

## PCGK - Pressure Case Gamma

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	23-Apr-15	25-Apr-15			
<b>Rig Bit Number</b>	0200	3			
<b>Bit Size (in)</b>	8.750	6.125			
<b>Tool Nominal OD (in)</b>	6.890	4.750			
<b>Log Start Depth (MD, ft)</b>	683.00	6,428.00			
<b>Log End Depth (MD, ft)</b>	6,428.00	10,305.00			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	21-Apr-15 23:50	24-Apr-15 06:48			
<b>Drill/Wipe End Date and Time</b>	23-Apr-15 06:25	25-Apr-15 05:06			
<b>Min Inc (deg) @ Depth (MD, ft)</b>	0.18 @ 734.00	88.46 @ 7,441.00			
<b>Max Inc (deg) @ Depth (MD, ft)</b>	88.97 @ 6,428.00	92.87 @ 9,241.00			
<b>Bit TFA(in2) / Bit Type</b>	1.24 / PDC	0.65 / PDC			
<b>Flow Rate (gpm)</b>	600.00	318.42			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	N/A / N/A	N/A / N/A			
<b>Fluid Type</b>	Native/Spud Mud	Fresh Water Gel			
<b>Density (ppg) / Viscosity (spqt)</b>	8.65 / 28.00	9.60 / 34.00			
<b>Filtrate CL (ppm)</b>	1,700.00	1,700.00			
<b>pH / Fluid Loss (mptm)</b>	8.10 / 0	10.80 / 10			
<b>PV (cP) / YP (lbf2)</b>	1 / 4.00	6 / 5.00			
<b>% Solids / % Sand</b>	2.20 / 0.15	6.30 / 0.15			
<b>% Oil / Oil:Water Ratio</b>	N/A / N/A	N/A / N/A			
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Max Tool Temp (deg F) @ 100 ft</b>	173.75 / 100 ft	217.22 / 100 ft			

Max Tool Temp (degF) / Source	172.78 / PCM	217.60 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 172.78	N/A @ 217.60			
Lead MWD Engineer	Robert Barnes	Robert Barnes			
Customer Representative	Jlm Turner	Jlm Turner			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404298	12310755			
Insert Serial Number	10997267	11680742			
Date and Time Initialized	21-Apr-15 13:14	23-Apr-15 09:01			
Date and Time Read	23-Apr-15 11:59	25-Apr-15 13:47			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	68.00			
Software Version	6.21	6.21			
Sub Serial Number	11404298	12310755			
Sonde Serial Number	11638501	11297516			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	183.50	104.40			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.96	70.64			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404298	12310755			
Insert/Sonde Serial Number	11681051	11293345			

## REMARKS

1. All depths are calibrated to driller's pipe tally and are Measured depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
  - 1:600 Log  
PGRC (Gamma CG) and ROPA (Average Rate of Penetration)  
Interval Resolution: 1.0 ft  
Interval Distance: 3.0 ft
  - 1:240 Log  
PGRC (Gamma CG):  
Interval Resolution: 0.5 ft  
Interval Distance: 0.6 ft
  - ROPA (Average Rate Of Penetration):  
Interval Resolution: 0.5 ft

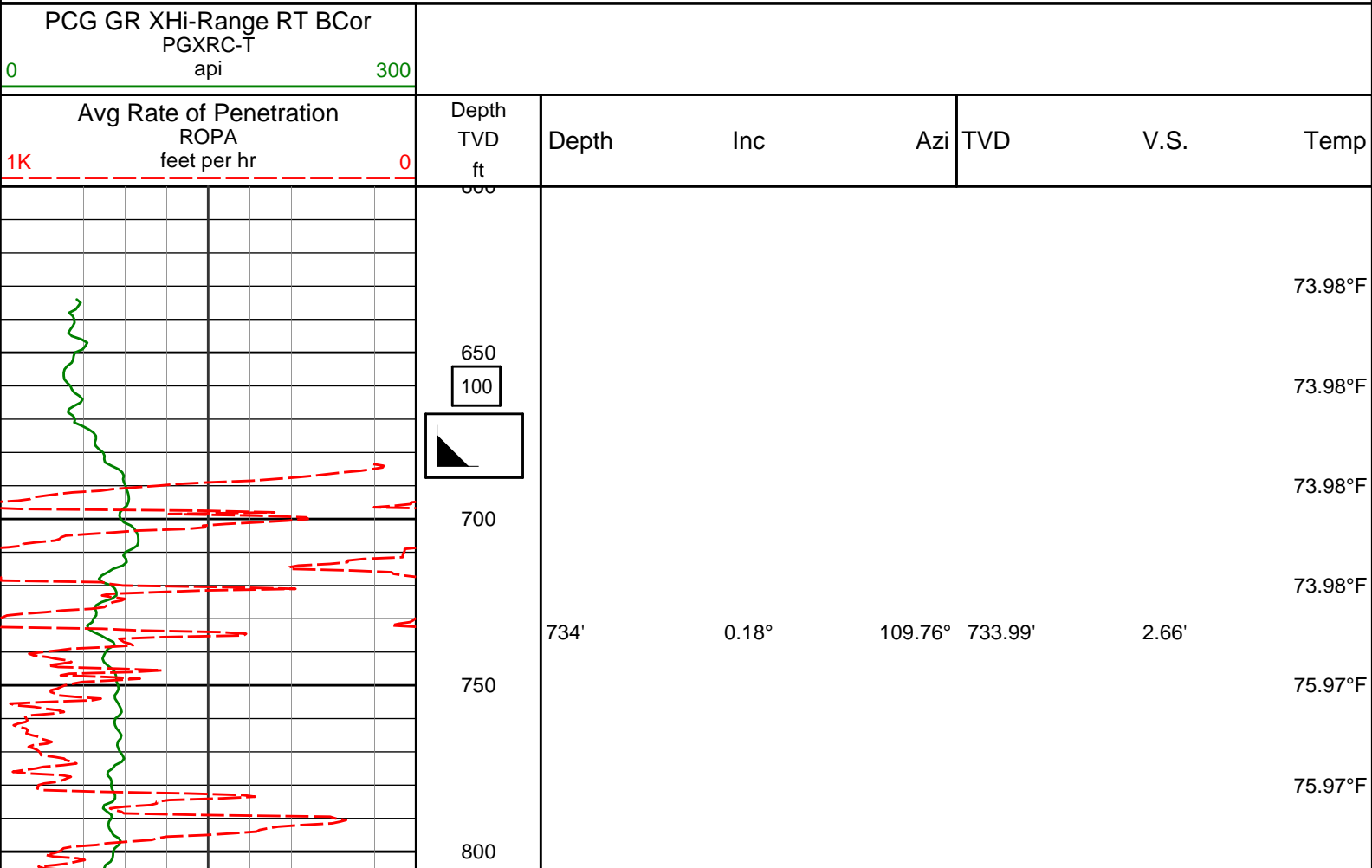
Interval Resolution: 1.2 ft

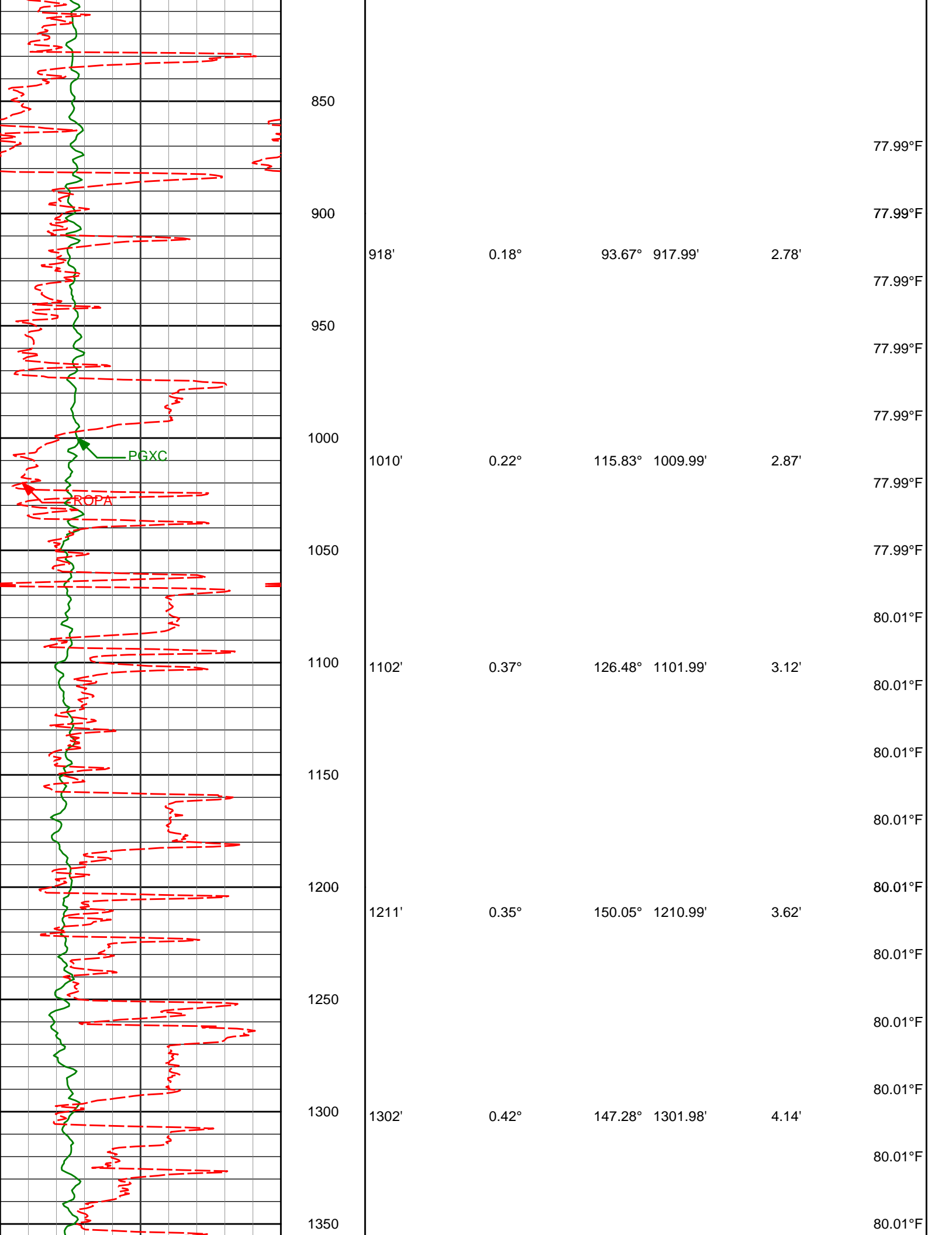
6. Insite Version v8.1.10

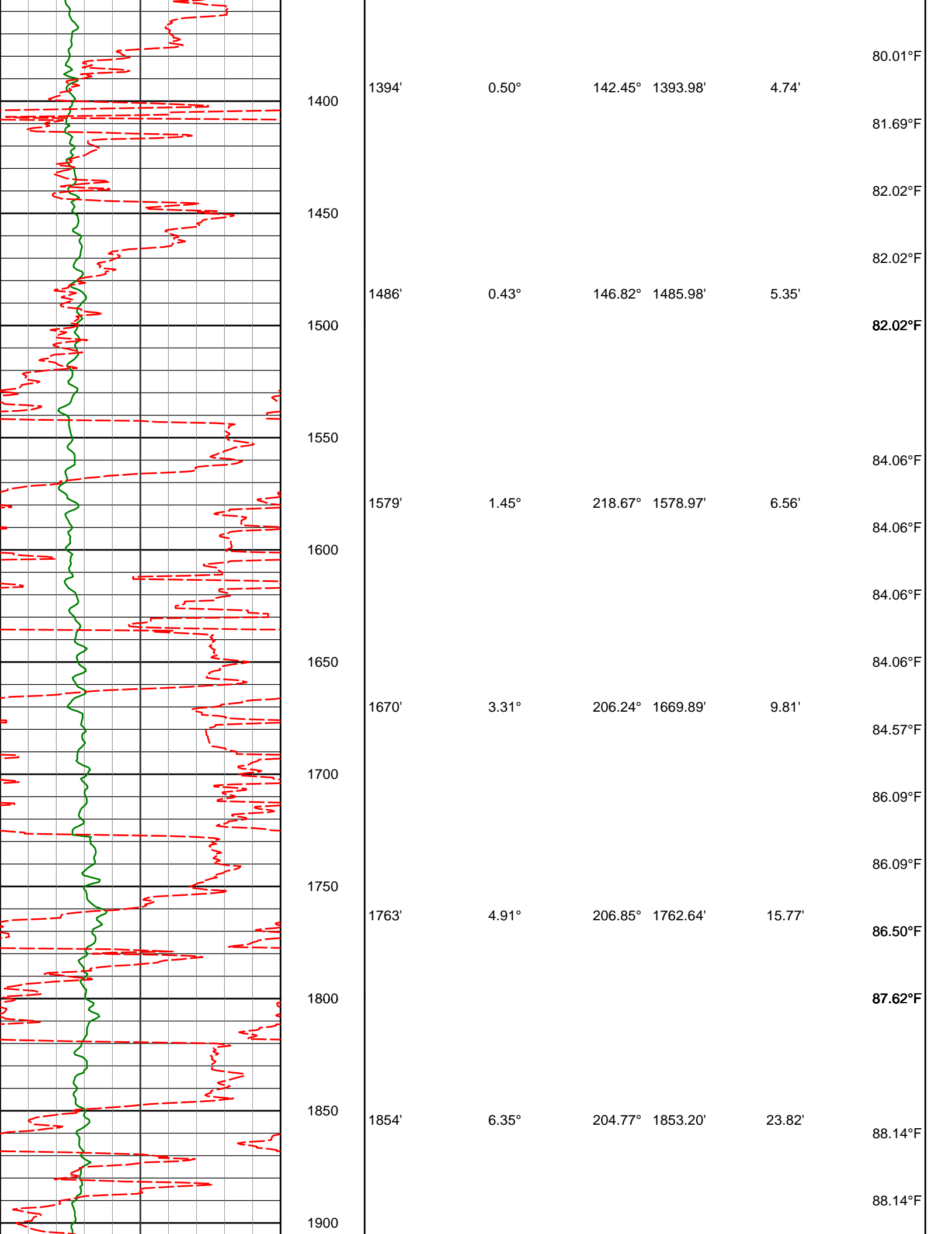
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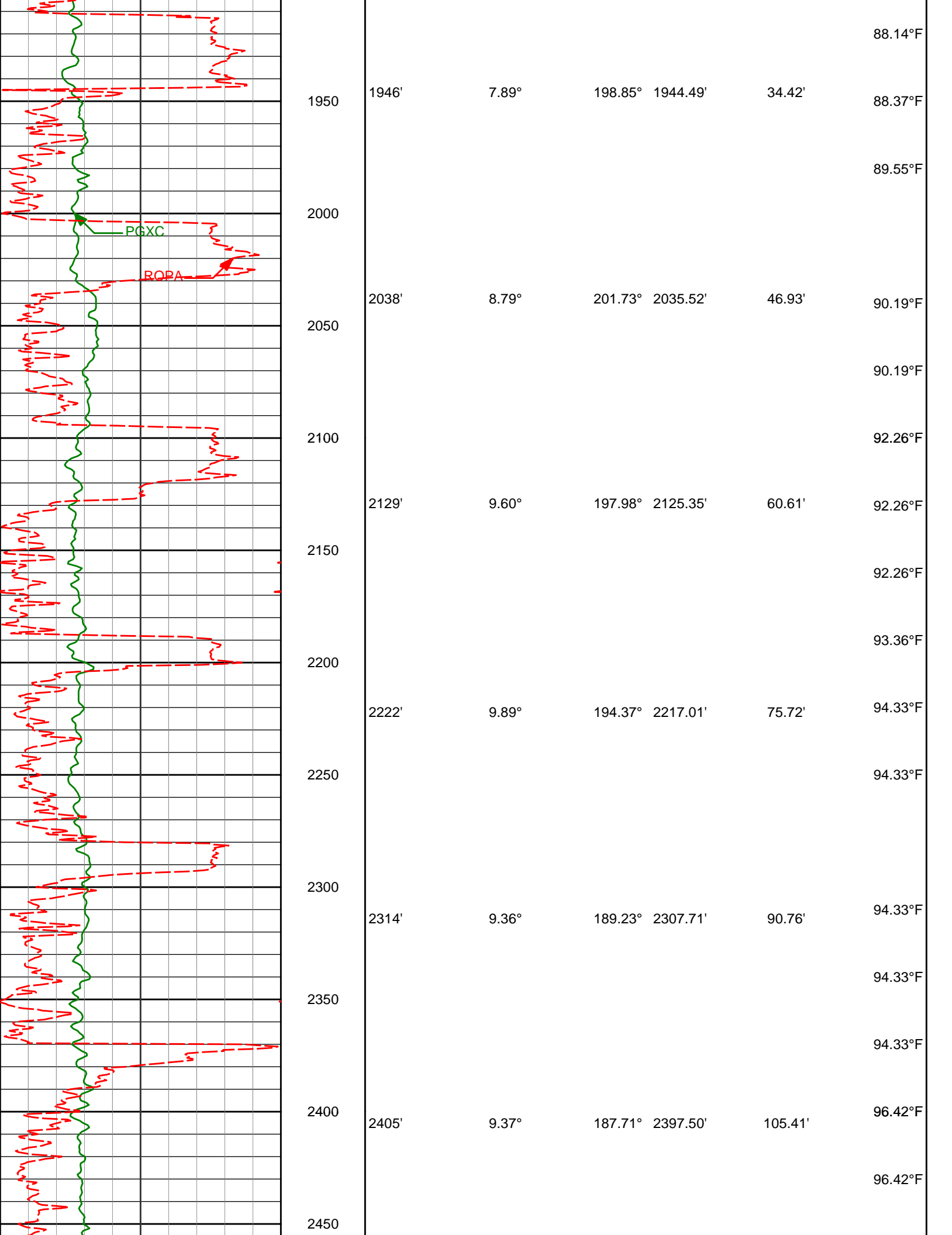
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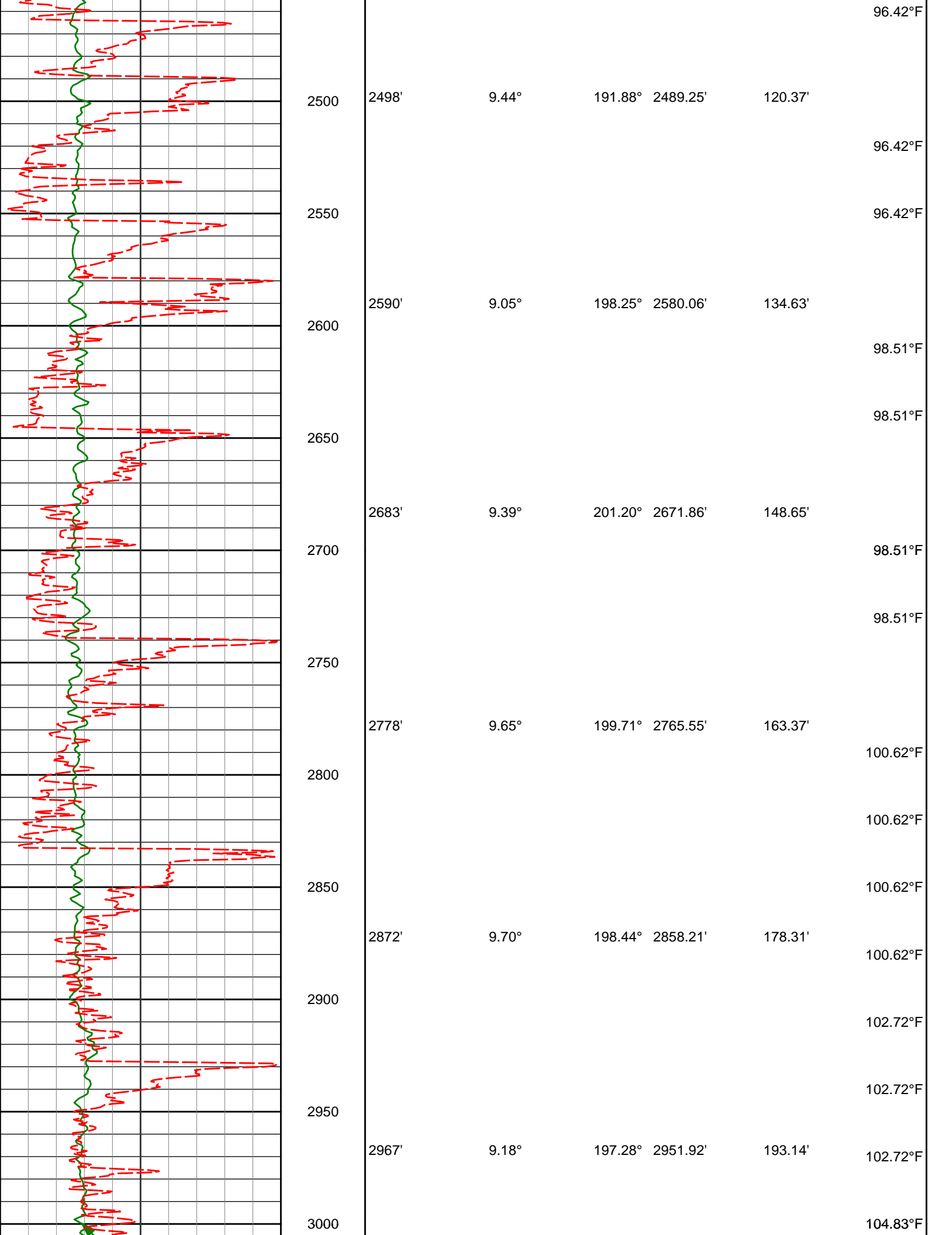
MD Detail 1:600 Scale

