



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	01-Dec-15	05-Dec-15			
Rig Bit Number	0100	0200			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.820			
Log Start Depth (MD, ft)	898.00	7,377.00			
Log End Depth (MD, ft)	7,377.00	17,410.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	30-Nov-15 03:30	02-Dec-15 08:09			
Drill/Wipe End Date and Time	01-Dec-15 02:36	05-Dec-15 02:16			
Min Inc (deg) @ Depth (MD, ft)	0.52 @ 928.00	88.03 @ 16,171.00			
Max Inc (deg) @ Depth (MD, ft)	83.15 @ 7,322.00	92.66 @ 17,348.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC			
Flow Rate (gpm)	589.90	304.72			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	8.60 / 28.00	10.20 / 35.00			
Filtrate CL (ppm)	16.00	2,600.00			
pH / Fluid Loss (mptm)	9.20 / 35	9.10 / 7			
PV (cP) / YP (lbf2)	3 / 3.00	12 / 14.00			
% Solids / % Sand	3.70 / 0.20	10.4 / 0.15			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (in F) / S	177.00 / PDC	270.00 / PDC			

Max Tool Temp (degF) / Source	177.64 / PCM	270.36 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Matt Busche	Matt Busche			
Customer Representative	John Druhota	John Druhota			

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	28-Nov-15 22:45	01-Dec-15 17:45			
Date and Time Read	01-Dec-15 10:42	06-Dec-15 00:31			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.00	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)	51.70	349.90			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.42	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)

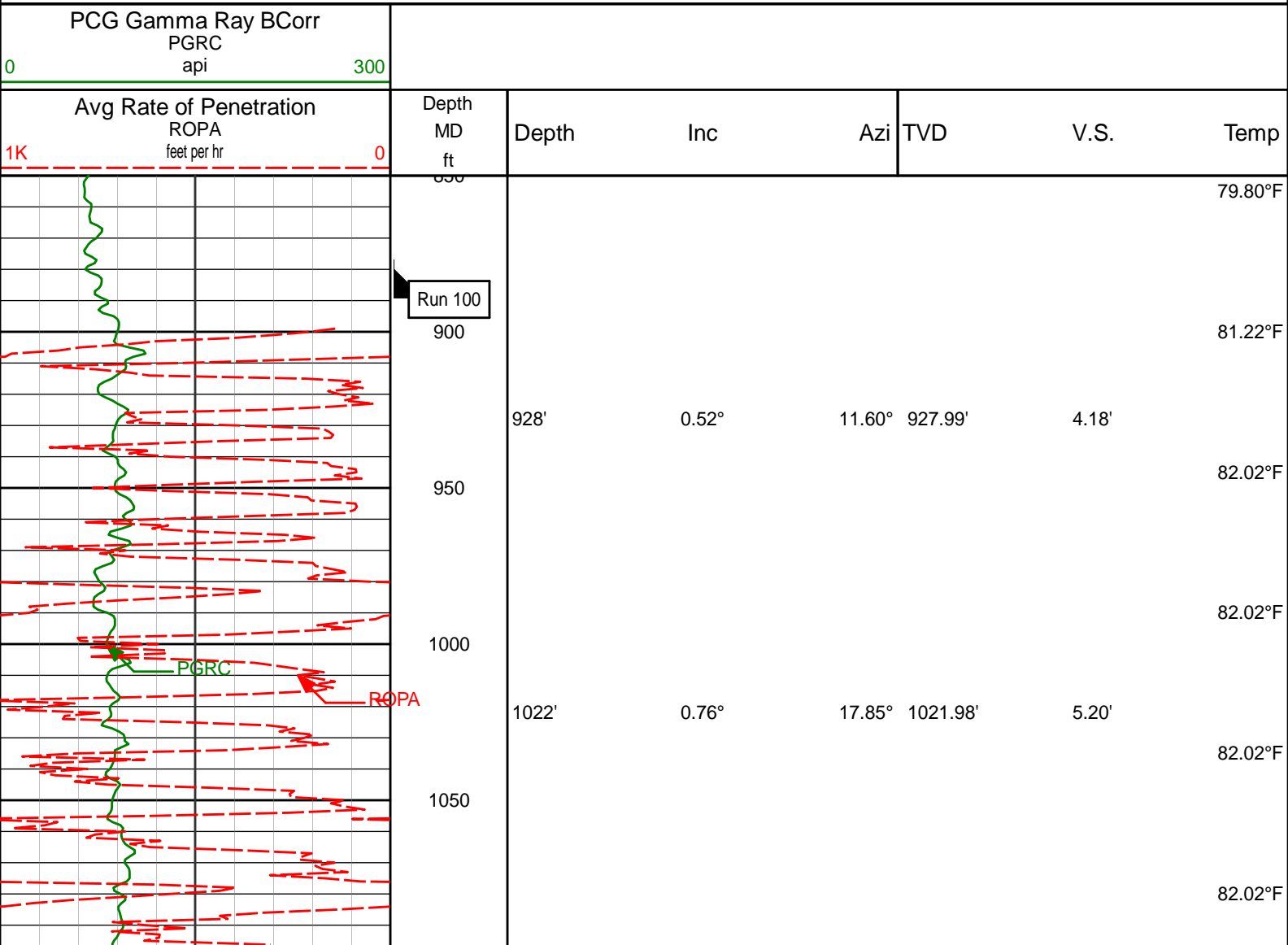
Interval: 0.5 ft

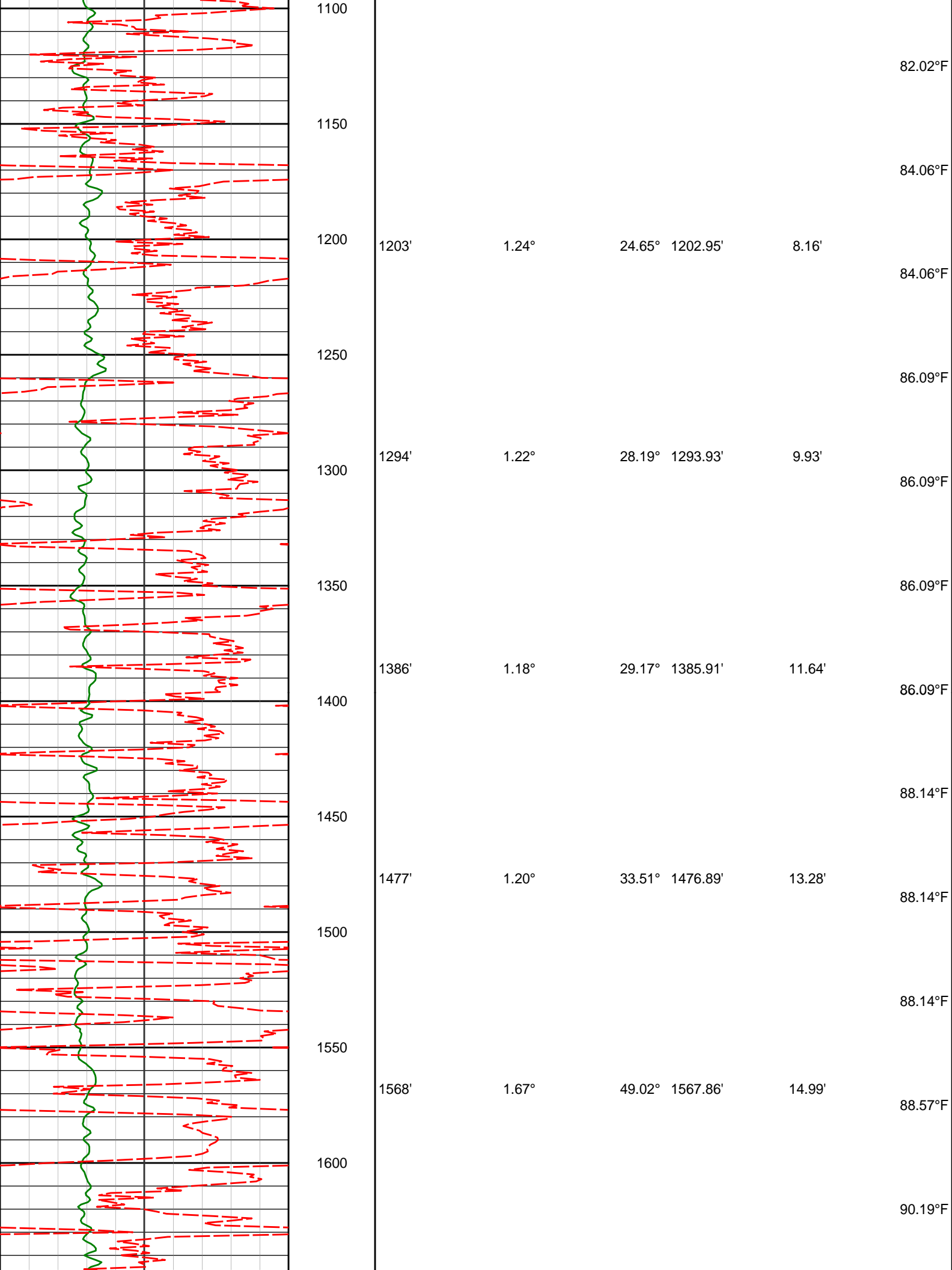
Coercion Distance: 0.6 ft (Gamma Ray)

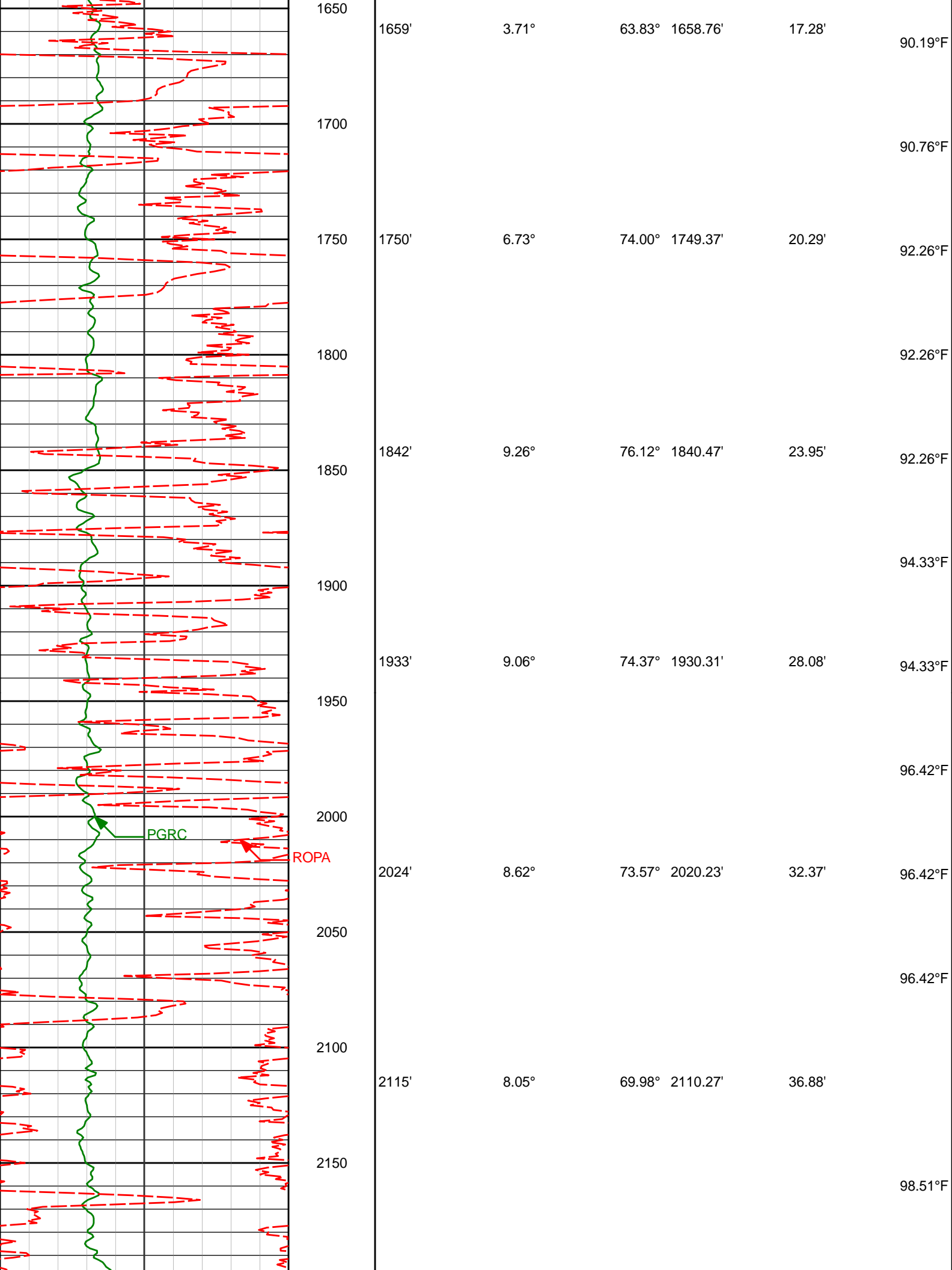
WARRANTY

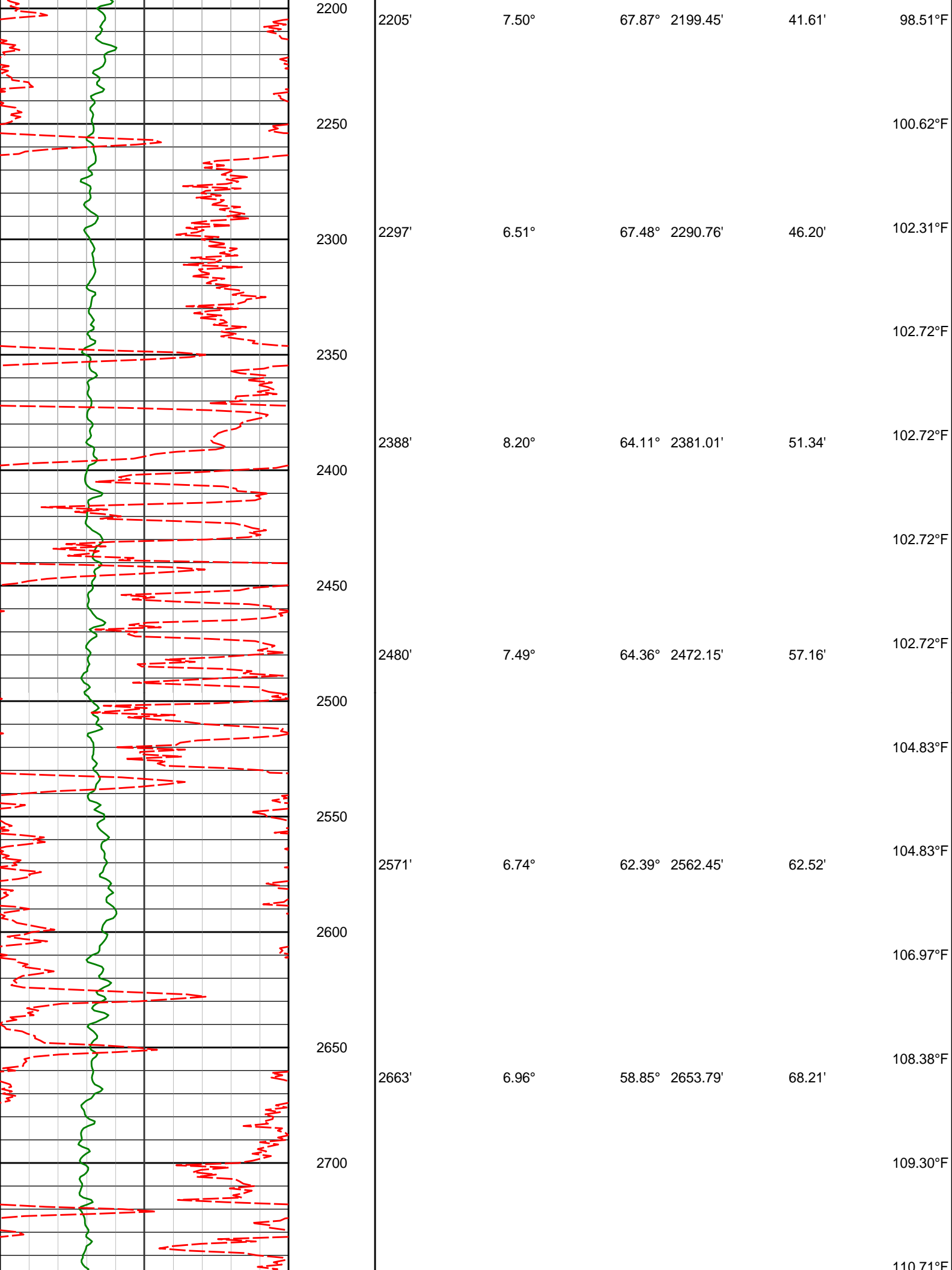
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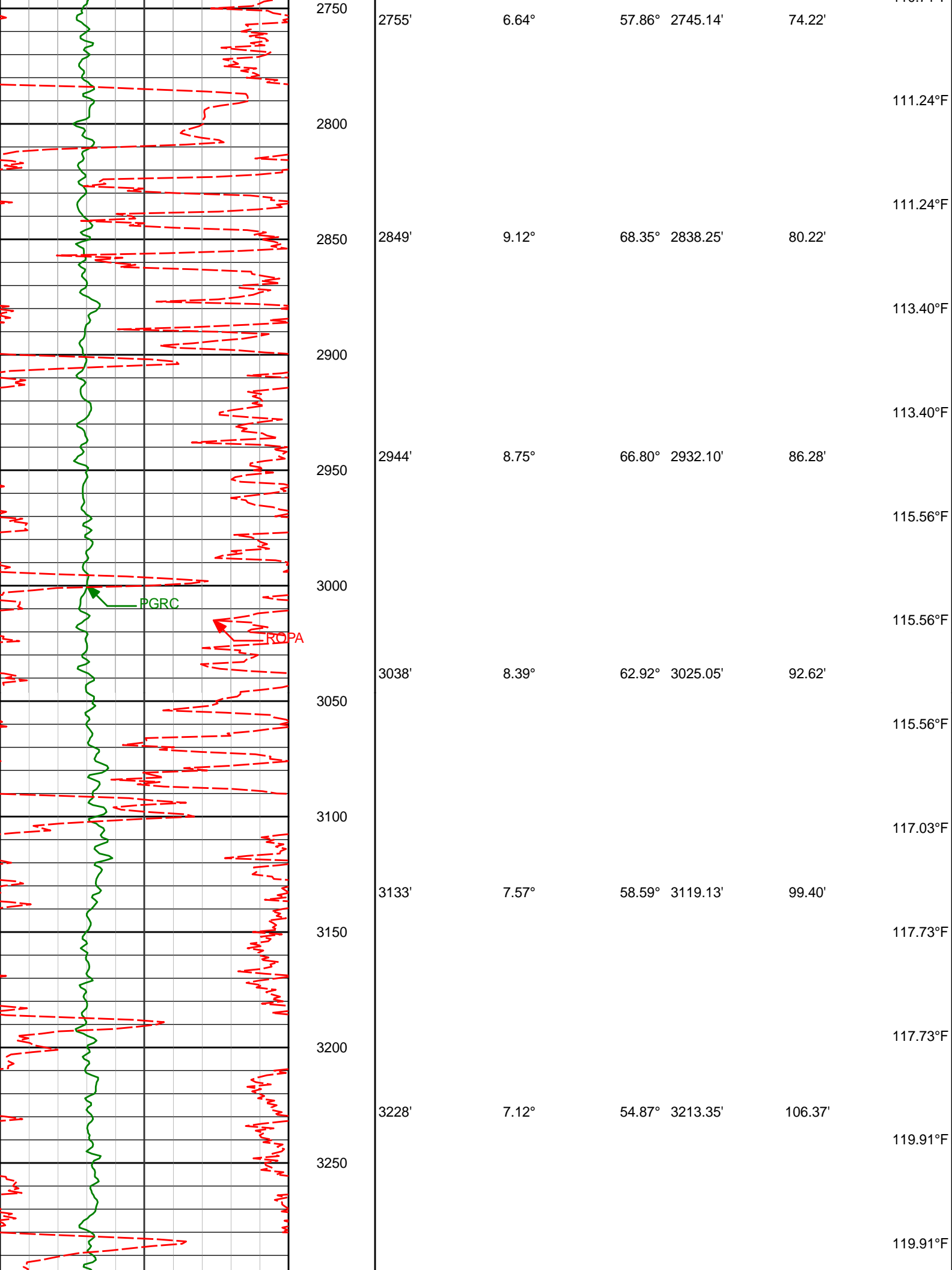
MD Detail 1:600 Scale

