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**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

NORTHERN PUMP COMPANY
COMPANY

GOVERNMENT 3-1
WELL NAME

RIO BLANCO COUNTY, COLORADO
LOCATION

JOB NUMBER

410-0294

TYPE OF SURVEY

MAGNETIC MULTI-SHOT

DATE

21-JAN-86

SURVEY BY
JON VALENZUELA

OFFICE
RM 410

EASTMAN WHIPSTOCK, INC.

RECORD OF SURVEY

FOR

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* * * * *
* OPERATOR      : NORTHERN PUMP COMPANY
* WELL NAME     : GOVERNMENT 3-1
* LOCATION      : RIO BLANCO, COLORADO
* JOB NUMBER    : 410-0294
* RIG           : SHELBY #1
* DECLINATION   : 13.00 E
* * * * *
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EW DISTRICT : ROCKY MOUNTAIN DIST.

NORTHERN PUMP COMPANY
GOVERNMENT 3-1
IO BLANCO, COLORADO

DATE PRINTED : 20-JAN-86
OUR REF. NO. : S02538.4NZ
DECLINATION : 13.00 JOB NUMBER :

PAGE NO. 1

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	RECTANGULAR COORDINATES	DOUGLED- SEVERITY
0.00	0 0	N 0 0 E	0.00	0.00	0.00 N 0.00 E	0.00
661.00	4 0	N 4 0 E	661.00	660.46	23.01 N 1.61 E	0.61
753.00	4 15	N 5 0 E	92.00	752.22	29.62 N 1.84 E	0.41
846.00	4 0	N 1 0 E	93.00	844.98	36.31 N 1.90 E	0.28
939.00	4 15	N 2 0 E	93.00	937.74	42.99 N 2.07 E	0.28
1031.00	5 0	N 6 0 E	92.00	1029.44	50.39 N 2.59 E	0.69
1124.00	5 0	N 3 0 W	93.00	1122.09	58.49 N 2.80 E	0.84
1217.00	5 15	N 5 0 W	93.00	1214.72	66.78 N 2.22 E	0.33
1309.00	5 15	N 5 0 W	92.00	1306.33	75.16 N 1.49 E	0.00
1402.00	5 0	N 5 0 W	93.00	1398.96	83.44 N 0.77 E	0.27
1495.00	5 0	N 4 0 W	93.00	1491.61	91.52 N 0.13 E	0.09
1587.00	5 0	N 1 0 W	92.00	1585.26	99.53 N 0.22 E	0.28
1680.00	4 30	N 3 0 W	93.00	1675.94	107.22 N 0.49 W	0.57
1773.00	4 45	N 2 0 E	93.00	1768.63	114.72 N 0.55 W	0.51
1865.00	4 45	N 4 0 E	92.00	1860.32	122.33 N 0.16 W	0.18
1958.00	4 45	N 5 0 E	93.00	1953.00	130.01 N 0.45 E	0.09
2051.00	5 30	N 3 0 E	93.00	2045.62	138.29 N 1.03 E	0.83
2143.00	5 45	N 5 0 E	92.00	2137.18	147.29 N 1.66 E	0.35
2236.00	5 45	N 10 0 E	93.00	2229.71	156.52 N 2.87 E	0.54
2329.00	5 15	N 11 0 E	93.00	2322.28	165.29 N 4.50 E	0.51
2421.00	5 0	N 15 0 E	92.00	2413.92	173.29 N 6.35 E	0.47
2514.00	4 45	N 15 0 E	93.00	2506.58	180.93 N 8.39 E	0.27
2607.00	4 0	N 16 0 E	93.00	2599.31	187.76 N 10.29 E	0.81
2699.00	3 45	N 7 0 E	92.00	2691.10	193.85 N 11.52 E	0.71
2792.00	4 30	N 5 0 W	93.00	2783.86	200.53 N 11.76 E	1.11
2885.00	5 0	N 3 0 W	93.00	2876.54	208.22 N 11.35 E	0.54
2977.00	5 45	N 5 0 W	92.00	2968.13	216.81 N 10.75 E	0.84
3070.00	5 45	N 6 0 W	93.00	3060.66	226.09 N 9.86 E	0.11
3163.00	5 15	N 8 0 W	93.00	3153.24	234.93 N 8.77 E	0.58
3255.00	5 30	N 6 0 W	92.00	3244.83	243.48 N 7.72 E	0.34

