

1 : 240

Country		: USA		Company : Anadarko Petroleum Corp.			
Field		: Wattenburg		Rig : Xtreme 22			
Location		: Lat: 40° 3' 20.51" North Long: 104°54' 58.43" West		Well : Griffiths 36C-20HZ			
Well		: Griffiths 36C-20HZ		Company : Anadarko Petroleum Corp.			
Company		: Anadarko Petroleum Corp.		Rig : Xtreme 22			
Rig		: Xtreme 22		LOCATION			
API Number : 05-123-36622		Latitude : 40° 3' 20.51" North Longitude : 104°54' 58.43" West		UTM Easting = 3,163,410.357 ft UTM Northing = 1,263,673.819 ft			
		UTM Easting = 3,163,410.357 ft UTM Northing = 1,263,673.819 ft		Other Services Directional Drilling			
Permanent Datum		: Ground Level		Elevation : 5060.00 ft		Elev. KB 5076.00 ft	
Log Measured From		: Kelly Bushing		16.00 ft Above Permanent Datum		DF 5077.00 ft GL 5060.00 ft WD N/A	
Drilling Measured From		: Kelly Bushing		MD LOG			
Depth Logged		: 1,005.00 ft To 16,774.00 ft		Unit No. : 11610117		Job No. : CA-XX-0900382957	
Date Logged		: 06-Jul-13 To 23-Jul-13		Plot Type : Final			
Total Depth MD		: 16,774.00 ft TVD : 7,812.27 ft		Plot Date : 23-Jul-13			
Spud Date		: 06-Jul-13					
Run No.	Borehole Record (MD)			Run No.	Borehole Record (MD)		
	Size	From	To		Size	From	To
0100	8.750 in	1,005.00 ft	7,256.00 ft				
0200	8.750 in	7,256.00 ft	8,080.00 ft				
0300	6.125 in	8,080.00 ft	11,097.00 ft				
0400	6.125 in	11,097.00 ft	14,798.00 ft				
0500	6.125 in	14,798.00 ft	16,774.00 ft				
				Size	Casing Record (MD) Weight	From	To
				9.625 in	36.00 lbpf	SURFACE	1,028.00 ft
				7.000 in	24.00 lbpf	SURFACE	8,070.00 ft

WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	09-Jul-13	11-Jul-13	14-Jul-13	18-Jul-13	23-Jul-13
Rig Bit Number	0100	0200	0300	0400	0500
Bit Size (in)	8.750	8.750	6.125	6.125	6.125
Tool Nominal OD (in)	6.750	6.750	4.750	4.750	4.750
Log Start Depth (MD, ft)	1,062.00	7,256.00	8,080.00	11,097.00	14,798.00
Log End Depth (MD, ft)	7,256.00	8,080.00	11,097.00	14,798.00	16,774.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	07-Jul-13 06:30	09-Jul-13 09:10	12-Jul-13 02:40	15-Jul-13 15:10	19-Jul-13 15:20
Drill/Wipe End Date and Time	08-Jul-13 18:15	10-Jul-13 15:15	14-Jul-13 04:45	18-Jul-13 05:15	21-Jul-13 17:45
Min Inc (deg) @ Depth (MD, ft)	.57 @ 6,479.00	11.46 @ 7,293.00	88.52 @ 10,001.00	87.65 @ 13,110.00	87.10 @ 15,680.00
Max Inc (deg) @ Depth (MD, ft)	11.78 @ 3,696.00	87.63 @ 8,032.00	91.85 @ 8,201.00	91.79 @ 12,081.00	90.62 @ 16,774.00
Bit TFA(in2) / Bit Type	2.23 / PDC	2.23 / PDC	.98 / PDC	.98 / PDC	1.24 / N/A
Flow Rate (gpm)	631.70	537.41	277.89	252.99	248.33
Max AV (fpm) / CV (fpm) @ MWD	241.2 / N/A	197.1 / N/A	336.6 / N/A	N/A / N/A	262.0 / N/A
Fluid Type	Fresh Water Gel	Fresh Water Gel	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas
Density (ppg) / Viscosity (spqt)	8.60 / 29.00	10.30 / 45.00	10.15 / 58.00	10.45 / 70.00	10.47 / 62.00
Filtrate CL (ppm)	1,400.00	1,300.00	50,000.00	55,000.00	253,593.00
pH / Fluid Loss (mptm)	7.50 / 0	8.80 / 4	N/A / N/A	N/A / N/A	N/A / N/A
PV (cP) / YP (lbf2)	1 / 1.00	11 / 11.00	14 / 13.00	29 / 9.00	29 / 9.00
% Solids / % Sand	2.00 / 0.00	10.00 / 0.10	13.00 / 0.15	16.00 / 0.15	15.30 / 0.25
% Oil / Oil:Water Ratio	N/A / N/A	3.00 / N/A	63.00 / 73:27	58.5 / 74:26	60.80 / 72:28
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	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	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (deg F) @ 100 ft	122.55 / DGM	122.55 / DGM	682.12 / UGDM	651.05 / UGDM	651.05 / UGDM

Max Tool Temp (degF) / Source	182.55 / PCM	182.55 / PCM	226.12 / HCIM	254.35 / HCIM	254.35 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 182.55	N/A @ 182.55	N/A @ 226.12	N/A @ 254.35	N/A @ 254.35
Lead MWD Engineer	Caleb Jones	Clay Wass	Clay Wass	Clay Wass	Clay Wass
Customer Representative	David Cornett	David Cornett	David Cornett	Scott Hancock	Scott Hancock

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	HCIM	HCIM	HCIM
Software Version	5.84	5.84	88.47	88.56	88.47
Sub Serial Number	11023390	0	240135	10537450	240135
Insert Serial Number	11620297	11620297	11473656	10990340	11473656
Date and Time Initialized	07-Jul-13 02:25	07-Jul-13 02:25	12-Jul-13 14:29	14-Jul-13 14:52	18-Jul-13 21:57
Date and Time Read	11-Jul-13 09:36	11-Jul-13 09:39	01-Jan-70 00:00	01-Jan-70 00:00	23-Jul-13 11:40
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	50.39	48.00	48.50	48.47	48.55
Software Version	6.21	6.21	6.21	6.21	6.21
Sub Serial Number	11023390	0	12121249	12121249	12121249
Sonde Serial Number	11638477	11638477	11478019	11638477	11478019
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	324.00	304.62	252.61	288.15	49.47

Gamma Ray Sensor Information

Tool Type	PCG	PCG	DGR	DGR	DGR
Distance From Bit (ft)	45.66	41.27	69.72	70.48	69.77
Recorded Sample Period (sec)	10	10	8	8	8
Software Version	8.15	8.15	N/A	N/A	N/A
Sub Serial Number	11023390	0	240135	268169	240135
Insert/Sonde Serial Number	11680968	11680968	094063	11219152	094063

Resistivity Sensor Information

Tool Type			Slim P4	Slim P4	Slim P4
Distance From Bit (ft)			63.22	63.48	63.27
Recorded Sample Period (sec)			10	10	10
Software Version			5.55	5.55	5.55
Sub Serial Number			240135	251278	240135
Receiver Insert Serial Number			265025	10537450	265025
Transmitter Insert Serial Number			243460	271830	243460
Receiver Orientation			Down	Down	Down

REMARKS

depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Kelly Bushing, 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" 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:

DGR (Dual Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

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

Insite version: 7.4.20

WARRANTY

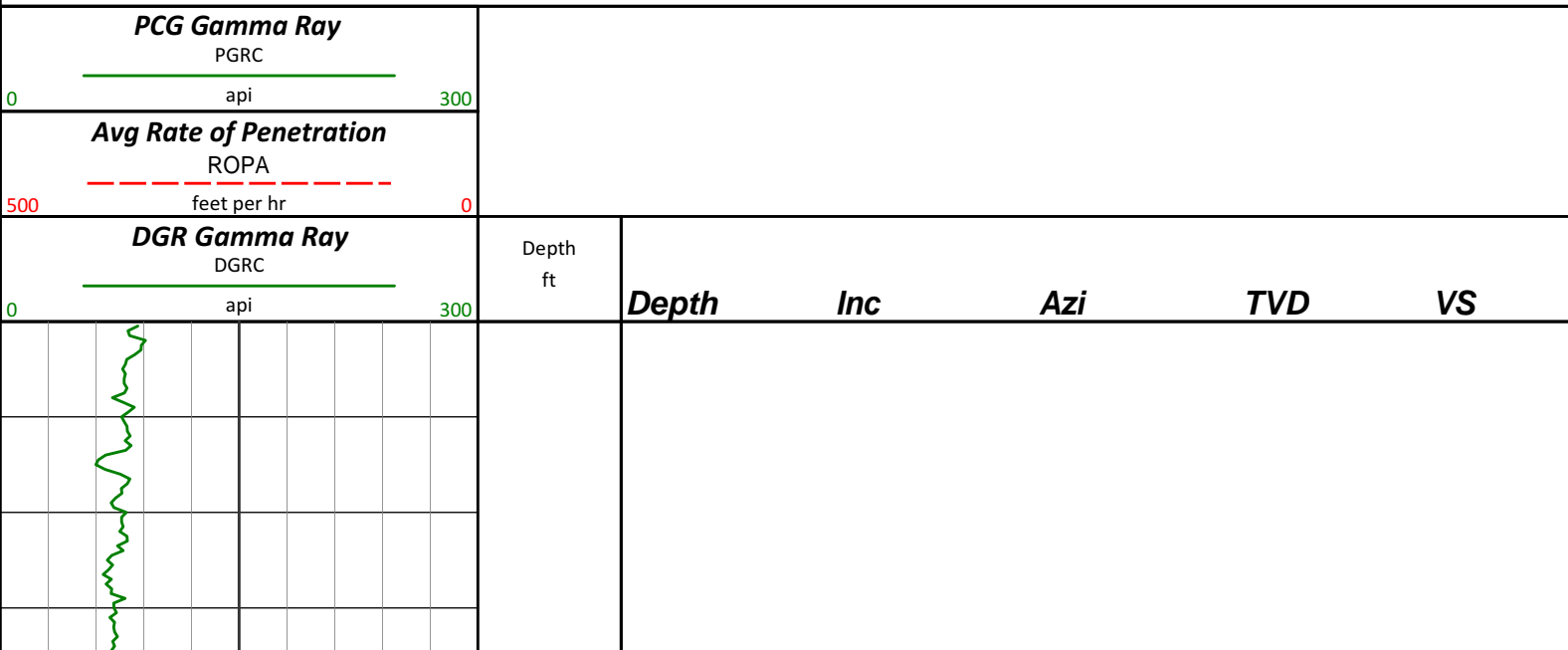
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

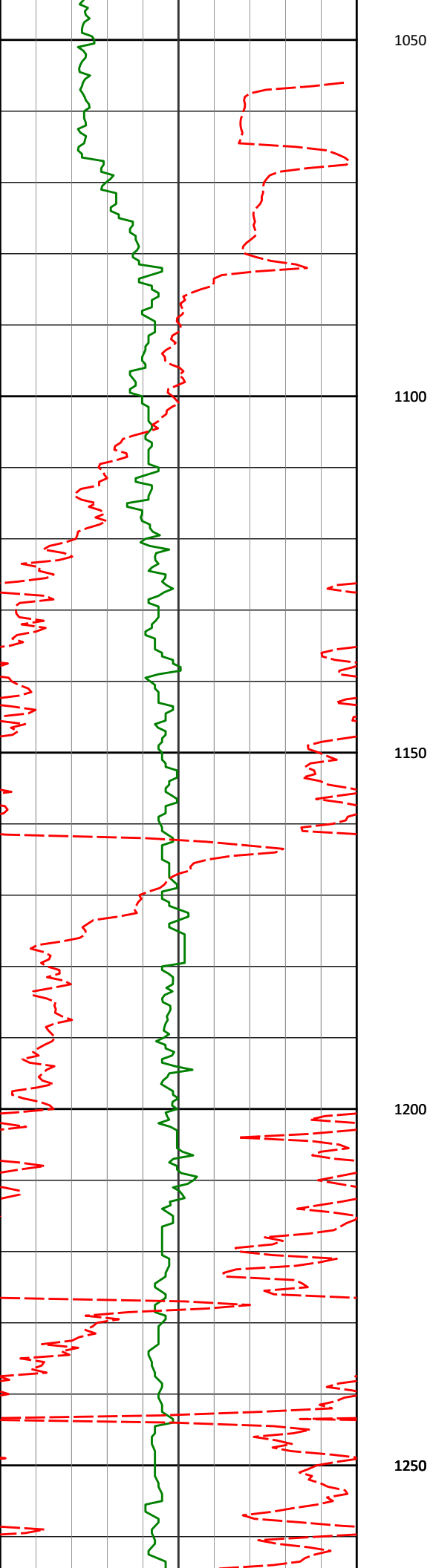
HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240

Company: Anadarko PC
Well: Wishbone 29N-E24HZ
Rig: Xtreme 22
Township and Range: T2N - R66W





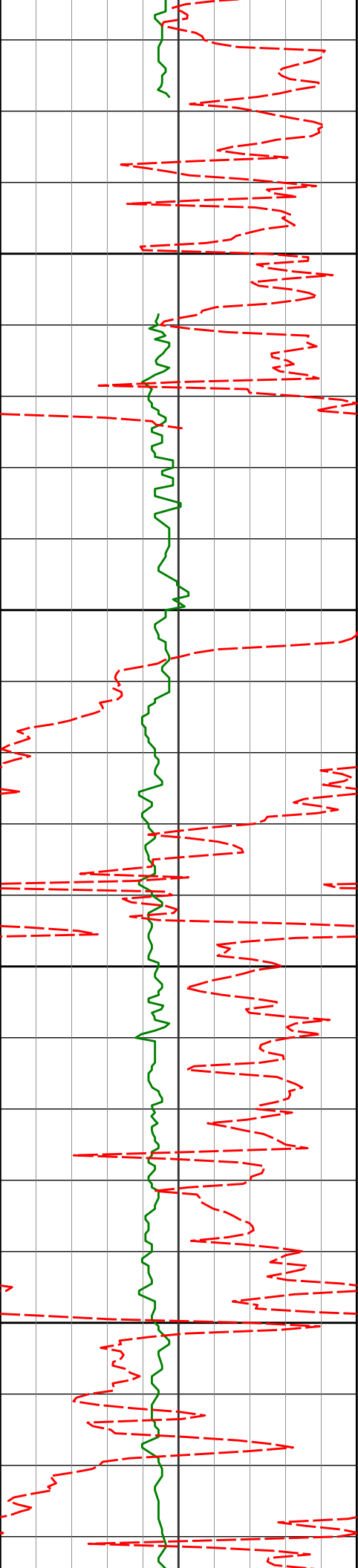
1206'

1.80°

123.63°

1205.73'

1.57'

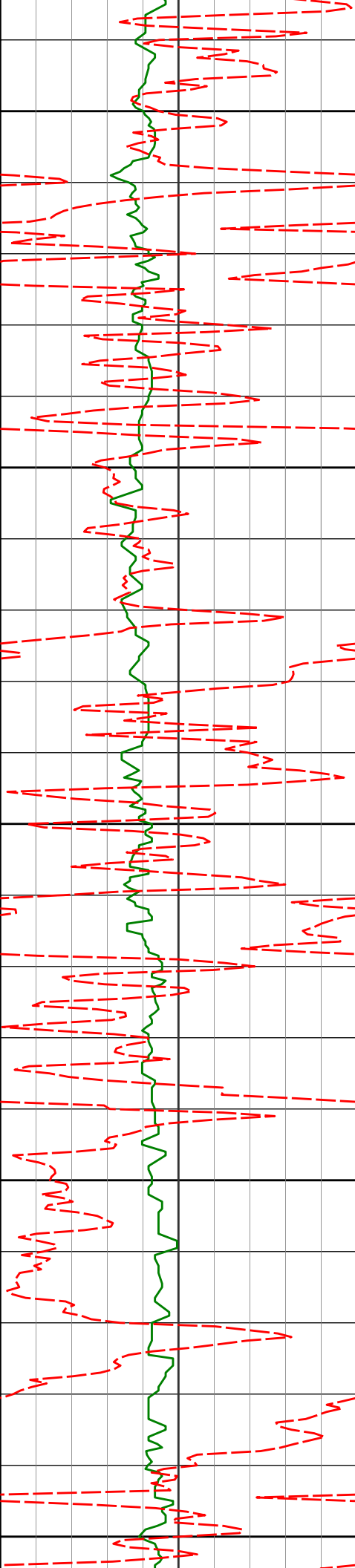


1300

1350

1400

1450



1492'

2.73°

161.14°

1491.52'

10.54'

1500

1550

1587'

5.23°

160.36°

1586.28'

16.78'

1600

1650

1682'

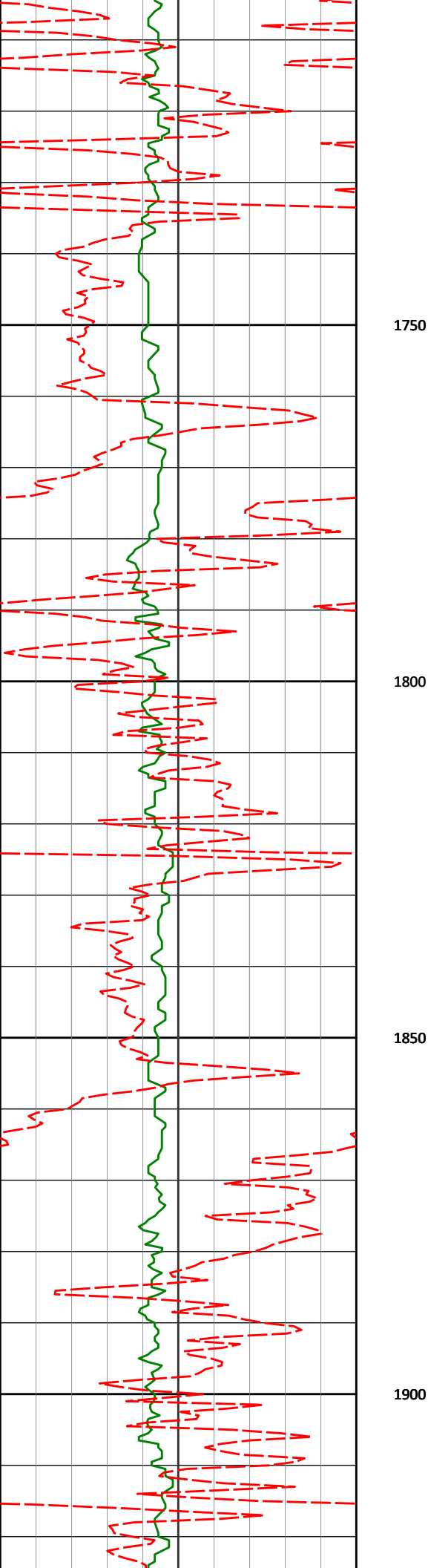
7.45°

171.37°

1680.70'

26.96'

1700



1773'

10.44°

171.07°

1770.58'

40.95'

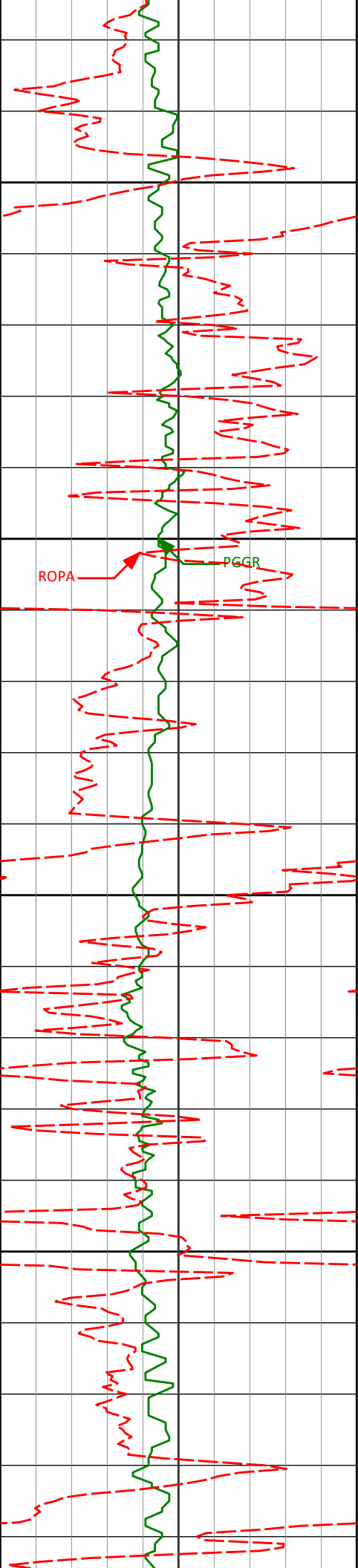
1865'

10.00°

154.12°

1861.14'

56.40'



1950

1957'

8.69°

140.34°

1951.93'

68.98'

2000

2050

2048'

8.00°

118.82°

2041.99'

77.39'

2100

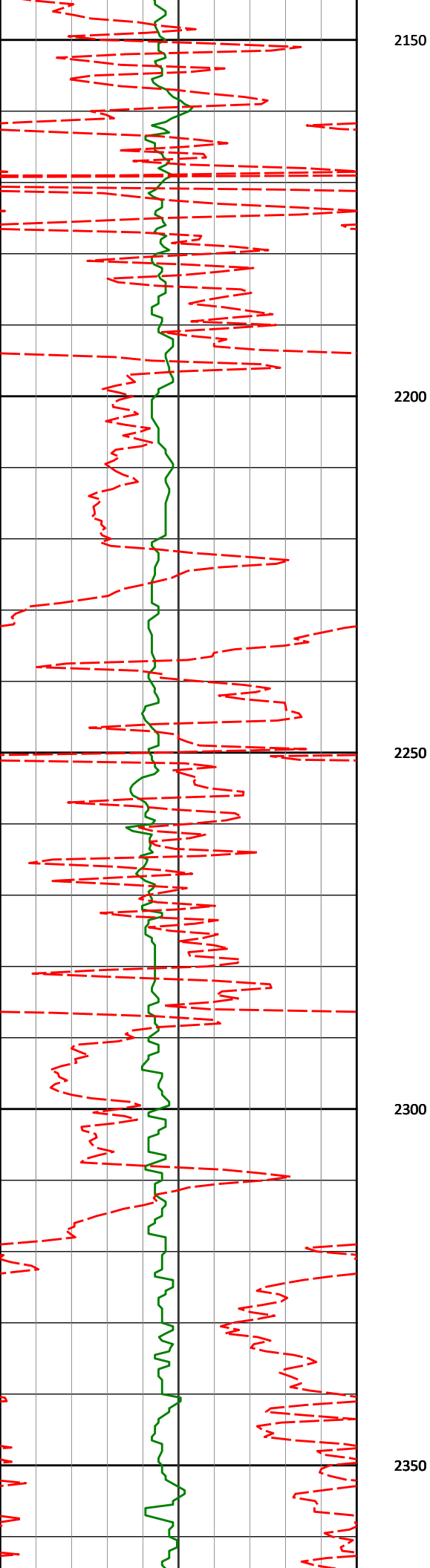
2140'

