



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	23-Nov-15	27-Nov-15			
Rig Bit Number	0100	0200			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	887.00	7,394.00			
Log End Depth (MD, ft)	7,394.00	15,900.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	22-Nov-15 08:00	24-Nov-15 19:30			
Drill/Wipe End Date and Time	23-Nov-15 14:15	26-Nov-15 18:30			
Min Inc (deg) @ Depth (MD, ft)	0.04 @ 1,386.00	87.04 @ 13,338.00			
Max Inc (deg) @ Depth (MD, ft)	89.00 @ 7,394.00	92.87 @ 14,378.00			
Bit TFA(in2) / Bit Type	1.20 / PDC	0.98 /			
Flow Rate (gpm)	592.54	308.92			
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)	10.60 / 35.00	10.30 / 34.00			
Filtrate CL (ppm)	2,400.00	1,200.00			
pH / Fluid Loss (mptm)	9.00 / 8	8.40 / 7			
PV (cP) / YP (lbf/ft2)	11 / 12.00	10 / 12.00			
% Solids / % Sand	10.20 / 0.05	9.20 / 0.20			
% 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	100.00 / 0.01	207.10 / 0.01			

Max Tool Temp (degF) / Source	180.09 / PCM	267.48 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Brian Neu	Brian Neu			
Customer Representative	Bryant Dear	Bryant Dear			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11341333	12463929			
Insert Serial Number	11620295	11145577			
Date and Time Initialized	21-Nov-15 21:55	23-Nov-15 16:47			
Date and Time Read	23-Nov-15 19:18	27-Nov-15 10:44			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	62.00			
Software Version	6.33	6.33			
Sub Serial Number	11341333	12463929			
Sonde Serial Number	11062040	11902176			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	283.90	183.70			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	50.18	55.01			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341333	12463929			
Insert/Sonde Serial Number	11680938	11681003			

REMARKS

1. All depths are calibrated to driller's pipe tally and are measured depths 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: 6.125"

Mud Density: 9.7-10.5ppg

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

1: 600 (2"):

Interval: 1.0 ft

Coercion Distance: 3.0 ft (ROPA)

Interval: 1.0 ft

Coercion Distance: 3.0 ft (Gamma Ray)

1: 240 (5")

Interval: 0.5 ft

Coercion Distance: 1.2 ft (ROPA)

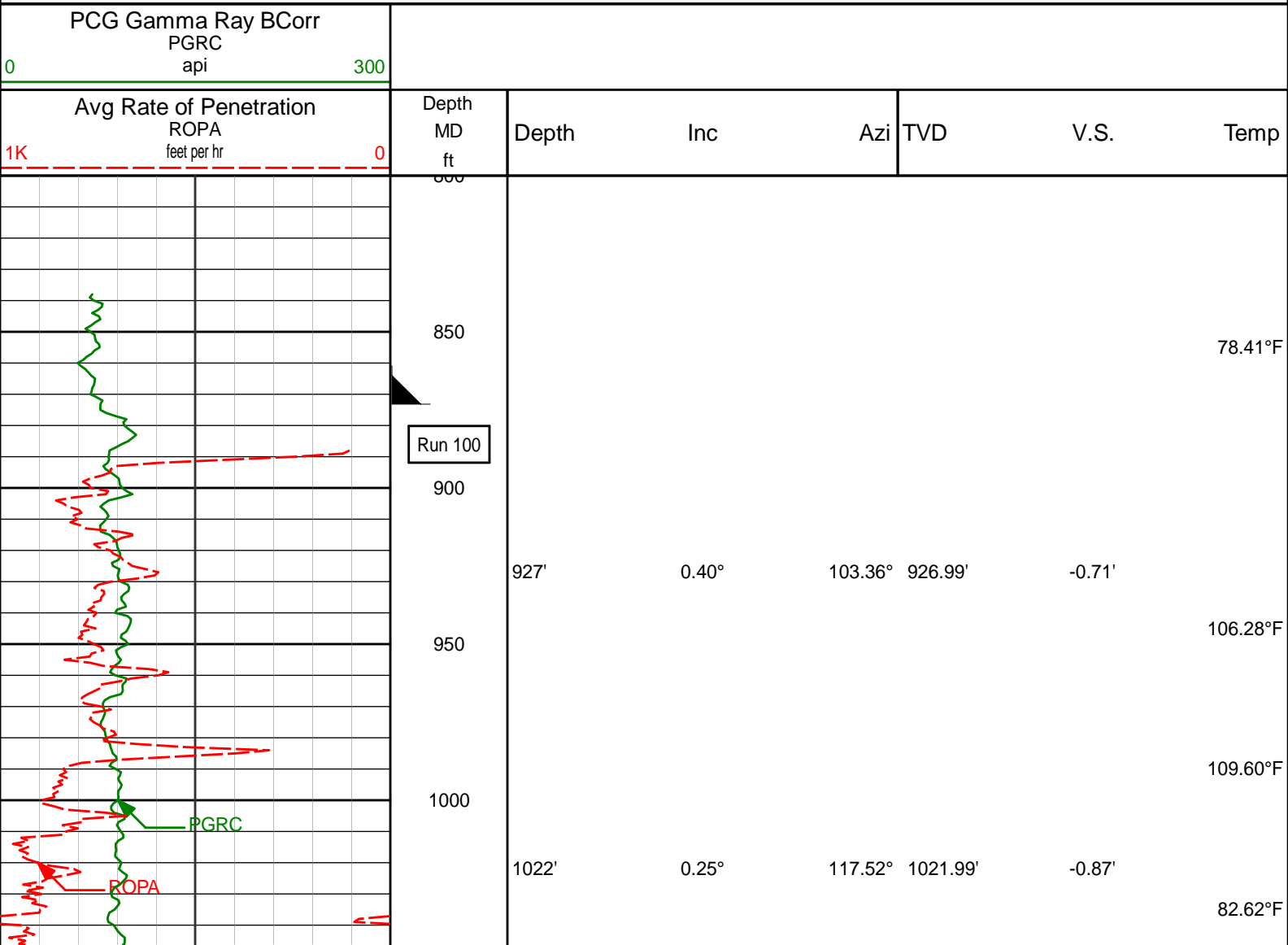
Interval: 0.5 ft

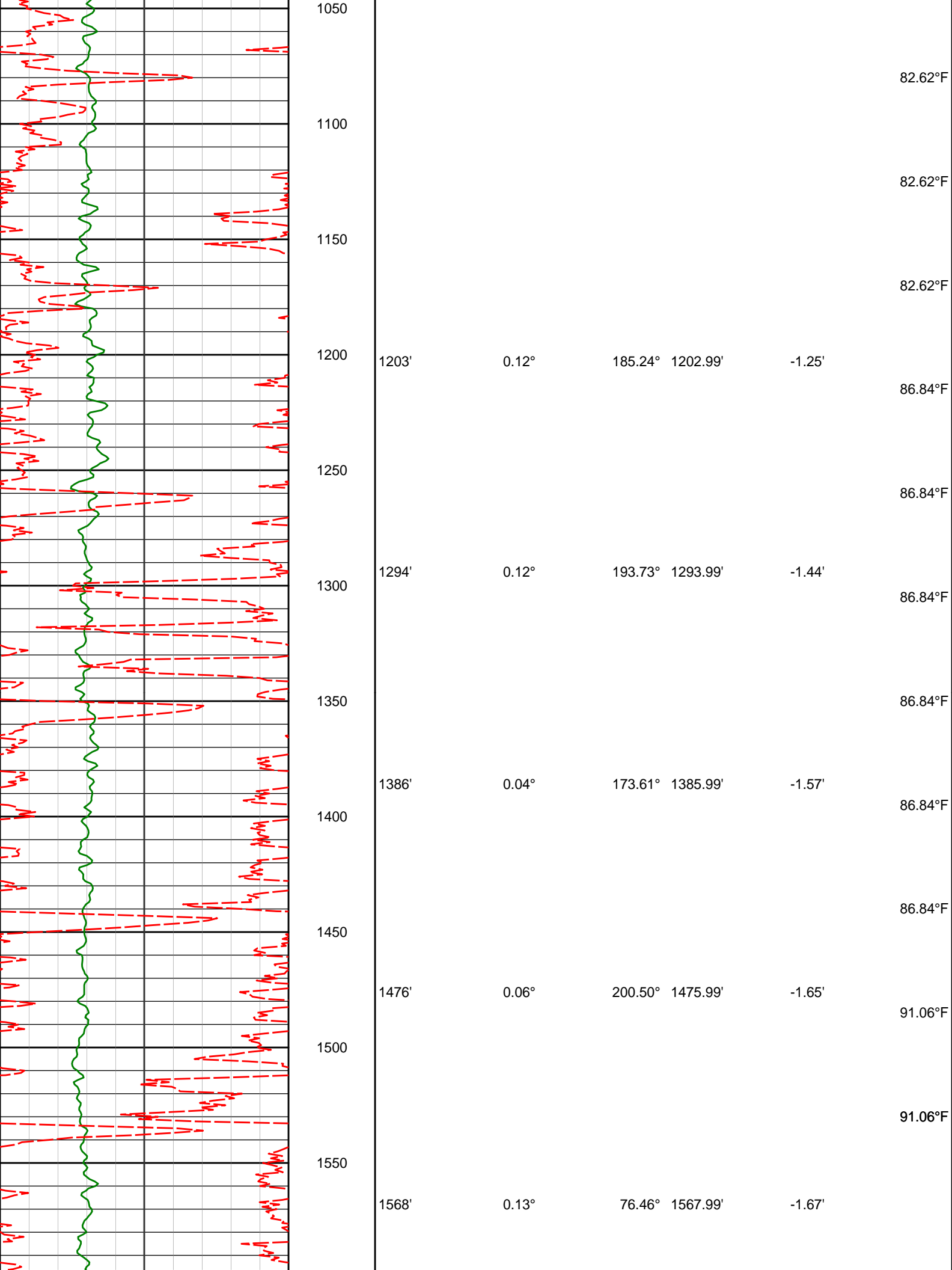
Coercion Distance: 0.6 ft (Gamma Ray)

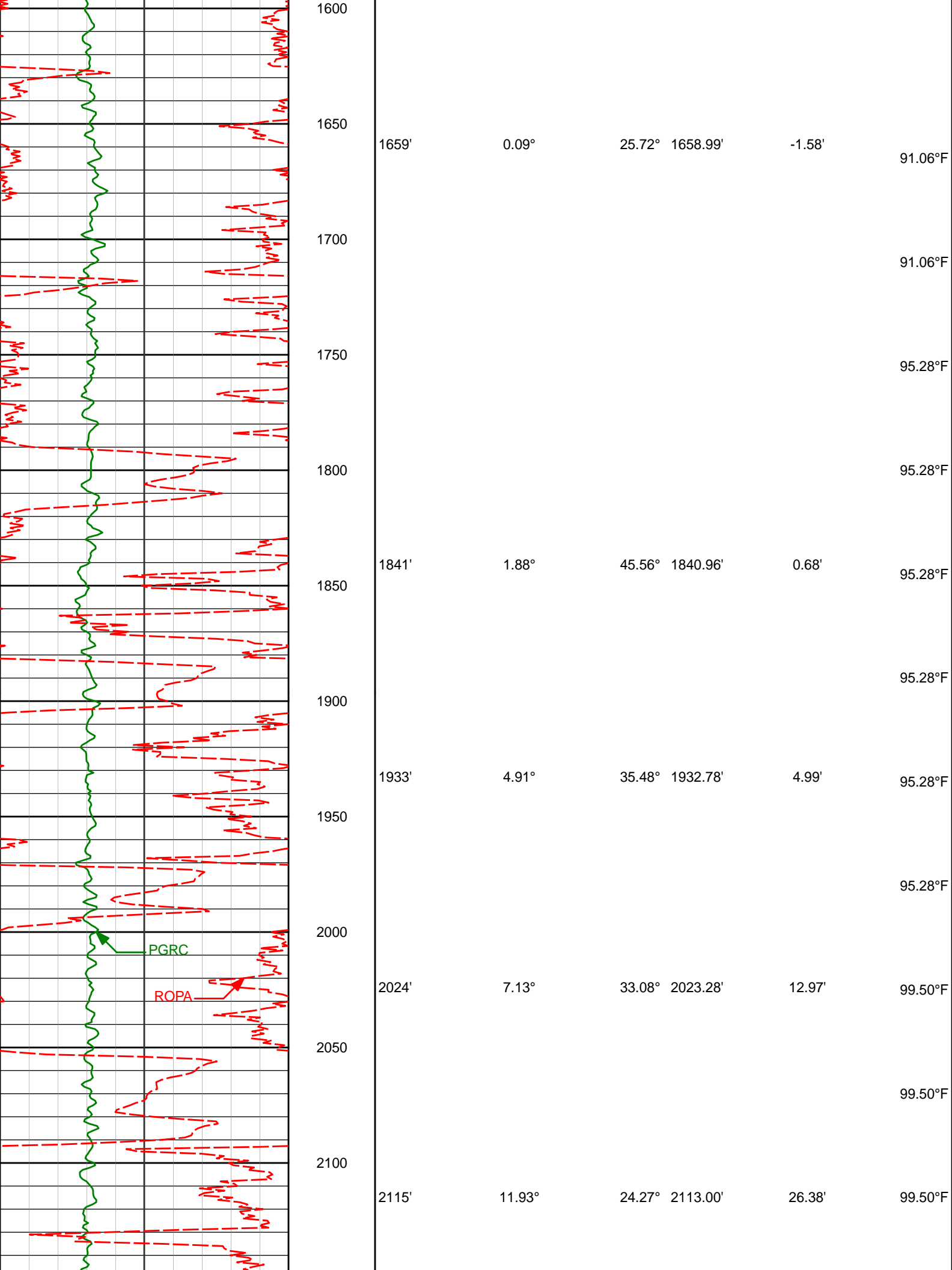
WARRANTY

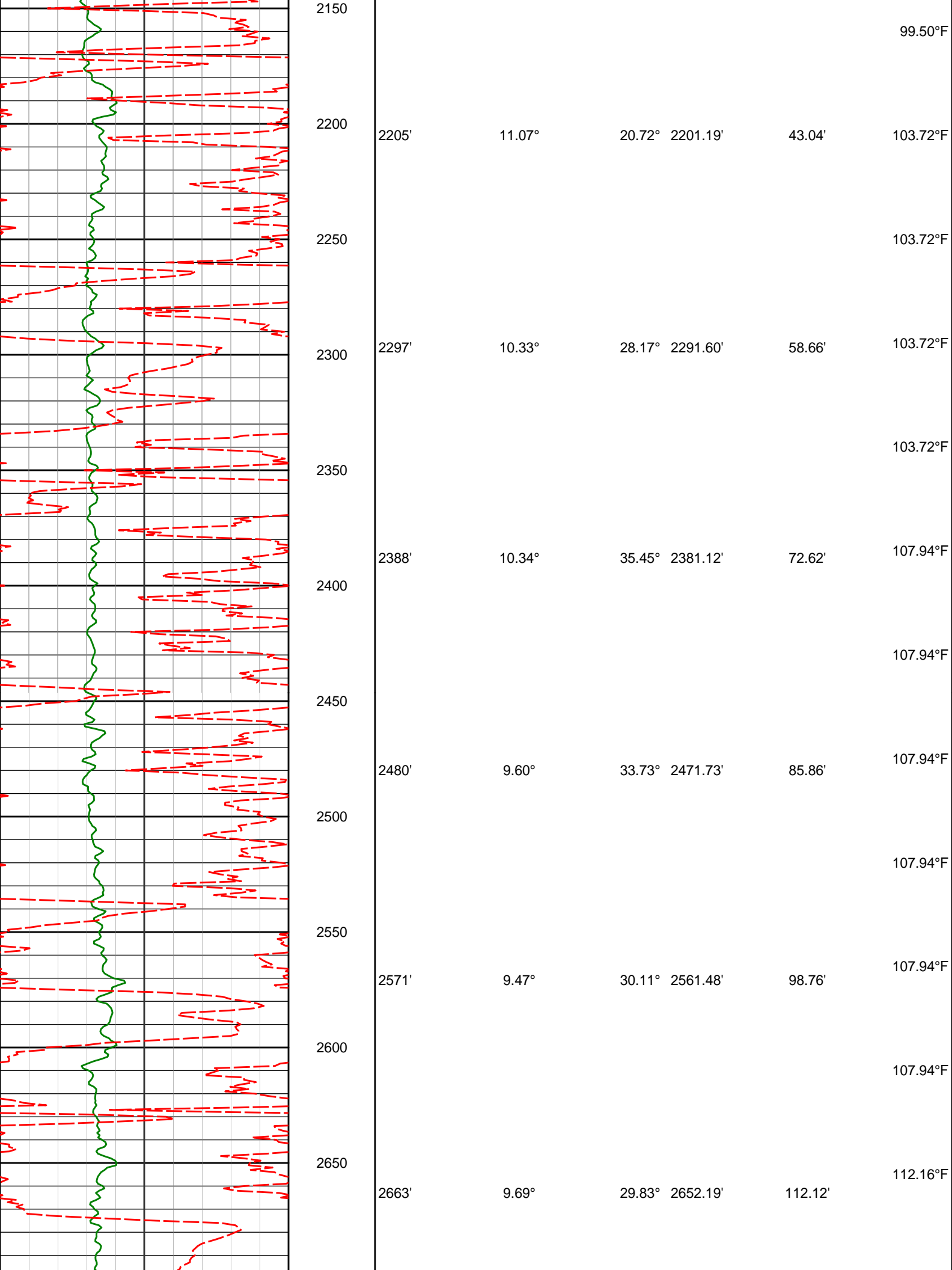
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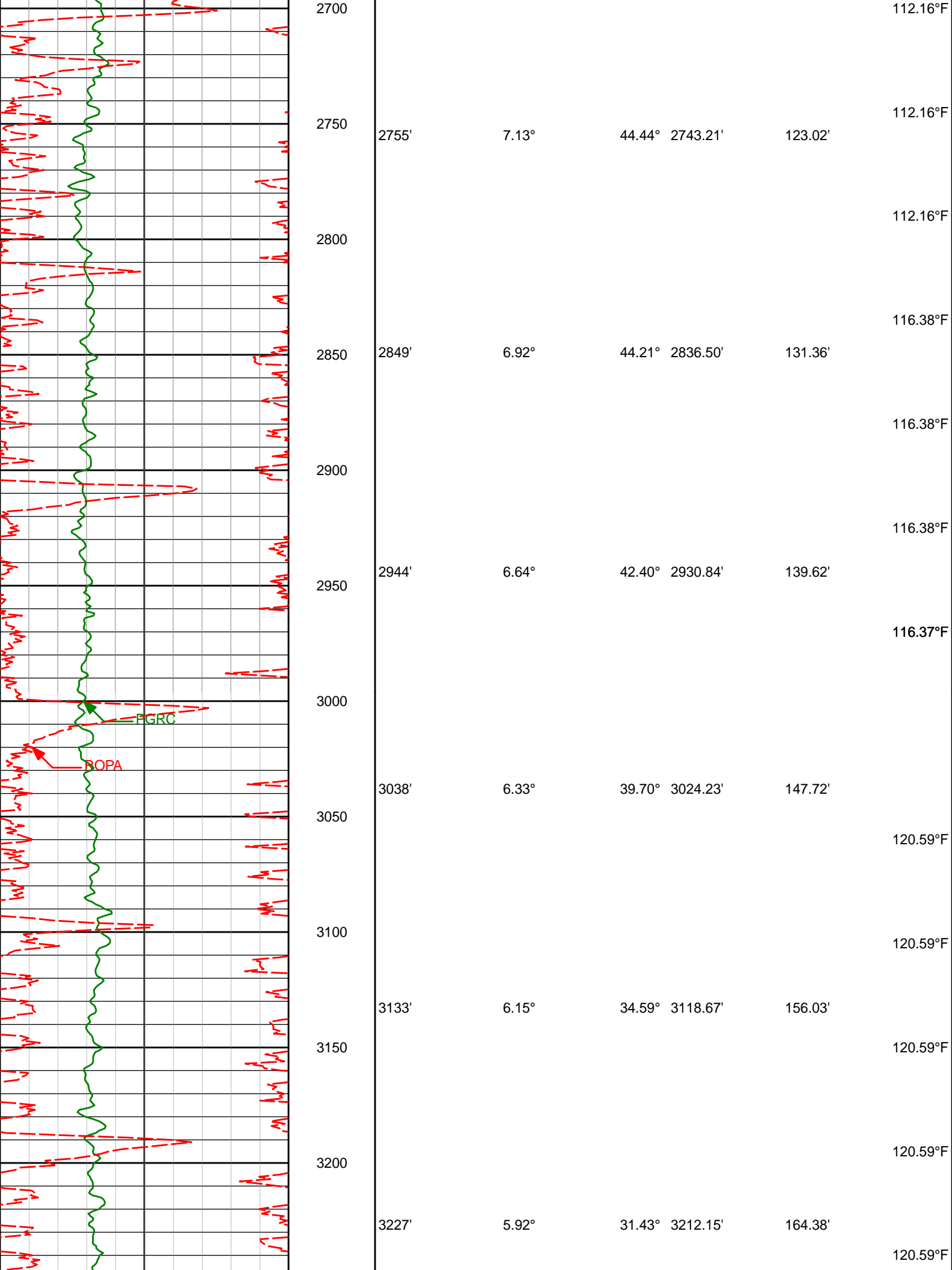
MD Detail 1:600 Scale

