

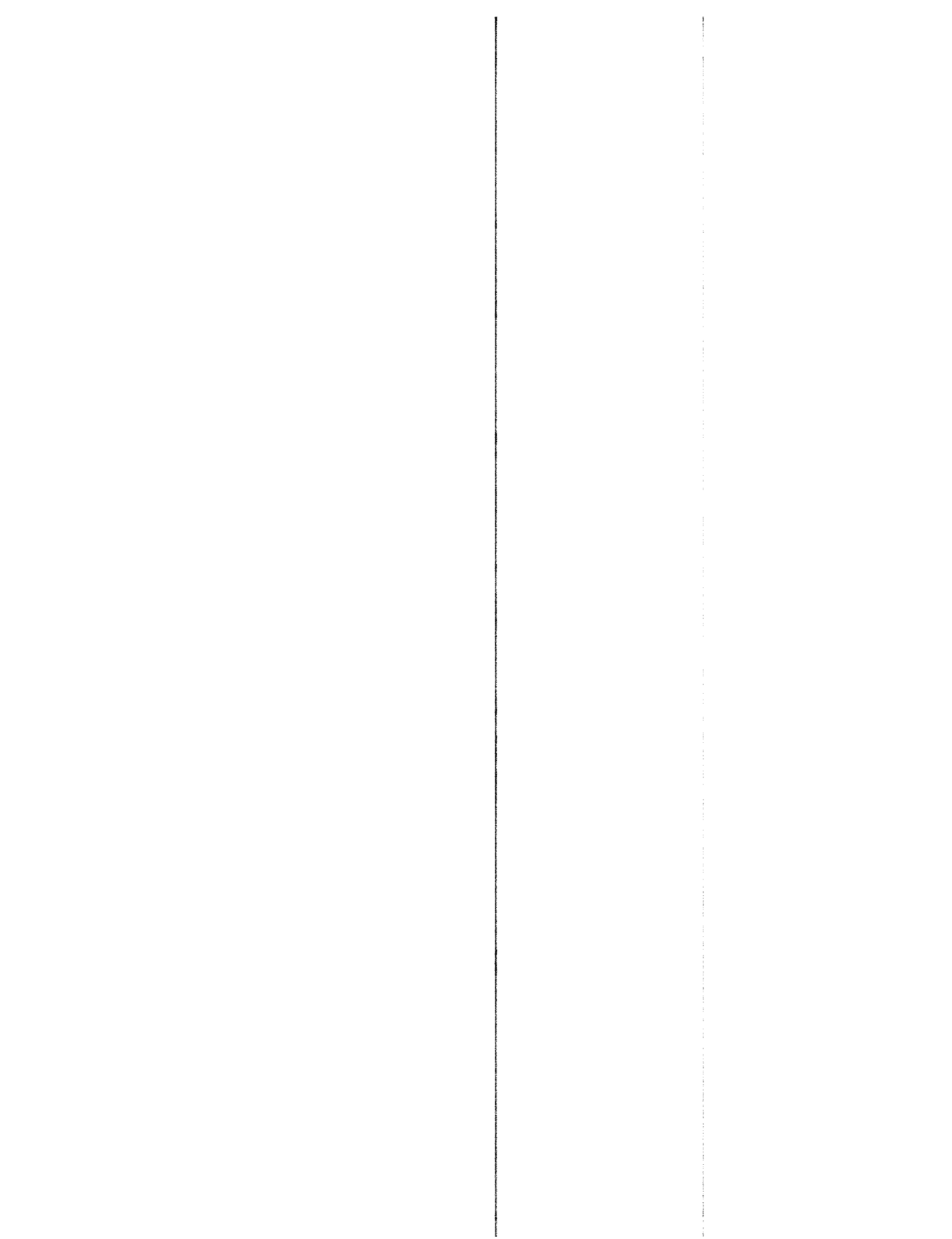
SUB-SURFACE
DIRECTIONAL
SURVEY
REPORT

AMOCO PRODUCTION COMPANY
COMPANY

SHU NO. 156
WELL NAME

LEA COUNTY, NEW MEXICO
STATE AND COUNTY

CERTIFIED REPORT



Year	Month	Day	Time	Location	Depth	Speed	Direction	Altitude	Temperature	Humidity	Pressure	Wind	Wave	Cloud	Visibility	Remarks	
1990	06	05	08:00	N 38.00 E 3	99.00	3	4268.04	3	279.30	3	26.81	N	279.12	E 3	279.41	N 84.49	E 3
1990	06	05	08:00	N 38.00 E 3	99.00	3	4268.04	3	279.30	3	26.81	N	279.12	E 3	279.41	N 84.49	E 3

