



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

AMOCO PRODUCTION COMPANY
COMPANY

FEDERAL H WELL NO. 1
WELL NAME

LEA COUNTY, NEW MEXICO
LOCATION

JOB NUMBER
WT-978 G-0103
WT-978 S-0102

TYPE OF SURVEY
Gyroscopic Multi Shot
Magnetic Multi Shot

DATE
9-25-78
9-25-78

SURVEY BY
Larry Massey
Larry Massey

OFFICE
West Texas
West Texas

AMOCO PRODUCTION CO.
FEDERAL H WELL NO. 1
LEA COUNTY, NEW MEXICO

EASIMAN WHIPSTOCK, INC.
GYROSCOPIC AND MAGNETIC MULTI SHOT SURVEY
WI978-G0103 AND WI978-S0102
9-26-78

RECORD OF SURVEY

RADIUS OF CURVATURE METHOD

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D M	TRUE		VERTICAL DEPTH FEET	RECTANGULAR		CORDINATES		CLOSURE		DOG LEG	
			FEET	DIRECTION		FEET	DIRECTION	FEET	DIRECTION	FEET	DIRECTION	SEVERITY DEG/100FT	SEVERITY DEG/100FT
0.	0 0	0	0.00	0.00	0.00	0.00	0.00	0.00	0 0	0.00	0 0	0.0	0.0
100.	0 30	N 17 E	100.00	.42 N	.13 E	.44	N 17 0 E	.5				.5	
200.	0 30	N 20 W	199.99	1.27 N	.11 E	1.28	N 4 43 E	.3				.3	
300.	1 0	N 28 W	299.99	2.47 N	.43 W	2.51	N 9 48 W	.5				.5	
400.	1 0	N 22 W	399.97	4.05 N	1.16 W	4.21	N 16 2 W	.1				.1	
500.	0 45	N 27 W	499.96	5.44 N	1.80 W	5.73	N 18 17 W	.3				.3	
600.	0 15	S 54 W	599.95	5.62 N	2.54 W	6.17	N 24 22 W	.8				.8	
700.	0 15	S 54 W	699.95	5.36 N	2.90 W	6.09	N 28 23 W	0.0				0.0	
800.	0 30	S 61 W	799.95	5.01 N	3.45 W	6.08	N 34 32 W	.3				.3	
900.	0 30	S 40 W	899.95	4.46 N	4.12 W	6.07	N 42 44 W	.2				.2	
1000.	0 15	S 2 W	999.95	3.86 N	4.35 W	5.81	N 48 25 W	.3				.3	
1100.	0 0	0	1099.95	3.64 N	4.36 W	5.68	N 50 7 W	.3				.3	
1200.	0 15	S 24 E	1199.95	3.44 N	4.27 W	5.48	N 51 7 W	.3				.3	
1300.	0 15	S 4 E	1299.94	3.02 N	4.16 W	5.14	N 54 2 W	.1				.1	
1400.	0 15	S 13 E	1399.94	2.59 N	4.10 W	4.85	N 57 43 W	.0				.0	
1500.	0 15	N 58 W	1499.94	2.39 N	4.38 W	4.99	N 61 21 W	.5				.5	
1600.	0 45	N 27 W	1599.94	3.03 N	4.96 W	5.81	N 58 36 W	.6				.6	
1700.	0 30	N 15 W	1699.93	4.04 N	5.35 W	6.70	N 52 55 W	.3				.3	
1800.	0 30	N 14 W	1799.93	4.89 N	5.57 W	7.41	N 48 43 W	.0				.0	
1900.	0 30	N 18 W	1899.92	5.73 N	5.81 W	8.16	N 45 24 W	.0				.0	
2000.	0 30	N 44 W	1999.92	6.47 N	6.25 W	9.00	N 44 2 W	.2				.2	
2100.	0 15	N 27 W	2099.92	7.00 N	6.63 W	9.64	N 43 28 W	.3				.3	
2200.	0 15	N 66 W	2199.92	7.29 N	6.94 W	10.07	N 43 35 W	.2				.2	
2300.	0 0	0	2299.92	7.38 N	7.14 W	10.27	N 44 3 W	.3				.3	
2400.	0 0	0	2399.92	7.38 N	7.14 W	10.27	N 44 3 W	0.0				0.0	
2500.	0 0	0	2499.92	7.38 N	7.14 W	10.27	N 44 3 W	0.0				0.0	
2600.	0 15	N 5 W	2599.92	7.60 N	7.16 W	10.44	N 43 18 W	.3				.3	
2700.	0 15	N 55 W	2699.92	7.97 N	7.37 W	10.85	N 42 47 W	.2				.2	
2800.	0 15	S 85 W	2799.91	8.08 N	7.79 W	11.22	N 43 57 W	.2				.2	
2900.	0 15	N 13 W	2899.91	8.31 N	8.11 W	11.61	N 44 18 W	.3				.3	

