



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

SANTA FE ENERGY
COMPANY

BILBREY 21 FED COM. 1
WELL NAME

6660 S 1780/E

LEA COUNTY, NEW MEXICO
LOCATION

21-21-32

JOB NUMBER
430-1118
430-1118

TYPE OF SURVEY
GYROSCOPIC MULTI-SHOT SURVEY
MAGNETIC MULTI-SHOT SURVEY

DATE
24/JAN/90
25/JAN/90

SURVEY BY TIM STEPHENS

OFFICE MIDLAND

RECEIVED
APR 9 1990
C/O
HQBMS OFFICE

FOR

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* * * * *
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OPERATOR	:	SANTA FE ENERGY
WELL NAME	:	BILBREY 21 FED COM 1
LOCATION	:	LEA COUNTY, NEW MEXICO
JOB NUMBER	:	
RIG	:	GRACE RIG 56
DECLINATION	:	10.00 E

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EC DISTRICT : WEST TEXAS BASE



SANTA FE ENERGY
BILBREY 21 FED COM 1
LEA COUNTY, NEW MEXICO

DECLINATION : 10.00 JOB NUMBER :
DATE PRINTED : 25-JAN-90
OUR REF. NO. : 501393.45F

PAGE NO. 2

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
0.00	0 0	N 0 0 E	0.00	0.00	0.00 N 0.00 E	0.00
100.00	0 30	S 65 19 W	100.00	100.00	0.18 S 0.40 W	0.50
200.00	0 45	S 45 1 W	100.00	199.99	0.80 S 1.29 W	0.33
300.00	1 0	S 15 44 W	100.00	299.98	2.11 S 2.05 W	0.50
400.00	1 30	S 32 26 W	100.00	399.96	4.09 S 2.94 W	0.61
500.00	1 45	S 27 8 W	100.00	499.92	6.55 S 4.35 W	0.29
600.00	2 0	S 32 50 W	100.00	599.86	9.38 S 5.98 W	0.31
700.00	2 15	S 34 30 W	100.00	699.79	12.47 S 8.04 W	0.26
800.00	2 15	S 37 4 W	100.00	799.72	15.65 S 10.33 W	0.10
900.00	2 0	S 36 32 W	100.00	899.65	18.62 S 12.55 W	0.25
1000.00	2 0	S 37 55 W	100.00	999.59	21.40 S 14.66 W	0.05
1100.00	1 45	S 38 13 W	100.00	1099.53	23.98 S 16.68 W	0.25
1200.00	1 45	S 38 25 W	100.00	1199.49	26.37 S 18.57 W	0.01
1300.00	1 30	S 48 31 W	100.00	1299.45	28.43 S 20.52 W	0.38
1400.00	1 15	S 55 32 W	100.00	1399.42	29.90 S 22.41 W	0.30
1500.00	1 0	S 59 29 W	100.00	1499.40	30.96 S 24.07 W	0.26
1600.00	1 0	S 51 26 W	100.00	1599.38	31.95 S 25.51 W	0.14
1700.00	0 45	S 54 23 W	100.00	1699.37	32.87 S 26.72 W	0.25
1800.00	0 30	S 63 20 W	100.00	1799.37	33.43 S 27.66 W	0.27
1900.00	0 30	S 27 1 W	100.00	1899.36	34.04 S 28.27 W	0.31
2000.00	0 30	S 7 2 E	100.00	1999.36	34.88 S 28.41 W	0.29
2100.00	0 30	S 5 5 E	100.00	2099.35	35.75 S 28.32 W	0.02
2200.00	0 15	S 15 52 W	100.00	2199.35	36.40 S 28.38 W	0.28
2300.00	0 30	N 70 49 E	100.00	2299.35	36.77 S 28.00 W	0.68
2400.00	1 15	N 48 45 E	100.00	2399.34	36.00 S 26.68 W	0.81
2500.00	1 30	N 43 40 E	100.00	2499.31	34.34 S 24.95 W	0.28
2600.00	2 0	N 47 36 E	100.00	2599.26	32.21 S 22.77 W	0.51
2700.00	2 15	N 45 30 E	100.00	2699.19	29.66 S 20.08 W	0.26
2800.00	2 30	N 44 25 E	100.00	2799.11	26.73 S 17.15 W	0.25
2900.00	2 30	N 50 19 E	100.00	2899.01	23.77 S 13.94 W	0.26

