



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

LANDIS DRILLING COMPANY
COMPANY

RIO PENASCO KD NO. 3
WELL NAME

EDDY COUNTY, NEW MEXICO
LOCATION

JOB NUMBER

WT681-S0333

TYPE OF SURVEY

MAGNETIC MULTI SHOT SURVEY

DATE

6-18-81

SURVEY BY

GARY DESPAIN

OFFICE

WEST TEXAS

LANDIS DRILLING COMPANY
RIO PENASCO KD NO. 3
EDDY COUNTY, NEW MEXICO BD1-2
JUNE 18, 1981

EASTMAN WHIPSTOCK, INC.
MAGNETIC MULTI SHOT SURVEY WT681-S0333
SURVEYOR: GARY DESPAIN (1316'-6050')

Eastman
Whipstock
RECORD OF SURVEY

RADIUS OF CURVATURE METHOD

LANDIS DRILLING COMPANY
RIO PENASCO KD NO. 3
EDDY COUNTY, NEW MEXICO

BD1-2

COMPUTATION

PAGE NO. 1

TIME DATE

00:17:44 00--00

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	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	DOGLEG SEVERITY DG/100FT
0.	0 0	0	0.	0.00	0.00	0.00
1316.	0 0	0	1316.	1316.00	0.00	0.00
1350.	0 45	S 69 W	34.	1350.00	0.08 S	2.21
1400.	0 45	S 70 W	50.	1399.99	0.31 S	0.03
1500.	1 0	S 82 W	100.	1499.98	0.68 S	0.31
1600.	0 45	S 70 W	100.	1599.97	1.05 S	0.31
1700.	1 0	S 70 W	100.	1699.96	1.57 S	0.25
1800.	1 0	S 73 W	100.	1799.94	2.12 S	0.05
1900.	1 0	S 73 W	100.	1899.93	2.63 S	0.00
2000.	1 0	S 64 W	100.	1999.91	3.27 S	0.16
2100.	1 15	S 65 W	100.	2099.89	4.12 S	0.25
2200.	1 15	S 70 W	100.	2199.87	4.95 S	0.11
2300.	1 45	S 69 W	100.	2299.84	5.87 S	0.50
2400.	2 0	S 69 W	100.	2399.78	7.04 S	0.25
2500.	2 0	S 64 W	100.	2499.72	8.43 S	0.17
2600.	2 0	S 73 W	100.	2599.66	9.71 S	0.31
2700.	2 0	S 72 W	100.	2699.60	10.76 S	0.03
2800.	2 0	S 72 W	100.	2799.54	11.84 S	0.00
2900.	2 0	S 76 W	100.	2899.48	12.80 S	0.14
3000.	2 0	S 80 W	100.	2999.42	13.53 S	0.14
3100.	2 0	S 81 W	100.	3099.36	14.10 S	0.03
3200.	2 15	S 79 W	100.	3199.29	14.74 S	0.26
3300.	2 15	S 80 W	100.	3299.21	15.46 S	0.04
3400.	2 30	S 84 W	100.	3399.12	16.04 S	0.30
3500.	2 15	S 80 W	100.	3499.04	16.61 S	0.30
3600.	2 0	S 84 W	100.	3598.97	17.13 S	0.29
3700.	2 0	S 86 W	100.	3698.91	17.43 S	0.07
3800.	2 15	S 89 W	100.	3798.84	17.59 S	0.27
3900.	2 15	N 82 W	100.	3898.76	17.36 S	0.35
4000.	2 30	N 77 W	100.	3998.68	16.60 S	0.32

LANDIS DRILLING COMPANY
RIO PENASCO KD NO. 3
EDDY COUNTY, NEW MEXICO

BD1-2

COMPUTATION PAGE NO. 2
TIME DATE
00:17:44 00--00

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	RECTANGULAR COORDINATES FEET	DOGLEG SEVERITY DG/100FT
4100.	2 30	N 72 W	100.	4098.58	15.44 S 81.50 W	0.22
4200.	2 45	N 70 W	100.	4198.48	13.94 S 85.84 W	0.27
4300.	3 30	N 77 W	100.	4298.33	12.40 S 91.06 W	0.84
4400.	3 15	N 74 W	100.	4398.15	10.92 S 96.76 W	0.31
4500.	4 0	N 69 W	100.	4497.95	8.92 S 102.75 W	0.81
4600.	4 0	N 64 W	100.	4597.71	6.14 S 109.15 W	0.35
4700.	4 0	N 60 W	100.	4697.46	2.86 S 115.30 W	0.28
4800.	4 0	N 58 W	100.	4797.22	0.73 N 121.28 W	0.14
4900.	3 30	N 42 W	100.	4897.01	4.92 N 126.28 W	1.15
5000.	4 0	N 36 W	100.	4996.79	10.00 N 130.39 W	0.63
5100.	4 30	N 32 W	100.	5096.52	16.14 N 134.53 W	0.58
5200.	4 45	N 35 W	100.	5196.19	22.87 N 138.98 W	0.35
5300.	5 0	N 34 W	100.	5295.83	29.87 N 143.80 W	0.26
5400.	5 0	N 30 W	100.	5395.45	37.26 N 148.41 W	0.35
5500.	5 0	N 27 W	100.	5495.07	44.92 N 152.57 W	0.26
5600.	5 30	N 19 W	100.	5594.65	53.33 N 156.14 W	0.89
5700.	5 45	N 18 W	100.	5694.17	62.63 N 159.26 W	0.27
5800.	6 0	N 18 W	100.	5793.64	72.36 N 162.42 W	0.25
5900.	6 15	N 19 W	100.	5893.07	82.48 N 165.80 W	0.27
6000.	6 15	N 19 W	100.	5992.48	92.78 N 169.35 W	0.00
6050.	6 15	N 20 W	50.	6042.18	97.91 N 171.17 W	0.22

