

Pressure Case Directional Pressure Case Gamma

1:600 / 1:240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	22-Feb-13	23-Feb-13	27-Feb-13		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.500	6.750	4.750		
Log Start Depth (MD, ft)	642.00	6,223.00	7,431.00		
Log End Depth (MD, ft)	6,223.00	7,431.00	11,410.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	21-Feb-13 03:38	22-Feb-13 11:30	24-Feb-13 13:45		
Drill/Wipe End Date and Time	22-Feb-13 01:27	23-Feb-13 07:36	27-Feb-13 03:30		
Min Inc (deg) @ Depth (MD, ft)	.10 @ 1,455.00	10.40 @ 6,290.00	86.79 @ 7,599.00		
Max Inc (deg) @ Depth (MD, ft)	13.39 @ 6,102.00	82.53 @ 7,376.00	91.97 @ 7,979.00		
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / N/A	.46 / PDC		
Flow Rate (gpm)	587.67	568.62	269.42		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	484.9 / N/A	NA / NA		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.55 / 30.00	9.60 / 44.00	9.32 / 38.00		
Filtrate CL (ppm)	2,400.00	2,500.00	2,850.00		
pH / Fluid Loss (mptm)	8.20 / 17	9.70 / 9	10.00 / 9		
PV (cP) / YP (lbf2)	5 / 1.00	13 / 15.00	12 / 13.00		
% Solids / % Sand	4.50 / 0.23	6.50 / 0.40	5.00 / 0.05		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	NA / NA		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	NA @ NA		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	NA @ NA		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	NA @ NA		
Max Tool Temp (degF) / Source	141.70 / PCM	171.20 / PCM	221.80 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 141.70	N/A @ 171.20	NA @ 221.80		
Lead MWD Engineer	Christopher Befort	Kyle Wass	Christopher Befort		
Customer Representative	Jim Turner	Jim Turner	Jim Turner		

SENSOR INFORMATION

Downhole Processor Information					
Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11341332	11341332	11750419		
Insert Serial Number	11400838	11400838	11400958		
Date and Time Initialized	19-Feb-13 14:46	19-Feb-13 14:46	23-Feb-13 20:33		
Date and Time Read	23-Jan-13 12:31	23-Feb-13 12:31	27-Feb-13 05:35		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information					
Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	58.00	55.00	64.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341332	11341332	11750419		
Sonde Serial Number	11833225	11833225	11477984		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	274.49	94.65	86.13		

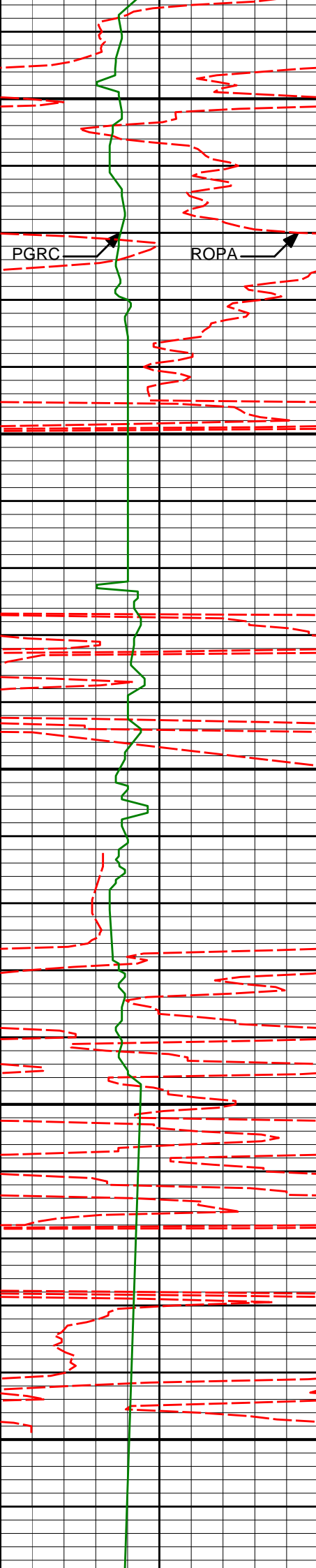
Gamma Ray Sensor Information					
Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.74	47.79	66.51		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341332	11341332	11750419		
Insert/Sonde Serial Number	11293307	11293307	11579788		

REMARKS
<p>1. All depths are calibrated to driller's pipe tally and are measured depth from the Drill Floor.</p> <p>2. No depth corrections have been made for pipe stretch or compression.</p> <p>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.</p> <p>4. All data presented is recorded data unless otherwise specified.</p> <p>5. The following smoothing parameters have been applied to the data:</p> <p>PGRC (Gamma CG): Interval Resolution: 0.5 ft Interval Distance: 0.6 ft</p> <p>ROPA (Average Rate Of Penetration): Interval Resolution: 0.5 ft Interval Distance: 1.2 ft</p> <p>6. Insite Version 7.4.1</p>

WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES

Avg Rate of Penetration (ROPA) feet per hr						
1K	0					
PCG Gamma Ray BCOR (PGRC) api		MD ft	Depth	Inc	Azm	TVD V/S
0	300					
		550				
		600				
		650				



700

716'

0.46°

327.88°

716.00'

-0.20'

750

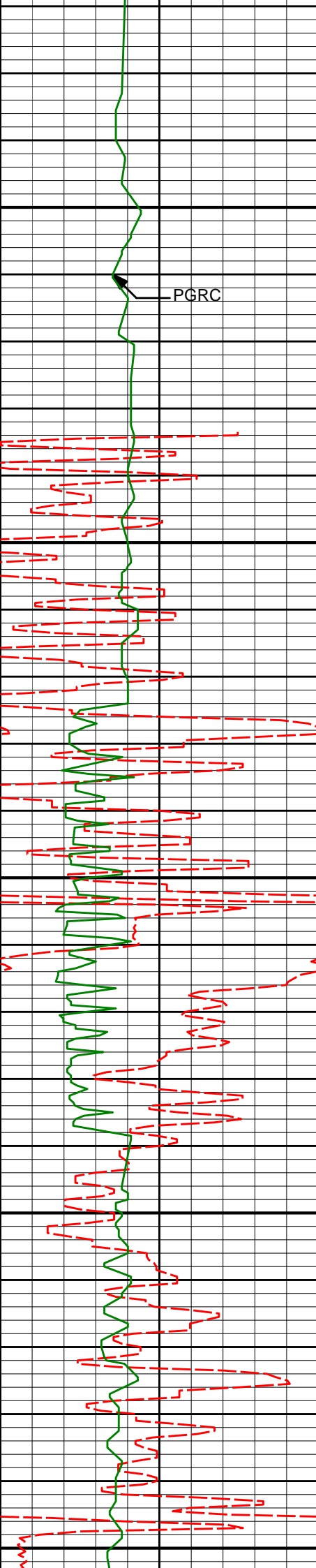
800

850

900

PGRC

ROPA



950

PGRC

1000

1050

1100

1150

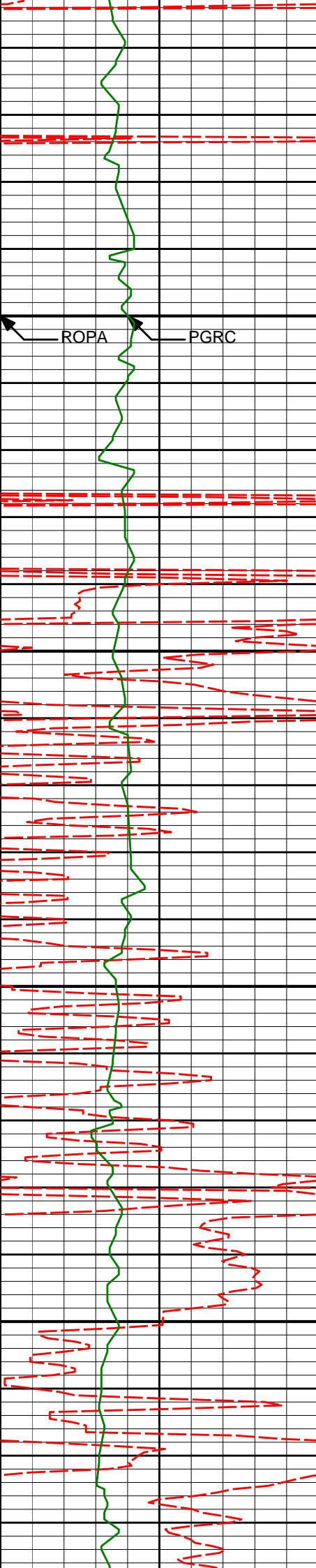
993'

0.29°

50.31°

992.99'

-0.44'



100

1200

ROPA

PGRC

1250

1269'

0.25°

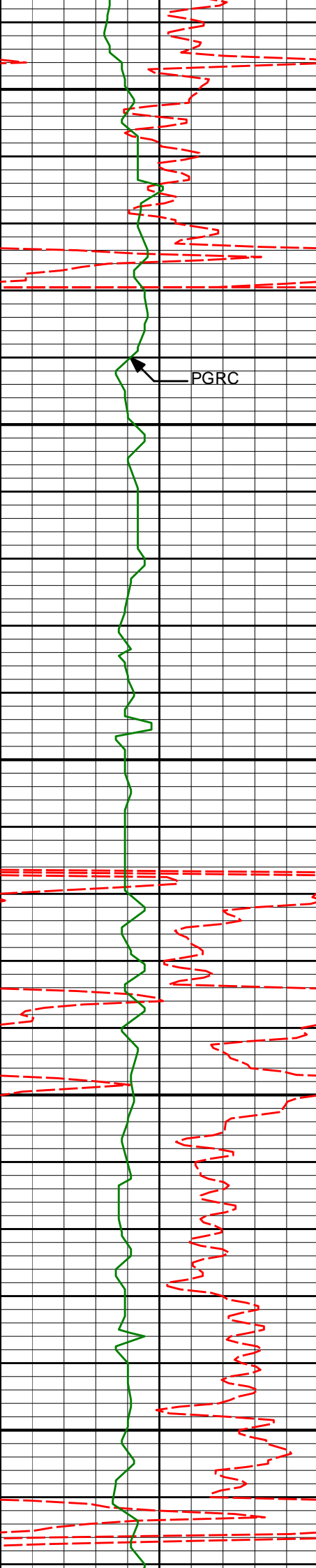
71.45°

1268.99'

