

PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	27-Jan-14	28-Jan-14			
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)	667.98	6,130.21			
Log End Depth (TVD, ft)	6,130.21	6,822.50			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	26-Jan-14 02:30	27-Jan-14 11:45			
Drill/Wipe End Date and Time	27-Jan-14 01:30	27-Jan-14 23:30			
Min Inc (deg) @ Depth (TVD, ft)	0.19 @ 713.98	12.73 @ 6,174.04			
Max Inc (deg) @ Depth (TVD, ft)	19.02 @ 3,750.45	79.44 @ 6,814.01			
Bit TFA(in2) / Bit Type	0.00 / PDC	0.00 / PDC			
Flow Rate (gpm)	593.56	566.67			
Max AV (fpm) / CV (fpm) @ MWD	417.4 / NA	392.5 / NA			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.60 / 26.00	9.95 / 35.00			
Filtrate CL (ppm)	2,400.00	3,200.00			
pH / Fluid Loss (mptm)	10.80 / 44	9.60 / 10			
PV (cP) / YP (lbf2)	2 / 3.00	8 / 10.00			
% Solids / % Sand	1.40 / 3.00	7.90 / 0.20			
% 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	127.07 / PDM	127.07 / PDM			

Max Tool Temp (degF) / Source	167.97 / PCM	167.97 / PCM			
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA			
Lead MWD Engineer	Brett Vandergon	Brett Vandergon			
Customer Representative	Johnny Sanchez	Johnny Sanchez			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341330	11341330			
Insert Serial Number	10997273	10997273			
Date and Time Initialized	25-Jan-14 13:29	01-Jan-70 00:00			
Date and Time Read	28-Jan-14 06:00	28-Jan-14 06:06			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.00	53.00			
Software Version	6.21	6.21			
Sub Serial Number	11341330	11341330			
Sonde Serial Number	11477956	11477956			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	186.67	347.72			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	47.99	45.89			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	1341330	1341330			
Insert/Sonde Serial Number	12037425	12037425			

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

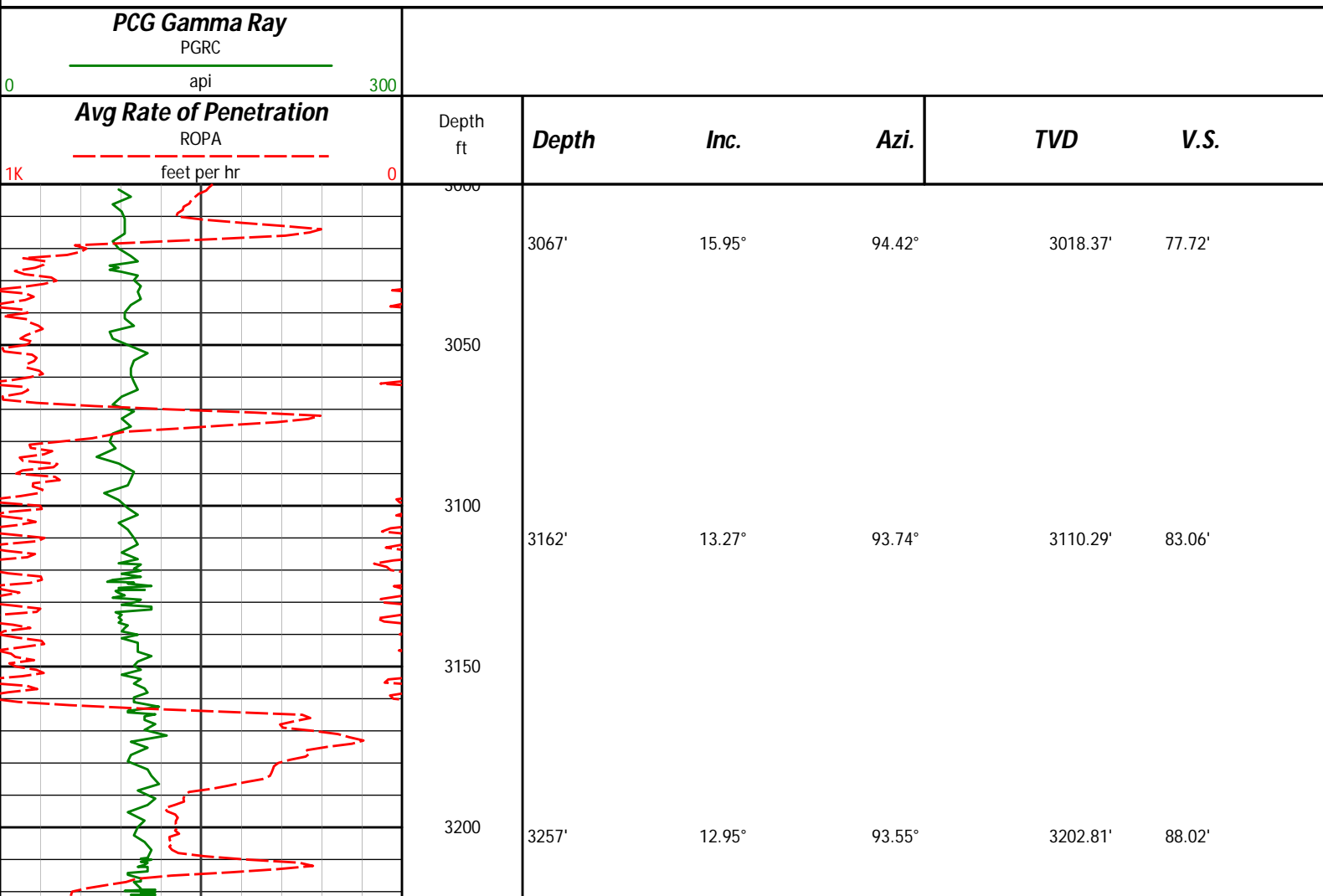
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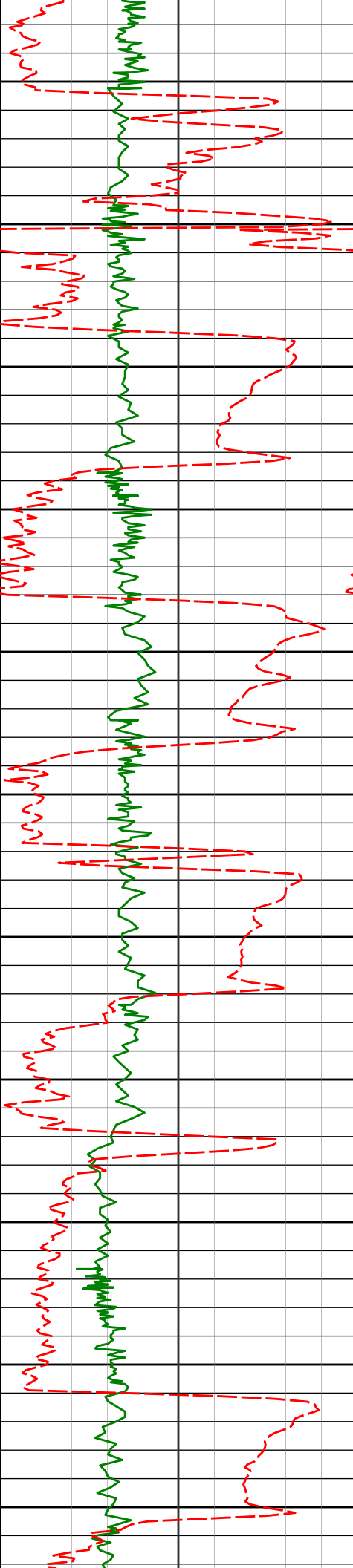
HALLIBURTON

Sperry Drilling Services

TVD Main Log 1:600

Noble Energy
Marie D04-72-1HN
H&P 343
T3N-R64W





3250

3300

3350

3400

3450

3500

3550

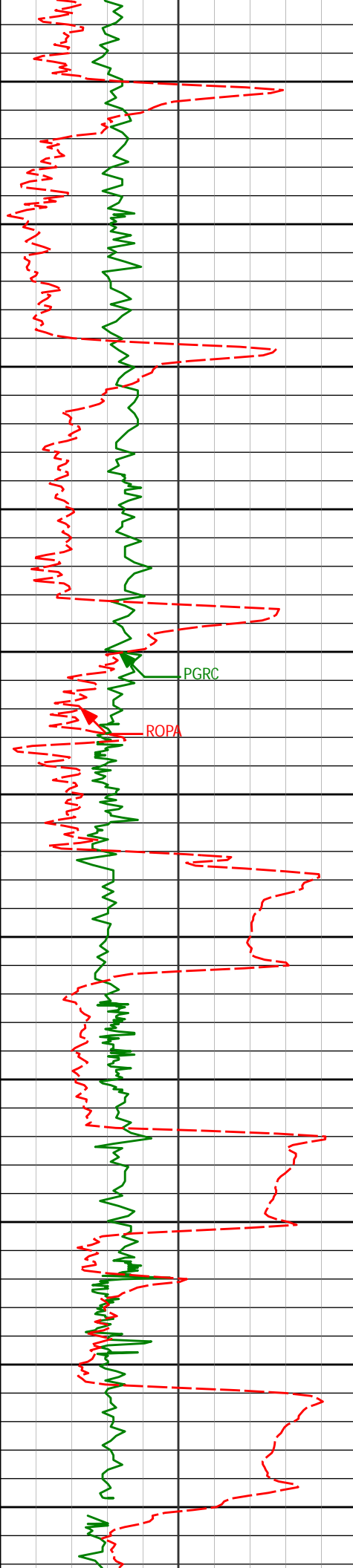
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3352'	13.79°	96.80°	3295.24'	92.50'
3446'	15.12°	101.32°	3386.26'	95.69'
3541'	15.31°	95.53°	3477.94'	99.40'
3636'	16.49°	96.39°	3569.30'	104.37'
3731'	15.33°	95.04°	3660.66'	109.45'
3825'	19.02°	96.50°	3750.45'	114.81'



