



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	08-Mar-15	09-Mar-15	13-Mar-15		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	927.00	5,946.00	6,985.00		
Log End Depth (MD, ft)	5,946.00	6,985.00	16,200.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	07-Mar-15 21:15	08-Mar-15 19:10	10-Mar-15 07:20		
Drill/Wipe End Date and Time	08-Mar-15 10:30	09-Mar-15 05:20	12-Mar-15 16:20		
Min Inc (deg) @ Depth (MD, ft)	0.17 @ 5,610.00	11.44 @ 6,083.00	84.66 @ 7,063.00		
Max Inc (deg) @ Depth (MD, ft)	11.25 @ 3,904.00	80.24 @ 6,933.00	93.46 @ 16,133.00		
Bit TFA(in2) / Bit Type	0.82 / PDC	0.86 / PDC	0.75 / PDC		
Flow Rate (gpm)	594.61	481.55	279.71		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.70 / 27.00	10.40 / 42.00	9.80 / 33.00		
Filtrate CL (ppm)	1,200.00	1,300.00	1,500.00		
pH / Fluid Loss (mptm)	9.00 / 65	8.80 / 0	8.00 / 9		
PV (cP) / YP (lhf2)	1 / 4.00	13 / 12.00	7 / 7.00		
% Solids / % Sand	1.80 / 0.30	7 / .15	7.50 / 1.50		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		

Max Tool Temp (degF) / Source	154.30 / PCM	154.30 / PCM	251.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Nielsen	Justin Fields	Justin Fields		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	246473	246473	12134679		
Insert Serial Number	11400937	11400937	11620280		
Date and Time Initialized	07-Mar-15 15:48	07-Mar-15 15:48	09-Mar-15 11:23		
Date and Time Read	09-Mar-15 08:35	09-Mar-15 08:56	13-Mar-15 04:55		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	51.32	49.77	64.79		
Software Version	6.21	6.21	6.21		
Sub Serial Number	246473	246473	12134679		
Sonde Serial Number	11297516	11297516	11638576		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	18.90	37.30	351.30		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	41.20	39.65	60.06		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	246473	246473	12134679		
Insert/Sonde Serial Number	11293417	11293417	11681014		

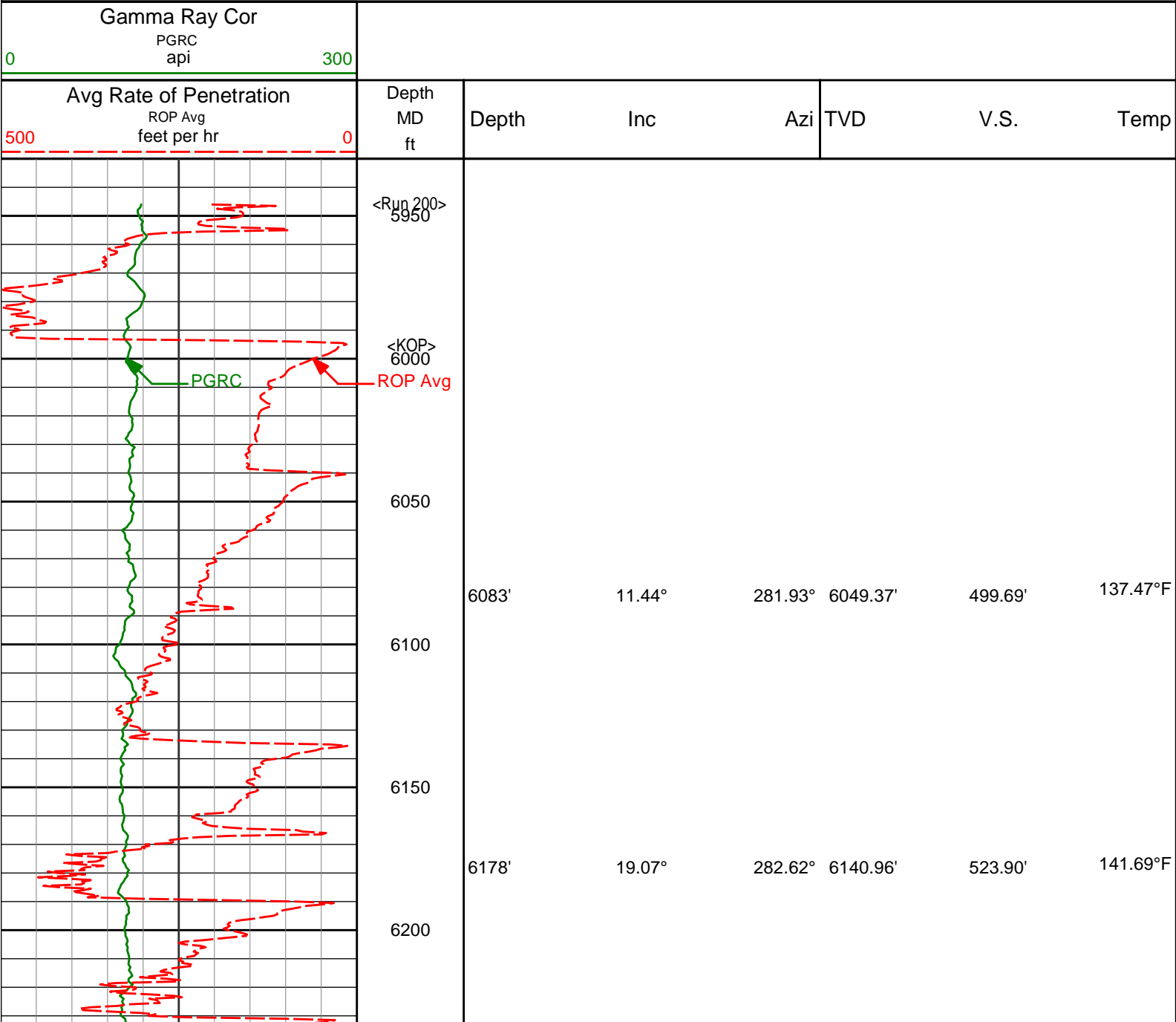
REMARKS

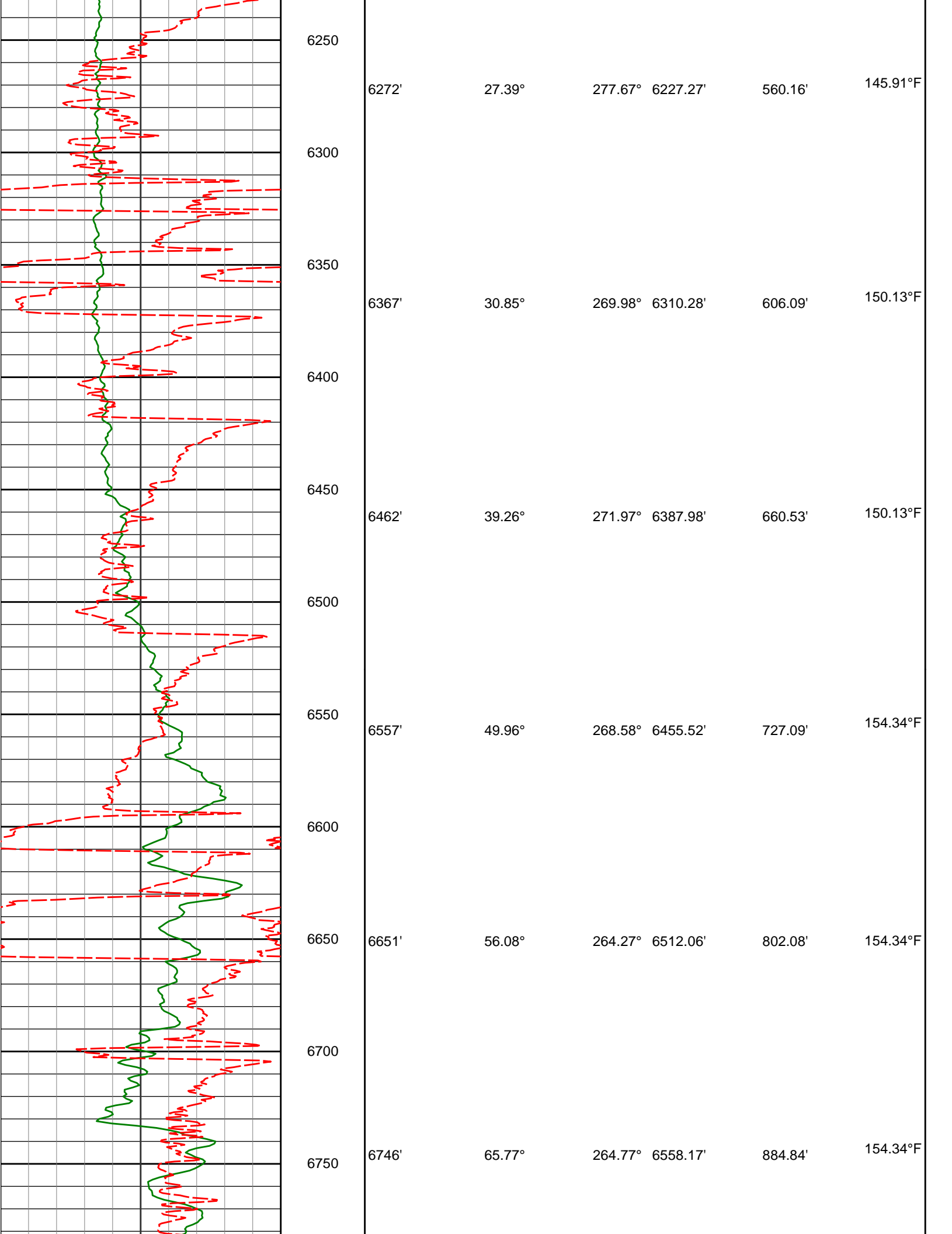
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 6945 ft. MD to 6985 ft. MD.

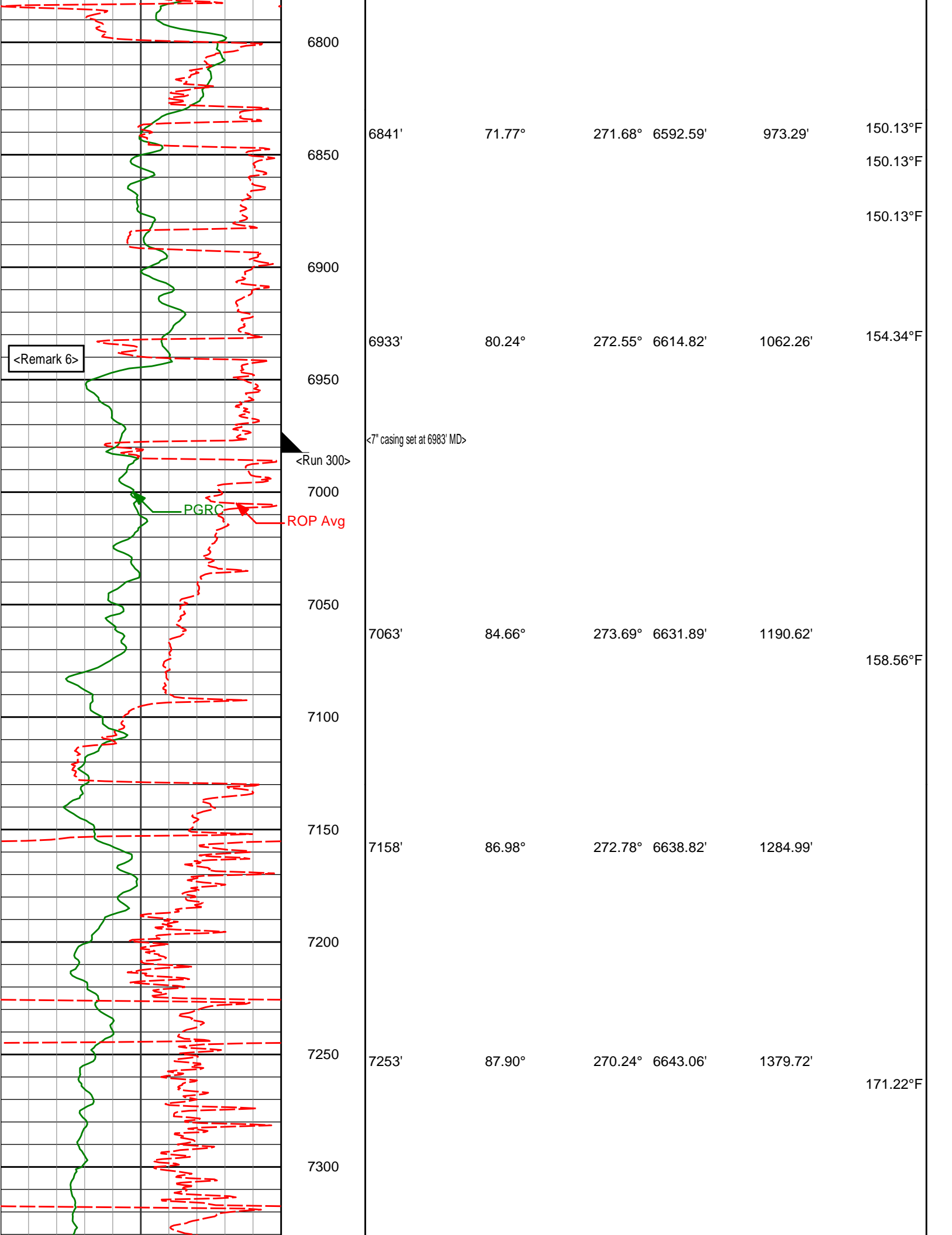
WARRANTY

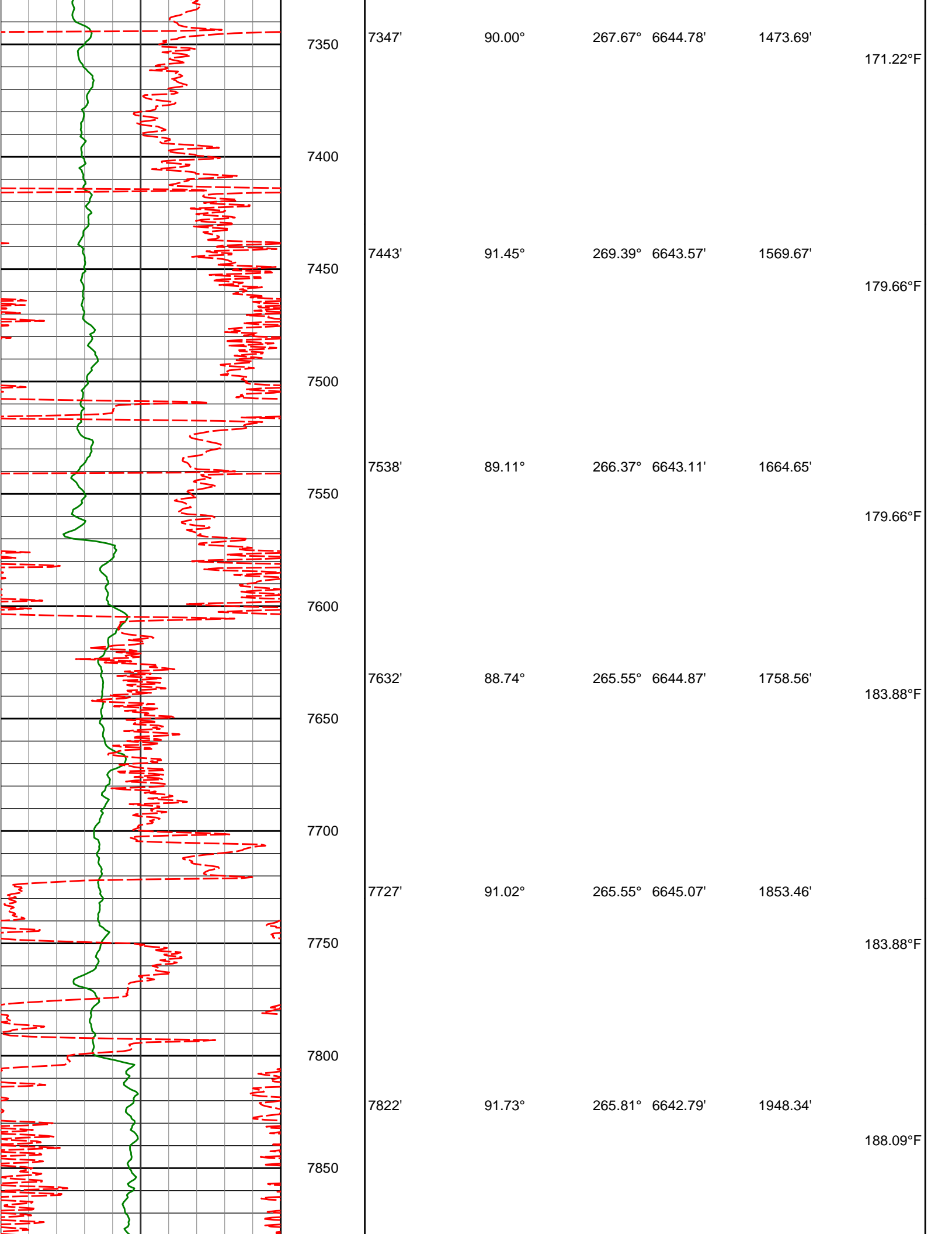
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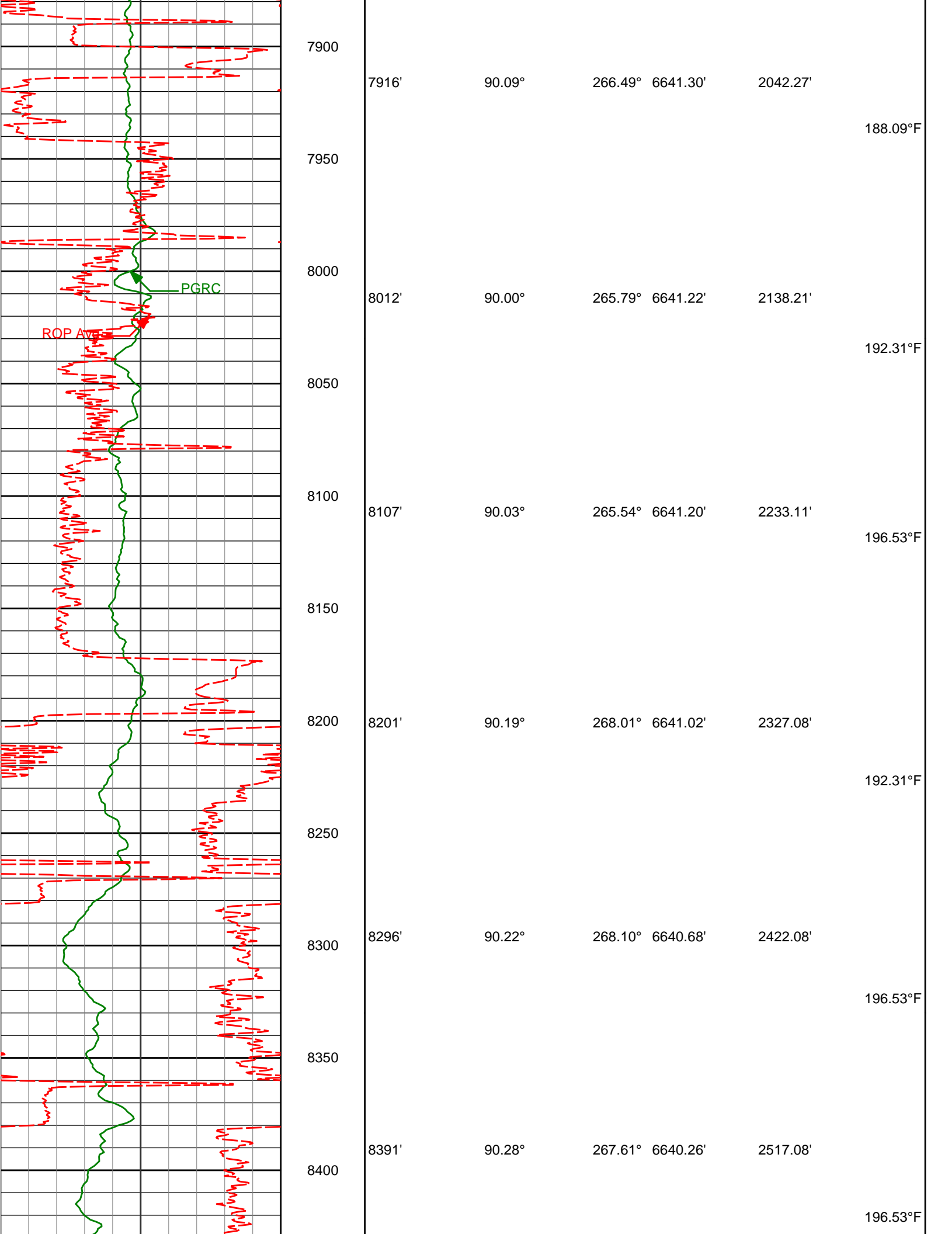
MD Detail 1:600 Scale

