



1:600 / 1:240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	30-Apr-15	02-May-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)	692.00	6,281.00			
Log End Depth (MD, ft)	6,281.00	10,160.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	29-Apr-15 02:55	30-Apr-15 23:15			
Drill/Wipe End Date and Time	29-Apr-15 20:10	02-May-15 08:05			
Min Inc (deg) @ Depth (MD, ft)	0.06 @ 1,571.00	85.12 @ 6,329.00			
Max Inc (deg) @ Depth (MD, ft)	83.77 @ 6,227.00	92.62 @ 7,746.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.65 / PDC			
Flow Rate (gpm)	575.65	298.94			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	10.20 / 47.00	10.30 / 44.00			
Filtrate CL (ppm)	1,200.00	1,200.00			
pH / Fluid Loss (mptm)	9.00 / 10	9.00 / 0			
PV (cP) / YP (lhf2)	12 / 10.00	13 / 10.00			
% Solids / % Sand	5.10 / 0.50	5.2 / .2			
% 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) / Source	171.20 / PCM	213.40 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Dave Neilson	Dave Neilson			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	246473	12301676			
Insert Serial Number	11400838	11400838			
Date and Time Initialized	28-Apr-15 07:18	30-Apr-15 03:10			
Date and Time Read	30-Apr-15 00:42	02-May-15 15:30			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.00	68.00			
Software Version	6.33	6.33			
Sub Serial Number	246473	12301676			
Sonde Serial Number	11638623	11638623			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	304.50	251.70			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	41.66	61.31			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	246473	12301676			
Insert/Sonde Serial Number	12071280	12071280			

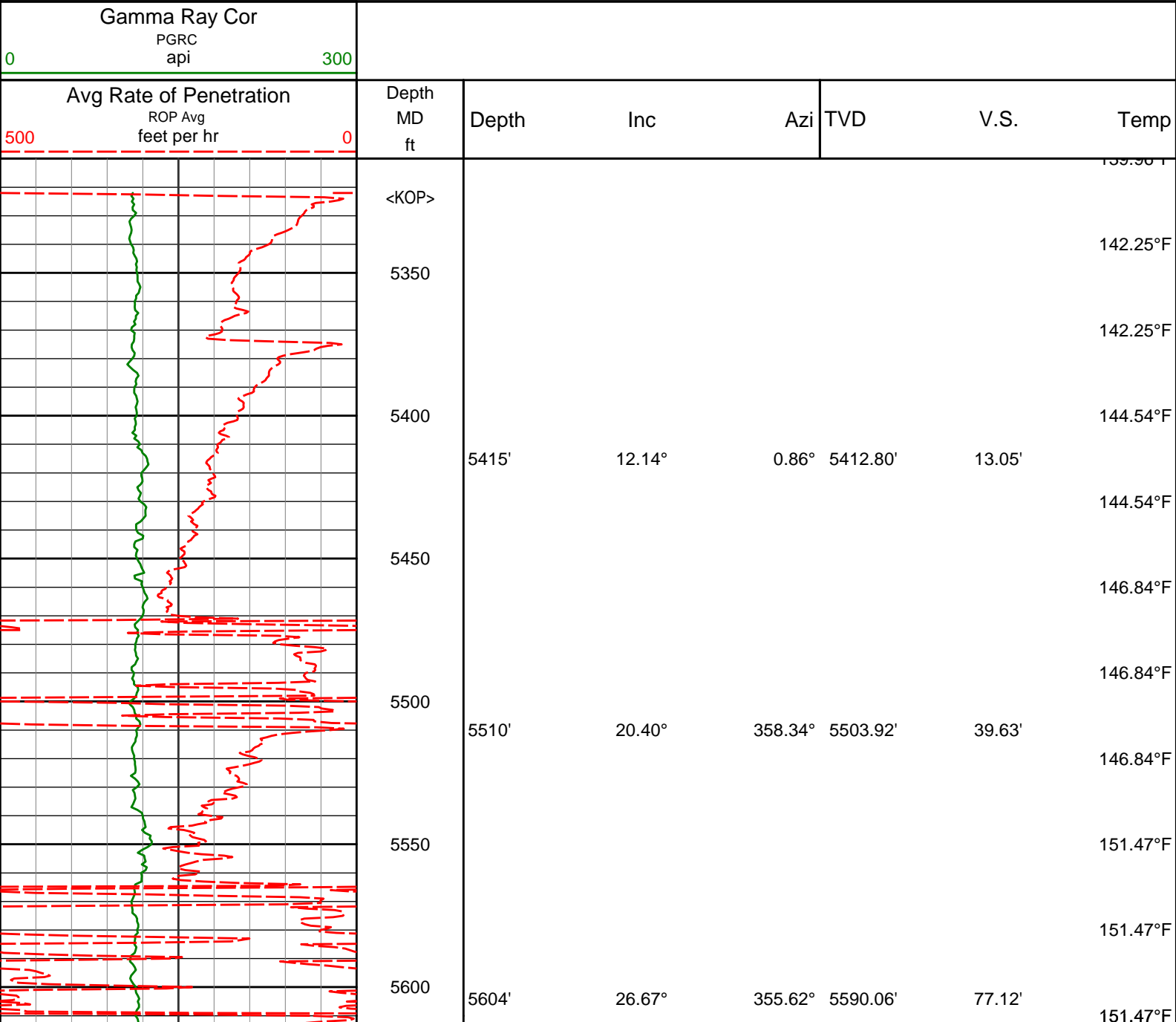
REMARKS

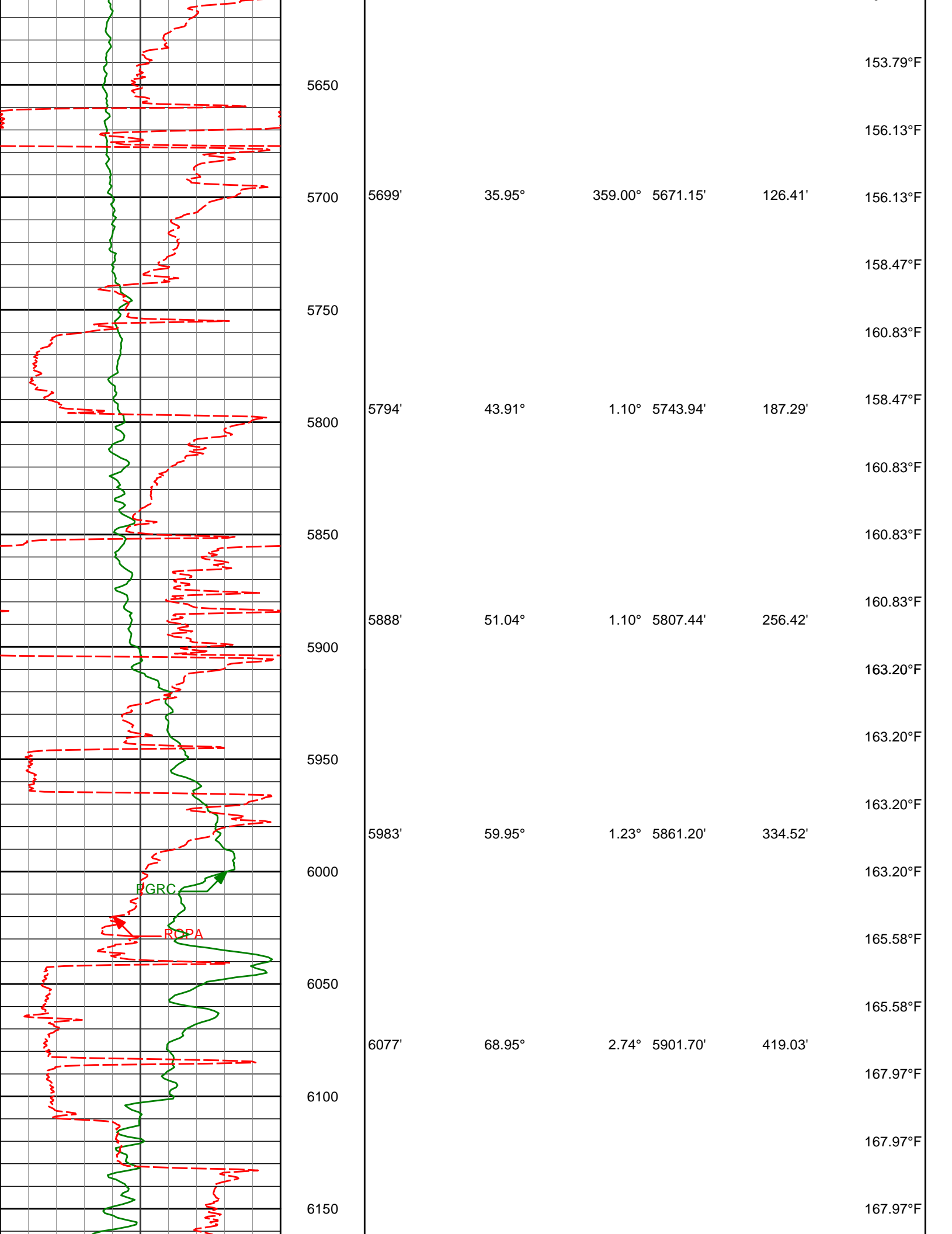
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 8.1.10
6. Gamma presented inside casing/cement from 6239 ft. MD to 6281 ft. MD.

