



WELL INFORMATION					
MWD Run Number	100				
Date run completed	28-Jun-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.890				
Log Start Depth (TVD, ft)	820.98				
Log End Depth (TVD, ft)	6,572.04				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	27-Jun-15 04:31				
Drill/Wipe End Date and Time	28-Jun-15 14:15				
Min Inc (deg) @ Depth (TVD, ft)	0.13 @ 1,944.89				
Max Inc (deg) @ Depth (TVD, ft)	71.31 @ 6,574.17				
Bit TFA(in2) / Bit Type	0.98 / PDC				
Flow Rate (gpm)	589.88				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	9.75 / 35.00				
Filtrate CL (ppm)	1,700.00				
pH / Fluid Loss (mptm)	11.00 / 10				
PV (cP) / YP (lhf2)	7 / 6.00				
% Solids / % Sand	3.00 / 0.25				
% Oil / Oil:Water Ratio	N/A / N/A				
Rm @ Measured Temp (degF)	N/A @ N/A				
Rmf @ Measured Temp (degF)	N/A @ N/A				
Rmc @ Measured Temp (degF)	N/A @ N/A				
Mud Temp (degF) @ Depth	175.10 / 20M				

Max Tool Temp (degF) / Source	175.40 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ 175.40				
Lead MWD Engineer	Matt Busche				
Customer Representative	Jeremy Stolz				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11404267				
Insert Serial Number	11680727				
Date and Time Initialized	26-Jun-15 15:07				
Date and Time Read	28-Jun-15 21:27				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	56.00				
Software Version	6.33				
Sub Serial Number	11404267				
Sonde Serial Number	11478122				
Sensor ID Number	N/A				
Toolface Offset (deg)	157.90				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	48.95				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11404267				
Insert/Sonde Serial Number	11680921				

REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical 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