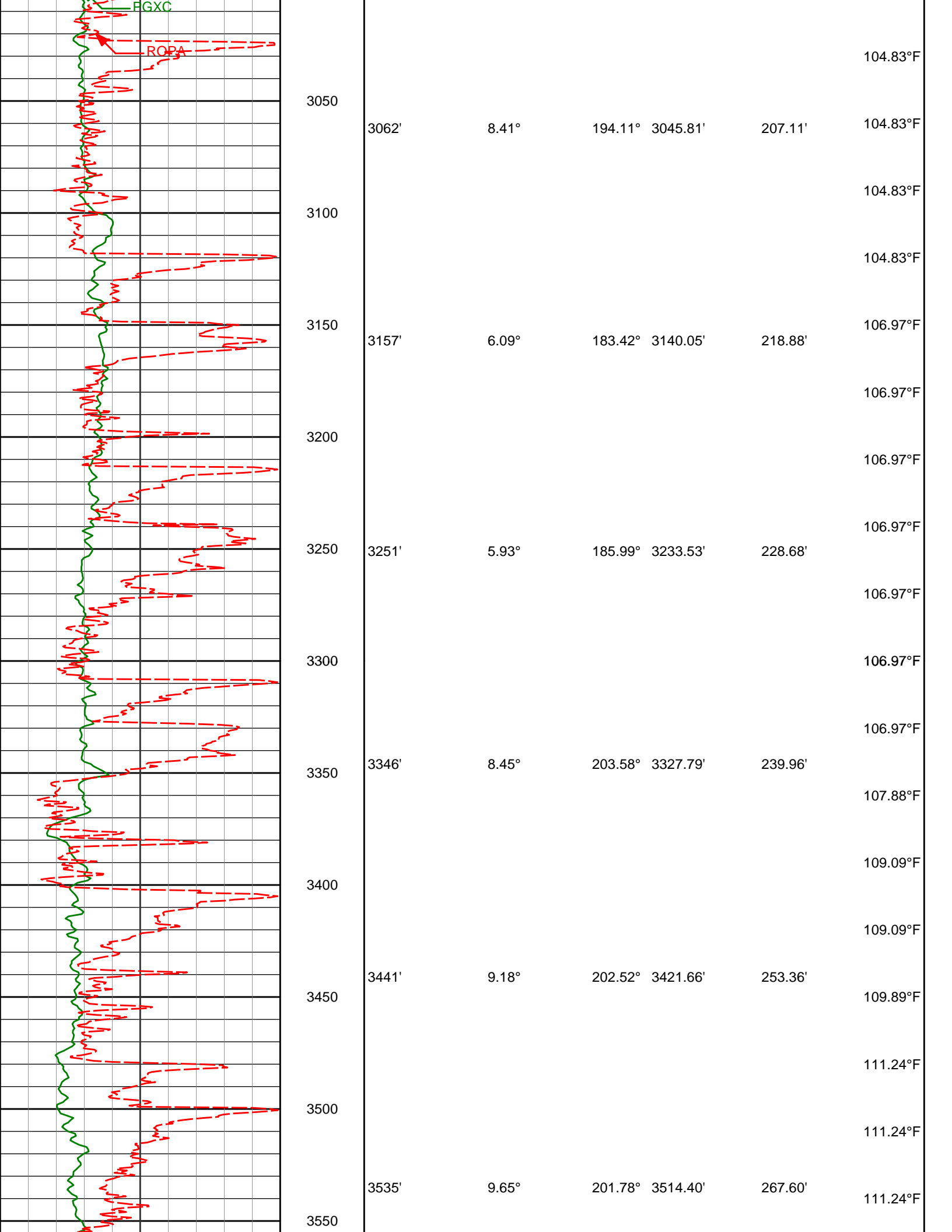




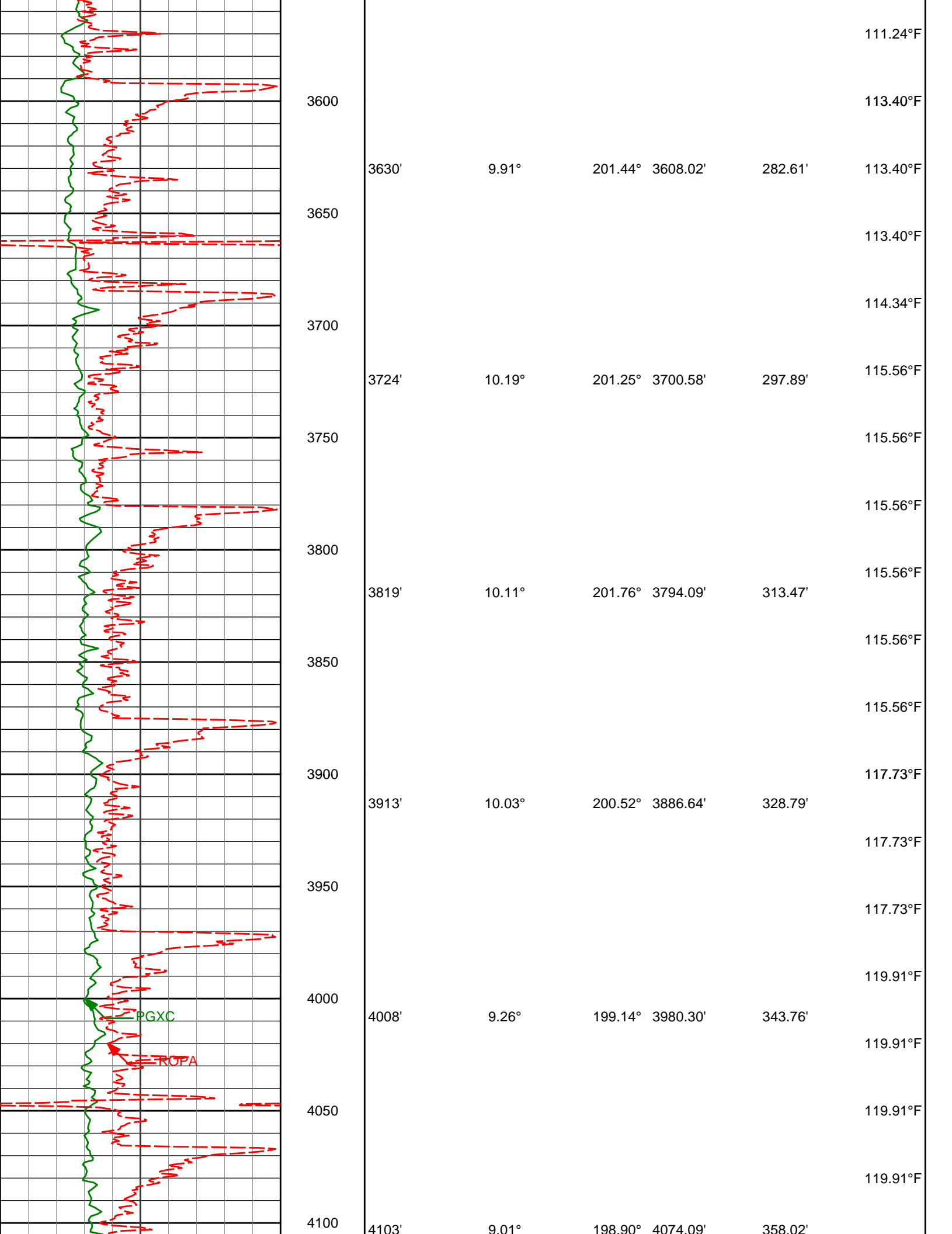


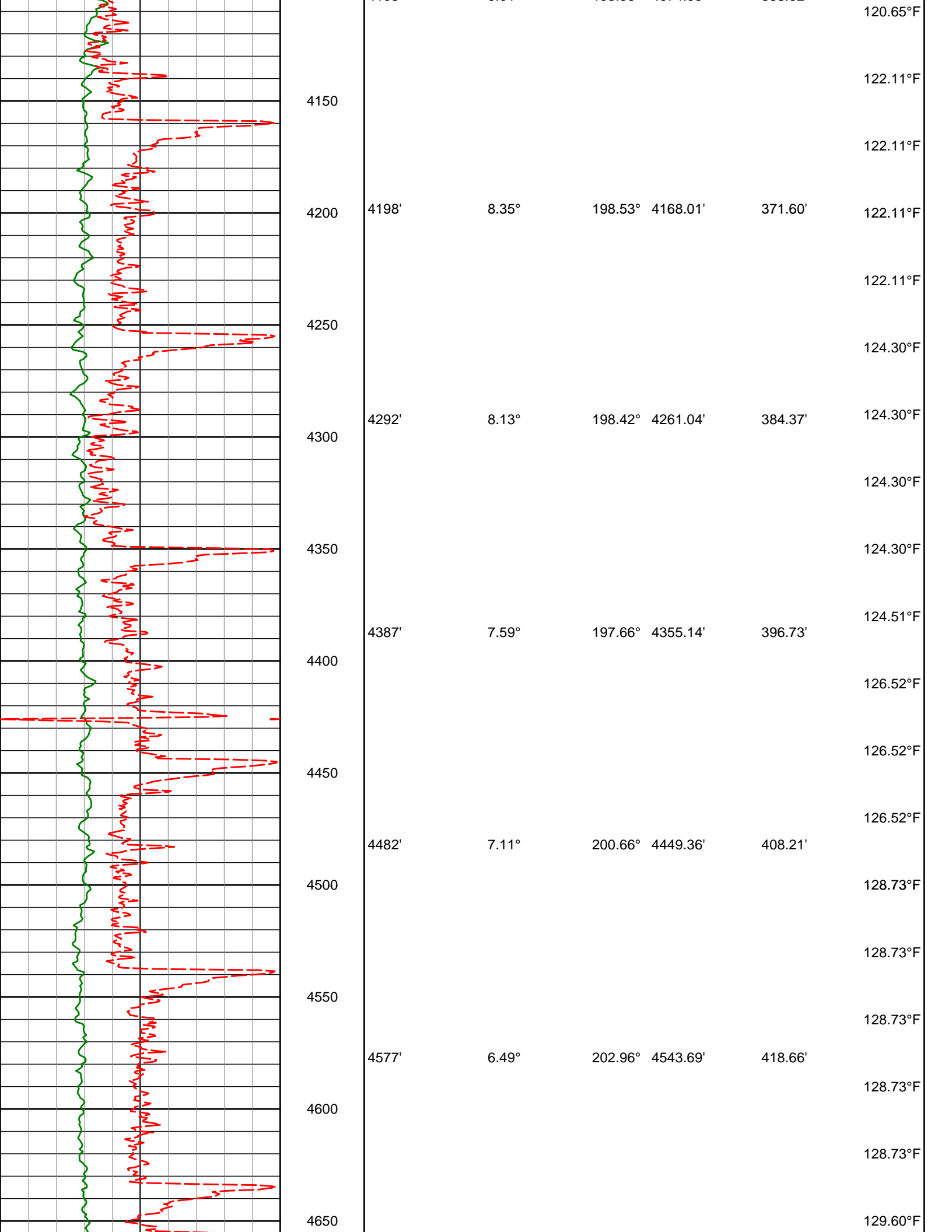


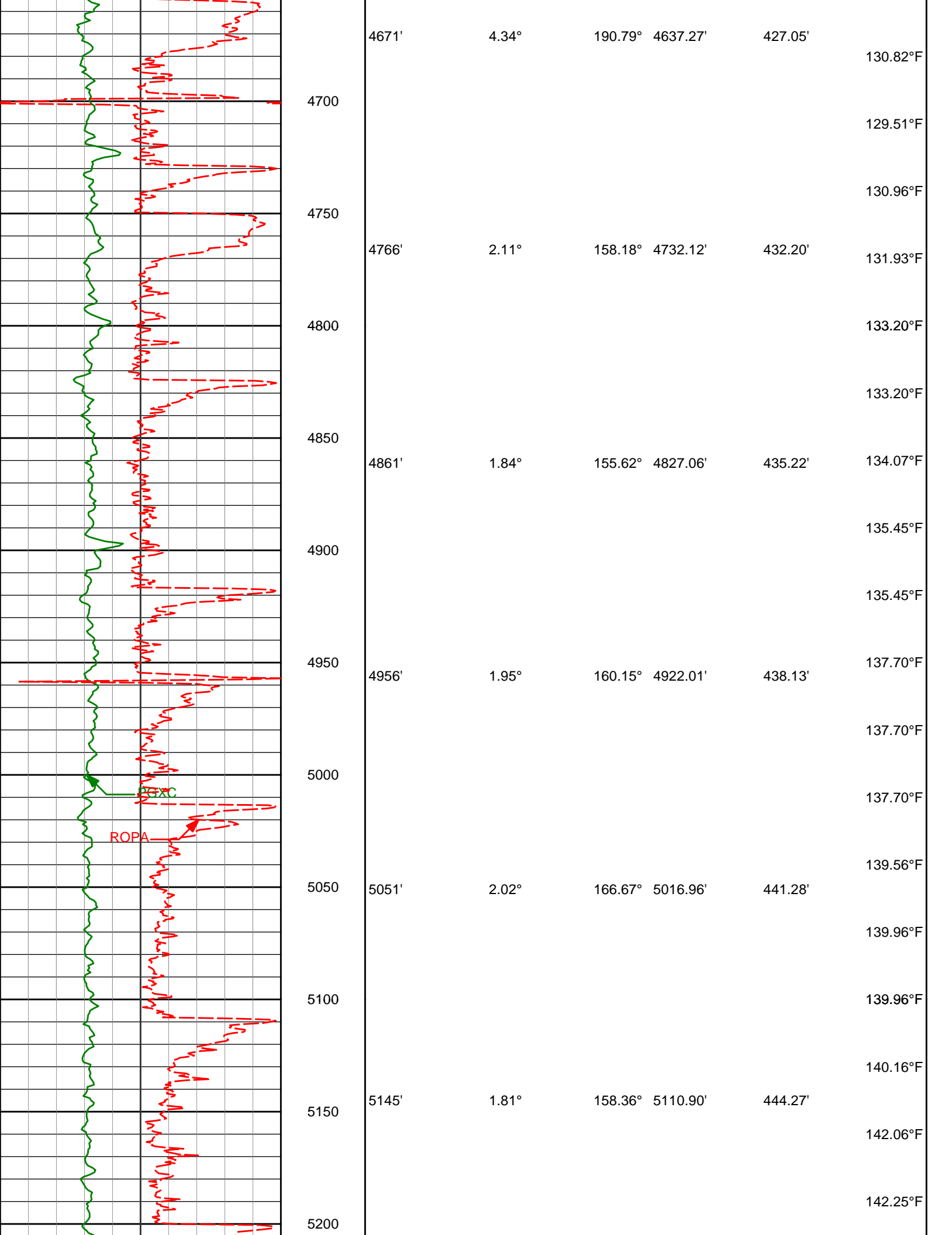


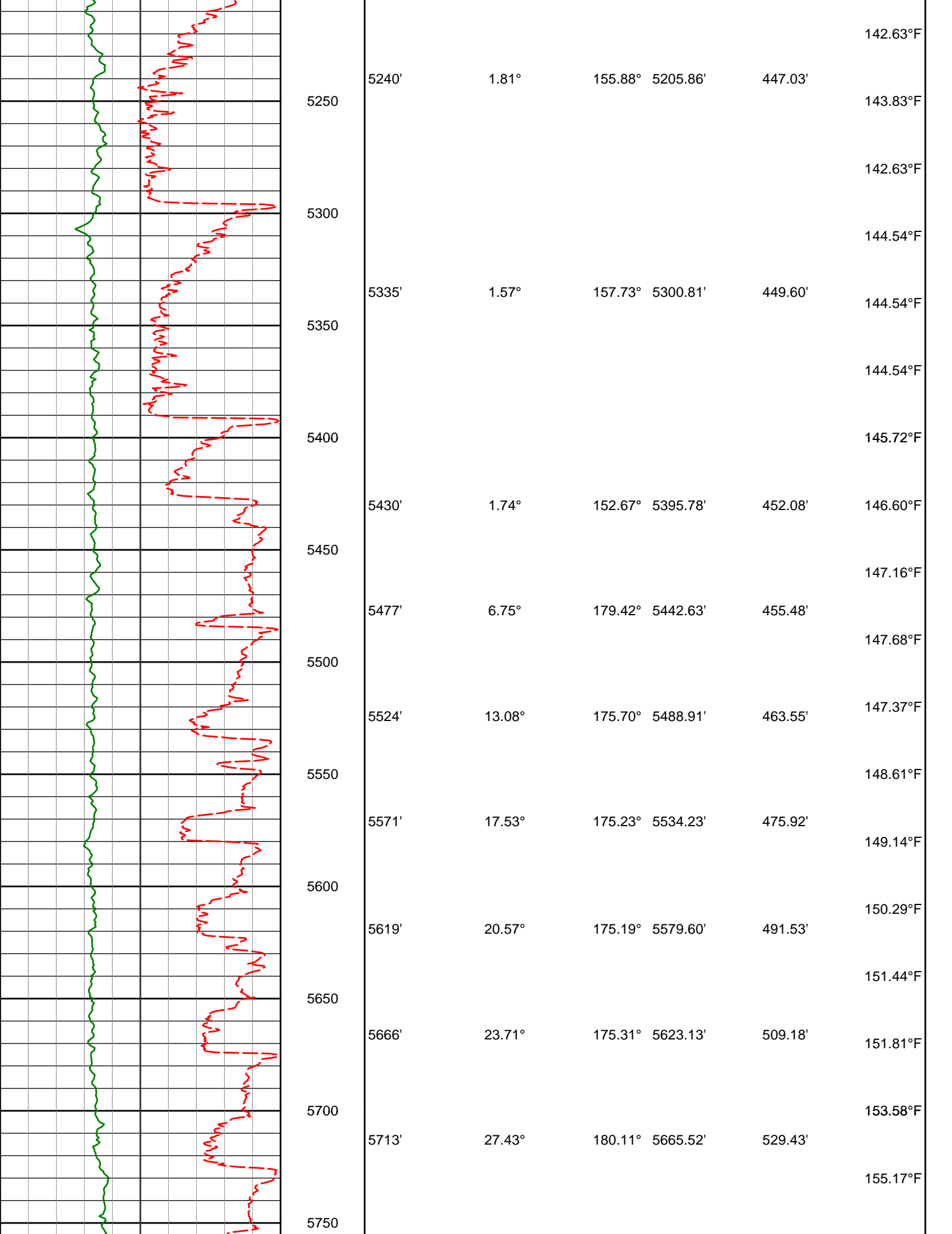


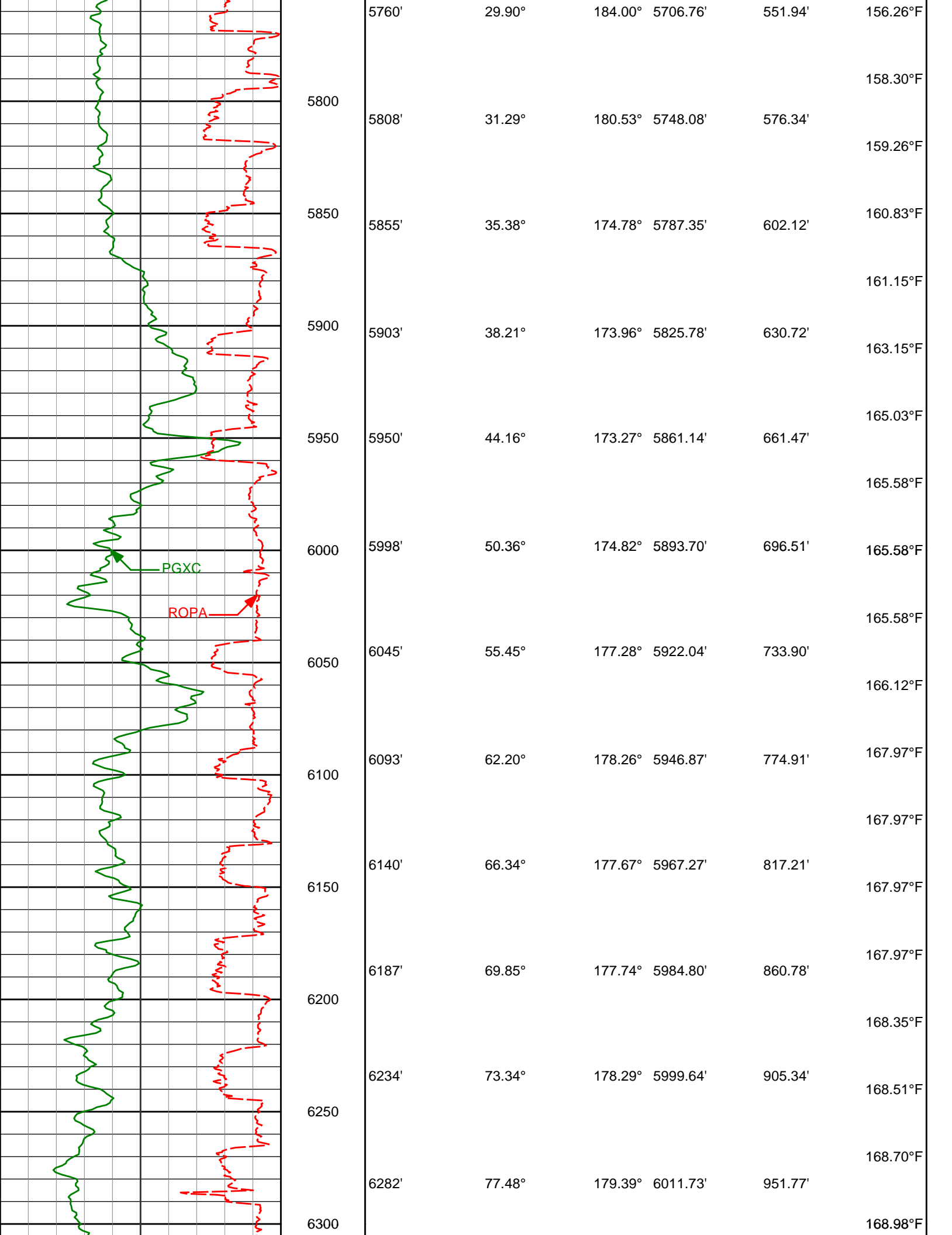


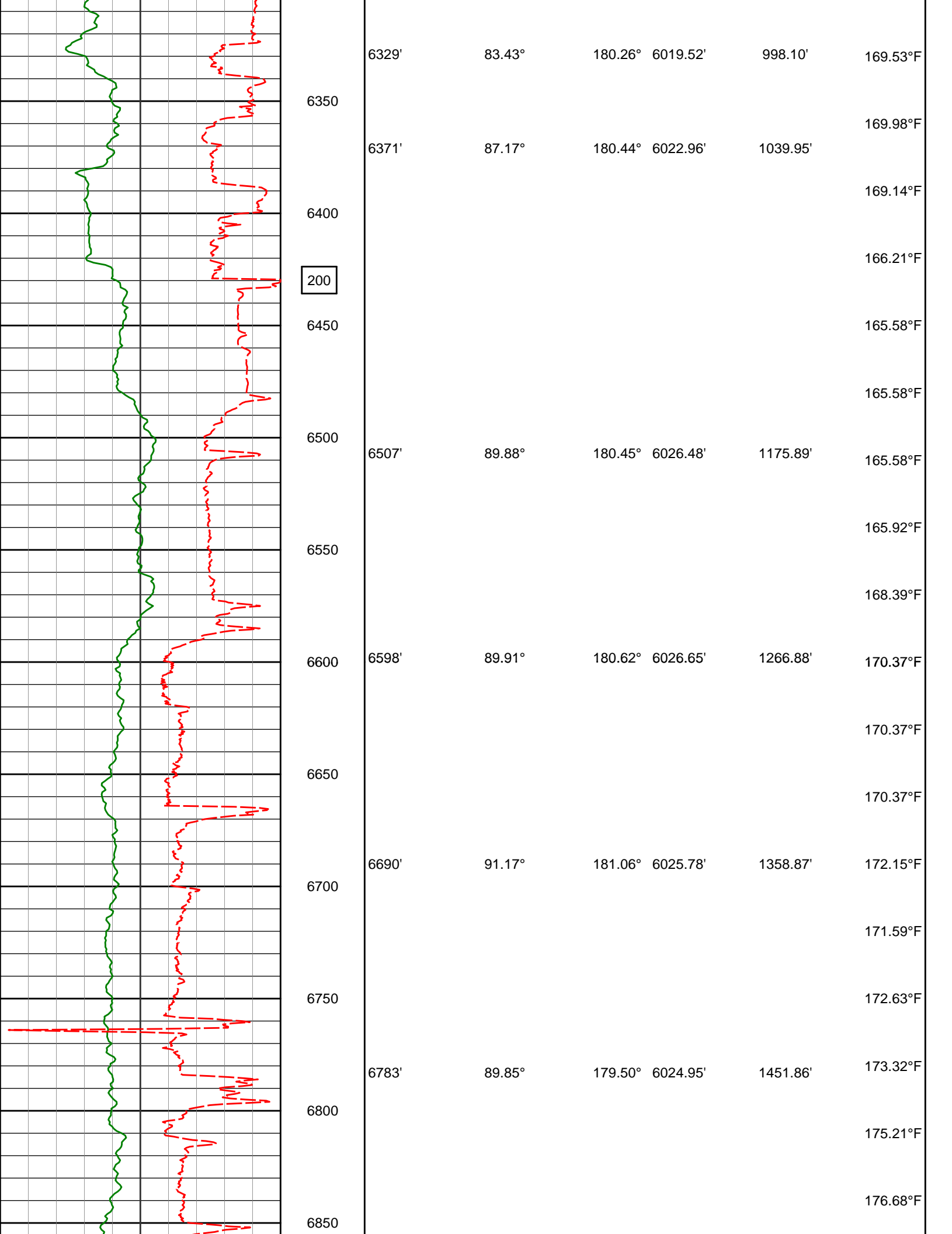


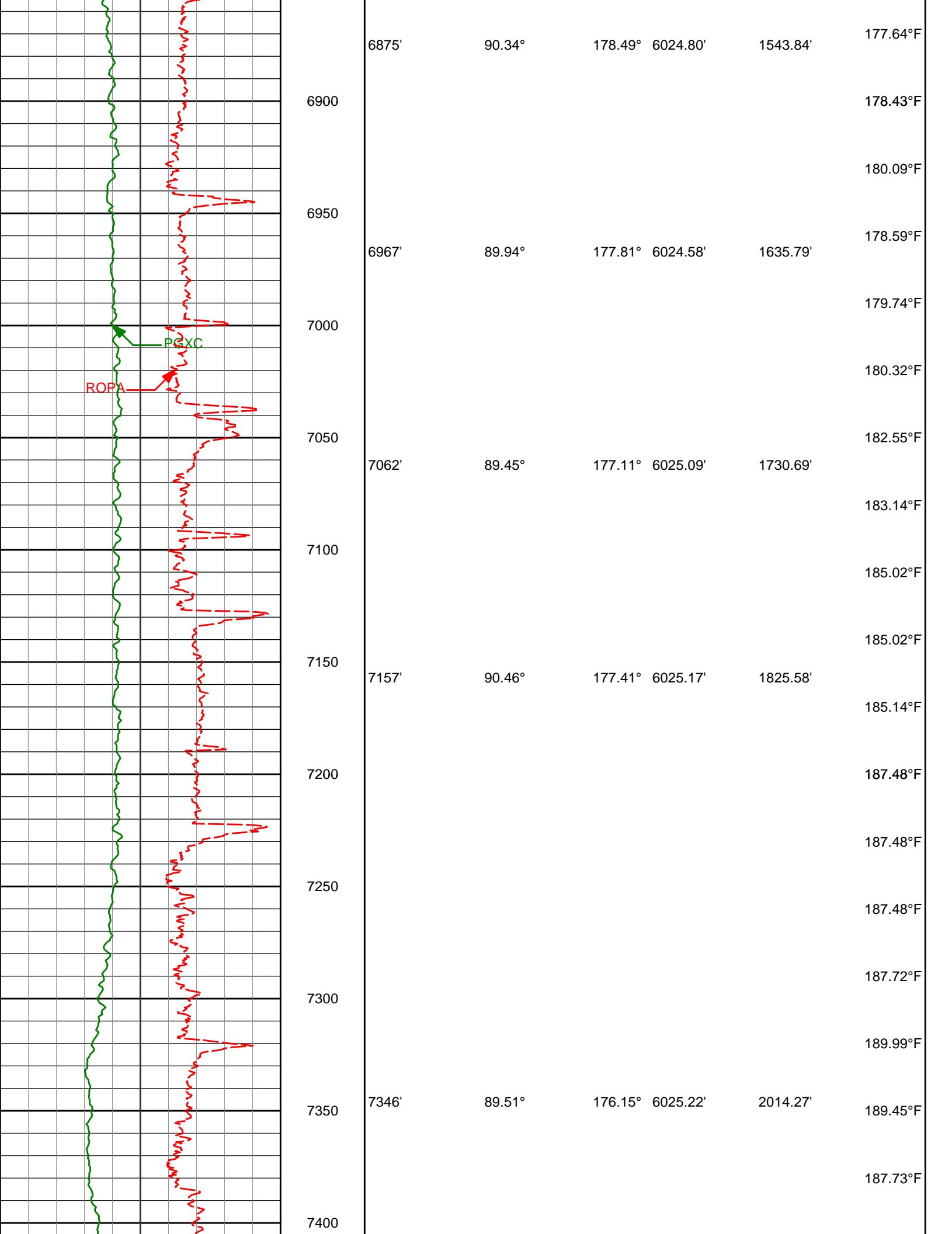


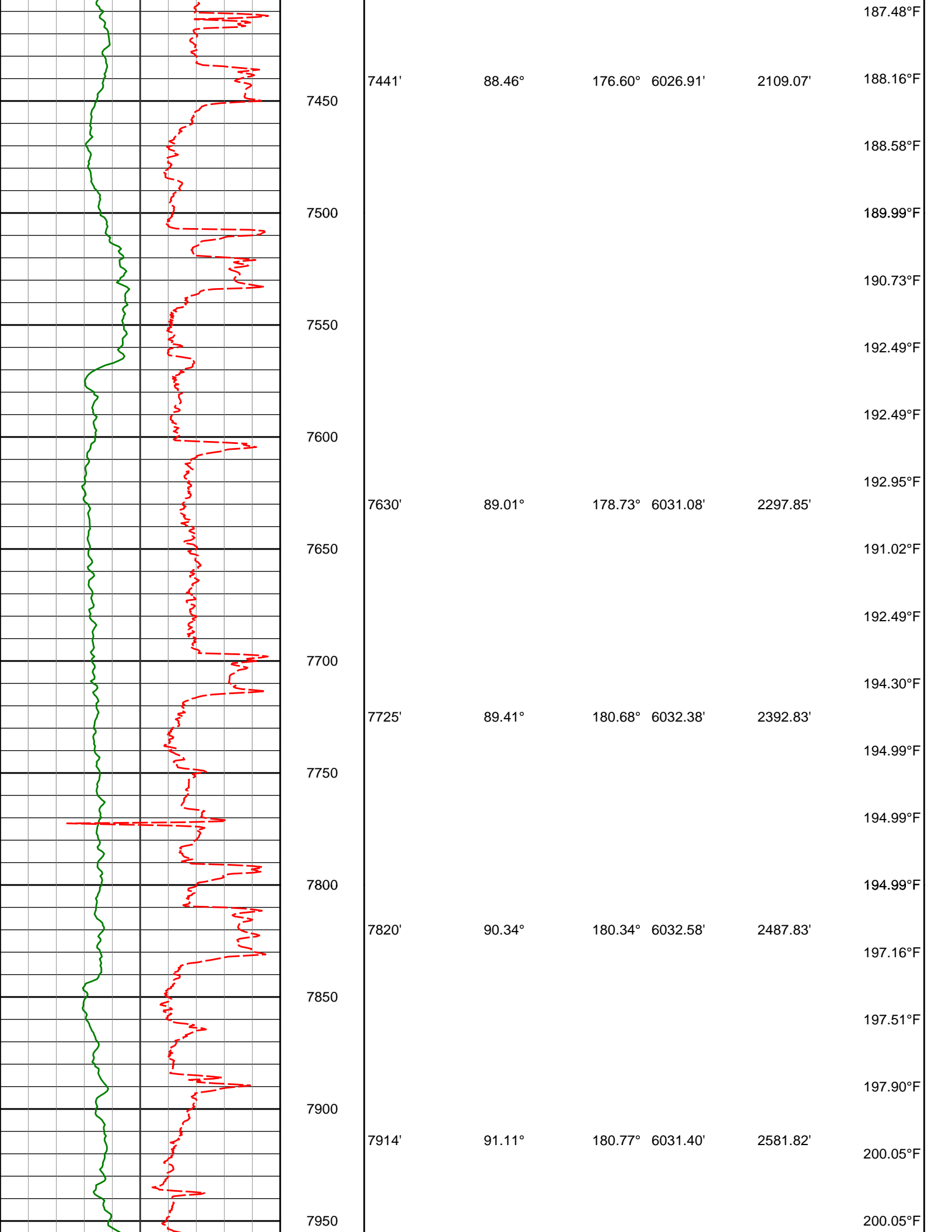




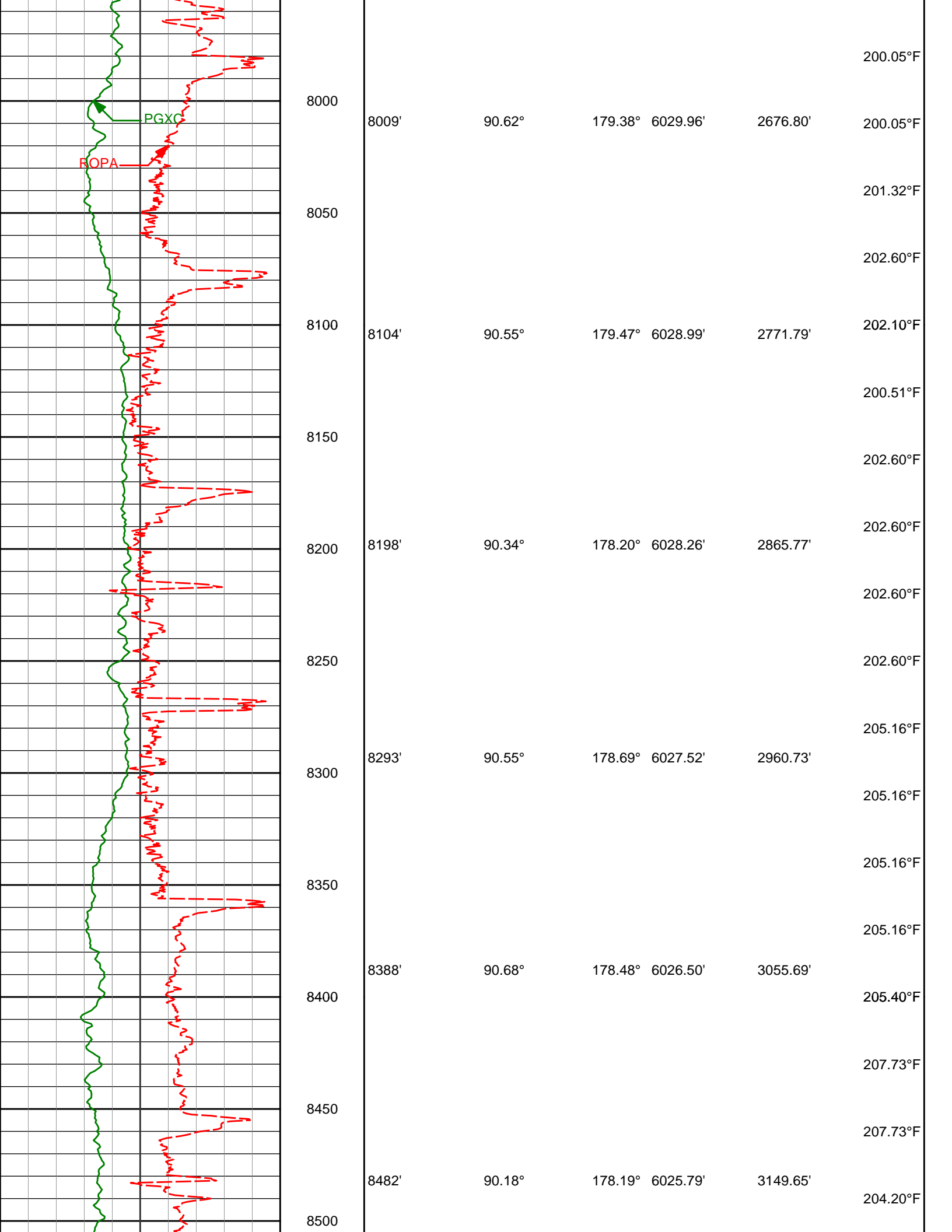


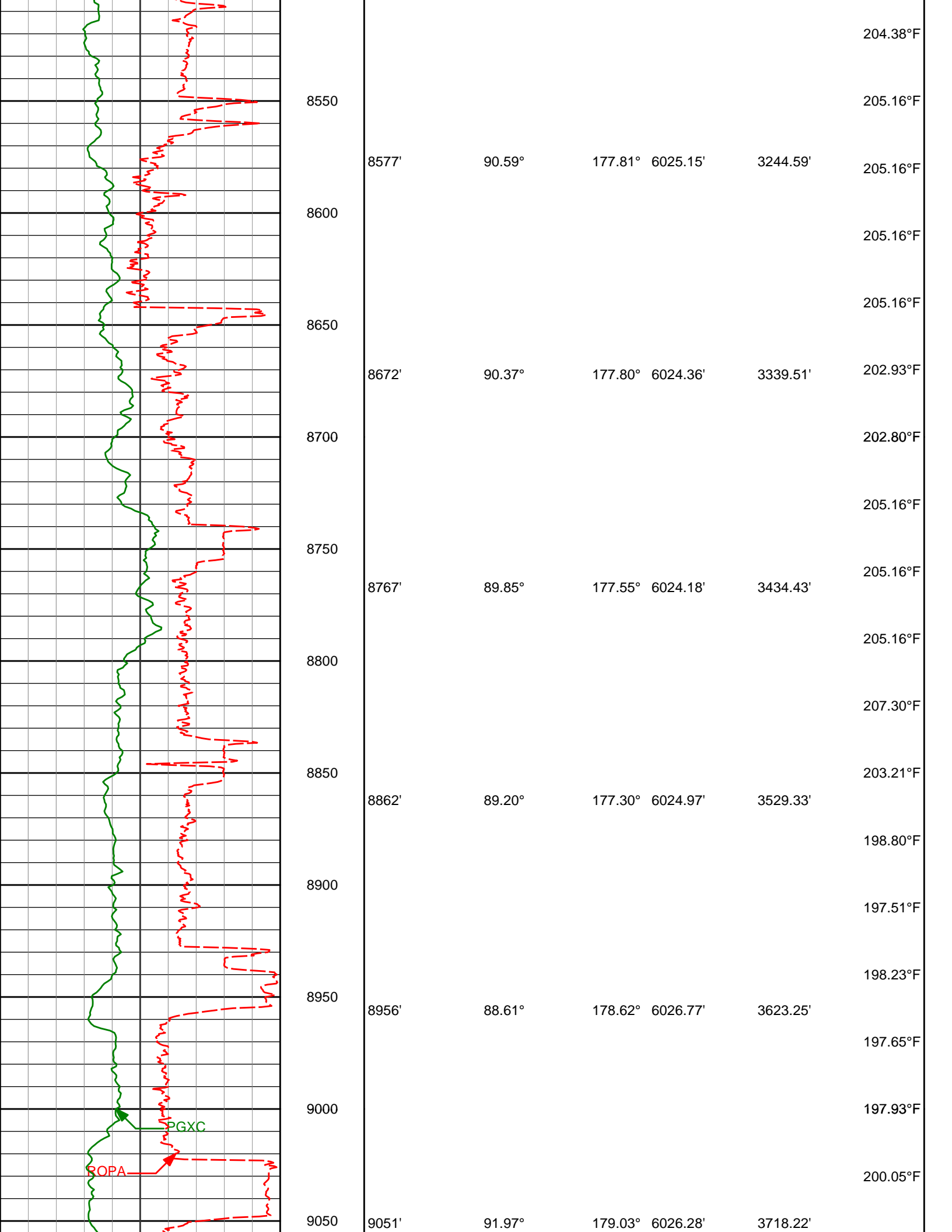


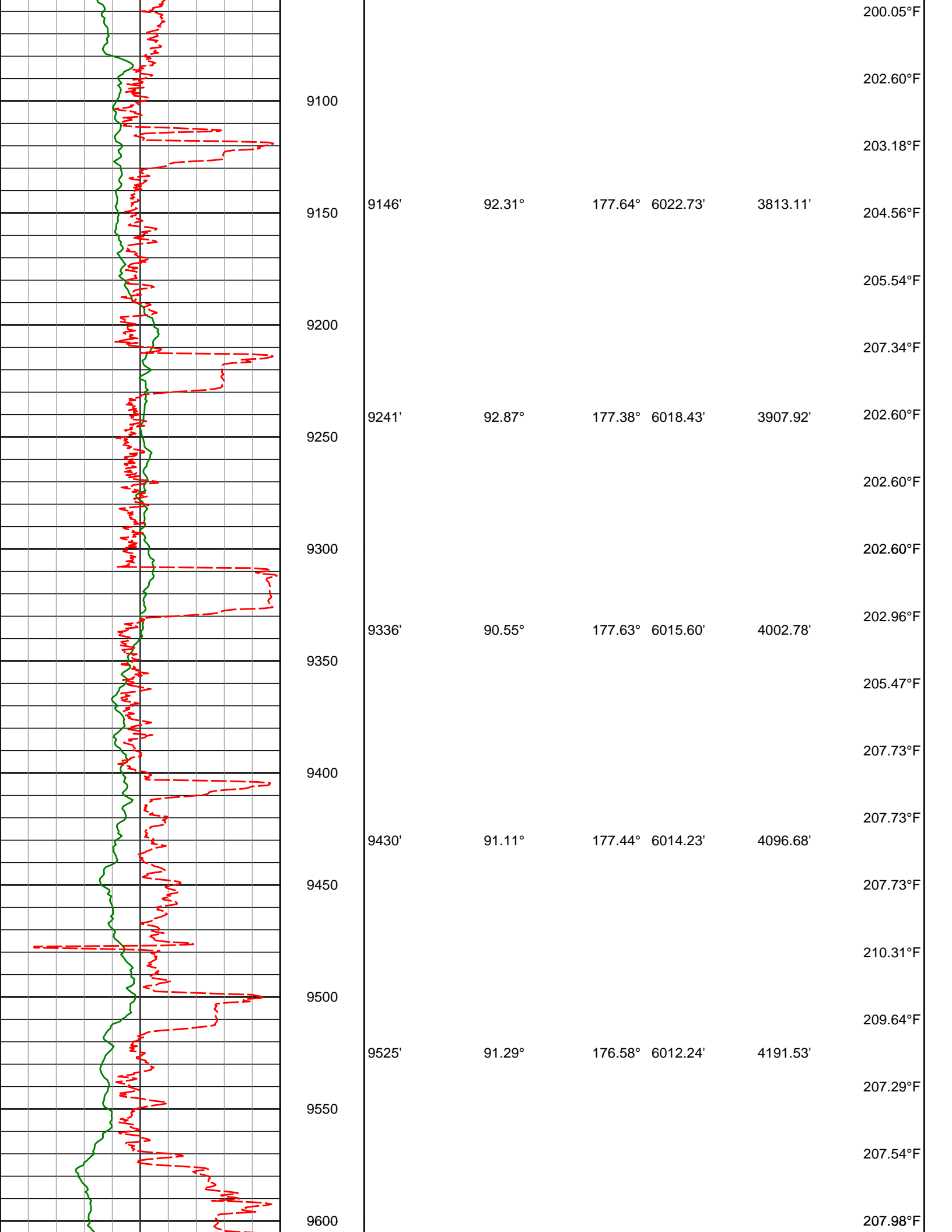


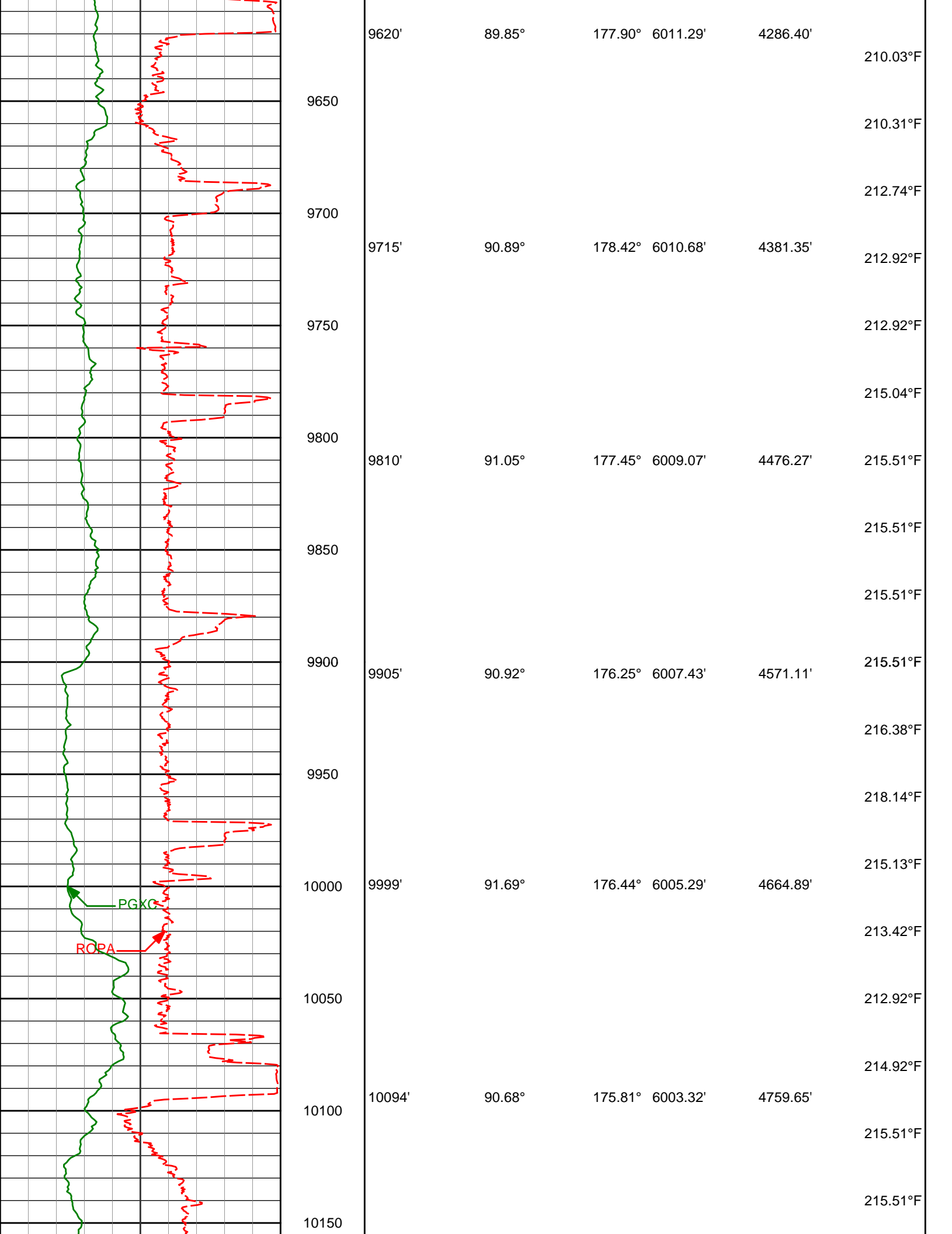


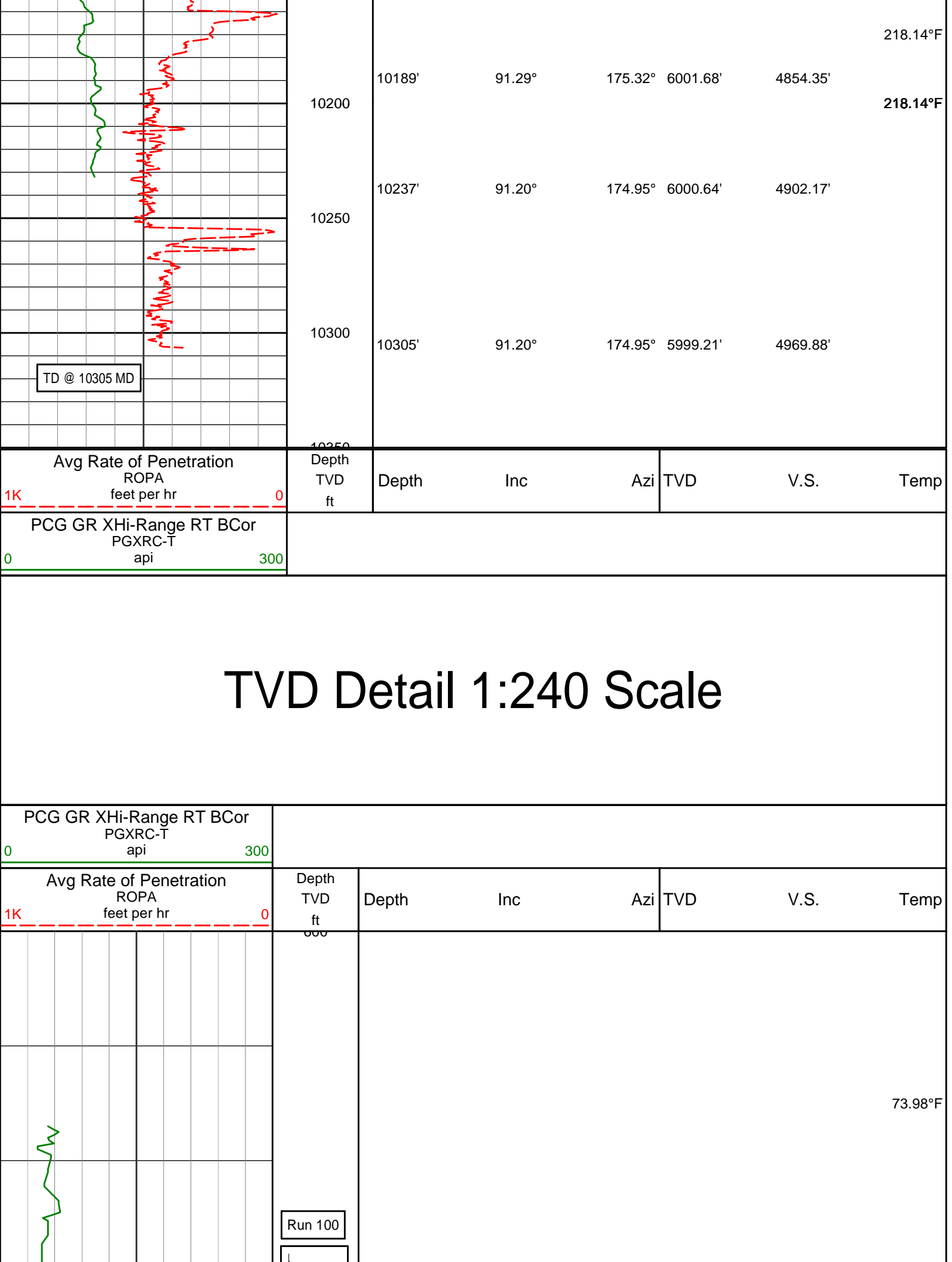


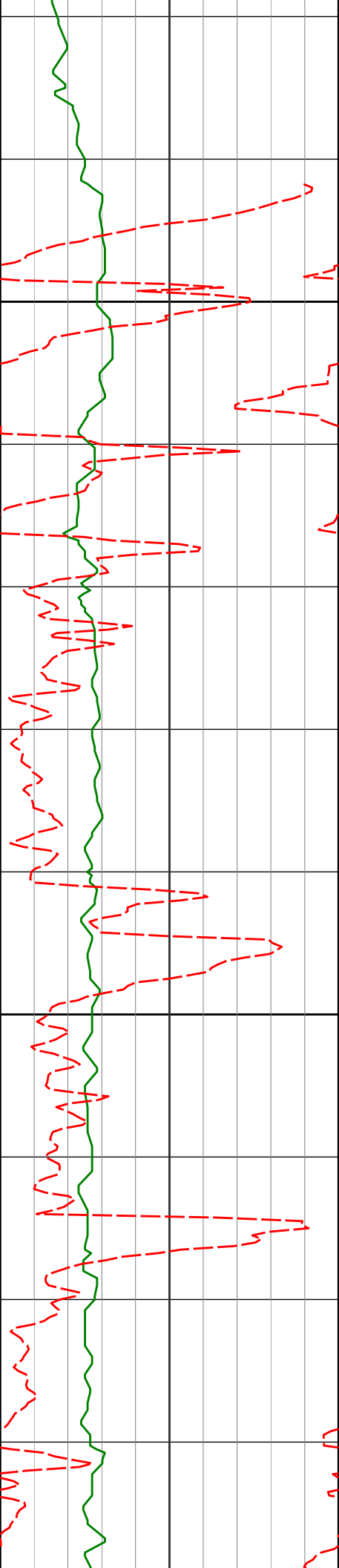












700

800

734'

0.18°

