

SUB-SURFACE
DIRECTIONAL
SURVEY
REPORT

NORTON DRILLING COMPANY
COMPANY
NEW MEXICO "EX" STATE NC.2
WELL NAME
LEA COUNTY, NEW MEXICO
STATE AND COUNTY

FIELD REPORT

NORTON DRILLING COMPANY

WELL #
NEW MEXICO "EX" STATE NO.2

LOCATION
LEA COUNTY, NEW MEXICO

DATE
1-28-88, 1-23-88, 1-25-88

JOB TYPE
GYRO. MULTISHOT, MAG. MULTISHOT, MAG. SINGLES

JOB #
GS-1715, MS-1713

SURVEYOR
A. HARBERT, A. HARBERT, B. WELCH

DEPTHS
0' - 4200', 4200' - 9858', 9858' - 9805'

DECL.
9 DEGREES EAST

ELEV.
0'

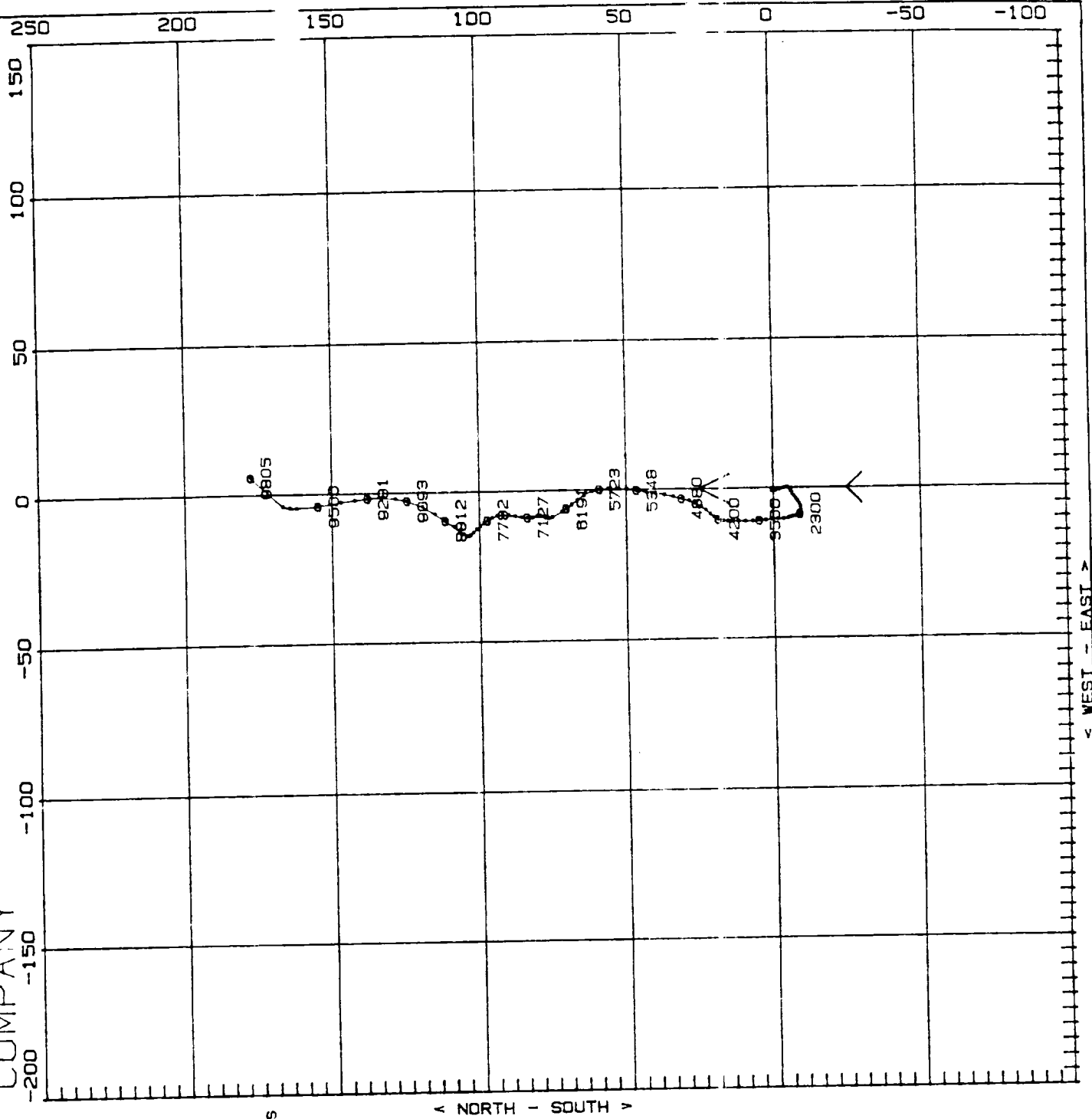
FILE #
WT-X13

FINAL STATION DATA:

