



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	03-Jul-13	08-Jul-13			
Rig Bit Number	02	03			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	621.00	6,984.00			
Log End Depth (MD, ft)	6,984.00	10,853.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Jul-13 02:00	05-Jul-13 20:45			
Drill/Wipe End Date and Time	03-Jul-13 11:50	07-Jul-13 09:00			
Min Inc (deg) @ Depth (MD, ft)	0 @ 621.00	86.51 @ 8,459.00			
Max Inc (deg) @ Depth (MD, ft)	83.25 @ 6,935.00	93.36 @ 7,294.00			
Bit TFA(in2) / Bit Type	.84 / PDC	.75 / PDC			
Flow Rate (gpm)	590.00	295.00			
Max AV (fpm) / CV (fpm) @ MWD	387.0 / 345.7	391.5 / 276.6			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.20 / 41.00	9.15 / 37.00			
Filtrate CL (ppm)	900.00	900.00			
pH / Fluid Loss (mptm)	9.50 / N/A	9.70 / N/A			
PV (cP) / YP (lbf2)	15 / 13.00	9 / 6.00			
% Solids / % Sand	11.10 / 0.30	4.80 / 0.25			
% 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 (deg F) / S	165.00 / PDC	210.44 / PDC			

Max Tool Temp (degF) / Source	165.60 / PCM	218.14 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 165.60	N/A @ 218.14			
Lead MWD Engineer	Scott Trowbridge	Scott Trowbridge			
Customer Representative	JW Irwin	JW Irwin			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11404263	11671371			
Insert Serial Number	11227520	11400950			
Date and Time Initialized	30-Jun-13 17:44	04-Jul-13 20:40			
Date and Time Read	03-Jul-13 22:48	08-Jul-13 03:00			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	49.00	64.00			
Software Version	6.21	6.21			
Sub Serial Number	11404263	11671371			
Sonde Serial Number	11181531	11062118			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	354.12	284.81			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	56.22	57.15			
Recorded Sample Period (sec)	15	15			
Software Version	8.15	8.15			
Sub Serial Number	11404263	11671371			
Insert/Sonde Serial Number	11681019	11293351			

REMARKS

1. All depths are measured bit depths, referenced to the Drillers Driller's pipe tally and are measured from the Drill Floor, unless unless otherwise specified.

2. No depth corrections have been made for pipe stretch or compression.

3. Critical annular velocities are calculated using the "Power Law" for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data is stored data unless otherwise specified.

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

PCG GR XHI-Range (Gamma Ray Cor)
Interval Resolution: .5
Interval Distance: .6
Gap Fill: 3

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

WARRANTY

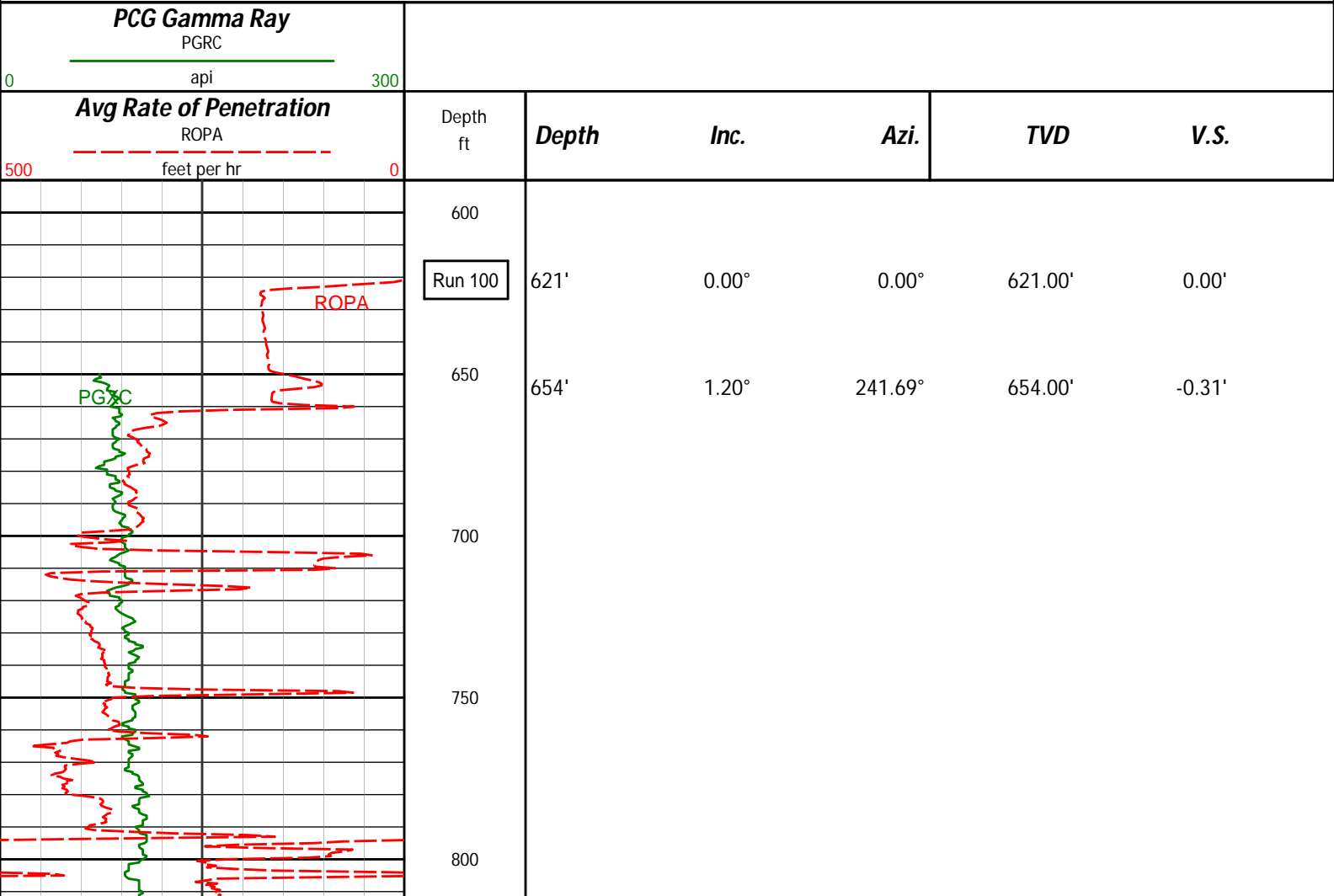
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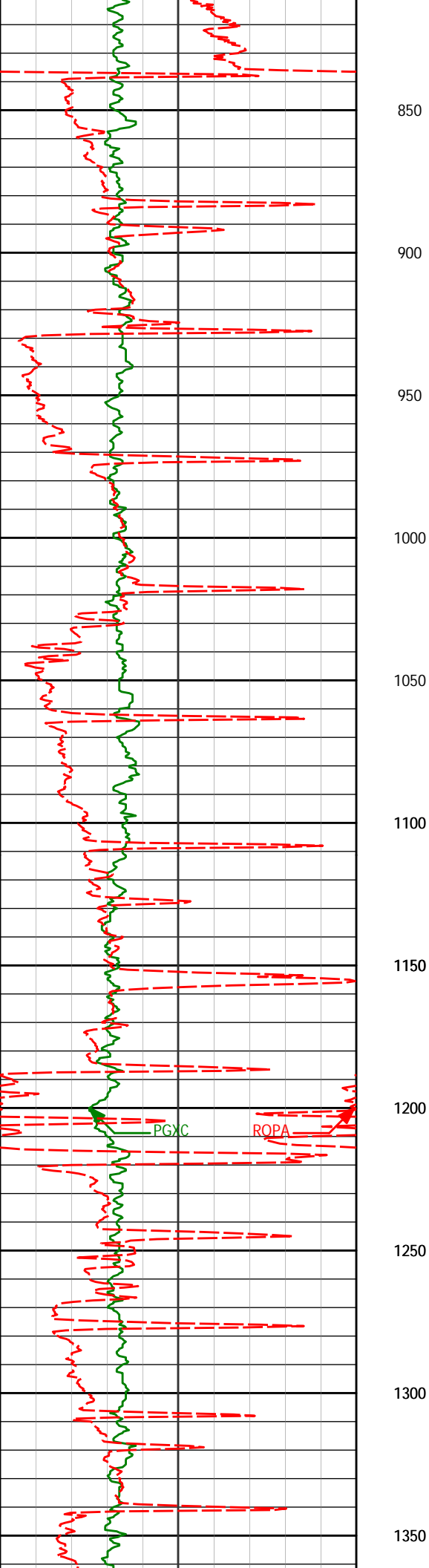
HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:600

Noble Energy
Wolfpack B02-64-1HN
PD 829
Sec 2-T5N-R64W



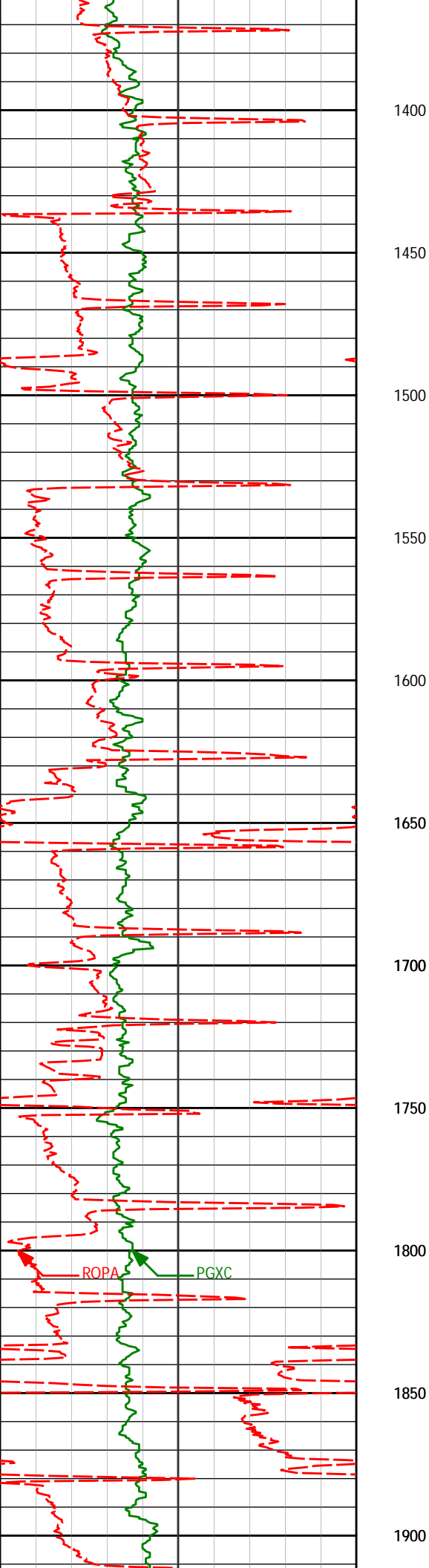


923' 0.86° 274.11° 922.96' -4.87'

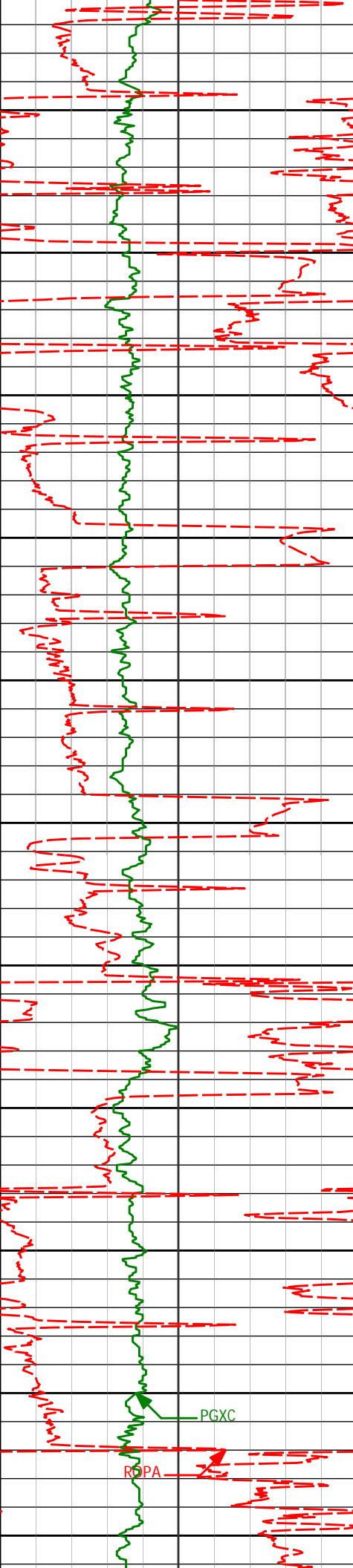
1164' 1.00° 274.02° 1163.92' -8.74'

PGXC

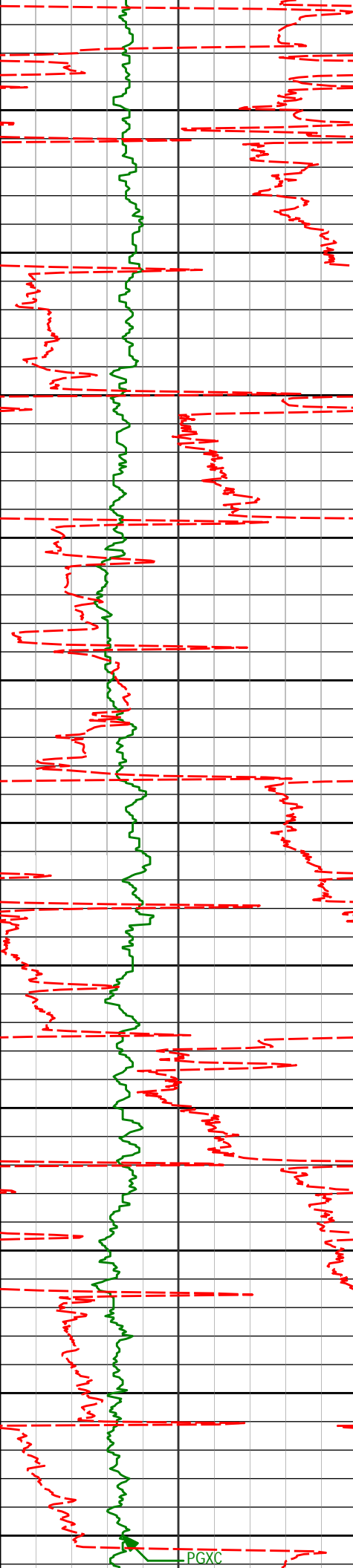
ROPA



1450'	1.10°	297.66°	1449.88'	-13.57'
1733'	1.47°	314.24°	1732.81'	-18.35'



1950	1953'	1.62°	303.46°	1952.73'	-22.74'
2000					
2050	2047'	2.95°	339.40°	2046.65'	-24.52'
2100					
2150	2141'	4.73°	342.27°	2140.44'	-26.20'
2200					
2250	2235'	6.74°	342.50°	2233.96'	-28.52'
2300					
2350	2325'	8.33°	332.41°	2323.19'	-32.49'
2400					
2450	2415'	7.80°	335.74°	2412.30'	-37.34'



2500

2504'

10.04°

335.87°

2500.21'

-42.26'

2550

2600

2594'

9.92°

337.13°

2588.85'

-47.63'

2650

2700

2684'

10.67°

339.17°

2677.40'

-52.72'

2750

2800

2773'

10.74°

337.41°

2764.85'

-57.93'

2850

2900

2863'

10.77°

338.88°

2853.27'

-63.26'

2950

2952'

10.58°

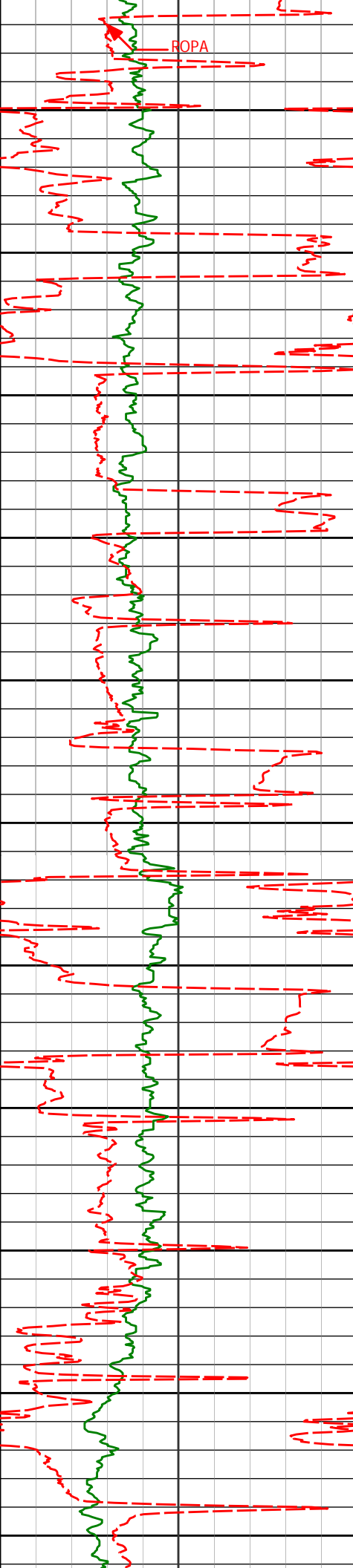
339.40°

2940.73'

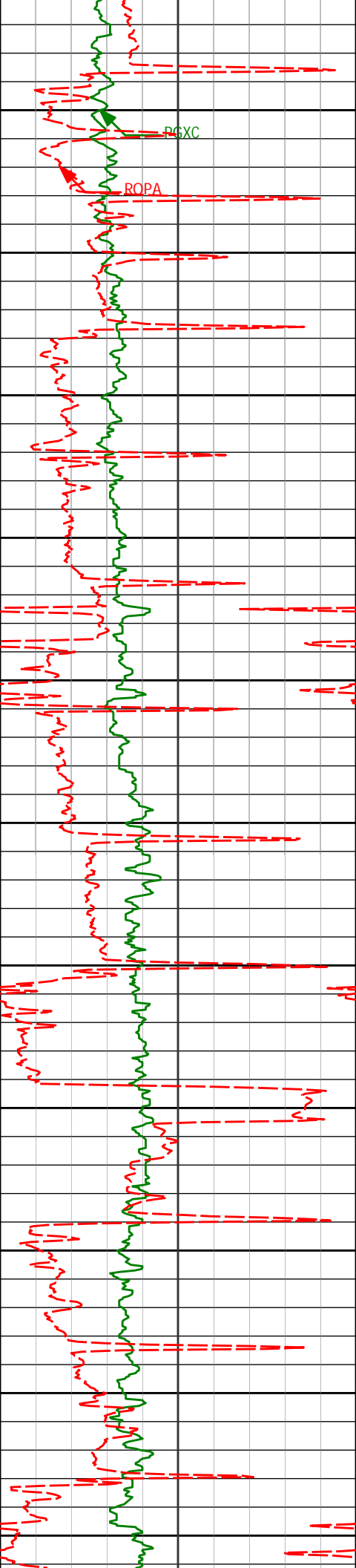
-68.22'