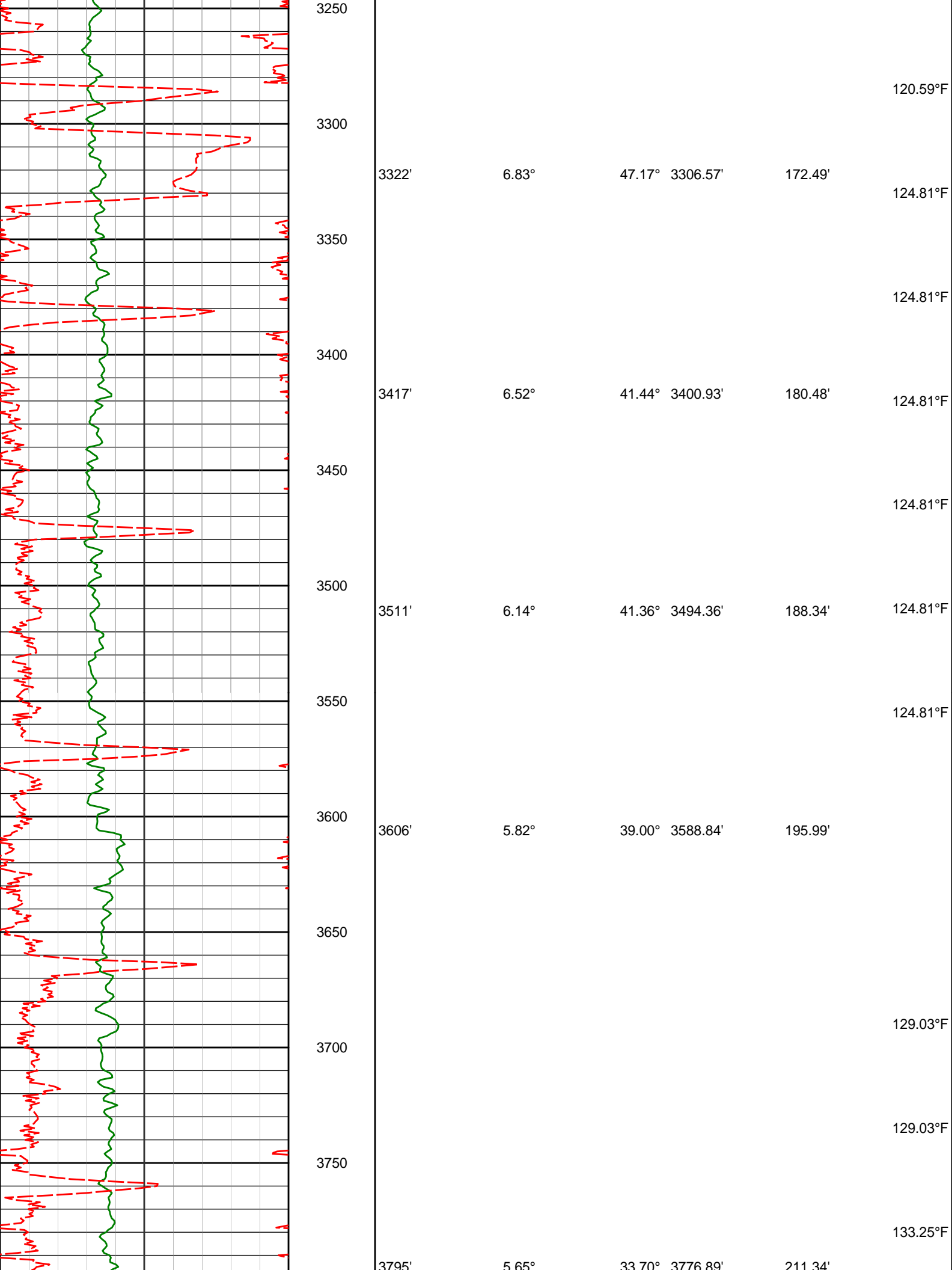


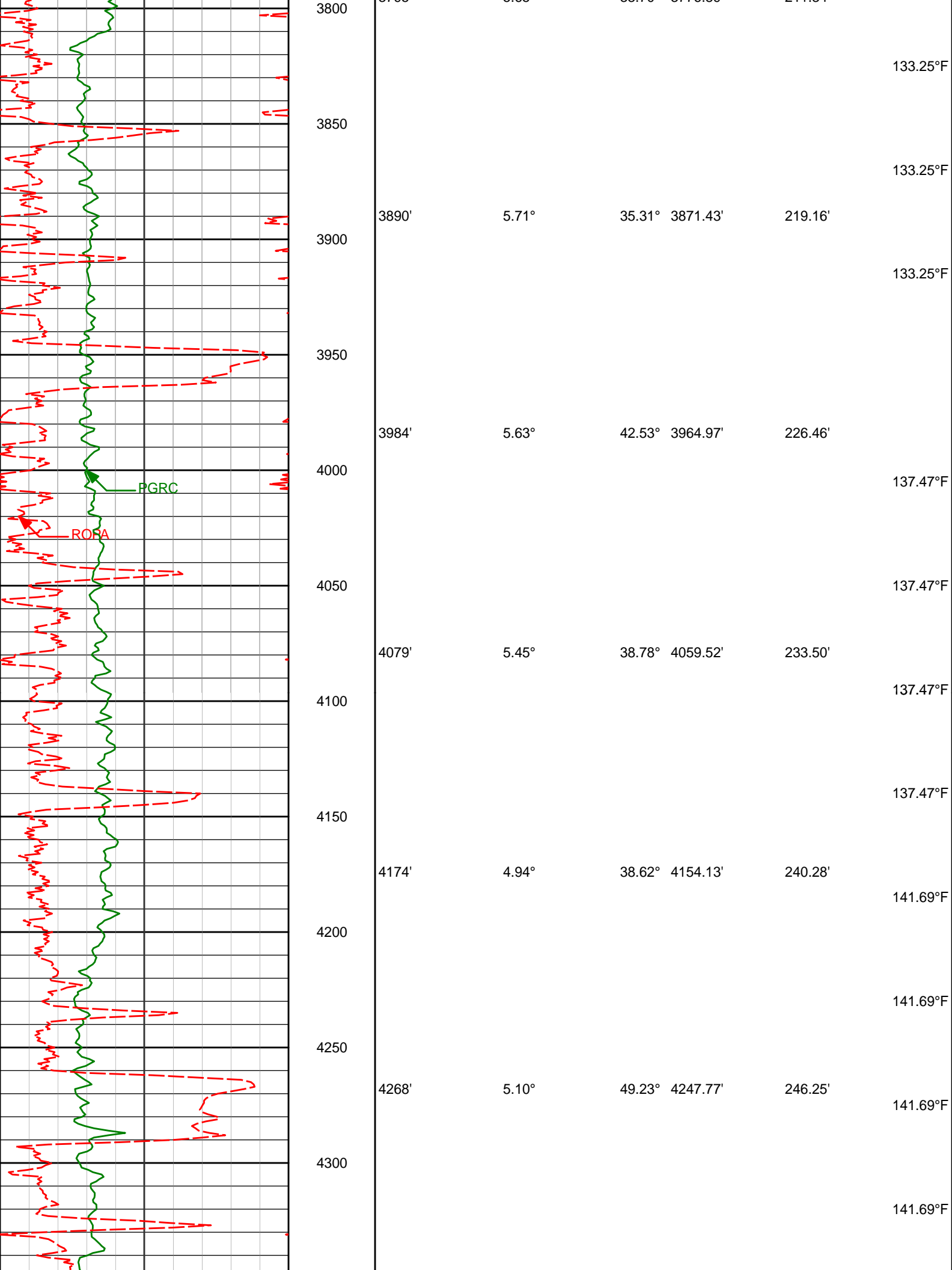


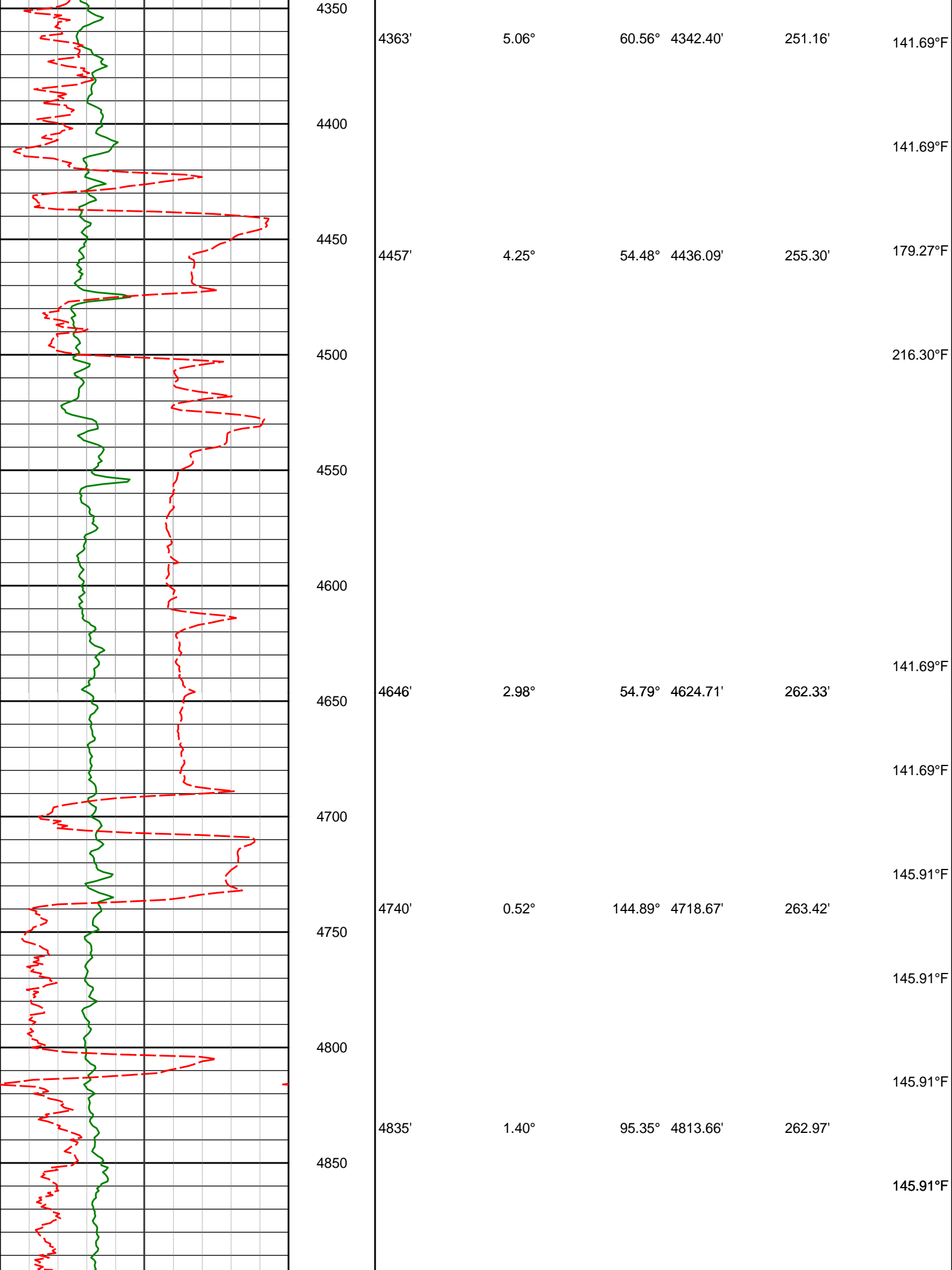


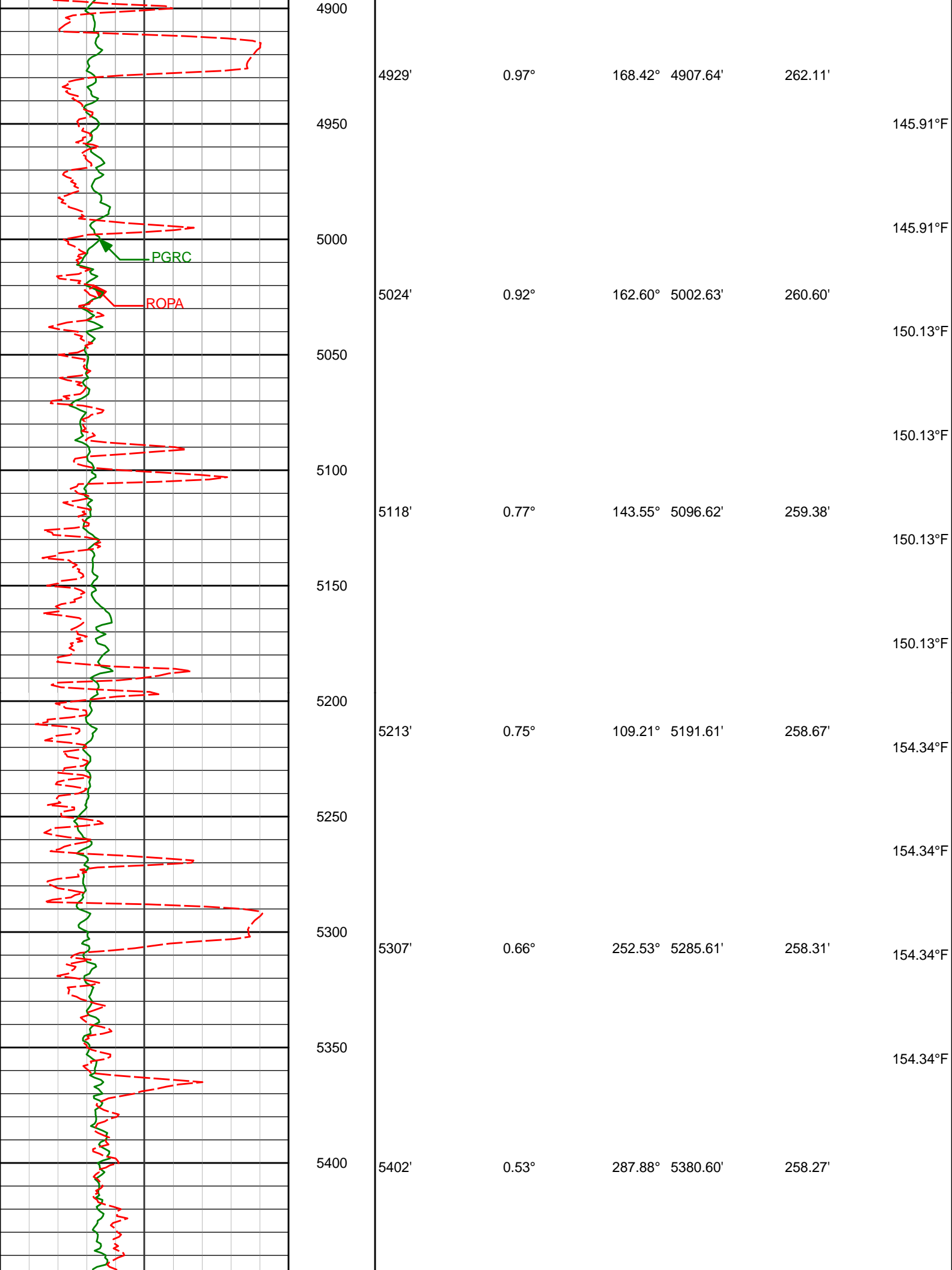


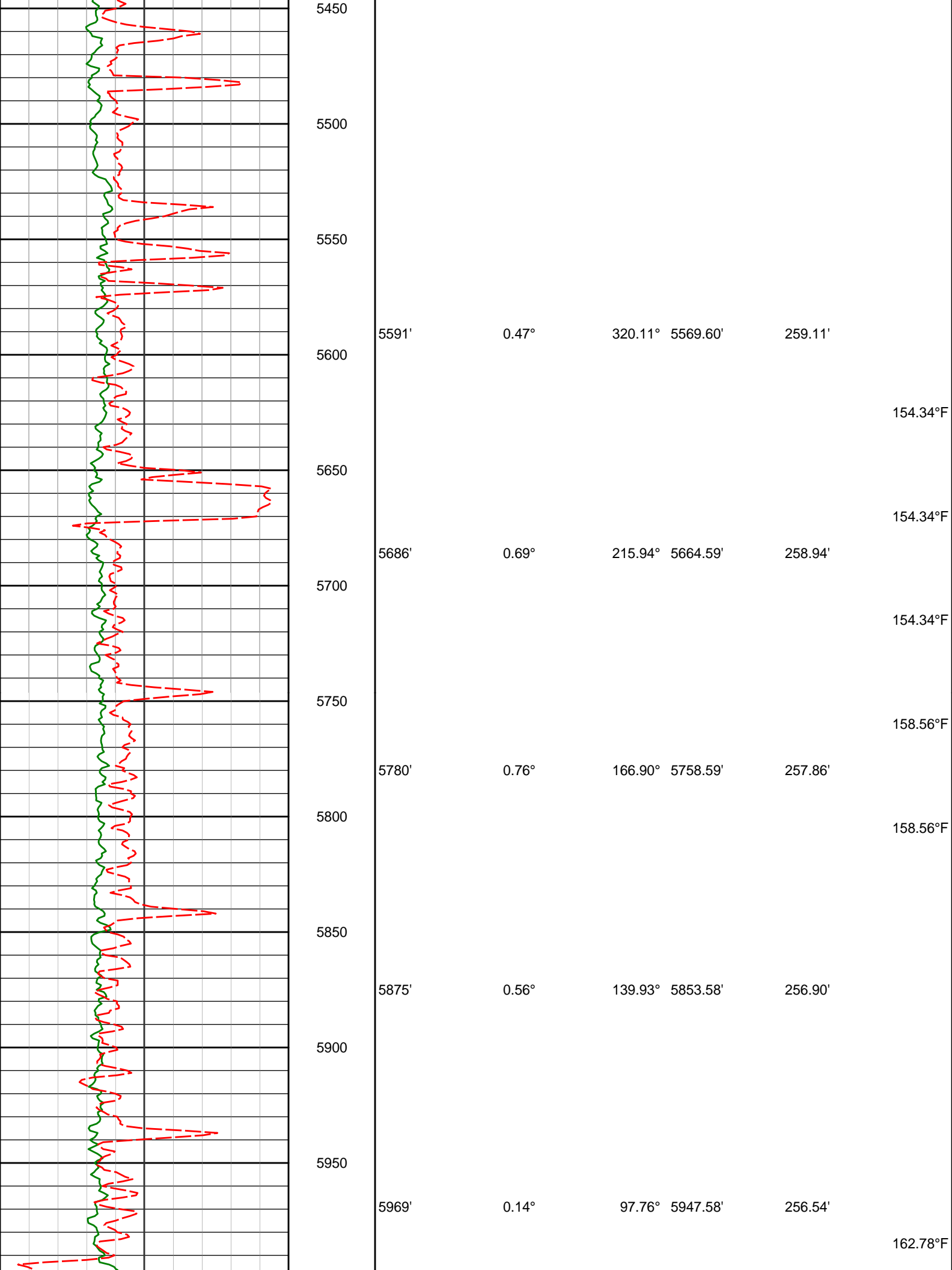


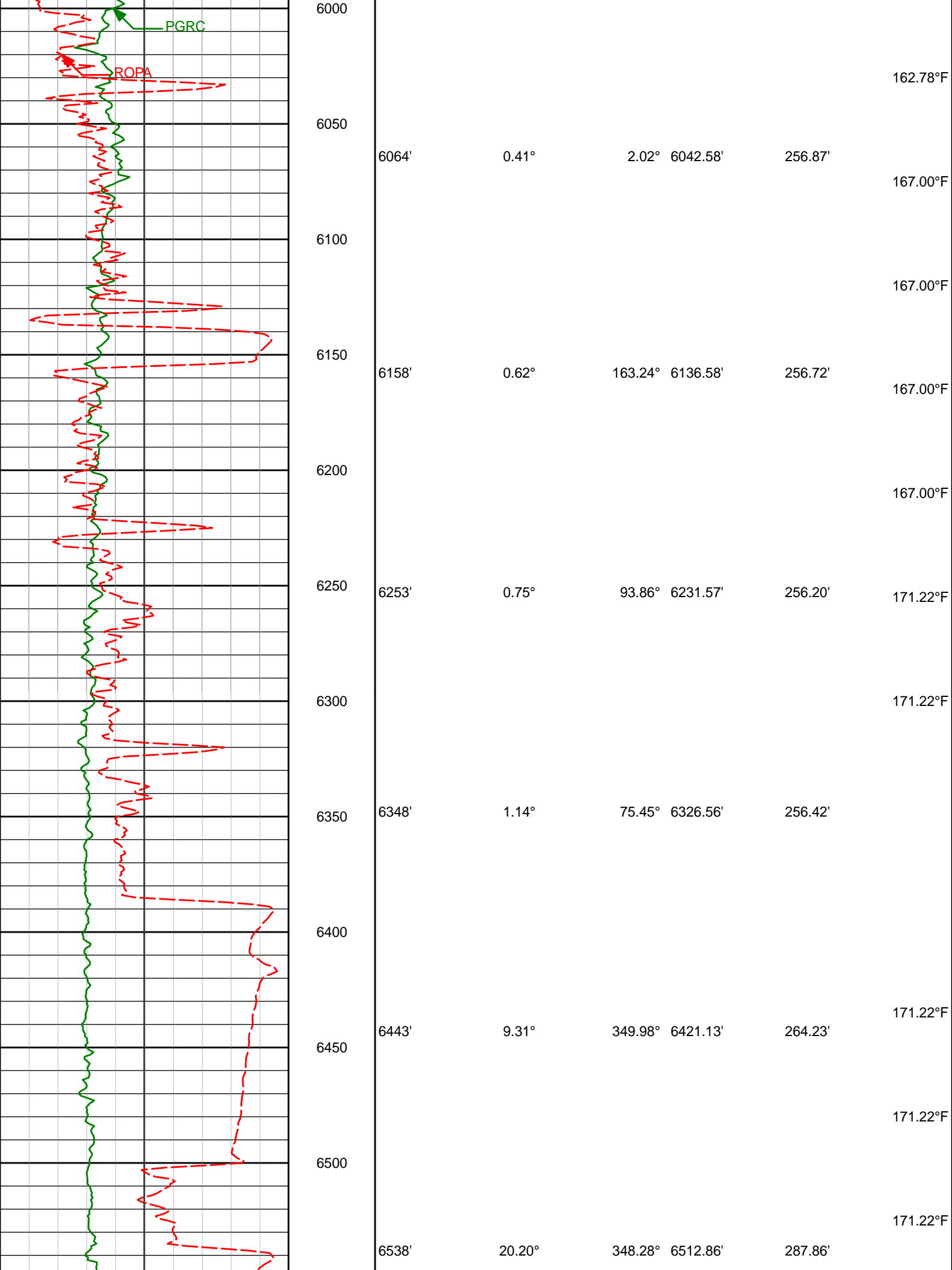


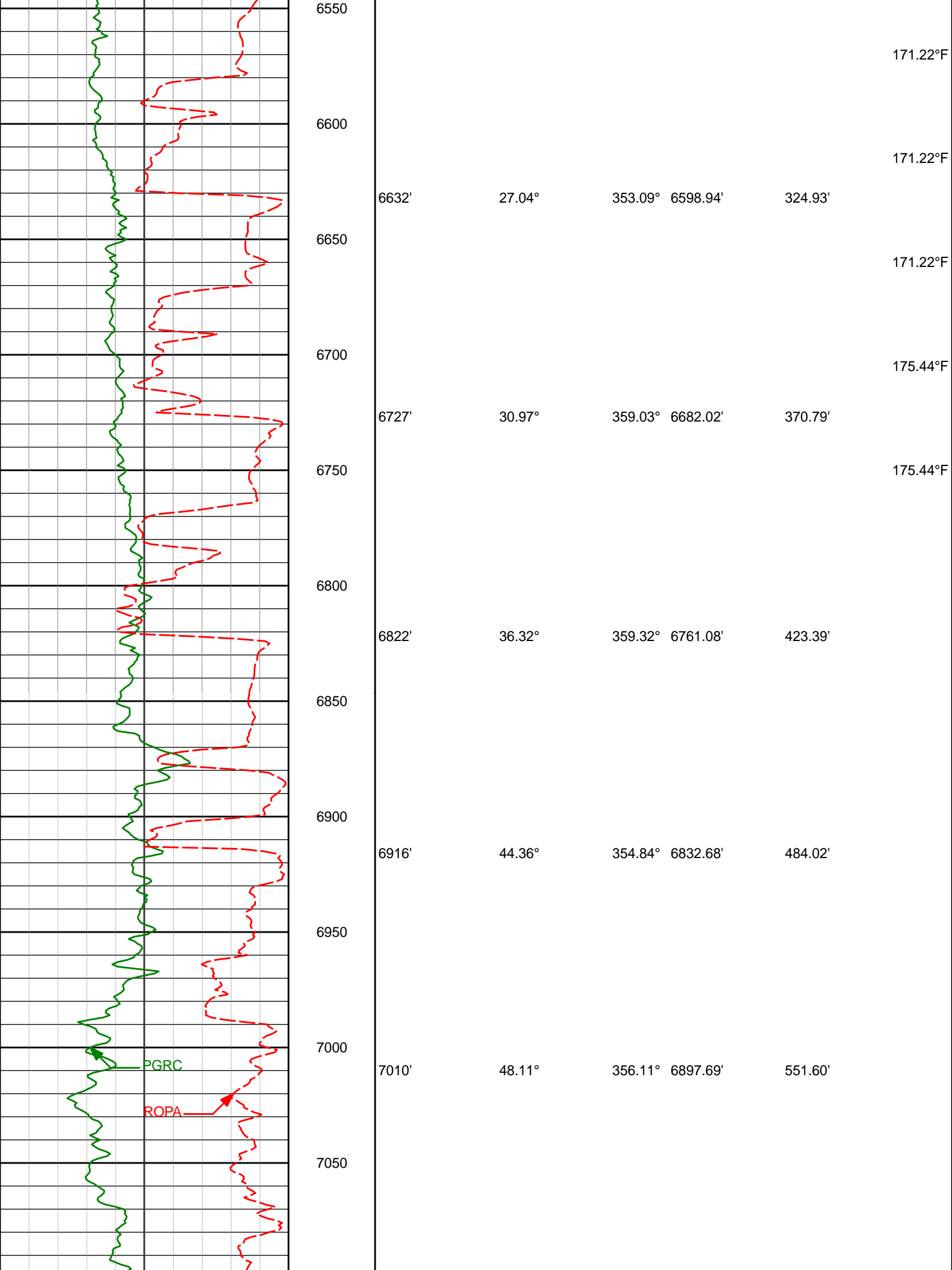


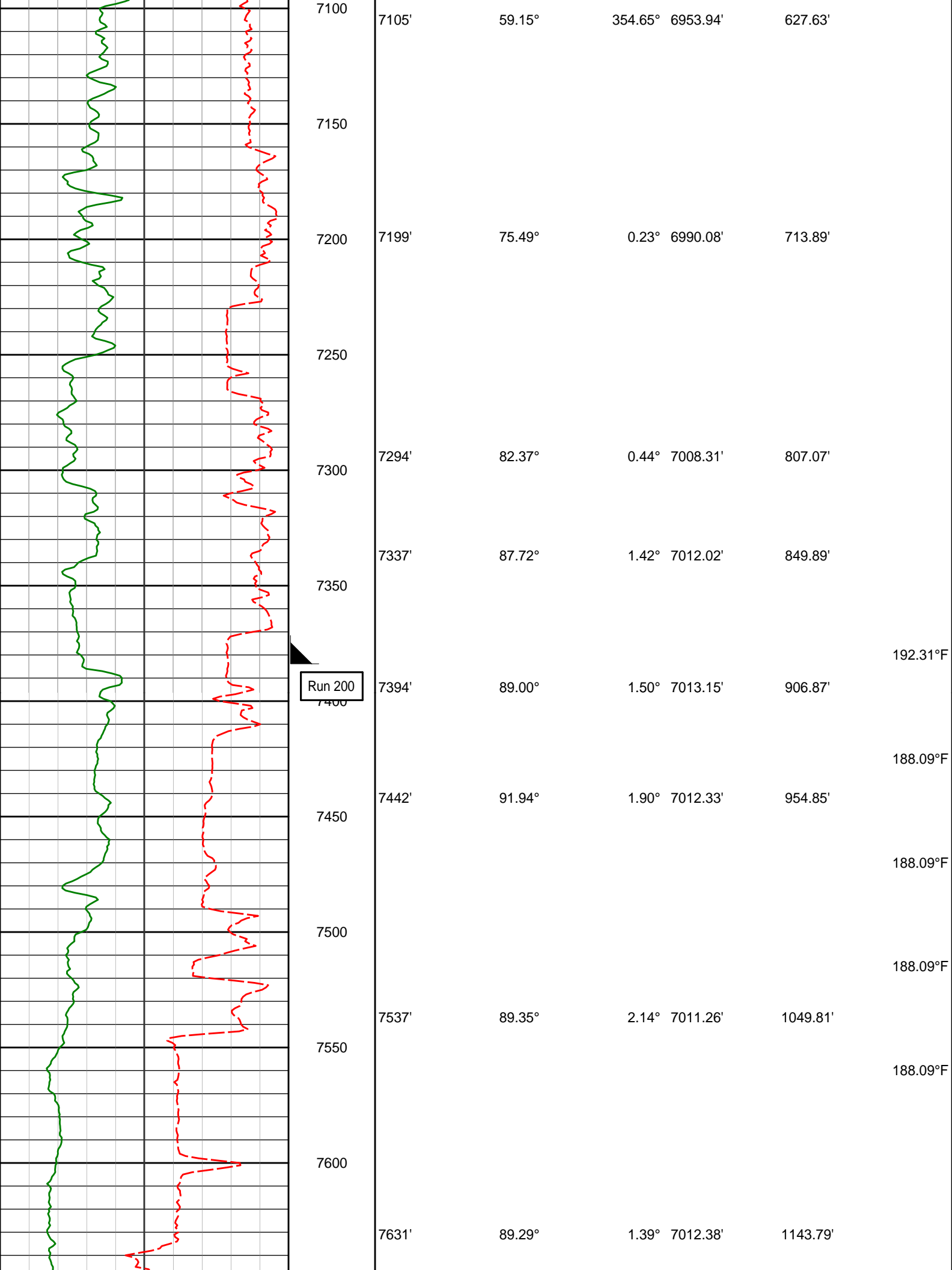


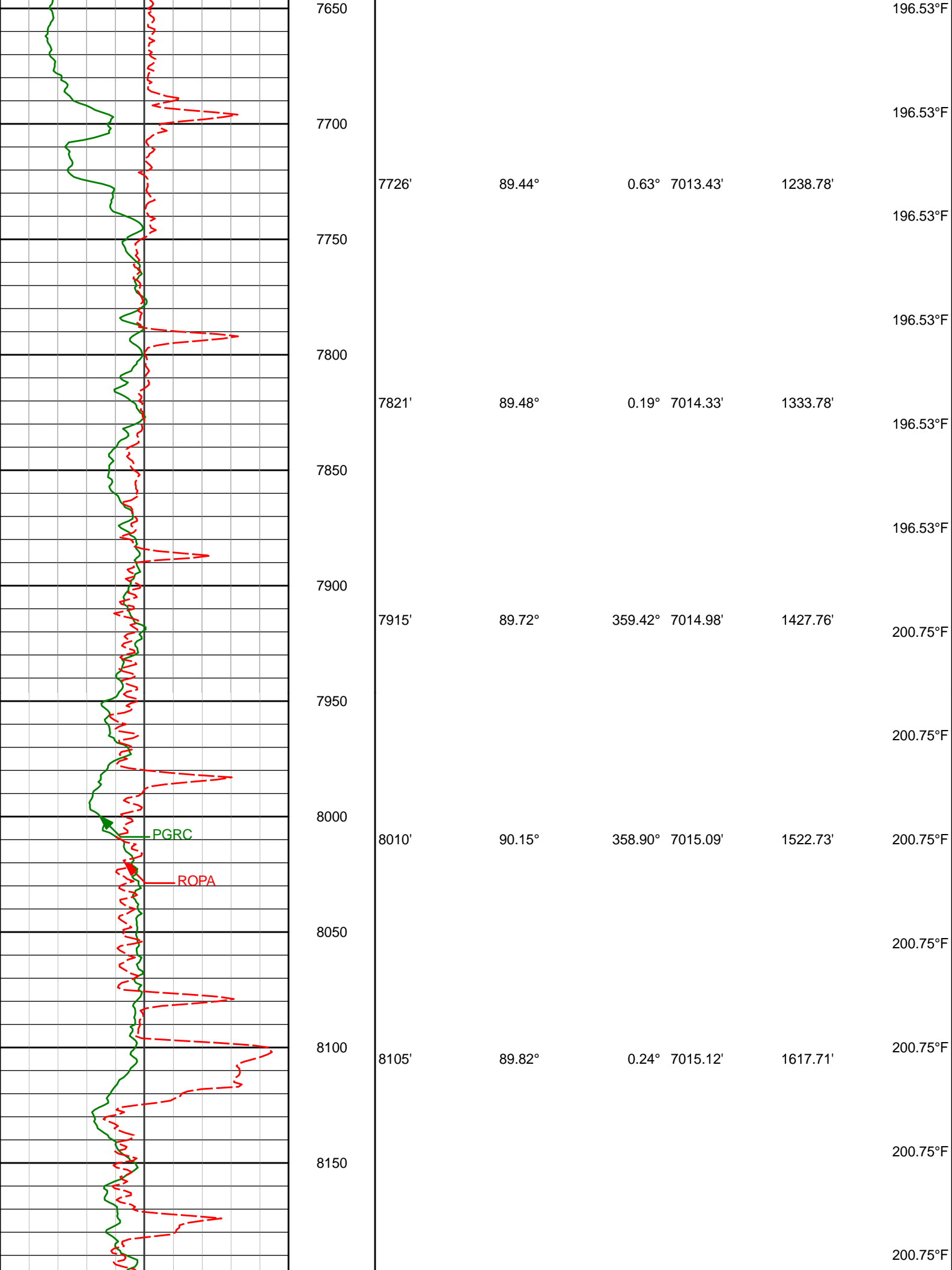


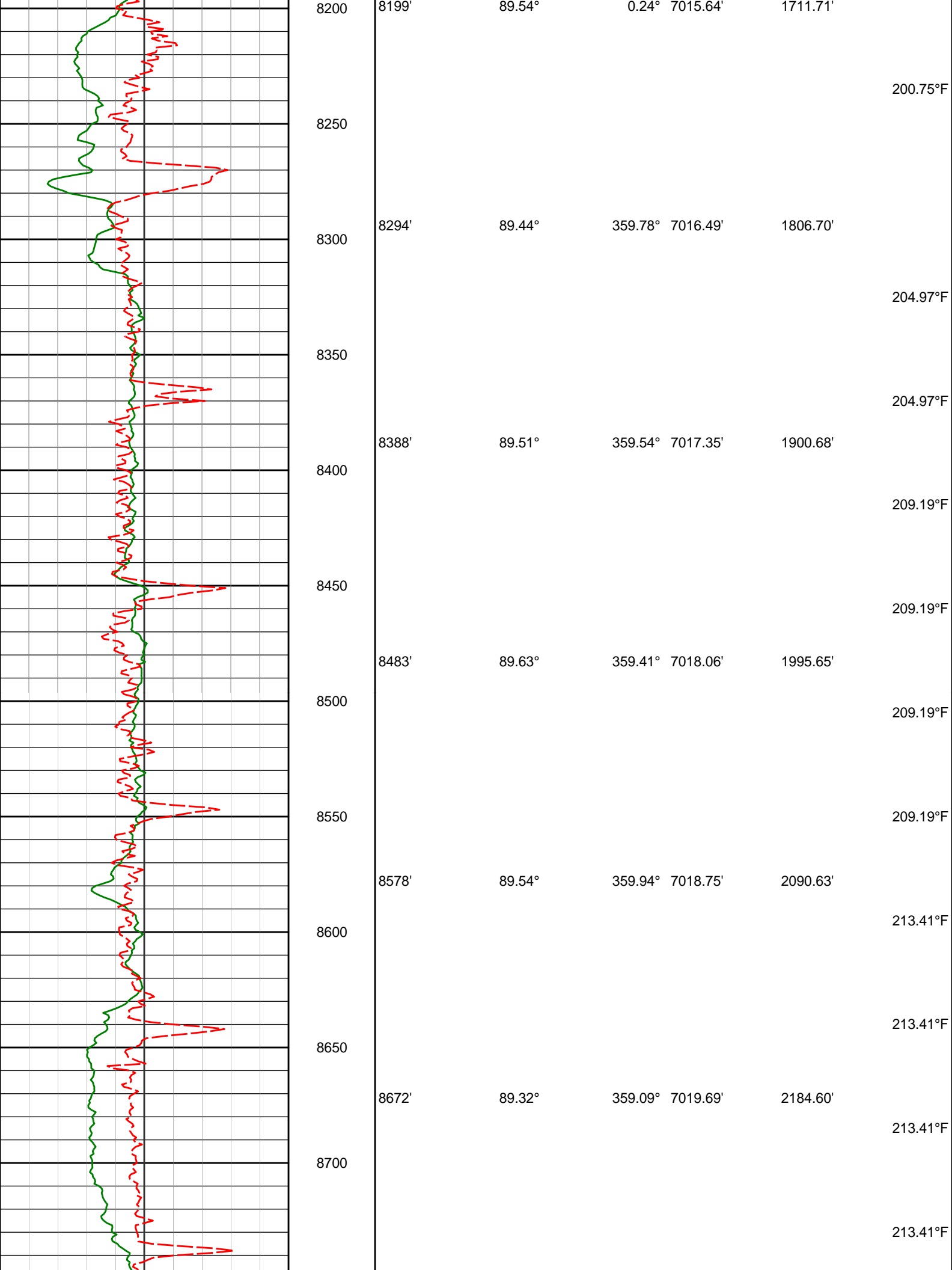


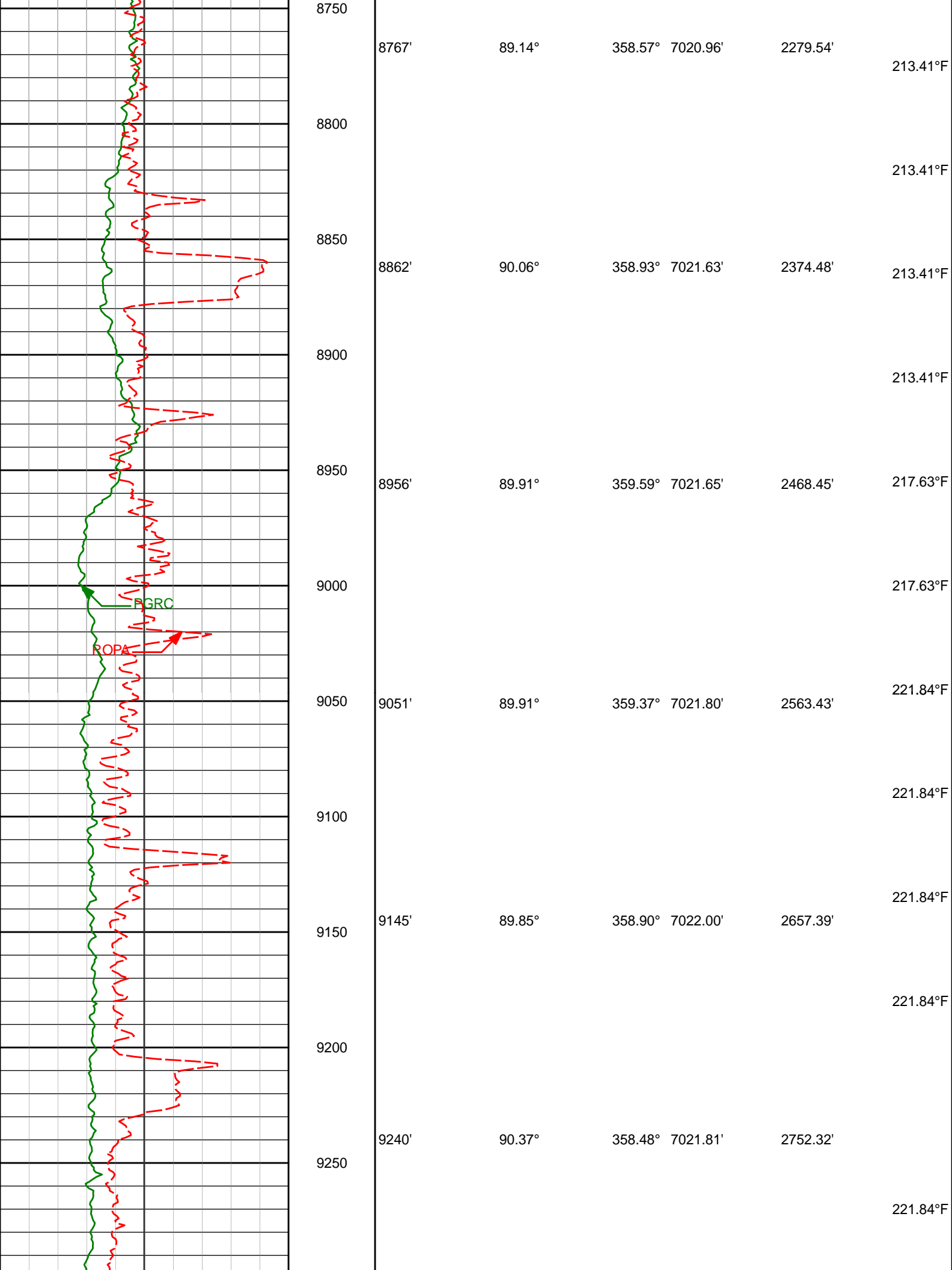


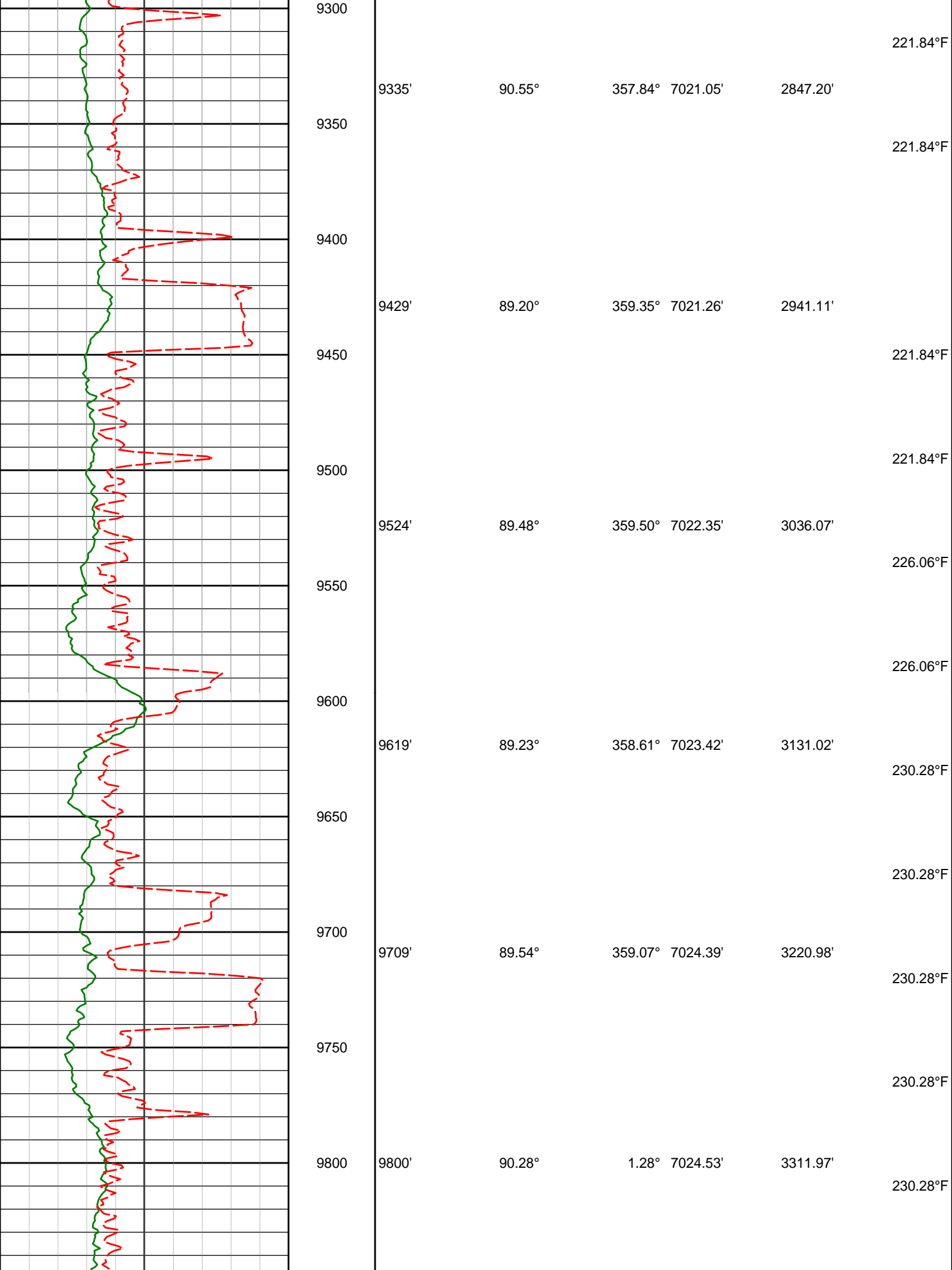


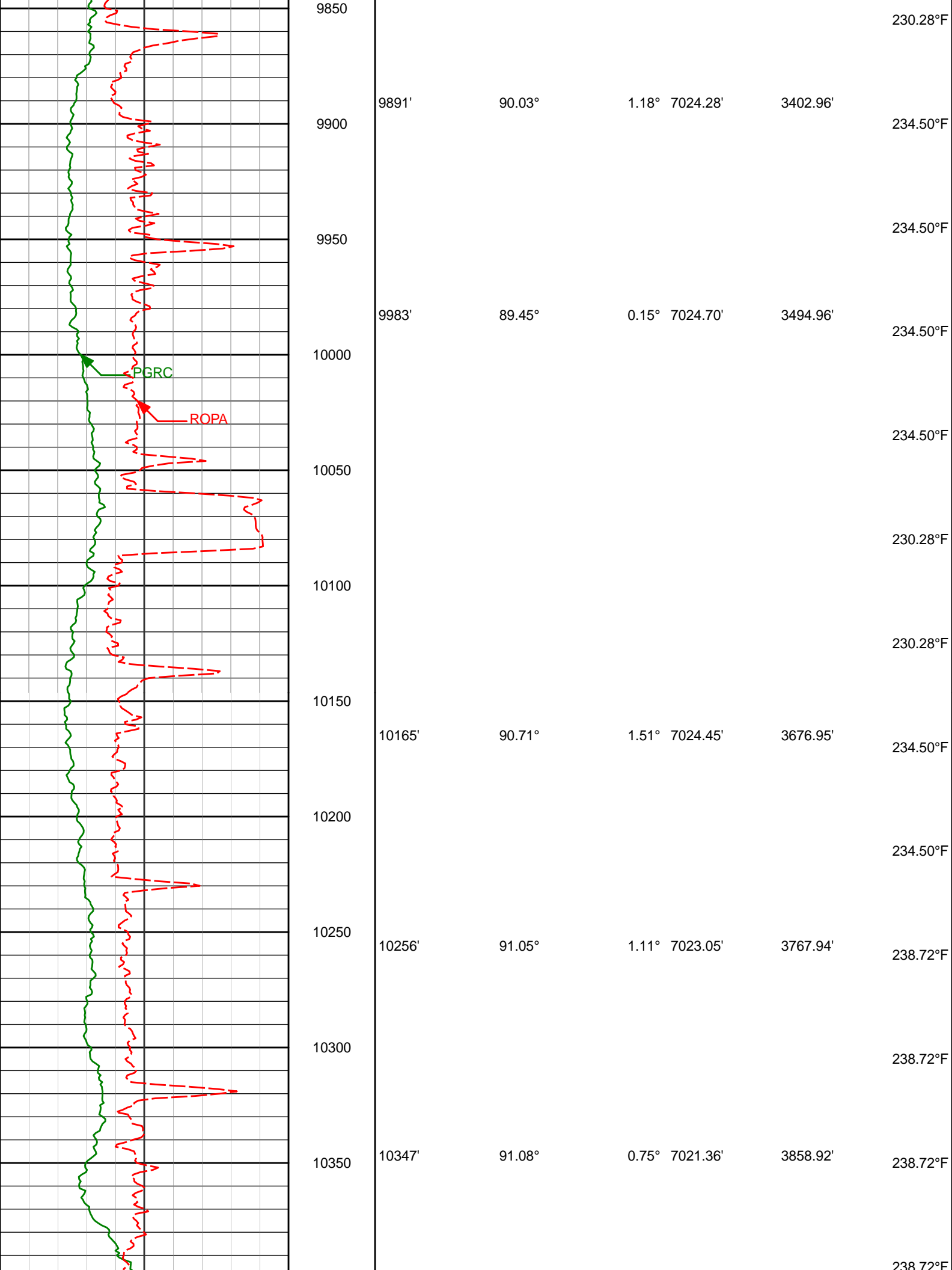


