

PCG Pressure Case Gamma Ray PCDC Pressure Case Directional

1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	08-Dec-14	10-Dec-14	13-Dec-14		
Rig Bit Number	0100	0200	0300		
Bit Size (in)	13.500	8.750	6.000		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	225.00	1,601.00	5,972.00		
Log End Depth (MD, ft)	1,601.00	5,972.00	10,510.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	08-Dec-14 03:00	09-Dec-14 04:55	11-Dec-14 16:00		
Drill/Wipe End Date and Time	08-Dec-14 09:10	10-Dec-14 01:35	12-Dec-14 12:30		
Min Inc (deg) @ Depth (MD, ft)	0.62 @ 264.00	0.75 @ 4,937.00	88.43 @ 9,016.00		
Max Inc (deg) @ Depth (MD, ft)	9.14 @ 1,454.00	88.63 @ 5,924.00	91.49 @ 8,465.00		
Bit TFA(in2) / Bit Type	1.53 / PDC	0.74 / PDC	0.55 / PDC		
Flow Rate (gpm)	720.00	542.73	257.54		
Max AV (fpm) / CV (fpm) @ MWD	NA / NA	NA / NA	NA / NA		
Fluid Type	Native/Spud Mud	Polymer	Polymer		
Density (ppg) / Viscosity (spqt)	8.50 / 28.00	9.50 / 40.00	9.70 / 4.00		
Filtrate CL (ppm)	200.00	3,000.00	3,000.00		
pH / Fluid Loss (mptm)	7.70 / 0	8.60 / 0	9.50 / 0		
PV (cP) / YP (lbf2)	1 / 1.00	11 / 9.00	4 / 3.00		
% Solids / % Sand	1.9 / 0.1	9.84 / 0.1	9.00 / 0.10		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	NA / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (degF) / S	112.42 / PGM	172.27 / PGM	222.44 / PGM		

Max Tool Temp (degF) / Source	113.40 / PCM	170.37 / PCM	223.41 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 113.40	N/A @ 170.37	N/A @ 223.41		
Lead MWD Engineer	Cody Wurdeman	Cody Wurdeman	Cody Wurdeman		
Customer Representative	Kennith Wilkerson	Kennith Wilkerson	Kennith Wilkerson		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11342302	11342302	10236502		
Insert Serial Number	11680771	11400868	11680771		
Date and Time Initialized	07-Dec-14 09:47	08-Dec-14 17:49	10-Dec-14 15:13		
Date and Time Read	08-Dec-14 12:29	10-Dec-14 10:08	13-Dec-14 02:53		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	53.87	46.24	41.22		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11342302	11342302	10236502		
Sonde Serial Number	11902178	11638590	11902178		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	159.61	9.11	317.56		

Gamma Ray Sensor Information

Tool Type		PCG	PCG		
Distance From Bit (ft)		55.04	46.17		
Recorded Sample Period (sec)		10	10		
Software Version		8.15	8.15		
Sub Serial Number		11342302	10236502		
Insert/Sonde Serial Number		11681067	11293344		

REMARKS

1. All depths are measured 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 annular velocities are calculated using the "Power Law" for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data is stored data unless otherwise specified.

5. The following smoothing parameters have been applied to the data:

PCG Gamma Ray BCorr (PGRC)
Interval Resolution: .5
Interval Distance: .6
Gap Fill: 3

Average Rate of Penetration (ROPA)
Interval Resolution: .5
Interval Distance: 1.2
Gap Fill: 3

WARRANTY

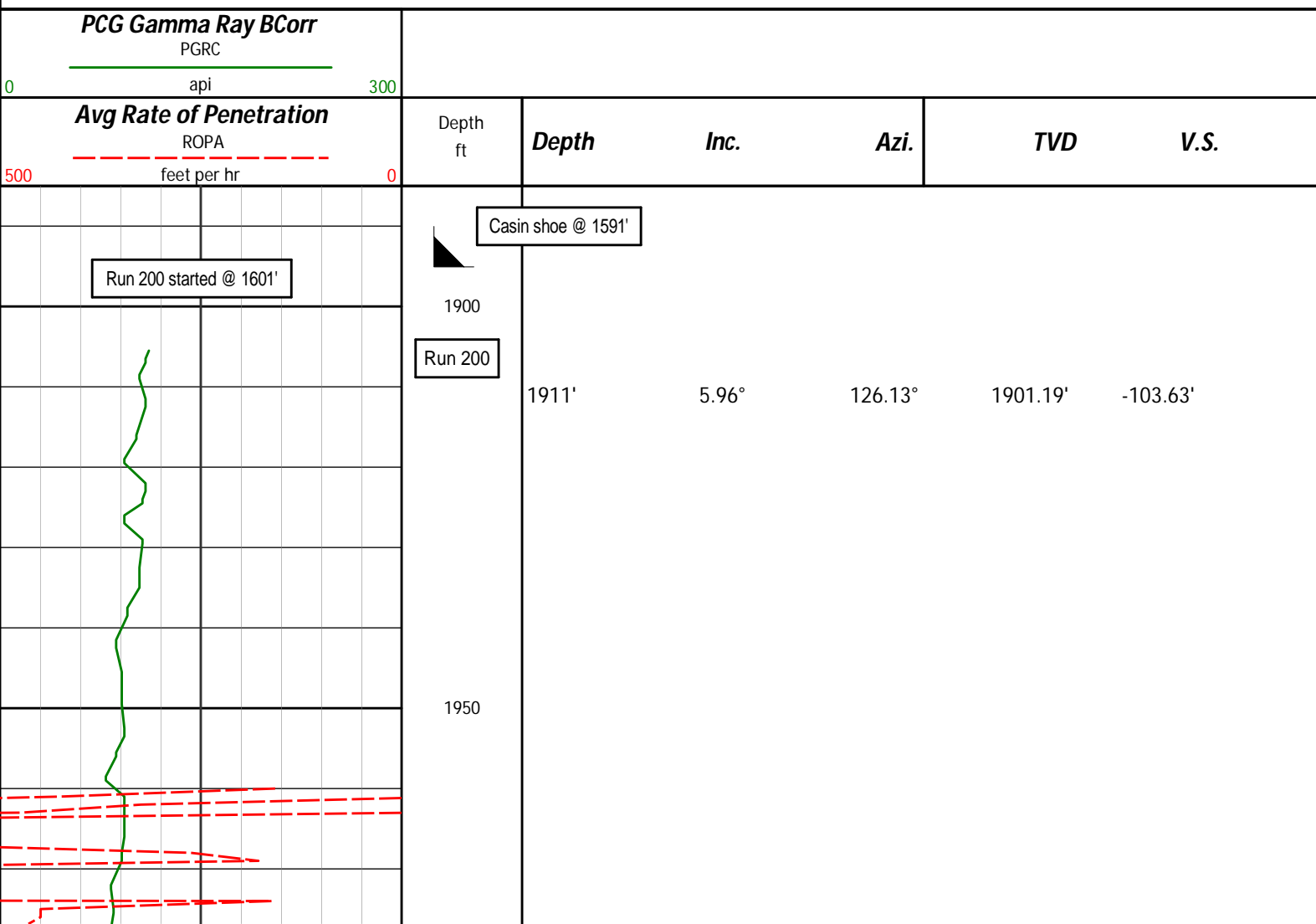
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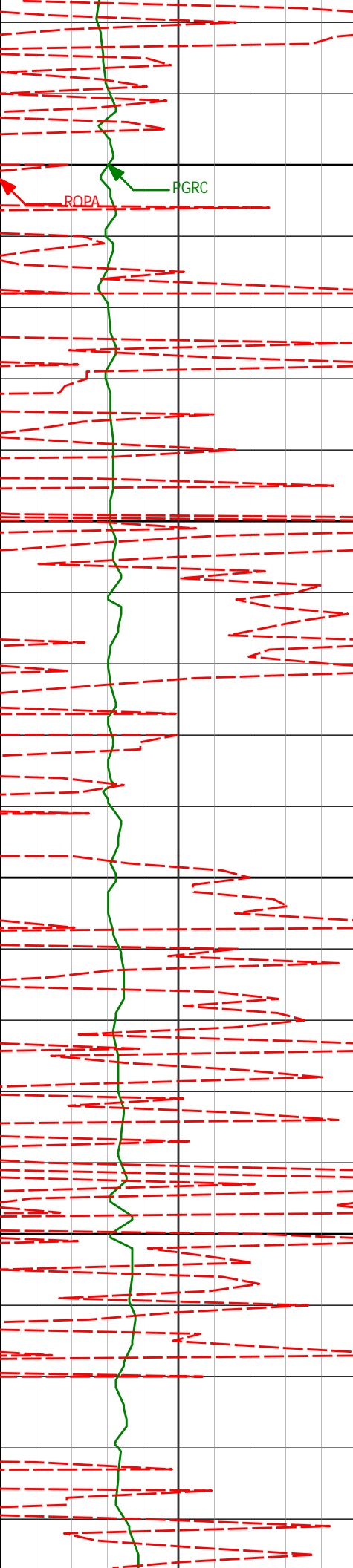
HALLIBURTON

Sperry Drilling Services

MD Main Log 1:240

Whiting Oil and Gas
Razor #33P-3316
Frontier 26
Sec. 33-T10N-R58W





2000

2002'

6.03°

125.15°

1991.69'

-108.59'

2050

2093'

5.42°

126.43°

2082.24'

-113.34'

2100

2150

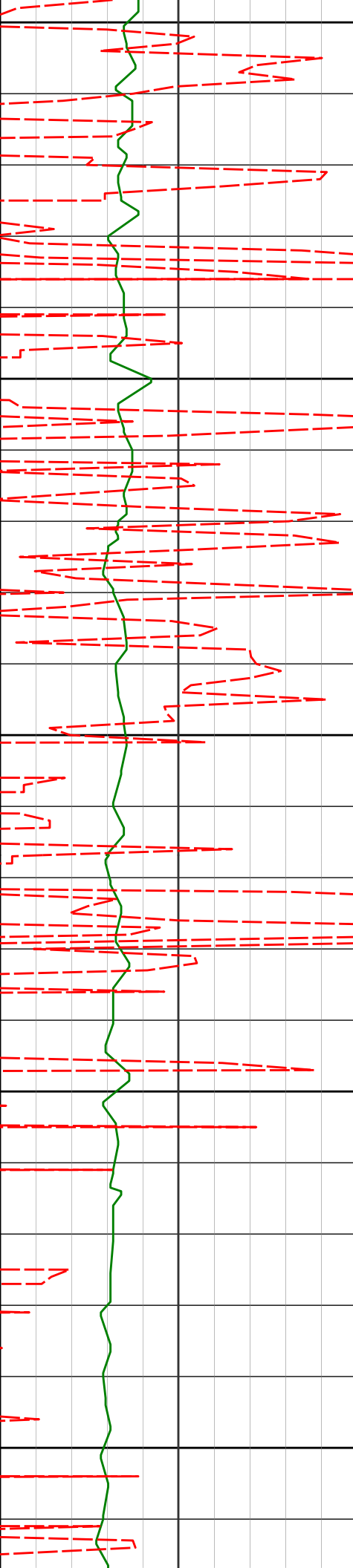
2185'

5.04°

126.59°

2173.86'

-117.82'



2200

2250

2300

2350

2400

2276'

4.47°

124.60°

2264.54'

-121.75'

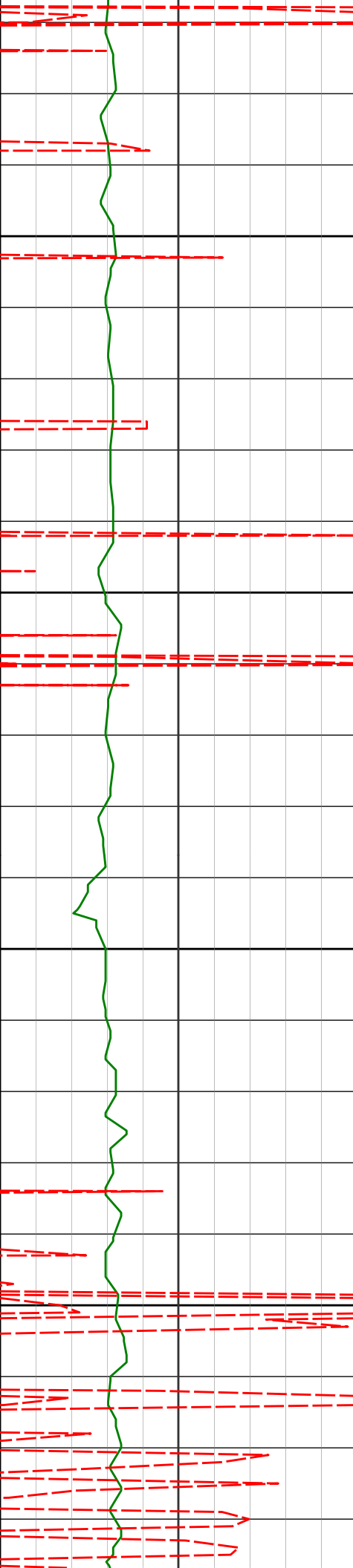
2369'