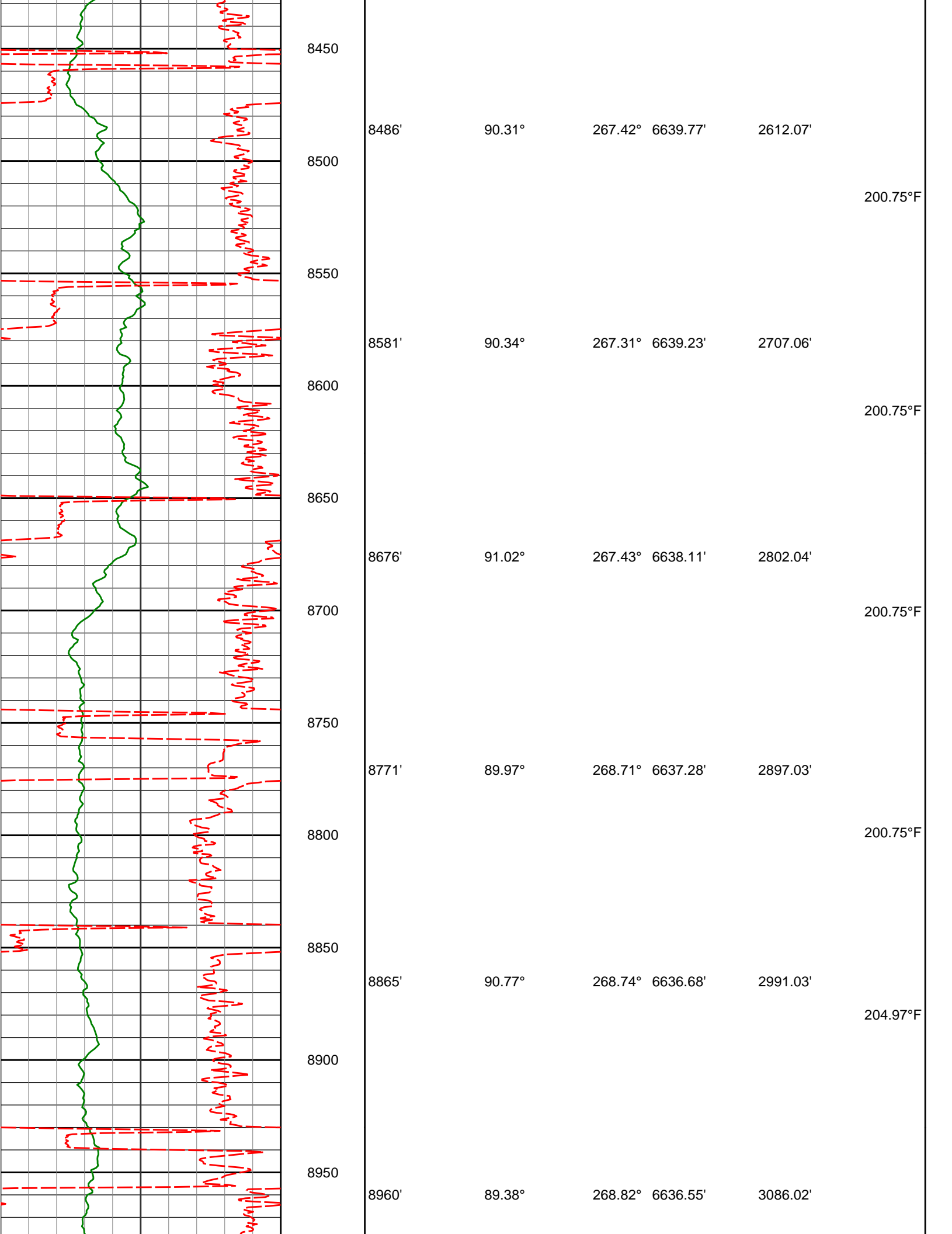


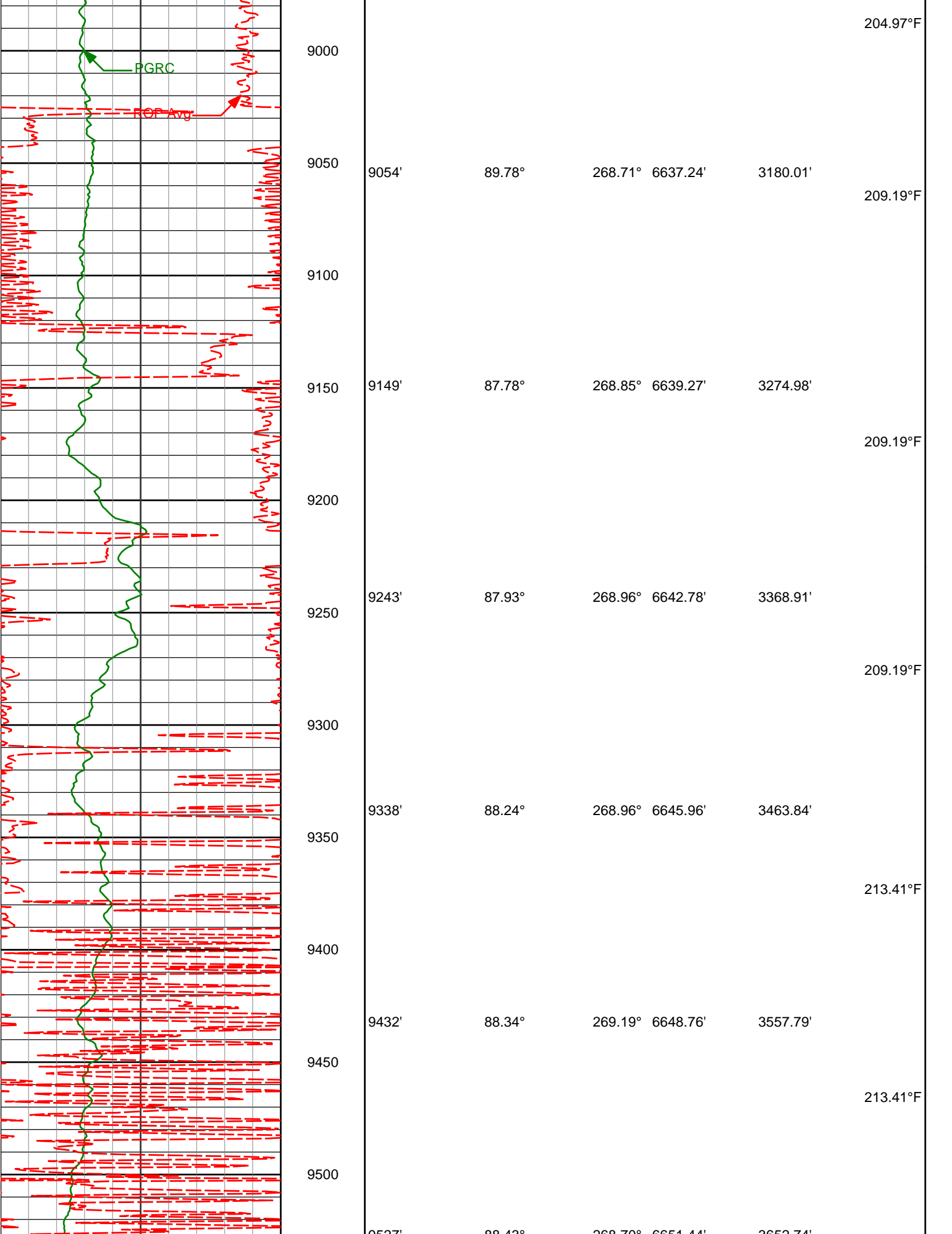


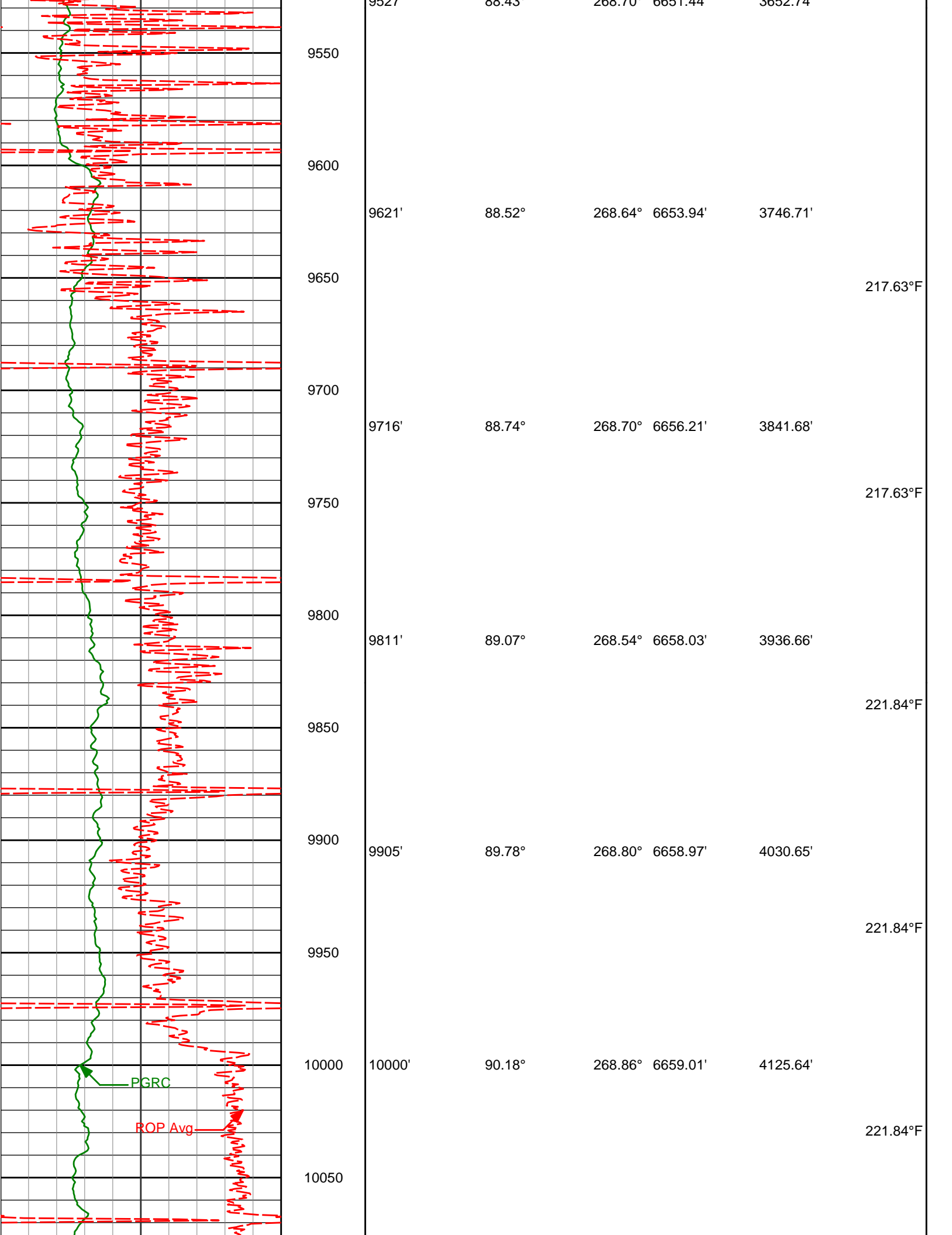


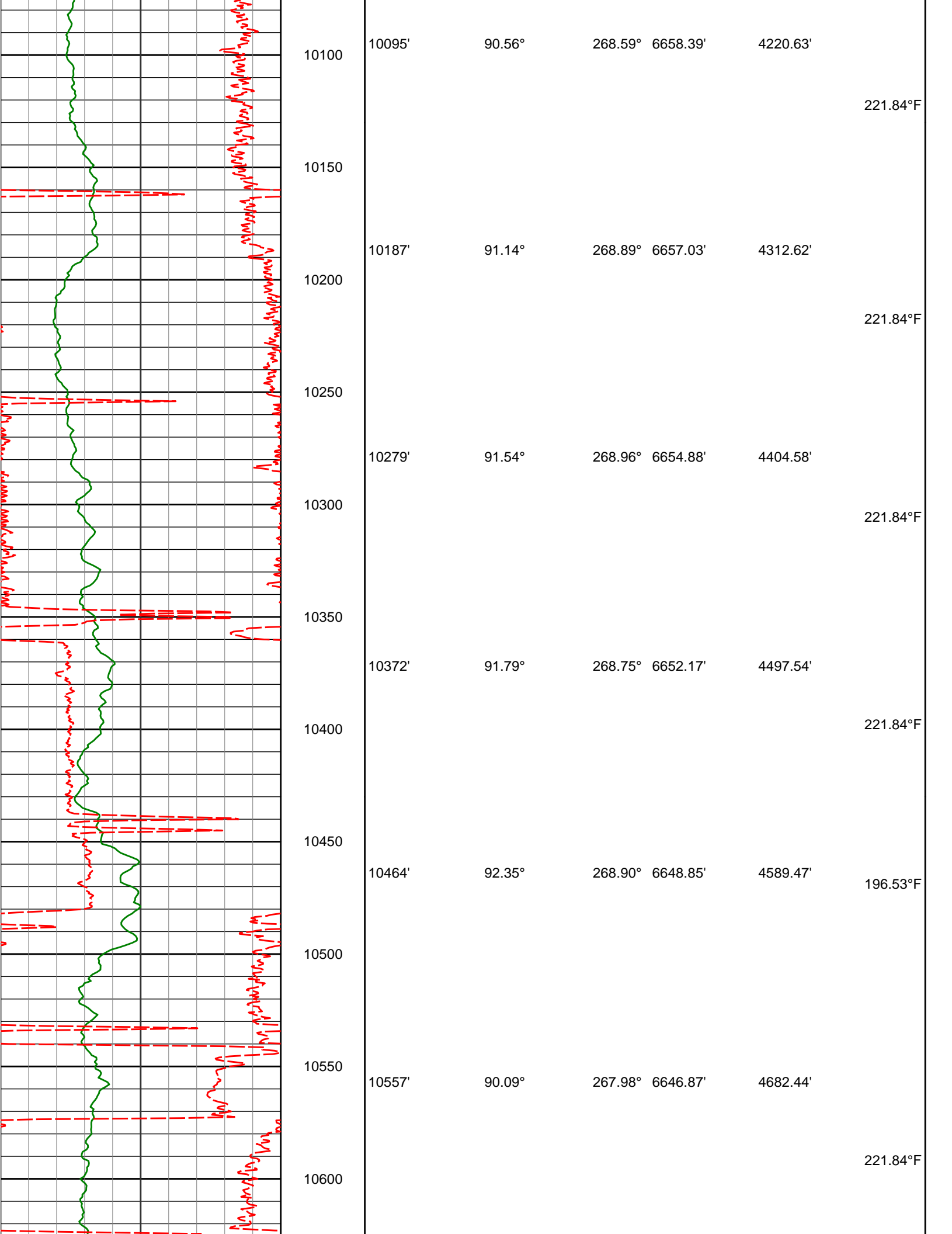


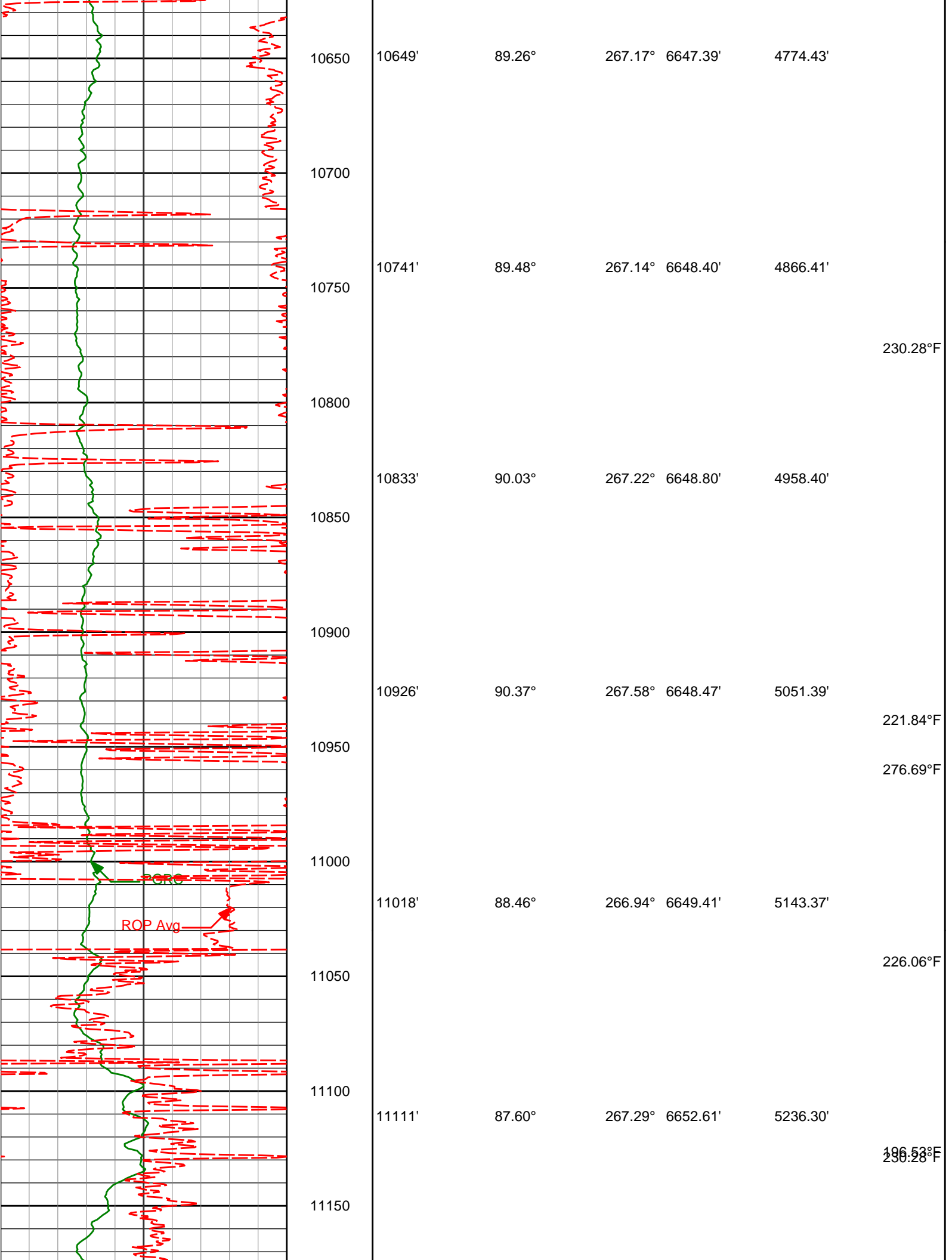


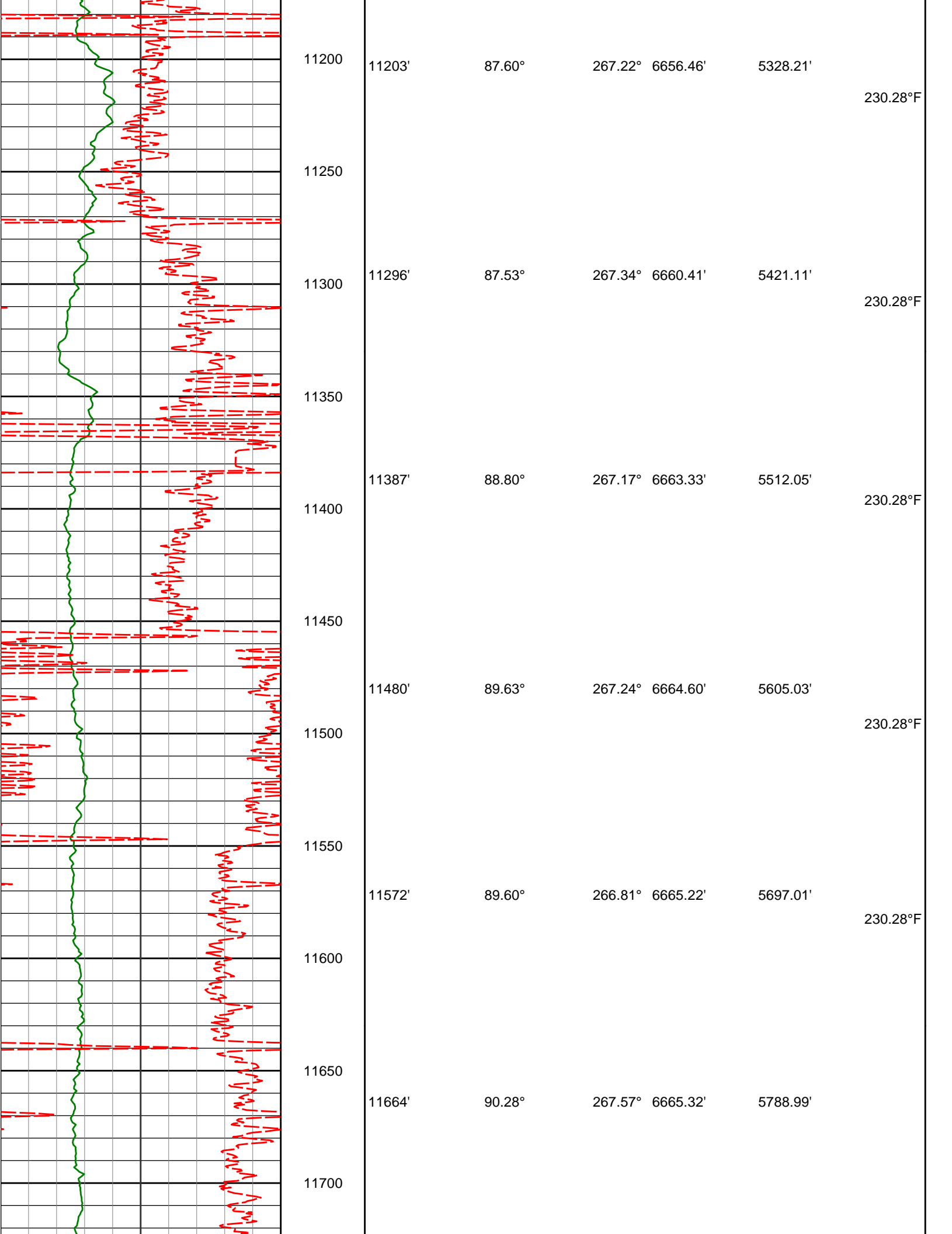


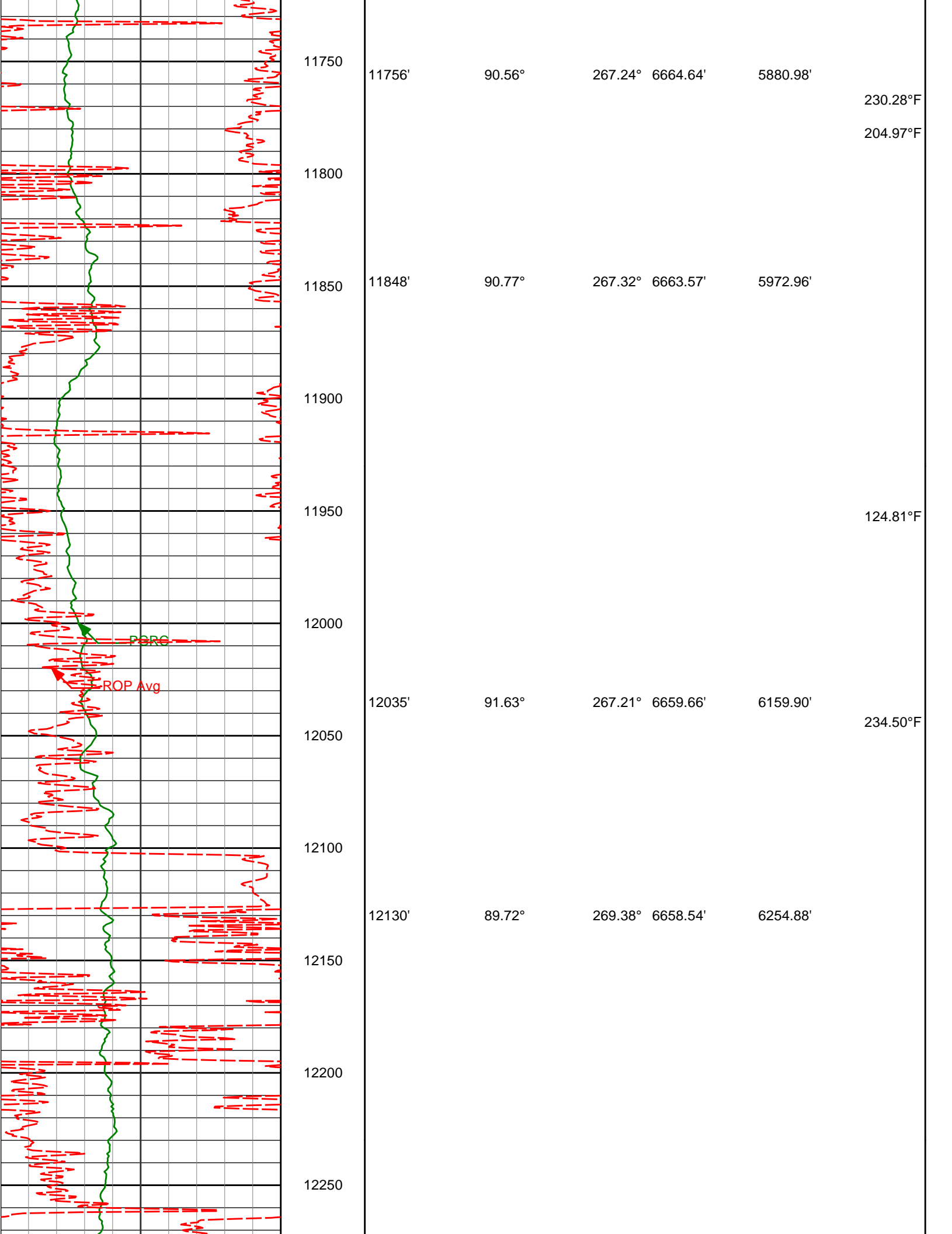


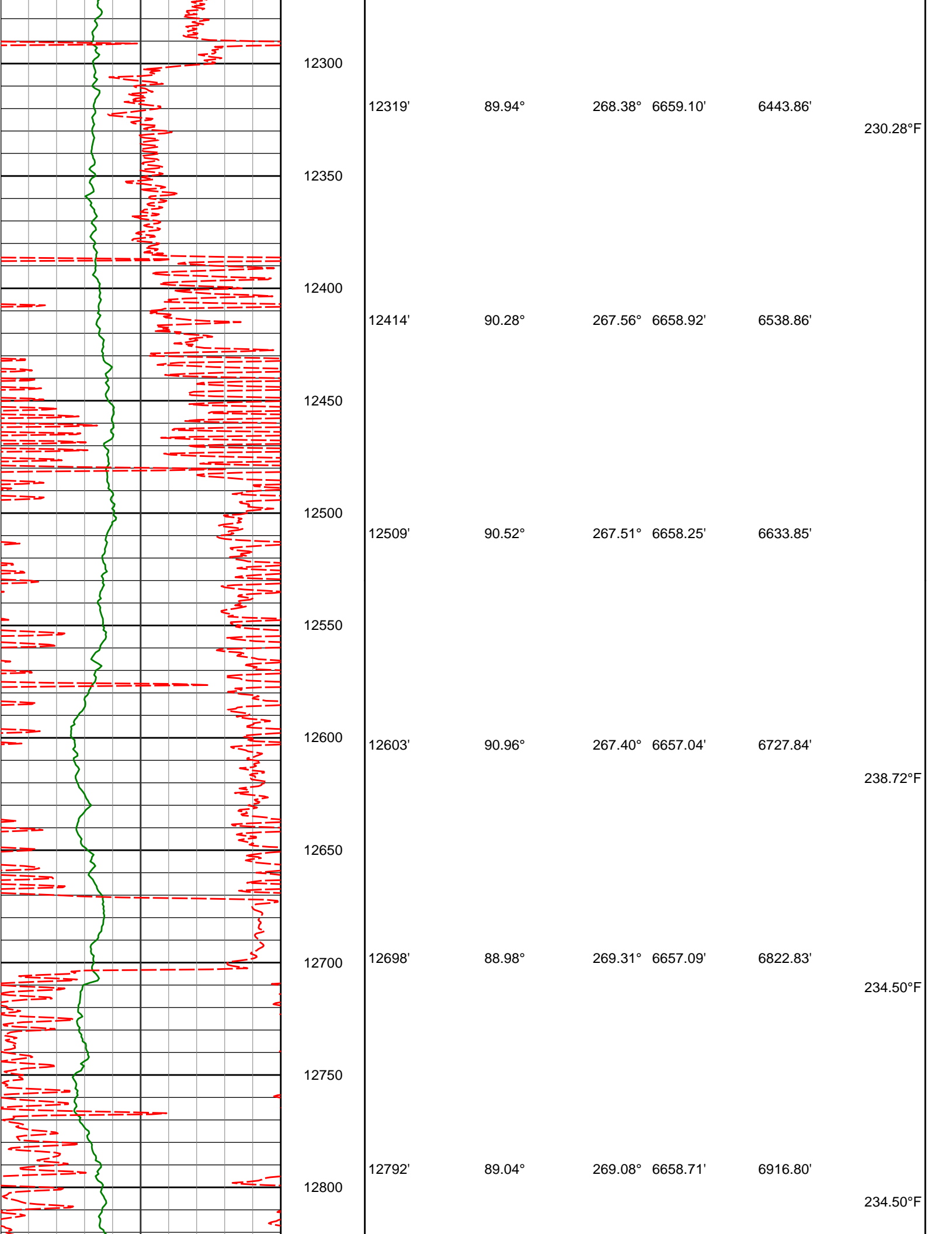


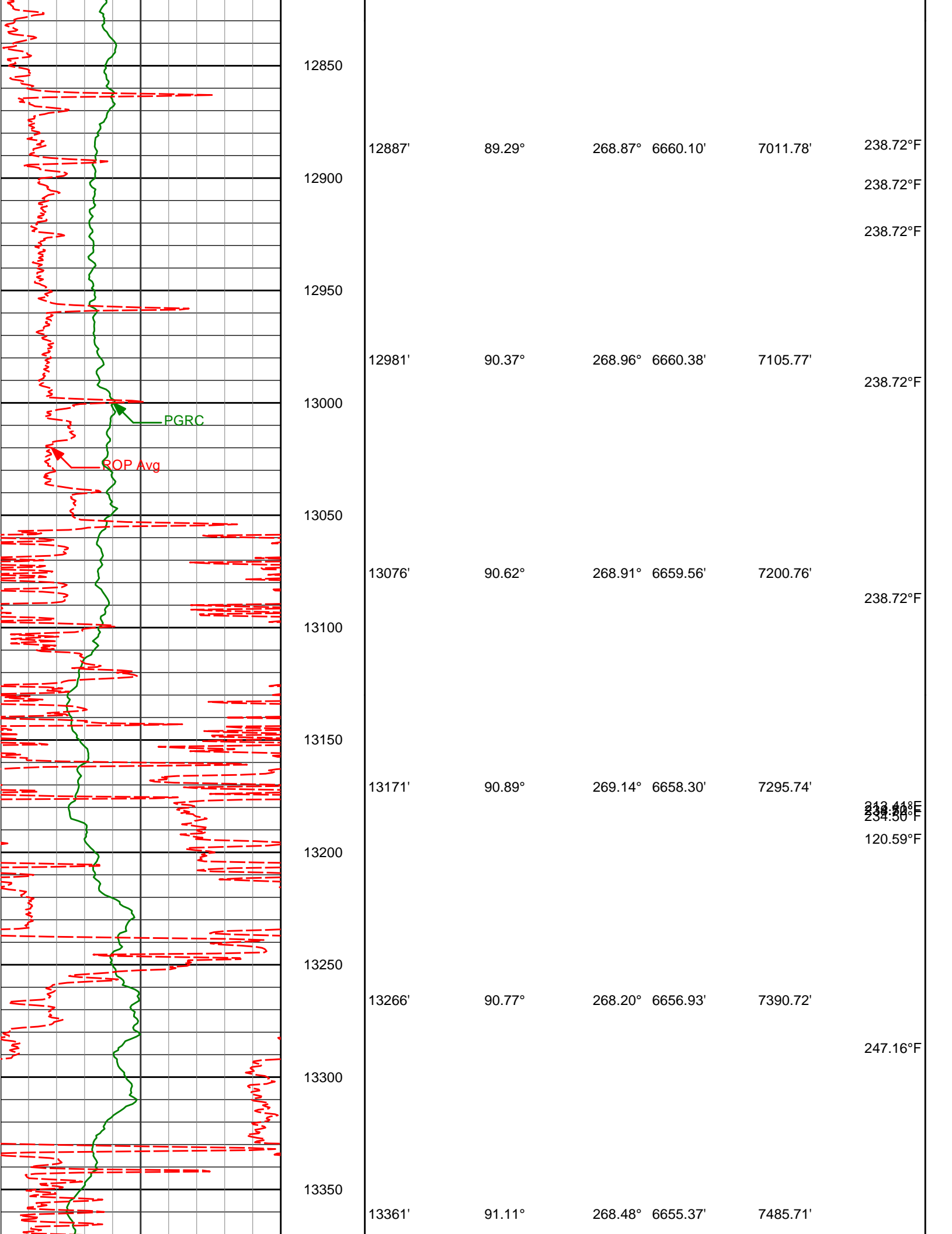


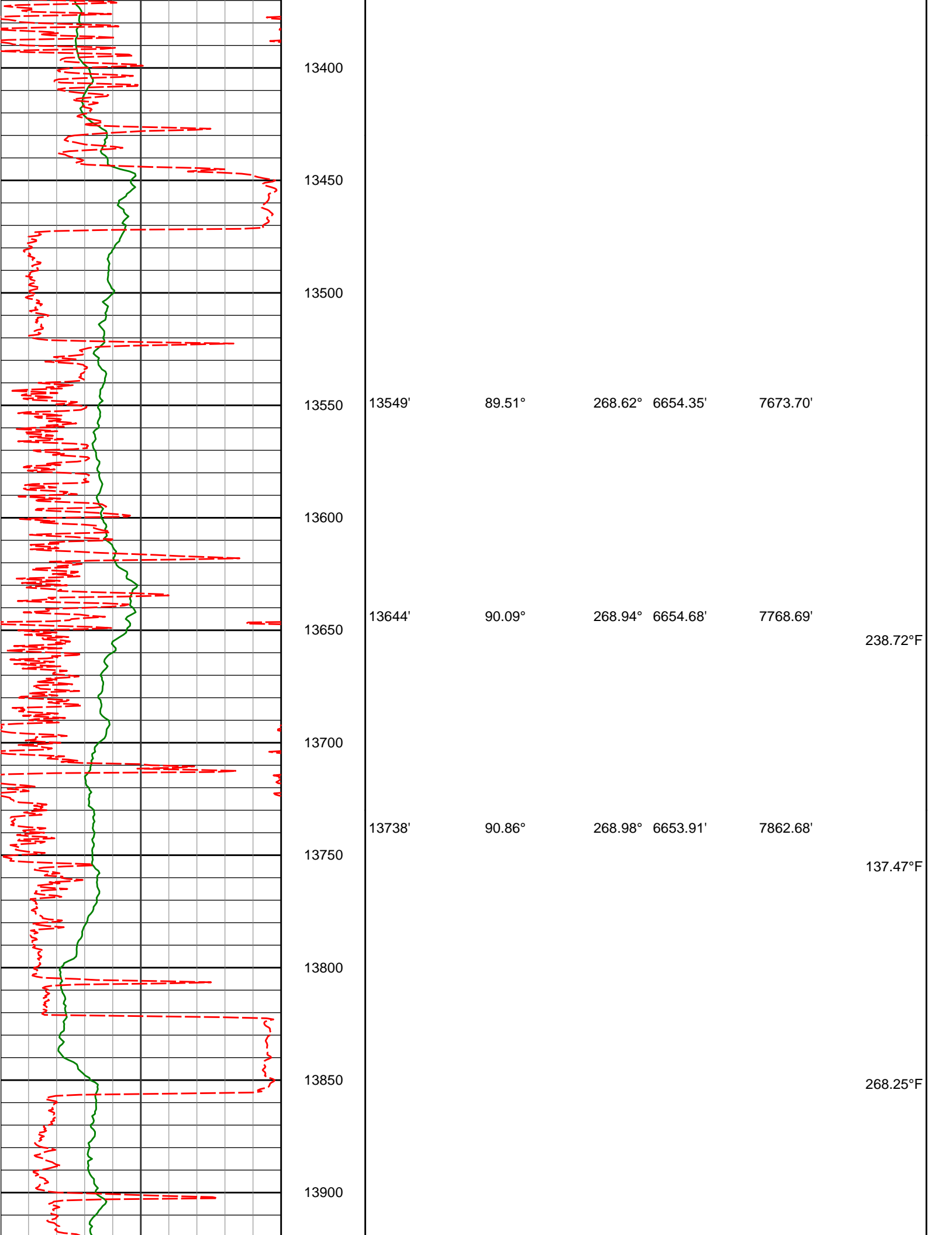


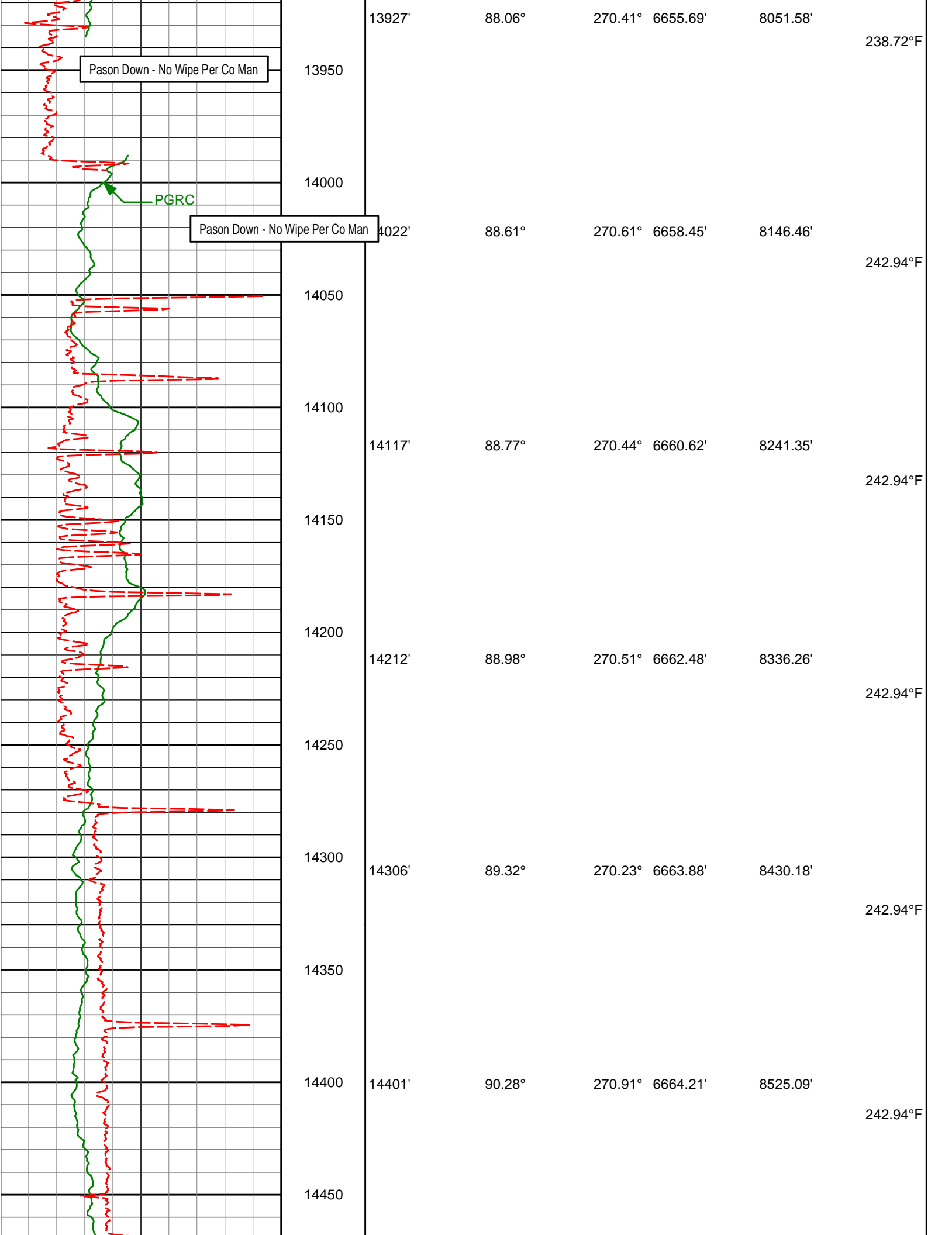


