

El Paso Natural Gas Company

El Paso, Texas

September 11, 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 South Blanco Extension Pool. The El Paso Natural Gas Company Rincon Unit No. 98(P. M.) is located 990 feet from the North line and 990 feet from the East line of Section 21, Township 27 North, Range 6 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 173 feet with 150 sacks of cement circulated to the surface.
2. 7 5/8" intermediate casing set at 3358 feet with 250 sacks of cement. Top of the cement is at 2065 feet, which is above the top of the Pictured Cliffs formation at 3173 feet.
3. 5 1/2" liner set from 3288 feet to 5653 feet with 300 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 formation was perforated in five 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 after treatment and completion was accomplished by setting a Baker Model EGJ production packer on 2" EUE tubing at 3326 feet with the tubing perforations set opposite the Point Lookout perforations. 1 1/4" Grade B line pipe was run, with the tubing perforations set opposite the Pictured Cliffs perforations, as a siphon string. The Point Lookout gas will be produced through the 2" EUE tubing and the Pictured Cliffs gas through the casing.

COPY



January 22, 1900

5. *Staphylococcus aureus*

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$$A_{\text{eff}} = A_0 \left(1 + \frac{1}{2} \frac{A_0^2}{A_{\text{eff}}^2} \right) \quad (1)$$

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

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9. A Garrett circulating sleeve was installed in the 2" EUE tubing string just below the Pictured Cliffs perforations. This will enable the bottom hole pressure tests to be taken at a future date if so required.
10. 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 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 the dual completion to allow production from both known producing formations, eliminating the high initial cost of drilling two separate wells.

The drilling block falls well within the boundaries of the Rincon Unit, and since El Paso Natural Gas Company is the only operator of this unit the approval of any other operator for dually completing this well has not been sought. I am enclosing:

- (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 E/2 of Section 21, Township 27N, Range 6 West, to the Mesa Verde formation, and the NE/4 of Section 21, Township 27 North, Range 6 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. J. COEL

E. J. Coel
Senior Petroleum Engineer

EJC/dgb

Encl.

cc: Emery Arnold
R. L. Hamblin
Phil McGrath



1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1862. It is a very important document, as it contains the President's annual message to Congress. The letter is written in a formal, dignified style, and it is one of the most important documents in the history of the United States. It is a document that has been read and studied by many generations of Americans, and it is a document that has shaped the course of our nation's history.

