

**PCGC - Pressure Case Gamma**  
**PCDC - Pressure Case Directional**

1 : 240

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	21-May-14	24-May-14			
<b>Rig Bit Number</b>	0100	0200			
<b>Bit Size (in)</b>	8.750	6.125			
<b>Tool Nominal OD (in)</b>	6.750	4.750			
<b>Log Start Depth (MD, ft)</b>	1,027.00	7,603.00			
<b>Log End Depth (MD, ft)</b>	7,603.00	11,768.00			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	19-May-14 03:10	22-May-14 10:00			
<b>Drill/Wipe End Date and Time</b>	20-May-14 22:20	24-May-14 03:00			
<b>Min Inc (deg) @ Depth (MD, ft)</b>	0.07 @ 3,362.00	88.24 @ 10,822.00			
<b>Max Inc (deg) @ Depth (MD, ft)</b>	82.78 @ 7,545.00	92.31 @ 8,824.00			
<b>Bit TFA(in2) / Bit Type</b>	1.19 / PDC	1.24 / PDC			
<b>Flow Rate (gpm)</b>	586.90	299.47			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	N/A / N/A	N/A / N/A			
<b>Fluid Type</b>	Native/Spud Mud	Native/Spud Mud			
<b>Density (ppg) / Viscosity (spqt)</b>	9.20 / 40.00	10.00 / 46.00			
<b>Filtrate CL (ppm)</b>	1,250.00	1,200.00			
<b>pH / Fluid Loss (mptm)</b>	9.40 / 5	11.00 / 5			
<b>PV (cP) / YP (lbf2)</b>	5 / 3.00	15 / 15.00			
<b>% Solids / % Sand</b>	8.9 / 0.85	9 / 0.50			
<b>% Oil / Oil:Water Ratio</b>	N/A / N/A	N/A / N/A			
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Max Tool Temp (in F) / S</b>	475.00 / PCM	330.00 / PCM			

Max Tool Temp (degF) / Source	175.21 / PCM	226.08 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Matt Busche	Matt Busche			
Customer Representative	Jim Baker	Jim Baker			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.76			
Sub Serial Number	11303519	12334776			
Insert Serial Number	12230081	11680779			
Date and Time Initialized	18-May-14 21:00	21-May-14 19:28			
Date and Time Read	21-May-14 07:03	24-May-14 20:38			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	44.55	43.79			
Software Version	6.21	6.21			
Sub Serial Number	11303519	12334776			
Sonde Serial Number	11638587	11833026			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	5.23	108.23			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.50	48.74			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11303519	12334776			
Insert/Sonde Serial Number	11579846	11293433			

## REMARKS

1. All depths are measured 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. All data presented is recorded data unless otherwise specified.
4. The final survey is a projection at the bit.
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

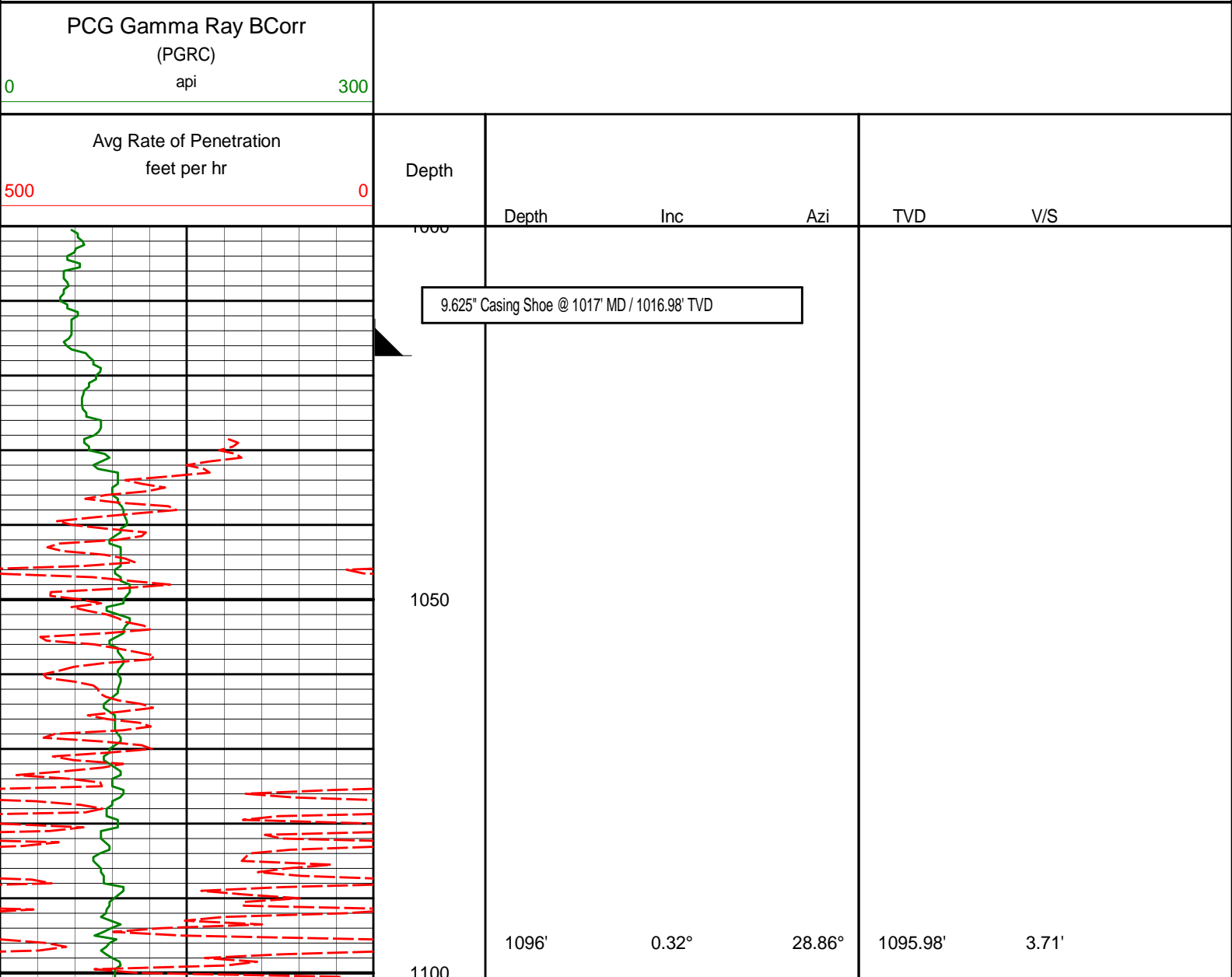
Insite version: 8.0.2

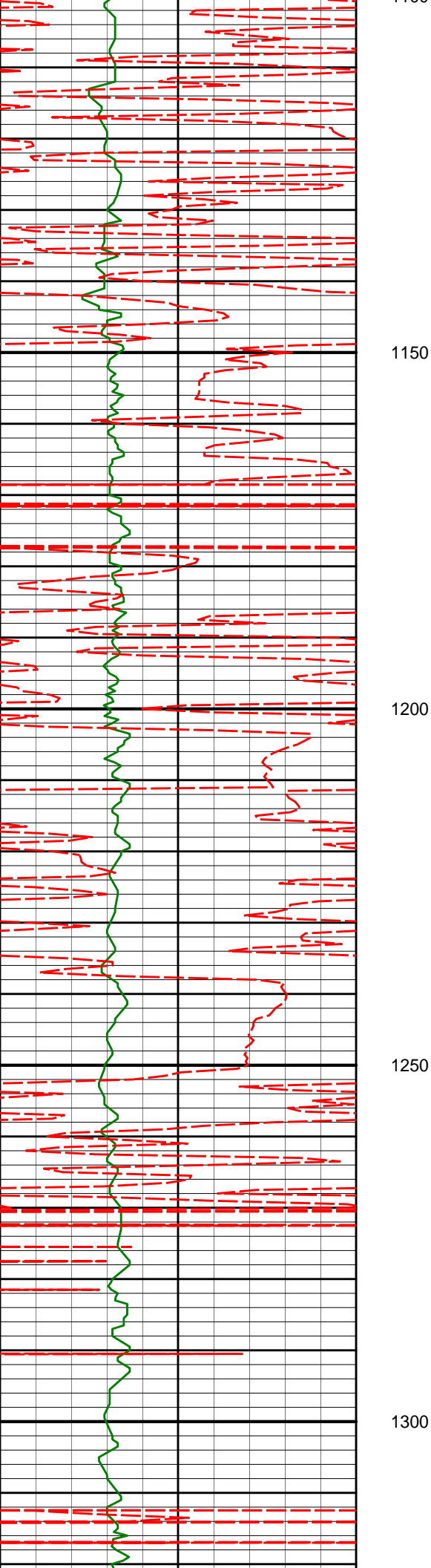
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HALLIBURTON

MD Main Log 1:240





1100

1150

1200

1250

1300

1190'

0.29°

169.97°

1189.98'

3.71'

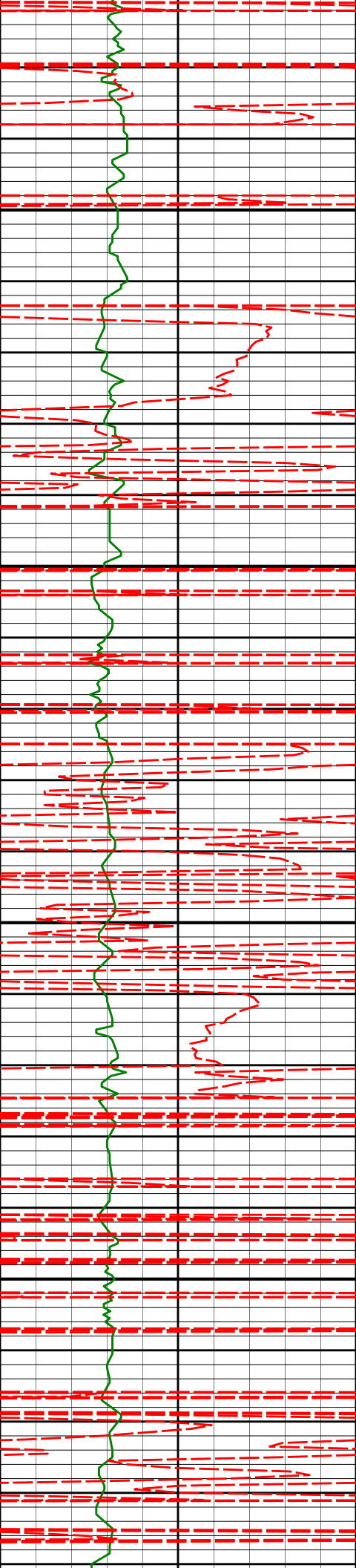
1285'

2.08°

205.46°

1284.95'

1.91'



1350

1379'

3.74°

193.77°

1378.83'

-2.63'

1400

1450

1473'

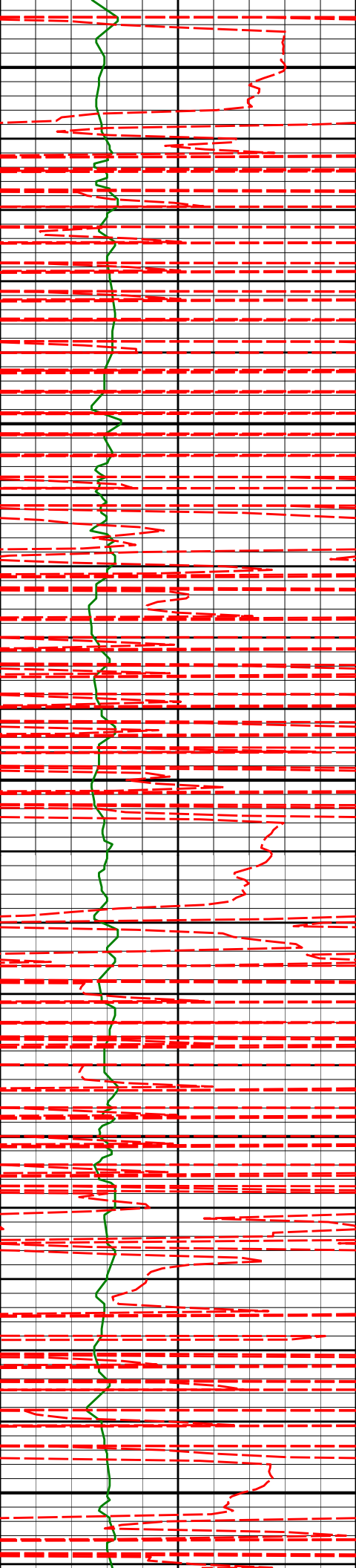
5.95°

196.53°

1472.49'

-10.30'

1500



1550

1567'

7.69°

193.50°

1565.82'

-21.12'

1600

1650

1660'

9.23°

190.36°

1657.81'

-34.53'

1700

1750

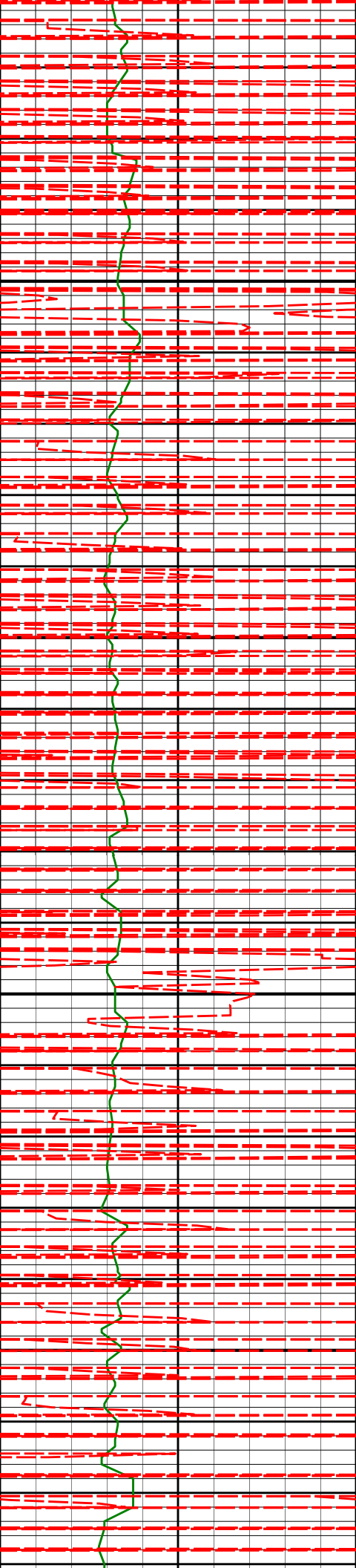
1755'

10.36°

184.71°

1751.42'

-50.56'



1800

1850

1900

1950

1849'

10.15°

182.51°

1843.92'

-67.27'