8.72°

97.48°

2133.03'

81.46'



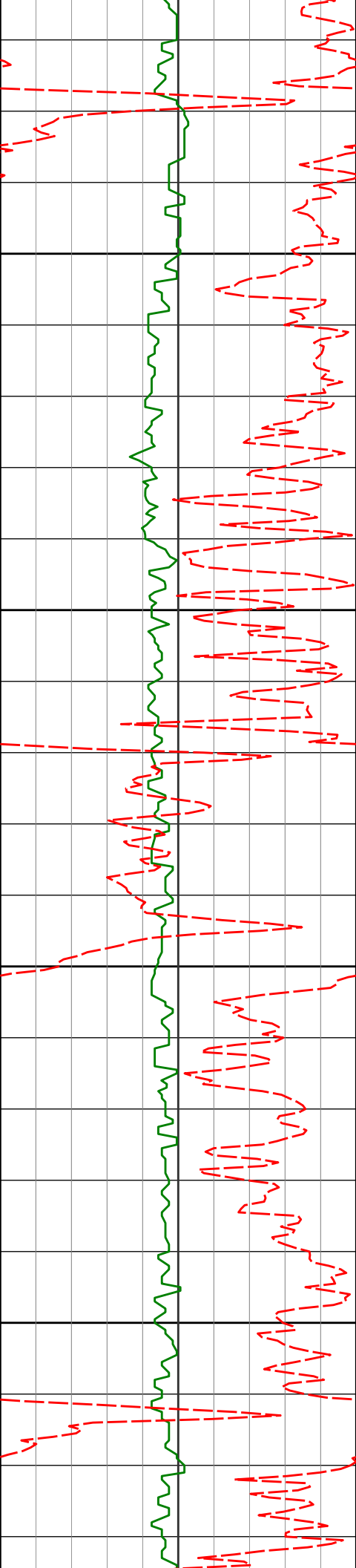
2232'

7.66°

75.49°

2224.11'

80.91'



2400

2414'

6.59°

74.21°

2404.71'

75.16'

2450

2500

2506'

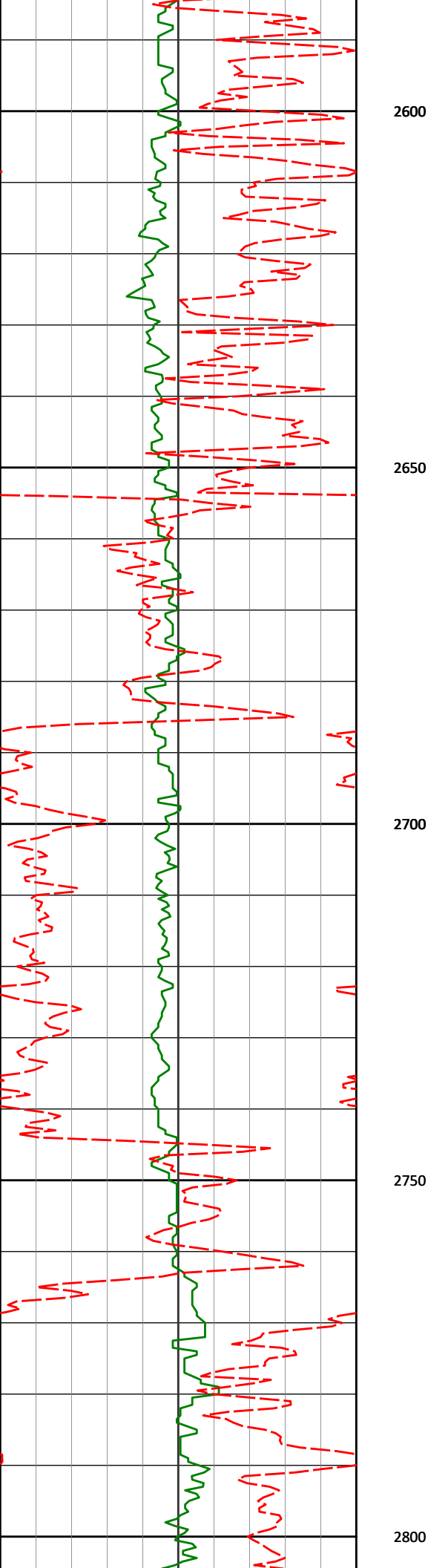
5.77°

80.54°

2496.17'

73.02'

2550



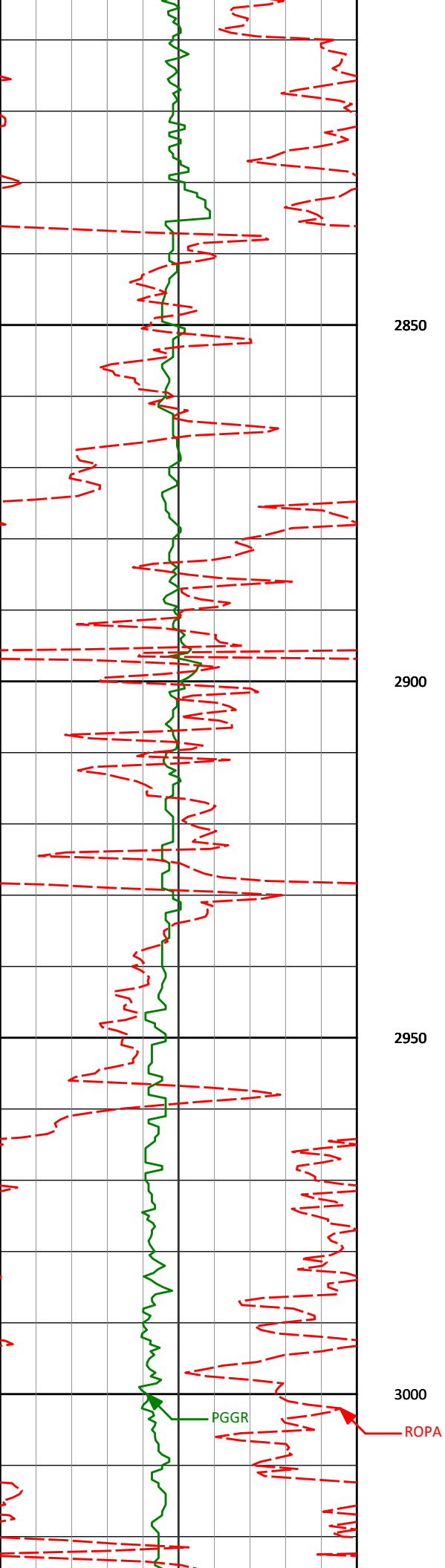
2689'

6.06°

62.85°

2678.21'

67.21'



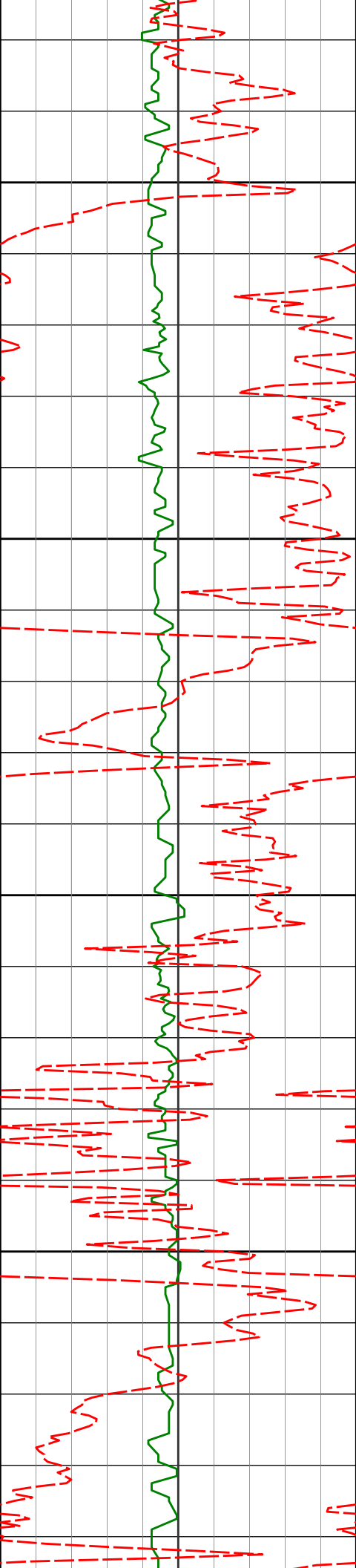
2872'

7.61°

54.94°

2859.91'

55.96'



3050

3054'

8.02°

53.19°

3040.22'

41.55'

3100

3150

3200

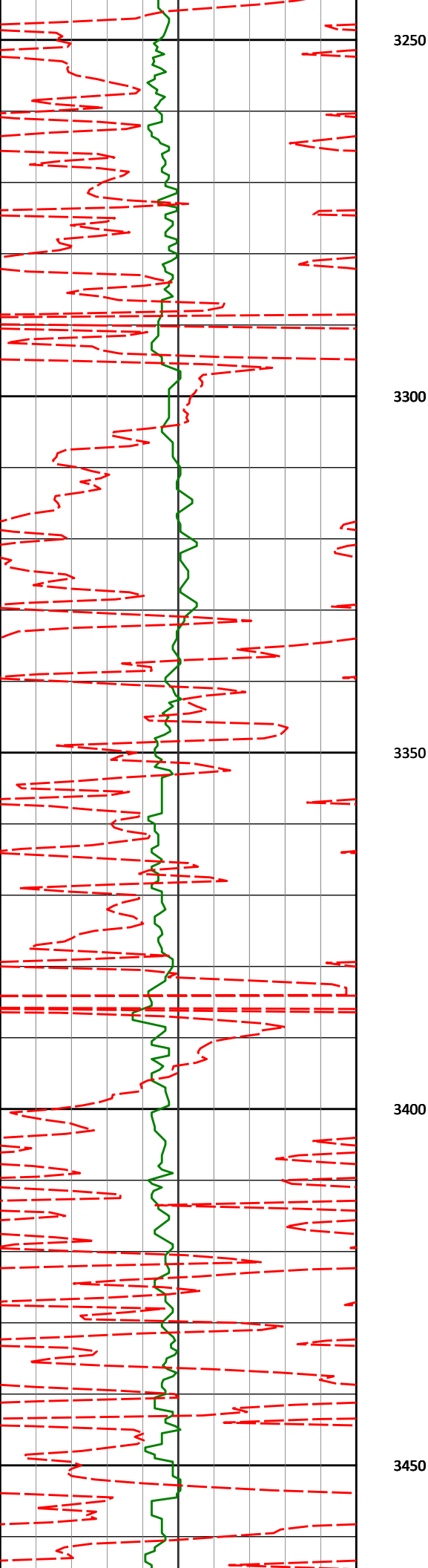
3238'

7.81°

40.82°

3222.48'

24.51'



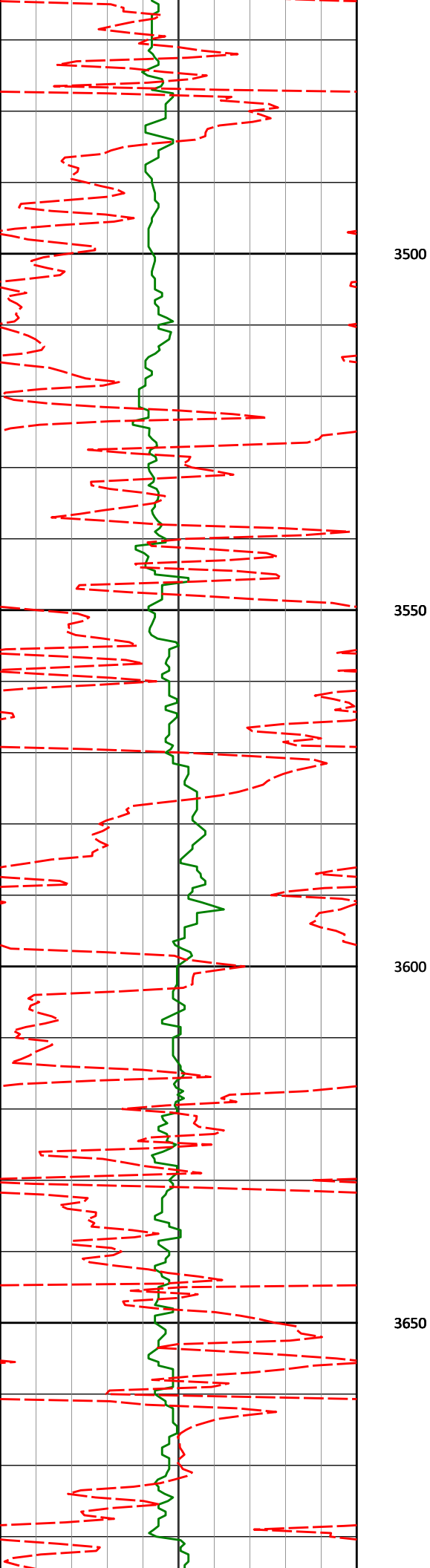
3421'

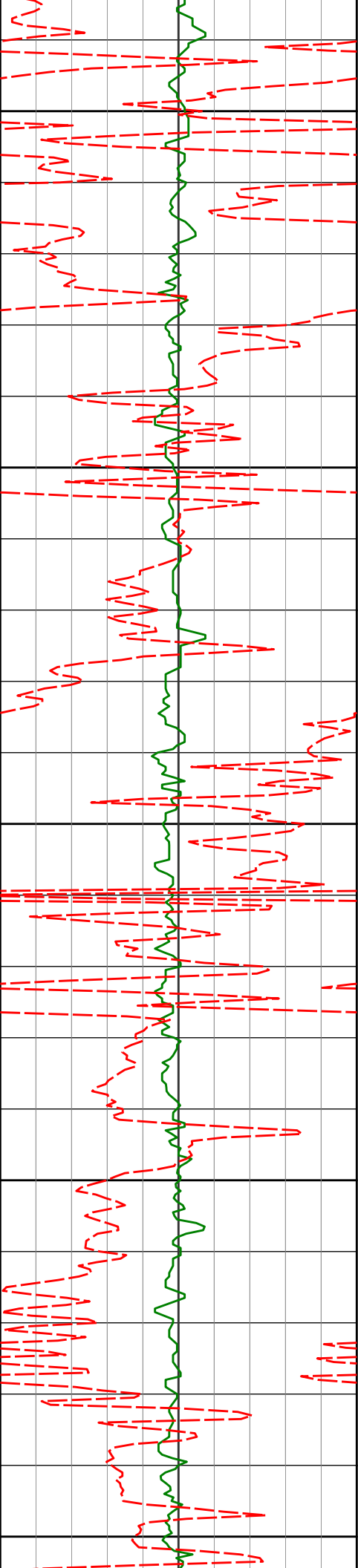
9.88°

45.40°

3403.30'

4.20'





3696'

11.78°

43.15°

3673.39'

-32.64'

3700

3750

3800

3850

3880'

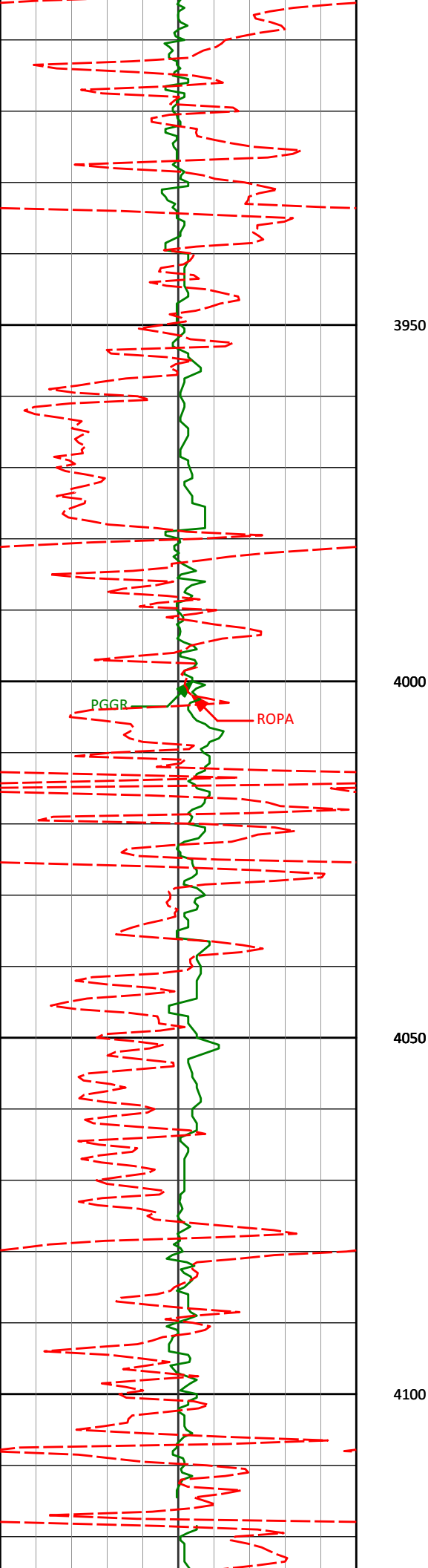
9.12°

59.04°

3854.35'

-53.70'

3900



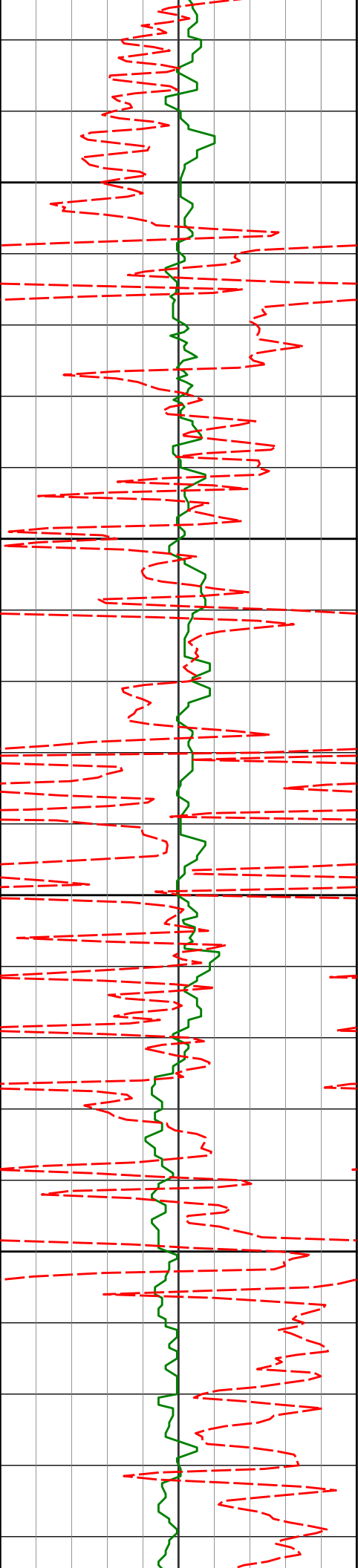
4062'

7.04°

67.96°

4034.54'

-65.17'



4150

4200

4250

4300

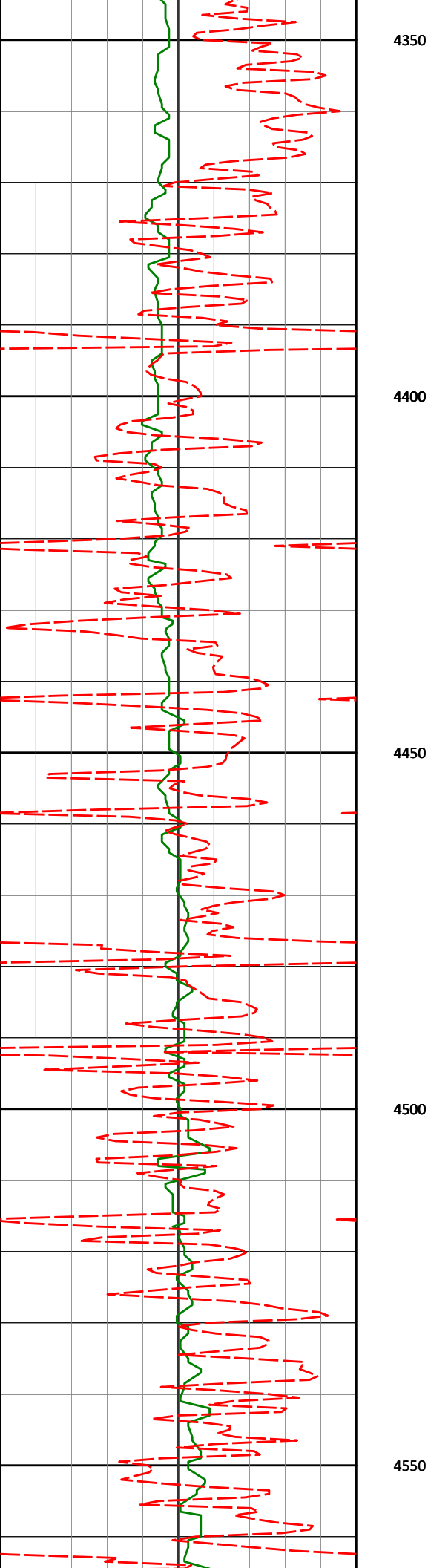
4245'

5.94°

95.84°

4216.41'

-68.30'