3000

PGXC



3050	3042'	8.46°	336.09°	3029.49'	-73.00'
3100					
3132'	6.25°	337.92°	3118.74'	-76.90'	
3150					
3200					
3221'	4.65°	337.63°	3207.33'	-79.63'	
3250					
3300					
3311'	3.57°	298.14°	3297.12'	-83.21'	
3350					
3400	3401'	0.55°	168.23°	3387.06'	-85.54'
3450					
3491'	0.86°	181.99°	3477.06'	-85.54'	
3500					
3550					



3600

3650

3700

3750

3760'

0.19°

122.84°

3746.05'

-85.36'

3800

3850

3900

3950

4000

4028'

0.65°

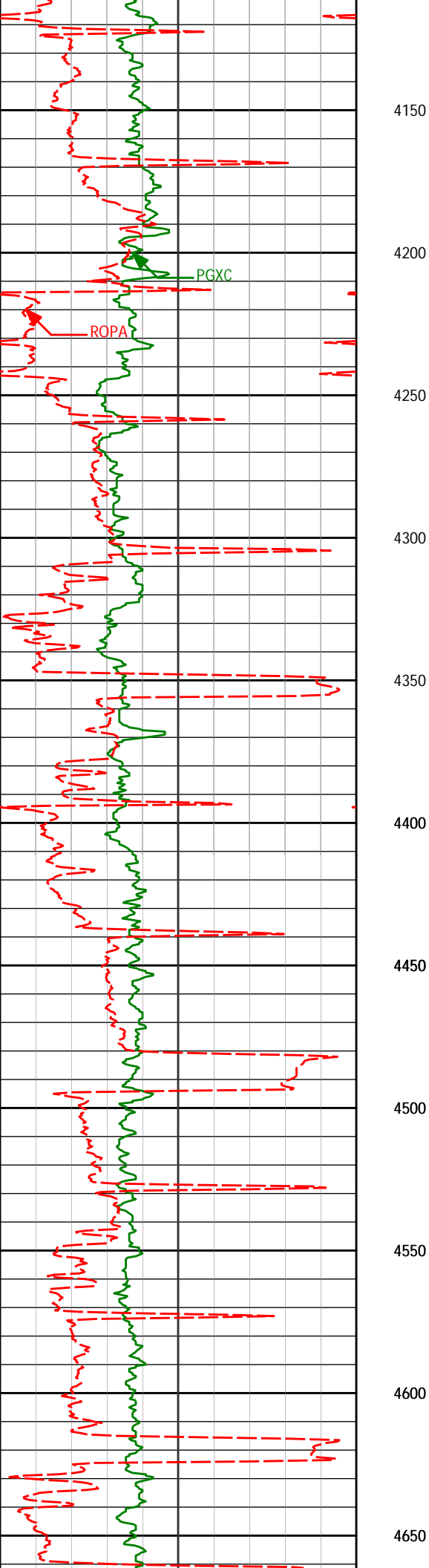
331.38°

4014.04'

-85.64'

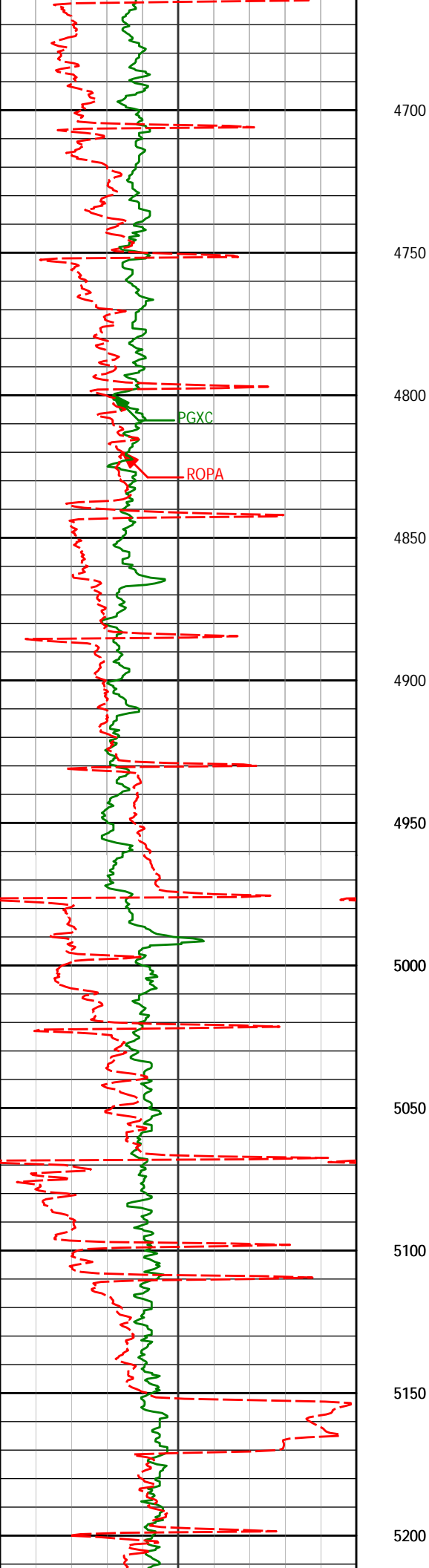
4050

4100

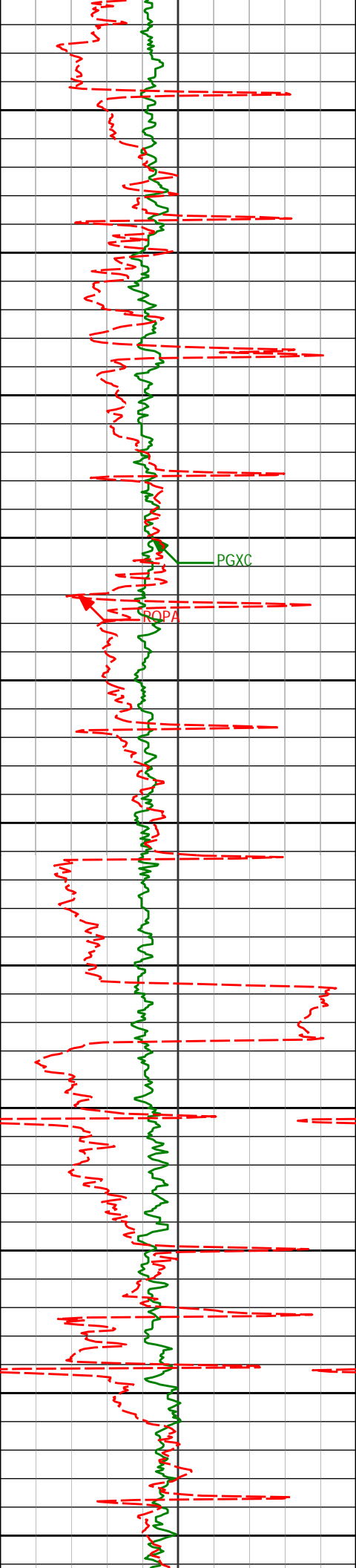


4297'	1.25°	315.08°	4283.00'	-88.24'
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4566'	1.86°	36.82°	4551.93'	-87.39'
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4835'	0.64°	185.95°	4820.89'	-84.82'
5104'	1.12°	172.37°	5089.86'	-84.86'



5250

5300

5350

5400

5450

5500

5550

5600

5650

5700

5750

5372'

1.01°

142.45°

5357.81'

-83.34'

PGXC

SOPA

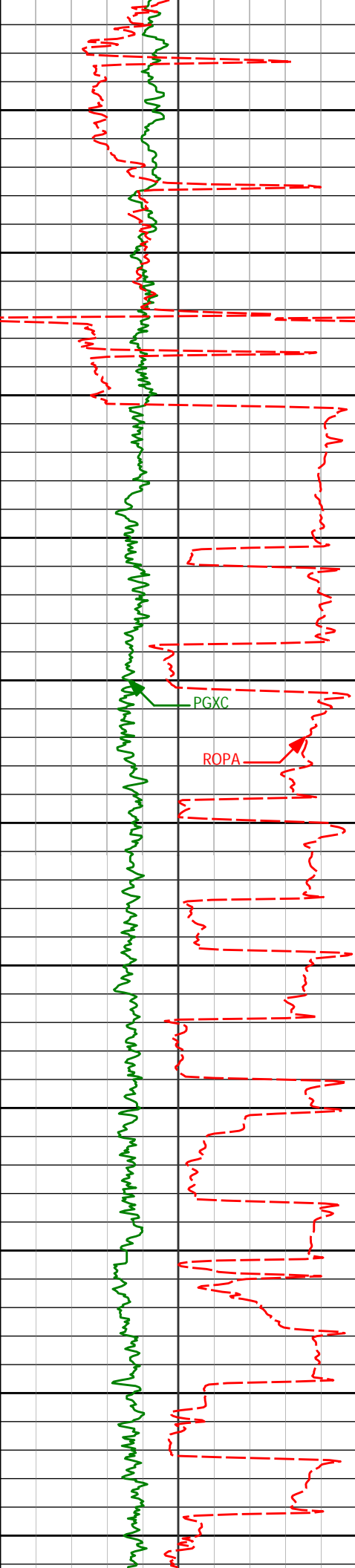
5641'

0.23°

349.31°

5626.80'

-82.09'



5800

5820'

0.55°

94.93°

5805.80'

-81.29'

5850

5900

5910'

2.20°

80.23°

5895.77'

-79.14'

5950

5955'

6.77°

81.31°

5940.62'

-75.64'

6000

6000'

10.25°

81.72°

5985.12'

-69.01'

PGXC

ROPA

6050

6044'

14.87°

83.84°

6028.05'

-59.46'

6100

6089'

18.40°

87.87°

6071.17'

-46.59'

6134'

21.20°

90.35°

6113.50'

-31.36'

6150

6179'

22.37°

88.18°

6155.29'

-14.69'

6200

6224'

24.81°

84.56°

6196.53'

3.31'

6250

6269'

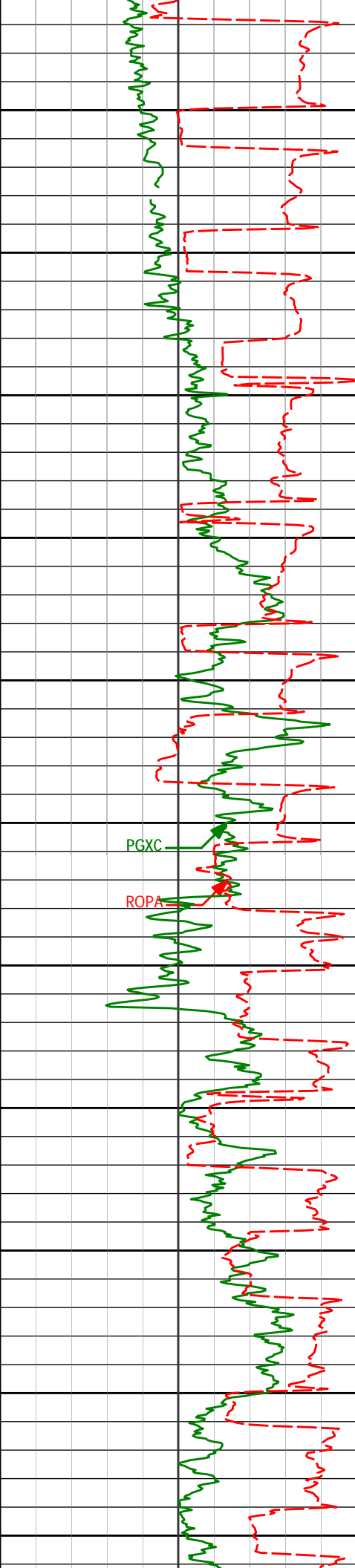
26.51°

85.85°

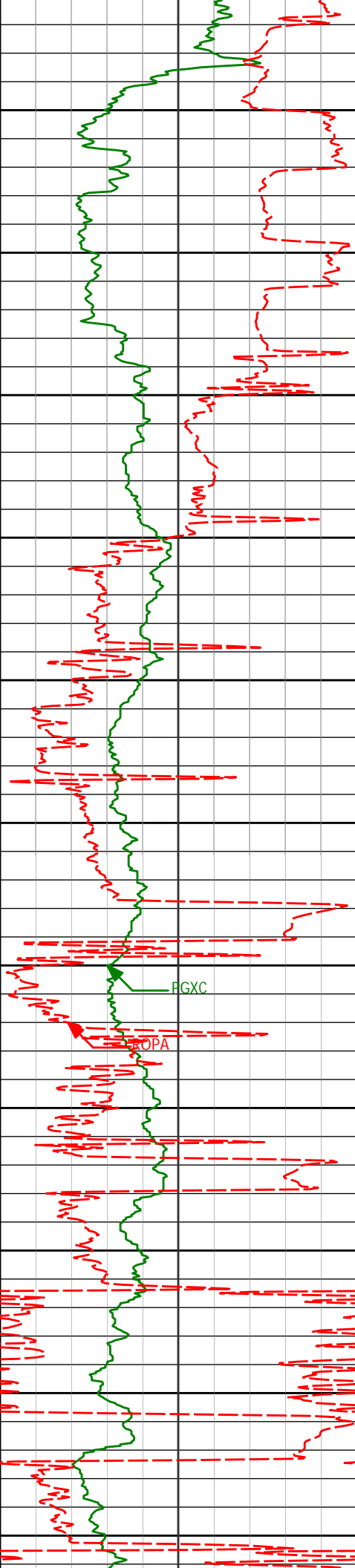
6237.09'

22.79'

6300



	6313'	28.68°	88.08°	6276.08'	43.17'
6350	6358'	33.08°	88.02°	6314.69'	66.26'
6400	6403'	36.68°	87.31°	6351.60'	91.99'
6450	6448'	39.33°	88.54°	6387.05'	119.68'
6500	6493'	45.79°	88.67°	6420.18'	150.08'
6550	6538'	51.89°	88.67°	6449.78'	183.93'
6600	6582'	55.51°	88.92°	6475.83'	219.36'
6650	6627'	58.83°	87.79°	6500.22'	257.15'
6700	6672'	62.29°	87.15°	6522.33'	296.33'
6750	6717'	64.99°	87.21°	6542.31'	336.65'
6800	6762'	66.72°	89.88°	6560.72'	377.68'
6850	6806'	72.25°	91.84°	6576.13'	418.76'
	6851'	77.67°	90.86°	6587.81'	462.06'



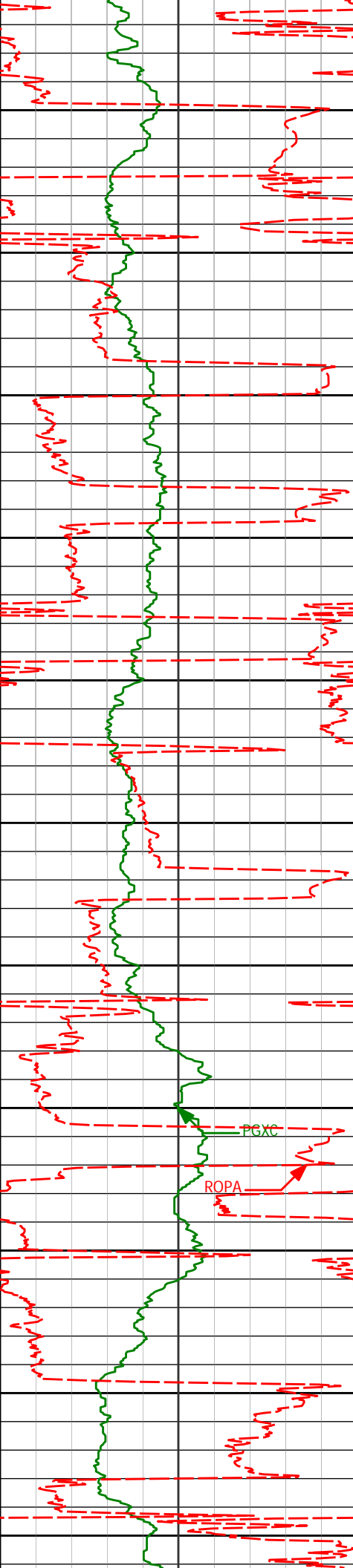
6900	6896'	80.52°	90.47°	6596.32'	506.13'
	6935'	83.25°	91.67°	6601.82'	544.62'
6950					
7000					
	7025'	87.16°	90.23°	6609.34'	634.03'
7050					
7100					
	7114'	87.97°	90.37°	6613.13'	722.77'
7150					
7200	7204'	91.91°	90.54°	6613.22'	812.56'
7250					
7300	7294'	93.36°	89.24°	6609.08'	902.31'
7350					
7400	7383'	92.90°	87.94°	6604.22'	991.13'

7" casing shoe at 6974ft MD

Run 200

FGXC

OPPA



7450

7473'

91.02°

87.82°

6601.15'

1081.05'

7500

7550

7563'

90.77°

87.56°

6599.75'

1171.02'

7600

7650

7653'

88.95°

87.74°

6599.96'

1261.00'

7700

7750

7742'

91.33°

89.70°

6599.75'

1349.94'

7800

7832'

91.39°

88.95°

6597.62'

1439.81'

7850

7900

7922'

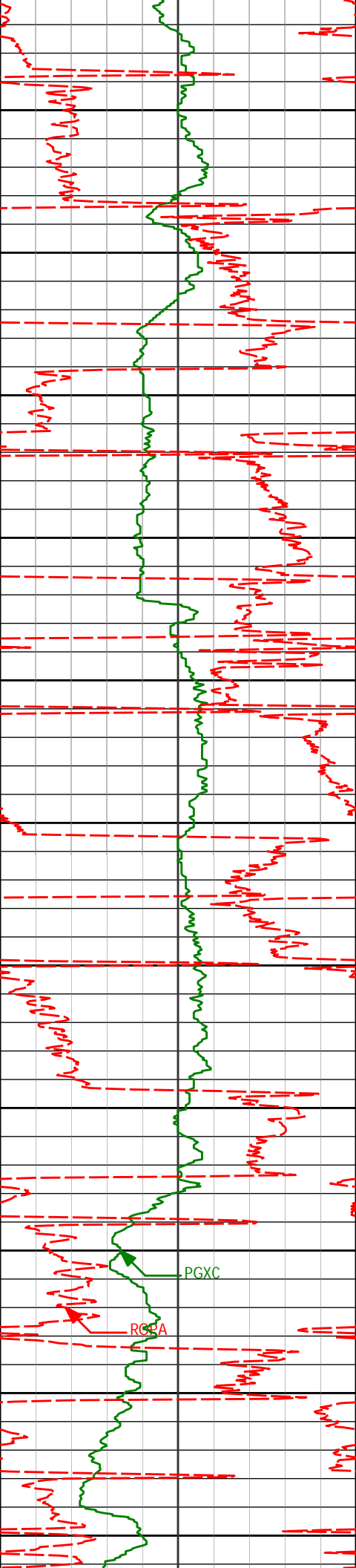
89.26°

91.88°

6597.11'

