



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	18-Sep-15	19-Sep-15	25-Sep-15		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	637.00	6,578.00	7,024.00		
Log End Depth (MD, ft)	6,578.00	7,024.00	16,116.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	17-Sep-15 15:33	18-Sep-15 21:05	20-Sep-15 19:00		
Drill/Wipe End Date and Time	18-Sep-15 13:33	19-Sep-15 12:00	25-Sep-15 04:30		
Min Inc (deg) @ Depth (MD, ft)	0.10 @ 661.00	52.16 @ 6,623.00	87.72 @ 13,798.00		
Max Inc (deg) @ Depth (MD, ft)	45.42 @ 6,528.00	88.92 @ 6,963.00	93.02 @ 12,661.00		
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC	0.65 / PDC		
Flow Rate (gpm)	592.33	550.50	296.65		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.60 / 28.00	10.14 / 43.00	9.80 / 40.00		
Filtrate CL (ppm)	1,000.00	15,000.00	2,300.00		
pH / Fluid Loss (mptm)	7.60 / 7	8.60 / 14	9.00 / 9		
PV (cP) / YP (lhf2)	3 / 1.00	10 / 15.00	14 / 8.00		
% Solids / % Sand	2.00 / 0.00	3.50 / 0.10	2.80 / 0.10		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		

Max Tool Temp (degF) / Source	175.21 / PCM	175.21 / PCM	234.50 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Adam Sampson	Adam Sampson	Paul Kock		
Customer Representative	Charles Colville	Charles Colville	Justin Fields		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11619287	11619287	12365892		
Insert Serial Number	11680789	11680789	11145605		
Date and Time Initialized	16-Sep-15 10:21	01-Jan-70 00:00	19-Sep-15 16:00		
Date and Time Read	19-Sep-15 17:11	19-Sep-15 17:21	25-Sep-15 17:51		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	61.00	61.00	68.00		
Software Version	6.21	6.21	6.33		
Sub Serial Number	11619287	11619287	12365892		
Sonde Serial Number	10993516	10993516	11297584		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	312.37	82.70	233.50		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.23	49.33	55.82		
Recorded Sample Period (sec)	15	15	15		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11619287	11619287	12365892		
Insert/Sonde Serial Number	11680999	11680999	11681042		

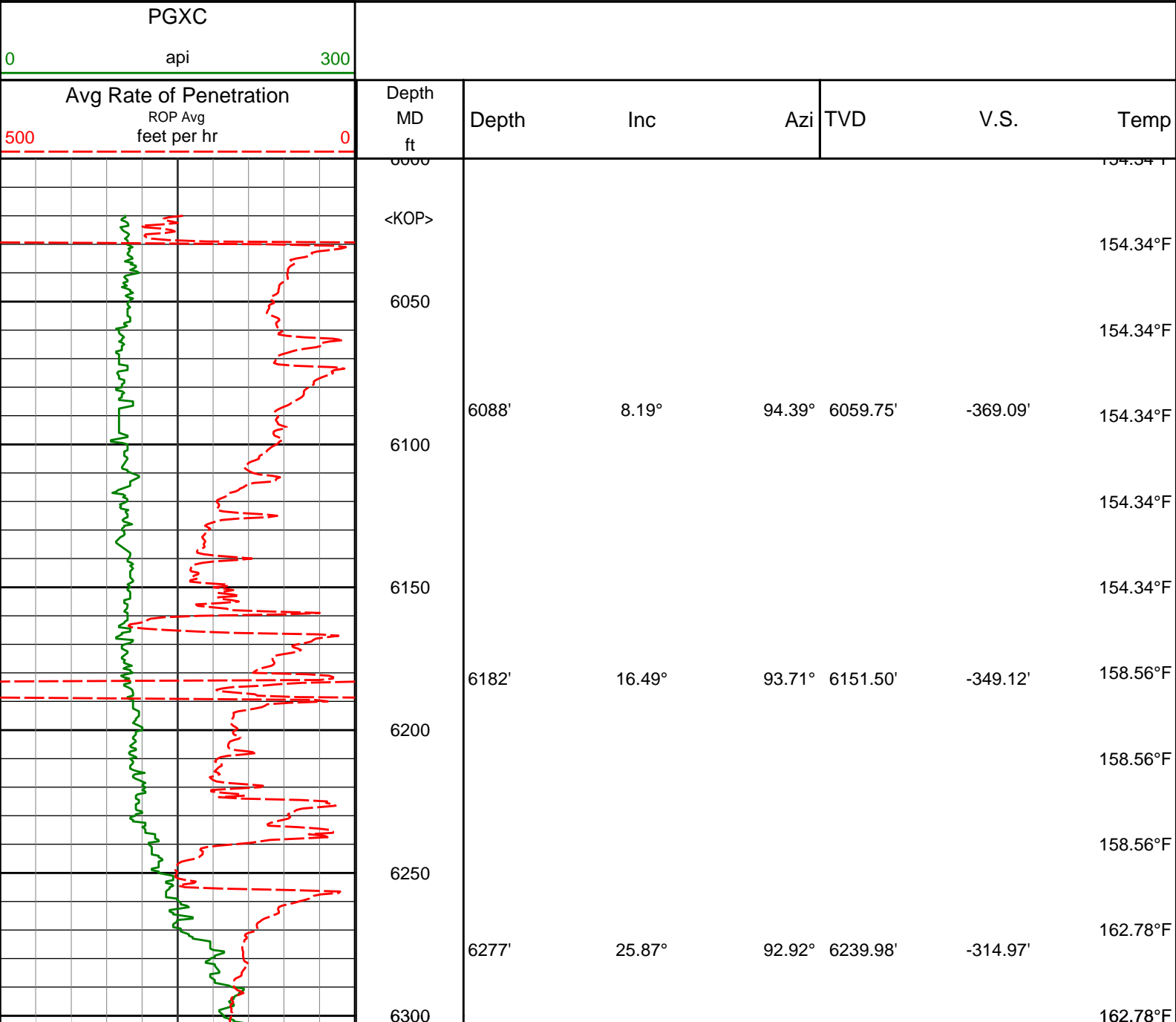
REMARKS

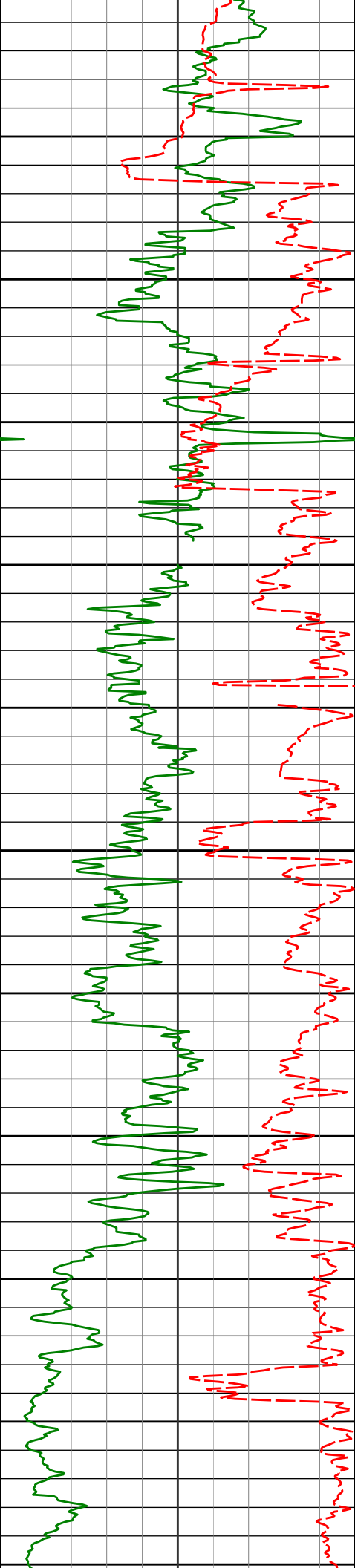
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
 - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
 - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.3.0
6. Gamma presented inside casing/cement from 6975 ft. MD to 7024 ft. MD.

WARRANTY

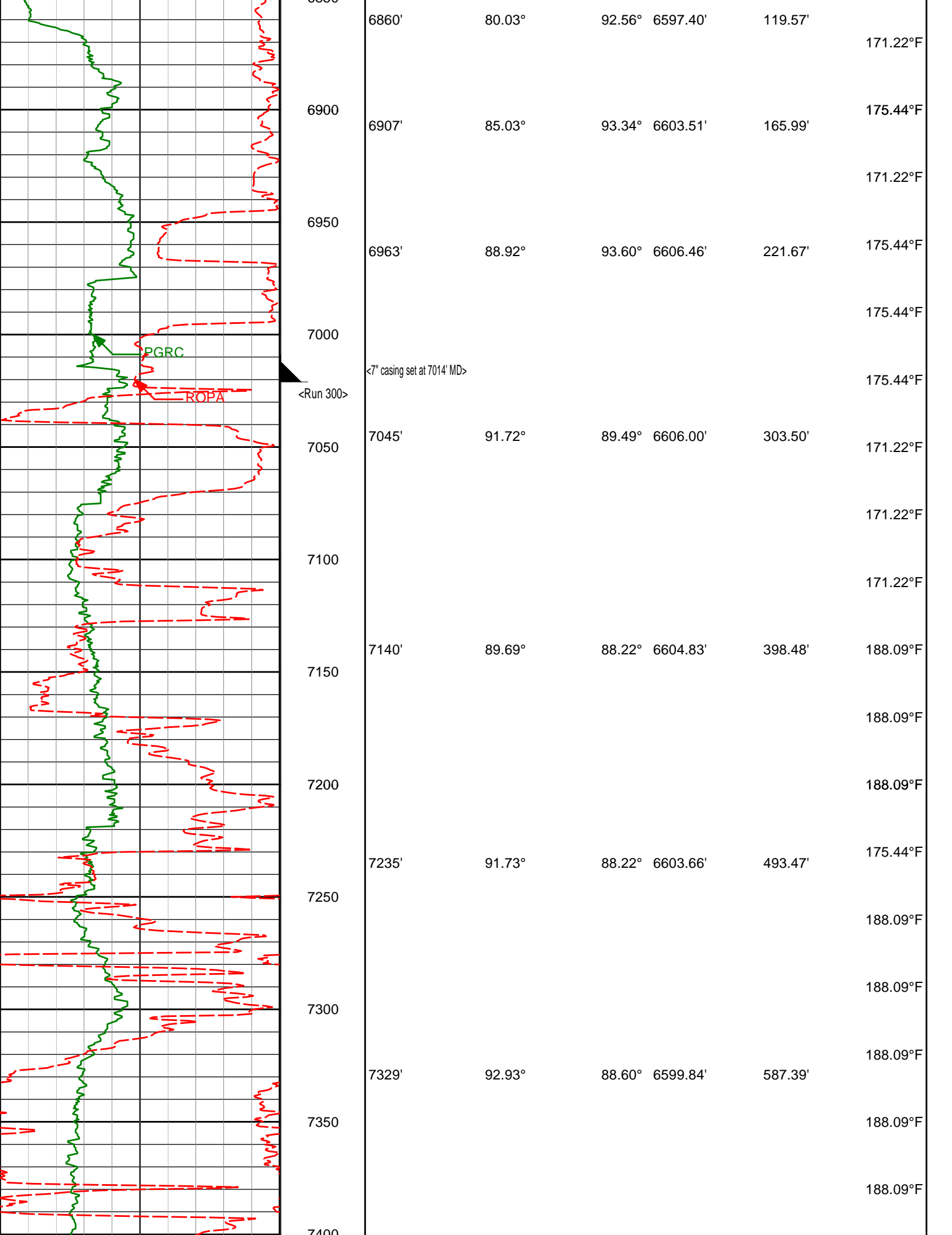
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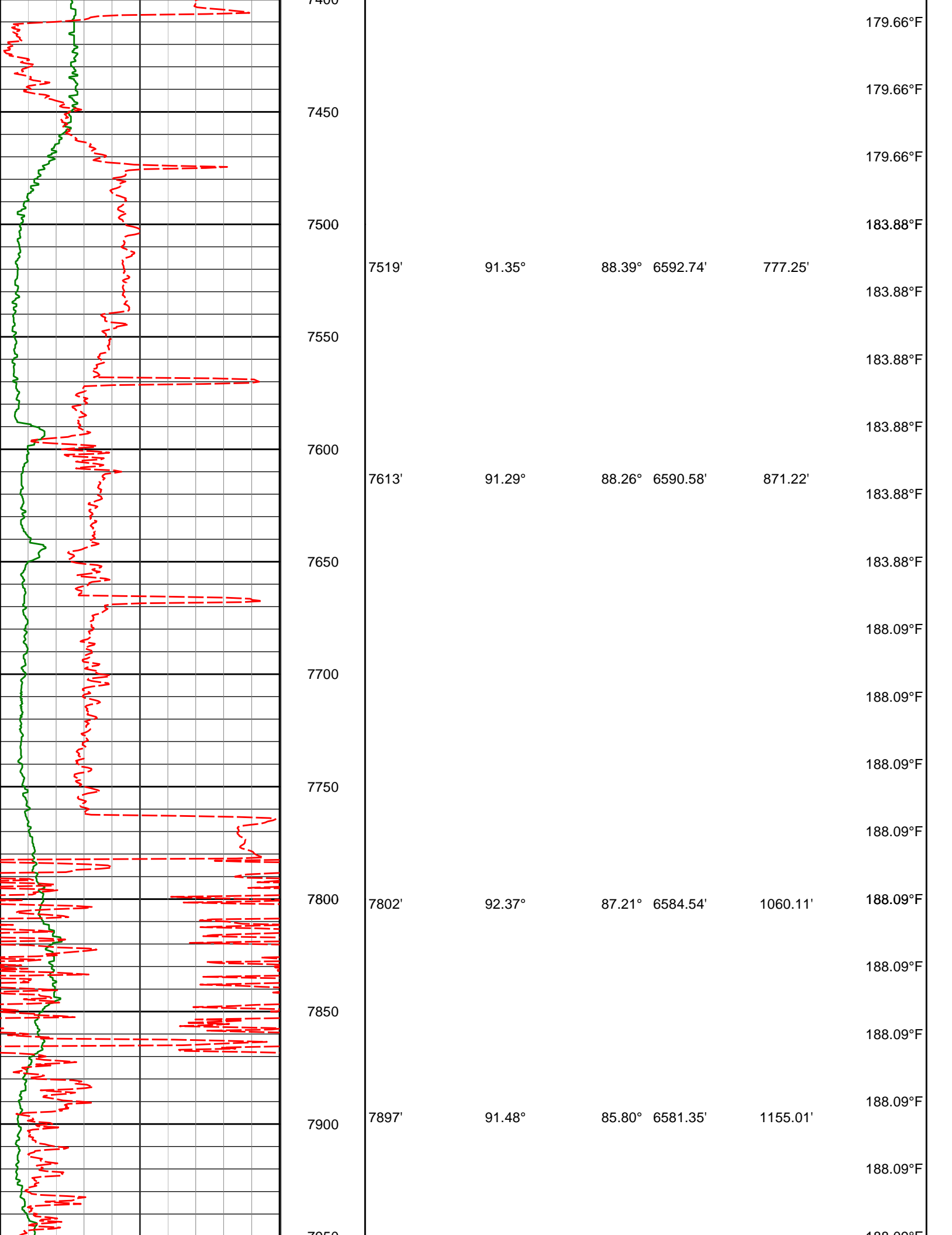
MD Detail 1:600 Scale

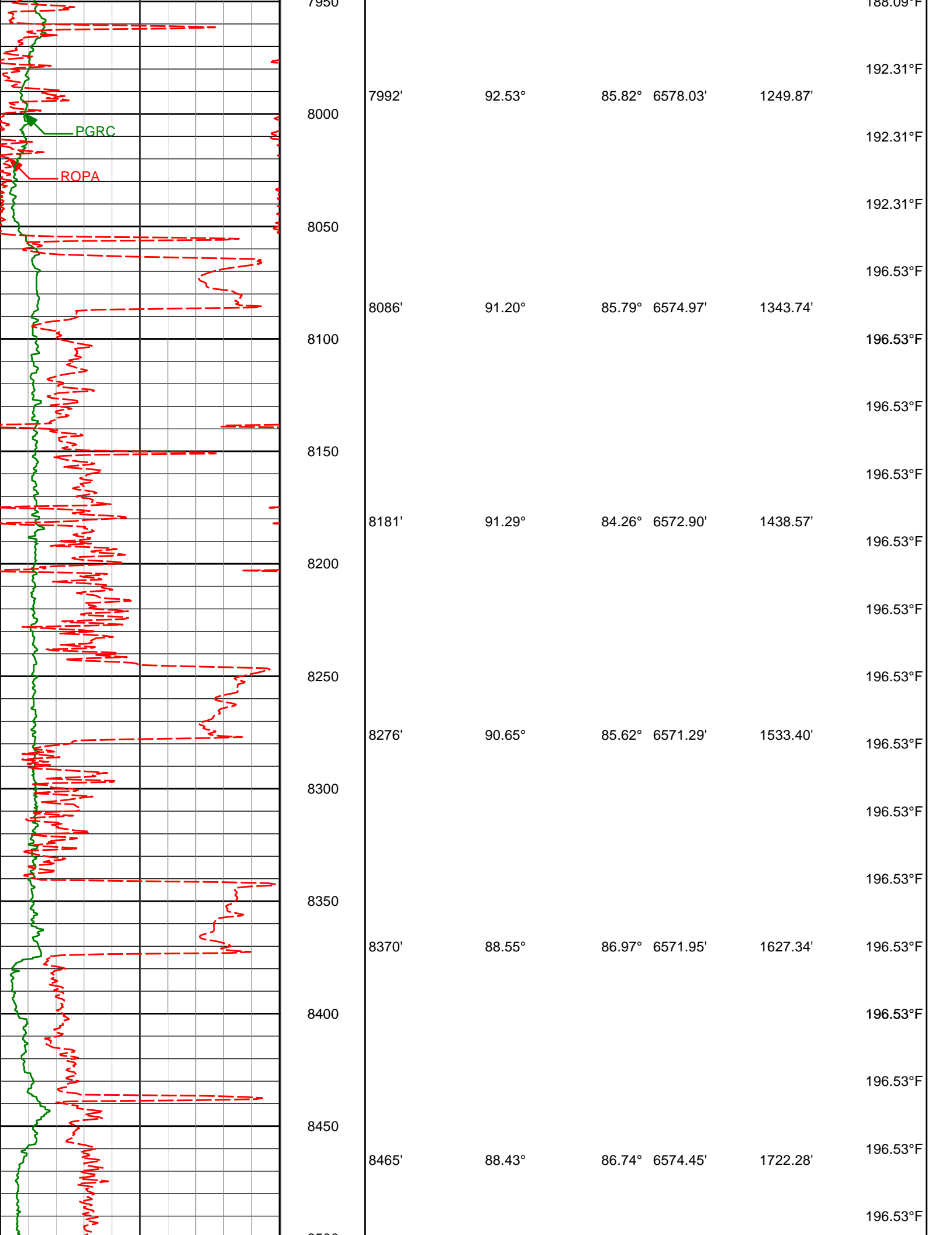


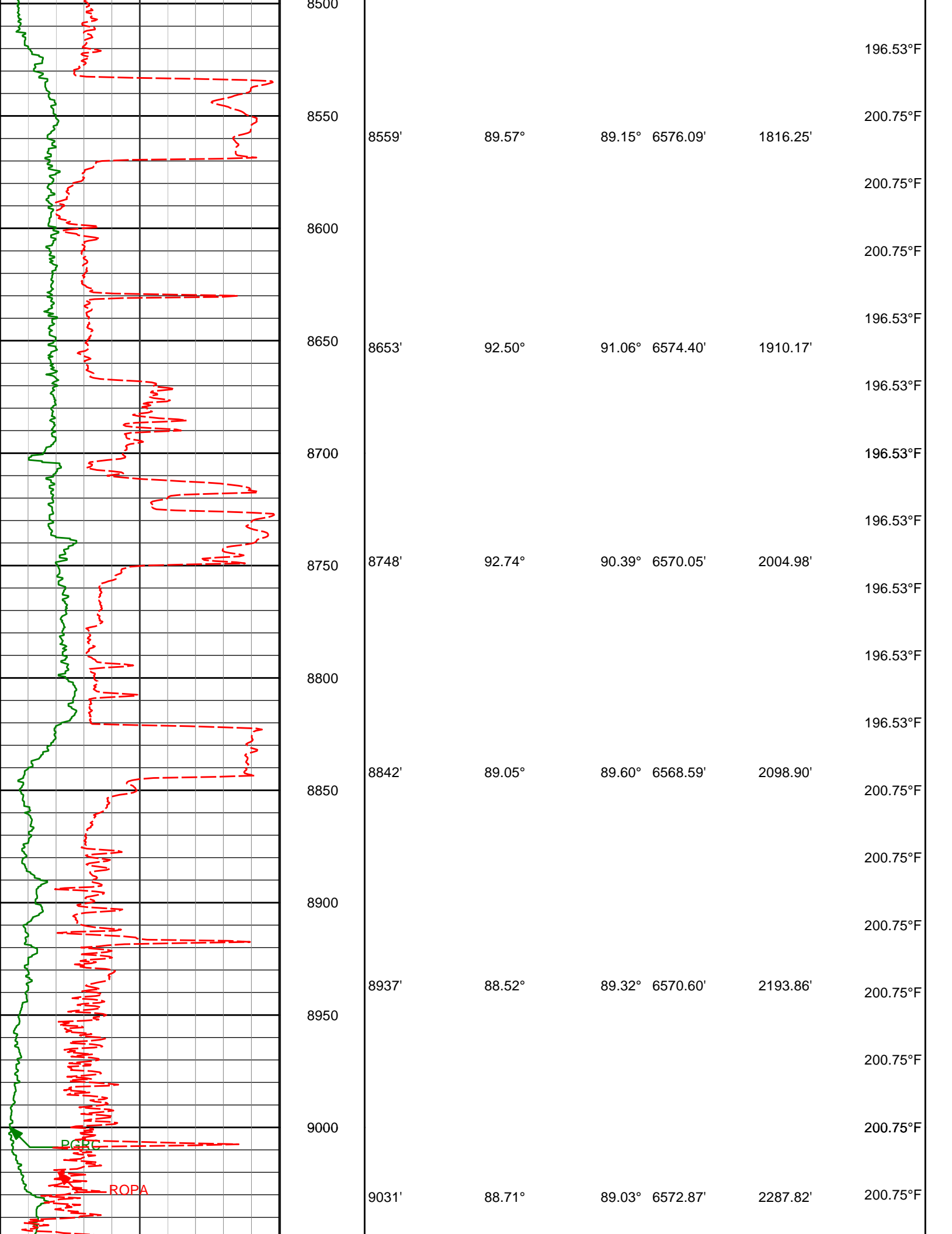


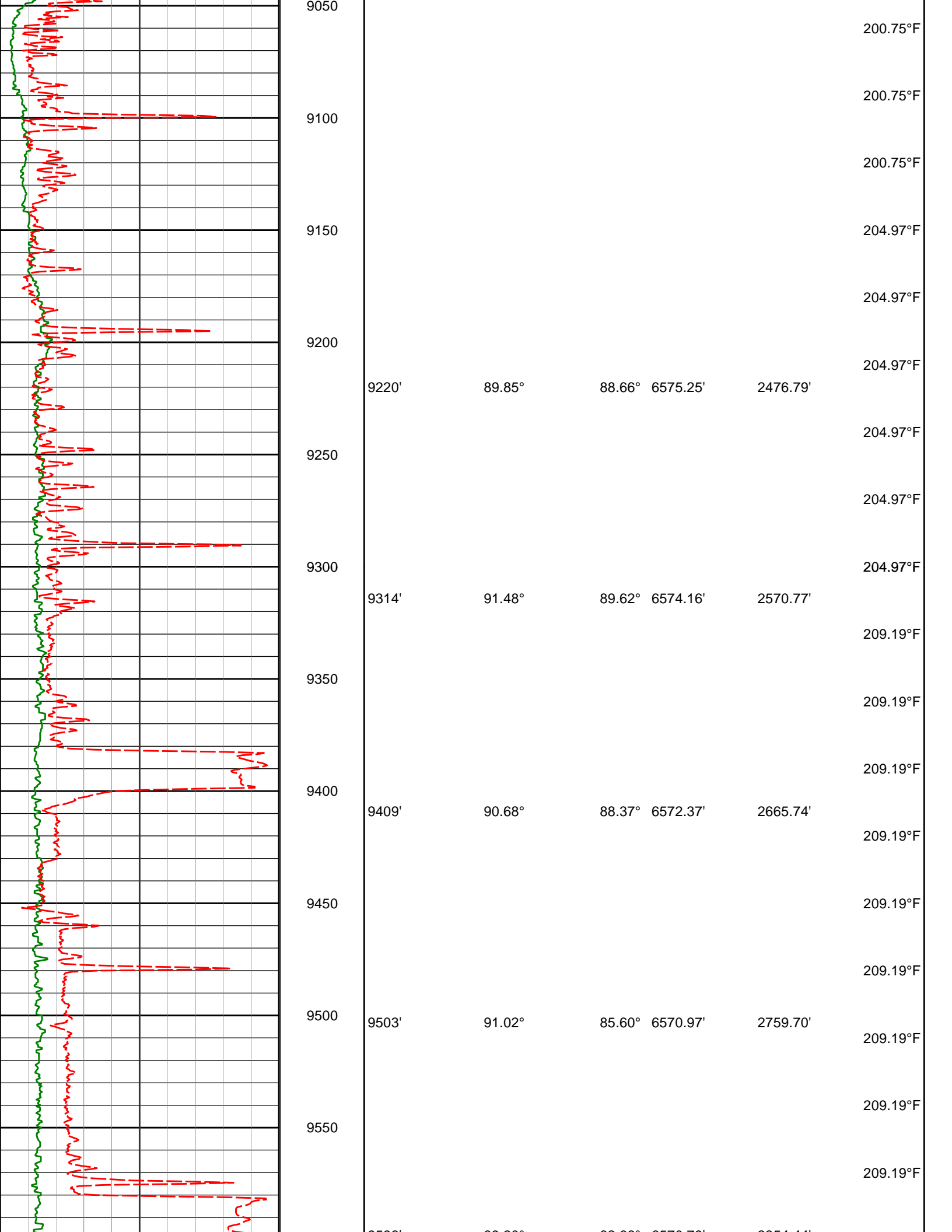
					162.78°F
6350					162.78°F
6372'	35.52°	88.42°	6321.59'	-266.59'	162.78°F
6400					162.78°F
6450					162.78°F
6466'	40.71°	84.75°	6395.52'	-208.63'	162.78°F
6500					167.00°F
6528'	45.42°	83.18°	6440.81'	-166.43'	167.00°F
6550					167.00°F
<Run 200>					167.00°F
6600					167.00°F
6623'	52.16°	84.31°	6503.36'	-95.21'	150.13°F
6650					150.13°F
6700					150.13°F
6718'	64.17°	89.27°	6553.40'	-14.71'	162.78°F
6750					150.13°F
6766'	69.64°	91.70°	6572.22'	29.39'	162.78°F
6800					167.00°F
6812'	73.94°	92.75°	6586.60'	72.96'	167.00°F
6850					167.00°F

