



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	03-Apr-15	04-Apr-15			
Rig Bit Number	0100	0200			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	926.00	6,358.00			
Log End Depth (MD, ft)	6,358.00	7,081.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	02-Apr-15 12:15	03-Apr-15 16:30			
Drill/Wipe End Date and Time	03-Apr-15 09:00	04-Apr-15 01:30			
Min Inc (deg) @ Depth (MD, ft)	0.37 @ 5,725.00	21.58 @ 6,388.00			
Max Inc (deg) @ Depth (MD, ft)	17.26 @ 6,357.00	82.93 @ 7,017.00			
Bit TFA(in2) / Bit Type	1.21 / PDC	1.21 / PDC			
Flow Rate (gpm)	586.55	581.60			
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)	10.45 / 38.00	10.40 / 34.00			
Filtrate CL (ppm)	2,700.00	2,900.00			
pH / Fluid Loss (mptm)	9.00 / 6	9.50 / 0			
PV (cP) / YP (lbf2)	13 / 12.00	7 / 7.00			
% Solids / % Sand	2.6 / 0.15	4.1 / .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/Av	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (in F) / S	159.48 / PCM	179.87 / PCM			

Max Tool Temp (degF) / Source	156.13 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 156.13	N/A @ 170.37			
Lead MWD Engineer	Cody Wurdeman	Cody Wurdeman			
Customer Representative	JW Irwing	JW Irwing			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	0	11404272			
Insert Serial Number	11680801	11227547			
Date and Time Initialized	01-Apr-15 19:30	03-Apr-15 11:27			
Date and Time Read	03-Apr-15 12:28	04-Apr-15 06:20			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	64.00	64.00			
Software Version	6.33	6.33			
Sub Serial Number	11404272	11404272			
Sonde Serial Number	11297623	11833216			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	74.65	279.17			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	57.76	57.09			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404272	11404272			
Insert/Sonde Serial Number	11579843	11681002			

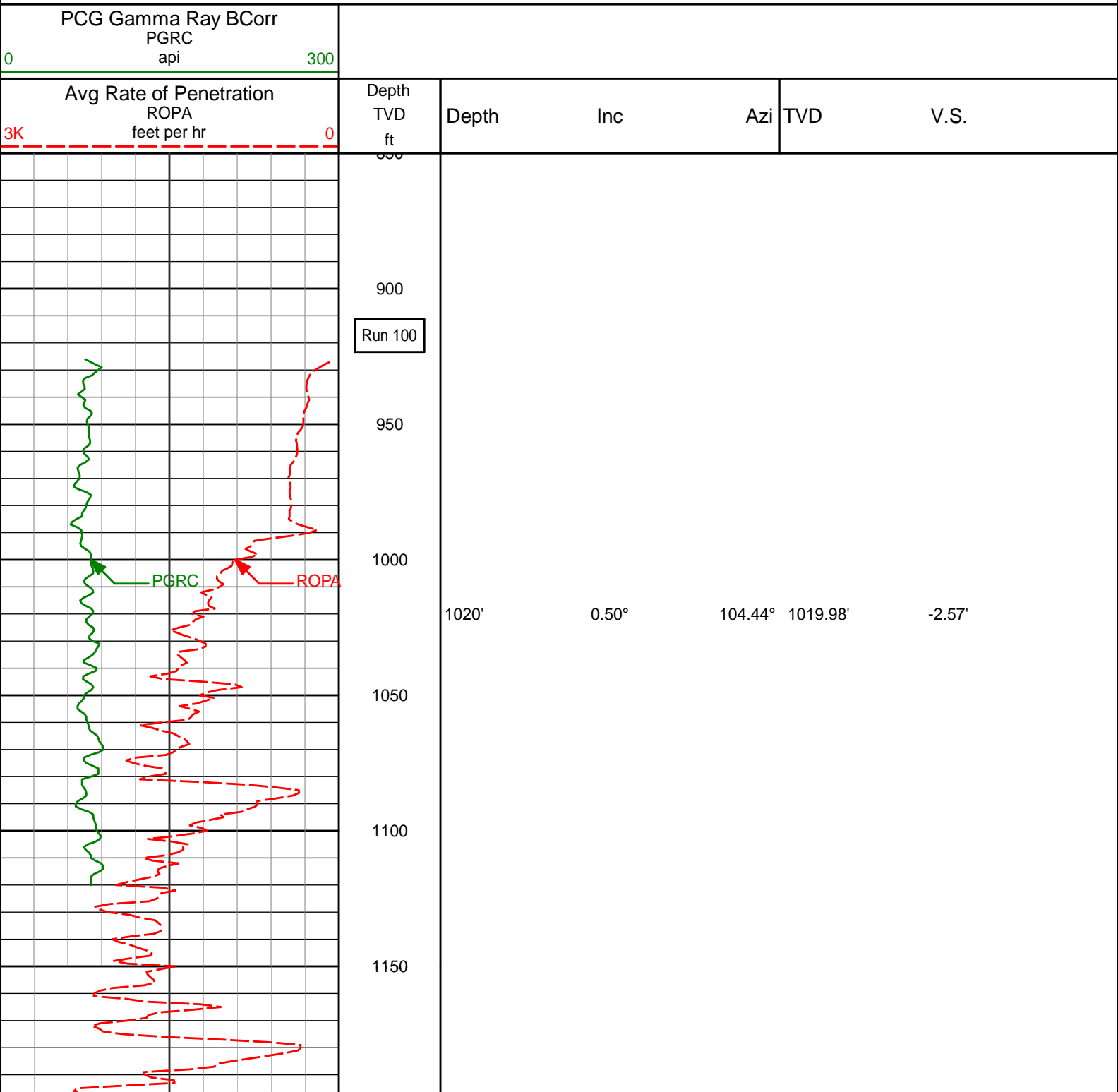
REMARKS

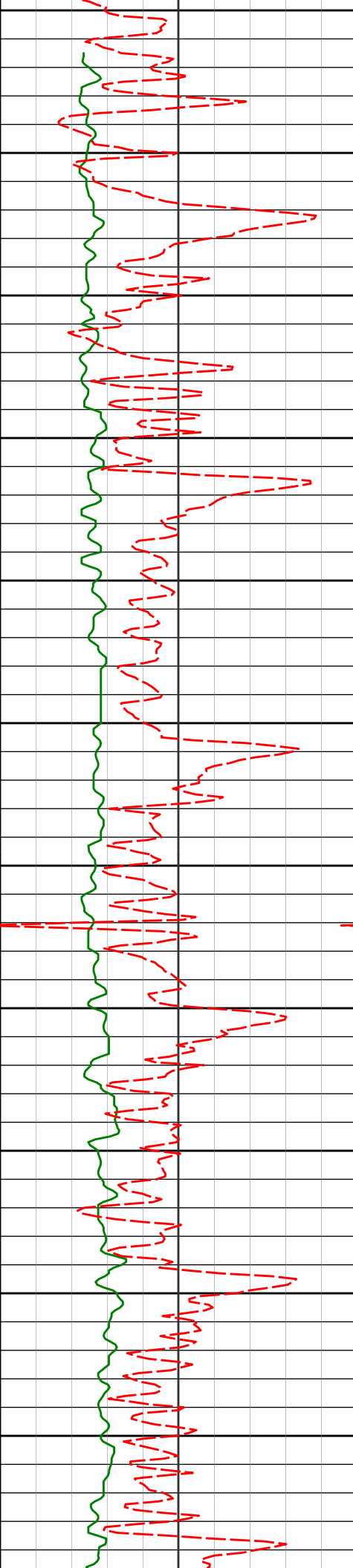
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance processing:
Hole Size: 8.75"
Mud Density: 9.9-11.0
5. The following smoothing parameters have been applied to the data:
Interval: 0.5 ft
Coercion Distance: 1.2 ft (ROPA)
Interval: 0.5 ft
Coercion Distance: 0.6 ft (Gamma Ray)

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

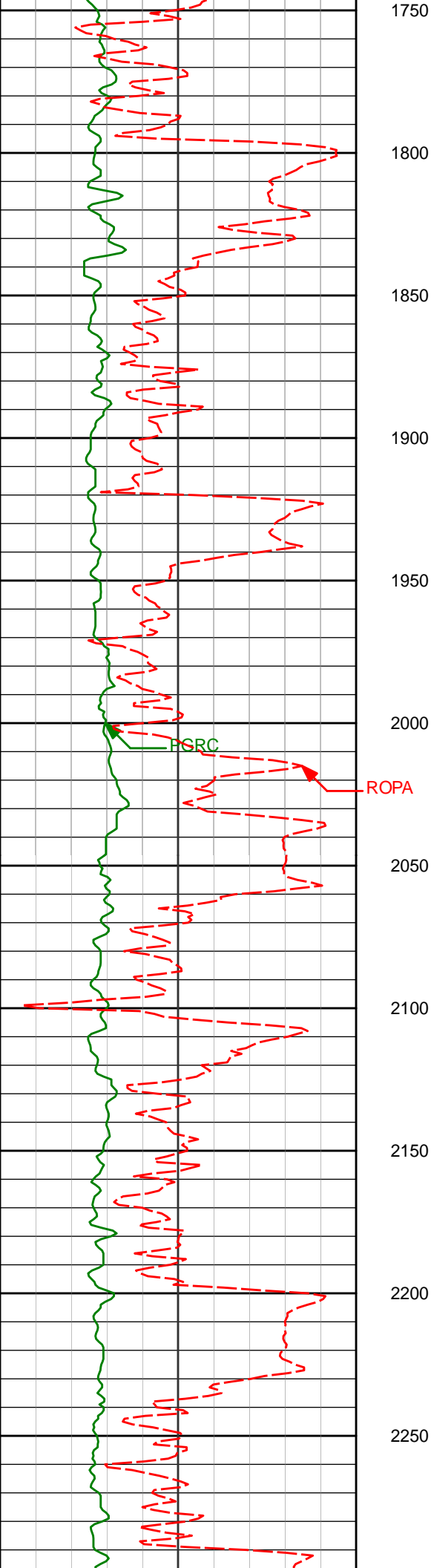
TVD Detail 1:600 Scale



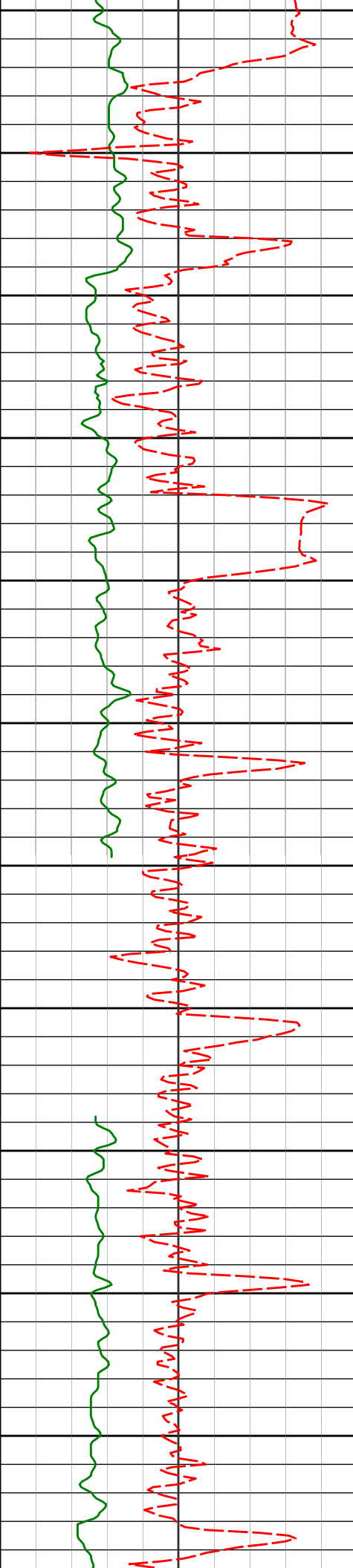


1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
1700

1208'	0.41°	108.45°	1207.98'	-3.99'
1300'	0.53°	65.03°	1299.98'	-4.69'
1393'	0.72°	40.34°	1392.97'	-5.48'
1486'	0.85°	31.85°	1485.96'	-6.25'
1579'	0.74°	17.22°	1578.95'	-6.83'