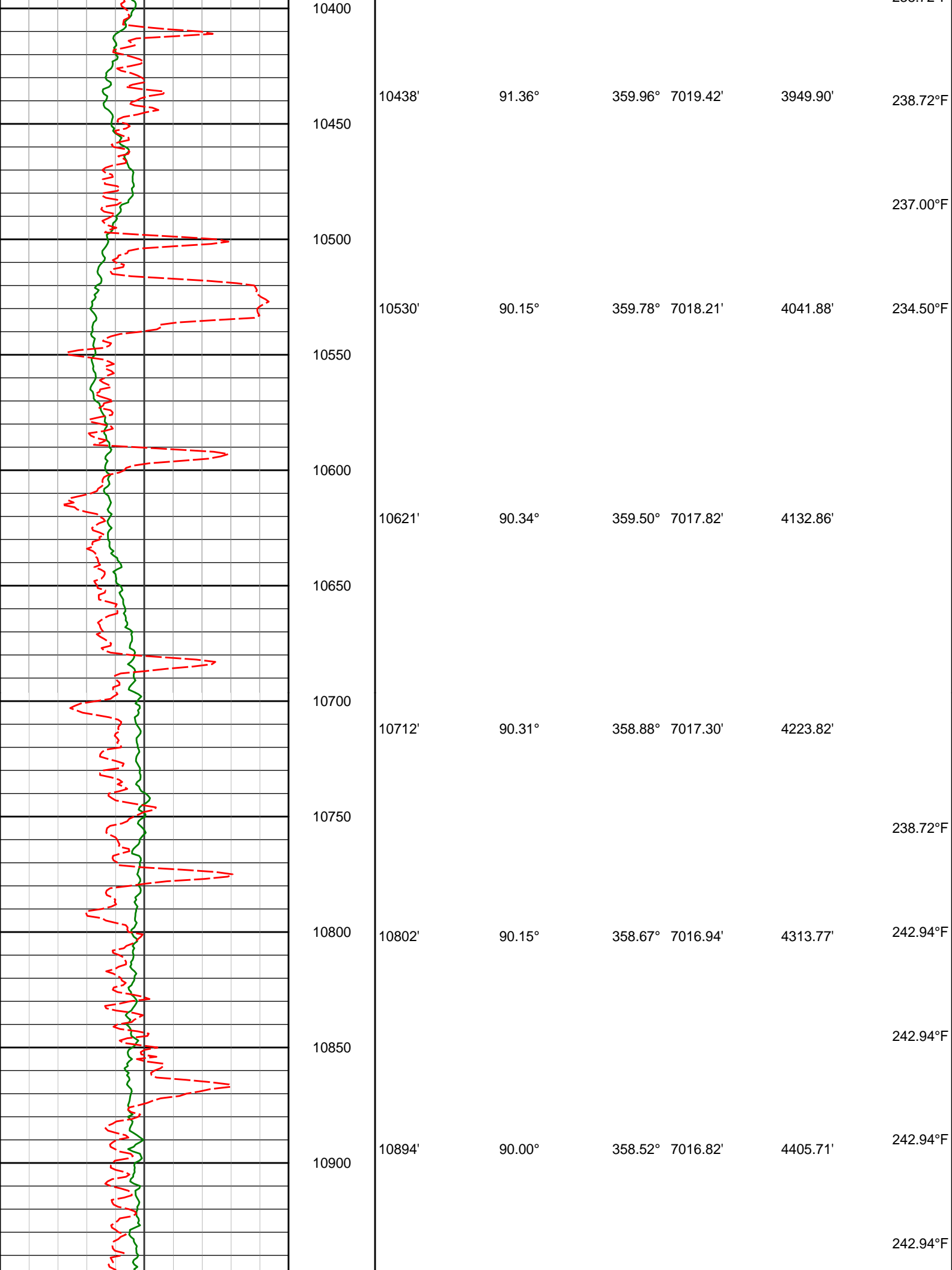


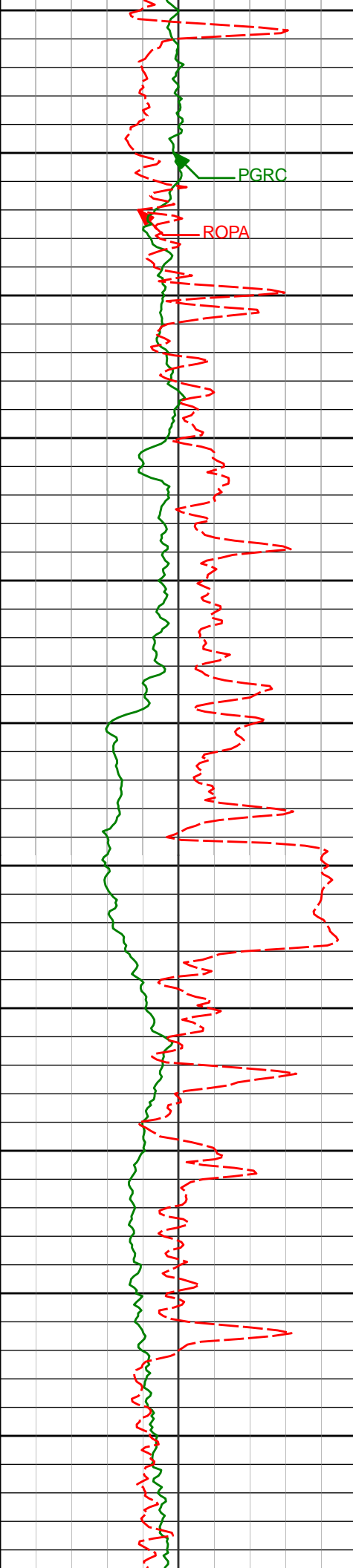




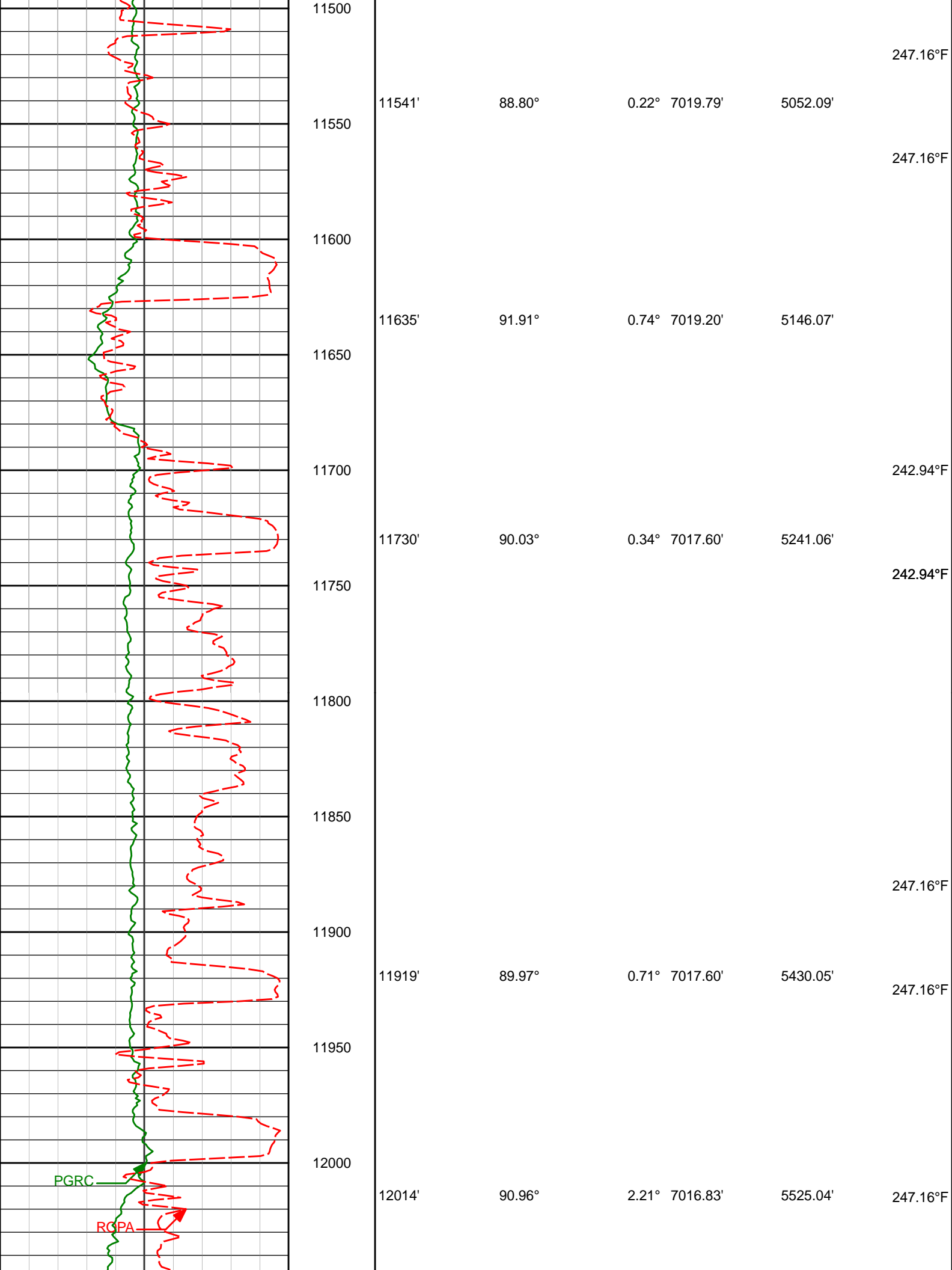


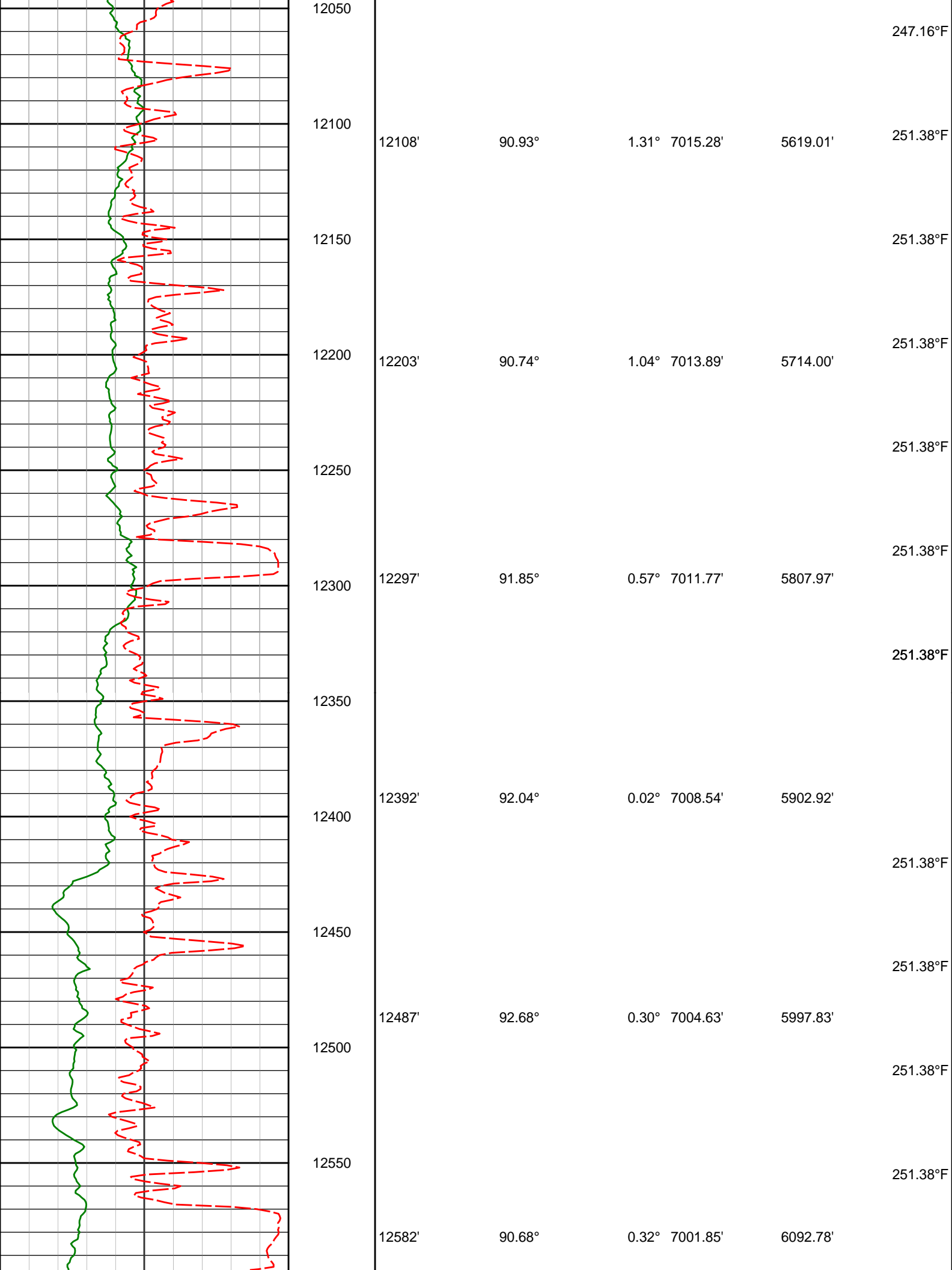


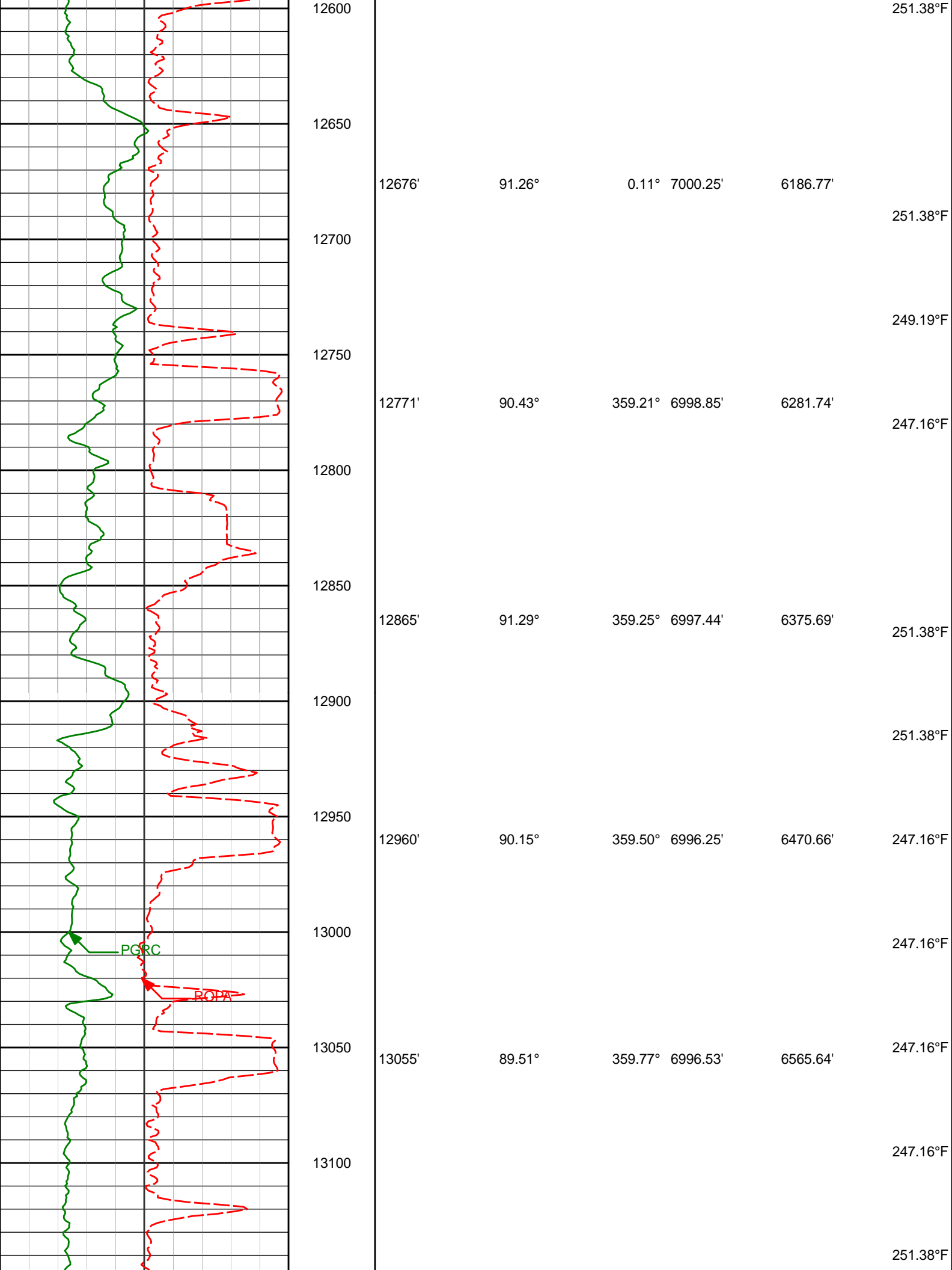


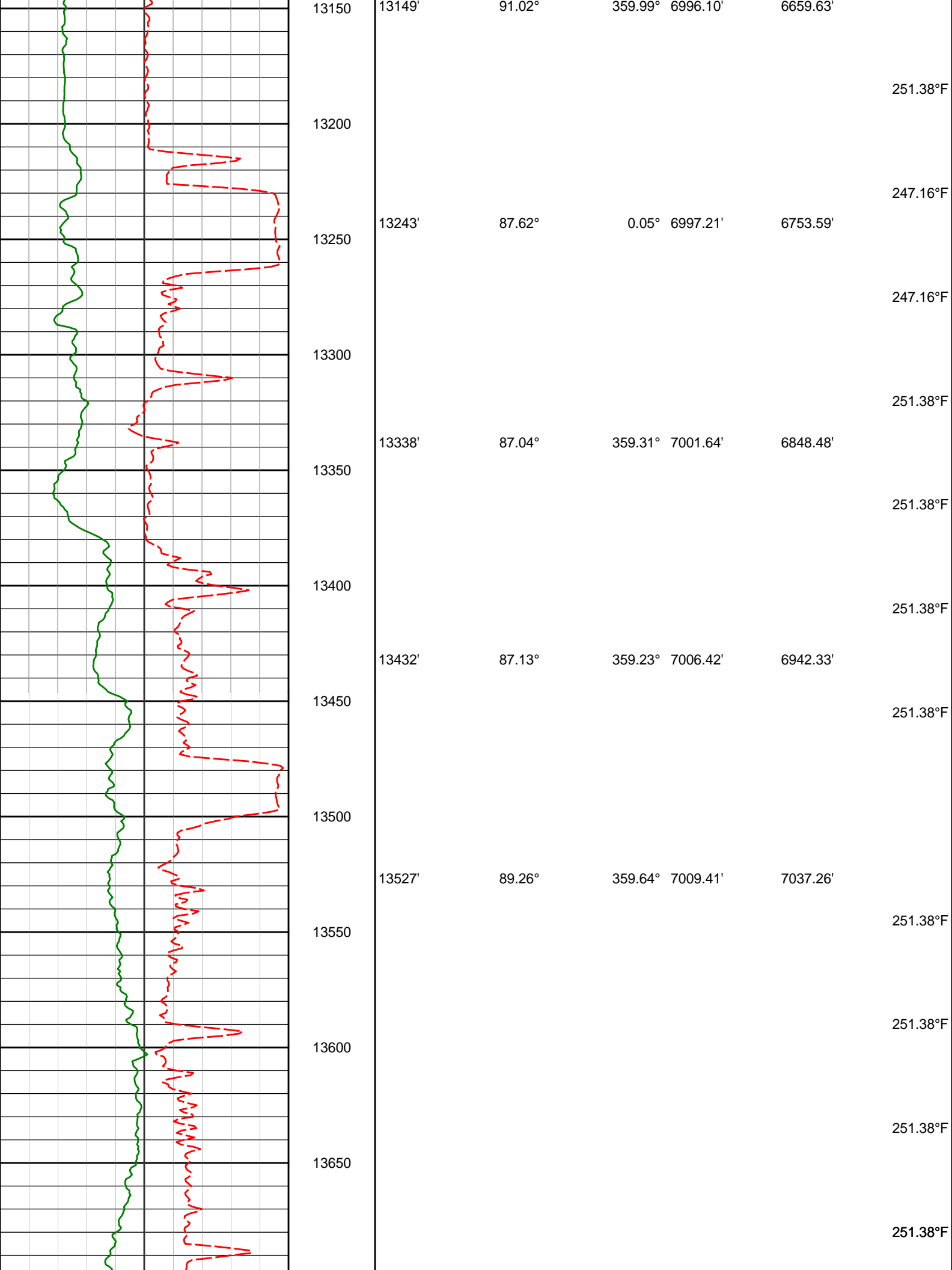


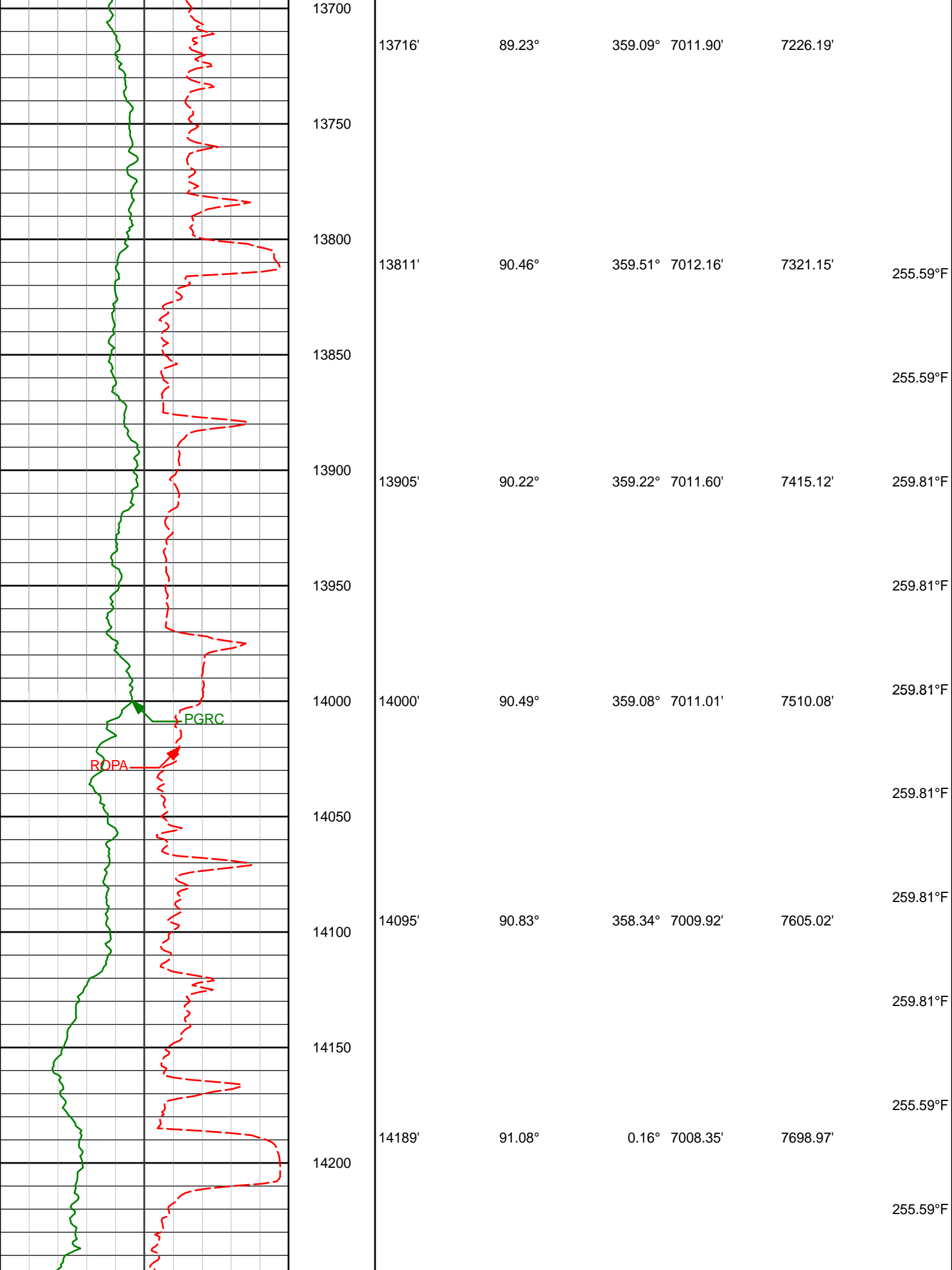
					242.94°F
					242.94°F
					150.13°F
11077'	90.06°	357.62°	7016.73'	4588.48'	
					150.13°F
11168'	90.25°	356.81°	7016.48'	4679.29'	247.16°F
					247.16°F
11260'	89.75°	358.41°	7016.48'	4771.16'	242.94°F
					242.94°F
11352'	89.54°	359.92°	7017.05'	4863.13'	
					247.16°F
					247.16°F