1529.60'

7950



8000

8011'	90.59°	91.47°	6597.23'	1618.26'
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8050

8100

8101'	89.75°	89.97°	6596.97'	1708.03'
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8150

8200

8190'	89.94°	89.30°	6597.21'	1796.90'
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8250

8300

8350

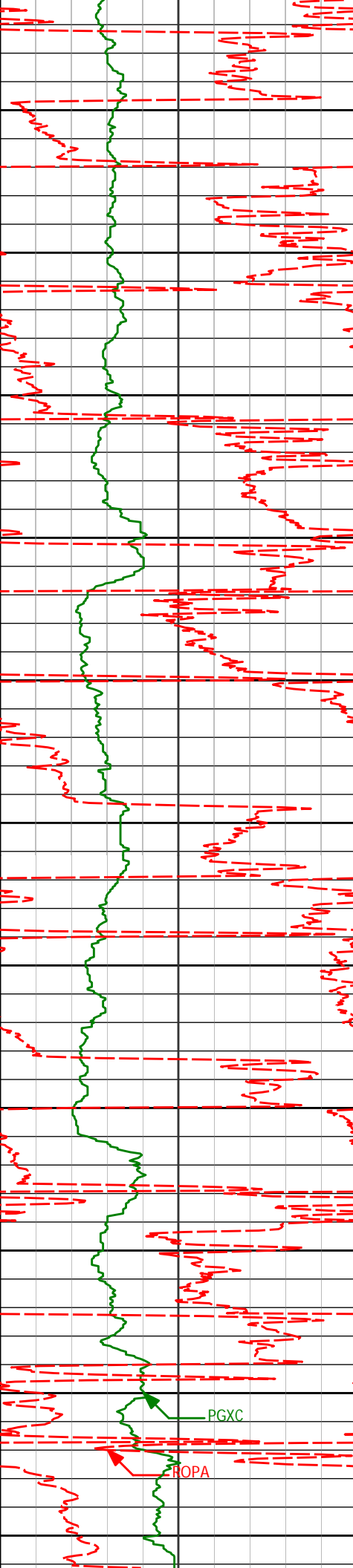
8370'	86.89°	85.50°	6599.07'	1976.80'
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8400

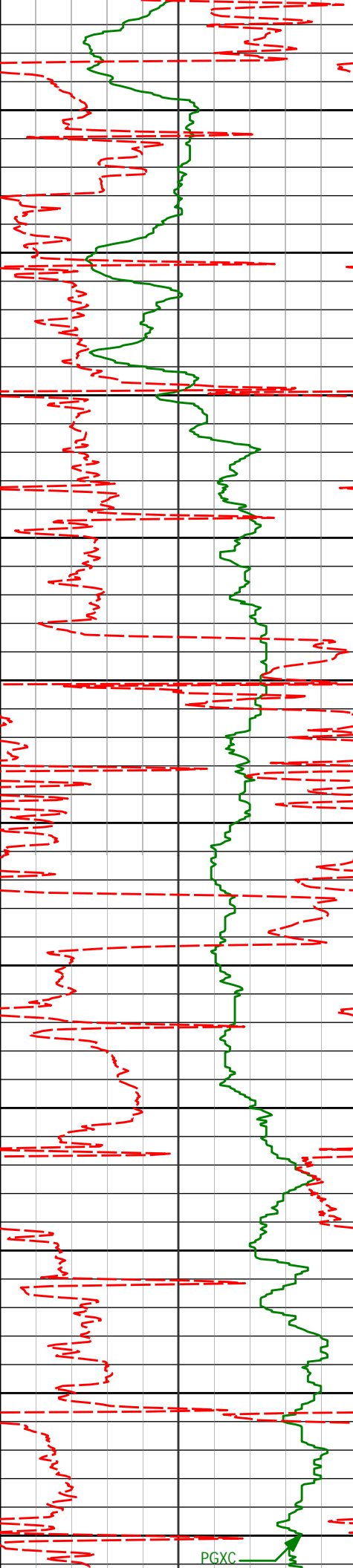
8450

8459'	86.51°	87.36°	6604.20'	2065.64'
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8500

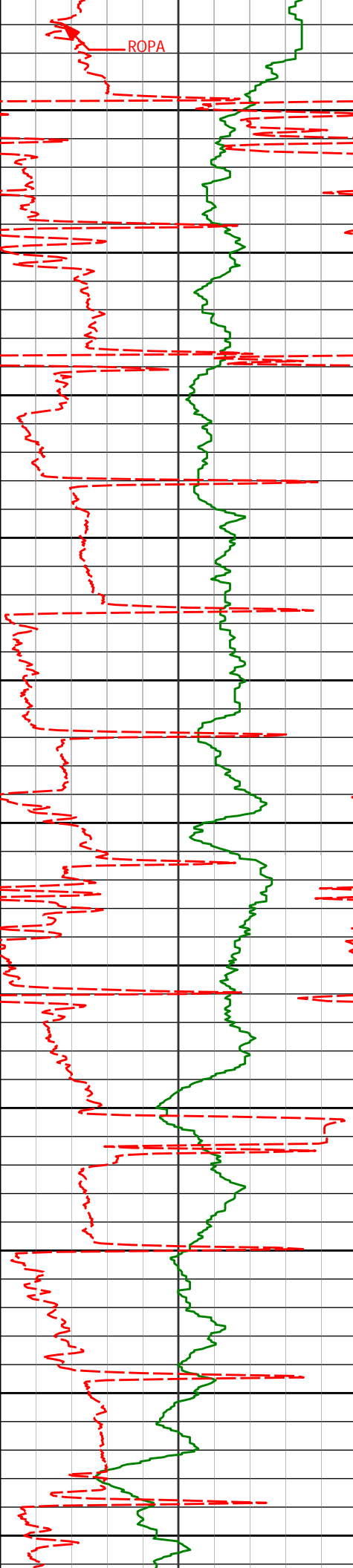


8550	8549'	89.57°	89.28°	6607.28'	2155.54'
8600					
8650	8639'	91.42°	87.90°	6606.51'	2245.48'
8700					
8750	8728'	91.23°	87.77°	6604.45'	2334.44'
8800					
8850	8818'	89.17°	88.00°	6604.13'	2424.41'
8900	8907'	89.75°	89.13°	6604.97'	2513.35'
8950					
9000	8997'	88.64°	89.33°	6606.23'	2603.25'
9050					



9087'	87.70°	90.98°	6609.11'	2693.03'
9100				
9150				
9176'	88.58°	90.84°	6612.00'	2781.74'
9200				
9250				
9300				
9311'	90.12°	89.08°	6613.52'	2916.50'
9350				
9400	9401'	88.80°	88.16°	6614.37'
9450				
9490'	88.98°	87.91°	6616.09'	3095.39'
9500				
9550				
9580'	89.04°	88.47°	6617.64'	3185.35'
9600				

PGXC



9650

9700

9750

9800

9850

9900

9950

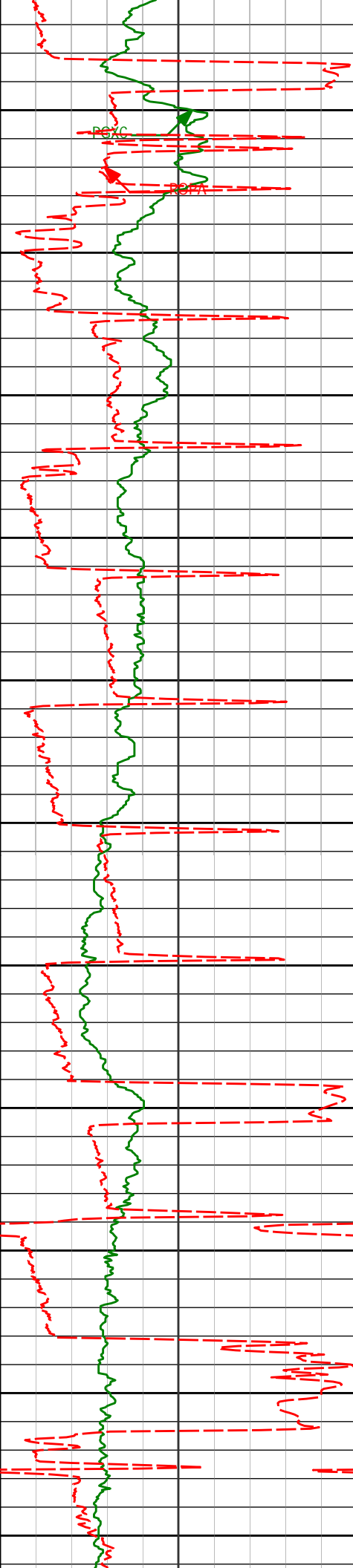
10000

10050

10100

10150

9670'	89.17°	88.88°	6619.05'	3275.28'
9759'	89.38°	89.09°	6620.18'	3364.20'
9849'	89.54°	89.03°	6621.02'	3454.11'
9939'	89.91°	88.81°	6621.46'	3544.04'
10028'	89.57°	90.31°	6621.87'	3632.92'
10118'	89.35°	89.98°	6622.72'	3722.75'



10200

10208'

90.68°

89.87°

6622.69'

3812.60'

10250

10300

10297'

91.08°

89.59°

6621.33'

3901.46'

10350

10387'

90.89°

88.43°

6619.78'

3991.37'

10400

10450

10477'

91.36°

87.16°

6618.01'

4081.34'

10500

10550

10566'

91.36°

88.27°

6615.90'

4170.29'

10600

10650

10656'

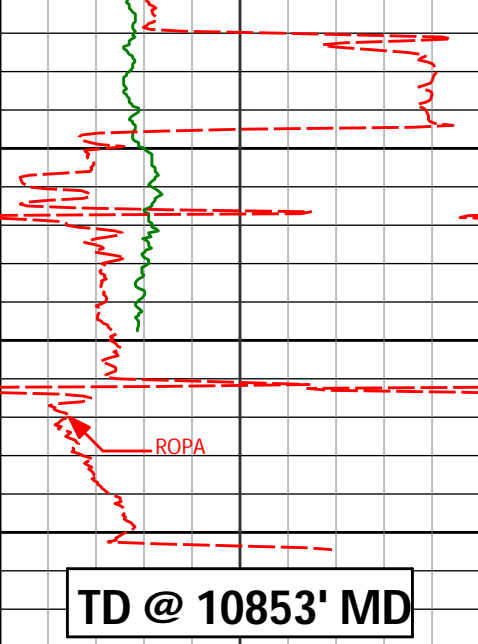
91.02°

88.95°

6614.04'

4260.22'

10700



10750

10746'

89.35°

88.90°

6613.75'

4350.15'

10800

10789'

89.69°

88.45°

6614.10'

4393.12'

10850

10853'

89.69°

88.45°

6614.45'

4457.09'

TD @ 10853' MD**Avg Rate of Penetration**

ROPA

feet per hr

500

0

PCG Gamma Ray

PGRC

api

0

300

Depth
ft**Depth****Inc.****Azi.****TVD****V.S.****HALLIBURTON**

Sperry Drilling Services

MD Detail Log 1:240

Noble Energy
Wolfpack B02-64-1HN
PD 829
Sec 2-T5N-R64WAvg Rate of Penetration
feet per hr

500

0

PCG GR XHi-Range RT BCor
api

0

300

Depth
ft**Depth****Inc****Azi****TVD****V.S.**

Run 100

621'

0.00°

0.00°

621.00'

0.00'

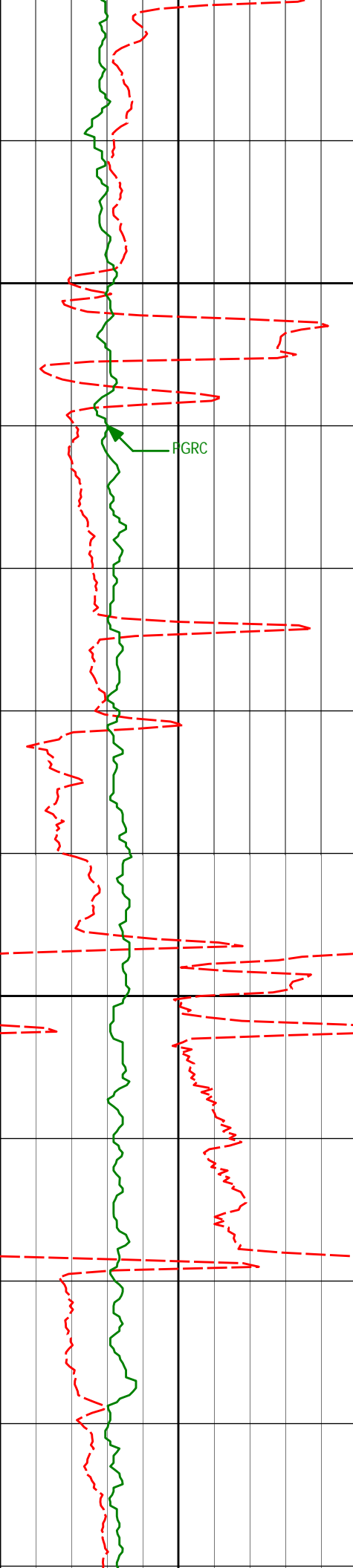
654'

1.20°

241.69°

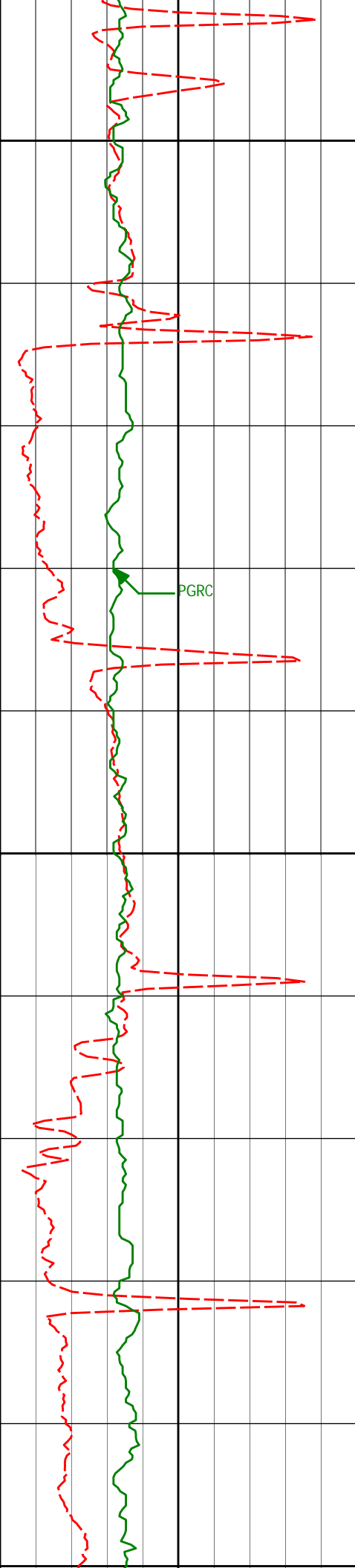
654.00'

-0.31'



700

800



900

923'

0.86°

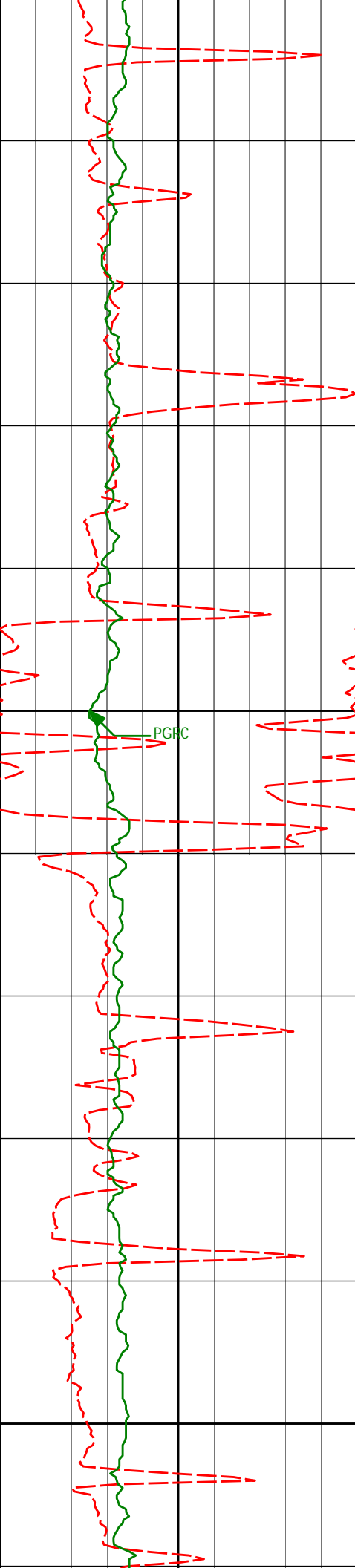
274.11°

922.96'

-4.87'

1000

1100



1100

1200

1300

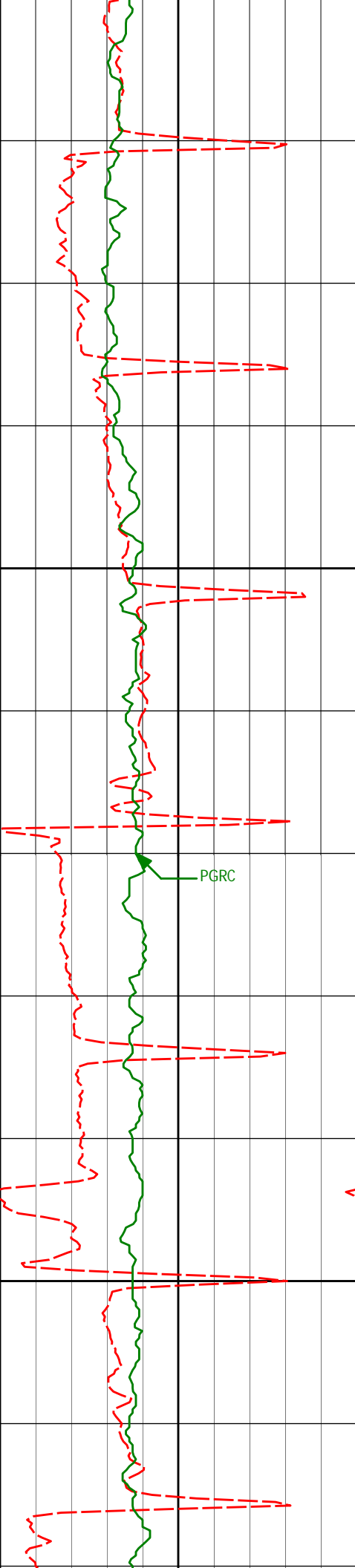
1164'

