



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	06-May-15	09-May-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.890	4.750			
Log Start Depth (MD, ft)	659.00	6,410.00			
Log End Depth (MD, ft)	6,410.00	10,745.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	04-May-15 18:35	07-May-15 20:03			
Drill/Wipe End Date and Time	06-May-15 19:20	09-May-15 11:32			
Min Inc (deg) @ Depth (MD, ft)	0.25 @ 824.00	86.76 @ 6,427.00			
Max Inc (deg) @ Depth (MD, ft)	82.34 @ 6,354.00	91.82 @ 6,982.00			
Bit TFA(in2) / Bit Type	1.37 / PDC	0.65 / PDC			
Flow Rate (gpm)	595.76	315.65			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	9.75 / 43.00	10.15 / 36.00			
Filtrate CL (ppm)	1,400.00	1,400.00			
pH / Fluid Loss (mptm)	9.60 / N/A	10.20 / N/A			
PV (cP) / YP (lbf2)	11 / 9.00	7 / 6.00			
% Solids / % Sand	9.50 / 0.40	8.20 / 0.10			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (degF) @ Depth (MD, ft)	163.00 / 824.00	215.00 / 6,427.00			

Max Tool Temp (degF) / Source	162.80 / PCM	217.60 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 162.80	N/A @ 217.60			
Lead MWD Engineer	Ryan Skaarvold	Ryan Skaarvold			
Customer Representative	Stetson Nielsen	Stetson Nielsen			

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	04-May-15 12:15	07-May-15 10:01			
Date and Time Read	07-May-15 00:13	09-May-15 20:14			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	67.00			
Software Version	6.21	6.33			
Sub Serial Number	11404298	12310755			
Sonde Serial Number	11638501	11062074			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	334.80	357.80			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.26	70.32			
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 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

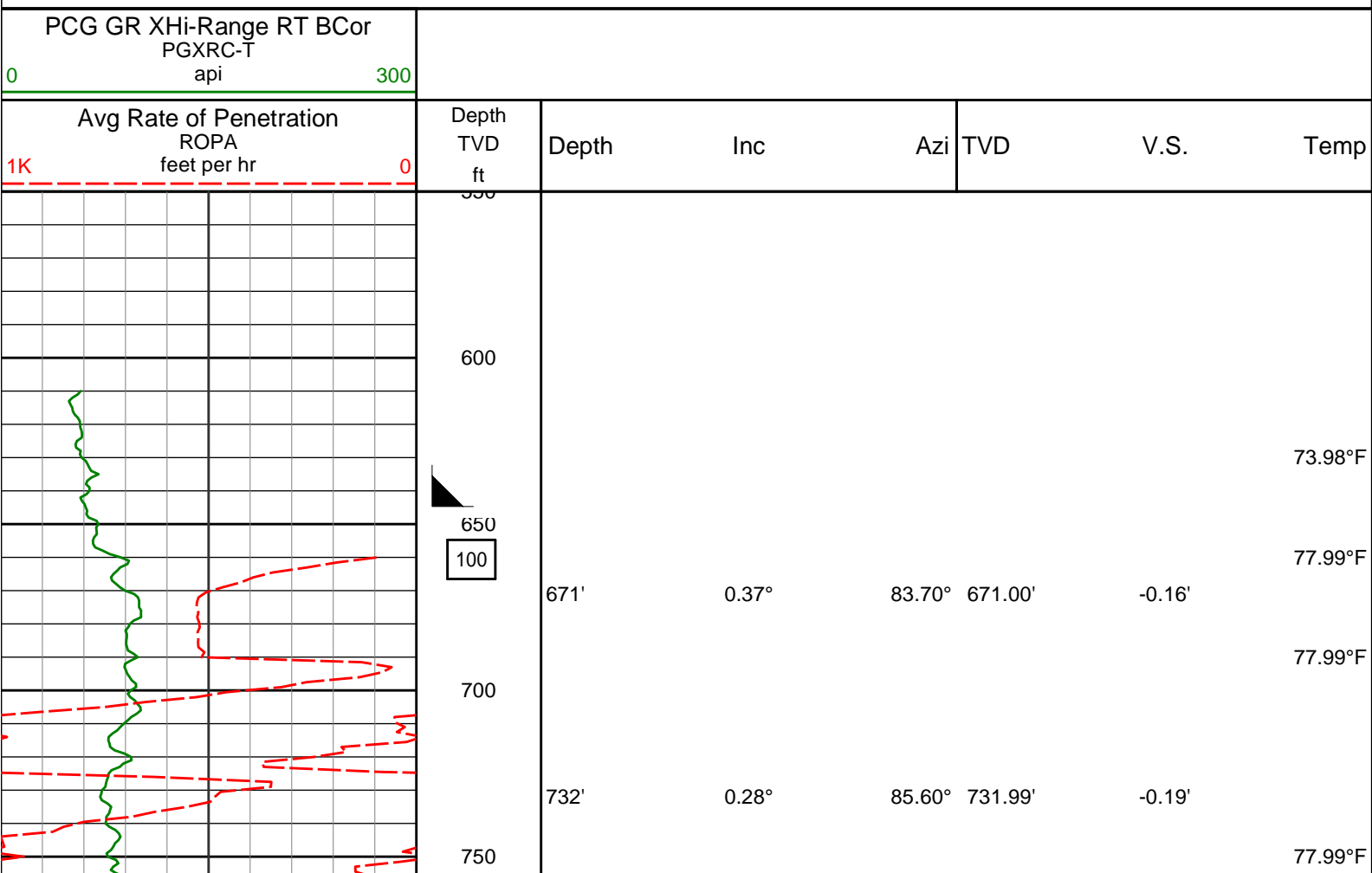
Interval Distance: 1.2 ft

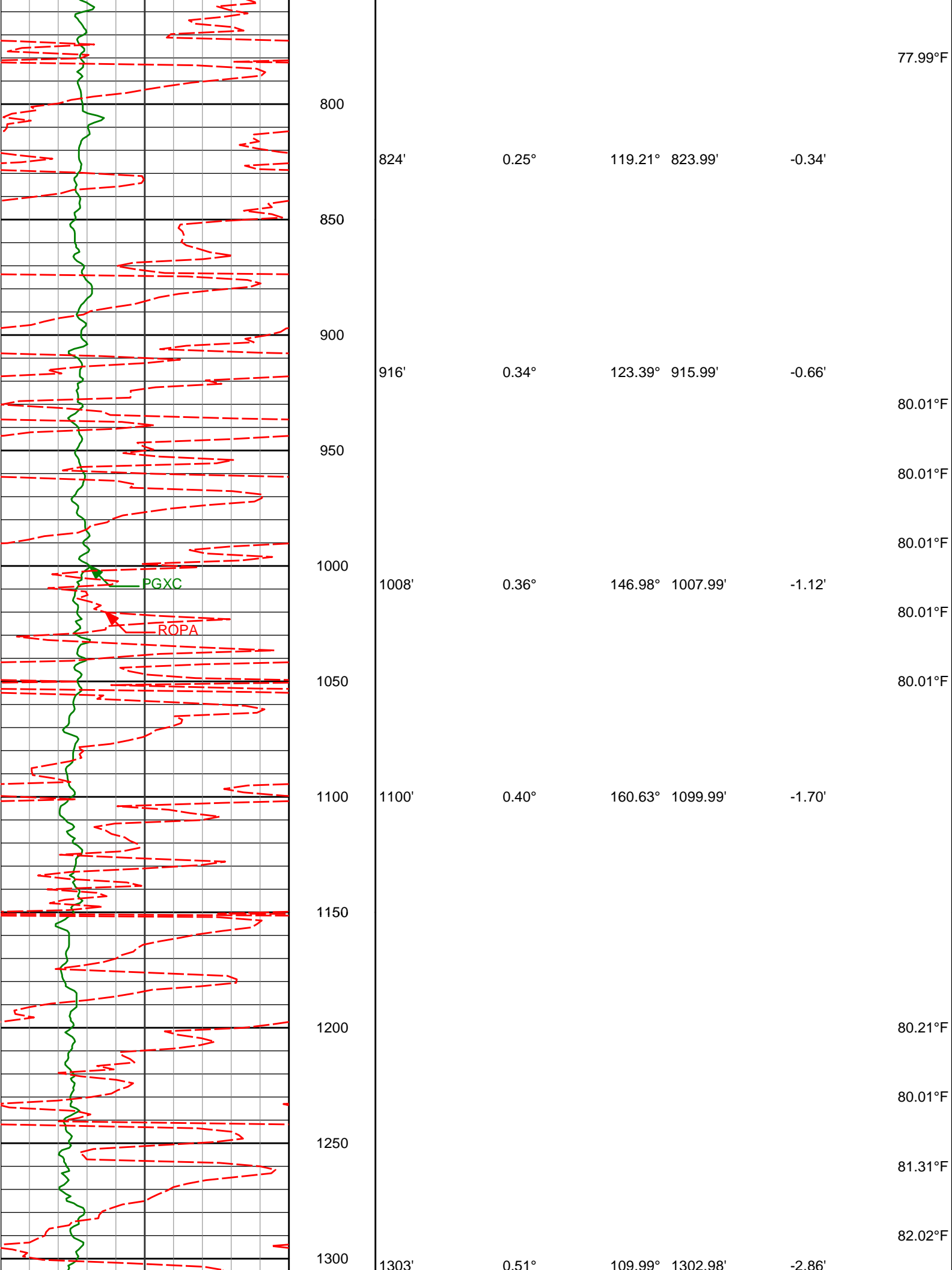
6. Insite Version V8.1.10

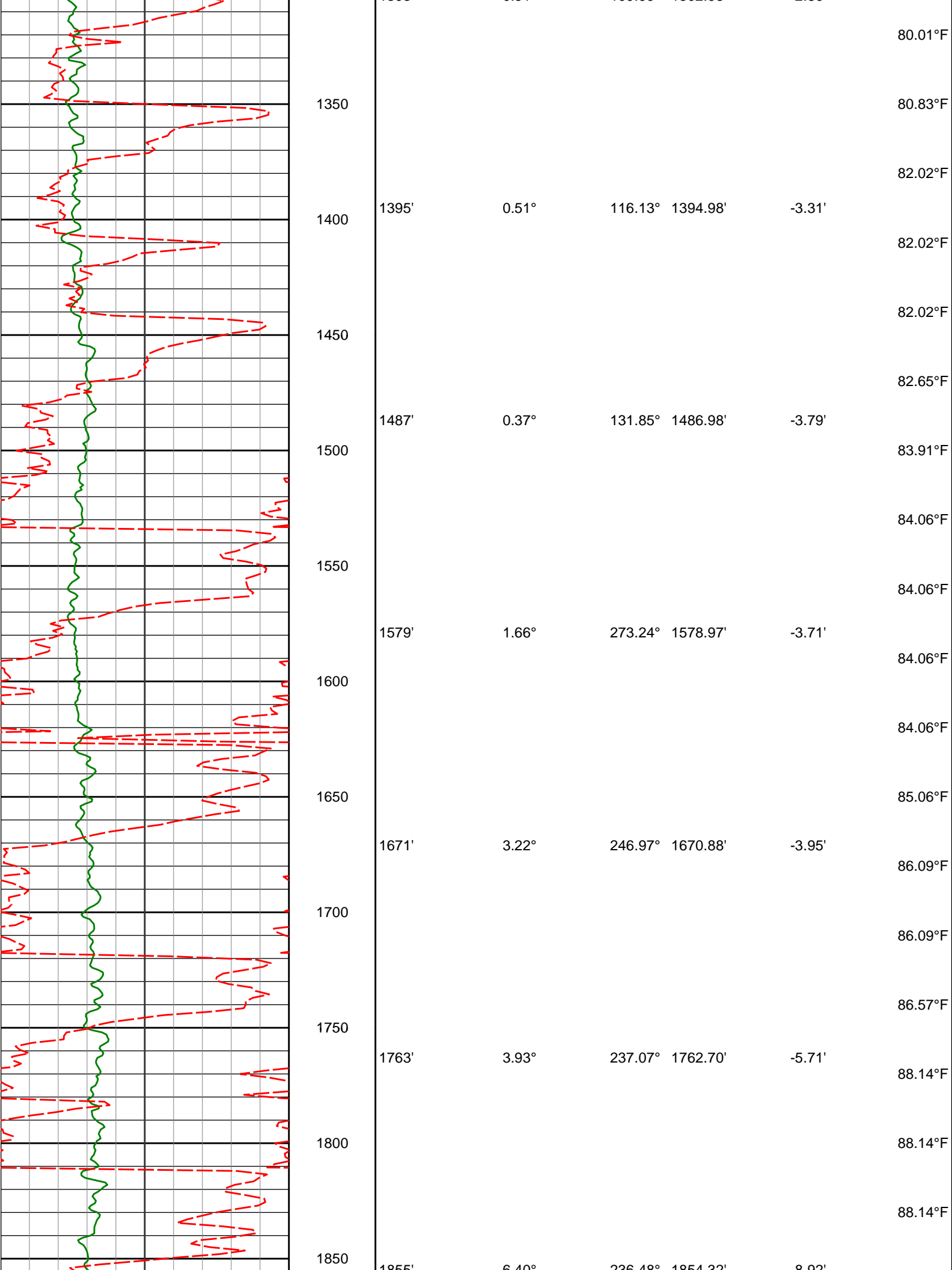
WARRANTY

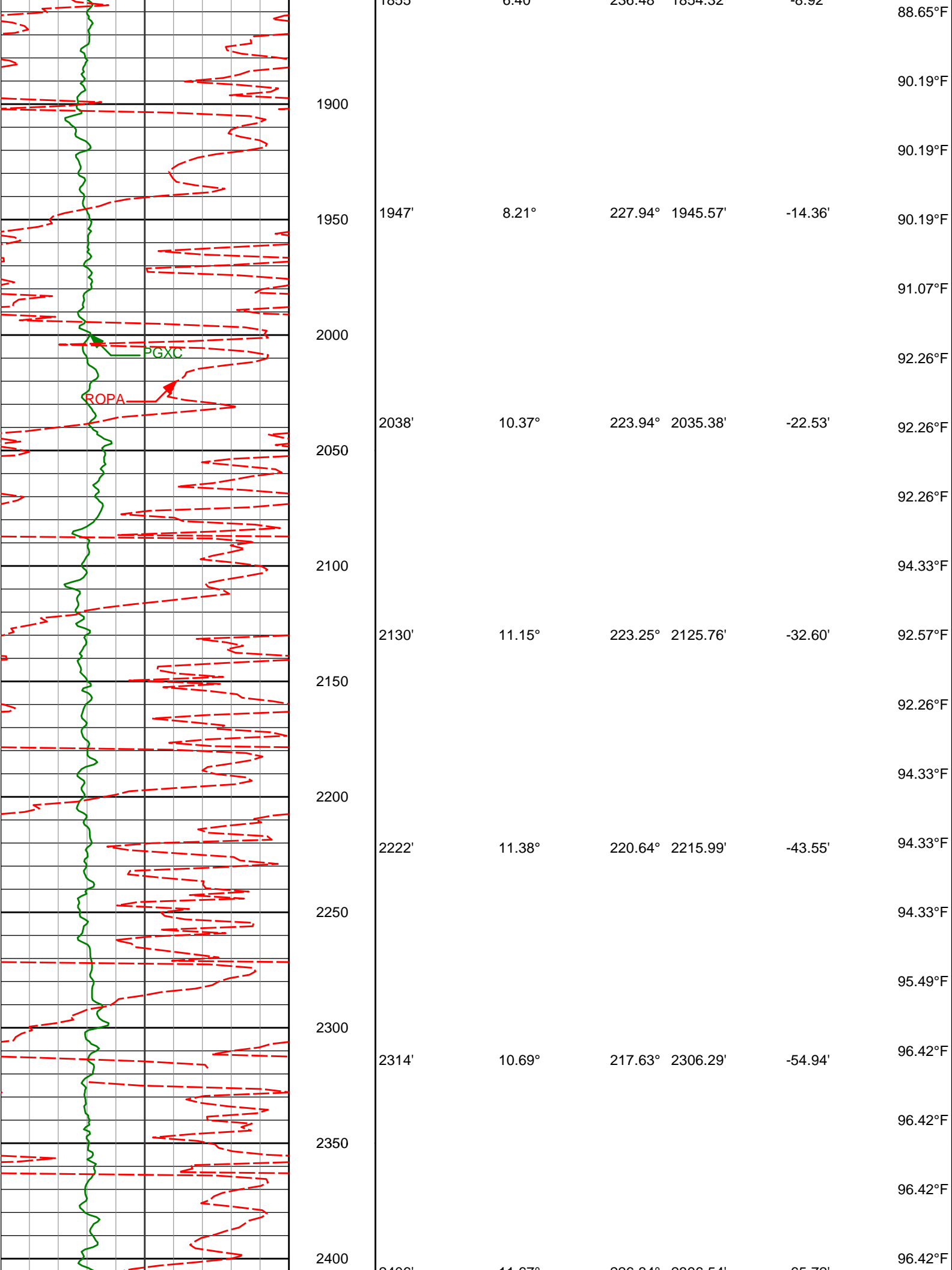
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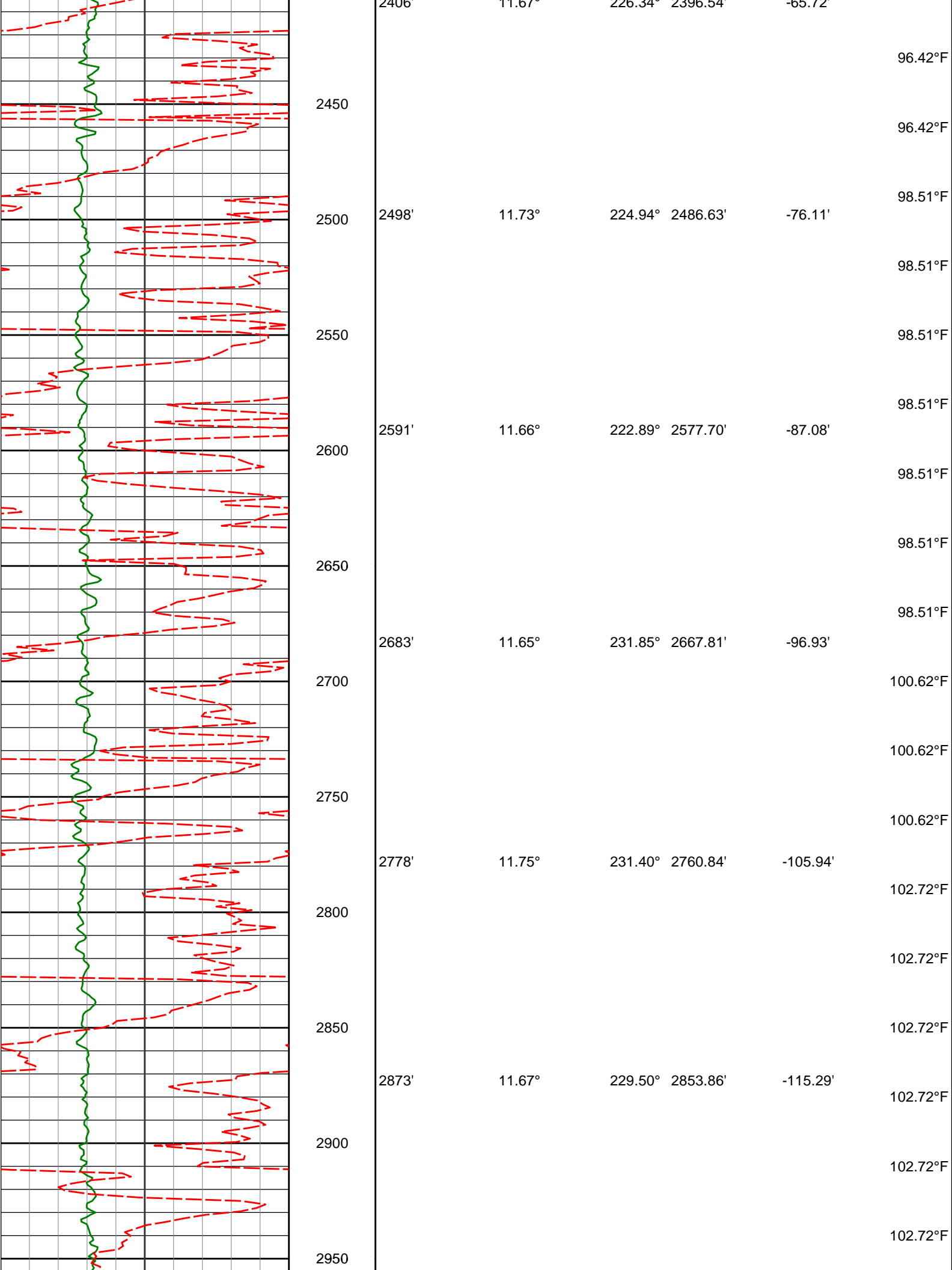
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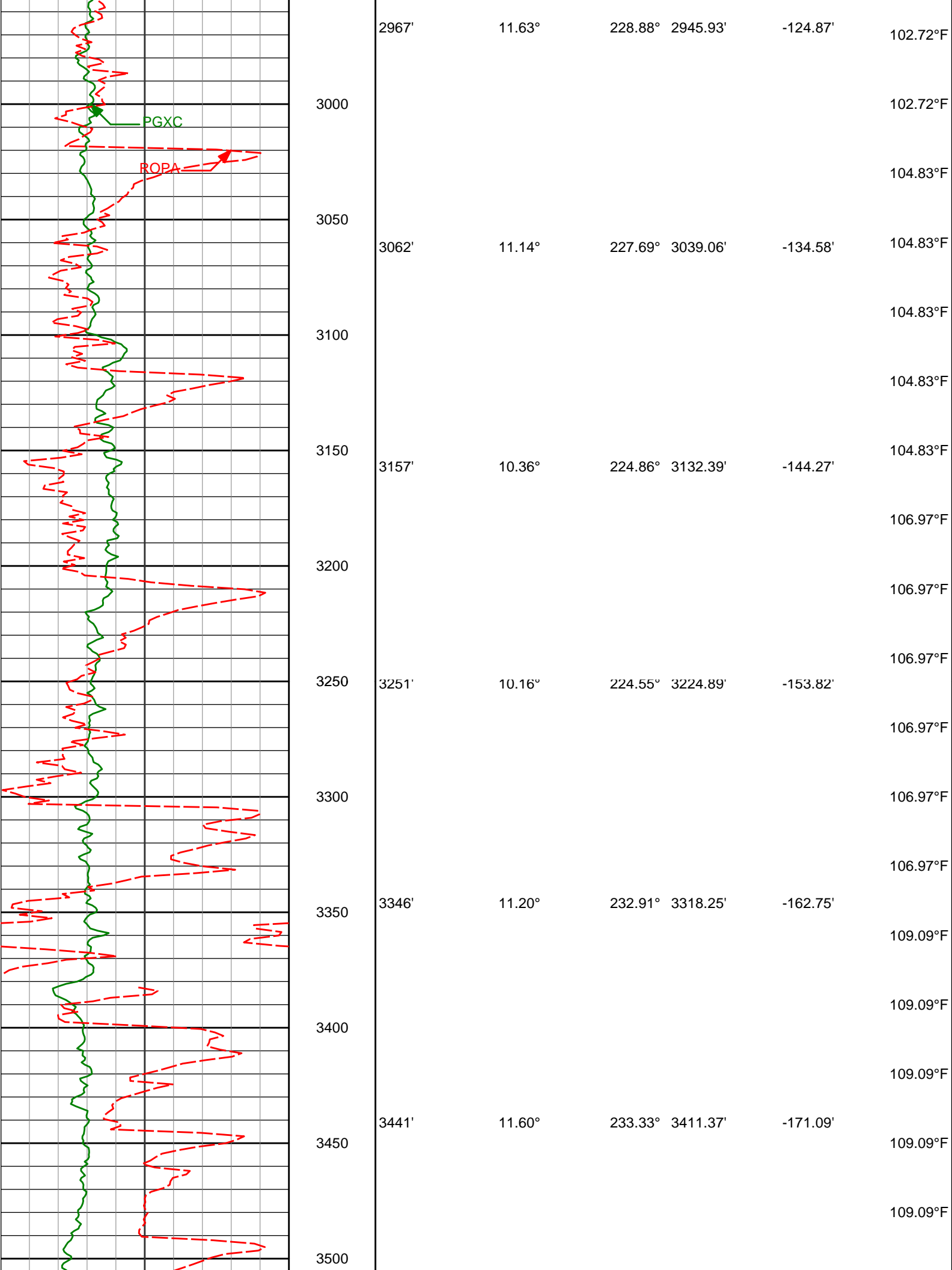