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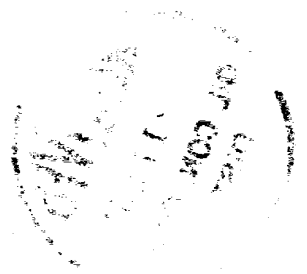
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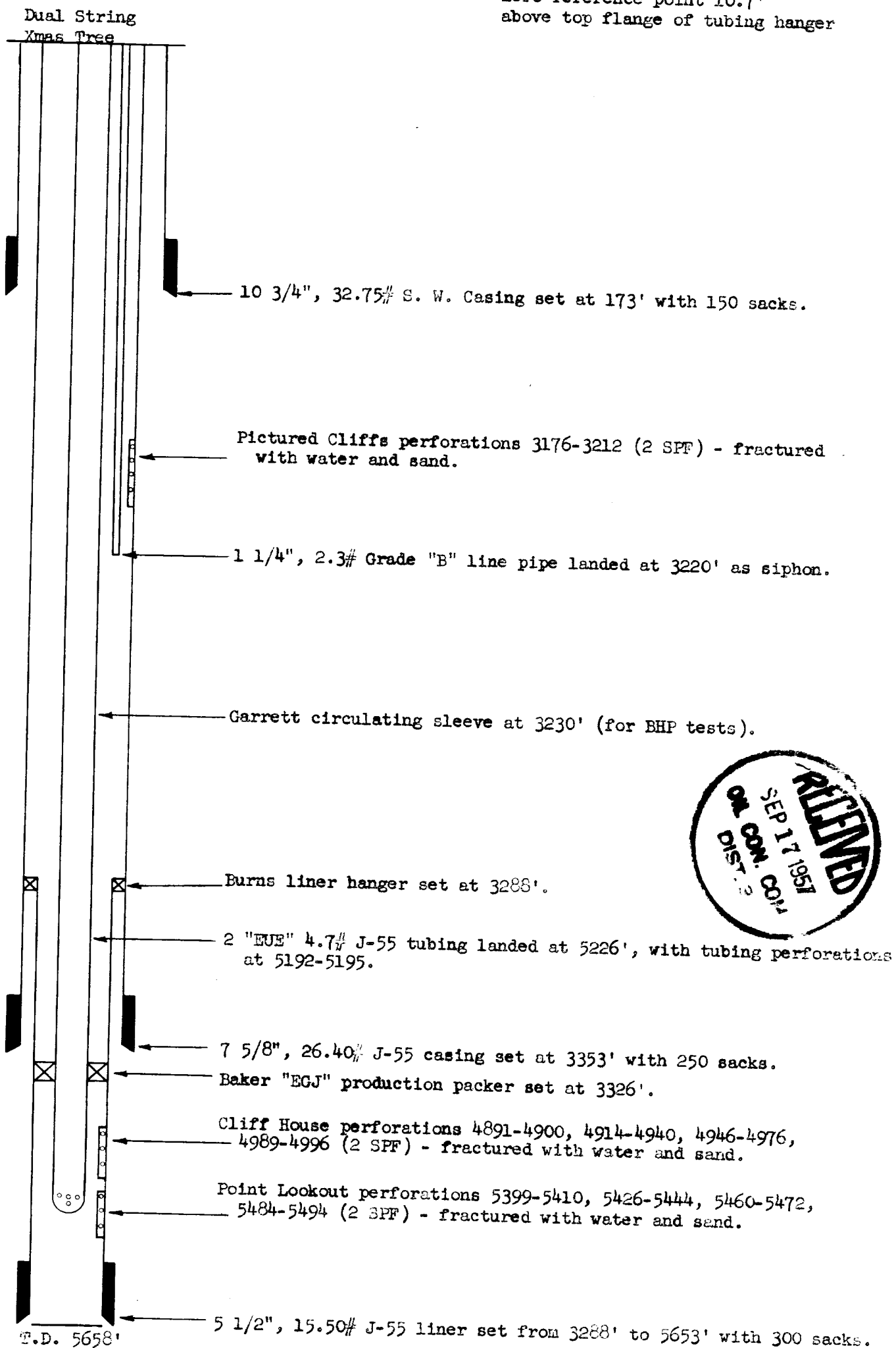
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ORIGINAL SIGNED E. J. COLE



SCHEMATIC DIAGRAM OF DUAL COMPLETION
EL PASO NATURAL GAS COMPANY RINCON UNIT NO. 98 (PM)
(NE/4 Section 21, T27N, R6W)

Zero reference point 10.7'
above top flange of tubing hanger



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 July 26,
1957, I was called to the location of the El Paso Natural Gas Company
Rincon Unit No. 98 (PM) Well located in the NE/4 of Section 21, Township
27 North, Range 6 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 3326 feet. The production packer was properly set in accordance
with the usual practices and customs of the industry.

Mack M. Mahaffey
Mack M. Mahaffey

Subscribed and sworn to before me, a Notary Public in and for San Juan
County, New Mexico, the 7 day of Aug, 1957.

Raul A. Macias
Notary Public in and for San Juan County
New Mexico

My commission expires February 24, 1960.



The first of these is the fact that the
 government has been unable to secure
 the necessary funds to carry out its
 policy of non-interference in the
 internal affairs of the country.
 The second is the fact that the
 government has been unable to secure
 the necessary funds to carry out its
 policy of non-interference in the
 internal affairs of the country.
 The third is the fact that the
 government has been unable to secure
 the necessary funds to carry out its
 policy of non-interference in the
 internal affairs of the country.

[Handwritten signature]
 Secretary of State

The second of these is the fact that the
 government has been unable to secure
 the necessary funds to carry out its
 policy of non-interference in the
 internal affairs of the country.
 The third is the fact that the
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EL PASO NATURAL GAS COMPANY

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

September 9, 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, Rincon No. 98, 990'N,
990'E, Sec. 21-27-6, Rio Arriba County, N.M.