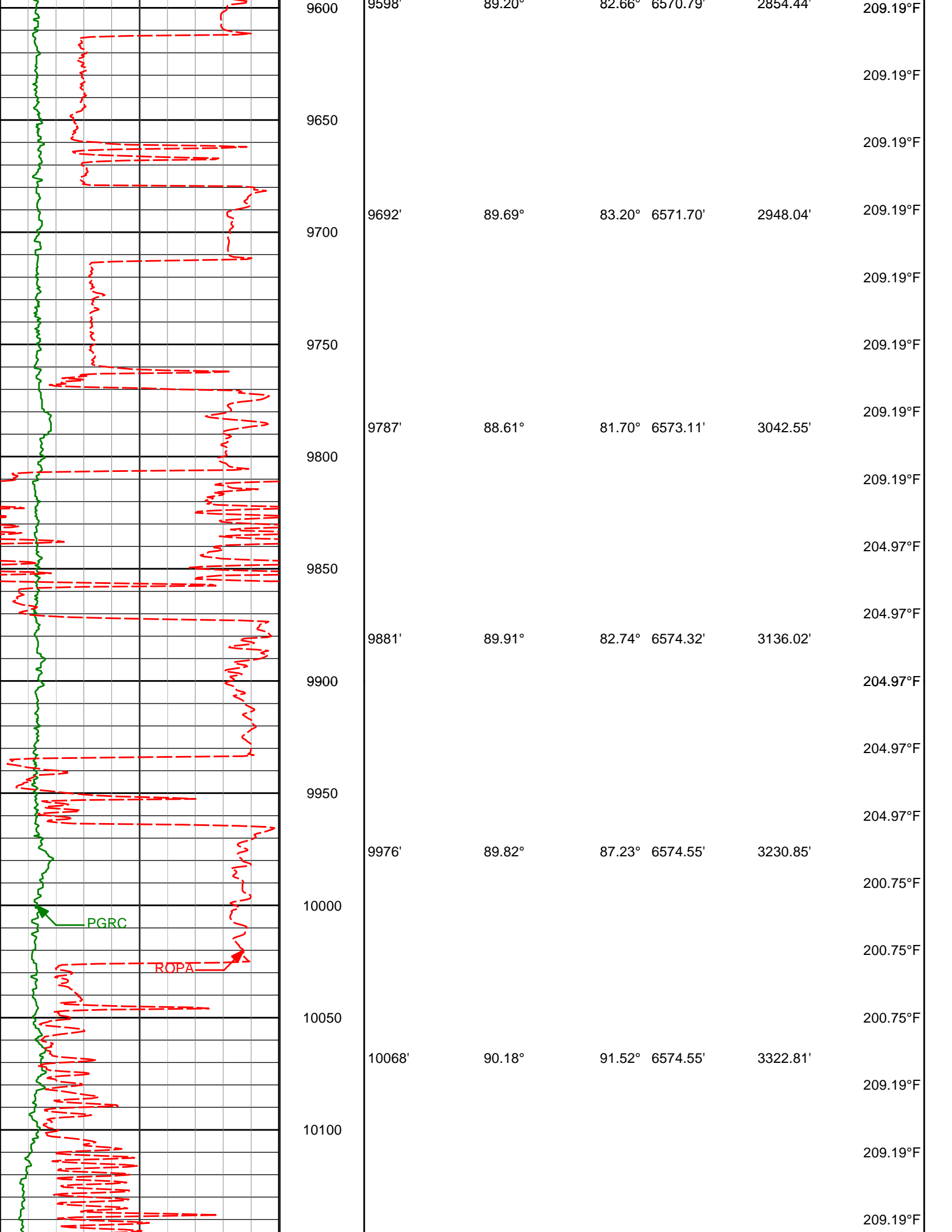


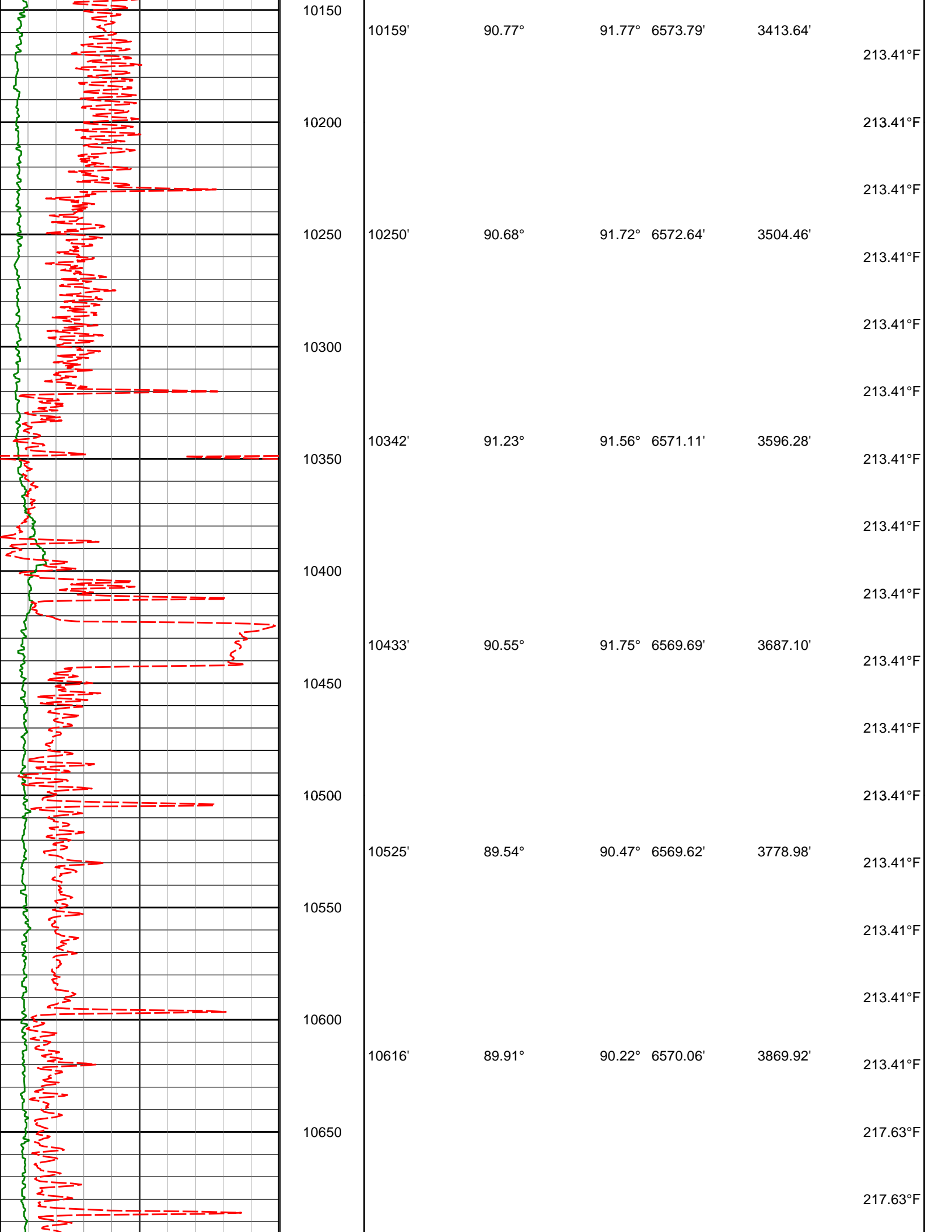


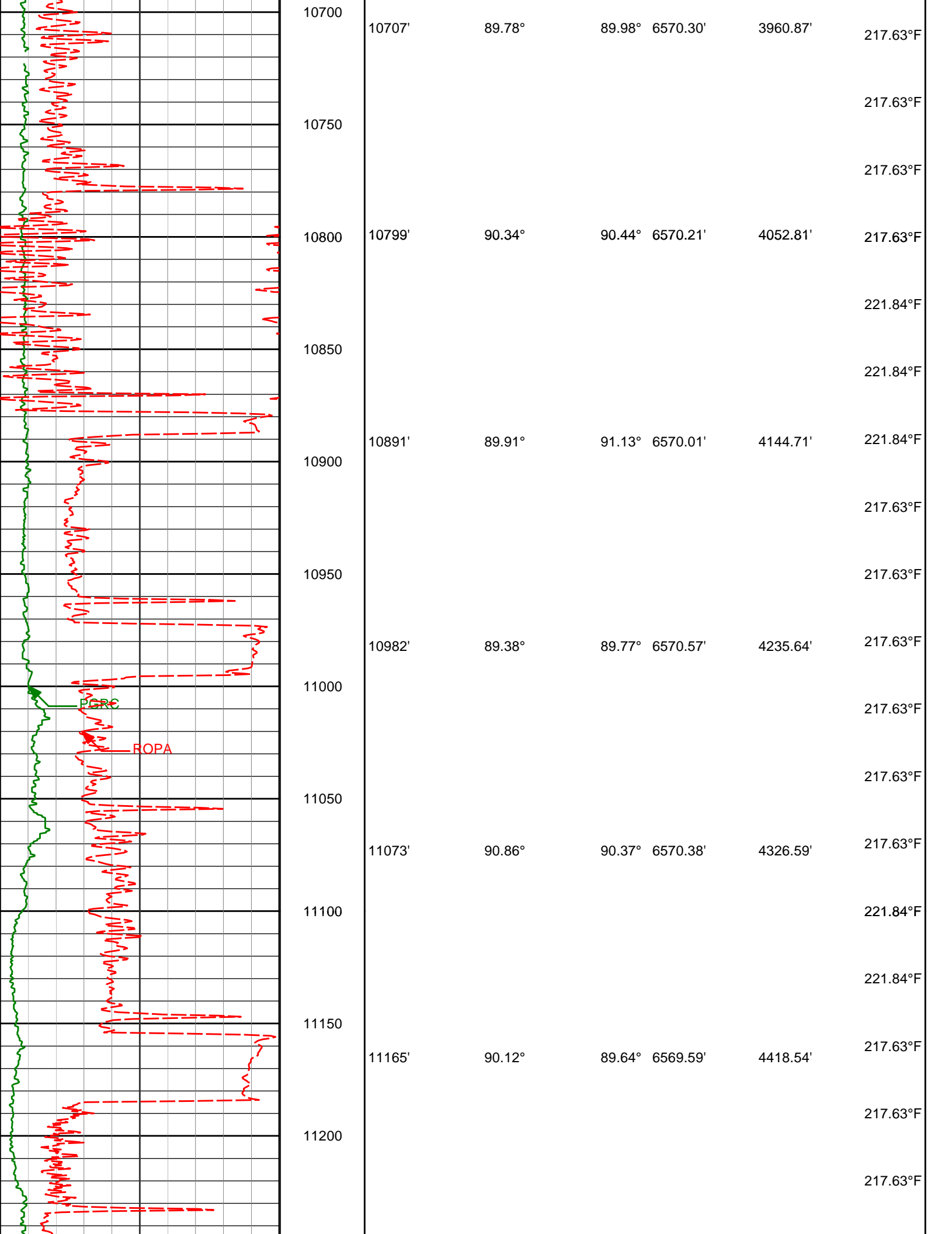


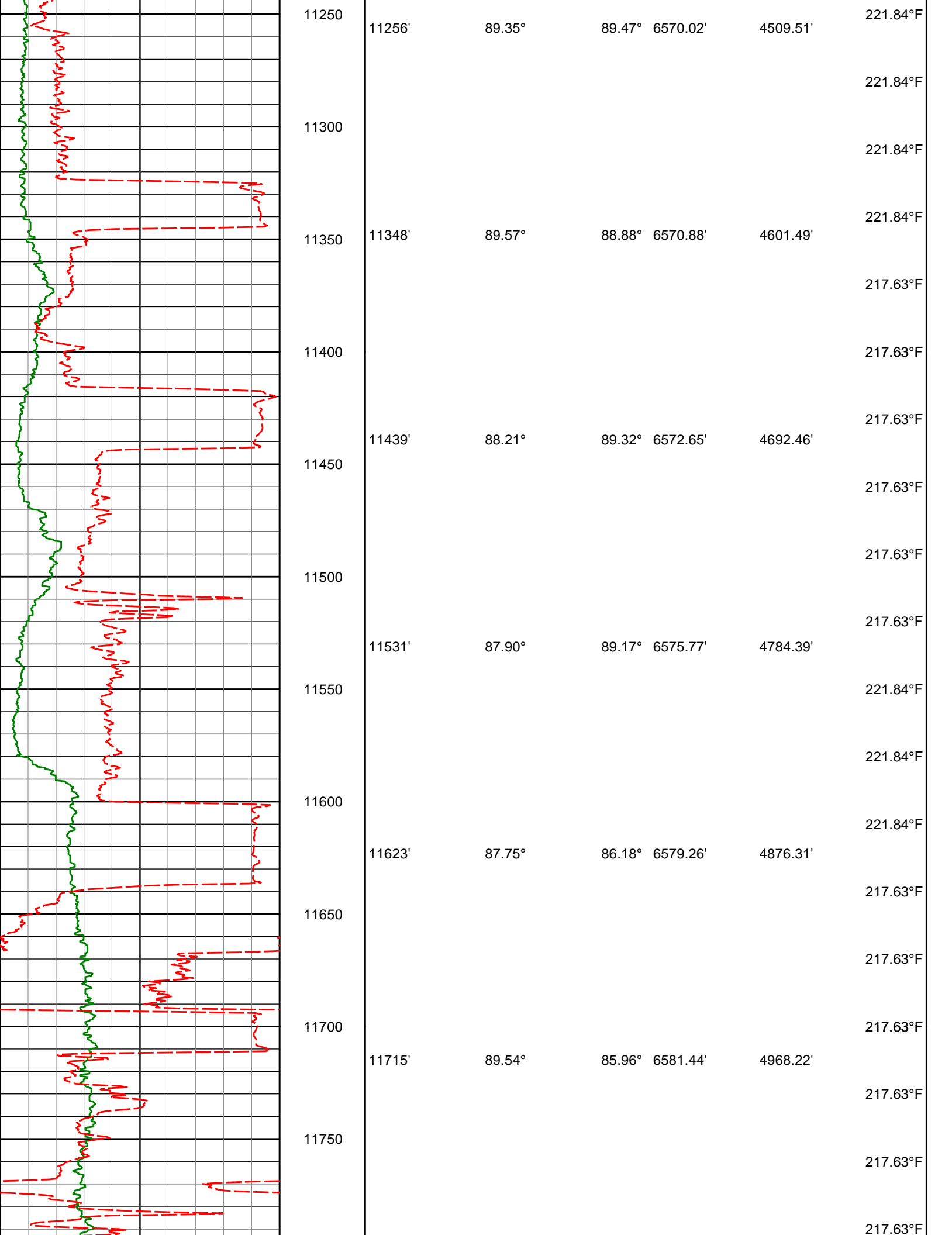


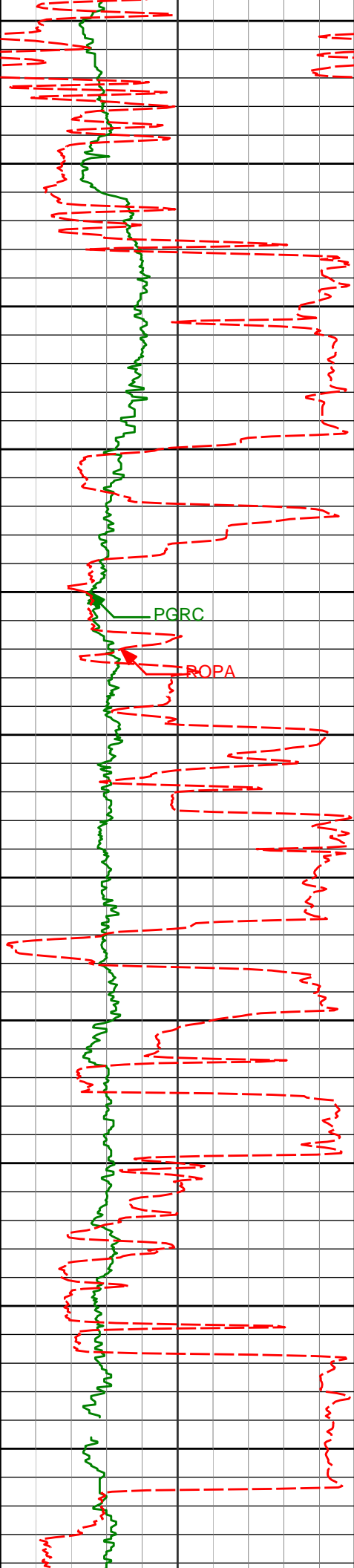




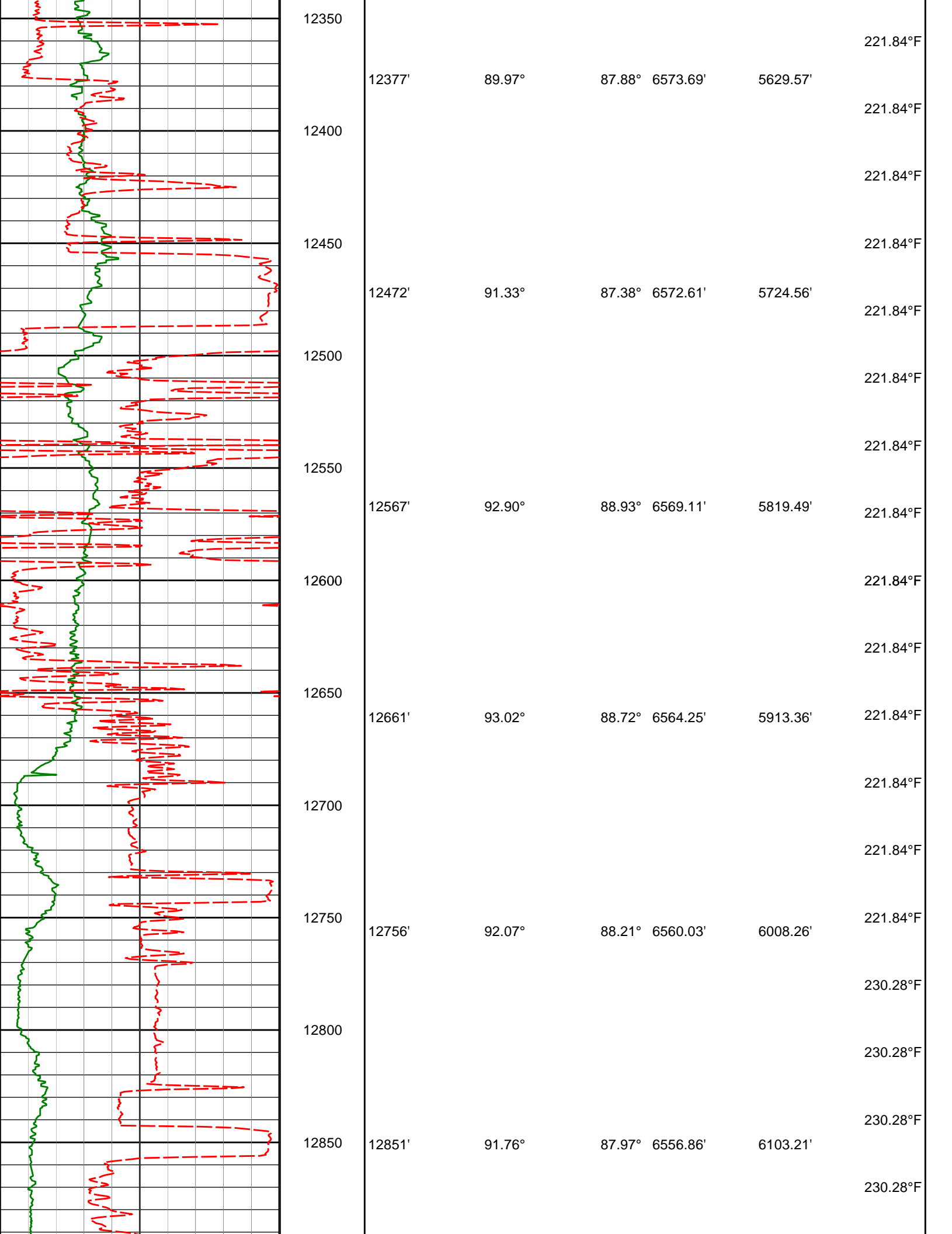


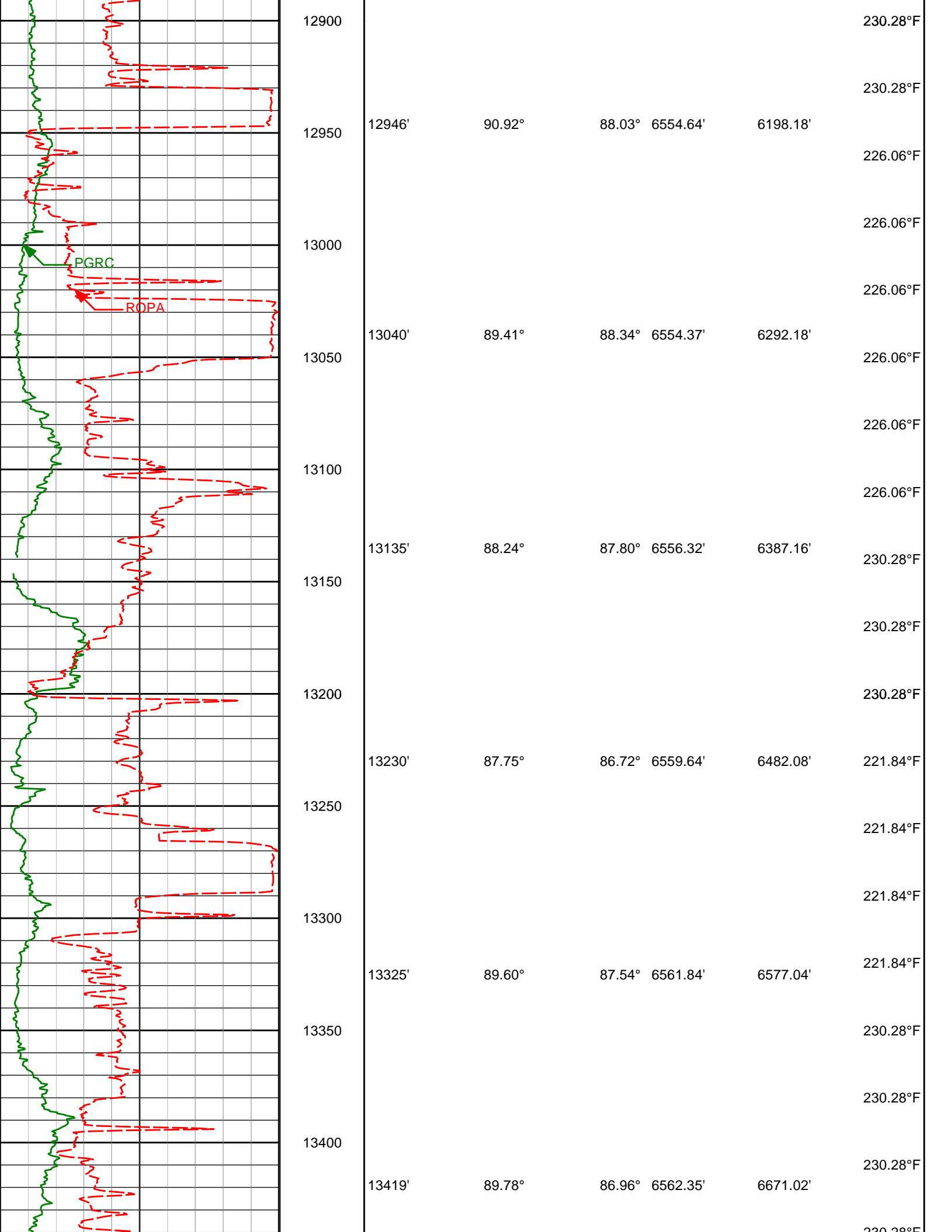


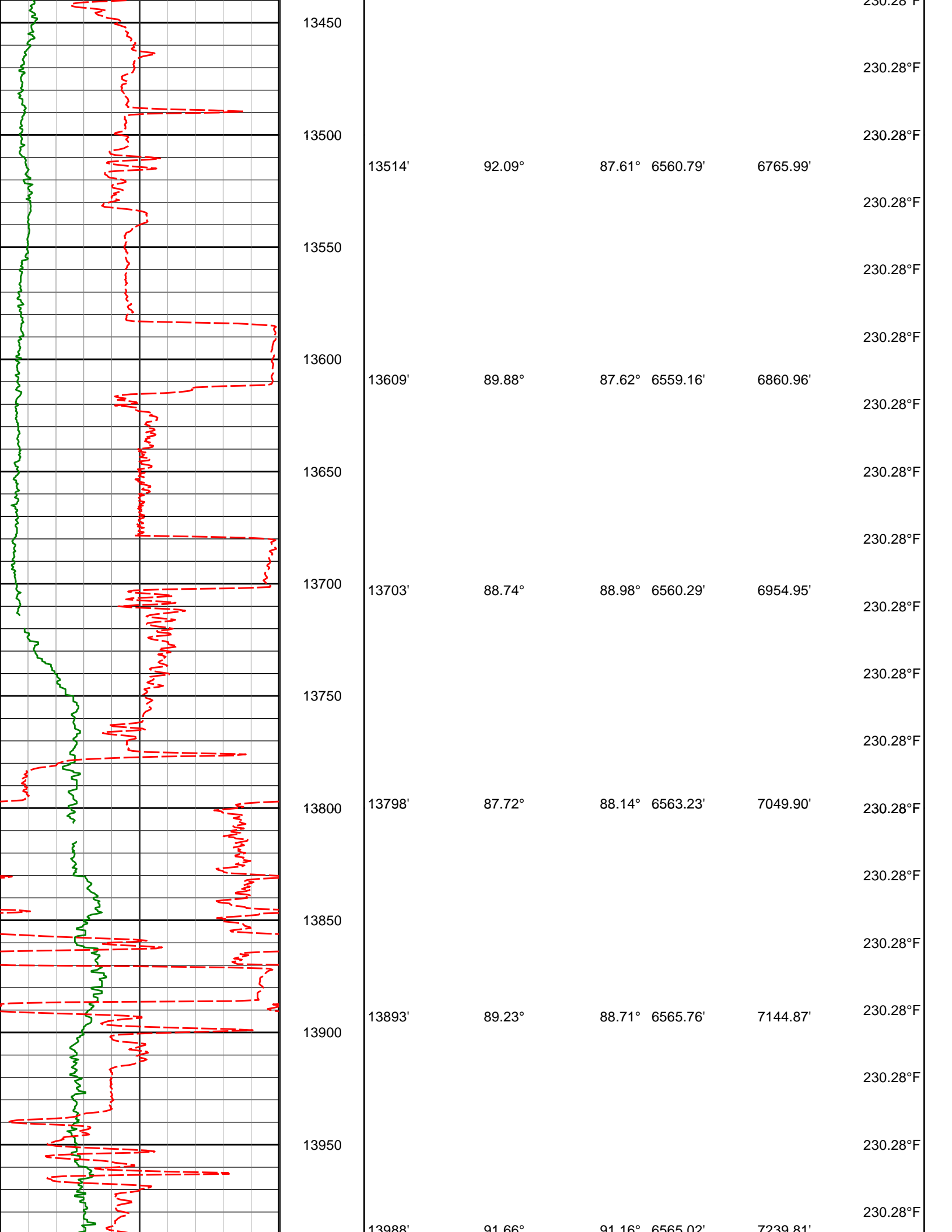


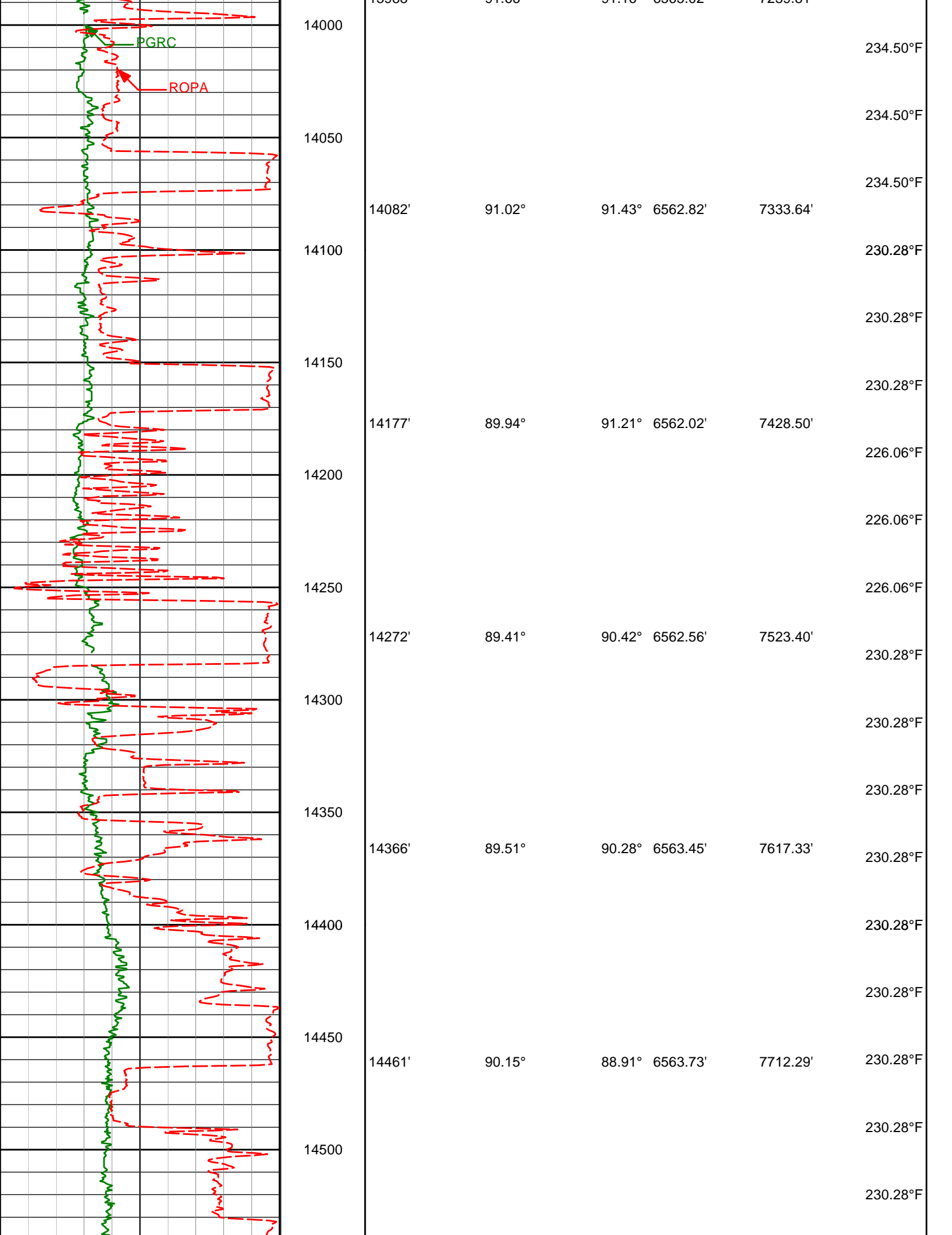


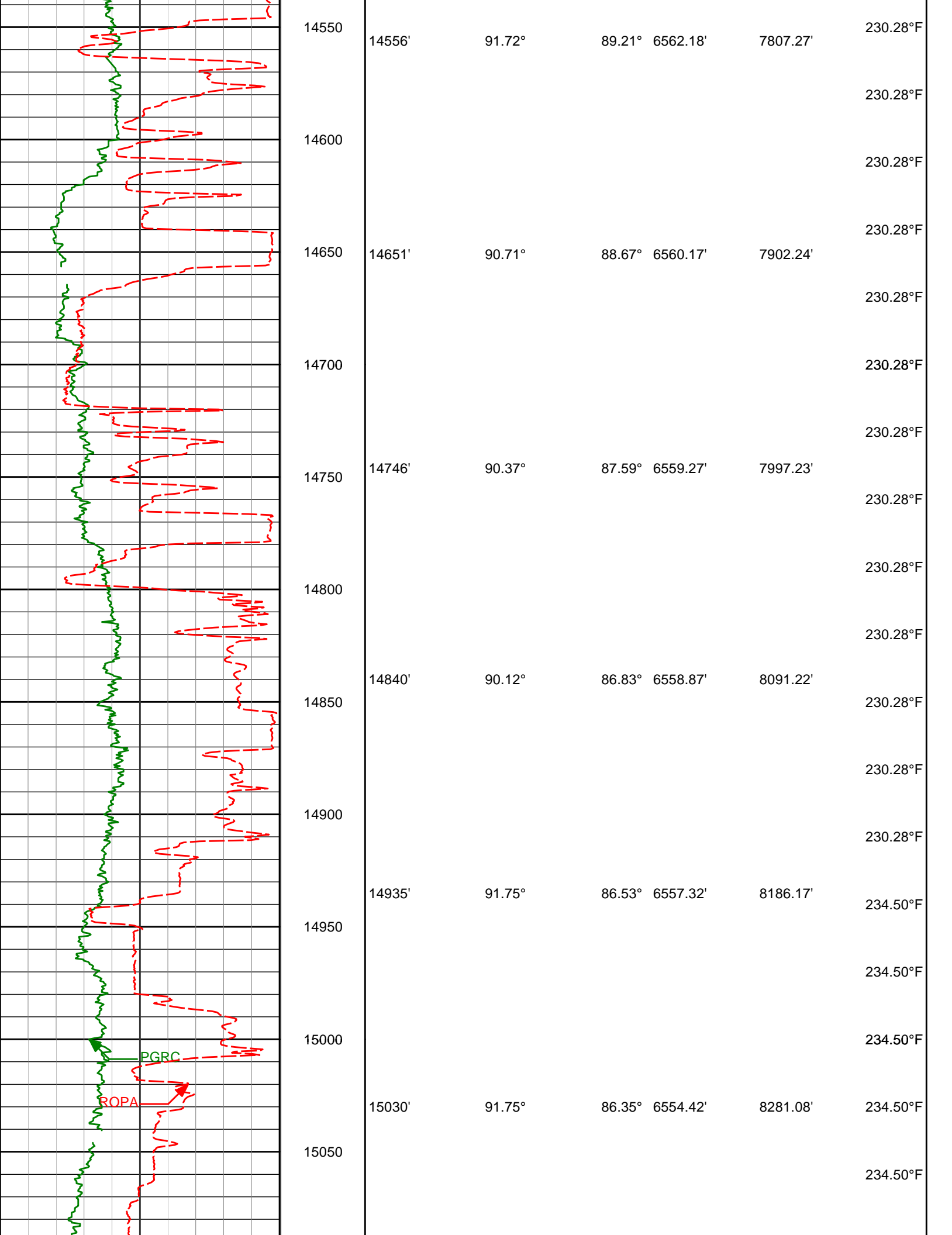
11800	11809'	89.85°	85.67°	6581.94'	5062.14'	217.63°F
11850						217.63°F
11900	11904'	90.83°	85.61°	6581.37'	5157.04'	221.84°F
11950						221.84°F
12000	11999'	91.72°	85.28°	6579.26'	5251.91'	221.84°F
12050						221.84°F
12100	12093'	90.89°	85.23°	6577.12'	5345.76'	221.84°F
12150						221.84°F
12200	12188'	90.99°	86.01°	6575.56'	5440.65'	221.84°F
12250						221.84°F
12300	12283'	90.65°	86.75°	6574.20'	5535.59'	221.84°F
						221.84°F

