

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 South Blanco Pictured Cliffs Extension Pool. The El Paso Natural Gas Company Warren No. 5 (PM) is located 1850 feet from the North line and 1750 feet from the East line of Section 24, Township 28 North, Range 9 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 171' with 150 sacks of cement circulated to the surface.
2. 7-5/8" intermediate casing set at 2329' and cemented with 250 sacks of cement. Top of cement by temperature survey was 810' which is above the top of the Pictured Cliffs at 2203'.
3. 5-1/2" liner set from 2349' to 4707' with 300 sacks of cement. The top of the liner was squeezed with 100 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 Pictured Cliffs formation was perforated in one interval 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" EUE tubing at 2437' 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

Page 10 of 12

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. *Chrysomelidae* (100%)

[illegible]

$\frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$

1. 在 1950 年 10 月 1 日以前，凡在中华人民共和国领域内居住，具有中华人民共和国国籍的公民，均为中华人民共和国公民。

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. The first step in the process of the development of a new product is the identification of a market need. This is often done through market research, which can be conducted in a variety of ways, including surveys, focus groups, and interviews. The goal is to understand what customers want and what problems they are trying to solve.

2. Once a market need has been identified, the next step is to develop a concept for a product that meets that need. This involves brainstorming ideas and creating a rough sketch of the product. It is important to consider the feasibility of the idea and to ensure that it is unique and innovative.

3. The third step is to create a prototype of the product. This is a physical model of the product that can be used to test the concept and to gather feedback from potential customers. The prototype can be made using a variety of materials and techniques, depending on the nature of the product.

4. The fourth step is to conduct a market test. This involves presenting the prototype to a small group of potential customers and asking them for their feedback. This can help to identify any problems with the product and to make improvements before the product is launched.

5. The final step is to launch the product. This involves creating a marketing plan and promoting the product to the target market. It is important to monitor the product's performance and to make adjustments as needed.

[illegible]

8. 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.
9. 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.

The offset operator to this well has been notified by registered mail regarding intentions to dual complete this well. Enclosed is a letter of approval from the offset operator. Also enclosed are:

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

It is intended to dedicate the E/2 of Section 24, Township 28 North, Range 9 West to the Mesa Verde formation and the NE/4 of Section 24, Township 28 North, Range 9 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

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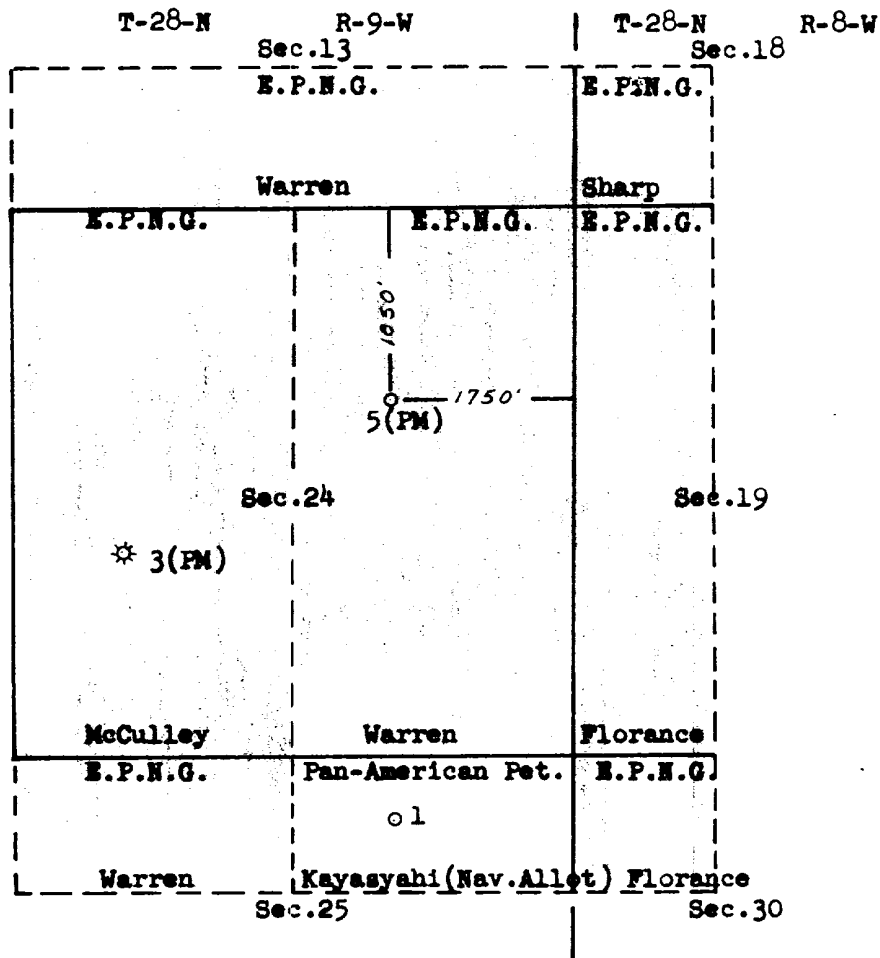
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PLAT SHOWING LOCATION OF DUAL COMPLETED
EL PASO NATURAL GAS WARREN NO. 5 (PM)
AND OFFSET ACREAGE