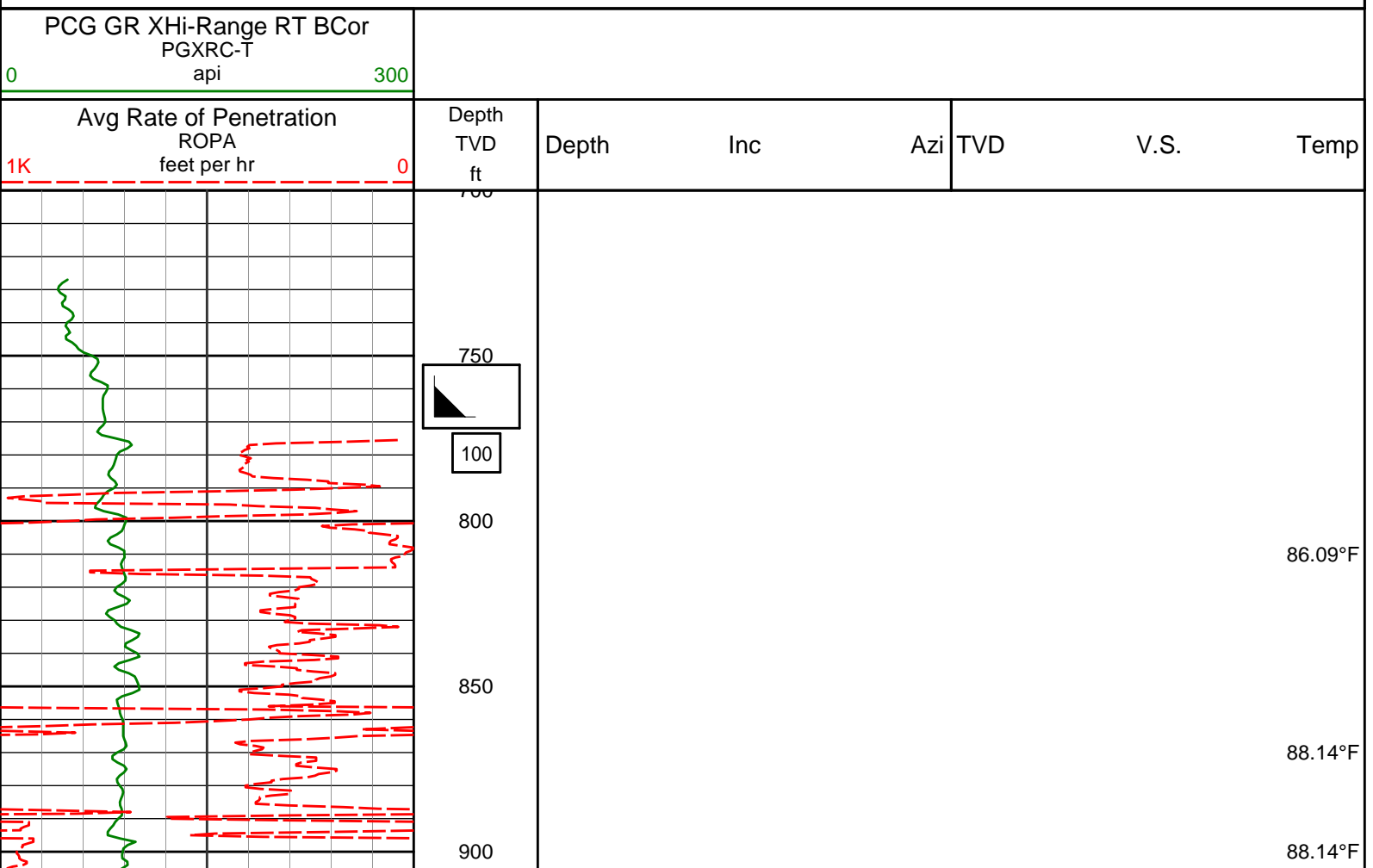
Interval Resolution: 1.2 ft

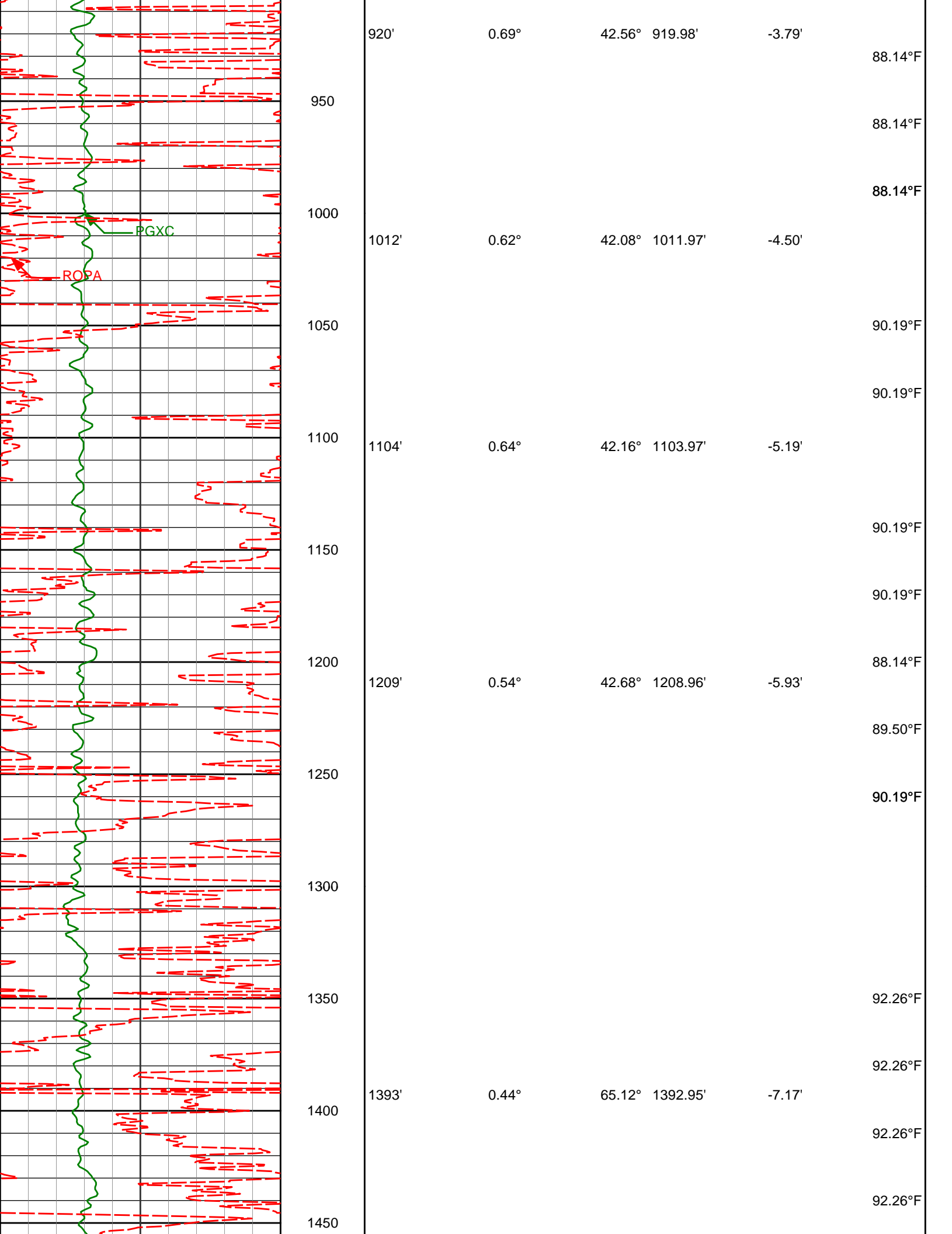
6. Insite Version v8.1.10

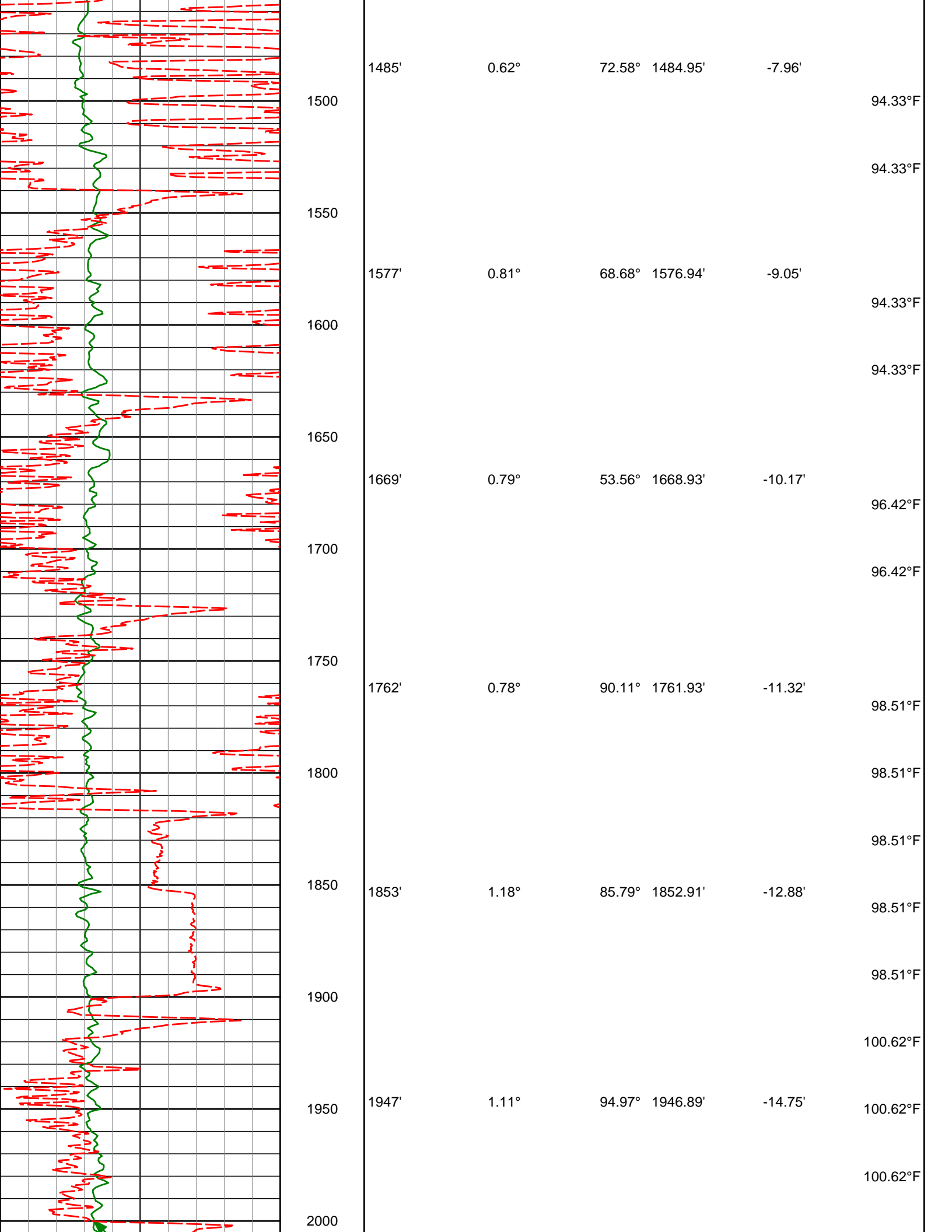
WARRANTY

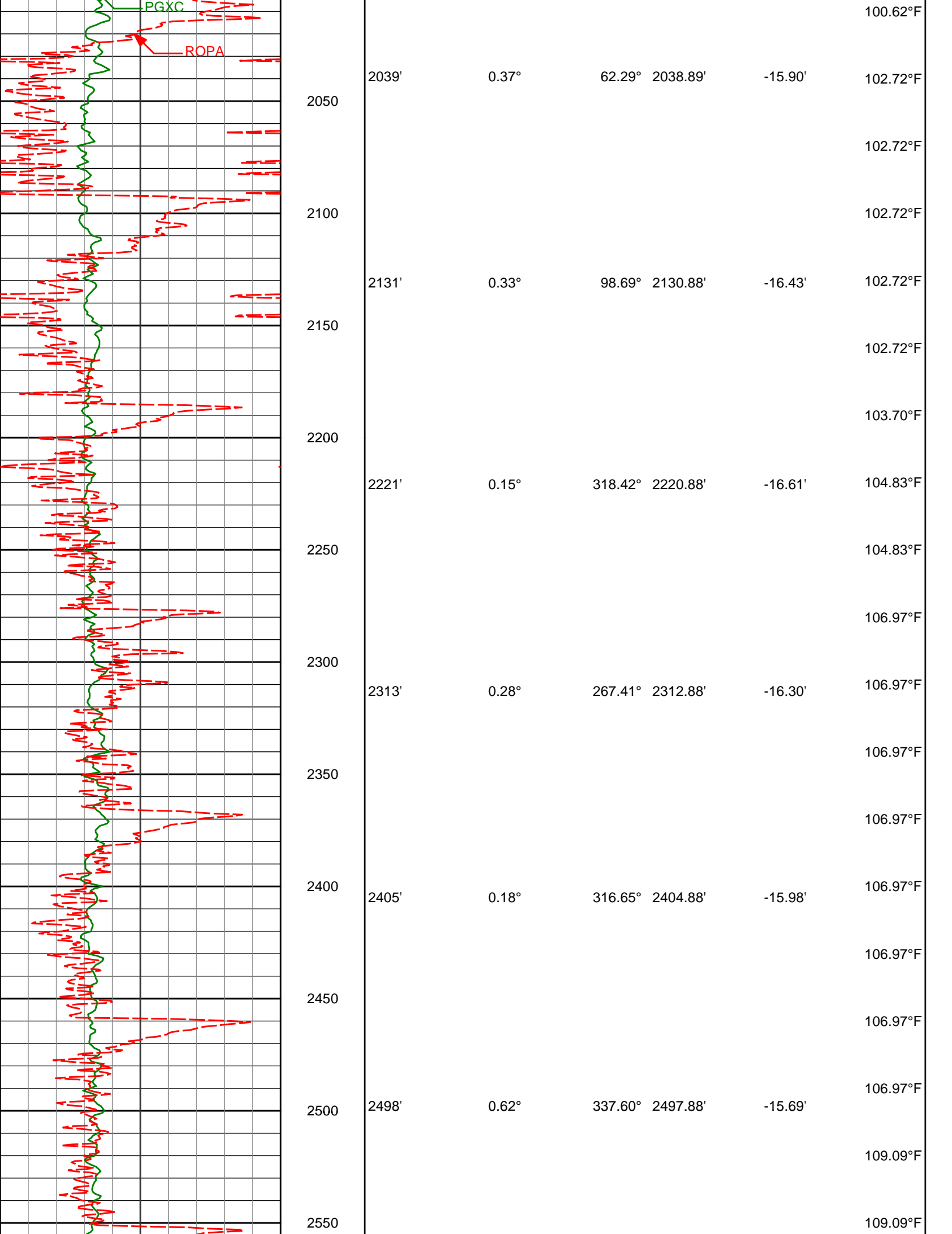
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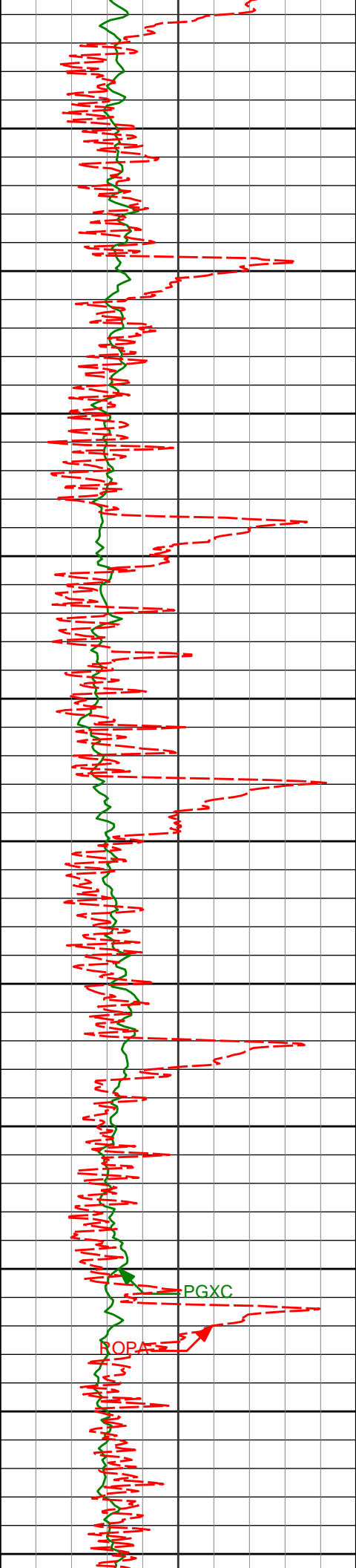
TVD Detail 1:600 Scale