1.00°

274.02°

1163.92'

-8.74'



1400

1450'

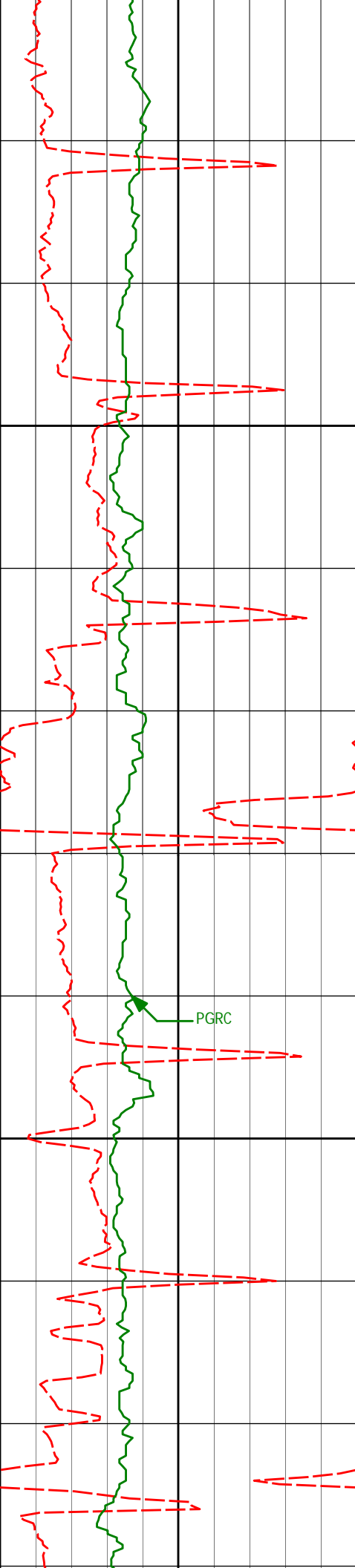
1.10°

297.66°

1449.88'

-13.57'

1500



1600

1700

PGRC

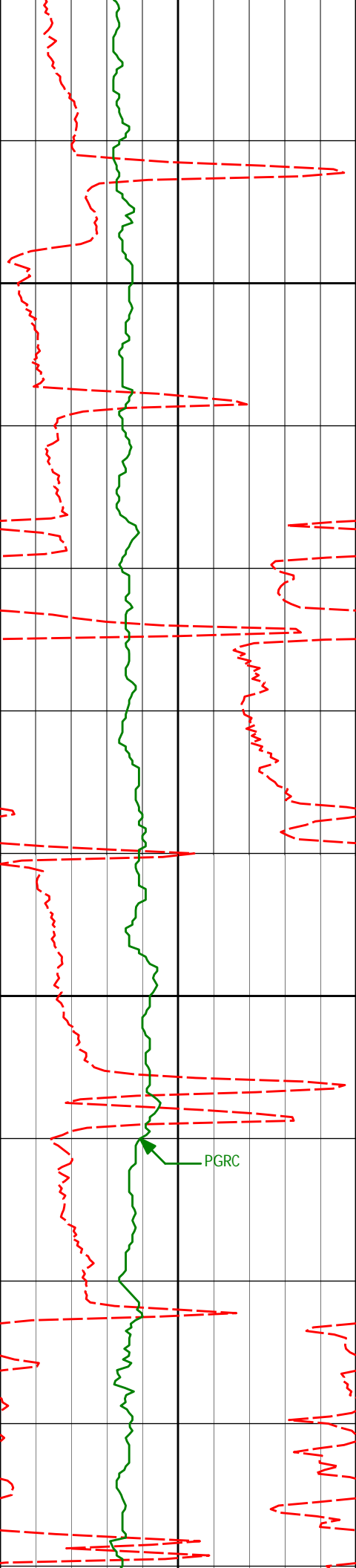
1733'

1.47°

314.24°

1732.81'

-18.35'



1800

1900

PGRC

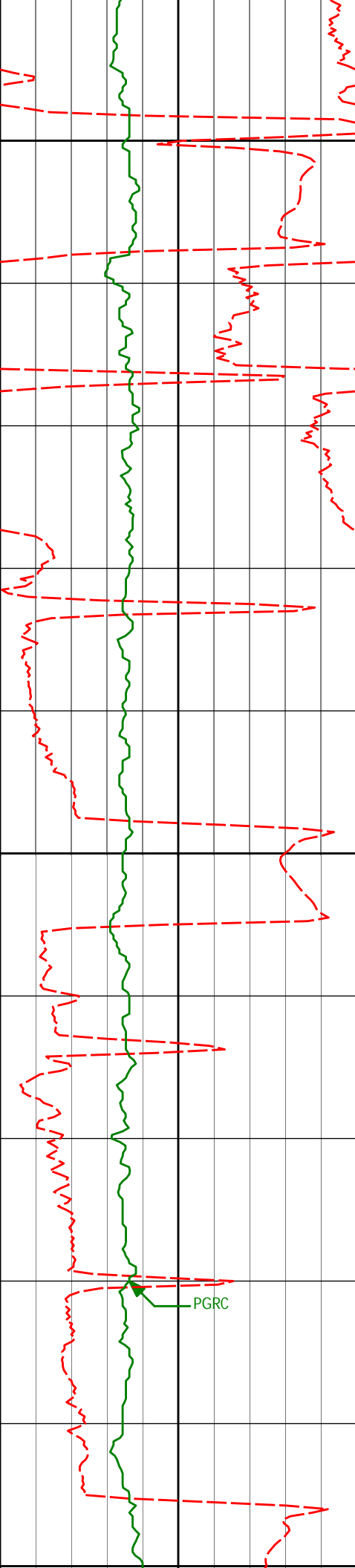
1953'

1.62°

303.46°

1952.73'

-22.74'



2000

2047'

2.95°

339.40°

2046.65'

-24.52'

2100

2141'

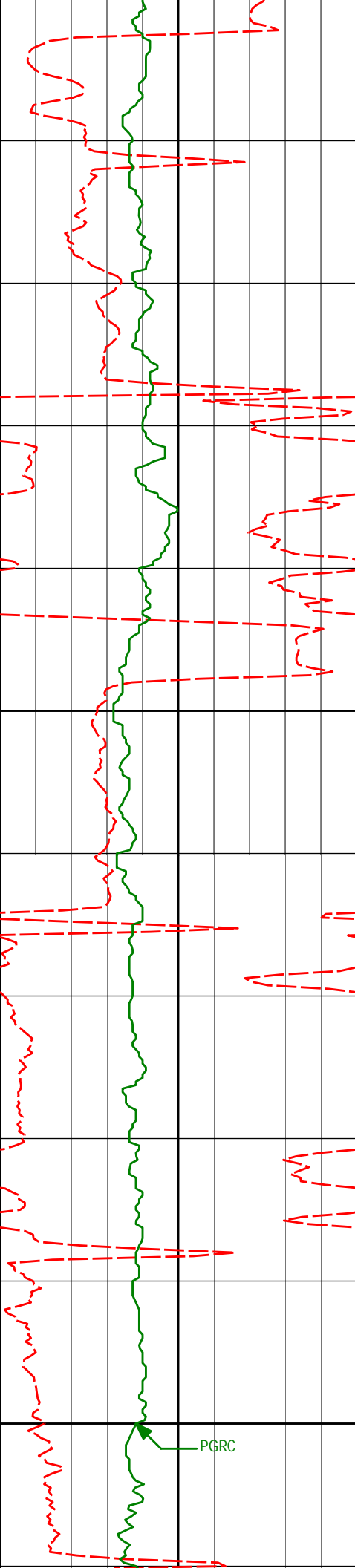
4.73°

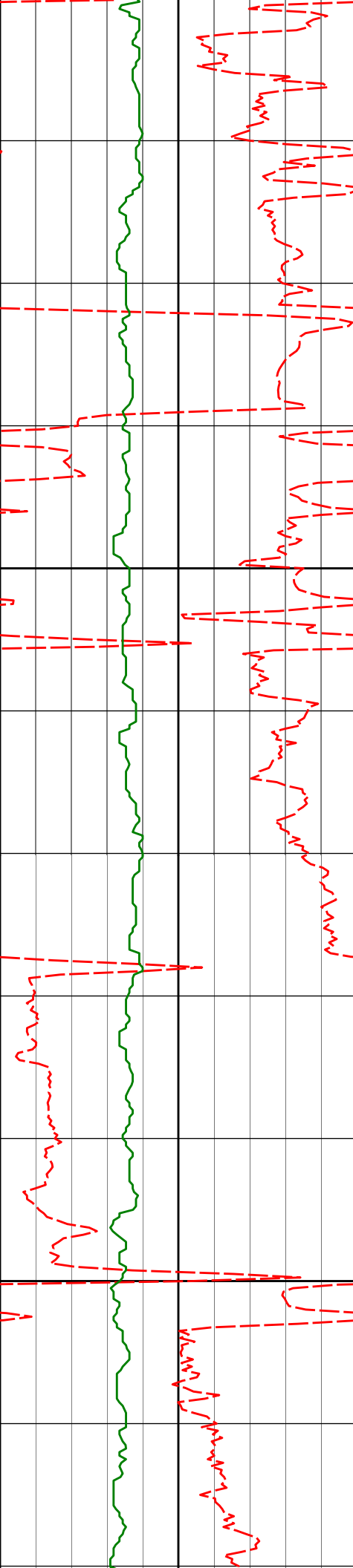
342.27°

2140.44'

-26.20'

2200





2500

2504'

10.04°

335.87°

2500.21'

-42.26'

2600

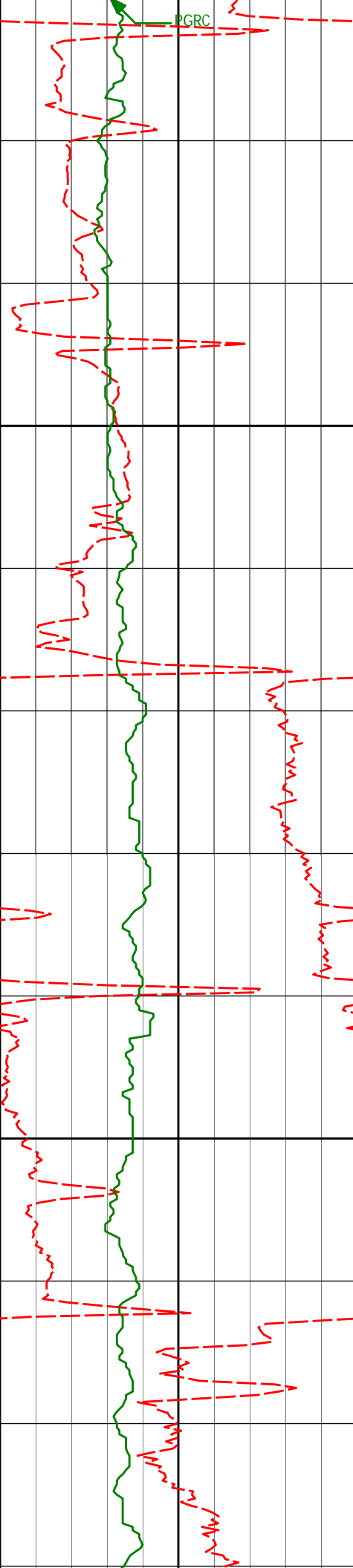
2594'

9.92°

337.13°

2588.85'

-47.63'



2700

2800

2684'

10.67°

339.17°

2677.40'

-52.72'

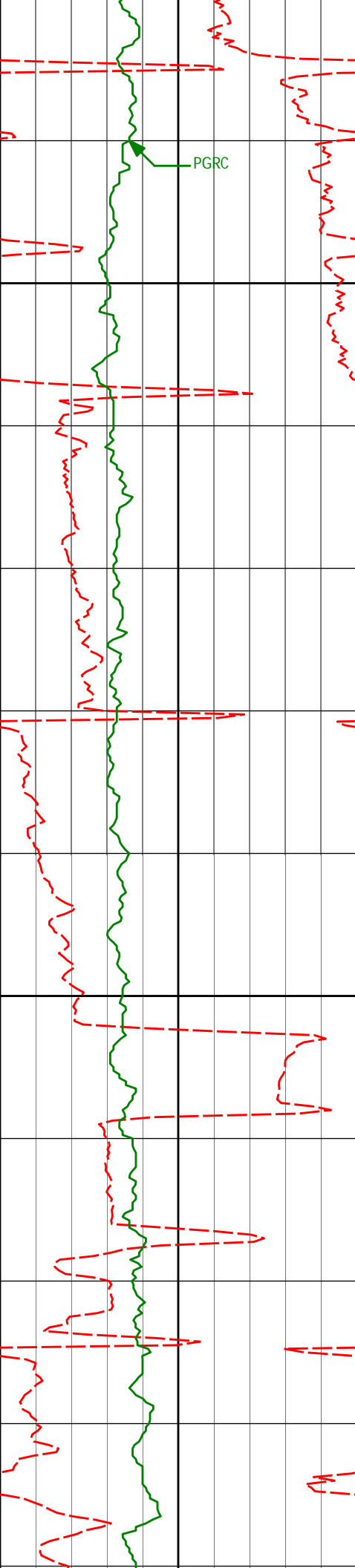
2773'

10.74°

337.41°

2764.85'

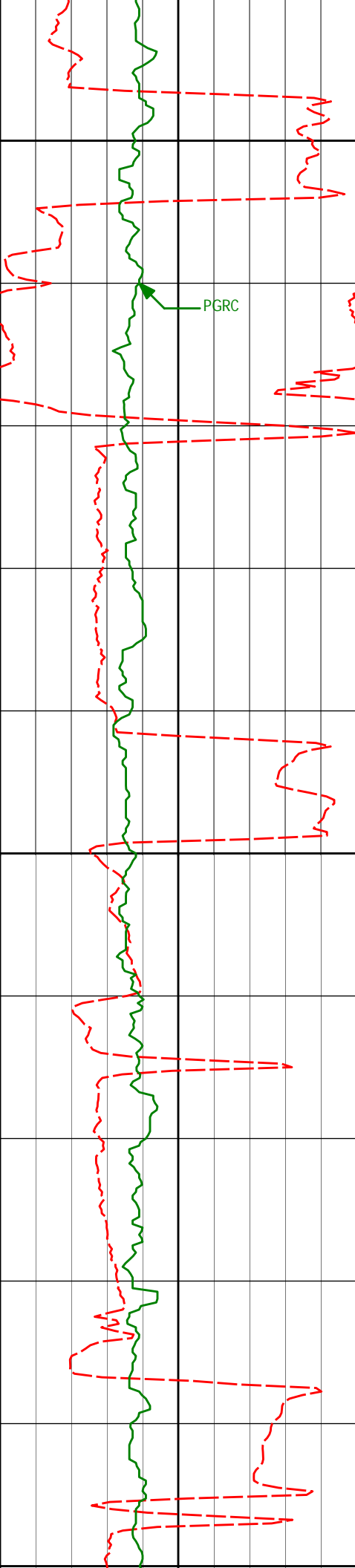
-57.93'



2900

3000

2863'	10.77°	338.88°	2853.27'	-63.26'
2952'	10.58°	339.40°	2940.73'	-68.22'
3042'	8.46°	336.09°	3029.49'	-73.00'



3100

3132'

6.25°

337.92°

3118.74'

-76.90'

3200

3221'

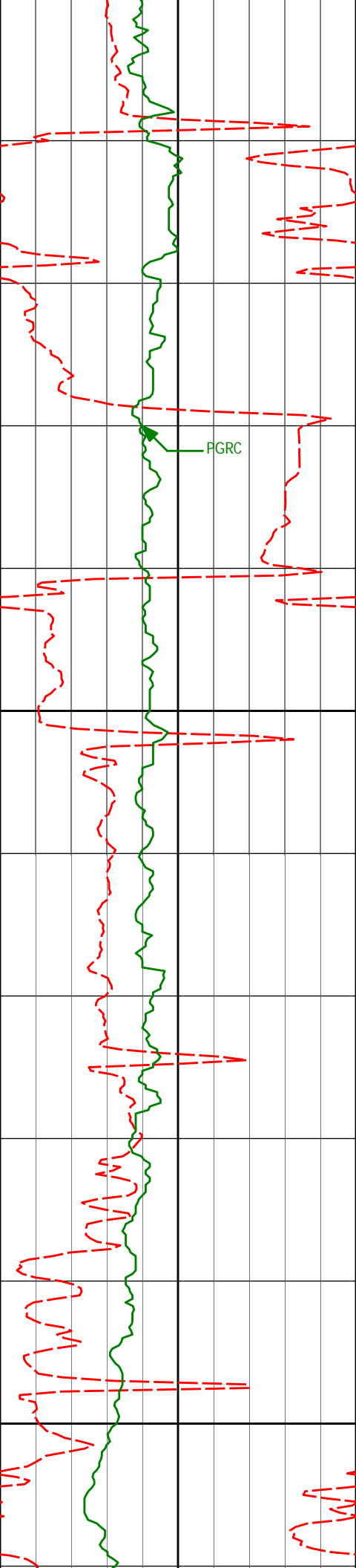
4.65°

337.63°

3207.33'

-79.63'

3300



3300

3311'

3.57°

298.14°

3297.12'

-83.21'

3400

3401'

0.55°

168.23°

3387.06'

-85.54'

3500

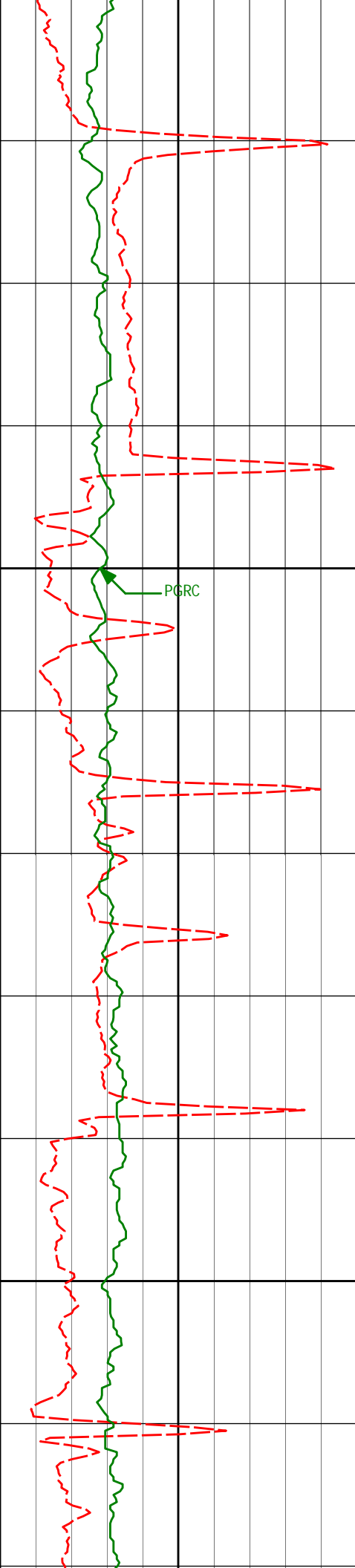
3491'