1764'	0.58°	23.73°	1763.94'	-7.63'
1857'	2.27°	232.46°	1856.92'	-6.33'
1950'	4.60°	217.37°	1949.75'	-2.48'
2043'	6.00°	213.11°	2042.35'	2.67'
2136'	5.78°	213.45°	2134.86'	8.17'
2227'	7.65°	232.71°	2225.24'	15.77'



2300

2320'

9.54°

243.39° 2317.20'

27.82'

2350

2400

2412'

9.45°

239.38° 2407.94'

41.37'

2450

2500

2504'

10.39°

253.35° 2498.58'

56.02'

2550

2600

2650

2689'

10.58°

251.05° 2680.49'

88.39'

2700

2750

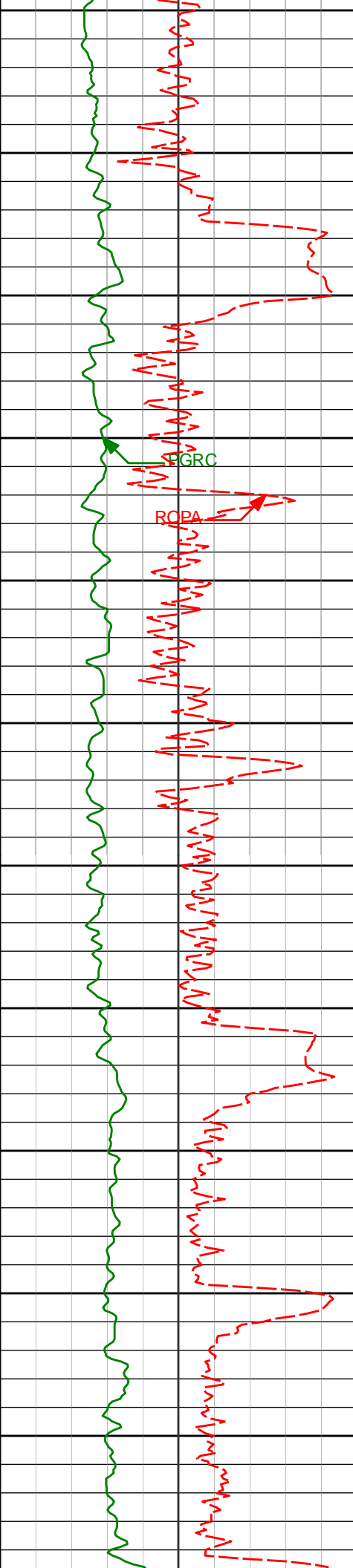
2783'

10.23°

247.44° 2772.94'

104.45'

2800



2850

2875'

10.61°

247.11° 2863.42'

120.00'

2900

2950

2970'

10.80°

253.33° 2956.77'

136.78'

3000

EGRC

ROPA

3050

3065'

11.00°

252.21° 3050.06'

154.10'

3100

3150

3160'

10.74°

249.40° 3143.36'

171.20'

3200

3250

3255'

9.12°

259.07° 3236.94'

187.03'

3300

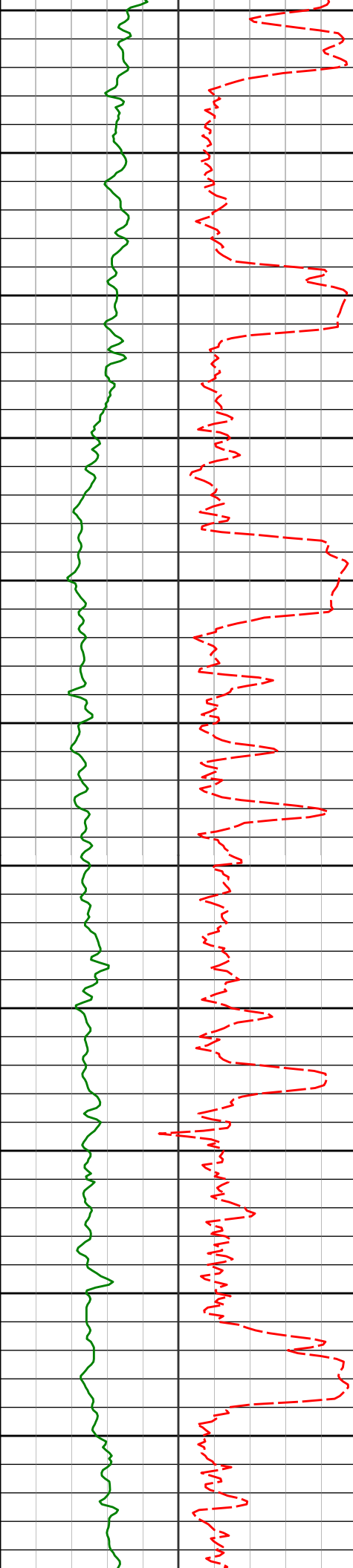
3350

3351'

7.85°

260.35° 3331.88'

201.04'



3400

3446'

6.87°

259.09° 3426.10'

213.08'

3450

3500

3541'

7.65°

254.11° 3520.34'

224.83'

3550

3600

3636'

9.57°

249.63° 3614.27'

238.45'

3650

3700

3731'

10.66°

248.55° 3707.79'

254.23'

3750

3800

3825'

11.27°

248.72° 3800.07'

271.08'

3850

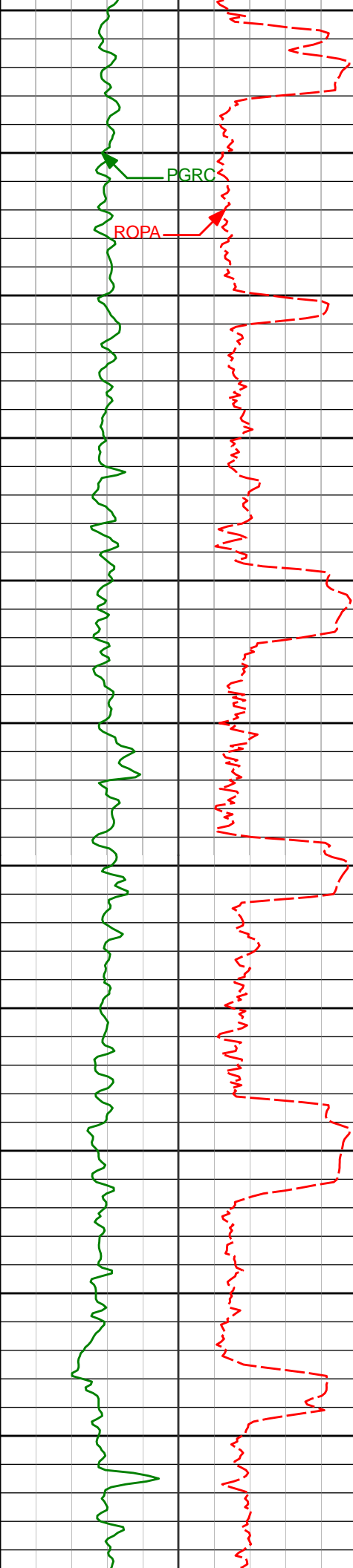
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3920'

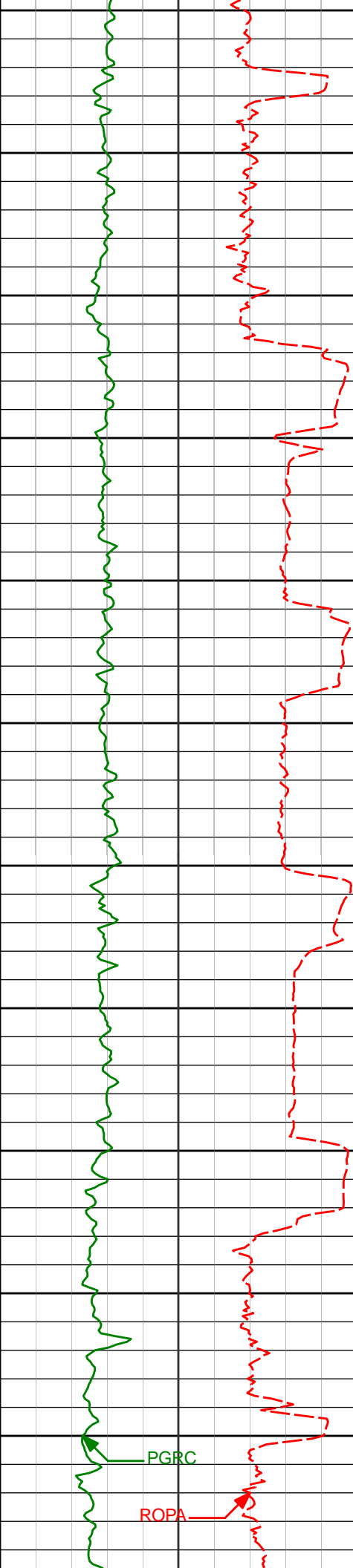
10.65°

254.80° 3893.34'

288.39'



3950				
4015'	8.43°	261.39°	3987.02'	303.85'
4000				
4050				
4110'	7.42°	263.39°	4081.12'	316.88'
4100				
4150				
4205'	7.86°	265.39°	4175.27'	329.48'
4200				
4250				
4300'	7.95°	261.68°	4269.37'	342.50'
4300				
4350				
4395'	9.21°	254.93°	4363.31'	356.43'
4400				
4450				
4489'	8.44°	254.47°	4456.19'	370.46'



4500
4550
4600
4650
4700
4750
4800
4850
4900
4950
5000
5060'

4584'	6.45°	255.84°	4550.39'	382.45'
4679'	6.92°	245.08°	4644.75'	392.93'
4774'	8.02°	242.04°	4738.94'	404.16'
4869'	7.64°	246.37°	4833.05'	415.98'
4965'	8.67°	248.22°	4928.08'	428.71'
5060'	8.22°	249.93°	5022.05'	441.90'

