

Company	:	Extraction Oil & Gas
Rig	:	Patterson 901
Well	:	GP-Cody Fed 20E-15-2
Field	:	Wattenberg
Country	:	USA
API Number	:	05-123-50285

Permanent Datum	: Ground Level	Elevation :	4673.00 ft
Log Measured From	: Drill Floor	29.00 ft Above Permanent Datum	
Drilling Measured From	: Drill Floor	MD LOG	
		Elev.	
		KB	N/A
		DF	4702.00 ft
		GL	4673.00 ft
		WD	N/A

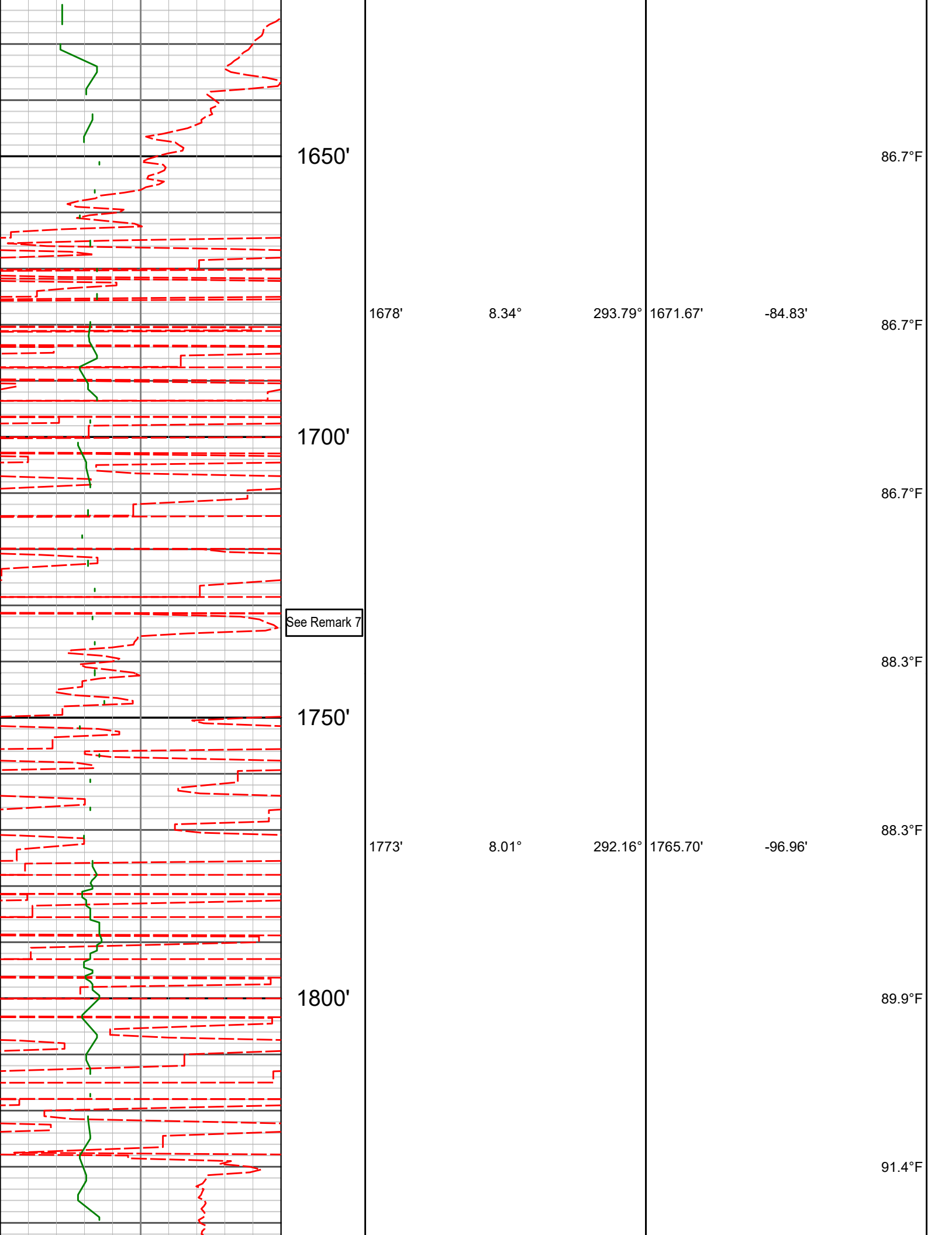
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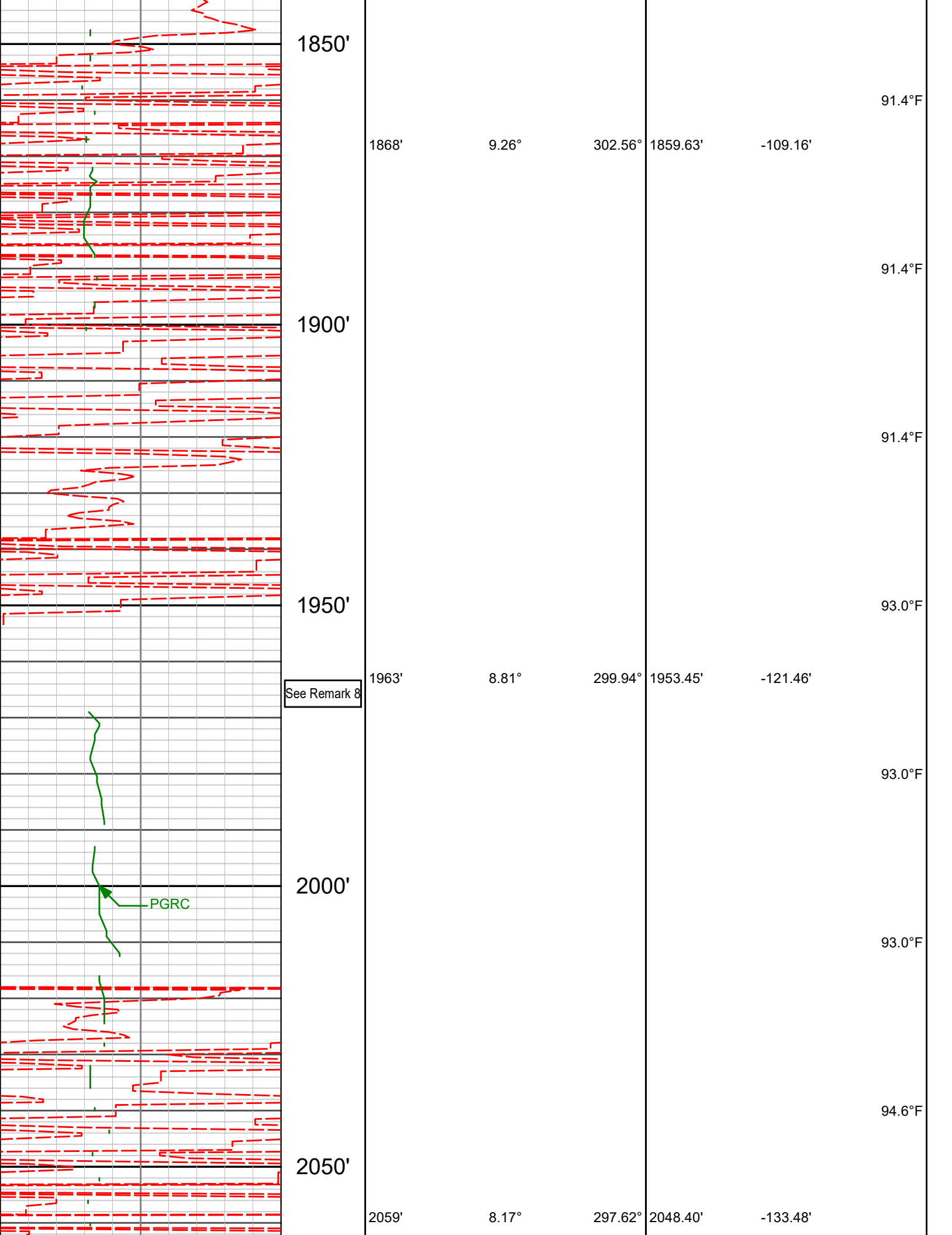
WELL INFORMATION

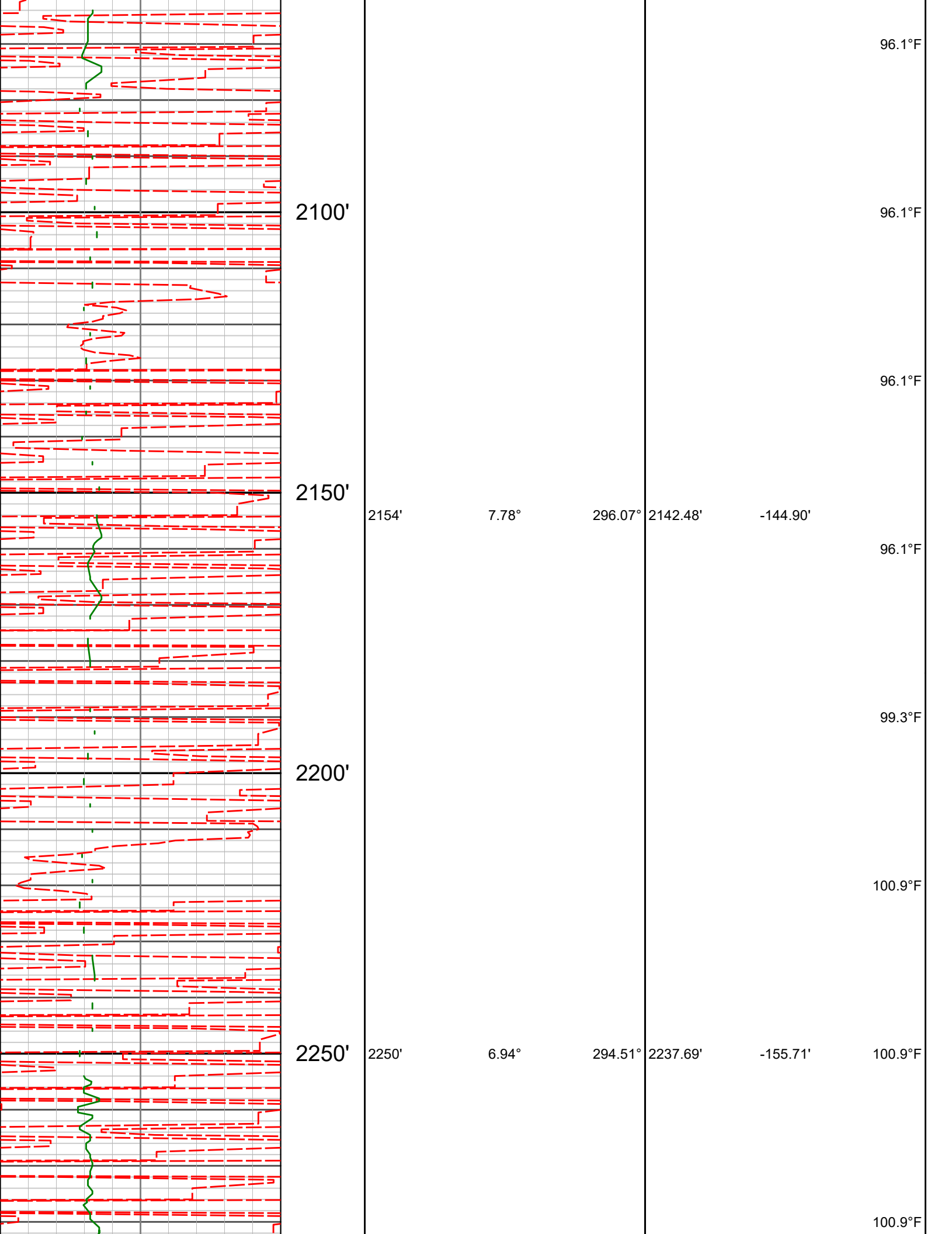
MWD Run Number	100				
Date run completed	11-Feb-20				
Rig Bit Number	0100				
Bit Size (in)	8.500				
Tool Nominal OD (in)	6.750				
Log Start Depth (MD, ft)	1,625.00				
Log End Depth (MD, ft)	14,211.00				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	09-Feb-20 22:28				
Drill/Wipe End Date and Time	11-Feb-20 09:15				
Min Inc (deg) @ Depth (MD, ft)	1.73 @ 6,377.00				
Max Inc (deg) @ Depth (MD, ft)	93.36 @ 13,412.00				
Bit TFA(in2) / Bit Type	0.61 / PDC				
Flow Rate (gpm)	630.00				
Max AV (fpm) / CV (fpm) @ MWD	581.0 / 581.0				
Fluid Type	Diesel Mud Base				
Density (ppg) / Viscosity (spqt)	9.70 / 57.00				
Filtrate CL (ppm)	51,000.00				
pH / API Filtrate (mptm)	N/A / 25				
PV (cP) / YP (lhf2)	19 / 10.00				
% Solids / % Sand	13 / 0.10				
% Oil / Oil:Water Ratio	67.4 / 77:23				
Rm @ Measured Temp (degF)	N/A @ N/A				
Rmf @ Measured Temp (degF)	N/A @ N/A				

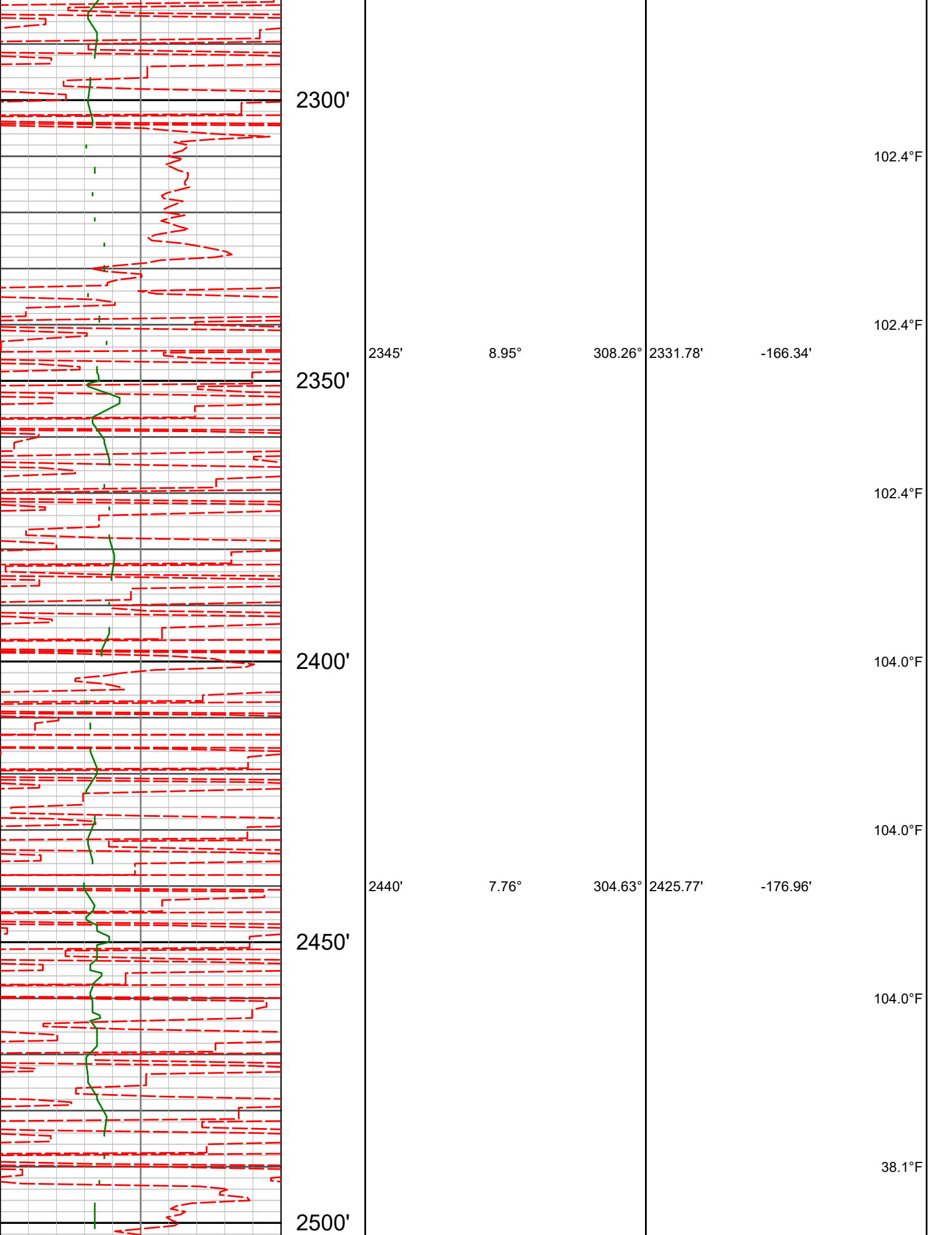
Rmc @ Measured Temp (degF)	N/A @ N/A				
Max Tool Temp (degF) / Source	253.00 / EMT				
Rm @ Max Tool Temp (degF)	N/A @ 253.00				
Lead MWD Engineer	Jonathan Davis				
Customer Representative	Danny Herrera				
SENSOR INFORMATION					
Downhole Processor Information					
Tool Type	EMT-DTU				
Software Version	4.48				
Sub Serial Number	12979193				
Insert Serial Number	12149266				
Date and Time Initialized	N/A				
Date and Time Read	N/A				
ECMB SW Version	N/A				
Directional Sensor Information					
Tool Type	PCDC				
Distance From Bit (ft)	57.00				
Software Version	6.43				
Sub Serial Number	12149266				
Sonde Serial Number	11833218				
Sensor ID Number	N/A				
Toolface Offset (deg)	269.23				
Gamma Ray Sensor Information					
Tool Type	PCG				
Distance From Bit (ft)	50.18				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	12149266				
Insert/Sonde Serial Number	12972169				
Electro Magnetic Downhole Terminal Unit Sensor Information					
Tool Type	EMT-DTU				
Distance From PWD To Bit (ft)	N/A				
Hardware Type	EMT Sonde				
Electronics Hardware Rev	Phase 3.0				
Software Version	4.48				
Telemetry Type	Carrier Wave				
REMARKS					
<p>1. All depths are calibrated to the driller's pipe tally and are measured depth measured from the drill floor.</p> <p>2. No depth corrections have been made for pipe stretch or compression.</p> <p>3. All data presented is recorded (Tool memory data) unless otherwise stated.</p> <p>4. EMT was used on Run 100.</p> <p>5. Environmental parameters used to process gamma ray are as follows:</p> <p>Hole Size: 8.50 in.</p> <p>Mud weight: 9.6 - 10 ppm</p>					

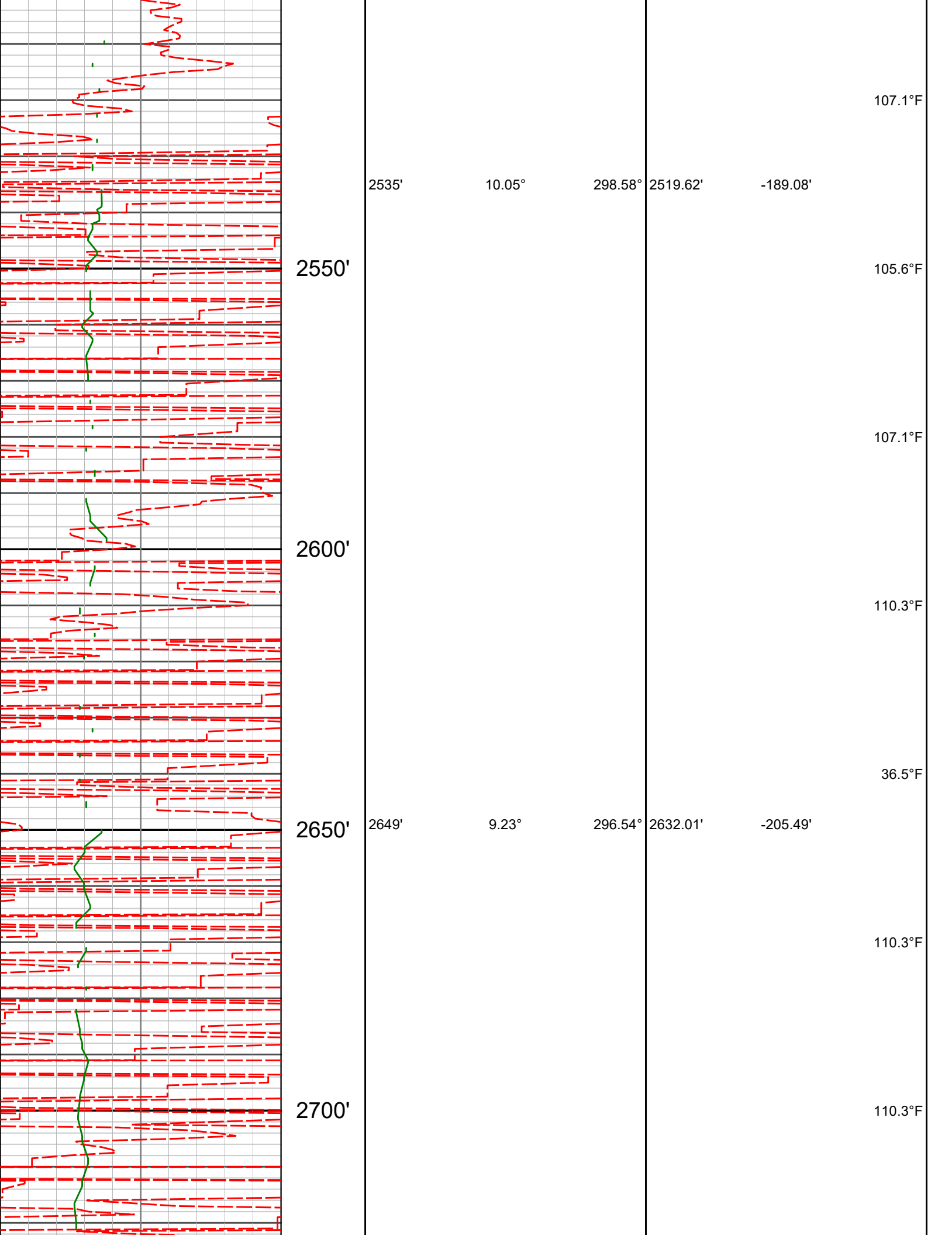
<div>PCG Gamma Ray BCorr</div> <div>(PGRC)</div> <div>api</div> <div>0300</div>								
<div>Avg Rate of Penetration</div> <div>(ROPA)</div> <div>feet per hr</div> <div>2K0</div>		<div>MD</div> <div>1 : 240</div> <div>ft</div>	<div>Depth</div>	<div>Inc</div>	<div>Azi</div>	<div>TVD</div>	<div>V/S</div>	<div>Temp</div>
		<div>1600'</div> <div> Casing Shoe @ 1625' MD</div>						

