



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	24-Mar-14	31-Mar-14			
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)	1,089.00	7,888.00			
Log End Depth (MD, ft)	7,888.00	17,080.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	22-Mar-14 04:30	25-Mar-14 17:30			
Drill/Wipe End Date and Time	24-Mar-14 00:02	31-Mar-14 01:30			
Min Inc (deg) @ Depth (MD, ft)	0.40 @ 1,568.00	87.90 @ 7,924.00			
Max Inc (deg) @ Depth (MD, ft)	83.23 @ 7,836.00	92.47 @ 9,243.00			
Bit TFA(in2) / Bit Type	0.969 / PDC	0.863 / PDC			
Flow Rate (gpm)	593.75	278			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Polymer	Mineral Oil Base			
Density (ppg) / Viscosity (spqt)	10.00 / 47.00	9.20 / 52.00			
Filtrate CL (ppm)	1,800.00	62,000.00			
pH / Fluid Loss (mptm)	8.40 / 6	N/A / 0			
PV (cP) / YP (Ihf2)	15 / 16.00	15 / 16.00			
% Solids / % Sand	12 / .8	8 / 0			
% 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) / C	163.00 / 68.00	146.00 / 60.00			

Max Tool Temp (degF) / Source	160.83 / PCM	412.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 160.83	N/A @ 412.20			
Lead MWD Engineer	Patrick Lane	Patrick Lane			
Customer Representative		Stan Walters			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11303511	12177826			
Insert Serial Number	10744813	11680880			
Date and Time Initialized	18-Mar-14 23:30	24-Mar-14 01:52			
Date and Time Read	01-Jan-70 00:00	01-Jan-70 00:00			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	52.00	52.00			
Software Version	6.21	6.21			
Sub Serial Number	11303511	12177826			
Sonde Serial Number	11145627	11638602			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	211.89	192.59			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	54.80	54.82			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11303511	12177826			
Insert/Sonde Serial Number	11293409	11680942			

REMARKS

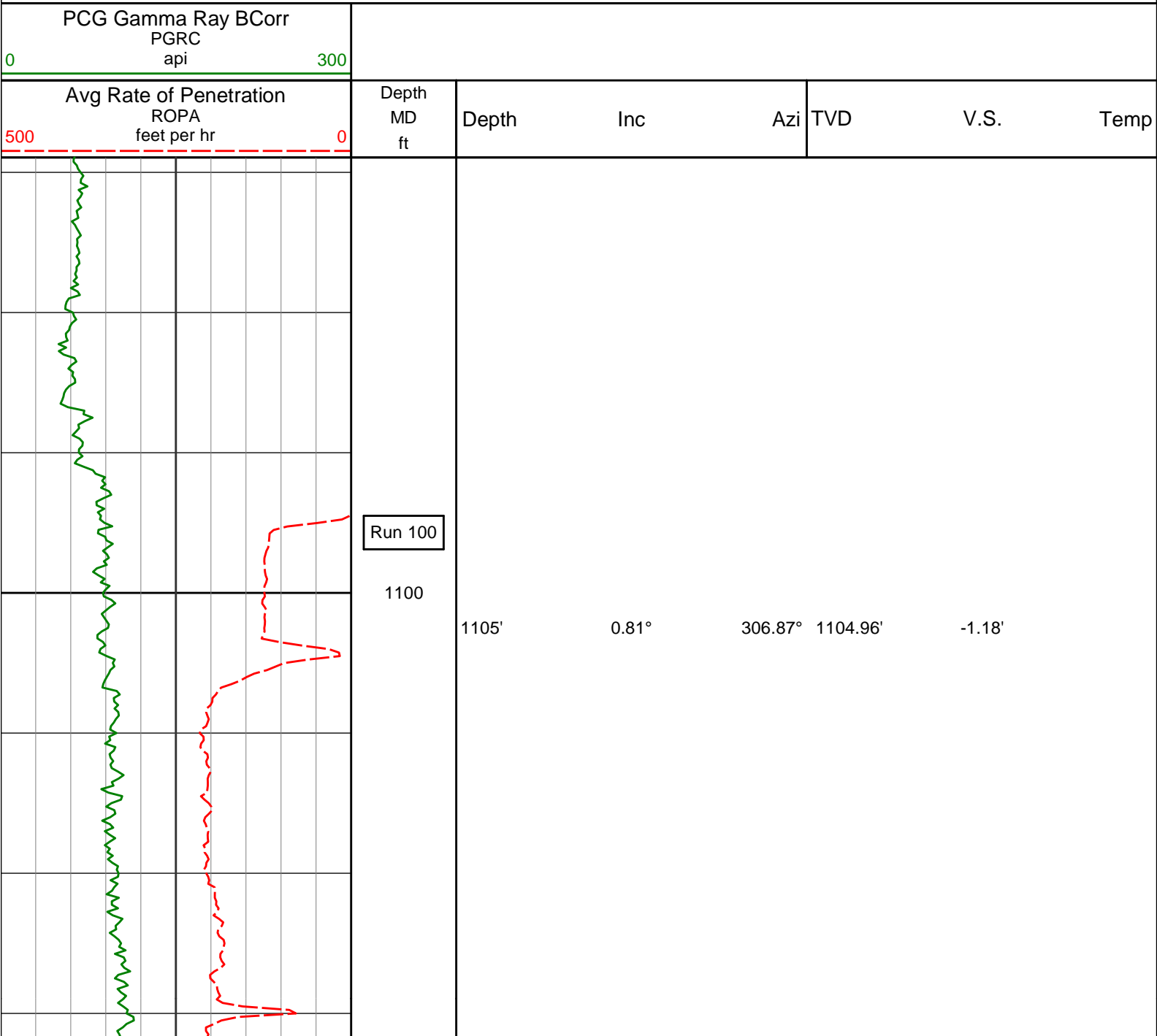
1. All depths are calibrated to the driller's pipe tally and are measured bit depths, measured from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities have been calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for synthetic and oil based fluids.
4. All data presented is recorded (memory) data unless otherwise stated
ROPA is realtime data
5. The following smoothing parameters have been applied to the data
ROPA: 0.5 ft interval, 1.2 ft coercion distance, 3 ft gap fill
PGRC: 0.5 ft interval, 0.6 ft coercion distance, 3 ft gap fill
6. Insite Version 8.1.1

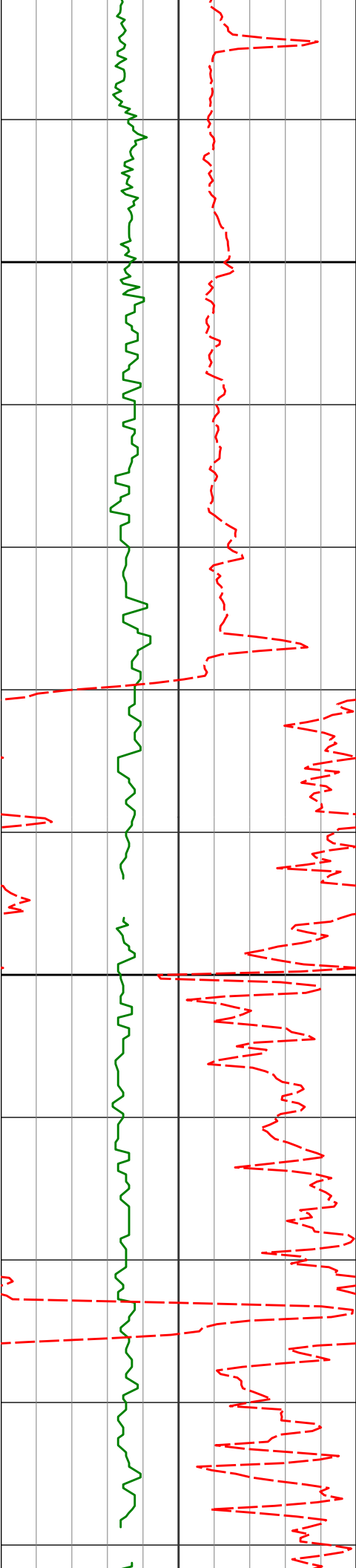
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MD Detail 1:240 Scale





1200

1300

1197'

0.68°

277.60° 1196.96'

-0.72'

1289'

0.71°

284.32° 1288.95'

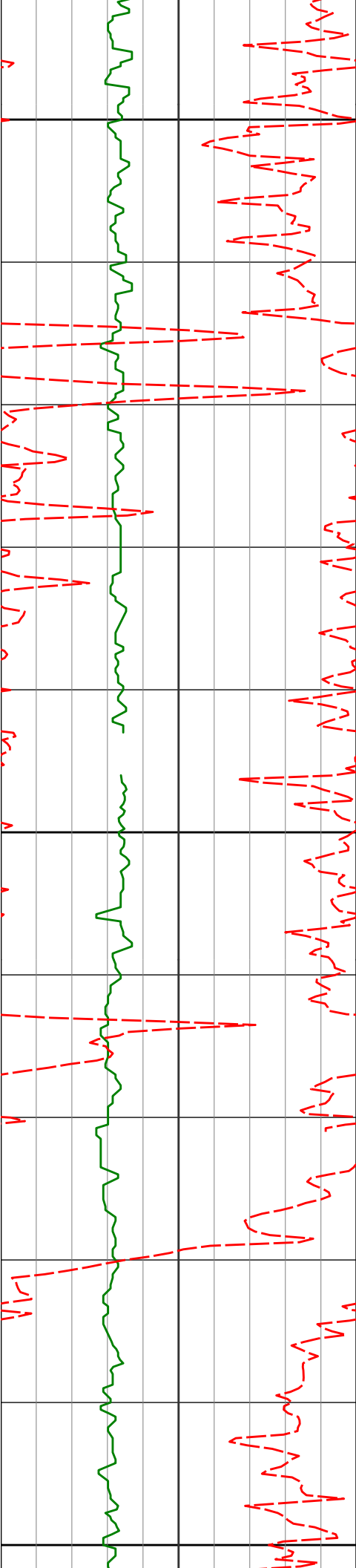
-0.50'

1382'

1.09°

294.78° 1381.94'

0.01'



1400

1475'

1.09°

282.65° 1474.92'

0.58'

1500

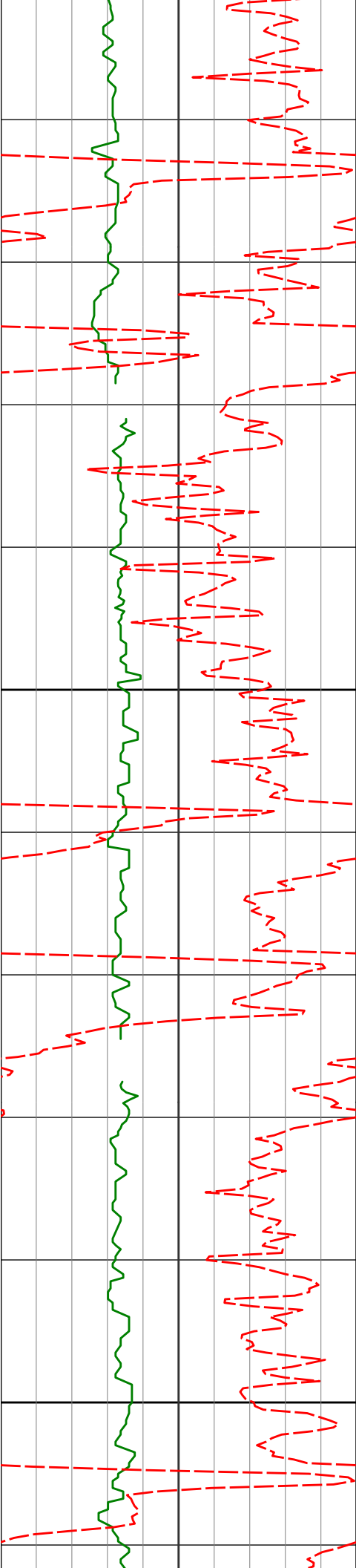
1568'

0.40°

24.22° 1567.91'

1.07'

1600



1700

1800

1660'

0.40°

355.60° 1659.91'

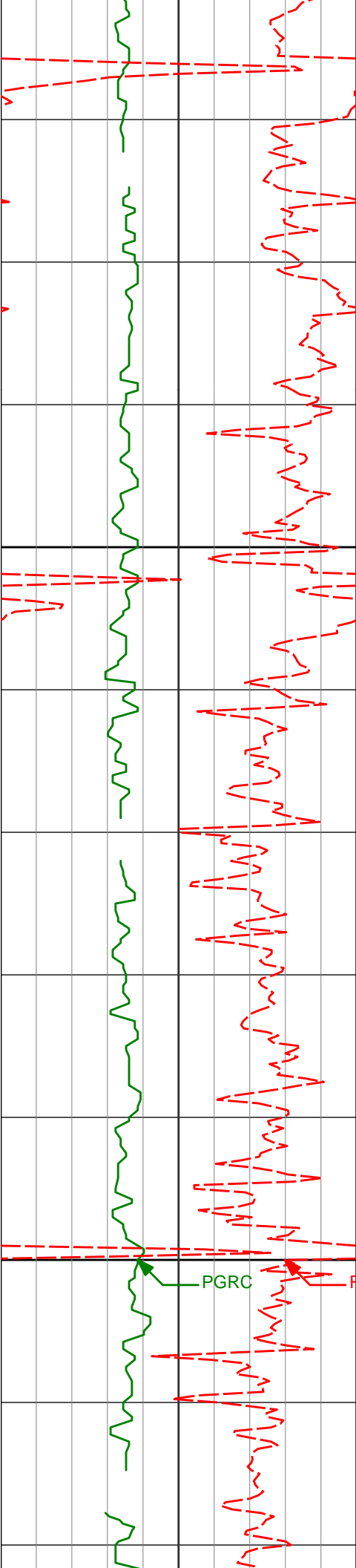
1.68'

1753'

1.07°

82.15° 1752.91'

2.12'



1900

2000

1845'

0.82°

75.32° 1844.89'

2.41'

1938'

0.62°

63.30° 1937.89'

2.80'

2031'

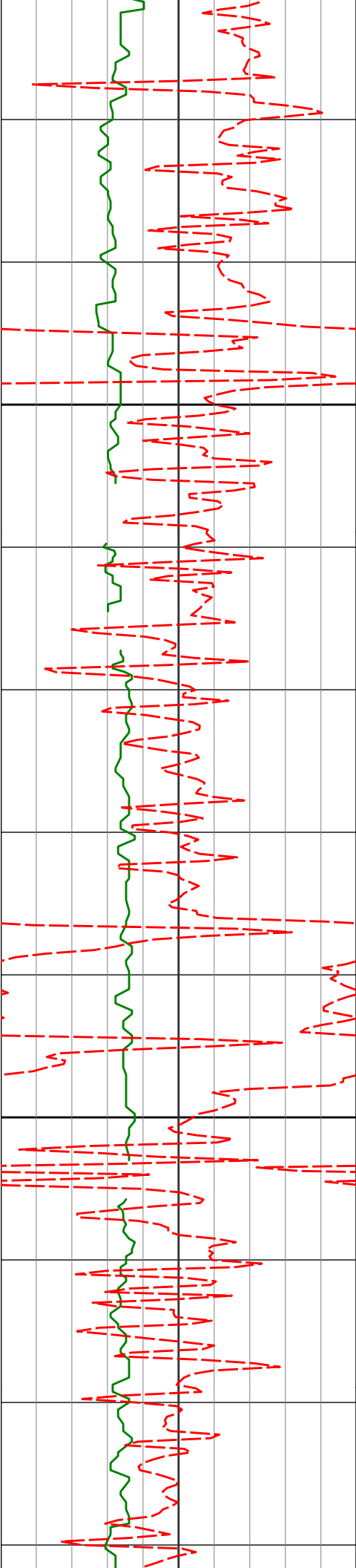
0.84°

23.85° 2030.88'

3.65'

PGRC

ROPA



2100

2124'

0.63°

46.16° 2123.87'

4.63'

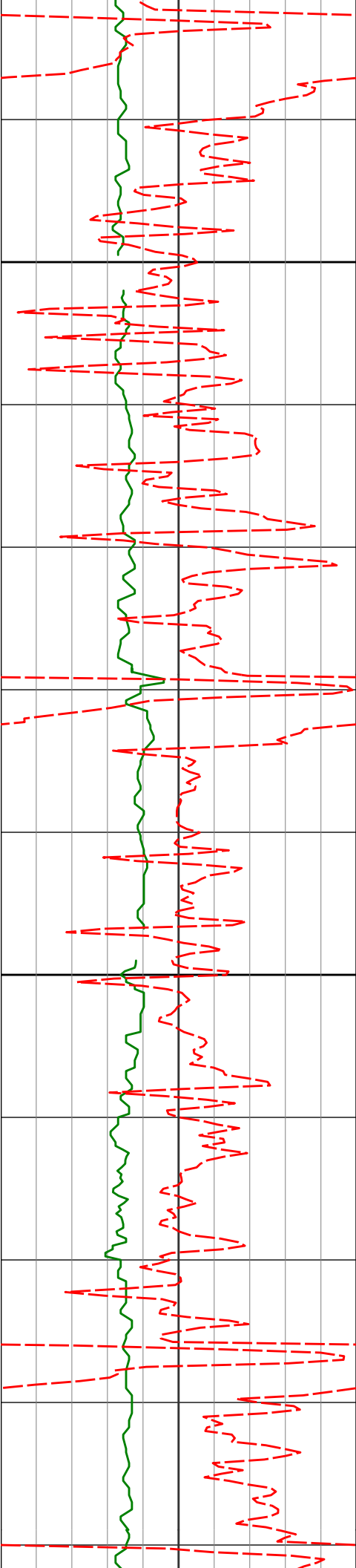
2200

2217'

0.96°

27.00° 2216.86'

5.67'



2300

2309'

1.45°

17.79° 2308.84'

7.47'

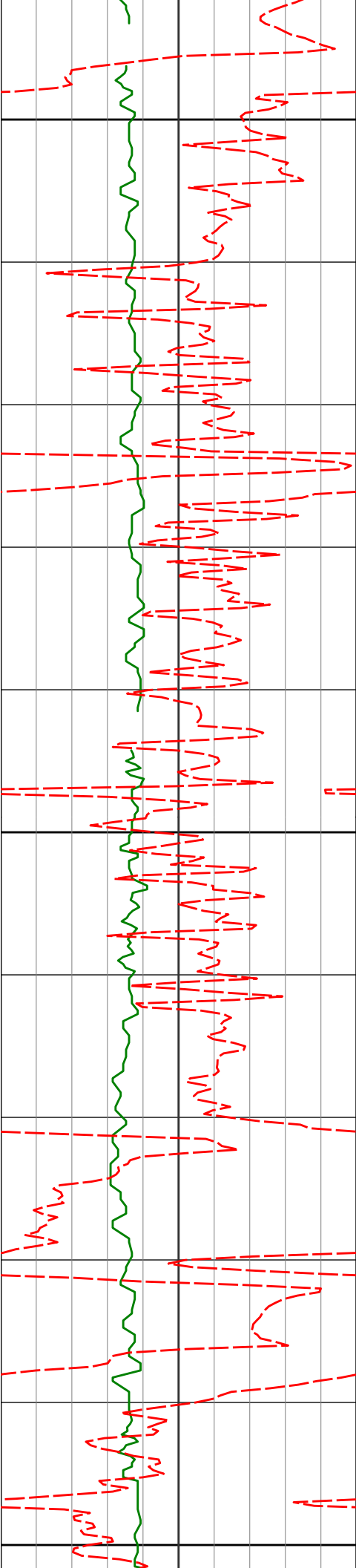
2400

2402'

1.74°

16.87° 2401.81'

9.94'



2500

2600

2700

2493'

1.94°

56.72° 2492.76'

12.10'

2586'

1.85°

42.24° 2585.71'

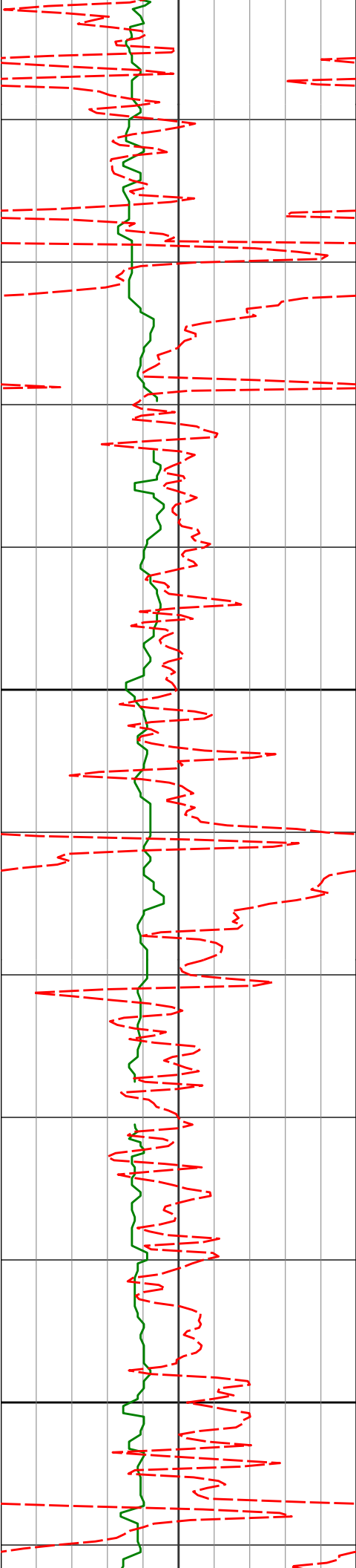
14.08'

2679'

2.36°

94.98° 2678.66'

15.02'



2800

2900

2772'

2.05°

97.11°

2771.59'

14.65'

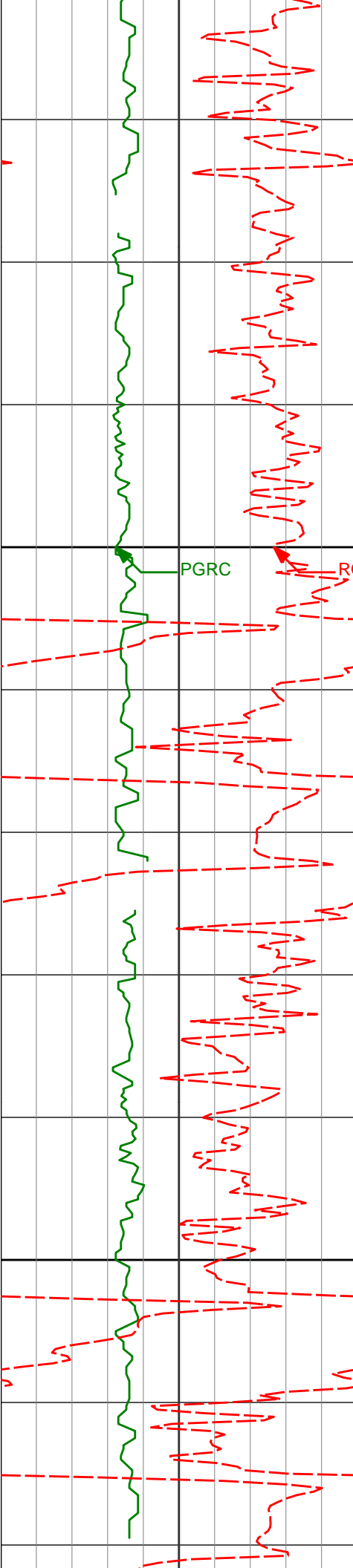
2867'

1.68°

102.77°

2866.54'

14.12'



3000

PGRC

ROPA

2961'

1.03°

107.21° 2960.51'

13.57'

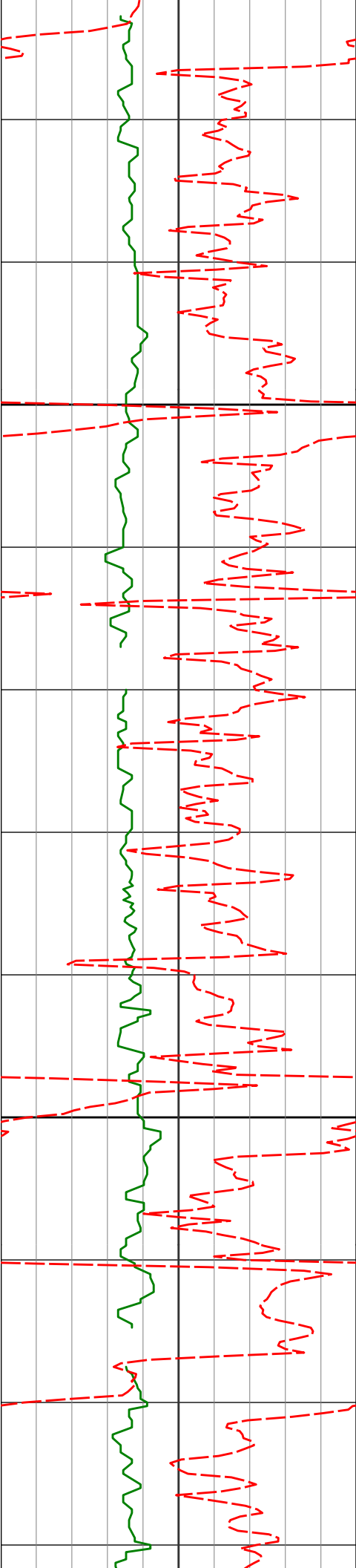
3056'