109.76°

733.99'

2.66'

73.98°F

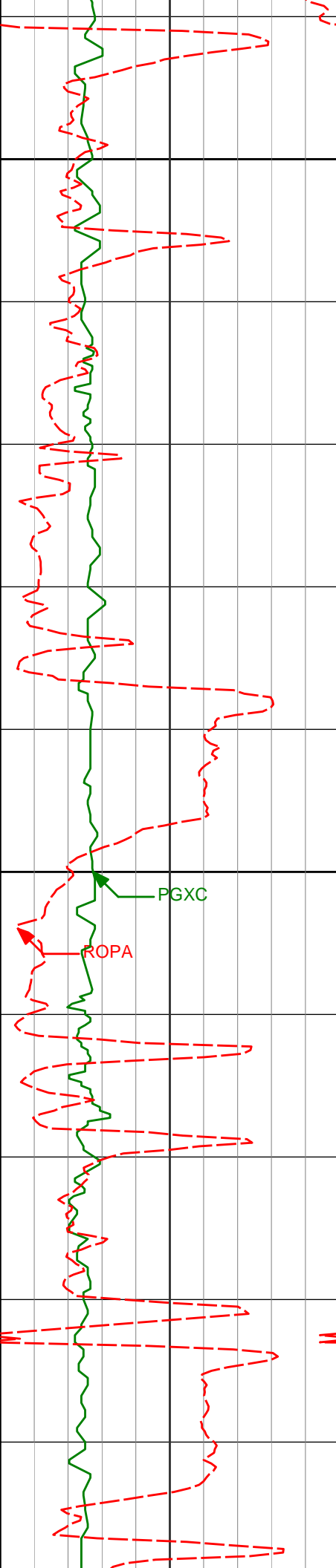
73.98°F

73.98°F

75.97°F

75.97°F

77.99°F



900

77.99°F

918'

0.18°

93.67°

917.99'

2.78'

77.99°F

77.99°F

77.99°F

1000

PGXC

1010'

0.22°

115.83°

1009.99'

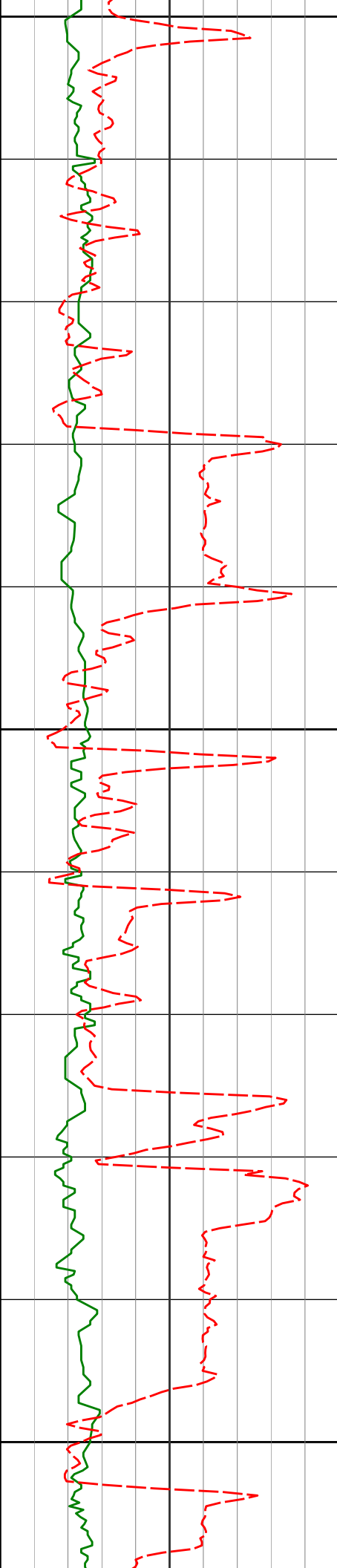
2.87'

77.99°F

77.99°F

80.01°F

ROPA



1100

1102'

0.37°

126.48°

1101.99'

3.12'

80.01°F

80.01°F

80.01°F

1200

1211'

0.35°

150.05°

1210.99'

3.62'

80.01°F

80.01°F

80.01°F

80.01°F

1300

1302'

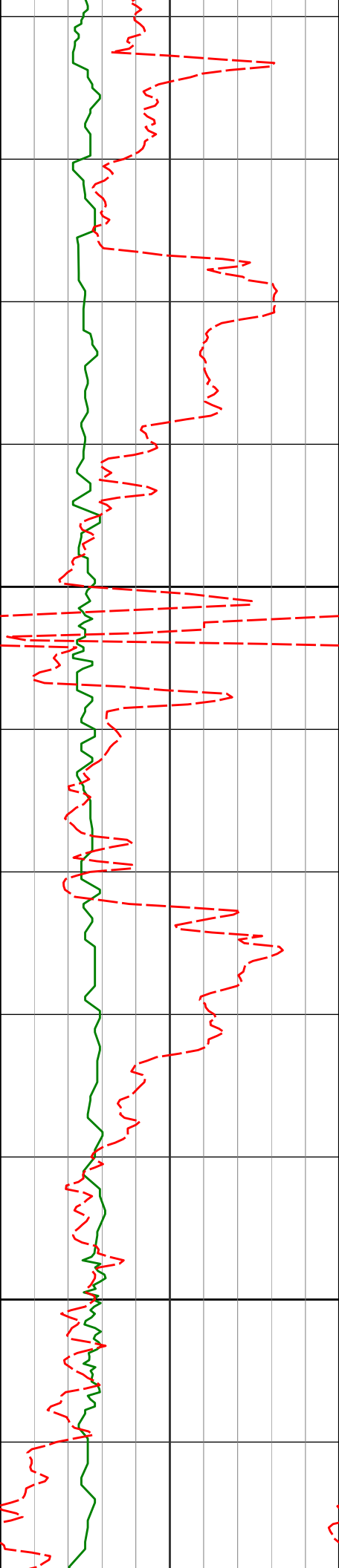
0.42°

147.28°

1301.98'

4.14'





1400

1500

1394'

0.50°

142.45°

1393.98'

4.74'

1486'

0.43°

146.82°

1485.98'

5.35'

80.01°F