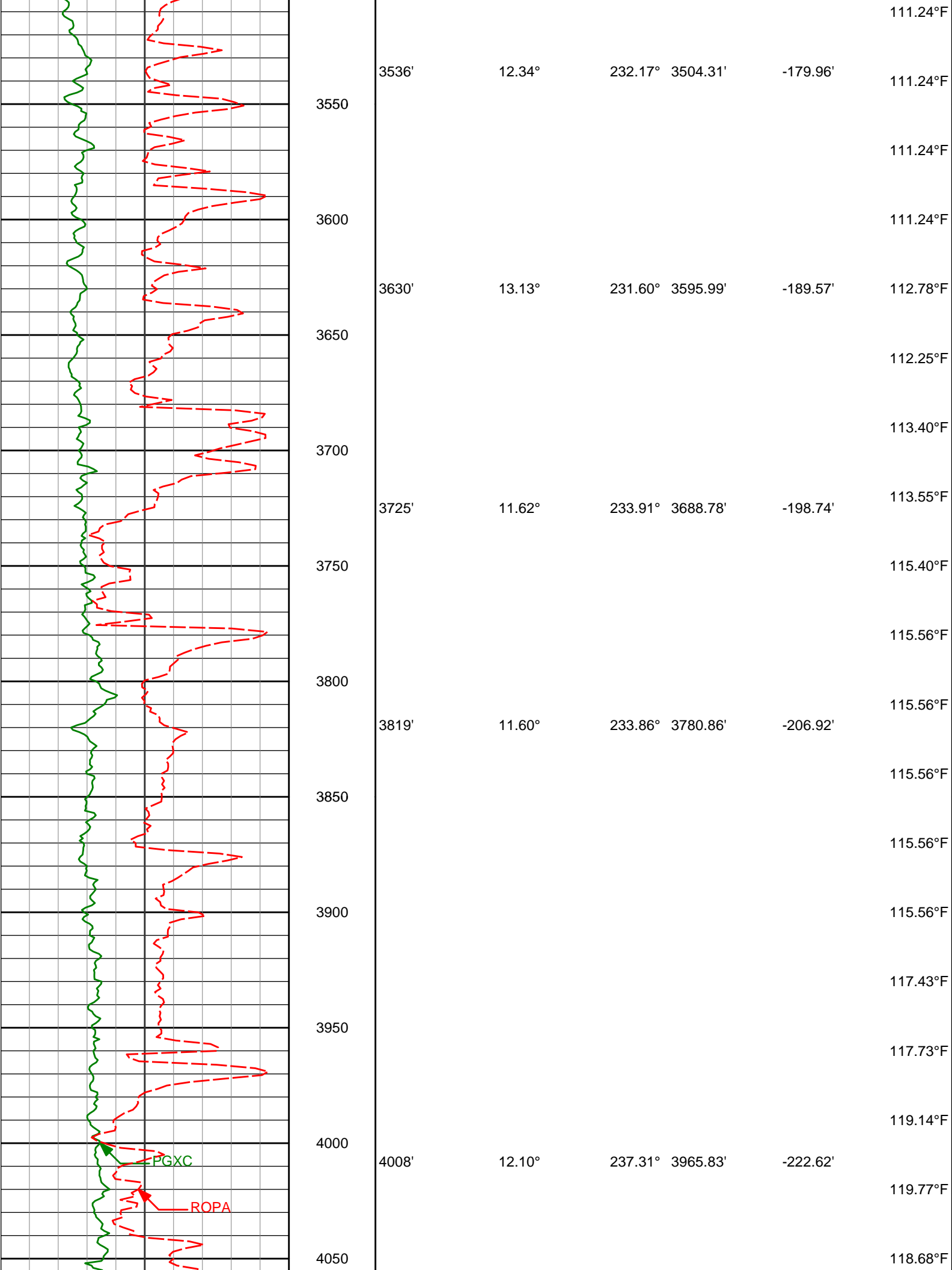


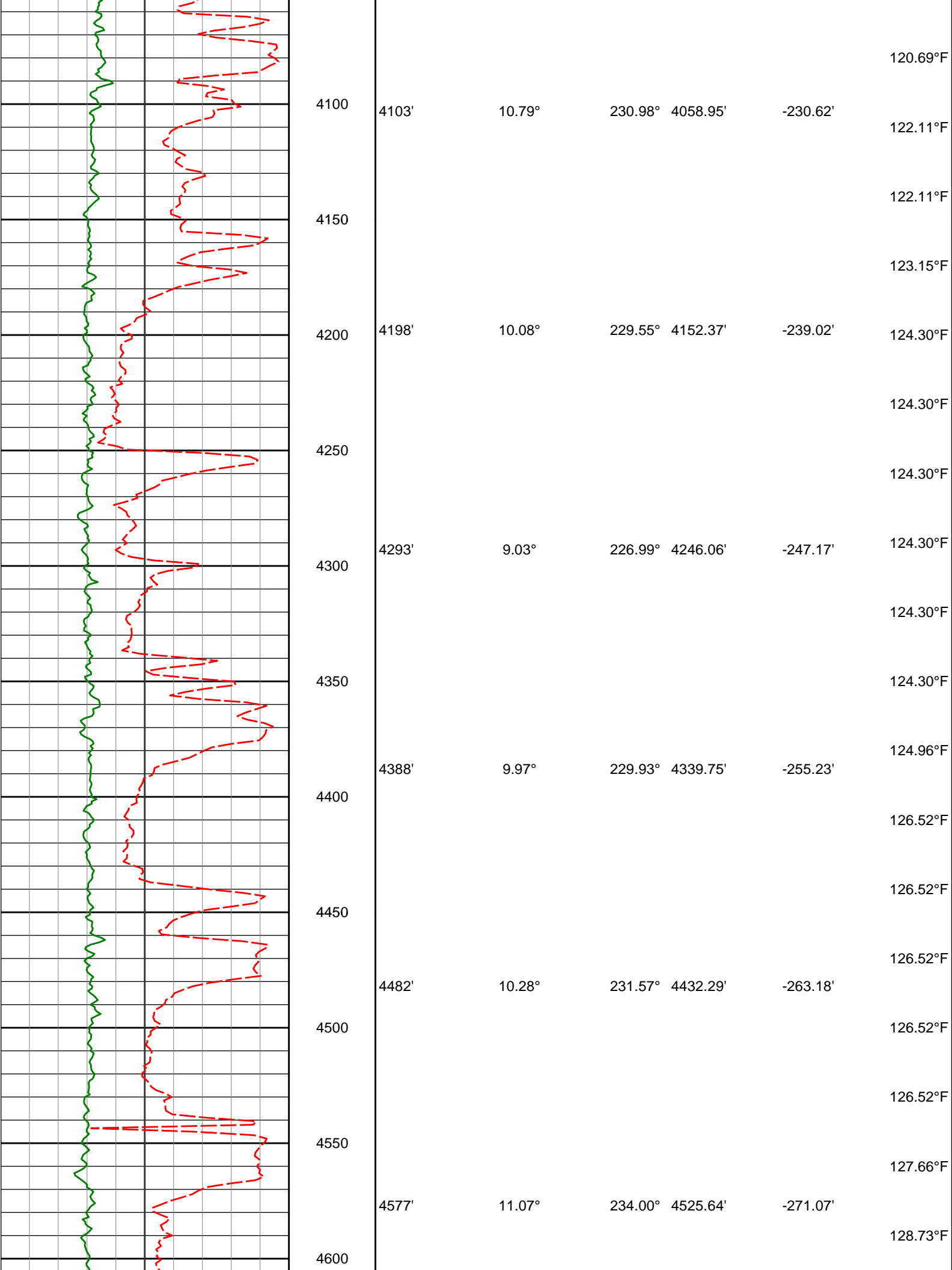


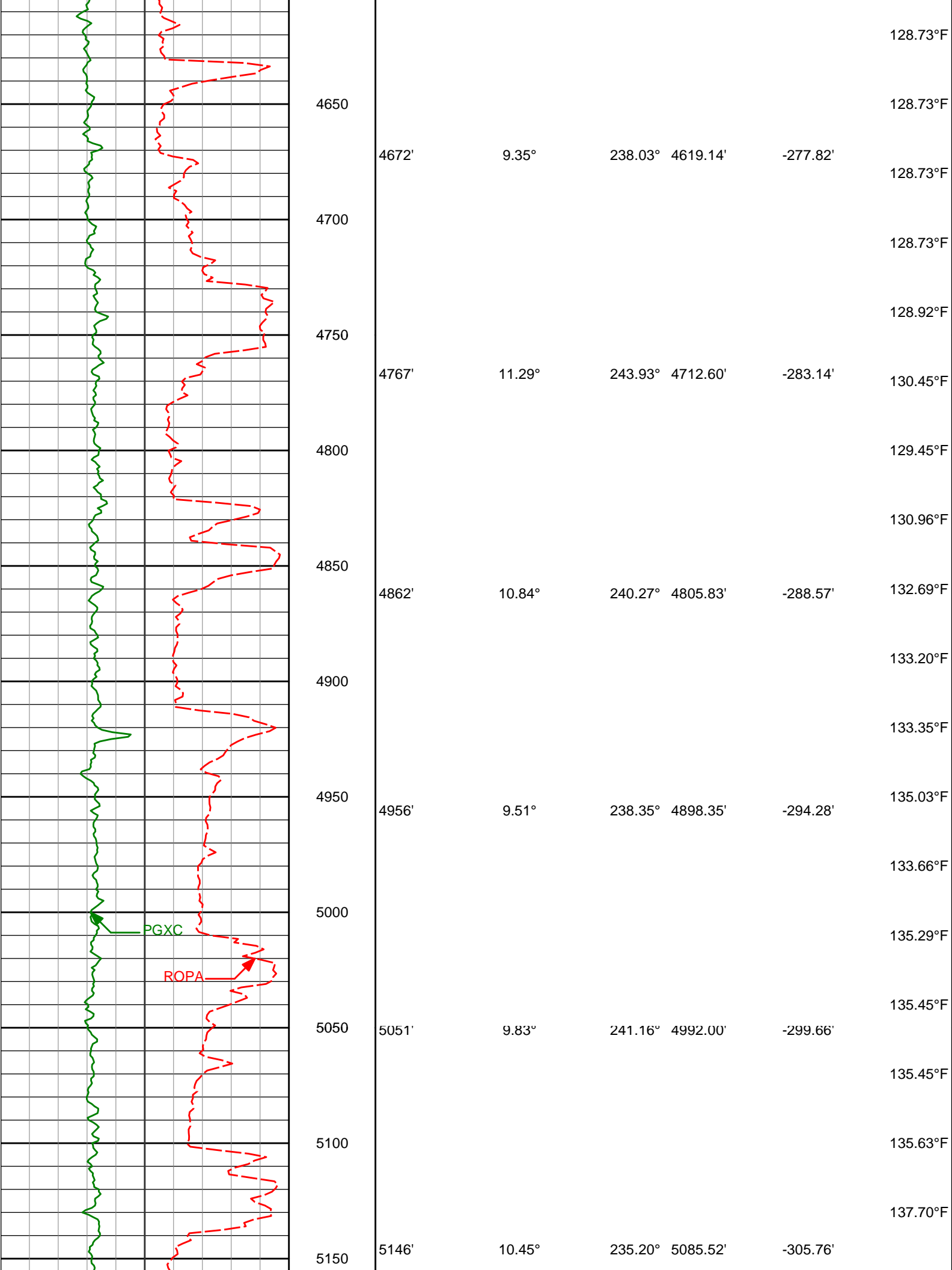


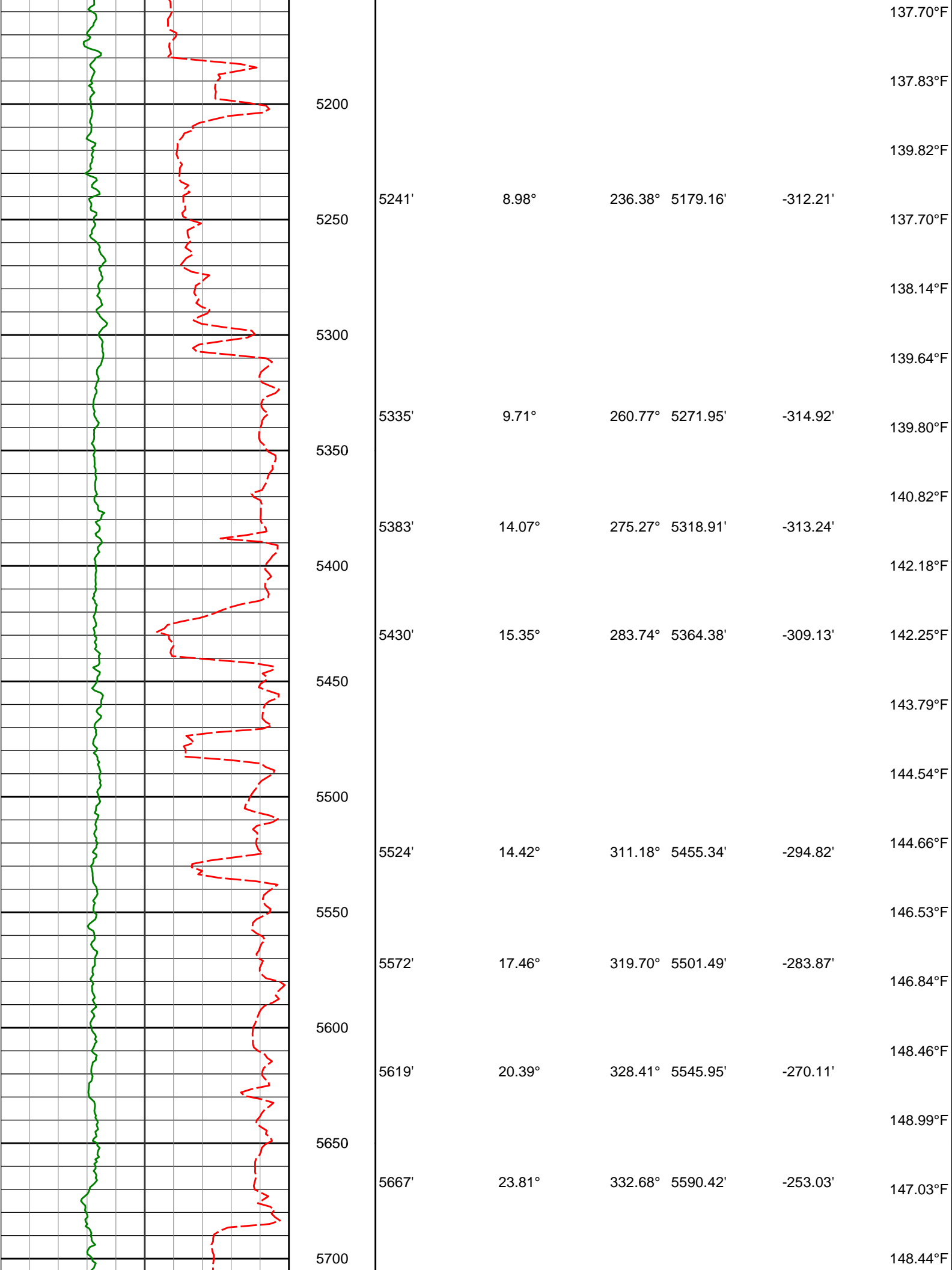


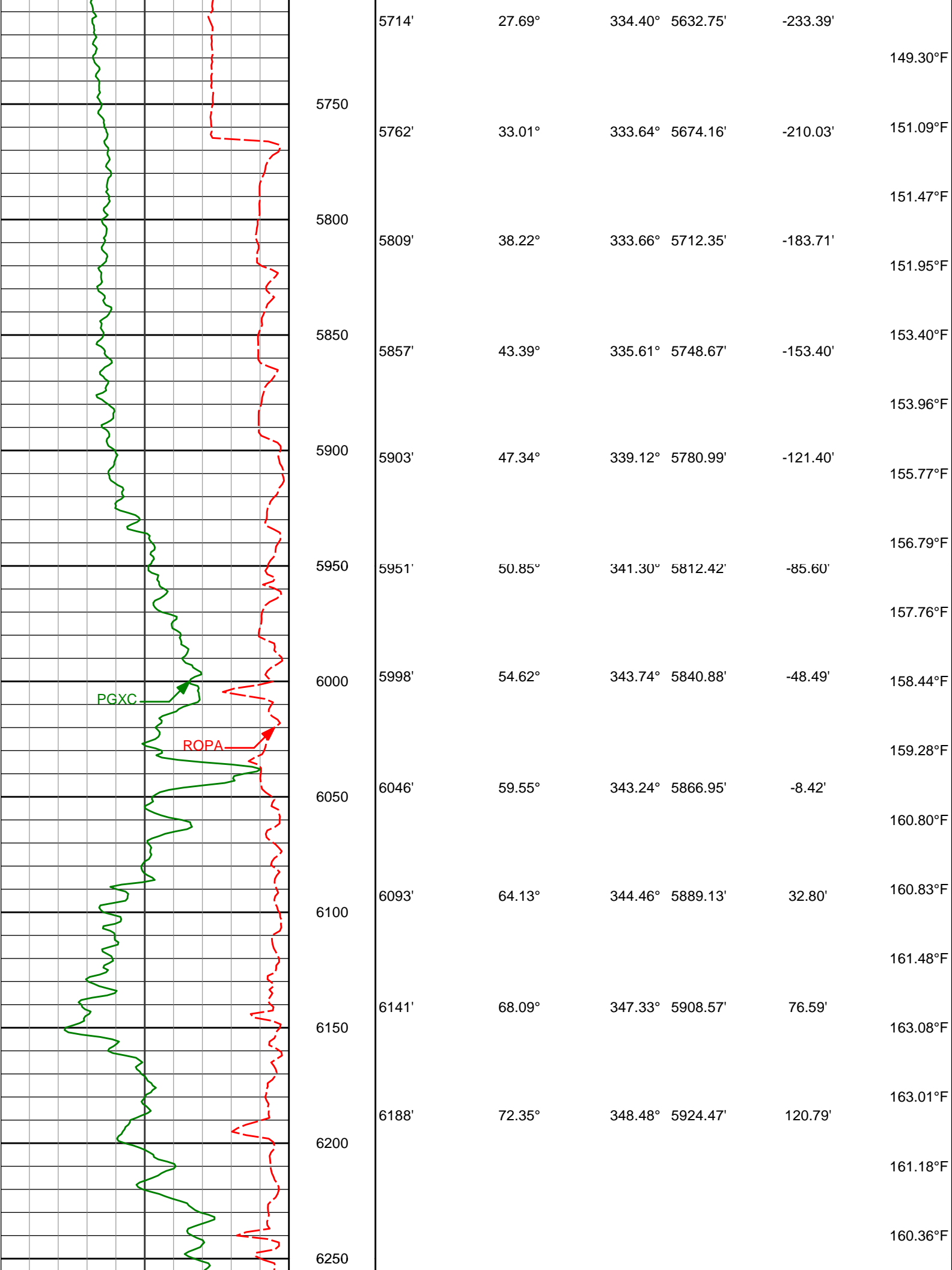


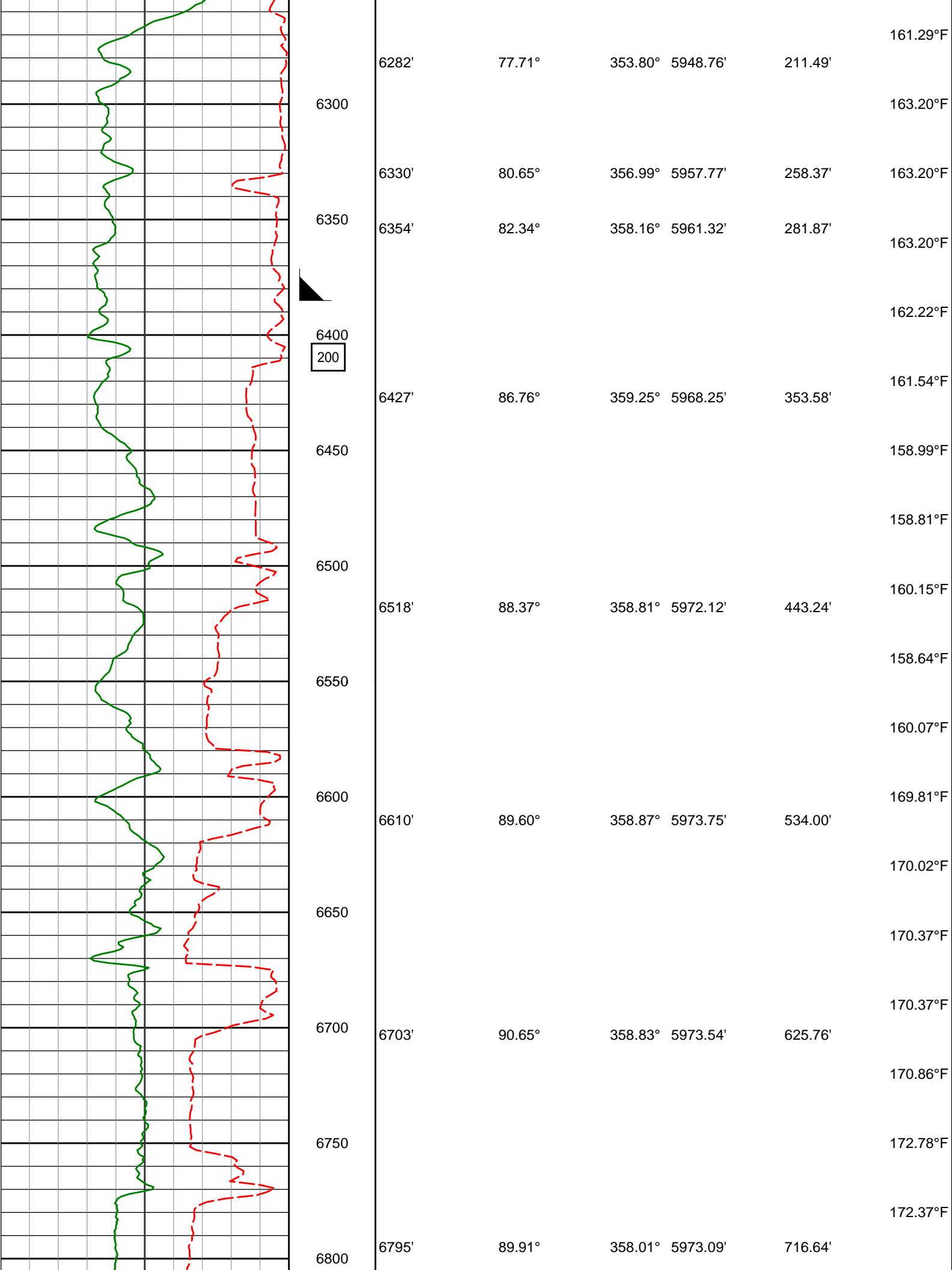


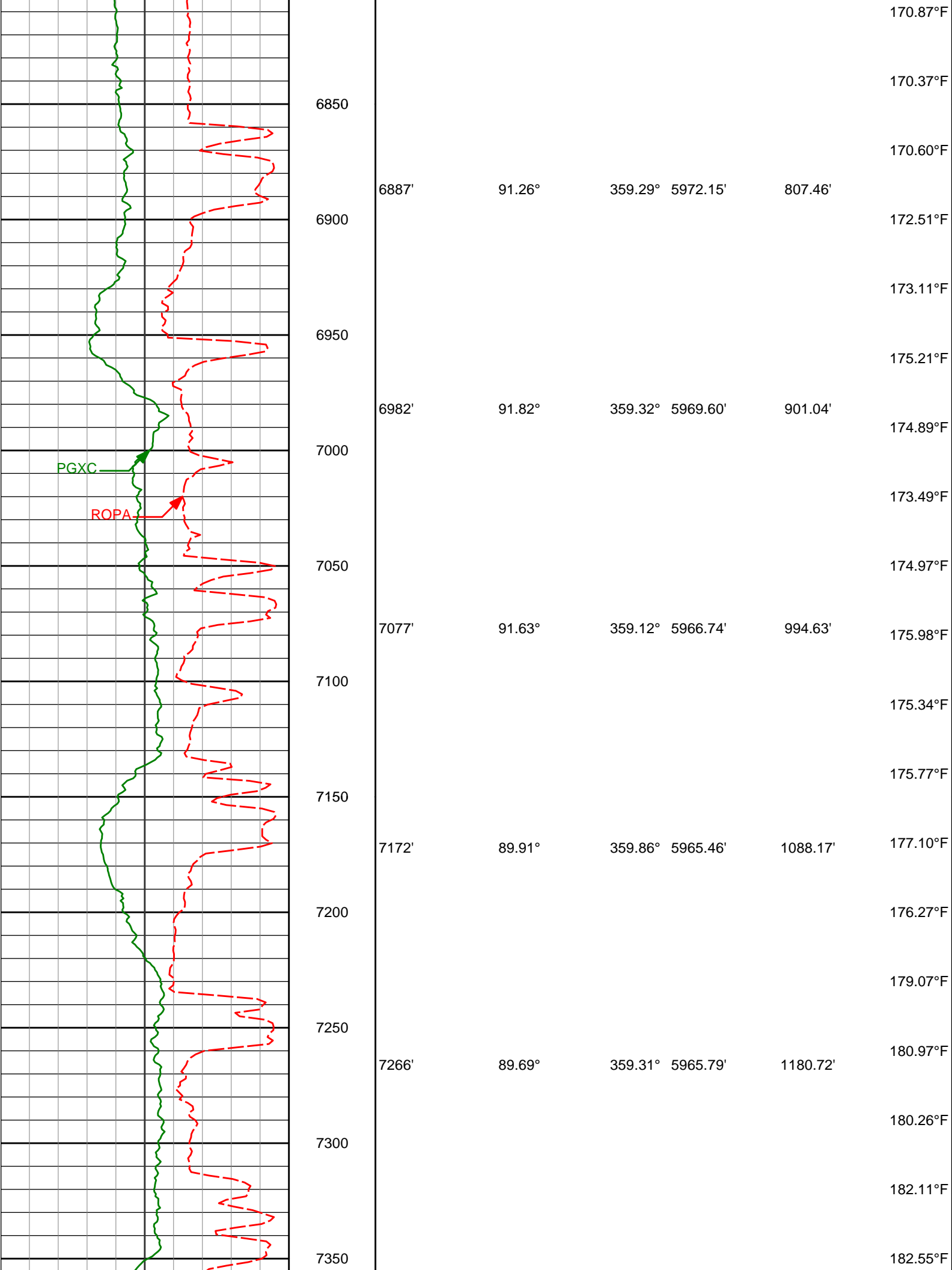


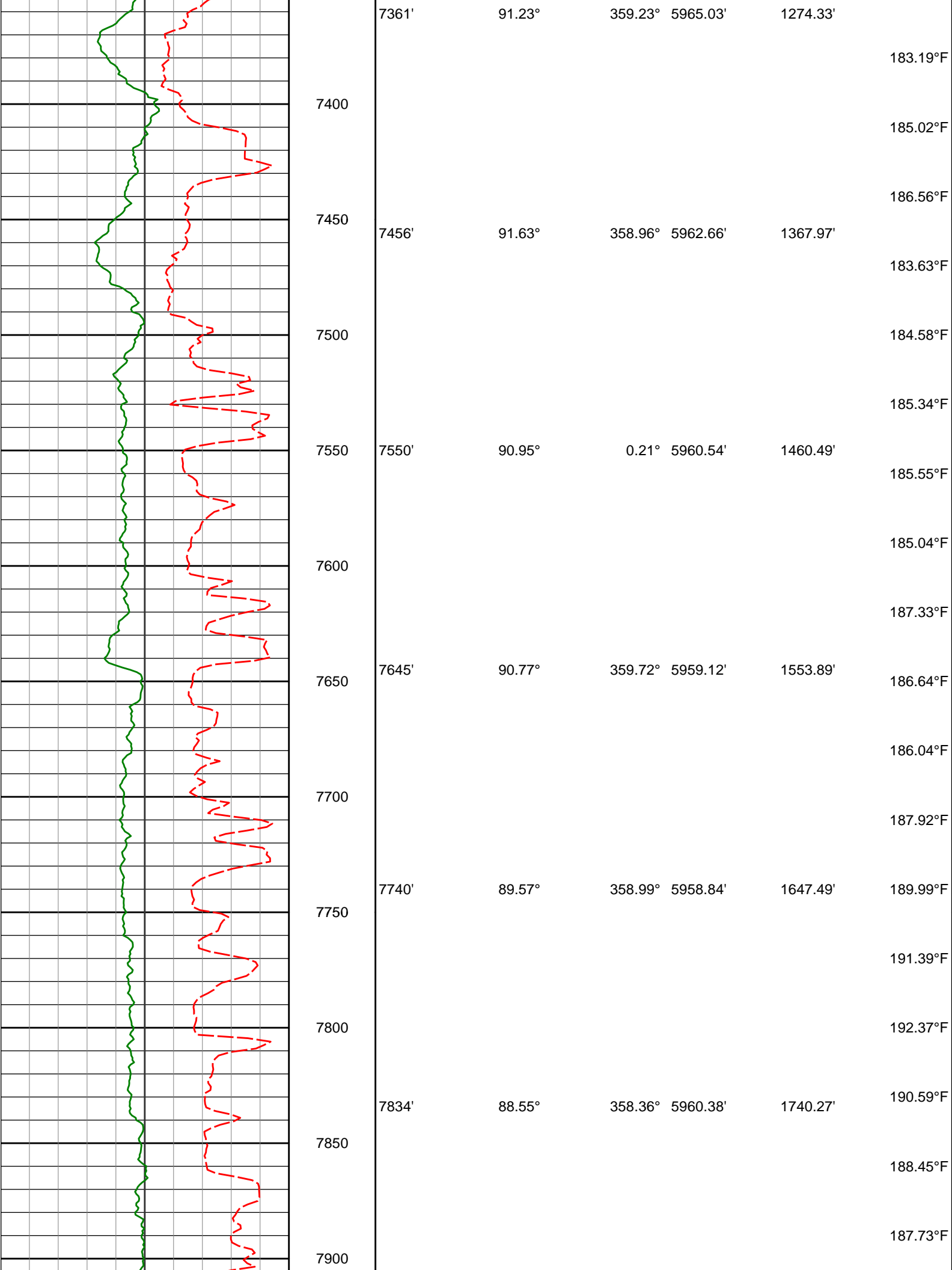


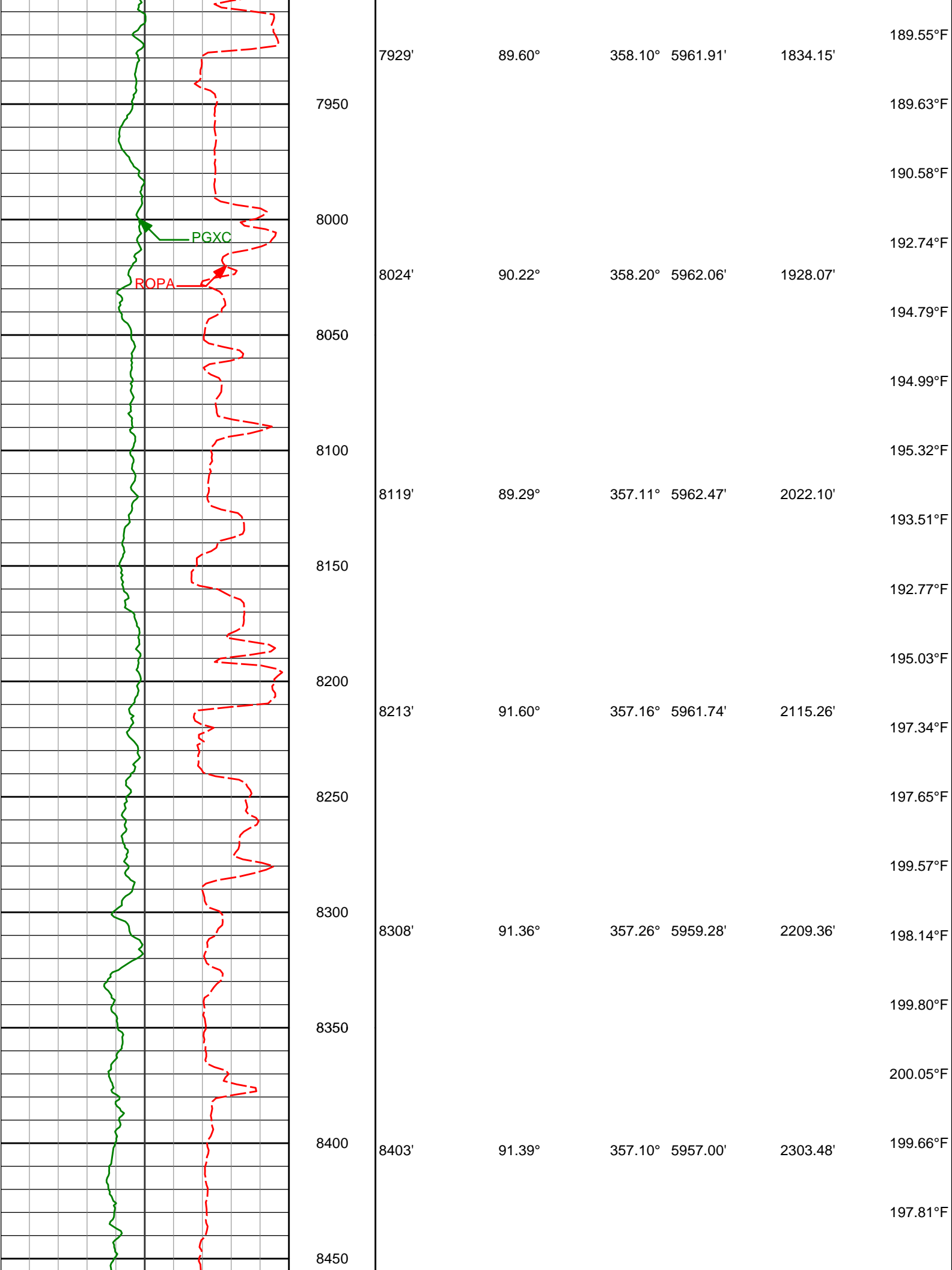


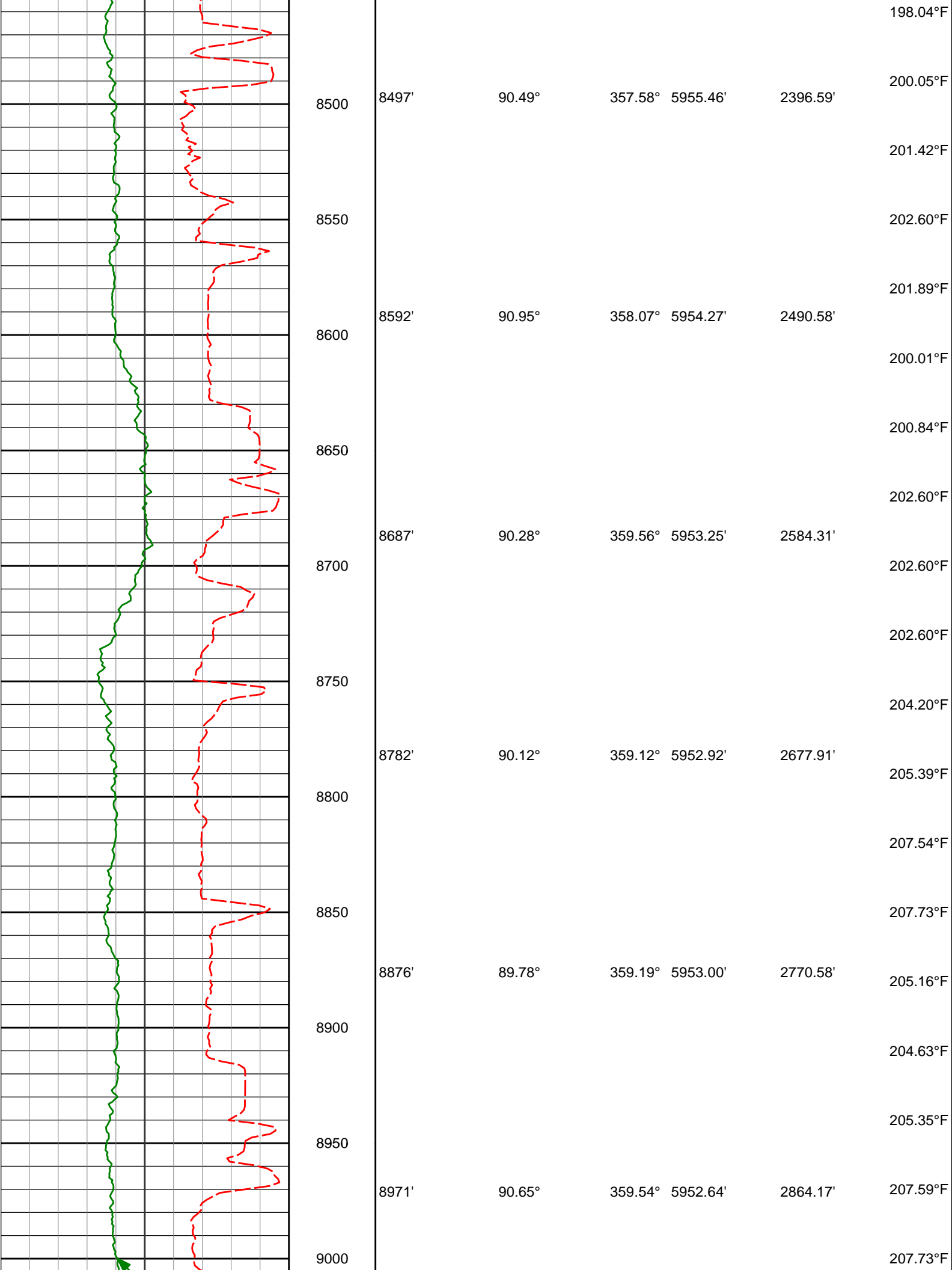


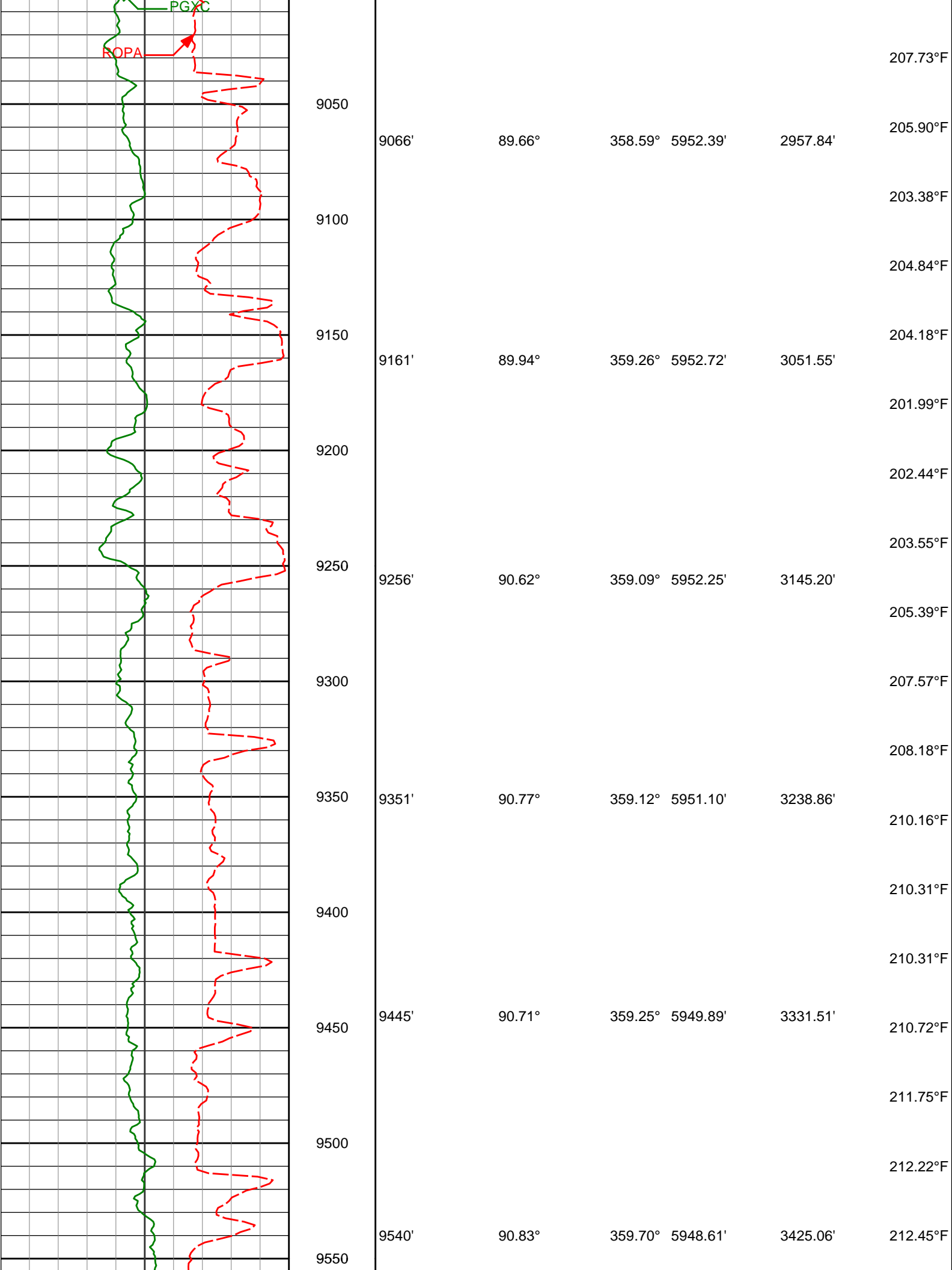


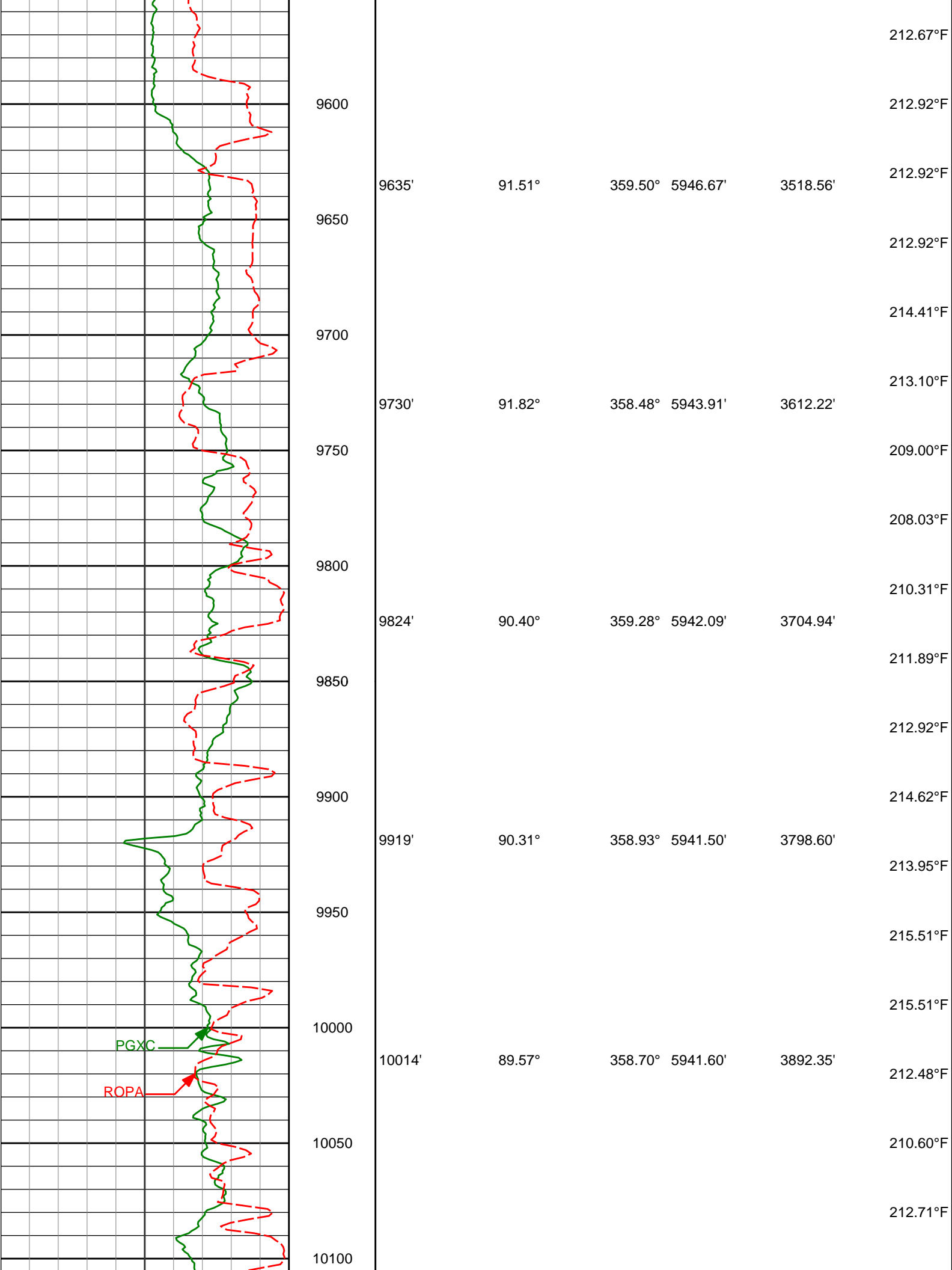


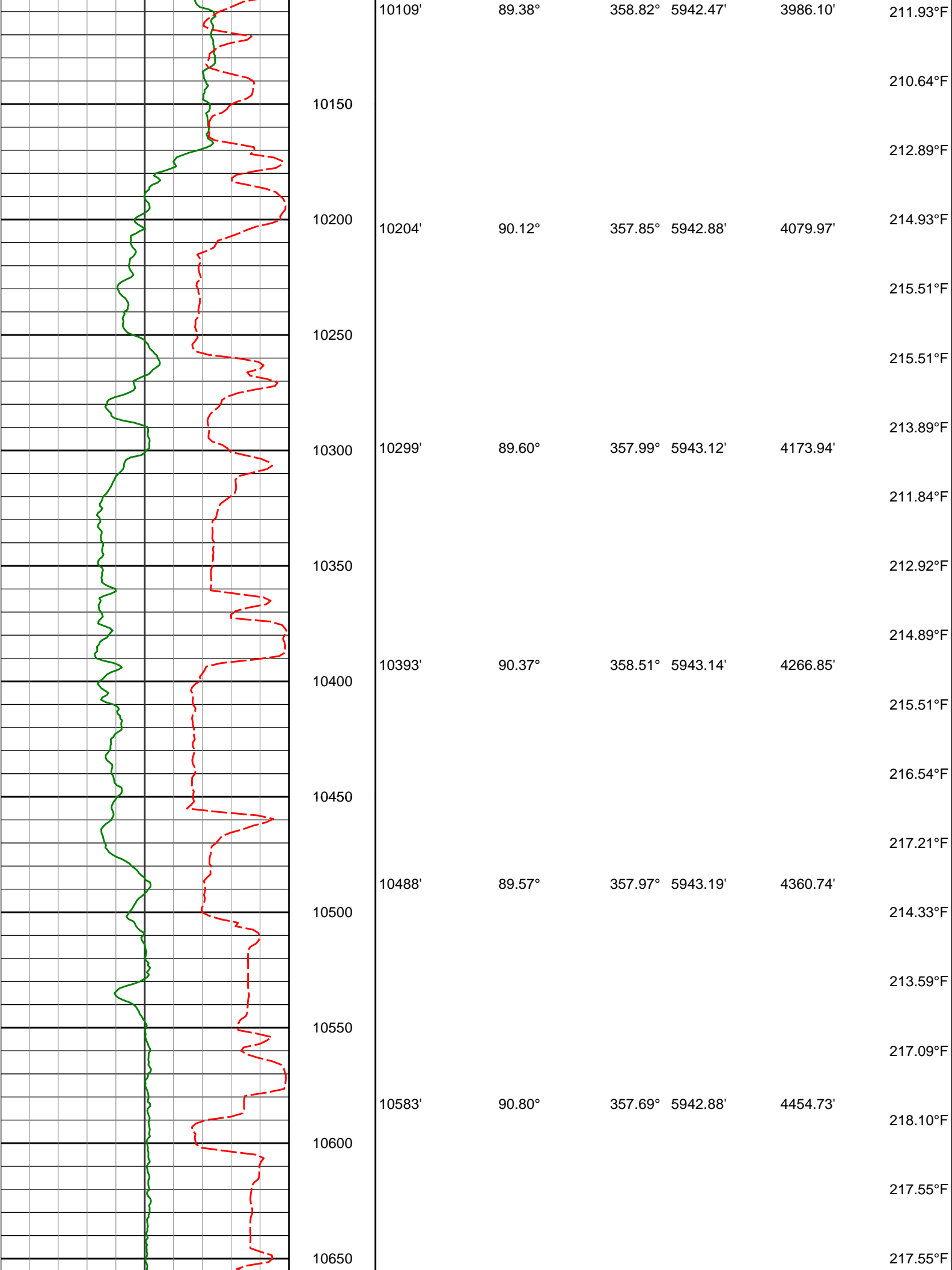


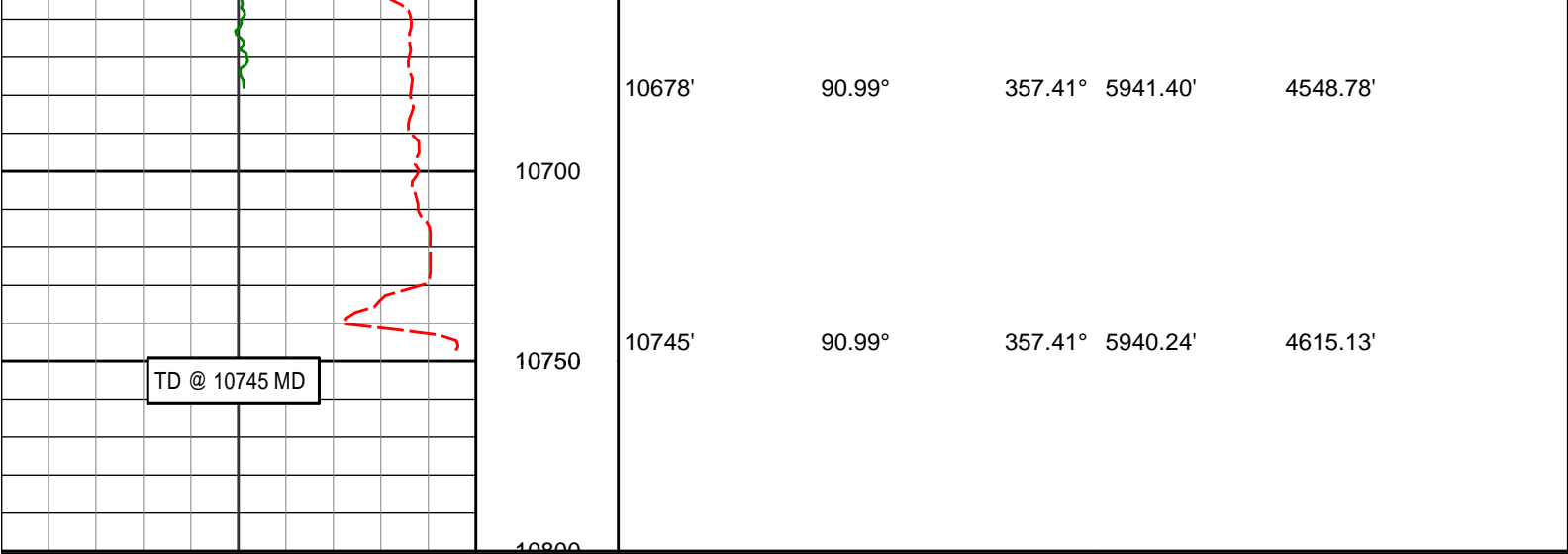