PGRC

ROPA



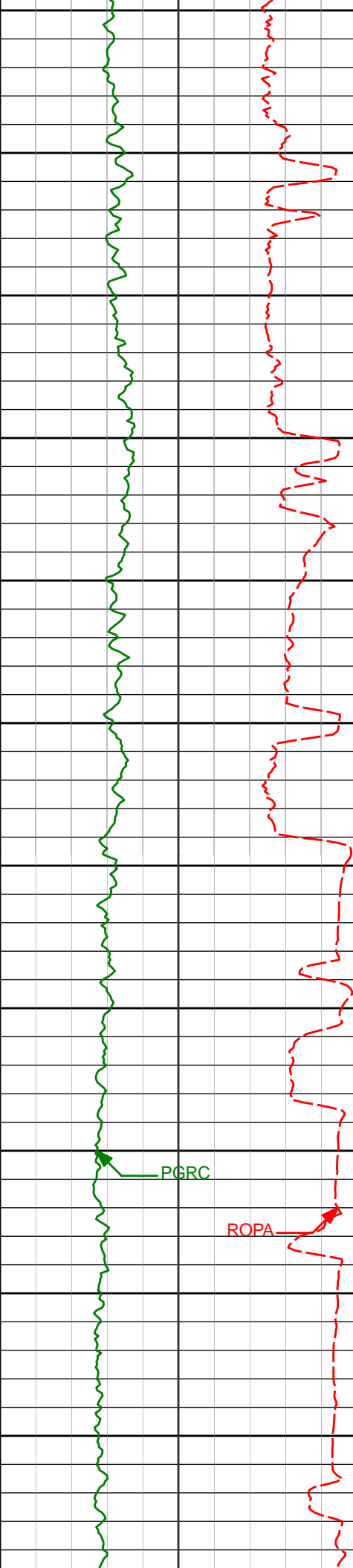
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5250'	5.31°	246.06°	5210.68'	463.33'
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5345'	4.20°	242.11°	5305.35'	470.53'
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5440'	1.96°	249.66°	5400.21'	475.20'
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5630'	0.38°	117.98°	5590.17'	477.74'
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5600

5650

5700

5750

5800

5850

5900

5950

6000

6050

6100

5725'

0.37°

141.23° 5685.17'

477.28'

5915'

1.39°

132.91° 5875.14'

475.28'

6010'

3.64°

252.11° 5970.08'

477.36'

6105'

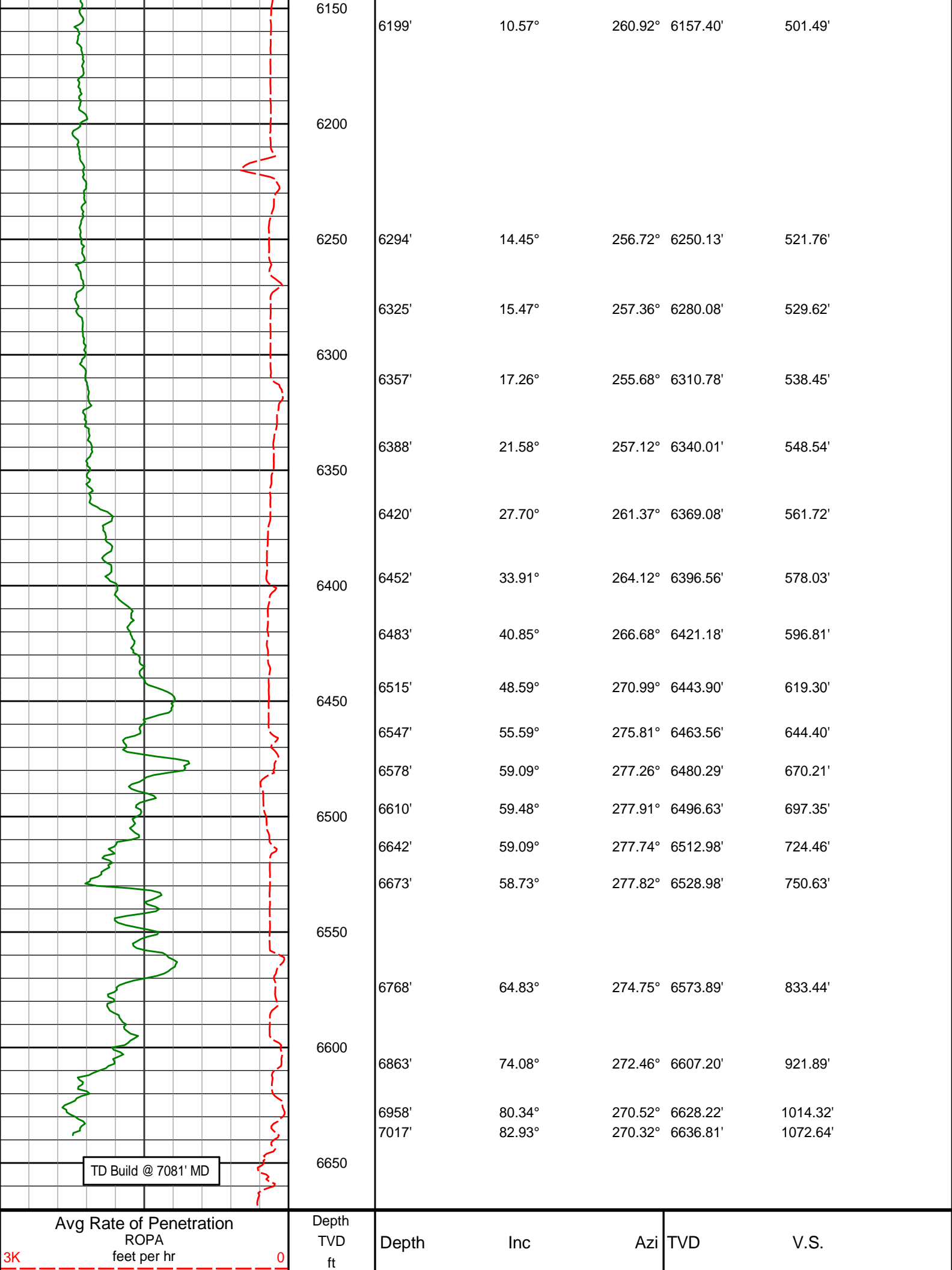
7.71°

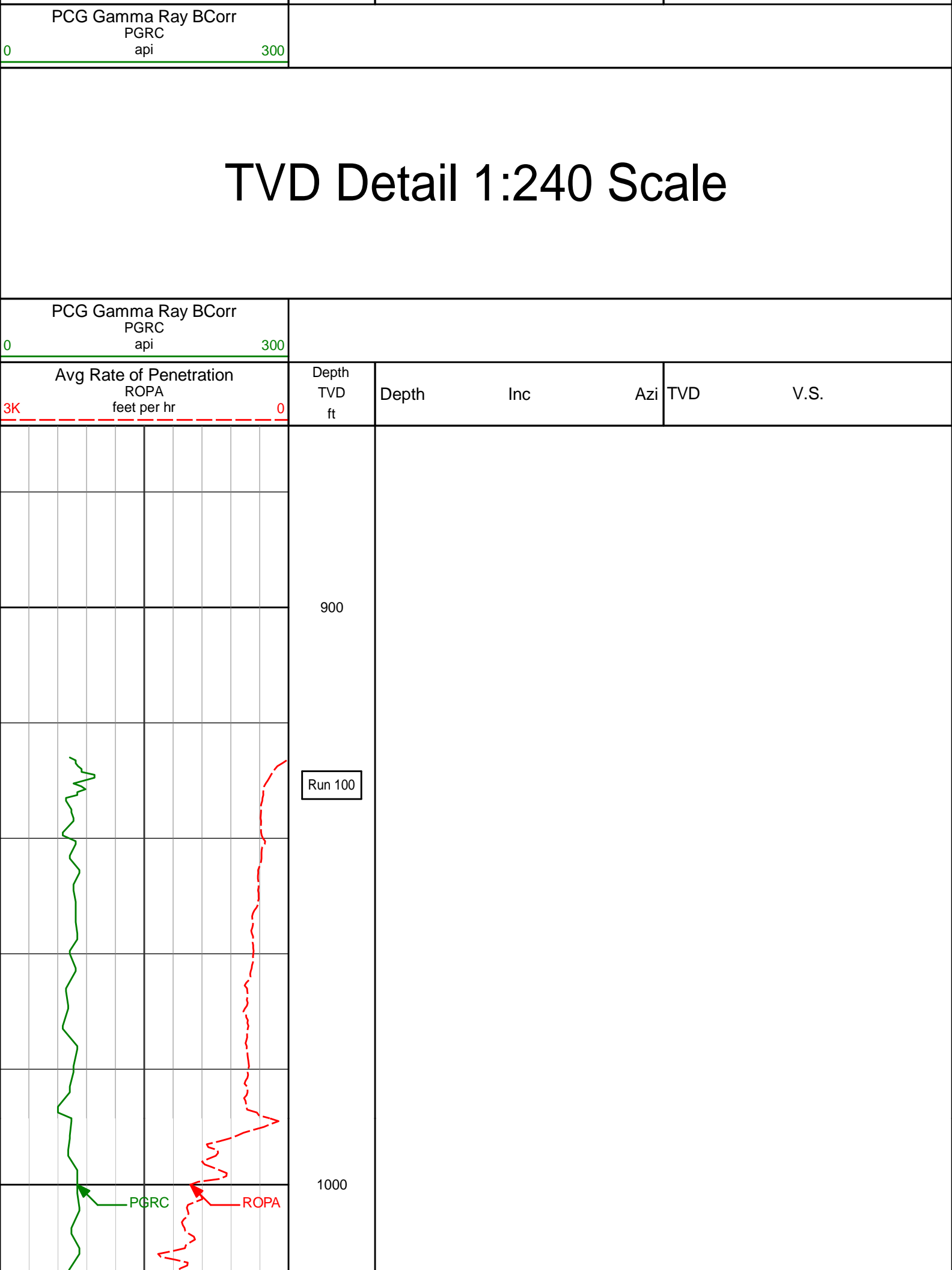
266.02° 6064.60'

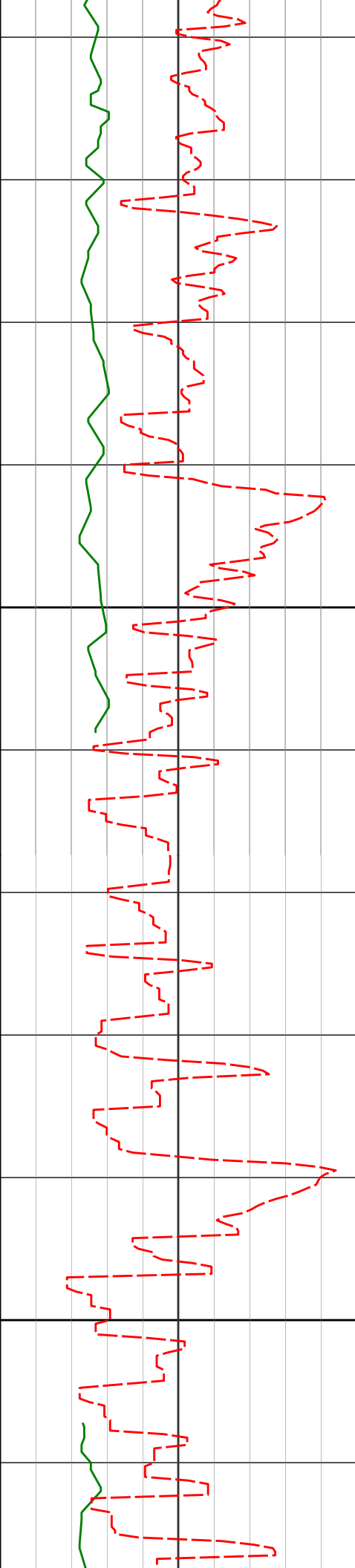
486.63'

PGRC

ROPA







1100

1200

1020'

0.50°

104.44° 1019.98'