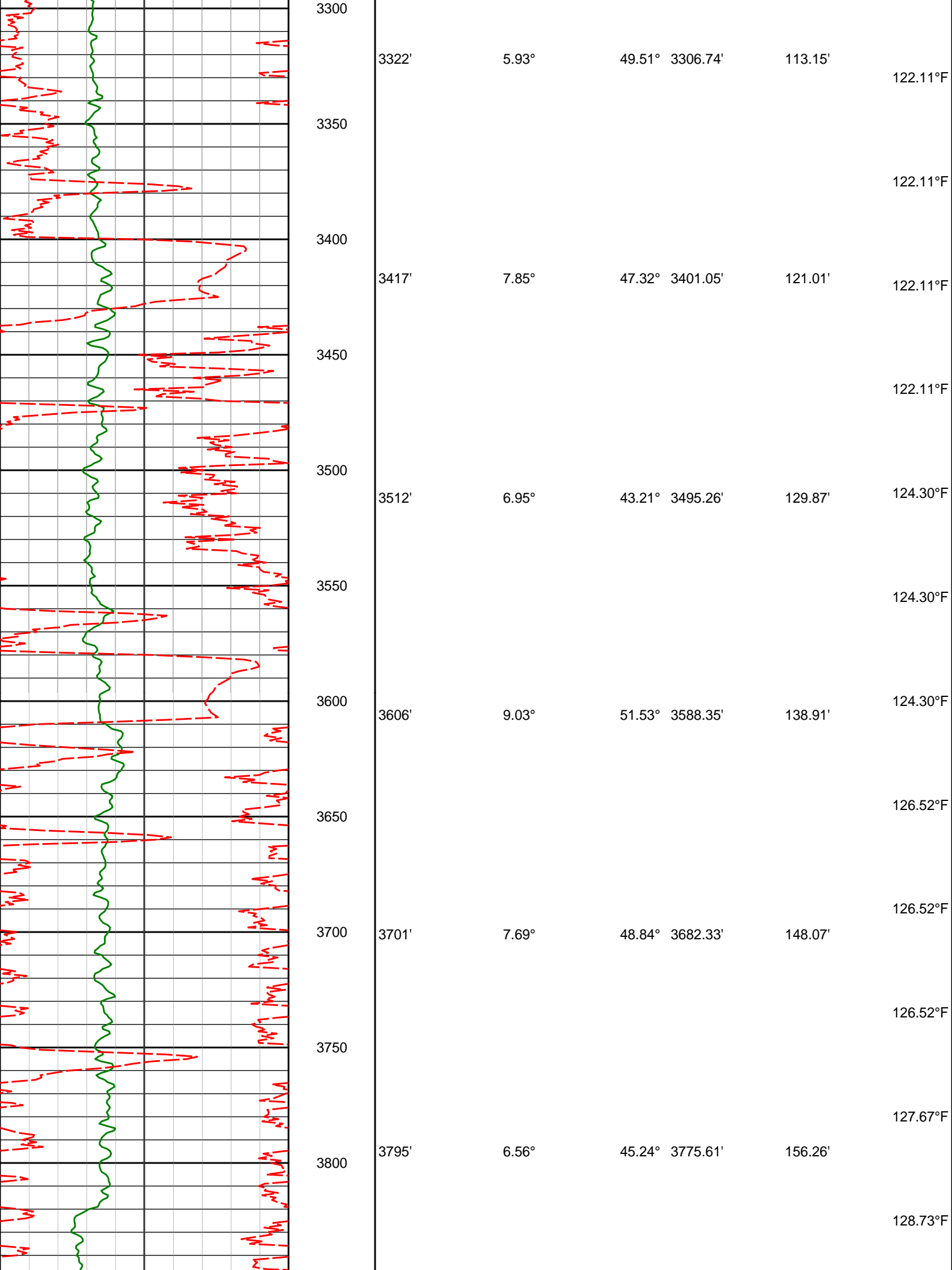


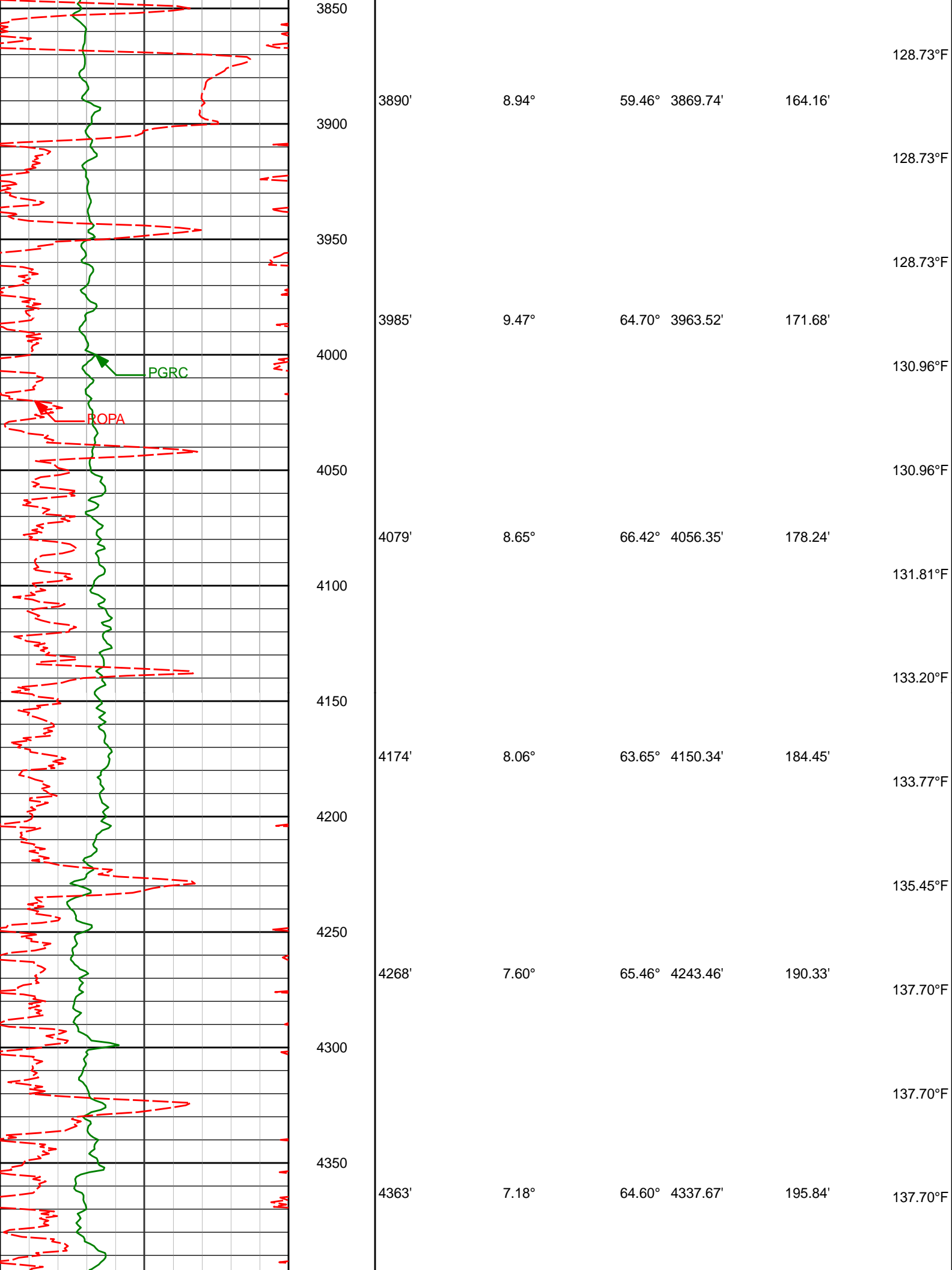


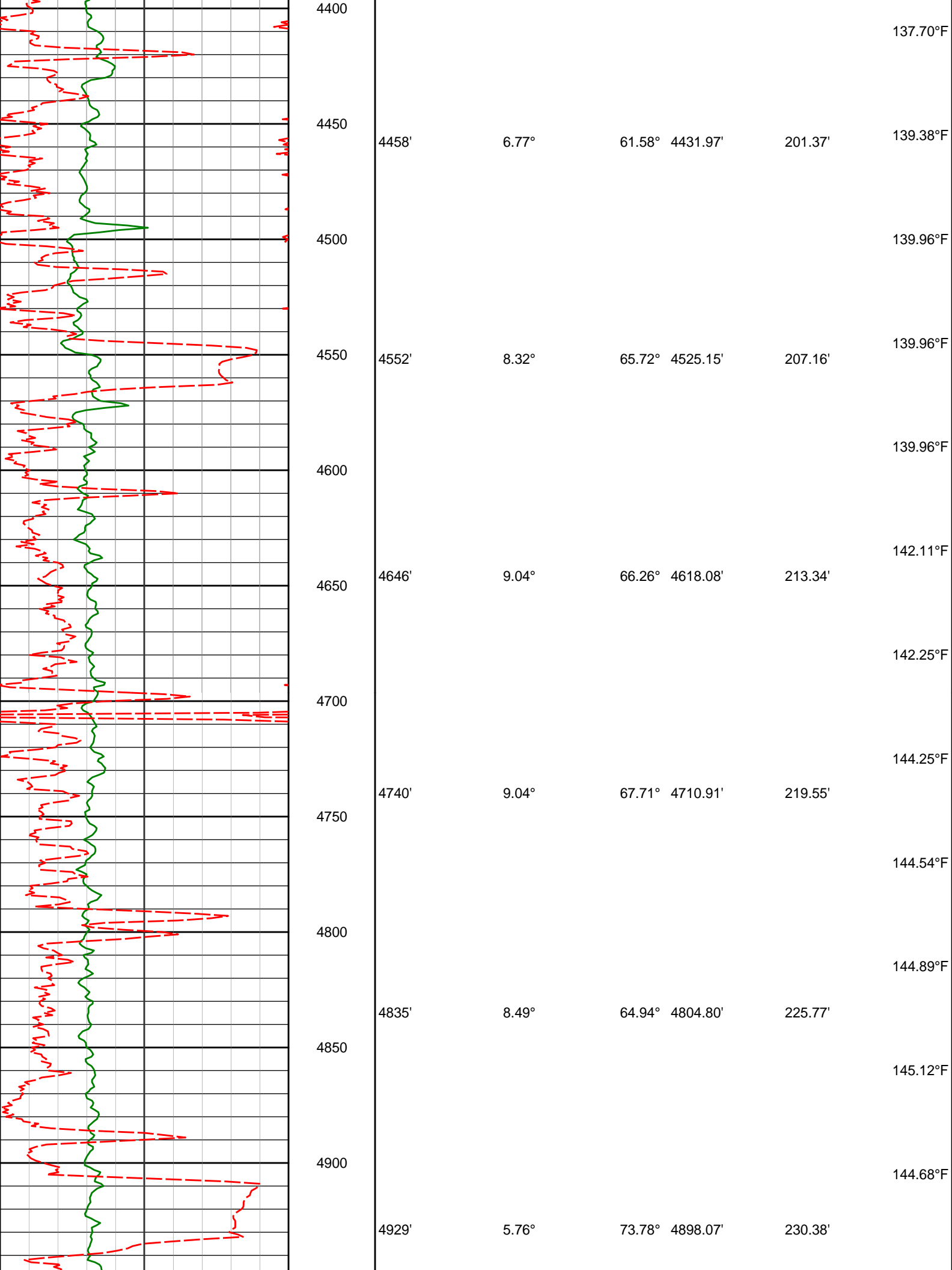


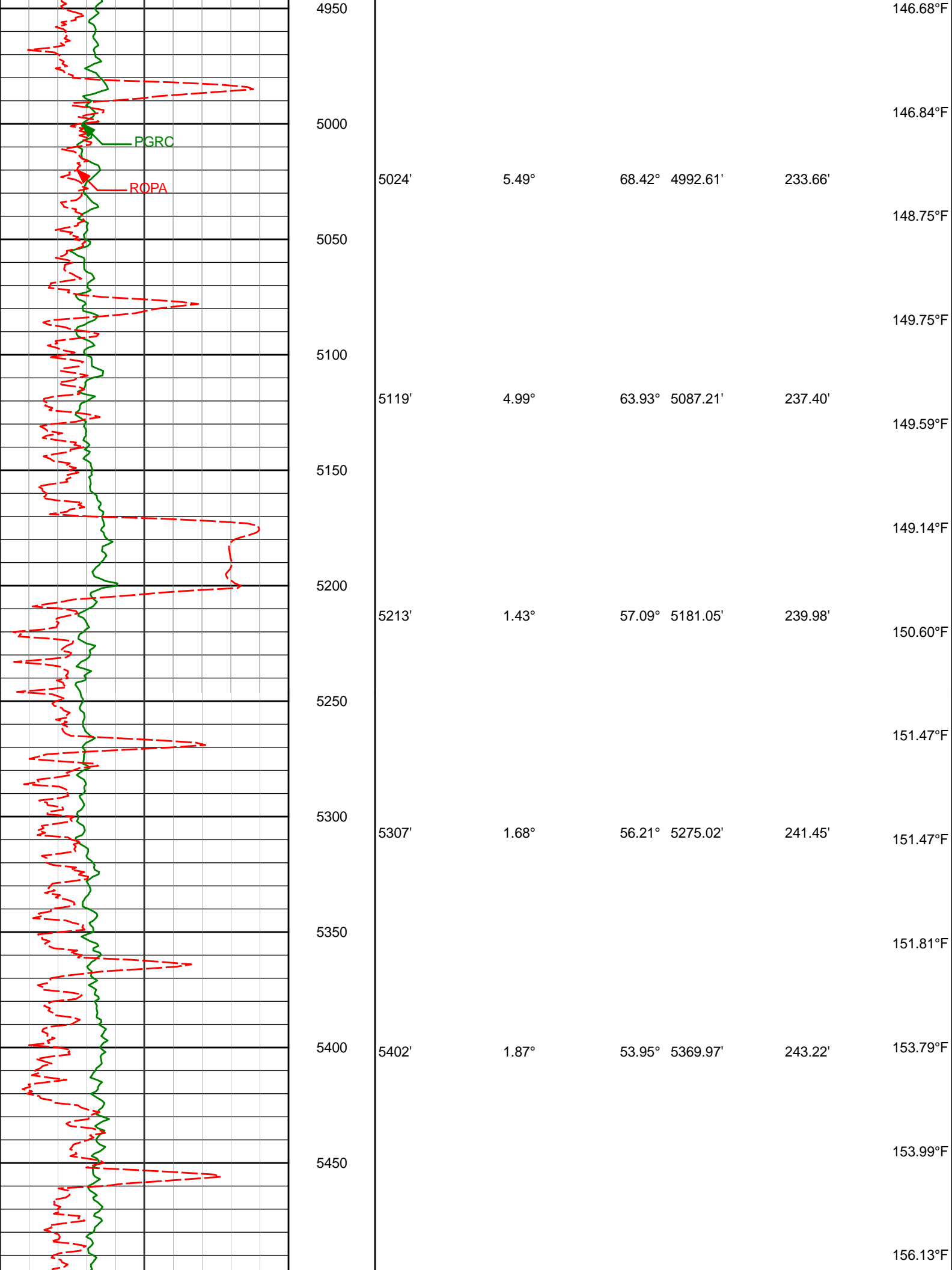


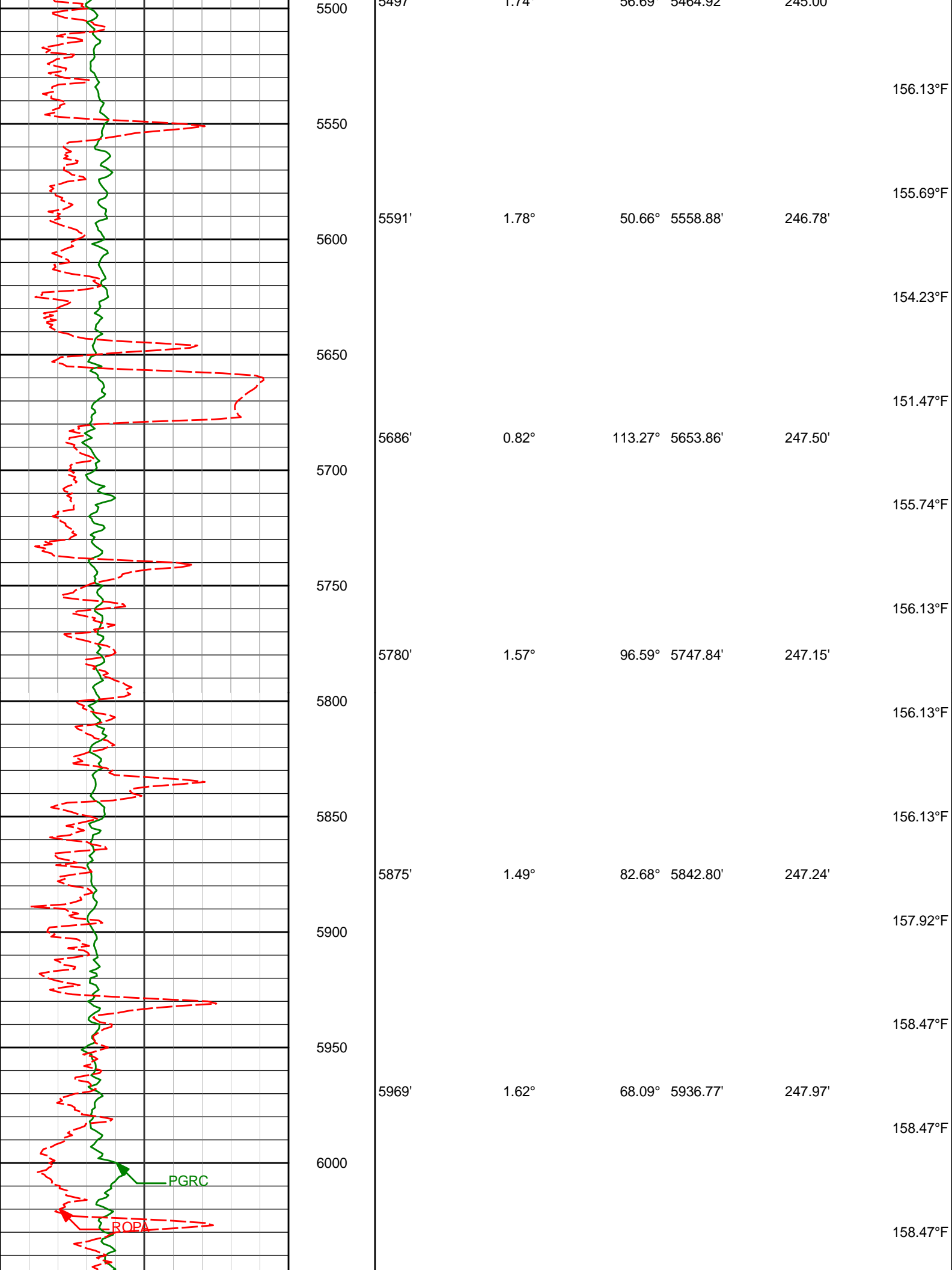


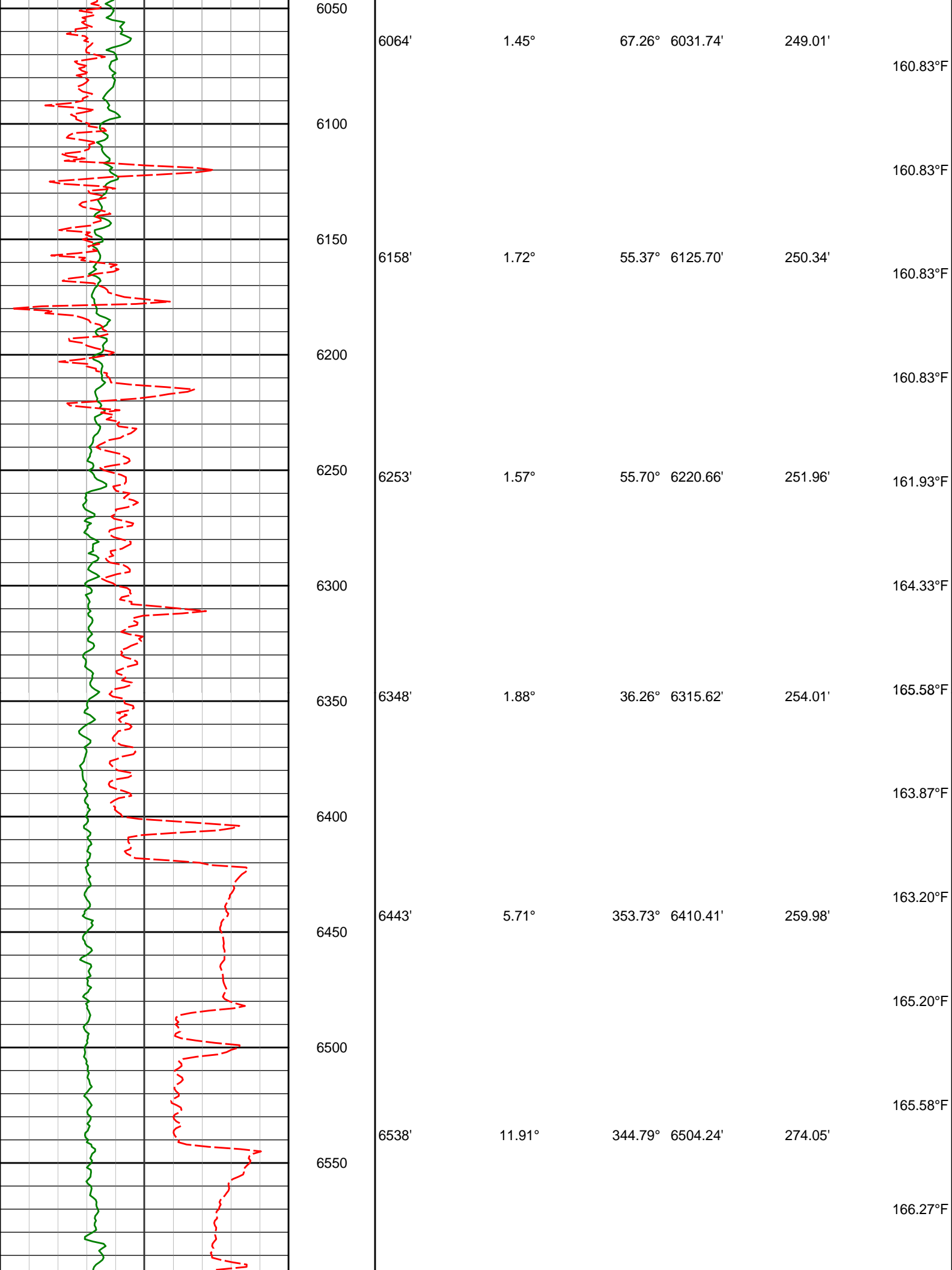


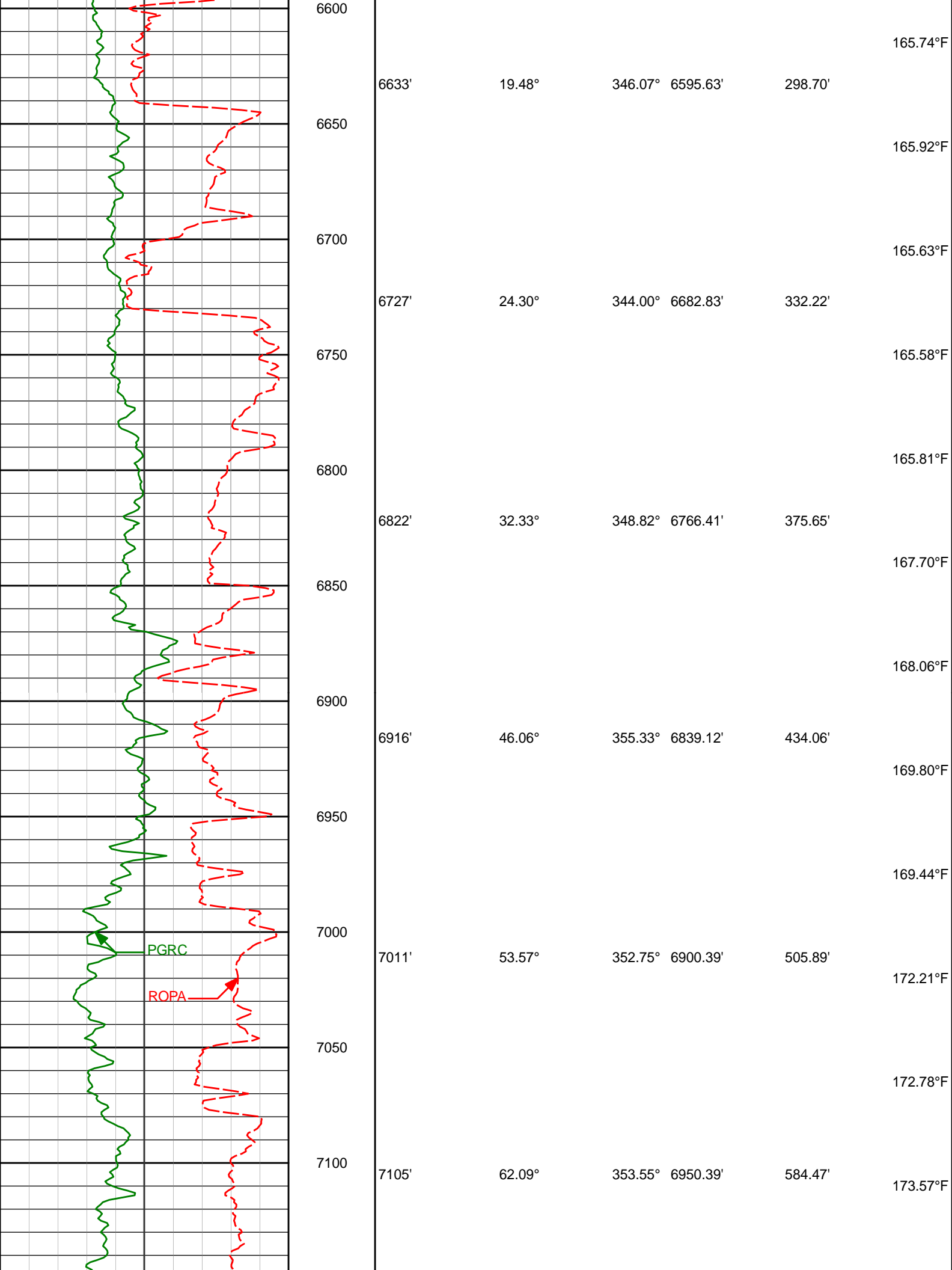


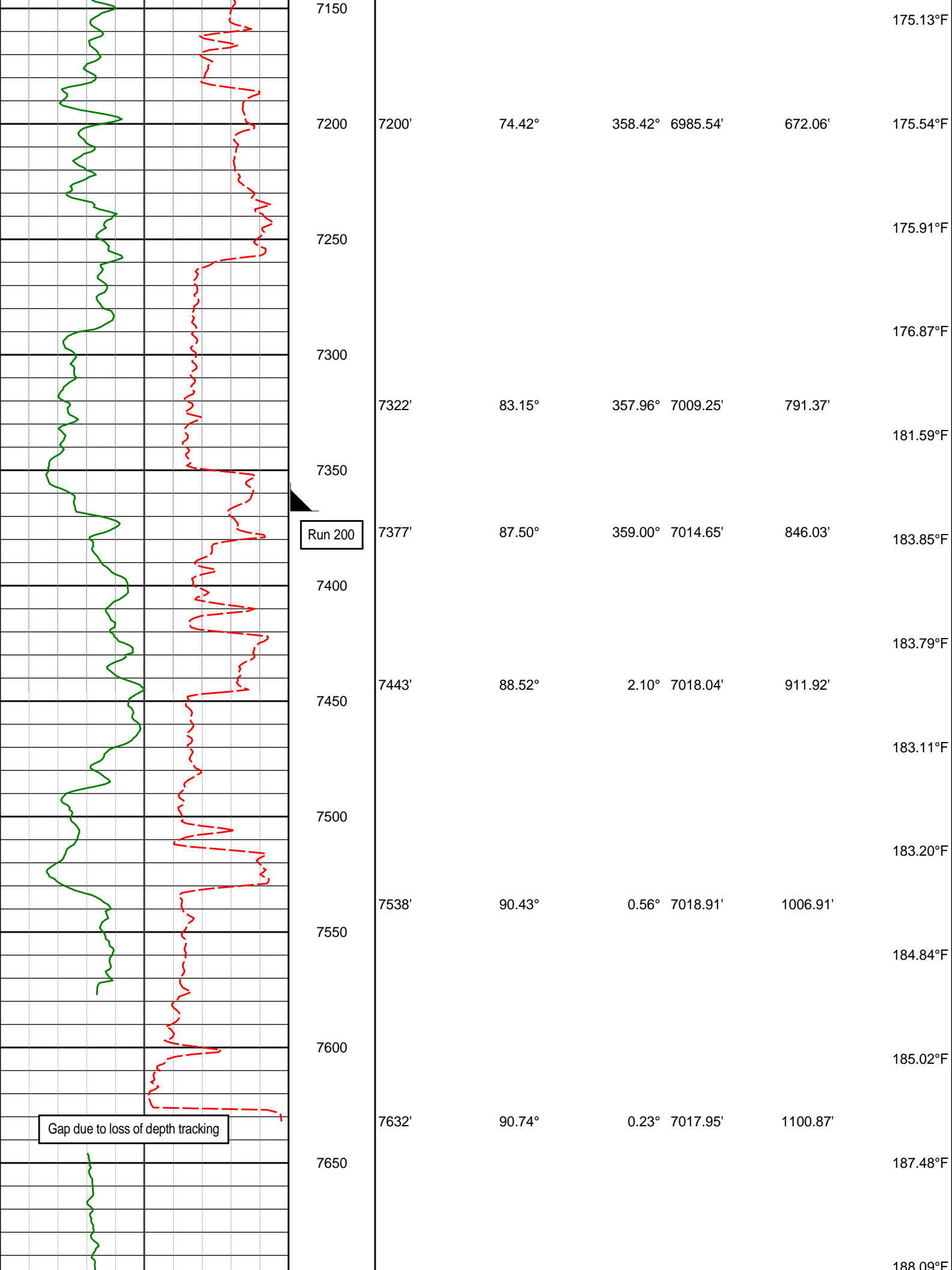


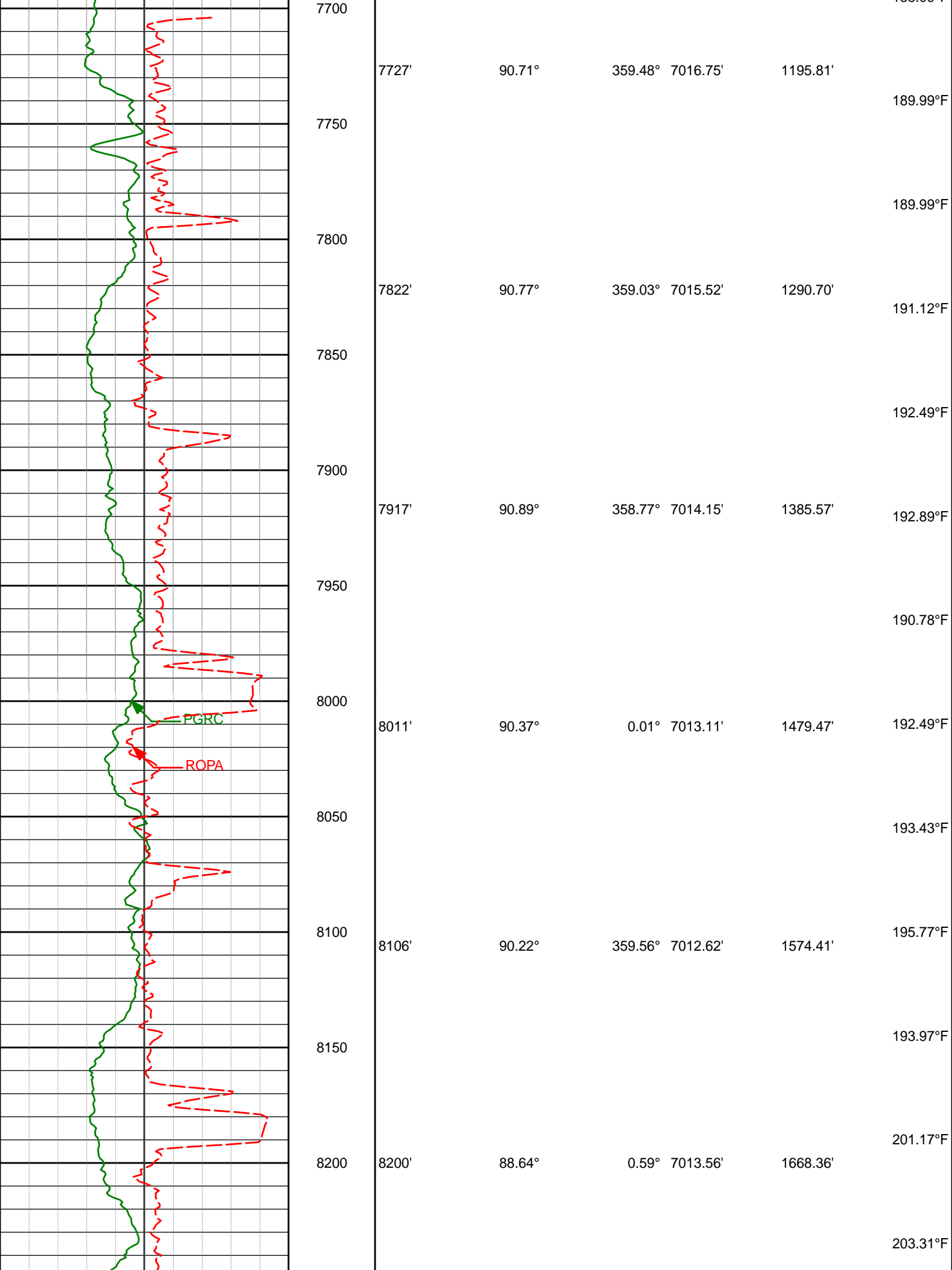


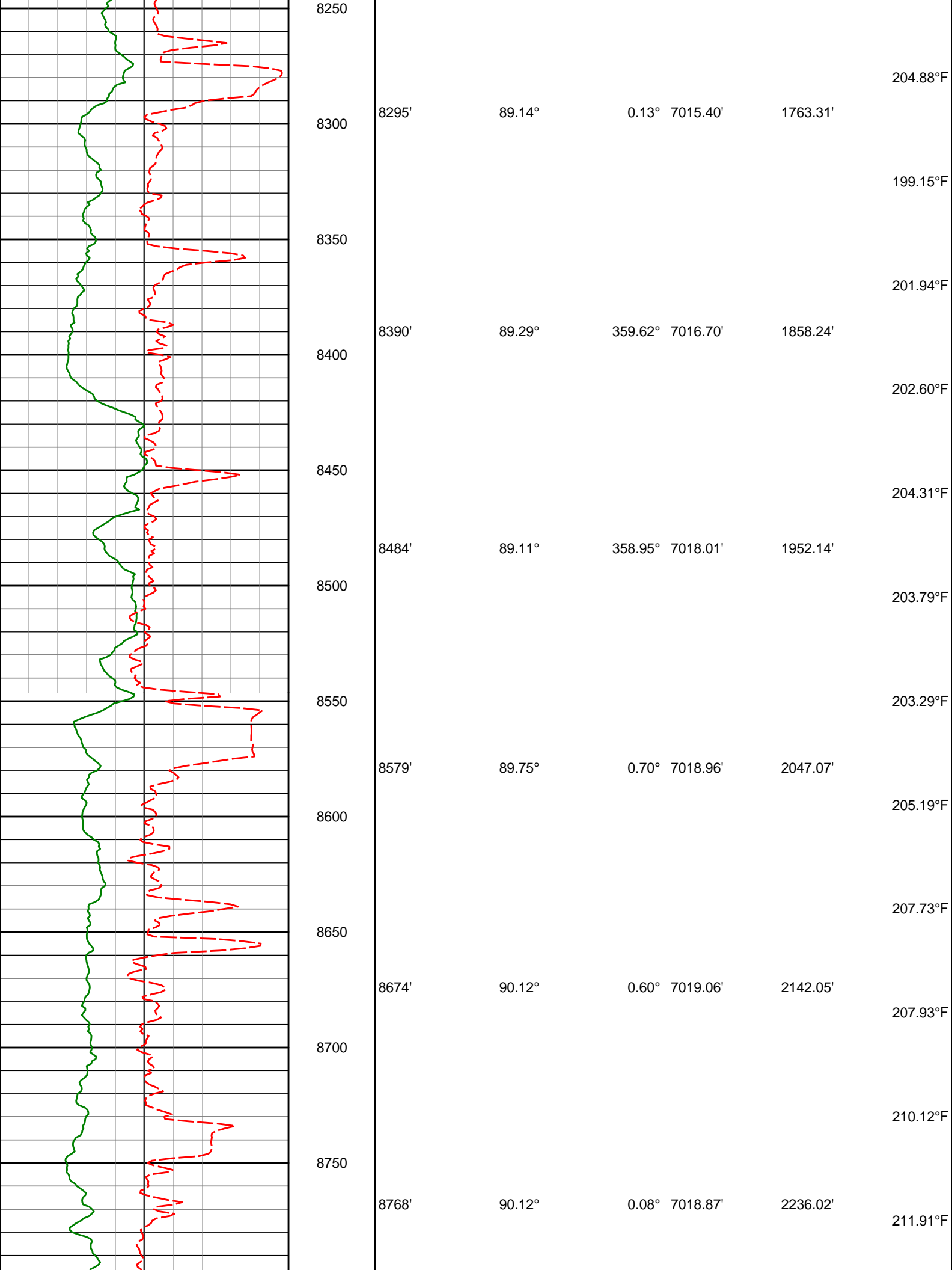


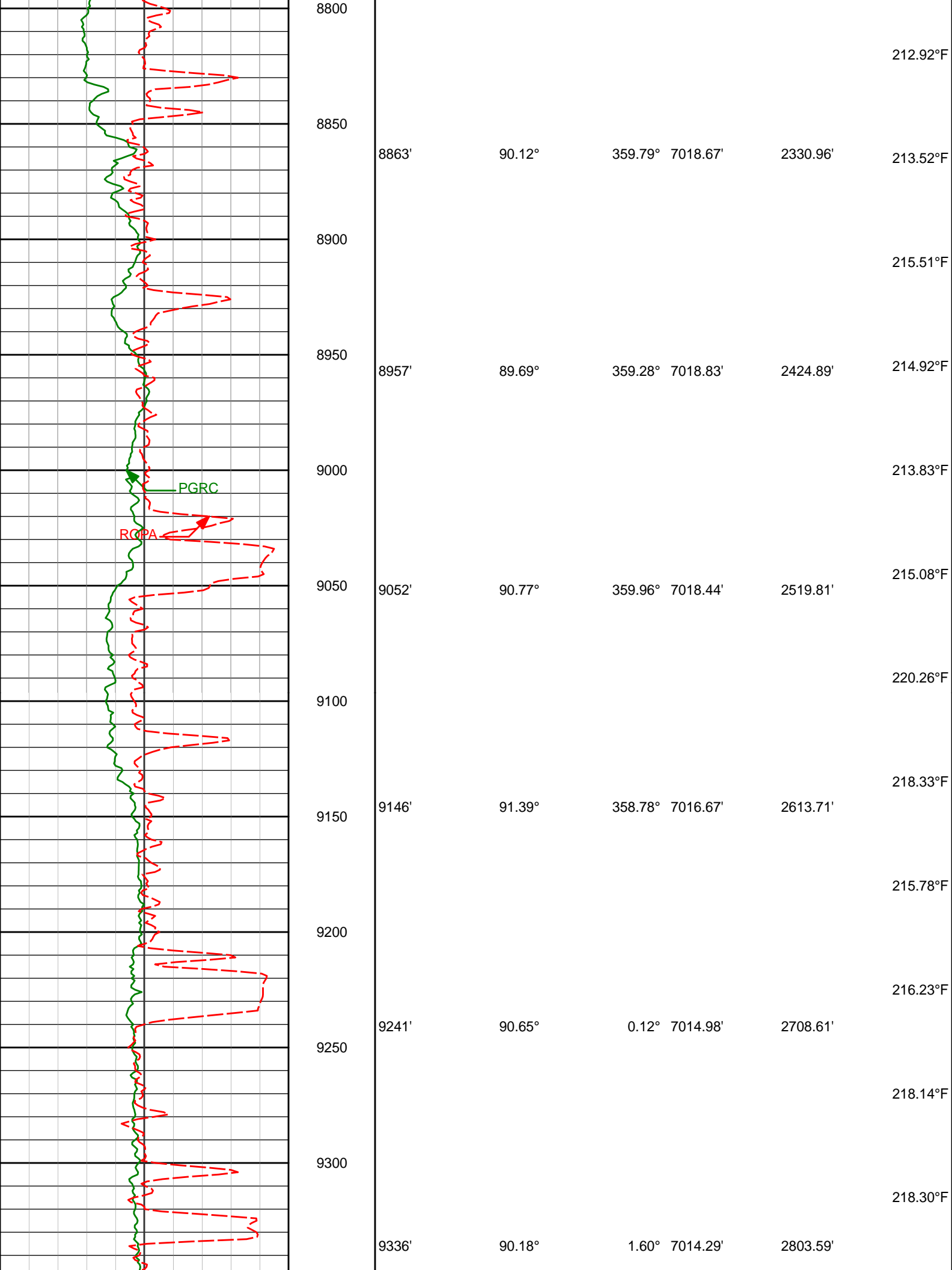


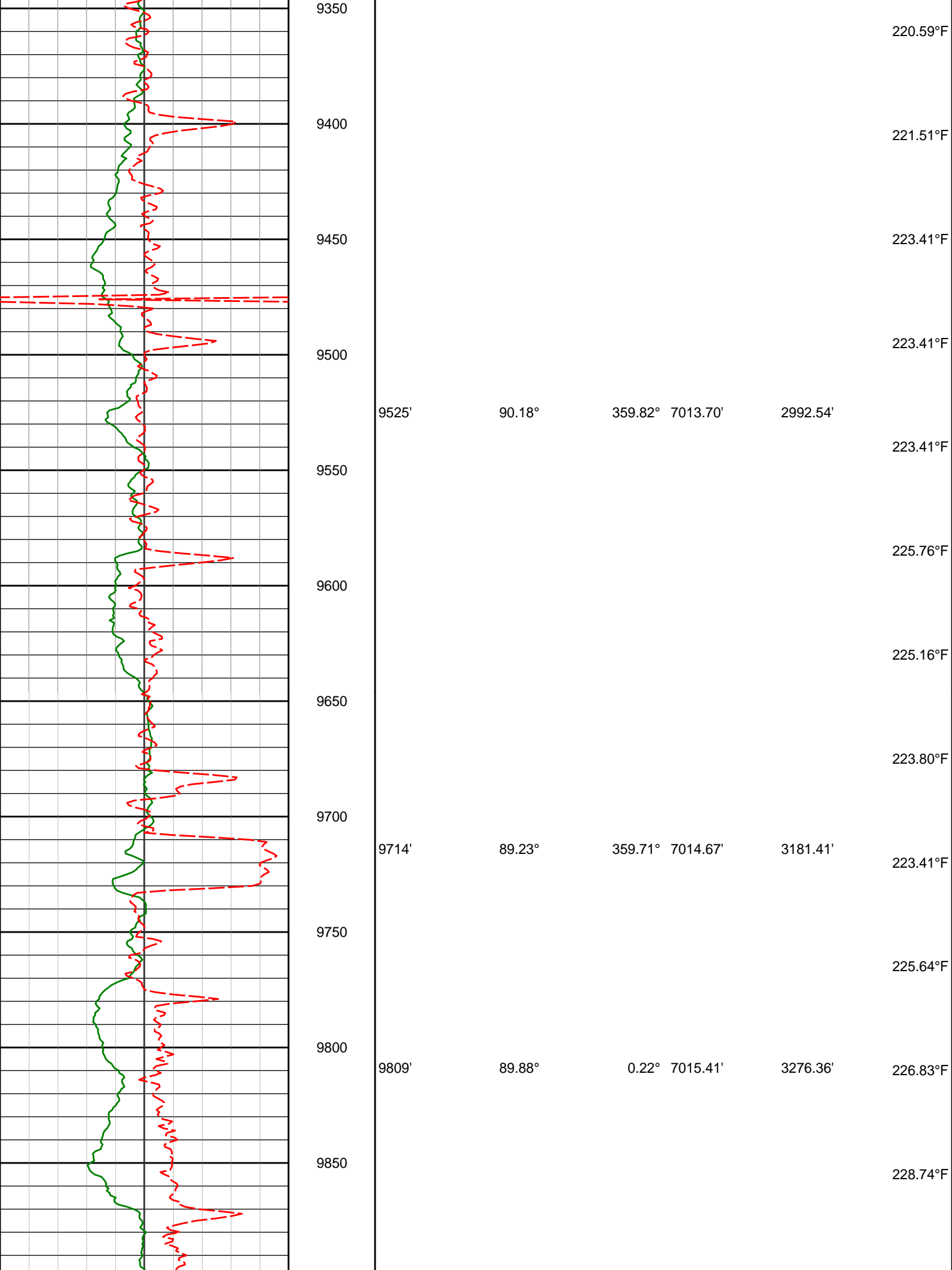


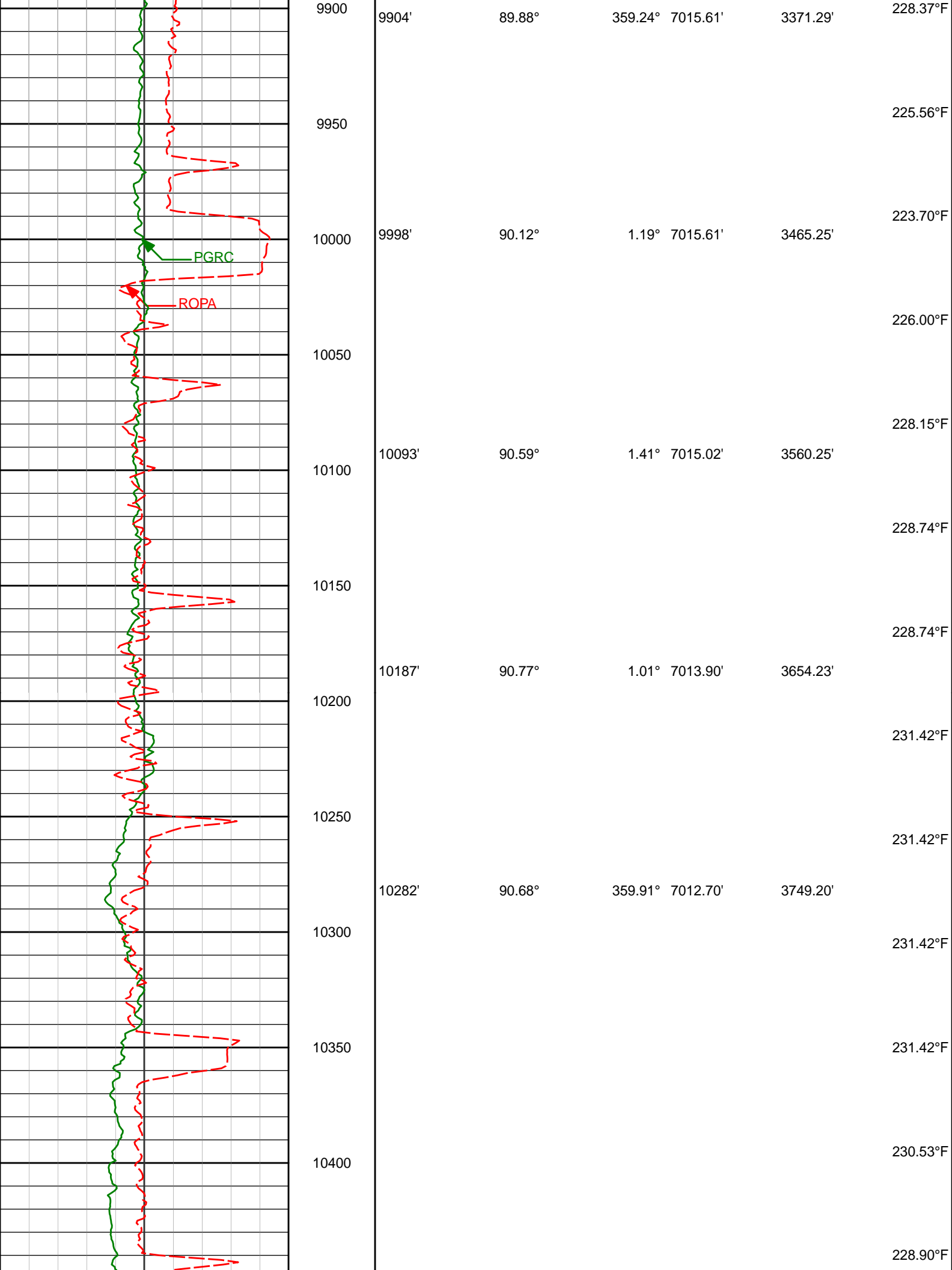


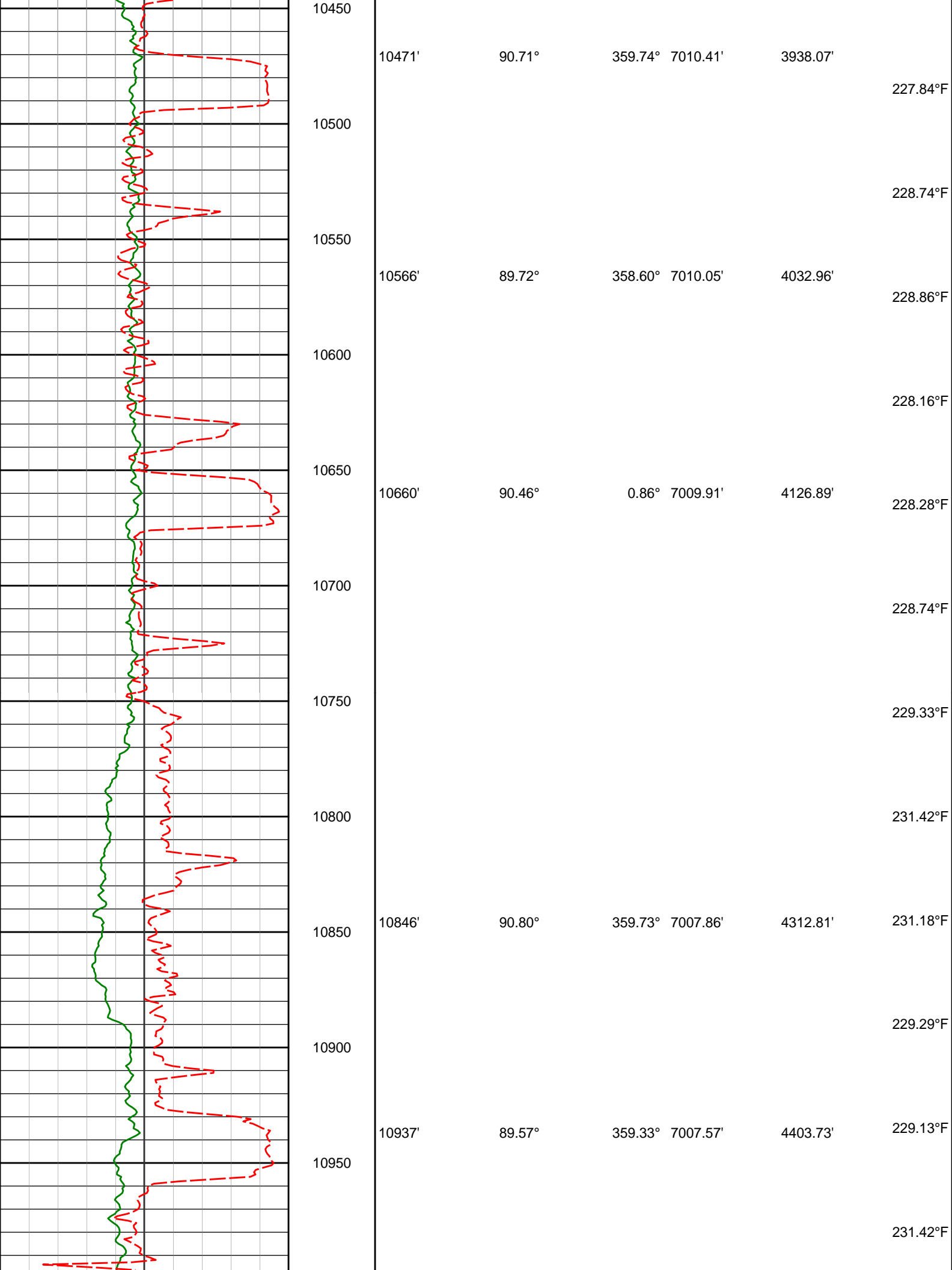


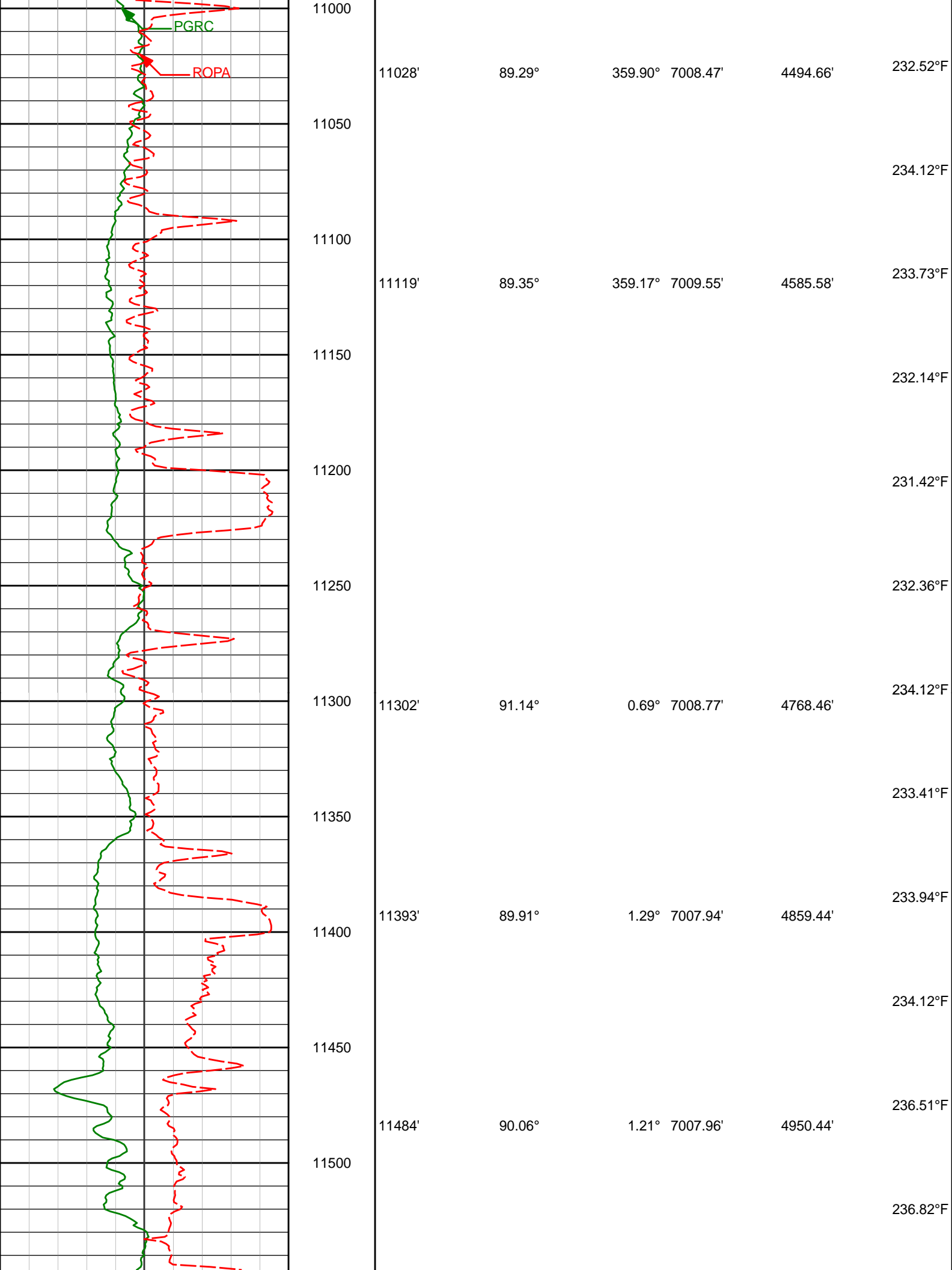


