

July 19, 1991

clsf
F20

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Type Test ☒ Initial ☐ Annual ☐ Special						Test Date 07-01-91			
Company Santa Fe Energy Resources, Inc.				Connection Vented					
Pool <i>S. Carlisle Morrow</i>				Formation Morrow				Unit	
Completion Date 5-18-91		Total Depth 11,840		Plug Back TO 11,750		Elevation		Farm or Lease Name Sheep Dip Fed. Com.	
Csg. Size 4 1/2		Wt. 11,836		Perforations From 11,381 To 11,459		Well No. 1			
Tub. Size 2 7/8 & 2 3/8		Wt. 6.5 & 4.7		Perforations From To		Unit I		Sec. Twp. Rge. 20 23 26	
Type Well - Single - Brdenhead - G.C. or G.O. Multiple Single						Packer Set At 11,317.60		County Eddy	
Producing Thru Tubing		Reservoir Temp. °F 187 & 11,339		Mean Annual Temp. °F 60		Baro. Press. - P _a 13.2		State New Mexico	
L *11,339		H *11,339		G _g .647		% CO ₂ 8.10		% N ₂ 0.23	
						% H ₂ S		Prover 3.068	
								Taps Flange	

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.	Temp. °F	Press. p.s.i.g.		Temp. °F
SI							3560		PKR		72 hr.
1.	3	X	1.750	525	6.00	86	3370		PKR		1 hr.
2.	3	X	1.750	535	10.00	80	3090		PKR		1 hr.
3.	3	X	1.750	540	20.00	80	2700		PKR		1 hr.
4.	3	X	1.750	540	32.00	80	2190		PKR		1 hr.
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	15.61	56.83	538.2	.9759	1.243	1.044	1,124
2	15.61	74.04	548.2	.9813	1.243	1.045	1,473
3	15.61	105.19	553.2	.9813	1.243	1.045	2,093
4	15.61	133.05	553.2	.9813	1.243	1.045	2,647
5							

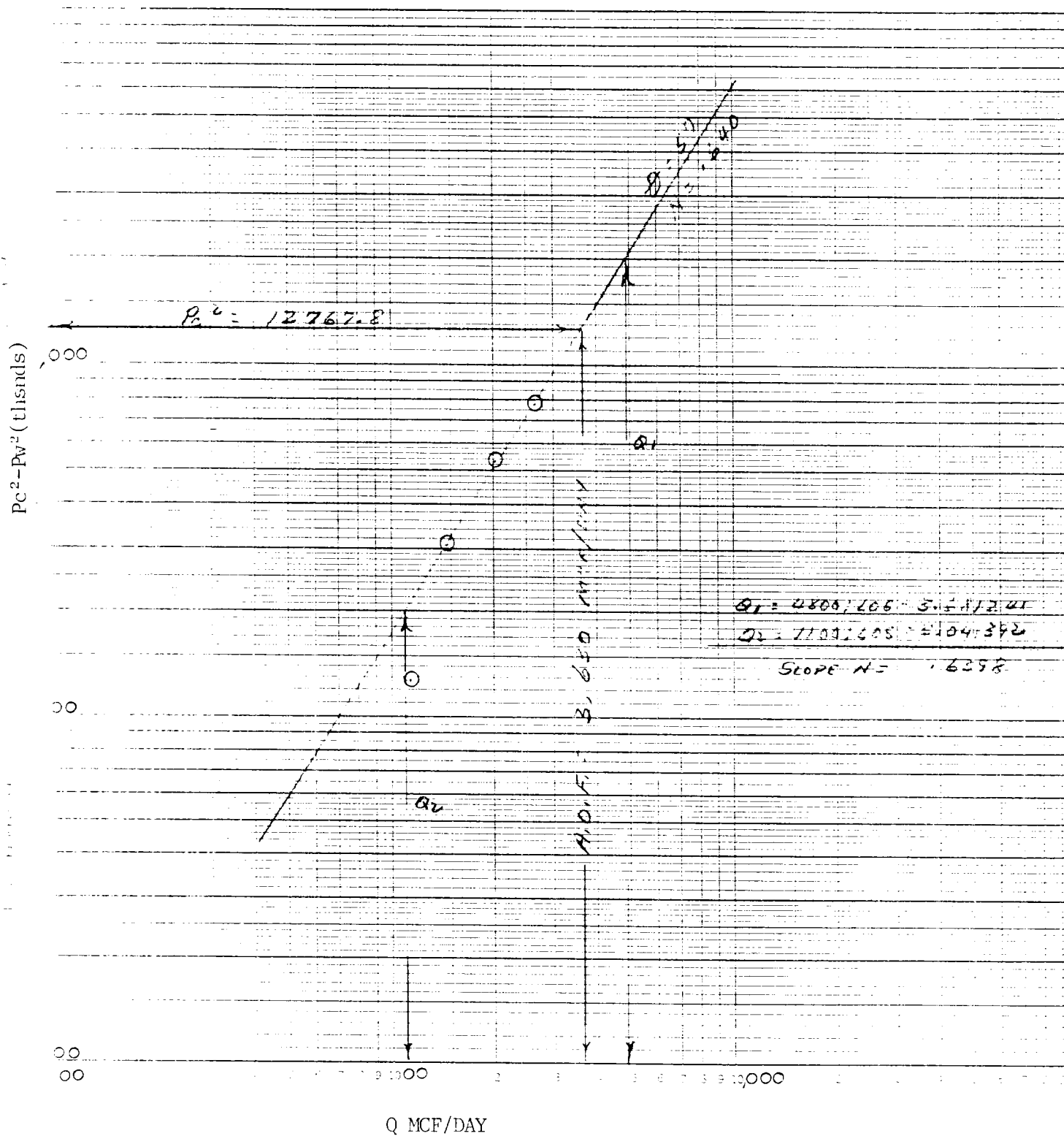
NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	Mc/abbl.
					DRY GAS	
					A.P.I. Gravity of Liquid Hydrocarbons	DRY
1.	.84	546	1.52	.917	Specific Gravity Separator Gas	.647
2.	.86	540	1.50	.915	Specific Gravity Flowing Fluid	X X X X X
3.	.86	540	1.50	.915	Critical Pressure	**636
4.	.86	540	1.50	.915	Critical Temperature	**358
5.						