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NORTHERN PUMP COMPANY
GOVERNMENT 3-1
IO BLANCO, COLORADO

DATE PRINTED : 20-JAN-86
OUR REF. NO. : S02538.4NZ
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PAGE NO: 3

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	RECTANGULAR COORDINATES		DOGLEG SEVERITY
3348.00	5 45	N 11 0 W	93.00	3337.38	252.50 N	6.38 E	0.59
3441.00	5 30	N 8 0 W	93.00	3429.93	261.49 N	4.87 E	0.41
3533.00	5 0	N 11 0 W	92.00	3521.55	269.79 N	3.48 E	0.62
3626.00	5 15	N 10 0 W	93.00	3614.18	277.96 N	1.97 E	0.29
3719.00	5 15	N 9 0 W	93.00	3706.79	286.35 N	0.57 E	0.10
3811.00	4 30	N 8 0 W	92.00	3798.45	294.08 N	0.59 W	0.83
3904.00	4 45	N 11 0 W	93.00	3891.15	301.48 N	1.83 W	0.37
3997.00	4 30	N 11 0 W	93.00	3983.85	308.84 N	3.26 W	0.27
4089.00	4 15	N 7 0 W	92.00	4075.58	315.77 N	4.36 W	0.43
4182.00	5 0	N 11 0 W	93.00	4168.28	323.18 N	5.53 W	0.88
4275.00	4 30	N 9 0 W	93.00	4260.96	330.76 N	6.87 W	0.57
4367.00	4 30	N 13 0 W	92.00	4352.67	337.82 N	8.37 W	0.31
4460.00	4 45	N 21 0 W	93.00	4445.37	344.95 N	10.68 W	0.59
4553.00	4 0	N 24 0 W	93.00	4538.10	351.50 N	13.40 W	0.84
4645.00	4 30	N 15 0 W	92.00	4629.84	357.92 N	15.67 W	0.90
4738.00	4 45	N 9 0 W	93.00	4722.54	365.25 N	17.23 W	0.39
4831.00	5 15	N 3 0 W	93.00	4815.19	373.31 N	18.08 W	0.78
4923.00	5 0	N 7 0 E	92.00	4906.82	381.51 N	17.79 W	1.01
5016.00	6 0	N 7 0 E	93.00	4999.39	390.36 N	16.70 W	1.08
5109.00	6 0	N 7 0 E	93.00	5091.88	400.01 N	15.52 W	0.00
5201.00	5 30	N 4 0 E	92.00	5183.42	409.14 N	14.24 W	0.59
5294.00	5 45	N 9 0 E	93.00	5275.97	418.14 N	12.81 W	0.27
5387.00	5 30	N 1 0 E	93.00	5368.52	427.20 N	11.78 W	0.59
5479.00	5 45	N 1 0 E	92.00	5460.08	436.20 N	11.31 W	0.35
5572.00	6 15	N 1 0 E	93.00	5552.57	445.91 N	10.80 W	0.58
5665.00	6 45	N 1 0 E	93.00	5644.97	456.43 N	10.34 W	0.65
5757.00	6 45	N 3 0 E	92.00	5736.33	467.23 N	9.96 W	0.26
5850.00	7 0	N 2 0 E	93.00	5828.66	478.35 N	9.48 W	0.30
5943.00	7 0	N 2 0 E	93.00	5920.97	489.68 N	9.08 W	0.00
6035.00	7 0	N 4 0 E	92.00	6012.28	500.88 N	8.49 W	0.26