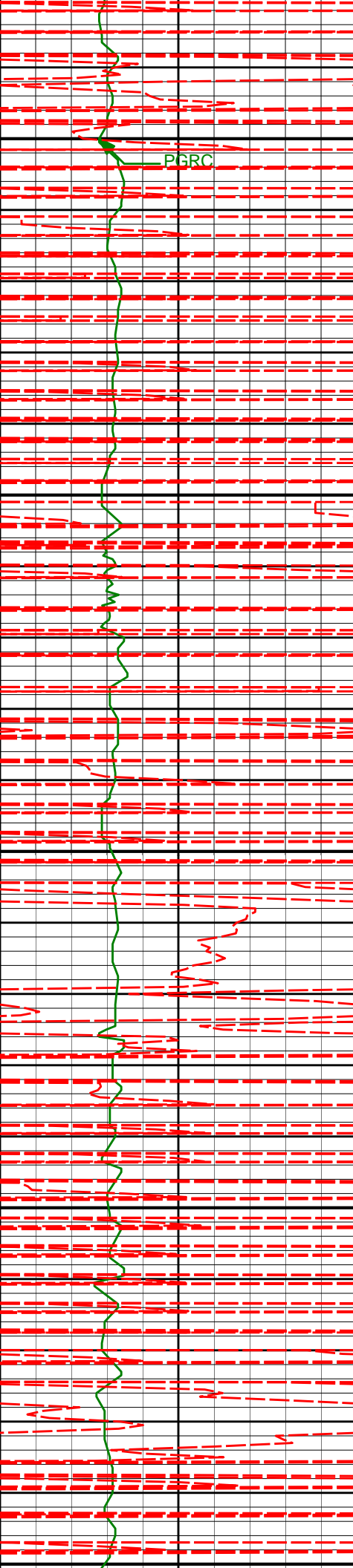
1943'

9.62°

177.25°

1936.53'

-83.39'



2000

PGRC

2038'

9.15°

178.69°

2030.25'

-98.87'

2050

2100

2132'

9.61°

185.08°

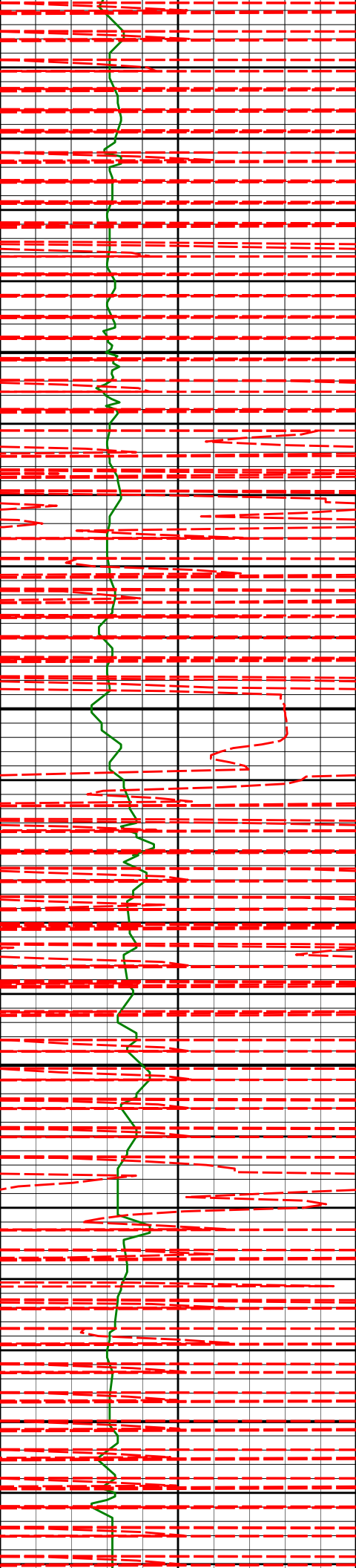
2123.00'

-114.16'

2150

2200





2200  
2250

2300

2350

2400

2226'

8.88°

184.64°

2215.78'

-129.22'

2320'

10.07°

181.63°

2308.49'

-144.67'

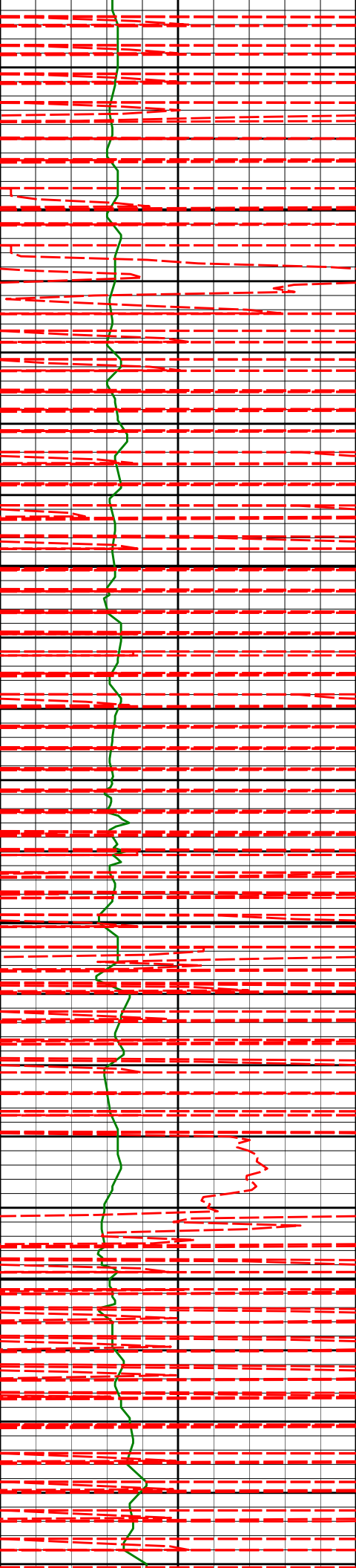
2414'

9.60°

180.47°

2401.11'

-160.73'



2450

2500

2550

2600

2509'

8.24°

183.13°

2494.96'

-175.45'

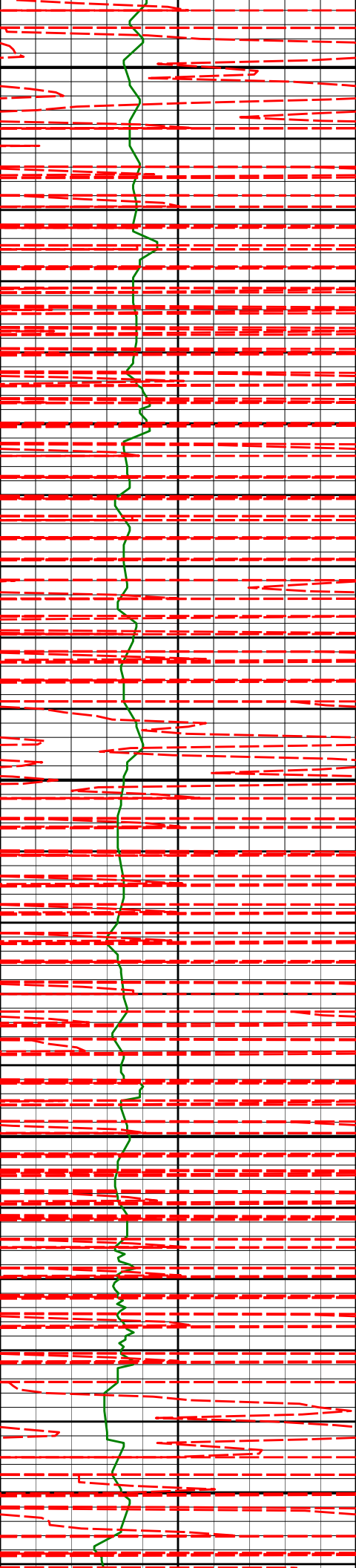
2603'

9.15°

179.65°

2587.88'

-189.65'



2650

2700

2750

2800

2850

2697'

7.81°

177.83°

2680.85'

-203.51'

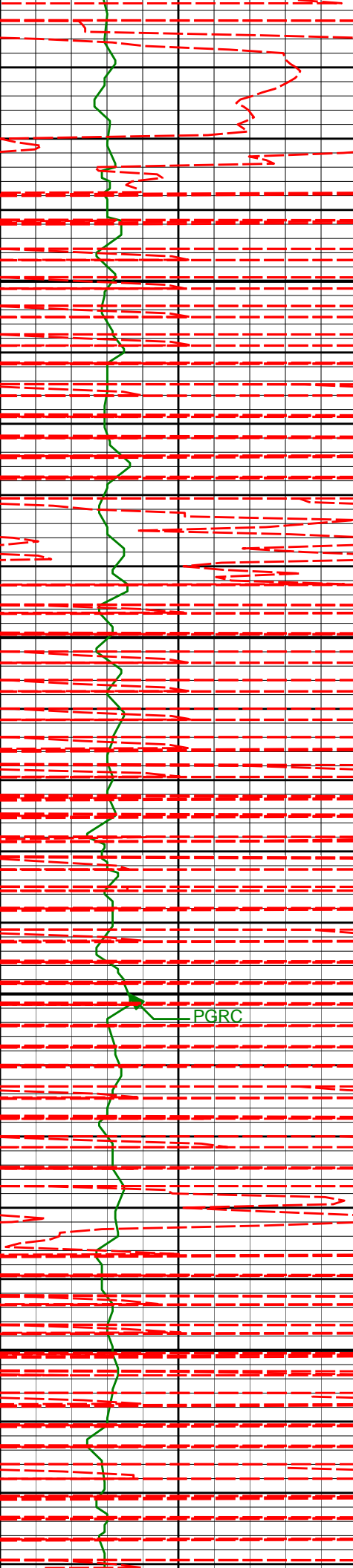
2792'

7.19°

176.74°

2775.04'

-215.88'



2900

2950

3000

3050

2887'

6.78°

193.58°

2869.34'

-227.28'

2982'

6.46°

193.11°

2963.71'

-237.97'

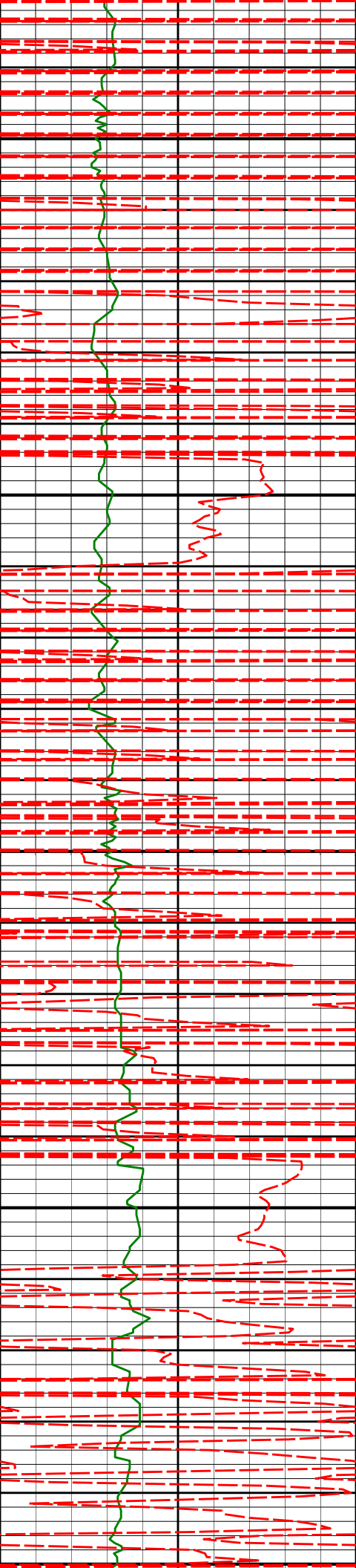
3077'

6.49°

193.79°

3058.10'

-248.41'



3100

3150

3172'

4.12°

189.44°

3152.69'

-257.01'

3200

3250

3267'

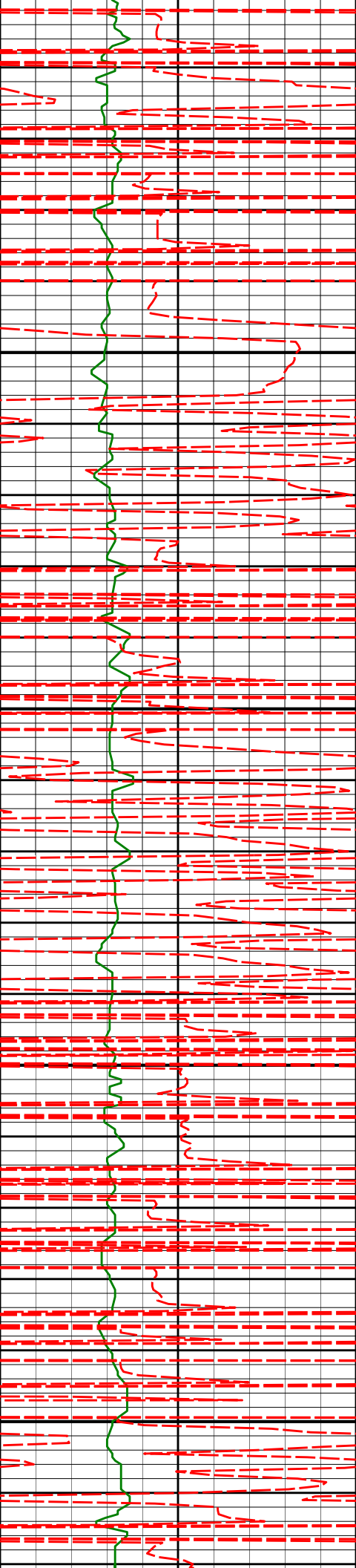
1.26°

176.00°

3247.58'

-261.43'

3300



3350

3400

3450

3500

3362'

0.07°

103.23°

3342.57'

-262.48'

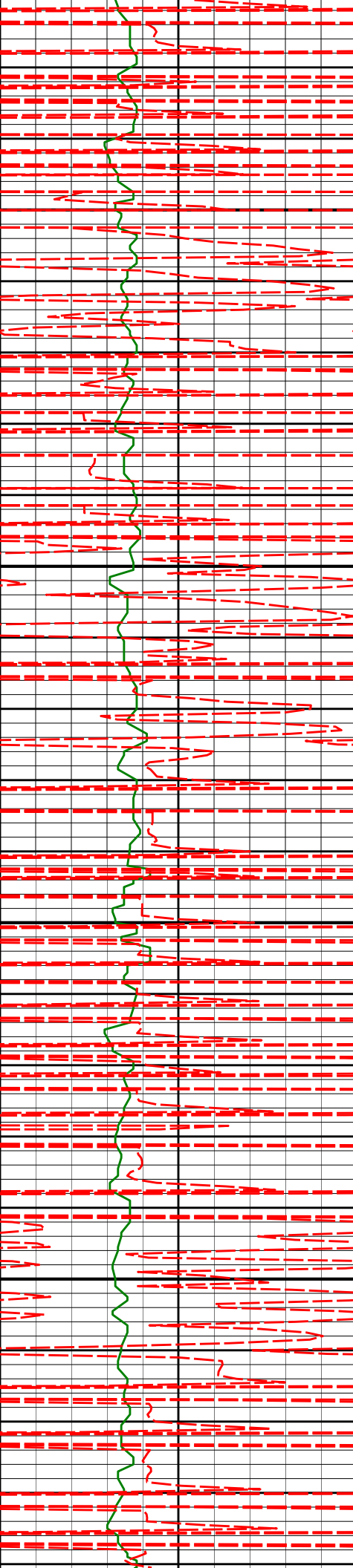
3457'