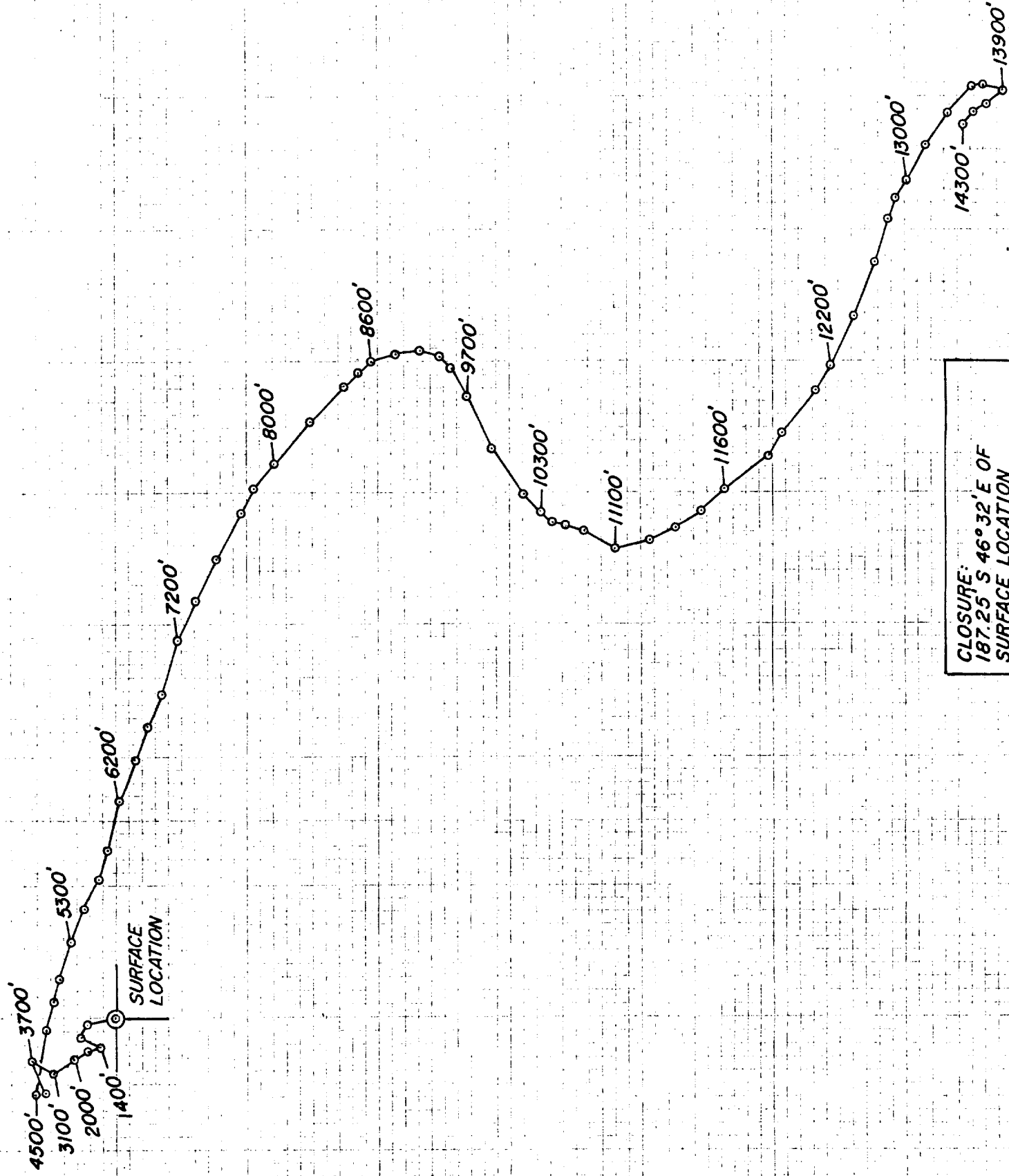
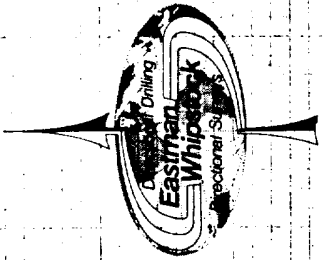
MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	TRUE VERTICAL DEPTH FEET	R E C T A N G U L A R		C L O S U R E		DOG LEG SEVERITY DEG/100FT
				C O O R D I N A T E S FEET	D I S T A N C E FEET	D I R E C T I O N D M		
3000.	0 30	N 5 W	2999.91	8.96 N	8.21 W	12.15 N 42 31 W	.3	
3100.	0 30	N 8 W	3099.91	9.82 N	8.31 W	12.87 N 40 14 W	.0	
3200.	0 30	N 7 W	3199.90	10.69 N	8.42 W	13.61 N 38 14 W	.0	
3300.	0 15	N 35 E	3299.90	11.31 N	8.27 W	14.01 N 36 10 W	.4	
3400.	0 15	N 39 E	3399.90	11.66 N	8.01 W	14.14 N 34 29 W	.0	
3500.	0 15	N 71 E	3499.90	11.91 N	7.65 W	14.15 N 32 44 W	.1	
3600.	0 30	N 52 E	3599.90	12.22 N	7.08 W	14.12 N 30 6 W	.3	
3700.	0 0	0	3699.90	12.49 N	6.74 W	14.19 N 28 21 W	.5	
3800.	0 0	0	3799.90	12.49 N	6.74 W	14.19 N 28 21 W	0.0	
3900.	0 15	S 10 W	3899.90	12.27 N	6.78 W	14.02 N 28 54 W	.3	
4000.	0 30	S 47 W	3999.89	11.71 N	7.08 W	13.68 N 31 11 W	.3	
4100.	1 0	S 73 W	4099.89	11.06 N	8.21 W	13.77 N 36 35 W	.6	
4200.	1 0	S 70 W	4199.87	10.50 N	9.86 W	14.41 N 43 12 W	.1	
4300.	0 45	N 66 W	4299.86	10.55 N	11.35 W	15.50 N 47 5 W	.7	
4400.	0 30	N 32 W	4399.85	11.26 N	12.16 W	16.57 N 47 12 W	.4	
4500.	0 45	S 89 E	4499.85	12.04 N	11.72 W	16.80 N 44 14 W	1.1	
4600.	1 0	S 87 E	4599.83	11.98 N	10.20 W	15.73 N 40 23 W	.3	
4700.	1 15	S 86 E	4699.82	11.86 N	8.24 W	14.44 N 34 46 W	.3	
4800.	1 45	S 81 E	4799.78	11.57 N	5.64 W	12.87 N 25 59 W	.5	
4900.	2 30	S 76 E	4899.71	10.83 N	2.00 W	11.01 N 10 29 W	.8	
5000.	2 30	S 73 E	4999.62	9.66 N	2.20 E	9.91 N 12 49 E	.1	
5100.	2 0	S 71 E	5099.54	8.45 N	5.93 E	10.32 N 35 5 E	.5	
5200.	1 30	S 66 E	5199.49	7.33 N	8.77 E	11.43 N 50 7 E	.5	
5300.	1 30	S 75 E	5299.46	6.46 N	11.24 E	12.96 N 60 7 E	.2	
5400.	1 30	S 67 E	5399.42	5.61 N	13.71 E	14.81 N 67 46 E	.2	
5500.	1 30	S 70 E	5499.39	4.65 N	16.15 E	16.80 N 73 57 E	.1	
5600.	1 30	S 60 E	5599.35	3.54 N	18.52 E	18.85 N 79 10 E	.3	
5700.	1 30	S 73 E	5699.32	2.50 N	20.91 E	21.06 N 83 11 E	.3	
5800.	1 15	S 75 E	5799.29	1.84 N	23.22 E	23.29 N 85 28 E	.3	
5900.	1 30	S 77 E	5899.26	1.26 N	25.55 E	25.58 N 87 11 E	.3	