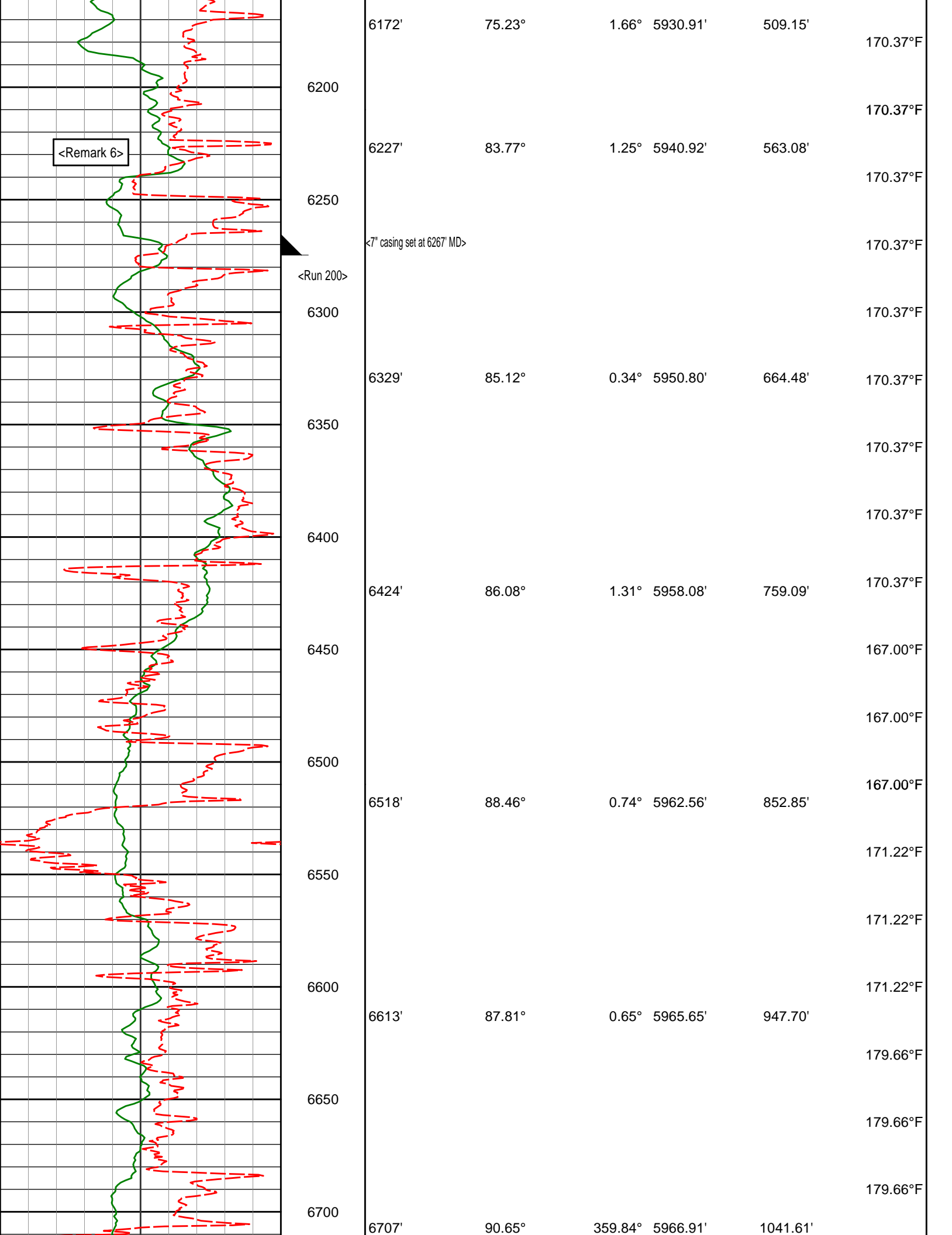
WARRANTY

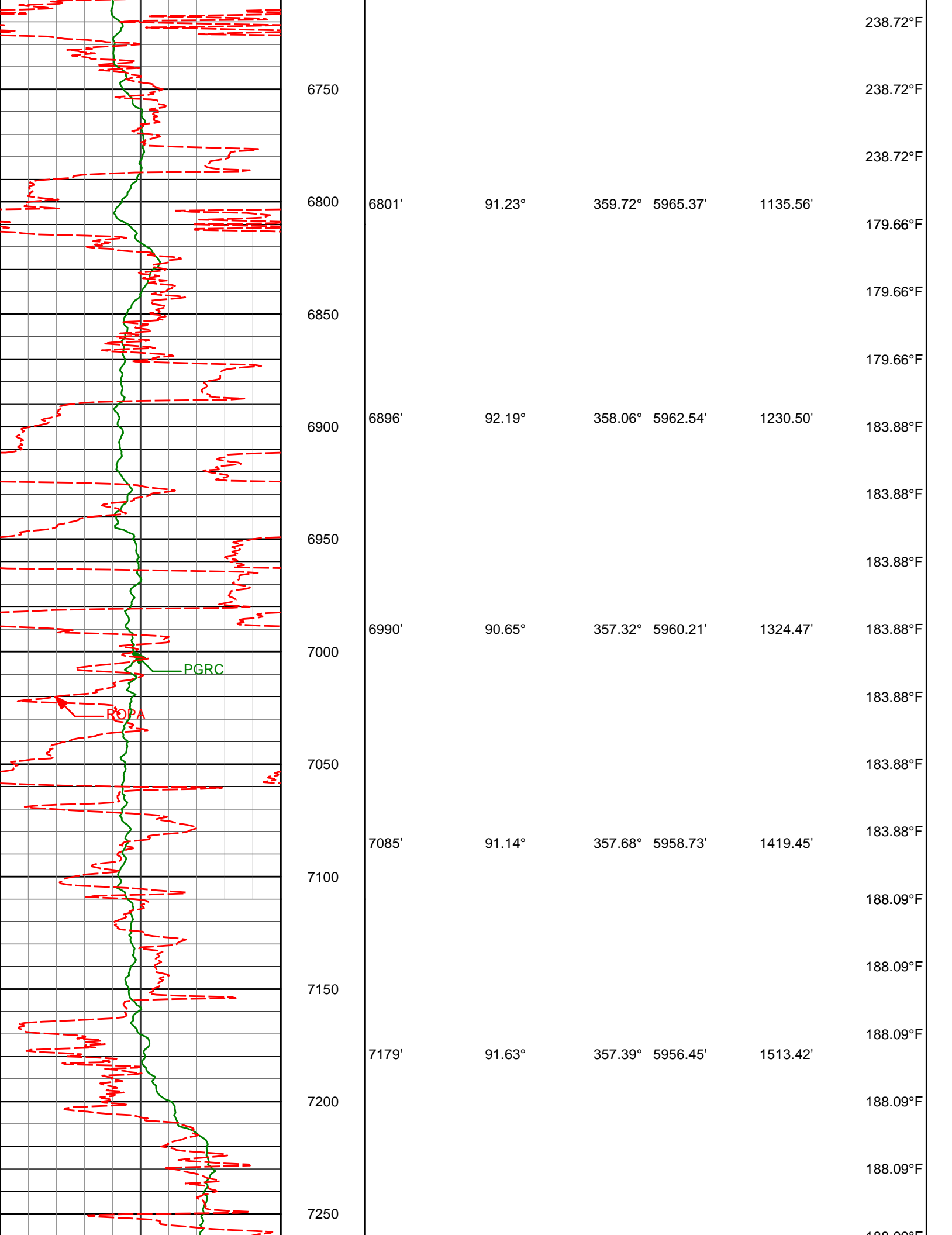
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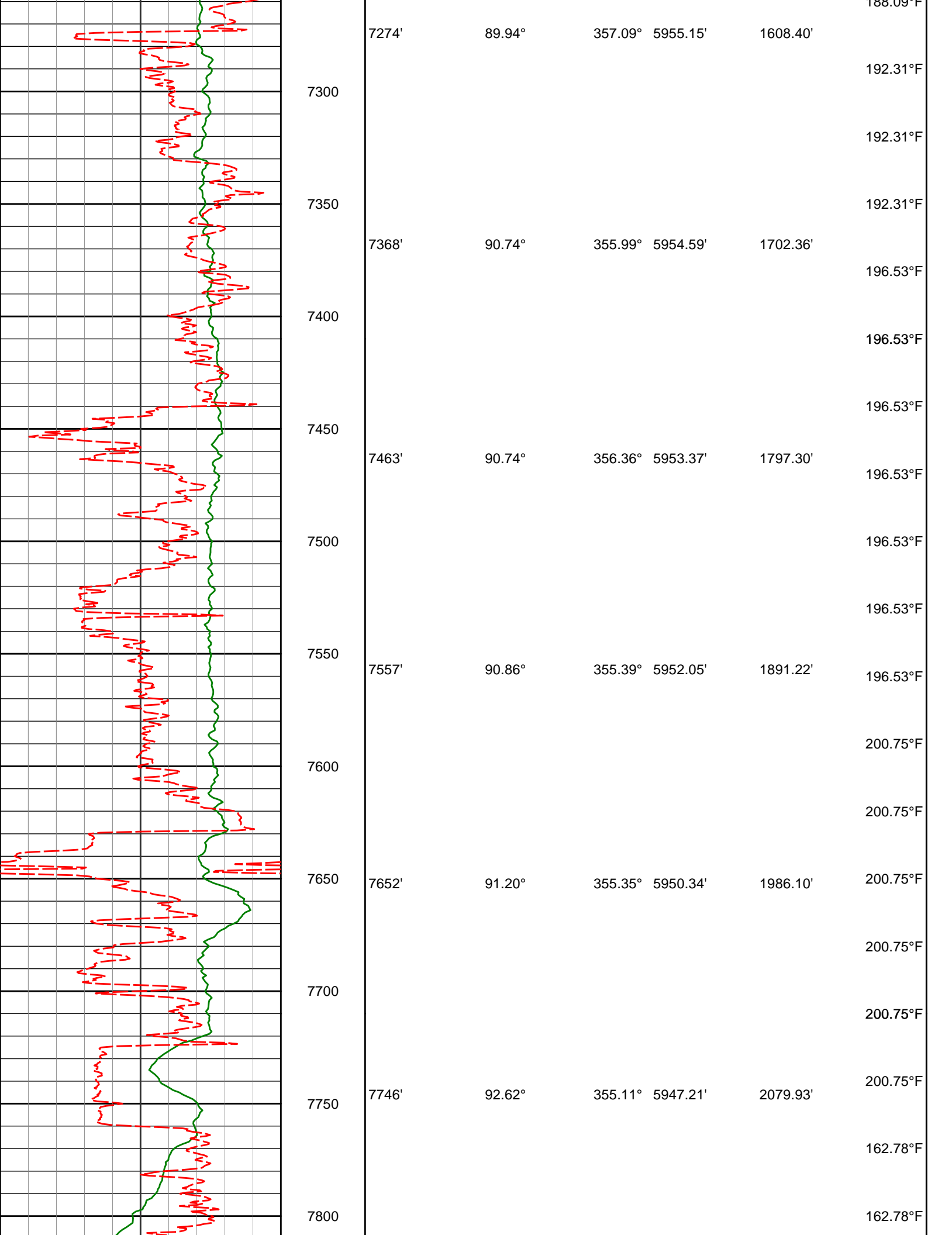
MD Detail 1:600 Scale

