



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

AMOCO PRODUCTION COMPANY
COMPANY

SOUTH HOBBS UNIT WELL NO. 145
WELL NAME

LEA COUNTY, NEW MEXICO
LOCATION

JOB NUMBER

WT1083-S0059
WT1083-S0060
WT1083-S0071
MS 1288

TYPE OF SURVEY

MAGNETIC MULTISHOT SURVEY
MAGNETIC MULTISHOT SURVEY
MAGNETIC MULTISHOT SURVEY
MAGNETIC MULTISHOT SURVEY

DATE

10/04/83
10/07/83
10/12/83
10/17/83

SURVEY BY
GARY DESPAIN
A. HARBERT

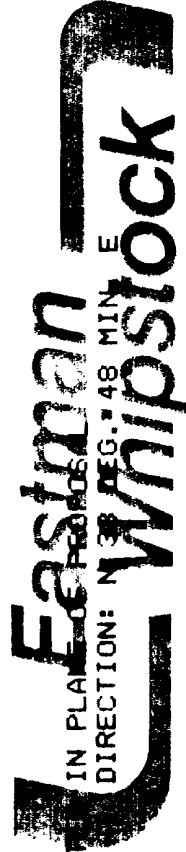
OFFICE
WEST TEXAS
D.I.G.

AMOCO PRODUCTION COMPANY
SOUTH HOBBS UNIT WELL NO. 145
LEA COUNTY, NEW MEXICO BD1-429

EASTMAN WHIPSTOCK INC.

MAGNETIC MULTI SHOT SURVEY	WT1083-S0059
SURVEYOR: GARY DESPAIN	(0'-1213')
MAGNETIC MULTI SHOT SURVEY	WT1083-S0060
SURVEYOR: GARY DESPAIN	(1213'-1635')
MAGNETIC MULTI SHOT SURVEY	WT1083-S0071
SURVEYOR: GARY DESPAIN	(1635'-3342')
MAGNETIC MULTI SHOT SURVEY	MS 1288
SURVEYOR: A. HARBERT	(3342'-4478')

LAST SURVEY INFORMATION IS TAKEN FROM D.I.G. MULTI SHOT SURVEY.



VERTICAL SECTION CALCULATION

IN PLACE FROM 1988
DIRECTION: N 33 DEG. 48 MIN. E

RECORD OF SURVEY

RADIUS OF CURVATURE METHOD

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES FEET	DOGLEG SEVERITY DG/100FT
0.	0 0	0	0.	0.00	0.00	0.00	0.00
82.	0 15	S 25 E	82.	82.00	-0.09	0.16 S	0.08 E
113.	0 15	S 64 W	31.	113.00	-0.21	0.28 S	0.03 E
175.	0 15	S 47 W	62.	175.00	-0.46	0.43 S	0.19 W
236.	0 30	S 23 E	61.	236.00	-0.81	0.80 S	0.27 W
298.	0 30	S 56 W	62.	298.00	-1.29	1.28 S	0.41 W
359.	0 45	S 50 W	61.	358.99	-1.91	1.68 S	0.94 W
421.	1 0	S 11 W	62.	420.98	-2.84	2.47 S	1.41 W
482.	1 0	S 16 W	61.	481.97	-3.84	3.51 S	1.66 W
544.	1 15	S 25 W	62.	543.96	-5.02	4.65 S	2.08 W
605.	1 15	S 35 W	62.	604.95	-6.35	5.80 S	2.75 W
667.	1 30	S 40 W	62.	666.93	-7.13	6.98 S	3.65 W
698.	1 30	S 43 W	31.	697.92	-8.63	7.56 S	4.22 W
759.	2 15	S 61 W	61.	758.89	-12.93	8.72 S	5.84 W
821.	2 45	S 61 W	62.	820.88	-12.93	10.03 S	8.20 W
882.	3 15	S 60 W	61.	881.74	-15.75	11.60 S	10.98 W
944.	3 45	S 69 W	62.	943.63	-19.00	13.23 S	14.40 W
1005.	3 45	S 76 W	61.	1004.50	-22.11	14.43 S	18.20 W
1067.	4 0	S 81 W	62.	1066.36	-25.09	15.26 S	22.30 W
1128.	5 0	S 84 W	61.	1127.17	-28.25	15.89 S	27.05 W
1190.	5 0	S 84 W	62.	1188.93	-31.71	16.45 S	32.42 W
1213.	5 15	S 84 W	23.	1211.84	-33.02	16.67 S	34.46 W
1262.	5 45	S 84 W	49.	1260.61	-36.03	17.16 S	39.13 W
1324.	4 30	S 88 W	62.	1322.36	-39.42	17.55 S	44.66 W
1385.	3 30	N 79 W	61.	1383.21	-41.50	17.21 S	48.89 W
1446.	3 30	N 89 W	61.	1444.10	-43.24	16.82 S	52.59 W
1508.	3 15	N 89 W	62.	1505.99	-45.21	16.76 S	56.24 W
1569.	2 15	S 66 W	61.	1566.92	-47.28	17.34 S	59.08 W
1635.	2 30	N 84 W	66.	1632.87	-49.11	17.76 S	61.75 W
1714.	2 0	S 61 W	79.	1711.80	-51.28	18.37 S	64.74 W