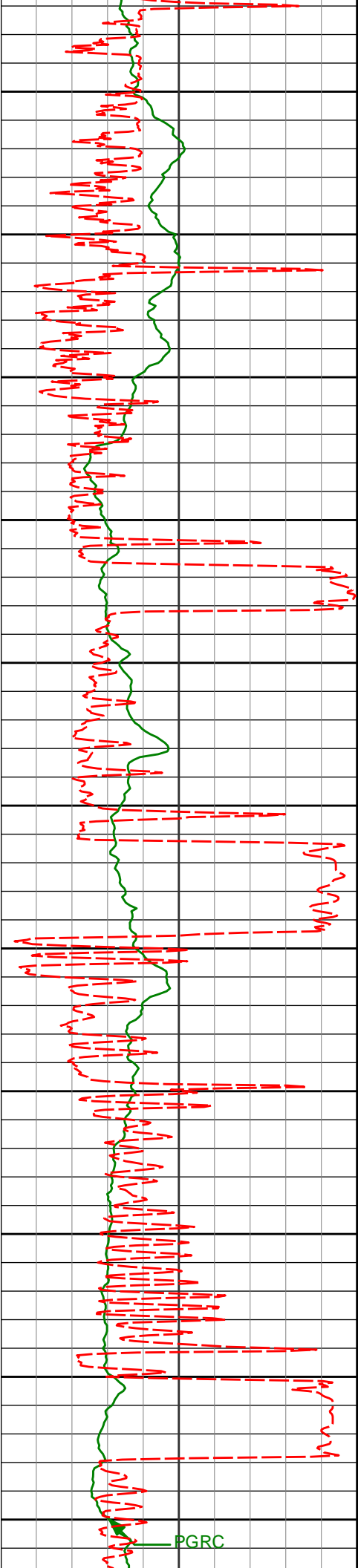












14500

14496'

90.77°

270.84°

6663.34'

8619.98'

242.94°F

14550

14600

14591'

91.27°

270.59°

6661.65'

8714.87'

242.94°F

238.72°F

14650

14700

14685'

91.02°

270.27°

6659.77'

8808.78'

242.94°F

14750

14800

14780'

88.80°

269.97°

6659.92'

8903.72'

14850

14900

14875'

89.26°

269.38°

6661.53'

8998.67'

242.94°F

14950

15000

14970'

87.84°

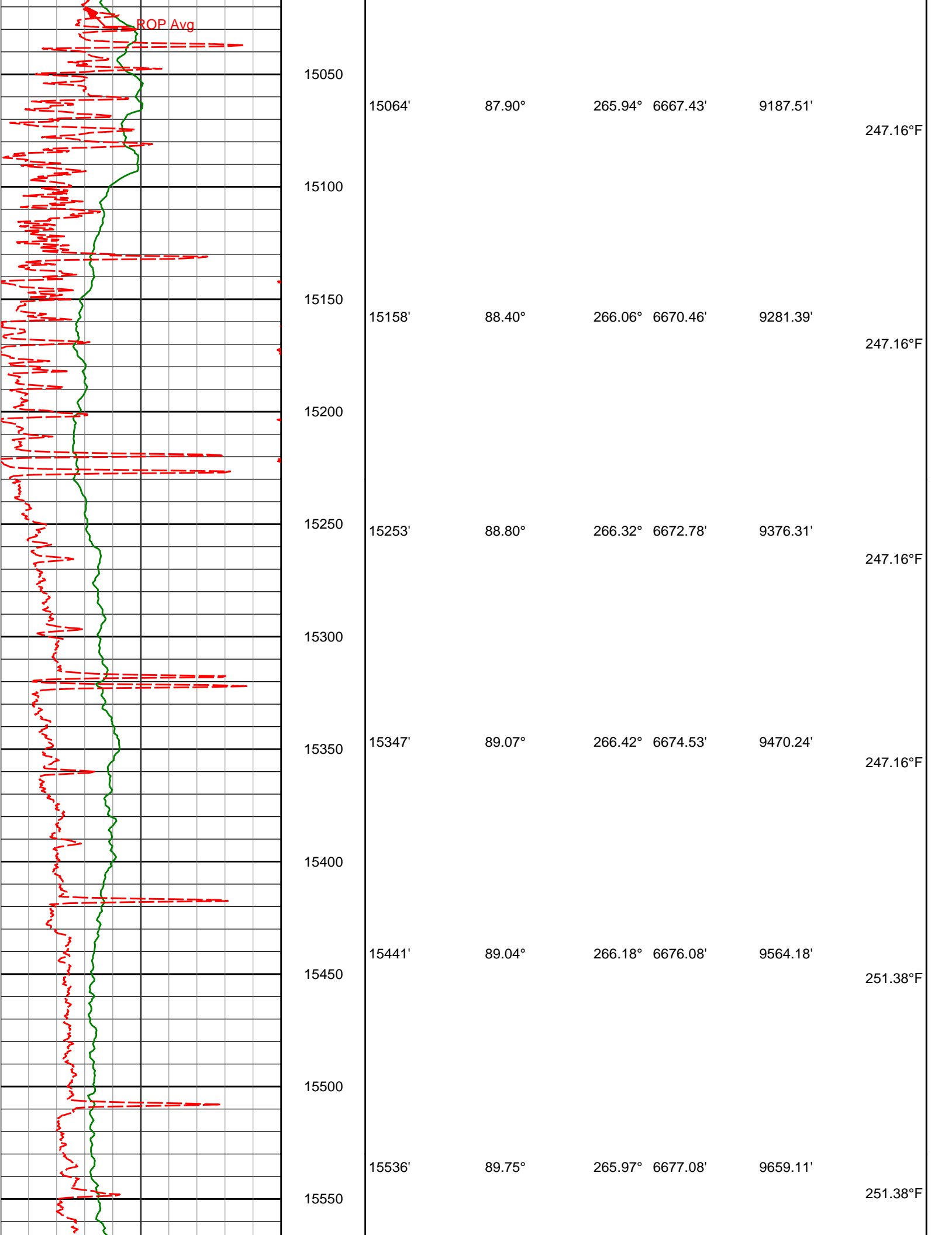
266.47°

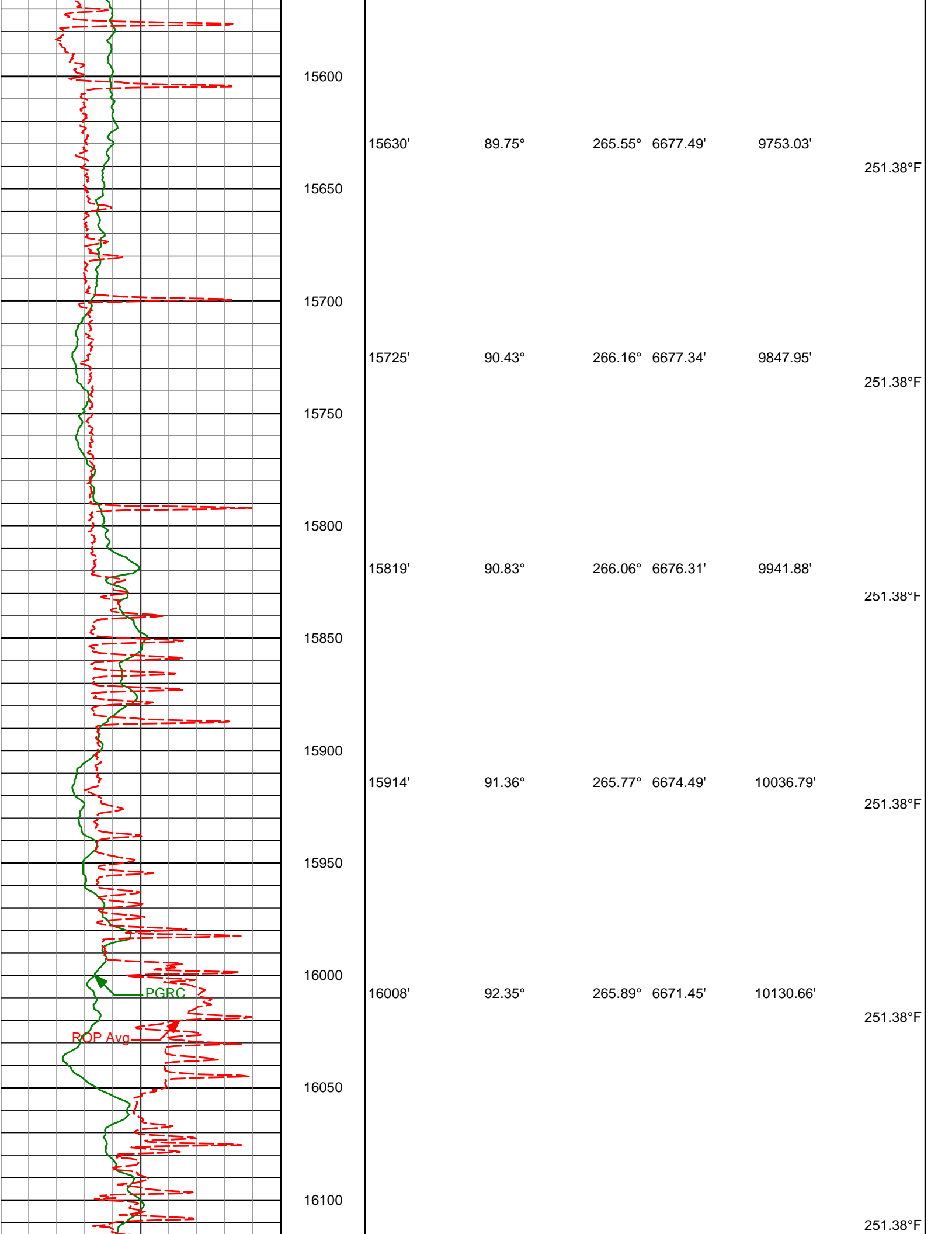
6663.93'