80.01°F

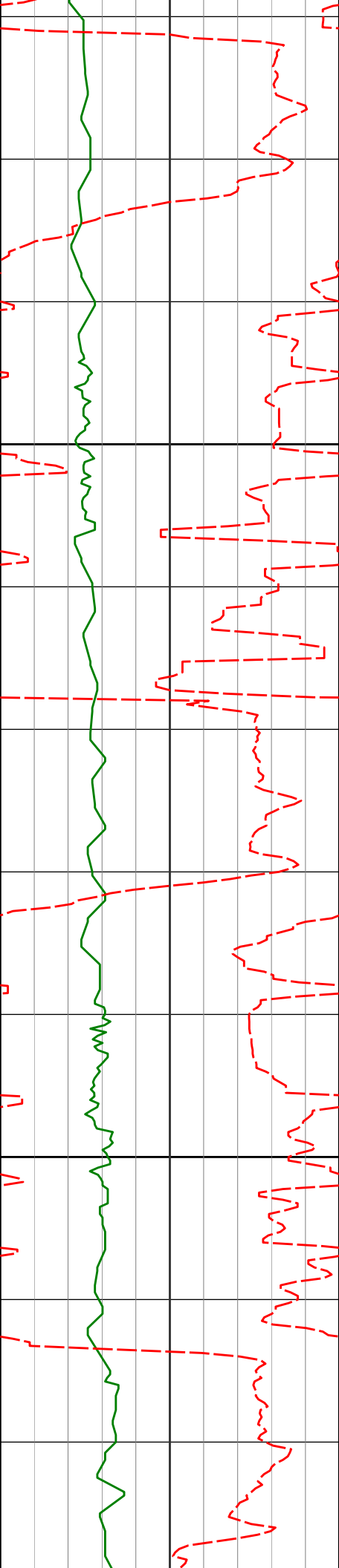
80.01°F

81.69°F

82.02°F

82.02°F

82.02°F



1579'

1.45°

218.67°

1578.97'

6.56'

1600

1670'

3.31°

206.24°

1669.89'

9.81'

1700

84.06°F

84.06°F

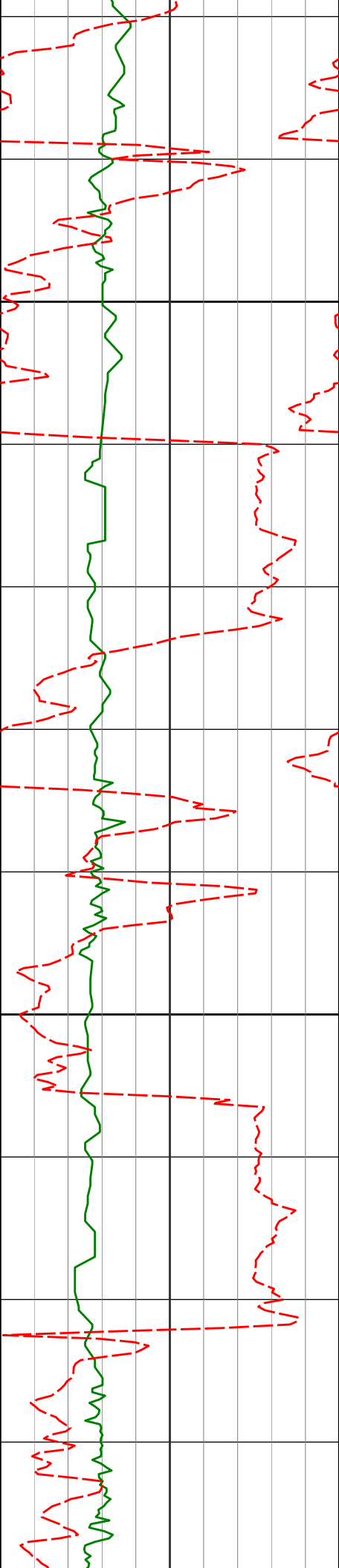
84.06°F

84.06°F

84.57°F

86.09°F

86.09°F



1763'

4.91°

206.85°

1762.64'

15.77'

86.50°F

1800

87.62°F

1854'

6.35°

204.77°

1853.20'

23.82'

88.14°F

88.14°F

1900

88.14°F

1946'

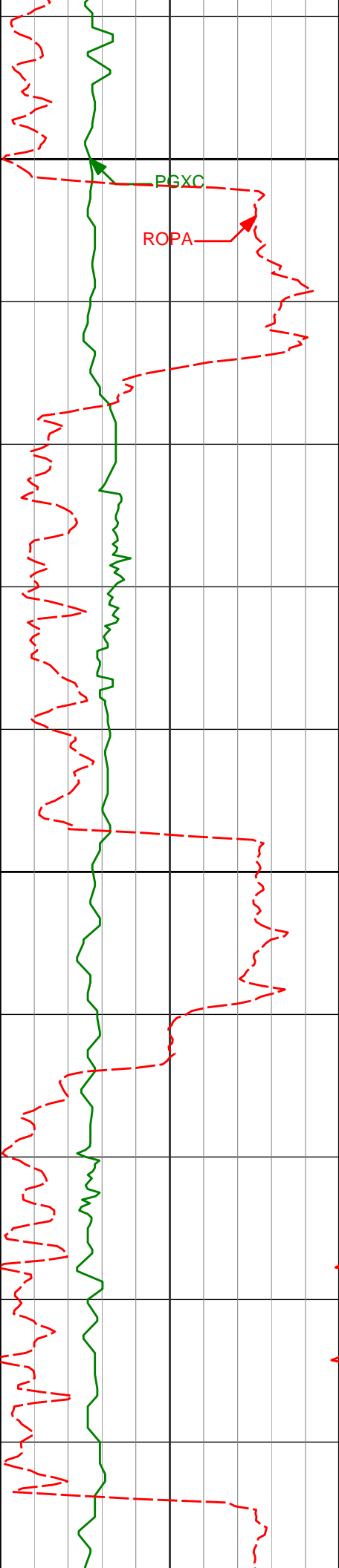
7.89°

198.85°

1944.49'

34.42'

88.37°F



2000

2038'

8.79°

201.73°

2035.52'

46.93'

90.19°F

90.19°F

2100

92.26°F

2129'

9.60°

197.98°

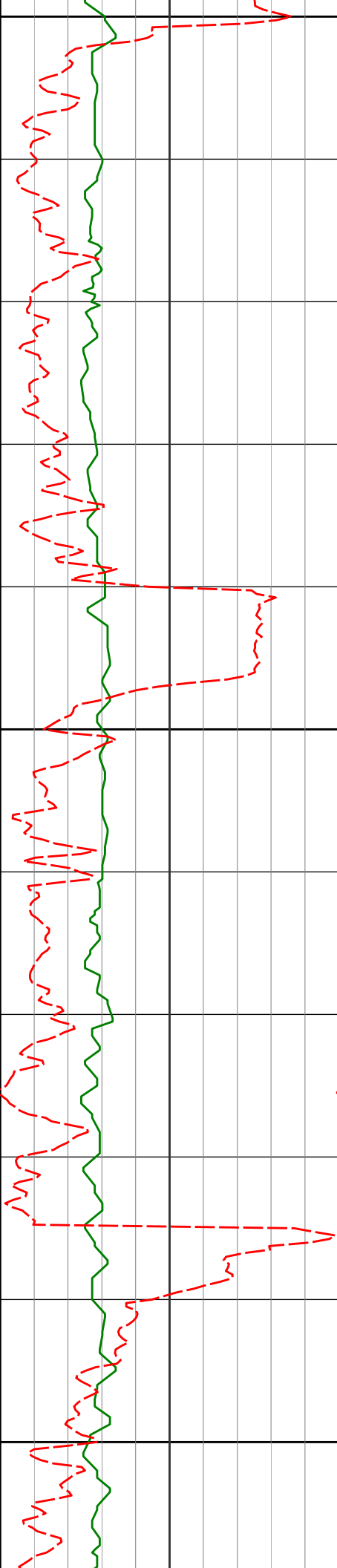
2125.35'