MD. 9805.00
TVD. 9800.60
N/S 177.36
E/W 6.05

CLOSURE DISTANCE
177.47 FEET
CLOSURE DIRECTION
N 1.95 E

1 IN. = 50 FT.



CUSTOMER : NORTON DRILLING COMPANY

WELL # : NEW MEXICO "EX" STATE NO.2

LOCATION : LEA COUNTY, NEW MEXICO

DATE : 1-26-86, 1-23-86, 1-25-86

WELL TYPE : GYRO.MULTISHOT, MAG.MULTISHOT, MAG.SINGLESHOT

WELL # : GS-1715, MS-1713

SURVEYOR : A.HARBERT, A.HARBERT, B.WELCH

DEPTH : 0'-4200', 4200'-9656', 9656'-9805'

DECL. : 9 DEGREES EAST

SL. : 0'

WELL # : WT-X13

METHOD : RADIUS OF CURVATURE

SECTION : 0

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

A. Harbert

DIG REPRESENTATIVE

NAL STATION DATA!

MEASURED	INCL.	HOLE	COURSE	VERTICAL	RECTANGULAR	C L O S U R E	DOG-LEG
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	COORDINATES	DISTANCE	DIRECTION
FEET	DEGS.	DEGS.	FEET	FEET	N/S	FEET	DEGS.
							DG/100FT

9805.00 7.00 N 67.00 E 149.00 9800.60 177.36 N 6.05 E 177.47' N 01.95 E 3.54

NORTON DRILLING COMPANY
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MEASURED	INCL.	HOLE	COURSE	VERTICAL	TRUE	RECTANGULAR	C L O S U R E	DOG-LEG
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH		COORDINATES	DISTANCE	SEVERITY
FEET	DEGS.	DEGS.	FEET	FEET	N/S	feet E/W	FEET	DEGS.
								DG/100FT
0.00	0.00	S * * * * *	0.00	0.00	0.00 N	0.00 E	0.00' N 00.00 E	0.00
100.00	.30	S N 53.00 W	100.00	100.00	.16 N	.21 W	.26' N 53.00 W	.30
200.00	.30	S N 57.00 W	100.00	200.00	.46 N	.64 W	.79' N 54.33 W	.02
300.00	0.00	S * * * * *	100.00	300.00	.60 N	.86 W	1.05' N 55.00 W	.30
400.00	.50	S S 00.00 E	100.00	400.00	.16 N	.86 W	.87' N 79.17 W	.50
500.00	.60	S S 17.00 E	100.00	499.99	.78 S	.72 W	1.06' S 42.49 W	.19
600.00	.80	S S 24.00 E	100.00	599.98	1.93 S	.29 W	1.95' S 08.52 W	.22
700.00	.40	S S 11.00 E	100.00	699.98	2.92 S	.03 E	2.92' S 00.50 E	.42
800.00	.50	S S 12.00 E	100.00	799.98	3.69 S	.18 E	3.70' S 02.83 E	.10
900.00	.40	S S 18.00 E	100.00	899.97	4.45 S	.39 E	4.47' S 04.95 E	.11
1000.00	.30	S S 30.00 W	100.00	999.97	5.04 S	.32 E	5.05' S 03.67 E	.30
1100.00	.20	S S 41.00 W	100.00	1099.97	5.39 S	.07 E	5.39' S 00.75 E	.11
1200.00	.30	S S 76.00 W	100.00	1199.97	5.62 S	.30 W	5.63' S 03.01 W	.18
1300.00	.50	S S 64.00 W	100.00	1299.97	5.86 S	.95 W	5.93' S 09.22 W	.22
1400.00	.60	S S 50.00 W	100.00	1399.96	6.38 S	1.75 W	6.62' S 15.37 W	.17
1500.00	.70	S S 60.00 W	100.00	1499.96	7.03 S	2.68 W	7.52' S 20.88 W	.15
1600.00	.50	S S 50.00 W	100.00	1599.95	7.63 S	3.54 W	8.41' S 24.88 W	.23
1700.00	.50	S S 58.00 W	100.00	1699.95	8.14 S	4.24 W	9.18' S 27.53 W	.07
1800.00	.70	S S 56.00 W	100.00	1799.94	8.71 S	5.12 W	10.11' S 30.45 W	.20
1900.00	.40	S S 76.00 W	100.00	1899.94	9.10 S	5.99 W	10.90' S 33.38 W	.35
2000.00	.50	S S 73.00 W	100.00	1999.93	9.31 S	6.75 W	11.50' S 35.95 W	.10
2100.00	.60	S N 79.00 W	100.00	2099.93	9.36 S	7.70 W	12.12' S 39.45 W	.28
2200.00	.20	S N 75.00 W	100.00	2199.93	9.20 S	8.38 W	12.45' S 42.32 W	.40
2300.00	.20	S N 75.00 W	100.00	2299.92	9.11 S	8.72 W	12.61' S 43.73 W	0.00
2400.00	.30	S N 08.00 W	100.00	2399.92	8.80 S	8.99 W	12.58' S 45.60 W	.29

