Form C-122

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Revised 12-1-55

Pool **Blanco-Pictured Cliffs** Formation **Pictured Cliffs** County **San Juan**

Initial **X** Annual_____ Special_____ Date of Test **July 3, 1959**

Company **Pan American Petroleum Corp.** Lease **Roshelle Gas Unit** Well No. **1**

Unit **P** Sec. **4** Twp. **29N** Rge. **7W** Purchaser **El Paso Natural Gas Company**

Casing **4-1/2** Wt. **9.5** I.D. **4.090** Set at **2345** Perf. **2232** To **2286**

Tubing **1-1/4** Wt. **2.3** I.D. **1.380** Set at **2246** Perf. **2236** To **2246**

Gas Pay: From **2232** To **2286** L **2232** xG **0.69(est)** -GL **1540** Bar.Press. **12**

Producing Thru: Casing **X** Tubing_____ Type Well **Single - Gas**

Single-Bradenhead-G. G. or G.O. Dual

Date of Completion: **June 19, 1959** Packer **None** Reservoir Temp. **95°F**

OBSERVED DATA

Tested Through (~~Bean~~) (Choke) (~~Meter~~)   Type Taps_____

No.	(~~Bean~~) (Line) Size	(Choke) (~~Orifice~~) Size	Flow Data Press. psig	Diff. h_w	Temp. °F.	Tubing Data Press. psig	Temp. °F.	Casing Data Press. psig	Temp. °F.	Duration of Flow Hr.
SI	Shut in 14 days					1034		1034		
1.	2"	3/4"	173		60°(est)	201	60°(est)	173	60°(est)	3 hrs.
2.										
3.										
4.										
5.										

FLOW CALCULATIONS

| No.	Coefficient (24-Hour)	$\sqrt{h_w p_f}$	Pressure psia	Flow Temp. Factor F_t	Gravity Factor F_g	Compress. Factor F_{pv}	Rate of Flow Q-MCFPD @ 15.025 psia
1.	12.365		185	1.000	0.9325	1.020	2176
2.							
3.							
4.							
5.							

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio_____ cf/bbl.
Gravity of Liquid Hydrocarbons_____ deg.
P_c _____ $(1-e^{-s})$ _____

Specific Gravity Separator Gas_____
Specific Gravity Flowing Fluid_____
P_c **1046** P_c^2 **1,094,116**

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	$\dfrac{P_w}{P_c}$
1.						45,369	1,048,747		
2.									
3.									
4.									
5.									

Absolute Potential: **2256** MCFPD; n **0.55**

COMPANY **Pan American Petroleum Corporation**

ADDRESS **Box 457, Farmington, New Mexico**

AGENT and TITLE **R. M. Bauer, Jr., Area Engineer** *RMBauer Jr.*

WITNESSED_____

COMPANY_____

REMARKS
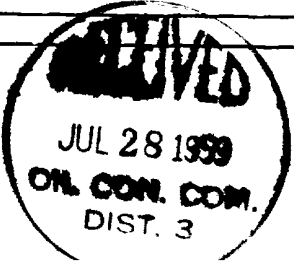
INSTRUCTIONS

This form is to be used for reporting multi-point back pressure tests on gas wells in the State, except those on which special orders are applicable. Three copies of this form and the back pressure curve shall be filed with the Commission at Box 871, Santa Fe.

The log log paper used for plotting the back pressure curve shall be of at least three inch cycles.

NOMENCLATURE

$Q =$ Actual rate of flow at end of flow period at W. H. working pressure (P_w). MCF/da. @ 15.025 psia and 60° F.

$P_c =$ 72 hour wellhead shut-in casing (or tubing) pressure whichever is greater. psia

$P_w =$ Static wellhead working pressure as determined at the end of flow period. (Casing if flowing thru tubing, tubing if flowing thru casing.) psia

$P_t =$ Flowing wellhead pressure (tubing if flowing through tubing, casing if flowing through casing.) psia

$P_f =$ Meter pressure, psia.

$h_w =$ Differential meter pressure, inches water.

