

SPERRY-SUN DRILLING SERVICES
MWD SURVEY REPORT
WILLIAMS NATURAL GAS COMPANY
ALDEN STORAGE FIELD #19
RICE COUNTY, KANSAS
(BEREDCO #6)
JOB #LFMM92E061 / API#15-159-22328-01-00
SEPT 18, 1992 THROUGH SEPT 26, 1992

OCT 28 1992
CONFIDENTIAL

RELEASED

NOV 18 1993

FROM CONFIDENTIAL

ALDEN STORAGE
ALDEN STORAGE FIELD #19
LFMM92E061 15-159-22328

WILLIAMS NATURAL GAS COMPANY
SEPTEMBER, 1992
NORTH REFERENCE : TRUE NORTH

MEASURED DEPTH	ANGLE DEGREE	DIRECTION QUADRANT	VERTICAL DEPTH	LATITUDE FEET	DEPARTURE FEET	VERTICAL SECTION	DOG LEG SEVERITY
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TIE ON INFORMATION PROVIDED BY THE CUSTOMER:

500.00	.00	N	.00	E	500.00	.00	N	.00	E	.00	.00
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SPERRY-SUN MWD:

950.00	.75	S	38.10	W	949.99	2.32	S	1.82	W	.07	.17
1485.00	.60	S	21.70	W	1484.95	7.76	S	4.95	W	-.68	.05
1950.00	.40	N	67.90	E	1949.93	10.01	S	2.68	W	-3.84	.20
2416.00	.60	S	11.80	E	2415.91	11.69	S	.47	E	-7.37	.17

2831.00	.70	N	57.70	E	2830.89	13.26	S	4.16	E	-11.26	.26
2862.00	3.50	N	39.70	W	2861.86	12.26	S	4.32	E	-10.80	11.80
2894.00	7.50	N	44.20	W	2893.71	9.98	S	2.27	E	-7.79	12.56
2925.00	11.20	N	44.00	W	2924.29	6.37	S	1.24	W	-2.82	11.94
2956.00	15.00	N	44.30	W	2954.48	1.33	S	6.13	W	4.12	12.26

2987.00	18.80	N	47.30	W	2984.14	4.95	N	12.59	W	13.05	12.57
3018.00	22.40	N	50.80	W	3013.15	12.10	N	20.82	W	23.92	12.27
3050.00	26.20	N	51.60	W	3042.31	20.35	N	31.08	W	37.08	11.92
3081.00	30.60	N	52.00	W	3069.57	29.46	N	42.67	W	51.82	14.21
3113.00	34.60	N	53.60	W	3096.52	39.89	N	56.40	W	69.05	12.79

3144.00	38.50	N	52.20	W	3121.42	51.02	N	71.12	W	87.51	12.86
3176.00	42.20	N	53.80	W	3145.81	63.49	N	87.66	W	108.22	12.01
3206.00	45.70	N	52.50	W	3167.40	75.97	N	104.32	W	129.04	12.05
3237.00	48.30	N	51.90	W	3188.54	89.86	N	122.23	W	151.71	8.51
3268.00	51.30	N	52.20	W	3208.55	104.42	N	140.90	W	175.38	9.71

3299.00	54.30	N	52.00	W	3227.29	119.59	N	160.38	W	200.06	9.69
3330.00	57.60	N	51.80	W	3244.64	135.44	N	180.59	W	225.74	10.66
3362.00	60.70	N	51.80	W	3261.05	152.42	N	202.18	W	253.20	9.69
3393.00	63.80	N	51.80	W	3275.48	169.39	N	223.74	W	280.62	10.00
3423.00	67.30	N	51.50	W	3287.90	186.33	N	245.15	W	307.91	11.70

3448.00	69.80	N	51.80	W	3297.04	200.77	N	263.40	W	331.17	10.06
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SURVEY PROJECTED TO T.D.:

3485.00	69.80	N	51.80	W	3309.82	222.24	N	290.68	W	365.88	.00
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RADIUS OF CURVATURE CALCULATION METHOD

HORIZONTAL DISPLACEMENT AT BOTTOM HOLE IS
365.91 FEET ALONG N 52 DEG 36 MIN W
RELATIVE TO WELL HEAD

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION COMPUTED ALONG 306.73 DEG

RELEASED

NOV 1 8 1993

FROM CONFIDENTIAL

CORRECTION FACTORS FROM MAGUTM:

TOTAL MAGNETIC FIELD STRENGTH = 54588 nT

MAGNETIC DIP ANGLE = 66.82

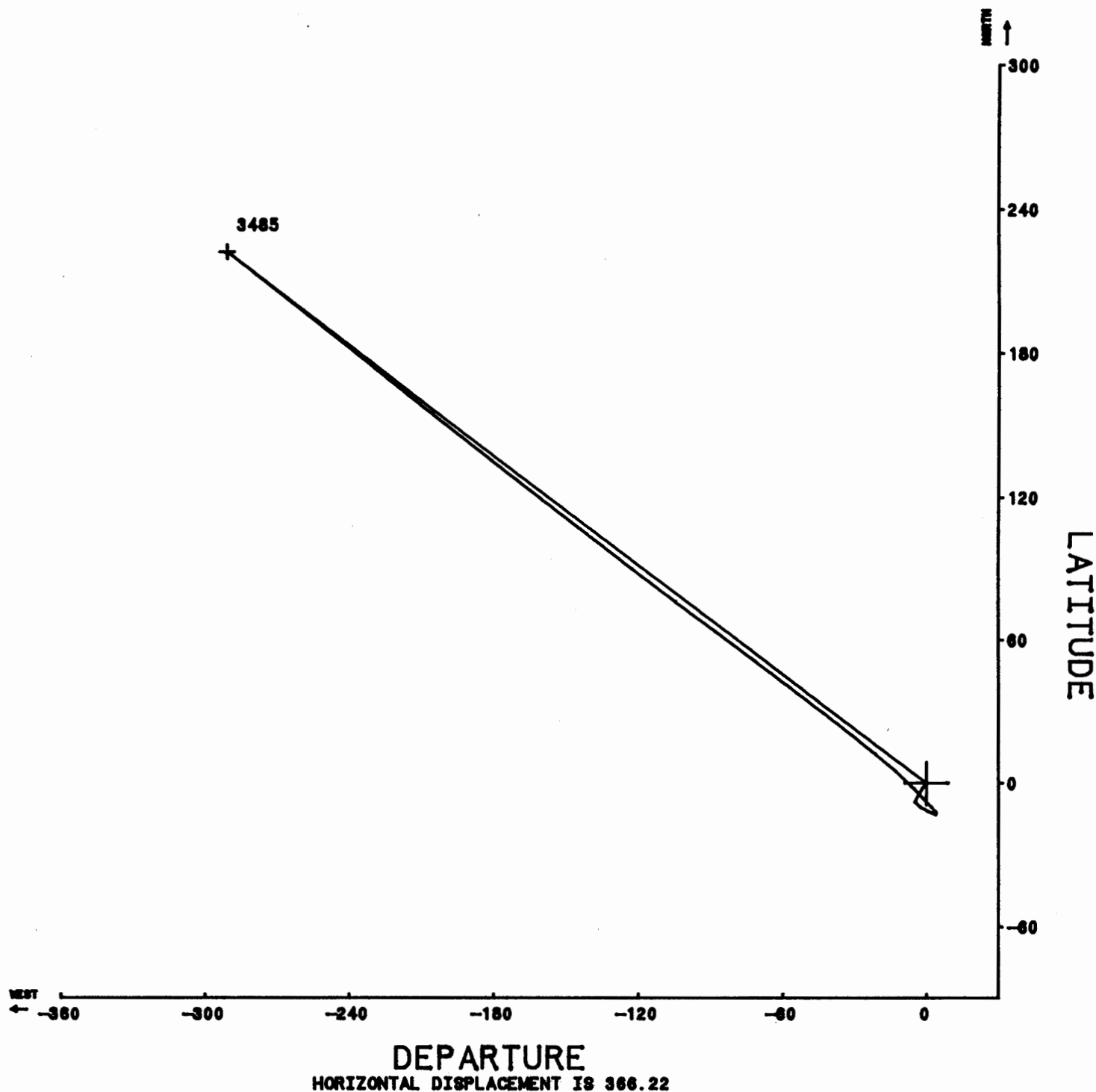
SURVEYS CORRECTED 7.12 DEGREES EAST FROM MAGNETIC NORTH TO TRUE NORTH.