0.86°

181.99°

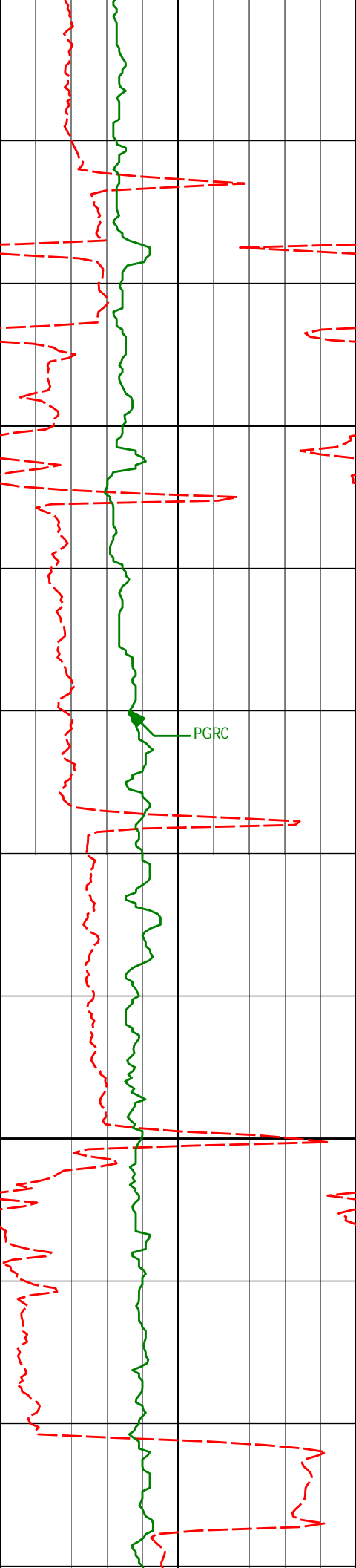
3477.06'

-85.54'



3600

3700



3800

3900

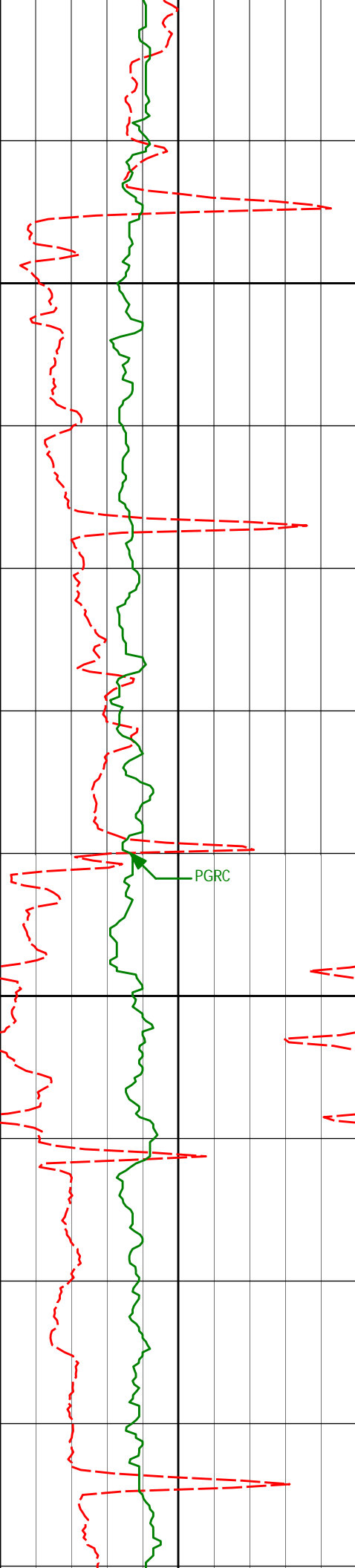
3760'

0.19°

122.84°

3746.05'

-85.36'



4000

4028'

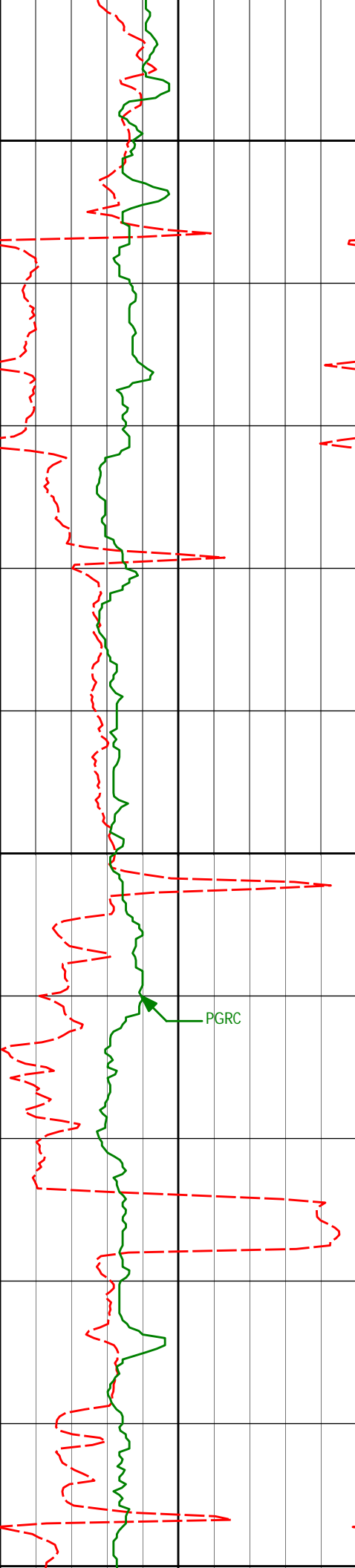
0.65°

331.38°

4014.04'

-85.64'

4100



4200

4300

4400

4297'

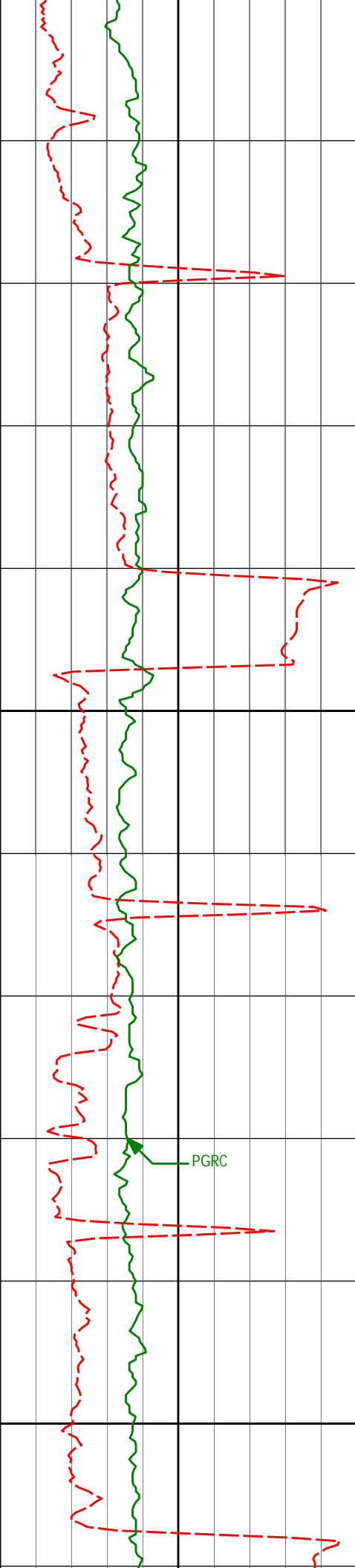
1.25°

315.08°

4283.00'

-88.24'

PGRC



4400

4500

4600

PGRC

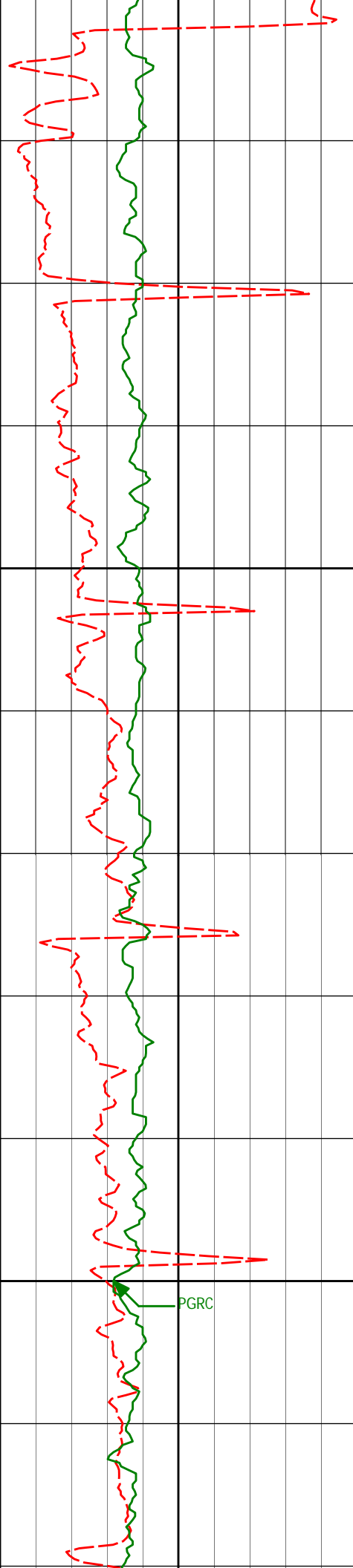
4566'

1.86°

36.82°

4551.93'

-87.39'



4700

4800

PGRC

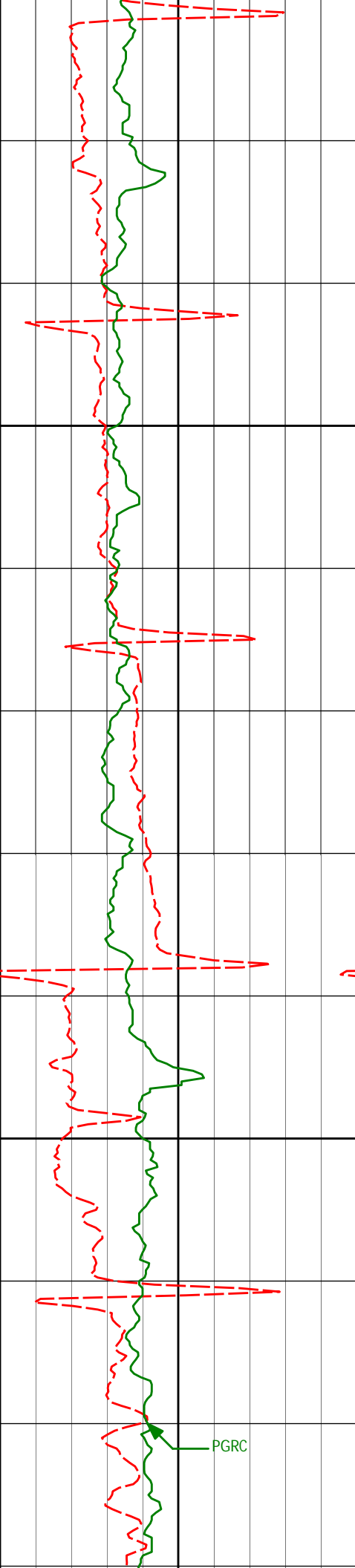
4835'

0.64°

185.95°

4820.89'

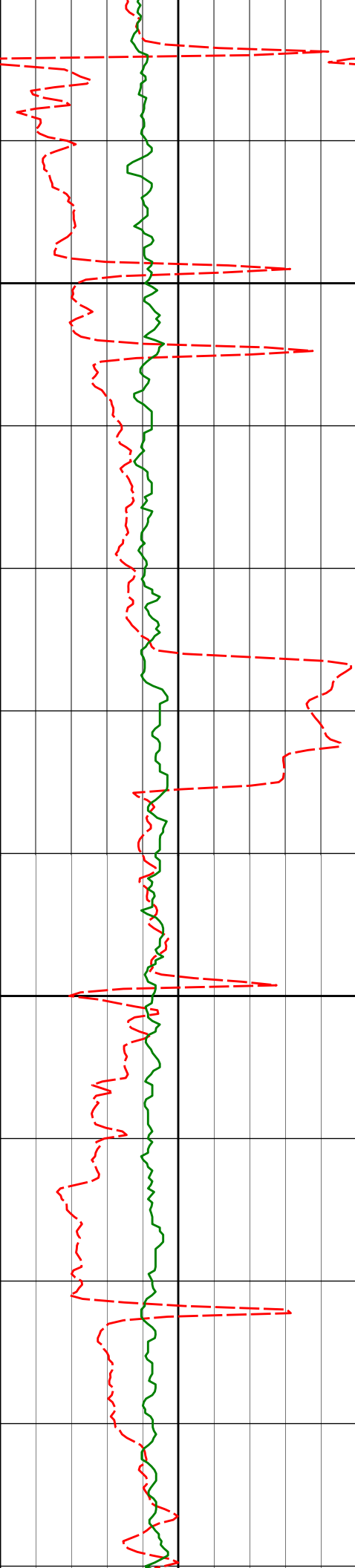
-84.82'



4900

5000

PGRC



5100

5104'

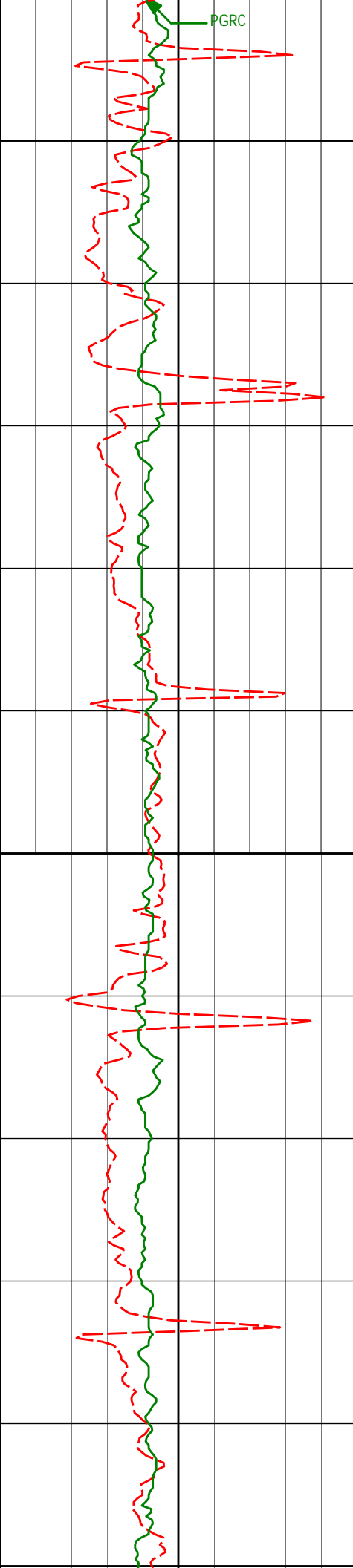
1.12°

172.37°

5089.86'

-84.86'

5200



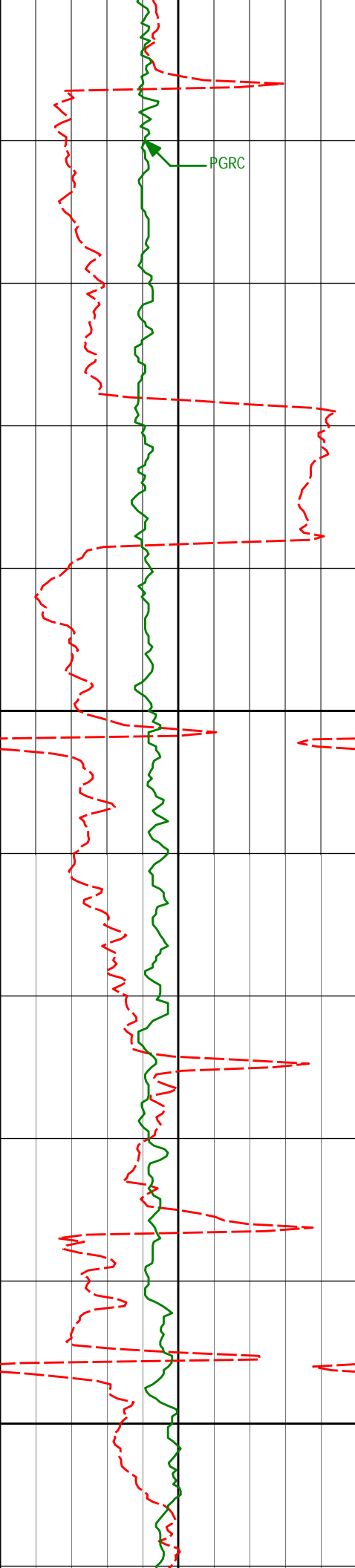
5372'

1.01°

142.45°

5357.81'

-83.34'



PGRC

5500

5600

5700

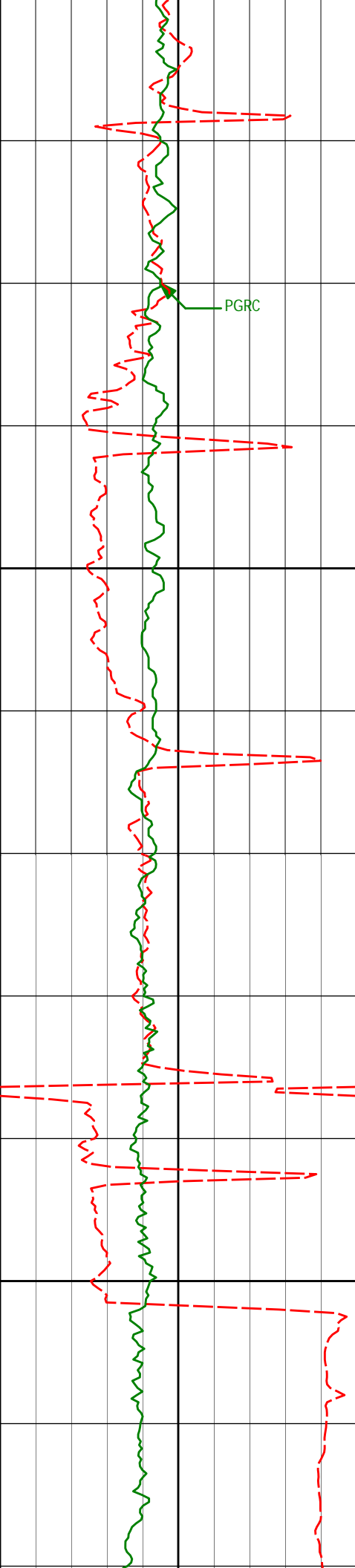
5641'