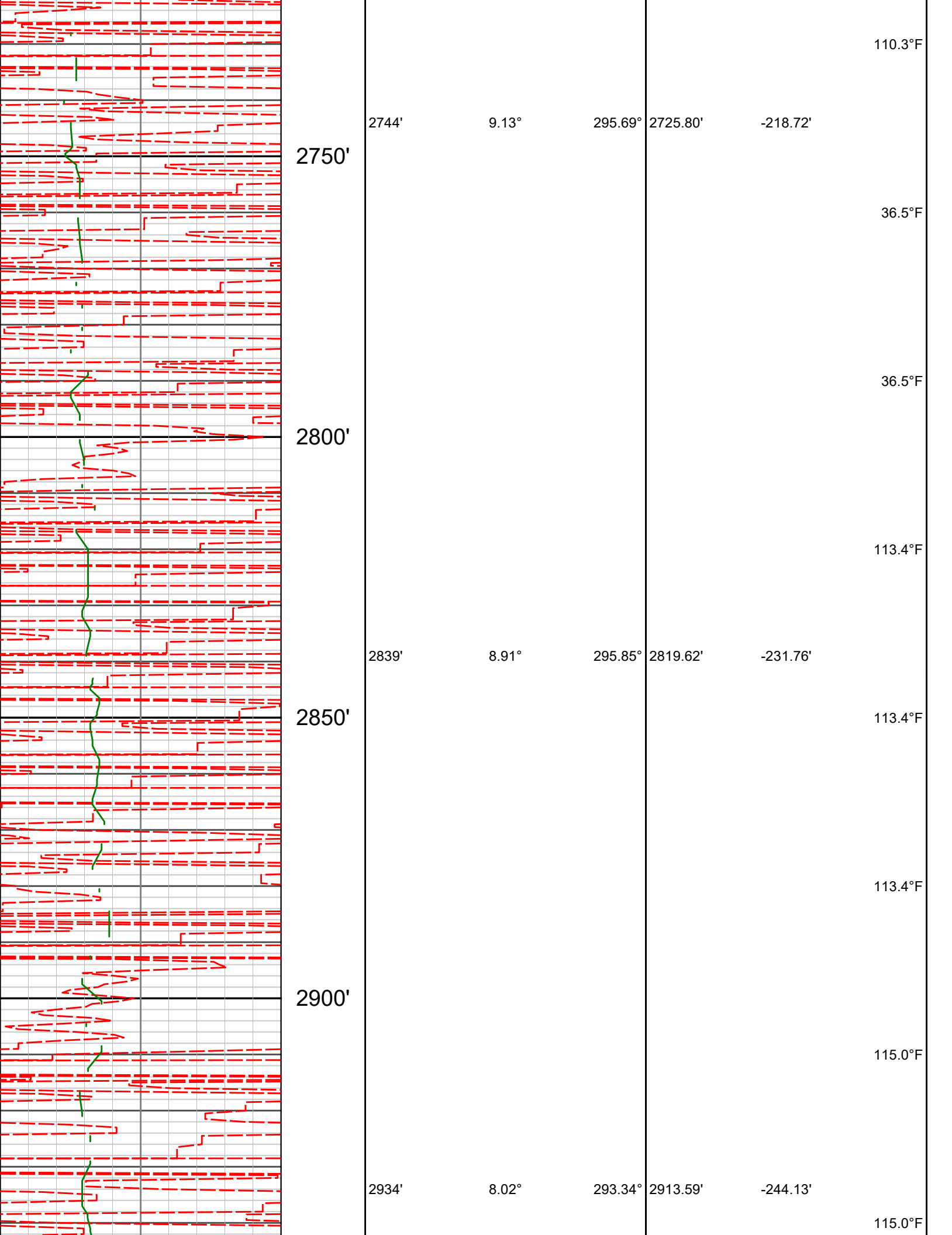


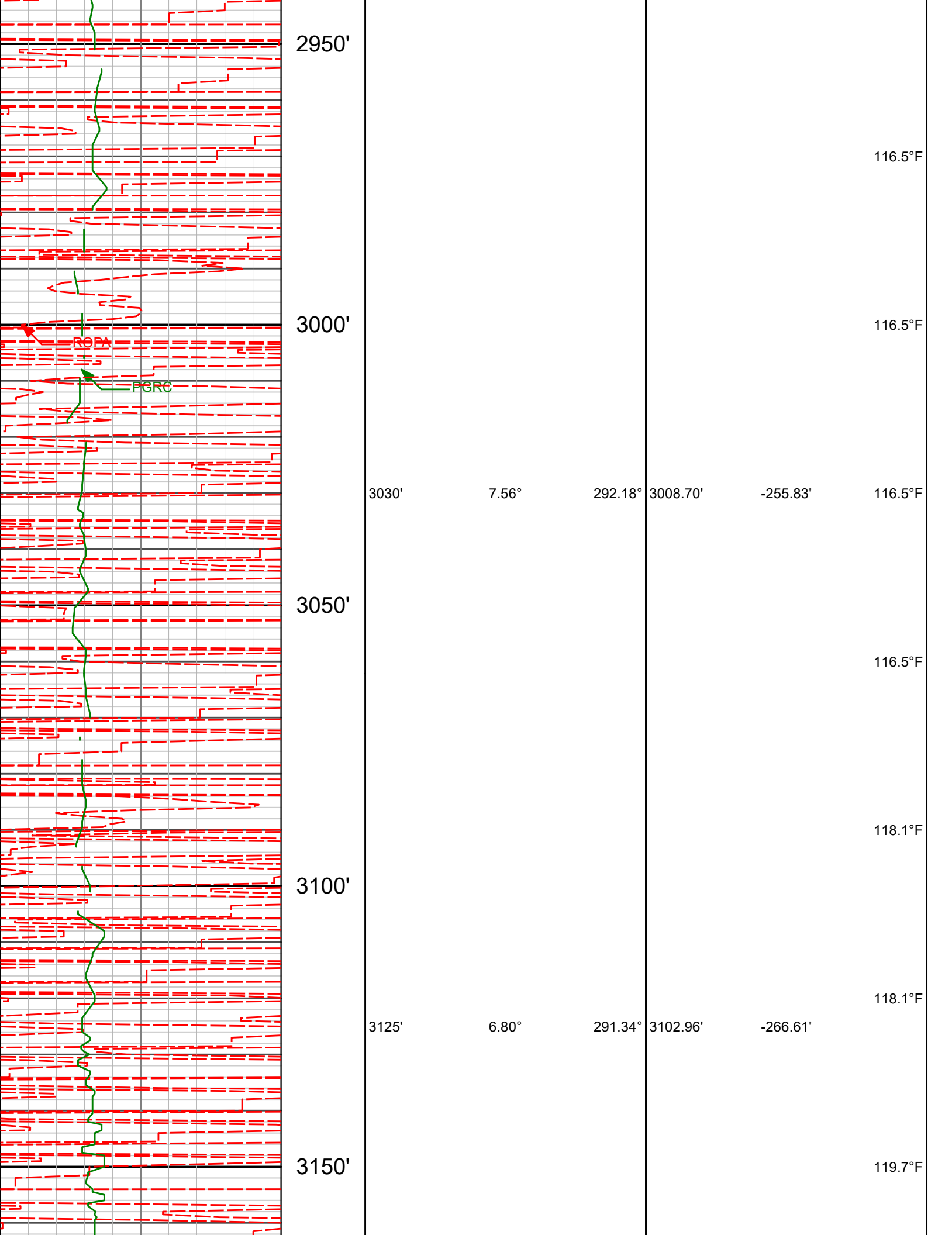


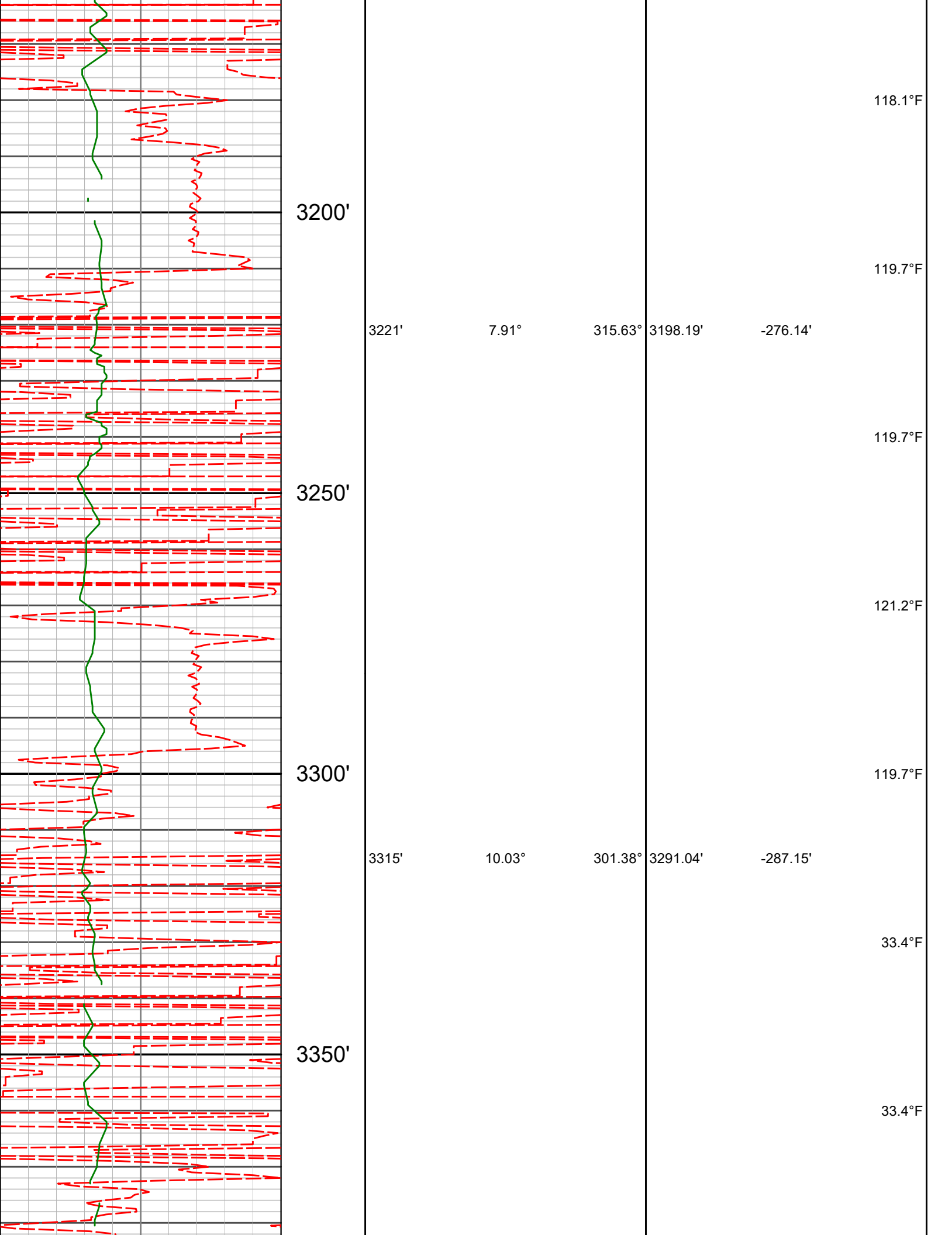


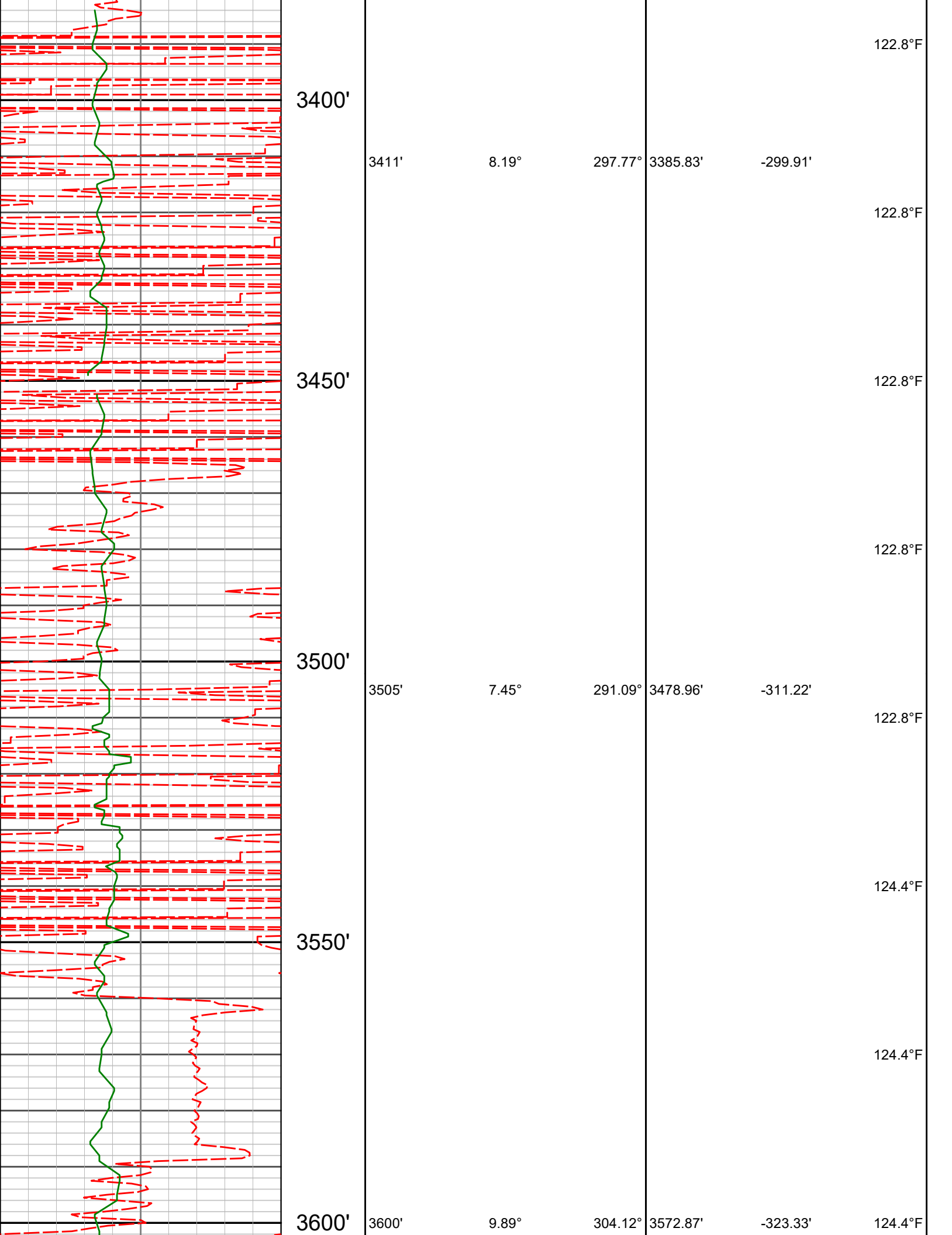


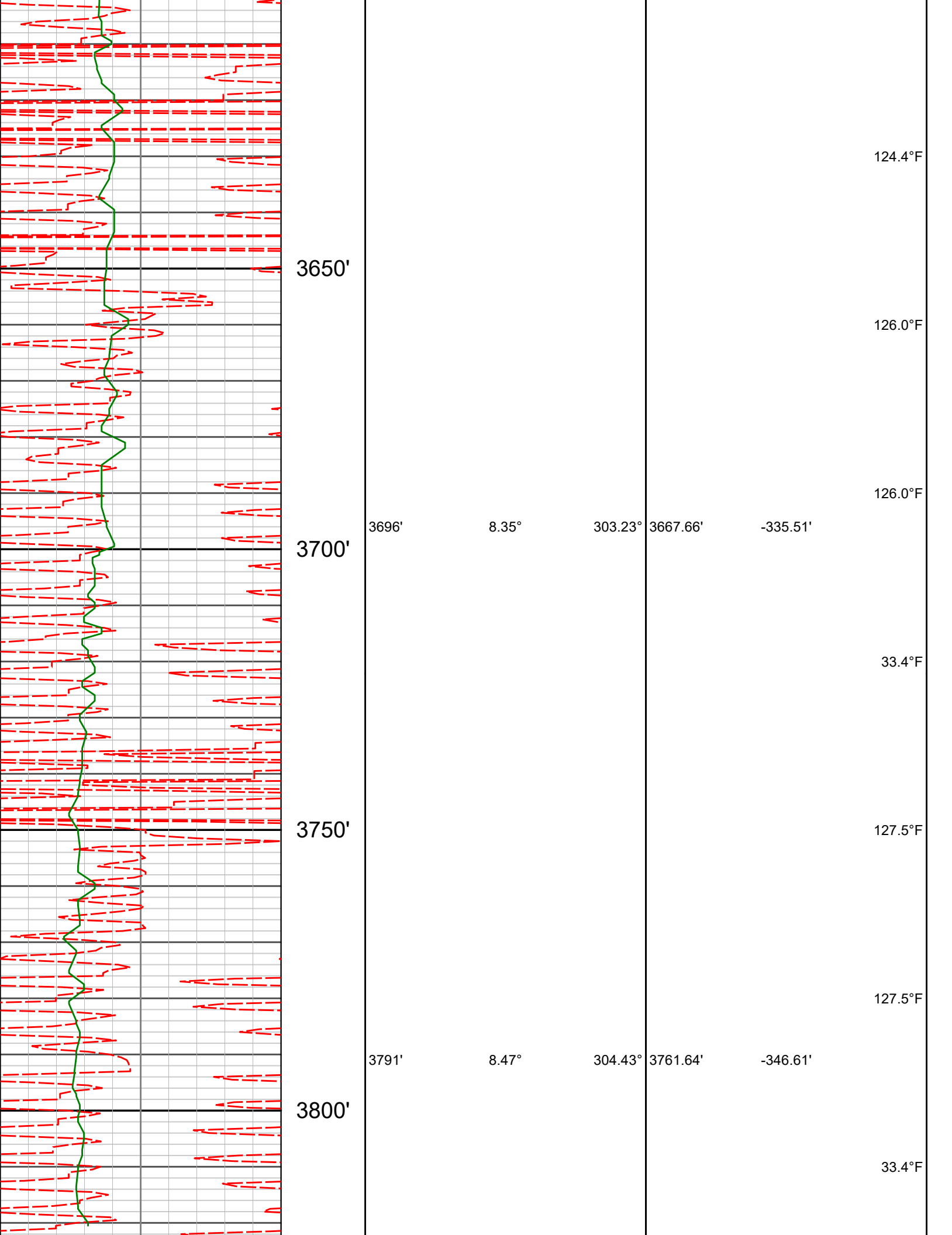


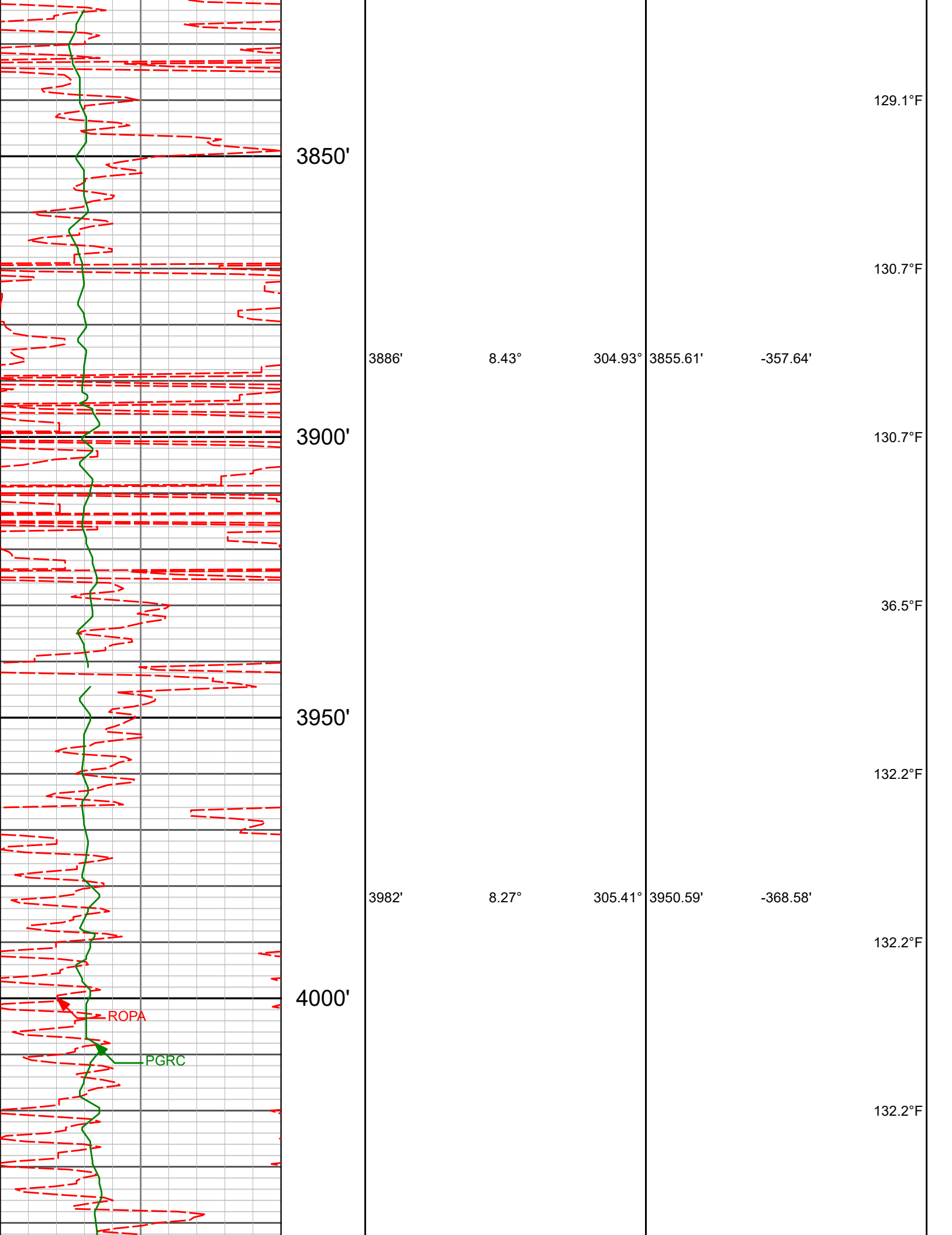


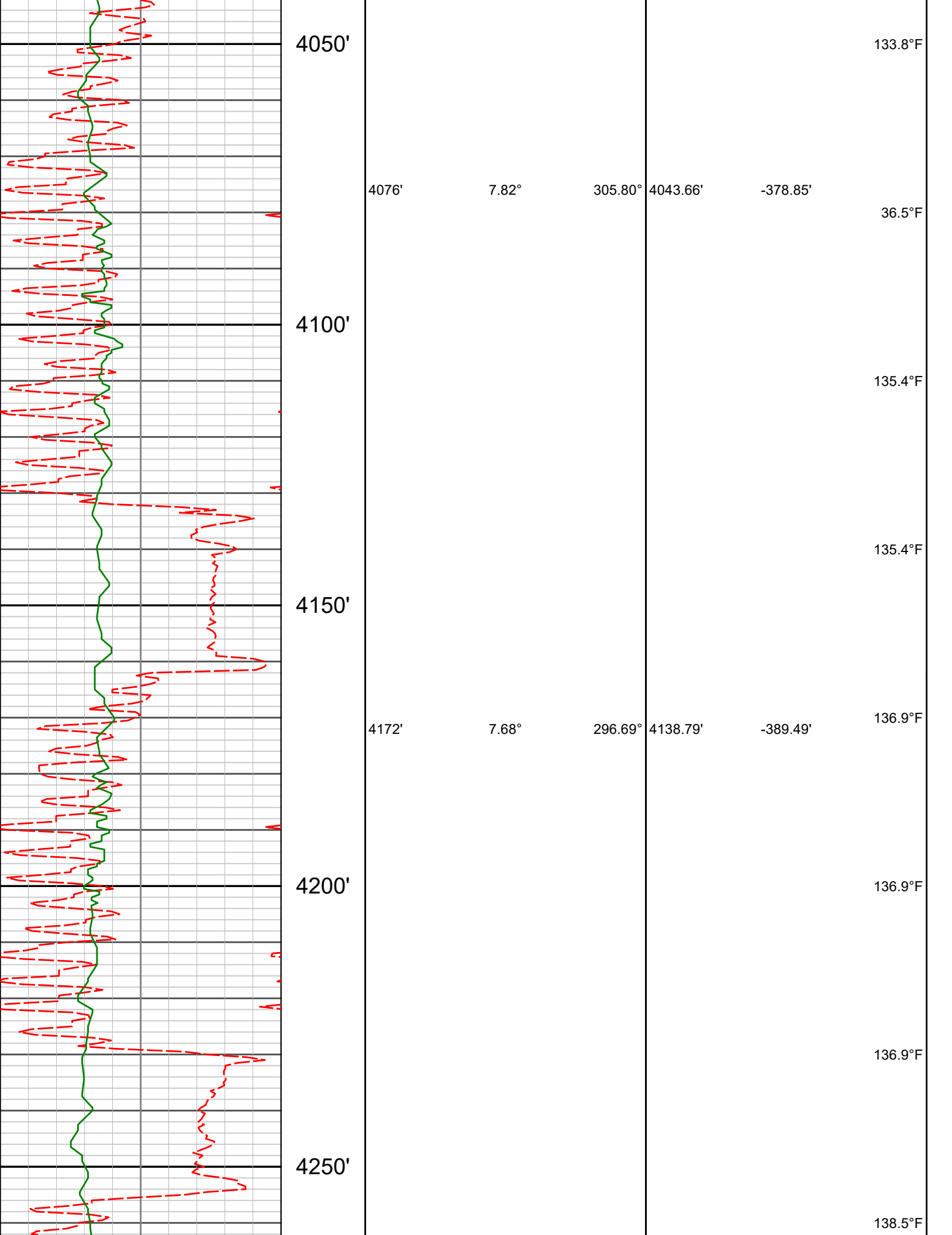


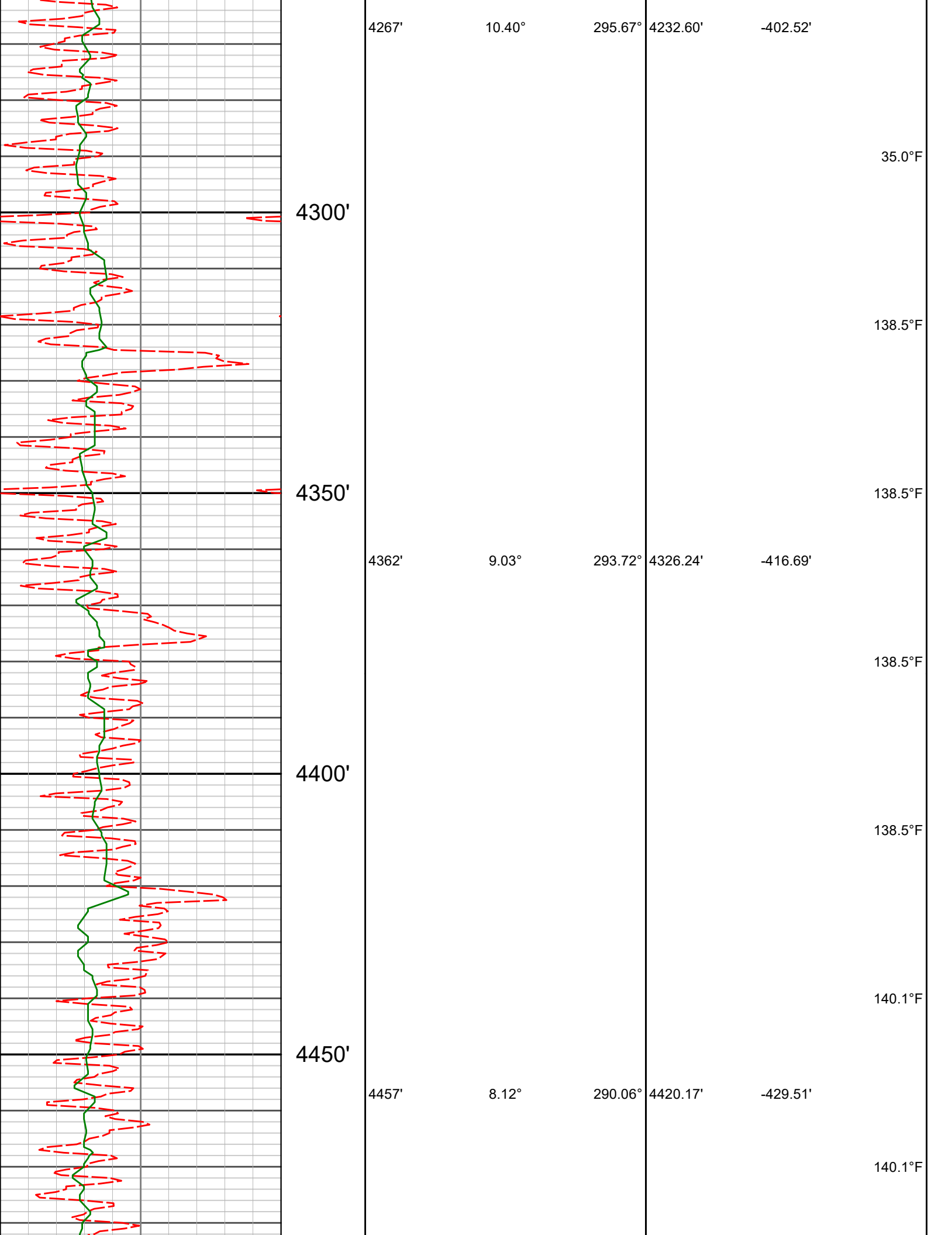


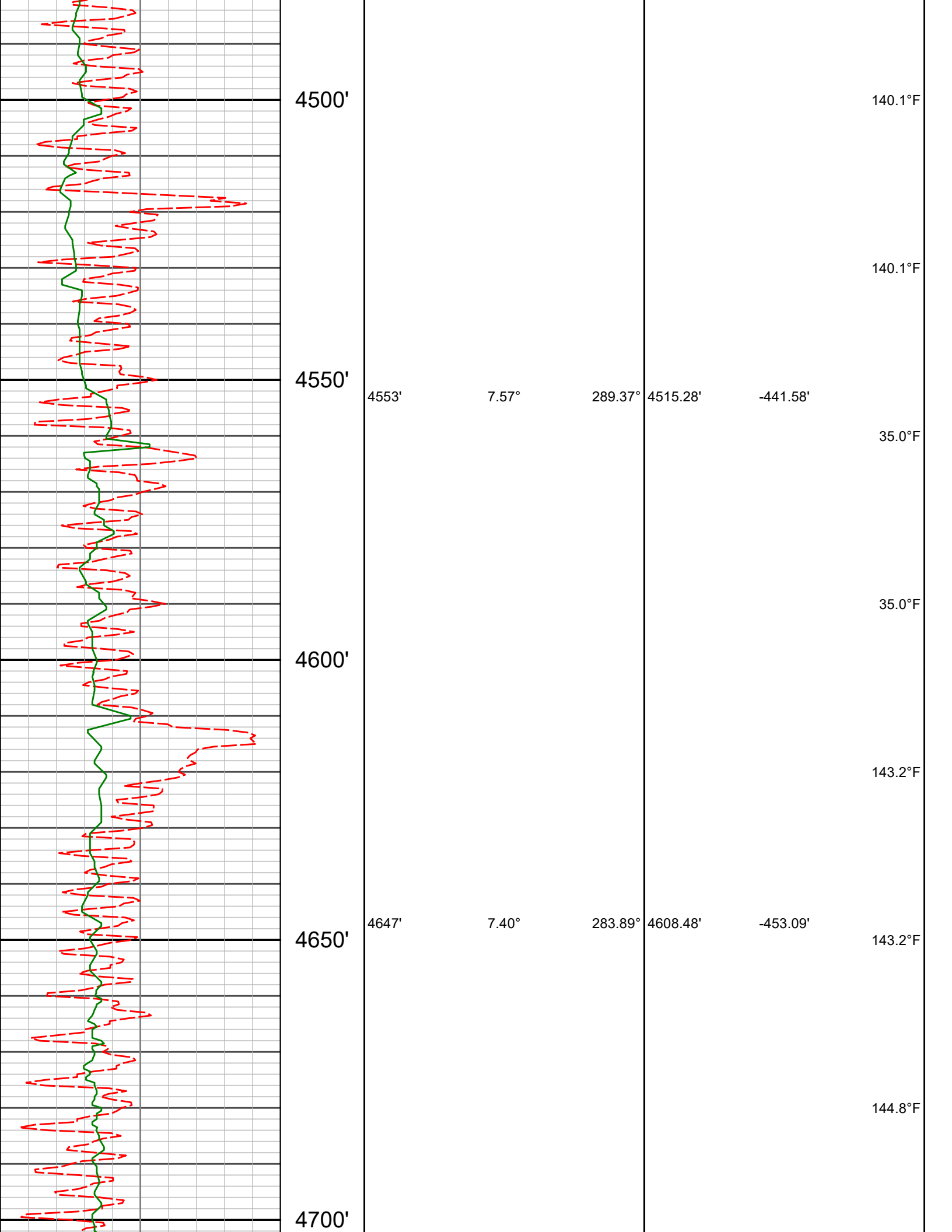


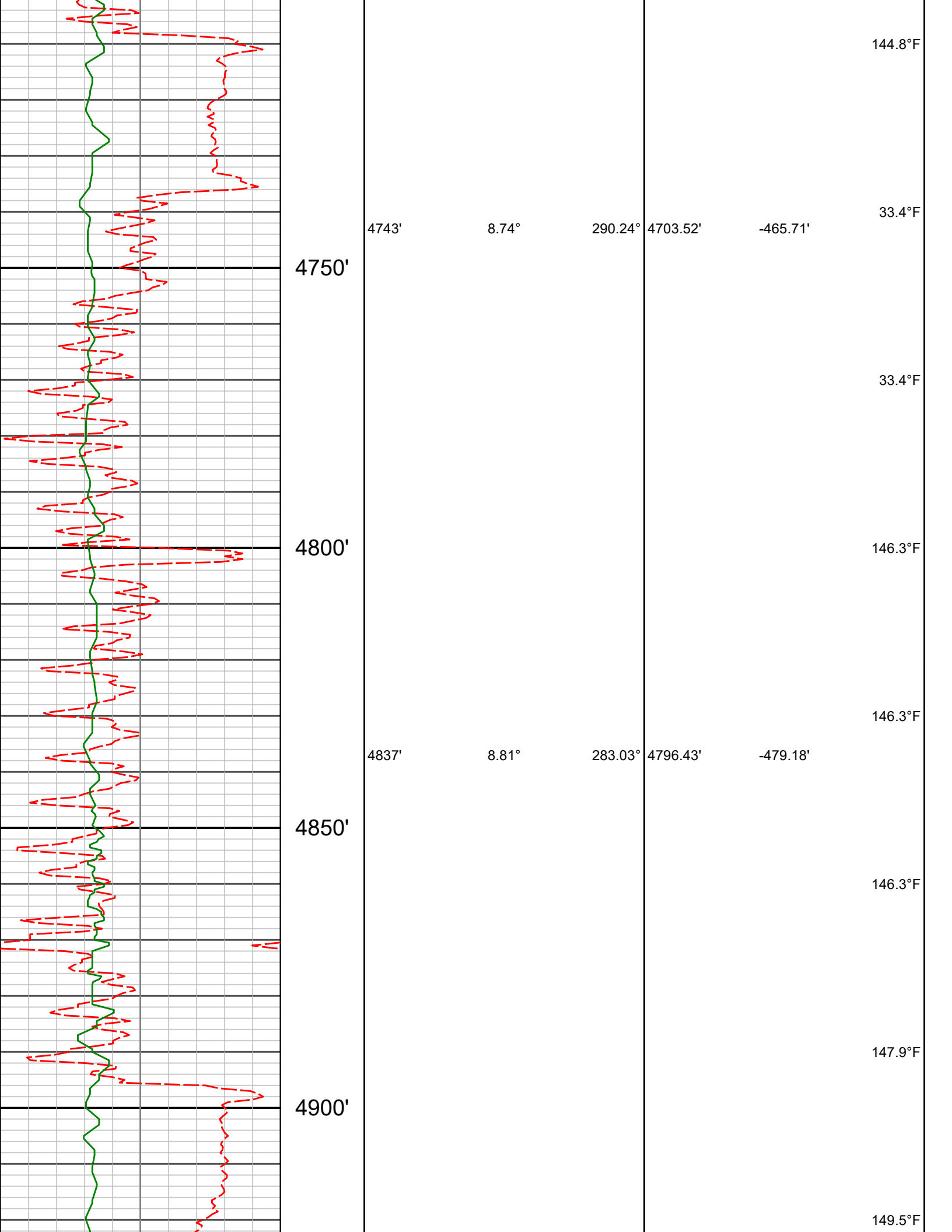


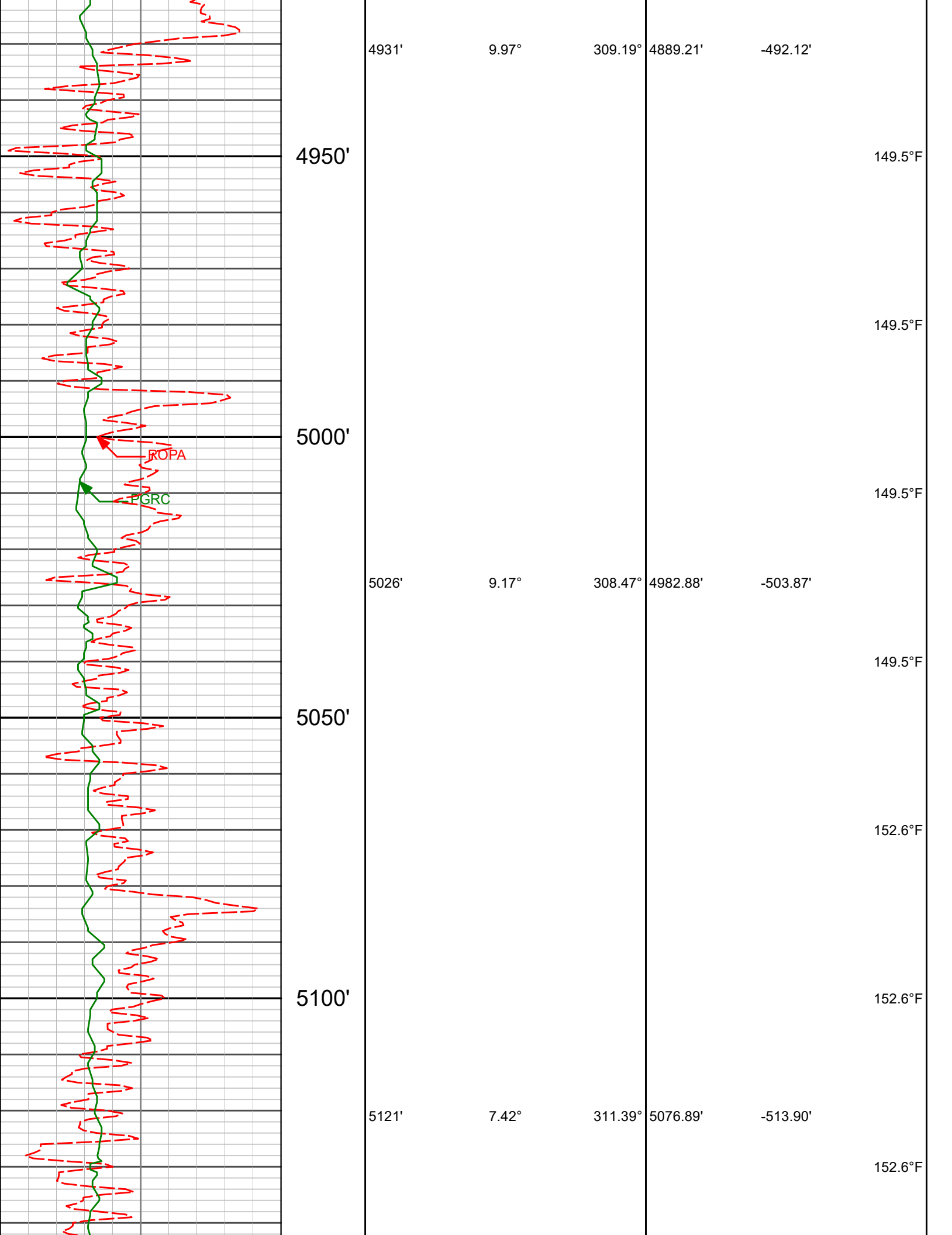


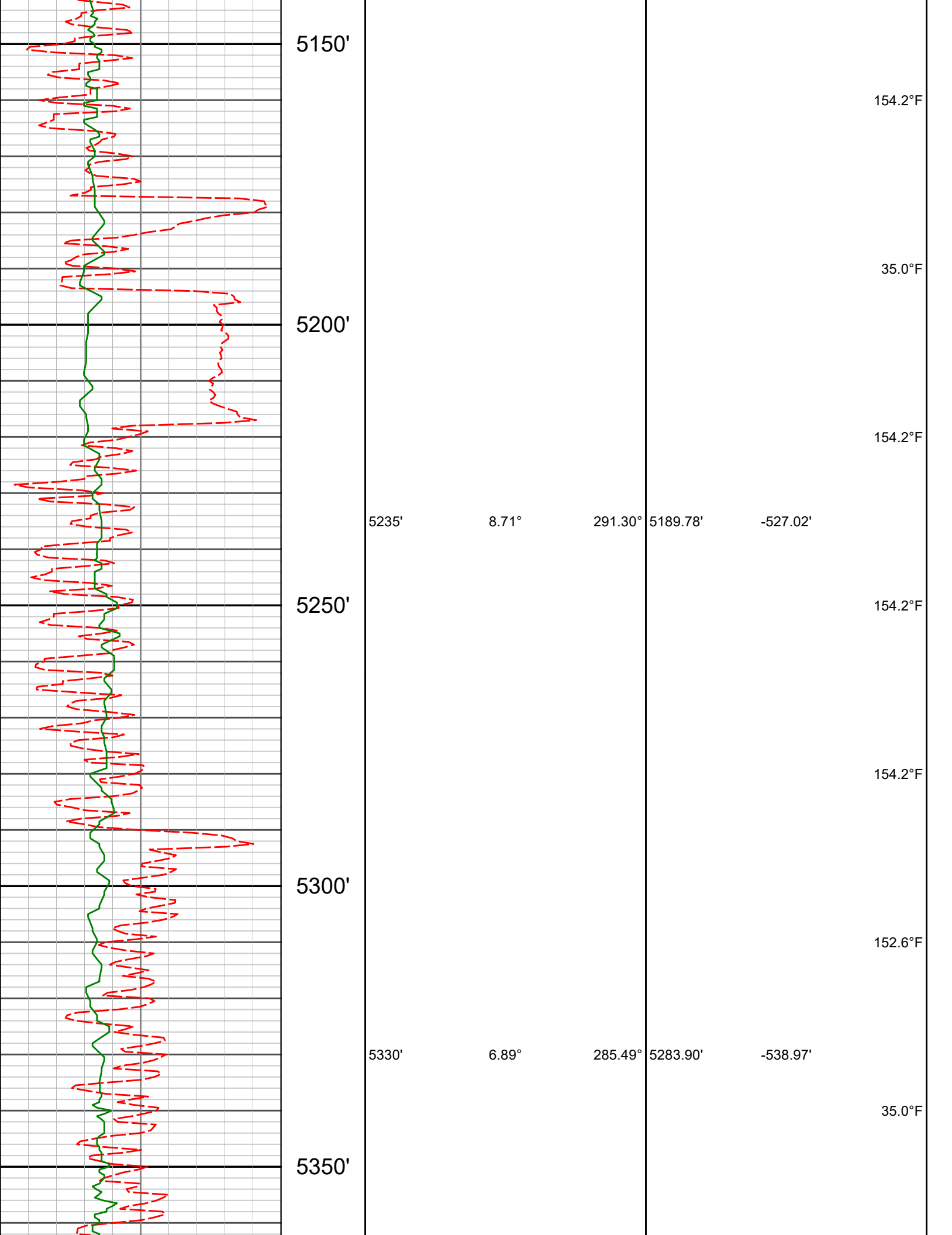


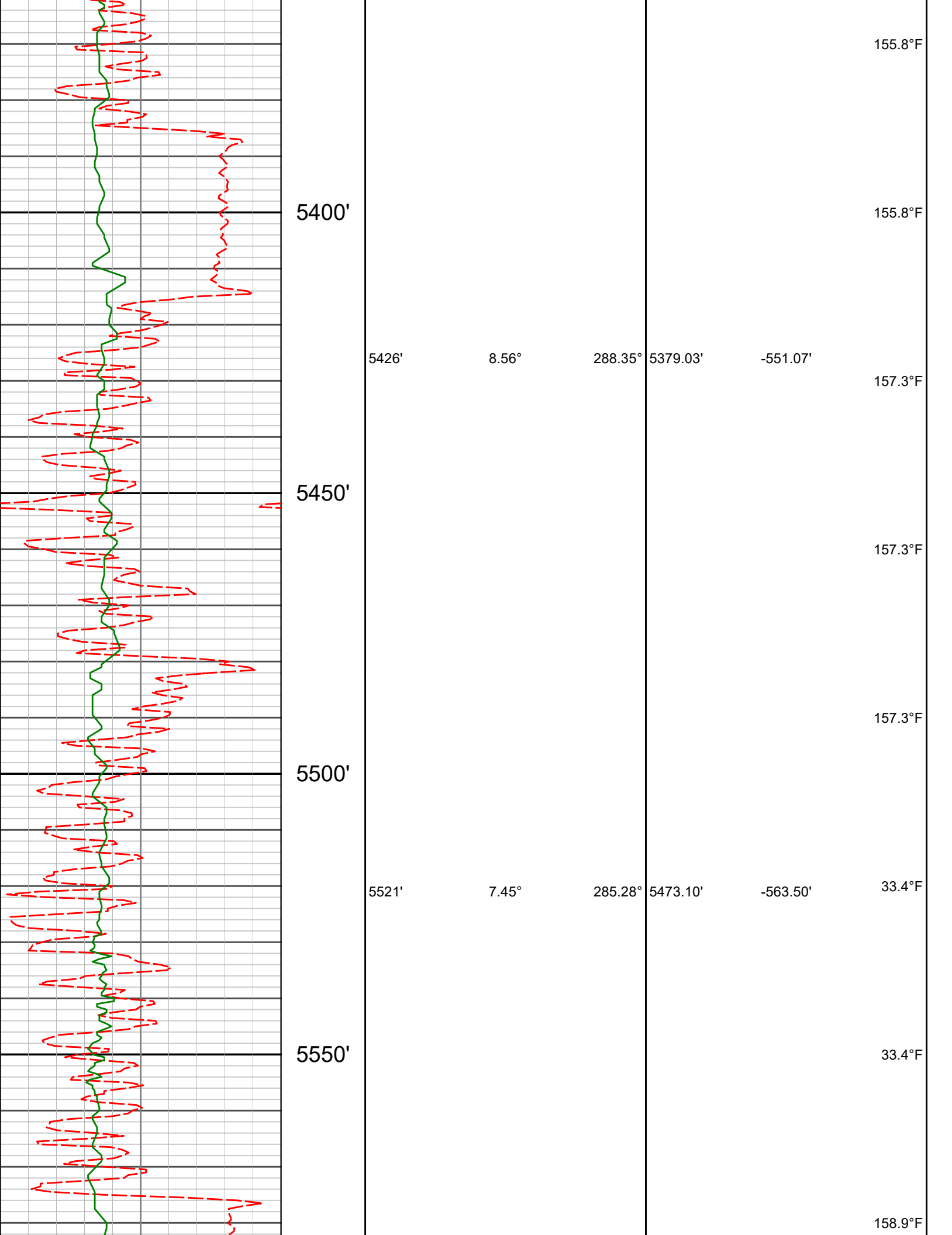


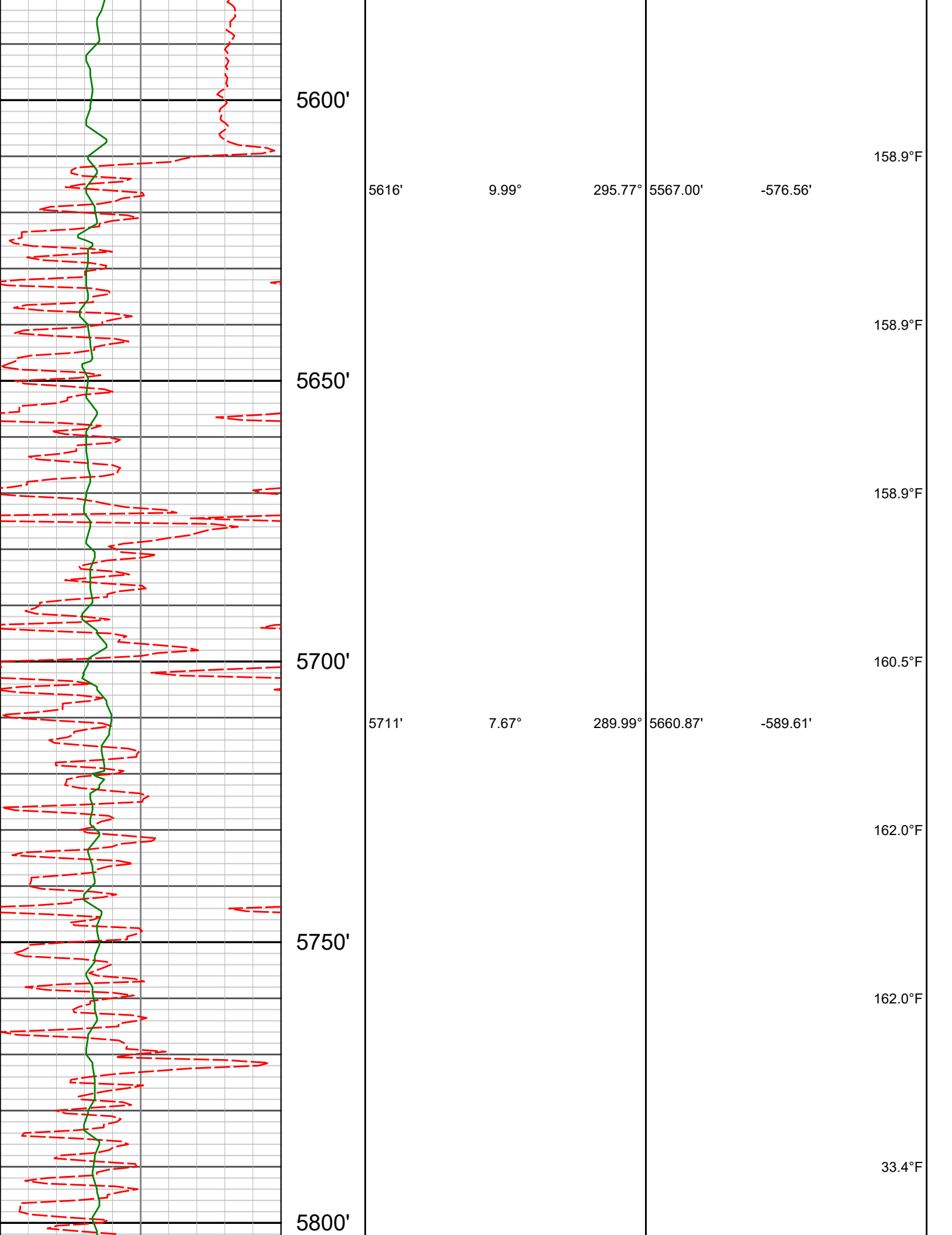


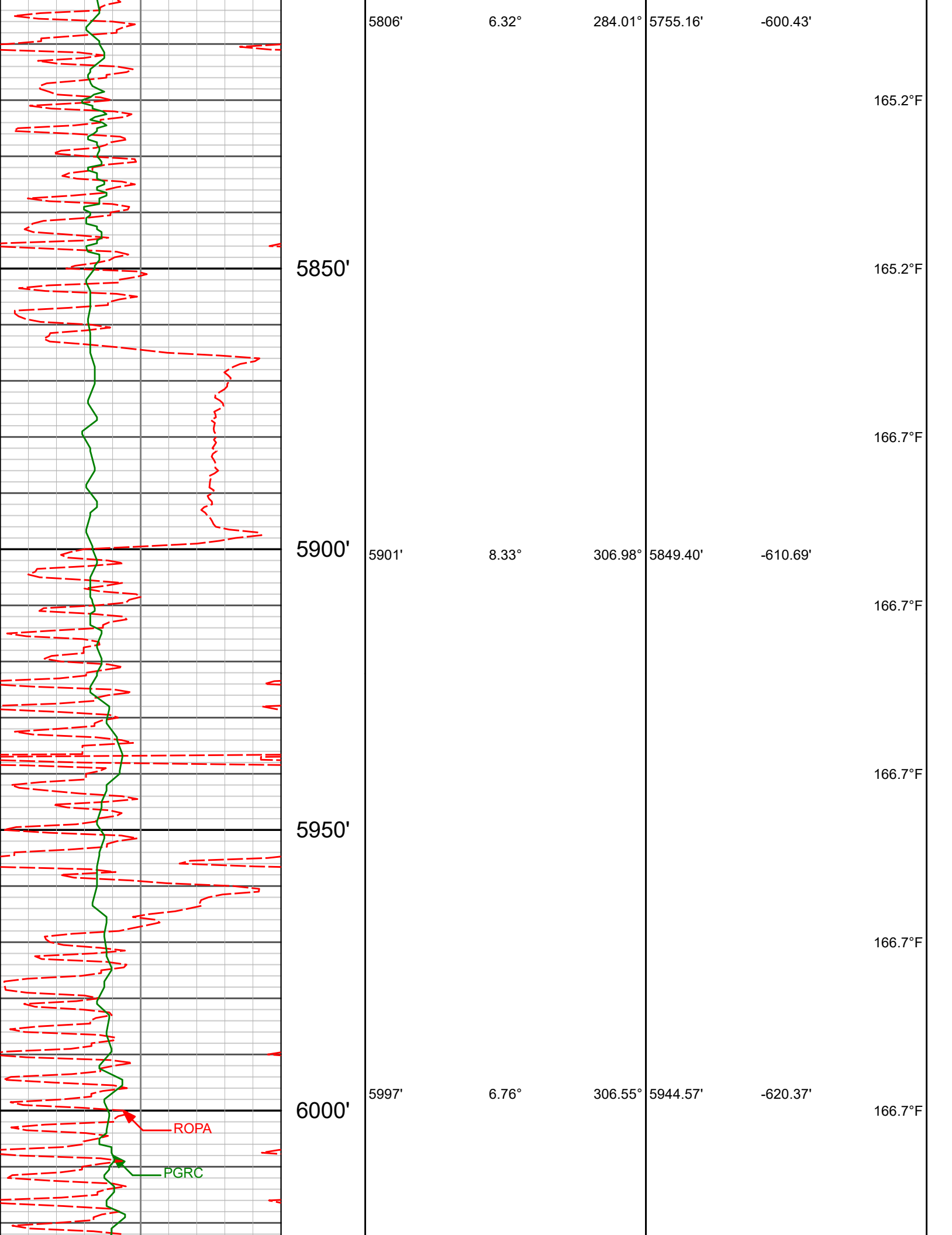


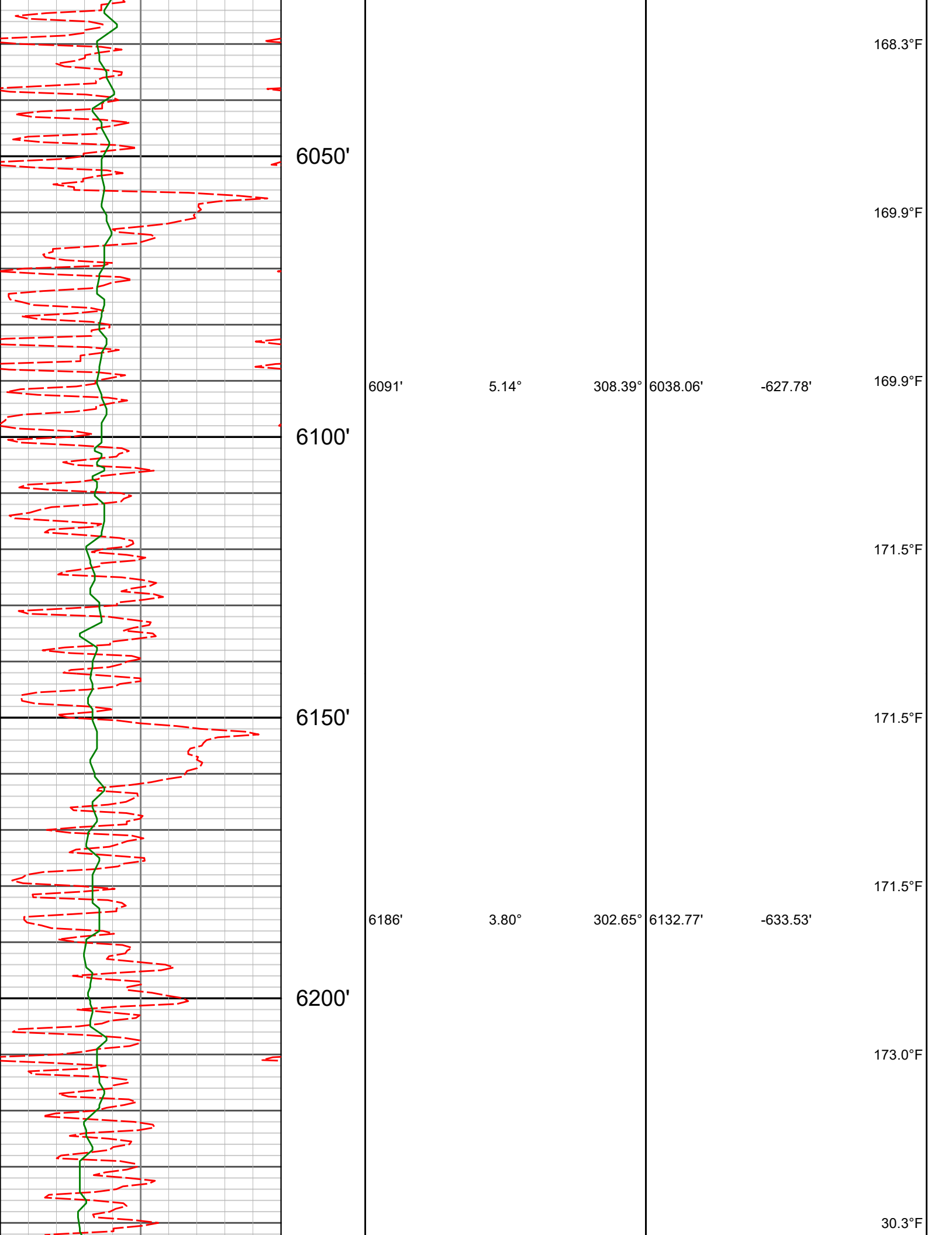


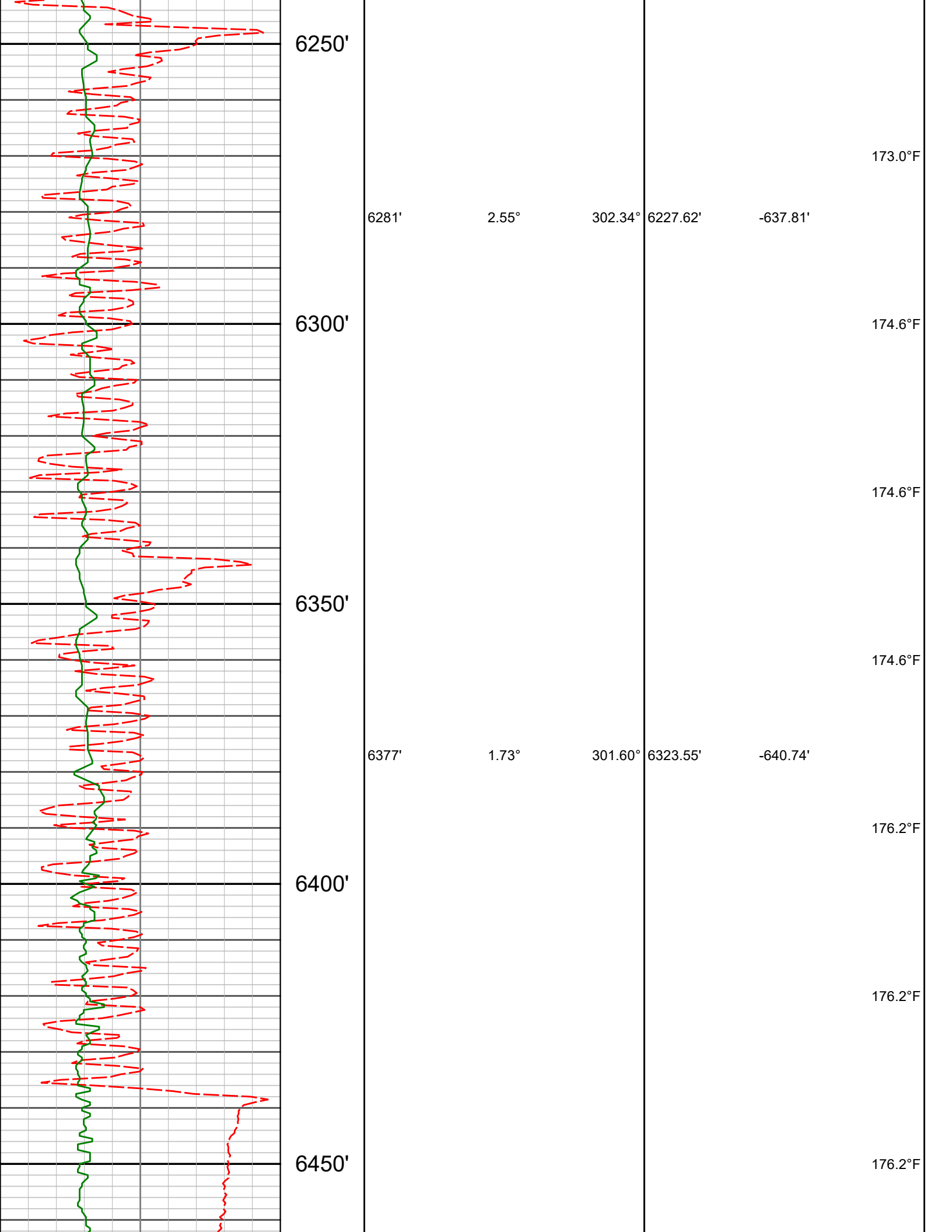


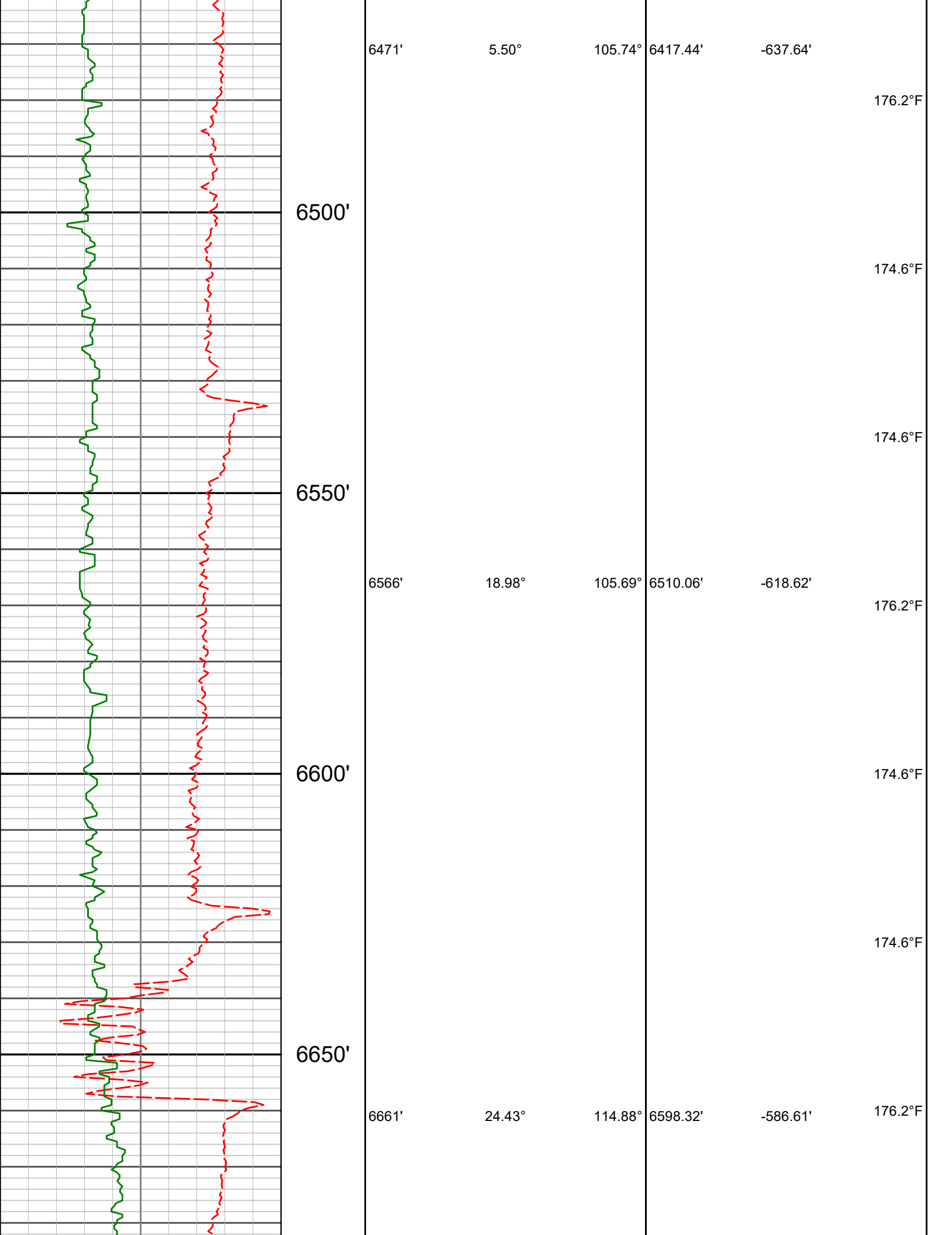


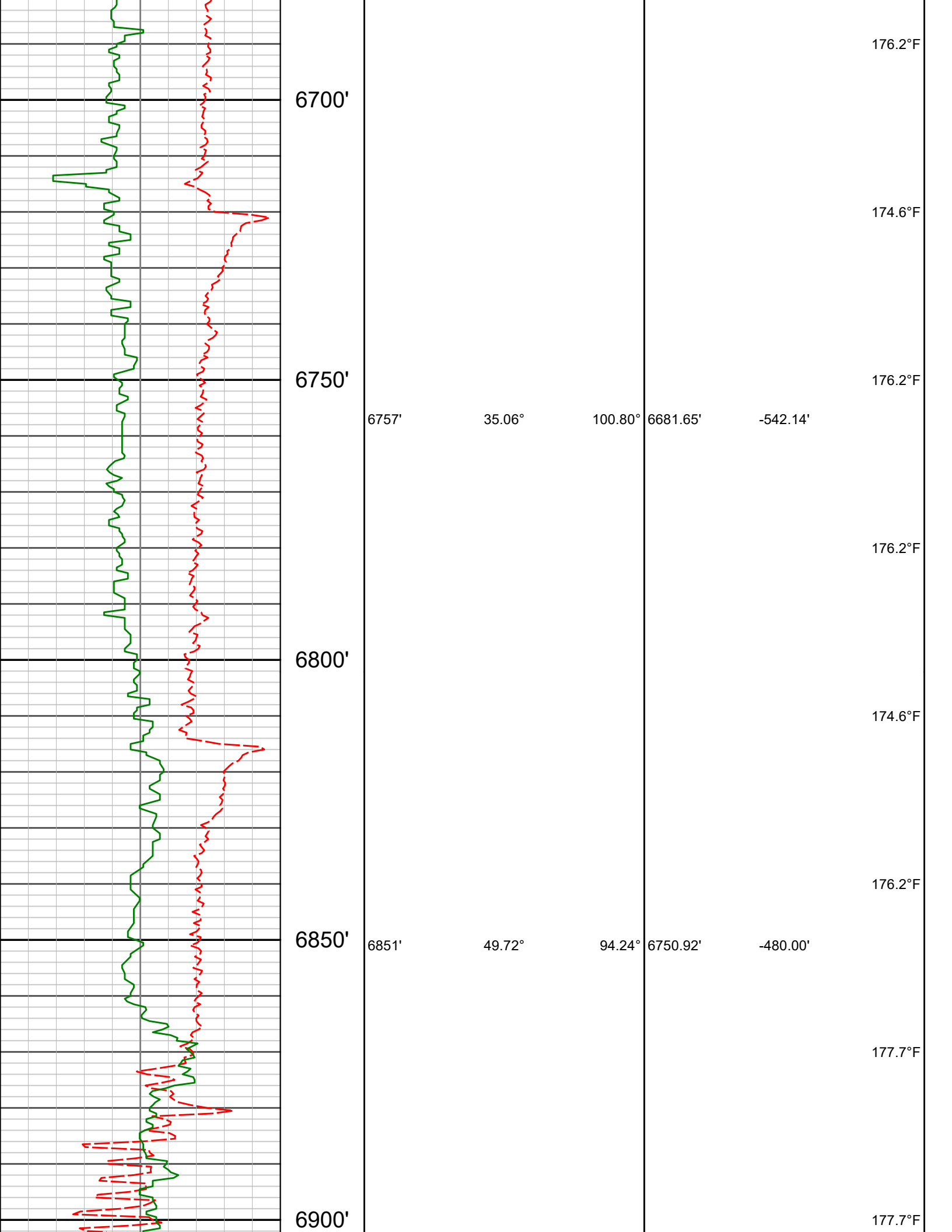


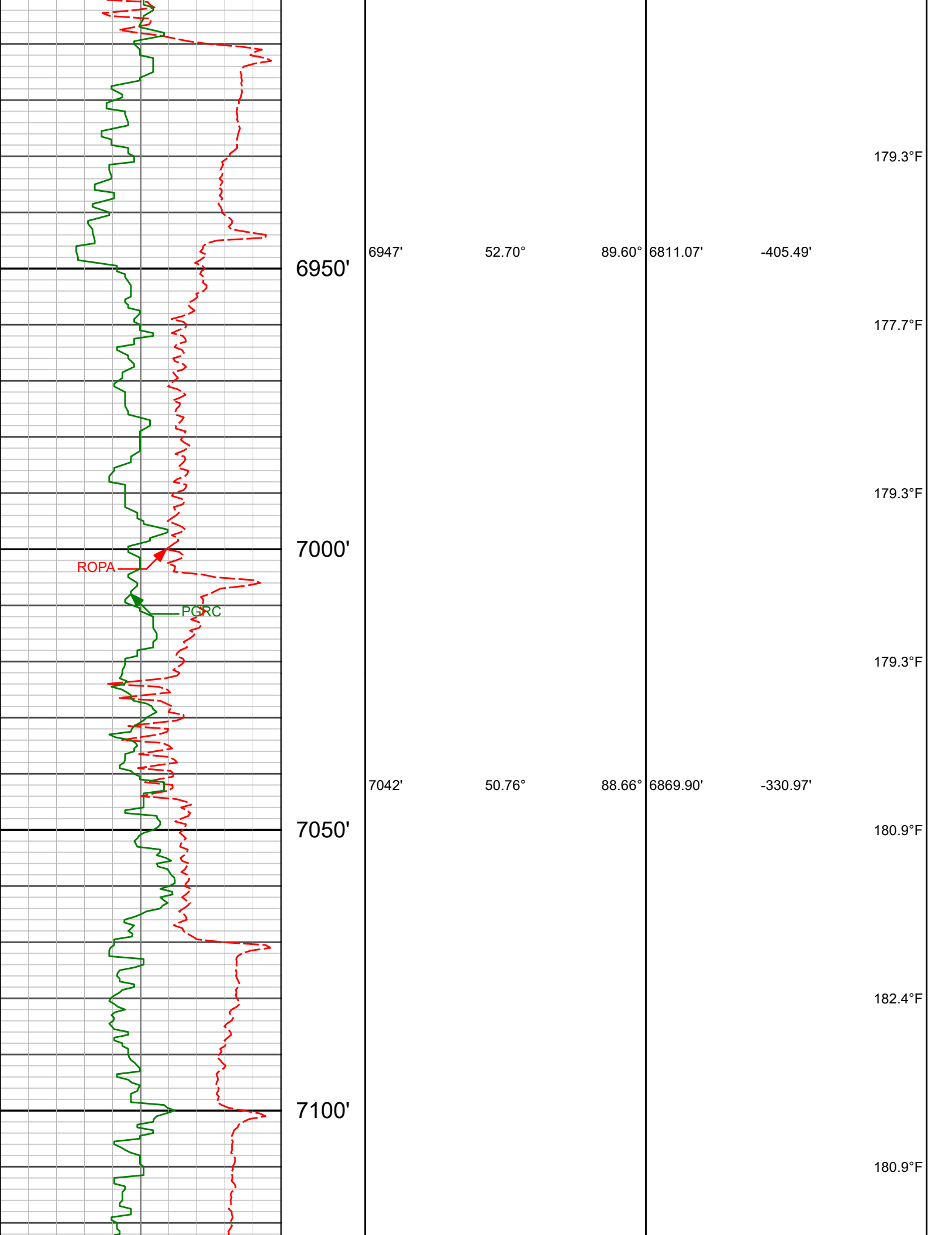


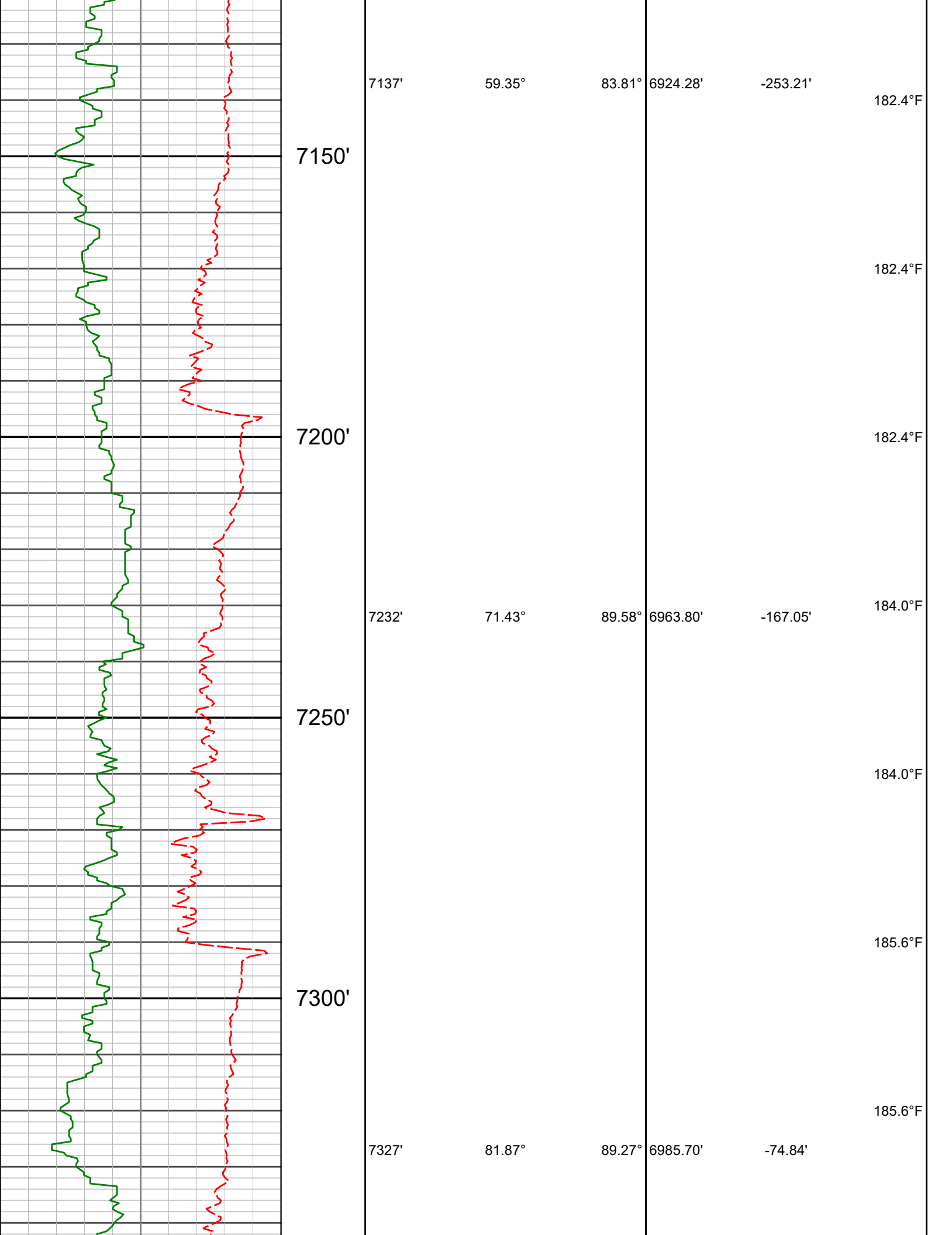


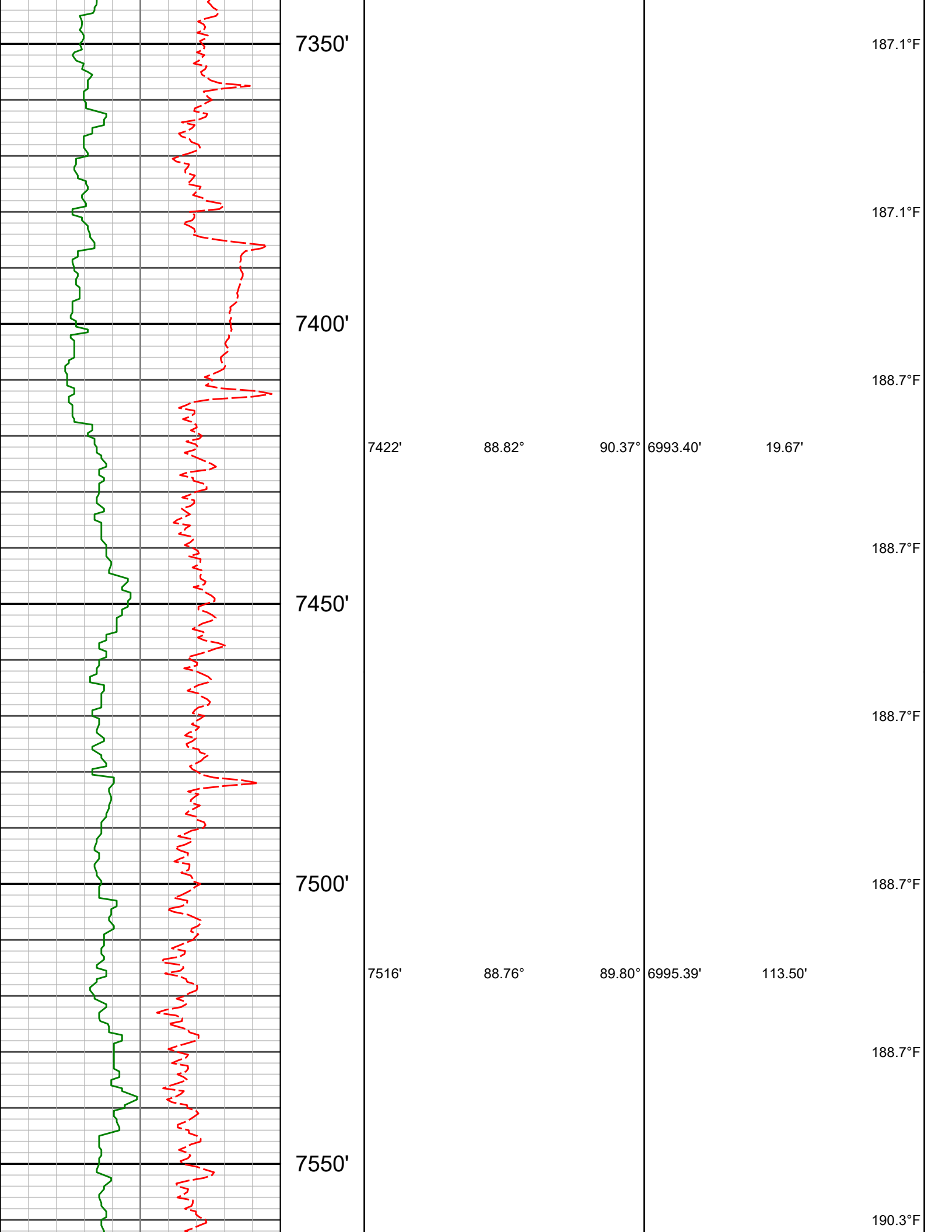


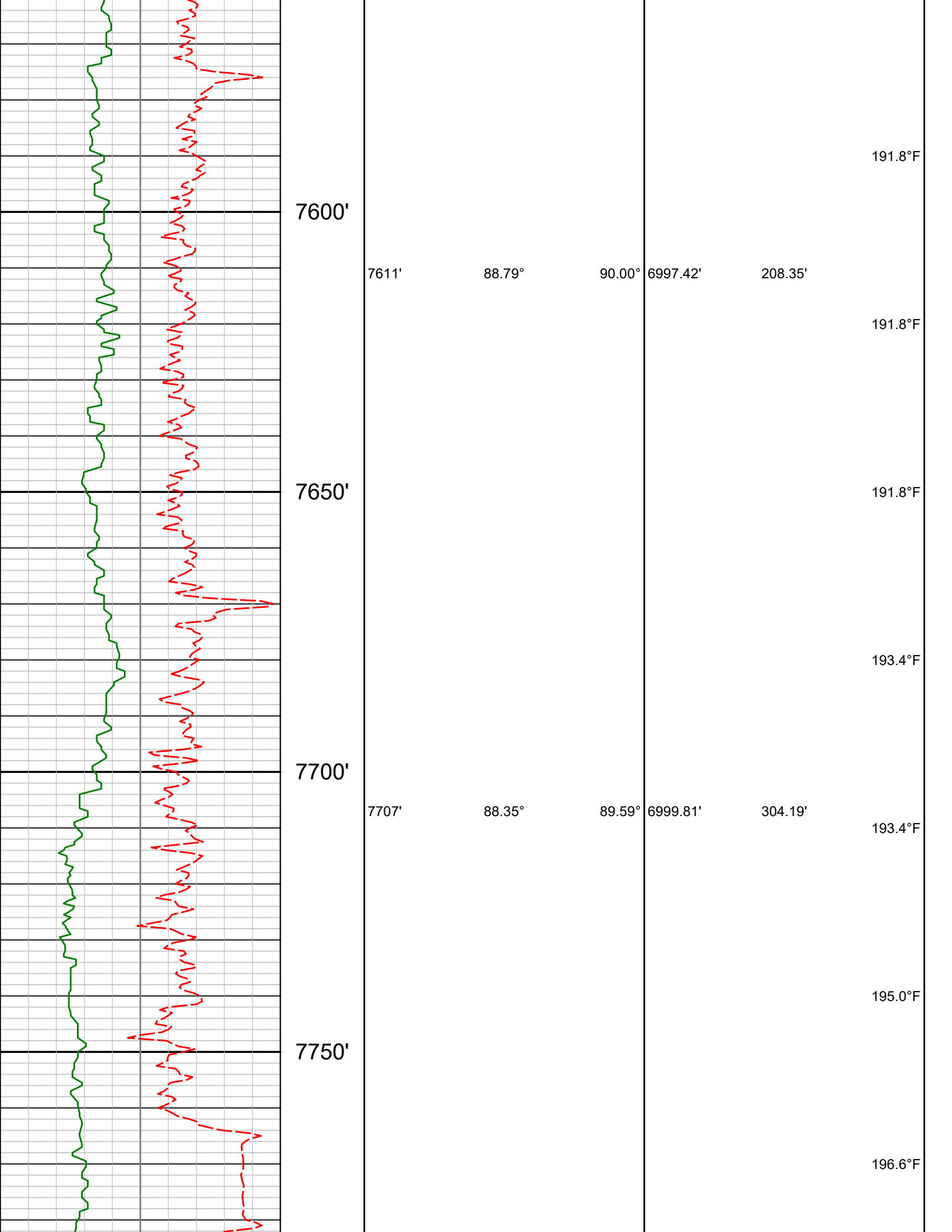


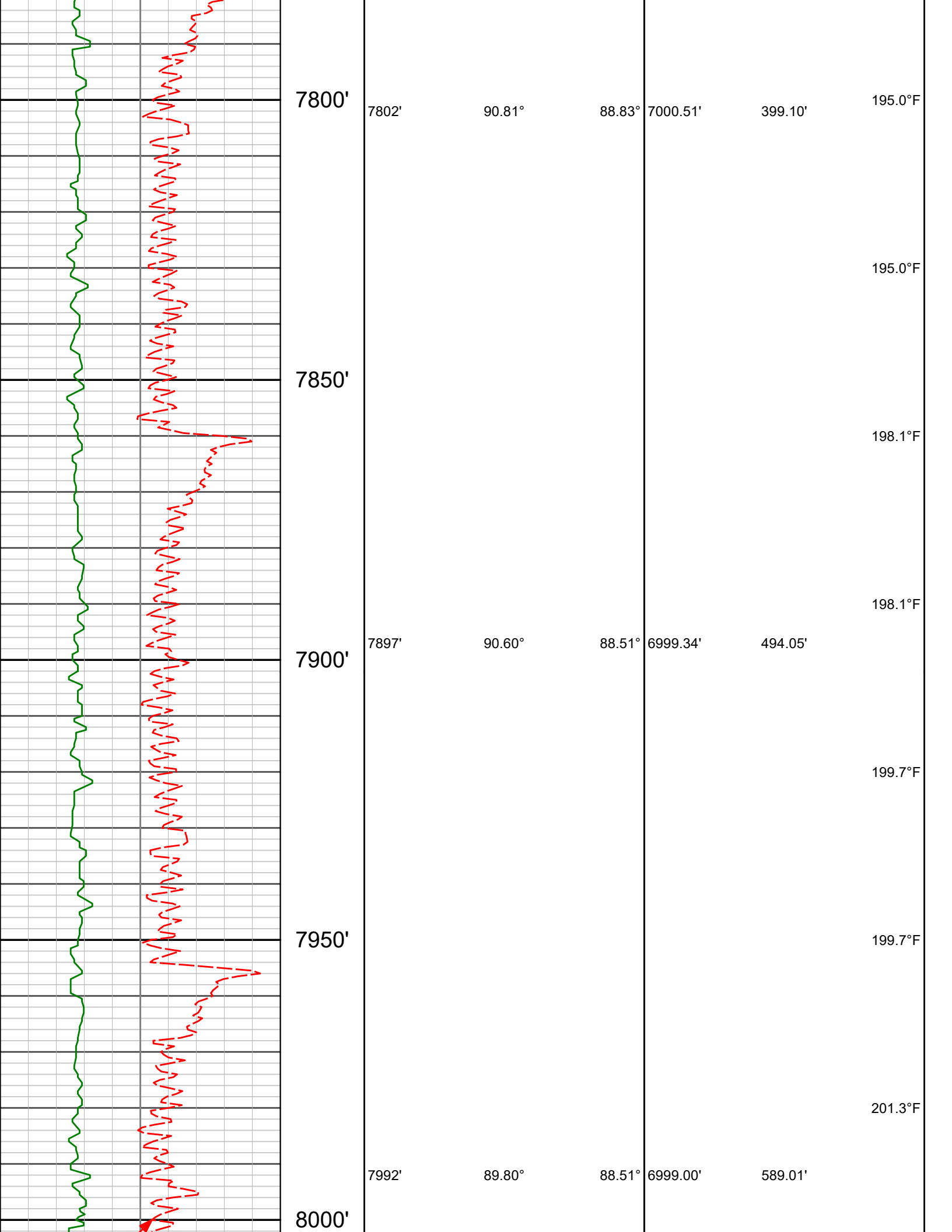


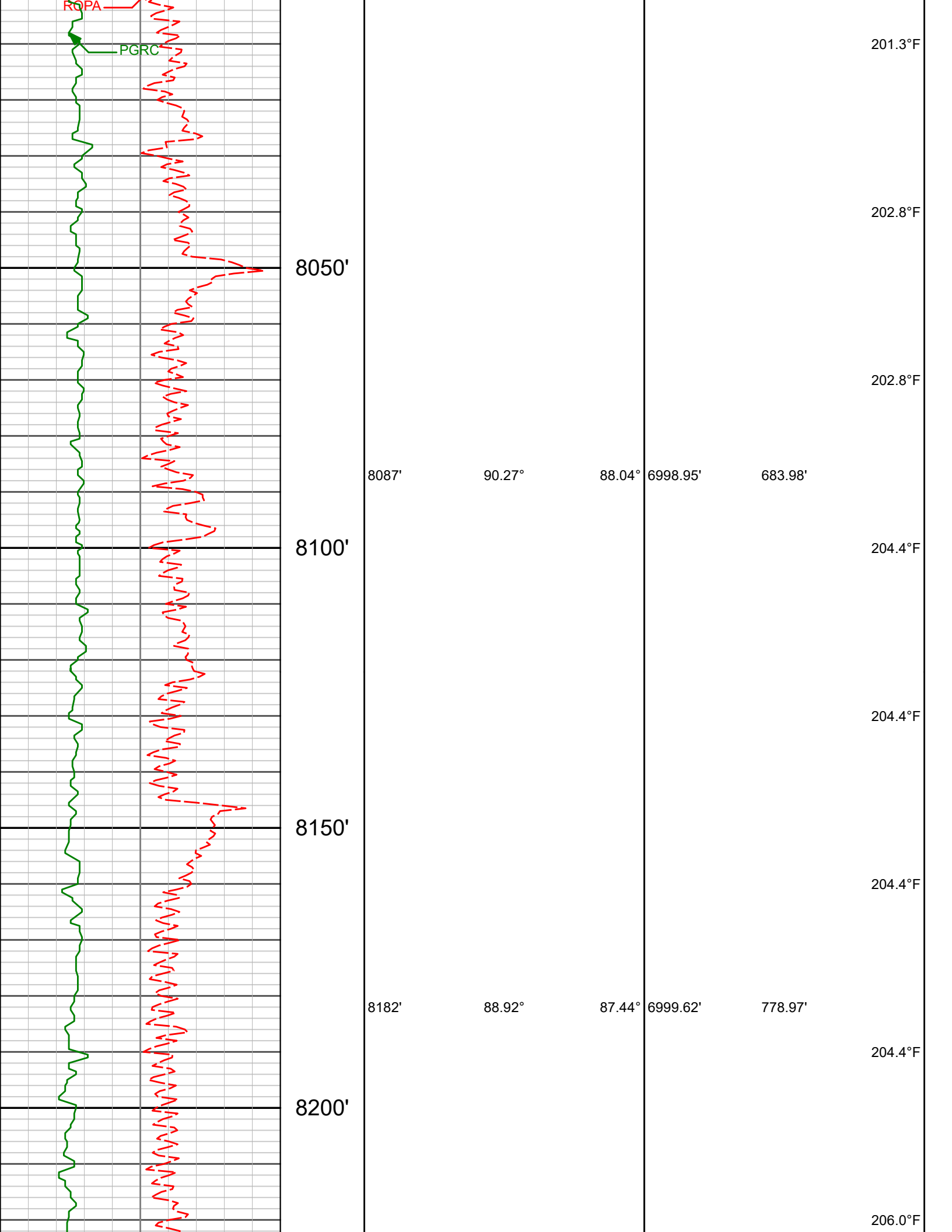


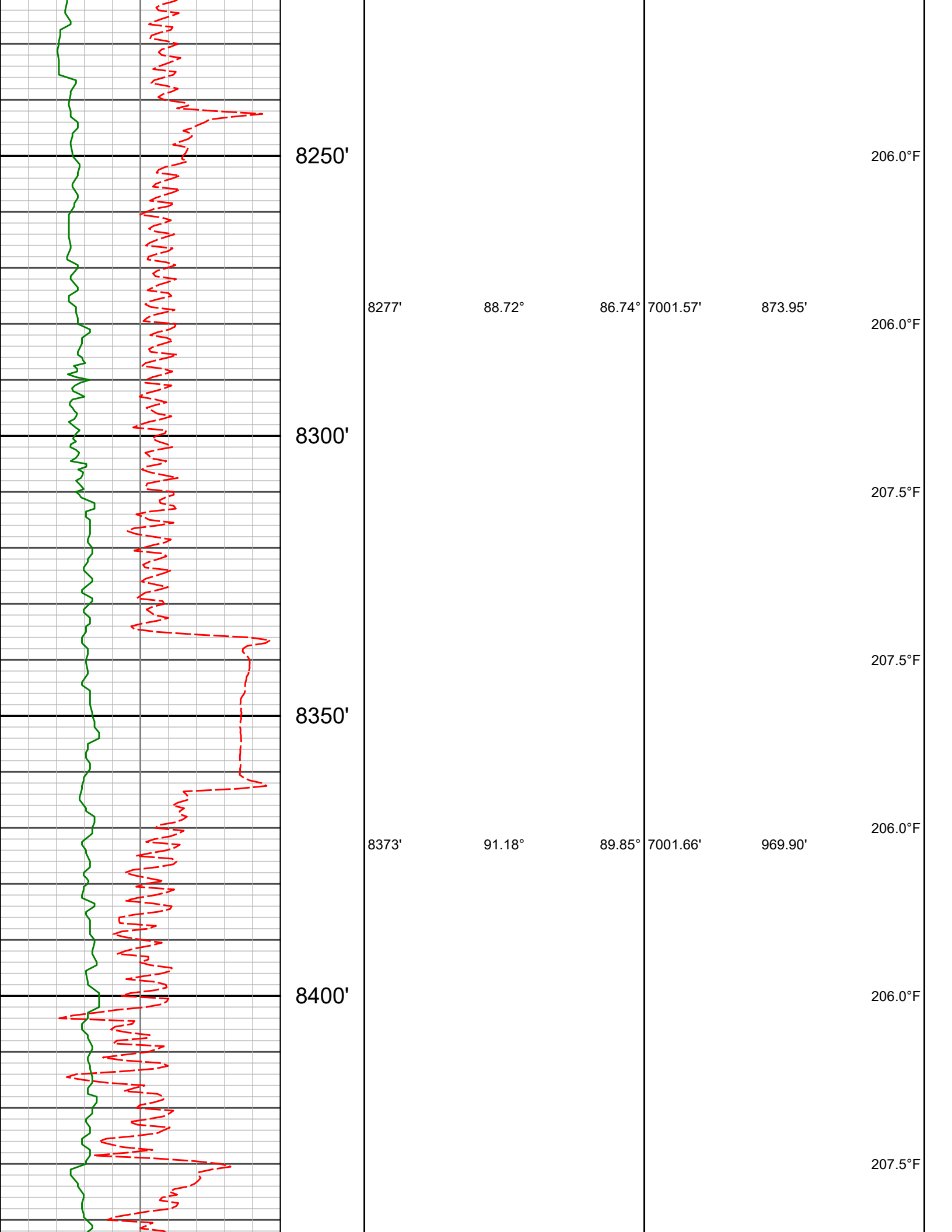


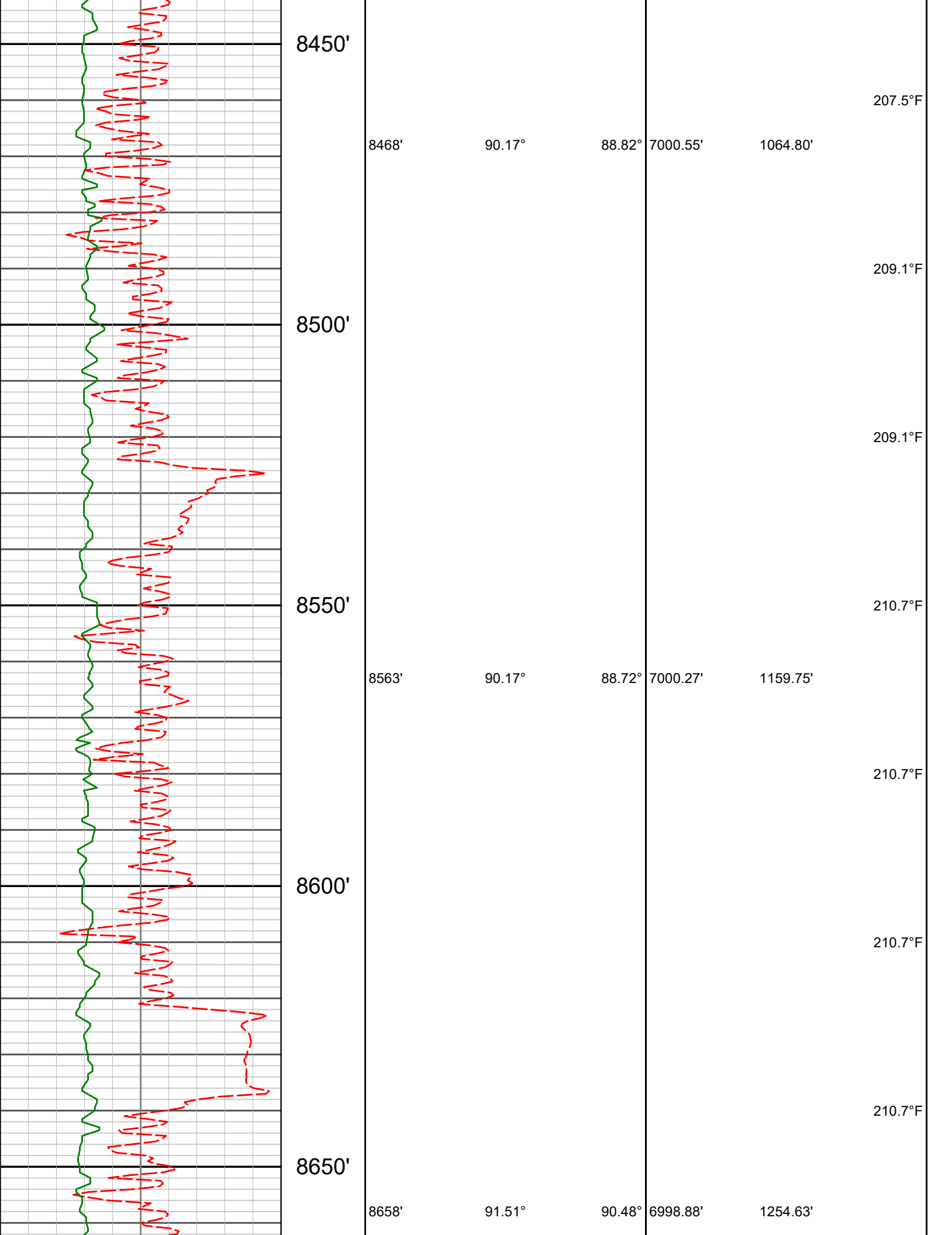


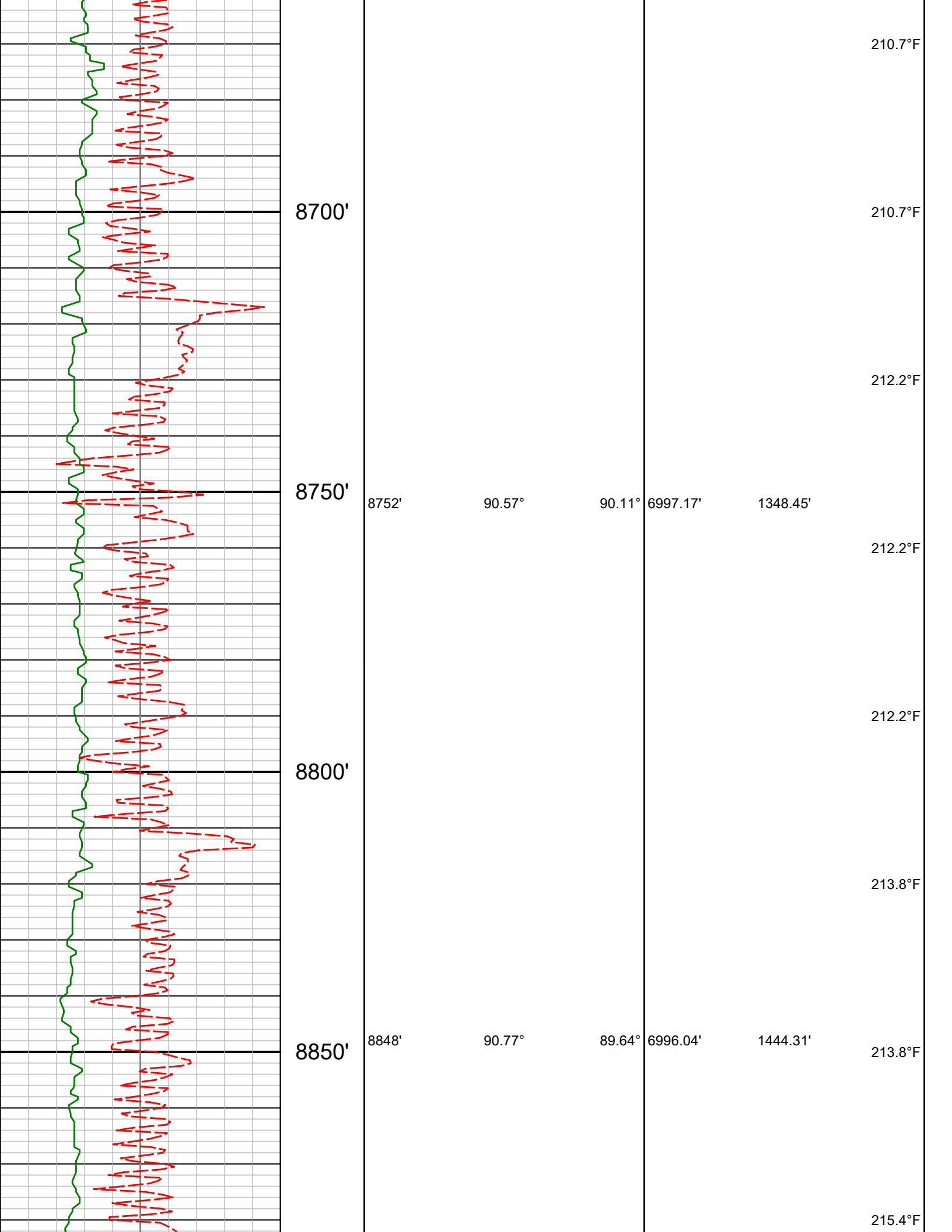


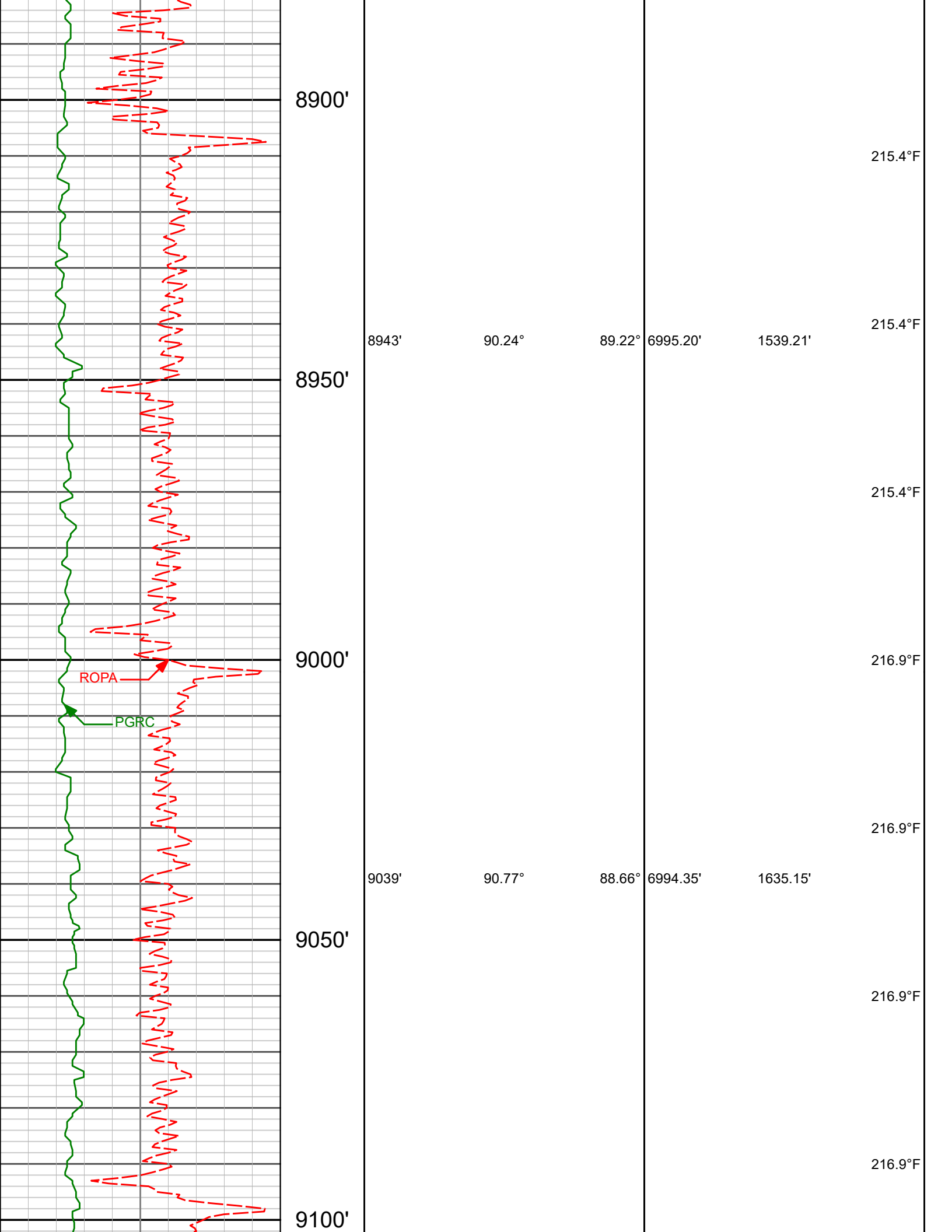


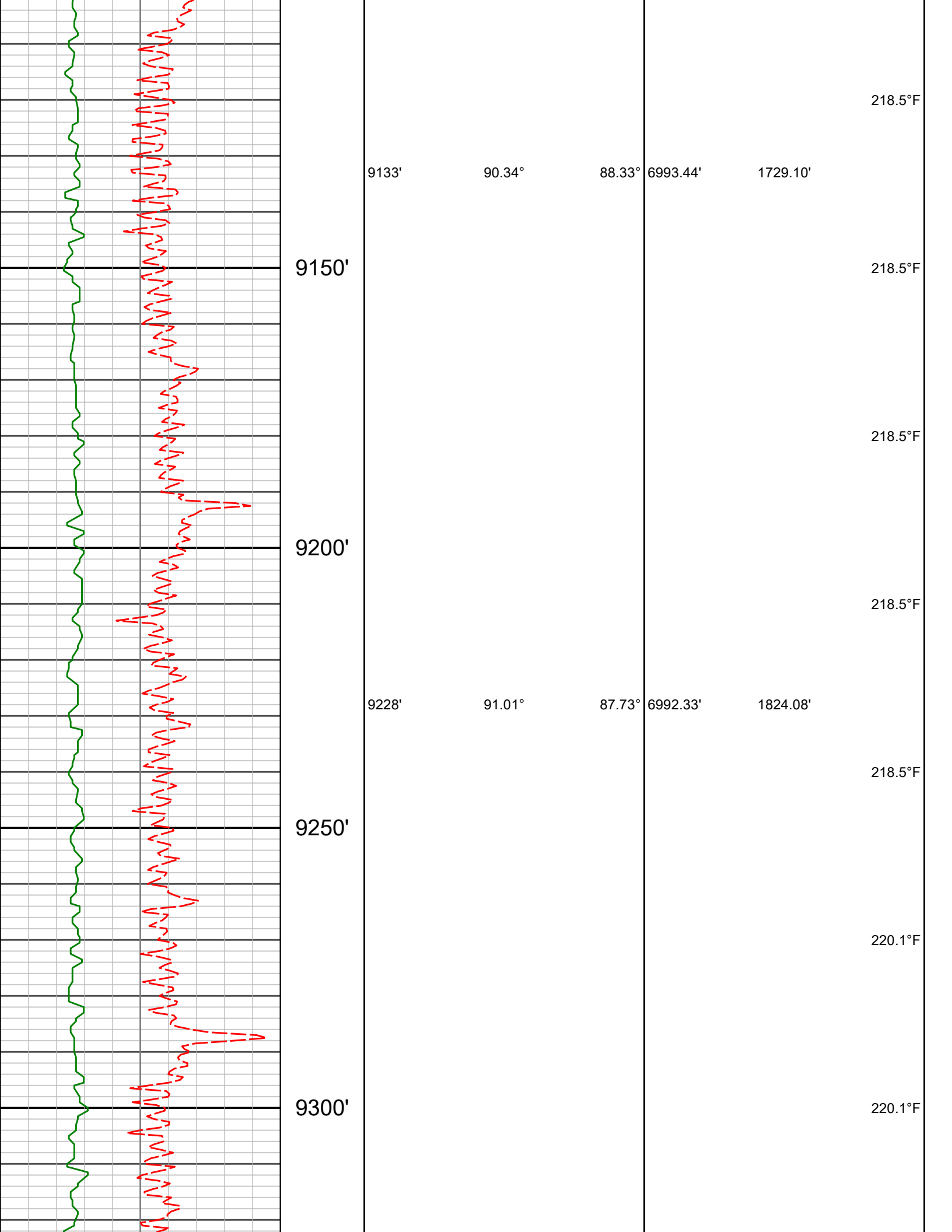


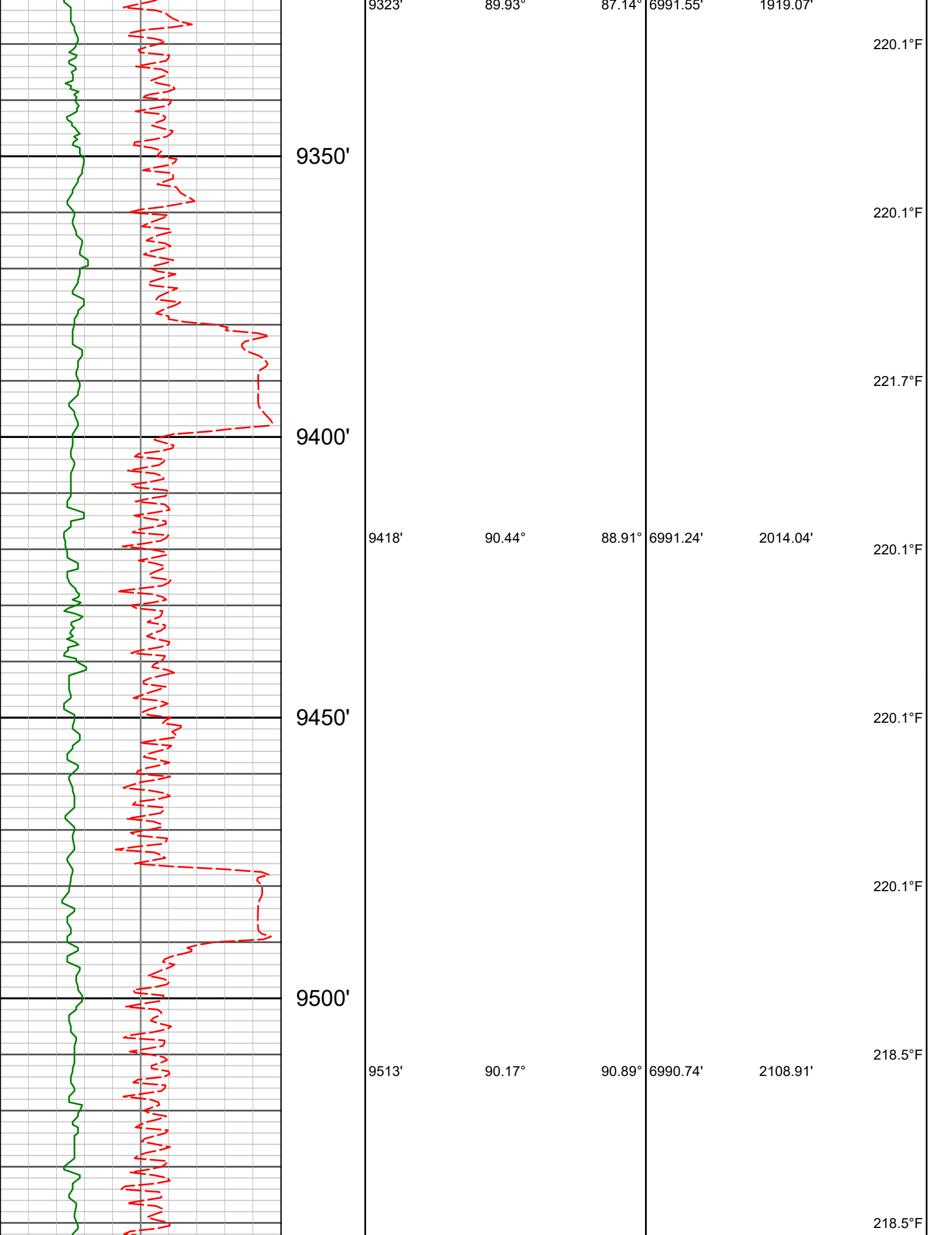


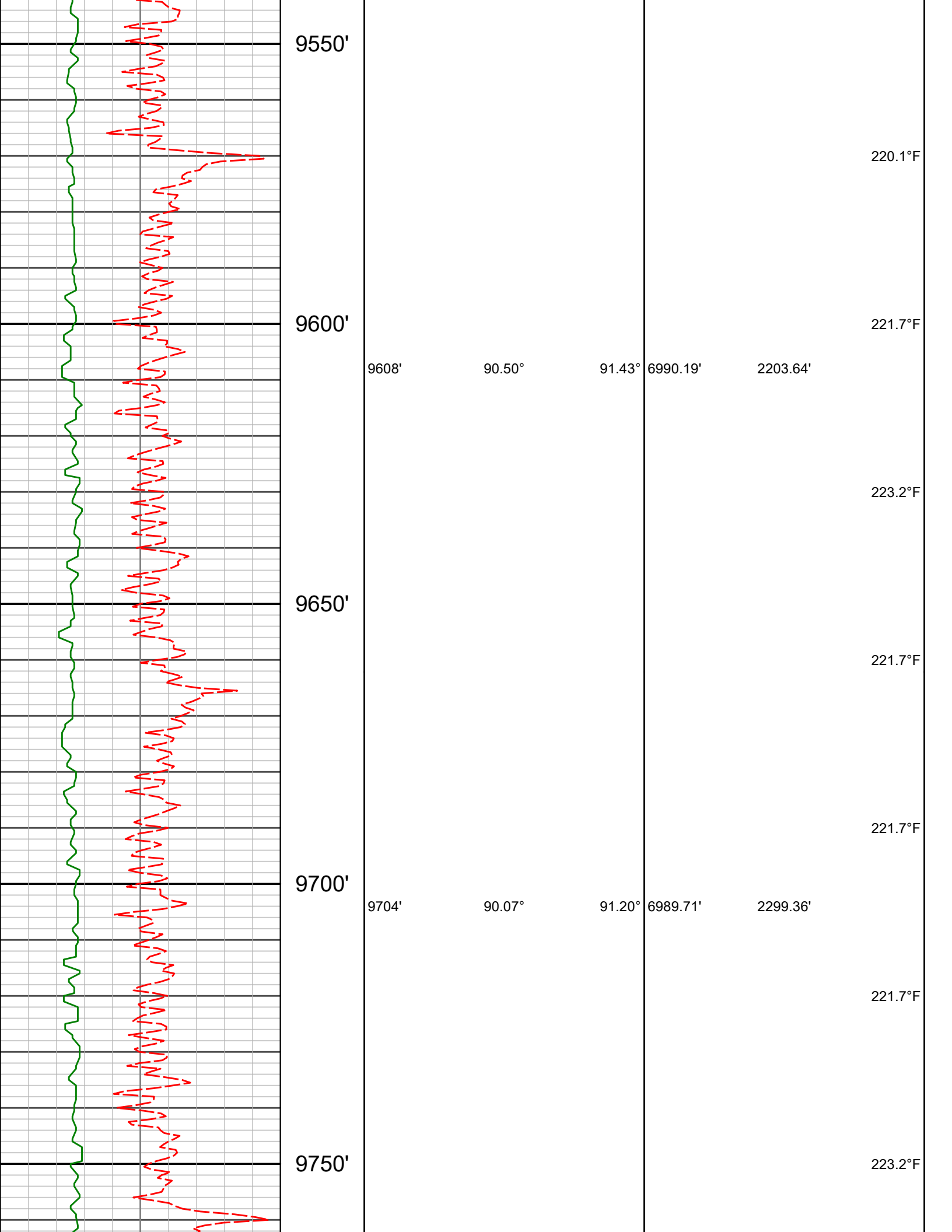


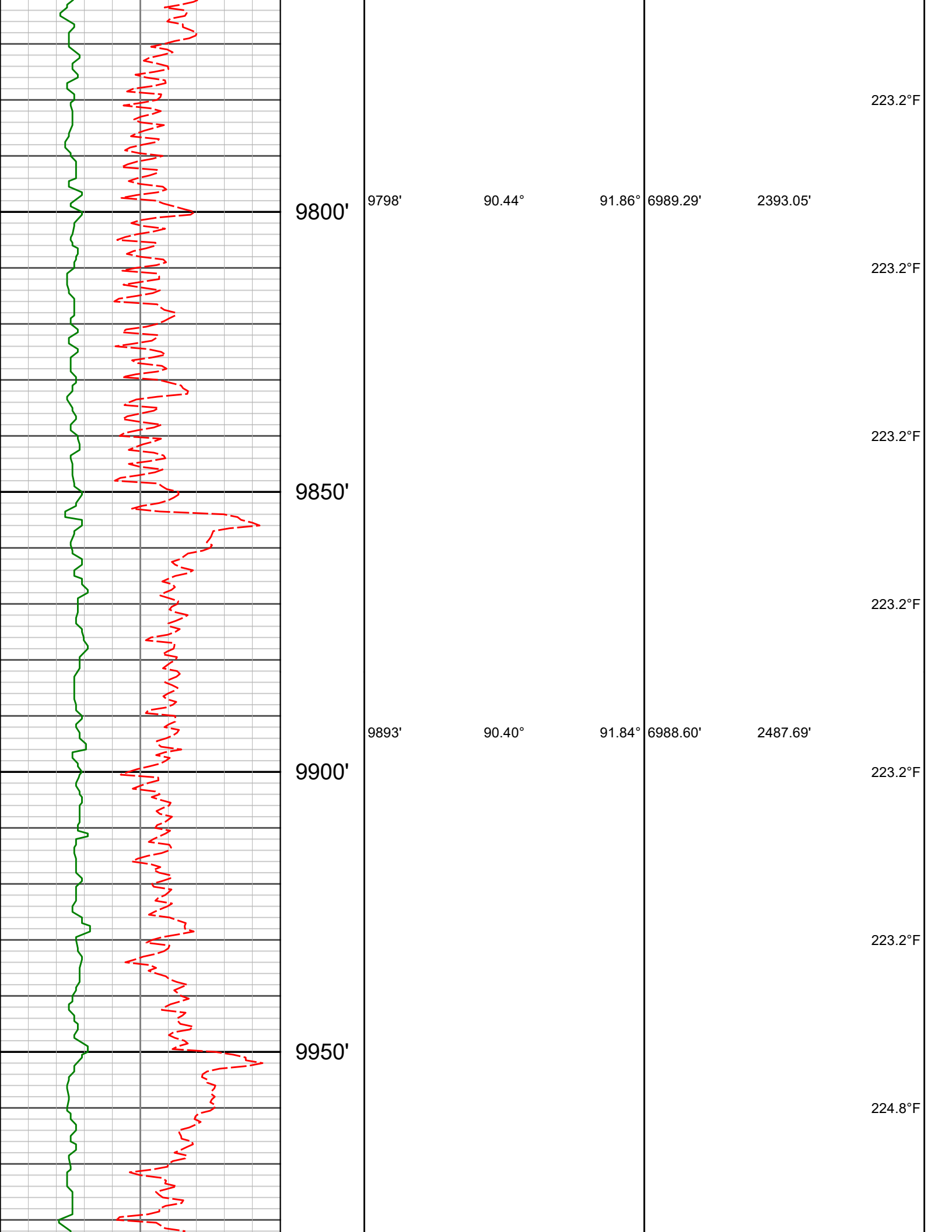


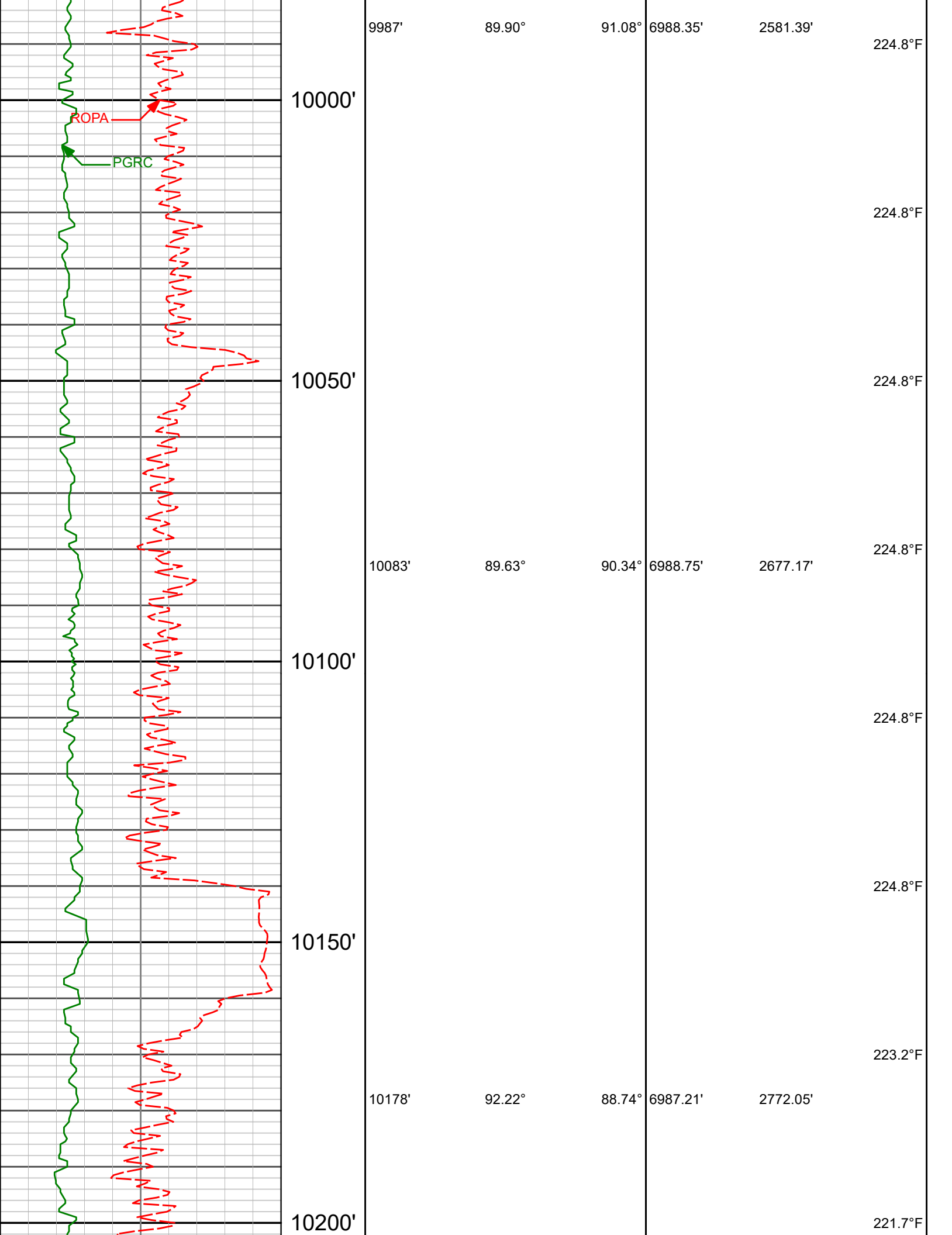


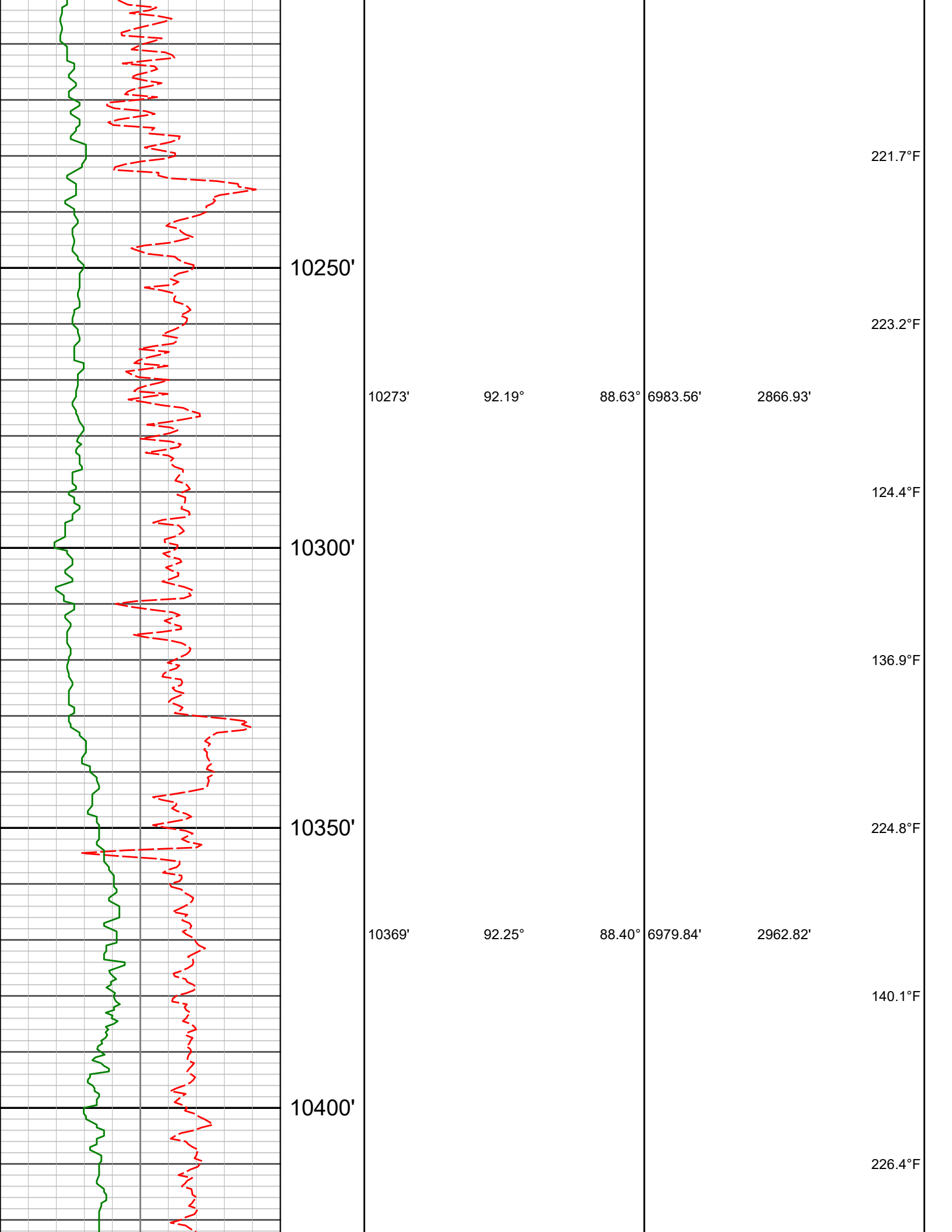


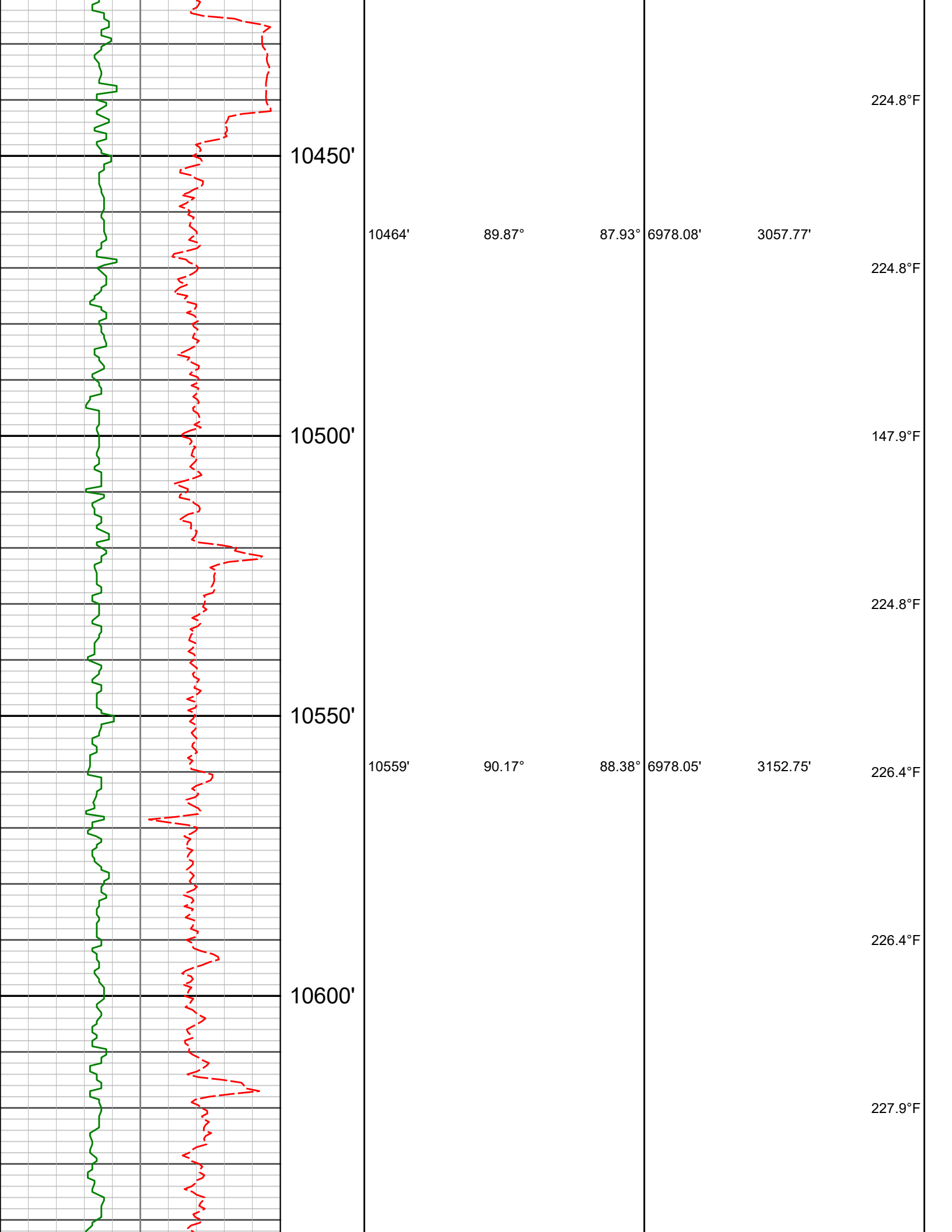


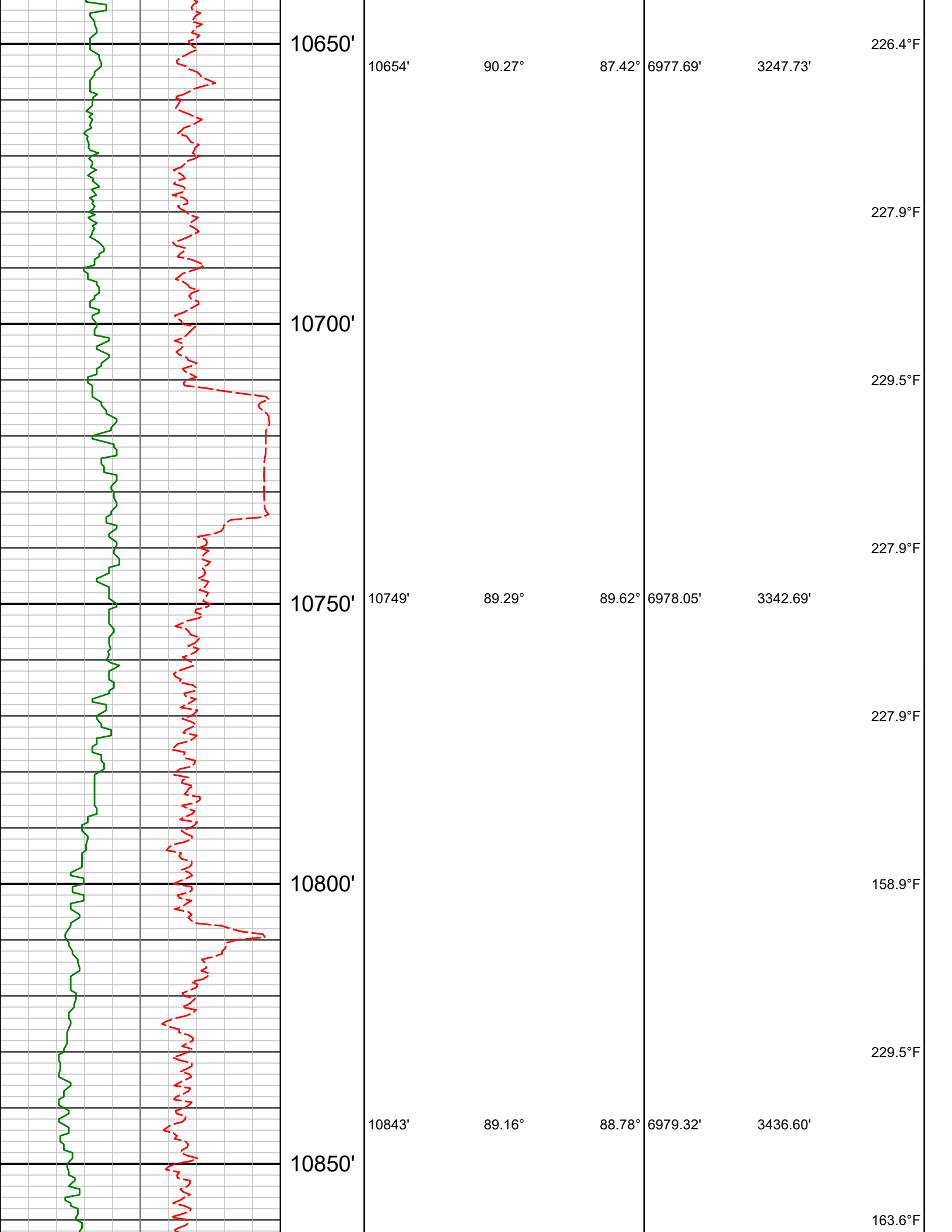


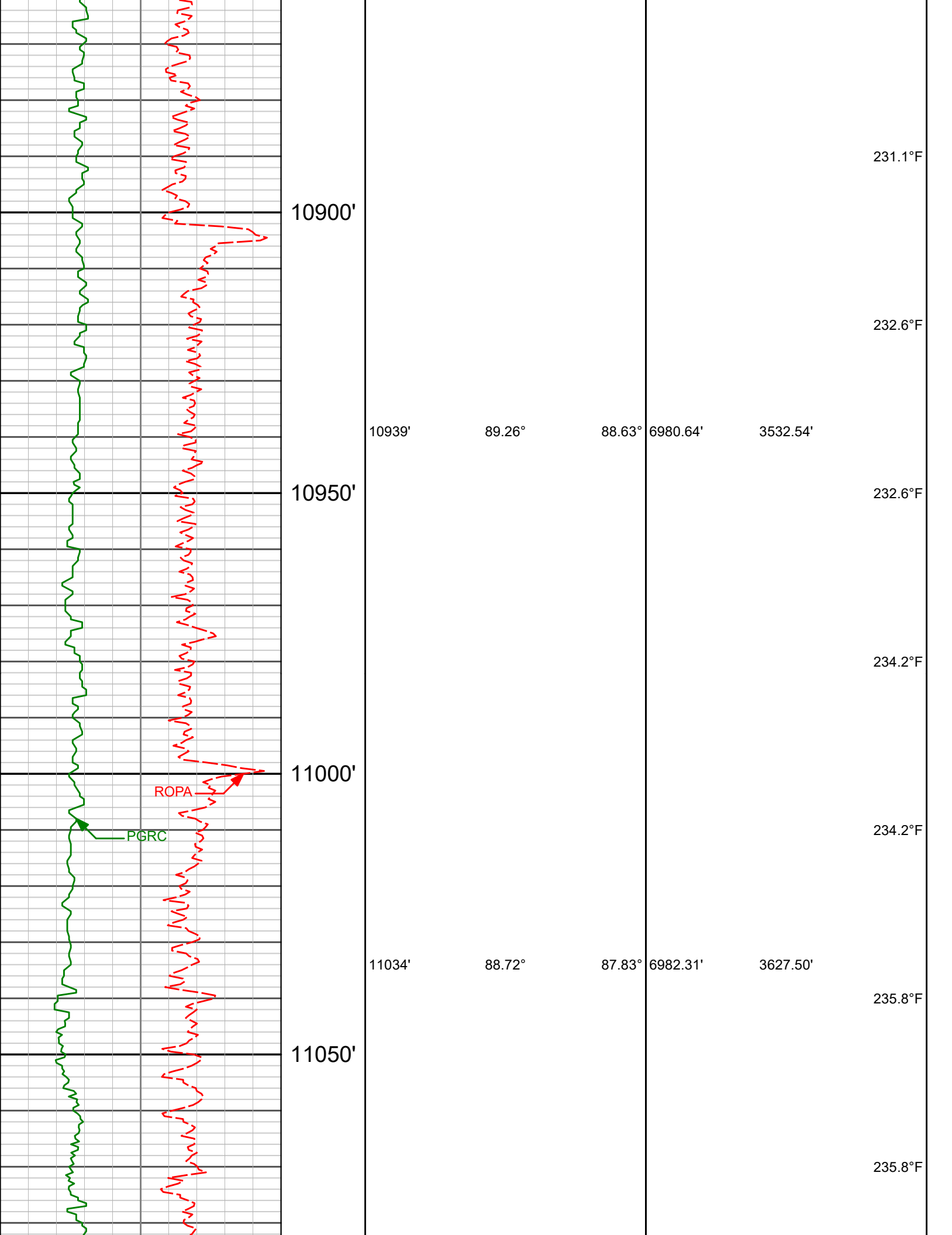


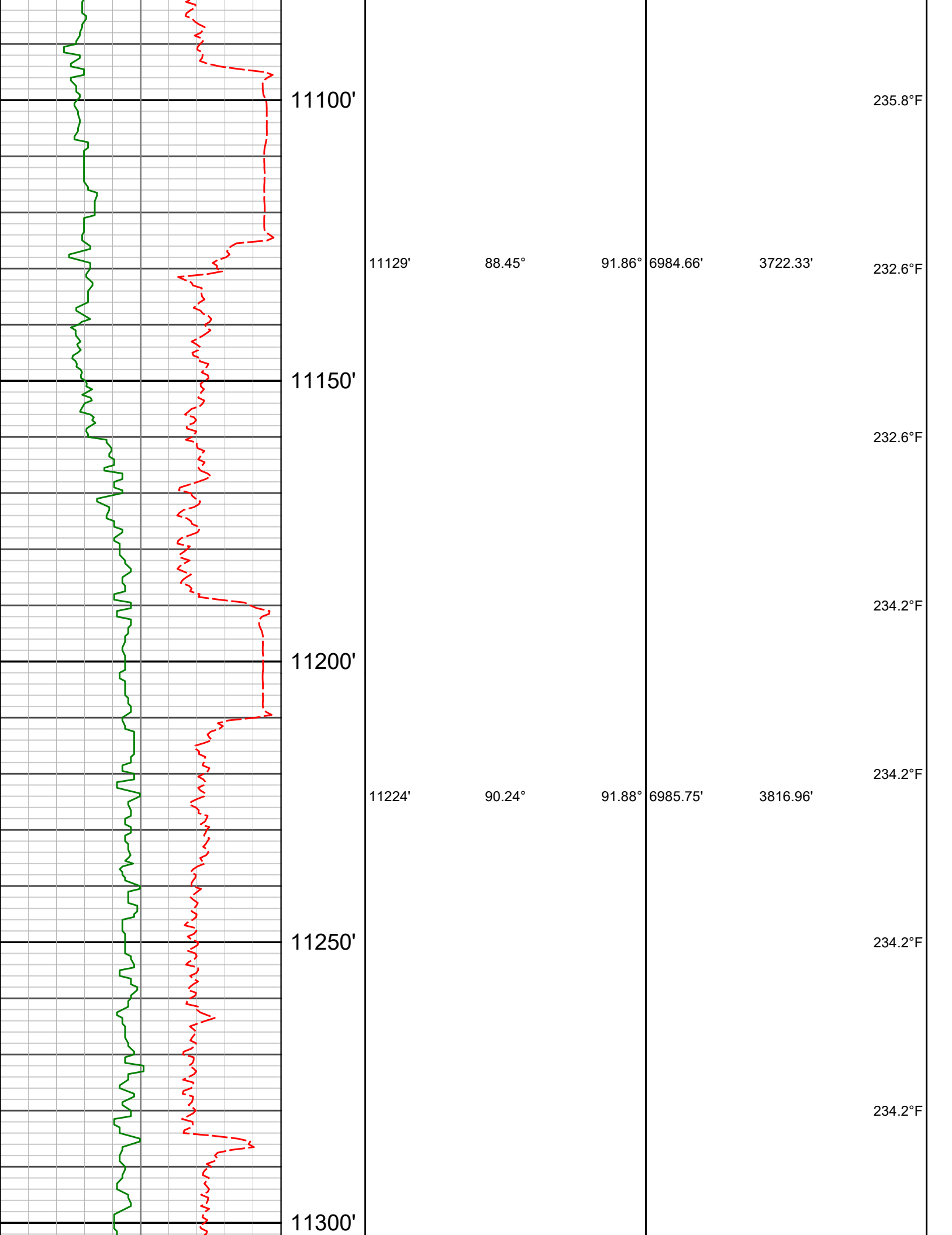


