

SUB-SURFACE
DIRECTIONAL
SURVEY
REPORT

AMOCO PRODUCTION COMPANY

COMPANY

SHU NO. 162

WELL NAME

LEA COUNTY, NEW MEXICO

STATE AND COUNTY

CERTIFIED REPORT

CUSTOMER : AMOCO PRODUCTION COMPANY

TELEPHONE # : SHU BELL NO. 162

LOCATION : LEA COUNTY, NEW MEXICO

DATE : 12/19/83, 12/24/83, (EW) 12/31/83

OR TYPE :MAG. MS. MAG. MS, (EW)MAG. MS

OR # MS-1360, MS-1365, (EW) S0225

URVEYOR : A. HARBERT, A. HARBERT, (EW) G. DESPAIN

DEPTH: 0'-1536', 1536'-3328', (EW) 3328'-4315'

ECL. : 10 DEGREES EAST.

LEAD

LE # 19-141

ETHOD ; RADIUS OF CURVATURE

SECTION : N90E

THIS SURVEY IS CORRECT TO THE BEST OF MY KNOWLEDGE AND IS SUPPORTED BY ACTUAL FIELD DATA.

Lawrence Massey
DTC REPRESENTATIVE

INAL STATION DATA!

[illegible]

4315.00	#	16.50
N 77.00	F	#
81.00	#	4280.73
393.71	#	29.73
E #	394.83	at N 85.68
1.85	#	

[illegible]

MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	VERTICAL DEPTH FEET	TRUE VERTICAL SECTION FEET	RECTANGULAR COORDINATES N/S	C L O S U R E DISTANCE FEET	DIRECTION DEGS.	SEVERITY DG/100FT
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
77.00	1.00	N 54.00 E	77.00	77.00	.54	.39 N	.67at N 54.00 E		1.30
107.00	.25	N 12.00 W	30.00	106.99	.65	.68 N	.95at N 43.74 E		3.09
168.00	1.00	S 80.00 E	61.00	167.99	1.05	1.09 N	1.51at N 43.83 E		1.83
229.00	0.00	N 00.00 E	61.00	228.99	1.57	1.00 N	1.86at N 57.58 E		1.64
290.00	.75	S 70.00 E	61.00	289.99	1.95	.86 N	2.13at N 66.13 E		1.23
351.00	.25	S 01.00 W	61.00	350.98	2.23	.45 N	2.27at N 78.59 E		1.16
411.00	.25	S 05.00 E	60.00	410.98	2.24	.19 N	2.25at N 85.19 E		.04
472.00	.75	N 21.00 W	61.00	471.98	1.98	.11 N	1.88at N 86.79 E		1.63
533.00	.25	N 57.00 W	61.00	532.98	1.55	.51 N	1.63at N 71.70 E		.93
594.00	1.25	N 10.00 E	61.00	593.97	1.25	1.20 N	1.73at N 46.05 E		1.93
655.00	1.25	N 09.00 E	61.00	654.96	1.47	2.52 N	2.91at N 30.26 E		.04
715.00	1.00	N 81.00 E	60.00	714.94	2.25	3.30 N	3.99at N 34.29 E		2.23
776.00	1.25	N 71.00 E	61.00	775.93	3.41	3.58 N	4.95at N 43.55 E		.52
837.00	.50	N 27.00 W	61.00	836.93	3.72	4.35 N	5.72at N 40.52 E		2.31
898.00	.25	N 38.00 W	61.00	897.92	3.50	4.68 N	5.85at N 36.78 E		.42
958.00	1.25	S 89.00 E	60.00	957.92	3.78	5.25 N	6.47at N 35.79 E		2.37
1019.00	1.25	S 80.00 E	61.00	1018.90	5.11	5.12 N	7.23at N 44.92 E		.32
1080.00	1.50	S 86.00 E	61.00	1079.89	6.56	4.94 N	8.21at N 53.00 E		.47
1141.00	1.50	S 84.00 E	61.00	1140.87	8.15	4.80 N	9.46at N 59.49 E		.09
1202.00	1.75	S 83.00 E	61.00	1201.84	9.87	4.61 N	10.89at N 64.97 E		.41
1262.00	.25	N 40.00 E	60.00	1261.83	10.80	4.97 N	11.89at N 65.27 E		2.71
1293.00	1.75	S 78.00 E	31.00	1292.82	11.29	5.14 N	12.40at N 65.51 E		5.31
1354.00	.25	N 83.00 E	61.00	1353.81	12.35	5.10 N	13.36at N 67.57 E		2.48
1414.00	1.25	S 11.00 E	60.00	1413.81	12.93	4.68 N	13.74at N 70.11 E		2.10