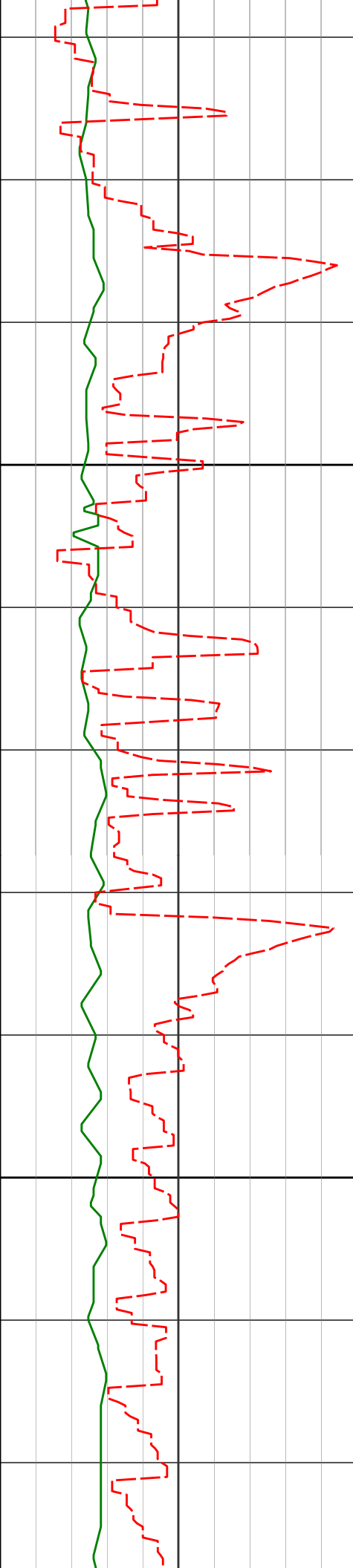
-2.57'

1208'

0.41°

108.45° 1207.98'

-3.99'



1300

1300'

0.53°

65.03° 1299.98'

-4.69'

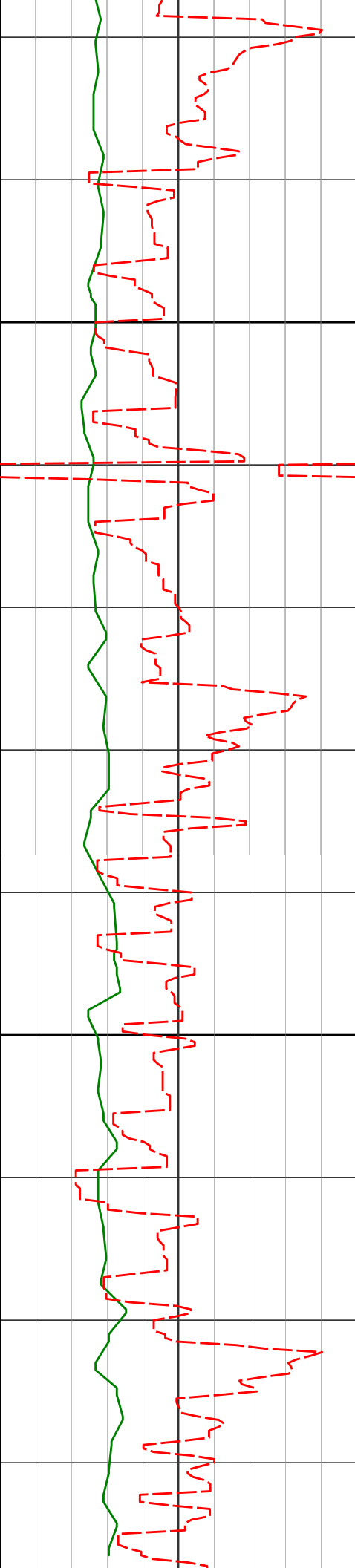
1400

1393'

0.72°

40.34° 1392.97'

-5.48'



1486'

0.85°

31.85° 1485.96'

-6.25'

1500

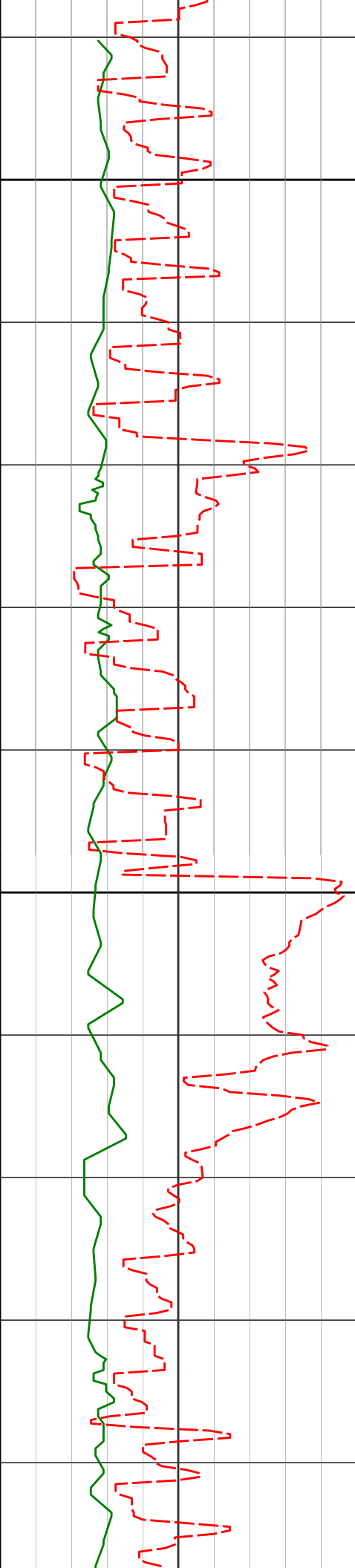
1579'

0.74°

17.22° 1578.95'

-6.83'

1600



1700

1764'

0.58°

23.73° 1763.94'

-7.63'

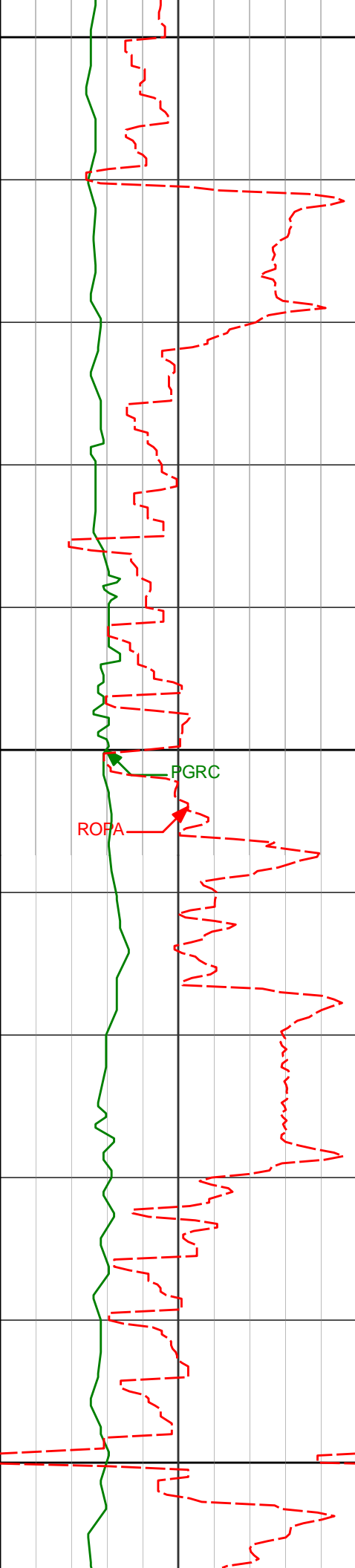
1800

1857'

2.27°

232.46° 1856.92'

-6.33'



1900

1950'

4.60°

217.37° 1949.75'

-2.48'

2000

PGRC

ROFA

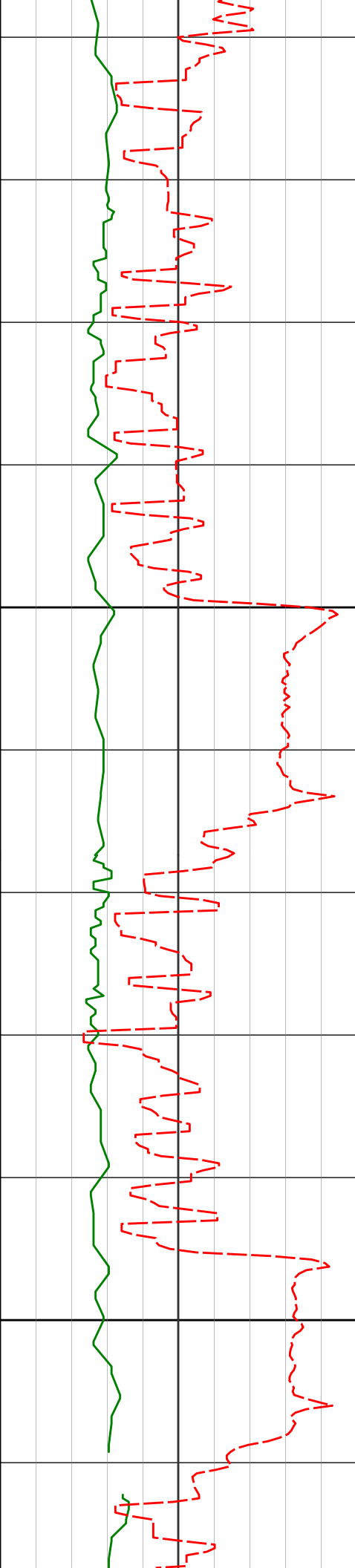
2043'

6.00°

213.11° 2042.35'

2.67'

2100



2136'

5.78°

213.45° 2134.86'

8.17'

2200

2227'

7.65°

232.71° 2225.24'

15.77'

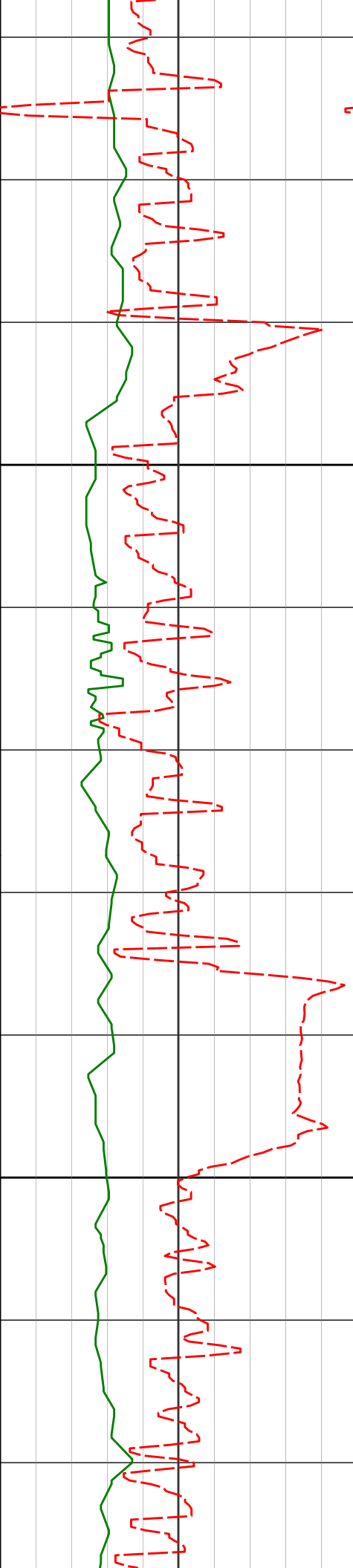
2300

2320'

9.54°

243.39° 2317.20'

27.82'



2400

2412'

9.45°

239.38° 2407.94'

41.37'