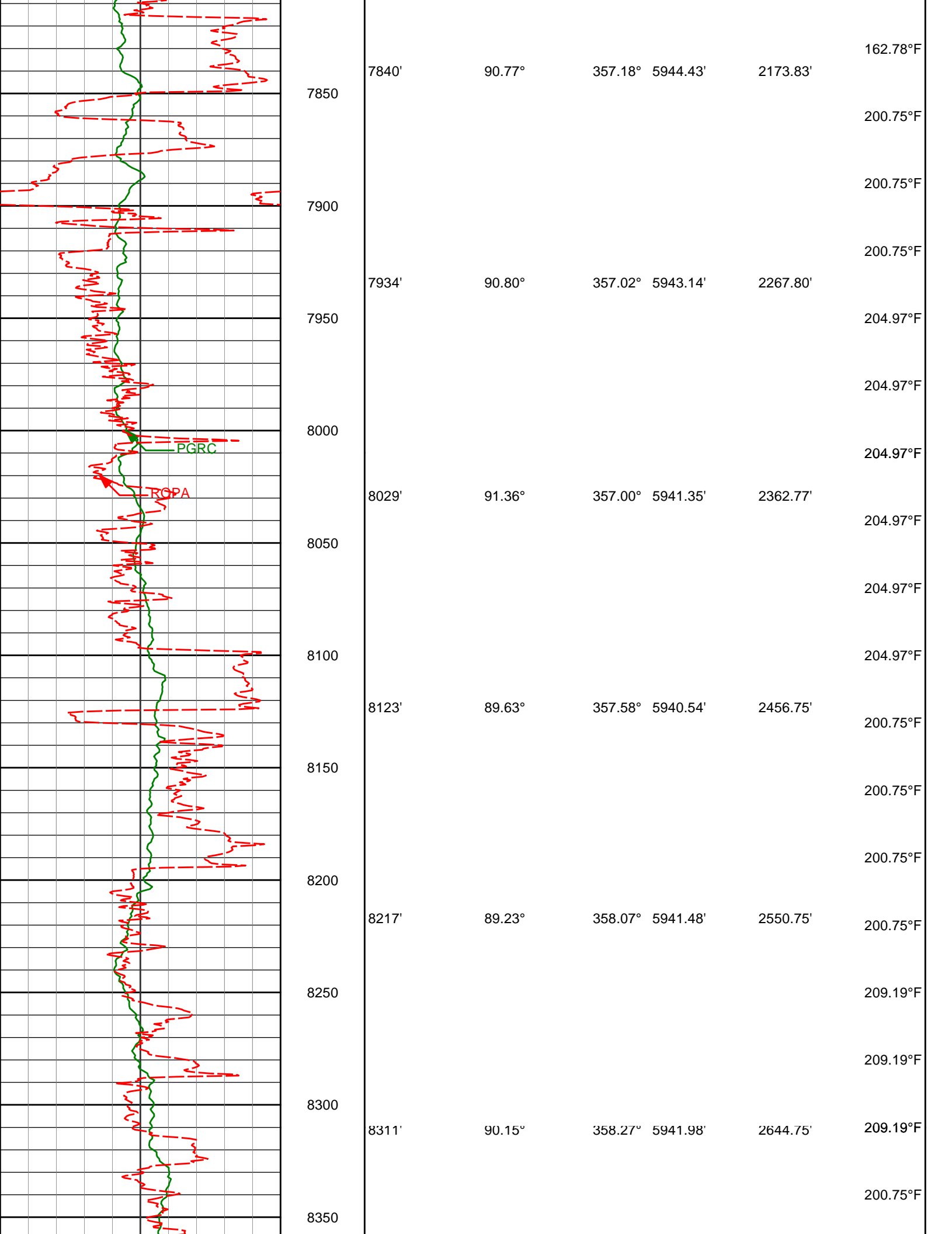


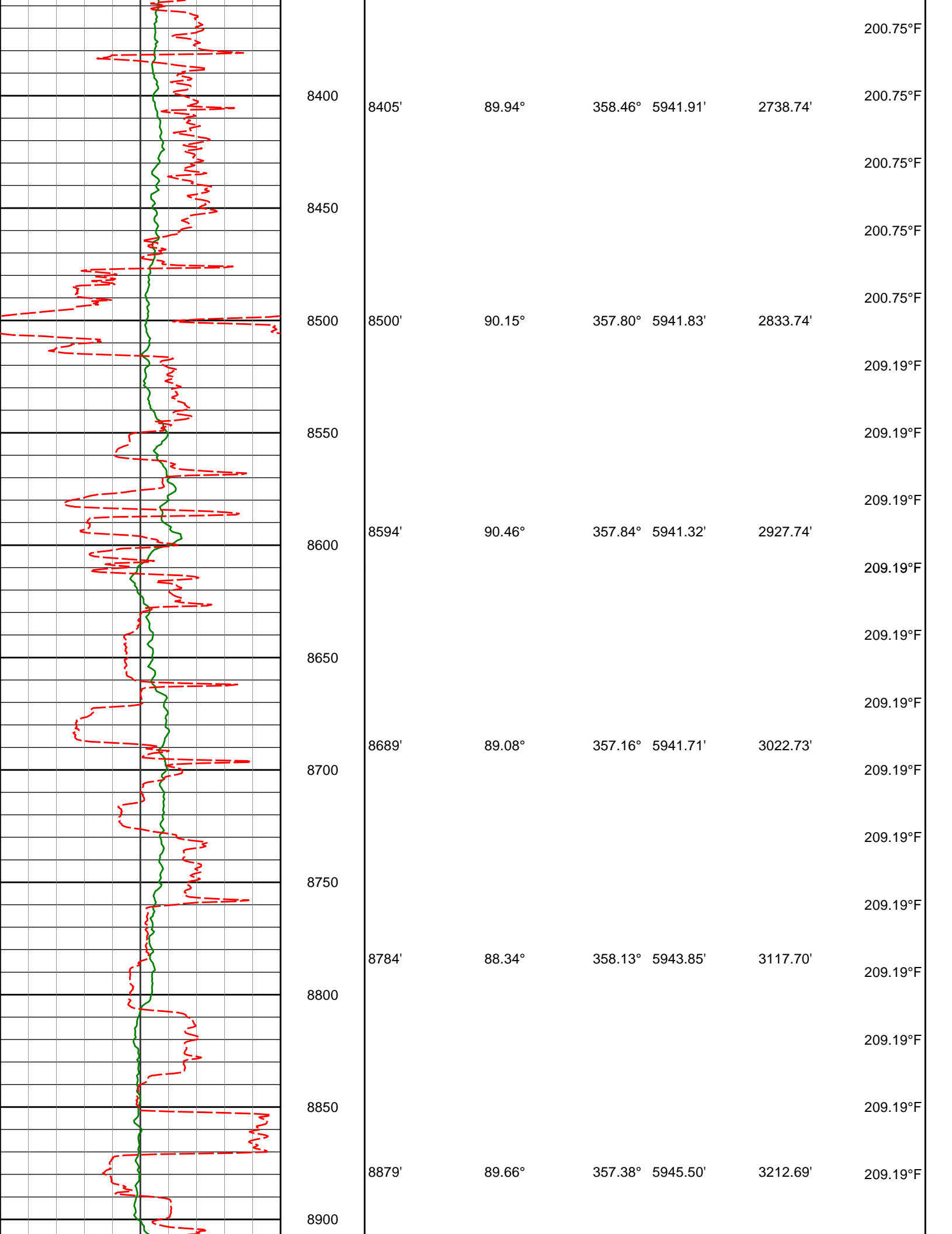


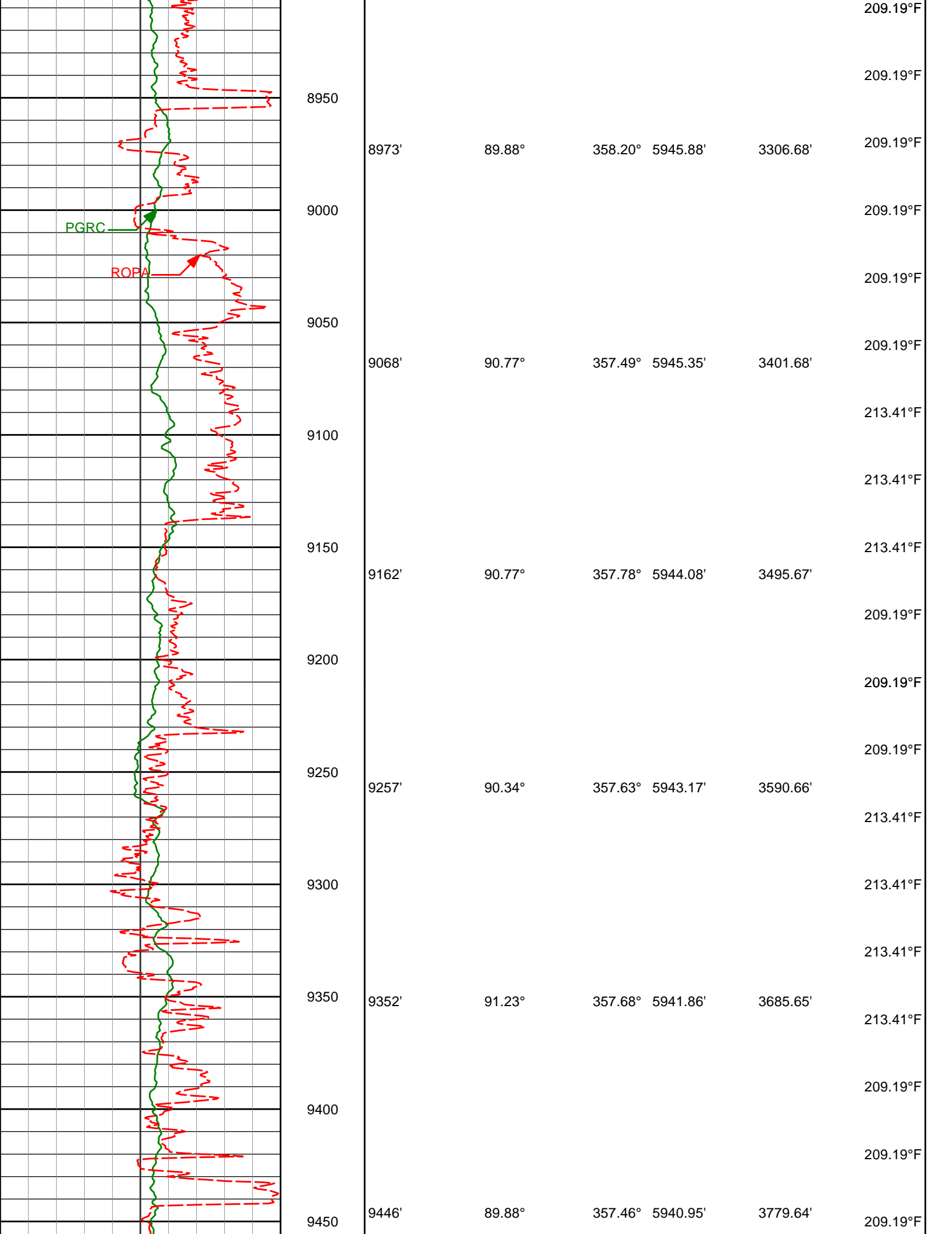


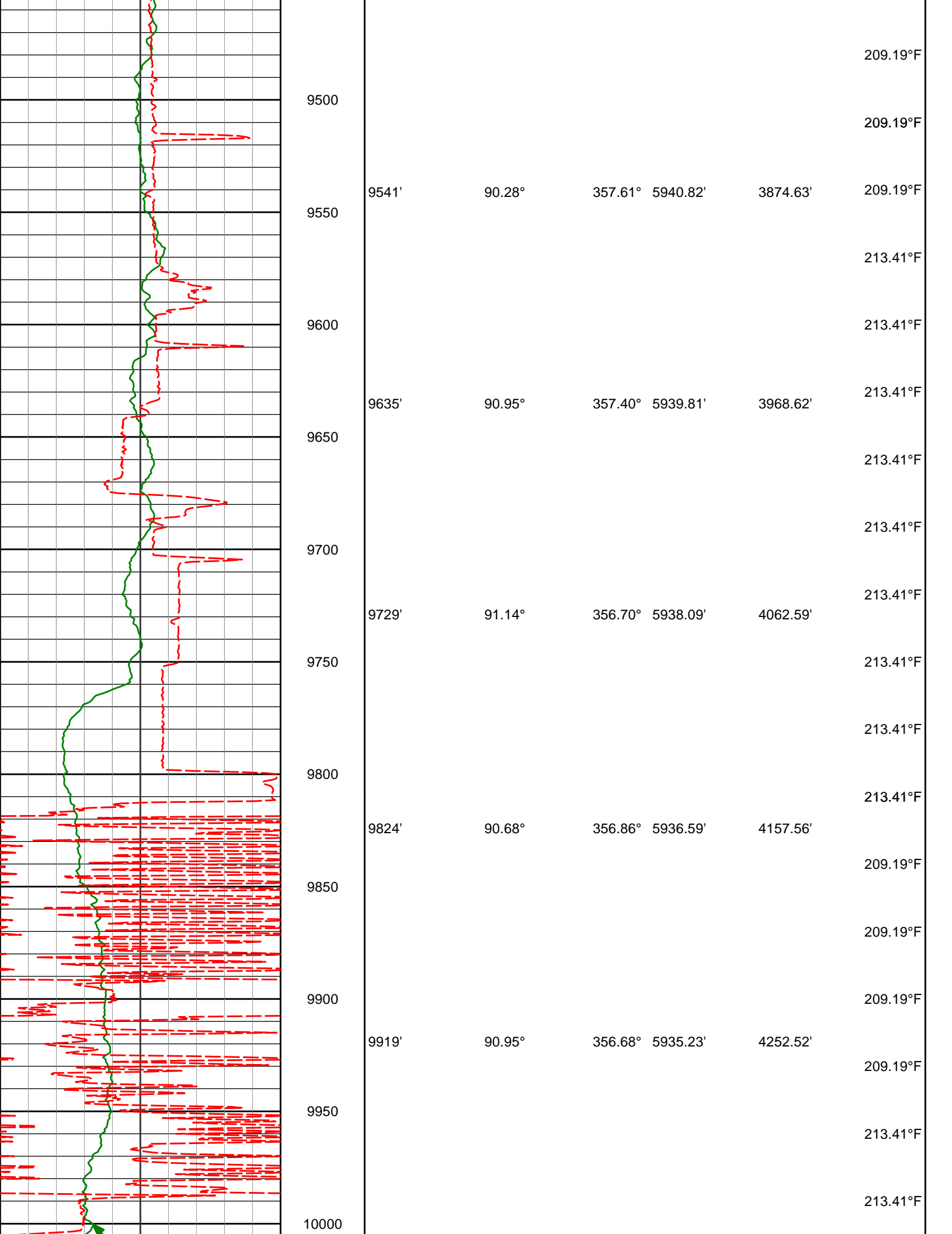


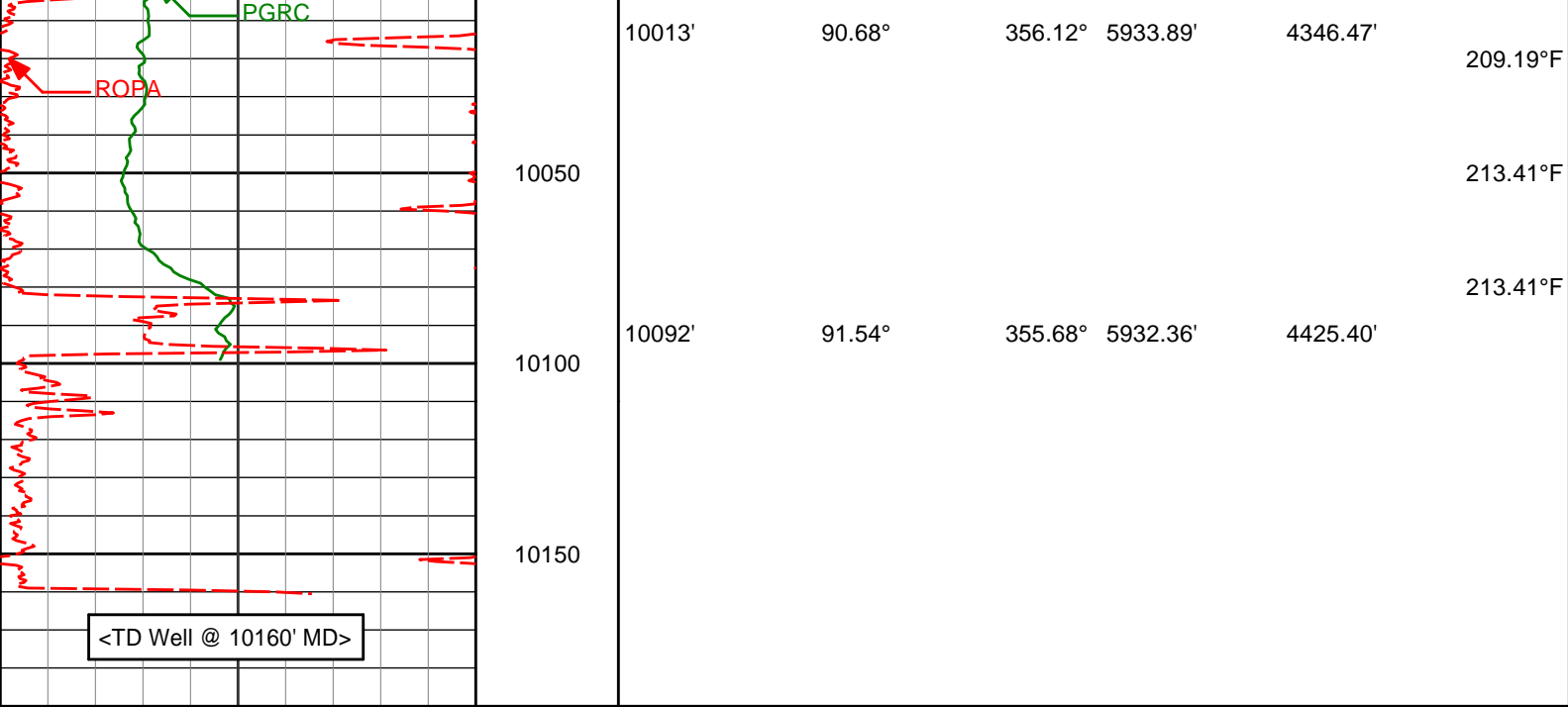






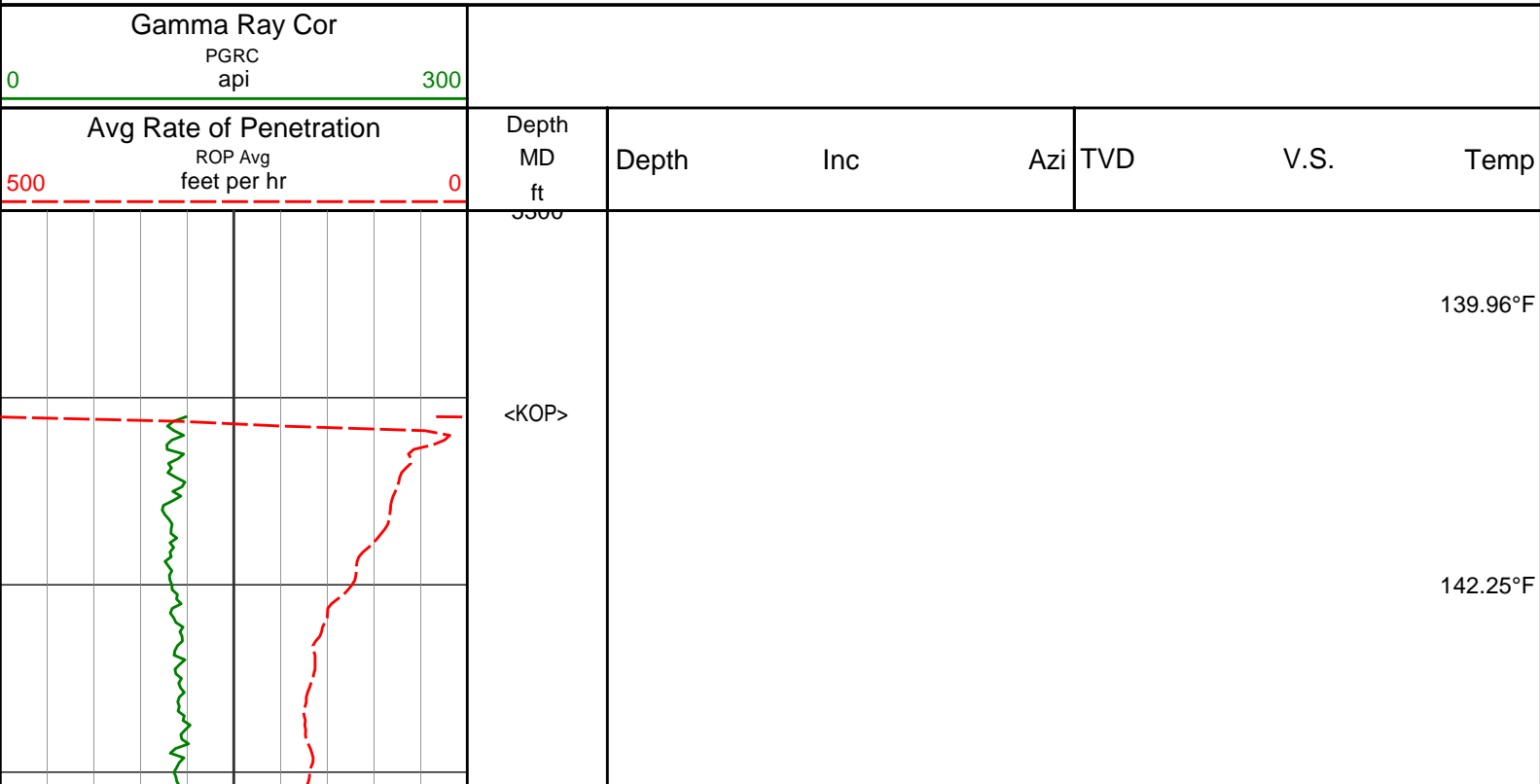


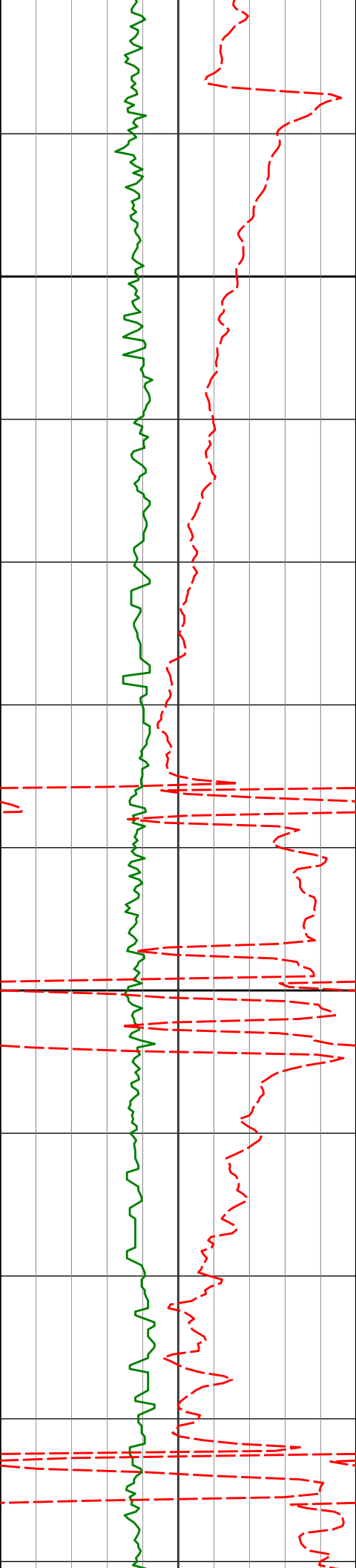




<div>Avg Rate of Penetration ROP Avg feet per hr</div> <div>5000</div>	Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
<div>Gamma Ray Cor PGRC api</div> <div>0300</div>							

MD Detail 1:240 Scale





5400

5500

5415'

5510'

12.14°

20.40°

0.86°

358.34°

5412.80'

5503.92'

13.05'

39.63'

142.25°F

144.54°F

144.54°F

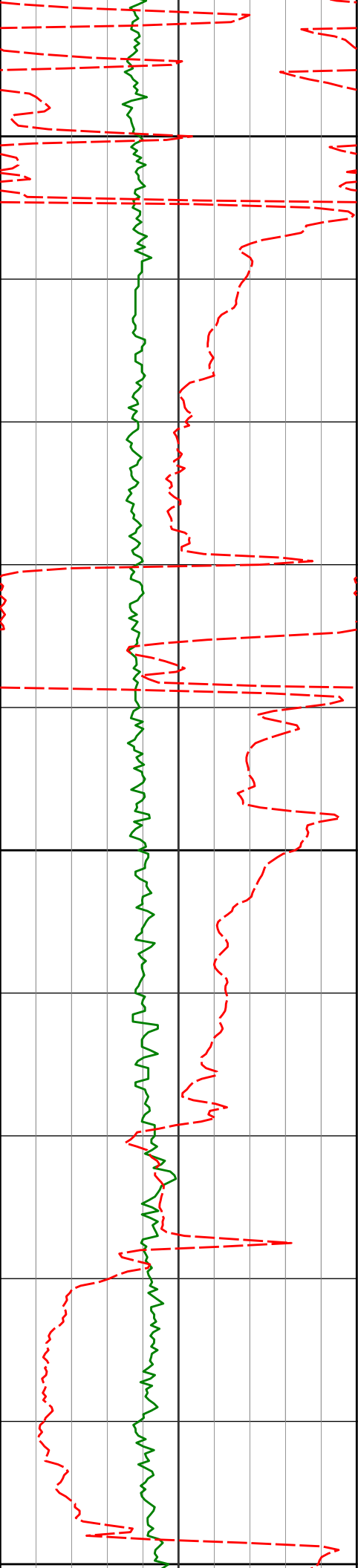