MEASURED	INCL.	HOLE	COURSE	TRUE	VERTICAL	DEPTH	FEET	FEET	N/S	feet	E/W	FEET	DIRECTION	C L O S U R E	SEVERITY
DEPTH	ANGLE	DIRECTION	LENGTH	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	DEGS.	DEGS.	DG/100FT
1475.00	1.25	S 76.00 E	61.00	1474.79	13.79	14.98	16.08	16.50	3.76 N	13.79 E	14.30at N 74.74 E	15.41at N 76.42 E	16.33at N 79.96 E	17.54at N 87.19 E	2.20
1536.00	1.00	N 90.00 E	61.00	1535.78	14.98	16.08	16.50	17.52	3.62 N	14.98 E	15.41at N 76.42 E	16.33at N 79.96 E	17.54at N 87.19 E	1.40	.61
1618.00	1.00	S 20.00 E	82.00	1617.77	16.08	16.50	17.52	17.52	2.85 N	16.08 E	16.33at N 79.96 E	17.54at N 87.19 E	18.76at N 93.54 E	1.17	1.40
1679.00	1.00	S 26.00 E	61.00	1678.76	16.50	17.52	17.52	17.52	1.87 N	16.50 E	16.33at N 79.96 E	17.54at N 87.19 E	18.76at N 93.54 E	1.17	1.40
1740.00	1.75	S 65.00 E	61.00	1739.74	17.52	17.52	17.52	17.52	.86 N	17.52 E	17.54at N 87.19 E	18.76at N 93.54 E	19.97at N 98.89 E	1.90	.84
1800.00	1.50	S 76.00 E	60.00	1799.72	19.12	20.80	22.59	24.32	.29 N	19.12 E	19.12at N 89.12 E	20.80at S 89.61 E	22.60at S 88.34 E	24.36at S 86.89 E	.66
1861.00	1.75	S 75.00 E	61.00	1860.69	20.80	22.59	24.32	26.21	.14 S	20.80 E	20.80at S 89.61 E	22.60at S 88.34 E	24.36at S 86.89 E	26.31at S 85.15 E	.41
1922.00	1.75	S 73.00 E	61.00	1921.66	22.59	24.32	26.21	28.09	.65 S	22.59 E	22.60at S 88.34 E	24.36at S 86.89 E	26.31at S 85.15 E	28.09at S 82.79 E	.10
1983.00	1.75	S 65.00 E	61.00	1982.64	24.32	26.21	28.09	30.00	1.32 S	24.32 E	24.36at S 86.89 E	26.31at S 85.15 E	28.09at S 82.79 E	30.00at S 80.15 E	.40
2043.00	2.25	S 64.00 E	60.00	2042.60	26.21	28.09	30.00	31.97	2.22 S	26.21 E	26.31at S 85.15 E	28.09at S 82.79 E	30.00at S 80.15 E	31.97at S 78.56 E	.84
2104.00	3.00	S 56.00 E	61.00	2103.53	28.63	31.97	36.79	42.80	3.62 S	28.63 E	28.86at S 82.79 E	32.45at S 80.15 E	37.53at S 78.56 E	43.76at S 77.98 E	1.37
2165.00	4.25	S 64.00 E	61.00	2164.41	31.97	36.79	42.80	49.87	5.55 S	31.97 E	32.45at S 80.15 E	37.53at S 78.56 E	43.76at S 77.98 E	50.93at S 78.26 E	2.21