3800

3920'

18.94°

96.03°

3840.29'

120.55'

3850

3900

4015'

16.01°

94.73°

3930.89'

126.26'

3950

4000

PGRC

ROPA

4110'

13.31°

94.12°

4022.79'

131.48'

4050

4100

4205'

14.99°

97.22°

4114.91'

135.99'

4150

4200

4300'

15.18°

93.79°

4206.64'

140.92'

4250

4300

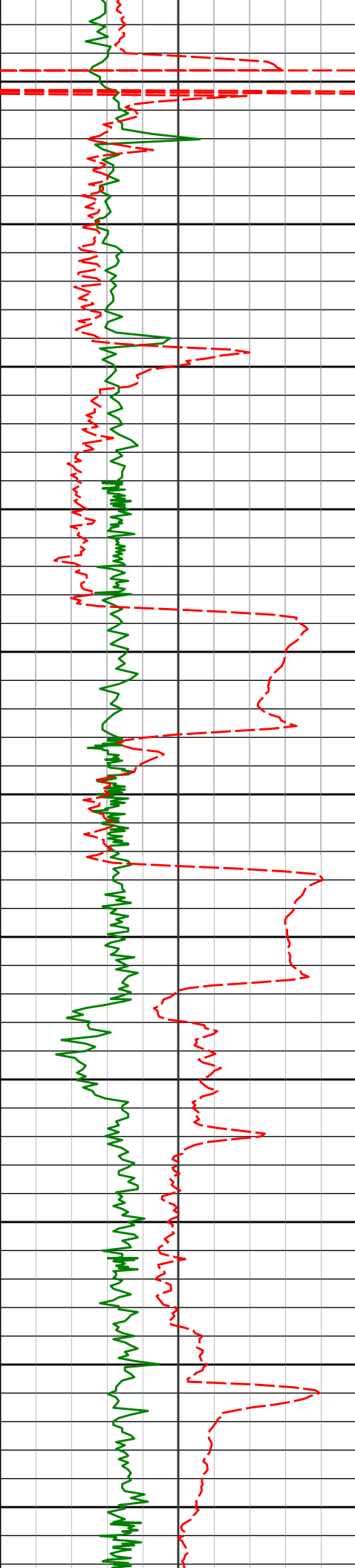
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96.35°

4298.12'

146.19'



4350

4490'

15.53°

95.39°

4389.52'

151.17'

4400

4450

4585'

13.97°

93.03°

4481.39'

156.50'

4500

4550

4679'

14.76°

98.72°

4572.45'

160.95'

4600

4650

4774'

15.99°

96.08°

4664.05'

165.16'

4700

4750

4869'

15.75°

92.32°

4755.43'

170.90'

4800

4850

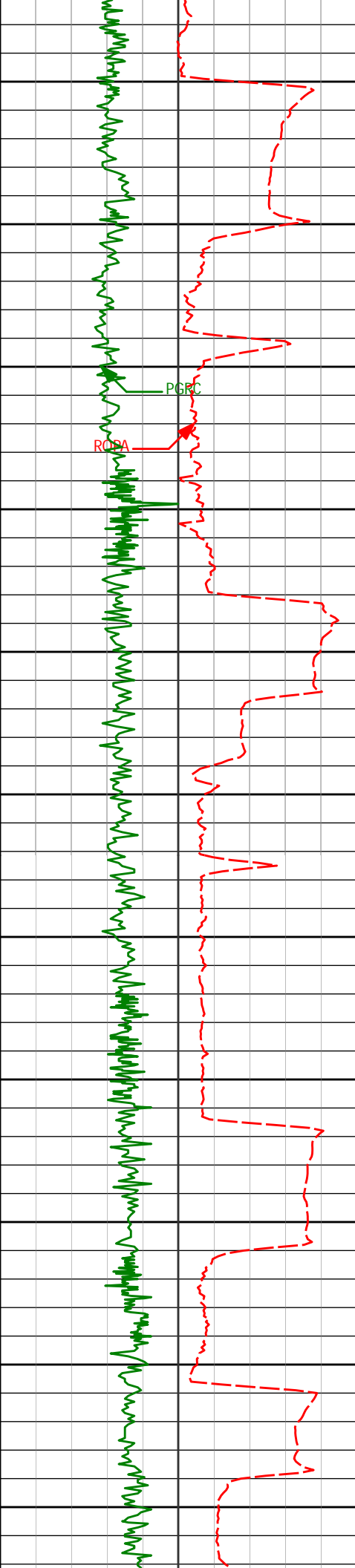
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93.36°

4847.27'

176.85'



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5059'

16.94°

94.23°

4938.85'

182.58'

4950

5000

5154'

16.77°

92.49°

5029.77'

189.07'

5050

5100

5248'

15.99°

98.58°

5119.96'

194.35'

5150

5200

5343'

13.60°

98.22°

5211.81'

197.96'

5250

5300

5438'

15.36°

97.27°

5303.79'

201.79'

5350

5400

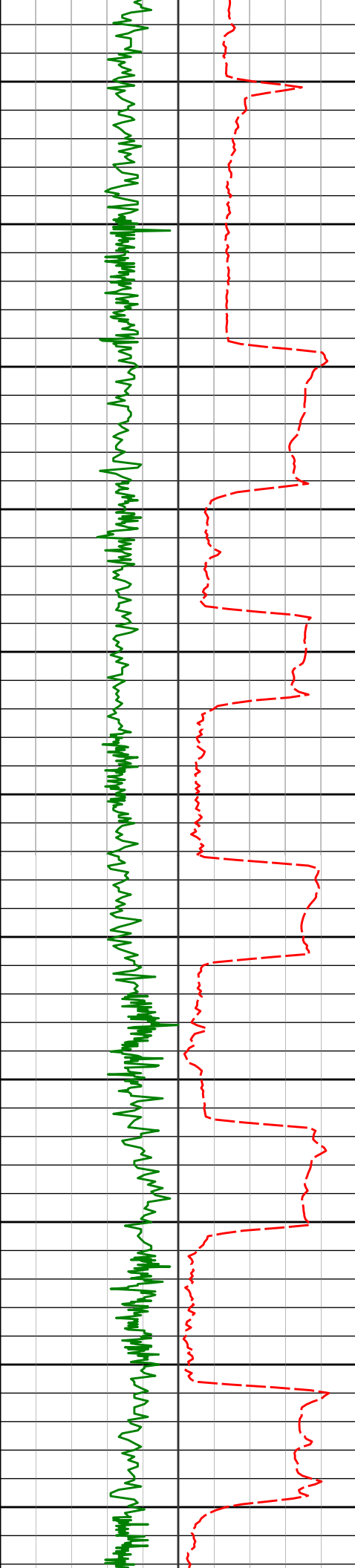
5532'

15.73°

95.12°

5394.35'

206.50'



5450

5627'

12.95°

89.13°

5486.39'

212.41'

5500

5550

5722'

14.36°

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5578.70'

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5600

5650

5817'

15.38°

93.30°

5670.52'

223.37'

5700

5750

5912'

15.36°

96.88°

5762.13'

228.55'

5800

5850

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97.26°

5853.83'

232.82'