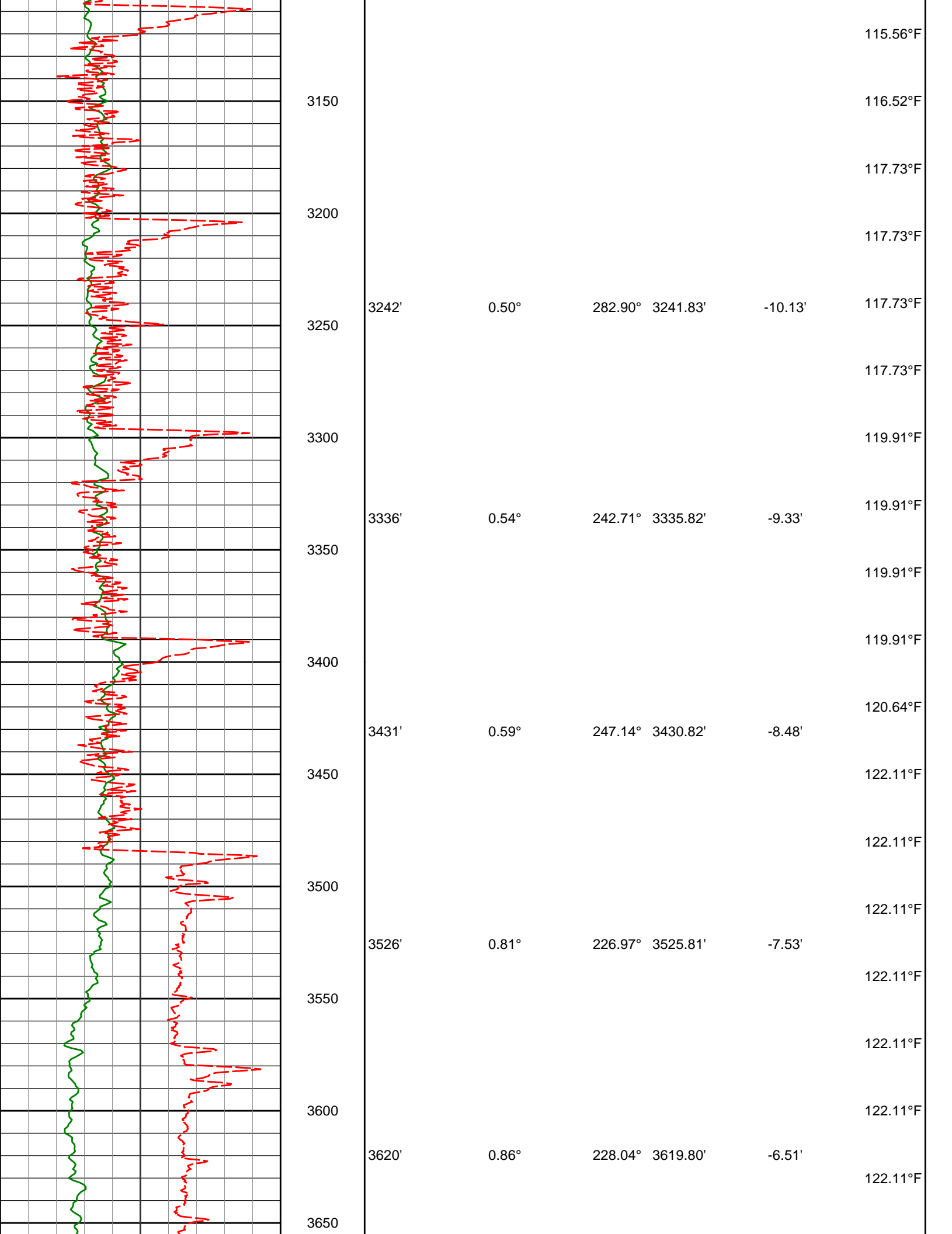


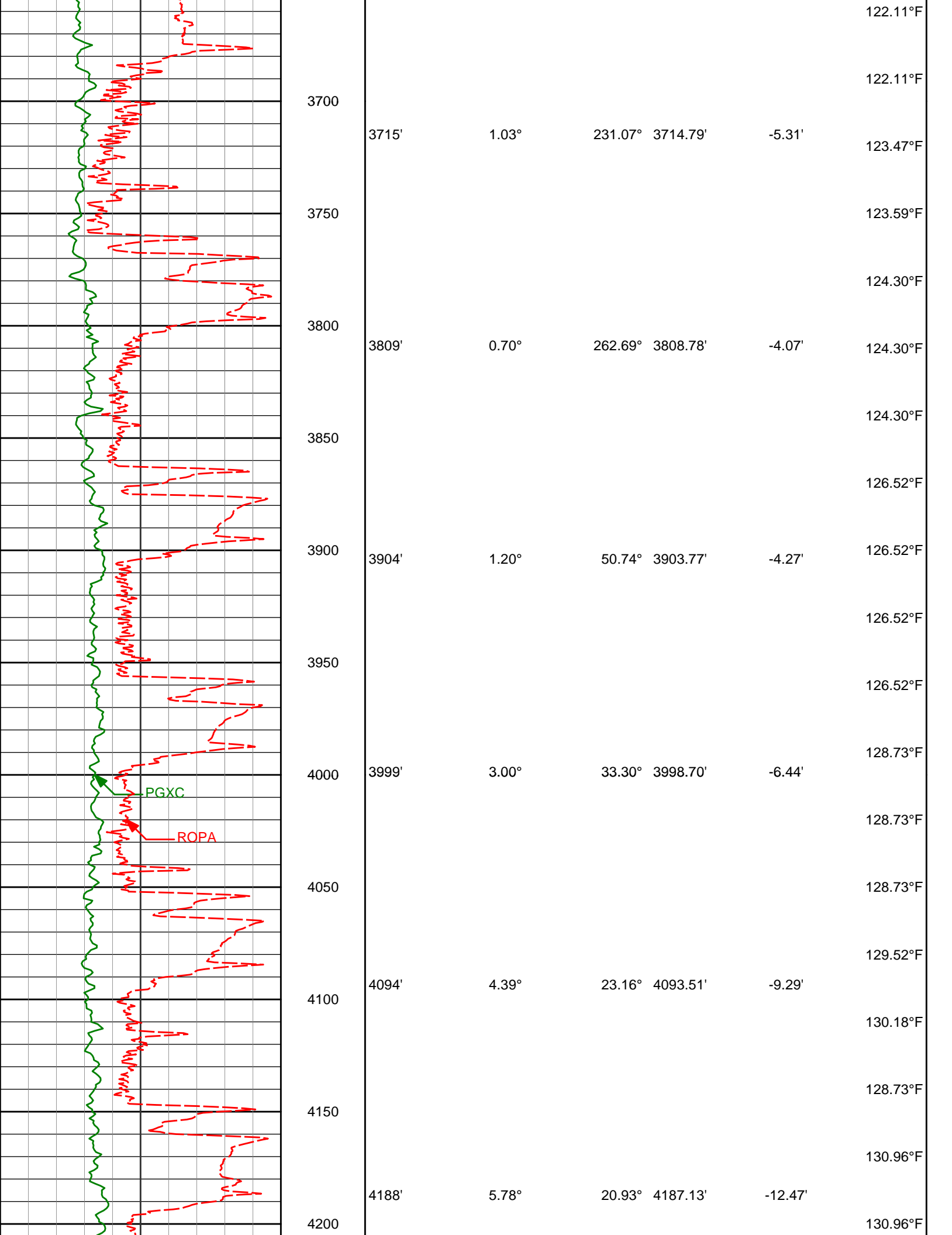


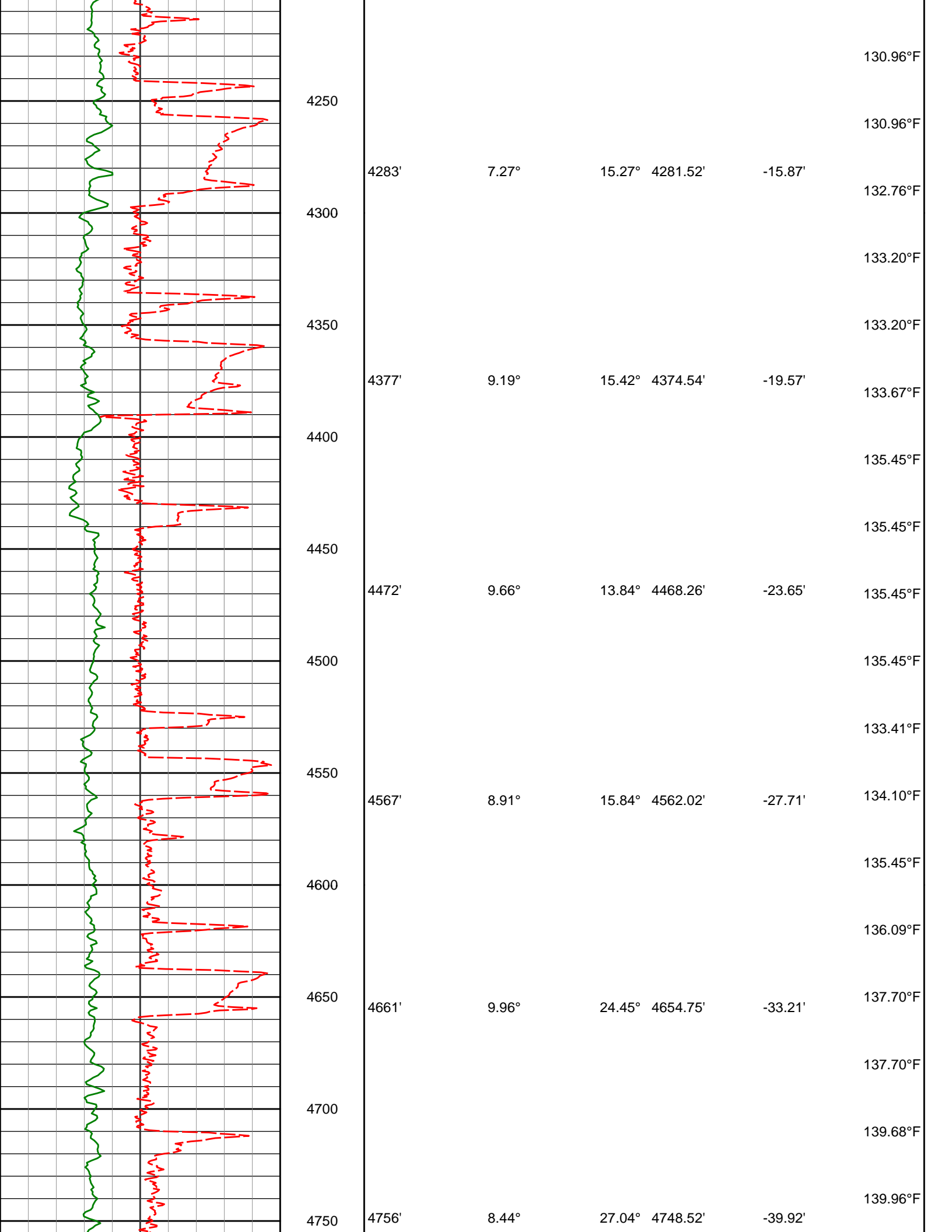


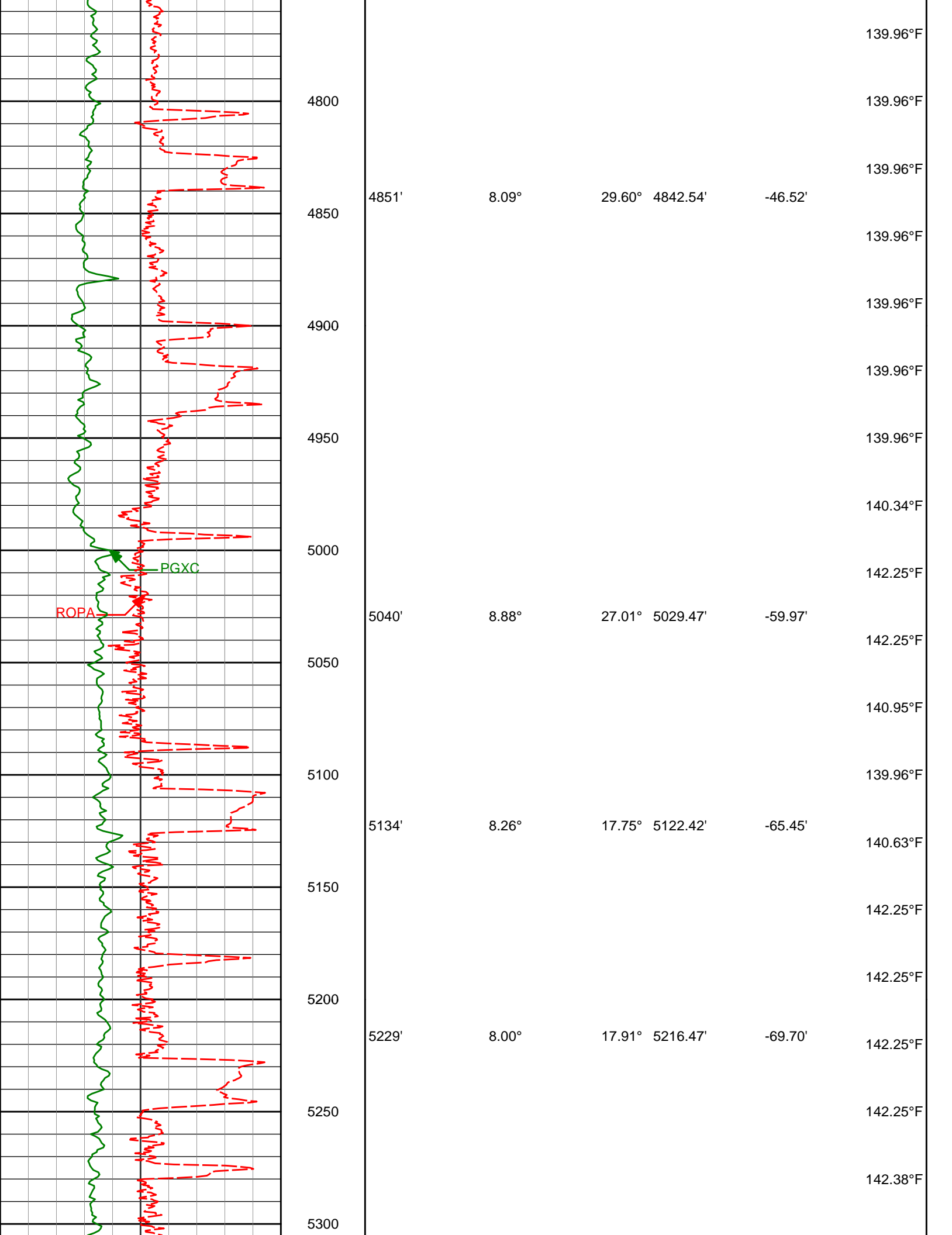


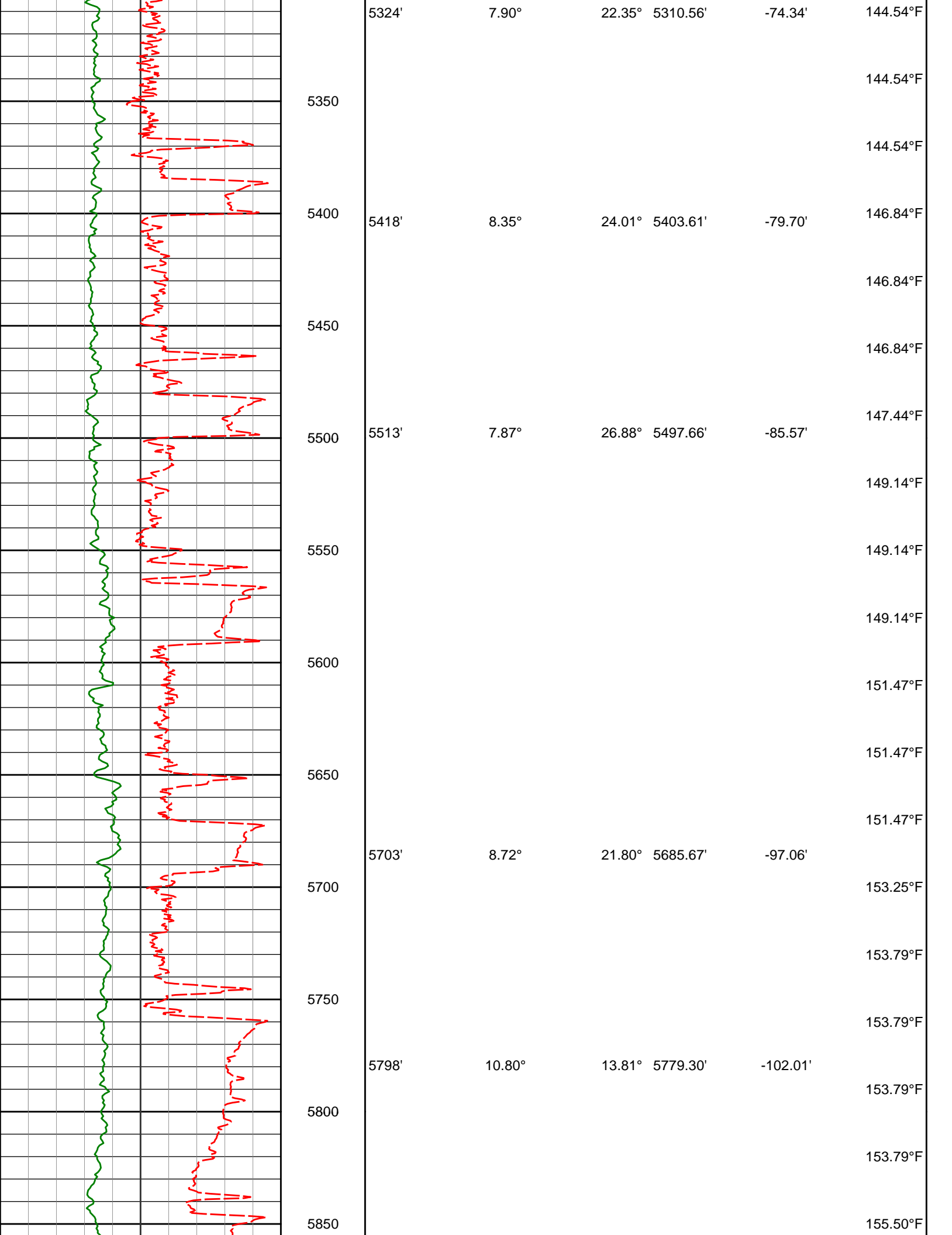
					109.09°F
	2591'	0.74°	322.57°	2590.87'	-15.15'
2600					109.09°F
					109.09°F
					109.09°F
2650					111.24°F
	2683'	0.48°	314.45°	2682.87'	-14.52'
2700					111.24°F
					111.24°F
					111.24°F
2750					111.24°F
	2775'	0.63°	320.21°	2774.86'	-13.93'
2800					111.24°F
					111.24°F
					111.24°F
2850					111.24°F
	2866'	0.68°	322.12°	2865.86'	-13.28'
2900					112.89°F
					113.40°F
					113.40°F
2950					113.40°F
	2959'	0.88°	321.88°	2958.85'	-12.51'
3000					113.40°F
					115.56°F
3050	3053'	0.86°	326.77°	3052.84'	-11.69'
					115.56°F
3100					115.56°F