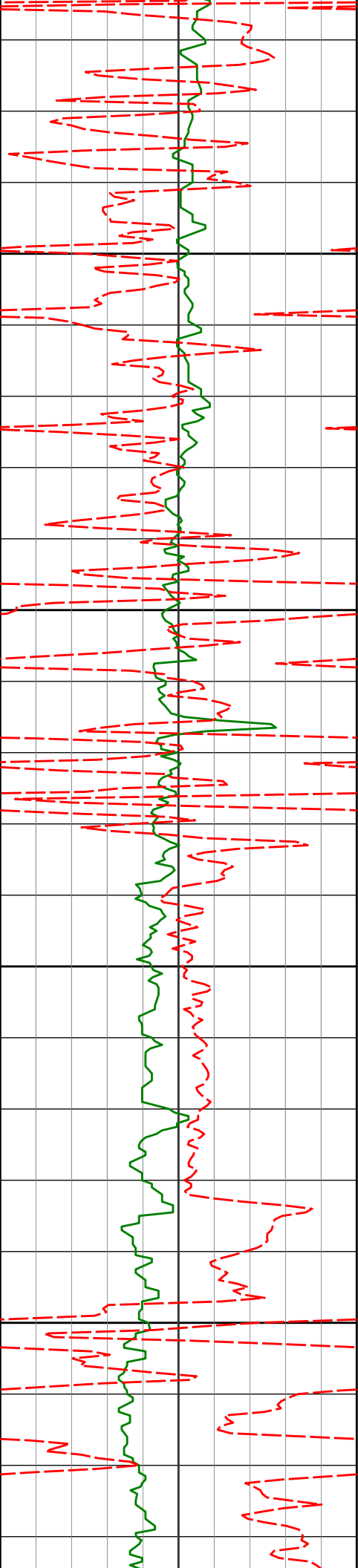
4422'

4.02°

94.10°

4392.74'

-66.83'



4594'

2.66°

60.73°

4564.46'

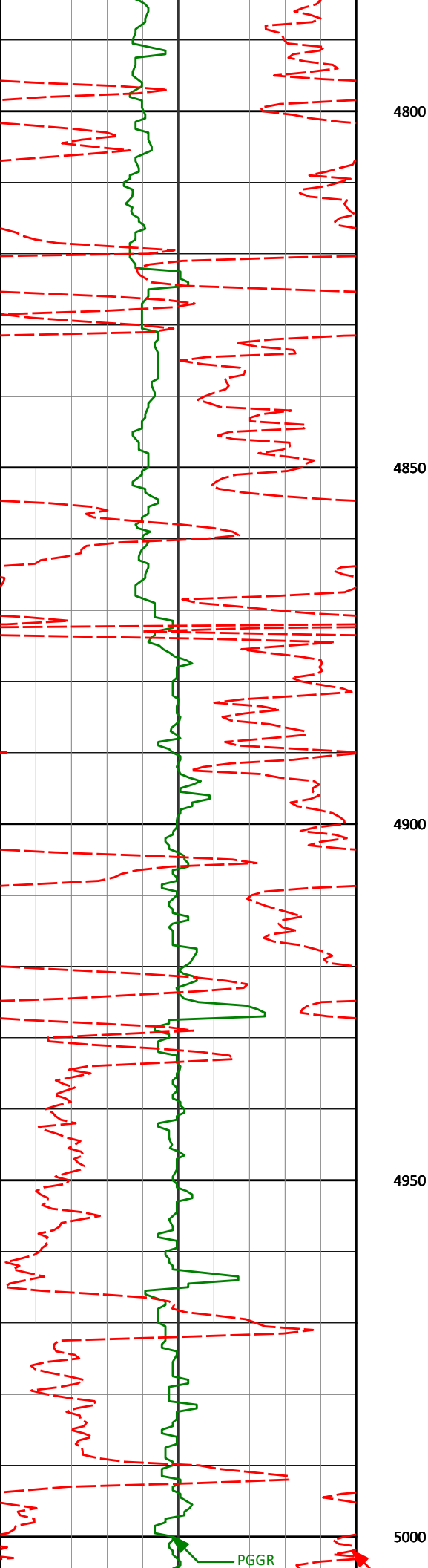
-68.29'

4600

4650

4700

4750



4851'

2.42°

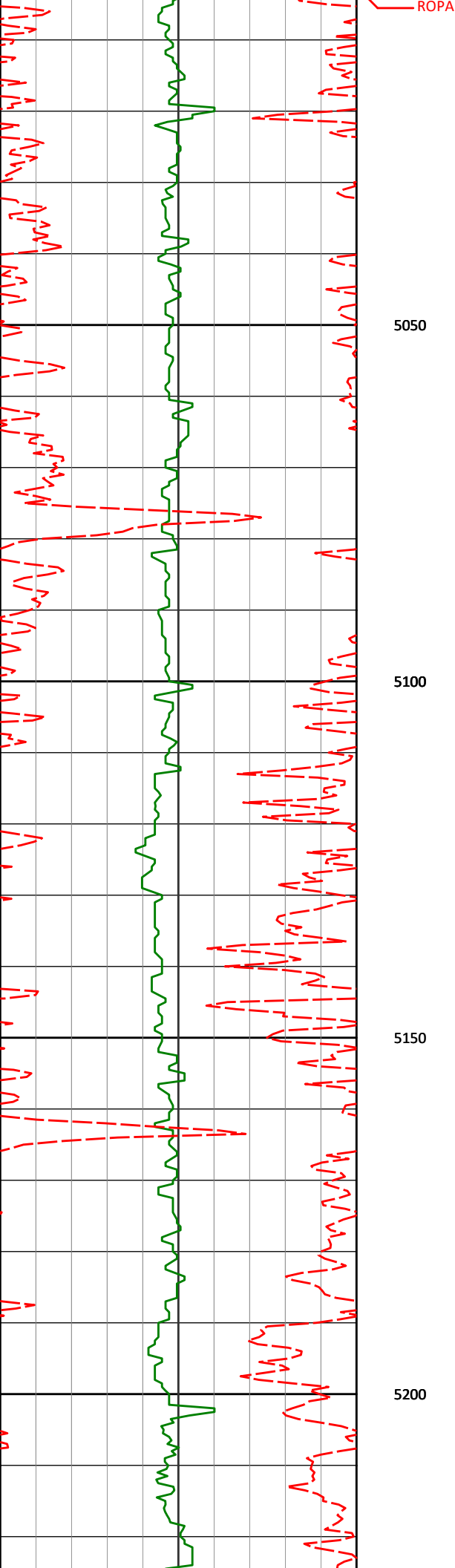
48.42°

4821.21'

-74.75'

5000

PGGR



5022' 2.16° 43.18° 4992.07' -79.46'

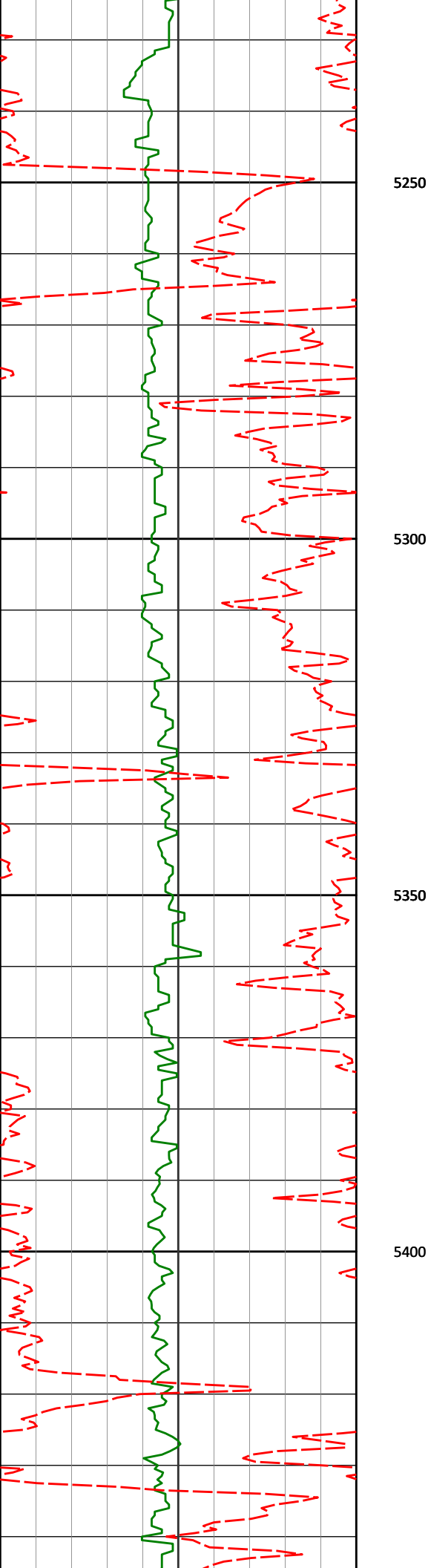
5050

5100

5150

5193' 2.34° 27.31° 5162.94' -84.89'

5200



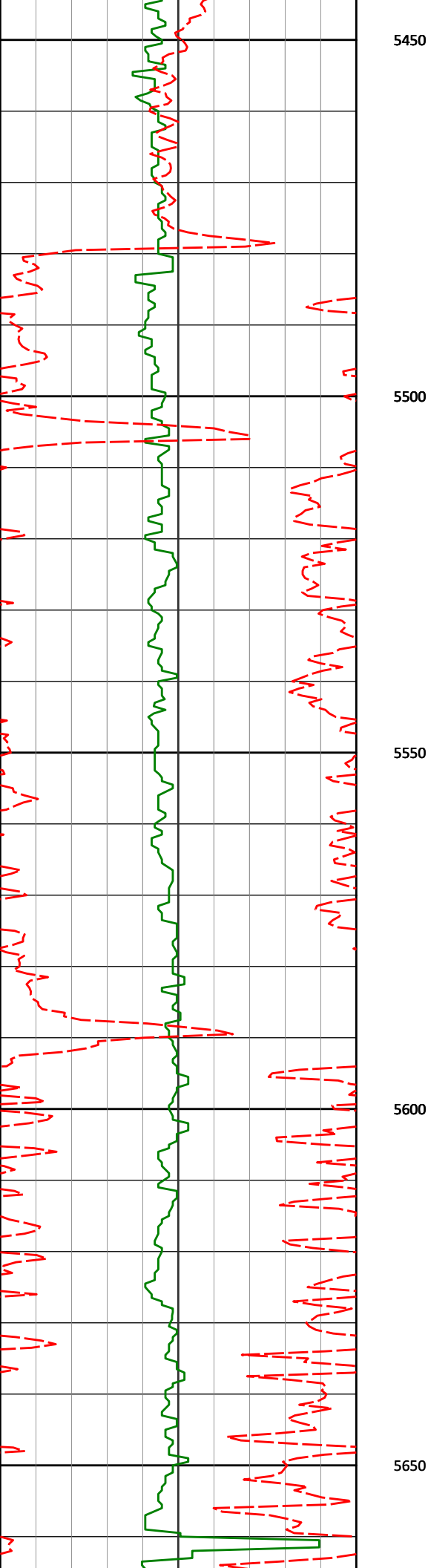
5365'

1.95°

40.12°

5334.82'

-90.23'



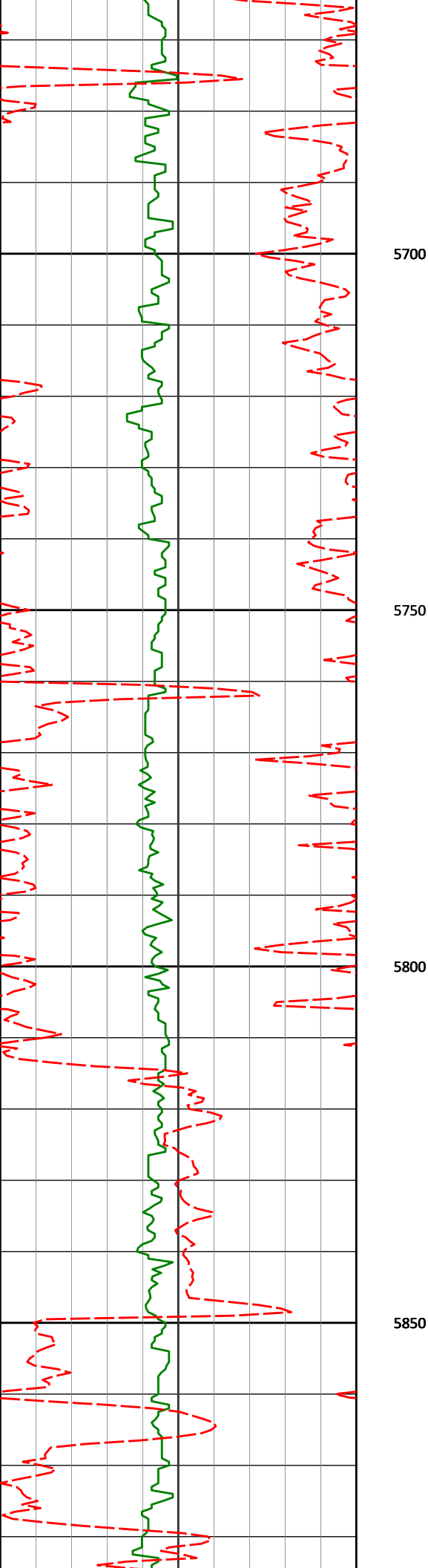
5536'

2.03°

112.07°

5505.74'

-91.29'



5700

5708'

1.67°

102.92°

5677.65'

-89.55'

5750

5800

5850

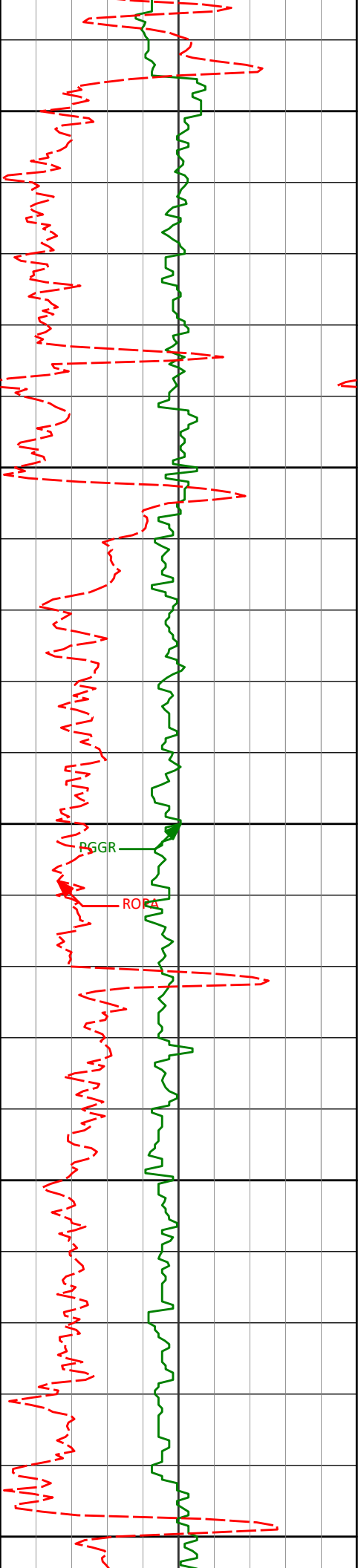
5879'

1.21°

104.62°

5848.60'

-88.51'



5900

5950

6000

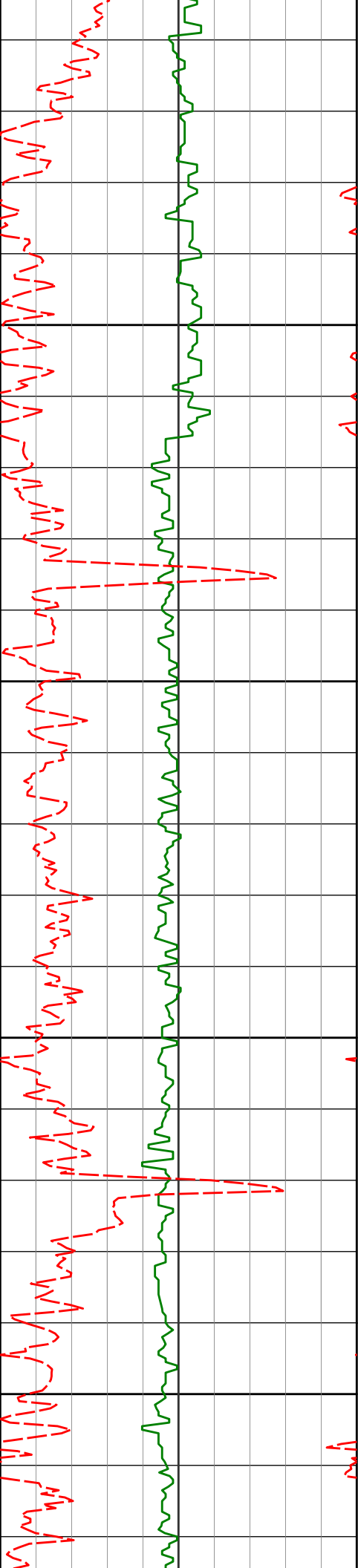
6050

6100

ROGR

ROP

6051'	1.04°	97.77°	6020.56'	-87.82'
-------	-------	--------	----------	---------



6150

6200

6250

6300

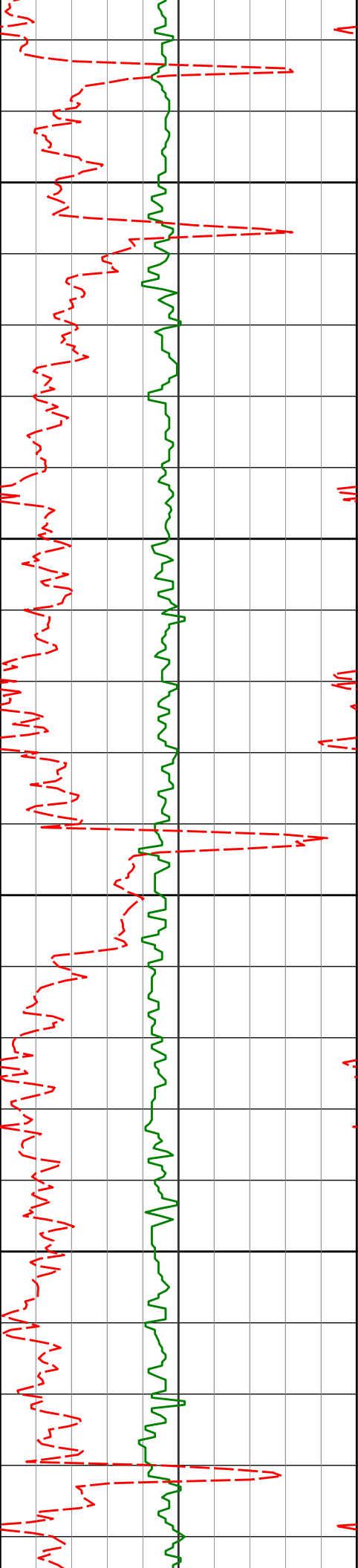
6222'

0.95°

95.10°

6191.54'

-87.46'



6350

6400

6450

6500

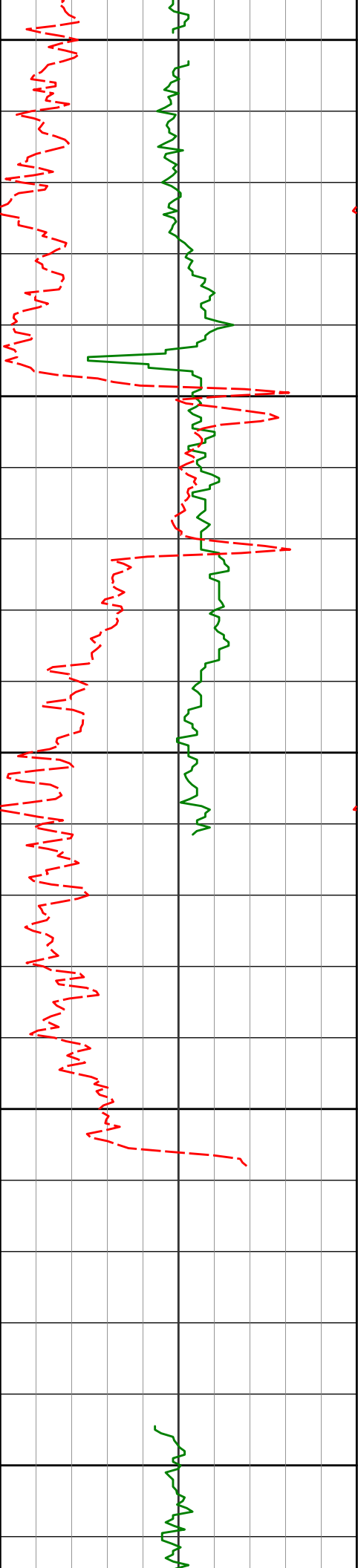
6479'

0.57°

58.84°

6448.52'

-87.91'



6550

6600

6650

Pason Down no Wipe

6700

6750

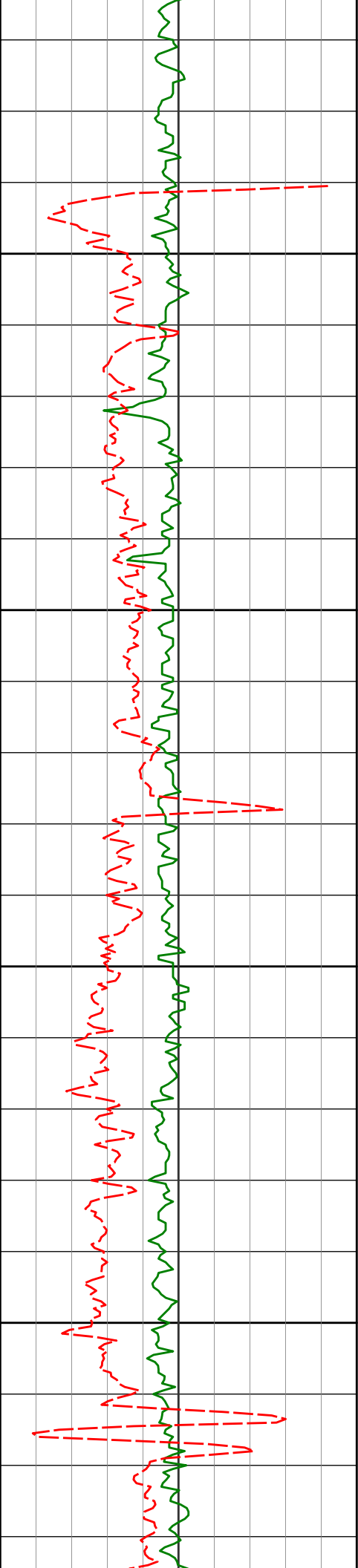
6736'

0.72°

65.31°

6705.50'

-89.23'