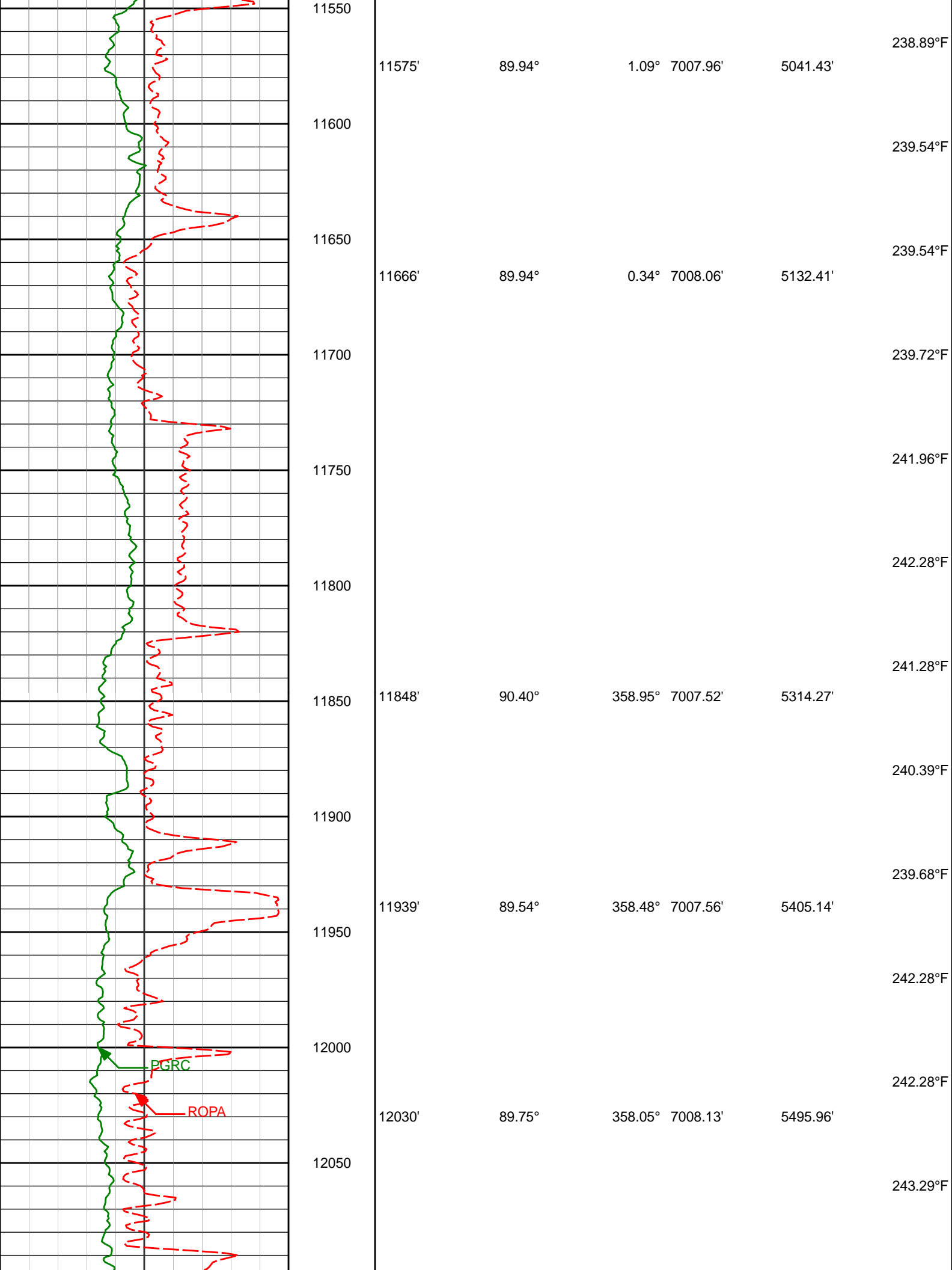


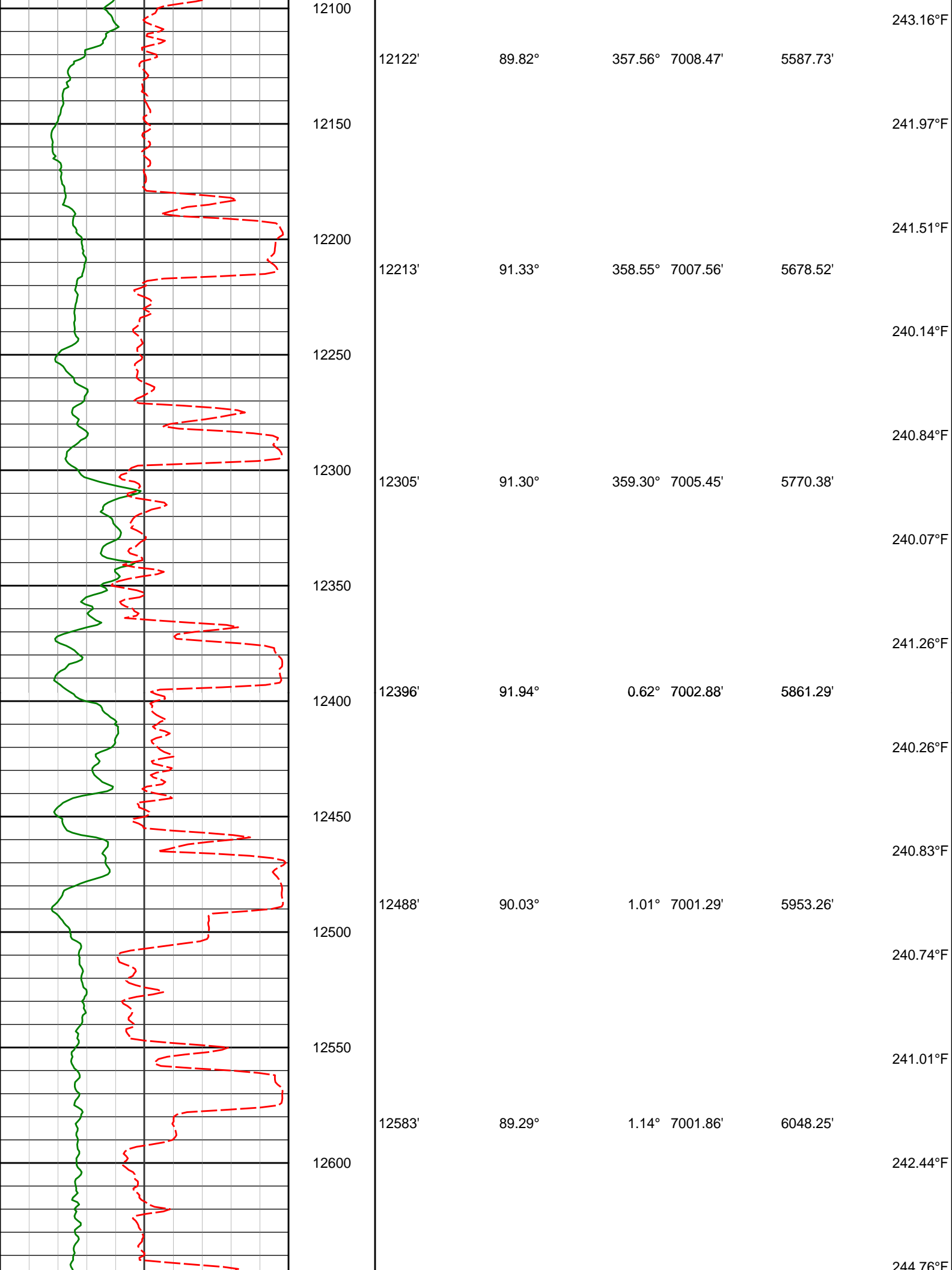


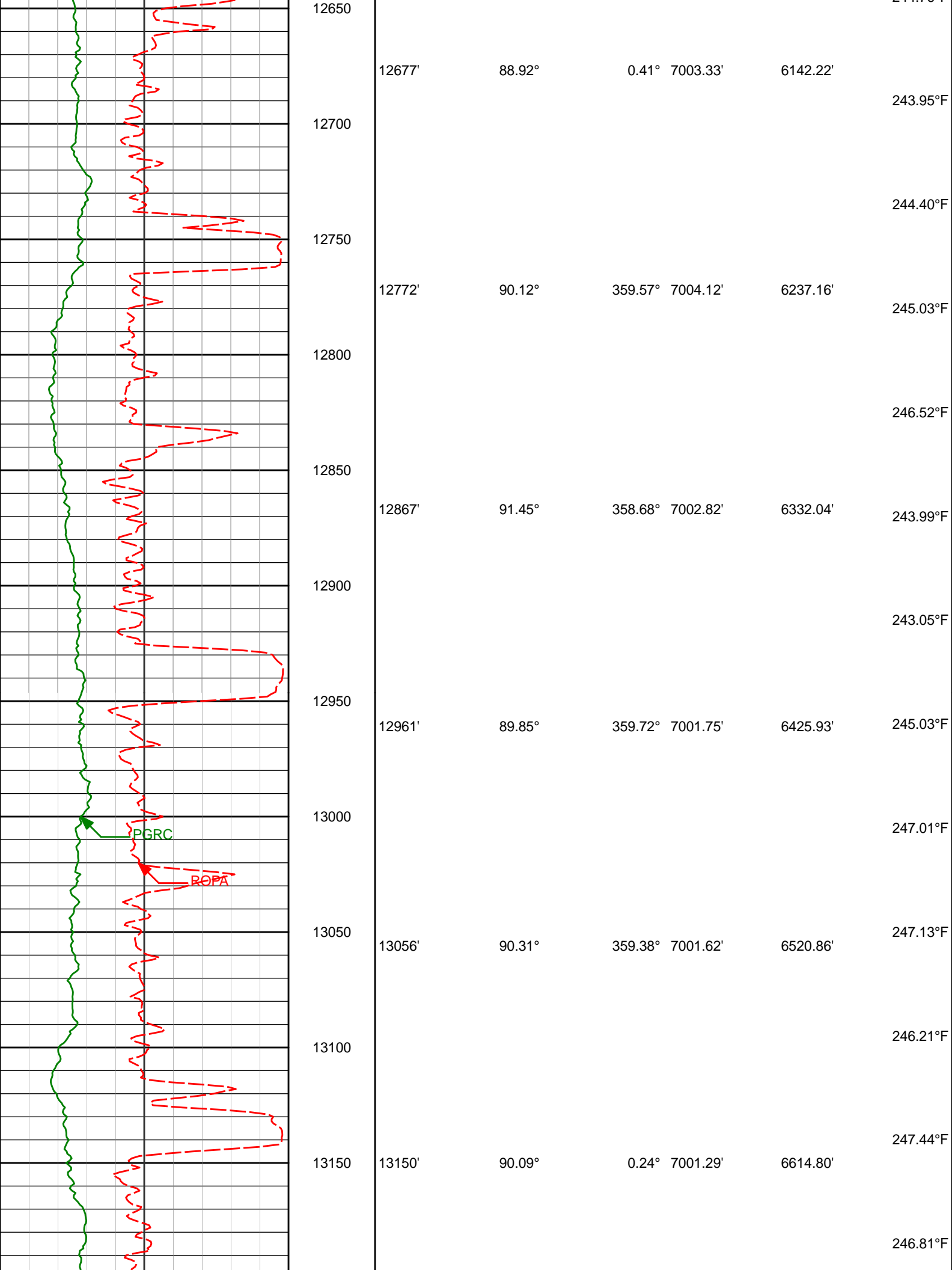


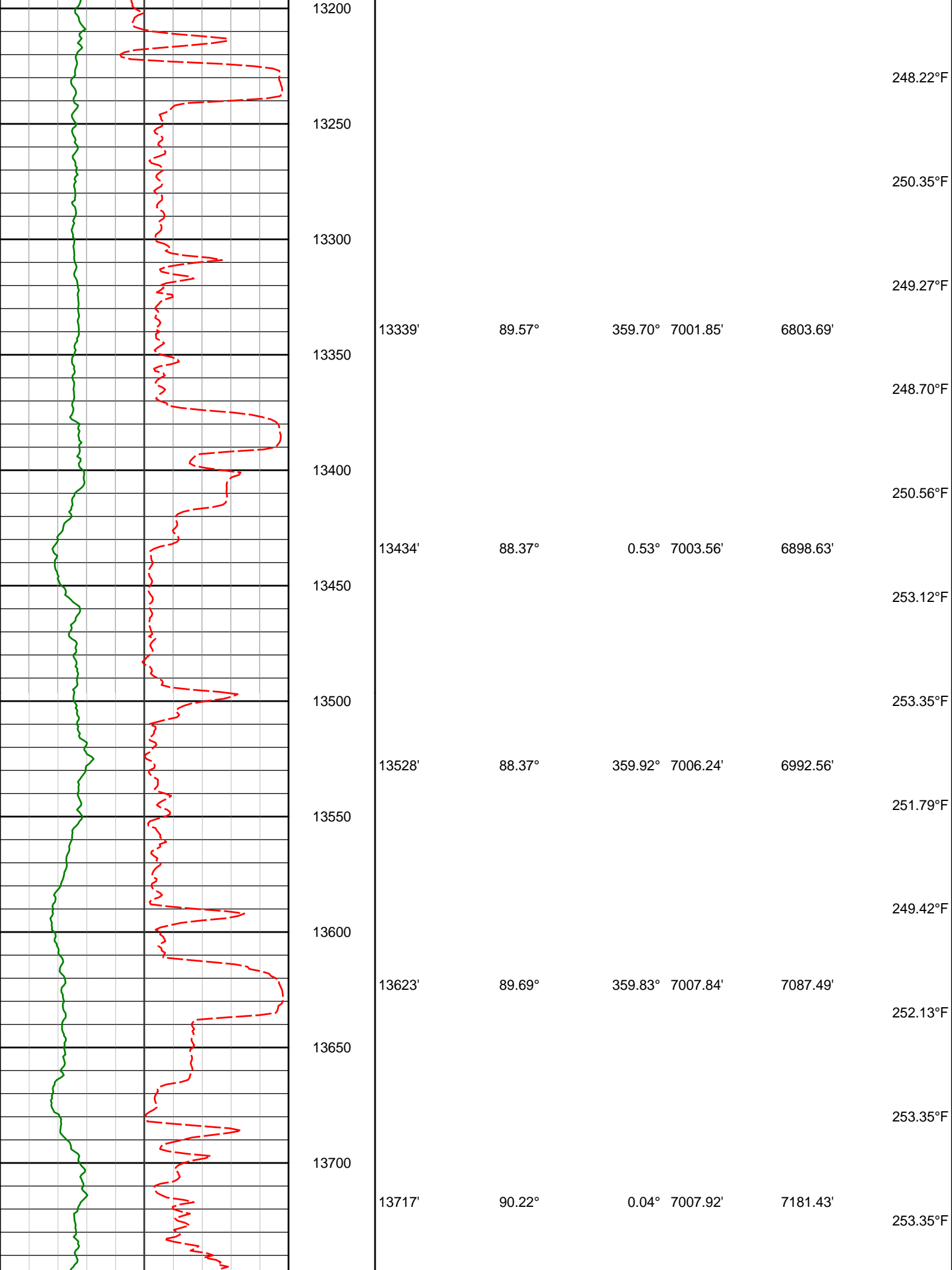


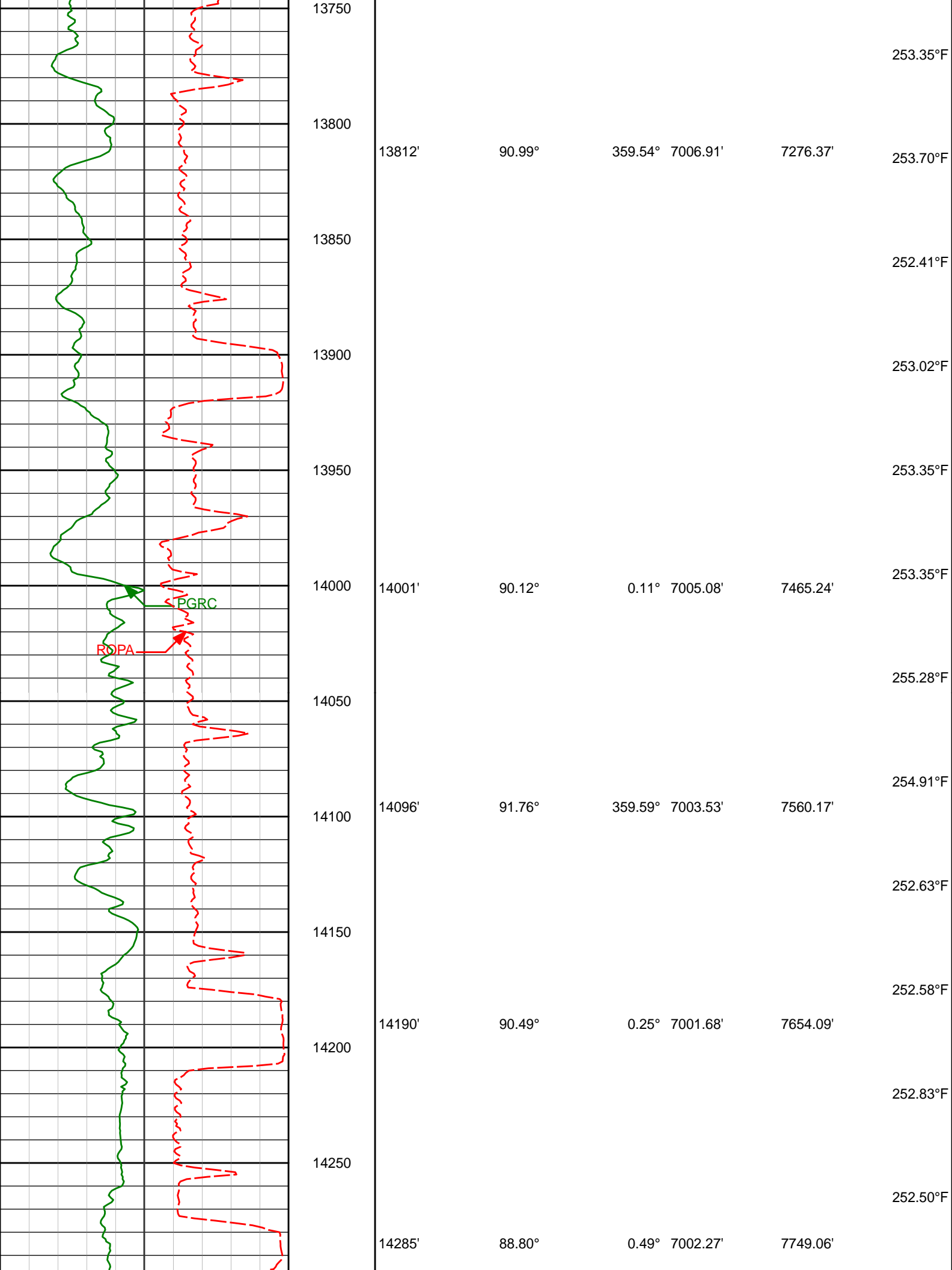


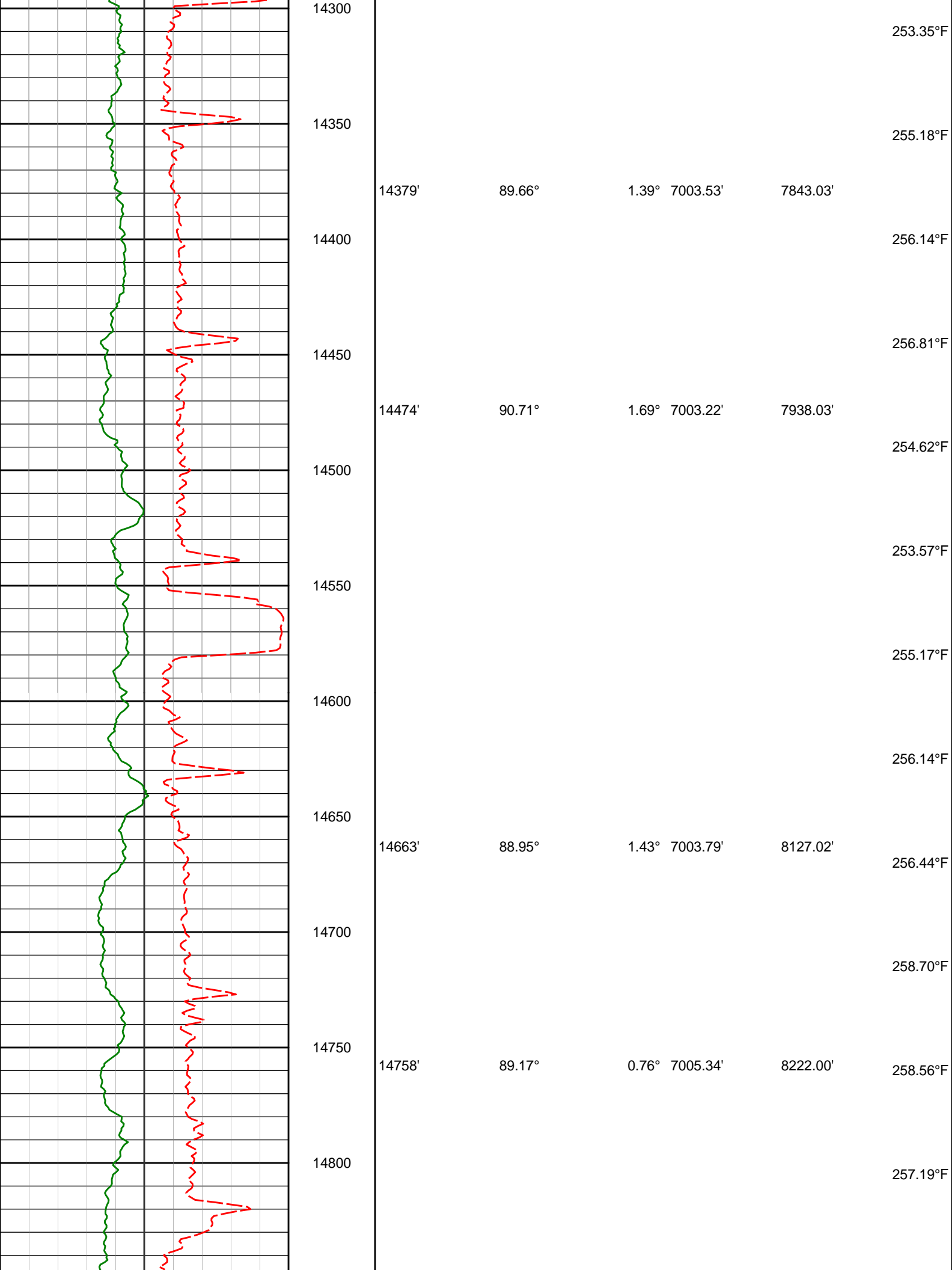


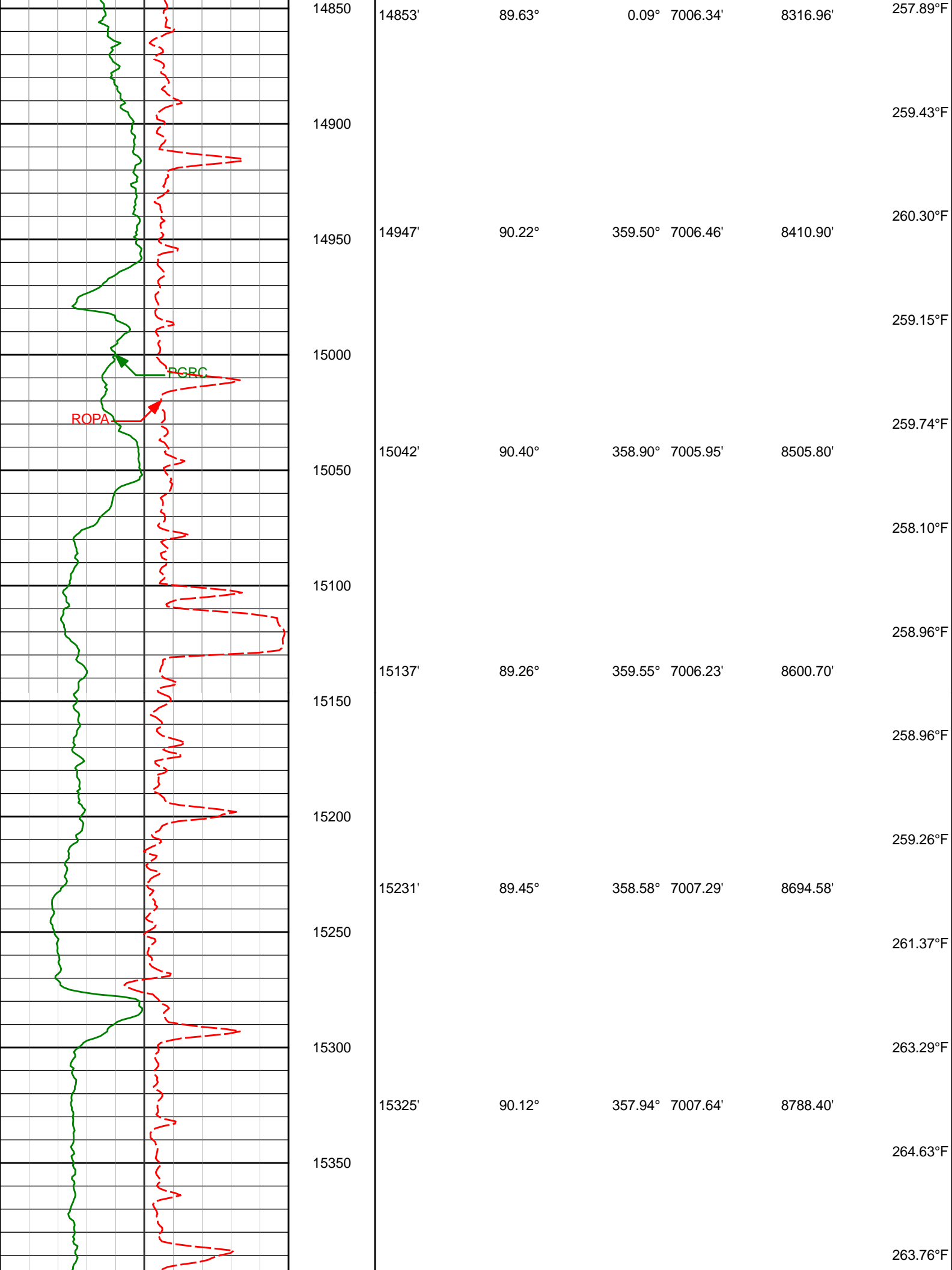


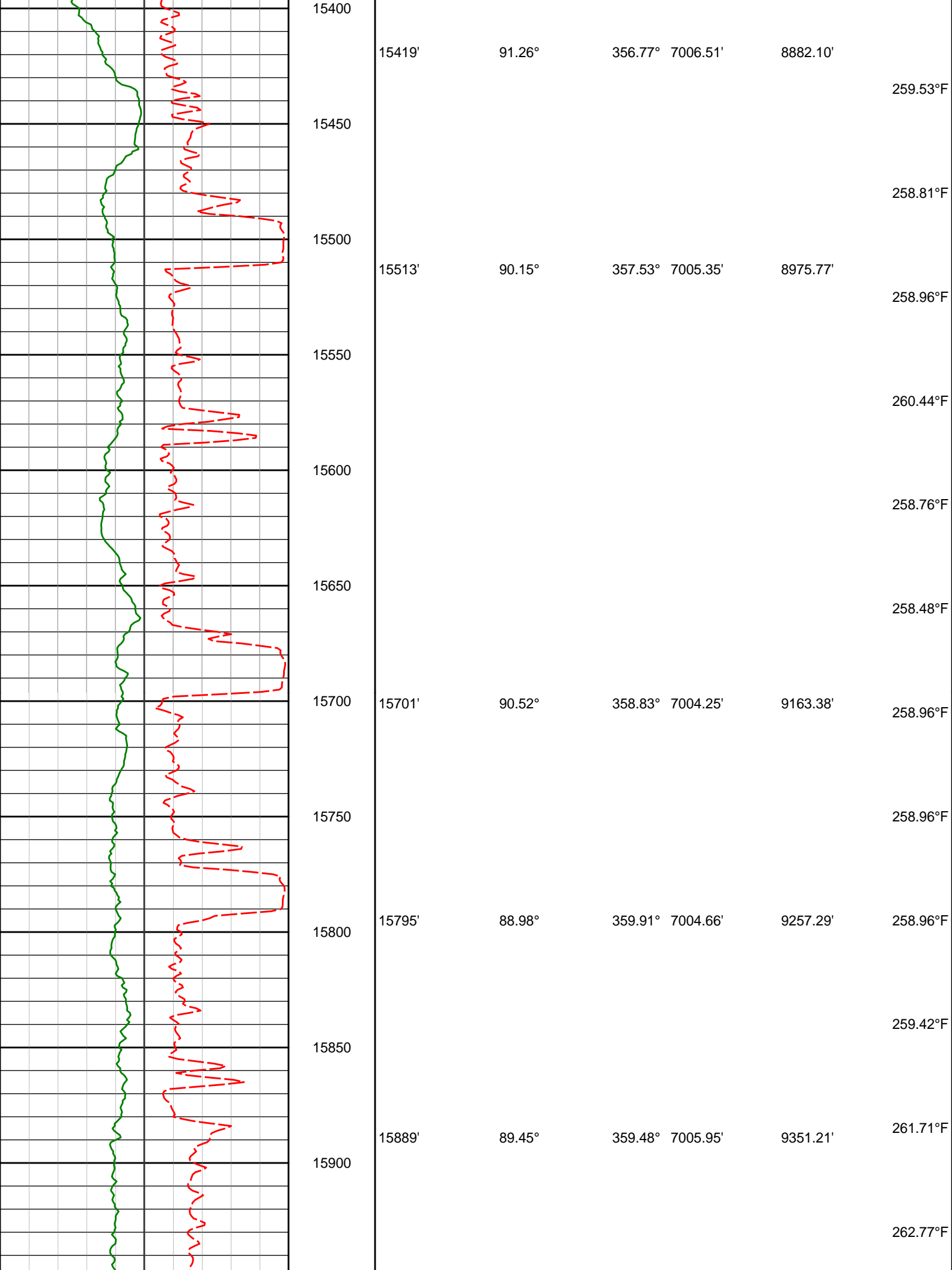


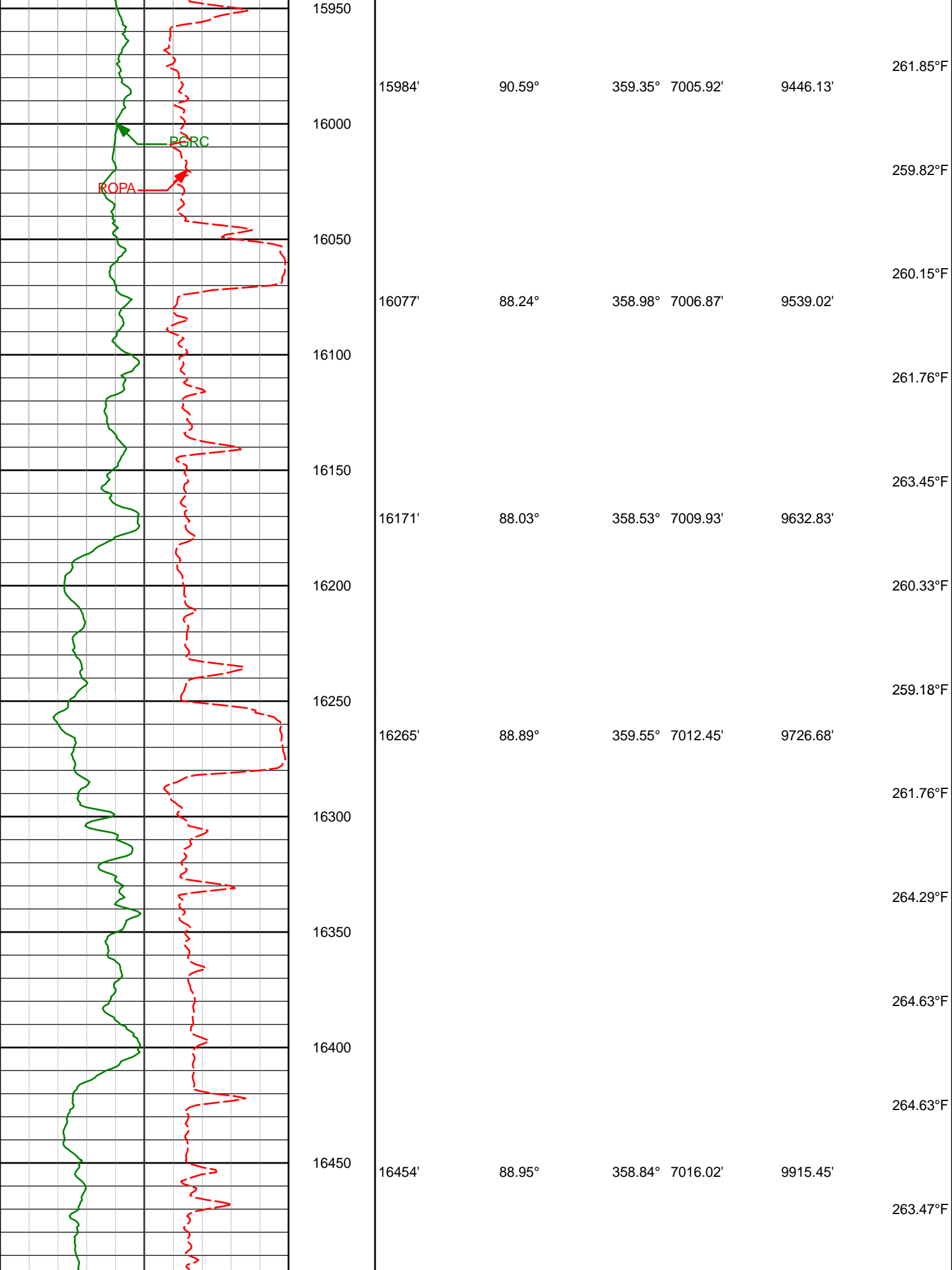


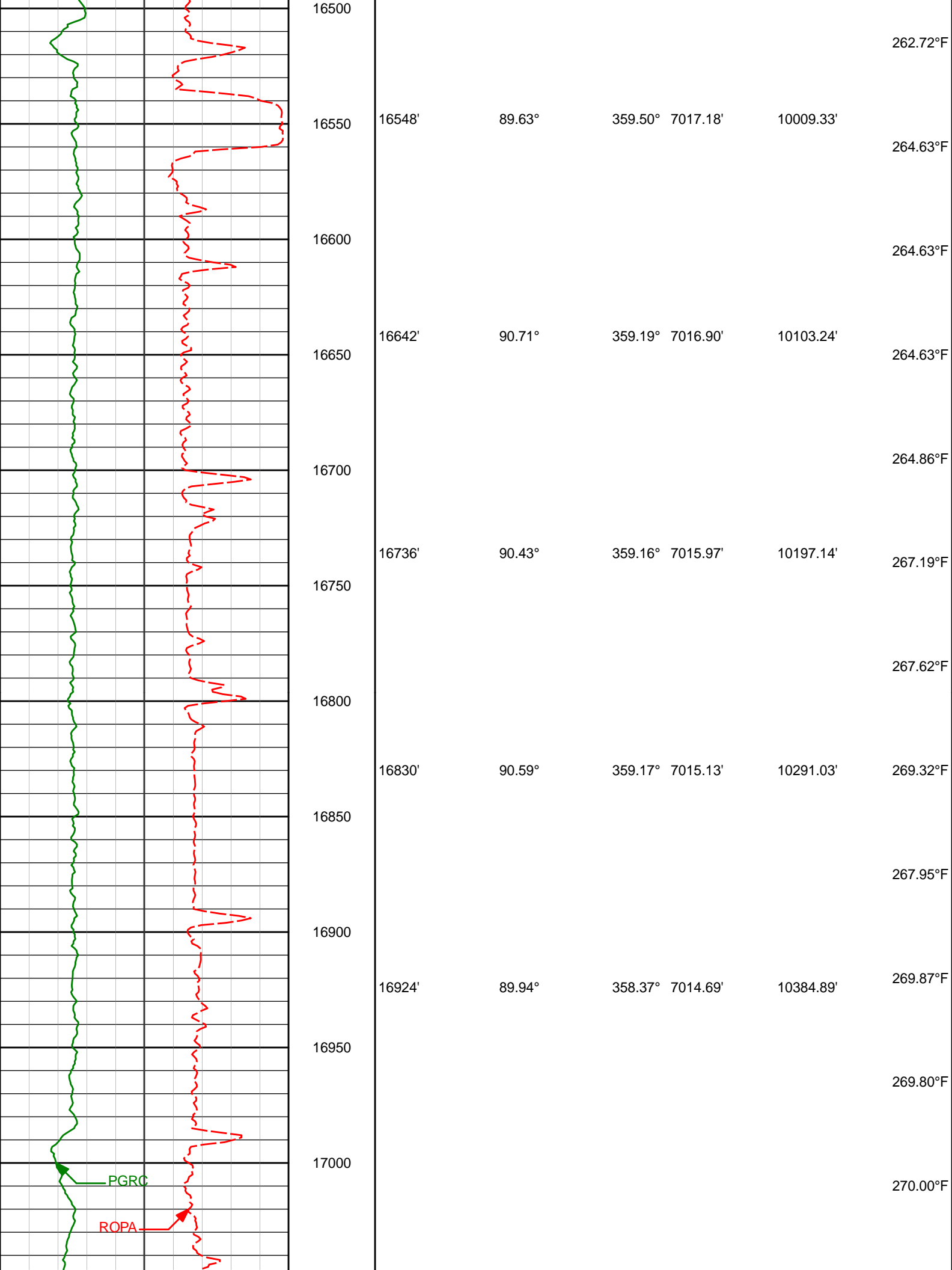


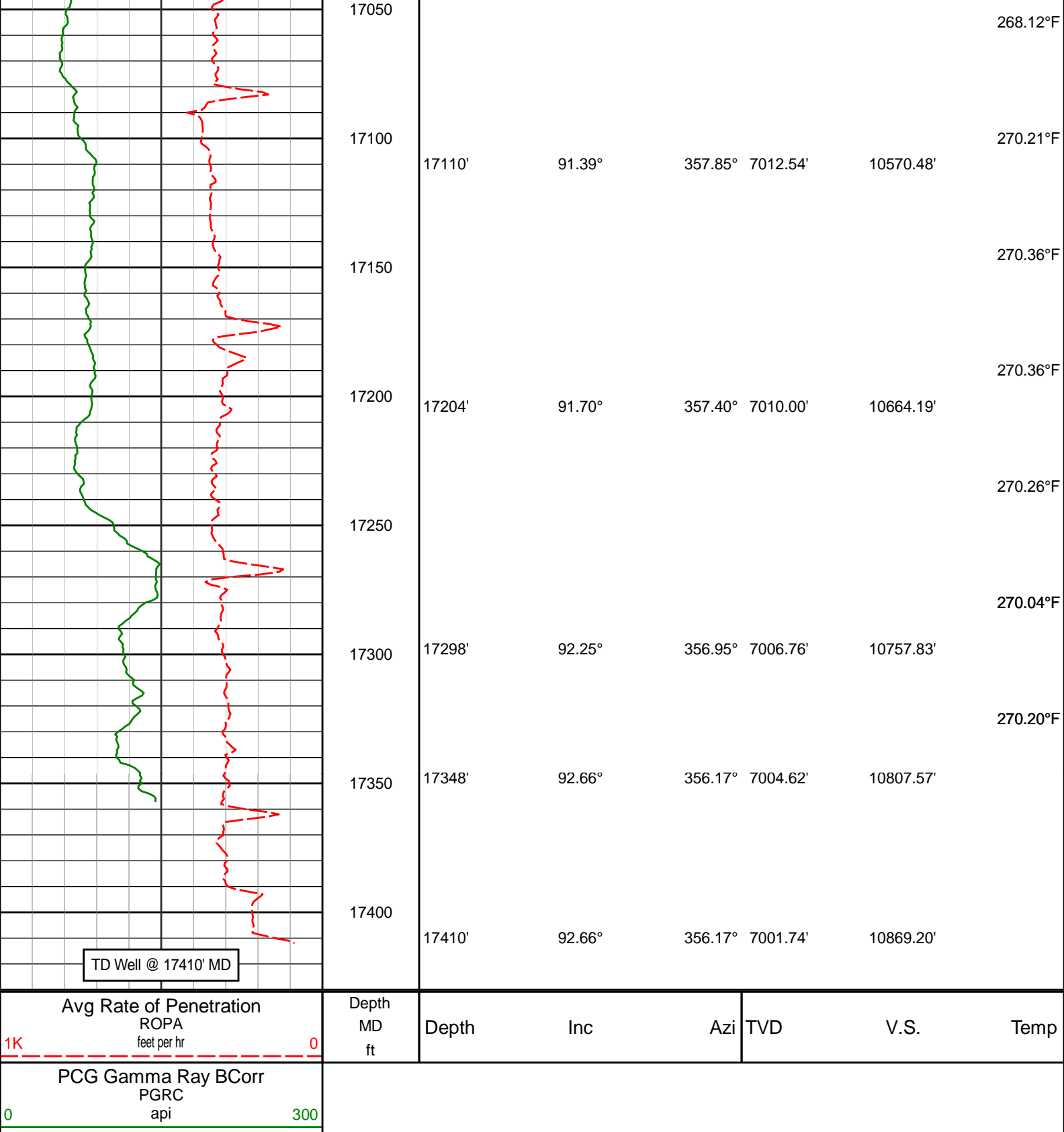






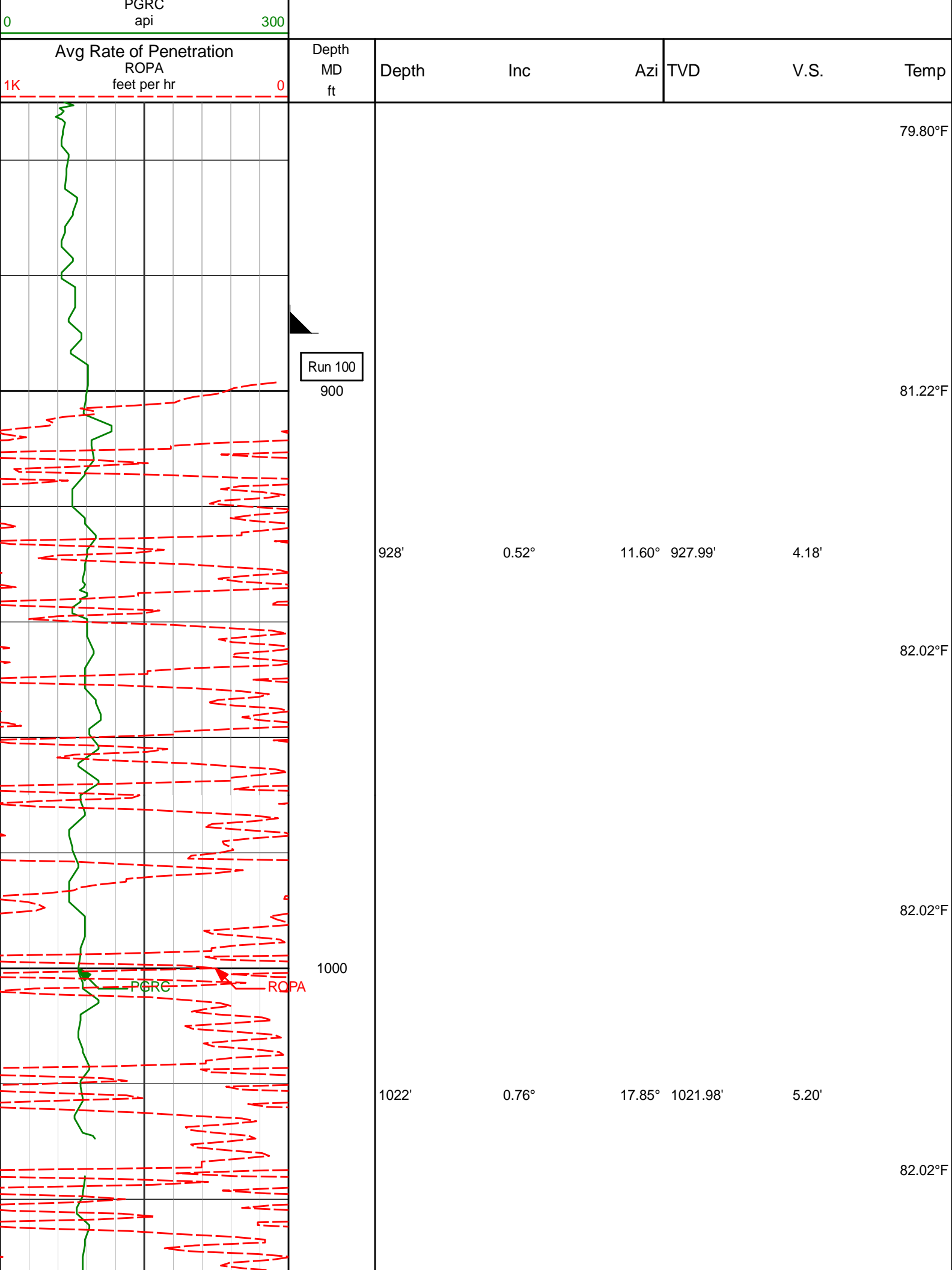


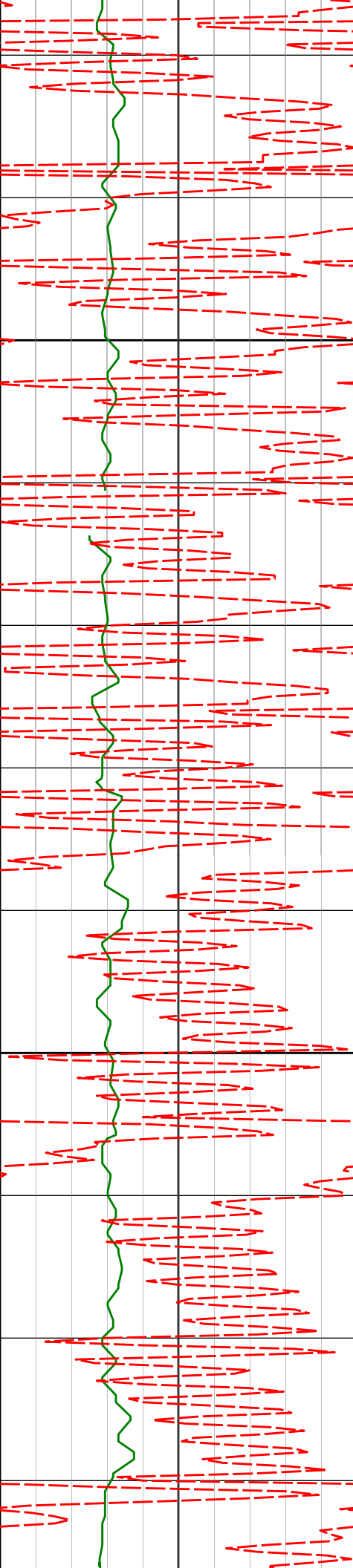




MD Detail 1:240 Scale

PCG Gamma Ray BCorr





1100

1200

1203'