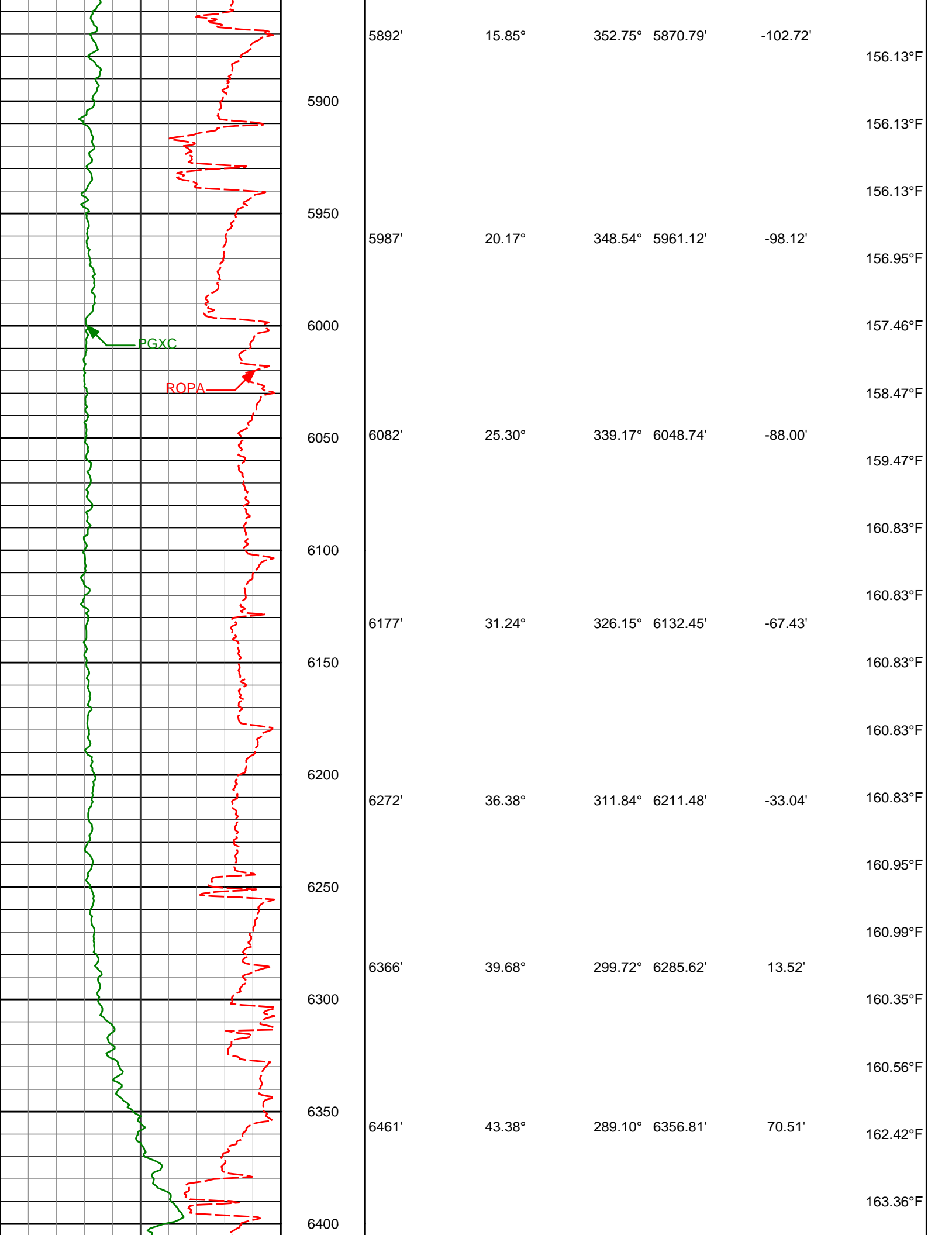


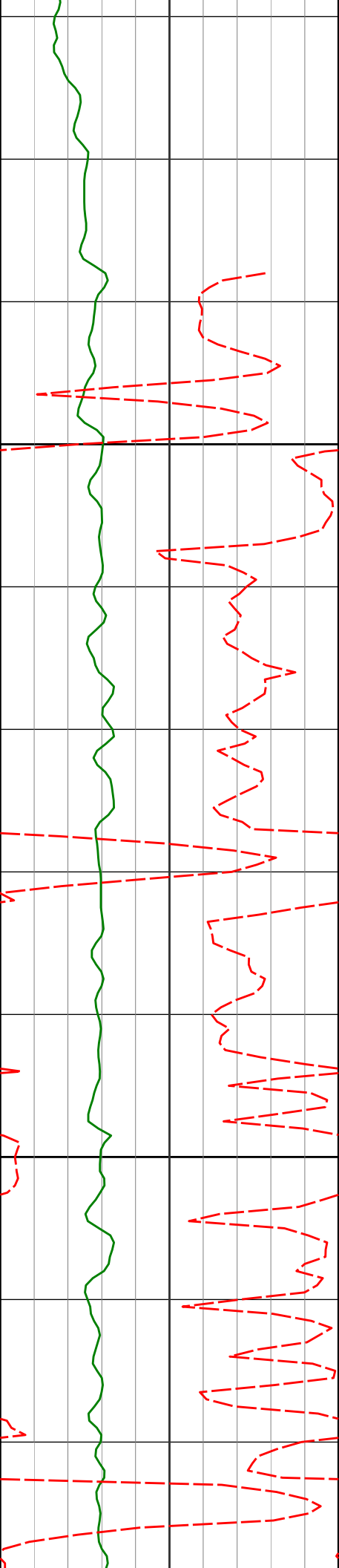












100

800

900

920'

0.69°

42.56° 919.98'

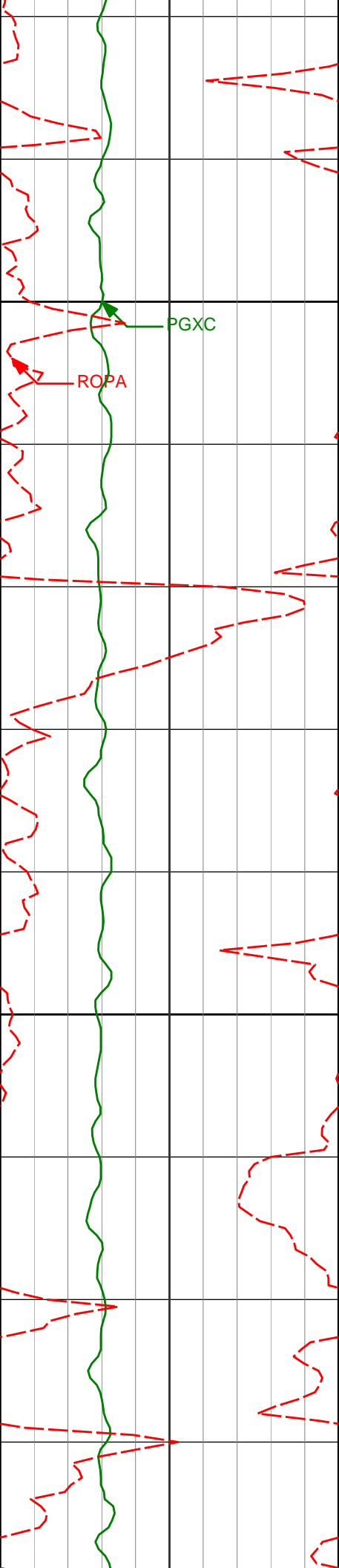
-3.79'

86.09°F

88.14°F

88.14°F

88.14°F



1000

1012'

0.62°

42.08°

1011.97'

-4.50'

1100

1104'

0.64°

42.16°

1103.97'

-5.19'

88.14°F

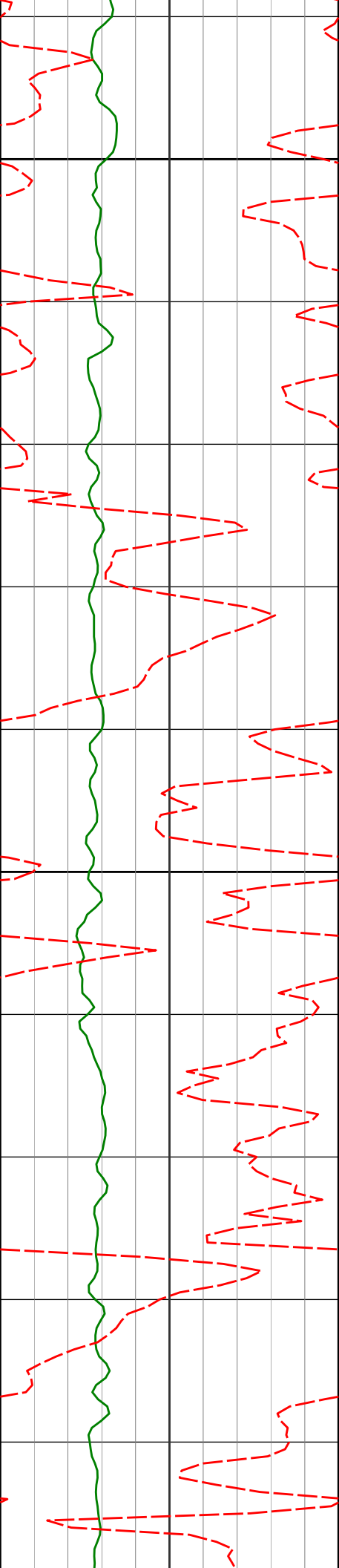
88.14°F

90.19°F

90.19°F

90.19°F

90.19°F



1200

1209'

0.54°

42.68°

1208.96'

-5.93'

88.14°F

89.50°F

90.19°F

1300

1393'

0.44°

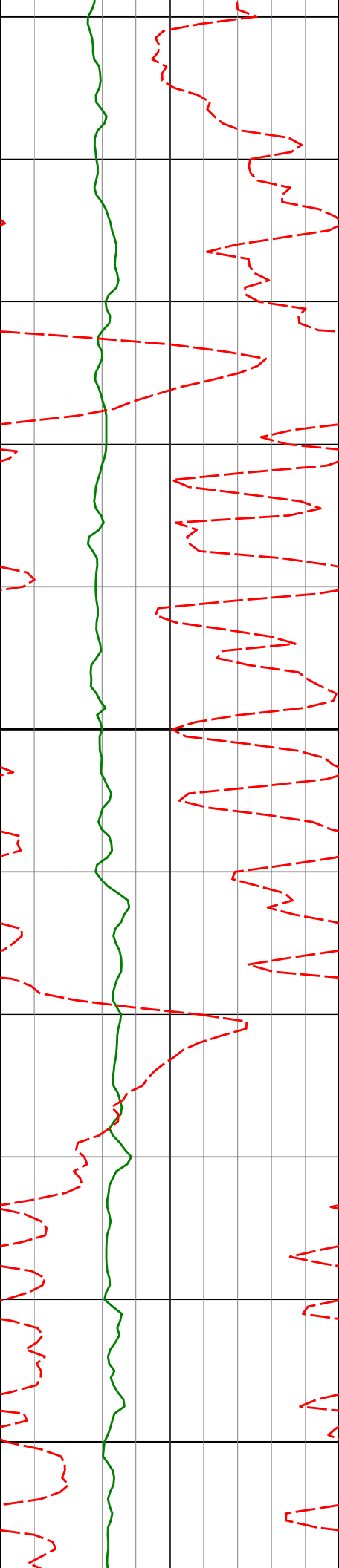
65.12°

1392.95'

-7.17'

92.26°F

92.26°F



1400

92.26°F

92.26°F

1485'

0.62°

72.58°

1484.95'

-7.96'

1500

94.33°F

94.33°F

1577'

0.81°

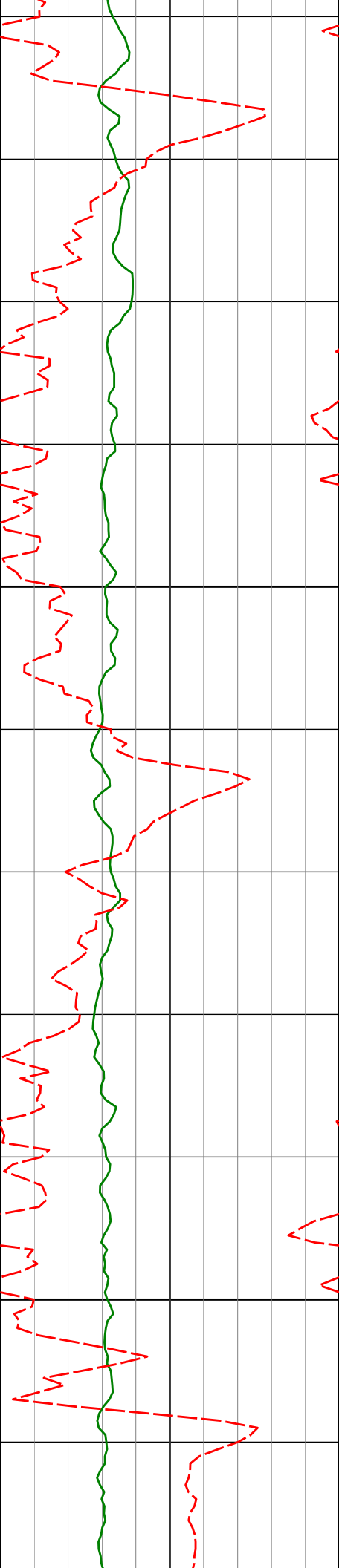
68.68°

1576.94'

-9.05'

94.33°F

1600



1700

1800

1669'

1762'

0.79°

0.78°

53.56°

90.11°

1668.93'

1761.93'

-10.17'

-11.32'

94.33°F

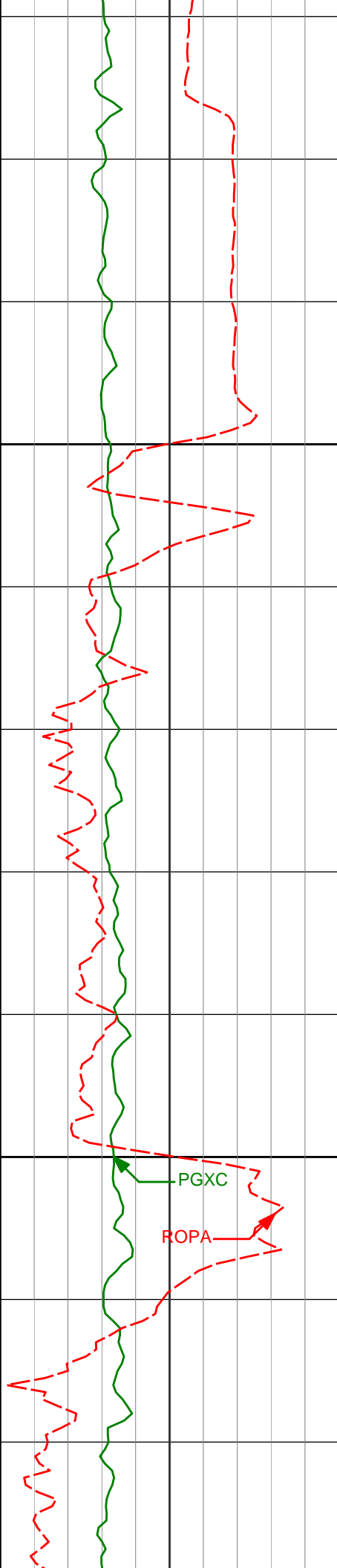
96.42°F

96.42°F

98.51°F

98.51°F

98.51°F



1900

2000

PGXC

ROPA

1853'