0.29°

34.56°

3437.57'

-262.29'



3550

3552'

0.39°

74.49°

3532.57'

-262.00'

3600

3650

3647'

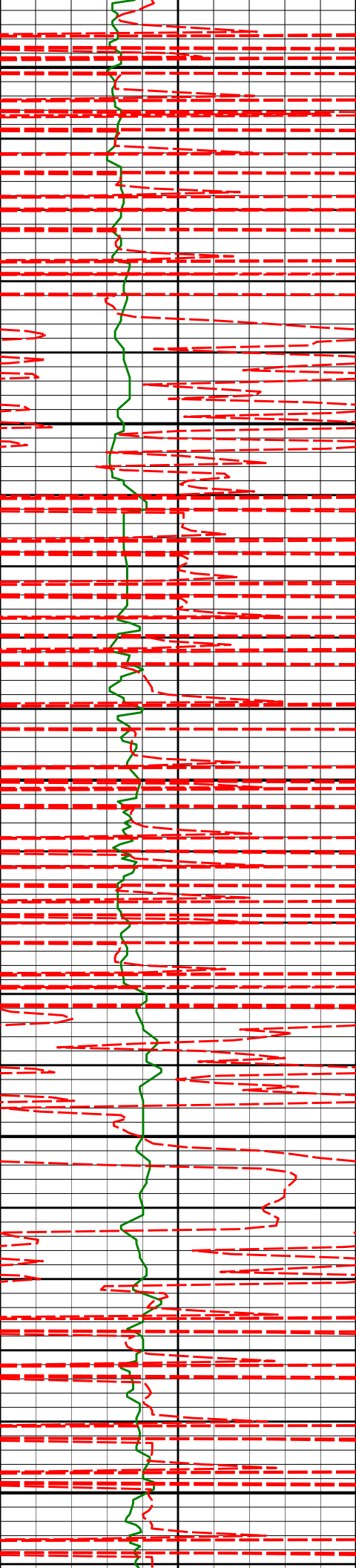
0.68°

31.86°

3627.56'

-261.43'

3700



3750

3800

3850

3900

3950

3742'

1.11°

340.14°

3722.55'

-260.09'

3838'

1.49°

340.38°

3818.53'

-258.05'

3933'

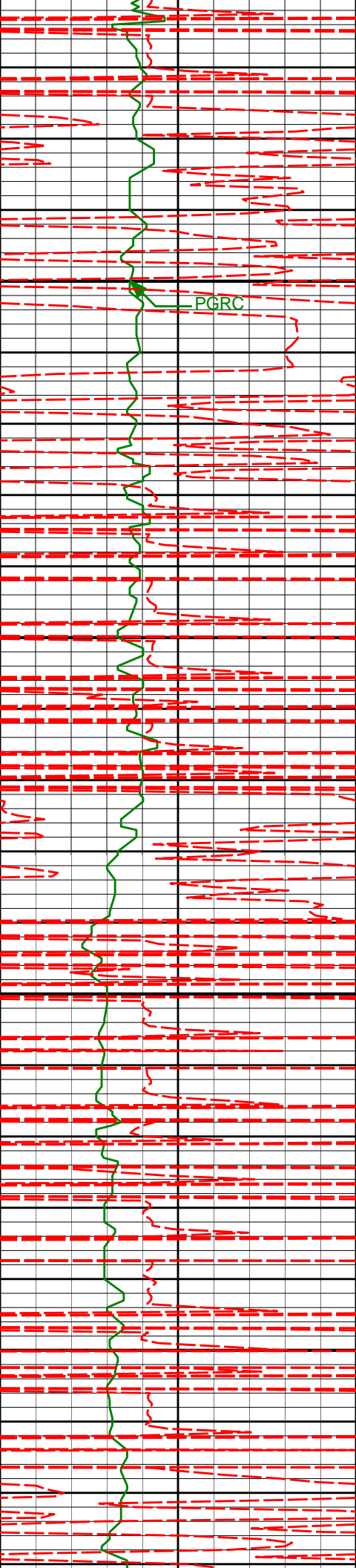
1.15°

311.58°

3913.50'

-256.26'





4000

PGRC

4028'

0.43°

319.24°

4008.49'

-255.37'

4050

4100

4123'

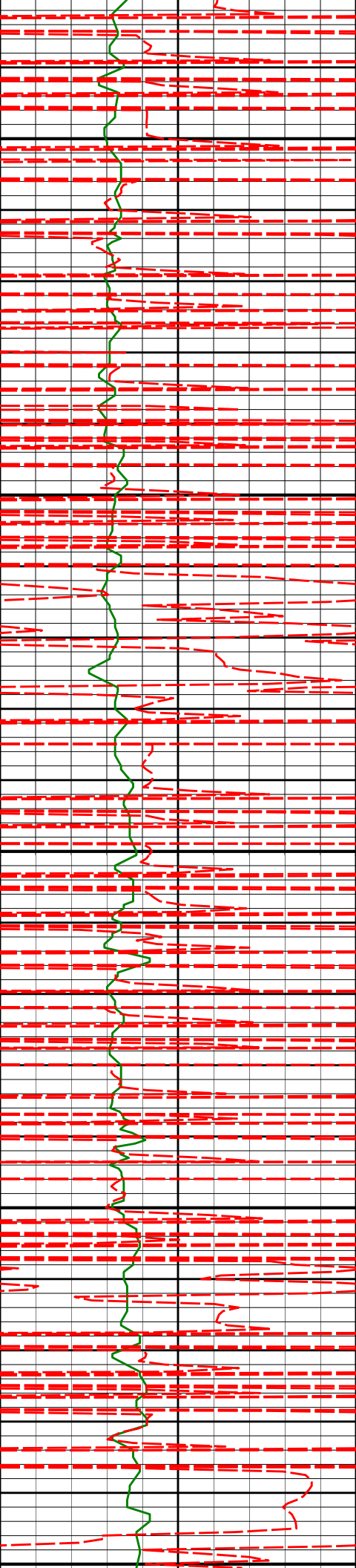
0.68°

286.42°

4103.49'

-254.95'

4150



4200

4218'

0.61°

296.85°

4198.48'

-254.57'

4250

4300

4313'

1.10°

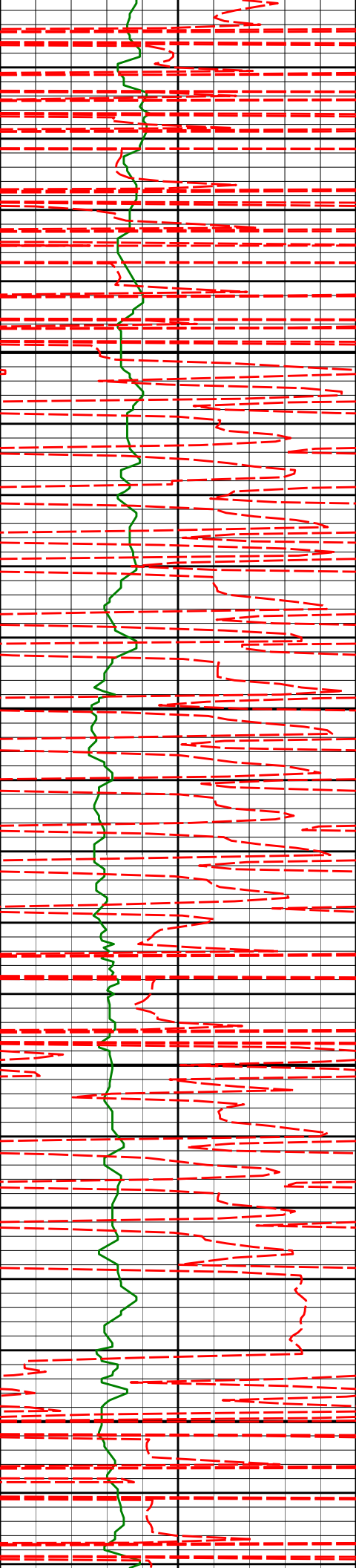
319.66°

4293.47'

-253.66'

4350

4400



4450

4500

4550

4600

4408'

1.08°

43.58°

4388.46'

-252.32'

4503'

1.77°

47.42°

4483.43'

-250.66'

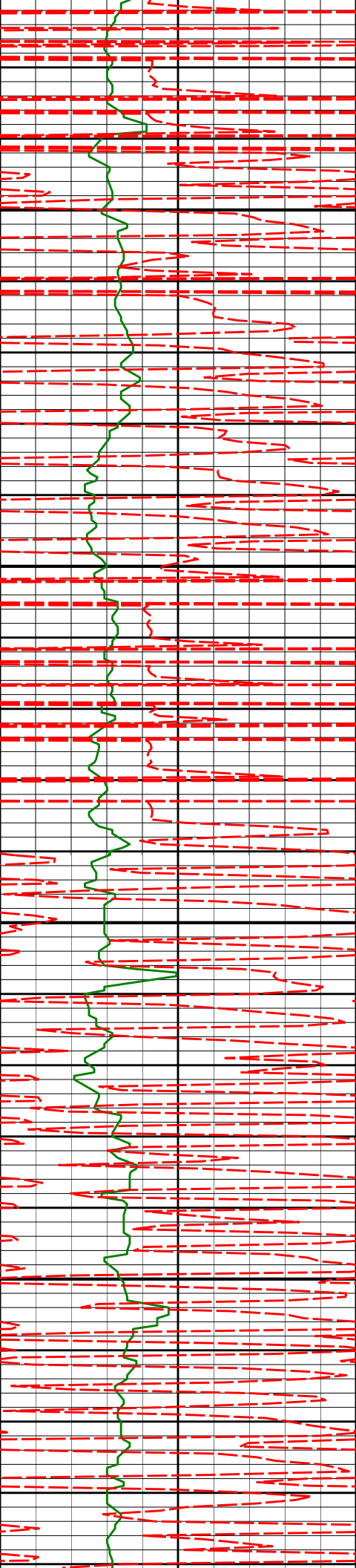
4598'

0.62°

335.89°

4578.41'

-249.18'



4650

4693'

1.24°

335.30°

4673.40'

-247.79'

4700

4750

4788'

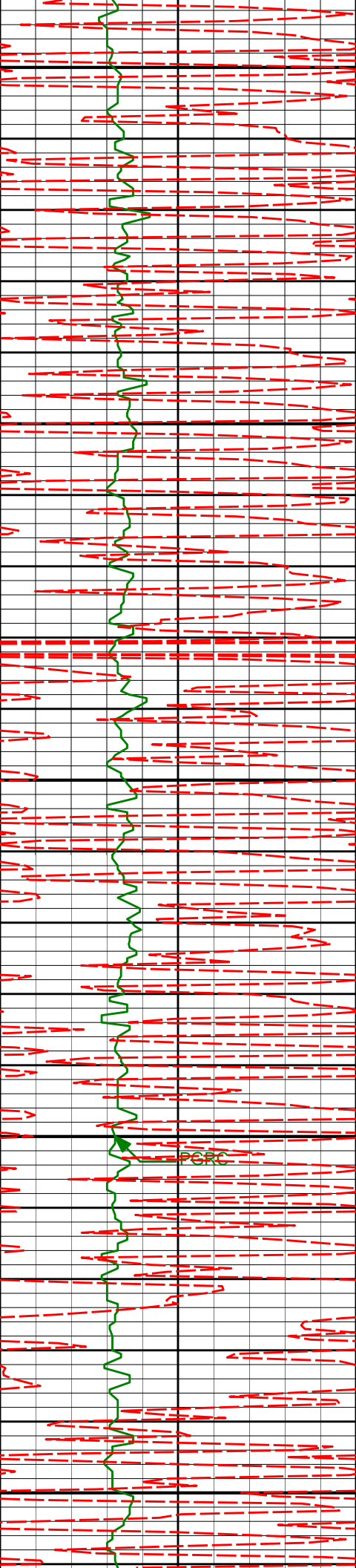
1.39°

333.25°

4768.37'

-245.84'

4800



4850

4883'

1.39°

345.27°

4863.35'

-243.70'

4900

4950

4977'

1.26°

346.60°

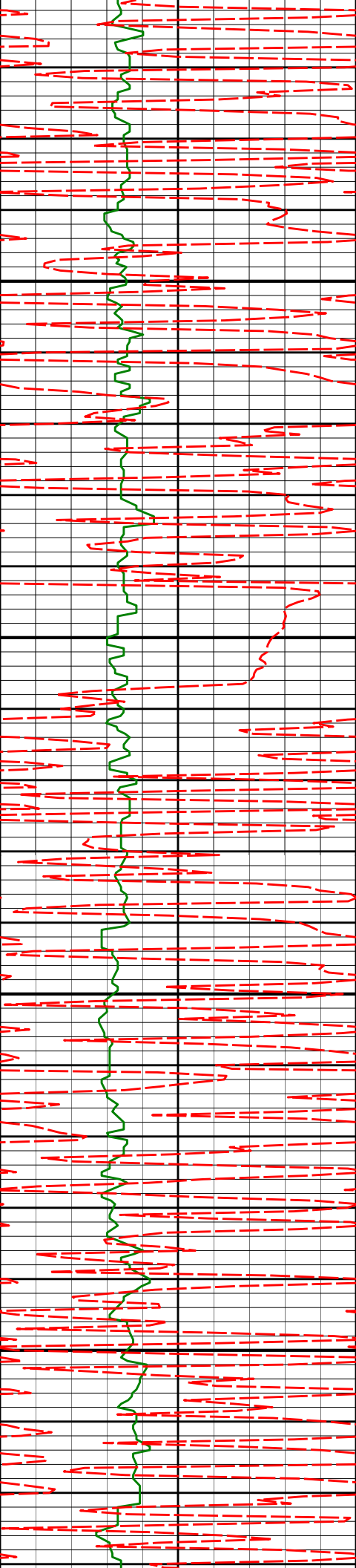
4957.32'

-241.60'

5000

PERC

5050



5072'

1.45°

346.23°

5052.29'

-239.42'

5100

5150

5167'

0.35°

129.59°

5147.29'

-238.44'

