

PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	25-Nov-13	26-Nov-13			
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)	797.98	5,891.13			
Log End Depth (TVD, ft)	5,891.13	6,659.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	24-Nov-13 15:30	25-Nov-13 17:30			
Drill/Wipe End Date and Time	25-Nov-13 07:45	26-Nov-13 15:30			
Min Inc (deg) @ Depth (TVD, ft)	0.09 @ 4,767.22	2.77 @ 5,951.08			
Max Inc (deg) @ Depth (TVD, ft)	11.07 @ 2,969.81	80.31 @ 6,651.82			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.98 / PDC			
Flow Rate (gpm)	597.19	571.89			
Max AV (fpm) / CV (fpm) @ MWD	472.0 / NA	392.0 / NA			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.50 / 28.00	9.20 / 36.00			
Filtrate CL (ppm)	2,100.00	2,200.00			
pH / Fluid Loss (mptm)	7.50 / 25	9.00 / 10			
PV (cP) / YP (lbf2)	2 / 2.00	9 / 9.00			
% Solids / % Sand	1.2 / .2	4 / .3			
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95			
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA			
Max Tool Temp (in F) / S	170.07 / PCM	170.07 / PCM			

Max Tool Temp (degF) / Source	170.37 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA			
Lead MWD Engineer	Gary Eifert	Gary Eifert			
Customer Representative	Johnny Sanchez	Johnny Sanchez			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341340	11341340			
Insert Serial Number	11227514	11227514			
Date and Time Initialized	21-Nov-13 16:40	21-Nov-13 16:40			
Date and Time Read	27-Nov-13 08:06	27-Nov-13 08:12			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	54.00			
Software Version	6.21	6.21			
Sub Serial Number	11341340	11341340			
Sonde Serial Number	12177530	12177530			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	292.80	348.30			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	50.30	47.53			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341340	11341340			
Insert/Sonde Serial Number	11579776	11579776			

REMARKS

1. All depths are true vertical bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.

2. No depth corrections have been made for pipe stretch or compression.

3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham 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 (Corrected Gamma Ray):
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

WARRANTY

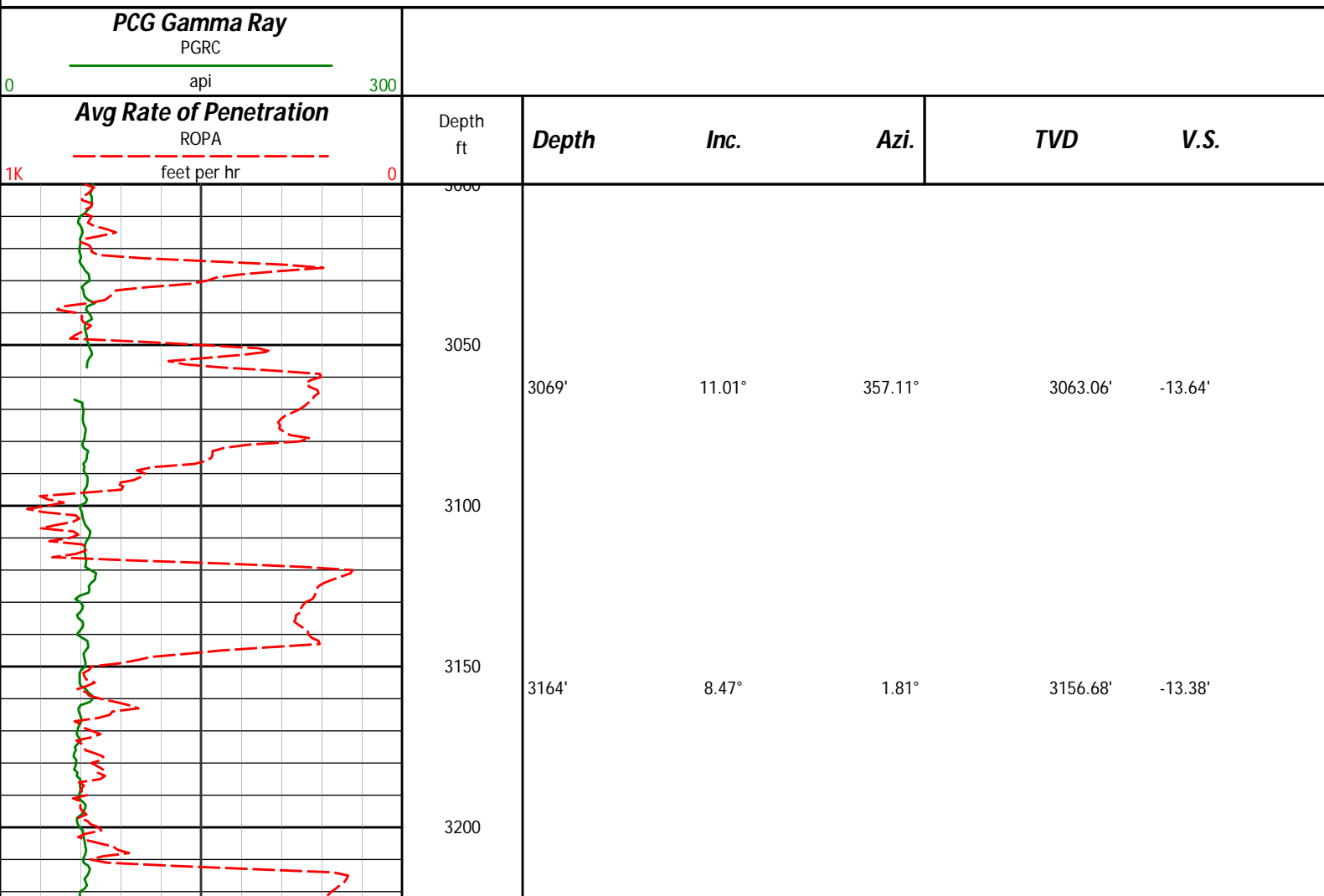
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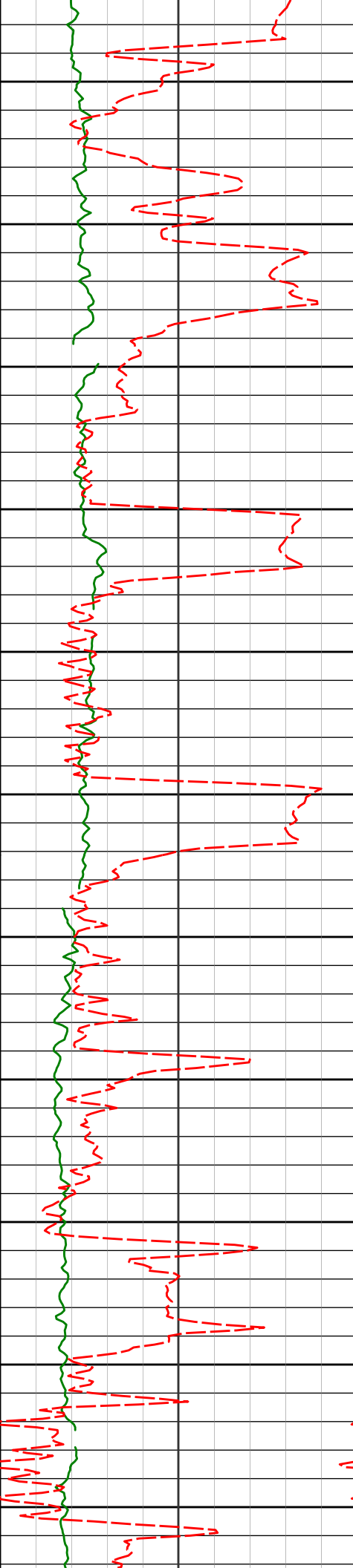
HALLIBURTON