NORTON DRILLING COMPANY
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MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	RECTANGULAR COORDINATES N/S E/W	C L D S U R E DISTANCE FEET	DIRECTION DEGS.	DOG-LEG SEVERITY DG/100FT
2500.00	.40	N 23.00 W	100.00	2499.92	8.22 S	9.15 W	12.30' S 48.09 W	.13
2600.00	.30	N 02.00 E	100.00	2599.92	7.62 S	9.26 W	12.00' S 50.56 W	.18
2700.00	.40	N 24.00 W	100.00	2699.92	7.03 S	9.38 W	11.72' S 53.16 W	.19
2800.00	.20	N 02.00 W	100.00	2799.92	6.52 S	9.50 W	11.52' S 55.53 W	.23
2900.00	.40	N 11.00 W	100.00	2899.92	6.00 S	9.56 W	11.28' S 57.88 W	.20
3000.00	.80	N 19.00 W	100.00	2999.91	4.99 S	9.83 W	11.02' S 63.08 W	.41
3100.00	1.10	N 07.00 W	100.00	3099.90	3.38 S	10.20 W	10.74' S 71.68 W	.36
3200.00	1.10	N 05.00 E	100.00	3199.88	1.46 S	10.23 W	10.34' S 81.88 W	.23
3300.00	1.20	N 09.00 W	100.00	3299.86	.54 N	10.30 W	10.32' N 87.00 W	.30
3400.00	1.20	N 05.00 W	100.00	3399.84	2.62 N	10.56 W	10.88' N 76.07 W	.08
3500.00	1.20	N 00.00 E	100.00	3499.81	4.71 N	10.65 W	11.64' N 66.14 W	.10
3600.00	1.40	N 05.00 W	100.00	3599.79	6.98 N	10.75 W	12.81' N 57.01 W	.23
3700.00	1.50	N 05.00 E	100.00	3699.76	9.50 N	10.75 W	14.35' N 48.52 W	.27
3800.00	1.20	N 00.00 E	100.00	3799.73	11.86 N	10.64 W	15.93' N 41.92 W	.32
3900.00	1.00	N 01.00 W	100.00	3899.71	13.78 N	10.66 W	17.42' N 37.74 W	.20
4000.00	.90	N 04.00 E	100.00	3999.70	15.43 N	10.62 W	18.73' N 34.53 W	.13
4100.00	.90	N 05.00 E	100.00	4099.68	17.00 N	10.49 W	19.98' N 31.69 W	.02
4200.00	.90	N 22.00 E	100.00	4199.67	18.52 N	10.13 W	21.11' N 28.68 W	.27
4319.00	1.00	N 38.00 E	119.00	4318.65	20.22 N	9.15 W	22.20' N 24.34 W	.24
4412.00	1.00	N 44.00 E	93.00	4411.64	21.45 N	8.08 W	22.92' N 20.65 W	.11
4506.00	1.20	N 39.00 E	94.00	4505.62	22.80 N	6.89 W	23.82' N 16.81 W	.24
4599.00	1.40	N 33.00 E	93.00	4598.60	24.51 N	5.65 W	25.15' N 12.98 W	.26
4693.00	1.30	N 26.00 E	94.00	4692.57	26.43 N	4.56 W	26.82' N 09.78 W	.20
4787.00	1.50	N 17.00 E	94.00	4786.54	28.57 N	3.72 W	28.81' N 07.41 W	.32
4880.00	1.70	N 16.00 E	93.00	4879.51	31.06 N	2.98 W	31.20' N 05.48 W	.22

GYROSCOPIC MULTISHOT SURVEY FROM SURFACE TO 4200' MD.