FINAL CLOSURE - DIRECTION: N 60 DEGS 14 MINS W
DISTANCE: 197.19 FEET

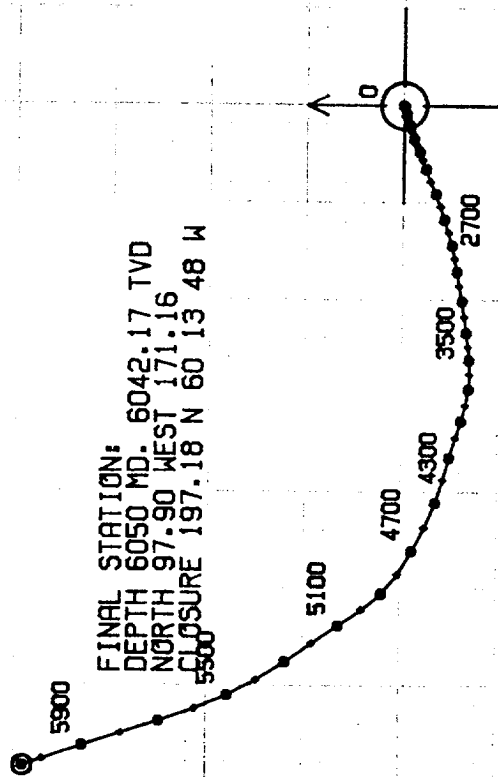
LANDIS DRILLING COMPANY
RIO PENASCO KD NO. 3
EDDY COUNTY, NEW MEXICO

BD1-2

EASTMAN WHIPSTOCK, INC.

HORIZONTAL PROJECTION

SCALE 1 IN. = 50 FEET
DEPTH INDICATOR: MD



5444.17 + 4.00 =
5810.17
1544.17 N
107.17 W



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, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of June 18, 1981 thru June 18, 1981 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 1316 feet to 6050 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of LANDIS DRILLING COMPANY for their RIO PENASCO KD NO.3, EDDY 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.

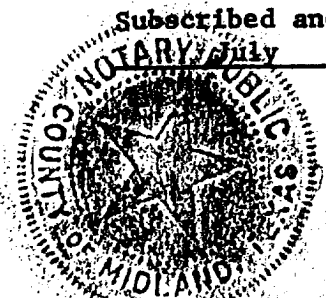
Gary D. DeSpain
Directional Supervisor/Surveyor

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 _____ 1st _____ day of _____, 1981.



Linda Mims
Notary Public in and for the County of Midland, Texas
My commission expires 3-27-85

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-----SCHLUMBERGER-----
-----SCHLUMBERGER-----

SCHLUMBERGER DIRECTIONAL SURVEY

YATES PETROLEUM CORP.

RIO PINASCO "KD" COM. #3

WILDCAT

EDDY COUNTY, NEW MEXICO

RUN NO. 1 5810 - 9360

JULY 2, 1981

START OF SURVEY IS 5810 FT.

TANGENTIAL METHOD

REFERENCE JOB 4535.

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-----SCHLUNBERGER-----

SCHLUNBERGER DIRECTIONAL SURVEY

YATES PETROLEUM CORP.

RIO PENASCO "KD" COM. #3

WILDCAT

EDDY COUNTY, NEW MEXICO

RUN NO. 1 5810 - 9360

JULY 2, 1981

START OF SURVEY IS 5810 FT.

TANGENTIAL METHOD

REFERENCE JOB 4535.

EF 4535.

