blanco	
Casing: Diameter 7-5/8"	Set At: Feet 4417	Tubing: Diameter 2"	Set At: Feet 4751
Pay Zone: From 4630	To 4740	Total Depth: 4830	Shut-in 5-1/58
Stimulation Method Sand Water Frac		Flow Through Casing	Flow Through Tubing X

Choke Size, Inches .75		Choke Constant: C 12.365		5-1/2" liner 4374 - 4825	
Shut-In Pressure, Casing, PSIG (PC) 669	- 12 = PSIA 681	Days Shut-In 14	Shut-In Pressure, Tubing PSIG (MV) 1088	- 12 = PSIA 1100	
Flowing Pressure: P PSIG 153	- 12 = PSIA	165	Working Pressure: P _w PSIG (Calc) 310	- 12 = PSIA	
Temperature: T °F 66	n =	.75	Fpv (From Tables) 1.019	Gravity .73	

Initial SIPC (PC) 669 psig

Packer at 4441', 1-1/4 at 2413

Final SIPC (PC) 669 psig

CHOKE VOLUME = $Q = C \times P_c \times F_c \times F_g \times F_{pv}$

$$Q = 12.365 (165) (.9943) (.9066) (1.019) = 1,874 \text{ MCF/D}$$

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

$$Aof = \left(\frac{1,210,000}{1,113,900} \right)^n = (1.0862)^{.75} (1,874) = (1.0640) (1,874)$$

$$Aof = 1,994 \text{ MCF/D}$$

TESTED BY Robert R. Davis

WITNESSED BY _____



Lewis D. Galloway
L. D. Galloway

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

(Form C-104)
Revised 7/1/57

REQUEST FOR (OIL) - (GAS) ALLOWABLE

New Well
~~Recompletion~~

This form shall be submitted by the operator before an initial allowable will be assigned to any completed Oil or Gas well. Form C-104 is to be submitted in QUADRUPLICATE to the same District Office to which Form C-101 was sent. The allowable will be assigned effective 7:00 A.M. on date of completion or recompletion, provided this form is filed during calendar month of completion or recompletion. The completion date shall be that date in the case of an oil well when new oil is delivered into the stock tanks. Gas must be reported on 15.025 psia at 60° Fahrenheit.

Farmington, New Mexico

July 29, 1958

(Place)

(Date)

WE ARE HEREBY REQUESTING AN ALLOWABLE FOR A WELL KNOWN AS:

El Paso Natural Gas Company

Bolack

Well No. 13-C(PM)

in SW

1/4

SW

1/4

(Company or Operator)

(Lease)

M

Sec. 29

T. 27N

R. 8W

NMPM,

South Blanco P.C.

Pool

Unit Letter

San Juan

County. Date Spudded. 3-11-58

Date Drilling Completed

4-19-58

Please indicate location:

Elevation 6385'

Total Depth

4830'

now C.O. 4780'

Top Oil/Gas Pay 2378' (Perf.)

Name of Prod. Form.

Pictured Cliffs

PRODUCING INTERVAL -

Perforations 2378-2388; 2394-2420

Open Hole

None

Depth

Casing Shoe

4428'

Depth

Tubing

2413'

OIL WELL TEST -

Natural Prod. Test: _____ bbls. oil, _____ bbls. water in _____ hrs, _____ min. Size _____ Choke

Test After Acid or Fracture Treatment (after recovery of volume of oil equal to volume of

load oil used): _____ bbls. oil, _____ bbls. water in _____ hrs, _____ min. Size _____ Choke

GAS WELL TEST -

Natural Prod. Test: _____ MCF/Day; Hours flowed _____ Choke Size _____

Method of Testing (pitot, back pressure, etc.): _____

Test After Acid or Fracture Treatment: 1118 MCF/Day; Hours flowed 3

Choke Size 3/4" Method of Testing: Calculated A.O.F.

Acid or Fracture Treatment (Give amounts of materials used, such as acid, water, oil, and sand): 42,250 gal. water and 40,000# sand.

