



1:240 / 1:600

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	15-Nov-12	16-Nov-12			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	742.00	5,937.97			
Log End Depth (TVD, ft)	5,937.97	6,705.78			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	12-Nov-12 14:07	12-Nov-12 15:30			
Drill/Wipe End Date and Time	12-Nov-12 14:07	12-Nov-12 15:30			
Min Inc (deg) @ Depth (TVD, ft)	.19 @ 5,515.02	1.31 @ 5,941.97			
Max Inc (deg) @ Depth (TVD, ft)	12.28 @ 3,150.59	81.58 @ 6,698.97			
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC			
Flow Rate (gpm)	576.40	479.47			
Max AV (fpm) / CV (fpm) @ MWD	458 / 312	458.4 / 312.6			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.05 / 29.00	10.50 / 42.00			
Filtrate CL (ppm)	2,000.00	2,350.00			
pH / Fluid Loss (mptm)	9.00 / 29	9.50 / 8			
PV (cP) / YP (lbf2)	1 / 4.00	14 / 14.00			
% Solids / % Sand	4.00 / 0.10	9.70 / 0.30			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (deg F) / S	145.00 / PDC	151.00 / PDC			

Max Tool Temp (degF) / Source	145.90 / PCM	154.30 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Adam Sampson	Adam Sampson			
Customer Representative	Mike Pino	Roger Foster			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341322	11341322			
Insert Serial Number	11400829	11227512			
Date and Time Initialized	13-Nov-12 18:23	14-Nov-12 17:57			
Date and Time Read	15-Nov-12 02:38	16-Nov-12 10:39			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	56.00			
Software Version	6.21	6.21			
Sub Serial Number	11341322	11341322			
Sonde Serial Number	11478107	11297623			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	41.50	325.20			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.49	48.40			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341322	11341322			
Insert/Sonde Serial Number	11681026	11680983			

REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft
ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft

6. Insite Version 7.4.1

WARRANTY

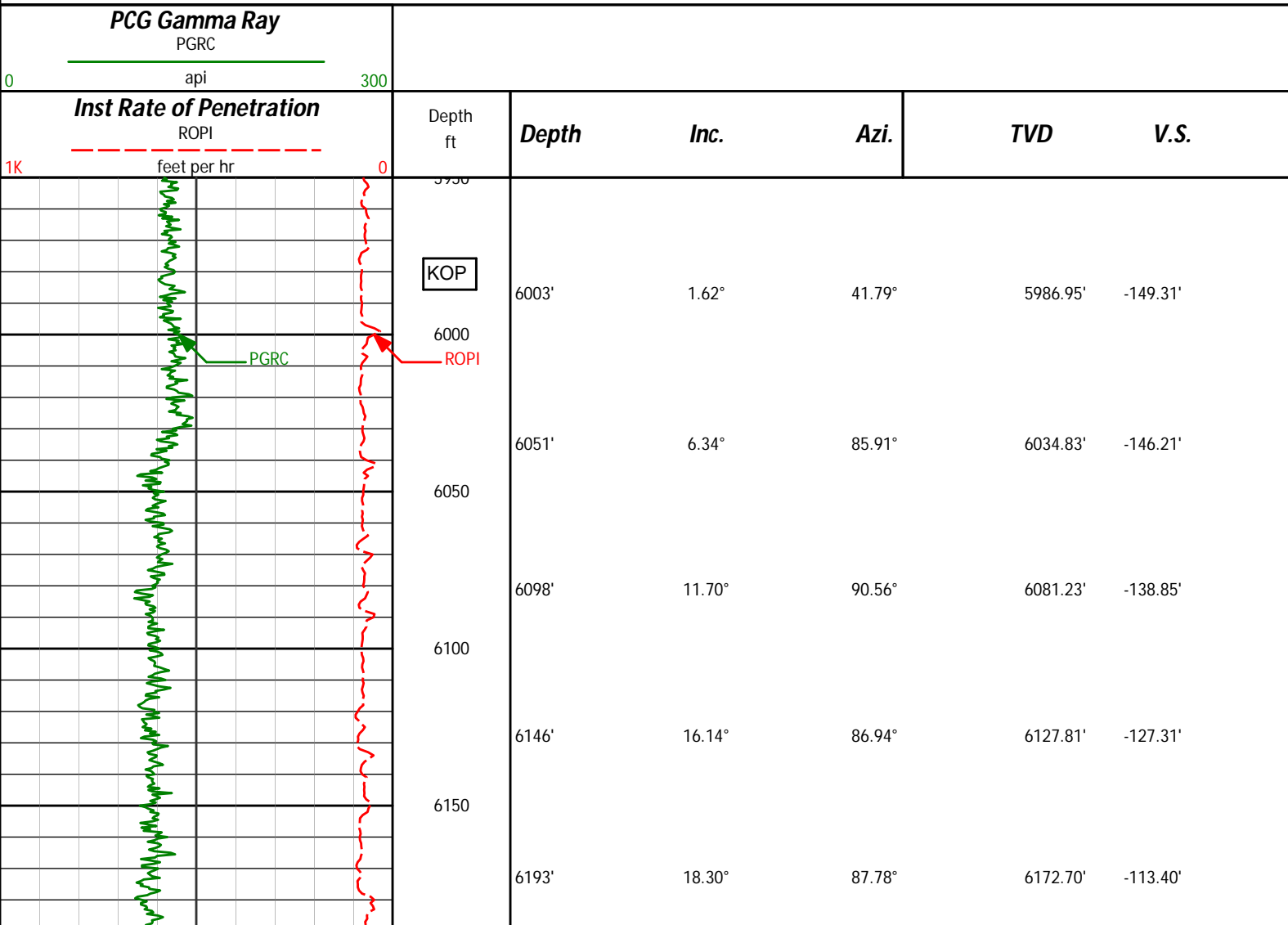
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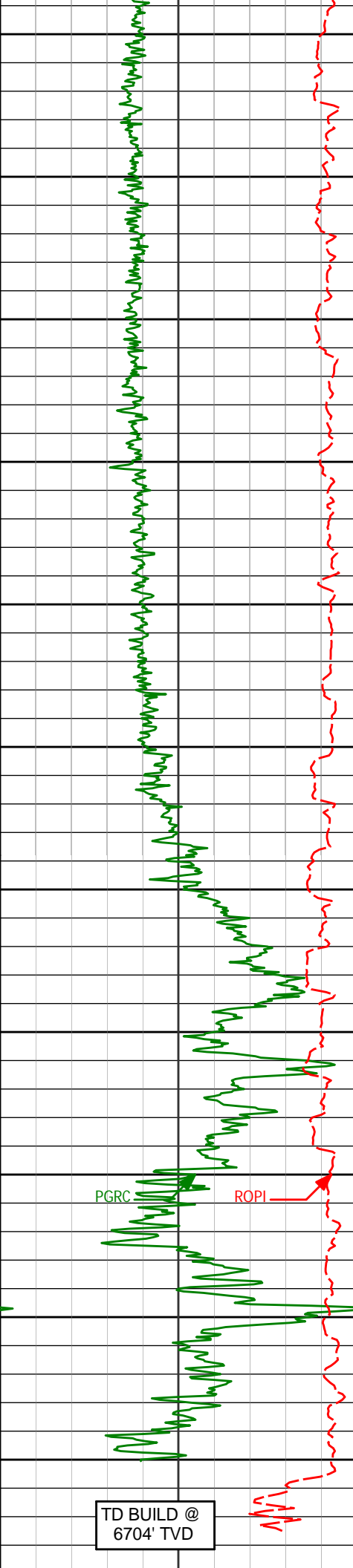
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Sperry Drilling Services