5900

5950

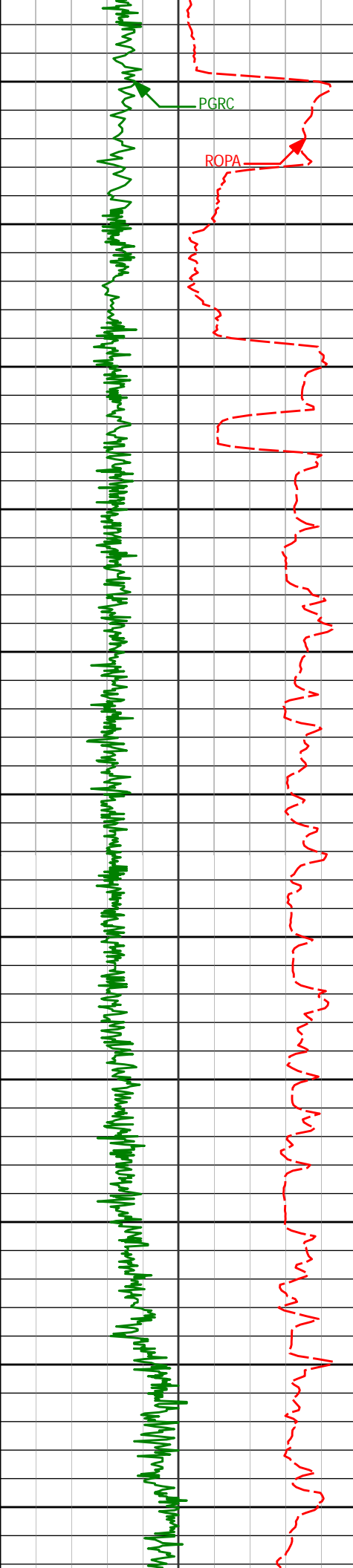
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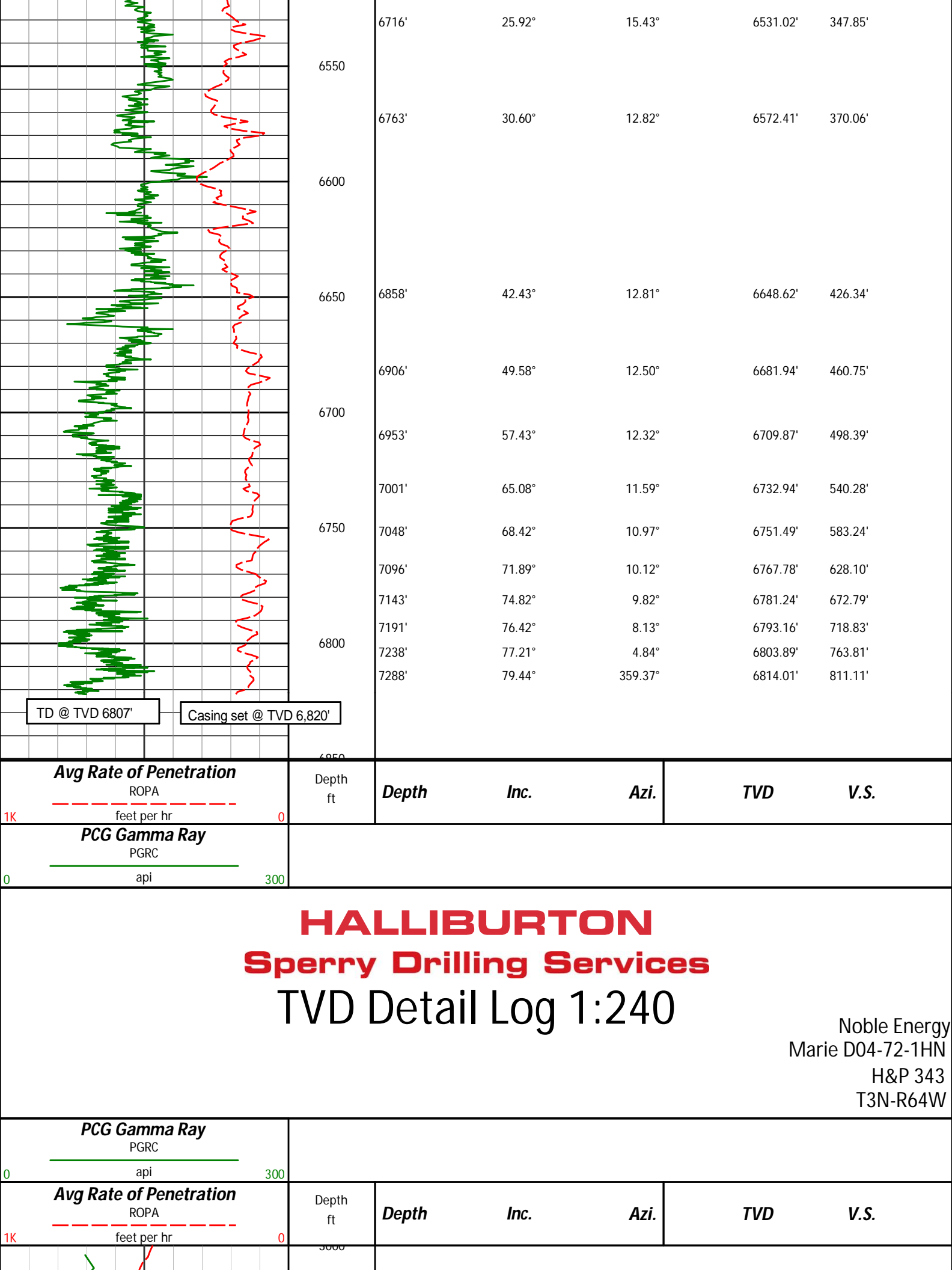
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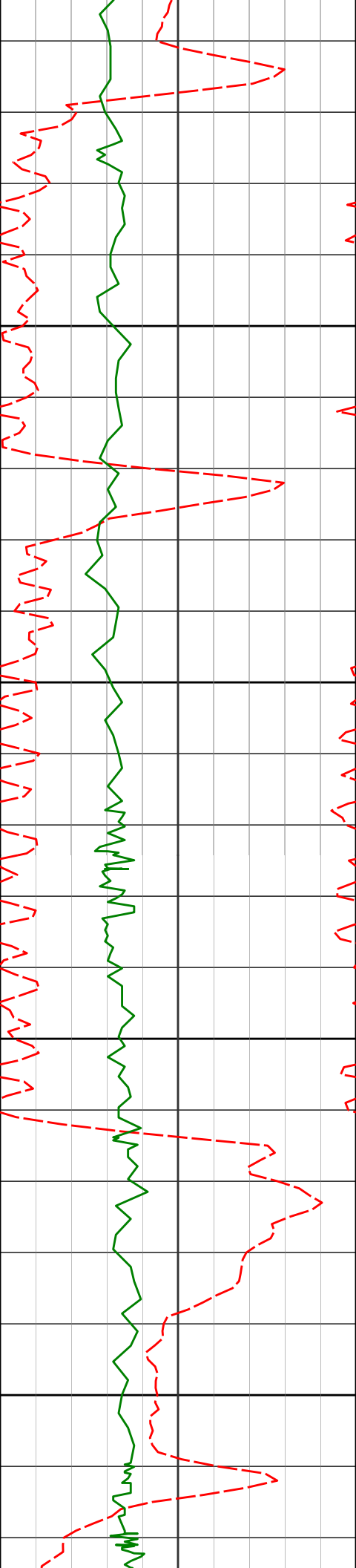
5944.50'

236.69'



6000				
	6196'	15.29°	98.82°	6036.07' 240.32'
6050				
	6238'	13.61°	95.73°	6076.74' 242.07'
6100				
6150				
	6338'	12.73°	90.05°	6174.04' 247.77'
6200				
	6384'	13.40°	74.50°	6218.86' 252.11'
6250				
	6432'	15.78°	62.58°	6265.32' 259.67'
6300				
	6479'	18.00°	55.48°	6310.29' 269.82'
6350				
	6527'	20.75°	52.63°	6355.57' 282.54'
6400				
	6574'	21.90°	48.29°	6399.36' 296.80'
6450				
	6622'	20.22°	35.03°	6444.18' 312.34'
6500				
	6668'	21.86°	21.51°	6487.13' 328.44'





3067'

15.95°

94.42°

3018.37'

77.72'

3050

3100

3162'

13.27°

93.74°

3110.29'

83.06'

3150

3200

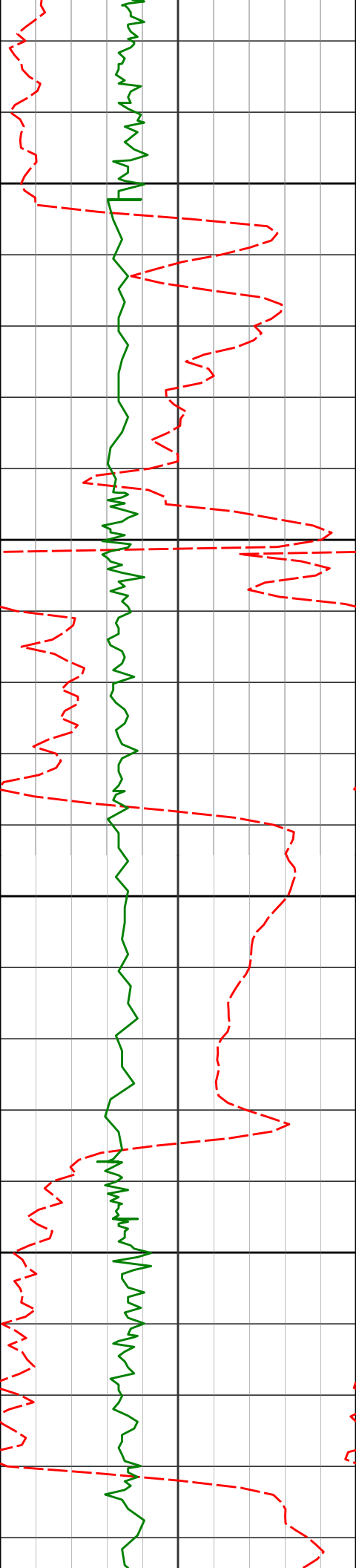
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12.95°

93.55°

3202.81'

88.02'



3250

3300

3350

3400

3352'

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96.80°

3295.24'

92.50'