Sperry Drilling Services

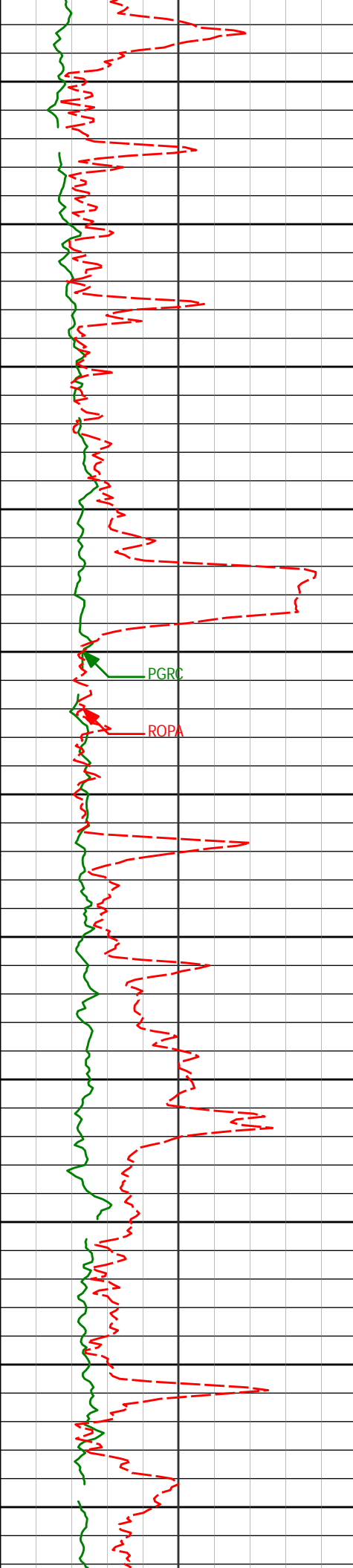
TVD Main Log 1:600

Noble Energy
NCLP PC AA 04-65-1HN
H&P 343
T6N-R63W





3250	3259'	6.35°	1.67°	3250.88'	-12.62'
3300					
3350	3354'	3.80°	354.72°	3345.50'	-12.50'
3400					
3450	3448'	1.83°	5.08°	3439.39'	-12.51'
3500					
3550	3543'	0.31°	151.83°	3534.37'	-12.21'
3600					
3650	3638'	0.33°	261.59°	3629.37'	-12.37'
3700					
3750	3733'	0.68°	229.02°	3724.37'	-13.08'



3800

3828'	1.19°	205.05°	3819.35'	-13.96'
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3850

3900

3923'	1.26°	222.87°	3914.33'	-15.14'
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3950

4000

4018'	0.15°	6.77°	4009.33'	-15.85'
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4050

4100

4112'	0.39°	301.92°	4103.32'	-16.10'
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4150

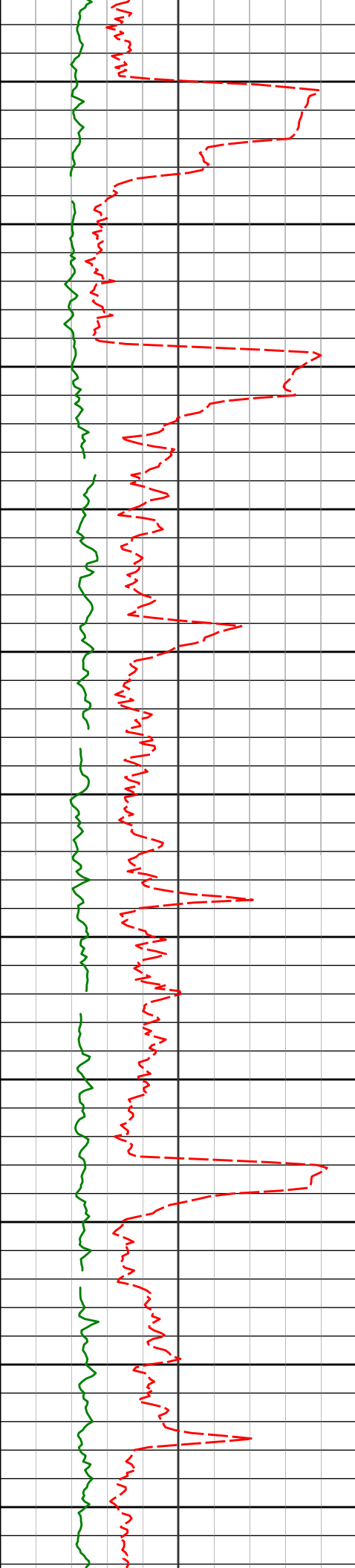
4200

4207'	0.54°	33.37°	4198.32'	-16.11'
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4250

4300

4301'	2.04°	85.30°	4292.30'	-14.19'
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4350

4396'

1.59°

53.75°

4387.25'

-11.41'

4400

4450

4491'

0.35°

38.27°

4482.24'

-10.14'

4500

4550

4586'

0.63°

0.54°

4577.23'

-9.93'

4600

4650

4681'

1.05°

11.47°

4672.22'

-9.71'

4700

4750

4776'

0.09°

8.29°

4767.22'

-9.50'

4800

4850

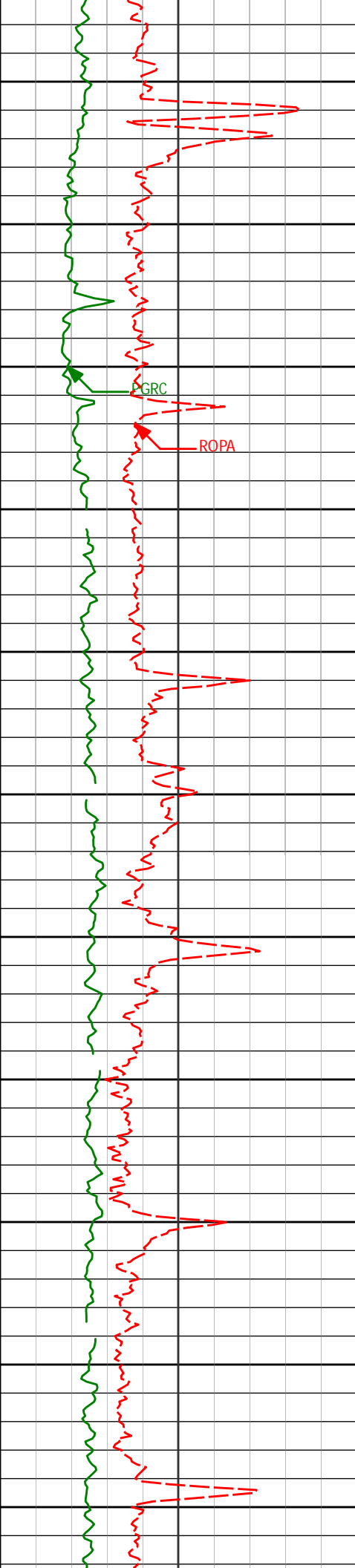
4871'

0.23°

6.69°

4862.22'

-9.45'



4900

4950

5000

5050

5100

5150

5200

5250

5300

5350

5400

4966'

0.31°

60.68°

4957.22'

-9.20'

5060'

0.31°

340.67°

5051.21'

-9.05'

5154'

0.37°

164.80°

5145.21'

-9.06'

5248'

0.68°

184.93°

5239.21'

-9.05'