TVD Main Log 1:600

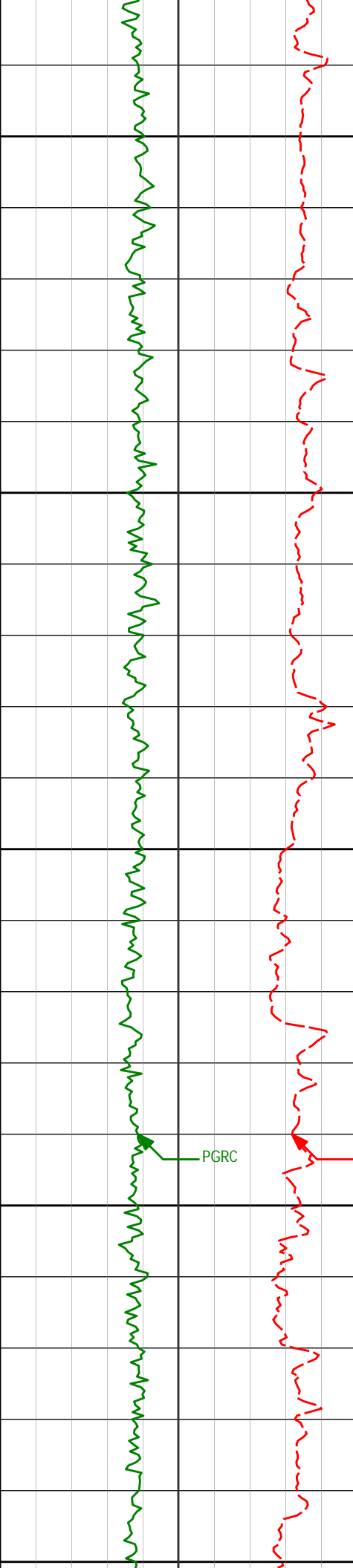
Noble Energy
Wells Ranch AE08-63-1HN
HP 321
T6N R62W





6200				
	6241'	19.65°	87.61°	6218.10' -97.81'
6250				
	6288'	22.45°	87.10°	6261.96' -80.94'
6300				
	6336'	25.03°	87.53°	6305.89' -61.64'
6350				
	6382'	28.87°	87.59°	6346.89' -40.81'
6400				
	6430'	33.38°	87.02°	6387.97' -16.03'
6450				
	6477'	38.47°	87.00°	6426.02' 11.51'
6500				
	6525'	42.18°	87.00°	6462.61' 42.53'
	6572'	44.97°	88.13°	6496.65' 74.91'
6550				
	6620'	48.34°	88.77°	6529.59' 109.80'
	6667'	53.62°	86.64°	6559.18' 146.28'
6600				
	6715'	57.64°	85.67°	6586.27' 185.82'
	6762'	60.24°	86.21°	6610.51' 225.99'
6650				
	6810'	62.84°	87.65°	6633.39' 268.14'
	6857'	66.91°	89.62°	6653.34' 310.68'
6700				
	6905'	71.62°	90.05°	6670.33' 355.55'
	6952'	75.34°	89.12°	6683.69' 400.60'
	7000'	78.63°	88.10°	6694.50' 447.36'
	7026'	81.58°	87.21°	6698.97' 472.95'
	7119'	86.34°	88.14°	6708.75' 565.36'
	7214'	87.53°	87.31°	6713.83' 660.16'
	7309'	87.28°	87.18°	6718.13' 754.99'
	7404'	87.11°	87.01°	6722.25' 849.82'
	7500'	88.00°	88.00°	6728.00' 944.65'
	7600'	88.00°	88.00°	6734.00' 1039.48'
	7700'	88.00°	88.00°	6740.00' 1134.31'
	7800'	88.00°	88.00°	6746.00' 1229.14'
	7900'	88.00°	88.00°	6752.00' 1323.97'
	8000'	88.00°	88.00°	6758.00' 1418.80'
	8100'	88.00°	88.00°	6764.00' 1513.63'
	8200'	88.00°	88.00°	6770.00' 1608.46'
	8300'	88.00°	88.00°	6776.00' 1703.29'
	8400'	88.00°	88.00°	6782.00' 1798.12'
	8500'	88.00°	88.00°	6788.00' 1892.95'
	8600'	88.00°	88.00°	6794.00' 1987.78'
	8700'	88.00°	88.00°	6800.00' 2082.61'
	8800'	88.00°	88.00°	6806.00' 2177.44'
	8900'	88.00°	88.00°	6812.00' 2272.27'
	9000'	88.00°	88.00°	6818.00' 2367.10'
	9100'	88.00°	88.00°	6824.00' 2461.93'
	9200'	88.00°	88.00°	6830.00' 2556.76'
	9300'	88.00°	88.00°	6836.00' 2651.59'
	9400'	88.00°	88.00°	6842.00' 2746.42'
	9500'	88.00°	88.00°	6848.00' 2841.25'
	9600'	88.00°	88.00°	6854.00' 2936.08'
	9700'	88.00°	88.00°	6860.00' 3030.91'
	9800'	88.00°	88.00°	6866.00' 3125.74'
	9900'	88.00°	88.00°	6872.00' 3220.57'
	10000'	88.00°	88.00°	6878.00' 3315.40'