0.23°

349.31°

5626.80'

-82.09'



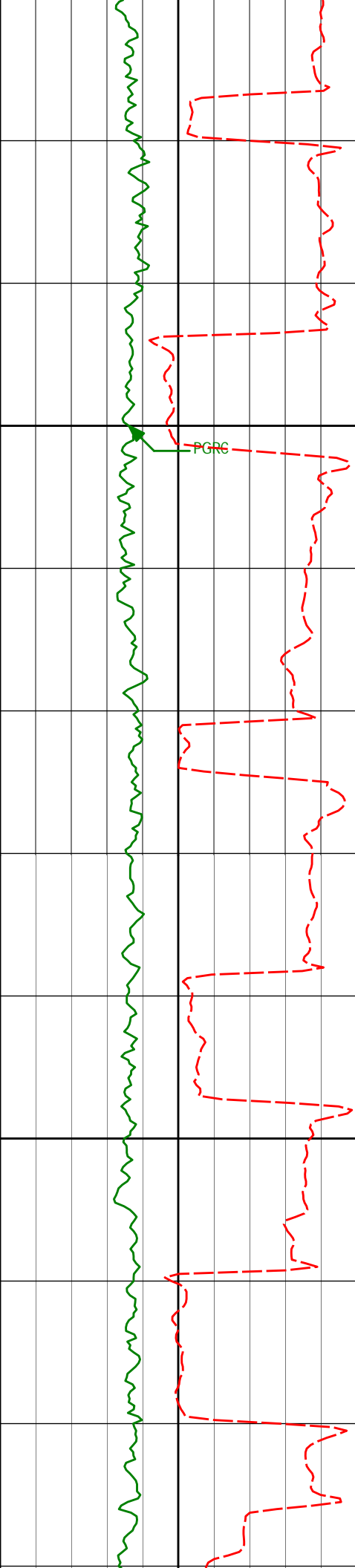
PGRC

5800

5820' 0.55° 94.93° 5805.80' -81.29'

5900

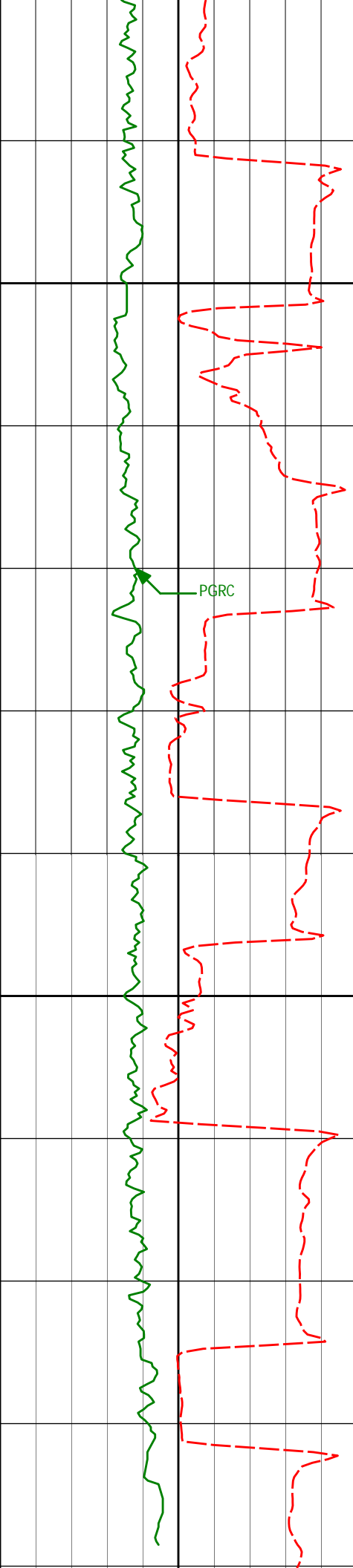
5910' 2.20° 80.23° 5895.77' -79.14'



6000

6100

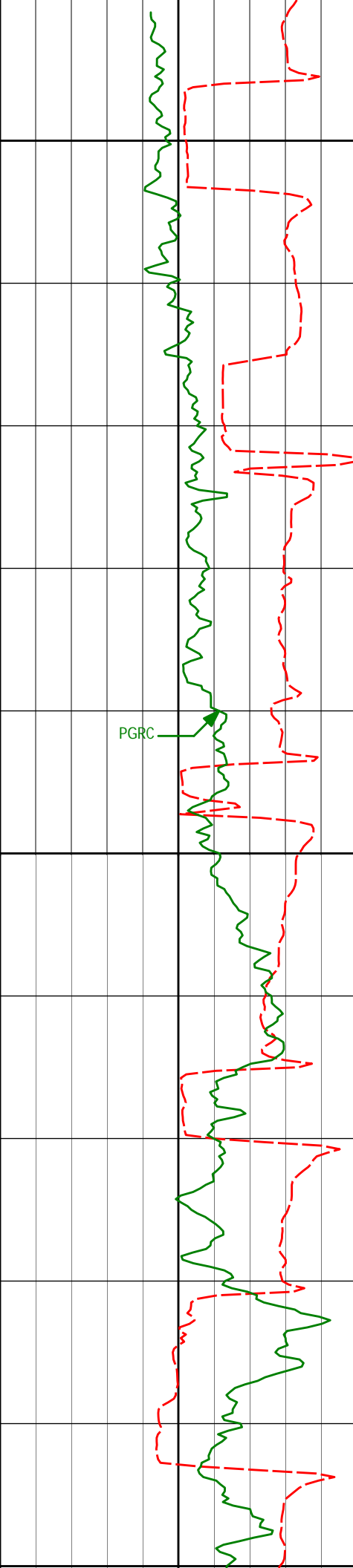
5955'	6.77°	81.31°	5940.62'	-75.64'
6000'	10.25°	81.72°	5985.12'	-69.01'
6044'	14.87°	83.84°	6028.05'	-59.46'
6089'	18.40°	87.87°	6071.17'	-46.59'
6134'	21.20°	90.35°	6113.50'	-31.36'



6200

6300

6179'	22.37°	88.18°	6155.29'	-14.69'
6224'	24.81°	84.56°	6196.53'	3.31'
6269'	26.51°	85.85°	6237.09'	22.79'
6313'	28.68°	88.08°	6276.08'	43.17'
6358'	33.08°	88.02°	6314.69'	66.26'



6400

6403'

36.68°

87.31°

6351.60'

91.99'

6448'

39.33°

88.54°

6387.05'

119.68'

6500

6493'

45.79°

88.67°

6420.18'

150.08'

6538'

51.89°

88.67°

6449.78'

183.93'

6582'

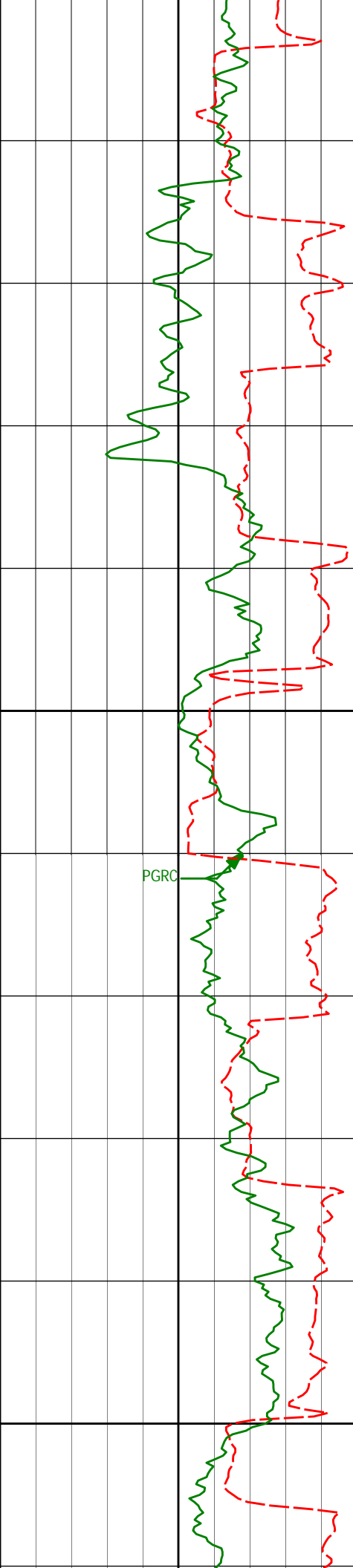
55.51°

88.92°

6475.83'

219.36'

6600



6600

6627'

58.83°

87.79°

6500.22'

257.15'

6672'

62.29°

87.15°

6522.33'

296.33'

6700

6717'

64.99°

87.21°

6542.31'

336.65'

PGRC

6762'

66.72°

89.88°

6560.72'

377.68'

6800

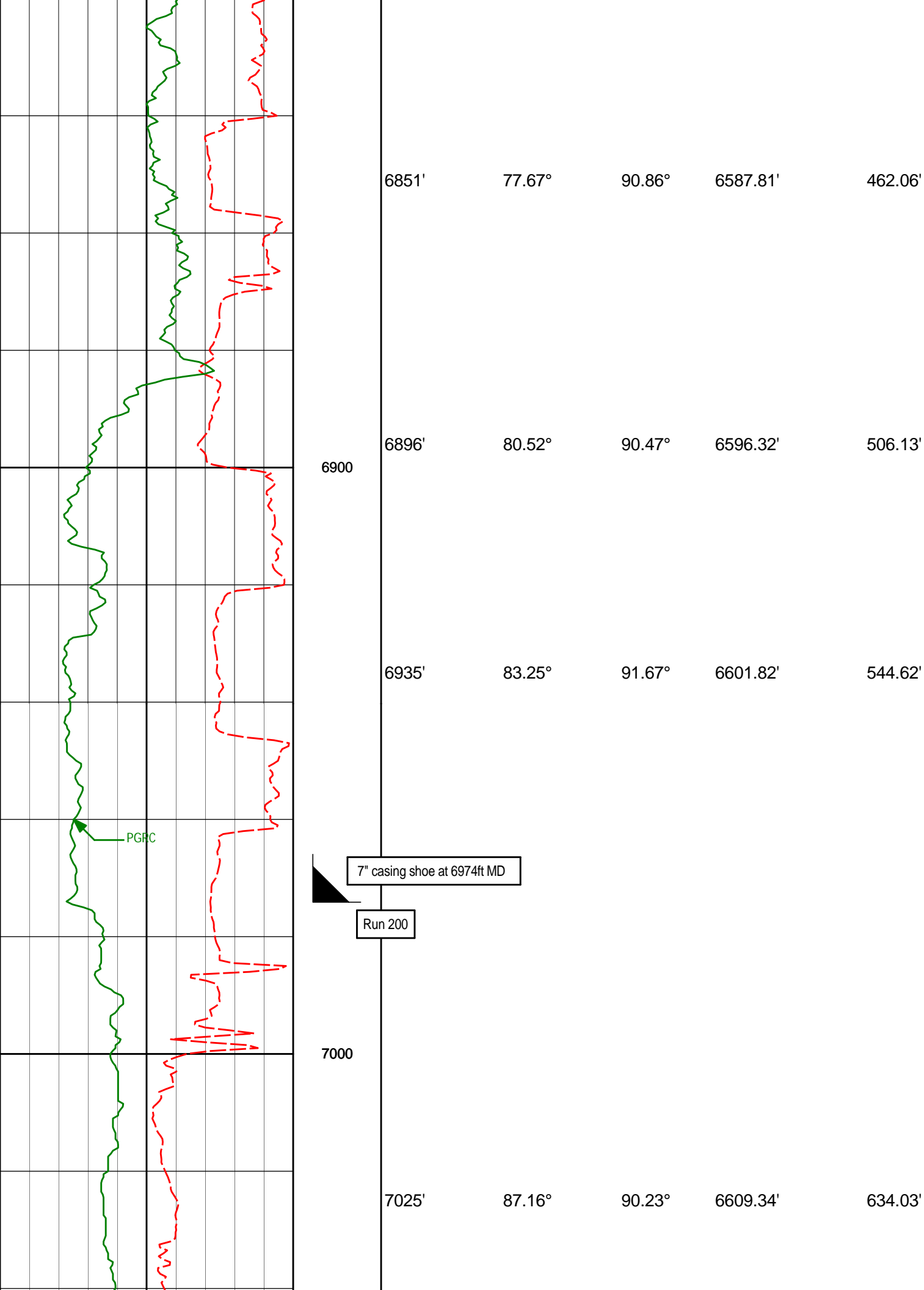
6806'

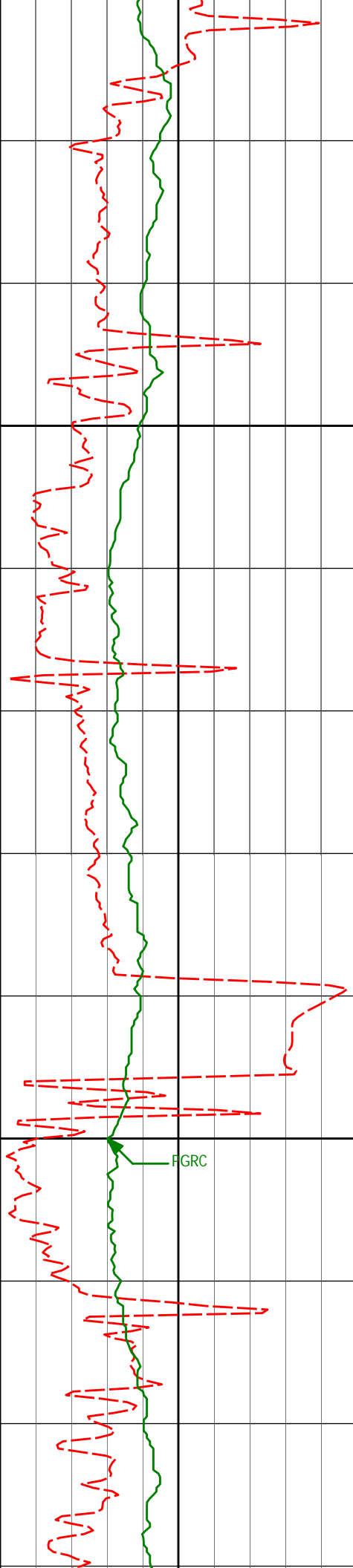
72.25°

91.84°

6576.13'

418.76'





7100

7114'

87.97°

90.37°

6613.13'

722.77'

7200

7204'

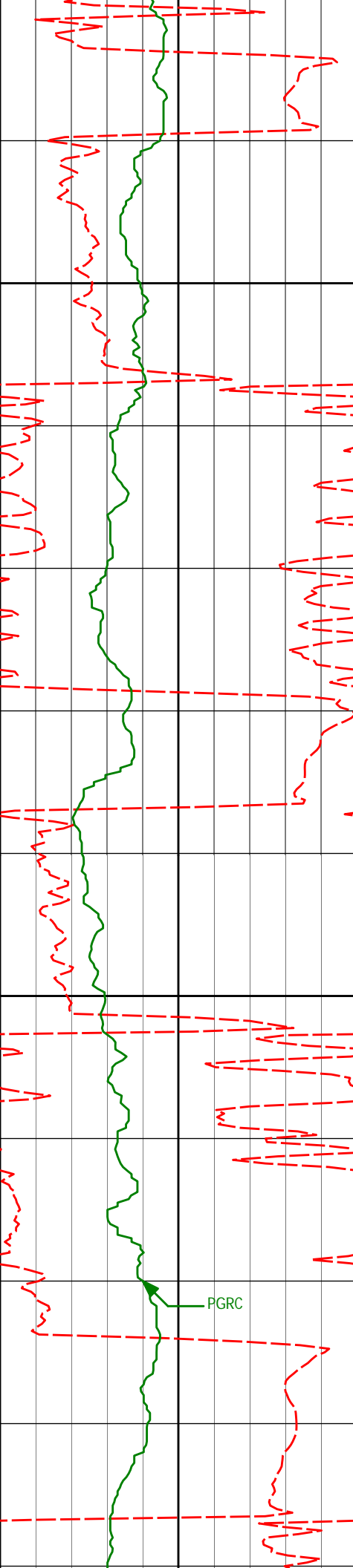
91.91°

90.54°

6613.22'

812.56'

FGRC



7300

7294'

93.36°

89.24°

6609.08'

902.31'

7400

7383'

92.90°

87.94°

6604.22'

991.13'

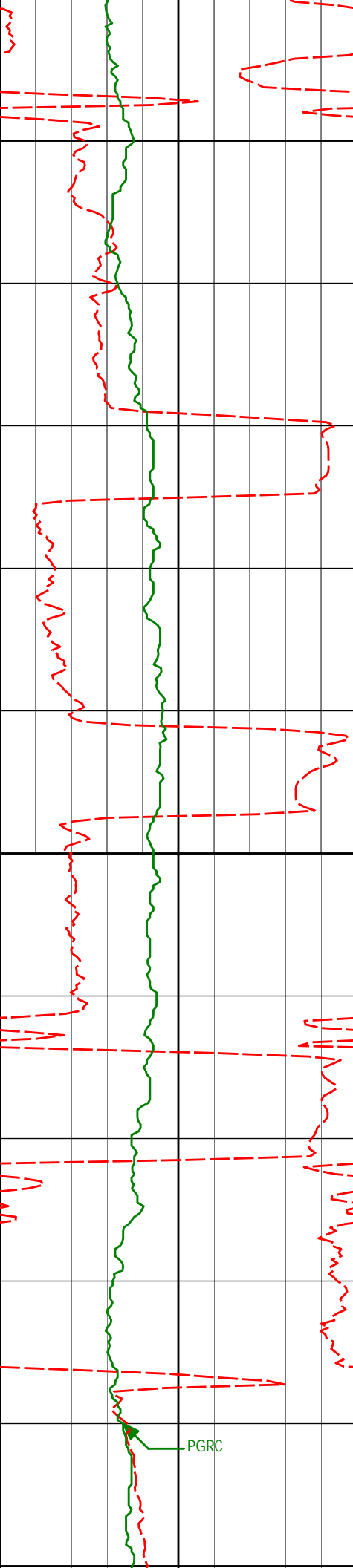
7473'

91.02°

87.82°

6601.15'

1081.05'



7500

7563'

90.77°

87.56°

6599.75'