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	TRUE VERTICAL DEPTH FEET		R E C T A N G U L A R C O R D I N A T E S FEET		C L O S U R E D I R E C T I O N D M		D O G L E G S E V E R I T Y D E G / 1 0 0 F T	
6000.	1 30	S 76 E	5992.23	.65 N	28.09 E	28.10	N 88 41 E		.0	
6100.	1 30	S 75 E	6099.19	.01 S	30.63 E	30.63	S 89 59 E		.0	
6200.	1 30	S 73 E	6192.16	.73 S	33.14 E	33.15	S 88 44 E		.1	
6300.	1 15	S 70 E	6299.13	1.49 S	35.42 E	35.45	S 87 35 E		.3	
6400.	1 15	S 71 E	6392.11	2.22 S	37.47 E	37.54	S 86 37 E		.0	
6500.	1 30	S 71 E	6492.08	3.00 S	39.74 E	39.86	S 85 41 E		.3	
6600.	1 30	S 69 E	6599.04	3.90 S	42.20 E	42.38	S 84 44 E		.1	
6700.	1 30	S 66 E	6692.01	4.90 S	44.62 E	44.89	S 83 44 E		.1	
6800.	1 30	S 66 E	6798.98	5.96 S	47.01 E	47.39	S 82 46 E		0.0	
6900.	1 30	S 66 E	6898.94	7.03 S	49.40 E	49.90	S 81 54 E		0.0	
7000.	1 45	S 71 E	6998.90	8.07 S	52.04 E	52.66	S 81 11 E		.3	
7100.	1 45	S 74 E	7098.85	8.98 S	54.95 E	55.68	S 80 43 E		.1	
7200.	1 45	S 74 E	7198.81	9.83 S	57.89 E	58.72	S 80 22 E		0.0	
7300.	1 45	S 65 E	7298.76	10.89 S	60.75 E	61.72	S 79 50 E		.3	
7400.	1 45	S 65 E	7398.71	12.18 S	63.51 E	64.67	S 79 8 E		0.0	
7500.	2 0	S 62 E	7498.66	13.64 S	66.44 E	67.83	S 78 24 E		.3	
7600.	2 15	S 61 E	7598.59	15.41 S	69.70 E	71.38	S 77 32 E		.3	
7700.	2 15	S 67 E	7698.51	17.13 S	73.23 E	75.21	S 76 50 E		.2	
7800.	2 30	S 57 E	7798.43	19.08 S	76.88 E	79.21	S 76 4 E		.5	
7900.	2 30	S 56 E	7898.33	21.48 S	80.52 E	83.34	S 75 4 E		.0	
8000.	2 45	S 53 E	7998.23	24.14 S	84.25 E	87.64	S 74 1 E		.3	
8100.	2 30	S 49 E	8098.12	27.02 S	87.81 E	91.87	S 72 54 E		.3	
8200.	2 15	S 51 E	8198.04	29.69 S	90.98 E	95.70	S 71 56 E		.3	
8300.	2 0	S 44 E	8297.97	32.19 S	93.71 E	99.09	S 71 2 E		.4	
8400.	2 0	S 40 E	8397.91	34.78 S	96.05 E	102.15	S 70 5 E		.1	
8500.	1 30	S 40 E	8497.86	37.12 S	98.01 E	104.81	S 69 15 E		.5	
8600.	1 15	S 28 E	8597.83	39.11 S	99.35 E	106.77	S 68 31 E		.4	
8700.	1 15	S 26 E	8697.81	41.05 S	100.34 E	108.41	S 67 45 E		.0	
8800.	1 0	S 18 E	8797.79	42.87 S	101.07 E	109.79	S 67 1 E		.3	
8900.	1 0	S 7 E	8897.77	44.57 S	101.45 E	110.81	S 66 17 E		.2	

