



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	21-Nov-15	24-Nov-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	854.00	7,435.00			
Log End Depth (MD, ft)	7,435.00	11,773.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	20-Nov-15 07:15	22-Nov-15 16:15			
Drill/Wipe End Date and Time	21-Nov-15 13:10	23-Nov-15 20:45			
Min Inc (deg) @ Depth (MD, ft)	0.20 @ 300.00	88.00 @ 7,455.00			
Max Inc (deg) @ Depth (MD, ft)	83.43 @ 7,379.00	91.57 @ 8,212.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.65 / PDC			
Flow Rate (gpm)	555.42	293.01			
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)	10.00 / 27.00	10.10 / 39.00			
Filtrate CL (ppm)	1,600.00	2,200.00			
pH / Fluid Loss (mptm)	8.90 / 41	9.50 / 8			
PV (cP) / YP (lbf2)	1 / 1.00	9 / 11.00			
% Solids / % Sand	0.70 / 0.01	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			
Mud Temp @ Measured Temp (degF)	125.00 / 125.00	215.00 / 125.00			

Max Tool Temp (degF) / Source	185.02 / PCM	245.03 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ 245.03			
Lead MWD Engineer	Henry Schemidler	Henry Schemidler			
Customer Representative	Charles Colville	Charles Colville			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	10907009	12310756			
Insert Serial Number	11400901	11400901			
Date and Time Initialized	19-Nov-15 22:18	22-Nov-15 02:46			
Date and Time Read	21-Nov-15 21:42	24-Nov-15 05:03			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	68.00			
Software Version	6.33	6.33			
Sub Serial Number	10907009	12310756			
Sonde Serial Number	11297584	11478096			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	184.30	119.24			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	43.53	56.16			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	10907009	12310756			
Insert/Sonde Serial Number	11681042	11293307			

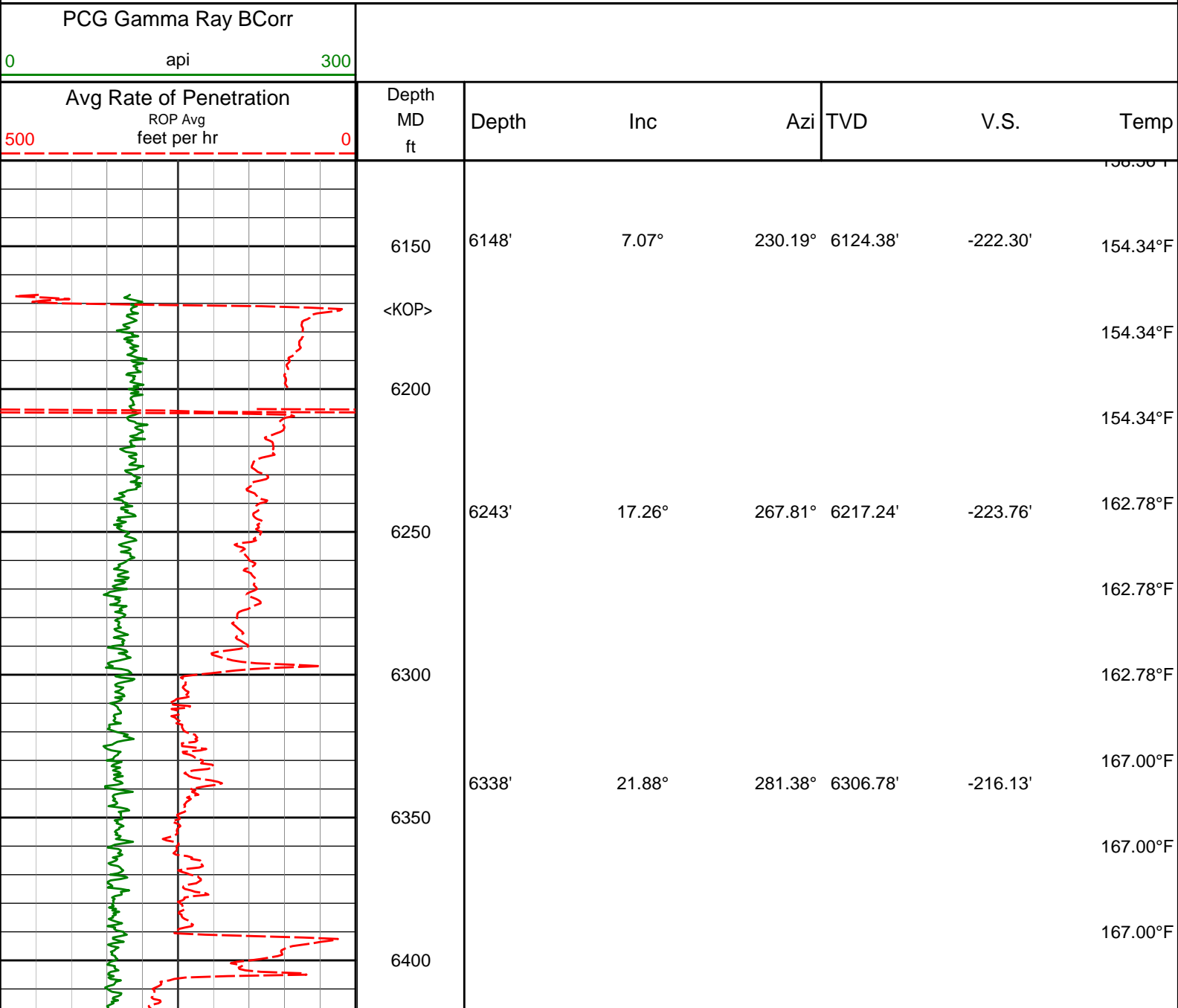
REMARKS

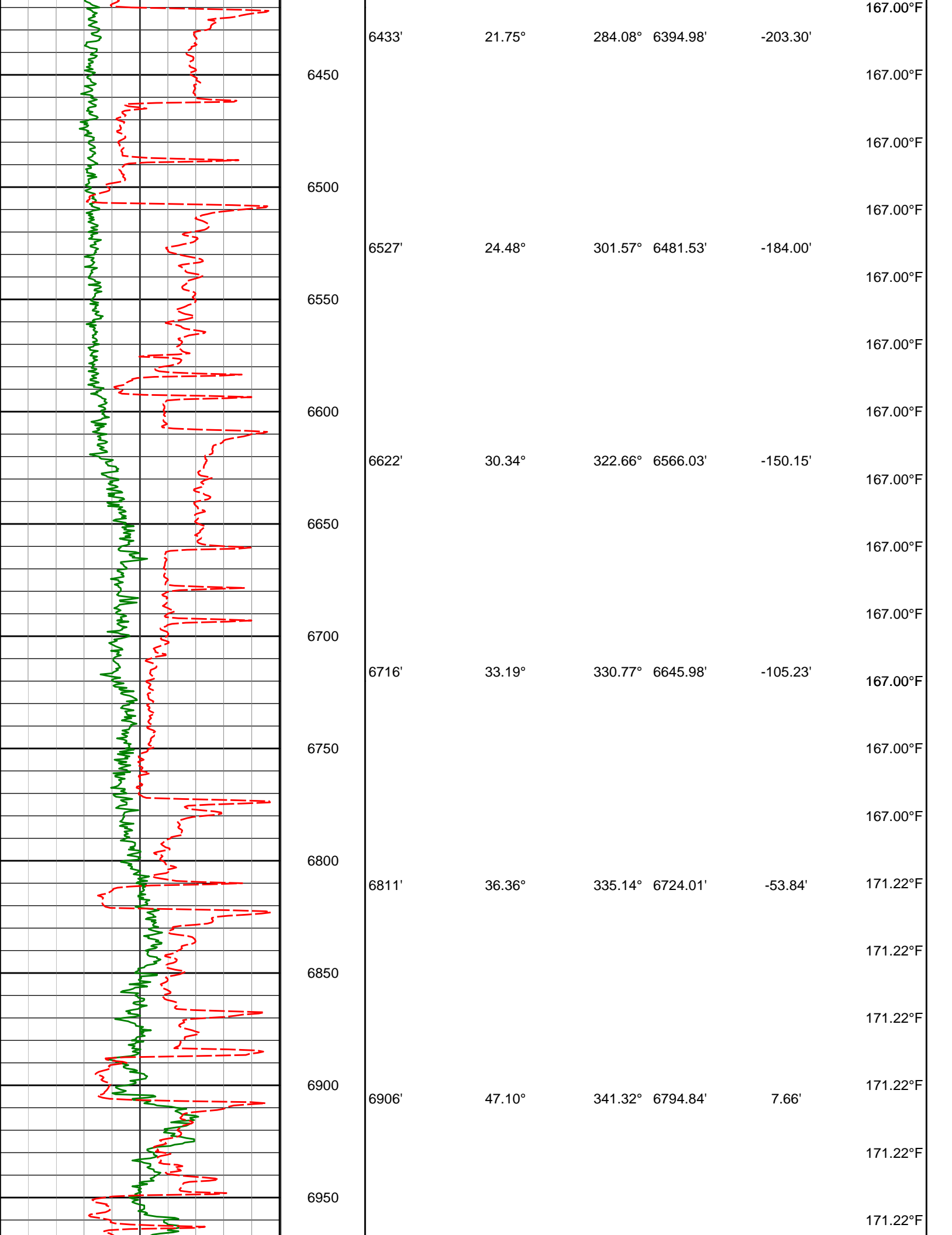
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 7391 ft. MD to 7425 ft. MD.