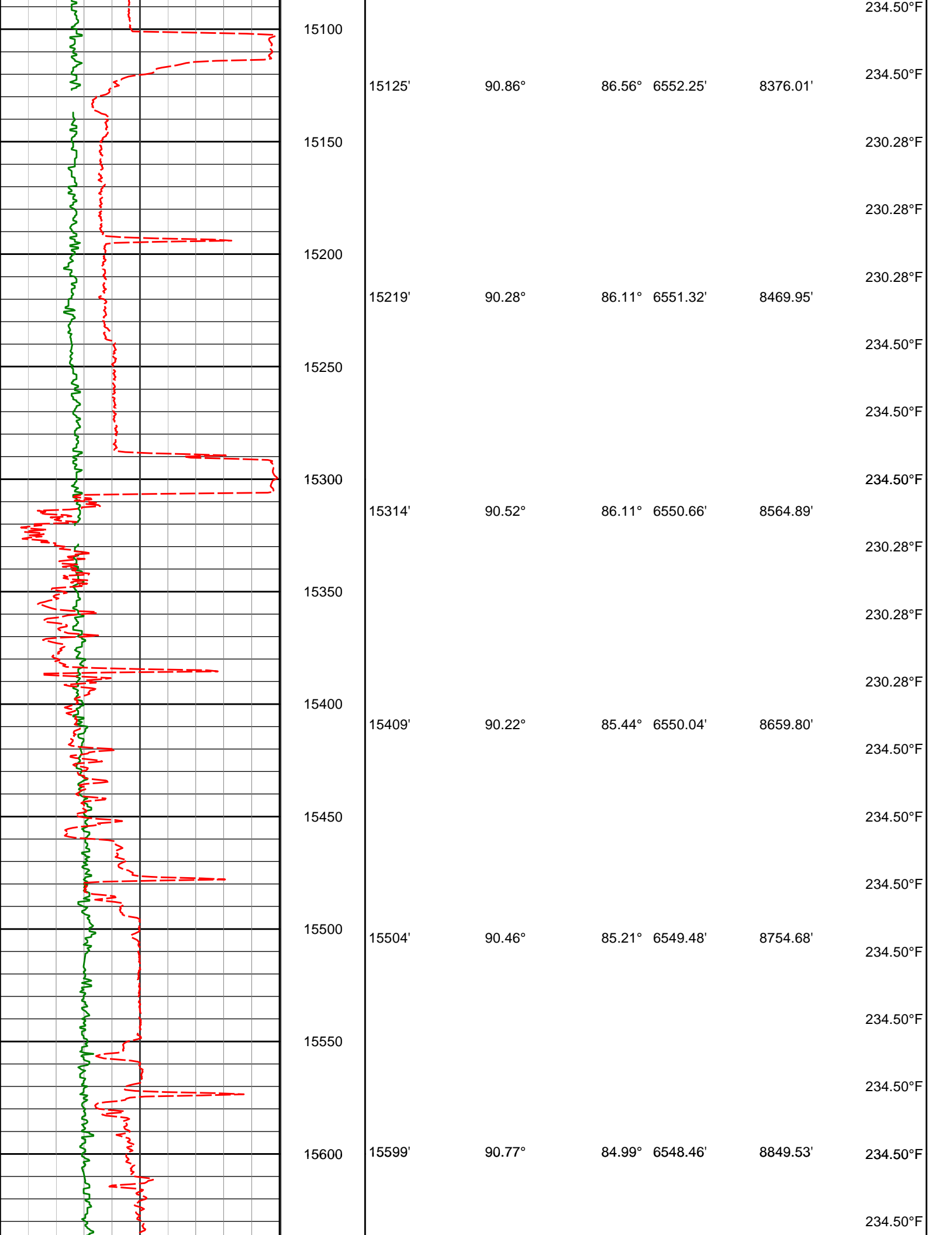


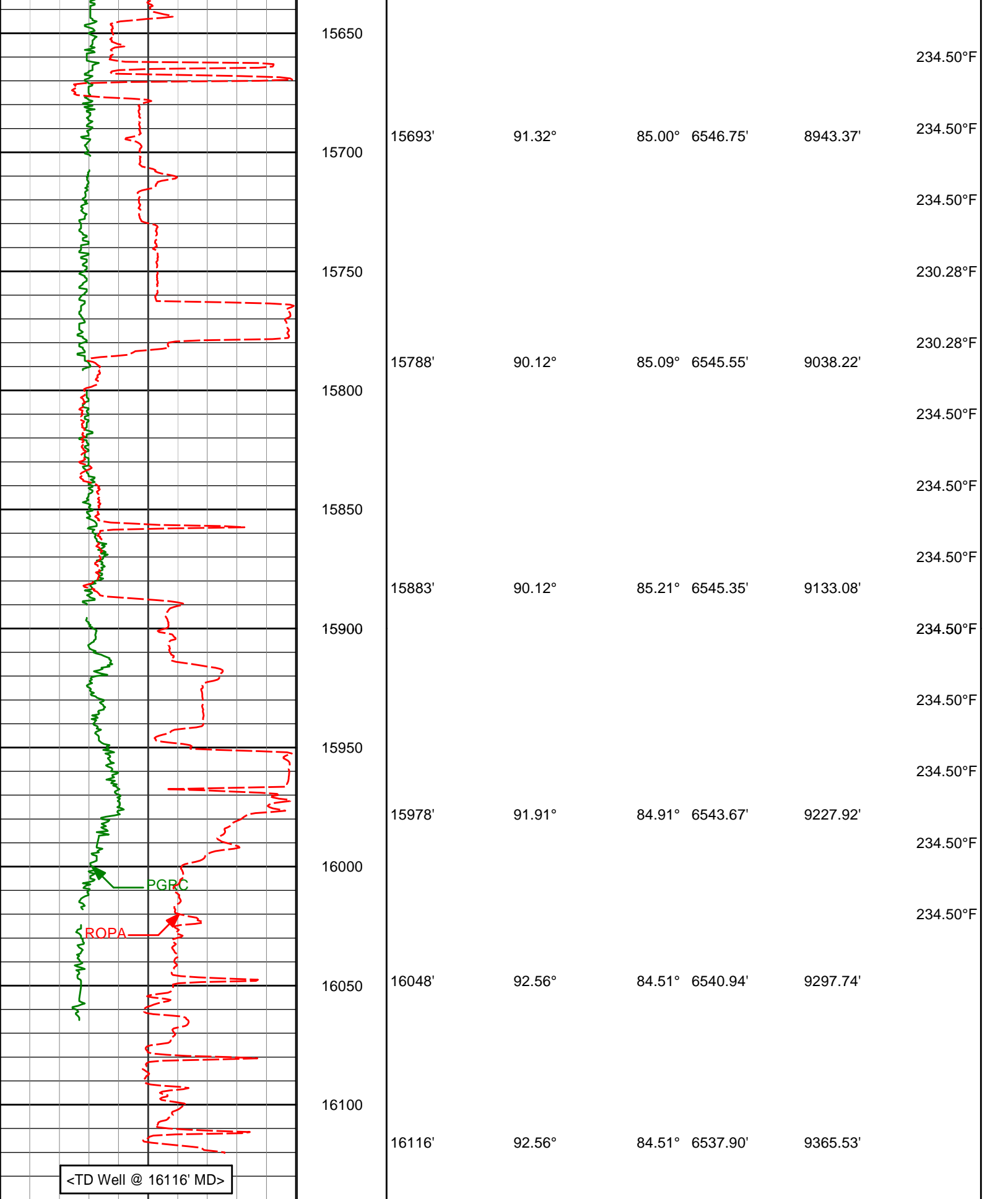






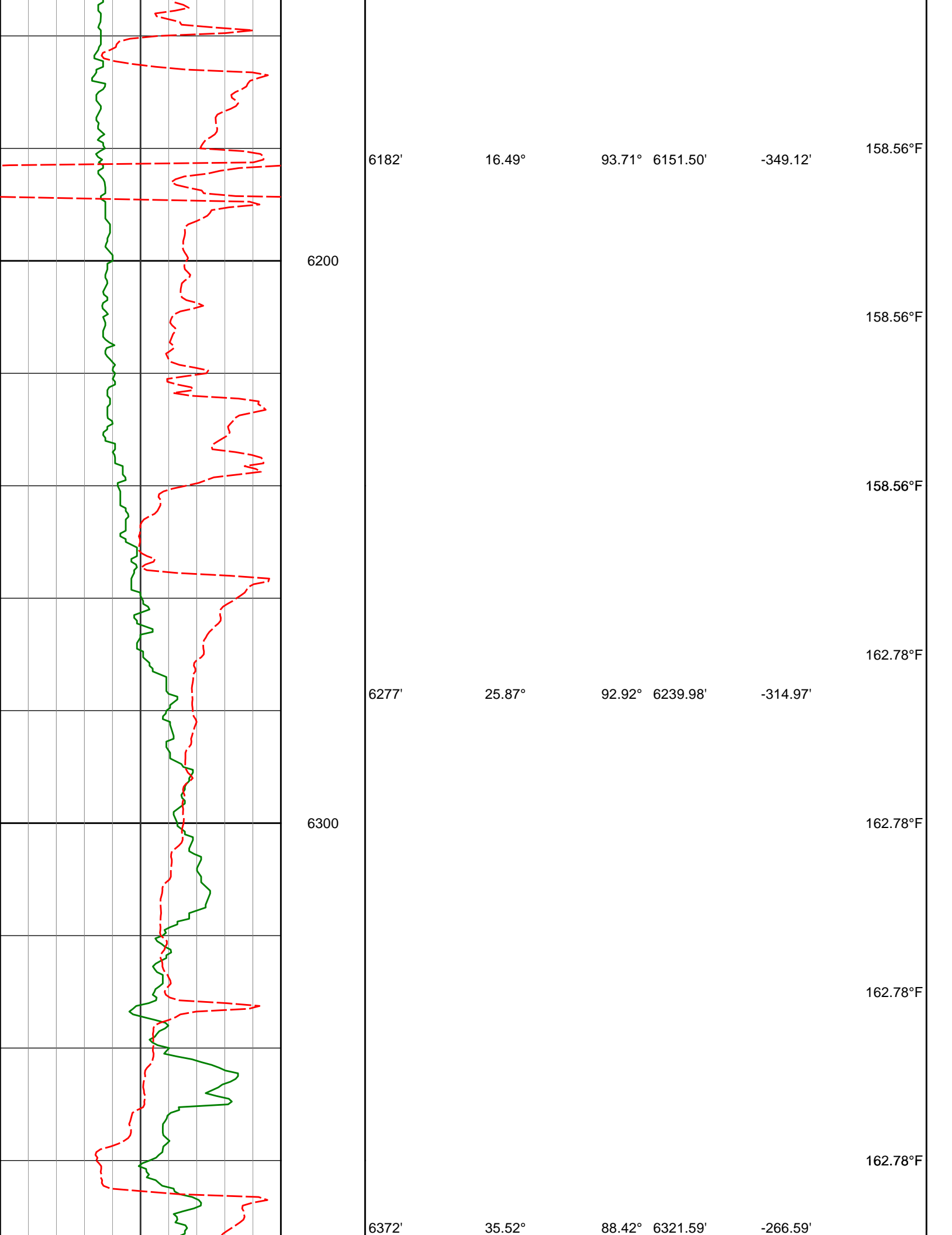


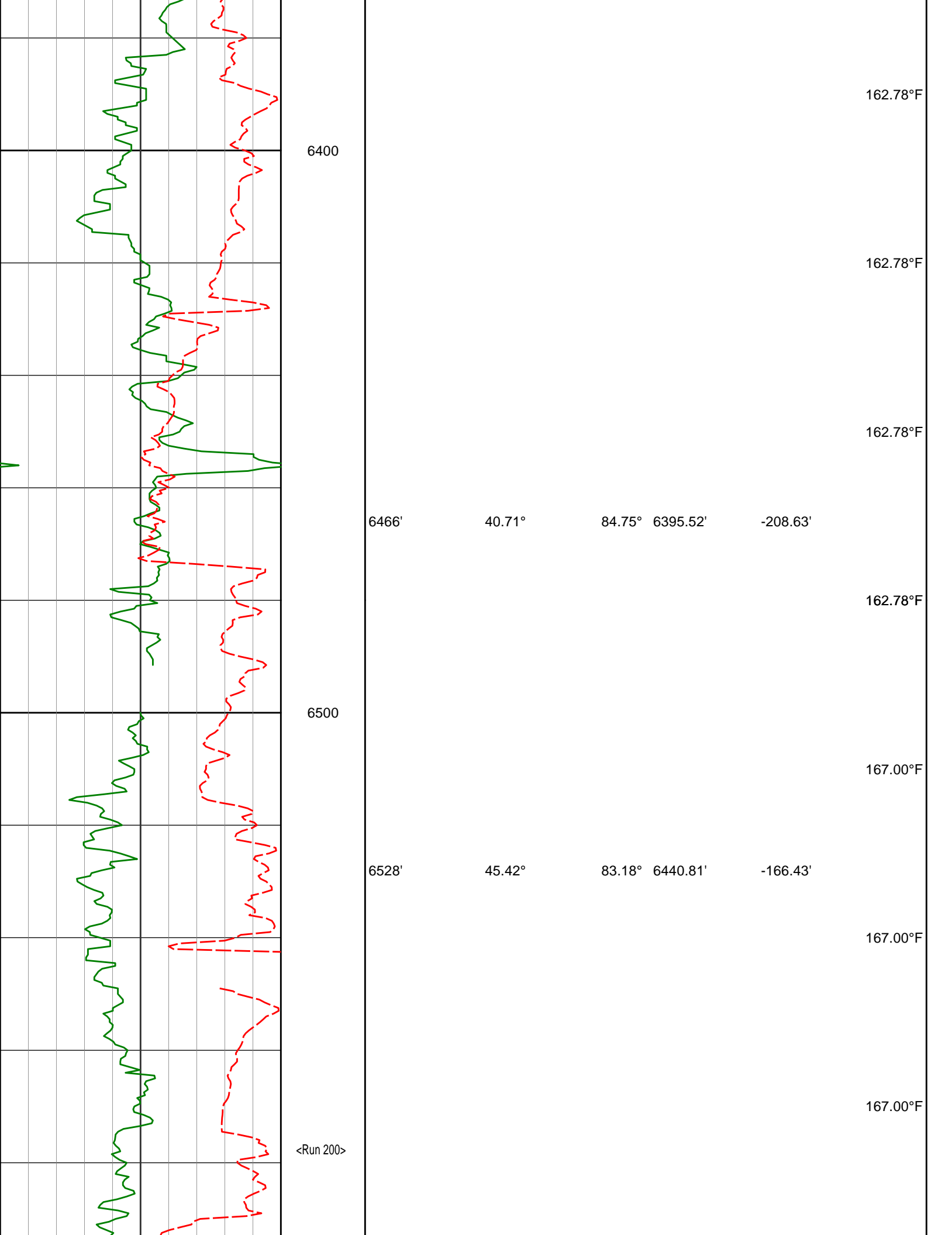


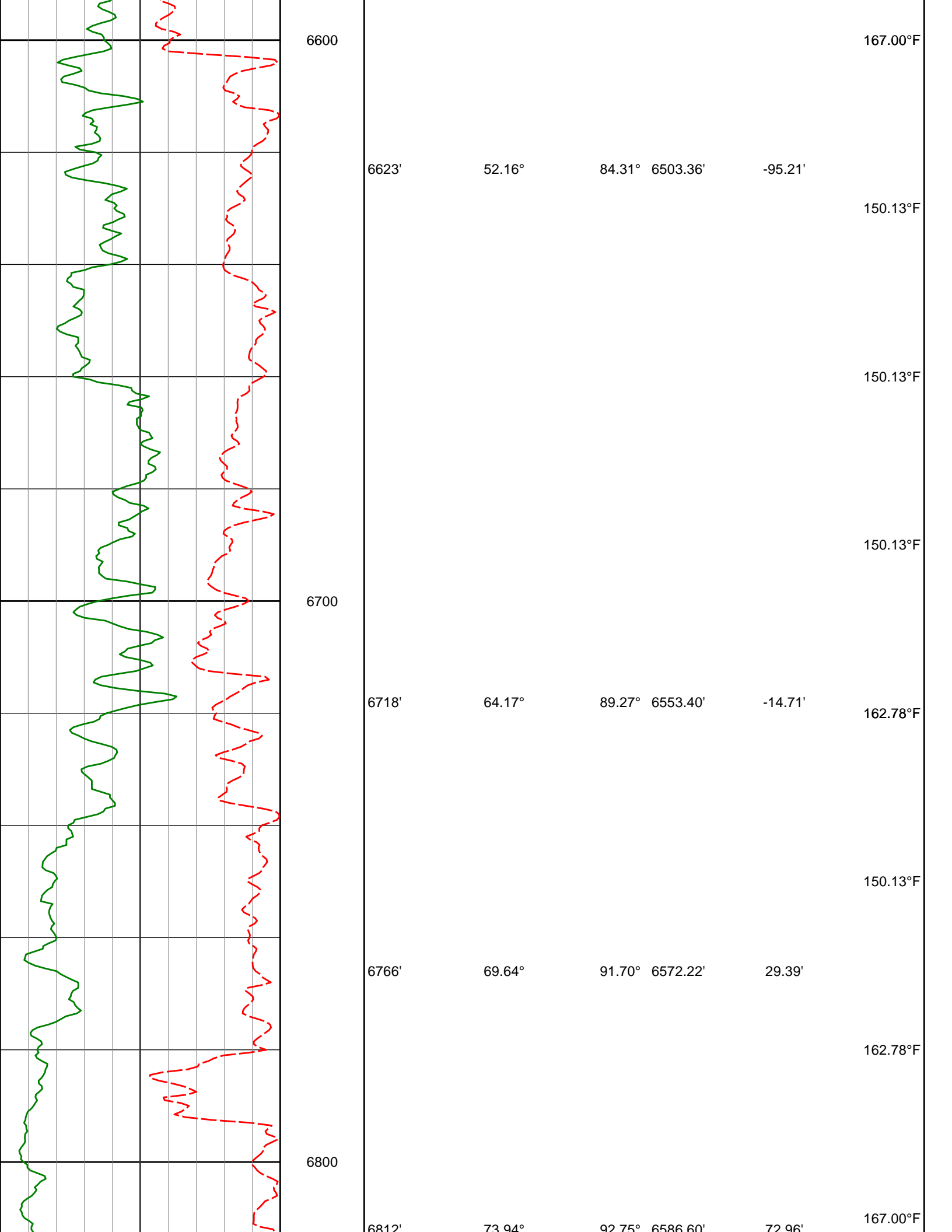


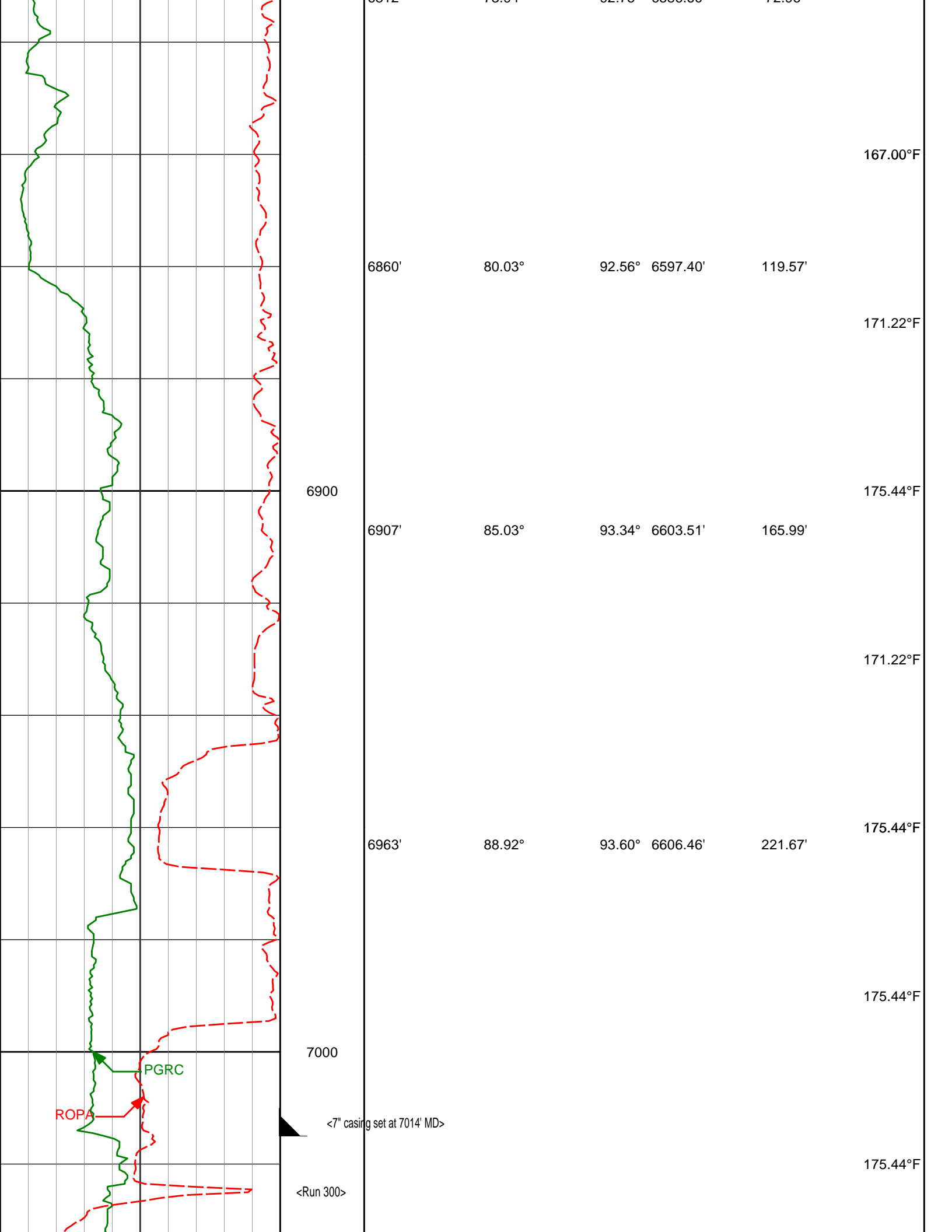
Avg Rate of Penetration ROP Avg feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500		0						

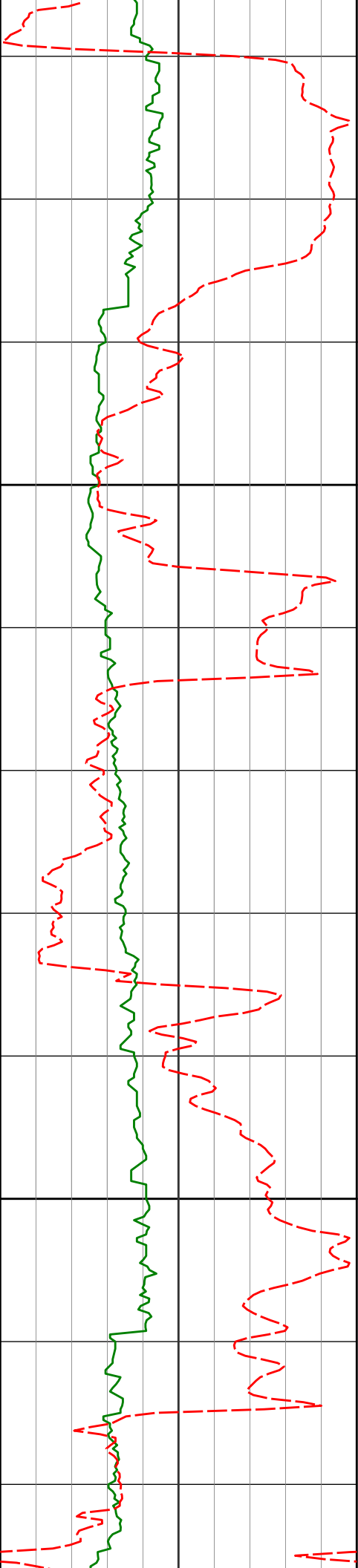
PGXC



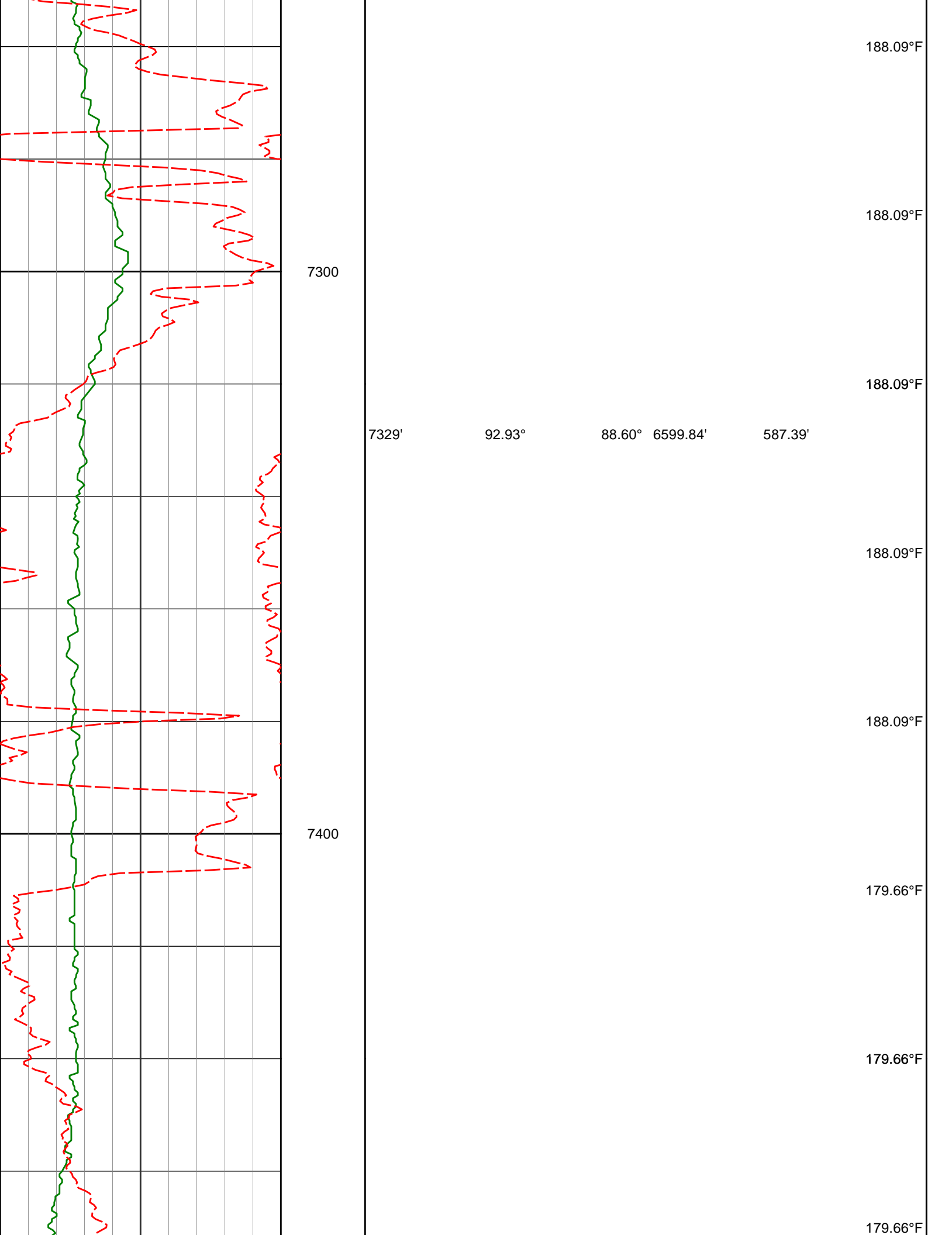


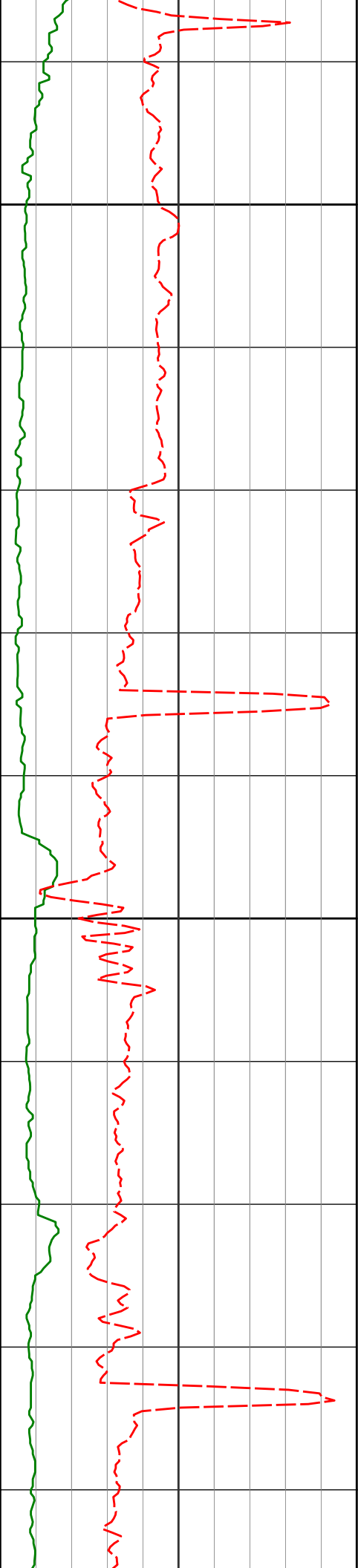






7045'	91.72°	89.49°	6606.00'	303.50'	171.22°F
					171.22°F
					171.22°F
					171.22°F
7140'	89.69°	88.22°	6604.83'	398.48'	188.09°F
					188.09°F
					188.09°F
					188.09°F
7235'	91.73°	88.22°	6603.66'	493.47'	175.44°F
					175.44°F
					175.44°F
					175.44°F