6800

6850

6900

6950

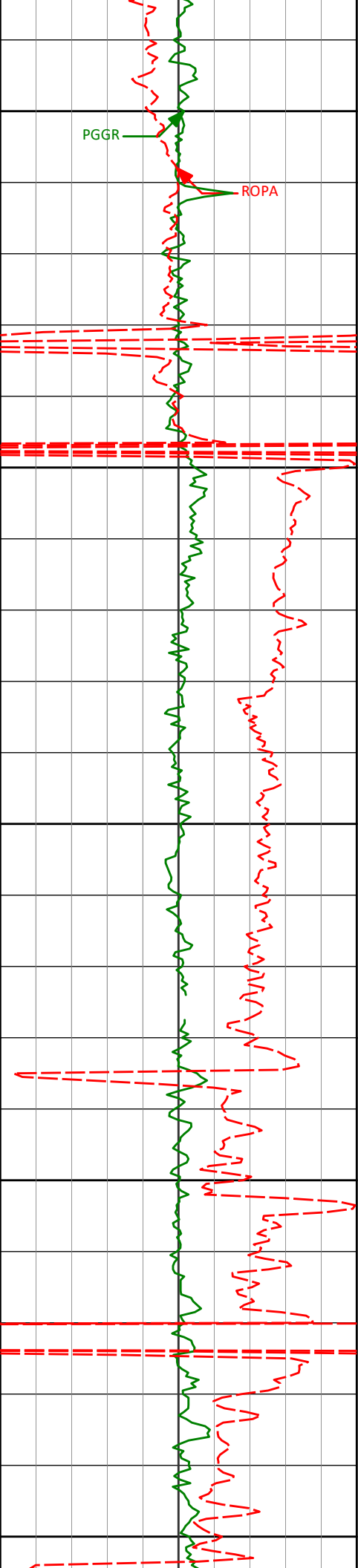
6908'

0.80°

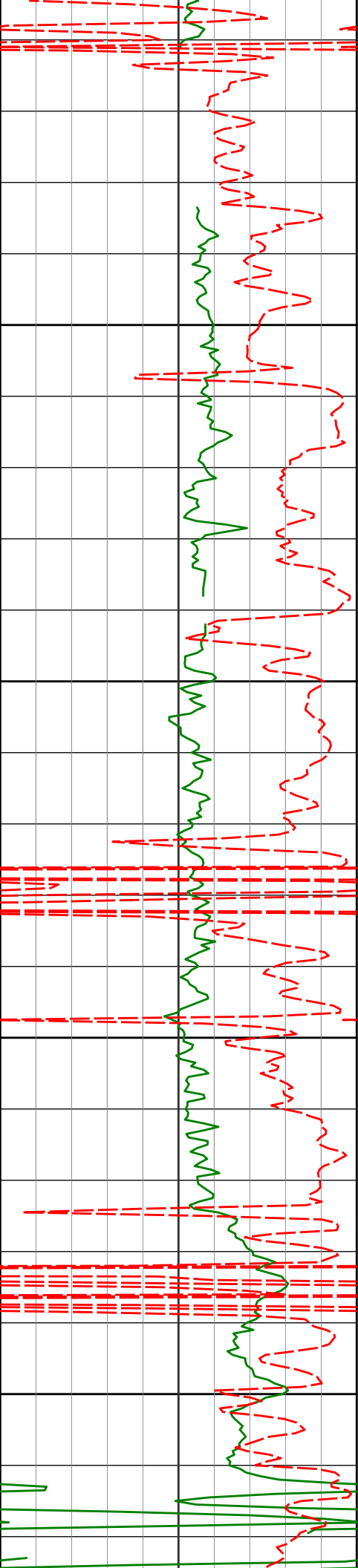
63.95°

6877.48'

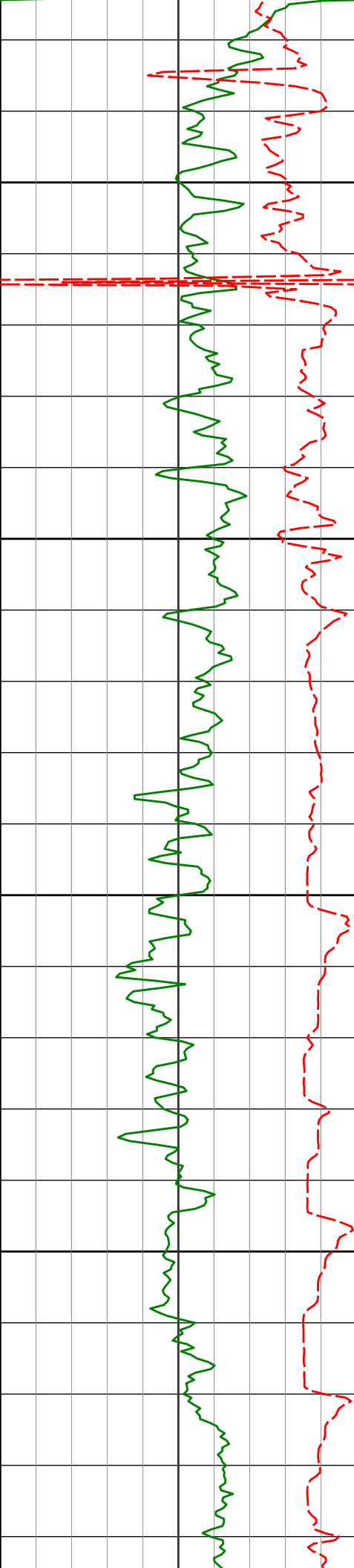
-90.19'



7000	6993'	0.94°	64.84°	6962.47'	-90.74'
	7036'	1.10°	72.84°	7005.47'	-91.01'
7050					
	7079'	2.34°	111.89°	7048.45'	-90.80'
7100					
	7122'	4.52°	136.51°	7091.37'	-89.23'
7150					
	7162'	6.76°	147.22°	7131.18'	-86.09'
7200					



	7205'	8.10°	154.21°	7173.81'	-81.22'
7250	7251'	8.80°	148.13°	7219.32'	-75.30'
Run 200					
	7293'	11.46°	136.65°	7260.66'	-69.50'
7300					
	7337'	15.05°	133.55°	7303.48'	-62.34'
7350					
	7380'	17.44°	141.03°	7344.77'	-53.43'
7400					
	7423'	17.09°	154.87°	7385.85'	-42.66'



7450

7500

7550

7600

7466'

20.74°

160.65°

7426.52'

-29.72'

7508'

23.45°

162.87°

7465.43'

-14.68'

7551'

28.05°

165.39°

7504.15'

3.32'

7594'

33.59°

166.47°

7541.07'

24.71'

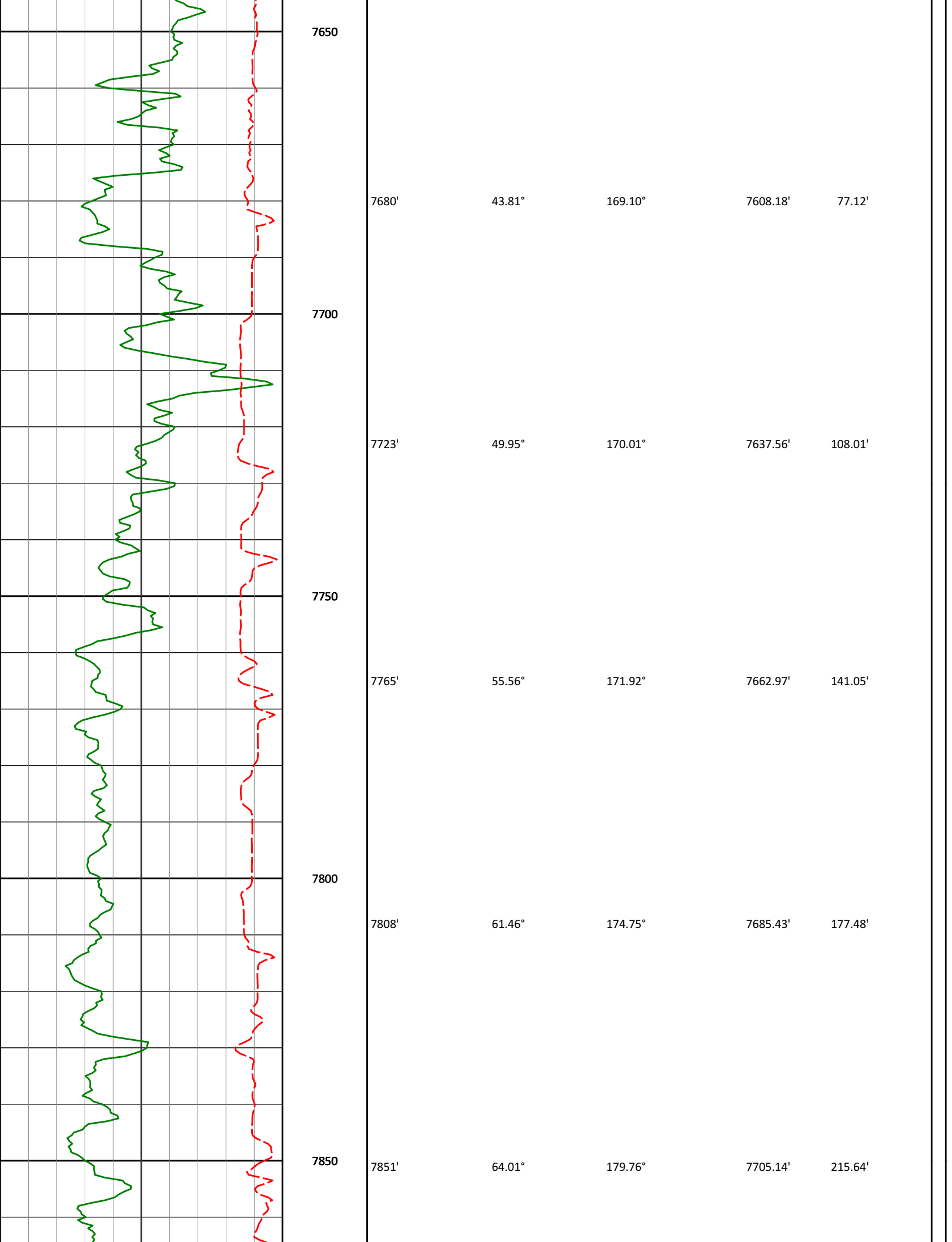
7637'

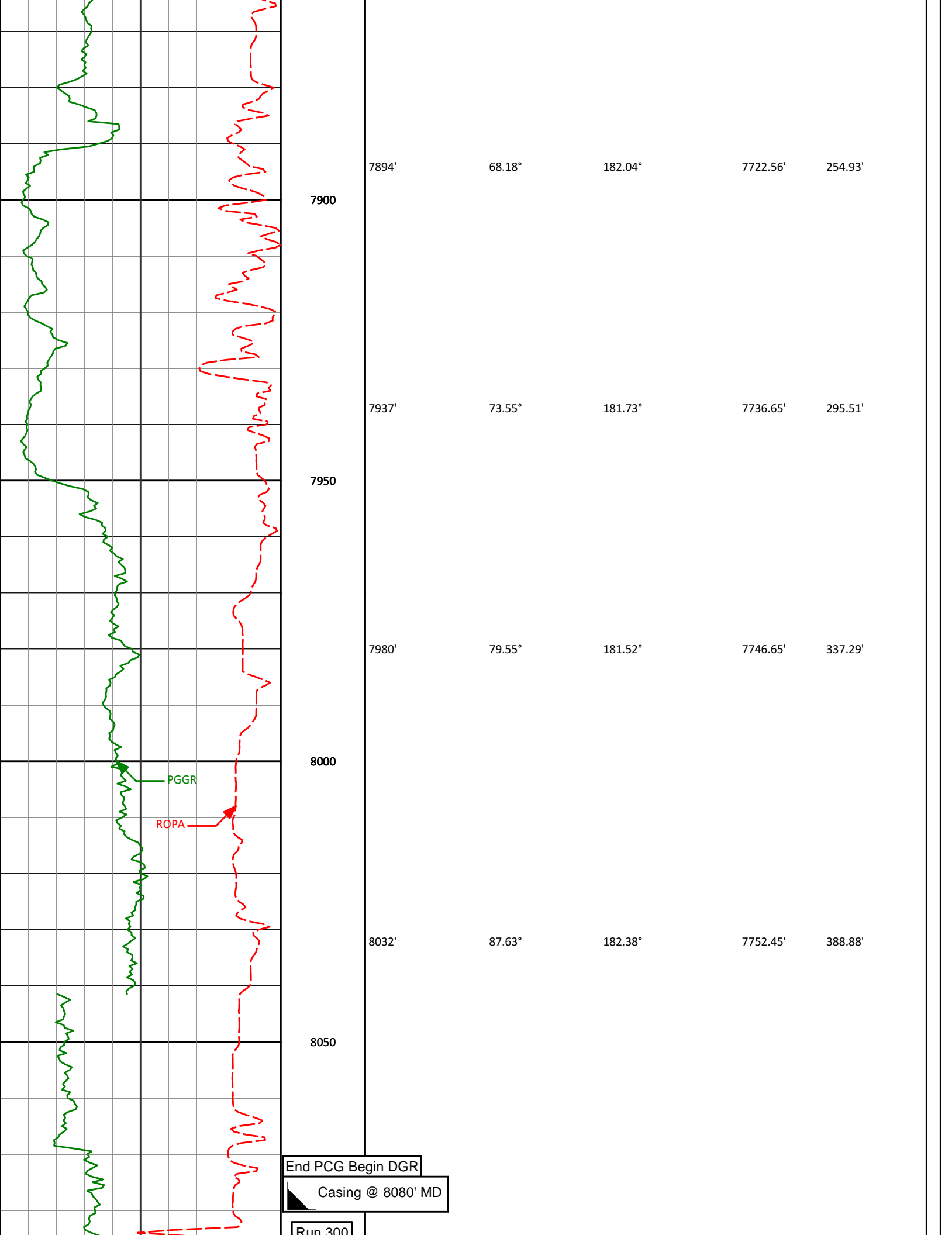
38.52°

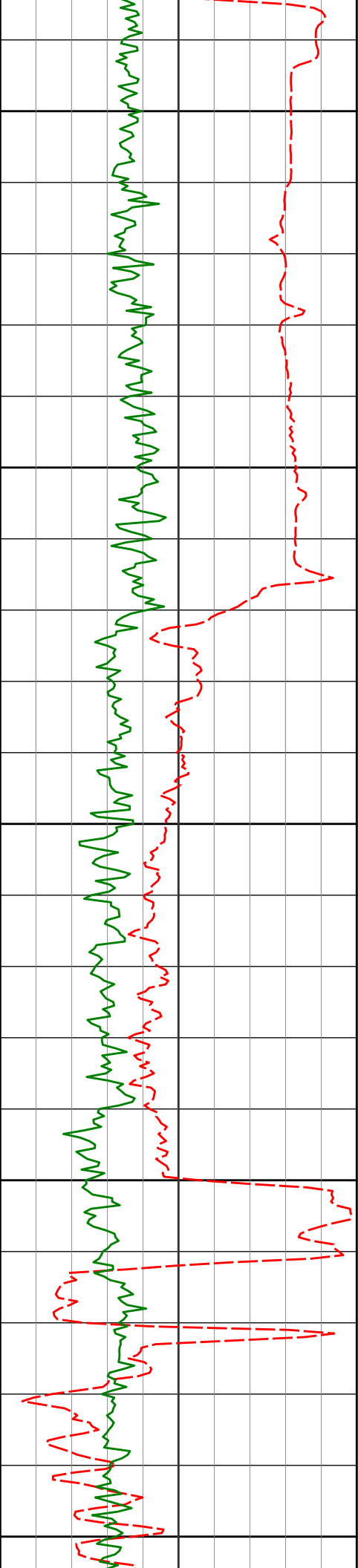
167.31°

7575.82'

49.39'







Run 000

8100

8115'

91.30°

182.99°

7753.23'

471.74'

8150

8200

8201'

91.85°

182.68°

7750.87'

557.58'

8250

8300

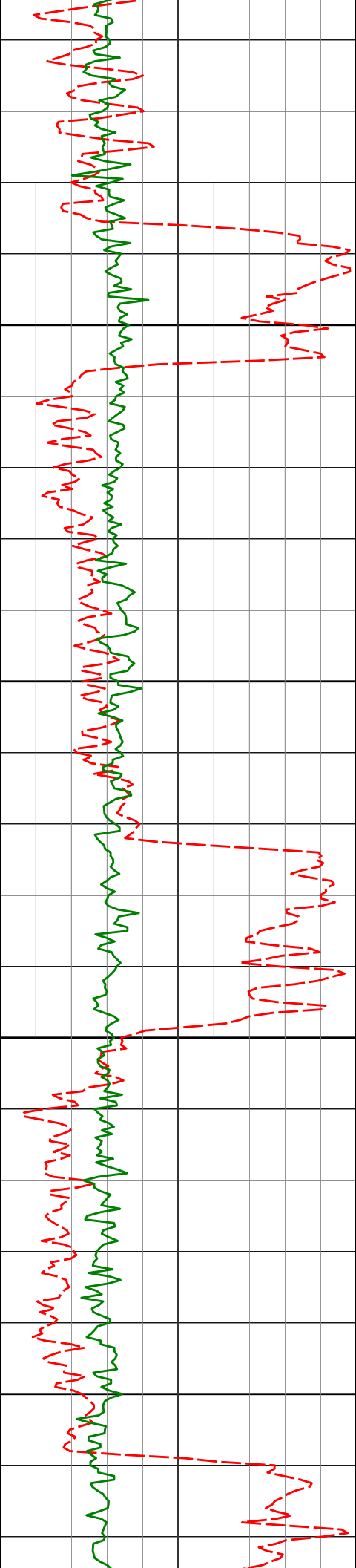
8287'

91.73°

182.04°

7748.19'

643.44'



8350

8372'

91.73°

181.51°

7745.62'

728.34'

8400

8450

8458'

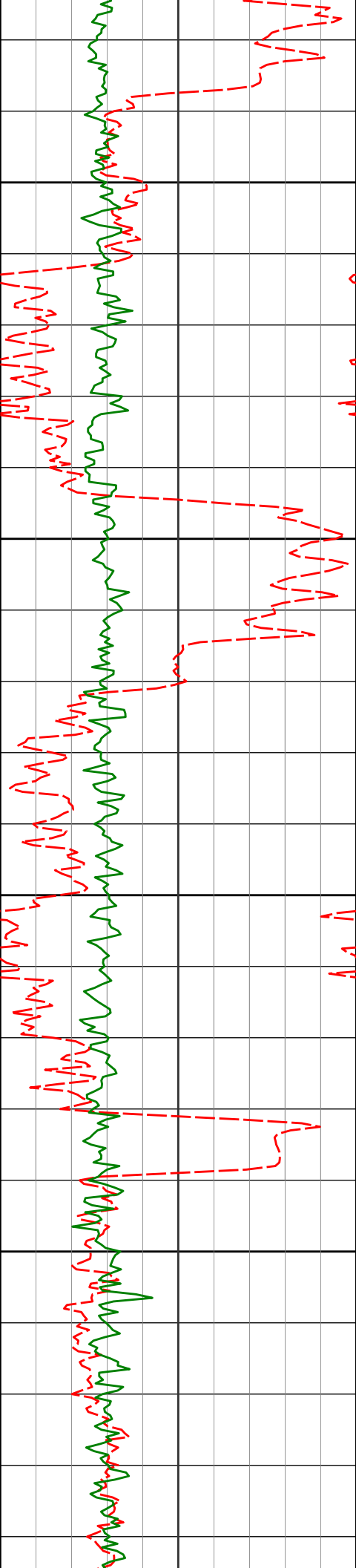
91.29°

182.18°

7743.35'

814.25'

8500



8544'

90.37°

181.85°

7742.10'

900.16'

8550

8600

8629'

89.69°

182.35°

7742.05'

985.08'

8650

8700

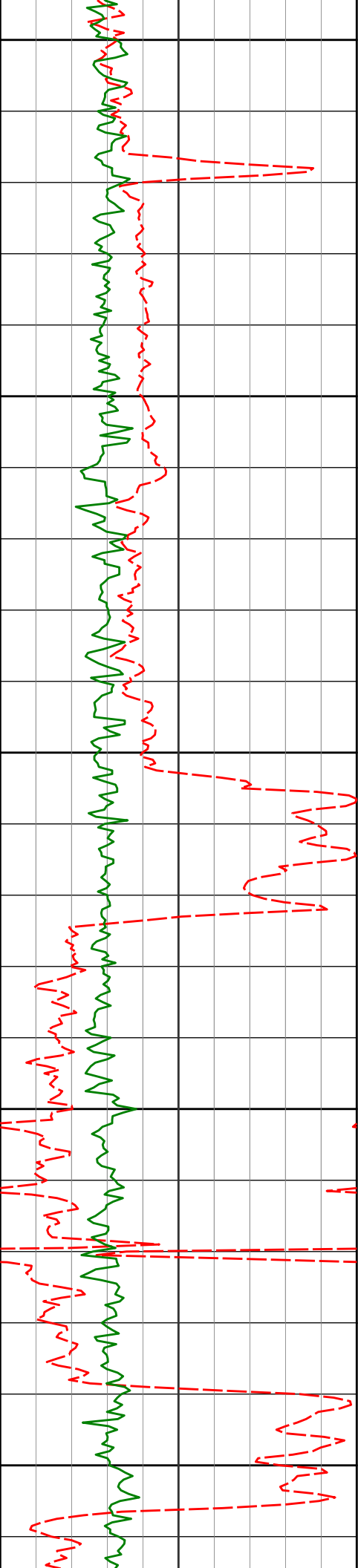
8715'

89.69°

181.24°

7742.52'

1071.02'



8750

8800

8850

8900

8950

8801'

89.63°

180.16°

7743.03'

1157.00'

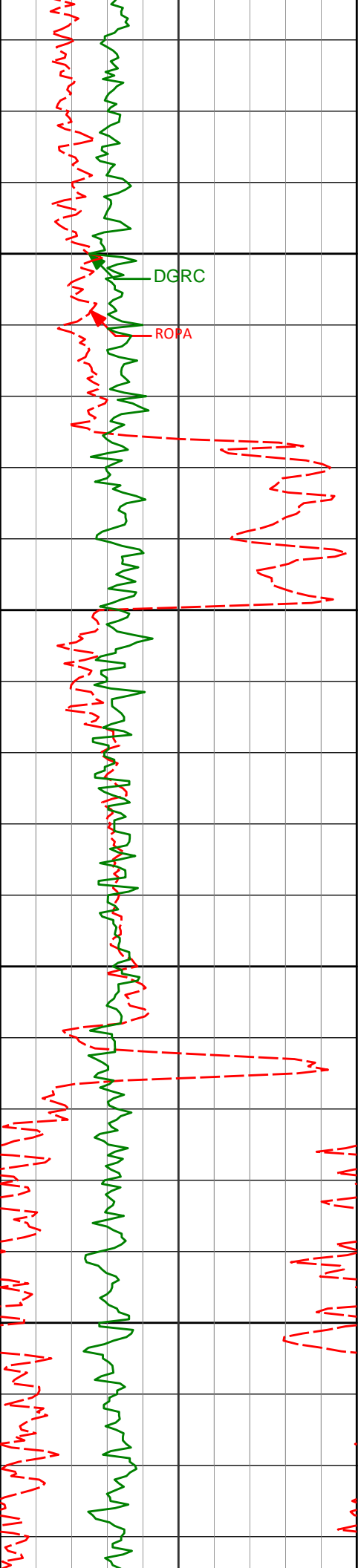
8887'

