



**1 : 600 / 1 : 240**

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	30-Apr-15	01-May-15			
Rig Bit Number	0100	0200			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	626.00	5,863.30			
Log End Depth (TVD, ft)	5,863.30	6,037.80			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	29-Apr-15 21:45	30-Apr-15 21:30			
Drill/Wipe End Date and Time	30-Apr-15 13:20	01-May-15 03:30			
Min Inc (deg) @ Depth (TVD, ft)	0.09 @ 5,024.46	45.12 @ 5,920.58			
Max Inc (deg) @ Depth (TVD, ft)	32.65 @ 5,846.71	81.50 @ 6,030.92			
Bit TFA(in2) / Bit Type	1.21 / PDC	1.18 / PDC			
Flow Rate (gpm)	626.92	575.00			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	8.80 / 28.00	10.80 / 38.00			
Filtrate CL (ppm)	1,800.00	1,800.00			
pH / Fluid Loss (mptm)	9.40 / 46	9.00 / 6			
PV (cP) / YP (lbf2)	4 / 3.00	15 / 14.00			
% Solids / % Sand	2.70 / 0.30	11.70 / 0.15			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (in F) / S	122.00 / PDM	122.00 / PDM			

Max Tool Temp (degF) / Source	160.83 / PCM	160.83 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 160.83	N/A @ 160.83			
Lead MWD Engineer	Kyle Regan	Kyle Regan			
Customer Representative	JW Erwin	JW Erwin			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	246470	246470			
Insert Serial Number	11680738	11680738			
Date and Time Initialized	29-Apr-15 12:36	01-Jan-70 00:00			
Date and Time Read	01-May-15 07:42	01-May-15 07:47			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.00	55.00			
Software Version	6.33	6.33			
Sub Serial Number	246470	246470			
Sonde Serial Number	11638628	11638628			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	68.67	53.30			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	47.11	47.95			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	246470	246470			
Insert/Sonde Serial Number	12037421	12037421			

## 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 annular velocities are calculated using the "Power Law" model for water 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

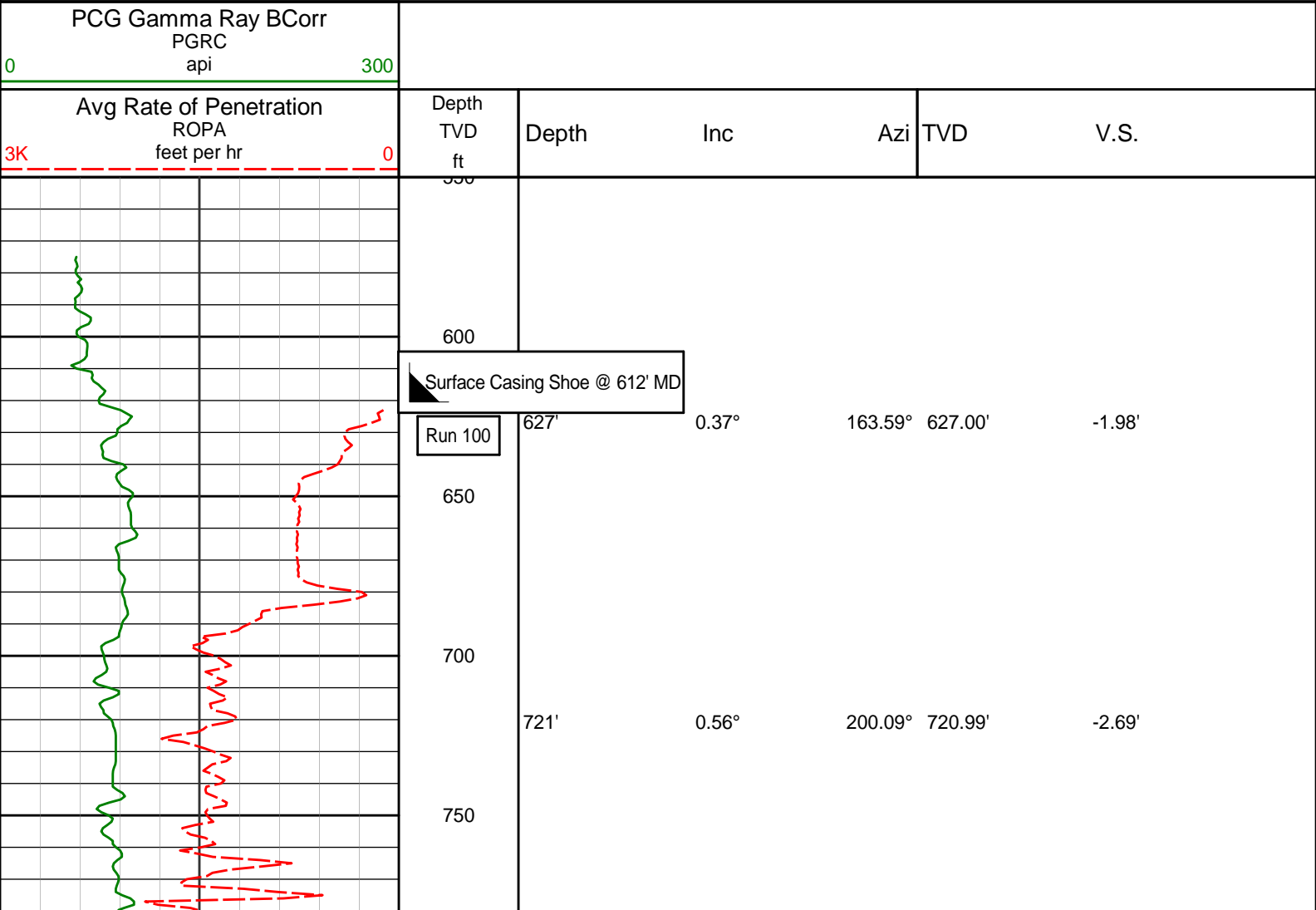
Interval Distance: 1.2 ft

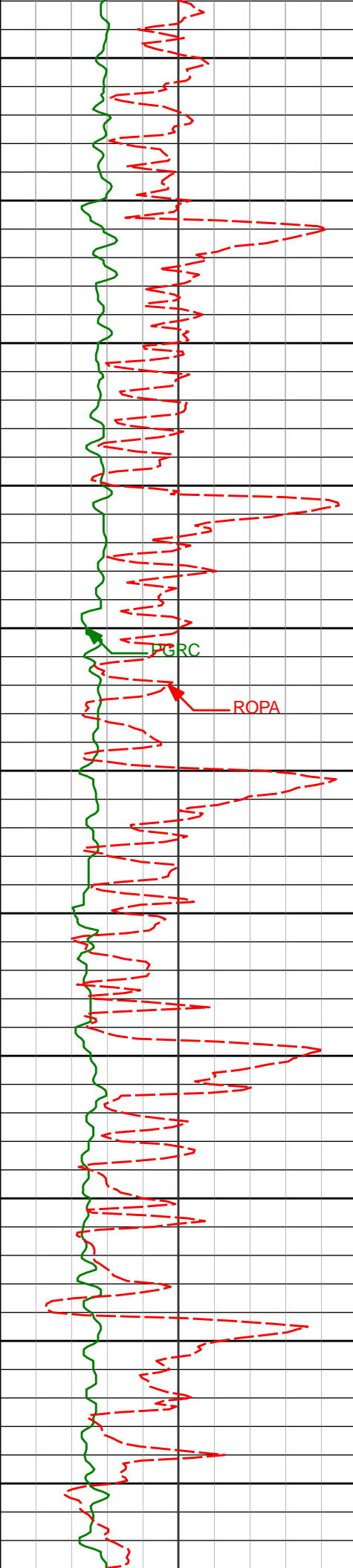
Gap Fill: 3.0 ft

WARRANTY

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TVD Detail 1:600 Scale





800

850

900

950

1000

1050

1100

1150

1200

1250

1300

910'

1.14°

203.12° 909.97'

-5.21'

1005'

1.13°

200.43° 1004.95'

-6.91'

1098'

1.17°

202.71° 1097.93'

-8.61'

1190'

1.35°

206.45° 1189.91'

-10.39'

1283'

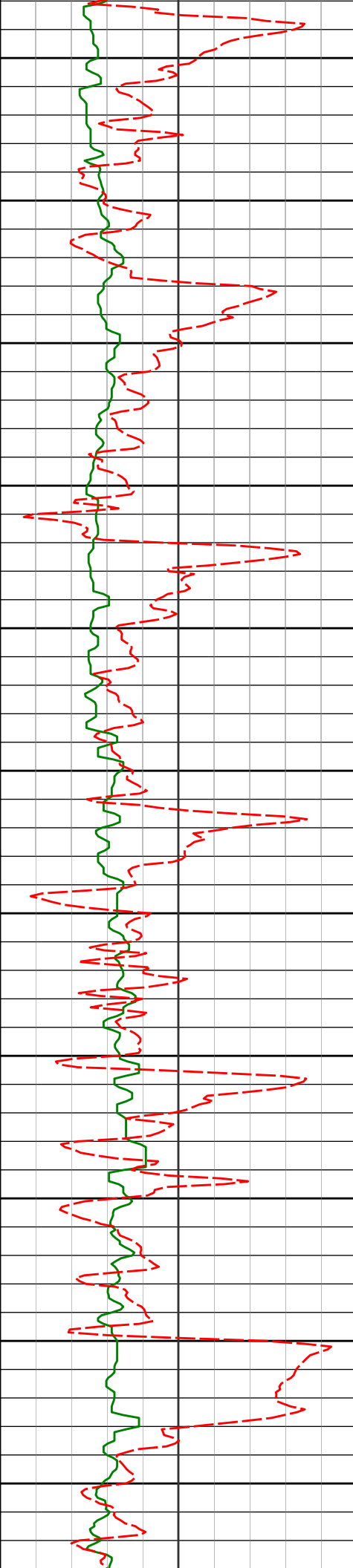
1.58°

213.06° 1282.88'

-12.38'

PGRC

ROPA



1350

1376'

1.71°

210.16° 1375.84'

-14.57'

1400

1450

1469'

1.59°

201.68° 1468.80'

-16.90'

1500

1550

1561'

1.64°

203.18° 1560.77'

-19.24'

1600

1650

1654'

1.64°

203.30° 1653.73'

-21.61'

1700

1750

1747'

1.25°

197.69° 1746.70'

-23.75'