1.18°

85.79°

1852.91'

-12.88'

98.51°F

98.51°F

100.62°F

1947'

1.11°

94.97°

1946.89'

-14.75'

100.62°F

100.62°F

100.62°F

2039'

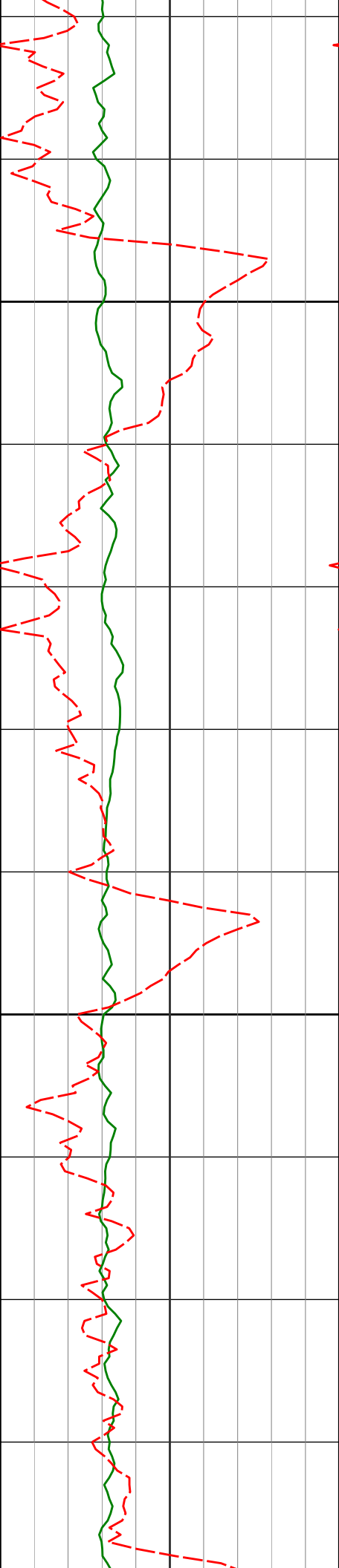
0.37°

62.29°

2038.89'

-15.90'

102.72°F



2100

2131'

0.33°

98.69°

2130.88'

-16.43'

2200

2221'

0.15°

318.42°

2220.88'

-16.61'

102.72°F

102.72°F

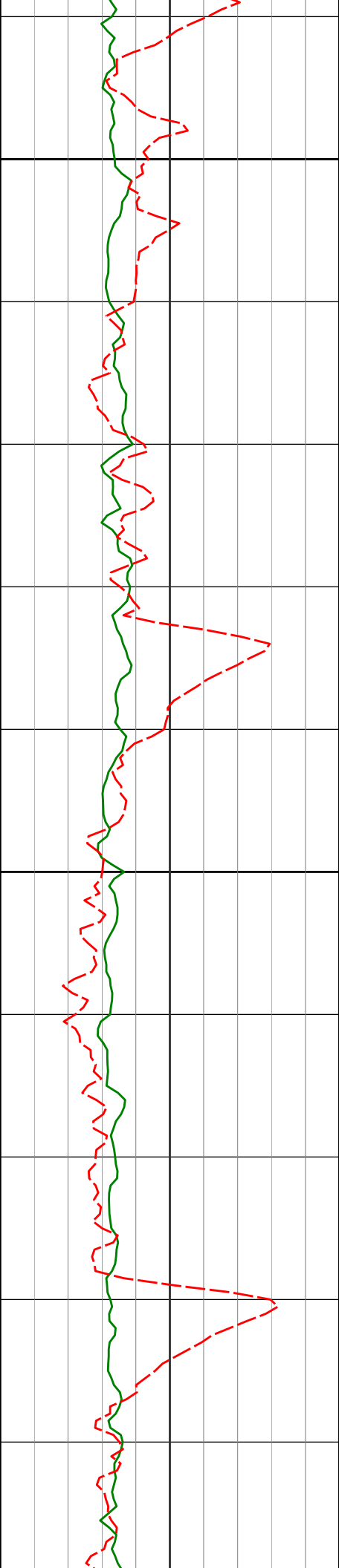
102.72°F

102.72°F

103.70°F

104.83°F

104.83°F



2300

2313'

0.28°

267.41°

2312.88'

-16.30'

106.97°F

2400

2405'

0.18°

316.65°

2404.88'

-15.98'

106.97°F

2408'

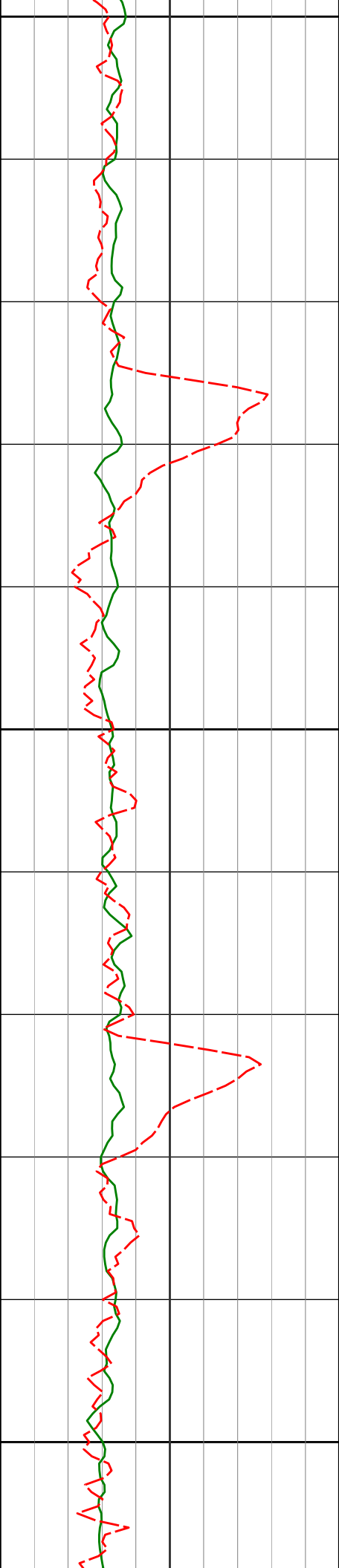
0.62°

227.60°

2407.88'

15.60'

106.97°F



2500

109.09°F

109.09°F

109.09°F

2591'

0.74°

322.57° 2590.87'

-15.15'

2600

109.09°F

109.09°F

111.24°F

2683'

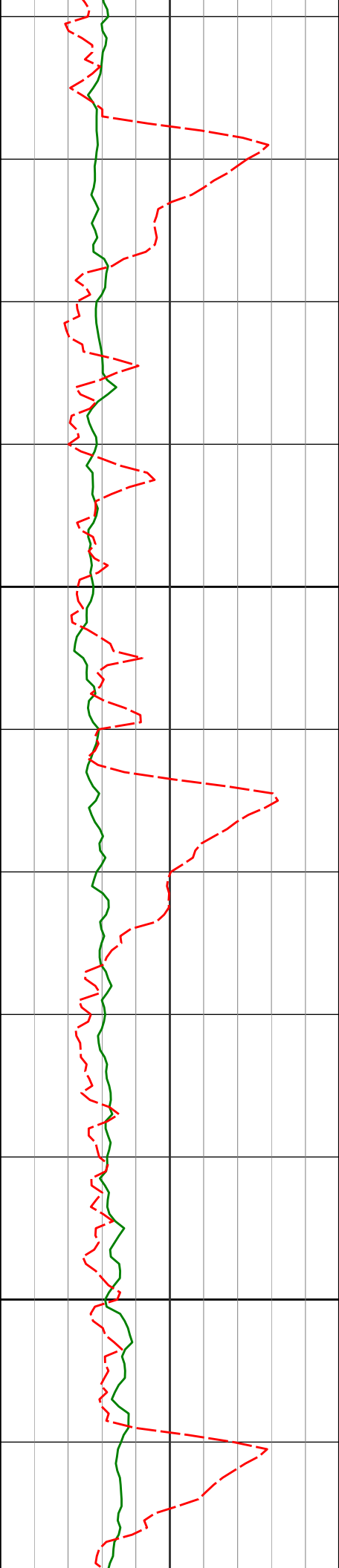
0.48°

314.45° 2682.87'

-14.52'

2700

111.24°F



2800

2900

2775'

0.63°

320.21° 2774.86'

-13.93'

2866'

0.68°

322.12° 2865.86'

-13.28'

111.24°F

111.24°F

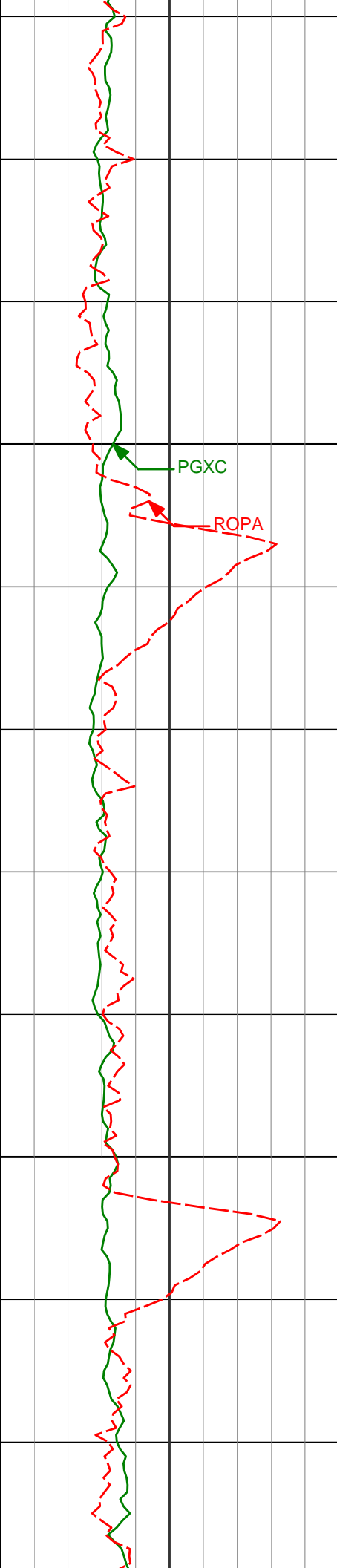
111.24°F

111.24°F

111.24°F

112.89°F

113.40°F



3000

3100

2959'

0.88°

321.88°

2958.85'

-12.51'

3053'

0.86°

326.77°

3052.84'

-11.69'

113.40°F

113.40°F

113.40°F

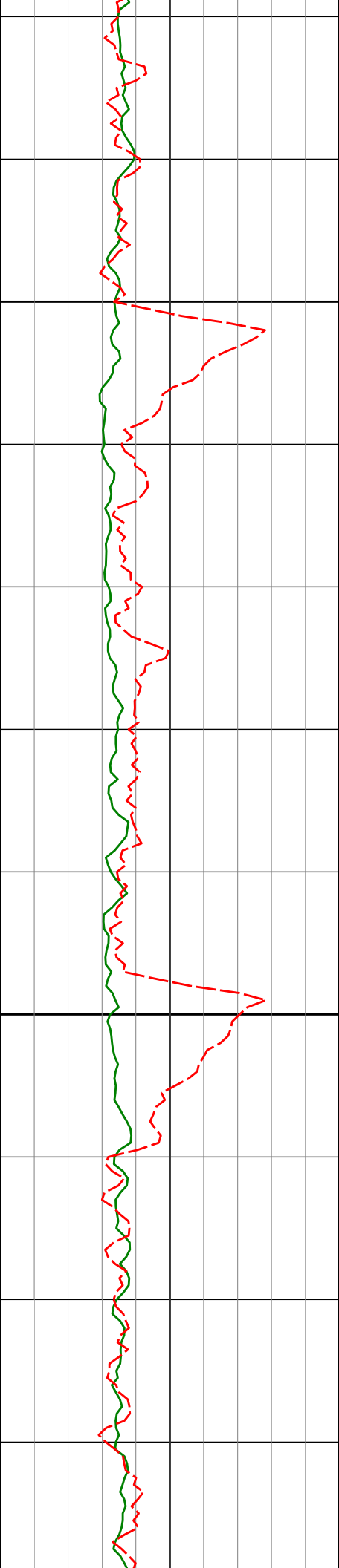
115.56°F

115.56°F

115.56°F

115.56°F

116.52°F



3200

3300

3242'

0.50°

282.90°

3241.83'

-10.13'

3336'