0.57'

1300

1350



1400

1450

1500

1550

1600

PGRC

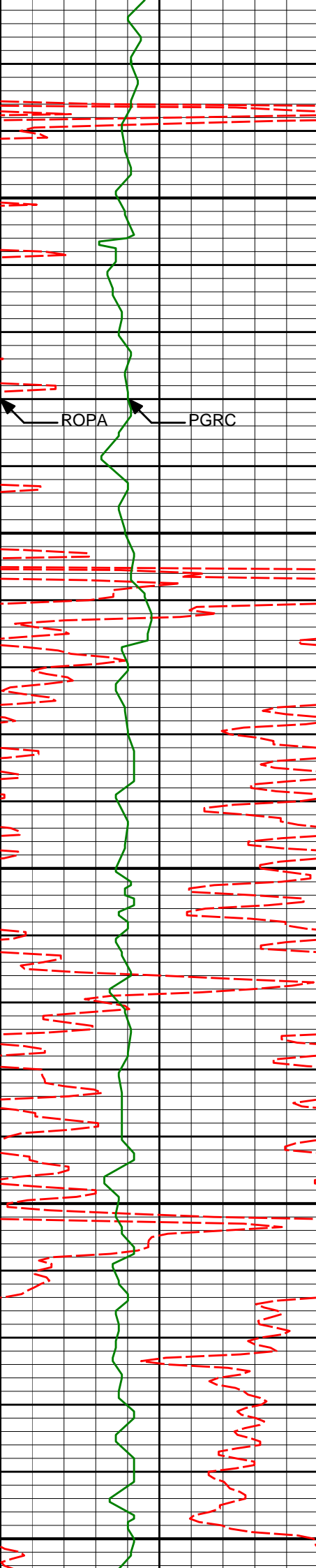
1455'

0.10°

86.80°

1454.99'

1.08'



1650

1700

1750

1800

1850

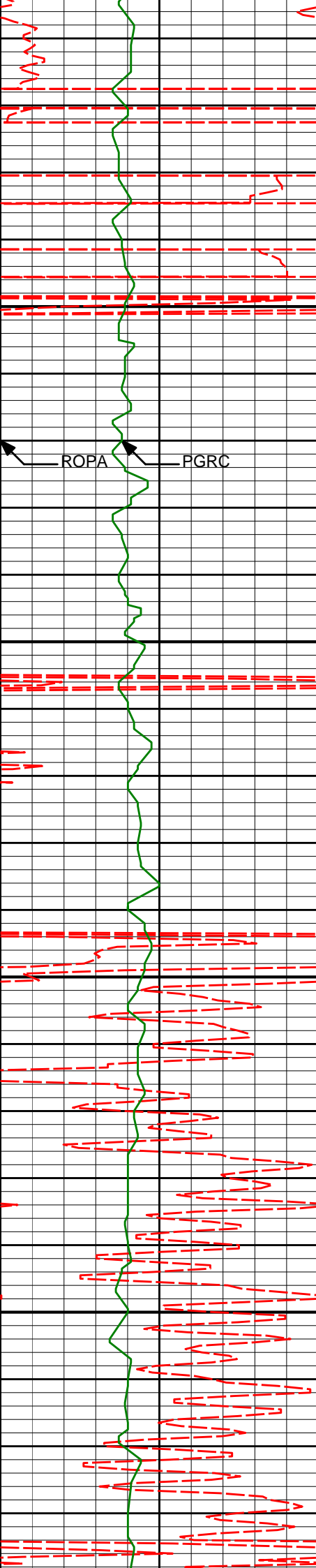
1739'

0.92°

284.78°

1738.98'

-0.94'