1800

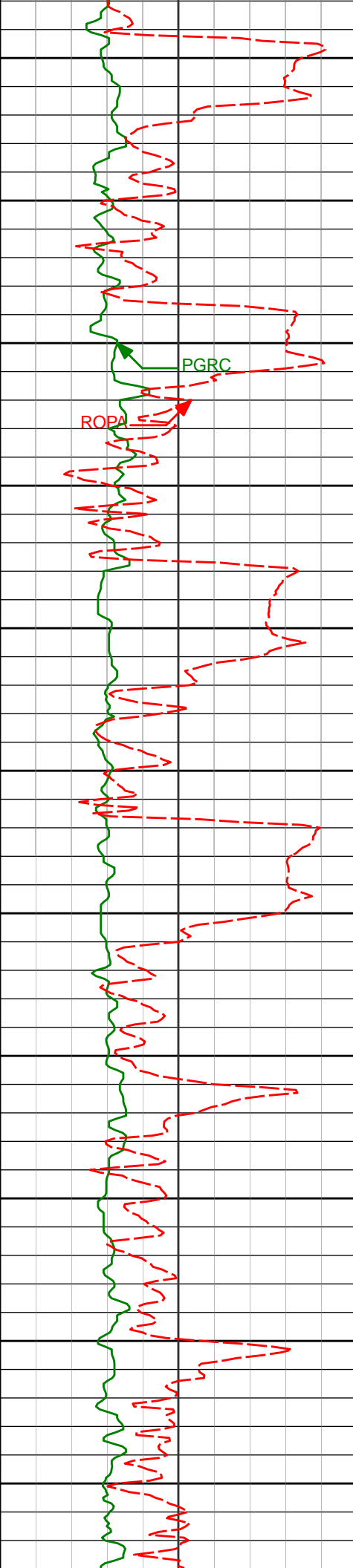
1839'

1.57°

315.88° 1838.69'

-23.73'

1850



1900

1930'

3.47°

313.81° 1929.59'

-20.77'

1950

2000

PGRC

ROPA

2024'

5.00°

318.22° 2023.33'

-15.48'

2050

2100

2116'

7.58°

324.85° 2114.78'

-7.20'

2150

2200

2209'

9.61°

316.63° 2206.73'

3.94'

2250

2300

2301'

8.92°

316.51° 2297.53'

15.25'

2350

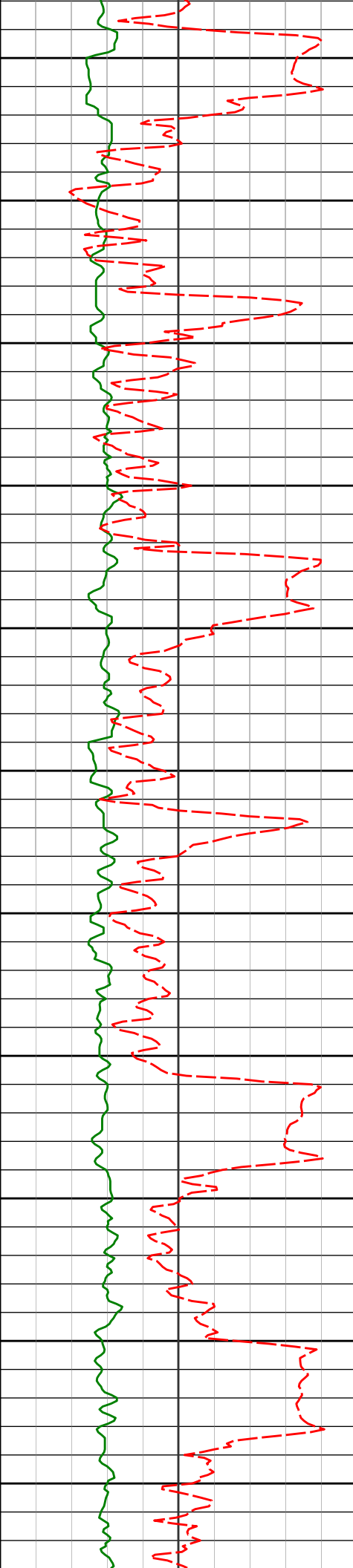
2394'

8.24°

313.05° 2389.49'

25.58'

2400



2450

2486'

8.81°

306.98° 2480.47'

34.89'

2500

2550

2580'

9.44°

305.35° 2573.28'

44.35'

2600

2650

2672'

10.12°

295.69° 2663.95'

52.96'

2700

2750

2763'

10.45°

294.22° 2753.49'

60.63'

2800

2850

2857'

8.67°

281.29° 2846.19'

66.34'

2900

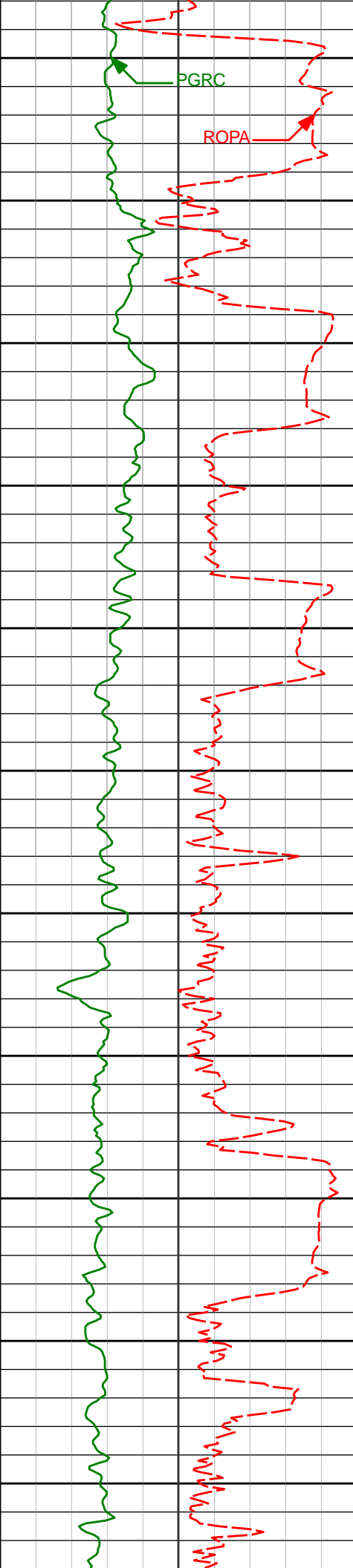
2950

2952'

8.28°

277.54° 2940.15'

69.41'



3000

3047'

5.06°

267.59° 3034.50'

70.75'

3050

3100

3141'

2.00°

205.84° 3128.34'

69.37'

3150

3200

3236'

3.60°

172.39° 3223.23'

64.94'

3250

3300

3330'

4.08°

167.22° 3317.01'

58.70'

3350

3400

3425'

3.92°

151.60° 3411.79'

52.43'

3450

3500

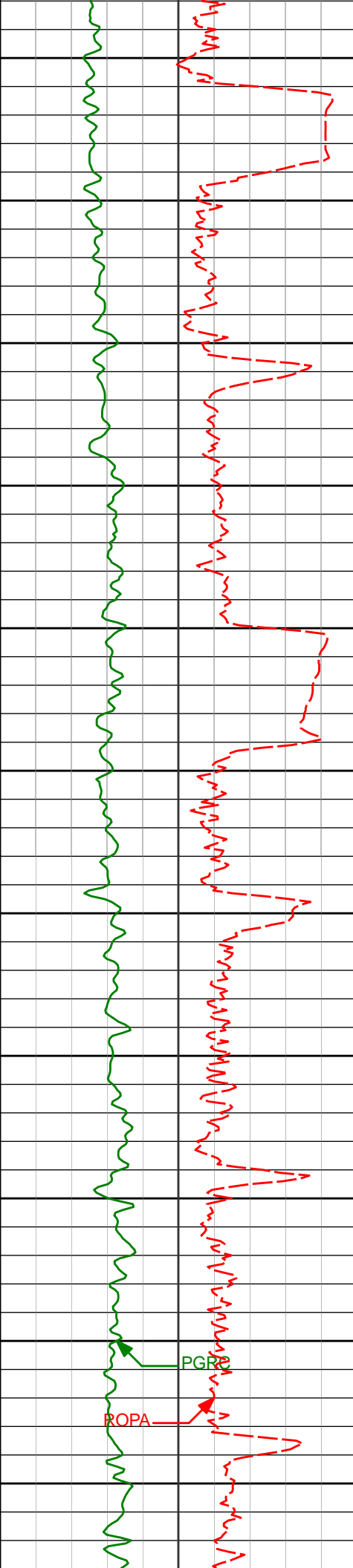
3520'

4.16°

136.28° 3506.55'

46.87'





3550

3600

3650

3700

3750

3800

3850

3900

3950

4000

4050

3615'

3.38°

114.57°

3601.35'

42.94'

3710'

3.54°

110.15°

3696.18'

40.47'

3804'

3.10°

47.07°

3790.05'

40.94'

3899'

2.36°

48.15°

3884.94'

43.80'

3994'

2.28°

36.59°

3979.86'

46.47'

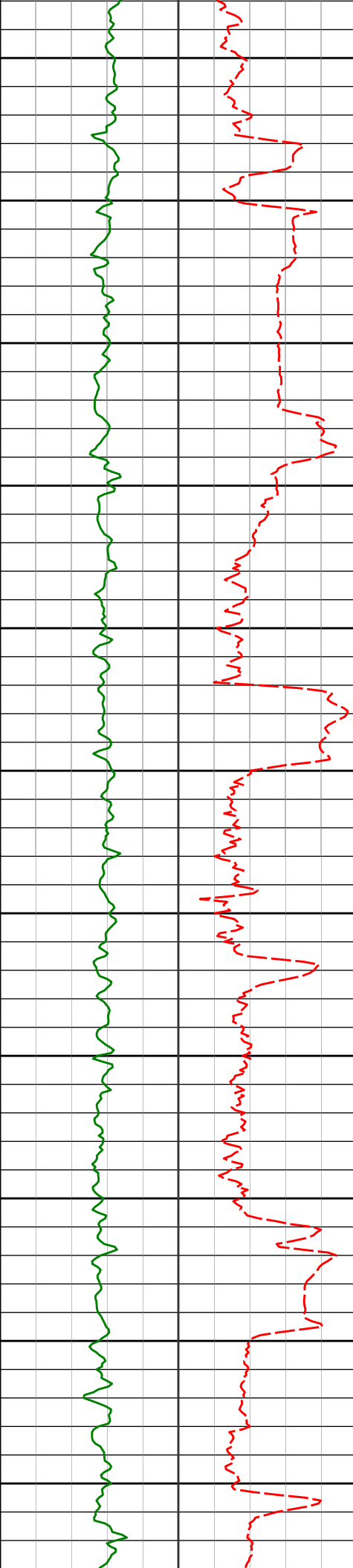
4089'