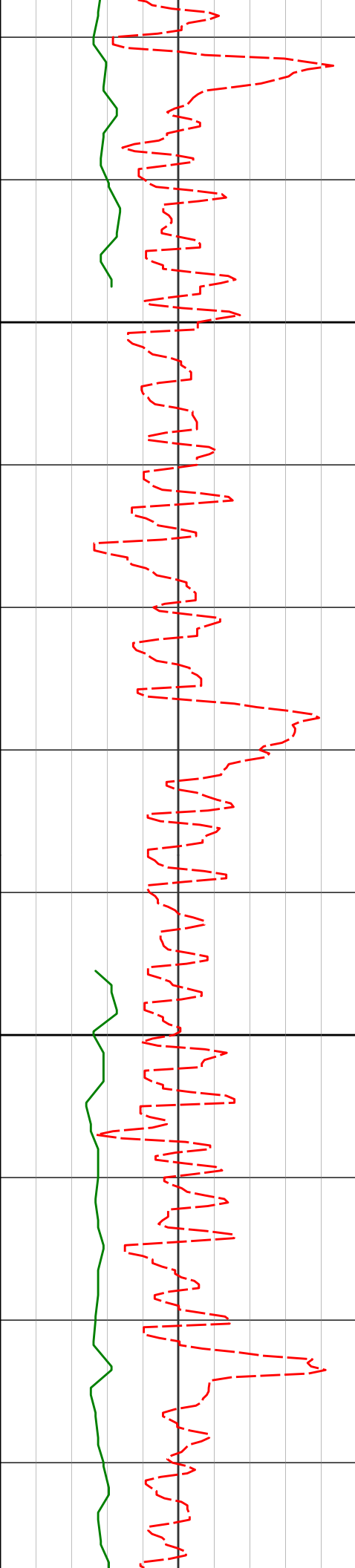
2500

2504'

10.39°

253.35° 2498.58'

56.02'



2600

2700

2689'

10.58°

251.05° 2680.49'

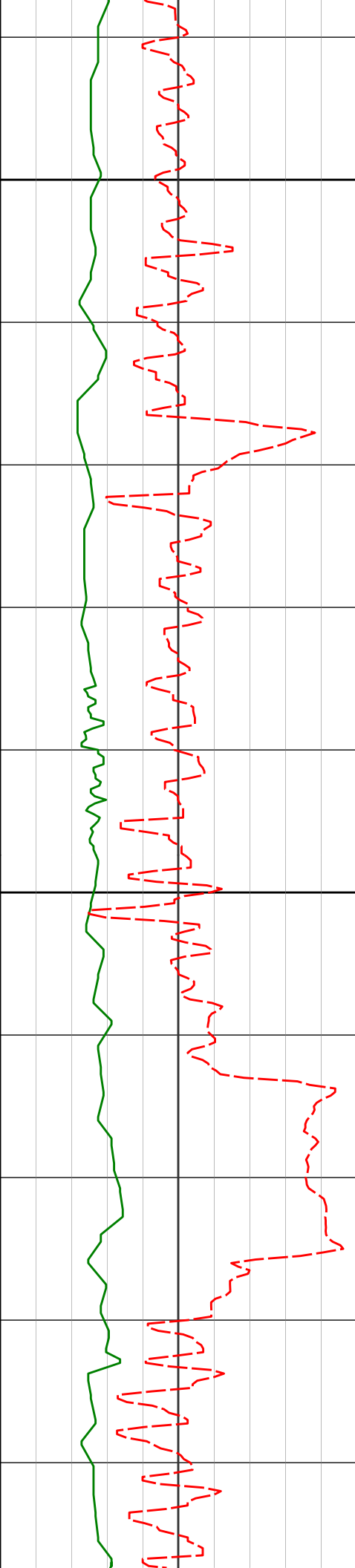
88.39'

2783'

10.23°

247.44° 2772.94'

104.45'



2800

2875'

10.61°

247.11° 2863.42'

120.00'

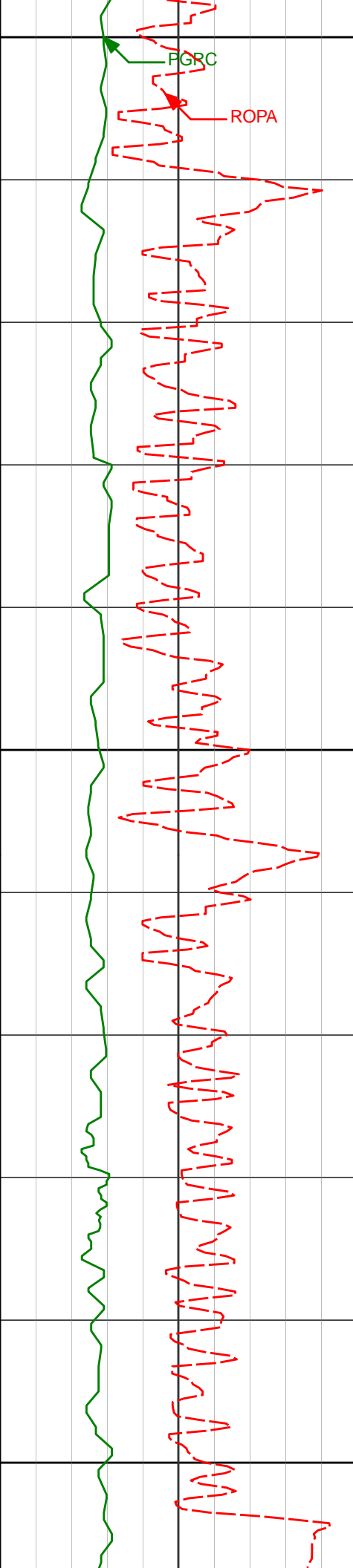
2900

2970'

10.80°

253.33° 2956.77'

136.78'



3000

3100

3200

3065'

11.00°

252.21° 3050.06'

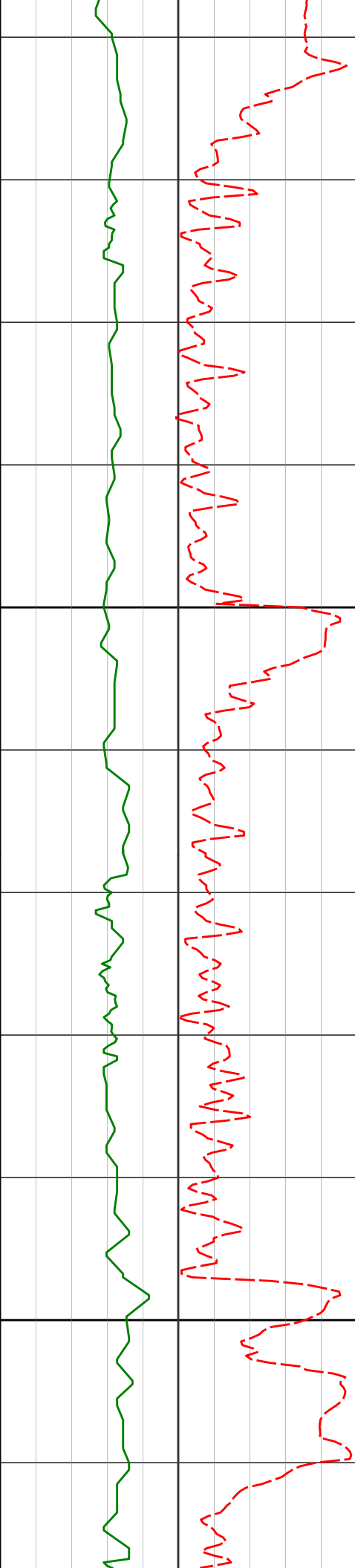
154.10'

3160'

10.74°

249.40° 3143.36'

171.20'



3255'

9.12°

259.07° 3236.94'

187.03'

3300

3351'

7.85°

260.35° 3331.88'

201.04'

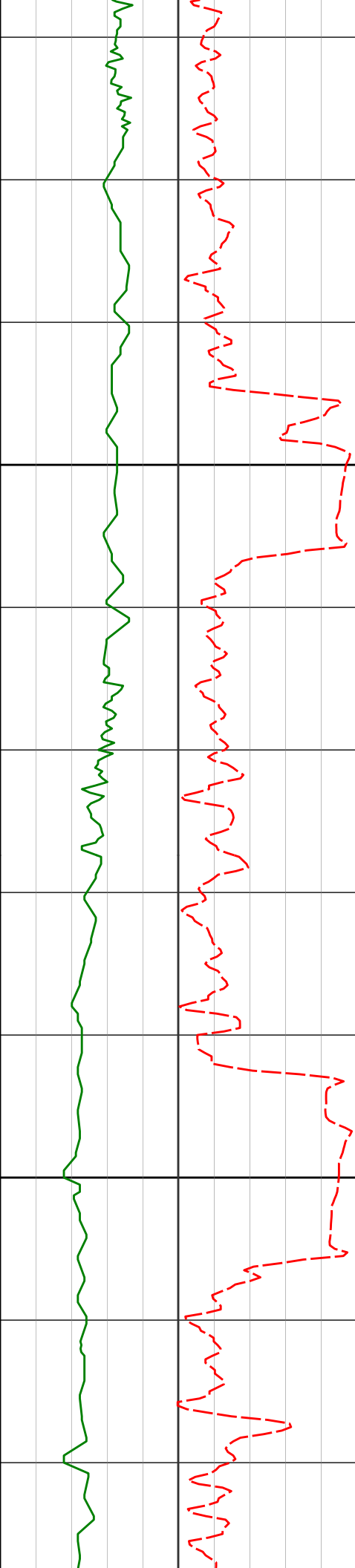
3400

3446'

6.87°

259.09° 3426.10'

213.08'



3500

3541'

7.65°

254.11° 3520.34'

224.83'

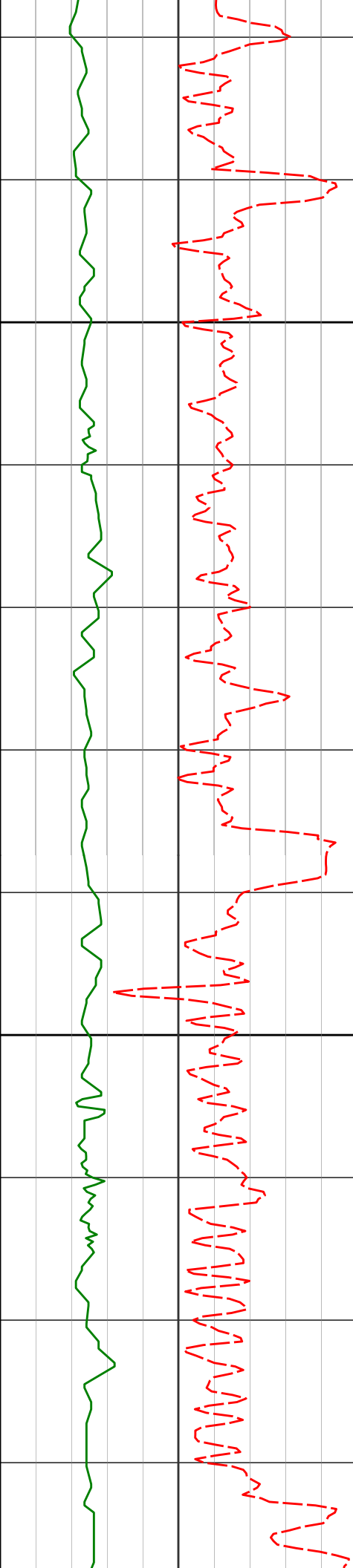
3600

3636'

9.57°

249.63° 3614.27'

238.45'



3700

3731'

10.66°

248.55° 3707.79'

254.23'