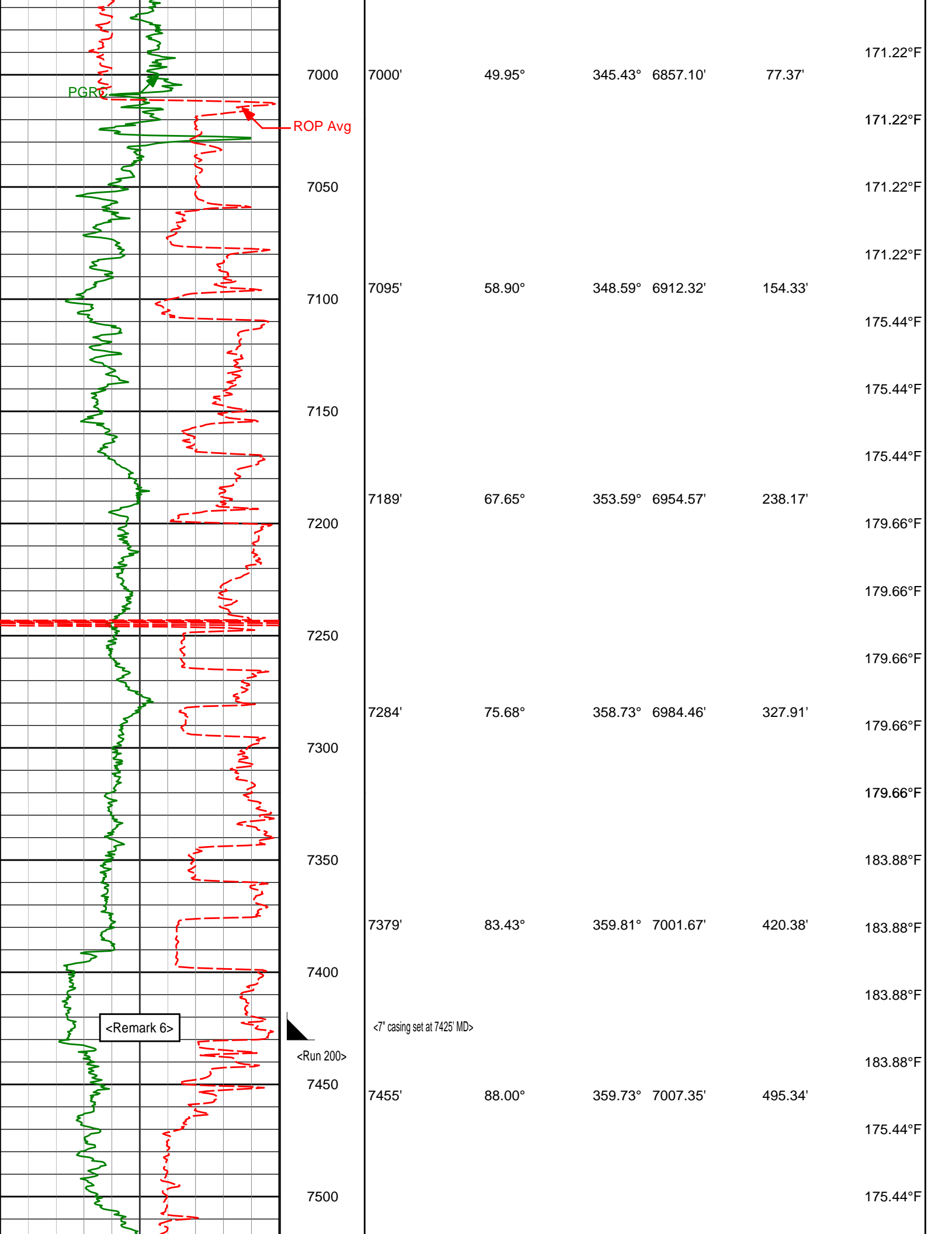
WARRANTY

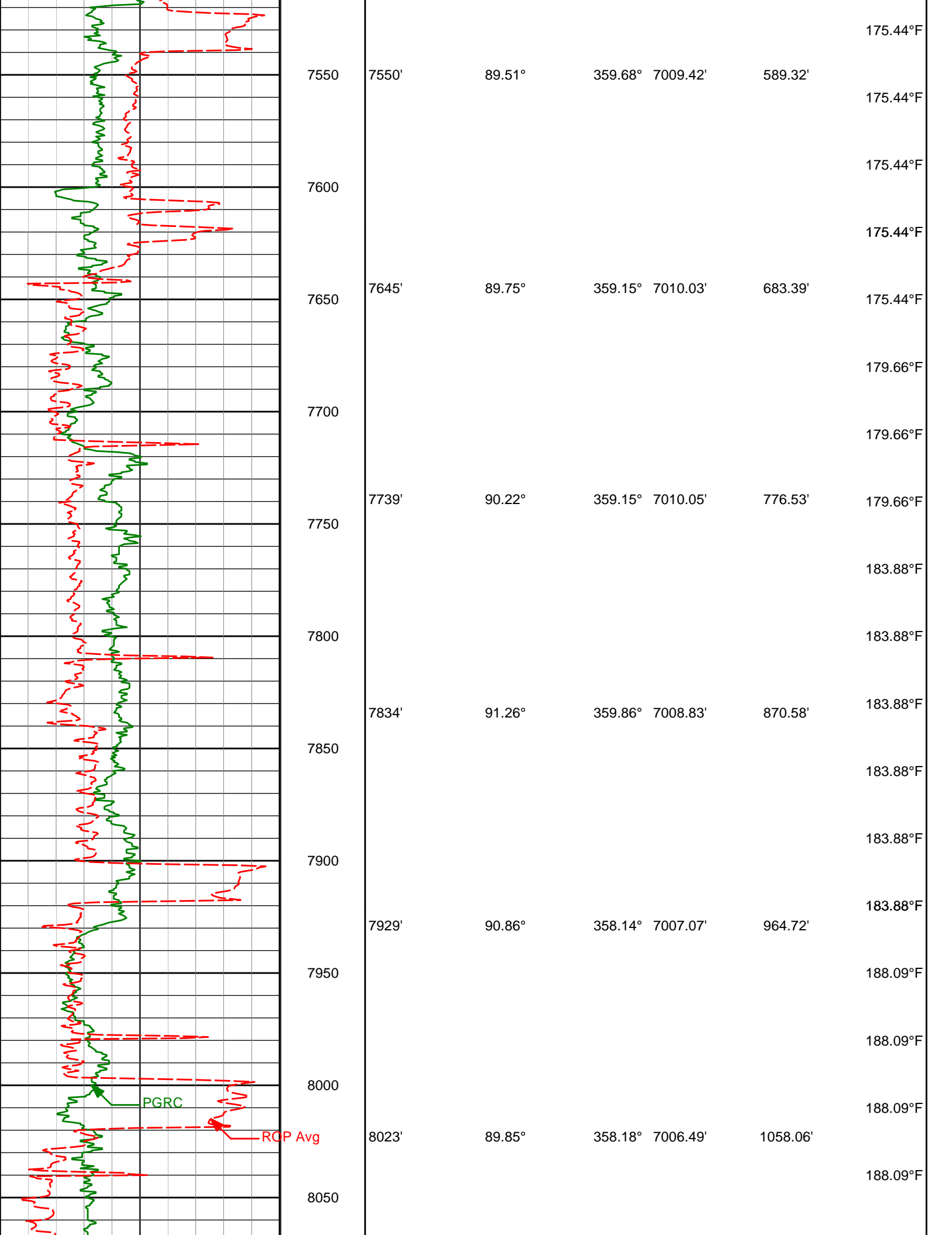
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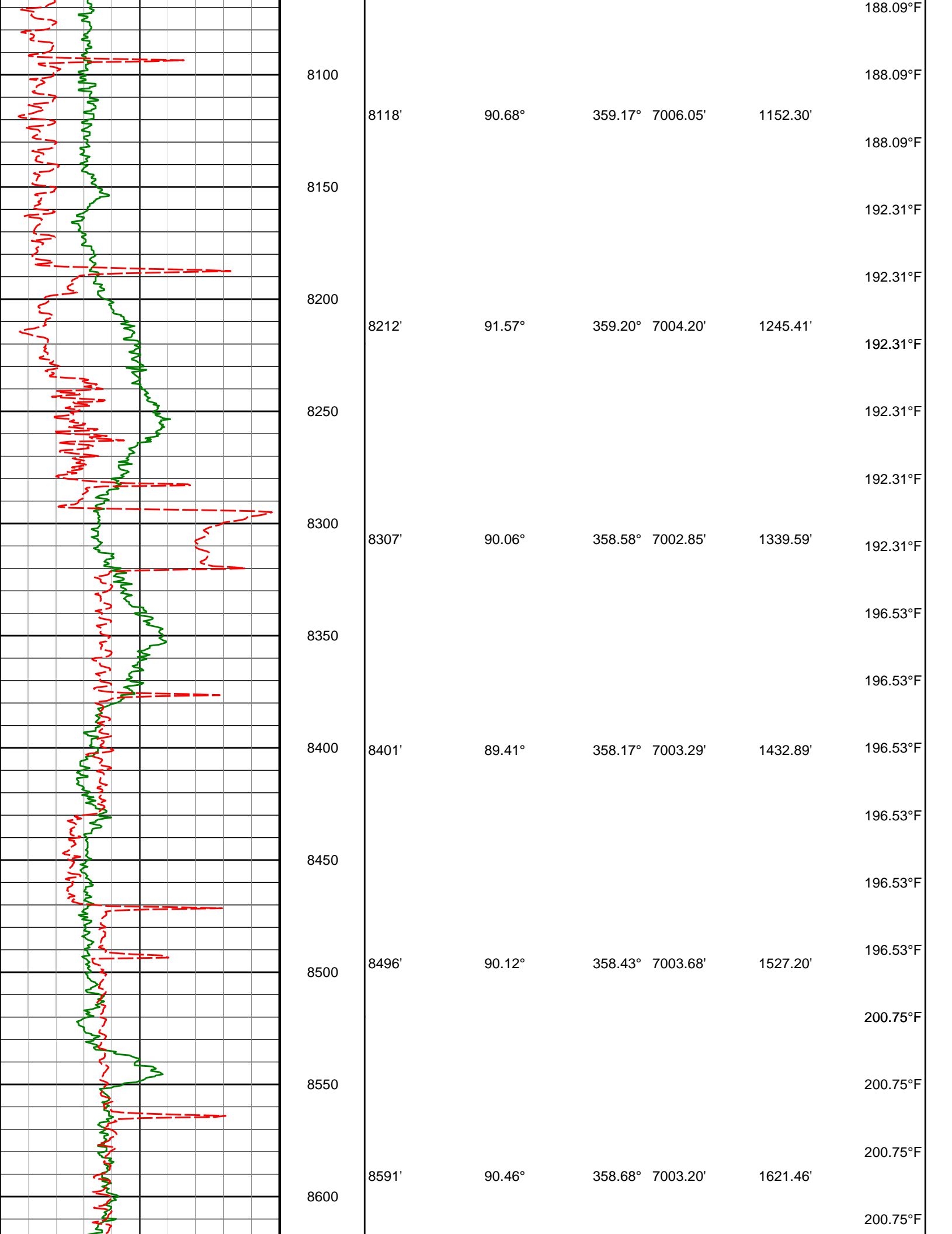
MD Detail 1:600 Scale