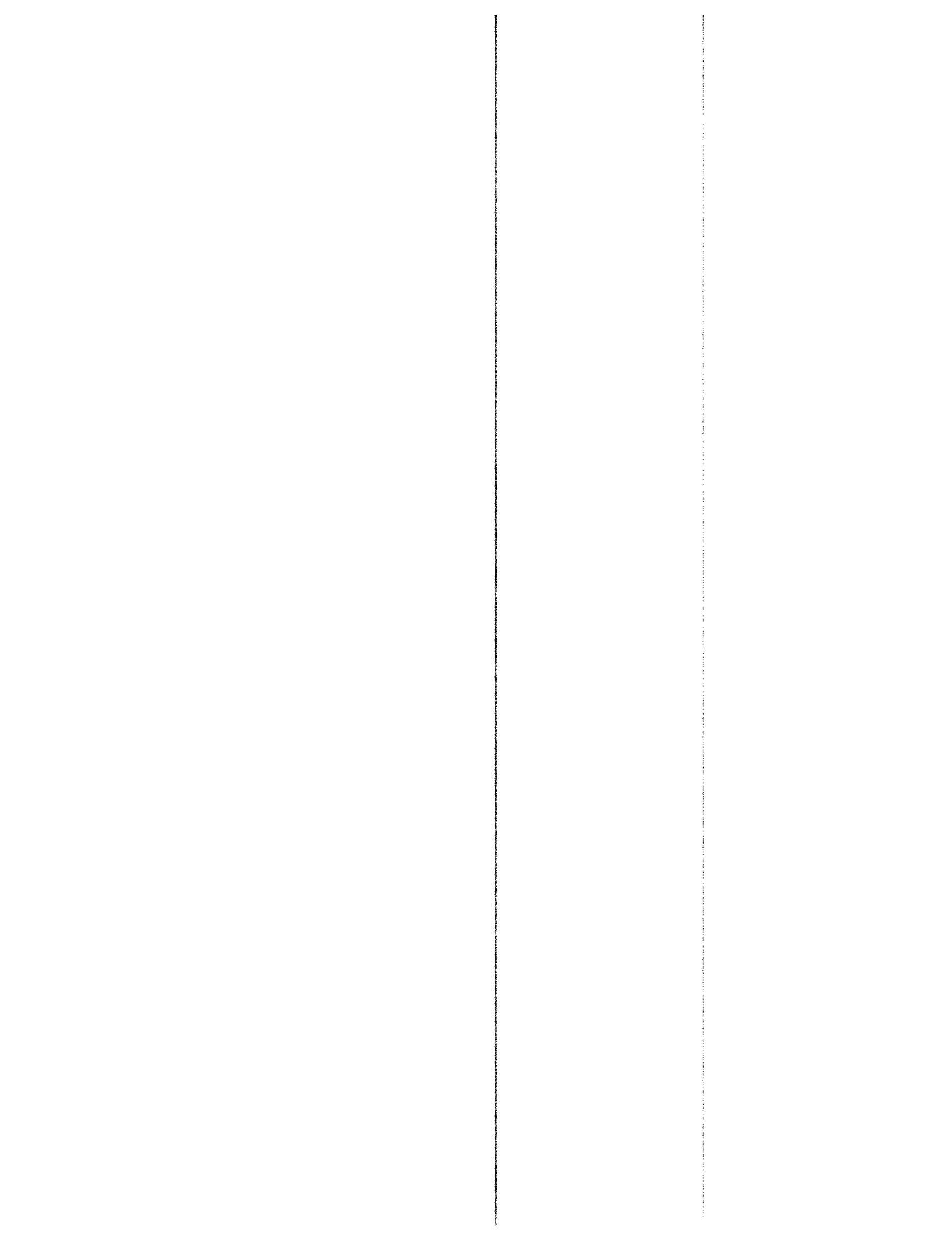
MEASURED	INCL.	HOLE	COURSE	TRUE	VERTICAL	VERTICAL	RECTANGULAR	C L O S U R E	DOG-LEG
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	SECTION	FEET	COORDINATES	DISTANCE	SEVERITY
FEET	DEGS.	DEGS.	FEET	FEET	FEET	N/S	FEET	DEGS.	DEGS.
0.00	0.00	N 00.00 E	0.00	0.00	0.00	0.00 N	0.00at N 00.00 E		0.00
82.00	.50	N 54.00 E	82.00	82.00	.31	.21 N	.36at N 54.00 E		.61
112.00	.50	N 20.00 W	30.00	112.00	.41	.44 N	.57at N 39.12 E		2.01
173.00	.50	S 67.00 W	61.00	173.00	0.00	.63 N	.64at N 06.80 W		1.19
233.00	.25	N 40.00 E	60.00	232.99	-.14	.86 N	.90at N 15.88 W		1.22
294.00	1.00	N 24.00 W	61.00	293.99	.03	1.49 N	1.50at N 06.05 W		1.51
355.00	.25	N 75.00 W	61.00	354.99	-.41	1.91 N	2.01at N 18.75 W		1.42
415.00	0.00	N 00.00 E	60.00	414.99	-.53	1.94 N	2.09at N 21.73 W		.42
476.00	1.00	N 56.00 W	61.00	475.98	-.93	2.24 N	2.55at N 28.49 W		1.64
536.00	.50	N 27.00 E	60.00	535.98	-1.02	2.93 N	3.25at N 25.42 W		1.77
597.00	.50	N 28.00 E	61.00	596.98	-.72	3.41 N	3.59at N 10.64 W		.01