60.61'

92.26°F

92.26°F

93.36°F



2200

2222'

9.89°

194.37°

2217.01'

75.72'

94.33°F

94.33°F

2300

2314'

9.36°

189.23°

2307.71'

90.76'

94.33°F

94.33°F

94.33°F

2400

2405'

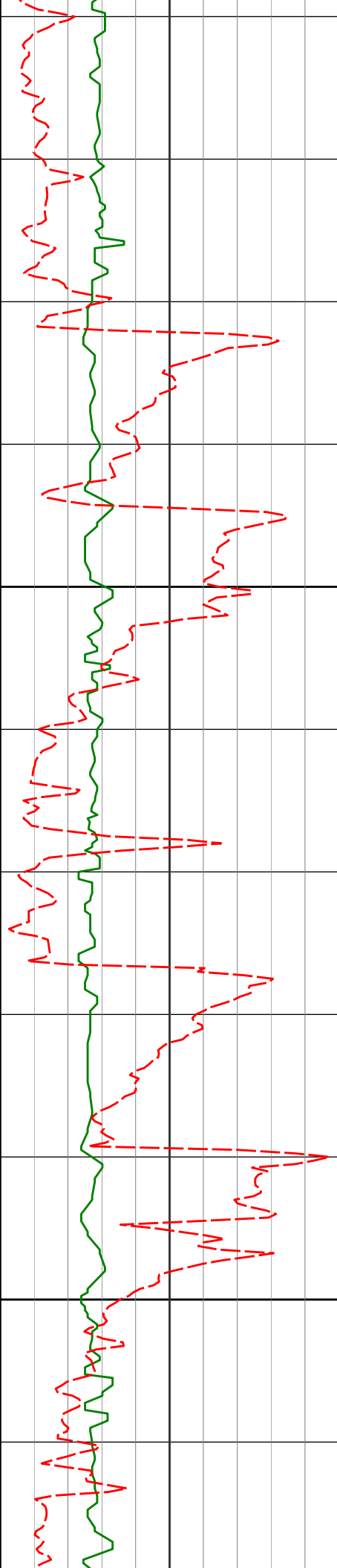
9.37°

187.71°

2397.50'

105.41'

96.42°F



2500

2600

2498'

2590'

9.44°

9.05°

191.88°

198.25°

2489.25'

2580.06'

120.37'

134.63'

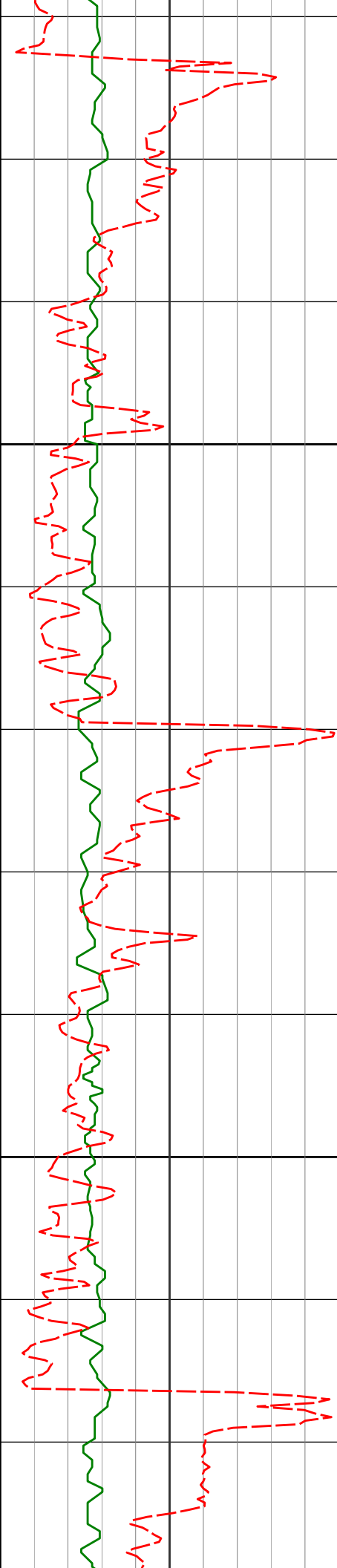
96.42°F

96.42°F

96.42°F

96.42°F

98.51°F



2700

2800

2683'

9.39°

201.20°

2671.86'

148.65'

2778'

9.65°

199.71°

2765.55'

163.37'

98.51°F

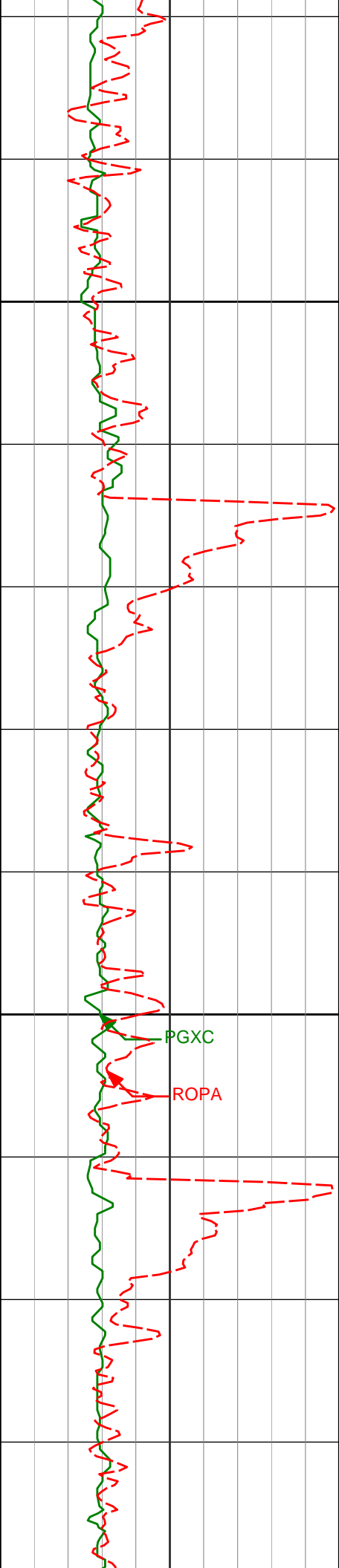
98.51°F

98.51°F

100.62°F

100.62°F

100.62°F



2872'

9.70°

198.44° 2858.21'

178.31'

2900

100.62°F

102.72°F

102.72°F

2967'

9.18°

197.28° 2951.92'

193.14'

102.72°F

3000

104.83°F

PGXC

ROPA

104.83°F

3062'

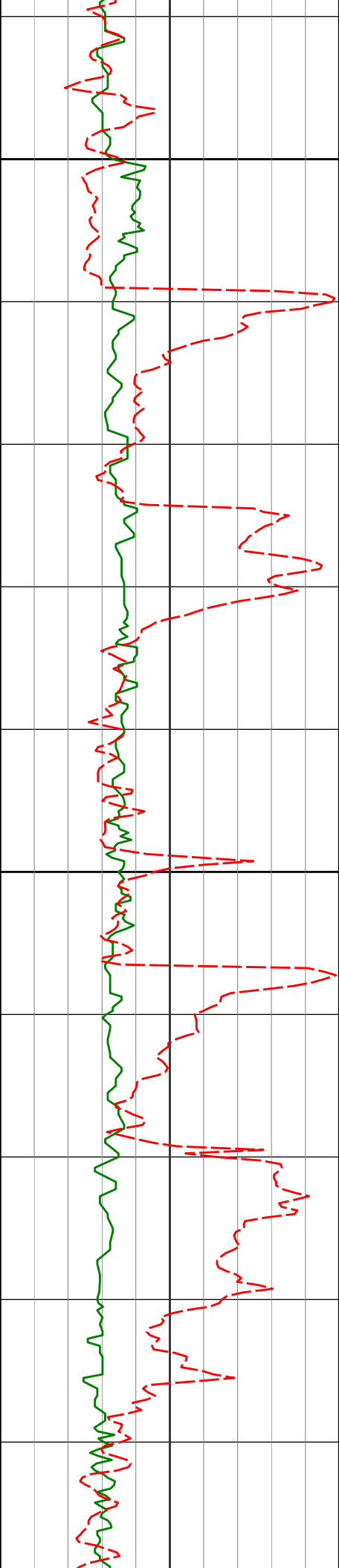
8.41°

194.11° 3045.81'

207.11'

104.83°F





3100

3157'

3200

3251'

6.09°

5.93°

183.42°

185.99°

3140.05'

3233.53'

218.88'

228.68'

104.83°F

104.83°F

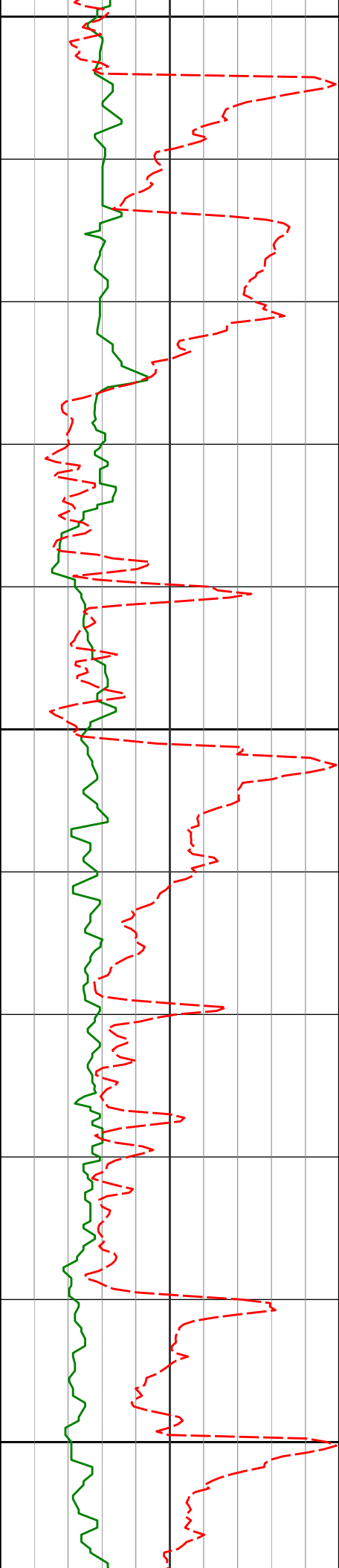
106.97°F

106.97°F

106.97°F

106.97°F

106.97°F



3300

3346'

8.45°

203.58°

3327.79'

239.96'

3400

3441'

9.18°

202.52°

3421.66'

253.36'

3500

106.97°F

106.97°F

107.88°F

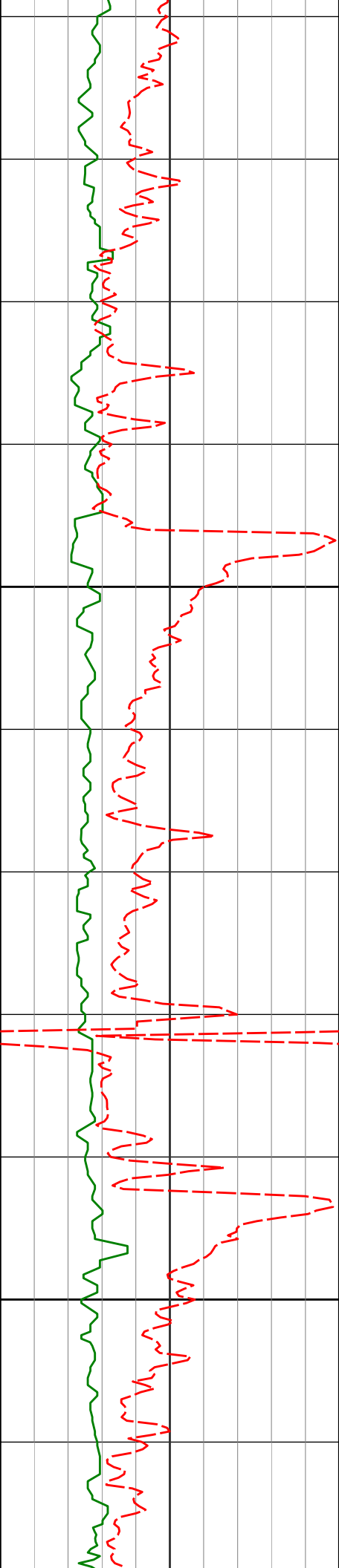
109.09°F

109.09°F

109.89°F

111.24°F

111.24°F



3535'

9.65°

201.78°

3514.40'

267.60'

111.24°F

111.24°F

3600

113.40°F

3630'

9.91°

201.44°

3608.02'

282.61'

113.40°F

113.40°F

114.34°F

3700

3724'

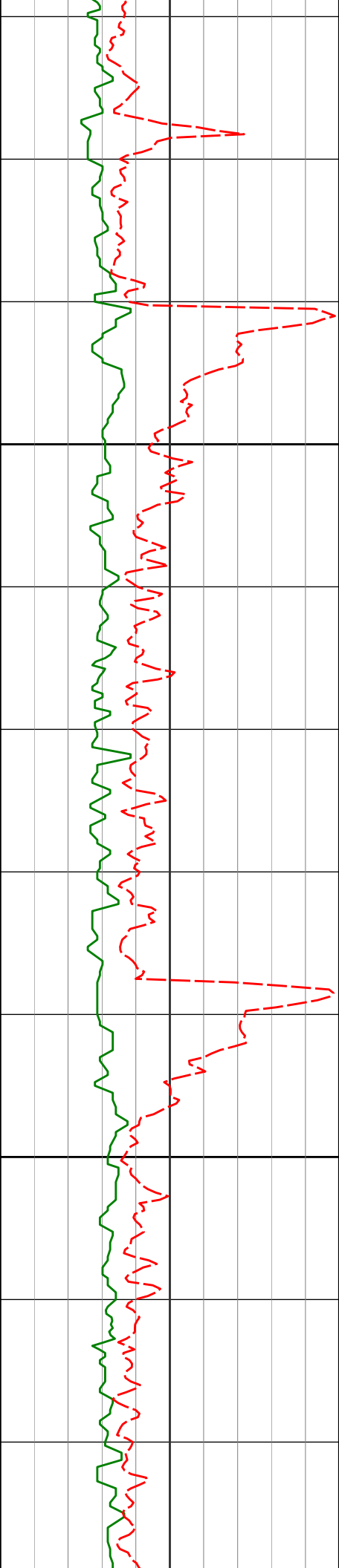
10.19°

201.25°

3700.58'

297.89'

115.56°F



3800

3819'

10.11°

201.76°

3794.09'

313.47'

3900

3913'

10.03°

200.52°

3886.64'

328.79'

115.56°F

115.56°F

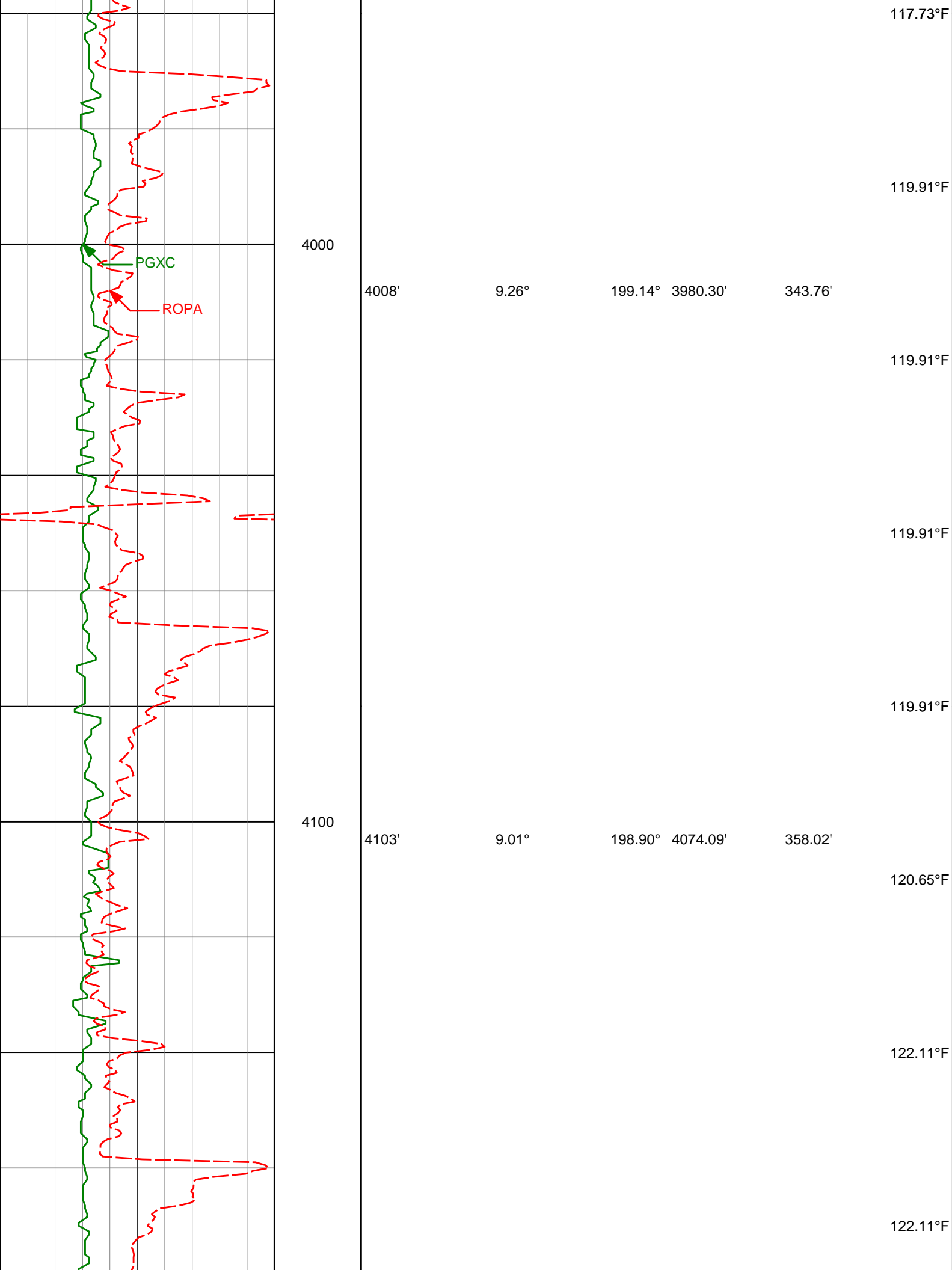
115.56°F

115.56°F

115.56°F

117.73°F

117.73°F



117.73°F

119.91°F

4000

PGXC

4008'

9.26°

199.14° 3980.30'

343.76'

ROPA

119.91°F

119.91°F

119.91°F

4100

4103'

9.01°

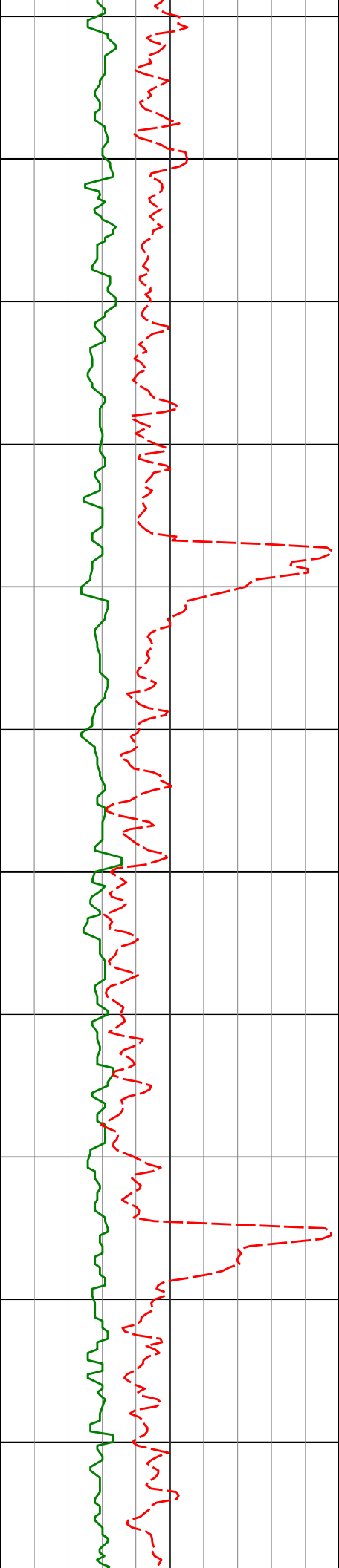
198.90° 4074.09'

358.02'

120.65°F

122.11°F

122.11°F



4200

4198'

8.35°

198.53°

4168.01'

371.60'

122.11°F

122.11°F

124.30°F

4300

4292'

8.13°

198.42°

4261.04'

384.37'