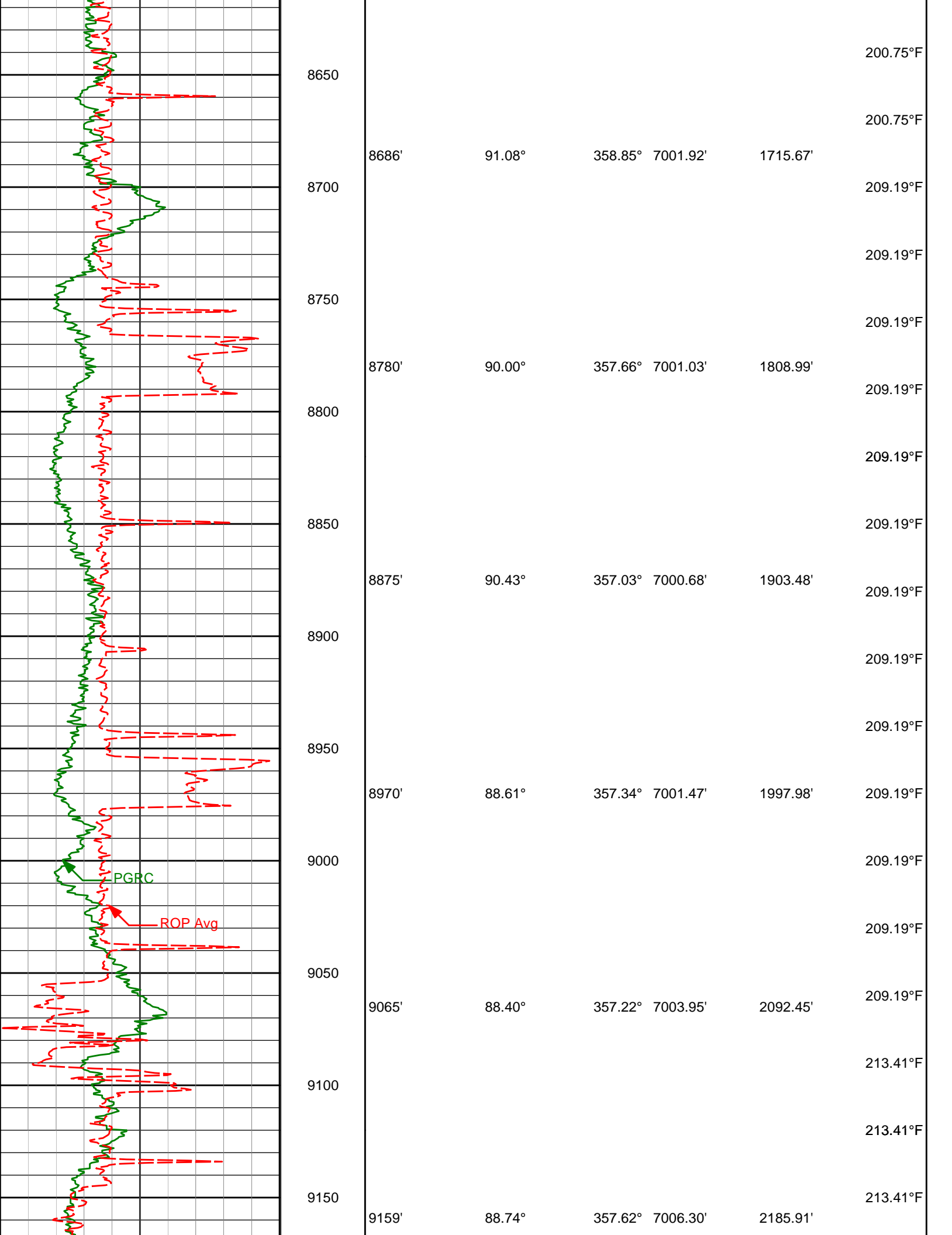


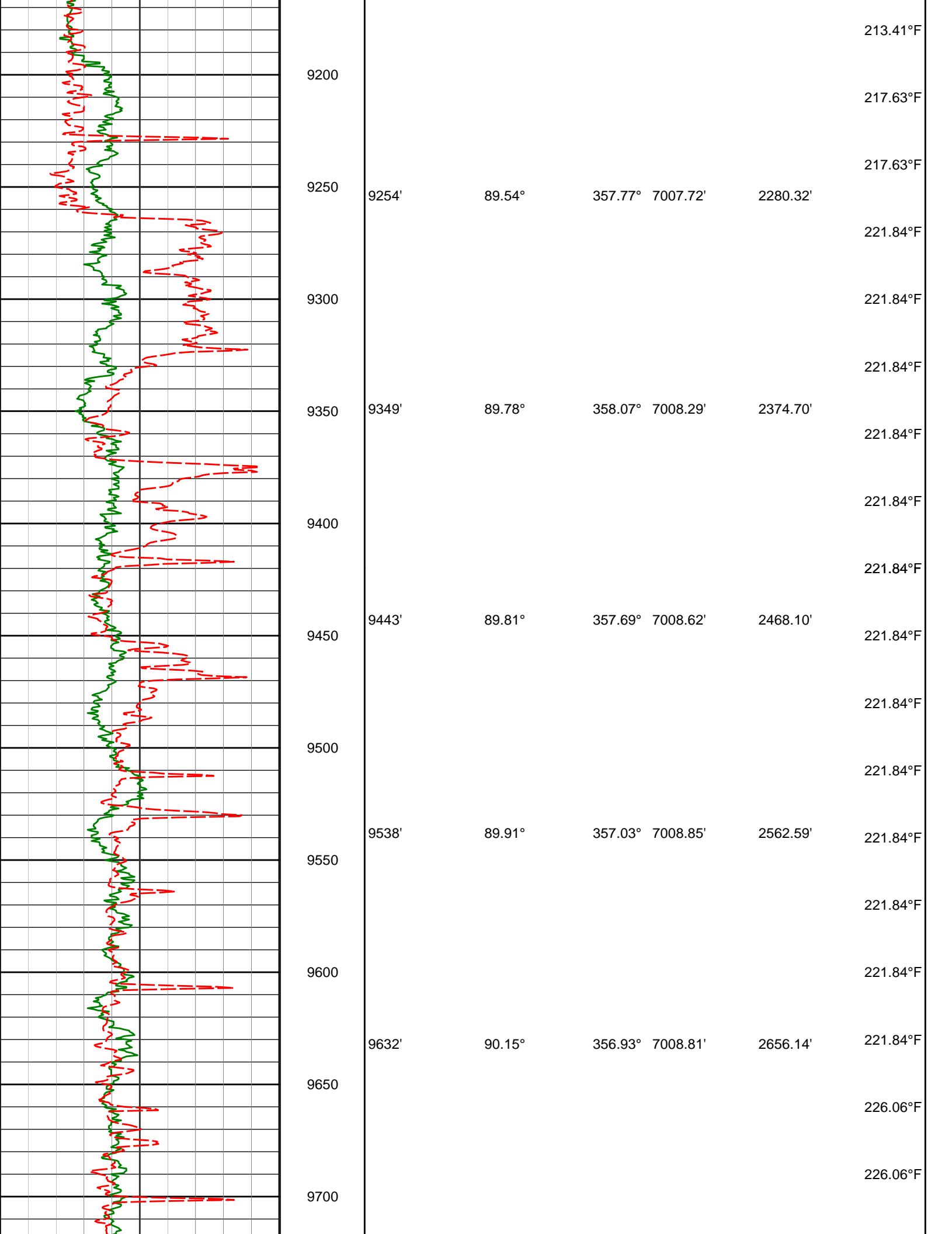


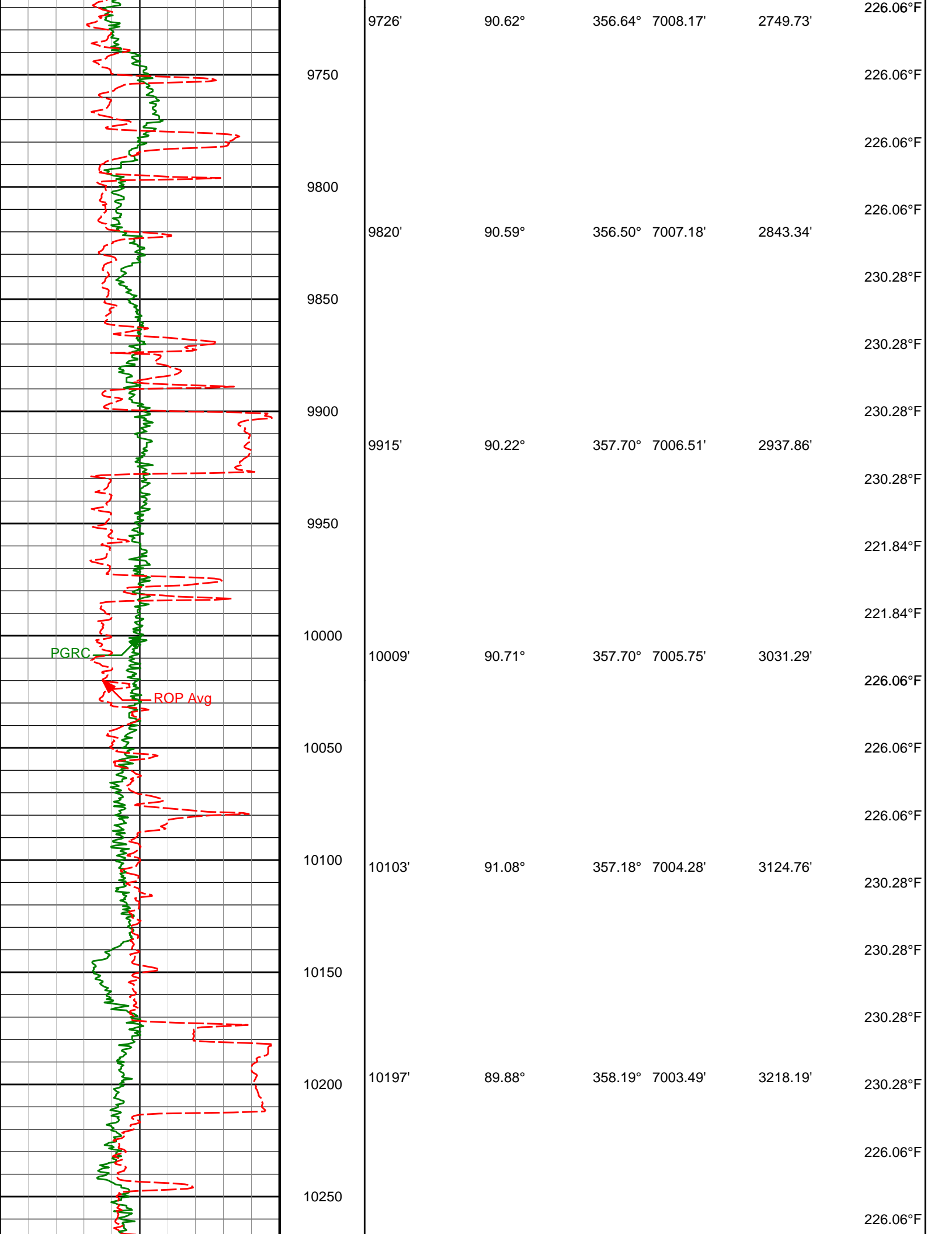


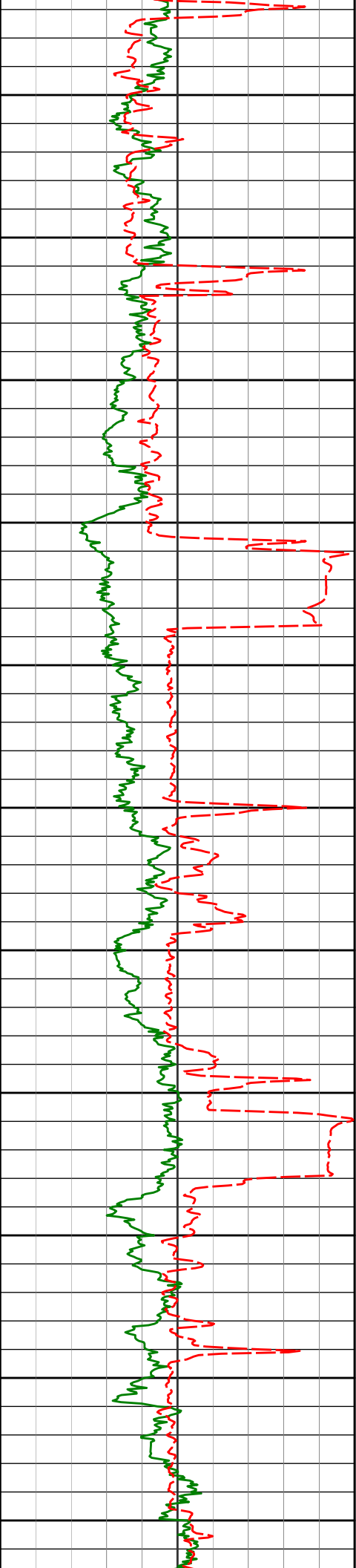




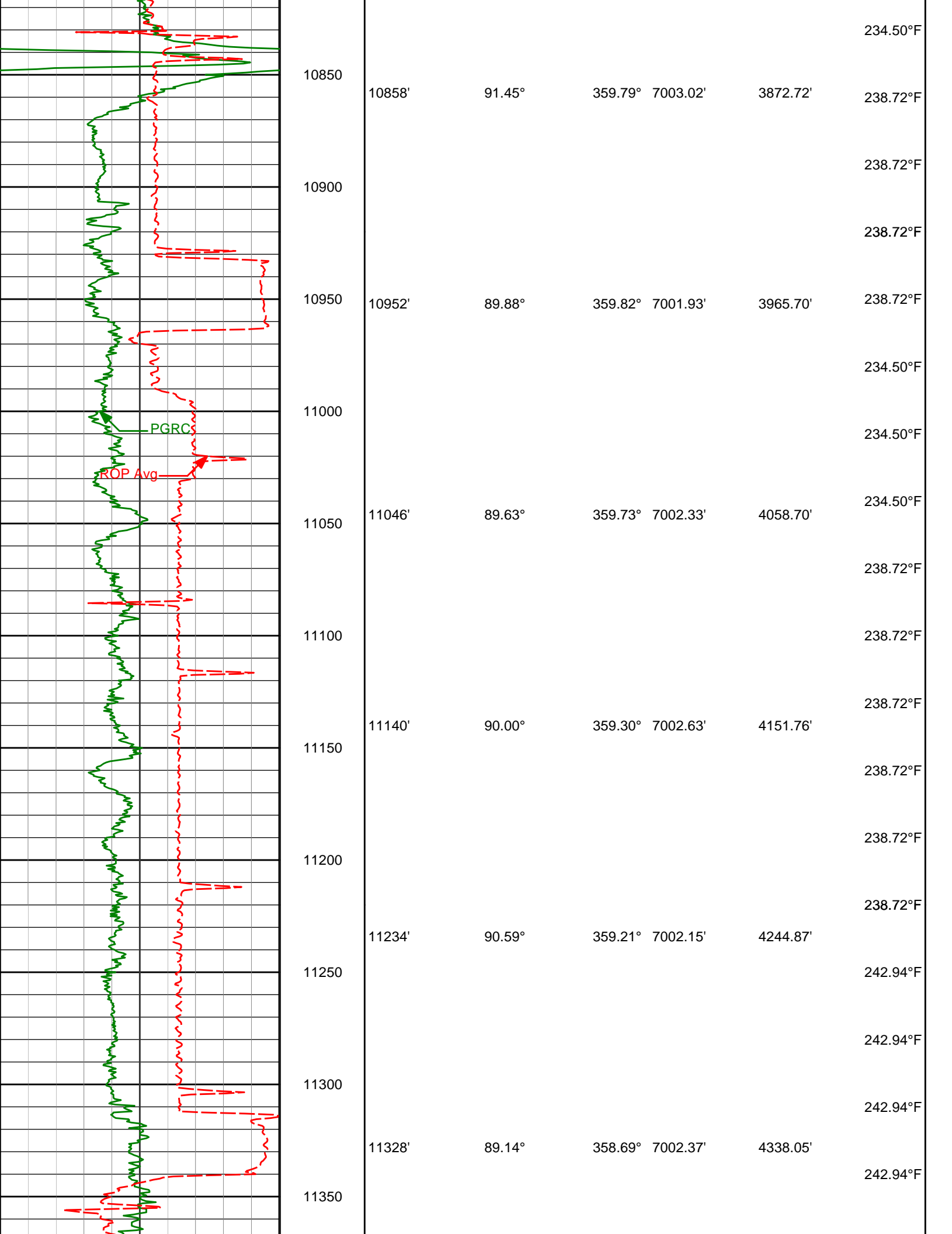


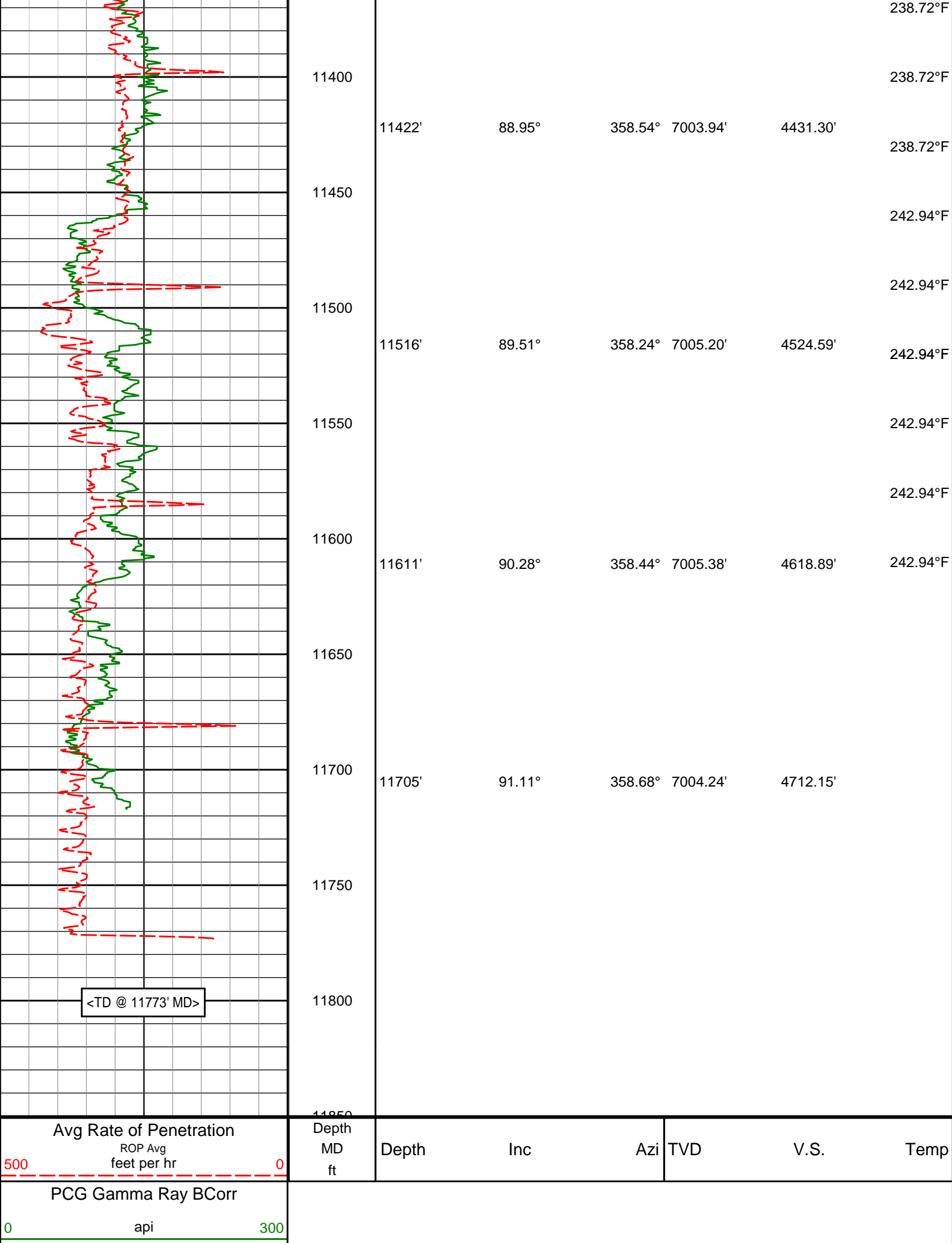






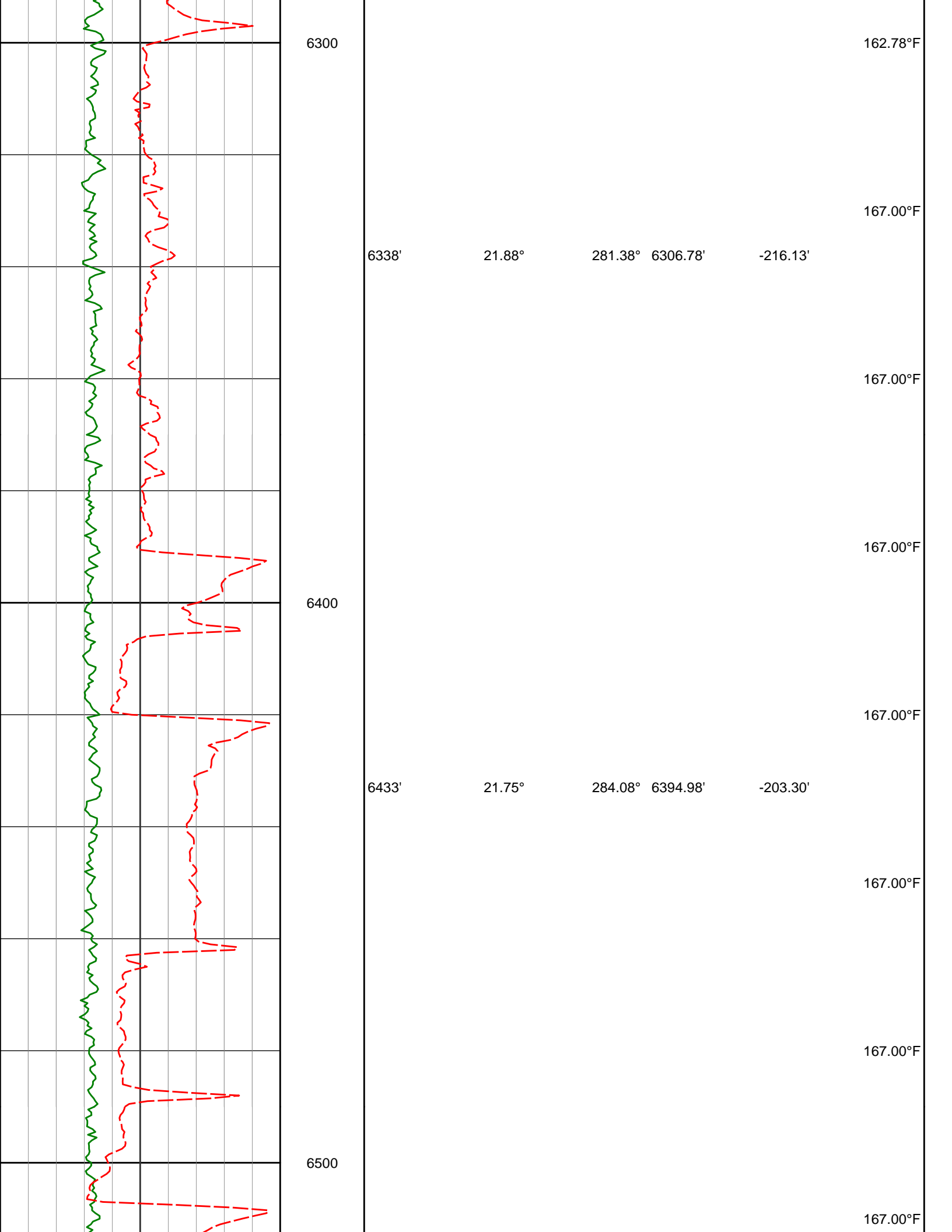
10300	10292'	90.03°	358.37°	7003.57'	3312.50'	226.06°F
						230.28°F
10350						230.28°F
	10386'	90.83°	358.54°	7002.86'	3405.79'	230.28°F
10400						230.28°F
						230.28°F
10450						230.28°F
	10480'	89.69°	0.07°	7002.43'	3498.89'	230.28°F
10500						230.28°F
						230.28°F
10550						230.28°F
	10575'	90.40°	0.36°	7002.36'	3592.77'	230.28°F
10600						230.28°F
						230.28°F
10650						230.28°F
	10669'	89.69°	0.25°	7002.29'	3685.63'	230.28°F
10700						230.28°F
						230.28°F
10750						230.28°F
	10763'	88.98°	359.03°	7003.38'	3778.66'	234.50°F
10800						234.50°F