5200

5250

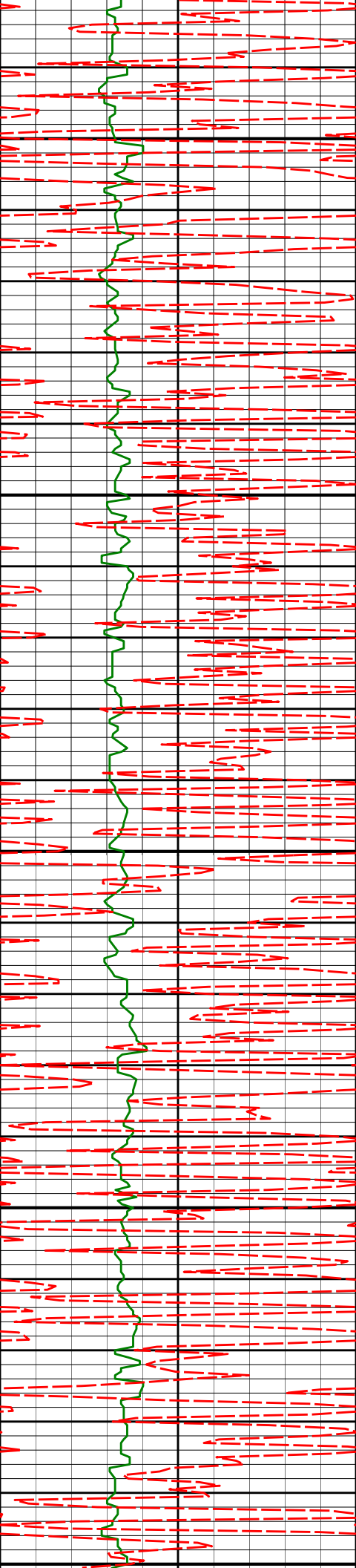
5263'

0.26°

145.26°

5243.28'

-238.80'



5300

5350

5400

5450

5500

5358'

0.59°

125.31°

5338.28'

-239.26'

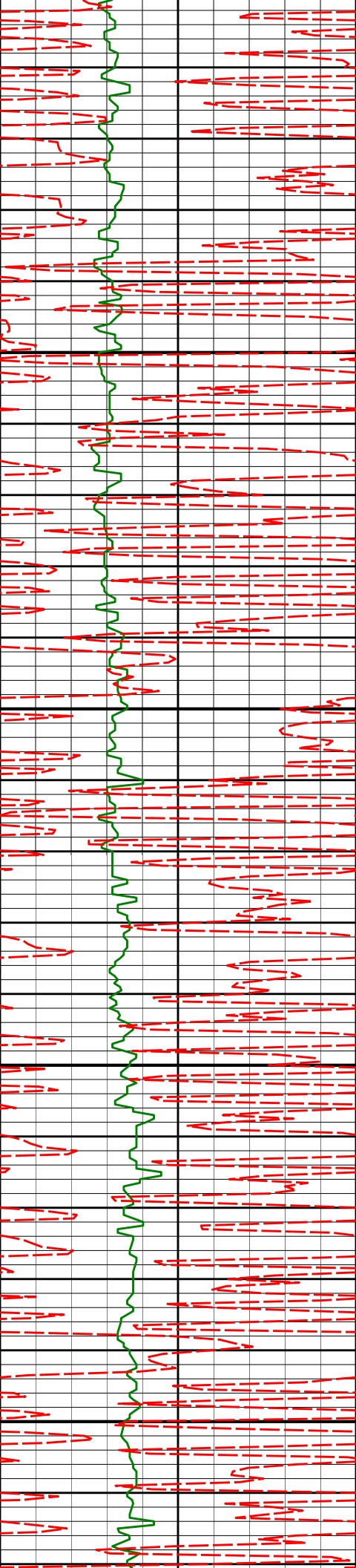
5453'

0.36°

111.40°

5433.28'

-239.64'



5550

5548'

0.90°

77.13°

5528.27'

-239.57'

5600

5650

5643'

1.07°

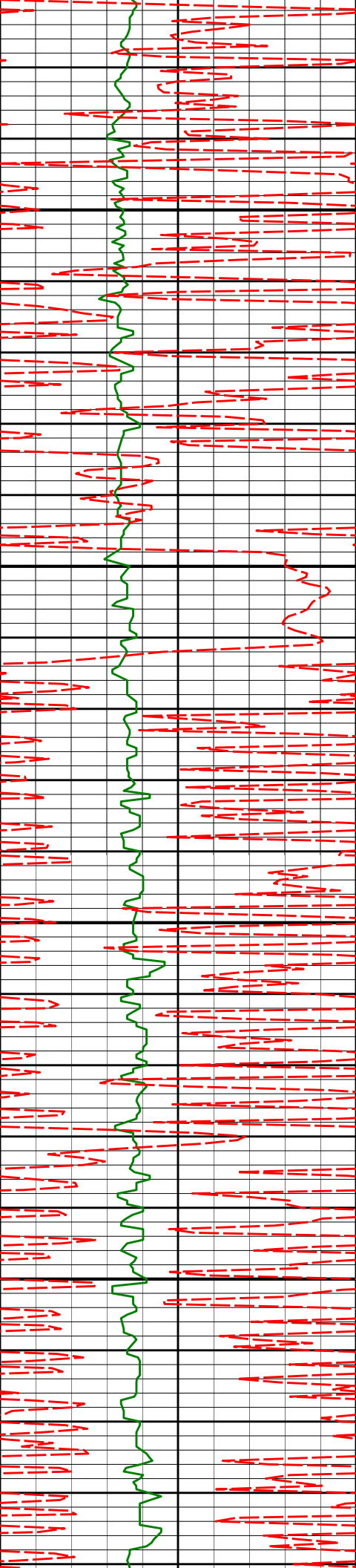
57.27°

5623.26'

-238.91'

5700





5738'

0.99°

17.78°

5718.25'

-237.64'

5750

5800

5833'

0.32°

102.38°

5813.24'

-236.91'

5850

5900

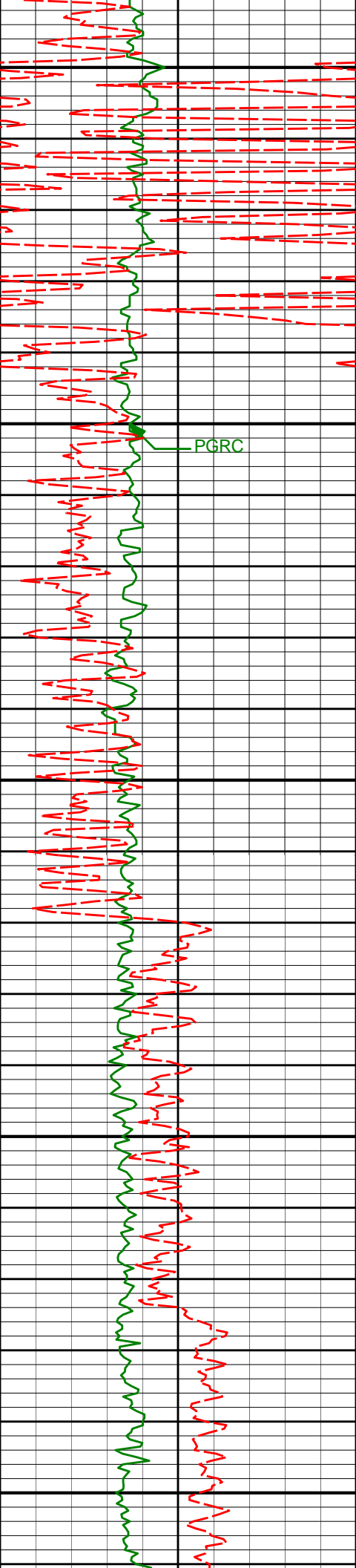
5929'

0.31°

15.03°

5909.24'

-236.71'



5950

6000

PGRC

6050

6100

6150

6024'

0.57°

345.69°

6004.24'

-236.01'

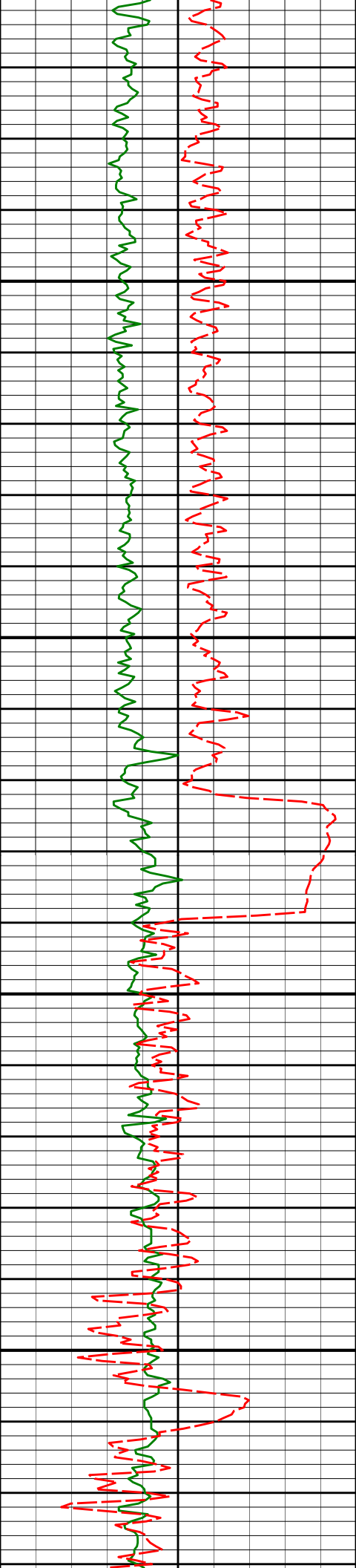
6119'

0.13°

332.99°

6099.23'

-235.45'



6200

6214'

0.42°

24.66°

6194.23'

-235.04'

6250

6300

6309'

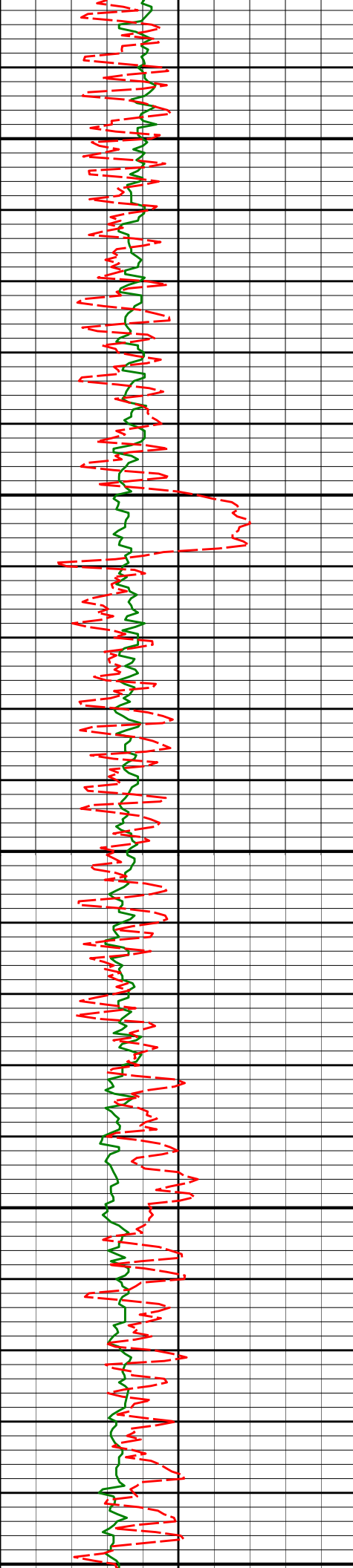
1.68°

189.63°

6289.22'

-236.10'

6350



6400

6404'

1.58°

189.65°

6384.18'

-238.77'

6450

6500

6499'

1.51°

189.00°

6479.15'

-241.30'

6550

6594'

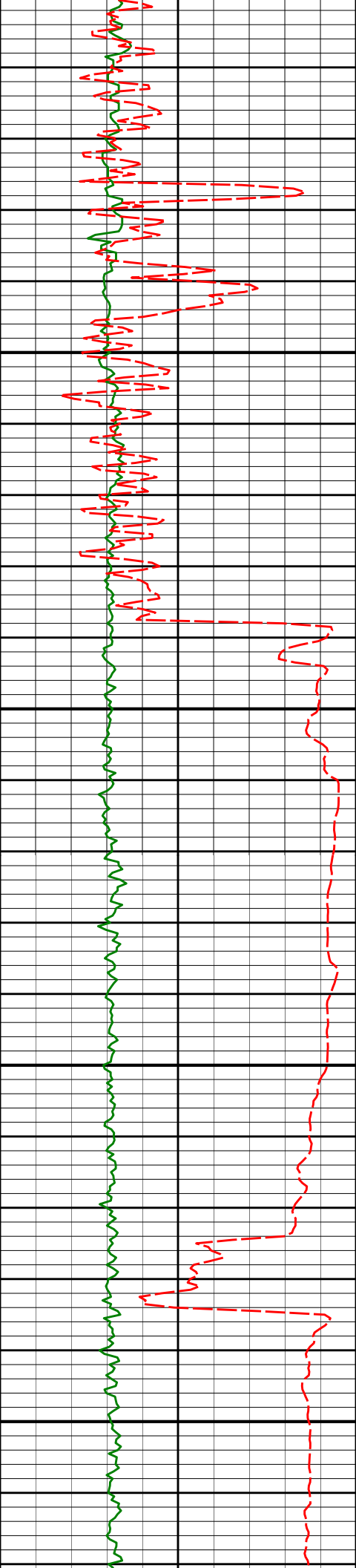
1.37°

203.09°

6574.12'

-243.59'

6600



6650

6700

6750

6800

6689'

0.36°

195.66°

6669.11'

-244.92'

6737'

3.30°

358.57°

6717.08'

-243.69'

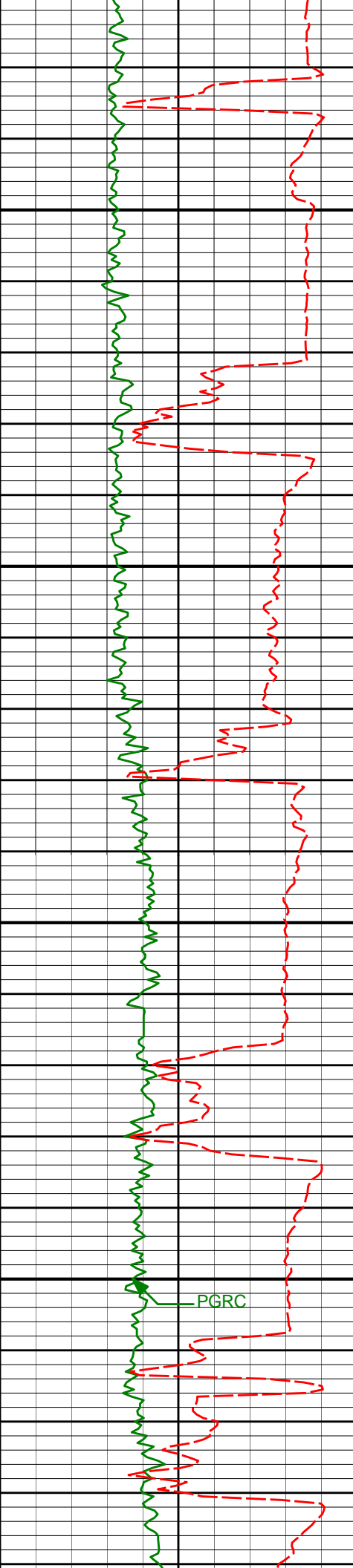
6784'