1.79°

26.51°

4074.80'

49.21'



4100

4150

4200

4250

4300

4350

4400

4450

4500

4550

4600

4184'

2.11°

23.91°

4169.75'

52.06'

4279'

2.33°

20.83°

4264.68'

55.38'

4374'

1.49°

26.94°

4359.62'

58.22'

4469'

1.91°

35.57°

4454.58'

60.53'

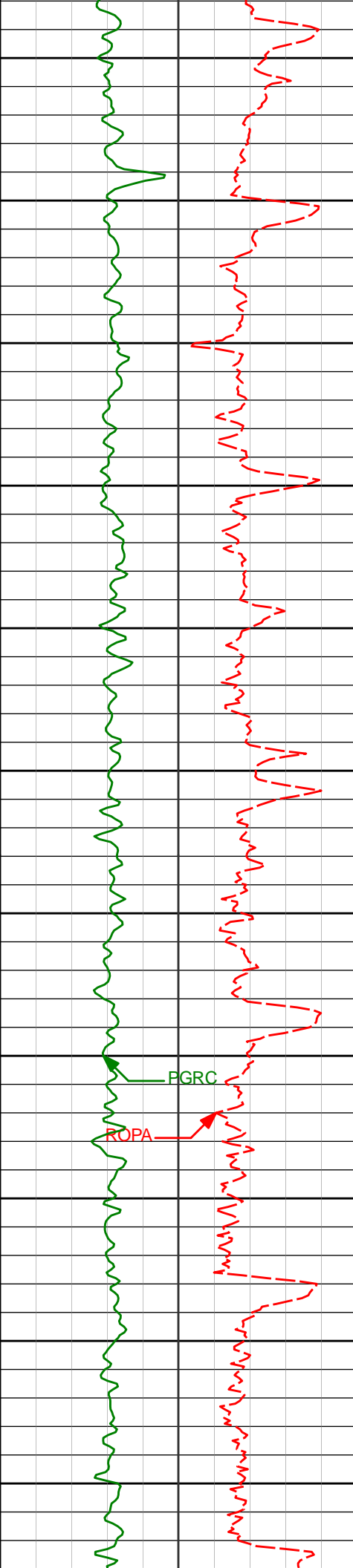
4564'

1.97°

331.01°

4549.54'

63.24'



4650

4700

4750

4800

4850

4900

4950

5000

5050

5100

5150

4659'

1.50°

353.96° 4644.49'

65.95'

4754'

0.83°

6.30° 4739.47'

67.88'

4849'

0.49°

4.33° 4834.47'

68.96'

4944'

0.25°

342.92° 4929.46'

69.56'

5039'

0.09°

294.44° 5024.46'

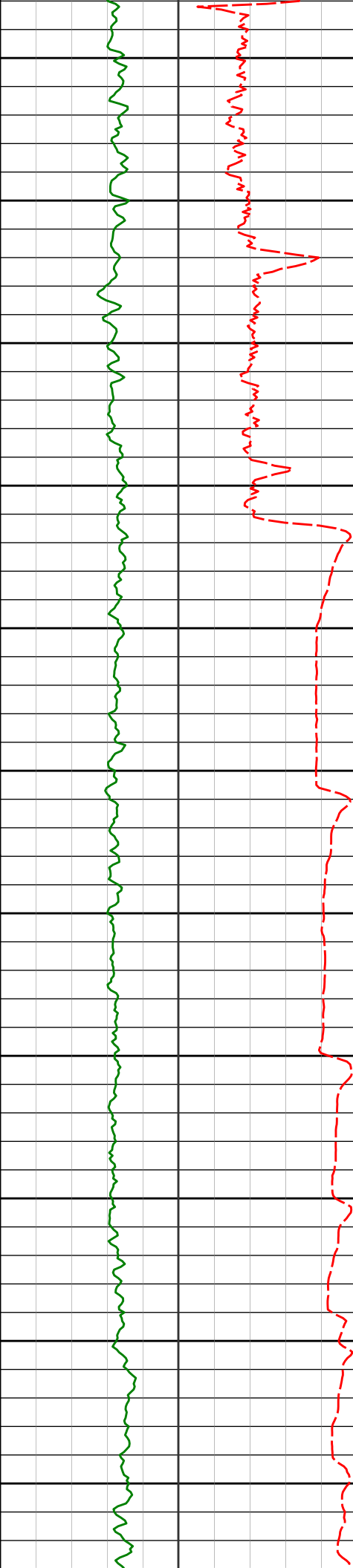
69.79'

5134'

0.19°

199.51° 5119.46'

69.68'



5200

5229'

0.57°

213.25° 5214.46'

69.15'

5250

5300

5324'

0.39°

164.26° 5309.46'

68.46'

5350

5400

5419'

3.99°

6.70° 5404.39'

71.40'

5450

5500

5514'

11.73°

358.77° 5498.43'

84.33'

5550

5600

5608'

17.81°

355.87° 5589.28'

108.27'

5650

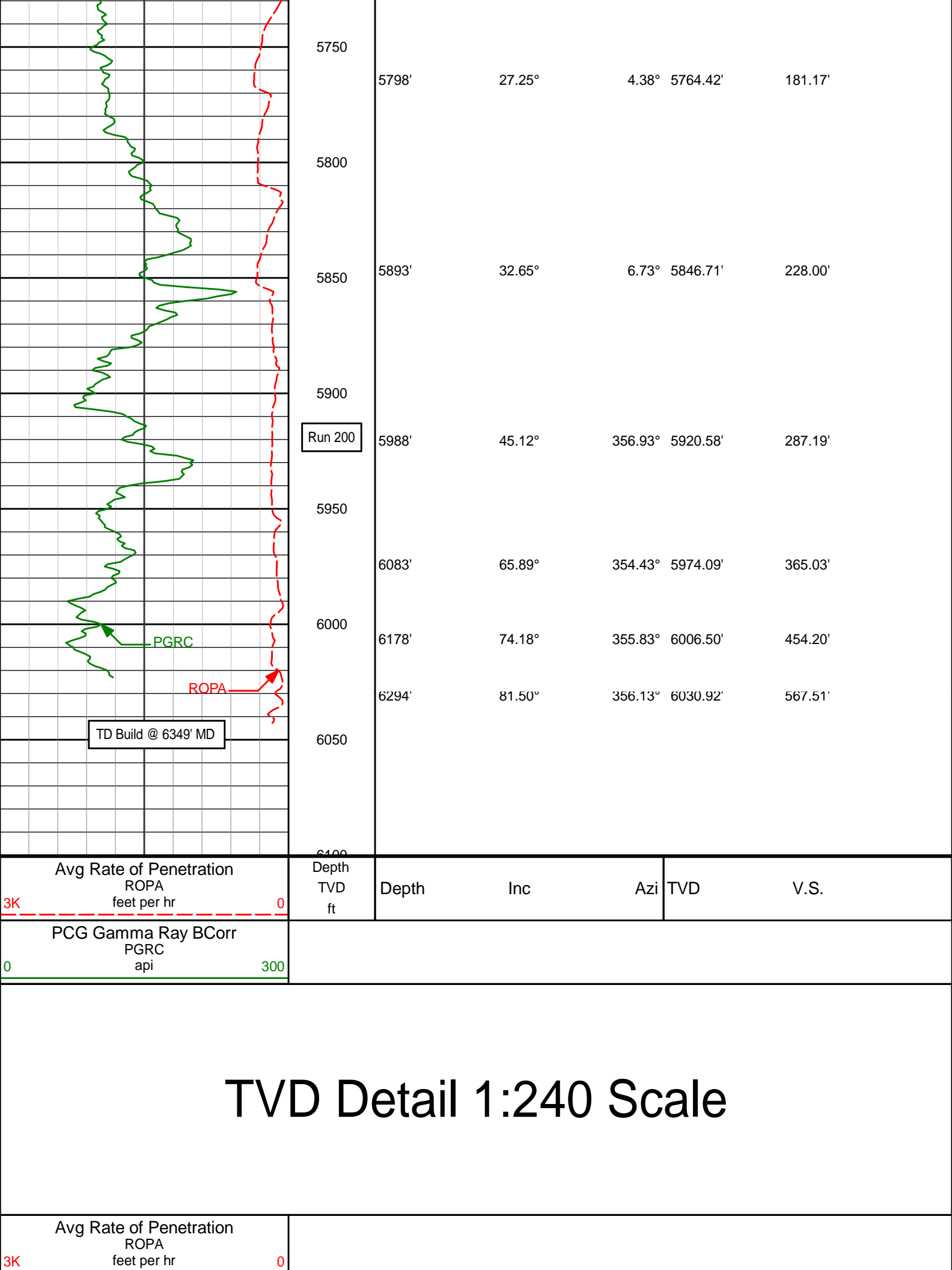
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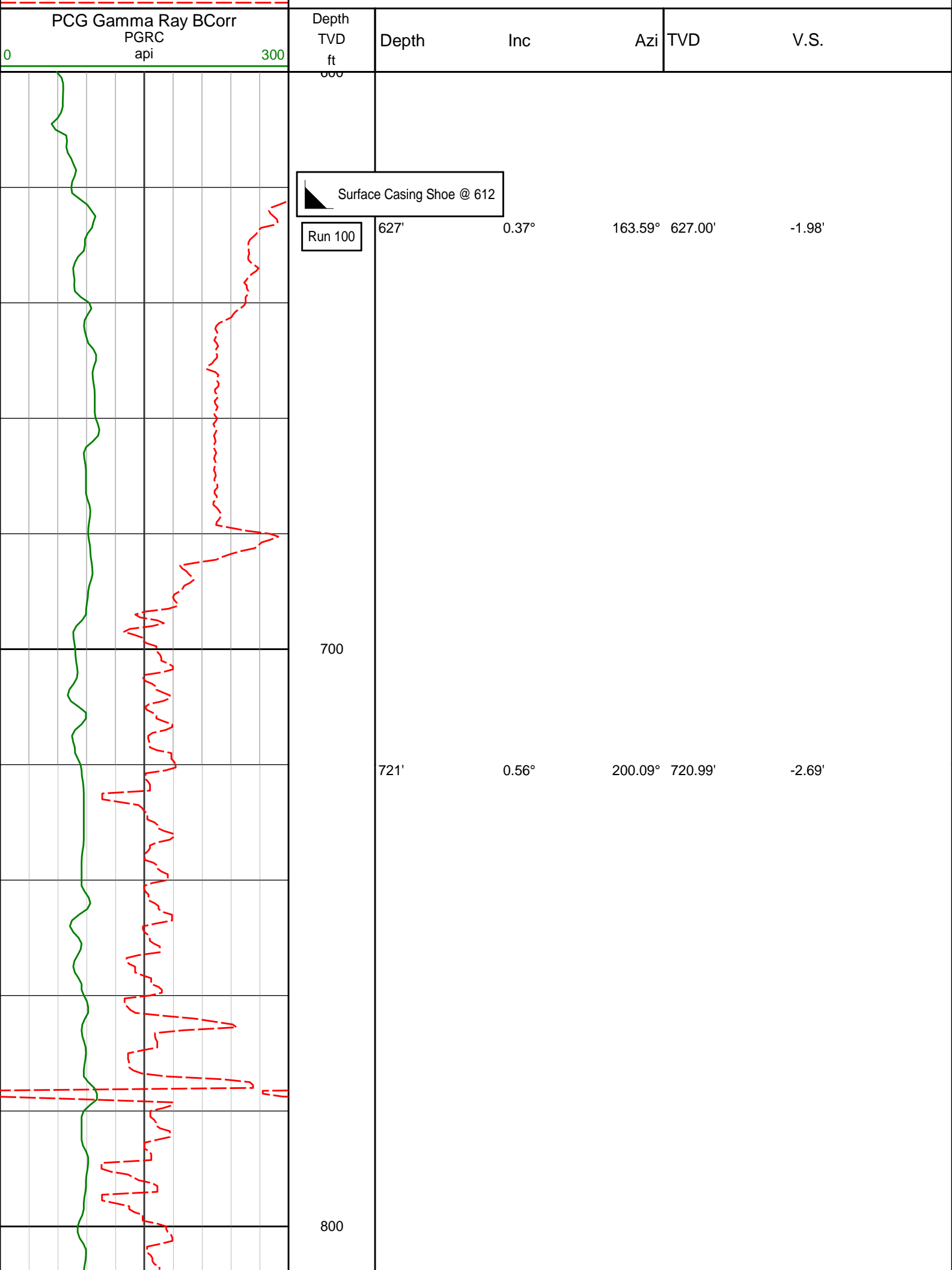
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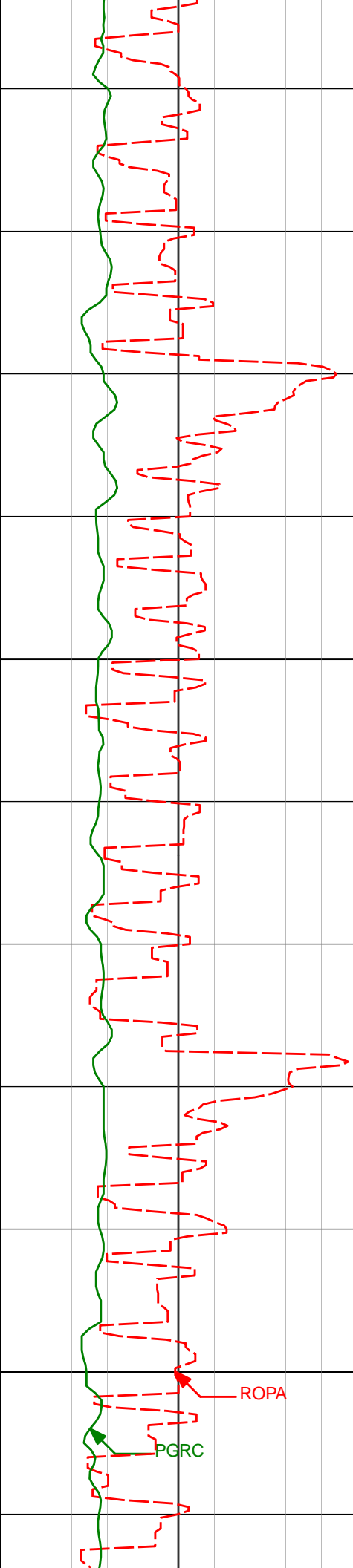
22.81°