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SANTA FE ENERGY
BILBREY 21 FED COM 1
LEA COUNTY, NEW MEXICO

DATE PRINTED : 25-JAN-90
OUR REF. NO. : S01393.4SF
DECLINATION : 10.00JOB NUMBER :

PAGE N 3

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	R E C T A N G U L A R C O O R D I N A T E S	DOG SEVE RITY
3000.00	3 0	N 51 12 E	100.00	2998.90	20.74 S 10.23 W	0 -50
3100.00	3 0	N 49 6 E	100.00	3098.76	17.38 S 6.21 W	0 -11
3200.00	3 0	N 52 59 E	100.00	3198.62	14.09 S 2.14 W	0 -20
3300.00	2 45	N 57 52 E	100.00	3298.50	11.25 S 1.99 E	0 -35
3400.00	2 45	N 59 12 E	100.00	3398.38	8.74 S 6.08 E	0 -06
3500.00	2 30	N 56 6 E	100.00	3498.28	6.29 S 9.95 E	0 -29
3600.00	2 30	N 51 59 E	100.00	3598.18	3.73 S 13.48 E	0 -18
3700.00	2 0	N 53 53 E	100.00	3698.10	1.37 S 16.61 E	0 -51
3800.00	1 45	N 51 46 E	100.00	3798.05	0.61 N 19.22 E	0 -26
3900.00	1 30	N 58 39 E	100.00	3898.01	2.23 N 21.54 E	0 -32
4000.00	1 30	N 67 31 E	100.00	3997.98	3.41 N 23.88 E	0 -23
4100.00	1 15	N 63 23 E	100.00	4097.95	4.41 N 26.06 E	0 -27
4200.00	1 15	N 70 14 E	100.00	4197.92	5.27 N 28.06 E	0 -15
4300.00	1 30	N 72 4 E	100.00	4297.89	6.04 N 30.33 E	0 -25
4400.00	1 0	N 61 54 E	100.00	4397.87	6.89 N 32.34 E	0 -55
4500.00	0 45	N 31 43 E	100.00	4497.86	7.92 N 33.44 E	0 -52
4600.00	0 30	N 55 32 E	100.00	4597.85	8.71 N 34.19 E	0 -36
4700.00	0 45	N 40 0 E	100.00	4697.85	9.44 N 34.99 E	0 -30
4800.00	0 45	N 26 0 E	100.00	4797.84	10.54 N 35.70 E	0 -18
4900.00	1 0	N 49 0 E	100.00	4897.83	11.74 N 36.63 E	0 -43
5000.00	0 30	N 78 0 E	100.00	4997.82	12.32 N 37.79 E	0 -61
5100.00	0 30	N 72 0 E	100.00	5097.81	12.54 N 38.63 E	0 -05
5200.00	0 15	N 80 0 E	100.00	5197.81	12.70 N 39.26 E	0 -25
5300.00	0 45	S 79 0 E	100.00	5297.81	12.69 N 40.13 E	0 -52
5400.00	0 30	S 78 0 E	100.00	5397.80	12.48 N 41.20 E	0 -25
5500.00	0 15	S 56 0 E	100.00	5497.80	12.22 N 41.80 E	0 -28
5600.00	0 0	N 0 0 E	100.00	5597.80	12.10 N 41.98 E	0 -25
5700.00	0 15	N 59 0 E	100.00	5697.80	12.21 N 42.17 E	0 -25
5800.00	0 15	S 31 0 E	100.00	5797.80	12.12 N 42.55 E	0 -35
5900.00	0 15	S 12 0 W	100.00	5897.80	11.70 N 42.62 E	0 -18

CONTINUED ON NEXT PAGE ...