7.80°

357.79°

6763.85'

-239.15'



6850

6900

6950

7000

PGRC

6832'

13.36°

356.46°

6811.02'

-230.36'

6880'

17.61°

358.70°

6857.26'

-217.56'

6928'

23.60°

0.47°

6902.17'

-200.68'

6975'

29.21°

358.68°

6944.25'

-179.80'

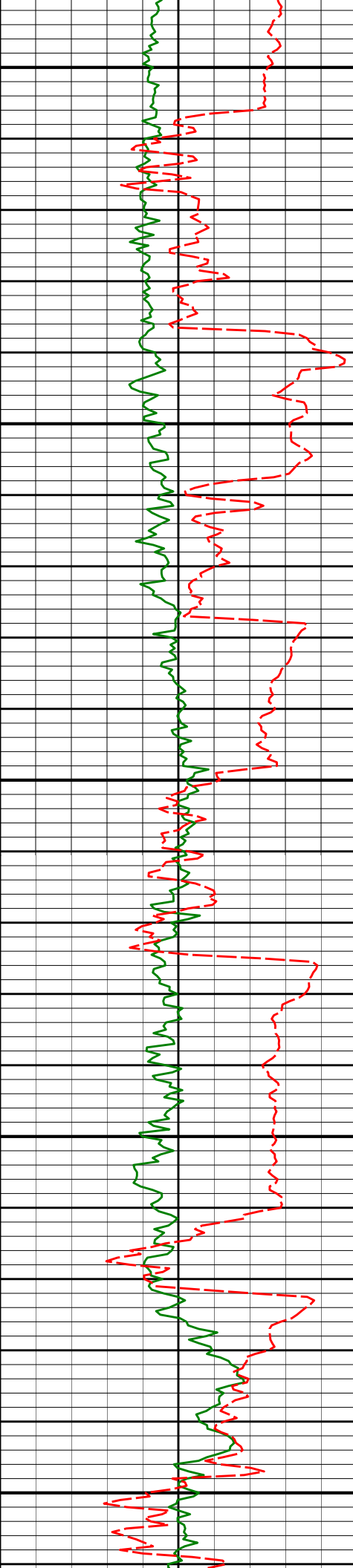
7023'

33.49°

357.97°

6985.24'

-154.85'



7050

7070'

37.46°

357.72°

7023.50'

-127.61'

7100

7118'

39.54°

359.66°

7061.07'

-97.75'

7150

7165'

43.09°

1.08°

7096.36'

-66.73'

7200

7213'

49.44°

1.51°

7129.53'

-32.07'

7250

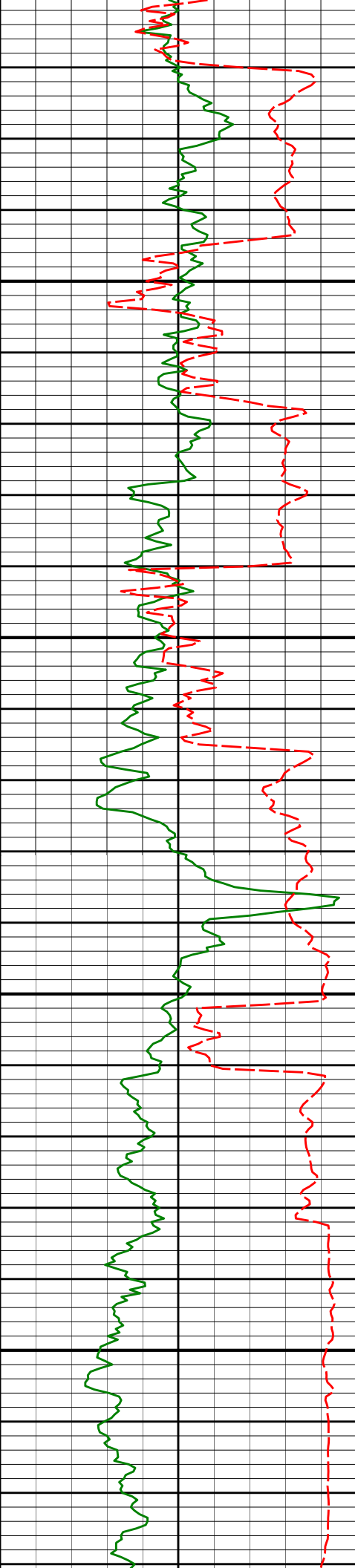
7260'

53.95°

3.46°

7158.66'

4.78'



7300

7308'

58.29°

2.38°

7185.41'

44.59'

7350

7355'

61.52°

2.15°

7208.98'

85.23'

7400

7403'

65.17°

2.89°

7230.50'

128.10'

7450

7450'

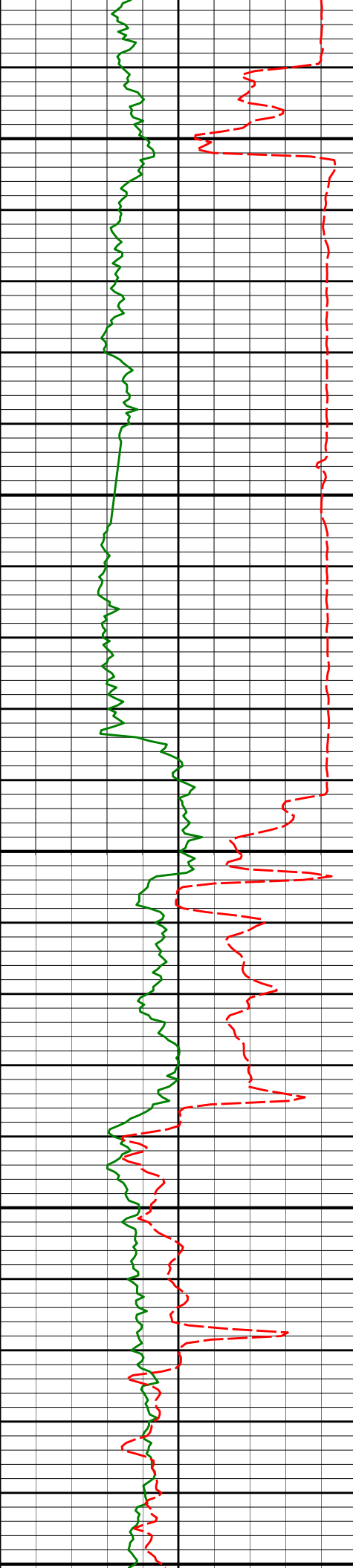
70.93°

1.84°

7248.07'

171.65'





7500

7498'

76.20°

0.76°

7261.64'

217.67'

7550

7545'

82.78°

0.01°

7270.21'

263.86'

7" Casing Shoe @ 7593' MD / 7273.44' TVD

7600

7621'

89.26°

0.40°

7275.48'

339.63'

7650

7683'

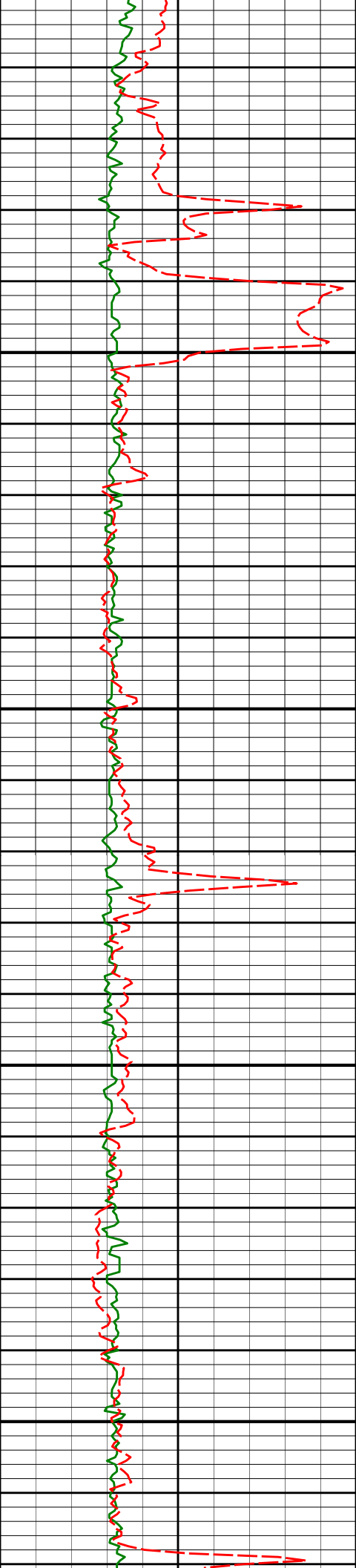
89.54°

359.85°

7276.13'

401.62'

7700



7700  
7750

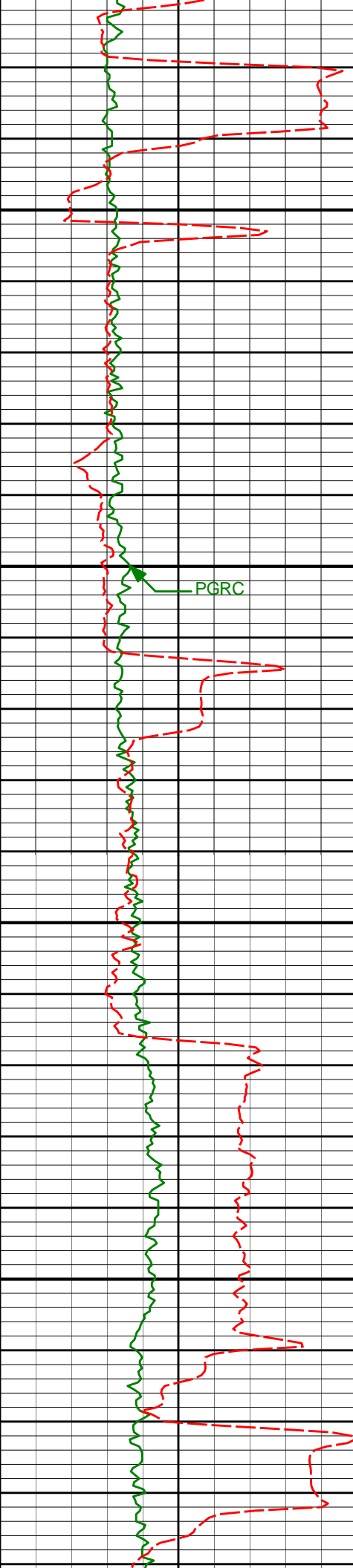
7778' 90.89° 359.69° 7275.78' 496.61'

7800

7850

7873' 91.88° 359.95° 7273.48' 591.57'

7900



7950

7968'

91.14°

0.09°

7270.98'

686.53'

8000

PGRC

8050

8063'

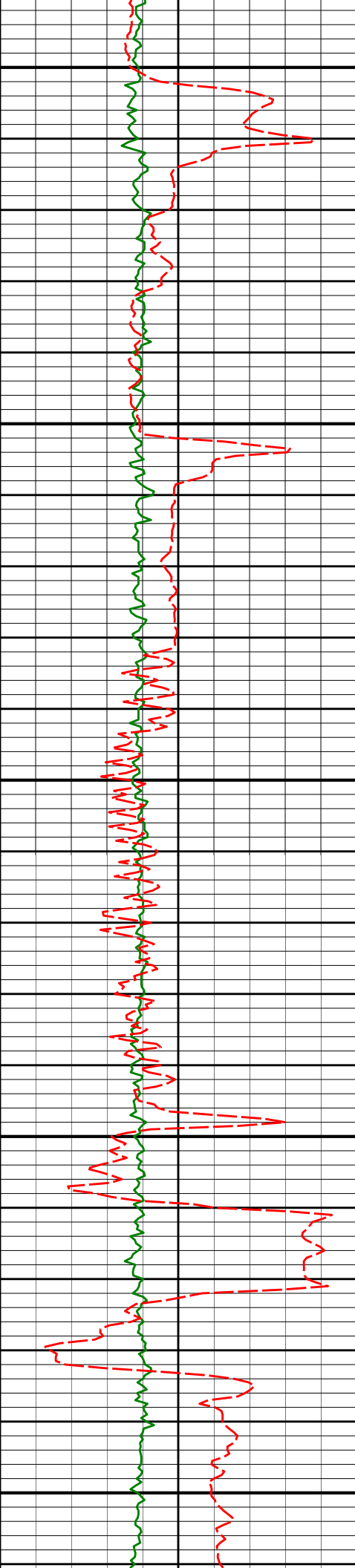
91.33°

359.59°

7268.93'

781.50'

8100



8150

8158'

90.09°

359.77°

7267.75'

876.48'

8200

8250

8254'

89.97°

357.99°

7267.70'

972.43'

8300

8350

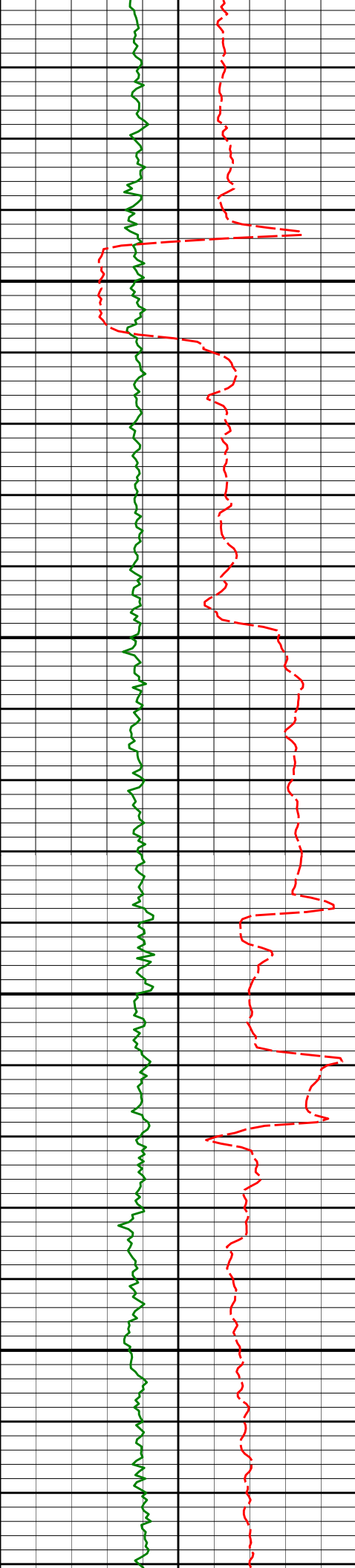
8349'