4.57°

117.88°

2357.25'

-125.07'



2450

2460'

4.78°

118.52°

2447.95'

-128.08'

2500

2550

2552'

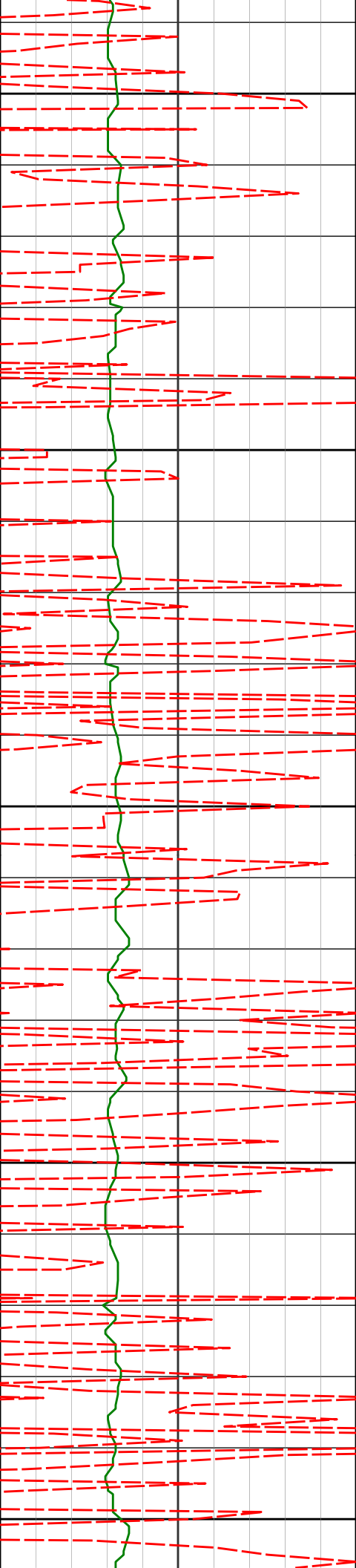
4.81°

117.80°

2539.63'

-131.20'

2600



2650

2700

2750

2800

2850

2643'

4.18°

117.80°

2630.35'

-134.06'

2735'

4.38°

109.45°

2722.09'

-136.32'

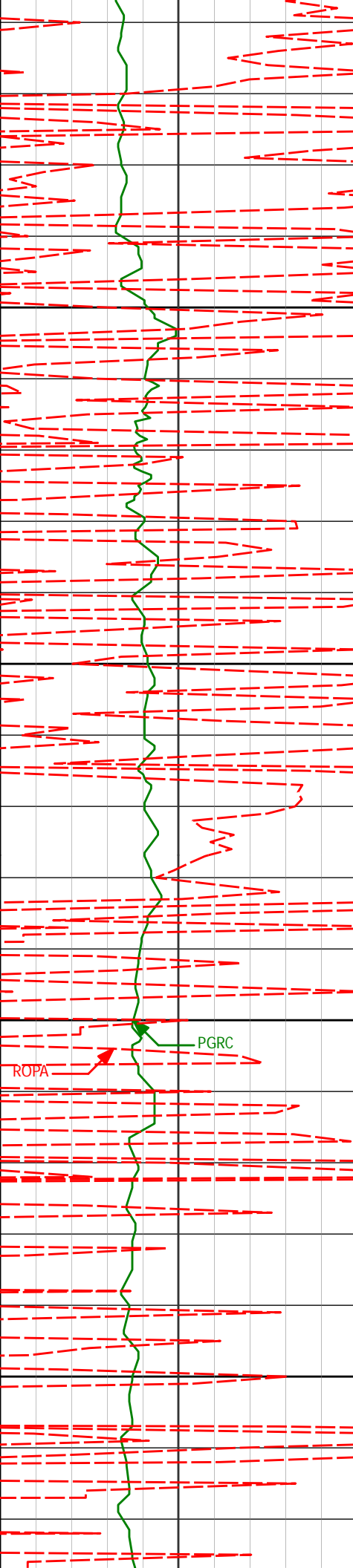
2826'

3.84°

112.65°

2812.86'

-138.20'



2900

2918'

3.63°

113.78°

2904.66'

-140.15'

2950

3000

3010'

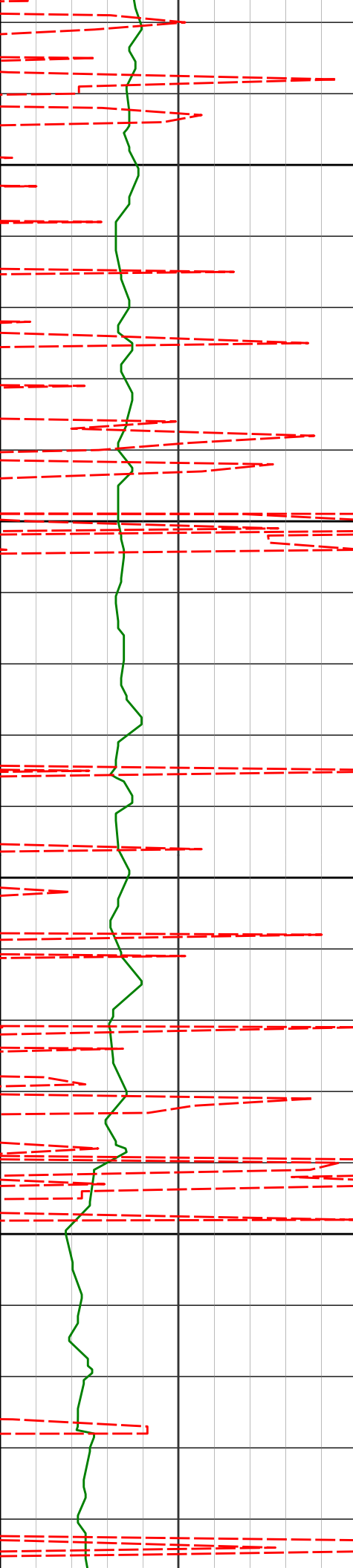
4.91°

115.57°

2996.41'

-142.55'

3050



3100

3102'

4.23°

118.45°

3088.11'

-145.38'

3150

3200

3194'

4.26°

111.39°

3179.86'

-147.78'

3250

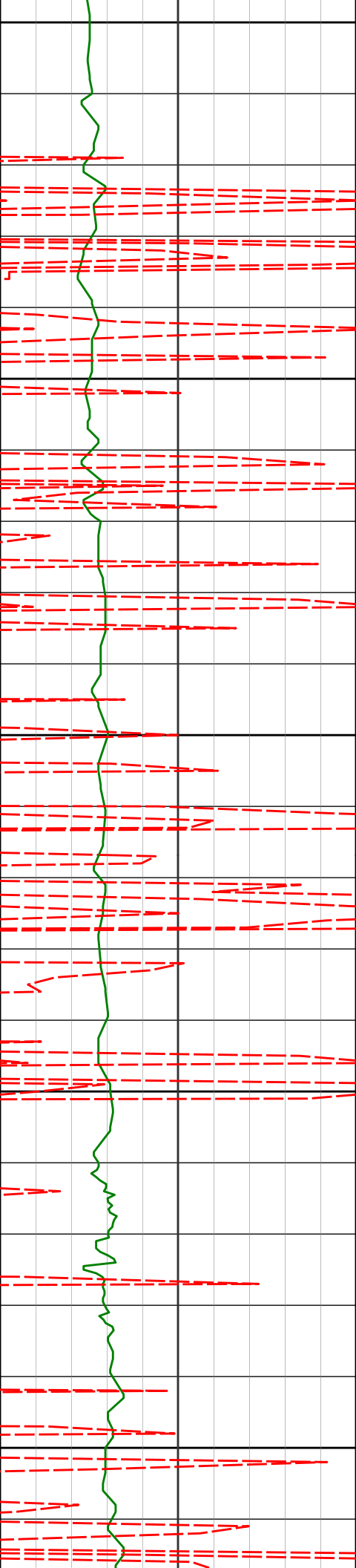
3285'

4.02°

112.07°

3270.62'

-149.76'



3300

3350

3400

3450

3500

3377'

3.87°

109.17°

3362.41'

-151.55'

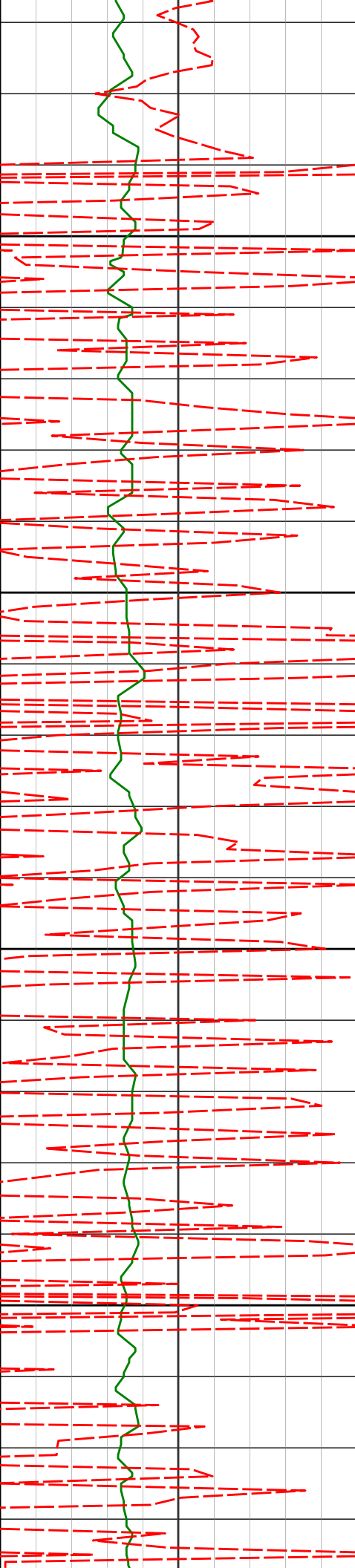
3469'

3.91°

112.60°

3454.19'

-153.34'



3550

3560'

6.73°

118.73°

3544.79'

-156.53'

3600

3650

3652'

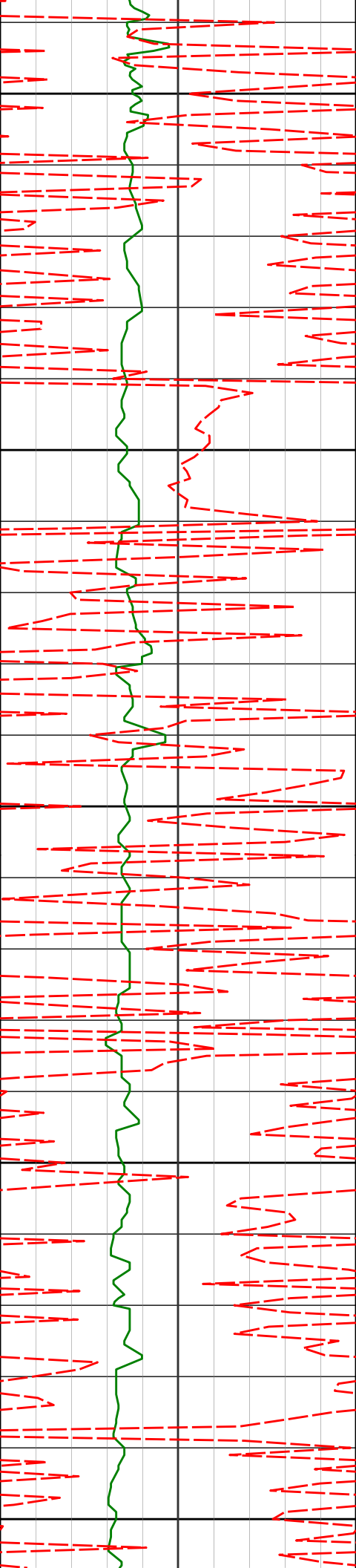
6.07°

113.66°

3636.22'