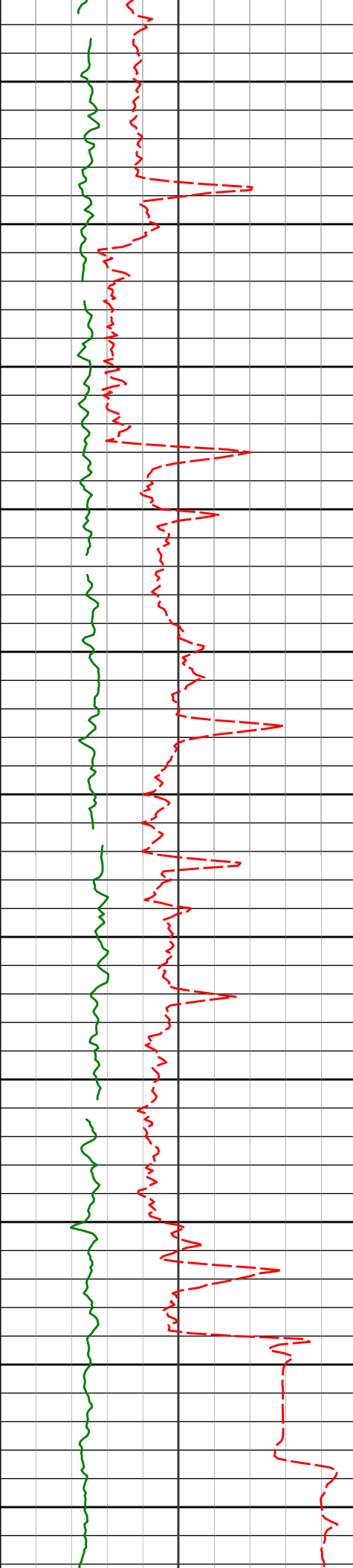
5343'

0.72°

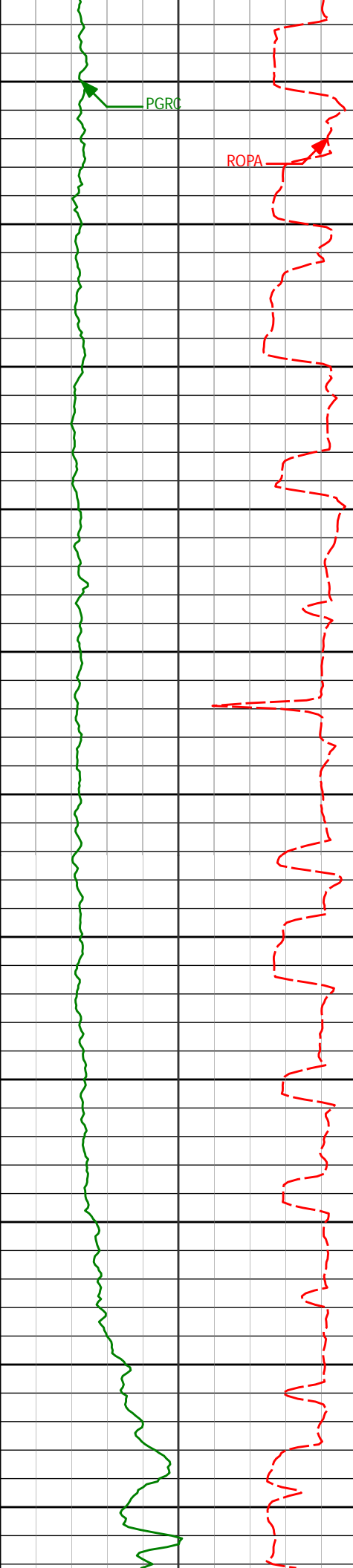
103.31°

5334.21'

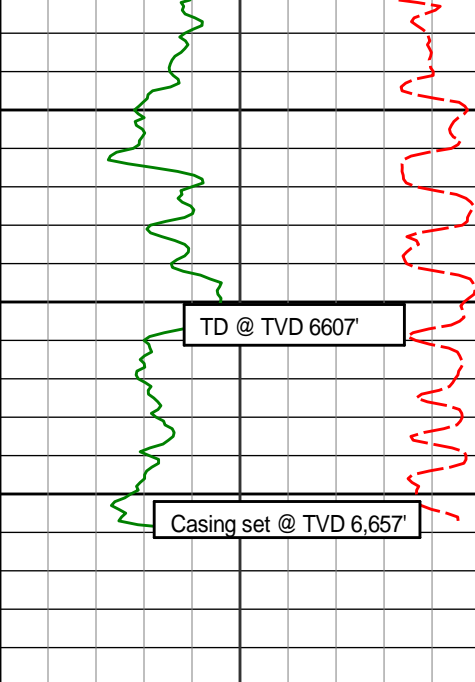
-8.54'



	5437'	1.15°	112.28°	5428.19'	-7.11'
5450					
5500					
	5532'	1.37°	91.24°	5523.17'	-5.10'
5550					
5600					
	5627'	0.93°	108.05°	5618.15'	-3.25'
5650					
5700					
	5722'	0.74°	98.43°	5713.14'	-1.92'
5750					
5800					
	5843'	0.47°	131.12°	5834.13'	-0.78'
5850					
<div>Run 200</div> 5900					
5950	5960'	2.77°	90.26°	5951.08'	2.39'



6000	6007'	5.86°	88.34°	5997.94'	5.93'
6050	6055'	8.25°	87.93°	6045.58'	11.82'
6100	6101'	9.40°	88.64°	6091.03'	18.88'
6150	6149'	12.60°	92.69°	6138.14'	28.02'
6200	6196'	17.29°	92.09°	6183.54'	40.11'
6250	6244'	23.46°	86.60°	6228.52'	56.79'
6300	6290'	28.31°	85.25°	6269.89'	76.85'
6350	6338'	30.16°	85.28°	6311.78'	100.26'
6400	6384'	33.77°	87.59°	6350.80'	124.60'
6450	6432'	37.62°	89.83°	6389.77'	152.59'
6500	6479'	43.06°	90.73°	6425.58'	182.98'
	6527'	49.30°	89.29°	6458.80'	217.58'
	6573'	51.99°	89.13°	6487.97'	253.14'
	6621'	52.51°	88.35°	6517.36'	291.09'



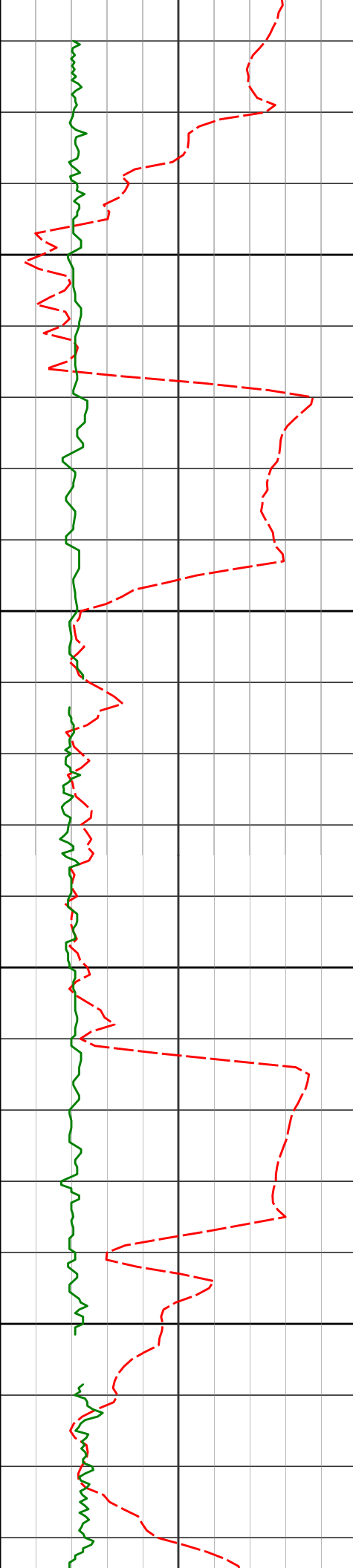
Station	Distance	Bearing	Angle	Distance	Distance
6550	6668'	57.65°	88.54°	6544.25'	329.62'
	6716'	61.20°	88.57°	6568.67'	370.93'
6600	6763'	63.71°	89.91°	6590.40'	412.60'
	6858'	73.69°	90.49°	6624.86'	500.94'
6650	6906'	77.49°	90.52°	6636.81'	547.38'
	6984'	80.31°	90.89°	6651.82'	623.84'
	7044'	84.87°	88.03°	6659.56'	683.31'
6700					

