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State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-122
Revised 4-1-91

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Operator SANTA FE ENERGY RESOURCES, INC.					Lease or Unit Name STERLING SILVER "33"				
Type Test ☒ Initial ☐ Annual ☐ Special					Test Date 2-24-95		Well No. 7		
Completion Date 1-7-95		Total Depth 14828		Plug Back TD 14150		Elevation		Unit Lr. - Sec. - TWP - Rge. (E), Sec. 33, 23S, 31	
Csg. Size 4 1/2	Wt. 13.5	d 3.920	Set At 14828	Perforations: From: 14566 To: 14610		County Eddy			
Tbg. Size 2-3/8	Wt. 4.7	d 1.995	Set At 14450	Perforations: From: To:		Pool			
Type Well - Single - Bradenhead - G.G. or G.O. Multiple single					Packer Set At 14450		Formation ATOKA		
Producing Thru TBG		Reservoir Temp. °F 60		Mean Annual Temp. °F 60		Baro. Press - P. 13.2		Connection	
L 14450	H 14450	Gg .578	% CO ₂ .53	% N ₂ 1.09	% H ₂ S	Prover 2.067	Meter Run 2.067	Taps FLG.	

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	
SI							5250	PKR	24 hr.
1.	2 X 1.500			720	12.00	70	4340	"	1 hr.
2.	2 X 1.500			725	18.00	55	3740	"	1 hr.
3.	2 X 1.500			730	22.00	54	3300	"	1 hr.
4.	2 X 1.500			735	34.00	56	2900	"	1 hr.
5.									

RATE OF FLOW CALCULATIONS							
NO.	COEFFICIENT (24 HOUR)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor Fg.	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1.	12.76	93.80	733.2	.9905	1,315	1.058	1,649
2.	12.76	115.27	738.2	1.005	1,315	1.058	2,057
3.	12.76	127.87	743.2	1.006	1,315	1.059	2,286
4.	12.76	159.50	748.2	1.004	1,315	1.059	2,846
5.							

NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	DRY GAS	Mcf/bbl.
1.	1.09	530	1.54	.894	A.P. I. Gravity of Liquid Hydrocarbons	DRY	Deg.
2.	1.10	515	1.50	.893	Specific Gravity Separator Gas	.578	XXXXXXXXXX
3.	1.10	514	1.49	.892	Specific Gravity Flowing Fluid	XXXXXX	
4.	1.11	516	1.50	.892	Critical Pressure	*671	P.S.I.A. P.S.I.A.
5.					Critical Temperature	*343	R R

P _c 5263.2	P _c ² 27701.3						
NO.	P _i ²	P _w	P _w ²	P _c ² - P _w ²	1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.469$	(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.408$	
1.	4369.7	19094.3	8607.0				
2.	3780.5	14292.2	13408.8				
3.	3349.3	11217.8	16483.5				
4.	2973.5	8841.7	18859.7				
5.							

Absolute Open Flow	4,004	Mcf @ 15.025	Angle of Slope θ	48.6	Slope, n	.890
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Remarks: NO FLUID PRODUCED

*=CORRECTED TO 1.09% N₂

Approved By Division	Conducted By: PRO WELL TESTER	Calculated By: BM	Checked By: BM
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Q MCF/DAY



FORM 0-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95

UNIT : 0 SECTION : 5 TOWNSHIP : 24 RANGE : 31

L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578

CO2 : 0.53 N2 : 1.09 H2S : 0

a : 1.995 Fr : 0.018231 Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		14450	7225		0		
2	SH		8352.1	4176.05		0		
3	37.5GH		313204	156602		0		
								DELTA P = 1300.1
								PW = 4369.7
4	Pc or Pn		5669.7	5058.9	5040.3	4412.3	4363.6	4365.7
5	Pr		8.52	7.54	7.51	6.58	6.50	6.51
6	T		678.5	606.25	606.25	534	534	534
7	Tr		1.98	1.77	1.77	1.56	1.56	1.56
8	Z		1.080	1.007	1.005	0.911	0.907	0.907
9	P/ZP/Z	4/8	5293.5	5026.1	5014.2	4844.0	4811.9	4813.3
10	P/TZ	9/6	7.8017	8.2905	8.2709	9.0712	9.0111	9.0137
11	Ln10 ² /1000	(10)2/100						
12	L/H(FrQm)2							
13		11+12						
14	In	10/13	128.177	120.620	120.906	110.239	110.975	110.942
15	M=Pn-Pn-1			611	629	628	677	675
16	N=In+In-1			248.797	249.083	231.145	231.881	231.848
17	M x N	15x16			156782			156400
18	SUM(MxN)	SUM17	313204		156422			