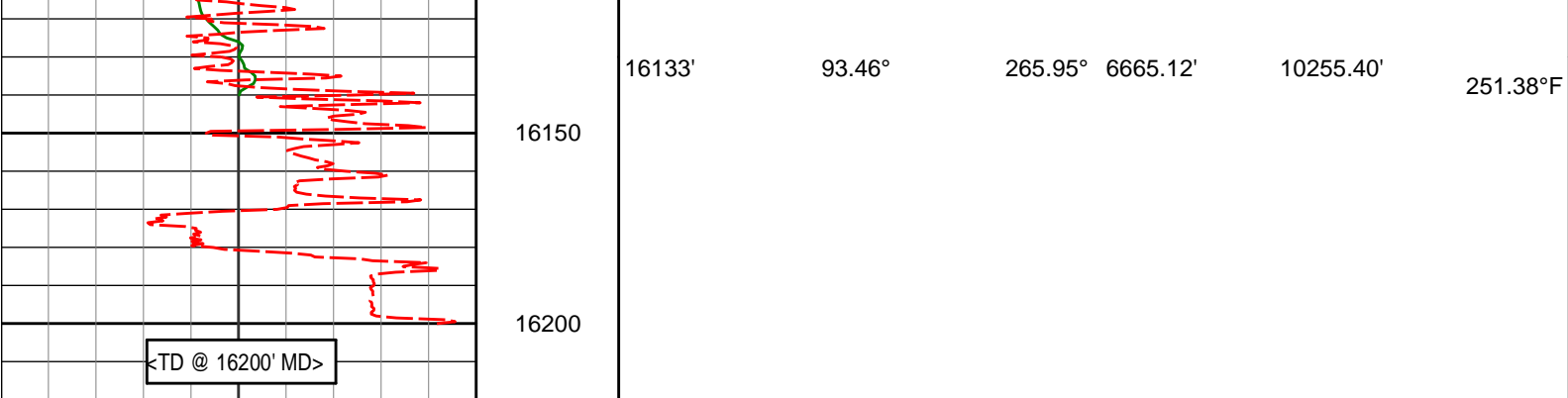
9093.63'

242.94°F

PGRC

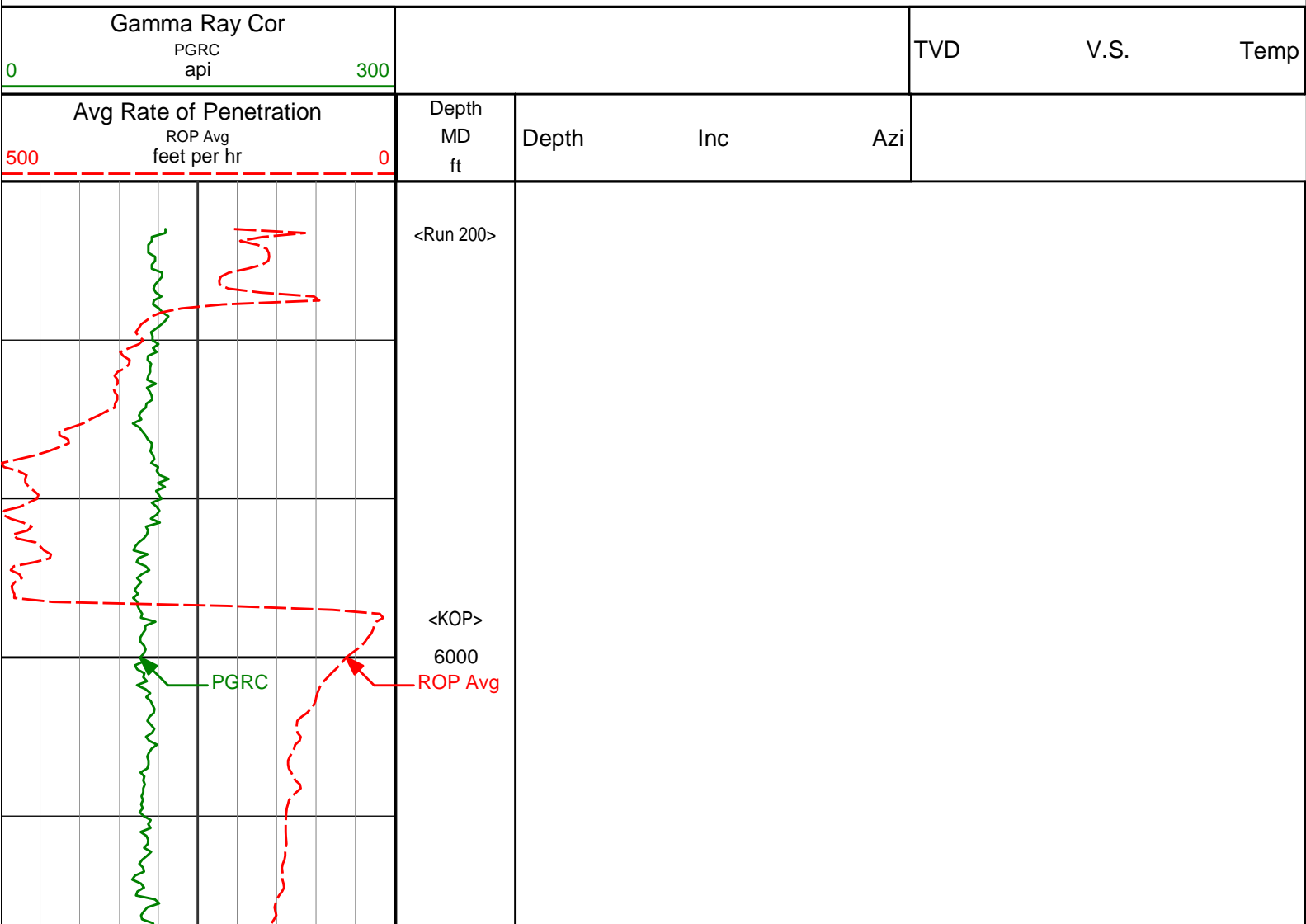


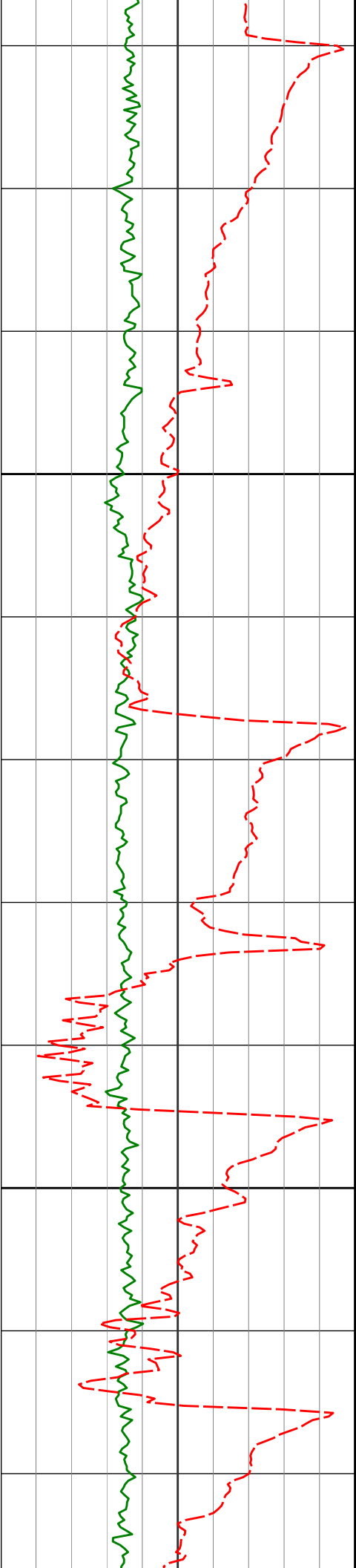




Avg Rate of Penetration ROP Avg feet per hr		Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500 0								
Gamma Ray Cor PGRC api								
0 300								

MD Detail 1:240 Scale





6100

6200

6083'

11.44°

281.93°

6049.37'

499.69'

137.47°F

6178'

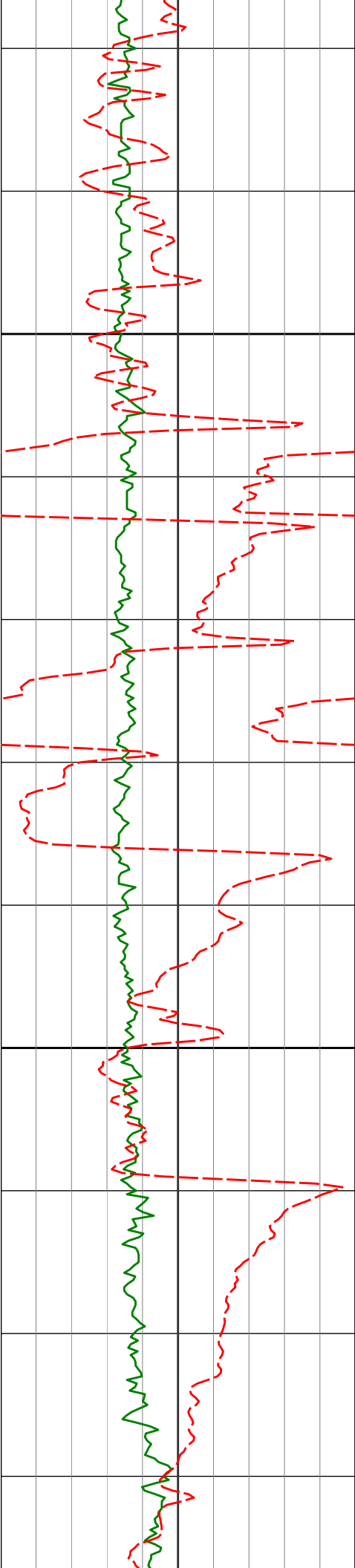
19.07°

282.62°

6140.96'

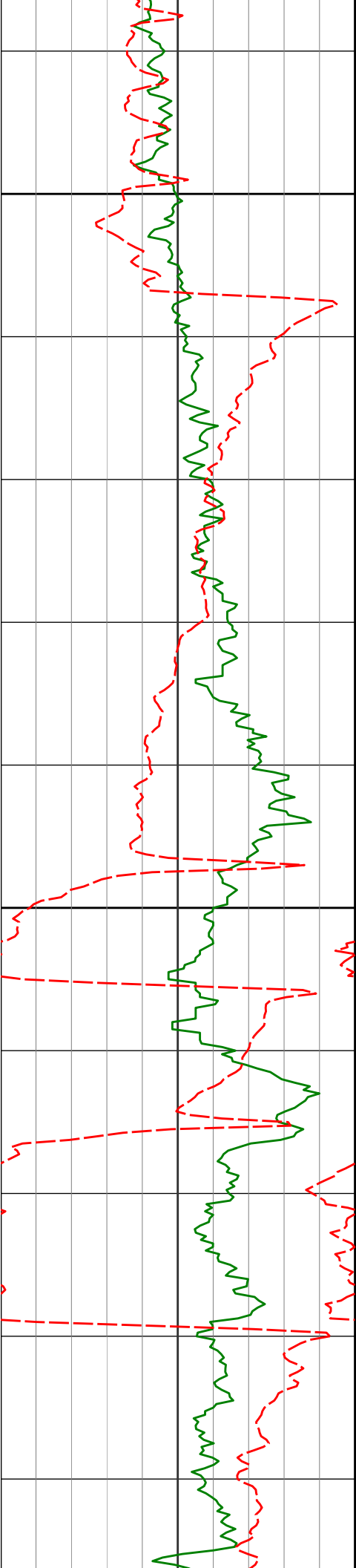
523.90'

141.69°F



6300

6400



6500

6600

6557'

49.96°

268.58°

6455.52'

727.09'

154.34°F

6651'

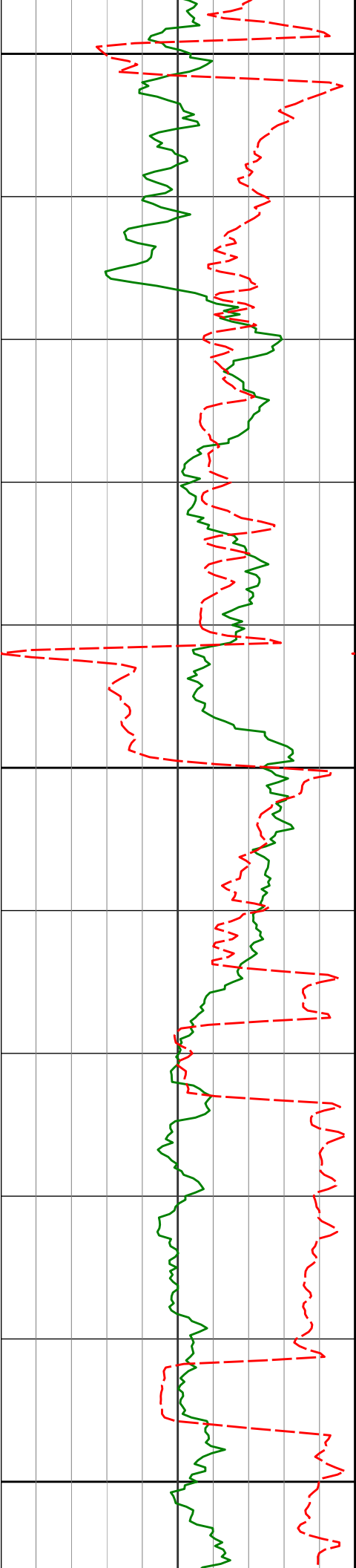
56.08°

264.27°

6512.06'

802.08'

154.34°F



6700

6746'

65.77°

264.77°

6558.17'

884.84'

154.34°F

6800

6841'

71.77°

271.68°

6592.59'

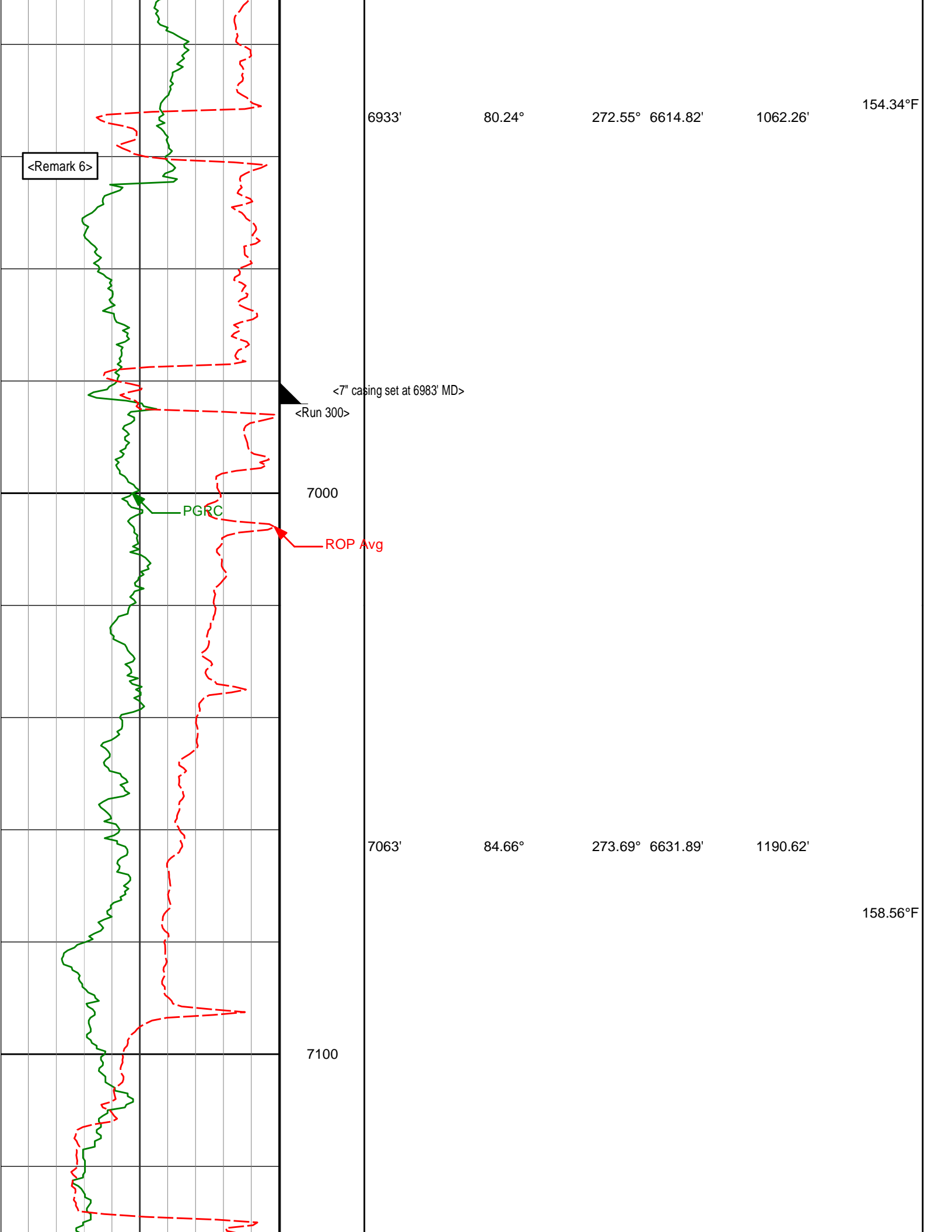
973.29'

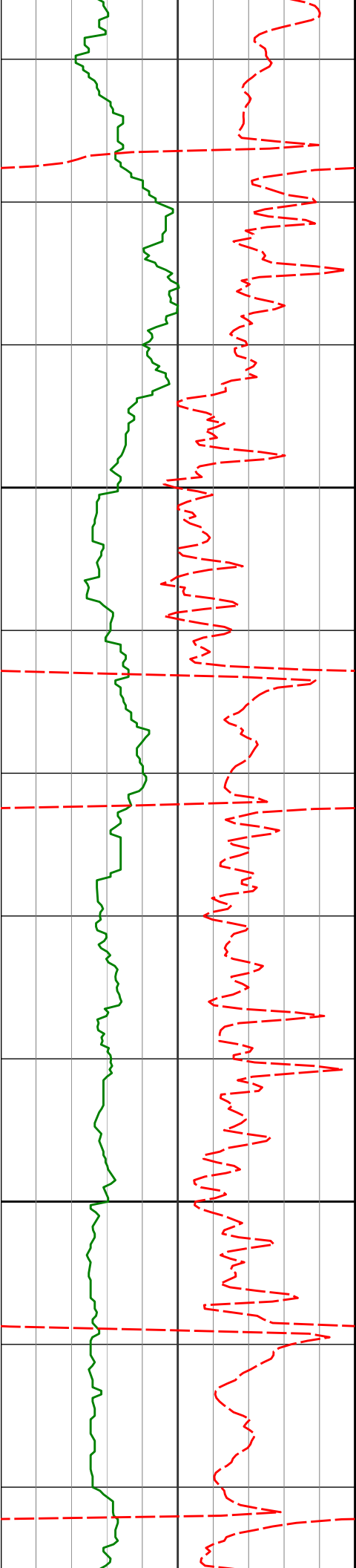
150.13°F

150.13°F

150.13°F

6900





7158'

86.98°

272.78° 6638.82'

1284.99'

7200

7253'

87.90°

270.24° 6643.06'

1379.72'

7300

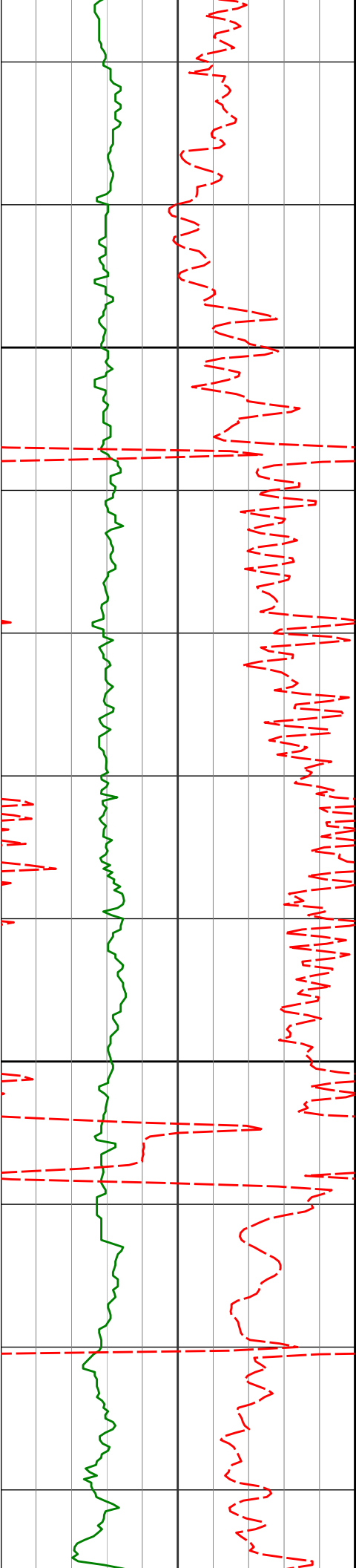
7347'

90.00°

267.67° 6644.78'

1473.69'

171.22°F



7400

7443'

91.45°

269.39° 6643.57'

1569.67'

7500

7538'