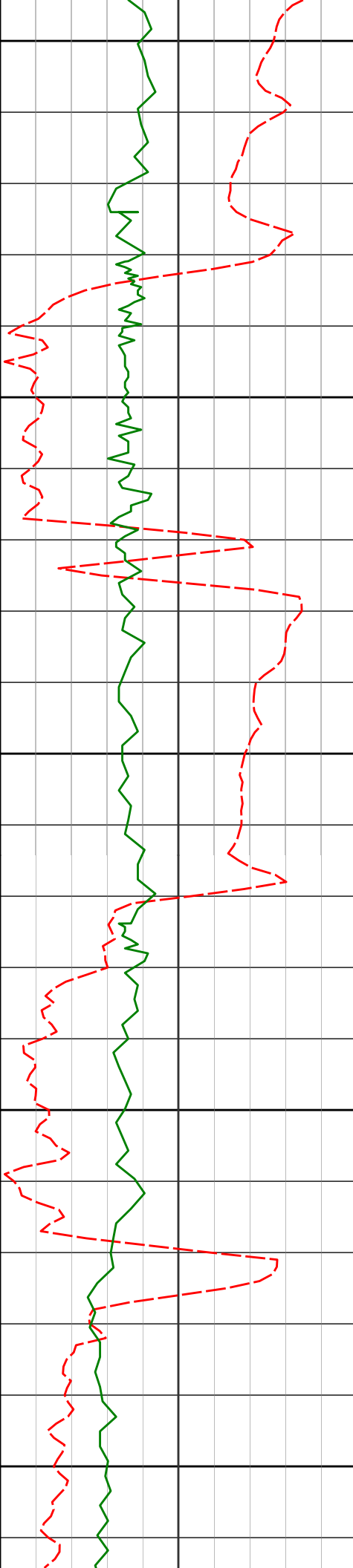
3446'

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101.32°

3386.26'

95.69'



3450

3541'

15.31°

95.53°

3477.94'

99.40'

3500

3550

3636'

16.49°

96.39°

3569.30'

104.37'

3600

3650

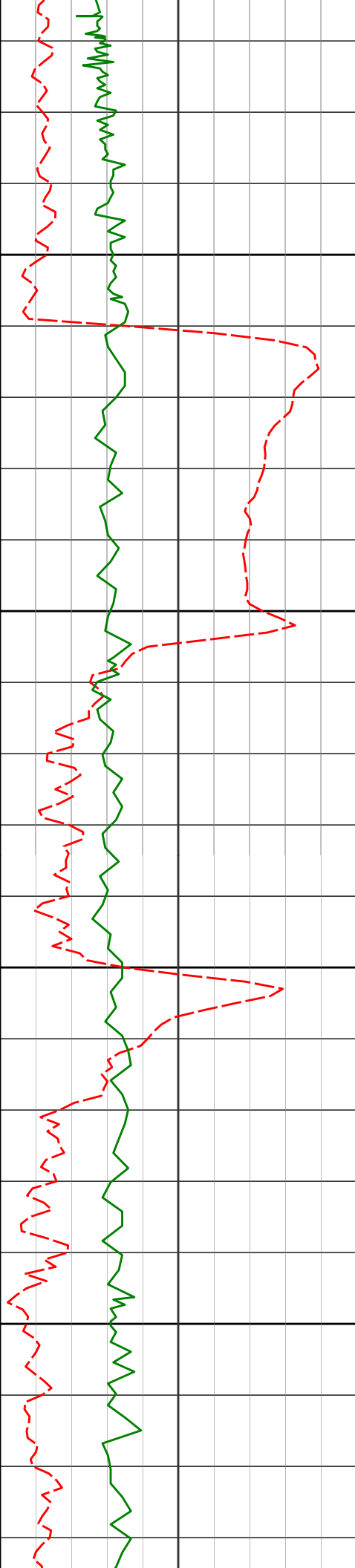
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95.04°

3660.66'

109.45'



3700

3750

3800

3850

3825'

19.02°

96.50°

3750.45'

114.81'

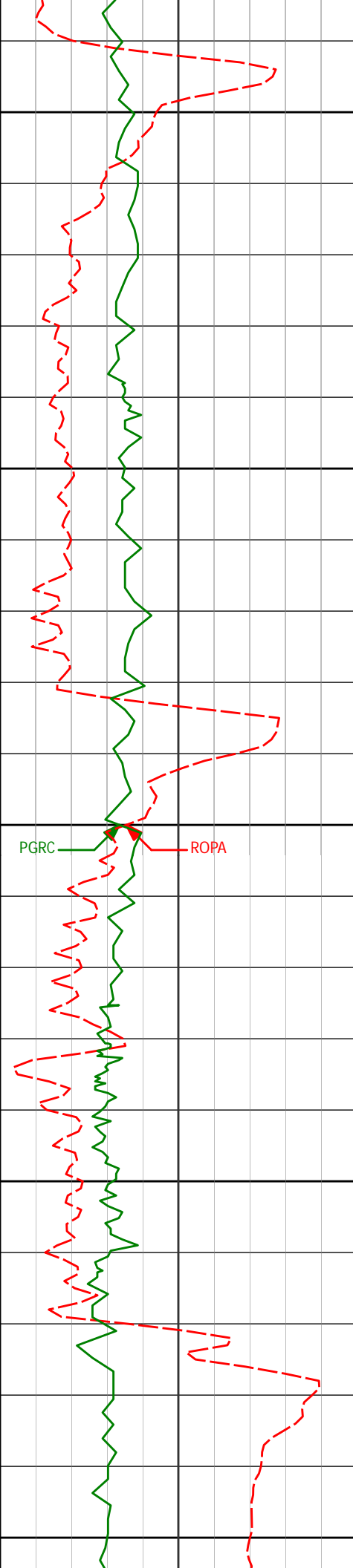
3920'

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96.03°

3840.29'

120.55'



3900

3950

4000

4050

4100

4015'

16.01°

94.73°

3930.89'

126.26'

4110'

13.31°

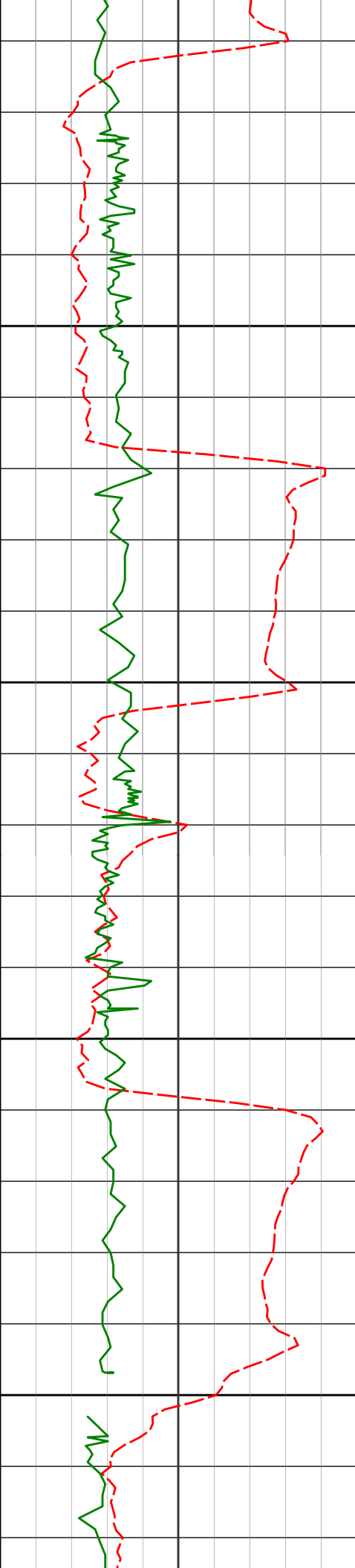
94.12°

4022.79'

131.48'

PGRC

ROPA



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4114.91'

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4150

4200

4300'

15.18°

93.79°

4206.64'

140.92'

4250

4300

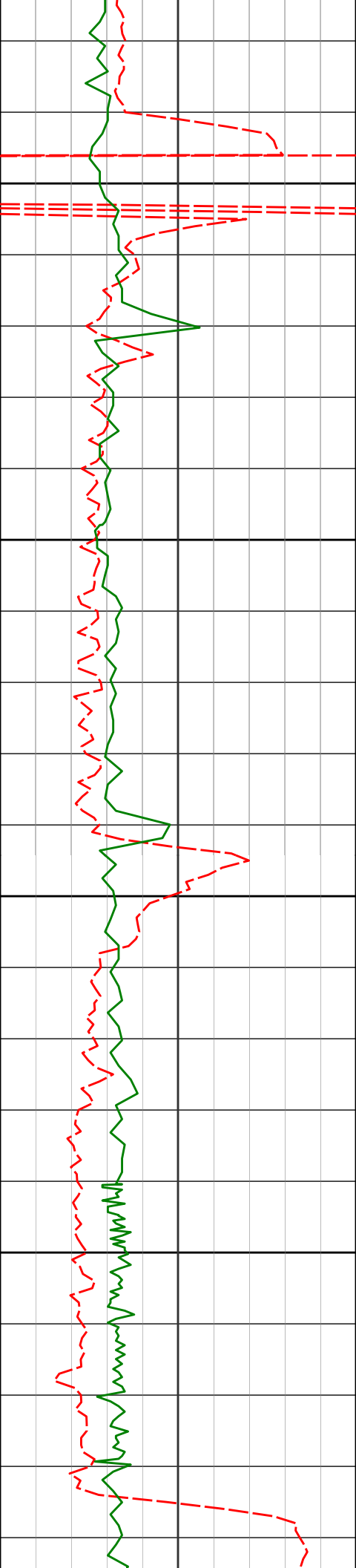
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96.35°