-160.38'

3700



3744'	5.09°	102.32°	3727.79'	-162.58'
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3750

3800

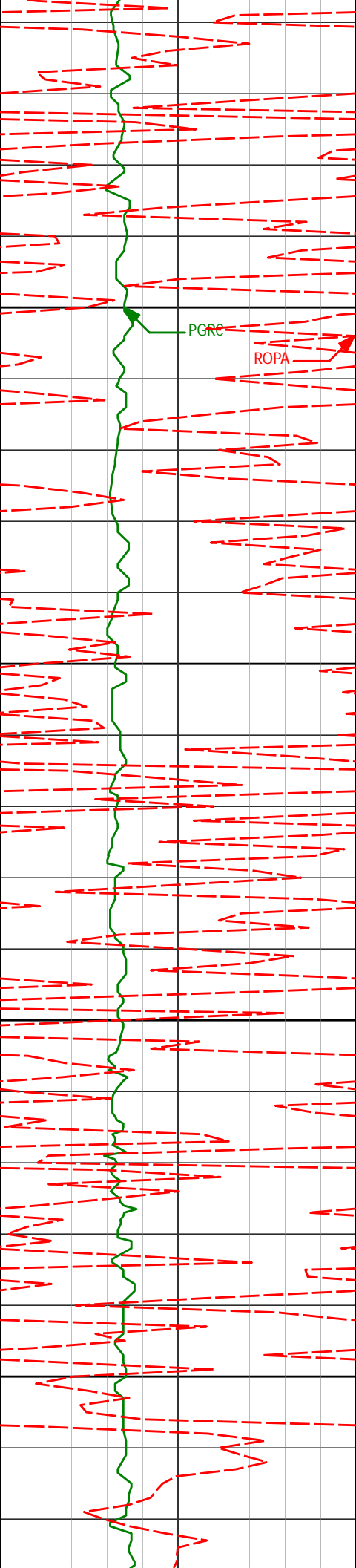
3836'	6.67°	111.94°	3819.30'	-164.78'
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3850

3900

3927'	6.07°	111.10°	3909.74'	-167.78'
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3950



4000

4050

4100

4150

4019'

5.75°

107.87°

4001.25'

-170.28'

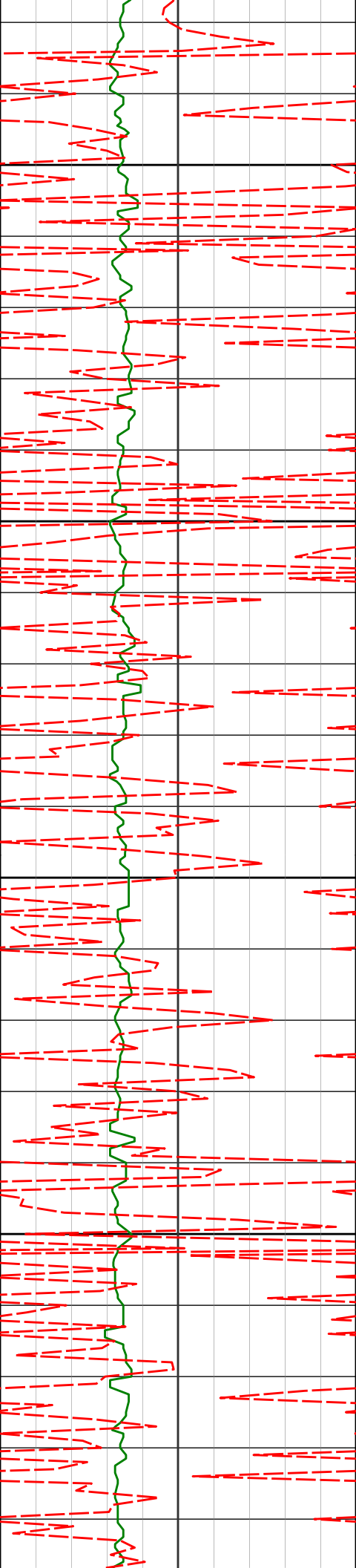
4110'

5.03°

106.08°

4091.85'

-172.18'



4200

4202'

6.17°

114.98°

4183.41'

-174.76'

4250

4293'

5.15°

108.91°

4273.96'

-177.53'

4300

4350

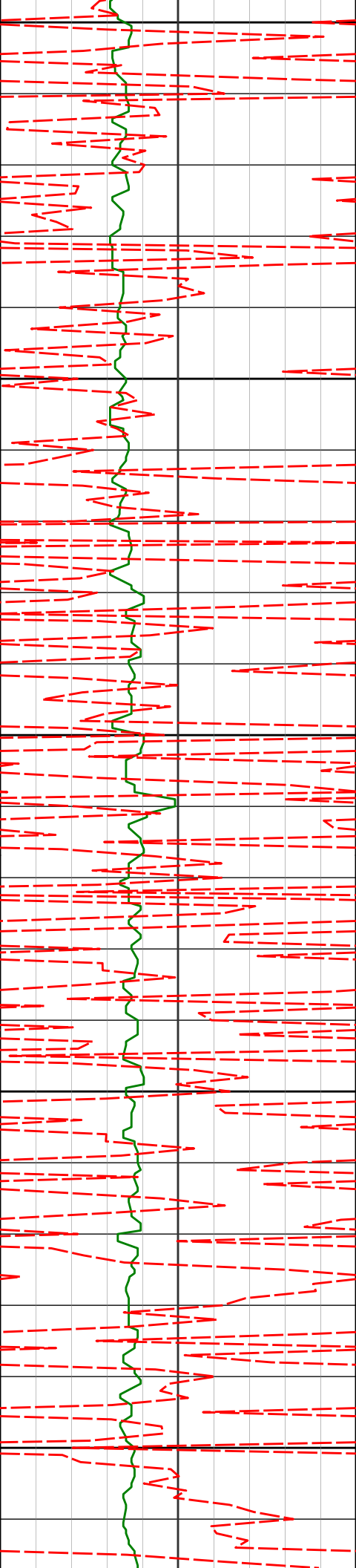
4385'

4.16°

102.41°

4365.66'

-179.05'



4400

4450

4500

4550

4600

4477'

3.60°

84.61°

4457.45'

-179.05'

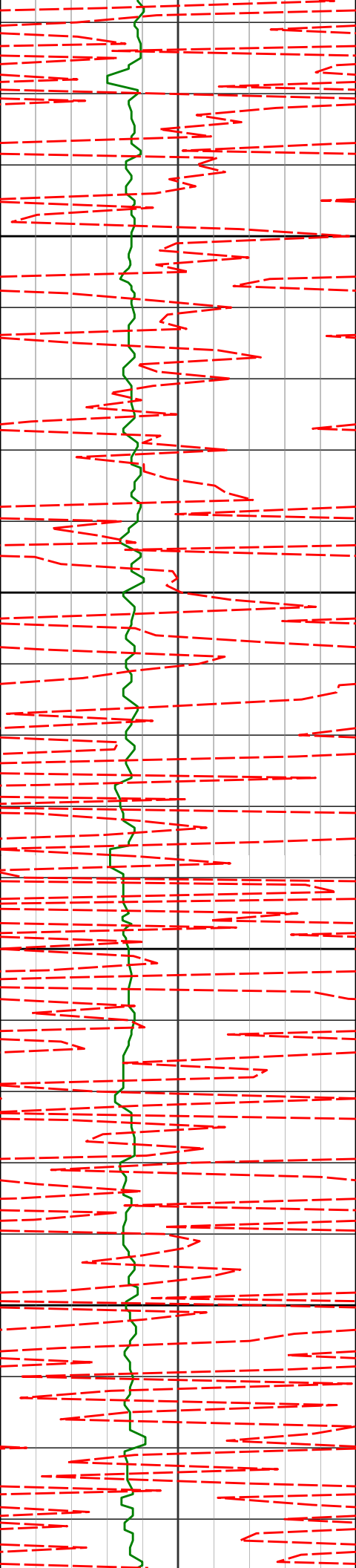
4569'

3.06°

78.57°

4549.30'

-177.90'



4650

4661'

2.72°

75.61°

4641.18'

-176.54'

4700

4750

4753'

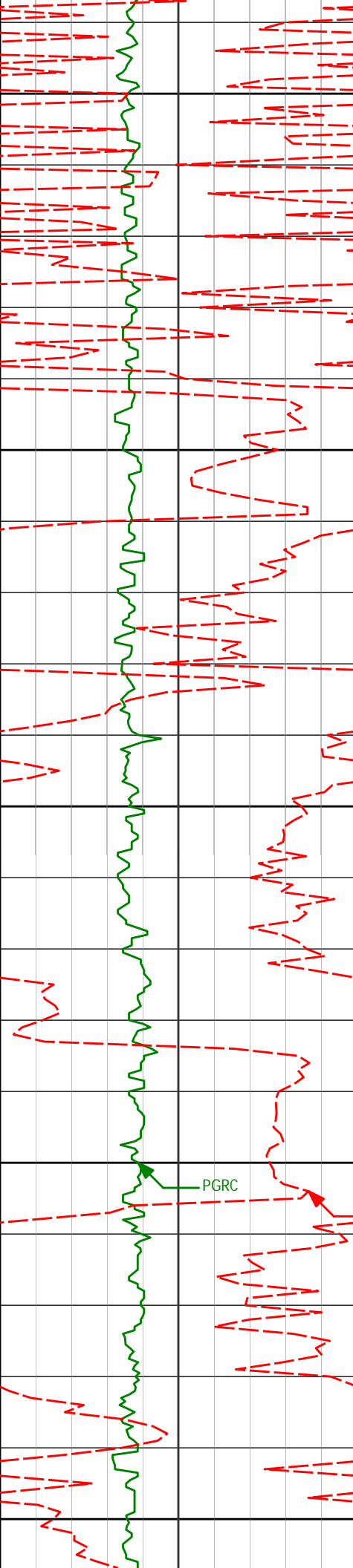
2.01°

76.69°

4733.10'

-175.36'

4800



4850

4900

4950

5000

5050

4845'

1.85°

69.50°

4825.05'

-174.25'

4937'

0.75°

109.50°

4917.03'

-173.79'

5032'

1.00°

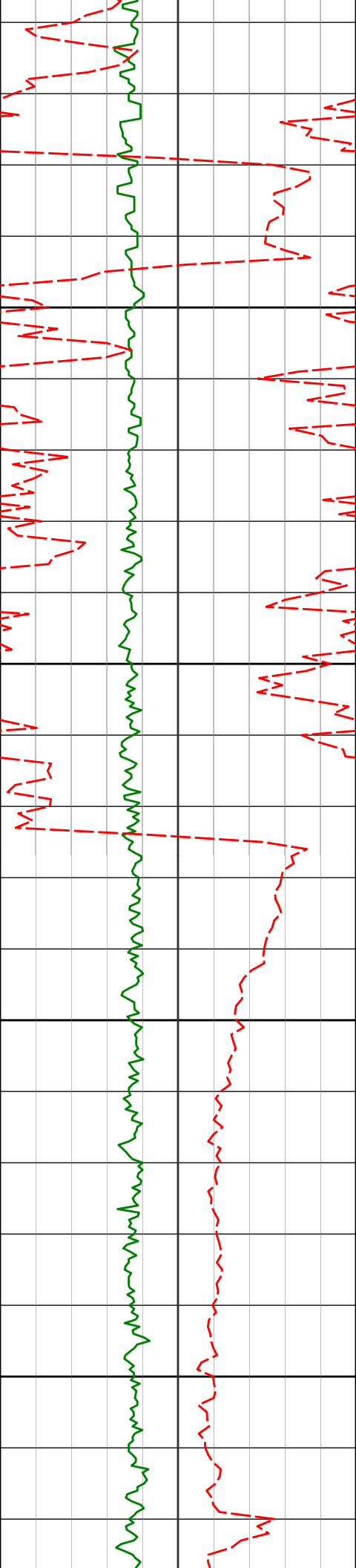
4.95°

5012.02'

-173.13'

PGRC

ROPA



5100

5126'

1.78°

11.25°

5105.99'

-170.86'

5150

KOP 5176' MD

5200

5221'

7.31°

356.29°

5200.66'

-163.40'