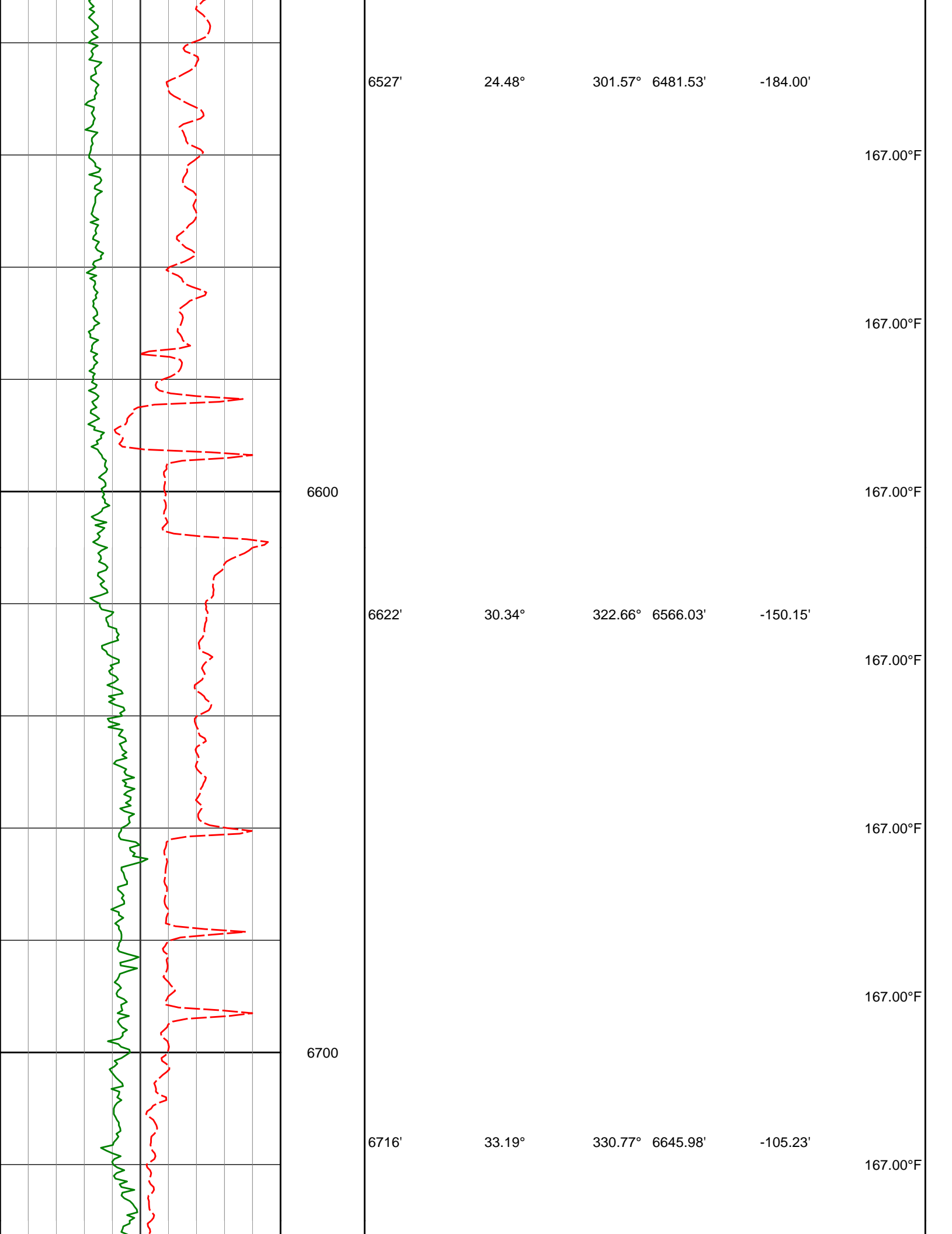


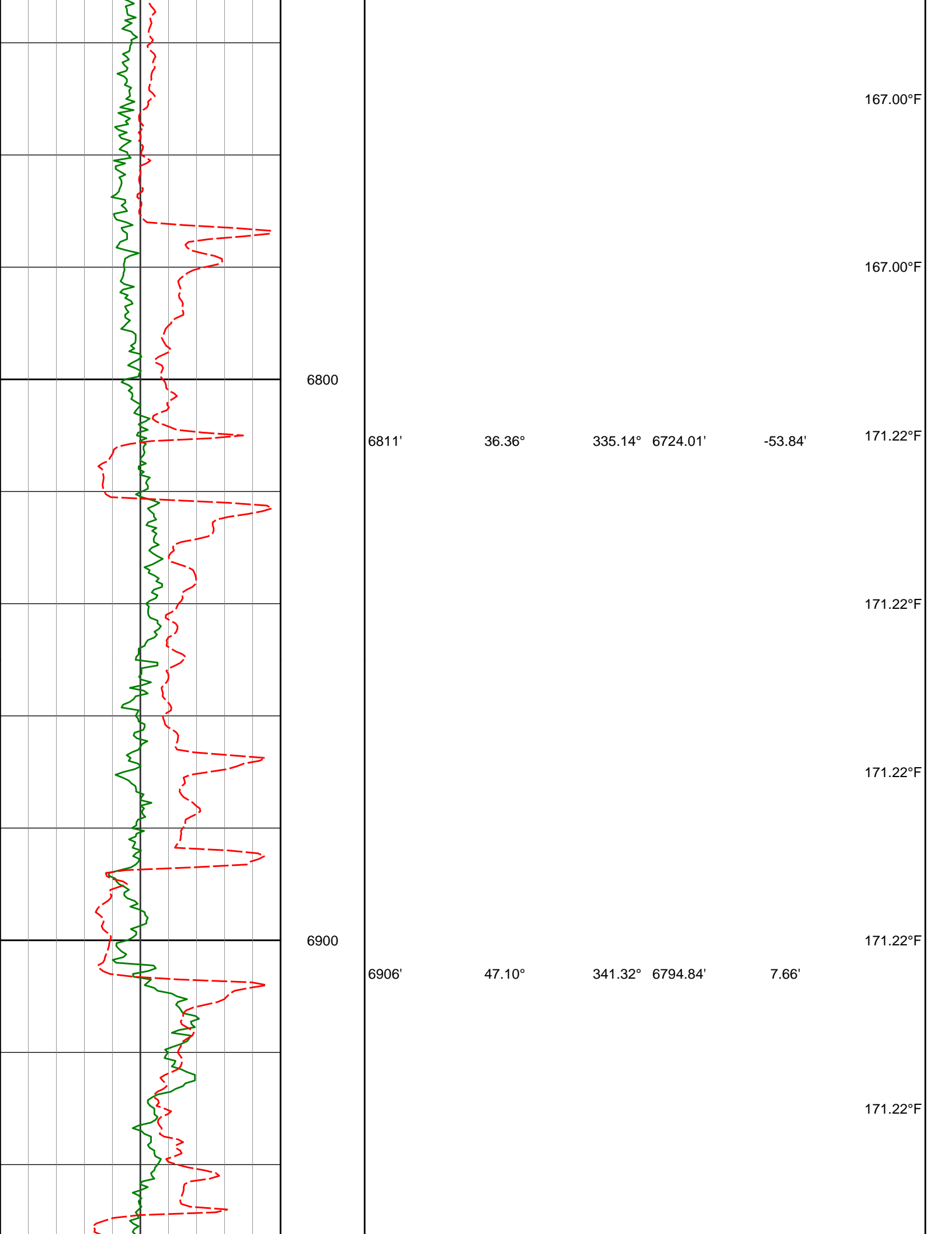


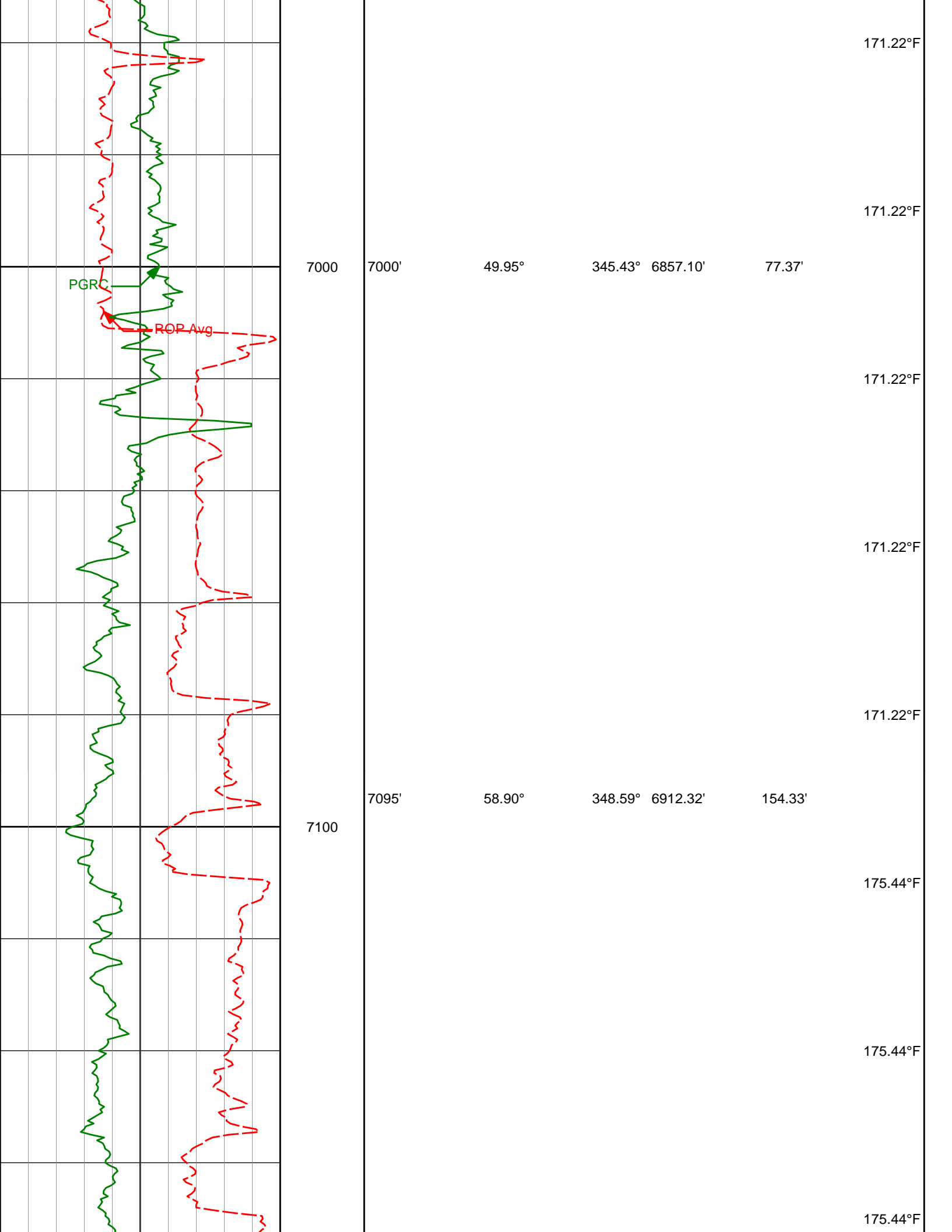
MD Detail 1:240 Scale

PCG Gamma Ray BCorr														
0														









171.22°F

171.22°F

7000

7000'

49.95°

345.43° 6857.10'

77.37'

PGR

ROP Avg

171.22°F

171.22°F

171.22°F

7100

7095'

58.90°

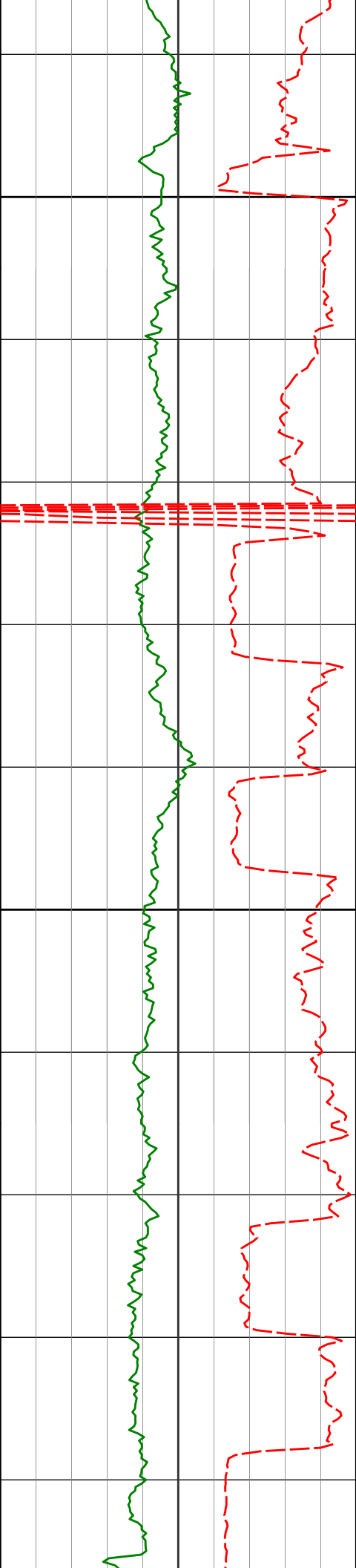
348.59° 6912.32'

154.33'

175.44°F

175.44°F

175.44°F



7200

7300

7189'

67.65°

353.59°

6954.57'

238.17'

179.66°F

179.66°F

179.66°F

7284'

75.68°

358.73°

6984.46'

327.91'

179.66°F

179.66°F

183.88°F

7379'