146.84°F

146.84°F

146.84°F

151.47°F

151.47°F



5600

5604'

26.67°

355.62° 5590.06'

77.12'

151.47°F

153.79°F

156.13°F

5700

5699'

35.95°

359.00° 5671.15'

126.41'

156.13°F

158.47°F

160.83°F

5800

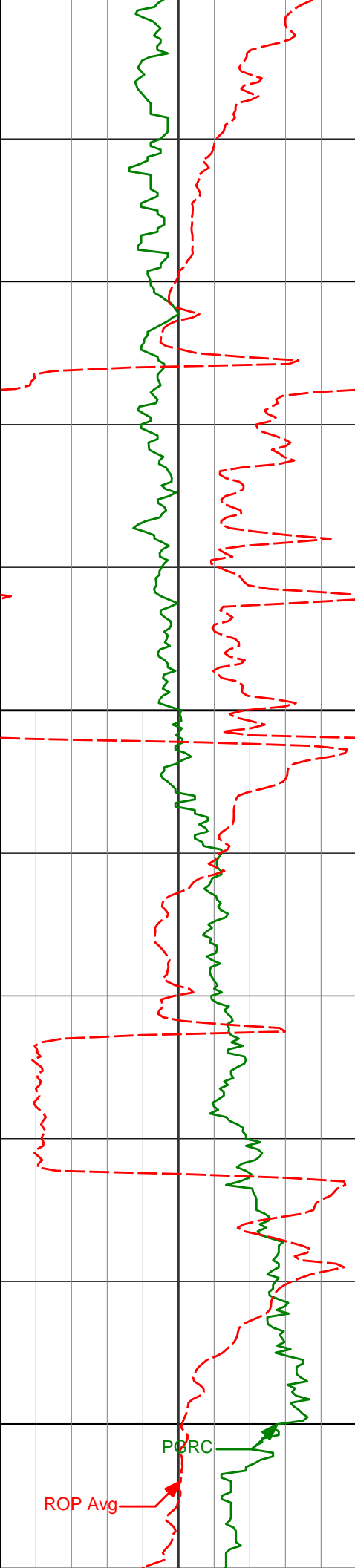
5794'

43.91°

1.10° 5743.94'

187.29'

158.47°F



5880
5900
6000

5888'

51.04°

1.10° 5807.44'

256.42'

5983'

59.95°

1.23° 5861.20'

334.52'

160.83°F

160.83°F

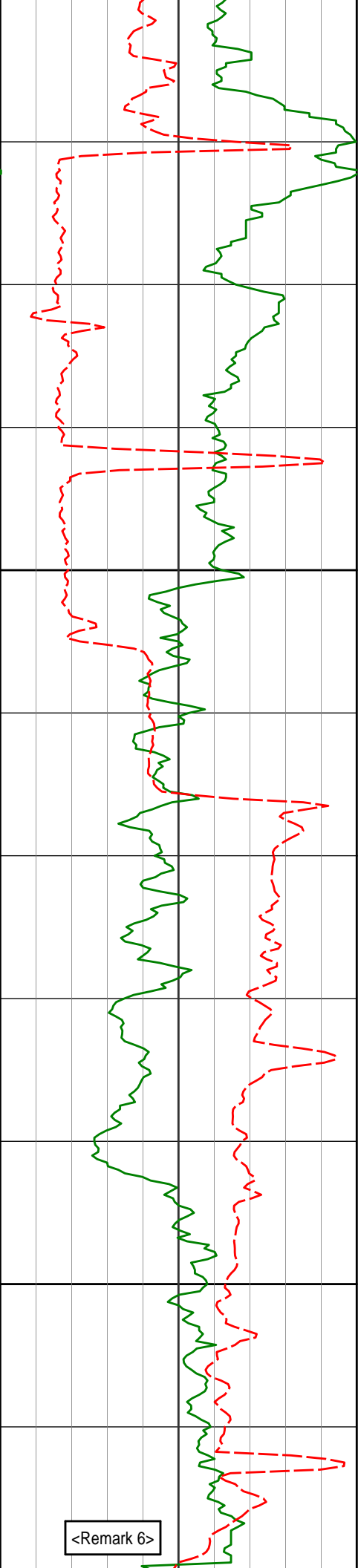
160.83°F

163.20°F

163.20°F

163.20°F

163.20°F



6100

6200

6077'

6172'

6227'

68.95°

75.23°

83.77°

2.74° 5901.70'

1.66° 5930.91'

1.25° 5940.92'

419.03'

509.15'

563.08'