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146.19'



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95.39°

4389.52'

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4450

4585'

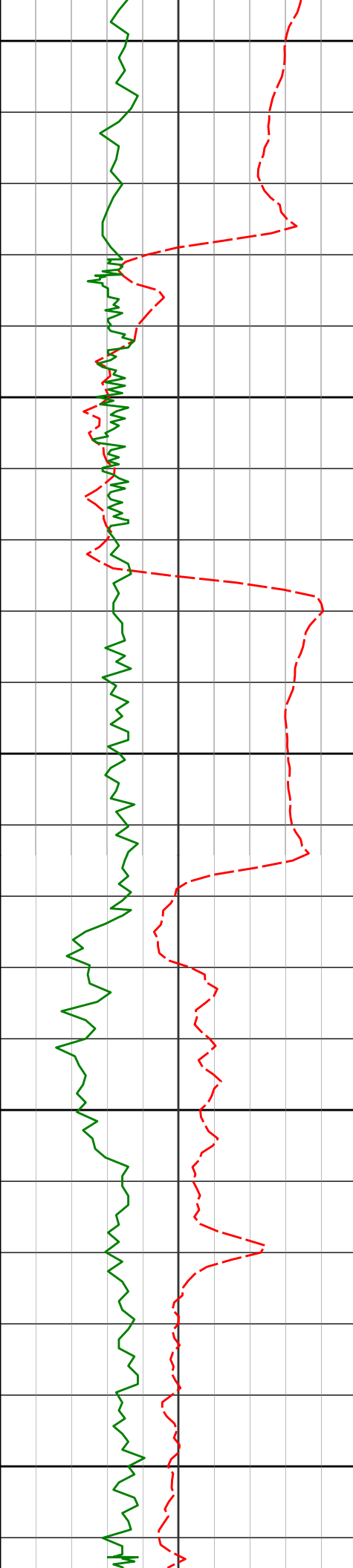
13.97°

93.03°

4481.39'

156.50'

4500



4550

4679'

14.76°

98.72°

4572.45'

160.95'

4600

4650

4774'

15.99°

96.08°

4664.05'

165.16'

4700

4750

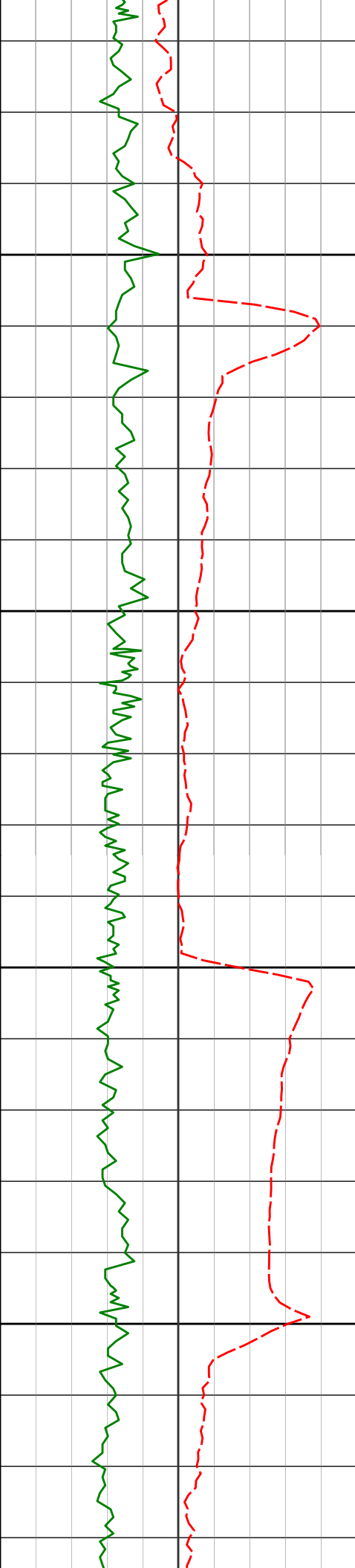
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92.32°

4755.43'

170.90'



4800

4850

4900

4950

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93.36°

4847.27'

176.85'

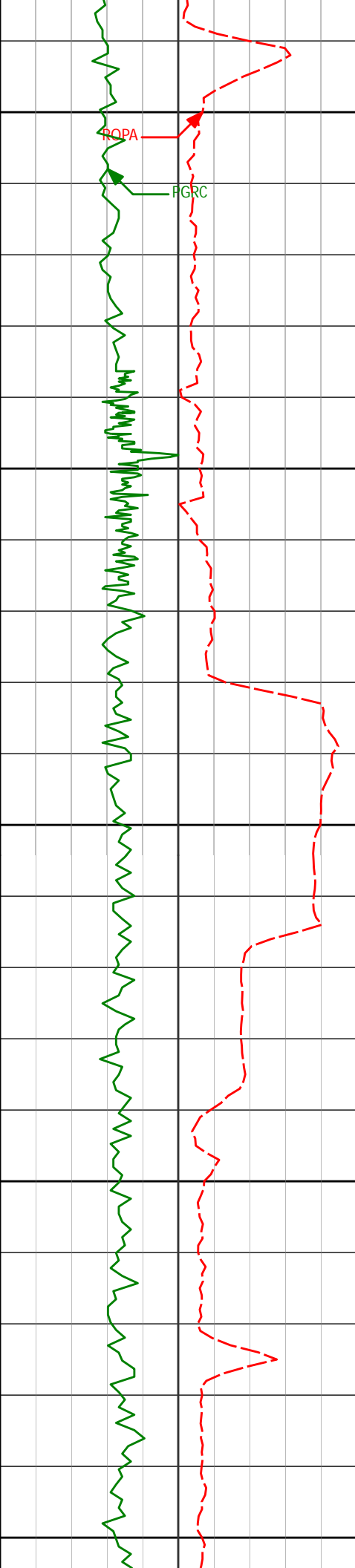
5059'

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94.23°

4938.85'

182.58'



5000

5050

5100

5150

5200

5154'

16.77°

92.49°

5029.77'

189.07'

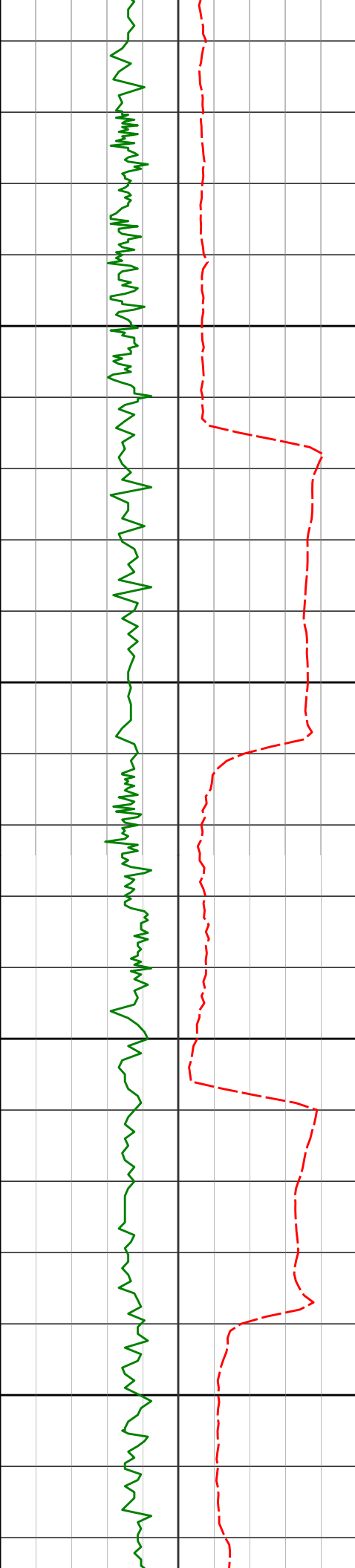
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98.58°

5119.96'

194.35'



5250

5300

5350

5400

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98.22°

5211.81'

197.96'

5438'

15.36°

97.27°

5303.79'

201.79'

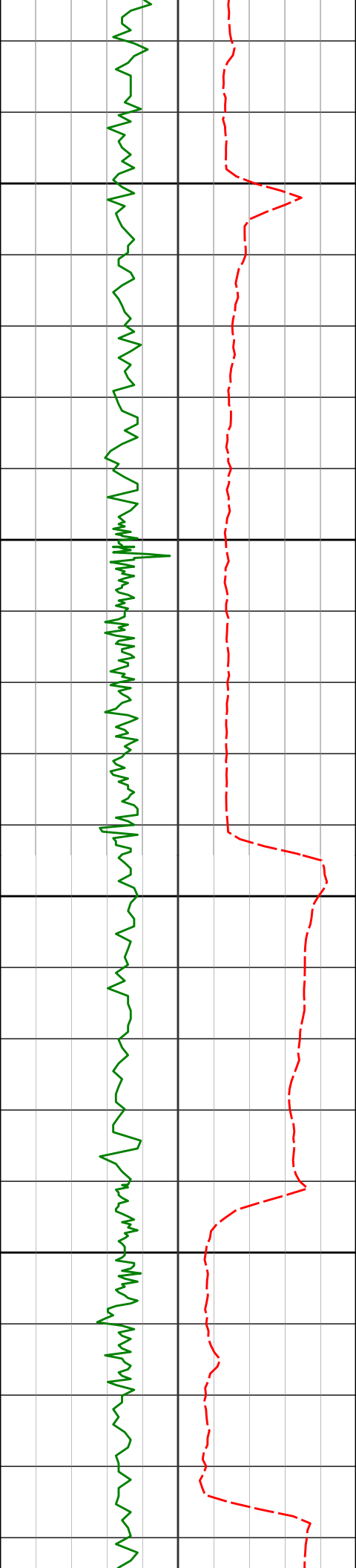
5532'