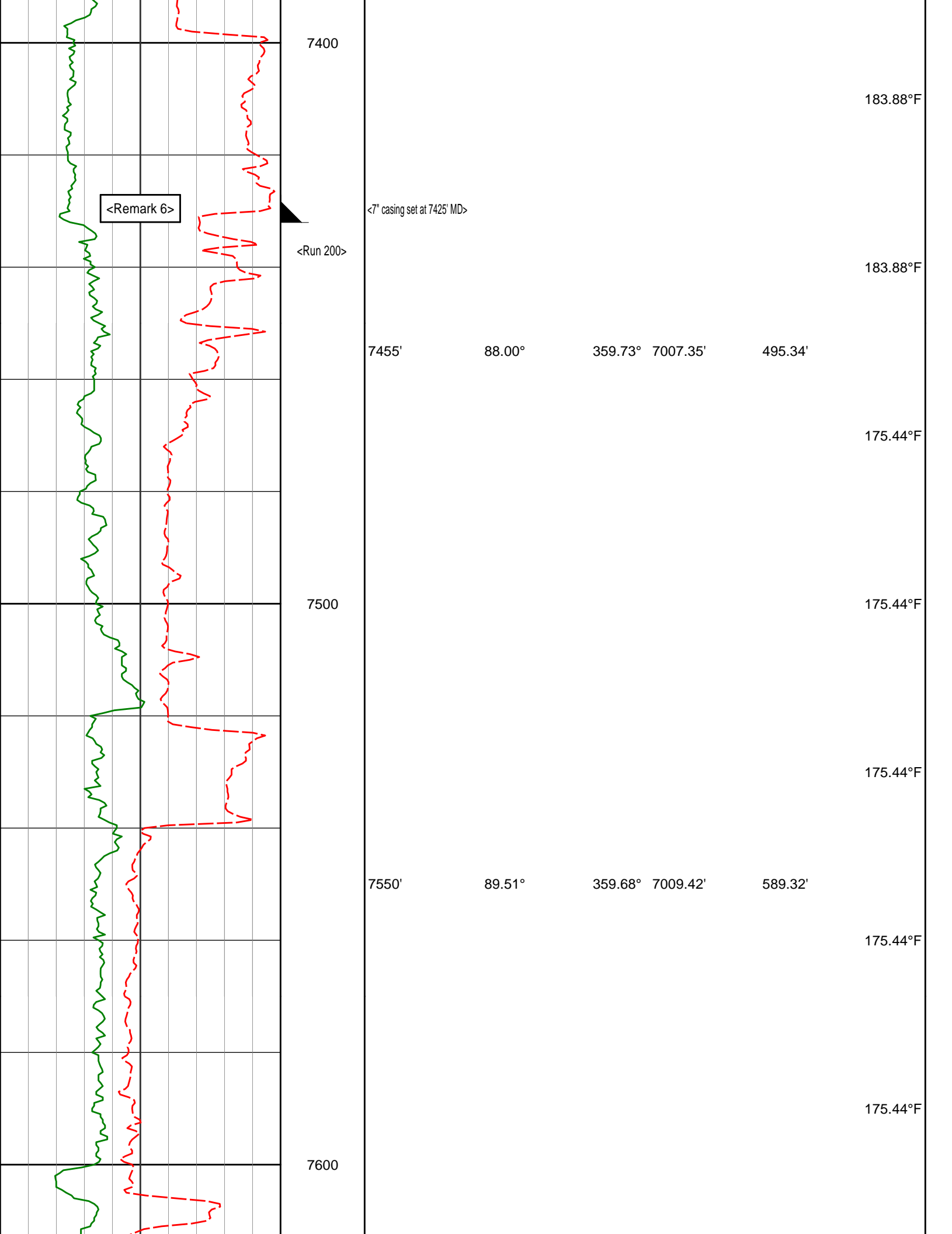
83.43°

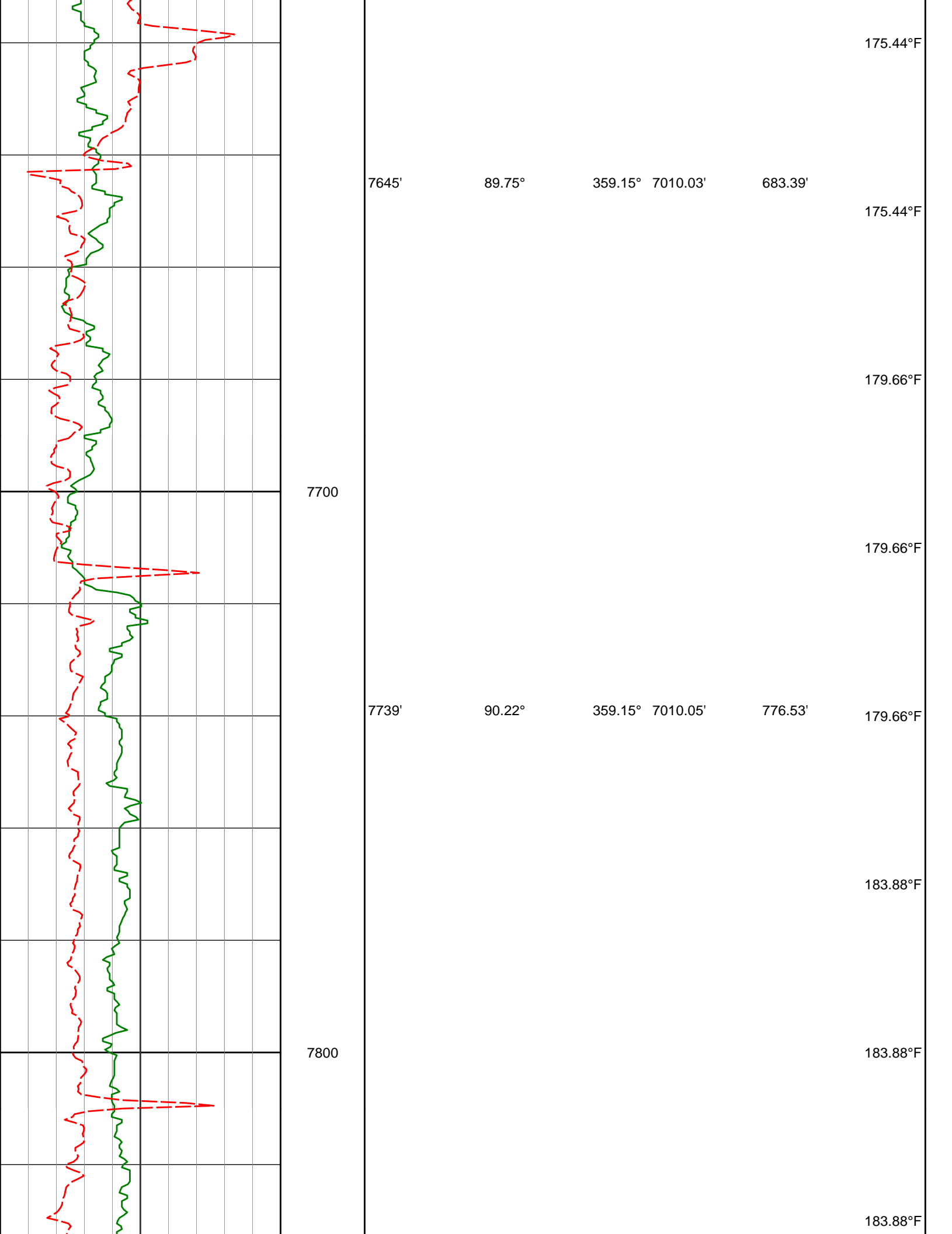
359.81°

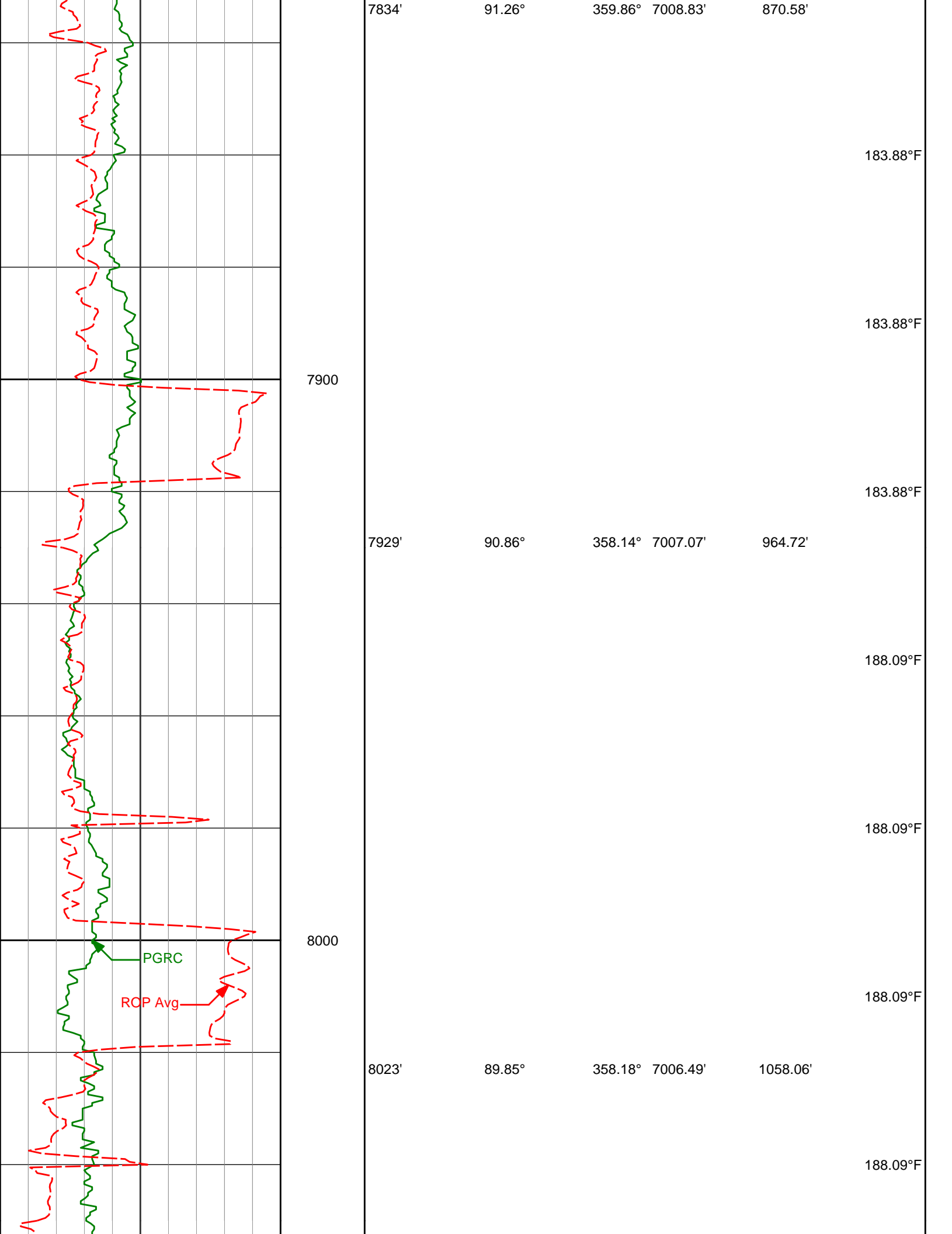
7001.67'

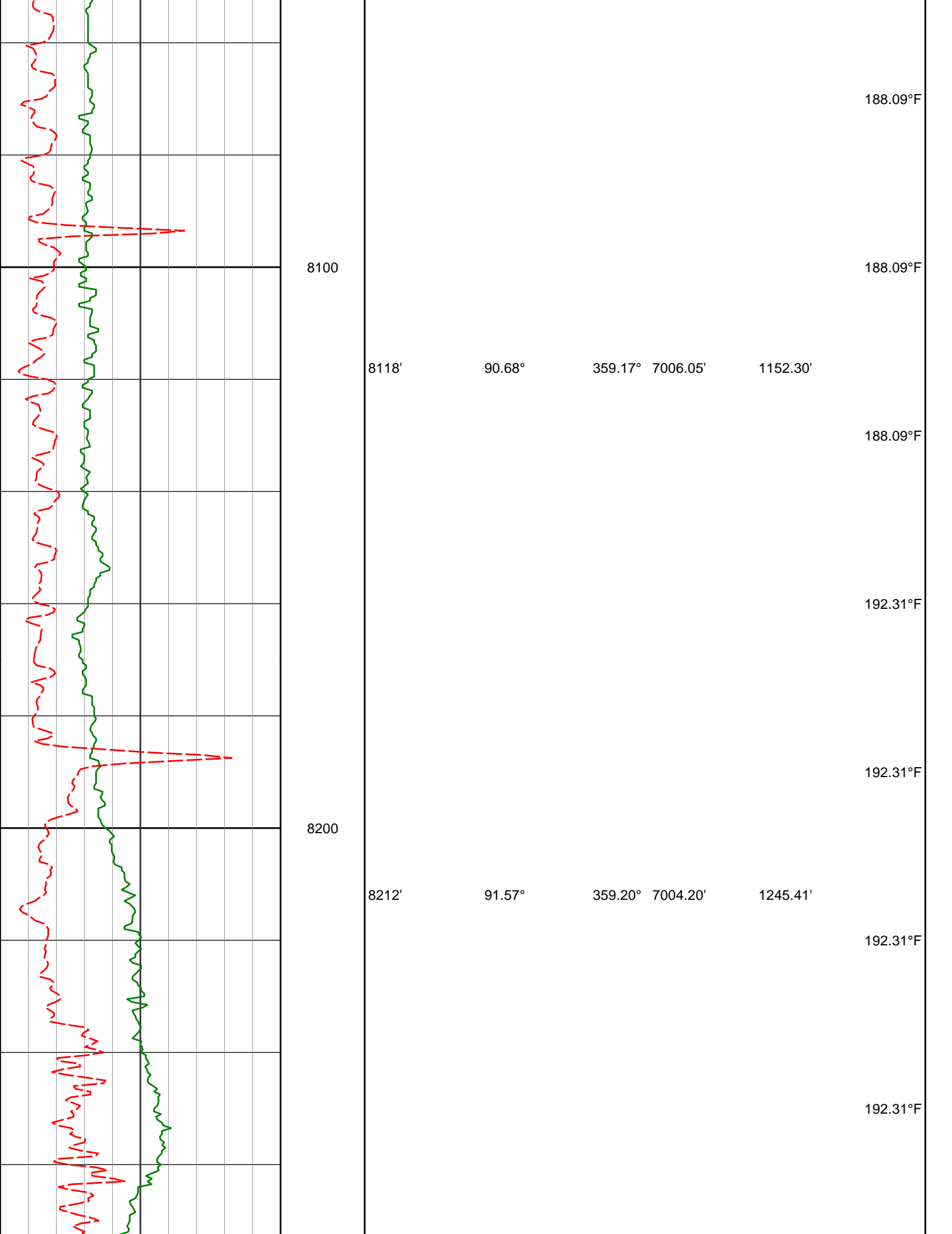
420.38'

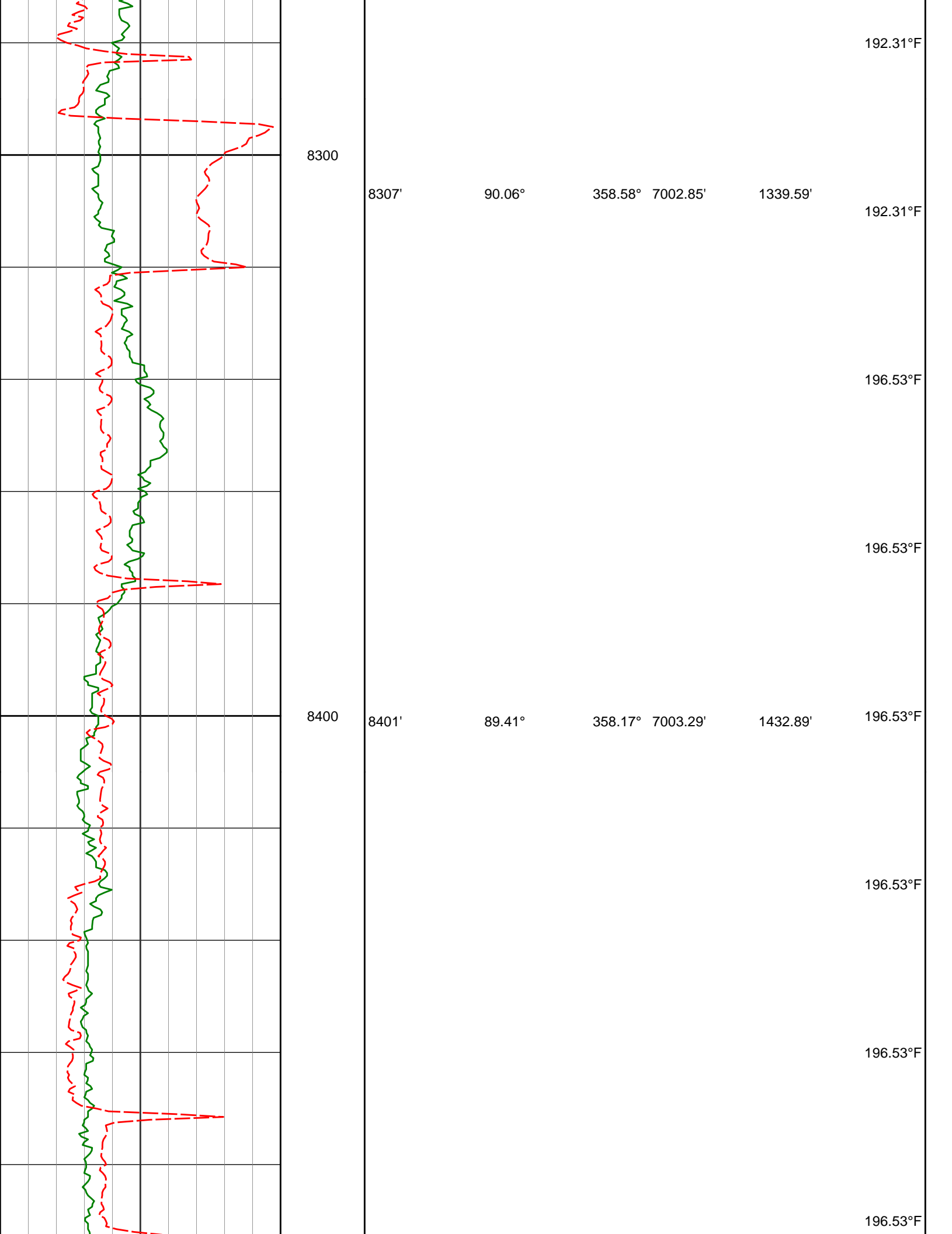
183.88°F

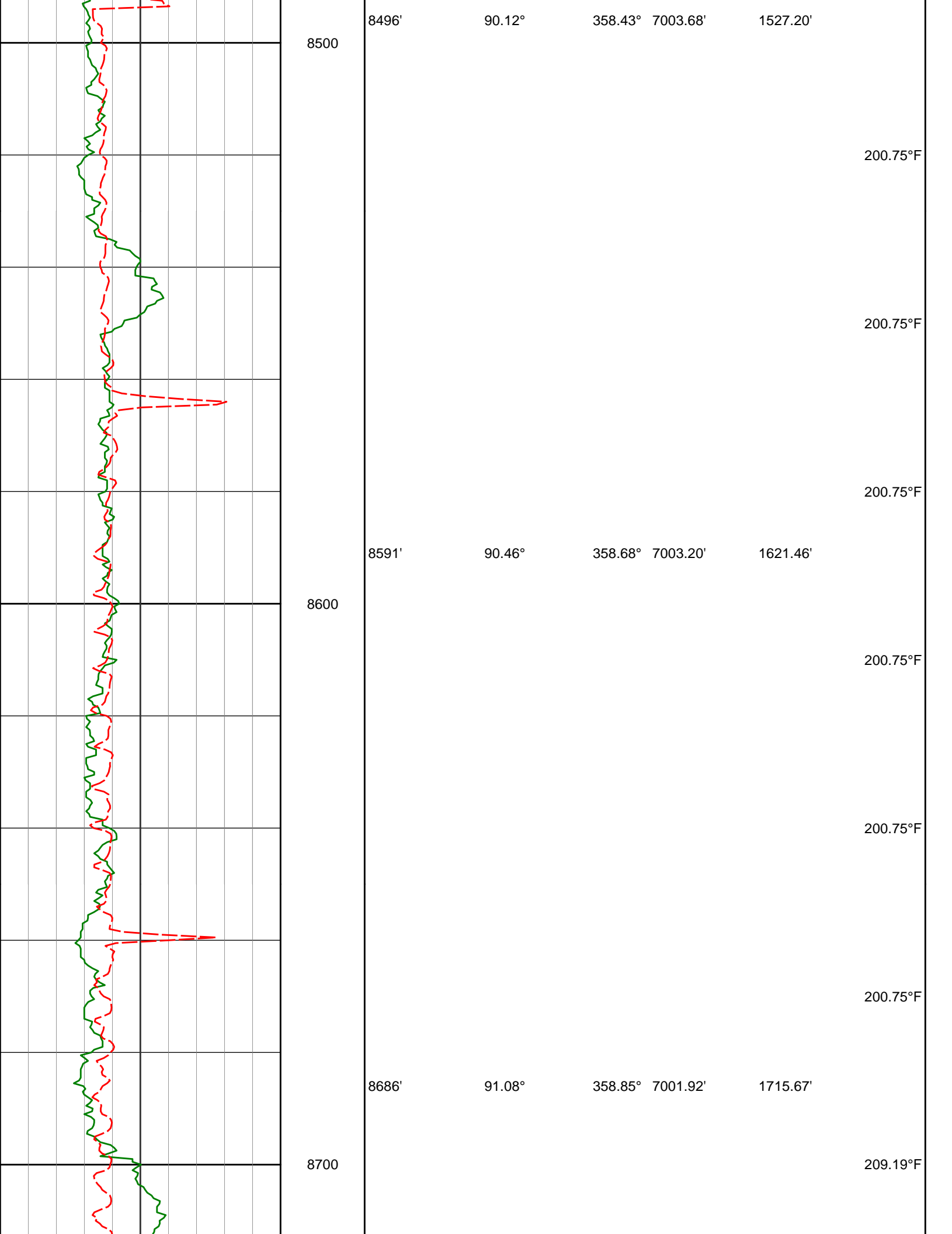


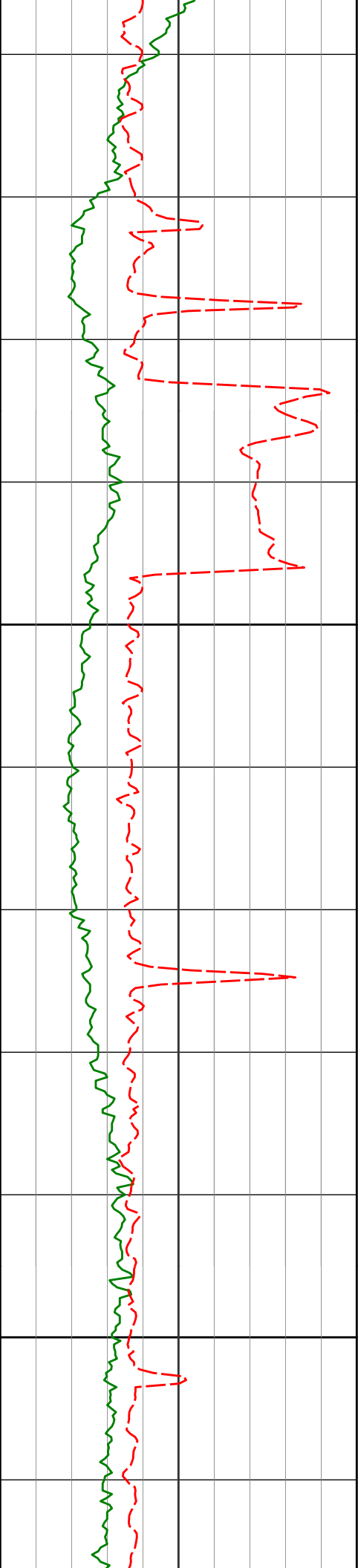












8800

8900

8780'