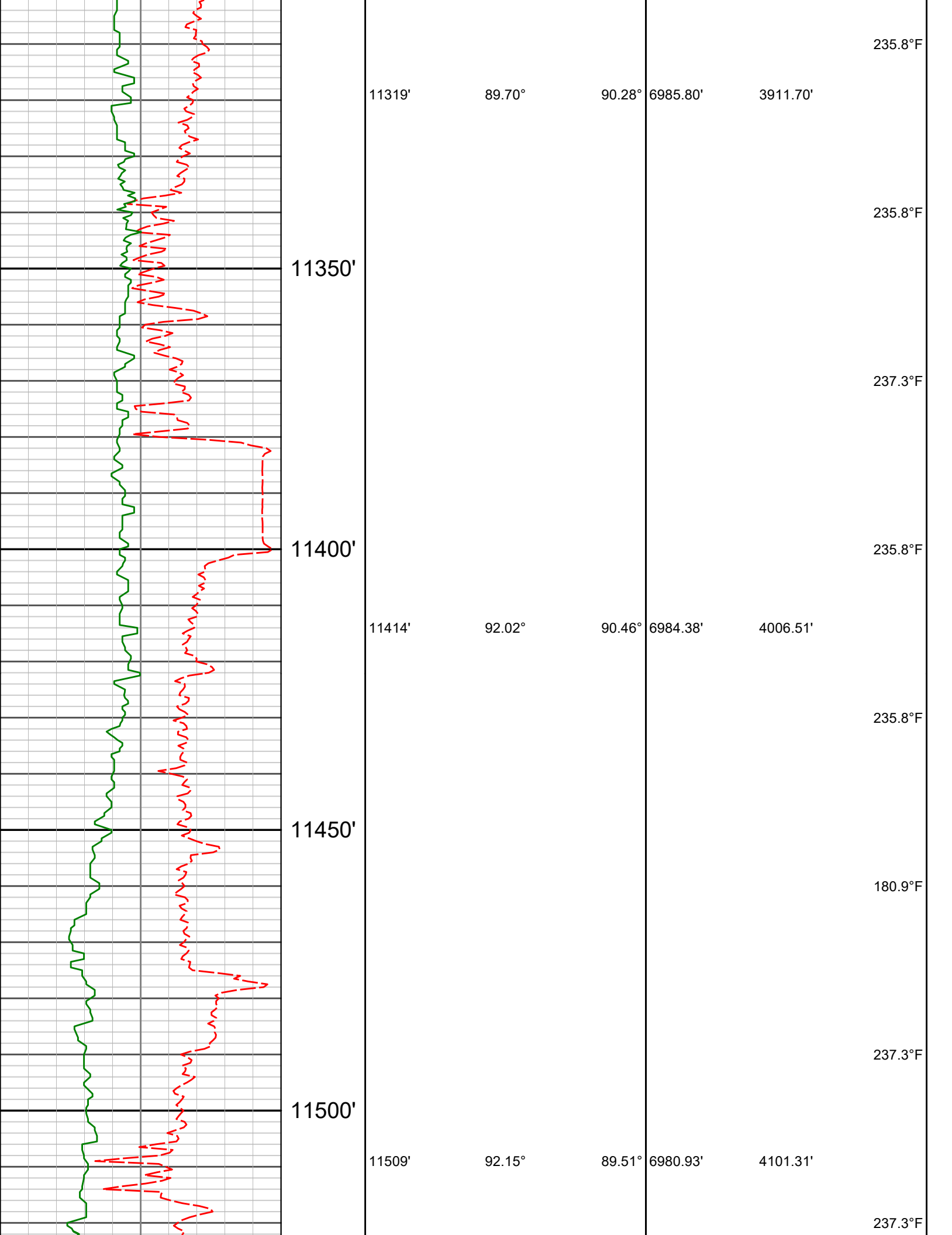


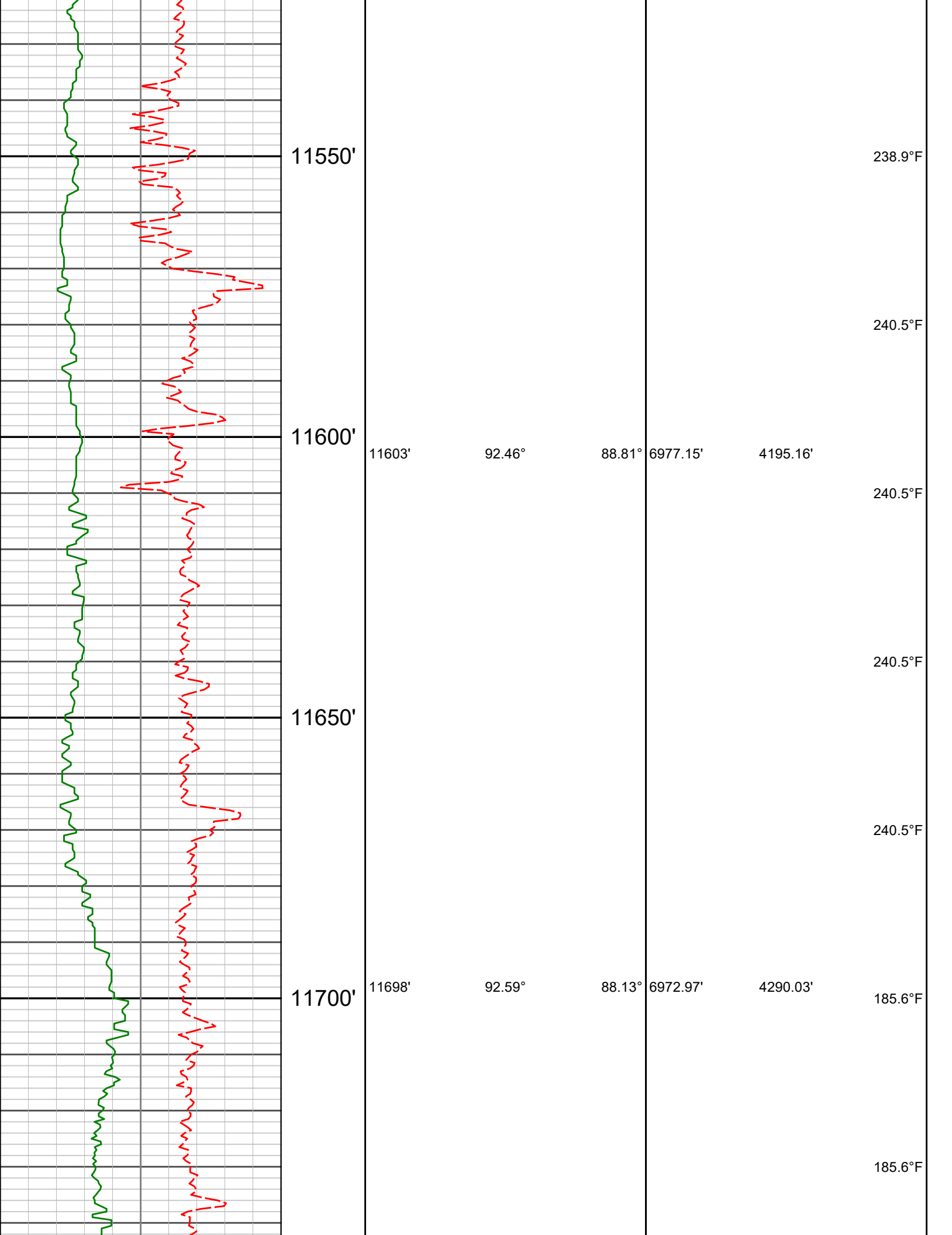


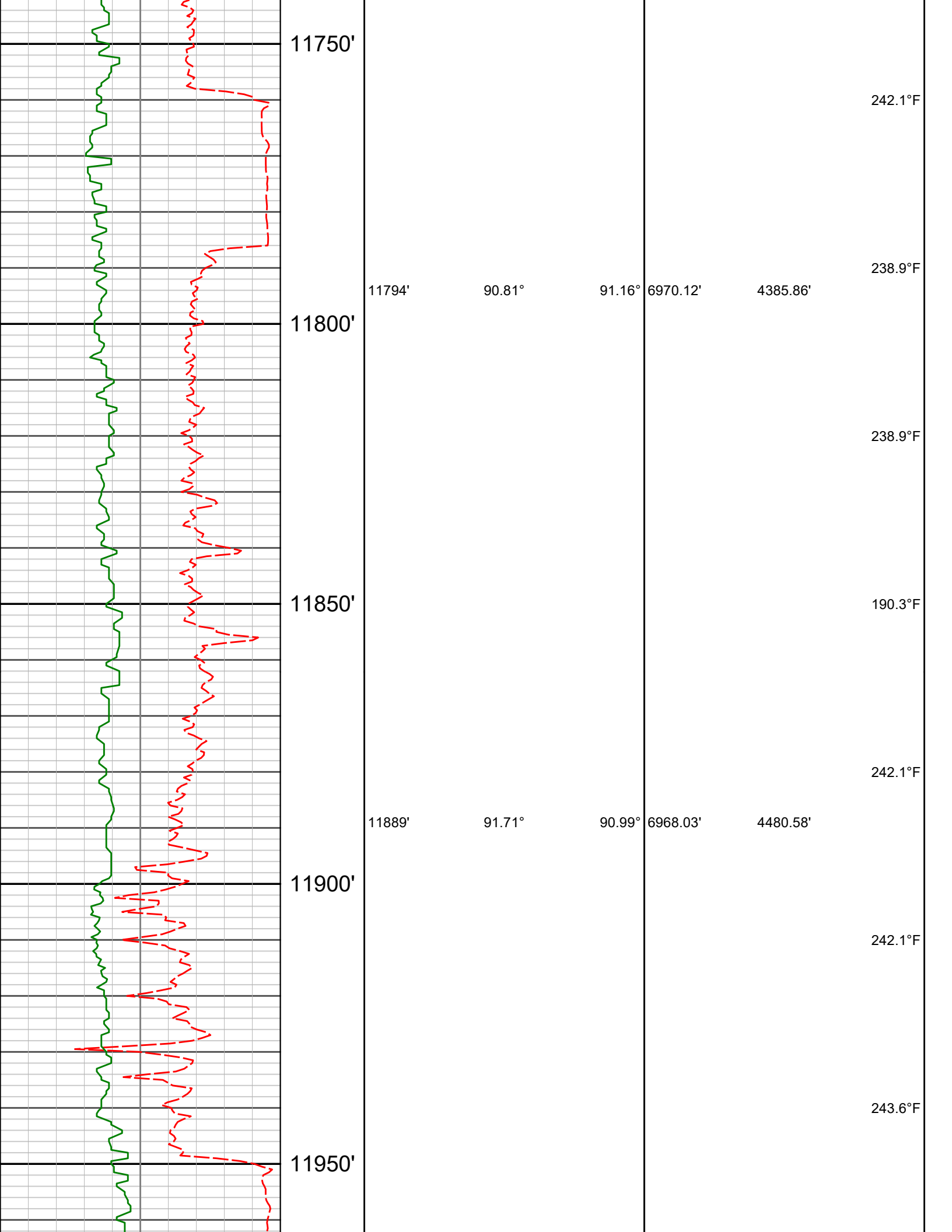


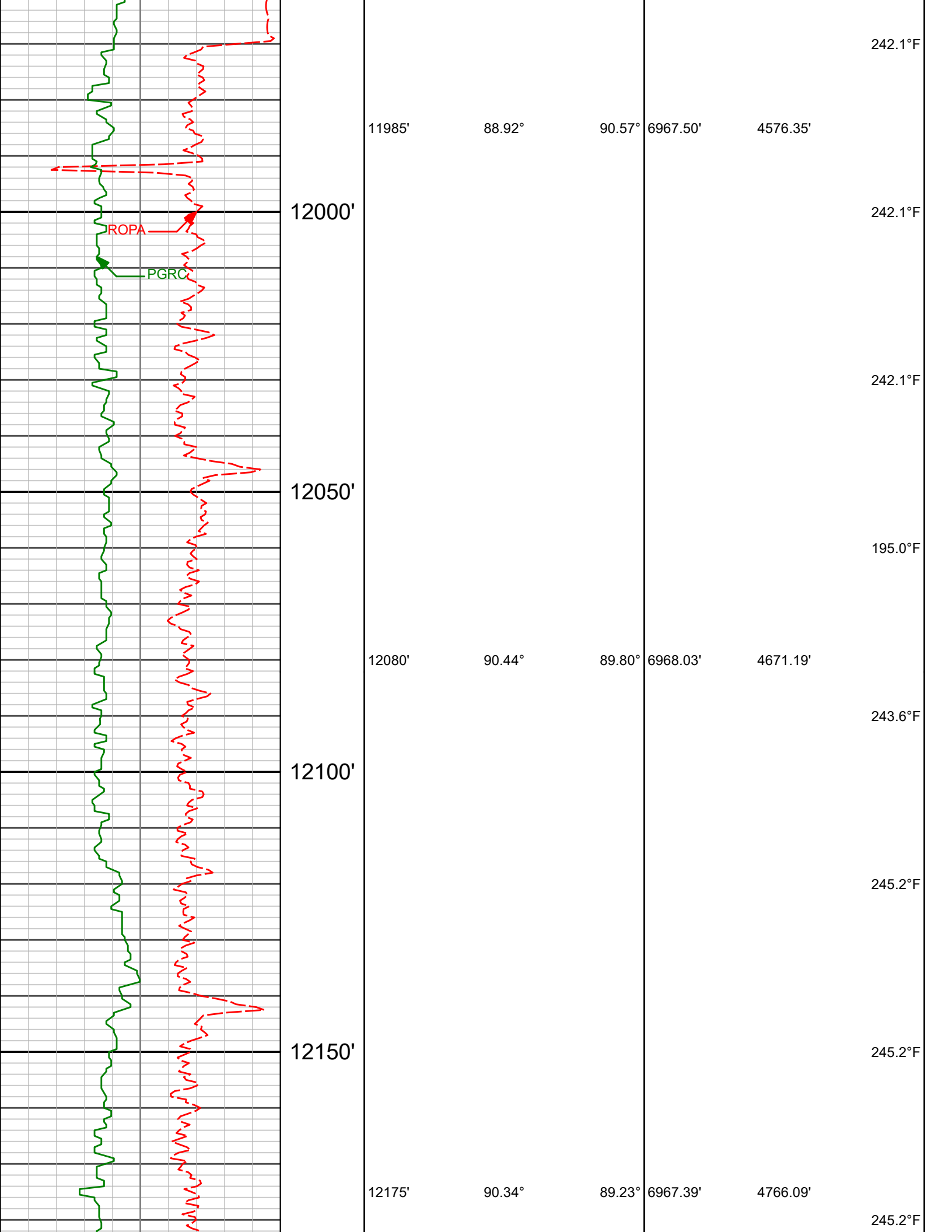


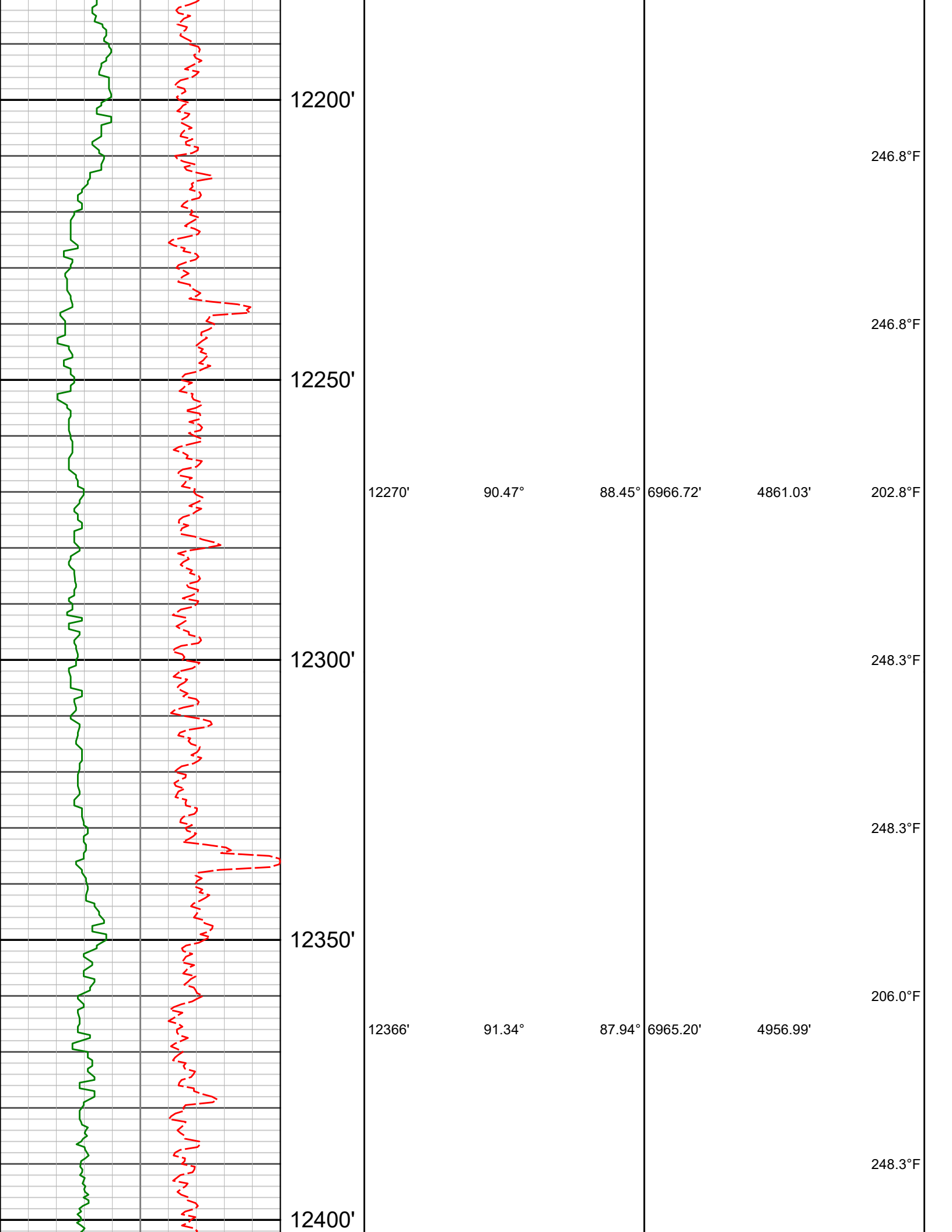


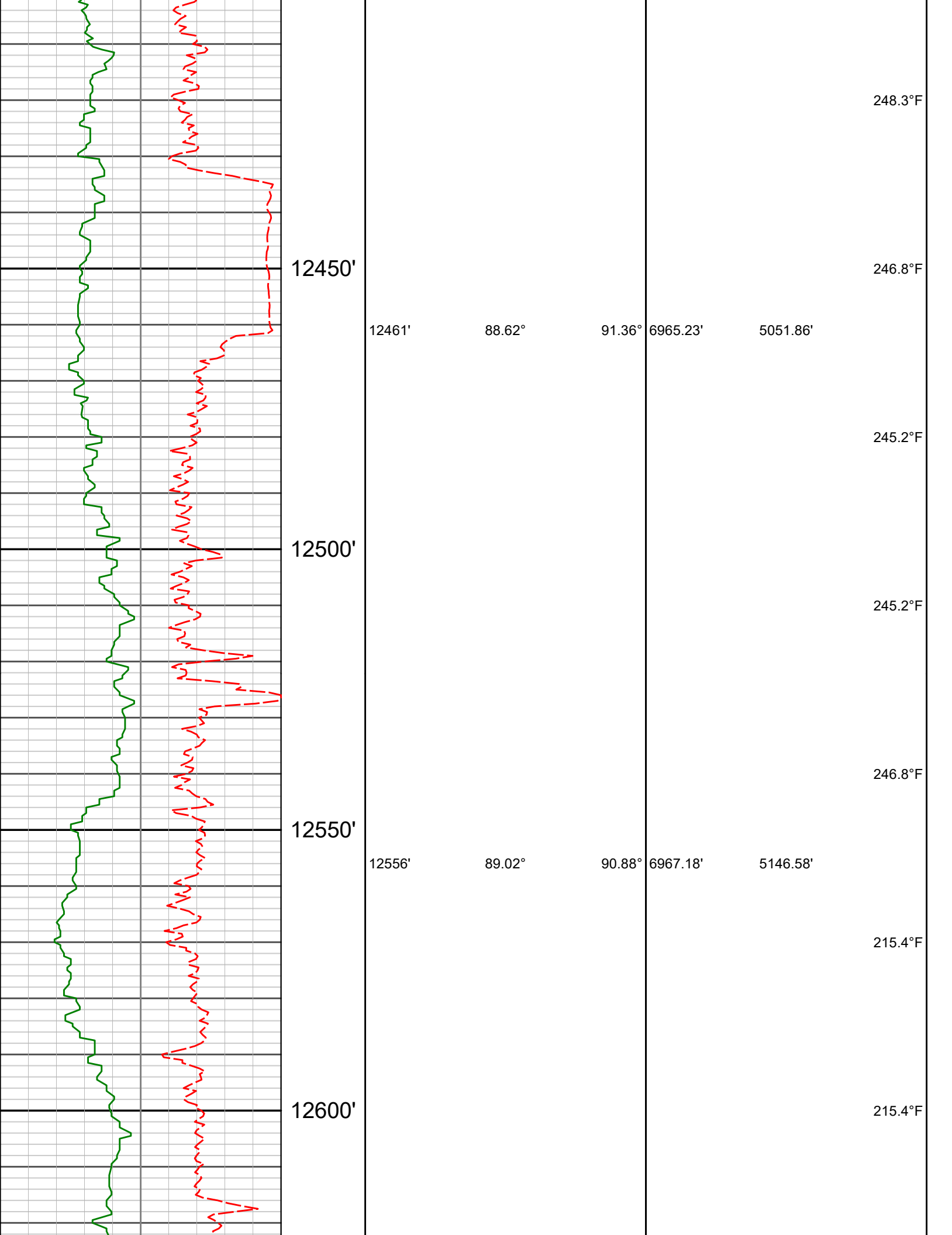


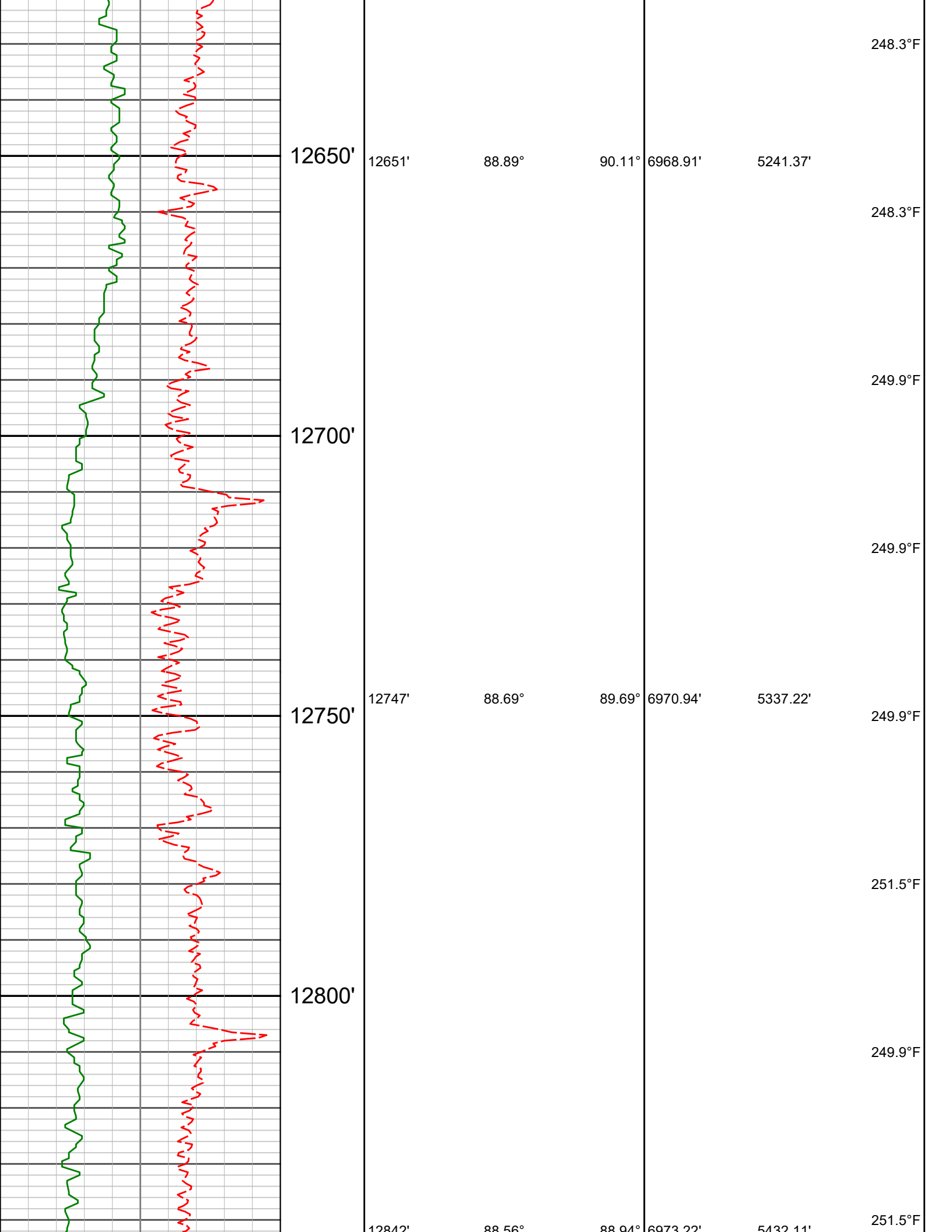


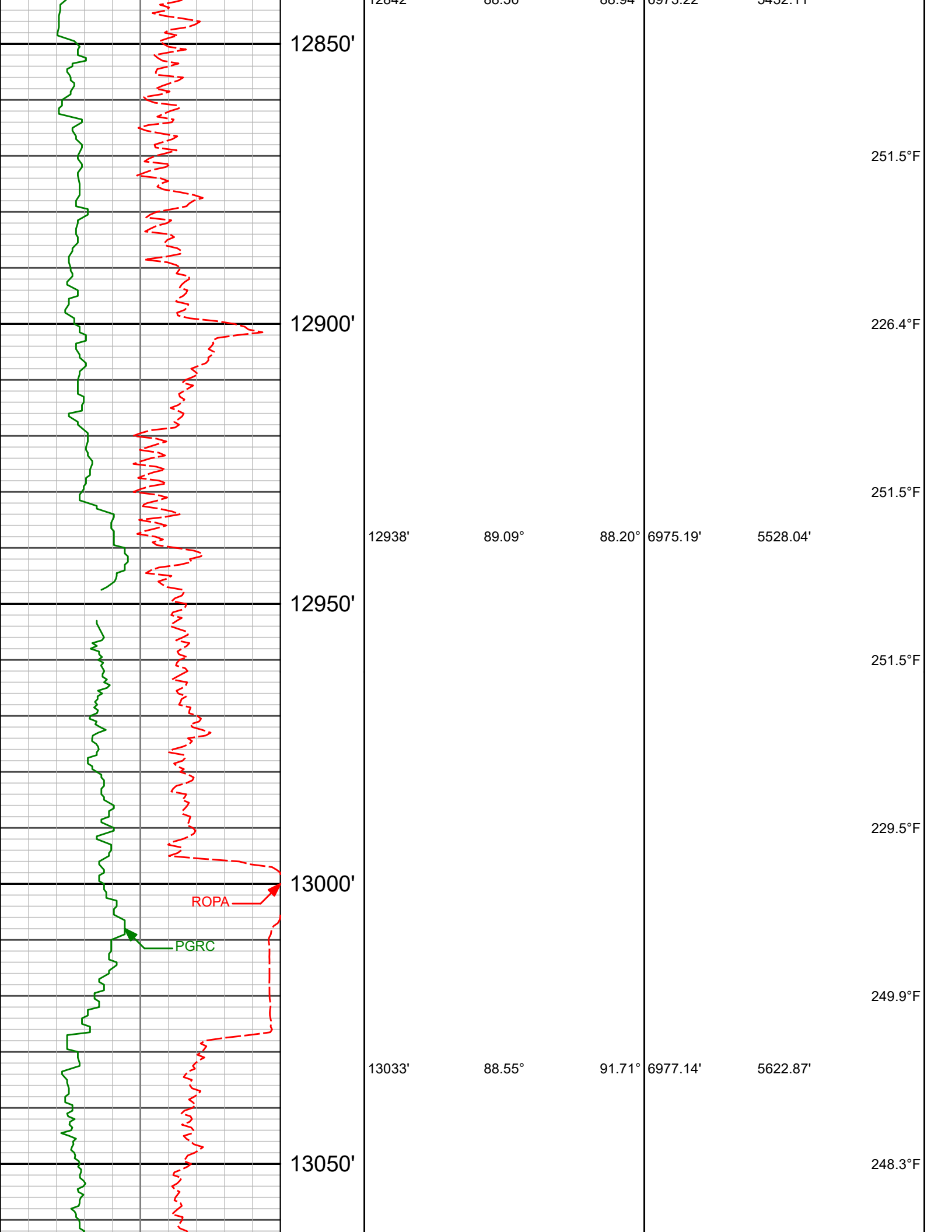


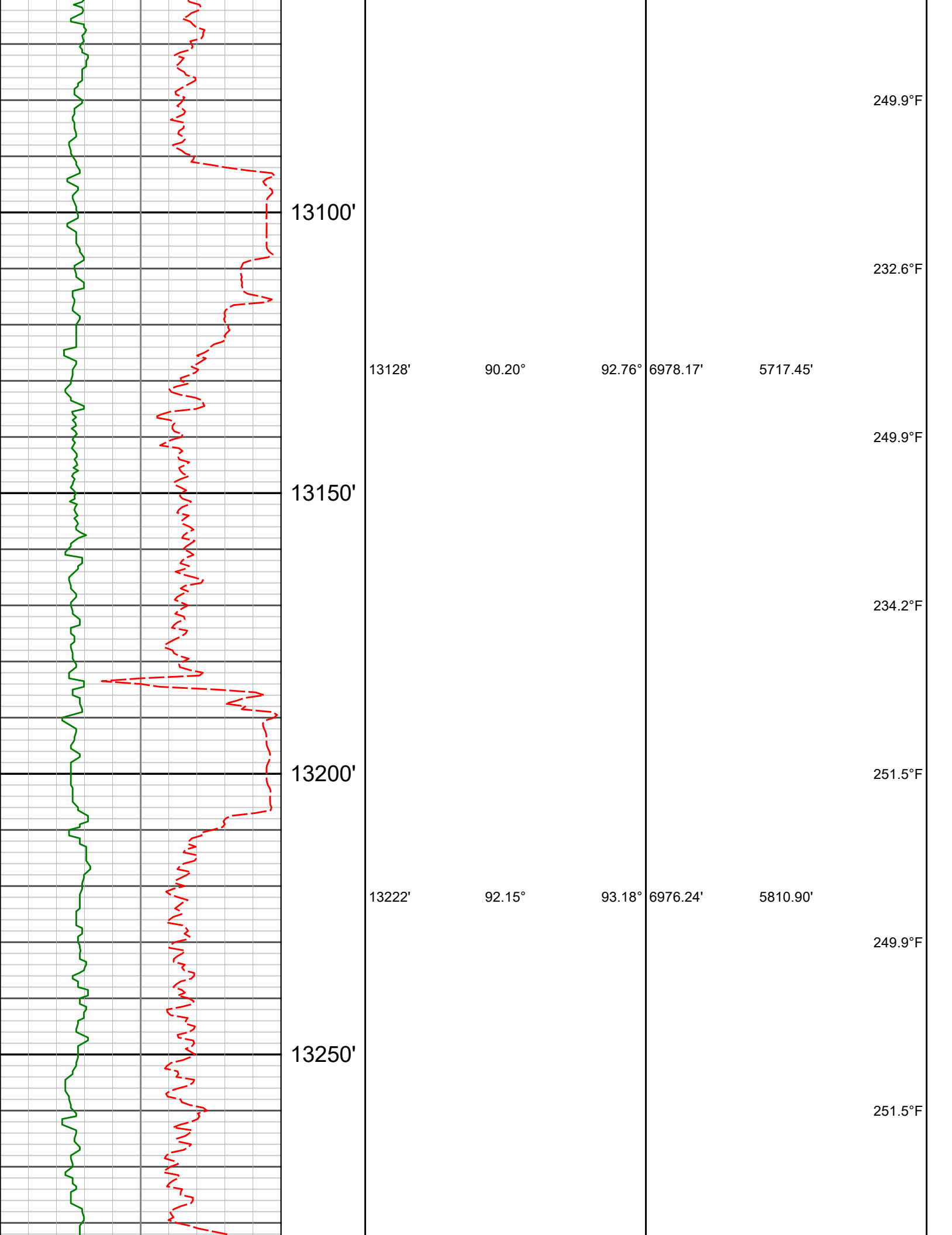


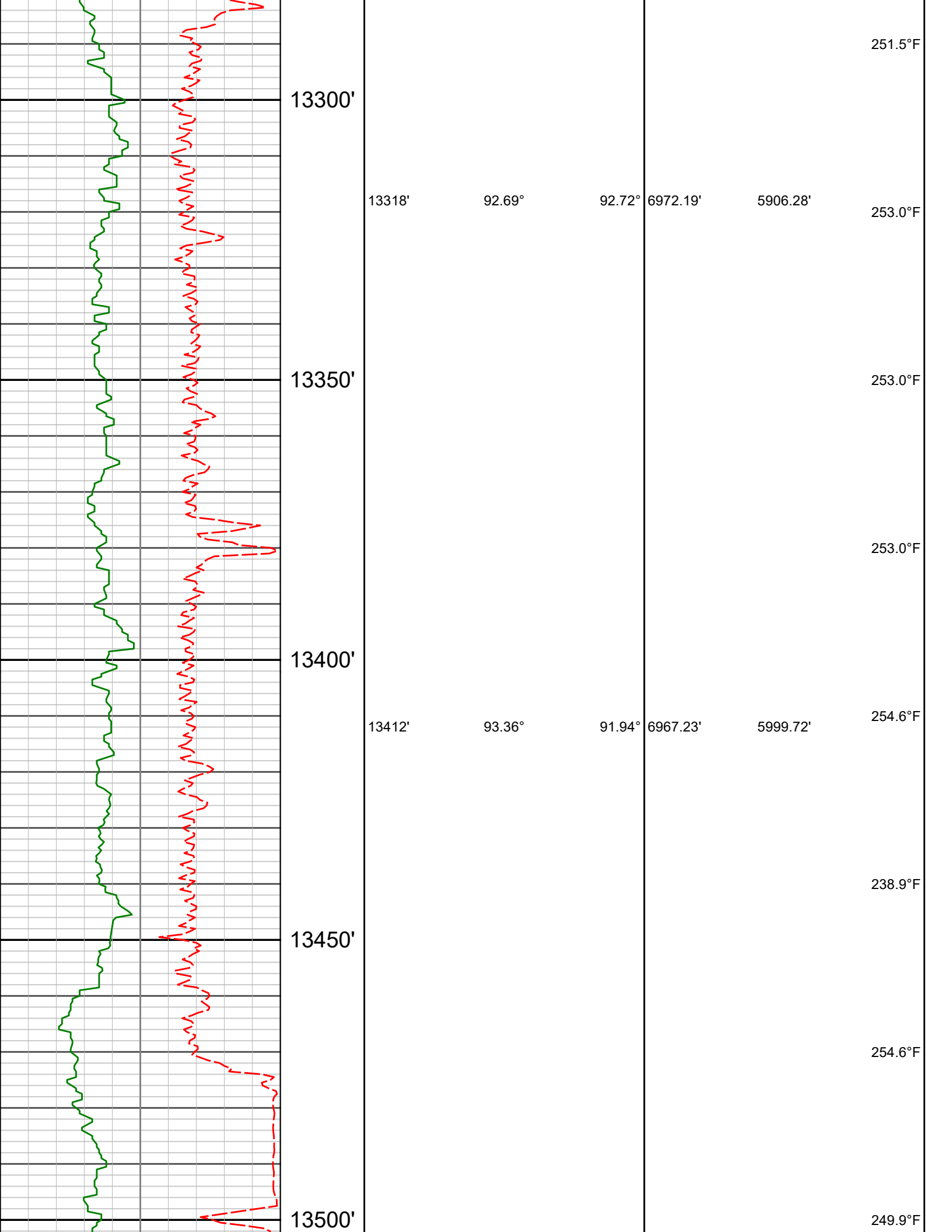


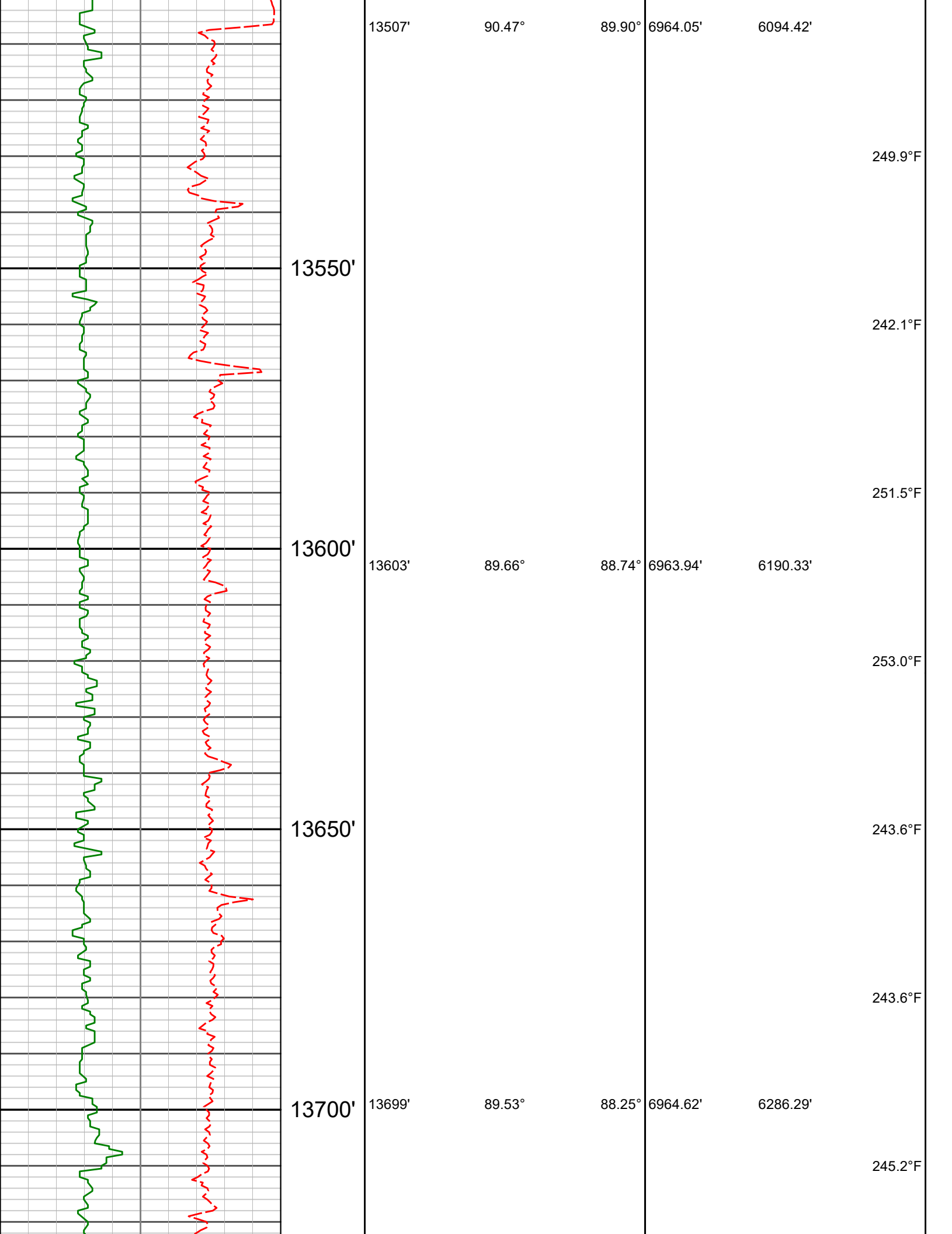


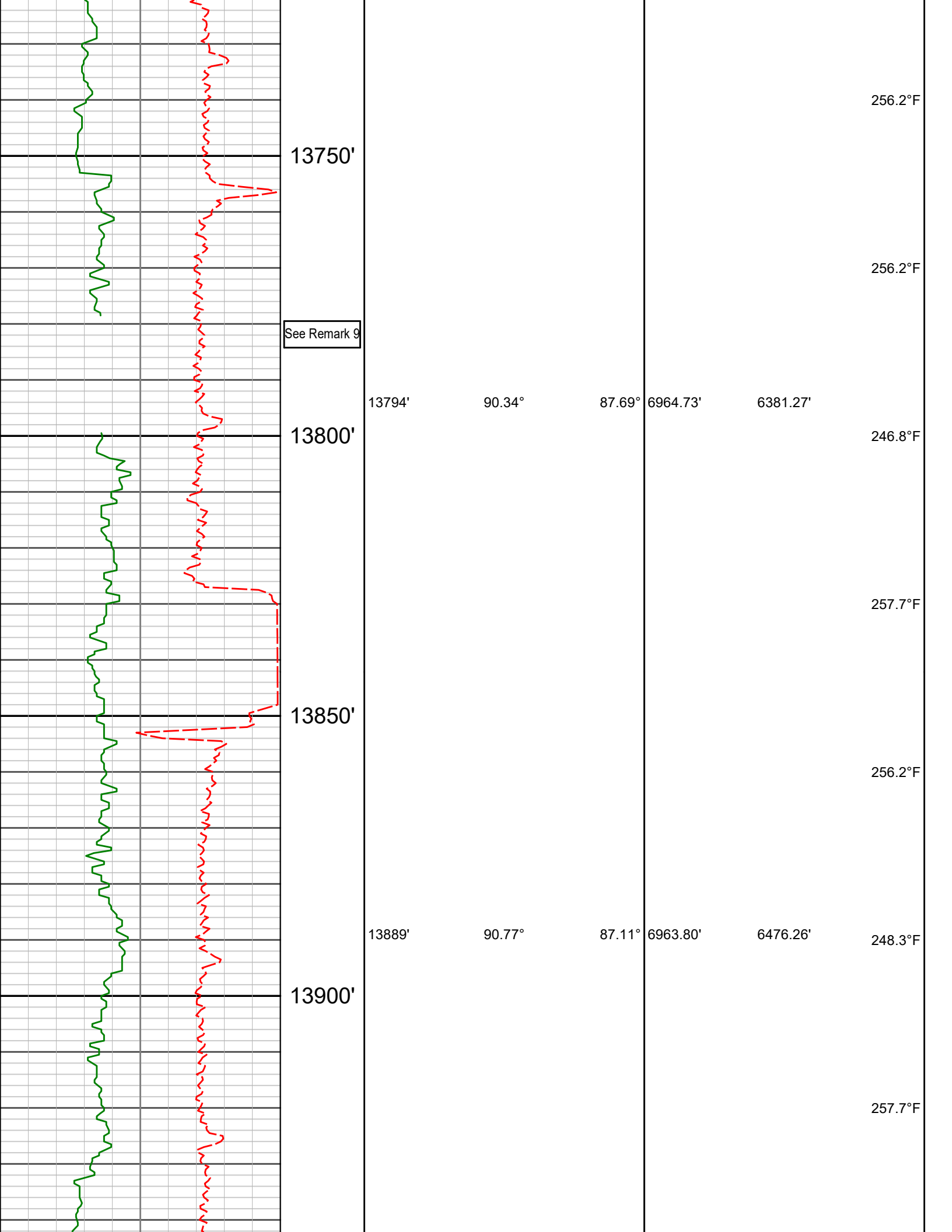


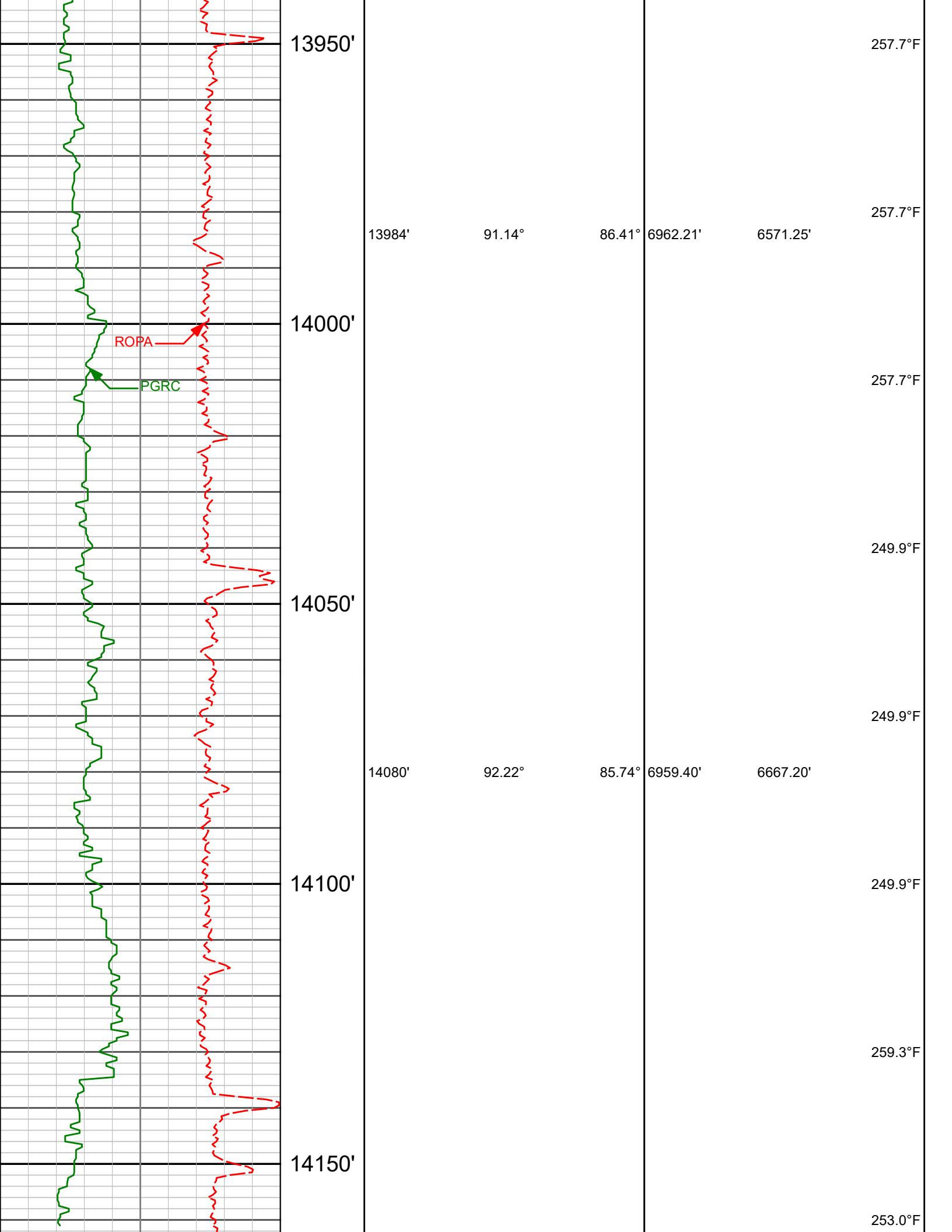


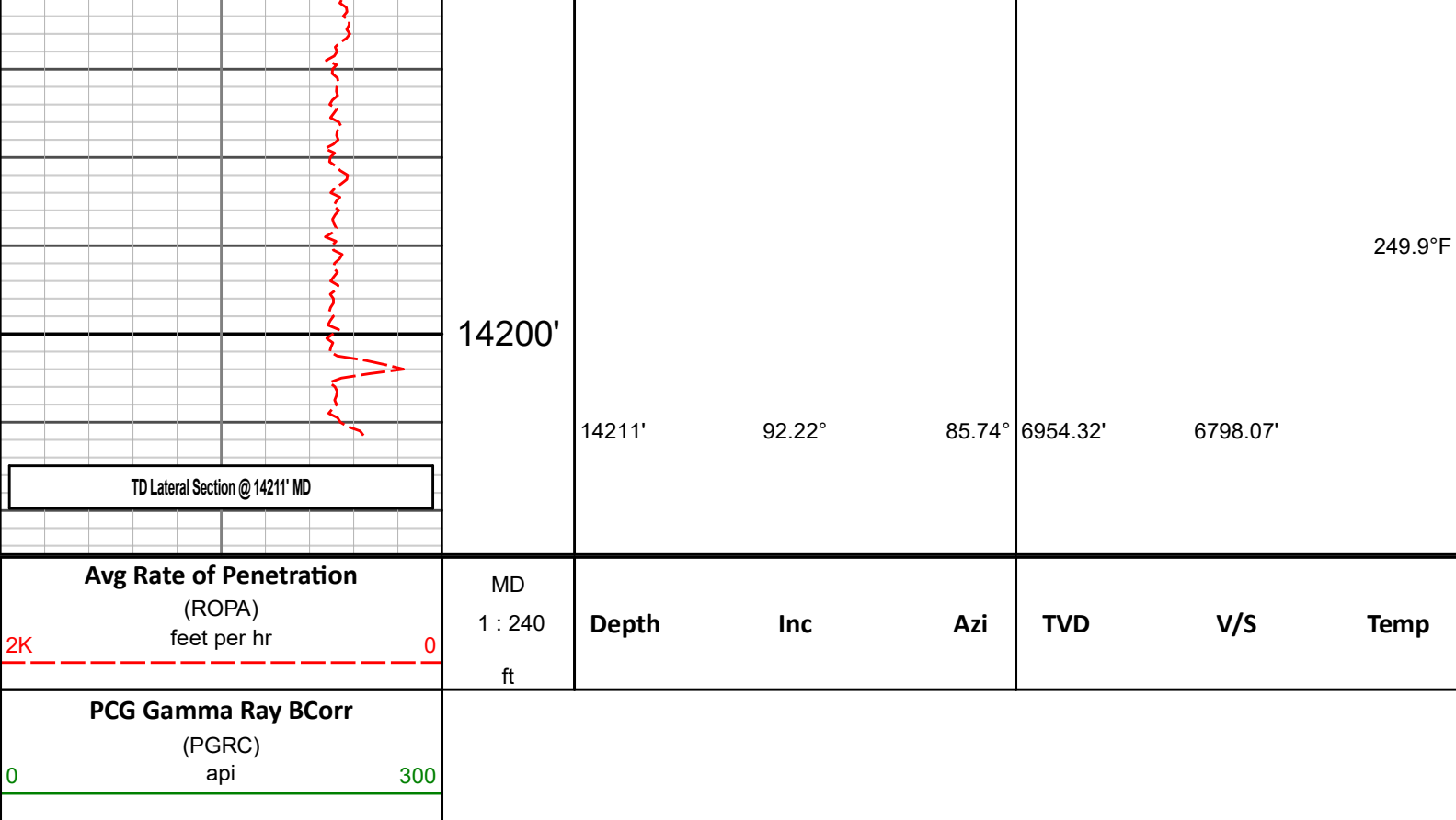












HALLIBURTON

DIRECTIONAL SURVEY REPORT

Extraction Oil _Gas
GP-Cody Fed 20E-15-2
Wattenberg
Weld Colorado
USA
CA-XX-0906221583
Third party Gyro surveys from 142.30' to 1,565.30' MD
First Sperry MWD survey @ 1678' MD

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
142.30	0.88	95.18	142.29	0.10 S	1.09 E	1.08	0.62
229.30	0.75	76.63	229.29	0.03 S	2.31 E	2.30	0.34
316.30	0.26	76.71	316.28	0.15 N	3.05 E	3.06	0.56
403.30	0.13	295.21	403.28	0.24 N	3.16 E	3.16	0.43
491.30	0.44	287.22	491.28	0.38 N	2.74 E	2.76	0.35
578.30	0.97	294.95	578.27	0.79 N	1.76 E	1.80	0.62
665.30	1.63	291.88	665.25	1.56 N	0.06 W	0.03	0.76
752.30	1.67	297.32	752.21	2.60 N	2.33 W	-2.19	0.19
840.30	2.24	304.97	840.16	4.18 N	4.88 W	-4.65	0.71
927.30	2.29	298.91	927.10	5.99 N	7.80 W	-7.46	0.28
1014.30	3.03	290.38	1014.00	7.63 N	11.47 W	-11.04	0.96
1102.30	3.96	294.86	1101.84	9.72 N	16.41 W	-15.86	1.10
1189.30	5.80	301.89	1188.52	13.31 N	22.87 W	-22.11	2.22
1276.30	7.87	302.69	1274.90	18.85 N	31.62 W	-30.55	2.38

GP-Cody Fed 20E-15-2

<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>