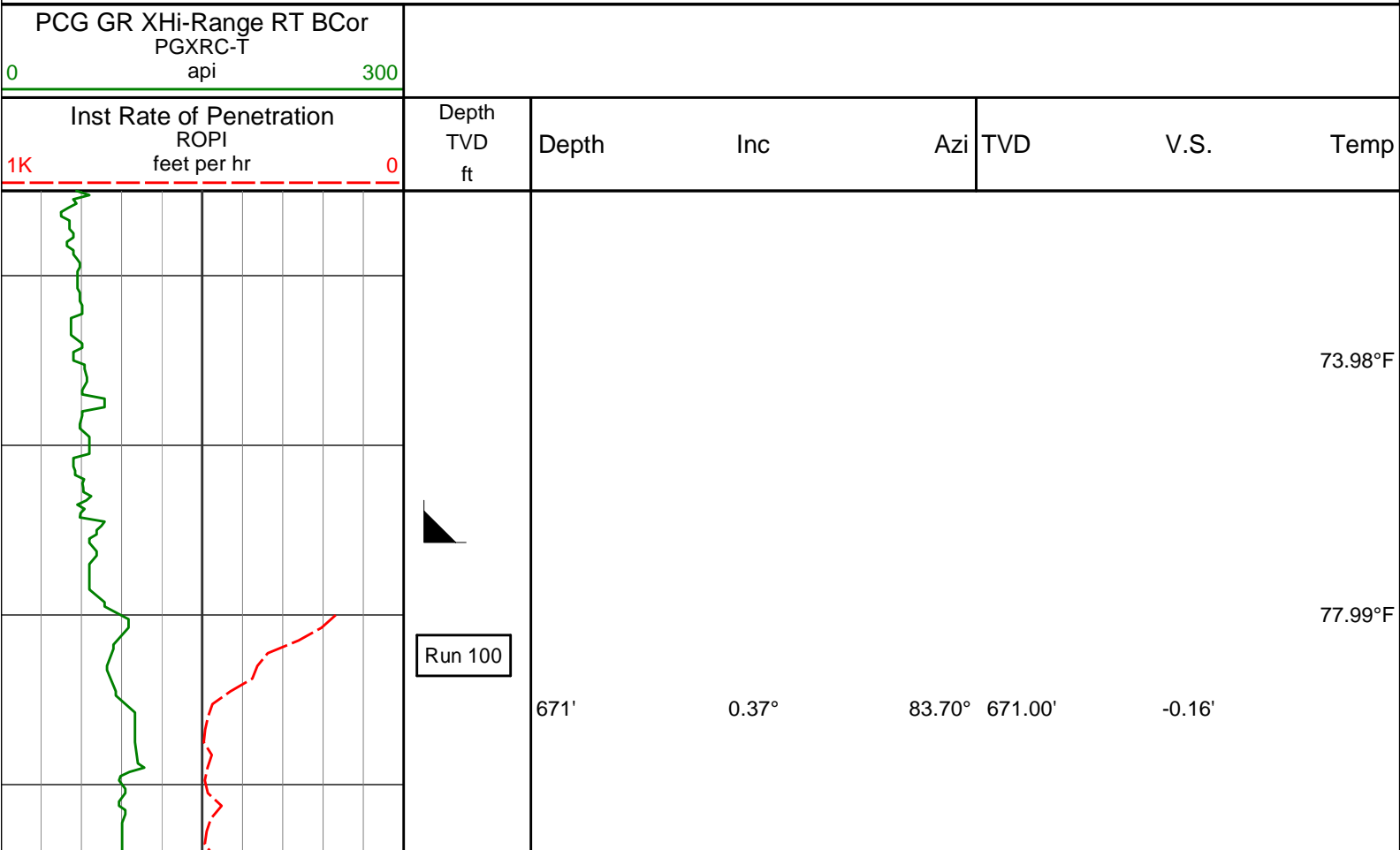


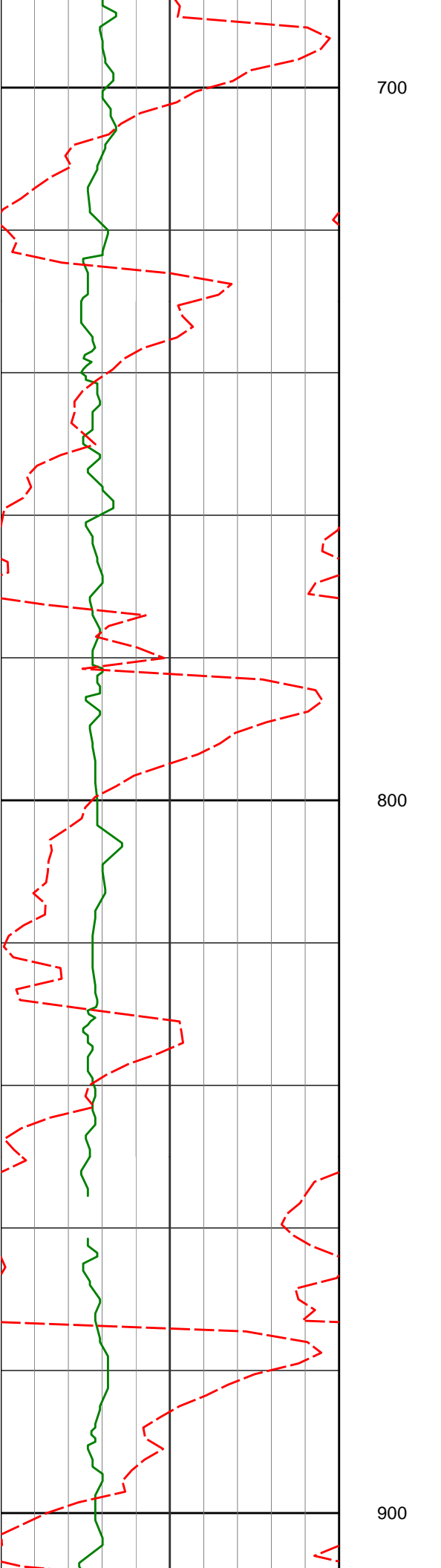




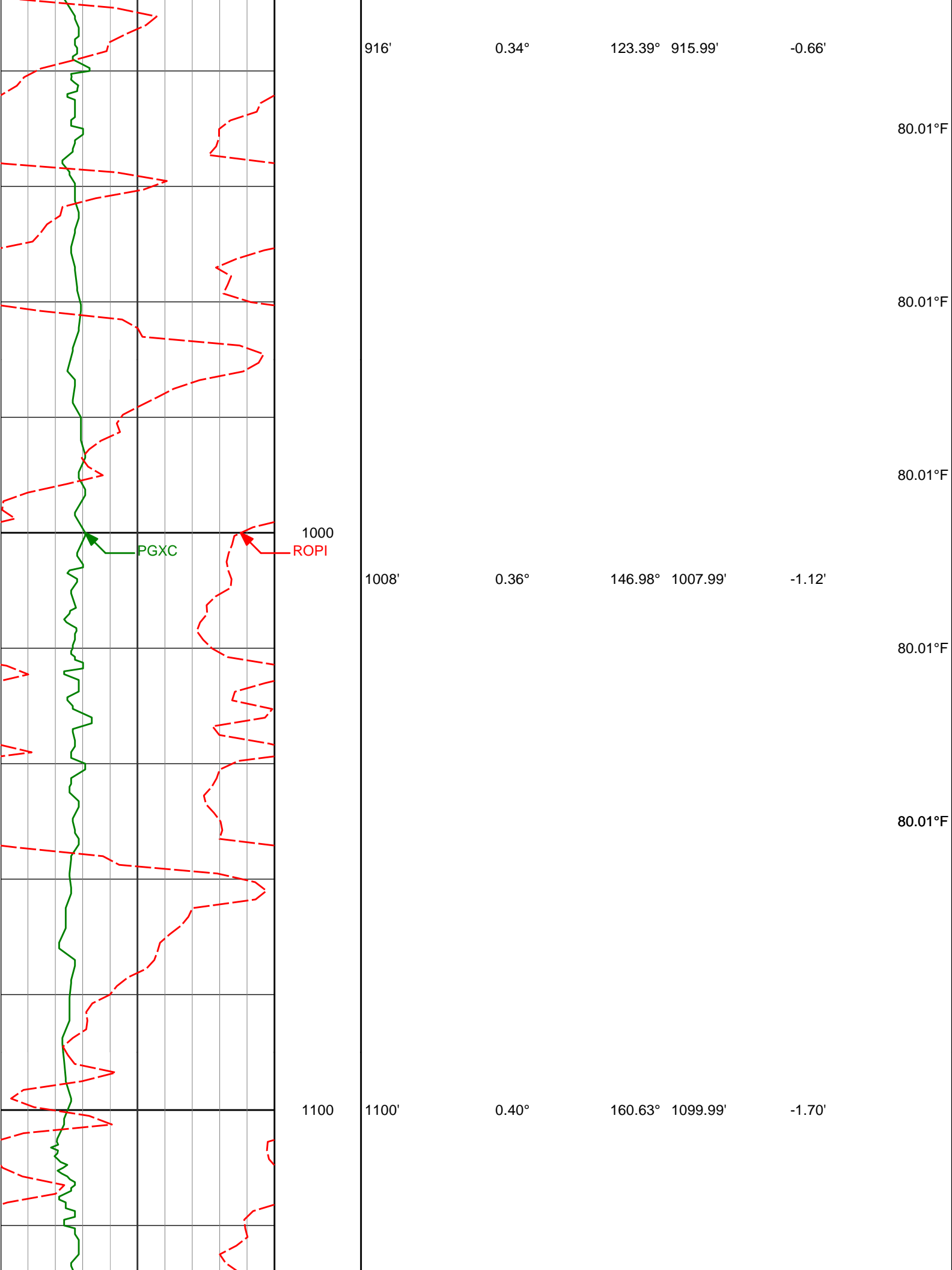
Avg Rate of Penetration ROPA feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
1K 0								
PCG GR XHi-Range RT BCor PGXRC-T api								
0 300								

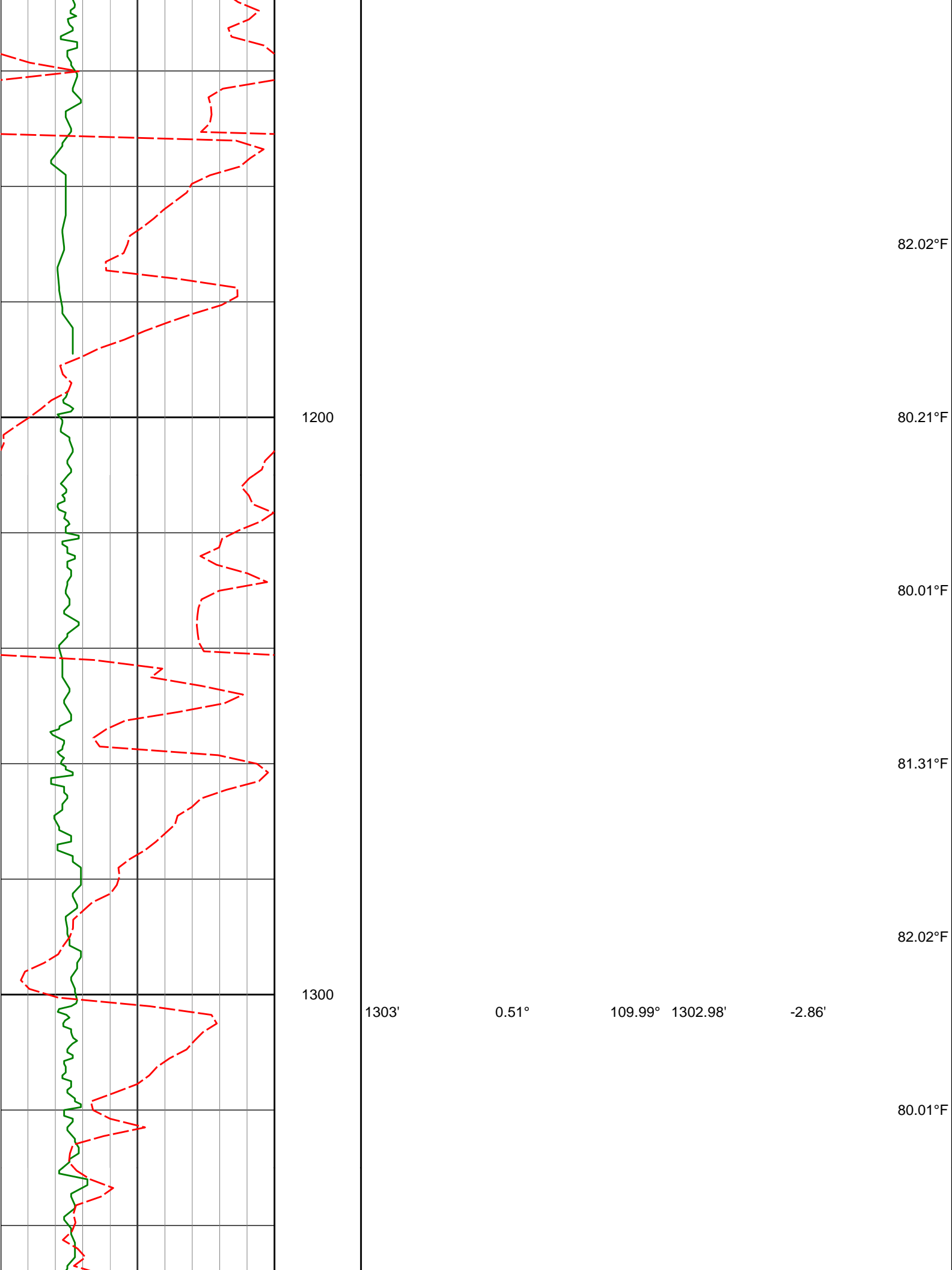
MD Detail 1:240 Scale

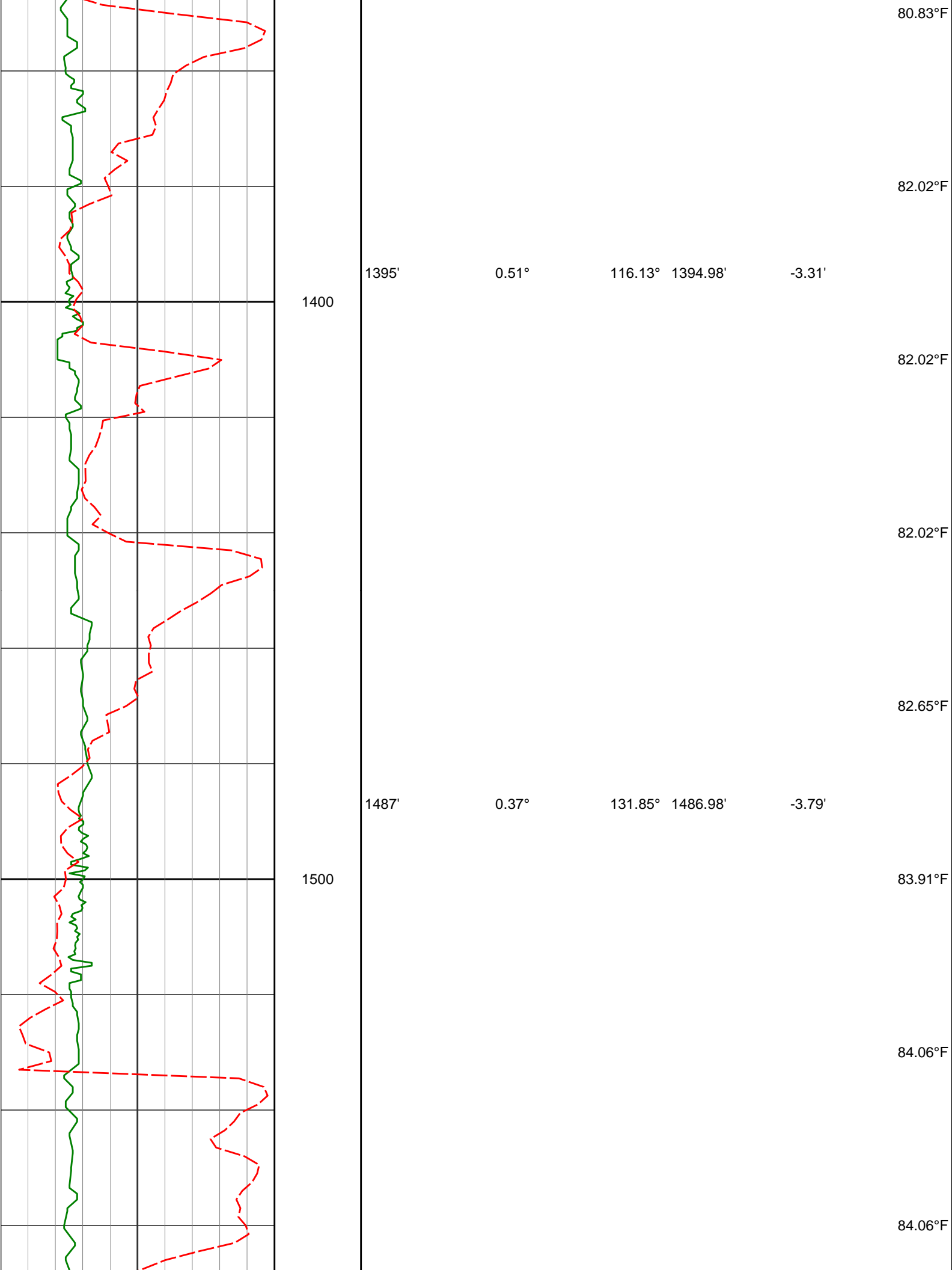


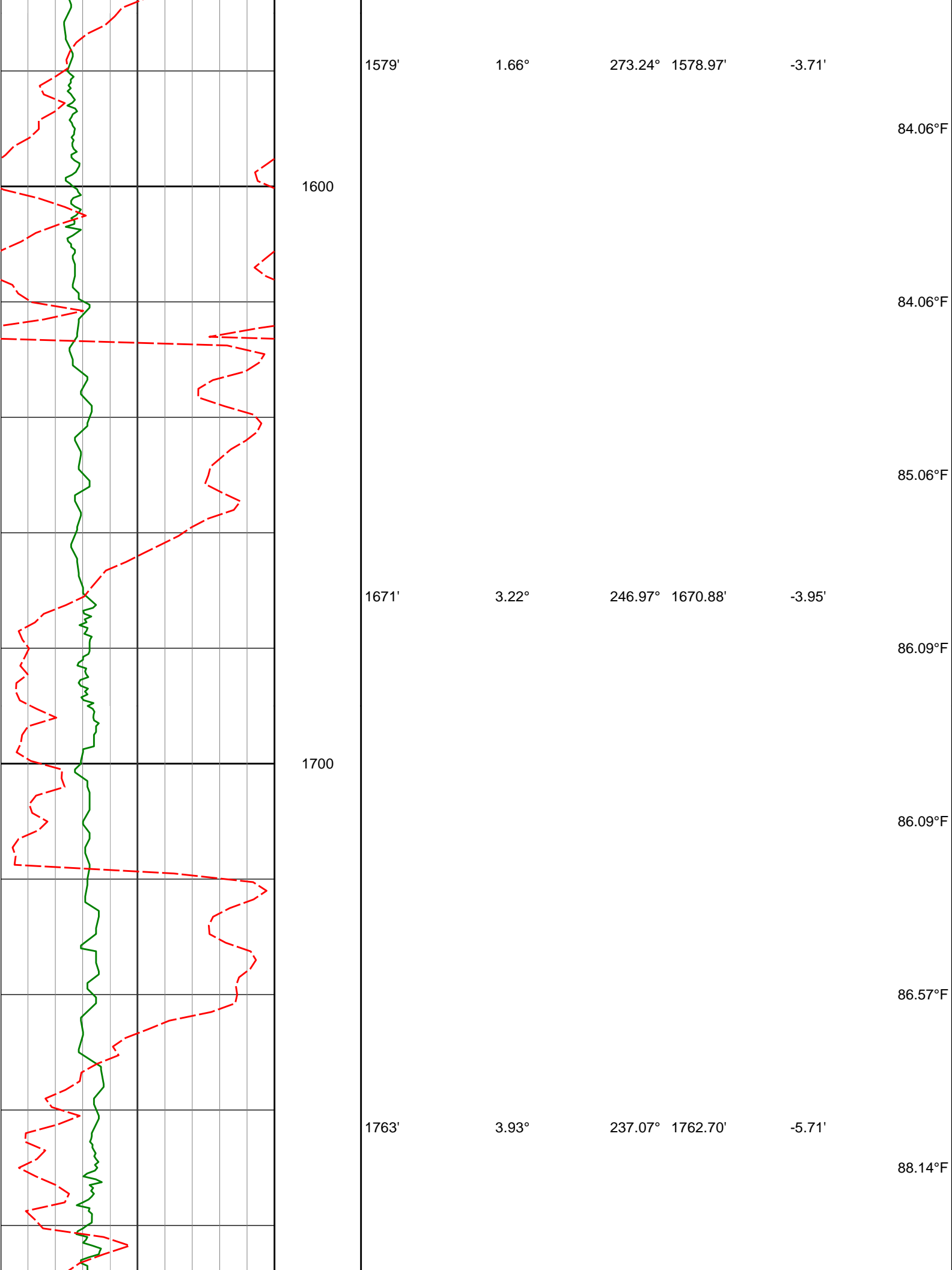


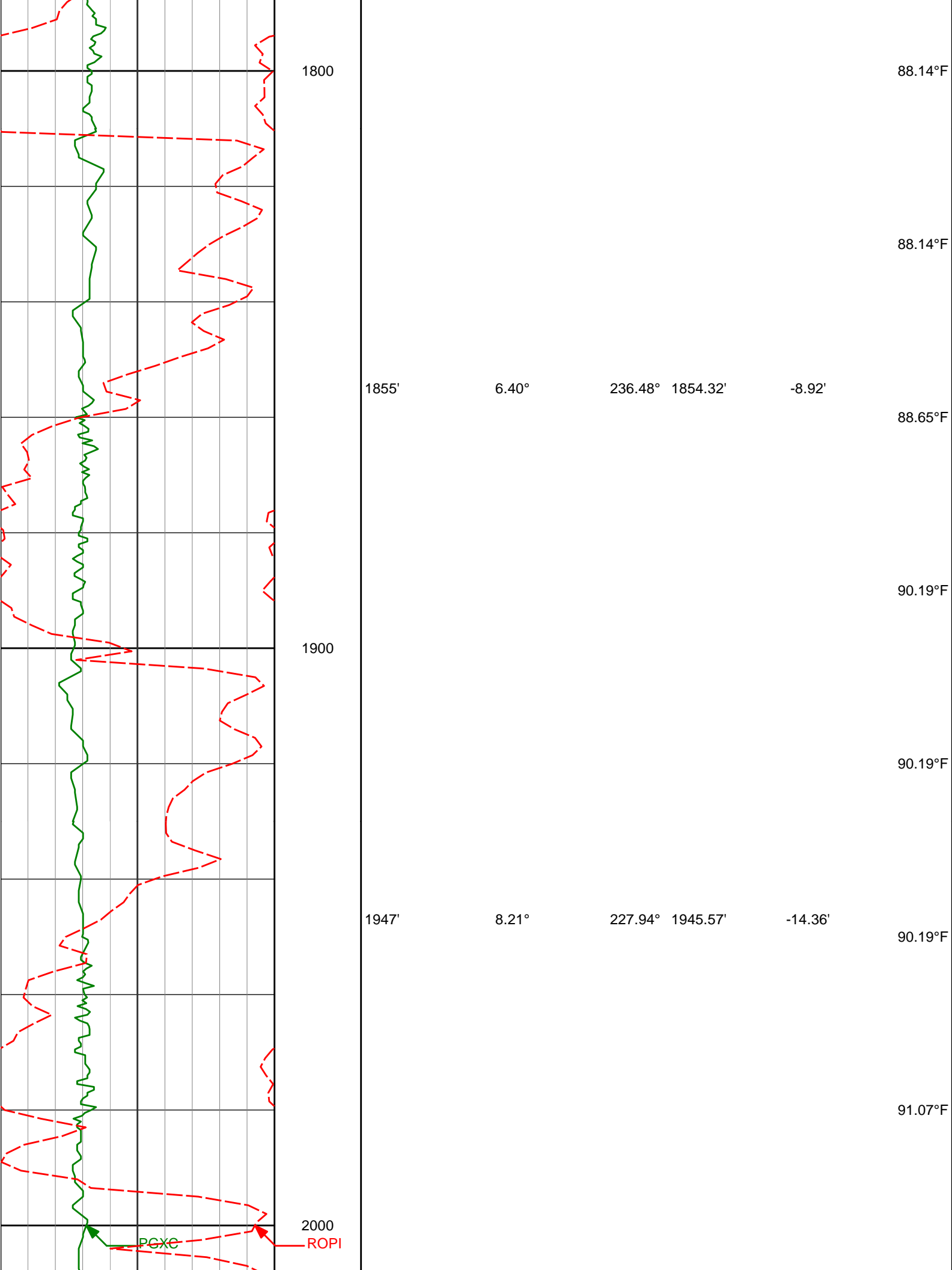
					77.99°F
700					
732'	0.28°	85.60°	731.99'	-0.19'	
					77.99°F
					77.99°F
800					
824'	0.25°	119.21°	823.99'	-0.34'	
900					