359.79° 5678.35'

141.20'







900

910'

1.14°

203.12° 909.97'

-5.21'

1000

1005'

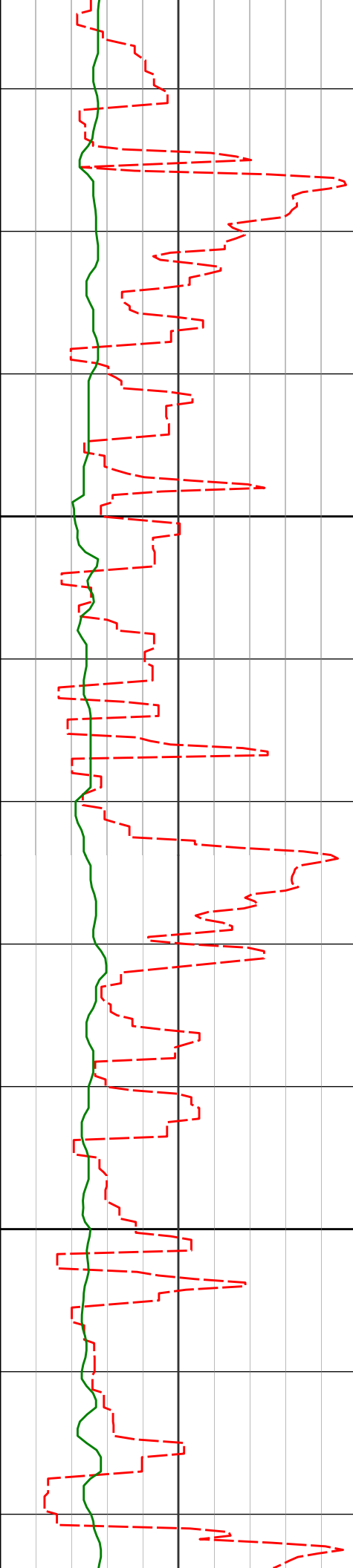
1.13°

200.43° 1004.95'

-6.91'

ROPA

PGRC



1100

1098'

1.17°

202.71° 1097.93'

-8.61'

1200

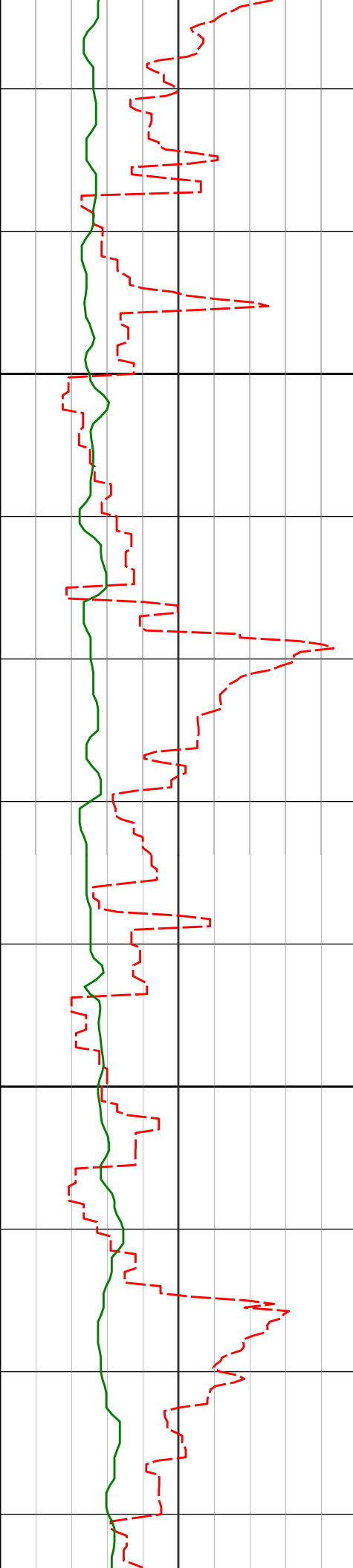
1190'

1.35°

206.45° 1189.91'

-10.39'





1300

1283'

1.58°

213.06° 1282.88'

-12.38'

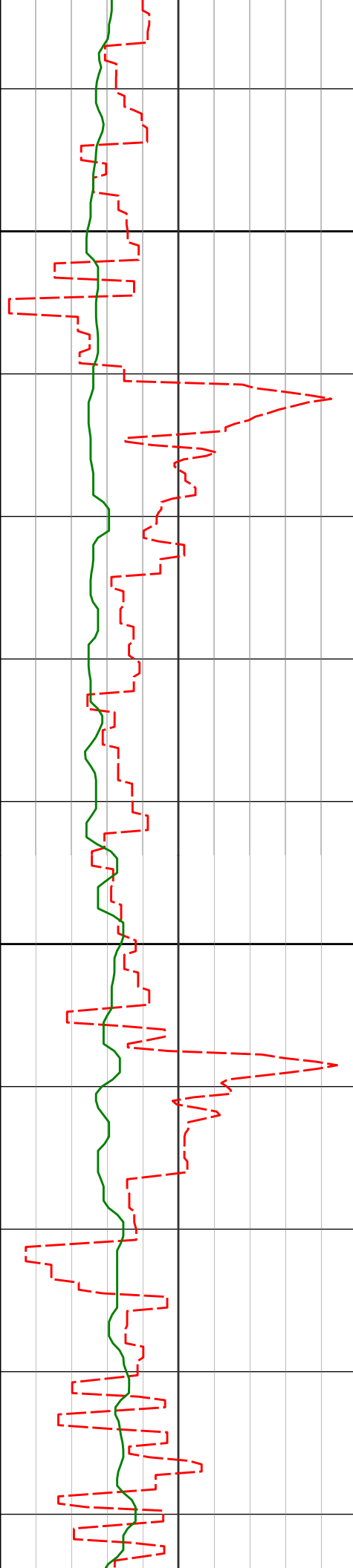
1376'

1.71°

210.16° 1375.84'

-14.57'