SANTA FE ENERGY
BILBREY 21 FEB COM 1
LEA COUNTY, NEW MEXICO

DECLINATION : 10.00 JOB NUMBER :
DATE PRINTED : 25-JAN-90
OUR REF. NO. : S01393.4SF

PAGE NO. 4

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
6000.00	0 15	S 77 0 E	100.00	5997.79	11.36 N 42.83 E	0.35
6100.00	0 15	S 69 0 E	100.00	6097.79	11.24 N 43.25 E	0.03
6200.00	0 0	N 0 0 E	100.00	6197.79	11.16 N 43.45 E	0.25
6300.00	0 15	N 34 0 E	100.00	6297.79	11.34 N 43.57 E	0.25
6400.00	0 0	N 0 0 E	100.00	6397.79	11.52 N 43.70 E	0.25
6500.00	0 15	N 46 0 W	100.00	6497.79	11.67 N 43.54 E	0.25
6600.00	0 15	N 10 0 W	100.00	6597.79	12.05 N 43.34 E	0.15
6700.00	0 15	N 4 0 W	100.00	6697.79	12.48 N 43.28 E	0.03
6800.00	0 15	N 54 0 W	100.00	6797.79	12.85 N 43.08 E	0.21
6900.00	0 15	N 12 0 W	100.00	6897.79	13.21 N 42.85 E	0.18
7000.00	0 30	N 78 0 W	100.00	6997.79	13.65 N 42.41 E	0.46
7100.00	0 15	N 59 0 W	100.00	7097.78	13.89 N 41.80 E	0.28
7200.00	0 15	S 74 0 W	100.00	7197.78	13.94 N 41.38 E	0.20
7300.00	0 30	S 49 0 W	100.00	7297.78	13.63 N 40.81 E	0.29
7400.00	0 45	S 44 0 W	100.00	7397.77	12.88 N 40.02 E	0.26
7500.00	0 45	S 16 0 W	100.00	7497.77	11.76 N 39.37 E	0.36
7600.00	0 45	S 14 0 W	100.00	7597.76	10.49 N 39.03 E	0.03
7700.00	1 0	S 20 0 W	100.00	7697.74	9.03 N 38.58 E	0.27
7800.00	0 45	S 43 0 W	100.00	7797.73	7.74 N 37.79 E	0.43
7900.00	1 0	S 34 0 W	100.00	7897.72	6.55 N 36.84 E	0.28
8000.00	1 0	S 25 0 W	100.00	7997.71	5.03 N 35.99 E	0.16
8100.00	1 15	S 4 0 W	100.00	8097.69	3.14 N 35.50 E	0.48
8200.00	1 0	S 16 0 W	100.00	8197.67	1.21 N 35.16 E	0.34
8300.00	1 0	S 23 0 W	100.00	8297.65	0.43 S 34.57 E	0.12
8400.00	1 15	S 43 0 W	100.00	8397.63	2.07 S 33.51 E	0.46
8500.00	1 0	S 56 0 W	100.00	8497.61	3.35 S 32.02 E	0.36
8600.00	1 0	S 59 0 W	100.00	8597.60	4.28 S 30.55 E	0.05
8700.00	1 0	S 49 0 W	100.00	8697.58	5.31 S 29.14 E	0.17
8800.00	1 15	S 45 0 W	100.00	8797.56	6.65 S 27.70 E	0.26
8900.00	1 45	S 43 0 W	100.00	8897.53	8.53 S 25.88 E	0.50