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D M	TRUE VERTICAL DEPTH FEET		R E C T A N G U L A R C O O R D I N A T E S FEET	C L O S U R E DISTANCE FEET	D I R E C T I O N D M	D O G L E G S E V E R I T Y DEG/100FT
9000.	1 0	S 5 W	8997.76		46.32 S	101.48 E	111.55 S 65 28 E	.2
9100.	1 0	S 15 W	9097.74		48.03 S	101.18 E	112.00 S 64 36 E	.2
9200.	0 45	S 18 W	9197.73		49.50 S	100.75 E	112.25 S 63 50 E	.3
9300.	0 30	S 33 E	9297.73		50.54 S	100.88 E	112.84 S 63 23 E	.6
9400.	0 45	S 86 W	9397.72		51.35 S	100.48 E	112.84 S 62 56 E	1.1
9500.	1 0	S 75 W	9497.71		51.60 S	98.98 E	111.62 S 62 28 E	.3
9600.	1 15	S 58 W	9597.69		52.38 S	97.18 E	110.40 S 61 40 E	.4
9700.	2 15	S 65 W	9697.64		53.84 S	94.50 E	108.76 S 60 20 E	1.0
9800.	2 30	S 66 W	9797.55		55.56 S	90.73 E	106.39 S 58 31 E	.3
9900.	2 30	S 62 W	9897.46		57.47 S	86.81 E	104.11 S 56 30 E	.2
10000.	2 30	S 57 W	9997.36		59.68 S	83.05 E	102.27 S 54 18 E	.2
10100.	2 0	S 49 W	10097.29		62.04 S	79.92 E	101.18 S 52 11 E	.6
10200.	0 45	S 42 W	10197.26		63.73 S	78.21 E	100.88 S 50 50 E	1.3
10300.	0 45	S 54 W	10297.25		64.60 S	77.24 E	100.69 S 50 6 E	.2
10400.	0 45	S 49 W	10397.24		65.41 S	76.21 E	100.44 S 49 22 E	.1
10500.	0 45	S 19 W	10497.23		66.49 S	75.49 E	100.59 S 48 38 E	.4
10600.	0 30	S 24 W	10597.22		67.50 S	75.09 E	100.97 S 48 3 E	.3
10700.	0 45	S 10 E	10697.22		68.57 S	74.96 E	101.59 S 47 33 E	.4
10800.	1 0	S 17 W	10797.21		70.08 S	74.87 E	102.55 S 46 54 E	.5
10900.	1 15	S 32 W	10897.19		71.86 S	74.06 E	103.19 S 45 52 E	.4
11000.	1 30	S 35 W	10997.16		73.86 S	72.73 E	103.66 S 44 34 E	.3
11100.	1 15	S 16 W	11097.13		76.02 S	71.70 E	104.50 S 43 20 E	.5
11200.	1 45	S 10 E	11197.09		78.61 S	71.57 E	106.31 S 42 19 E	.8
11300.	2 0	S 19 E	11297.04		81.77 S	72.39 E	109.21 S 41 31 E	.4
11400.	2 30	S 35 E	11396.96		85.26 S	74.16 E	113.00 S 41 1 E	.8
11500.	3 0	S 41 E	11496.85		89.04 S	77.11 E	117.79 S 40 54 E	.6
11600.	2 30	S 38 E	11596.73		92.74 S	80.17 E	122.59 S 40 50 E	.5
11700.	2 15	S 47 E	11696.65		95.79 S	82.96 E	126.72 S 40 54 E	.4
11800.	2 15	S 46 E	11796.57		98.49 S	85.81 E	130.63 S 41 4 E	.0
11900.	2 45	S 50 E	11896.47		101.41 S	89.05 E	134.96 S 41 17 E	.5