89.11°

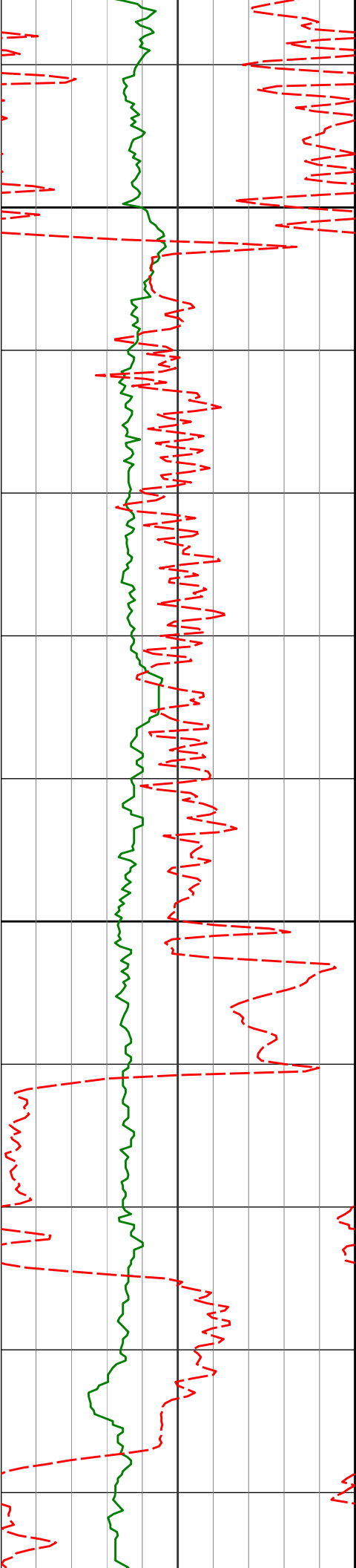
266.37° 6643.11'

1664.65'

171.22°F

179.66°F

179.66°F



7600

7632'

88.74°

265.55° 6644.87'

1758.56'

183.88°F

7700

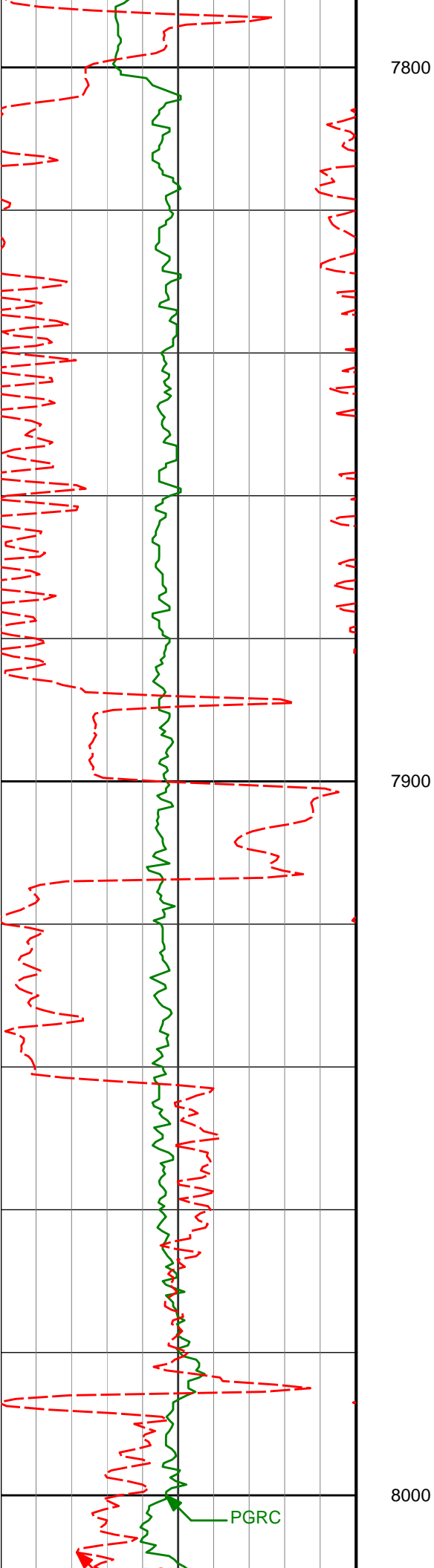
7727'

91.02°

265.55° 6645.07'

1853.46'

183.88°F



7800

7822'

91.73°

265.81° 6642.79'

1948.34'

188.09°F

7900

7916'

90.09°

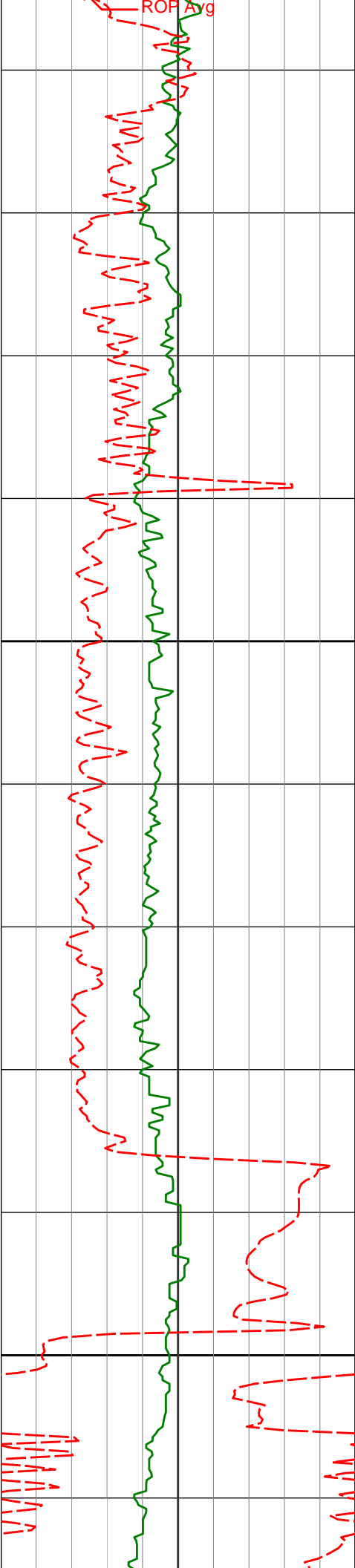
266.49° 6641.30'

2042.27'

188.09°F

8000

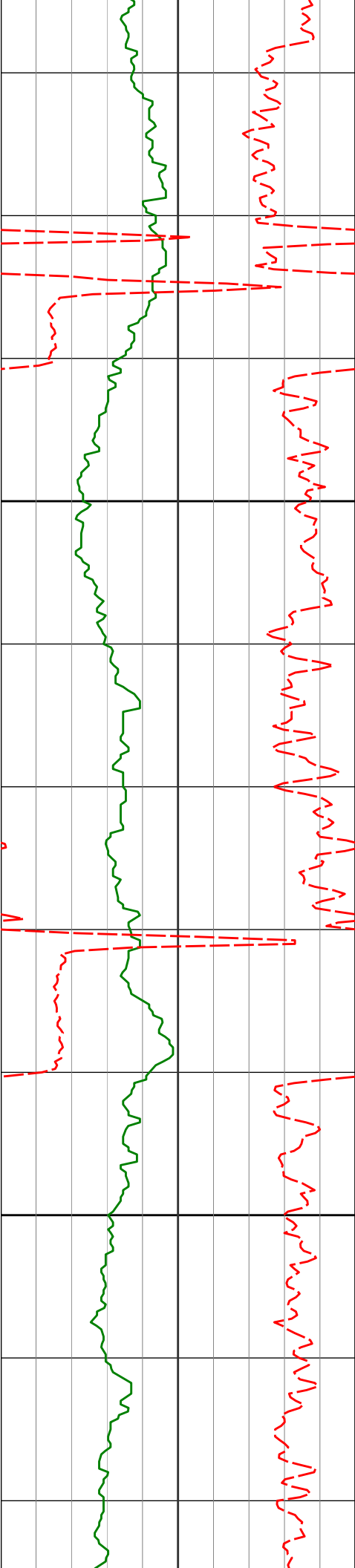
PGRC



8100

8200

8012'	90.00°	265.79°	6641.22'	2138.21'	192.31°F
8107'	90.03°	265.54°	6641.20'	2233.11'	196.53°F
8201'	90.19°	268.01°	6641.02'	2327.08'	192.31°F



8300

8296'

90.22°

268.10° 6640.68'

2422.08'

196.53°F

8400

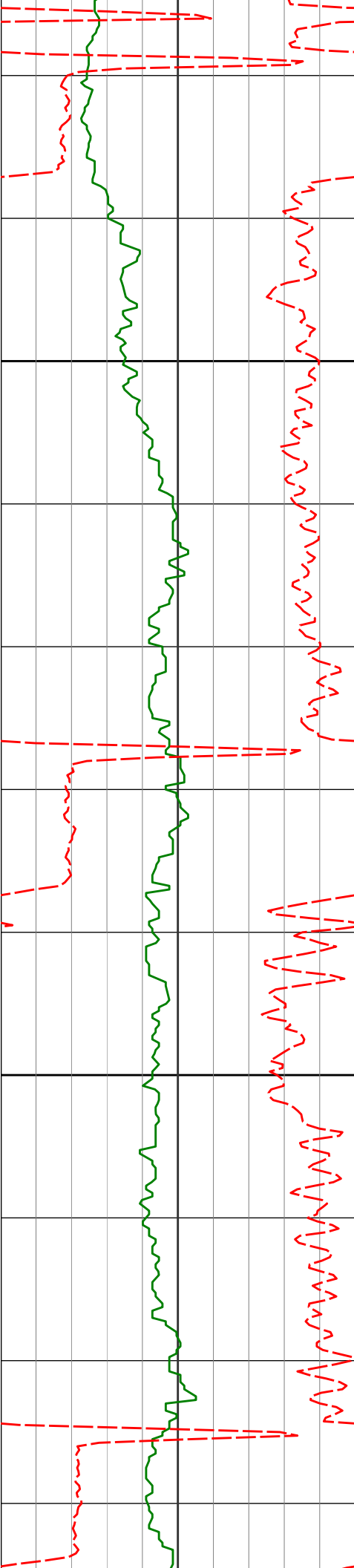
8391'

90.28°

267.61° 6640.26'

2517.08'

196.53°F



8486' 90.31° 267.42° 6639.77' 2612.07'

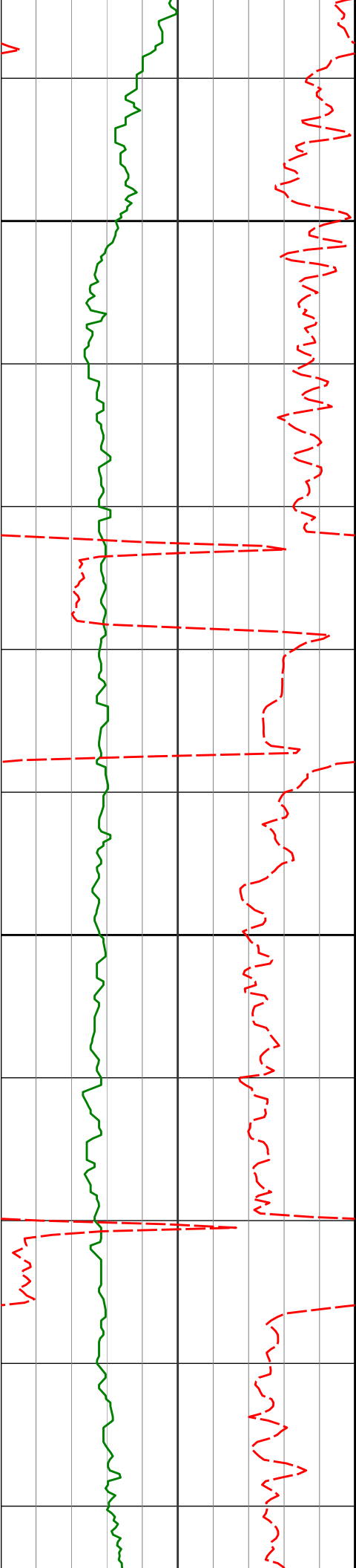
8500

200.75°F

8581' 90.34° 267.31° 6639.23' 2707.06'

8600

200.75°F



8676'

91.02°

267.43° 6638.11'

2802.04'

8700

200.75°F

8771'

89.97°

268.71° 6637.28'

2897.03'

8800

200.75°F

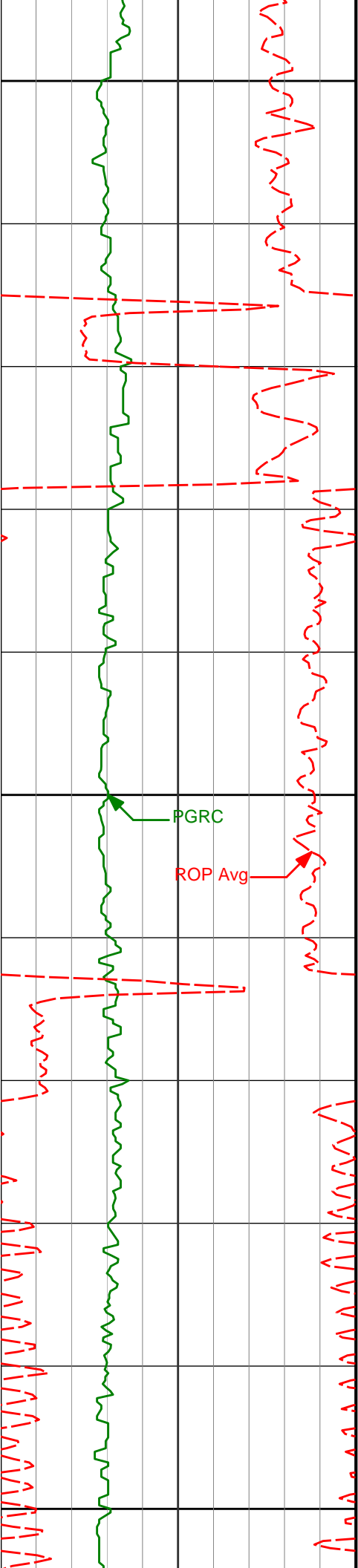
8865'

90.77°

268.74° 6636.68'

2991.03'

204.97°F



8900

8960'

89.38°

268.82° 6636.55'

3086.02'

204.97°F

9000

PGRC

ROP Avg

9054'

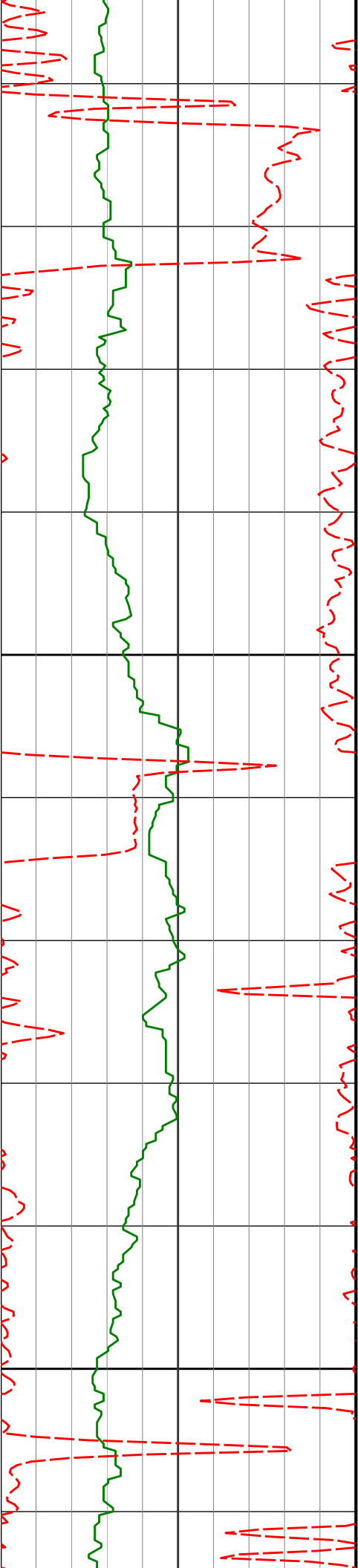
89.78°

268.71° 6637.24'

3180.01'

209.19°F

9100



9149'

87.78°

268.85° 6639.27'

3274.98'

9200

9243'

87.93°

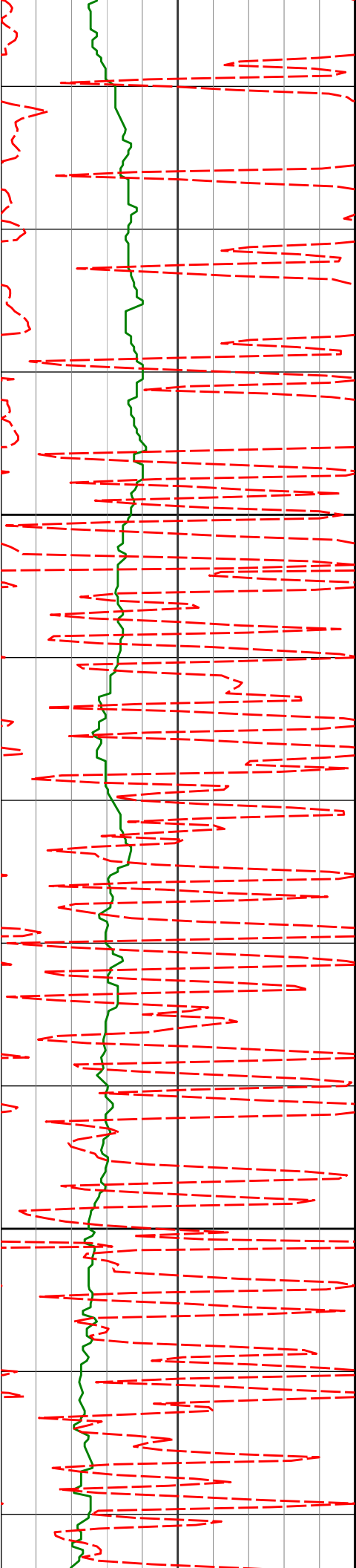
268.96° 6642.78'

3368.91'

9300

209.19°F

209.19°F



9338'

88.24°

268.96° 6645.96'

3463.84'

213.41°F

9400

9432'

88.34°

269.19° 6648.76'

3557.79'

213.41°F

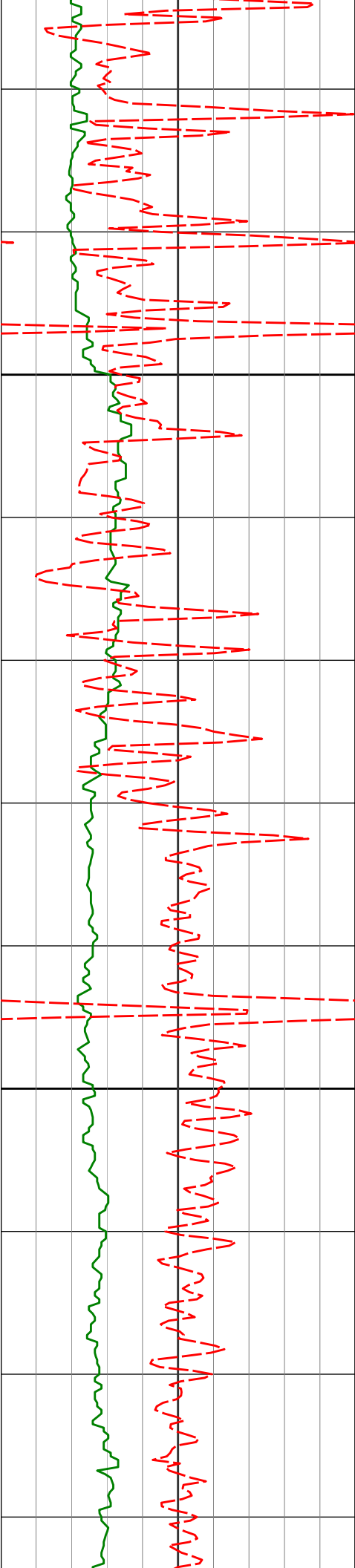
9500

9527'

88.43°

268.70° 6651.44'

3652.74'



9600

9621'

88.52°

268.64° 6653.94'

3746.71'

217.63°F

9700

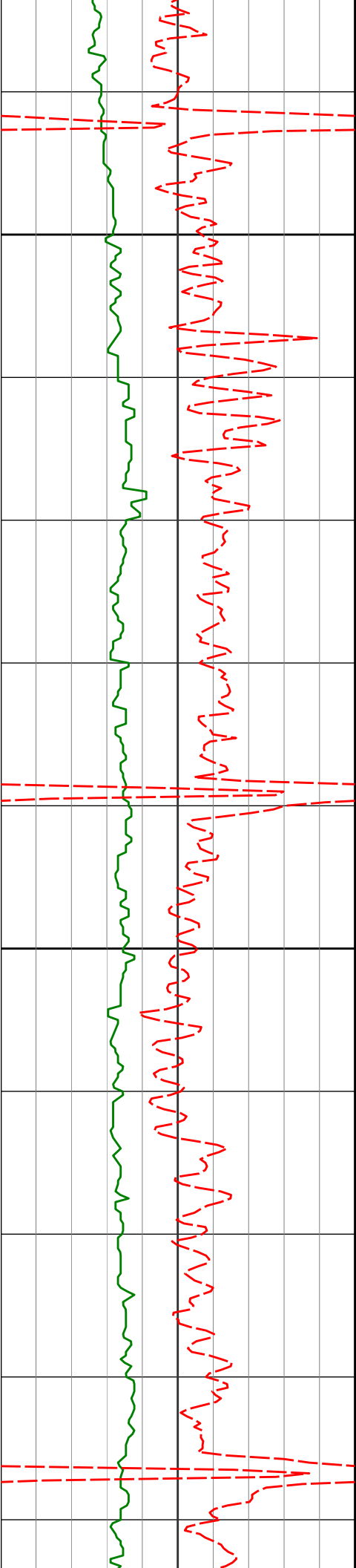
9716'

88.74°

268.70° 6656.21'

3841.68'

217.63°F



9800

9811'

89.07°

268.54° 6658.03'

3936.66'

221.84°F

9900

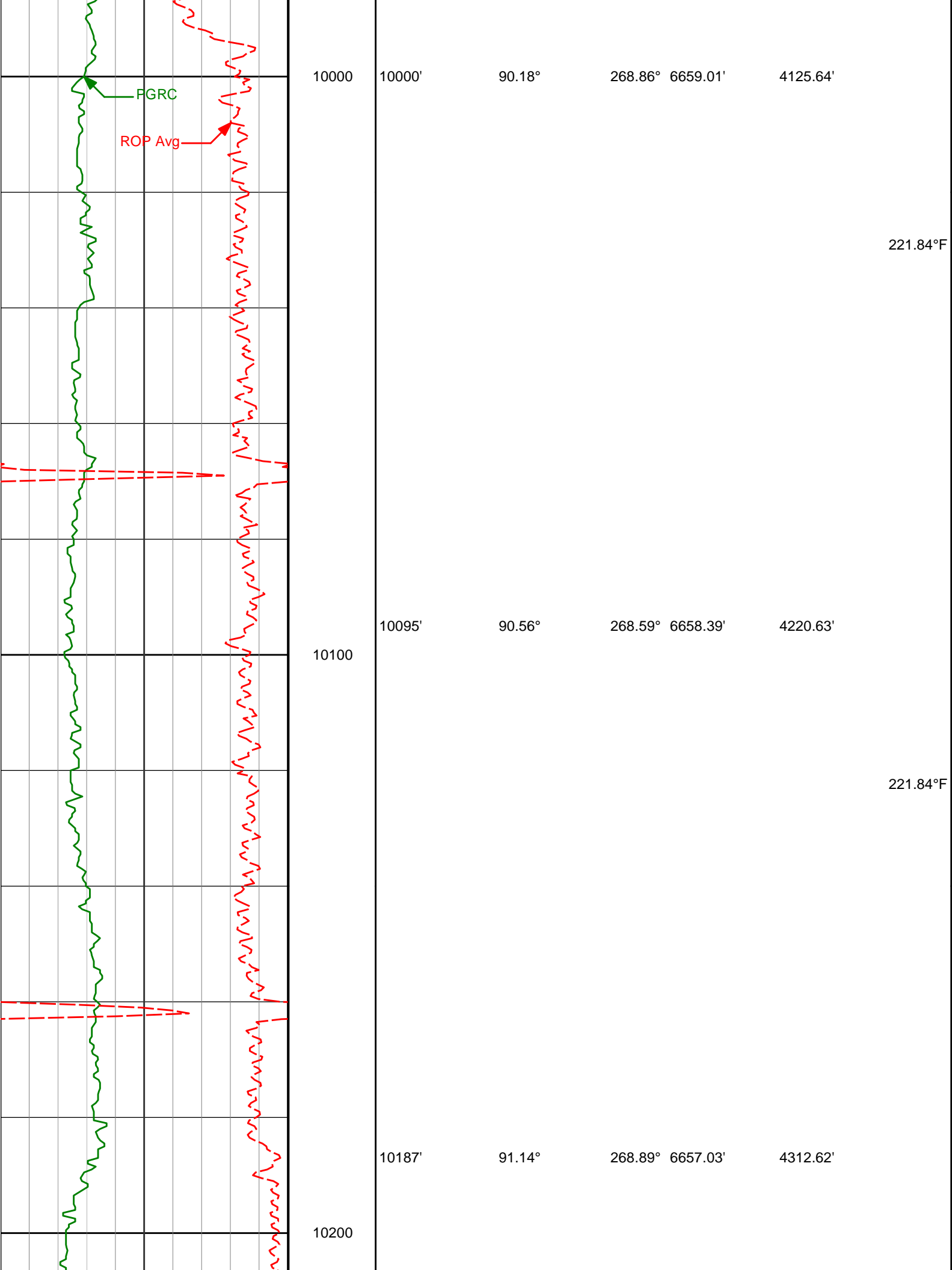
9905'