1.24°

24.65°

1202.95'

8.16'

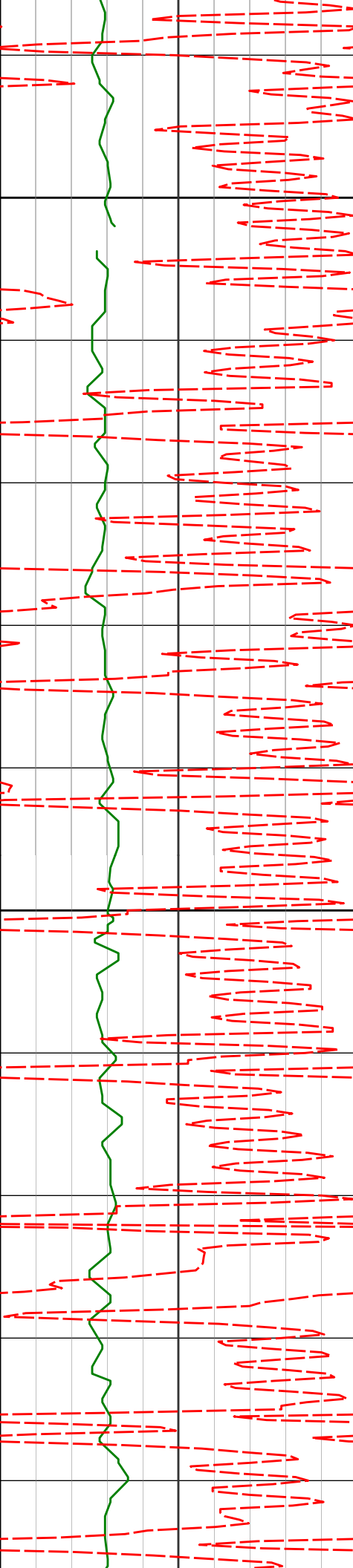
82.02°F

82.02°F

84.06°F

84.06°F

86.09°F



1300

1400

1294'

1.22°

28.19°

1293.93'

9.93'

1386'

1.18°

29.17°

1385.91'

11.64'

1477'

1.20°

33.51°

1476.89'

13.28'

86.09°F

86.09°F

86.09°F

88.14°F

88.14°F



1500

88.14°F

1568'

1.67°

49.02°

1567.86'

14.99'

88.57°F

1600

90.19°F

1659'

3.71°

63.83°

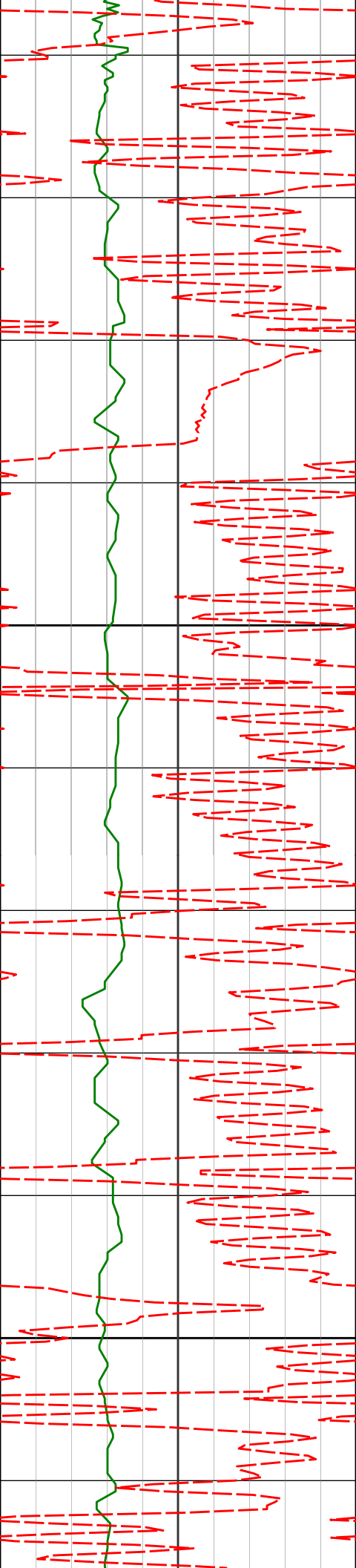
1658.76'

17.28'

90.19°F

1700

90.76°F



1750'

6.73°

74.00° 1749.37'

20.29'

92.26°F

1800

92.26°F

1842'

9.26°

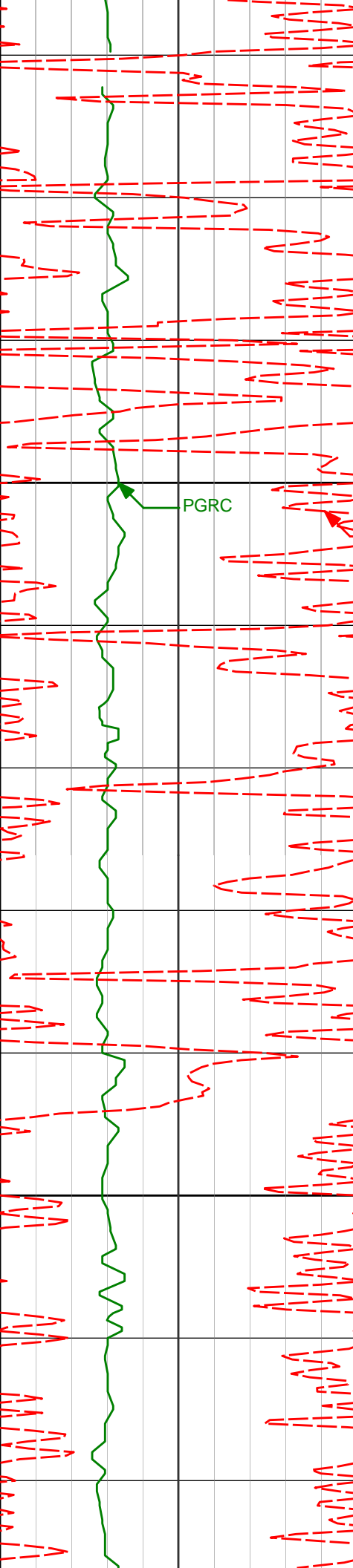
76.12° 1840.47'

23.95'

92.26°F

1900

94.33°F



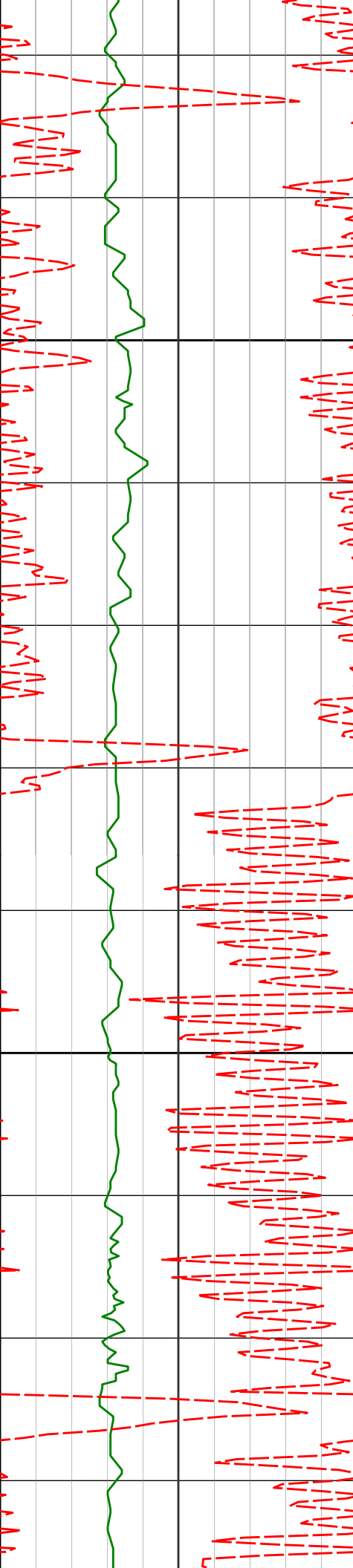
2000

PGRC

ROPA

2100

1933'	9.06°	74.37°	1930.31'	28.08'	94.33°F
2024'	8.62°	73.57°	2020.23'	32.37'	96.42°F
2115'	8.05°	69.98°	2110.27'	36.88'	96.42°F



2200

2205'

7.50°

67.87° 2199.45'

41.61'

98.51°F

98.51°F

100.62°F

2300

2297'

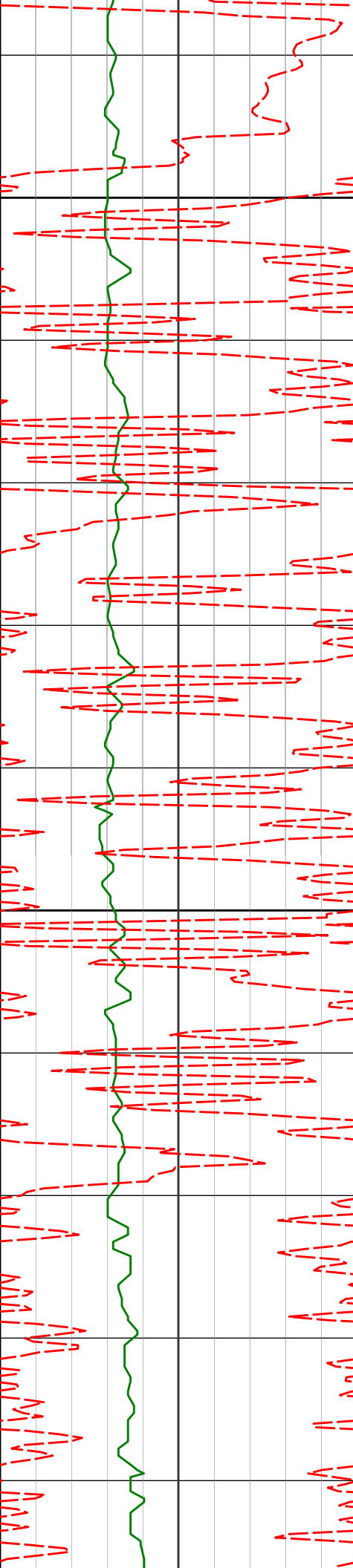
6.51°

67.48° 2290.76'

46.20'

102.31°F

102.72°F



2388'

8.20°

64.11°

2381.01'

51.34'

102.72°F

2400

102.72°F

2480'

7.49°

64.36°

2472.15'

57.16'

102.72°F

2500

104.83°F

2571'

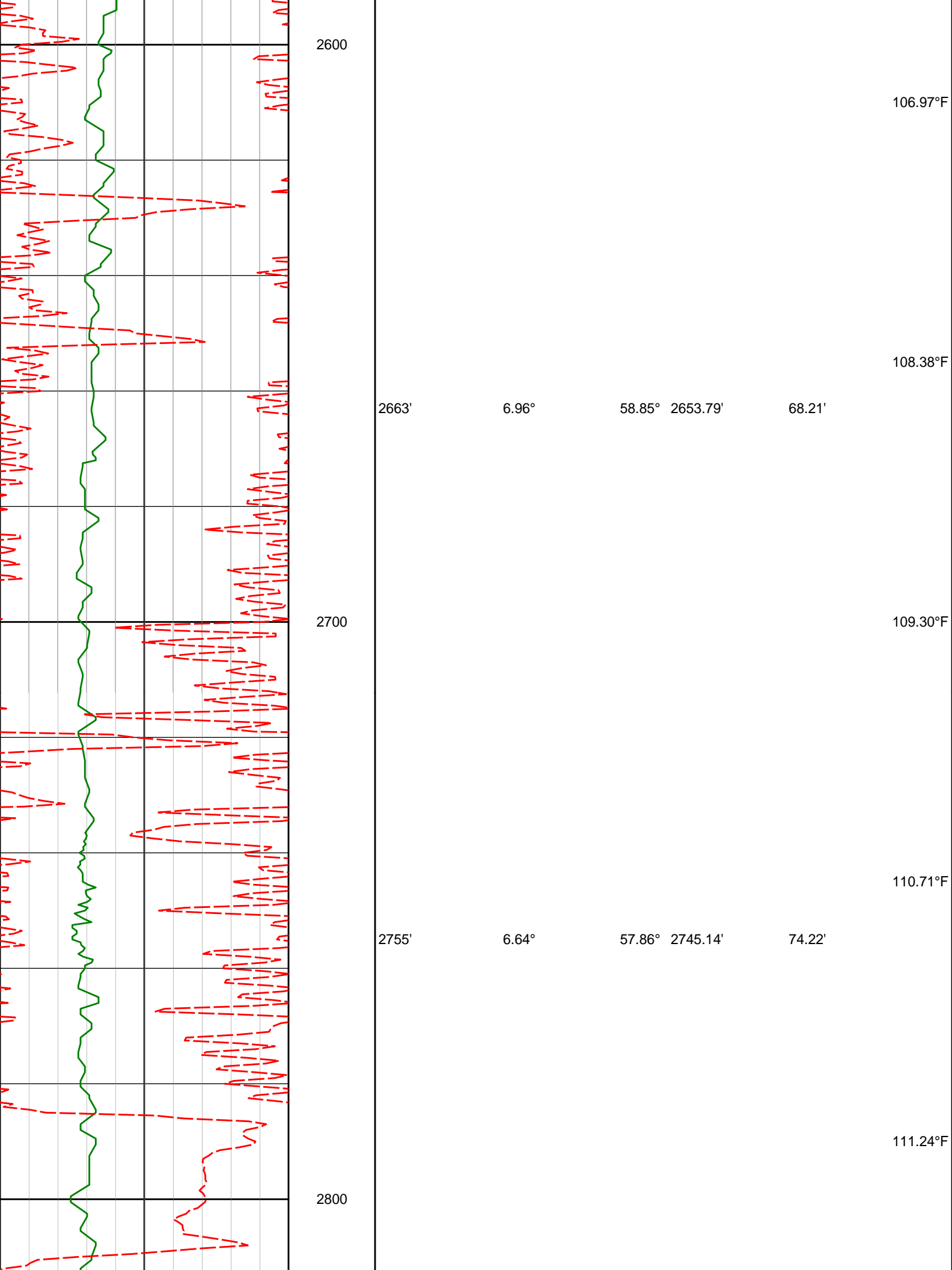
6.74°

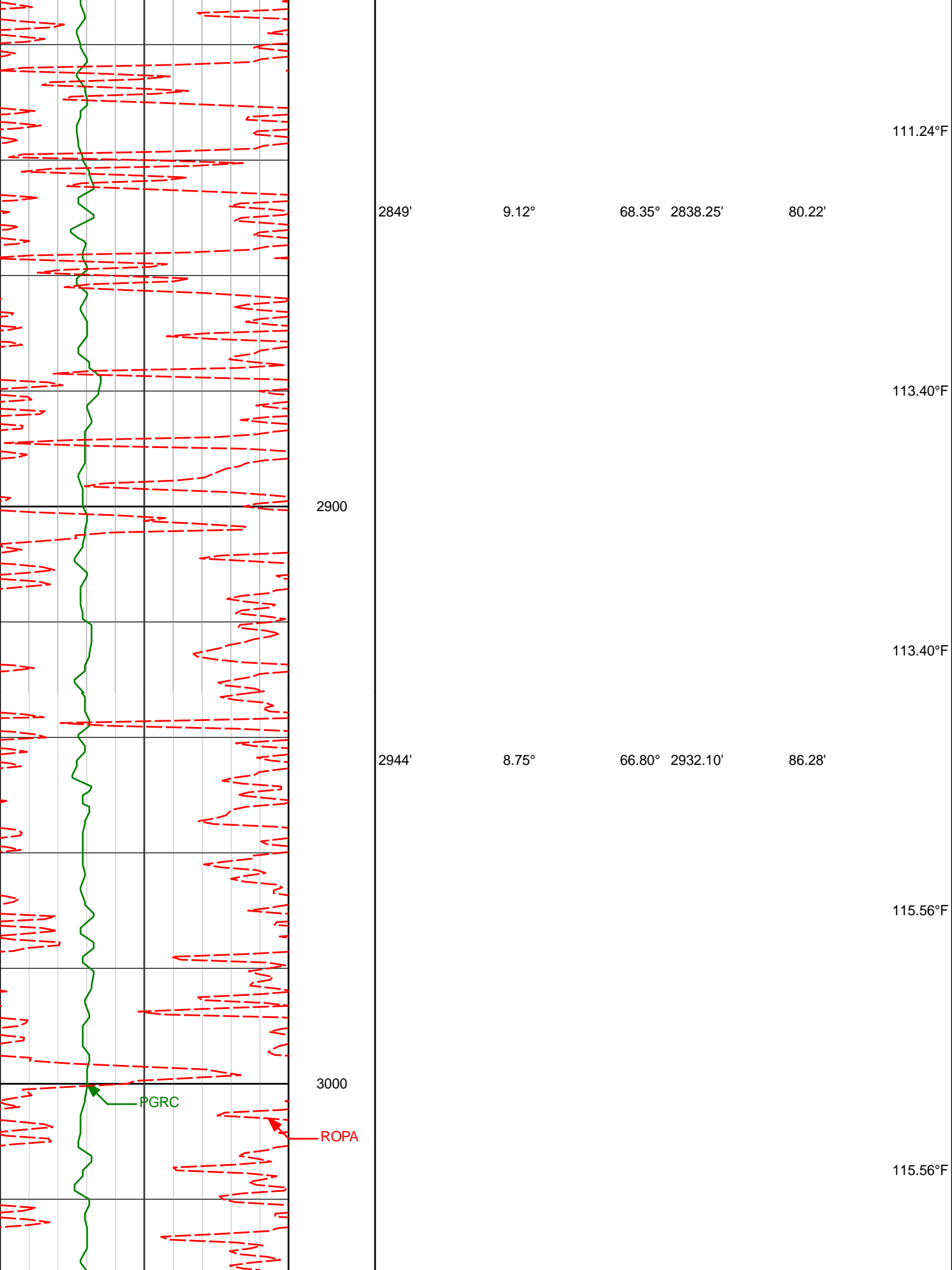
62.39°

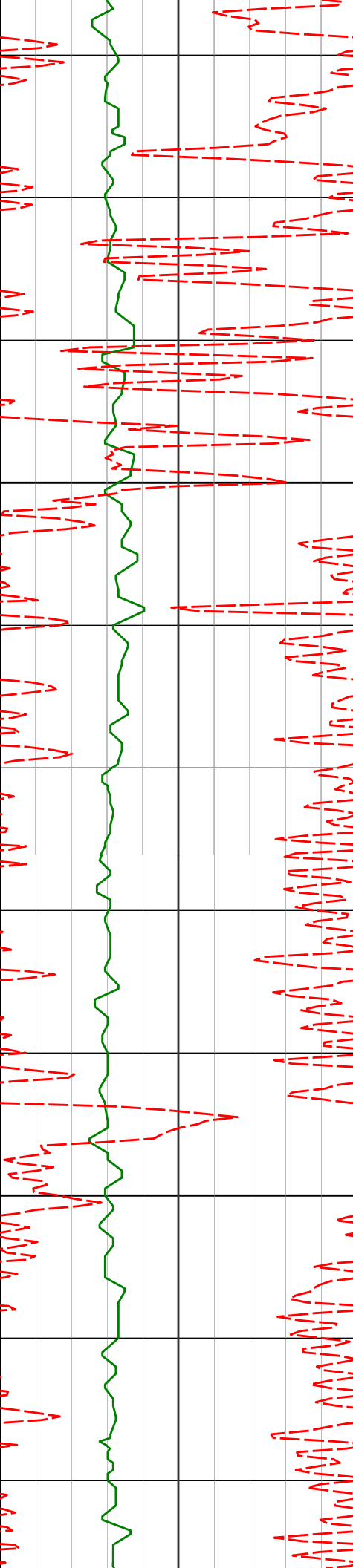
2562.45'

62.52'

104.83°F







3100

3200

3038'

8.39°

62.92°

3025.05'

92.62'

115.56°F

117.03°F

3133'

7.57°

58.59°

3119.13'

99.40'

117.73°F

117.73°F

3228'

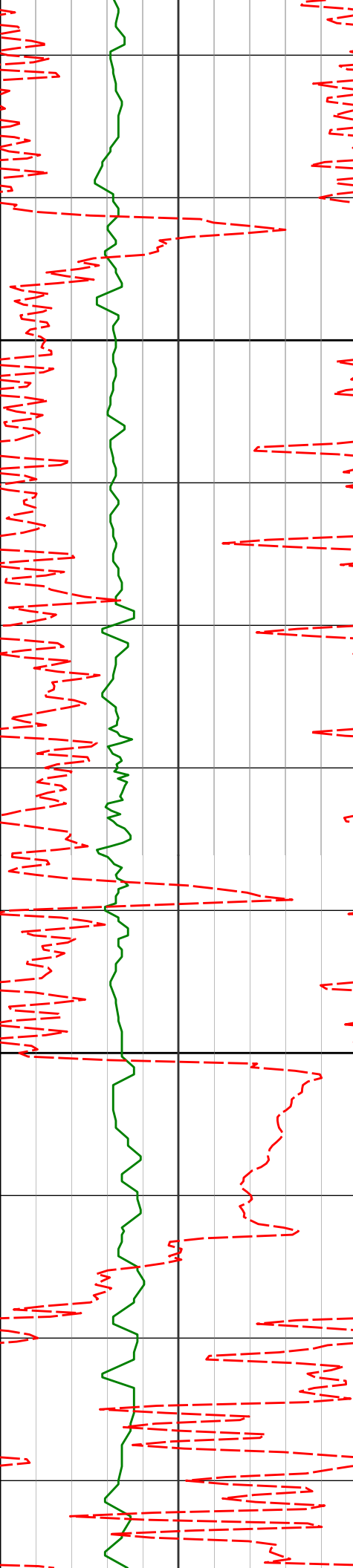
7.12°

54.87°

3213.35'

106.37'

119.91°F



3300

3322'

5.93°

49.51°

3306.74'

113.15'

119.91°F

122.11°F

122.11°F

3400

3417'

7.85°

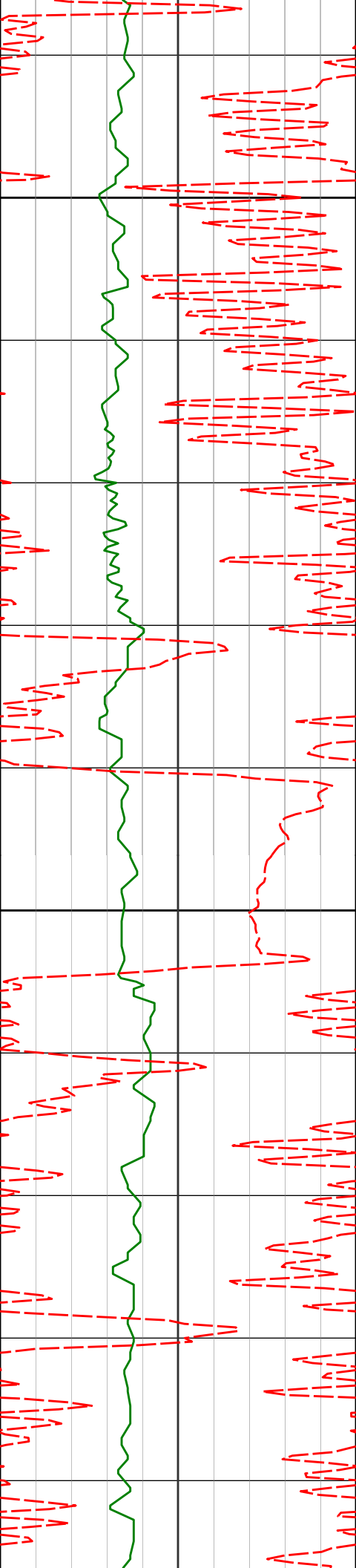
47.32°

3401.05'

121.01'

122.11°F

122.11°F



3500

3512'

6.95°

43.21°

3495.26'

129.87'

124.30°F

124.30°F

3600

3606'

9.03°

51.53°

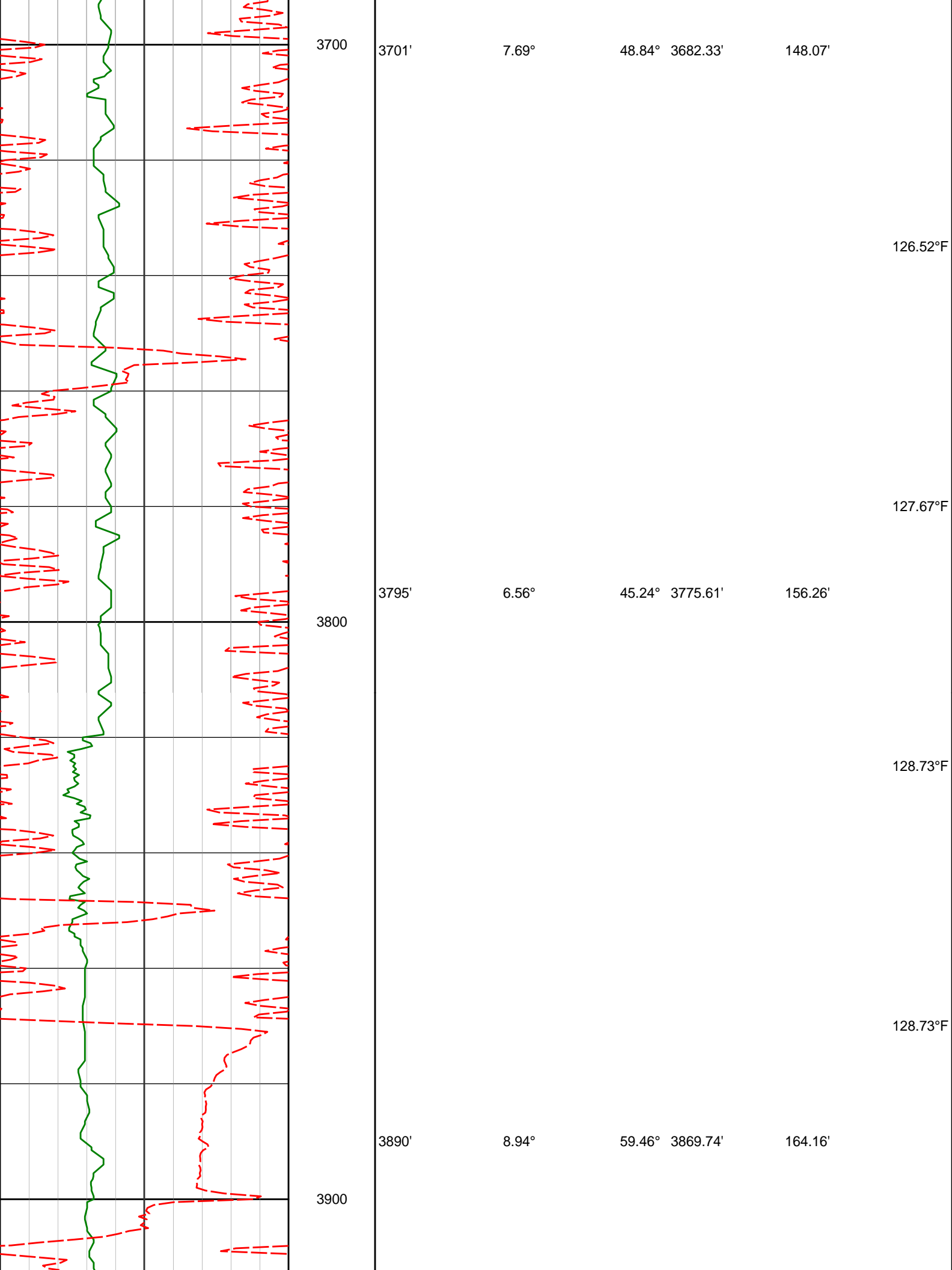
3588.35'

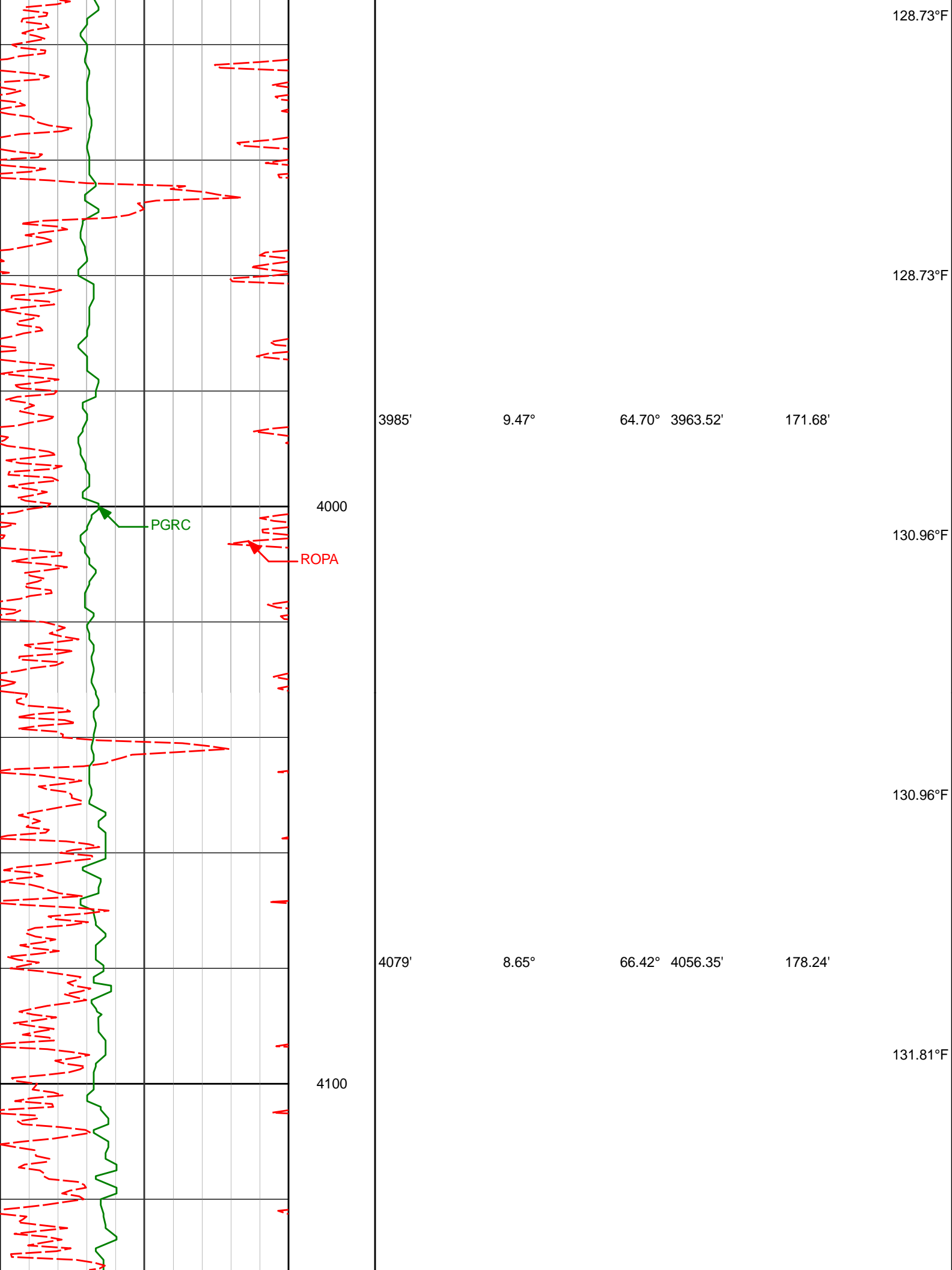
138.91'