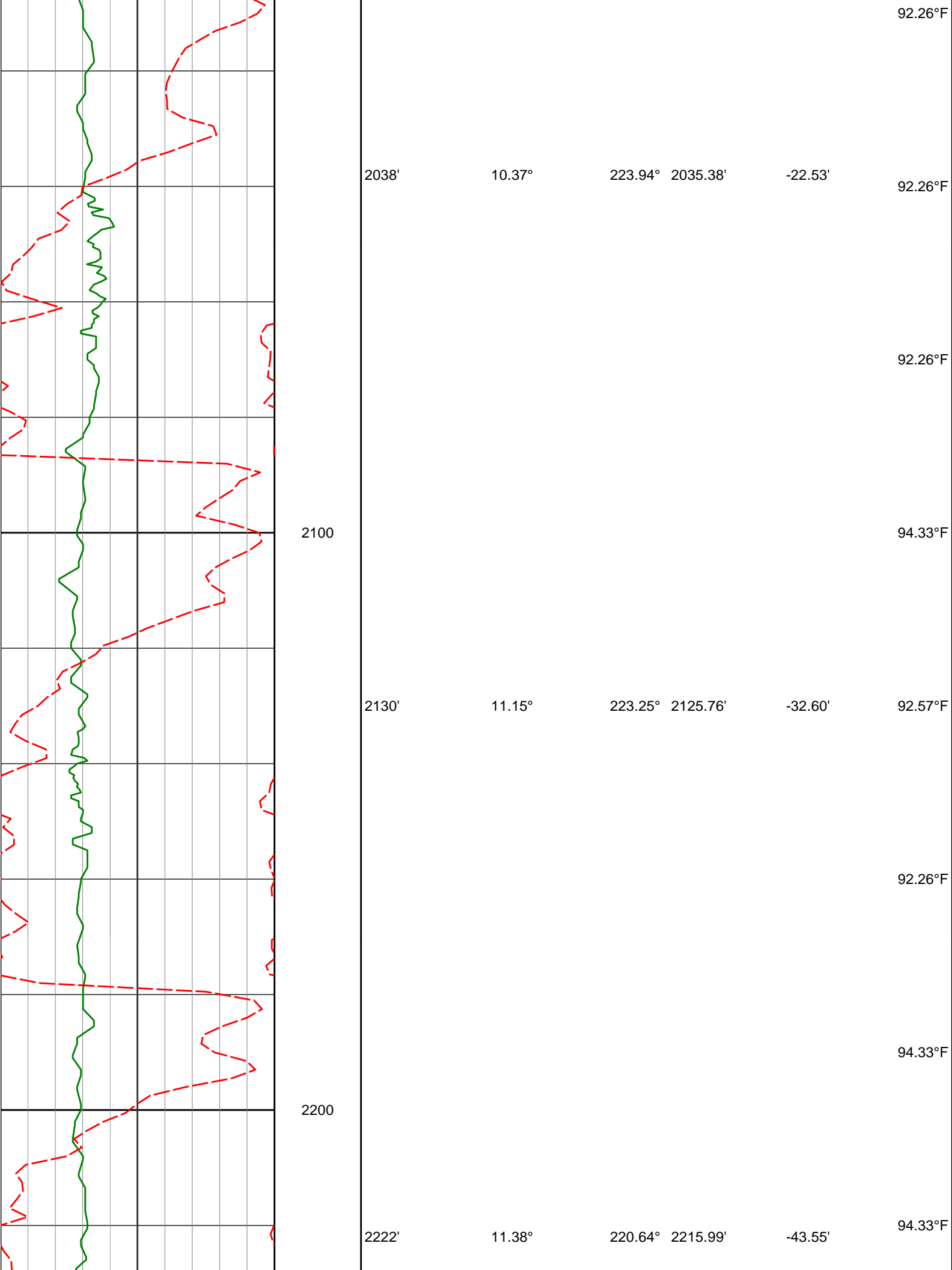


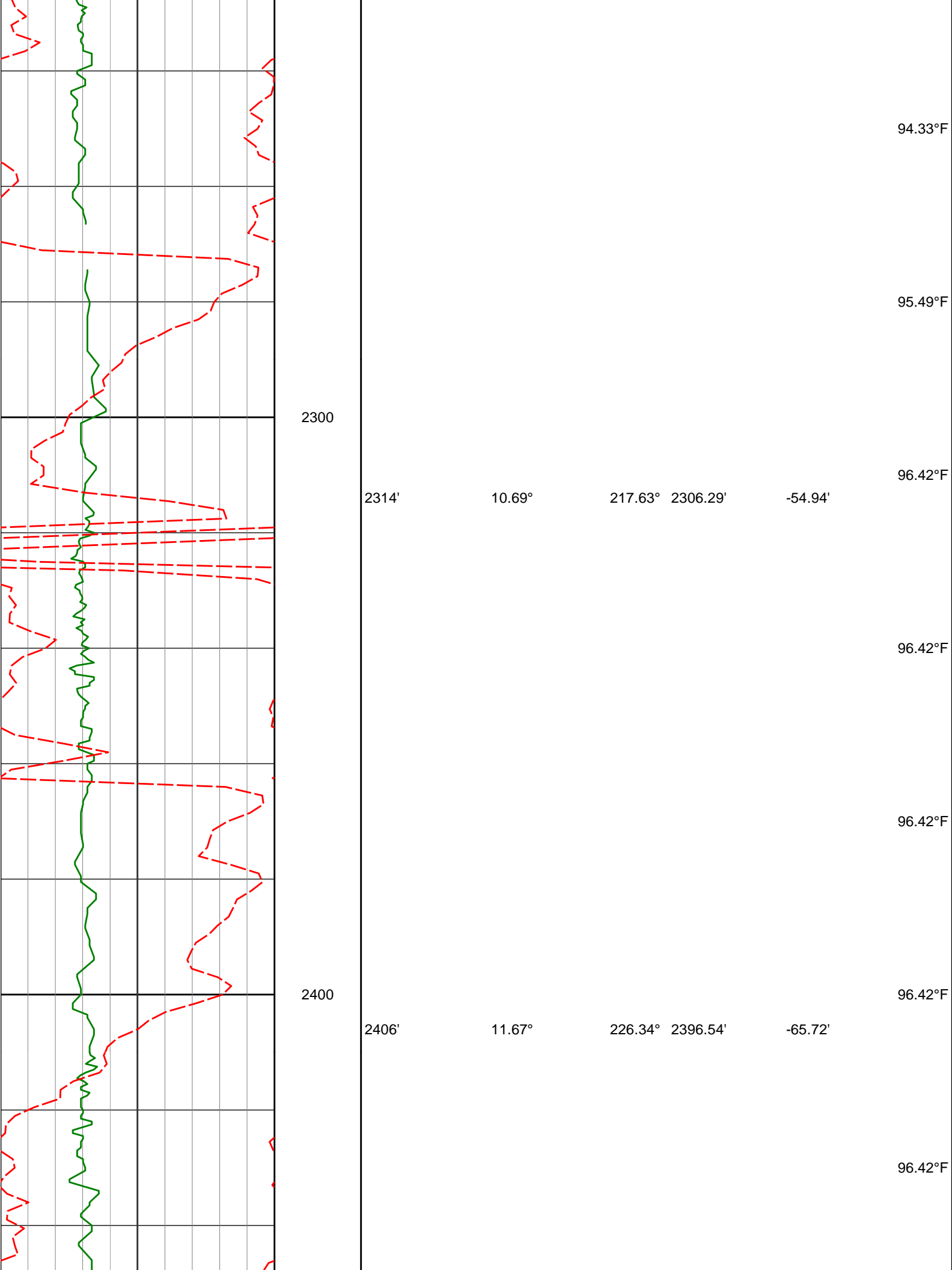


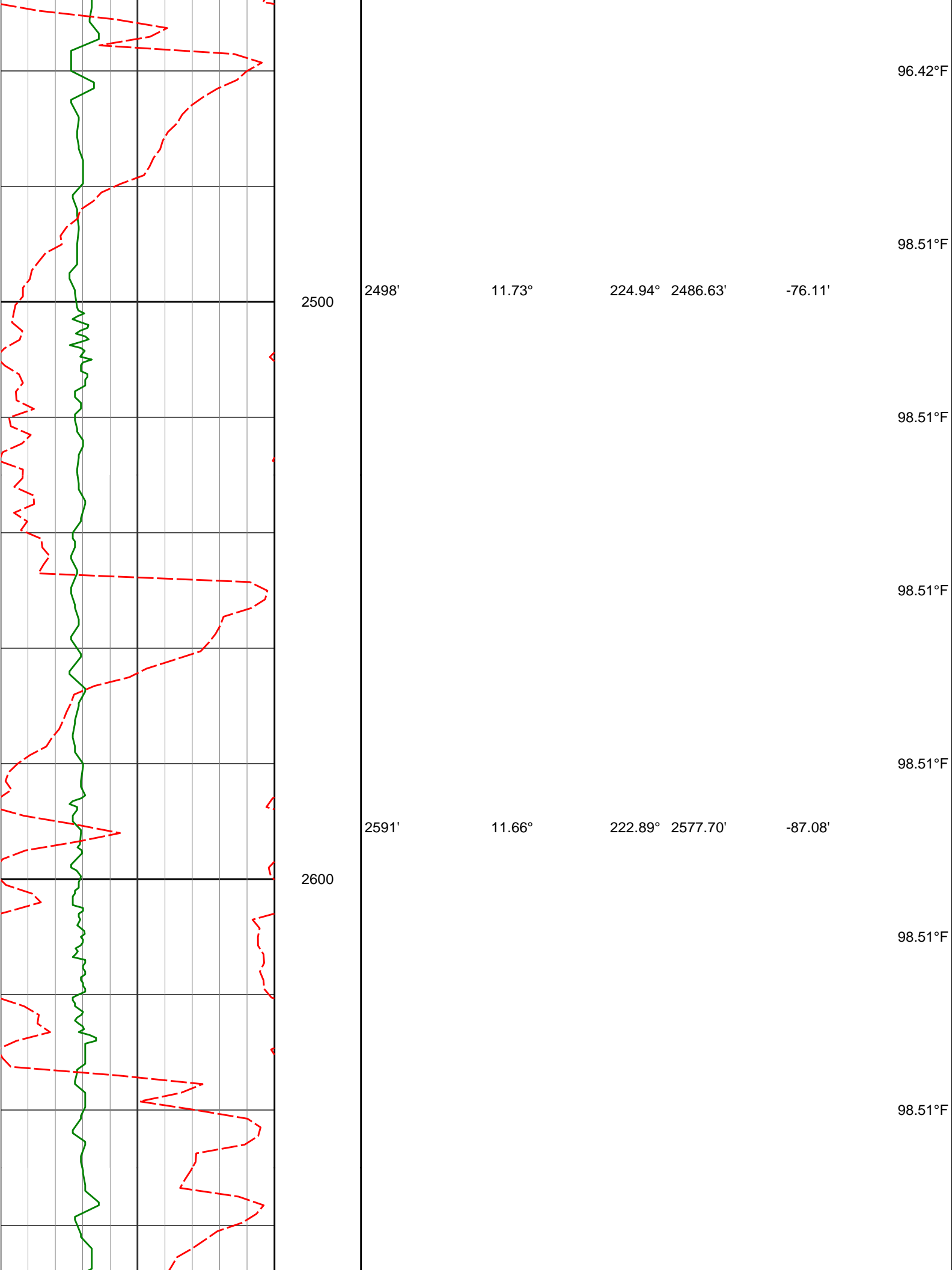


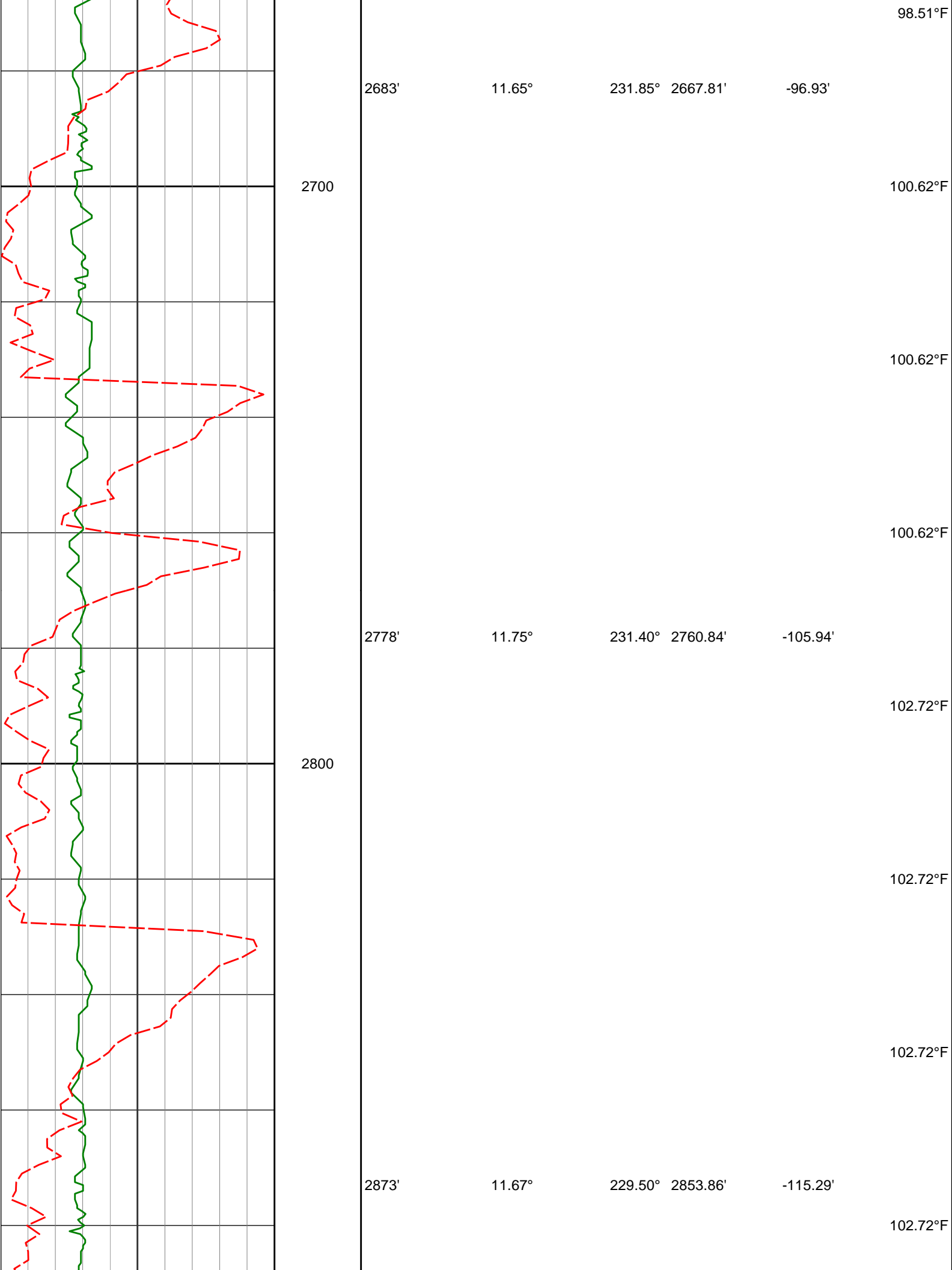


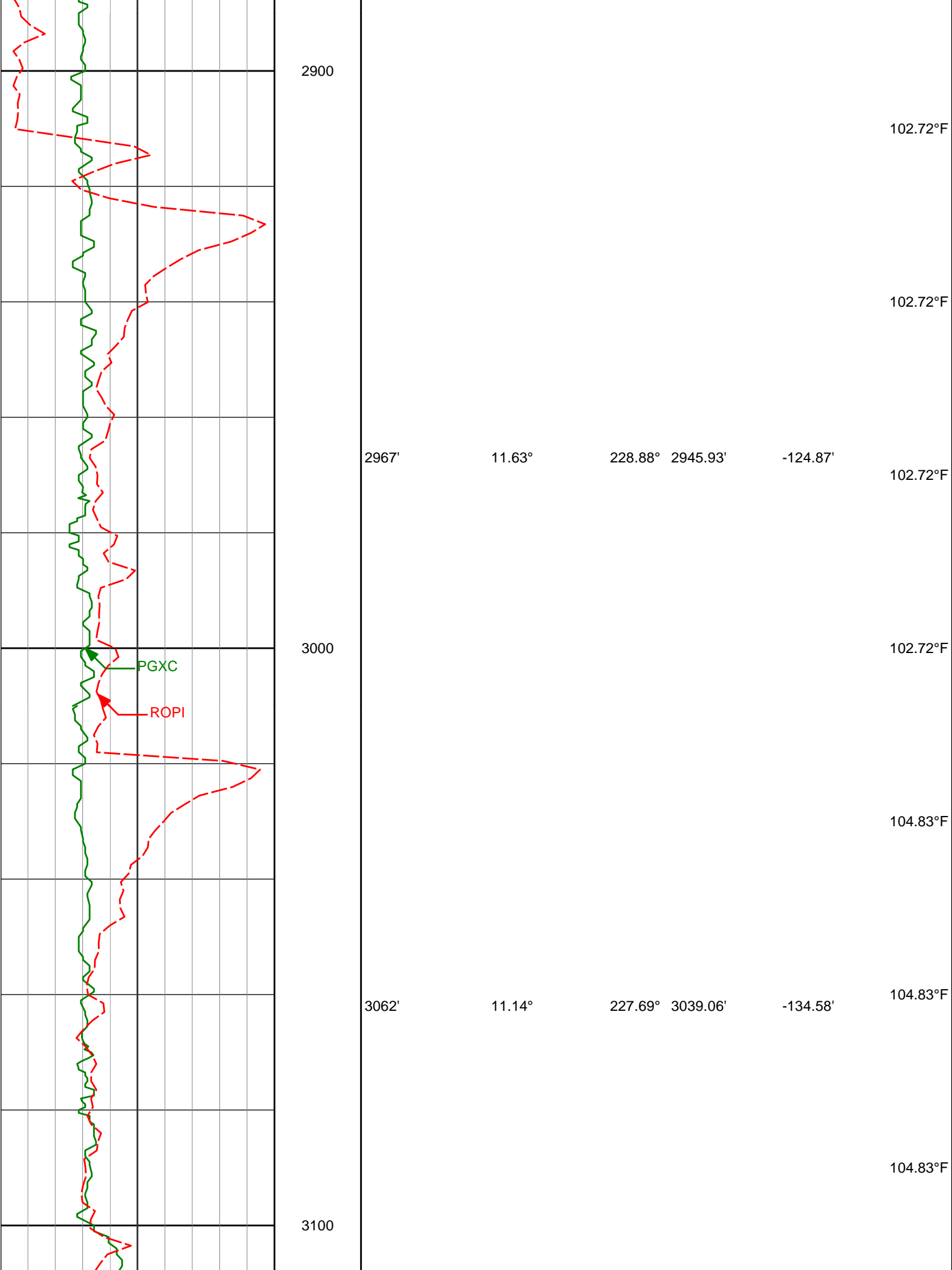


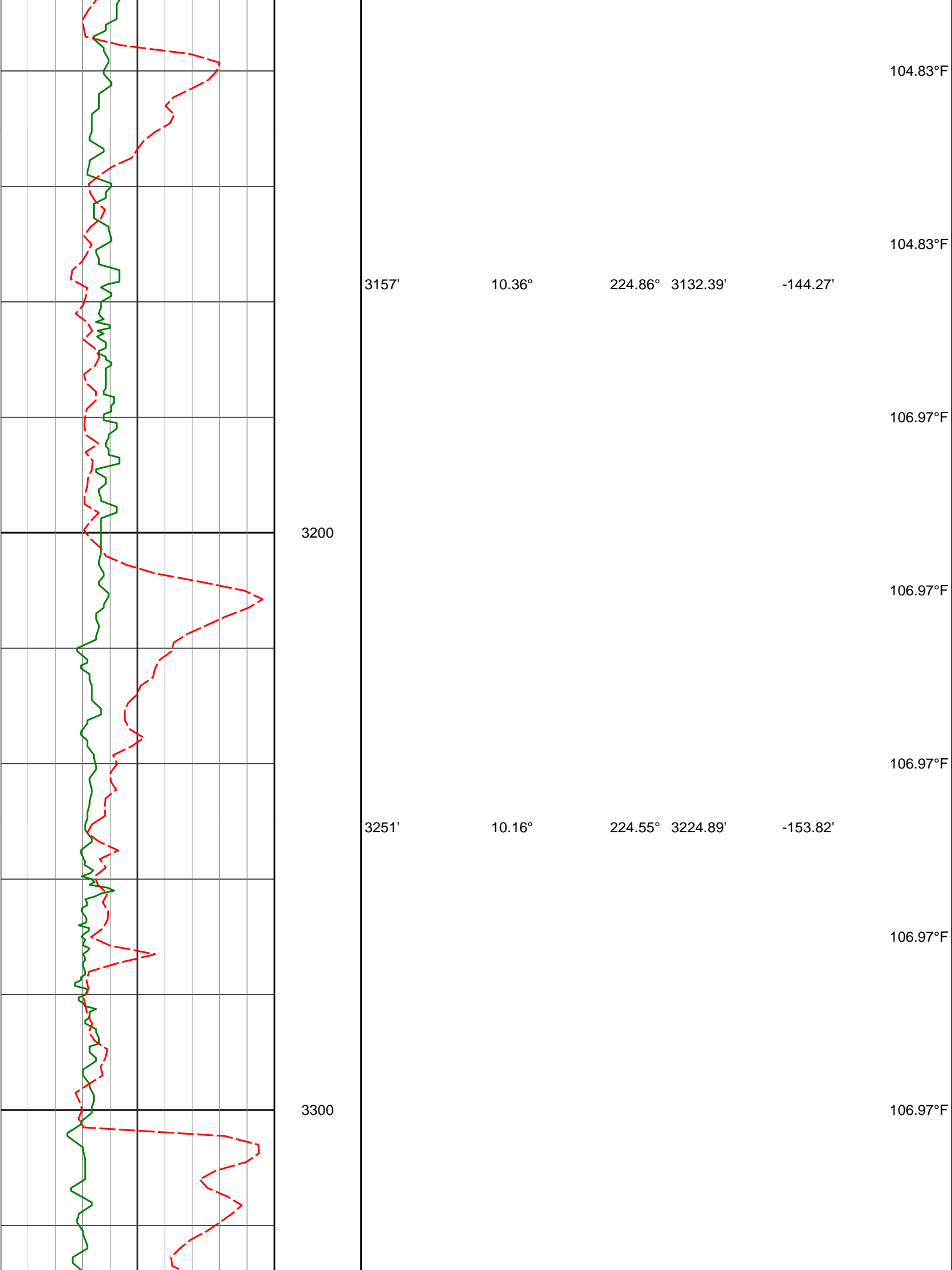


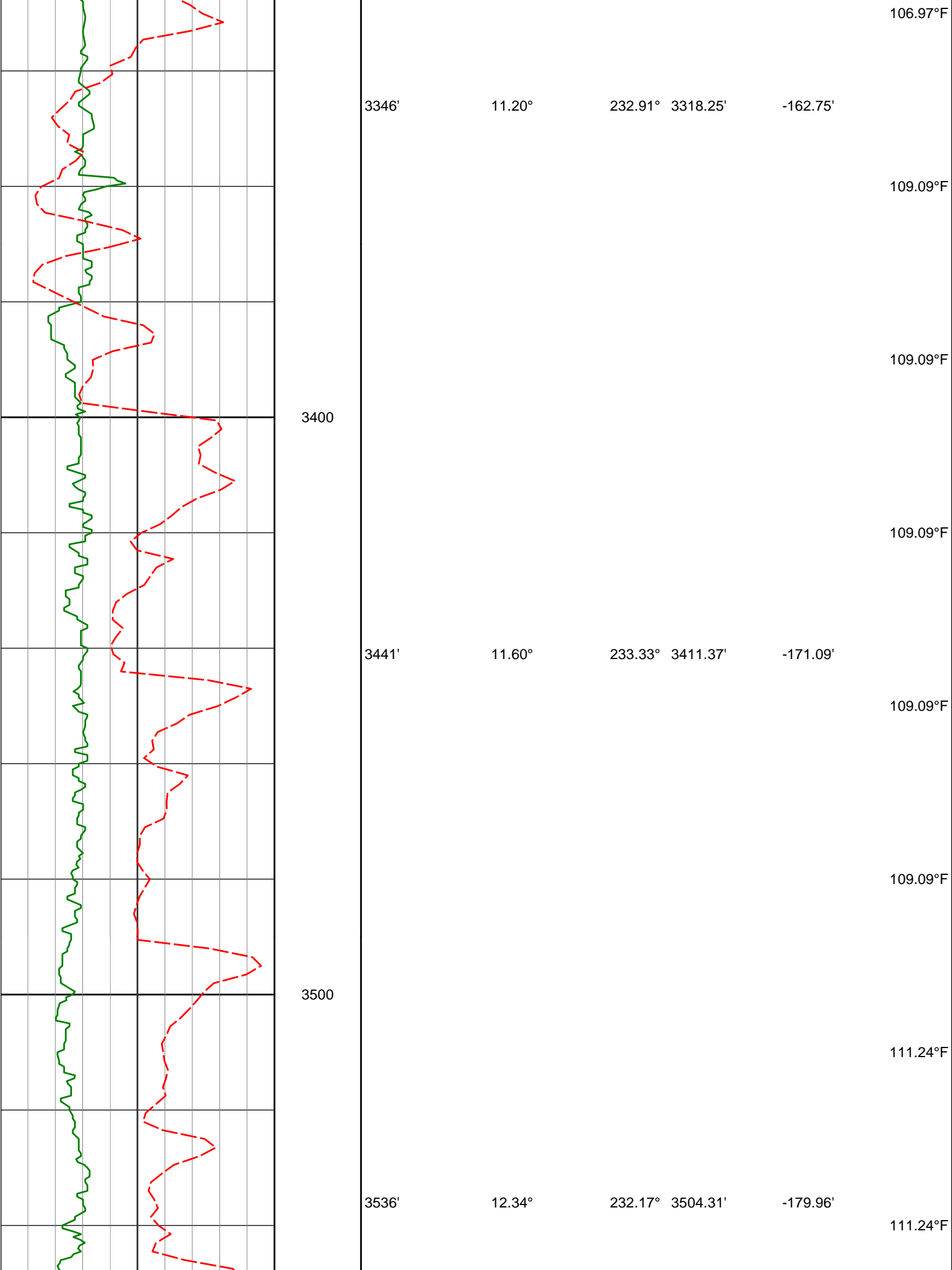


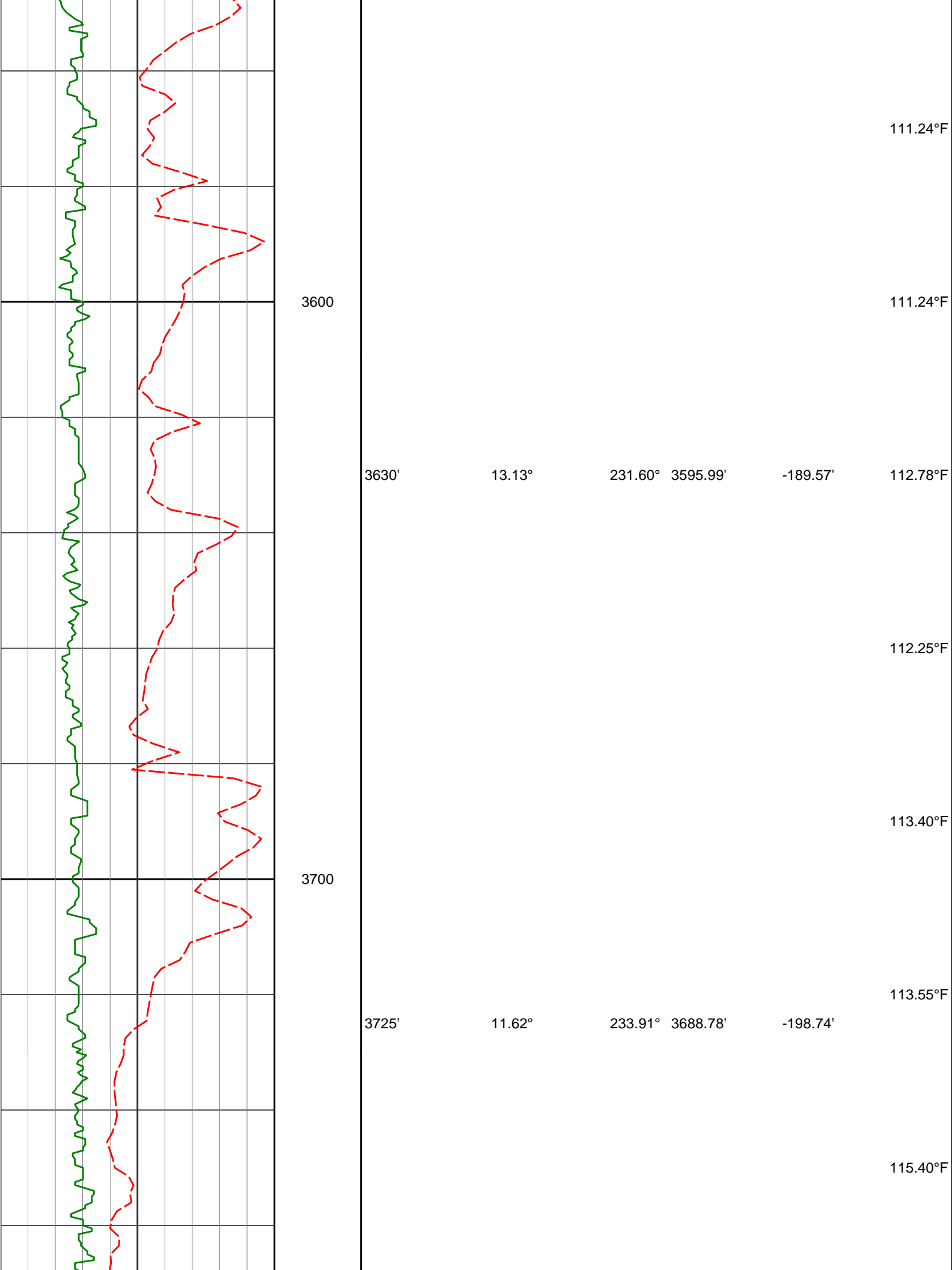


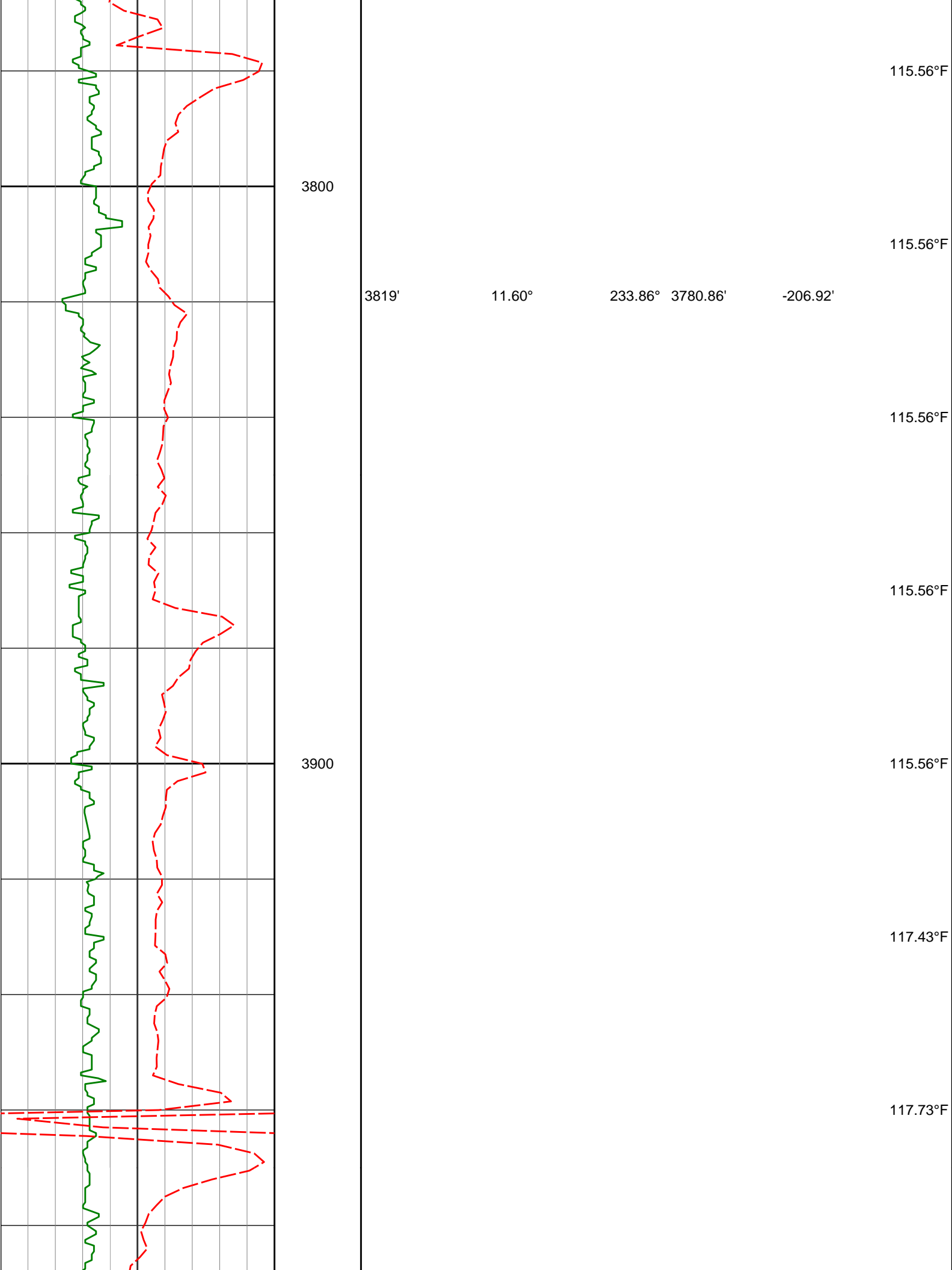