7500

7519'

91.35°

88.39° 6592.74'

777.25'

7600

7613'

91.29°

88.26° 6590.58'

871.22'

183.88°F

183.88°F

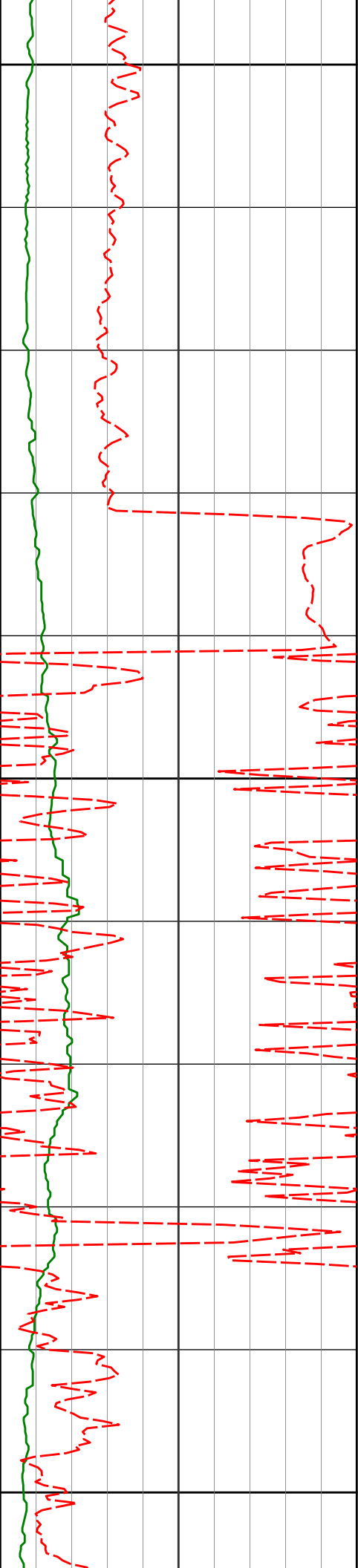
183.88°F

183.88°F

183.88°F

183.88°F

188.09°F



7700

188.09°F

188.09°F

188.09°F

7800

7802'

92.37°

87.21° 6584.54'

1060.11'

188.09°F

188.09°F

188.09°F

7900

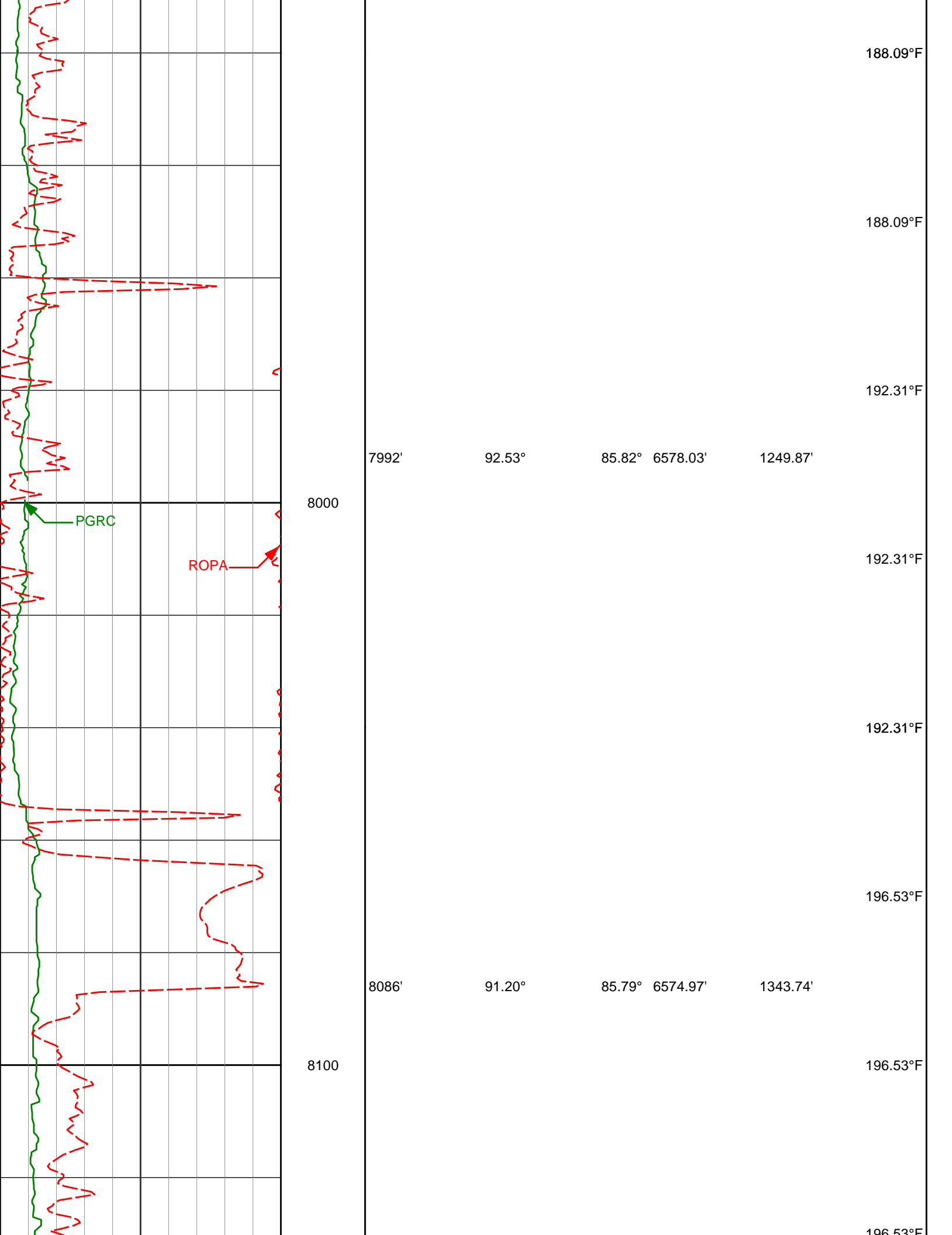
7897'

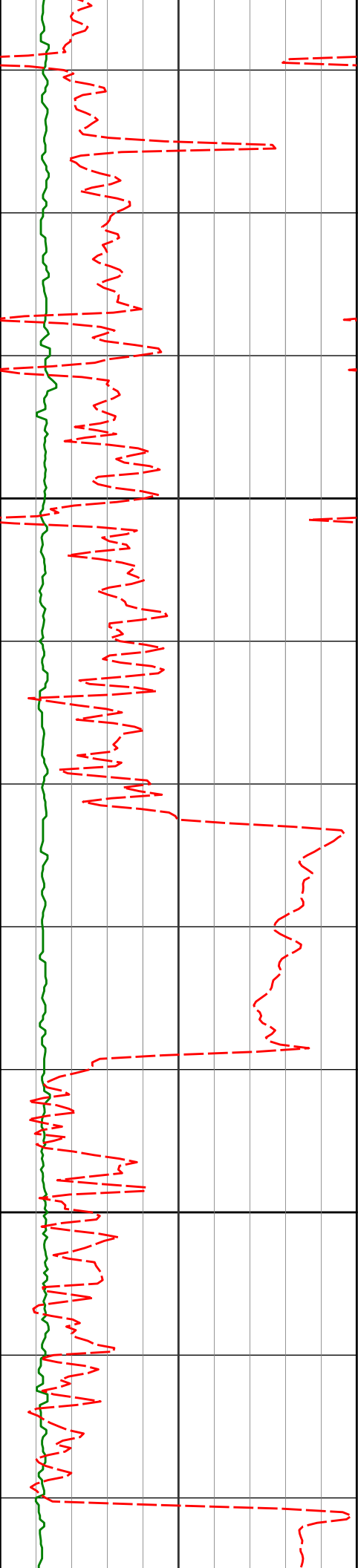
91.48°

85.80° 6581.35'

1155.01'

188.09°F





8200

8300

8181'

8276'

91.29°

90.65°

84.26°

85.62°

6572.90'

6571.29'

1438.57'

1533.40'

196.53°F

196.53°F

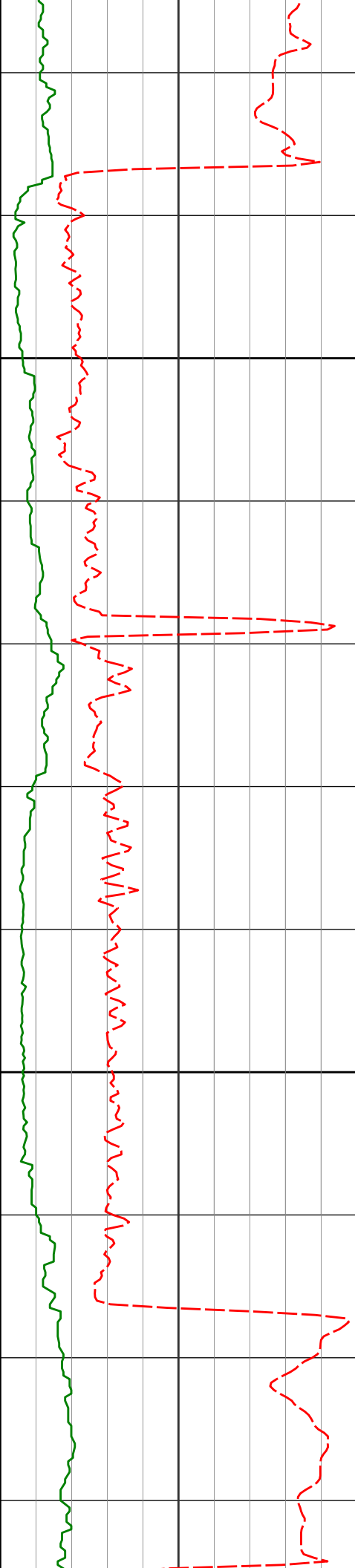
196.53°F

196.53°F

196.53°F

196.53°F

196.53°F



8400

8500

8370'

8465'

8559'

88.55°

88.43°

89.57°

86.97°

86.74°

89.15°

6571.95'

6574.45'

6576.09'

1627.34'

1722.28'

1816.25'

196.53°F

196.53°F

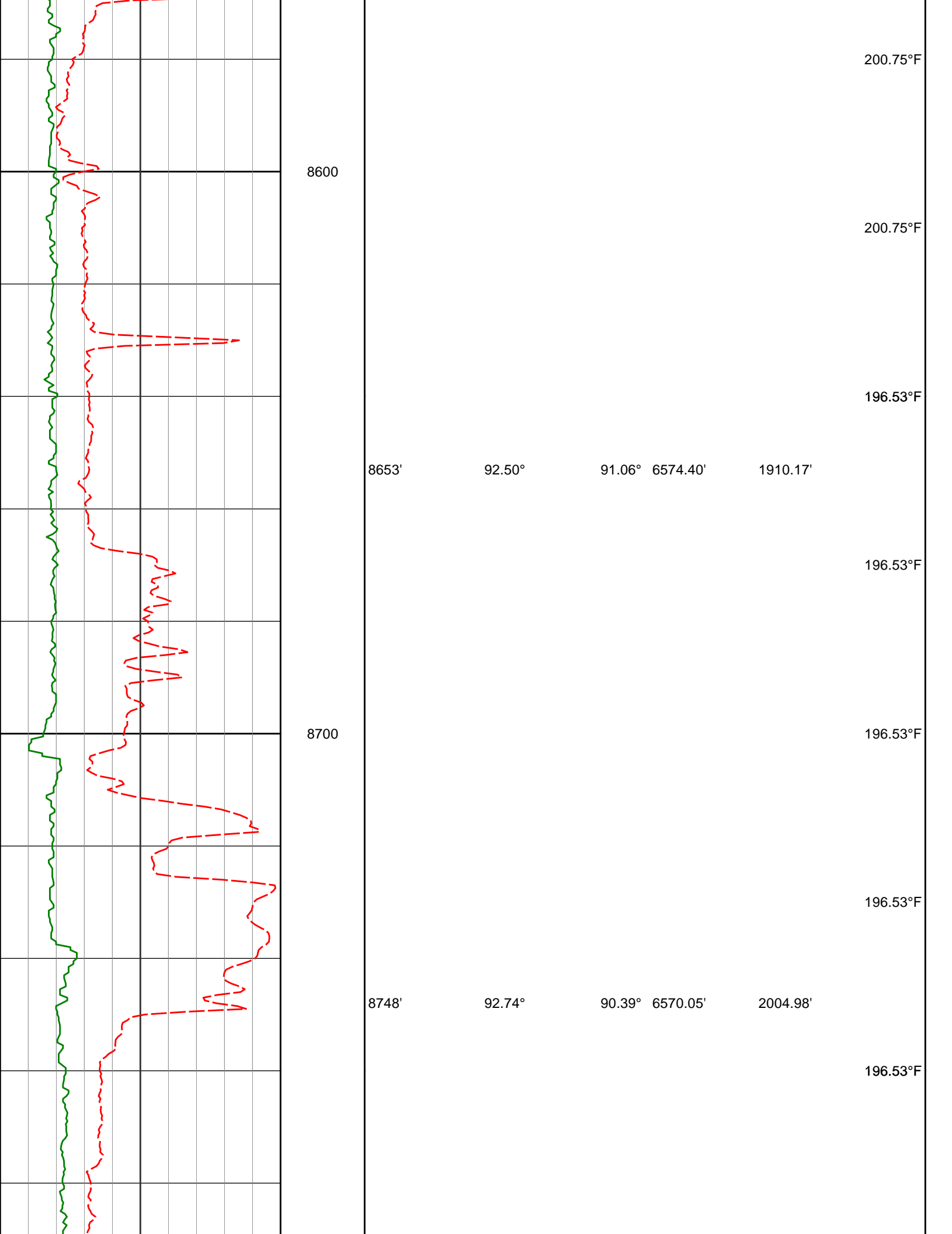
196.53°F

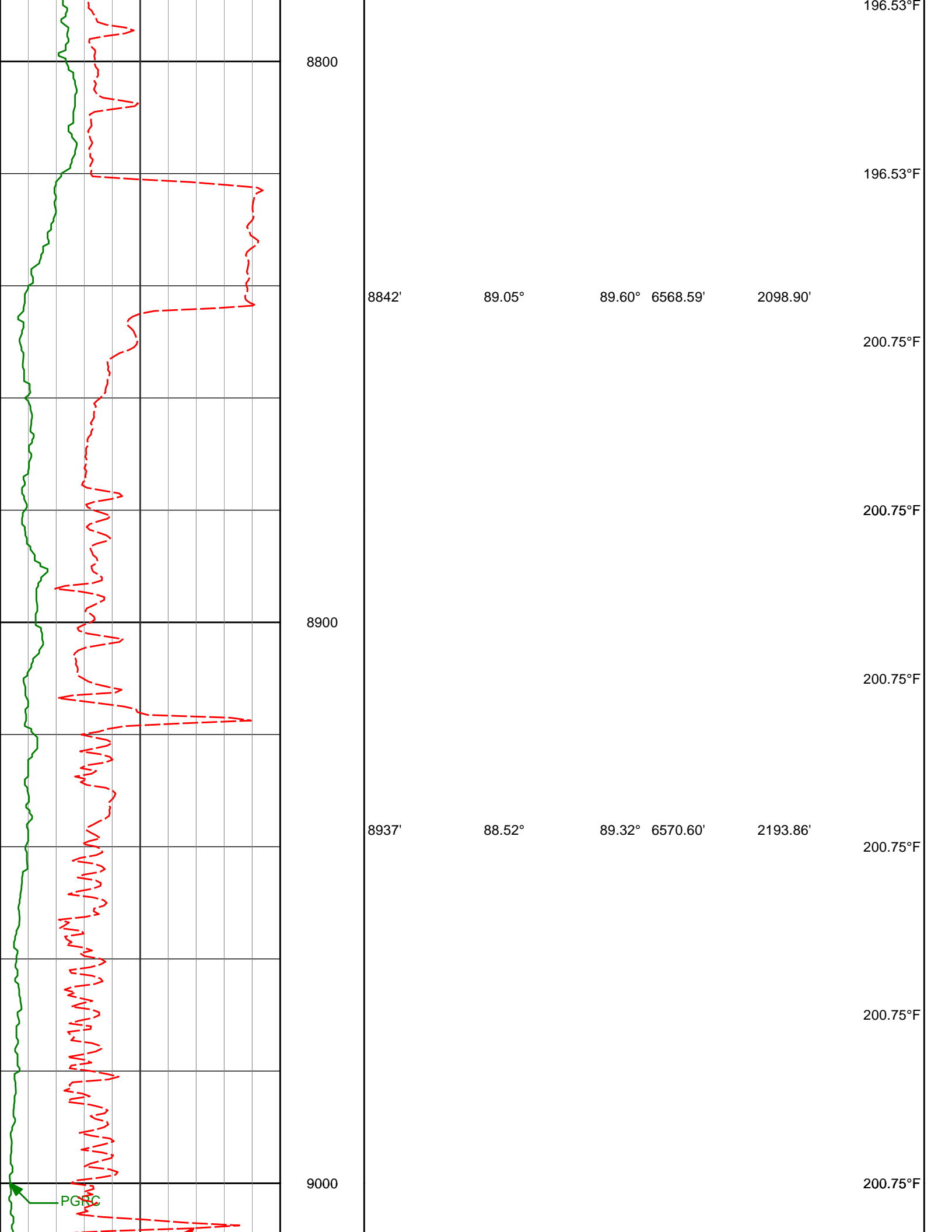
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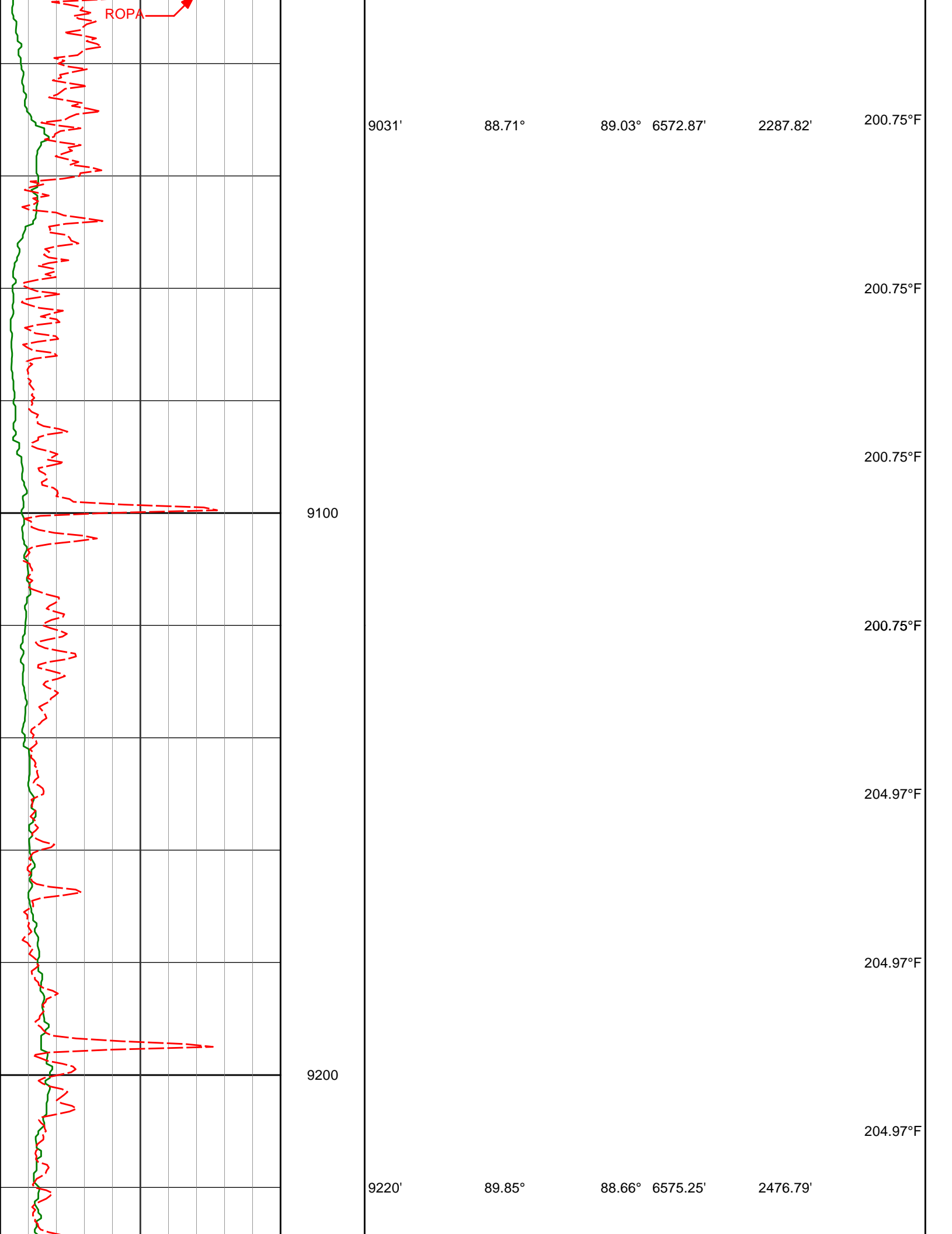
196.53°F

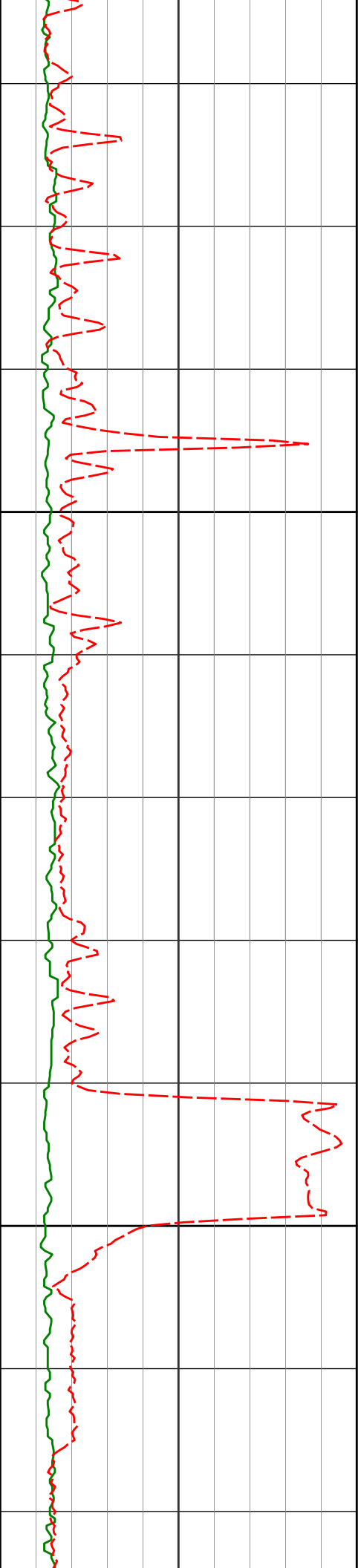
196.53°F

200.75°F









9300

9400

9314'

9409'

91.48°

90.68°

89.62°

88.37°

6574.16'

6572.37'

2570.77'

2665.74'

204.97°F

204.97°F

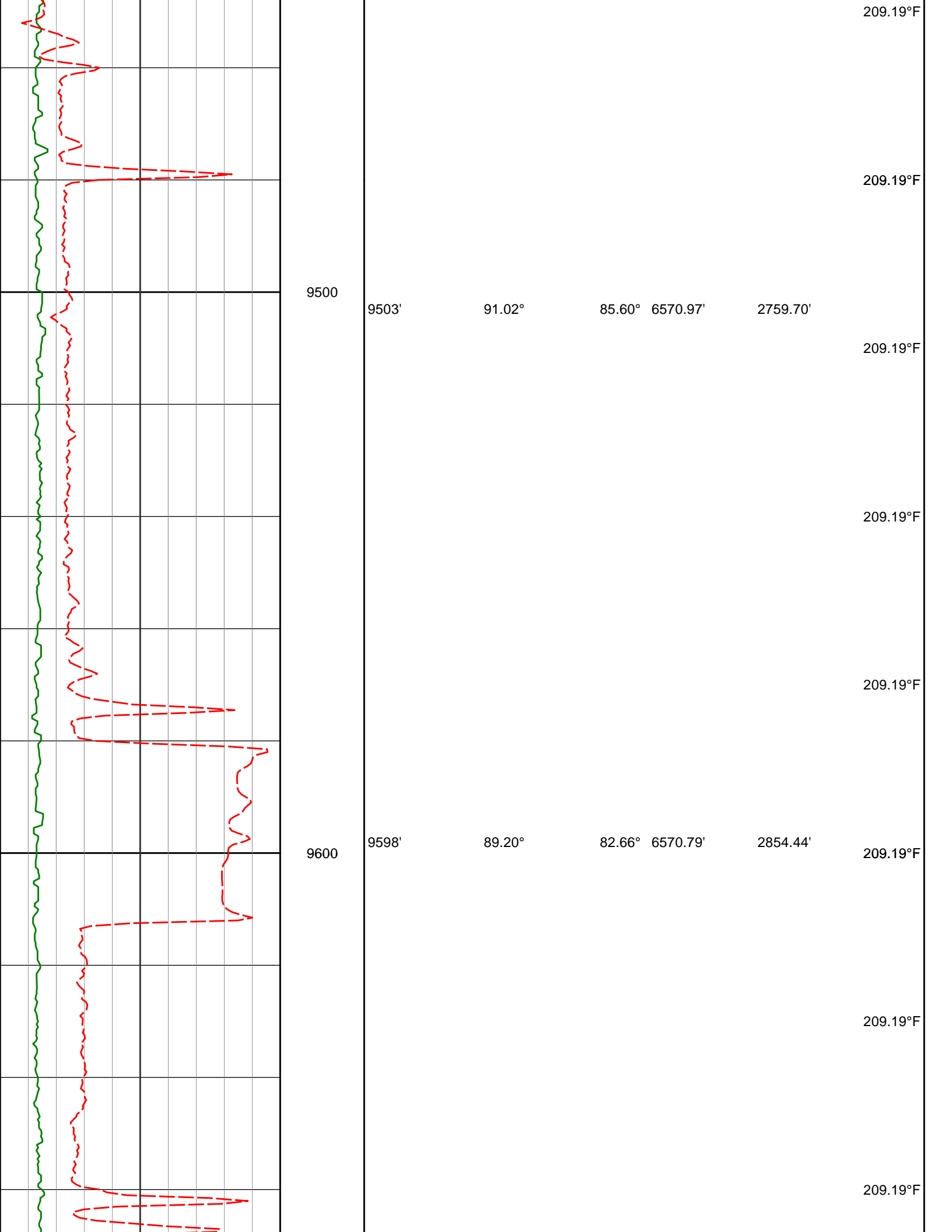
204.97°F

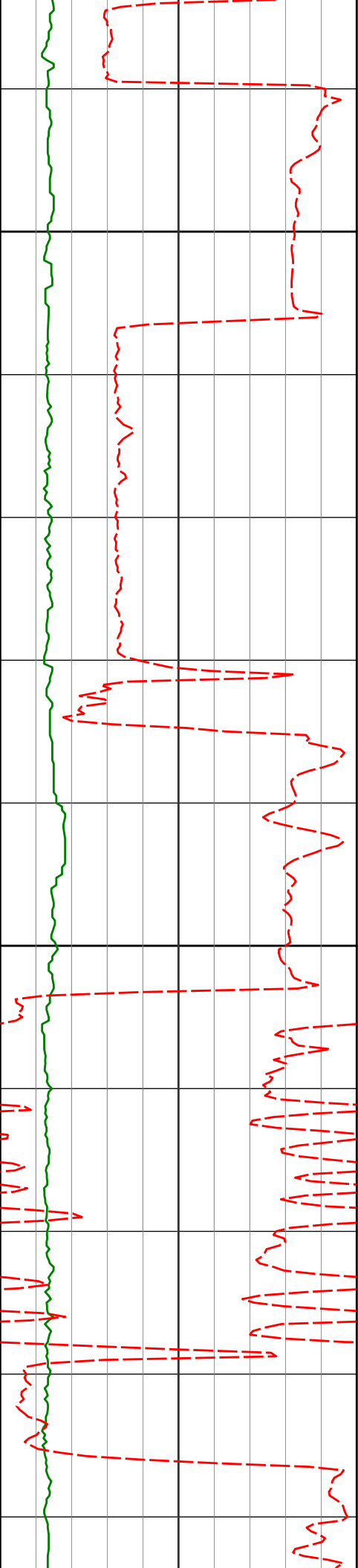
209.19°F

209.19°F

209.19°F

209.19°F





9700

9800

9692'