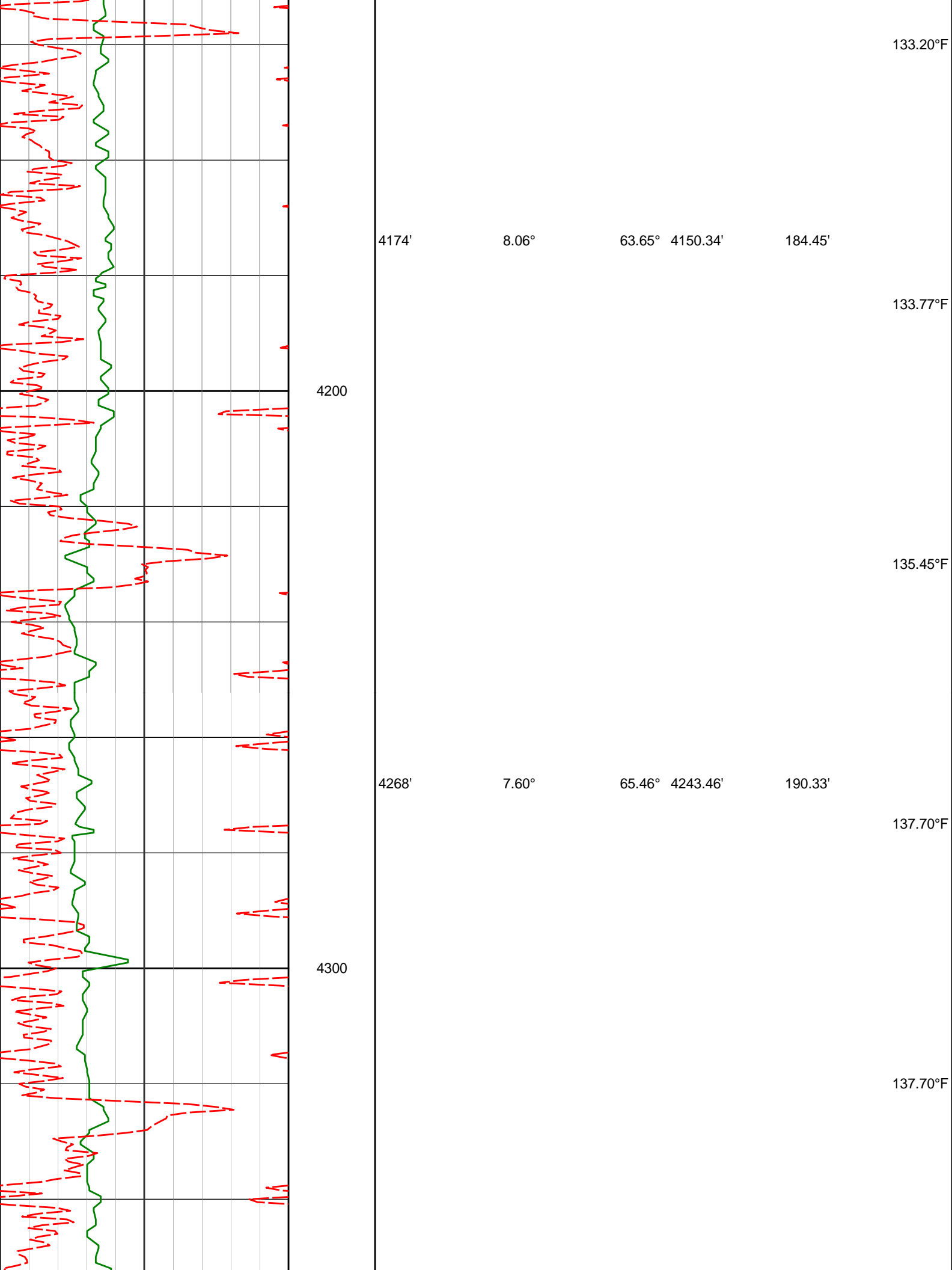
124.30°F

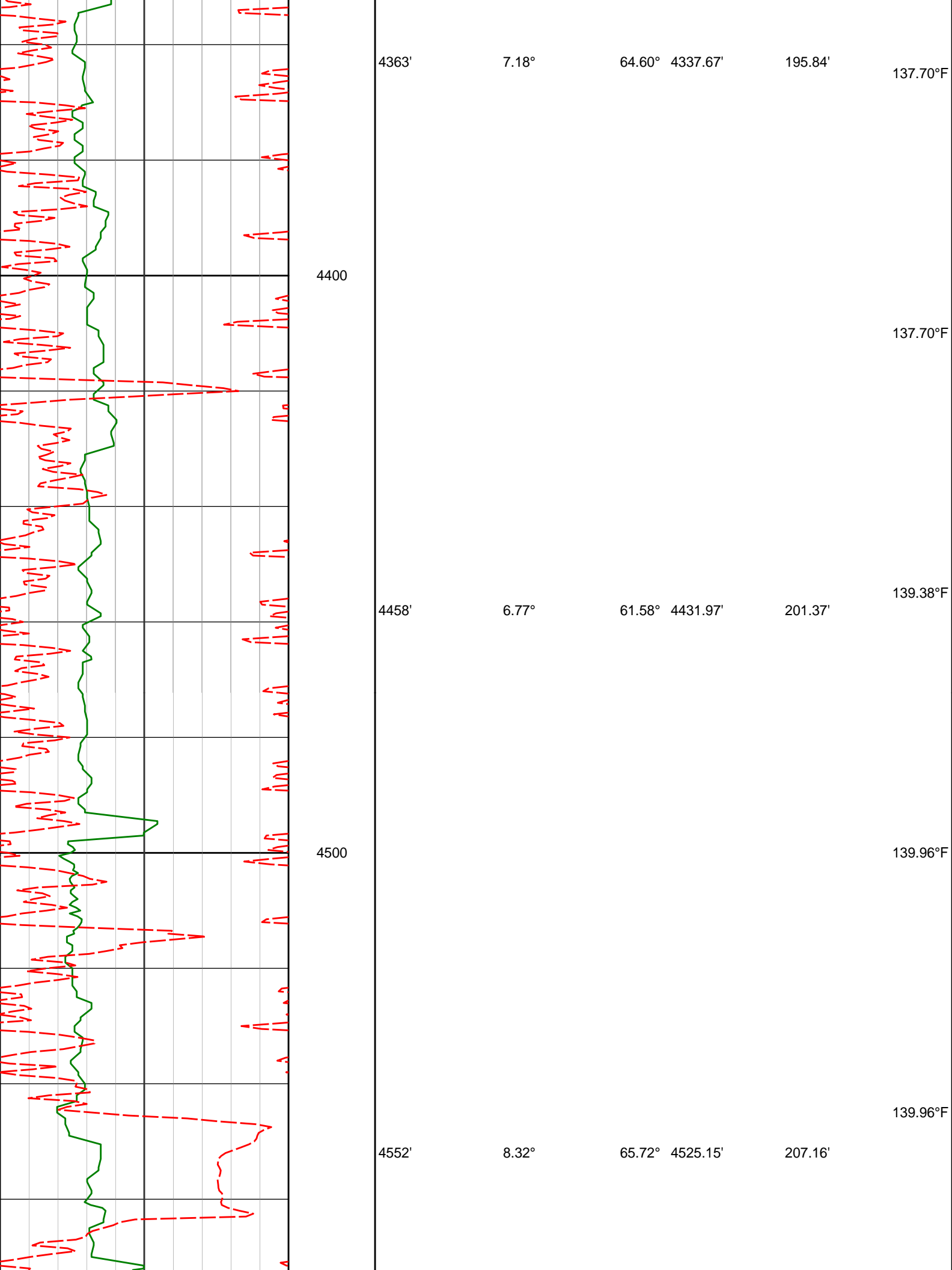
126.52°F

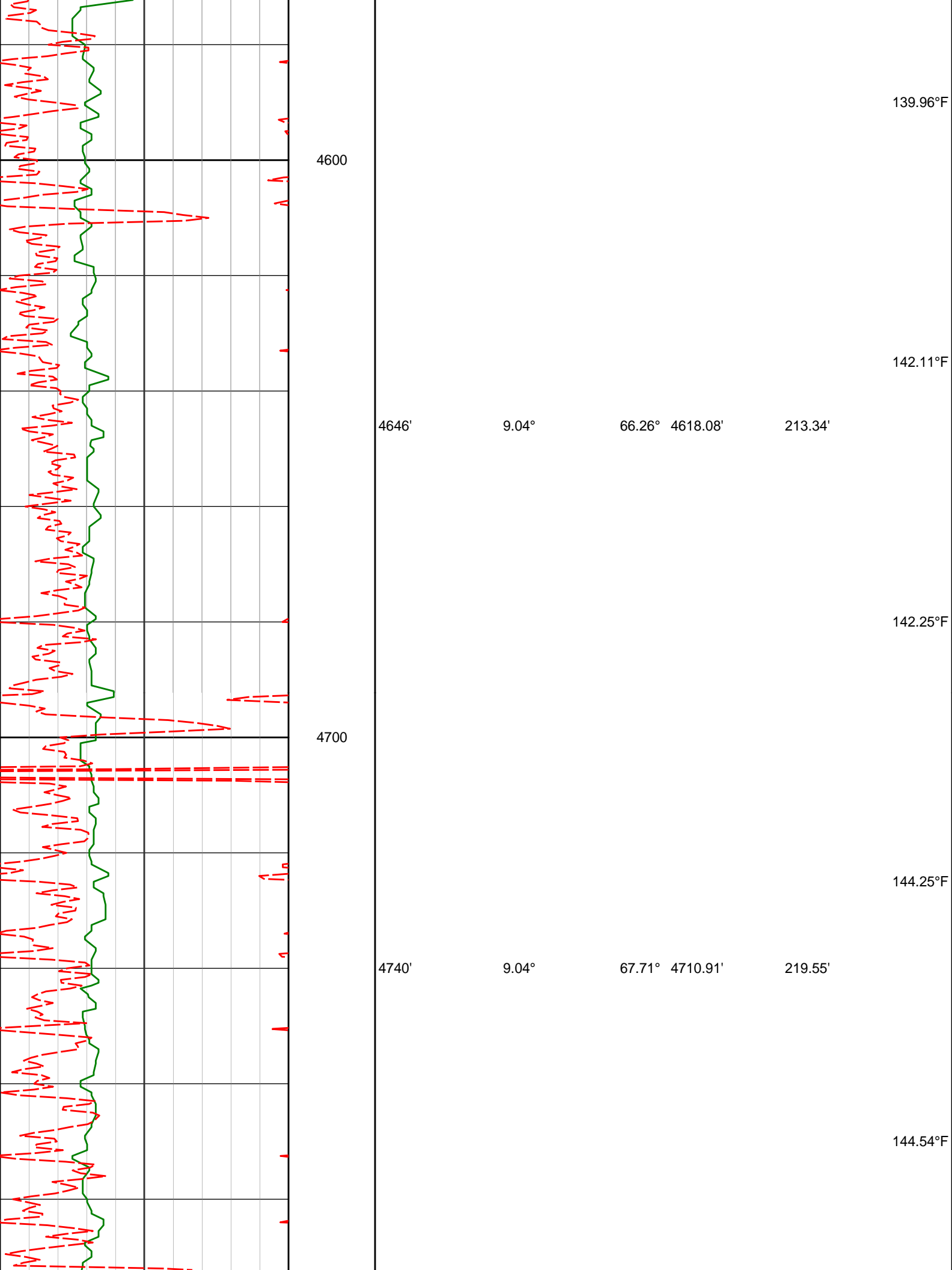
126.52°F

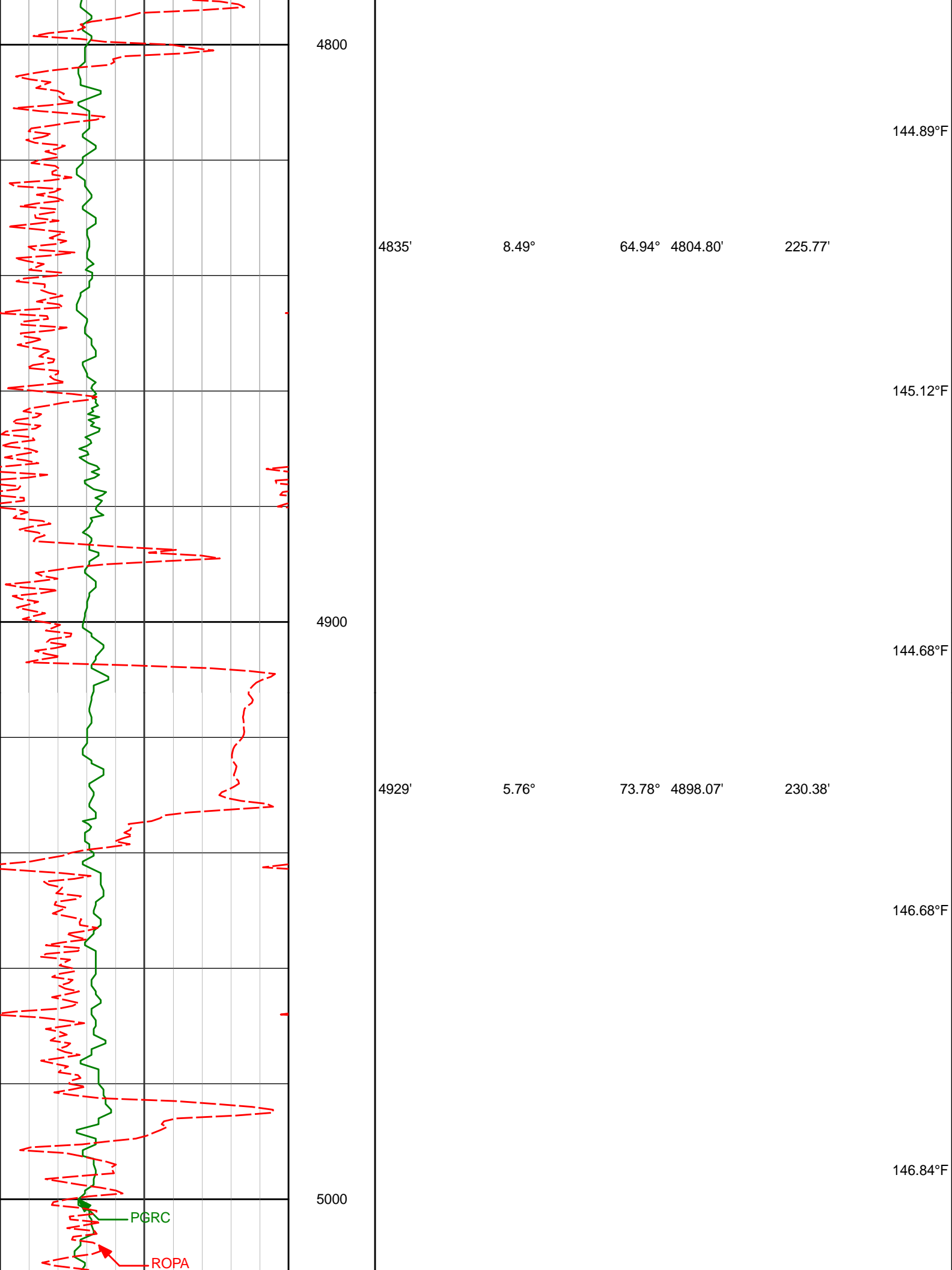


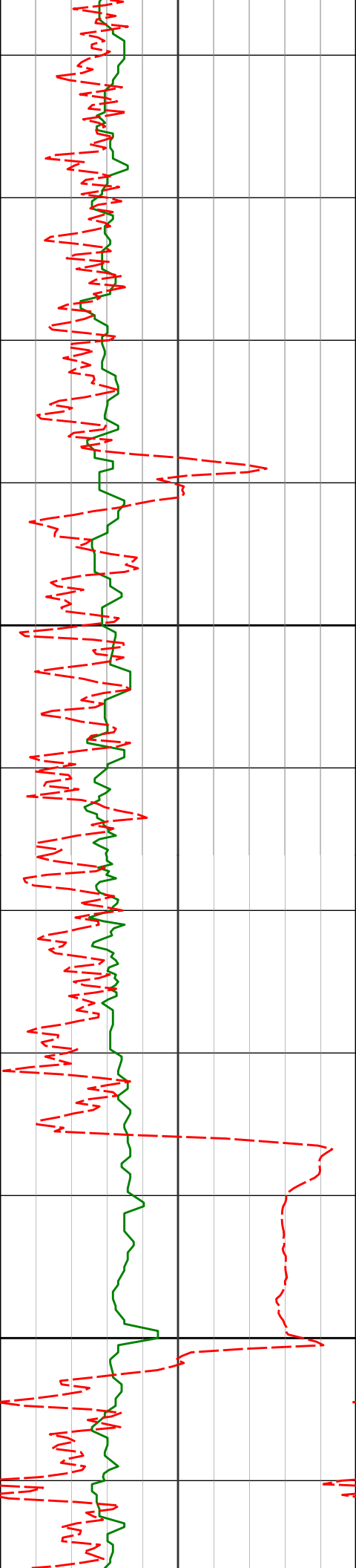












5024'

5.49°

68.42° 4992.61'

233.66'

148.75°F

149.75°F

5100

5119'

4.99°

63.93° 5087.21'

237.40'

149.59°F

149.14°F

5200

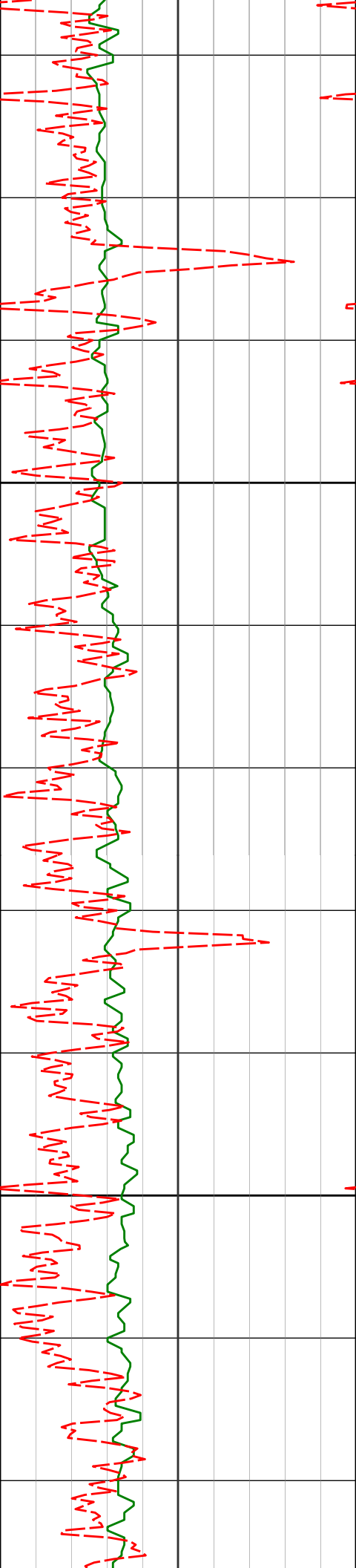
5213'

1.43°

57.09° 5181.05'

239.98'

150.60°F



5300

5307'

1.68°

56.21° 5275.02'

241.45'

151.47°F

151.47°F

151.81°F

5400

5402'

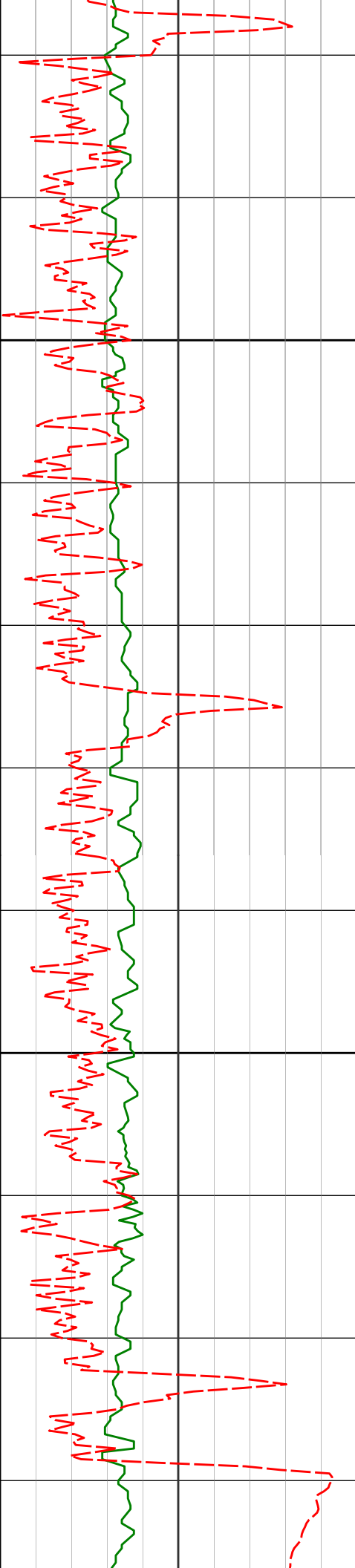
1.87°

53.95° 5369.97'

243.22'

153.79°F

153.99°F



5500

5600

5497'

5591'

1.74°

1.78°

56.69°

50.66°

5464.92'

5558.88'

245.00'

246.78'

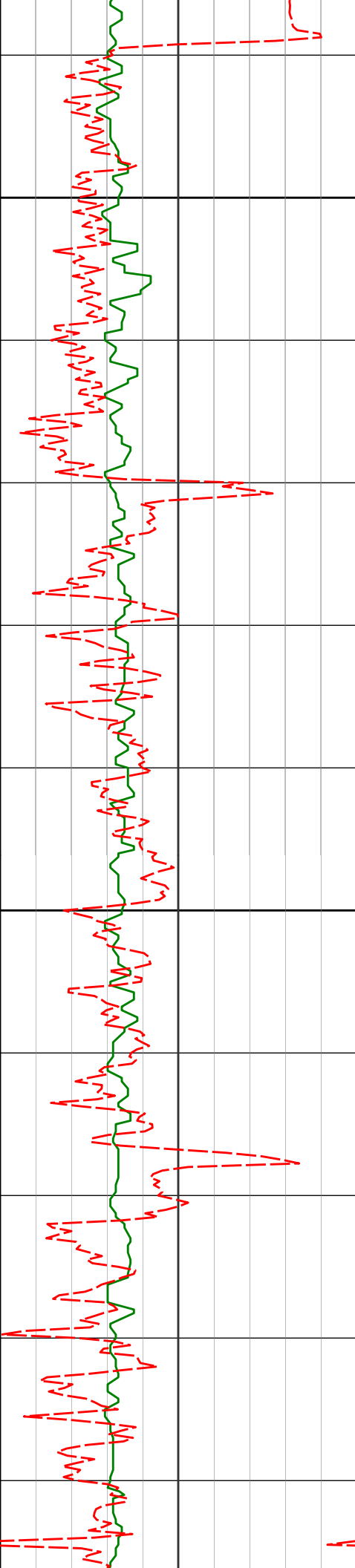
156.13°F

156.13°F

155.69°F

154.23°F

151.47°F



5686'

0.82°

113.27° 5653.86'

247.50'

5700

155.74°F

156.13°F

5780'

1.57°

96.59° 5747.84'

247.15'

5800

156.13°F

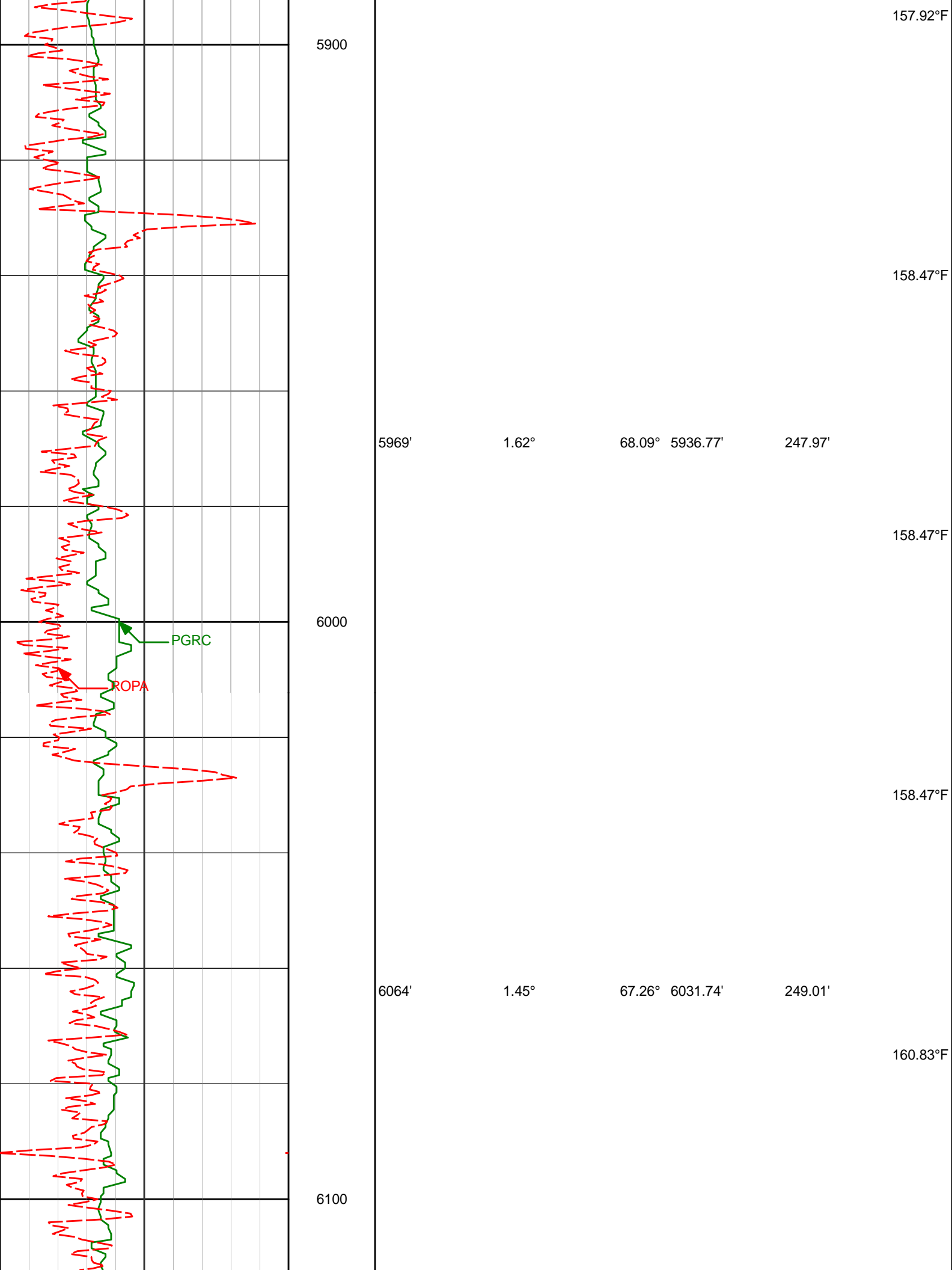
156.13°F

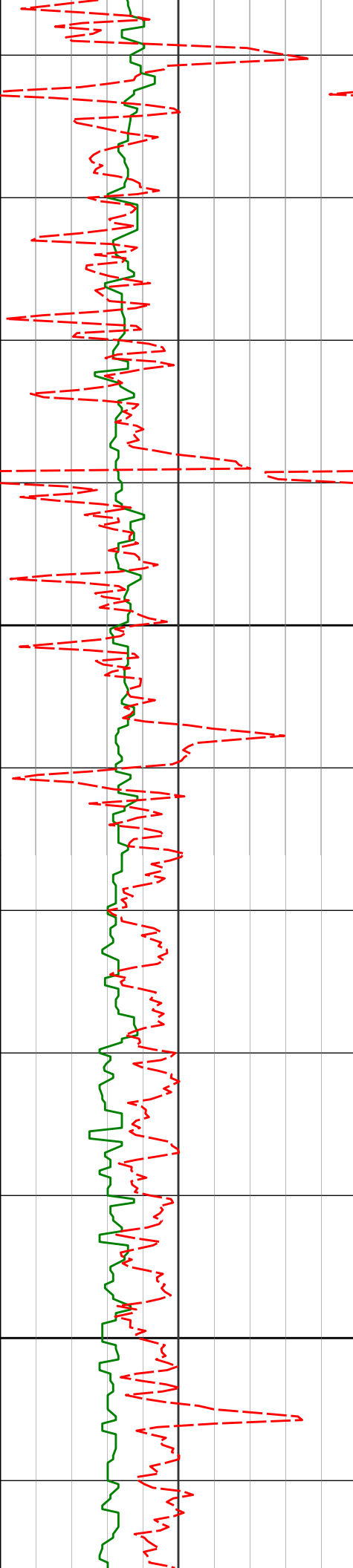
5875'

1.49°

82.68° 5842.80'

247.24'





6200

6300

6158'

1.72°

55.37° 6125.70'

250.34'

6253'

1.57°

55.70° 6220.66'

251.96'

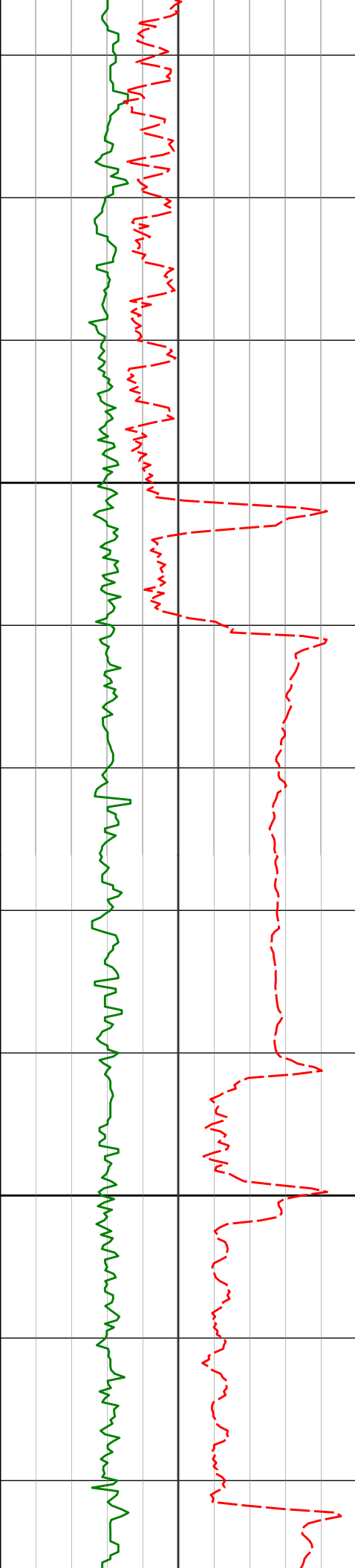
160.83°F

160.83°F

160.83°F

161.93°F

164.33°F



6400

6500

6348'

1.88°

36.26° 6315.62'

254.01'

165.58°F

6443'

5.71°

353.73° 6410.41'

259.98'

163.20°F

6538'

11.91°

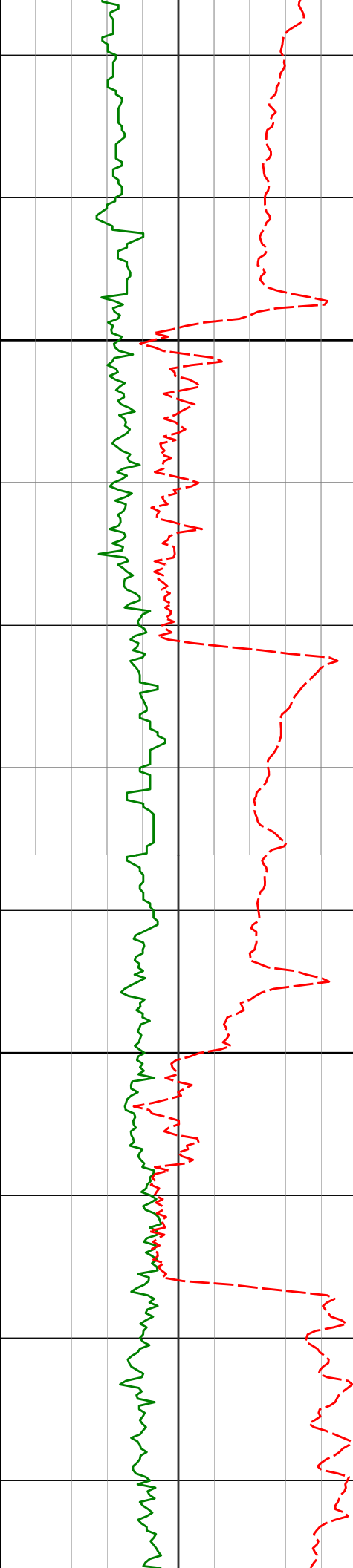
344.79° 6504.24'

274.05'

165.58°F

163.87°F

165.20°F



6600

6700

6633'

6727'

19.48°

24.30°

346.07°

344.00°

6595.63'

6682.83'

298.70'

332.22'

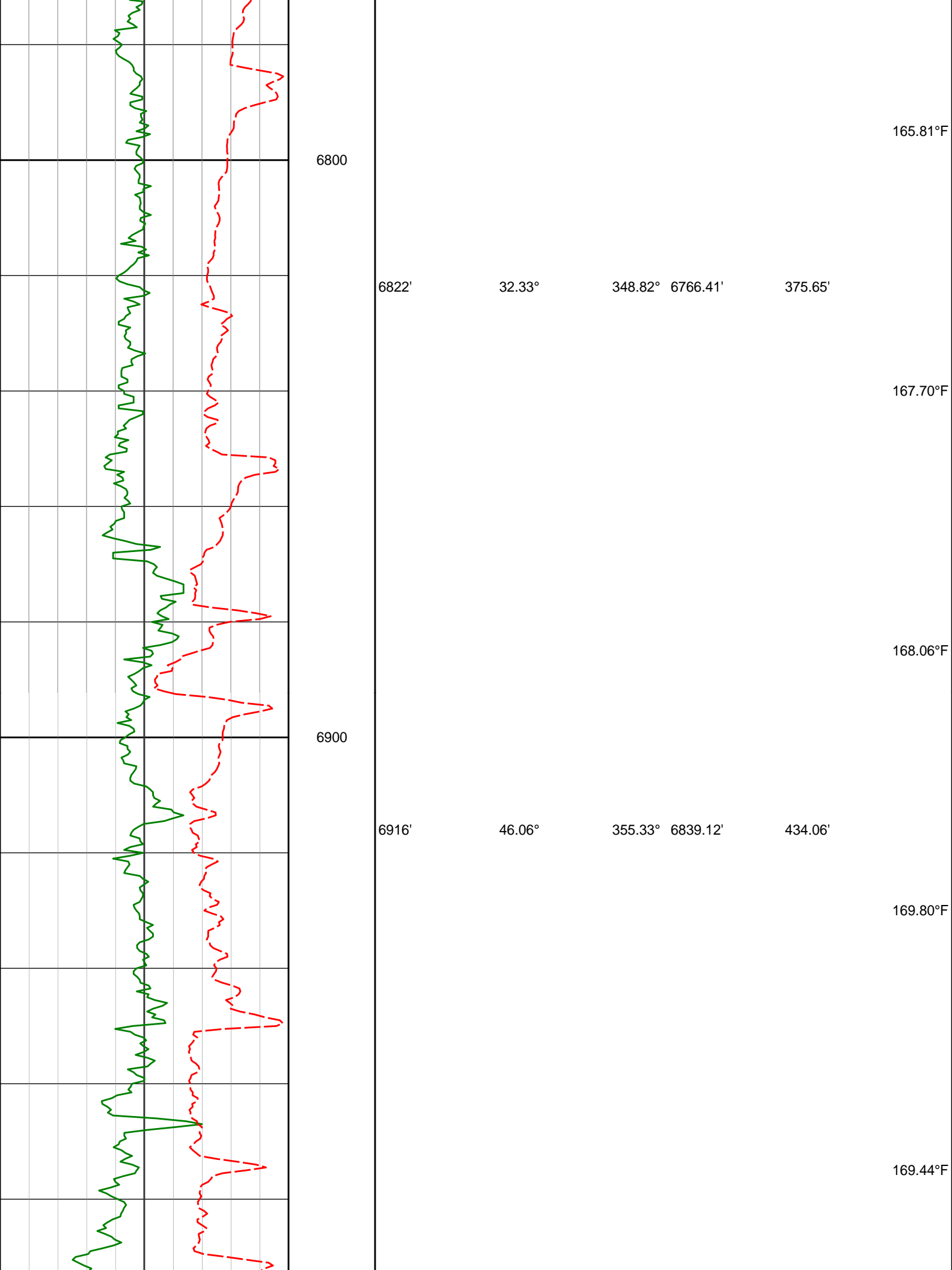
166.27°F

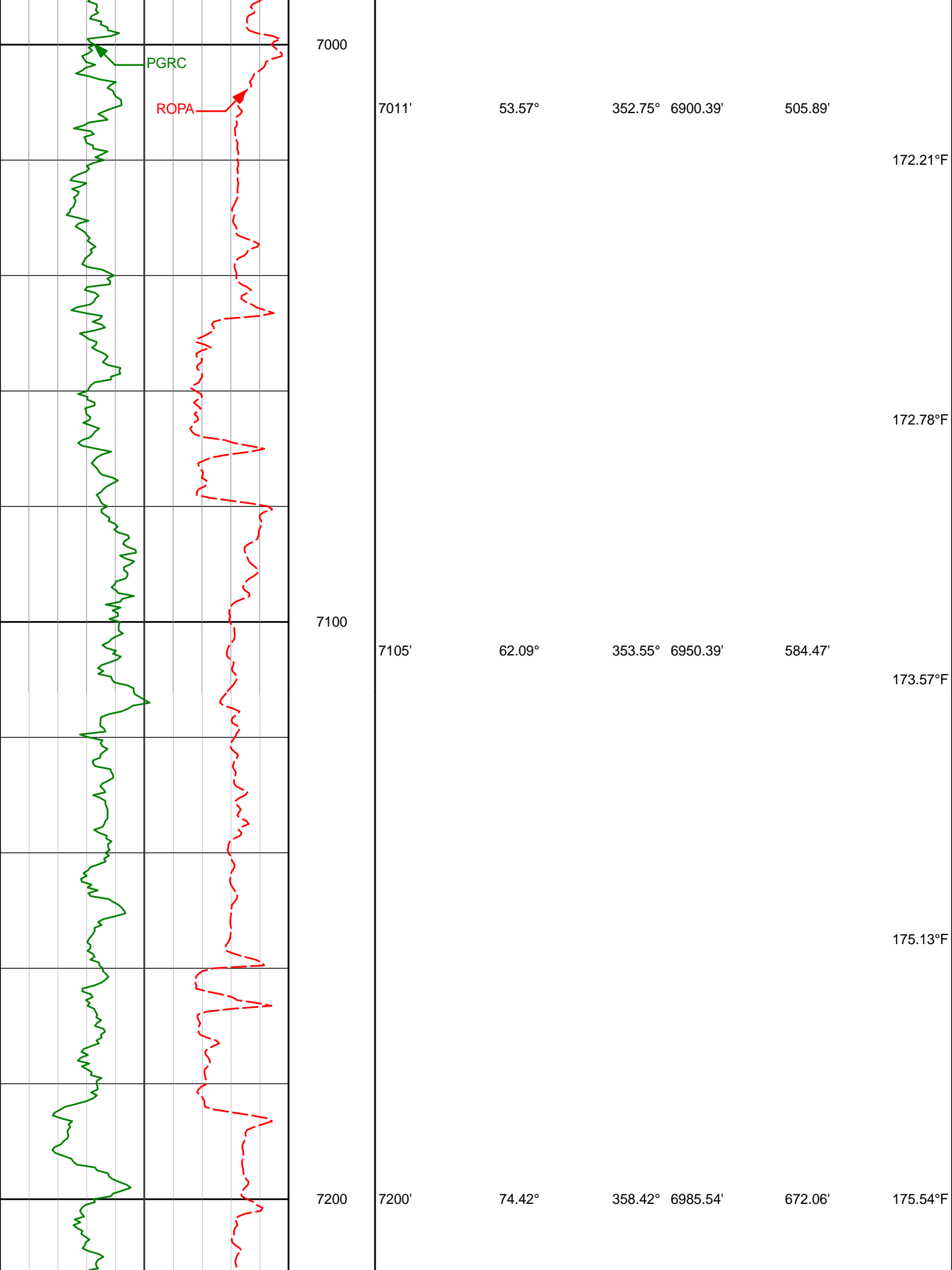
165.74°F

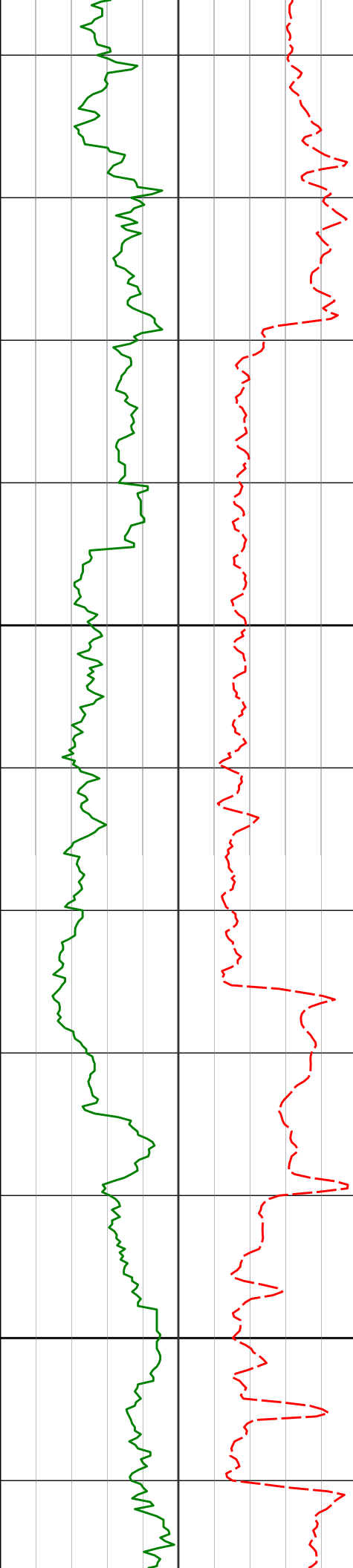
165.92°F

165.63°F

165.58°F







7300

7322'

83.15°

357.96° 7009.25'

791.37'

175.91°F

176.87°F

181.59°F

Run 200

7377'

87.50°

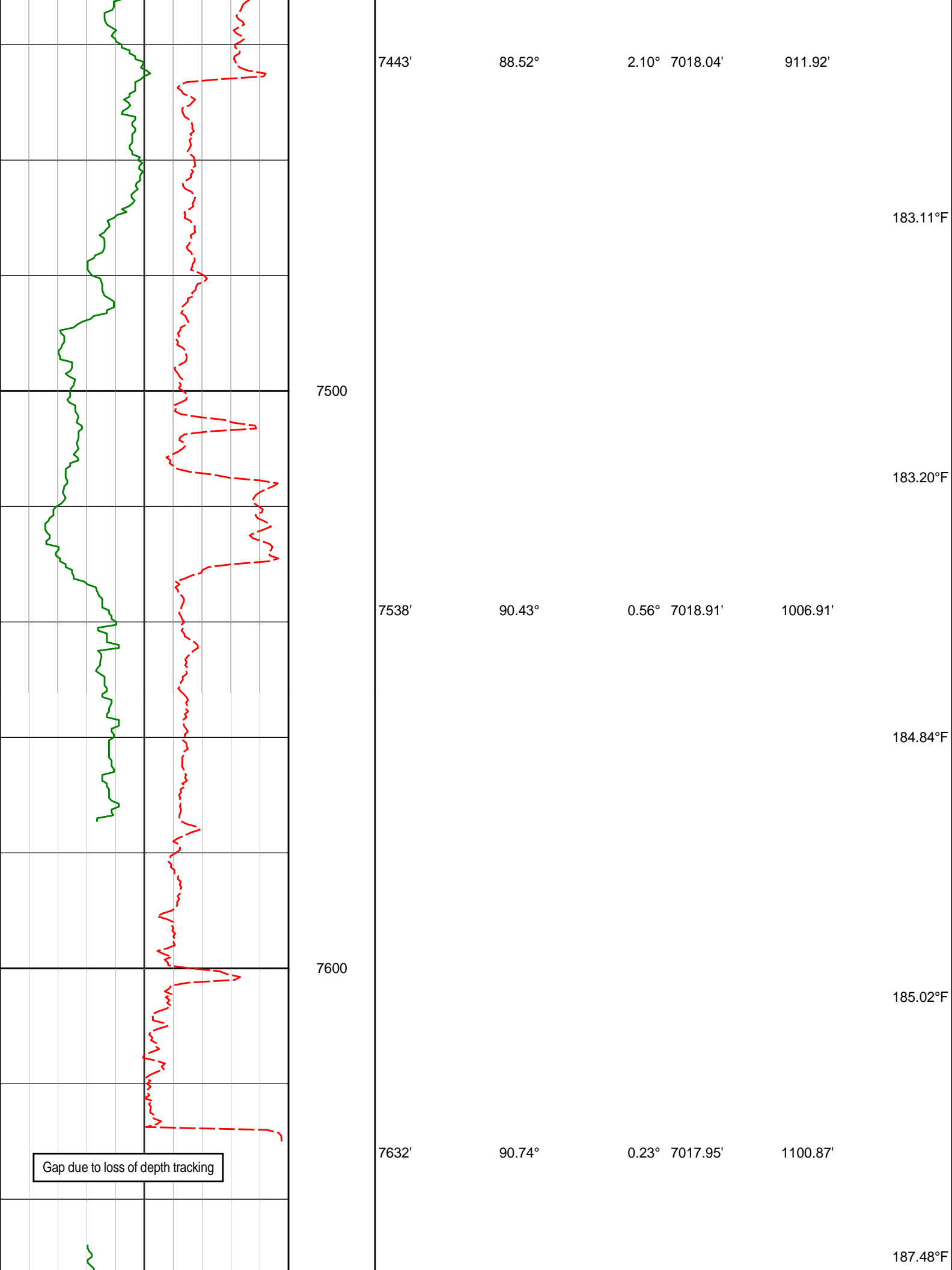
359.00° 7014.65'

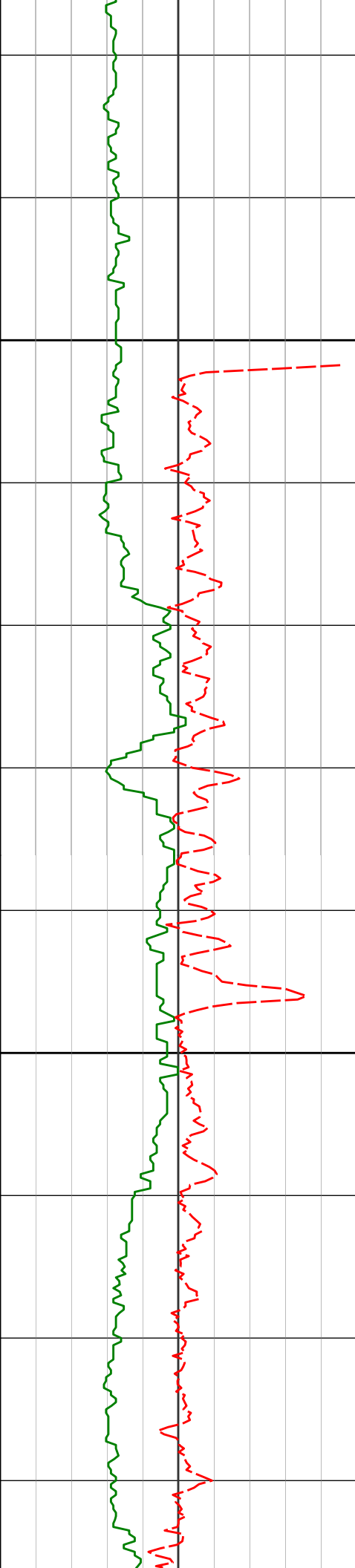
846.03'