PAGE 2

DEPTH	DEVIATION	AZIMUTH	TRUE VERTICAL	CO-ORDINATES		COURSE		*****	
FEET	DEGREES	DEGREES	DEPTH	+ NORTH	+ EAST	+ SOUTH	+ WEST	LENGTH	*****
			FEET					FEET	

6270.0	6.3	335.0	6267.3	45.4	-19.8			49.5	
6280.0	6.3	334.0	6277.3	46.4	-20.3			50.6	
6290.0	6.3	334.0	6287.2	47.3	-20.8			51.7	
6300.0	6.2	334.0	6297.1	48.3	-21.2			52.8	
6310.0	6.2	335.0	6307.1	49.3	-21.7			53.8	
6320.0	6.2	335.0	6317.0	50.3	-22.1			54.9	
6330.0	6.2	335.0	6327.0	51.2	-22.6			56.0	
6340.0	6.2	336.0	6336.9	52.2	-23.0			57.1	
6350.0	6.3	335.0	6346.8	53.2	-23.5			58.2	
6360.0	6.2	336.0	6356.8	54.2	-23.9			59.3	
6370.0	6.2	336.0	6366.7	55.2	-24.4			60.3	
6380.0	6.2	335.0	6376.7	56.2	-24.8			61.4	
6390.0	6.2	337.0	6386.6	57.2	-25.3			62.5	
6400.0	6.2	336.0	6396.5	58.2	-25.7			63.6	
6410.0	6.2	335.0	6406.5	59.1	-26.2			64.7	
6420.0	6.2	337.0	6416.4	60.1	-26.6			65.7	
6430.0	6.1	336.0	6426.4	61.1	-27.0			66.8	
6440.0	6.1	336.0	6436.3	62.1	-27.4			67.9	
6450.0	6.1	336.0	6446.3	63.0	-27.9			68.9	
6460.0	6.1	336.0	6456.2	64.0	-28.3			70.0	
6470.0	6.1	336.0	6466.1	65.0	-28.7			71.1	
6480.0	6.1	337.0	6476.1	66.0	-29.2			72.1	
6490.0	6.1	337.0	6486.0	66.9	-29.6			73.2	
6500.0	6.1	336.0	6496.0	67.9	-30.0			74.2	
6510.0	6.1	337.0	6505.9	68.9	-30.4			75.3	
6520.0	6.1	335.0	6515.9	69.9	-30.9			76.4	
6530.0	6.1	336.0	6525.8	70.8	-31.3			77.4	
6540.0	6.1	340.0	6535.8	71.8	-31.7			78.5	
6550.0	6.1	347.0	6545.7	72.9	-31.9			79.5	
6560.0	6.0	343.0	6555.6	73.9	-32.2			80.6	
6570.0	5.9	347.0	6565.6	74.9	-32.4			81.6	
6580.0	6.0	342.0	6575.5	75.9	-32.8			82.6	
6590.0	6.0	341.0	6585.5	76.8	-33.1			83.7	
6600.0	5.9	341.0	6595.4	77.8	-33.4			84.7	
6610.0	5.9	342.0	6605.4	78.8	-33.8			85.7	
6620.0	5.9	340.0	6615.3	79.8	-34.1			86.7	
6630.0	6.0	352.0	6625.3	80.8	-34.2			87.8	
6640.0	5.9	338.0	6635.2	81.7	-34.6			88.8	
6650.0	5.9	337.0	6645.2	82.7	-35.0			89.8	
6660.0	5.9	337.0	6655.1	83.6	-35.4			90.8	
6670.0	5.9	339.0	6665.1	84.6	-35.8			91.9	
6680.0	5.9	340.0	6675.0	85.6	-36.2			92.9	
6690.0	5.9	347.0	6684.9	86.6	-36.4			93.9	
6700.0	5.9	338.0	6694.9	87.5	-36.8			94.9	
6710.0	5.9	340.0	6704.8	88.5	-37.1			96.0	
6720.0	5.9	340.0	6714.8	89.5	-37.3			97.0	

DEPTH	DEVIATION	AZIMUTH	TRUE	CO-ORDINATES				
FEET	DEGREES	DEGREES	VERTICAL	*****	COURSE			
			DEPTH	+ NORTH	+ EAST	LENGTH		
			FEET	- SOUTH	- WEST	FEET		