90.74°

0.51°

7267.11'

1067.39'



8400

8444'

89.69°

359.52°

7266.76'

1162.39'

8450

8500

8539'

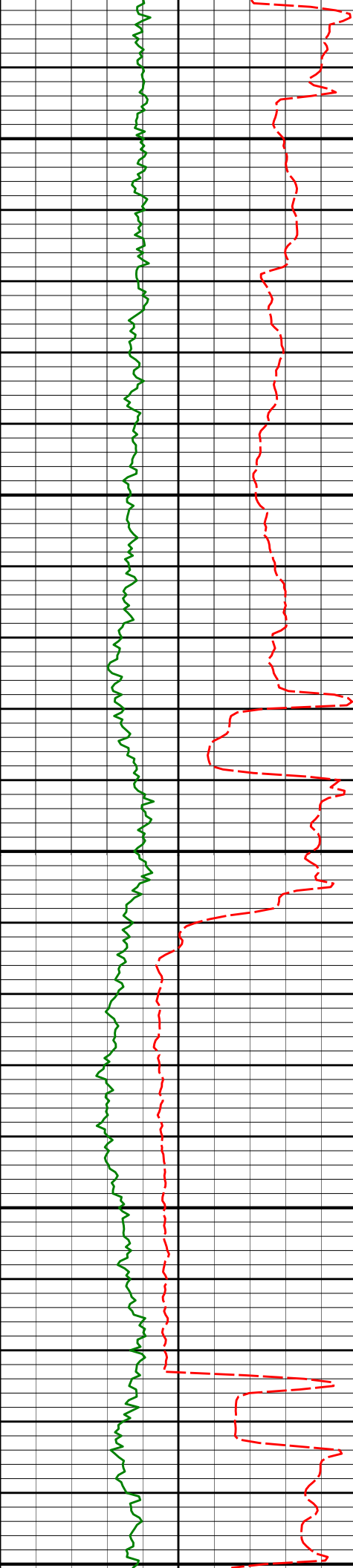
89.48°

359.88°

7267.44'

1257.37'

8550



8600

8634'

91.57°

359.03°

7266.57'

1352.34'

8650

8700

8729'

91.36°

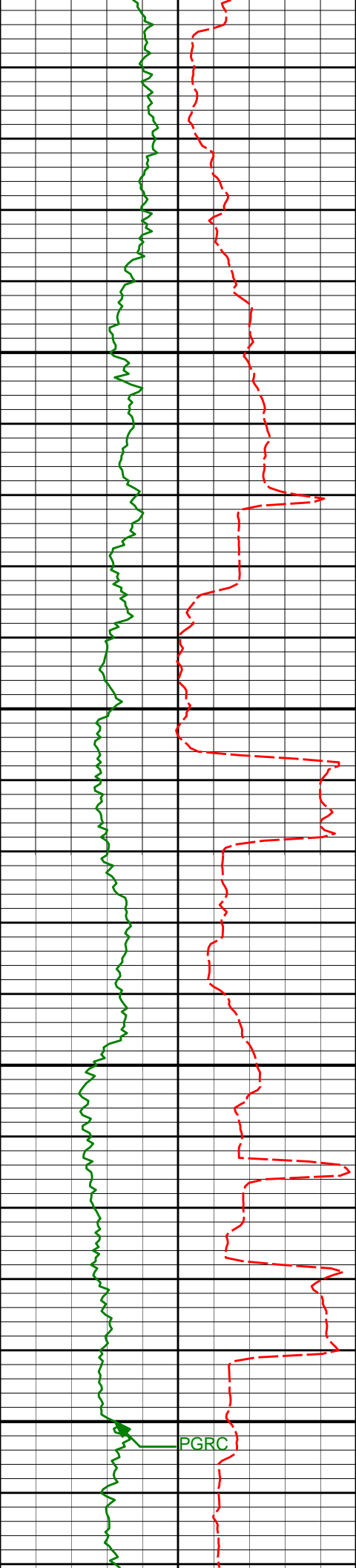
359.90°

7264.15'

1447.29'

8750

8800



8850

8900

8950

9000

8824'

92.31°

1.75°

7261.10'

1542.24'

8919'

92.16°

2.19°

7257.40'

1637.14'

9015'

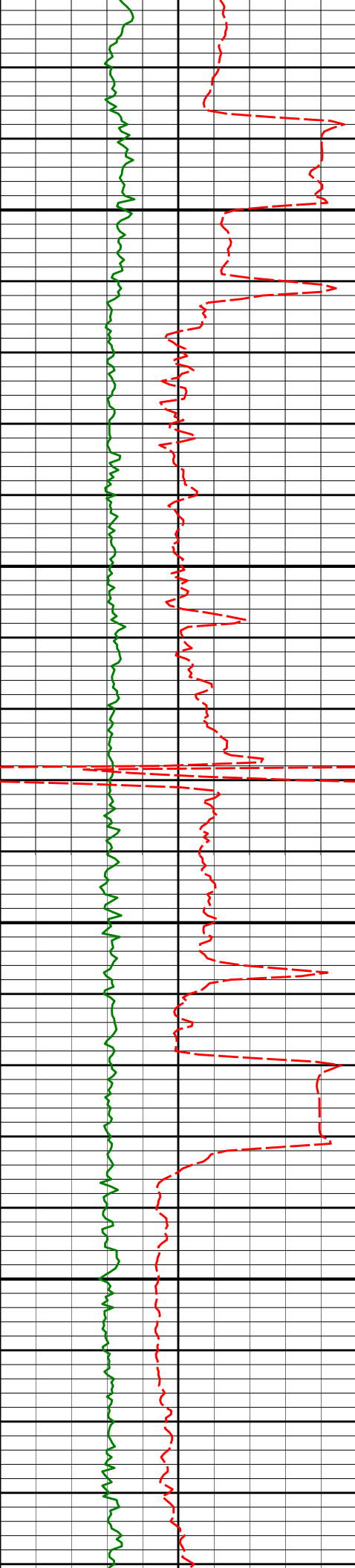
91.54°

2.40°

7254.30'

1733.04'

PGRC



9050

9100

9150

9200

9110'

89.91°

359.78°

7253.10'

1828.02'

9205'

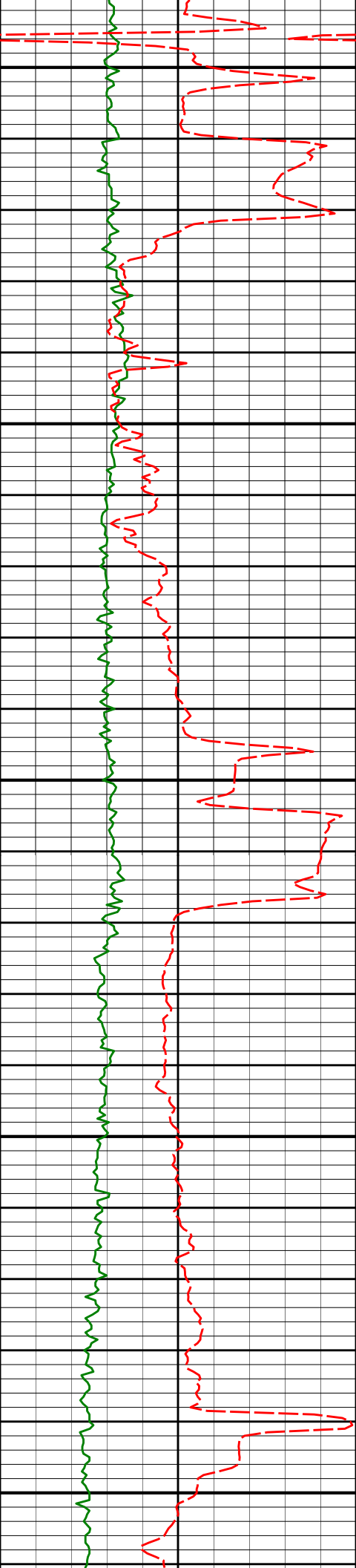
90.09°

0.75°

7253.10'

1923.02'





9250

9300

9350

9400

9450

9300'

89.66°

0.14°

7253.30'

2018.02'

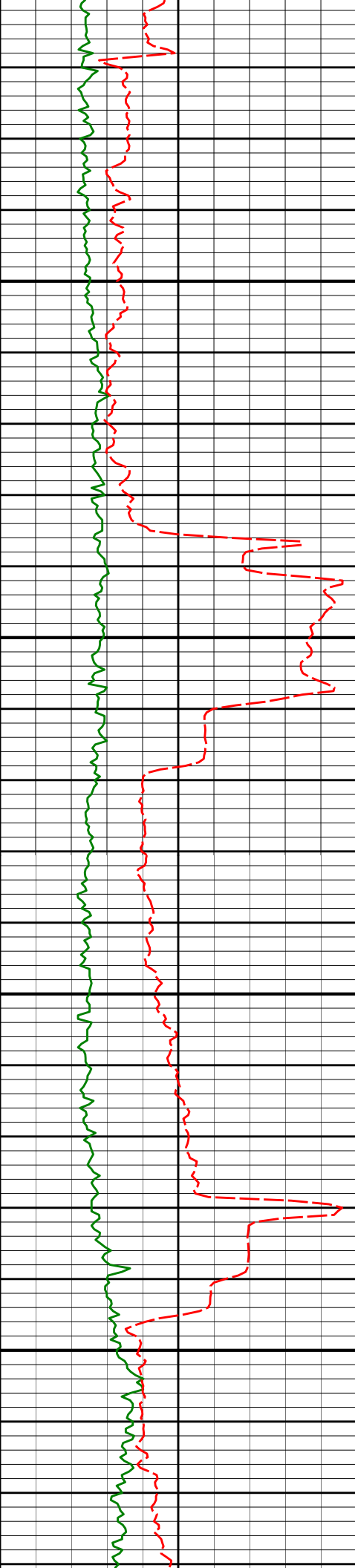
9395'

89.20°

1.02°

7254.25'

2113.01'



9490'

90.74°

0.76°

7254.30'

2208.01'

9500

9550

9600

9650

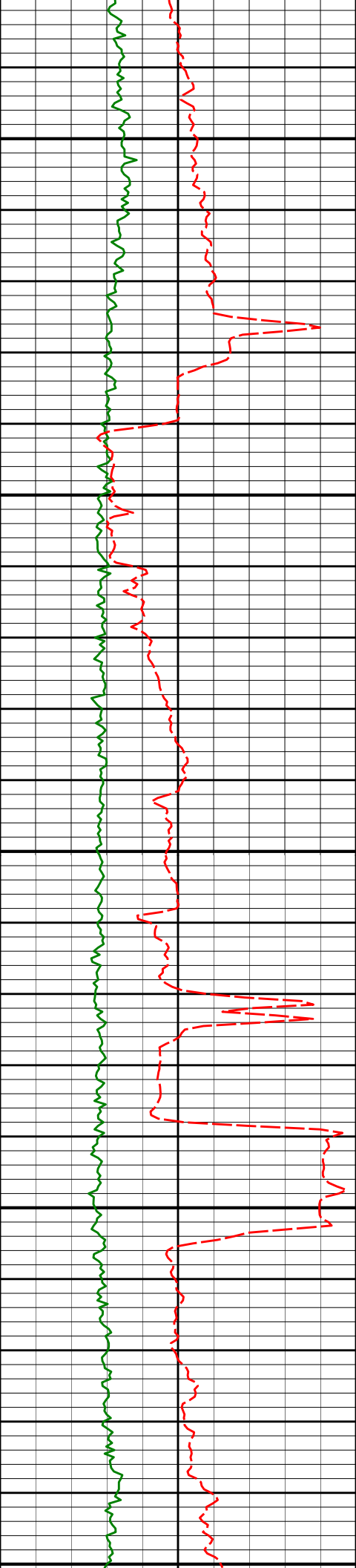
9586'

89.35°

0.58°

7254.22'

2304.01'



9700

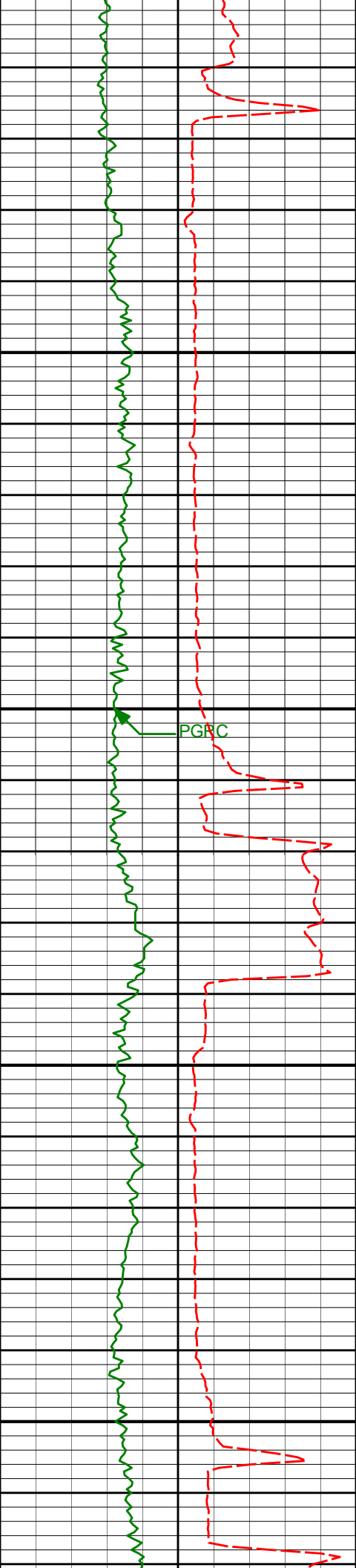
9750

9800

9850

9900

9681'	89.75°	0.44°	7254.97'	2399.00'
9776'	90.28°	0.05°	7254.95'	2494.00'
9871'	89.91°	0.80°	7254.79'	2589.00'



9950

9966'

90.62°

0.09°

7254.35'

2684.00'

10000

PGRC

10050

10061'