0.54°

242.71°

3335.82'

-9.33'

117.73°F

117.73°F

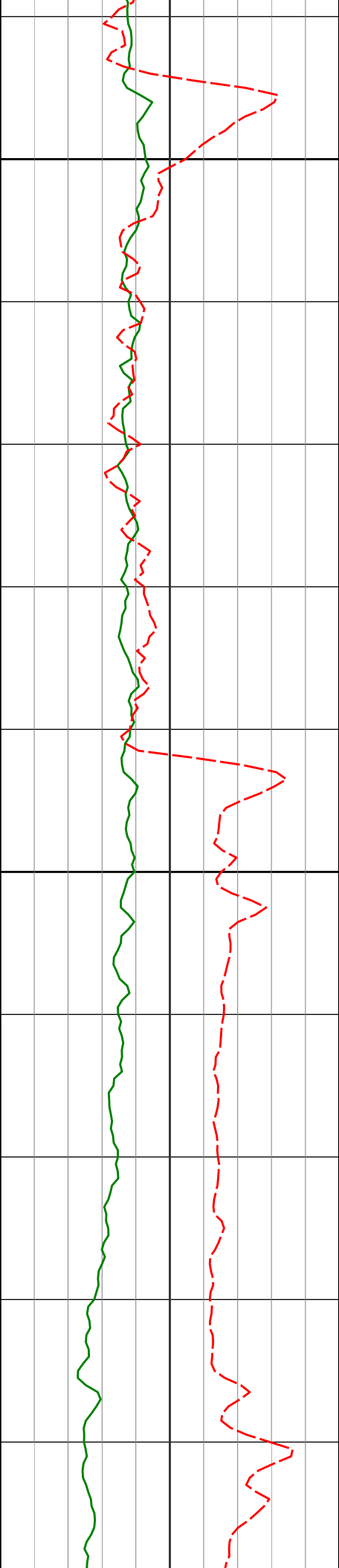
117.73°F

117.73°F

119.91°F

119.91°F

119.91°F



3400

3500

3431'

0.59°

247.14°

3430.82'

-8.48'

3526'

0.81°

226.97°

3525.81'

-7.53'

119.91°F

120.64°F

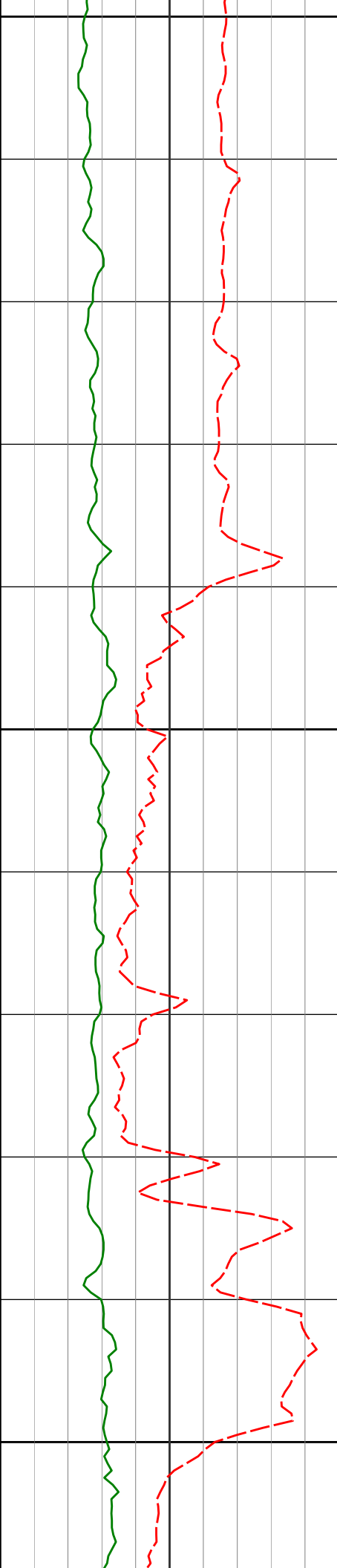
122.11°F

122.11°F

122.11°F

122.11°F

122.11°F



3600

3620'

0.86°

228.04°

3619.80'

-6.51'

122.11°F

122.11°F

122.11°F

122.11°F

3700

3715'

1.03°

231.07°

3714.79'

-5.31'

123.47°F

123.59°F

124.30°F

3800

3809'

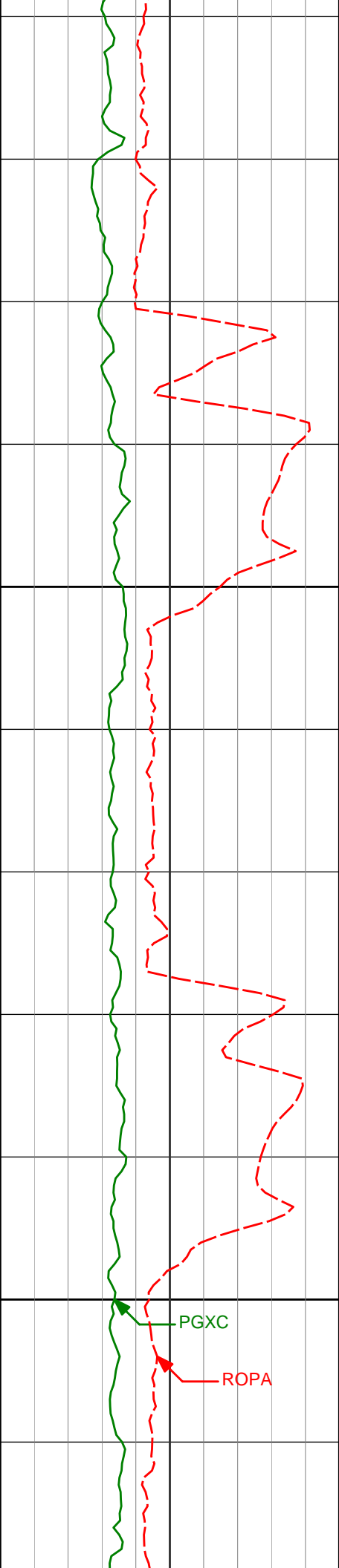
0.70°

262.69°

3808.78'

-4.07'

124.30°F



3900

4000

3904'

3999'

1.20°

3.00°

50.74°

33.30°

3903.77'

3998.70'

-4.27'

-6.44'

124.30°F

126.52°F

126.52°F

126.52°F

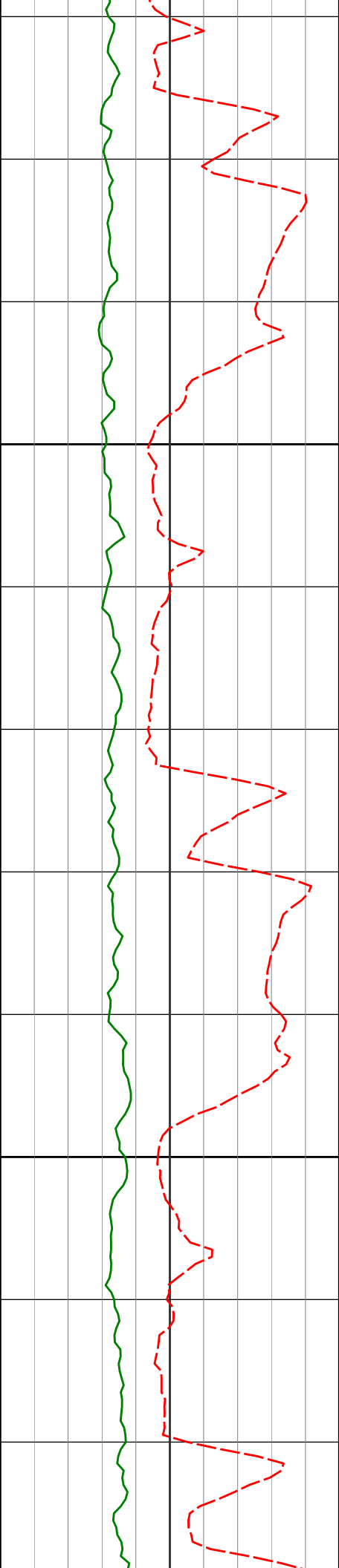
126.52°F

128.73°F

128.73°F

PGXC

ROPA



4100

4094'

4.39°

23.16°

4093.51'

-9.29'

4200

4188'

5.78°

20.93°

4187.13'

-12.47'

128.73°F

129.52°F

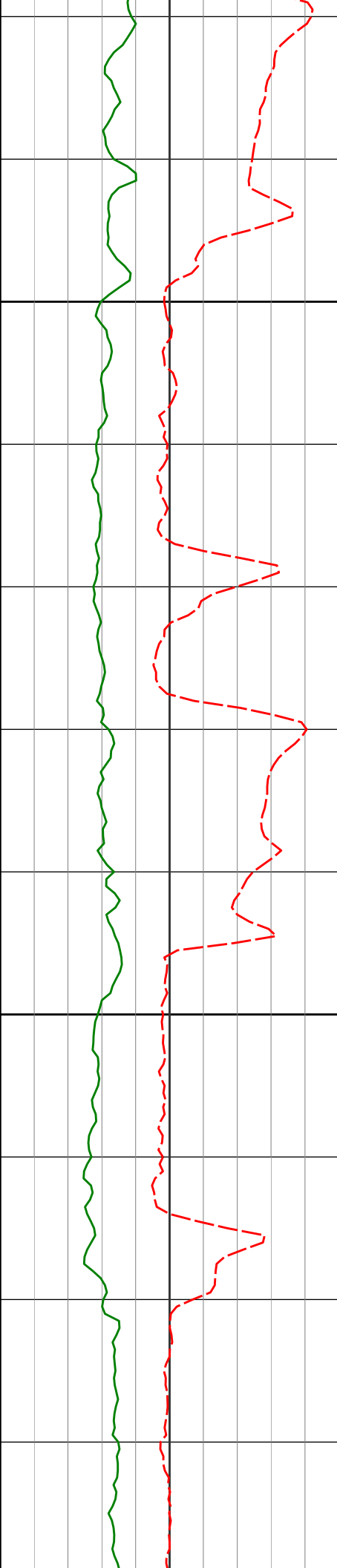
130.18°F

128.73°F

130.96°F

130.96°F

130.96°F



4283'

7.27°

15.27°

4281.52'

-15.87'

4300

4377'

9.19°

15.42°

4374.54'

-19.57'

4400

4472'

9.66°

13.84°

4468.26'

-23.65'

130.96°F

132.76°F

133.20°F

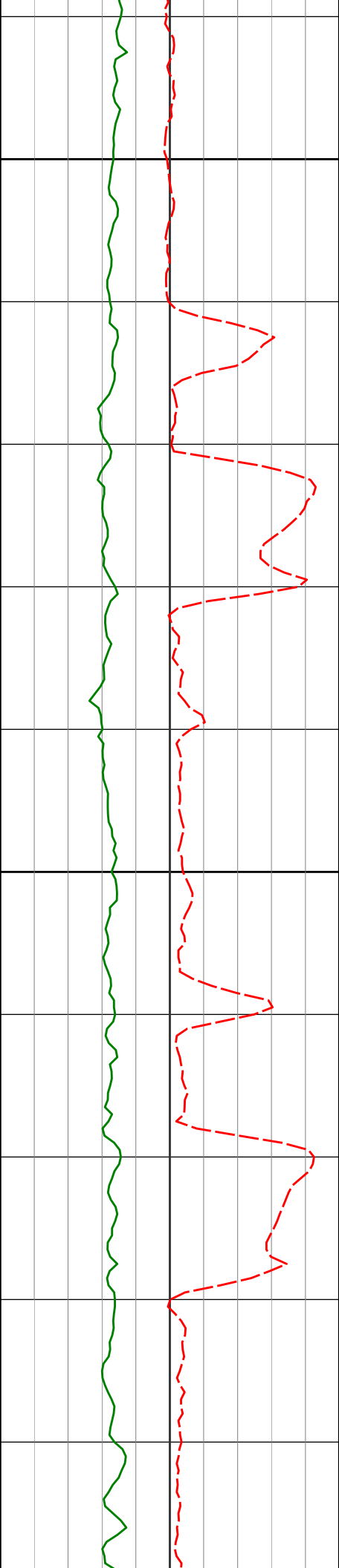
133.20°F

133.67°F

135.45°F

135.45°F

135.45°F



4500

135.45°F

133.41°F

134.10°F

4567'

8.91°

15.84°

4562.02'

-27.71'

135.45°F

4600

136.09°F

137.70°F

4661'