15.73°

95.12°

5394.35'

206.50'



5450

5500

5550

5600

5627'

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89.13°

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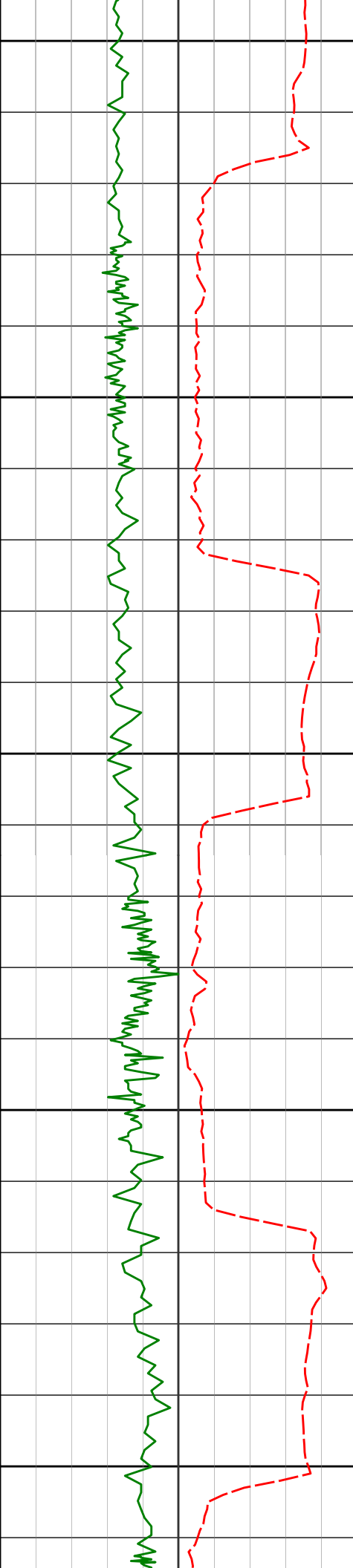
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14.36°

95.44°

5578.70'

218.03'



5650

5817'

15.38°

93.30°

5670.52'

223.37'

5700

5750

5912'

15.36°

96.88°

5762.13'

228.55'

5800

5850

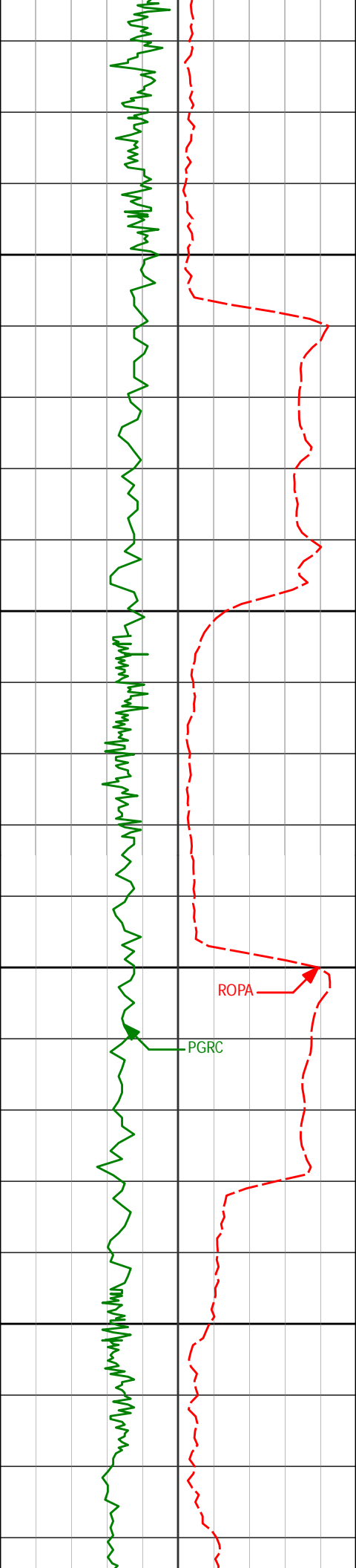
6007'

14.94°

97.26°

5853.83'

232.82'



5900

6101'

15.63°

98.69°

5944.50'

236.69'

5950

6000

6196'

15.29°

98.82°

6036.07'

240.32'

6050

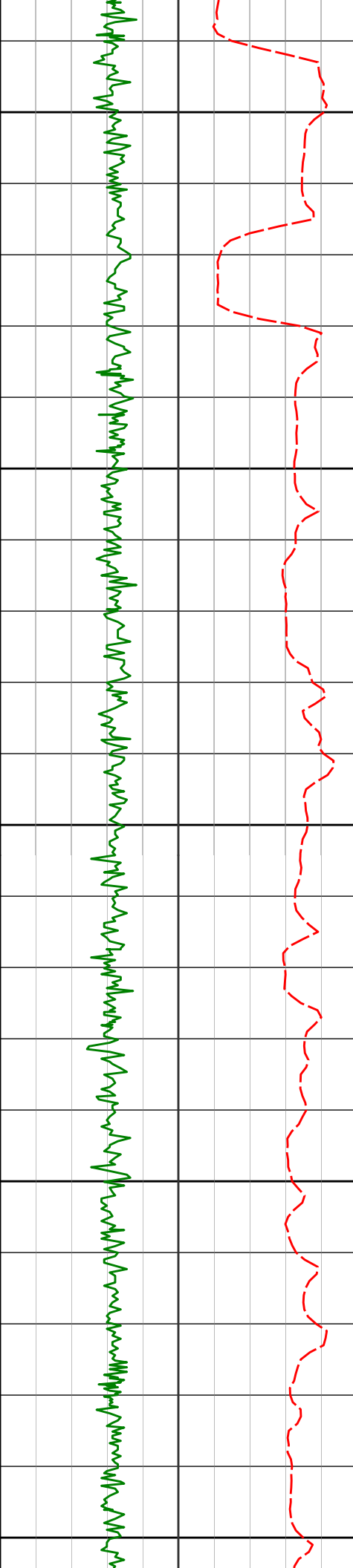
6238'

13.61°

95.73°

6076.74'

242.07'



Run 200

6100

6150

6200

6250

6300

6338'

12.73°

90.05°

6174.04'

247.77'

6384'

13.40°

74.50°

6218.86'

252.11'

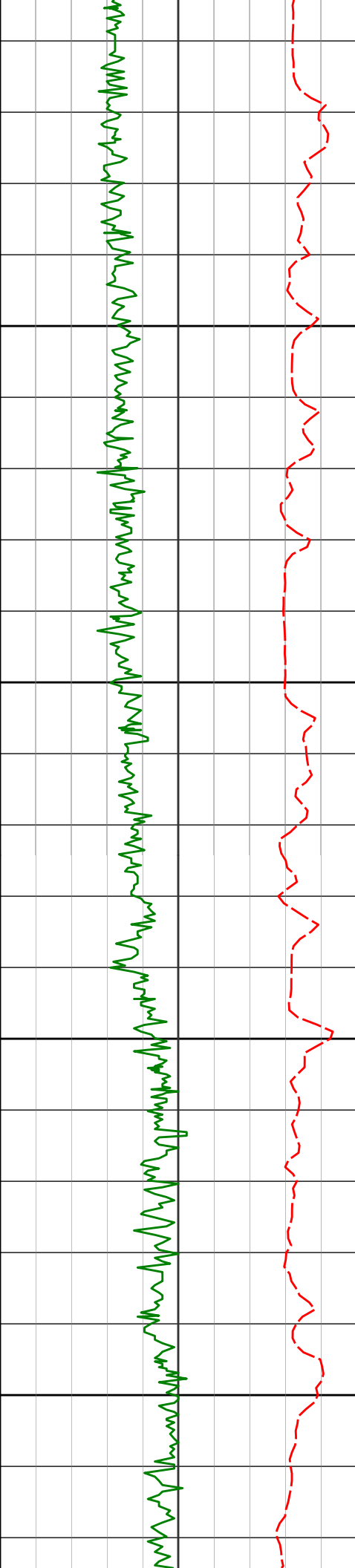
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62.58°

6265.32'

259.67'