2.68°

98.18° 3055.46'

13.00'

3100



3150'

4.26°

110.31° 3149.28'

11.47'

3200

3244'

4.01°

108.05° 3243.04'

9.23'

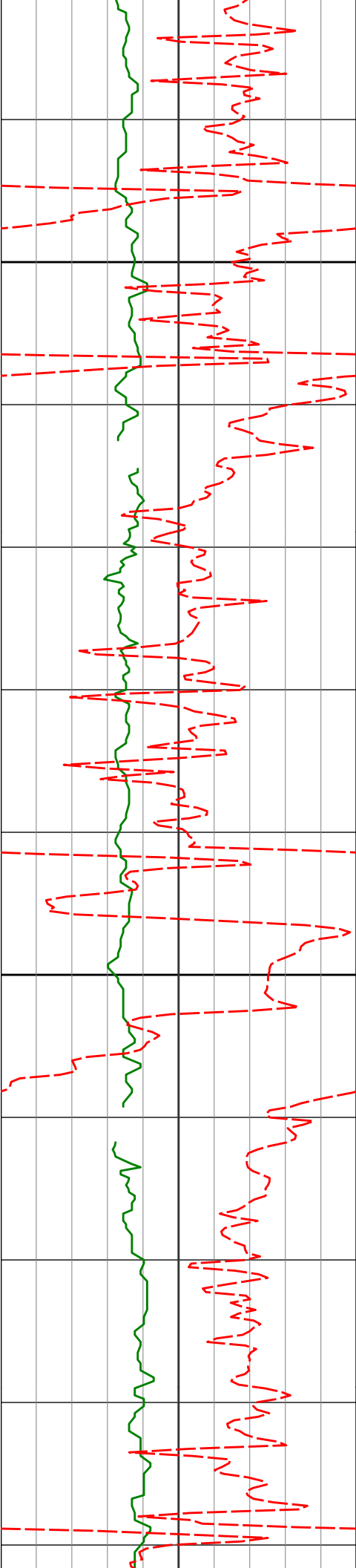
3300

3339'

5.45°

110.05° 3337.71'

6.65'



3400

3433'

5.09°

112.55° 3431.32'

3.51'

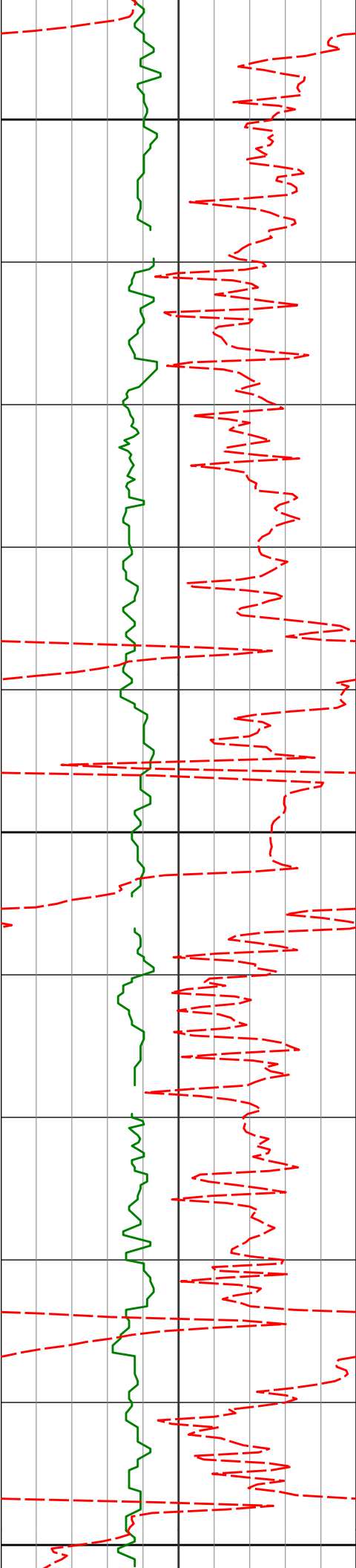
3500

3527'

6.32°

104.63° 3524.85'

0.60'



3600

3621'

5.10°

99.17° 3618.38'

-1.38'

3700

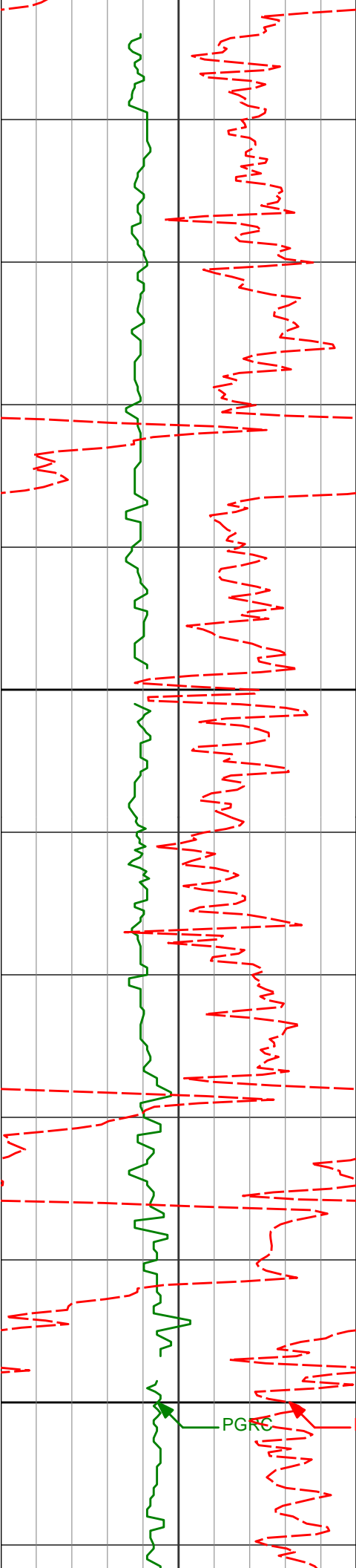
3715'

6.89°

108.33° 3711.87'

-3.83'

3800



3900

4000

3810'

3904'

3999'

6.49°

5.38°

6.82°

108.12° 3806.22'

102.61° 3899.72'

99.44° 3994.18'

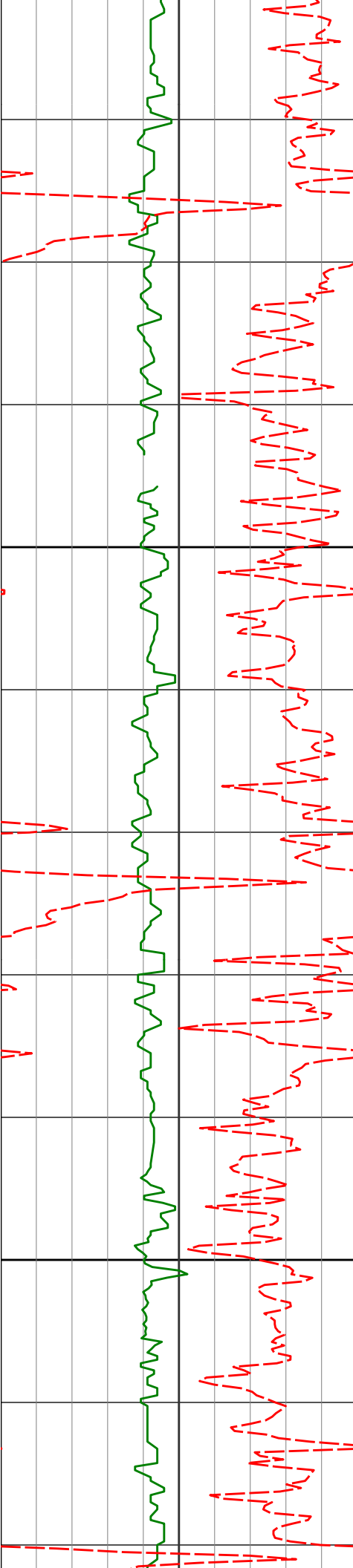
-7.30'

-9.92'

-11.83'

PGRC

ROPA



4100

4093'

5.72°

97.29° 4087.61'

-13.35'

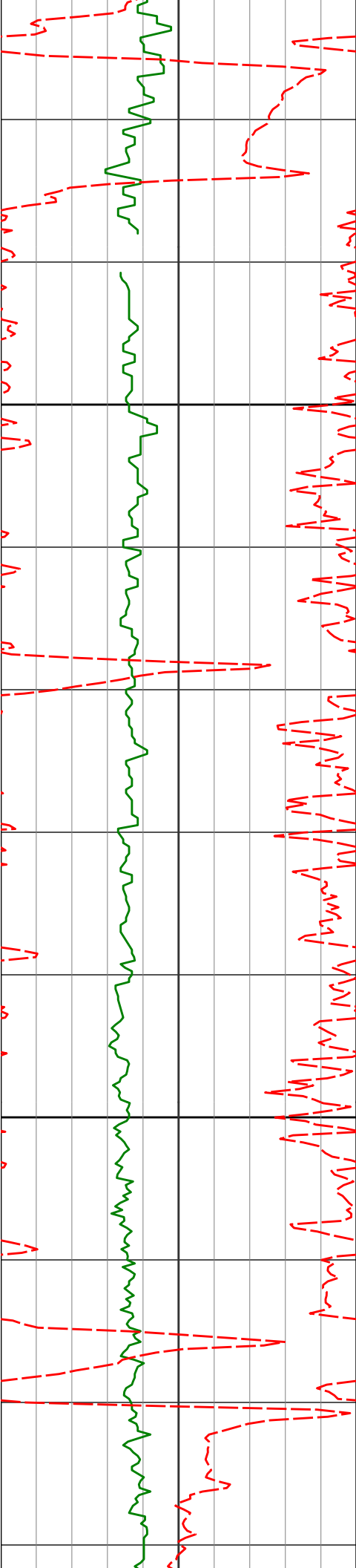
4200

4187'

4.86°

100.62° 4181.21'

-14.68'



4300

4400

4282'

6.66°

95.95° 4275.73'

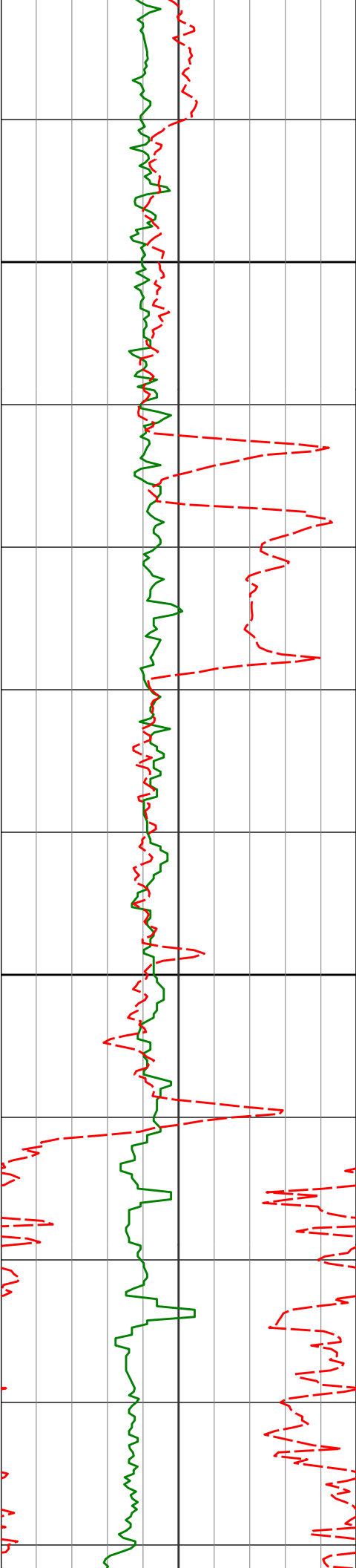
-16.00'

4376'

5.72°

91.41° 4369.18'

-16.69'



4500

4600

4470'

5.29°

89.60° 4462.75'

-16.79'

4565'

6.26°

73.15° 4557.27'

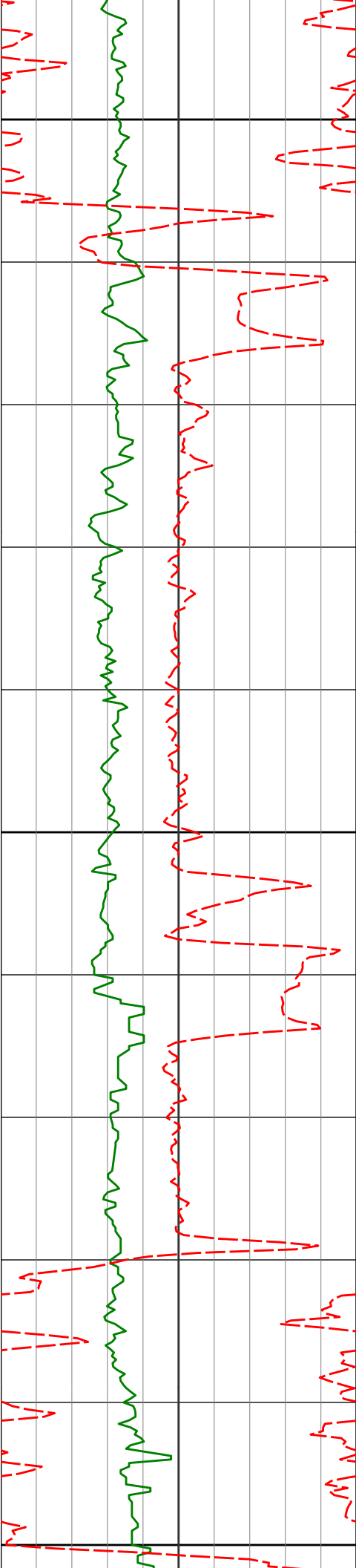
-15.26'

4659'

5.06°

69.35° 4650.81'

-12.32'



4700

4753'

4.95°

77.05° 4744.45'

-9.96'

4800

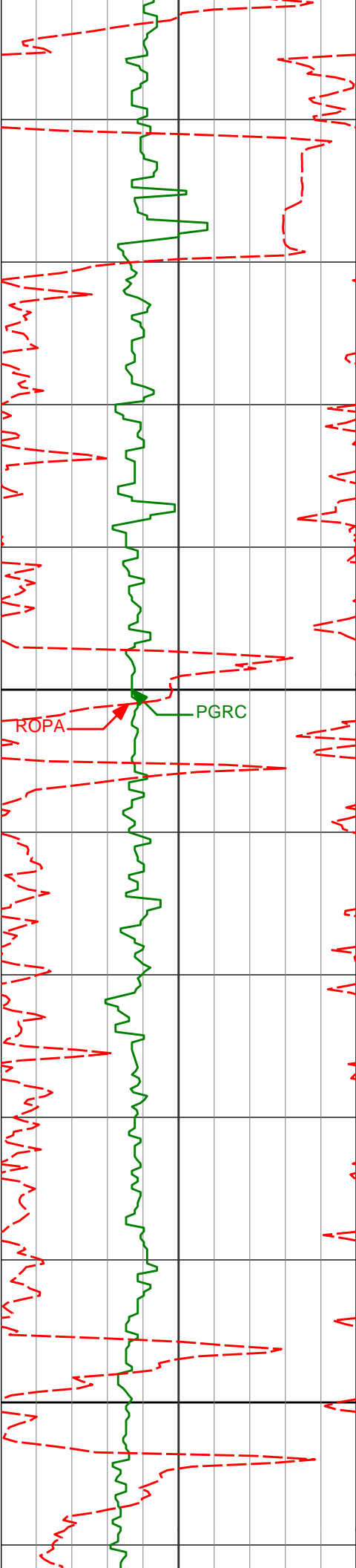
4848'

5.56°

78.68° 4839.05'

-8.14'

4900



4942'

7.00°

85.40° 4932.49'

-6.80'

5000

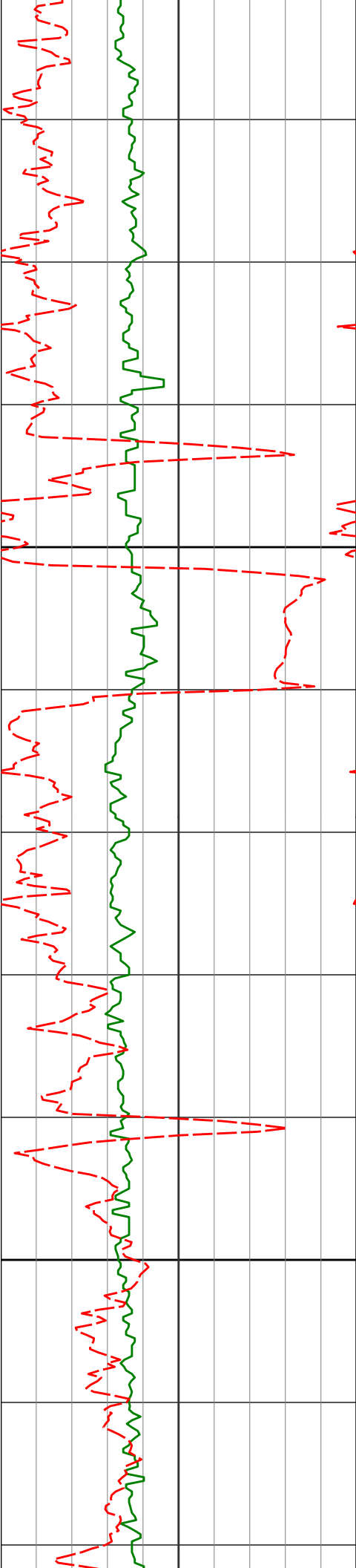
5036'

6.23°

86.29° 5025.86'

-6.02'

5100



5200

5300

5131'

5.61°

84.89° 5120.35'

-5.28'

5225'

6.05°

95.82° 5213.87'

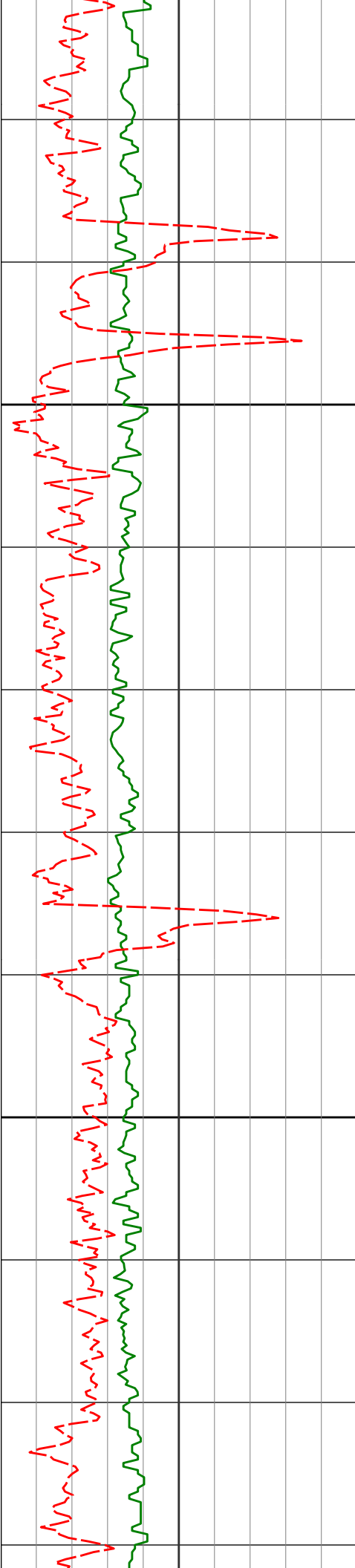
-5.38'

5320'

5.92°

93.55° 5308.35'

-6.20'



5400

5414'

5.30°

93.22° 5401.90'

-6.75'

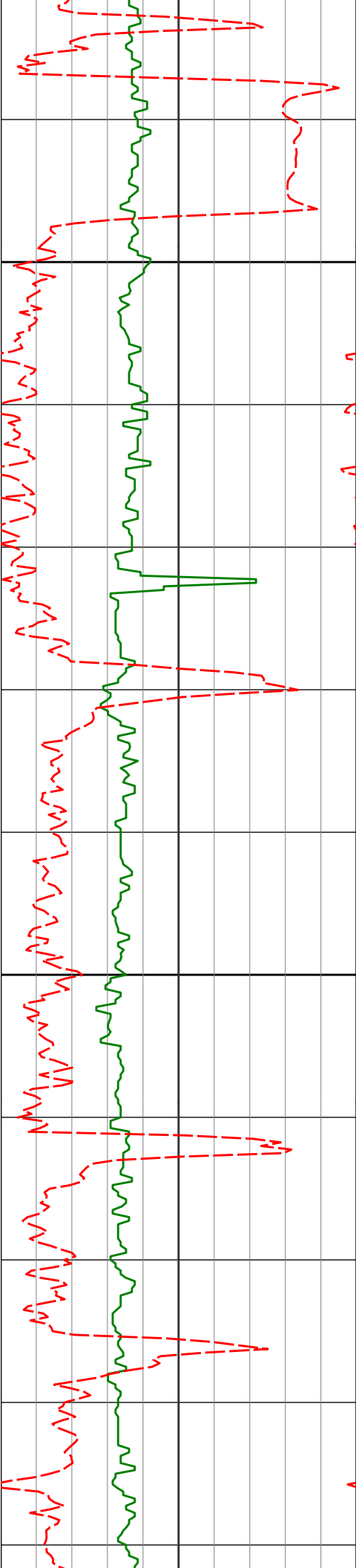
5500

5508'

4.34°

91.15° 5495.57'

-7.08'



5600

5603'

6.19°

93.93° 5590.16'

-7.51'

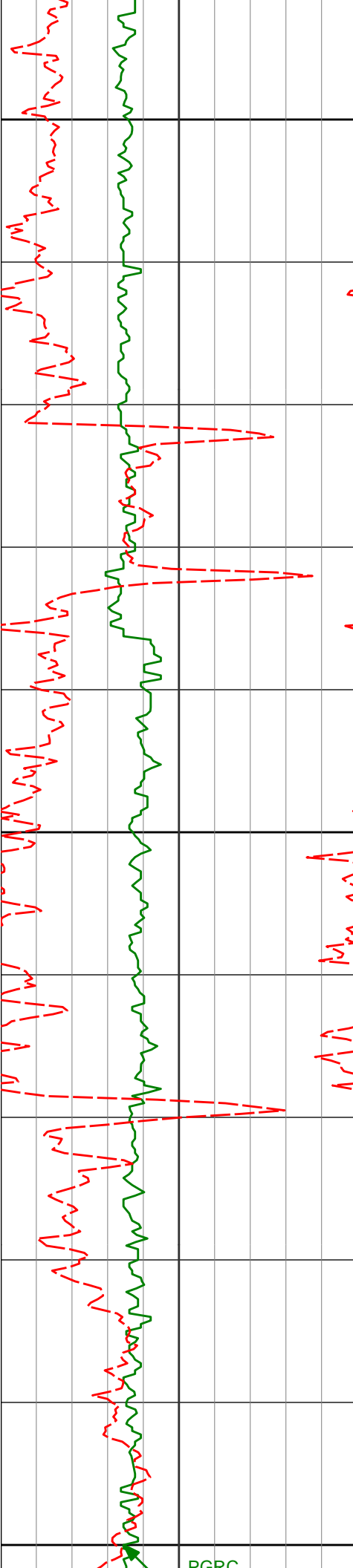
5700

5697'

5.17°

88.08° 5683.70'

-7.72'



5800

5900

6000

5791'

4.32°

80.05° 5777.38'

-6.97'

5886'

3.49°

95.48° 5872.16'

-6.64'

5980'

2.64°

97.98° 5966.03'

-7.22'

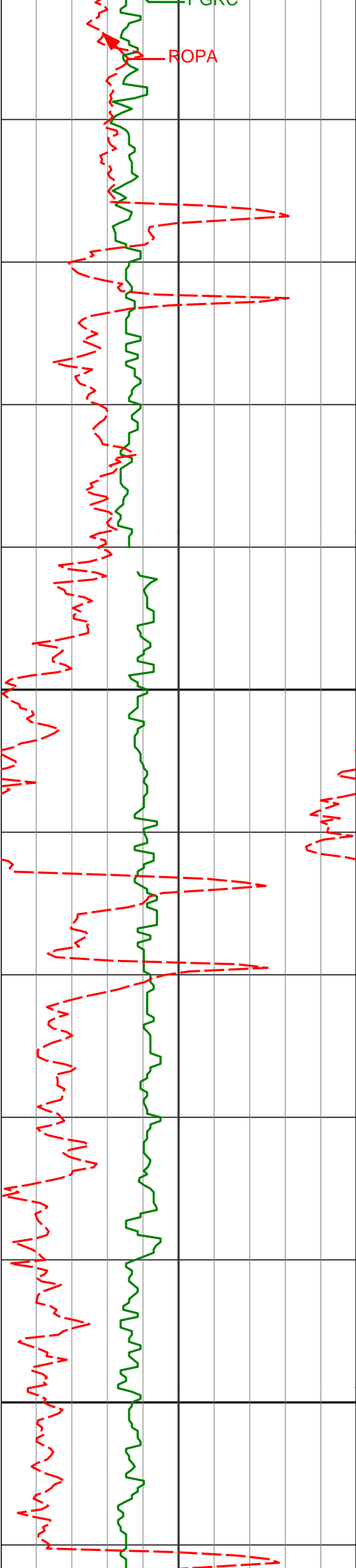
138.61°F

137.82°F

137.70°F

137.70°F

PGPC



6074'