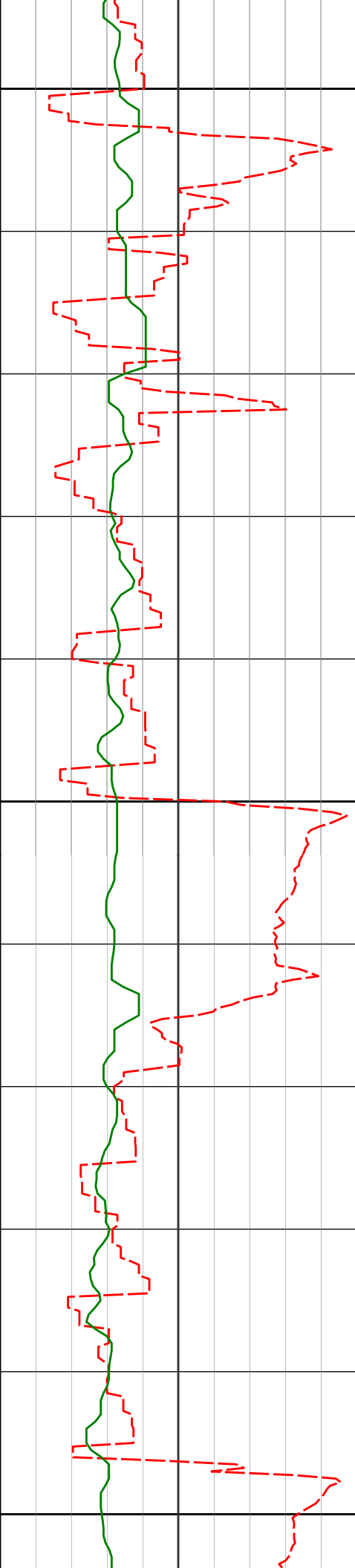
1400



1500

1600

1469'	1.59°	201.68°	1468.80'	-16.90'
1561'	1.64°	203.18°	1560.77'	-19.24'
1654'	1.64°	203.30°	1653.73'	-21.61'



1700

1747'

1.25°

197.69° 1746.70'

-23.75'

1800

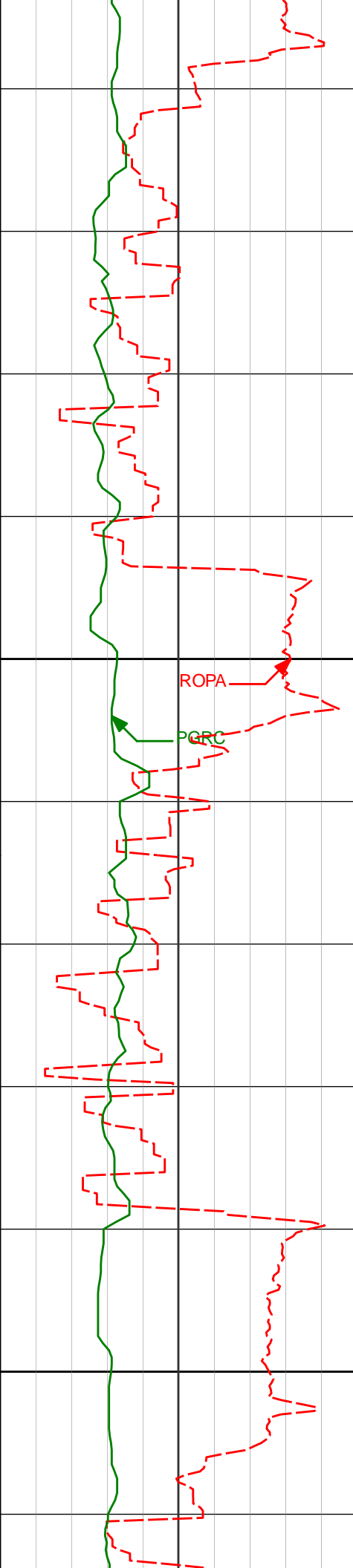
1839'

1.57°

315.88° 1838.69'

-23.73'

1900



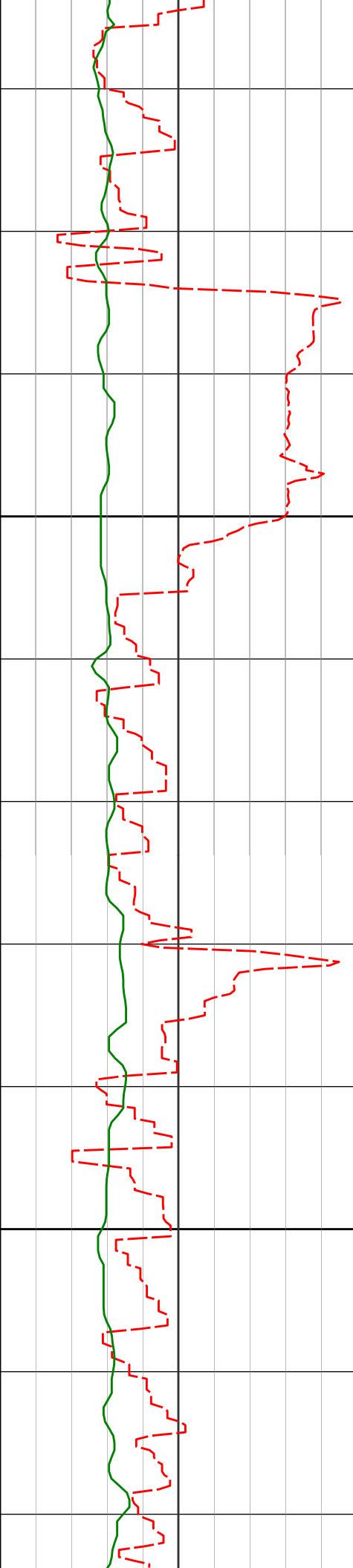
2000

2100

1930'      3.47°      313.81°    1929.59'      -20.77'

2024'      5.00°      318.22°    2023.33'      -15.48'

2116'      7.58°      324.85°    2114.78'      -7.20'



2200

2209'

9.61°

316.63° 2206.73'

3.94'

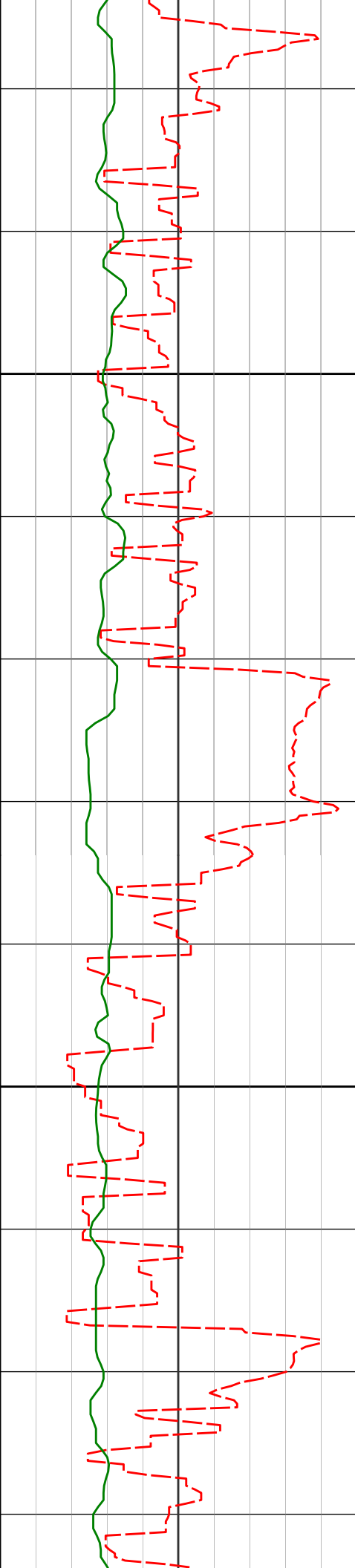
2300

2301'

8.92°

316.51° 2297.53'

15.25'



2400

2500

2394'

8.24°

313.05° 2389.49'

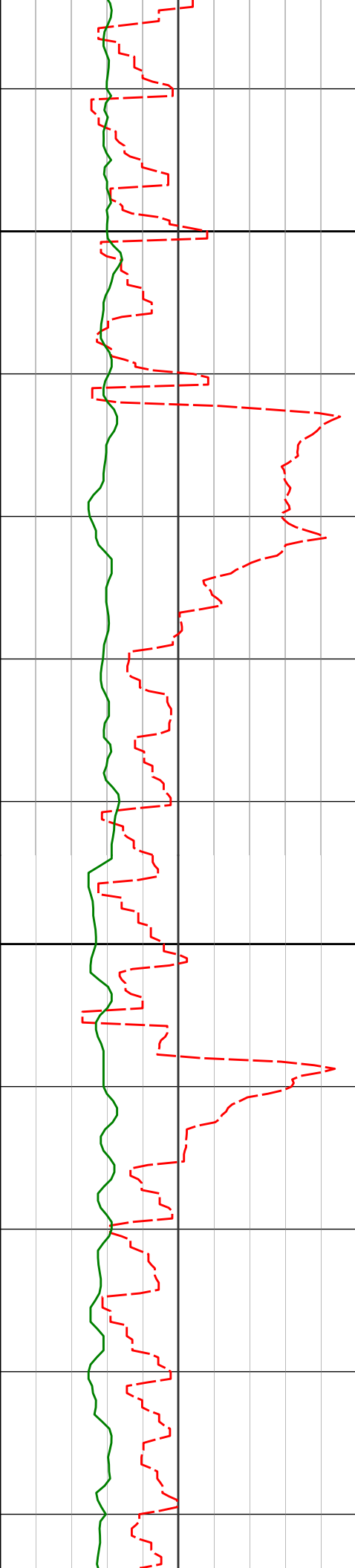
25.58'

2486'

8.81°

306.98° 2480.47'

34.89'



2600

2700

2580'

9.44°

305.35° 2573.28'

44.35'

2672'

10.12°

295.69° 2663.95'