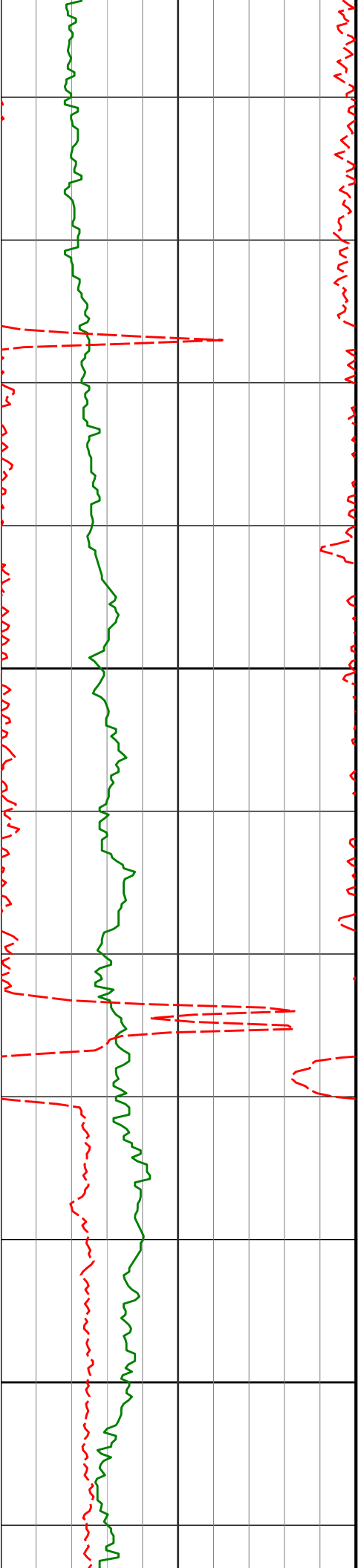
89.78°

268.80° 6658.97'

4030.65'

221.84°F





10300

10400

10279'

10372'

91.54°

91.79°

268.96° 6654.88'

268.75° 6652.17'

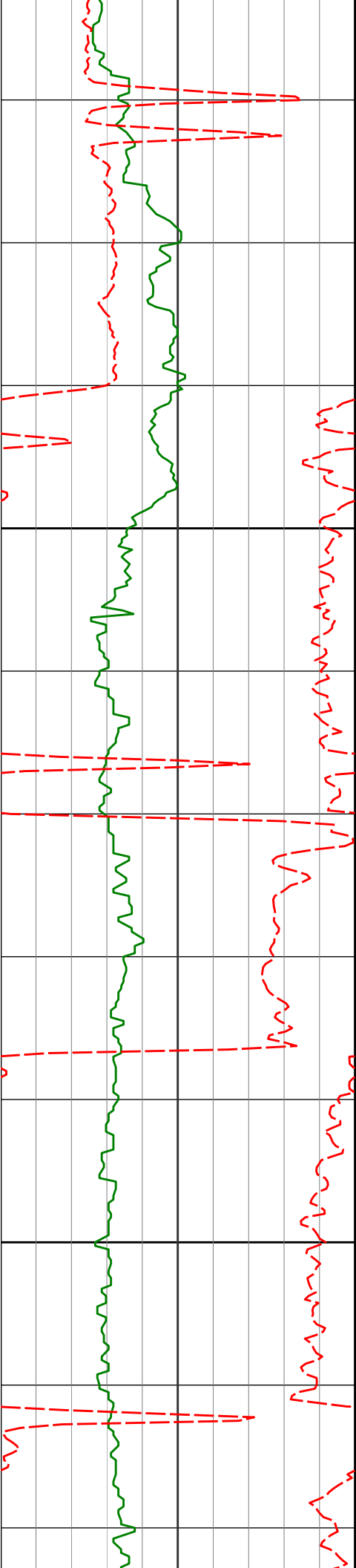
4404.58'

4497.54'

221.84°F

221.84°F

221.84°F



10500

10600

10464'

92.35°

268.90°

6648.85'

4589.47'

196.53°F

10557'

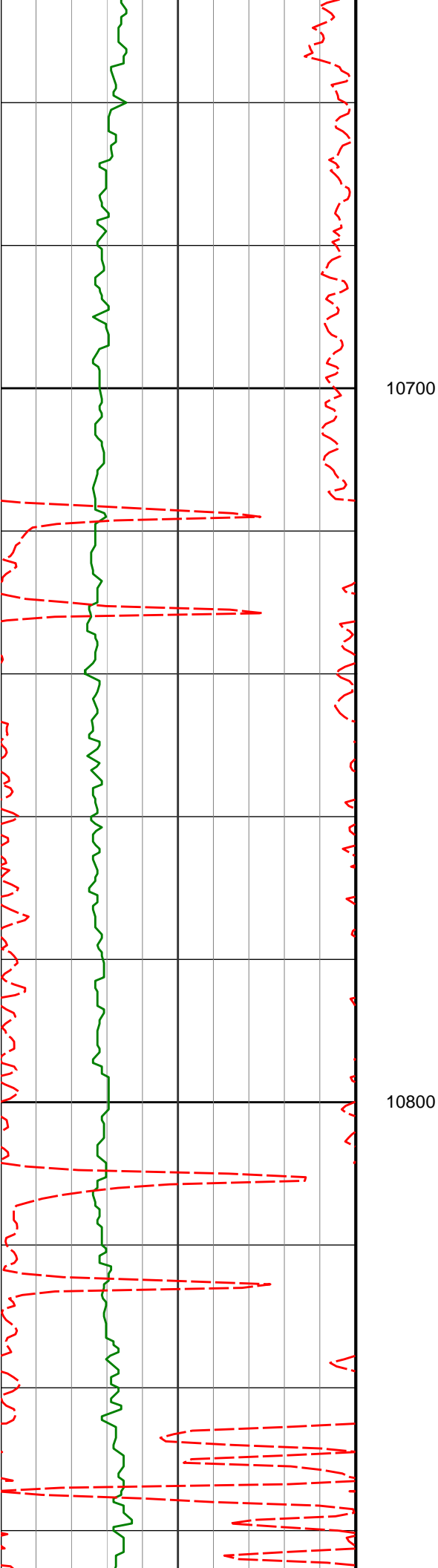
90.09°

267.98°

6646.87'

4682.44'

221.84°F



10649'

89.26°

267.17° 6647.39'

4774.43'

10700

10741'

89.48°

267.14° 6648.40'

4866.41'

10800

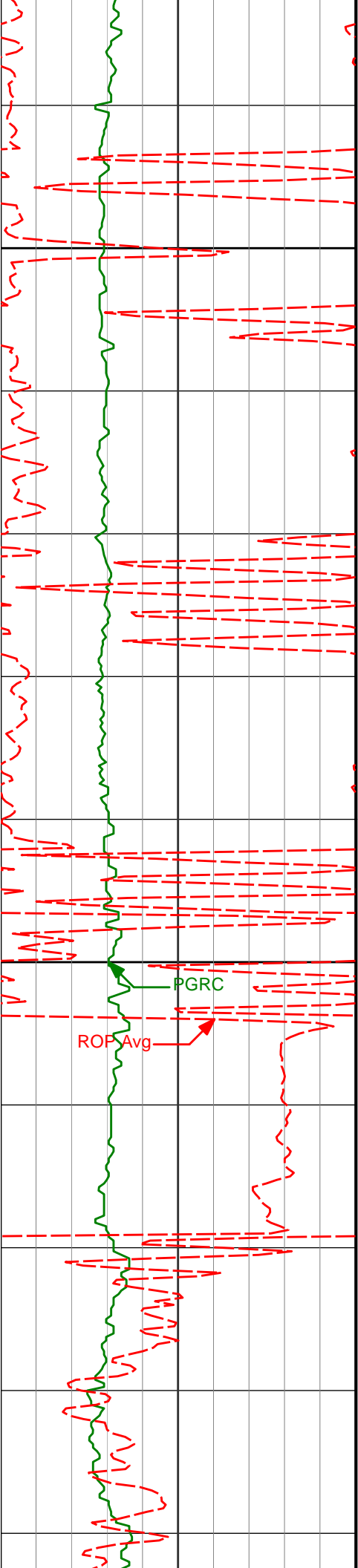
10833'

90.03°

267.22° 6648.80'

4958.40'

230.28°F



10900

10926'

90.37°

267.58° 6648.47'

5051.39'

221.84°F

276.69°F

11000

PGRC

ROP Avg

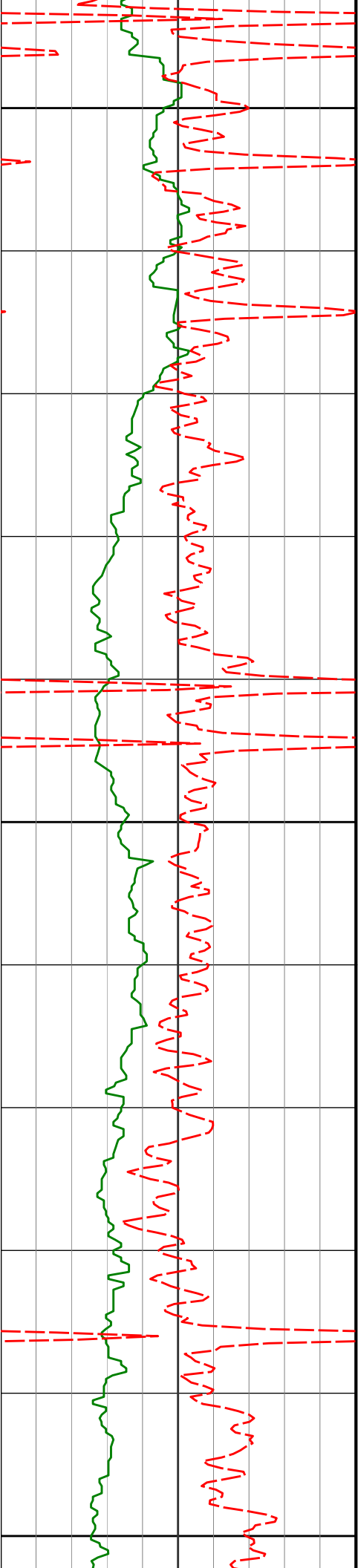
11018'

88.46°

266.94° 6649.41'

5143.37'

226.06°F



11100

11111'

87.60°

267.29° 6652.61'

5236.30'

196.53°F
230.28°F

11200

11203'

87.60°

267.22° 6656.46'

5328.21'

230.28°F

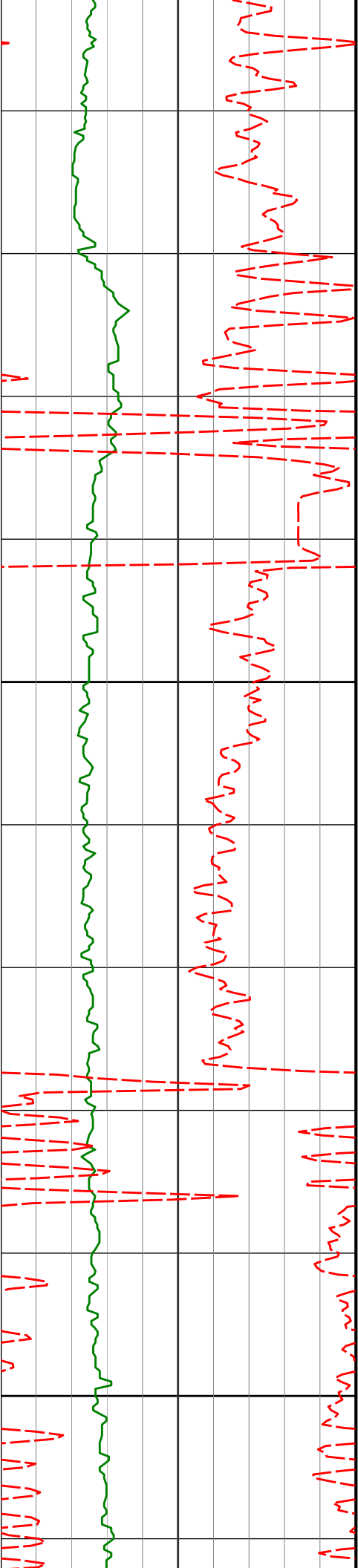
11300

11296'

87.53°

267.34° 6660.41'

5421.11'



11400

11500

11387'

11480'

88.80°

89.63°

267.17° 6663.33'

267.24° 6664.60'

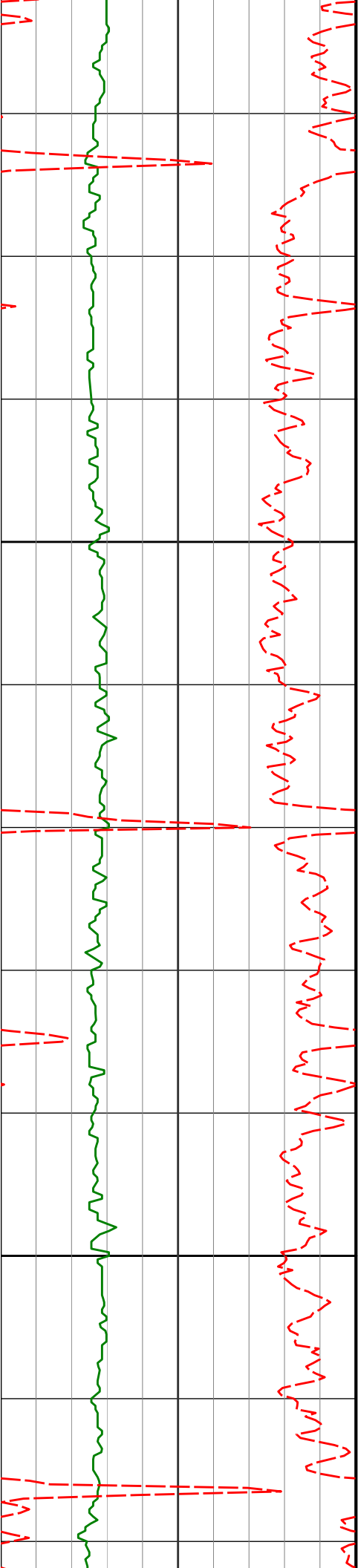
5512.05'

5605.03'

230.28°F

230.28°F

230.28°F



11572'

89.60°

266.81°

6665.22'

5697.01'

230.28°F

11600

11664'

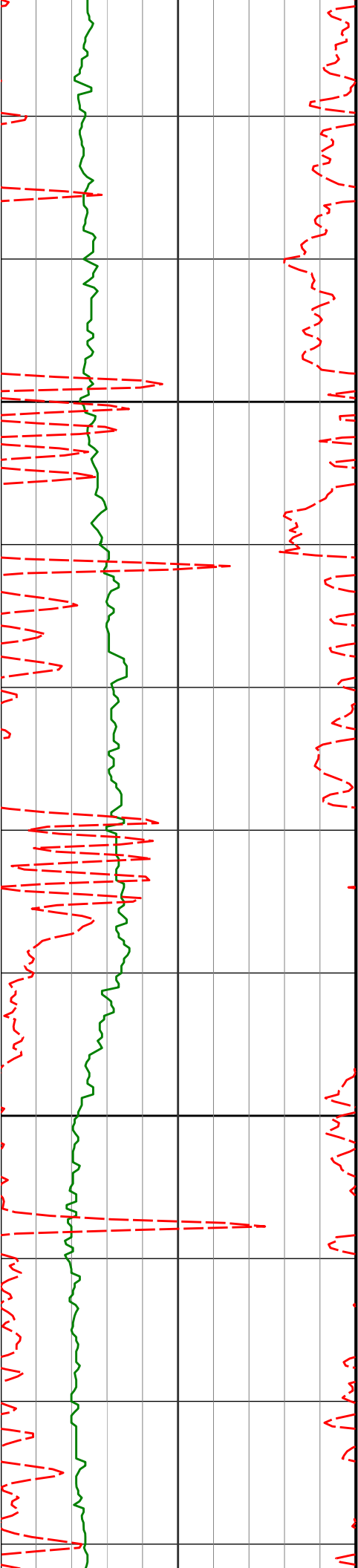
90.28°

267.57°

6665.32'

5788.99'

11700



11800

11900

11756'

90.56°

267.24° 6664.64'

5880.98'

11848'

90.77°

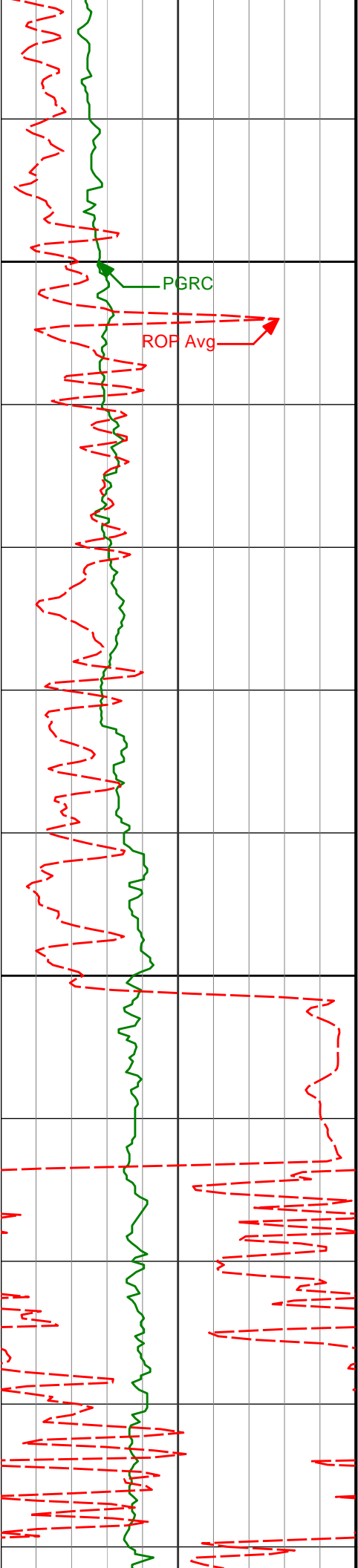
267.32° 6663.57'

5972.96'

230.28°F

204.97°F

124.81°F



12000

PGRC

ROP Avg

12035'

91.63°

267.21° 6659.66'

6159.90'

234.50°F

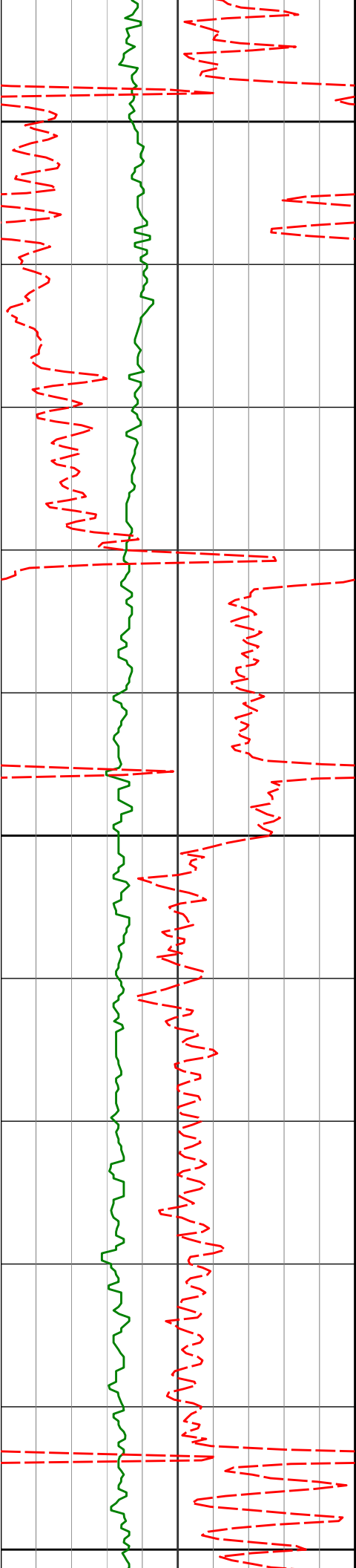
12100

12130'

89.72°

269.38° 6658.54'

6254.88'



12200

12300

12319'

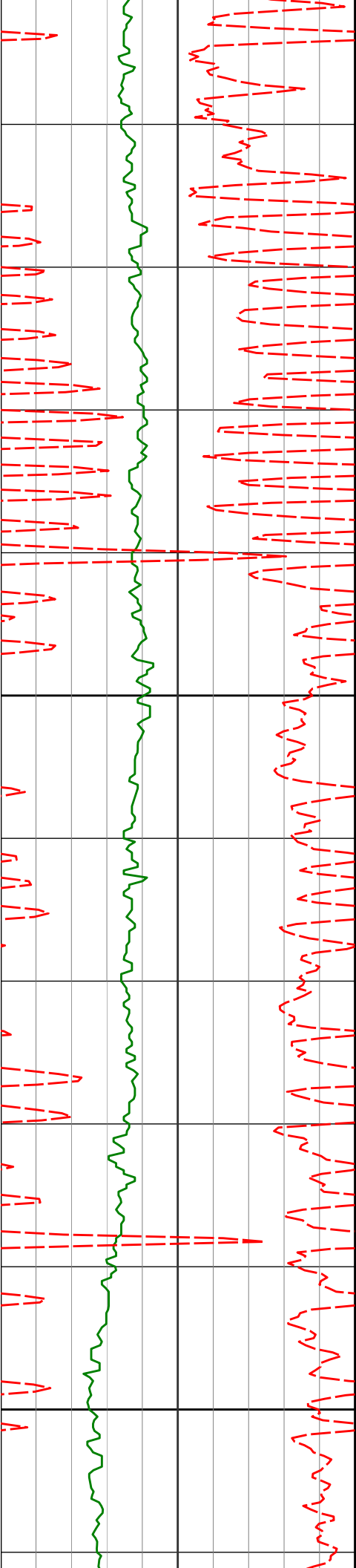
89.94°

268.38° 6659.10'