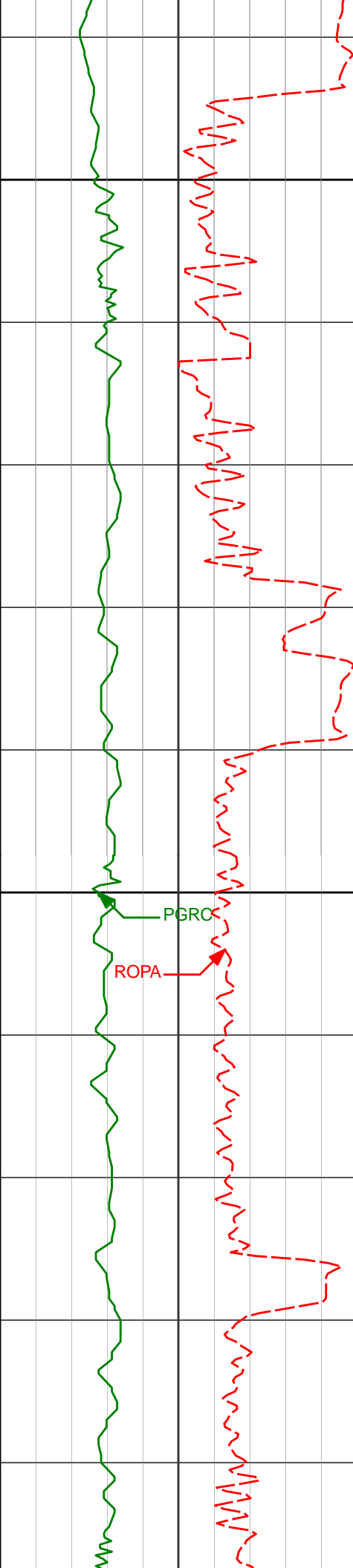
3800

3825'

11.27°

248.72° 3800.07'

271.08'



3900

4000

3920'

10.65°

254.80° 3893.34'

288.39'

4015'

8.43°

261.39° 3987.02'

303.85'

4110'

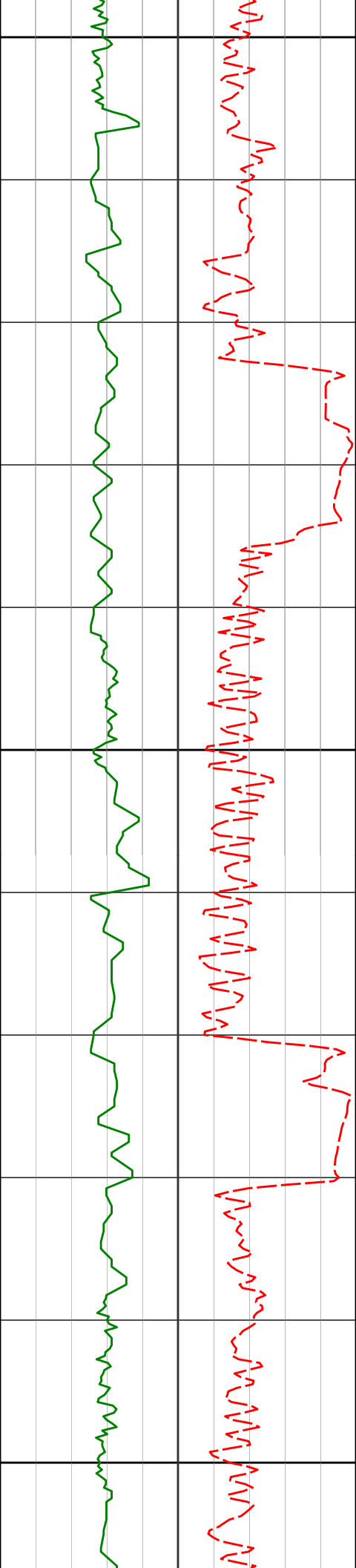
7.42°

263.39° 4081.12'

316.88'

PGRC

ROPA



4100

4205'

7.86°

265.39° 4175.27'

329.48'

4200

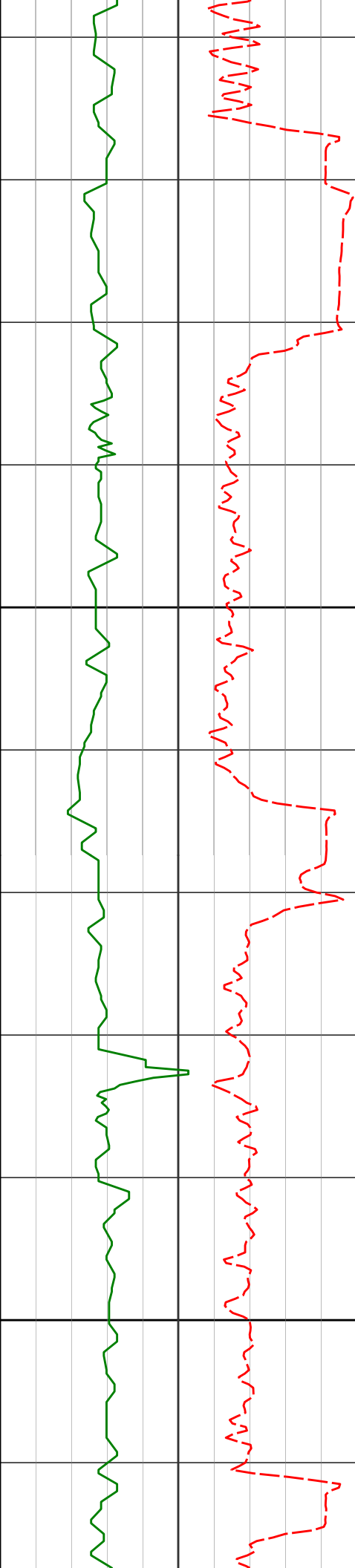
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7.95°

261.68° 4269.37'

342.50'

4300



4400

4500

4395'

9.21°

254.93° 4363.31'

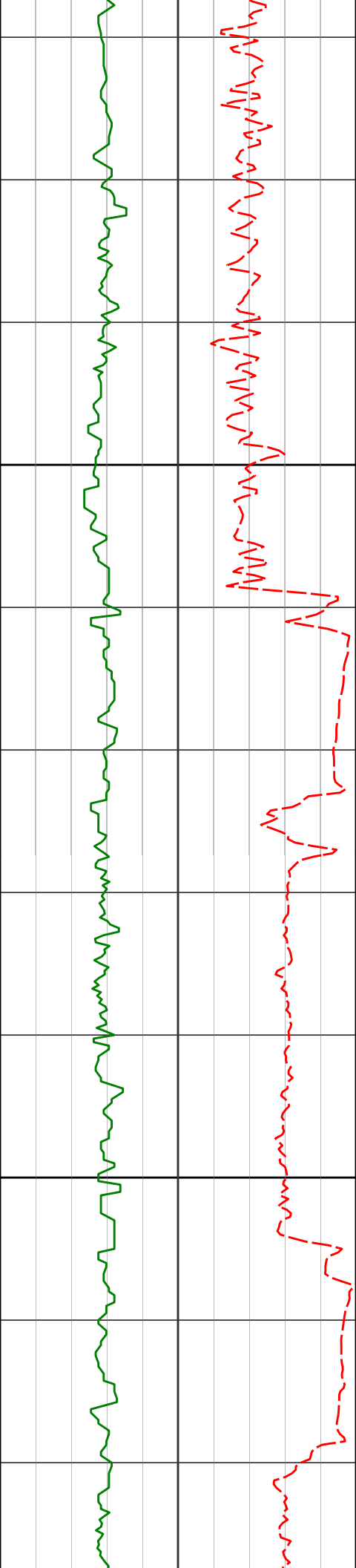
356.43'

4489'

8.44°

254.47° 4456.19'

370.46'



4600

4700

4584'

6.45°

255.84° 4550.39'

382.45'

4679'

6.92°

245.08° 4644.75'

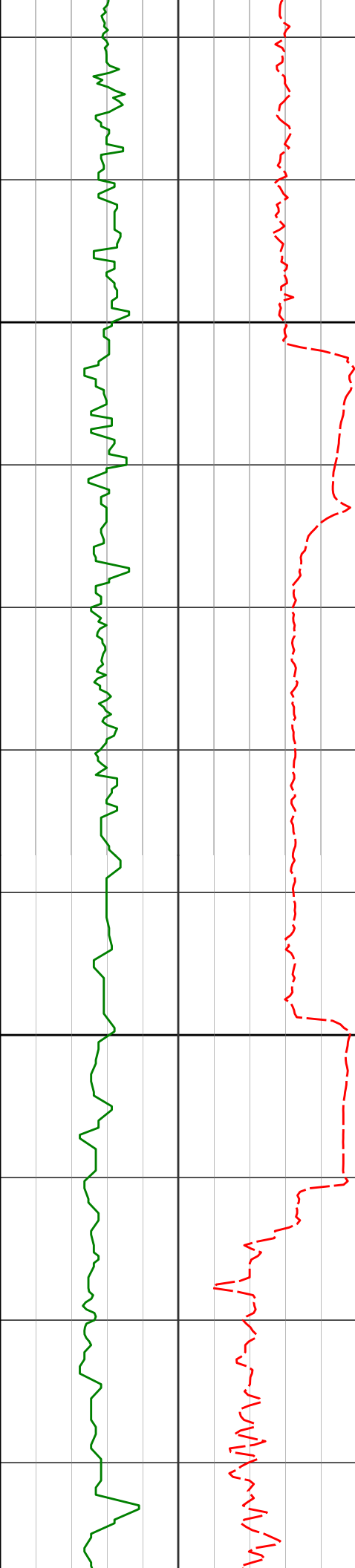
392.93'

4774'

8.02°

242.04° 4738.94'

404.16'



4800

4869'

7.64°

246.37° 4833.05'

415.98'

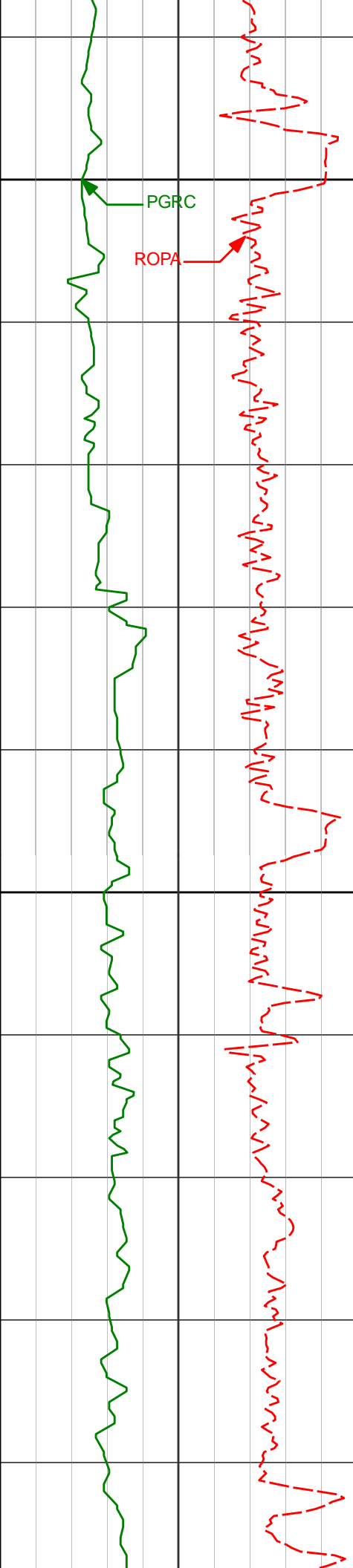
4900

4965'

8.67°

248.22° 4928.08'

428.71'