$F_g =$ Gravity correction factor.

$F_t =$ Flowing temperature correction factor.

$F_{pv} =$ Supercompressability factor.

$n =$ Slope of back pressure curve.

Note: If P_w cannot be taken because of manner of completion or condition of well, then P_w must be calculated by adding the pressure drop due to friction within the flow string to P_t.

OIL CONSERVATION COMMISSION		
AZTEC DISTRICT OFFICE		
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Initial Deliverability Test (handwritten, diagonal, top-left)

NEW MEXICO OIL CONSERVATION COMMISSION
GAS WELL TEST DATA SHEET - - SAN JUAN BASIN

(TO BE USED FOR FRUITLAND, PICTURED CLIFFS, MESAVERDE, & ALL DAKOTA
EXCEPT BARKER DOME STORAGE AREA)

Pool **Blanco Pictured Cliffs** _____ Formation **Pictured Cliffs** _____ County **San Juan**

Purchasing Pipeline **El Paso Natural Gas Company** _____ Date Test Filed **October 8, 1959**

Operator **Pan American Petroleum Corp.** Lease **Rochelle Gas Unit** _____ Well No. **1**

Unit **P** ___ Sec. **4** ___ Twp. **29N** ___ Rge. **9W** ___ Pay Zone: From **2232** To **2266**

Casing: OD **4-1/2** WT. **9.5** Set At **2345** Tubing: OD **1.66** WT. **2.3** T. Perf. **2236**

Produced Through: Casing **x** Tubing _____ Gas Gravity: Measured **0.640** Estimated _____

Date of Flow Test: From **9-5-59** To **9-13-59** * Date S.I.P. Measured **7-3-59**

Meter Run Size **4"** Orifice Size **1.500** Type Chart **Sq. Rt.** Type Taps **Flange**

OBSERVED DATA

Flowing casing pressure (Dwt) _____ psig + 12 = _____ psia (a)

Flowing tubing pressure (Dwt) _____ psig + 12 = _____ psia (b)

Flowing meter pressure (Dwt) _____ psig + 12 = _____ psia (c)

Flowing meter pressure (meter reading when Dwt. measurement taken:

Normal chart reading _____ psig + 12 = _____ psia (d)

Square root chart reading (_____)^2 x spring constant _____ = _____ psia (d)

Meter error (c) - (d) or (d) - (c)   ±   = _____ psi (e)

Friction loss, Flowing column to meter:

(b) - (c) Flow through tubing: (a) - (c) Flow through casing   = _____ psi (f)

Seven day average static meter pressure (from meter chart):

Normal chart average reading _____ psig + 12 = _____ psia (g)

Square root chart average reading (**7.058**)^2 x sp. const. **5** = **249** psia (g)

Corrected seven day avge. meter press. (p_f) (g) + (e)   = **249** psia (h)

P_t = (h) + (f)   = **249** psia (i)

Wellhead casing shut-in pressure (Dwt) **1034** psig + 12 = **1046** psia (j)

Wellhead tubing shut-in pressure (Dwt) **1034** psig + 12 = **1046** psia (k)

P_c = (j) or (k) whichever well flowed through   = **1046** psia (l)

Flowing Temp. (Meter Run) **69** °F + 460   = **529** °Abs (m)

$P_d = \frac{1}{2} P_c = \frac{1}{2}$ (l)   = **523** psia (n)

FLOW RATE CALCULATION

$$Q = \underline{\qquad} \times \left(\frac{\sqrt{(c)}}{\sqrt{(d)}} = \underline{\qquad} = \underline{\qquad} \right)^* = \underline{\qquad} \text{MCF/da}$$

(integrated)

DELIVERABILITY CALCULATION

$$D = Q \; \textbf{452} \left[\frac{P_c^2 - P_d^2 = \frac{820587}{795,627}}{P_c^2 - P_w^2 = \frac{1,027,195}{1032115}} \right]^n \; \textbf{0.8142} \; 72=7 \quad 7750 = \textbf{370} \text{ MCF/da.}$$