6443.86'

230.28°F

12400



12500

12600

12414'

12509'

12603'

90.28°

90.52°

90.96°

267.56° 6658.92'

267.51° 6658.25'

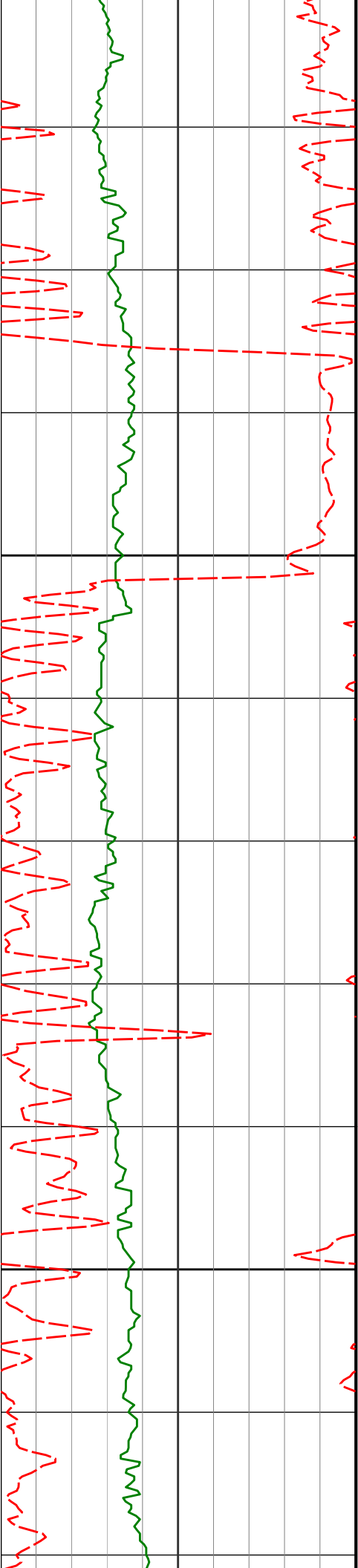
267.40° 6657.04'

6538.86'

6633.85'

6727.84'

238.72°F



12700

12698'

88.98°

269.31° 6657.09'

6822.83'

234.50°F

12800

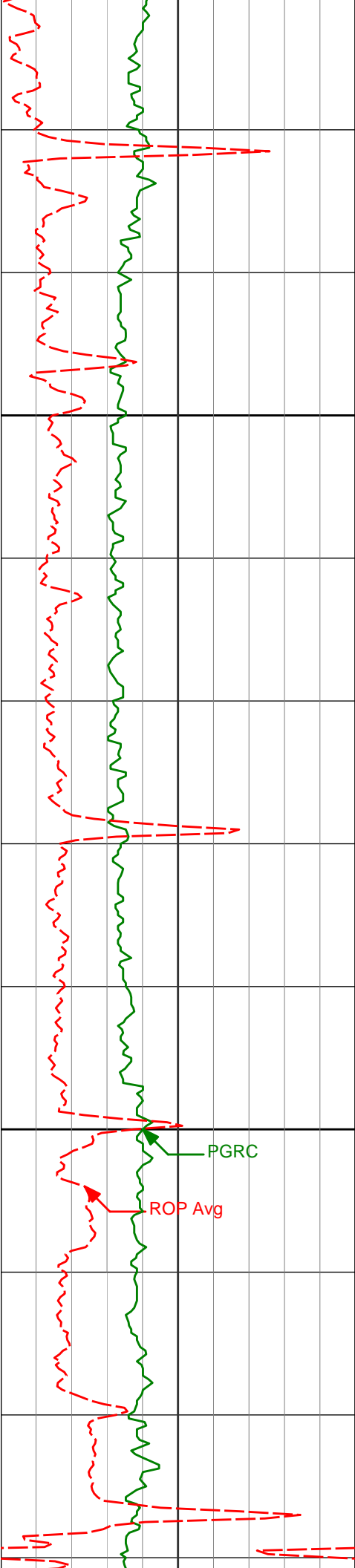
12792'

89.04°

269.08° 6658.71'

6916.80'

234.50°F



12900

13000

12887'

89.29°

268.87°

6660.10'

7011.78'

238.72°F

238.72°F

238.72°F

12981'

90.37°

268.96°

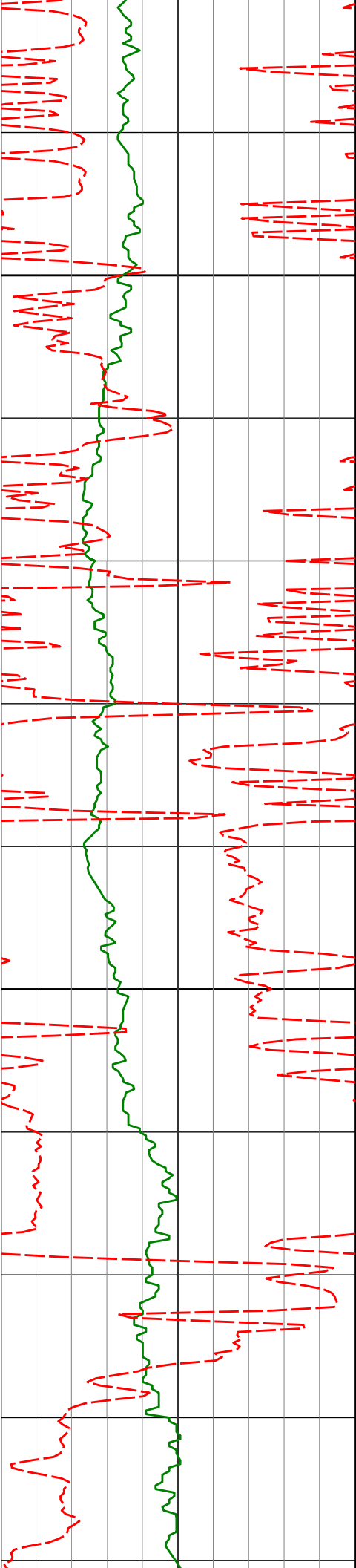
6660.38'

7105.77'

238.72°F

PGRC

ROP Avg



13076'

90.62°

268.91° 6659.56'

7200.76'

13100

13171'

90.89°

269.14° 6658.30'

7295.74'

13200

13266'

90.77°

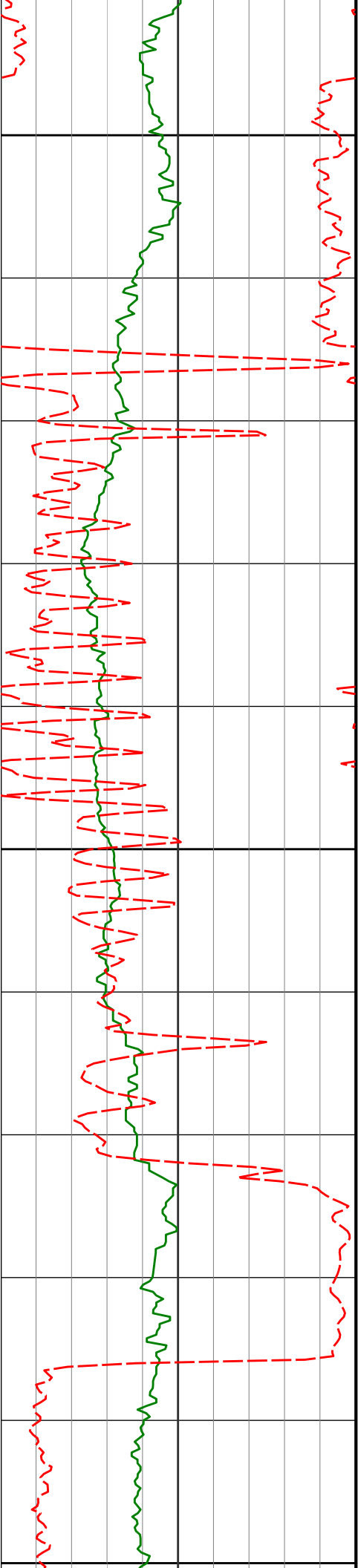
268.20° 6656.93'

7390.72'

238.72°F

213.41°F
238.50°F
234.50°F

120.59°F



13300

13361'

91.11°

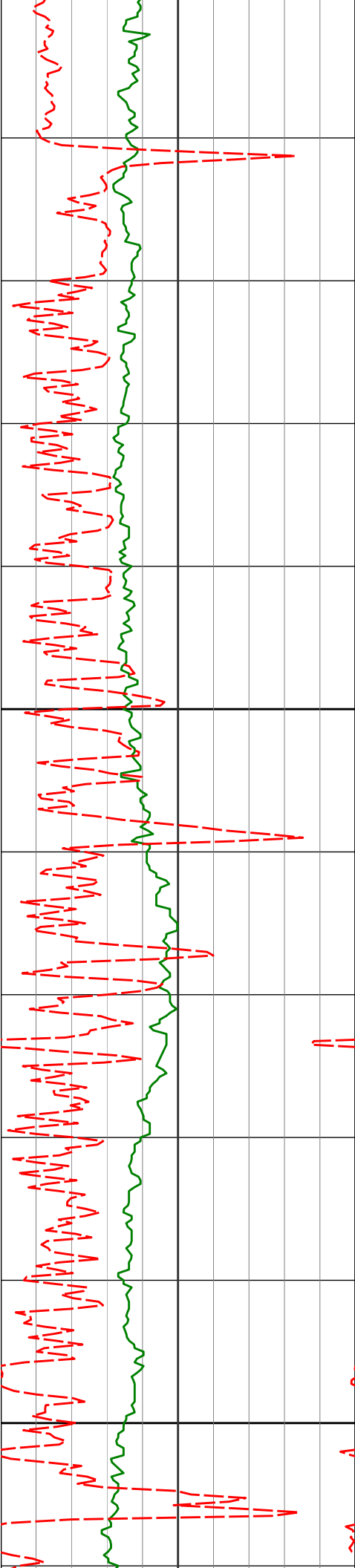
268.48° 6655.37'

7485.71'

13400

13500

247.16°F



13500

13549'

89.51°

268.62° 6654.35'

7673.70'

13600

13644'

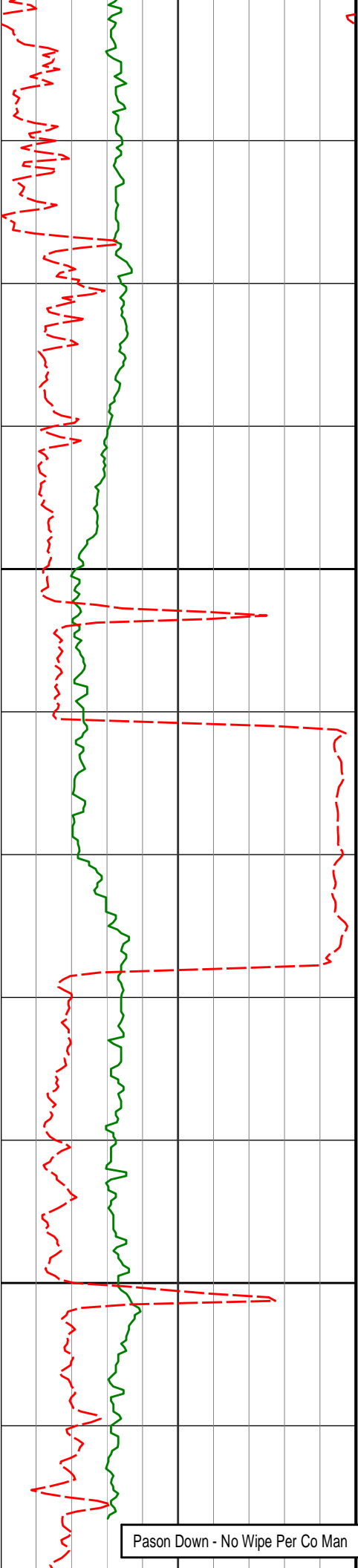
90.09°

268.94° 6654.68'

7768.69'

13700

238.72°F



13738'

90.86°

268.98° 6653.91'

7862.68'

13800

13900

13927'

88.06°

270.41° 6655.69'

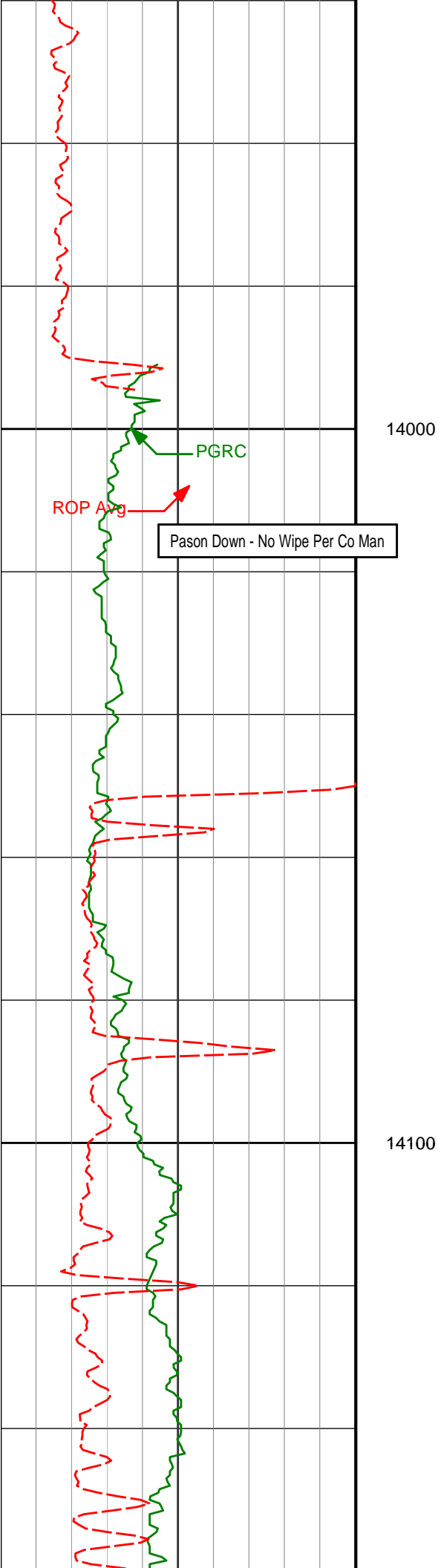
8051.58'

Pason Down - No Wipe Per Co Man

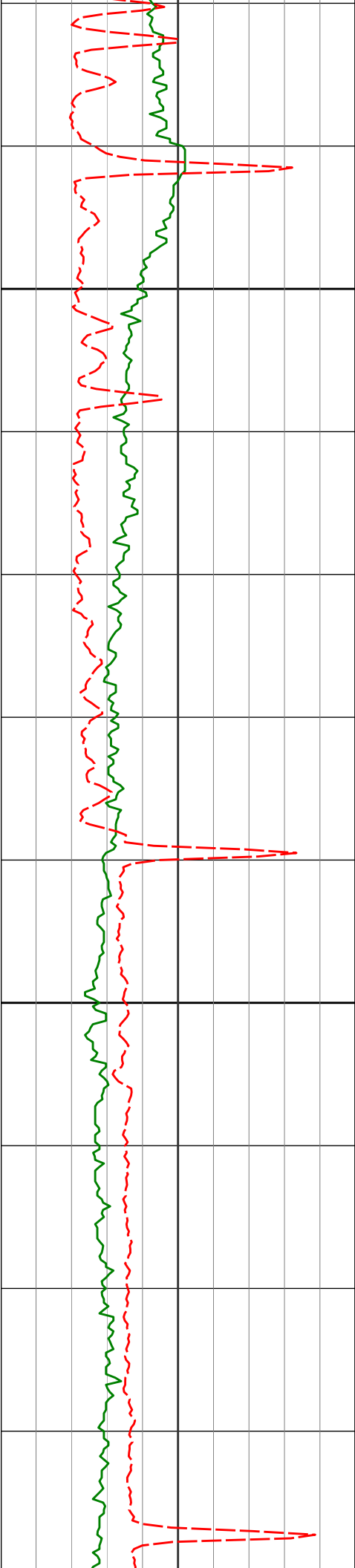
137.47°F

268.25°F

238.72°F



14022'	88.61°	270.61°	6658.45'	8146.46'	242.94°F
14117'	88.77°	270.44°	6660.62'	8241.35'	242.94°F



14200

14212'

88.98°

270.51° 6662.48'

8336.26'

242.94°F

14300

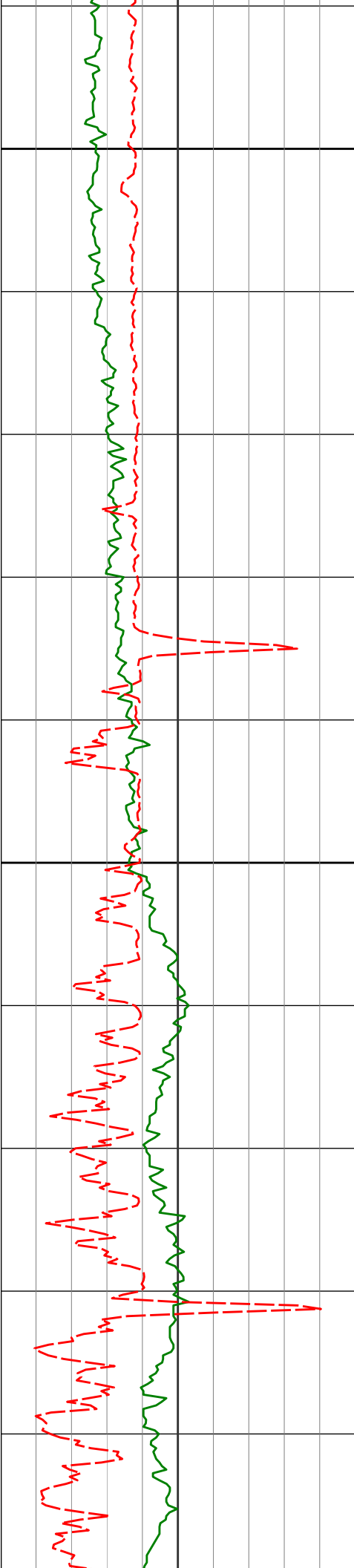
14306'

89.32°

270.23° 6663.88'

8430.18'

242.94°F



14400

14401'

90.28°

270.91° 6664.21'

8525.09'

242.94°F

14500

14496'

90.77°

270.84° 6663.34'

8619.98'

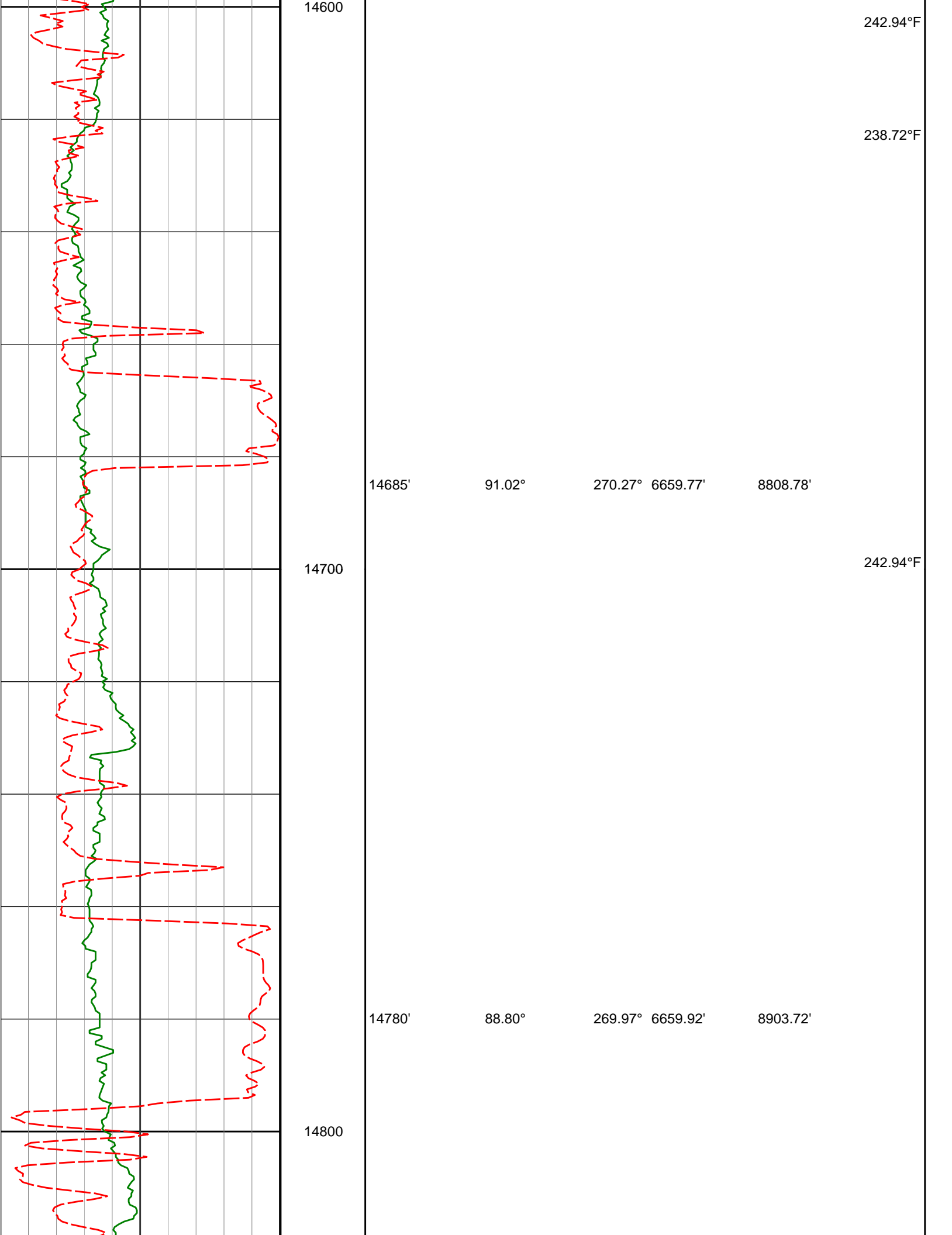
242.94°F

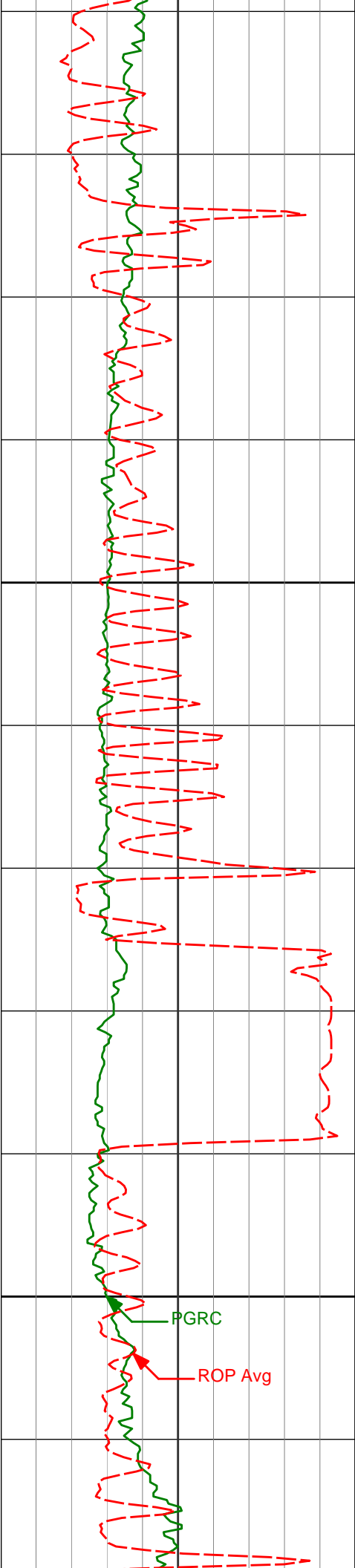
14591'