Avg Rate of Penetration ROPA ----- feet per hr		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
1K	0						
PCG Gamma Ray PGRC ----- api							
0	300						

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Sperry Drilling Services
TVD Detail Log 1:240

Noble Energy
NCLP PC AA04-65-1HN
H&P 343
T6N-R63W

PCG Gamma Ray PGRC api							
Avg Rate of Penetration ROPA feet per hr		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
0	300	3000					
1K	0	3050					
		3069'	11.01°	357.11°	3063.06'	-13.64'	



3100

3150

3200

3250

3164'

8.47°

1.81°

3156.68'

-13.38'

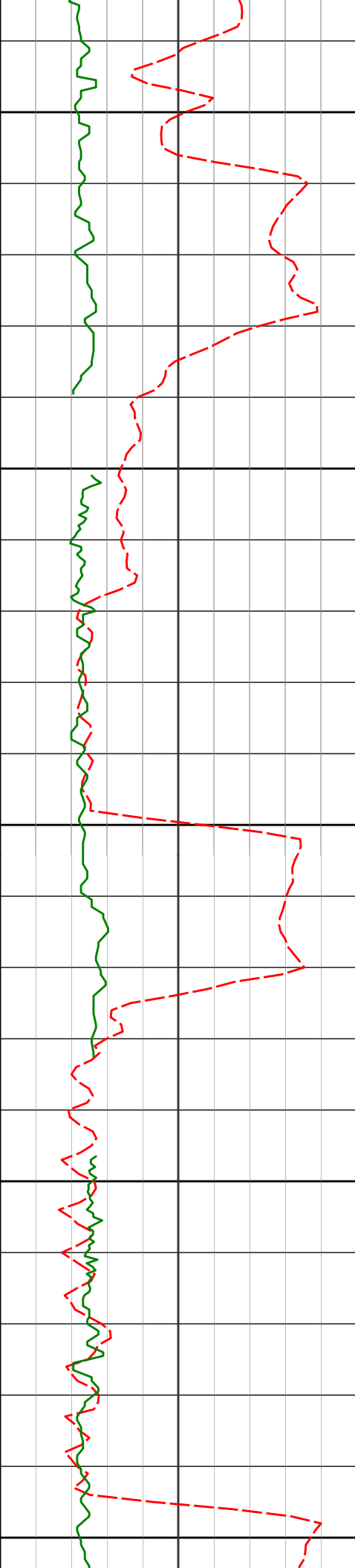
3259'

6.35°

1.67°

3250.88'

-12.62'



3300

3350

3400

3450

3500

3354'

3.80°

354.72°

3345.50'

-12.50'

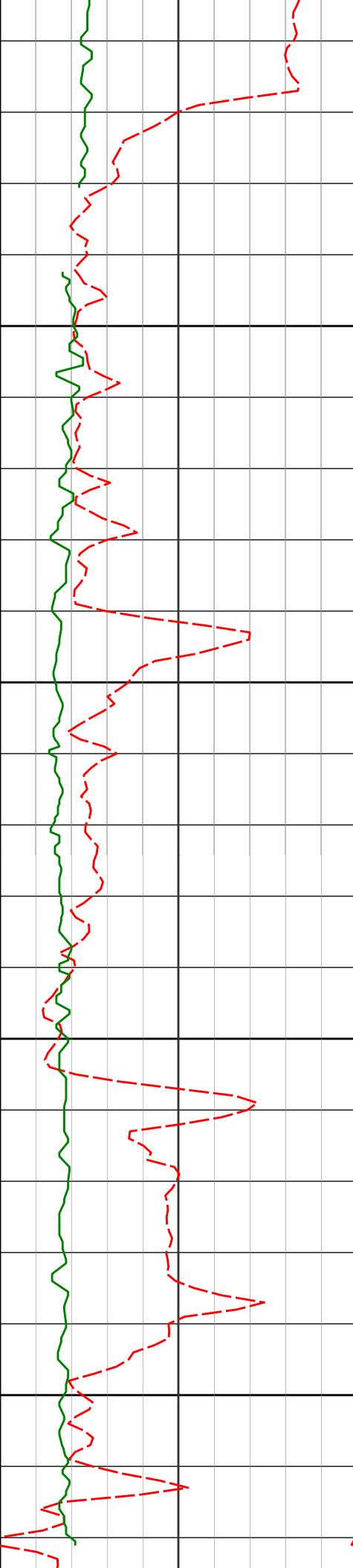
3448'

1.83°

5.08°

3439.39'

-12.51'



3543'

0.31°

151.83°

3534.37'

-12.21'

3550

3600

3638'

0.33°

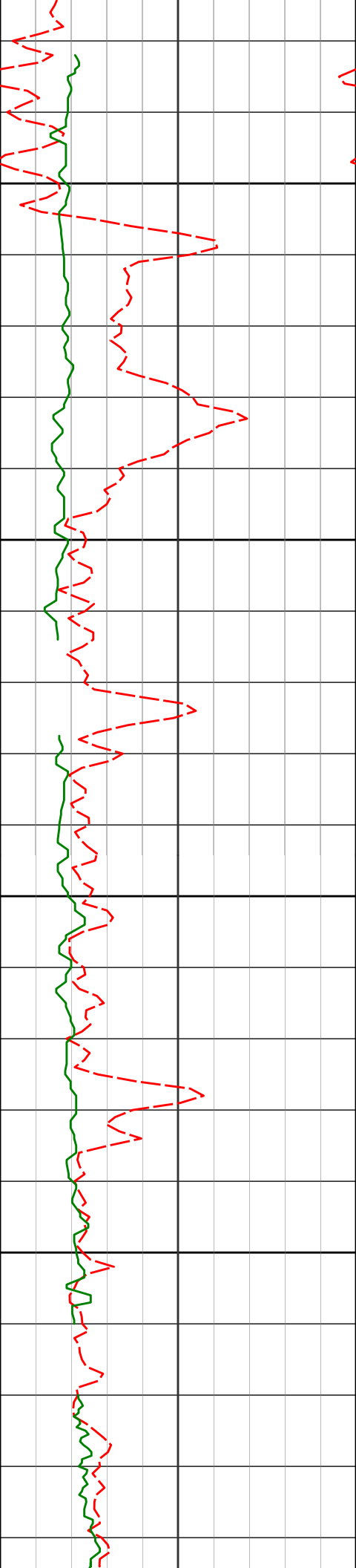
261.59°

3629.37'

-12.37'

3650

3700



3750

3800

3850

3900

3828'

1.19°

205.05°

3819.35'

-13.96'

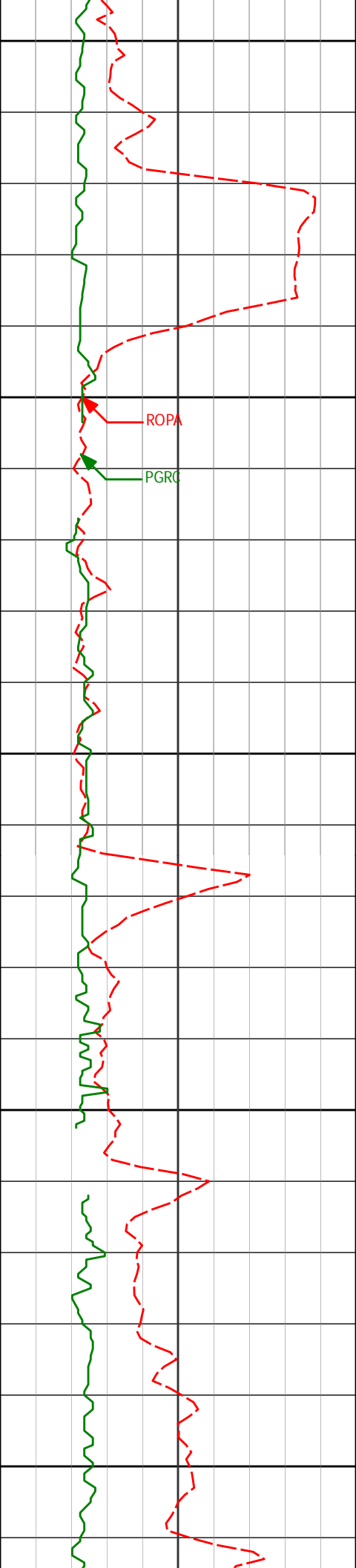
3923'

