



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

RECEIVED

OCT 19 '87

O. C. D.
ARTESIA OFFICE

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OCT 16 1987

OCD
HOBBS OFFICE

SANTA FE ENERGY COMPANY
COMPANY

H.B. 3 FEDERAL NO. 1
WELL NAME

EDDY COUNTY, NEW MEXICO
LOCATION

<u>JOB NUMBER</u>	<u>TYPE OF SURVEY</u>	<u>DATE</u>
430-0609	GYROSCOPIC MULTI SHOT SURVEY	8-14-87
430-0609	MAGNETIC MULTI SHOT SURVEY	8-15-87
430-0609	MAGNETIC MULTI SHOT SURVEY	9-17-87

SURVEY BY
GARY DESPAIN

OFFICE
WEST TEXAS BASE

FOR

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** ** ** ** **** ** ** ** **** ** ** ** 
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OPERATOR	:	SANTA FE ENERGY COMPANY
WELL NAME	:	H.B. 3 FEDERAL NO. 1
LOCATION	:	EDDY COUNTY, NEW MEXICO
JOB NUMBER	:	
RIG	:	MCVAY RIG 10
DECLINATION	:	10.00 E

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** ** ** ** 
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EC DISTRICT : WEST TEXAS BASE

SANTA FE ENERGY COMPANY
H.B. 3 FEDERAL NO. 1
EDDY COUNTY, NEW MEXICO

DATE PRINTED : 17-AUG-87
OUR REF. NO. : S01218.4SF
DECLINATION : 10.00 JOB NUMBER :

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	C L O S U R E DISTANCE	D I R E C T I O N D M	DOGLEG SEVERITY
0.00	0 0	N 0	0.00	0.00	0.00 N	0.00	S 90	0.00
100.00	0 15	S 27	100.00	100.00	0.19 S	0.22	S 27	0.25
200.00	0 15	S 84	100.00	200.00	0.43 S	0.62	S 45	0.24
300.00	0 15	N 53	100.00	300.00	0.59 S	1.03	S 55	0.13
400.00	0 45	N 74	100.00	399.99	0.74 S	1.83	S 66	0.63
500.00	1 45	N 68	100.00	499.97	0.03 S	3.74	S 89	1.01
600.00	2 0	N 62	100.00	599.92	1.35 N	6.83	N 78	0.32
700.00	2 0	N 61	100.00	699.85	3.01 N	10.22	N 72	0.03
800.00	1 45	N 74	100.00	799.80	4.26 N	13.47	N 71	0.49
900.00	1 15	N 66	100.00	899.77	5.16 N	16.09	N 71	0.54
1000.00	1 0	N 84	100.00	999.75	5.66 N	18.04	N 71	0.43
1100.00	1 0	N 76	100.00	1099.73	5.97 N	19.77	N 72	0.14
1200.00	0 30	S 74	100.00	1199.72	5.95 N	20.14	N 73	0.62
1300.00	0 45	N 79	100.00	1299.72	5.90 N	22.03	N 74	0.38
1400.00	0 30	S 74	100.00	1399.71	5.85 N	23.06	N 75	0.38
1500.00	0 30	N 72	100.00	1499.71	5.87 N	23.90	N 75	0.29
1600.00	0 30	N 10	100.00	1599.70	6.55 N	24.47	N 74	0.66
1700.00	0 0	N 0	100.00	1699.70	6.98 N	24.52	N 73	0.50
1800.00	0 15	N 54	100.00	1799.70	7.68 N	25.73	N 72	0.44
1900.00	0 30	N 57	100.00	1899.70	8.12 N	25.21	N 71	0.50
2000.00	0 0	N 0	100.00	1999.70	8.33 N	25.31	N 70	0.25
2100.00	0 15	N 6	100.00	2099.70	8.66 N	25.86	N 70	0.59
2200.00	0 30	S 76	100.00	2199.70	8.32 N	26.95	N 72	0.50
2300.00	1 0	S 74	100.00	2299.69	7.60 N	28.94	N 74	0.75
2400.00	1 45	S 71	100.00	2399.66	6.38 N	31.60	N 78	0.32
2500.00	2 0	S 65	100.00	2499.60	5.07 N	34.56	N 81	0.21
2600.00	2 0	S 71	100.00	2599.54	3.68 N	37.57	N 84	0.31
2700.00	2 0	S 62	100.00	2699.48	1.91 N	40.44	N 87	0.17
2800.00	2 0	S 57	100.00	2799.42	0.08 S	42.98	S 89	0.39
2900.00	1 45	S 48	100.00	2899.37				