1900

1950

2000

2050

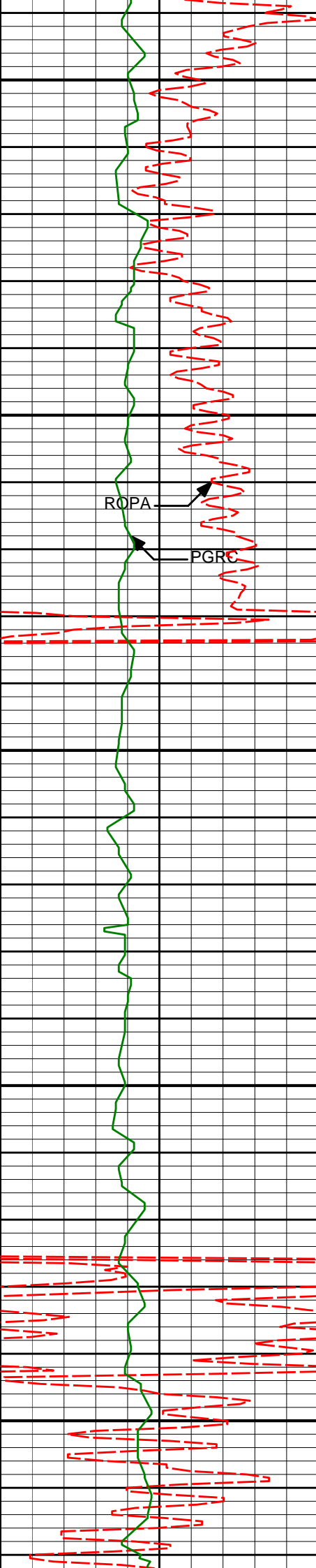
2024'

1.16°

262.59°

2023.93'

-5.99'



2100

2150

ROPA

PGRC

2200

2250

2300

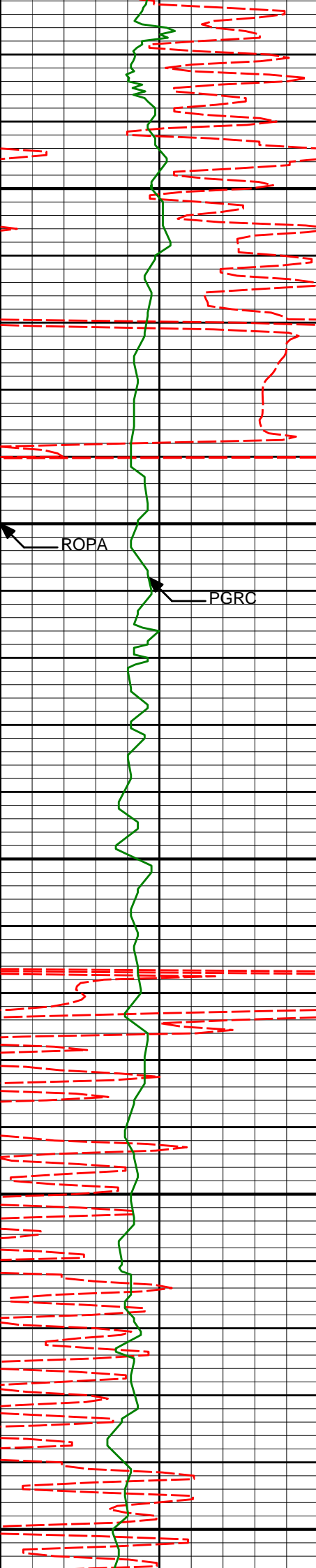
2309'

1.48°

236.32°

2308.86'

-11.51'



2350

2400

2450

2500

2550

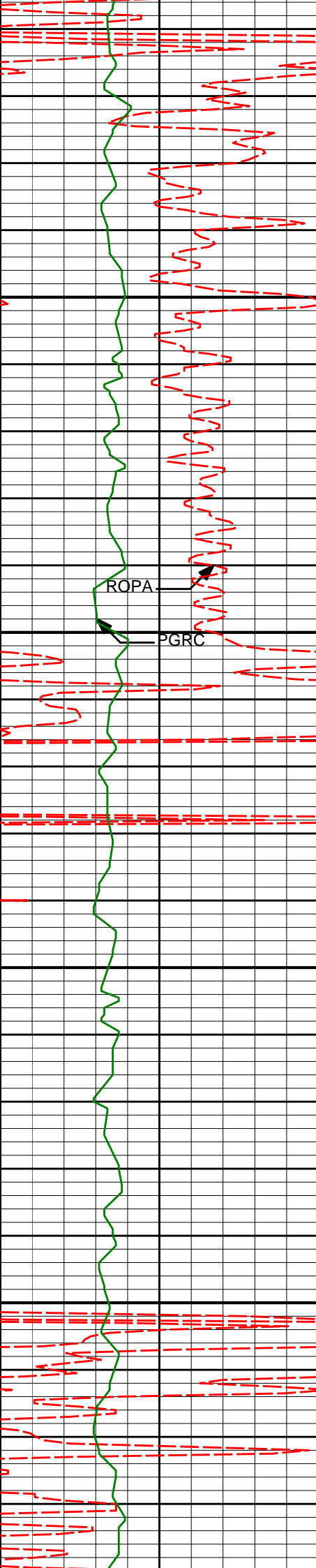
2404'

0.57°

348.78°

2403.85'

-12.58'