124.30°F

124.30°F

124.30°F

124.51°F

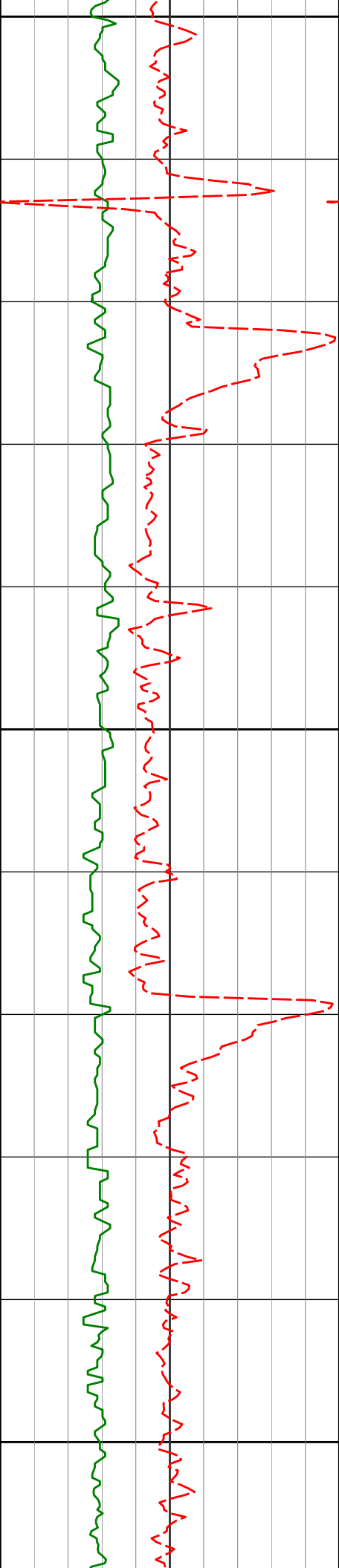
4387'

7.59°

197.66°

4355.14'

396.73'



4400

126.52°F

126.52°F

126.52°F

4482'

7.11°

200.66°

4449.36'

408.21'

4500

128.73°F

128.73°F

128.73°F

4577'

6.49°

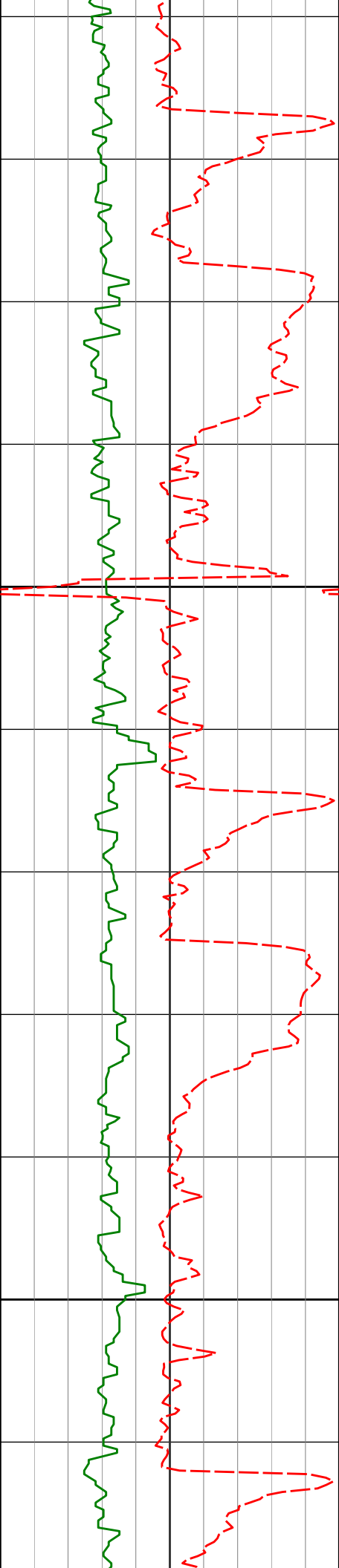
202.96°

4543.69'

418.66'

4600

128.73°F



4700

4800

4671'

4766'

4.34°

2.11°

190.79°

158.18°

4637.27'

4732.12'

427.05'

432.20'

128.73°F

129.60°F

130.82°F

129.51°F

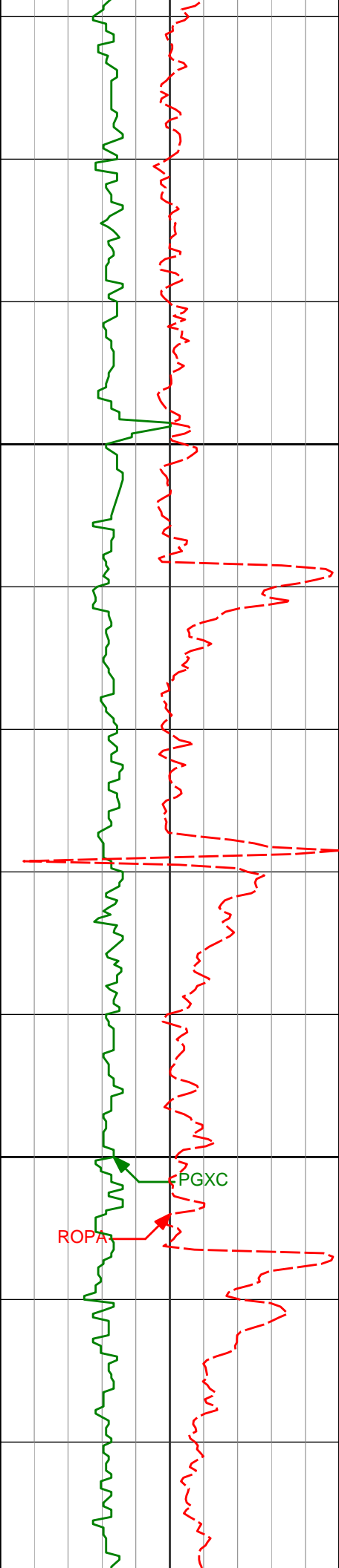
130.96°F

131.93°F

133.20°F

133.20°F





4900

5000

4861'

1.84°

155.62°

4827.06'

435.22'

134.07°F

135.45°F

135.45°F

137.70°F

4956'

1.95°

160.15°

4922.01'

438.13'

137.70°F

137.70°F

139.56°F

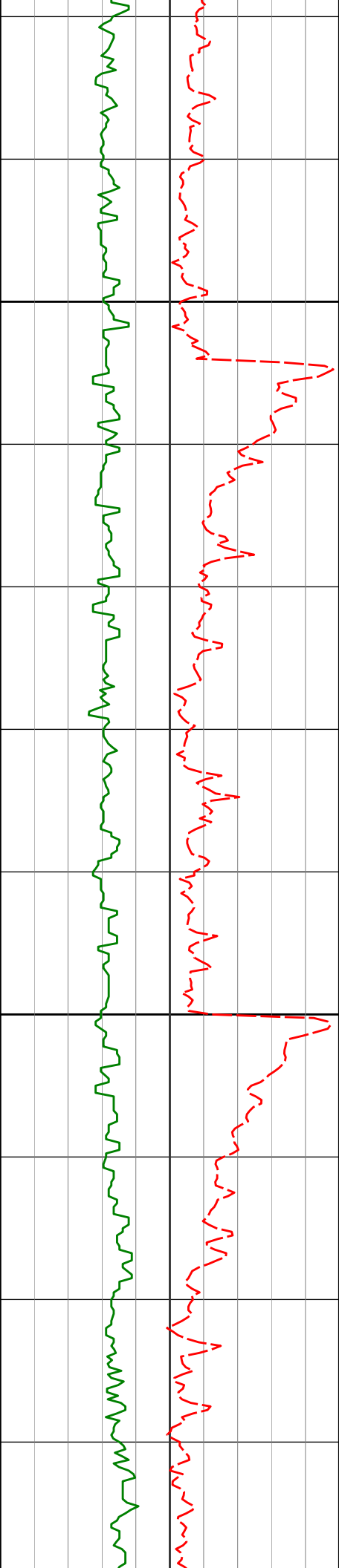
5051'

2.02°

166.67°

5016.96'

441.28'



5100

5145'

1.81°

158.36°

5110.90'

444.27'

5200

5240'

1.81°

155.88°

5205.86'

447.03'

139.96°F

139.96°F

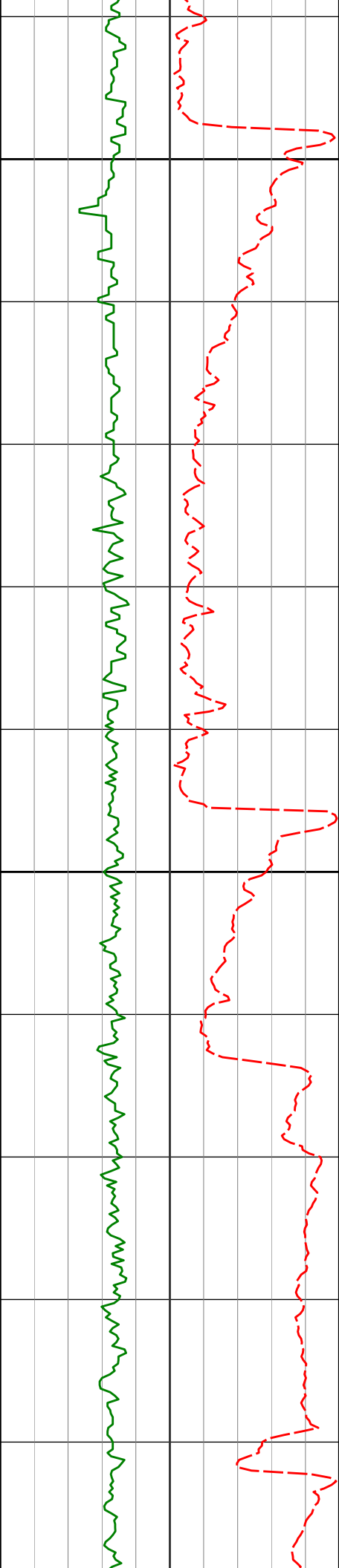
140.16°F

142.06°F

142.25°F

142.63°F

143.83°F



5300

5335'

1.57°

157.73°

5300.81'

449.60'

5400

5430'

1.74°

152.67°

5395.78'

452.08'

5477'

6.75°

179.42°

5442.63'

455.48'

142.63°F

144.54°F

144.54°F

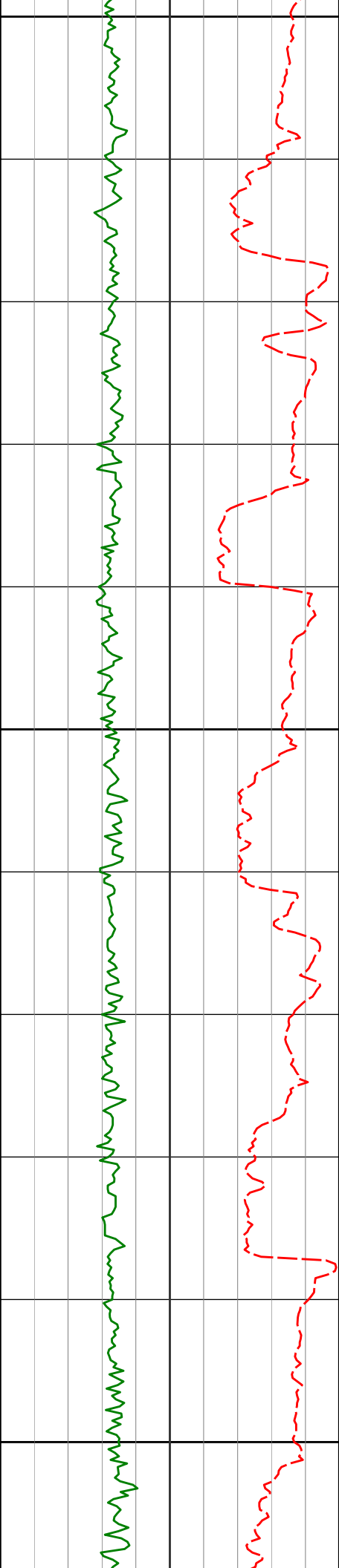
144.54°F

145.72°F

146.60°F

147.16°F

147.68°F



5500

5524'

13.08°

175.70°

5488.91'

463.55'

147.37°F

148.61°F

5571'

17.53°

175.23°

5534.23'

475.92'

149.14°F

5600

5619'

20.57°

175.19°

5579.60'

491.53'

150.29°F

151.44°F

5666'

23.71°

175.31°

5623.13'

509.18'

151.81°F

5700

153.58°F

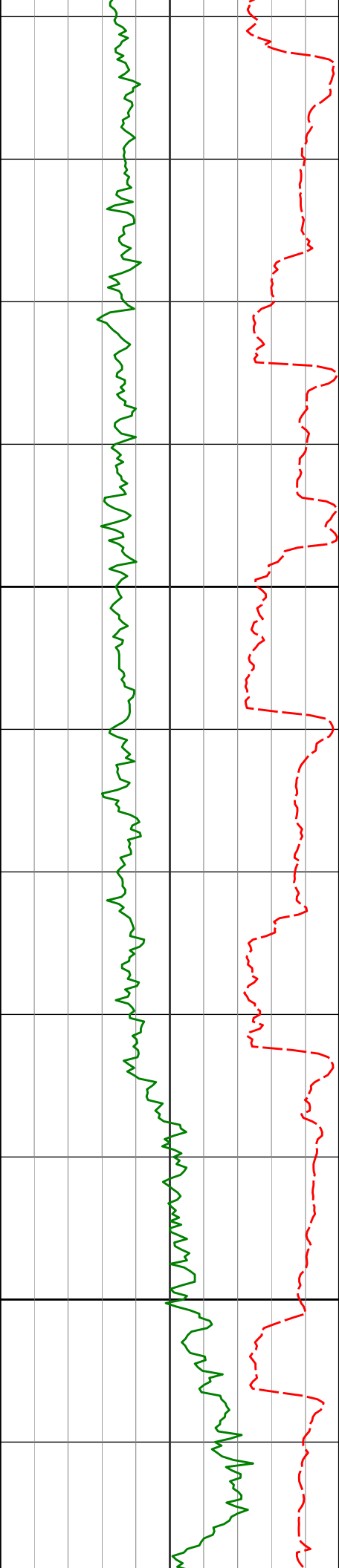
5713'

27.43°

180.11°

5665.52'

529.43'



5800

5900

5760'

5808'

5855'

5903'

29.90°

31.29°

35.38°

38.21°

184.00°

180.53°

174.78°

173.96°

5706.76'

5748.08'

5787.35'

5825.78'

551.94'

576.34'

602.12'

630.72'

155.17°F

156.26°F

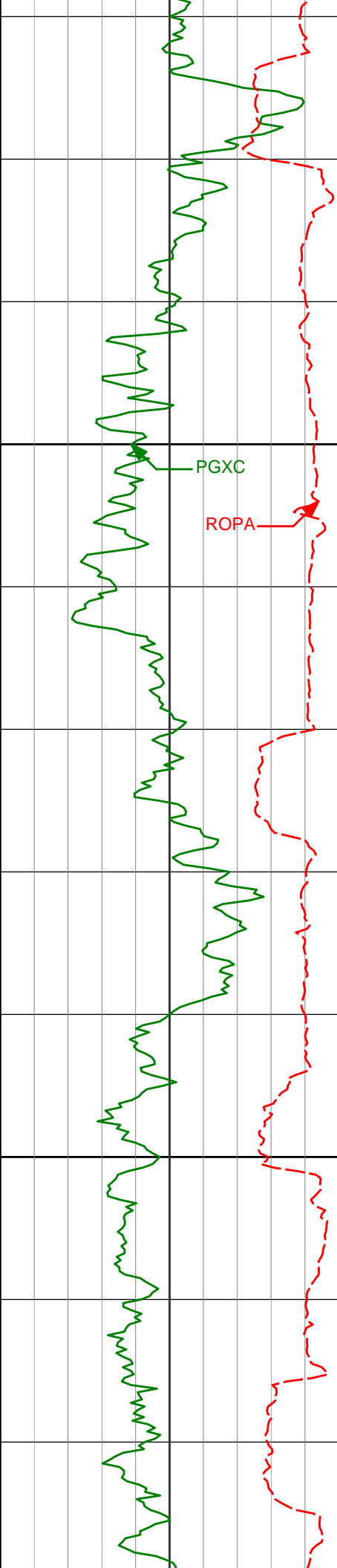
158.30°F

159.26°F

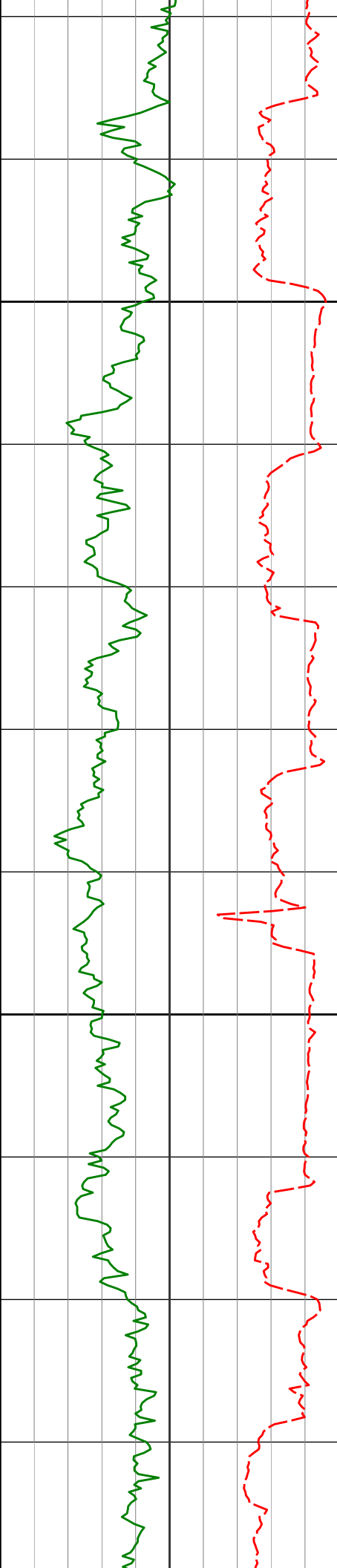
160.83°F

161.15°F

163.15°F



					165.03°F
	5950'	44.16°	173.27°	5861.14'	661.47'
					165.58°F
6000	5998'	50.36°	174.82°	5893.70'	696.51'
					165.58°F
					165.58°F
	6045'	55.45°	177.28°	5922.04'	733.90'
					166.12°F
					166.12°F
	6093'	62.20°	178.26°	5946.87'	774.91'
6100					167.97°F
					167.97°F
					167.97°F
	6140'	66.34°	177.67°	5967.27'	817.21'
					167.97°F



6200

6187'

69.85°

177.74° 5984.80'

860.78'

167.97°F

168.35°F

6234'

73.34°

178.29° 5999.64'

905.34'

168.51°F

168.70°F

6282'

77.48°

179.39° 6011.73'

951.77'

168.98°F

6300

6329'

83.43°

180.26° 6019.52'

998.10'

169.53°F

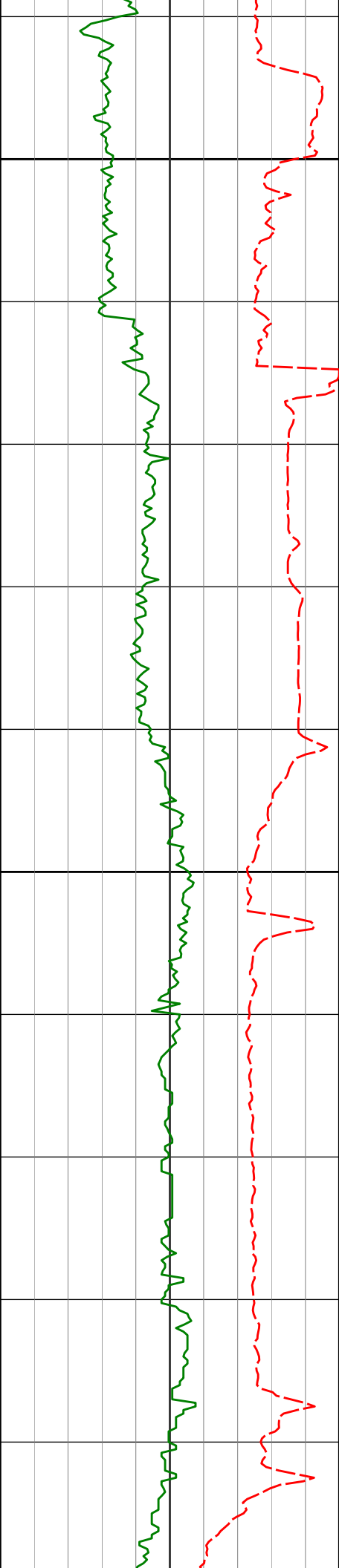
169.98°F

6371'

87.17°

180.44° 6022.96'

1039.95'



6400

200

6500

6507'

89.88°

180.45°

6026.48'

1175.89'