1171.02'

7600

7653'

88.95°

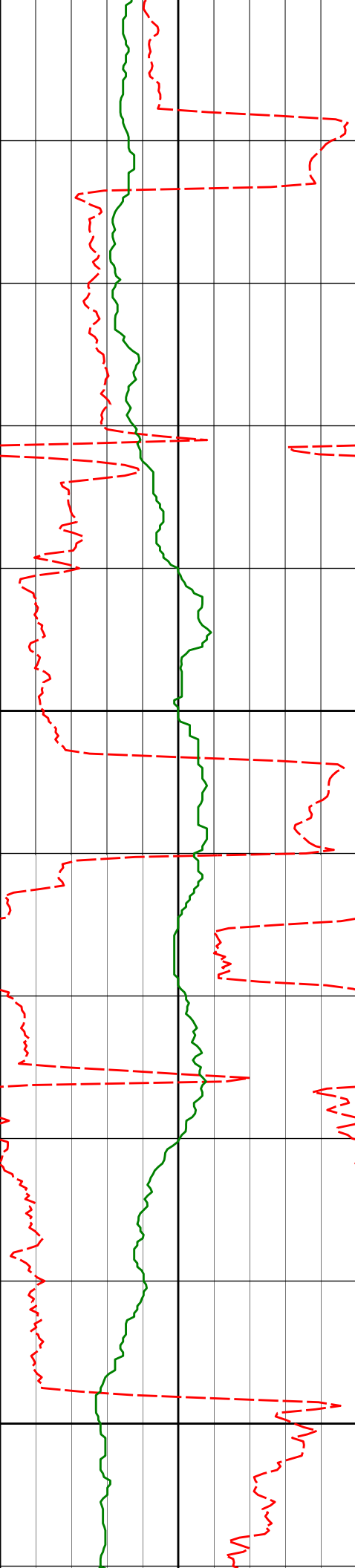
87.74°

6599.96'

1261.00'

PGRC

7700



7700

7800

7900

7742'

91.33°

89.70°

6599.75'

1349.94'

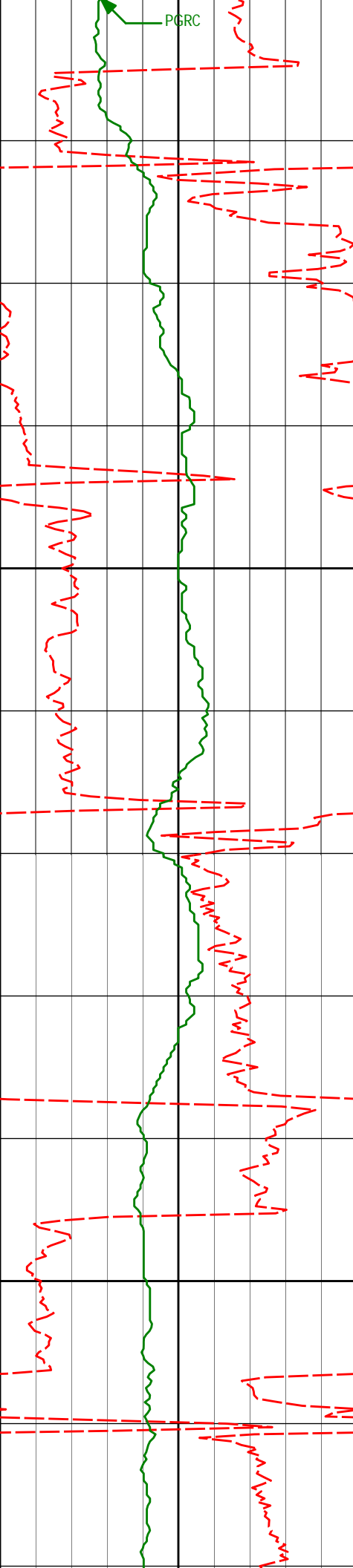
7832'

91.39°

88.95°

6597.62'

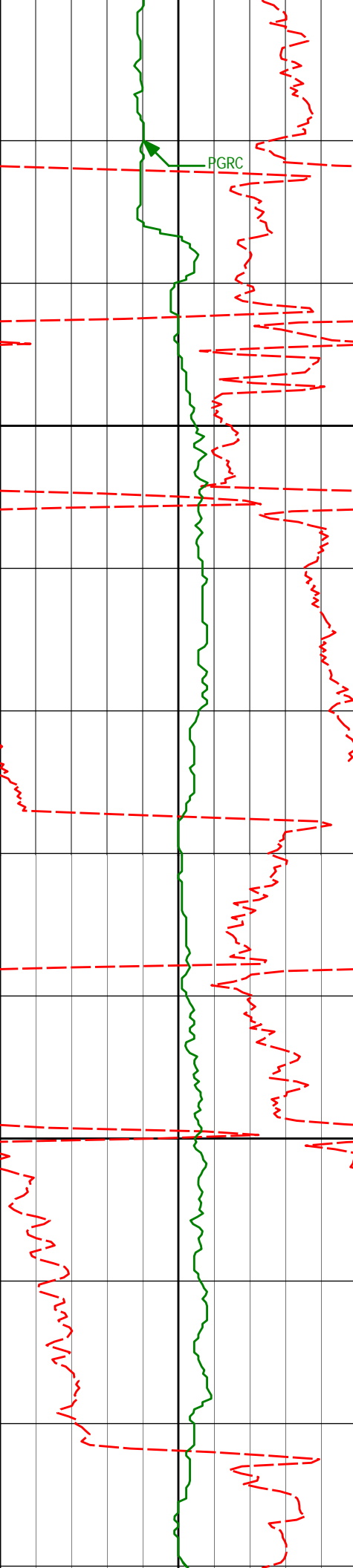
1439.81'



8000

8100

7922'	89.26°	91.88°	6597.11'	1529.60'
8011'	90.59°	91.47°	6597.23'	1618.26'
8101'	89.75°	89.97°	6596.97'	1708.03'

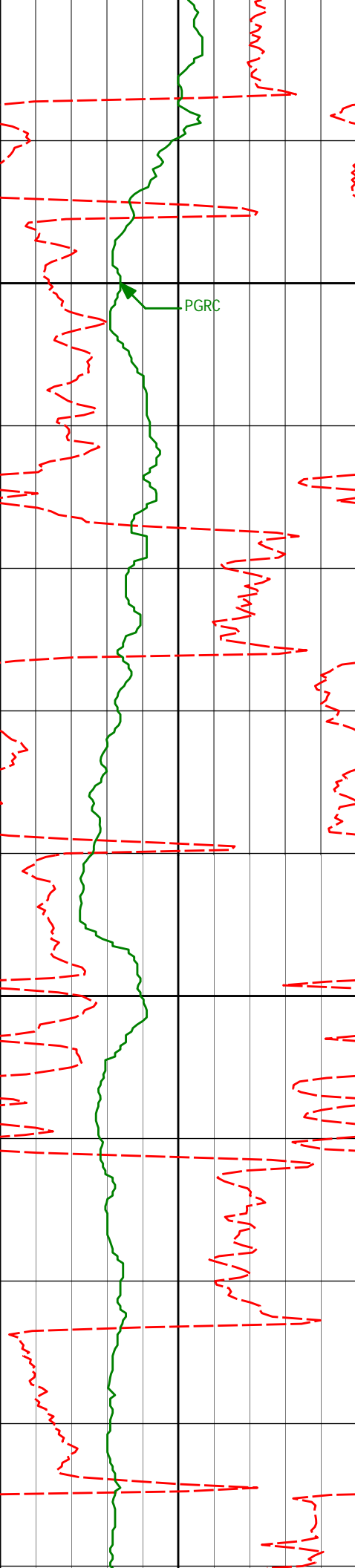


8190'	89.94°	89.30°	6597.21'	1796.90'
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8200

8280'	90.40°	84.46°	6596.94'	1886.88'
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8300



8400

8500

8370'

86.89°

85.50°

6599.07'

1976.80'

8459'

86.51°

87.36°

6604.20'

2065.64'

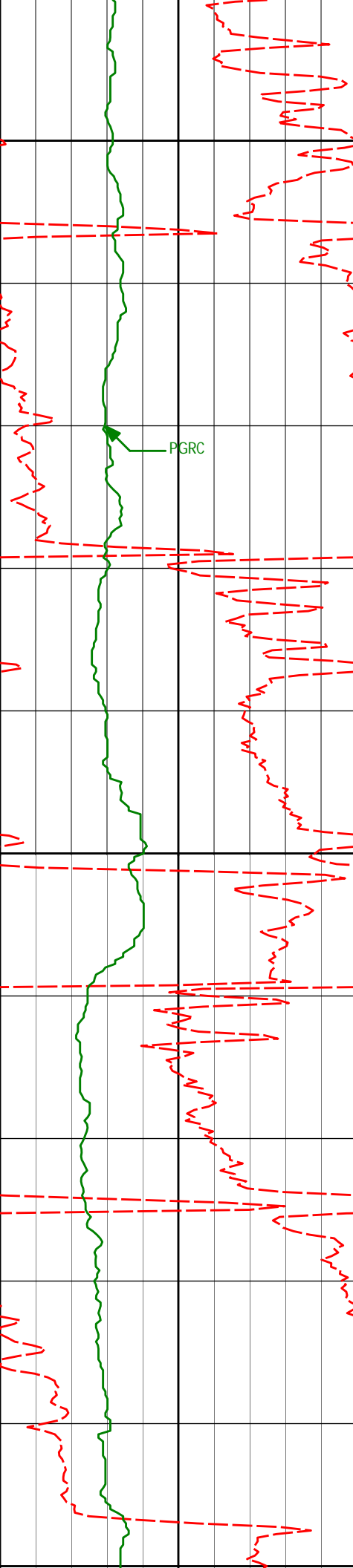
8549'

89.57°

89.28°

6607.28'

2155.54'



8600

8639'

91.42°

87.90°

6606.51'

2245.48'

8700

8728'

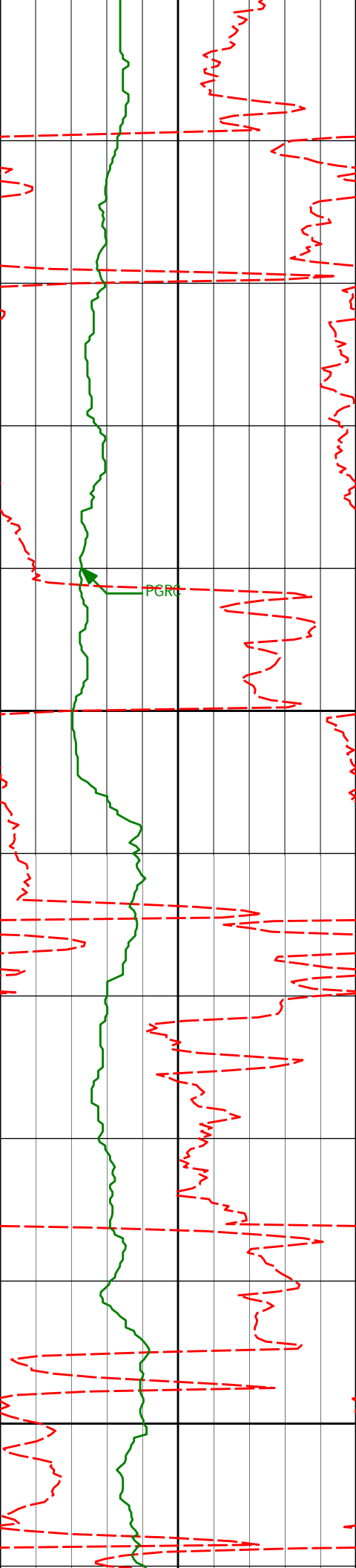
91.23°

87.77°

6604.45'

2334.44'

8800



8800

8818'

89.17°

88.00°

6604.13'

2424.41'

8900

8907'

89.75°

89.13°

6604.97'

2513.35'

9000

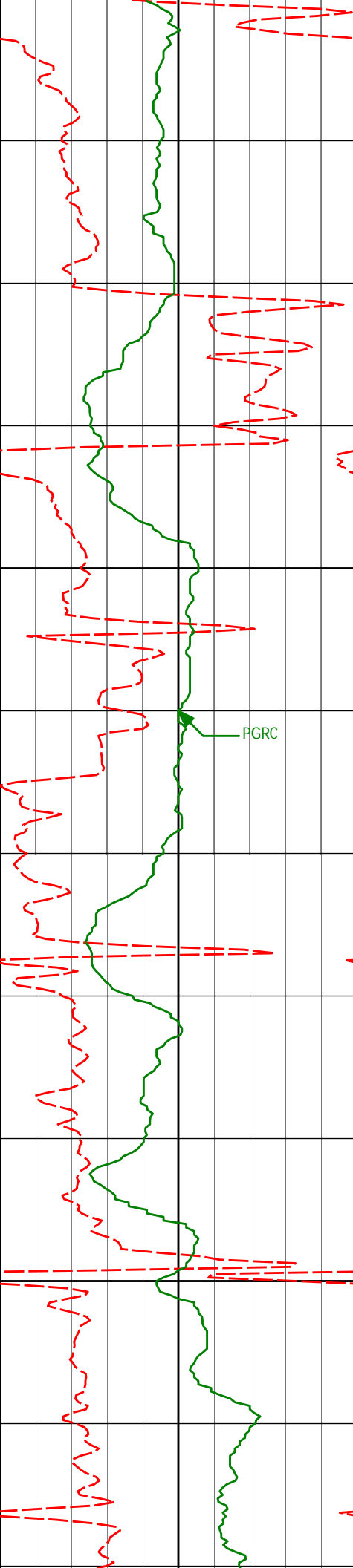
8997'

88.64°

89.33°

6606.23'

2603.25'



9100

9087'

87.70°

90.98°

6609.11'

2693.03'

PGRC

9176'

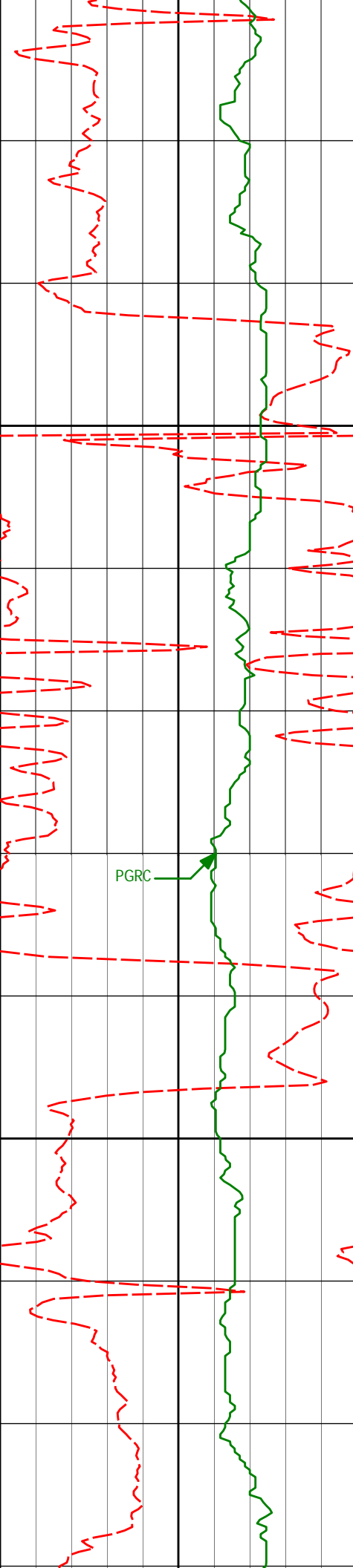
88.58°

90.84°

6612.00'

2781.74'

9200



9300

9311'

90.12°

89.08°

6613.52'

2916.50'

9400

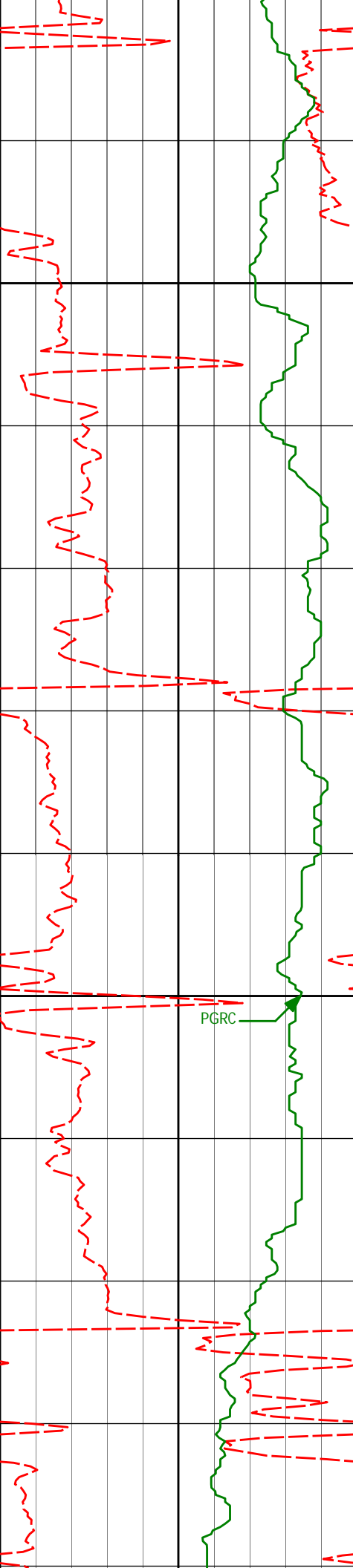
9401'

88.80°

88.16°

6614.37'

3006.44'



9500

9490'

88.98°

87.91°

6616.09'

3095.39'

9580'

89.04°

88.47°

6617.64'

3185.35'

9600

PGRC

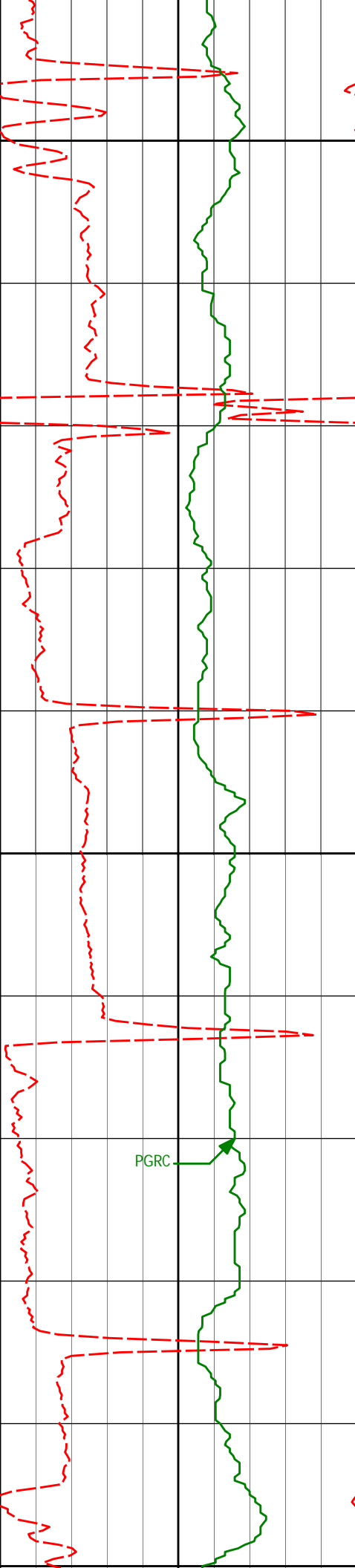
9670'