2600

2650

2700

2750

ROPA

PGRC

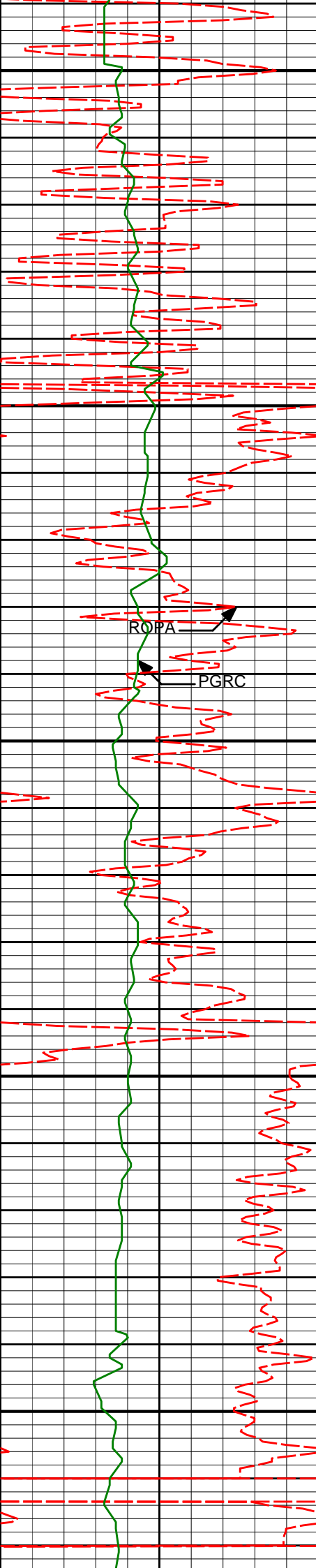
2688'

1.03°

309.92°

2687.82'

-15.21'



2800

2850

2900

2950

3000

ROPA

PGRC

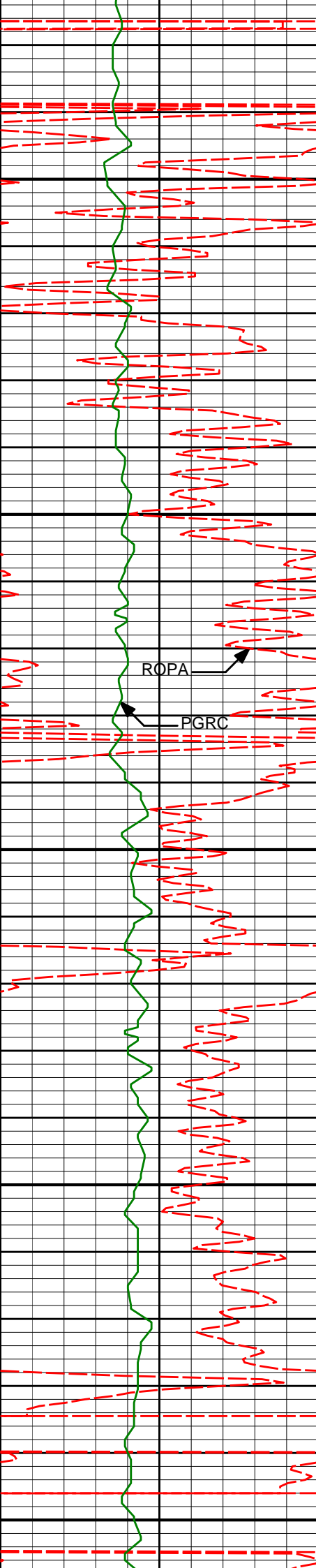
2973'

1.24°

275.60°

2972.77'

-20.44'



3050

3100

ROPA

PGRC

3150

3200

3250

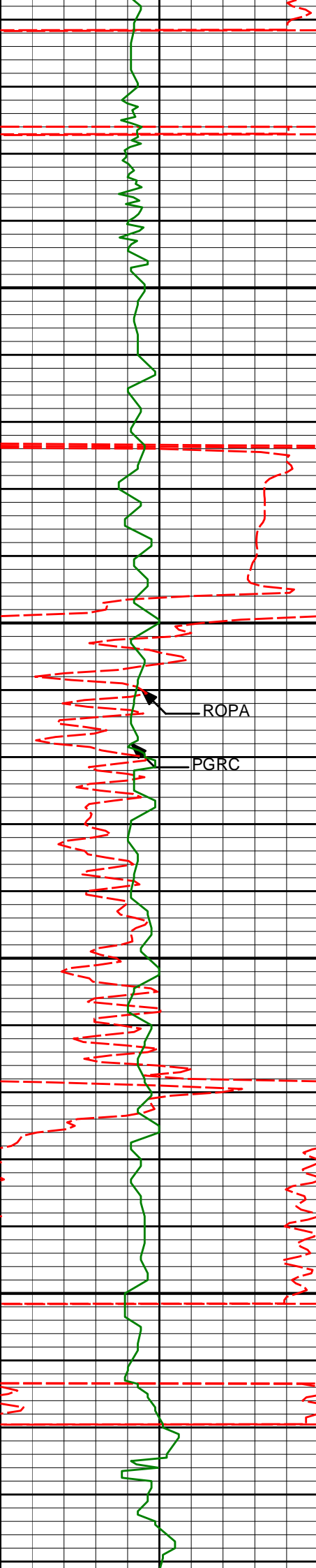
00501

1.540

004.000

0057.001

07.041



3300

3350

3400

3450

3258'