2.68°

91.31° 6059.92'

-7.57'

137.70°F

137.70°F

137.70°F

137.70°F

137.70°F

6169'

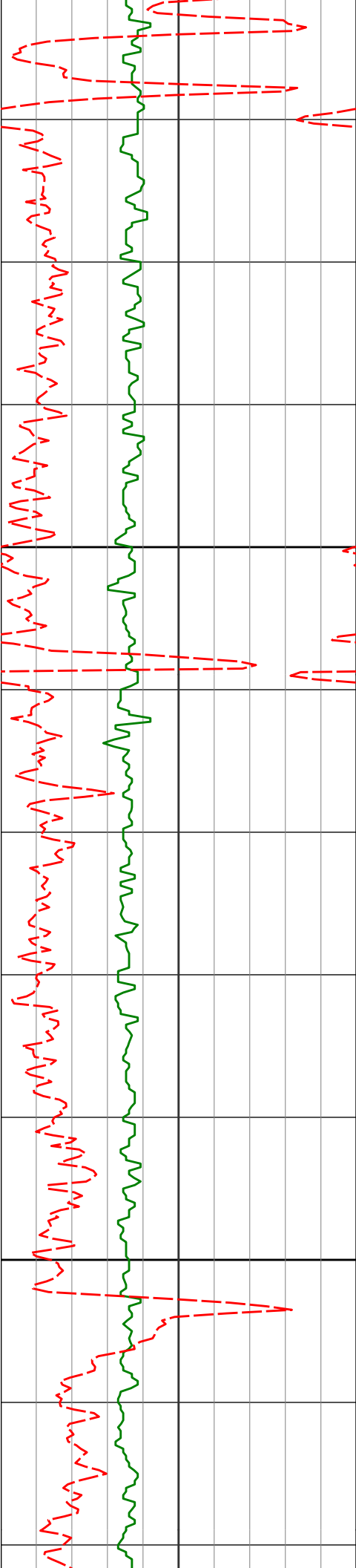
2.29°

95.13° 6154.83'

-7.79'

137.70°F

138.54°F



6300

6400

6263'

2.13°

74.19°

6248.77'

-7.49'

6358'

1.55°

70.62°

6343.72'

-6.58'

139.73°F

139.96°F

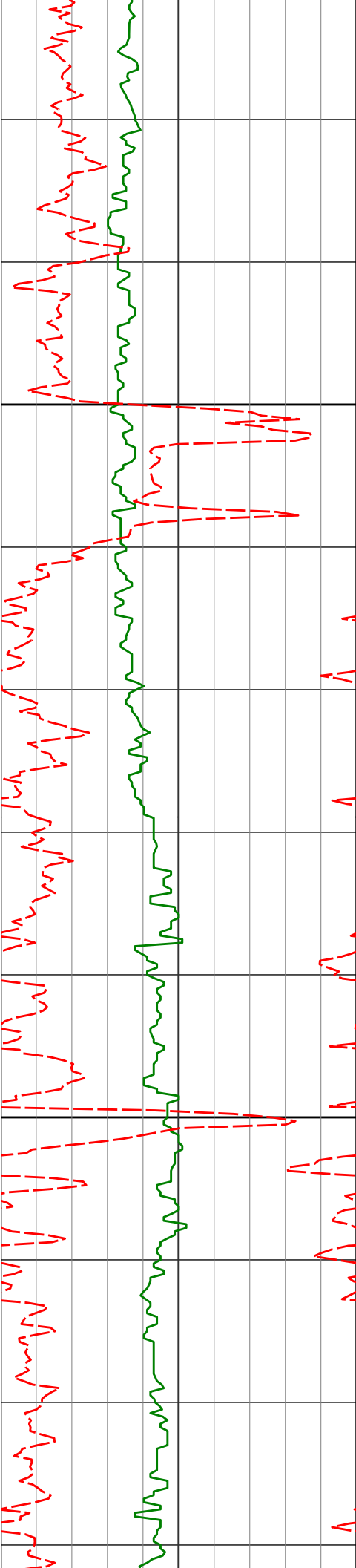
140.15°F

141.22°F

142.12°F

142.25°F

142.25°F



6500

6600

6452'

1.56°

50.55° 6437.68'

-5.35'

142.92°F

144.37°F

144.54°F

144.54°F

6547'

1.32°

71.02° 6532.65'

-4.18'

144.54°F

144.80°F

146.34°F

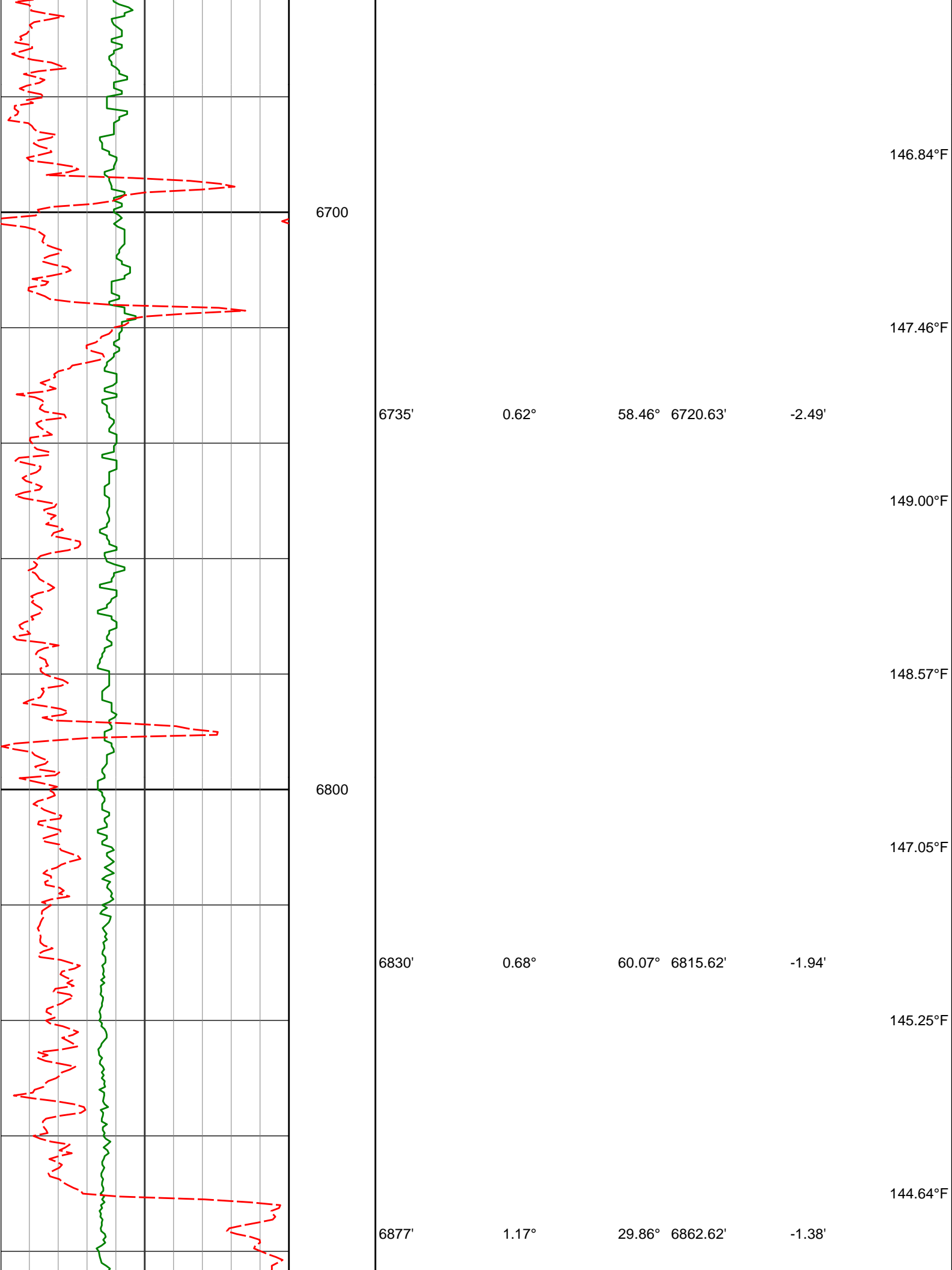
6641'

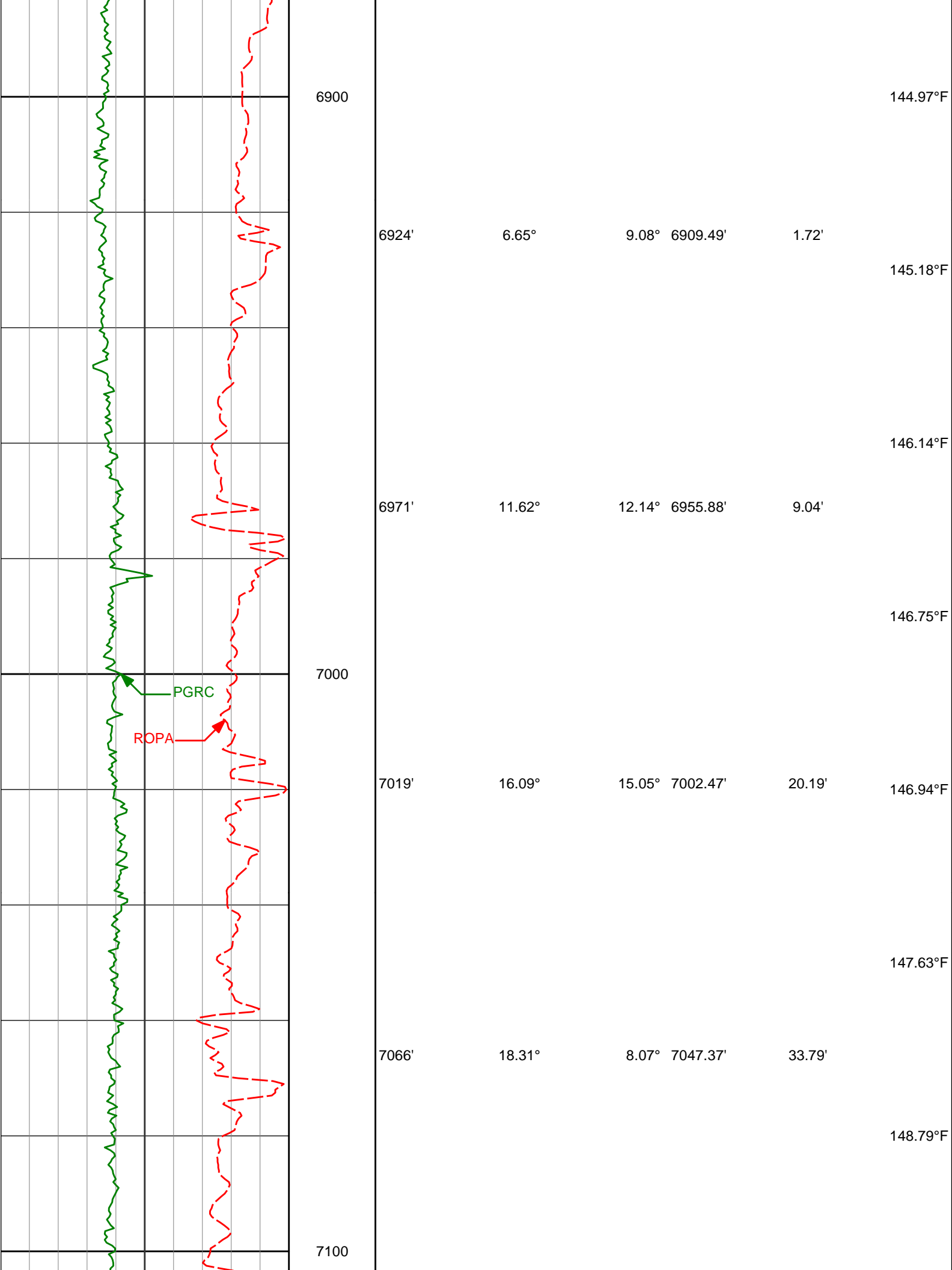
0.81°

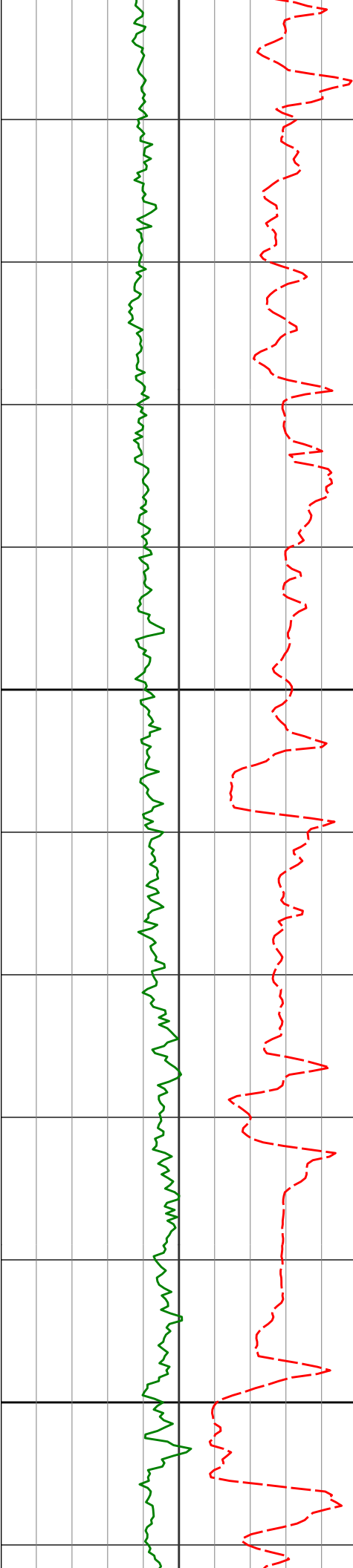
36.11° 6626.64'

-3.29'

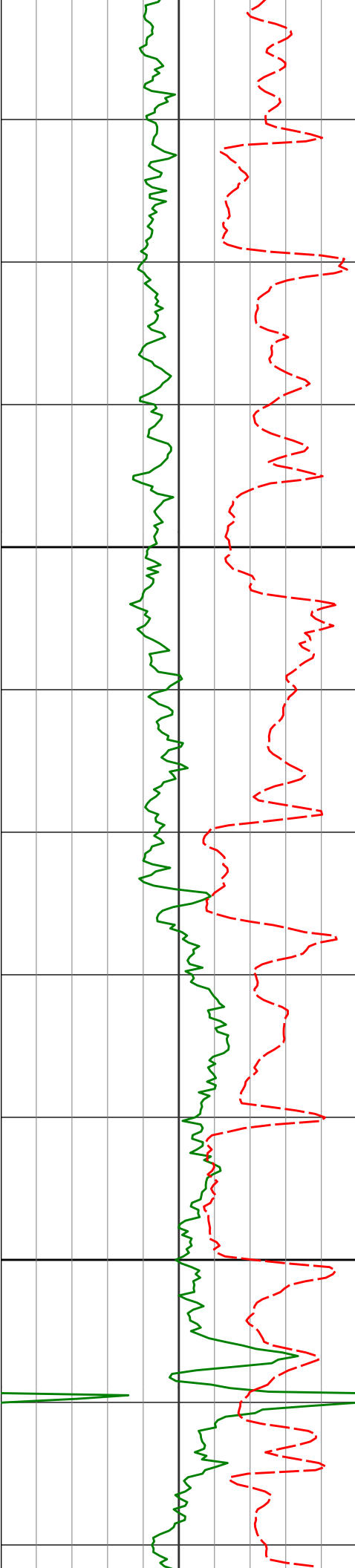
146.84°F







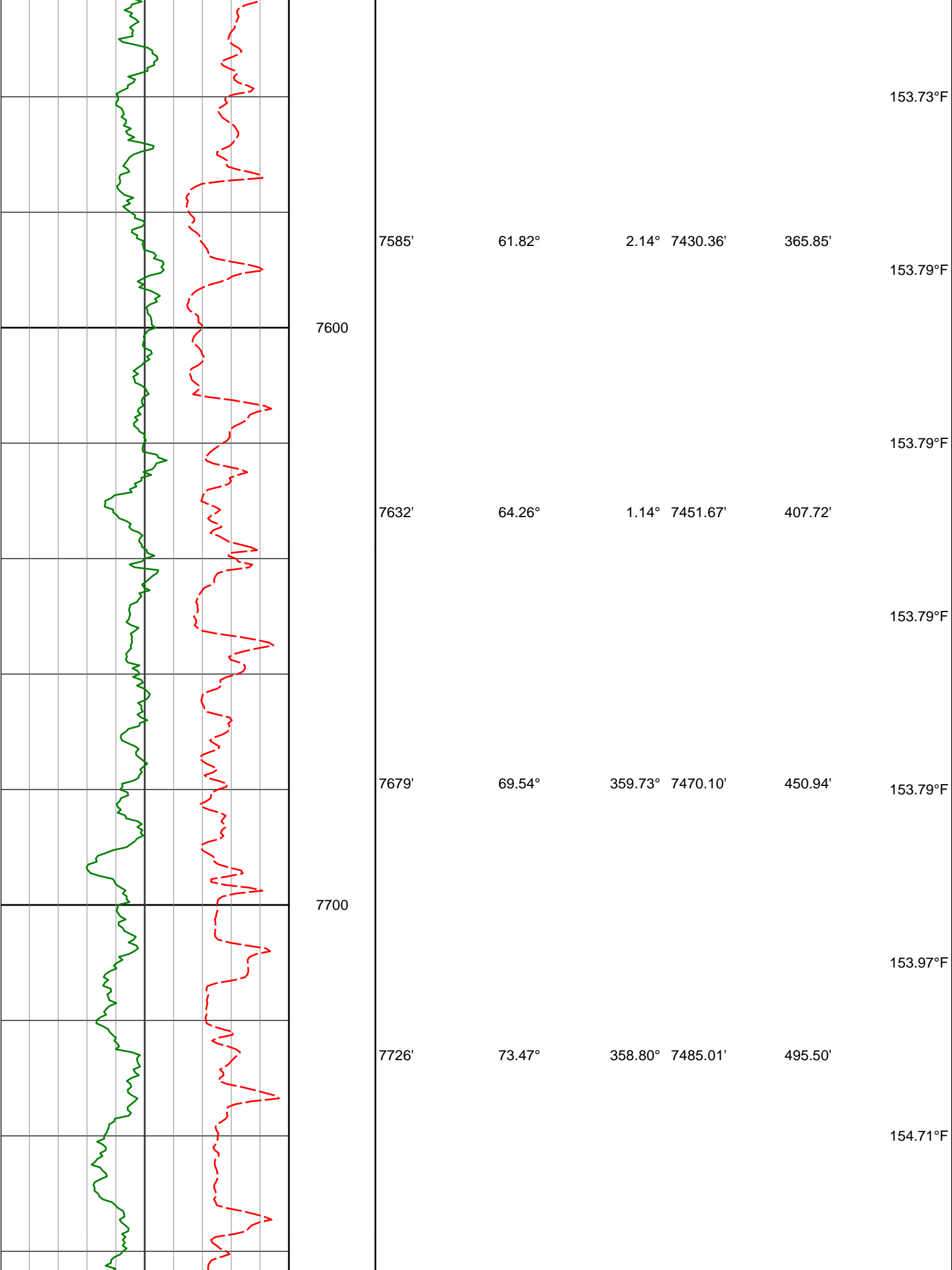
7200	7113'	22.82°	5.26°	7091.37'	50.19'	149.14°F
						149.14°F
	7160'	27.17°	0.96°	7133.96'	70.00'	
						149.23°F
	7207'	31.85°	356.98°	7174.86'	93.13'	150.00°F
						151.29°F
	7254'	35.64°	359.18°	7213.93'	119.22'	
						151.47°F
7300	7302'	39.51°	0.46°	7251.97'	148.48'	151.47°F
						151.37°F

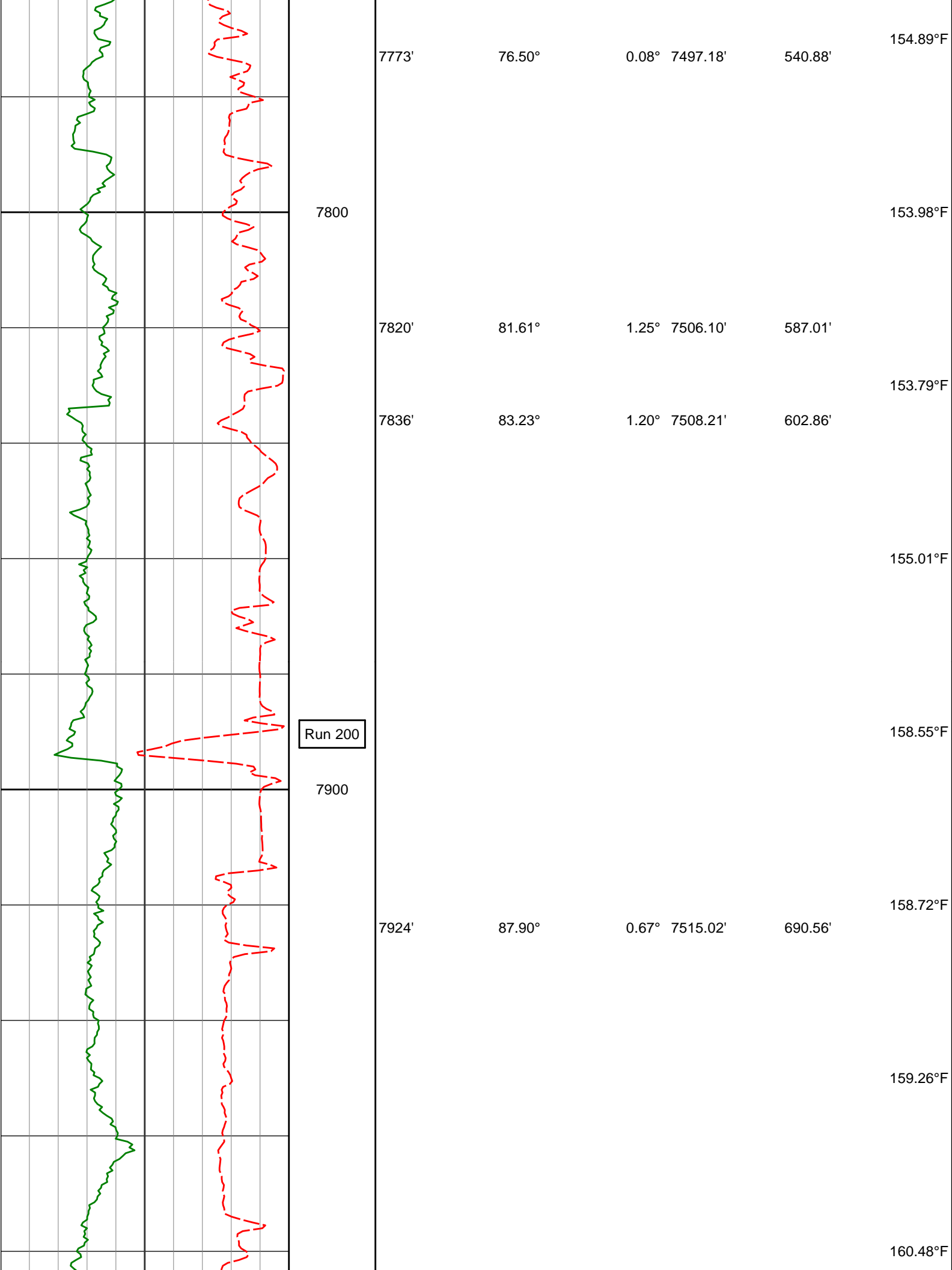


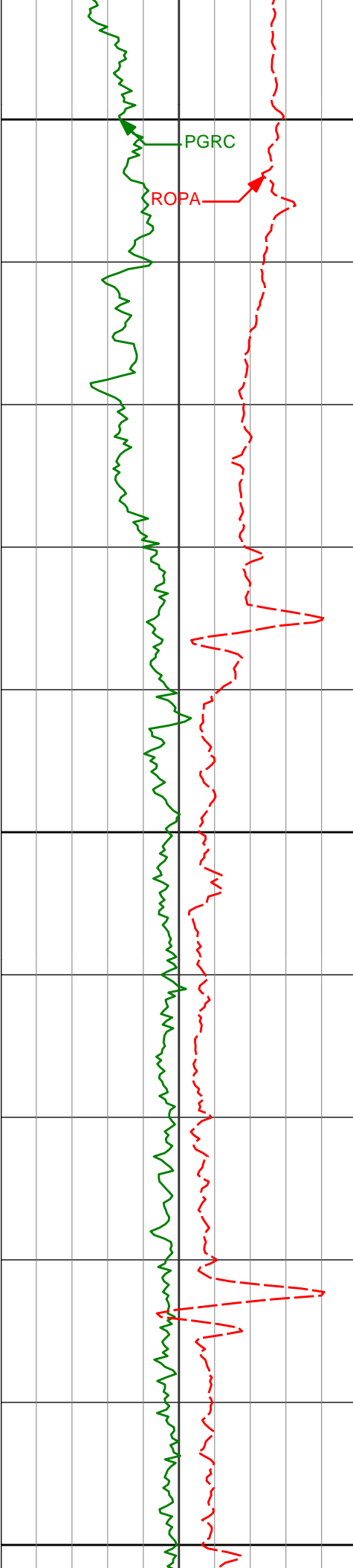
7400

7500

7349'	43.78°	1.52°	7287.08'	179.70'	150.81°F
7396'	46.76°	0.39°	7320.16'	213.08'	150.63°F
7443'	50.51°	1.21°	7351.21'	248.34'	149.77°F
7490'	53.82°	2.57°	7380.04'	285.43'	150.96°F
7537'	58.11°	2.27°	7406.34'	324.34'	151.44°F
					151.61°F
					152.92°F