9787'

9881'

89.69°

88.61°

89.91°

83.20°

81.70°

82.74°

6571.70'

6573.11'

6574.32'

2948.04'

3042.55'

3136.02'

209.19°F

209.19°F

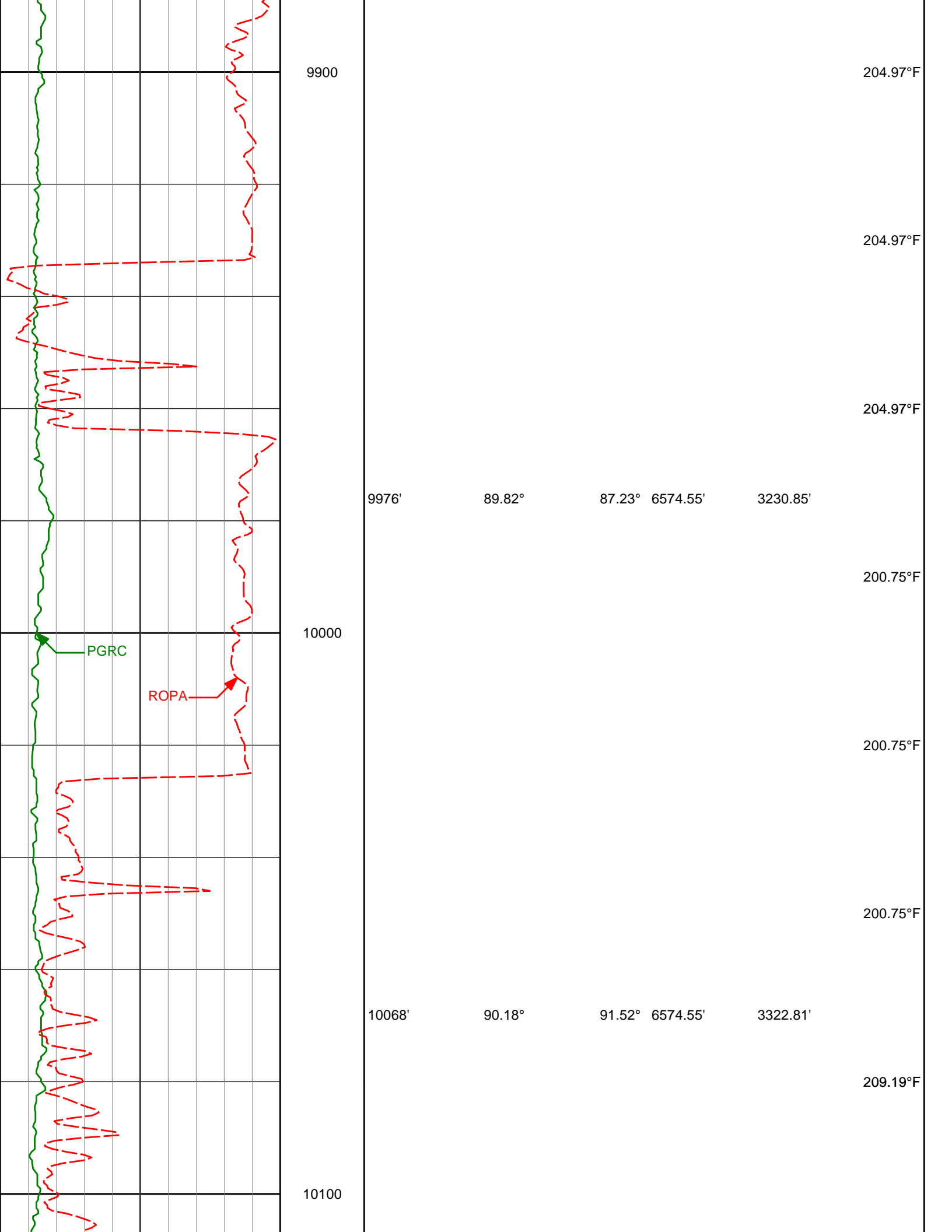
209.19°F

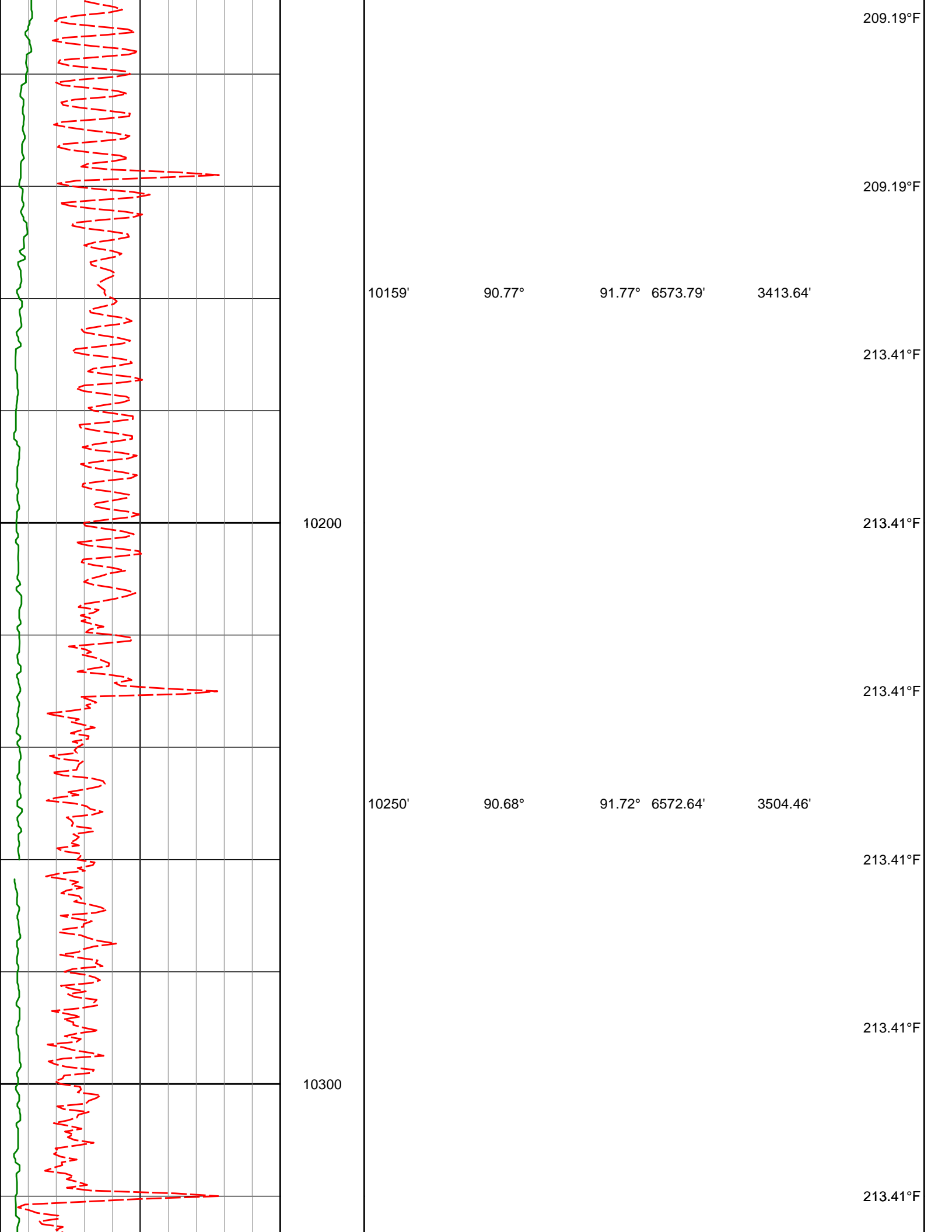
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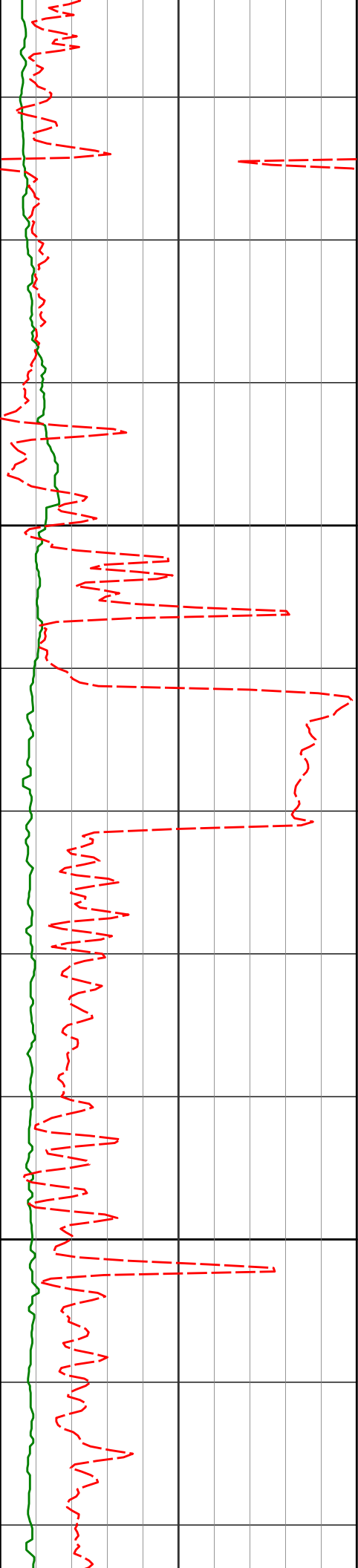
209.19°F

204.97°F

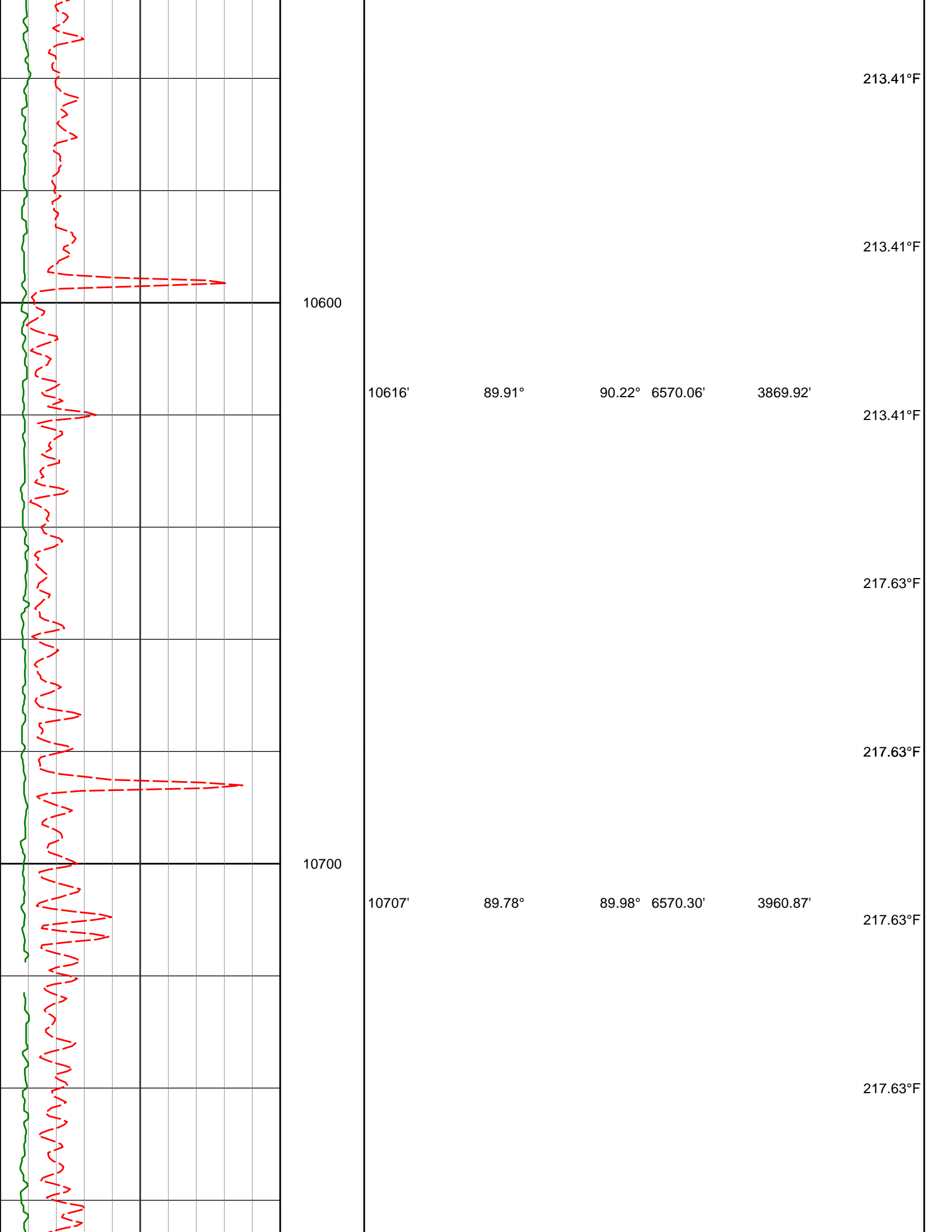
204.97°F

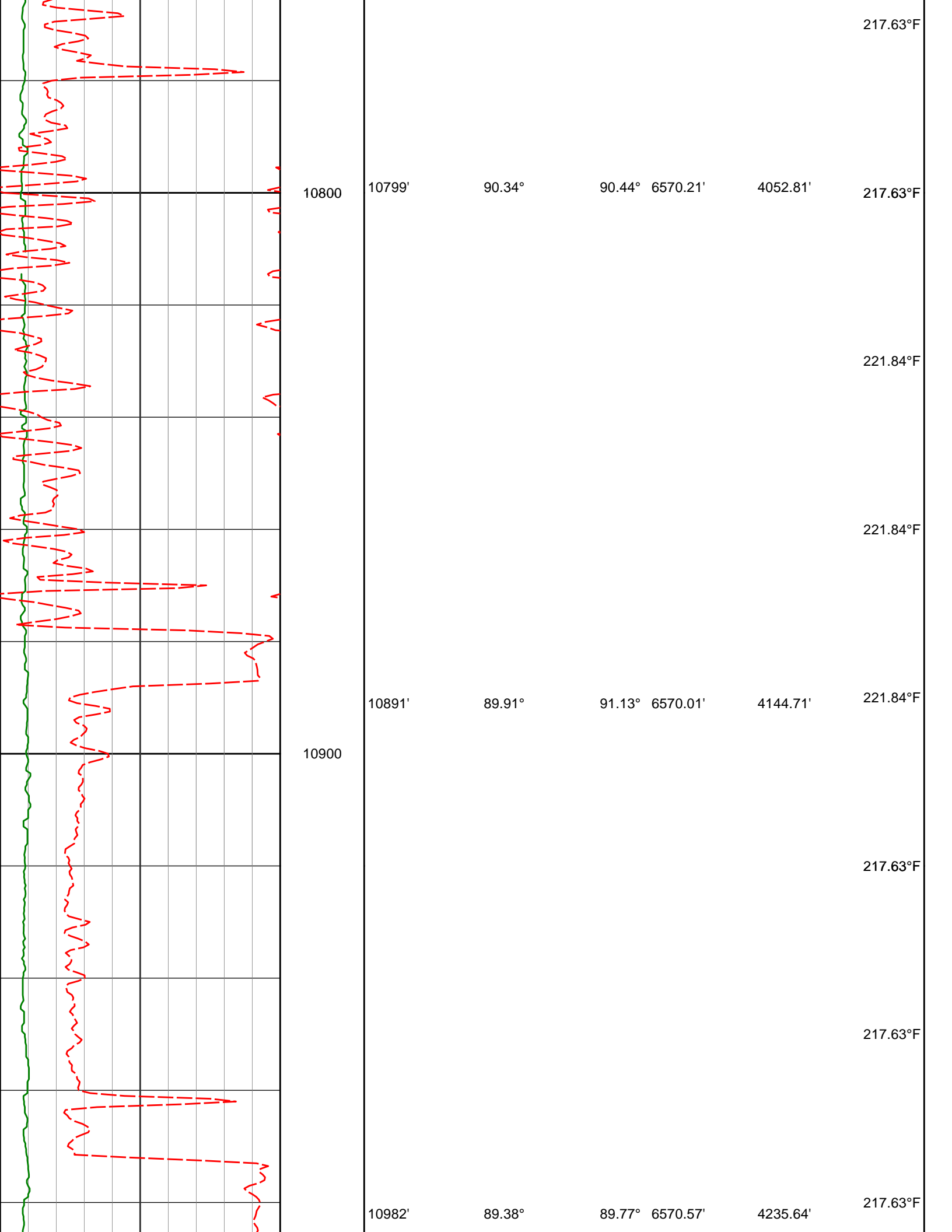


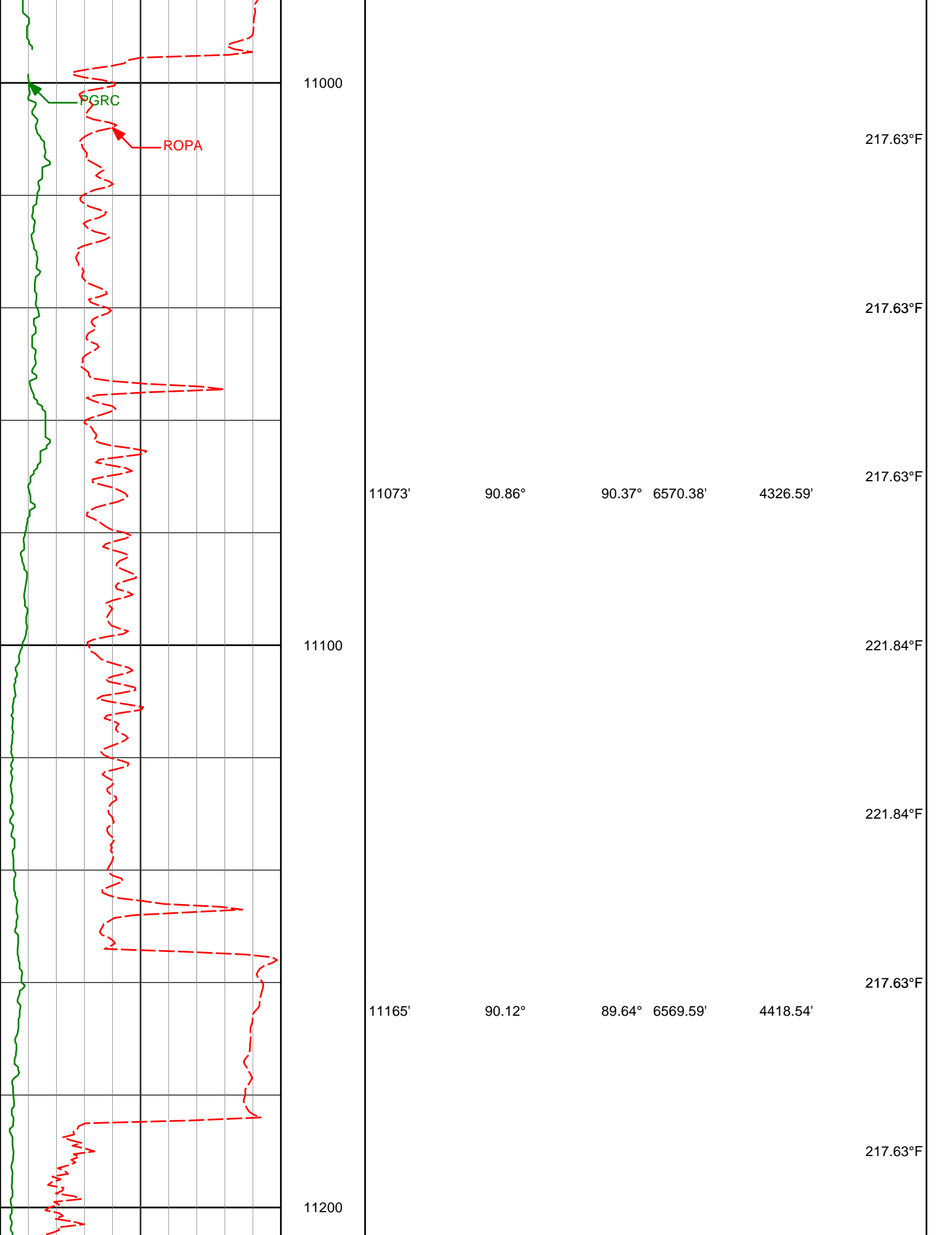


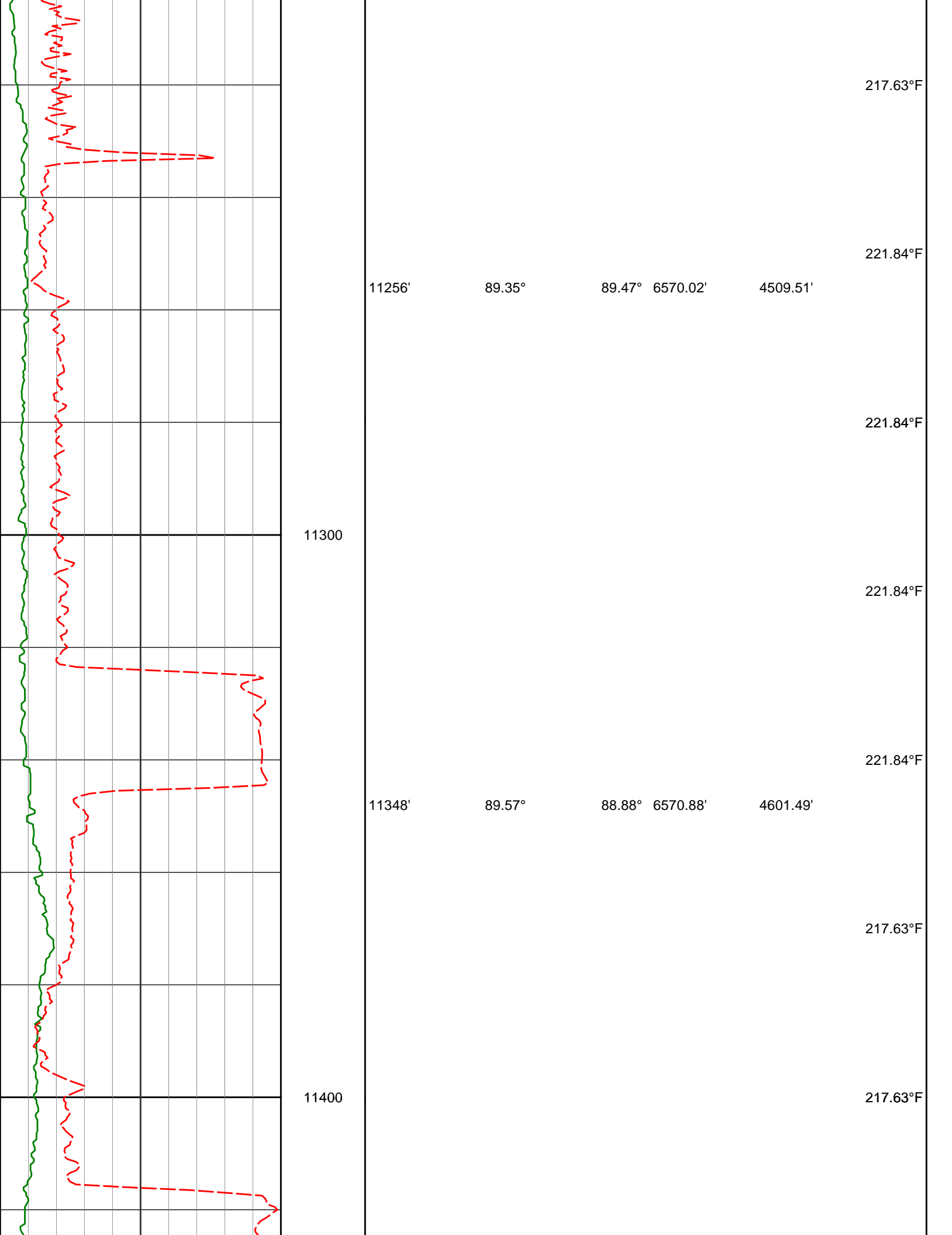


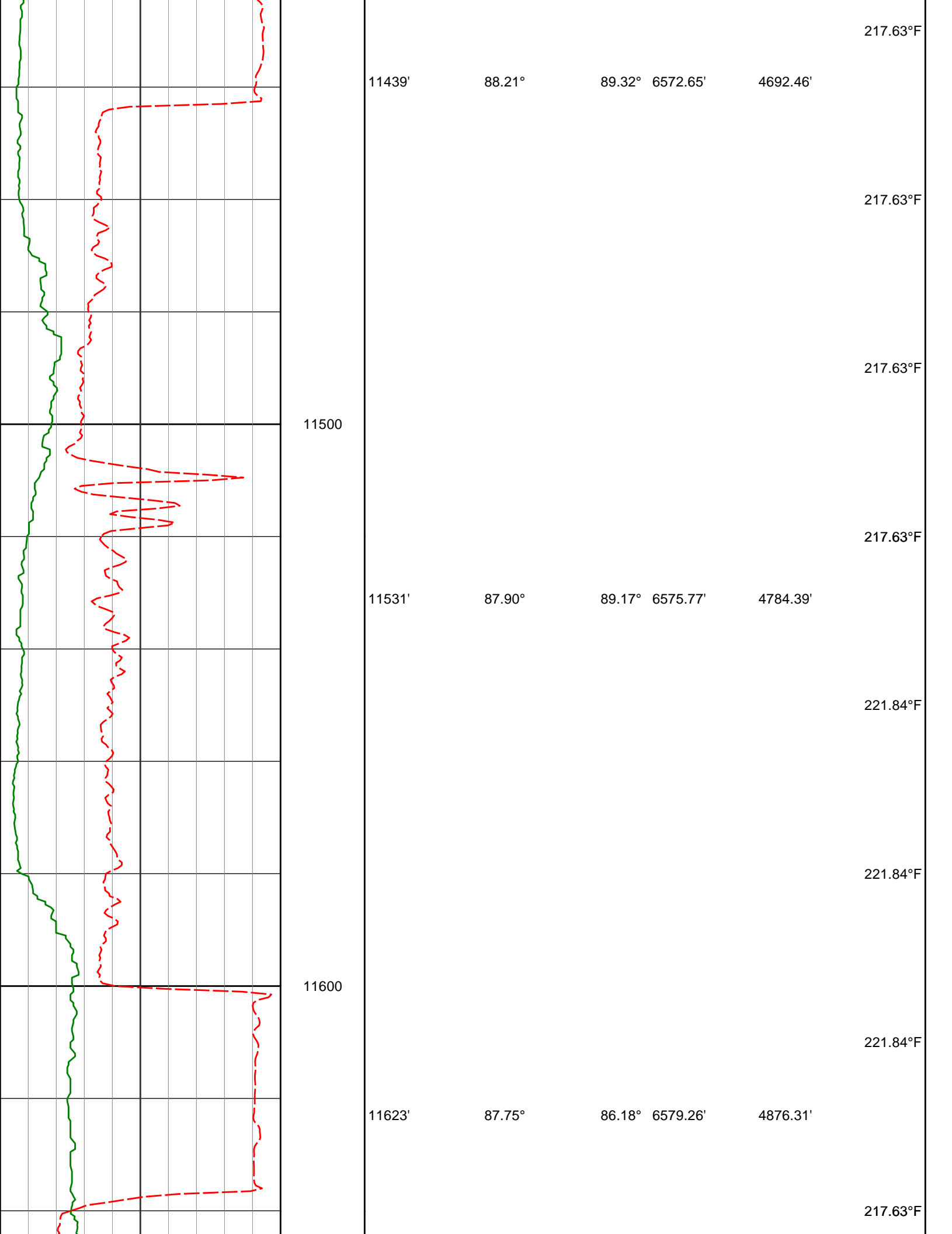
10342'	91.23°	91.56°	6571.11'	3596.28'	
					213.41°F
					213.41°F
10400					
					213.41°F
10433'	90.55°	91.75°	6569.69'	3687.10'	
					213.41°F
					213.41°F
10500					
					213.41°F
10525'	89.54°	90.47°	6569.62'	3778.98'	
					213.41°F