1.54°

264.08°

3257.69'

-27.24'

3352'

0.83°

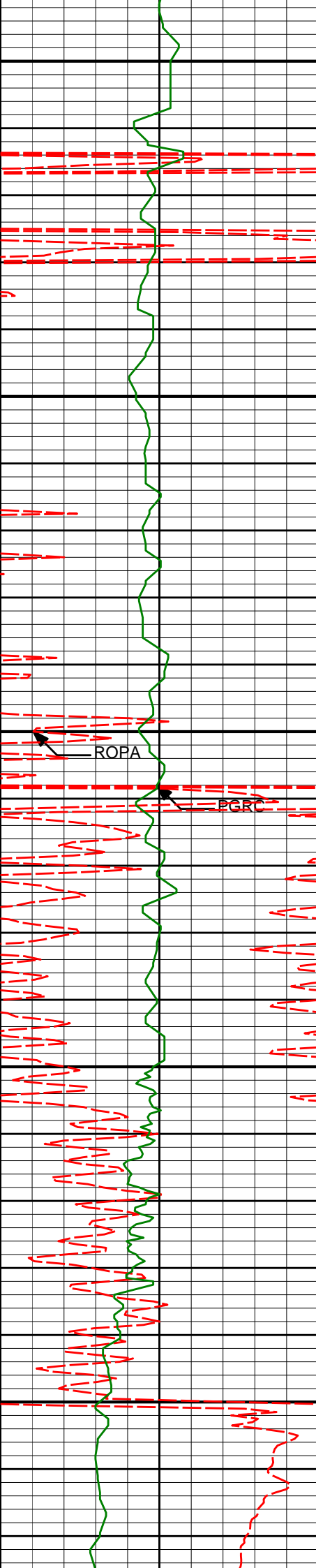
237.02°

3351.67'

-28.98'

ROPA

PGRC



3500

3550

3600

3650

3700

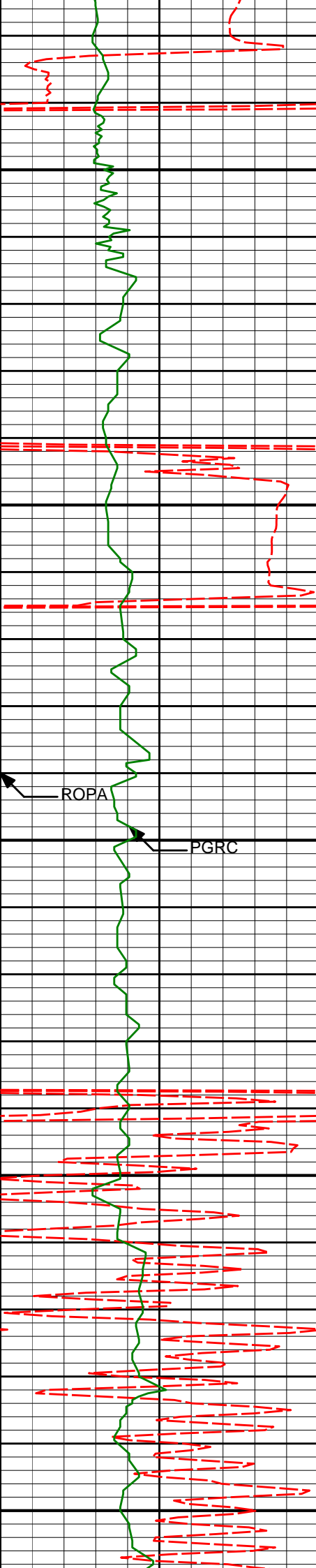
3637'

1.77°

231.94°

3636.59'

-33.59'



3750

3800

3850

3900

3950

3732'

1.23°

225.65°

3731.56'

-35.22'

3826'

1.28°

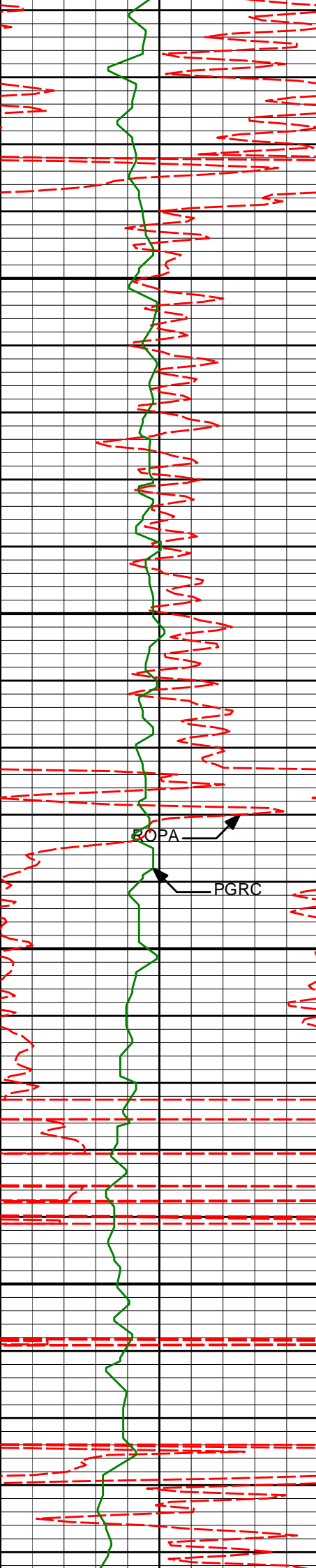
138.70°

3825.54'