8875'

90.00°

90.43°

357.66°

357.03°

7001.03'

7000.68'

1808.99'

1903.48'

209.19°F

209.19°F

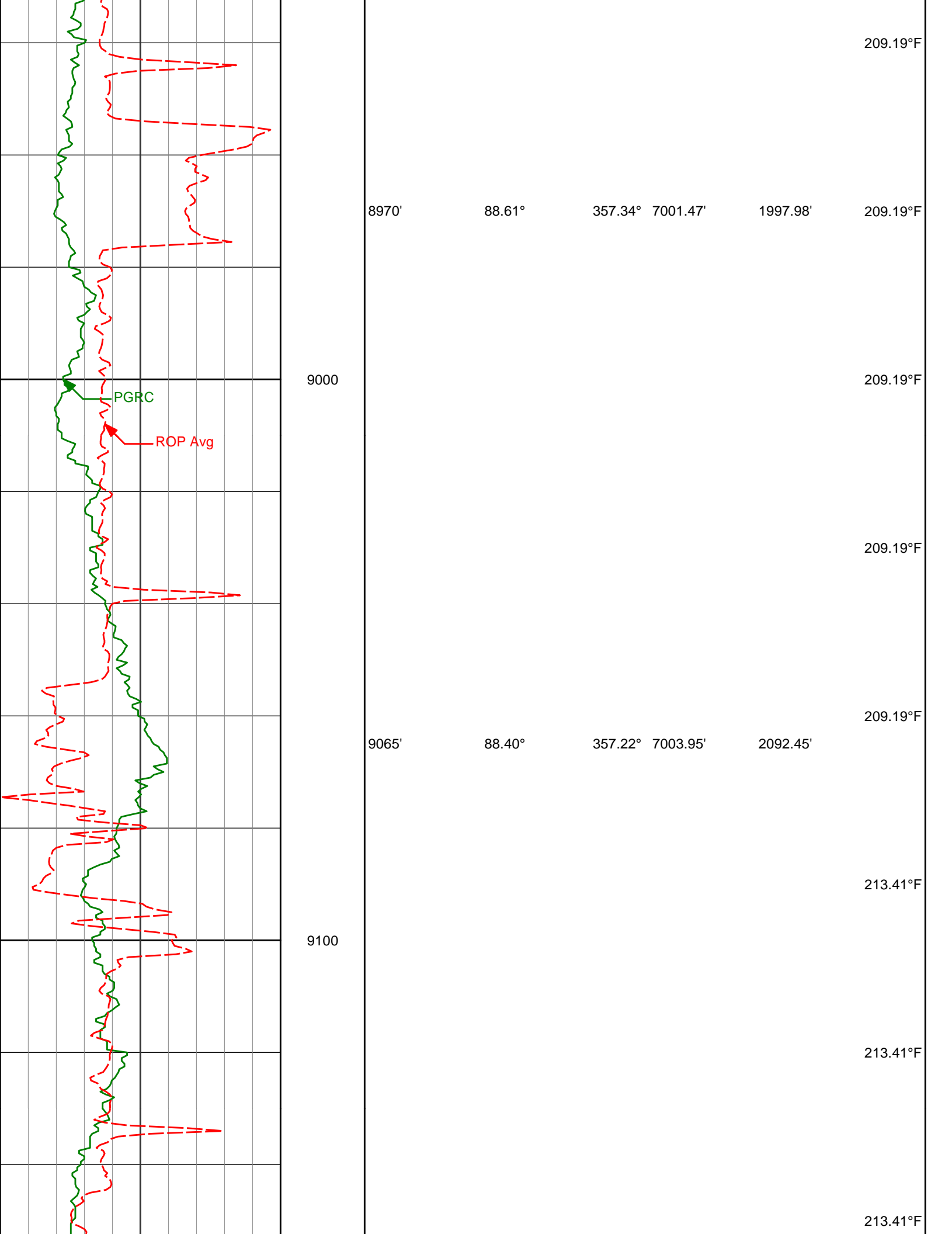
209.19°F

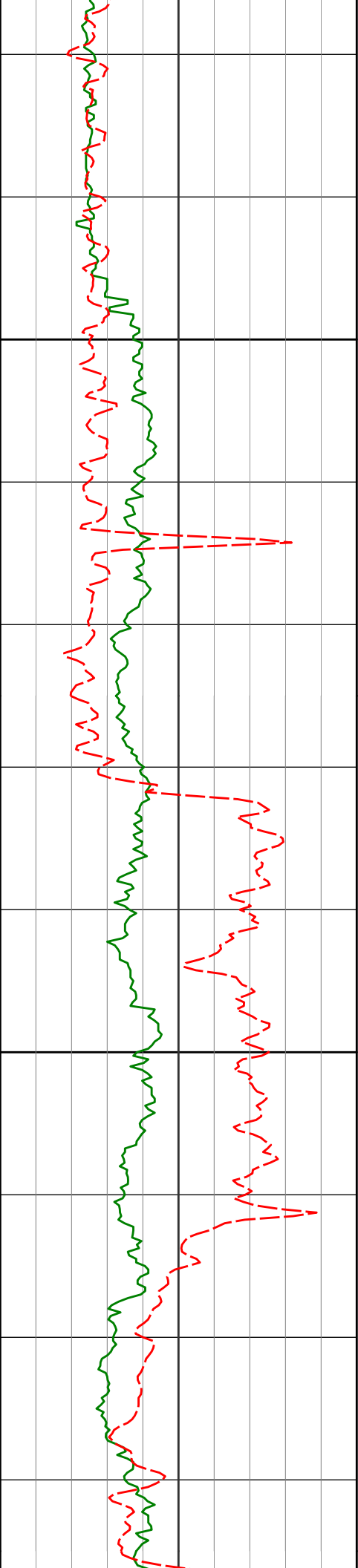
209.19°F

209.19°F

209.19°F

209.19°F





9200

9300

9159' 88.74° 357.62° 7006.30' 2185.91'

213.41°F

217.63°F

217.63°F

9254' 89.54° 357.77° 7007.72' 2280.32'

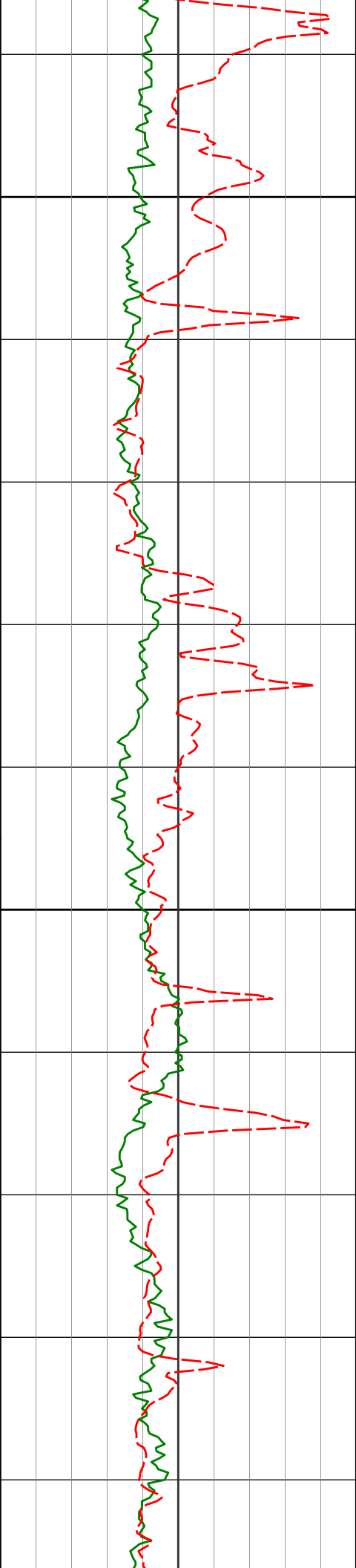
221.84°F

221.84°F

221.84°F

9349' 89.78° 358.07° 7008.29' 2374.70'

221.84°F



9400

9500

9443'

9538'

89.81°

89.91°

357.69°

357.03°

7008.62'

7008.85'

2468.10'

2562.59'

221.84°F

221.84°F

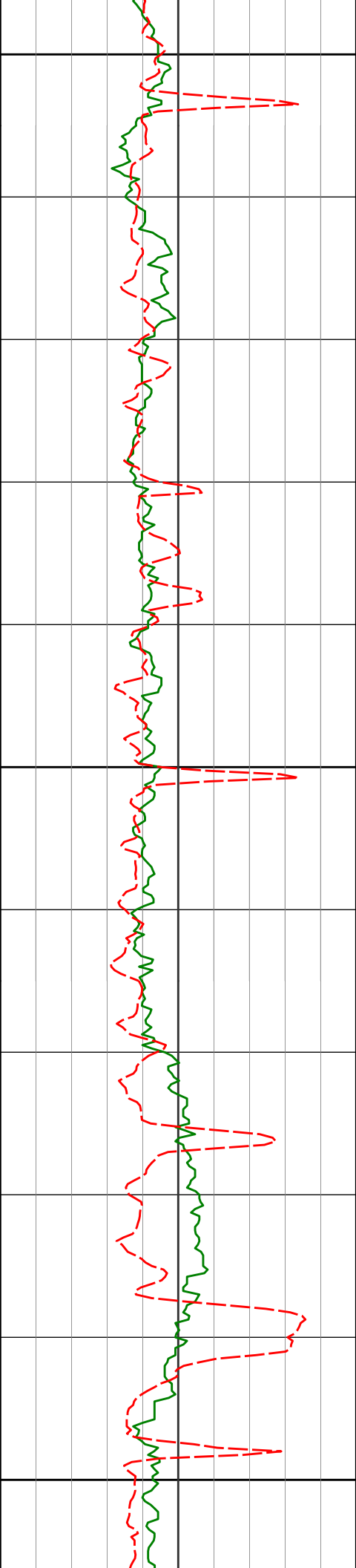
221.84°F

221.84°F

221.84°F

221.84°F

221.84°F



9600

9700

9800

9632'

9726'

90.15°

90.62°

356.93°

356.64°

7008.81'

7008.17'

2656.14'

2749.73'

221.84°F

221.84°F

226.06°F

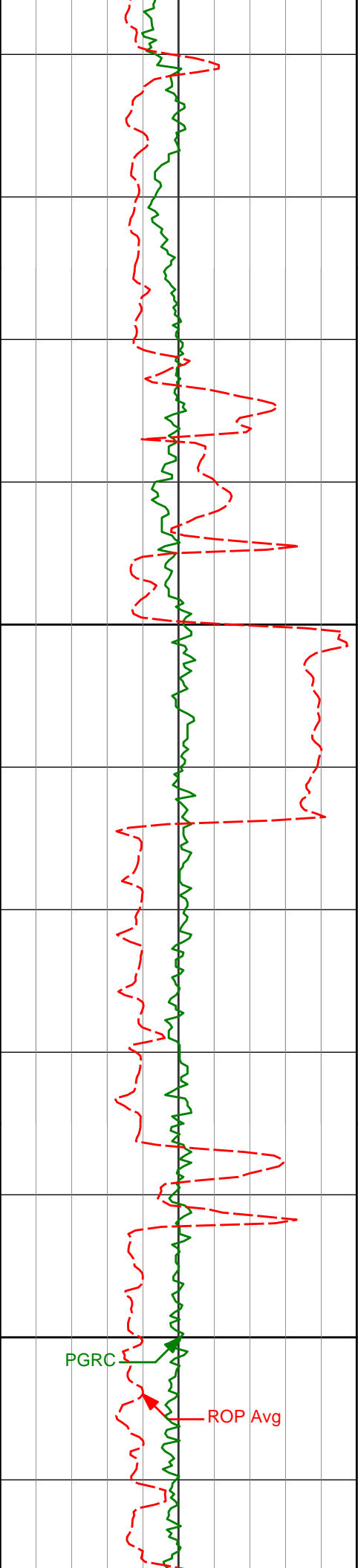
226.06°F

226.06°F

226.06°F

226.06°F

226.06°F



9900

10000

9820'

9915'

10009'

90.59°

90.22°

90.71°

356.50°

357.70°

357.70°

7007.18'

7006.51'

7005.75'

2843.34'

2937.86'

3031.29'

230.28°F

230.28°F

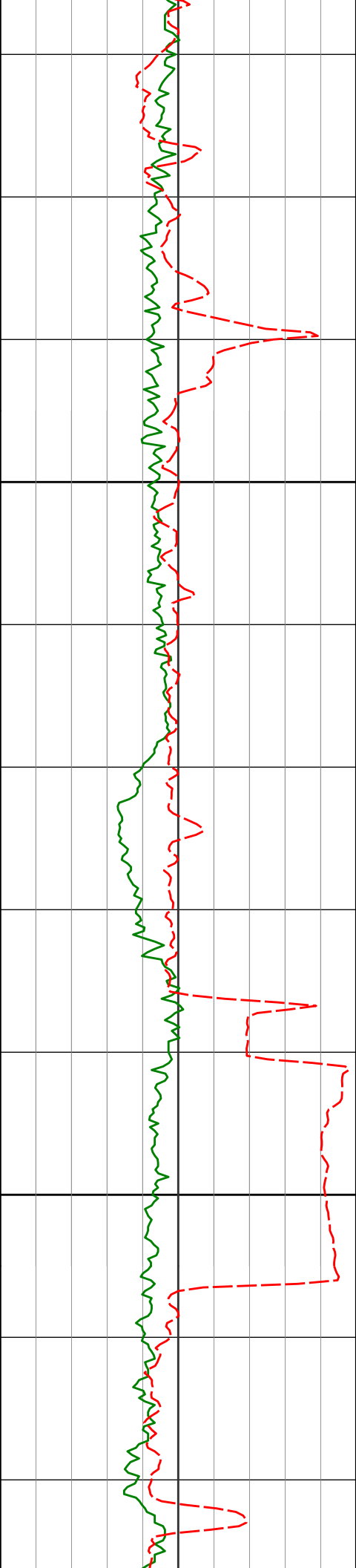
230.28°F

230.28°F

221.84°F

221.84°F

226.06°F



10100

10103'

91.08°

357.18° 7004.28'

3124.76'

226.06°F

226.06°F

230.28°F

230.28°F

230.28°F

10200

10197'

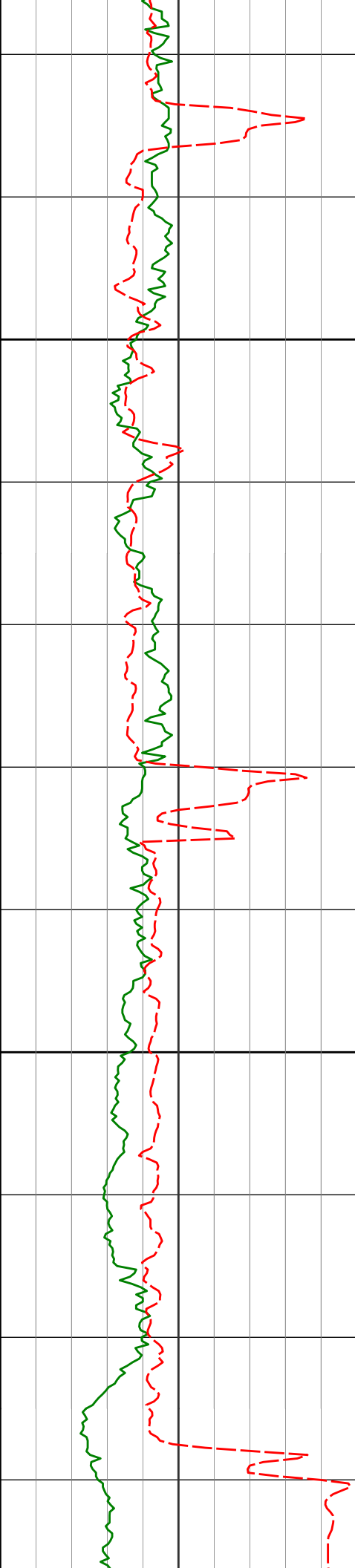
89.88°

358.19° 7003.49'