6730.0	5.9	352.0	6724.7	90.5	-37.5	98.0		
6740.0	5.9	340.0	6734.7	91.5	-37.8	99.0		
6750.0	5.9	346.0	6744.6	92.5	-38.1	100.0		
6760.0	5.9	347.0	6754.6	93.5	-38.3	101.0		
6770.0	5.8	349.0	6764.5	94.5	-38.5	102.0		
6780.0	5.8	341.0	6774.5	95.4	-38.8	103.0		
6790.0	5.8	346.0	6784.4	96.4	-39.1	104.0		
6800.0	5.8	342.0	6794.4	97.4	-39.4	105.0		
6810.0	5.7	341.0	6804.3	98.3	-39.7	106.0		
6820.0	5.6	339.0	6814.3	99.2	-40.1	107.0		
6830.0	5.6	340.0	6824.2	100.1	-40.4	108.0		
6840.0	5.6	339.0	6834.2	101.0	-40.7	108.9		
6850.0	5.5	338.0	6844.1	101.9	-41.1	109.9		
6860.0	5.4	339.0	6854.1	102.8	-41.4	110.8		
6870.0	5.3	338.0	6864.0	103.7	-41.8	111.8		
6880.0	5.3	339.0	6874.0	104.5	-42.1	112.7		
6890.0	5.2	337.0	6884.0	105.4	-42.5	113.6		
6900.0	5.1	337.0	6893.9	106.2	-42.8	114.5		
6910.0	5.1	337.0	6903.9	107.0	-43.2	115.4		
6920.0	5.1	337.0	6913.8	107.8	-43.5	116.2		
6930.0	5.0	336.0	6923.8	108.6	-43.9	117.1		
6940.0	5.0	337.0	6933.8	109.4	-44.2	118.0		
6950.0	5.0	333.0	6943.7	110.2	-44.6	118.9		
6960.0	5.0	333.0	6953.7	111.0	-45.0	119.7		
6970.0	4.9	332.0	6963.7	111.7	-45.4	120.6		
6980.0	4.9	333.0	6973.6	112.5	-45.8	121.4		
6990.0	5.0	331.0	6983.6	113.2	-46.2	122.3		
7000.0	4.8	332.0	6993.5	114.0	-46.6	123.1		
7010.0	4.8	331.0	7003.5	114.7	-47.0	124.0		
7020.0	4.8	330.0	7013.5	115.4	-47.4	124.8		
7030.0	4.7	332.0	7023.4	116.2	-47.8	125.6		
7040.0	4.6	331.0	7033.4	116.9	-48.2	126.4		
7050.0	4.7	332.0	7043.4	117.6	-48.6	127.2		
7060.0	4.7	336.0	7053.3	118.3	-48.9	128.1		
7070.0	4.5	333.0	7063.3	119.0	-49.3	128.8		
7080.0	4.3	334.0	7073.3	119.7	-49.6	129.6		
7090.0	4.3	333.0	7083.3	120.4	-50.0	130.3		
7100.0	4.3	331.0	7093.2	121.0	-50.3	131.1		
7110.0	4.2	332.0	7103.2	121.7	-50.7	131.8		
7120.0	4.1	330.0	7113.2	122.3	-51.0	132.5		
7130.0	4.1	332.0	7123.1	122.9	-51.4	133.2		
7140.0	4.1	330.0	7133.1	123.6	-51.7	133.9		
7150.0	4.1	331.0	7143.1	124.2	-52.1	134.6		
7160.0	4.1	332.0	7153.1	124.8	-52.4	135.4		
7170.0	4.0	330.0	7163.0	125.4	-52.7	136.1		
7180.0	4.0	330.0	7173.0	126.0	-53.1	136.7		

EF 4535.

PAGE 4

DEPTH	DEVIATION	AZIMUTH	TRUE	CO-ORDINATES			
FEET	DEGREES	DEGREES	VERTICAL	NORTH	EAST	COURSE	
			DEPTH	+ NORTH	+ EAST	LENGTH	
			FEET	- SOUTH	- WEST	FEET	

7190.0	3.9	331.0	7183.0	126.6	-53.4	137.4	
7200.0	3.8	330.0	7193.0	127.2	-53.7	138.1	
7210.0	3.7	330.0	7203.0	127.7	-54.1	138.7	
7220.0	3.7	306.0	7212.9	128.1	-54.6	139.3	
7230.0	3.6	325.0	7222.9	128.6	-55.0	139.9	
7240.0	3.5	323.0	7232.9	129.1	-55.3	140.5	
7250.0	3.4	317.0	7242.9	129.6	-55.7	141.0	
7260.0	3.4	307.0	7252.9	129.9	-56.2	141.6	
7270.0	3.5	317.0	7262.8	130.4	-56.6	142.1	
7280.0	3.4	313.0	7272.8	130.8	-57.0	142.7	
7290.0	3.4	304.0	7282.8	131.1	-57.5	143.2	
7300.0	3.5	303.0	7292.8	131.4	-58.1	143.7	
7310.0	3.5	303.0	7302.8	131.8	-58.6	144.2	
7320.0	3.5	304.0	7312.8	132.1	-59.1	144.7	
7330.0	3.4	307.0	7322.7	132.5	-59.5	145.2	
7340.0	3.4	310.0	7332.7	132.8	-60.0	145.8	
7350.0	3.4	311.0	7342.7	133.2	-60.4	146.3	
7360.0	3.4	313.0	7352.7	133.6	-60.9	146.9	
7370.0	3.3	311.0	7362.7	134.0	-61.3	147.4	
7380.0	3.3	311.0	7372.6	134.4	-61.7	147.9	
7390.0	3.2	312.0	7382.6	134.8	-62.2	148.4	
7400.0	3.2	312.0	7392.6	135.1	-62.6	148.9	
7410.0	3.2	309.0	7402.6	135.5	-63.0	149.4	
7420.0	3.1	308.0	7412.6	135.8	-63.4	149.9	
7430.0	3.0	308.0	7422.6	136.1	-63.9	150.4	
7440.0	3.0	308.0	7432.6	136.5	-64.3	150.8	
7450.0	2.9	306.0	7442.5	136.8	-64.7	151.3	
7460.0	2.9	305.0	7452.5	137.1	-65.1	151.7	
7470.0	2.7	302.0	7462.5	137.3	-65.5	152.1	
7480.0	2.5	303.0	7472.5	137.5	-65.9	152.5	
7490.0	2.4	304.0	7482.5	137.8	-66.2	152.9	
7500.0	2.3	306.0	7492.5	138.0	-66.5	153.2	
7510.0	2.1	307.0	7502.5	138.2	-66.8	153.5	
7520.0	2.1	308.0	7512.5	138.5	-67.1	153.9	
7530.0	2.1	308.0	7522.5	138.7	-67.4	154.2	
7540.0	2.1	313.0	7532.5	138.9	-67.7	154.5	
7550.0	2.0	315.0	7542.5	139.2	-67.9	154.9	
7560.0	2.0	313.0	7552.5	139.4	-68.2	155.2	
7570.0	2.1	309.0	7562.5	139.7	-68.4	155.5	
7580.0	2.1	305.0	7572.4	139.9	-68.7	155.8	
7590.0	2.0	301.0	7582.4	140.0	-69.0	156.1	
7600.0	1.9	305.0	7592.4	140.2	-69.3	156.4	
7610.0	1.9	306.0	7602.4	140.4	-69.6	156.7	
7620.0	1.8	307.0	7612.4	140.6	-69.8	157.0	
7630.0	1.8	309.0	7622.4	140.8	-70.1	157.3	
7640.0	1.7	312.0	7632.4	141.0	-70.3	157.6	