-35.04'

ROPA

PGRC



4000

4050

4100

4150

POPA

PGRC

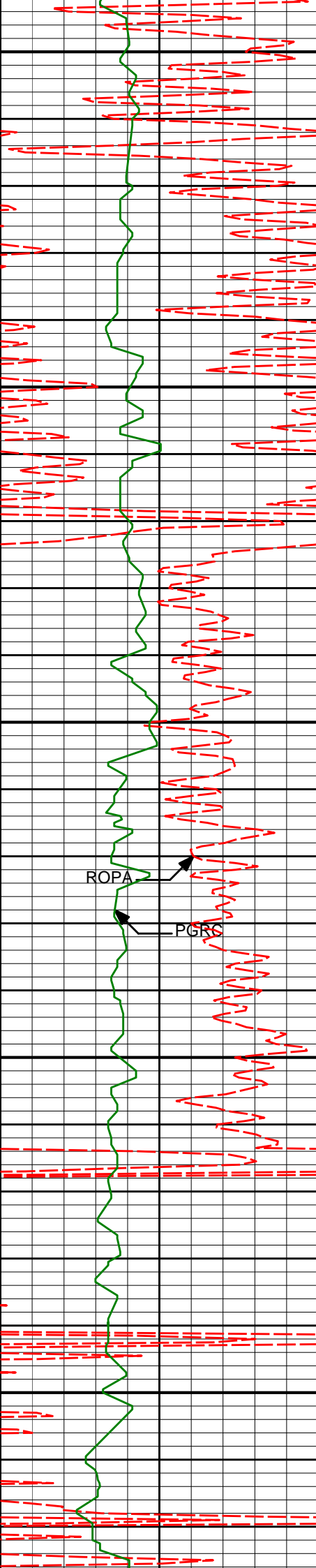
4111'

1.75°

111.92°

4110.45'

-28.40'



4200

4250

4300

4350

4400

ROPA

PGR

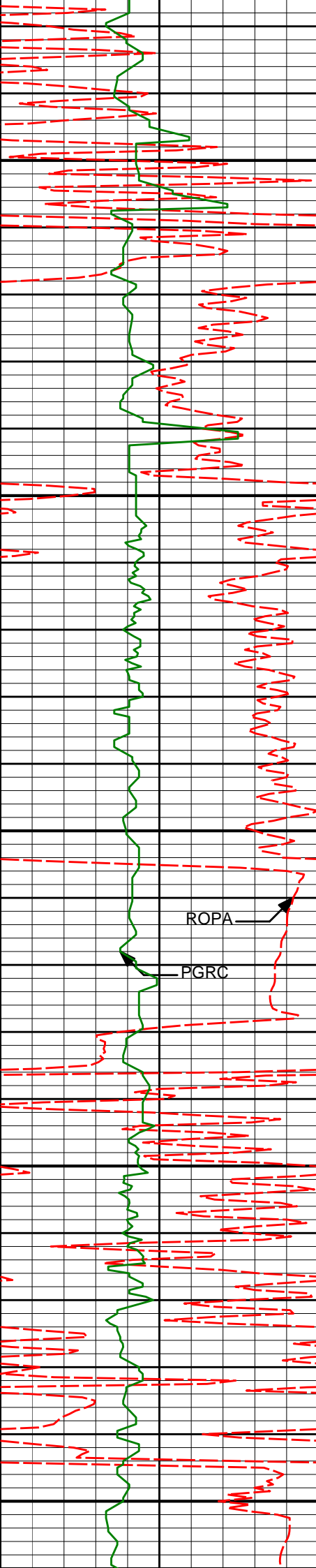
4395'

2.29°

90.66°

4394.27'

-18.58'



4450

4490'

2.17°

69.40°

4489.20'

-15.12'

4500

4550

ROPA

PGRC

4585'