1.26°

222.87°

3914.33'

-15.14'



3950

4000

4050

4100

4150

ROPA

PGRG

4018'

0.15°

6.77°

4009.33'

-15.85'

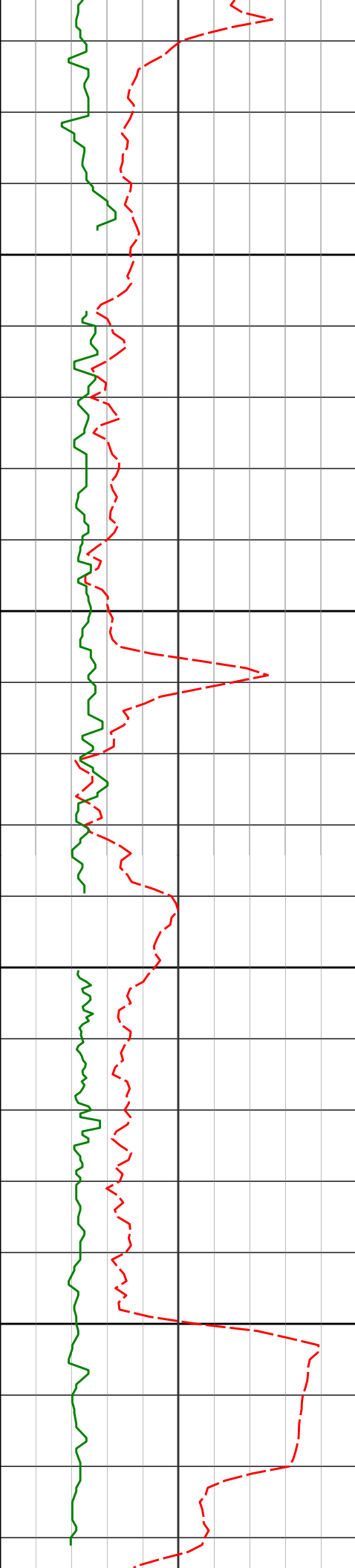
4112'

0.39°

301.92°

4103.32'

-16.10'



4200

4250

4300

4350

4207'

4301'

0.54°

2.04°

33.37°

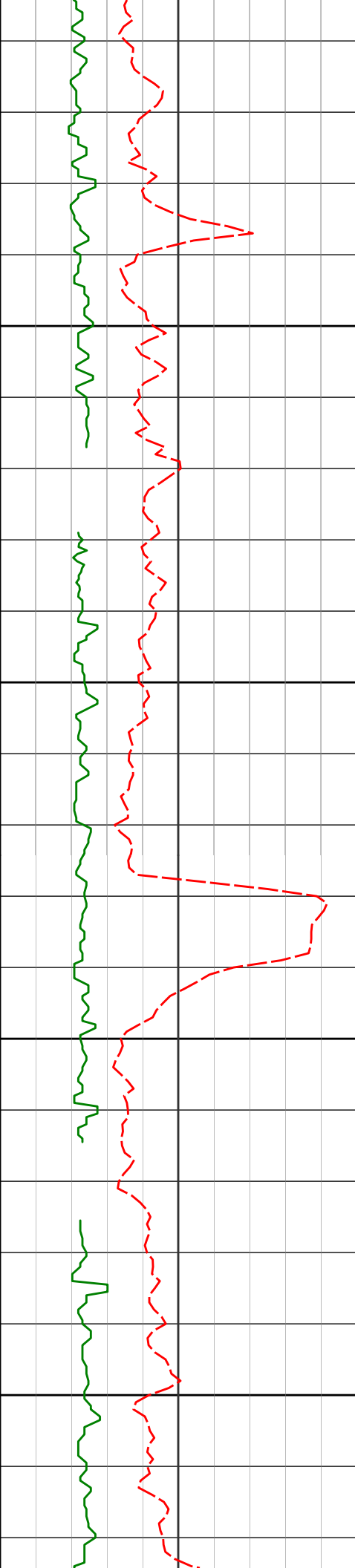
85.30°

4198.32'

4292.30'

-16.11'

-14.19'



4650

4681'

1.05°

11.47°

4672.22'

-9.71'

4700

4750

4776'

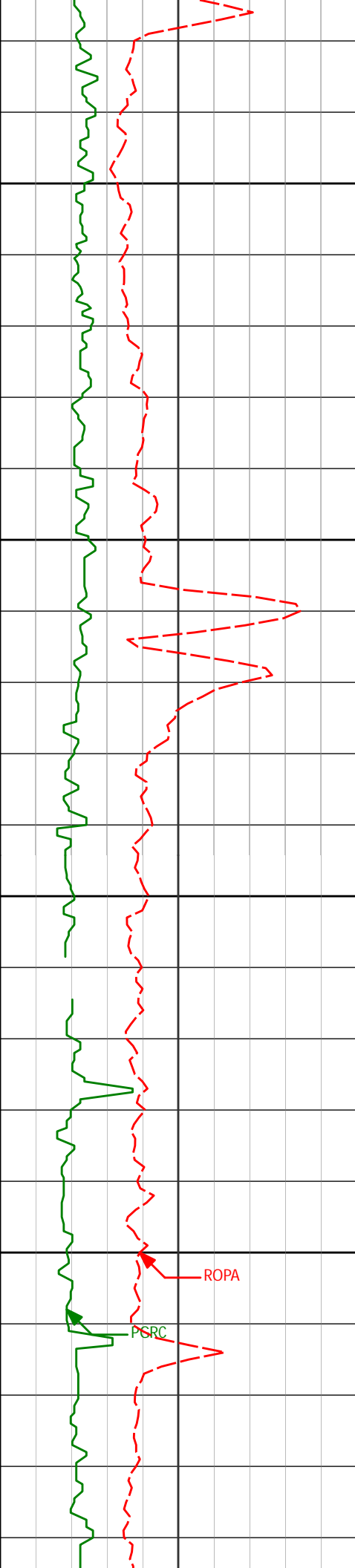
0.09°

8.29°

4767.22'

-9.50'

4800



4850

4871'

0.23°

6.69°

4862.22'

-9.45'

4900

4950

4966'

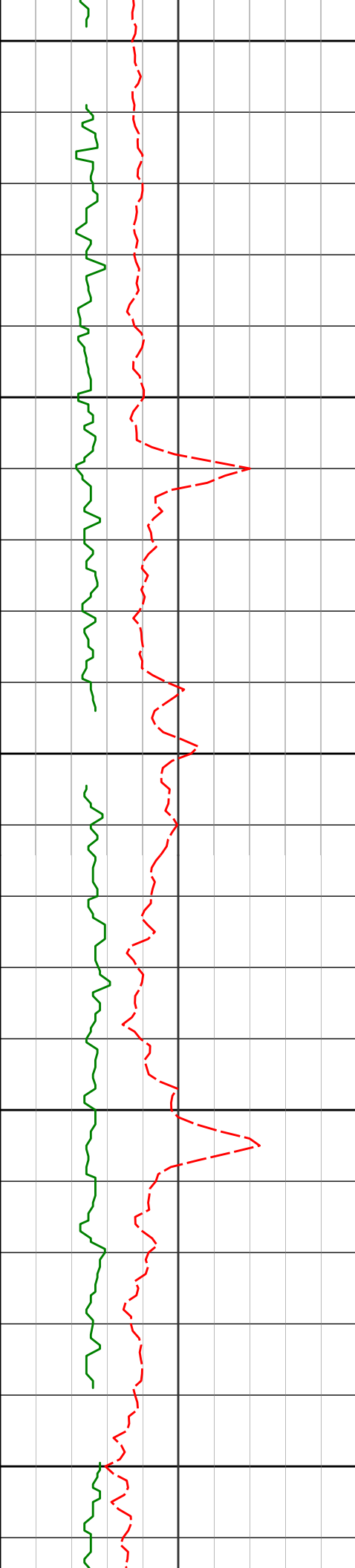
0.31°

60.68°

4957.22'