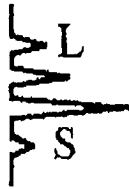
NO.	P _r ²	P _w ²	P _r ² - P _w ²	(1) $\frac{P_r^2}{P_r^2 - P_w^2} =$	(2) $\left[\frac{P_r^2}{P_r^2 - P_w^2} \right]^n =$
1	3386.7	11469.6	1298.2	1.638	1.371
2	3109.5	9669.1	3098.7		
3	2727.3	7437.9	5329.8		
4	2230.0	4972.7	7795.0		
5					

Absolute Open Flow		3,629	Mcfd @ 15.025	Angle of Slope θ	57	Slope, n	.640
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Remarks		*=MIXED STRING TBG. 2 7/8=8807' 2 3/8=2532.65	
		**=corrected to 8.10% CO ₂	
NO FLUID PRODUCED DURING TEST			

Santa Fe Energy Resources, Inc.
 Sheep Dip Fed. Comm., Well # 1
 20 - 23 - 26
 Eddy County, New Mexico
 07-01-91





Laboratory Services

1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

RECEIVED

JUL 19 1991

O. C. D.
ARTESIA, OFFICE

FOR: Pro Well Testing & Wireline SAMPLE Sheep Dip 20
Attention: Mr. Leonard Abney IDENTIFICATION: Federal Com #1
P. O. Box 791 COMPANY: Sante Fe Energy
Hobbs, New Mexico 88240 LEASE:
PLANT:

SAMPLE DATA: DATE SAMPLED: 7/1/91 12:20PM GAS (XX) LIQUID ()
ANALYSIS DATE: 07-01-91 SAMPLED BY: Leonard Abney
PRESSURE - PSIG ANALYSIS BY: Rolland Perry
SAMPLE TEMP. °F
ATMOS. TEMP. °F 80.00

REMARKS:

COMPONENT ANALYSIS

COMPONENT	MOL PERCENT	GPM	
Oxygen (O2)			
Hydrogen Sulfide (H2S)			
Nitrogen (N2)	0.23		
Carbon Dioxide (CO2)	8.10		
Methane (C1)	89.32		
Ethane (C2)	2.06	0.549	
Propane (C3)	0.22	0.060	
I-Butane (IC4)	0.02	0.007	
N-Butane (NC4)	0.03	0.009	
I-Pentane (IC5)	0.00	0.000	
N-Pentane (NC5)	0.00	0.000	
Hexane (C6)	0.02	0.008	
Heptanes Plus (C7+)	0.00	0.000	
	100.00	0.633	
BTU/CU.FT. - DRY	947	MOLECULAR WT	18.7194
AT 14.650 DRY	944		
AT 14.650 WET	927	26# GASOLINE -	0.011
AT 15.025 DRY	968		
AT 15.025 WET	951		
SPECIFIC GRAVITY -			
CALCULATED	0.647		
MEASURED	0.000		