NORTON DRILLING COMPANY
 NEW MEXICO "EX" STATE NO.2
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MEASURED	INCL.	HOLE	COURSE	VERTICAL	TRUE	N/S	feet	E/W	FEET	DIRECTION	C L O S U R E	DOG-LEG
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	DEPTH							SEVERITY
FEET	DEGS.	DEGS.	FEET	FEET	FEET							DEGS.
4974.00	1.90	N 13.00 E	94.00	4973.46		33.91 N		2.24 W		33.99' N 03.78 W		.24
5067.00	1.90	N 12.00 E	93.00	5066.41		36.92 N		1.57 W		36.96' N 02.44 W		.04
5161.00	1.90	N 07.00 E	94.00	5160.36		40.00 N		1.06 W		40.01' N 01.52 W		.18
5255.00	2.00	N 08.00 E	94.00	5254.30		43.17 N		.64 W		43.17' N 00.85 W		.11
5348.00	2.00	N 11.00 E	93.00	5347.25		46.37 N		.10 W		46.37' N 00.13 W		.11
5442.00	2.20	N 04.00 E	94.00	5441.18		49.78 N		.34 E		49.78' N 00.40 E		.35
5536.00	1.90	N 01.00 E	94.00	5535.12		53.14 N		.49 E		53.14' N 00.53 E		.34
5629.00	1.80	N 00.00 E	93.00	5628.08		56.14 N		.52 E		56.15' N 00.53 E		.11
5723.00	1.70	N 07.00 W	94.00	5722.03		59.01 N		.34 E		59.01' N 00.33 E		.25
5816.00	1.70	N 17.00 W	93.00	5814.99		61.70 N		.23 W		61.70' N 00.21 W		.32
5910.00	1.90	N 33.00 W	94.00	5908.94		64.37 N		1.47 W		64.39' N 01.31 W		.57
6004.00	1.60	N 38.00 W	94.00	6002.90		66.71 N		3.14 W		66.78' N 02.70 W		.36
6097.00	1.40	N 39.00 W	93.00	6095.87		68.61 N		4.66 W		68.77' N 03.88 W		.22
6191.00	1.20	N 32.00 W	94.00	6189.84		70.35 N		5.09 W		70.59' N 04.79 W		.27
6284.00	1.20	N 34.00 W	93.00	6282.82		71.98 N		6.95 W		72.31' N 05.52 W		.05
6472.00	1.00	N 21.00 W	188.00	6470.79		75.17 N		8.62 W		75.62' N 06.54 W		.17
6565.00	.00	N 09.00 W	93.00	6563.78		76.58 N		0.00 W		77.11' N 06.70 W		.29
6659.00	.30	N 31.00 E	94.00	6657.77		77.45 N		8.83 W		77.95' N 06.50 W		.64
6752.00	.80	N 20.00 E	93.00	6750.77		78.25 N		8.44 W		78.71' N 06.16 W		.55
6846.00	.50	N 10.00 E	94.00	6844.76		79.28 N		8.17 W		79.70' N 05.88 W		.34
6940.00	.90	N 16.00 W	94.00	6938.76		80.42 N		8.23 W		80.84' N 05.84 W		.53
7033.00	.90	N 11.00 W	93.00	7031.74		81.84 N		8.57 W		82.29' N 05.98 W		.08
7127.00	1.20	N 05.00 E	94.00	7125.73		83.55 N		8.66 W		84.00' N 05.92 W		.44
7221.00	1.30	N 06.00 E	94.00	7219.71		85.60 N		8.46 W		86.01' N 05.65 W		.11
7314.00	1.40	N 13.00 E	93.00	7312.68		87.76 N		8.10 W		88.13' N 05.27 W		.21