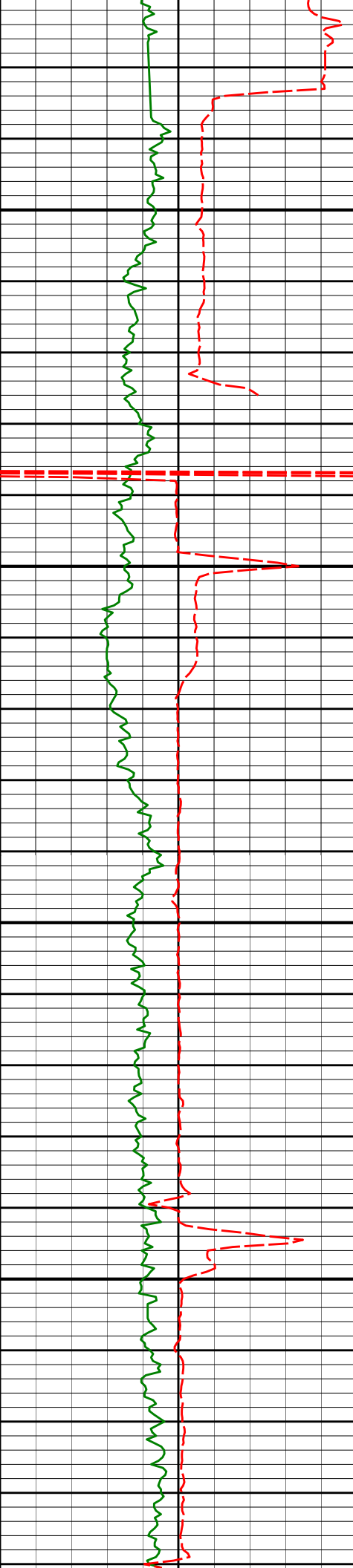
89.88°

1.46°

7253.93'

2778.99'

10100



10150

10156'

88.58°

1.11°

7255.21'

2873.97'

10200

10250

10252'

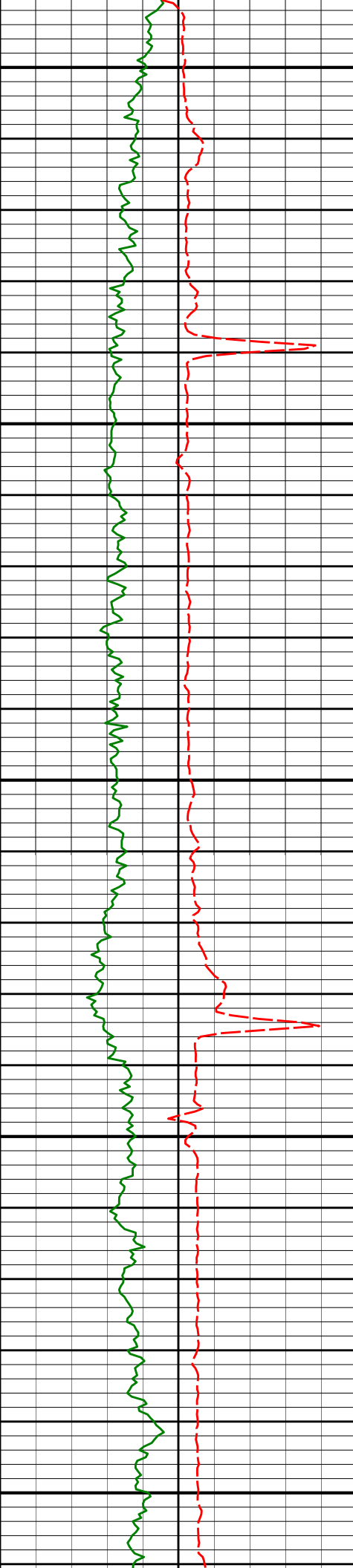
89.01°

1.02°

7257.23'

2969.95'

10300



10350

10400

10450

10500

10550

10347'

88.98°

0.59°

7258.90'

3064.93'

10442'

89.02°

359.90°

7260.55'

3159.92'

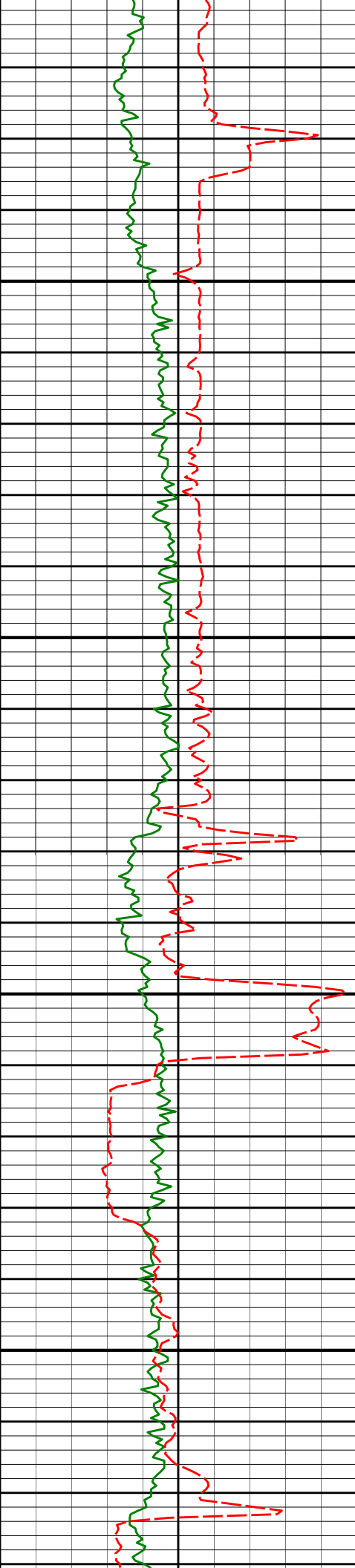
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88.58°

359.88°

7262.54'

3254.89'



10600

10632'

88.33°

359.16°

7265.10'

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10650

10700

10727'

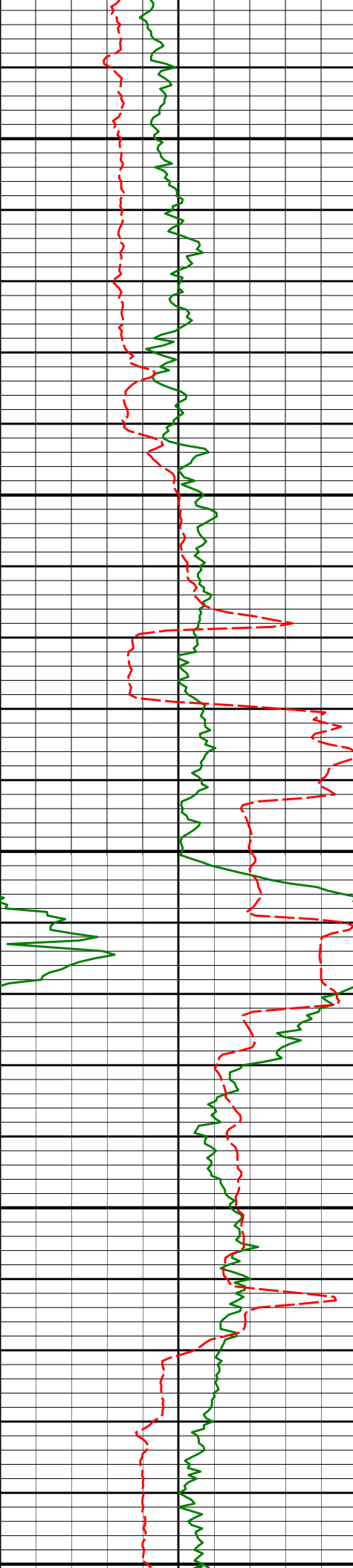
88.55°

359.30°

7267.69'

3444.77'

10750



10800

10822'

88.24°

358.75°

7270.35'

3539.70'

10850

10900

10918'

90.43°

359.93°

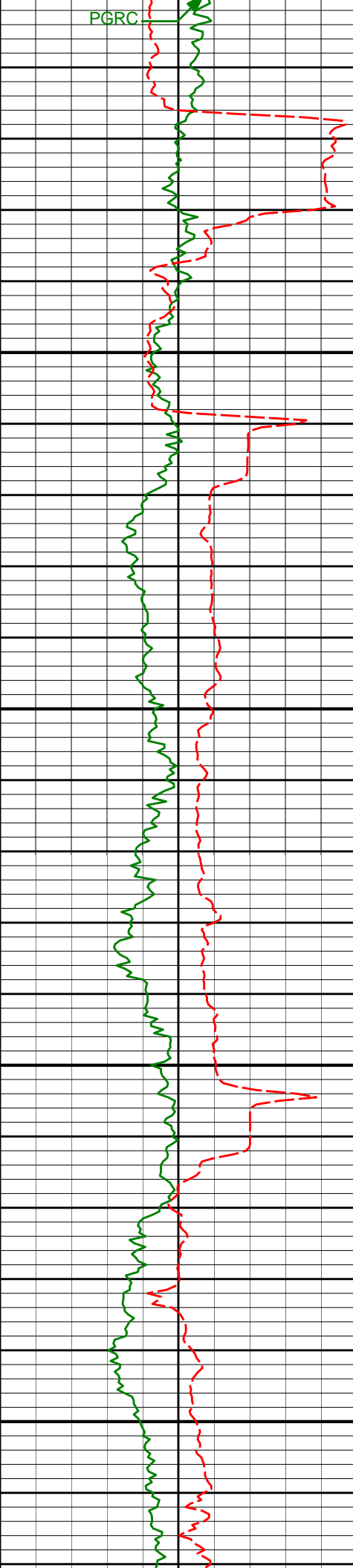
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3635.66'

10950

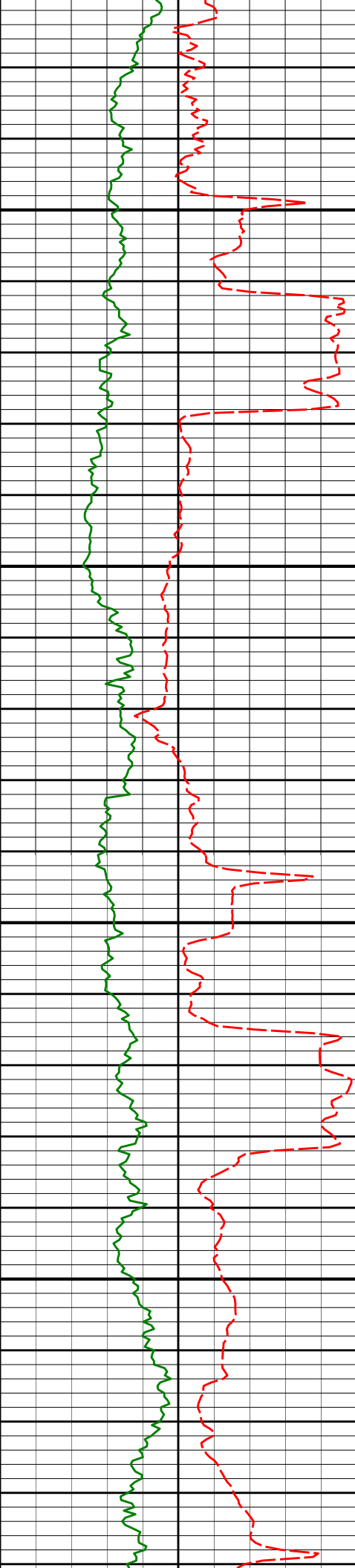
11000





11000  
11050  
11100  
11150  
11200

11013'	90.62°	0.34°	7270.60'	3730.65'
11108'	90.25°	0.73°	7269.87'	3825.65'
11203'	90.43°	0.31°	7269.31'	3920.65'



11250

11300

11350

11400

11298'

89.81°

1.70°

7269.11'

4015.64'

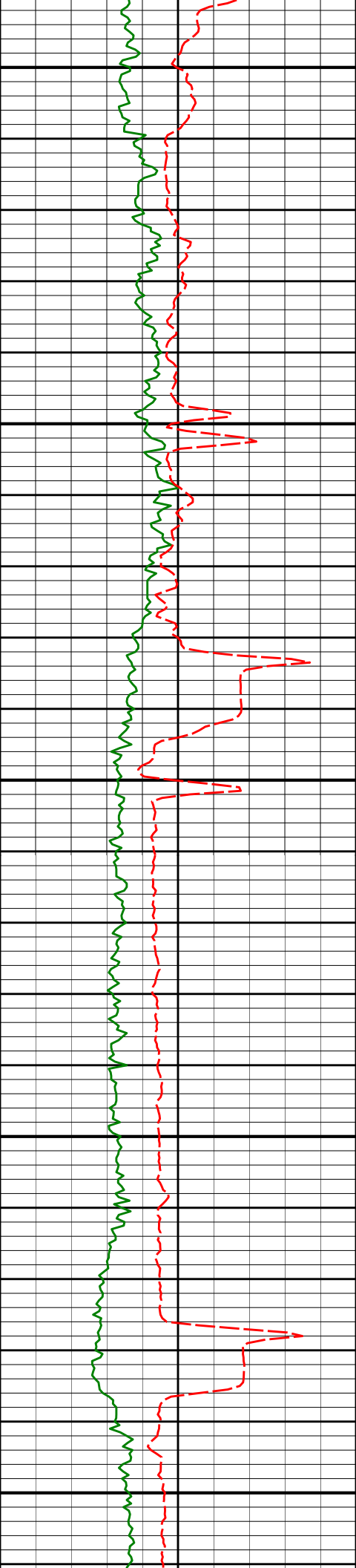
11393'

88.61°

2.53°

7270.42'

4110.60'



11450

11488'

88.30°

1.49°

7272.98'

4205.53'

11500

11550

11583'