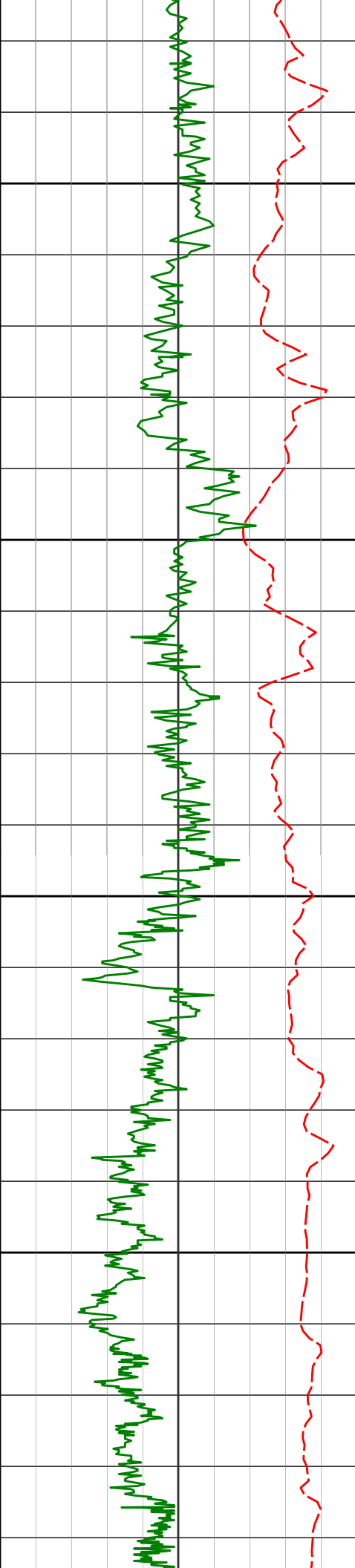
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6400

6450

6500

6479'	18.00°	55.48°	6310.29'	269.82'
6527'	20.75°	52.63°	6355.57'	282.54'
6574'	21.90°	48.29°	6399.36'	296.80'
6622'	20.22°	35.03°	6444.18'	312.34'
6668'	21.86°	21.51°	6487.13'	328.44'



6550

6600

6650

6700

6716'

25.92°

15.43°

6531.02'

347.85'

6763'

30.60°

12.82°

6572.41'

370.06'

6858'

42.43°

12.81°

6648.62'

426.34'

6906'

49.58°

12.50°

6681.94'

460.75'

6953'

57.43°

12.32°

6709.87'

498.39'

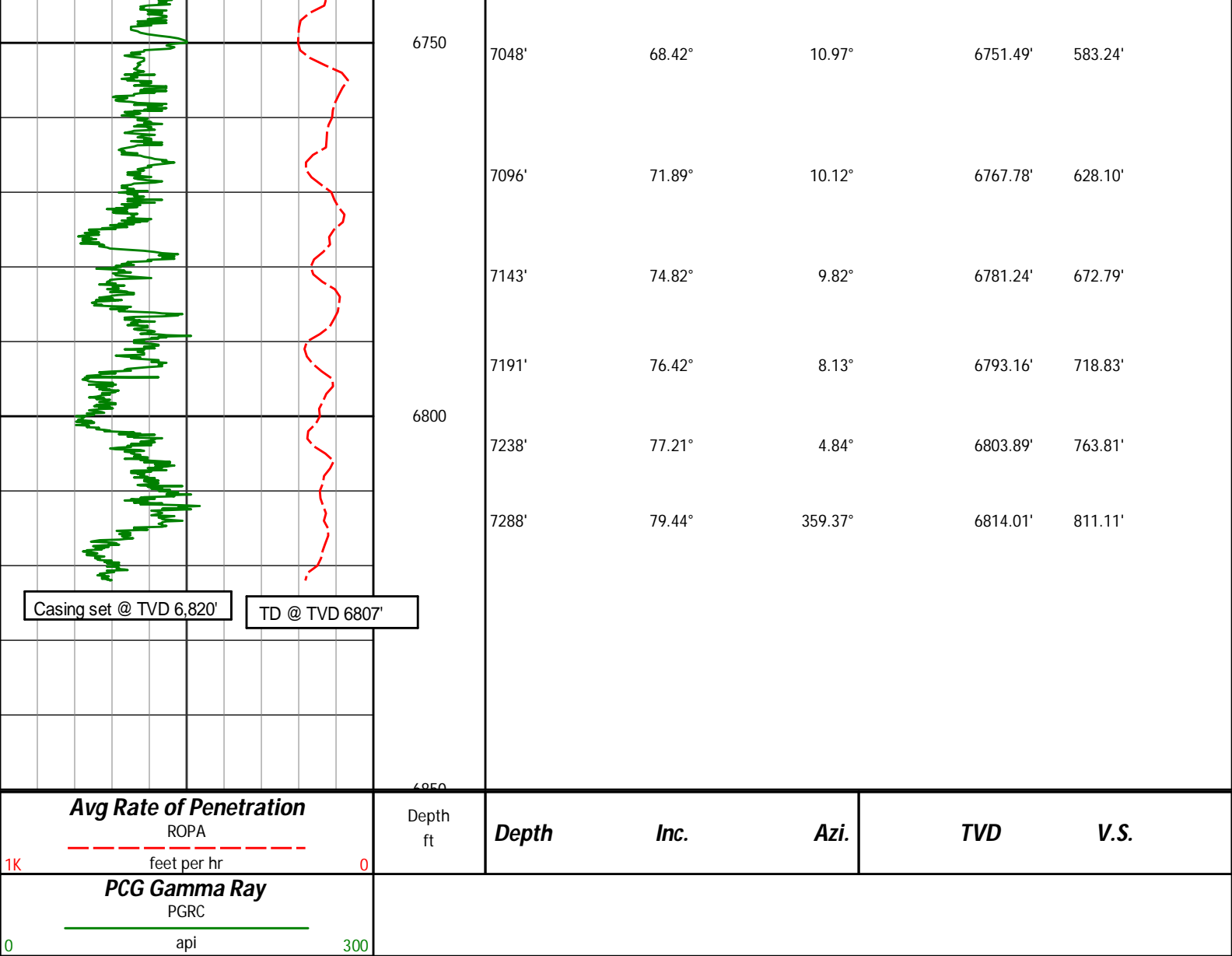
7001'

65.08°

11.59°

6732.94'

540.28'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Marie D04-72-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0900918616

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
350.00	0.60	193.01	349.99	1.79 S	0.41 W	-1.83	0.17
650.00	0.50	166.01	649.98	4.59 S	0.45 W	-4.52	0.09
714.00	0.19	315.06	713.98	4.78 S	0.46 W	-4.71	1.04
900.00	0.37	275.42	899.98	4.51 S	1.27 W	-4.69	0.14
992.00	0.49	206.83	991.98	4.84 S	1.75 W	-5.14	0.54
1085.00	0.77	152.89	1084.97	5.75 S	1.64 W	-5.98	0.67
1177.00	0.81	171.00	1176.96	6.94 S	1.26 W	-7.01	0.27
1270.00	3.16	114.58	1269.91	8.65 S	1.17 E	-7.93	3.00
1362.00	5.97	101.01	1361.61	10.62 S	8.17 E	-7.77	3.26
1456.00	7.05	96.90	1455.00	12.25 S	18.70 E	-6.25	1.25
1551.00	8.25	94.94	1549.15	13.54 S	31.29 E	-3.81	1.29
1645.00	7.56	96.67	1642.26	14.84 S	44.15 E	-1.30	0.77