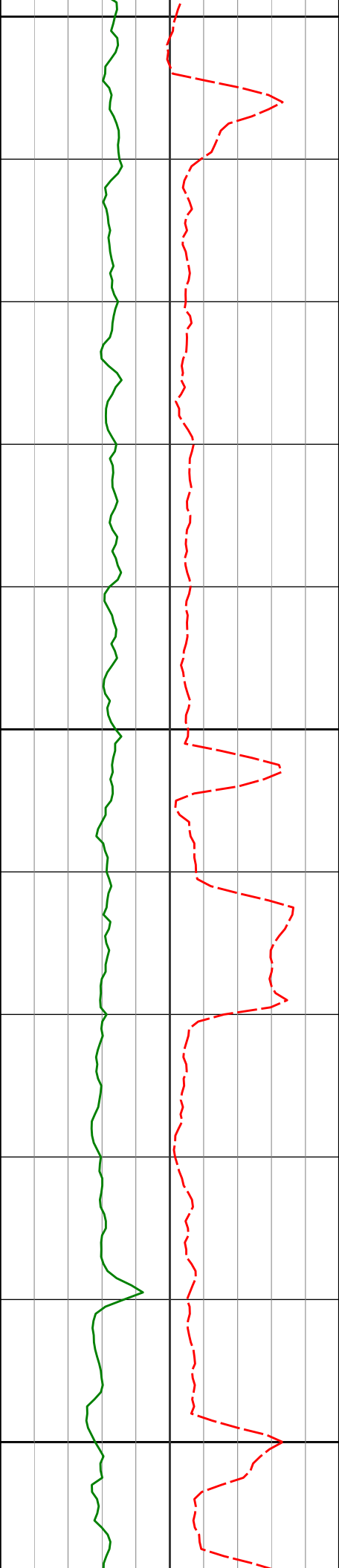
9.96°

24.45°

4654.75'

-33.21'

137.70°F



4700

4756'

8.44°

27.04°

4748.52'

-39.92'

4800

4851'

8.09°

29.60°

4842.54'

-46.52'

4900

139.68°F

139.96°F

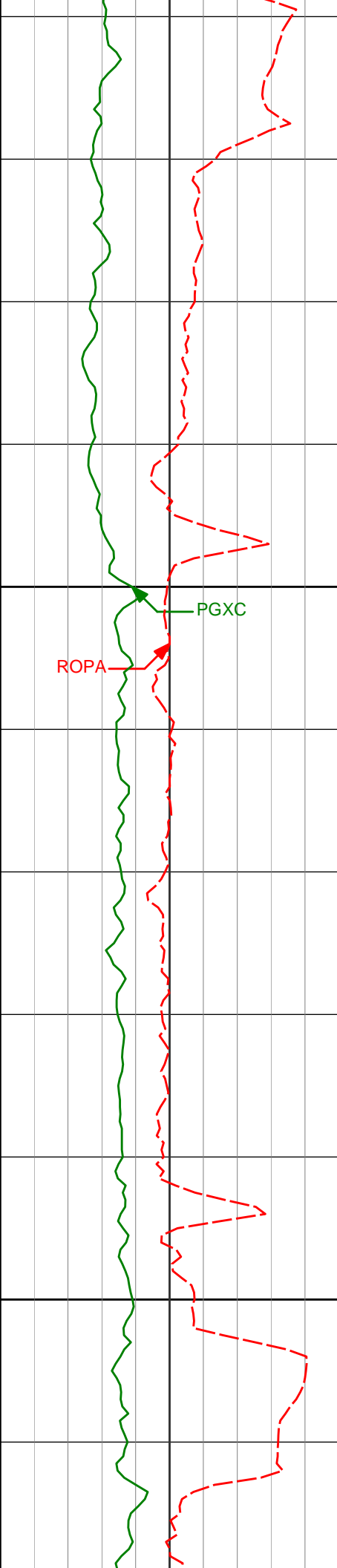
139.96°F

139.96°F

139.96°F

139.96°F

139.96°F



5000

5040'

8.88°

27.01°

5029.47'

-59.97'

5100

5134'

8.26°

17.75°

5122.42'

-65.45'

139.96°F

139.96°F

140.34°F

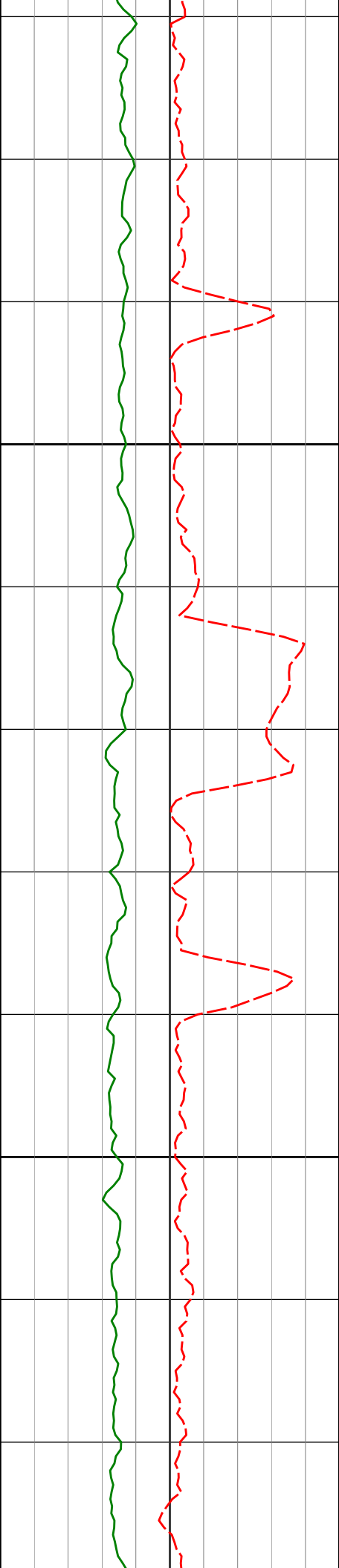
142.25°F

142.25°F

140.95°F

139.96°F

140.63°F



5200

5229'

8.00°

17.91°

5216.47'

-69.70'

142.25°F

142.25°F

142.25°F

142.25°F

142.38°F

5300

5324'

7.90°

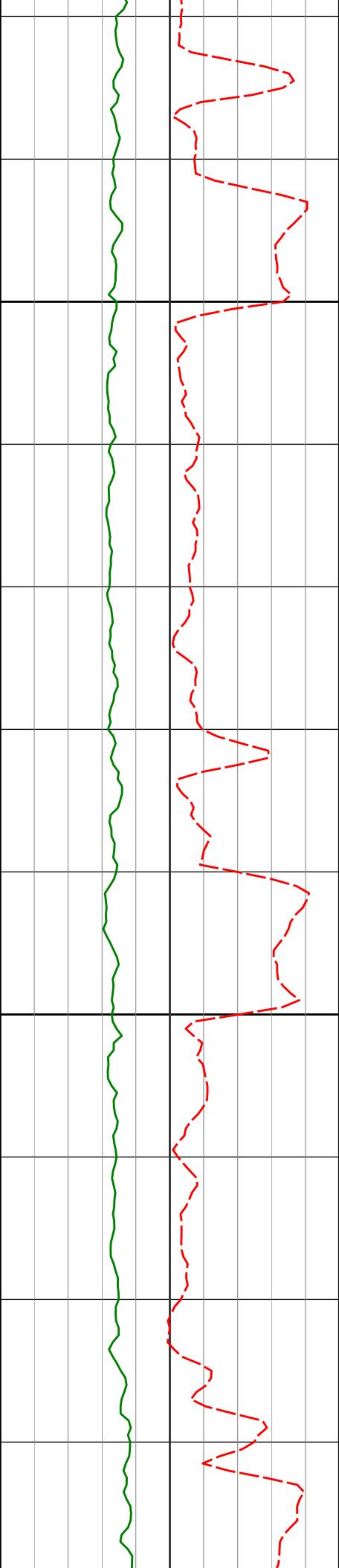
22.35°

5310.56'

-74.34'

144.54°F

144.54°F



5400

5418'

8.35°

24.01°

5403.61'

-79.70'

144.54°F

146.84°F

146.84°F

146.84°F

147.44°F

5500

5513'

7.87°

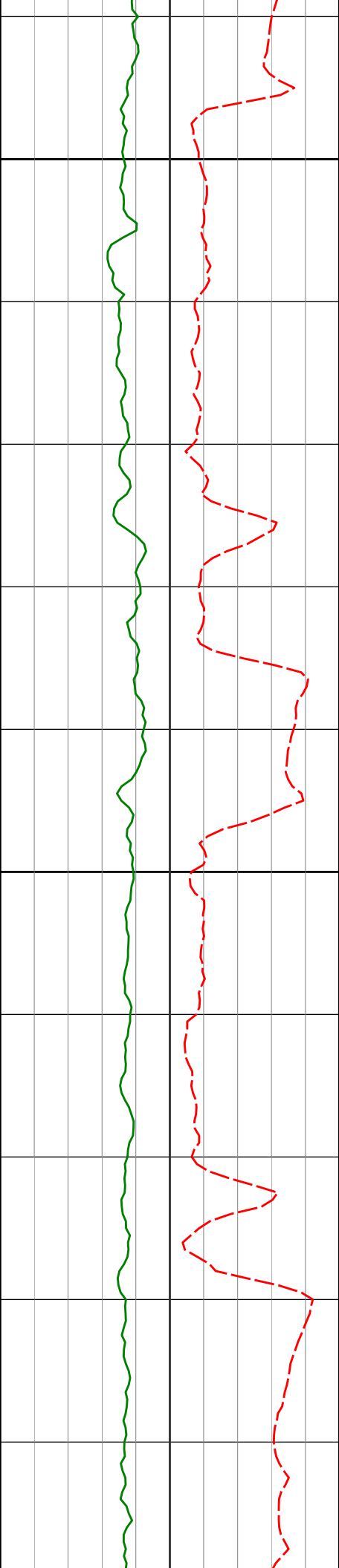
26.88°

5497.66'

-85.57'

149.14°F

149.14°F



5600

5703'

5700

5798'

8.72°

21.80°

5685.67'

-97.06'

10.80°

13.81° 5779.30'

-102.01'

149.14°F

151.47°F

151.47°F

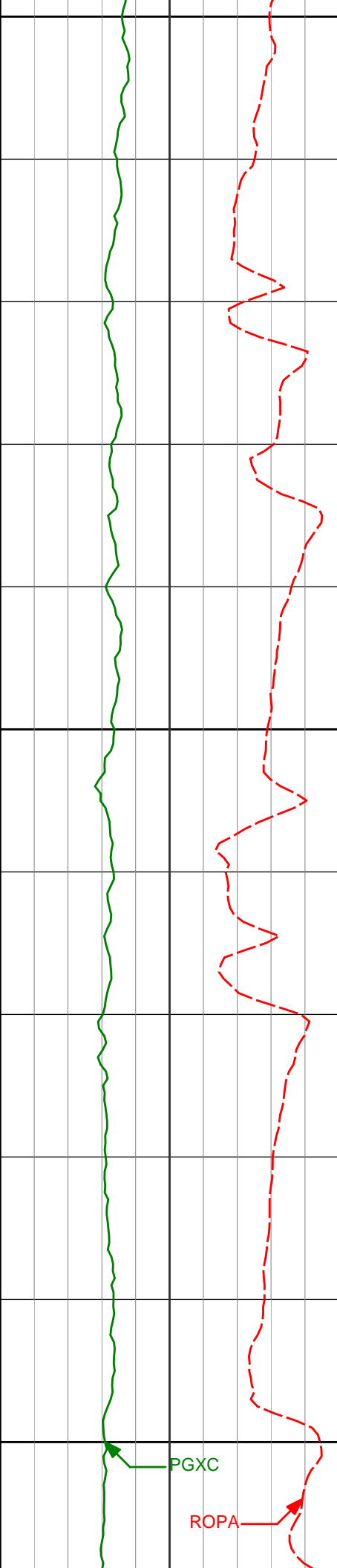
151.47°F

153.25°F

153.79°F

153.79°F

153.79°F



5800

153.79°F

155.50°F

5892'

15.85°

352.75°

5870.79'

-102.72'

156.13°F

5900

156.13°F

156.13°F

5987'

20.17°

348.54°

5961.12'

-98.12'

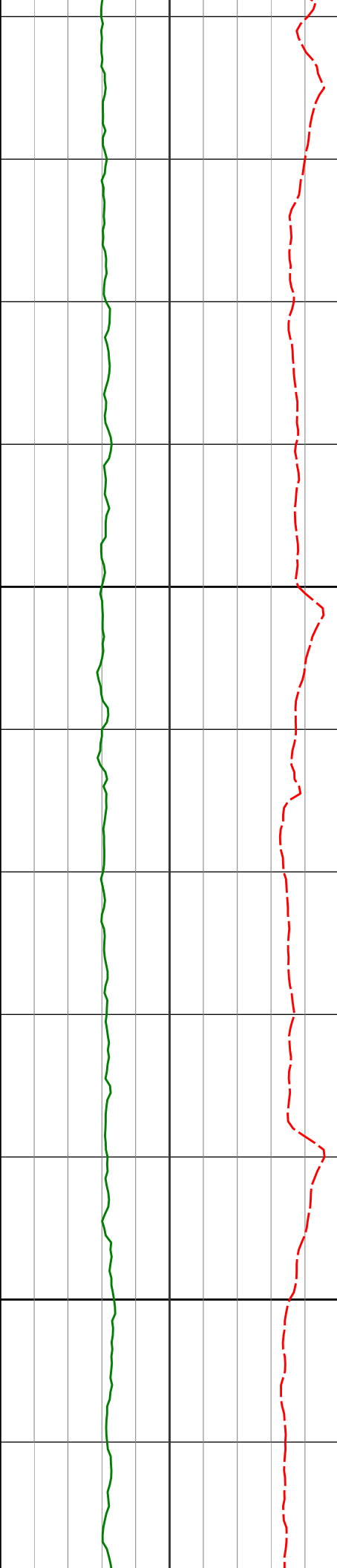
156.95°F

6000

157.46°F

PGXC

ROPA



6100

6200

6082'