Eastman
Weststock

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE		VERTICAL SECTION FEET	R E C T A N G U L A R C O O R D I N A T E S FEET		DOGLEG SEVERITY DG/100FT
				VERTICAL DEPTH FEET					
1776.	1 30	N 48 W	62.	1773.78		-52.10	18.17 S	66.51 W	3.34
1838.	5 0	N 29 E	62.	1835.67		-49.73	14.96 S	67.05 W	7.88
1901.	7 45	N 31 E	63.	1898.27		-42.75	8.90 S	63.55 W	4.38
1963.	9 0	N 41 E	62.	1959.61		-33.74	1.60 S	58.25 W	3.09
2025.	9 30	N 37 E	62.	2020.80		-23.81	6.14 N	51.98 W	1.31
2088.	10 30	N 40 E	63.	2082.84		-12.91	14.70 N	45.17 W	1.79
2150.	13 15	N 37 E	62.	2143.51		-0.20	24.68 N	37.23 W	4.54
2213.	14 0	N 35 E	63.	2204.74		14.63	36.69 N	28.50 W	1.41
2275.	15 30	N 40 E	62.	2264.69		30.38	49.21 N	18.90 W	3.17
2337.	17 15	N 39 E	62.	2324.18		47.77	62.69 N	7.78 W	2.86
2400.	18 45	N 39 E	63.	2384.05		67.16	77.82 N	4.47 E	2.38
2462.	20 15	N 36 E	62.	2442.33		109.25	94.24 N	17.07 E	2.91
2524.	20 15	N 36 E	62.	2500.70		111.60	111.60 N	29.68 E	0.00
2587.	22 15	N 33 E	63.	2559.41		130.41	130.41 N	42.61 E	3.61
2649.	23 0	N 36 E	62.	2616.92		150.07	150.07 N	56.12 E	2.22
2711.	24 15	N 25 E	62.	2673.44		180.69	171.44 N	68.71 E	7.38
2774.	23 15	N 36 E	63.	2731.11		205.98	193.27 N	81.57 E	7.20
2836.	22 0	N 36 E	62.	2788.34		229.82	212.57 N	95.59 E	2.02
2899.	22 45	N 38 E	63.	2846.59		253.76	231.72 N	110.02 E	1.70
2961.	22 0	N 35 E	62.	2903.92		277.33	250.69 N	124.06 E	2.20
3023.	22 0	N 38 E	62.	2961.41		300.53	269.36 N	137.87 E	1.81
3086.	20 15	N 39 E	63.	3020.17		323.16	287.13 N	152.00 E	2.84
3148.	20 0	N 38 E	62.	3078.39		344.42	303.82 N	165.28 E	0.69
3210.	20 0	N 39 E	62.	3136.65		365.55	320.42 N	178.49 E	0.55
3273.	20 0	N 41 E	63.	3195.85		386.97	336.92 N	192.34 E	1.09
3342.	19 15	N 41 E	69.	3260.84		409.96	354.41 N	207.54 E	1.09