5000

5060'

8.22°

249.93° 5022.05'

441.90'

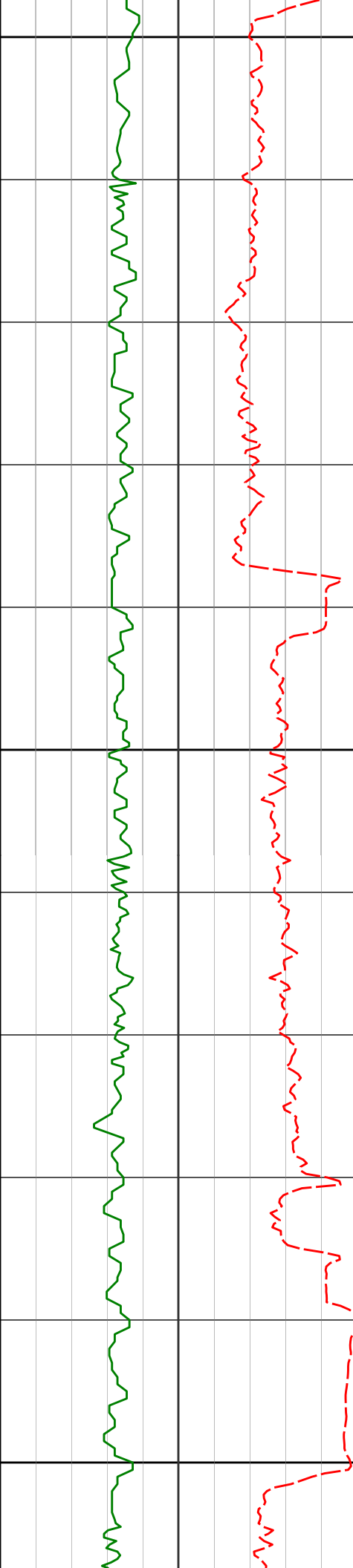
5100

5155'

6.93°

250.11° 5116.22'

453.80'



5200

5250'

5.31°

246.06° 5210.68'

463.33'

5300

5345'

4.20°

242.11° 5305.35'

470.53'

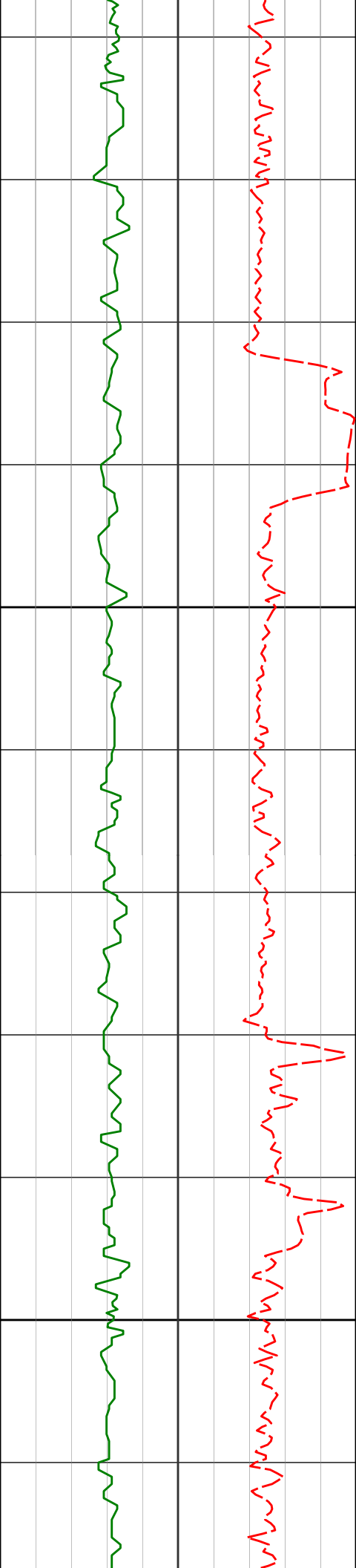
5400

5440'

1.96°

249.66° 5400.21'

475.20'



5500

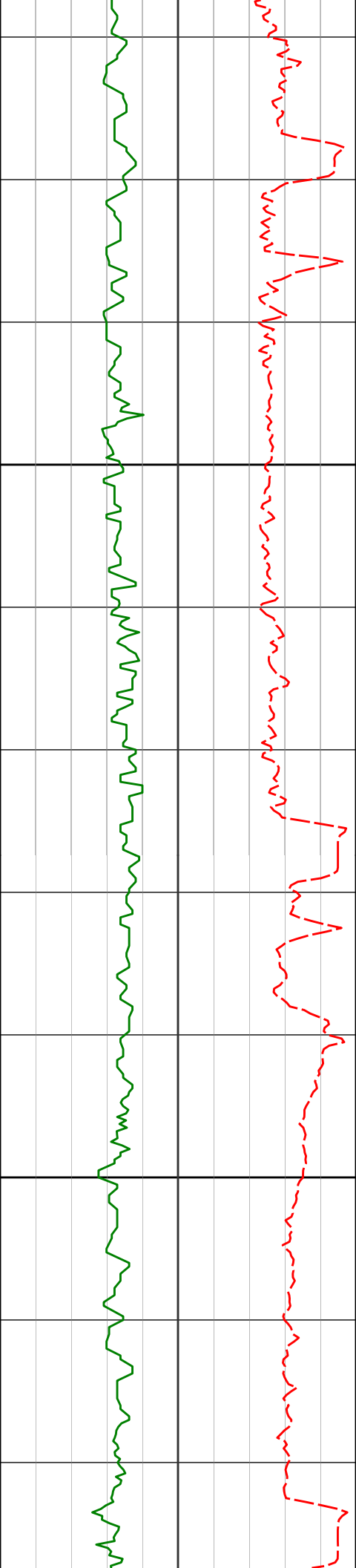
5600

5630'

0.38°

117.98° 5590.17'

477.74'



5700

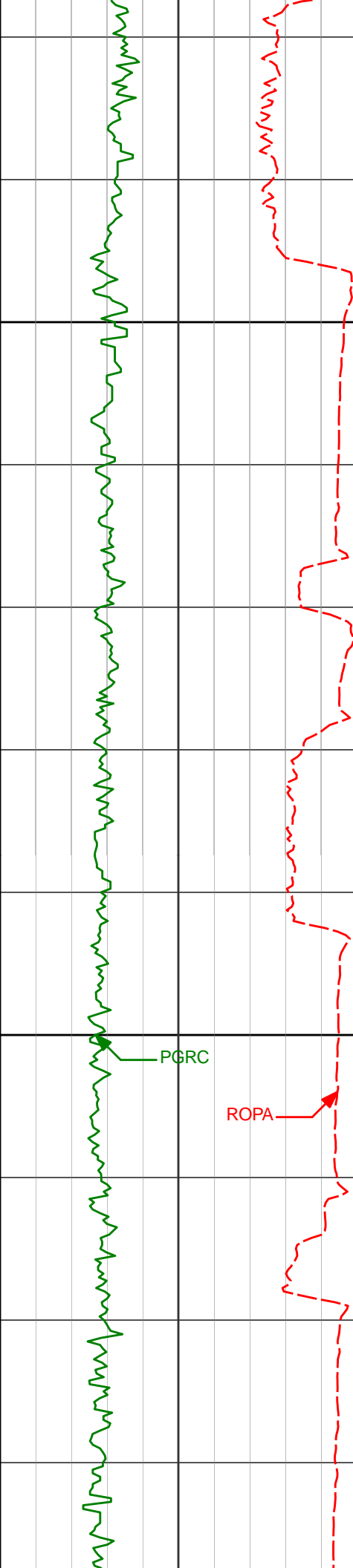
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5725'

0.37°

141.23° 5685.17'

477.28'



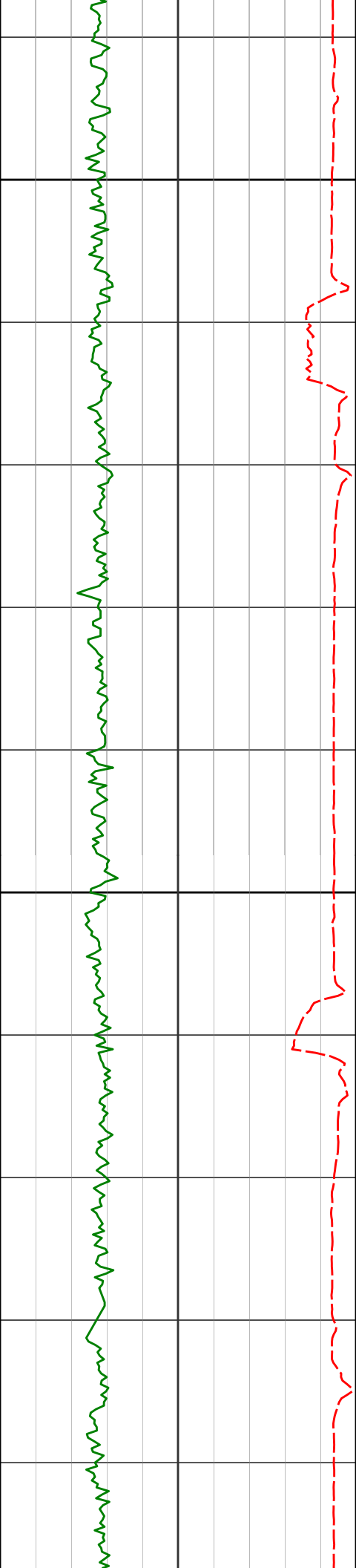
5900

6000

5915'	1.39°	132.91°	5875.14'	475.28'
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6010'	3.64°	252.11°	5970.08'	477.36'
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6105'	7.71°	266.02°	6064.60'	486.63'
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6100

6199'

10.57°

260.92° 6157.40'

501.49'

6200

6294'

14.45°

256.72° 6250.13'

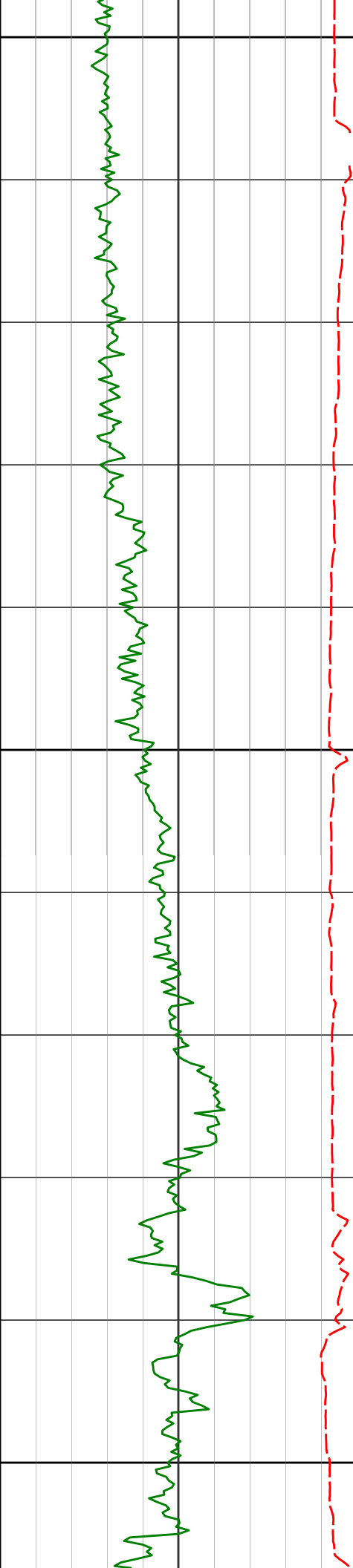
521.76'