169.14°F

166.21°F

165.58°F

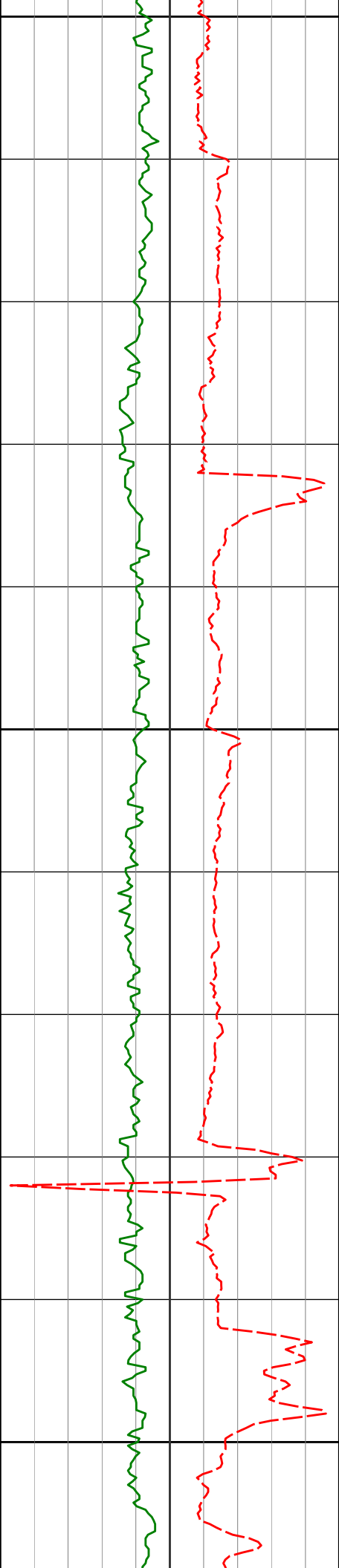
165.58°F

165.58°F

165.92°F

168.39°F



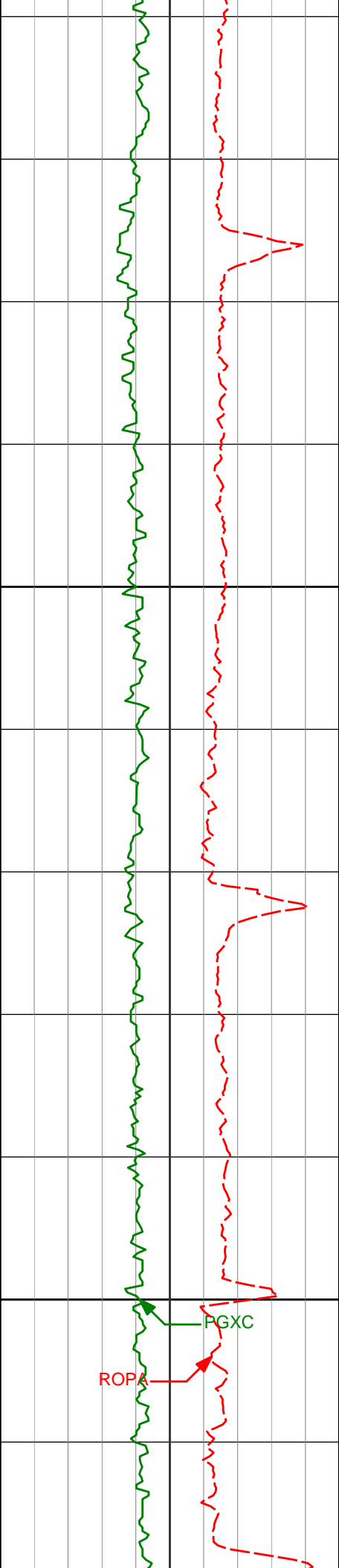


6600

6700

6800

6598'	89.91°	180.62°	6026.65'	1266.88'	170.37°F
					170.37°F
					170.37°F
					170.37°F
6690'	91.17°	181.06°	6025.78'	1358.87'	172.15°F
					171.59°F
					172.63°F
					173.32°F
6783'	89.85°	179.50°	6024.95'	1451.86'	175.21°F



6900

7000

6875'

90.34°

178.49°

6024.80'

1543.84'

6967'

89.94°

177.81°

6024.58'

1635.79'

176.68°F

177.64°F

178.43°F

180.09°F

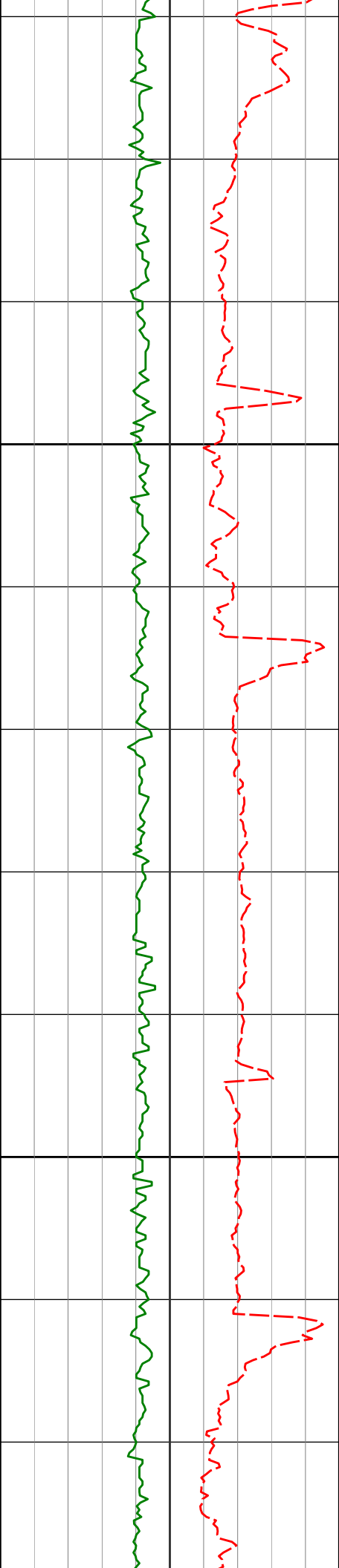
178.59°F

179.74°F

180.32°F

ROPA

PGXC



7100

7062'

89.45°

177.11°

6025.09'

1730.69'

7157'

90.46°

177.41°

6025.17'

1825.58'

7200

182.55°F

183.14°F

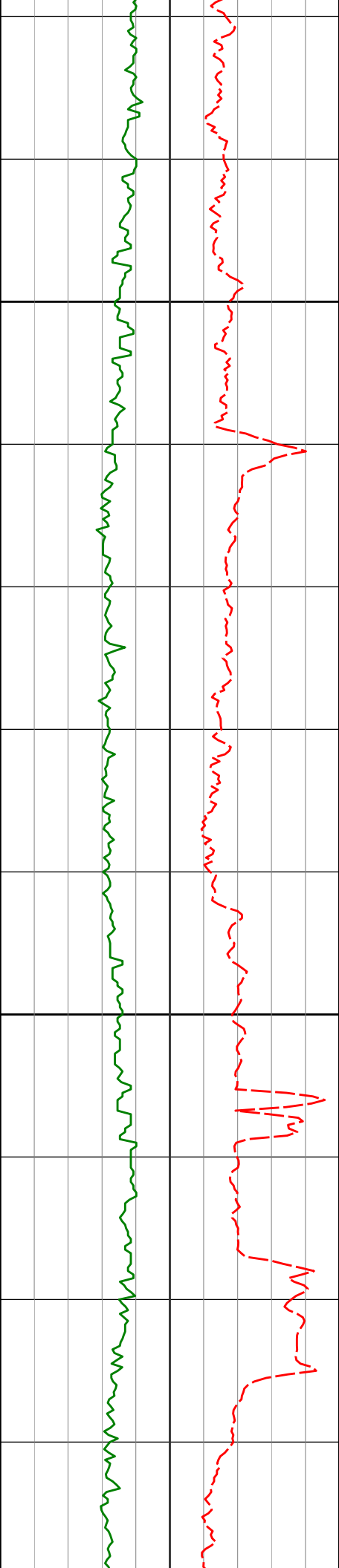
185.02°F

185.02°F

185.14°F

187.48°F

187.48°F



7300

7346'

89.51°

176.15°

6025.22'

2014.27'

7400

7441'

88.46°

176.60°

6026.91'

2109.07'

187.48°F

187.72°F

189.99°F

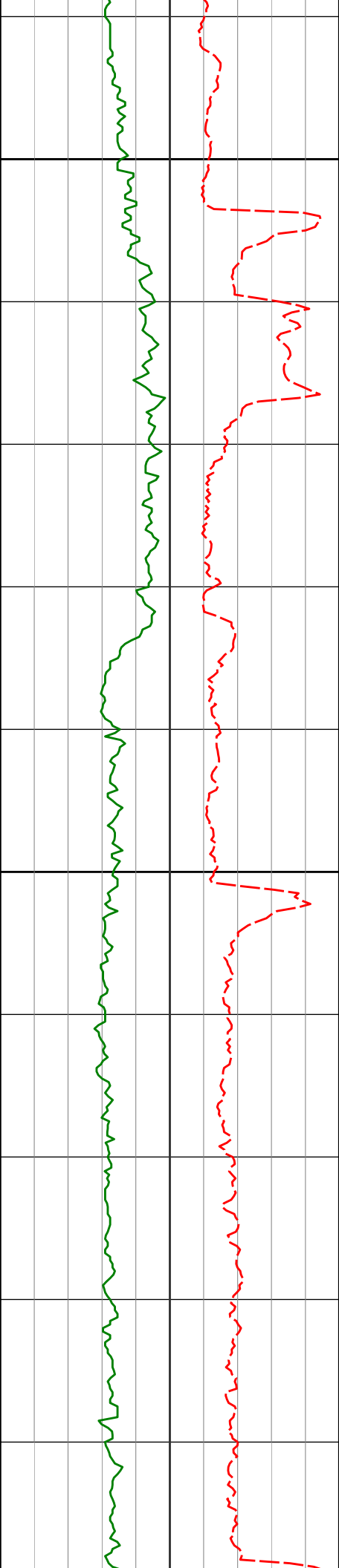
189.45°F

187.73°F

187.48°F

188.16°F

188.58°F



7500

189.99°F

190.73°F

192.49°F

192.49°F

7600

192.95°F

7630'

89.01°

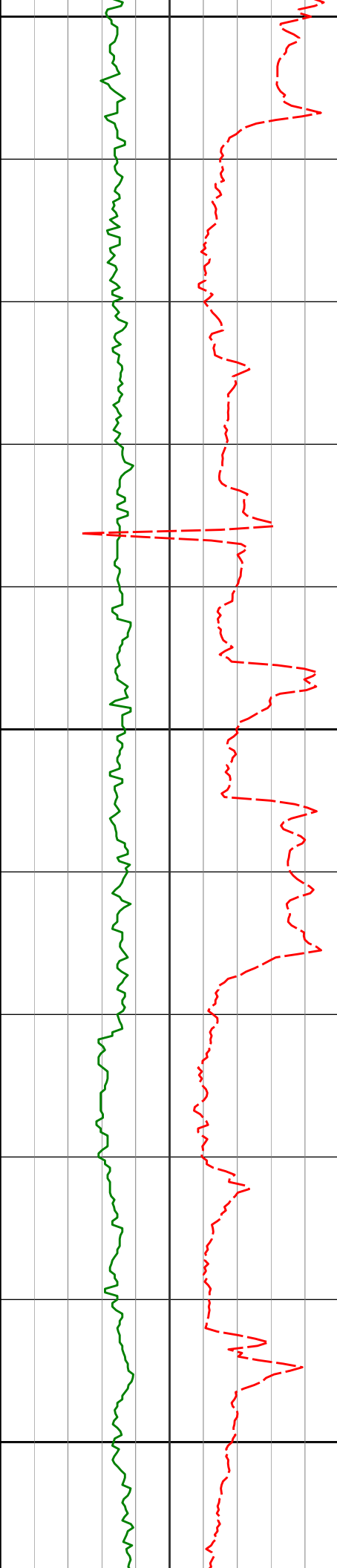
178.73°

6031.08'

2297.85'

191.02°F

192.49°F



7700

7725'

89.41°

180.68° 6032.38'

2392.83'

194.30°F

194.99°F

194.99°F

7800

7820'

90.34°

180.34° 6032.58'

2487.83'

194.99°F

197.16°F

197.51°F

197.90°F

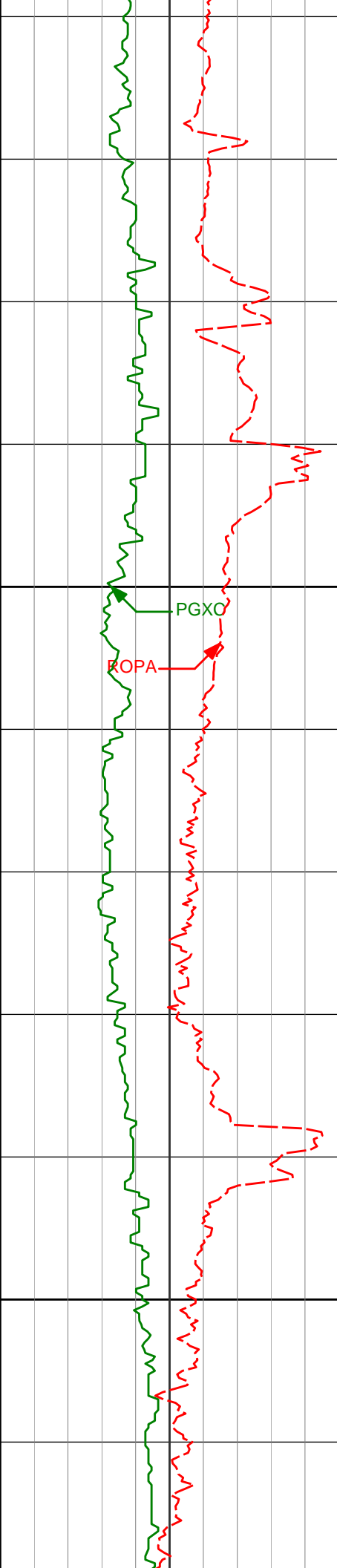
7900

7914'

91.11°

180.77° 6031.40'

2581.82'



8000

8009'

90.62°

179.38°

6029.96'

2676.80'

PGXC

ROPA

8100

8104'

90.55°

179.47°

6028.99'

2771.79'

200.05°F

200.05°F

200.05°F

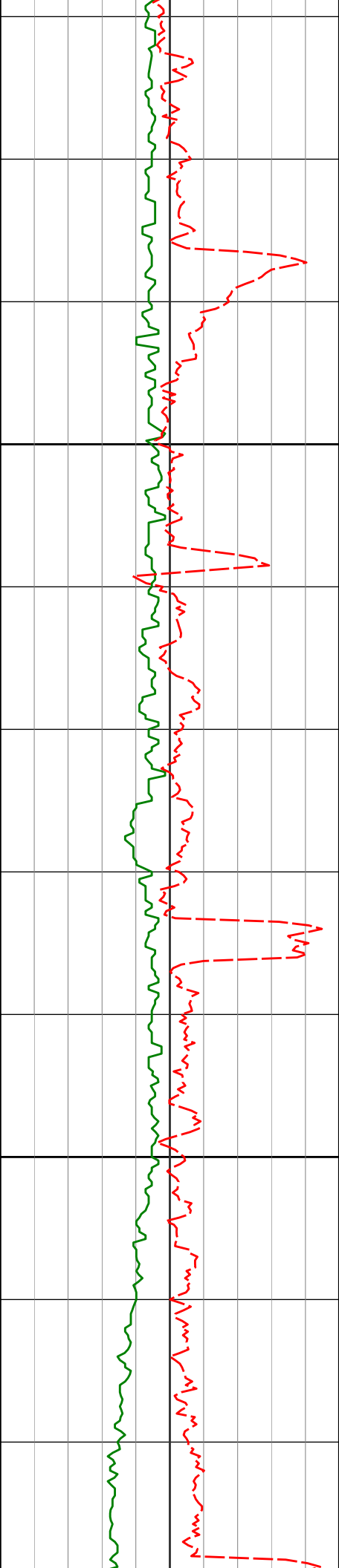
200.05°F

201.32°F

202.60°F

202.10°F

200.51°F



8200

8198'

90.34°

178.20°

6028.26'

2865.77'

8300

8293'

90.55°

178.69°

6027.52'

2960.73'

202.60°F

202.60°F

202.60°F

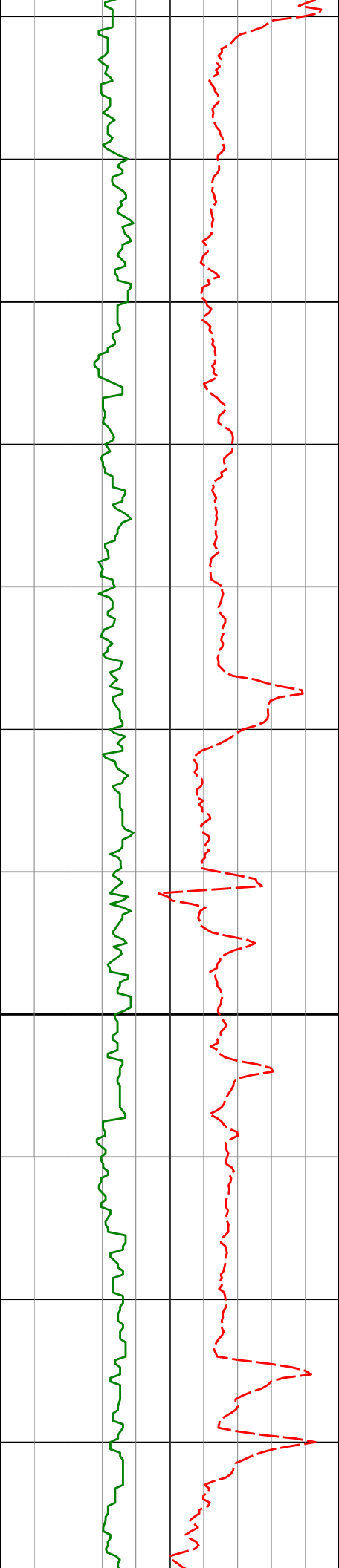
202.60°F

205.16°F

205.16°F

205.16°F





8400

8500

8388'

90.68°

178.48° 6026.50'

3055.69'

8482'

90.18°

178.19° 6025.79'

3149.65'

8577'

90.59°

177.81° 6025.15'

3244.59'

205.16°F

205.40°F

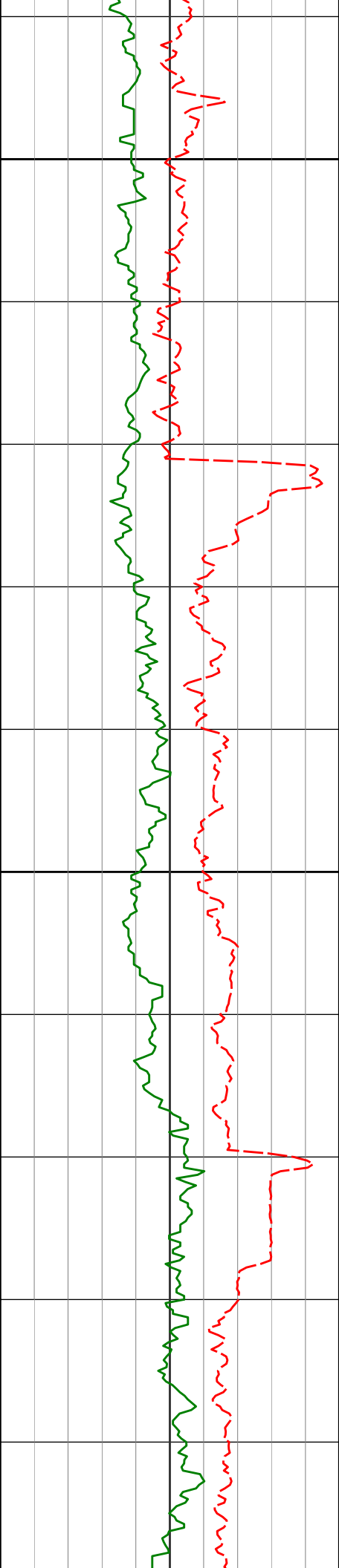
207.73°F

207.73°F

204.20°F

204.38°F

205.16°F



8600

8700

8672'

8767'

90.37°

89.85°

177.80°

177.55°

6024.36'

6024.18'

3339.51'

3434.43'

205.16°F

205.16°F

205.16°F

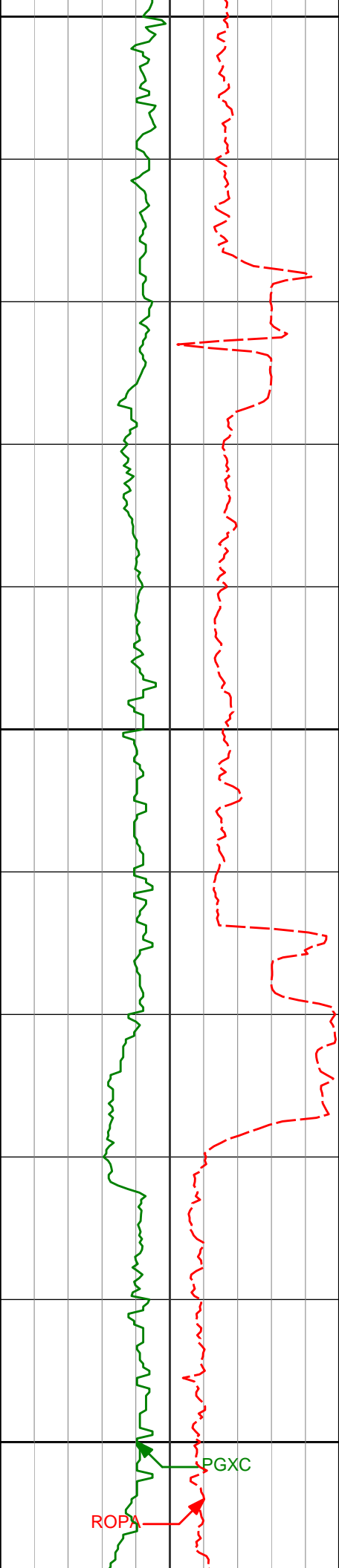
202.93°F

202.80°F

205.16°F

205.16°F

205.16°F



8800

207.30°F

203.21°F

8862'

89.20°

177.30° 6024.97'

3529.33'

198.80°F

8900

197.51°F

198.23°F

8956'

88.61°

178.62° 6026.77'

3623.25'

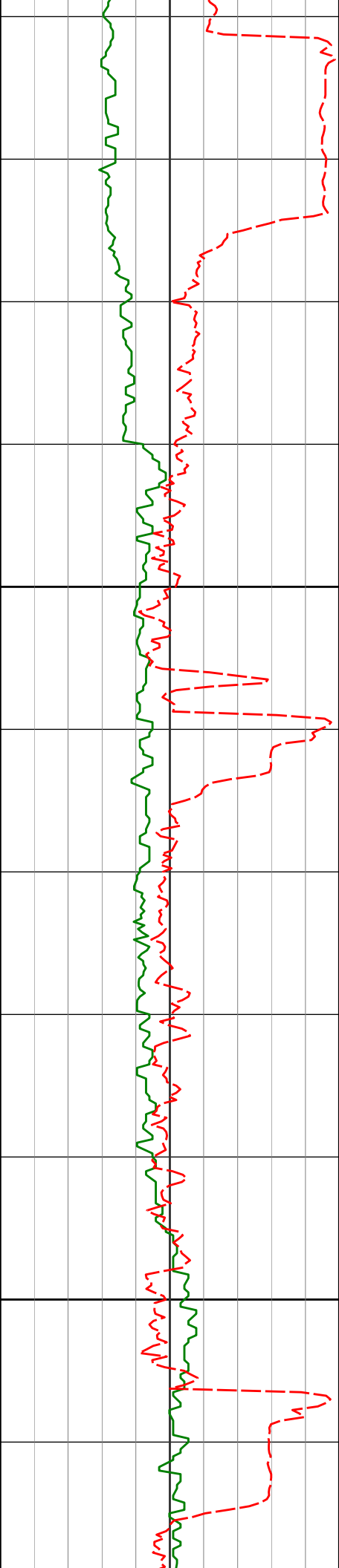
197.65°F

9000

197.93°F

PGXC

ROPA



9100

9200

9051'