-9.20'

5000



5050

5060'

0.31°

340.67°

5051.21'

-9.05'

5100

5150

5154'

0.37°

164.80°

5145.21'

-9.06'

5200

5250

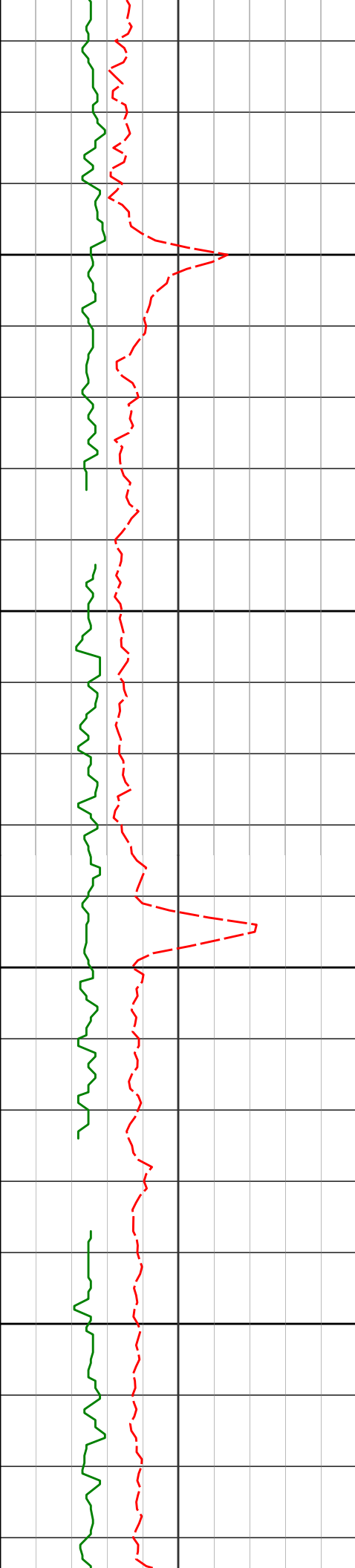
5248'

0.68°

184.93°

5239.21'

-9.05'



5300

5343'

0.72°

103.31°

5334.21'

-8.54'

5350

5400

5437'

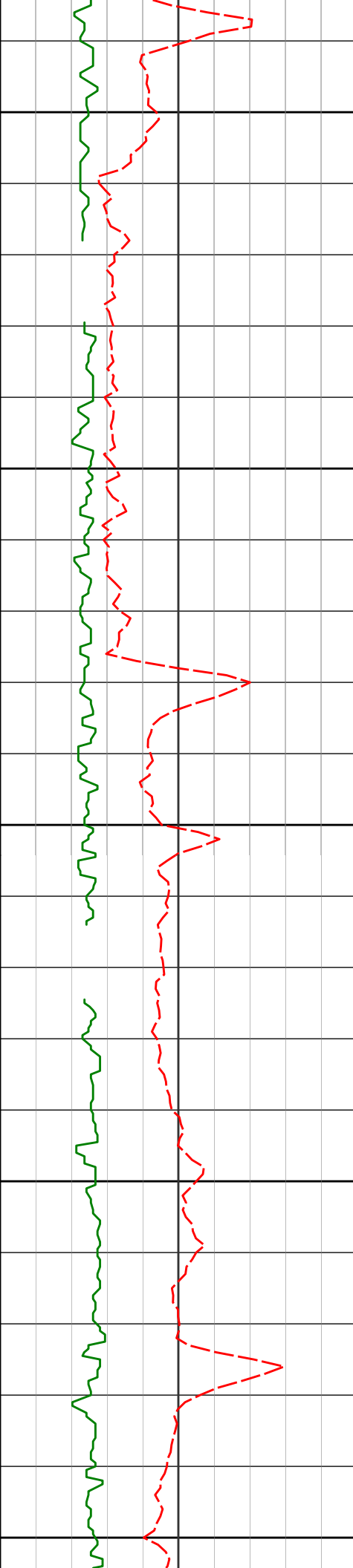
1.15°

112.28°

5428.19'

-7.11'

5450



5500

5532'

1.37°

91.24°

5523.17'

-5.10'

5550

5600

5627'

0.93°

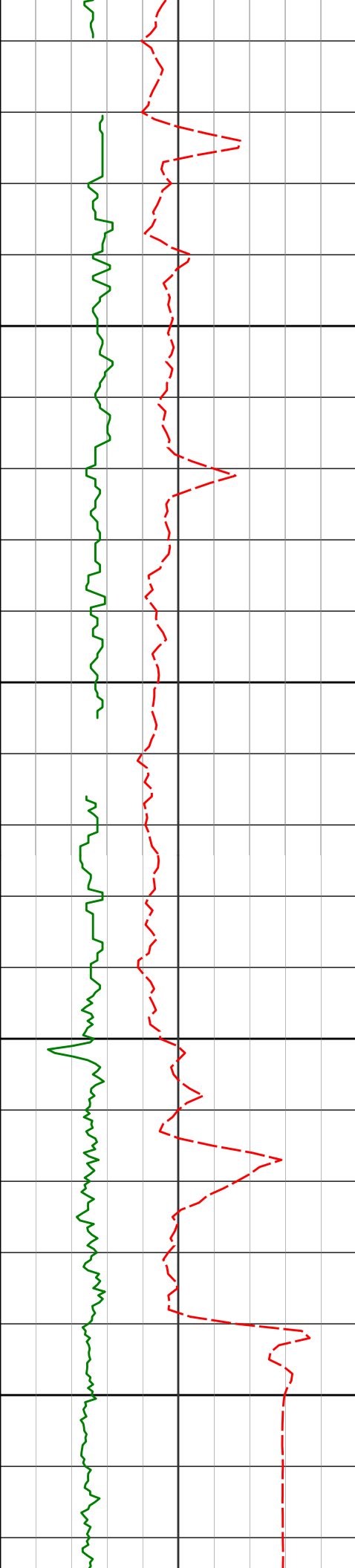
108.05°

5618.15'

-3.25'

5650

5700



5722'

0.74°

98.43°

5713.14'

-1.92'

5750

5800

5843'