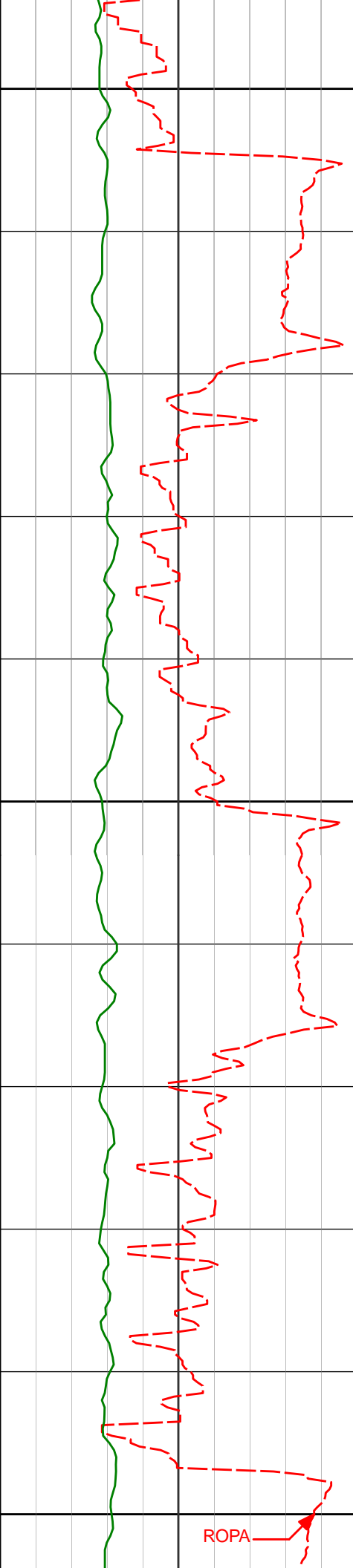
52.96'

2763'

10.45°

294.22° 2753.49'

60.63'



2800

2857'

8.67°

281.29° 2846.19'

66.34'

2900

2952'

8.28°

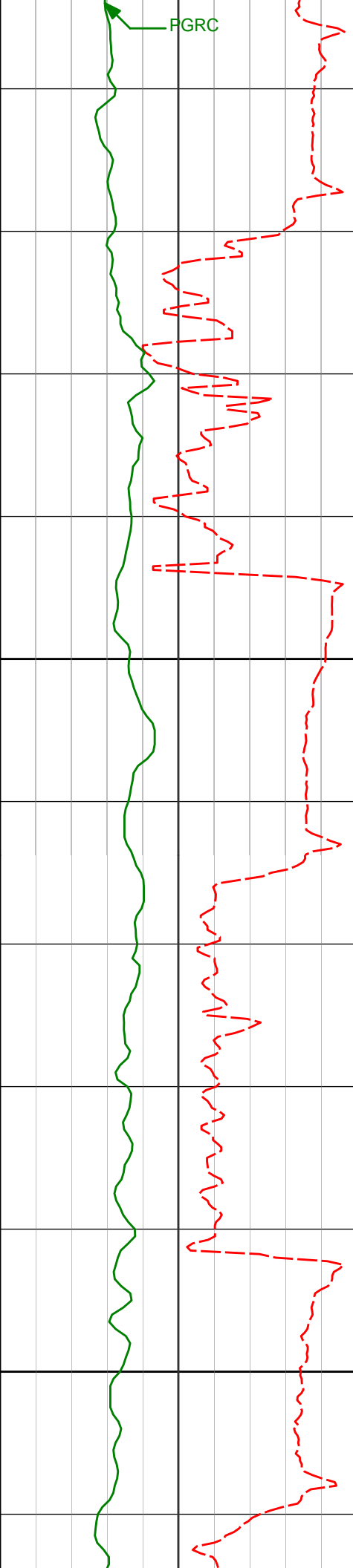
277.54° 2940.15'

69.41'

3000

ROPA





FGRC

3047'

5.06°

267.59° 3034.50'

70.75'

3100

3141'

2.00°

205.84° 3128.34'

69.37'

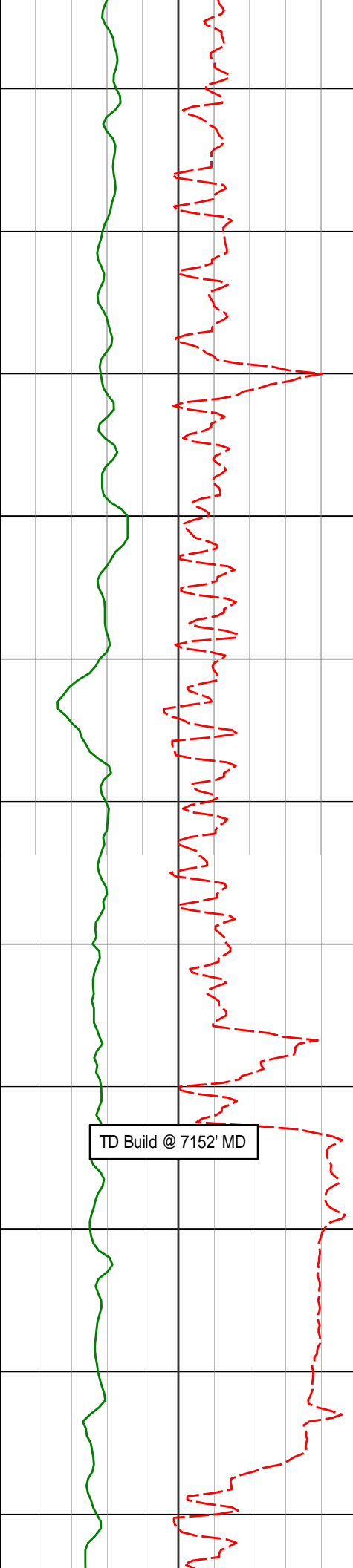
3200

3236'

3.60°

172.39° 3223.23'

64.94'



3300

3330'

4.08°

167.22° 3317.01'

58.70'

TD Build @ 7152' MD

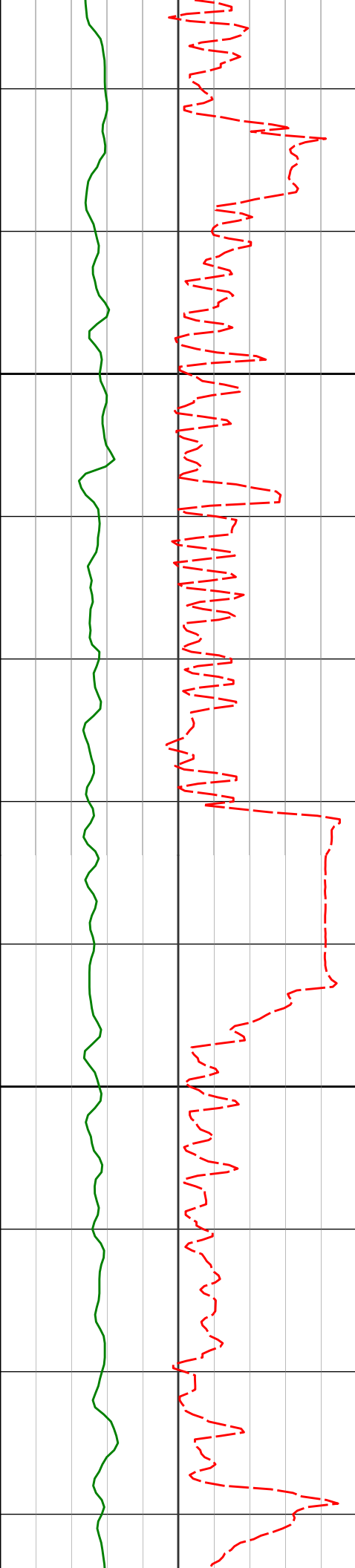
3400

3425'

3.92°

151.60° 3411.79'

52.43'



3500

3520'

4.16°

136.28° 3506.55'

46.87'

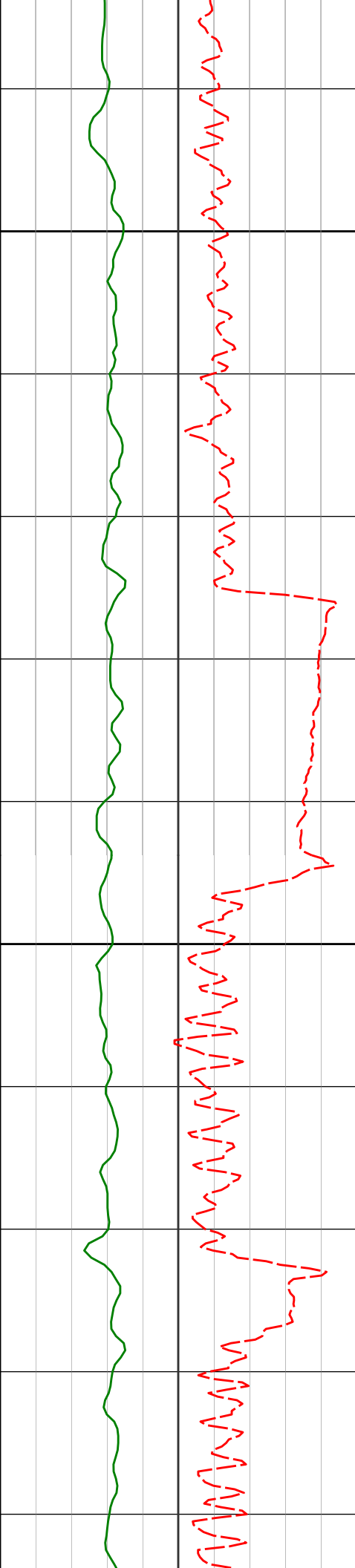
3600

3615'

3.38°

114.57° 3601.35'

42.94'



3700

3800

3710'

3.54°

110.15° 3696.18'

40.47'

3804'

3.10°

47.07° 3790.05'

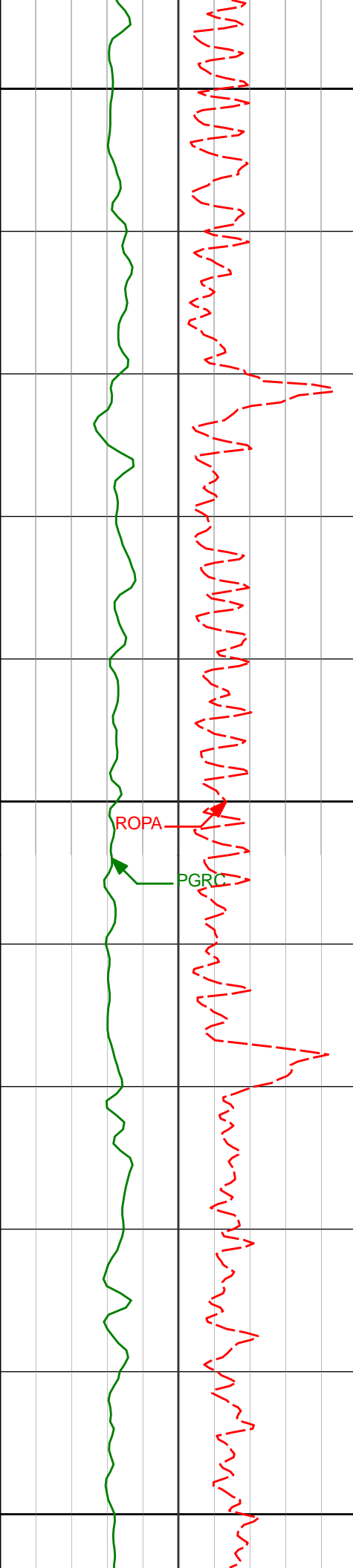
40.94'