165.58°F

165.58°F

167.97°F

167.97°F

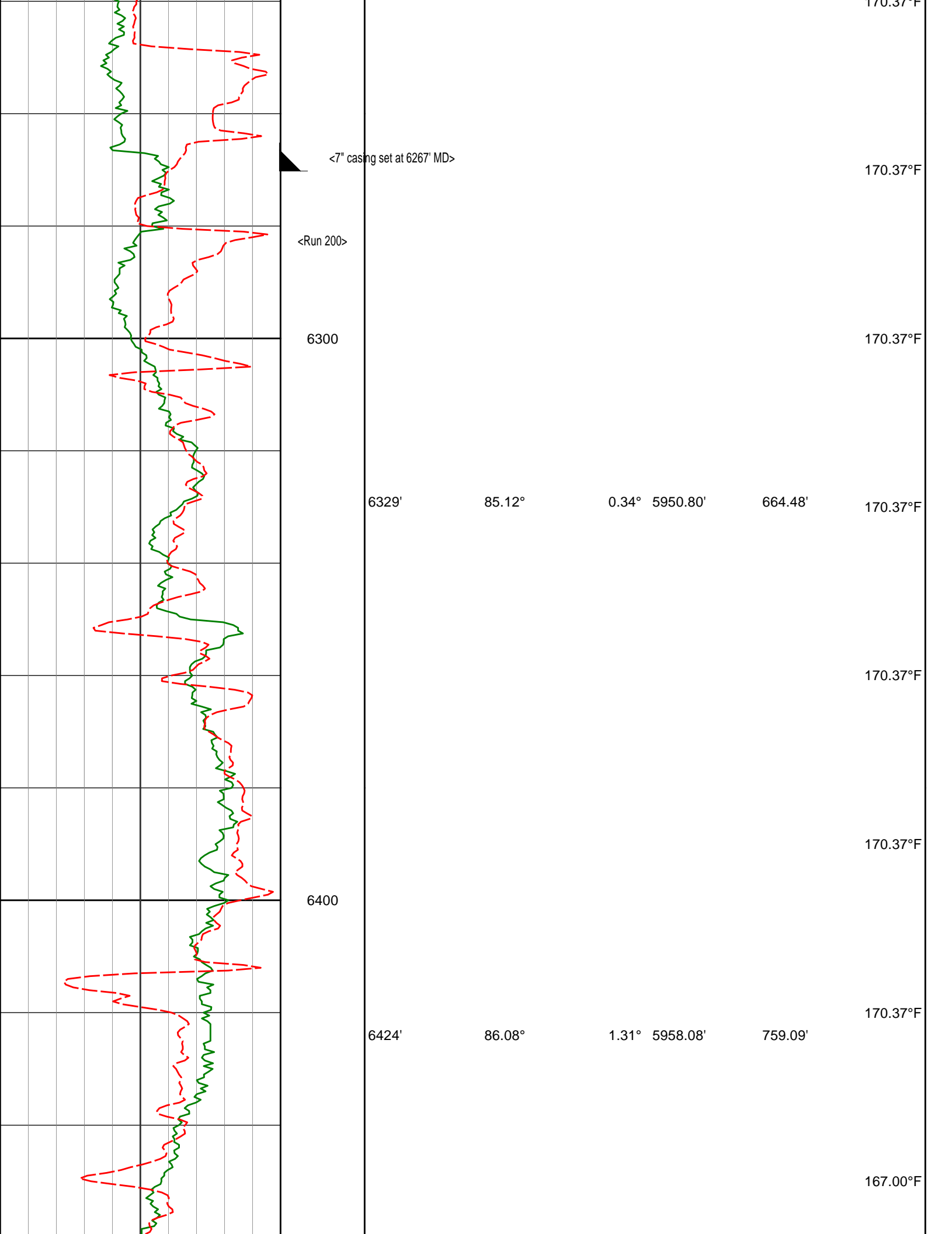
167.97°F

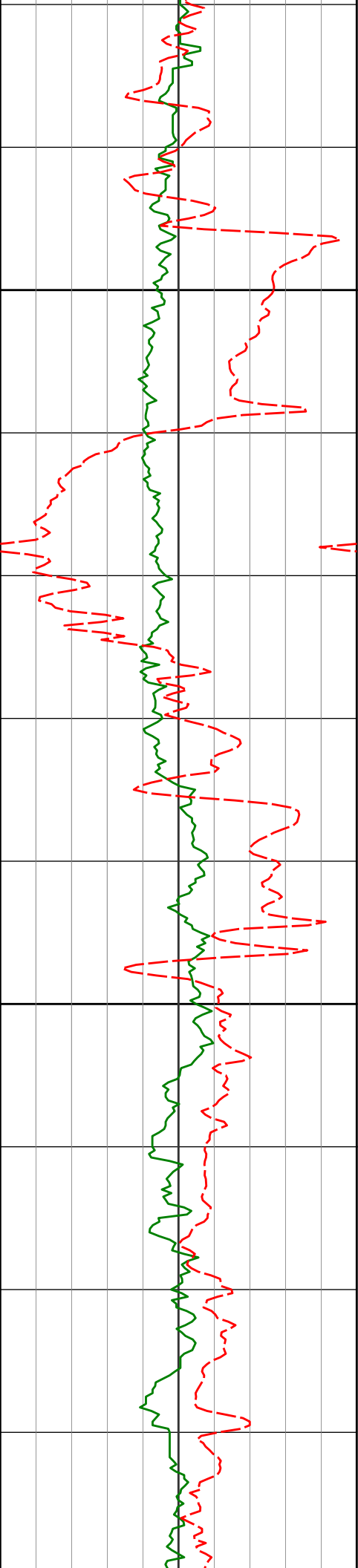
170.37°F

170.37°F

170.37°F

<Remark 6>





6500

6600

6518'

6613'

88.46°

87.81°

0.74°

0.65°

5962.56'

5965.65'

852.85'

947.70'

167.00°F

167.00°F

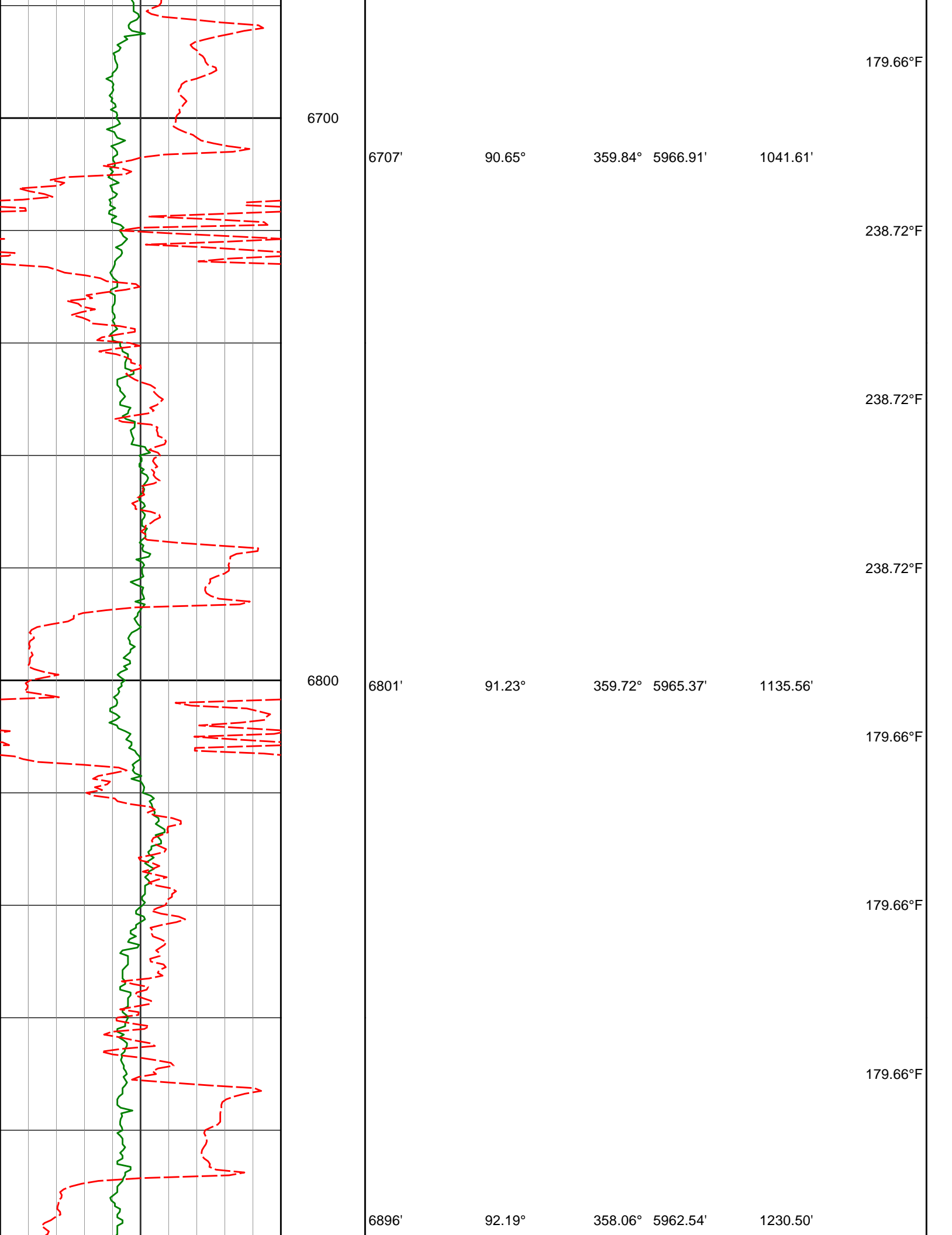
171.22°F

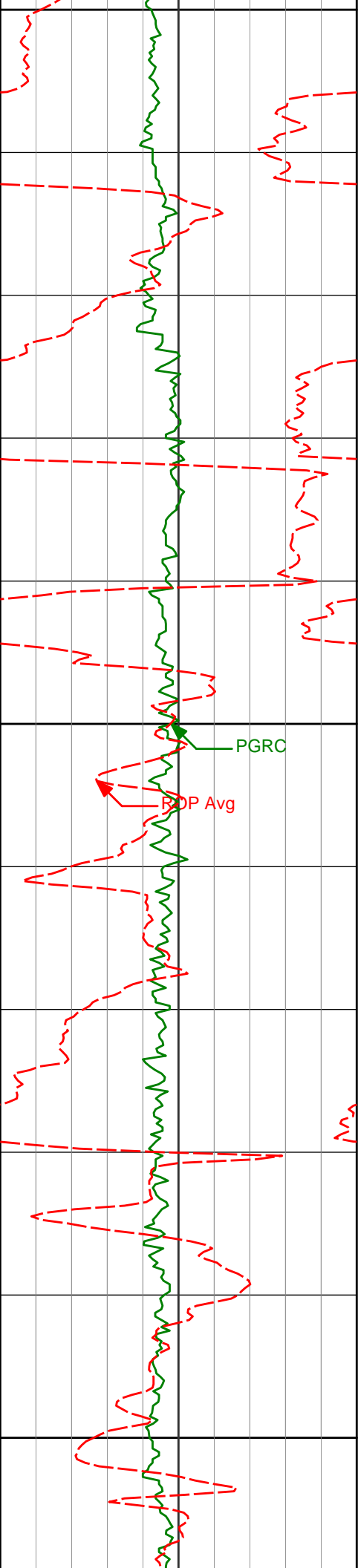
171.22°F

171.22°F

179.66°F

179.66°F





6900

183.88°F

183.88°F

183.88°F

6990'

90.65°

357.32° 5960.21'

1324.47'

183.88°F

7000

183.88°F

183.88°F

7085'

91.14°

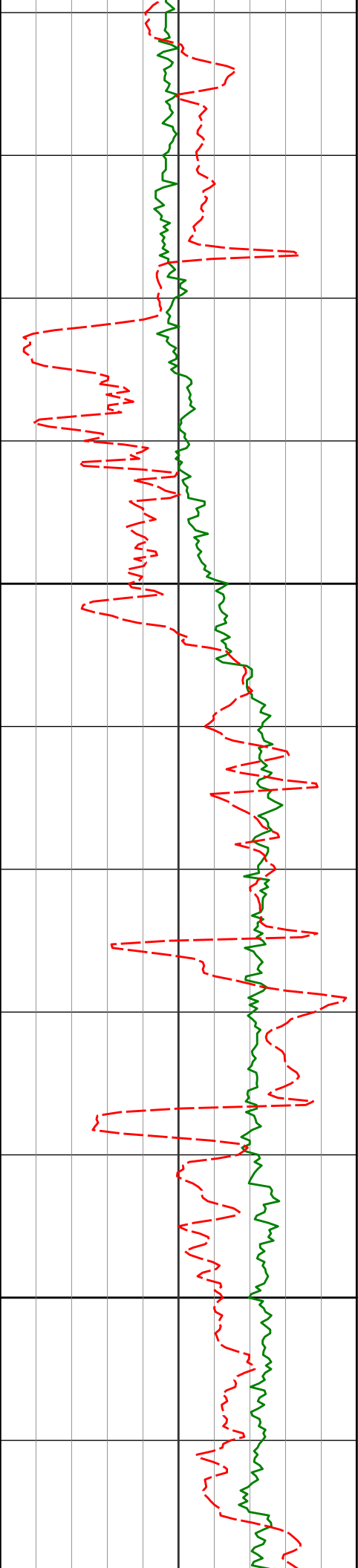
357.68° 5958.73'

1419.45'

183.88°F

7100

188.09°F



7200

7300

7179'

91.63°

357.39° 5956.45'

1513.42'

7274'

89.94°

357.09° 5955.15'

1608.40'

188.09°F

188.09°F

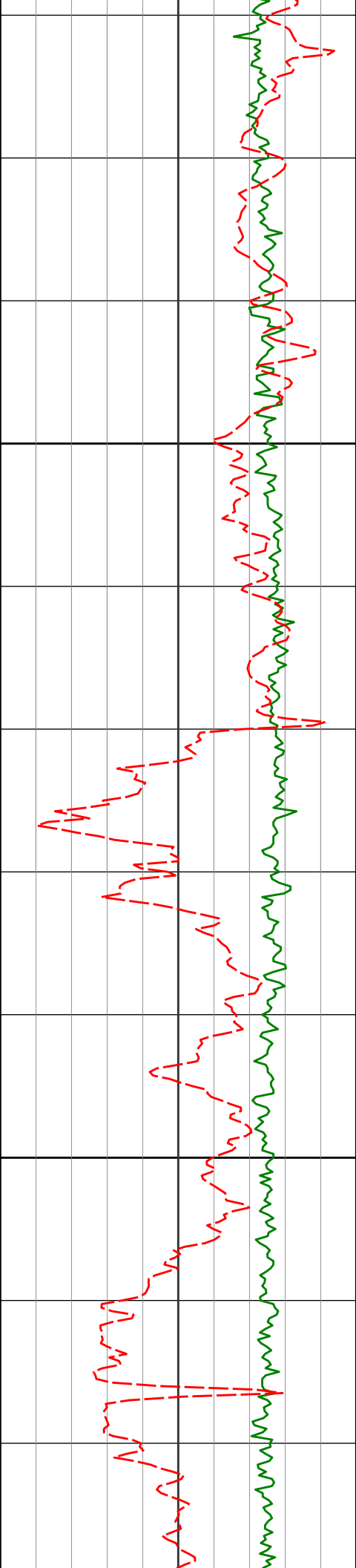
188.09°F

188.09°F

188.09°F

192.31°F

192.31°F



7400

7500

7368'

7463'

7557'

90.74°

90.74°

90.86°

355.99°

356.36°

355.39°

5954.59'

5953.37'

5952.05'

1702.36'

1797.30'

1891.22'