[illegible]



6100

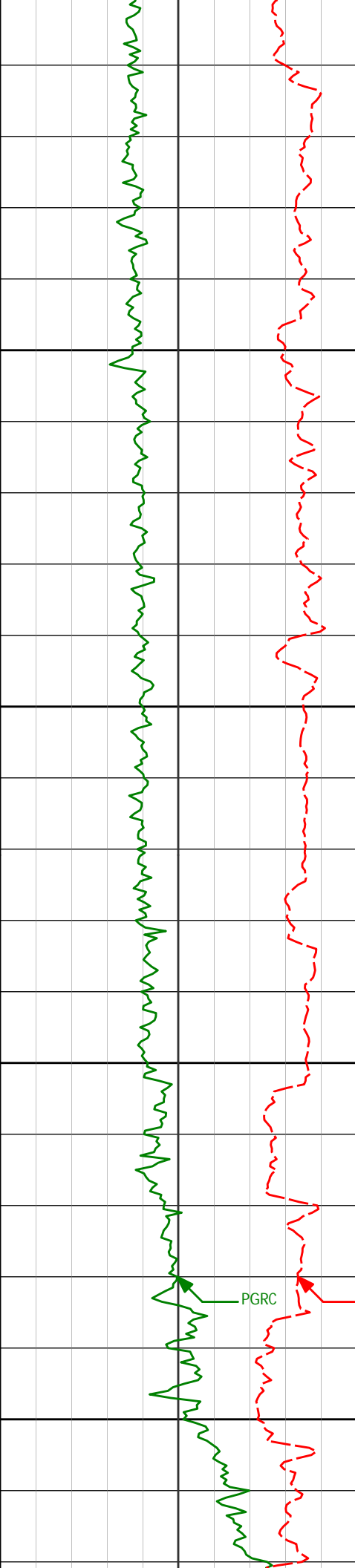
6150

6200

6250

6300

6098	11.70°	90.56°	6081.23'	-138.85'
6146'	16.14°	86.94°	6127.81'	-127.31'
6193'	18.30°	87.78°	6172.70'	-113.40'
6241'	19.65°	87.61°	6218.10'	-97.81'
6288'	22.45°	87.10°	6261.96'	-80.94'



6350

6400

6450

6500

6336' 25.03° 87.53° 6305.89' -61.64'

6382' 28.87° 87.59° 6346.89' -40.81'

6430' 33.38° 87.02° 6387.97' -16.03'