3899'

2.36°

48.15° 3884.94'

43.80'



3900

3994'

2.28°

36.59° 3979.86'

46.47'

4000

ROPA

PGRC

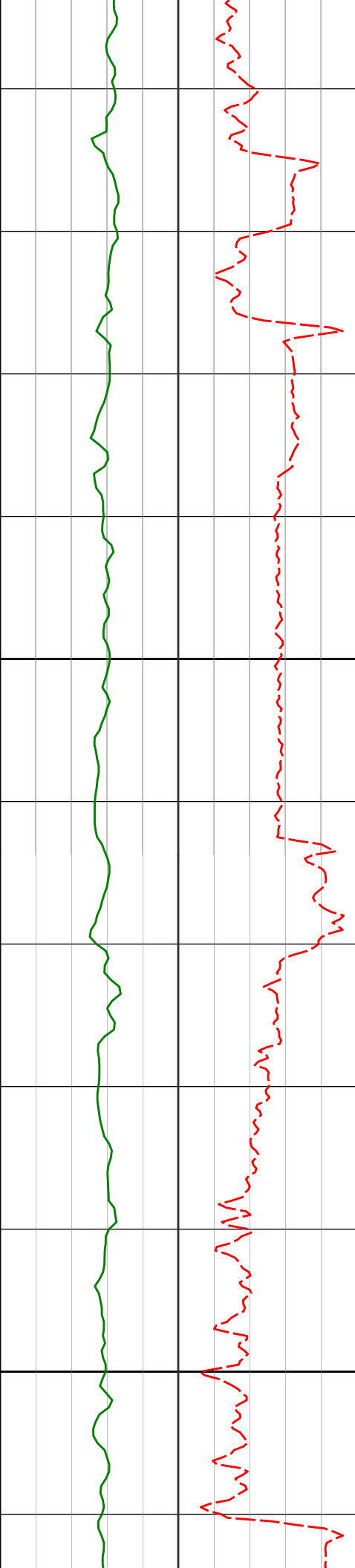
4089'

1.79°

26.51° 4074.80'

49.21'

4100



4200

4300

4184'

2.11°

23.91° 4169.75'

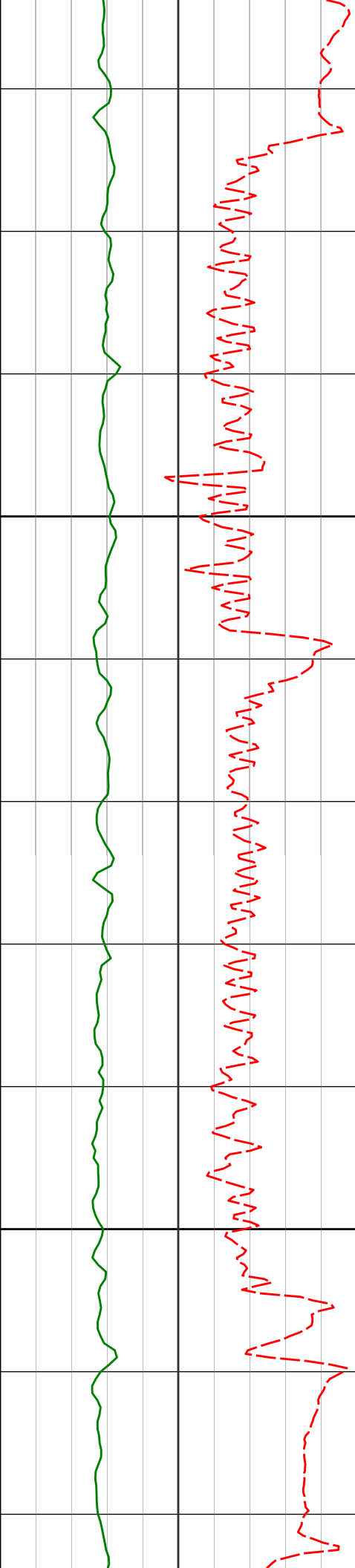
52.06'

4279'

2.33°

20.83° 4264.68'

55.38'



4400

4500

4374'

1.49°

26.94° 4359.62'

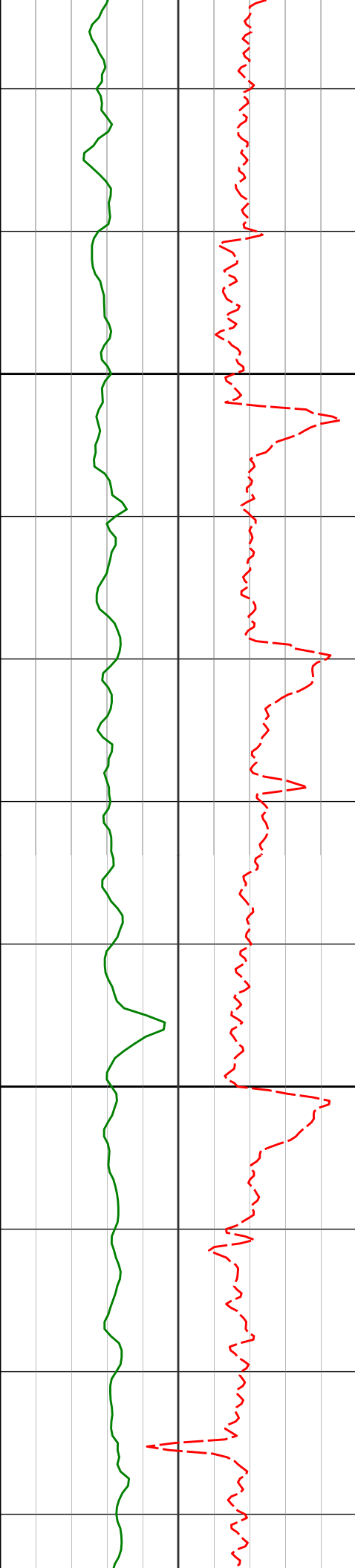
58.22'

4469'

1.91°

35.57° 4454.58'

60.53'

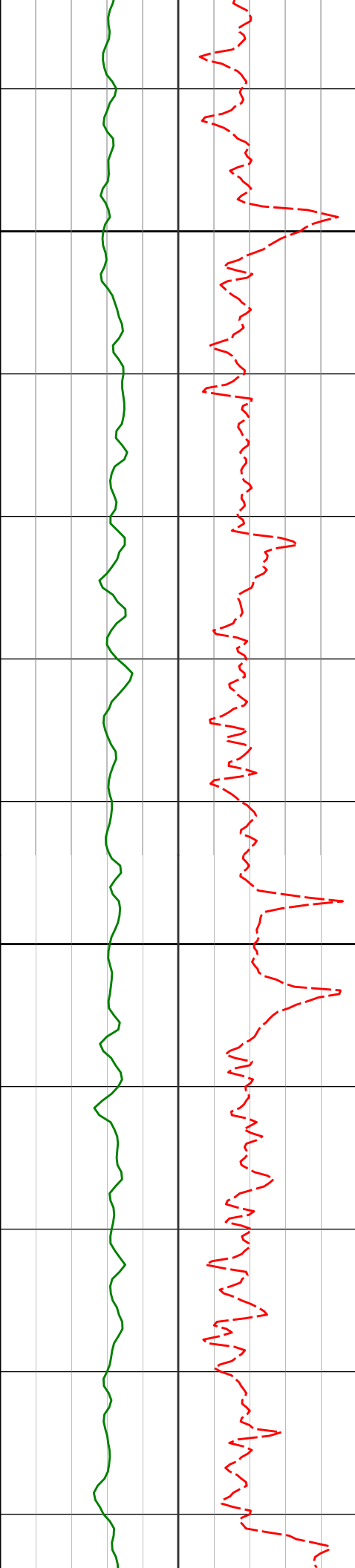


4600

4700

4564'	1.97°	331.01°	4549.54'	63.24'
4659'	1.50°	353.96°	4644.49'	65.95'
4754'	0.83°	6.30°	4739.47'	67.88'





4800

4849'

0.49°

4.33° 4834.47'

68.96'

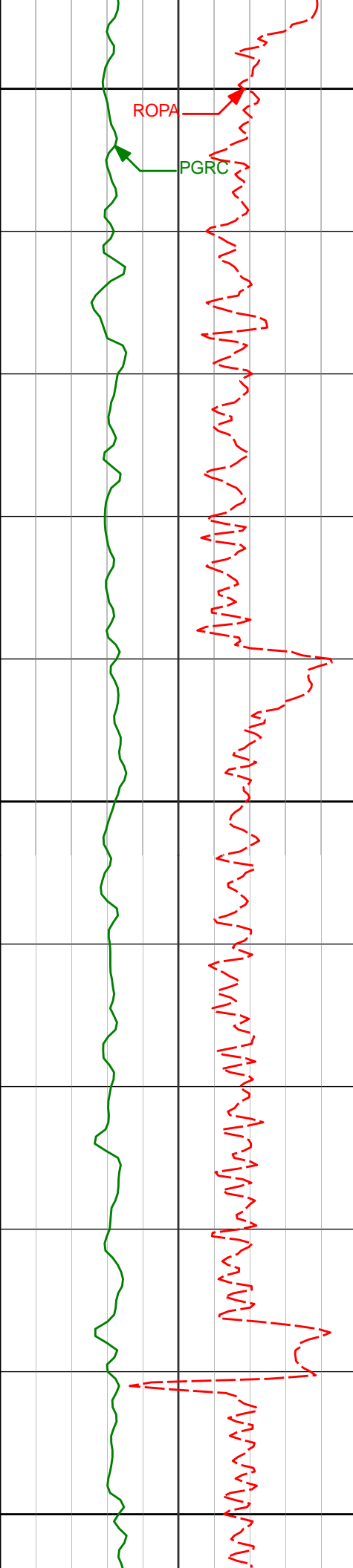
4900

4944'

0.25°

342.92° 4929.46'

69.56'



5000

ROPA

PGRC

5100

5200

5039'

0.09°

294.44° 5024.46'