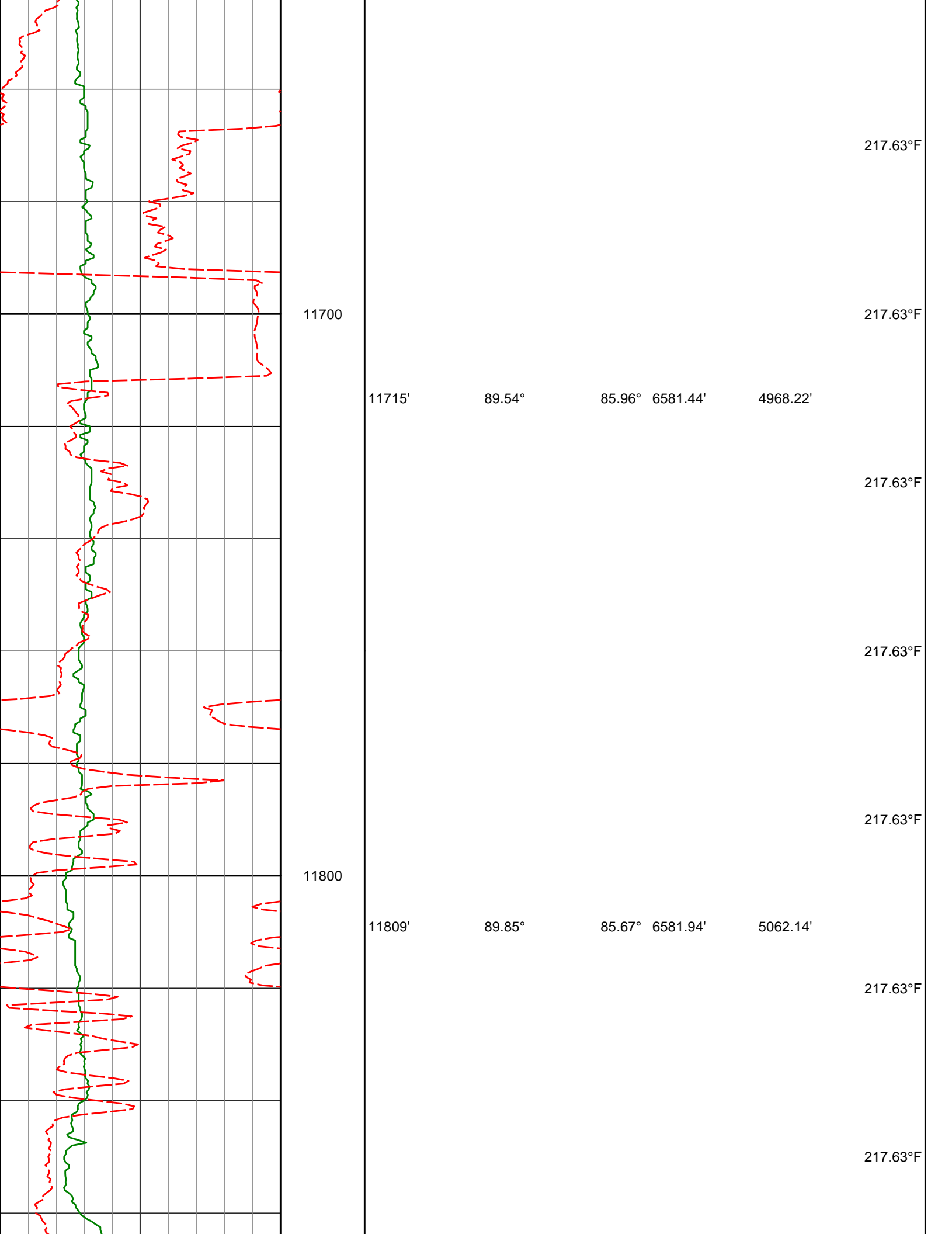


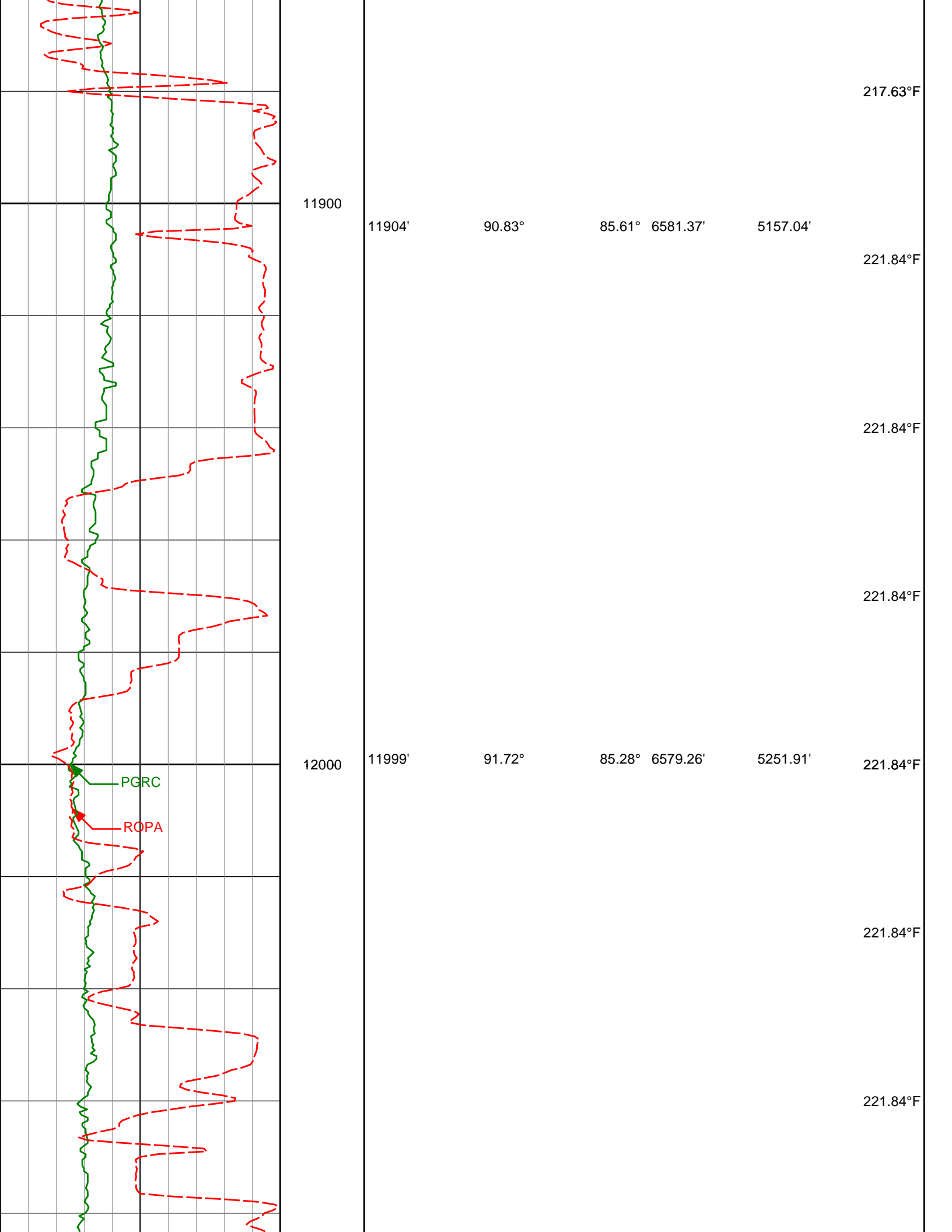


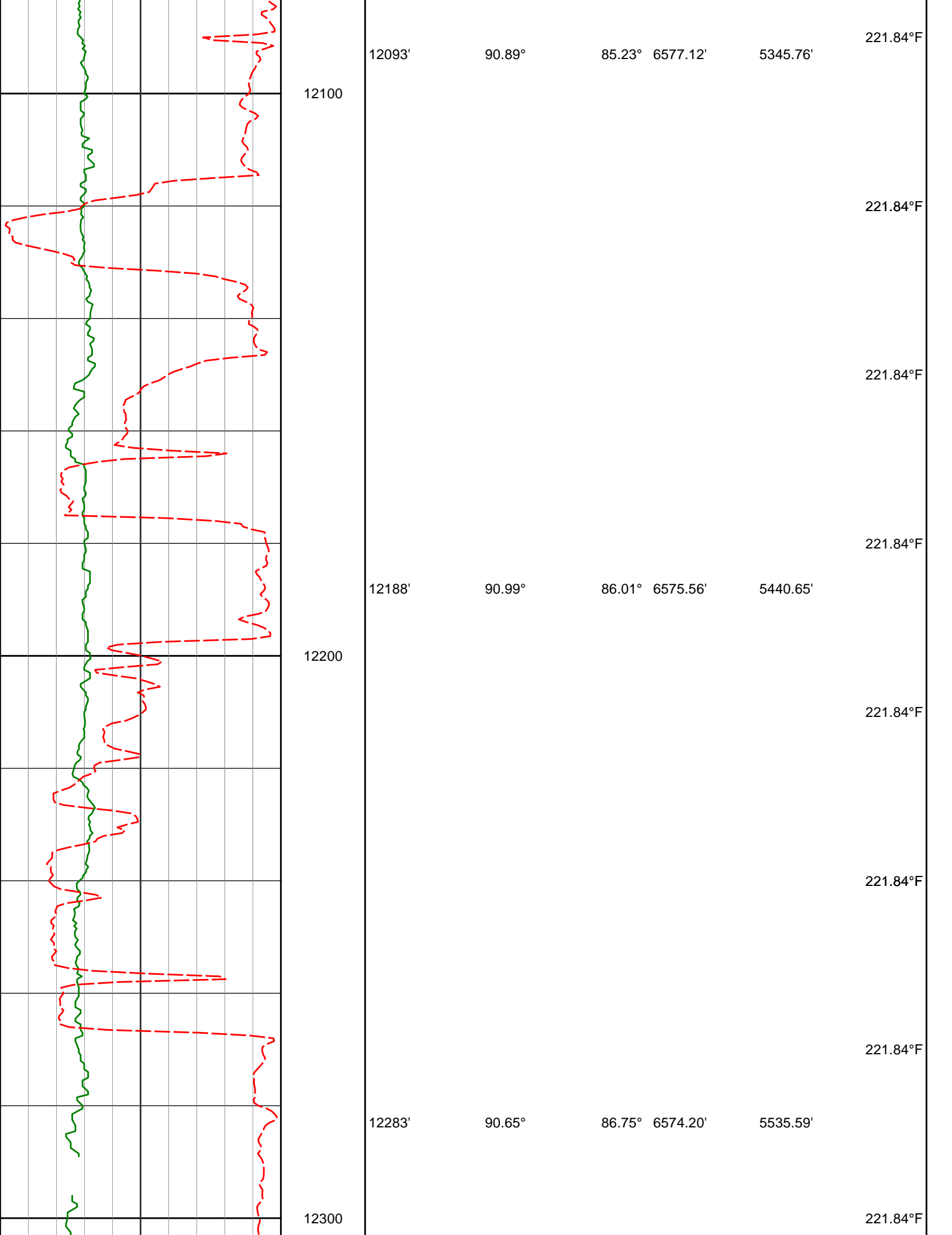


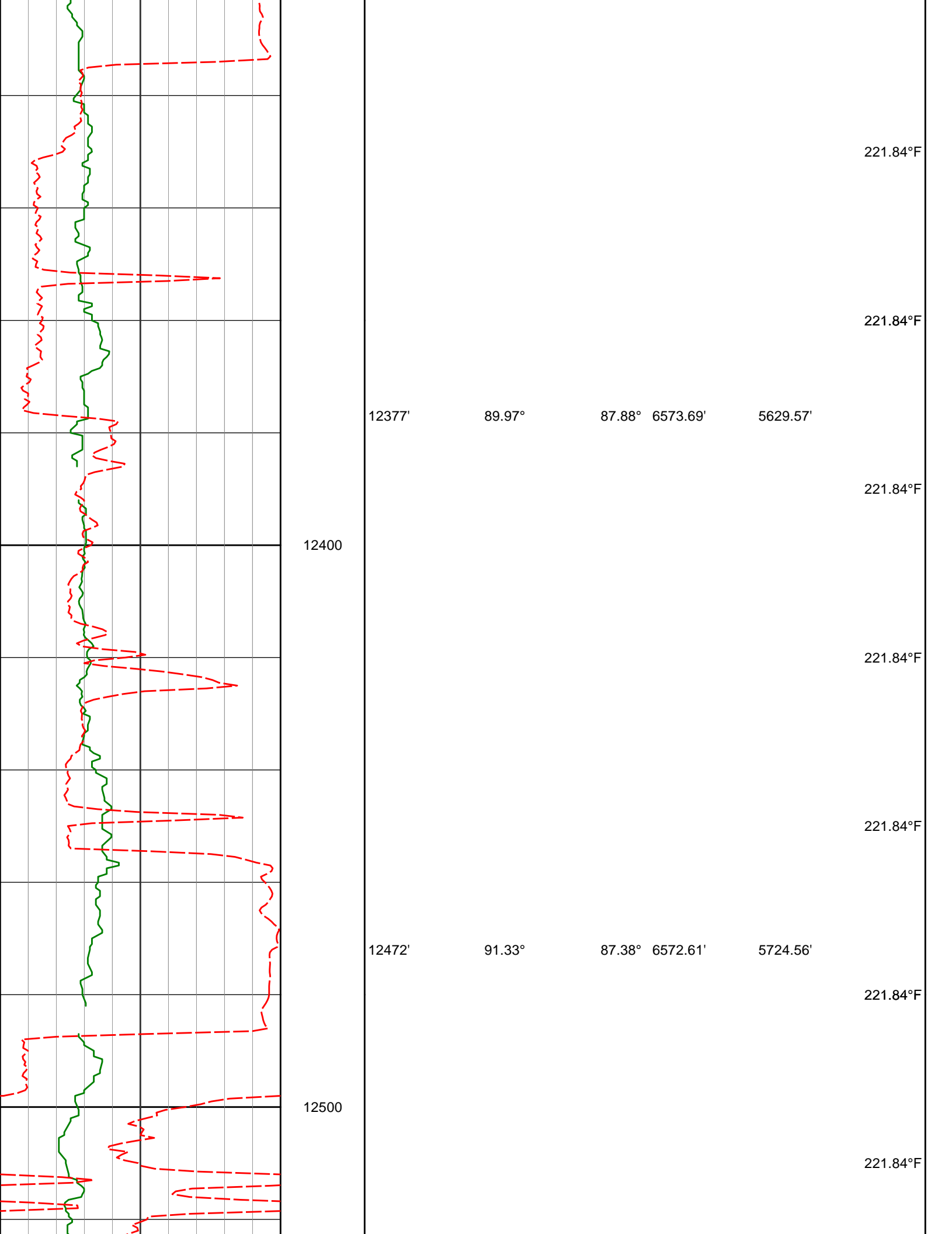


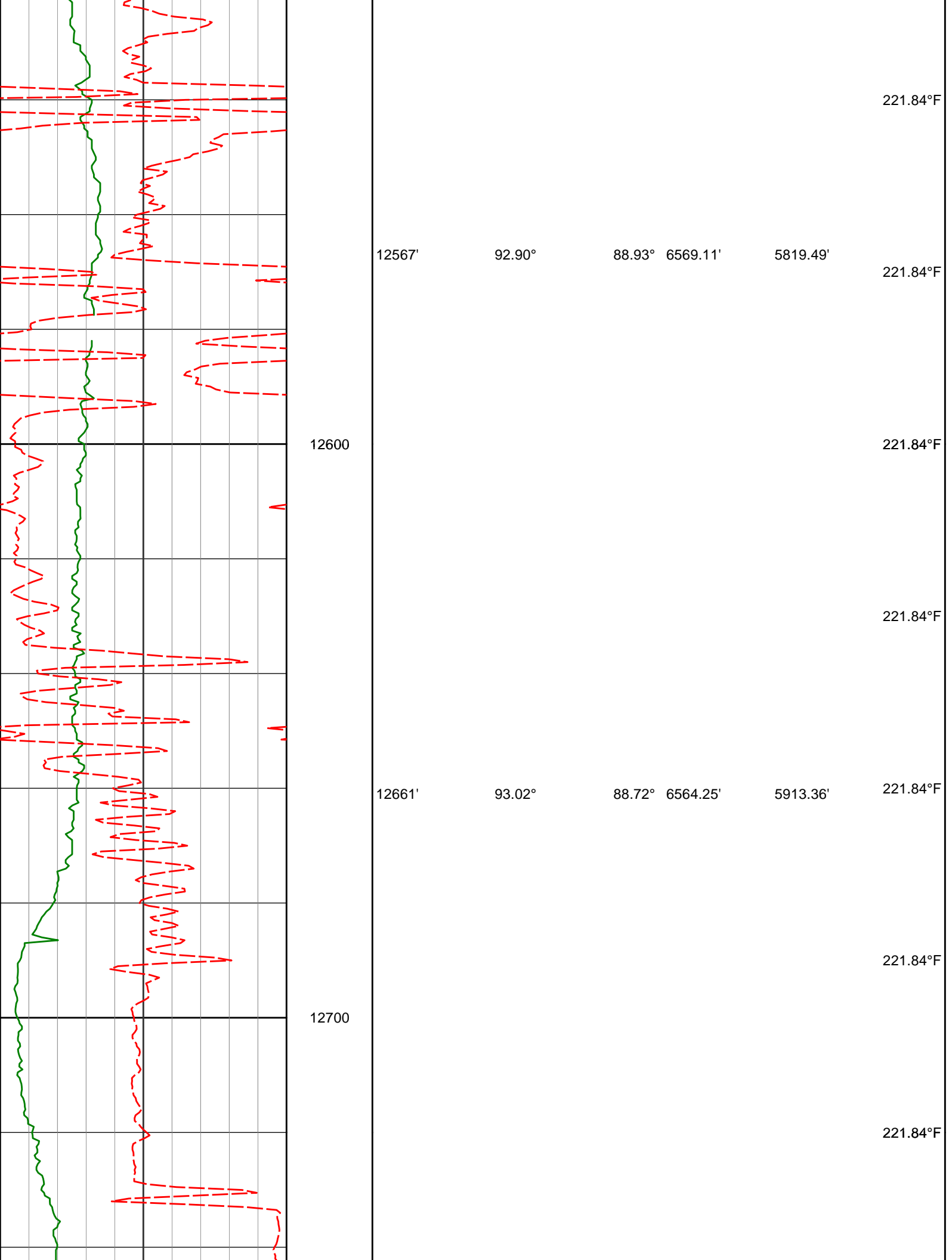


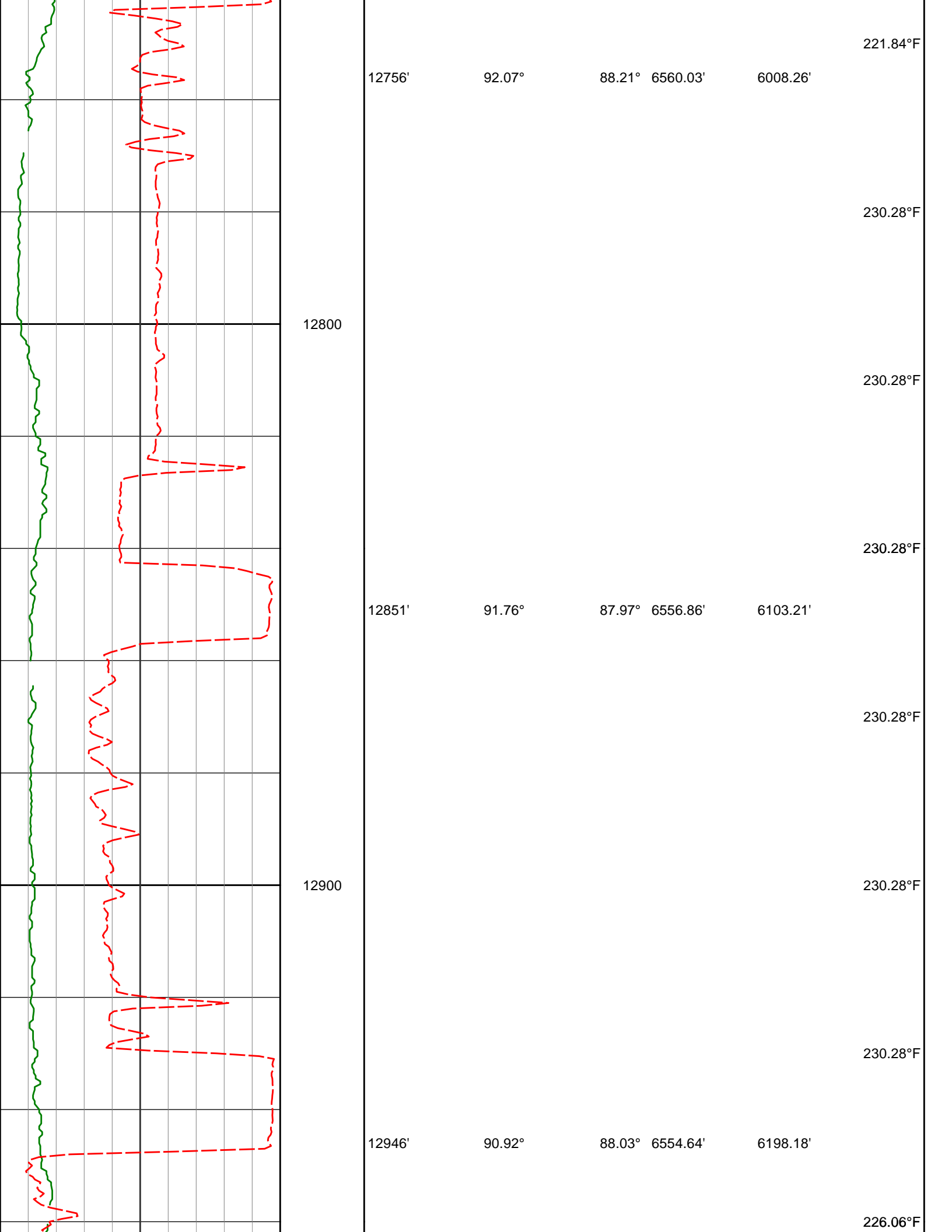


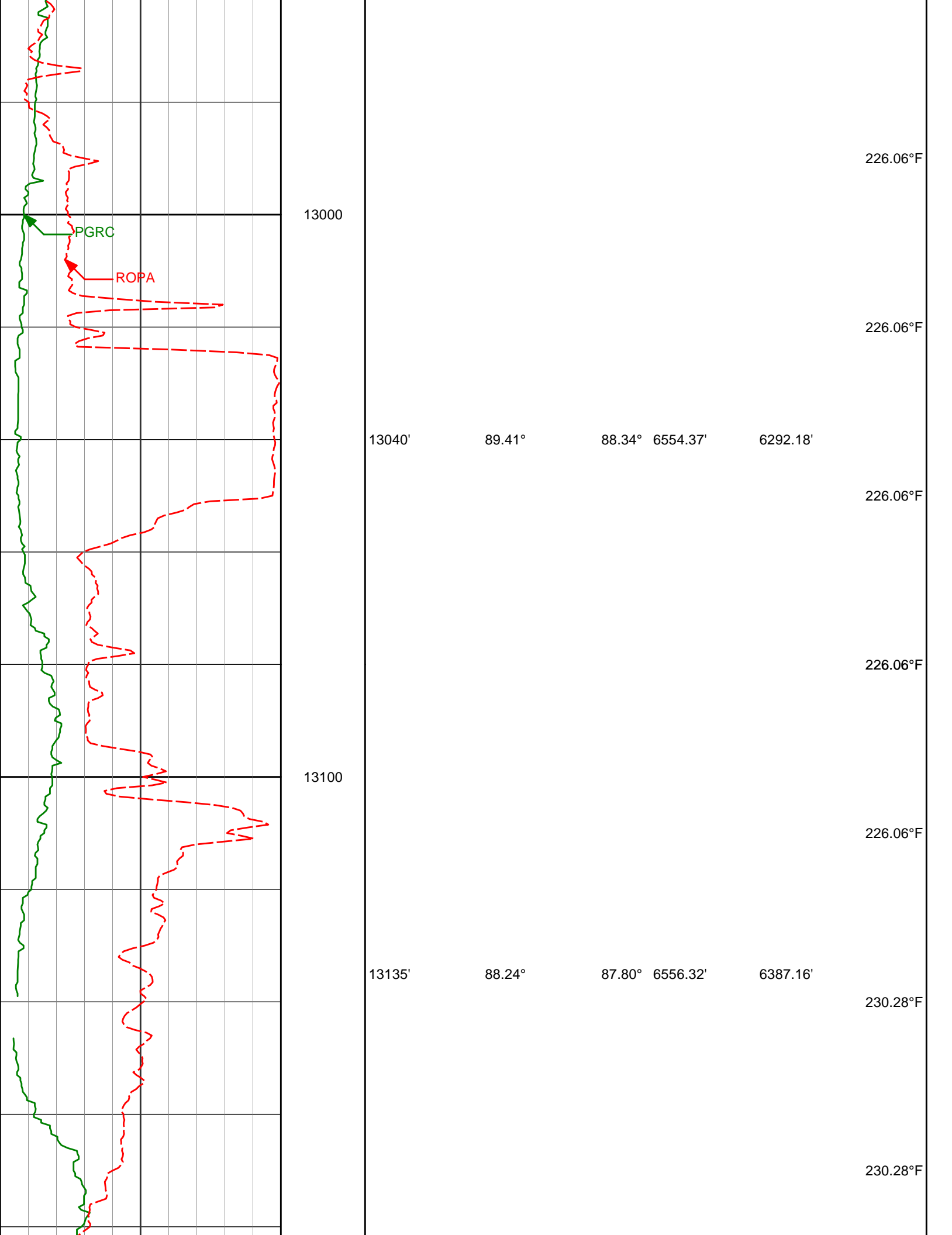


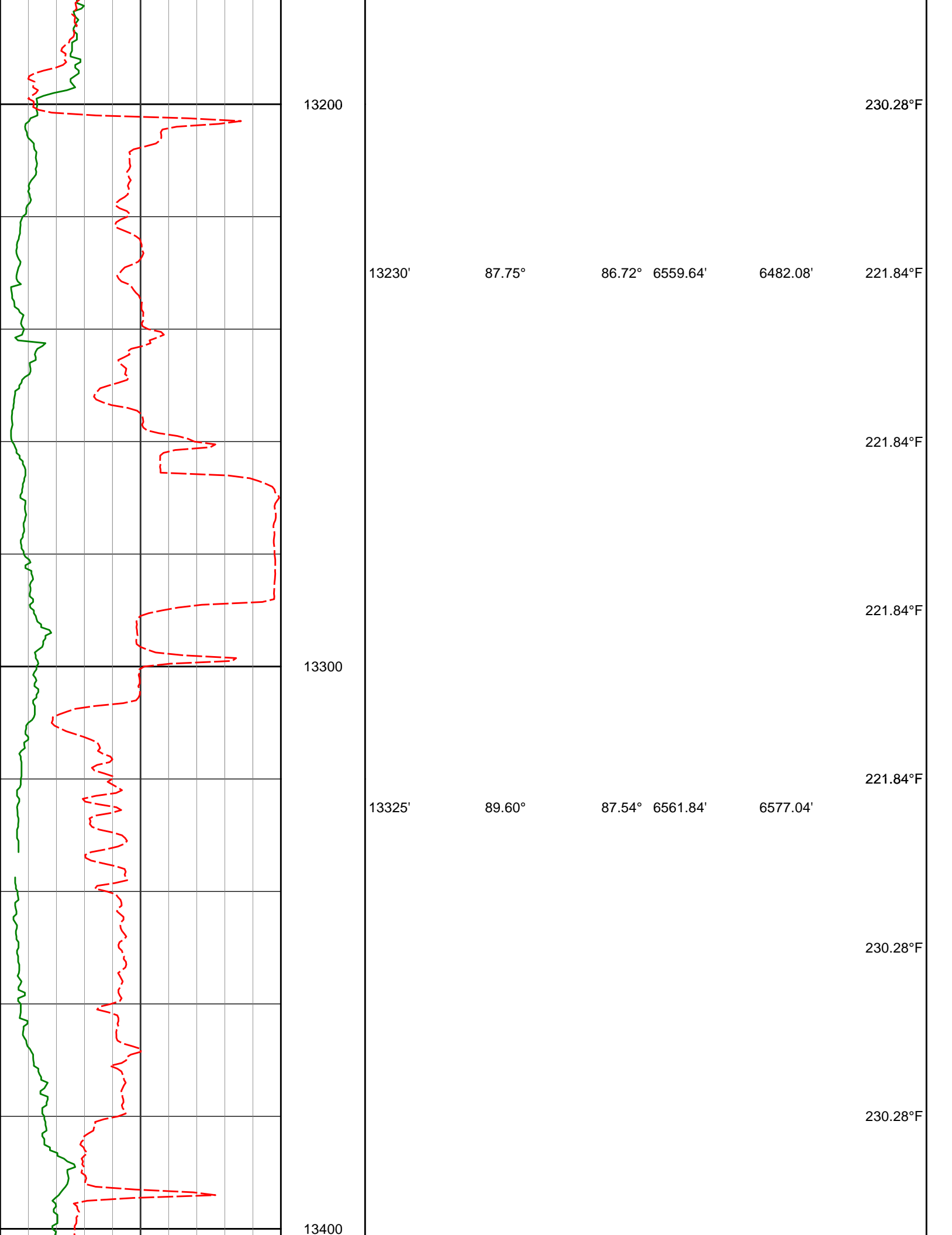


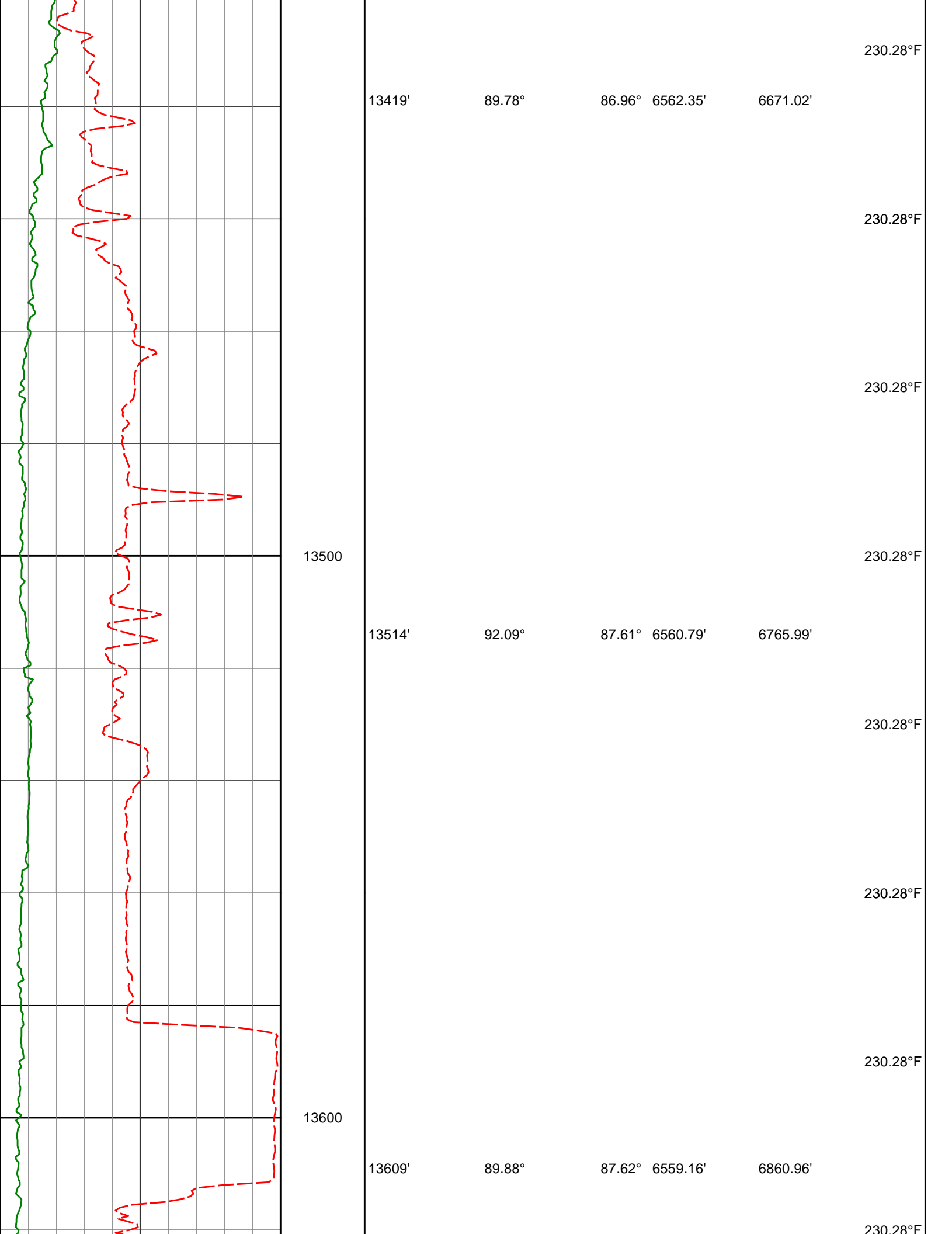