2226.00	5.50	S 73.00 E	61.00	2225.19	36.79	42.80	49.87	58.46	7.44 S	36.79 E	37.53at S 78.56 E	43.76at S 77.98 E	50.93at S 78.26 E	59.50at S 79.31 E	2.40
2287.00	6.25	S 76.00 E	61.00	2285.87	42.80	49.87	58.46	68.00	9.11 S	42.80 E	43.76at S 77.98 E	50.93at S 78.26 E	59.50at S 79.31 E	68.94at S 80.50 E	1.33
2347.00	7.50	S 84.00 E	60.00	2345.44	49.87	58.46	68.00	78.07	10.36 S	49.87 E	50.93at S 78.26 E	59.50at S 79.31 E	68.94at S 80.50 E	78.89at S 81.71 E	2.62
2408.00	8.75	S 87.00 E	61.00	2405.82	58.46	68.00	78.07	88.53	11.03 S	58.46 E	59.50at S 79.31 E	68.94at S 80.50 E	78.89at S 81.71 E	89.24at S 82.74 E	2.16
2469.00	9.25	S 89.00 E	61.00	2466.07	68.00	78.07	88.53	99.33	11.37 S	68.00 E	68.94at S 80.50 E	78.89at S 81.71 E	89.24at S 82.74 E	99.96at S 83.57 E	.97
2530.00	9.75	N 89.00 E	61.00	2526.23	78.07	88.53	99.33	110.84	11.37 S	78.07 E	78.89at S 81.71 E	89.24at S 82.74 E	99.96at S 83.57 E	111.39at S 84.29 E	.98
2591.00	10.00	N 90.00 E	61.00	2586.33	88.53	99.33	110.84	122.34	11.28 S	88.53 E	89.24at S 82.74 E	99.96at S 83.57 E	111.39at S 84.29 E	122.82at S 84.96 E	.50
2651.00	10.75	N 89.00 E	60.00	2645.35	99.33	110.84	122.34	133.46	11.18 S	99.33 E	99.96at S 83.57 E	111.39at S 84.29 E	122.82at S 84.96 E	133.88at S 85.46 E	1.29
2712.00	11.00	N 90.00 E	61.00	2705.25	110.84	122.34	133.46	154.20	11.08 S	110.84 E	111.39at S 84.29 E	122.82at S 84.96 E	133.88at S 85.46 E	154.59at S 85.93 E	.51
2773.00	10.75	N 87.00 E	61.00	2765.16	122.34	133.46	154.20	164.25	10.78 S	122.34 E	122.82at S 84.96 E	133.88at S 85.46 E	154.59at S 85.93 E	164.58at S 86.36 E	1.01
2834.00	10.25	S 89.00 E	61.00	2825.14	133.46	154.20	164.25	173.74	10.59 S	133.46 E	133.88at S 85.46 E	154.59at S 85.93 E	164.58at S 86.36 E	173.74at S 86.89 E	1.45
2955.00	9.50	S 89.00 E	121.00	2944.34	154.20	164.25	173.74	183.00	10.95 S	154.20 E	154.59at S 85.93 E	164.58at S 86.36 E	173.74at S 86.89 E	183.00at S 87.19 E	.62
3016.00	9.50	N 83.00 E	61.00	3004.51	164.25	173.74	183.00	192.00	10.42 S	164.25 E	164.58at S 86.36 E	173.74at S 86.89 E	183.00at S 87.19 E	192.00at S 87.19 E	2.16