91.27°

270.59° 6661.65'

8714.87'





14900

15000

14875'

89.26°

269.38° 6661.53'

8998.67'

242.94°F

14970'

87.84°

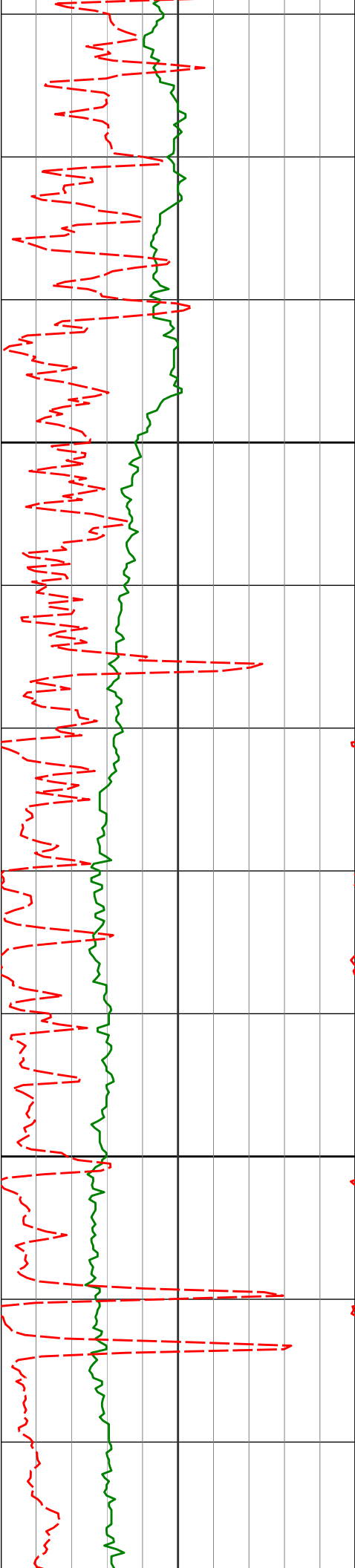
266.47° 6663.93'

9093.63'

242.94°F

PGRC

ROP Avg



15100

15200

15253'

15064'

87.90°

265.94° 6667.43'

9187.51'

247.16°F

15158'

88.40°

266.06° 6670.46'

9281.39'

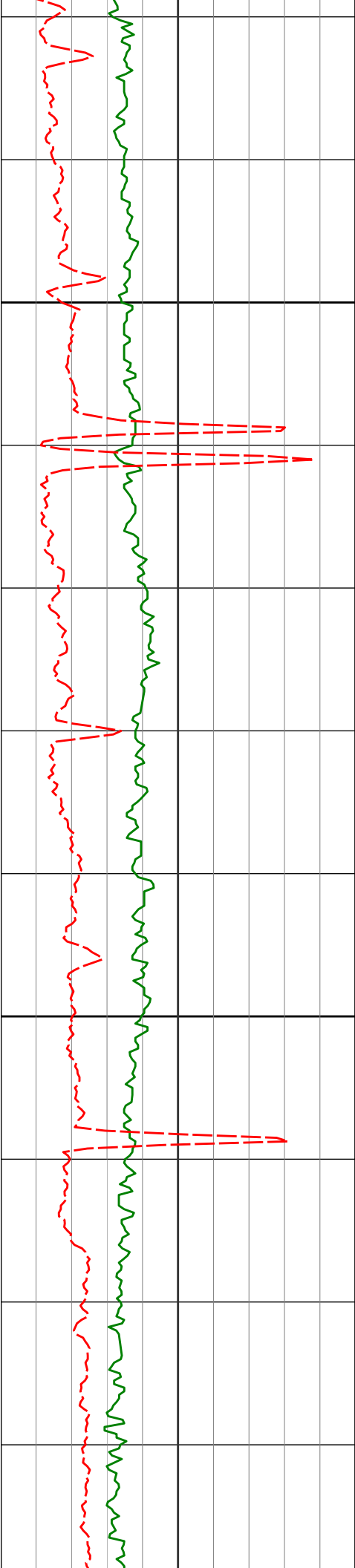
247.16°F

15253'

88.80°

266.32° 6672.78'

9376.31'



15300

15347'

89.07°

266.42° 6674.53'

9470.24'

15400

15441'

89.04°

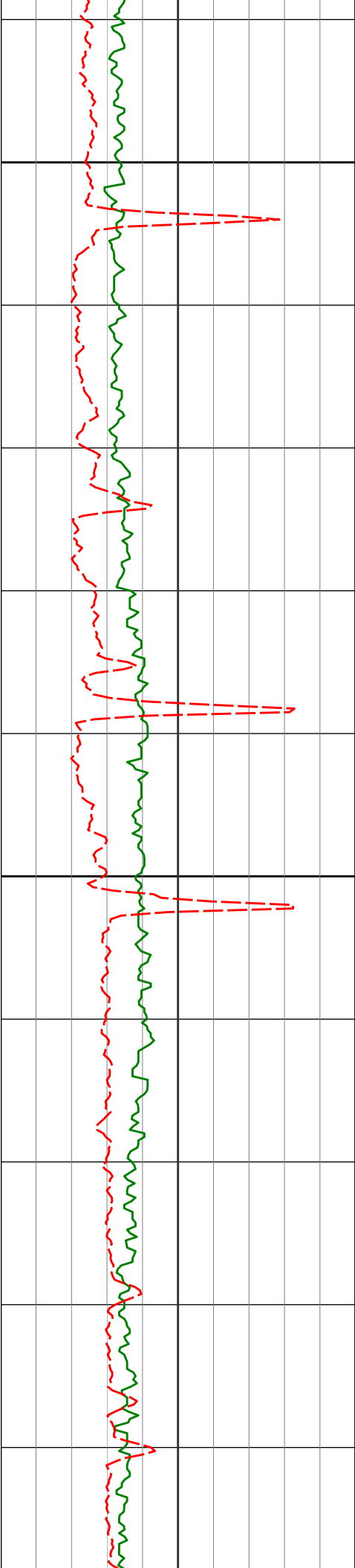
266.18° 6676.08'

9564.18'

247.16°F

247.16°F

251.38°F



15500

15536'

89.75°

265.97° 6677.08'

9659.11'

251.38°F

15600

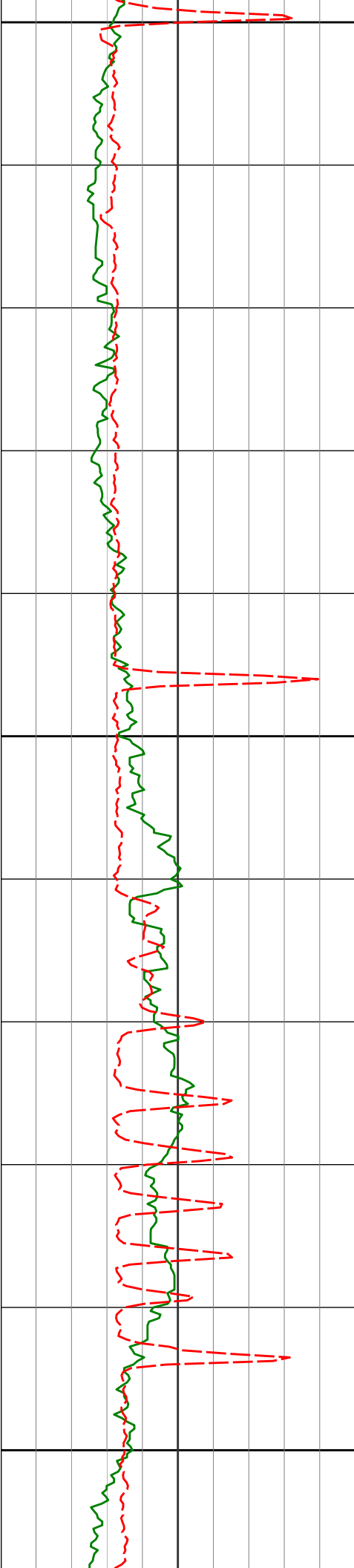
15630'

89.75°

265.55° 6677.49'

9753.03'

251.38°F



15700

15725'

90.43°

266.16°

6677.34'

9847.95'

251.38°F

15800

15819'

90.83°

266.06°

6676.31'

9941.88'

251.38°F

15900

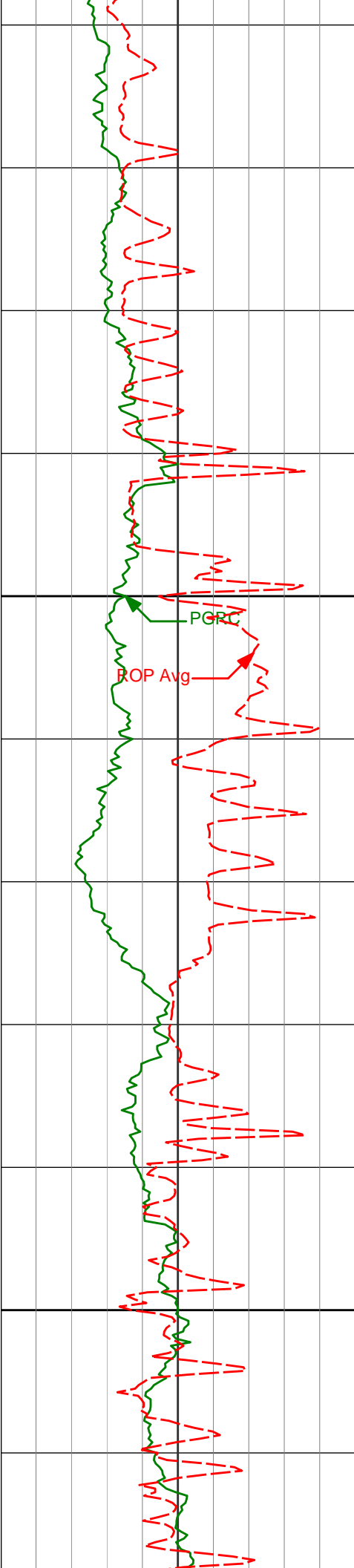
15914'

91.36°

265.77°

6674.49'

10036.79'



16000

16008'

92.35°

265.89° 6671.45'

10130.66'

16100

16133'

93.46°

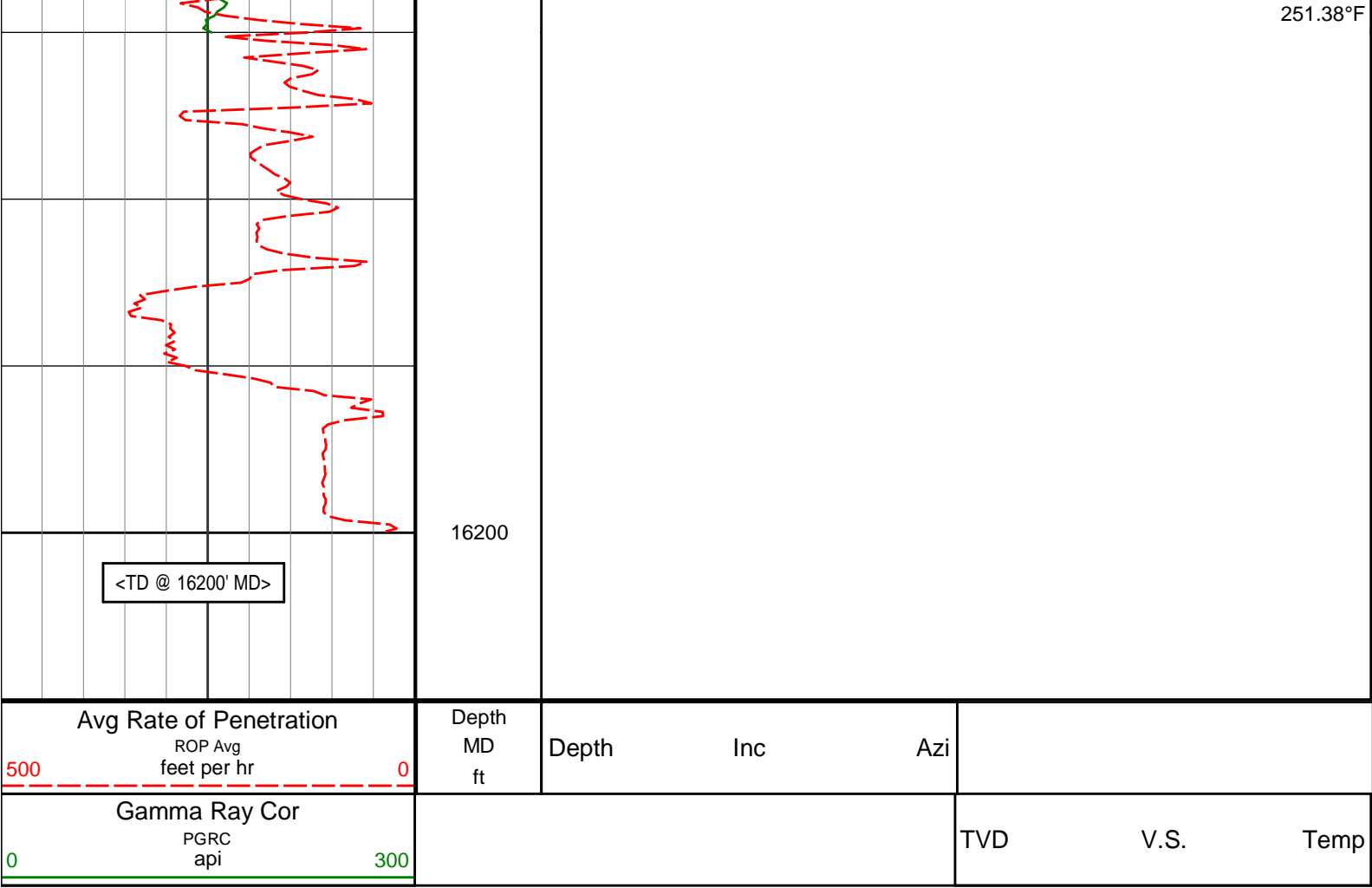
265.95° 6665.12'

10255.40'

251.38°F

251.38°F

251.38°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Colt A13-625
Wattenberg
Weld Colorado
USA
CA-XX-0902118957

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	0.10	302.03	300.00	0.14 N	0.22 W	0.22	0.03
700.00	0.90	285.83	699.98	1.18 N	3.54 W	3.50	0.20
900.00	0.80	283.33	899.96	1.93 N	6.41 W	6.34	0.05
990.00	1.10	333.50	989.95	2.85 N	7.41 W	7.31	0.94
1082.00	3.51	307.98	1081.87	5.37 N	10.02 W	9.84	2.78
1175.00	4.32	296.31	1174.65	8.68 N	15.41 W	15.12	1.22
1267.00	5.77	286.22	1266.30	11.51 N	22.95 W	22.57	1.84
1358.00	6.92	279.41	1356.74	13.68 N	32.75 W	32.30	1.51
1451.00	7.94	268.54	1448.96	14.43 N	44.70 W	44.22	1.86
1543.00	8.54	261.75	1540.01	13.29 N	57.82 W	57.36	1.24
1728.00	6.65	255.80	1723.38	8.69 N	81.80 W	81.48	1.11
1819.00	7.31	262.15	1813.71	6.61 N	92.64 W	92.38	1.11
1912.00	6.44	260.21	1906.04	4.91 N	103.64 W	103.43	0.97
2007.00	7.36	265.07	2000.35	3.48 N	114.95 W	114.78	1.15
2102.00	8.25	262.63	2094.47	2.09 N	127.78 W	127.64	1.00
2197.00	7.50	263.17	2188.58	0.47 N	140.69 W	140.60	0.79
2291.00	8.23	264.48	2281.69	0.90 S	153.48 W	153.43	0.80
2386.00	6.81	267.70	2375.87	1.78 S	165.88 W	165.85	1.56
2481.00	8.20	256.25	2470.06	3.62 S	178.09 W	178.11	2.14

2495.00	8.65	257.78	2564.04	6.74 S	191.65 W	191.77	0.53
2576.00	7.68	259.16	2658.07	9.45 S	204.87 W	205.06	1.04
2766.00	8.78	262.21	2752.09	11.62 S	218.28 W	218.54	1.25
2861.00	8.70	262.26	2845.99	13.57 S	232.59 W	232.90	0.08
2956.00	7.73	263.28	2940.01	15.29 S	246.05 W	246.42	1.03
3051.00	8.31	263.90	3034.08	16.77 S	259.22 W	259.63	0.62
3145.00	7.01	265.14	3127.24	17.97 S	271.69 W	272.13	1.39
3240.00	7.55	253.70	3221.48	20.22 S	283.46 W	283.96	1.63
3335.00	5.64	251.47	3315.85	23.45 S	293.88 W	294.48	2.03
3430.00	8.26	272.10	3410.16	24.69 S	305.13 W	305.76	3.77
3525.00	7.77	260.28	3504.23	25.52 S	318.28 W	318.93	1.81
3620.00	9.73	264.02	3598.13	27.44 S	332.59 W	333.30	2.15
3715.00	11.14	265.28	3691.55	29.03 S	349.72 W	350.47	1.50
3810.00	10.48	261.44	3784.87	31.07 S	367.42 W	368.22	1.03
3904.00	11.25	259.11	3877.18	34.08 S	384.87 W	385.77	0.94
3999.00	8.66	255.55	3970.74	37.62 S	400.90 W	401.90	2.80
4094.00	7.15	256.98	4064.84	40.73 S	413.59 W	414.68	1.60
4189.00	6.18	262.62	4159.20	42.72 S	424.42 W	425.57	1.23
4284.00	4.83	263.97	4253.76	43.80 S	433.47 W	434.65	1.43
4379.00	5.88	268.72	4348.34	44.33 S	442.31 W	443.50	1.20
4474.00	6.73	270.37	4442.77	44.40 S	452.74 W	453.93	0.91
4568.00	5.29	269.06	4536.25	44.44 S	462.58 W	463.77	1.54
4663.00	4.11	265.85	4630.93	44.75 S	470.36 W	471.55	1.27
4758.00	2.50	260.59	4725.76	45.34 S	475.80 W	477.00	1.72
4853.00	1.51	218.54	4820.71	46.66 S	478.62 W	479.87	1.80
4949.00	1.55	201.74	4916.68	48.85 S	479.89 W	481.21	0.47
5043.00	0.43	124.53	5010.66	50.23 S	480.07 W	481.43	1.61
5138.00	0.34	81.09	5105.66	50.39 S	479.50 W	480.86	0.31
5233.00	0.33	58.35	5200.66	50.20 S	478.99 W	480.35	0.14
5327.00	0.34	349.22	5294.66	49.79 S	478.81 W	480.16	0.40
5421.00	0.32	320.68	5388.66	49.31 S	479.03 W	480.36	0.17
5610.00	0.17	349.72	5577.65	48.63 S	479.41 W	480.72	0.10
5705.00	0.33	333.29	5672.65	48.24 S	479.56 W	480.86	0.18
5800.00	0.58	348.54	5767.65	47.53 S	479.78 W	481.05	0.29
5893.00	0.25	339.95	5860.65	46.88 S	479.94 W	481.20	0.36
6083.00	11.44	281.93	6049.37	42.58 S	498.58 W	499.69	5.95
6178.00	19.07	282.62	6140.96	37.23 S	522.98 W	523.90	8.03
6272.00	27.39	277.67	6227.27	30.98 S	559.46 W	560.16	9.08
6367.00	30.85	269.98	6310.28	28.07 S	605.51 W	606.09	5.36
6462.00	39.26	271.97	6387.98	27.04 S	660.00 W	660.53	8.93
6557.00	49.96	268.58	6455.52	26.91 S	726.60 W	727.09	11.54
6651.00	56.08	264.27	6512.06	31.70 S	801.48 W	802.08	7.47
6746.00	65.77	264.77	6558.17	39.60 S	884.03 W	884.84	10.21
6841.00	71.77	271.68	6592.59	42.24 S	972.43 W	973.29	9.26
6933.00	80.24	272.55	6614.82	38.93 S	1061.56 W	1062.26	9.25
7063.00	84.66	273.69	6631.89	31.91 S	1190.21 W	1190.62	3.51
7158.00	86.98	272.78	6638.82	26.57 S	1284.80 W	1284.99	2.62
7253.00	87.90	270.24	6643.06	24.07 S	1379.66 W	1379.72	2.84
7347.00	90.00	267.67	6644.78	25.78 S	1473.62 W	1473.69	3.53
7443.00	91.45	269.39	6643.57	28.25 S	1569.57 W	1569.67	2.34
7538.00	89.11	266.37	6643.11	31.76 S	1664.49 W	1664.65	4.02
7632.00	88.74	265.55	6644.87	38.38 S	1758.23 W	1758.56	0.96
7727.00	91.02	265.55	6645.07	45.75 S	1852.94 W	1853.46	2.40
7822.00	91.73	265.81	6642.79	52.91 S	1947.64 W	1948.34	0.80
7916.00	90.09	266.49	6641.30	59.22 S	2041.42 W	2042.27	1.89
8012.00	90.00	265.79	6641.22	65.68 S	2137.20 W	2138.21	0.74
8107.00	90.03	265.54	6641.20	72.86 S	2231.93 W	2233.11	0.27
8201.00	90.19	268.01	6641.02	78.15 S	2325.77 W	2327.08	2.63
8296.00	90.22	268.10	6640.68	81.37 S	2420.71 W	2422.08	0.10
8391.00	90.28	267.61	6640.26	84.93 S	2515.65 W	2517.08	0.52
8486.00	90.31	267.42	6639.77	89.05 S	2610.56 W	2612.07	0.20
8581.00	90.34	267.31	6639.23	93.41 S	2705.45 W	2707.06	0.12
8676.00	91.02	267.43	6638.11	97.77 S	2800.35 W	2802.04	0.73
8771.00	89.97	268.71	6637.28	100.97 S	2895.29 W	2897.03	1.74
8865.00	90.77	268.74	6636.68	103.06 S	2989.26 W	2991.03	0.85
8960.00	89.38	268.82	6636.55	105.09 S	3084.24 W	3086.02	1.47
9054.00	89.78	268.71	6637.24	107.11 S	3178.21 W	3180.01	0.44
9149.00	87.78	268.85	6639.27	109.13 S	3273.16 W	3274.98	2.11
9243.00	87.93	268.96	6642.78	110.93 S	3367.08 W	3368.91	0.20
9338.00	88.24	268.96	6645.96	112.65 S	3462.01 W	3463.84	0.33

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 268.17 DEGREES (GRID)
A TOTAL CORRECTION OF 7.43 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16200.00 FEET
IS 10322.23 FEET ALONG 268.14 DEGREES (GRID)**

Surface surveys at 300 ft, 700 ft and 900 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 16133 ft MD to TD at 16200 ft MD.

Date Printed:13 March 2015