5250

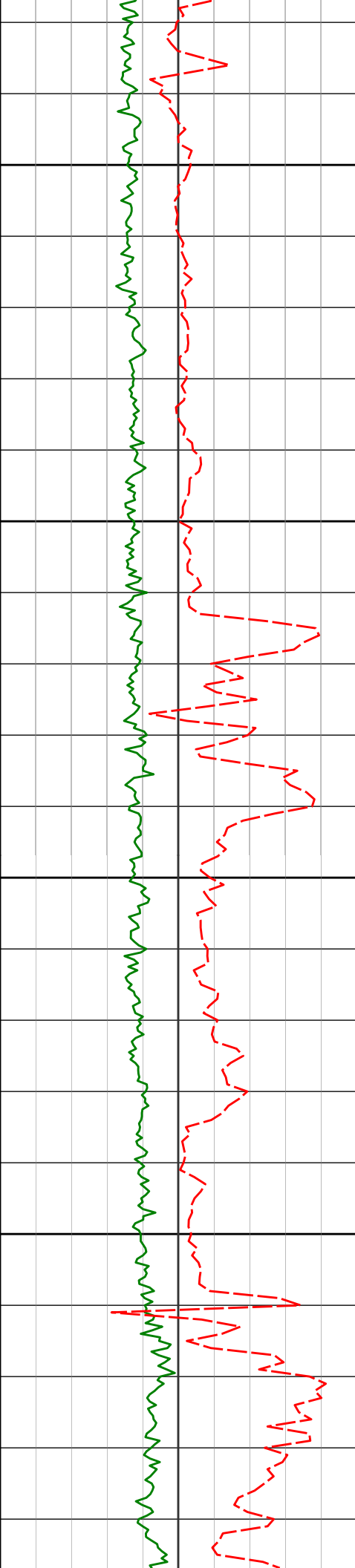
5268'

12.51°

359.46°

5246.94'

-155.36'



5300

5316'

17.11°

5.06°

5293.34'

-143.11'

5350

5363'

23.11°

4.81°

5337.45'

-126.96'

5400

5412'

24.78°

2.70°

5382.23'

-107.08'

5450

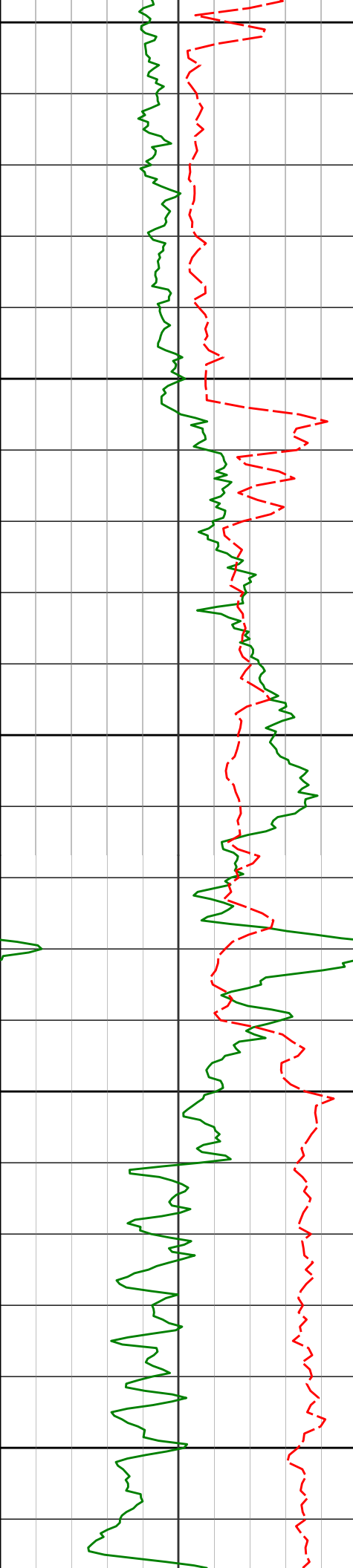
5459'

28.63°

0.29°

5424.21'

-85.99'



5500

5506'

30.35°

357.67°

5465.12'

-62.96'

5550

5553'

36.21°

355.95°

5504.40'

-37.40'

5600

5601'

42.01°

355.71°

5541.63'

-7.46'

5650

5648'

48.89°

355.87°

5574.58'

25.65'

5700

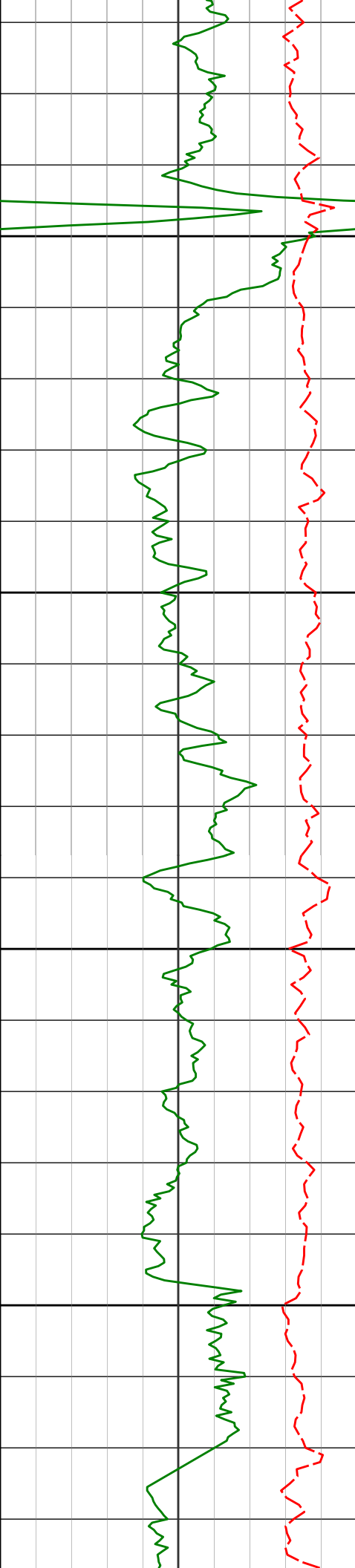
5696'

55.19°

356.31°

5604.09'

63.10'



5750

5800

5850

5900

5743'

62.78°

356.42°

5628.29'

102.97'

5791'

69.66°

356.87°

5647.63'

146.49'

5838'

77.00°

358.15°

5661.11'

191.18'

5886'

83.20°

2.91°

5669.36'

238.33'

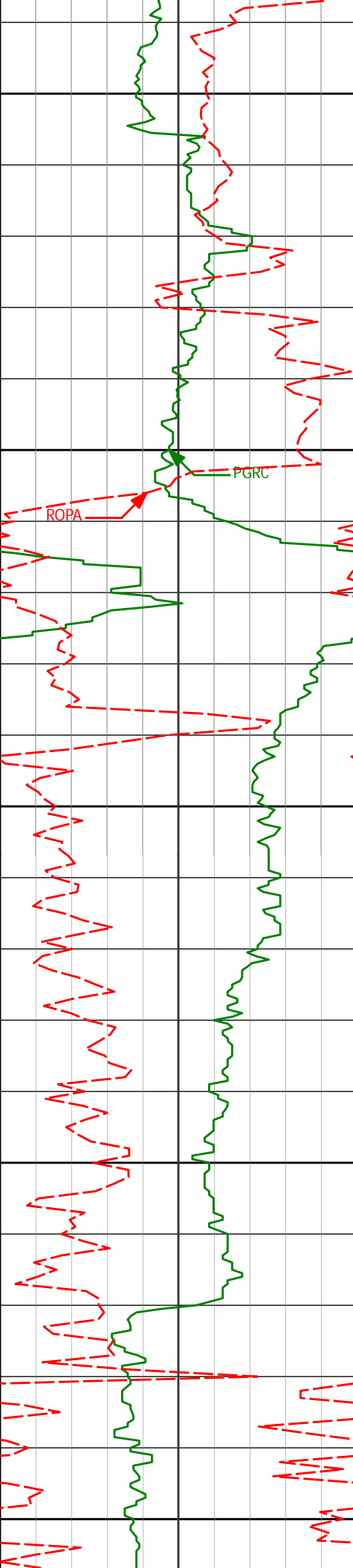
5924'

88.63°

5.22°

5672.07'

276.21'



5950
Casing at 5955' MD

Run 300

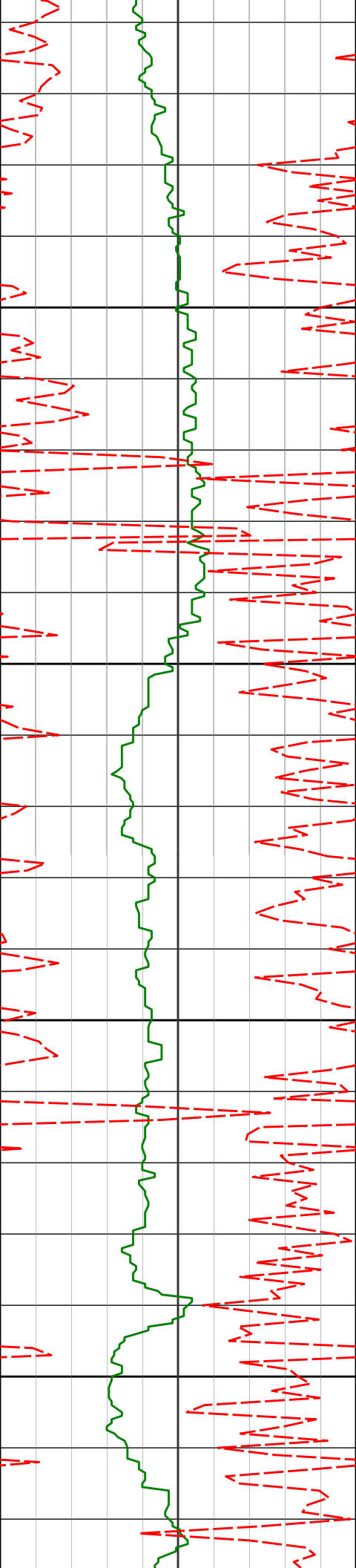
6000

6050

6100

6150

6087' 89.17° 4.80° 5674.51' 439.17'



6179'

88.83°

4.21°

5676.11'

531.16'

6200

6250

6270'

88.95°

3.56°

5677.88'

622.14'

6300

6350

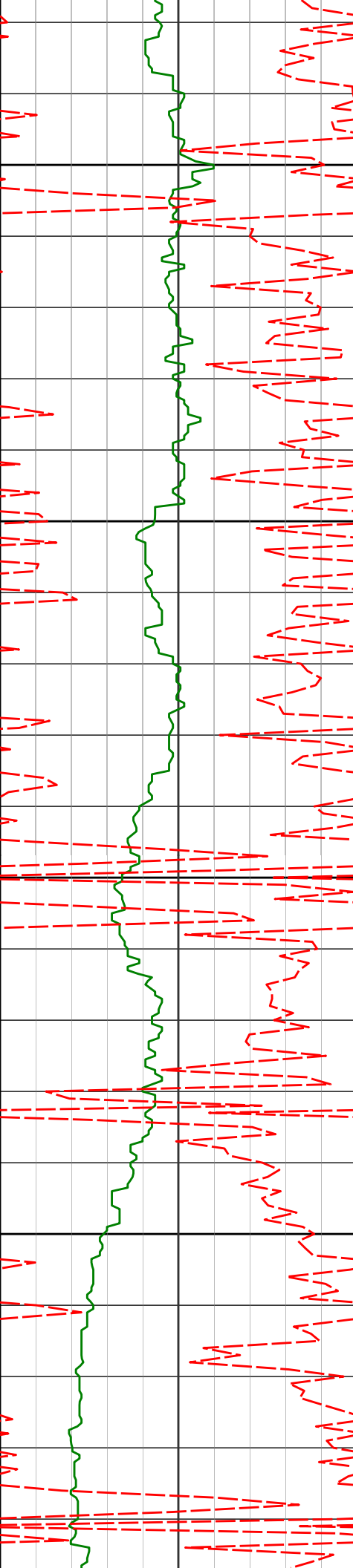
6362'

88.72°

2.76°

5679.75'

714.10'



6400

6450

6500

6550

6453'

89.41°

2.68°

5681.23'

805.06'