89.17°

88.88°

6619.05'

3275.28'



9700

9759'

89.38°

89.09°

6620.18'

3364.20'

9800

9849'

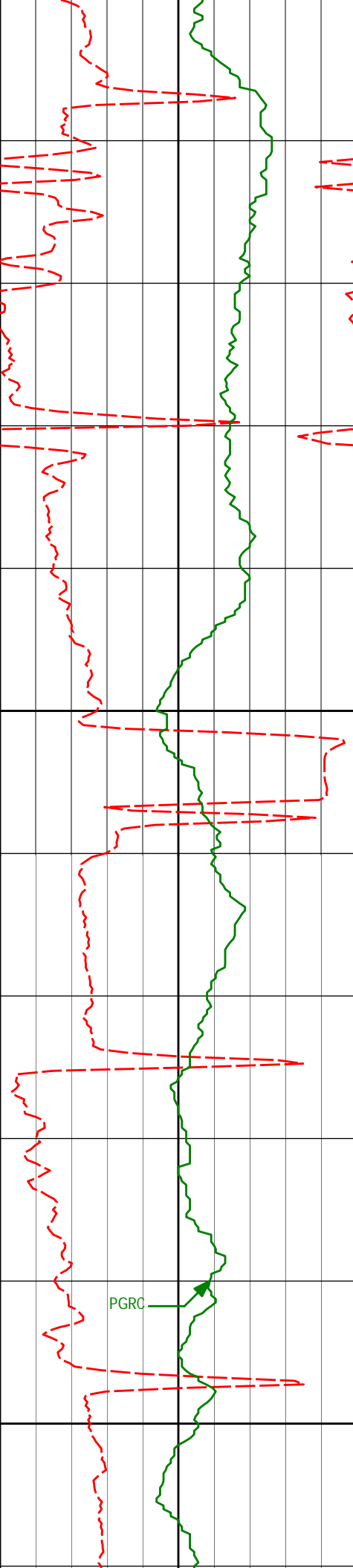
89.54°

89.03°

6621.02'

3454.11'

9900



9939'

10000

10028'

10100

89.91°

88.81°

6621.46'

3544.04'

89.57°

90.31°

6621.87'

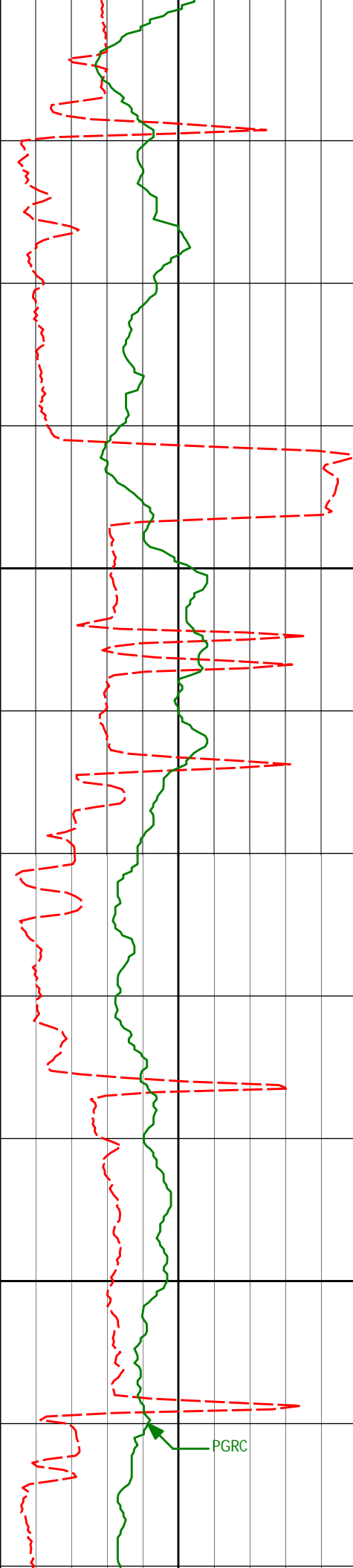
3632.92'

89.35°

89.98°

6622.72'

3722.75'

1020010208' 90.68° 89.87°6622.69'

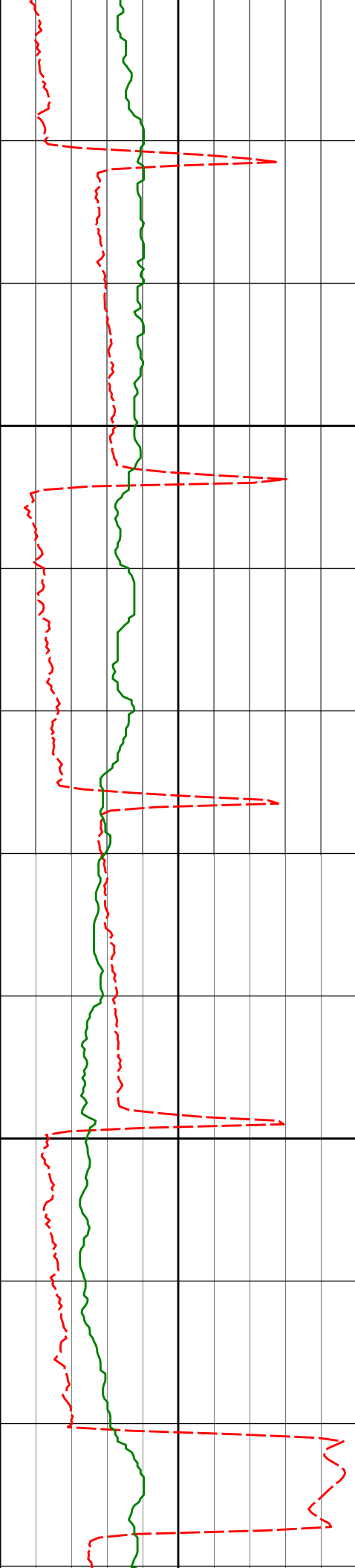
3812.60'

10300

10297'

91.08°89.59°6621.33'

3901.46'



10400

10500

10387'

90.89°

88.43°

6619.78'

3991.37'

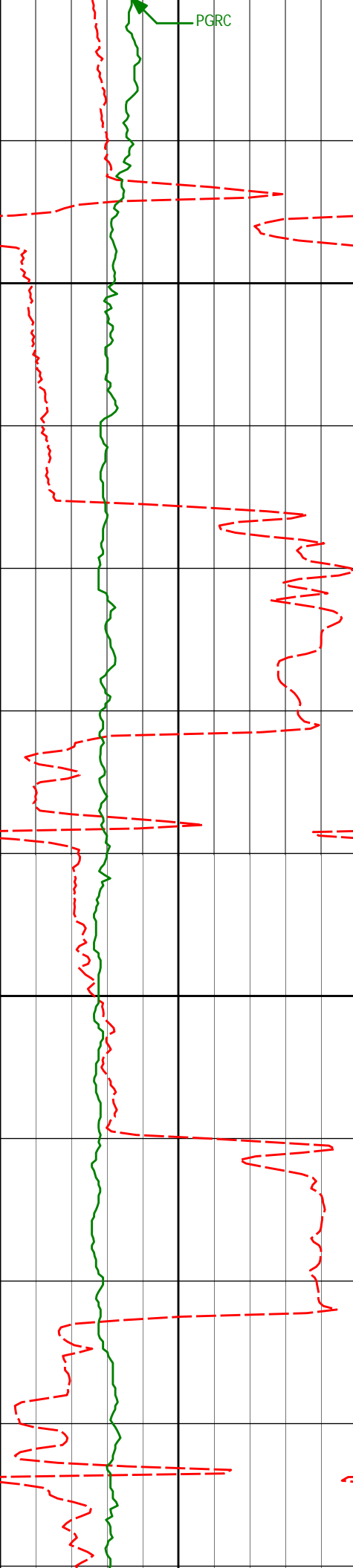
10477'

91.36°

87.16°

6618.01'

4081.34'



10566'	91.36°	88.27°	6615.90'	4170.29'
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10600

10656'	91.02°	88.95°	6614.04'	4260.22'
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10700

10746'	89.35°	88.90°	6613.75'	4350.15'
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HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wolfpack B02-64-1HN - A1
Kersey
Weld Colorado
USA
CA-XX-0900544022

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
621.00	0.00	0.00	621.00	0.00 N	0.00 E	0.00	TIE-IN
654.00	1.20	241.69	654.00	0.16 S	0.30 W	-0.31	3.64
923.00	0.86	274.11	922.96	1.36 S	4.80 W	-4.87	0.25
1164.00	1.00	274.02	1163.92	1.08 S	8.69 W	-8.74	0.06
1450.00	1.10	297.66	1449.88	0.37 N	13.61 W	-13.57	0.15
1733.00	1.47	314.24	1732.81	4.17 N	18.63 W	-18.35	0.18
1953.00	1.62	303.46	1952.73	7.86 N	23.24 W	-22.74	0.15
2047.00	2.95	339.40	2046.65	10.85 N	25.20 W	-24.52	2.02
2141.00	4.73	342.27	2140.44	16.81 N	27.23 W	-26.20	1.90
2235.00	6.74	342.50	2233.96	25.77 N	30.07 W	-28.52	2.14
2325.00	8.33	332.41	2323.19	36.59 N	34.68 W	-32.49	2.29
2415.00	7.80	335.74	2412.30	47.94 N	40.22 W	-37.34	0.79
2504.00	10.04	335.87	2500.21	60.54 N	45.87 W	-42.26	2.52
2594.00	9.92	337.13	2588.85	74.84 N	52.09 W	-47.63	0.28
2684.00	10.67	339.17	2677.40	89.77 N	58.07 W	-52.72	0.93

2773.00	10.74	337.41	2764.85	105.13 N	64.19 W	-57.93	0.37
2863.00	10.77	338.88	2853.27	120.72 N	70.44 W	-63.26	0.31
2952.00	10.58	339.40	2940.73	136.13 N	76.31 W	-68.22	0.24
3042.00	8.46	336.09	3029.49	149.92 N	81.90 W	-73.00	2.43
3132.00	6.25	337.92	3118.74	160.51 N	86.43 W	-76.90	2.47
3221.00	4.65	337.63	3207.33	168.34 N	89.62 W	-79.63	1.79
3311.00	3.57	298.14	3297.12	173.04 N	93.48 W	-83.21	3.29
3401.00	0.55	168.23	3387.06	173.94 N	95.87 W	-85.54	4.39
3491.00	0.86	181.99	3477.06	172.84 N	95.81 W	-85.54	0.39
3760.00	0.19	122.84	3746.05	170.57 N	95.49 W	-85.36	0.29
4028.00	0.65	331.38	4014.04	171.66 N	95.84 W	-85.64	0.31
4297.00	1.25	315.08	4283.00	175.08 N	98.64 W	-88.24	0.24
4566.00	1.86	36.82	4551.93	180.65 N	98.11 W	-87.39	0.78
4835.00	0.64	185.95	4820.89	182.64 N	95.65 W	-84.82	0.90
5104.00	1.12	172.37	5089.86	178.53 N	95.46 W	-84.86	0.19
5372.00	1.01	142.45	5357.81	174.06 N	93.68 W	-83.34	0.21
5641.00	0.23	349.31	5626.80	172.72 N	92.34 W	-82.09	0.45
5820.00	0.55	94.93	5805.80	173.01 N	91.55 W	-81.29	0.36
5910.00	2.20	80.23	5895.77	173.27 N	89.42 W	-79.14	1.86
5955.00	6.77	81.31	5940.62	173.81 N	85.94 W	-75.64	10.14
6000.00	10.25	81.72	5985.12	174.79 N	79.36 W	-69.01	7.75
6044.00	14.87	83.84	6028.05	175.96 N	69.86 W	-59.46	10.55
6089.00	18.40	87.87	6071.17	176.84 N	57.02 W	-46.59	8.24
6134.00	21.20	90.35	6113.50	177.06 N	41.78 W	-31.36	6.49
6179.00	22.37	88.18	6155.29	177.28 N	25.09 W	-14.69	3.16
6224.00	24.81	84.56	6196.53	178.45 N	7.13 W	3.31	6.31
6269.00	26.51	85.85	6237.09	180.07 N	12.29 E	22.79	3.97
6313.00	28.68	88.08	6276.08	181.13 N	32.64 E	43.17	5.47
6358.00	33.08	88.02	6314.69	181.92 N	55.72 E	66.26	9.77
6403.00	36.68	87.31	6351.60	182.97 N	81.43 E	91.99	8.05
6448.00	39.33	88.54	6387.05	183.97 N	109.12 E	119.68	6.11
6493.00	45.79	88.67	6420.18	184.71 N	139.53 E	150.08	14.38
6538.00	51.89	88.67	6449.78	185.49 N	173.39 E	183.93	13.55
6582.00	55.51	88.92	6475.83	186.23 N	208.83 E	219.36	8.23
6627.00	58.83	87.79	6500.22	187.33 N	246.62 E	257.15	7.67
6672.00	62.29	87.15	6522.33	189.06 N	285.77 E	296.33	7.80
6717.00	64.99	87.21	6542.31	191.05 N	326.04 E	336.65	5.98
6762.00	66.72	89.88	6560.72	192.09 N	367.08 E	377.68	6.65
6806.00	72.25	91.84	6576.13	191.46 N	408.27 E	418.76	13.23
6851.00	77.67	90.86	6587.81	190.44 N	451.70 E	462.06	12.22
6896.00	80.52	90.47	6596.32	189.93 N	495.88 E	506.13	6.39
6935.00	83.25	91.67	6601.82	189.20 N	534.48 E	544.62	7.63
7025.00	87.16	90.23	6609.34	187.72 N	624.13 E	634.03	4.63
7114.00	87.97	90.37	6613.13	187.26 N	713.05 E	722.77	0.92
7204.00	91.91	90.54	6613.22	186.54 N	803.03 E	812.56	4.39
7294.00	93.36	89.24	6609.08	186.71 N	892.93 E	902.31	2.16
7383.00	92.90	87.94	6604.22	188.89 N	981.77 E	991.13	1.54
7473.00	91.02	87.82	6601.15	192.22 N	1071.65 E	1081.05	2.09
7563.00	90.77	87.56	6599.75	195.84 N	1161.56 E	1171.02	0.40
7653.00	88.95	87.74	6599.96	199.53 N	1251.48 E	1261.00	2.03
7742.00	91.33	89.70	6599.75	201.51 N	1340.45 E	1349.94	3.46
7832.00	91.39	88.95	6597.62	202.57 N	1430.42 E	1439.81	0.84
7922.00	89.26	91.88	6597.11	201.92 N	1520.40 E	1529.60	4.03
8011.00	90.59	91.47	6597.23	199.32 N	1609.36 E	1618.26	1.56
8101.00	89.75	89.97	6596.97	198.19 N	1699.35 E	1708.03	1.91
8190.00	89.94	89.30	6597.21	198.76 N	1788.35 E	1796.90	0.78
8280.00	90.40	84.46	6596.94	203.66 N	1878.18 E	1886.88	5.40
8370.00	86.89	85.50	6599.07	211.54 N	1967.80 E	1976.80	4.07
8459.00	86.51	87.36	6604.20	217.07 N	2056.47 E	2065.64	2.14
8549.00	89.57	89.28	6607.28	219.70 N	2146.37 E	2155.54	4.01
8639.00	91.42	87.90	6606.51	221.92 N	2236.33 E	2245.48	2.56
8728.00	91.23	87.77	6604.45	225.28 N	2325.24 E	2334.44	0.25
8818.00	89.17	88.00	6604.13	228.60 N	2415.18 E	2424.41	2.31
8907.00	89.75	89.13	6604.97	230.82 N	2504.14 E	2513.35	1.43
8997.00	88.64	89.33	6606.23	232.03 N	2594.13 E	2603.25	1.25
9087.00	87.70	90.98	6609.11	231.78 N	2684.08 E	2693.03	2.11
9176.00	88.58	90.84	6612.00	230.37 N	2773.02 E	2781.74	1.01
9311.00	90.12	89.08	6613.52	230.46 N	2908.00 E	2916.50	1.73
9401.00	88.80	88.16	6614.37	232.63 N	2997.97 E	3006.44	1.80
9490.00	88.98	87.91	6616.09	235.68 N	3086.90 E	3095.39	0.35
9580.00	89.04	88.47	6617.64	238.52 N	3176.84 E	3185.35	0.62
9670.00	89.17	88.88	6619.05	240.61 N	3266.80 E	3275.28	0.48
9759.00	89.38	89.09	6620.18	242.18 N	3355.78 E	3364.20	0.34
9849.00	89.54	89.03	6621.02	243.65 N	3445.76 E	3454.11	0.18
9939.00	89.91	88.81	6621.46	245.35 N	3535.75 E	3544.04	0.48

10028.00	89.57	90.31	6621.87	246.04 N	3624.74 E	3632.92	1.73
10118.00	89.35	89.98	6622.72	245.81 N	3714.74 E	3722.75	0.44
10208.00	90.68	89.87	6622.69	245.92 N	3804.73 E	3812.60	1.48
10297.00	91.08	89.59	6621.33	246.34 N	3893.72 E	3901.46	0.55
10387.00	90.89	88.43	6619.78	247.89 N	3983.69 E	3991.37	1.31
10477.00	91.36	87.16	6618.01	251.35 N	4073.61 E	4081.34	1.50
10566.00	91.36	88.27	6615.90	254.89 N	4162.51 E	4170.29	1.25
10656.00	91.02	88.95	6614.04	257.07 N	4252.47 E	4260.22	0.84
10746.00	89.35	88.90	6613.75	258.76 N	4342.45 E	4350.15	1.85
10789.00	89.69	88.45	6614.10	259.76 N	4385.43 E	4393.12	1.32
10853.00	89.69	88.45	6614.45	261.49 N	4449.41 E	4457.09	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 86.65 DEGREES (GRID)
A TOTAL CORRECTION OF 7.86 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10853.00 FEET
IS 4457.09 FEET ALONG 86.64 DEGREES (GRID)**

**Tie onto casing at 621' MD
Final Survey is a projection to bit at TD**