192.31°F

196.53°F

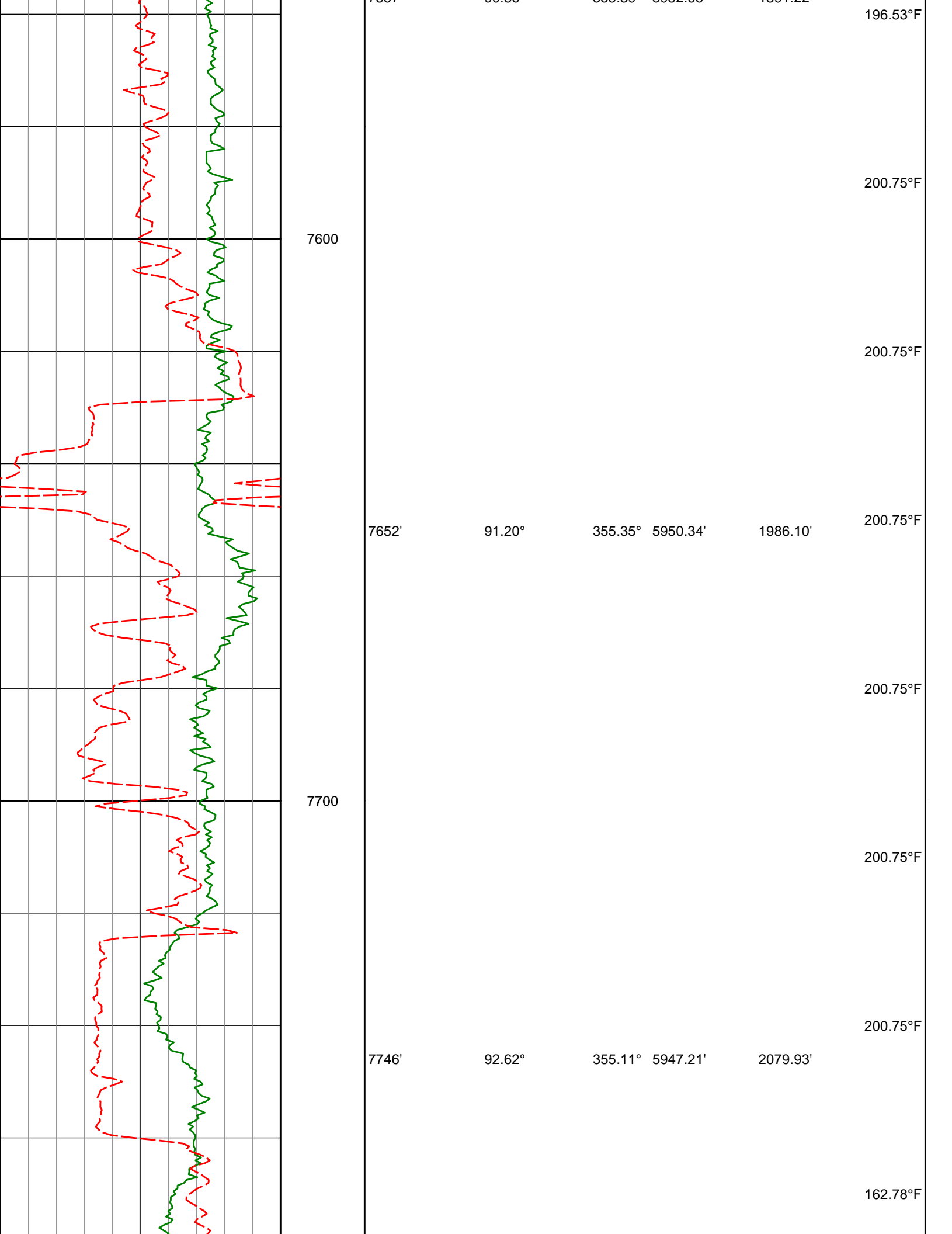
196.53°F

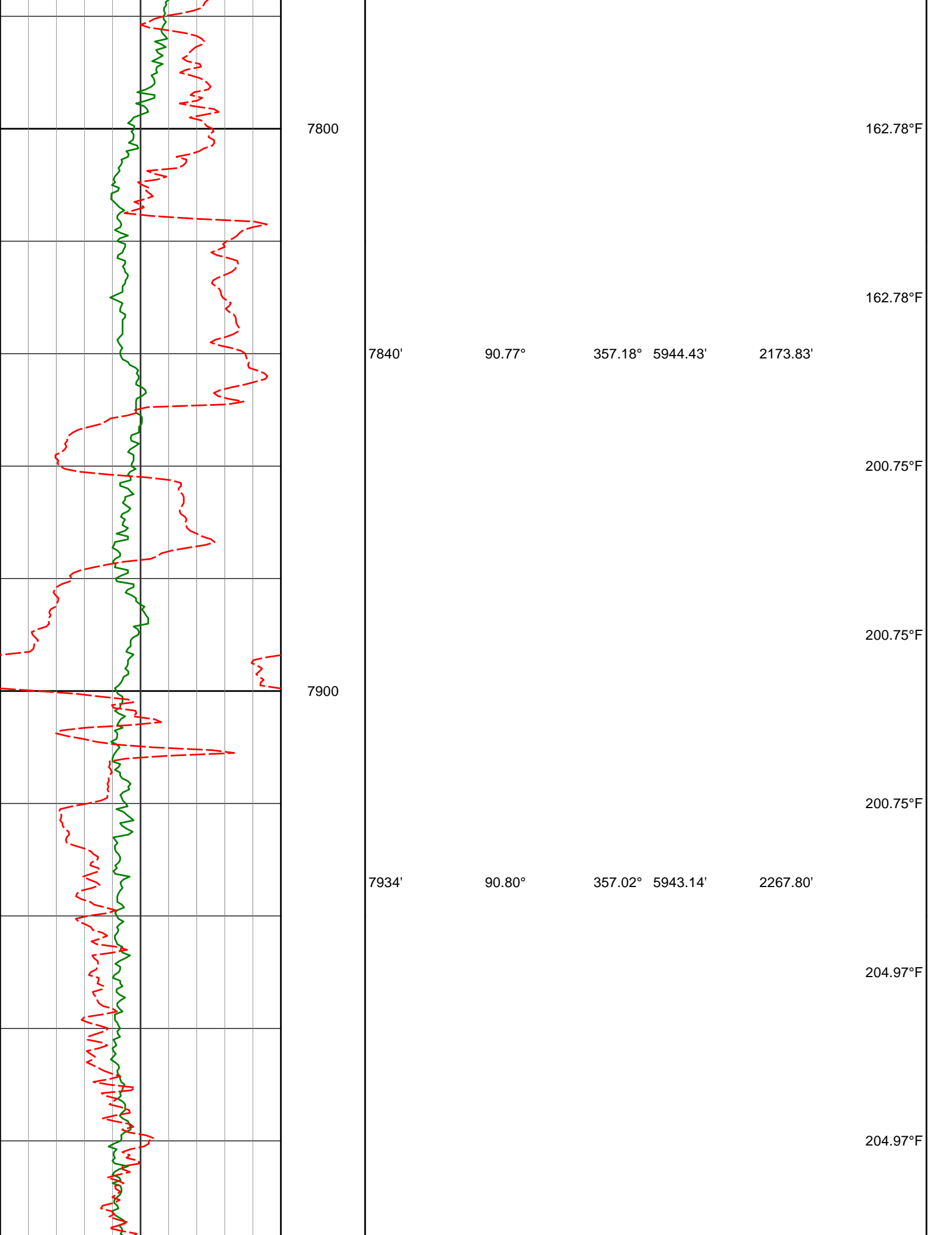
196.53°F

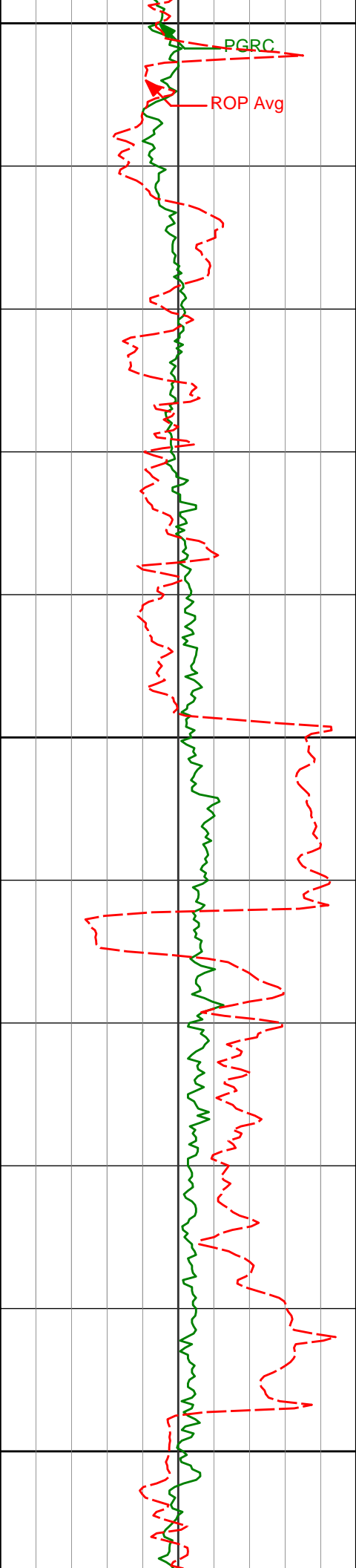
196.53°F

196.53°F

196.53°F







8000

8029'

91.36°

357.00° 5941.35'

2362.77'

204.97°F

204.97°F

204.97°F

8100

204.97°F

8123'

89.63°

357.58° 5940.54'

2456.75'

200.75°F

200.75°F

200.75°F

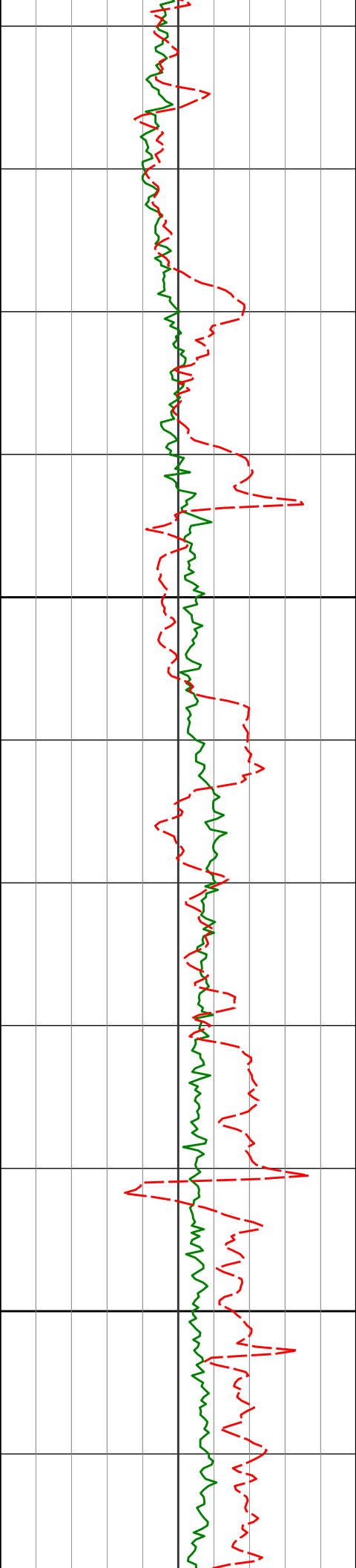
8200

8245'

89.63°

357.58° 5941.12'

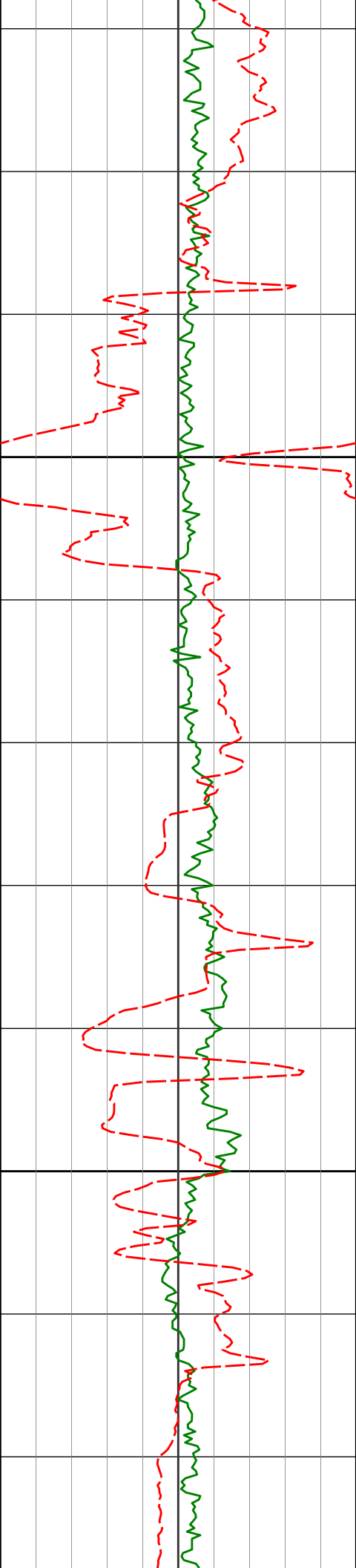
2552.75'



8300

8400

8217'	89.23°	358.07°	5941.48'	2550.75'	200.75°F
					209.19°F
					209.19°F
8311'	90.15°	358.27°	5941.98'	2644.75'	209.19°F
					200.75°F
					200.75°F
8405'	89.94°	358.46°	5941.91'	2738.74'	200.75°F
					200.75°F



8500

8600

8500'

8594'

90.15°

90.46°

357.80° 5941.83'

357.84° 5941.32'

2833.74'

2927.74'