T-28-N R-9-W		T-28-N R-8-W	
Sec.13		Sec.18	
E.P.N.G.		E.P.N.G.	
Warren		Sharp	
E.P.N.G.	E.P.N.G.	E.P.N.G.	E.P.N.G.
	50		

PLAT SHOWING LOCATION OF DUAL COMPLETED
EL PASO NATURAL GAS WARREN NO. 5 (PM)
AND OFFSET ACREAGE



EL PASO NATURAL GAS COMPANY
EL PASO, TEXAS

SCALE

DATE

No.

DRAWN BY

CHECKED BY

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. E. E. Alsup

Date: April 17, 1957

From: Gas Engineering Department

Place: Farmington, New Mexico

DUAL COMPLETIONSubject: Test data on the El Paso Natural Gas Company Well,
WARREN # 5, San Juan County, New Mexico.

Tested By: R. A. Ullrich

Location Sec. 24 T. 28 R. 9 1850'N, 1750'E

Shut-In Pressure Pictured Cliffs SIPC 834 psig
Mesa Verde SIPT 1033 psig ; (Shut-in 9 days)0.750" Choke Volume 3952 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 5436 MCF/D

Working Pressure On Calculated 603 Psig

Producing Formation Mesa Verde

Stimulation Method Sand Water Frac

Total Depth 4710 - c/o - 4660. Packer at 2437

Field Blanco

H₂S Sweet to lead acetate.

Final SIPC (Pictured Cliffs) - 832 psig

cc: D. H. Tucker

H. H. Lines

~~*****~~

Bill Parrish

W. T. Hollis

Dean Rittmann

~~*****~~

W. M. Rodgers

~~*****~~

Drilling Department

B. D. Adams

Roland Hamblin

Jack Purvis

W. V. Holik

C. C. Kennedy

E. J. Coel, Jr. (6)

A. J. Dudenhoeffer

File

Lewis D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY
GAS WELL TEST

To: Mr. E. E. Alsup

Date: April 8, 1957

From: Gas Engineering Department

Place: Farmington, New Mexico

DUAL COMPLETION

Subject: Test data on the El Paso Natural Gas Company Well,
WARREN #5, San Juan County, New Mexico.

Tested By: K. C. McBride

Location Sec. 24 T. 28 R. 9 1850'N, 1750'E

Shut-In Pressure Pictured Cliffs SIPC 780 psig ; (Shut-in 7 days)
Pictured Cliffs SIPT 781 psig
Mesa Verde SIPT 991 psig

0.750" Choke Volume 2809 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 2984 MCF/D

Working Pressure On tubing 196 Psig

Producing Formation Pictured Cliffs

Stimulation Method Sand Water Frac

Total Depth 4710 - c/o - 4660'

Field Undesignated

H₂S Sweet to lead acetate.

cc: D. H. Tucker

~~*****~~

W. T. Hollis

~~*****~~

W. M. Rodgers

~~*****~~

Drilling Department

B. D. Adams

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A. J. Dudenhoefter

File

H. H. Lines
Bill Parrish
Dean Rittmann

Lewis D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY

Box 997
Farmington, N.M.

April 18, 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, Warren # 5, NE 24-28-9,
San Juan 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 2437 feet. The Pictured Cliffs zone was tested April 8, 1957 with the following results:

Pictured Cliffs - SIPC - 780 psig; shut-in 7 days.
Pictured Cliffs - SIPT - 781 psig
Mesa Verde - SIPT - 991 psig.

The casing was opened at 11:25 A.M. and flowed three hours through a 3/4" choke.

<u>Time</u>	<u>Casing Choke Pressure, Psig</u>	<u>Temp. OF</u>	<u>Tubing Pressure, Psig</u>
11:25	Opened casing		991
11:40	433		992
11:55	341		993
12:10	297		993
12:25	271		993
1:50	204		994
2:25	189	62	994

The calculated choke volume was 2809 MCF/Day. After the well was shut-in for 9 days, the Mesa Verde zone was tested with the following results:

Pictured Cliffs - SIPC - 834 psig
Mesa Verde - SIPT - 1033 psig; shut-in 9 days.

The tubing was opened at 11:00 A.M. through a 3/4" positive choke and flowed for three hours.

<u>Time</u>	<u>Tubing Choke Pressure, Psig</u>	<u>Temp. Of</u>	<u>Casing Pressure, Psig</u>
11:00	Tubing opened		834
11:15	450		835
11:30	390		835
11:45	361		834
12:00	347		834
2:00	283	66	832

The calculated choke volume was 3952 MCF/D. These tests were witnessed by Mr. E. C. Arnold of the New Mexico Oil Conservation Commission.