AMOCO PRODUCTION COMPANY
 FEDERAL H WELL NO. 1
 LEA COUNTY, NEW MEXICO

SCALE: 1" = 20'



CLOSURE: 187.25 S 46° 32' E OF
 SURFACE LOCATION
 SOUTH, 128.78' EAST, 135.93'
 14300' MD 14295.22' TVD



P. O. Box 5577/Midland, Texas 79701/(915) 563-0511
TWX 910-881-5066/Cable: EASTCO

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Larry Massey, in the employ of Eastman Whipstock, Inc., did on the days of September 25, 19 78 thru September 29, 19 78 conduct or supervise the taking of a Gyroscopic Multi Shot survey by the method of magnetic orientation from a depth of 0 feet to 12200 feet, with recordings of inclination and direction being obtained at approximate intervals of Random feet.

This survey was conducted at the request of Amoco Production Company for their Federal H Well No. 1, Lea County, State of New Mexico, in the _____ field.

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

Larry Massey
Directional Supervisor/Surveyor

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

James B. [Signature]

Before me, the undersigned authority, on this day personally appeared Larry Massey, 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 4th day of October, 19 78.

Anna M. Smith
Notary Public in and for the County of
Midland, Texas
My commission expires 5-24-80



P. O. Box 5577/Midland, Texas 79701/(915) 563-0511
TWX 910-881-5066/Cable: EASTCO

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Larry Massey, in the employ of Eastman Whipstock, Inc., did on the days of September 25, 19 78 thru September 25, 1978 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 12200 feet to 14300 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of Amoco Production Company for their Federal H Well No. 1, Lea County, State of New Mexico, in the _____ field.

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

Larry Massey
Directional Supervisor/Surveyor

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

James Blackledge

Before me, the undersigned authority, on this day personally appeared Larry Massey, 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 4th day of October, 19 78.

Anna M. Smith
Notary Public in and for the County of
Midland, Texas
My commission expires 5-24-80