6325'

15.47°

257.36° 6280.08'

529.62'



6300

6357'	17.26°	255.68°	6310.78'	538.45'
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6388'	21.58°	257.12°	6340.01'	548.54'
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6420'	27.70°	261.37°	6369.08'	561.72'
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6400

6452'	33.91°	264.12°	6396.56'	578.03'
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6483'	40.85°	266.68°	6421.18'	596.81'
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6515'	48.59°	270.99°	6443.90'	619.30'
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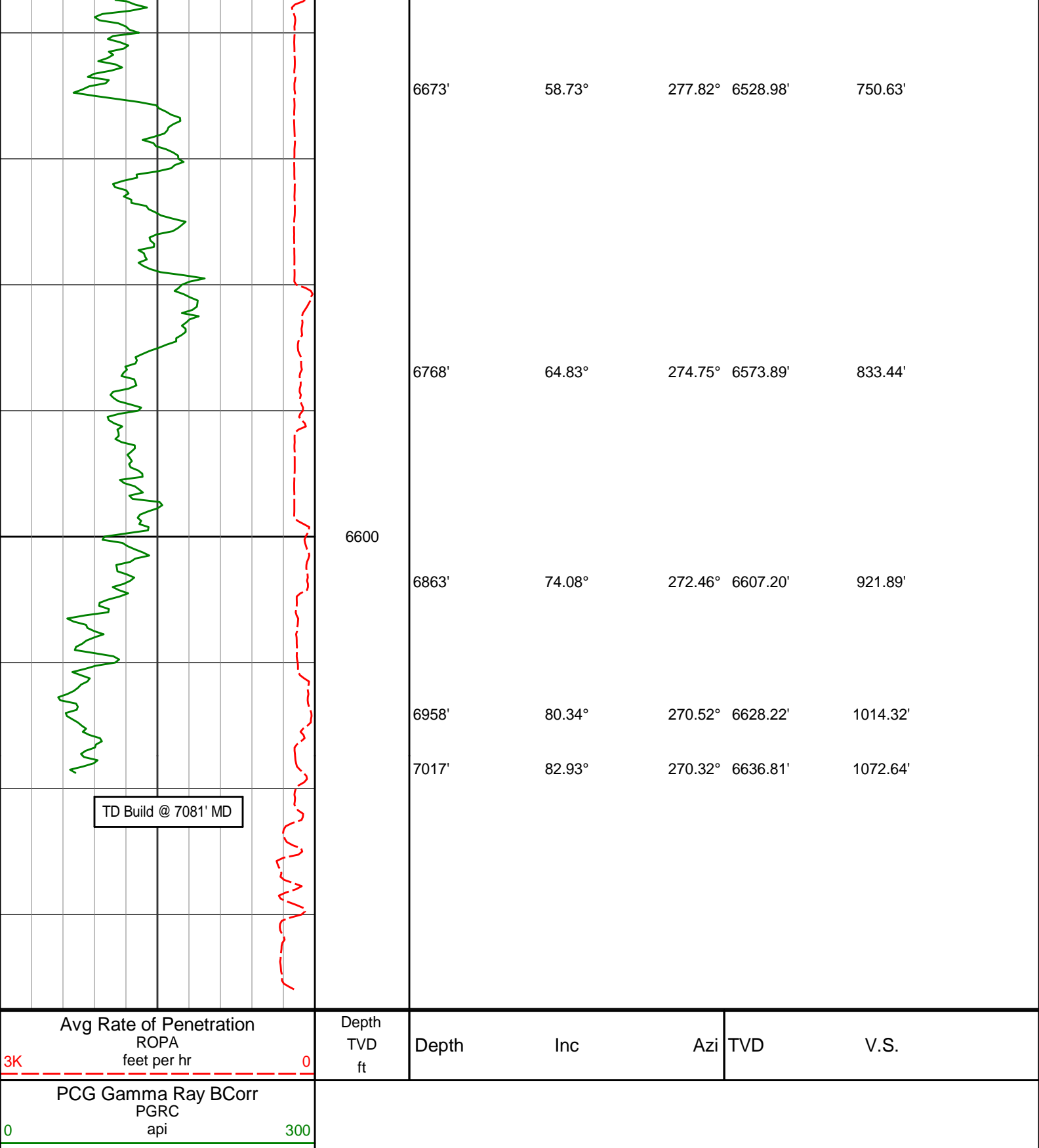
6547'	55.59°	275.81°	6463.56'	644.40'
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6578'	59.09°	277.26°	6480.29'	670.21'
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6500

6610'	59.48°	277.91°	6496.63'	697.35'
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6642'	59.09°	277.74°	6512.98'	724.46'
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HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Colt A13-655
Wattenburg
Weld Colorado
USA

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
374.00	0.40	6.30	374.00	1.30 N	0.14 E	-0.19	0.11
652.00	0.40	159.93	651.99	1.35 N	0.58 E	-0.63	0.28
1020.00	0.50	104.44	1019.98	0.26 S	2.58 E	-2.57	0.12
1208.00	0.41	108.45	1207.98	0.67 S	4.01 E	-3.99	0.05
1300.00	0.53	65.03	1299.98	0.60 S	4.71 E	-4.69	0.40
1393.00	0.72	40.34	1392.97	0.03 N	5.48 E	-5.48	0.35
1486.00	0.85	31.85	1485.96	1.06 N	6.22 E	-6.25	0.19
1579.00	0.74	17.22	1578.95	2.22 N	6.76 E	-6.83	0.25
1764.00	0.58	23.73	1763.94	4.22 N	7.49 E	-7.63	0.10
1857.00	2.27	232.46	1856.92	3.53 N	6.22 E	-6.33	3.00
1950.00	4.60	217.37	1949.75	0.56 S	2.50 E	-2.48	2.67
2043.00	6.00	213.11	2042.35	7.60 S	2.42 W	2.67	1.56
2136.00	5.78	213.45	2134.86	15.57 S	7.66 W	8.17	0.24
2227.00	7.65	232.71	2225.24	23.07 S	15.01 W	15.77	3.19
2320.00	9.54	243.39	2317.20	30.27 S	26.82 W	27.82	2.65
2412.00	9.45	239.38	2407.94	37.53 S	40.14 W	41.37	0.73
2504.00	10.39	253.35	2498.58	43.76 S	54.59 W	56.02	2.80
2689.00	10.58	251.05	2680.49	54.05 S	86.63 W	88.39	0.25
2783.00	10.23	247.44	2772.94	60.06 S	102.51 W	104.45	0.79
2875.00	10.61	247.11	2863.42	66.49 S	117.85 W	120.00	0.42
2970.00	10.80	253.33	2956.77	72.44 S	134.44 W	136.78	1.23
3065.00	11.00	252.21	3050.06	77.77 S	151.59 W	154.10	0.31
3160.00	10.74	249.40	3143.36	83.65 S	168.51 W	171.20	0.62
3255.00	9.12	259.07	3236.94	88.19 S	184.19 W	187.03	2.44
3351.00	7.85	260.35	3331.88	90.73 S	198.12 W	201.04	1.34
3446.00	6.87	259.09	3426.10	92.90 S	210.10 W	213.08	1.05
3541.00	7.65	254.11	3520.34	95.70 S	221.76 W	224.83	1.05
3636.00	9.57	249.63	3614.27	100.18 S	235.25 W	238.45	2.14
3731.00	10.66	248.55	3707.79	106.15 S	250.83 W	254.23	1.16
3825.00	11.27	248.72	3800.07	112.66 S	267.48 W	271.08	0.65
3920.00	10.65	254.80	3893.34	118.33 S	284.60 W	288.39	1.38
4015.00	8.43	261.39	3987.02	121.67 S	299.96 W	303.85	2.60
4110.00	7.42	263.39	4081.12	123.42 S	312.94 W	316.88	1.10
4205.00	7.86	265.39	4175.27	124.65 S	325.51 W	329.48	0.54
4300.00	7.95	261.68	4269.37	126.12 S	338.48 W	342.50	0.55
4395.00	9.21	254.93	4363.31	129.05 S	352.32 W	356.43	1.70
4489.00	8.44	254.47	4456.19	132.85 S	366.23 W	370.46	0.82
4584.00	6.45	255.84	4550.39	136.03 S	378.13 W	382.45	2.10
4679.00	6.92	245.08	4644.75	139.74 S	388.49 W	392.93	1.41
4774.00	8.02	242.04	4738.94	145.26 S	399.54 W	404.16	1.23
4869.00	7.64	246.37	4833.05	150.90 S	411.17 W	415.98	0.74
4965.00	8.67	248.22	4928.08	156.14 S	423.74 W	428.71	1.11
5060.00	8.22	249.93	5022.05	161.13 S	436.77 W	441.90	0.54
5155.00	6.93	250.11	5116.22	165.41 S	448.54 W	453.80	1.36
5250.00	5.31	246.06	5210.68	169.15 S	457.95 W	463.33	1.76
5345.00	4.20	242.11	5305.35	172.56 S	465.04 W	470.53	1.22
5440.00	1.96	249.66	5400.21	174.75 S	469.64 W	475.20	2.39
5630.00	0.38	117.98	5590.17	176.17 S	472.13 W	477.74	1.17
5725.00	0.37	141.23	5685.17	176.56 S	471.66 W	477.28	0.16
5915.00	1.39	132.91	5875.14	178.61 S	469.58 W	475.28	0.54
6010.00	3.64	252.11	5970.08	180.32 S	471.61 W	477.36	4.72
6105.00	7.71	266.02	6064.60	181.69 S	480.84 W	486.63	4.49
6199.00	10.57	260.92	6157.40	183.49 S	495.65 W	501.49	3.16
6294.00	14.45	256.72	6250.13	187.59 S	515.80 W	521.76	4.19
6325.00	15.47	257.36	6280.08	189.38 S	523.60 W	529.62	3.33
6357.00	17.26	255.68	6310.78	191.49 S	532.36 W	538.45	5.79
6388.00	21.58	257.12	6340.01	193.90 S	542.38 W	548.54	14.02
6420.00	27.70	261.37	6369.08	196.33 S	555.48 W	561.72	19.90
6452.00	33.91	264.12	6396.56	198.36 S	571.73 W	578.03	19.89
6483.00	40.85	266.68	6421.18	199.84 S	590.48 W	596.81	22.94
6515.00	48.59	270.99	6443.90	200.24 S	612.97 W	619.30	25.97
6547.00	55.59	275.81	6463.56	198.69 S	638.14 W	644.40	24.88
6578.00	59.09	277.26	6480.29	195.71 S	664.06 W	670.21	11.96
6610.00	59.48	277.91	6496.63	192.08 S	691.33 W	697.35	2.13
6642.00	59.09	277.74	6512.98	188.34 S	718.58 W	724.46	1.30
6673.00	58.73	277.82	6528.98	184.74 S	744.89 W	750.63	1.18
6768.00	64.83	274.75	6573.89	175.65 S	828.05 W	833.44	7.02

6863.00	74.08	272.46	6607.20	170.12 S	916.73 W	921.89	9.99
6958.00	80.34	270.52	6628.22	167.73 S	1009.29 W	1014.32	6.88
7017.00	82.93	270.32	6636.81	167.30 S	1067.65 W	1072.64	4.40

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 268.09 DEGREES (GRID)
A TOTAL CORRECTION OF 7.41 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7017.00 FEET
IS 1080.68 FEET ALONG 261.09 DEGREES (GRID)

Final survey is a straight line projection to TD.