183.85°F

7400

183.79°F





7700

7727'

90.71°

359.48°

7016.75'

1195.81'

188.09°F

189.99°F

189.99°F

7800

7822'

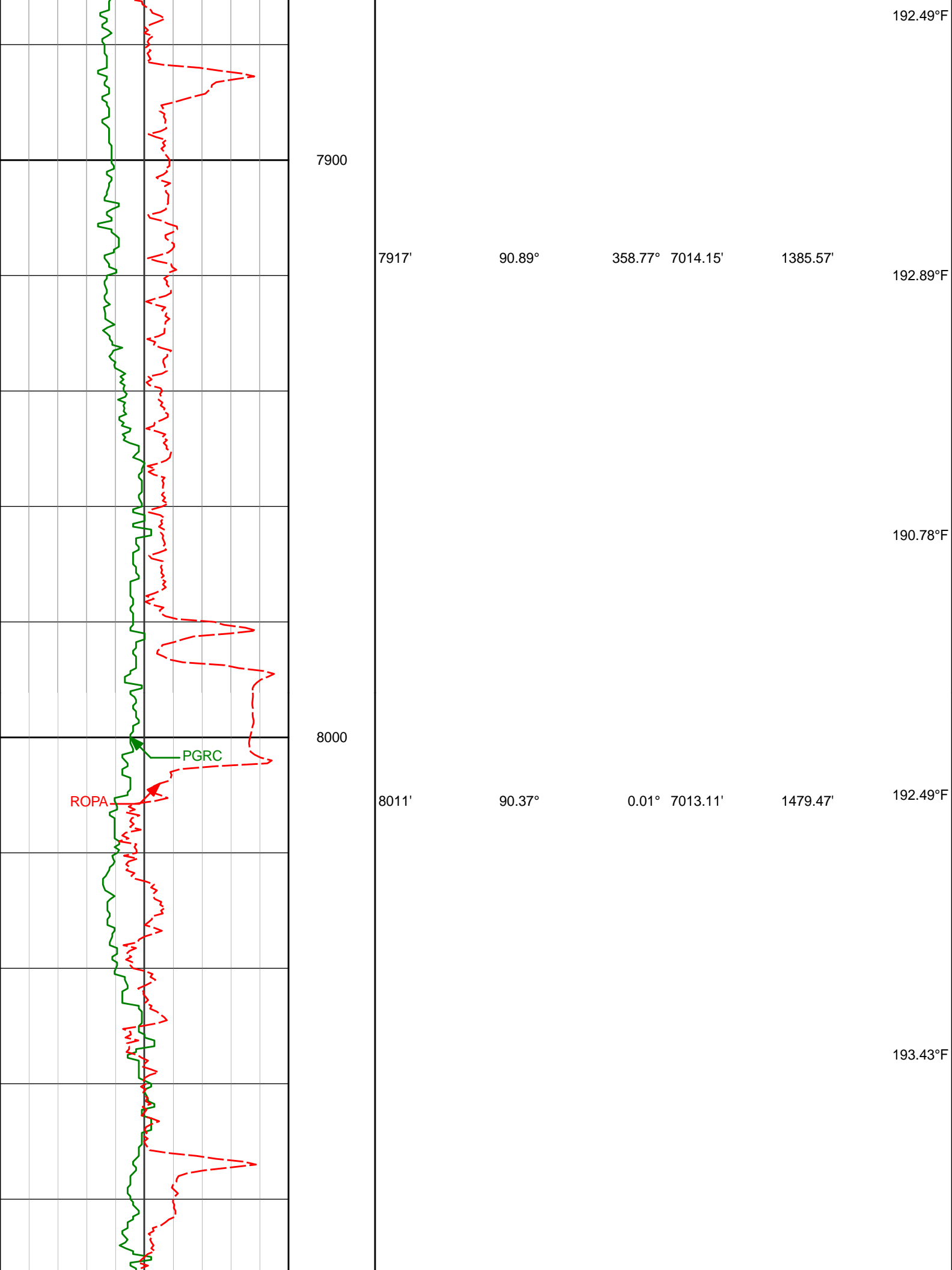
90.77°

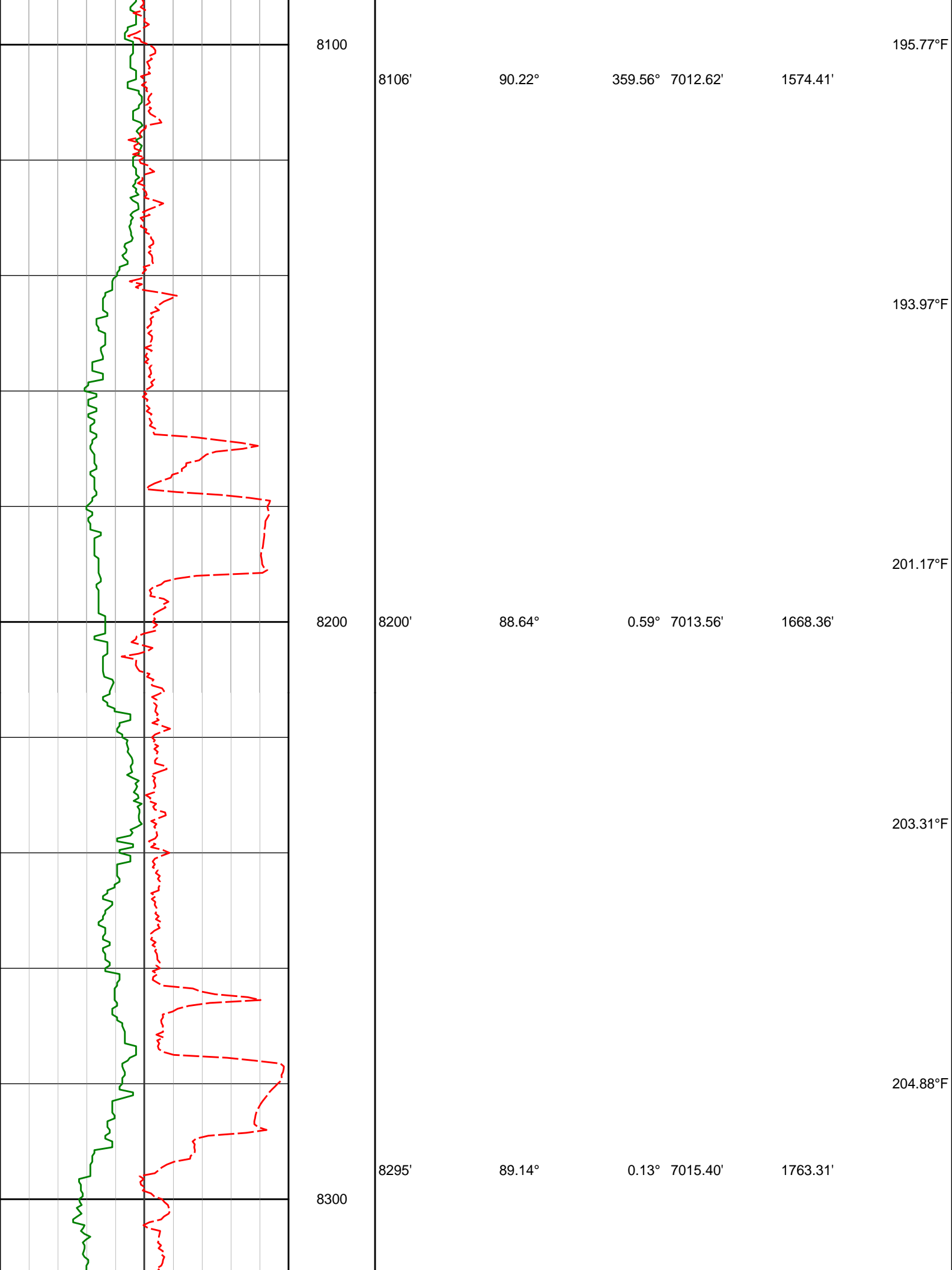
359.03°

7015.52'

1290.70'

191.12°F





8100

195.77°F

8106'

90.22°

359.56° 7012.62'

1574.41'

193.97°F

8200

8200'

88.64°

0.59° 7013.56'

1668.36'

201.17°F

203.31°F

204.88°F

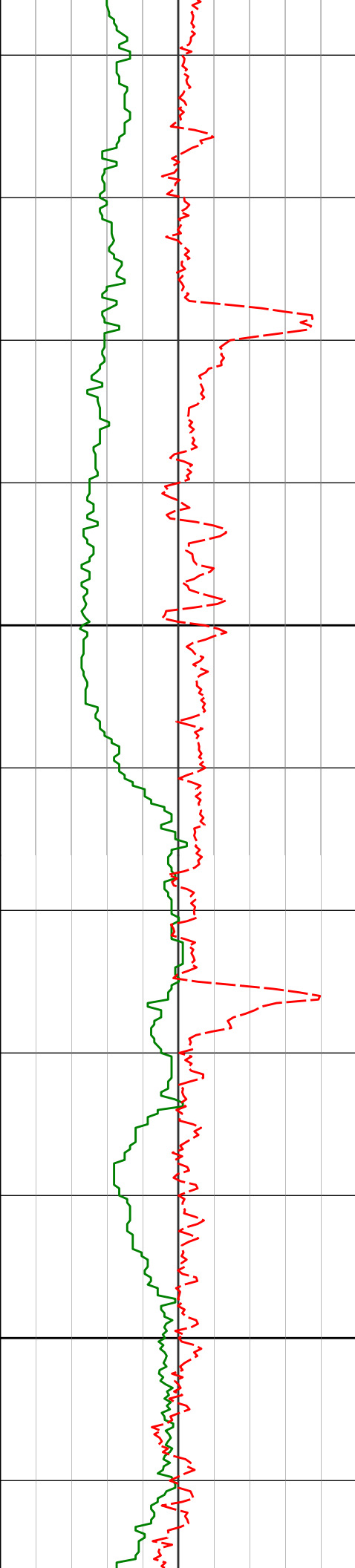
8300

8295'

89.14°

0.13° 7015.40'

1763.31'



8390' 89.29° 359.62° 7016.70' 1858.24'

8400

199.15°F

201.94°F

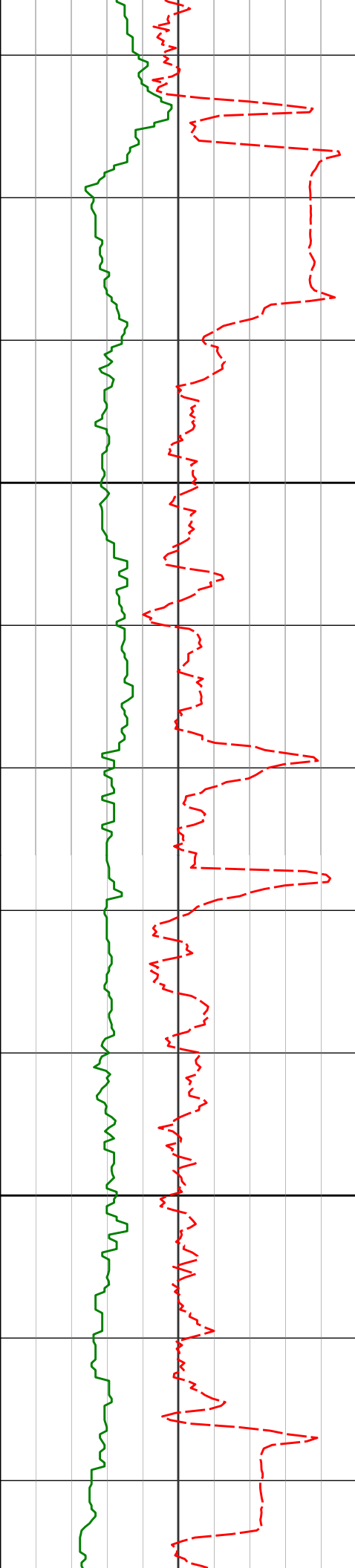
202.60°F

204.31°F

8484' 89.11° 358.95° 7018.01' 1952.14'

8500

203.79°F



8600

8700

8579'

89.75°

0.70° 7018.96'

2047.07'

8674'

90.12°

0.60° 7019.06'

2142.05'

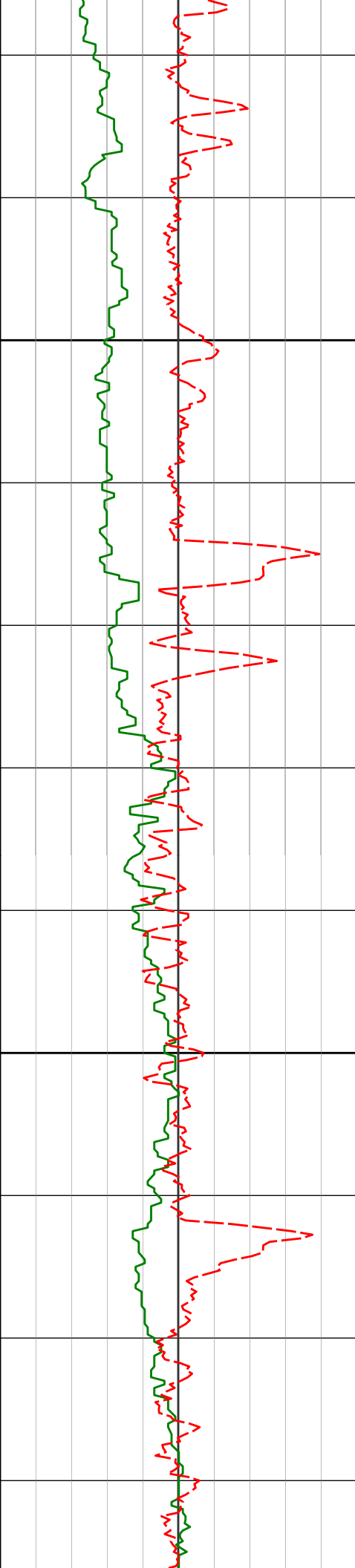
203.29°F

205.19°F

207.73°F

207.93°F

210.12°F



8800

8900

8768'

90.12°

0.08° 7018.87'

2236.02'

211.91°F

212.92°F

8863'

90.12°

359.79° 7018.67'

2330.96'

213.52°F

215.51°F

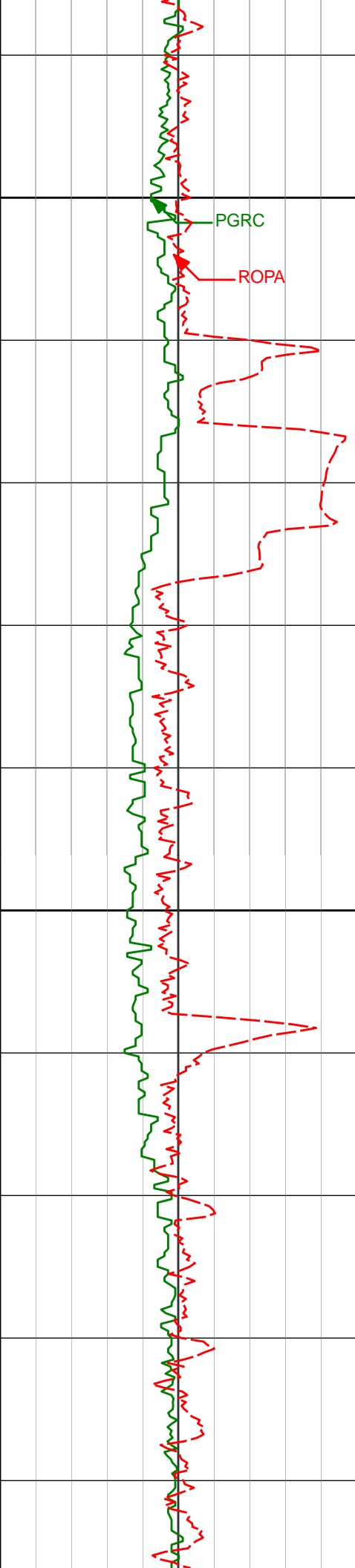
8957'

89.69°

359.28° 7018.83'

2424.89'

214.92°F



9000

PGRC

ROPA

213.83°F

215.08°F

9052'

90.77°

359.96°

7018.44'

2519.81'

220.26°F

9100

218.33°F

9146'

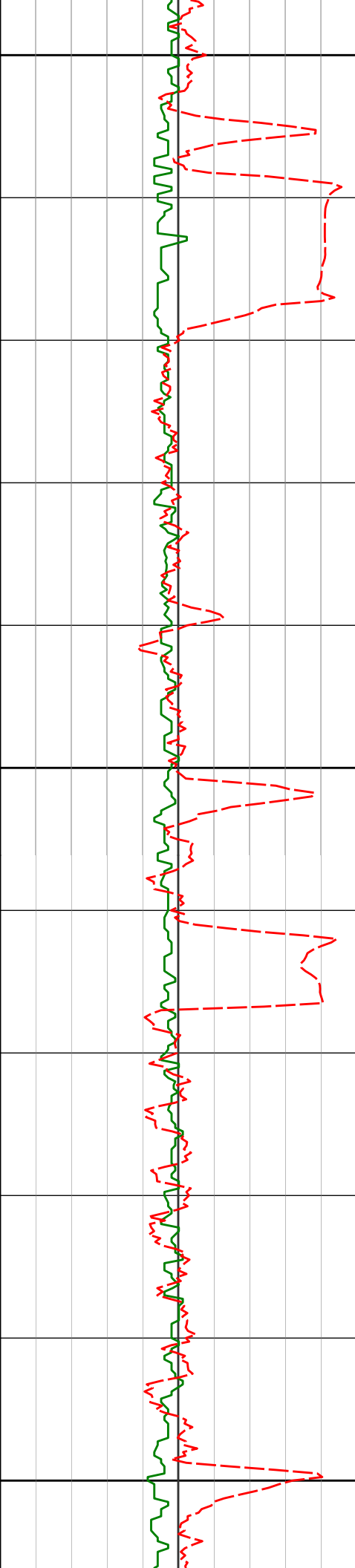
91.39°

358.78°

7016.67'

2613.71'

215.78°F



9200

9241'

90.65°

0.12° 7014.98'

2708.61'

216.23°F

9300

9336'

90.18°

1.60° 7014.29'

2803.59'

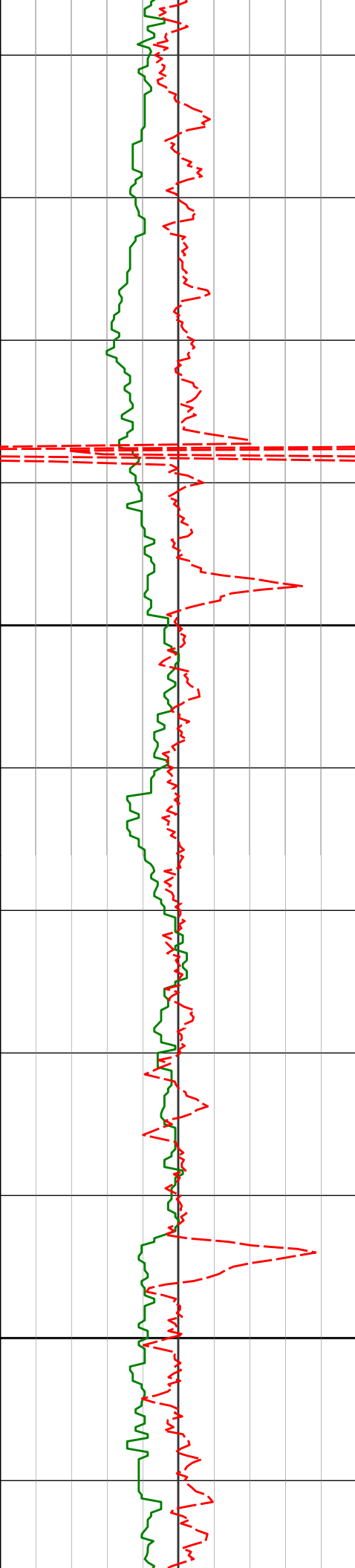
218.14°F

218.30°F

220.59°F

9400

221.51°F



9500

9525'

90.18°

359.82° 7013.70'

2992.54'

9600

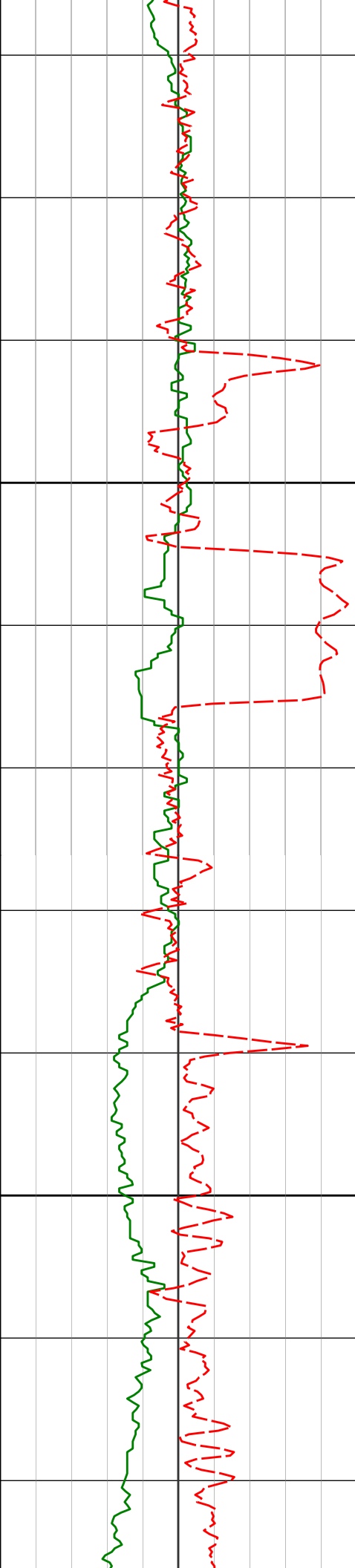
223.41°F

223.41°F

223.41°F

225.76°F

225.16°F



9700

9714'

89.23°

359.71° 7014.67'

3181.41'

223.80°F

223.41°F

225.64°F

9800

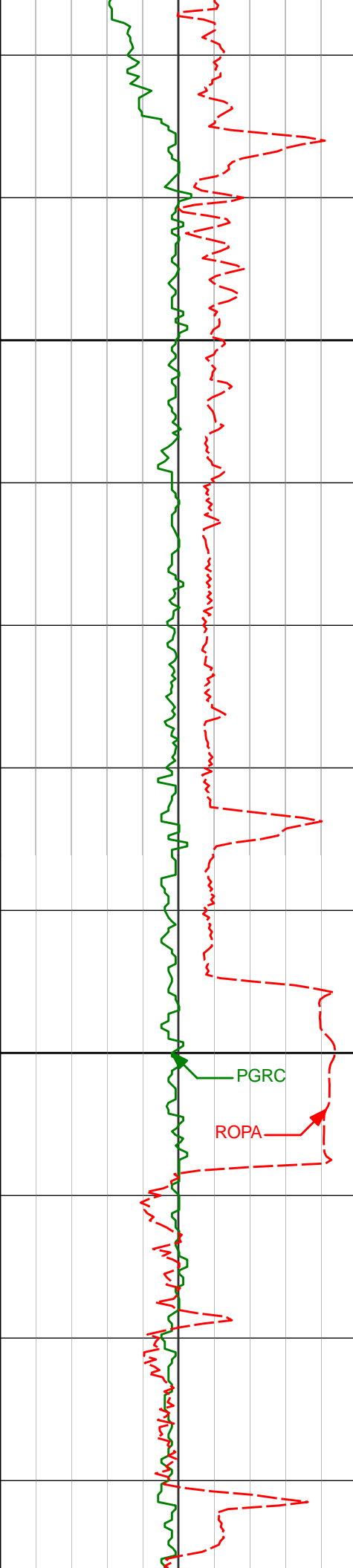
9809'

89.88°

0.22° 7015.41'

3276.36'

226.83°F



9900

9904'

89.88°

359.24° 7015.61'

3371.29'

228.37°F

225.56°F

10000

9998'

90.12°

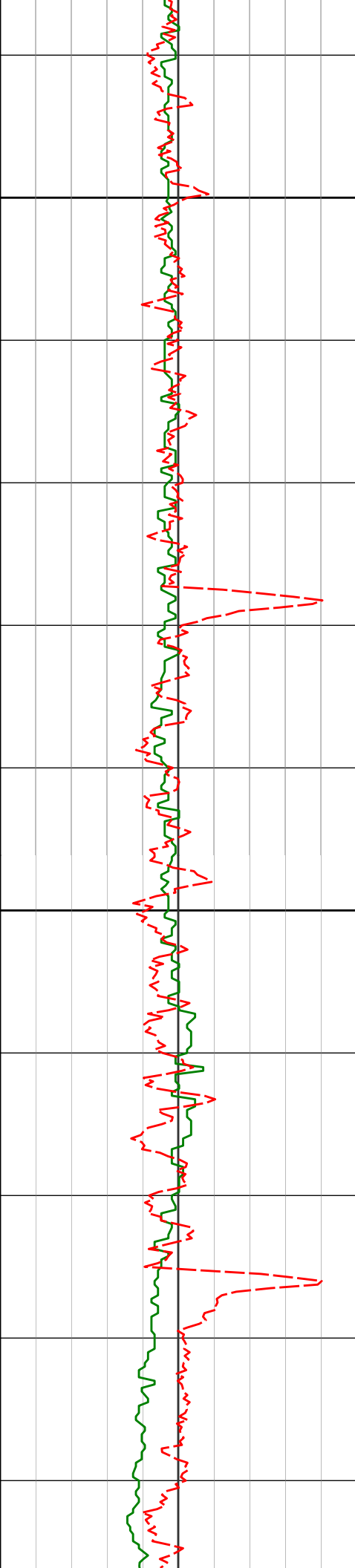
1.19° 7015.61'

3465.25'

223.70°F

226.00°F

228.74°F



10100

10200

10093'

90.59°

1.41° 7015.02'

3560.25'

10187'

90.77°

1.01° 7013.90'

3654.23'

10282'

90.68°

359.91° 7012.70'

3749.20'

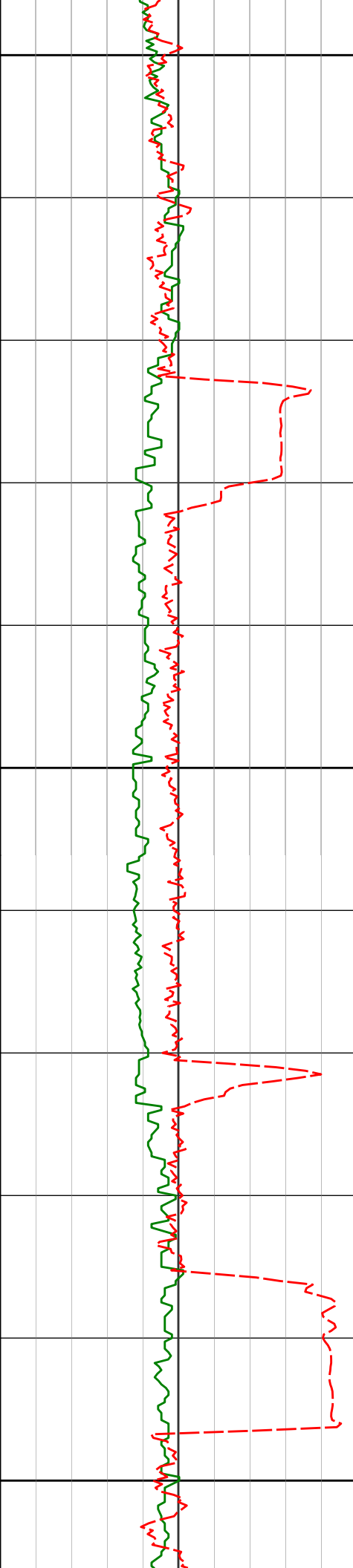
228.15°F

228.74°F

228.74°F

231.42°F

231.42°F



10300

231.42°F

231.42°F

10400

230.53°F

228.90°F

10471'

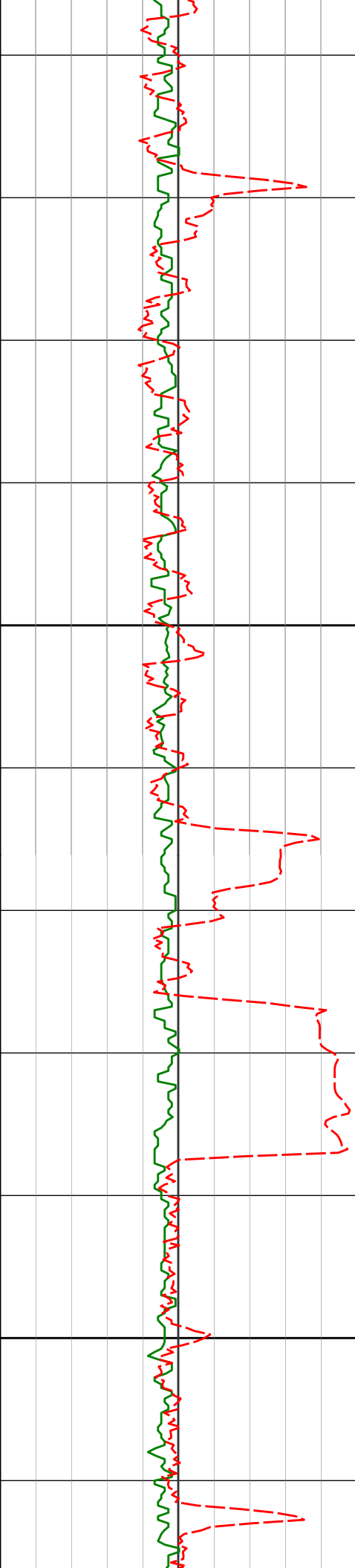
90.71°

359.74° 7010.41'

3938.07'

227.84°F

10500



10600

10700

10566'

89.72°

358.60°

7010.05'

4032.96'

10660'

90.46°

0.86°

7009.91'

4126.89'

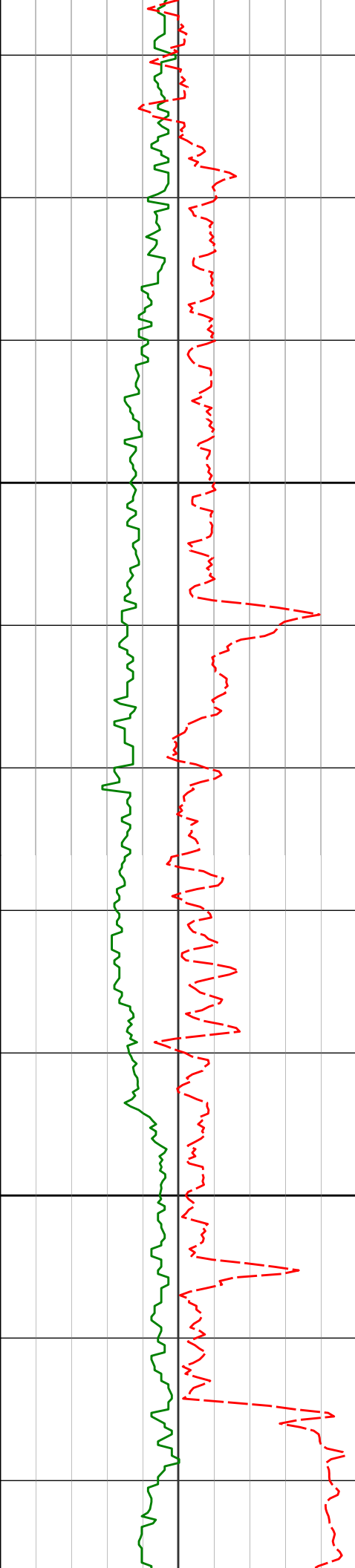
228.74°F

228.86°F

228.16°F

228.28°F

228.74°F



10800

10846'

10900

10937'

90.80°

89.57°

359.73°

359.33°

7007.86'

7007.57'

4312.81'

4403.73'

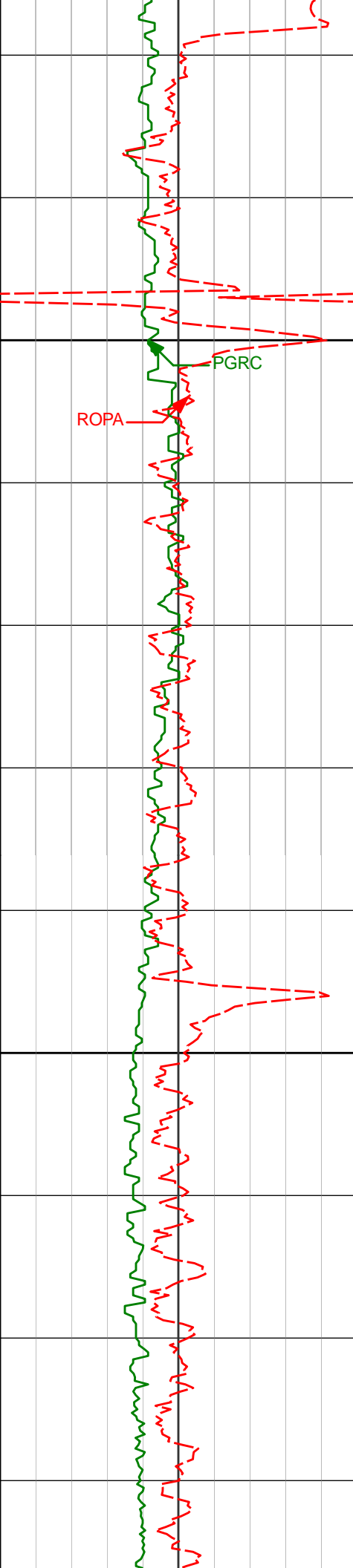
229.33°F

231.42°F

231.18°F

229.29°F

229.13°F



11000

11100

11028'

11119'

89.29°

89.35°

359.90° 7008.47'

359.17° 7009.55'

4494.66'

4585.58'

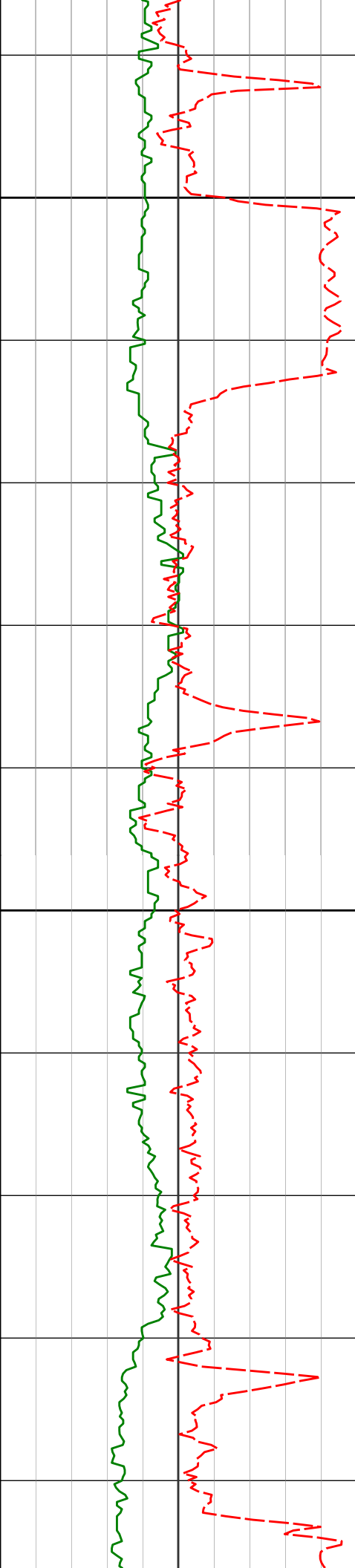
231.42°F

232.52°F

234.12°F

233.73°F

232.14°F



11200

231.42°F

232.36°F

234.12°F

11300

11302'

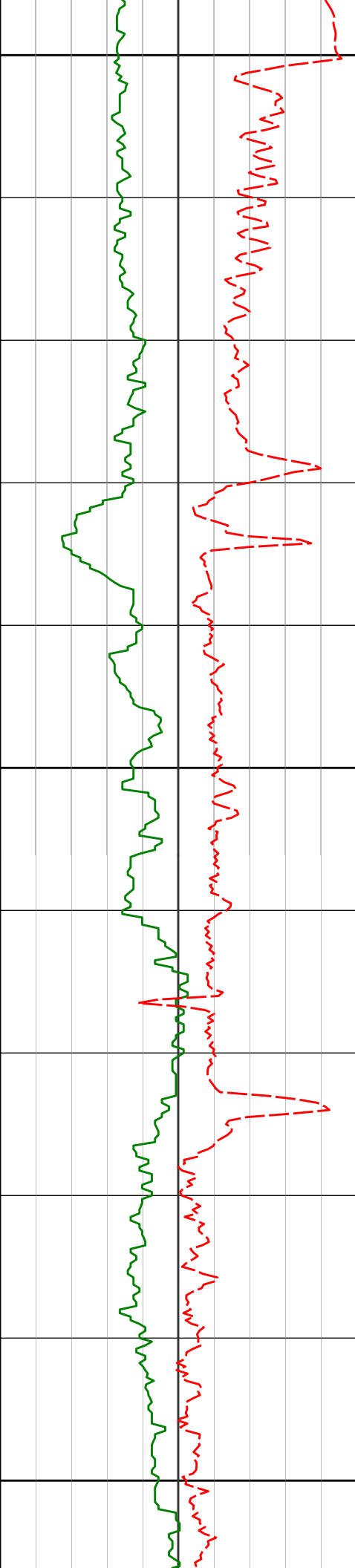
91.14°

0.69° 7008.77'

4768.46'

233.41°F

233.94°F

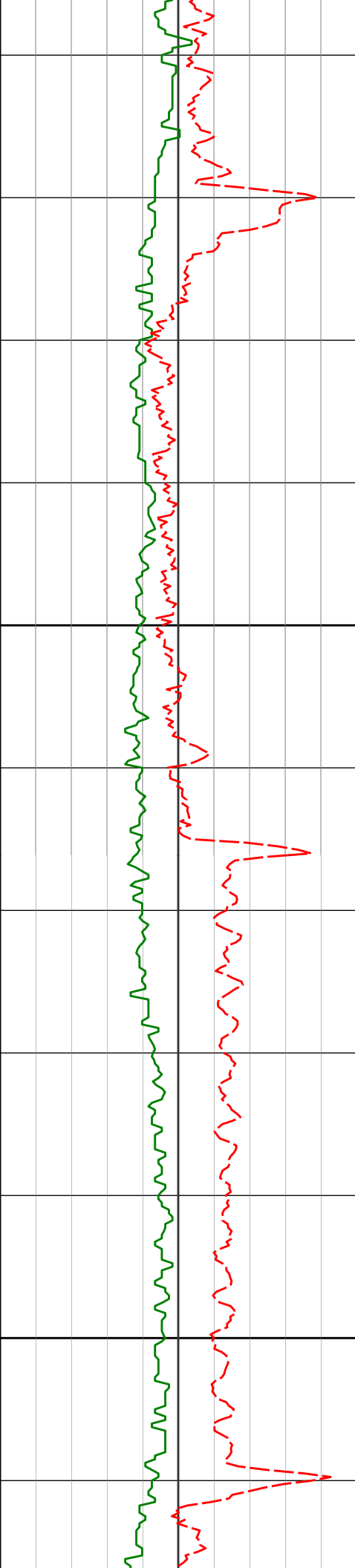


11400

11500

11600

11393'	89.91°	1.29°	7007.94'	4859.44'	
					234.12°F
					236.51°F
11484'	90.06°	1.21°	7007.96'	4950.44'	
					236.82°F
					238.89°F
11575'	89.94°	1.09°	7007.96'	5041.43'	
					239.54°F



11700

11800

11666'

89.94°

0.34° 7008.06'