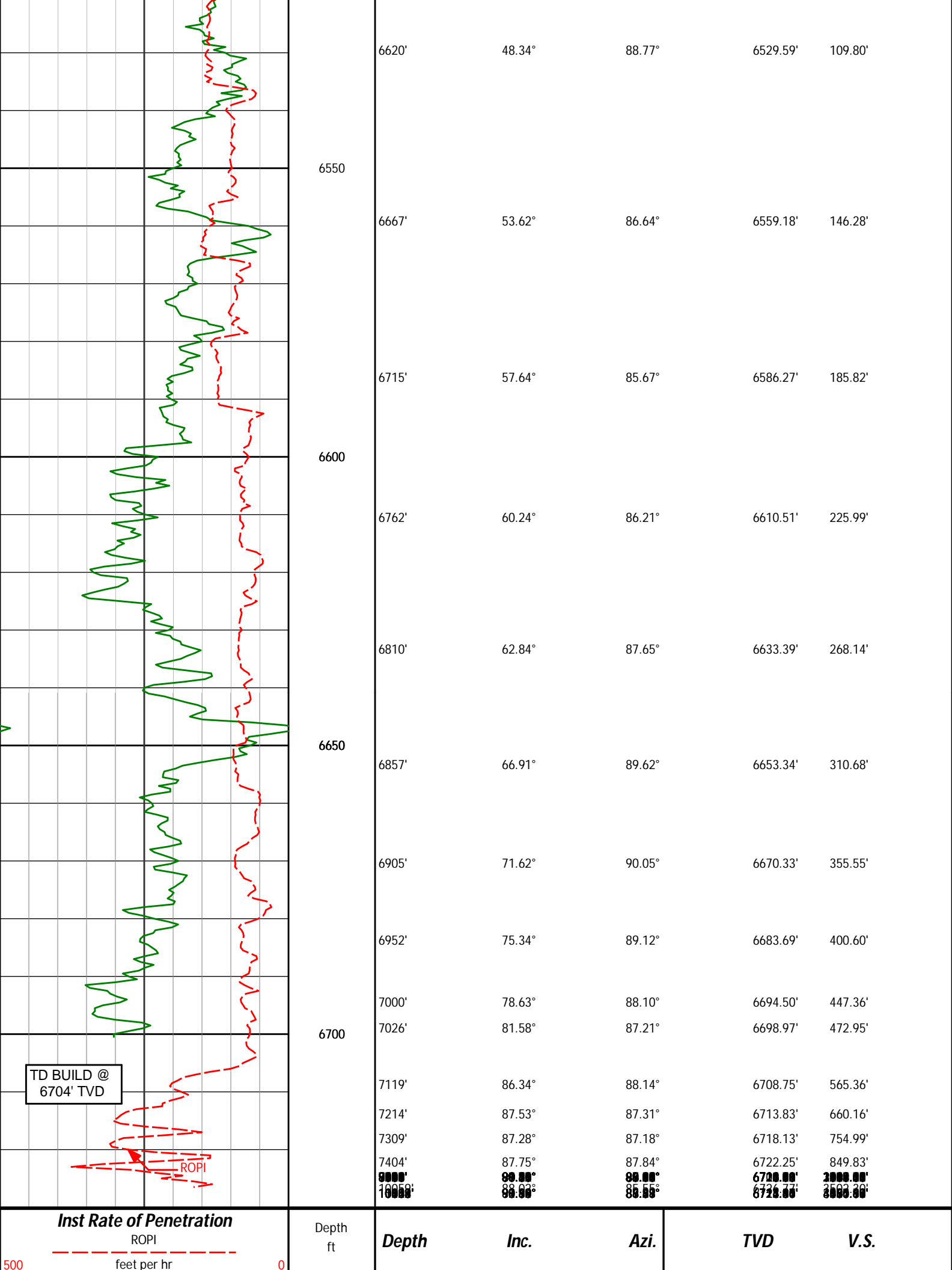
6477' 38.47° 87.00° 6426.02' 11.51'

6525' 42.18° 87.00° 6462.61' 42.53'

6572' 44.97° 88.13° 6496.65' 74.91'

PGRC

ROPI



Inst Rate of Penetration

ROPI

feet per hr

Depth
ft

Depth

Inc.

Azi.

TVD

V.S.



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DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AE08-63-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0009919209