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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	C L O S U R E DISTANCE	D I R E C T I O N D M	DOGLEG SEVERITY
3000.00	1 45	S 47	100.00	2999.32	2.14 S	45.24 E	S 87 17 E	0.03
3100.00	1 15	S 32	100.00	3099.29	4.16 S	46.90 E	S 84 56 E	0.63
3200.00	1 15	S 35	100.00	3199.26	5.98 S	48.10 E	S 82 55 E	0.07
3300.00	1 15	S 35	100.00	3299.24	7.76 S	49.35 E	S 81 4 E	0.00
3400.00	1 0	S 5	100.00	3399.22	9.59 S	50.02 E	S 79 9 E	0.63
3500.00	1 0	S 3	100.00	3499.20	11.33 S	50.14 E	S 77 16 E	0.03
3600.00	1 0	S 15	100.00	3599.19	13.05 S	50.41 E	S 75 29 E	0.21
3700.00	0 30	S 4	100.00	3699.18	14.35 S	50.53 E	S 74 9 E	0.55
3800.00	0 30	S 4	100.00	3799.18	15.22 S	50.47 E	S 73 13 E	0.00
3900.00	1 0	S 1	100.00	3899.17	16.52 S	50.42 E	S 71 51 E	0.50
4000.00	1 0	S 1	100.00	3999.15	18.27 S	50.39 E	S 70 4 E	0.00
4100.00	0 15	S 26	100.00	4099.15	19.33 S	50.62 E	S 69 6 E	0.79
4200.00	0 30	S 18	100.00	4199.14	19.96 S	50.66 E	S 68 30 E	0.36
4300.00	0 45	S 28	100.00	4299.14	20.97 S	50.24 E	S 67 21 E	0.27
4400.00	0 45	S 31	100.00	4399.13	22.11 S	49.59 E	S 65 58 E	0.04
4500.00	0 30	S 11	100.00	4499.12	23.12 S	49.20 E	S 64 50 E	0.33
4600.00	0 15	S 0	100.00	4599.12	23.77 S	49.14 E	S 64 11 E	0.26
4700.00	0 45	S 22	100.00	4699.12	24.63 S	48.98 E	S 63 18 E	0.53
4800.00	0 30	S 23	100.00	4799.11	25.64 S	48.56 E	S 62 10 E	0.25
4900.00	0 45	S 25	100.00	4899.11	26.63 S	48.11 E	S 61 2 E	0.25
5000.00	1 0	S 27	100.00	4999.09	28.01 S	47.44 E	S 59 27 E	0.25
5100.00	1 0	S 35	100.00	5099.08	29.50 S	46.55 E	S 57 38 E	0.14
5200.00	1 0	S 21	100.00	5199.06	31.04 S	45.73 E	S 55 50 E	0.24
5300.00	1 0	S 21	100.00	5299.05	32.67 S	45.10 E	S 54 5 E	0.00
5400.00	1 0	S 36	100.00	5399.03	34.20 S	44.27 E	S 52 19 E	0.26
5500.00	1 30	S 39	100.00	5499.01	35.93 S	42.95 E	S 50 5 E	0.50
5600.00	1 30	S 39	100.00	5598.98	37.96 S	41.30 E	S 47 25 E	0.00
5700.00	1 30	S 28	100.00	5698.94	40.14 S	39.86 E	S 44 48 E	0.29
5800.00	1 30	S 29	100.00	5798.91	42.44 S	38.61 E	S 42 17 E	0.03
5900.00	2 0	S 18	100.00	5898.86	45.24 S	37.39 E	S 39 34 E	0.60



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SANTA FE ENERGY COMPANY
H.B. 3 FEDERAL NO. 1
EDDY COUNTY, NEW MEXICO