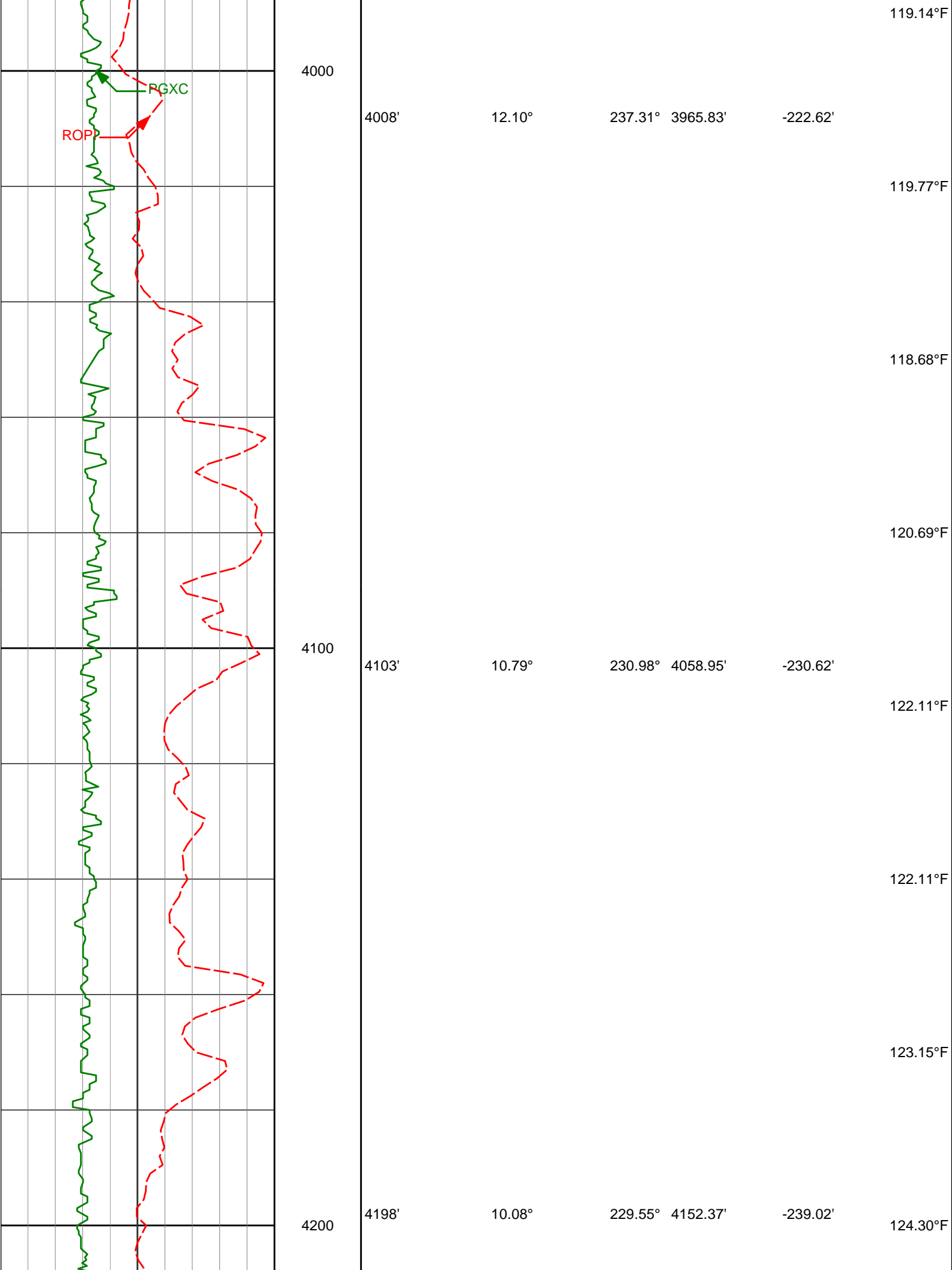


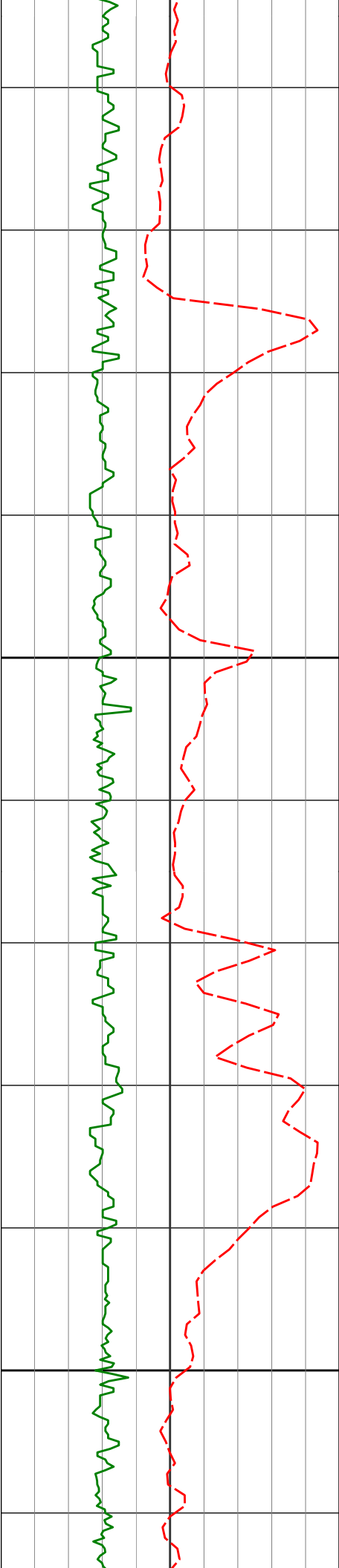












4300

4400

4293'

4388'

9.03°

9.97°

226.99°

229.93°

4246.06'

4339.75'

-247.17'

-255.23'

124.30°F

124.30°F

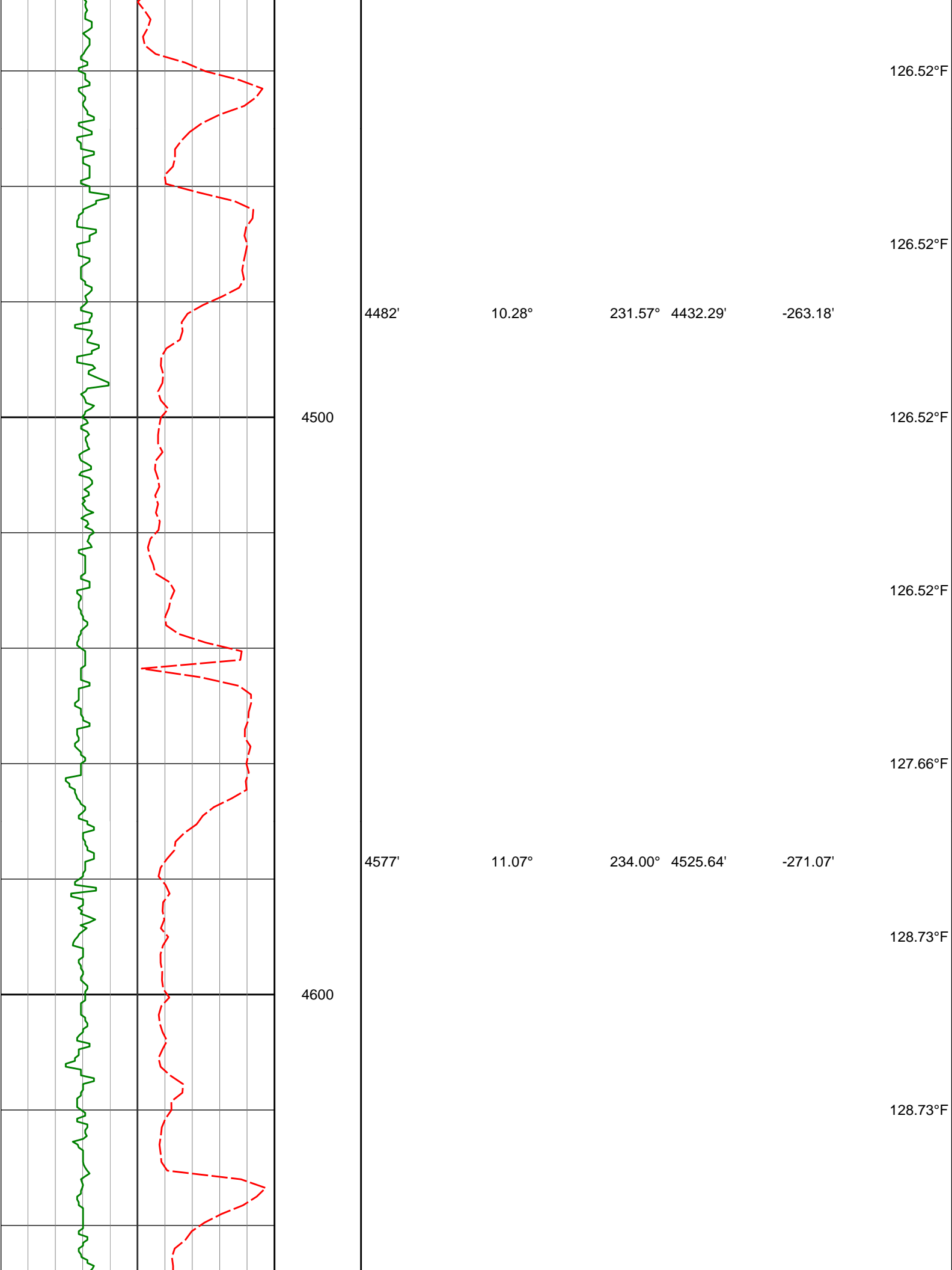
124.30°F

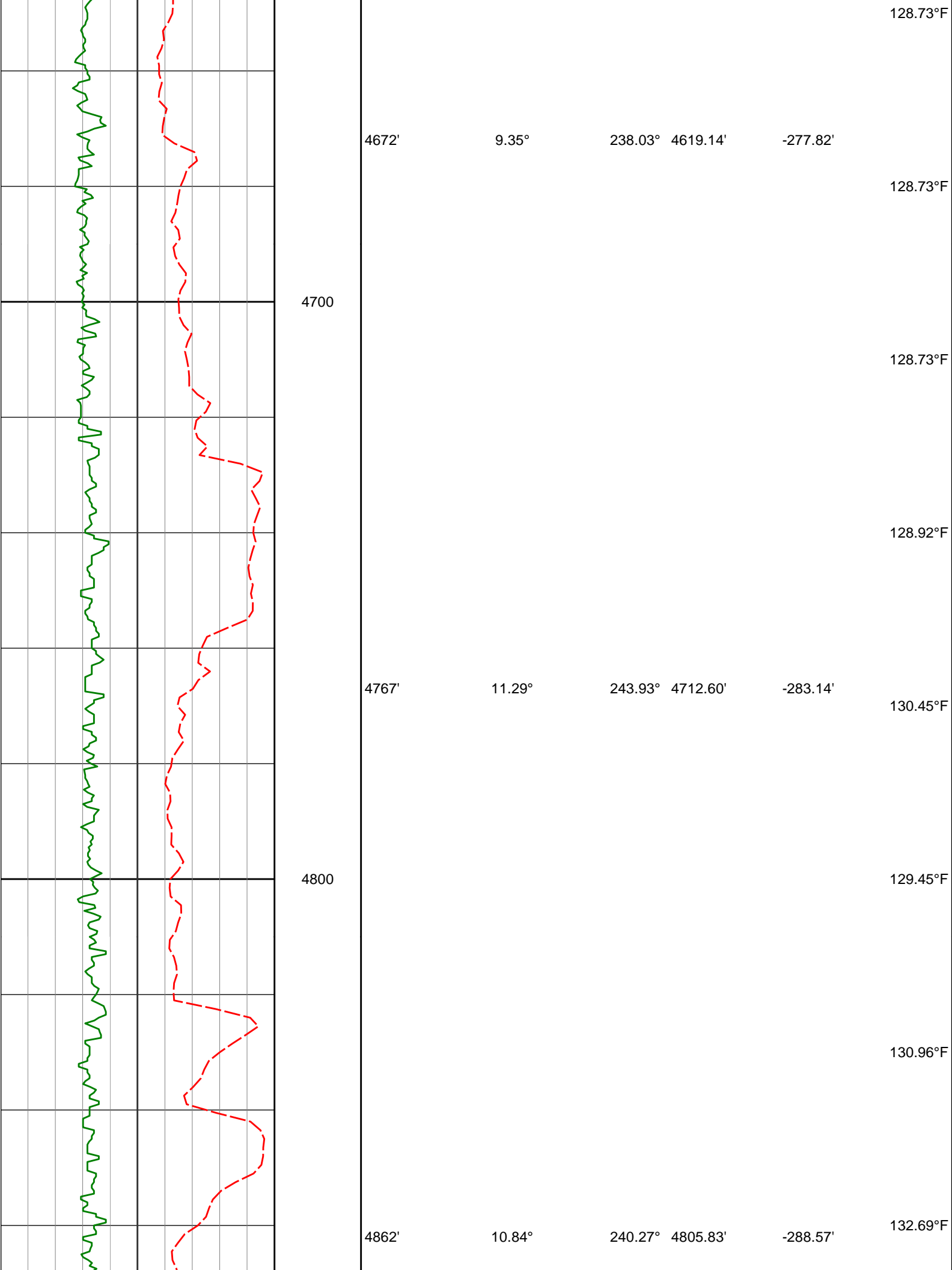
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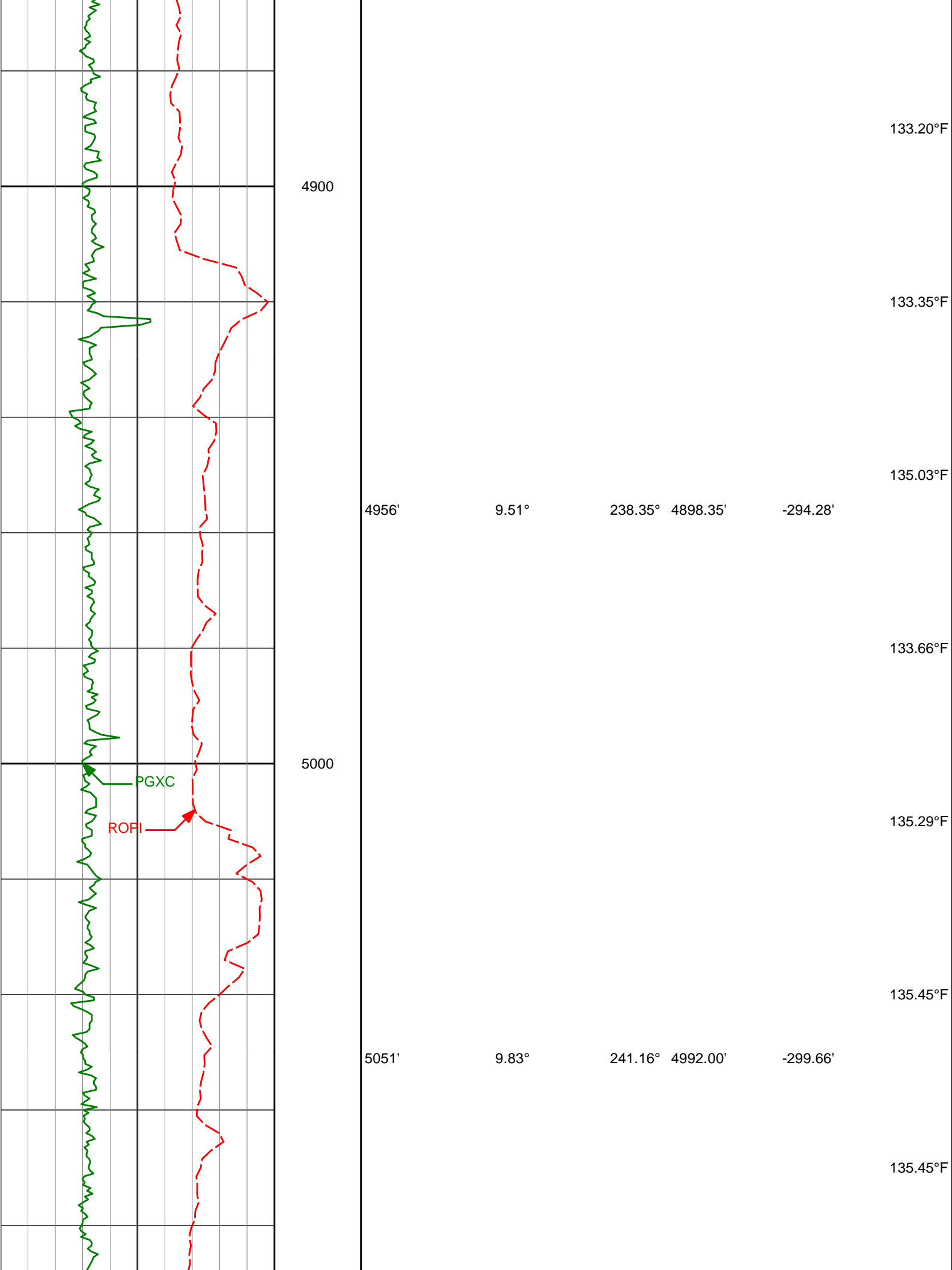
124.30°F