NORTON DRILLING COMPANY
NEW MEXICO "EX" STATE NO.2
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MEASURED	INCL.	HOLE	COURSE	TRUE	VERTICAL	RECTANGULAR	C L O S U R E	DIRECTION	SEVERITY
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	FEET	N/S	feet	DEGS.	DG/100FT
FEET	DEGS.	DEGS.	FEET	FEET	FEET				
7408.00	1.30	N 06.00 E	94.00	7406.65	89.94 N	7.73 W	90.27' N 04.91 W		.20
7501.00	1.30	N 01.00 W	93.00	7499.63	92.05 N	7.64 W	92.36' N 04.75 W		.17
7595.00	1.10	N 15.00 W	94.00	7593.61	93.99 N	7.92 W	94.32' N 04.81 W		.38
7689.00	1.10	N 28.00 W	94.00	7687.59	95.67 N	8.58 W	96.05' N 05.12 W		.26
7782.00	1.00	N 29.00 W	93.00	7780.58	97.16 N	9.39 W	97.62' N 05.52 W		.11
7876.00	1.00	N 38.00 W	94.00	7874.56	98.53 N	10.29 W	99.07' N 05.96 W		.17
7969.00	1.00	N 41.00 W	93.00	7967.55	99.78 N	11.33 W	100.42' N 06.48 W		.06
8063.00	1.00	N 43.00 W	94.00	8061.53	101.00 N	12.42 W	101.76' N 07.01 W		.04
8157.00	.90	N 47.00 W	94.00	8155.52	102.10 N	13.52 W	102.99' N 07.55 W		.13
8250.00	.70	N 34.00 W	93.00	8248.51	103.09 N	14.37 W	104.08' N 07.93 W		.29
8344.00	.20	N 27.00 W	94.00	8342.51	103.72 N	14.74 W	104.77' N 08.09 W		.53
8437.00	.60	N 40.00 E	93.00	8435.51	104.33 N	14.67 W	105.36' N 08.00 W		.60
8531.00	1.00	N 34.00 E	94.00	8529.50	105.38 N	13.88 W	106.29' N 07.50 W		.43
8625.00	1.20	N 46.00 E	94.00	8623.48	106.76 N	12.72 W	107.52' N 06.80 W		.32
8718.00	1.80	N 33.00 E	93.00	8716.45	108.63 N	11.18 W	109.21' N 05.88 W		.74
8812.00	2.30	N 34.00 E	94.00	8810.39	111.44 N	9.32 W	111.83' N 04.78 W		.53
8906.00	2.70	N 33.00 E	94.00	8904.00	114.00 N	4.07 W	115.21' N 03.47 W		.64
8999.00	3.10	N 29.00 E	93.00	8997.16	119.17 N	4.46 W	119.25' N 02.14 W		.31
9093.00	3.70	N 13.00 E	94.00	9091.00	124.35 N	2.47 W	124.38' N 01.14 W		1.19
9155.00	3.90	N 09.00 E	62.00	9152.86	128.39 N	1.69 W	128.40' N 00.75 W		.54
9218.00	4.60	N 04.00 E	63.00	9215.69	133.02 N	1.16 W	133.03' N 00.50 W		1.26
9281.00	4.10	N 11.00 W	63.00	9278.50	137.78 N	1.45 W	137.79' N 00.60 W		1.97
9344.00	4.00	N 03.00 W	63.00	9341.35	142.19 N	1.99 W	142.21' N 00.80 W		.91
9406.00	4.80	N 11.00 W	62.00	9403.16	146.91 N	2.57 W	146.93' N 01.00 W		1.62
9500.00	4.70	N 08.00 W	94.00	9496.84	154.59 N	3.86 W	154.63' N 01.43 W		.28

NORTON DRILLING COMPANY
NEW MEXICO "EX" STATE NO.2
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MEASURED	INCL.	HOLE	COURSE	VERTICAL	RECTANGULAR	CLOSURE	DIRECTION	DOG-LEG
DEPTH	ANGLE	DIRECTION	LENGTH	DEPTH	COORDINATES	DISTANCE	DEGS.	SEVERITY
FEET	DEGS.	DEGS.	FEET	FEET	N/S	FEET	DEGS.	DC/100FT
9594.00	4.40	N 01.00 W	94.00	9590.54	162.01 N	162.08'	N 01.57 W	.67
9625.00	4.10	N 07.00 E	31.00	9621.46	164.31 N	164.36'	N 01.51 W	2.14
9656.00	4.60	N 18.00 E	31.00	9652.37	166.60 N	166.64'	N 01.31 W	3.13
MAGNETIC MULTISHOT SURVEY FROM 4200'-9656'MD.								
9805.00	7.00	N 67.00 E	149.00	9800.60	177.36 N	177.47'	N 01.95 E	3.54
MAGNETIC SINGLESOT SURVEY AT 9805'MD.								

CLOSURE DISTANCE = 177.47 FEET.
CLOSURE DIRECTION = N 01.95 E