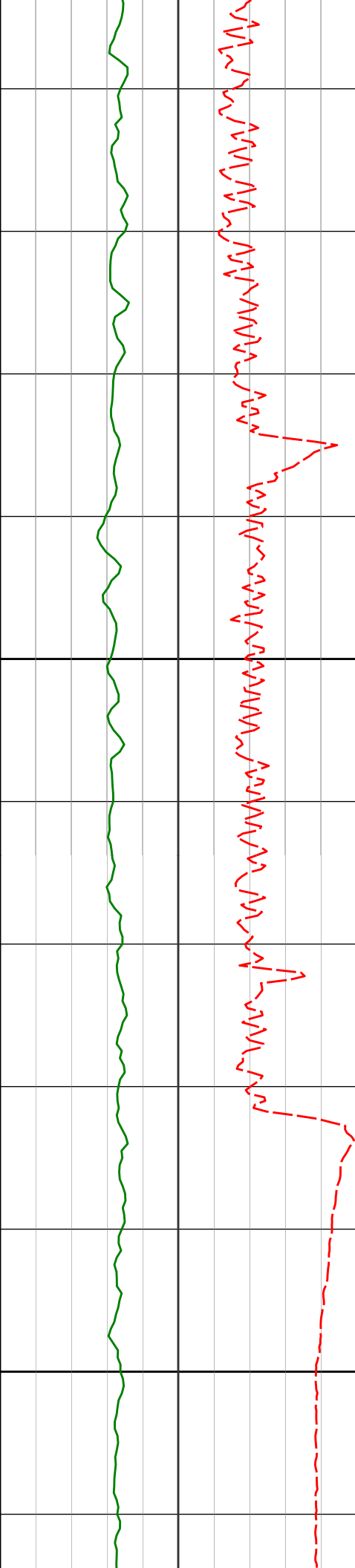
69.79'

5134'

0.19°

199.51° 5119.46'

69.68'



5300

5400

5229'

0.57°

213.25° 5214.46'

69.15'

5324'

0.39°

164.26° 5309.46'

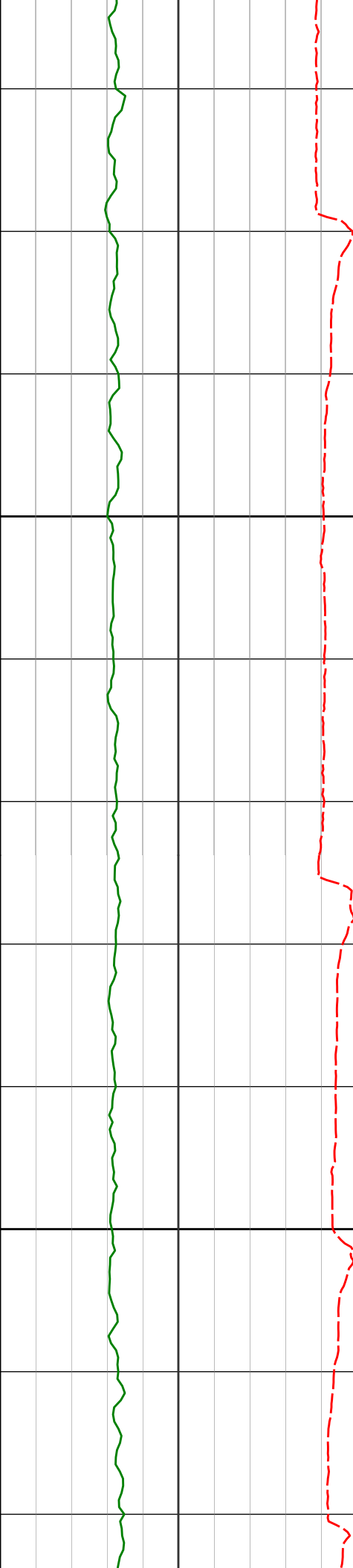
68.46'

5419'

3.99°

6.70° 5404.39'

71.40'



5500

5514'

11.73°

358.77° 5498.43'

84.33'

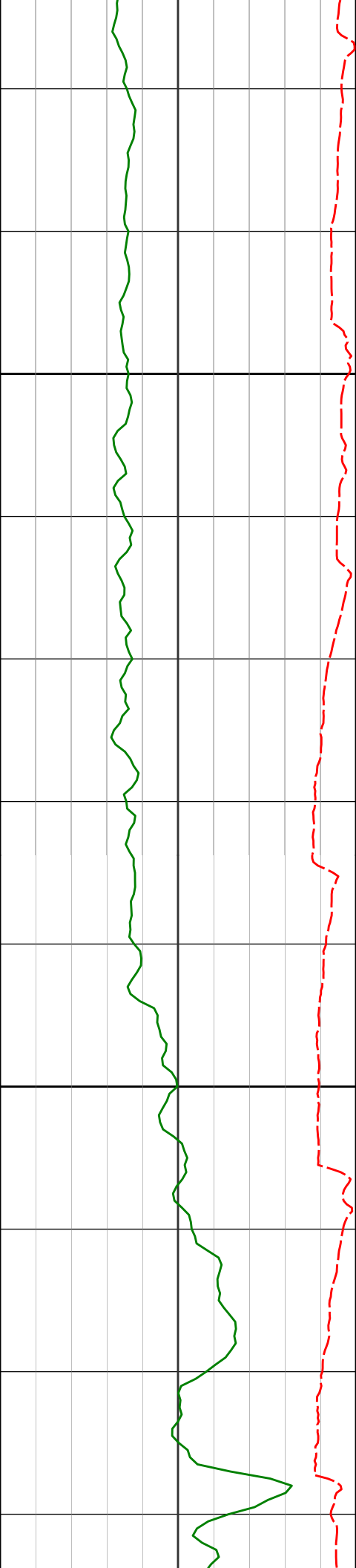
5600

5608'

17.81°

355.87° 5589.28'

108.27'



5700

5800

5703'

22.81°

359.79° 5678.35'

141.20'

5798'

27.25°

4.38° 5764.42'

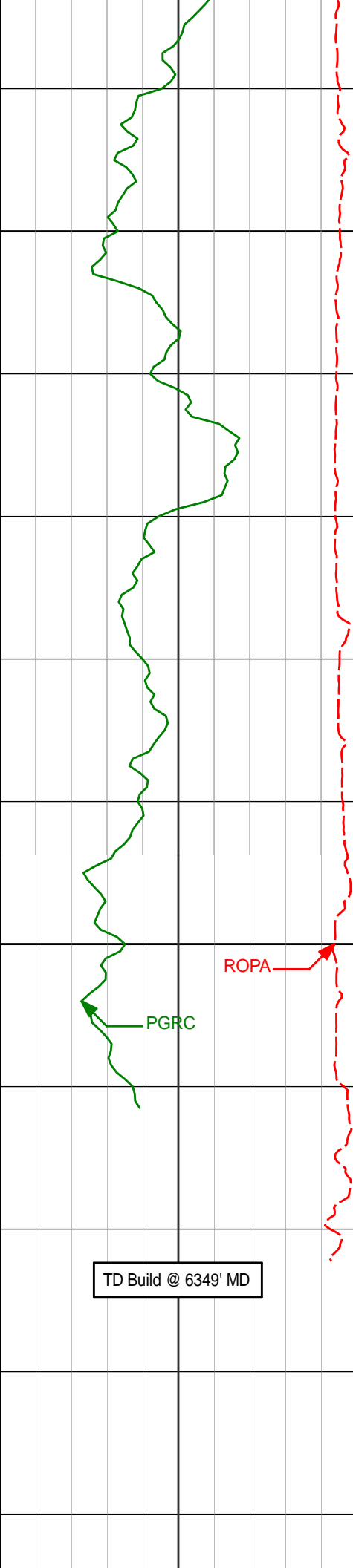
181.17'

5893'

32.65°

6.73° 5846.71'

228.00'



5900

Run 200

5988'

45.12°

356.93° 5920.58'

287.19'

6083'

65.89°

354.43° 5974.09'

365.03'

6000

6178'

74.18°

355.83° 6006.50'

454.20'

6294'

81.50°

356.13° 6030.92'

567.51'



4835.00	9.00	274.37	4017.00	19.21 N	403.70 W	91.23	2.23
4950.00	7.44	275.07	4911.75	16.44 N	477.78 W	94.74	2.28
5045.00	9.09	290.08	5005.77	19.56 N	490.95 W	99.99	2.85
5140.00	9.69	276.33	5099.51	23.02 N	505.96 W	105.87	2.44
5235.00	9.78	267.67	5193.15	23.57 N	521.97 W	109.04	1.54
5330.00	10.28	268.28	5286.69	22.99 N	538.50 W	111.19	0.54
5425.00	11.67	269.07	5379.95	22.58 N	556.59 W	113.75	1.47
5519.00	15.49	275.66	5471.32	23.66 N	578.59 W	118.44	4.38
5614.00	17.99	281.73	5562.29	27.90 N	605.58 W	127.05	3.21
5710.00	20.79	300.09	5652.92	39.47 N	634.87 W	143.28	6.95
5805.00	35.12	317.59	5736.75	68.29 N	668.11 W	177.17	17.23
5899.00	49.02	326.18	5806.42	118.02 N	706.32 W	232.50	15.98
5994.00	57.00	337.13	5863.64	184.75 N	741.89 W	304.18	12.44
6089.00	61.87	343.08	5911.97	261.63 N	769.59 W	384.56	7.44
6184.00	69.42	352.88	5951.19	346.13 N	787.36 W	470.83	12.30
6279.00	71.37	358.15	5983.09	435.31 N	794.33 W	559.94	5.61
6374.00	77.54	0.01	6008.54	526.77 N	795.78 W	650.40	6.76
6440.00	82.27	0.57	6020.10	591.73 N	795.45 W	714.42	7.22
6517.00	87.53	0.03	6026.94	668.40 N	795.05 W	789.98	6.87
6609.00	87.81	359.94	6030.67	760.32 N	795.08 W	880.66	0.32
6702.00	88.12	359.76	6033.97	853.26 N	795.32 W	972.38	0.38
6794.00	87.72	359.70	6037.31	945.20 N	795.75 W	1063.13	0.44
6887.00	88.55	0.53	6040.34	1038.15 N	795.55 W	1154.79	1.26
6980.00	89.11	359.72	6042.24	1131.13 N	795.35 W	1246.47	1.06

**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 350.54 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.04 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6980.00 FEET  
IS 1382.76 FEET ALONG 324.89 DEGREES (GRID)**

**Tie in is from Surface**