Dear Mr. Arnold:

The subject well was dually completed in the Pictured Cliffs and Mesa Verde zones and a packer was set at 3326 feet. The Mesa Verde zone was tested through a 3/4" choke for three hours August 23, 1957 with the following data obtained:

Pictured Cliffs SIPC - 1055 psig; shut-in 28 days
Pictured Cliffs SIPT - 1054 psig;

Mesa Verde SIPT - 1034 psig; shut-in 28 days.

<u>Time Minutes</u>	<u>MV Flowing Pressure Tubing Psig</u>	<u>PC SIPC Psig</u>	<u>MV Working Pressure, Psig</u>	<u>Temp °F</u>
15	444	1061		
30	411	1063		
45	379	1064		
60	360	1064		
180	303	1065	Calculated 606	65

The choke volume for the Mesa Verde was 3789 MCF/D with an A.O.F. of 5229 MCF/D.

The Pictured Cliffs zone was tested September 4, 1957 with a 3/4" choke for 3 hours with the following data obtained:

Pictured Cliffs SIPC - 1071 psig; shut-in 40 days
Pictured Cliffs SIPT - 1071 psig;

Mesa Verde SIPT - 1028 psig; shut-in 40 days



<u>Time Minutes</u>	<u>PC Flowing Pressure Casing Psig</u>	<u>MV SIPT Psig</u>	<u>PC Working Pressure, Psig</u>	<u>Temp °F</u>
0	open	1028		
15	611	1029		66
30	524	1028		64
45	491	1028		65
60	461	1028		68
120	385	1028		68
180	324	1028	341	68

The choke volume for the Pictured Cliffs test was 4144 MCF/D with an A.O.F. of 4558 MCF/D.

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

Very truly yours,

S. V. Roberts
S. V. Roberts
Gas Engineer

SVR/jla

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



EL PASO NATURAL GAS COMPANY GAS WELL TEST

To: Mr. E. E. Alsup

From: Gas Engineering Department

Date: **August 23, 1957**

Place: **Farmington, New Mexico**

DUAL COMPLETION

Subject: Test data on the El Paso Natural Gas Company Well,
RINCON NO. 98, Rio Arriba County, New Mexico.

Tested By: Tom Grant. (No State witness available)

Location Sec. 21 T. 27 R. 6 , 990'N, 990'E

Shut-In Pressure PC SIPC 1055 psig ; (Shut-in 28 days)
 PC SIPT 1054 psig
 MV SIPT 1034

0.750" Choke Volume..... 3789 MCF/D @ 14.7 psia and 60° F. for 0.6
gravity gas. Flow through tubing for 3 hours.

Calculated 3 Hour Absolute Open Flow.....	5229	MCF/D
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Working Pressure On **Calculated** = 606 Psig

Producing Formation..... Mesa Verde

Stimulation Method..... Sand Water Frac.

Total Depth 5655 - c/o 5510

Field Blanco Mesa Verde

H₂S Sweet to lead acetate.

Final SIPC (P.C.) - 1065 psig

cc: D. H. Tucker
~~R. W. Hollis~~
W. T. Hollis
~~E. C. Walker~~
W. M. Rodgers
Wayne Cheek
Drilling Department
B. D. Adams
Roland Hamblin
Jack Purvis
~~W. T. Hollis~~ +
C. C. Kennedy
E. J. Coel, Jr.
A. J. Dudenhoeffer
File

Bill Parrish
Dean Rittmann

Lewis D. Galloway
L. D. Galloway



DATE August 23, 1957

Operator El Paso Natural Gas Company		Lease Rincon No. 98	
Location 990'N, 990'E, Sec. 21-27-6		County Rio Arriba	State New Mexico
Formation Mesa Verde		Pool Blanco Mesa Verde	
Casing: Diameter 5-1/2	Set At: Feet 5653	Tubing: Diameter 2"	Set At: Feet 5185
Pay Zone: From 4897	To 5494	Total Depth: 5655 - c/o 5510	
Stimulation Method Sand Water Frac.		Flow Through Casing	Flow Through Tubing X