FORM G-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95

UNIT : 0 SECTION : 3 TOWNSHIP : 24 RANGE : 31

L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578

Q2 : 0.53 N2 : 1.09 H2S : 1.09

a : 1.995 Fr : 0.018231 Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	6	
1	H		14450	7225		0			
2	GH		8352.1	4176.05		0			DELTA P = 1184.2
3	37.5GH		313204	156602		0			
									PW = 3780.5
4	Pc or Pn		4964.7	4407.3	4390.9	3818.5	3774.4	3777.8	
5	Pr		7.46	6.57	6.54	5.69	5.63	5.63	
6	T		678.5	606.25	606.25	534	534	534	
7	Tr		1.98	1.77	1.77	1.56	1.56	1.56	
8	Z		1.037	0.963	0.962	0.865	0.865	0.862	
9	P/ZP/Z	4/8	4830.6	4577.5	4565.4	4416.5	4365.5	4384.1	
10	P/TZ	9/6	7.1195	7.5505	7.5305	8.2707	8.1751	8.2099	
11	Ln10 ⁻² /1000:(10)2/100								
12	L/H(FrQm)2								
13	11+12								
14	In	10/13	140.458	132.441	132.794	120.909	122.322	121.804	
15	M=Pn-Pn-1			557	574	572	616	613	
16	N=In+In-1			272.899	273.252	253.703	255.116	254.597	
17	M x N	15x16			156804			156082	
18	SUM(MxN)	SUM17	313204		156400				

FORM 0-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : SANTA FE LEASE :SS 33 WELL NO. : 1 DATE : 2 24 95
 UNIT : 0 SECTION : 5 TOWNSHIP : 24 RANGE : 31
 L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578
 Q02 : 0.53 H2 : 1.09 H2S : 0
 a : 1.995 Fr :0.018231 Qm : 0.000 (L/H)(FrQm)0.000000

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		14450	7225		0		
2	GH		8352.1	4176.05		0		
3	37.5GH		313204	156602		0		
4	Pc or Pn		4435.4	3922.8	3908.4	3382.9	3343.5	3345.9
5	Pr		6.67	5.85	5.82	5.04	4.98	4.99
6	T		678.5	606.25	606.25	534	534	534
7	Tr		1.98	1.77	1.77	1.56	1.56	1.56
8	Z		1.007	0.934	0.934	0.836	0.834	0.834
9	P/ZP/Z	4/8	4441.9	4197.9	4186.0	4045.3	4009.1	4011.3
10	P/TZ	9/6	6.5466	6.9244	6.9047	7.5756	7.5076	7.5118
11	Ln10^2/1000!(10)2/100!							
12	L/H(FrQm)2							
13		11+12						
14	In	10/13	152.752	144.417	144.828	132.004	133.198	133.124
15	M=Pn-Pn-1			513	527	526	565	562
16	N=In+In-1			297.168	297.580	276.832	278.026	277.952
17	M x N	15x16			156819			156343
18	SUM(MxN)	SUM17	313204		156385			

DELTA P = 1086.0

PW = 3349.3

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SURFACE) PRESSURE (Pc & Pw)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95
 UNIT : 0 SECTION : 3 TOWNSHIP : 24 RANGE : 31
 L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578
 CO2 : 0.53 M2 : 1.09 H2S : 1.09
 a : 1.995 Fr : 0.018231 Qm : 0.000 $[(L/H)(FrQm)0.000000]$