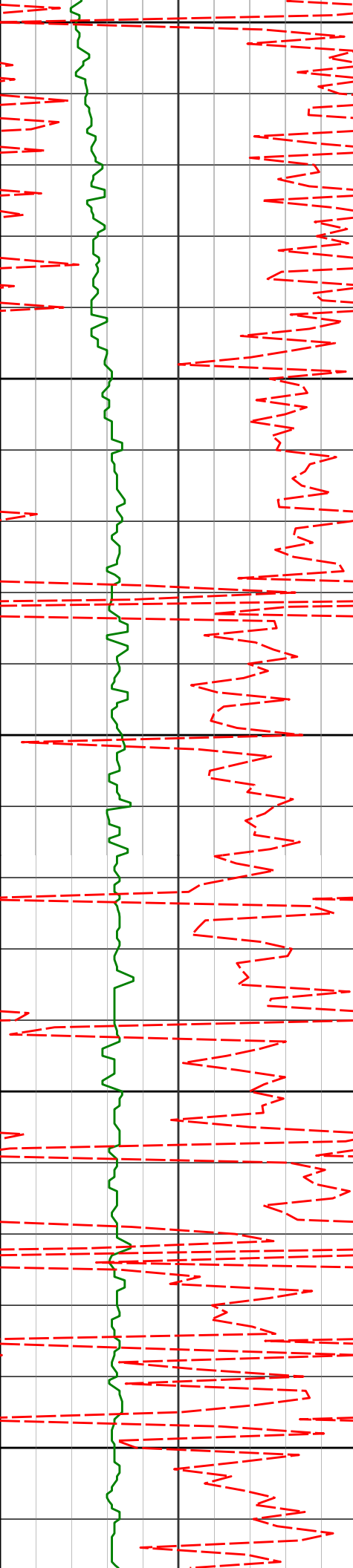
6544'

89.19°

2.20°

5682.34'

896.01'



6600

6634'

89.45°

1.92°

5683.41'

985.94'

6650

6700

6726'

89.96°

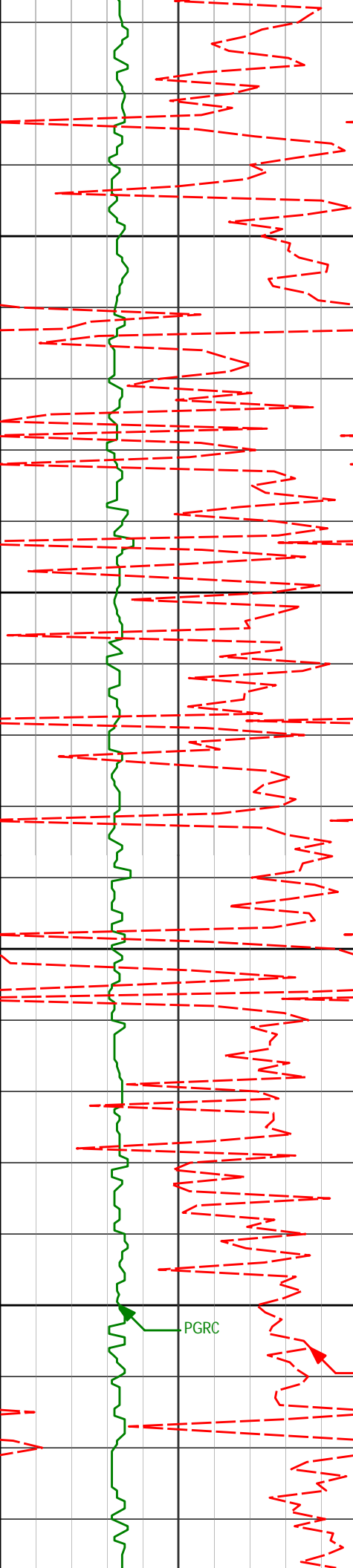
1.44°

5683.88'

1077.84'

6750

6800



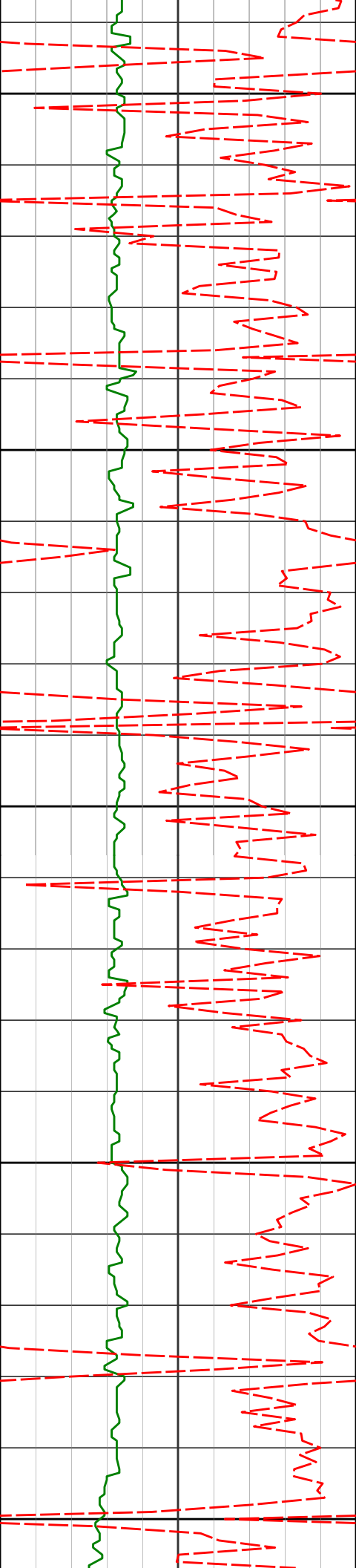
6850

6900

6950

7000

6818'	90.28°	1.94°	5683.69'	1169.75'
6909'	89.62°	0.72°	5683.77'	1260.64'
7000'	90.65°	0.90°	5683.56'	1351.47'



7050

7090'

90.09°

0.03°

5682.98'

1441.28'

7100

7150

7182'

90.46°

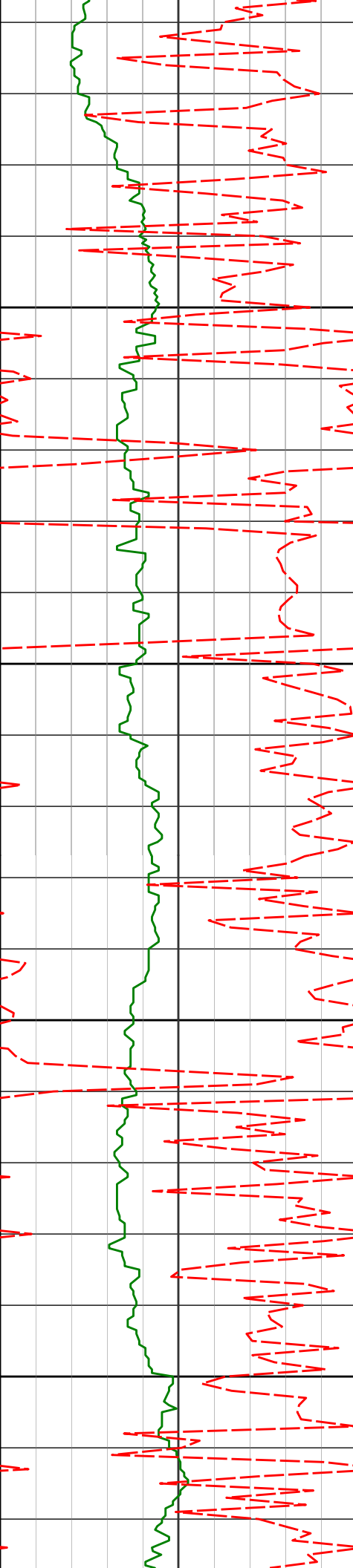
359.64°

5682.53'

1533.01'

7200

7250



7274'

90.69°

359.58°

5681.61'

1624.70'

7300

7350

7365'

89.93°

358.72°

5681.12'

1715.34'

7400

7450

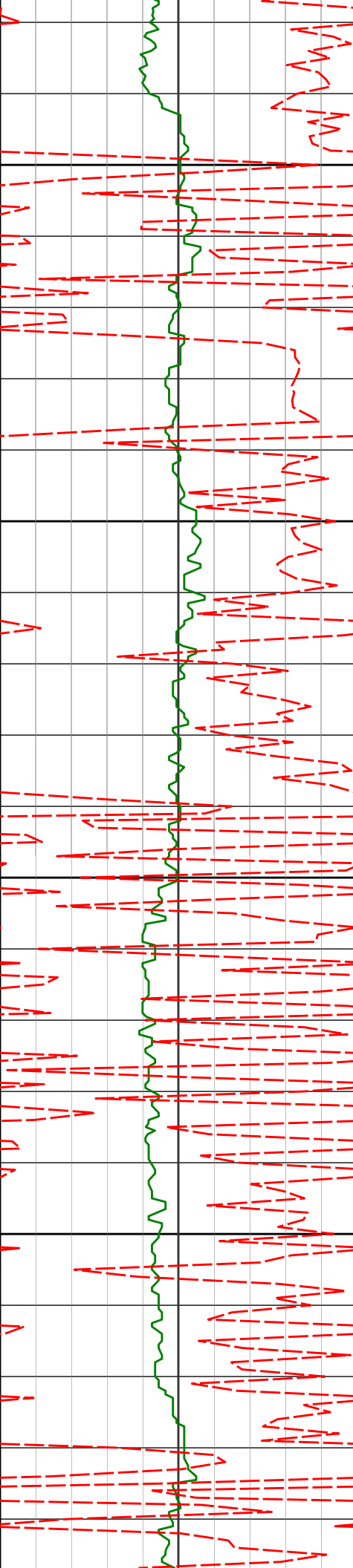
7456'

90.35°

358.28°

5680.90'

1805.89'



7500

7550

7600

7650

7548'

88.89°

358.63°

5681.51'

1897.42'

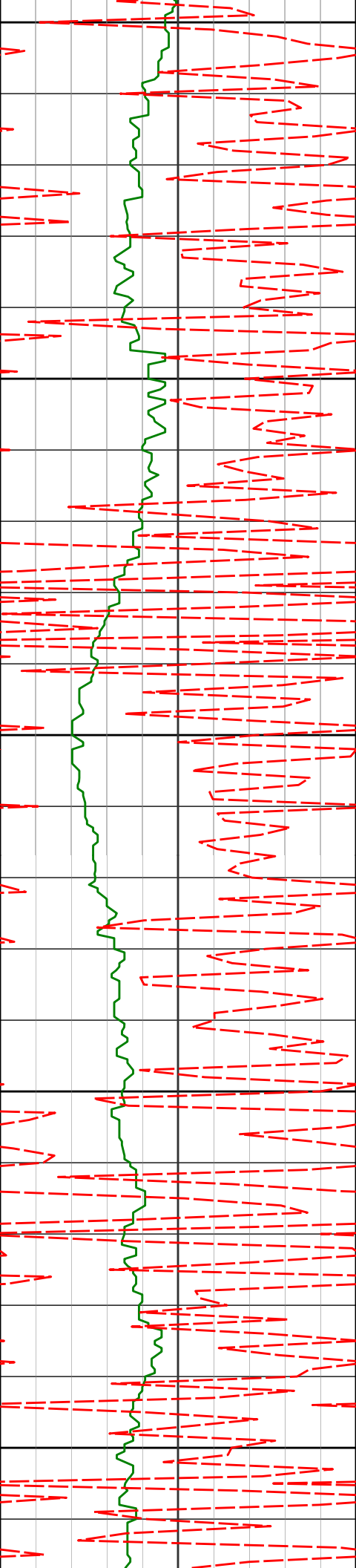
7639'

89.63°

358.68°

5682.68'

1987.98'



7700

7731'

89.88°

358.44°

5683.08'

2079.53'

7750

7800

7822'

89.50°

358.66°

5683.57'

2170.09'

7850

7900

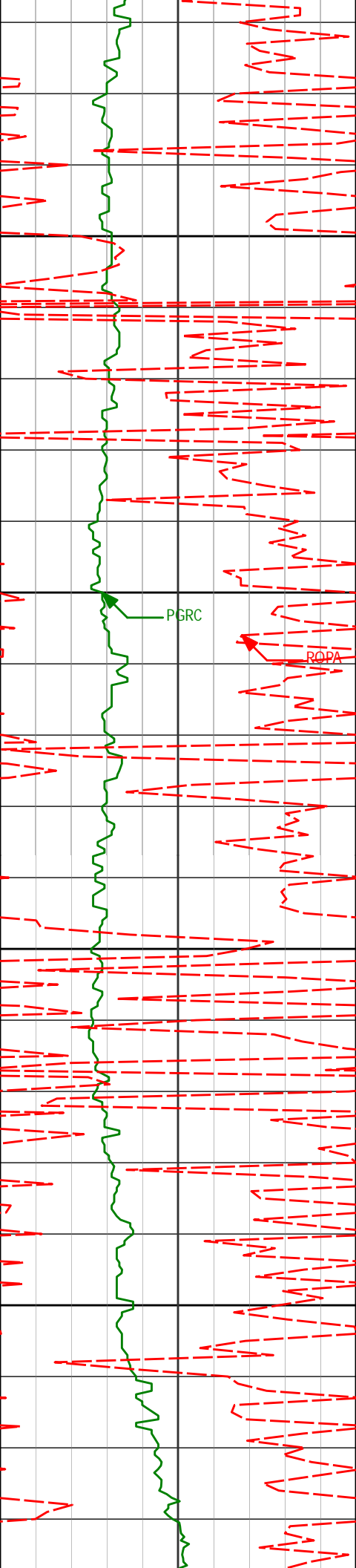
7915'