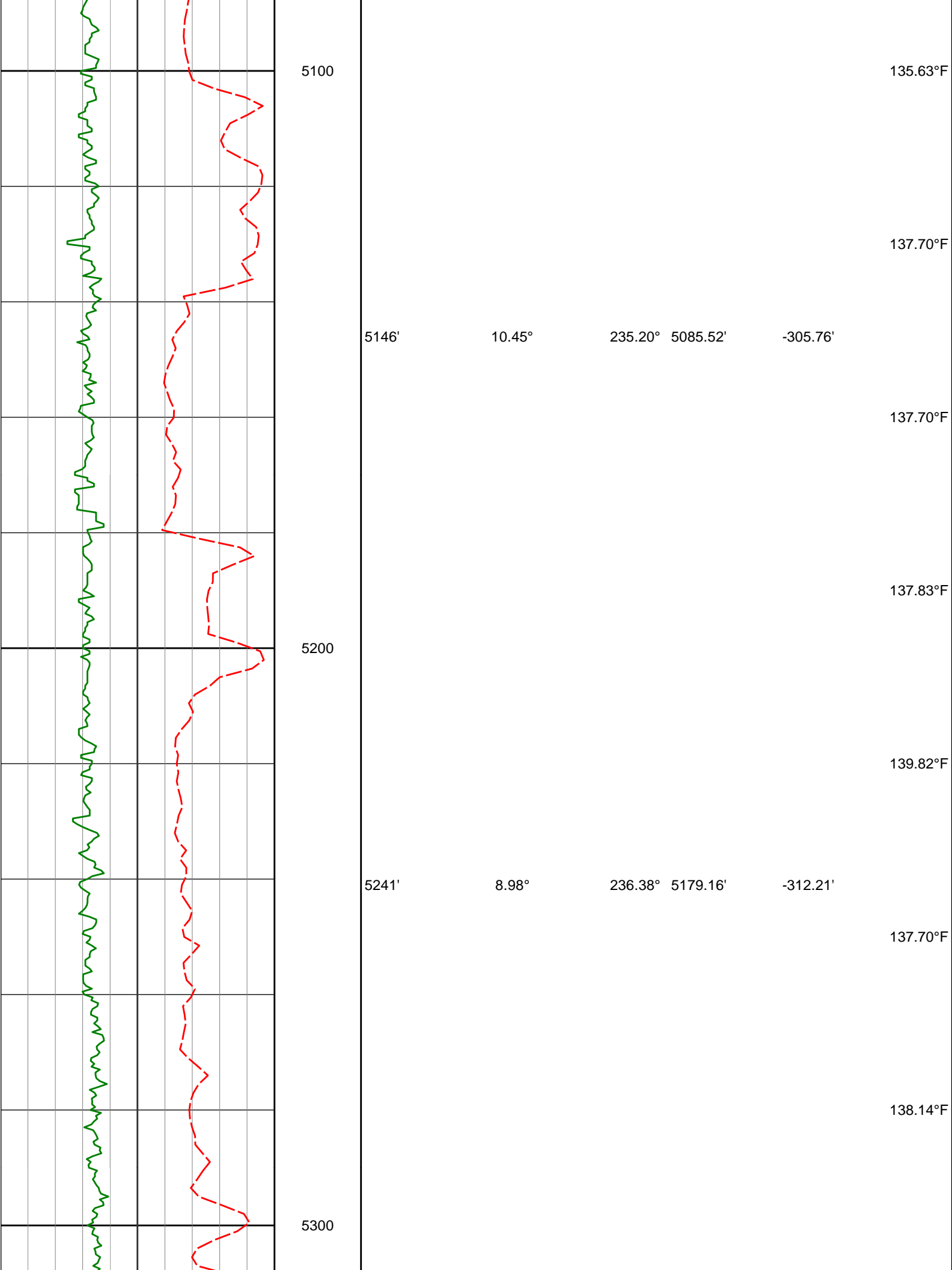
124.96°F

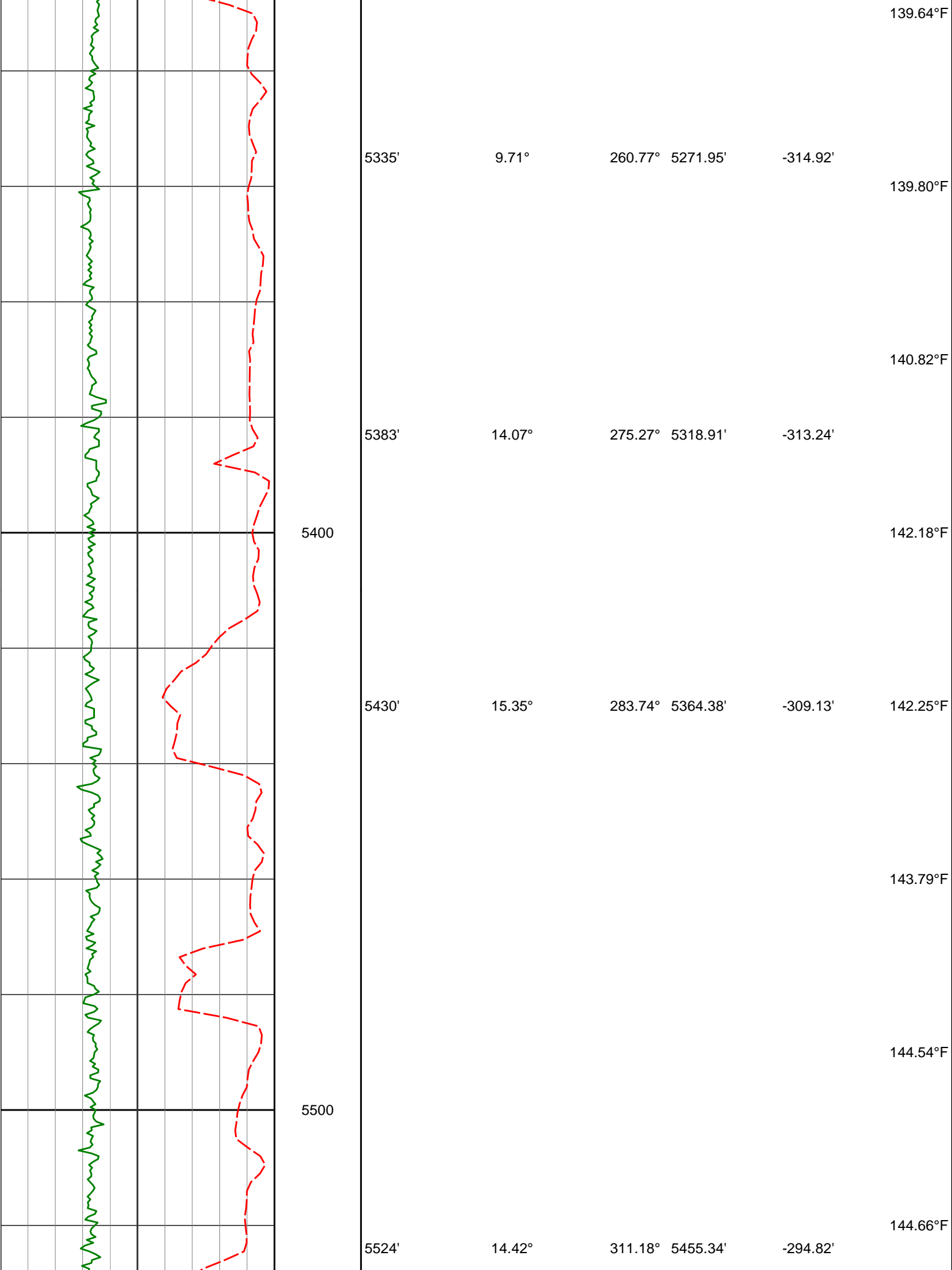
126.52°F

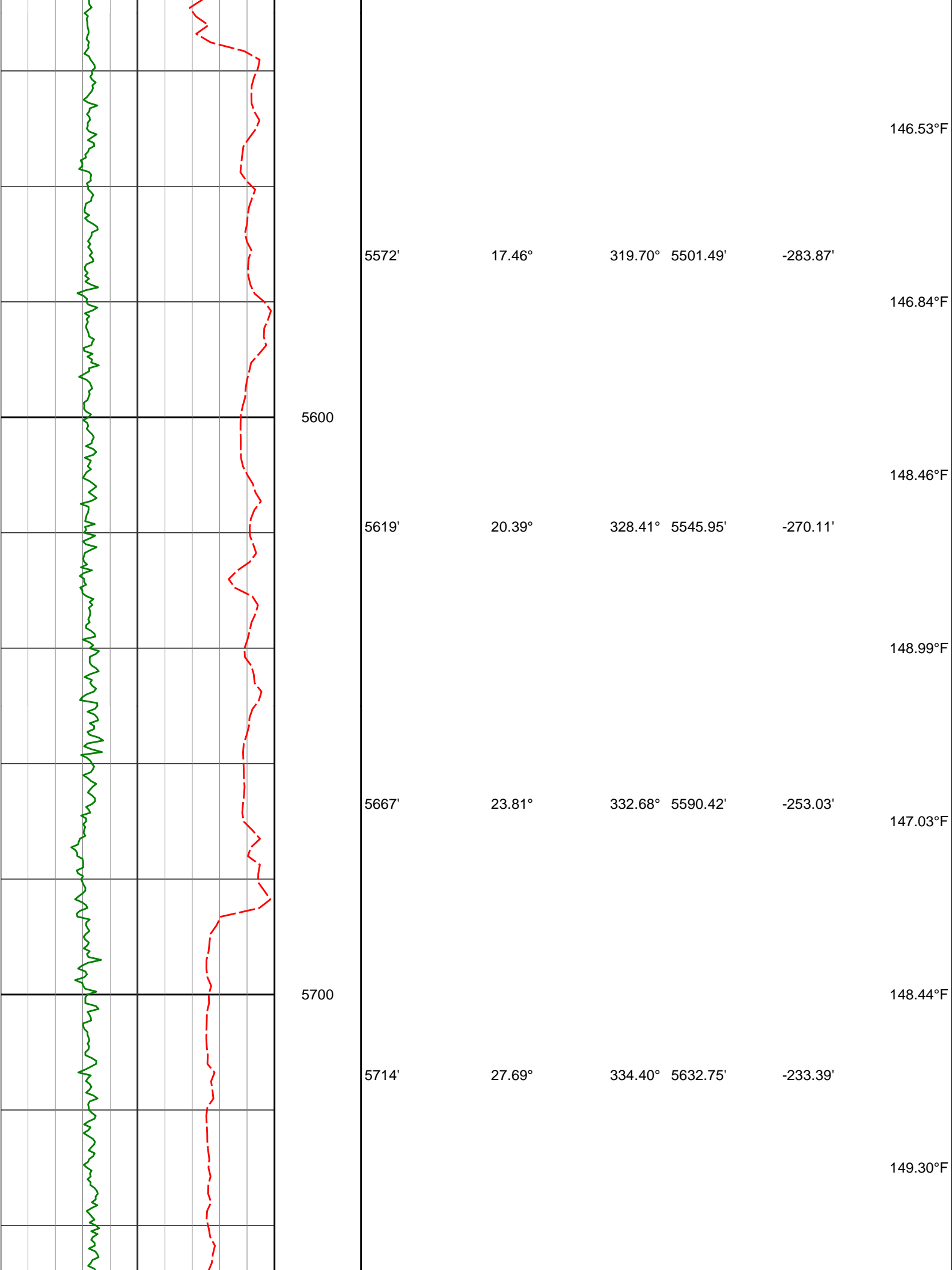


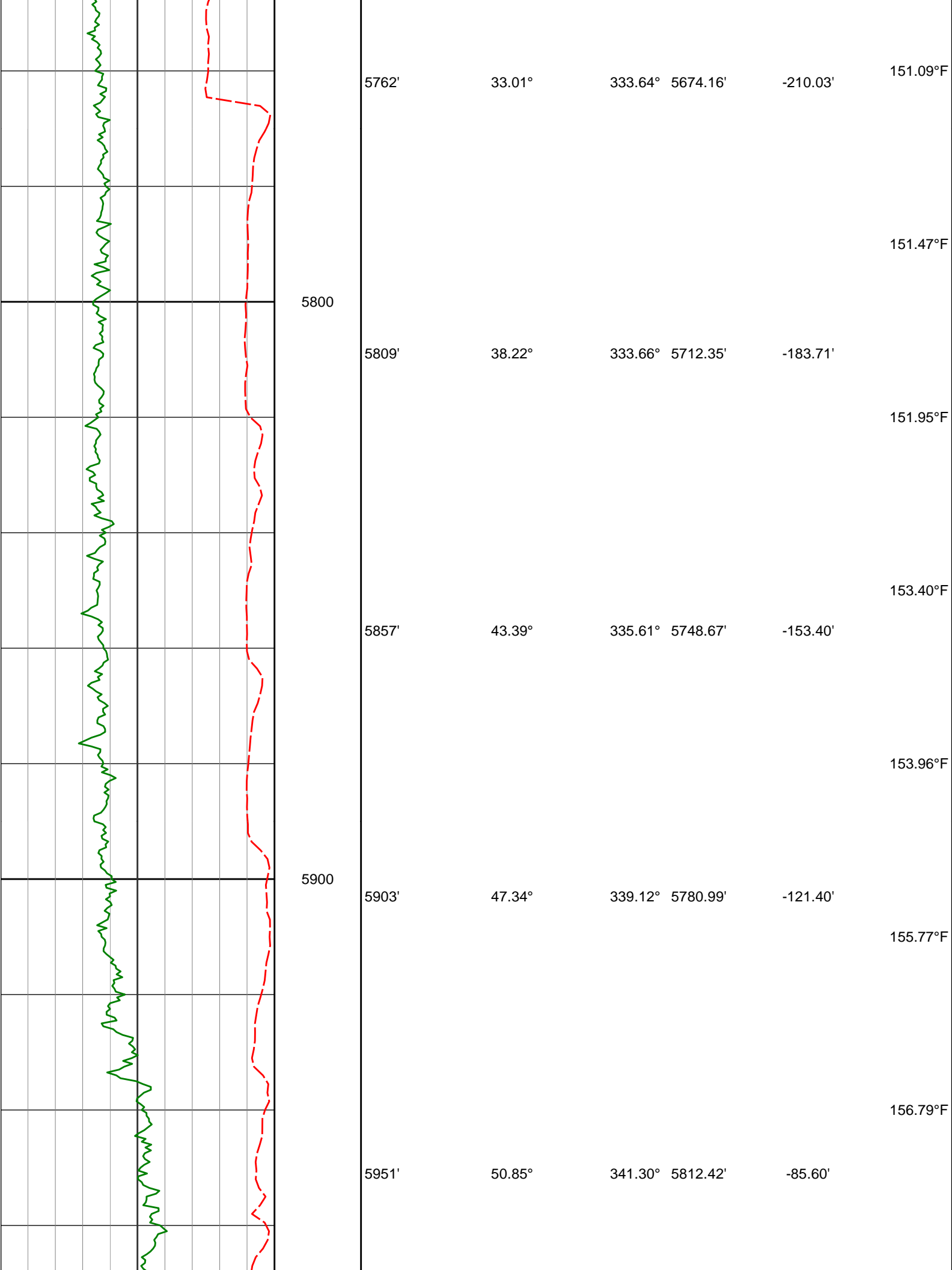


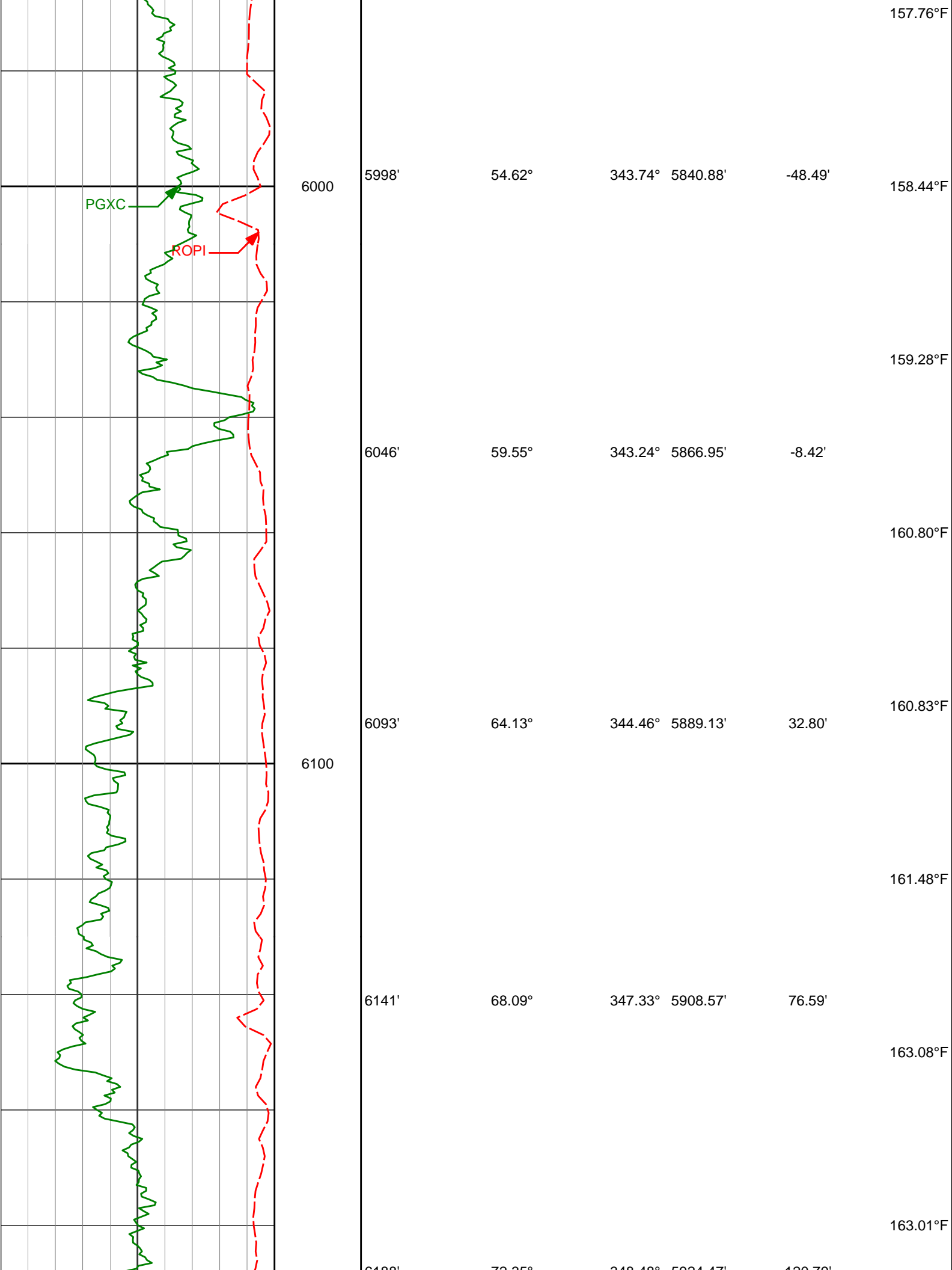


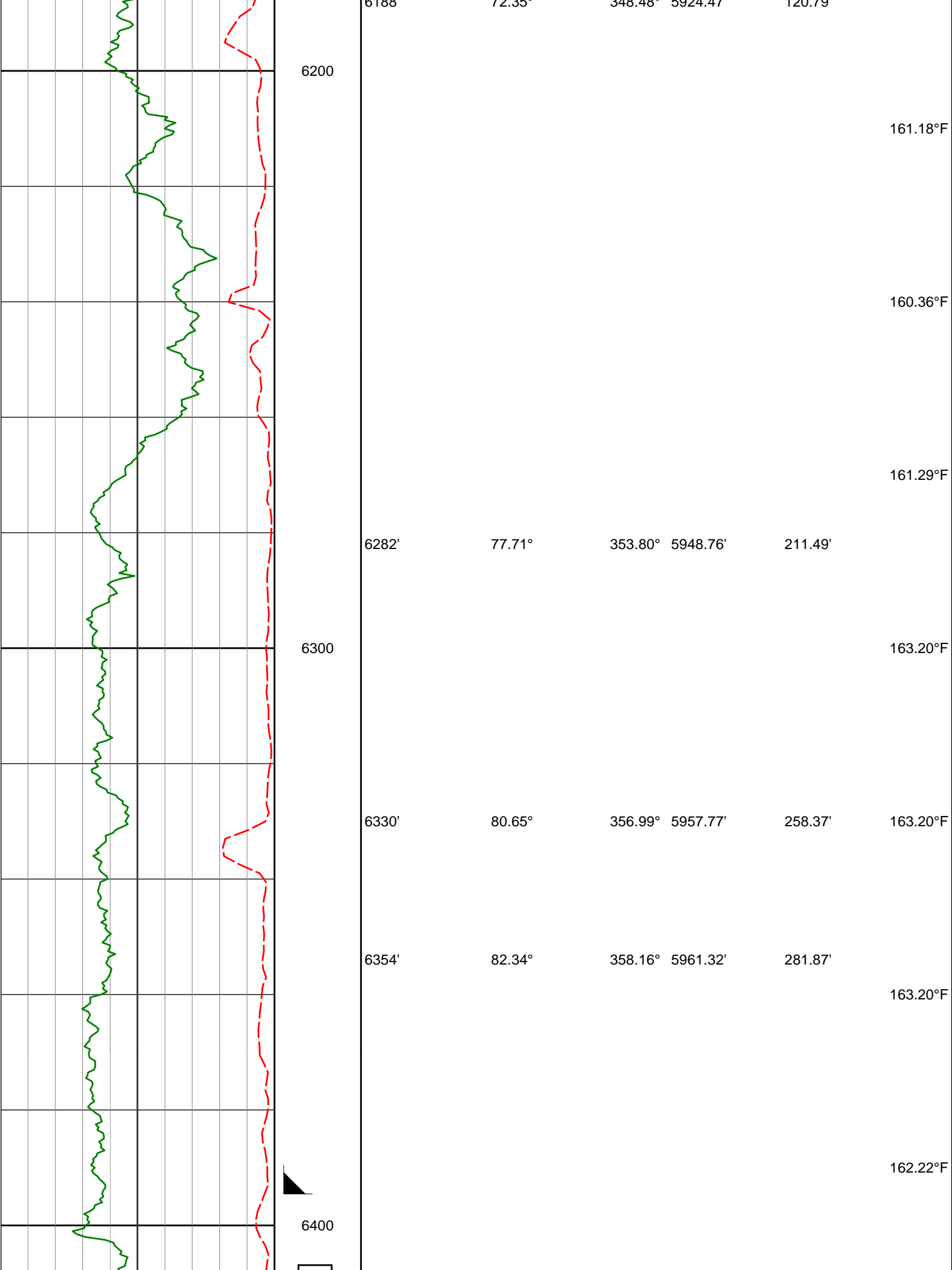


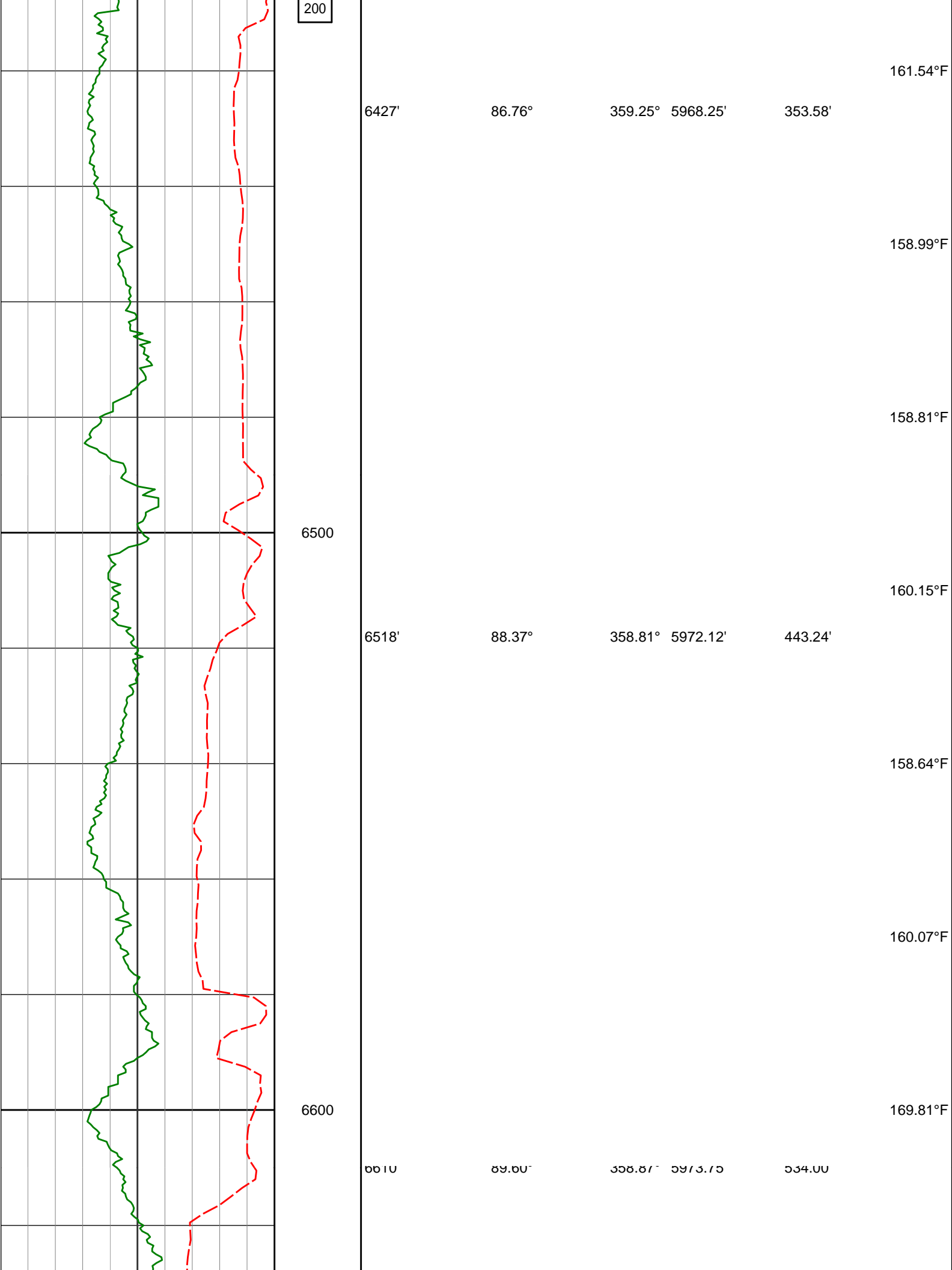


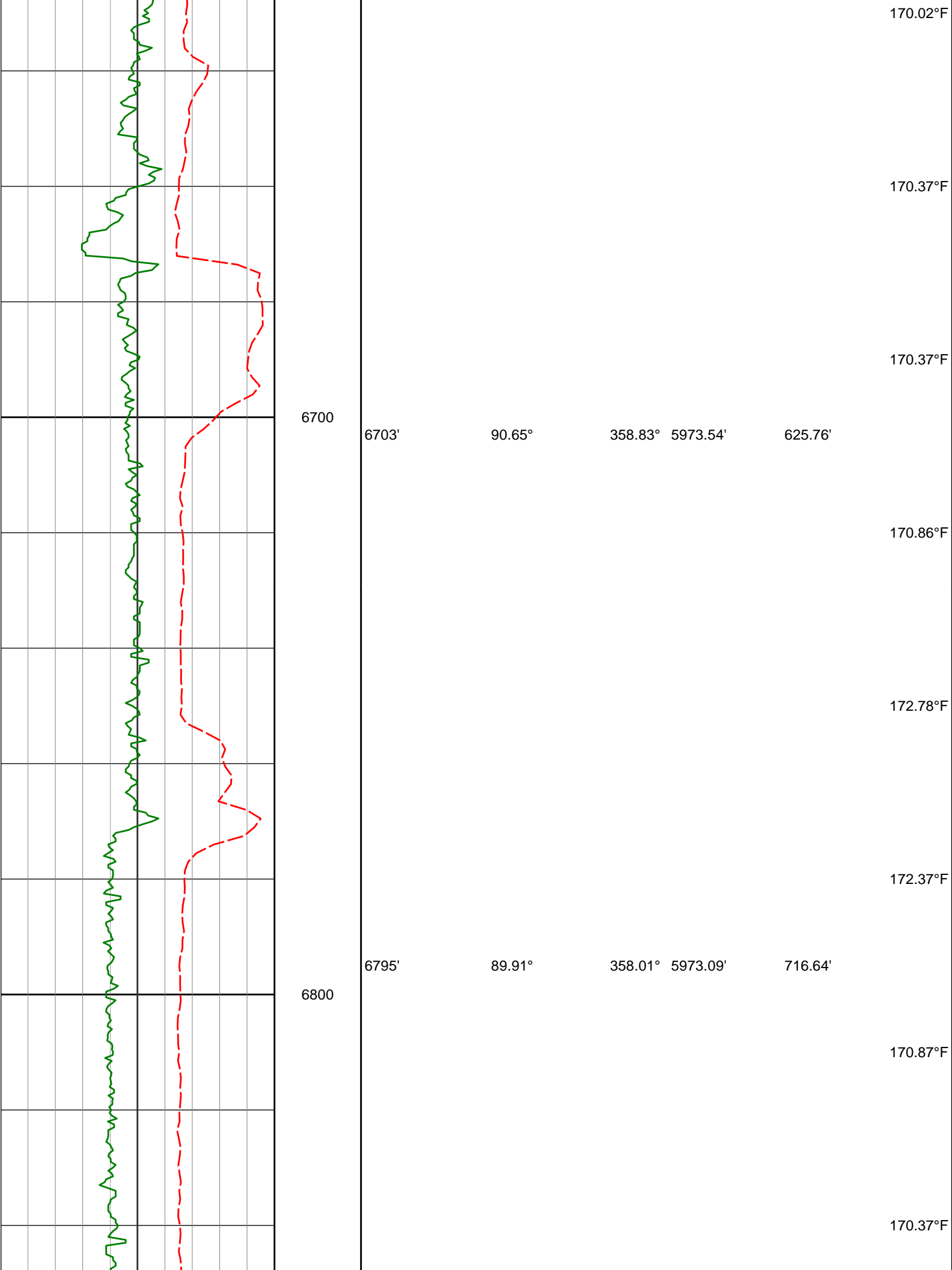


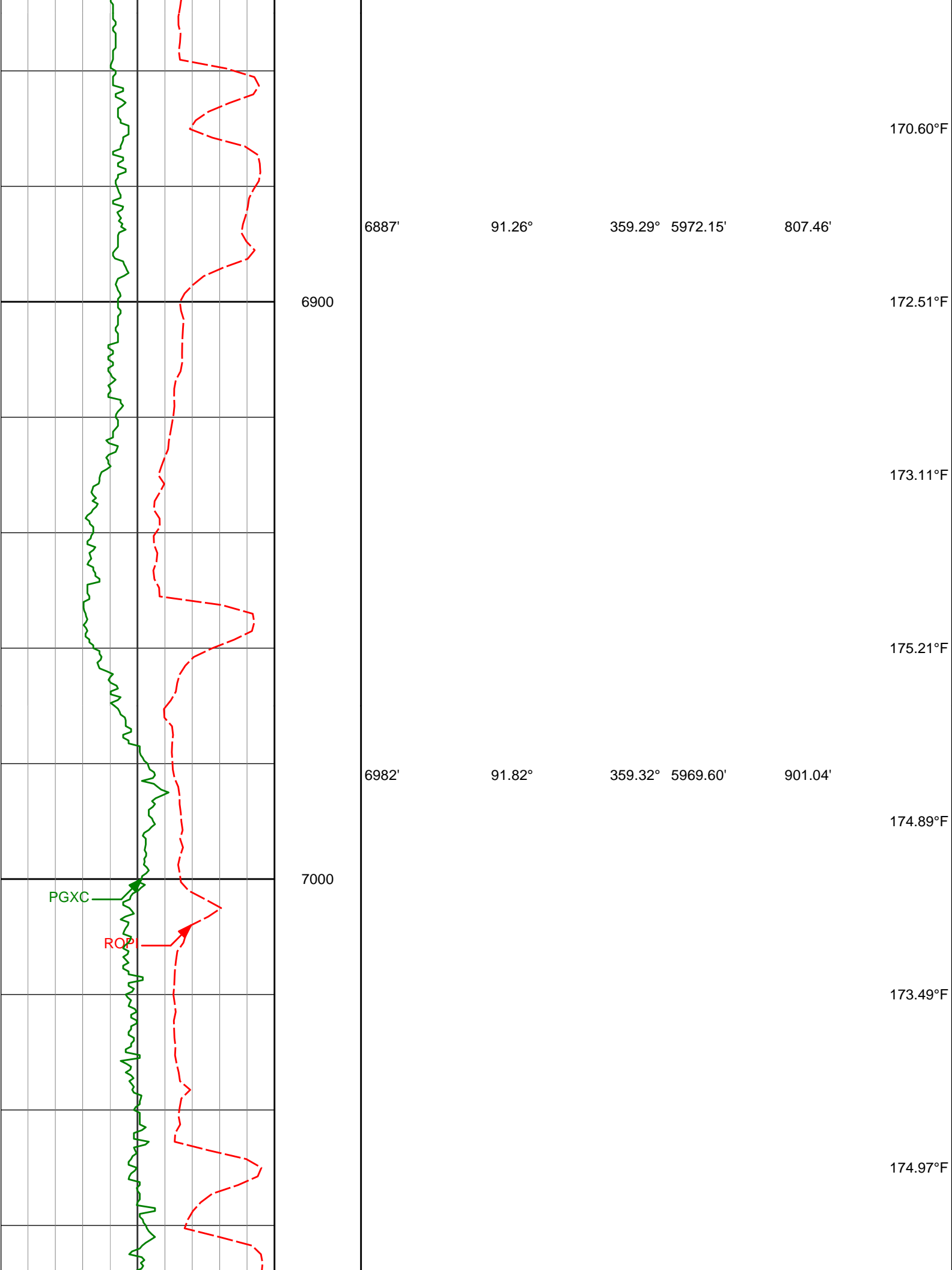


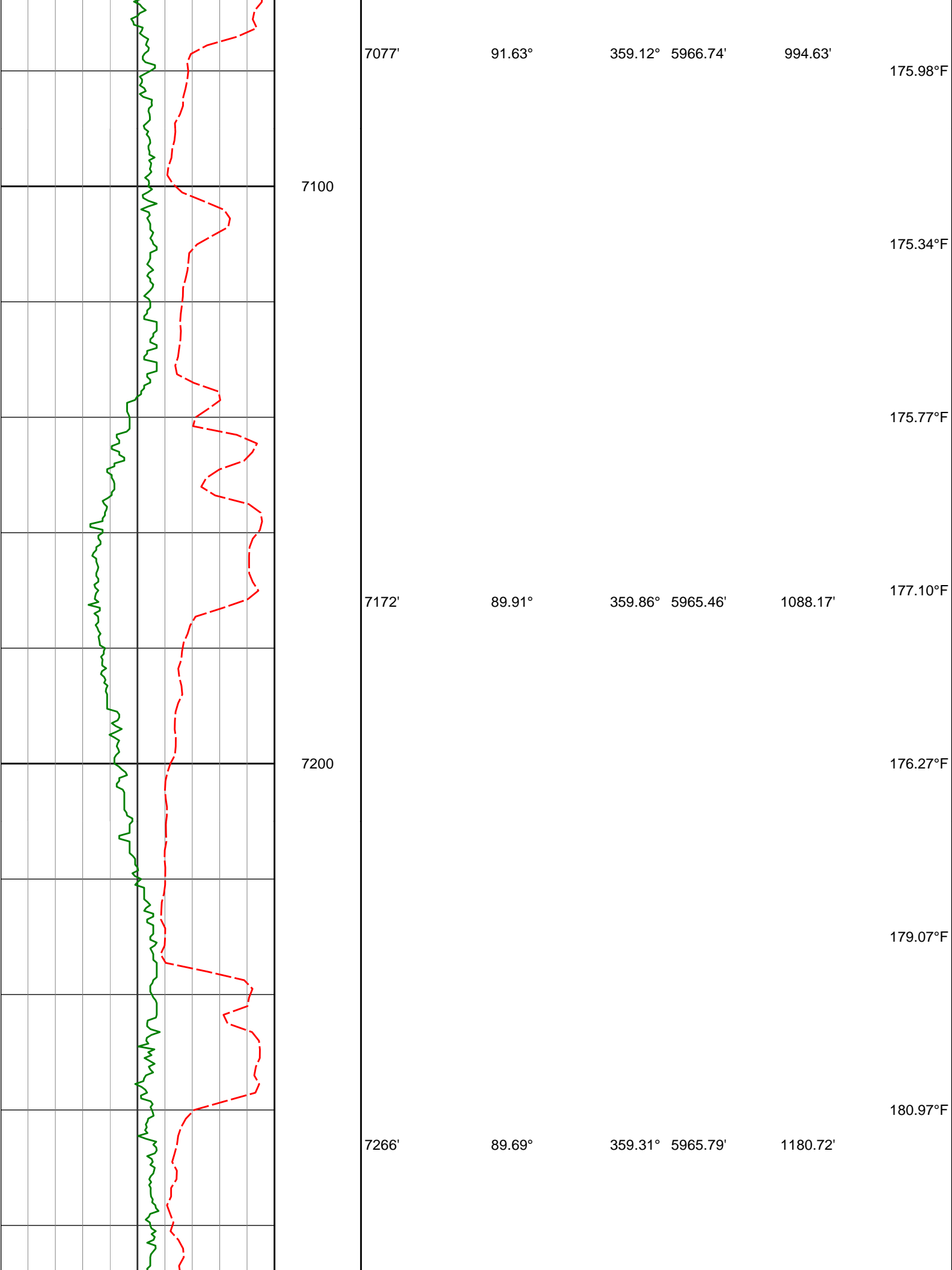


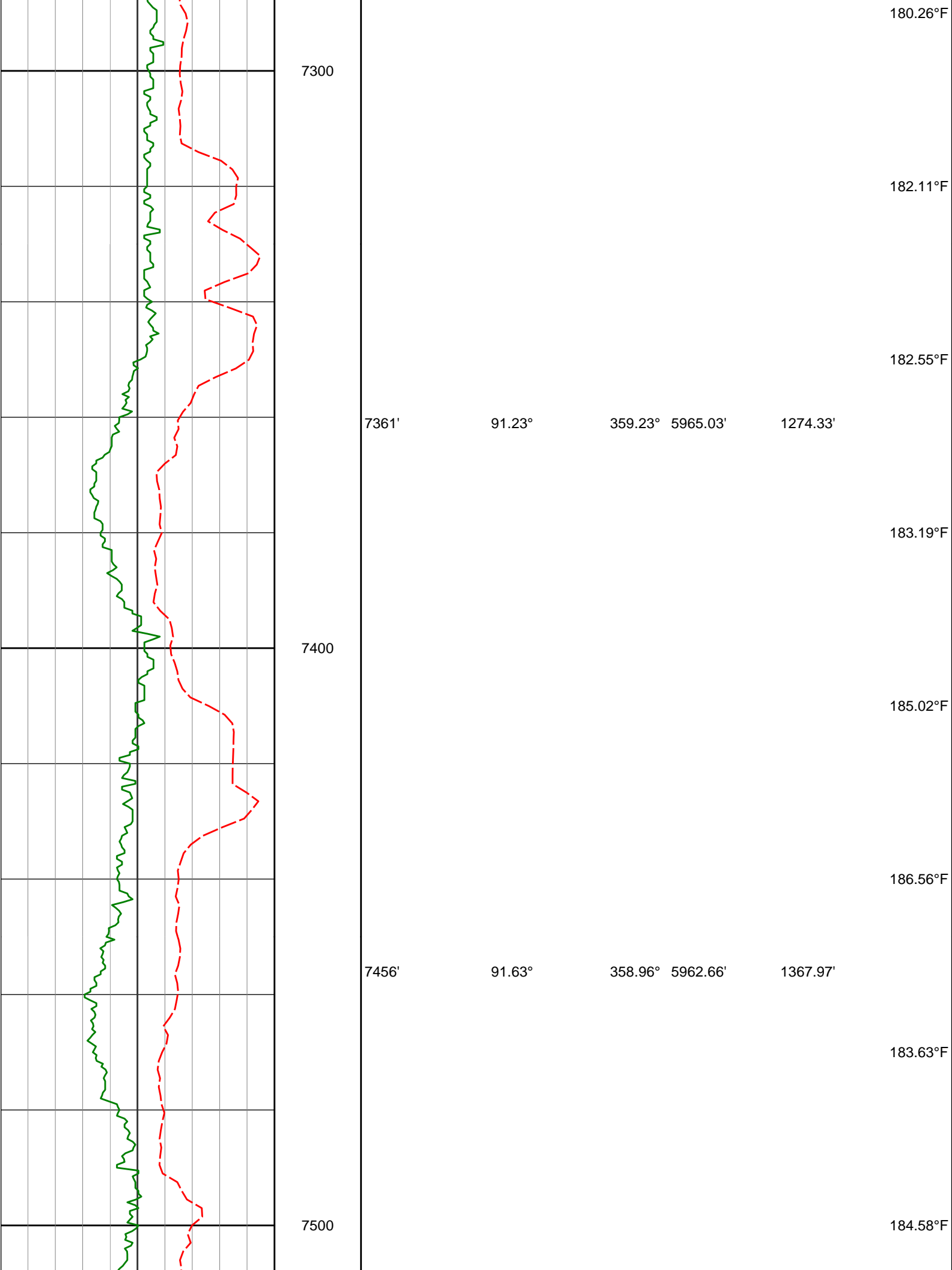


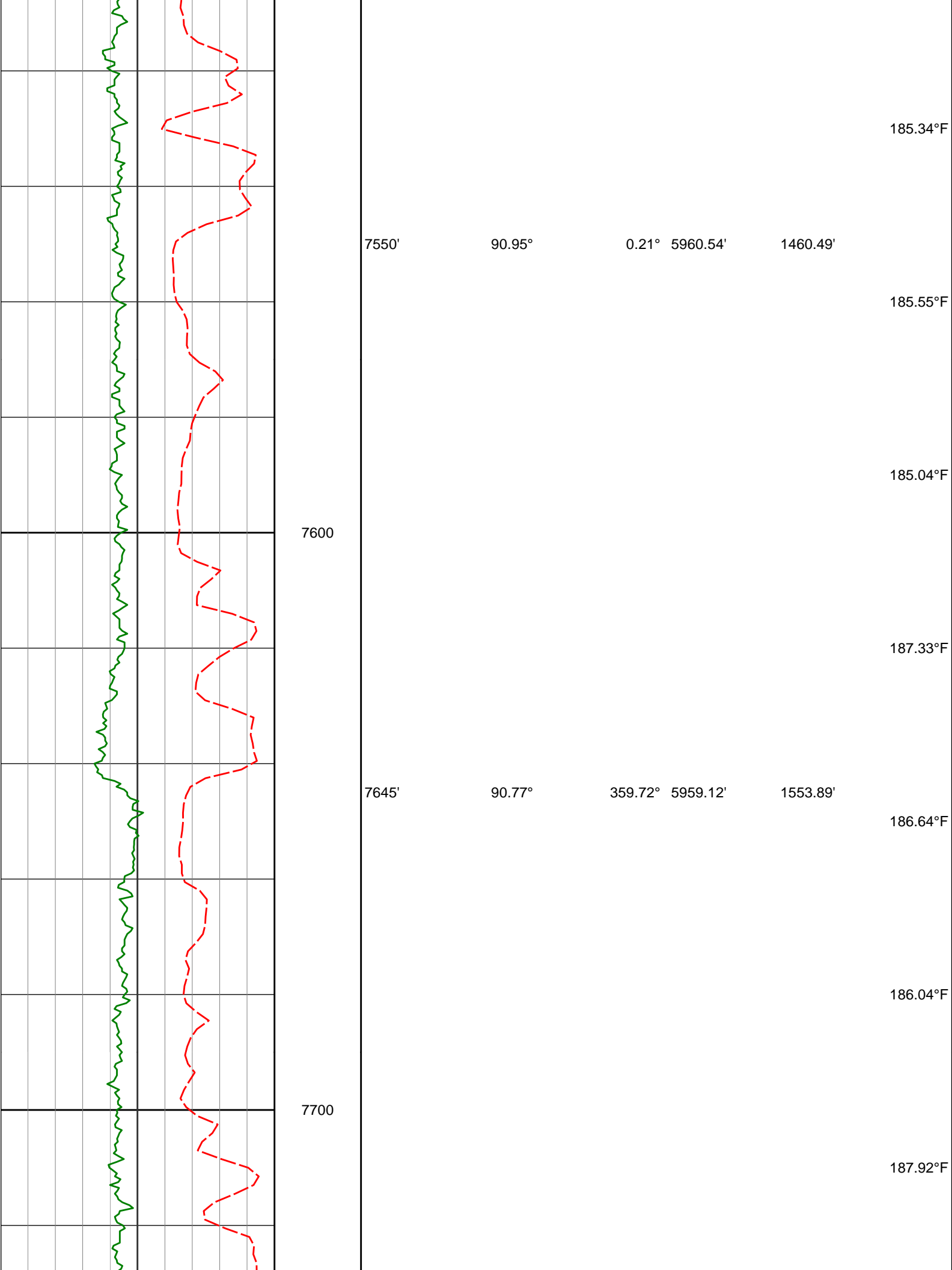


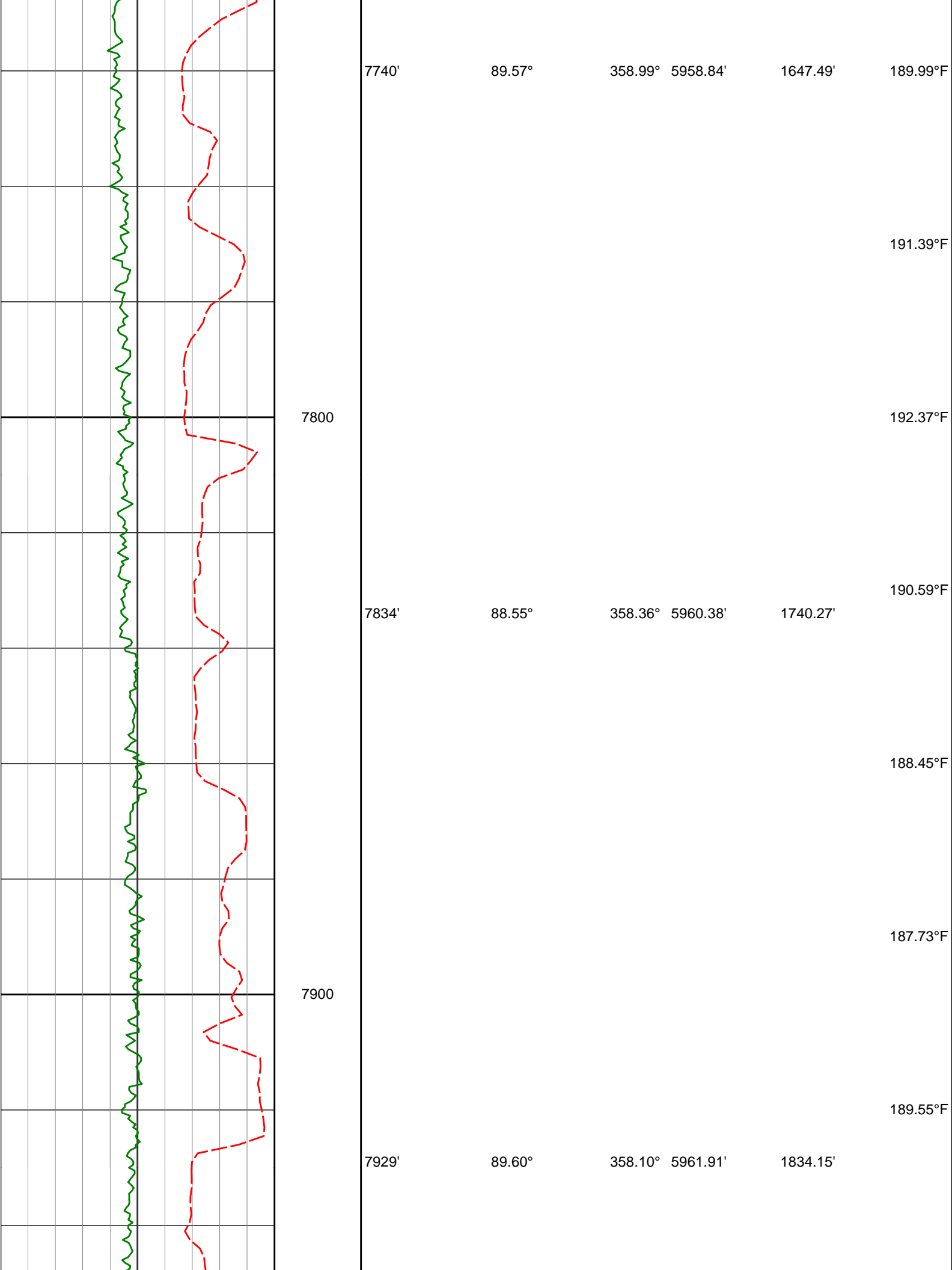


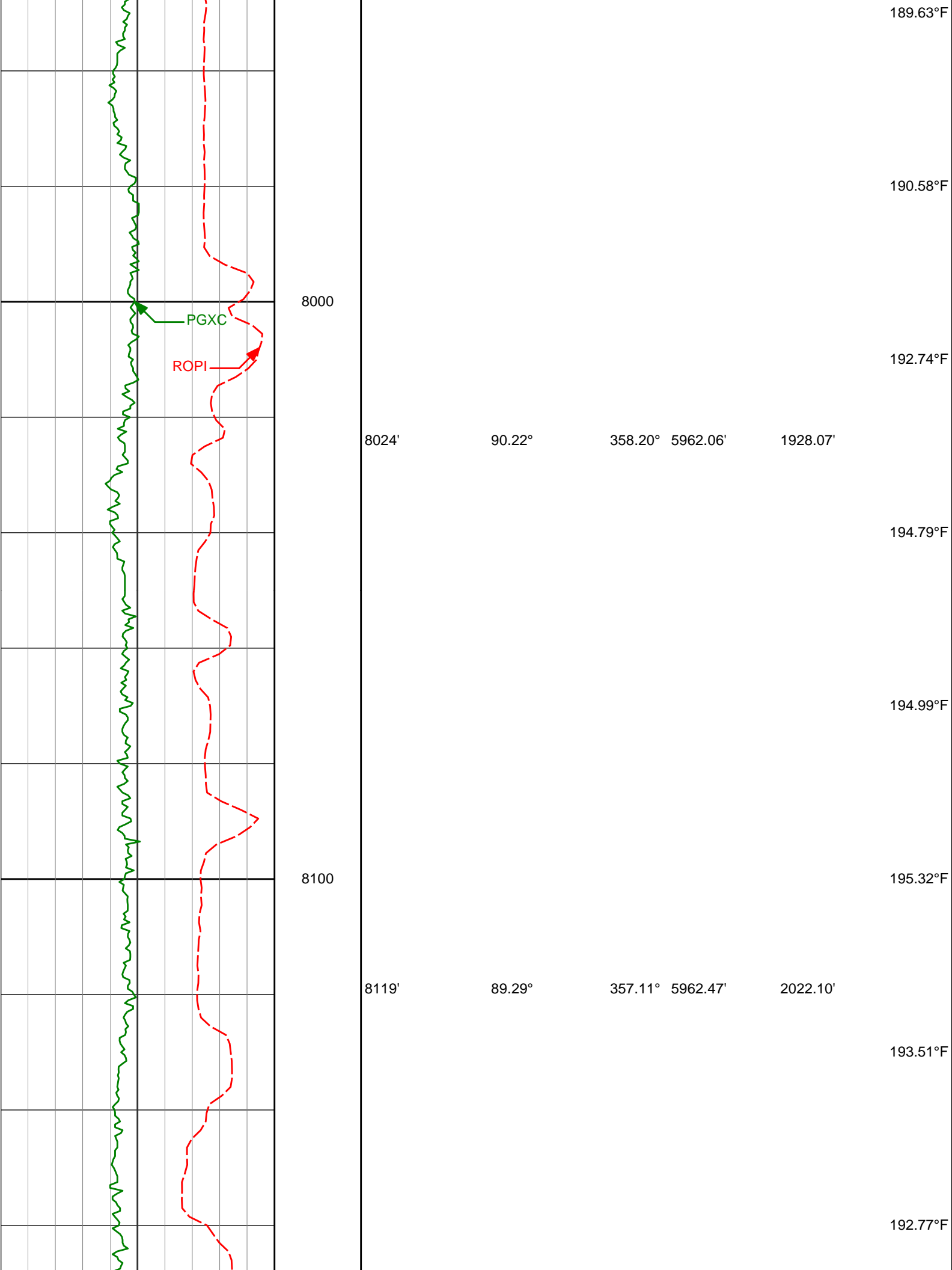


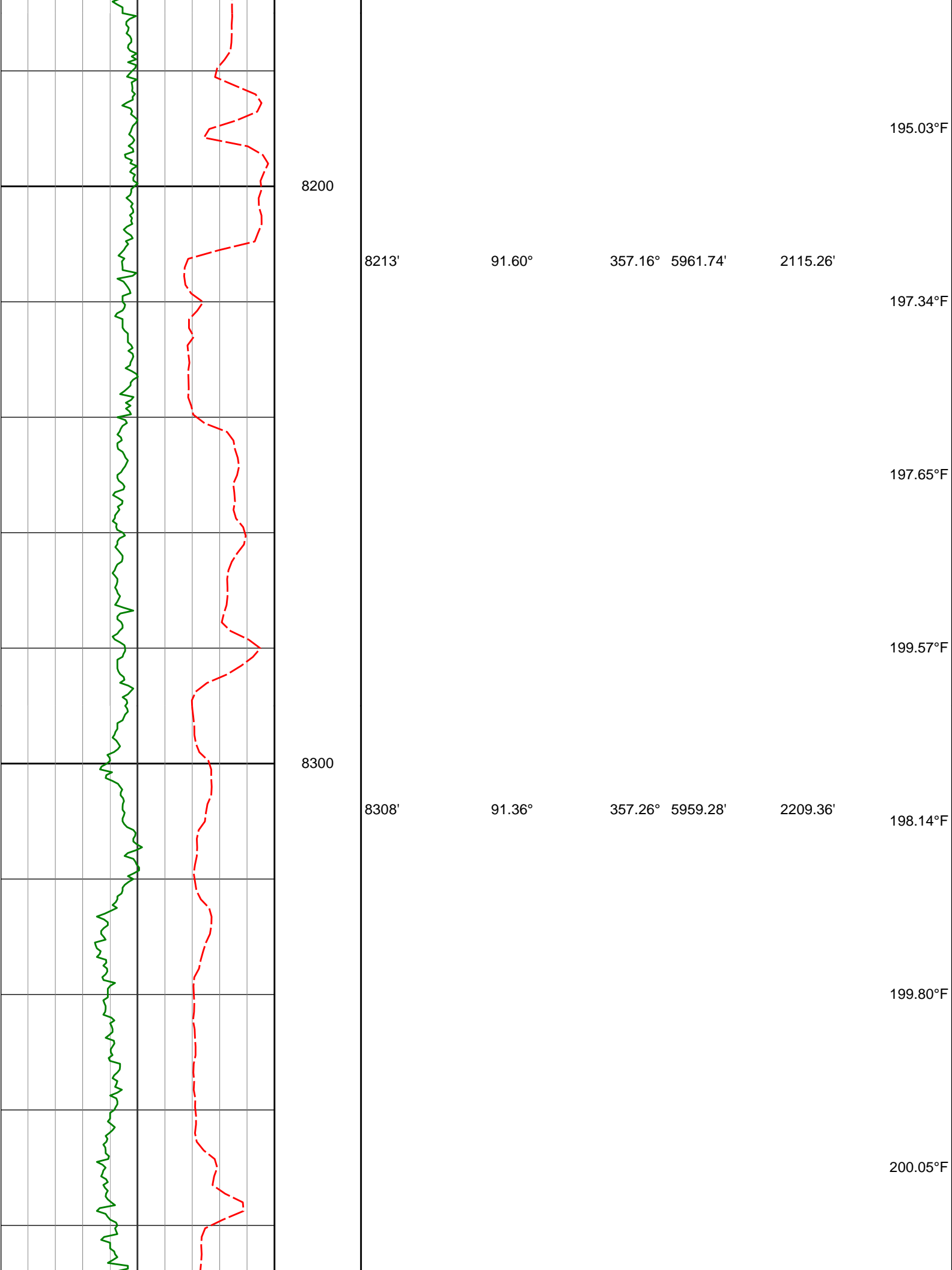


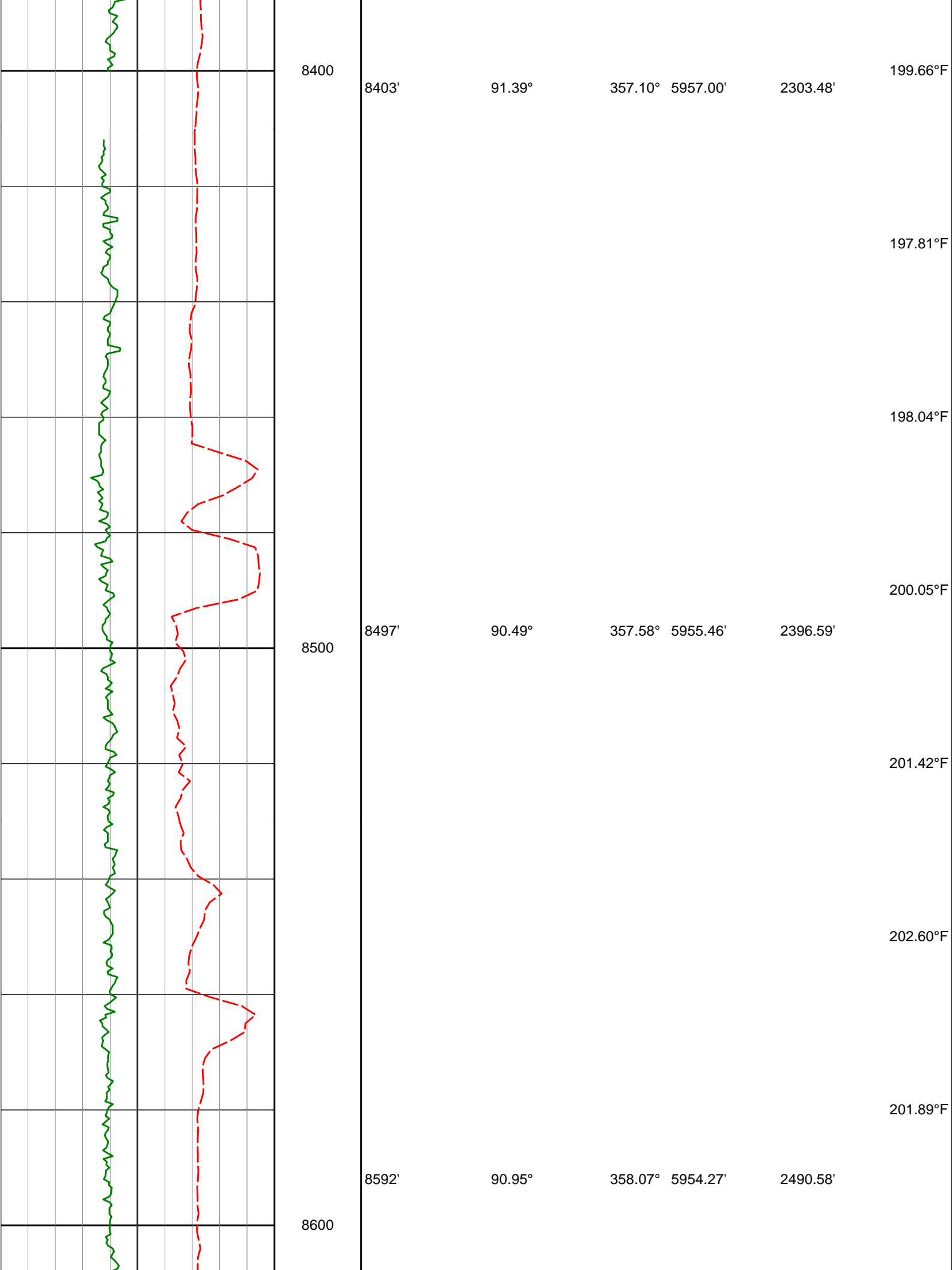


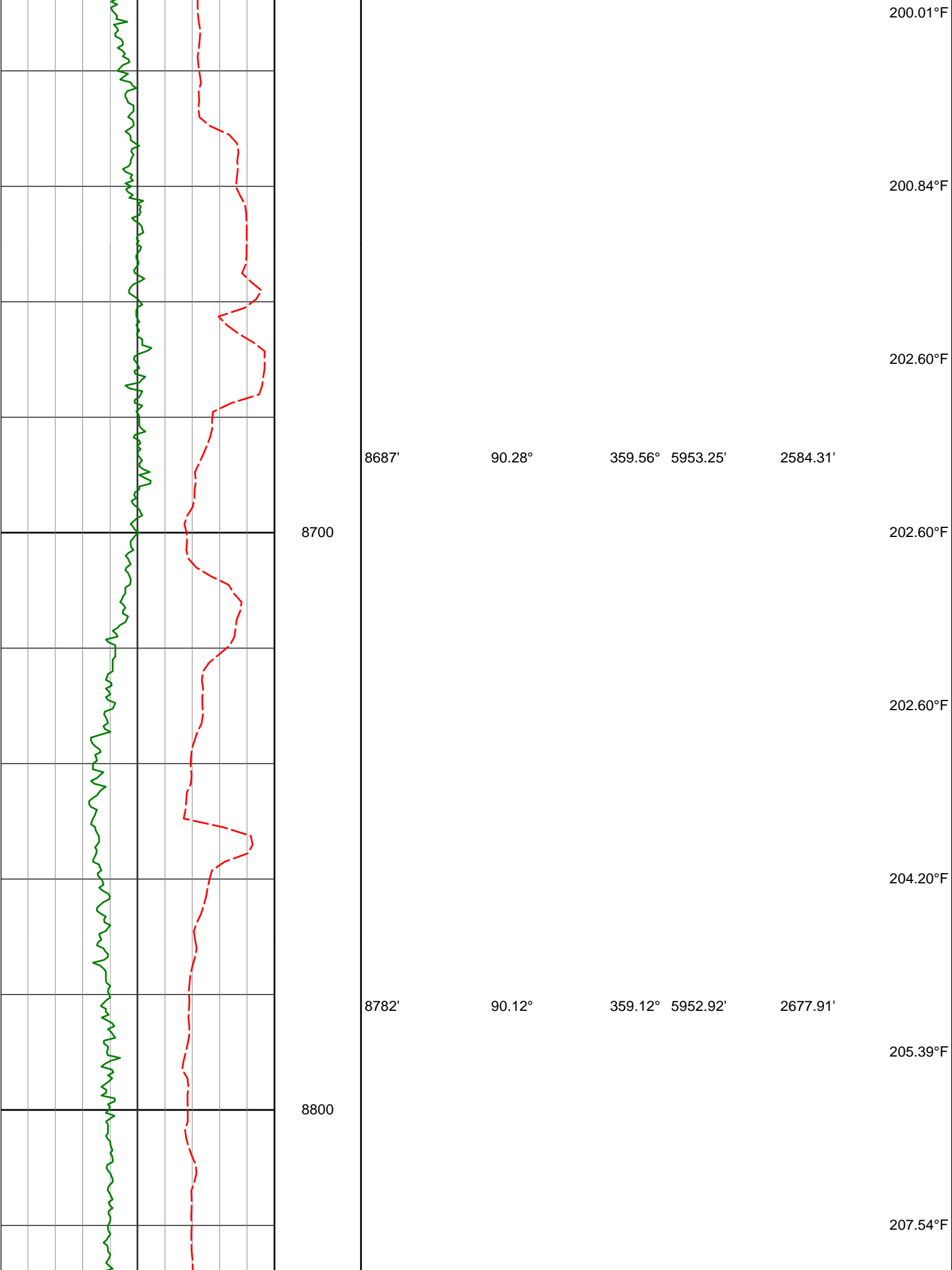


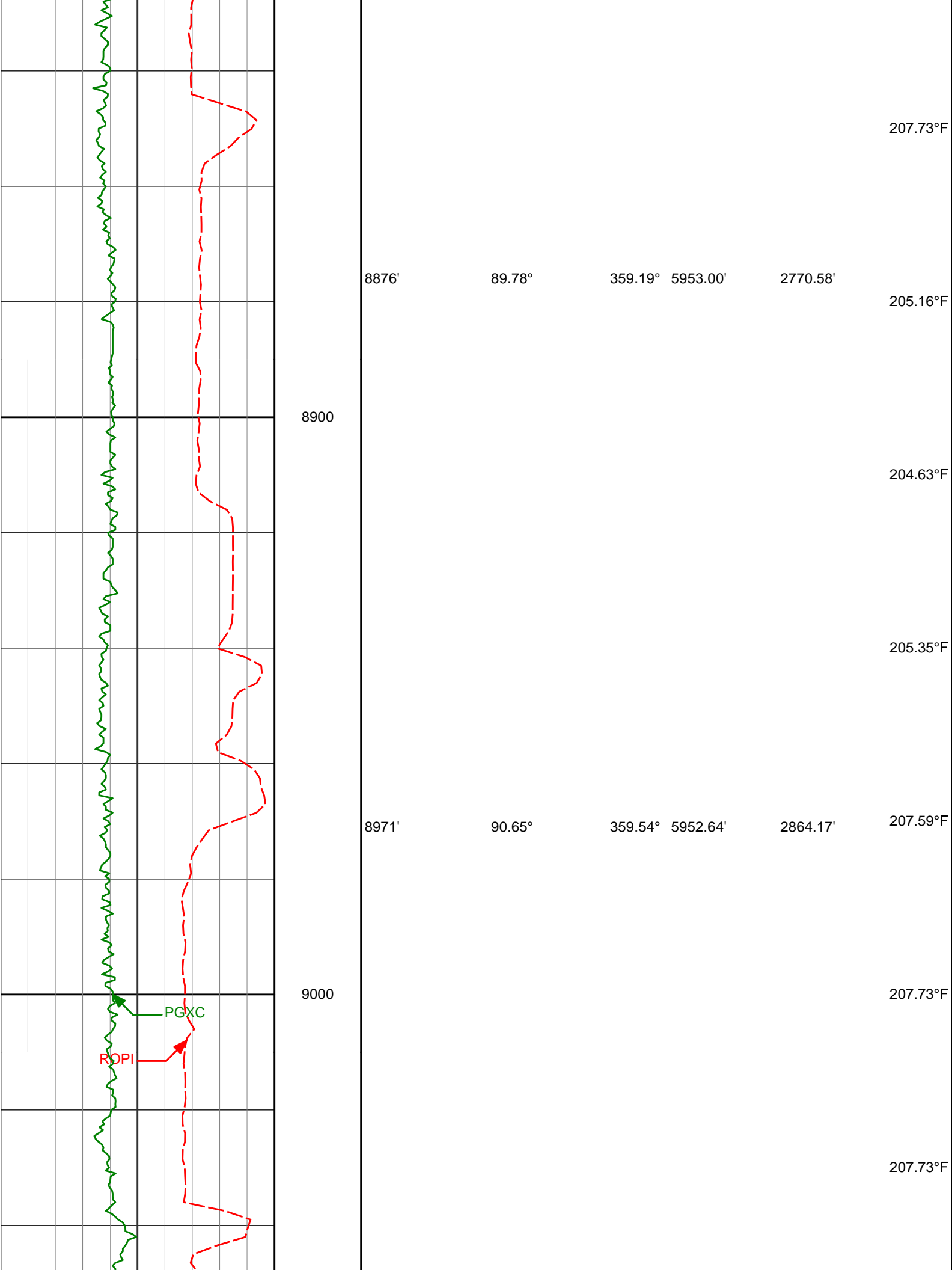


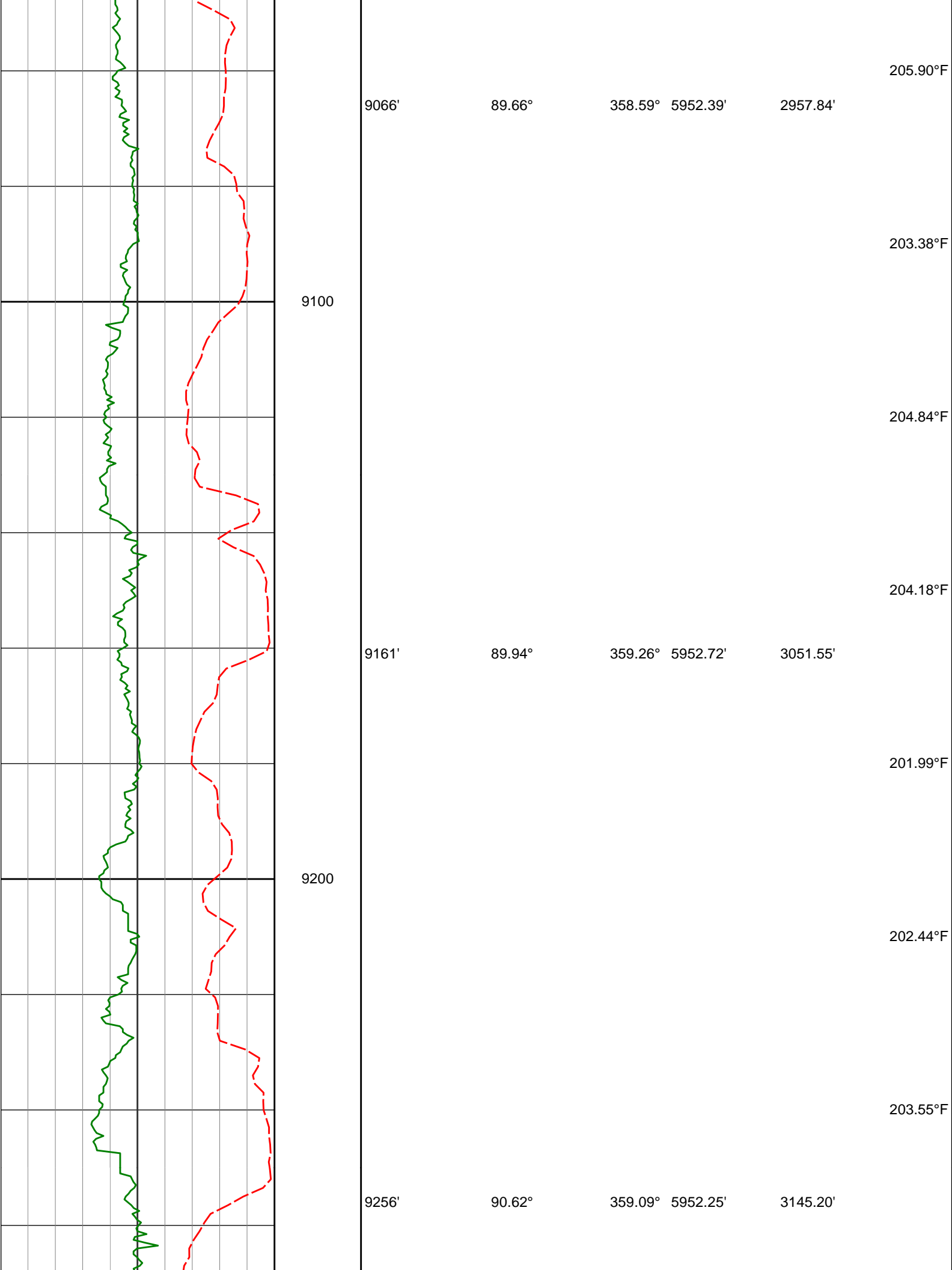


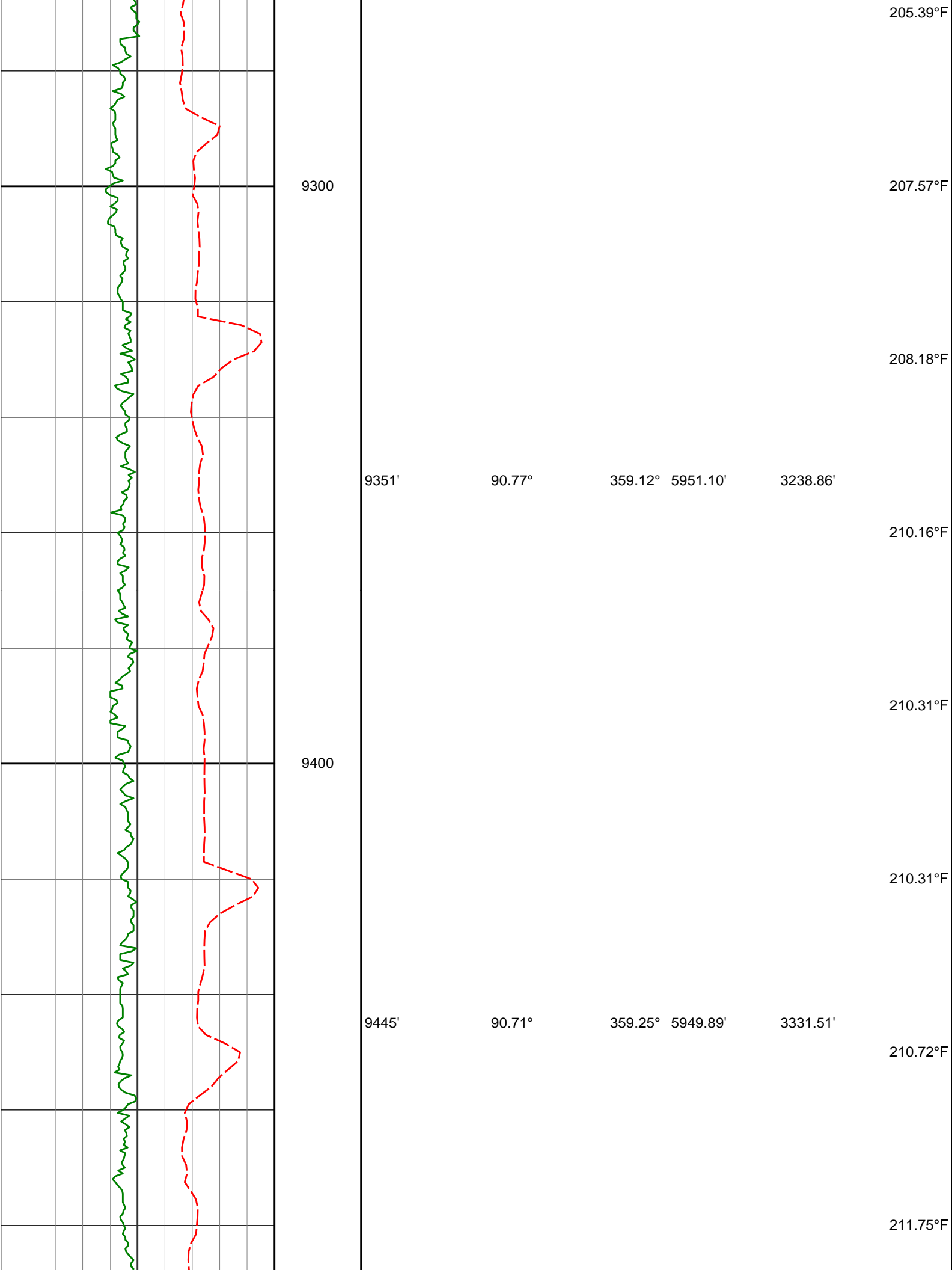


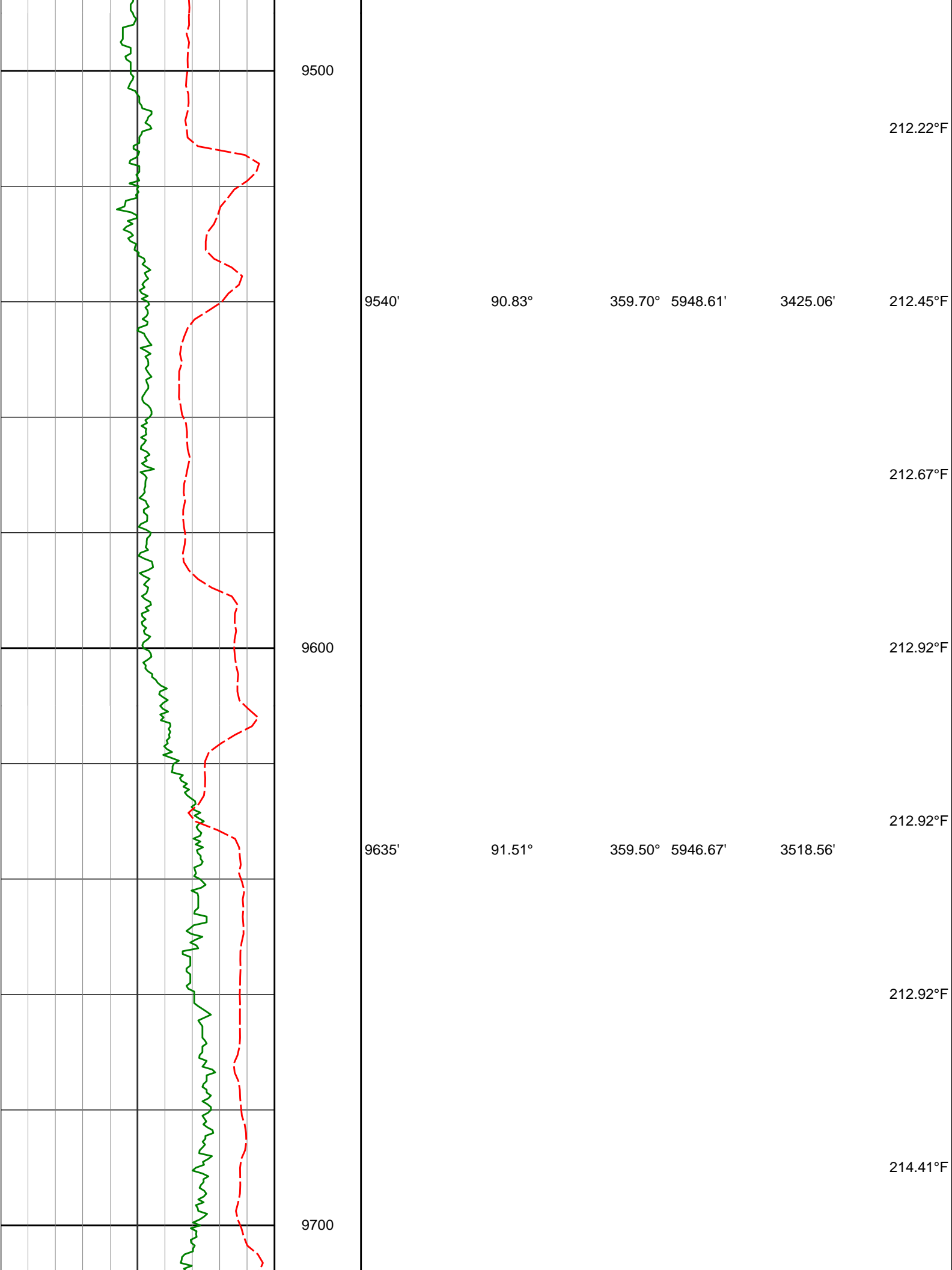


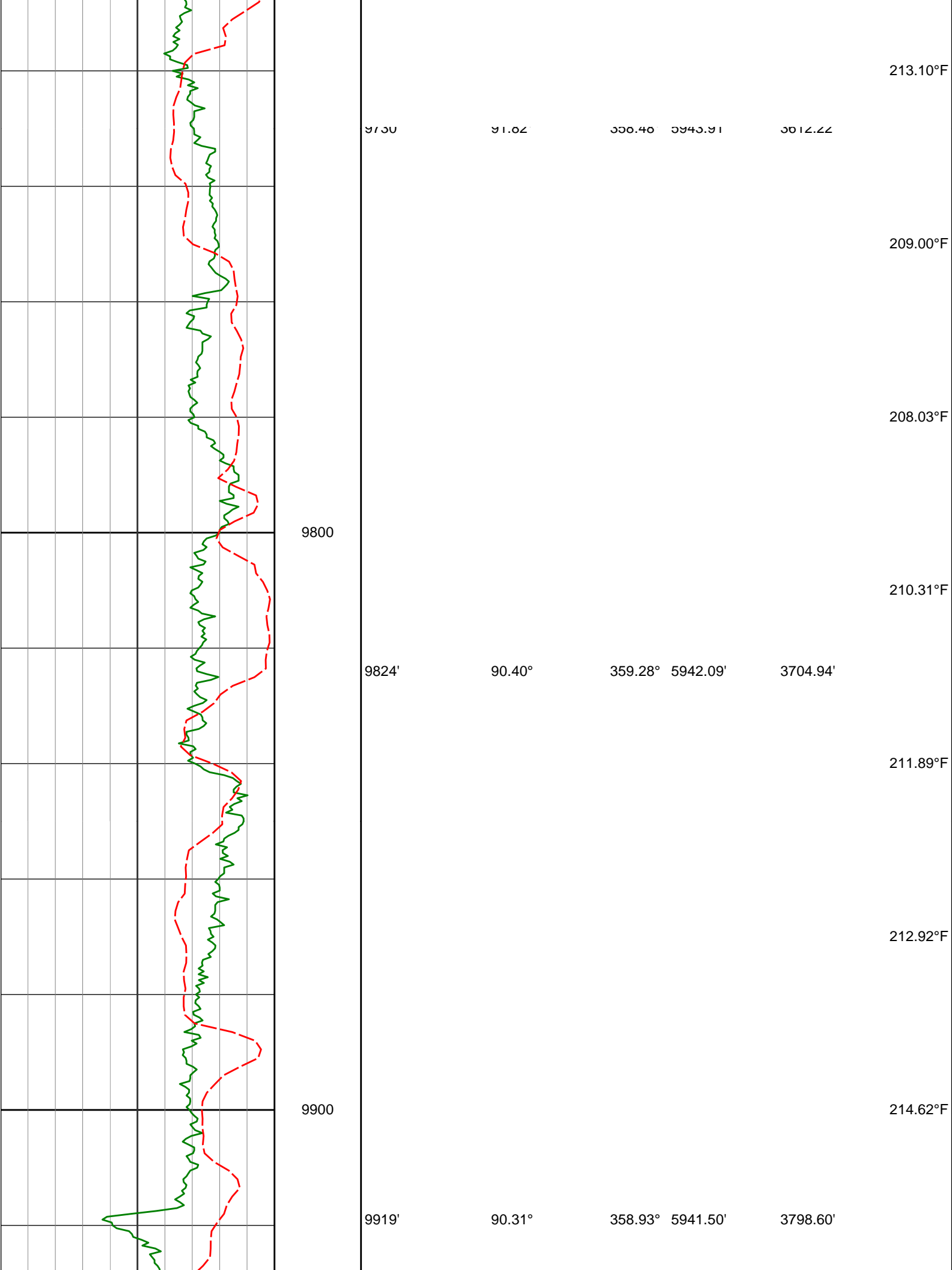


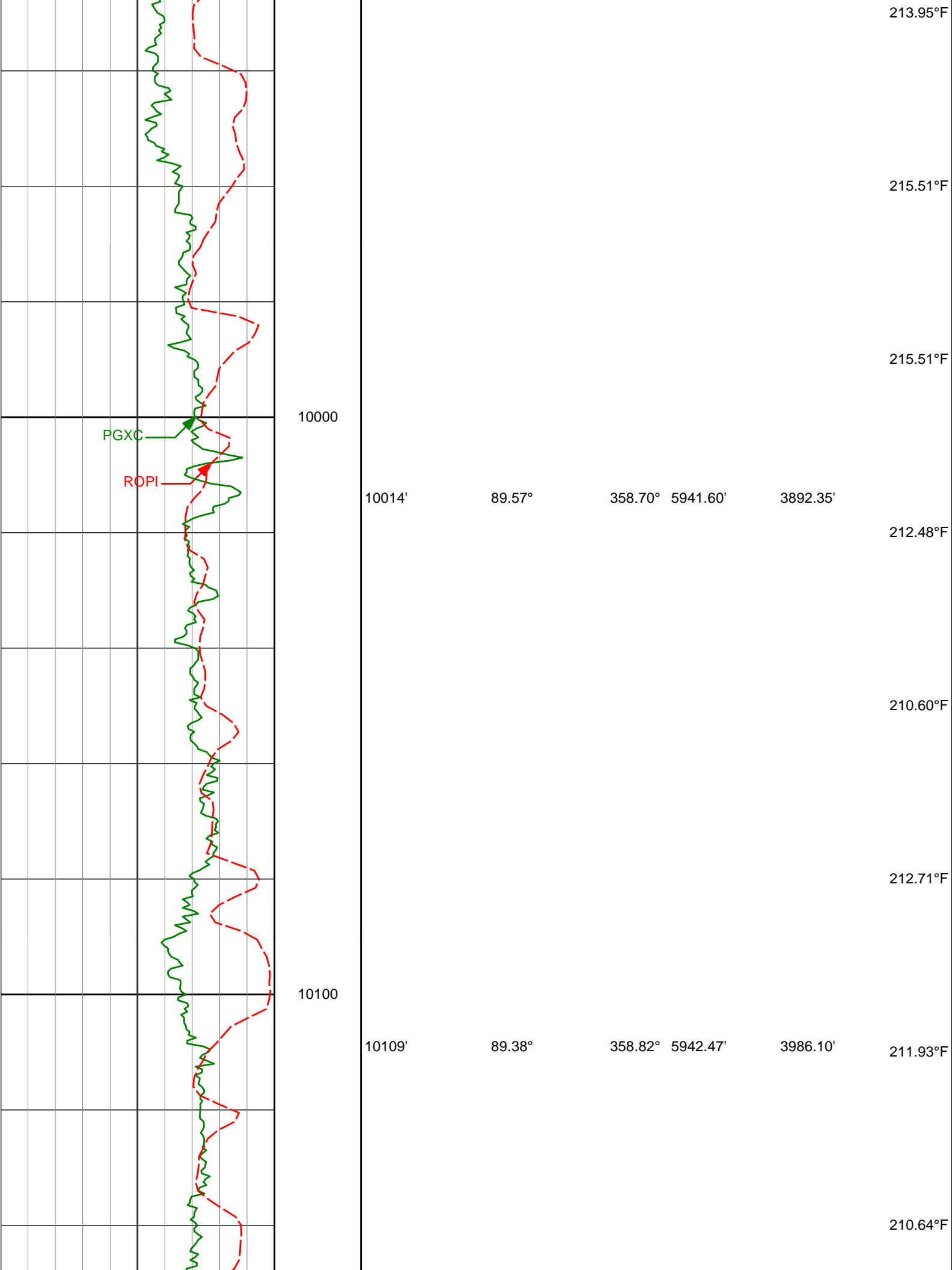


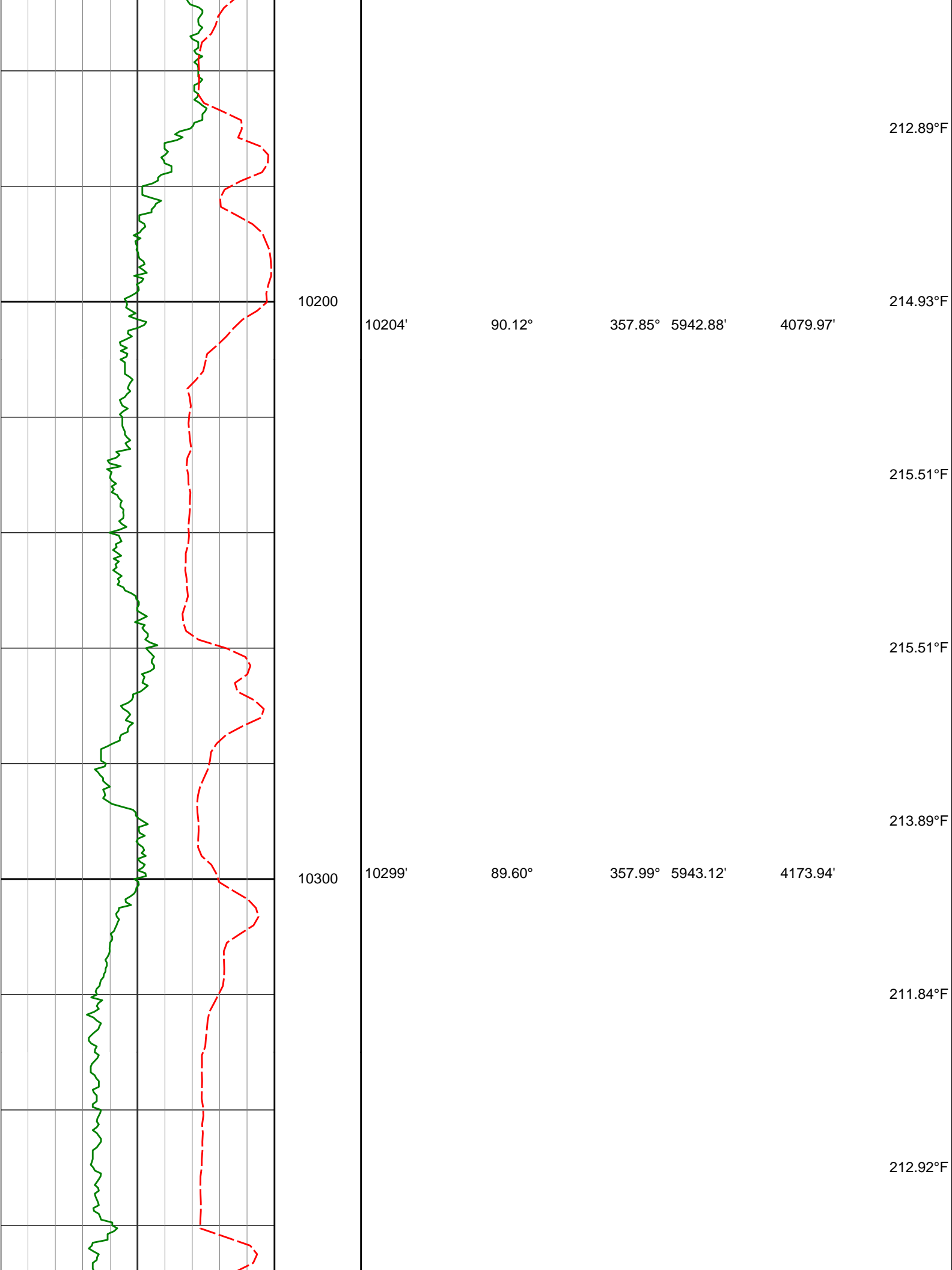


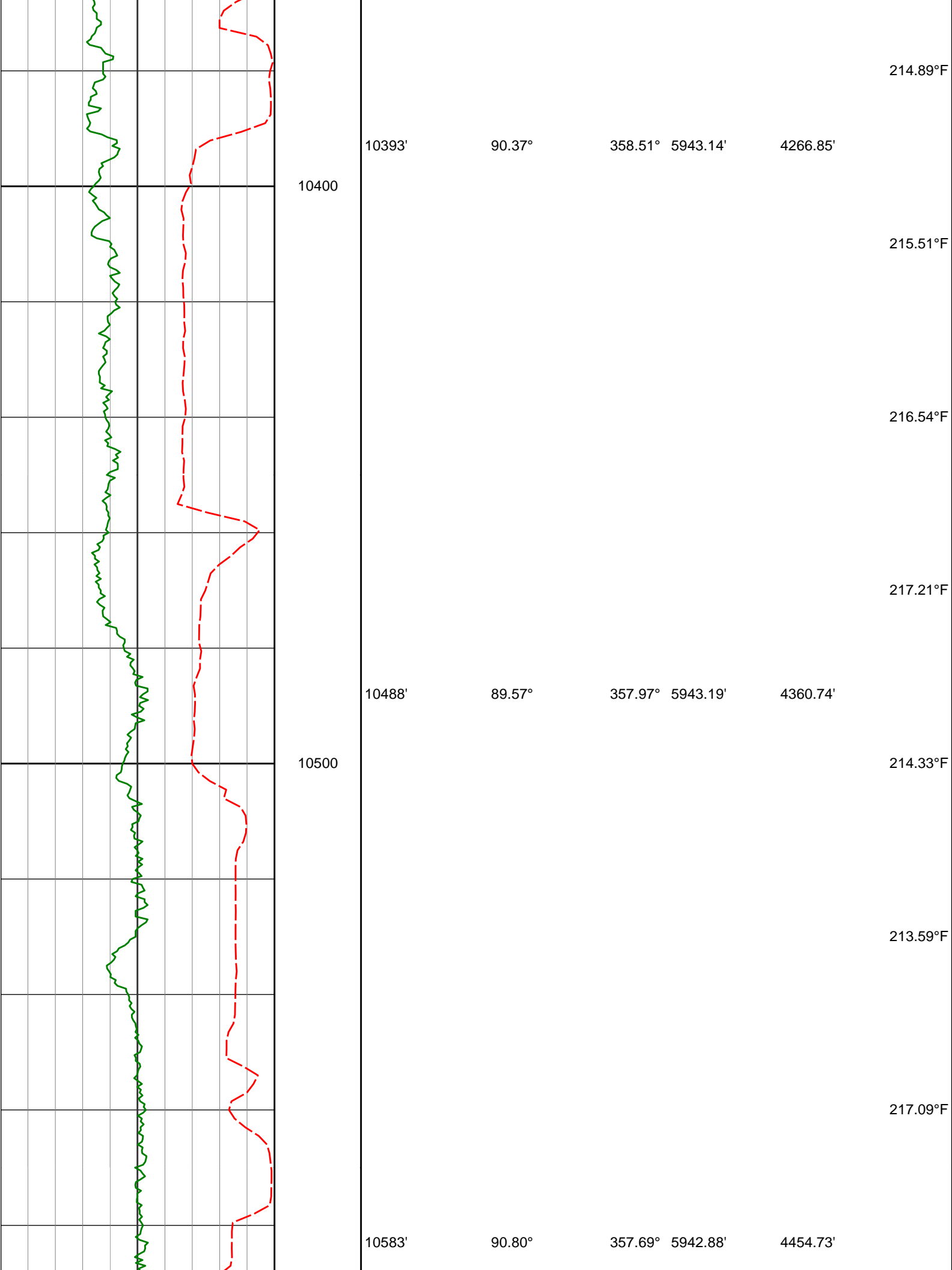


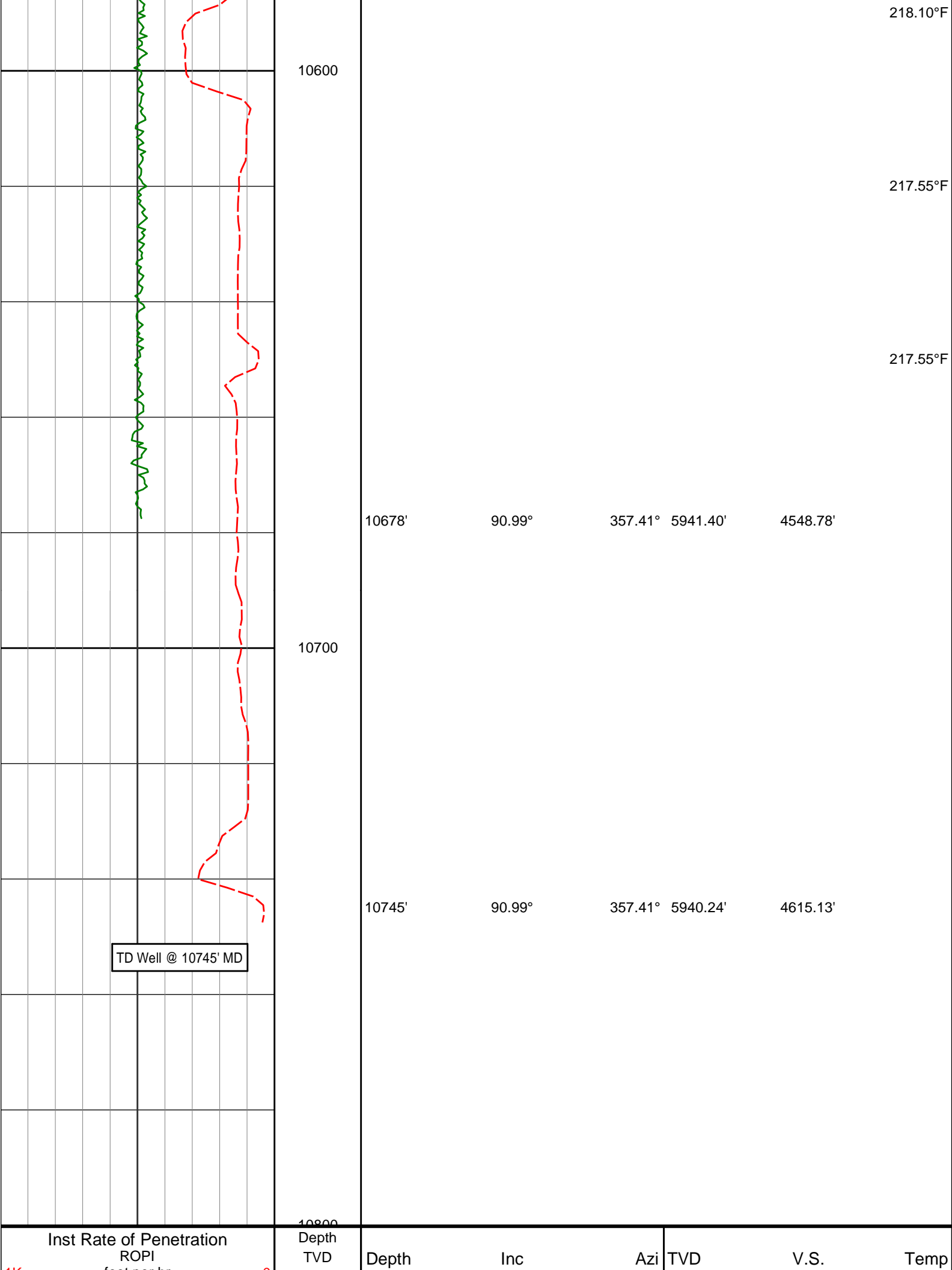












feet per hr	0	ft	
PCG GR XHi-Range RT BCor PGXRC-T api	300		

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble
Kevin LC26-748
Wattenberg
Weld Colorado
USA
CA-XX-0902239399
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
671.00	0.37	83.70	671.00	0.24 N	2.15 E	-0.16	0.06
732.00	0.28	85.60	731.99	0.27 N	2.50 E	-0.19	0.15
824.00	0.25	119.21	823.99	0.19 N	2.90 E	-0.34	0.17
916.00	0.34	123.39	915.99	0.06 S	3.30 E	-0.66	0.10
1008.00	0.36	146.98	1007.99	0.45 S	3.69 E	-1.12	0.16
1100.00	0.40	160.63	1099.99	1.00 S	3.95 E	-1.70	0.11
1303.00	0.51	109.99	1302.98	1.97 S	5.03 E	-2.86	0.20
1395.00	0.51	116.13	1394.98	2.29 S	5.79 E	-3.31	0.06
1487.00	0.37	131.85	1486.98	2.67 S	6.38 E	-3.79	0.20
1579.00	1.66	273.24	1578.97	2.79 S	5.27 E	-3.71	2.13
1671.00	3.22	246.97	1670.88	3.73 S	1.56 E	-3.95	2.04
1763.00	3.93	237.07	1762.70	6.46 S	3.47 W	-5.71	1.02
1855.00	6.40	236.48	1854.32	11.00 S	10.39 W	-8.92	2.69
1947.00	8.21	227.94	1945.57	18.23 S	19.54 W	-14.36	2.29
2038.00	10.37	223.94	2035.38	28.49 S	30.05 W	-22.53	2.48
2130.00	11.15	223.25	2125.76	40.93 S	41.89 W	-32.60	0.86
2222.00	11.38	220.64	2215.99	54.29 S	53.90 W	-43.55	0.61
2314.00	10.69	217.63	2306.29	67.94 S	65.02 W	-54.94	0.98
2406.00	11.67	226.34	2396.54	81.12 S	76.96 W	-65.72	2.12
2498.00	11.73	224.94	2486.63	94.17 S	90.30 W	-76.11	0.32
2591.00	11.66	222.89	2577.70	107.74 S	103.37 W	-87.08	0.45
2683.00	11.65	231.85	2667.81	120.29 S	117.01 W	-96.93	1.97
2778.00	11.75	231.40	2760.84	132.25 S	132.11 W	-105.94	0.14
2873.00	11.67	229.50	2853.86	144.53 S	146.97 W	-115.29	0.41
2967.00	11.63	228.88	2945.93	156.93 S	161.34 W	-124.87	0.14
3062.00	11.14	227.69	3039.06	169.41 S	175.34 W	-134.58	0.57
3157.00	10.36	224.86	3132.39	181.64 S	188.15 W	-144.27	0.99