SUMMARY

P_c = **1035** *1044* psia

Q = **452** Mcf/day

P_w = **249** psia

P_d = **523** psia

D = **370** Mcf/day

Company **Pan American Petroleum Corporation**
By **R. M. Bauer, Jr.** *R.M. Bauer by 7HH*
Title **Area Engineer**
Witnessed by _____
Company _____

* This is date of completion test.
* Meter error correction factor

REMARKS OR FRICTION CALCULATIONS

GL	$(1-e^{-S})$	$(F_cQ)2$	$\dfrac{(F_cQ)^2 \quad (1-e^{-S})}{R^2}$	$\dfrac{P_t^2}{\text{(Column i)}}$	$P_t^2 + R^2$	P_w
Friction Loss Negligible						

Furnished by pipeline company

INITIAL DELIVERABILITY TEST

Initial Deliverability Test

NEW MEXICO OIL CONSERVATION COMMISSION
GAS WELL TEST DATA SHEET - - SAN JUAN BASIN

(TO BE USED FOR FRUITLAND, PICTURED CLIFFS, MESAVERDE, & ALL DAKOTA
EXCEPT BARKER DOME STORAGE AREA)

Pool **Blanco-Pictured Cliffs** _____ Formation **Pictured Cliffs** _____ County **San Juan**

Purchasing Pipeline **El Paso Natural Gas Company** _____ Date Test Filed **October 21, 1959**

Operator **Pan American Petroleum Corp.** Lease **Rochelle Gas Unit** _____ Well No. **1**

Unit **P** _____ Sec. **4** _____ Twp. **29N** _____ Rge. **9W** _____ Pay Zone: From **2232** _____ To **2286**

Casing: OD **4-1/2** _____ WT. **9.5** _____ Set At **2345** _____ Tubing: OD **1.66** _____ WT. **2.3** _____ T. Perf. **2236**

Produced Through: Casing **X** _____ Tubing _____ Gas Gravity: Measured **0.680*** _____ Estimated _____

Date of Flow Test: From **9-5-59** _____ To **9-13-59** * Date S.I.P. Measured **7-3-59**

Meter Run Size **4"** _____ Orifice Size **1.500"** _____ Type Chart **Sq. Rt.** Type Taps **Flange**

OBSERVED DATA

Flowing casing pressure (Dwt) _____ psig + 12 = _____ psia (a)

Flowing tubing pressure (Dwt) _____ psig + 12 = _____ psia (b)

Flowing meter pressure (Dwt) _____ psig + 12 = _____ psia (c)

Flowing meter pressure (meter reading when Dwt. measurement taken:

Normal chart reading _____ psig + 12 = _____ psia (d)

Square root chart reading (_____)^2 x spring constant _____ = _____ psia (d)

Meter error (c) - (d) or (d) - (c) ± _____ = _____ psi (e)

Friction loss, Flowing column to meter:

(b) - (c) Flow through tubing: (a) - (c) Flow through casing = _____ psi (f)

Seven day average static meter pressure (from meter chart):

Normal chart average reading _____ psig + 12 = _____ psia (g)

Square root chart average reading (**7.054**)^2 x sp. const. **5** = **249** psia (g)

Corrected seven day avge. meter press. (p_f) (g) + (e) = **249** psia (h)

P_t = (h) + (f) = **249** psia (i)

Wellhead casing shut-in pressure (Dwt) **1034** psig + 12 = **1046** psia (j)

Wellhead tubing shut-in pressure (Dwt) **1034** psig + 12 = **1046** psia (k)

P_c = (j) or (k) whichever well flowed through = **1046** psia (l)

Flowing Temp. (Meter Run) **69** °F + 460 = **529** °Abs (m)

$P_d = \frac{1}{2} P_c = \frac{1}{2}$ (l) = **523** psia (n)

FLOW RATE CALCULATION

$$Q = \underline{\hspace{2cm}} \times \left(\frac{\sqrt{(c)} = \underline{\hspace{1.5cm}}}{\sqrt{(d)} \quad \underline{\hspace{2cm}}} = \underline{\hspace{2cm}} \right)^{\bullet} = \underline{\hspace{2cm}} \text{MCF/da}$$