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NORTHERN PUMP COMPANY
GOVERNMENT 3-1
RIO BLANCO, COLORADO

DATE PRINTED : 20-JAN-86
OUR REF. NO. : S02538.4NZ
DECLINATION : 13.00 JOB NUMBER :

PAGE NO. 4

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	RECTANGULAR COORDINATES	DOUBLE SEVERITY
6128.00	6 45	N 1 0 W	93.00	6104.62	512.00 N 8.20 W	0.70
6221.00	6 0	N 1 0 W	93.00	6197.04	522.32 N 8.38 W	0.81
6313.00	6 0	N 0 0 E	92.00	6288.54	531.94 N 8.47 W	0.11
6406.00	5 15	N 3 0 E	93.00	6381.09	541.05 N 8.23 W	0.67
6440.00	5 30	N 2 0 E	34.00	6414.94	544.23 N 8.09 W	0.79

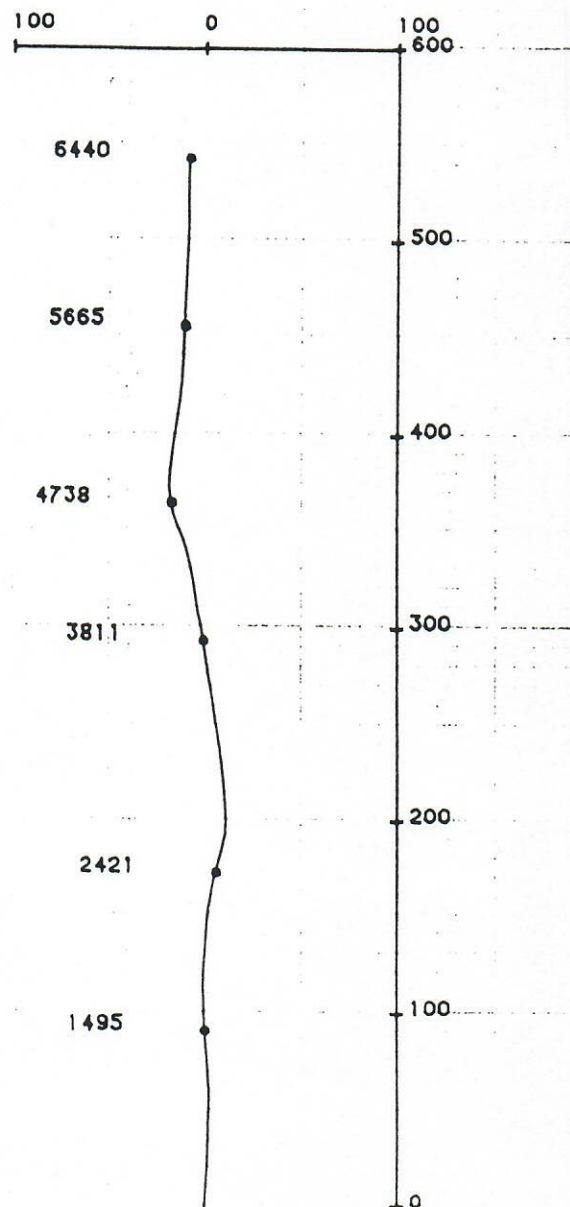
CLOSURE - DISTANCE : 544.29
DIRECTION : N 0 51 W

REPORT UNITS : Feet
SURVEY CALCULATION METHOD : Radius of curvature

SURVEY RUN INFORMATION

0-6440' MULTISHOT/ 410-0295/ JON VALENZUELA / 1-8-86

FINAL STATION:
DEPTH: 6440.00 MD. 6414.94 TVD
544.23 NORTH. 8.09 WEST
CLOSURE: 544.29 AT N 0 51 W



SCALE 1"=100FT.

NOTE: COORDINATES RELATIVE
TO SLOT