Casing Press. 689 Tubing Press. _____ Date first new oil run to tanks

Oil Transporter El Paso Natural Gas Products Company

Gas Transporter El Paso Natural Gas Company

Remarks: Baker "EGJ" pkr. @ 4441'

I hereby certify that the information given above is true and complete to the best of my knowledge.
Approved AUG 1 1958 July 29 19 58 El Paso Natural Gas Company
(Company or Operator)

OIL CONSERVATION COMMISSION

By: Original Signed Emery C. Arnold

Title Supervisor Dist. # 3

By: Original Signed D. C. Johnson
(Signature)

Title Petroleum Engineer

Send Communications regarding well to:

Name E. S. Oberly

Address Box 997, Farmington, New Mexico

AUG 1 1958
OIL CON. COM.
DIST. 3

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

(Form C-104)
Revised 7/1/57

REQUEST FOR (OIL) - (GAS) ALLOWABLE

New Well
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Farmington, New Mexico July 29, 1958
(Place) (Date)

WE ARE HEREBY REQUESTING AN ALLOWABLE FOR A WELL KNOWN AS:

El Paso Natural Gas Company Bolack, Well No. 13-C(FM), in SW $\frac{1}{4}$ SW $\frac{1}{4}$,
(Company or Operator) (Lease)

M, Sec. 29, T. 27N, R. 8W, NMPM., Blanco Ext. Pool
Unit Letter

San Juan

County. Date Spudded 3-11-58 Date Drilling Completed 4-19-58
Elevation 6385' Total Depth 4830' ~~max~~ C.O. 4780'

Please indicate location:

D	G	B	A
E	F	G	H
L	K	J	I
M X	N	O	P

Top Oil/Gas Pay 4630' (Perf.) Name of Prod. Form. Mesa Verde

PRODUCING INTERVAL -

Perforations 4630-4640; 4650-4660; 4670-4680; 4690-4710; 4722-4740; 4750-4762

Open Hole None Depth 4825' Casing Shoe 4825' Depth 4751' Tubing

OIL WELL TEST -

Natural Prod. Test: _____ bbls. oil, _____ bbls water in _____ hrs, _____ min. Size _____ Choke

Test After Acid or Fracture Treatment (after recovery of volume of oil equal to volume of load oil used): _____ bbls. oil, _____ bbls water in _____ hrs, _____ min. Size _____ Choke

GAS WELL TEST -

Natural Prod. Test: _____ MCF/Day; Hours flowed _____ Choke Size _____

Tubing, Casing and Cementing Record

Size	Feet	Sax
10 3/4"	162'	150
7 5/8"	4417'	470
5 1/2"	451'	200
2"	4751'	---
1 1/4"	4830'	---

Method of Testing (pitot, back pressure, etc.): _____

Test After Acid or Fracture Treatment: 2219 MCF/Day; Hours flowed 3

Choke Size 3/4" Method of Testing: Calculated A.O.F.

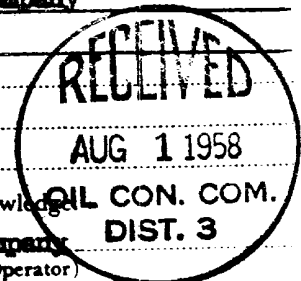
Acid or Fracture Treatment (Give amounts of materials used, such as acid, water, oil, and sand): 41,244 gal. water and 50,000# sand.