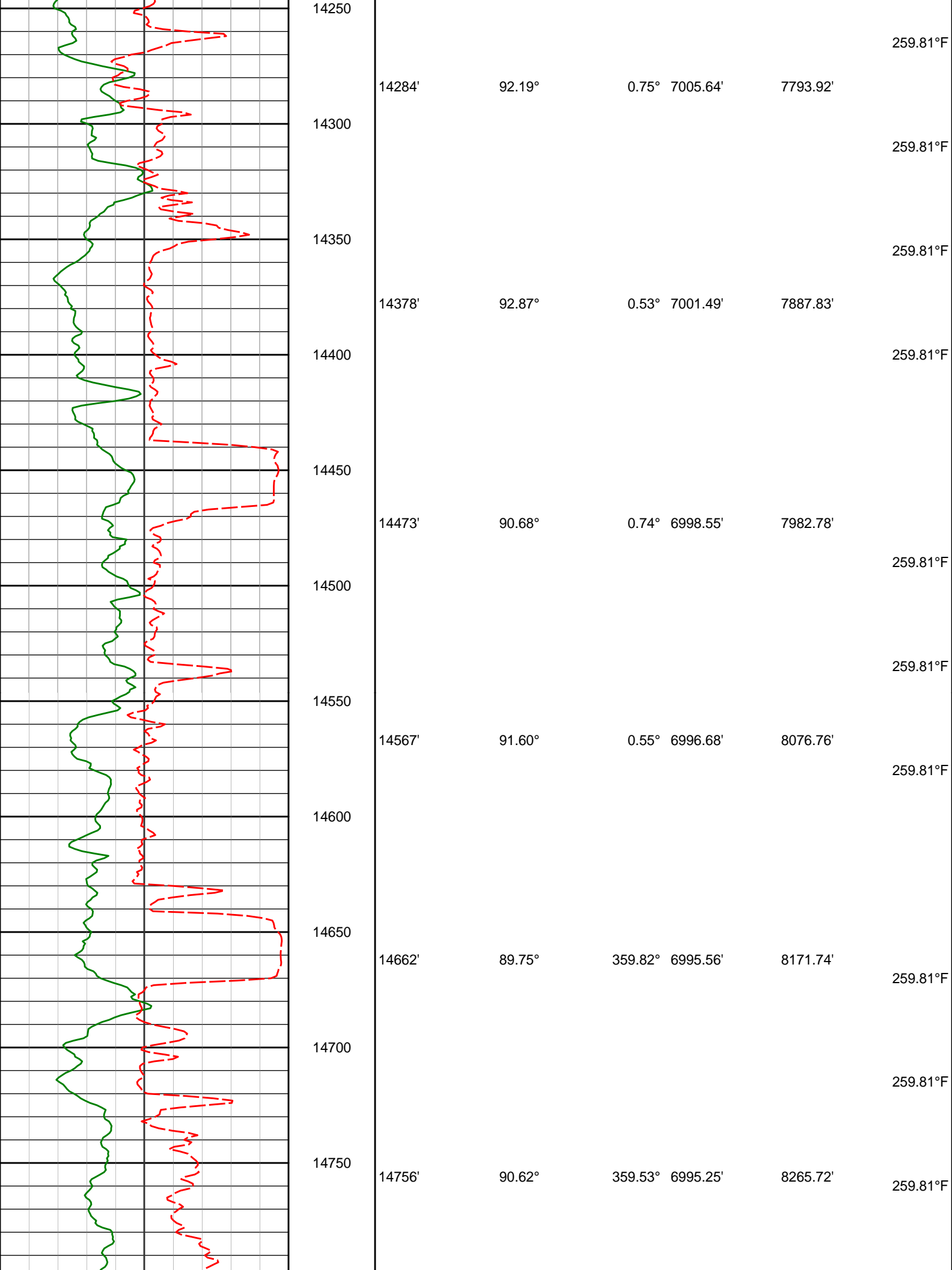


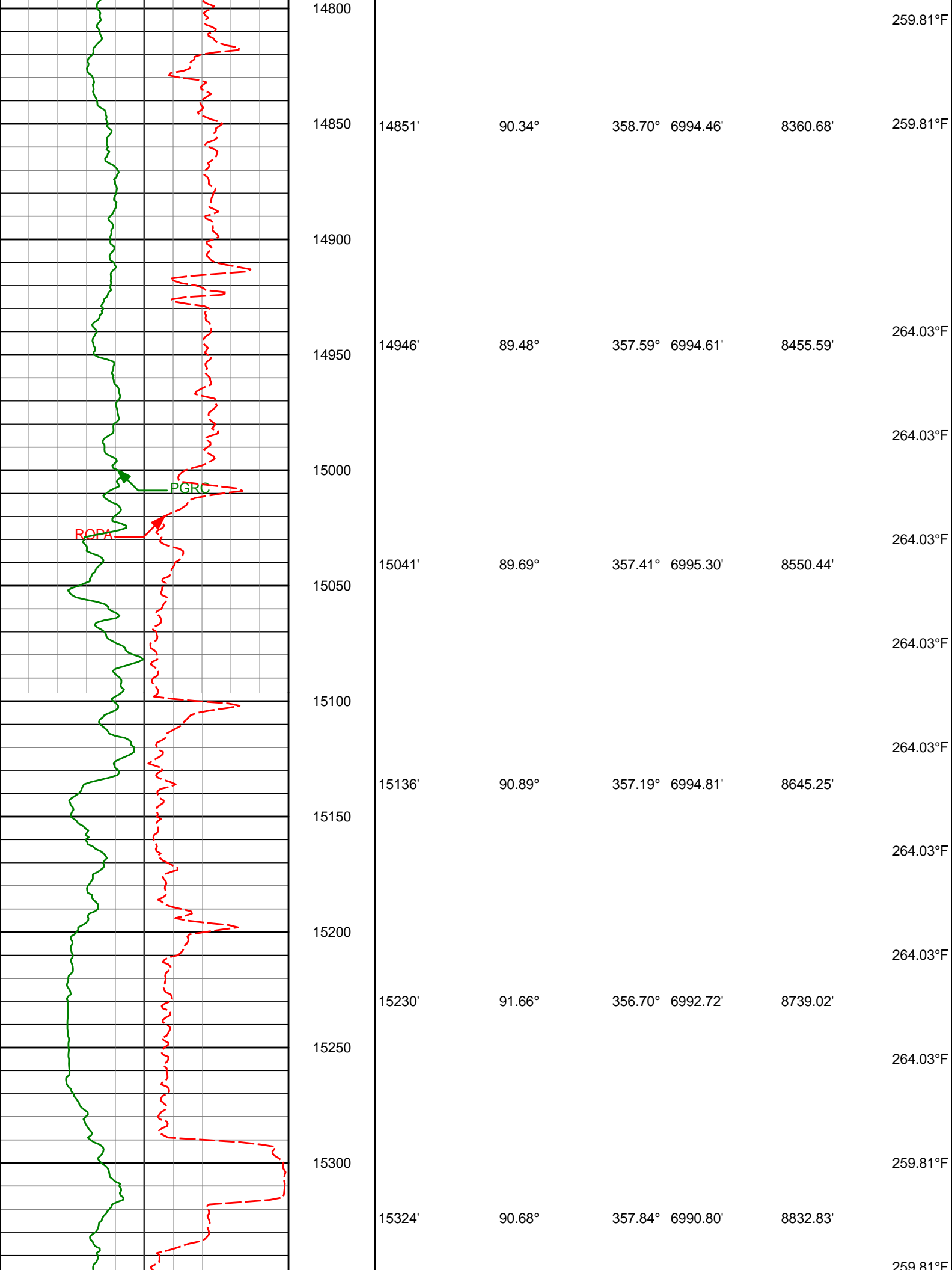


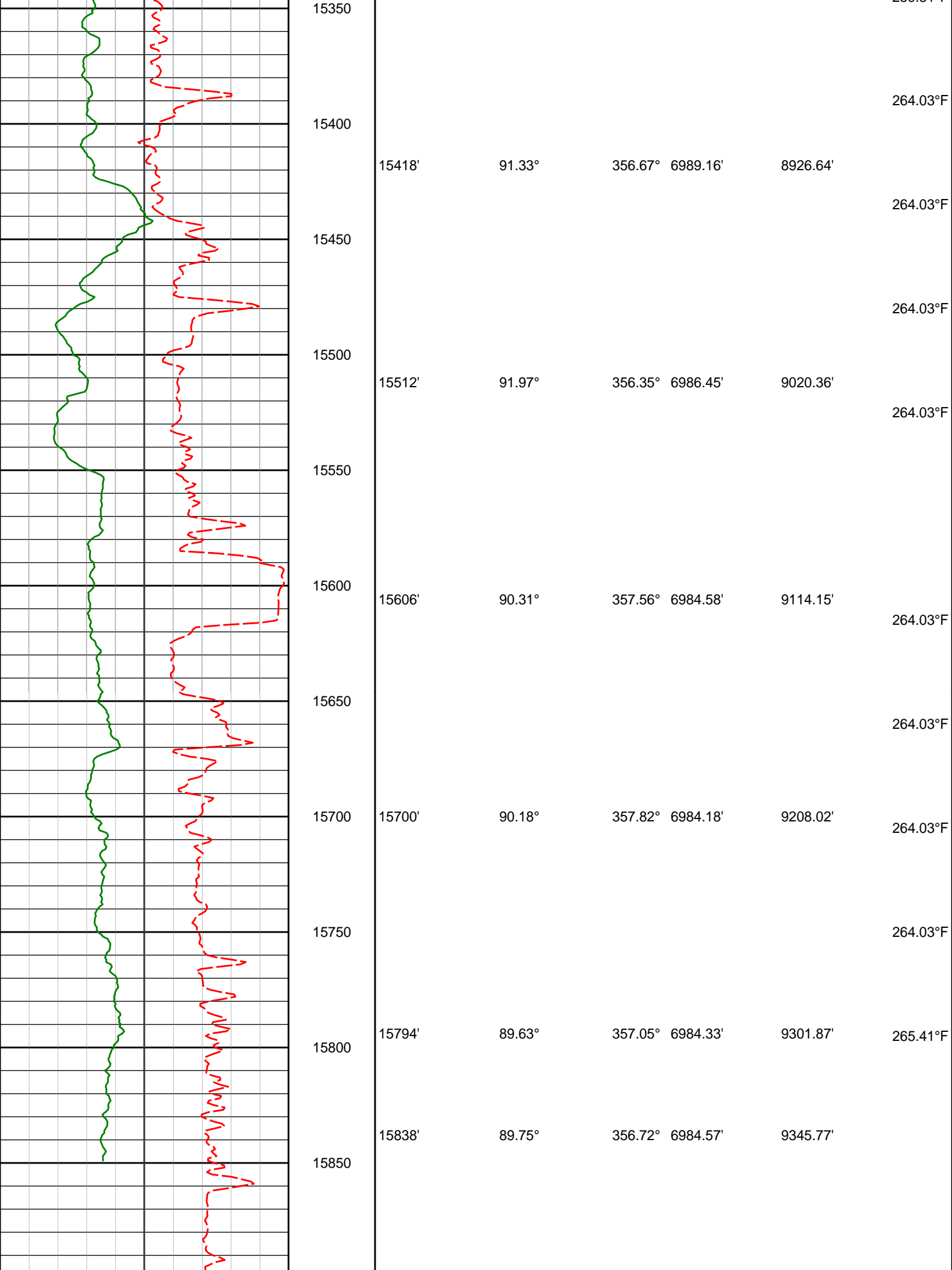


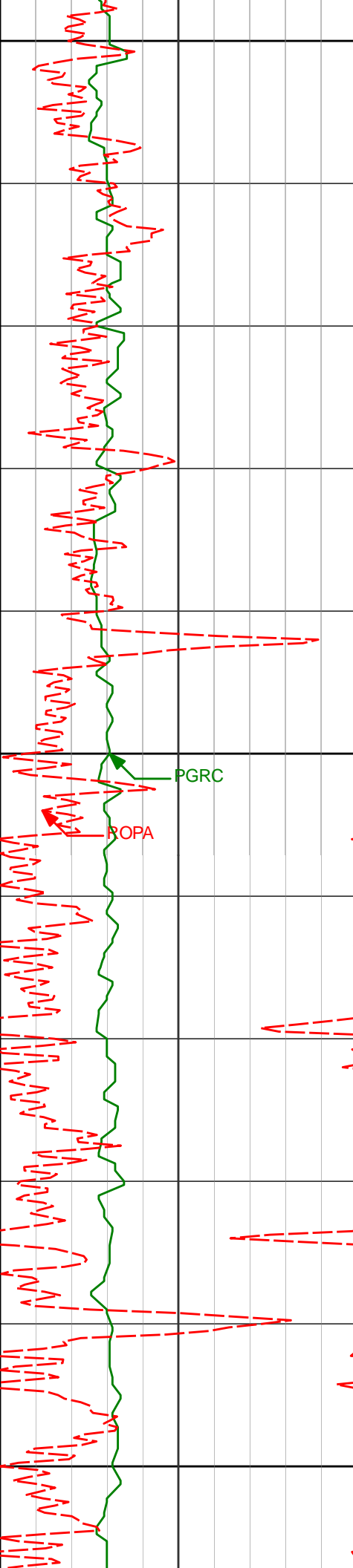












900

927'

0.40°

103.36° 926.99'

-0.71'

106.28°F

109.60°F

1000

PGRC

ROPA

1022'

0.25°

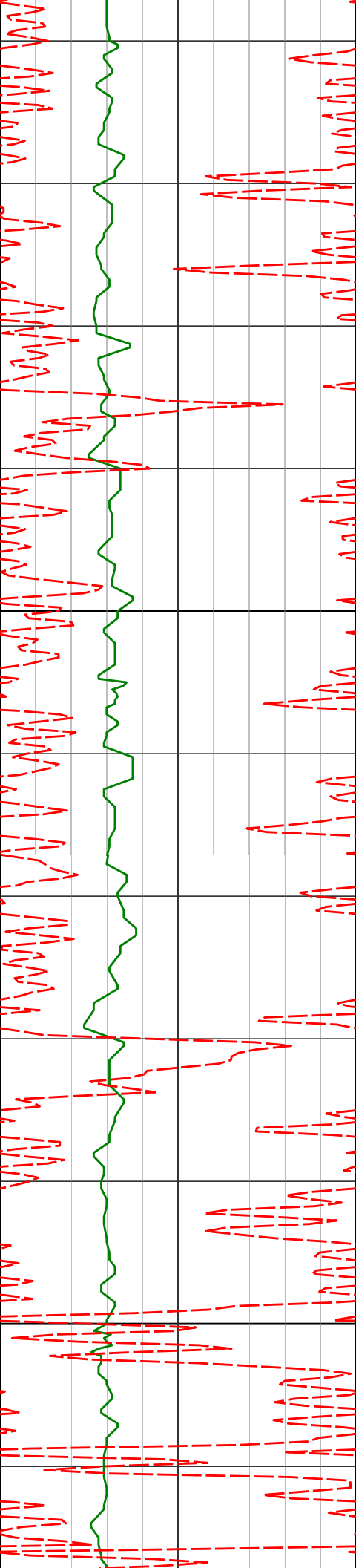
117.52° 1021.99'

-0.87'

82.62°F

82.62°F

1100



1200

1203'

0.12°

185.24° 1202.99'

-1.25'

1300

1294'

0.12°

193.73° 1293.99'

-1.44'

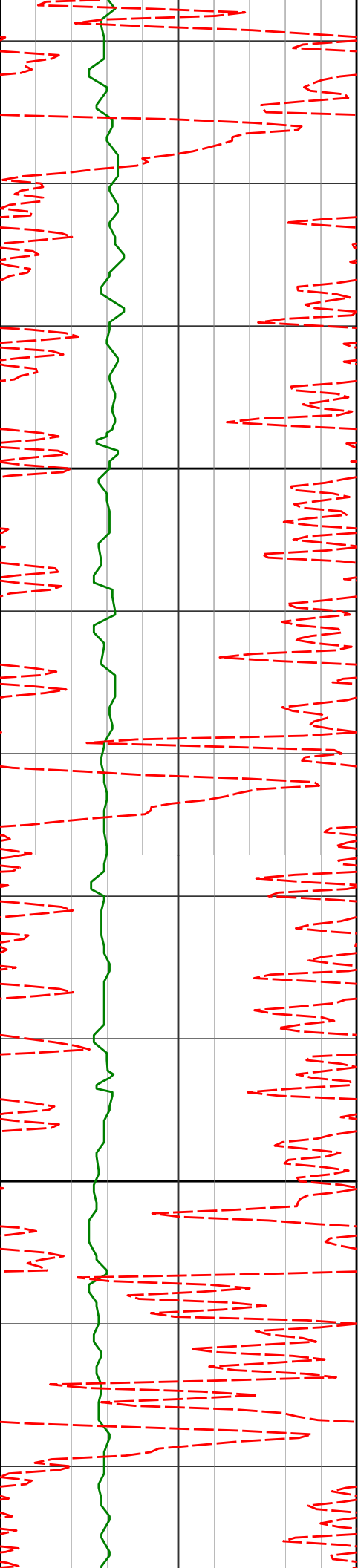
82.62°F

82.62°F

86.84°F

86.84°F

86.84°F



1386'

0.04°

173.61° 1385.99'

-1.57'

1400

1476'

0.06°

200.50° 1475.99'

-1.65'

1500

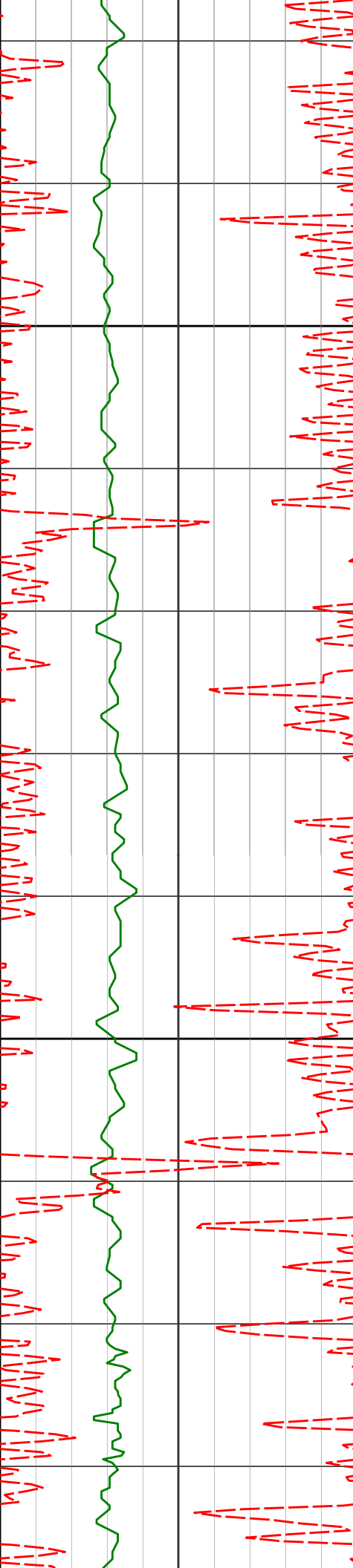
86.84°F

86.84°F

86.84°F

91.06°F

91.06°F



1600

1700

1568'

0.13°

76.46° 1567.99'

-1.67'

1659'

0.09°

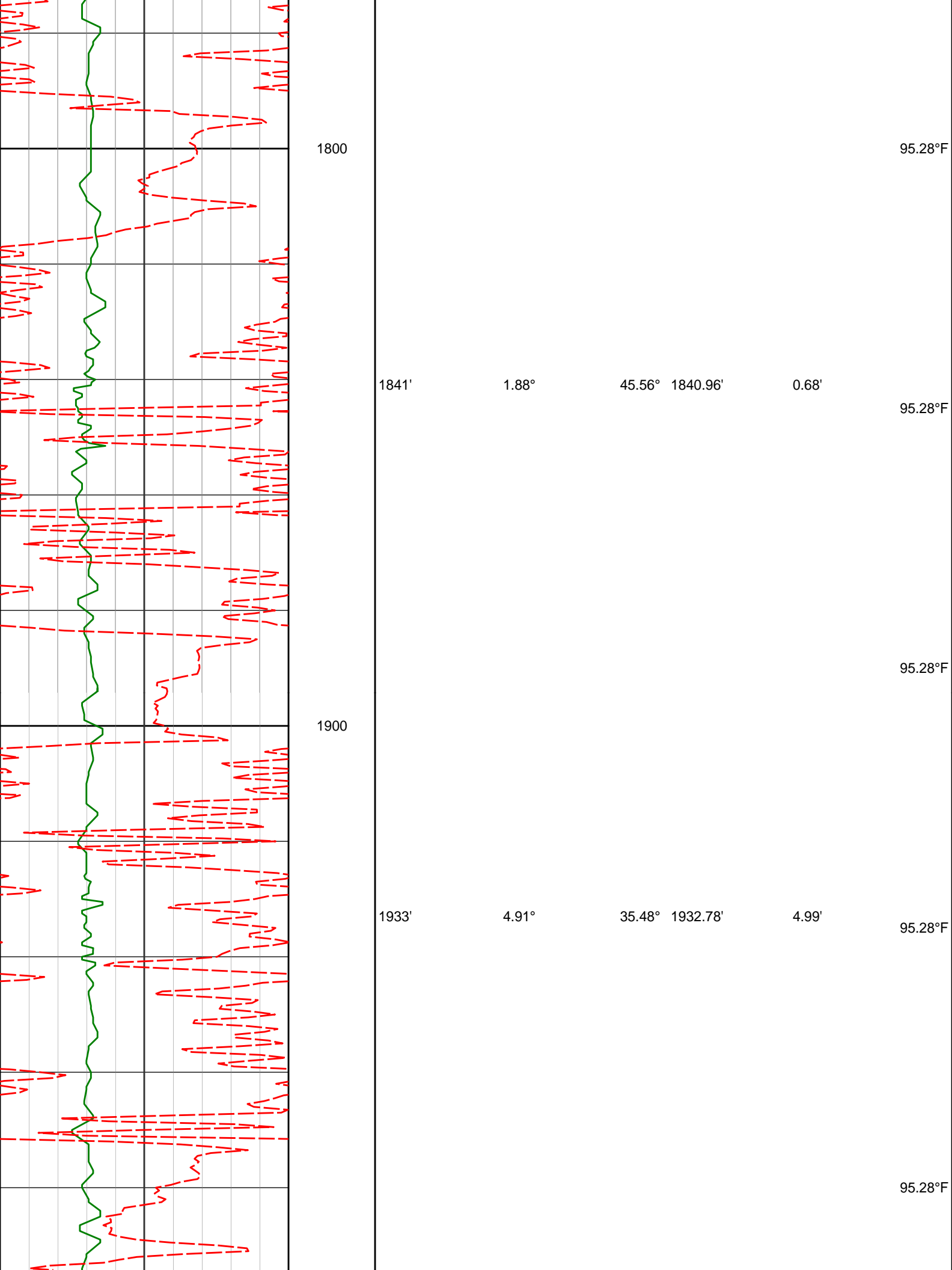
25.72° 1658.99'

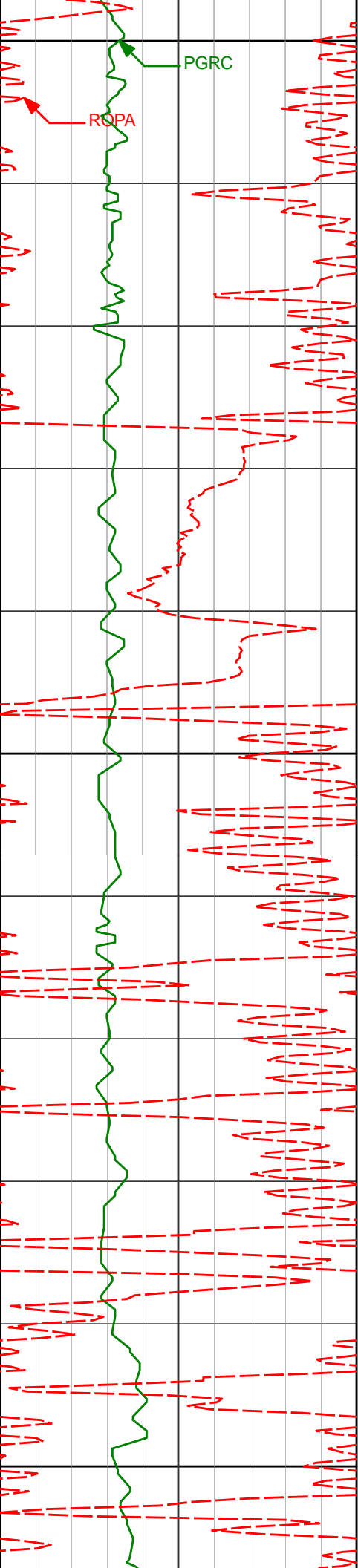
-1.58'

91.06°F

91.06°F

95.28°F





2000

PGRC

ROPA

2024'

7.13°

33.08° 2023.28'

12.97'

99.50°F

99.50°F

2100

2115'

11.93°

24.27° 2113.00'

26.38'

99.50°F

99.50°F

2200

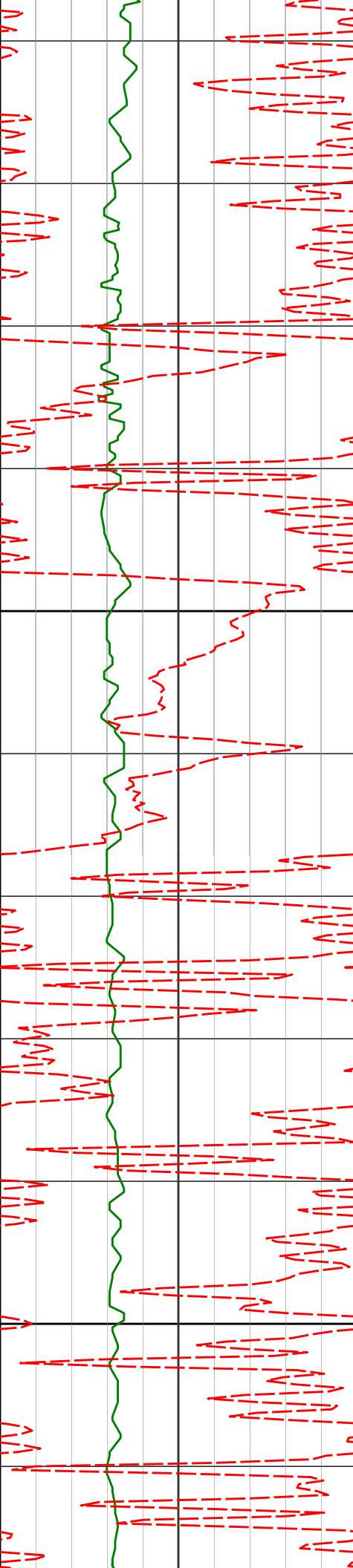
2205'

11.07°

20.72° 2201.19'

43.04'

103.72°F



2300

2400

2297'

2388'

10.33°

10.34°

28.17°

35.45°

2291.60'

2381.12'

58.66'

72.62'

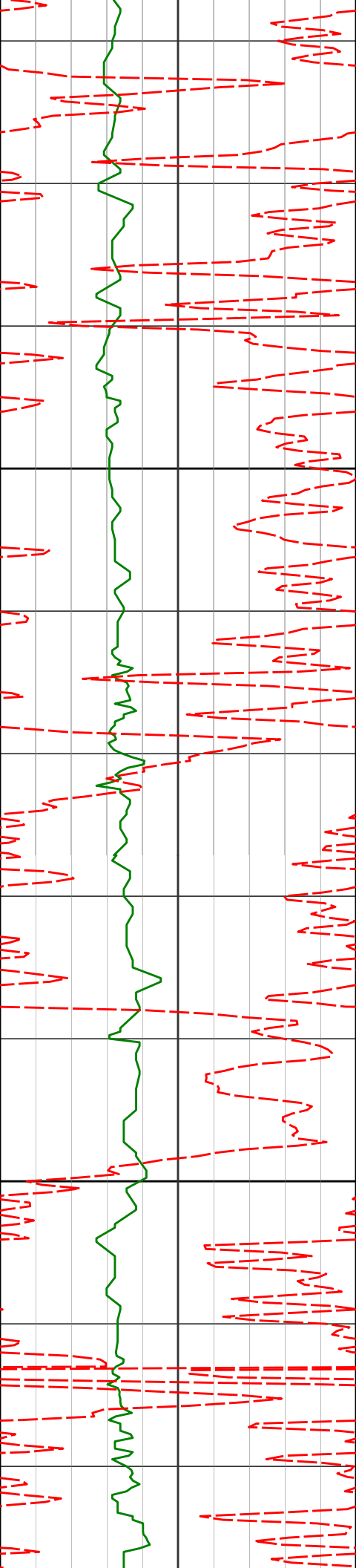
103.72°F

103.72°F

103.72°F

107.94°F

107.94°F



2480'

9.60°

33.73° 2471.73'

85.86'

107.94°F

2500

107.94°F

2571'

9.47°

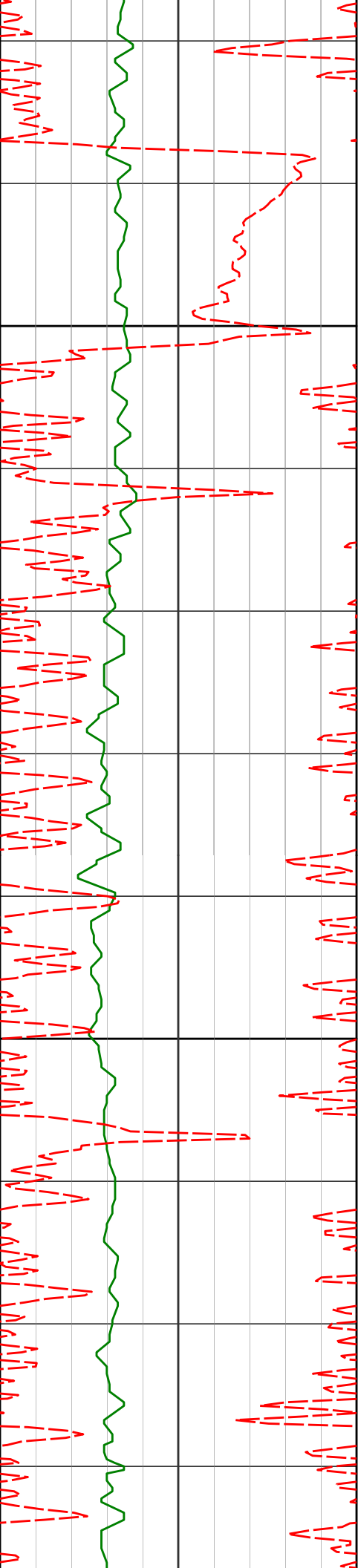
30.11° 2561.48'

98.76'

107.94°F

2600

107.94°F



2663'

9.69°

29.83°

2652.19'

112.12'

2700

112.16°F

2755'

7.13°

44.44°

2743.21'

123.02'

2800

112.16°F

2849'

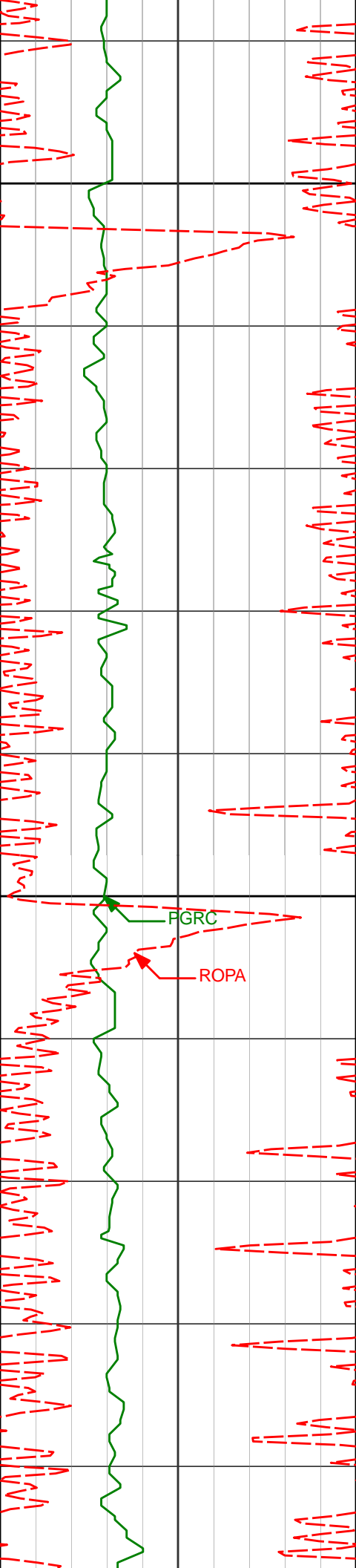
6.92°

44.21°

2836.50'

131.36'

116.38°F



2900

2944'

6.64°

42.40°

2930.84'

139.62'

3000

PGRC

ROPA

3038'

6.33°

39.70°

3024.23'

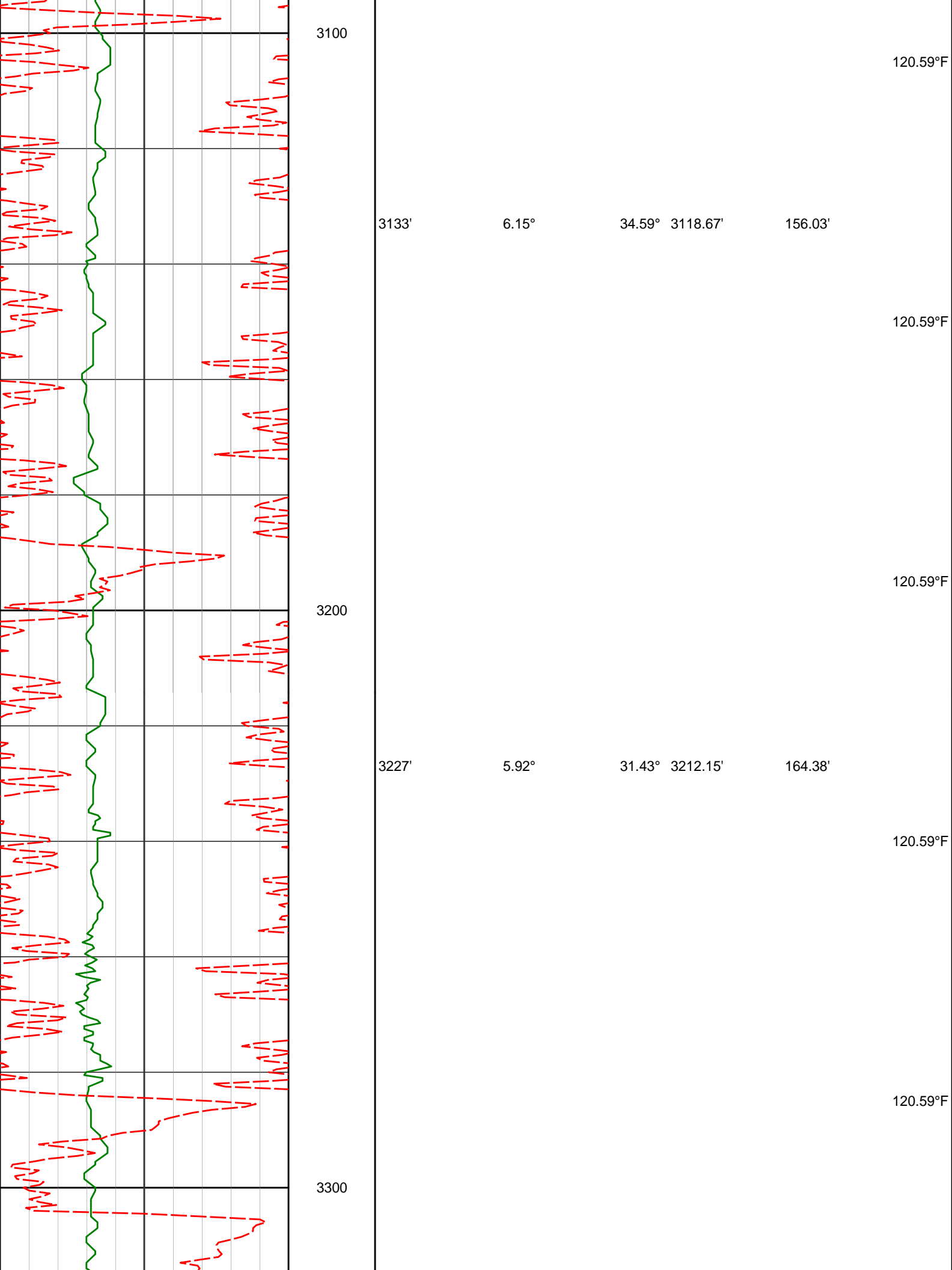
147.72'

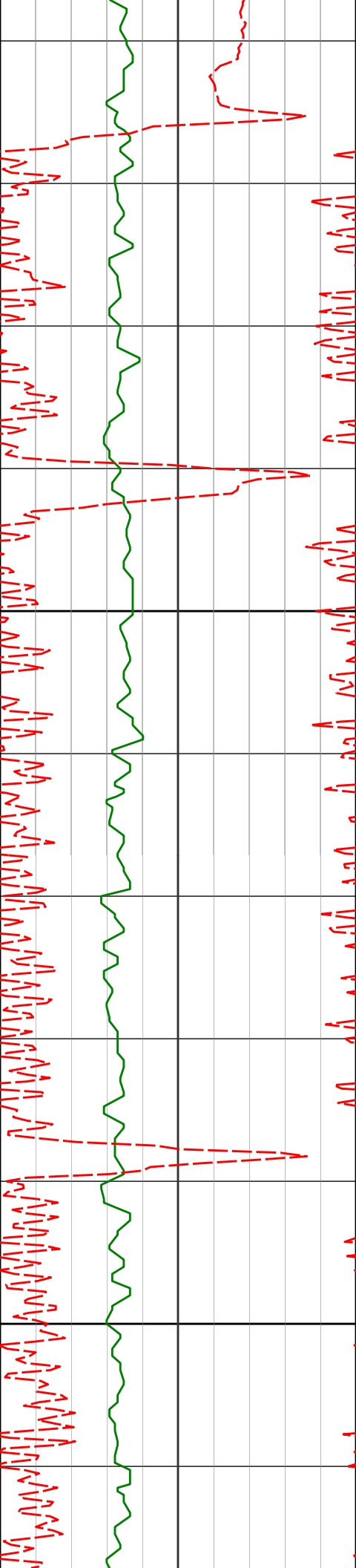
116.38°F

116.38°F

116.37°F

120.59°F





3400

3500

3322'