MEASURED INCL. HOLE DIRECTION DEGS. DEPTH FEET COURSE LENGTH FEET VERTICAL DEPTH FEET TRUE VERTICAL SECTION FEET N/S FEET E/W FEET DISTANCE FEET CLOSURE DEGS. DOG-LEG

3077.00	9.00	S	85.00	E	61.00	3064.71	174.04	10.25	S	174.04	E	174.34	S	86.62	E	3.26
3138.00	8.50	S	89.00	E	61.00	3125.00	183.30	10.74	S	183.30	E	183.62	S	86.64	E	1.29
3198.00	8.50	S	86.00	E	60.00	3184.34	192.16	11.12	S	192.16	E	192.48	S	86.68	E	.74
3259.00	8.00	S	86.00	E	61.00	3244.71	200.89	11.73	S	200.89	E	201.23	S	86.65	E	.82
3320.00	7.50	N	86.00	E	61.00	3305.15	209.11	11.73	S	209.11	E	209.44	S	86.78	E	1.95
3328.00	7.00	N	88.00	E	8.00	3313.09	210.12	11.68	S	210.12	E	210.44	S	86.81	E	7.00
3381.00	7.25	S	89.00	E	53.00	3365.68	216.69	11.62	S	216.69	E	217.00	S	86.92	E	.85
3442.00	8.00	N	89.00	E	61.00	3426.14	224.79	11.62	S	224.79	E	225.09	S	87.03	E	1.30
3503.00	8.50	N	83.00	E	61.00	3486.51	233.51	11.01	S	233.51	E	233.77	S	87.29	E	1.63
3564.00	8.25	N	86.00	E	61.00	3546.86	242.36	10.16	S	242.36	E	242.57	S	87.59	E	.83
3625.00	9.00	N	83.00	E	61.00	3607.17	251.46	9.29	S	251.46	E	251.63	S	87.88	E	1.43
3686.00	10.00	N	83.00	E	61.00	3667.33	261.45	8.06	S	261.45	E	261.58	S	88.23	E	1.64
3746.00	10.00	N	79.00	E	60.00	3726.42	271.74	6.43	S	271.74	E	271.82	S	88.64	E	1.16
3807.00	10.75	N	77.00	E	61.00	3786.42	282.49	4.14	S	282.49	E	282.52	S	89.15	E	1.36
3868.00	11.25	N	75.00	E	61.00	3846.30	293.78	1.33	S	293.78	E	293.78	S	89.74	E	1.03
3929.00	11.75	N	75.00	E	61.00	3906.08	305.53	1.82	N	305.53	E	305.53	N	89.65	E	.82
3990.00	12.75	N	73.00	E	61.00	3965.69	317.97	5.39	N	317.97	E	318.01	N	89.02	E	1.78
4051.00	13.00	N	72.00	E	61.00	4025.15	330.93	9.47	N	330.93	E	331.07	N	88.36	E	.55
4112.00	13.50	N	70.00	E	61.00	4084.53	344.15	14.02	N	344.15	E	344.44	N	87.66	E	1.11
4173.00	14.25	N	72.00	E	61.00	4143.75	357.98	18.79	N	357.98	E	358.47	N	86.99	E	1.46
4234.00	15.00	N	71.00	E	61.00	4202.77	372.59	23.67	N	372.59	E	373.34	N	86.36	E	1.30
4315.00	16.50	N	77.00	E	81.00	4280.73	393.71	29.73	N	393.71	E	394.83	N	85.68	E	2.73

CLOSURE DISTANCE = 394.83 FEET.
CLOSURE DIRECTION = N 85.68 E

AMOCO PRODUCTION COMPANY

WELL #
SHU WELL NO. 182

LOCATION
LEA COUNTY, NEW MEXICO

DATE
12/18/89, 12/24/89, (EW) 12/31/89

JOB TYPE
MAG. MS, MAG. MS, (EW) MAG. MS

JOB #
MS-1360, MS-1365, (EW) S0225

SURVEYOR
A. HARBERT, A. HARBERT, (EW) G. DESPAIN

DEPTHS
0'-1530', 1530'-3328', (EW) 3328'-4315'