DATE PRINTED : 17-AUG-87
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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	C L O S U R E DISTANCE	D I R E C T I O N D M	DOGLEG SEVERITY
6000.00	2 0	S 17	100.00	5998.80	48.57 S	36.34 E	60.66 S 36 48 E	0.03
6100.00	2 0	S 15	100.00	6098.74	51.92 S	35.38 E	62.83 S 34 16 E	0.07
6200.00	2 0	S 7	100.00	6198.68	55.34 S	34.71 E	65.33 S 32 6 E	0.28
6300.00	2 0	S 9	100.00	6298.62	58.80 S	34.23 E	68.04 S 30 12 E	0.07
6400.00	2 0	S 2	100.00	6398.55	62.27 S	33.89 E	70.90 S 28 34 E	0.24
6500.00	2 0	S 0	100.00	6498.49	65.76 S	33.83 E	73.95 S 27 14 E	0.07
6600.00	2 0	S 3	100.00	6598.43	69.25 S	33.74 E	77.03 S 25 59 E	0.10
6700.00	1 45	S 5	100.00	6698.38	72.51 S	33.51 E	79.88 S 24 48 E	0.26
6800.00	1 45	S 5	100.00	6798.33	75.55 S	33.25 E	82.55 S 23 45 E	0.00
6900.00	1 0	S 6	100.00	6898.30	77.94 S	33.02 E	84.65 S 22 57 E	0.75
7000.00	1 0	S 7	100.00	6998.29	79.68 S	32.82 E	86.17 S 22 23 E	0.02
7100.00	0 30	S 5	100.00	7098.28	80.98 S	32.68 E	87.33 S 21 59 E	0.50
7200.00	0 45	S 34	100.00	7198.27	82.00 S	32.32 E	88.14 S 21 31 E	0.40
7300.00	1 30	S 32	100.00	7298.25	83.64 S	31.25 E	89.29 S 20 29 E	0.75
7400.00	1 45	S 43	100.00	7398.21	85.89 S	29.53 E	90.83 S 18 58 E	0.40
7500.00	2 0	S 49	100.00	7498.16	88.16 S	27.18 E	92.26 S 17 8 E	0.32
7600.00	1 45	S 47	100.00	7598.11	90.35 S	24.75 E	93.68 S 15 19 E	0.26
7700.00	1 0	S 51	100.00	7698.08	91.93 S	22.93 E	94.74 S 14 1 E	0.76
7800.00	1 45	S 58	100.00	7798.05	93.98 S	23.06 E	96.76 S 13 47 E	2.28
7900.00	0 30	S 36	100.00	7898.03	95.31 S	24.49 E	98.40 S 14 25 E	1.30
8000.00	0 30	S 19	100.00	7998.02	96.08 S	24.89 E	99.25 S 14 31 E	0.15
8100.00	0 30	S 13	100.00	8098.02	96.92 S	25.13 E	100.12 S 14 32 E	0.05
8200.00	1 0	S 43	100.00	8198.01	98.13 S	24.80 E	101.22 S 14 11 E	0.83
8300.00	0 0	N 0	100.00	8298.00	98.77 S	24.21 E	101.69 S 13 46 E	1.00
8400.00	0 0	N 0	100.00	8398.00	98.77 S	24.21 E	101.69 S 13 46 E	0.00
8500.00	1 45	N 63	100.00	8497.99	98.08 S	22.85 E	100.70 S 13 7 E	1.75
8600.00	1 30	N 73	100.00	8597.95	97.02 S	20.22 E	99.10 S 11 46 E	0.38
8700.00	1 30	N 86	100.00	8697.91	96.54 S	17.65 E	98.14 S 10 22 E	0.34
8800.00	2 0	N 87	100.00	8797.87	96.35 S	14.61 E	97.45 S 8 37 E	0.50
8900.00	1 45	S 80	100.00	8897.81	96.55 S	11.35 E	97.22 S 6 42 E	0.49

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SANTA FE ENERGY COMPANY
H.B. 3 FEDERAL NO. 1
EDDY COUNTY, NEW MEXICO