90.00°

180.21°

7743.30'

1243.00'



8972'

89.81°

181.11°

7743.44'

1327.99'

9000

DGRC

ROPA

9050

9058'

89.57°

181.59°

7743.90'

1413.95'

9100

9150

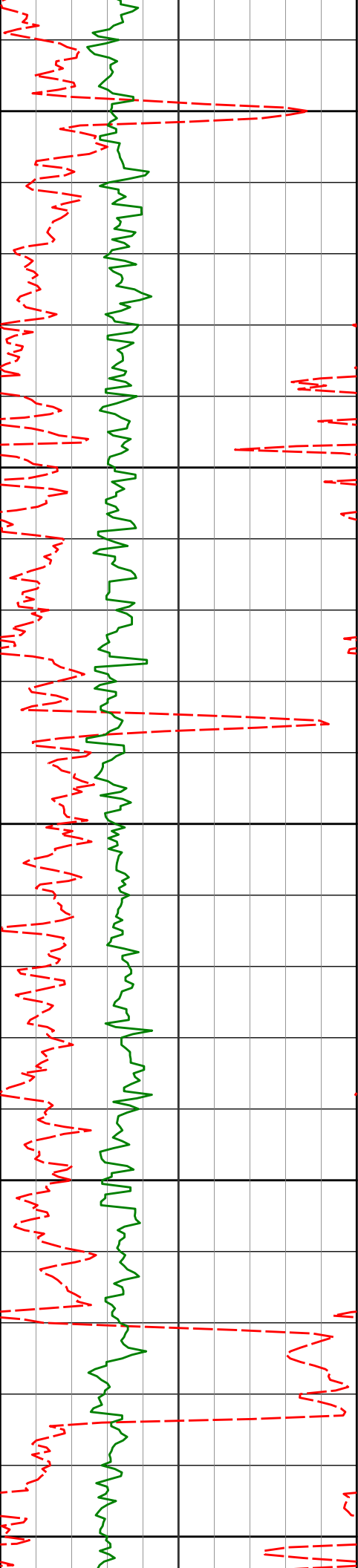
9144'

90.00°

181.01°

7744.23'

1499.91'



9200

9230' 90.00° 180.43° 7744.23' 1585.89'

9250

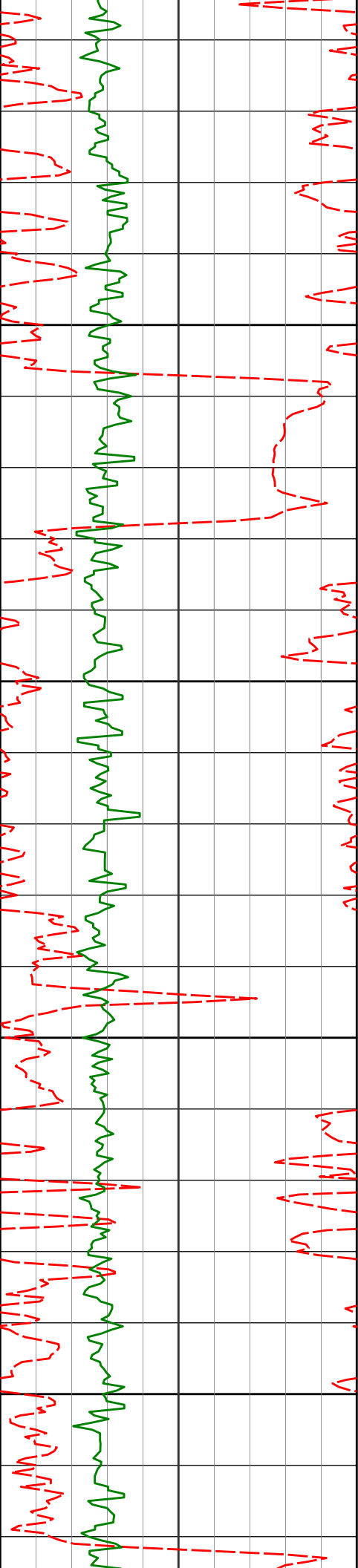
9300

9315' 90.25° 180.14° 7744.04' 1670.89'

9350

9400

9401' 90.99° 179.22° 7743.12' 1756.88'



9450

9487'

90.06°

179.45°

7742.33'

1842.88'

9500

9550

9572'

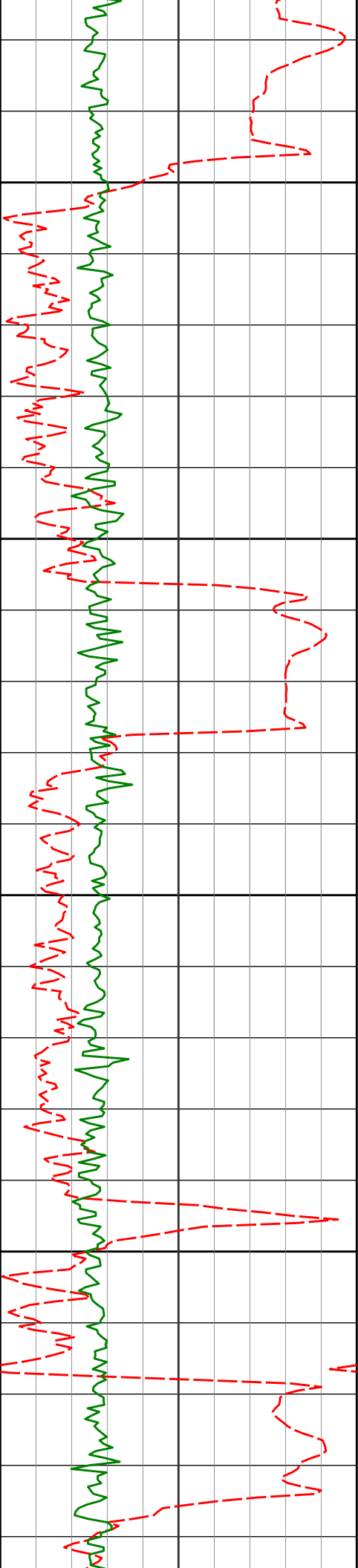
90.74°

178.69°

7741.73'

1927.87'

9600



9650

9658'

90.25°

178.90°

7740.99'

2013.86'

9700

9750

9744'

89.38°

179.64°

7741.27'

2099.85'

9800

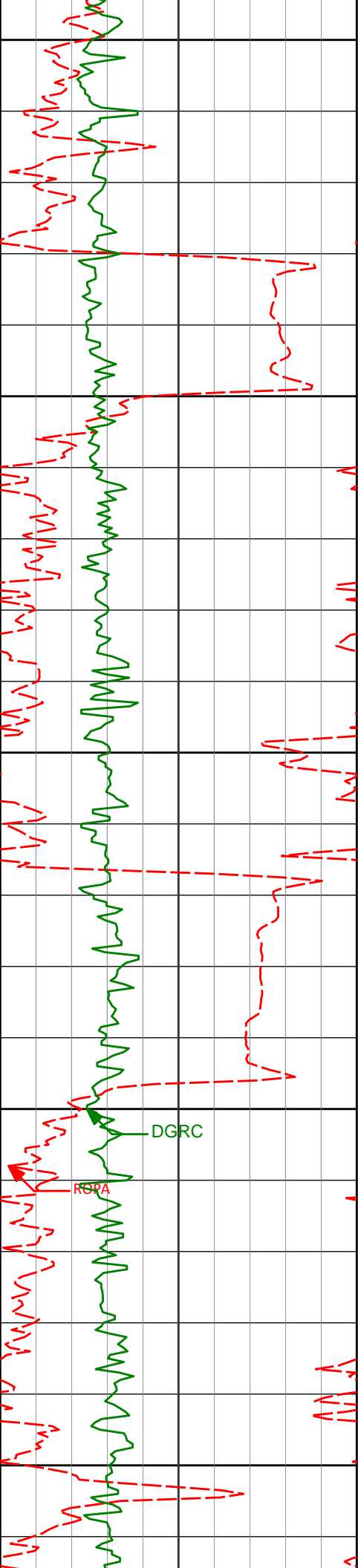
9830'

89.94°

179.64°

7741.78'

2185.85'



9850

9900

9950

10000

10050

9915'

89.44°

179.73°

7742.23'

2270.85'

10001'

88.52°

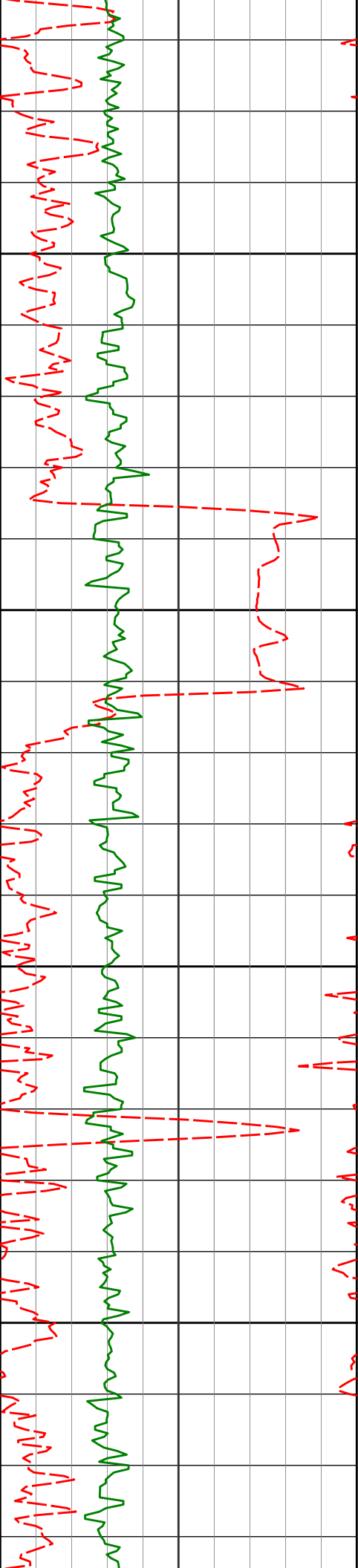
181.37°

7743.77'

2356.82'

DGRC

RCPA



10100

10150

10200

10250

10087'

89.44°

180.68°

7745.30'

2442.78'

10172'

89.44°

181.74°

7746.12'

2527.74'

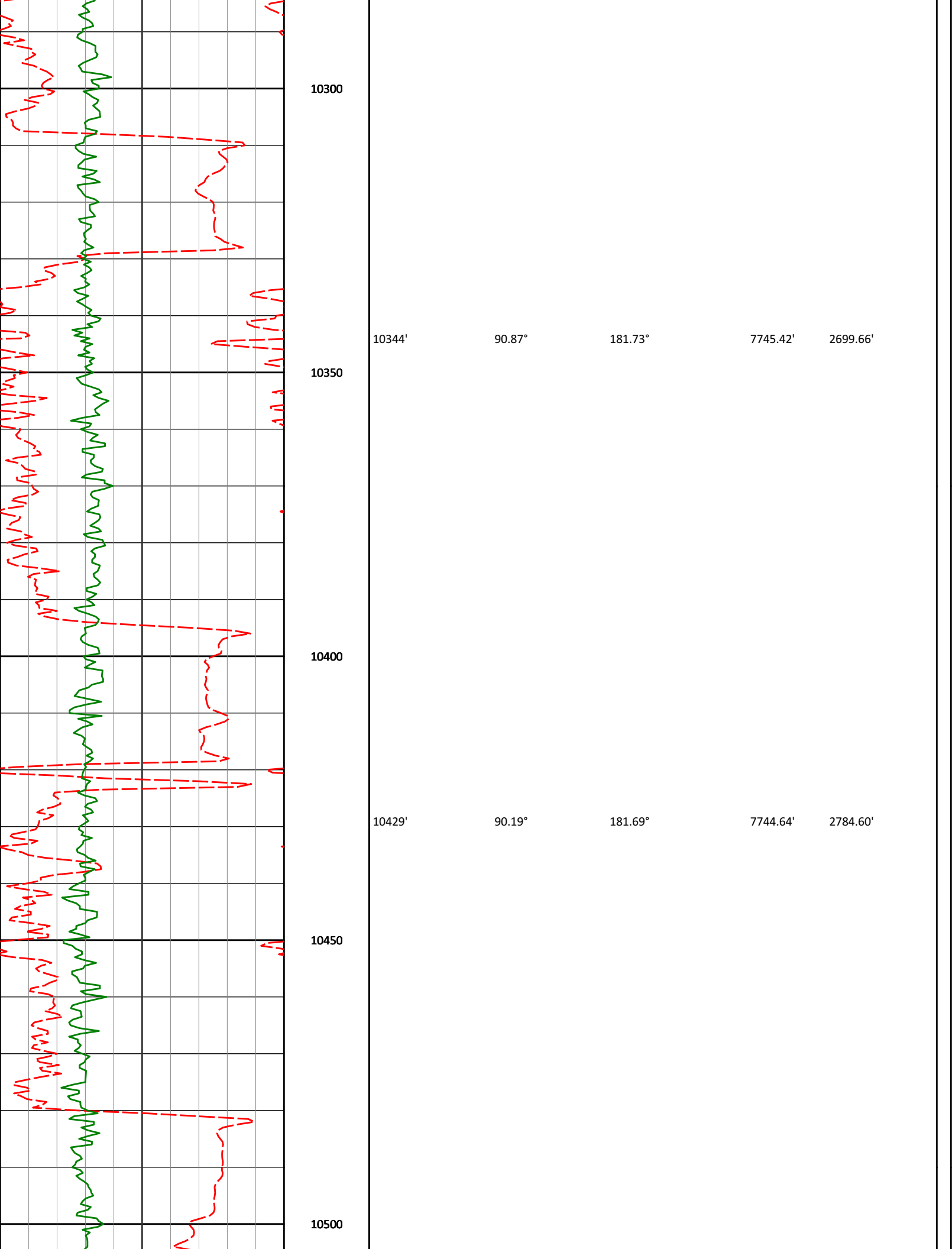
10258'

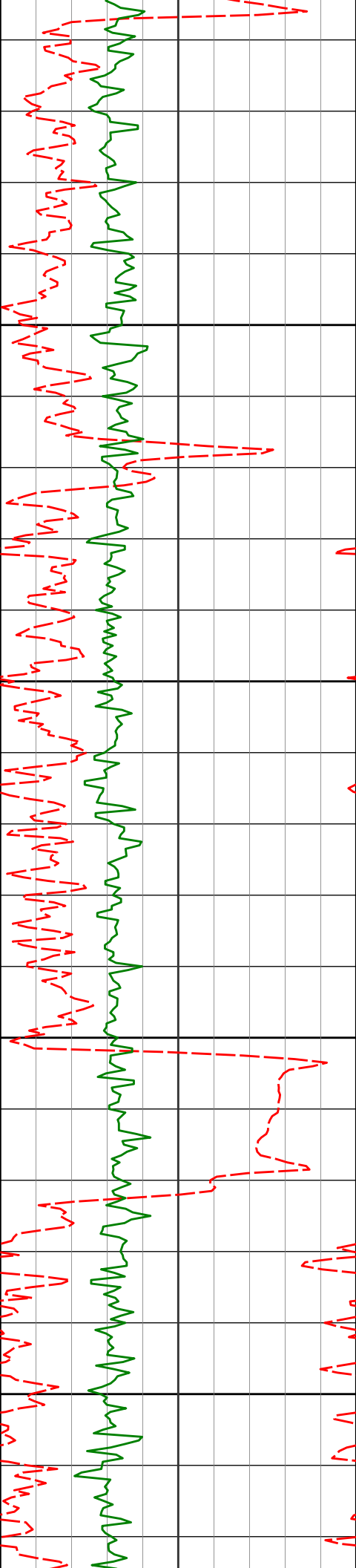
90.31°

181.04°

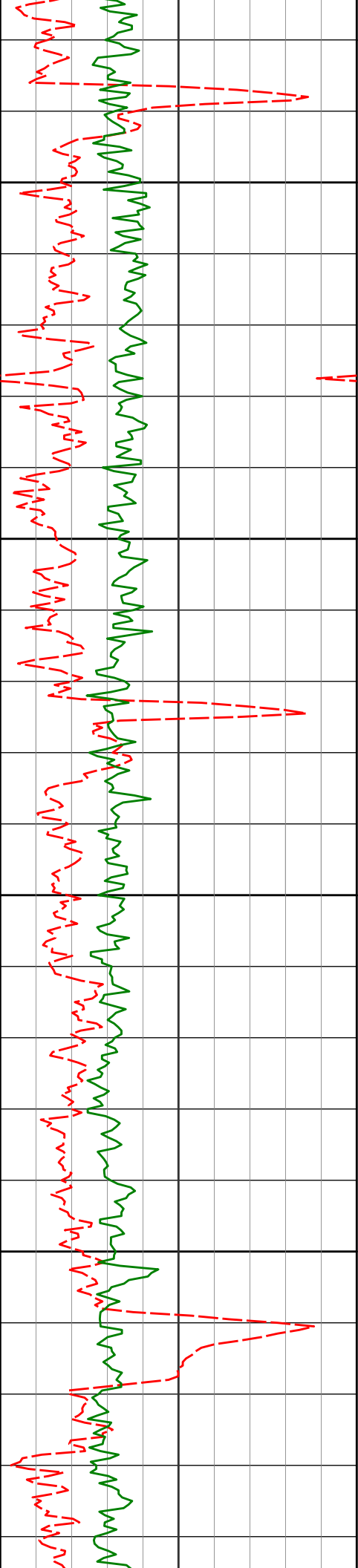
7746.31'

2613.70'





10515'	89.32°	181.91°	7745.02'	2870.54'	
10550					
10600	10601'	89.75°	181.55°	7745.71'	2956.48'
10650					
10687'	88.70°	180.75°	7746.87'	3042.44'	
10700					



10750

10772'

89.20°

180.31°

7748.43'

3127.41'

10800

10850

10858'

89.63°

179.52°

7749.31'

3213.41'

10900

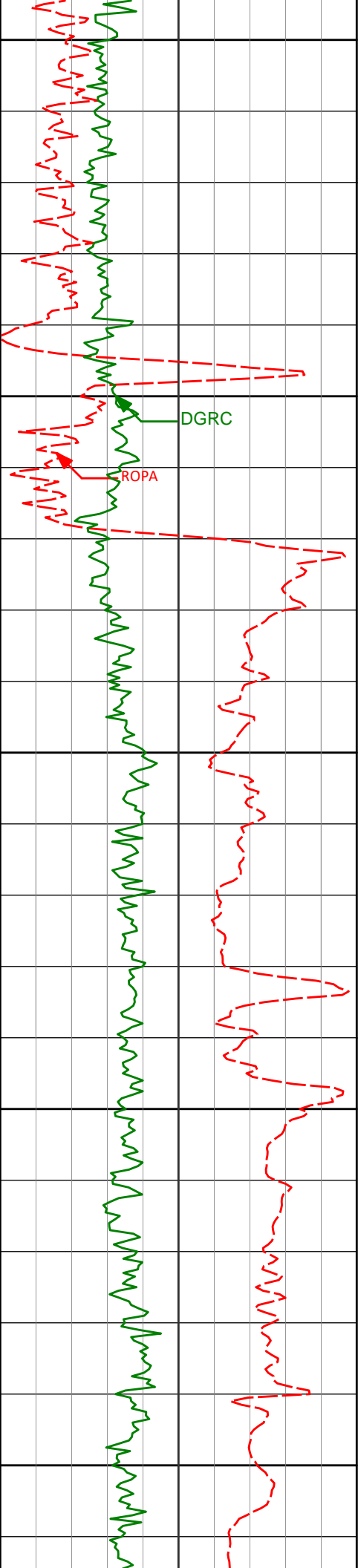
10944'

90.31°

179.14°

7749.35'

3299.40'



10950

11000

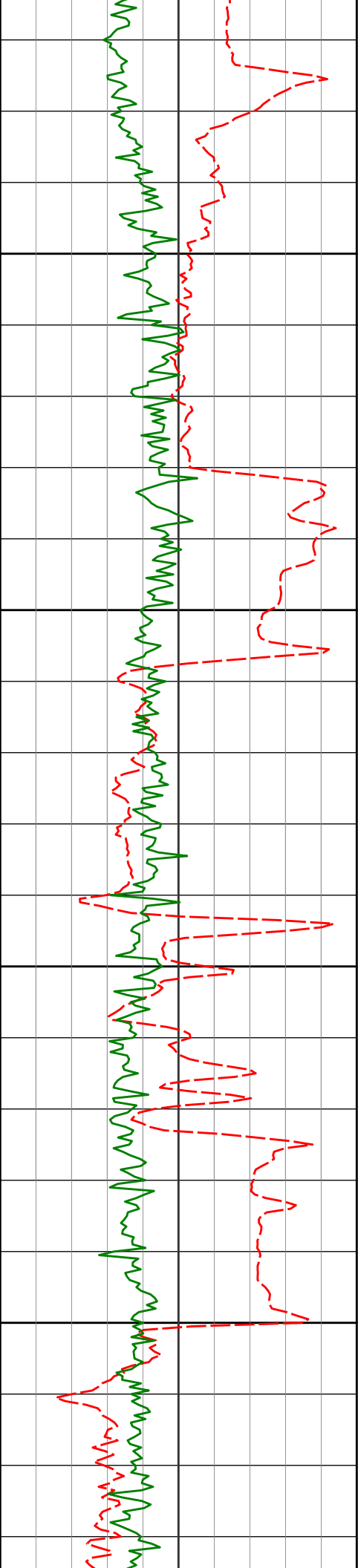
11050

11100

11150

Run 400

10944'	98.91°	179.14°	7749.99'	3299.48'
11029'	88.70°	177.86°	7750.09'	3384.38'
11093'	89.14°	178.14°	7751.29'	3448.34'



11200

11250

11300

11350

11184'

89.13°

175.83°

7752.67'

3539.23'

11276'

87.96°

177.41°

7755.00'

3631.06'