658.00	0.00	N 00.00 E	61.00	657.97	-.56	3.64 N	3.78at N 15.71 W		.82
718.00	0.00	N 00.00 E	60.00	717.97	-.56	3.64 N	3.78at N 15.71 W		0.00
779.00	1.00	N 67.00 W	61.00	778.97	-1.03	3.85 N	4.14at N 21.47 W		1.64
840.00	.75	N 60.00 W	61.00	839.96	-1.80	4.26 N	4.87at N 28.83 W		.44
900.00	1.00	N 43.00 E	60.00	899.96	-1.82	5.05 N	5.62at N 26.00 W		2.30
961.00	0.00	N 00.00 E	61.00	960.95	-1.41	5.44 N	5.83at N 21.11 W		1.64
1021.00	.25	S 54.00 E	60.00	1020.95	-1.32	5.37 N	5.72at N 20.40 W		.42
1082.00	1.00	S 03.00 E	61.00	1081.95	-.74	5.12 N	5.31at N 15.11 W		1.30
1143.00	1.00	N 72.00 E	61.00	1142.94	.32	5.23 N	5.24at N 03.63 W		.71
1203.00	1.00	N 70.00 E	60.00	1202.93	1.34	5.57 N	5.61at N 06.73 E		.06
1264.00	.75	S 25.00 E	61.00	1263.92	2.08	5.24 N	5.44at N 15.37 E		1.96
1325.00	.50	N 15.00 E	61.00	1324.92	2.59	5.29 N	5.63at N 20.26 E		1.93
1385.00	1.00	S 74.00 E	60.00	1384.92	3.24	5.63 N	6.19at N 24.48 E		1.88
1446.00	1.00	S 81.00 E	61.00	1445.91	4.25	5.40 N	6.49at N 33.70 E		.20