0.47°

131.12°

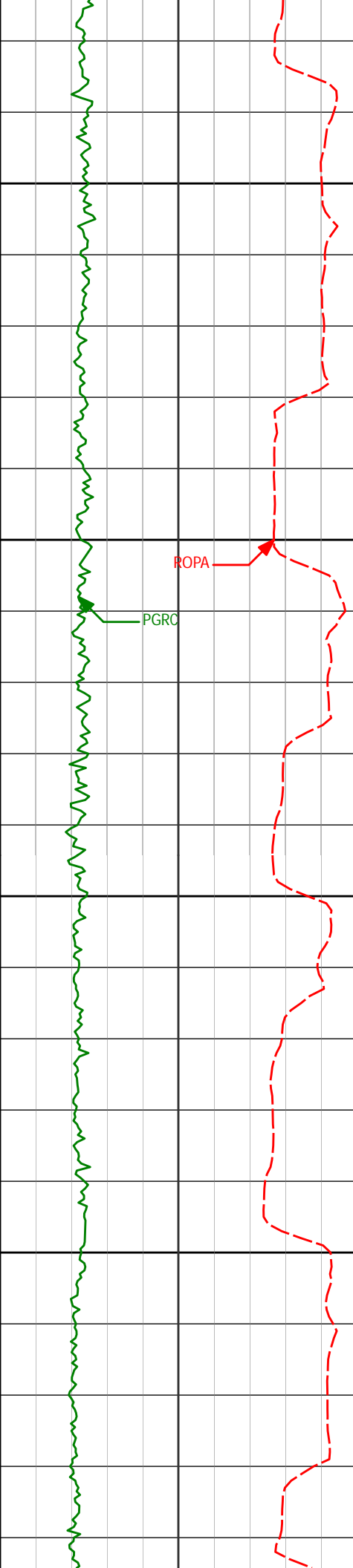
5834.13'

-0.78'

5850

Run 200

5900



5950

5960'

2.77°

90.26°

5951.08'

2.39'

6000

6007'

5.86°

88.34°

5997.94'

5.93'

6050

6055'

8.25°

87.93°

6045.58'

11.82'

6100

6101'

9.40°

88.64°

6091.03'

18.88'

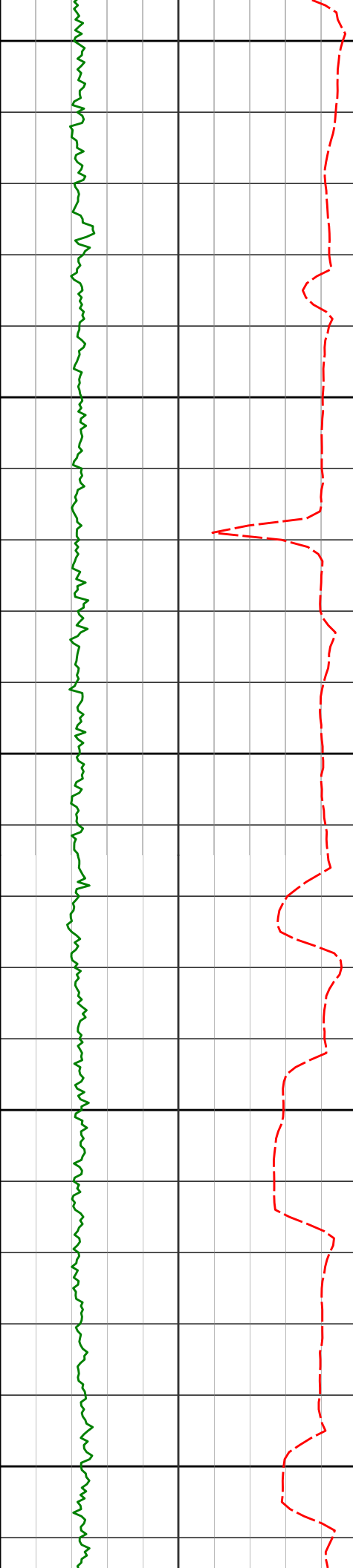
6149'

12.60°

92.69°

6138.14'

28.02'



6150

6196'

17.29°

92.09°

6183.54'

40.11'

6200

6244'

23.46°

86.60°

6228.52'

56.79'

6250

6290'

28.31°

85.25°

6269.89'

76.85'

6300

6338'

30.16°

85.28°

6311.78'

100.26'

6350

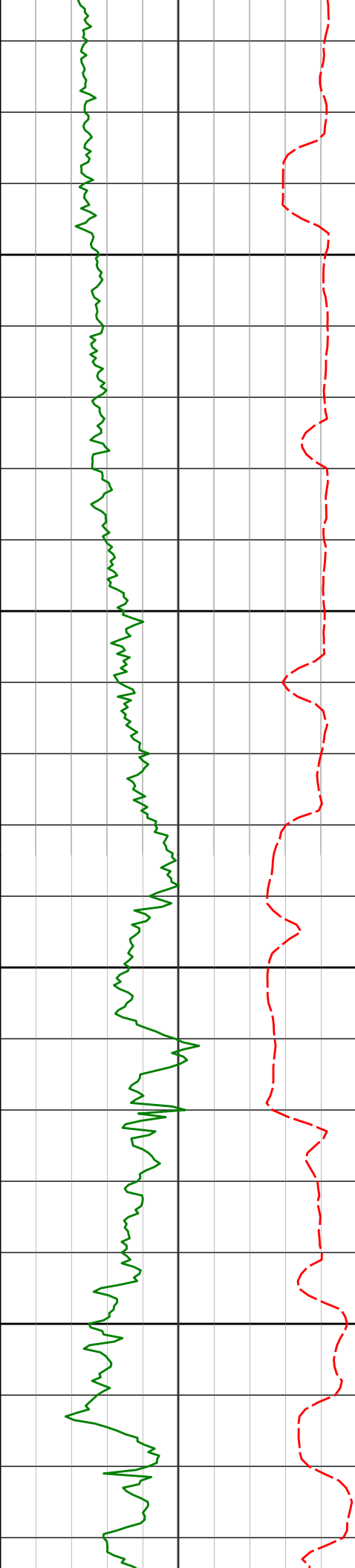
6384'

33.77°

87.59°

6350.80'

124.60'