DECL.
10 DEGREES EAST

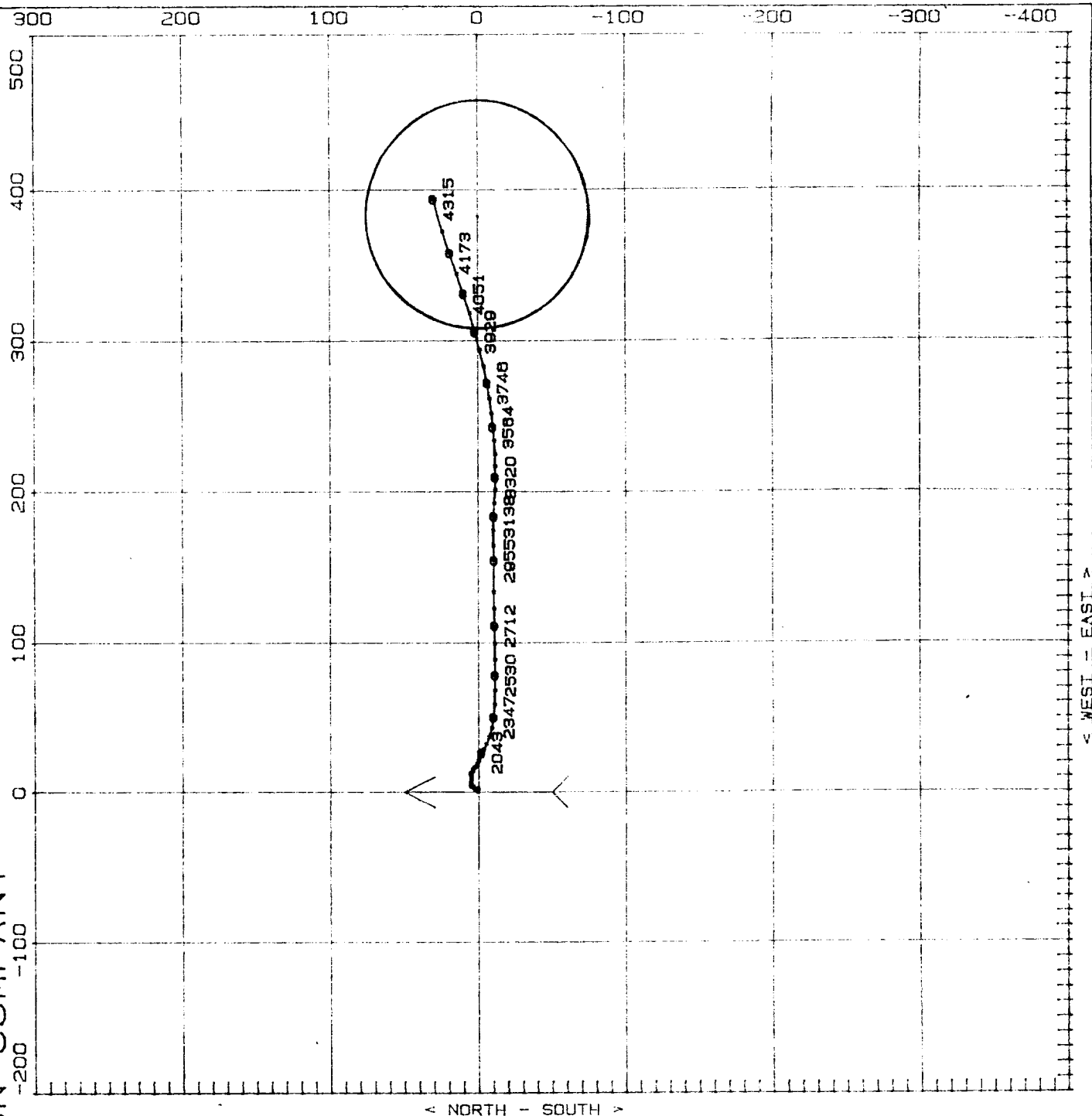
ELEV.
0'

FILE #
WT-G1S

FINAL STATION DATA:
MD. 4315.00
TVD. 4280.73
N/S 29.73
E/W 393.71

CLOSURE DISTANCE
394.83 FEET
CLOSURE DIRECTION
N 85.68 E

1 IN. = 100 FT.





DIRECTIONAL
INVESTMENT
GUIDANCE, INC.

P. O. BOX 7238
MIDLAND, TEXAS 79708

SURVEY CERTIFICATION

STATE TEXAS

COUNTY OF MIDLAND

I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 12-19, 1983 through 12-19, 1983 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 0 feet to 1536 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 WELL NO. 162, LEA County, State of NEW MEXICO in the _____ 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



DIRECTIONAL
INVESTMENT
GUIDANCE, INC.

P. O. BOX 7238
MIDLAND, TEXAS 79708

SURVEY CERTIFICATION

STATE TEXAS

COUNTY OF MIDLAND

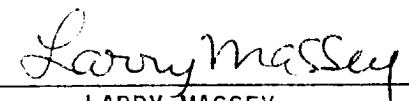
I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 12-24, 1983 through 12-24, 1983 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 1536 feet to 3328 feet, with recordings of inclination being obtained at approximately intervals of 61 feet.

This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU WELL NO. 162, LEA County, State of NEW MEXICO in the _____ 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



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 30, 1983 thru December 31, 1983 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 3328 feet to 4315 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 # 162, 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.

Tina 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 12TH day of JAN., 1984

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