3251.00	10.16	224.55	3224.89	193.54 S	199.93 W	-153.82	0.22
3346.00	11.20	232.91	3318.25	205.08 S	213.17 W	-162.75	1.96
3441.00	11.60	233.33	3411.37	216.34 S	228.19 W	-171.09	0.43
3536.00	12.34	232.17	3504.31	228.27 S	243.87 W	-179.96	0.82
3630.00	13.13	231.60	3595.99	241.07 S	260.17 W	-189.57	0.85
3725.00	11.62	233.91	3688.78	253.41 S	276.36 W	-198.74	1.67
3819.00	11.60	233.86	3780.86	264.56 S	291.64 W	-206.92	0.02
4008.00	12.10	237.31	3965.83	286.46 S	323.66 W	-222.62	0.46
4103.00	10.79	230.98	4058.95	297.44 S	338.95 W	-230.62	1.91
4198.00	10.08	229.55	4152.37	308.43 S	352.18 W	-239.02	0.80
4293.00	9.03	226.99	4246.06	318.91 S	363.96 W	-247.17	1.19
4388.00	9.97	229.93	4339.75	329.29 S	375.71 W	-255.23	1.11
4482.00	10.28	231.57	4432.29	339.74 S	388.51 W	-263.18	0.45
4577.00	11.07	234.00	4525.64	350.37 S	402.53 W	-271.07	0.96
4672.00	9.35	238.03	4619.14	359.82 S	416.45 W	-277.82	1.96
4767.00	11.29	243.93	4712.60	367.99 S	431.35 W	-283.14	2.32
4862.00	10.84	240.27	4805.83	376.51 S	447.46 W	-288.57	0.88

	4956.00	9.51	238.35	4898.35	384.97 S	461.75 W	-294.28	1.46
	5051.00	9.83	241.16	4992.00	393.00 S	475.54 W	-299.66	0.60
	5146.00	10.45	235.20	5085.52	401.83 S	489.71 W	-305.76	1.28
	5241.00	8.98	236.38	5179.16	410.85 S	502.96 W	-312.21	1.56
	5335.00	9.71	260.77	5271.95	416.19 S	516.90 W	-314.92	4.25
	5383.00	14.07	275.27	5318.91	416.30 S	526.71 W	-313.24	10.94
	5430.00	15.35	283.74	5364.38	414.30 S	538.45 W	-309.13	5.32
	5524.00	14.42	311.18	5455.34	403.62 S	559.37 W	-294.82	7.49
	5572.00	17.46	319.70	5501.49	394.19 S	568.53 W	-283.87	7.98
	5619.00	20.39	328.41	5545.95	381.83 S	577.38 W	-270.11	8.64
	5667.00	23.81	332.68	5590.42	366.10 S	586.21 W	-253.03	7.87
	5714.00	27.69	334.40	5632.75	347.81 S	595.29 W	-233.39	8.41
	5762.00	33.01	333.64	5674.16	326.02 S	605.92 W	-210.03	11.11
	5809.00	38.22	333.66	5712.35	301.51 S	618.06 W	-183.71	11.09
	5857.00	43.39	335.61	5748.67	273.16 S	631.47 W	-153.40	11.09
	5903.00	47.34	339.12	5780.99	242.95 S	644.03 W	-121.40	10.16
	5951.00	50.85	341.30	5812.42	208.82 S	656.29 W	-85.60	8.08
	5998.00	54.62	343.74	5840.88	173.15 S	667.50 W	-48.49	9.02
	6046.00	59.55	343.24	5866.95	134.53 S	678.96 W	-8.42	10.31
	6093.00	64.13	344.46	5889.13	94.74 S	690.47 W	32.80	10.01
	6141.00	68.09	347.33	5908.57	52.18 S	701.15 W	76.59	9.90
	6188.00	72.35	348.48	5924.47	8.95 S	710.40 W	120.79	9.35
	6282.00	77.71	353.80	5948.76	80.72 N	724.33 W	211.49	7.90
	6330.00	80.65	356.99	5957.77	127.70 N	728.11 W	258.37	8.95
	6354.00	82.34	358.16	5961.32	151.41 N	729.11 W	281.87	8.53
	6427.00	86.76	359.25	5968.25	224.05 N	730.75 W	353.58	6.23
	6518.00	88.37	358.81	5972.12	314.95 N	732.29 W	443.24	1.83
	6610.00	89.60	358.87	5973.75	406.91 N	734.15 W	534.00	1.34
	6703.00	90.65	358.83	5973.54	499.89 N	736.02 W	625.76	1.13
	6795.00	89.91	358.01	5973.09	591.86 N	738.55 W	716.64	1.20