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	6
1	H		14450	7225		0		
2	GH		8352.1	4176.05		0		
3	'37.5GH		313204	156602		0		
4	Pc or Pn		3963.0	3494.5	3482.0	3002.4	2968.1	2970.9
5	Pr		5.95	5.21	5.19	4.47	4.42	4.43
6	T		678.5	606.25	606.25	534	534	534
7	Tr		1.98	1.77	1.77	1.56	1.56	1.56
8	Z		0.983	0.913	0.913	0.817	0.817	0.816
9	P/ZP/Z	4/8	4060.3	3825.7	3814.4	3674.4	3632.4	3641.6
10	P/TZ	9/6	5.9842	6.3105	6.2918	6.8809	6.8023	6.8195
11	$\ln 10^2 / 1000 (10) 2 / 100$							
12	$L/H(FrQm)^2$							
13		11+12						
14	In	10/13	167.105	158.467	158.938	145.329	147.010	146.639
15	M=Pn-Pn-1			469	481	480	514	511
16	M=In+In-1			325.572	326.043	304.267	305.948	305.577
17	M x N	15x16			156829			156185
18	SUM(MxN)	SUM17	313204		156375			

DELTA P = 989.6

Pw = 2973.5

VOLUME 1: 1649 PSIA 1: 4353.2
2: 2057 2: 3753.2

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95
UNIT : SECTION : 3 TOWNSHIP : 24 RANGE : 31
L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578
CO2 : 0.53 N2 : 1.09 H2S : 0
d : 1.995 Fr : 0.018231 Qm : 1.649 '(L/H)(FrQm)0.000904

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5
1	H		0	7225		14450	
2	GH		0	4176.05		8352.10	DELTA P = 1316.5
3	37.5GH		0	156602		313204	Ps = 5669.7
4	Pc or Pn		4353.2	5065.6	5037.5	5719.2	5719.2
5	Pr		6.49	7.55	7.51	8.52	8.52
6	T		534	606.25	606.25	678.5	678.5
7	Tr		1.56	1.77	1.77	1.98	1.98
8	Z		0.906	1.007	1.005	1.080	1.080
9	P/ZP/Z	4/8	4805.0	5030.4	5012.4	5293.5	5293.5
10	P/TZ	9/6	8.9981	8.2976	8.2679	7.8017	7.8017
11	Ln10^2/1000	(10)2/100	0.08097	0.06885	0.06836	0.06087	0.06087
12	L/H(FrQm)2		0.000904	0.000904	0.000904	0.000904	0.000904
13		11+12	0.081870	0.069754	0.069261	0.061770	0.061770
14	In	10/13	109.907	118.955	119.372	126.302	126.302
15	m=Pn-Pn-1			712	684	682	636
16	N=In+In-1			228.862	229.279	245.674	245.674
17	M x N	15x16			156887		156317
18	SUM(MxN)	SUM17			156887		313204

FORM Q-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95

UNIT : 0 SECTION : 3 TOWNSHIP : 24 RANGE : 31

L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578

CO2 : 0.53 N2 : 1.09 H2S : 0

d : 1.995 Fr : 0.018231 Qm : 2.057 '(L/H)(FrGm)0.001406

PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	7225		14450		
2	GH		0	4176.05		8352.10		DELTA P = 1211.5
3	57.5GH		0	156602		313204		Ps = 4964.7
4	Pc or Pn		3753.2	4406.6	4381.9	5008.0	5008.0	
5	Pr		5.59	6.57	6.53	7.46	7.46	
6	T		534	606.25	606.25	678.5	678.5	
7	Tr		1.56	1.77	1.77	1.98	1.98	
8	Z		0.860	0.963	0.961	1.037	1.037	
9	P/ZP/Z	4/8	4364.2	4577.0	4558.6	4830.6	4830.6	
10	P/TZ	9/6	8.1727	7.5497	7.5194	7.1195	7.1195	
11	Ln10^2/1000	(10)2/100	0.06679	0.05700	0.05654	0.05069	0.05069	
12	L/H(FrGm)2		0.001406	0.001406	0.001406	0.001406	0.001406	
13		11+12	0.068200	0.058405	0.057948	0.052094	0.052094	
14	In	10/13	119.835	129.266	129.762	136.667	136.667	
15	M=Pn-Pn-1			653	629	626	587	
16	N=In+In-1			249.101	249.597	266.428	266.428	
17	M x N	15x16			156914		156290	
18	SUM(MxN)	SUM17			156914		313204	