88.27°

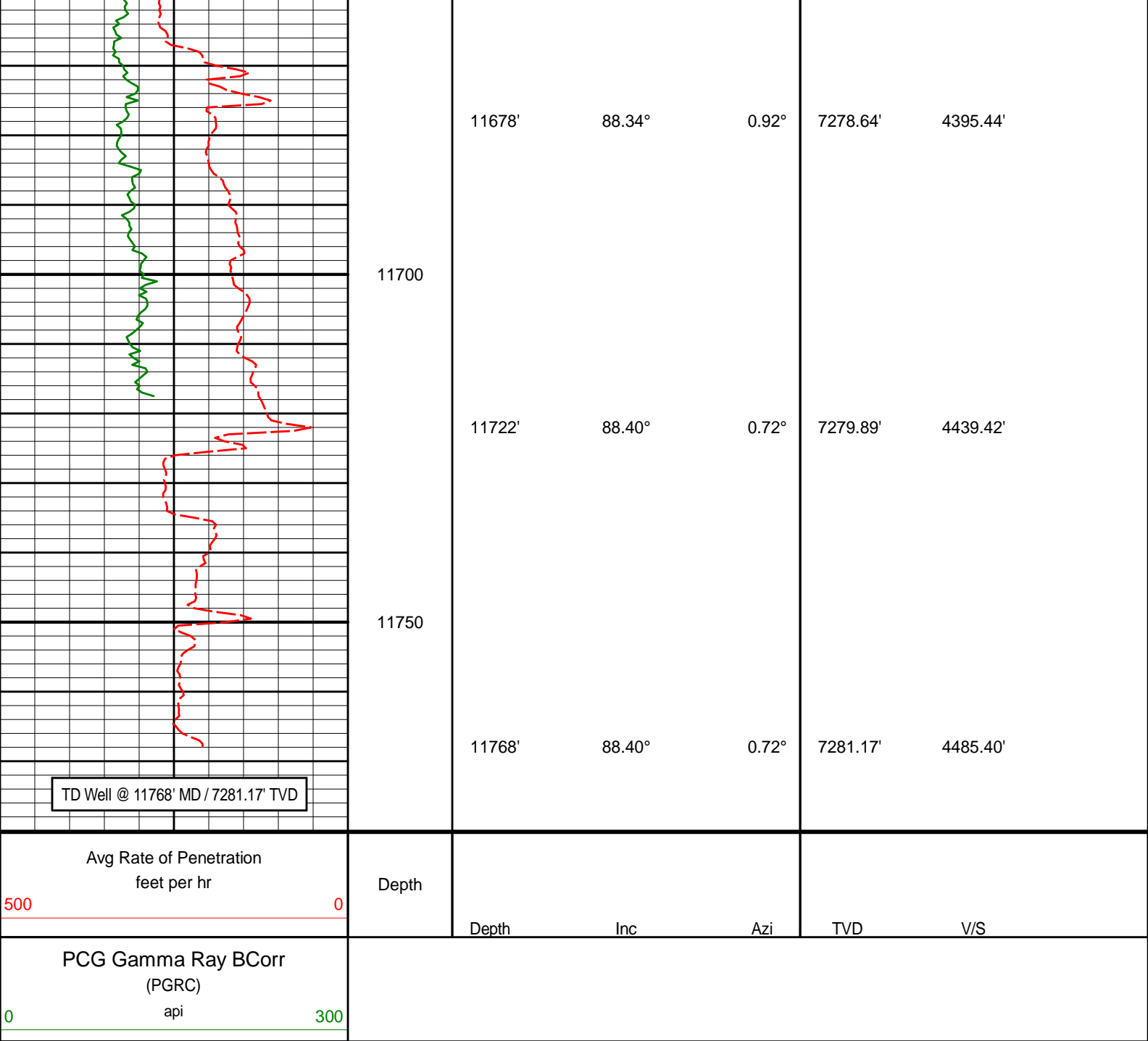
1.24°

7275.83'

4300.48'

11600

11650



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corporation

Maverick 2N-13HZ

Wattenberg

Weld Colorado

USA

CA-XX-0901247767

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
813.00	0.25	292.02	812.98	2.80 N	1.00 W	2.79	TIE-IN
1096.00	0.32	28.86	1095.98	3.72 N	1.19 W	3.71	0.15
1190.00	0.29	169.97	1189.98	3.72 N	1.02 W	3.71	0.61
1285.00	2.08	205.46	1284.95	1.93 N	1.72 W	1.91	1.95
1379.00	3.74	193.77	1378.83	2.59 S	3.19 W	-2.63	1.87

1473.00	5.95	196.53	1472.49	10.24 S	5.30 W	-10.30	2.36
1567.00	7.69	193.50	1565.82	21.03 S	8.16 W	-21.12	1.89
1660.00	9.23	190.36	1657.81	34.42 S	10.95 W	-34.53	1.73
1755.00	10.36	184.71	1751.42	50.43 S	13.02 W	-50.56	1.56
1849.00	10.15	182.51	1843.92	67.12 S	14.08 W	-67.27	0.47
1943.00	9.62	177.25	1936.53	83.24 S	14.06 W	-83.39	1.11
2038.00	9.15	178.69	2030.25	98.72 S	13.51 W	-98.87	0.55
2132.00	9.61	185.08	2123.00	114.01 S	14.03 W	-114.16	1.21
2226.00	8.88	184.64	2215.78	129.06 S	15.32 W	-129.22	0.78
2320.00	10.07	181.63	2308.49	144.51 S	16.14 W	-144.67	1.37
2414.00	9.60	180.47	2401.11	160.56 S	16.44 W	-160.73	0.54
2509.00	8.24	183.13	2494.96	175.28 S	16.87 W	-175.45	1.50
2603.00	9.15	179.65	2587.88	189.48 S	17.19 W	-189.65	1.12
2697.00	7.81	177.83	2680.85	203.34 S	16.91 W	-203.51	1.45
2792.00	7.19	176.74	2775.04	215.72 S	16.32 W	-215.88	0.67
2887.00	6.78	193.58	2869.34	227.11 S	17.30 W	-227.28	2.19
2982.00	6.46	193.11	2963.71	237.76 S	19.83 W	-237.97	0.34
3077.00	6.49	193.79	3058.10	248.18 S	22.32 W	-248.41	0.09
3172.00	4.12	189.44	3152.69	256.77 S	24.16 W	-257.01	2.53
3267.00	1.26	176.00	3247.58	261.17 S	24.65 W	-261.43	3.06
3362.00	0.07	103.23	3342.57	262.23 S	24.52 W	-262.48	1.31
3457.00	0.29	34.56	3437.57	262.05 S	24.33 W	-262.29	0.29
3552.00	0.39	74.49	3532.57	261.76 S	23.88 W	-262.00	0.26
3647.00	0.68	31.86	3627.56	261.20 S	23.27 W	-261.43	0.50
3742.00	1.11	340.14	3722.55	259.85 S	23.29 W	-260.09	0.92
3838.00	1.49	340.38	3818.53	257.80 S	24.02 W	-258.05	0.40
3933.00	1.15	311.58	3913.50	256.01 S	25.15 W	-256.26	0.77
4028.00	0.43	319.24	4008.49	255.10 S	26.09 W	-255.37	0.76
4123.00	0.68	286.42	4103.49	254.67 S	26.87 W	-254.95	0.42
4218.00	0.61	296.85	4198.48	254.29 S	27.86 W	-254.57	0.14
4313.00	1.10	319.66	4293.47	253.36 S	28.90 W	-253.66	0.62
4408.00	1.08	43.58	4388.46	252.02 S	28.87 W	-252.32	1.53
4503.00	1.77	47.42	4483.43	250.38 S	27.18 W	-250.66	0.73
4598.00	0.62	335.89	4578.41	248.91 S	26.31 W	-249.18	1.77
4693.00	1.24	335.30	4673.40	247.51 S	26.95 W	-247.79	0.65
4788.00	1.39	333.25	4768.37	245.55 S	27.89 W	-245.84	0.17
4883.00	1.39	345.27	4863.35	243.41 S	28.71 W	-243.70	0.31
4977.00	1.26	346.60	4957.32	241.30 S	29.24 W	-241.60	0.14
5072.00	1.45	346.23	5052.29	239.11 S	29.76 W	-239.42	0.20
5167.00	0.35	129.59	5147.29	238.13 S	29.83 W	-238.44	1.84
5263.00	0.26	145.26	5243.28	238.50 S	29.48 W	-238.80	0.13
5358.00	0.59	125.31	5338.28	238.96 S	28.95 W	-239.26	0.38
5453.00	0.36	111.40	5433.28	239.35 S	28.28 W	-239.64	0.27
5548.00	0.90	77.13	5528.27	239.29 S	27.27 W	-239.57	0.67
5643.00	1.07	57.27	5623.26	238.65 S	25.80 W	-238.91	0.40
5738.00	0.99	17.78	5718.25	237.38 S	24.80 W	-237.64	0.74
5833.00	0.32	102.38	5813.24	236.66 S	24.29 W	-236.91	1.06
5929.00	0.31	15.03	5909.24	236.47 S	23.96 W	-236.71	0.45
6024.00	0.57	345.69	6004.24	235.76 S	24.01 W	-236.01	0.35
6119.00	0.13	332.99	6099.23	235.21 S	24.18 W	-235.45	0.47
6214.00	0.42	24.66	6194.23	234.79 S	24.08 W	-235.04	0.37
6309.00	1.68	189.63	6289.22	235.85 S	24.17 W	-236.10	2.20
6404.00	1.58	189.65	6384.18	238.52 S	24.62 W	-238.77	0.11
6499.00	1.51	189.00	6479.15	241.04 S	25.04 W	-241.30	0.08
6594.00	1.37	203.09	6574.12	243.32 S	25.68 W	-243.59	0.40
6689.00	0.36	195.66	6669.11	244.66 S	26.20 W	-244.92	1.07
6737.00	3.30	358.57	6717.08	243.42 S	26.28 W	-243.69	7.60
6784.00	7.80	357.79	6763.85	238.88 S	26.44 W	-239.15	9.58
6832.00	13.36	356.46	6811.02	230.08 S	26.91 W	-230.36	11.59
6880.00	17.61	358.70	6857.26	217.28 S	27.41 W	-217.56	8.94
6928.00	23.60	0.47	6902.17	200.40 S	27.50 W	-200.68	12.55
6975.00	29.21	358.68	6944.25	179.51 S	27.69 W	-179.80	12.05
7023.00	33.49	357.97	6985.24	154.55 S	28.42 W	-154.85	8.95
7070.00	37.46	357.72	7023.50	127.30 S	29.45 W	-127.61	8.45
7118.00	39.54	359.66	7061.07	97.43 S	30.12 W	-97.75	5.01
7165.00	43.09	1.08	7096.36	66.41 S	29.91 W	-66.73	7.81
7213.00	49.44	1.51	7129.53	31.76 S	29.12 W	-32.07	13.24
7260.00	53.95	3.46	7158.66	5.08 N	27.50 W	4.78	10.13
7308.00	58.29	2.38	7185.41	44.87 N	25.48 W	44.59	9.23
7355.00	61.52	2.15	7208.98	85.49 N	23.88 W	85.23	6.89
7403.00	65.17	2.89	7230.50	128.34 N	21.99 W	128.10	7.73
7450.00	70.93	1.84	7248.07	171.88 N	20.20 W	171.65	12.43
7498.00	76.20	0.76	7261.64	217.89 N	19.16 W	217.67	11.19
7545.00	82.78	0.01	7270.21	264.07 N	18.85 W	263.86	14.09
7621.00	89.26	0.40	7275.48	339.85 N	18.58 W	339.63	8.54

7683.00	89.54	359.85	7276.13	401.85 N	18.44 W	401.62	1.00
7778.00	90.89	359.69	7275.78	496.84 N	18.83 W	496.61	1.43
7873.00	91.88	359.95	7273.48	591.81 N	19.12 W	591.57	1.08
7968.00	91.14	0.09	7270.98	686.78 N	19.09 W	686.53	0.79
8063.00	91.33	359.59	7268.93	781.76 N	19.36 W	781.50	0.56
8158.00	90.09	359.77	7267.75	876.75 N	19.89 W	876.48	1.32
8254.00	89.97	357.99	7267.70	972.72 N	21.76 W	972.43	1.86
8349.00	90.74	0.51	7267.11	1067.71 N	23.01 W	1067.39	2.77
8444.00	89.69	359.52	7266.76	1162.70 N	22.98 W	1162.39	1.52
8539.00	89.48	359.88	7267.44	1257.70 N	23.48 W	1257.37	0.44
8634.00	91.57	359.03	7266.57	1352.68 N	24.38 W	1352.34	2.37
8729.00	91.36	359.90	7264.15	1447.65 N	25.27 W	1447.29	0.94
8824.00	92.31	1.75	7261.10	1542.58 N	23.90 W	1542.24	2.19
8919.00	92.16	2.19	7257.40	1637.46 N	20.64 W	1637.14	0.49
9015.00	91.54	2.40	7254.30	1733.33 N	16.80 W	1733.04	0.68
9110.00	89.91	359.78	7253.10	1828.29 N	14.99 W	1828.02	3.25
9205.00	90.09	0.75	7253.10	1923.29 N	14.55 W	1923.02	1.04
9300.00	89.66	0.14	7253.30	2018.29 N	13.81 W	2018.02	0.79
9395.00	89.20	1.02	7254.25	2113.27 N	12.85 W	2113.01	1.05
9490.00	90.74	0.76	7254.30	2208.26 N	11.38 W	2208.01	1.64
9586.00	89.35	0.58	7254.22	2304.25 N	10.25 W	2304.01	1.46
9681.00	89.75	0.44	7254.97	2399.24 N	9.41 W	2399.00	0.45
9776.00	90.28	0.05	7254.95	2494.24 N	9.00 W	2494.00	0.69
9871.00	89.91	0.80	7254.79	2589.24 N	8.30 W	2589.00	0.88
9966.00	90.62	0.09	7254.35	2684.23 N	7.56 W	2684.00	1.06
10061.00	89.88	1.46	7253.93	2779.22 N	6.28 W	2778.99	1.64
10156.00	88.58	1.11	7255.21	2874.19 N	4.14 W	2873.97	1.42
10252.00	89.01	1.02	7257.23	2970.15 N	2.36 W	2969.95	0.46
10347.00	88.98	0.59	7258.90	3065.13 N	1.03 W	3064.93	0.45
10442.00	89.02	359.90	7260.55	3160.11 N	0.62 W	3159.92	0.73
10537.00	88.58	359.88	7262.54	3255.09 N	0.80 W	3254.89	0.46
10632.00	88.33	359.16	7265.10	3350.05 N	1.60 W	3349.84	0.80
10727.00	88.55	359.30	7267.69	3445.01 N	2.87 W	3444.77	0.27
10822.00	88.24	358.75	7270.35	3539.95 N	4.49 W	3539.70	0.66
10918.00	90.43	359.93	7271.47	3635.93 N	5.60 W	3635.66	2.59
11013.00	90.62	0.34	7270.60	3730.93 N	5.37 W	3730.65	0.48
11108.00	90.25	0.73	7269.87	3825.92 N	4.49 W	3825.65	0.57
11203.00	90.43	0.31	7269.31	3920.92 N	3.62 W	3920.65	0.48
11298.00	89.81	1.70	7269.11	4015.90 N	1.96 W	4015.64	1.60
11393.00	88.61	2.53	7270.42	4110.82 N	1.55 E	4110.60	1.54
11488.00	88.30	1.49	7272.98	4205.73 N	4.88 E	4205.53	1.14
11583.00	88.27	1.24	7275.83	4300.66 N	7.14 E	4300.48	0.26
11678.00	88.34	0.92	7278.64	4395.60 N	8.93 E	4395.44	0.34
11722.00	88.40	0.72	7279.89	4439.58 N	9.56 E	4439.42	0.47
11768.00	88.40	0.72	7281.17	4485.56 N	10.14 E	4485.40	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 0.62 DEGREES (TRUE)  
A TOTAL CORRECTION OF 8.56 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11768.00 FEET  
IS 4485.57 FEET ALONG 0.13 DEGREES (TRUE)**

**All directional surveys tied on to the last gyro survey at 813.00' MD. Final survey is a straight-line projection to the bit.**