1364.30	9.18	300.93	1361.92	25.71 N	42.71 W	-41.25	1.52
1451.30	9.10	295.65	1447.82	32.25 N	54.86 W	-53.03	0.97
1538.30	9.45	294.95	1533.68	38.25 N	67.54 W	-65.37	0.42
1565.30	9.40	293.28	1560.32	40.05 N	71.58 W	-69.30	1.03
1678.00	8.34	293.79	1671.67	46.99 N	87.51 W	-84.83	0.94
1773.00	8.01	292.16	1765.70	52.26 N	99.94 W	-96.96	0.42
1868.00	9.26	302.56	1859.63	58.87 N	112.52 W	-109.16	2.10
1963.00	8.81	299.94	1953.45	66.62 N	125.26 W	-121.46	0.64
2059.00	8.17	297.62	2048.40	73.44 N	137.67 W	-133.48	0.76
2154.00	7.78	296.07	2142.48	79.40 N	149.42 W	-144.90	0.46
2250.00	6.94	294.51	2237.69	84.66 N	160.54 W	-155.71	0.90
2345.00	8.95	308.26	2331.78	91.62 N	171.56 W	-166.34	2.90
2440.00	7.76	304.63	2425.77	99.84 N	182.64 W	-176.96	1.37
2535.00	10.05	298.58	2519.62	107.45 N	195.20 W	-189.08	2.60
2649.00	9.23	296.54	2632.01	116.29 N	212.11 W	-205.49	0.78
2744.00	9.13	295.69	2725.80	122.96 N	225.72 W	-218.72	0.18
2839.00	8.91	295.85	2819.62	129.44 N	239.13 W	-231.76	0.23
2934.00	8.02	293.34	2913.59	135.27 N	251.84 W	-244.13	1.02
3030.00	7.56	292.18	3008.70	140.31 N	263.83 W	-255.83	0.51
3125.00	6.80	291.34	3102.96	144.71 N	274.86 W	-266.61	0.80
3221.00	7.91	315.63	3198.19	151.50 N	284.78 W	-276.14	3.41
3315.00	10.03	301.38	3291.04	160.39 N	296.29 W	-287.15	3.25
3411.00	8.19	297.77	3385.83	167.93 N	309.48 W	-299.91	2.01
3505.00	7.45	291.09	3478.96	173.24 N	321.09 W	-311.22	1.24
3600.00	9.89	304.12	3572.87	180.03 N	333.59 W	-323.33	3.28
3696.00	8.35	303.23	3667.66	188.48 N	346.25 W	-335.51	1.62
3791.00	8.47	304.43	3761.64	196.21 N	357.78 W	-346.61	0.23
3886.00	8.43	304.93	3855.61	204.15 N	369.26 W	-357.64	0.09
3982.00	8.27	305.41	3950.59	212.18 N	380.65 W	-368.58	0.18