Casing Tubing 1125 Date first new
Press. Press. _____ oil run to tanks

Oil Transporter El Paso Natural Gas Products Company

Gas Transporter El Paso Natural Gas Company

Remarks: Baker "B3" Pkr. @ 4441'



I hereby certify that the information given above is true and complete to the best of my knowledge.
Approved: AUG 1 1958 July 29, 19 58 El Paso Natural Gas Company
(Company or Operator)

OIL CONSERVATION COMMISSION

By: Original Signed Emery C. Arnold

Title: Supervisor Dist. # 3

By: Original Signed D. C. Johnston
(Signature)

Title: Petroleum Engineer

Send Communications regarding well to:

Name: E. S. Oberly

Address: Box 997, Farmington, New Mexico

El Paso Natural Gas Company

El Paso, Texas

July 30, 1958

ADDRESS REPLY TO:
POST OFFICE 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 South Blanco Pictured Cliffs Pool. The El Paso Natural Gas Company Bolack No. 13-C (PM) is located 960 feet from the South line and 800 feet from the West line of Section 29, Township 27 North, Range 8 West, N.M.P.M., San Juan County, New Mexico.

This well has been completed in the Point Lookout section 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 175 feet with 150 sacks of cement circulated to the surface.
2. 7 5/8" intermediate casing set at 4428 feet with 470 sacks of cement. Top of the cement is at 1950 feet, which is above the top of the Pictured Cliffs at 2364 feet.
3. 5 1/2" liner set from 4374 feet to 4825 feet with 200 sacks of cement.
4. The casing and liner were tested for leaks before perforating.
5. The Point Lookout section was perforated in six intervals and fractured with water and sand.
6. The Pictured Cliffs formation was perforated in two intervals and fractured with water and sand.
7. All perforations were cleaned out after treatment and completion was accomplished by setting a Baker Model "EGJ" production packer on 2" NUE tubing at 4441 feet with tubing perforations set opposite the Point Lookout perforations. 1 1/4" NUE tubing siphon string was run with tubing perforations set opposite the Pictured Cliffs perforations. The Point Lookout gas will be produced through the 2" tubing and the Pictured Cliffs gas through the casing.
8. Initial potential tests have been run and commercial production has been found in both zones. A packer leakage test has been run and witnessed by a member of the Artec office of the Oil Conservation Commission. This test shows no communication in the well bore between the two producing formations.

COPY

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

The offset operators to the acreage dedicated to the well have been notified of El Paso Natural Gas Company's dual completion plans, and in turn have waived objections to said plans. Enclosed are copies of these waivers. Also 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.
- (e) Two plats showing the location of the well and offset operators.

It is intended to dedicate the W/2 of Section 29, Township 27 North, Range 8 West to the Mesa Verde formation and the SW/4 of Section 29, Township 27 North, Range 8 West to the Pictured Cliffs formation.