* TRUE		* CO-ORDINATES		* COURSE				
DEPTH	DEVIATION	AZIMUTH	VERTICAL	*****		LENGTH		
FEET	DEGREES	DEGREES	DEPTH	+ NORTH	+ EAST	FEET		
			FEET	- SOUTH	- WEST			

7650.0	1.7	310.0	7642.4	141.2	-70.5	157.8		
7660.0	1.6	307.0	7652.4	141.4	-70.8	158.1		
7670.0	1.7	302.0	7662.4	141.5	-71.0	158.3		
7680.0	1.7	302.0	7672.4	141.7	-71.3	158.6		
7690.0	1.7	300.0	7682.4	141.8	-71.5	158.8		
7700.0	1.8	300.0	7692.4	142.0	-71.8	159.1		
7710.0	1.8	285.0	7702.4	142.1	-72.1	159.3		
7720.0	1.8	303.0	7712.4	142.2	-72.4	159.6		
7730.0	1.8	301.0	7722.4	142.4	-72.6	159.9		
7740.0	1.8	302.0	7732.4	142.6	-72.9	160.1		
7750.0	1.8	296.0	7742.4	142.7	-73.2	160.4		
7760.0	1.7	295.0	7752.4	142.8	-73.4	160.6		
7770.0	1.7	295.0	7762.4	143.0	-73.7	160.8		
7780.0	1.7	298.0	7772.3	143.1	-74.0	161.1		
7790.0	1.7	302.0	7782.3	143.3	-74.2	161.3		
7800.0	1.7	301.0	7792.3	143.4	-74.5	161.6		
7810.0	1.7	300.0	7802.3	143.6	-74.7	161.8		
7820.0	1.7	298.0	7812.3	143.7	-75.0	162.1		
7830.0	1.7	302.0	7822.3	143.9	-75.2	162.3		
7840.0	1.7	302.0	7832.3	144.0	-75.5	162.6		
7850.0	1.7	299.0	7842.3	144.2	-75.8	162.8		
7860.0	1.6	297.0	7852.3	144.3	-76.0	163.1		
7870.0	1.6	295.0	7862.3	144.4	-76.3	163.3		
7880.0	1.6	295.0	7872.3	144.5	-76.5	163.5		
7890.0	1.6	286.0	7882.3	144.6	-76.8	163.7		
7900.0	1.7	296.0	7892.3	144.7	-77.0	164.0		
7910.0	1.6	296.0	7902.3	144.8	-77.3	164.2		
7920.0	1.6	300.0	7912.3	145.0	-77.5	164.4		
7930.0	1.6	297.0	7922.3	145.1	-77.8	164.6		
7940.0	1.7	303.0	7932.3	145.3	-78.0	164.9		
7950.0	1.7	307.0	7942.3	145.5	-78.3	165.2		
7960.0	1.7	306.0	7952.3	145.6	-78.5	165.4		
7970.0	1.7	310.0	7962.3	145.8	-78.7	165.7		
7980.0	1.7	307.0	7972.3	146.0	-79.0	166.0		
7990.0	1.7	308.0	7982.3	146.2	-79.2	166.3		
8000.0	1.7	309.0	7992.3	146.4	-79.4	166.5		
8010.0	1.7	305.0	8002.3	146.5	-79.7	166.8		
8020.0	1.7	306.0	8012.2	146.7	-79.9	167.1		
8030.0	1.7	306.0	8022.2	146.9	-80.2	167.3		
8040.0	1.7	302.0	8032.2	147.0	-80.4	167.6		
8050.0	1.7	302.0	8042.2	147.2	-80.7	167.9		
8060.0	1.6	292.0	8052.2	147.3	-80.9	168.1		
8070.0	1.6	303.0	8062.2	147.5	-81.2	168.3		
8080.0	1.6	301.0	8072.2	147.6	-81.4	168.6		
8090.0	1.6	299.0	8082.2	147.7	-81.6	168.8		
8100.0	1.5	292.0	8092.2	147.8	-81.9	169.0		