3218.19'

230.28°F

226.06°F



10300

10400

10292'

90.03°

358.37°

7003.57'

3312.50'

10386'

90.83°

358.54°

7002.86'

3405.79'

226.06°F

226.06°F

230.28°F

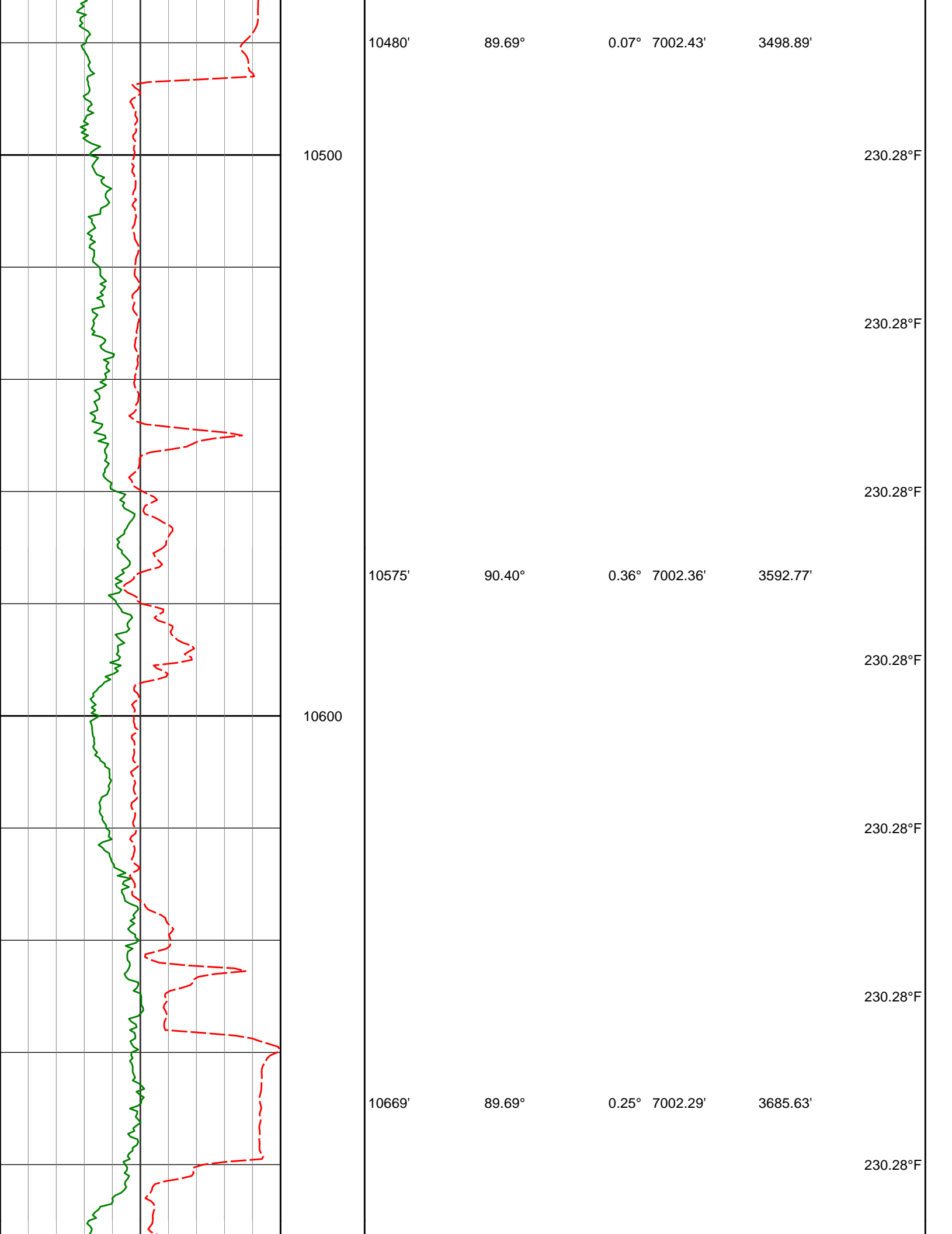
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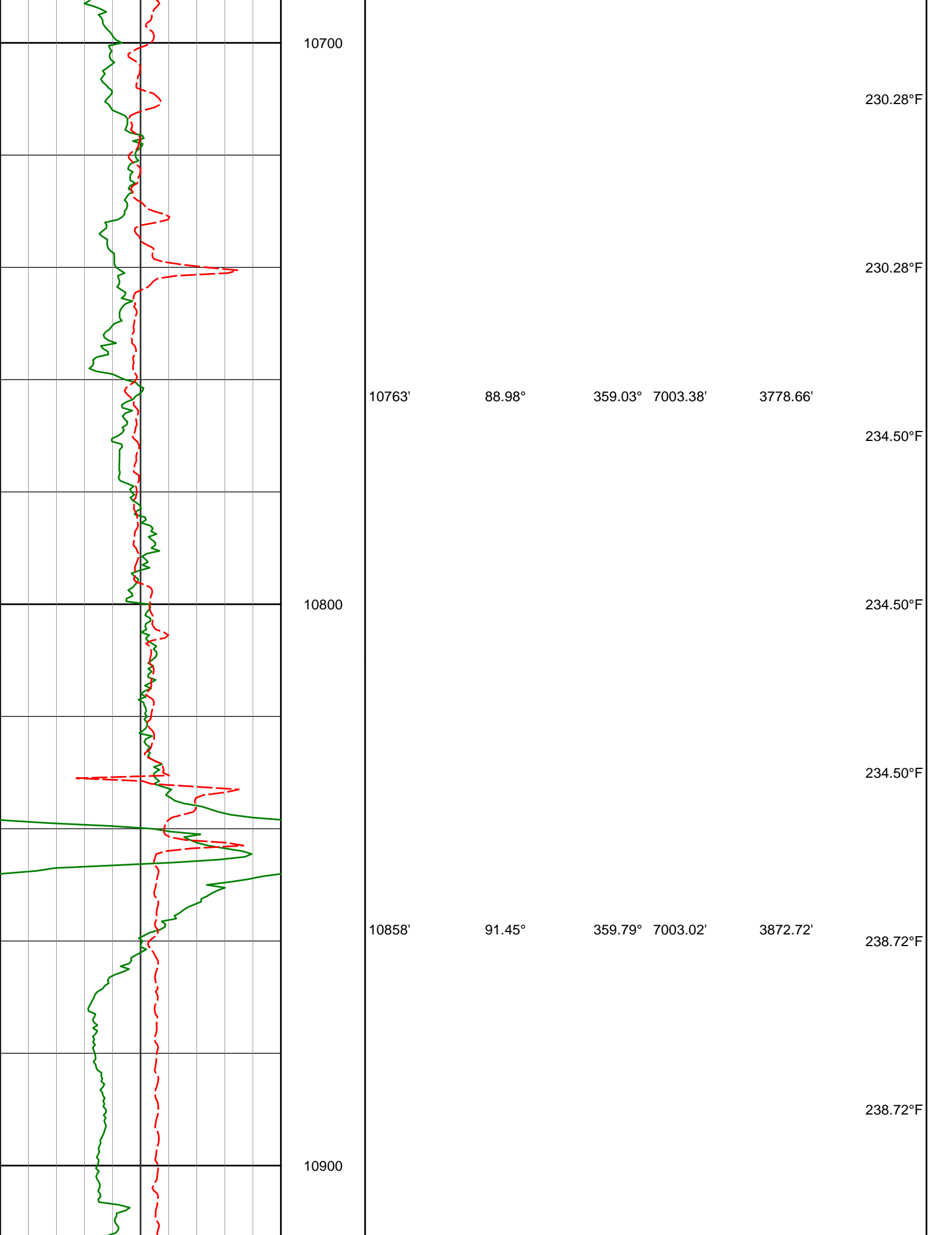
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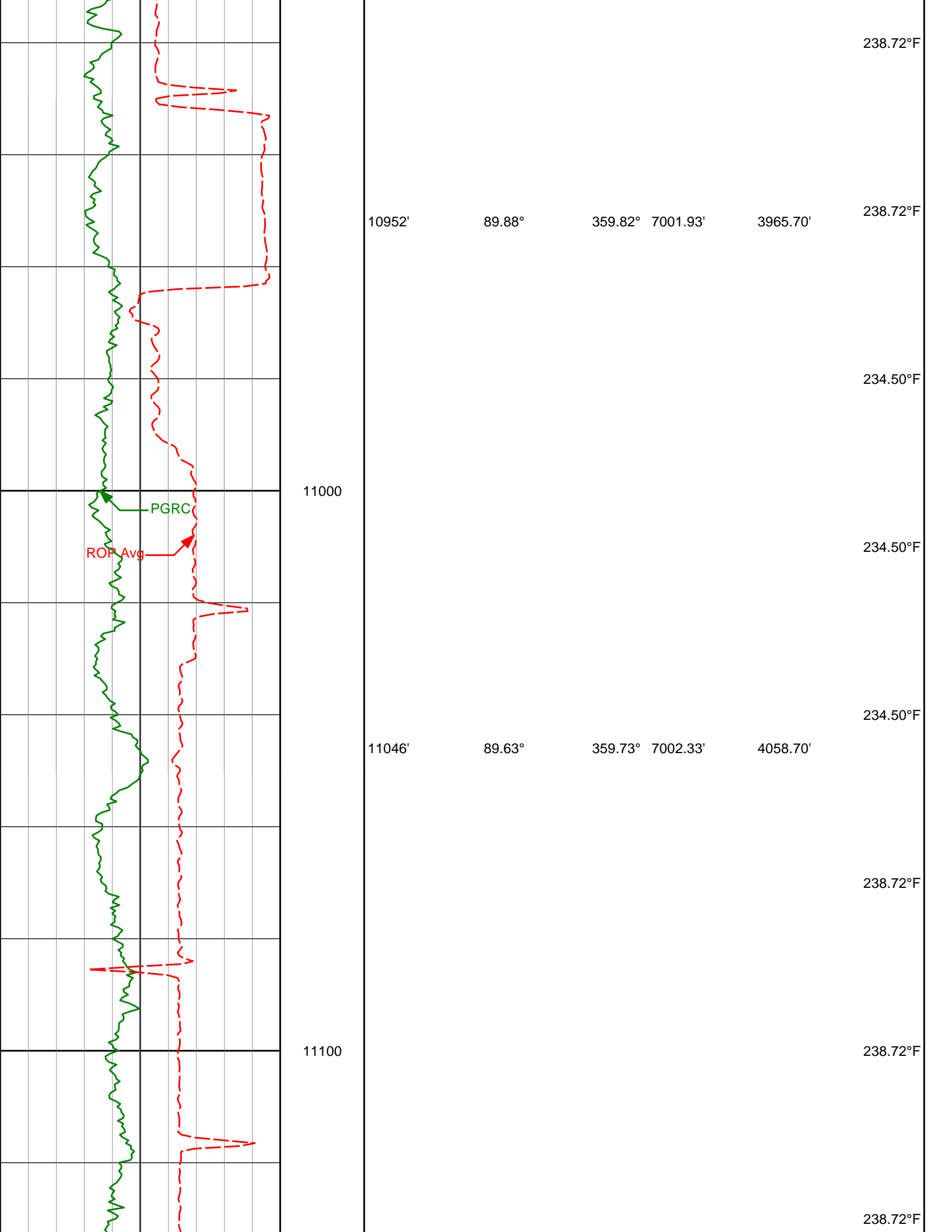
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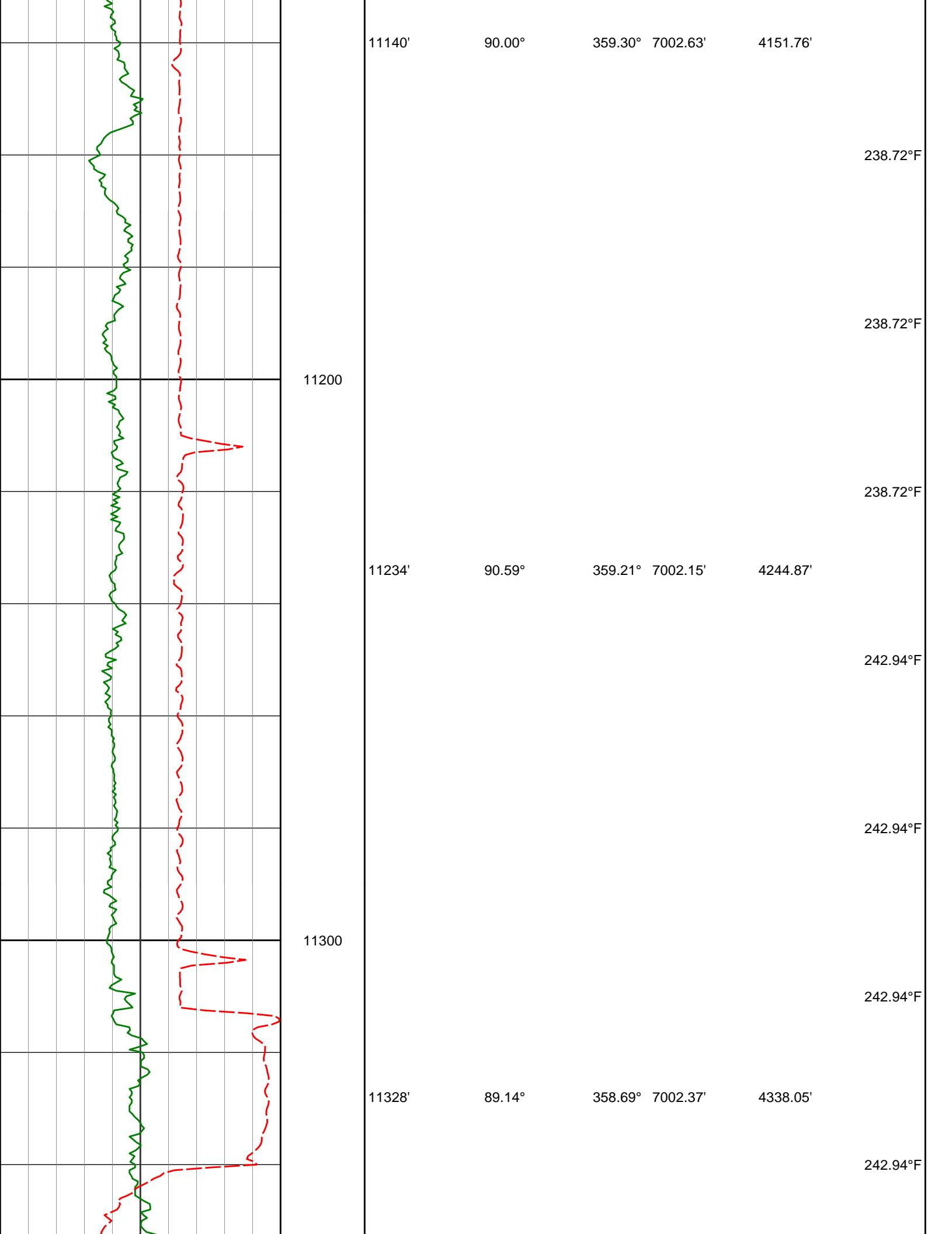
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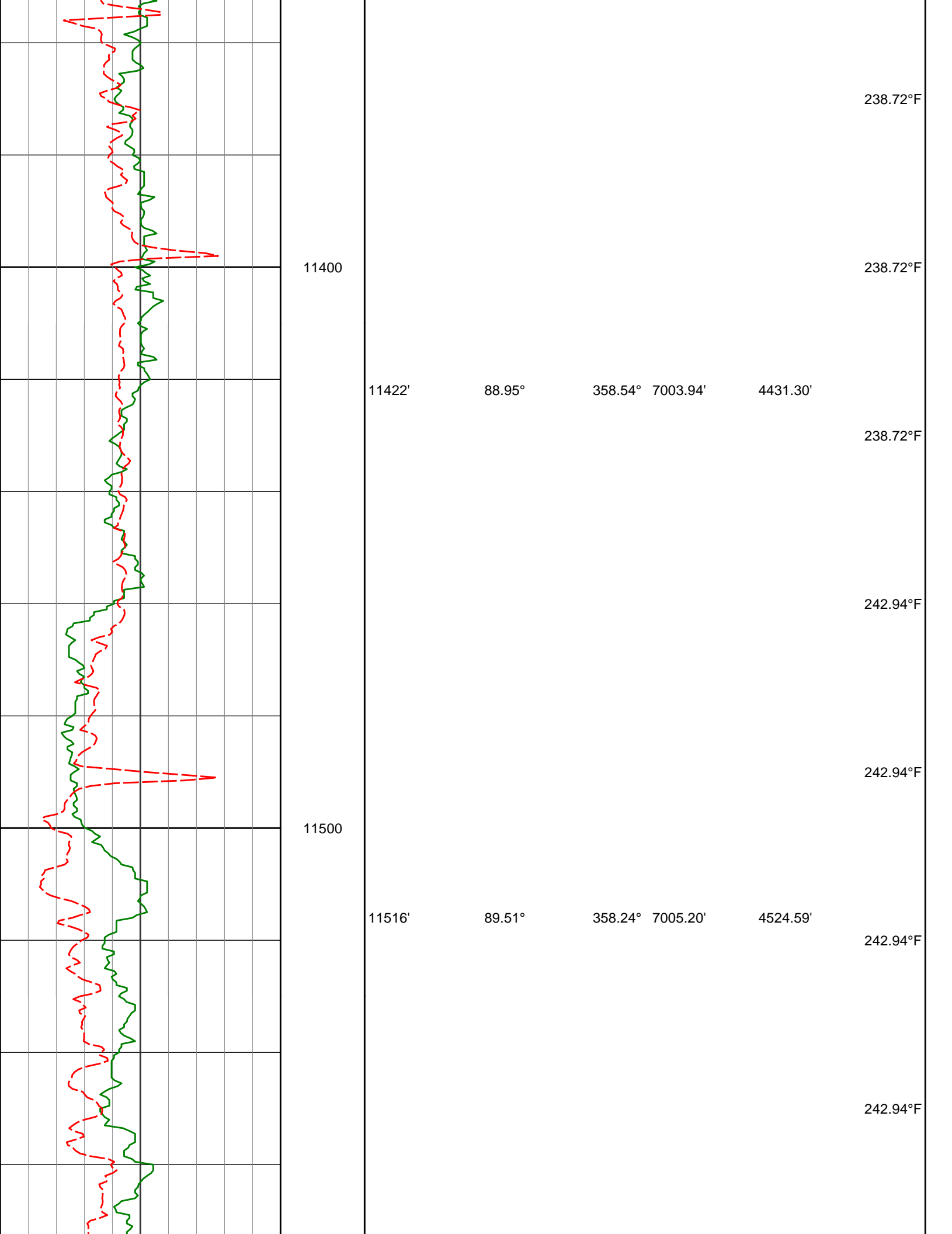
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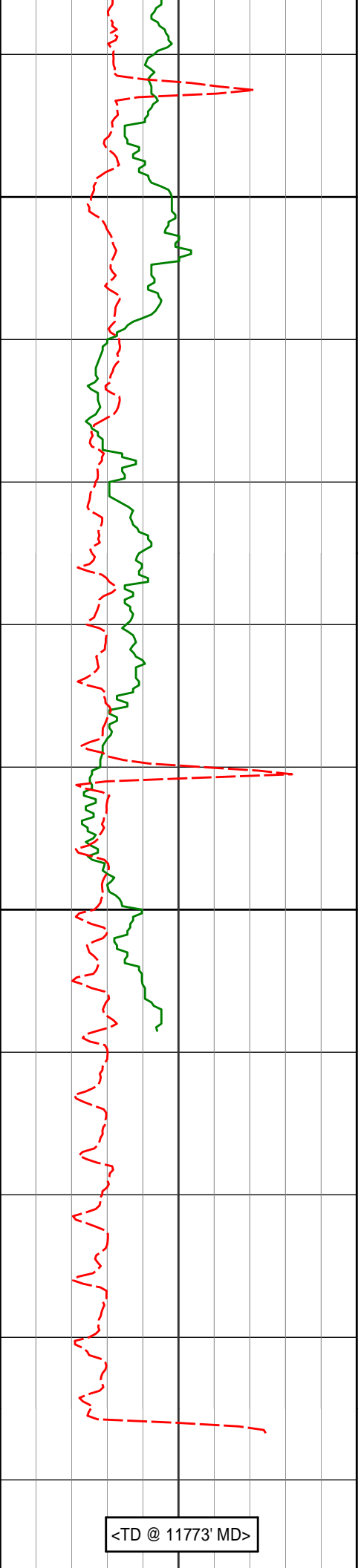