9146'

91.97°

92.31°

179.03°

177.64°

6026.28'

6022.73'

3718.22'

3813.11'

200.05°F

200.05°F

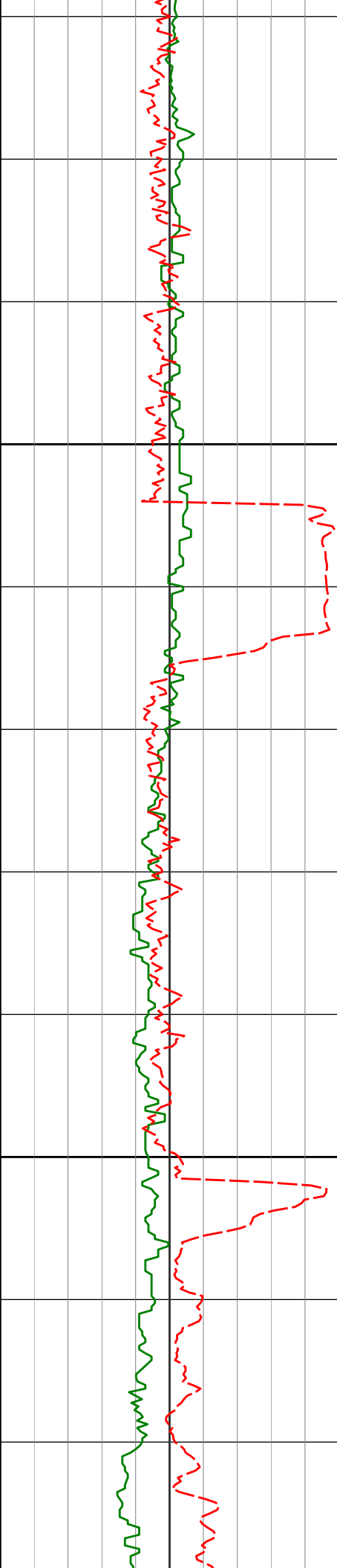
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203.18°F

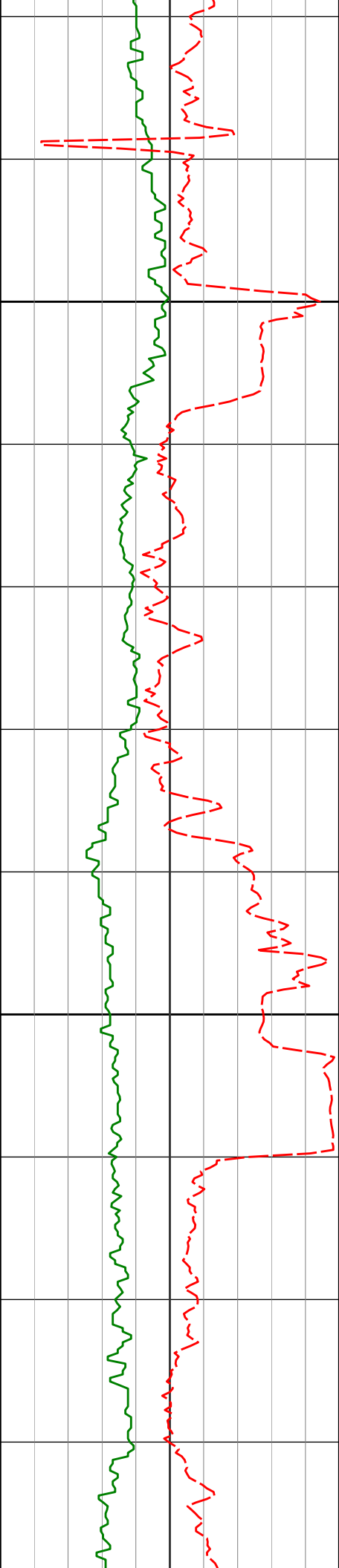
204.56°F

205.54°F

207.34°F



9241'	92.87°	177.38°	6018.43'	3907.92'	202.60°F
					202.60°F
					202.60°F
					202.60°F
					202.96°F
9336'	90.55°	177.63°	6015.60'	4002.78'	
					205.47°F
					207.73°F
					207.73°F
					207.73°F



9500

9600

9525'

9620'

91.29°

89.85°

176.58°

177.90°

6012.24'

6011.29'

4191.53'

4286.40'

210.31°F

209.64°F

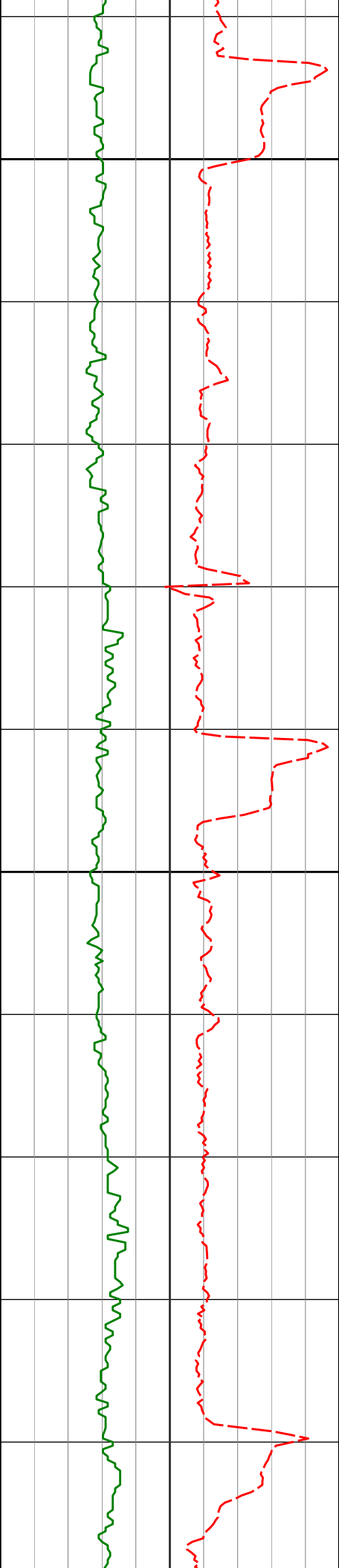
207.29°F

207.54°F

207.98°F

210.03°F

210.31°F



9700

9715'

90.89°

178.42° 6010.68'

4381.35'

212.74°F

212.92°F

212.92°F

215.04°F

9800

9810'

91.05°

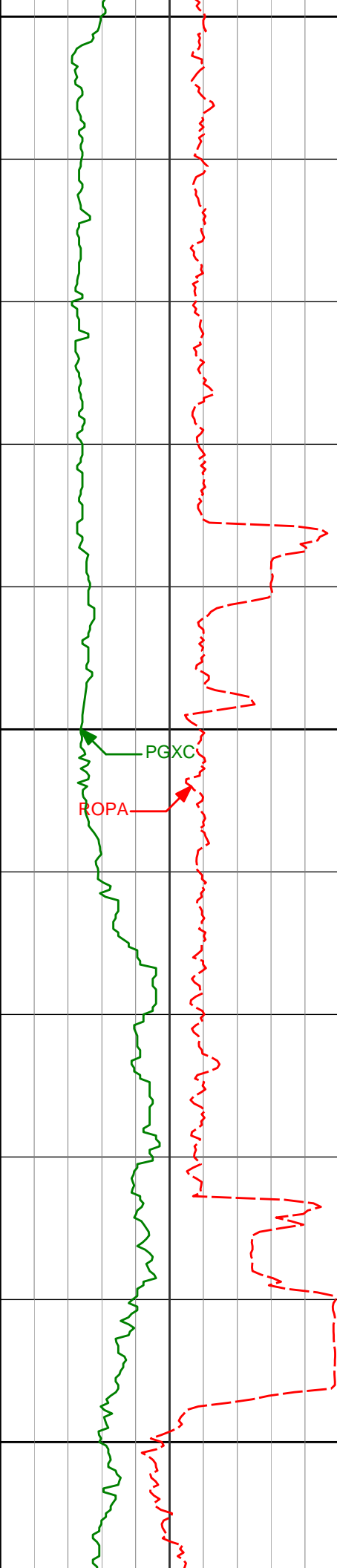
177.45° 6009.07'

4476.27'

215.51°F

215.51°F

215.51°F



9900

9905'

90.92°

176.25° 6007.43'

4571.11'

215.51°F

216.38°F

218.14°F

215.13°F

10000

9999'

91.69°

176.44° 6005.29'

4664.89'

213.42°F

212.92°F

214.92°F

10100

10094'

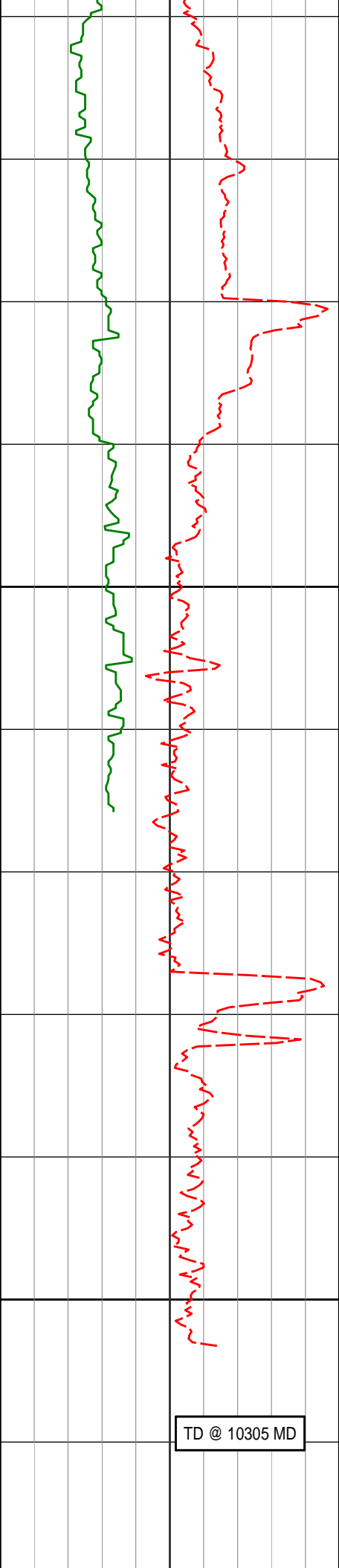
90.68°

175.81° 6003.32'

4759.65'

215.51°F





10200

10189'

91.29°

175.32°

6001.68'

4854.35'

215.51°F

218.14°F

218.14°F

10237'

91.20°

174.95°

6000.64'

4902.17'

10300

10305'

91.20°

174.95°

5999.21'

4969.88'

[illegible]**HALLIBURTON**

## DIRECTIONAL SURVEY REPORT

**Noble  
Neal LC35-738  
Wildcat  
Weld Colorado  
USA  
CA-XX-0902239555  
Tied in @ Surface  
First two surveys from 3rd party.**

## Final survey projected to bit.

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
281.00	0.40	163.22	281.00	0.94 S	0.28 E	0.94	0.14
528.00	0.40	240.12	527.99	2.19 S	0.22 W	2.19	0.20
734.00	0.18	109.76	733.99	2.66 S	0.54 W	2.66	0.26
918.00	0.18	93.67	917.99	2.78 S	0.02 E	2.78	0.03
1010.00	0.22	115.83	1009.99	2.87 S	0.33 E	2.87	0.10
1102.00	0.37	126.48	1101.99	3.12 S	0.73 E	3.12	0.17
1211.00	0.35	150.05	1210.99	3.62 S	1.18 E	3.62	0.14
1302.00	0.42	147.28	1301.98	4.14 S	1.50 E	4.14	0.08
1394.00	0.50	142.45	1393.98	4.74 S	1.93 E	4.74	0.09
1486.00	0.43	146.82	1485.98	5.35 S	2.36 E	5.35	0.08
1579.00	1.45	218.67	1578.97	6.56 S	1.82 E	6.56	1.48
1670.00	3.31	206.24	1669.89	9.81 S	0.06 W	9.81	2.11
1763.00	4.91	206.85	1762.64	15.77 S	3.05 W	15.77	1.73
1854.00	6.35	204.77	1853.20	23.82 S	6.92 W	23.82	1.60
1946.00	7.89	198.85	1944.49	34.42 S	11.09 W	34.42	1.85
2038.00	8.79	201.73	2035.52	46.93 S	15.74 W	46.93	1.08
2129.00	9.60	197.98	2125.35	60.60 S	20.65 W	60.61	1.10
2222.00	9.89	194.37	2217.01	75.71 S	25.03 W	75.72	0.73
2314.00	9.36	189.23	2307.71	90.75 S	28.19 W	90.76	1.10
2405.00	9.37	187.71	2397.50	105.39 S	30.37 W	105.41	0.27
2498.00	9.44	191.88	2489.25	120.36 S	32.95 W	120.37	0.74
2590.00	9.05	198.25	2580.06	134.61 S	36.77 W	134.63	1.19
2683.00	9.39	201.20	2671.86	148.63 S	41.81 W	148.65	0.62
2778.00	9.65	199.71	2765.55	163.36 S	47.30 W	163.37	0.38
2872.00	9.70	198.44	2858.21	178.29 S	52.46 W	178.31	0.23
2967.00	9.18	197.28	2951.92	193.12 S	57.24 W	193.14	0.58
3062.00	8.41	194.11	3045.81	207.09 S	61.19 W	207.11	0.96
3157.00	6.09	183.42	3140.05	218.86 S	63.18 W	218.88	2.81
3251.00	5.93	185.99	3233.53	228.66 S	63.99 W	228.68	0.33
3346.00	8.45	203.58	3327.79	239.94 S	67.29 W	239.96	3.50
3441.00	9.18	202.52	3421.66	253.33 S	72.99 W	253.36	0.78
3535.00	9.65	201.78	3514.40	267.57 S	78.78 W	267.60	0.51
3630.00	9.91	201.44	3608.02	282.58 S	84.72 W	282.61	0.29
3724.00	10.19	201.25	3700.58	297.86 S	90.69 W	297.89	0.30
3819.00	10.11	201.76	3794.09	313.43 S	96.83 W	313.47	0.13
3913.00	10.03	200.52	3886.64	328.76 S	102.76 W	328.79	0.25
4008.00	9.26	199.14	3980.30	343.72 S	108.16 W	343.76	0.84

4103.00	9.01	198.90	4074.09	357.98 S	113.08 W	358.02	0.28
4198.00	8.35	198.53	4168.01	371.55 S	117.68 W	371.60	0.70
4292.00	8.13	198.42	4261.04	384.33 S	121.95 W	384.37	0.23
4387.00	7.59	197.66	4355.14	396.69 S	125.97 W	396.73	0.58
4482.00	7.11	200.66	4449.36	408.17 S	129.95 W	408.21	0.65
4577.00	6.49	202.96	4543.69	418.62 S	134.12 W	418.66	0.72
4671.00	4.34	190.79	4637.27	427.00 S	136.86 W	427.05	2.58
4766.00	2.11	158.18	4732.12	432.15 S	136.88 W	432.20	2.95
4861.00	1.84	155.62	4827.06	435.17 S	135.60 W	435.22	0.30
4956.00	1.95	160.15	4922.01	438.08 S	134.42 W	438.13	0.20
5051.00	2.02	166.67	5016.96	441.23 S	133.49 W	441.28	0.25
5145.00	1.81	158.36	5110.90	444.22 S	132.56 W	444.27	0.37
5240.00	1.81	155.88	5205.86	446.98 S	131.39 W	447.03	0.08
5335.00	1.57	157.73	5300.81	449.55 S	130.29 W	449.60	0.26
5430.00	1.74	152.67	5395.78	452.04 S	129.13 W	452.08	0.23
5477.00	6.75	179.42	5442.63	455.43 S	128.78 W	455.48	11.19
5524.00	13.08	175.70	5488.91	463.51 S	128.35 W	463.55	13.53
5571.00	17.53	175.23	5534.23	475.87 S	127.36 W	475.92	9.48
5619.00	20.57	175.19	5579.60	491.48 S	126.06 W	491.53	6.34
5666.00	23.71	175.31	5623.13	509.13 S	124.59 W	509.18	6.67
5713.00	27.43	180.11	5665.52	529.39 S	123.84 W	529.43	9.06
5760.00	29.90	184.00	5706.76	551.90 S	124.68 W	551.94	6.58
5808.00	31.29	180.53	5748.08	576.30 S	125.63 W	576.34	4.68
5855.00	35.38	174.78	5787.35	602.07 S	124.50 W	602.12	11.00
5903.00	38.21	173.96	5825.78	630.68 S	121.67 W	630.72	5.98
5950.00	44.16	173.27	5861.14	661.43 S	118.22 W	661.47	12.70
5998.00	50.36	174.82	5893.70	696.47 S	114.59 W	696.51	13.13
6045.00	55.45	177.28	5922.04	733.86 S	112.04 W	733.90	11.59
6093.00	62.20	178.26	5946.87	774.87 S	110.45 W	774.91	14.18
6140.00	66.34	177.67	5967.27	817.18 S	108.95 W	817.21	8.88
6187.00	69.85	177.74	5984.80	860.74 S	107.20 W	860.78	7.46
6234.00	73.34	178.29	5999.64	905.30 S	105.65 W	905.34	7.51
6282.00	77.48	179.39	6011.73	951.73 S	104.72 W	951.77	8.92
6329.00	83.43	180.26	6019.52	998.06 S	104.58 W	998.10	12.79
6371.00	87.17	180.44	6022.96	1039.91 S	104.84 W	1039.95	8.90
6507.00	89.88	180.45	6026.48	1175.85 S	105.89 W	1175.89	1.99
6598.00	89.91	180.62	6026.65	1266.85 S	106.74 W	1266.88	0.19
6690.00	91.17	181.06	6025.78	1358.83 S	108.09 W	1358.87	1.45
6783.00	89.85	179.50	6024.95	1451.82 S	108.54 W	1451.86	2.20
6875.00	90.34	178.49	6024.80	1543.80 S	106.93 W	1543.84	1.22
6967.00	89.94	177.81	6024.58	1635.75 S	103.96 W	1635.79	0.86
7062.00	89.45	177.11	6025.09	1730.66 S	99.75 W	1730.69	0.91
7157.00	90.46	177.41	6025.17	1825.55 S	95.21 W	1825.58	1.12
7346.00	89.51	176.15	6025.22	2014.24 S	84.59 W	2014.27	0.84
7441.00	88.46	176.60	6026.91	2109.04 S	78.58 W	2109.07	1.20
7630.00	89.01	178.73	6031.08	2297.82 S	70.89 W	2297.85	1.16
7725.00	89.41	180.68	6032.38	2392.81 S	70.39 W	2392.83	2.09
7820.00	90.34	180.34	6032.58	2487.80 S	71.23 W	2487.83	1.04
7914.00	91.11	180.77	6031.40	2581.79 S	72.14 W	2581.82	0.94
8009.00	90.62	179.38	6029.96	2676.78 S	72.27 W	2676.80	1.55
8104.00	90.55	179.47	6028.99	2771.77 S	71.32 W	2771.79	0.12
8198.00	90.34	178.20	6028.26	2865.74 S	69.41 W	2865.77	1.37
8293.00	90.55	178.69	6027.52	2960.71 S	66.83 W	2960.73	0.57
8388.00	90.68	178.48	6026.50	3055.67 S	64.49 W	3055.69	0.26
8482.00	90.18	178.19	6025.79	3149.63 S	61.76 W	3149.65	0.61
8577.00	90.59	177.81	6025.15	3244.57 S	58.45 W	3244.59	0.59
8672.00	90.37	177.80	6024.36	3339.49 S	54.81 W	3339.51	0.23
8767.00	89.85	177.55	6024.18	3434.42 S	50.95 W	3434.43	0.61
8862.00	89.20	177.30	6024.97	3529.32 S	46.68 W	3529.33	0.73
8956.00	88.61	178.62	6026.77	3623.24 S	43.33 W	3623.25	1.53
9051.00	91.97	179.03	6026.28	3718.20 S	41.38 W	3718.22	3.56
9146.00	92.31	177.64	6022.73	3813.09 S	38.63 W	3813.11	1.50
9241.00	92.87	177.38	6018.43	3907.91 S	34.51 W	3907.92	0.65
9336.00	90.55	177.63	6015.60	4002.77 S	30.37 W	4002.78	2.45
9430.00	91.11	177.44	6014.23	4096.67 S	26.33 W	4096.68	0.62
9525.00	91.29	176.58	6012.24	4191.52 S	21.38 W	4191.53	0.93
9620.00	89.85	177.90	6011.29	4286.40 S	16.81 W	4286.40	2.06
9715.00	90.89	178.42	6010.68	4381.35 S	13.76 W	4381.35	1.23
9810.00	91.05	177.45	6009.07	4476.27 S	10.34 W	4476.27	1.03
9905.00	90.92	176.25	6007.43	4571.11 S	5.13 W	4571.11	1.27
9999.00	91.69	176.44	6005.29	4664.89 S	0.86 E	4664.89	0.84

10094.00	90.68	175.81	6003.32	4759.66 S	7.27 E	4759.65	1.26
10189.00	91.29	175.32	6001.68	4854.36 S	14.62 E	4854.35	0.83
10237.00	91.20	174.95	6000.64	4902.17 S	18.69 E	4902.17	0.80
10305.00	91.20	174.95	5999.21	4969.89 S	24.68 E	4969.88	0.01

<p> 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 180.02 DEGREES (GRID)  A TOTAL CORRECTION OF 7.02 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED   HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  HORIZONTAL DISPLACEMENT(CLOSURE) AT 10305.00 FEET  IS 4969.95 FEET ALONG 179.72 DEGREES (GRID) </p>
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