DEPTH	DEVIATION	AZIMUTH	TRUE	CO-ORDINATES		COURSE	
FEET	DEGREES	DEGREES	VERTICAL	NORTH	EAST	LENGTH	
			DEPTH	SOUTH	WEST	FEET	

8110.0	1.5	292.0	8102.2	147.9	-82.1	169.2	
8120.0	1.5	298.0	8112.2	148.1	-82.4	169.4	
8130.0	1.5	299.0	8122.2	148.2	-82.6	169.6	
8140.0	1.4	298.0	8132.2	148.3	-82.8	169.8	
8150.0	1.4	300.0	8142.2	148.4	-83.0	170.1	
8160.0	1.3	300.0	8152.2	148.5	-83.2	170.3	
8170.0	1.3	302.0	8162.2	148.7	-83.4	170.5	
8180.0	1.3	302.0	8172.2	148.8	-83.6	170.7	
8190.0	1.3	303.0	8182.2	148.9	-83.8	170.9	
8200.0	1.3	304.0	8192.2	149.0	-84.0	171.1	
8210.0	1.3	301.0	8202.2	149.1	-84.2	171.3	
8220.0	1.3	292.0	8212.2	149.2	-84.4	171.4	
8230.0	1.4	288.0	8222.2	149.3	-84.6	171.6	
8240.0	1.4	290.0	8232.2	149.4	-84.8	171.8	
8250.0	1.4	294.0	8242.2	149.5	-85.1	172.0	
8260.0	1.4	298.0	8252.2	149.6	-85.3	172.2	
8270.0	1.4	295.0	8262.2	149.7	-85.5	172.4	
8280.0	1.5	294.0	8272.2	149.8	-85.7	172.6	
8290.0	1.5	293.0	8282.2	149.9	-86.0	172.8	
8300.0	1.6	294.0	8292.2	150.0	-86.2	173.0	
8310.0	1.6	293.0	8302.2	150.1	-86.5	173.3	
8320.0	1.7	295.0	8312.1	150.3	-86.8	173.5	
8330.0	1.7	293.0	8322.1	150.4	-87.0	173.7	
8340.0	1.7	290.0	8332.1	150.5	-87.3	174.0	
8350.0	1.7	290.0	8342.1	150.6	-87.6	174.2	
8360.0	1.7	283.0	8352.1	150.6	-87.9	174.4	
8370.0	1.6	285.0	8362.1	150.7	-88.2	174.6	
8380.0	1.6	288.0	8372.1	150.8	-88.4	174.8	
8390.0	1.6	289.0	8382.1	150.9	-88.7	175.0	
8400.0	1.5	288.0	8392.1	151.0	-88.9	175.2	
8410.0	1.5	288.0	8402.1	151.1	-89.2	175.4	
8420.0	1.4	287.0	8412.1	151.1	-89.4	175.6	
8430.0	1.4	288.0	8422.1	151.2	-89.7	175.8	
8440.0	1.3	288.0	8432.1	151.3	-89.9	176.0	
8450.0	1.3	287.0	8442.1	151.3	-90.1	176.1	
8460.0	1.3	285.0	8452.1	151.4	-90.3	176.3	
8470.0	1.3	287.0	8462.1	151.5	-90.5	176.4	
8480.0	1.3	282.0	8472.1	151.5	-90.7	176.6	
8490.0	1.3	282.0	8482.1	151.6	-91.0	176.8	
8500.0	1.3	281.0	8492.1	151.6	-91.2	176.9	
8510.0	1.3	281.0	8502.1	151.6	-91.4	177.1	
8520.0	1.4	277.0	8512.1	151.7	-91.7	177.2	
8530.0	1.3	280.0	8522.1	151.7	-91.9	177.4	
8540.0	1.3	282.0	8532.1	151.8	-92.1	177.5	
8550.0	1.3	280.0	8542.1	151.8	-92.3	177.7	
8560.0	1.2	285.0	8552.1	151.9	-92.5	177.8	