SPERRY-SUN DRILLING SERVICES

HORIZONTAL PROJECTION

WILLIAMS NATURAL GAS COMPANY
ALDEN STORAGE FIELD #19
SEPTEMBER, 1992
LFMM92E06115-159-22328

START TVD = 500
FINISH TVD = 3309.82
SCALE IS 60 FEET/IN

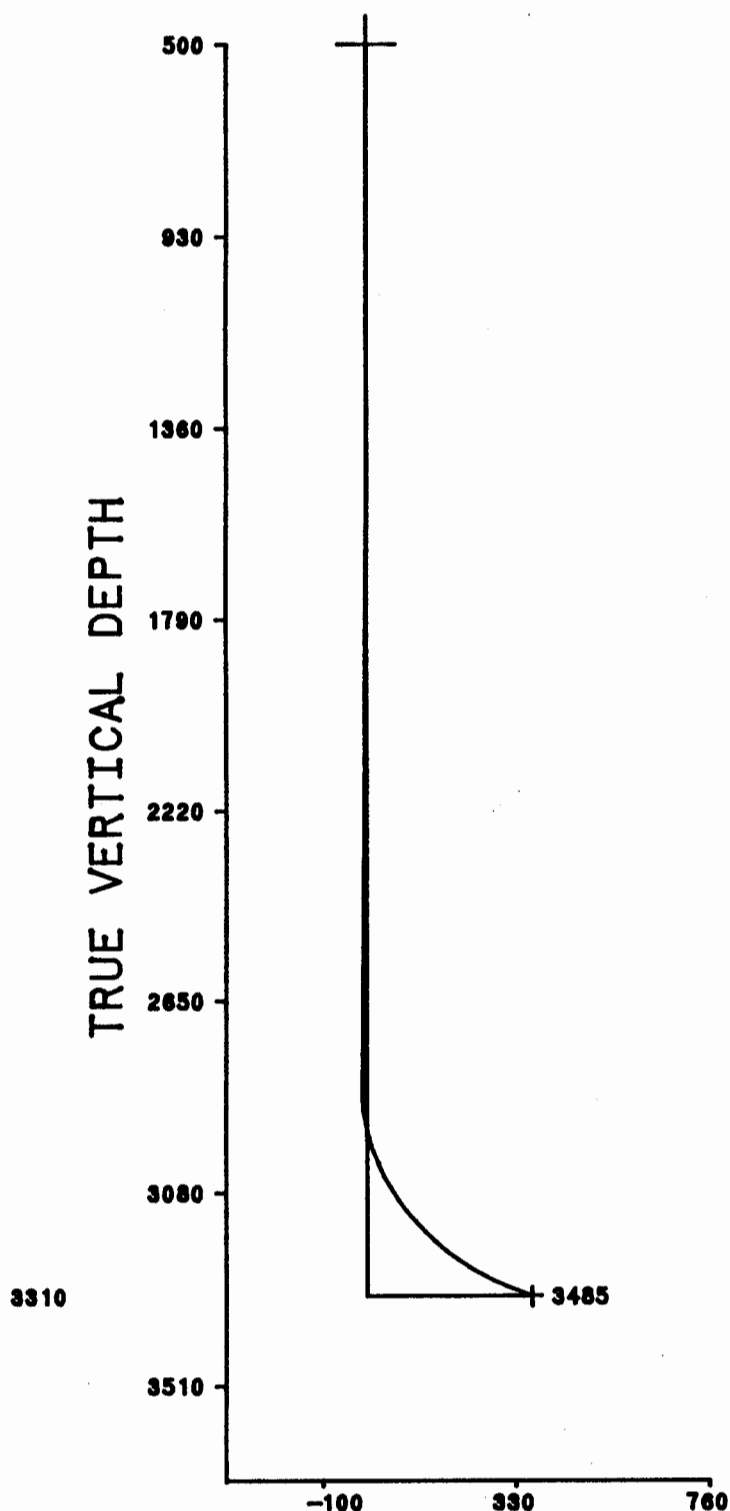


SPERRY-SUN DRILLING SERVICES

VERTICAL PROJECTION

WILLIAMS NATURAL GAS COMPANY
ALDEN STORAGE FIELD #19
SEPTEMBER, 1992
LFMM92E06115-159-22328

START TVD = 500
FINISH TVD = 3309.82
SCALE IS 430 FEET/IN



VERTICAL SECTION

DIRECTION = 307.00

SPERRY-SUN DRILLING SERVICES

VERTICAL/HORIZONTAL PROJECTIONS

WILLIAMS NATURAL GAS COMPANY
ALDEN STORAGE FIELD #19
SEPTEMBER, 1992
LFMM92E06115-159-22328

START TVD = 500
FINISH TVD = 3309.82
VERT SECT SCALE IS 430 FEET/IN
HORZ SECT SCALE IS 120 FEET/IN