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SANTA FE ENERGY
BILBREY 21 FED COM 1
LEA COUNTY, NEW MEXICO

DECLINATION : 10.00 JOB NUMBER :
DATE PRINTED : 25-JAN-90
OUR REF. NO. : S01393.4SF

PAGE NO. 5

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
9000.00	1 30	S 56 O W	100.00	8997.49	10.37 S 23.73 E	0.44
9100.00	1 30	S 61 O W	100.00	9097.45	11.74 S 21.50 E	0.13
9200.00	2 0	S 65 O W	100.00	9197.41	13.12 S 18.78 E	0.51
9300.00	2 30	S 85 O W	100.00	9297.33	14.13 S 15.01 E	0.92
9400.00	3 15	N 79 O W	100.00	9397.20	13.87 S 10.01 E	1.09
9500.00	3 30	N 85 O W	100.00	9497.03	13.05 S 4.19 E	0.43
9600.00	3 45	S 86 O W	100.00	9596.83	13.00 S 2.13 W	0.62
9700.00	3 45	N 89 O W	100.00	9696.61	13.17 S 8.67 W	0.33
9800.00	3 45	N 86 O W	100.00	9796.40	12.88 S 15.20 W	0.20
9900.00	3 45	N 89 O W	100.00	9896.19	12.60 S 21.73 W	0.20
10000.00	3 0	N 89 O W	100.00	9996.01	12.49 S 27.62 W	0.75
10100.00	2 15	S 89 O W	100.00	10095.91	12.49 S 32.20 W	0.76
10200.00	2 0	S 89 O W	100.00	10195.84	12.56 S 35.91 W	0.25
10300.00	2 15	S 85 O W	100.00	10295.77	12.75 S 39.61 W	0.29
10400.00	2 30	S 75 O W	100.00	10395.68	13.47 S 43.68 W	0.48
10500.00	2 15	S 71 O W	100.00	10495.60	14.68 S 47.65 W	0.30
10600.00	2 0	S 75 O W	100.00	10595.53	15.77 S 51.19 W	0.29
10700.00	1 45	S 81 O W	100.00	10695.47	16.45 S 54.39 W	0.32
10800.00	0 45	S 82 O W	100.00	10795.45	16.77 S 56.55 W	1.00
10900.00	0 45	S 66 O W	100.00	10895.44	17.13 S 57.80 W	0.21
11000.00	1 0	N 76 O W	100.00	10995.43	17.26 S 59.29 W	0.62
11100.00	1 0	N 51 O W	100.00	11095.41	16.49 S 60.84 W	0.43
11200.00	0 45	N 46 O W	100.00	11195.40	15.48 S 61.98 W	0.26
11300.00	0 30	N 39 O W	100.00	11295.39	14.67 S 62.72 W	0.26
11400.00	0 45	N 49 O W	100.00	11395.39	13.89 S 63.48 W	0.27
11500.00	1 0	S 66 O W	100.00	11495.38	13.67 S 64.91 W	0.96
11600.00	1 0	S 55 O W	100.00	11595.36	14.53 S 66.43 W	0.19
11700.00	1 15	S 71 O W	100.00	11695.34	15.42 S 68.17 W	0.40
11800.00	1 30	S 89 O W	100.00	11795.31	15.83 S 70.52 W	0.50
11900.00	1 30	N 77 O W	100.00	11895.28	15.56 S 73.12 W	0.37

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SANTA FE ENERGY
BILBREY 21 FEB COM 1
LEA COUNTY, NEW MEXICO

DECLINATION : 10.00JOB NUMBER :
DATE PRINTED : 25-JAN-90
OUR REF. NO. : S01393.48F

PAGE NO. 6

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
12000.00	1 15	N 65 0 W	100.00	11995.25	14.78 S 75.39 W	0.38
12100.00	1 15	N 64 0 W	100.00	12095.23	13.84 S 77.35 W	0.02