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* DEPTH * DEVIATION * AZIMUTH * TRUE * CO-ORDINATES *
* FEET * DEGREES * DEGREES * DEPTH * + NORTH * + EAST * COURSE *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
8570.0 * 1.2 * 287.0 * 8562.1 * 151.9 * -92.7 * 178.0 *
8580.0 * 1.2 * 291.0 * 8572.1 * 152.0 * -92.9 * 178.1 *
8590.0 * 1.2 * 290.0 * 8582.1 * 152.1 * -93.1 * 178.3 *
8600.0 * 1.3 * 288.0 * 8592.1 * 152.1 * -93.3 * 178.5 *
8610.0 * 1.3 * 291.0 * 8602.1 * 152.2 * -93.5 * 178.7 *
8620.0 * 1.3 * 281.0 * 8612.1 * 152.3 * -93.8 * 178.8 *
8630.0 * 1.3 * 293.0 * 8622.1 * 152.3 * -94.0 * 179.0 *
8640.0 * 1.3 * 289.0 * 8632.1 * 152.4 * -94.2 * 179.2 *
8650.0 * 1.3 * 283.0 * 8642.0 * 152.5 * -94.4 * 179.3 *
8660.0 * 1.3 * 283.0 * 8652.0 * 152.5 * -94.6 * 179.5 *
8670.0 * 1.3 * 281.0 * 8662.0 * 152.6 * -94.9 * 179.6 *
8680.0 * 1.4 * 281.0 * 8672.0 * 152.6 * -95.1 * 179.8 *
8690.0 * 1.4 * 279.0 * 8682.0 * 152.6 * -95.3 * 180.0 *
8700.0 * 1.4 * 285.0 * 8692.0 * 152.7 * -95.6 * 180.2 *
8710.0 * 1.3 * 284.0 * 8702.0 * 152.8 * -95.8 * 180.3 *
8720.0 * 1.3 * 286.0 * 8712.0 * 152.8 * -96.0 * 180.5 *
8730.0 * 1.3 * 287.0 * 8722.0 * 152.9 * -96.2 * 180.7 *
8740.0 * 1.3 * 296.0 * 8732.0 * 153.0 * -96.4 * 180.8 *
8750.0 * 1.4 * 293.0 * 8742.0 * 153.1 * -96.7 * 181.0 *
8760.0 * 1.5 * 292.0 * 8752.0 * 153.2 * -96.9 * 181.3 *
8770.0 * 1.4 * 301.0 * 8762.0 * 153.3 * -97.1 * 181.5 *
8780.0 * 1.3 * 302.0 * 8772.0 * 153.4 * -97.3 * 181.7 *
8790.0 * 1.2 * 298.0 * 8782.0 * 153.5 * -97.5 * 181.9 *
8800.0 * 1.2 * 296.0 * 8792.0 * 153.6 * -97.7 * 182.0 *
8810.0 * 1.2 * 295.0 * 8802.0 * 153.7 * -97.9 * 182.2 *
8820.0 * 1.2 * 300.0 * 8812.0 * 153.8 * -98.0 * 182.4 *
8830.0 * 1.3 * 295.0 * 8822.0 * 153.9 * -98.2 * 182.6 *
8840.0 * 1.3 * 286.0 * 8832.0 * 154.0 * -98.5 * 182.8 *
8850.0 * 1.3 * 288.0 * 8842.0 * 154.0 * -98.7 * 182.9 *
8860.0 * 1.3 * 288.0 * 8852.0 * 154.1 * -98.9 * 183.1 *
8870.0 * 1.3 * 291.0 * 8862.0 * 154.2 * -99.1 * 183.3 *
8880.0 * 1.3 * 288.0 * 8872.0 * 154.3 * -99.3 * 183.5 *
8890.0 * 1.3 * 287.0 * 8882.0 * 154.3 * -99.5 * 183.7 *
8900.0 * 1.3 * 288.0 * 8892.0 * 154.4 * -99.8 * 183.8 *
8910.0 * 1.3 * 284.0 * 8902.0 * 154.5 * -100.0 * 184.0 *
8920.0 * 1.3 * 278.0 * 8912.0 * 154.5 * -100.2 * 184.1 *
8930.0 * 1.3 * 279.0 * 8922.0 * 154.5 * -100.4 * 184.3 *
8940.0 * 1.3 * 282.0 * 8932.0 * 154.6 * -100.6 * 184.5 *
8950.0 * 1.3 * 279.0 * 8942.0 * 154.6 * -100.9 * 184.6 *
8960.0 * 1.3 * 275.0 * 8952.0 * 154.6 * -101.1 * 184.7 *
8970.0 * 1.3 * 277.0 * 8962.0 * 154.7 * -101.3 * 184.9 *
8980.0 * 1.3 * 272.0 * 8972.0 * 154.7 * -101.6 * 185.0 *
8990.0 * 1.3 * 273.0 * 8982.0 * 154.7 * -101.8 * 185.2 *