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

Yours very truly,

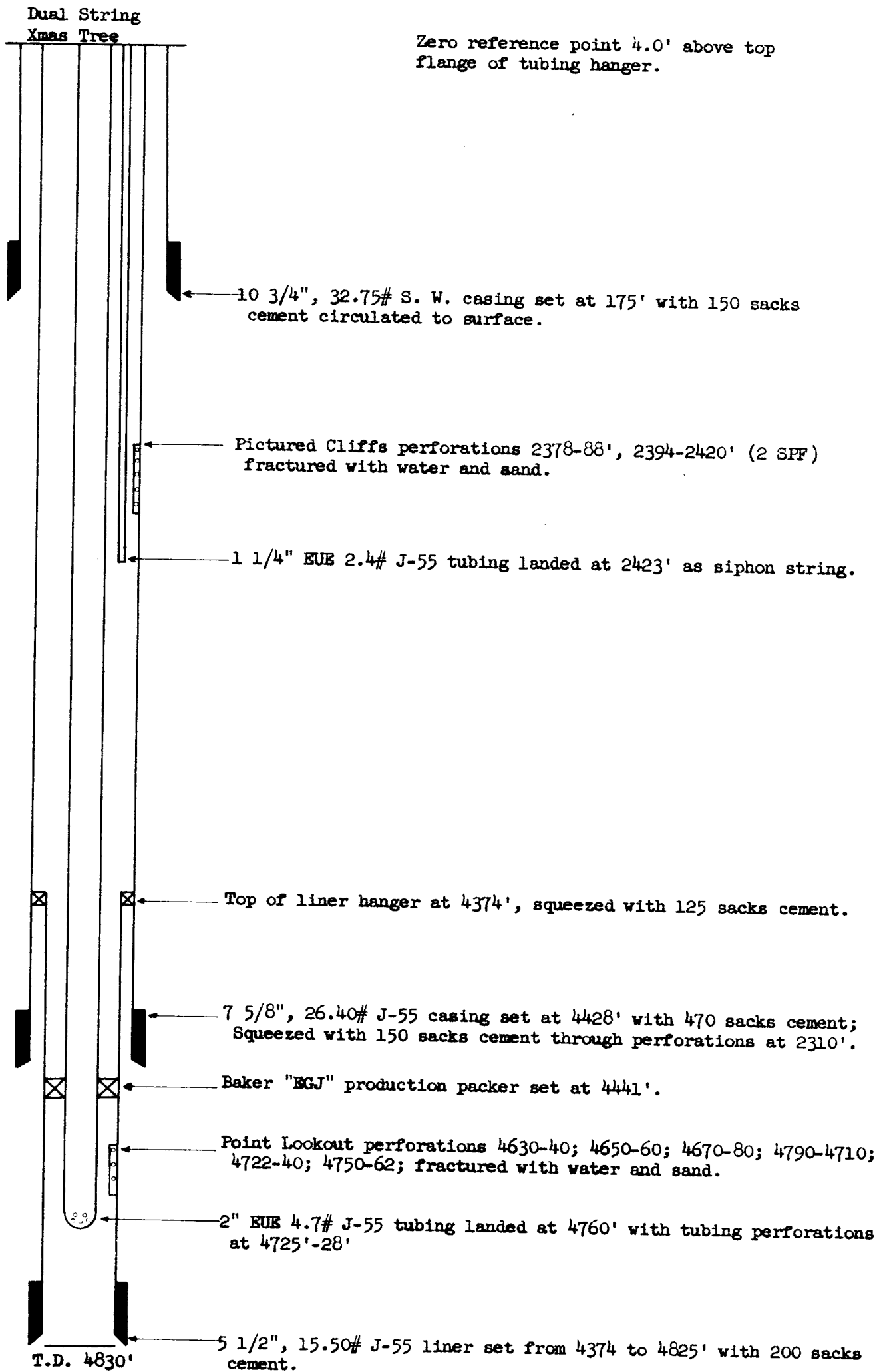
ORIGINAL SIGNED E. S. OBERLY

E. S. Oberly,
Division Petroleum Engineer

ESO:dgb

cc: NMCCC (2) (Emery Arnold) ✓
Sam Smith
USGS (Phil McGrath)

SCHEMATIC DIAGRAM OF DUAL COMPLETION
El Paso Natural Gas Co. Bolack No. 13-C (PM)
SW/4 Section 29, T-27-N, R-8-W



STATE OF NEW MEXICO)

COUNTY OF SAN JUAN)

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, 1958, I was called to the location of the El Paso Natural Gas Company Bolack No. 13-C (PM) Well located in the SWSW/4 of Section 29, Township 27 North, Range 8 West, N.M.P.M., for advisory service in connection with installation of a production packer. In my presence, a Baker Model "EGJ" Production Packer was set in this well at 4441 feet in accordance with the usual practices and customs of the industry.

Mack M. Mahaffey

Subscribed and sworn to before me, a Notary Public in and for San Juan County, New Mexico, the 31st day of July, 1958.

Paul Maclellan
Notary Public in and for San Juan County,
New Mexico

My commission expires February 24, 1960.