6.83°

47.17° 3306.57'

172.49'

124.81°F

3417'

6.52°

41.44° 3400.93'

180.48'

124.81°F

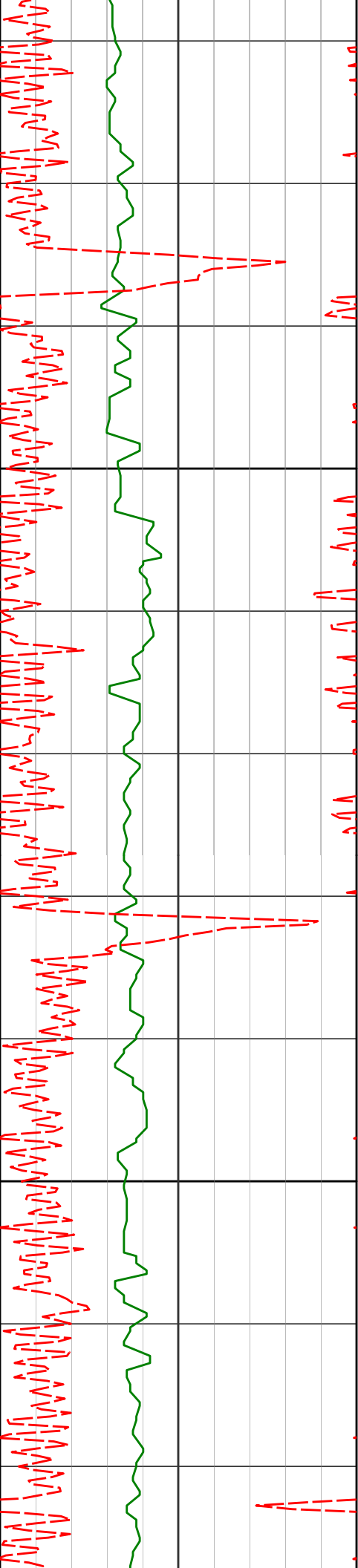
3511'

6.14°

41.36° 3494.36'

188.34'

124.81°F



3600

3700

3606'

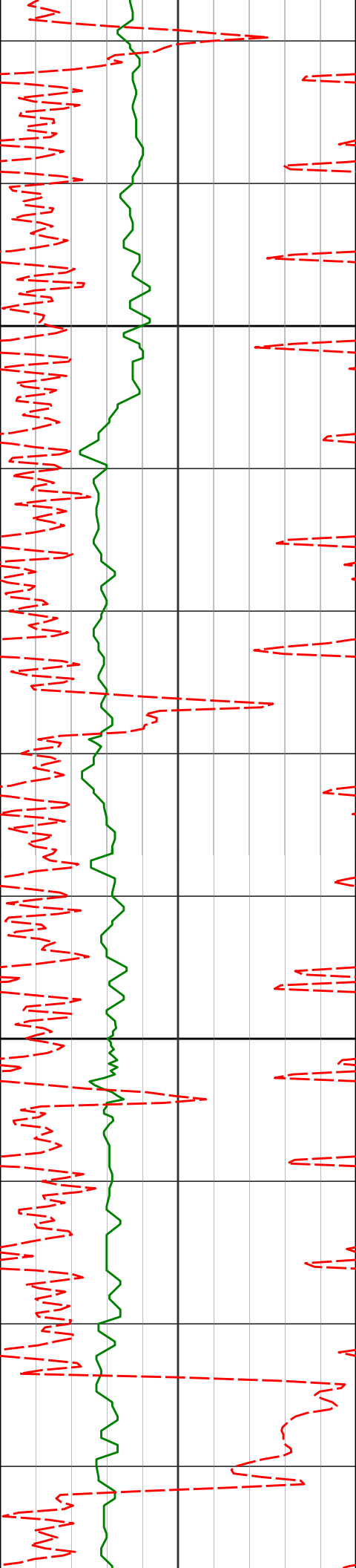
5.82°

39.00° 3588.84'

195.99'

124.81°F

129.03°F



3800

3900

3795'

5.65°

33.70° 3776.89'

211.34'

133.25°F

133.25°F

133.25°F

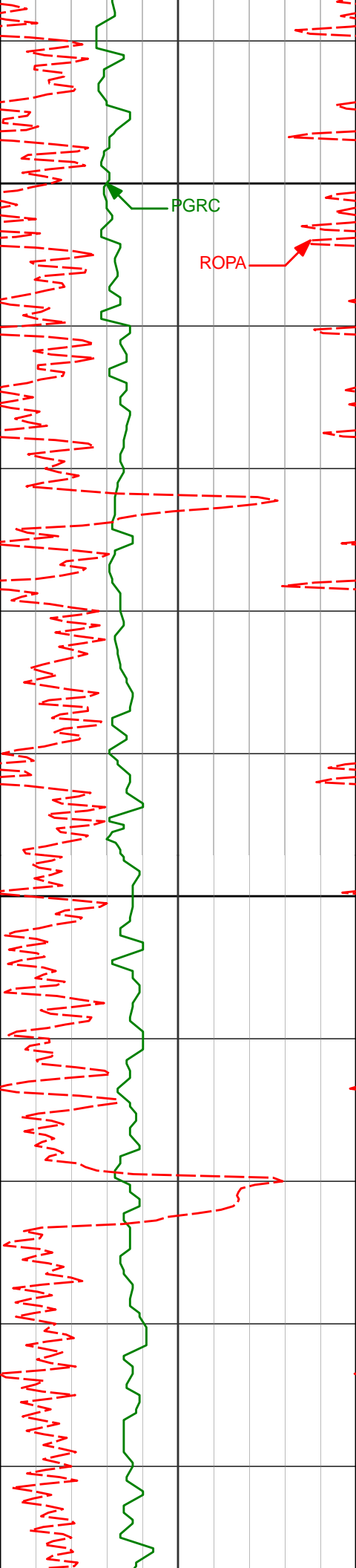
3890'

5.71°

35.31° 3871.43'

219.16'

133.25°F



3984'

5.63°

42.53°

3964.97'

226.46'

4000

PGRC

ROPA

137.47°F

137.47°F

4079'

5.45°

38.78°

4059.52'

233.50'

4100

137.47°F

137.47°F

4174'

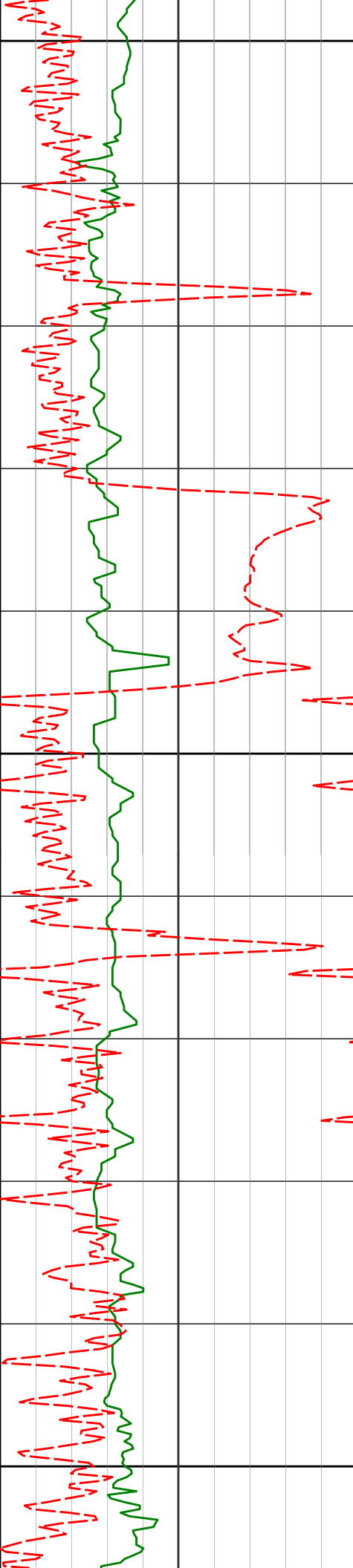
4.94°

38.62°

4154.13'

240.28'

141.69°F



4200

141.69°F

4268'

5.10°

49.23° 4247.77'

246.25'

141.69°F

4300

141.69°F

4363'

5.06°

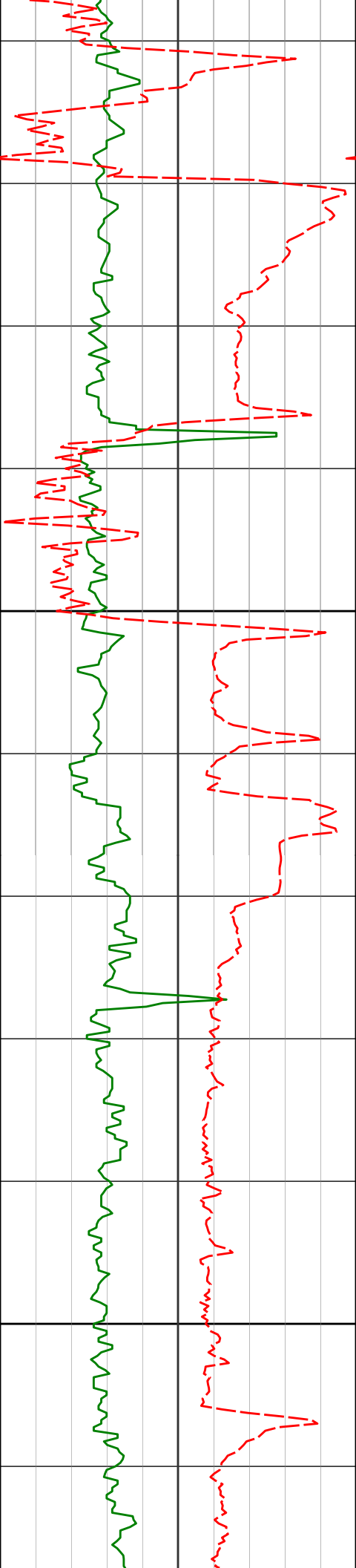
60.56° 4342.40'

251.16'

141.69°F

4400

141.69°F



4500

4600

4457'

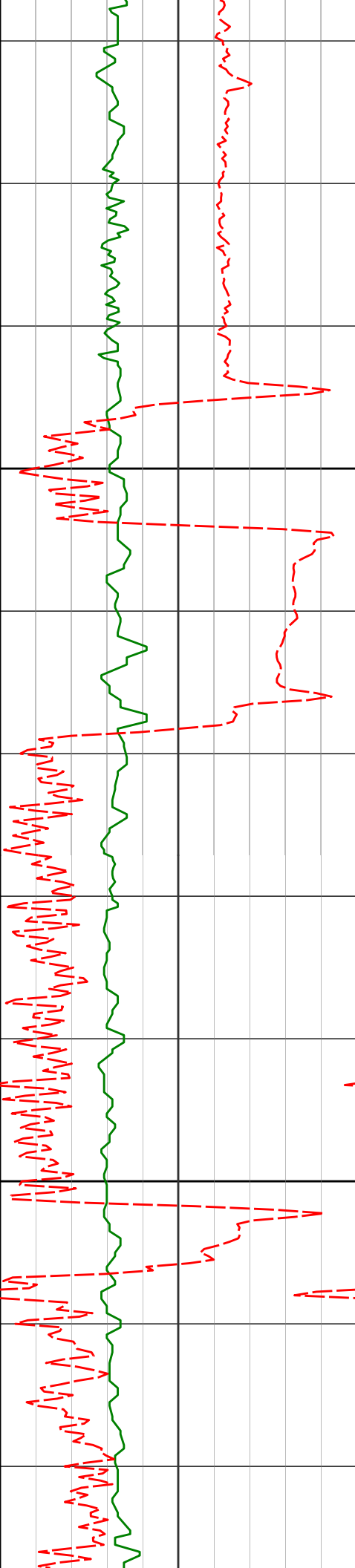
4.25°

54.48° 4436.09'

255.30'

179.27°F

216.30°F



4700

4800

4646'

2.98°

54.79° 4624.71'

262.33'

4740'

0.52°

144.89° 4718.67'

263.42'

4835'

1.40°

95.35° 4813.66'

262.97'

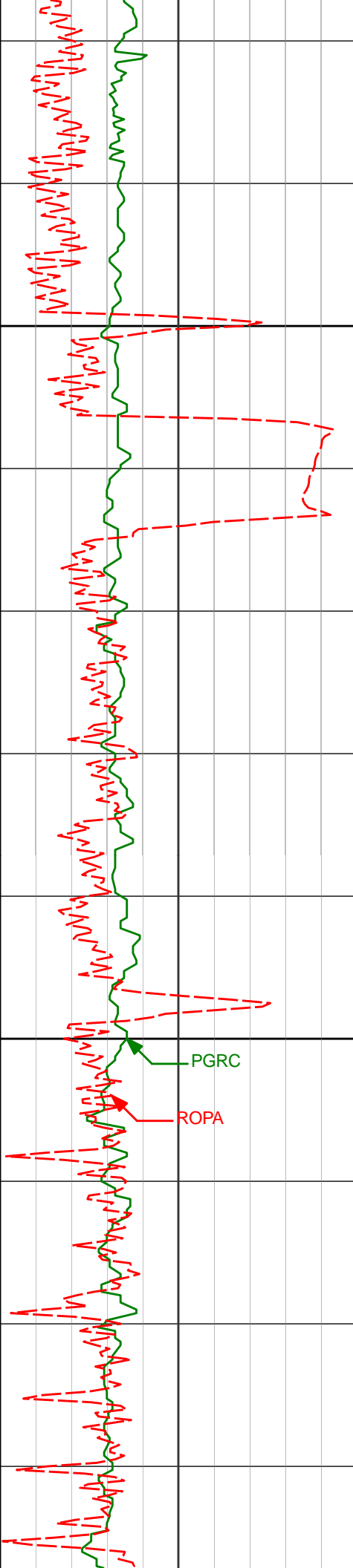
141.69°F

141.69°F

145.91°F

145.91°F

145.91°F



4900

4929'

0.97°

168.42°

4907.64'

262.11'

5000

PGRC

ROPA

5024'

0.92°

162.60°

5002.63'

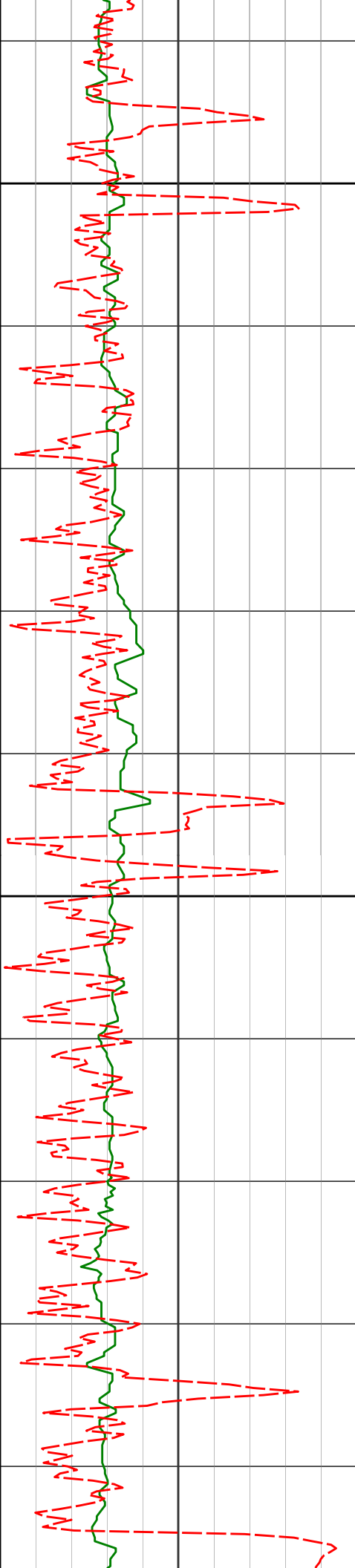
260.60'

145.91°F

145.91°F

145.91°F

150.13°F



5100

5200

5118'

5213'

0.77°

0.75°

143.55° 5096.62'

109.21° 5191.61'

259.38'

258.67'

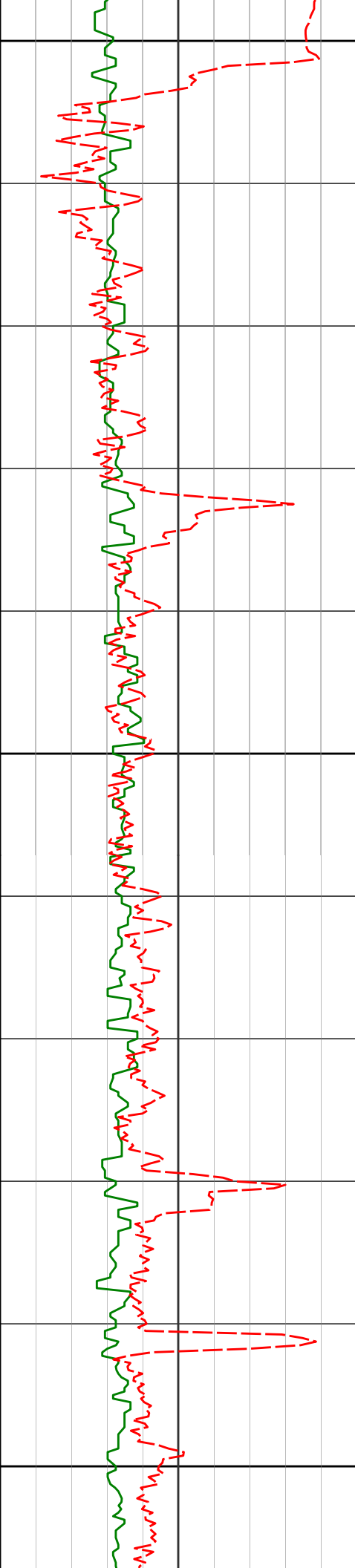
150.13°F

150.13°F

150.13°F

154.34°F

154.34°F



5300

5307'

0.66°

252.53° 5285.61'

258.31'

154.34°F

154.34°F

5400

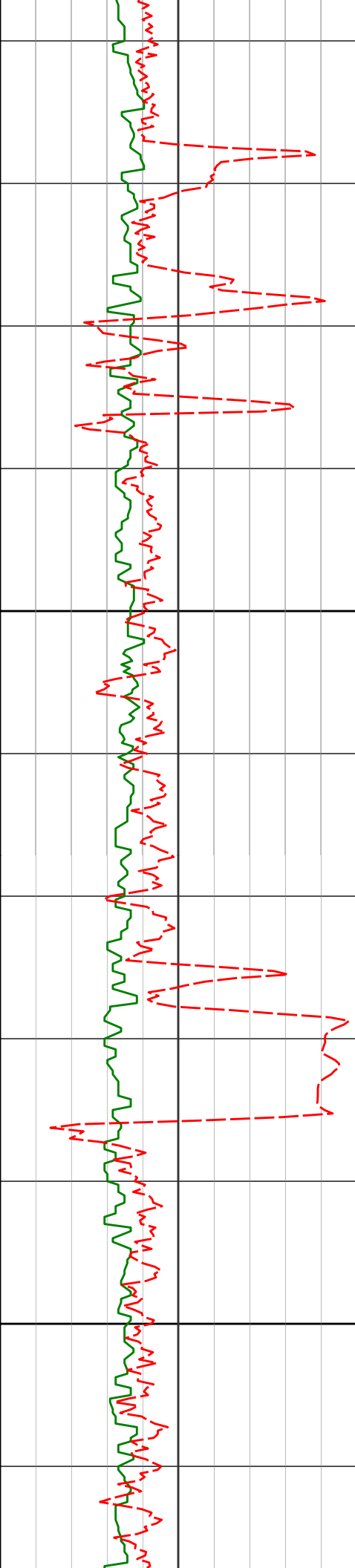
5402'

0.53°

287.88° 5380.60'

258.27'

5500



5591' 0.47° 320.11° 5569.60' 259.11'

5600

154.34°F

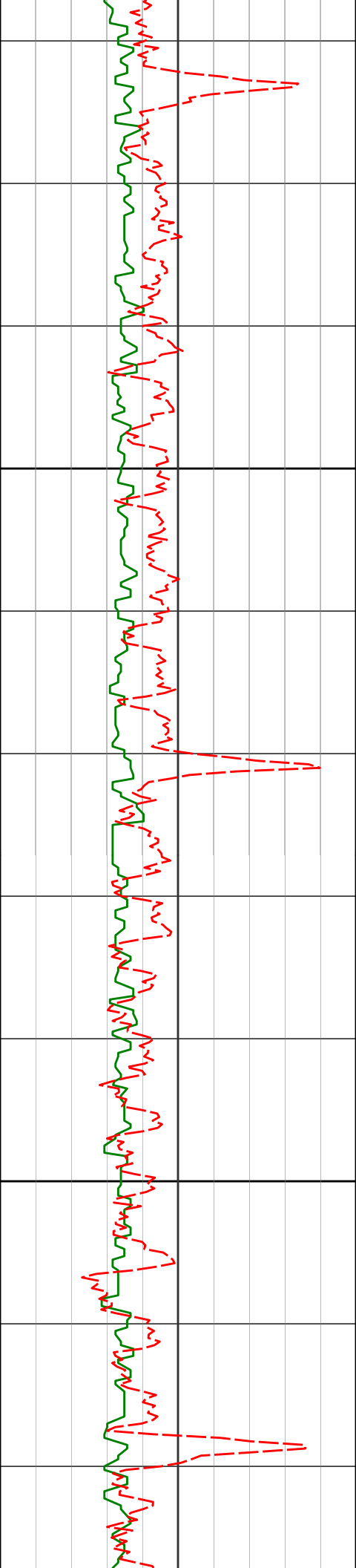
154.34°F

<KOP>

5686' 0.69° 215.94° 5664.59' 258.94'

5700

154.34°F



5780'

0.76°

166.90° 5758.59'

257.86'

158.56°F

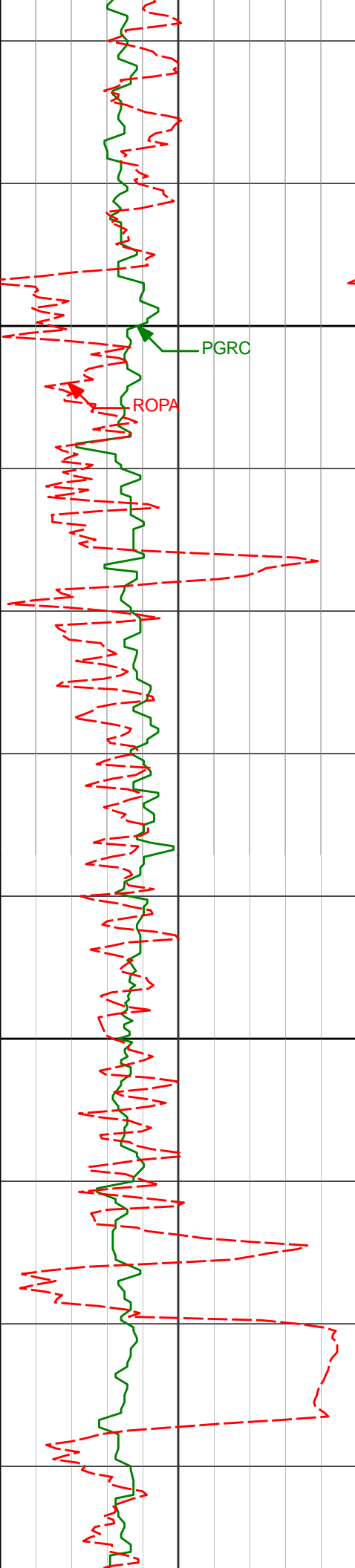
5875'

0.56°

139.93° 5853.58'

256.90'

158.56°F



6000

6100

5969'

0.14°

97.76° 5947.58'

256.54'

6064'

0.41°

2.02° 6042.58'

256.87'

6158'

0.62°

163.24° 6136.58'

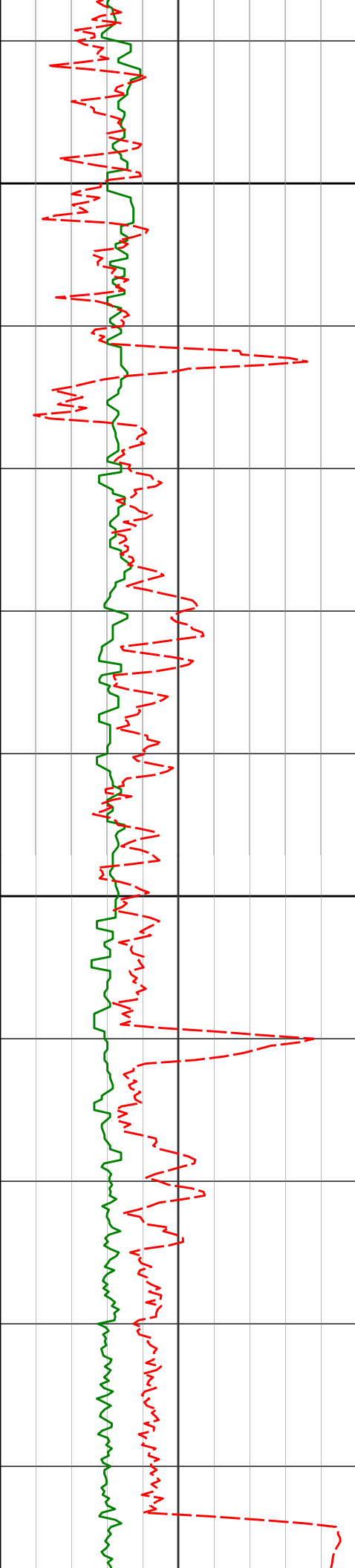
256.72'

162.78°F

167.00°F

167.00°F

167.00°F



6200

167.00°F

6253'

0.75°

93.86°

6231.57'

256.20'

171.22°F

6300

171.22°F

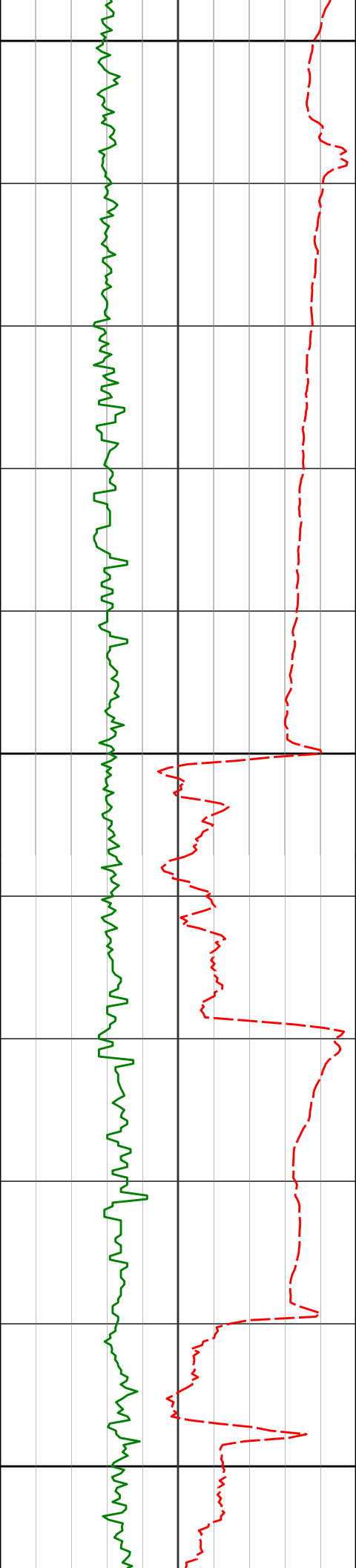
6348'

1.14°

75.45°

6326.56'

256.42'



6400

6443'

9.31°

349.98°

6421.13'

264.23'

171.22°F

6500

171.22°F

6538'

20.20°

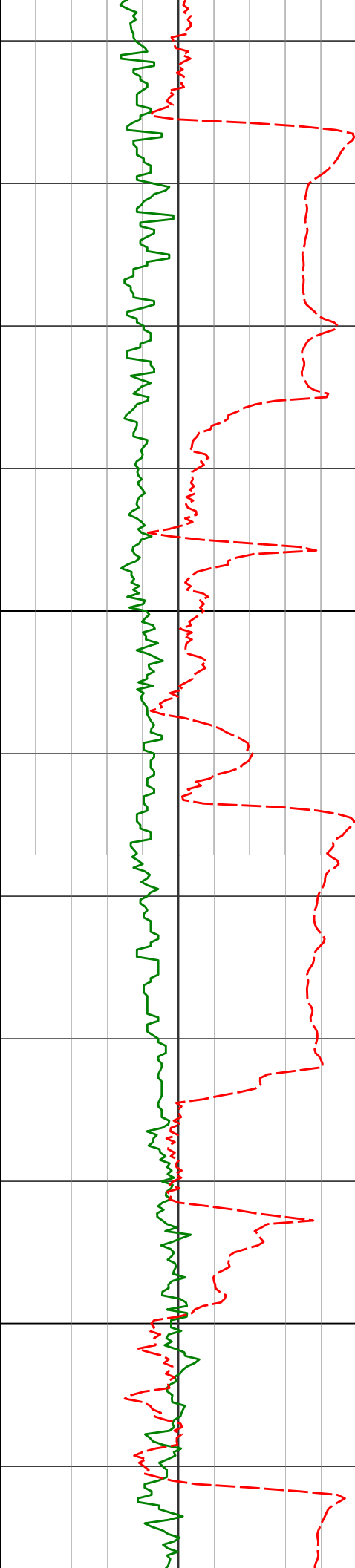
348.28°

6512.86'

287.86'

171.22°F

6600



6700

6800

6632'

27.04°

353.09° 6598.94'

324.93'

6727'

30.97°

359.03° 6682.02'

370.79'

6822'

36.32°

359.32° 6761.08'

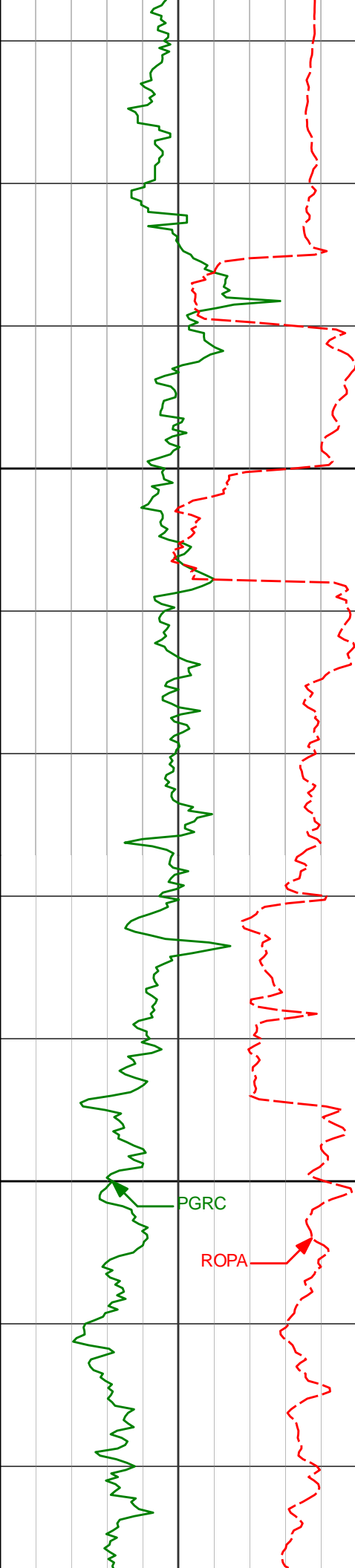
423.39'

171.22°F

171.22°F

175.44°F

175.44°F



6900

6916'

44.36°

354.84° 6832.68'

484.02'

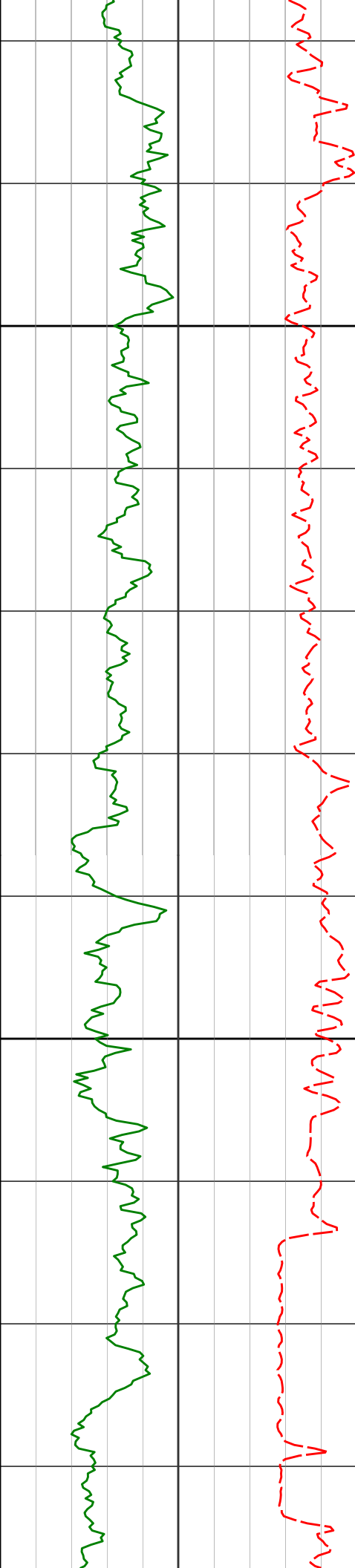
7000

7010'