8000

PGRC

ROPA

8019'

88.71°

0.43° 7517.83'

785.52'

161.22°F

163.46°F

165.49°F

8100

8113'

89.51°

359.49° 7519.29'

879.50'

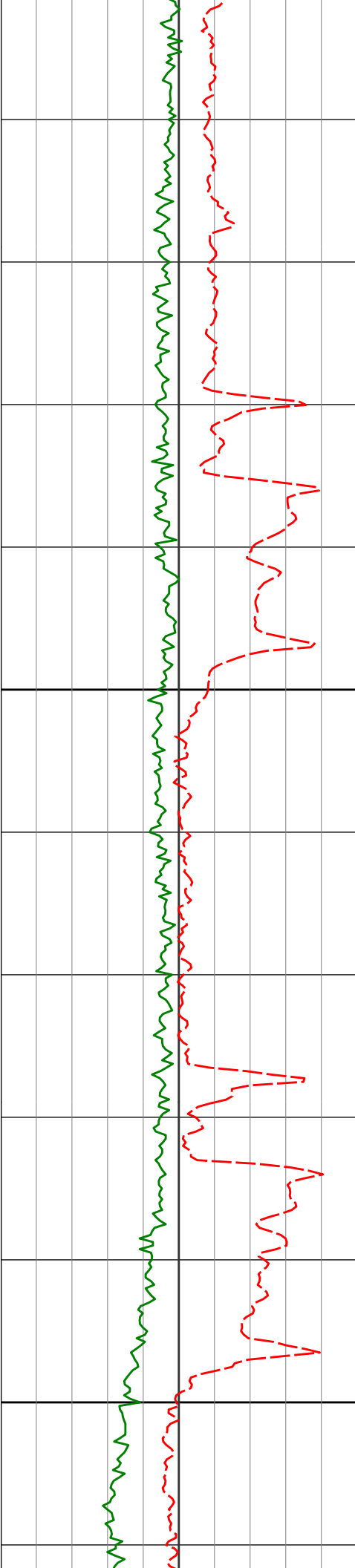
166.13°F

167.60°F

167.97°F

8200

167.72°F



8300

8400

8208'

8302'

8397'

90.46°

91.02°

91.14°

359.11°

359.80°

1.29°

7519.31'

7518.10'

7516.31'

974.50'

1068.48'

1163.46'

166.79°F

166.21°F

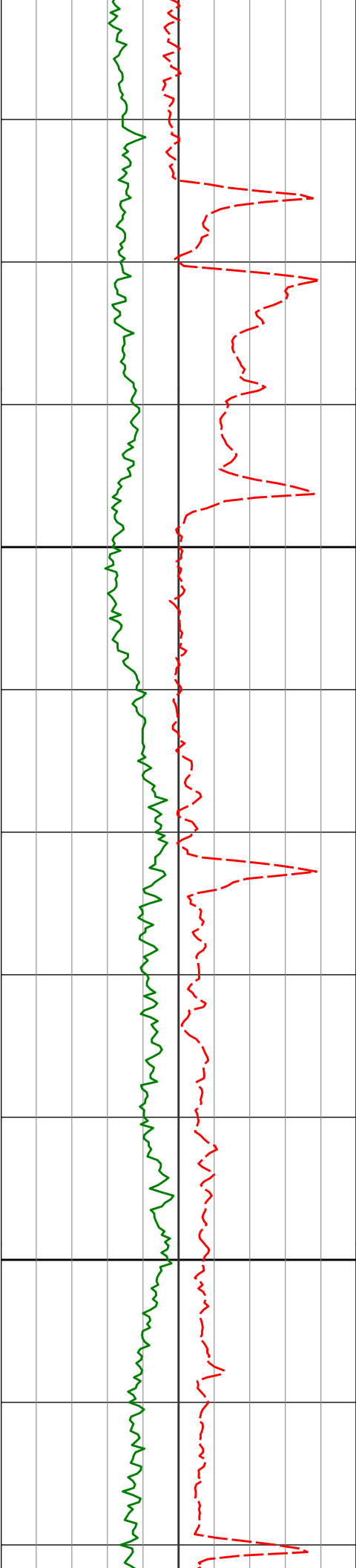
168.33°F

169.47°F

168.47°F

169.70°F

170.99°F



8500

8600

8491'

90.28°

1.48° 7515.14'

1257.42'

171.91°F

173.37°F

174.94°F

175.06°F

8586'

90.92°

1.20° 7514.15'

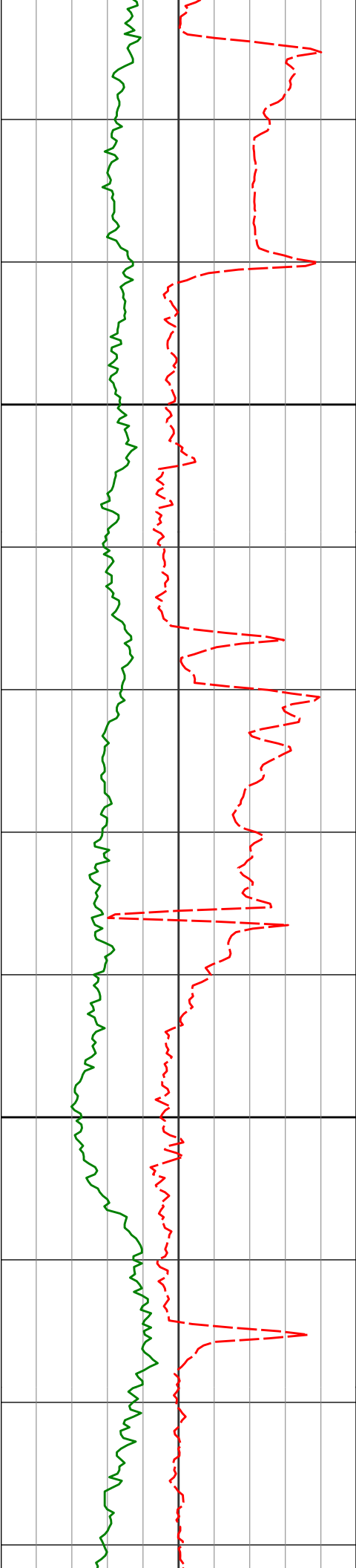
1352.39'

174.21°F

174.11°F

170.58°F

170.48°F



8680'

89.88°

1.65° 7513.49'

1446.35'

8700

176.30°F

175.99°F

176.30°F

178.12°F

8774'

89.17°

1.95° 7514.27'

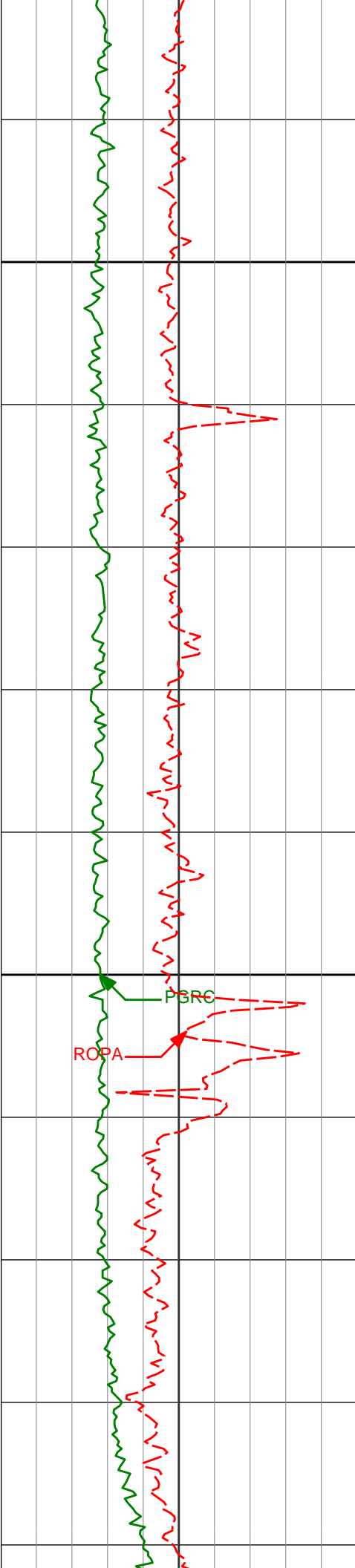
1540.30'

8800

177.25°F

179.17°F

180.14°F



8900

9000

8869'

89.78°

1.56° 7515.14'

1635.25'

181.32°F

182.54°F

183.41°F

8963'

90.56°

0.85° 7514.86'

1729.22'

183.16°F

183.46°F

184.80°F

9058'

91.30°

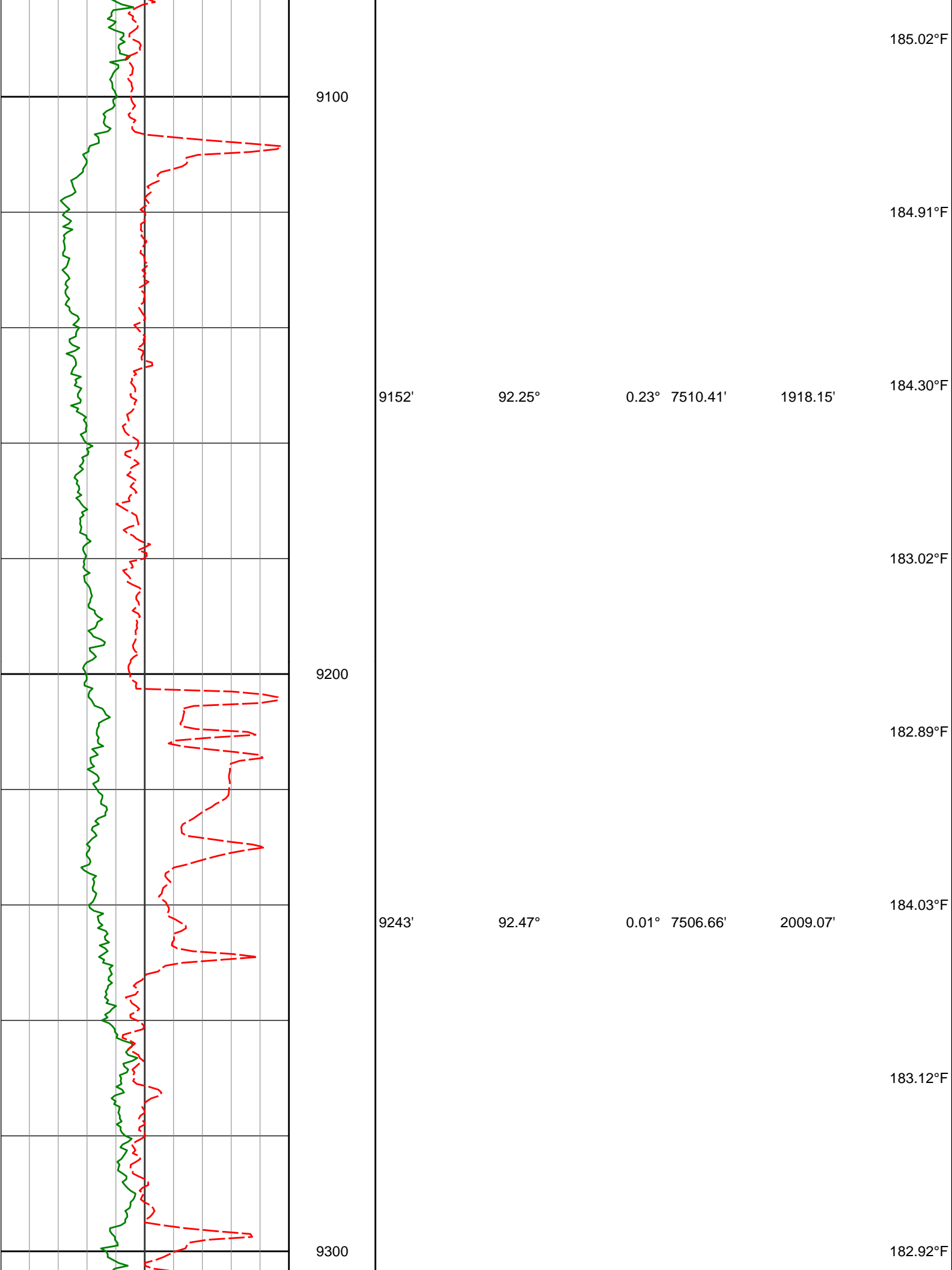
0.77° 7513.32'

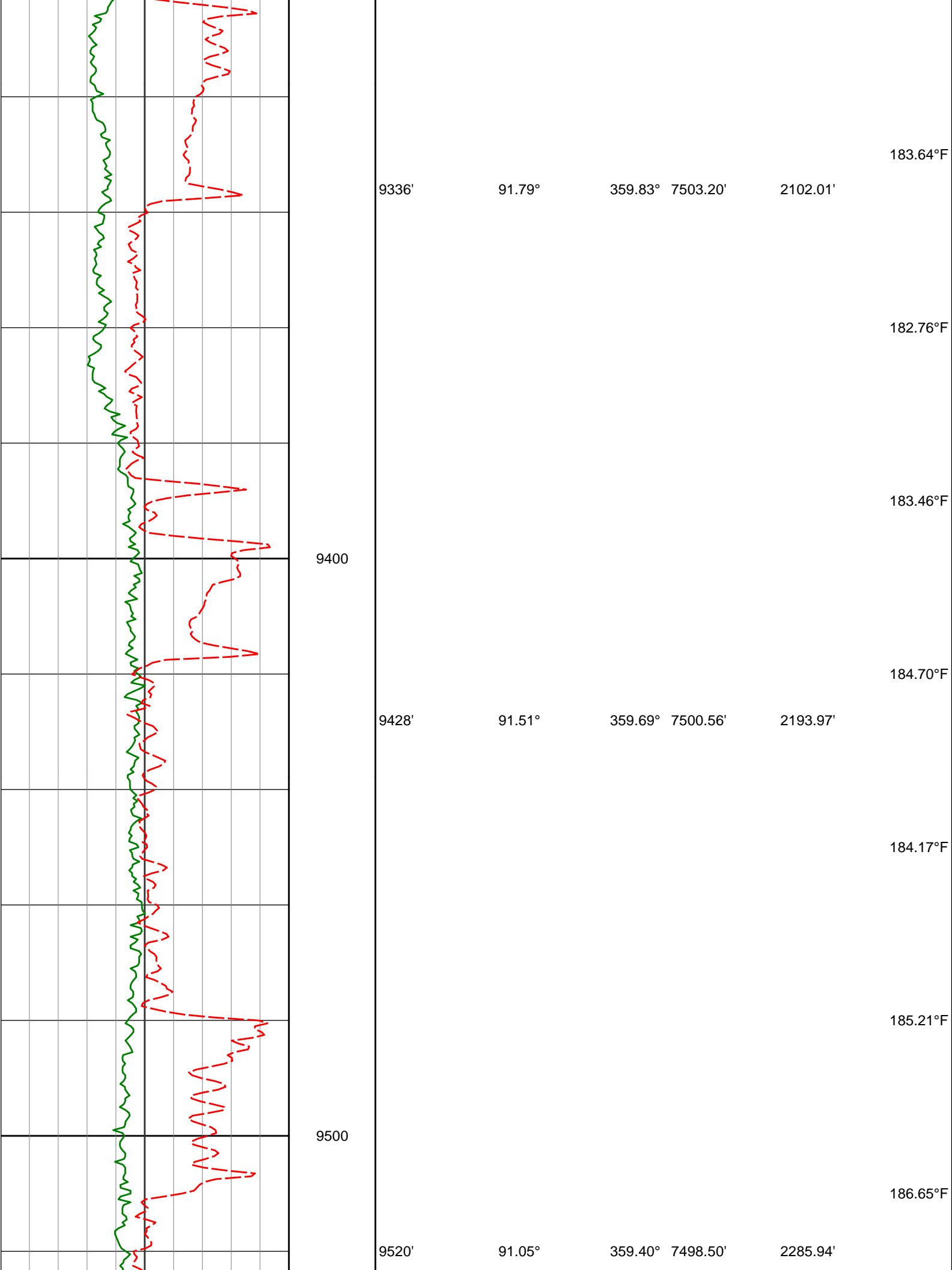
1824.20'

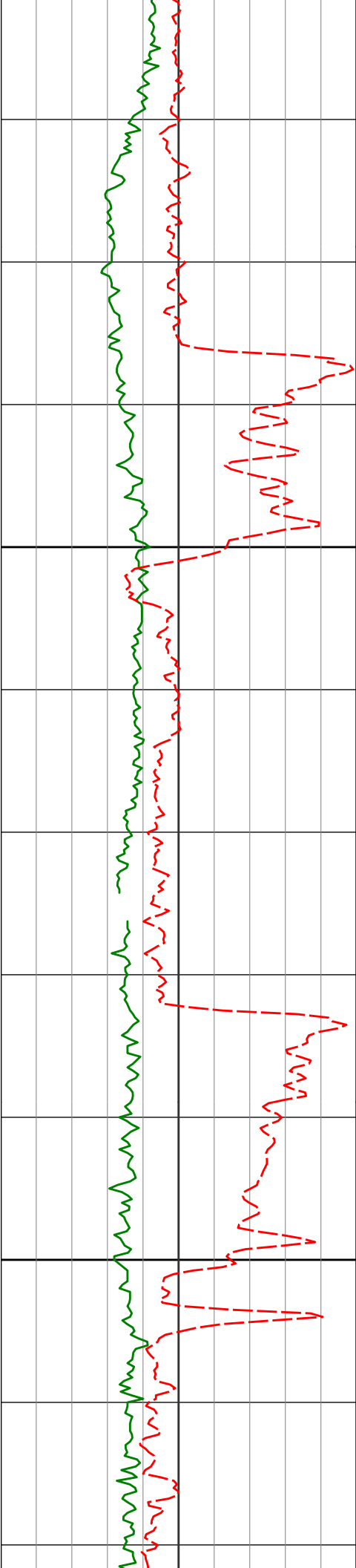
185.02°F

PGRC

ROPA







9600

9613'

90.80°

359.60° 7497.00'

2378.93'

9700

9706'

89.63°

359.57° 7496.65'

2471.92'