25.30°

339.17°

6048.74'

-88.00'

6177'

31.24°

326.15°

6132.45'

-67.43'

6272'

36.38°

311.84°

6211.48'

-33.04'

158.47°F

159.47°F

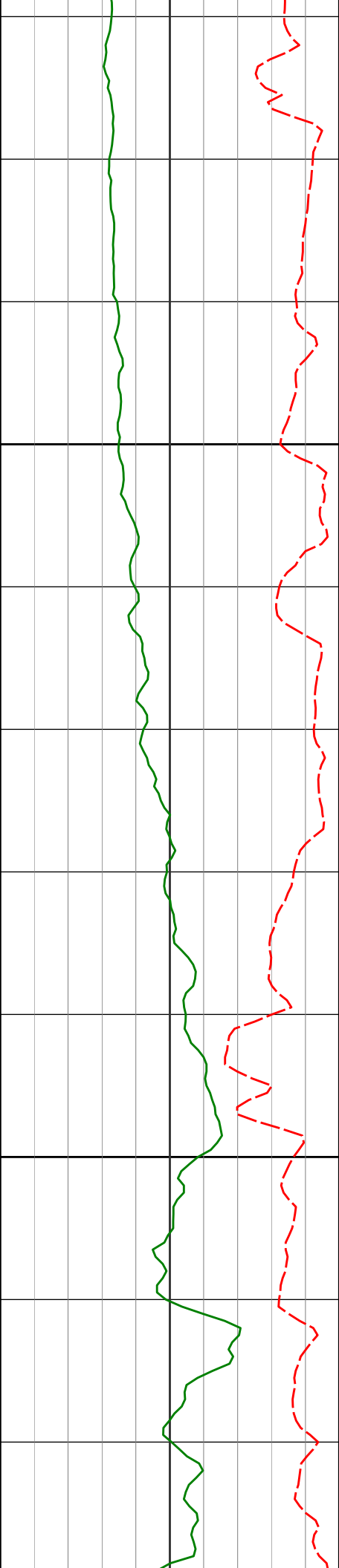
160.83°F

160.83°F

160.83°F

160.83°F

160.83°F



6300

6400

6366'

6461'

6556'

39.68°

43.38°

48.41°

299.72°

289.10°

280.56°

6285.62'

6356.81'

6422.97'

13.52'

70.51'

136.19'

160.95°F

160.99°F

160.35°F

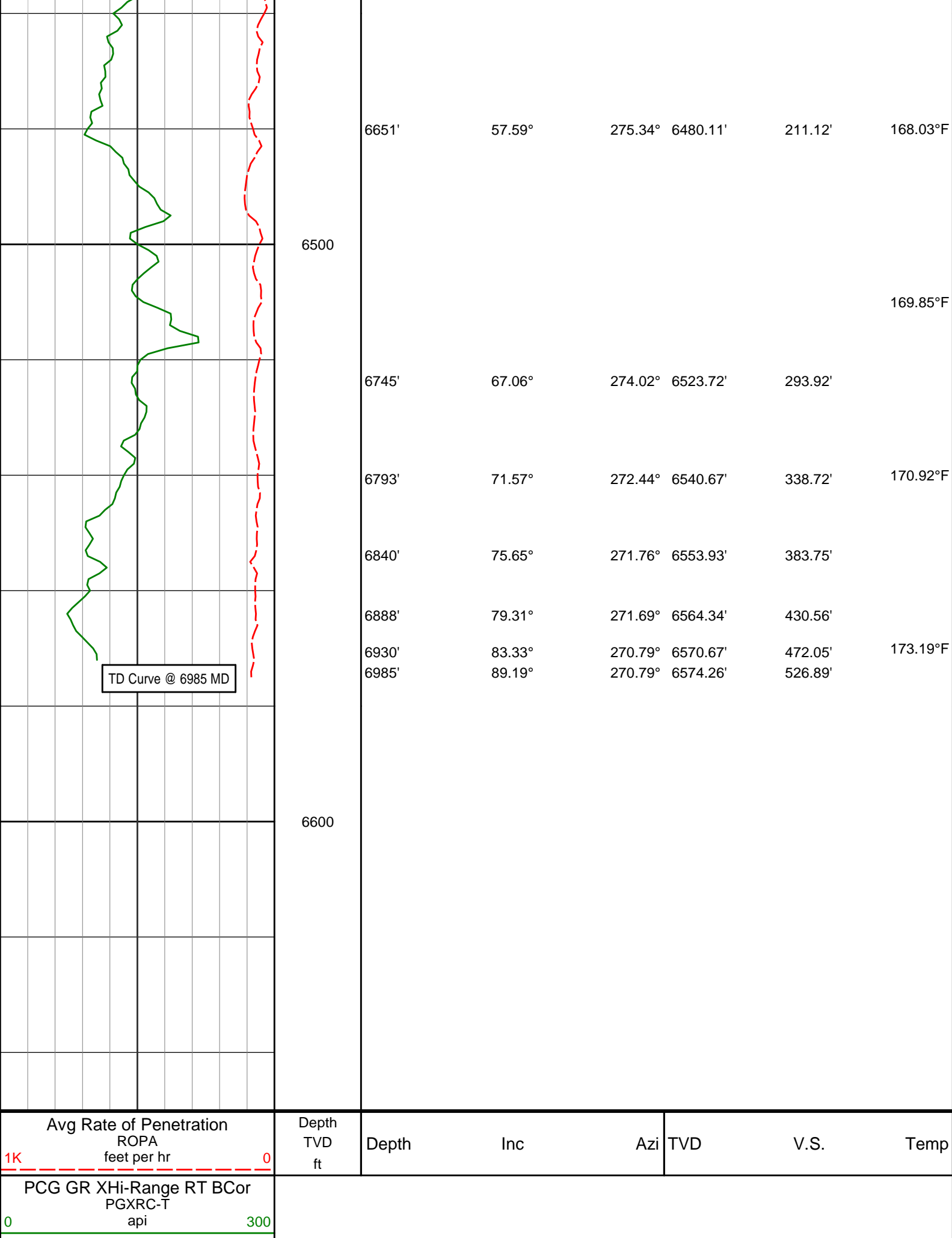
160.56°F

162.42°F

163.36°F

165.23°F

166.48°F



TD Curve @ 6985 MD

Avg Rate of Penetration
ROPA
feet per hr
1K 0

PCG GR XHi-Range RT BCor
PGXRC-T
api
0 300

Depth
TVD
ft

Depth Inc Azi TVD V.S. Temp

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
70 Ranch State BB18-675
Wattensburg
Weld Colorado
USA
CA-XX-0902563262
Tied in @ Surface

Final survey projected to bit.

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
920.00	0.69	42.56	919.98	4.08 N	3.75 E	-3.79	0.07
1012.00	0.62	42.08	1011.97	4.86 N	4.46 E	-4.50	0.08
1104.00	0.64	42.16	1103.97	5.61 N	5.13 E	-5.19	0.02
1209.00	0.54	42.68	1208.96	6.41 N	5.86 E	-5.93	0.10
1393.00	0.44	65.12	1392.95	7.34 N	7.09 E	-7.17	0.12
1485.00	0.62	72.58	1484.95	7.64 N	7.89 E	-7.96	0.21
1577.00	0.81	68.68	1576.94	8.02 N	8.97 E	-9.05	0.21
1669.00	0.79	53.56	1668.93	8.64 N	10.08 E	-10.17	0.23
1762.00	0.78	90.11	1761.93	9.02 N	11.23 E	-11.32	0.53
1853.00	1.18	85.79	1852.91	9.08 N	12.79 E	-12.88	0.45
1947.00	1.11	94.97	1946.89	9.08 N	14.66 E	-14.75	0.21
2039.00	0.37	62.29	2038.89	9.14 N	15.81 E	-15.90	0.89
2131.00	0.33	98.69	2130.88	9.24 N	16.33 E	-16.43	0.24
2221.00	0.15	318.42	2220.88	9.28 N	16.51 E	-16.61	0.51
2313.00	0.28	267.41	2312.88	9.36 N	16.21 E	-16.30	0.24
2405.00	0.18	316.65	2404.88	9.46 N	15.88 E	-15.98	0.23
2498.00	0.62	337.60	2497.88	10.03 N	15.59 E	-15.69	0.49
2591.00	0.74	322.57	2590.87	10.97 N	15.03 E	-15.15	0.23
2683.00	0.48	314.45	2682.87	11.71 N	14.40 E	-14.52	0.30
2775.00	0.63	320.21	2774.86	12.37 N	13.80 E	-13.93	0.17
2866.00	0.68	322.12	2865.86	13.18 N	13.15 E	-13.28	0.06
2959.00	0.88	321.88	2958.85	14.18 N	12.37 E	-12.51	0.22
3053.00	0.86	326.77	3052.84	15.34 N	11.54 E	-11.69	0.08
3242.00	0.50	282.90	3241.83	16.71 N	9.96 E	-10.13	0.32
3336.00	0.54	242.71	3335.82	16.60 N	9.16 E	-9.33	0.38
3431.00	0.59	247.14	3430.82	16.20 N	8.31 E	-8.48	0.07
3526.00	0.81	226.97	3525.81	15.55 N	7.37 E	-7.53	0.34
3620.00	0.86	228.04	3619.80	14.63 N	6.36 E	-6.51	0.06
3715.00	1.03	231.07	3714.79	13.62 N	5.17 E	-5.31	0.19
3809.00	0.70	262.69	3808.78	13.01 N	3.94 E	-4.07	0.60
3904.00	1.20	50.74	3903.77	13.57 N	4.13 E	-4.27	1.93
3999.00	3.00	33.30	3998.70	16.28 N	6.27 E	-6.44	1.99
4094.00	4.39	23.16	4093.51	21.70 N	9.07 E	-9.29	1.61
4188.00	5.78	20.93	4187.13	29.43 N	12.17 E	-12.47	1.49
4283.00	7.27	15.27	4281.52	39.69 N	15.46 E	-15.87	1.71
4377.00	9.19	15.42	4374.54	52.67 N	19.03 E	-19.57	2.04
4472.00	9.66	13.84	4468.26	67.72 N	22.95 E	-23.65	0.56
4567.00	8.91	15.84	4562.02	82.54 N	26.86 E	-27.71	0.86
4661.00	9.96	24.45	4654.75	96.94 N	32.22 E	-33.21	1.87
4756.00	8.44	27.04	4748.52	110.63 N	38.79 E	-39.92	1.66
4851.00	8.09	29.60	4842.54	122.65 N	45.26 E	-46.52	0.53
5040.00	8.88	27.01	5029.47	147.21 N	58.45 E	-59.97	0.46
5134.00	8.26	17.75	5122.42	160.11 N	63.81 E	-65.45	1.61
5229.00	8.00	17.91	5216.47	172.90 N	67.92 E	-69.70	0.27
5324.00	7.90	22.35	5310.56	185.23 N	72.43 E	-74.34	0.65
5418.00	8.35	24.01	5403.61	197.44 N	77.67 E	-79.70	0.54
5513.00	7.87	26.88	5497.66	209.54 N	83.42 E	-85.57	0.66
5703.00	8.72	21.80	5685.67	234.52 N	94.65 E	-97.06	0.59
5798.00	10.80	13.81	5779.30	249.85 N	99.45 E	-102.01	2.61
5893.00	15.85	252.75	5870.79	271.16 N	99.93 E	-102.72	7.27

5892.00	15.83	332.75	5870.79	271.16 N	99.93 E	-102.72	7.37
5987.00	20.17	348.54	5961.12	300.10 N	95.03 E	-98.12	4.75
6082.00	25.30	339.17	6048.74	335.16 N	84.55 E	-88.00	6.59
6177.00	31.24	326.15	6132.45	374.66 N	63.57 E	-67.43	8.98
6272.00	36.38	311.84	6211.48	414.00 N	28.78 E	-33.04	9.95
6366.00	39.68	299.72	6285.62	447.53 N	18.13 W	13.52	8.67
6461.00	43.38	289.10	6356.81	473.28 N	75.39 W	70.51	8.36
6556.00	48.41	280.56	6422.97	490.50 N	141.25 W	136.19	8.34
6651.00	57.59	275.34	6480.11	500.77 N	216.29 W	211.12	10.61
6745.00	67.06	274.02	6523.72	507.51 N	299.17 W	293.92	10.15
6793.00	71.57	272.44	6540.67	510.03 N	343.99 W	338.72	9.89
6840.00	75.65	271.76	6553.93	511.68 N	389.04 W	383.75	8.79
6888.00	79.31	271.69	6564.34	513.09 N	435.87 W	430.56	7.63
6930.00	83.33	270.79	6570.67	513.98 N	477.37 W	472.05	9.80
6985.00	89.19	270.79	6574.26	514.74 N	532.22 W	526.89	10.65

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 269.41 DEGREES (GRID)
 A TOTAL CORRECTION OF 7.55 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED
 HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
 HORIZONTAL DISPLACEMENT(CLOSURE) AT 6985.00 FEET
 IS 740.42 FEET ALONG 314.04 DEGREES (GRID)