200.75°F

200.75°F

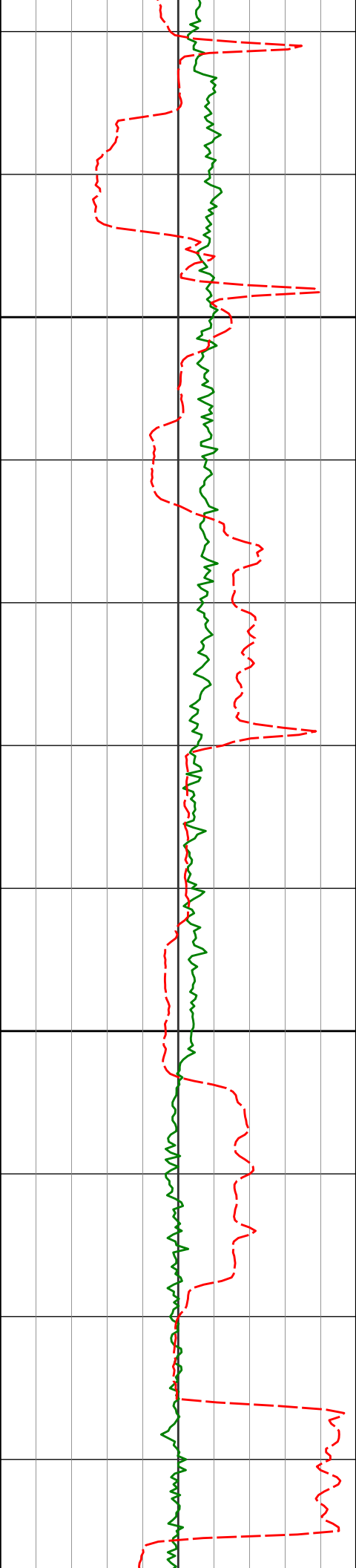
209.19°F

209.19°F

209.19°F

209.19°F

209.19°F



8700

8800

8689'

89.08°

357.16°

5941.71'

3022.73'

8784'

88.34°

358.13°

5943.85'

3117.70'

209.19°F

209.19°F

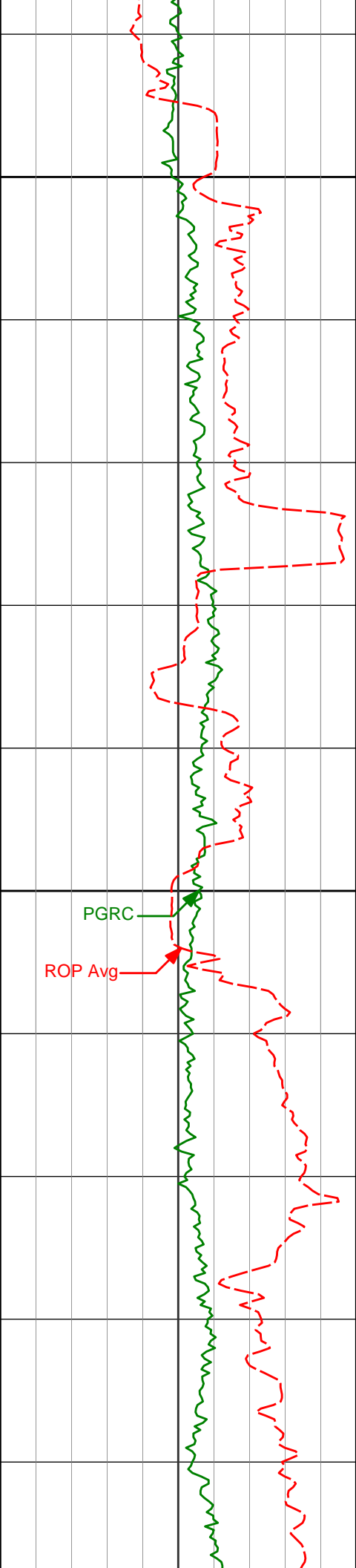
209.19°F

209.19°F

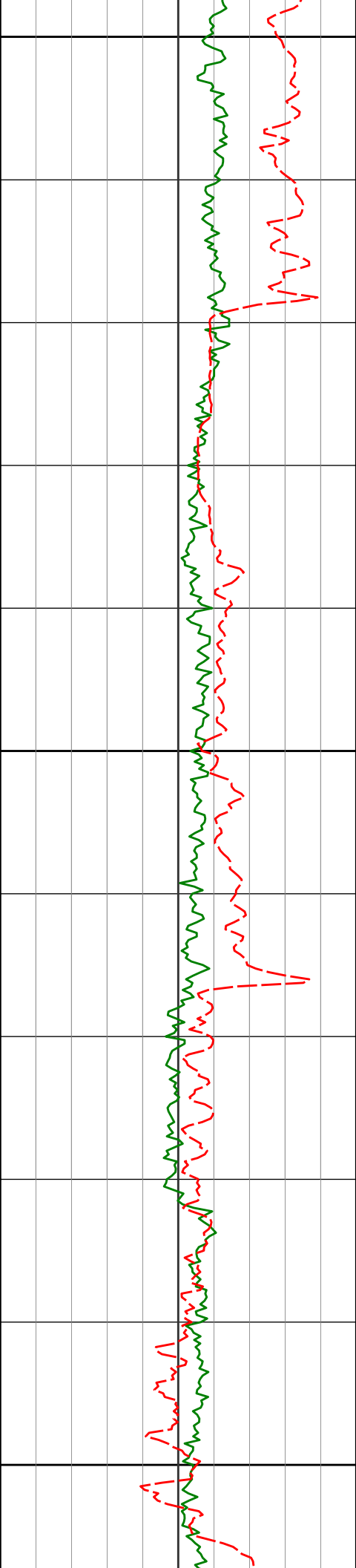
209.19°F

209.19°F

209.19°F



8879'	89.66°	357.38°	5945.50'	3212.69'	209.19°F
8900					209.19°F
					209.19°F
					209.19°F
8973'	89.88°	358.20°	5945.88'	3306.68'	209.19°F
					209.19°F
9000					209.19°F
					209.19°F
					209.19°F
					209.19°F
9068'	90.77°	357.49°	5945.35'	3401.68'	213.41°F



9100

213.41°F

213.41°F

9162'

90.77°

357.78°

5944.08'

3495.67'

209.19°F

9200

209.19°F

209.19°F

9257'

90.34°

357.63°

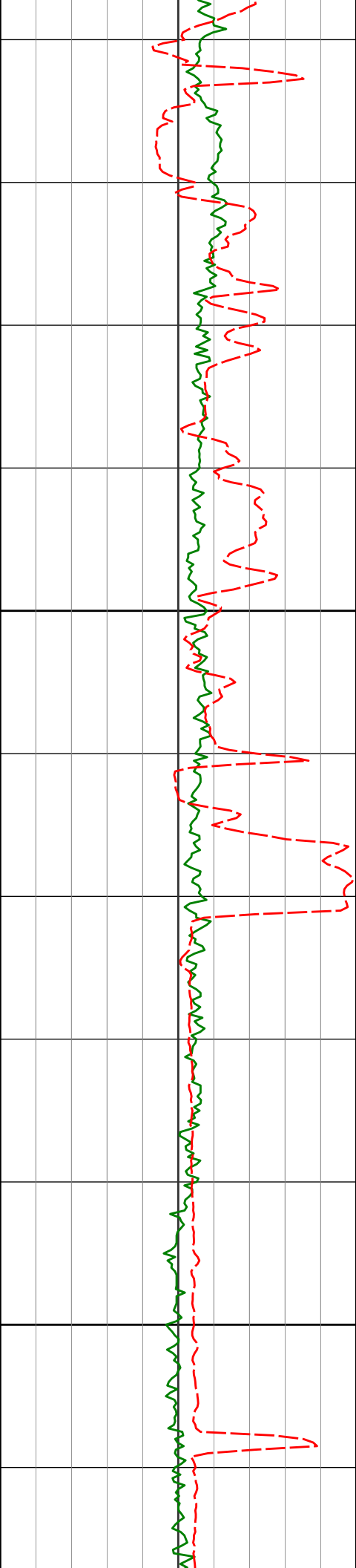
5943.17'

3590.66'

213.41°F

9300

213.41°F



9400

9500

9352'

91.23°

357.68°

5941.86'

3685.65'

9446'

89.88°

357.46°

5940.95'

3779.64'

213.41°F

213.41°F

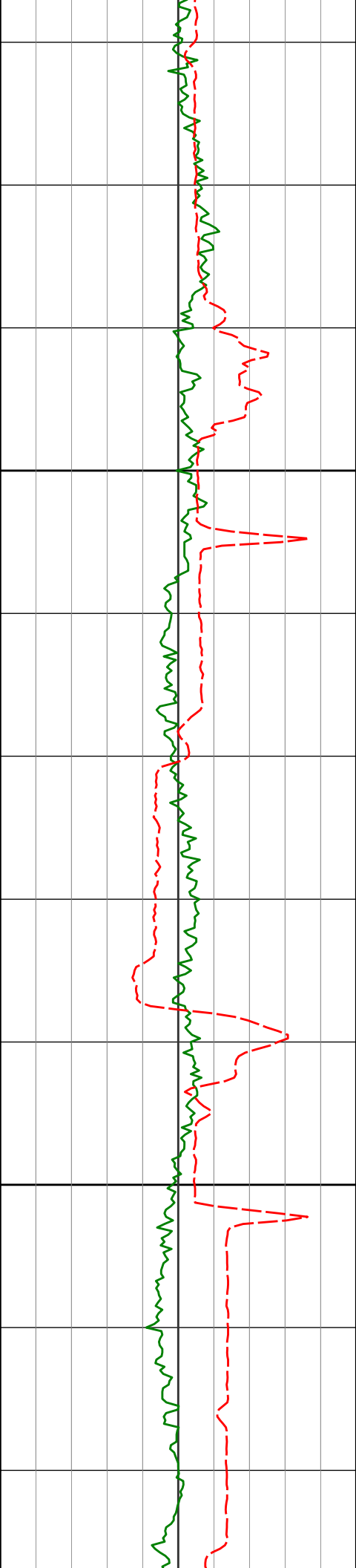
209.19°F

209.19°F

209.19°F

209.19°F

209.19°F



9600

9700

9541'

90.28°

357.61° 5940.82'

3874.63'

209.19°F

213.41°F

213.41°F

9635'

90.95°

357.40° 5939.81'

3968.62'

213.41°F

213.41°F

213.41°F

213.41°F

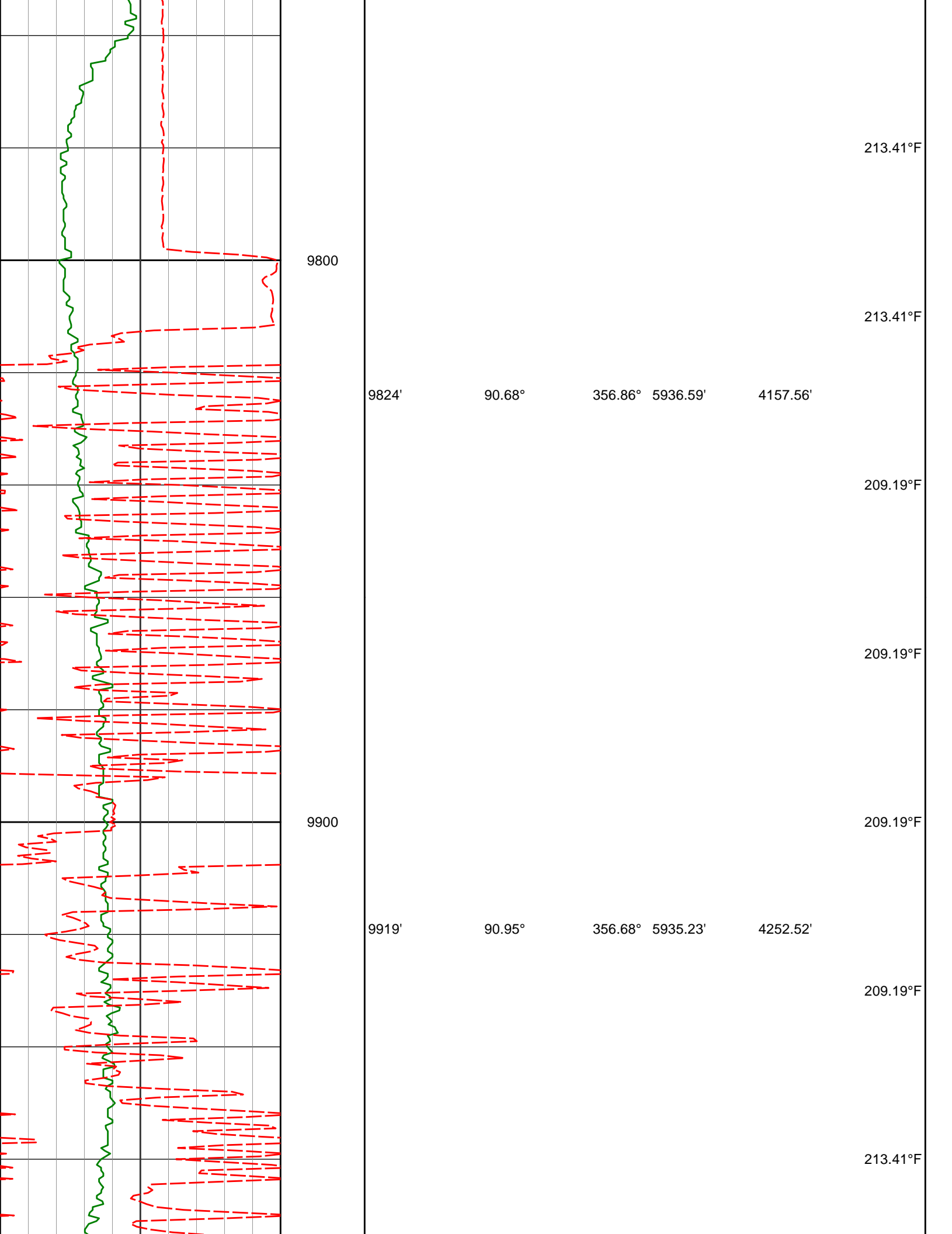
9729'