COMPANY :	SANTA Fe ENERGY	LEASE :	SHEEP DIP FED COM	WELL NO. :	1	Pc =	3573.2	Pc2 =	12767.8 *
UNIT :		SECTION :	20	TOWNSHIP :	23				*
L :	11339	H :	11339	L/H :	1	G/GMIX :	0.647	Pt2 =	***** Pw =
%CD2 :	8.1	%N2 :	0.23	H2S :		DATE :	7 1 91		9629.9 3109.5 *
d :	2.282	Fr :	0.012833	GH :	7336.3	RANGE :			7361.5 2727.3 *
									4854.1 2230.0 *
									*
VOL 1 :	1124	PSIA 1 :	3383.2	RESV. TEMP	187.4			Pc2-Pw2=	1298.2 Pw2 =
VOL 2 :	1473	PSIA 2 :	3103.2						3098.7 11469.6 *
VOL 3 :	2093	PSIA 3 :	2713.2	SHUT-IN PR=	3573.2				5329.8 9669.1 *
VOL 4 :	2647	PSIA 4 :	2203.2						7795.0 7437.9 *
									4972.7 *
									*
								n =	0.640 *
									*
								Pc2/(Pc2-Pw2) =	9.835 *
LINE	RATE 1		RATE 2		RATE 3		RATE 4		4.120 *
	'1ST	'2ND	'1ST	'2ND	'1ST	'2ND	'1ST	'2ND	2.396 *
									1.638 *
1	DM	1.124	1.124	1.473	1.473	2.093	2.093	2.647	2.647 *
2	TW	534	534	534	534	534	534	534	534 *
3	Te	647.4	647.4	647.4	647.4	647.4	647.4	647.4	647.4 *
4	T	590.7	590.7	590.7	590.7	590.7	590.7	590.7	590.7 *
	FR (est)	5.32		4.88		4.27		3.46	
									1.371 *
5	Z(est)	0.859	0.893	0.845	0.872	0.831	0.848	0.824	0.827 *
6	TZ	507.6	527.3	499.2	515.1	490.6	500.8	486.5	488.7 *
7	GH/TZ	14.452	13.913	14.696	14.242	14.953	14.649	15.081	15.012 *
8	eS	1.719	1.685	1.735	1.706	1.752	1.732	1.760	1.756 *
9	1-e-S	0.418	0.407	0.424	0.414	0.429	0.423	0.432	0.430 *
									3.630 *
10	Pt	3383.2	3383.2	3103.2	3103.2	2713.2	2713.2	2203.2	2203.2 *
11	Pt2 /10000	11446.0	11446.0	9629.9	9629.9	7361.5	7361.5	4854.1	4854.1 *
12	Fr	0.012833	0.012833	0.012833	0.012833	0.012833	0.012833	0.012833	0.0128334 *
13	Fc=FrTZ	6.514	6.767	6.407	6.611	6.296	6.427	6.243	6.272 *
14	FcQm	7.32	7.61	9.44	9.74	13.18	13.45	16.53	16.60 *
15	L/4(FcQm)	53.6	57.9	89.1	94.8	173.7	181.0	273.1	275.6 *
16	Pw	22.43283	23.51832	37.73180	39.23791	74.54126	76.48633	117.9598	118.63643 *
17	Pw2	11468.5	11469.6	9667.6	9669.1	7436.0	7437.9	4972.1	4972.7 *
18	Ps2	19718.9	19325.8	16774.6	16493.9	13027.7	12883.1	8752.7	8731.4 *
19	Ps	4440.6	4396.1	4095.7	4061.3	3609.4	3589.3	2958.5	2954.9 *
20	P	3911.9	3889.7	3599.4	3582.2	3161.3	3151.3	2580.8	2579.0 *
21	Pr	6.15	6.12	5.66	5.63	4.97	4.95	4.06	4.06 *
22	Tr	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65 *
23	I	0.893	0.891	0.872	0.871	0.848	0.847	0.827	0.827 *

FORM C122-D *

Equivalent Diameter Program
Author: Bob Murray
Date: December 26, 1990

L1 =	8807 ft.	L5 =	0 ft.	Lt =	11339.65 ft.
D1 =	2.441 in.	D5 =	1 in.	C =	0.10797
L2 =	2532.65 ft.	L6 =	0 ft.		
D2 =	1.995 in.	D6 =	1 in.		
				Deff =	2.282 in.
L3 =	0 ft.	L7 =	0 ft.	Fr =	0.01251
D3 =	1 in.	D7 =	1 in.		
L4 =	0 ft.	L8 =	0 ft.		
D4 =	1 in.	D8 =	1 in.		