48.11°

356.11° 6897.69'

551.60'



7100

7105'

59.15°

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627.63'

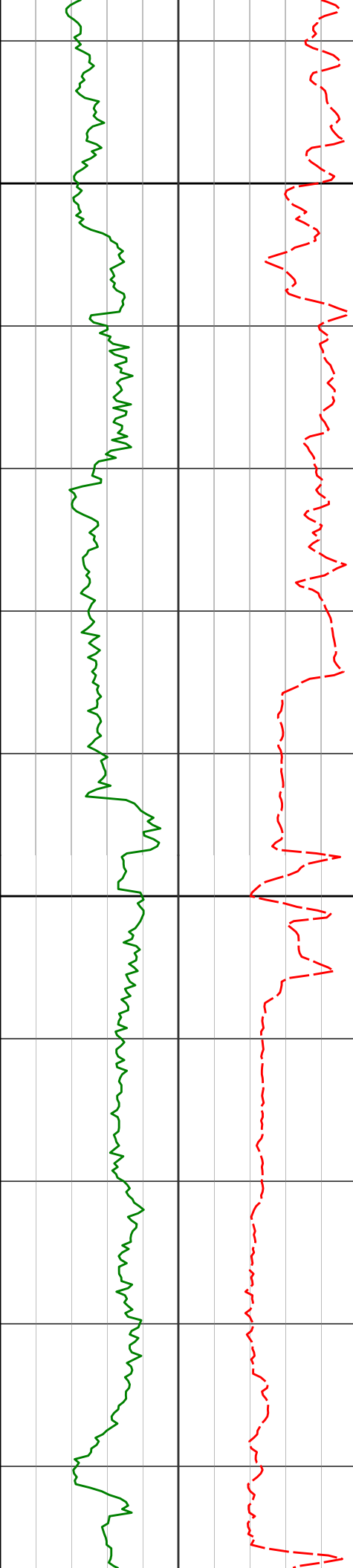
7200

7199'

75.49°

0.23° 6990.08'

713.89'



Run 200

7294'

82.37°

0.44° 7008.31'

807.07'

7300

7337'

87.72°

1.42° 7012.02'

849.89'

7400

7394'

89.00°

1.50° 7013.15'

906.87'

7442'

91.94°

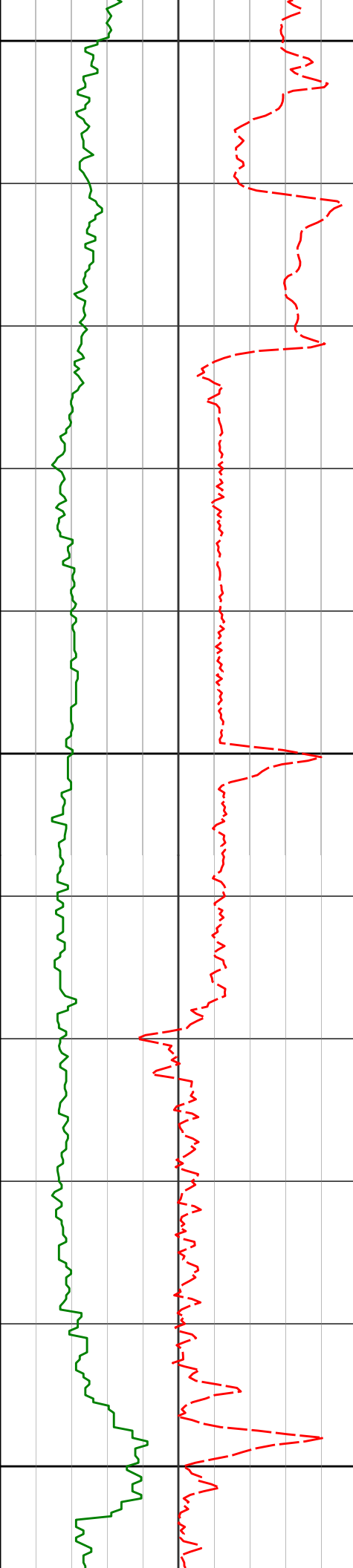
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954.85'

192.31°F

188.09°F

188.09°F



7500

188.09°F

7537'

89.35°

2.14° 7011.26'

1049.81'

188.09°F

7600

7631'

89.29°

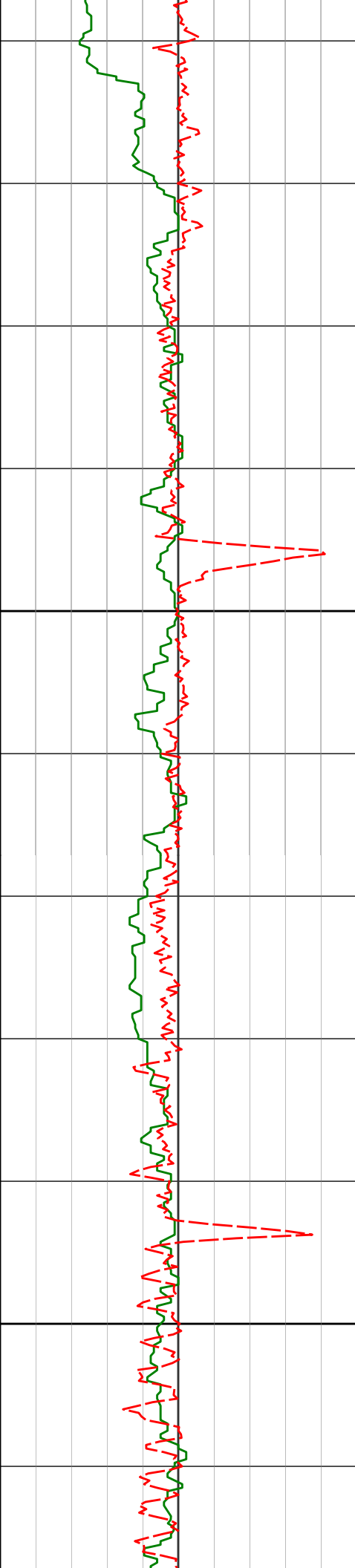
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1143.79'

196.53°F

7700

196.53°F



7726'

89.44°

0.63° 7013.43'

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196.53°F

7800

7821'

89.48°

0.19° 7014.33'

1333.78'

196.53°F

7900

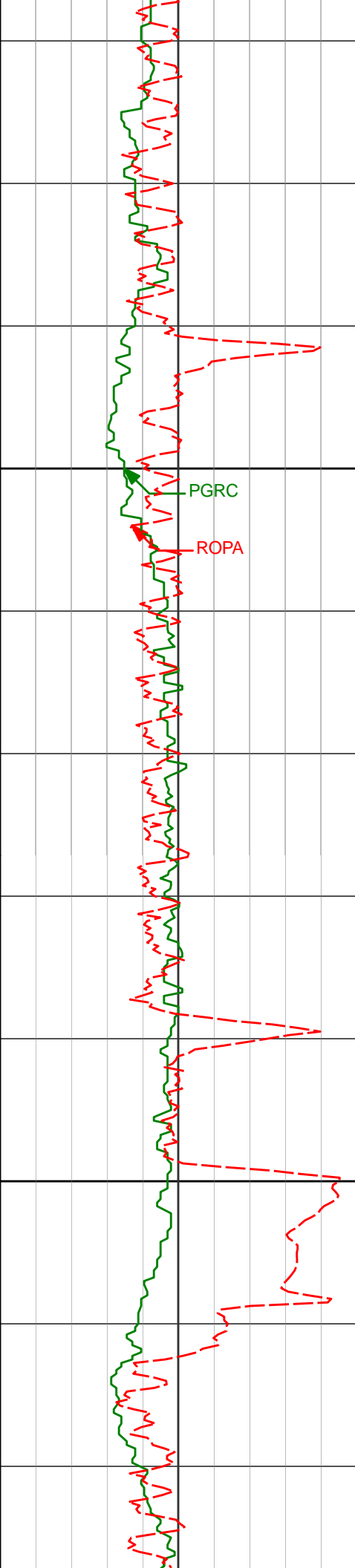
7915'

89.72°

359.42° 7014.98'

1427.76'

200.75°F



8000

8100

8010'

8105'

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89.82°

358.90°

0.24°

7015.09'

7015.12'

1522.73'

1617.71'

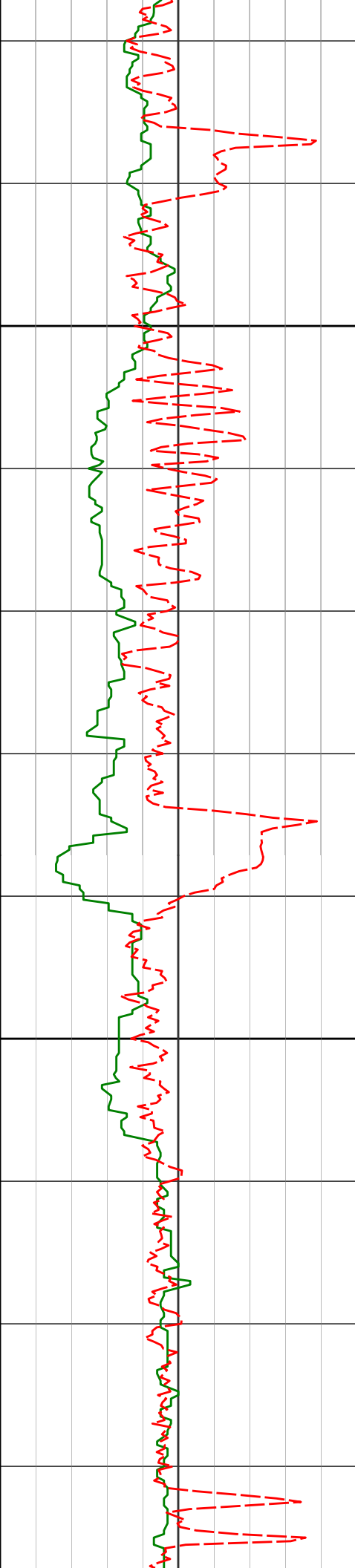
200.75°F

200.75°F

200.75°F

200.75°F

200.75°F



8200

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89.54°

0.24° 7015.64'

1711.71'

200.75°F

200.75°F

8300

8294'

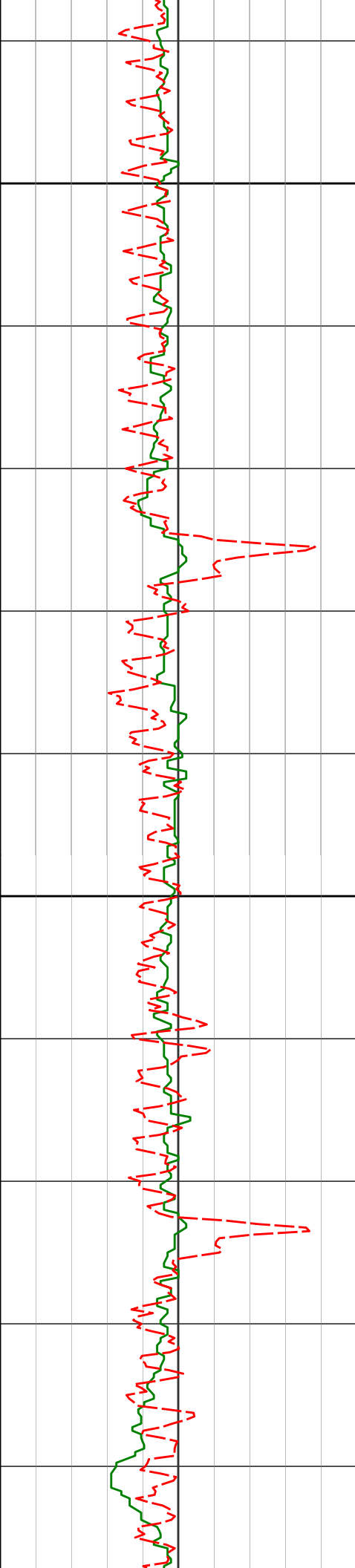
89.44°

359.78° 7016.49'

1806.70'

204.97°F

204.97°F



8400

8500

8388'

89.51°

359.54° 7017.35'

1900.68'

209.19°F

209.19°F

8483'

89.63°

359.41° 7018.06'

1995.65'

209.19°F

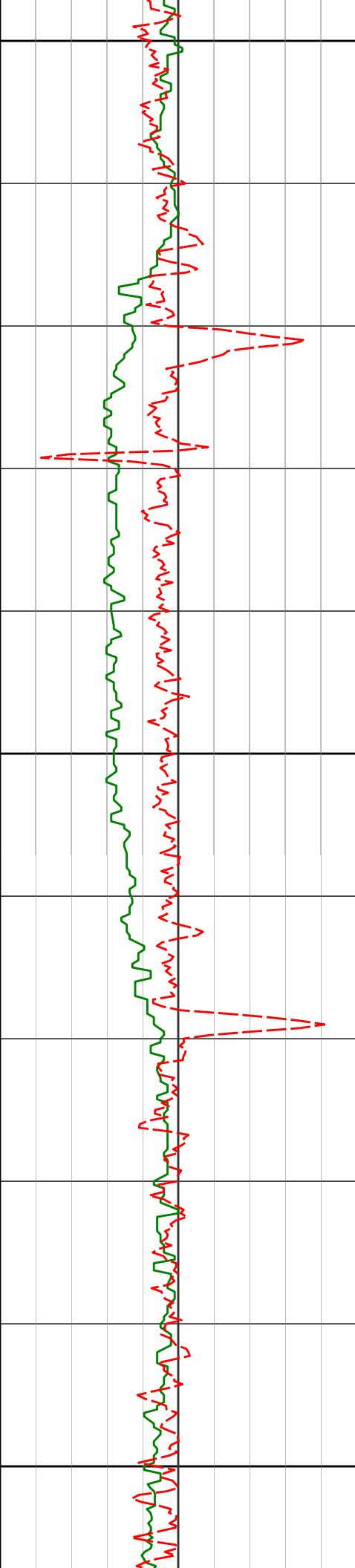
209.19°F

8578'

89.54°

359.94° 7018.75'

2090.63'



8600

8700

8800

8672'

89.32°

359.09° 7019.69'

2184.60'

8767'

89.14°

358.57° 7020.96'

2279.54'

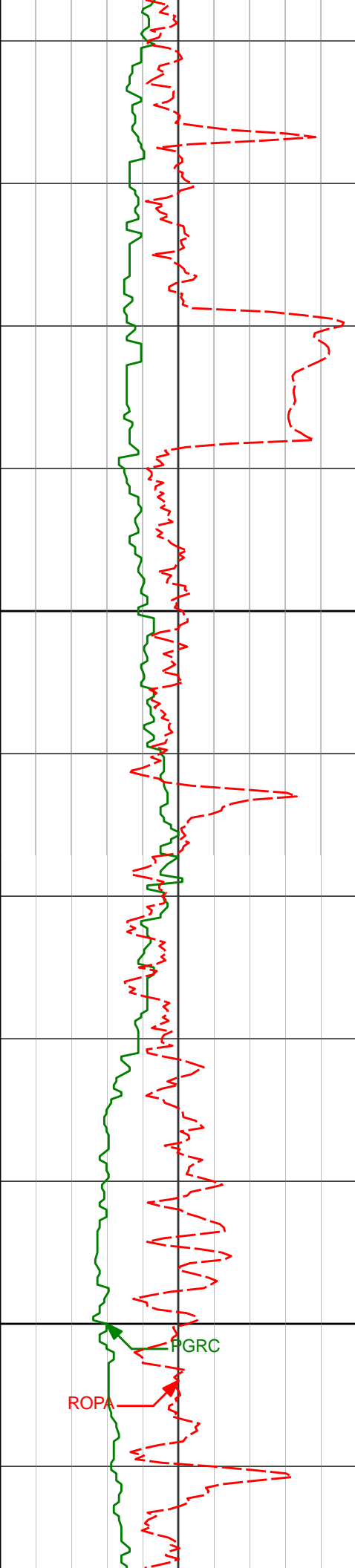
213.41°F

213.41°F

213.41°F

213.41°F

213.41°F



8900

9000

8862'

90.06°

358.93° 7021.63'

2374.48'

8956'

89.91°

359.59° 7021.65'

2468.45'

213.41°F

213.41°F

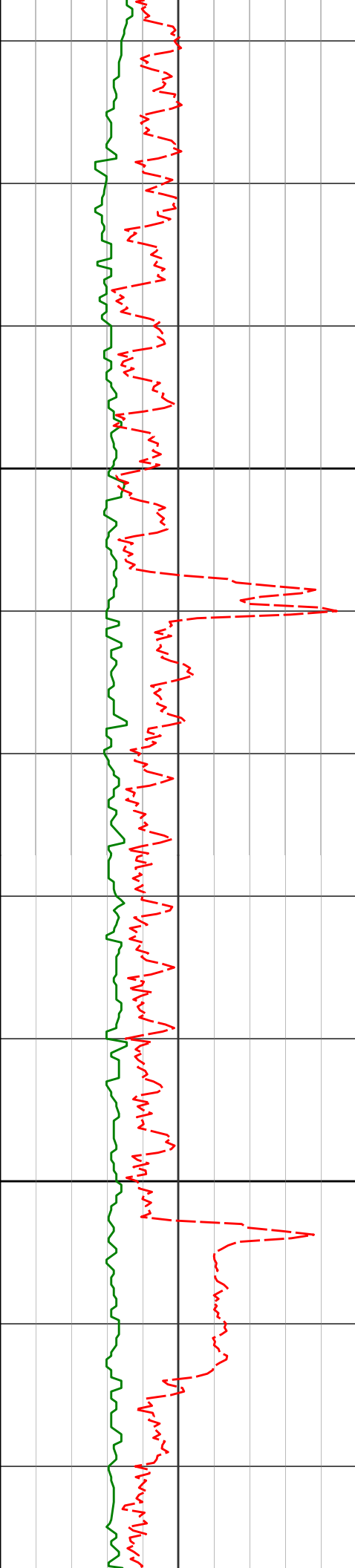
213.41°F

217.63°F

217.63°F

PGRC

ROPA



9100

9200

9051'

89.91°

359.37° 7021.80'

2563.43'

221.84°F

9145'

89.85°

358.90° 7022.00'

2657.39'

221.84°F

221.84°F

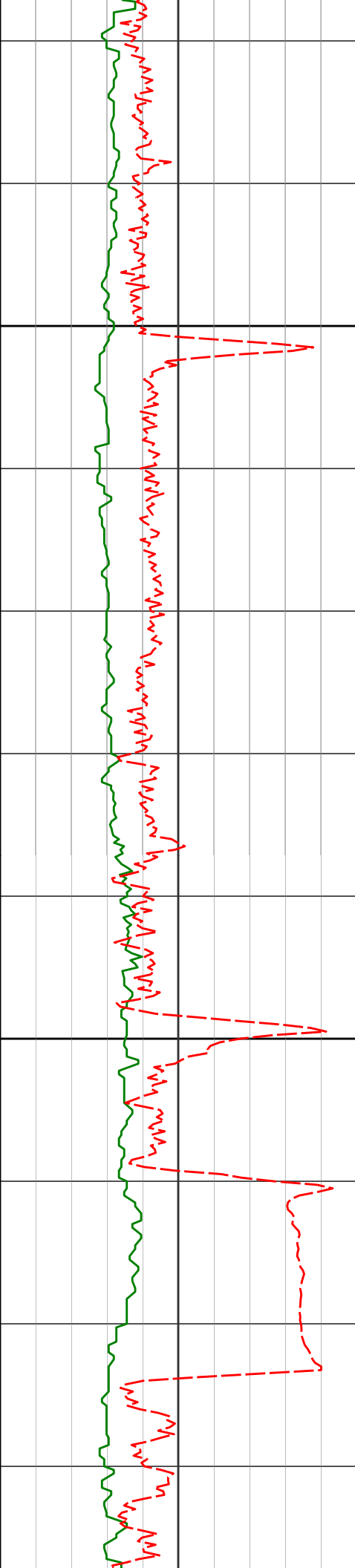
221.84°F

9240'

90.37°

358.48° 7021.81'

2752.32'



9300

9400

9335'

9429'

90.55°

89.20°

357.84° 7021.05'

359.35° 7021.26'

2847.20'

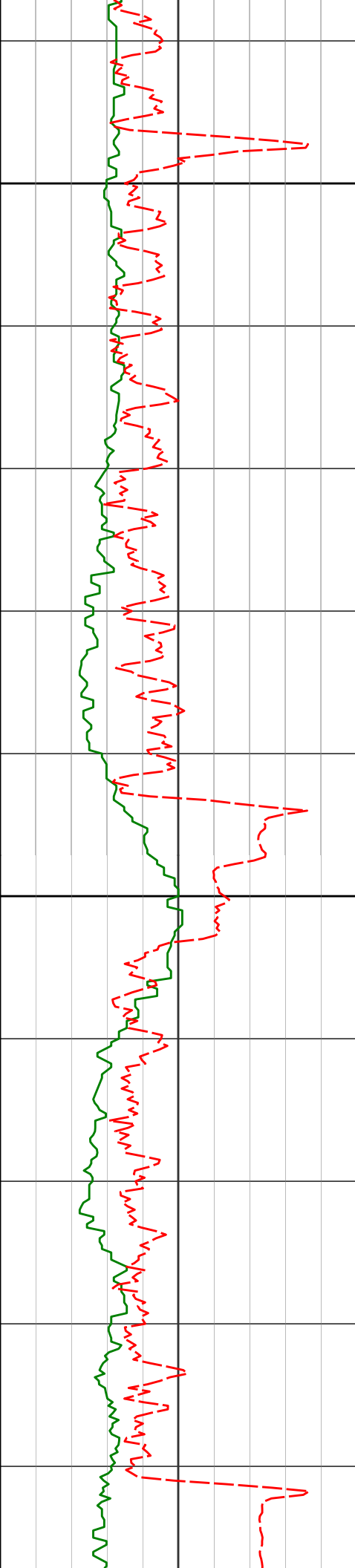
2941.11'

221.84°F

221.84°F

221.84°F

221.84°F



9500

9524'

89.48°

359.50° 7022.35'

3036.07'

9600

9619'

89.23°

358.61° 7023.42'

3131.02'

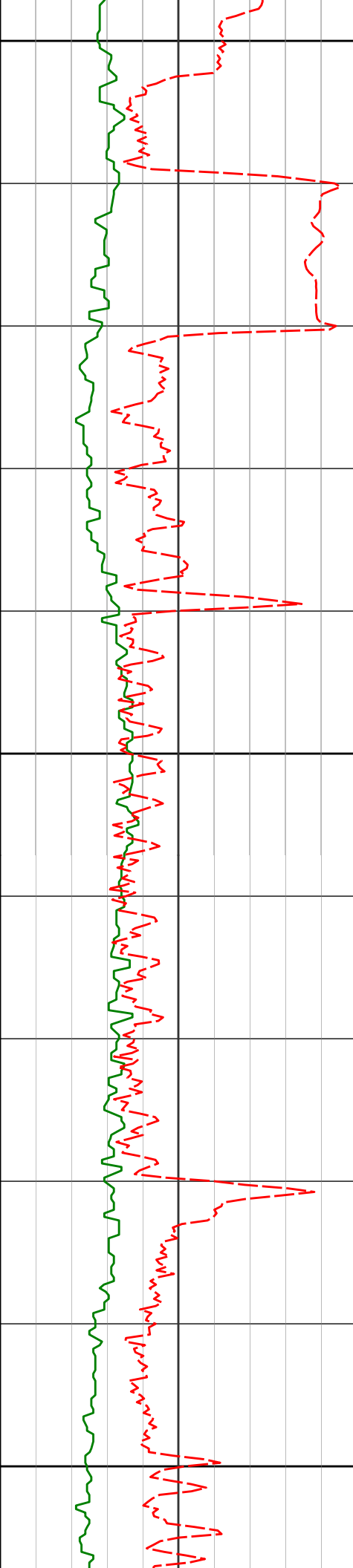
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226.06°F

226.06°F

230.28°F

230.28°F



9700

9709'

89.54°

359.07° 7024.39'

3220.98'

230.28°F

230.28°F

9800

9800'

90.28°

1.28° 7024.53'

3311.97'

230.28°F

230.28°F

9891'

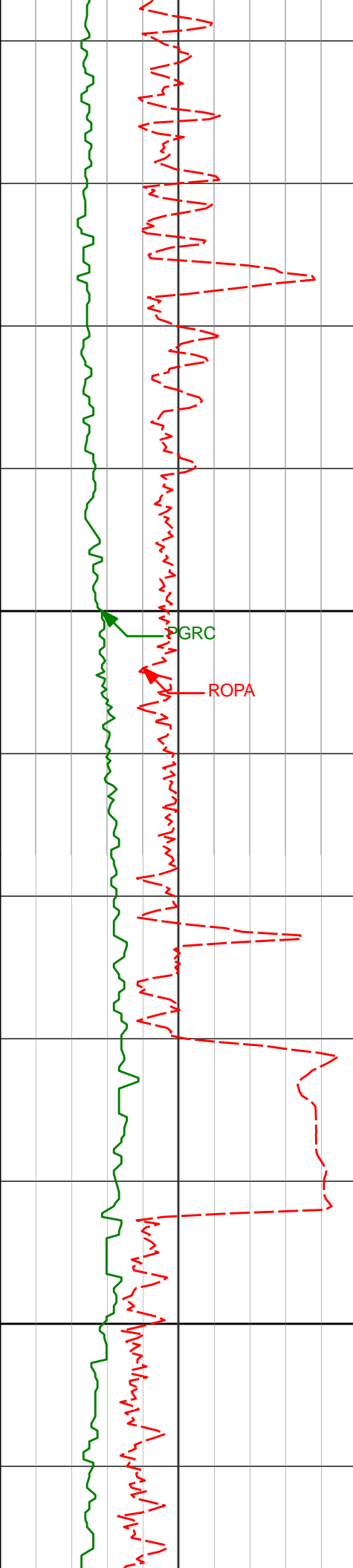
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1.18° 7024.28'

3402.96'

9900

234.50°F



10000

10100

9983'

89.45°

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3494.96'

234.50°F

234.50°F

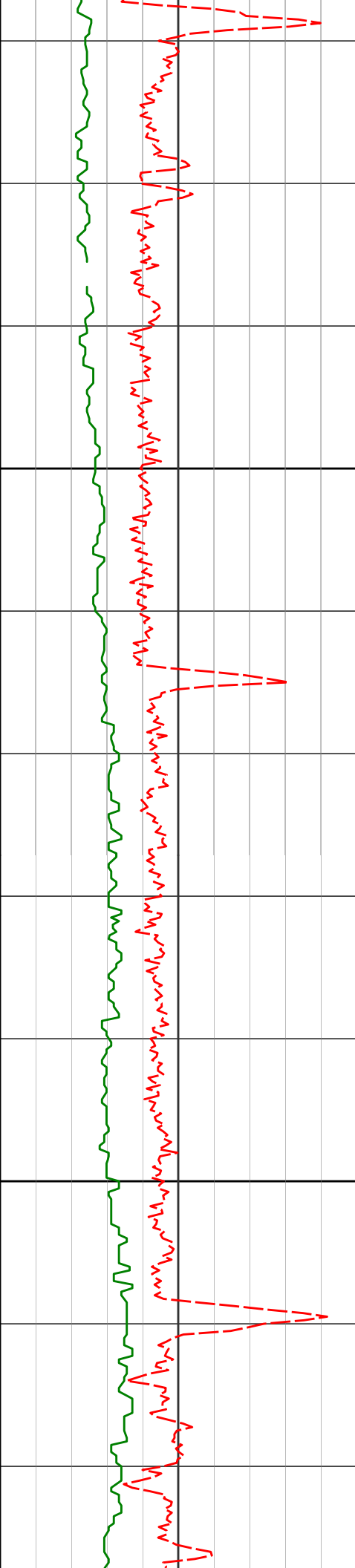
234.50°F

230.28°F

230.28°F

GRC

ROPA



10165'

90.71°

1.51° 7024.45'

3676.95'

234.50°F

234.50°F

10256'

91.05°

1.11° 7023.05'

3767.94'

238.72°F

10300

238.72°F

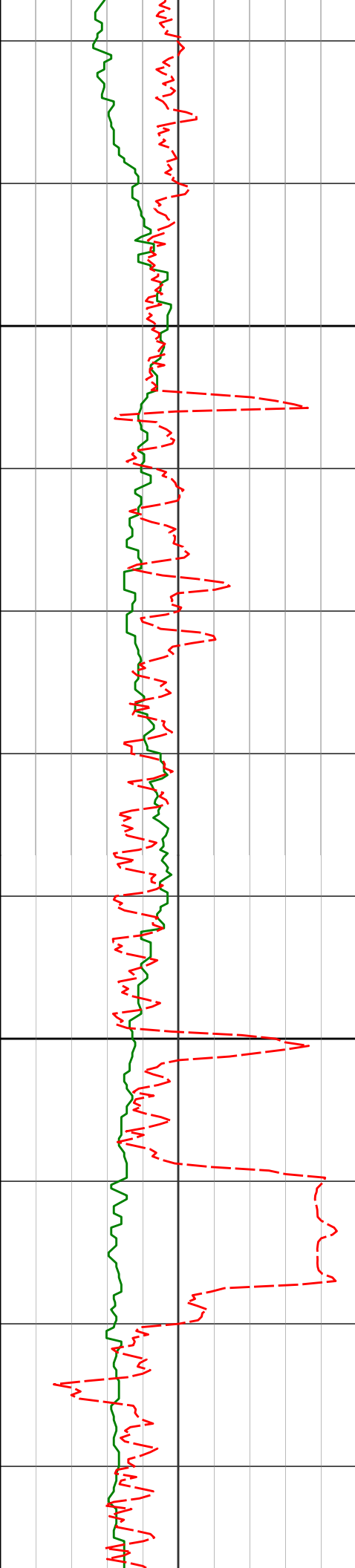
10347'

91.08°

0.75° 7021.36'

3858.92'

238.72°F



10400

10438'

91.36°

359.96° 7019.42'

3949.90'

238.72°F

238.72°F

10500

10530'

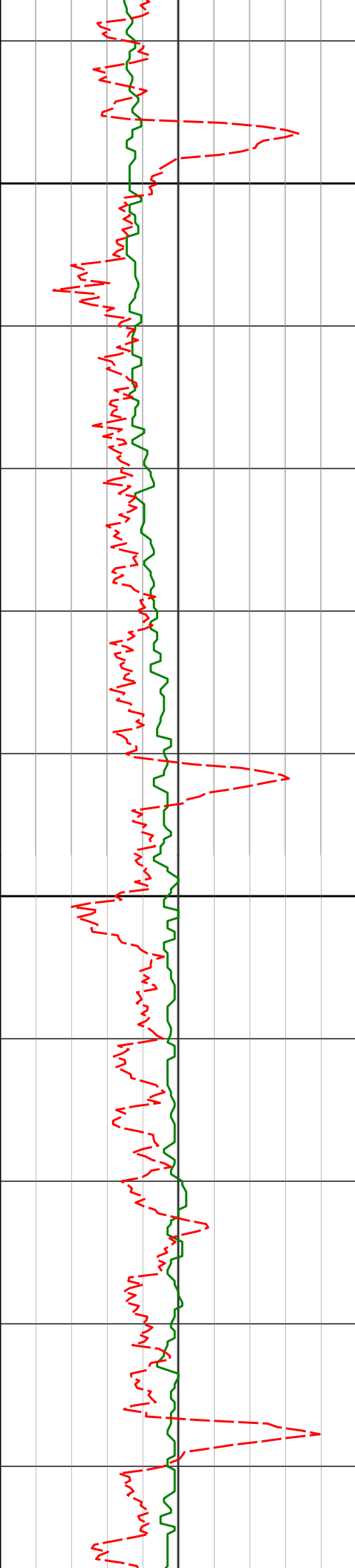
90.15°

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4041.88'

237.00°F

234.50°F



10600

10621'

90.34°

359.50° 7017.82'

4132.86'