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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	C L O S U R E DISTANCE	D I R E C T I O N D M	DOGLEG SEVERITY
9000.00	1 0	S 78	100.00	8997.78	97.01 S	8.99 E	S 5 18 E	0.75
9100.00	1 30	S 66	100.00	9097.76	97.68 S	6.92 E	S 4 3 E	0.56
9200.00	1 45	S 41	100.00	9197.72	99.36 S	4.66 E	S 2 41 E	0.74
9300.00	1 30	S 26	100.00	9297.68	101.71 S	3.10 E	S 1 45 E	0.49
9400.00	1 30	S 29	100.00	9397.65	104.04 S	1.89 E	S 1 2 E	0.08
9500.00	1 0	S 23	100.00	9497.62	106.00 S	0.93 E	S 0 30 E	0.52
9600.00	1 0	S 43	100.00	9597.61	107.45 S	0.01 W	S 0 0 W	0.35
9700.00	1 0	S 49	100.00	9697.59	108.66 S	1.27 W	S 0 40 W	0.10
9800.00	1 30	S 48	100.00	9797.57	110.11 S	2.90 W	S 1 31 W	0.50
9900.00	1 45	S 51	100.00	9897.53	111.95 S	5.06 W	S 2 35 W	0.26
10000.00	1 45	S 49	100.00	9997.48	113.91 S	7.40 W	S 3 43 W	0.06
10100.00	1 45	S 51	100.00	10097.43	115.88 S	9.74 W	S 4 48 W	0.06
10200.00	1 45	S 50	100.00	10197.38	117.82 S	12.09 W	S 5 52 W	0.03
10300.00	1 30	S 50	100.00	10297.34	119.64 S	14.26 W	S 6 48 W	0.25
10398.00	1 0	S 56	98.00	10395.32	120.93 S	15.97 W	S 7 31 W	0.53

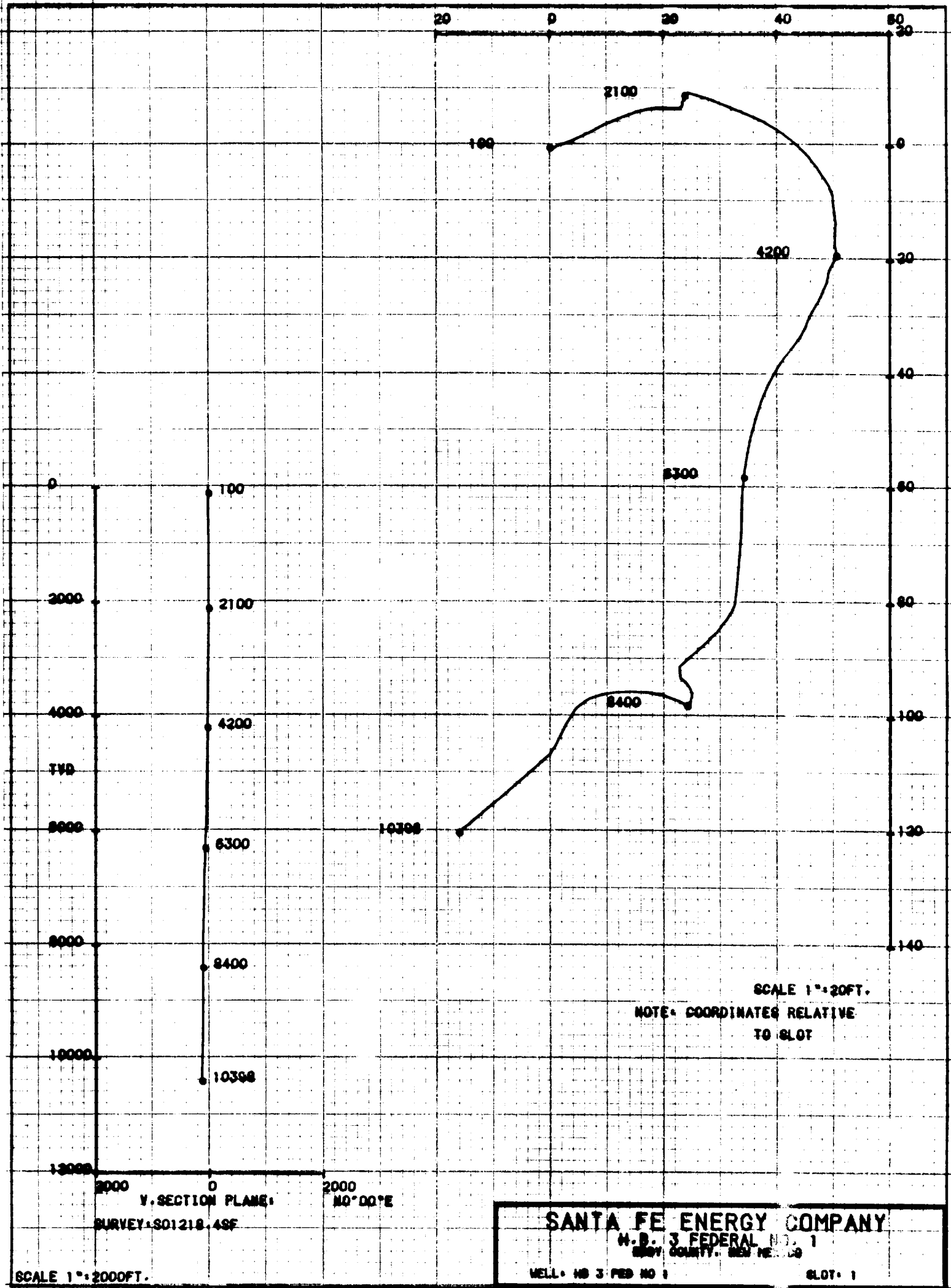
CLOSURE - DISTANCE : 121.98
DIRECTION : S 7 31 W