EL PASO NATURAL GAS COMPANY

P.O. Box 987
Farmington, New Mexico

July 17, 1958

Mr. E. J. Arnold
Oil Conservation Commission
1001 Rio Brazos Road
Aztec, New Mexico

Re: Leaker Leakage Test on the El Paso Natural Gas
Company Well, Bolack 13-C (PM), 960S, 800W;
29-27-8, San Juan County, New Mexico
(Name - Location - Company)

Dear Mr. Arnold:

The subject well was dually completed in the Pictured Cliffs and Mesa Verde zones and a packer was set at 4441 feet. The Mesa Verde zone was tested through a $3/4$ " choke for three hours July 8, 1958 with the following data obtained:

PC SHTC 673 psig; Shut-in 10 days
PC SHTC 673 psig;
MV SHTC 1113 psig; Shut-in 10 days

Time Minutes	MV) Flowing Pressure Tubing Psig	PC) SHTC) Psig	() Working Pressure, Psig	Temp ° F
0				
15	340	676		73
30	288	676		74
45	271	676		75
60	250	676		75
120	202	676		76
180	170	676	Calc. 341	76

The choke volume for the Mesa Verde was 2064 MCF/D with an AOF of 2219 MCF/D.

The Pictured Cliffs zone was tested July 17, 1958 with a $3/4$ " choke for 3 hours with the following data obtained:

PC SHTC 677 psig; Shut-in 19 days
PC SHTC 677 psig;
MV SHTC 1105 psig; Shut-in 9 days

July 17, 1958

Time Minutes	(PC) Flowing Pressure Casing Psig	(MV) BIP (T) Psig	(PC) Working tbg. Pressure, Psig	Temp ° F
0				
15	204	1103	218	57
30	136	1104	142	61
45	117	1104	122	61
60	108	1105	111	65
180	80	1105	82	66

The close volume for the Pictured Cliffs test was 1100 MCF/D with an ADV of 1118 MCF/D.

The results of the above tests indicate there is no packer leakage.

Very truly yours,

Frank Clark
Gas Technician

FC/nb

cc: J. M. Rodgers
E. S. Oberly (C)
File

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

DUAL COMPLETION

DATE July 8, 1958

El Paso Natural Gas Company		Bolack No. 13-C (M)	
Location 9608, 800W; 29-27-8		County San Juan	State New Mexico
Formation Mesa Verde		Blanco	
Perforation 7-5/8	Set At Feet 4417	Tubing Diameter 2"	Set At Feet 4751
Flow Zone 4630	4740	Total Depth 4830 w/o 4780	Shut-in 6/24/58
Sand Water Frac.		Flow Through Casing	Flow Through Tubing X

Choke Size, inches .75	Choke Constant, C 12.365	5-1/2 liner 4374 - 4825
Surface Pressure, PSIG (PC) 673	PSIG - 12 - PSIA 685	Days Shut-in 14
Flowing Pressure, P 170	PSIG - 12 - PSIA 182	Surface Pressure, Tubing (MV) 1113
Temperature, T 76	F .75	PSIG - 12 - PSIA 1125
		Working Pressure, Pw 341 (Calc.)
		App. From Tables 1.020
		Gravity .722

Final SIPC (PC) 676

Packer at 4441
1-1/4" at 2413

CHOKE VOLUME $Q = C \times P_r \times F_v \times F_g \times F_{pv}$

$Q = 12.365 (182)(.9850)(.9129)(1.020)$

2064

MCF/D

$$Q_{TH} = Q \left(\frac{P_r^2 - P_w^2}{P_r^2 - P_a^2} \right)^{1/n}$$

$$Q_{TH} = \left(\frac{1265625}{1149344} \right)^{1/n}$$

$$(1.1011)^{.75} (2064) = (1.0749)(2064)$$

Asf 2219 MCF/D

R. R. Davis

Lewis D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

Dual Completion

DATE July 17, 1958

Operator El Paso Natural Gas		Lease Bolack 13-C (P)	
Location 960S, 800W; 29-27-8		County San Juan	State New Mexico
Formation Pictured Cliffs		Pool South Blanco	
Casing Diameter 7-5/8	Set At Feet 4417	Tubing Diameter 1-1/4	Set At Feet 2413
Perforation Depth 2378	To 2420	Total Depth 4830 x/o 4780	Shut-in 6/28/58
Stimulation Method Sand Water Frac.		Flow Through Casing X	Flow Through Tubing