89.64°

358.62°

5684.27'

2262.64'



7950

8000

8050

8100

8006'

89.53°

358.21°

5684.92'

2353.17'

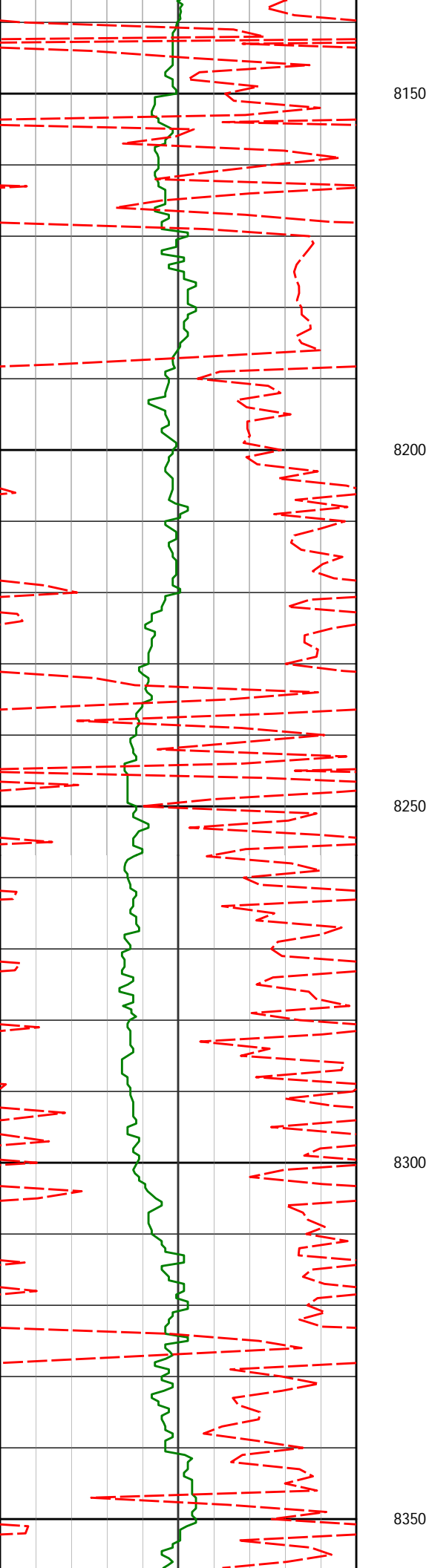
8097'

89.69°

357.75°

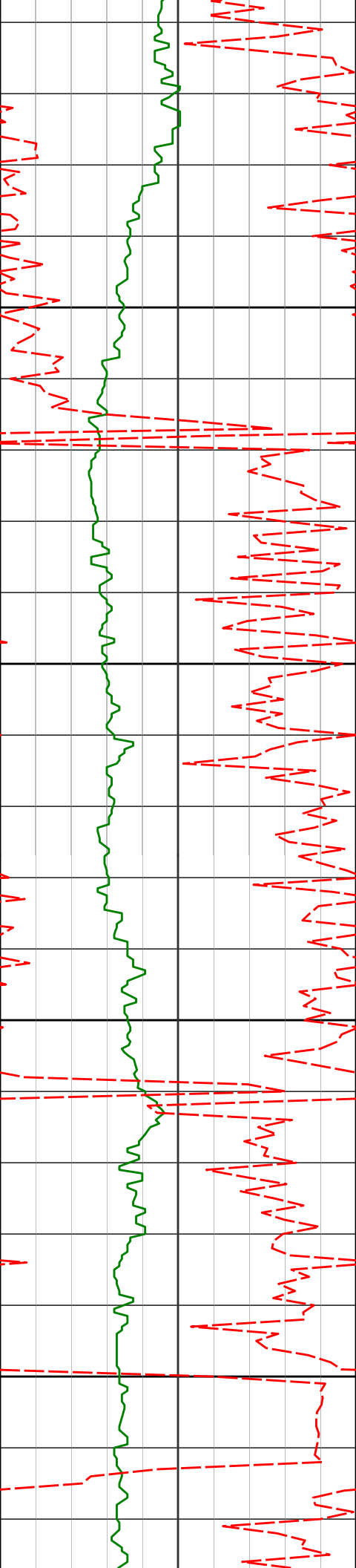
5685.54'

2443.63'



8189'	89.14°	359.55°	5686.48'	2535.19'
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8280'	90.71°	0.53°	5686.60'	2625.94'
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8373'

91.21°

0.47°

5685.04'

2718.73'

8400

8450

8465'

91.49°

0.06°

5682.88'

2810.49'

8500

8550

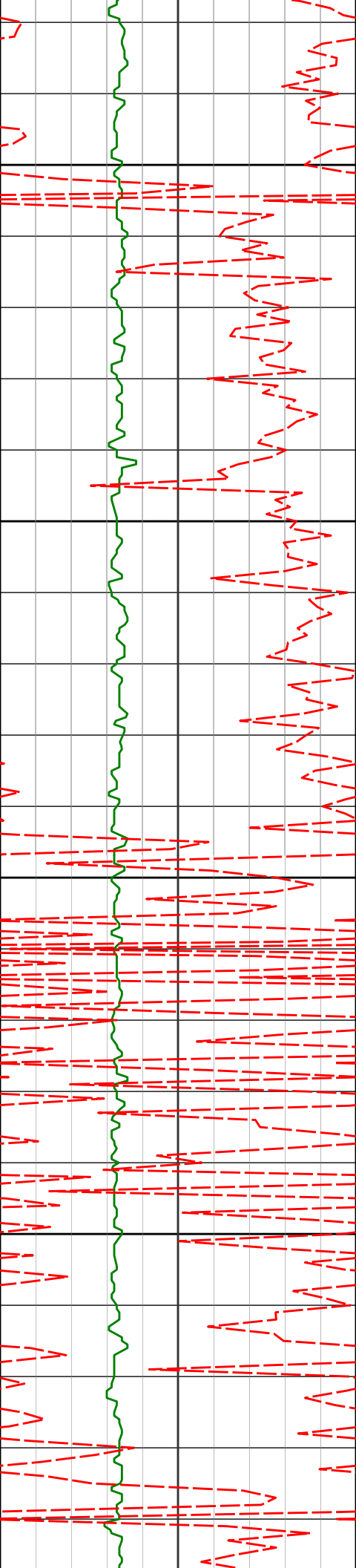
8557'

89.92°

359.53°

5681.75'

2902.21'



8600

8650

8700

8750

8648'

90.54°

0.04°

5681.38'

2992.93'

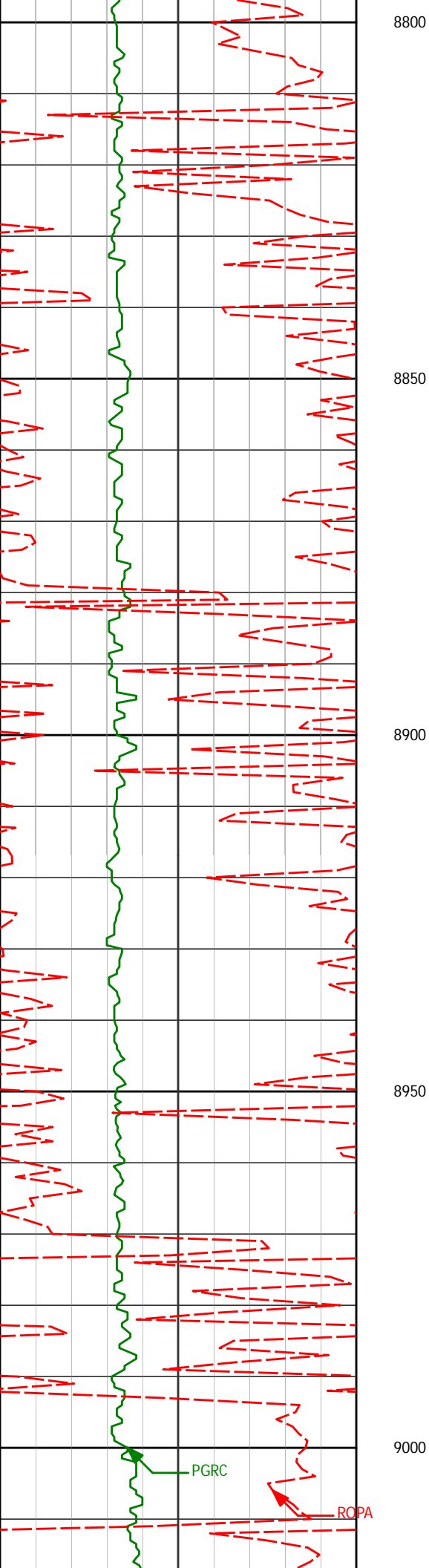
8741'

90.28°

359.17°

5680.71'

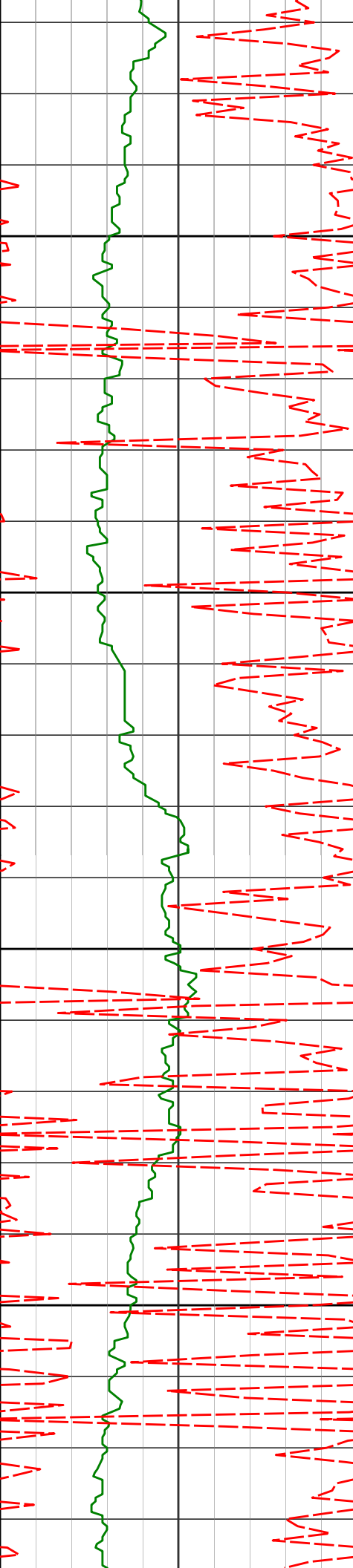
3085.63'



8832' 89.66° 358.57° 5680.76' 3176.23'

8924' 90.28° 358.93° 5680.81' 3267.81'

9016' 88.43° 359.78° 5681.85' 3359.47'



9050

9100

9150

9200

9108'

88.80°

0.21°

5684.07'

3451.19'

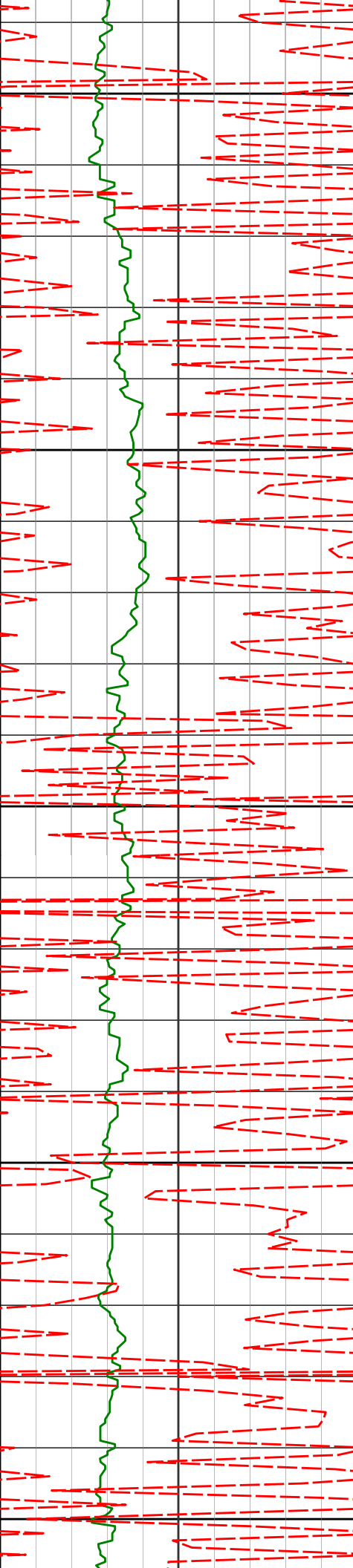
9200'