REPORT UNITS : Feet
SURVEY CALCULATION METHOD : Radius of curvature

SURVEY RUN INFORMATION

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GYROSCOPIC MULTI SHOT SURVEY	430-0609
SURVEYOR: GARY DESPAIN	(0-3100')
MAGNETIC MULTI SHOT SURVEY	430-0609
SURVEYOR: GARY DESPAIN	(3100'-10,398')





2103 Market, Midland, Texas 79703, Phone: (915) 694-9517, (915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Christensen, Inc. did on the days of August 14, 1987 thru August 14, 1987 conduct or supervise the taking of a Gyroscopic Multi Shot survey by the method of magnetic orientation from a depth of 0 feet to 3100 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 H.B. 3 FEDERAL NO. 1, EDDY 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.

Gary DeSpain
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.

Burley Glascock
Before me, the undersigned authority, on this day personally appeared Gary DeSpain, 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 9 day of October, 1987



Timothy R. Stephens
Notary Public, State of Texas
My Commission Expires 4-1-89

Timothy R. Stephens
Notary Public in and for the
County of Midland, Texas
My commission expires _____



2103 Market, Midland, Texas 79703, Phone: (915) 694-9517, (915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Christensen, Inc. did on the days of August 15, 19 87 thru August 15, 19 87 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 3100 feet to 10,398 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 H.B. 3 FEDERAL NO. 1, EDDY 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.

Gary DeSpain
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.

Burley Glasscock
Before me, the undersigned authority, on this day personally appeared Gary DeSpain, 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 9 day of October, 1987



Timothy R. Stephens
Notary Public, State of Texas
My Commission Expires 4-1-89

Timothy R. Stephens
Notary Public in and for the
County of Midland, Texas
My commission expires _____



2103 Market, Midland, Texas 79703, Phone: (915) 694-9517, (915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Christensen, Inc. did on the days of September 16, 19 87 thru September 17, 1987 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 10,300 feet to 13,385 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 H.B. 3 FEDERAL NO. 1, EDDY 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.

Gary DeSpain
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.

Bundy Glasscock

Before me, the undersigned authority, on this day personally appeared Gary DeSpain, 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 9 day of October, 1987



Timothy R. Stephens
Notary Public, State of Texas
My Commission Expires 4-1-89

Timothy R. Stephens
Notary Public in and for the
County of Midland, Texas
My commission expires _____