10700

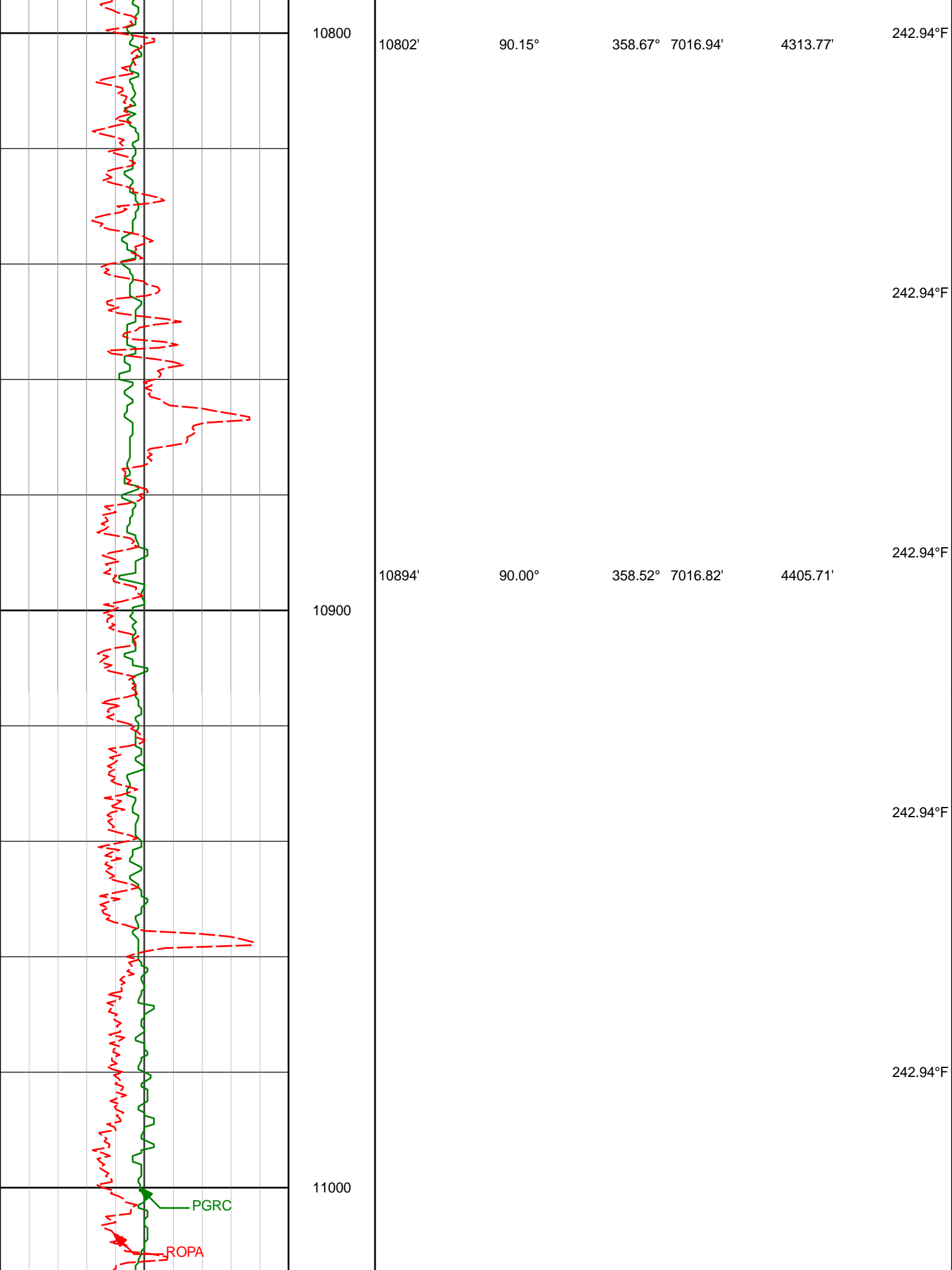
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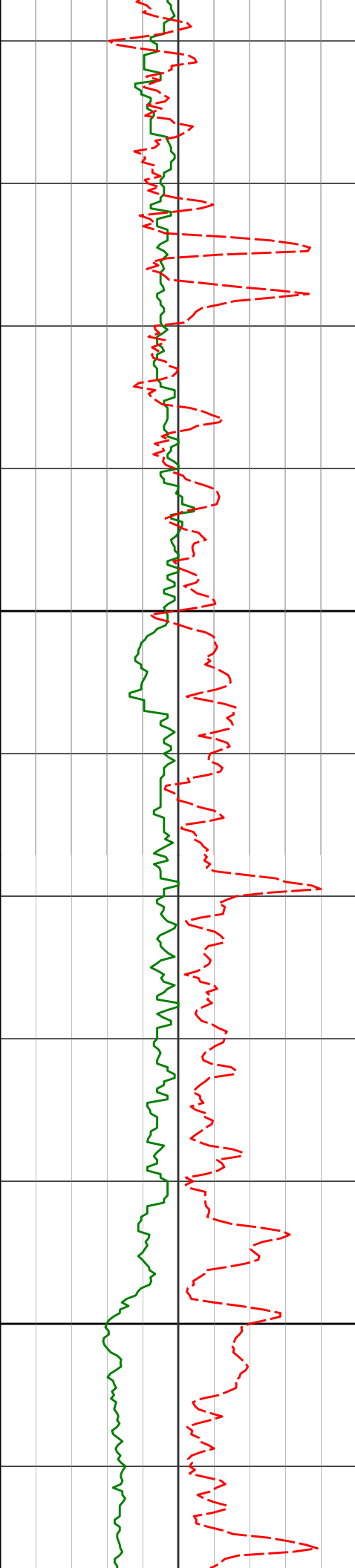
90.31°

358.88° 7017.30'

4223.82'

238.72°F





1100

11200

11077'

90.06°

357.62° 7016.73'

4588.48'

11168'

90.25°

356.81° 7016.48'

4679.29'

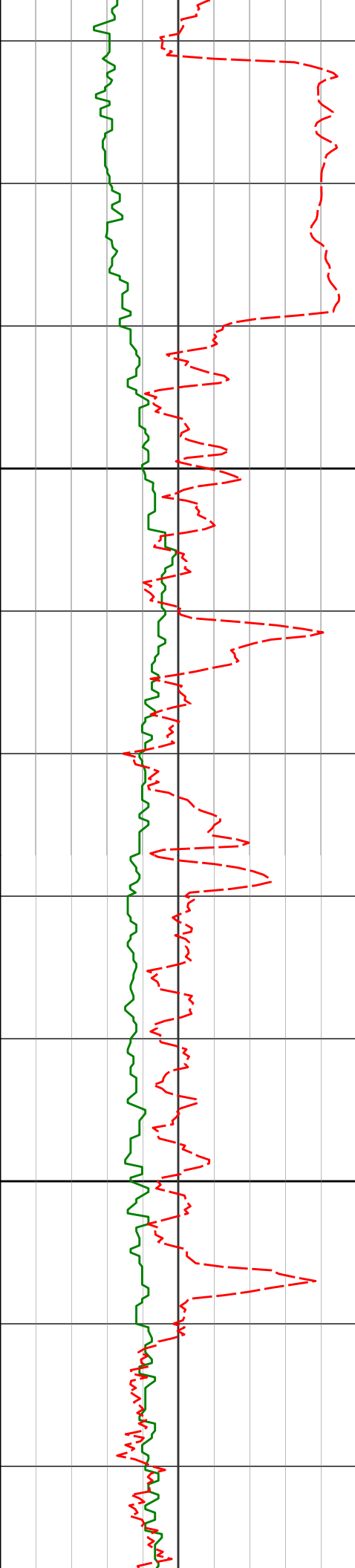
242.94°F

150.13°F

150.13°F

247.16°F

247.16°F



11300

11400

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89.75°

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11352'

89.54°

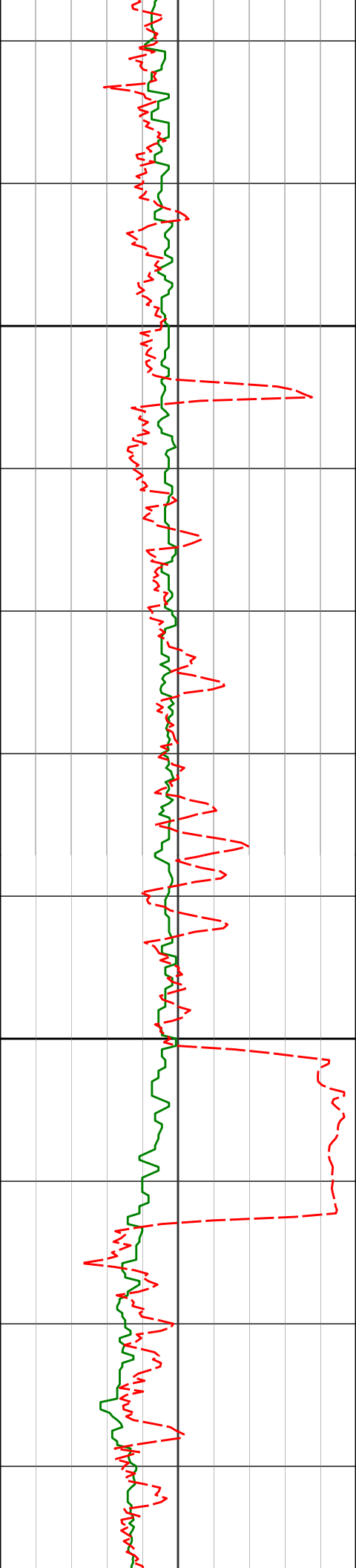
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4863.13'

242.94°F

242.94°F

247.16°F



11500

11600

11541'

88.80°

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5052.09'

11635'

91.91°

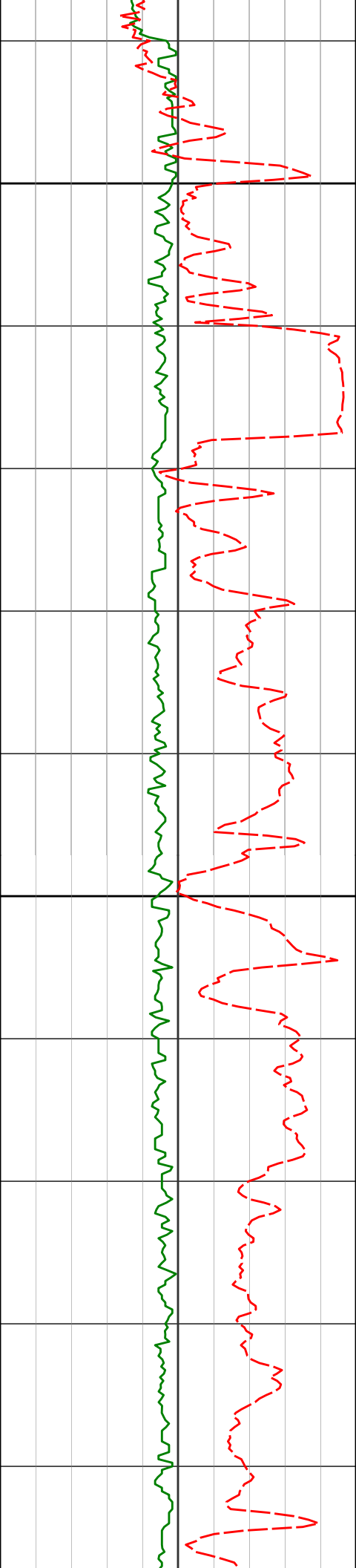
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5146.07'

247.16°F

247.16°F

247.16°F



11700

11730'

90.03°

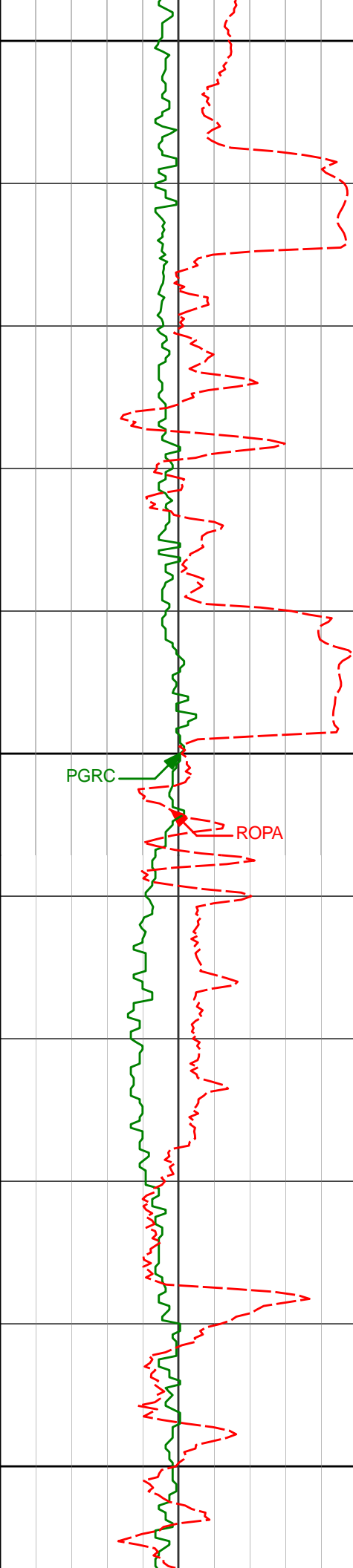
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5241.06'

11800

242.94°F

247.16°F



11900

11919'

89.97°

0.71° 7017.60'

5430.05'

247.16°F

12000

PGRC

ROPA

12014'

90.96°

2.21° 7016.83'

5525.04'

247.16°F

247.16°F

12100

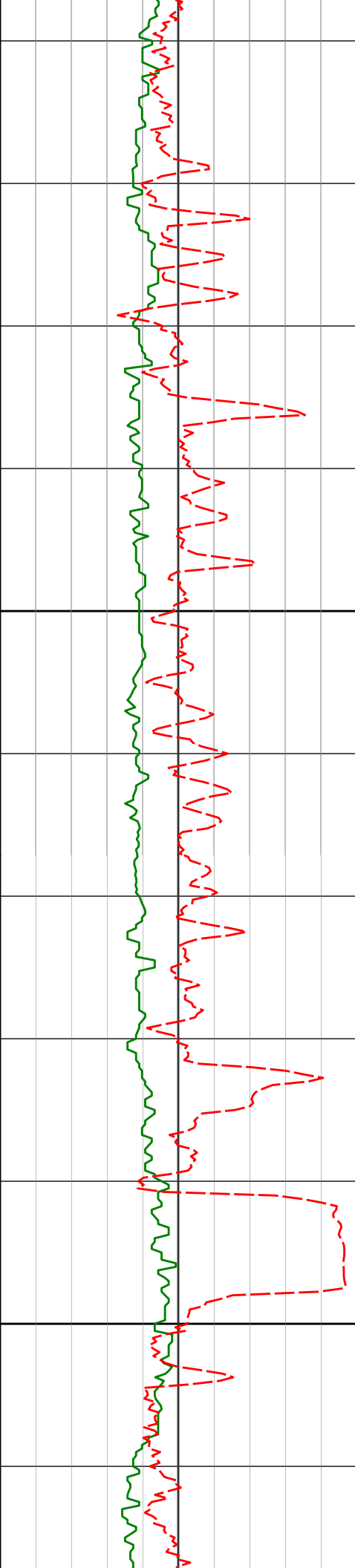
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90.93°

1.31° 7015.28'

5619.01'

251.38°F



12200

12300

12203'

12297'

90.74°

91.85°

1.04° 7013.89'

0.57° 7011.77'

5714.00'

5807.97'

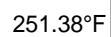
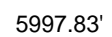
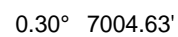
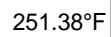
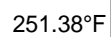
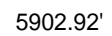
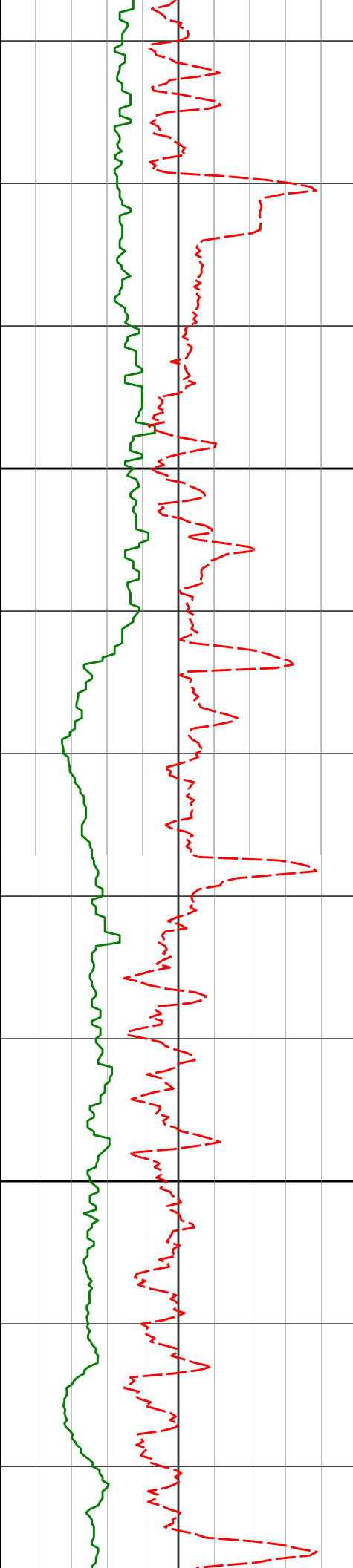
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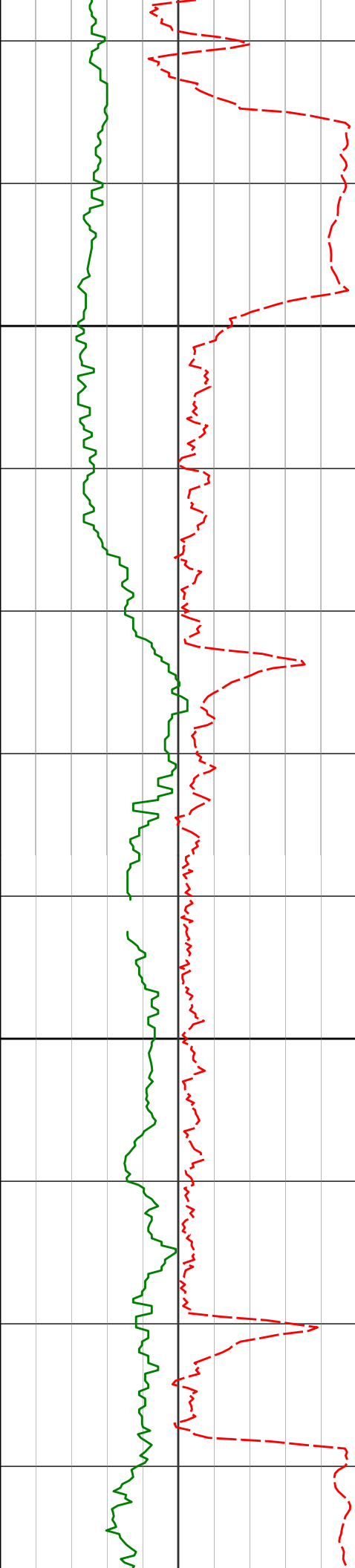
251.38°F

251.38°F

251.38°F

251.38°F





12582'

90.68°

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6092.78'

12600

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91.26°

0.11° 7000.25'

6186.77'

12700

12771'

90.43°

359.21° 6998.85'

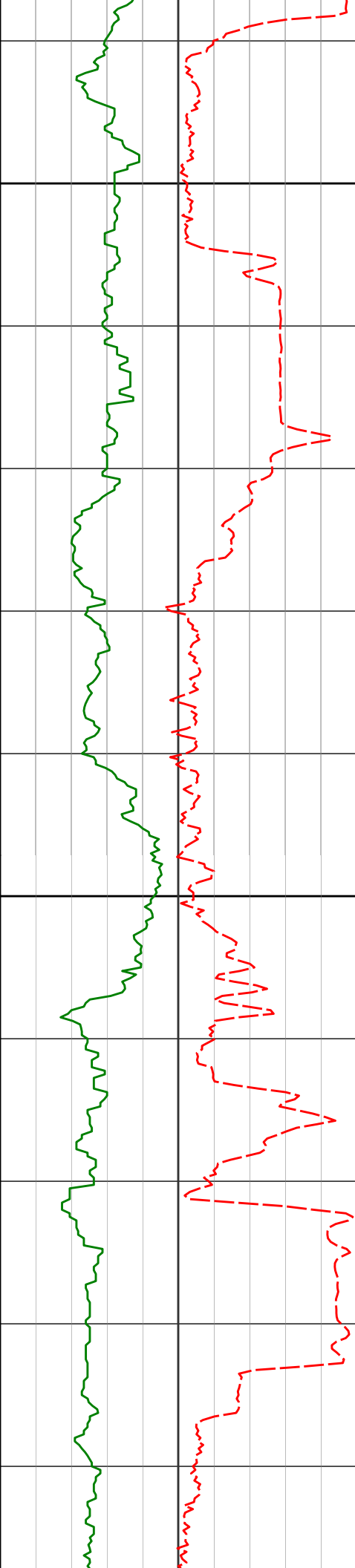
6281.74'

251.38°F

251.38°F

251.38°F

249.19°F



12800

12900

12865'

91.29°

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6375.69'

247.16°F

251.38°F

251.38°F

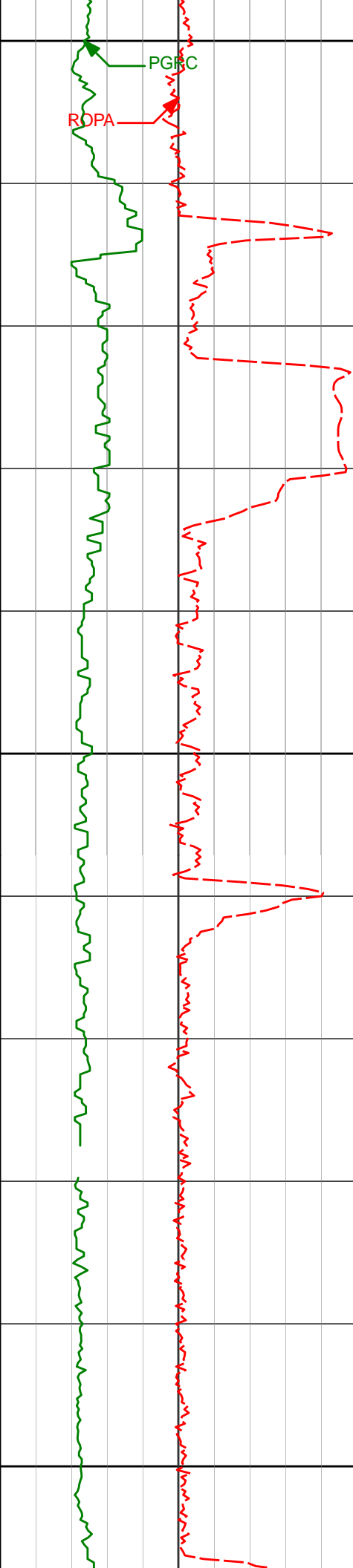
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247.16°F



13000

247.16°F

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247.16°F

13100

247.16°F

13149'

91.02°

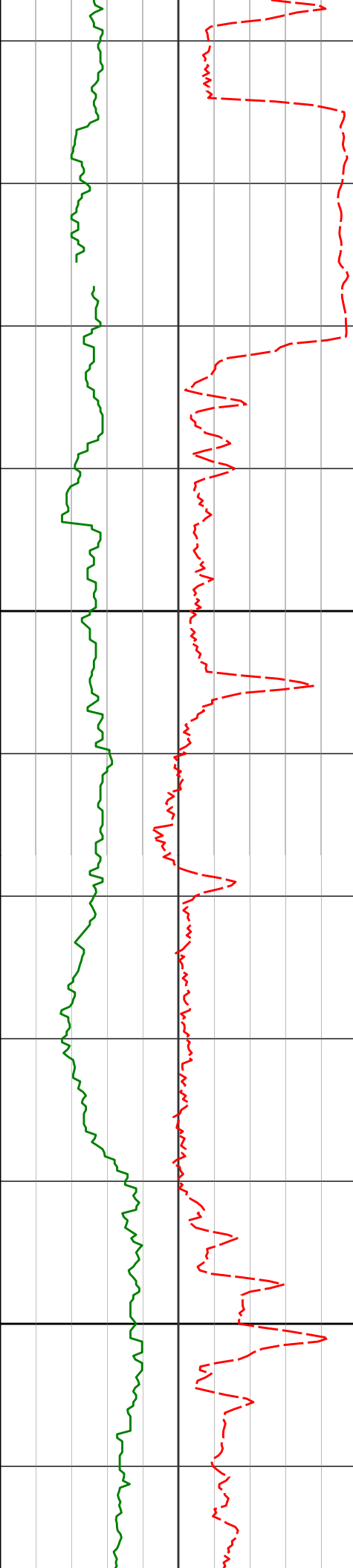
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6659.63'

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251.38°F

13200



13300

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87.62°

87.04°

87.13°

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359.23° 7006.42'

6753.59'

6848.48'

6942.33'

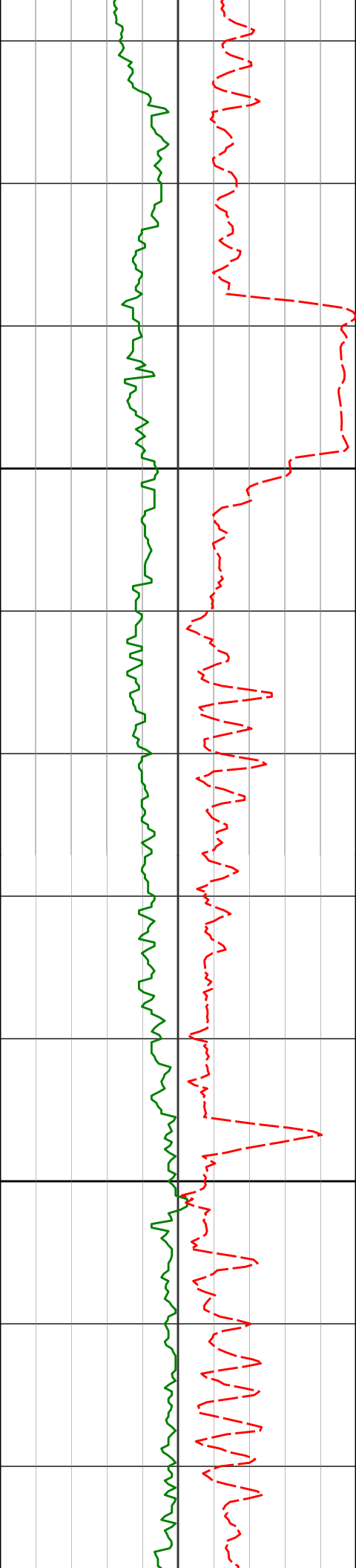
247.16°F

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251.38°F

251.38°F



13500

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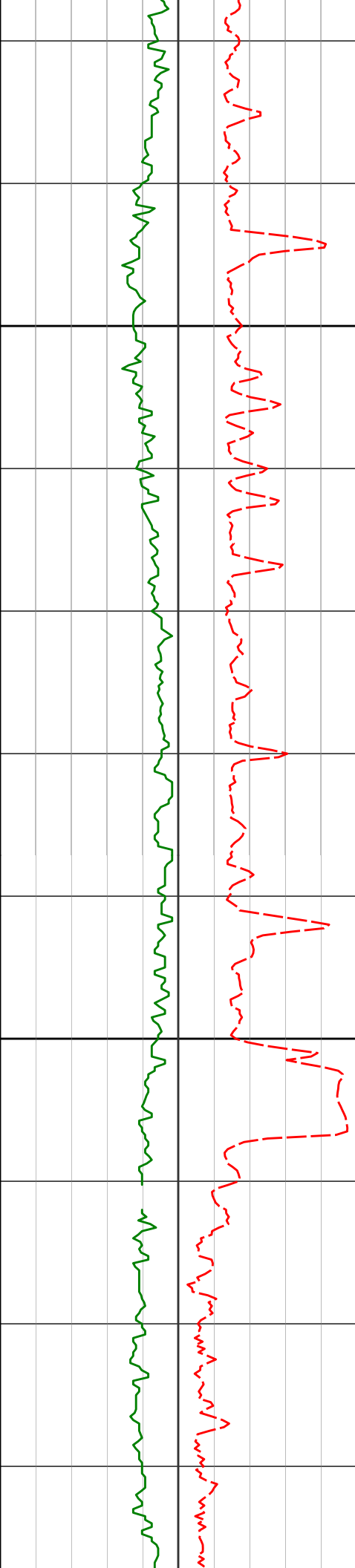
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251.38°F

251.38°F

251.38°F

251.38°F



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13800

13811'

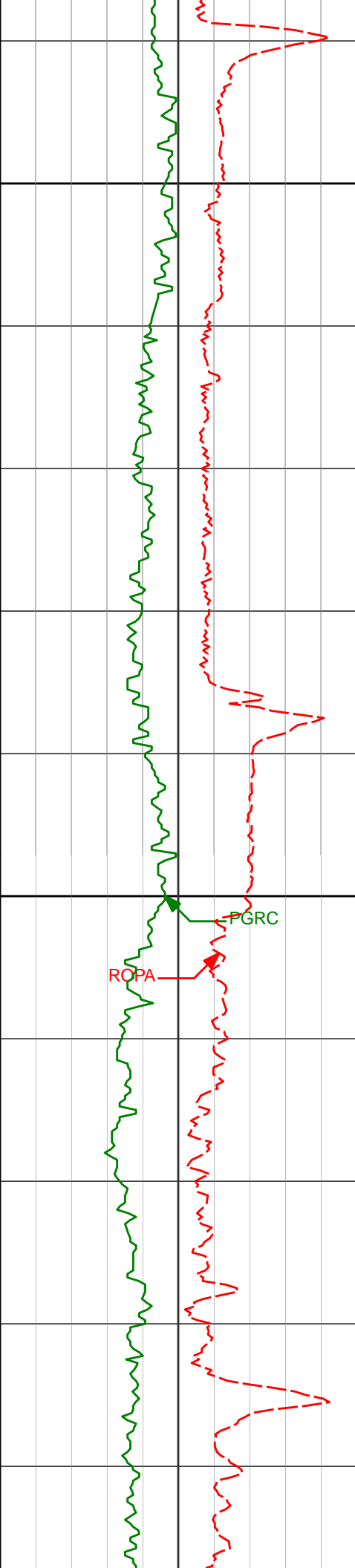
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251.38°F

255.59°F



13900

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259.81°F

259.81°F

259.81°F

14000

14000'

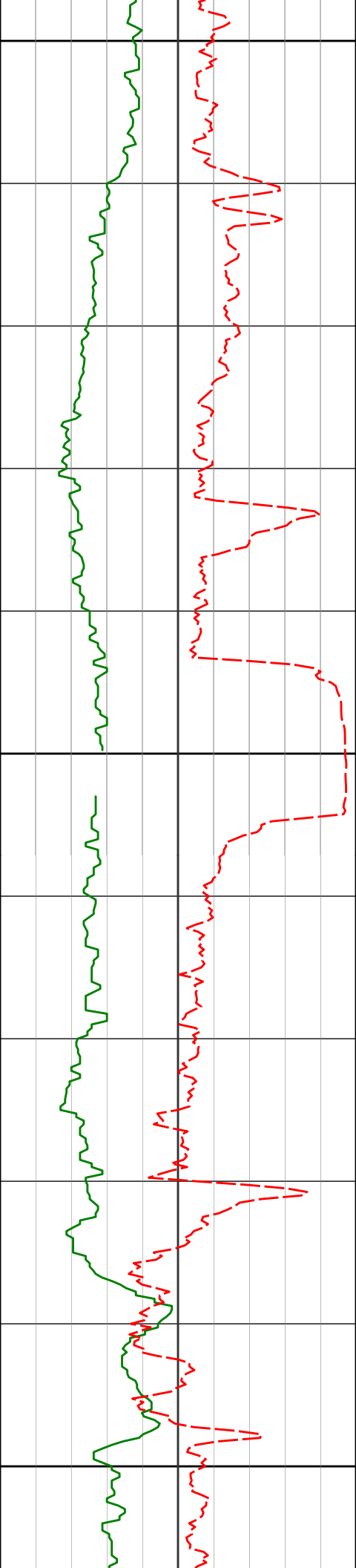
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7510.08'

259.81°F

259.81°F

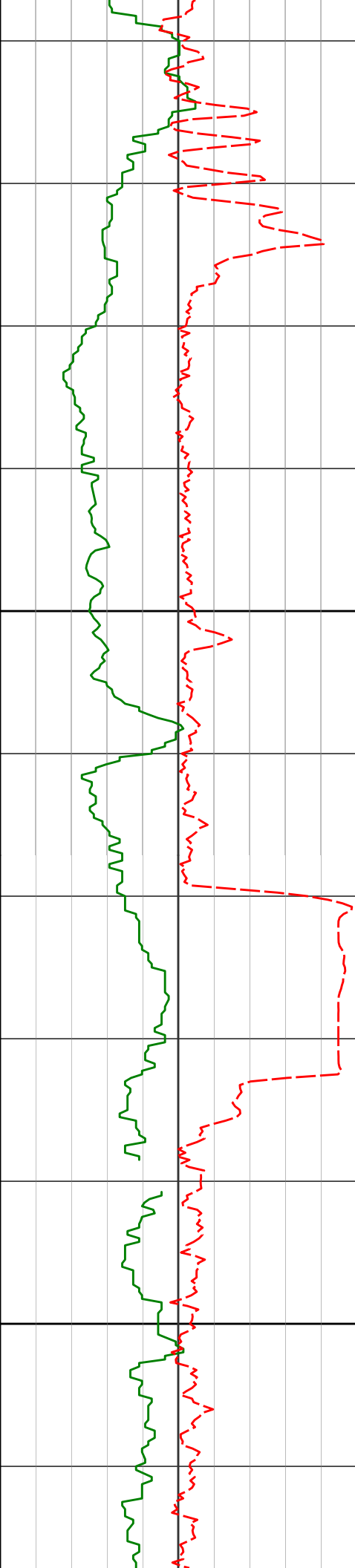


14100

14200

14300

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					259.81°F
					255.59°F
14189'	91.08°	0.16°	7008.35'	7698.97'	
					255.59°F
					259.81°F
14284'	92.19°	0.75°	7005.64'	7793.92'	
					259.81°F



14400

14500

14378'

92.87°

0.53° 7001.49'

7887.83'

14473'