4076.00	7.82	305.80	4043.66	219.84 N	391.35 W	-378.85	0.48
4172.00	7.68	296.69	4138.79	226.54 N	402.37 W	-389.49	1.29
4267.00	10.40	295.67	4232.60	233.10 N	415.78 W	-402.52	2.88
4362.00	9.03	293.72	4326.24	239.82 N	430.34 W	-416.69	1.49
4457.00	8.12	290.06	4420.17	245.12 N	443.46 W	-429.51	1.12
4553.00	7.57	289.37	4515.28	249.54 N	455.79 W	-441.58	0.58
4647.00	7.40	283.89	4608.48	253.05 N	467.51 W	-453.09	0.78
4743.00	8.74	290.24	4703.52	257.05 N	480.36 W	-465.71	1.67
4837.00	8.81	283.03	4796.43	261.15 N	494.08 W	-479.18	1.17
4931.00	9.97	309.19	4889.21	267.92 N	507.41 W	-492.12	4.66
5026.00	9.17	308.47	4982.88	277.82 N	519.71 W	-503.87	0.86
5121.00	7.42	311.39	5076.89	286.59 N	530.23 W	-513.90	1.89
5235.00	8.71	291.30	5189.78	294.59 N	543.80 W	-527.02	2.70
5330.00	6.89	285.49	5283.90	298.73 N	555.99 W	-538.97	2.09
5426.00	8.56	288.35	5379.03	302.51 N	568.32 W	-551.07	1.79
5521.00	7.45	285.28	5473.10	306.36 N	580.97 W	-563.50	1.26
5616.00	9.99	295.77	5567.00	311.57 N	594.34 W	-576.56	3.15
5711.00	7.67	289.99	5660.87	317.31 N	607.72 W	-589.61	2.61
5806.00	6.32	284.01	5755.16	320.75 N	618.74 W	-600.43	1.61
5901.00	8.33	306.98	5849.40	326.15 N	629.32 W	-610.69	3.70
5997.00	6.76	306.55	5944.57	333.70 N	639.41 W	-620.37	1.63
6091.00	5.14	308.39	6038.06	339.61 N	647.16 W	-627.78	1.74
6186.00	3.80	302.65	6132.77	343.96 N	653.15 W	-633.53	1.49
6281.00	2.55	302.34	6227.62	346.79 N	657.59 W	-637.81	1.32
6377.00	1.73	301.60	6323.55	348.69 N	660.63 W	-640.74	0.85
6471.00	5.50	105.74	6417.44	348.21 N	657.50 W	-637.64	7.65

GP-Cody Fed 20E-15-2

<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>
6566.00	18.98	105.69	6510.06	342.77 N	638.15 W	-618.62	14.18
6661.00	24.43	114.88	6598.32	330.32 N	605.43 W	-586.61	6.74