MEASURED	INCL.	HOLE	COURSE	TRUE	VERTICAL	SECTION	RECTANGULAR	CLOSURE	DIRECTION	SEVERITY
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	FEET	FEET	N/S	E/W	FEET	DG/100FT
FEET	DEGS.	DEGS.	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
(1597'-2953' RESULT OF DIG SURVEY MS-1352)										
1506.00	.50	N 52.00 E	60.00	1505.90	5.00	5.59 N	4.34 E	7.08at N 37.82 E		1.26
1567.00	.50	S 51.00 W	61.00	1566.90	5.18	5.33 N	4.56 E	7.01at N 40.53 E		1.64
1597.00	1.00	S 42.00 E	30.00	1596.90	5.11	4.98 N	4.53 E	6.73at N 42.20 E		3.80
1661.00	.75	N 04.00 E	64.00	1660.89	5.86	5.23 N	5.26 E	7.41at N 45.14 E		2.52
1722.00	.75	N 31.00 E	61.00	1721.88	6.19	5.98 N	5.49 E	8.12at N 42.55 E		.57
1782.00	1.00	N 18.00 E	60.00	1781.80	6.67	6.81 N	5.87 E	9.00at N 40.75 E		.53
1842.00	1.00	N 52.00 E	60.00	1841.87	7.36	7.66 N	6.46 E	10.02at N 40.15 E		.97
1903.00	.75	N 39.00 E	61.00	1902.86	8.10	8.31 N	7.13 E	10.95at N 40.61 E		.52
1963.00	.75	N 53.00 W	60.00	1962.85	8.10	9.01 N	7.04 E	11.44at N 38.00 E		1.80
2024.00	1.00	N 30.00 E	61.00	2023.85	8.04	9.85 N	6.07 E	12.01at N 34.91 E		1.93
2084.00	1.00	N 22.00 E	60.00	2083.84	8.61	10.79 N	7.33 E	13.04at N 34.20 E		.23
2145.00	1.25	N 23.00 E	61.00	2144.83	9.20	11.89 N	7.79 E	14.22at N 33.22 E		.41
2205.00	1.50	N 10.00 E	60.00	2204.81	9.78	13.27 N	8.20 E	15.60at N 31.70 E		.66
2266.00	2.00	N 05.00 W	61.00	2265.78	10.09	15.13 N	8.28 E	17.24at N 28.69 E		1.11
2326.00	2.00	N 08.00 E	60.00	2325.74	10.40	17.21 N	8.33 E	19.12at N 25.82 E		.75
2387.00	2.25	N 24.00 E	61.00	2386.70	11.29	19.38 N	8.95 E	21.35at N 24.79 E		1.05
2447.00	2.25	N 25.00 E	60.00	2446.66	12.52	21.52 N	9.93 E	23.71at N 24.76 E		.07
2508.00	4.25	N 56.00 E	61.00	2507.55	15.05	24.12 N	12.15 E	27.01at N 26.73 E		4.25
2568.00	7.25	N 65.00 E	60.00	2567.25	20.60	27.08 N	17.37 E	32.17at N 32.68 E		5.21
2629.00	9.25	N 80.00 E	61.00	2627.61	29.18	29.70 N	25.70 E	39.28at N 40.86 E		4.79
2689.00	10.75	N 89.00 E	60.00	2686.70	39.59	30.70 N	36.06 E	47.36at N 49.58 E		3.60
2750.00	11.25	N 90.00 E	61.00	2746.58	51.15	30.80 N	47.70 E	56.78at N 57.14 E		.88
2810.00	11.75	S 89.00 E	60.00	2805.37	63.00	30.70 N	59.66 E	67.09at N 62.77 E		.90
2871.00	12.50	N 89.00 E	61.00	2865.01	75.72	30.70 N	72.47 E	78.70at N 67.04 E		1.41
2931.00	12.75	N 90.00 E	60.00	2923.56	88.74	30.81 N	85.58 E	90.96at N 70.19 E		.55