1740.00	9.15	97.23	1736.25	16.51 S	57.86 E	1.10	1.68
1834.00	10.91	86.77	1828.81	16.95 S	74.16 E	5.44	2.69
1929.00	10.65	93.16	1922.14	16.93 S	91.90 E	10.64	1.29
2024.00	12.71	92.89	2015.17	17.94 S	111.10 E	15.28	2.17
2119.00	14.99	93.84	2107.40	19.29 S	133.79 E	20.62	2.41
2213.00	15.54	90.78	2198.09	20.28 S	158.51 E	26.90	1.04
2308.00	15.30	94.00	2289.67	21.32 S	183.74 E	33.26	0.93
2403.00	14.84	93.36	2381.40	22.91 S	208.39 E	38.94	0.52
2498.00	16.38	95.18	2472.90	24.84 S	233.87 E	44.55	1.70
2593.00	17.39	95.79	2563.80	27.48 S	261.33 E	50.04	1.08
2688.00	17.20	95.21	2654.51	30.19 S	289.44 E	55.66	0.27
2782.00	16.49	95.01	2744.47	32.61 S	316.57 E	61.26	0.75
2877.00	16.71	95.96	2835.52	35.21 S	343.58 E	66.67	0.37
2972.00	15.19	93.97	2926.86	37.49 S	369.58 E	72.08	1.70
3067.00	15.95	94.42	3018.37	39.35 S	395.01 E	77.72	0.81
3162.00	13.27	93.74	3110.29	41.07 S	418.91 E	83.06	2.82
3257.00	12.95	93.55	3202.81	42.44 S	440.42 E	88.02	0.34
3352.00	13.79	96.80	3295.24	44.44 S	462.29 E	92.50	1.18
3446.00	15.12	101.32	3386.26	48.18 S	485.43 E	95.69	1.86
3541.00	15.31	95.53	3477.94	51.82 S	510.07 E	99.40	1.61
3636.00	16.49	96.39	3569.30	54.53 S	535.96 E	104.37	1.27
3731.00	15.33	95.04	3660.66	57.13 S	561.88 E	109.45	1.29
3825.00	19.02	96.50	3750.45	59.96 S	589.48 E	114.81	3.95
3920.00	18.94	96.03	3840.29	63.33 S	620.19 E	120.55	0.18
4015.00	16.01	94.73	3930.89	66.03 S	648.58 E	126.26	3.11
4110.00	13.31	94.12	4022.79	67.89 S	672.55 E	131.48	2.84
4205.00	14.99	97.22	4114.91	70.22 S	695.65 E	135.99	1.93
4300.00	15.18	93.79	4206.64	72.59 S	720.25 E	140.92	0.96
4395.00	16.11	96.35	4298.12	74.87 S	745.76 E	146.19	1.21
4490.00	15.53	95.39	4389.52	77.52 S	771.52 E	151.17	0.66
4585.00	13.97	93.03	4481.39	79.32 S	795.64 E	156.50	1.76
4679.00	14.76	98.72	4572.45	81.73 S	818.80 E	160.95	1.72
4774.00	15.99	96.08	4664.05	84.95 S	843.78 E	165.16	1.49
4869.00	15.75	92.32	4755.43	86.86 S	869.67 E	170.90	1.11
4964.00	13.86	93.36	4847.27	88.05 S	893.92 E	176.85	2.01
5059.00	16.94	94.23	4938.85	89.74 S	919.09 E	182.58	3.25
5154.00	16.77	92.49	5029.77	91.35 S	946.59 E	189.07	0.56
5248.00	15.99	98.58	5119.96	93.87 S	972.94 E	194.35	2.01
5343.00	13.60	98.22	5211.81	97.42 S	996.93 E	197.96	2.52
5438.00	15.36	97.27	5303.79	100.61 S	1020.46 E	201.79	1.88
5532.00	15.73	95.12	5394.35	103.33 S	1045.50 E	206.50	0.72
5627.00	12.95	89.13	5486.39	104.31 S	1068.97 E	212.41	3.31
5722.00	14.36	95.44	5578.70	105.27 S	1091.34 E	218.03	2.15
5817.00	15.38	93.30	5670.52	107.11 S	1115.64 E	223.37	1.22
5912.00	15.36	96.88	5762.13	109.34 S	1140.71 E	228.55	1.00
6007.00	14.94	97.26	5853.83	112.40 S	1165.34 E	232.82	0.46
6101.00	15.63	98.69	5944.50	115.85 S	1189.88 E	236.69	0.84
6196.00	15.29	98.82	6036.07	119.70 S	1214.91 E	240.32	0.36
6238.00	13.61	95.73	6076.74	121.04 S	1225.30 E	242.07	4.39
6290.00	13.49	92.23	6127.29	121.89 S	1237.45 E	244.80	1.60
6338.00	12.73	90.05	6174.04	122.11 S	1248.33 E	247.77	1.89
6384.00	13.40	74.50	6218.86	120.69 S	1258.54 E	252.11	7.76
6432.00	15.78	62.58	6265.32	116.20 S	1269.70 E	259.67	7.95
6479.00	18.00	55.48	6310.29	109.14 S	1281.36 E	269.82	6.45
6527.00	20.75	52.63	6355.57	99.77 S	1294.23 E	282.54	6.05
6574.00	21.90	48.29	6399.36	88.89 S	1307.39 E	296.80	4.15
6622.00	20.22	35.03	6444.18	76.13 S	1318.84 E	312.34	10.50
6668.00	21.86	21.51	6487.13	61.65 S	1326.54 E	328.44	11.11
6716.00	25.92	15.43	6531.02	43.21 S	1332.61 E	347.85	9.88
6763.00	30.60	12.82	6572.41	21.63 S	1338.01 E	370.06	10.30
6858.00	42.43	12.81	6648.62	33.39 N	1350.52 E	426.34	12.46
6906.00	49.58	12.50	6681.94	67.07 N	1358.07 E	460.75	14.89
6953.00	57.43	12.32	6709.87	103.94 N	1366.18 E	498.39	16.71
7001.00	65.08	11.59	6732.94	145.08 N	1374.88 E	540.28	15.99
7048.00	68.42	10.97	6751.49	187.43 N	1383.33 E	583.24	7.20
7096.00	71.89	10.12	6767.78	231.81 N	1391.58 E	628.10	7.41
7143.00	74.82	9.82	6781.24	276.15 N	1399.38 E	672.79	6.27
7191.00	76.42	8.13	6793.16	322.08 N	1406.63 E	718.83	4.78
7238.00	77.21	4.84	6803.89	367.54 N	1411.79 E	763.81	7.02
7288.00	79.44	359.37	6814.01	416.45 N	1413.58 E	811.11	11.58
7429.00	86.58	356.31	6831.17	556.19 N	1408.29 E	943.22	5.51
7522.00	90.03	356.89	6833.92	648.97 N	1402.77 E	1030.34	3.76
7613.00	89.63	357.13	6834.19	739.85 N	1398.03 E	1115.87	0.51
7708.00	89.82	358.96	6834.65	834.79 N	1394.78 E	1205.73	1.93

7803.00	90.62	0.84	6834.29	929.78 N	1394.62 E	1296.53	2.15
7898.00	89.20	0.90	6834.44	1024.77 N	1396.06 E	1387.80	1.50
7993.00	90.74	1.68	6834.49	1119.74 N	1398.20 E	1479.25	1.82
8088.00	89.17	359.68	6834.56	1214.73 N	1399.33 E	1570.43	2.68
8183.00	91.08	359.40	6834.36	1309.72 N	1398.57 E	1661.06	2.03
8277.00	90.31	1.11	6833.22	1403.71 N	1398.99 E	1751.07	1.99
8372.00	90.90	0.17	6832.22	1498.69 N	1400.05 E	1842.23	1.17
8467.00	89.35	1.15	6832.01	1593.68 N	1401.15 E	1933.40	1.92
8562.00	91.57	1.59	6831.25	1688.65 N	1403.42 E	2024.88	2.38
8657.00	90.22	1.08	6829.76	1783.61 N	1405.63 E	2116.35	1.53
8751.00	88.80	0.50	6830.57	1877.59 N	1406.93 E	2206.62	1.63
8846.00	88.70	357.88	6832.64	1972.55 N	1405.59 E	2297.04	2.76
8941.00	89.97	358.04	6833.74	2067.48 N	1402.20 E	2386.85	1.34
9036.00	91.76	357.85	6832.31	2162.41 N	1398.80 E	2476.64	1.89
9131.00	91.20	359.01	6829.85	2257.34 N	1396.20 E	2566.68	1.35
9226.00	89.26	359.36	6829.47	2352.32 N	1394.85 E	2657.12	2.08
9321.00	90.12	359.31	6829.98	2447.31 N	1393.74 E	2747.65	0.91
9416.00	91.60	358.97	6828.55	2542.29 N	1392.32 E	2838.07	1.60
9510.00	90.52	0.22	6826.81	2636.27 N	1391.65 E	2927.76	1.75
9605.00	89.54	0.27	6826.75	2731.26 N	1392.06 E	3018.73	1.04
9700.00	90.46	0.68	6826.75	2826.26 N	1392.84 E	3109.82	1.06
9794.00	89.60	359.57	6826.70	2920.26 N	1393.04 E	3199.78	1.49
9889.00	90.31	359.66	6826.78	3015.25 N	1392.40 E	3290.44	0.75
9984.00	91.48	359.25	6825.30	3110.24 N	1391.50 E	3381.02	1.31
10078.00	90.86	359.72	6823.38	3204.21 N	1390.65 E	3470.65	0.82
10173.00	90.99	359.51	6821.84	3299.20 N	1390.01 E	3561.31	0.26
10267.00	90.46	0.42	6820.65	3393.19 N	1389.96 E	3651.19	1.12
10362.00	89.91	0.62	6820.35	3488.18 N	1390.82 E	3742.30	0.62
10456.00	89.11	0.73	6821.16	3582.17 N	1391.93 E	3832.51	0.86
10551.00	90.18	0.25	6821.74	3677.17 N	1392.74 E	3923.60	1.24
10646.00	89.69	0.01	6821.85	3772.17 N	1392.95 E	4014.52	0.58
10741.00	91.66	0.29	6820.72	3867.15 N	1393.20 E	4105.44	2.10
10836.00	90.86	358.86	6818.63	3962.13 N	1392.49 E	4196.06	1.72
10931.00	89.78	359.50	6818.09	4057.11 N	1391.13 E	4286.51	1.32
11026.00	89.88	359.35	6818.37	4152.11 N	1390.18 E	4377.09	0.18
11121.00	91.57	359.03	6817.17	4247.09 N	1388.84 E	4467.54	1.82
11215.00	91.26	358.59	6814.85	4341.04 N	1386.89 E	4556.82	0.57
11331.00	92.65	358.03	6810.88	4456.92 N	1383.47 E	4666.65	1.29
11395.00	92.65	358.03	6807.92	4520.81 N	1381.27 E	4727.12	0.00

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 16.98 DEGREES (GRID)
A TOTAL CORRECTION OF 7.81 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11395.00 FEET
IS 4727.12 FEET ALONG 16.99 DEGREES (GRID)**

Surveys are tied into two non-Haliburton surveys at MD 350' and 650' taken while drilling the surface section.