	6887.00	91.26	359.29	5972.15	683.82 N	740.72 W	807.46	2.02
	6982.00	91.82	359.32	5969.60	778.78 N	741.87 W	901.04	0.59
	7077.00	91.63	359.12	5966.74	873.73 N	743.17 W	994.63	0.29
	7172.00	89.91	359.86	5965.46	968.71 N	744.01 W	1088.17	1.97
	7266.00	89.69	359.31	5965.79	1062.71 N	744.69 W	1180.72	0.63
	7361.00	91.23	359.23	5965.03	1157.69 N	745.90 W	1274.33	1.62
	7456.00	91.63	358.96	5962.66	1252.65 N	747.40 W	1367.97	0.51
	7550.00	90.95	0.21	5960.54	1346.62 N	748.08 W	1460.49	1.51
	7645.00	90.77	359.72	5959.12	1441.61 N	748.14 W	1553.89	0.55
	7740.00	89.57	358.99	5958.84	1536.60 N	749.21 W	1647.49	1.48
	7834.00	88.55	358.36	5960.38	1630.56 N	751.39 W	1740.27	1.28
	7929.00	89.60	358.10	5961.91	1725.51 N	754.32 W	1834.15	1.14
	8024.00	90.22	358.20	5962.06	1820.46 N	757.39 W	1928.07	0.66
	8119.00	89.29	357.11	5962.47	1915.37 N	761.27 W	2022.10	1.51
	8213.00	91.60	357.16	5961.74	2009.25 N	765.97 W	2115.26	2.46
	8308.00	91.36	357.26	5959.28	2104.10 N	770.59 W	2209.36	0.27
	8403.00	91.39	357.10	5957.00	2198.96 N	775.27 W	2303.48	0.17
	8497.00	90.49	357.58	5955.46	2292.84 N	779.63 W	2396.59	1.09
	8592.00	90.95	358.07	5954.27	2387.77 N	783.23 W	2490.58	0.71
	8687.00	90.28	359.56	5953.25	2482.74 N	785.20 W	2584.31	1.72
	8782.00	90.12	359.12	5952.92	2577.73 N	786.29 W	2677.91	0.49
	8876.00	89.78	359.19	5953.00	2671.72 N	787.68 W	2770.58	0.37
	8971.00	90.65	359.54	5952.64	2766.71 N	788.73 W	2864.17	0.99
	9066.00	89.66	358.59	5952.39	2861.70 N	790.28 W	2957.84	1.44
	9161.00	89.94	359.26	5952.72	2956.68 N	792.06 W	3051.55	0.76
	9256.00	90.62	359.09	5952.25	3051.67 N	793.43 W	3145.20	0.74
	9351.00	90.77	359.12	5951.10	3146.65 N	794.92 W	3238.86	0.16
	9445.00	90.71	359.25	5949.89	3240.63 N	796.25 W	3331.51	0.15
	9540.00	90.83	359.70	5948.61	3335.62 N	797.12 W	3425.06	0.49
	9635.00	91.51	359.50	5946.67	3430.60 N	797.79 W	3518.56	0.75
	9730.00	91.82	358.48	5943.91	3525.54 N	799.46 W	3612.22	1.12
	9824.00	90.40	359.28	5942.09	3619.50 N	801.30 W	3704.94	1.73
	9919.00	90.31	358.93	5941.50	3714.49 N	802.78 W	3798.60	0.38
	10014.00	89.57	358.70	5941.60	3809.47 N	804.75 W	3892.35	0.82
	10109.00	89.38	358.82	5942.47	3904.44 N	806.80 W	3986.10	0.24
	10204.00	90.12	357.85	5942.88	3999.40 N	809.56 W	4079.97	1.28
	10299.00	89.60	357.99	5943.12	4094.33 N	813.01 W	4173.94	0.57
	10393.00	90.37	358.51	5943.14	4188.29 N	815.88 W	4266.85	0.99
	10488.00	89.57	357.97	5943.19	4283.24 N	818.80 W	4360.74	1.02
	10583.00	90.80	357.69	5942.88	4378.17 N	822.40 W	4454.73	1.33

10678.00	90.99	357.41	5941.40	4473.08 N	826.46 W	4548.78	0.36
10745.00	90.99	357.41	5940.24	4540.00 N	829.48 W	4615.13	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 CLOSURE OF 349.65 DEGREES (GRID)
A TOTAL CORRECTION OF 6.95 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10745.00 FEET
IS 4615.15 FEET ALONG 349.65 DEGREES (GRID)**

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