3397 IS THE START OF D.I.G. SURVEY.

3397.	18 45	N 39 E	55.	3312.84		427.76	368.13 N	219.05 E	1.49
3459.	19 45	N 40 E	62.	3371.38		448.10	383.90 N	232.05 E	1.70

TIME DATE
13:42:29 08-NOV-83

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	R E C T A N G U L A R C O O R D I N A T E S FEET	DOGLEG SEVERITY DG/100FT
3521.	19 30	N 38 E	62.	3429.77	468.84	400.08 N 245.15 E	1.16
3583.	20 0	N 37 E	62.	3488.13	489.75	416.70 N 257.91 E	0.97
3645.	21 0	N 36 E	62.	3546.20	511.44	434.16 N 270.82 E	1.71
3707.	22 30	N 31 E	62.	3603.79	534.40	453.31 N 283.50 E	3.84
3769.	24 30	N 33 E	62.	3660.64	559.11	474.27 N 296.60 E	3.47
3831.	25 0	N 33 E	62.	3716.94	585.06	496.04 N 310.74 E	0.81
3893.	25 15	N 33 E	62.	3773.08	611.39	518.12 N 325.07 E	0.40
3955.	26 30	N 32 E	62.	3828.86	638.44	540.94 N 339.61 E	2.14
4018.	27 15	N 31 E	63.	3885.06	666.89	565.22 N 354.49 E	1.39
4080.	28 0	N 31 E	62.	3939.99	695.60	589.86 N 369.30 E	1.21
4142.	28 30	N 30	62.	3994.60	724.90	615.15 N 384.19 E	1.11
4204.	29 30	N 30	62.	4048.83	753.83	641.18 N 399.22 E	1.61
4266.	29 45	N 30	62.	4102.72	785.47	677.72 N 414.54 E	0.40
4328.	30 0	N 30 E	62.	4156.49	816.22	704.47 N 429.98 E	0.40
4390.	29 45	N 30 E	62.	4210.39	841.16	721.21 N 445.43 E	0.40
4452.	30 30	N 31 E	62.	4263.87	878.17	748.02 N 461.22 E	1.46
4478.	31 15	N 31 E	26.	4286.19	891.50	759.46 N 468.09 E	2.88
4498.	31 15	N 31 E	20.	4303.29	901.86	768.35 N 473.43 E	0.00