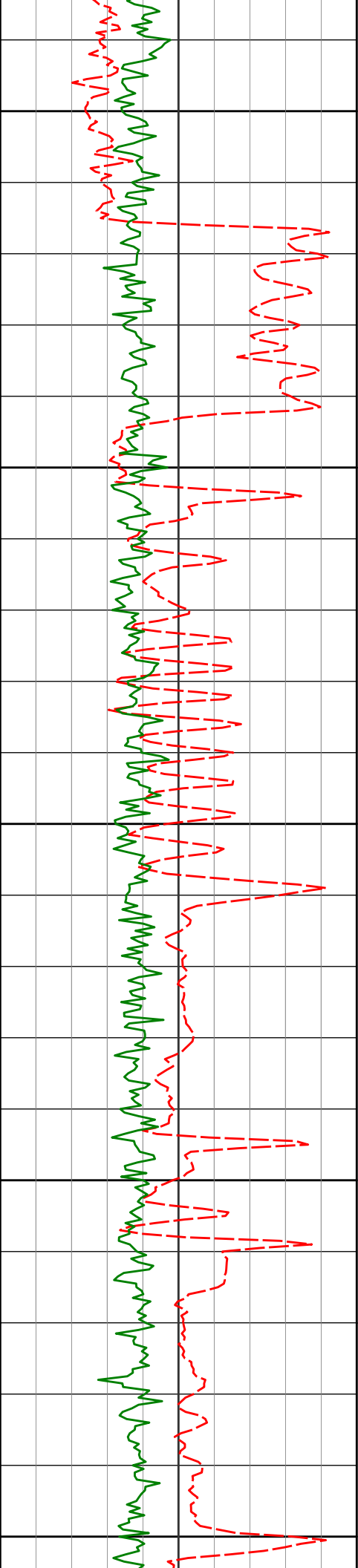
11368'

88.82°

179.55°

7757.58'

3723.00'



11400

11450

11500

11550

11600

11458'

89.81°

180.38°

7758.65'

3812.99'

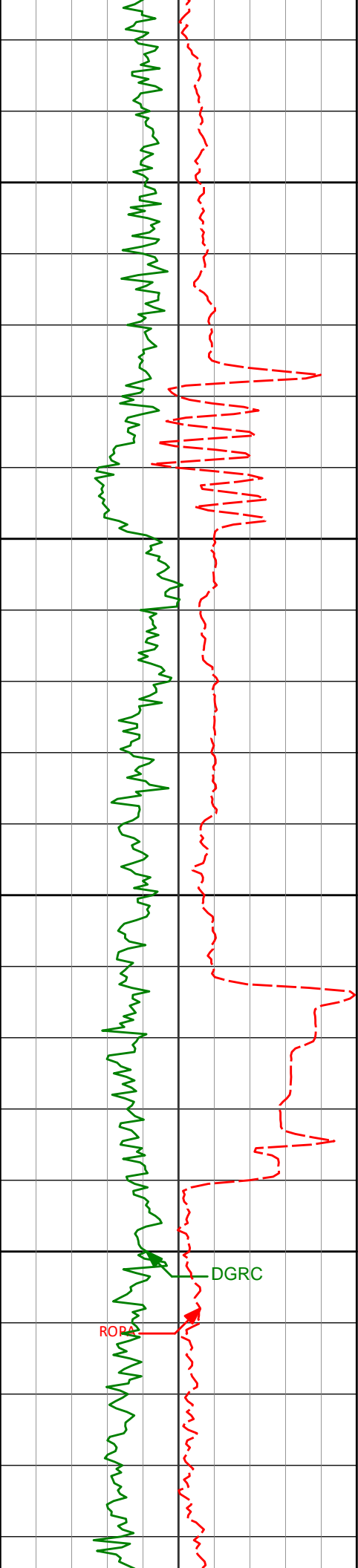
11549'

90.00°

179.94°

7758.80'

3903.99'



11850

11900

11950

12000

11910'

91.73°

179.36°

7755.39'

4264.95'

11996'

91.42°

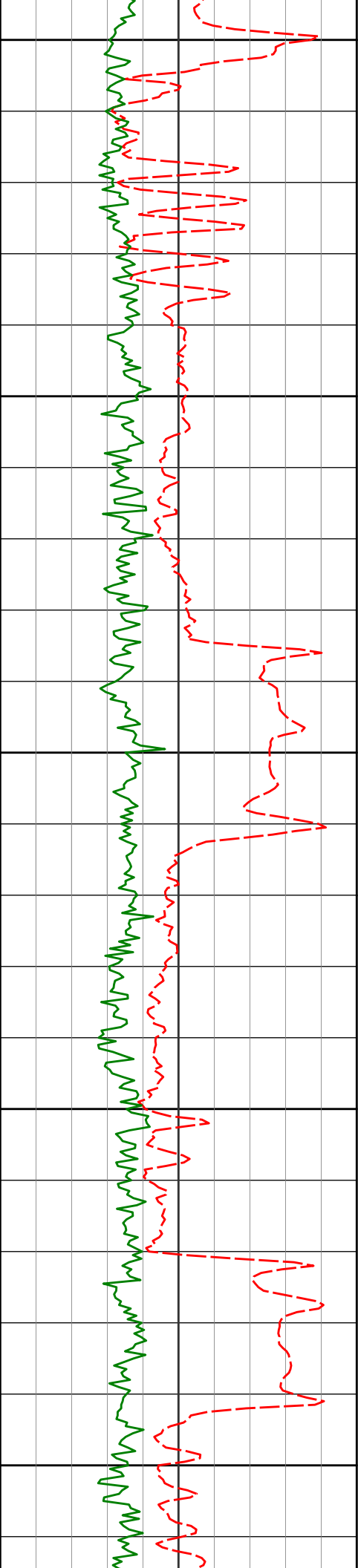
181.27°

7753.02'

4350.90'

DGRC

ROPA



12050

12081'

91.79°

180.65°

7750.64'

4435.85'

12100

12150

12167'

89.75°

180.76°

7749.48'

4521.82'

12200

12250

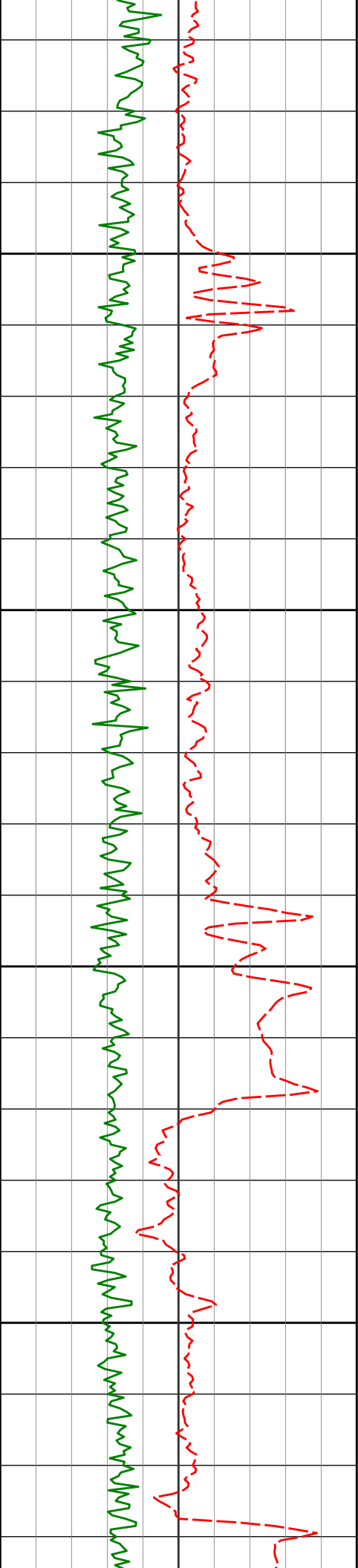
12253'

90.93°

181.66°

7748.97'

4607.79'



12300

12338'

91.17°

180.93°

7747.41'

4692.73'

12350

12400

12424'

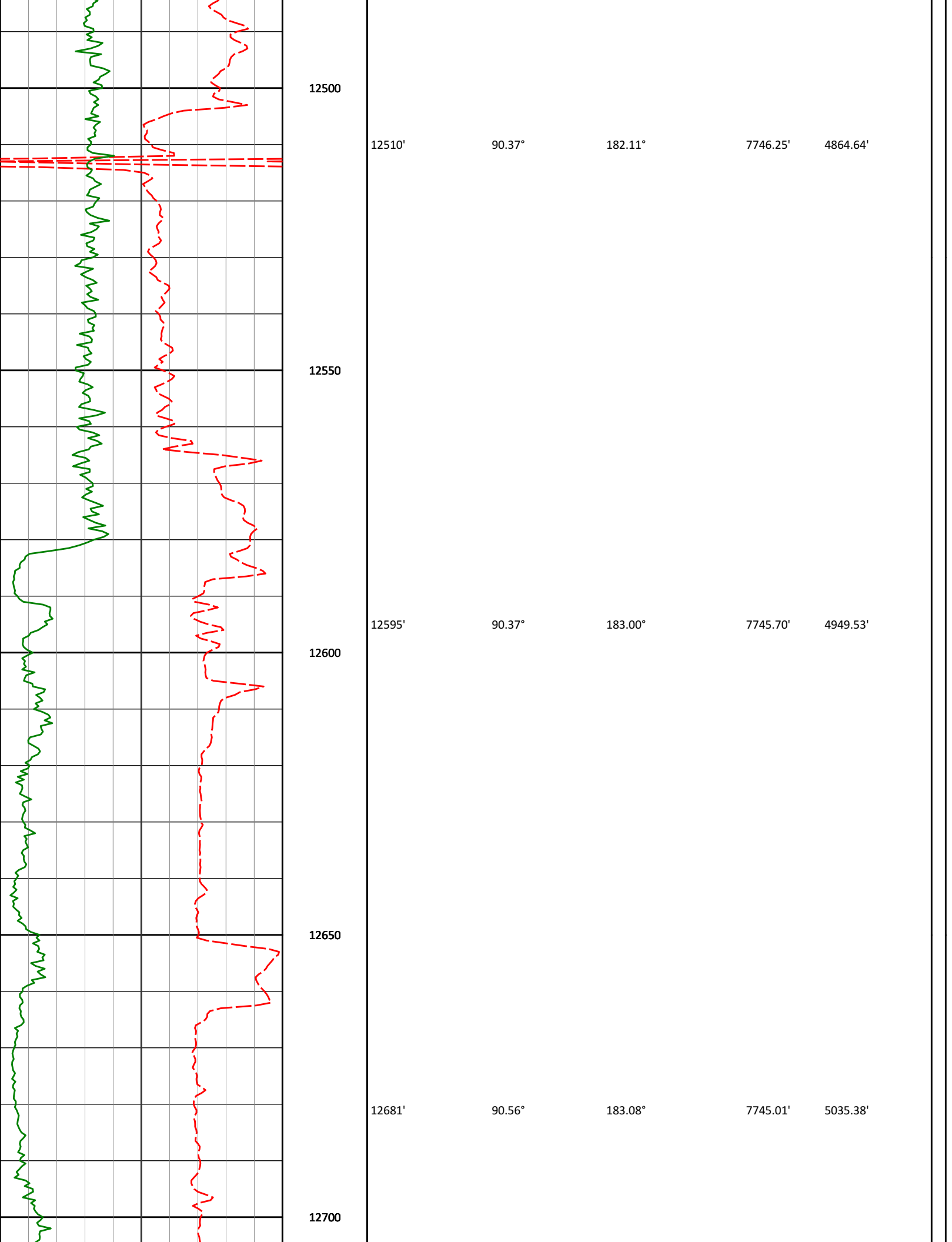
90.00°

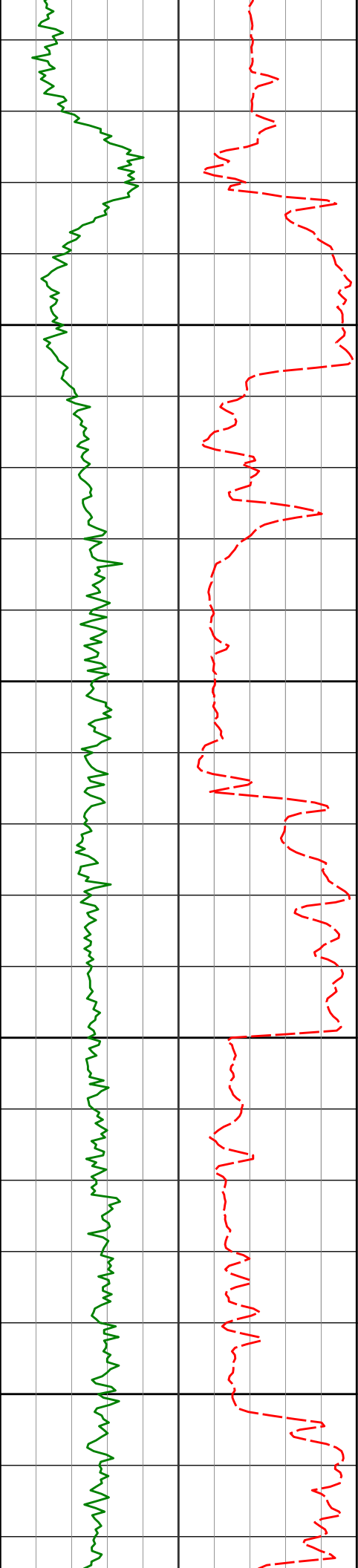
181.33°

7746.53'

4778.70'

12450





12750

12800

12850

12900

12767'

90.43°

183.52°

7744.27'

5121.20'

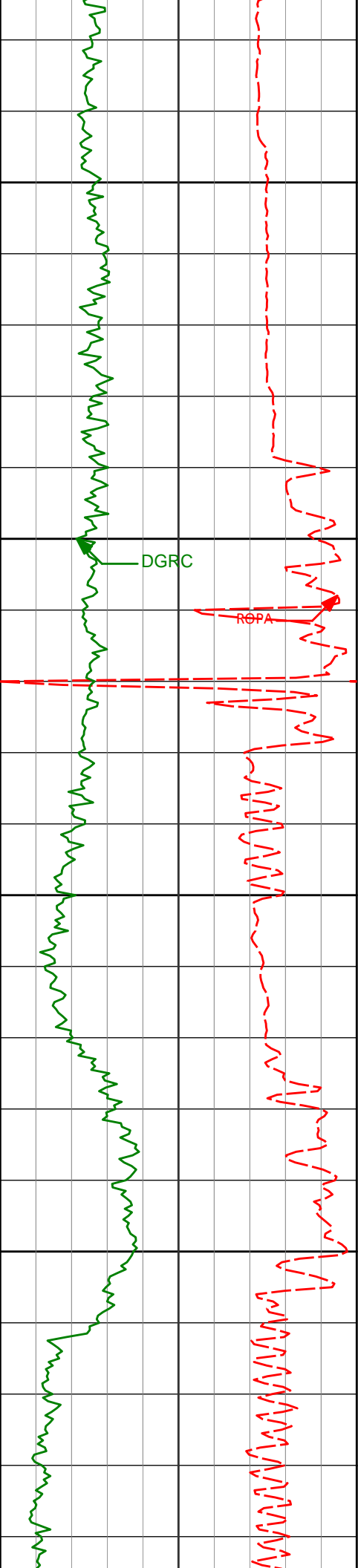
12853'

90.19°

182.28°

7743.80'

5207.06'



12950

13000

13050

13100

12938'

89.20°

181.39°

7744.26'

5291.99'

13024'

88.21°

181.50°

7746.21'

5377.93'

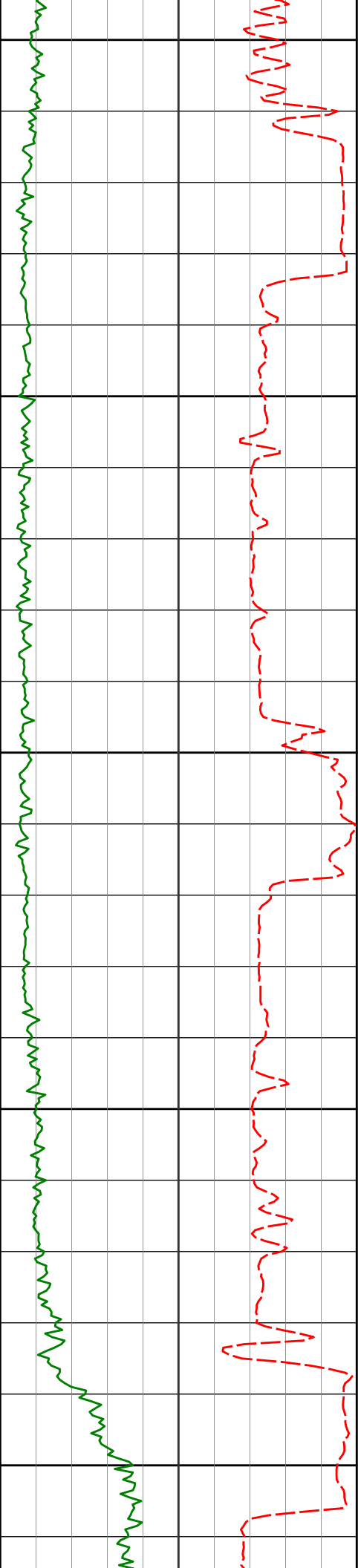
13110'

87.65°

180.92°

7749.32'

5463.84'



13150

13195'

89.44°

182.74°

7751.47'

5548.74'

13200

13250

13281'

90.62°

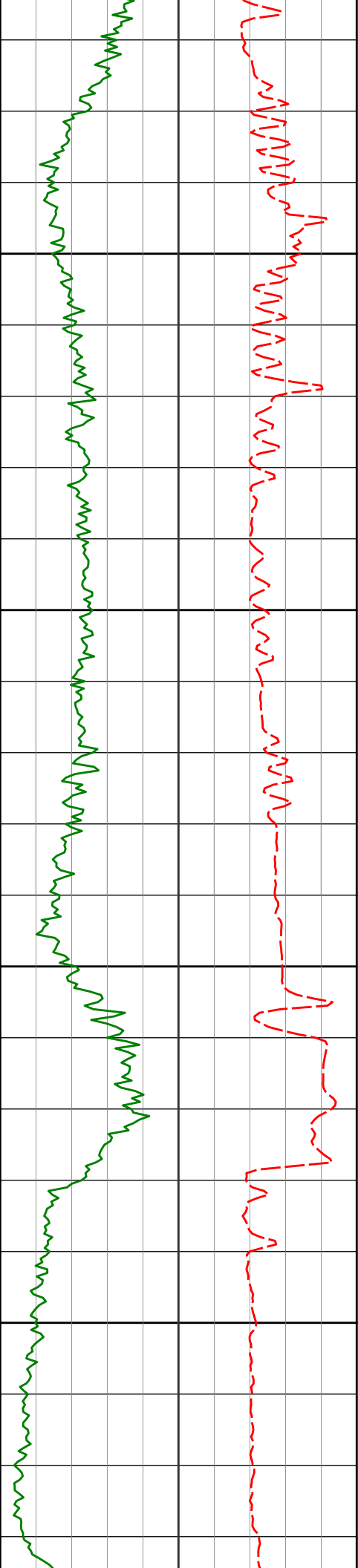
183.47°

7751.42'

5634.59'

13300

13350



13400

13450

13500

13550

13367'

90.37°

183.94°

7750.68'

5720.37'

13453'

90.49°

182.89°

7750.03'

5806.18'

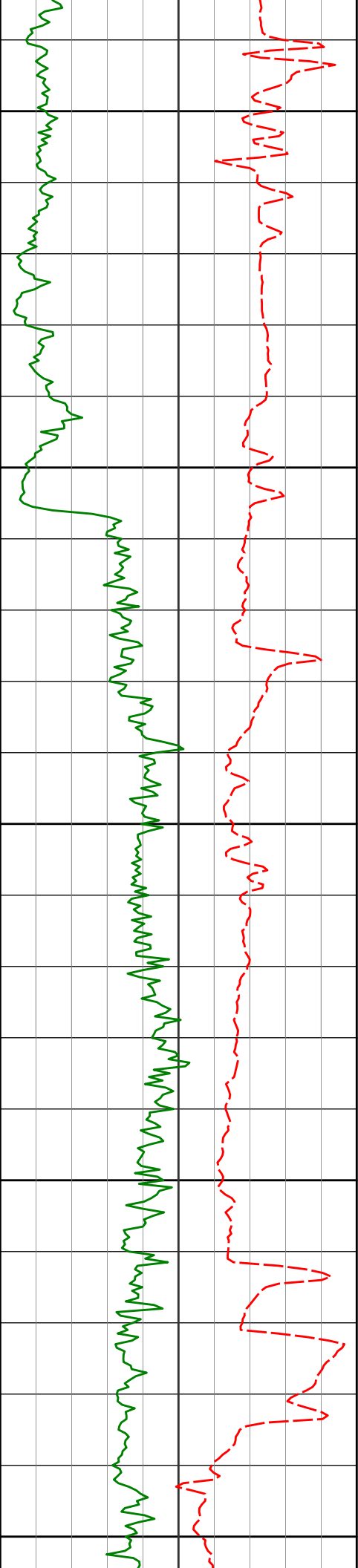
13538'

88.21°

181.51°

7751.00'

5891.08'



13600

13624'

88.27°

180.84°

7753.64'

5977.01'

13650

13700

13709'

88.89°

180.33°

7755.75'

6061.97'

13750

13800

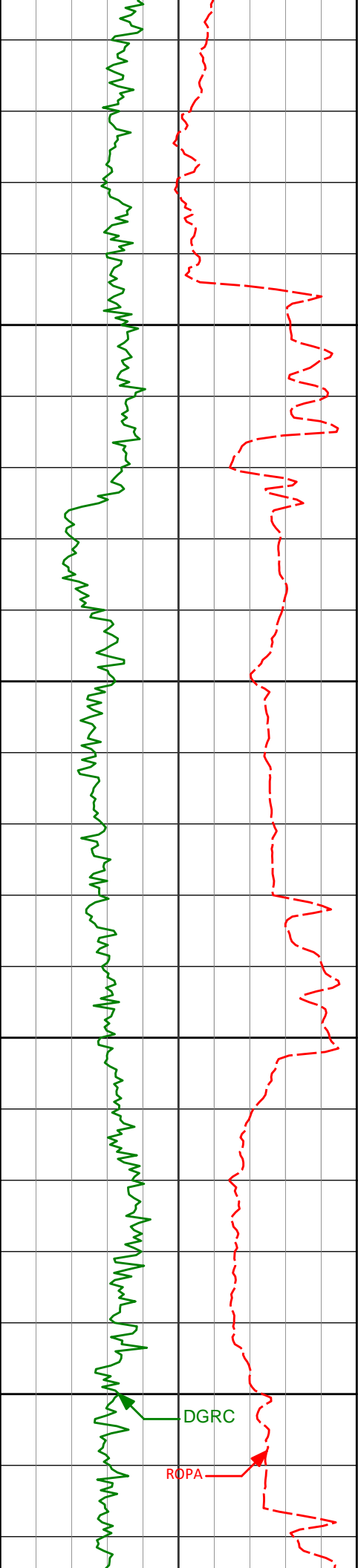
13793'

