

CLSF
File

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Type Test ☒ Initial ☐ Annual ☐ Special					Test Date 3/12/90				
Company Santa Fe Energy Resources, Inc.					Connection None				
Well Malaga Atoka Gas					Formation Atoka Bank		Unit		
Completion Date 3/6/90		Total Depth 12,137'		Plug Back TD 12,050'		Elevation 3009' KB		Farm or Lease Name Malaga 1 Fed. Com.	
Coq. Size 4 1/2	Wt. 13.5#	d 3.920	Set At 12,135	Perforations: From 11,926.5 To 11,940		Well No. 1			
Trq. Size 2 3/8	Wt. 4.7#	d 1.995	Set At 11,751	Perforations: From Open To Ended		Unit Sec. Twp. Rye. N 1 24s 28e			
Type Well - Single - Brdenhead - G.G. or G.O. Multiple Single					Packer Set At 11,644'		County Eddy		
Producing Thru Tbg		Reservoir Temp. °F 173° @ 11,609'		Mean Annual Temp. °F 60°		Baro. Press. - P _a 13.2		State New Mexico	
L	H	G _g	% CO ₂	% N ₂	% H ₂ S	Prover	Meter Run	Taps	
-	-	0.575	0.89	0.49	-	-	3.068	FLC	

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g. DWT	Temp. °F	Press. p.s.i.g.		Temp. °F
SI							3370		Packer		168 hrs.
1.	3.068 x 0.750			500	4"	71	3310				1.0 hr.
2.	3.068 x 0.750			510	40"	50	3105				1.0 hr.
3.	3.068 x 0.750			520	89"	60	2815				1.0 hr.
4.	3.068 x 1.250			500	22"	64	2515				1.0 hr.
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor F _g	Super Compress. Factor, F _{sp}	Rate of Flow Q, Mscf/d
1	2.672	45.31	513.2	0.9896	1.319	1.038	164
2	2.672	144.67	523.2	1.010	1.319	1.044	538
3	2.672	217.84	533.2	1.000	1.319	1.042	800
4	7.577	106.26	513.2	0.9962	1.319	1.039	1099
5							

NO.	P _r	Temp. °R	T _g	Z	Gas-Liquid Hydrocarbon Ratio	A.P.I. Gravity of Liquid Hydrocarbons	Specific Gravity Separator Gas	Specific Gravity Flowing Fluid	Critical Pressure	Critical Temperature
1	0.76	531	1.53	0.929	Dry Gas	-	XXXXXX	XXXXX	672	346
2	0.77	510	1.47	0.918						
3	0.79	520	1.50	0.921						
4	0.76	524	1.51	0.926						
5										

P_c 4344.2 P_c² 18872.1 *

NO.	P ₁ ²	P _w	P _w ²	P _c ² - P _w ²	(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 3.244$	(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.060$
1		4293.2	18431.6	440.5		
2		3992.2	15937.7	2934.4		
3		3613.2	13055.2	5816.9		
4		3238.2	10485.9	8386.2		
5						

AOF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1648$

Post ID-2
4-20-90
comp + BK

Absolute Open Flow	1648	Mscf @ 15.025	Angle of Slope @	58° 27'	Slope, n	0.614
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Remarks: * Bottom hole pressures @ 11,933 (-8924) used for pressure calculations

Approved By Division	Conducted By: Jarrel Services, Inc.	Calculated By: D. Dickerson	Checked By: D. Dickerson
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