90.68°

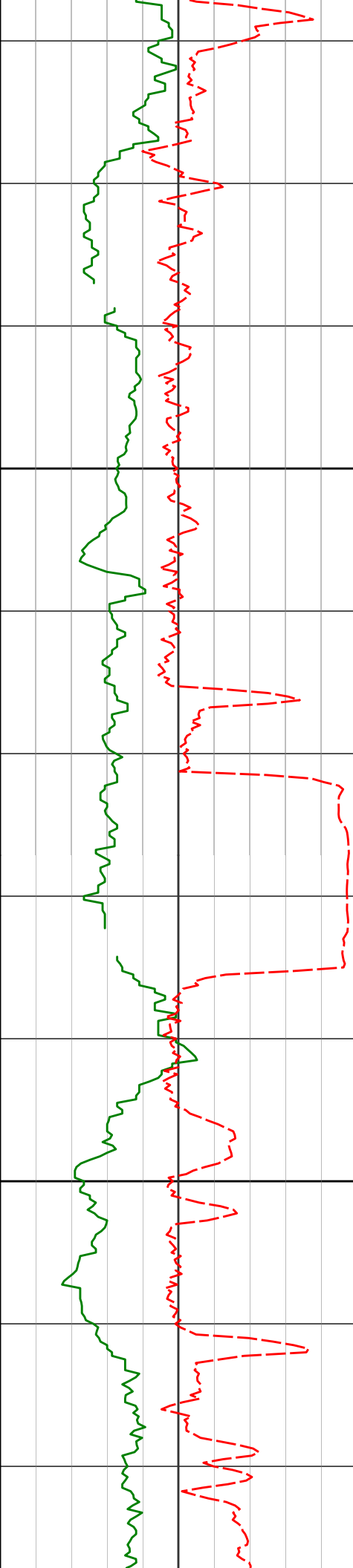
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7982.78'

259.81°F

259.81°F

259.81°F



14600

14700

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91.60°

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14662'

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359.82° 6995.56'

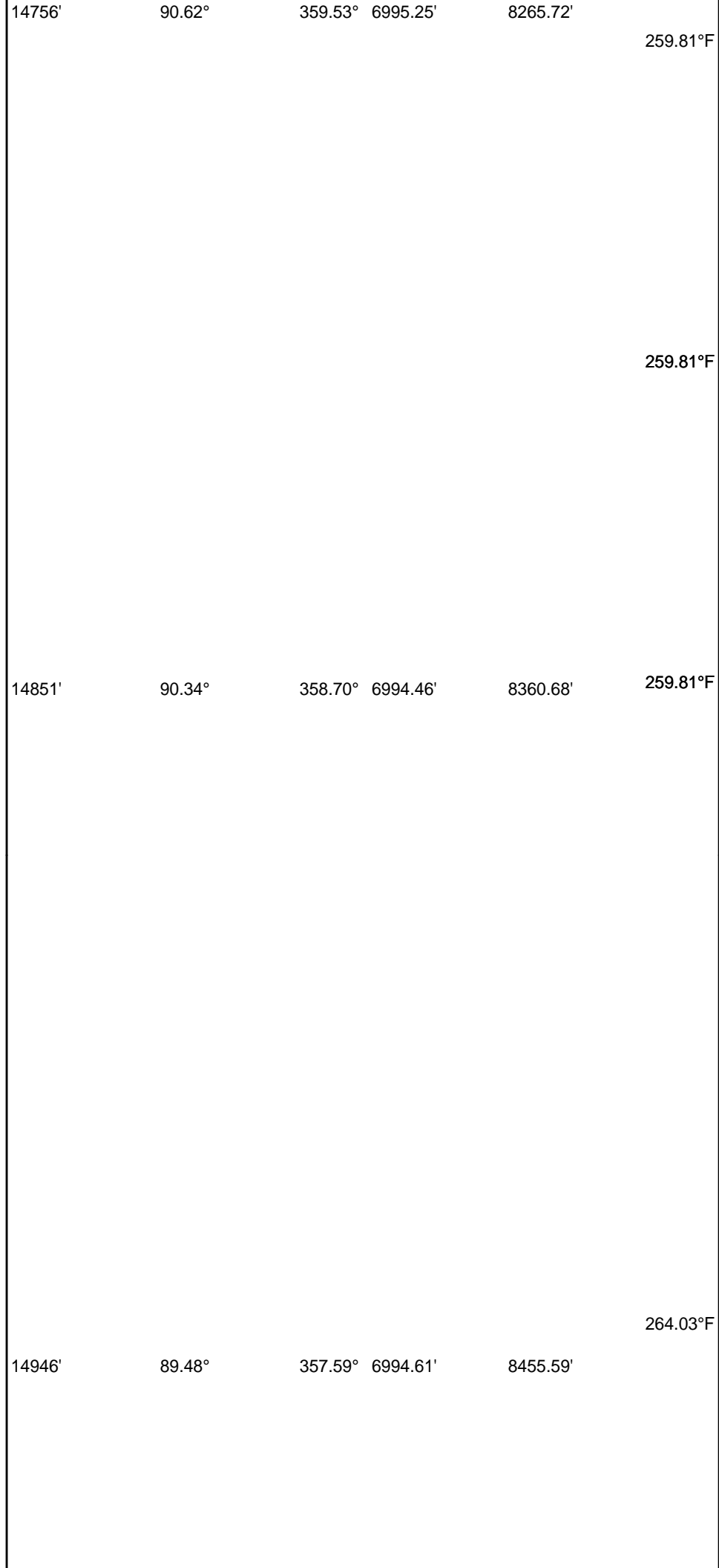
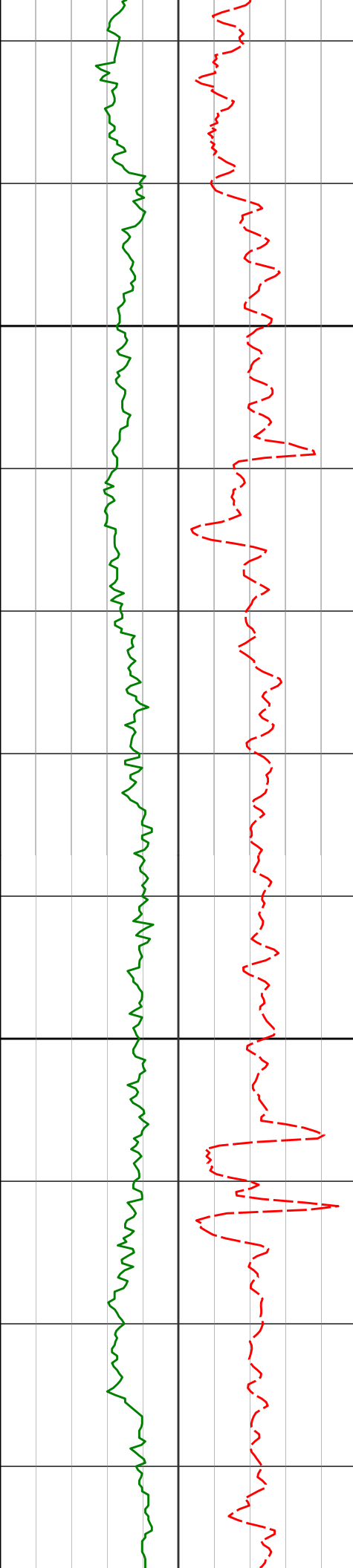
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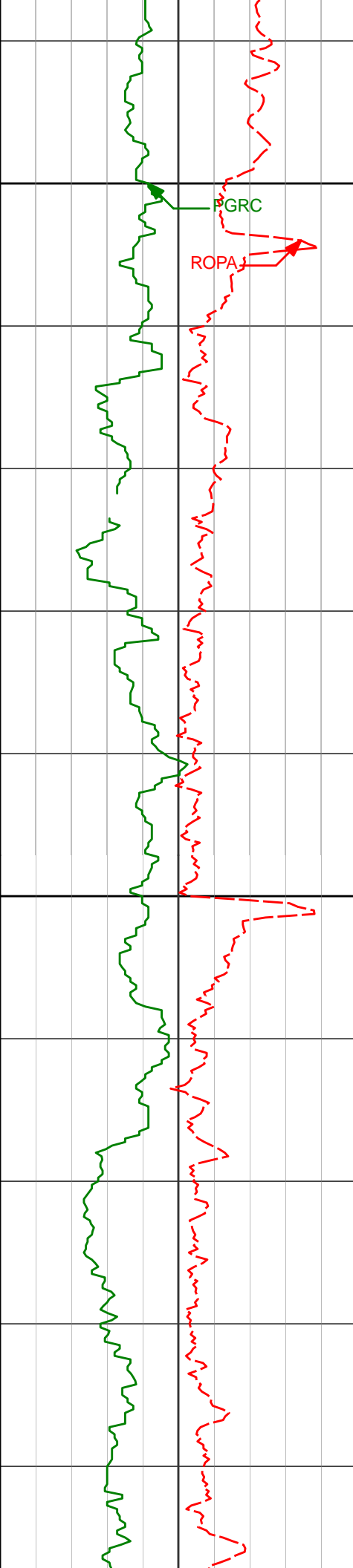
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259.81°F

259.81°F

259.81°F





15000

15100

15041'

15136'

89.69°

90.89°

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357.19° 6994.81'

8550.44'

8645.25'

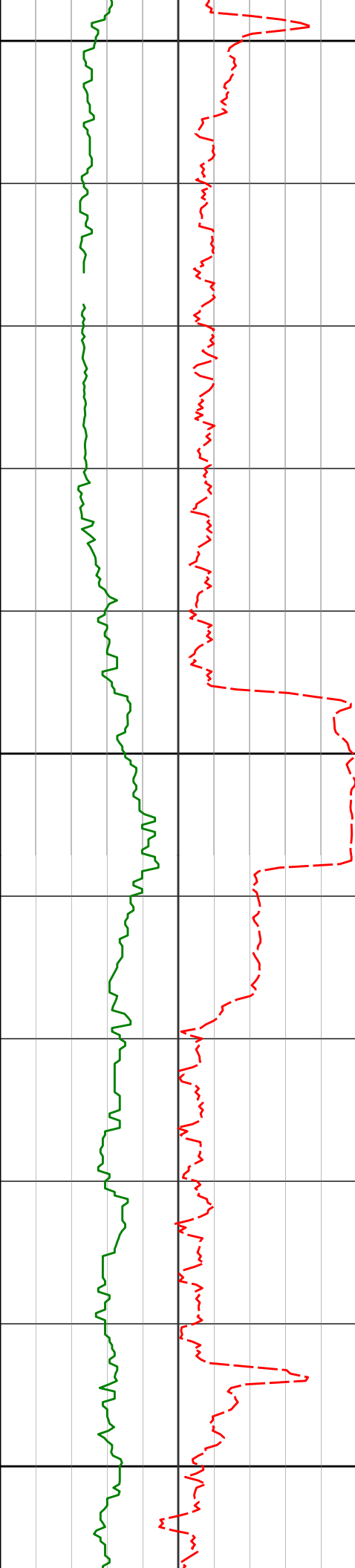
264.03°F

264.03°F

264.03°F

264.03°F

264.03°F



15200

15230'

91.66°

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8739.02'

264.03°F

264.03°F

15300

15324'

90.68°

357.84° 6990.80'

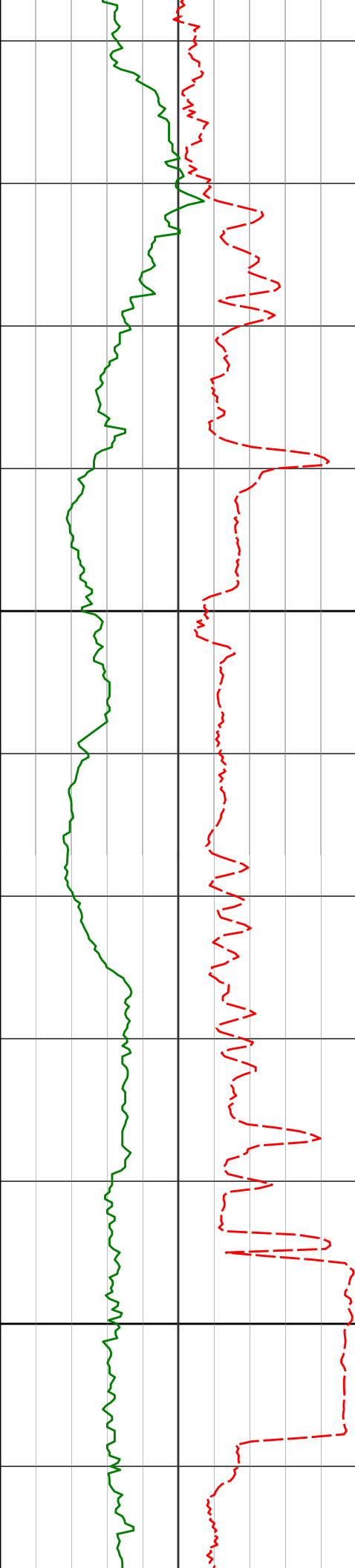
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259.81°F

259.81°F

15400

264.03°F



15500

15600

15418'

91.33°

356.67° 6989.16'

8926.64'

264.03°F

264.03°F

15512'

91.97°

356.35° 6986.45'

9020.36'

264.03°F

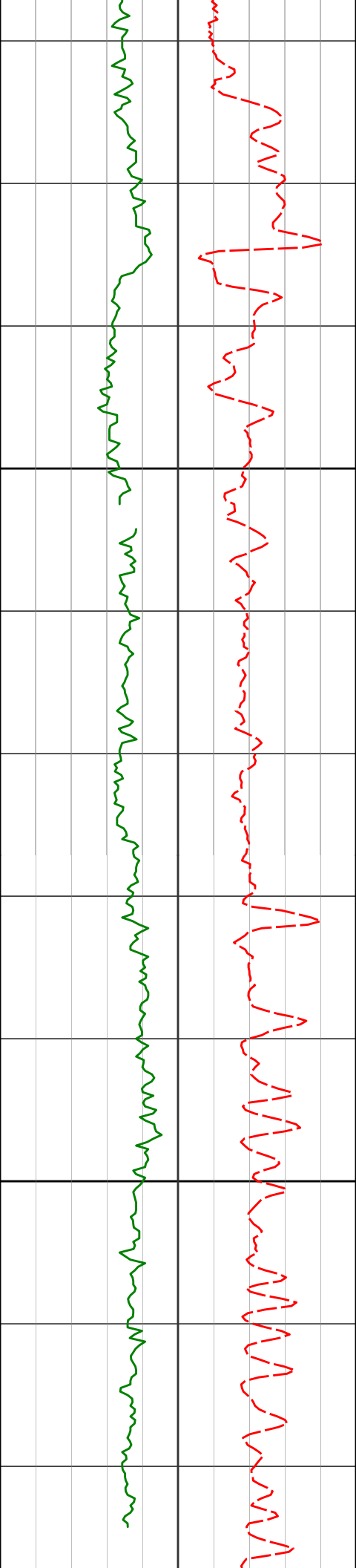
15606'

90.31°

357.56° 6984.58'

9114.15'

264.03°F



15700

15700'

90.18°

357.82° 6984.18'

9208.02'

264.03°F

264.03°F

264.03°F

15800

15794'

89.63°

357.05° 6984.33'

9301.87'

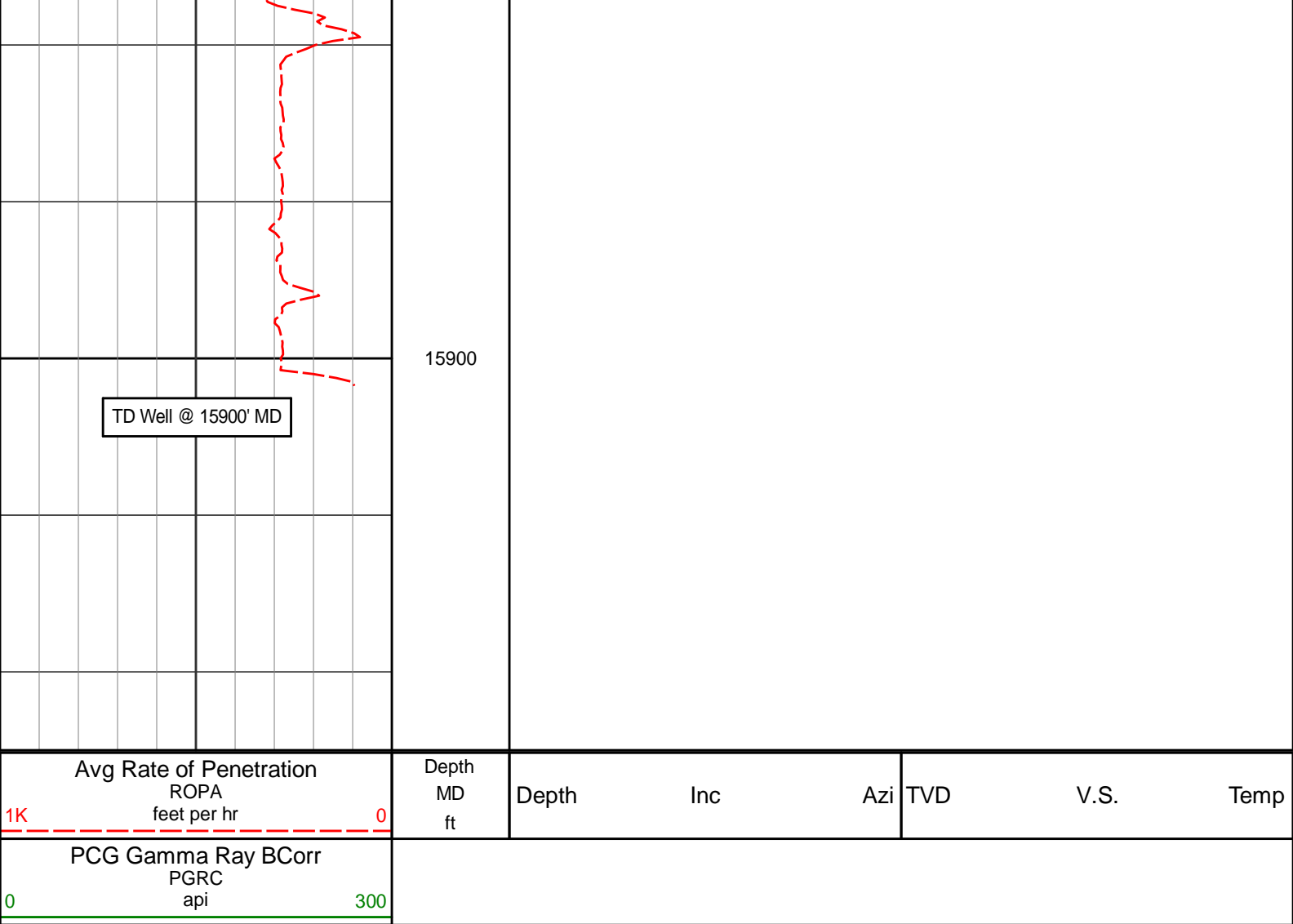
265.41°F

15838'

89.75°

356.72° 6984.57'

9345.77'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Moser H22-715
Wattenberg
Weld Colorado
USA

CA-XX-0902863038

Surveys in the Lateral Section have had IFR/MSA Corrections applied.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
927.00	0.40	103.36	926.99	0.75 S	3.15 E	-0.71	0.04
1022.00	0.25	117.52	1021.99	0.92 S	3.66 E	-0.87	0.18
1203.00	0.12	185.24	1202.99	1.30 S	4.00 E	-1.25	0.13
1294.00	0.12	193.73	1293.99	1.49 S	3.97 E	-1.44	0.02
1386.00	0.04	173.61	1385.99	1.62 S	3.95 E	-1.57	0.09
1476.00	0.06	200.50	1475.99	1.70 S	3.93 E	-1.65	0.03
1568.00	0.13	76.46	1567.99	1.73 S	4.02 E	-1.67	0.19
1659.00	0.09	25.72	1658.99	1.64 S	4.15 E	-1.58	0.11
1841.00	1.88	45.56	1840.96	0.59 N	6.35 E	0.68	0.99
1933.00	4.91	35.48	1932.78	4.86 N	9.72 E	4.99	3.34
2024.00	7.13	33.08	2023.28	12.76 N	15.06 E	12.97	2.46
2115.00	11.93	24.27	2113.00	26.08 N	22.02 E	26.38	5.50
2205.00	11.07	20.72	2201.19	42.64 N	28.90 E	43.04	1.24
2297.00	10.33	28.17	2291.60	58.17 N	35.91 E	58.66	1.70

2388.00	10.34	35.45	2381.12	72.02 N	44.50 E	72.62	1.43
2480.00	9.60	33.73	2471.73	85.13 N	53.55 E	85.86	0.87
2571.00	9.47	30.11	2561.48	97.92 N	61.52 E	98.76	0.67
2663.00	9.69	29.83	2652.19	111.18 N	69.17 E	112.12	0.24
2755.00	7.13	44.44	2743.21	121.97 N	77.02 E	123.02	3.60
2849.00	6.92	44.21	2836.50	130.20 N	85.05 E	131.36	0.22
2944.00	6.64	42.40	2930.84	138.36 N	92.75 E	139.62	0.37
3038.00	6.33	39.70	3024.23	146.36 N	99.73 E	147.72	0.47
3133.00	6.15	34.59	3118.67	154.58 N	105.96 E	156.03	0.61
3227.00	5.92	31.43	3212.15	162.86 N	111.35 E	164.38	0.43
3322.00	6.83	47.17	3306.57	170.88 N	118.05 E	172.49	2.06
3417.00	6.52	41.44	3400.93	178.76 N	125.76 E	180.48	0.77
3511.00	6.14	41.36	3494.36	186.53 N	132.61 E	188.34	0.40
3606.00	5.82	39.00	3588.84	194.09 N	139.00 E	195.99	0.43
3795.00	5.65	33.70	3776.89	209.28 N	150.19 E	211.34	0.29
3890.00	5.71	35.31	3871.43	217.04 N	155.52 E	219.16	0.18
3984.00	5.63	42.53	3964.97	224.26 N	161.35 E	226.46	0.76
4079.00	5.45	38.78	4059.52	231.21 N	167.33 E	233.50	0.43
4174.00	4.94	38.62	4154.13	237.92 N	172.71 E	240.28	0.54
4268.00	5.10	49.23	4247.77	243.82 N	178.40 E	246.25	1.00
4363.00	5.06	60.56	4342.40	248.63 N	185.24 E	251.16	1.05
4457.00	4.25	54.48	4436.09	252.69 N	191.68 E	255.30	1.01
4646.00	2.98	54.79	4624.71	259.58 N	201.38 E	262.33	0.67
4740.00	0.52	144.89	4718.67	260.64 N	203.62 E	263.42	3.22
4835.00	1.40	95.35	4813.66	260.17 N	205.03 E	262.97	1.19
4929.00	0.97	168.42	4907.64	259.29 N	206.33 E	262.11	1.54
5024.00	0.92	162.60	5002.63	257.77 N	206.72 E	260.60	0.11
5118.00	0.77	143.55	5096.62	256.54 N	207.32 E	259.38	0.34
5213.00	0.75	109.21	5191.61	255.82 N	208.28 E	258.67	0.47
5307.00	0.66	252.53	5285.61	255.46 N	208.35 E	258.31	1.42
5402.00	0.53	287.88	5380.60	255.43 N	207.41 E	258.27	0.40
5591.00	0.47	320.11	5569.60	256.30 N	206.08 E	259.11	0.15
5686.00	0.69	215.94	5664.59	256.13 N	205.49 E	258.94	0.98
5780.00	0.76	166.90	5758.59	255.06 N	205.30 E	257.86	0.65
5875.00	0.56	139.93	5853.58	254.09 N	205.74 E	256.90	0.38
5969.00	0.14	97.76	5947.58	253.72 N	206.15 E	256.54	0.50
6064.00	0.41	2.02	6042.58	254.05 N	206.27 E	256.87	0.47
6158.00	0.62	163.24	6136.58	253.90 N	206.43 E	256.72	1.08
6253.00	0.75	93.86	6231.57	253.37 N	207.20 E	256.20	0.83
6348.00	1.14	75.45	6326.56	253.56 N	208.73 E	256.42	0.52
6443.00	9.31	349.98	6421.13	261.38 N	208.31 E	264.23	9.78
6538.00	20.20	348.28	6512.86	285.08 N	203.63 E	287.86	11.47
6632.00	27.04	353.09	6598.94	322.23 N	197.75 E	324.93	7.56
6727.00	30.97	359.03	6682.02	368.14 N	194.74 E	370.79	5.12
6822.00	36.32	359.32	6761.08	420.76 N	193.99 E	423.39	5.64
6916.00	44.36	354.84	6832.68	481.44 N	190.70 E	484.02	9.08
7010.00	48.11	356.11	6897.69	549.10 N	185.37 E	551.60	4.11
7105.00	59.15	354.65	6953.94	625.22 N	179.15 E	627.63	11.69
7199.00	75.49	0.23	6990.08	711.54 N	175.54 E	713.89	18.21
7294.00	82.37	0.44	7008.31	804.71 N	176.09 E	807.07	7.24
7337.00	87.72	1.42	7012.02	847.53 N	176.79 E	849.89	12.66
7442.00	91.94	2.17	7012.33	952.46 N	180.08 E	954.85	4.08
7537.00	89.35	1.99	7011.26	1047.38 N	183.52 E	1049.81	2.73
7631.00	89.29	1.35	7012.38	1141.33 N	186.26 E	1143.79	0.68
7726.00	89.44	0.72	7013.43	1236.31 N	187.98 E	1238.78	0.68
7821.00	89.48	0.25	7014.33	1331.30 N	188.78 E	1333.78	0.50
7915.00	89.72	359.61	7014.98	1425.30 N	188.67 E	1427.76	0.73
8010.00	90.15	358.98	7015.09	1520.29 N	187.50 E	1522.73	0.80
8105.00	89.82	0.37	7015.12	1615.29 N	186.96 E	1617.71	1.50
8199.00	89.54	0.51	7015.64	1709.28 N	187.68 E	1711.71	0.33
8294.00	89.44	359.96	7016.49	1804.28 N	188.07 E	1806.70	0.59
8388.00	89.51	359.43	7017.35	1898.27 N	187.57 E	1900.68	0.57
8483.00	89.63	359.63	7018.06	1993.27 N	186.79 E	1995.65	0.25
8578.00	89.54	359.74	7018.75	2088.26 N	186.27 E	2090.63	0.15
8672.00	89.32	359.21	7019.69	2182.25 N	185.41 E	2184.60	0.61
8767.00	89.14	358.47	7020.96	2277.22 N	183.48 E	2279.54	0.80
8862.00	90.06	359.17	7021.63	2372.20 N	181.53 E	2374.48	1.22
8956.00	89.91	359.80	7021.65	2466.20 N	180.68 E	2468.45	0.69
9051.00	89.91	359.32	7021.80	2561.19 N	179.95 E	2563.43	0.51
9145.00	89.85	358.83	7022.00	2655.18 N	178.44 E	2657.39	0.53
9240.00	90.37	358.31	7021.81	2750.15 N	176.07 E	2752.32	0.77
9335.00	90.55	357.69	7021.05	2845.09 N	172.75 E	2847.20	0.68
9429.00	89.20	359.17	7021.26	2939.05 N	170.17 E	2941.11	2.13
9524.00	89.48	359.33	7022.35	3034.03 N	168.93 E	3036.07	0.34
9619.00	89.23	358.78	7023.42	3129.01 N	167.36 E	3131.02	0.64

9709.00	89.54	359.27	7024.39	3219.00 N	165.83 E	3220.98	0.64
9800.00	90.28	1.53	7024.53	3309.99 N	166.47 E	3311.97	2.61
9891.00	90.03	1.28	7024.28	3400.96 N	168.70 E	3402.96	0.39
9983.00	89.45	0.29	7024.70	3492.95 N	169.96 E	3494.96	1.25
10165.00	90.71	1.42	7024.45	3674.92 N	172.68 E	3676.95	0.93
10256.00	91.05	1.28	7023.05	3765.88 N	174.82 E	3767.94	0.40
10347.00	91.08	0.60	7021.36	3856.86 N	176.31 E	3858.92	0.75
10438.00	91.36	0.14	7019.42	3947.83 N	176.90 E	3949.90	0.59
10530.00	90.15	359.98	7018.21	4039.82 N	177.00 E	4041.88	1.33
10621.00	90.34	359.35	7017.82	4130.82 N	176.46 E	4132.86	0.72
10712.00	90.31	358.87	7017.30	4221.81 N	175.05 E	4223.82	0.53
10802.00	90.15	358.88	7016.94	4311.79 N	173.28 E	4313.77	0.18
10894.00	90.00	358.49	7016.82	4403.76 N	171.17 E	4405.71	0.45
11077.00	90.06	357.45	7016.73	4586.65 N	164.69 E	4588.48	0.57
11168.00	90.25	356.78	7016.48	4677.53 N	160.11 E	4679.29	0.77
11260.00	89.75	358.66	7016.48	4769.45 N	156.45 E	4771.16	2.11
11352.00	89.54	0.12	7017.05	4861.44 N	155.47 E	4863.13	1.60
11541.00	88.80	0.05	7019.79	5050.42 N	155.75 E	5052.09	0.39
11635.00	91.91	0.82	7019.20	5144.41 N	156.46 E	5146.07	3.41
11730.00	90.03	0.27	7017.60	5239.38 N	157.37 E	5241.06	2.06
11919.00	89.97	0.81	7017.60	5428.37 N	159.15 E	5430.05	0.29
12014.00	90.96	2.08	7016.83	5523.34 N	161.54 E	5525.04	1.69
12108.00	90.93	1.53	7015.28	5617.28 N	164.50 E	5619.01	0.59
12203.00	90.74	0.89	7013.89	5712.25 N	166.51 E	5714.00	0.70
12297.00	91.85	0.66	7011.77	5806.21 N	167.78 E	5807.97	1.21
12392.00	92.04	0.20	7008.54	5901.15 N	168.49 E	5902.92	0.52
12487.00	92.68	0.19	7004.63	5996.07 N	168.82 E	5997.83	0.67
12582.00	90.68	0.45	7001.85	6091.03 N	169.35 E	6092.78	2.12
12676.00	91.26	0.32	7000.25	6185.01 N	169.98 E	6186.77	0.63
12771.00	90.43	359.27	6998.85	6280.00 N	169.64 E	6281.74	1.41
12865.00	91.29	359.19	6997.44	6373.98 N	168.37 E	6375.69	0.92
12960.00	90.15	359.69	6996.25	6468.96 N	167.45 E	6470.66	1.31
13055.00	89.51	359.95	6996.53	6563.96 N	167.15 E	6565.64	0.73
13149.00	91.02	359.81	6996.10	6657.96 N	166.95 E	6659.63	1.61
13243.00	87.62	359.95	6997.21	6751.94 N	166.75 E	6753.59	3.62
13338.00	87.04	359.55	7001.64	6846.83 N	166.34 E	6848.48	0.74
13432.00	87.13	359.49	7006.42	6940.71 N	165.55 E	6942.33	0.12
13527.00	89.26	359.77	7009.41	7035.65 N	164.94 E	7037.26	2.26
13716.00	89.23	359.10	7011.90	7224.63 N	163.08 E	7226.19	0.35
13811.00	90.46	359.41	7012.16	7319.62 N	161.84 E	7321.15	1.34
13905.00	90.22	359.48	7011.60	7413.61 N	160.93 E	7415.12	0.27
14000.00	90.49	358.91	7011.01	7508.60 N	159.60 E	7510.08	0.66
14095.00	90.83	358.53	7009.92	7603.57 N	157.47 E	7605.02	0.54
14189.00	91.08	0.08	7008.35	7697.54 N	156.33 E	7698.97	1.67
14284.00	92.19	0.57	7005.64	7792.50 N	156.87 E	7793.92	1.28
14378.00	92.87	0.77	7001.49	7886.40 N	157.97 E	7887.83	0.75
14473.00	90.68	0.98	6998.55	7981.34 N	159.42 E	7982.78	2.32
14567.00	91.60	0.42	6996.68	8075.31 N	160.57 E	8076.76	1.15
14662.00	89.75	359.80	6995.56	8170.30 N	160.75 E	8171.74	2.05
14756.00	90.62	359.36	6995.25	8264.30 N	160.06 E	8265.72	1.04
14851.00	90.34	358.91	6994.46	8359.28 N	158.63 E	8360.68	0.56
14946.00	89.48	357.77	6994.61	8454.24 N	155.88 E	8455.59	1.50
15041.00	89.69	357.44	6995.30	8549.16 N	151.91 E	8550.44	0.41
15136.00	90.89	357.05	6994.81	8644.04 N	147.34 E	8645.25	1.33
15230.00	91.66	356.96	6992.72	8737.89 N	142.43 E	8739.02	0.82
15324.00	90.68	357.68	6990.80	8831.77 N	138.04 E	8832.83	1.29
15418.00	91.33	356.83	6989.16	8925.64 N	133.53 E	8926.64	1.14
15512.00	91.97	356.60	6986.45	9019.45 N	128.15 E	9020.36	0.72
15606.00	90.31	357.83	6984.58	9113.31 N	123.58 E	9114.15	2.20
15700.00	90.18	357.78	6984.18	9207.24 N	119.98 E	9208.02	0.15
15794.00	89.63	357.31	6984.33	9301.16 N	115.96 E	9301.87	0.77
15838.00	89.75	356.66	6984.57	9345.10 N	113.64 E	9345.77	1.50
15900.00	89.75	356.66	6984.84	9406.99 N	110.03 E	9407.61	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 0.79 DEGREES (GRID)
A TOTAL CORRECTION OF 7.79 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 15900.00 FEET
IS 9407.63 FEET ALONG 0.67 DEGREES (GRID)

Final survey is a straight line projection to TD.

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