4498 IS A PROJECTION BASED ON MULTISHOT SURVEY.

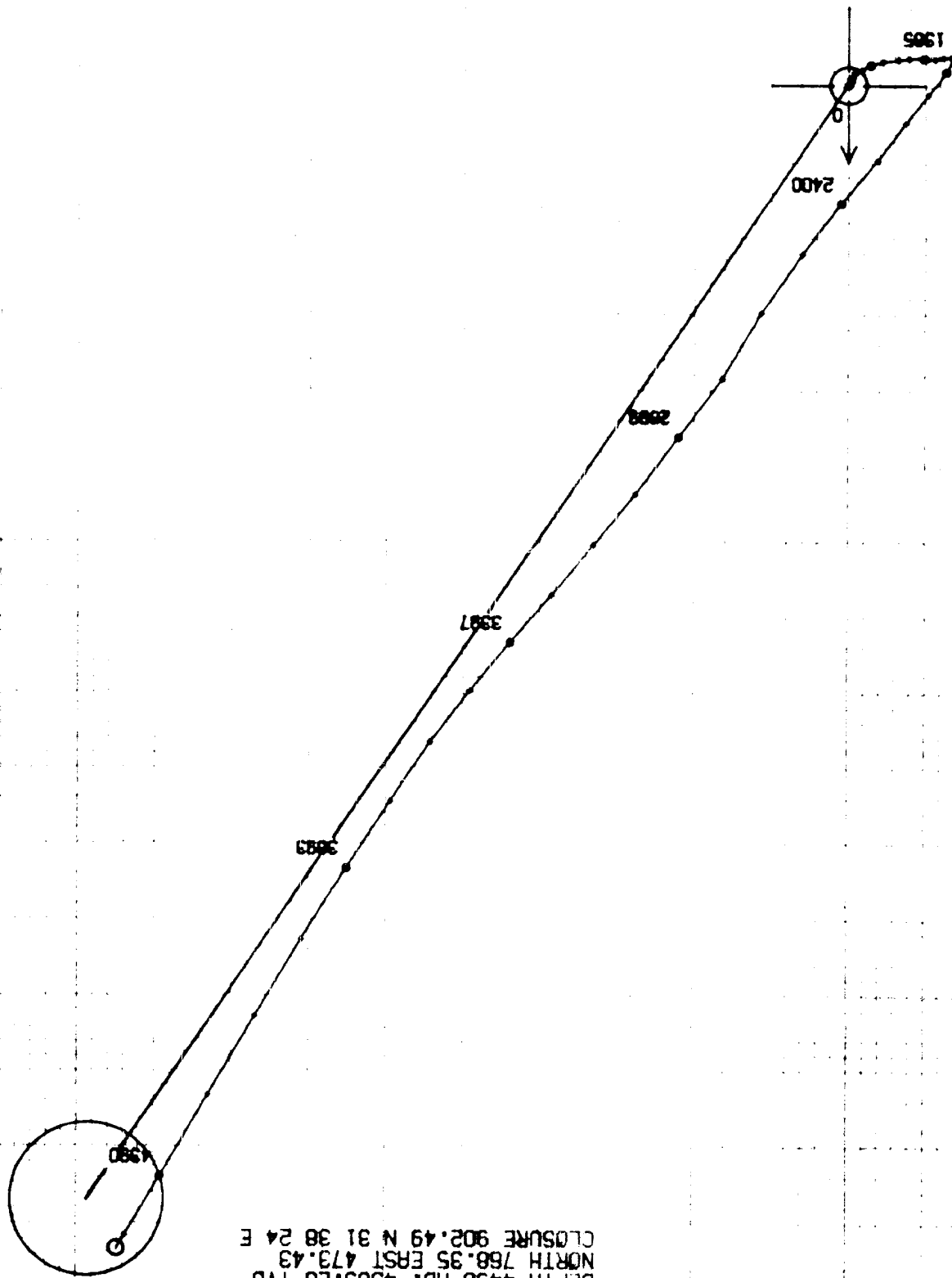
FINAL CLOSURE - DIRECTION: N 31 DEGS 38 MINS E
DISTANCE: 902.50 FEET

HORIZONTAL PROJECTION

SCALE 1 IN. = 100 FEET
DEPTH INDICATOR, MD

RHOD PRODUCTION COMPANY
SOUTH HOBBS UNIT WELL NO. 145
LEA COUNTY, NEW MEXICO B01-429
ERSTMAN WHIPSTOCK, INC.

FINAL STRATION:
DEPTH 4498 MD. 4309.28 TVD
NORTH 768.95 EAST 473.43
CLOSURE 902.49 N 31 38 24 E





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 October 4, 1983 thru October 4, 1983 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 0' feet to 1,213' feet, with recordings of inclination and direction being obtained at approximate intervals of 62' feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit #289, 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 8TH day of NOV., 1983

Ray L. Stenke
Notary Public In and for the
County of Midland, Texas
My commission expires 7/19/85





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 October 7, 1983 thru October 7, 1983 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 1,213' feet to 1,635' feet, with recordings of inclination and direction being obtained at approximate intervals of 62' feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit #145, 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 8th day of NOV., 1983

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





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 October 12, 1983 thru October 12, 1983 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 1635' feet to 3342' feet, with recordings of inclination and direction being obtained at approximate intervals of 62' feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit #145, 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 8TH day of NOV, 1983

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



SURVEY CERTIFICATION

STATE TEXASCOUNTY OF MIDLAND

I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 10-17, 1983 through 10-17, 1983 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 3342 feet to 4498 feet, with recordings of inclination being obtained at approximately intervals of 62 feet.

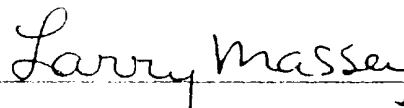
This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU #145, LEA County, State of NEW MEXICO in the SOUTH HOBBS UNIT field.

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