185.89°F

186.95°F

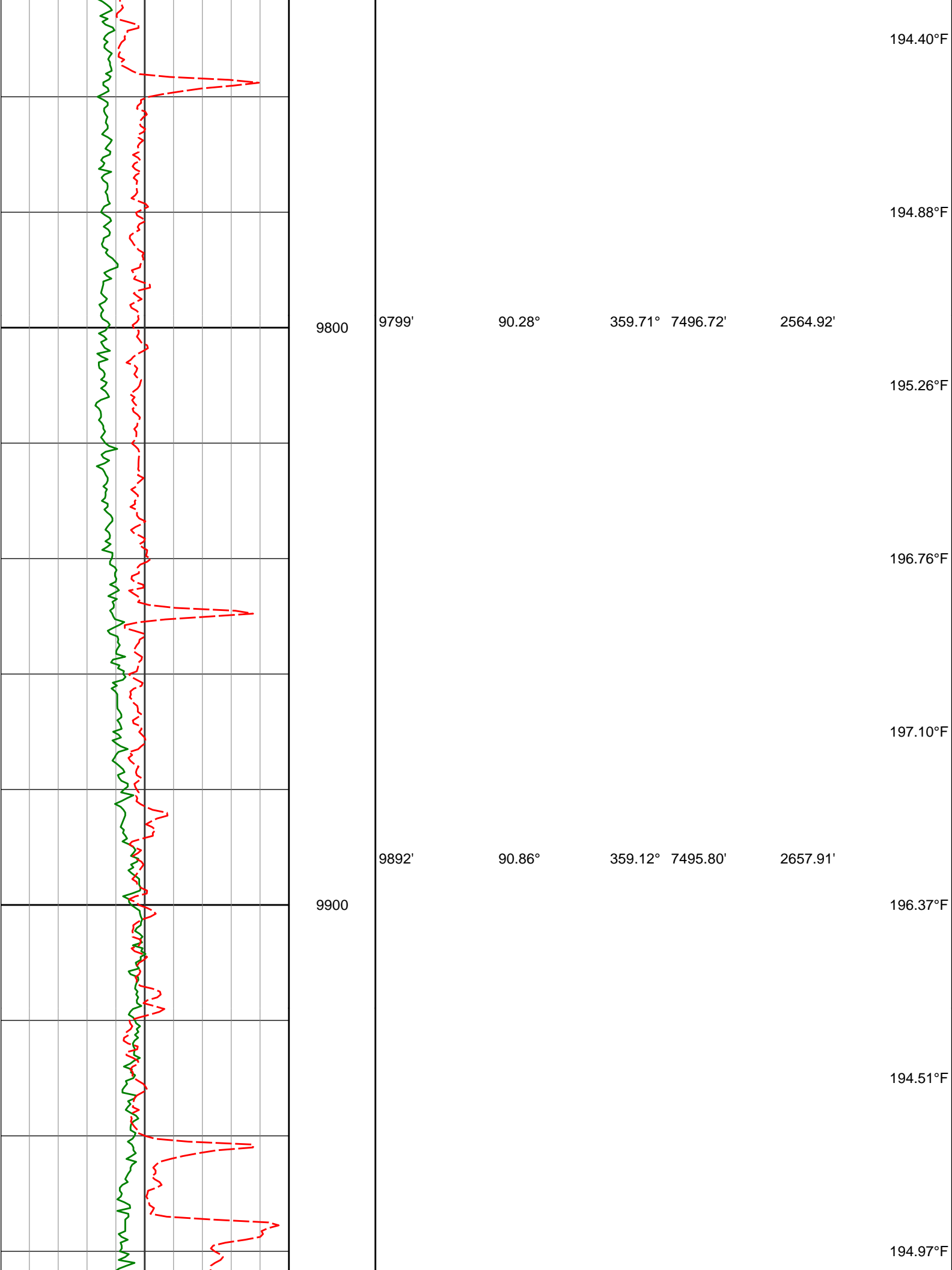
187.38°F

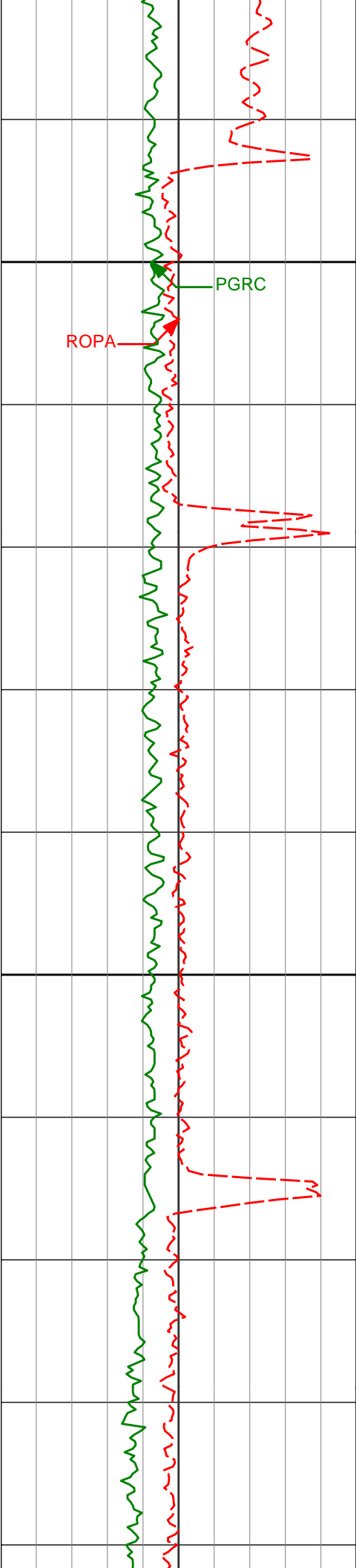
186.98°F

187.60°F

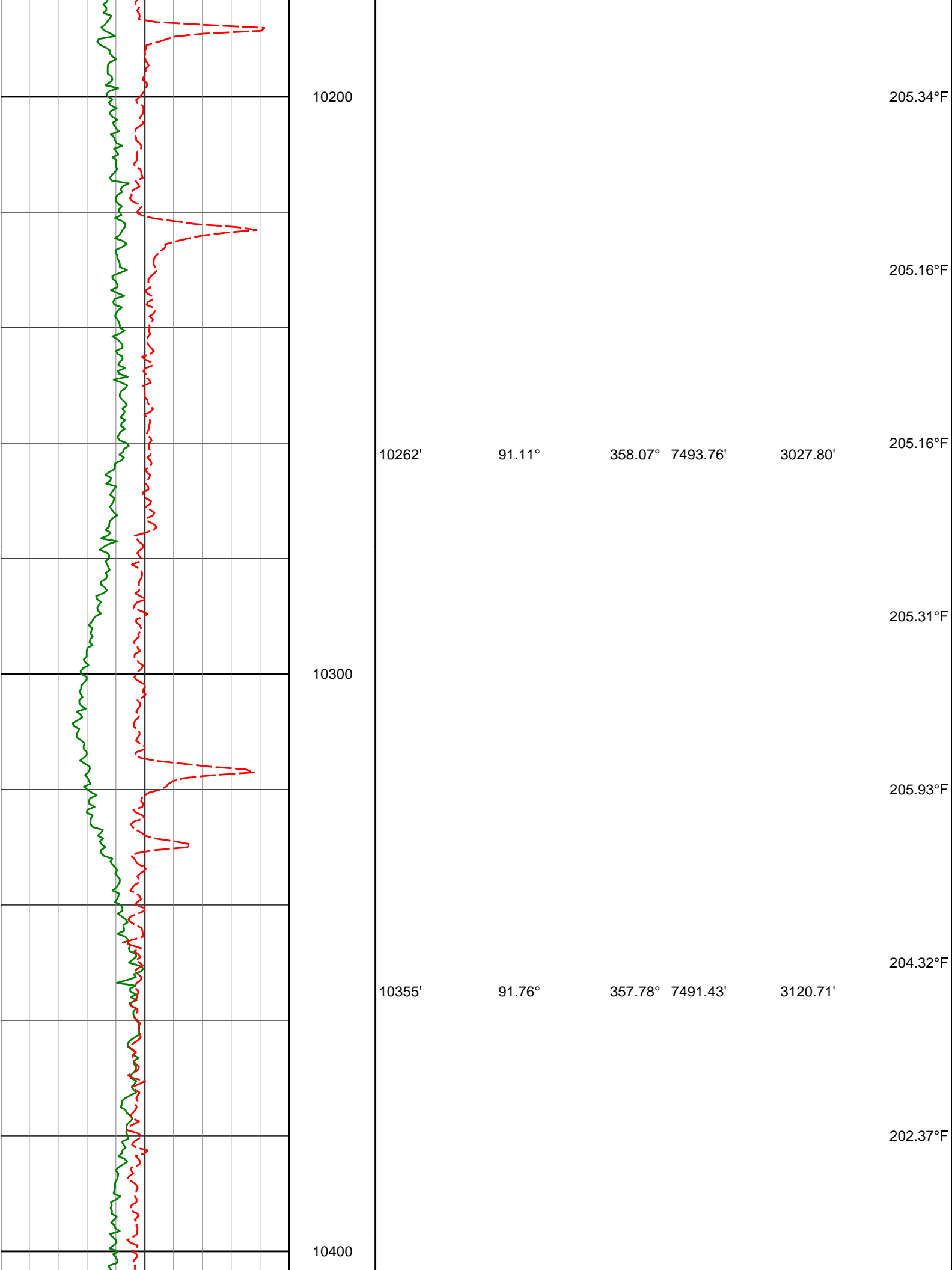
190.42°F

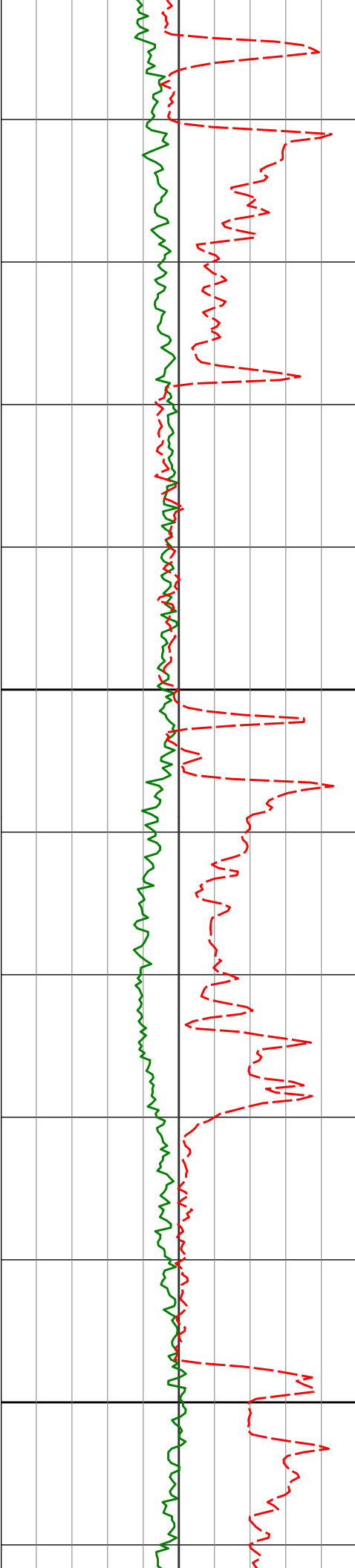
192.58°F





9984'	89.63°	358.77°	7495.40'	2749.89'	197.23°F
10000					
198.01°F					
199.99°F					
10076'	90.12°	359.03°	7495.60'	2841.88'	201.93°F
10100					
202.99°F					
206.24°F					
10169'	90.52°	358.33°	7495.09'	2934.85'	206.17°F





10500

10600

10448'

90.31°

357.40° 7489.75'

3213.62'

10540'

90.09°

359.93° 7489.43'

3305.58'

202.07°F

204.38°F

204.73°F

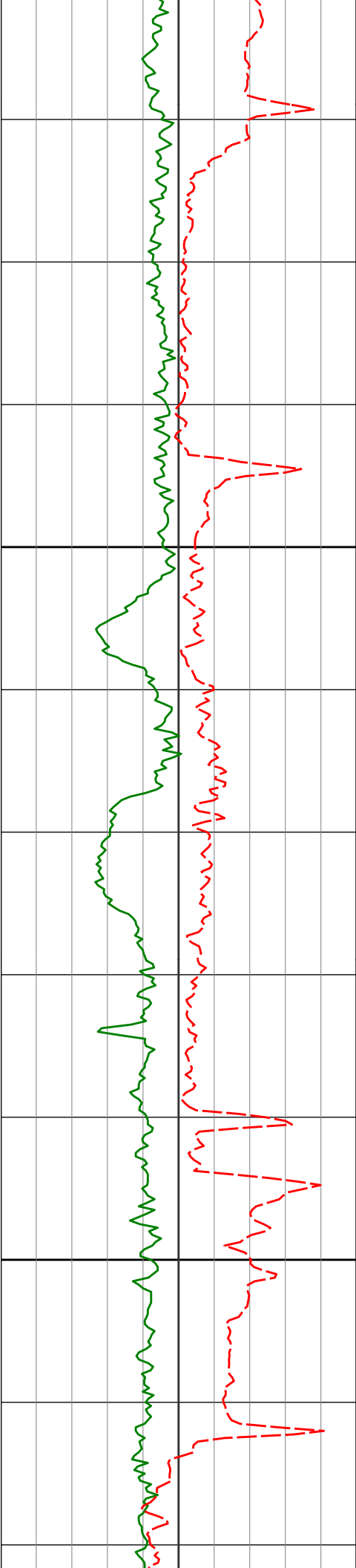
203.88°F

203.25°F

202.59°F

202.85°F

204.54°F



10700

10800

10633' 88.98° 0.08° 7490.19' 3398.58'

206.63°F

207.62°F

207.73°F

10724' 89.48° 359.56° 7491.41' 3489.57'

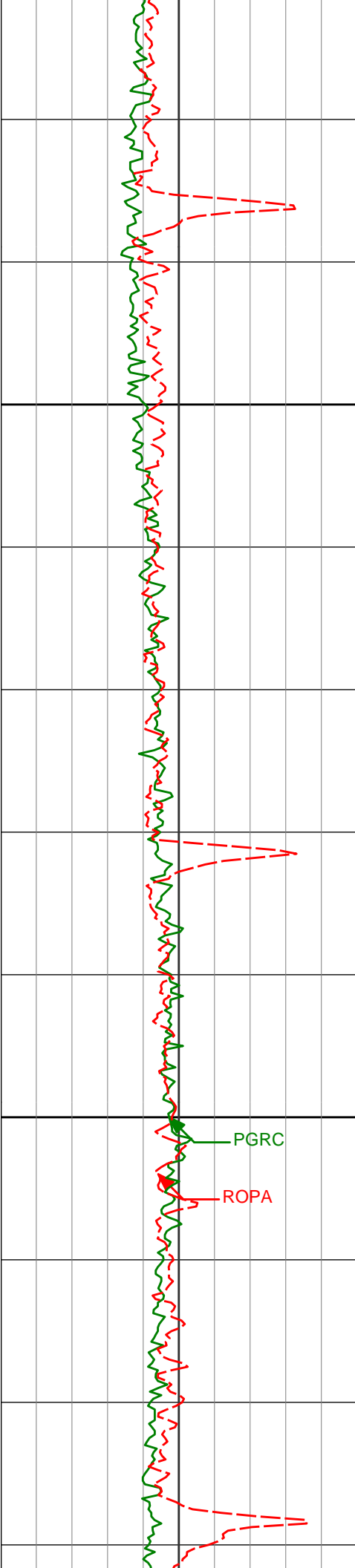
207.58°F

206.50°F

207.58°F

10817' 88.67° 0.83° 7492.91' 3582.55'

208.52°F



10900

10910'

89.23°

359.60° 7494.62'

3675.54'

11000

11003'

89.66°

358.96° 7495.52'

3768.52'

210.31°F

212.37°F

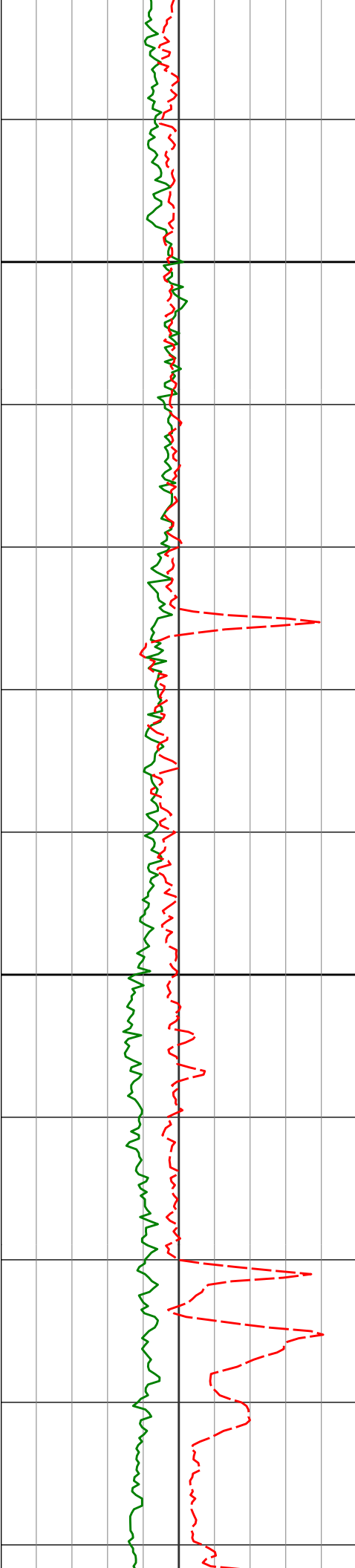
212.92°F

212.92°F

213.20°F

215.22°F

215.51°F



11100

11096'

90.12°

359.04° 7495.70'

3861.51'

215.51°F

215.63°F

216.33°F

217.88°F

11200

11189'

91.11°

358.44° 7494.70'

3954.48'

217.55°F

216.03°F

215.61°F

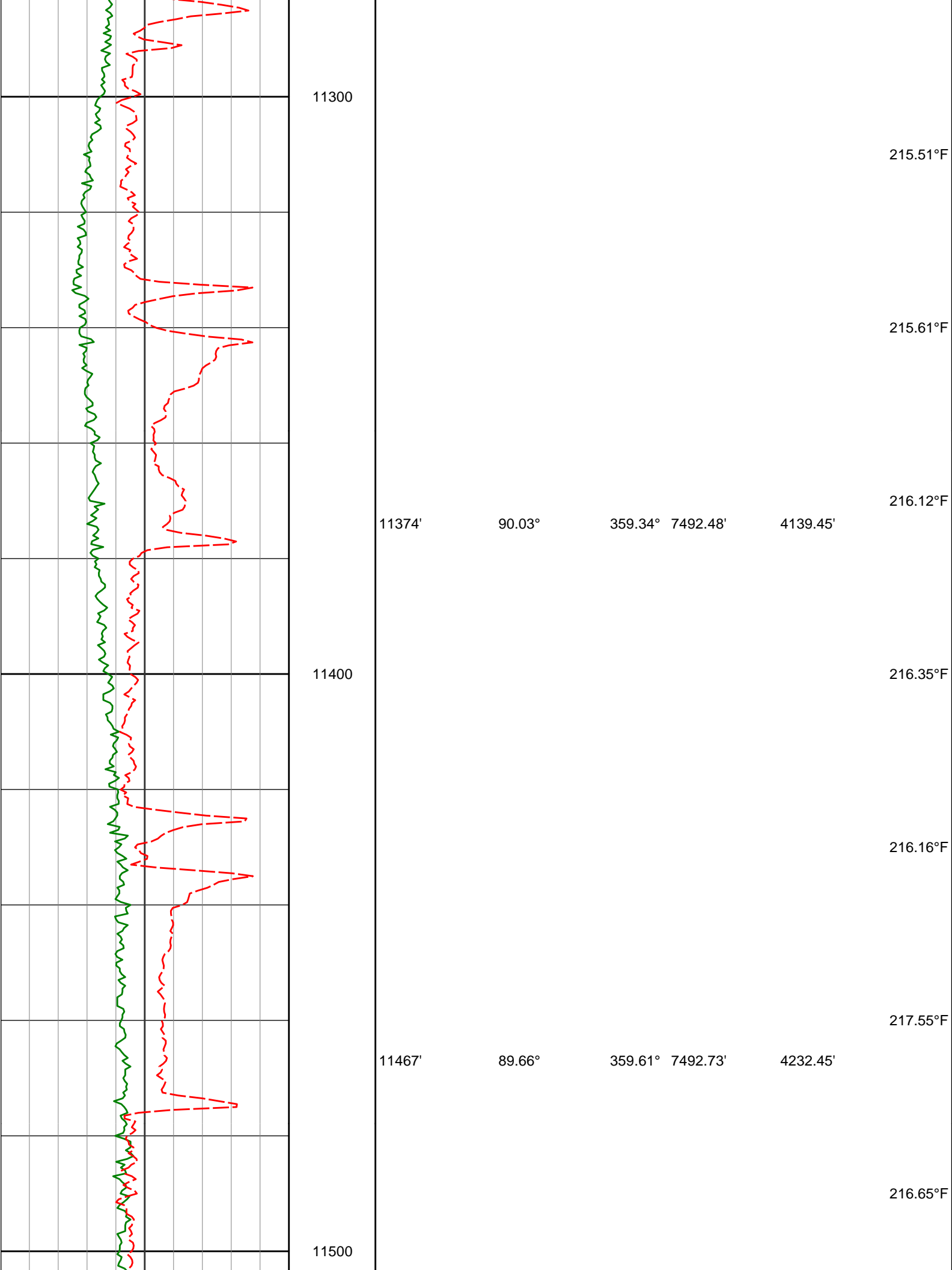
11282'

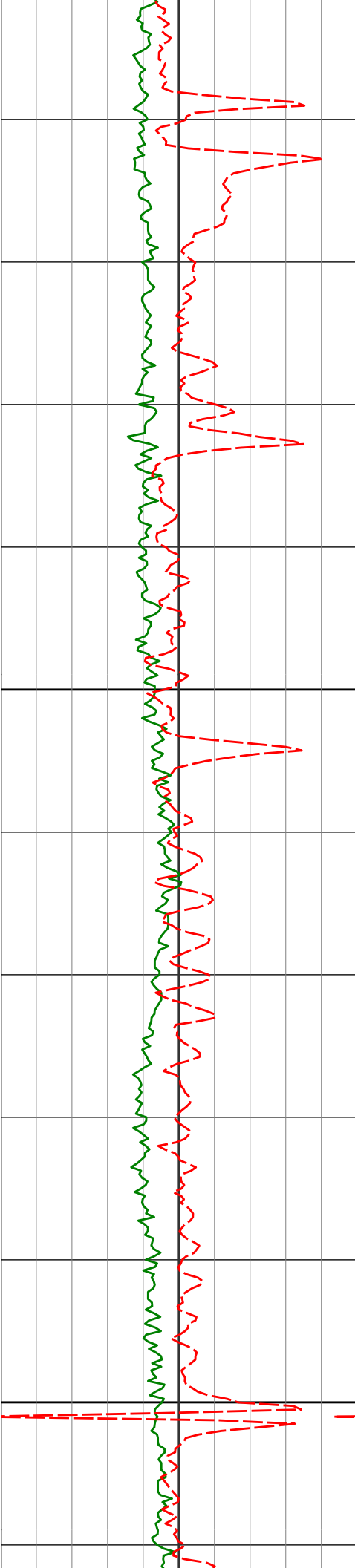
90.80°

359.65° 7493.15'

4047.46'

215.51°F





11600

11700

11557'

88.89°

1.82° 7493.87'

4322.43'

11649'

89.23°

1.70° 7495.38'

4414.37'

216.21°F

217.77°F

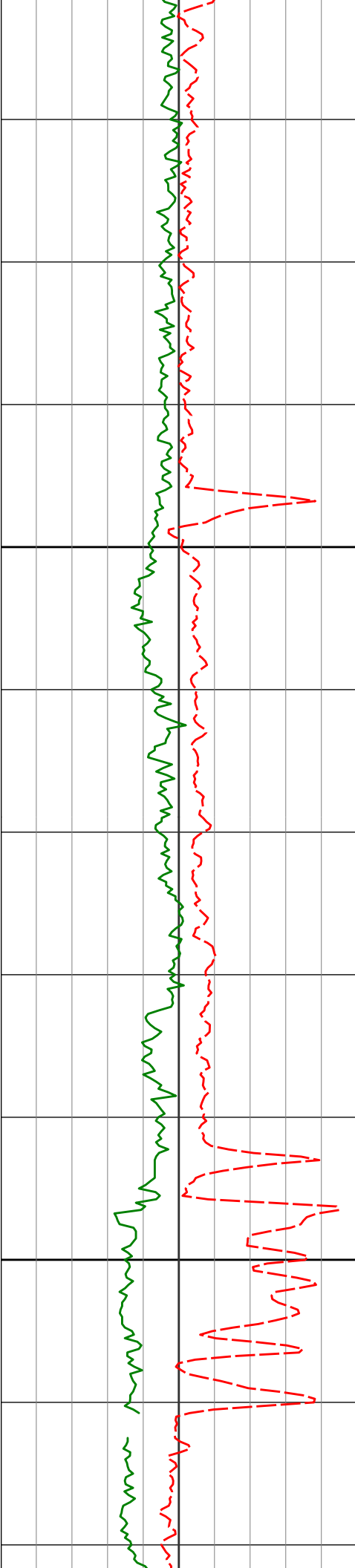
218.66°F

220.33°F

220.77°F

220.77°F

220.77°F



11800

11900

11741'

89.72°

1.38° 7496.22'

4506.33'

11832'

90.15°

1.05° 7496.33'

4597.31'

11926'

89.75°

1.16° 7496.41'

4691.29'

220.77°F

221.33°F

222.87°F

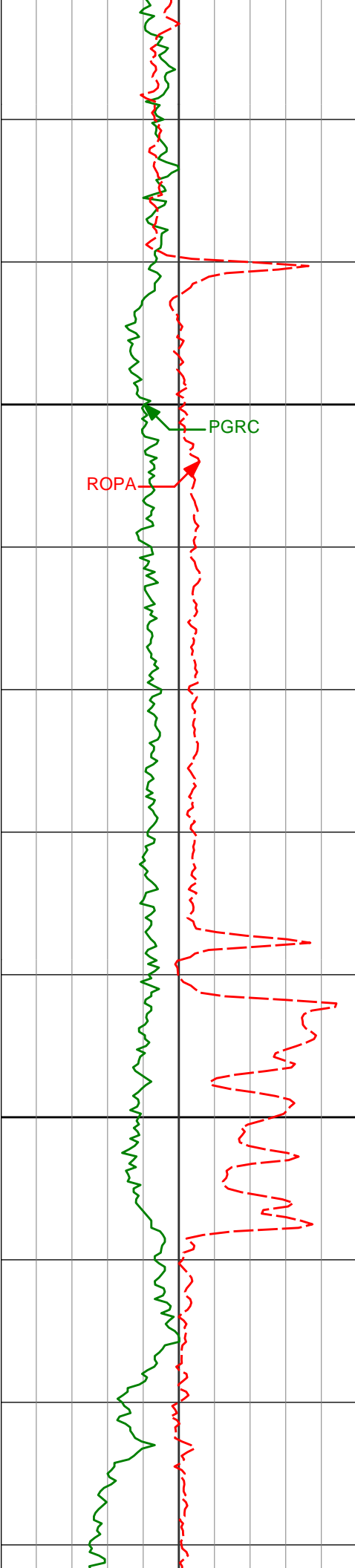
221.84°F

219.24°F

218.61°F

220.15°F

221.13°F



12000

12021'

90.37°

0.90° 7496.31'

4786.27'

222.75°F

223.02°F

221.70°F

220.02°F

220.72°F

12100

12115'

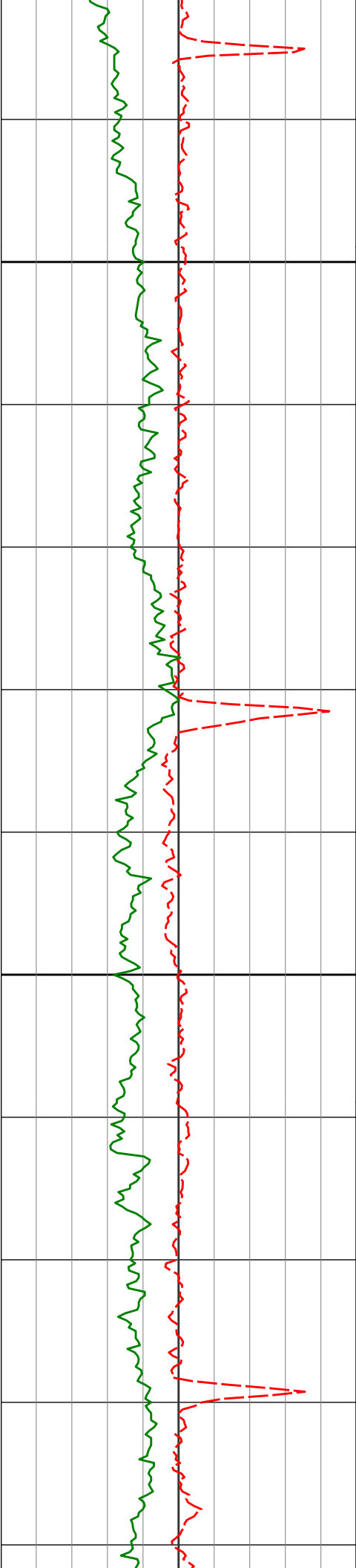
89.41°

1.60° 7496.49'

4880.24'

222.75°F

223.65°F



12200

12209'

89.78°

1.14° 7497.15'

4974.21'

225.28°F

225.98°F

226.08°F

226.40°F

12300

12304'