(integrated)

DELIVERABILITY CALCULATION

$$D = Q \underline{\ 452\ } \left[\frac{\left(P_c^2 - P_d^2 \right) = \mathbf{820,587}}{\left(P_c^2 - P_w^2 \right) = \mathbf{1,032,115}} \right]^n \ \mathbf{0.8230} = \mathbf{372} \text{ MCF/da.}$$

SUMMARY

P_c = **1046** _____ psia

Q = **452** _____ Mcf/day

P_w = **249** _____ psia

P_d = **523** _____ psia

D = **370** _____ Mcf/day

Company **Pan American Petroleum Corporation**

By **R. M. Bauer, Jr.** *RMBauer Jr.*

Title **Area Engineer**

Witnessed by _____

Company _____

* This is date of completion test.

* Meter error correction factor
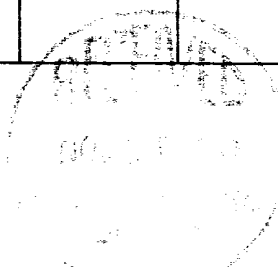
REMARKS OR FRICTION CALCULATIONS

GL	$(1-e^{-s})$	$(F_cQ)2$	$\dfrac{(F_cQ)^2 \quad (1-e^{-s})}{R^2}$	$\dfrac{Pt^2}{\text{(Column i)}}$	$P_t^2 + R^2$	P_w

Friction Loss Negligible

*Furnished by pipeline company.

INITIAL DELIVERABILITY TEST

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION
TO TRANSPORT OIL AND NATURAL GAS

Company or Operator **Pan American Petroleum Corporation**   Lease **Rochelle Gas Unit**

Well No. **1**   Unit Letter **P** S **4**   T **29N** R **9W**   Pool **Blanco Pictured Cliffs**

County **San Juan**   Kind of Lease (State, Fed. or Patented) **Federal**

If well produces oil or condensate, give location of tanks: Unit ___ S ___ T ___ R ___

Authorized Transporter of Oil or Condensate _____   Eff. 2-1-71,

Address _____   Pan American Petro. Corp. has changed its name to AMOCO PROD. CO.

(Give address to which approved copy of this form is to be sent)

Authorized Transporter of Gas **El Paso Natural Gas Company**

Address **El Paso, Texas**   Date Connected *****

(Give address to which approved copy of this form is to be sent)

If Gas is not being sold, give reasons and also explain its present disposition:
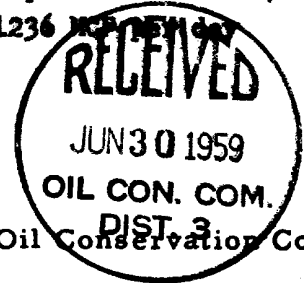
*Waiting on pipeline connection.

Reasons for Filing: (Please check proper box)   New Well _____ (**x**)

Change in Transporter of (Check One): Oil ( ) Dry Gas ( ) C'head ( ) Condensate ( )

Change in Ownership _____ ( )   Other _____ ( )

Remarks: (Give explanation below)

Completed as a gas well June 19, 1959. Preliminary test flowed 1236 MCF/day pitot tube measurement.

RECEIVED
JUN 30 1959
OIL CON. COM.
DIST. 3

The undersigned certifies that the Rules and Regulations of the Oil Conservation Commission have been complied with.

Executed this the **26th** day of **June** 19 **59**

ORIGINAL SIGNED BY
R. M. Bauer, Jr.

By _____

Approved ___ **JUL 14 1959** ___ 19 ___

Title **Area Engineer**

OIL CONSERVATION COMMISSION
Original Signed By
By ___ A. R. KENDRICK ___

Company **Pan American Petroleum Corp.**

Address **Box 487**

Title PETROLEUM ENGINEER DIST. NO. **3**

Farmington, New Mexico

Attn: L. O. Speer, Jr.