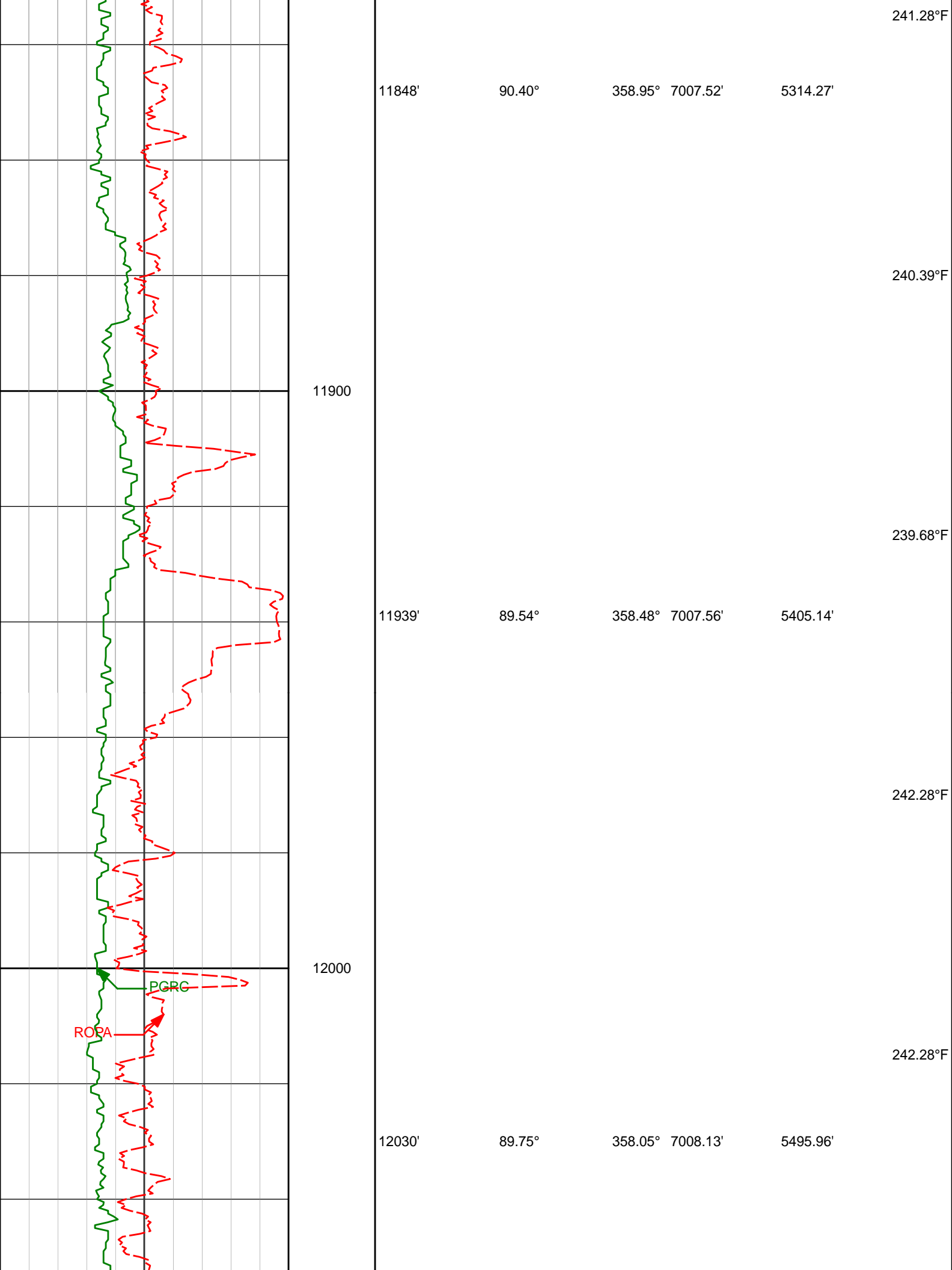
5132.41'

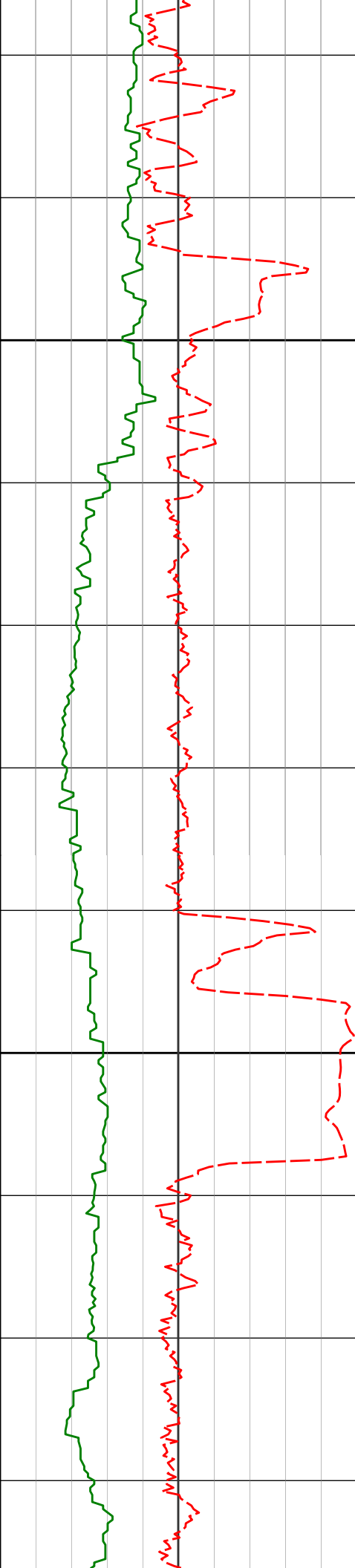
239.54°F

239.72°F

241.96°F

242.28°F





12100

12122'

89.82°

357.56° 7008.47'

5587.73'

12200

12213'

91.33°

358.55° 7007.56'

5678.52'

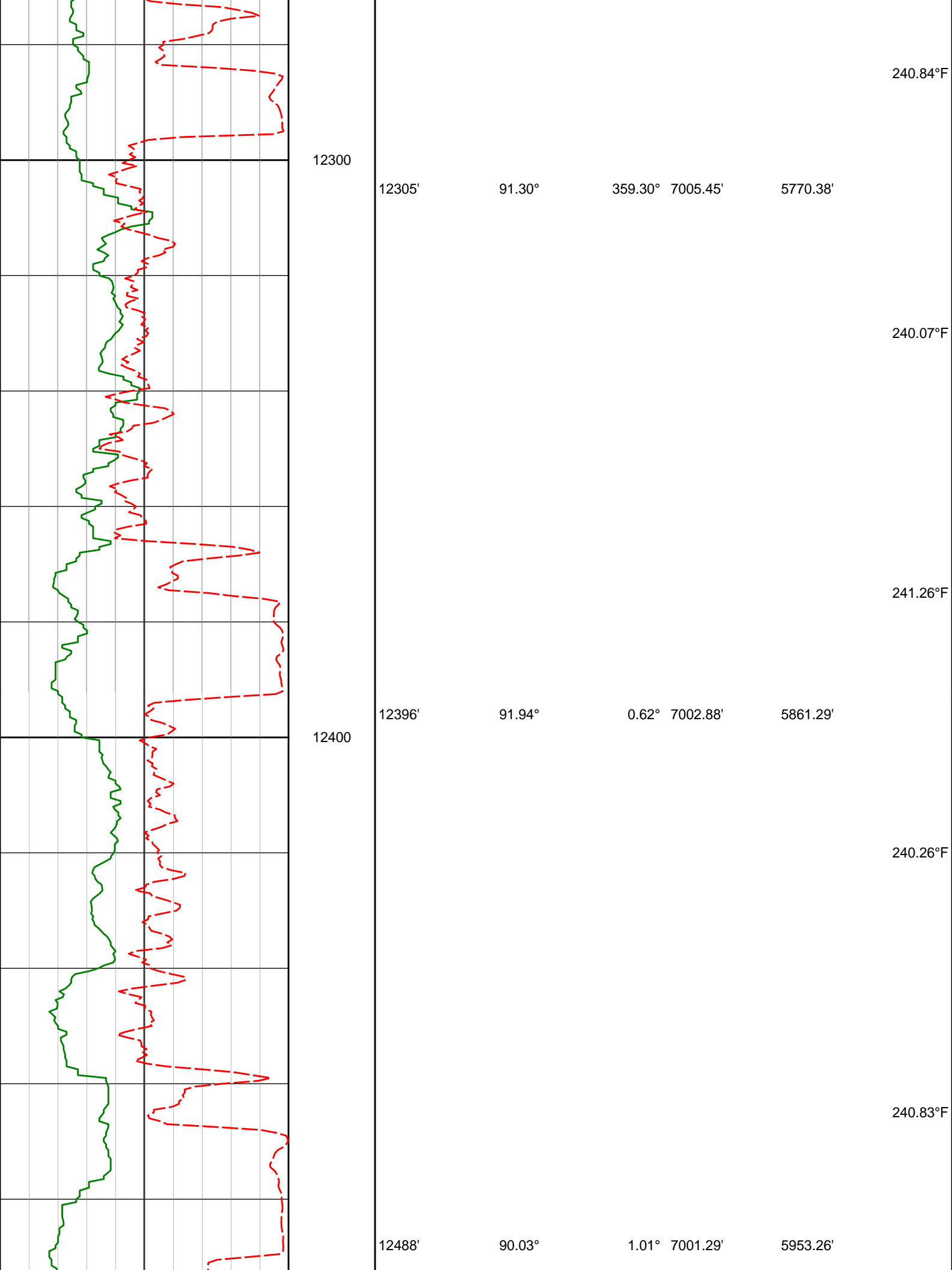
243.29°F

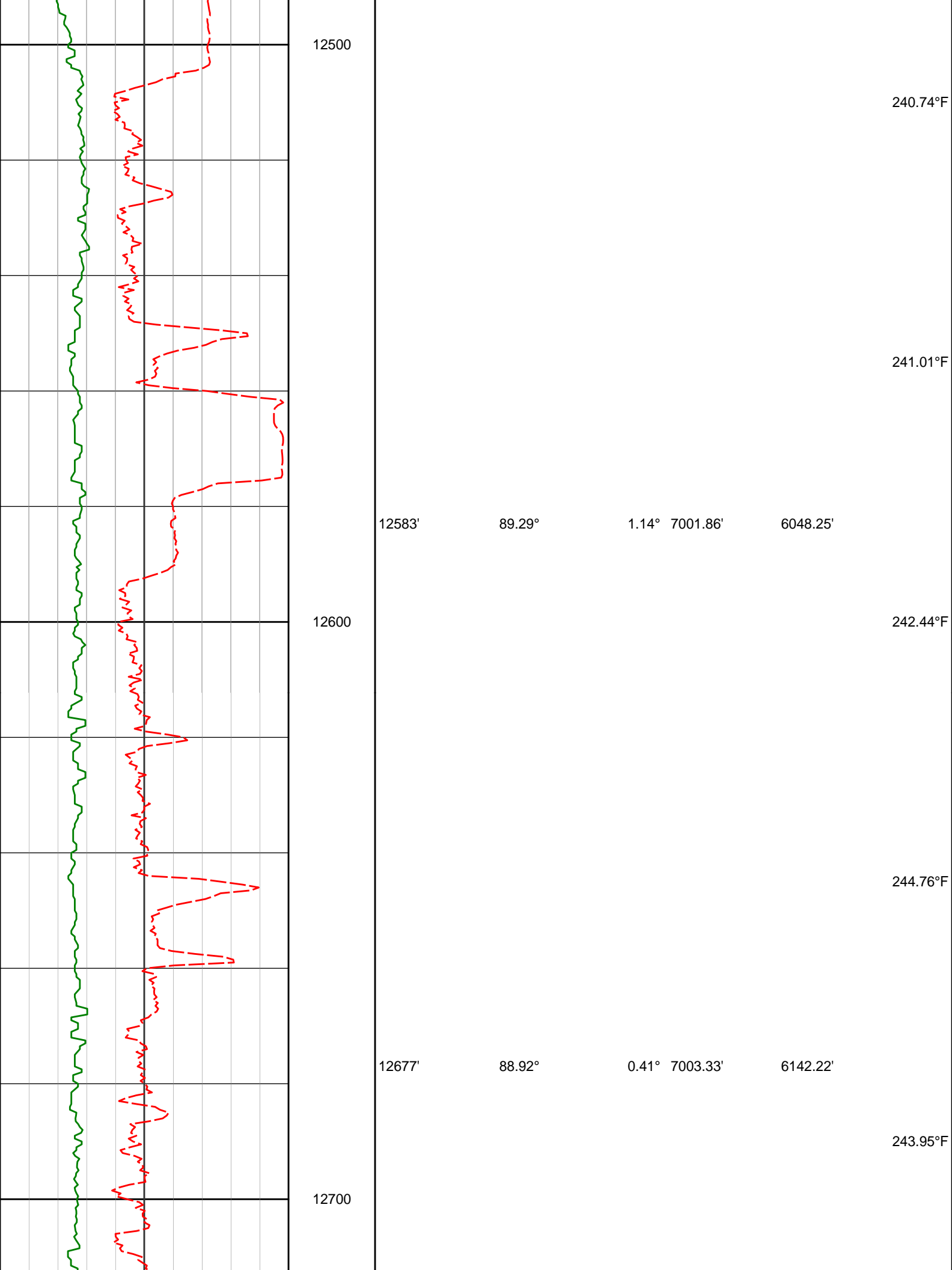
243.16°F

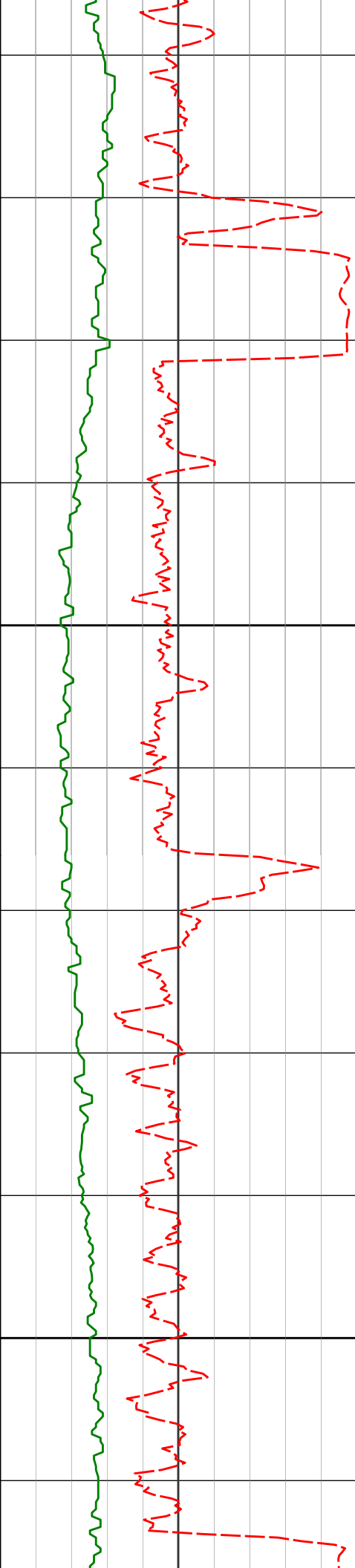
241.97°F

241.51°F

240.14°F







12800

12900

12772'

90.12°

359.57° 7004.12'

6237.16'

12867'

91.45°

358.68° 7002.82'

6332.04'

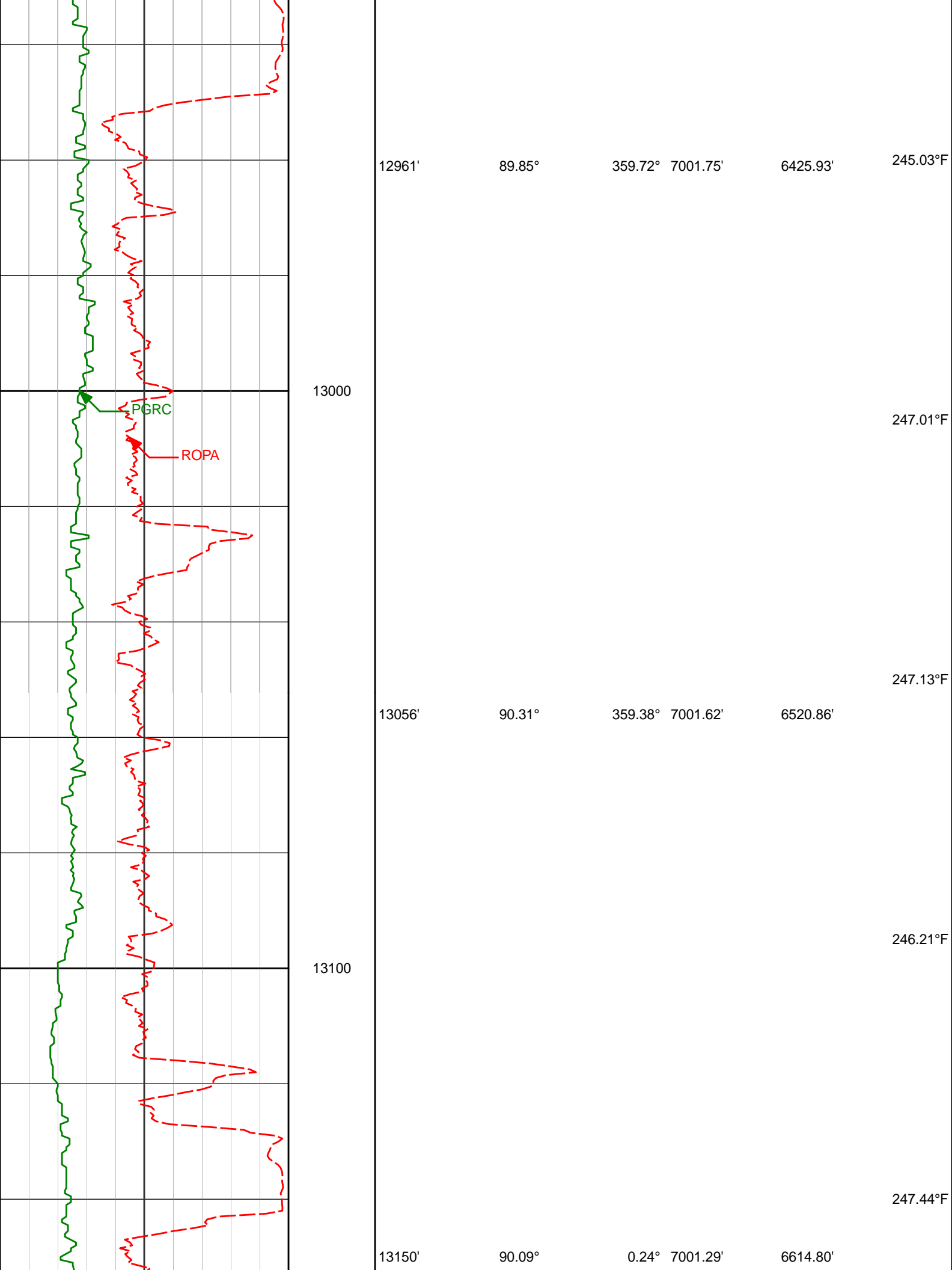
244.40°F

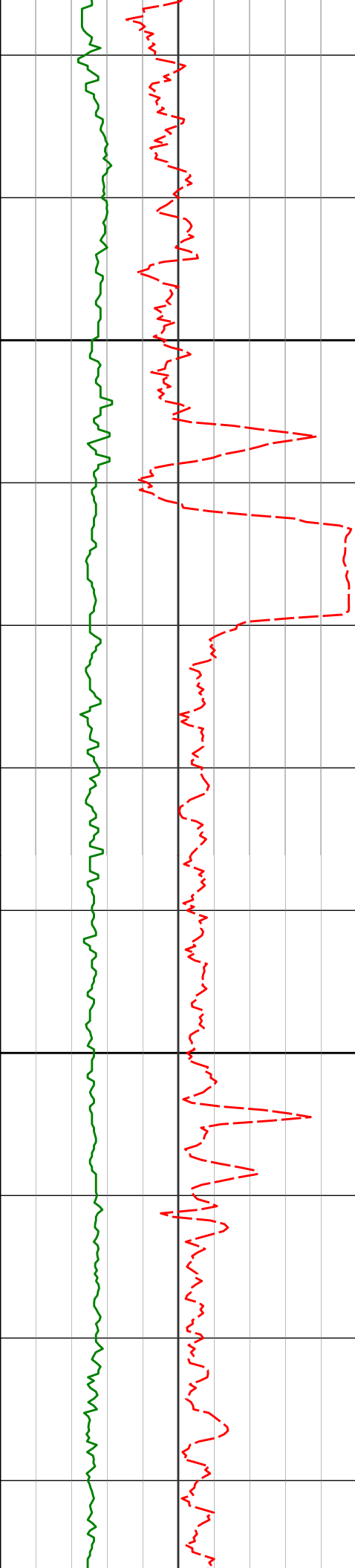
245.03°F

246.52°F

243.99°F

243.05°F





13200

13300

13339'

89.57°

359.70° 7001.85'

6803.69'

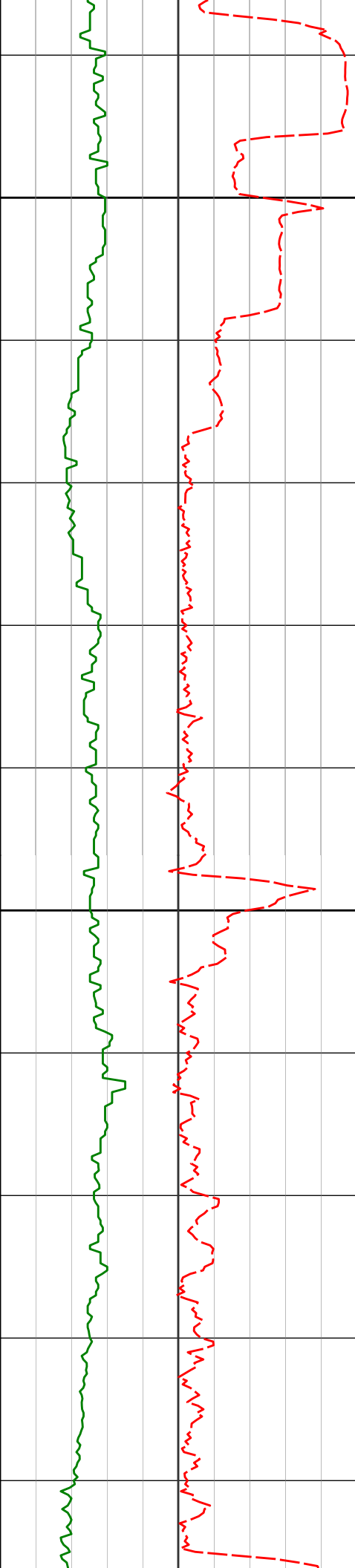
246.81°F

248.22°F

250.35°F

249.27°F

248.70°F



13400

13434'

88.37°

0.53° 7003.56'

6898.63'

13500

13528'

88.37°

359.92° 7006.24'

6992.56'

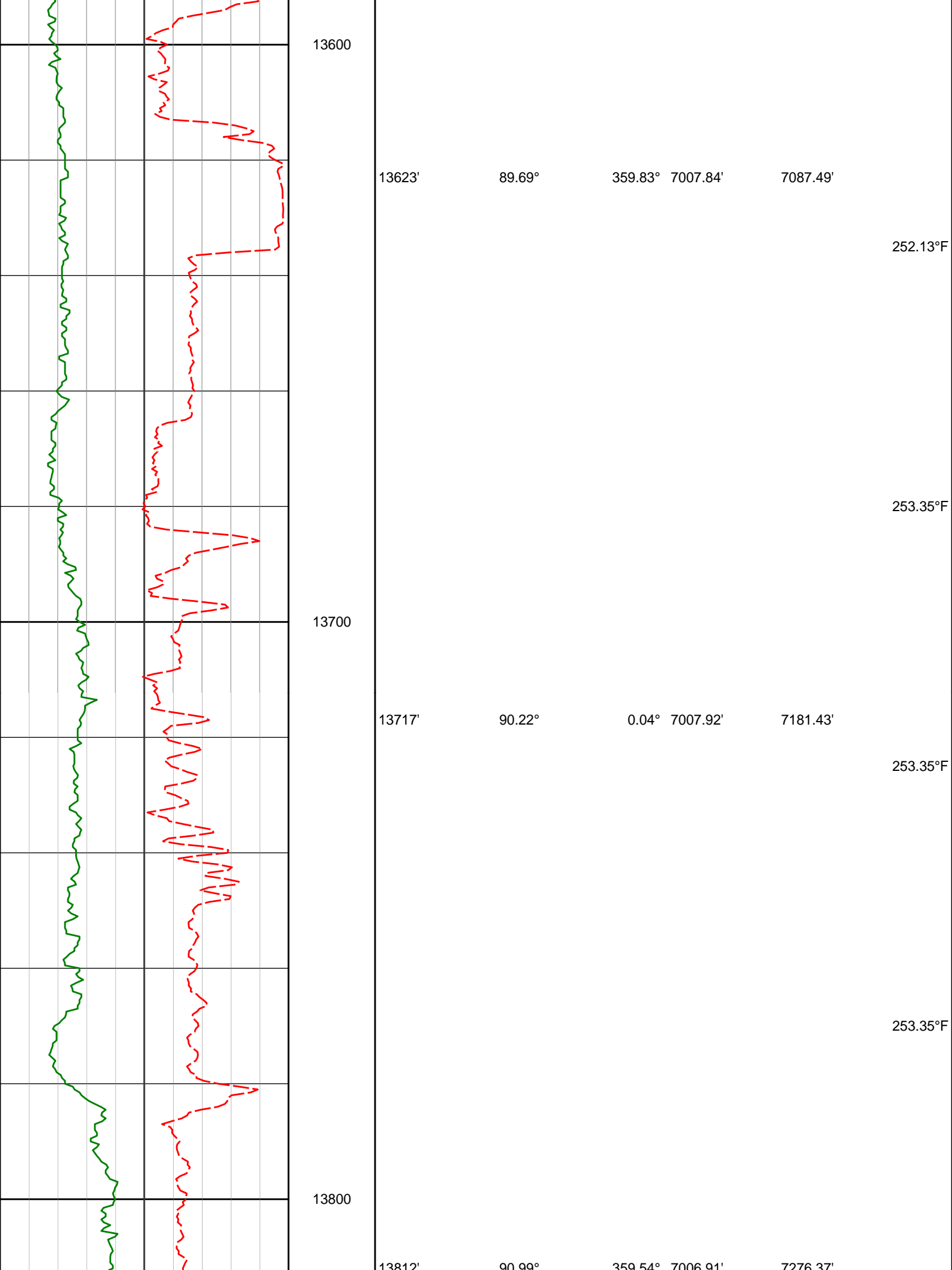
250.56°F

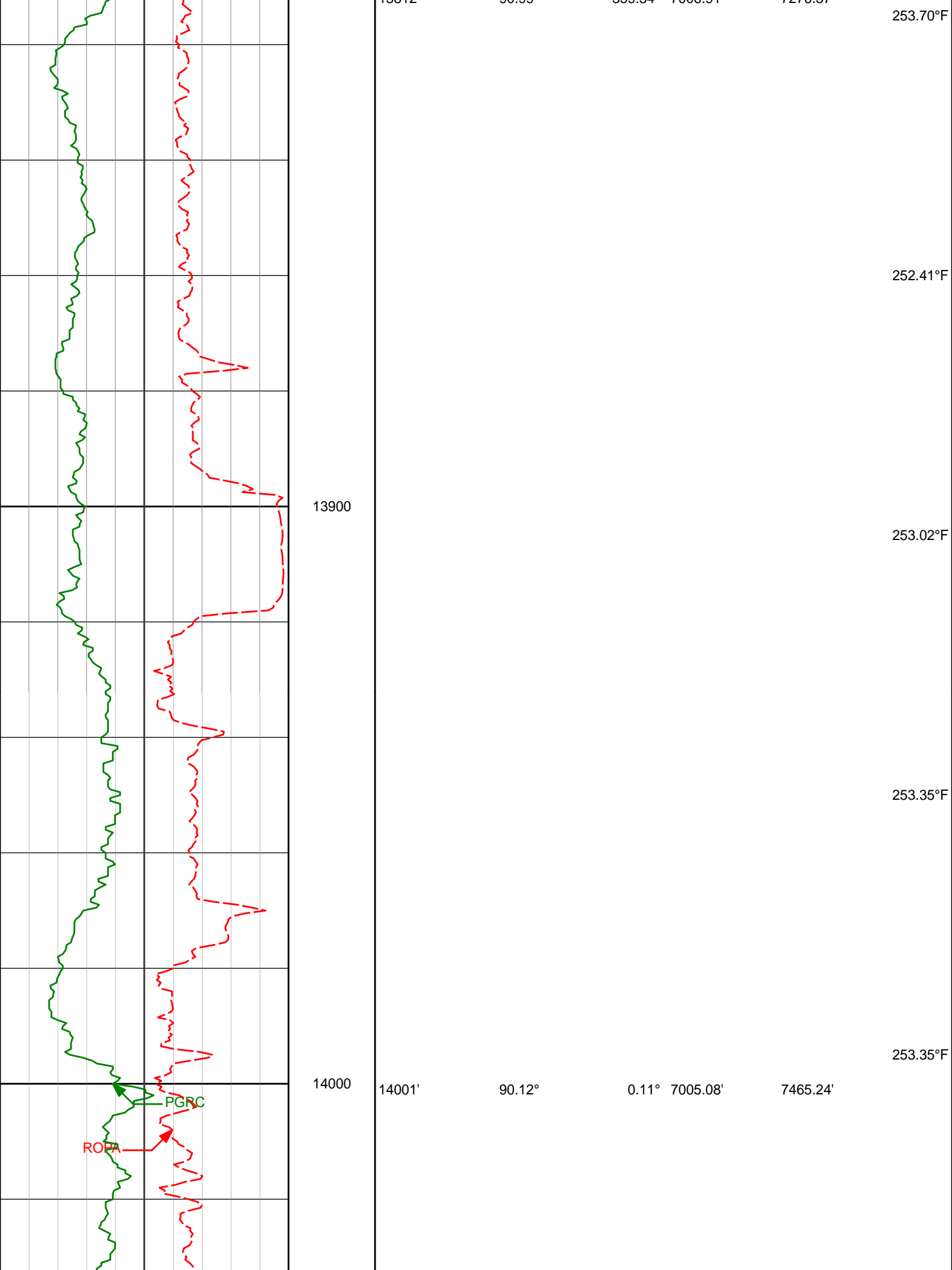
253.12°F

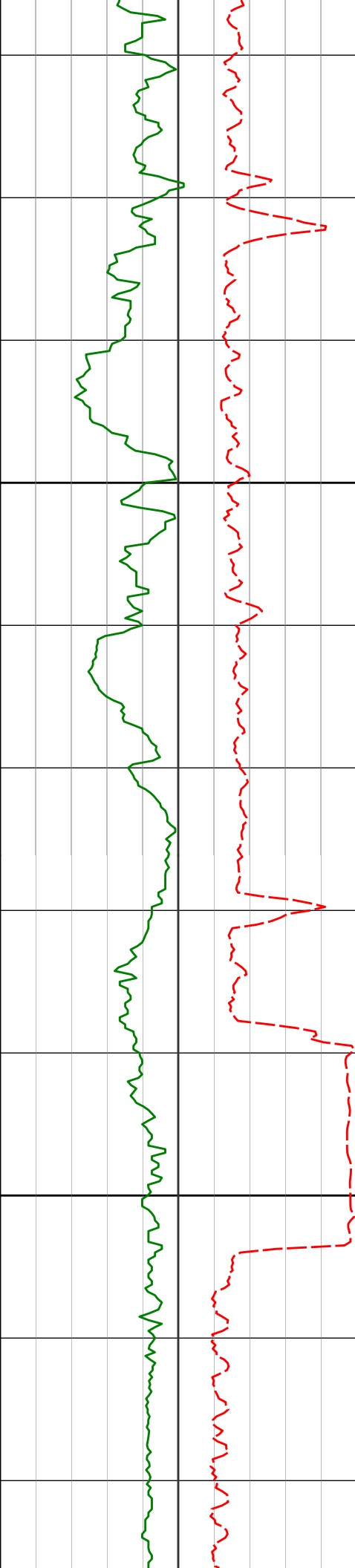
253.35°F

251.79°F

249.42°F







14100

14200

14096'

14190'

91.76°

90.49°

359.59°

0.25°

7003.53'

7001.68'

7560.17'

7654.09'

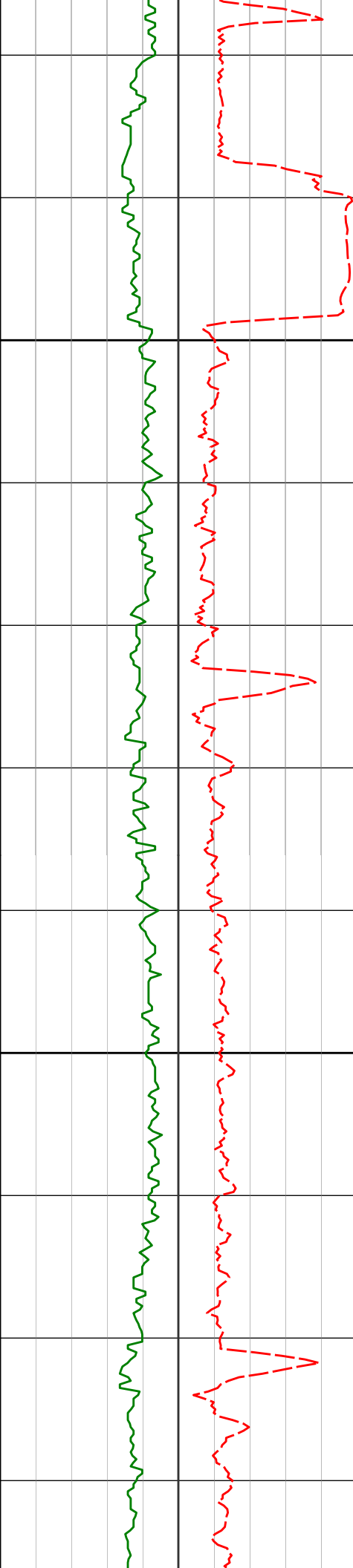
255.28°F

254.91°F

252.63°F

252.58°F

252.83°F



14300

14285'

88.80°

0.49° 7002.27'

7749.06'

252.50°F

253.35°F

255.18°F

14379'

89.66°

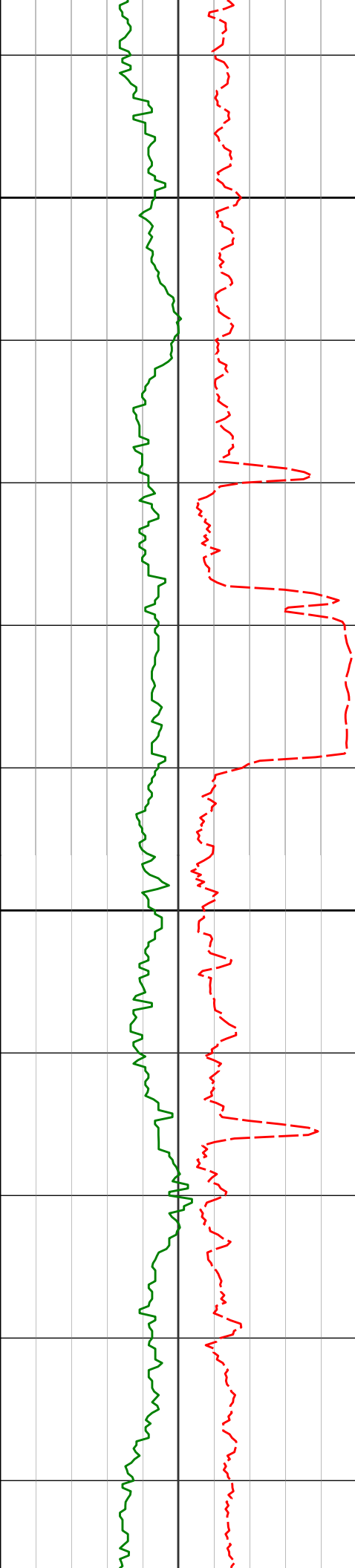
1.39° 7003.53'

7843.03'

14400

256.14°F

256.81°F



14500

14600

14474'

90.71°

1.69° 7003.22'

7938.03'

254.62°F

253.57°F

255.17°F

256.14°F

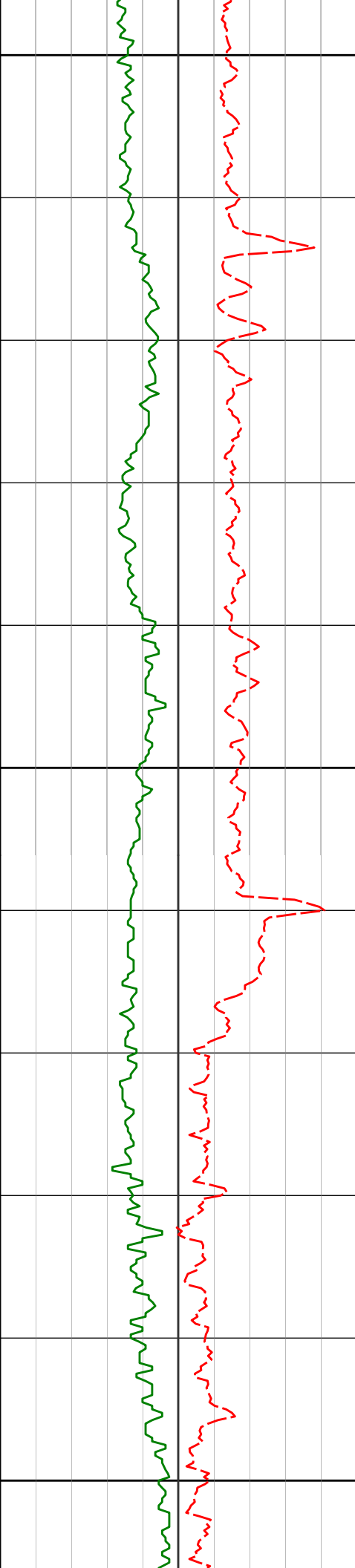
14663'

88.95°

1.43° 7003.79'

8127.02'

256.44°F



14700

258.70°F

14758'

89.17°

0.76° 7005.34'

8222.00'

258.56°F

14800

257.19°F

14853'

89.63°

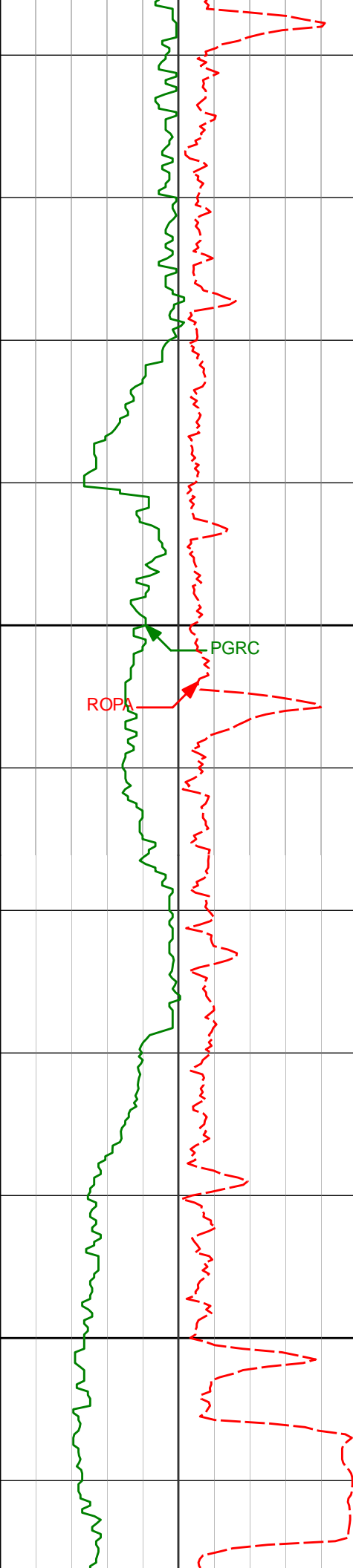
0.09° 7006.34'

8316.96'

257.89°F

14900

259.43°F



15000

15100

14947'

90.22°

359.50° 7006.46'

8410.90'

15042'

90.40°

358.90° 7005.95'

8505.80'