6757.00	35.06	100.80	6681.65	316.75 N	560.15 W	-542.14	13.19
6851.00	49.72	94.24	6750.92	308.99 N	497.49 W	-480.00	16.27
6947.00	52.70	89.60	6811.07	306.54 N	422.75 W	-405.49	4.88
7042.00	50.76	88.66	6869.90	307.66 N	348.17 W	-330.97	2.19
7137.00	59.35	83.81	6924.28	312.94 N	270.59 W	-253.21	9.96
7232.00	71.43	89.58	6963.80	317.70 N	184.56 W	-167.05	13.85
7327.00	81.87	89.27	6985.70	318.63 N	92.26 W	-74.84	11.00
7422.00	88.82	90.37	6993.40	318.91 N	2.37 E	19.67	7.41
7516.00	88.76	89.80	6995.39	318.77 N	96.35 E	113.50	0.61
7611.00	88.79	90.00	6997.42	318.93 N	191.33 E	208.35	0.21
7707.00	88.35	89.59	6999.81	319.27 N	287.29 E	304.19	0.62
7802.00	90.81	88.83	7000.51	320.58 N	382.28 E	399.10	2.70
7897.00	90.60	88.51	6999.34	322.78 N	477.24 E	494.05	0.40
7992.00	89.80	88.51	6999.00	325.25 N	572.21 E	589.01	0.84
8087.00	90.27	88.04	6998.95	328.11 N	667.17 E	683.98	0.70
8182.00	88.92	87.44	6999.62	331.85 N	762.09 E	778.97	1.56
8277.00	88.72	86.74	7001.57	336.67 N	856.94 E	873.95	0.76
8373.00	91.18	89.85	7001.66	339.53 N	952.88 E	969.90	4.13
8468.00	90.17	88.82	7000.55	340.63 N	1047.87 E	1064.80	1.52
8563.00	90.17	88.72	7000.27	342.67 N	1142.84 E	1159.75	0.10
8658.00	91.51	90.48	6998.88	343.33 N	1237.83 E	1254.63	2.33
8752.00	90.57	90.11	6997.17	342.84 N	1331.81 E	1348.45	1.07
8848.00	90.77	89.64	6996.04	343.04 N	1427.80 E	1444.31	0.54
8943.00	90.24	89.22	6995.20	343.99 N	1522.79 E	1539.21	0.72
9039.00	90.77	88.66	6994.35	345.76 N	1618.77 E	1635.15	0.81
9133.00	90.34	88.33	6993.44	348.23 N	1712.73 E	1729.10	0.58
9228.00	91.01	87.73	6992.33	351.50 N	1807.67 E	1824.08	0.94
9323.00	89.93	87.14	6991.55	355.74 N	1902.57 E	1919.07	1.29