Very truly yours,

K. C. McBride

K. C. McBride
Gas Engineer

KCMCB/jla

cc: W. T. Hollis
W. R. Rodgers
E. J. Coel, Jr.
File

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

DUAL COMPLETION

DATE April 17, 1957

Operator El Paso Natural Gas Company		Lease Warren # 5	
Location 1850'N, 1750'E, Sec. 24-28-9		County San Juan State New Mexico	
Formation Mesa Verde		Pool Blanco	
Casing Diameter 7 5/8	Set At Feet 2408	Tubing Diameter 2"	Set At Feet 4612
Pay Zone Feet 4467	4652	Total Depth 4710 - 4660. Packer at 2437.	
Stimulation Method Sand Water Frac		Flow Through Casing Flow Through Tubing	

Choke Size, Inches 0.75	Choke Constant, C 14.1605	5 1/2" liner - 2349 to 4707
Shut-In Pressure, Casing P.C. 834	PSIG 12 PSIA 9	Shut-In Pressure, Tubing 1033
Flowing Pressure, P 283	PSIG 12 PSIA 295	Annulus Pressure, P _W Calculated 615
Temperature, T 66	.75	Gravity 1.035

Final SIPC (Pictured Cliffs) - 832 psig

CHOKE VOLUME $Q = C \times P_1 \times F_1 \times F_2 \times F_{gv}$

$$C = 14.1605 \times 295 \times .9943 \times .9193 \times 1.035$$

3952

MCF/D

OPEN FLOW $Aof = \left(\frac{P_1^2}{P_2^2 - P_1^2} \right)^n$

$$Aof = \left(\frac{1,092,025}{713,800} \right)^{.75} (1,5298)^{.75} \times 3952 = 1.3755 \times 3952$$

Aof **5436**

MCF/D

By **R. A. Ullrich**

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

L. D. Galloway
L. D. Galloway

EL PASO NATURAL GAS COMPANY
OPEN FLOW TEST DATA

DUAL COMPLETION

DATE April 8, 1957

Operator El Paso Natural Gas Company		Lease Warren # 5	
Location 1850'N, 1750'E, Sec. 24-28-9		County San Juan	State New Mexico
Formation Pictured Cliffs		Pool Undesignated	
Casing 7 5/8	Set At: Feet 2408	Tubing Diameter 1 1/2	Set At: Feet 2264
Pay Zone: Feet 2230	2270	Total Depth 4710 - c/o - 4660	
Stimulation Method Sand Water Frac		Flow Through: Gas X	

Choke Size, inches .750	Choke Constant: C 14.1605	5 1/2" liner - 2349 to 4707. Packer at 2437	
Shut-in Pressure, psig 780	PSIG - 12" PSIA 792	Days Since 7	Shut-in Pressure, psig 791
Flowing Pressure, P 189	PSIG - 12" PSIA 201	Working Pressure, Pw 196	PSIG - 12" PSIA 208
Temperature, F 62	F .65	Rel. From Tables 1.017	Gravity .635

SIPT (A.V.) - 991. Ending SIPT (A.V.) - 994.

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

$$= 14.1605 \times 201 \times .9981 \times .9721 \times 1.017$$

2809

MCF/D

OPEN FLOW $Q = \left(\frac{P_1^2 - P_2^2}{P_1^2} \right)^n$

$$Q = \left(\frac{628,849}{585,585} \right)^n (1.0738)^{.85} \times 2809 = 1.0624 \times 2809$$

$$Q = 2984 \text{ MCF/D}$$

By: **K. C. McBride**

With: cc: **L. J. Coel, Jr. (6)**

L. D. Galloway
L. D. Galloway

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 1, 1957, I was called to the location of the El Paso
Natural Gas Company Warren No. 5 (PM) Well located in the SW/4
NE/4 of Section 24, Township 28 North, Range 9 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 2437 feet. The production packer was properly set in
accordance with the usual practices and customs of the industry.

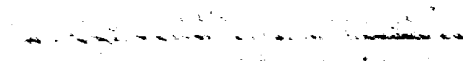
Mack M. Mahaffey
Mack M. Mahaffey

Subscribed and sworn to before me, a Notary Public in and
for San Juan County, New Mexico, the 9 day of MAY,
1957.

Walter B. MacIsaac
Notary Public in (and for San Juan
County, New Mexico

My commission expires:

2-24-60



1. *Chlorophyll a* (Chl *a*)

1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 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, 26

SCHEMATIC DIAGRAM OF DUAL COMPLETION
 EPNG WARREN NO. 5 (1M)
 (NE Section 24-T28N-R5W)

Zero Measurements 8.9'
 above tubing hanger.