MEASURED INCL. HOLE DIRECTION DEGS. DEPTH FEET COURSE LENGTH FEET TRUE VERTICAL SECTION FEET RECTANGULAR CLOSURES DISTANCE FEET DIRECTION DEGS. DOG-LEG SEVERITY

2953.00	12.50	S 88.00 E	22.00	2945.03	93.50	30.73 N	90.39 E	95.47	N 71.22 E	2.29	
(1597'-2953' RESULT OF DIG SURVEY MS-1352)											
(2953'-4290' RESULT OF EASTMAN WHIPSTOCK SURVEY S0196)											
2971.00	12.25	S 87.00 E	18.00	2962.61	97.31	30.56 N	94.25 E	99.08	N 72.03 E	1.83	
3032.00	11.75	S 86.00 E	61.00	3022.28	109.77	29.79 N	106.90 E	110.98	N 74.43 E	.89	
3154.00	10.50	S 85.00 E	122.00	3141.98	132.83	27.94 N	130.37 E	133.33	N 77.90 E	1.04	
3215.00	10.00	S 86.00 E	61.00	3202.01	143.46	27.09 N	141.19 E	143.77	N 79.13 E	.87	
3276.00	9.50	S 87.00 E	61.00	3262.13	153.61	26.46 N	151.50 E	153.80	N 80.09 E	.87	
3337.00	9.00	S 88.00 E	61.00	3322.33	163.28	26.03 N	161.30 E	163.39	N 80.83 E	.86	
3398.00	8.25	S 86.00 E	61.00	3382.64	172.29	25.55 N	170.43 E	172.34	N 81.47 E	1.32	
3459.00	8.00	S 89.00 E	61.00	3443.03	180.79	25.17 N	179.05 E	180.81	N 81.99 E	.81	
3521.00	8.00	N 90.00 E	62.00	3504.43	189.34	25.10 N	187.67 E	189.34	N 82.38 E	.22	
3582.00	8.00	N 89.00 E	61.00	3564.83	197.77	25.17 N	196.16 E	197.77	N 82.68 E	.23	
3643.00	7.25	S 88.00 E	61.00	3625.29	205.79	25.10 N	204.26 E	205.79	N 82.99 E	1.39	
3704.00	7.50	N 90.00 E	61.00	3685.79	213.54	24.97 N	212.08 E	213.55	N 83.28 E	.59	
3765.00	6.75	N 90.00 E	61.00	3746.32	221.05	24.97 N	219.65 E	221.06	N 83.51 E	1.23	
3826.00	6.50	N 88.00 E	61.00	3806.91	228.05	25.09 N	226.69 E	228.07	N 83.68 E	.56	
3887.00	6.75	N 87.00 E	61.00	3867.50	235.06	25.40 N	233.72 E	235.09	N 83.79 E	.45	
3948.00	6.25	N 88.00 E	61.00	3928.11	241.95	25.70 N	240.62 E	241.98	N 83.90 E	.84	
4009.00	6.25	N 90.00 E	61.00	3988.75	248.55	25.81 N	247.26 E	248.60	N 84.04 E	.36	
4070.00	6.25	N 89.00 E	61.00	4049.39	255.14	25.87 N	253.90 E	255.21	N 84.18 E	.18	
4131.00	6.00	N 88.00 E	61.00	4110.04	261.62	26.04 N	260.40 E	261.70	N 84.28 E	.45	
4192.00	6.50	N 87.00 E	61.00	4170.67	268.24	26.33 N	267.04 E	268.33	N 84.36 E	.64	
(2953'-4290' RESULT OF EASTMAN WHIPSTOCK SURVEY S0196)											
4290.00	6.50	N 88.00 E	90.00	4268.04	279.30	26.81 N	278.12 E	279.41	N 84.49 E	.12	