9418.00	90.44	88.91	6991.24	359.01 N	1997.51 E	2014.04	1.94
9513.00	90.17	90.89	6990.74	359.18 N	2092.50 E	2108.91	2.10
9608.00	90.50	91.43	6990.19	357.27 N	2187.48 E	2203.64	0.67
9704.00	90.07	91.20	6989.71	355.07 N	2283.45 E	2299.36	0.51
9798.00	90.44	91.86	6989.29	352.56 N	2377.42 E	2393.05	0.80
9893.00	90.40	91.84	6988.60	349.49 N	2472.37 E	2487.69	0.04
9987.00	89.90	91.08	6988.35	347.10 N	2566.34 E	2581.39	0.98
10083.00	89.63	90.34	6988.75	345.91 N	2662.33 E	2677.17	0.81
10178.00	92.22	88.74	6987.21	346.67 N	2757.30 E	2772.05	3.20
10273.00	92.19	88.63	6983.56	348.84 N	2852.21 E	2866.93	0.12
10369.00	92.25	88.40	6979.84	351.32 N	2948.10 E	2962.82	0.25
10464.00	89.87	87.93	6978.08	354.36 N	3043.03 E	3057.77	2.56
10559.00	90.17	88.38	6978.05	357.42 N	3137.98 E	3152.75	0.57
10654.00	90.27	87.42	6977.69	360.90 N	3232.91 E	3247.73	1.02
10749.00	89.29	89.62	6978.05	363.36 N	3327.87 E	3342.69	2.53
10843.00	89.16	88.78	6979.32	364.67 N	3421.86 E	3436.60	0.90
10939.00	89.26	88.63	6980.64	366.85 N	3517.82 E	3532.54	0.19
11034.00	88.72	87.83	6982.31	369.79 N	3612.76 E	3627.50	1.02
11129.00	88.45	91.86	6984.66	370.05 N	3707.71 E	3722.33	4.25
11224.00	90.24	91.88	6985.75	366.96 N	3802.65 E	3816.96	1.88
11319.00	89.70	90.28	6985.80	365.17 N	3897.63 E	3911.70	1.77
11414.00	92.02	90.46	6984.38	364.55 N	3992.61 E	4006.51	2.45
11509.00	92.15	89.51	6980.93	364.58 N	4087.55 E	4101.31	1.01
11603.00	92.46	88.81	6977.15	365.96 N	4181.46 E	4195.16	0.81
11698.00	92.59	88.13	6972.97	368.49 N	4276.33 E	4290.03	0.73

<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>
11794.00	90.81	91.16	6970.12	369.09 N	4372.28 E	4385.86	3.66
11889.00	91.71	90.99	6968.03	367.31 N	4467.23 E	4480.58	0.97