9000.0 * 1.3 * 277.0 * 8992.0 * 154.7 * -102.0 * 185.3 *
9010.0 * 1.3 * 270.0 * 9002.0 * 154.7 * -102.2 * 185.4 *
9020.0 * 1.3 * 270.0 * 9012.0 * 154.7 * -102.5 * 185.6 *
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* DEPTH    * DEVIATION * AZIMUTH * TRUE      * CO-ORDINATES * COURSE *
* FEET     * DEGREES  * DEGREES * DEPTH    * + NORTH * + EAST * LENGTH *
*          *          *          * FEET     * - SOUTH * - WEST * FEET   *
*****
9030.0 * 1.3 * 275.0 * 9022.0 * 154.7 * -102.7 * 185.7 *
9040.0 * 1.3 * 264.0 * 9031.9 * 154.7 * -102.9 * 185.8 *
9050.0 * 1.3 * 260.0 * 9041.9 * 154.7 * -103.1 * 185.9 *
9060.0 * 1.4 * 249.0 * 9051.9 * 154.6 * -103.4 * 185.9 *
9070.0 * 1.3 * 247.0 * 9061.9 * 154.5 * -103.6 * 186.0 *
9080.0 * 1.3 * 250.0 * 9071.9 * 154.4 * -103.8 * 186.0 *
9090.0 * 1.3 * 251.0 * 9081.9 * 154.3 * -104.0 * 186.1 *
9100.0 * 1.3 * 255.0 * 9091.9 * 154.3 * -104.2 * 186.2 *
9110.0 * 1.4 * 251.0 * 9101.9 * 154.2 * -104.4 * 186.2 *
9120.0 * 1.5 * 257.0 * 9111.9 * 154.1 * -104.7 * 186.3 *
9130.0 * 1.4 * 263.0 * 9121.9 * 154.1 * -104.9 * 186.4 *
9140.0 * 1.3 * 268.0 * 9131.9 * 154.1 * -105.2 * 186.6 *
9150.0 * 1.2 * 263.0 * 9141.9 * 154.1 * -105.4 * 186.7 *
9160.0 * 1.3 * 269.0 * 9151.9 * 154.1 * -105.6 * 186.8 *
9170.0 * 1.4 * 276.0 * 9161.9 * 154.1 * -105.8 * 186.9 *
9180.0 * 1.4 * 275.0 * 9171.9 * 154.1 * -106.1 * 187.1 *
9190.0 * 1.5 * 268.0 * 9181.9 * 154.1 * -106.4 * 187.2 *
9200.0 * 1.3 * 269.0 * 9191.9 * 154.1 * -106.6 * 187.4 *
9210.0 * 1.3 * 276.0 * 9201.9 * 154.1 * -106.8 * 187.5 *
9220.0 * 1.3 * 275.0 * 9211.9 * 154.1 * -107.0 * 187.7 *
9230.0 * 1.1 * 275.0 * 9221.9 * 154.2 * -107.2 * 187.8 *
9240.0 * 1.1 * 274.0 * 9231.9 * 154.2 * -107.4 * 187.9 *
9250.0 * 1.2 * 270.0 * 9241.9 * 154.2 * -107.6 * 188.0 *
9260.0 * 1.2 * 277.0 * 9251.9 * 154.2 * -107.8 * 188.2 *
9270.0 * 1.3 * 272.0 * 9261.9 * 154.2 * -108.1 * 188.3 *
9280.0 * 1.3 * 265.0 * 9271.9 * 154.2 * -108.3 * 188.4 *
9290.0 * 1.2 * 268.0 * 9281.9 * 154.2 * -108.5 * 188.5 *
9300.0 * 1.2 * 262.0 * 9291.9 * 154.2 * -108.7 * 188.6 *
9310.0 * 1.1 * 266.0 * 9301.9 * 154.1 * -108.9 * 188.7 *
9320.0 * 1.0 * 274.0 * 9311.9 * 154.2 * -109.1 * 188.8 *
9330.0 * 1.0 * 279.0 * 9321.9 * 154.2 * -109.2 * 189.0 *
9340.0 * 1.2 * 270.0 * 9331.9 * 154.2 * -109.4 * 189.1 *
9350.0 * 1.0 * 269.0 * 9341.9 * 154.2 * -109.6 * 189.2 *
9360.0 * 1.0 * 257.0 * 9351.9 * 154.1 * -109.8 * 189.2 *
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BOTTOM HOLE LOCATION

COURSE LENGTH: 189.2 FEET

COURSE AZIMUTH: 324.5 DEGREES

MEASURED DEPTH: 9360.0 FEET

TRUE VERTICAL DEPTH: 9351.9 FEET

DISTANCE NORTH: 154.1 FEET

DISTANCE WEST: 109.8 FEET

TANGENTIAL METHOD