CLOSURE DISTANCE = 279.41 FEET.
CLOSURE DIRECTION = 84.49 E



AMOCO PRODUCTION COMPANY

WELL # :

SHU NO. 156

LOCATION :

LEA COUNTY, NEW MEXICO

DATE :

12/8/83, 12/12/83, (EW) 12/15/83

JOB TYPE :

MAG. MS. MAG. MS, (EW) MAG. MS

JOB # :

MS-1347, MS-1352, (EW) S0198

SURVEYOR :

R. RICE, A. HARBERT, (EW) G. DESPAIN

DEPTHS :

0'-1597', 1597'-2853', (EW) 2853'-4290'

DECL. :

10 DEGREES EAST

ELEV. :

0'

FILE # :

WT-C49

FINAL STATION DATA:

MD. 4290.00

TVD. 4268.04

N/S 26.81

E/W 278.12

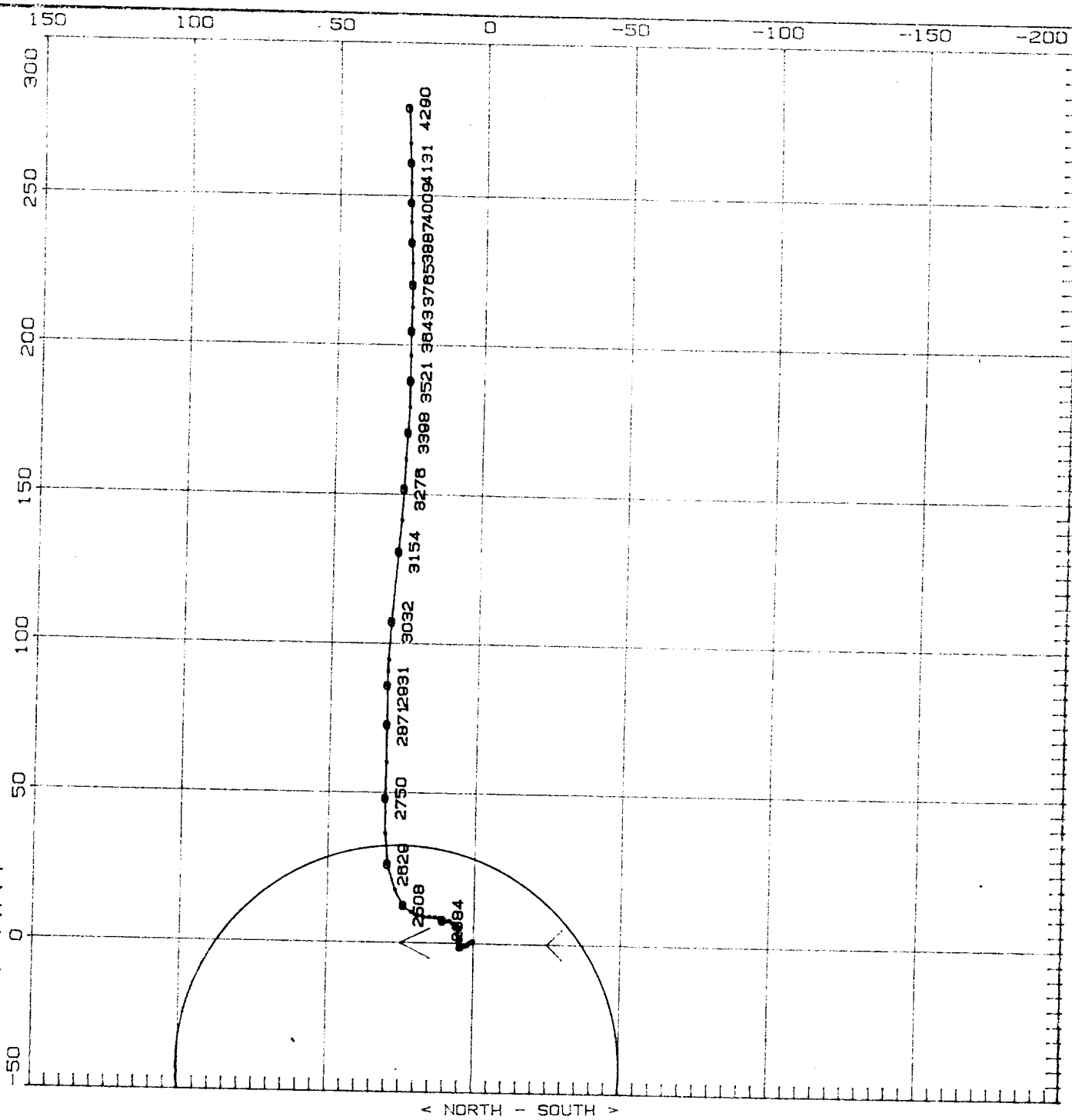
CLOSURE DISTANCE

279.41 FEET

CLOSURE DIRECTION

N 84.49 E

1 IN. = 50 FT.





SURVEY CERTIFICATION

STATE TEXASCOUNTY OF MIDLAND

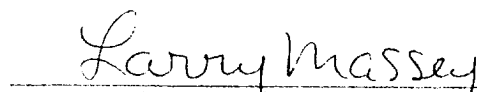
I, RALPH RICE, in the employ of D.I.G., Inc., did on the days of 12-8, 1983 through 12-8, 1983 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 0 feet to 1597 feet, with recordings of inclination being obtained at approximately intervals of 61 feet.

This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU NO. 156, LEA County, State of NEW MEXICO in the SOUTH HOBBS field.

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


RALPH RICE

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.


LARRY MASSEY



DIRECTIONAL
INVESTMENT
GUIDANCE, INC.

P. O. BOX 7238
MIDLAND, TEXAS 79703

SURVEY CERTIFICATION

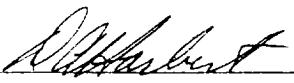
STATE TEXAS

COUNTY OF MIDLAND

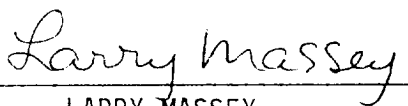
I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 12-12, 19 83 through 12-12, 19 83 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 1597 feet to 2953 feet, with recordings of inclination being obtained at approximately intervals of 61 feet.

This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU NO. 156, LEA County, State of NEW MEXICO in the SOUTH HOBBS field.

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


D. A. HARBERT

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.


LARRY MASSEY

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	
0	0	1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400	441	484	529	576	625	676	729	784	841	900	961	1024	1089	1156	1225	1296	1369	1444	1521	1600	1681	1764	1849	1936	2025	2116	2209	2304	2401	2500	2601	2704	2809	2916	3025	3136	3249	3364	3481	3600	3721	3844	3969	4096	4225	4356	4489	4624	4761	4900	5041	5184	5329	5476	5625	5776	5929	6084	6241	6400	6561	6724	6889	7056	7225	7396	7569	7744	7921	8100	8281	8464	8649	8836	9025	9216	9409	9604	9801	10000



P. O. Box 5577/Midland, Texas 79704/(915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of December 15, 19 83 thru December 16, 19 83 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 2953 feet to 4290 feet, with recordings of inclination and direction being obtained at approximate intervals of 61 feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit Well # 156, 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 Whipstock, 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 Whipstock, Inc.

Tim Stephens

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 19TH day of DEC, 19 83

Ray Stante
Notary Public in and for the
County of Midland, Texas
My commission expires 7/9/85