90.00°

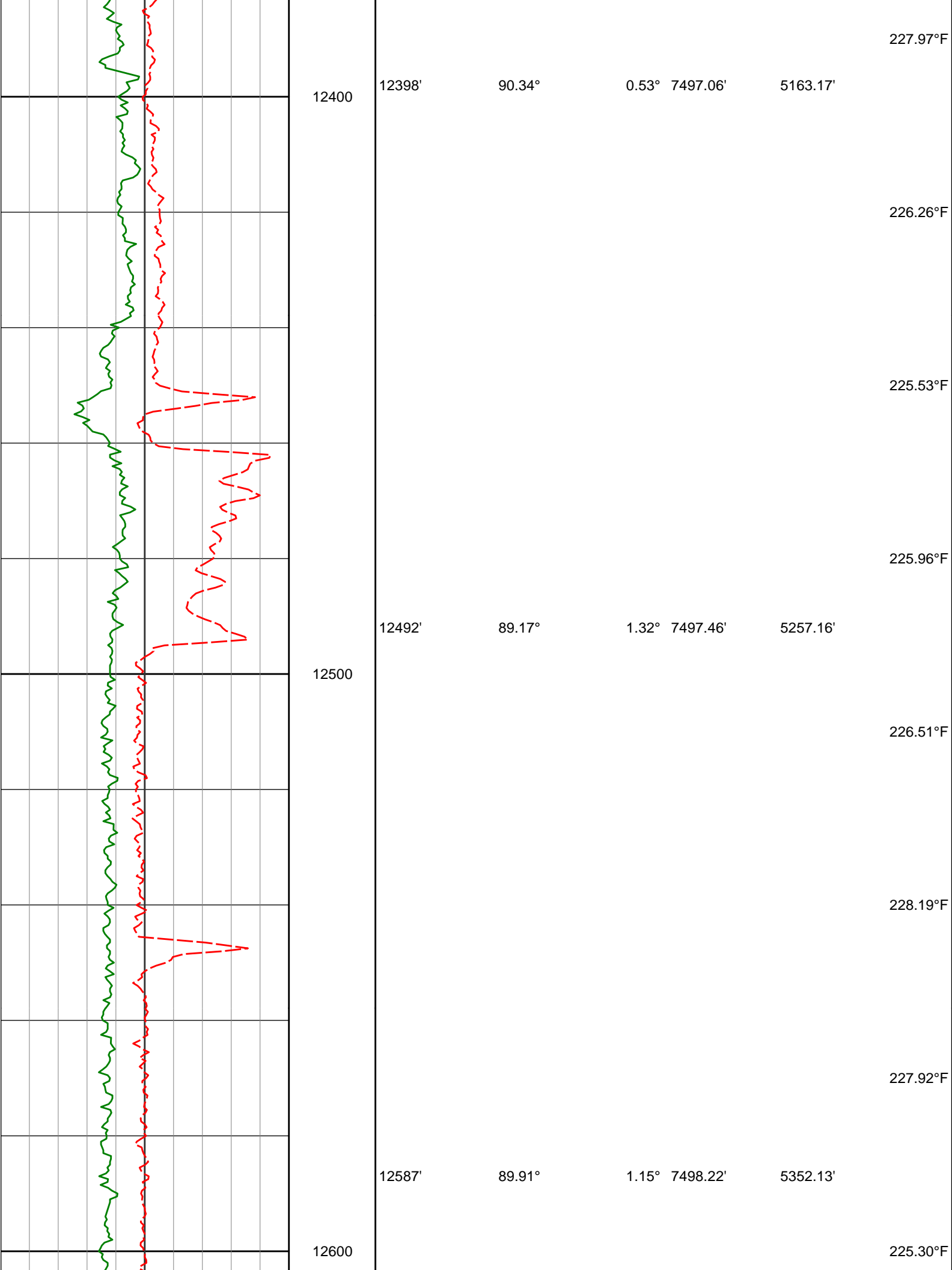
1.23° 7497.34'

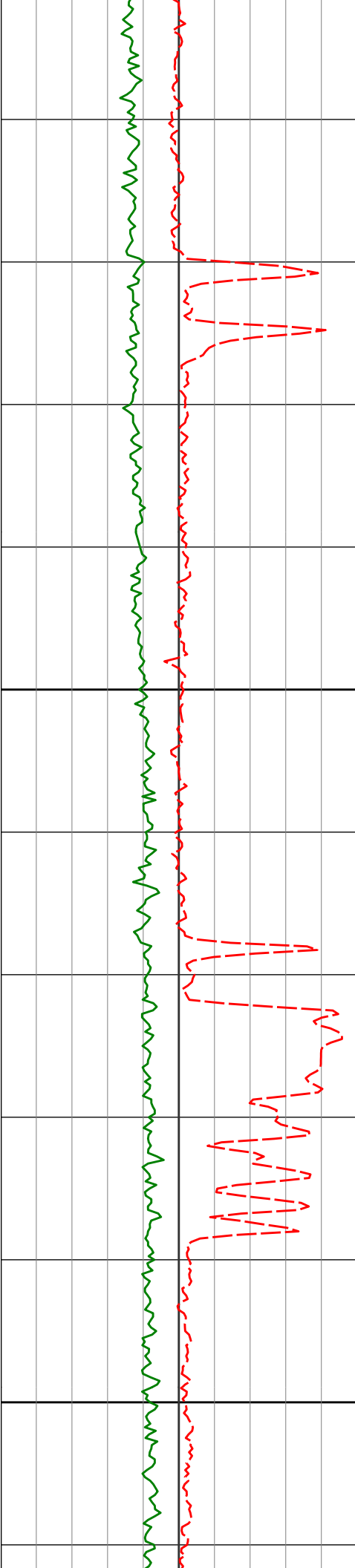
5069.19'

227.58°F

228.25°F

228.65°F





12700

12800

12681'

12776'

90.34°

89.69°

0.89° 7498.02'

1.13° 7497.99'

5446.11'

5541.10'

225.95°F

226.41°F

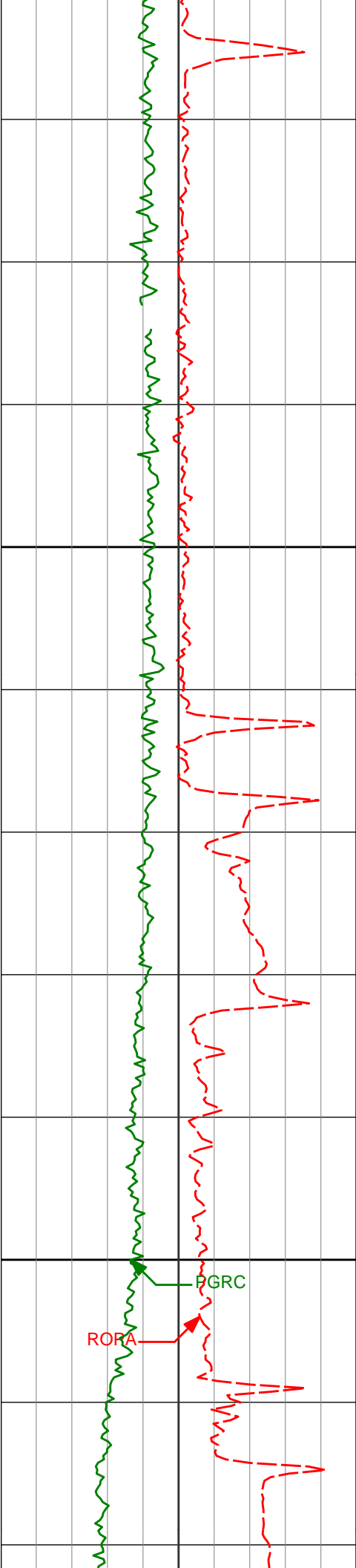
225.58°F

222.85°F

223.17°F

225.36°F

226.07°F



12900

13000

12870'

90.31°

0.87° 7497.99'

5635.08'

226.70°F

226.17°F

226.08°F

12964'

90.52°

0.19° 7497.31'

5729.07'

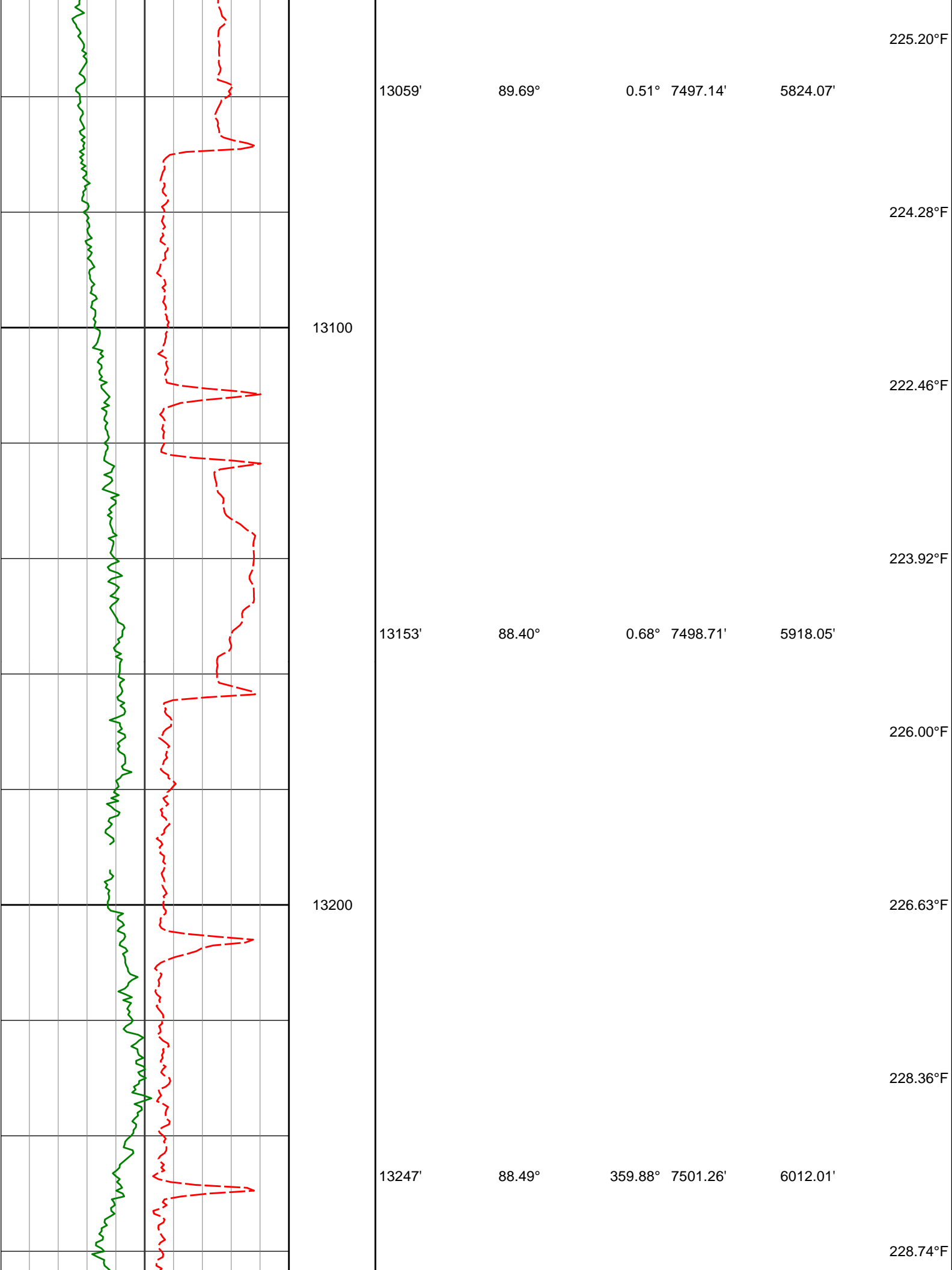
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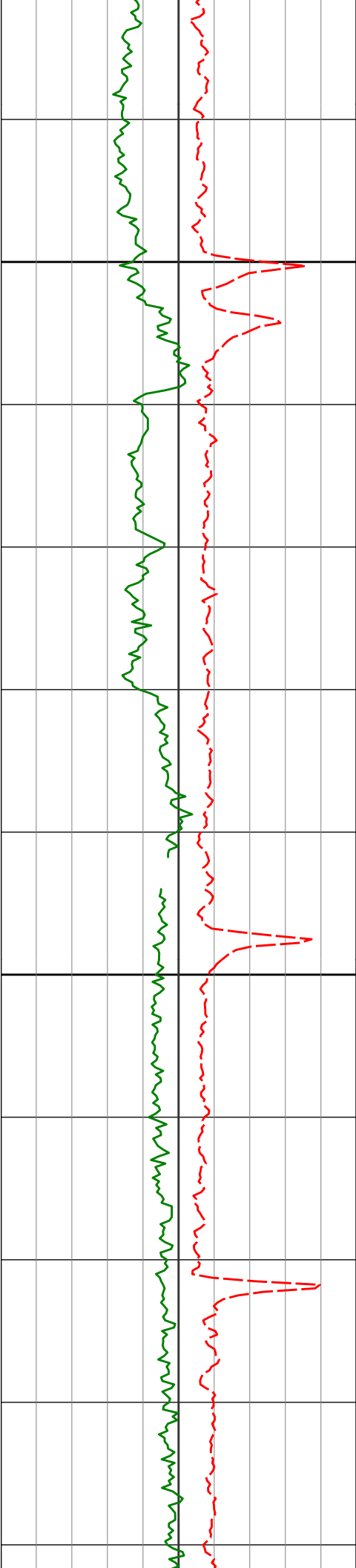
224.43°F

223.87°F

PGRC

RORA





13300

13342'

13400

13436'

88.77°

359.43°

7503.53'

6106.98'

89.20°

359.36°

7505.19'

6200.96'

228.84°F

229.40°F

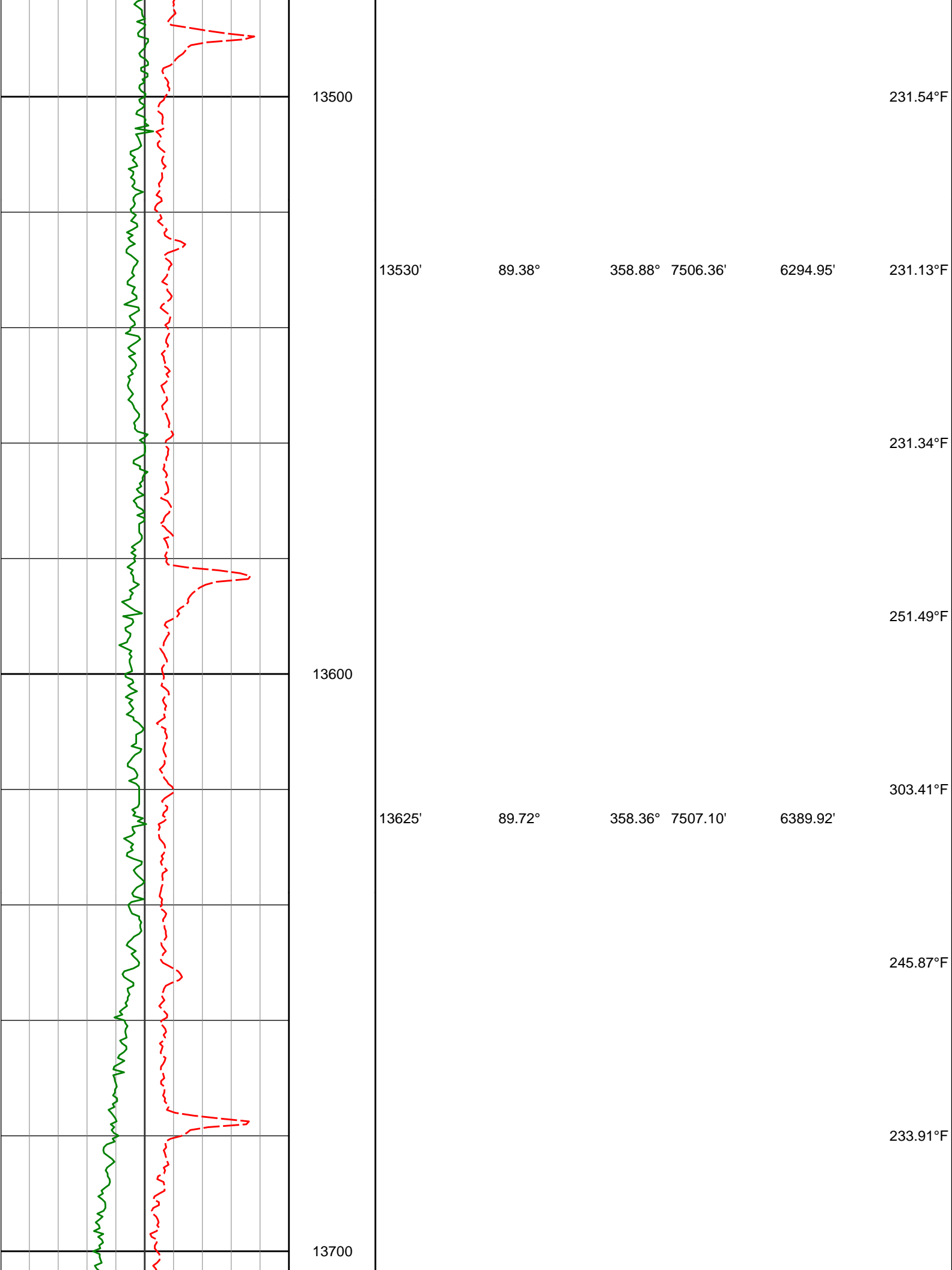
230.32°F

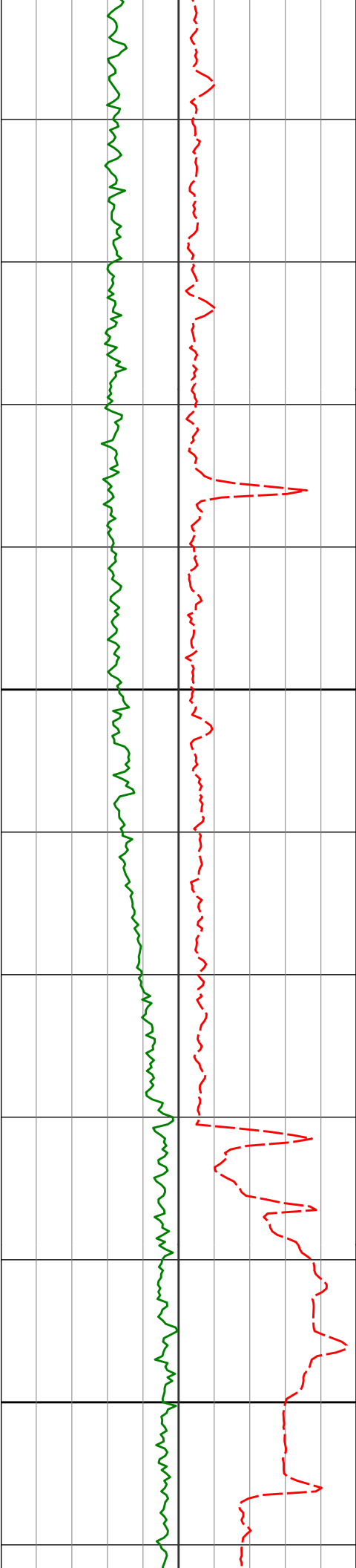
231.27°F

231.42°F

231.42°F

231.42°F





13800

13900

13719'

13813'

13908'

90.15°

90.89°

90.74°

357.98°

357.15°

357.55°

7507.21'

7506.36'

7505.01'

6483.87'

6577.78'

6672.68'

234.12°F

234.12°F

233.68°F

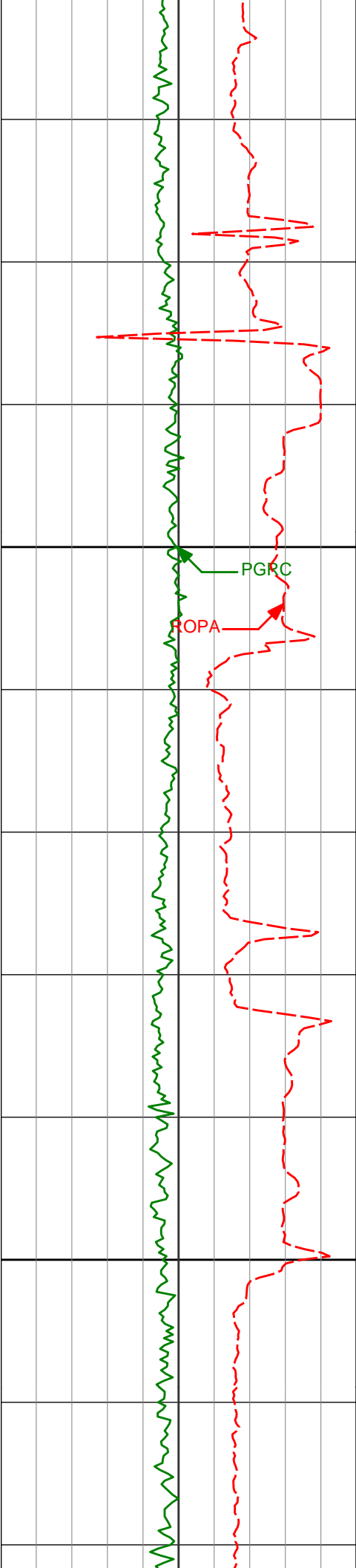
229.93°F

227.06°F

225.96°F

227.41°F

227.06°F



14000

14100

14002'

14096'

90.15°

89.54°

358.11°

359.10°

7504.28'

7504.53'

6766.61'

6860.58'

226.32°F

226.30°F

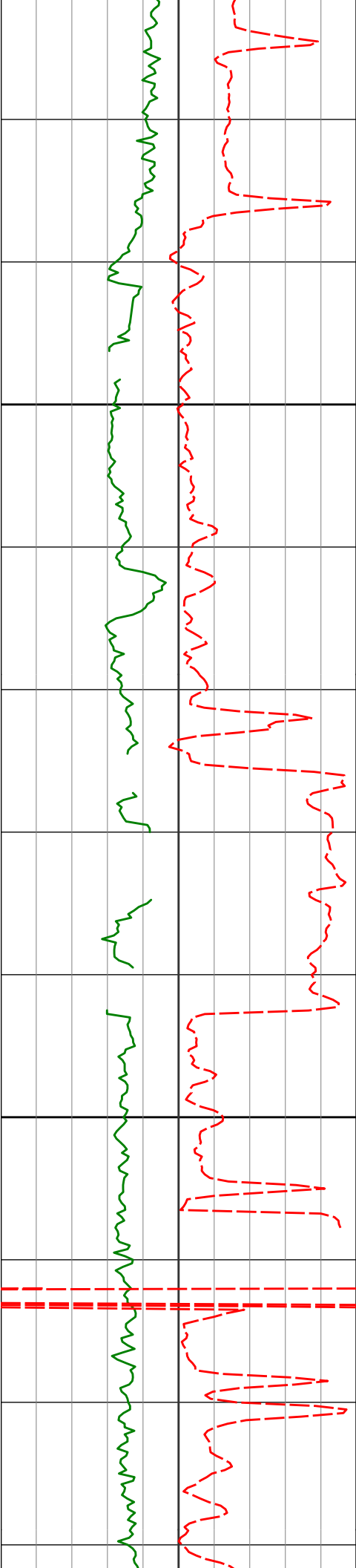
226.39°F

224.99°F

225.28°F

224.58°F

225.92°F



14200

14300

14191'

89.94°

358.89°

7504.96'

6955.57'

223.23°F

221.61°F

223.28°F

225.58°F

226.62°F

227.99°F

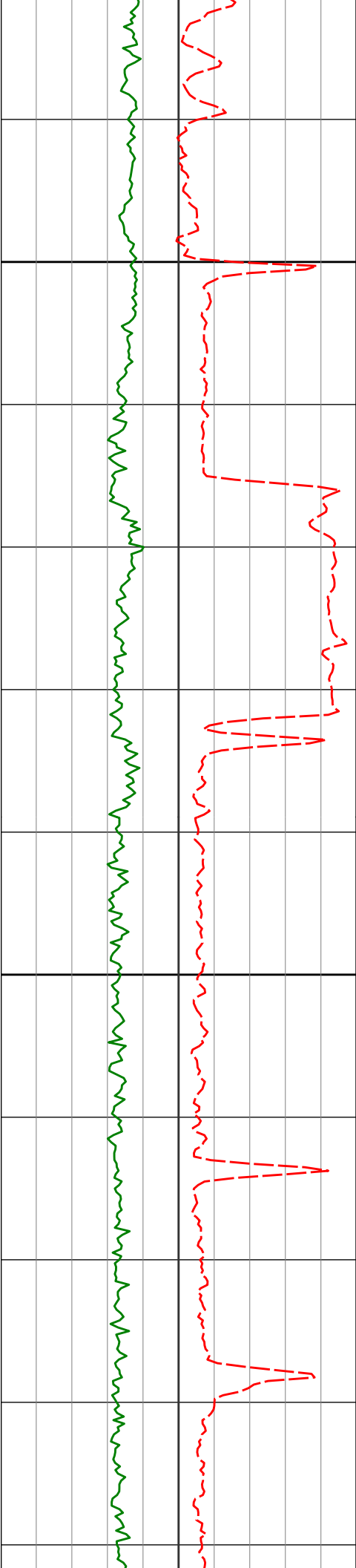
14285'