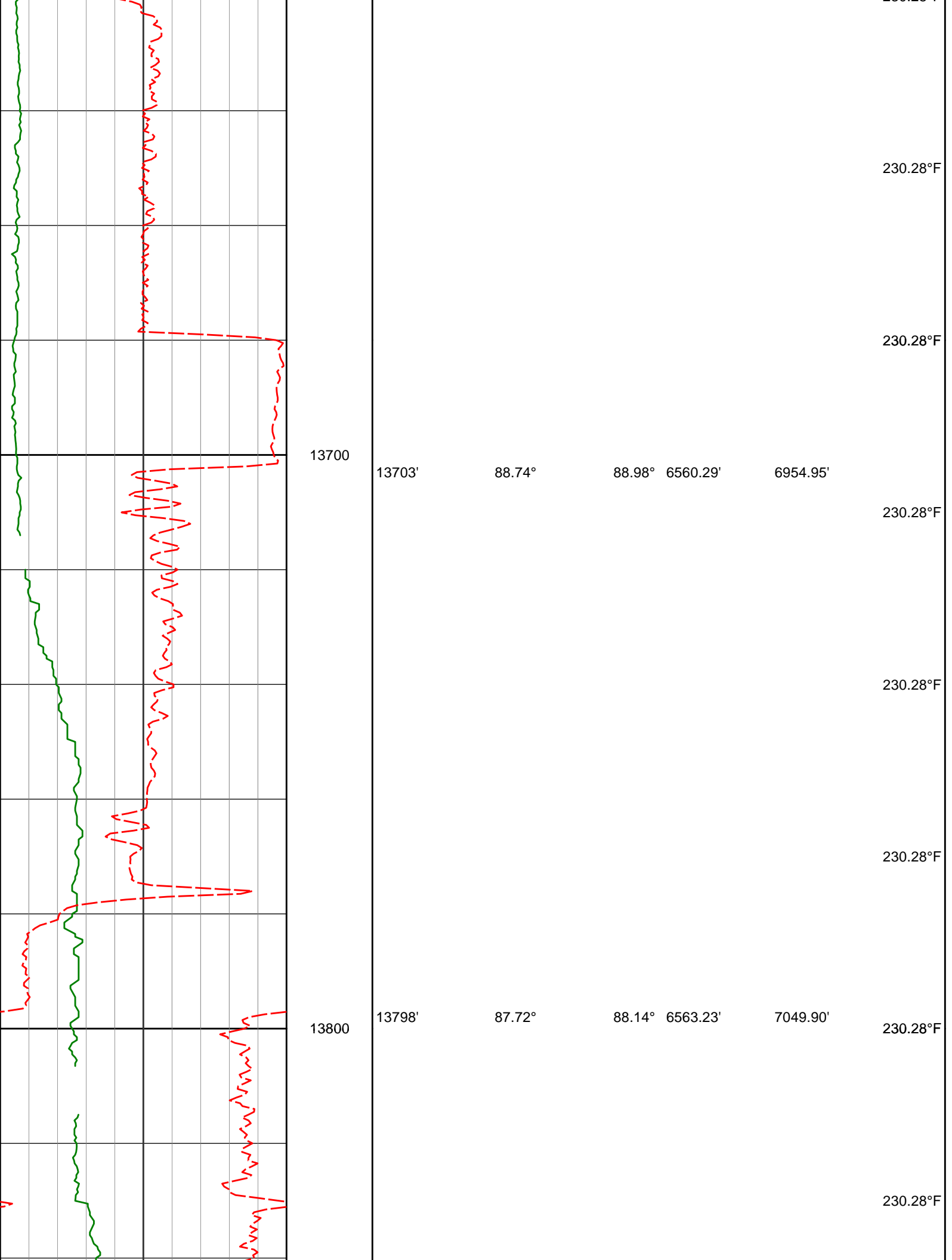


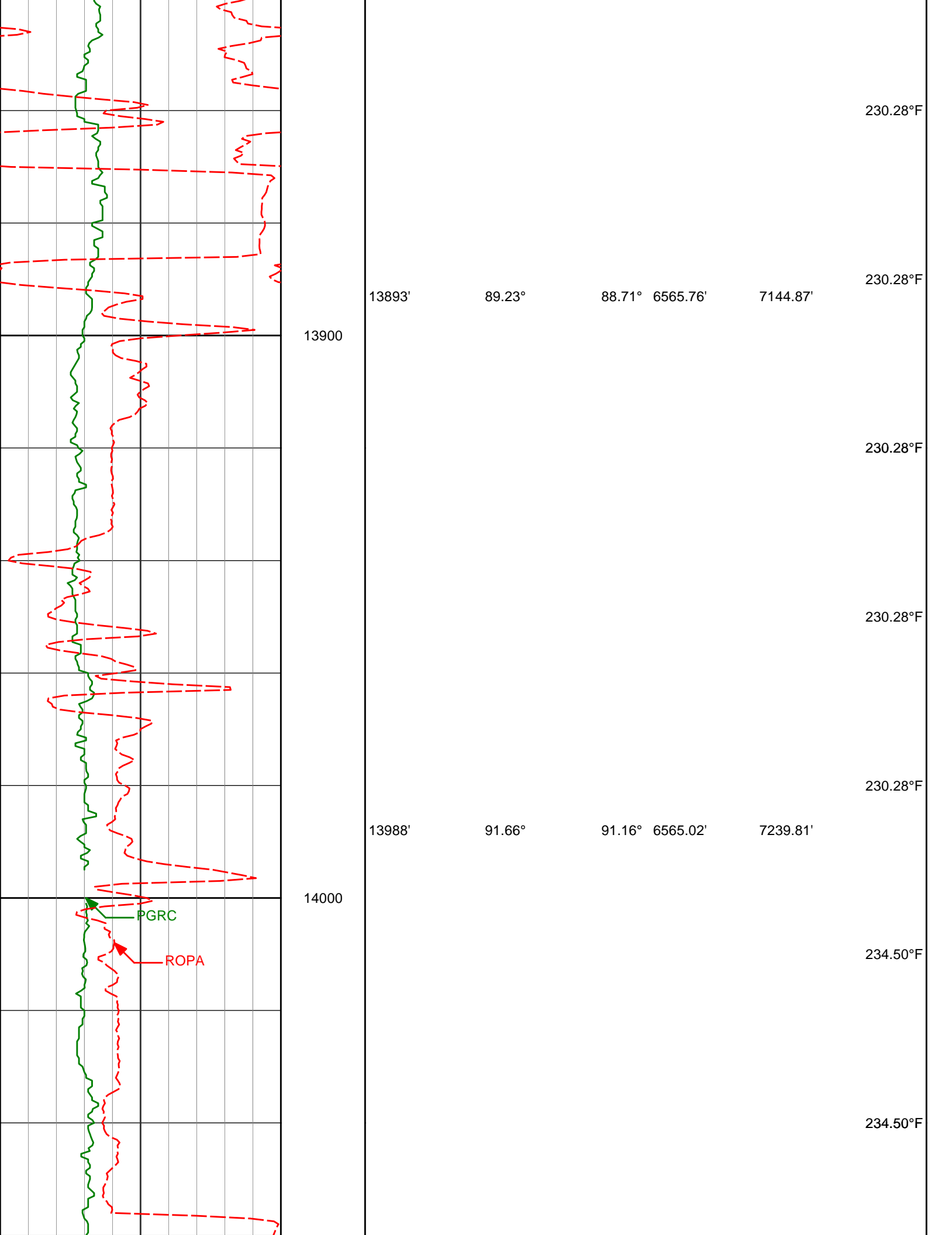


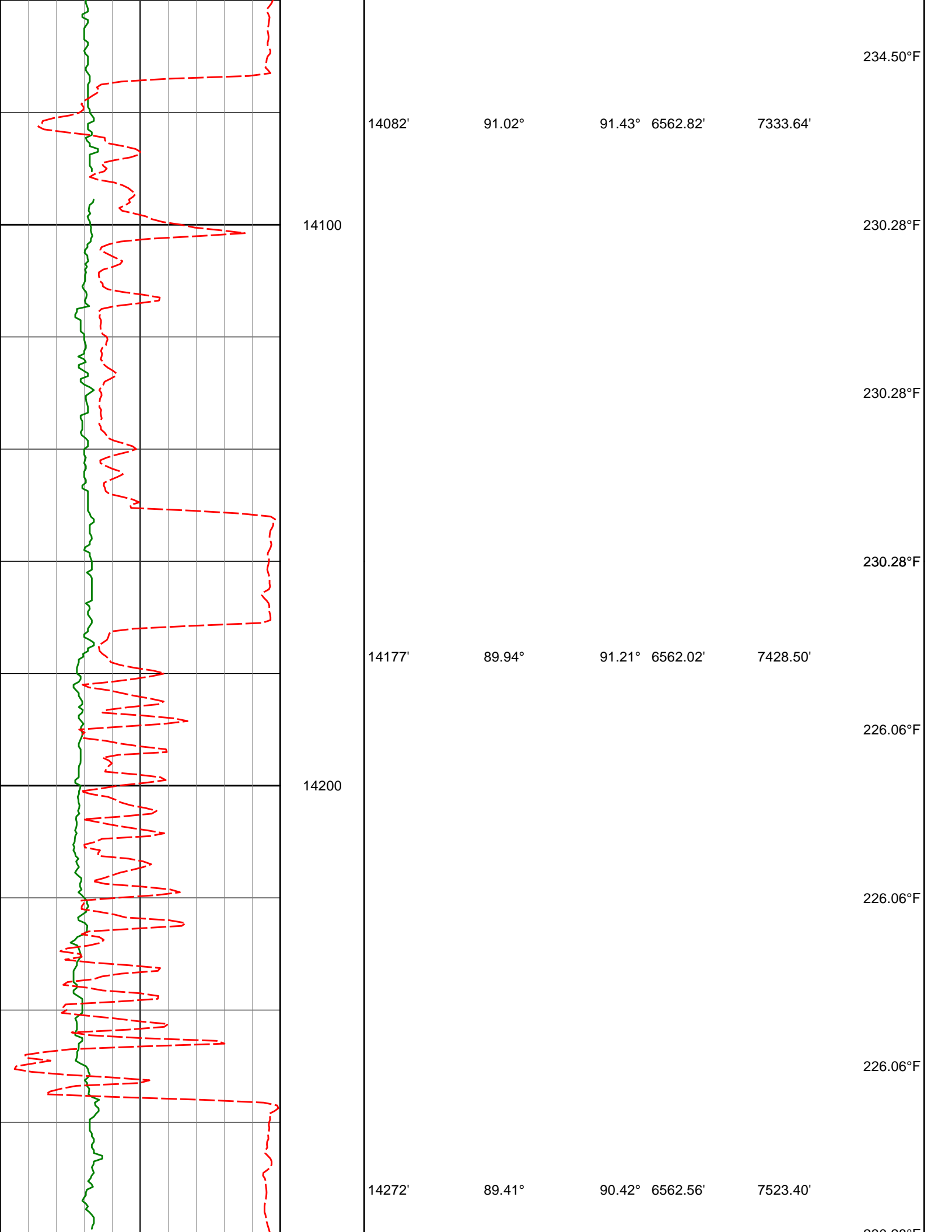


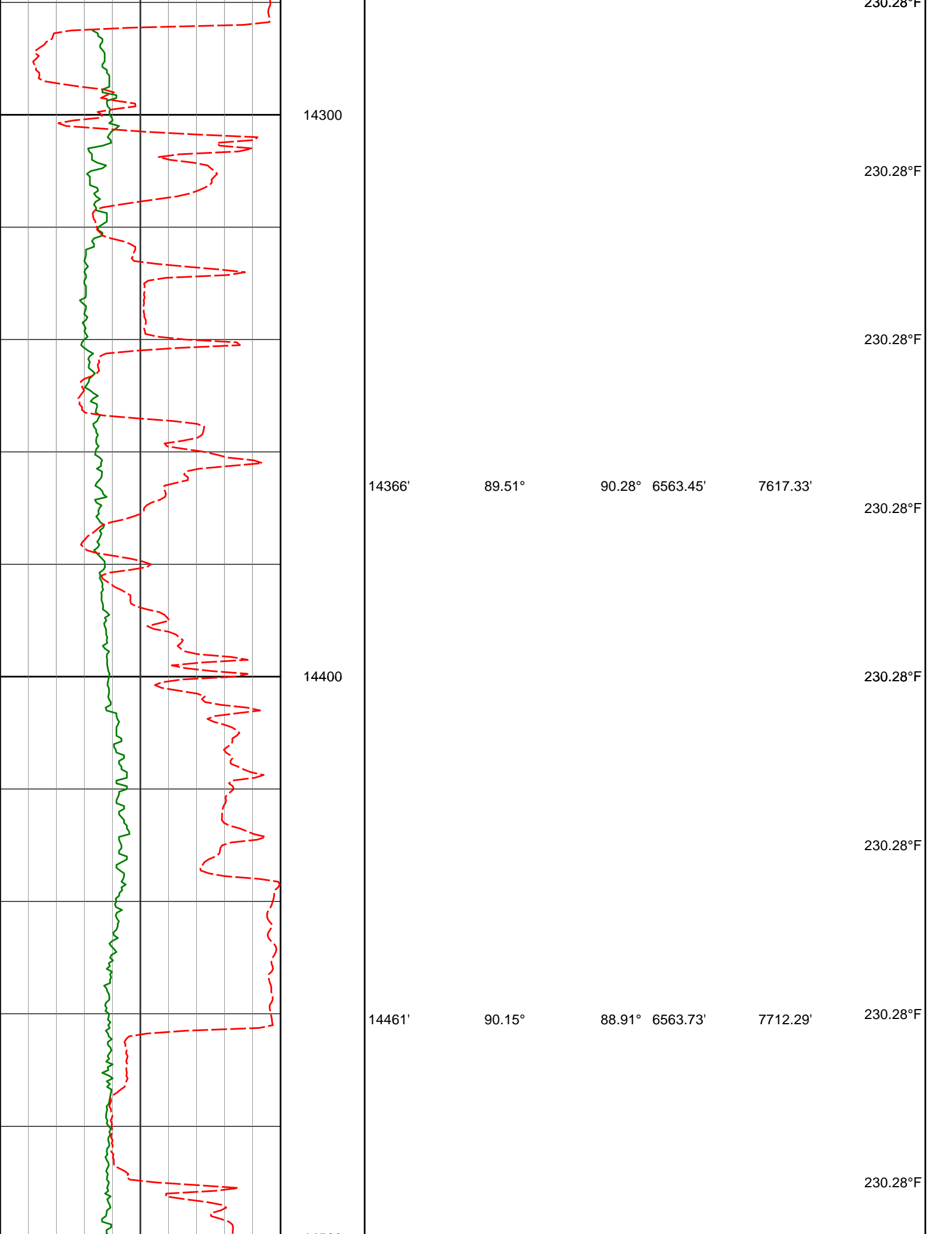


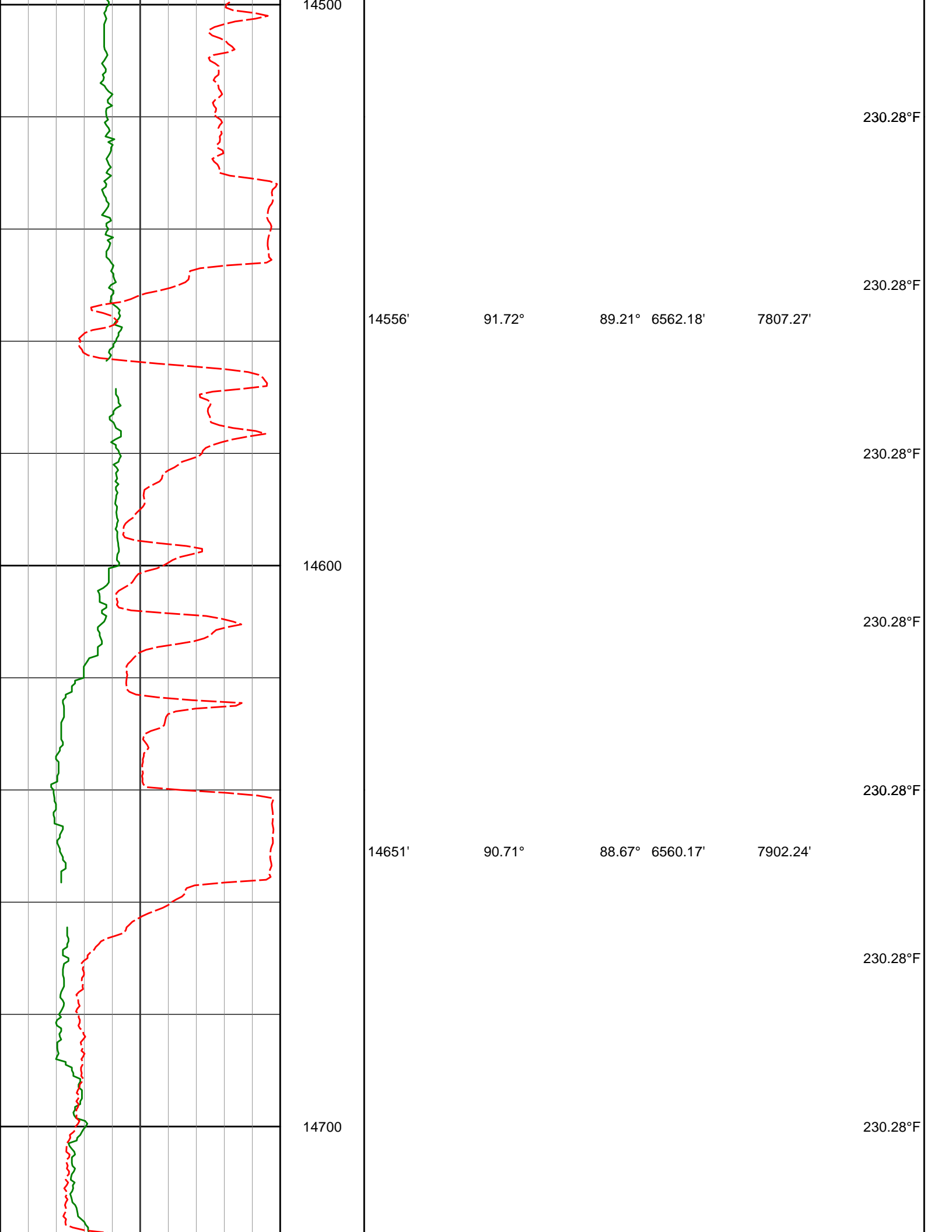


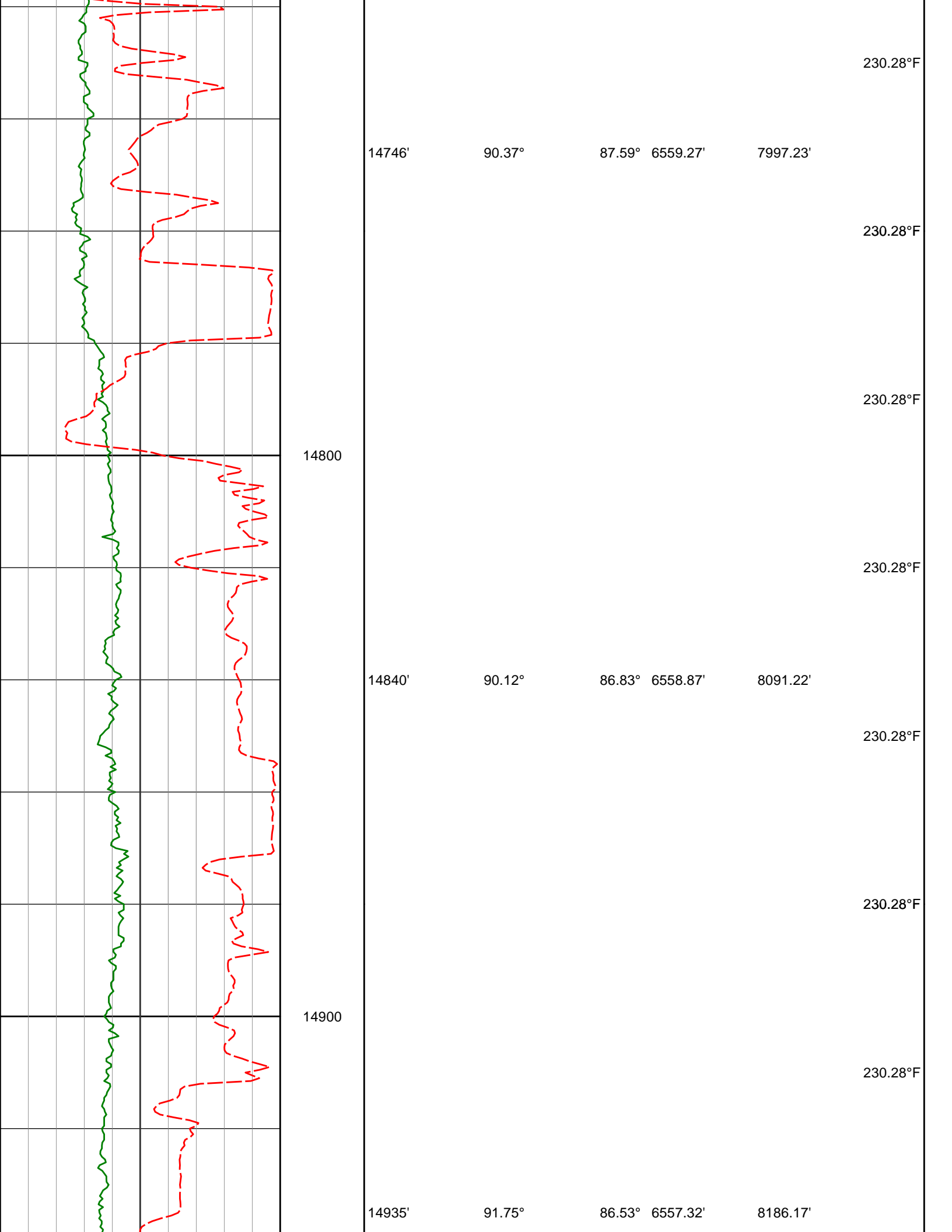


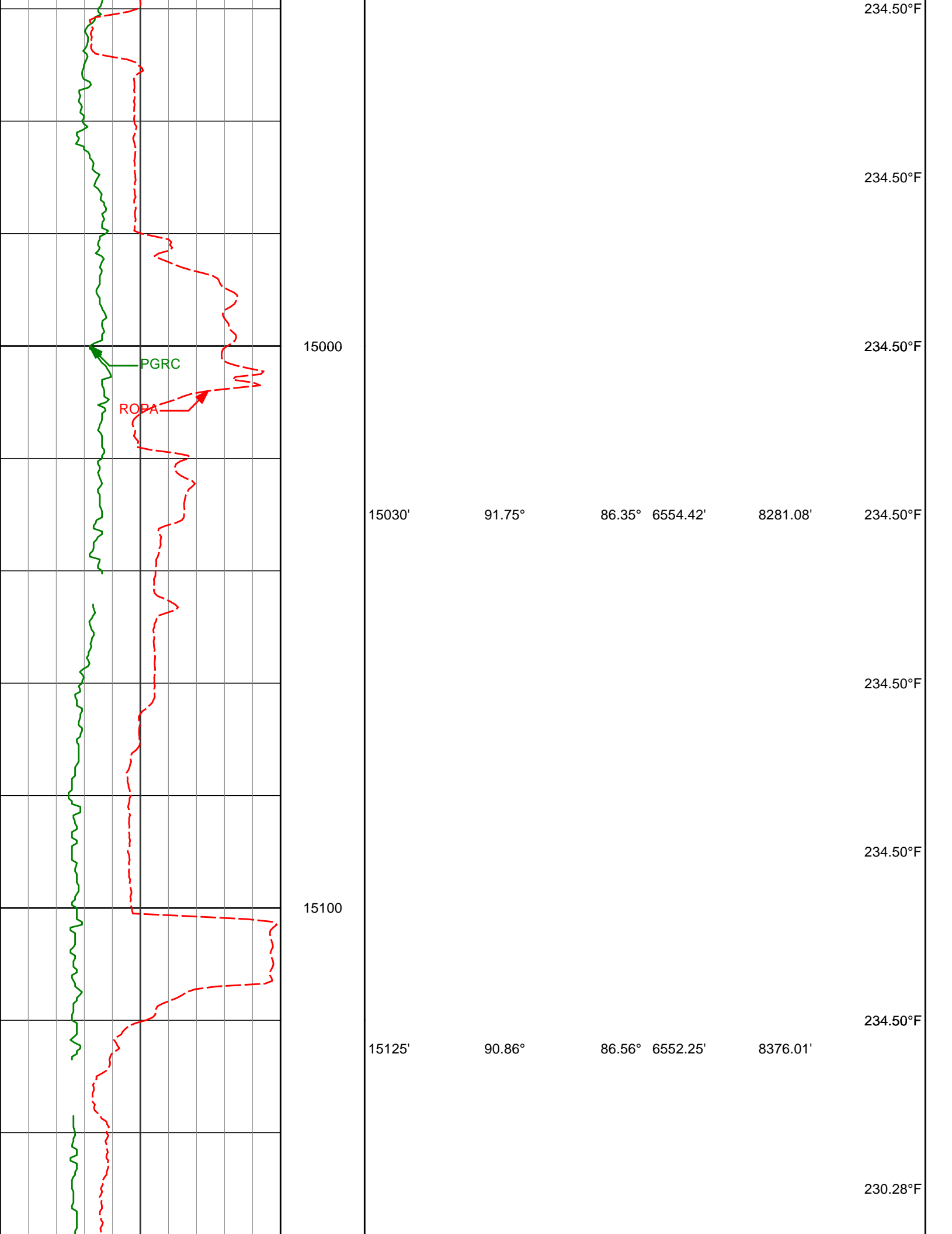


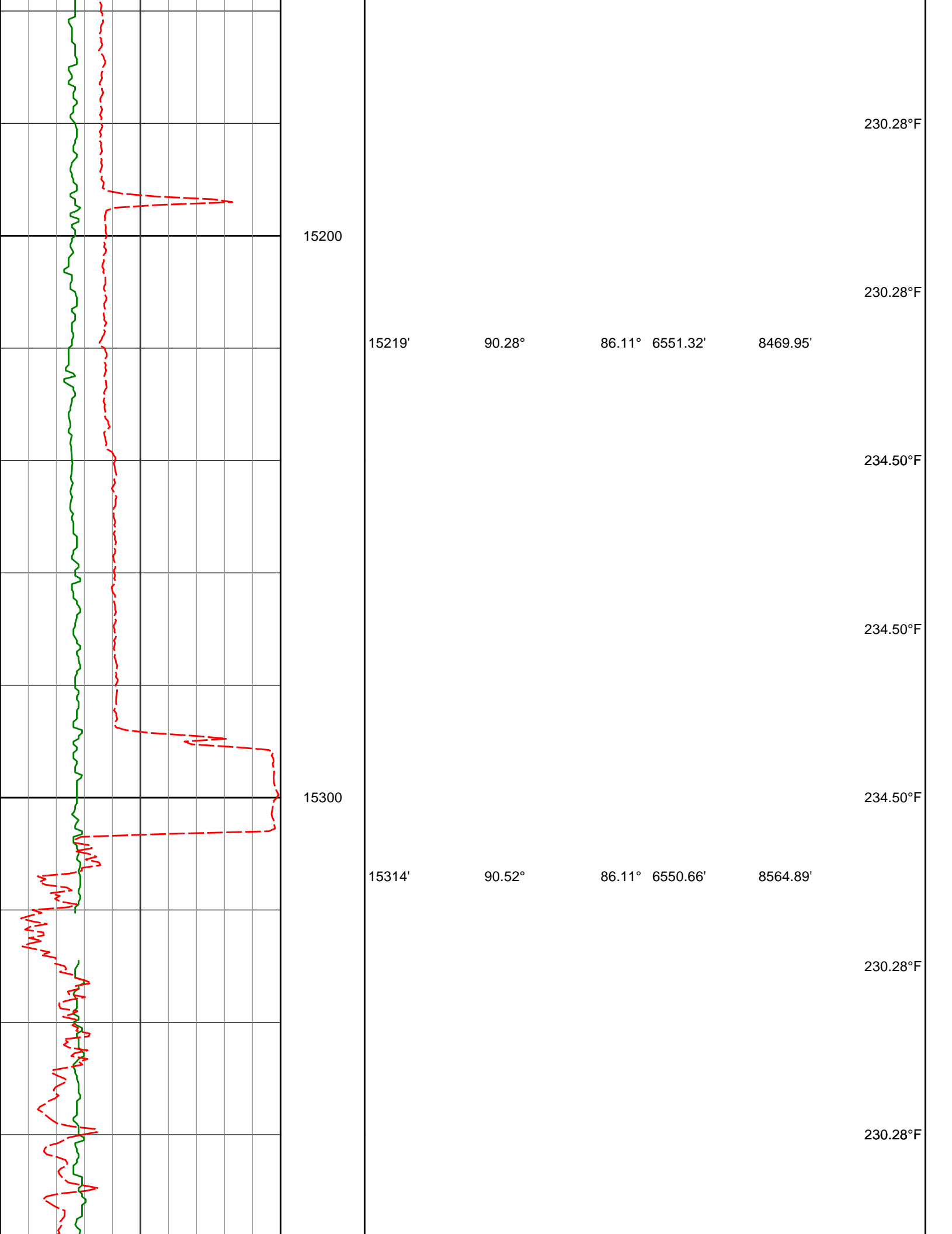


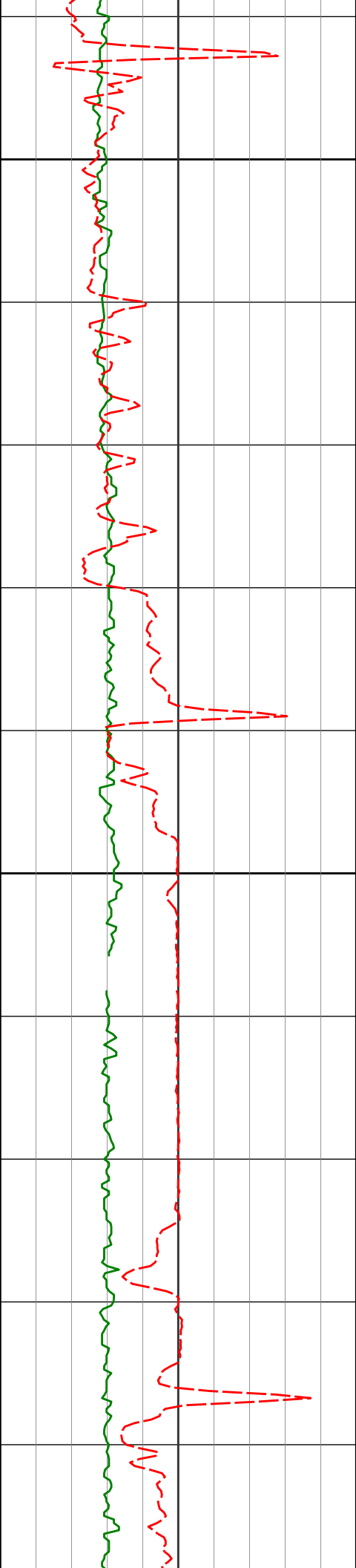












15400

15500

15409'