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
752.00	0.00	0.00	752.00	0.00 N	0.00 E	0.00	TIE-IN
814.00	0.21	19.60	814.00	0.11 N	0.04 E	0.04	0.33
1090.00	0.55	45.03	1089.99	1.50 N	1.14 E	1.15	0.13
1365.00	0.49	77.39	1364.98	2.69 N	3.21 E	3.22	0.11
1645.00	0.37	97.76	1644.98	2.82 N	5.27 E	5.29	0.07
1928.00	0.25	117.85	1927.97	2.42 N	6.72 E	6.73	0.06
2212.00	0.56	156.49	2211.96	0.86 N	7.81 E	7.81	0.14
2495.00	0.89	187.47	2494.94	2.58 S	8.07 E	8.06	0.18
2590.00	3.92	219.21	2589.85	5.82 S	5.92 E	5.89	3.37
2684.00	6.01	226.73	2683.49	11.69 S	0.31 E	0.23	2.33
2779.00	7.66	228.42	2777.81	19.30 S	8.05 W	-8.18	1.74
2874.00	8.83	237.84	2871.84	27.38 S	18.96 W	-19.14	1.88
2969.00	10.59	243.15	2965.47	35.20 S	32.92 W	-33.15	2.07
3063.00	11.81	247.44	3057.68	42.80 S	49.51 W	-49.79	1.58
3158.00	12.28	246.73	3150.59	50.52 S	67.77 W	-68.11	0.52
3254.00	11.16	247.55	3244.59	58.10 S	85.74 W	-86.12	1.18
3348.00	11.71	246.19	3336.72	65.43 S	102.88 W	-103.31	0.65
3443.00	10.99	245.49	3429.86	73.08 S	119.94 W	-120.42	0.77
3538.00	8.47	234.30	3523.50	80.92 S	133.86 W	-134.40	3.30
3633.00	5.90	210.64	3617.76	89.21 S	142.04 W	-142.63	4.07
3728.00	4.83	213.35	3712.34	96.75 S	146.73 W	-147.36	1.16
3823.00	2.21	220.82	3807.16	101.47 S	150.12 W	-150.79	2.79
3918.00	0.47	214.96	3902.13	103.18 S	151.54 W	-152.22	1.83
4013.00	0.46	192.03	3997.12	103.87 S	151.84 W	-152.53	0.20
4297.00	0.73	205.50	4281.11	106.62 S	152.86 W	-153.56	0.10
4582.00	1.48	197.67	4566.05	111.77 S	154.76 W	-155.50	0.27
4677.00	0.66	139.95	4661.04	113.36 S	154.78 W	-155.53	1.33
4961.00	0.41	89.85	4945.03	114.61 S	152.70 W	-153.46	0.18
5246.00	0.31	265.59	5230.03	114.67 S	152.45 W	-153.21	0.25
5531.00	0.19	201.99	5515.02	115.18 S	153.41 W	-154.17	0.10
5815.00	1.10	48.60	5799.01	113.83 S	151.56 W	-152.31	0.45
5898.00	1.47	38.17	5881.99	112.47 S	150.30 W	-151.05	0.53
5958.00	1.31	42.95	5941.97	111.36 S	149.36 W	-150.09	0.33
6003.00	1.62	41.79	5986.95	110.51 S	148.58 W	-149.31	0.69
6051.00	6.34	85.91	6034.83	109.81 S	145.48 W	-146.21	11.04
6098.00	11.70	90.56	6081.23	109.67 S	138.12 W	-138.85	11.50
6146.00	16.14	86.94	6127.81	109.36 S	126.59 W	-127.31	9.42
6193.00	18.30	87.78	6172.70	108.73 S	112.69 W	-113.40	4.62
6241.00	19.65	87.61	6218.10	108.10 S	97.09 W	-97.81	2.80
6288.00	22.45	87.10	6261.96	107.31 S	80.23 W	-80.94	5.98
6336.00	25.03	87.53	6305.89	106.41 S	60.93 W	-61.64	5.38
6382.00	28.87	87.59	6346.89	105.53 S	40.11 W	-40.81	8.35
6430.00	33.38	87.02	6387.97	104.35 S	15.34 W	-16.03	9.43
6477.00	38.47	87.00	6426.02	102.92 S	12.19 E	11.51	10.83
6525.00	42.18	87.00	6462.61	101.29 S	43.21 E	42.53	7.73
6572.00	44.97	88.13	6496.65	99.93 S	75.57 E	74.91	6.17
6620.00	48.34	88.77	6529.59	98.99 S	110.46 E	109.80	7.09
6667.00	53.62	86.64	6559.18	97.50 S	146.93 E	146.28	11.77
6715.00	57.64	85.67	6586.27	94.84 S	186.45 E	185.82	8.55
6762.00	60.24	86.21	6610.51	91.99 S	226.61 E	225.99	5.60
6810.00	62.84	87.65	6633.39	89.74 S	268.74 E	268.14	6.03
6857.00	66.91	89.62	6653.34	88.74 S	311.27 E	310.68	9.45

6905.00	71.62	90.05	6670.33	88.61 S	356.15 E	355.55	9.85
6952.00	75.34	89.12	6683.69	88.28 S	401.20 E	400.60	8.14
7000.00	78.63	88.10	6694.50	87.14 S	447.94 E	447.36	7.16
7026.00	81.58	87.21	6698.97	86.09 S	473.53 E	472.95	11.84

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A CLOSURE OF 100.30 DEGREES (GRID)
A TOTAL CORRECTION OF 7.77 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7026.00 FEET
IS 481.30 FEET ALONG 100.30 DEGREES (GRID)**

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