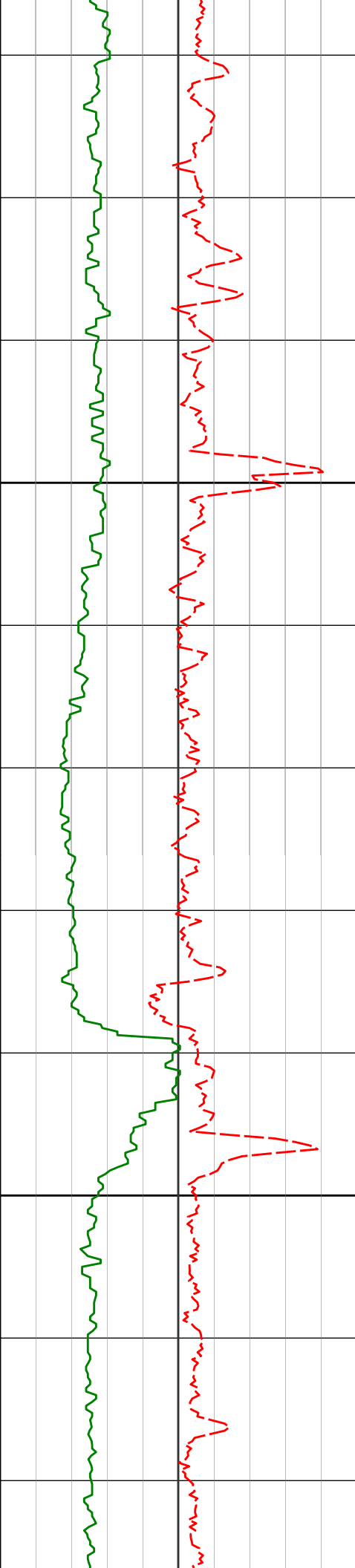
260.30°F

259.15°F

259.74°F

258.10°F

258.96°F



15200

15300

15137'

89.26°

359.55° 7006.23'

8600.70'

258.96°F

259.26°F

15231'

89.45°

358.58° 7007.29'

8694.58'

261.37°F

263.29°F

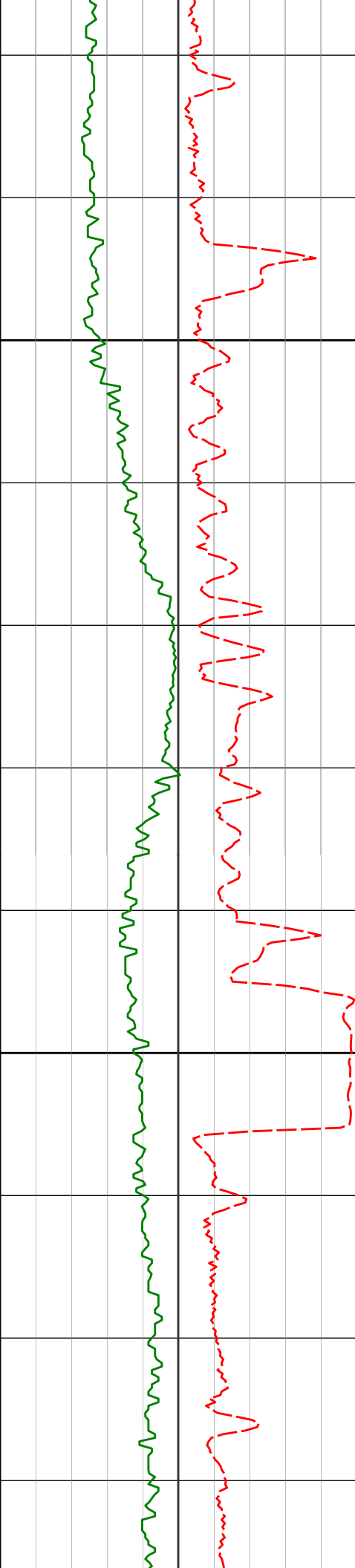
15325'

90.12°

357.94° 7007.64'

8788.40'

264.63°F



15400

15419'

91.26°

356.77° 7006.51'

8882.10'

263.76°F

259.53°F

258.81°F

15500

15513'

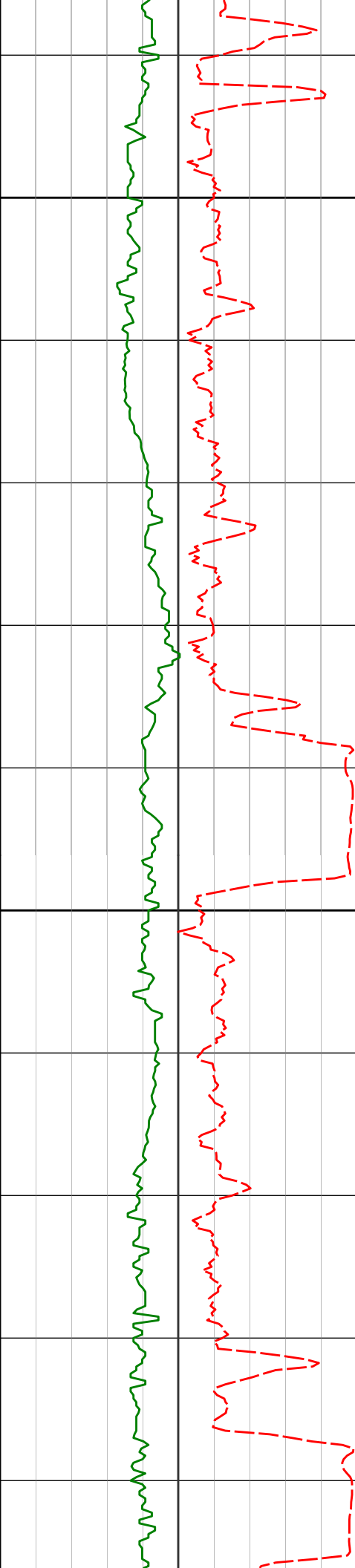
90.15°

357.53° 7005.35'

8975.77'

258.96°F

260.44°F



15600

258.76°F

258.48°F

15700

15701'

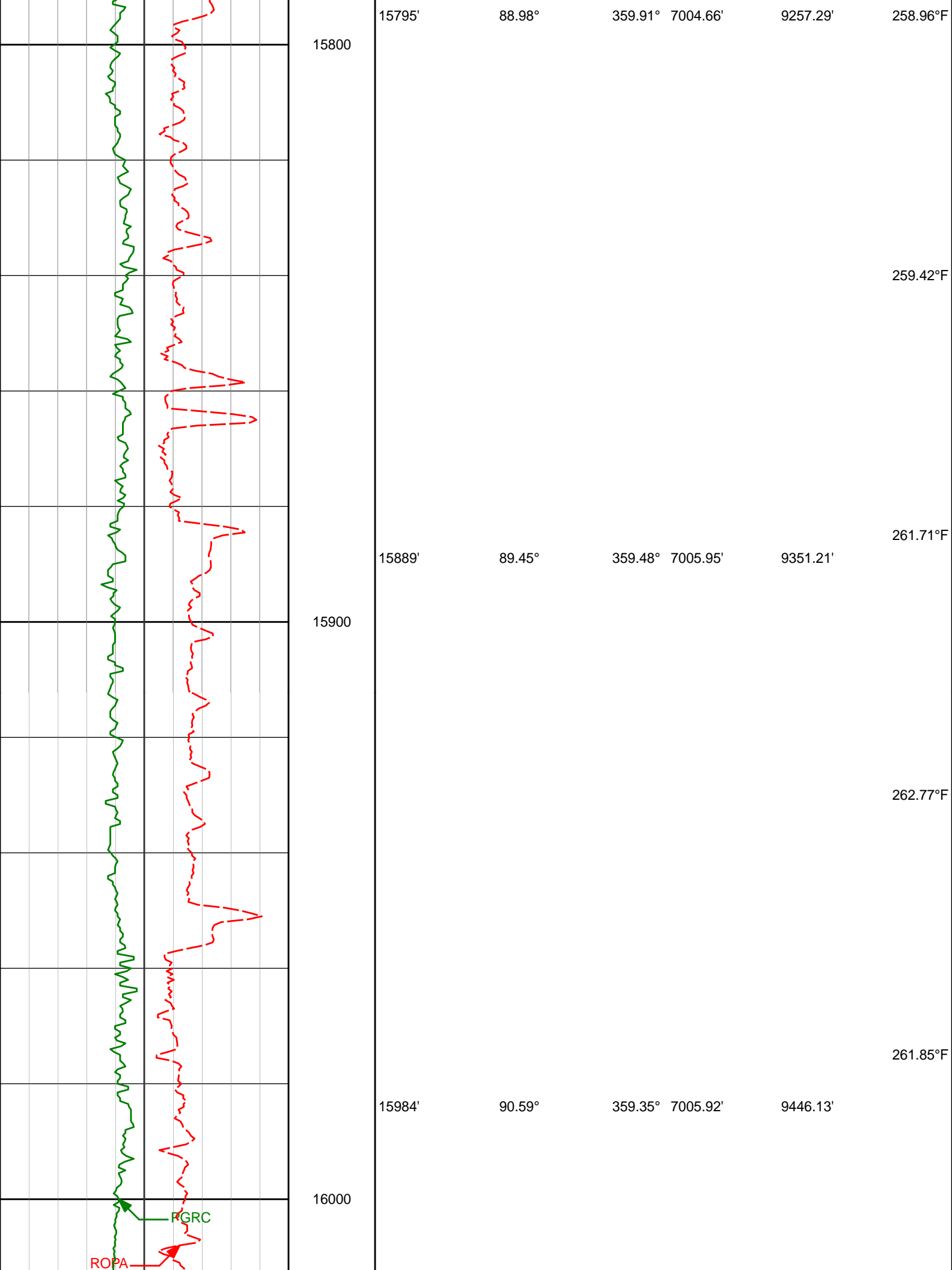
90.52°

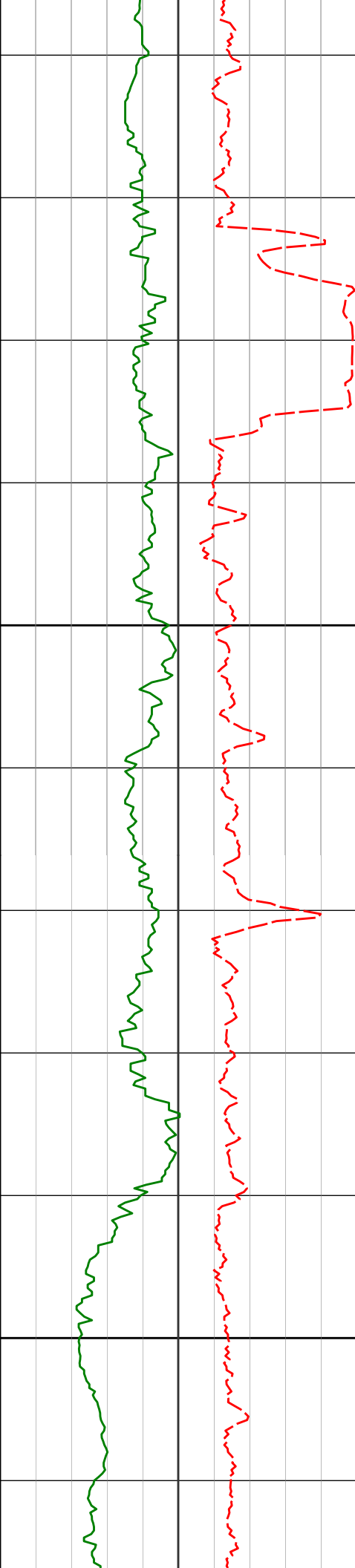
358.83° 7004.25'

9163.38'

258.96°F

258.96°F





16100

16200

16077'

88.24°

358.98° 7006.87'

9539.02'

16171'

88.03°

358.53° 7009.93'

9632.83'

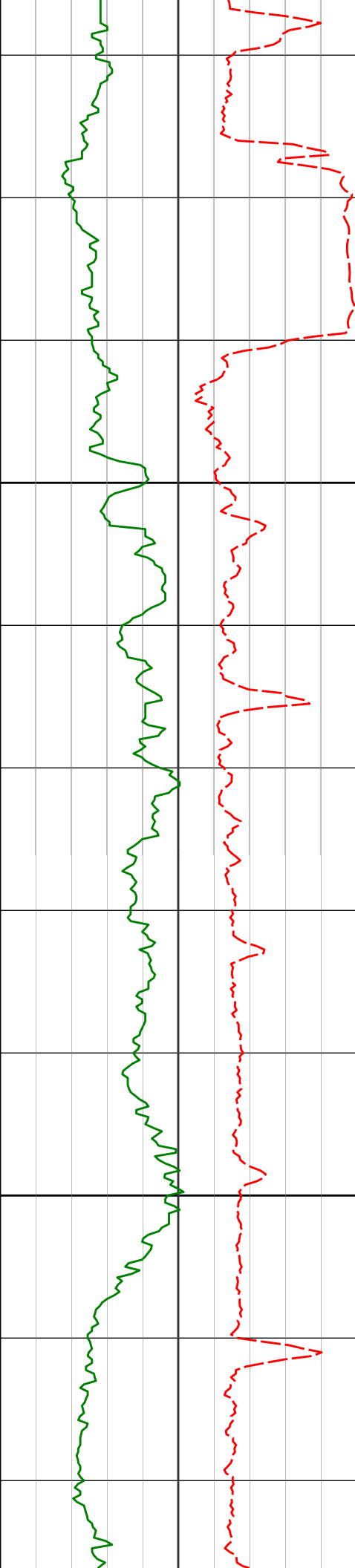
259.82°F

260.15°F

261.76°F

263.45°F

260.33°F



16300

16400

16265'

88.89°

359.55° 7012.45'

9726.68'

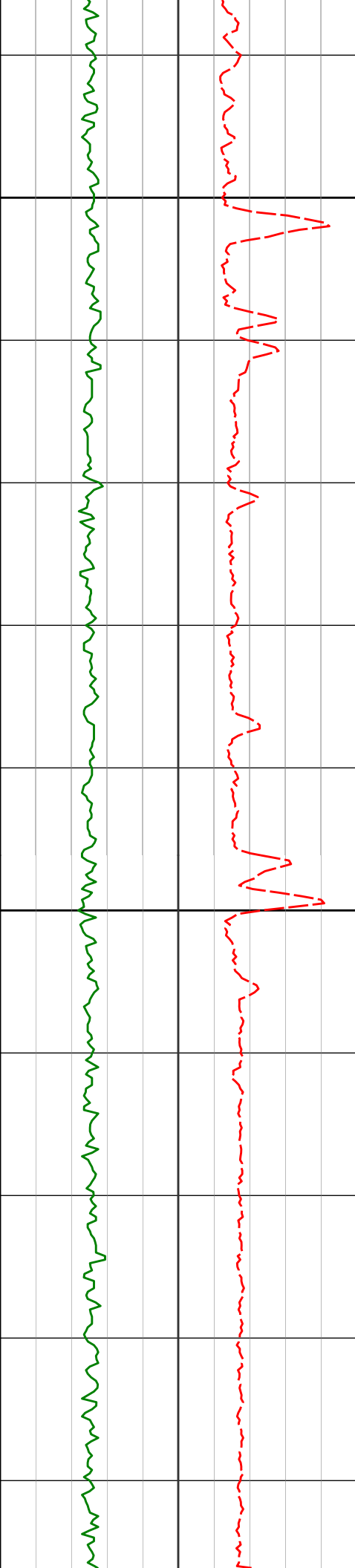
259.18°F

261.76°F

264.29°F

264.63°F

264.63°F



16700

16736'

90.43°

359.16°

7015.97'

10197.14'

264.86°F

267.19°F

16800

16830'

90.59°

359.17°

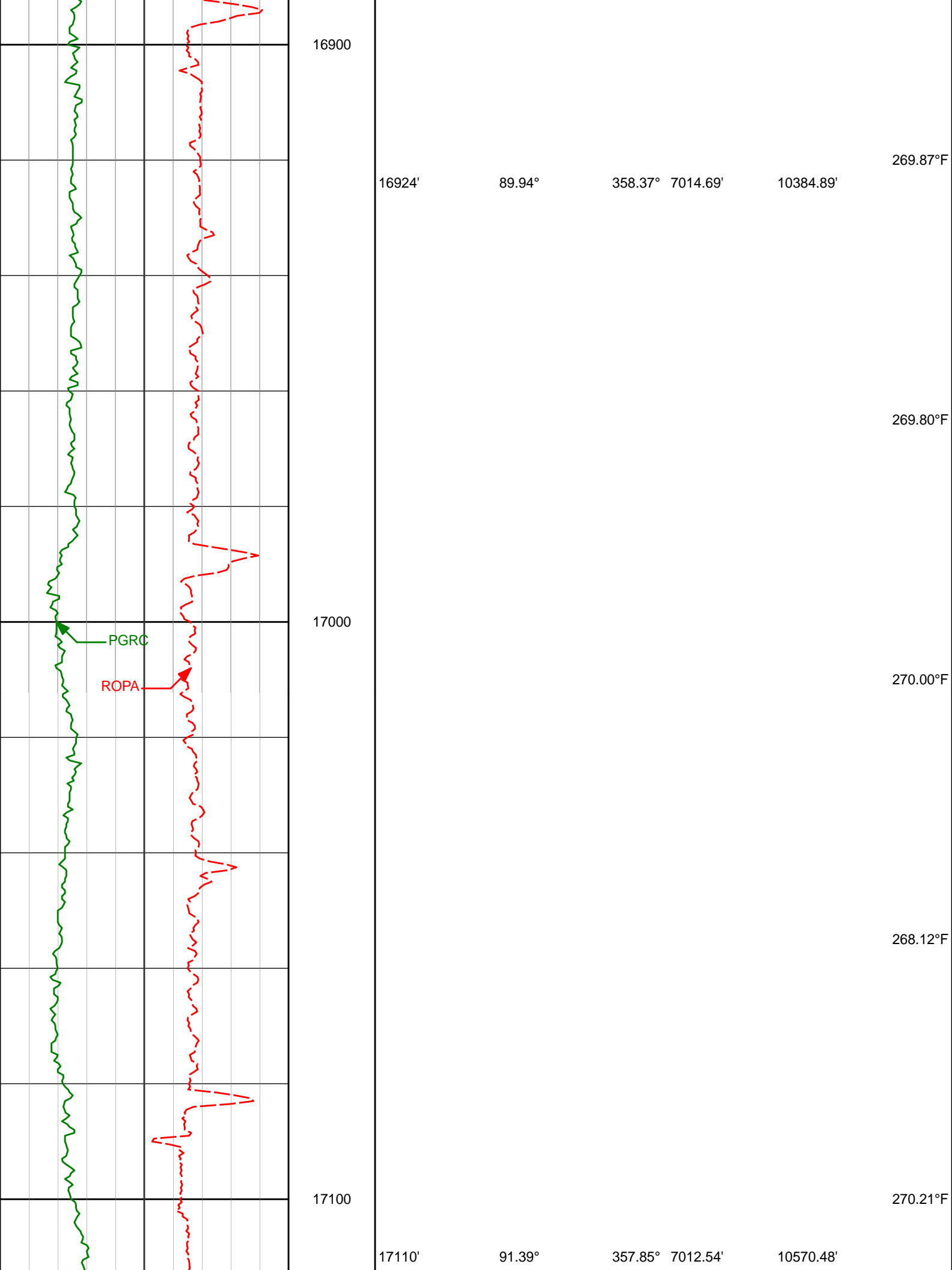
7015.13'

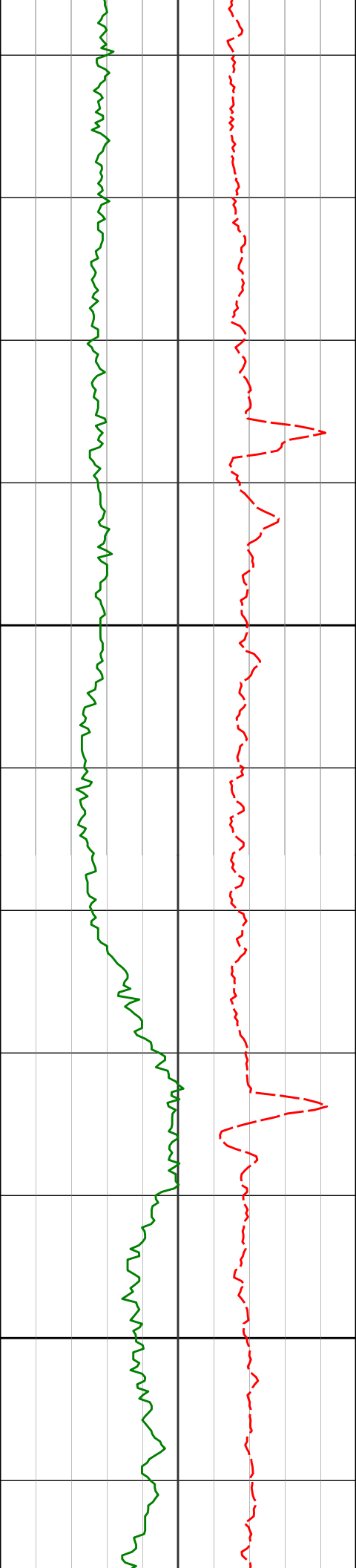
10291.03'

267.62°F

269.32°F

267.95°F





17200

17204'

91.70°

357.40° 7010.00'

10664.19'

270.36°F

270.36°F

270.26°F

270.04°F

17300

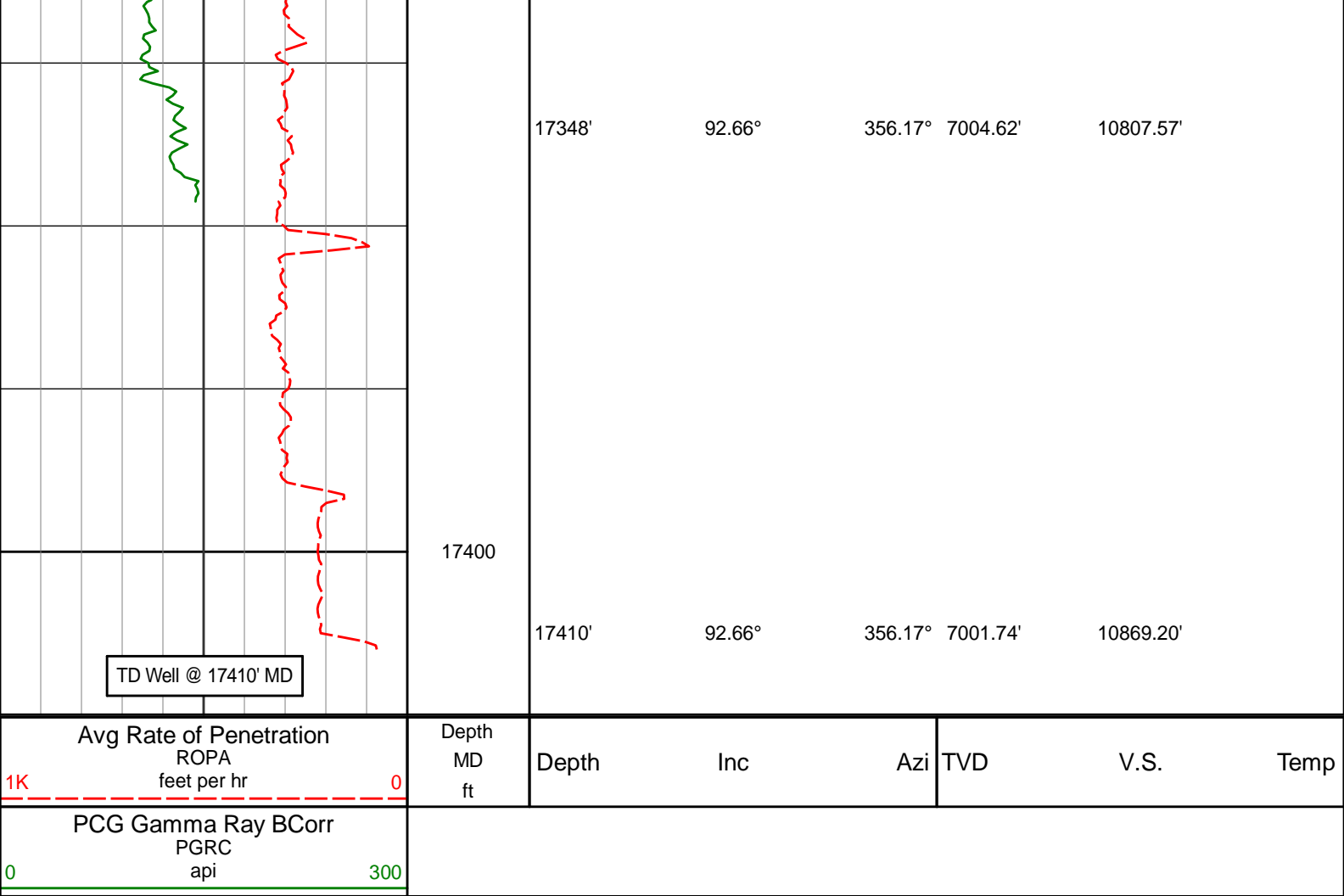
17298'

92.25°

356.95° 7006.76'

10757.83'

270.20°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Moser H22-711
Wattenburg
Weld Colorado
USA

CA-XX-0902863040

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
928.00	0.52	11.60	927.99	4.15 N	0.85 E	4.18	0.06
1022.00	0.76	17.85	1021.98	5.17 N	1.13 E	5.20	0.26
1203.00	1.24	24.65	1202.95	8.09 N	2.31 E	8.16	0.27
1294.00	1.22	28.19	1293.93	9.83 N	3.18 E	9.93	0.09
1386.00	1.18	29.17	1385.91	11.52 N	4.10 E	11.64	0.05
1477.00	1.20	33.51	1476.89	13.13 N	5.08 E	13.28	0.10
1568.00	1.67	49.02	1567.86	14.79 N	6.61 E	14.99	0.66
1659.00	3.71	63.83	1658.76	16.96 N	10.25 E	17.28	2.35
1750.00	6.73	74.00	1749.37	19.72 N	18.02 E	20.29	3.46
1842.00	9.26	76.12	1840.47	22.99 N	30.39 E	23.95	2.77
1933.00	9.06	74.37	1930.31	26.67 N	44.39 E	28.08	0.38
2024.00	8.62	73.57	2020.23	30.53 N	57.83 E	32.37	0.50
2115.00	8.05	69.98	2110.27	34.64 N	70.35 E	36.88	0.85
2205.00	7.50	67.87	2199.45	39.01 N	81.71 E	41.61	0.68
2297.00	6.51	67.48	2290.76	43.26 N	92.09 E	46.20	1.08
2388.00	8.20	64.11	2381.01	48.07 N	102.69 E	51.34	1.92
2480.00	7.49	64.36	2472.15	53.53 N	113.99 E	57.16	0.77

2571.00	6.74	62.39	2562.45	58.57 N	124.07 E	62.52	0.87
2663.00	6.96	58.85	2653.79	63.95 N	133.62 E	68.21	0.52
2755.00	6.64	57.86	2745.14	69.66 N	142.89 E	74.22	0.37
2849.00	9.12	68.35	2838.25	75.30 N	154.42 E	80.22	3.04
2944.00	8.75	66.80	2932.10	80.93 N	168.05 E	86.28	0.46
3038.00	8.39	62.92	3025.05	86.86 N	180.73 E	92.62	0.73
3133.00	7.57	58.59	3119.13	93.28 N	192.24 E	99.40	1.07
3228.00	7.12	54.87	3213.35	99.93 N	202.39 E	106.37	0.68
3322.00	5.93	49.51	3306.74	106.43 N	210.85 E	113.15	1.42
3417.00	7.85	47.32	3401.05	114.02 N	219.36 E	121.01	2.04
3512.00	6.95	43.21	3495.26	122.61 N	228.06 E	129.87	1.11
3606.00	9.03	51.53	3588.35	131.34 N	237.73 E	138.91	2.53
3701.00	7.69	48.84	3682.33	140.17 N	248.36 E	148.07	1.47
3795.00	6.56	45.24	3775.61	148.09 N	256.91 E	156.26	1.30
3890.00	8.94	59.46	3869.74	155.66 N	267.12 E	164.16	3.20
3985.00	9.47	64.70	3963.52	162.75 N	280.54 E	171.68	1.04
4079.00	8.65	66.42	4056.35	168.89 N	294.01 E	178.24	0.91
4174.00	8.06	63.65	4150.34	174.70 N	306.53 E	184.45	0.76
4268.00	7.60	65.46	4243.46	180.21 N	318.09 E	190.33	0.55
4363.00	7.18	64.60	4337.67	185.36 N	329.17 E	195.84	0.46
4458.00	6.77	61.58	4431.97	190.57 N	339.45 E	201.37	0.58
4552.00	8.32	65.72	4525.15	196.01 N	350.52 E	207.16	1.75
4646.00	9.04	66.26	4618.08	201.78 N	363.48 E	213.34	0.76
4740.00	9.04	67.71	4710.91	207.55 N	377.07 E	219.55	0.24
4835.00	8.49	64.94	4804.80	213.35 N	390.33 E	225.77	0.73
4929.00	5.76	73.78	4898.07	217.61 N	401.15 E	230.38	3.11
5024.00	5.49	68.42	4992.61	220.61 N	409.95 E	233.66	0.63
5119.00	4.99	63.93	5087.21	224.10 N	417.89 E	237.40	0.68
5213.00	1.43	57.09	5181.05	226.53 N	422.55 E	239.98	3.80
5307.00	1.68	56.21	5275.02	227.94 N	424.68 E	241.45	0.27
5402.00	1.87	53.95	5369.97	229.62 N	427.09 E	243.22	0.21
5497.00	1.74	56.69	5464.92	231.33 N	429.55 E	245.00	0.17
5591.00	1.78	50.66	5558.88	233.03 N	431.86 E	246.78	0.20
5686.00	0.82	113.27	5653.86	233.70 N	433.63 E	247.50	1.66
5780.00	1.57	96.59	5747.84	233.29 N	435.52 E	247.15	0.87
5875.00	1.49	82.68	5842.80	233.30 N	438.04 E	247.24	0.40
5969.00	1.62	68.09	5936.77	233.95 N	440.49 E	247.97	0.44
6064.00	1.45	67.26	6031.74	234.91 N	442.85 E	249.01	0.18
6158.00	1.72	55.37	6125.70	236.17 N	445.10 E	250.34	0.45
6253.00	1.57	55.70	6220.66	237.72 N	447.35 E	251.96	0.15
6348.00	1.88	36.26	6315.62	239.71 N	449.35 E	254.01	0.69
6443.00	5.71	353.73	6410.41	245.67 N	449.75 E	259.98	4.75
6538.00	11.91	344.79	6504.24	259.84 N	446.66 E	274.05	6.66
6633.00	19.48	346.07	6595.63	284.71 N	440.27 E	298.70	7.97
6727.00	24.30	344.00	6682.83	318.54 N	431.16 E	332.22	5.19
6822.00	32.33	348.82	6766.41	362.32 N	420.83 E	375.65	8.78
6916.00	46.06	355.33	6839.12	421.01 N	413.16 E	434.06	15.23
7011.00	53.57	352.75	6900.39	493.12 N	405.54 E	505.89	8.18
7105.00	62.09	353.55	6950.39	572.05 N	396.08 E	584.47	9.09
7200.00	74.42	358.42	6985.54	659.88 N	390.07 E	672.06	13.82
7322.00	83.15	357.96	7009.25	779.37 N	386.28 E	791.37	7.17
7443.00	88.52	2.10	7018.04	899.98 N	386.35 E	911.92	5.60
7538.00	90.43	0.56	7018.91	994.94 N	388.56 E	1006.91	2.58
7632.00	90.74	0.23	7017.95	1088.94 N	389.21 E	1100.87	0.48
7727.00	90.71	359.48	7016.75	1183.93 N	388.97 E	1195.81	0.79
7822.00	90.77	359.03	7015.52	1278.91 N	387.73 E	1290.70	0.48
7917.00	90.89	358.77	7014.15	1373.88 N	385.91 E	1385.57	0.30
8011.00	90.37	0.01	7013.11	1467.87 N	384.91 E	1479.47	1.43
8106.00	90.22	359.56	7012.62	1562.87 N	384.55 E	1574.41	0.50
8200.00	88.64	0.59	7013.56	1656.86 N	384.67 E	1668.36	2.01
8295.00	89.14	0.13	7015.40	1751.84 N	385.27 E	1763.31	0.72
8390.00	89.29	359.62	7016.70	1846.83 N	385.06 E	1858.24	0.56
8484.00	89.11	358.95	7018.01	1940.81 N	383.89 E	1952.14	0.74
8579.00	89.75	0.70	7018.96	2035.80 N	383.60 E	2047.07	1.96
8674.00	90.12	0.60	7019.06	2130.80 N	384.68 E	2142.05	0.40
8768.00	90.12	0.08	7018.87	2224.80 N	385.24 E	2236.02	0.55
8863.00	90.12	359.79	7018.67	2319.80 N	385.13 E	2330.96	0.31
8957.00	89.69	359.28	7018.83	2413.79 N	384.37 E	2424.89	0.71
9052.00	90.77	359.96	7018.44	2508.79 N	383.73 E	2519.81	1.34
9146.00	91.39	358.78	7016.67	2602.76 N	382.70 E	2613.71	1.42
9241.00	90.65	0.12	7014.98	2697.74 N	381.79 E	2708.61	1.61
9336.00	90.18	1.60	7014.29	2792.72 N	383.22 E	2803.59	1.63
9525.00	90.18	359.82	7013.70	2981.70 N	385.56 E	2992.54	0.94
9714.00	89.23	359.71	7014.67	3170.69 N	384.78 E	3181.41	0.51
9892.00	89.28	359.22	7015.44	3365.68 N	384.78 E	3370.32	0.27

9809.00	89.88	0.22	7015.41	3265.69 N	384.72 E	3276.36	0.87
9904.00	89.88	359.24	7015.61	3360.69 N	384.28 E	3371.29	1.03
9998.00	90.12	1.19	7015.61	3454.68 N	384.63 E	3465.25	2.09
10093.00	90.59	1.41	7015.02	3549.66 N	386.78 E	3560.25	0.55
10187.00	90.77	1.01	7013.90	3643.63 N	388.77 E	3654.23	0.47
10282.00	90.68	359.91	7012.70	3738.62 N	389.53 E	3749.20	1.16
10471.00	90.71	359.74	7010.41	3927.60 N	388.95 E	3938.07	0.09
10566.00	89.72	358.60	7010.05	4022.59 N	387.58 E	4032.96	1.59
10660.00	90.46	0.86	7009.91	4116.58 N	387.14 E	4126.89	2.53
10846.00	90.80	359.73	7007.86	4302.56 N	388.09 E	4312.81	0.63
10937.00	89.57	359.33	7007.57	4393.56 N	387.35 E	4403.73	1.42
11028.00	89.29	359.90	7008.47	4484.55 N	386.73 E	4494.66	0.70
11119.00	89.35	359.17	7009.55	4575.54 N	386.00 E	4585.58	0.80
11302.00	91.14	0.69	7008.77	4758.53 N	385.77 E	4768.46	1.28
11393.00	89.91	1.29	7007.94	4849.51 N	387.34 E	4859.44	1.50
11484.00	90.06	1.21	7007.96	4940.48 N	389.33 E	4950.44	0.19
11575.00	89.94	1.09	7007.96	5031.47 N	391.16 E	5041.43	0.19
11666.00	89.94	0.34	7008.06	5122.46 N	392.29 E	5132.41	0.82
11848.00	90.40	358.95	7007.52	5304.45 N	391.16 E	5314.27	0.80
11939.00	89.54	358.48	7007.56	5395.43 N	389.12 E	5405.14	1.08
12030.00	89.75	358.05	7008.13	5486.38 N	386.37 E	5495.96	0.53
12122.00	89.82	357.56	7008.47	5578.31 N	382.84 E	5587.73	0.54
12213.00	91.33	358.55	7007.56	5669.25 N	379.76 E	5678.52	1.98
12305.00	91.30	359.30	7005.45	5761.21 N	378.03 E	5770.38	0.82
12396.00	91.94	0.62	7002.88	5852.17 N	377.97 E	5861.29	1.61
12488.00	90.03	1.01	7001.29	5944.15 N	379.27 E	5953.26	2.12
12583.00	89.29	1.14	7001.86	6039.13 N	381.06 E	6048.25	0.79
12677.00	88.92	0.41	7003.33	6133.11 N	382.33 E	6142.22	0.87
12772.00	90.12	359.57	7004.12	6228.10 N	382.31 E	6237.16	1.54
12867.00	91.45	358.68	7002.82	6323.08 N	380.86 E	6332.04	1.68
12961.00	89.85	359.72	7001.75	6417.06 N	379.55 E	6425.93	2.03
13056.00	90.31	359.38	7001.62	6512.05 N	378.80 E	6520.86	0.60
13150.00	90.09	0.24	7001.29	6606.05 N	378.49 E	6614.80	0.94
13339.00	89.57	359.70	7001.85	6795.05 N	378.39 E	6803.69	0.40
13434.00	88.37	0.53	7003.56	6890.03 N	378.58 E	6898.63	1.54
13528.00	88.37	359.92	7006.24	6983.99 N	378.95 E	6992.56	0.65
13623.00	89.69	359.83	7007.84	7078.98 N	378.74 E	7087.49	1.39
13717.00	90.22	0.04	7007.92	7172.98 N	378.64 E	7181.43	0.61
13812.00	90.99	359.54	7006.91	7267.97 N	378.29 E	7276.37	0.97
14001.00	90.12	0.11	7005.08	7456.96 N	377.71 E	7465.24	0.55
14096.00	91.76	359.59	7003.53	7551.94 N	377.46 E	7560.17	1.81
14190.00	90.49	0.25	7001.68	7645.92 N	377.33 E	7654.09	1.52
14285.00	88.80	0.49	7002.27	7740.91 N	377.95 E	7749.06	1.80
14379.00	89.66	1.39	7003.53	7834.89 N	379.49 E	7843.03	1.32
14474.00	90.71	1.69	7003.22	7929.85 N	382.04 E	7938.03	1.15
14663.00	88.95	1.43	7003.79	8118.77 N	387.19 E	8127.02	0.94
14758.00	89.17	0.76	7005.34	8213.74 N	389.00 E	8222.00	0.74
14853.00	89.63	0.09	7006.34	8308.73 N	389.71 E	8316.96	0.86
14947.00	90.22	359.50	7006.46	8402.73 N	389.37 E	8410.90	0.89
15042.00	90.40	358.90	7005.95	8497.72 N	388.04 E	8505.80	0.66
15137.00	89.26	359.55	7006.23	8592.71 N	386.76 E	8600.70	1.38
15231.00	89.45	358.58	7007.29	8686.69 N	385.22 E	8694.58	1.05
15325.00	90.12	357.94	7007.64	8780.65 N	382.37 E	8788.40	0.99
15419.00	91.26	356.77	7006.51	8874.54 N	378.03 E	8882.10	1.74
15513.00	90.15	357.53	7005.35	8968.41 N	373.36 E	8975.77	1.43
15701.00	90.52	358.83	7004.25	9156.31 N	367.39 E	9163.38	0.72
15795.00	88.98	359.91	7004.66	9250.30 N	366.35 E	9257.29	2.00
15889.00	89.45	359.48	7005.95	9344.29 N	365.85 E	9351.21	0.68
15984.00	90.59	359.35	7005.92	9439.28 N	364.88 E	9446.13	1.21
16077.00	88.24	358.98	7006.87	9532.26 N	363.53 E	9539.02	2.56
16171.00	88.03	358.53	7009.93	9626.19 N	361.49 E	9632.83	0.53
16265.00	88.89	359.55	7012.45	9720.14 N	359.91 E	9726.68	1.42
16454.00	88.95	358.84	7016.02	9909.08 N	357.26 E	9915.45	0.38
16548.00	89.63	359.50	7017.18	10003.07 N	355.90 E	10009.33	1.01
16642.00	90.71	359.19	7016.90	10097.06 N	354.82 E	10103.24	1.20
16736.00	90.43	359.16	7015.97	10191.04 N	353.47 E	10197.14	0.30
16830.00	90.59	359.17	7015.13	10285.03 N	352.10 E	10291.03	0.17
16924.00	89.94	358.37	7014.69	10379.00 N	350.08 E	10384.89	1.10
17110.00	91.39	357.85	7012.54	10564.89 N	343.95 E	10570.48	0.83
17204.00	91.70	357.40	7010.00	10658.77 N	340.05 E	10664.19	0.58
17298.00	92.25	356.95	7006.76	10752.60 N	335.42 E	10757.83	0.76
17348.00	92.66	356.17	7004.62	10802.46 N	332.43 E	10807.57	1.76
17410.00	92.66	356.17	7001.74	10864.26 N	328.29 E	10869.20	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 1.84 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 17410.00 FEET
IS 10869.22 FEET ALONG 1.73 DEGREES (GRID)

Final survey is a straight line projection to TD.

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