88.92°

359.00°

7505.90'

7049.55'



14400

14500

14380'

89.57°

358.90° 7507.15'

7144.52'

227.41°F

226.33°F

226.34°F

228.26°F

14474'

88.98°

0.10° 7508.34'

7238.51'

229.92°F

231.43°F

232.86°F

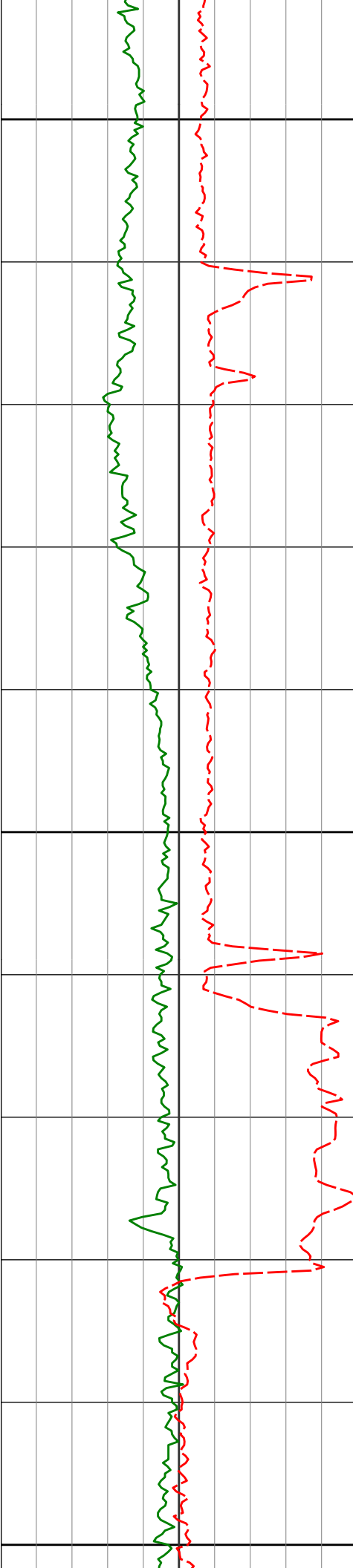
14569'

89.75°

0.39° 7509.39'

7333.50'

233.99°F



14600

234.48°F

235.09°F

14663'

90.31°

359.97°

7509.34'

7427.50'

232.36°F

14700

230.25°F

230.94°F

14757'

90.19°

0.55°

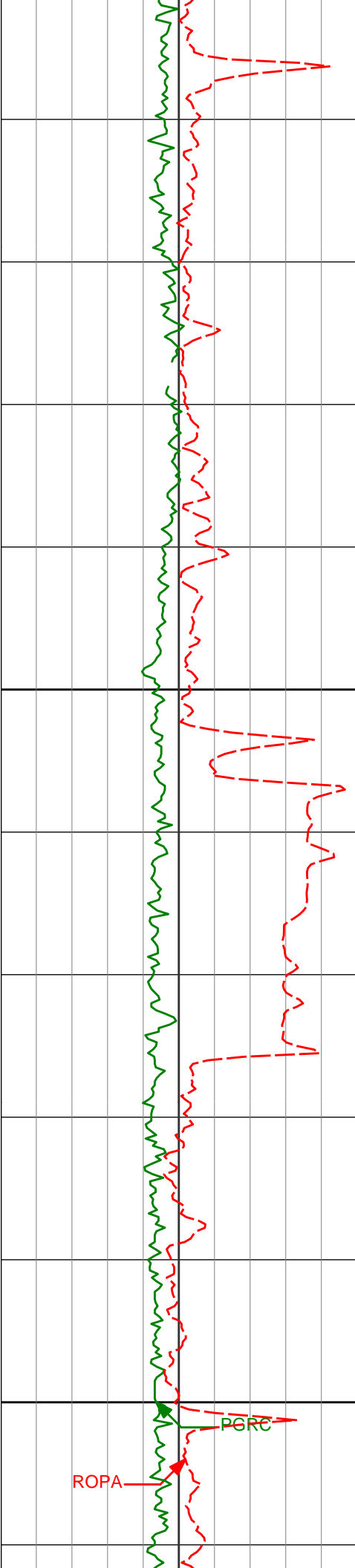
7508.93'

7521.50'

233.72°F

235.28°F

14800



14900

15000

14852'

90.56°

359.91°

7508.31'

7616.49'

235.36°F

234.33°F

234.23°F

235.59°F

14946'

89.04°

0.33°

7508.64'

7710.49'

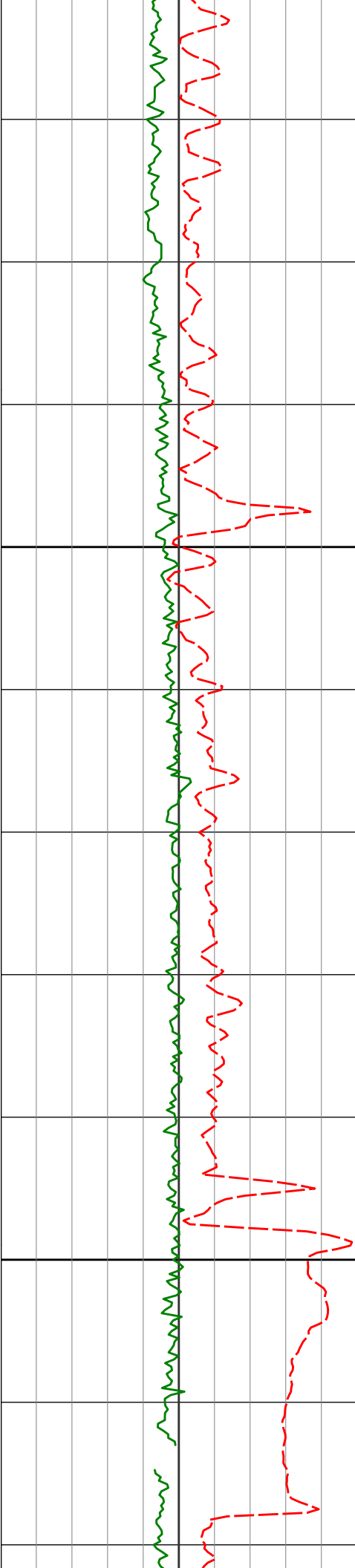
236.89°F

238.41°F

ROPA

PGRC

236.39°F



15100

15200

15041'

89.29°

359.75°

7510.02'

7805.48'

15135'

89.51°

359.20°

7511.01'

7899.47'

15230'

89.51°

1.01°

7511.82'

7994.46'

239.39°F

239.69°F

240.67°F

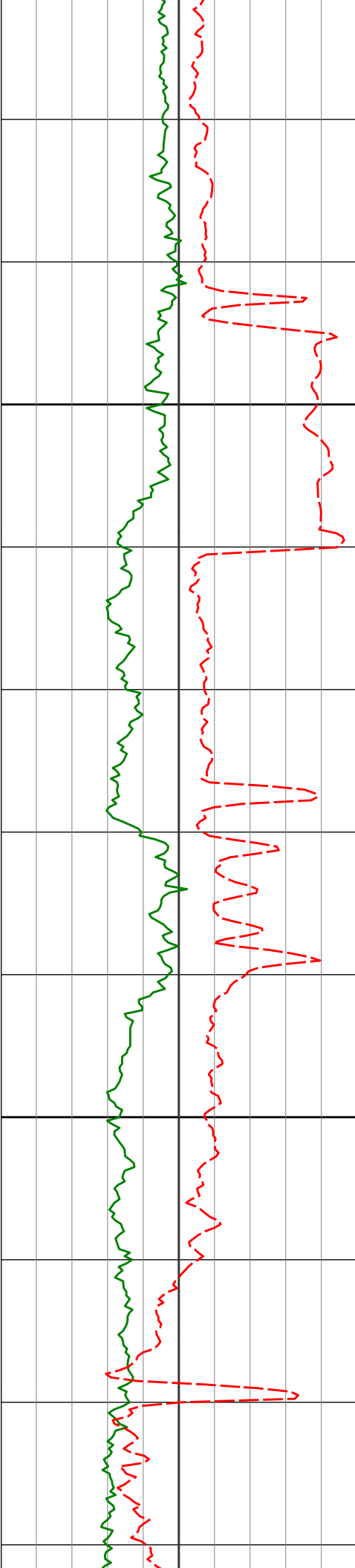
239.91°F

237.34°F

237.03°F

237.98°F

237.30°F



15300

15324'

89.29°

0.85° 7512.80'

8088.44'

15400

15418'

89.63°

359.65° 7513.69'

8182.44'

237.36°F

239.14°F

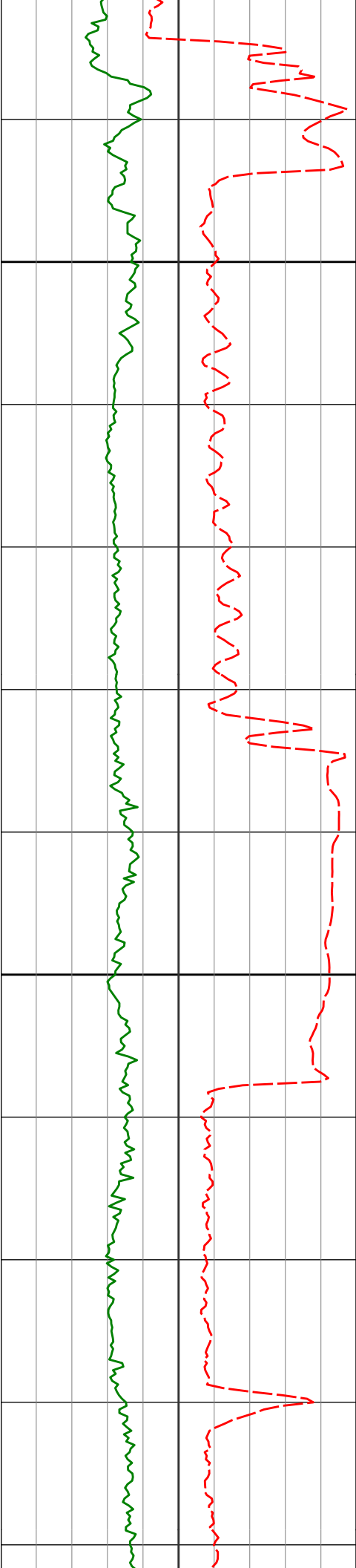
239.54°F

240.01°F

239.45°F

235.87°F

236.05°F



15500

15512'

90.40°

359.47°

7513.66'

8276.43'

236.00°F

234.58°F

234.68°F

15600

15607'

88.98°

359.63°

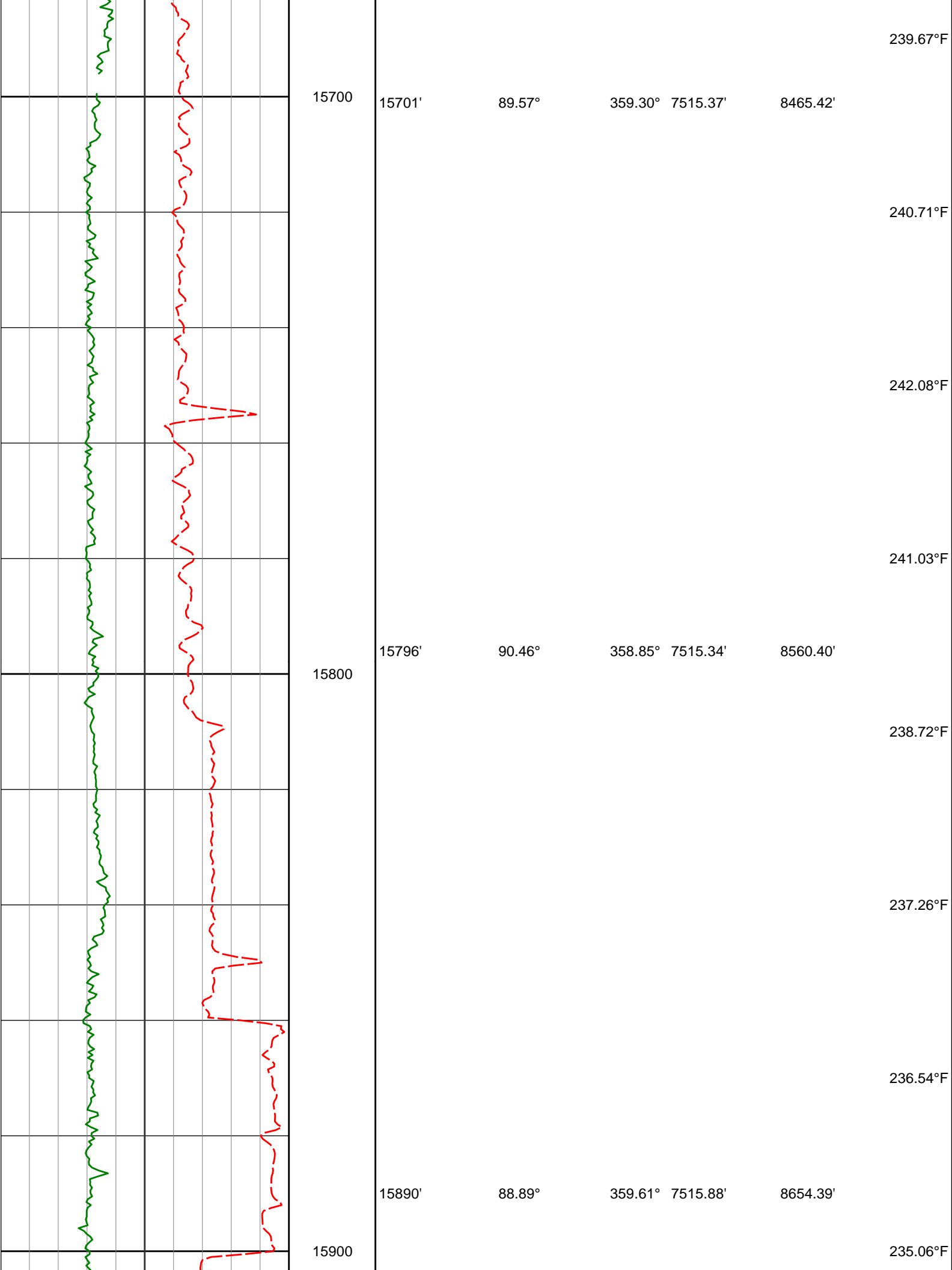
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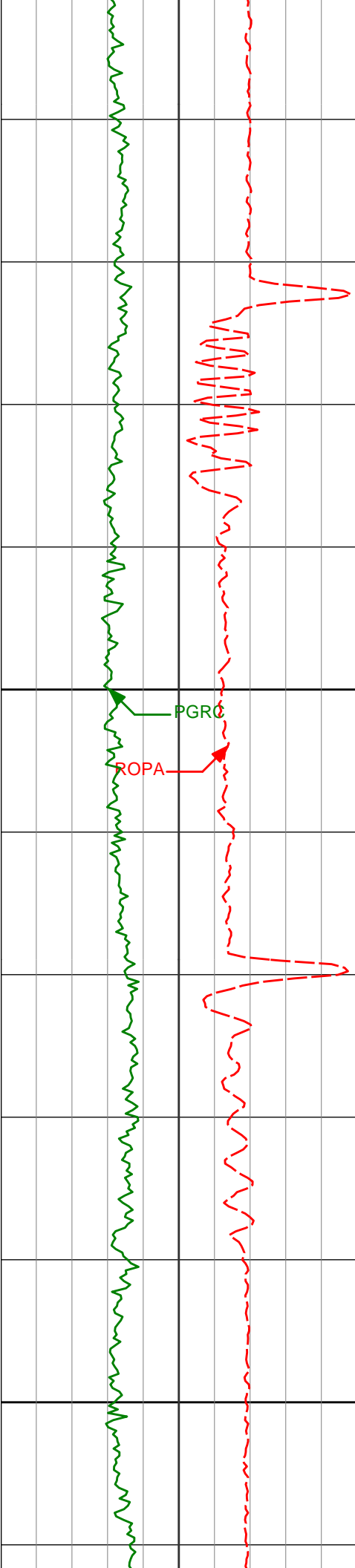
8371.43'

236.64°F

238.02°F

239.38°F





16000

16100

15984'

90.09°

0.13° 7516.71'

8748.38'

16078'

90.15°

359.08° 7516.52'

8842.38'

236.62°F

238.80°F

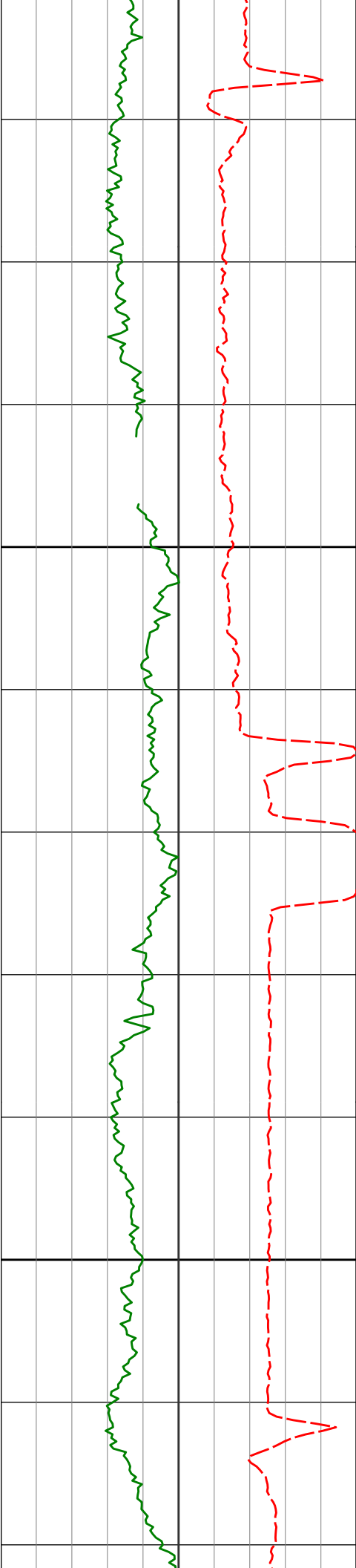
239.82°F

241.53°F

242.19°F

242.28°F

242.88°F



16173'

90.86°

359.01°

7515.68'

8937.37'

16200

16267'

91.58°

358.79°

7513.68'

9031.33'

16300

244.31°F

243.32°F

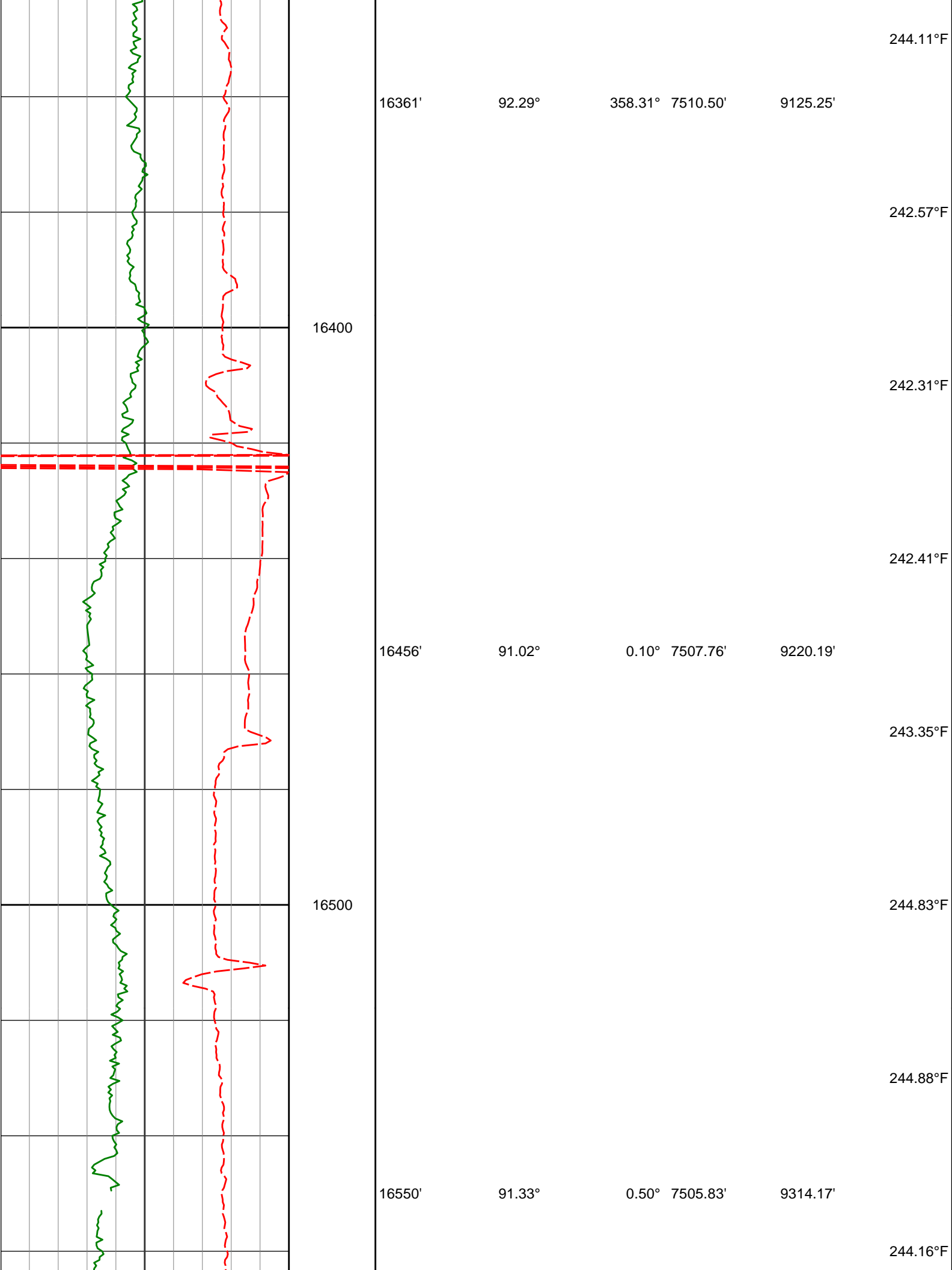
243.82°F

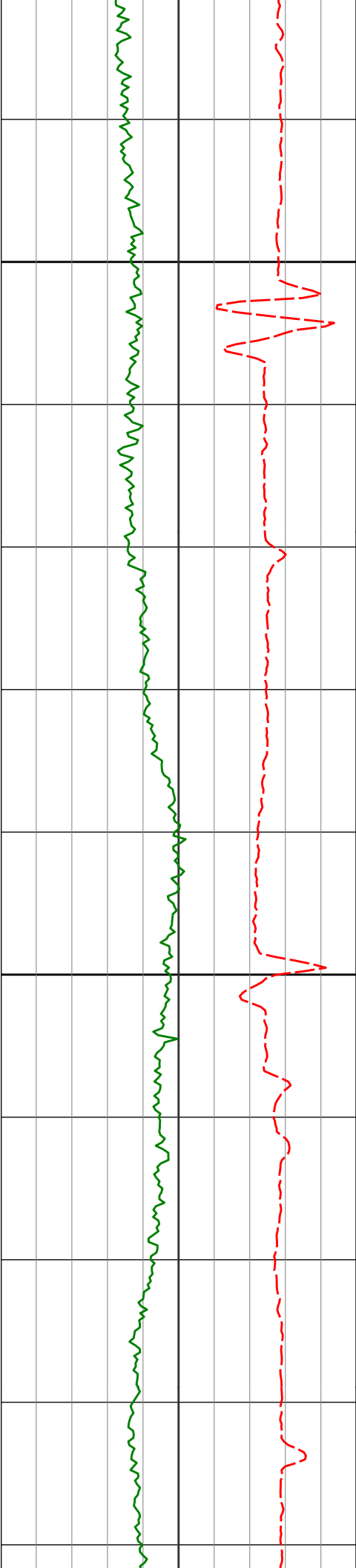
245.17°F

245.90°F

245.02°F

244.94°F





16600

16645'

16700

16739'

91.79°

0.08° 7503.25'

9409.13'

92.28°

0.08° 7499.91'

9503.07'