89.15°

0.02°

5685.72'

3542.94'



9250

9292'

89.23°

359.88°

5687.02'

3634.67'

9300

9350

9383'

89.42°

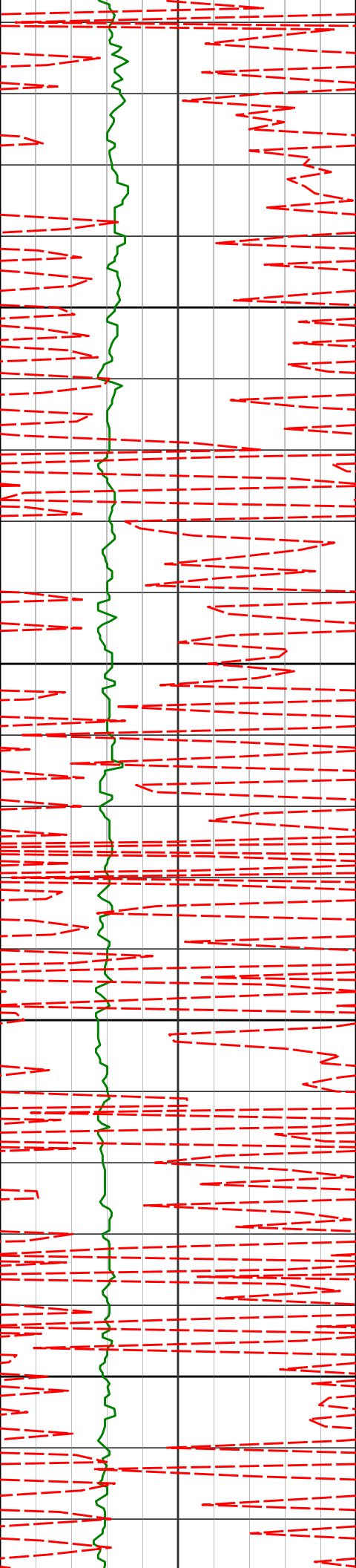
0.23°

5688.09'

3725.43'

9400

9450



9475'

90.55°

1.08°

5688.11'

3817.25'

9500

9550

9566'

90.37°

1.60°

5687.38'

3908.13'

9600

9650

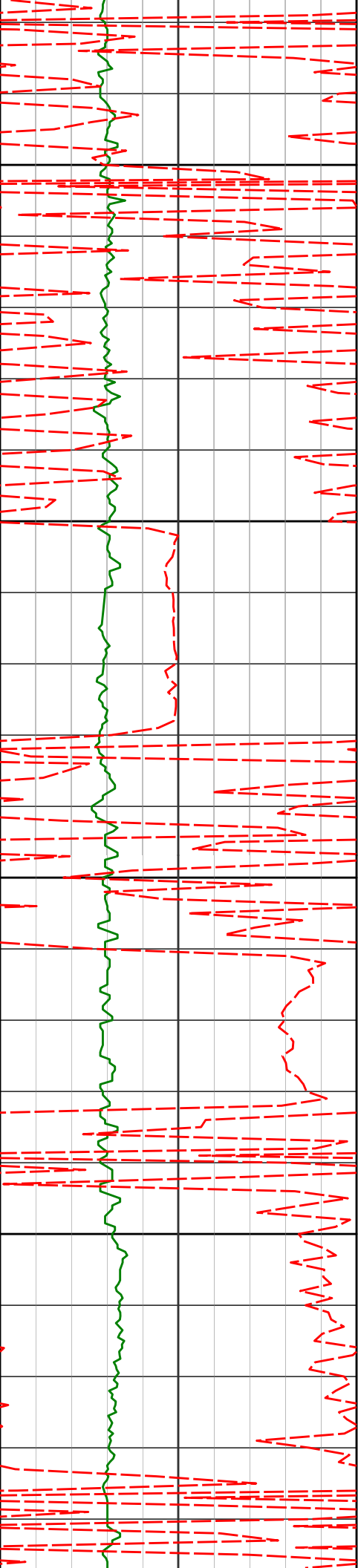
9658'

90.06°

2.12°

5687.04'

4000.05'



9700

9750

9800

9850

9750'

9842'

90.12°

90.52°

2.83°

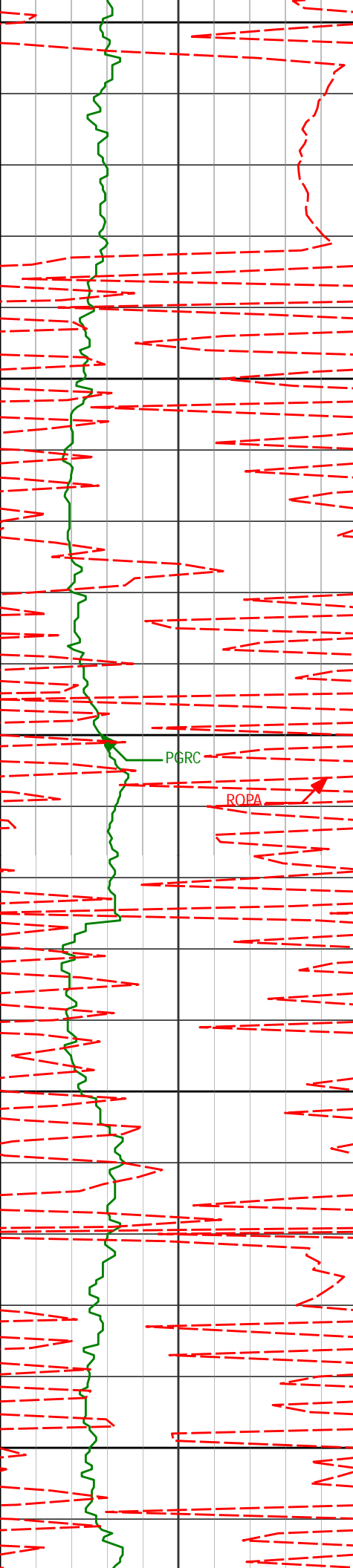
2.22°

5686.89'

5686.38'

4092.01'

4183.96'



9900

9934'

88.74°

357.39°

5686.97'

4275.66'

9950

10000

PGRC

ROPA

10025'

88.71°

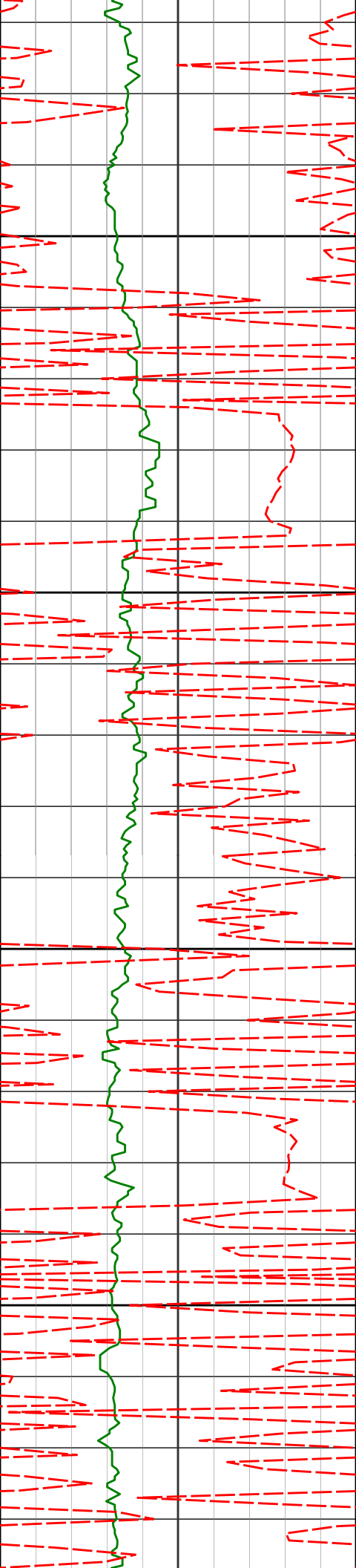
356.92°

5689.00'

4365.95'

10050

10100



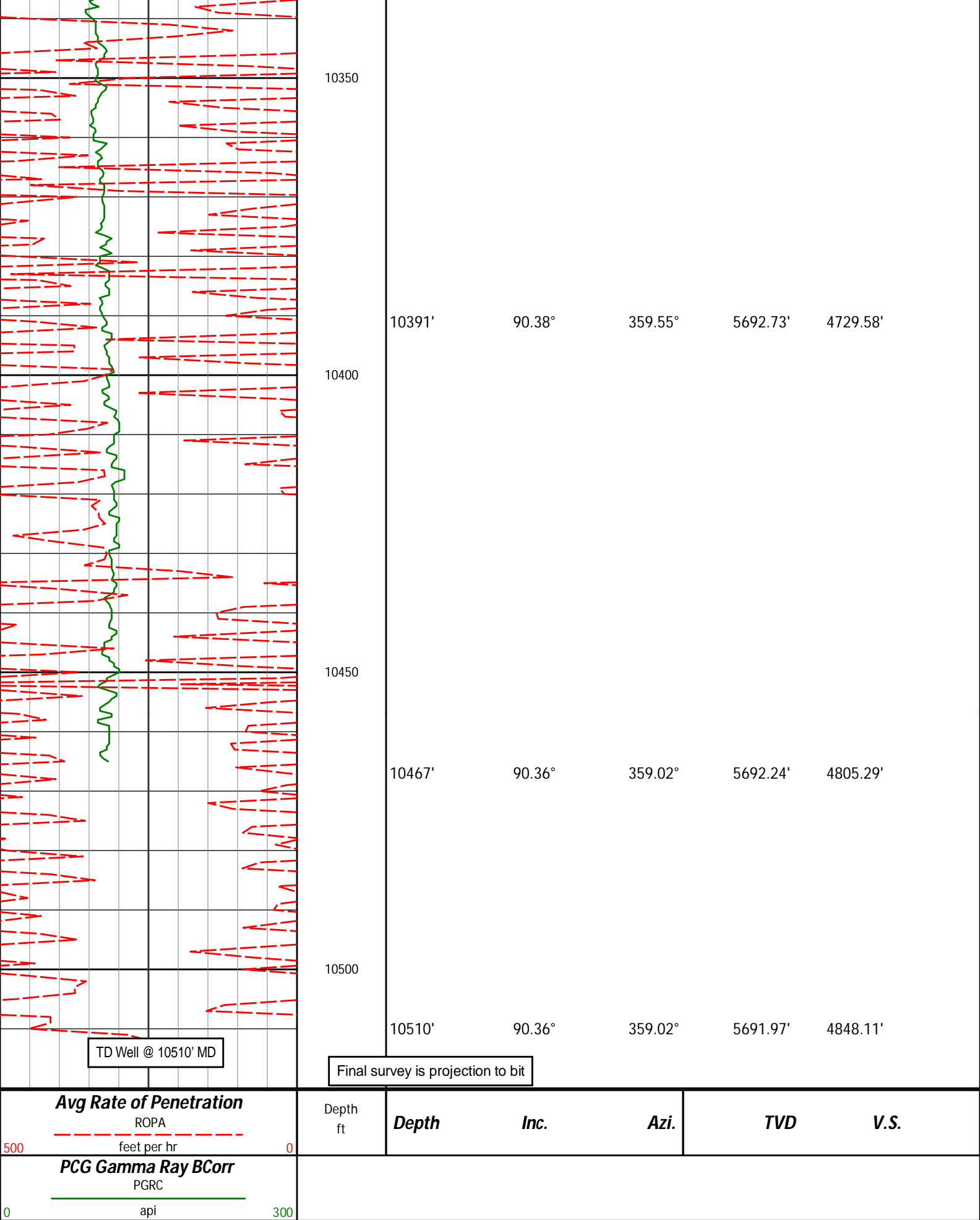
10150

10200

10250

10300

10117'	89.23°	356.22°	5690.63'	4457.11'
10208'	89.03°	357.74°	5692.03'	4547.37'
10300'	89.86°	359.20°	5692.92'	4638.90'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Whiting Oil and Gas

Razor #33P-3316

Redtail

Weld Colorado

USA

CA-XX-0901813681

Surveys are Sag, IFR and MS corrected.