CLOSURE - DISTANCE : 78.58
DIRECTION : S 79 51 W

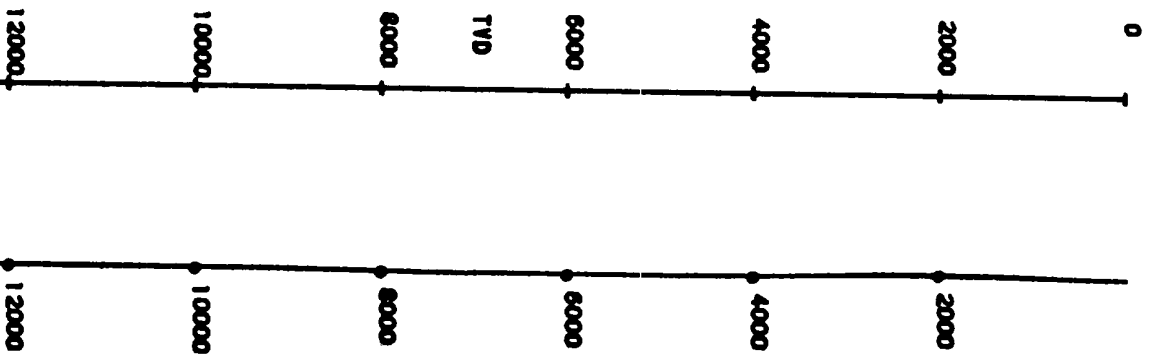
REPORT UNITS : Feet
SURVEY CALCULATION METHOD : Radius of curvature

Accepted by :
Checked by :

SURVEY RUN INFORMATION

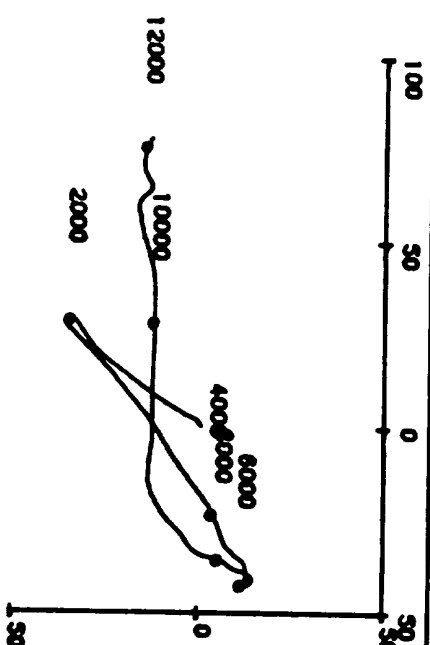
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GYROSCOPIC MULTI-SHOT SURVEY	430-1118
SURVEYOR: TIM STEPHENS	(0'-4600')
MAGNETIC MULTI-SHOT SURVEY	430-1118
SURVEYOR: TIM STEPHENS	(4600'-12100')



2000 0 2000
V. SECTION PLANE
SURVEY 801393.46F

SCALE 1"=2000FT.



SCALE 1"=50FT.
NOTE: COORDINATES RELATIVE
TO 81.07

SANTA FE ENERGY
BILBERRY 21 FED CON
LEA COUNTY, NEW MEXICO
WELL: BILBERRY 21
SLOT: 1



2103 Market, Midland, Texas 79703, Phone: (915) 694-9517

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, TIM STEPHENS, in the employ of Eastman Christensen, Inc. did on the days of JANUARY 25, 1990 thru JANUARY 25, 1990 conduct or supervise the taking of a MAGNETIC MULTI-SHOT survey by the method of magnetic orientation from a depth of 4600 feet to 12100 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of SANTA FE ENERGY for their BILBREY 21 FED COM.1, LEA County, State of NEW MEXICO, in the _____ field.

This data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Eastman Christensen, Inc. and is true and correct to the best of my knowledge.

Tim Stephens
Directional Supervisor/Surveyor

The data for this survey has been examined by me and conforms to principles and procedures set forth by Eastman Christensen, Inc.

[Signature]

Before me, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that this instrument is a true statement of facts therein recited.

Subscribed and sworn to before me on this _____ day of _____, 19____

Notary Public in and for the
County of Midland, Texas
My commission expires _____

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