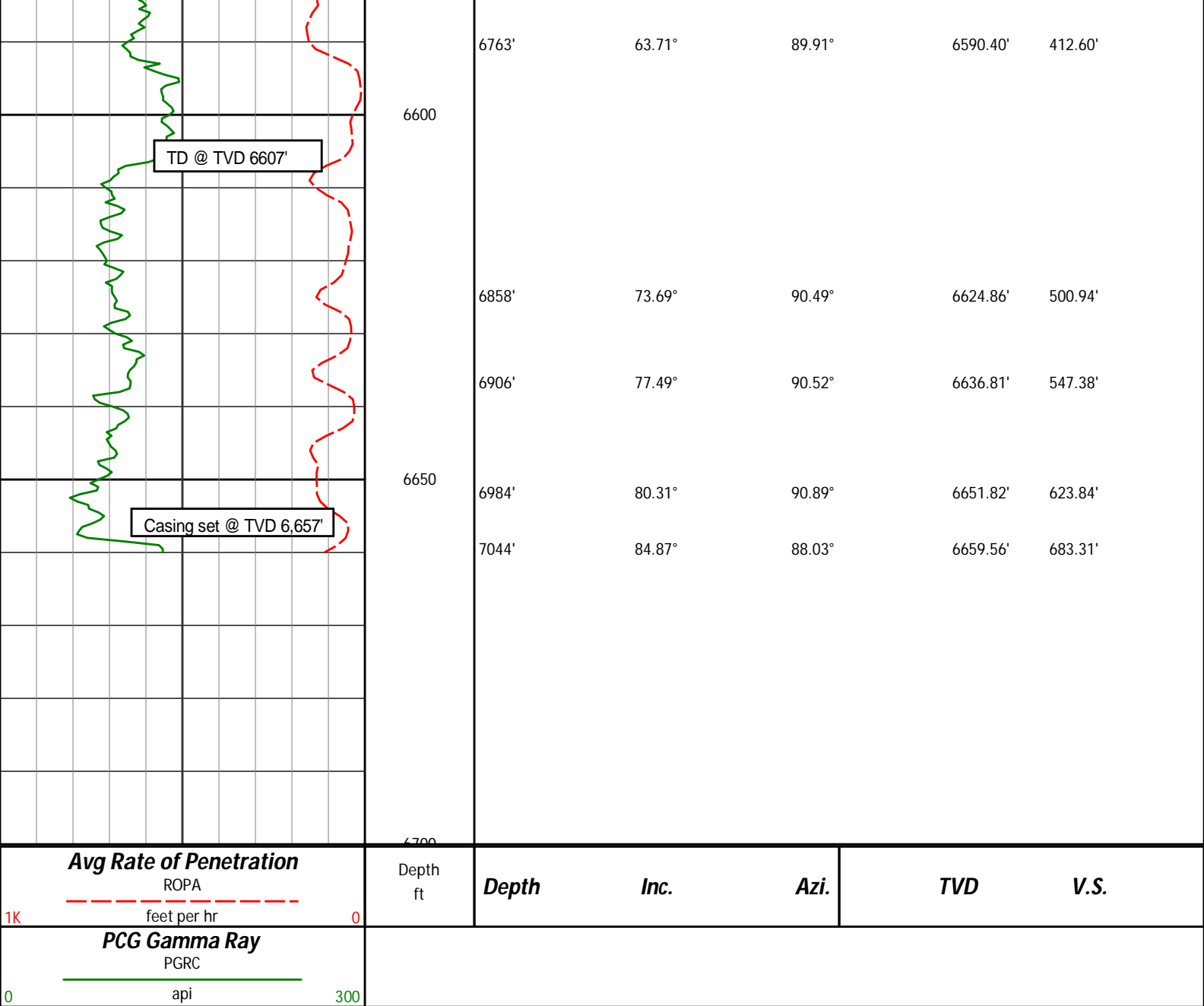
6400

6450

6500

6550

6432'	37.62°	89.83°	6389.77'	152.59'
6479'	43.06°	90.73°	6425.58'	182.98'
6527'	49.30°	89.29°	6458.80'	217.58'
6573'	51.99°	89.13°	6487.97'	253.14'
6621'	52.51°	88.35°	6517.36'	291.09'
6668'	57.65°	88.54°	6544.25'	329.62'
6716'	61.20°	88.57°	6568.67'	370.93'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
NCLP PC AA04-65-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0900859736

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
249.00	0.60	151.83	249.00	1.15 S	0.62 E	0.58	0.24
529.00	0.40	317.43	528.99	1.72 S	0.65 E	0.59	0.35
758.00	0.60	24.73	757.98	0.04 S	0.61 E	0.61	0.25
904.00	0.62	334.31	903.98	1.36 N	0.58 E	0.63	0.36
997.00	0.74	352.79	996.97	2.41 N	0.29 E	0.37	0.27
1090.00	0.65	14.56	1089.96	3.52 N	0.35 E	0.46	0.30
1183.00	0.83	13.67	1182.96	4.68 N	0.64 E	0.79	0.19
1276.00	1.05	353.93	1275.94	6.18 N	0.71 E	0.90	0.42
1370.00	1.00	338.23	1369.93	7.80 N	0.31 E	0.56	0.30

1519.00	1.08	353.28	1555.91	10.07 N	0.28 W	0.04	0.74
1463.00	0.53	9.35	1462.92	8.98 N	0.08 E	0.36	0.66
1556.00	0.98	327.36	1555.91	10.07 N	0.28 W	0.04	0.74
1648.00	1.02	326.62	1647.90	11.42 N	1.15 W	-0.79	0.05
1743.00	0.97	351.50	1742.89	12.92 N	1.74 W	-1.33	0.45
1838.00	0.72	333.19	1837.87	14.25 N	2.12 W	-1.68	0.38
1933.00	0.77	23.14	1932.87	15.37 N	2.14 W	-1.66	0.66
2027.00	1.18	346.66	2026.85	16.89 N	2.12 W	-1.59	0.77
2122.00	1.32	6.49	2121.83	18.93 N	2.22 W	-1.63	0.48
2216.00	1.04	27.71	2215.81	20.76 N	1.70 W	-1.05	0.55
2311.00	0.78	27.26	2310.80	22.10 N	1.00 W	-0.31	0.27
2406.00	1.19	19.16	2405.79	23.61 N	0.38 W	0.35	0.45
2500.00	3.08	349.24	2499.72	27.01 N	0.53 W	0.31	2.27
2595.00	4.81	340.14	2594.49	33.26 N	2.36 W	-1.32	1.93
2690.00	5.97	340.38	2689.07	41.66 N	5.38 W	-4.07	1.22
2784.00	8.04	347.02	2782.36	52.68 N	8.49 W	-6.84	2.36
2879.00	9.18	348.56	2876.29	66.58 N	11.49 W	-9.40	1.22
2974.00	11.07	349.40	2969.81	82.97 N	14.67 W	-12.07	2.00
3069.00	11.01	357.11	3063.06	101.00 N	16.81 W	-13.64	1.55
3164.00	8.47	1.81	3156.68	117.05 N	17.04 W	-13.38	2.80
3259.00	6.35	1.67	3250.88	129.30 N	16.67 W	-12.62	2.23
3354.00	3.80	354.72	3345.50	137.69 N	16.80 W	-12.50	2.76
3448.00	1.83	5.08	3439.39	142.28 N	16.96 W	-12.51	2.16
3543.00	0.31	151.83	3534.37	143.57 N	16.70 W	-12.21	2.21
3638.00	0.33	261.59	3629.37	143.30 N	16.85 W	-12.37	0.55
3733.00	0.68	229.02	3724.37	142.89 N	17.55 W	-13.08	0.46
3828.00	1.19	205.05	3819.35	141.63 N	18.39 W	-13.96	0.67
3923.00	1.26	222.87	3914.33	139.97 N	19.52 W	-15.14	0.41
4018.00	0.15	6.77	4009.33	139.33 N	20.22 W	-15.85	1.46
4112.00	0.39	301.92	4103.32	139.62 N	20.47 W	-16.10	0.38
4207.00	0.54	33.37	4198.32	140.16 N	20.50 W	-16.11	0.71
4301.00	2.04	85.30	4292.30	140.67 N	18.59 W	-14.19	1.87
4396.00	1.59	53.75	4387.25	141.59 N	15.84 W	-11.41	1.13
4491.00	0.35	38.27	4482.24	142.60 N	14.60 W	-10.14	1.32
4586.00	0.63	0.54	4577.23	143.35 N	14.41 W	-9.93	0.43
4681.00	1.05	11.47	4672.22	144.72 N	14.24 W	-9.71	0.47
4776.00	0.09	8.29	4767.22	145.65 N	14.05 W	-9.50	1.01
4871.00	0.23	6.69	4862.22	145.91 N	14.02 W	-9.45	0.15
4966.00	0.31	60.68	4957.22	146.23 N	13.77 W	-9.20	0.27
5060.00	0.31	340.67	5051.21	146.59 N	13.64 W	-9.05	0.42
5154.00	0.37	164.80	5145.21	146.54 N	13.64 W	-9.06	0.72
5248.00	0.68	184.93	5239.21	145.69 N	13.61 W	-9.05	0.38
5343.00	0.72	103.31	5334.21	144.99 N	13.08 W	-8.54	0.96
5437.00	1.15	112.28	5428.19	144.50 N	11.63 W	-7.11	0.48
5532.00	1.37	91.24	5523.17	144.11 N	9.61 W	-5.10	0.54
5627.00	0.93	108.05	5618.15	143.85 N	7.74 W	-3.25	0.58
5722.00	0.74	98.43	5713.14	143.52 N	6.40 W	-1.92	0.25
5843.00	0.47	131.12	5834.13	143.08 N	5.26 W	-0.78	0.35
5960.00	2.77	90.26	5951.08	142.75 N	2.07 W	2.39	2.08
6007.00	5.86	88.34	5997.94	142.81 N	1.47 E	5.93	6.58

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 DIRECTION OF 88.21 DEGREES (GRID)
A TOTAL CORRECTION OF 7.73 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6007.00 FEET
IS 142.82 FEET ALONG 0.59 DEGREES (GRID)**

Surveys are tied into three non-Haliburton surveys at MD 249', 529' and 758' taken while drilling the surface section.