11600

11700

11611'

11705'

90.28°

91.11°

358.44°

358.68°

7005.38'

7004.24'

4618.89'

4712.15'

242.94°F

242.94°F

<TD @ 11773' MD>

[illegible]

DIRECTIONAL SURVEY REPORT

**Noble Energy
Moser State H22-785
Wattenberg
Weld Colorado
USA
CA-XX-0902771575**

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	0.20	265.53	300.00	0.04 S	0.52 W	0.04	0.07
600.00	0.39	265.53	600.00	0.16 S	2.06 W	0.15	0.06
854.00	0.56	265.53	853.99	0.33 S	4.16 W	0.30	0.07
916.00	0.60	265.53	915.98	0.37 S	4.79 W	0.35	0.06
1105.00	0.79	264.33	1104.97	0.58 S	7.06 W	0.48	0.10
1199.00	1.09	217.11	1198.96	1.35 S	8.24 W	-0.11	0.85
1294.00	0.96	244.60	1293.94	2.41 S	9.50 W	-0.96	0.53
1386.00	0.96	249.63	1385.93	3.01 S	10.93 W	-1.35	0.09
1477.00	0.75	245.08	1476.92	3.53 S	12.19 W	-1.67	0.24
1569.00	1.04	242.92	1568.91	4.17 S	13.48 W	-2.10	0.31
1660.00	0.82	246.68	1659.90	4.80 S	14.81 W	-2.53	0.25
1751.00	0.79	228.15	1750.89	5.47 S	15.87 W	-3.04	0.29
1843.00	0.69	262.74	1842.88	5.97 S	16.89 W	-3.37	0.49
1935.00	1.10	247.53	1934.87	6.37 S	18.26 W	-3.57	0.51
2026.00	1.32	258.67	2025.85	6.91 S	20.10 W	-3.83	0.36
2209.00	1.35	264.61	2208.80	7.53 S	24.32 W	-3.81	0.08
2300.00	0.50	286.04	2299.79	7.52 S	25.78 W	-3.58	0.99
2392.00	0.50	61.55	2391.79	7.22 S	25.82 W	-3.28	1.01
2484.00	0.61	243.60	2483.78	7.25 S	25.90 W	-3.29	1.20
2576.00	1.32	232.98	2575.77	8.10 S	27.19 W	-3.95	0.80
2667.00	1.32	227.41	2666.75	9.45 S	28.80 W	-5.03	0.14
2759.00	3.95	230.69	2758.64	12.17 S	32.03 W	-7.24	2.87
2850.00	5.68	232.44	2849.32	16.90 S	38.03 W	-11.03	1.90
2941.00	6.60	227.21	2939.79	23.20 S	45.44 W	-16.15	1.18
3033.00	6.09	226.28	3031.23	30.17 S	52.85 W	-21.93	0.56
3124.00	6.96	223.25	3121.64	37.52 S	60.12 W	-28.11	1.03
3218.00	6.22	221.41	3215.02	45.50 S	67.39 W	-34.91	0.82
3312.00	6.95	221.11	3308.40	53.60 S	74.51 W	-41.86	0.78
3407.00	5.02	218.03	3402.87	61.21 S	80.85 W	-48.43	2.06
3501.00	7.00	238.66	3496.36	67.43 S	88.28 W	-53.47	3.08
3595.00	5.13	248.73	3589.83	71.93 S	97.08 W	-56.61	2.28
3690.00	6.59	246.70	3684.34	75.63 S	106.05 W	-58.92	1.56
3784.00	9.39	233.17	3777.42	82.37 S	117.15 W	-63.92	3.57
3878.00	7.73	229.04	3870.37	91.10 S	128.06 W	-70.93	1.89
3973.00	7.60	229.20	3964.52	99.39 S	137.64 W	-77.69	0.14
4068.00	7.56	229.82	4058.69	107.53 S	147.16 W	-84.31	0.10
4162.00	6.45	228.26	4151.99	115.03 S	155.83 W	-90.44	1.19
4256.00	7.80	223.86	4245.26	123.15 S	164.19 W	-97.21	1.54
4351.00	7.56	222.26	4339.41	132.42 S	172.86 W	-105.08	0.33
4446.00	6.70	217.33	4433.68	141.45 S	180.42 W	-112.88	1.11
4541.00	6.46	216.72	4528.05	150.14 S	186.98 W	-120.49	0.26
4635.00	7.70	225.41	4621.34	158.80 S	194.62 W	-127.91	1.74
4730.00	7.55	224.20	4715.50	167.75 S	203.51 W	-135.43	0.23
4824.00	7.08	225.24	4808.73	176.26 S	211.93 W	-142.59	0.52
4919.00	6.59	231.44	4903.05	183.78 S	220.35 W	-148.76	0.93
5014.00	7.90	234.07	4997.29	191.01 S	229.90 W	-154.49	1.43

5108.00	7.25	240.37	5090.47	197.74 S	240.29 W	-159.58	1.12
5203.00	6.39	241.08	5184.80	203.25 S	250.13 W	-163.57	0.91
5297.00	5.41	247.98	5278.31	207.44 S	258.81 W	-166.41	1.29
5391.00	5.45	243.59	5371.88	211.09 S	266.91 W	-168.80	0.45
5486.00	6.38	232.49	5466.38	216.31 S	275.14 W	-172.74	1.54
5581.00	5.36	230.43	5560.88	222.35 S	282.75 W	-177.57	1.09
5675.00	6.82	222.84	5654.35	229.24 S	289.93 W	-183.31	1.76
5770.00	4.97	208.73	5748.85	236.98 S	295.74 W	-190.09	2.46
5865.00	6.18	211.29	5843.40	244.96 S	300.37 W	-197.29	1.30
5959.00	7.47	211.28	5936.73	254.50 S	306.17 W	-205.85	1.37
6054.00	6.52	207.10	6031.02	264.57 S	311.83 W	-214.97	1.13
6148.00	7.07	230.19	6124.38	273.03 S	318.71 W	-222.30	2.94
6243.00	17.26	267.81	6217.24	277.33 S	337.35 W	-223.76	13.06
6338.00	21.88	281.38	6306.78	274.37 S	368.82 W	-216.13	6.79
6433.00	21.75	284.08	6394.98	266.60 S	403.24 W	-203.30	1.06
6527.00	24.48	301.57	6481.53	252.14 S	436.77 W	-184.00	7.83
6622.00	30.34	322.66	6566.03	222.67 S	468.19 W	-150.15	11.85
6716.00	33.19	330.77	6645.98	181.31 S	495.18 W	-105.23	5.45
6811.00	36.36	335.14	6724.01	133.05 S	519.72 W	-53.84	4.24
6906.00	47.10	341.32	6794.84	74.34 S	542.78 W	7.66	12.10
7000.00	49.95	345.43	6857.10	6.88 S	562.87 W	77.37	4.46
7095.00	58.90	348.59	6912.32	68.35 N	580.10 W	154.33	9.80
7189.00	67.65	353.59	6954.57	151.20 N	592.94 W	238.17	10.45
7284.00	75.68	358.73	6984.46	241.07 N	598.87 W	327.91	9.88
7379.00	83.43	359.81	7001.67	334.42 N	600.05 W	420.38	8.23
7455.00	88.00	359.73	7007.35	410.18 N	600.35 W	495.34	6.02
7550.00	89.51	359.68	7009.42	505.16 N	600.84 W	589.32	1.59
7645.00	89.75	359.15	7010.03	600.15 N	601.81 W	683.39	0.61
7739.00	90.22	359.15	7010.05	694.14 N	603.21 W	776.53	0.50
7834.00	91.26	359.86	7008.83	789.12 N	604.03 W	870.58	1.33
7929.00	90.86	358.14	7007.07	884.09 N	605.68 W	964.72	1.86
8023.00	89.85	358.18	7006.49	978.04 N	608.70 W	1058.06	1.08
8118.00	90.68	359.17	7006.05	1073.01 N	610.90 W	1152.30	1.36
8212.00	91.57	359.20	7004.20	1166.98 N	612.24 W	1245.41	0.95
8307.00	90.06	358.58	7002.85	1261.95 N	614.08 W	1339.59	1.72
8401.00	89.41	358.17	7003.29	1355.91 N	616.74 W	1432.89	0.82
8496.00	90.12	358.43	7003.68	1450.87 N	619.56 W	1527.20	0.80
8591.00	90.46	358.68	7003.20	1545.84 N	621.96 W	1621.46	0.44
8686.00	91.08	358.85	7001.92	1640.81 N	624.00 W	1715.67	0.68
8780.00	90.00	357.66	7001.03	1734.75 N	626.87 W	1808.99	1.71
8875.00	90.43	357.03	7000.68	1829.65 N	631.27 W	1903.48	0.80
8970.00	88.61	357.34	7001.47	1924.53 N	635.93 W	1997.98	1.94
9065.00	88.40	357.22	7003.95	2019.39 N	640.44 W	2092.45	0.25
9159.00	88.74	357.62	7006.30	2113.26 N	644.67 W	2185.91	0.56
9254.00	89.54	357.77	7007.72	2208.18 N	648.49 W	2280.32	0.86
9349.00	89.78	358.07	7008.29	2303.11 N	651.94 W	2374.70	0.40
9443.00	89.81	357.69	7008.62	2397.05 N	655.41 W	2468.10	0.41
9538.00	89.91	357.03	7008.85	2491.95 N	659.79 W	2562.59	0.70
9632.00	90.15	356.93	7008.81	2585.81 N	664.74 W	2656.14	0.28
9726.00	90.62	356.64	7008.17	2679.66 N	670.01 W	2749.73	0.59
9820.00	90.59	356.50	7007.18	2773.49 N	675.64 W	2843.34	0.15
9915.00	90.22	357.70	7006.51	2868.36 N	680.44 W	2937.86	1.32
10009.00	90.71	357.70	7005.75	2962.29 N	684.22 W	3031.29	0.52
10103.00	91.08	357.18	7004.28	3056.18 N	688.41 W	3124.76	0.68
10197.00	89.88	358.19	7003.49	3150.10 N	692.21 W	3218.19	1.67
10292.00	90.03	358.37	7003.57	3245.05 N	695.06 W	3312.50	0.25
10386.00	90.83	358.54	7002.86	3339.02 N	697.60 W	3405.79	0.87
10480.00	89.69	0.07	7002.43	3433.00 N	698.74 W	3498.89	2.03
10575.00	90.40	0.36	7002.36	3528.00 N	698.38 W	3592.77	0.81
10669.00	89.69	0.25	7002.29	3622.00 N	697.88 W	3685.63	0.76
10763.00	88.98	359.03	7003.38	3715.99 N	698.47 W	3778.66	1.50
10858.00	91.45	359.79	7003.02	3810.98 N	699.45 W	3872.72	2.72
10952.00	89.88	359.82	7001.93	3904.97 N	699.77 W	3965.70	1.67
11046.00	89.63	359.73	7002.33	3998.96 N	700.14 W	4058.70	0.28
11140.00	90.00	359.30	7002.63	4092.96 N	700.93 W	4151.76	0.60
11234.00	90.59	359.21	7002.15	4186.95 N	702.16 W	4244.87	0.63
11328.00	89.14	358.69	7002.37	4280.93 N	703.88 W	4338.05	1.64
11422.00	88.95	358.54	7003.94	4374.89 N	706.15 W	4431.30	0.26
11516.00	89.51	358.24	7005.20	4468.85 N	708.79 W	4524.59	0.68
11611.00	90.28	358.44	7005.38	4563.80 N	711.54 W	4618.89	0.84
11705.00	91.11	358.68	7004.24	4657.77 N	713.91 W	4712.15	0.92

11773.00

91.11

358.68

7002.92

4725.74 N

715.47 W

4779.59

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 351.40 DEGREES (GRID)
A TOTAL CORRECTION OF 7.80 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11773.00 FEET
IS 4779.59 FEET ALONG 351.39 DEGREES (GRID)**

Surveys at 300 ft and 600 ft are interpolated between surface and first survey at 854 ft.

Last survey is a projection from 11705 ft MD to TD at 11773 ft MD.

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