VOLUME 1: 2286 PSIA 1: 3313.2
2: 2846 2: 2913.2

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95
UNIT : SECTION : 3 TOWNSHIP : 24 RANGE : 31
G : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578
CO2 : 0.53 N2 : 1.09 H2S : 0
a : 1.995 Fr : 0.018231 Qm : 2.286 (L/H)(FrQm)0.001737
PCR : 671 TCR : 343

LINE	ITEM	SOURCE	1	2	3	4	5
1	H		0	7225		14450	
2	GH		0	4176.05		8352.10	DELTA P = 1122.2
3	'37.5GH		0	156602		313204	Ps = 4435.4
4	Pc or Pn		3313.2	3915.2	3894.0	4472.4	4472.4
5	Pr		4.94	5.83	5.80	6.67	6.67
6	T		534	606.25	606.25	678.5	678.5
7	Tr		1.56	1.77	1.77	1.98	1.98
8	Z		0.832	0.934	0.933	1.007	1.007
9	P/ZP/Z	4/8	3980.8	4191.6	4174.0	4441.9	4441.9
10	P/TZ	9/6	7.4548	6.9140	6.8850	6.5466	6.5466
11	Ln10 ² /1000	(10)2/100	0.05557	0.04780	0.04740	0.04286	0.04286
12	L/H(FrQm)2		0.001737	0.001737	0.001737	0.001737	0.001737
13		11+12	0.057310	0.049540	0.049140	0.044595	0.044595
14	In	10/13	130.077	139.563	140.110	146.802	146.802
15	M=Pn-Pn-1			602	581	578	545
16	N=In+In-1			269.640	270.187	286.912	286.912
17	M x N	15x16			156920		156284
18	SUM(MxN)	SUM17			156920		313204

FORM C-122E WORKSHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (Pf & Ps)

COMPANY : SANTA FE LEASE : SS 33 WELL NO. : 1 DATE : 2 24 95

UNIT : 0 SECTION : 3 TOWNSHIP : 24 RANGE : 31

L : 14450 H : 14450 L/H : 1.0 G/GMIX : 0.578

CO2 : 0.53 N2 : 1.09 H2S : 0

a : 1.995 Fr : 0.018231 Qm : 2.846 (L/H)(FrQm)0.002692

PCR : 671 TOR : 343

LINE	ITEM	SOURCE	1	2	3	4	5	
1	H		0	7225		14450		
2	GH		0	4176.05		8352.10		DELTA P = 1049.8
3	37.5GH		0	156602		313204		Ps = 3963.0
4	Pc or Pn		2913.2	3469.7	3453.4	3991.6	3991.6	
5	Pr		4.34	5.17	5.15	5.95	5.95	
6	T		534	606.25	606.25	678.5	678.5	
7	Tr		1.56	1.77	1.77	1.98	1.98	
8	Z		0.814	0.912	0.912	0.983	0.983	
9	P/ZP/Z	4/8	3580.6	3803.1	3788.1	4060.3	4060.3	
10	P/TZ	9/6	6.7053	6.2731	6.2484	5.9842	5.9842	
11	Ln10 ² /1000	(10)2/100	0.04496	0.03935	0.03904	0.03581	0.03581	
12	L/H(FrQm)2		0.002692	0.002692	0.002692	0.002692	0.002692	
13		11+12	0.047653	0.042044	0.041735	0.038503	0.038503	
14	In	10/13	140.711	149.204	149.717	155.422	155.422	
15	M=Pn-Pn-1			556	540	538	512	
16	N=In+In-1			289.914	290.428	305.139	305.139	
17	M x N	15x16			156879		156325	
18	SUM(MxN)	SUM17			156879		313204	