Choke Size, Inches .75		Stroke Constant, C 12.365	
Shut-in Pressure, Casing (PC) 677	PSIG 12 - PSIA 689	Days Shut-in 19	Shut-in Pressure, Tubing (PC) 677
Flowing Pressure, Casing 80	PSIG 12 - PSIA 92		Flowing Pressure, Tubing 82
Temperature, Casing 66	Flowing Pressure, Tubing .85		Flowing Pressure, Tubing 94
			Gravity .646

Initial (MV) SIPT = 1105 psig
Final (MV) SIPT = 1105 psig

Packer at 4441

CHOKE VOLUME, Q C x P₁ x F₁ x F_g x F_p

C 12.365 x 92 x .9943 x .9645 x 1.007

1100

MCF/D

OPEN FLOW, A = Q

$$\left(\frac{P_1^2 - P_2^2}{P_1 - P_2} \right)^n$$

A =

$$\left(\frac{474721}{465885} \right)^n$$

$$1.0189^{.85} \times 1100 = 1.0160 \times 1100$$

A =

1118

MCF/D

Frank Clark

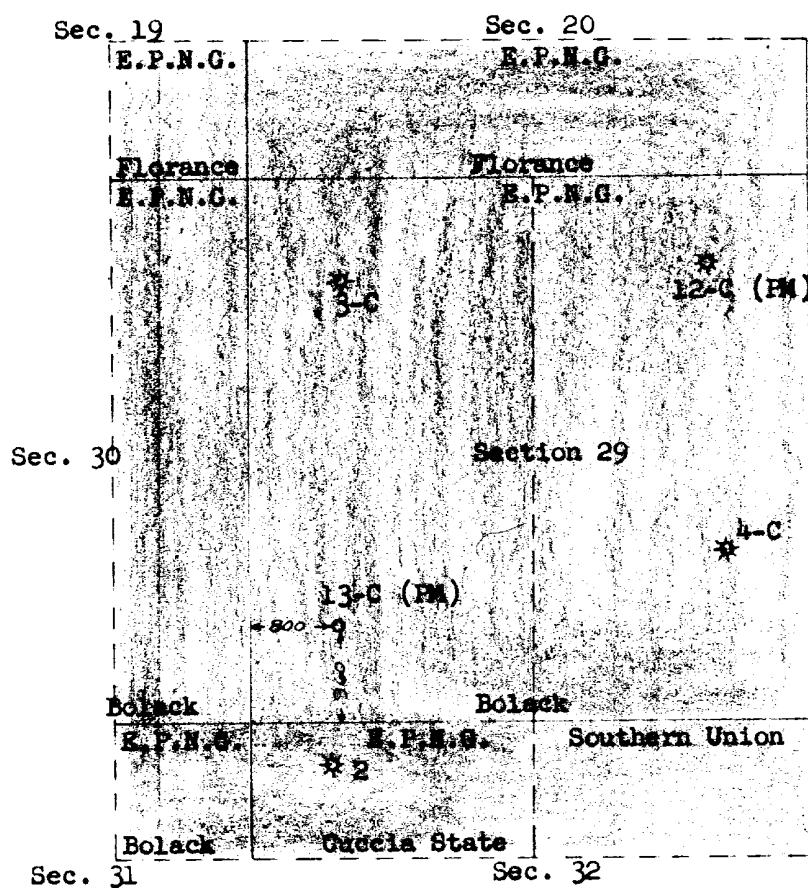
Checked By

Tom Grant

L. D. Galloway

PLAT SHOWING LOCATION OF DUAL COMPLETED
El Paso Natural Gas Co. Bolack No. 13-C (FM)

T-27-N, R-8-W



EL PASO NATURAL GAS COMPANY
EL PASO, TEXAS

SCALE

DATE

No.

DRAWN BY

CHECKED BY