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
173.00	0.30	163.85	173.00	0.44 S	0.13 E	-0.42	0.17
264.00	0.62	175.27	264.00	1.15 S	0.23 E	-1.13	0.36
356.00	0.69	177.62	355.99	2.20 S	0.30 E	-2.18	0.08
448.00	1.38	165.84	447.97	3.83 S	0.59 E	-3.78	0.78
540.00	1.74	166.43	539.94	6.26 S	1.19 E	-6.16	0.39
632.00	2.84	139.20	631.87	9.35 S	3.01 E	-9.10	1.65
724.00	4.63	121.63	723.67	13.02 S	7.66 E	-12.42	2.29
815.00	5.39	120.73	814.32	17.13 S	14.46 E	-16.02	0.84
997.00	5.82	125.64	995.45	26.88 S	29.31 E	-24.65	0.35
1088.00	6.38	128.31	1085.94	32.70 S	37.02 E	-29.88	0.69
1180.00	7.07	132.53	1177.31	39.69 S	45.21 E	-36.26	0.92
1271.00	7.82	133.06	1267.54	47.71 S	53.86 E	-43.61	0.83
1363.00	8.63	135.87	1358.59	56.93 S	63.24 E	-52.13	0.98
1454.00	9.14	137.13	1448.50	67.13 S	72.91 E	-61.59	0.60
1545.00	9.08	137.11	1538.35	77.69 S	82.71 E	-71.39	0.07
1636.00	8.58	145.44	1628.28	88.54 S	91.45 E	-81.57	1.51
1728.00	7.24	137.33	1719.40	98.46 S	99.27 E	-90.88	1.89
1819.00	6.58	131.19	1809.74	106.11 S	107.08 E	-97.94	1.09
1911.00	5.96	126.13	1901.19	112.39 S	114.91 E	-103.63	0.90
2002.00	6.03	125.15	1991.69	117.93 S	122.63 E	-108.59	0.14
2093.00	5.42	126.43	2082.24	123.24 S	130.00 E	-113.34	0.68
2185.00	5.04	126.59	2173.86	128.22 S	136.74 E	-117.82	0.41
2276.00	4.47	124.60	2264.54	132.62 S	142.87 E	-121.75	0.65
2369.00	4.57	117.88	2357.25	136.41 S	149.12 E	-125.07	0.58
2460.00	4.78	118.52	2447.95	139.92 S	155.66 E	-128.08	0.24
2552.00	4.81	117.80	2539.63	143.55 S	162.44 E	-131.20	0.07
2643.00	4.18	117.80	2630.35	146.87 S	168.75 E	-134.06	0.69
2735.00	4.38	109.45	2722.09	149.61 S	175.03 E	-136.32	0.71
2826.00	3.84	112.65	2812.86	151.94 S	181.12 E	-138.20	0.64
2918.00	3.63	113.78	2904.66	154.30 S	186.63 E	-140.15	0.24
3010.00	4.91	115.57	2996.41	157.17 S	192.84 E	-142.55	1.40
3102.00	4.23	118.45	3088.11	160.49 S	199.38 E	-145.38	0.78
3194.00	4.26	111.39	3179.86	163.35 S	205.54 E	-147.78	0.57
3285.00	4.02	112.07	3270.62	165.78 S	211.64 E	-149.76	0.27
3377.00	3.87	109.17	3362.41	168.01 S	217.57 E	-151.55	0.27
3469.00	3.91	112.60	3454.19	170.24 S	223.39 E	-153.34	0.26
3560.00	6.73	118.73	3544.79	173.99 S	230.94 E	-156.53	3.16
3652.00	6.07	113.66	3636.22	178.54 S	240.12 E	-160.38	0.94
3744.00	5.09	102.32	3727.79	181.36 S	248.56 E	-162.58	1.60
3836.00	6.67	111.94	3819.30	184.23 S	257.51 E	-164.78	2.02
3927.00	6.07	111.10	3909.74	187.93 S	266.90 E	-167.78	0.67
4019.00	5.75	107.87	4001.25	191.10 S	275.82 E	-170.28	0.50
4110.00	5.03	106.08	4091.85	193.60 S	283.99 E	-172.18	0.81
4202.00	6.17	114.98	4183.41	196.81 S	292.35 E	-174.76	1.55
4293.00	5.15	108.91	4273.96	200.20 S	300.65 E	-177.53	1.30
4385.00	4.16	102.41	4365.66	202.25 S	307.81 E	-179.05	1.22
4477.00	3.60	84.61	4457.45	202.70 S	313.95 E	-179.05	1.44
4569.00	3.06	78.57	4549.30	201.94 S	319.23 E	-177.90	0.70
4661.00	2.72	75.61	4641.18	200.91 S	323.75 E	-176.54	0.40
4753.00	2.01	76.69	4733.10	200.00 S	327.44 E	-175.36	0.77
4845.00	1.85	69.50	4825.05	199.11 S	330.40 E	-174.25	0.32
4937.00	0.75	109.50	4917.03	198.79 S	332.36 E	-173.79	1.48
5032.00	1.00	4.95	5012.02	198.17 S	333.01 E	-173.13	1.47
5126.00	1.78	11.25	5105.99	195.92 S	333.37 E	-170.86	0.84
5221.00	7.31	356.29	5200.66	188.43 S	333.27 E	-163.40	5.90
5268.00	12.51	359.46	5246.94	180.36 S	333.02 E	-155.36	11.12
5313.00	15.44	355.33	5288.21	182.43 S	333.33 E	-148.44	12.25

5316.00	17.11	5.06	5293.34	168.12 S	333.60 E	-143.11	10.03
5363.00	23.11	4.81	5337.45	152.02 S	334.98 E	-126.96	12.77
5412.00	24.78	2.70	5382.23	132.18 S	336.27 E	-107.08	3.83
5459.00	28.63	0.29	5424.21	111.07 S	336.79 E	-85.99	8.51
5506.00	30.35	357.67	5465.12	87.95 S	336.37 E	-62.96	4.57
5553.00	36.21	355.95	5504.40	62.21 S	334.90 E	-37.40	12.63
5601.00	42.01	355.71	5541.63	32.03 S	332.70 E	-7.46	12.09
5648.00	48.89	355.87	5574.58	1.36 N	330.24 E	25.65	14.64
5696.00	55.19	356.31	5604.09	39.10 N	327.67 E	63.10	13.14
5743.00	62.78	356.42	5628.29	79.27 N	325.12 E	102.97	16.15
5791.00	69.66	356.87	5647.63	123.09 N	322.56 E	146.49	14.36
5838.00	77.00	358.15	5661.11	168.04 N	320.61 E	191.18	15.83
5886.00	83.20	2.91	5669.36	215.29 N	321.07 E	238.33	16.19
5924.00	88.63	5.22	5672.07	253.08 N	323.75 E	276.21	15.52
5995.00	89.35	5.37	5673.32	323.76 N	330.31 E	347.19	1.04
6087.00	89.17	4.80	5674.51	415.39 N	338.46 E	439.17	0.65
6179.00	88.83	4.21	5676.11	507.09 N	345.68 E	531.16	0.74
6270.00	88.95	3.56	5677.88	597.87 N	351.85 E	622.14	0.73
6362.00	88.72	2.76	5679.75	689.71 N	356.92 E	714.10	0.90
6453.00	89.41	2.68	5681.23	780.59 N	361.24 E	805.06	0.76
6544.00	89.19	2.20	5682.34	871.50 N	365.11 E	896.01	0.58
6634.00	89.45	1.92	5683.41	961.44 N	368.35 E	985.94	0.42
6726.00	89.96	1.44	5683.88	1053.40 N	371.04 E	1077.84	0.76
6818.00	90.28	1.94	5683.69	1145.36 N	373.76 E	1169.75	0.65
6909.00	89.62	0.72	5683.77	1236.33 N	375.87 E	1260.64	1.52
7000.00	90.65	0.90	5683.56	1327.32 N	377.15 E	1351.47	1.15
7090.00	90.09	0.03	5682.98	1417.31 N	377.89 E	1441.28	1.15
7182.00	90.46	359.64	5682.53	1509.31 N	377.62 E	1533.01	0.58
7274.00	90.69	359.58	5681.61	1601.30 N	376.99 E	1624.70	0.26
7365.00	89.93	358.72	5681.12	1692.29 N	375.64 E	1715.34	1.26
7456.00	90.35	358.28	5680.90	1783.26 N	373.26 E	1805.89	0.67
7548.00	88.89	358.63	5681.51	1875.22 N	370.78 E	1897.42	1.63
7639.00	89.63	358.68	5682.68	1966.19 N	368.65 E	1987.98	0.82
7731.00	89.88	358.44	5683.08	2058.16 N	366.33 E	2079.53	0.38
7822.00	89.50	358.66	5683.57	2149.13 N	364.03 E	2170.09	0.48
7915.00	89.64	358.62	5684.27	2242.10 N	361.82 E	2262.64	0.16
8006.00	89.53	358.21	5684.92	2333.06 N	359.31 E	2353.17	0.47
8097.00	89.69	357.75	5685.54	2424.00 N	356.10 E	2443.63	0.54
8189.00	89.14	359.55	5686.48	2515.97 N	353.93 E	2535.19	2.05
8280.00	90.71	0.53	5686.60	2606.96 N	353.99 E	2625.94	2.03
8373.00	91.21	0.47	5685.04	2699.95 N	354.81 E	2718.73	0.54
8465.00	91.49	0.06	5682.88	2791.92 N	355.23 E	2810.49	0.54
8557.00	89.92	359.53	5681.75	2883.91 N	354.90 E	2902.21	1.80
8648.00	90.54	0.04	5681.38	2974.91 N	354.56 E	2992.93	0.88
8741.00	90.28	359.17	5680.71	3067.90 N	353.92 E	3085.63	0.98
8832.00	89.66	358.57	5680.76	3158.88 N	352.12 E	3176.23	0.95
8924.00	90.28	358.93	5680.81	3250.86 N	350.12 E	3267.81	0.78
9016.00	88.43	359.78	5681.85	3342.84 N	349.08 E	3359.47	2.21
9108.00	88.80	0.21	5684.07	3434.82 N	349.07 E	3451.19	0.62
9200.00	89.15	0.02	5685.72	3526.80 N	349.26 E	3542.94	0.43
9292.00	89.23	359.88	5687.02	3618.79 N	349.18 E	3634.67	0.18
9383.00	89.42	0.23	5688.09	3709.78 N	349.27 E	3725.43	0.44
9475.00	90.55	1.08	5688.11	3801.78 N	350.32 E	3817.25	1.54
9566.00	90.37	1.60	5687.38	3892.75 N	352.45 E	3908.13	0.60
9658.00	90.06	2.12	5687.04	3984.70 N	355.43 E	4000.05	0.66
9750.00	90.12	2.83	5686.89	4076.61 N	359.40 E	4092.01	0.77
9842.00	90.52	2.22	5686.38	4168.52 N	363.46 E	4183.96	0.79
9934.00	88.74	357.39	5686.97	4260.49 N	363.14 E	4275.66	5.59
10025.00	88.71	356.92	5689.00	4351.35 N	358.63 E	4365.95	0.52
10117.00	89.23	356.22	5690.65	4443.17 N	353.13 E	4457.11	0.95
10208.00	89.03	357.74	5692.03	4534.03 N	348.33 E	4547.37	1.68
10300.00	89.86	359.20	5692.92	4625.99 N	345.88 E	4638.90	1.83
10391.00	90.38	359.55	5692.73	4716.99 N	344.88 E	4729.58	0.69
10467.00	90.36	359.02	5692.24	4792.98 N	343.93 E	4805.29	0.70
10510.00	90.36	359.02	5691.97	4835.97 N	343.20 E	4848.11	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 4.22 DEGREES (TRUE)
A TOTAL CORRECTION OF 7.57 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10510.00 FEET
IS 4848.13 FEET ALONG 4.06 DEGREES (TRUE)

Tie onto surface at 0' MD
Final survey is a projection to the bit at TD

Date Printed:13 December 2014