89.44°

180.47°

7756.98'

6145.95'



13850

13900

13950

14000

13881'

88.82°

180.83°

7758.31'

6233.93'

13966'

90.00°

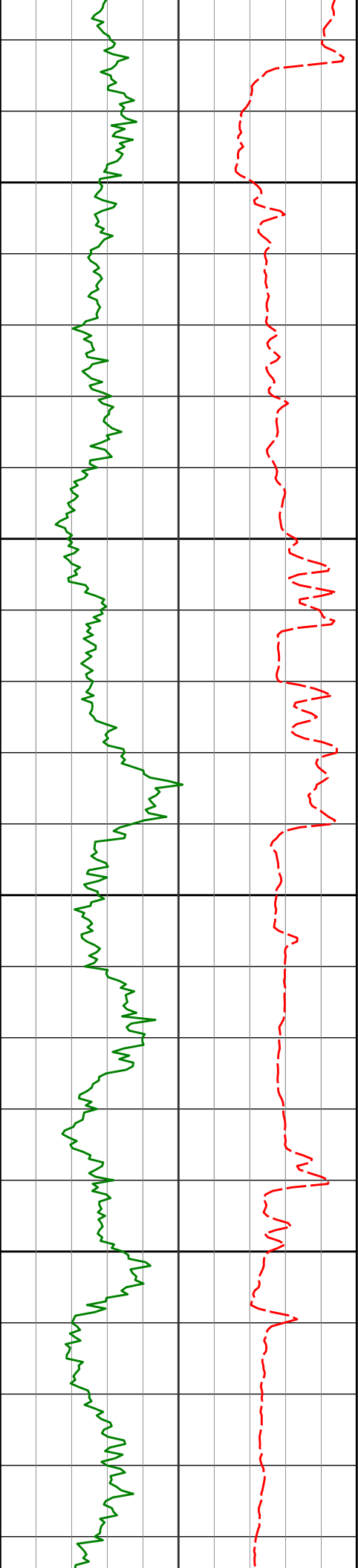
182.27°

7759.18'

6318.87'

DGRC

ROPA



14050

14052'

90.25°

182.42°

7758.99'

6404.78'

14100

14137'

89.38°

180.86°

7759.26'

6489.72'

14150

14200

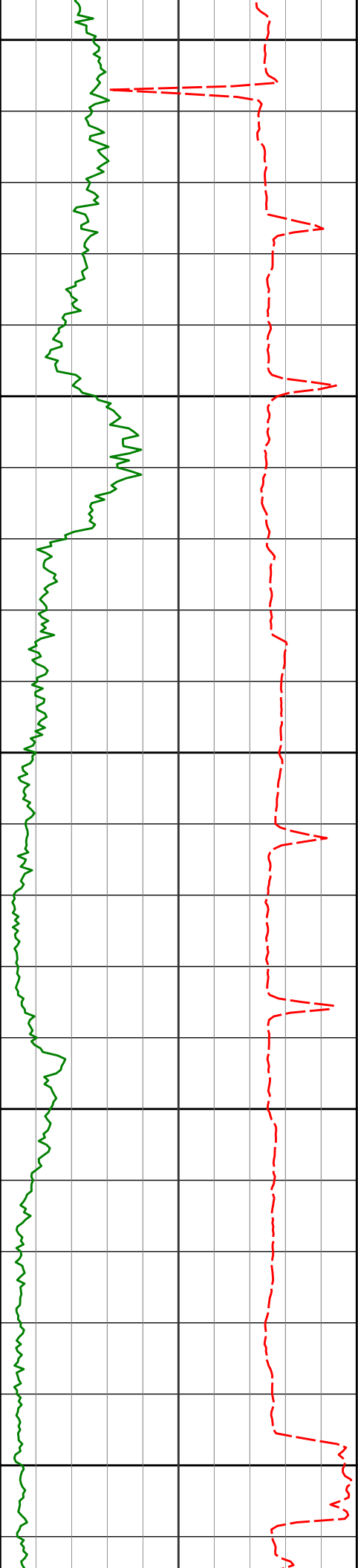
14223'

88.52°

179.70°

7760.84'

6575.70'



14250

14300

14350

14400

14450

14309'

87.90°

178.92°

7763.53'

6661.66'

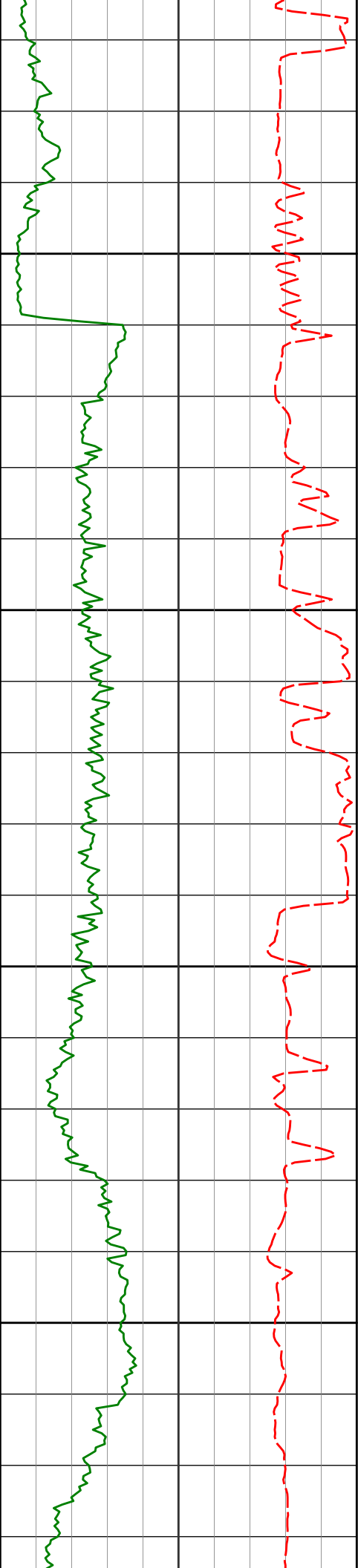
14395'

88.03°

178.36°

7766.58'

6747.59'



14481'

88.52°

178.25°

7769.17'

6833.53'

14500

14550

14566'

88.77°

177.29°

7771.19'

6918.46'

14600

14650

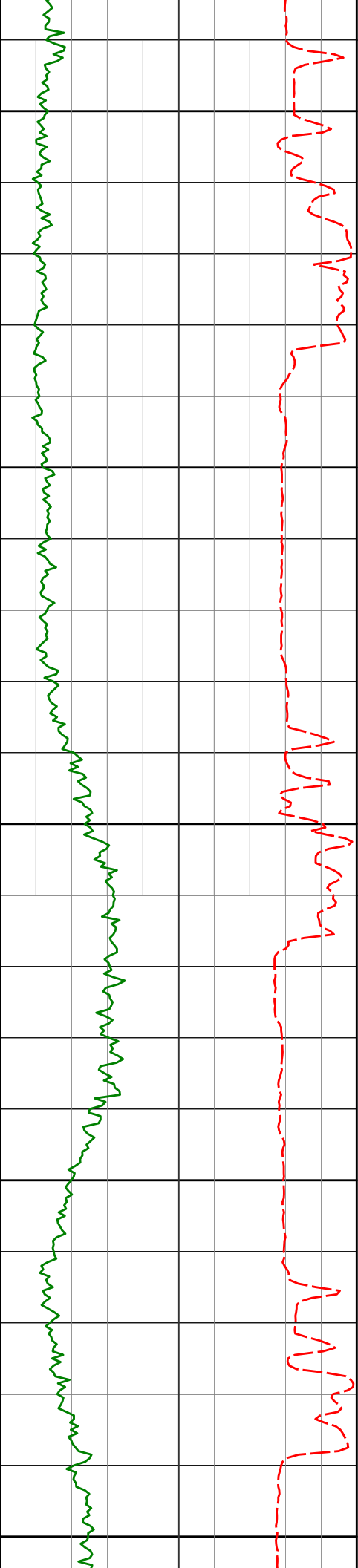
14652'

88.21°

177.81°

7773.46'

7004.37'



14700

14738'

89.81°

177.76°

7774.95'

7090.31'

14750

Run 500

14800

14823'

90.56°

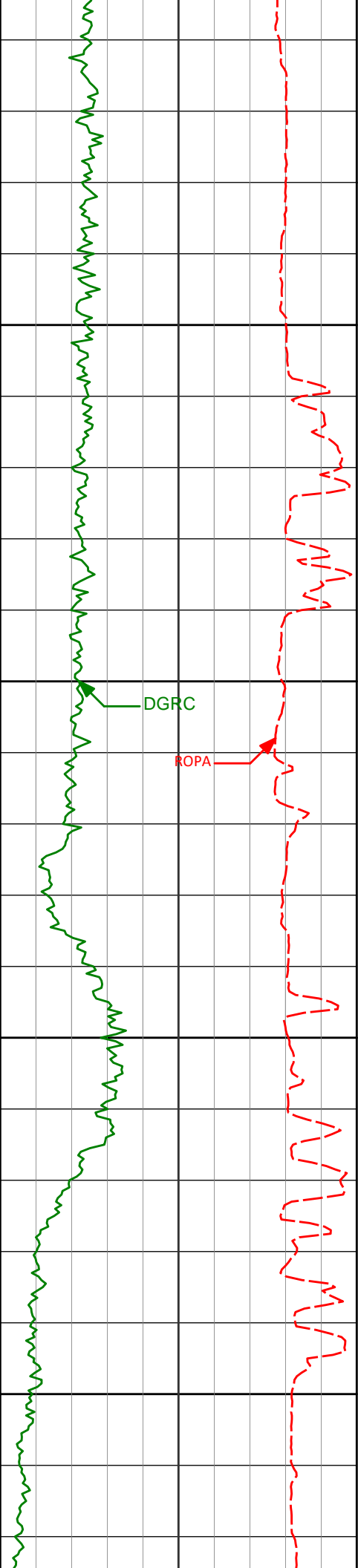
178.80°

7774.67'

7175.28'

14850

14900



14950

15000

15050

15100

14909'

90.06°

180.65°

7774.21'

7261.27'

14995'

88.33°

181.15°

7775.42'

7347.24'

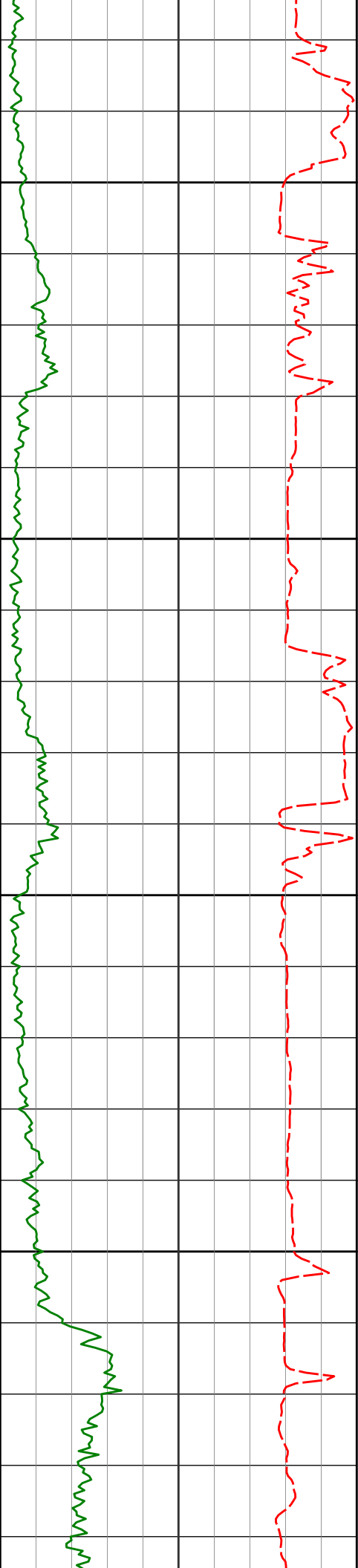
15080'

88.02°

180.13°

7778.12'

7432.19'



15150

15166'

88.76°

180.75°

7780.53'

7518.14'

15200

15250

15252'

88.76°

183.08°

7782.39'

7604.05'

15300

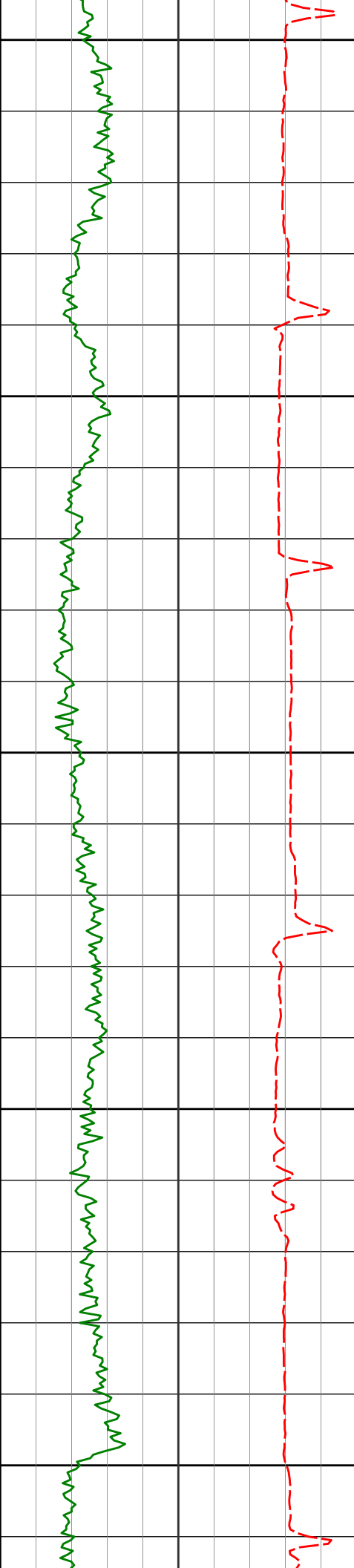
15337'

89.13°

183.15°

7783.95'

7688.88'



15350

15400

15450

15500

15550

15423'

88.76°

183.34°

7785.52'

7774.70'

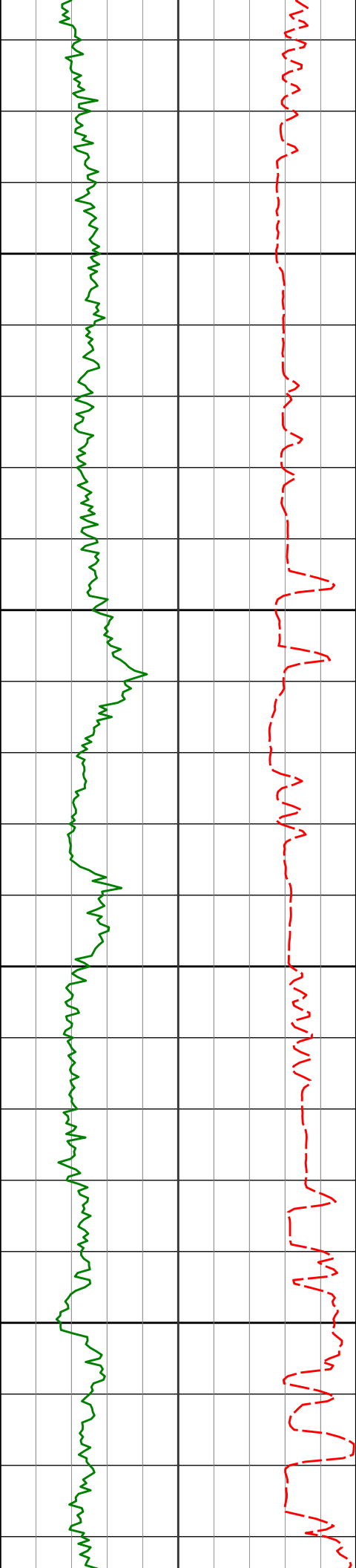
15509'

88.33°

183.00°

7787.70'

7860.51'



15600

15650

15700

15750

15594'

87.96°

181.26°

7790.45'

7945.38'

15680'

87.10°

181.29°

7794.16'

8031.26'

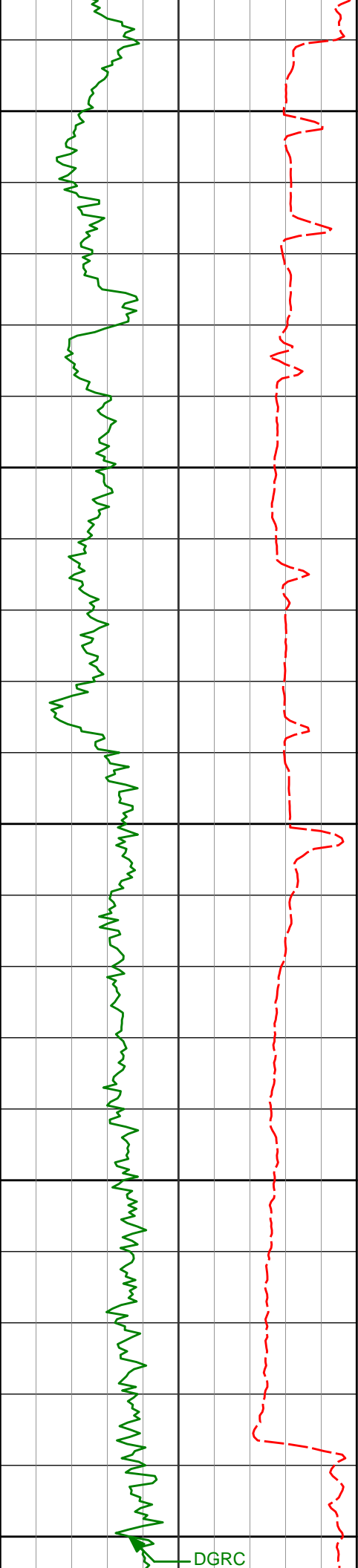
15766'

87.90°

183.19°

7797.92'

8117.09'



15800

15850

15900

15950

16000

15852'

88.27°

182.41°

7800.79'

8202.91'

15938'

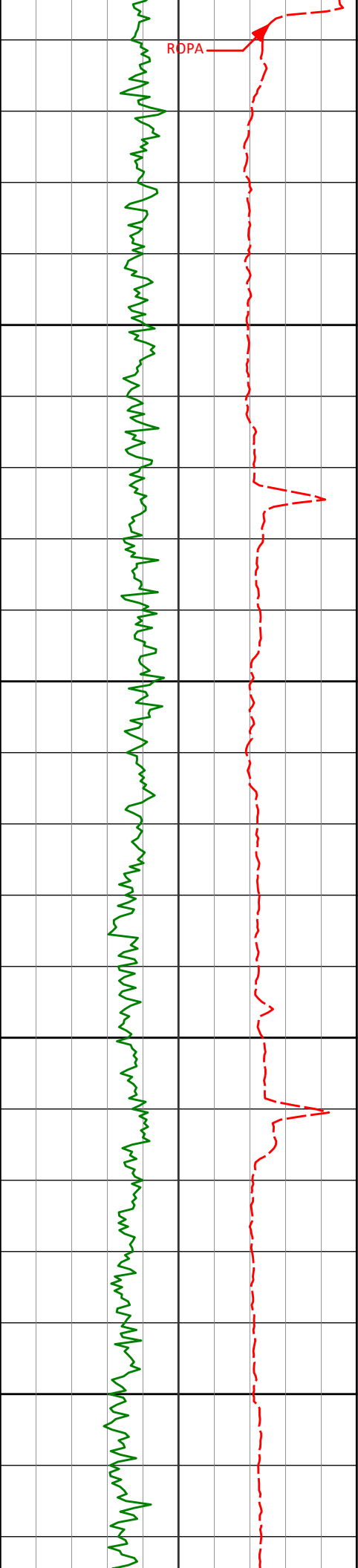
87.22°

182.76°

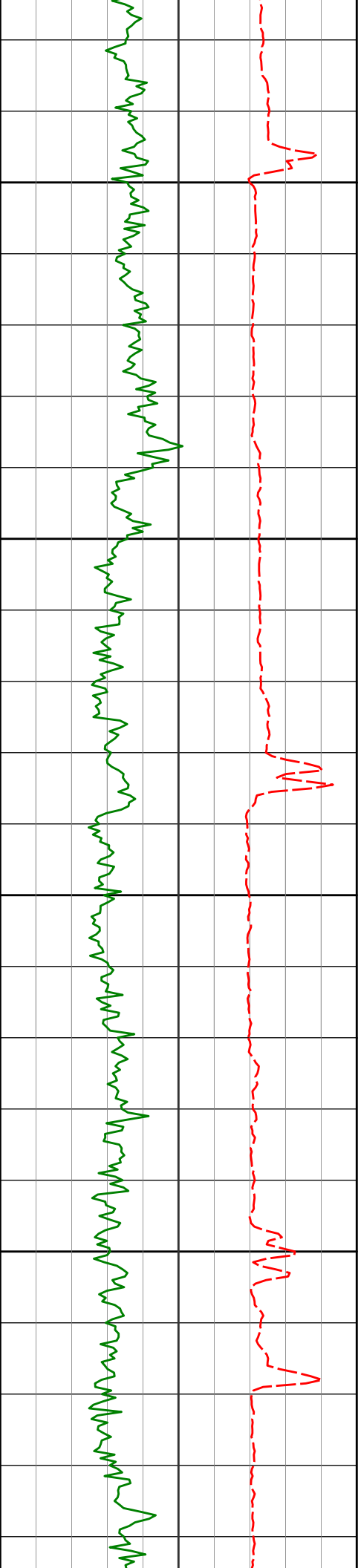
7804.18'

8288.73'

DGRC



	16023'	88.83°	183.66°	7807.11'	8373.51'
16050					
16100					
	16109'	88.83°	185.00°	7808.87'	8459.21'
16150					
16200					
	16195'	89.20°	185.76°	7810.35'	8544.76'



16250

16300

16350

16400

16280'