15504'

90.22°

90.46°

85.44°

85.21°

6550.04'

6549.48'

8659.80'

8754.68'

230.28°F

234.50°F

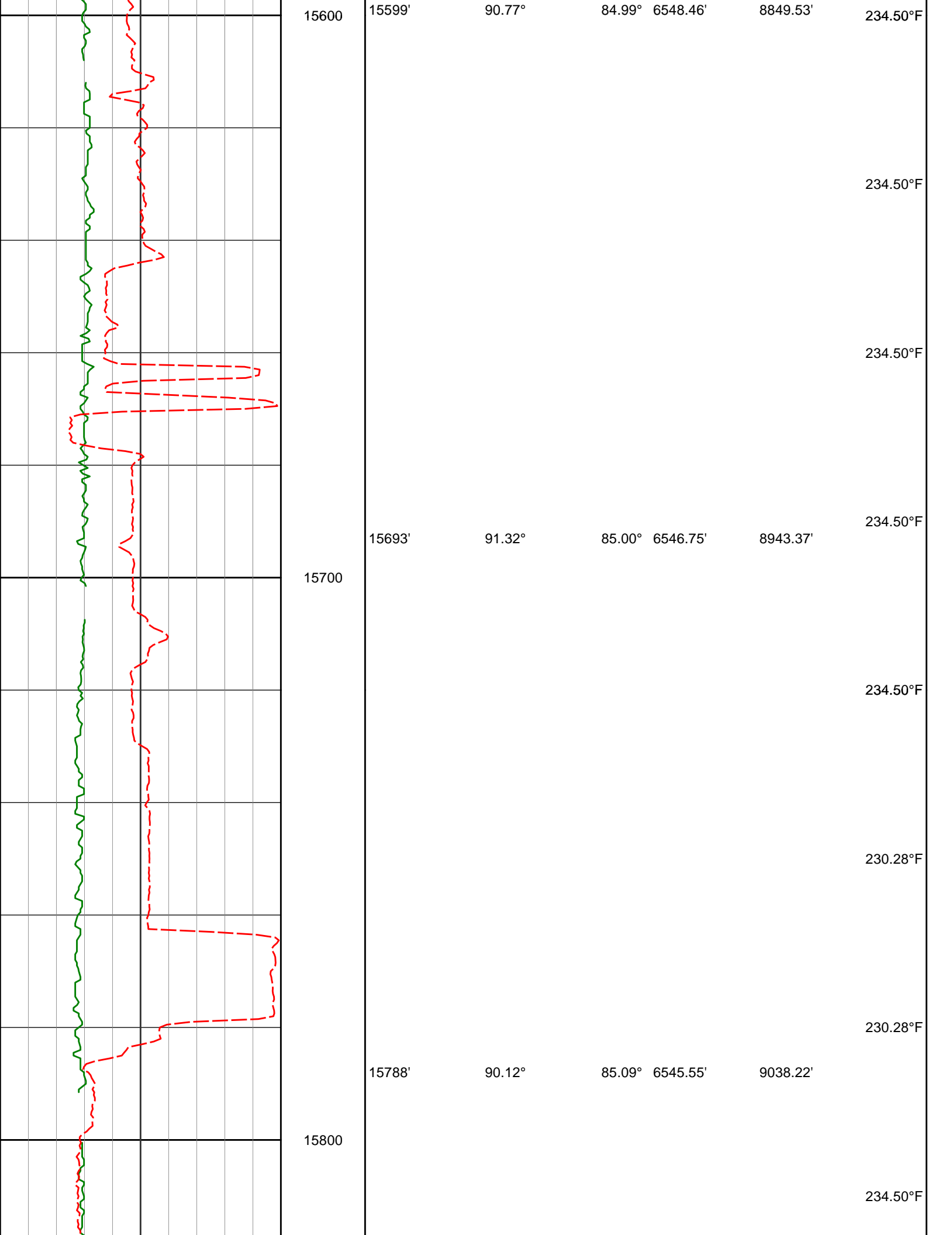
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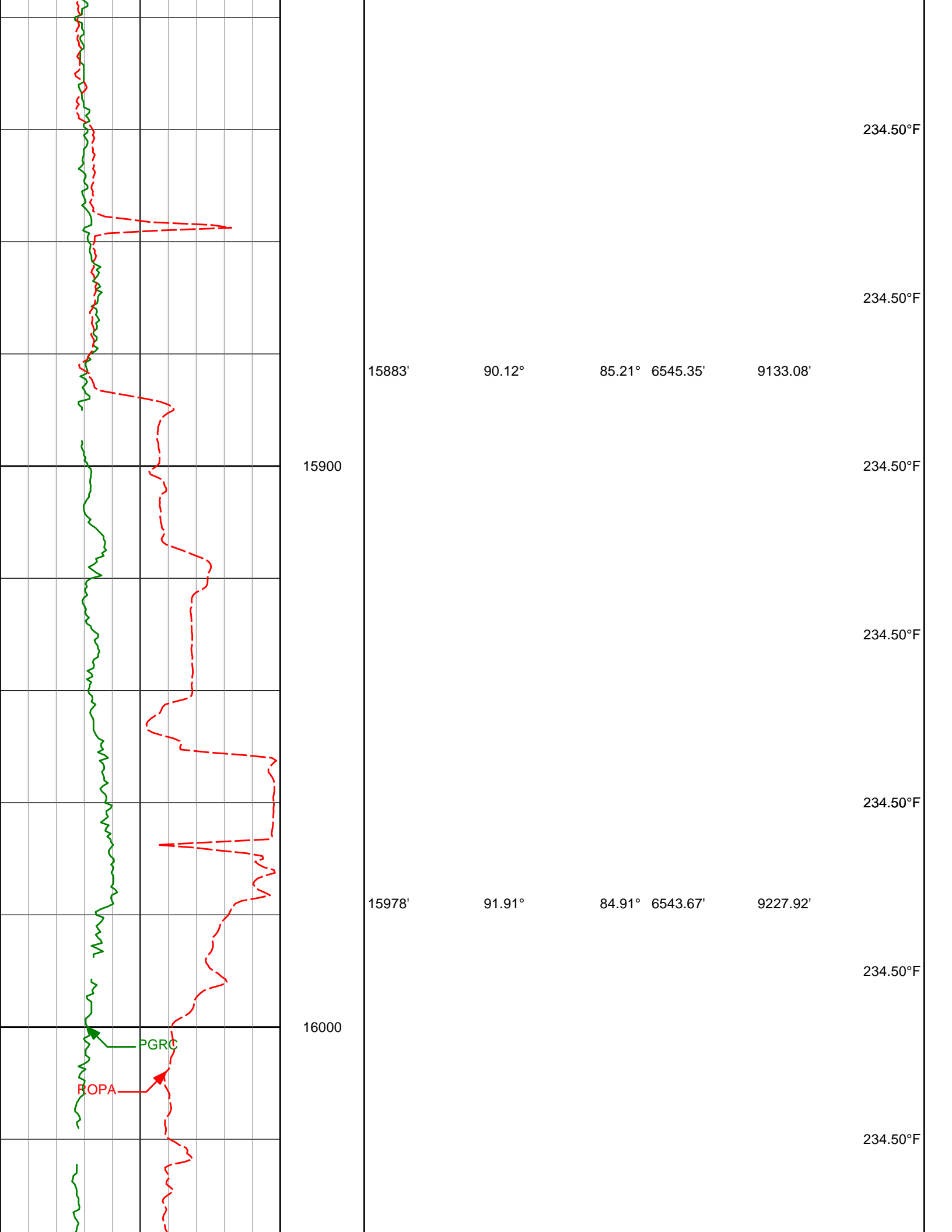
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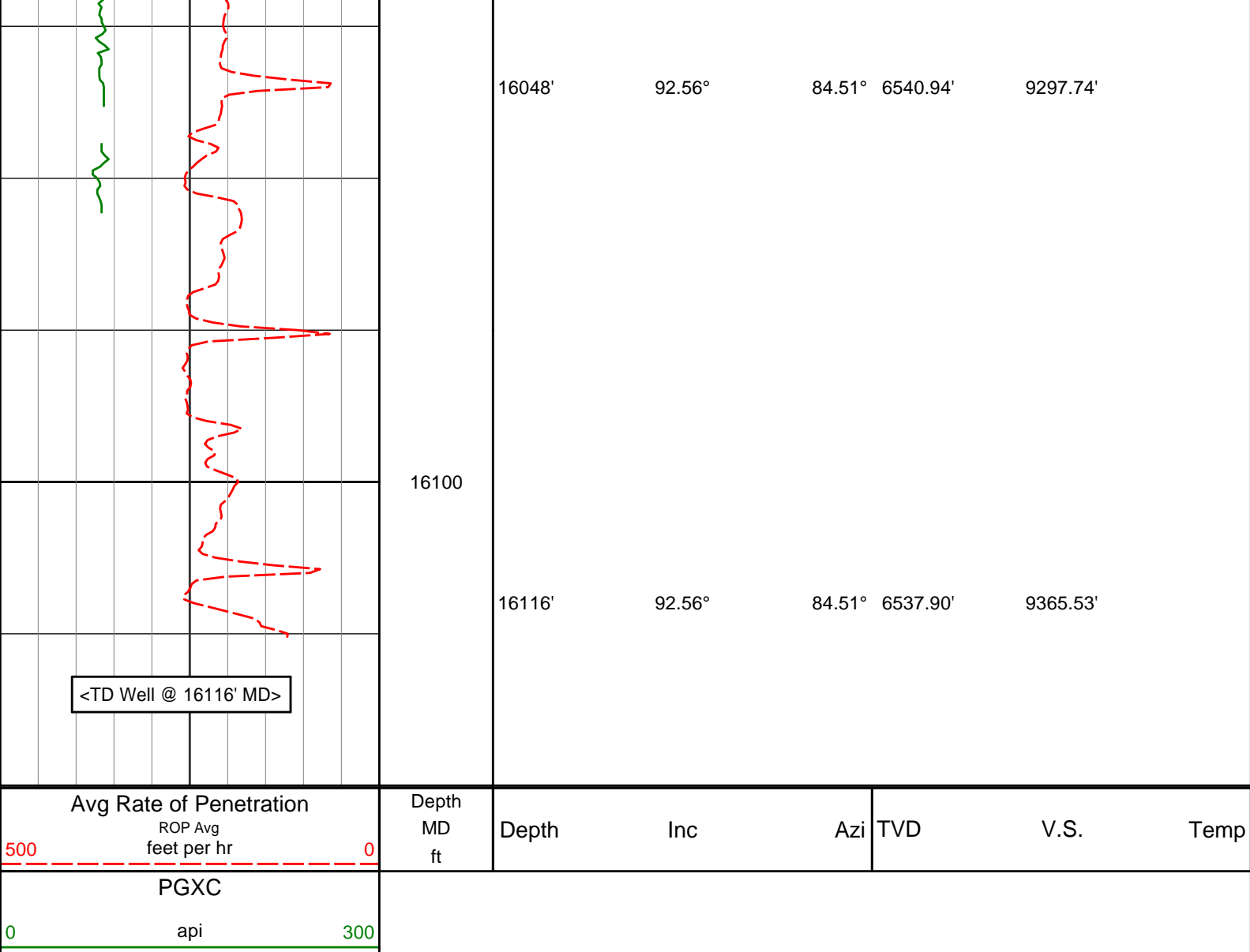
234.50°F

234.50°F

234.50°F







DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch AE32-620
Wattenberg
Weld Colorado
USA
CA-XX-0902715780

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
300.00	0.05	68.42	300.00	0.05 N	0.12 E	0.12	0.02
637.00	0.10	68.42	637.00	0.21 N	0.53 E	0.54	0.01
661.00	0.10	68.42	661.00	0.23 N	0.57 E	0.58	0.01
755.00	0.11	144.23	755.00	0.18 N	0.70 E	0.70	0.14
943.00	0.22	140.95	943.00	0.24 S	1.03 E	1.02	0.06
1037.00	0.28	149.27	1037.00	0.58 S	1.26 E	1.24	0.07
1222.00	0.22	147.50	1222.00	1.27 S	1.68 E	1.64	0.03
1496.00	0.19	86.15	1495.99	1.69 S	2.42 E	2.37	0.08
1588.00	0.21	103.88	1587.99	1.72 S	2.73 E	2.68	0.07
1680.00	0.17	68.31	1679.99	1.71 S	3.02 E	2.96	0.13
1770.00	0.17	341.75	1769.99	1.53 S	3.10 E	3.05	0.26
1862.00	3.17	288.82	1861.94	0.58 S	0.65 E	0.63	3.33
1954.00	4.60	293.28	1953.73	1.70 N	5.14 W	-5.09	1.59
2045.00	5.76	292.14	2044.36	4.86 N	12.72 W	-12.56	1.29
2137.00	8.29	287.29	2135.66	8.58 N	23.34 W	-23.05	2.82

2107.00	9.23	257.22	2100.00	0.88 N	20.84 W	-20.88	2.02
2228.00	9.65	276.22	2225.55	11.35 N	37.18 W	-36.80	2.41
2319.00	10.95	260.71	2315.10	10.78 N	53.29 W	-52.92	3.35
2411.00	10.26	258.55	2405.53	7.75 N	69.94 W	-69.66	0.86
2502.00	9.70	256.98	2495.16	4.41 N	85.35 W	-85.17	0.69
2594.00	9.19	256.20	2585.91	0.92 N	100.03 W	-99.95	0.57
2685.00	8.52	254.39	2675.83	2.63 S	113.57 W	-113.60	0.80
2777.00	8.04	252.90	2766.87	6.36 S	126.28 W	-126.42	0.57
2869.00	8.58	257.50	2857.90	9.73 S	139.14 W	-139.37	0.93
2963.00	8.03	257.95	2950.91	12.62 S	152.41 W	-152.73	0.59
3057.00	8.36	267.25	3043.96	14.32 S	165.66 W	-166.03	1.45
3151.00	9.32	267.91	3136.84	14.93 S	180.10 W	-180.48	1.03
3246.00	8.15	262.49	3230.74	16.09 S	194.46 W	-194.87	1.51
3341.00	7.09	260.74	3324.90	17.91 S	206.92 W	-207.38	1.14
3436.00	8.95	268.69	3418.97	19.02 S	220.10 W	-220.59	2.28
3530.00	8.99	267.62	3511.82	19.49 S	234.74 W	-235.24	0.18
3625.00	9.24	267.58	3605.62	20.12 S	249.78 W	-250.29	0.27
3720.00	9.74	267.79	3699.32	20.75 S	265.43 W	-265.96	0.53
3815.00	9.96	268.28	3792.92	21.31 S	281.68 W	-282.21	0.25
3909.00	9.46	267.19	3885.57	21.94 S	297.53 W	-298.07	0.57
4004.00	8.82	267.94	3979.36	22.58 S	312.61 W	-313.17	0.68
4099.00	8.05	265.95	4073.33	23.31 S	326.53 W	-327.10	0.87
4194.00	6.85	265.63	4167.53	24.21 S	338.82 W	-339.41	1.27
4288.00	6.36	264.25	4260.90	25.16 S	349.58 W	-350.20	0.54
4383.00	4.72	259.83	4355.46	26.38 S	358.67 W	-359.32	1.78
4478.00	2.87	250.72	4450.25	27.85 S	364.76 W	-365.45	2.04
4573.00	0.75	231.36	4545.19	29.03 S	367.49 W	-368.22	2.29
4667.00	0.39	232.26	4639.19	29.60 S	368.22 W	-368.97	0.38
4762.00	0.24	263.31	4734.19	29.83 S	368.67 W	-369.43	0.23
4857.00	0.35	288.81	4829.19	29.76 S	369.14 W	-369.90	0.18
4951.00	0.30	294.40	4923.18	29.56 S	369.64 W	-370.39	0.06
5046.00	0.25	324.87	5018.18	29.28 S	369.99 W	-370.73	0.16
5141.00	0.33	357.34	5113.18	28.84 S	370.13 W	-370.85	0.19
5236.00	0.70	12.28	5208.18	28.00 S	370.02 W	-370.71	0.42
5330.00	1.05	0.26	5302.17	26.57 S	369.89 W	-370.54	0.42
5425.00	1.27	262.94	5397.15	25.83 S	370.93 W	-371.56	1.84
5520.00	1.41	276.42	5492.13	25.83 S	373.13 W	-373.76	0.36
5614.00	0.94	254.88	5586.11	25.90 S	375.02 W	-375.65	0.68
5709.00	0.34	212.73	5681.10	26.34 S	375.92 W	-376.57	0.76
5804.00	0.54	175.74	5776.10	27.02 S	376.04 W	-376.71	0.35
5898.00	0.74	158.81	5870.10	28.03 S	375.79 W	-376.49	0.29
5993.00	0.53	147.11	5965.09	28.96 S	375.33 W	-376.06	0.26
6088.00	8.19	94.39	6059.75	29.85 S	368.34 W	-369.09	8.30
6182.00	16.49	93.71	6151.50	31.23 S	348.31 W	-349.12	8.83
6277.00	25.87	92.92	6239.98	33.16 S	314.08 W	-314.97	9.88
6372.00	35.52	88.42	6321.59	33.45 S	265.67 W	-266.59	10.44
6466.00	40.71	84.75	6395.52	29.89 S	207.80 W	-208.63	6.02
6528.00	45.42	83.18	6440.81	25.41 S	165.71 W	-166.43	7.79
6623.00	52.16	84.31	6503.36	17.67 S	94.70 W	-95.21	7.16
6718.00	64.17	89.27	6553.40	13.39 S	14.30 W	-14.71	13.38
6766.00	69.64	91.70	6572.22	13.79 S	29.83 E	29.39	12.31
6812.00	73.94	92.75	6586.60	15.49 S	73.49 E	72.96	9.61
6860.00	80.03	92.56	6597.40	17.65 S	120.18 E	119.57	12.68
6907.00	85.03	93.34	6603.51	20.05 S	166.70 E	165.99	10.78
6963.00	88.92	93.60	6606.46	23.44 S	222.51 E	221.67	6.96
7045.00	91.72	89.49	6606.00	25.65 S	304.46 E	303.50	6.06
7140.00	89.69	88.22	6604.83	23.75 S	399.42 E	398.48	2.52
7235.00	91.73	88.22	6603.66	20.80 S	494.37 E	493.47	2.15
7329.00	92.93	88.60	6599.84	18.19 S	588.25 E	587.39	1.34
7519.00	91.35	88.39	6592.74	13.21 S	778.05 E	777.25	0.84
7613.00	91.29	88.26	6590.58	10.46 S	871.98 E	871.22	0.15
7802.00	92.37	87.21	6584.54	2.99 S	1060.73 E	1060.11	0.80
7897.00	91.48	85.80	6581.35	2.79 N	1155.50 E	1155.01	1.75
7992.00	92.53	85.82	6578.03	9.73 N	1250.18 E	1249.87	1.11
8086.00	91.20	85.79	6574.97	16.60 N	1343.88 E	1343.74	1.42
8181.00	91.29	84.26	6572.90	24.84 N	1438.50 E	1438.57	1.61
8276.00	90.65	85.62	6571.29	33.22 N	1533.11 E	1533.40	1.58
8370.00	88.55	86.97	6571.95	39.29 N	1626.90 E	1627.34	2.66
8465.00	88.43	86.74	6574.45	44.50 N	1721.73 E	1722.28	0.27
8559.00	89.57	89.15	6576.09	47.87 N	1815.65 E	1816.25	2.84
8653.00	92.50	91.06	6574.40	47.70 N	1909.62 E	1910.17	3.72
8748.00	92.74	90.39	6570.05	46.50 N	2004.51 E	2004.98	0.75

8842.00	89.05	89.60	6568.59	46.51 N	2098.48 E	2098.90	4.01
8937.00	88.52	89.32	6570.60	47.40 N	2193.45 E	2193.86	0.63
9031.00	88.71	89.03	6572.87	48.76 N	2287.42 E	2287.82	0.37
9220.00	89.85	88.66	6575.25	52.56 N	2476.36 E	2476.79	0.63
9314.00	91.48	89.62	6574.16	53.98 N	2570.34 E	2570.77	2.01
9409.00	90.68	88.37	6572.37	55.64 N	2665.30 E	2665.74	1.56
9503.00	91.02	85.60	6570.97	60.58 N	2759.15 E	2759.70	2.97
9598.00	89.20	82.66	6570.79	70.30 N	2853.64 E	2854.44	3.64
9692.00	89.69	83.20	6571.70	81.87 N	2946.92 E	2948.04	0.78
9787.00	88.61	81.70	6573.11	94.35 N	3041.08 E	3042.55	1.95
9881.00	89.91	82.74	6574.32	107.07 N	3134.21 E	3136.02	1.77
9976.00	89.82	87.23	6574.55	115.37 N	3228.82 E	3230.85	4.73
10068.00	90.18	91.52	6574.55	116.38 N	3320.79 E	3322.81	4.68
10159.00	90.77	91.77	6573.79	113.76 N	3411.75 E	3413.64	0.70
10250.00	90.68	91.72	6572.64	110.99 N	3502.70 E	3504.46	0.11
10342.00	91.23	91.56	6571.11	108.36 N	3594.65 E	3596.28	0.62
10433.00	90.55	91.75	6569.69	105.73 N	3685.60 E	3687.10	0.78
10525.00	89.54	90.47	6569.62	103.95 N	3777.58 E	3778.98	1.77
10616.00	89.91	90.22	6570.06	103.40 N	3868.58 E	3869.92	0.49
10707.00	89.78	89.98	6570.30	103.24 N	3959.58 E	3960.87	0.30
10799.00	90.34	90.44	6570.21	102.91 N	4051.58 E	4052.81	0.79
10891.00	89.91	91.13	6570.01	101.65 N	4143.57 E	4144.71	0.88
10982.00	89.38	89.77	6570.57	100.93 N	4234.56 E	4235.64	1.60
11073.00	90.86	90.37	6570.38	100.82 N	4325.56 E	4326.59	1.75
11165.00	90.12	89.64	6569.59	100.81 N	4417.55 E	4418.54	1.13
11256.00	89.35	89.47	6570.02	101.52 N	4508.55 E	4509.51	0.87
11348.00	89.57	88.88	6570.88	102.84 N	4600.53 E	4601.49	0.68
11439.00	88.21	89.32	6572.65	104.27 N	4691.50 E	4692.46	1.57
11531.00	87.90	89.17	6575.77	105.49 N	4783.44 E	4784.39	0.37
11623.00	87.75	86.18	6579.26	109.21 N	4875.29 E	4876.31	3.25
11715.00	89.54	85.96	6581.44	115.52 N	4967.04 E	4968.22	1.96
11809.00	89.85	85.67	6581.94	122.38 N	5060.79 E	5062.14	0.45
11904.00	90.83	85.61	6581.37	129.60 N	5155.51 E	5157.04	1.03
11999.00	91.72	85.28	6579.26	137.14 N	5250.19 E	5251.91	1.00
12093.00	90.89	85.23	6577.12	144.92 N	5343.84 E	5345.76	0.88
12188.00	90.99	86.01	6575.56	152.17 N	5438.55 E	5440.65	0.83
12283.00	90.65	86.75	6574.20	158.17 N	5533.35 E	5535.59	0.86
12377.00	89.97	87.88	6573.69	162.57 N	5627.24 E	5629.57	1.40
12472.00	91.33	87.38	6572.61	166.50 N	5722.15 E	5724.56	1.53
12567.00	92.90	88.93	6569.11	169.56 N	5817.03 E	5819.49	2.32
12661.00	93.02	88.72	6564.25	171.48 N	5910.89 E	5913.36	0.26
12756.00	92.07	88.21	6560.03	174.02 N	6005.76 E	6008.26	1.13
12851.00	91.76	87.97	6556.86	177.19 N	6100.65 E	6103.21	0.41
12946.00	90.92	88.03	6554.64	180.50 N	6195.57 E	6198.18	0.89
13040.00	89.41	88.34	6554.37	183.48 N	6289.52 E	6292.18	1.64
13135.00	88.24	87.80	6556.32	186.68 N	6384.44 E	6387.16	1.36
13230.00	87.75	86.72	6559.64	191.22 N	6479.27 E	6482.08	1.25
13325.00	89.60	87.54	6561.84	195.97 N	6574.12 E	6577.04	2.13
13419.00	89.78	86.96	6562.35	200.48 N	6668.01 E	6671.02	0.65
13514.00	92.09	87.61	6560.79	204.98 N	6762.89 E	6765.99	2.53
13609.00	89.88	87.62	6559.16	208.93 N	6857.79 E	6860.96	2.33
13703.00	88.74	88.98	6560.29	211.72 N	6951.73 E	6954.95	1.89
13798.00	87.72	88.14	6563.23	214.11 N	7046.66 E	7049.90	1.39
13893.00	89.23	88.71	6565.76	216.72 N	7141.58 E	7144.87	1.70
13988.00	91.66	91.16	6565.02	216.83 N	7236.57 E	7239.81	3.63
14082.00	91.02	91.43	6562.82	214.70 N	7330.52 E	7333.64	0.74
14177.00	89.94	91.21	6562.02	212.51 N	7425.49 E	7428.50	1.16
14272.00	89.41	90.42	6562.56	211.16 N	7520.47 E	7523.40	1.00
14366.00	89.51	90.28	6563.45	210.59 N	7614.47 E	7617.33	0.18
14461.00	90.15	88.91	6563.73	211.26 N	7709.46 E	7712.29	1.59
14556.00	91.72	89.21	6562.18	212.82 N	7804.43 E	7807.27	1.68
14651.00	90.71	88.67	6560.17	214.58 N	7899.40 E	7902.24	1.21
14746.00	90.37	87.59	6559.27	217.68 N	7994.34 E	7997.23	1.19
14840.00	90.12	86.83	6558.87	222.25 N	8088.23 E	8091.22	0.85
14935.00	91.75	86.53	6557.32	227.75 N	8183.05 E	8186.17	1.74
15030.00	91.75	86.35	6554.42	233.65 N	8277.82 E	8281.08	0.19
15125.00	90.86	86.56	6552.25	239.52 N	8372.62 E	8376.01	0.96
15219.00	90.28	86.11	6551.32	245.53 N	8466.42 E	8469.95	0.78
15314.00	90.52	86.11	6550.66	251.97 N	8561.20 E	8564.89	0.25
15409.00	90.22	85.44	6550.04	258.97 N	8655.94 E	8659.80	0.77
15504.00	90.46	85.21	6549.48	266.71 N	8750.62 E	8754.68	0.35

15599.00	90.77	84.99	6548.46	274.83 N	8845.27 E	8849.53	0.40
15693.00	91.32	85.00	6546.75	283.03 N	8938.89 E	8943.37	0.59
15788.00	90.12	85.09	6545.55	291.23 N	9033.53 E	9038.22	1.27
15883.00	90.12	85.21	6545.35	299.27 N	9128.19 E	9133.08	0.13
15978.00	91.91	84.91	6543.67	307.44 N	9222.81 E	9227.92	1.91
16048.00	92.56	84.51	6540.94	313.89 N	9292.46 E	9297.74	1.09
16116.00	92.56	84.51	6537.90	320.39 N	9360.08 E	9365.53	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 88.20 DEGREES (GRID)
A TOTAL CORRECTION OF 7.32 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16116.00 FEET
IS 9365.57 FEET ALONG 88.04 DEGREES (GRID)**

Surveys at 300 ft and 637 ft are interpolated between surface and first survey at 661 ft.

Last survey is a projection from 16048 ft MD to TD at 16116 ft MD.

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