11985.00	88.92	90.57	6967.50	366.00 N	4563.21 E	4576.35	2.94
12080.00	90.44	89.80	6968.03	365.70 N	4658.21 E	4671.19	1.78
12175.00	90.34	89.23	6967.39	366.51 N	4753.20 E	4766.09	0.62
12270.00	90.47	88.45	6966.72	368.43 N	4848.18 E	4861.03	0.83
12366.00	91.34	87.94	6965.20	371.45 N	4944.12 E	4956.99	1.05
12461.00	88.62	91.36	6965.23	372.04 N	5039.10 E	5051.86	4.60
12556.00	89.02	90.88	6967.18	370.18 N	5134.06 E	5146.58	0.66
12651.00	88.89	90.11	6968.91	369.36 N	5229.04 E	5241.37	0.82
12747.00	88.69	89.69	6970.94	369.53 N	5325.01 E	5337.22	0.49
12842.00	88.56	88.94	6973.22	370.66 N	5419.98 E	5432.11	0.80
12938.00	89.09	88.20	6975.19	373.06 N	5515.93 E	5528.04	0.96
13033.00	88.55	91.71	6977.14	373.13 N	5610.89 E	5622.87	3.74
13128.00	90.20	92.76	6978.17	369.43 N	5705.81 E	5717.45	2.05
13222.00	92.15	93.18	6976.24	364.57 N	5799.66 E	5810.90	2.12
13318.00	92.69	92.72	6972.19	359.64 N	5895.45 E	5906.28	0.74
13412.00	93.36	91.94	6967.23	355.82 N	5989.24 E	5999.72	1.09
13507.00	90.47	89.90	6964.05	354.31 N	6084.16 E	6094.42	3.72
13603.00	89.66	88.74	6963.94	355.44 N	6180.15 E	6190.33	1.47
13699.00	89.53	88.25	6964.62	357.96 N	6276.11 E	6286.29	0.53
13794.00	90.34	87.69	6964.73	361.32 N	6371.05 E	6381.27	1.04
13889.00	90.77	87.11	6963.80	365.63 N	6465.95 E	6476.26	0.77
13984.00	91.14	86.41	6962.21	371.00 N	6560.78 E	6571.25	0.83
14080.00	92.22	85.74	6959.40	377.57 N	6656.51 E	6667.20	1.32
14211.00	92.22	85.74	6954.32	387.29 N	6787.05 E	6798.07	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 86.89 DEGREES (TRUE)
A TOTAL CORRECTION OF 7.76 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 14211.00 FEET
IS 6798.10 FEET ALONG 86.73 DEGREES (TRUE)

Final survey is a projection to bit.