Choke Size, inches 0.750		Choke Constant: C 12.365			
Shut-In Pressure, Casing, PSIG 1055 PC	- 12 = PSIA 1067	Days Shut-In 28	Shut-In Pressure, Tubing PSIG 1034 MV	- 12 = PSIA 1046	
Flowing Pressure: P PSIG 303	- 12 = PSIA 315		Working Pressure: P _w PSIG Calculated	- 12 = PSIA 618	
Temperature: T °F 65	n = 0.750		F _{pv} (From Tables) 1.033	Gravity .670	

Final SIPC (P.C.) - 1065 psig

CHOKE VOLUME : Q = C x P_f x F_t x F_g x F_{pv}

Q = 12.365 x 315 x .9952 x .9463 x 1.033 = 3789 MCF/D

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

Aof $\left(\frac{1,094,116}{712,192} \right)^n = 1.5362^{.75} \times 3789 = 1.3800 \times 3789$

Aof 5,229 MCF/D

TESTED BY Tom Grant

WITNESSED BY None available

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

L. D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. E. E. Alsup

Date: September 4, 1957

From: Gas Engineering Department

Place: Farmington, New Mexico

DUAL COMPLETIONSubject: Test data on the El Paso Natural Gas Company Well,
RINCON NO. 98, Rio Arriba County, New Mexico.

Tested By: S. V. Roberts and R. R. Davis

Location Sec. 21 T. 27N R. 6W 990'N, 990'E

Shut-In Pressure P.C. SIPC 1071 psig
P.C. SIPT 1071 psig ; (Shut-in 40 days)
M.V. SIPT 1028 psig0.750" Choke Volume 4144 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 4558 MCF/D

Working Pressure On tubing = 341 Psig

Producing Formation Pictured Cliffs

Stimulation Method Sand Water Frac.

Total Depth 5655 - c/o 5510

Field Undesignated

H₂S Sweet to lead acetate.

Final (MV) - 1028 psig

cc: D. H. Tucker

Bill Parrish
Dean Rittmann*Lewis D. Galloway*
L. D. Galloway~~W. T. Hollis~~~~W. T. Hollis~~~~W. T. Hollis~~

W. M. Rodgers

Wayne Cheek

Drilling Department

B. D. Adams

Roland Hamblin

Jack Purvis

~~W. T. Hollis~~

C. C. Kennedy

E. J. Coel, Jr. (6)

A. J. Dudenhoefter

File



EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATADUAL COMPLETIONDATE September 4, 1957

Operator El Paso Natural Gas Company		Lease Rincon No. 98	
Location 990'N, 990'E, Sec. 21-27-6		County Rio Arriba	State New Mexico
Formation Pictured Cliffs		Pool Undesignated	
Casing: Diameter 7-5/8	Set At: Feet 3346	Tubing: Diameter 1-1/4	Set At: Feet 3209
Pay Zone: From 3176	To 3212	Total Depth: 5655 - c/o 5510	
Stimulation Method Sand Water Frac.		Flow Through Casing X	Flow Through Tubing

Choke Size, Inches 0.750		Choke Constant: C 12.365		5-1/2" liner - 3288-5653	
Shut-In Pressure, Casing, PSIG 1071	- 12 = PSIA 1083	Days Shut-In 40	Shut-In Pressure, Tubing, PSIG 1071	- 12 = PSIA 1083	
Flowing Pressure: P, PSIG 324	- 12 = PSIA 336		Working Pressure: P _w , PSIG 341	- 12 = PSIA 353	
Temperature: T, °F 68	n = 0.85		F _{pv} (From Tables) 1.030	Gravity .630	

SIPT (MV) Initial - 1028 psig; Final 1028 psig. Packer at 3326. Sleeve at 3230. 2" at 5215

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

$$Q = 12.365 \times 336 \times .9924 \times .9759 \times 1.030 = 4144 \text{ MCF/D}$$

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

$$Aof = \left(\frac{1,172,889}{1,048,280} \right)^n = 1.1188^{.85} \times 4144 = 1.1000 \times 4144$$

$$Aof = 4558 \text{ MCF/D}$$

TESTED BY S. V. Roberts and R. R. Davis

WITNESSED BY _____

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

L. D. Galloway
L. D. Galloway