89.32°

186.75°

7811.45'

8629.19'

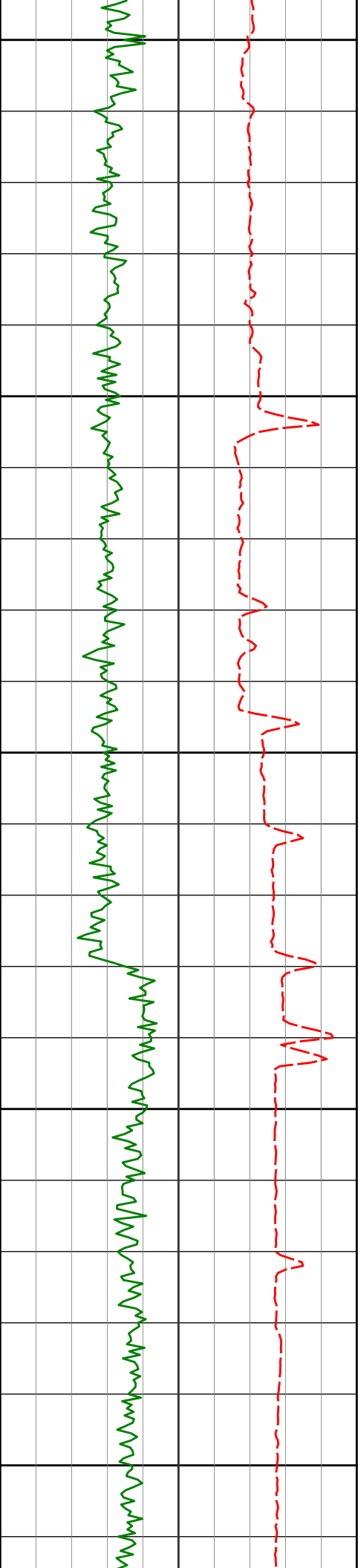
16366'

89.20°

186.77°

7812.57'

8714.52'



16450

16452'

89.51°

188.18°

7813.54'

8799.71'

16500

16537'

89.69°

189.02°

7814.14'

8883.67'

16550

16600

16623'

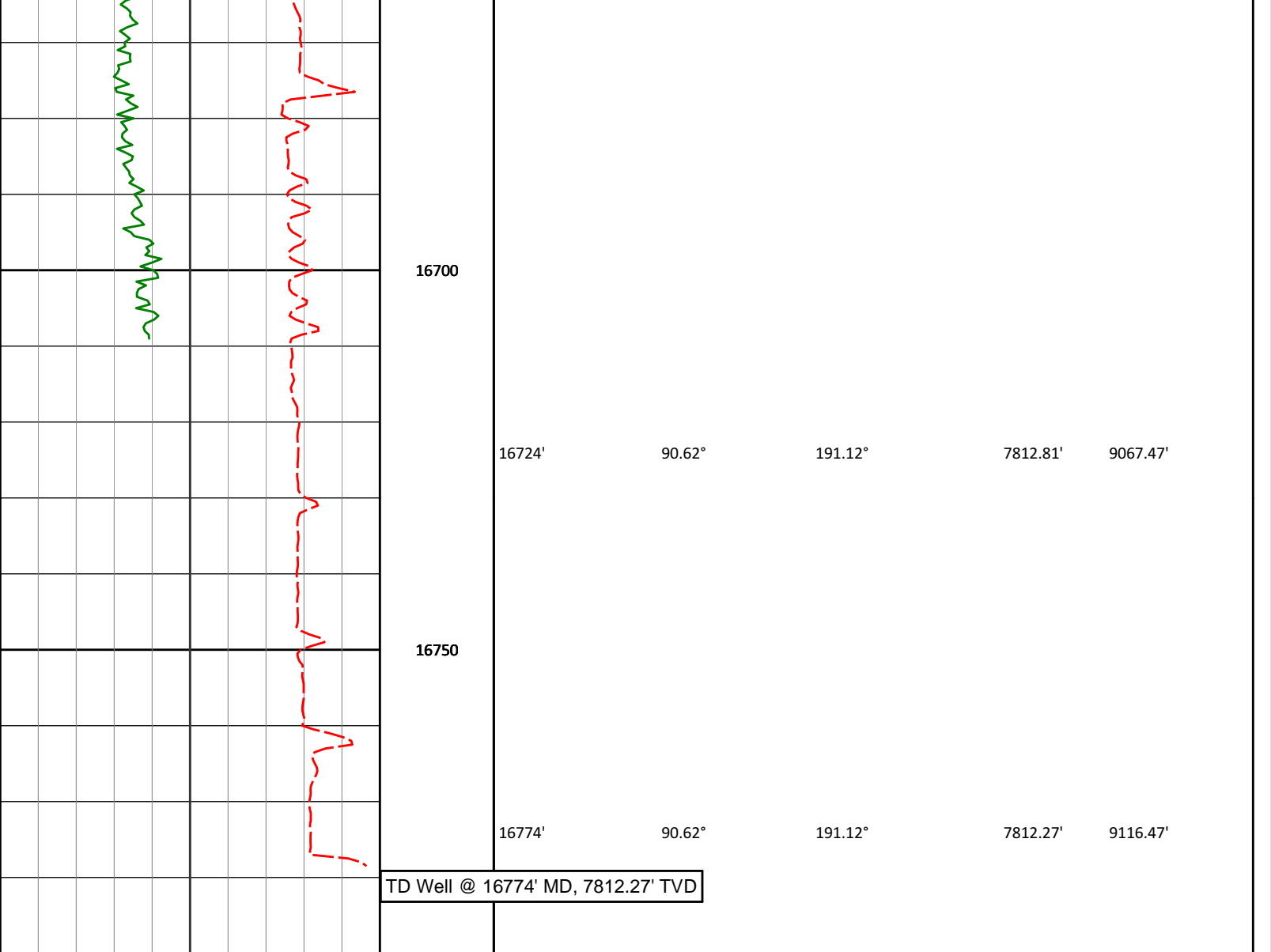
90.62°

190.33°

7813.90'

8968.36'

16650



<div><div><div>DGR Gamma Ray</div><div>DGRC</div><div><div>0</div><div>300</div></div><div>api</div></div></div>			Depth ft					
			<i>Depth</i>	<i>Inc</i>	<i>Azi</i>	<i>TVD</i>	<i>VS</i>	
<div><div><div>Avg Rate of Penetration</div><div>ROPA</div><div><div>500</div><div>0</div></div><div>feet per hr</div></div></div>								
<div><div><div>PCG Gamma Ray</div><div>PGRC</div><div><div>0</div><div>300</div></div><div>api</div></div></div>								



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.
Griffiths 36C-20HZ
Wattenburg
Weld Colorado
USA
CA-XX-0900382957

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1001.00	1.46	107.44	1000.81	1.13 N	17.20 E	-1.02	TIE-IN
1206.00	1.80	123.63	1205.73	1.43 S	22.37 E	1.57	0.28

1492.00	2.73	161.14	1491.52	10.37 S	28.30 E	10.54	0.60
1587.00	5.23	160.36	1586.28	16.59 S	30.49 E	16.78	2.63
1682.00	7.45	171.37	1680.70	26.76 S	32.87 E	26.96	2.65
1773.00	10.44	171.07	1770.58	40.73 S	35.04 E	40.95	3.29
1865.00	10.00	154.12	1861.14	56.16 S	39.82 E	56.40	3.29
1957.00	8.69	140.34	1951.93	68.69 S	47.74 E	68.98	2.81
2048.00	8.00	118.82	2041.99	77.04 S	57.67 E	77.39	3.49
2140.00	8.72	97.48	2133.03	81.03 S	70.20 E	81.46	3.44
2232.00	7.66	75.49	2224.11	80.40 S	83.06 E	80.91	3.57
2414.00	6.59	74.21	2404.71	74.52 S	104.85 E	75.16	0.60
2506.00	5.77	80.54	2496.17	72.33 S	114.49 E	73.02	1.15
2689.00	6.06	62.85	2678.21	66.41 S	132.16 E	67.21	1.00
2872.00	7.61	54.94	2859.91	55.04 S	150.68 E	55.96	0.99
3054.00	8.02	53.19	3040.22	40.51 S	170.70 E	41.55	0.26
3238.00	7.81	40.82	3222.48	23.36 S	189.15 E	24.51	0.93
3421.00	9.88	45.40	3403.30	2.92 S	208.46 E	4.20	1.19
3696.00	11.78	43.15	3673.39	34.13 N	244.47 E	-32.64	0.71
3880.00	9.12	59.04	3854.35	55.35 N	269.84 E	-53.70	2.12
4062.00	7.04	67.96	4034.54	66.96 N	292.55 E	-65.17	1.33
4245.00	5.94	95.84	4216.41	70.21 N	312.36 E	-68.30	1.80
4422.00	4.02	94.10	4392.74	68.83 N	327.66 E	-66.83	1.09
4594.00	2.66	60.73	4564.46	70.35 N	337.16 E	-68.29	1.35
4851.00	2.42	48.42	4821.21	76.87 N	346.42 E	-74.75	0.23
5022.00	2.16	43.18	4992.07	81.61 N	351.32 E	-79.46	0.19
5193.00	2.34	27.31	5162.94	87.06 N	355.12 E	-84.89	0.38
5365.00	1.95	40.12	5334.82	92.42 N	358.62 E	-90.23	0.36
5536.00	2.03	112.07	5505.74	93.51 N	363.31 E	-91.29	1.37
5708.00	1.67	102.92	5677.65	91.80 N	368.59 E	-89.55	0.27
5879.00	1.21	104.62	5848.60	90.79 N	372.78 E	-88.51	0.27
6051.00	1.04	97.77	6020.56	90.12 N	376.09 E	-87.82	0.13
6222.00	0.95	95.10	6191.54	89.78 N	379.04 E	-87.46	0.06
6479.00	0.57	58.84	6448.52	90.25 N	382.24 E	-87.91	0.23
6736.00	0.72	65.31	6705.50	91.58 N	384.80 E	-89.23	0.07
6908.00	0.80	63.95	6877.48	92.56 N	386.86 E	-90.19	0.05
6993.00	0.94	64.84	6962.47	93.12 N	388.03 E	-90.74	0.17
7036.00	1.10	72.84	7005.47	93.39 N	388.74 E	-91.01	0.50
7079.00	2.34	111.89	7048.45	93.18 N	389.95 E	-90.80	3.81
7122.00	4.52	136.51	7091.37	91.63 N	391.93 E	-89.23	6.00
7162.00	6.76	147.22	7131.18	88.51 N	394.29 E	-86.09	6.18
7205.00	8.10	154.21	7173.81	83.65 N	396.98 E	-81.22	3.75
7251.00	8.80	148.13	7219.32	77.74 N	400.25 E	-75.30	2.46
7293.00	11.46	136.65	7260.66	71.98 N	404.81 E	-69.50	7.92
7337.00	15.05	133.55	7303.48	64.86 N	411.96 E	-62.34	8.31
7380.00	17.44	141.03	7344.77	56.00 N	420.06 E	-53.43	7.38
7423.00	17.09	154.87	7385.85	45.27 N	426.80 E	-42.66	9.57
7466.00	20.74	160.65	7426.52	32.36 N	432.00 E	-29.72	9.53
7508.00	23.45	162.87	7465.43	17.35 N	436.93 E	-14.68	6.76
7551.00	28.05	165.39	7504.15	0.62 S	442.01 E	3.32	10.97
7594.00	33.59	166.47	7541.07	21.98 S	447.34 E	24.71	12.95
7637.00	38.52	167.31	7575.82	46.62 S	453.07 E	49.39	11.54
7680.00	43.81	169.10	7608.18	74.32 S	458.83 E	77.12	12.59
7723.00	49.95	170.01	7637.56	105.18 S	464.51 E	108.01	14.37
7765.00	55.56	171.92	7662.97	138.18 S	469.74 E	141.05	13.84
7808.00	61.46	174.75	7685.43	174.58 S	473.96 E	177.48	14.82
7851.00	64.01	179.76	7705.14	212.74 S	475.77 E	215.64	11.93
7894.00	68.18	182.04	7722.56	252.04 S	475.14 E	254.93	10.86
7937.00	73.55	181.73	7736.65	292.62 S	473.80 E	295.51	12.49
7980.00	79.55	181.52	7746.65	334.41 S	472.62 E	337.29	13.96
8032.00	87.63	182.38	7752.45	386.01 S	470.86 E	388.88	15.63
8115.00	91.30	182.99	7753.23	468.90 S	466.97 E	471.74	4.48
8201.00	91.85	182.68	7750.87	554.76 S	462.71 E	557.58	0.74
8287.00	91.73	182.04	7748.19	640.64 S	459.17 E	643.44	0.76
8372.00	91.73	181.51	7745.62	725.56 S	456.54 E	728.34	0.62
8458.00	91.29	182.18	7743.35	811.49 S	453.77 E	814.25	0.93
8544.00	90.37	181.85	7742.10	897.43 S	450.75 E	900.16	1.14
8629.00	89.69	182.35	7742.05	982.37 S	447.63 E	985.08	0.99
8715.00	89.69	181.24	7742.52	1068.32 S	444.94 E	1071.02	1.29
8801.00	89.63	180.16	7743.03	1154.31 S	443.89 E	1157.00	1.25
8887.00	90.00	180.21	7743.30	1240.31 S	443.61 E	1243.00	0.43
8972.00	89.81	181.11	7743.44	1325.31 S	442.63 E	1327.99	1.09
9058.00	89.57	181.59	7743.90	1411.28 S	440.60 E	1413.95	0.63
9144.00	89.89	181.01	7744.23	1497.26 S	438.64 E	1499.81	0.84

9144.00	90.00	181.01	7744.23	1497.26 S	438.84 E	1499.91	0.84
9230.00	90.00	180.43	7744.23	1583.25 S	437.56 E	1585.89	0.68
9315.00	90.25	180.14	7744.04	1668.25 S	437.15 E	1670.89	0.44
9401.00	90.99	179.22	7743.12	1754.24 S	437.63 E	1756.88	1.37
9487.00	90.06	179.45	7742.33	1840.23 S	438.62 E	1842.88	1.11
9572.00	90.74	178.69	7741.73	1925.22 S	440.00 E	1927.87	1.20
9658.00	90.25	178.90	7740.99	2011.19 S	441.80 E	2013.86	0.63
9744.00	89.38	179.64	7741.27	2097.19 S	442.89 E	2099.85	1.32
9830.00	89.94	179.64	7741.78	2183.18 S	443.43 E	2185.85	0.64
9915.00	89.44	179.73	7742.23	2268.18 S	443.90 E	2270.85	0.59
10001.00	88.52	181.37	7743.77	2354.16 S	443.08 E	2356.82	2.19
10087.00	89.44	180.68	7745.30	2440.13 S	441.54 E	2442.78	1.34
10172.00	89.44	181.74	7746.12	2525.10 S	439.75 E	2527.74	1.25
10258.00	90.31	181.04	7746.31	2611.08 S	437.66 E	2613.70	1.29
10344.00	90.87	181.73	7745.42	2697.05 S	435.58 E	2699.66	1.04
10429.00	90.19	181.69	7744.64	2782.01 S	433.04 E	2784.60	0.80
10515.00	89.32	181.91	7745.02	2867.96 S	430.34 E	2870.54	1.04
10601.00	89.75	181.55	7745.71	2953.92 S	427.74 E	2956.48	0.65
10687.00	88.70	180.75	7746.87	3039.89 S	426.01 E	3042.44	1.54
10772.00	89.20	180.31	7748.43	3124.87 S	425.22 E	3127.41	0.77
10858.00	89.63	179.52	7749.31	3210.87 S	425.35 E	3213.41	1.05
10944.00	90.31	179.14	7749.35	3296.86 S	426.35 E	3299.40	0.90
11029.00	88.70	177.86	7750.09	3381.82 S	428.57 E	3384.38	2.42
11093.00	89.14	178.14	7751.29	3445.77 S	430.81 E	3448.34	0.81
11184.00	89.13	175.83	7752.67	3536.63 S	435.59 E	3539.23	2.55
11276.00	87.96	177.41	7755.00	3628.44 S	441.02 E	3631.06	2.14
11368.00	88.82	179.55	7757.58	3720.36 S	443.46 E	3723.00	2.51
11458.00	89.81	180.38	7758.65	3810.35 S	443.51 E	3812.99	1.43
11549.00	90.00	179.94	7758.80	3901.35 S	443.25 E	3903.99	0.52
11641.00	90.06	180.01	7758.75	3993.35 S	443.29 E	3995.99	0.09
11733.00	90.19	178.77	7758.55	4085.35 S	444.27 E	4087.98	1.35
11824.00	91.11	180.16	7757.52	4176.33 S	445.12 E	4178.97	1.83
11910.00	91.73	179.36	7755.39	4262.30 S	445.48 E	4264.95	1.17
11996.00	91.42	181.27	7753.02	4348.27 S	445.00 E	4350.90	2.25
12081.00	91.79	180.65	7750.64	4433.22 S	443.58 E	4435.85	0.85
12167.00	89.75	180.76	7749.48	4519.20 S	442.52 E	4521.82	2.37
12253.00	90.93	181.66	7748.97	4605.18 S	440.71 E	4607.79	1.72
12338.00	91.17	180.93	7747.41	4690.14 S	438.78 E	4692.73	0.90
12424.00	90.00	181.33	7746.53	4776.12 S	437.08 E	4778.70	1.44
12510.00	90.37	182.11	7746.25	4862.08 S	434.50 E	4864.64	1.00
12595.00	90.37	183.00	7745.70	4946.99 S	430.71 E	4949.53	1.05
12681.00	90.56	183.08	7745.01	5032.87 S	426.15 E	5035.38	0.23
12767.00	90.43	183.52	7744.27	5118.72 S	421.20 E	5121.20	0.53
12853.00	90.19	182.28	7743.80	5204.61 S	416.86 E	5207.06	1.47
12938.00	89.20	181.39	7744.26	5289.56 S	414.14 E	5291.99	1.56
13024.00	88.21	181.50	7746.21	5375.51 S	411.97 E	5377.93	1.15
13110.00	87.65	180.92	7749.32	5461.44 S	410.15 E	5463.84	0.93
13195.00	89.44	182.74	7751.47	5546.36 S	407.44 E	5548.74	3.00
13281.00	90.62	183.47	7751.42	5632.23 S	402.78 E	5634.59	1.61
13367.00	90.37	183.94	7750.68	5718.05 S	397.22 E	5720.37	0.62
13453.00	90.49	182.89	7750.03	5803.89 S	392.10 E	5806.18	1.24
13538.00	88.21	181.51	7751.00	5888.81 S	388.84 E	5891.08	3.14
13624.00	88.27	180.84	7753.64	5974.76 S	387.08 E	5977.01	0.78
13709.00	88.89	180.33	7755.75	6059.72 S	386.21 E	6061.97	0.95
13793.00	89.44	180.47	7756.98	6143.71 S	385.62 E	6145.95	0.69
13881.00	88.82	180.83	7758.31	6231.70 S	384.62 E	6233.93	0.81
13966.00	90.00	182.27	7759.18	6316.66 S	382.33 E	6318.87	2.19
14052.00	90.25	182.42	7758.99	6402.58 S	378.81 E	6404.78	0.34
14137.00	89.38	180.86	7759.26	6487.55 S	376.38 E	6489.72	2.10
14223.00	88.52	179.70	7760.84	6573.53 S	375.97 E	6575.70	1.68
14309.00	87.90	178.92	7763.53	6659.48 S	377.00 E	6661.66	1.15
14395.00	88.03	178.36	7766.58	6745.40 S	379.04 E	6747.59	0.67
14481.00	88.52	178.25	7769.17	6831.32 S	381.58 E	6833.53	0.58
14566.00	88.77	177.29	7771.19	6916.23 S	384.88 E	6918.46	1.17
14652.00	88.21	177.81	7773.46	7002.12 S	388.56 E	7004.37	0.88
14738.00	89.81	177.76	7774.95	7088.04 S	391.88 E	7090.31	1.87
14823.00	90.56	178.80	7774.67	7173.00 S	394.43 E	7175.28	1.51
14909.00	90.06	180.65	7774.21	7259.00 S	394.84 E	7261.27	2.22
14995.00	88.33	181.15	7775.42	7344.98 S	393.49 E	7347.24	2.10
15080.00	88.02	180.13	7778.12	7429.93 S	392.54 E	7432.19	1.26
15166.00	88.76	180.75	7780.53	7515.89 S	391.88 E	7518.14	1.12
15252.00	88.76	183.08	7782.39	7601.81 S	389.00 E	7604.05	2.70

15337.00	89.13	183.15	7783.95	7686.67 S	384.39 E	7688.88	0.44
15423.00	88.76	183.34	7785.52	7772.52 S	379.52 E	7774.70	0.48
15509.00	88.33	183.00	7787.70	7858.36 S	374.77 E	7860.51	0.64
15594.00	87.96	181.26	7790.45	7943.26 S	371.62 E	7945.38	2.09
15680.00	87.10	181.29	7794.16	8029.15 S	369.71 E	8031.26	1.01
15766.00	87.90	183.19	7797.92	8115.00 S	366.35 E	8117.09	2.39
15852.00	88.27	182.41	7800.79	8200.85 S	362.15 E	8202.91	1.01
15938.00	87.22	182.76	7804.18	8286.70 S	358.28 E	8288.73	1.29
16023.00	88.83	183.66	7807.11	8371.51 S	353.52 E	8373.51	2.16
16109.00	88.83	185.00	7808.87	8457.24 S	347.03 E	8459.21	1.56
16195.00	89.20	185.76	7810.35	8542.85 S	338.97 E	8544.76	0.99
16280.00	89.32	186.75	7811.45	8627.34 S	329.71 E	8629.19	1.17
16366.00	89.20	186.77	7812.57	8712.73 S	319.59 E	8714.52	0.14
16452.00	89.51	188.18	7813.54	8797.99 S	308.40 E	8799.71	1.69
16537.00	89.69	189.02	7814.14	8882.03 S	295.69 E	8883.67	1.01
16623.00	90.62	190.33	7813.90	8966.81 S	281.23 E	8968.36	1.86
16724.00	90.62	191.12	7812.81	9066.04 S	262.44 E	9067.47	0.79
16774.00	90.62	191.12	7812.27	9115.09 S	252.79 E	9116.47	0.01

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 179.65 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.67 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16774.00 FEET
IS 9118.60 FEET ALONG 178.41 DEGREES (TRUE)**

Directional Surveys Tied on to Surface Casing @ 1001'. Final survey is a straight line projection to bit.