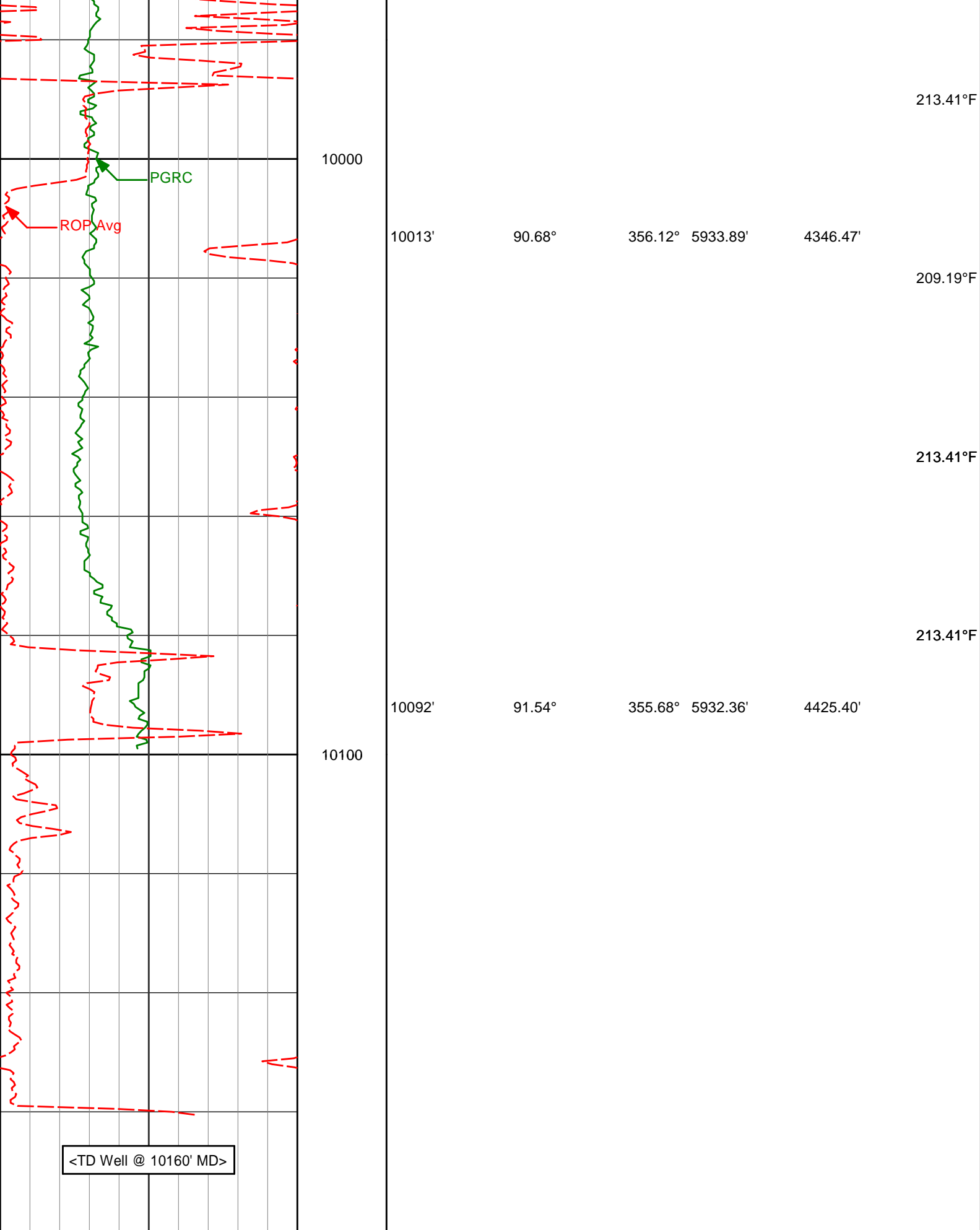
91.14°

356.70° 5938.09'

4062.59'

213.41°F





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

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Gleason LC26-720
Wattenberg
Weld Colorado
USA
CA-XX-0902230128

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
250.00	0.33	148.09	250.00	0.61 S	0.38 E	-0.62	0.13
500.00	0.66	148.09	499.99	2.44 S	1.52 E	-2.49	0.13
729.00	0.96	148.09	728.97	5.20 S	3.24 E	-5.30	0.13
824.00	0.65	152.60	823.96	6.36 S	3.91 E	-6.48	0.33
920.00	0.57	177.04	919.95	7.32 S	4.18 E	-7.45	0.28
1109.00	0.57	182.25	1108.94	9.19 S	4.20 E	-9.32	0.03
1386.00	0.74	190.71	1385.92	12.31 S	3.81 E	-12.43	0.07
1479.00	0.30	334.63	1478.92	12.68 S	3.59 E	-12.79	1.08
1571.00	0.06	45.51	1570.92	12.42 S	3.52 E	-12.54	0.32
1664.00	0.09	302.27	1663.92	12.35 S	3.49 E	-12.46	0.13
1756.00	0.43	4.63	1755.92	11.97 S	3.46 E	-12.08	0.43
1847.00	0.56	3.04	1846.92	11.18 S	3.51 E	-11.30	0.15
2125.00	0.83	33.21	2124.90	8.14 S	4.68 E	-8.30	0.16
2218.00	0.80	11.07	2217.89	6.94 S	5.18 E	-7.11	0.34
2401.00	1.09	9.83	2400.86	3.97 S	5.72 E	-4.16	0.16
2494.00	1.04	18.12	2493.85	2.30 S	6.13 E	-2.50	0.18
2587.00	1.27	21.92	2586.83	0.55 S	6.78 E	-0.77	0.26
2679.00	1.24	15.74	2678.81	1.35 N	7.43 E	1.10	0.15
2866.00	1.87	322.69	2865.74	5.73 N	6.12 E	5.52	0.80
2960.00	1.71	320.90	2959.70	8.04 N	4.31 E	7.89	0.18
3054.00	1.52	319.67	3053.66	10.09 N	2.61 E	9.99	0.20
3148.00	1.60	305.39	3147.63	11.80 N	0.73 E	11.77	0.42
3243.00	1.25	305.21	3242.60	13.16 N	1.19 W	13.20	0.36
3338.00	1.31	314.24	3337.57	14.52 N	2.82 W	14.61	0.22
3432.00	1.52	313.86	3431.54	16.14 N	4.49 W	16.28	0.22
3527.00	1.59	310.83	3526.51	17.87 N	6.40 W	18.08	0.11
3622.00	0.91	249.44	3621.49	18.47 N	8.10 W	18.73	1.47
3716.00	0.88	255.38	3715.48	18.02 N	9.49 W	18.33	0.10
3810.00	0.84	249.85	3809.47	17.60 N	10.84 W	17.96	0.10
3906.00	0.75	249.53	3905.46	17.14 N	12.08 W	17.54	0.10
4000.00	1.12	231.33	3999.45	16.36 N	13.37 W	16.80	0.50
4094.00	1.46	222.39	4093.42	14.90 N	14.90 W	15.39	0.42
4188.00	1.68	223.60	4187.39	13.02 N	16.65 W	13.57	0.23
4283.00	1.51	213.41	4282.35	10.96 N	18.30 W	11.57	0.35
4377.00	1.55	202.49	4376.32	8.76 N	19.47 W	9.41	0.31
4471.00	1.69	185.97	4470.28	6.21 N	20.10 W	6.88	0.52
4566.00	1.68	176.04	4565.24	3.43 N	20.15 W	4.10	0.31
4661.00	1.38	165.00	4660.21	0.94 N	19.76 W	1.60	0.44
4755.00	1.27	154.81	4754.18	1.09 S	19.02 W	-0.45	0.27
4850.00	0.80	142.85	4849.17	2.57 S	18.17 W	-1.96	0.54
5132.00	0.59	146.30	5131.14	5.36 S	16.17 W	-4.81	0.08
5226.00	0.68	171.54	5225.14	6.31 S	15.82 W	-5.78	0.31
5415.00	12.14	0.86	5412.80	12.54 N	15.35 W	13.05	6.78
5510.00	20.40	358.34	5503.92	39.12 N	15.68 W	39.63	8.72
5604.00	26.67	355.62	5590.06	76.56 N	17.77 W	77.12	6.77
5699.00	35.95	359.00	5671.15	125.81 N	19.89 W	126.41	9.94
5794.00	43.91	1.10	5743.94	186.73 N	19.75 W	187.29	8.50
5888.00	51.04	1.10	5807.44	255.95 N	18.42 W	256.42	7.59
5983.00	59.95	1.23	5861.20	334.14 N	16.82 W	334.52	9.38

6077.00	68.95	2.74	5901.70	418.80 N	13.85 W	419.03	9.68
6172.00	75.23	1.66	5930.91	509.08 N	10.39 W	509.15	6.71
6227.00	83.77	1.25	5940.92	563.10 N	9.02 W	563.08	15.53
6329.00	85.12	0.34	5950.80	664.60 N	7.61 W	664.48	1.60
6424.00	86.08	1.31	5958.08	759.31 N	6.24 W	759.09	1.43
6518.00	88.46	0.74	5962.56	853.18 N	4.56 W	852.85	2.60
6613.00	87.81	0.65	5965.65	948.12 N	3.40 W	947.70	0.69
6707.00	90.65	359.84	5966.91	1042.11 N	3.00 W	1041.61	3.14
6801.00	91.23	359.72	5965.37	1136.09 N	3.36 W	1135.56	0.63
6896.00	92.19	358.06	5962.54	1231.03 N	5.20 W	1230.50	2.02
6990.00	90.65	357.32	5960.21	1324.92 N	8.99 W	1324.47	1.82
7085.00	91.14	357.68	5958.73	1419.82 N	13.14 W	1419.45	0.64
7179.00	91.63	357.39	5956.45	1513.70 N	17.18 W	1513.42	0.61
7274.00	89.94	357.09	5955.15	1608.58 N	21.75 W	1608.40	1.81
7368.00	90.74	355.99	5954.59	1702.40 N	27.43 W	1702.36	1.45
7463.00	90.74	356.36	5953.37	1797.18 N	33.76 W	1797.30	0.40
7557.00	90.86	355.39	5952.05	1890.93 N	40.52 W	1891.22	1.04
7652.00	91.20	355.35	5950.34	1985.60 N	48.19 W	1986.10	0.36
7746.00	92.62	355.11	5947.21	2079.22 N	56.01 W	2079.93	1.53
7840.00	90.77	357.18	5944.43	2172.96 N	62.32 W	2173.83	2.95
7934.00	90.80	357.02	5943.14	2266.83 N	67.08 W	2267.80	0.17
8029.00	91.36	357.00	5941.35	2361.68 N	72.03 W	2362.77	0.58
8123.00	89.63	357.58	5940.54	2455.57 N	76.48 W	2456.75	1.93
8217.00	89.23	358.07	5941.48	2549.50 N	80.05 W	2550.75	0.68
8311.00	90.15	358.27	5941.98	2643.45 N	83.05 W	2644.75	1.01
8405.00	89.94	358.46	5941.91	2737.41 N	85.73 W	2738.74	0.31
8500.00	90.15	357.80	5941.83	2832.36 N	88.82 W	2833.74	0.73
8594.00	90.46	357.84	5941.32	2926.29 N	92.39 W	2927.74	0.33
8689.00	89.08	357.16	5941.71	3021.20 N	96.54 W	3022.73	1.63
8784.00	88.34	358.13	5943.85	3116.09 N	100.44 W	3117.70	1.29
8879.00	89.66	357.38	5945.50	3211.00 N	104.17 W	3212.69	1.60
8973.00	89.88	358.20	5945.88	3304.93 N	107.80 W	3306.68	0.90
9068.00	90.77	357.49	5945.35	3399.86 N	111.37 W	3401.68	1.20
9162.00	90.77	357.78	5944.08	3493.77 N	115.25 W	3495.67	0.30
9257.00	90.34	357.63	5943.17	3588.69 N	119.05 W	3590.66	0.48
9352.00	91.23	357.68	5941.86	3683.60 N	122.93 W	3685.65	0.94
9446.00	89.88	357.46	5940.95	3777.51 N	126.92 W	3779.64	1.46
9541.00	90.28	357.61	5940.82	3872.42 N	131.01 W	3874.63	0.45
9635.00	90.95	357.40	5939.81	3966.32 N	135.10 W	3968.62	0.76
9729.00	91.14	356.70	5938.09	4060.18 N	139.94 W	4062.59	0.77
9824.00	90.68	356.86	5936.59	4155.02 N	145.28 W	4157.56	0.52
9919.00	90.95	356.68	5935.23	4249.86 N	150.63 W	4252.52	0.35
10013.00	90.68	356.12	5933.89	4343.67 N	156.52 W	4346.47	0.66
10092.00	91.54	355.68	5932.36	4422.45 N	162.16 W	4425.40	1.23
10160.00	91.54	355.68	5930.53	4490.23 N	167.28 W	4493.32	0.01

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 358.07 DEGREES (GRID)
A TOTAL CORRECTION OF 7.01 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10160.00 FEET
IS 4493.34 FEET ALONG 357.87 DEGREES (GRID)**

Surveys at 250 ft and 500 ft were interpolated from first survey at 729 ft per Noble Energy.

Last survey is a projection from 10092 ft MD to TD at 10160 ft MD.