245.12°F

246.54°F

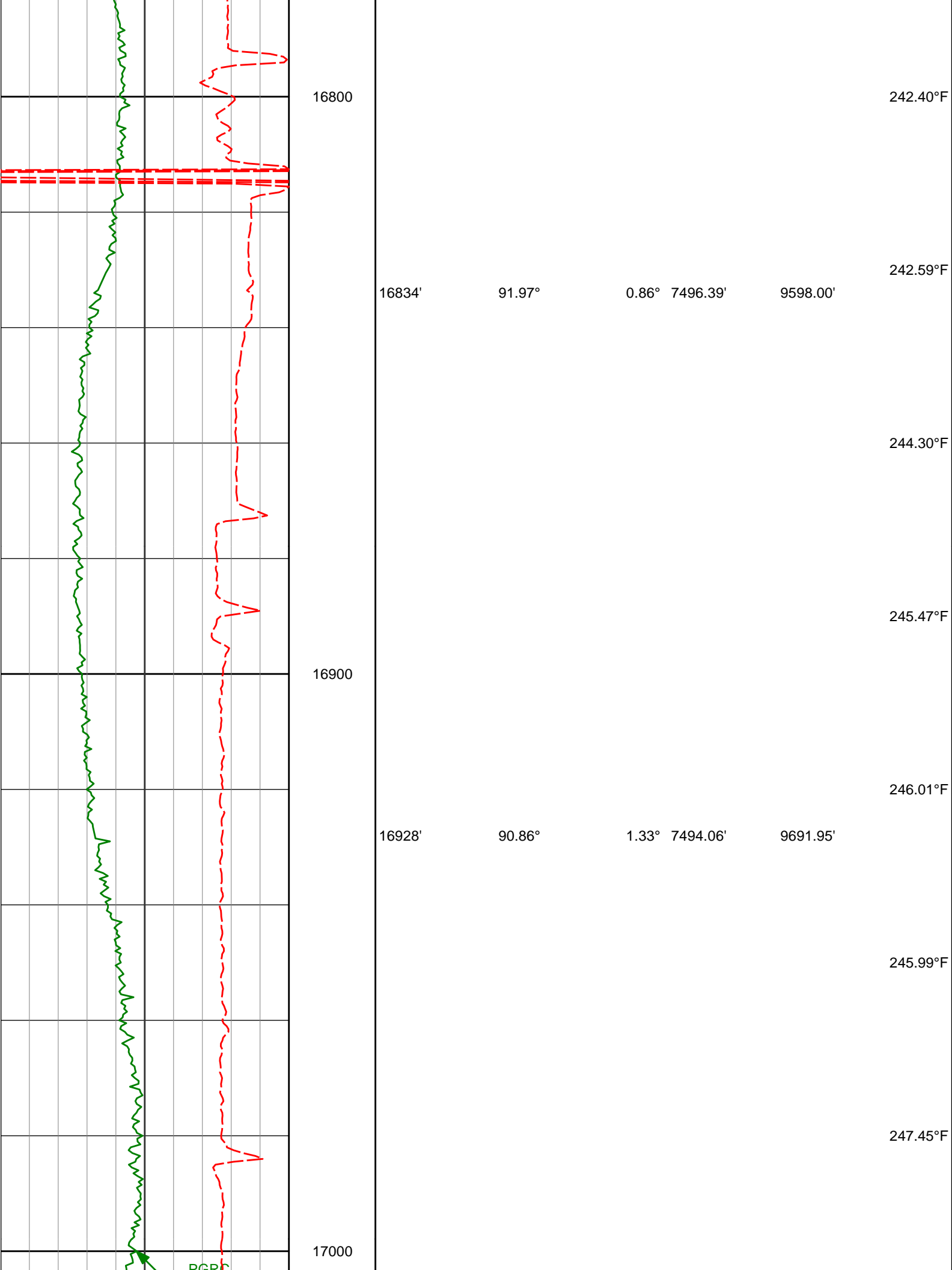
246.21°F

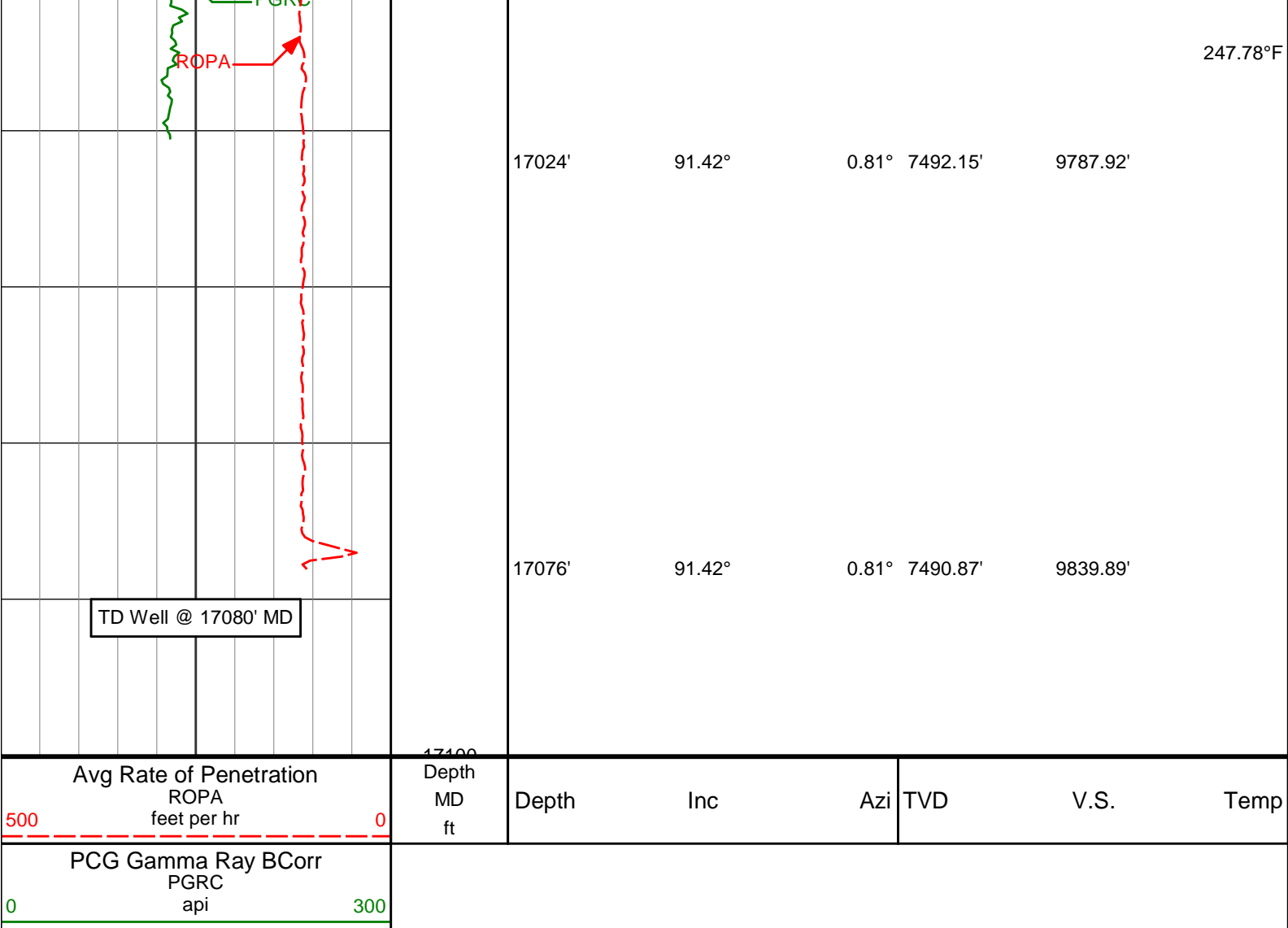
247.44°F

247.40°F

245.41°F

243.31°F





HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp
NRC 4N-4HZ
Wattenburg
Weld Colorado
USA
-XX-0901165847
All surveys are IFR Corrected

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
971.00	0.32	324.06	970.97	2.05 S	2.22 E	-2.05	TIE-IN
1105.00	0.81	306.87	1104.96	1.18 S	1.24 E	-1.18	0.38
1197.00	0.68	277.60	1196.96	0.72 S	0.18 E	-0.72	0.43
1289.00	0.71	284.32	1288.95	0.50 S	0.91 W	-0.50	0.09
1382.00	1.09	294.78	1381.94	0.01 N	2.27 W	0.01	0.44
1475.00	1.09	282.65	1474.92	0.57 N	3.94 W	0.58	0.25
1568.00	0.40	24.22	1567.91	1.06 N	4.67 W	1.07	1.33
1660.00	0.40	355.60	1659.91	1.68 N	4.56 W	1.68	0.21
1753.00	1.07	82.15	1752.91	2.12 N	3.73 W	2.12	1.20
1845.00	0.82	75.32	1844.89	2.40 N	2.24 W	2.41	0.30
1938.00	0.62	63.30	1937.89	2.80 N	1.15 W	2.80	0.27
2031.00	0.84	23.85	2030.88	3.65 N	0.42 W	3.65	0.57
2124.00	0.63	46.16	2123.87	4.63 N	0.22 E	4.63	0.38
2217.00	0.96	27.00	2216.86	5.67 N	0.95 E	5.67	0.45
2309.00	1.45	17.79	2308.84	7.47 N	1.65 E	7.47	0.57

2303.00	1.43	17.19	2308.84	7.47 N	1.03 E	7.47	0.37
2402.00	1.74	16.87	2401.81	9.94 N	2.42 E	9.94	0.31
2493.00	1.94	56.72	2492.76	12.11 N	4.11 E	12.10	1.39
2586.00	1.85	42.24	2585.71	14.08 N	6.43 E	14.08	0.52
2679.00	2.36	94.98	2678.66	15.03 N	9.35 E	15.02	2.07
2772.00	2.05	97.11	2771.59	14.66 N	12.91 E	14.65	0.34
2867.00	1.68	102.77	2866.54	14.14 N	15.95 E	14.12	0.43
2961.00	1.03	107.21	2960.51	13.58 N	18.10 E	13.57	0.70
3056.00	2.68	98.18	3055.46	13.02 N	21.12 E	13.00	1.76
3150.00	4.26	110.31	3149.28	11.49 N	26.57 E	11.47	1.84
3244.00	4.01	108.05	3243.04	9.26 N	32.97 E	9.23	0.32
3339.00	5.45	110.05	3337.71	6.68 N	40.36 E	6.65	1.53
3433.00	5.09	112.55	3431.32	3.55 N	48.41 E	3.51	0.45
3527.00	6.32	104.63	3524.85	0.65 N	57.27 E	0.60	1.55
3621.00	5.10	99.17	3618.38	1.32 S	66.40 E	-1.38	1.42
3715.00	6.89	108.33	3711.87	3.76 S	75.88 E	-3.83	2.15
3810.00	6.49	108.12	3806.22	7.23 S	86.39 E	-7.30	0.42
3904.00	5.38	102.61	3899.72	9.84 S	95.74 E	-9.92	1.33
3999.00	6.82	99.44	3994.18	11.74 S	105.65 E	-11.83	1.56
4093.00	5.72	97.29	4087.61	13.25 S	115.80 E	-13.35	1.20
4187.00	4.86	100.62	4181.21	14.58 S	124.36 E	-14.68	0.97
4282.00	6.66	95.95	4275.73	15.89 S	133.80 E	-16.00	1.96
4376.00	5.72	91.41	4369.18	16.57 S	143.90 E	-16.69	1.13
4470.00	5.29	89.60	4462.75	16.65 S	152.92 E	-16.79	0.49
4565.00	6.26	73.15	4557.27	15.12 S	162.25 E	-15.26	2.01
4659.00	5.06	69.35	4650.81	12.17 S	171.04 E	-12.32	1.34
4753.00	4.95	77.05	4744.45	9.80 S	178.87 E	-9.96	0.72
4848.00	5.56	78.68	4839.05	7.98 S	187.38 E	-8.14	0.66
4942.00	7.00	85.40	4932.49	6.63 S	197.55 E	-6.80	1.72
5036.00	6.23	86.29	5025.86	5.84 S	208.35 E	-6.02	0.83
5131.00	5.61	84.89	5120.35	5.09 S	218.12 E	-5.28	0.67
5225.00	6.05	95.82	5213.87	5.18 S	227.63 E	-5.38	1.27
5320.00	5.92	93.55	5308.35	6.00 S	237.50 E	-6.20	0.28
5414.00	5.30	93.22	5401.90	6.54 S	246.67 E	-6.75	0.66
5508.00	4.34	91.15	5495.57	6.85 S	254.56 E	-7.08	1.04
5603.00	6.19	93.93	5590.16	7.28 S	263.26 E	-7.51	1.97
5697.00	5.17	88.08	5683.70	7.48 S	272.55 E	-7.72	1.25
5791.00	4.32	80.05	5777.38	6.73 S	280.27 E	-6.97	1.15
5886.00	3.49	95.48	5872.16	6.39 S	286.68 E	-6.64	1.40
5980.00	2.64	97.98	5966.03	6.96 S	291.67 E	-7.22	0.92
6074.00	2.68	91.31	6059.92	7.31 S	296.01 E	-7.57	0.33
6169.00	2.29	95.13	6154.83	7.53 S	300.12 E	-7.79	0.45
6263.00	2.13	74.19	6248.77	7.22 S	303.67 E	-7.49	0.87
6358.00	1.55	70.62	6343.72	6.32 S	306.58 E	-6.58	0.62
6452.00	1.56	50.55	6437.68	5.08 S	308.77 E	-5.35	0.58
6547.00	1.32	71.02	6532.65	3.90 S	310.80 E	-4.18	0.59
6641.00	0.81	36.11	6626.64	3.02 S	312.22 E	-3.29	0.85
6735.00	0.62	58.46	6720.63	2.21 S	313.04 E	-2.49	0.36
6830.00	0.68	60.07	6815.62	1.66 S	313.97 E	-1.94	0.07
6877.00	1.17	29.86	6862.62	1.11 S	314.45 E	-1.38	1.44
6924.00	6.65	9.08	6909.49	2.00 N	315.12 E	1.72	11.85
6971.00	11.62	12.14	6955.88	9.32 N	316.54 E	9.04	10.62
7019.00	16.09	15.05	7002.47	20.47 N	319.29 E	20.19	9.42
7066.00	18.31	8.07	7047.37	34.08 N	322.02 E	33.79	6.44
7113.00	22.82	5.26	7091.37	50.47 N	323.89 E	50.19	9.82
7160.00	27.17	0.96	7133.96	70.29 N	324.91 E	70.00	10.02
7207.00	31.85	356.98	7174.86	93.41 N	324.43 E	93.13	10.79
7254.00	35.64	359.18	7213.93	119.50 N	323.58 E	119.22	8.47
7302.00	39.51	0.46	7251.97	148.76 N	323.51 E	148.48	8.22
7349.00	43.78	1.52	7287.08	179.98 N	324.06 E	179.70	9.21
7396.00	46.76	0.39	7320.16	213.36 N	324.61 E	213.08	6.57
7443.00	50.51	1.21	7351.21	248.63 N	325.10 E	248.34	8.09
7490.00	53.82	2.57	7380.04	285.72 N	326.34 E	285.43	7.40
7537.00	58.11	2.27	7406.34	324.62 N	327.98 E	324.34	9.14
7585.00	61.82	2.14	7430.36	366.14 N	329.58 E	365.85	7.73
7632.00	64.26	1.14	7451.67	408.01 N	330.77 E	407.72	5.53
7679.00	69.54	359.73	7470.10	451.23 N	331.09 E	450.94	11.57
7726.00	73.47	358.80	7485.01	495.79 N	330.51 E	495.50	8.57
7773.00	76.50	0.08	7497.18	541.17 N	330.07 E	540.88	6.96
7820.00	81.61	1.25	7506.10	587.30 N	330.61 E	587.01	11.14
7836.00	83.23	1.20	7508.21	603.15 N	330.95 E	602.86	10.13

7924.00	87.90	0.67	7515.02	690.85 N	332.38 E	690.56	5.34
8019.00	88.71	0.43	7517.83	785.81 N	333.29 E	785.52	0.89
8113.00	89.51	359.49	7519.29	879.79 N	333.23 E	879.50	1.31
8208.00	90.46	359.11	7519.31	974.79 N	332.07 E	974.50	1.08
8302.00	91.02	359.80	7518.10	1068.77 N	331.17 E	1068.48	0.95
8397.00	91.14	1.29	7516.31	1163.75 N	332.08 E	1163.46	1.57
8491.00	90.28	1.48	7515.14	1257.71 N	334.35 E	1257.42	0.94
8586.00	90.92	1.20	7514.15	1352.68 N	336.57 E	1352.39	0.74
8680.00	89.88	1.65	7513.49	1446.65 N	338.91 E	1446.35	1.21
8774.00	89.17	1.95	7514.27	1540.60 N	341.86 E	1540.30	0.82
8869.00	89.78	1.56	7515.14	1635.55 N	344.77 E	1635.25	0.76
8963.00	90.56	0.85	7514.86	1729.53 N	346.75 E	1729.22	1.12
9058.00	91.30	0.77	7513.32	1824.50 N	348.09 E	1824.20	0.78
9152.00	92.25	0.23	7510.41	1918.45 N	348.91 E	1918.15	1.16
9243.00	92.47	0.01	7506.66	2009.38 N	349.10 E	2009.07	0.34
9336.00	91.79	359.83	7503.20	2102.31 N	348.97 E	2102.01	0.76
9428.00	91.51	359.69	7500.56	2194.27 N	348.58 E	2193.97	0.34
9520.00	91.05	359.40	7498.50	2286.25 N	347.85 E	2285.94	0.59
9613.00	90.80	359.60	7497.00	2379.23 N	347.04 E	2378.93	0.34
9706.00	89.63	359.57	7496.65	2472.23 N	346.37 E	2471.92	1.26
9799.00	90.28	359.71	7496.72	2565.22 N	345.78 E	2564.92	0.71
9892.00	90.86	359.12	7495.80	2658.21 N	344.84 E	2657.91	0.89
9984.00	89.63	358.77	7495.40	2750.19 N	343.14 E	2749.89	1.39
10076.00	90.12	359.03	7495.60	2842.18 N	341.38 E	2841.88	0.60
10169.00	90.52	358.33	7495.09	2935.15 N	339.23 E	2934.85	0.87
10262.00	91.11	358.07	7493.76	3028.09 N	336.31 E	3027.80	0.69
10355.00	91.76	357.78	7491.43	3121.00 N	332.95 E	3120.71	0.77
10448.00	90.31	357.40	7489.75	3213.90 N	329.04 E	3213.62	1.61
10540.00	90.09	359.93	7489.43	3305.87 N	326.89 E	3305.58	2.76
10633.00	88.98	0.08	7490.19	3398.87 N	326.90 E	3398.58	1.20
10724.00	89.48	359.56	7491.41	3489.86 N	326.61 E	3489.57	0.79
10817.00	88.67	0.83	7492.91	3582.84 N	326.93 E	3582.55	1.62
10910.00	89.23	359.60	7494.62	3675.82 N	327.28 E	3675.54	1.45
11003.00	89.66	358.96	7495.52	3768.81 N	326.11 E	3768.52	0.83
11096.00	90.12	359.04	7495.70	3861.80 N	324.49 E	3861.51	0.50
11189.00	91.11	358.44	7494.70	3954.77 N	322.44 E	3954.48	1.24
11282.00	90.80	359.65	7493.15	4047.74 N	320.89 E	4047.46	1.34
11374.00	90.03	359.34	7492.48	4139.73 N	320.08 E	4139.45	0.90
11467.00	89.66	359.61	7492.73	4232.73 N	319.23 E	4232.45	0.49
11557.00	88.89	1.82	7493.87	4322.71 N	320.35 E	4322.43	2.60
11649.00	89.23	1.70	7495.38	4414.65 N	323.18 E	4414.37	0.39
11741.00	89.72	1.38	7496.22	4506.61 N	325.65 E	4506.33	0.64
11832.00	90.15	1.05	7496.33	4597.59 N	327.58 E	4597.31	0.60
11926.00	89.75	1.16	7496.41	4691.58 N	329.39 E	4691.29	0.44
12021.00	90.37	0.90	7496.31	4786.56 N	331.10 E	4786.27	0.71
12115.00	89.41	1.60	7496.49	4880.54 N	333.15 E	4880.24	1.26
12209.00	89.78	1.14	7497.15	4974.51 N	335.40 E	4974.21	0.63
12304.00	90.00	1.23	7497.34	5069.48 N	337.36 E	5069.19	0.25
12398.00	90.34	0.53	7497.06	5163.47 N	338.81 E	5163.17	0.83
12492.00	89.17	1.32	7497.46	5257.46 N	340.32 E	5257.16	1.50
12587.00	89.91	1.15	7498.22	5352.43 N	342.37 E	5352.13	0.80
12681.00	90.34	0.89	7498.02	5446.42 N	344.04 E	5446.11	0.53
12776.00	89.69	1.13	7497.99	5541.40 N	345.72 E	5541.10	0.73
12870.00	90.31	0.87	7497.99	5635.39 N	347.36 E	5635.08	0.72
12964.00	90.52	0.19	7497.31	5729.38 N	348.23 E	5729.07	0.76
13059.00	89.69	0.51	7497.14	5824.38 N	348.81 E	5824.07	0.94
13153.00	88.40	0.68	7498.71	5918.36 N	349.79 E	5918.05	1.38
13247.00	88.49	359.88	7501.26	6012.32 N	350.24 E	6012.01	0.86
13342.00	88.77	359.43	7503.53	6107.29 N	349.67 E	6106.98	0.56
13436.00	89.20	359.36	7505.19	6201.27 N	348.68 E	6200.96	0.46
13530.00	89.38	358.88	7506.36	6295.25 N	347.24 E	6294.95	0.55
13625.00	89.72	358.36	7507.10	6390.22 N	344.95 E	6389.92	0.65
13719.00	90.15	357.98	7507.21	6484.17 N	341.95 E	6483.87	0.61
13813.00	90.89	357.15	7506.36	6578.08 N	337.95 E	6577.78	1.18
13908.00	90.74	357.55	7505.01	6672.97 N	333.56 E	6672.68	0.45
14002.00	90.15	358.11	7504.28	6766.90 N	330.00 E	6766.61	0.87
14096.00	89.54	359.10	7504.53	6860.87 N	327.71 E	6860.58	1.24
14191.00	89.94	358.89	7504.96	6955.85 N	326.05 E	6955.57	0.48
14285.00	88.92	359.00	7505.90	7049.83 N	324.32 E	7049.55	1.09
14380.00	89.57	358.90	7507.15	7144.81 N	322.58 E	7144.52	0.69
14474.00	88.98	0.10	7508.34	7238.79 N	321.75 E	7238.51	1.42

14569.00	89.75	0.39	7509.39	7333.79 N	322.16 E	7333.50	0.87
14663.00	90.31	359.97	7509.34	7427.78 N	322.46 E	7427.50	0.74
14757.00	90.19	0.55	7508.93	7521.78 N	322.88 E	7521.50	0.63
14852.00	90.56	359.91	7508.31	7616.78 N	323.26 E	7616.49	0.78
14946.00	89.04	0.33	7508.64	7710.78 N	323.46 E	7710.49	1.68
15041.00	89.29	359.75	7510.02	7805.76 N	323.53 E	7805.48	0.66
15135.00	89.51	359.20	7511.01	7899.76 N	322.67 E	7899.47	0.63
15230.00	89.51	1.01	7511.82	7994.75 N	322.84 E	7994.46	1.91
15324.00	89.29	0.85	7512.80	8088.73 N	324.37 E	8088.44	0.29
15418.00	89.63	359.65	7513.69	8182.72 N	324.78 E	8182.44	1.33
15512.00	90.40	359.47	7513.66	8276.72 N	324.05 E	8276.43	0.84
15607.00	88.98	359.63	7514.18	8371.71 N	323.31 E	8371.43	1.50
15701.00	89.57	359.30	7515.37	8465.70 N	322.43 E	8465.42	0.72
15796.00	90.46	358.85	7515.34	8560.69 N	320.90 E	8560.40	1.05
15890.00	88.89	359.61	7515.88	8654.67 N	319.63 E	8654.39	1.86
15984.00	90.09	0.13	7516.71	8748.67 N	319.42 E	8748.38	1.39
16078.00	90.15	359.08	7516.52	8842.66 N	318.77 E	8842.38	1.12
16173.00	90.86	359.01	7515.68	8937.65 N	317.19 E	8937.37	0.75
16267.00	91.58	358.79	7513.68	9031.61 N	315.38 E	9031.33	0.80
16361.00	92.29	358.31	7510.50	9125.52 N	313.01 E	9125.25	0.91
16456.00	91.02	0.10	7507.76	9220.47 N	311.69 E	9220.19	2.31
16550.00	91.33	0.50	7505.83	9314.45 N	312.18 E	9314.17	0.54
16645.00	91.79	0.08	7503.25	9409.41 N	312.66 E	9409.13	0.66
16739.00	92.28	0.08	7499.91	9503.35 N	312.79 E	9503.07	0.52
16834.00	91.97	0.86	7496.39	9598.28 N	313.57 E	9598.00	0.88
16928.00	90.86	1.33	7494.06	9692.23 N	315.37 E	9691.95	1.28
17024.00	91.42	0.81	7492.15	9788.20 N	317.16 E	9787.92	0.80
17076.00	91.42	0.81	7490.87	9840.18 N	317.90 E	9839.89	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 359.95 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.53 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 17076.00 FEET
IS 9845.31 FEET ALONG 1.85 DEGREES (TRUE)**