1.21°

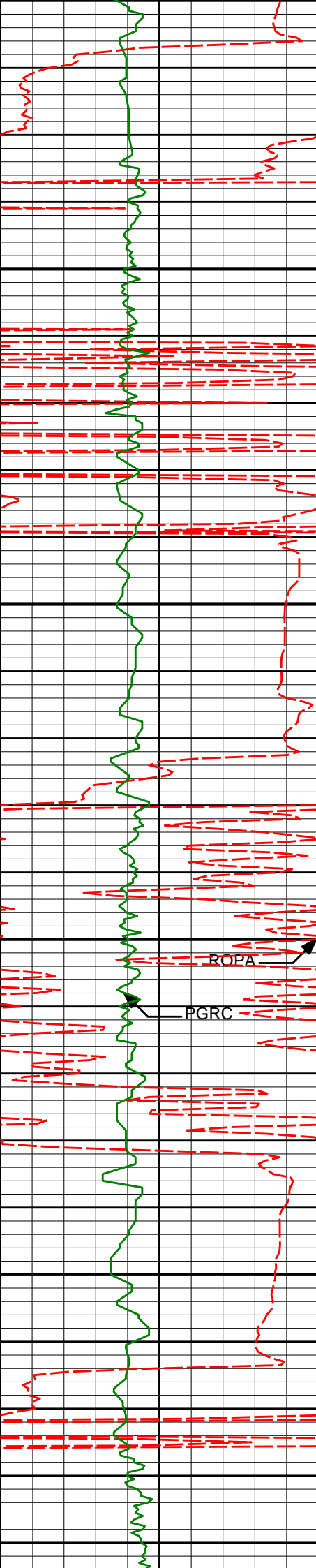
152.14°

4584.17'

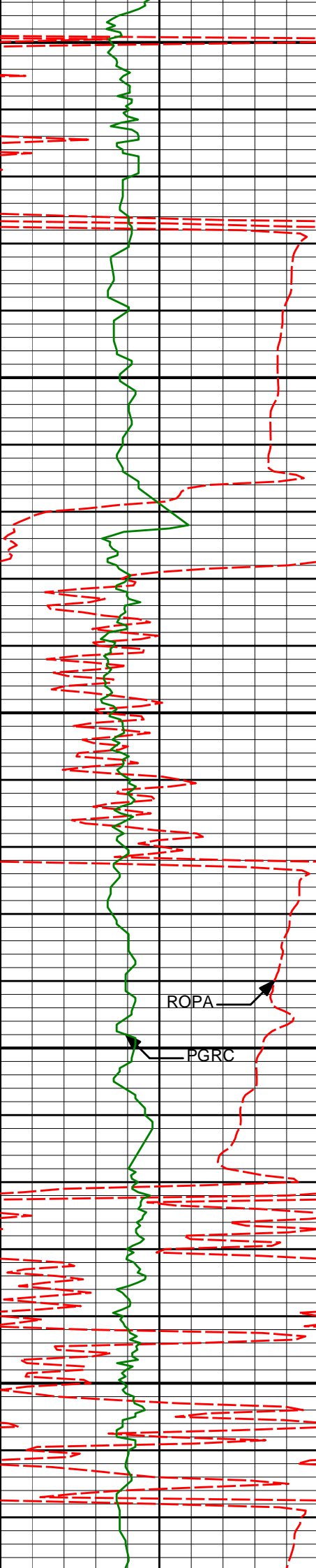
-12.96'

4600

4650



4680'	2.15°	181.00°	4679.13'	-12.15'
4700				
4750				
4774'	3.97°	189.43°	4772.99'	-12.00'
4800				
4850				
4869'	5.39°	195.07°	4867.67'	-12.62'



4900

4950

5000

5050

5100

4964'

7.07°

202.54°

4962.11'

-14.62'

ROPA

PGRC

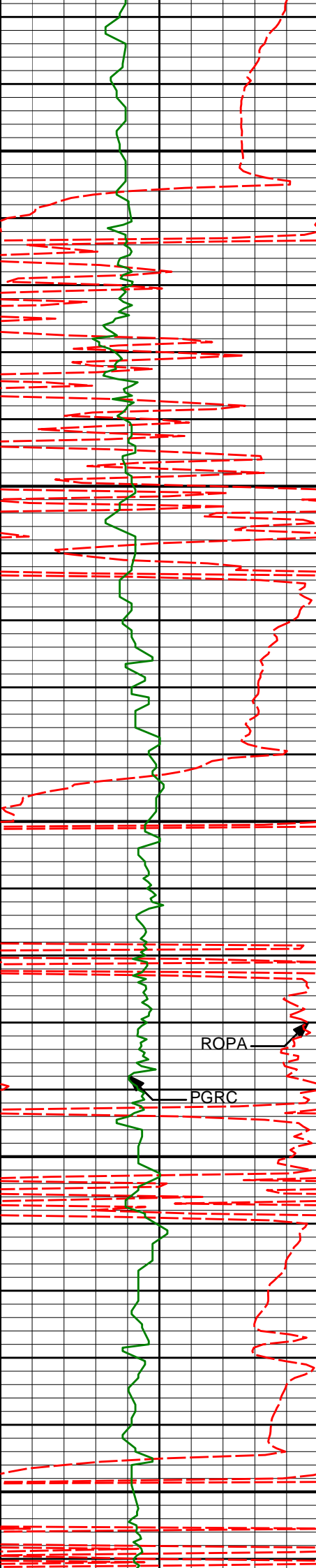
5059'

9.76°

205.15°

5056.08'

-18.45'



5150

5153'

11.75°

209.51°

5148.42'

-24.28'

5200

5250

5248'

11.59°

204.94°

5241.46'

-30.58'

5300

5350

5343'

12.19°

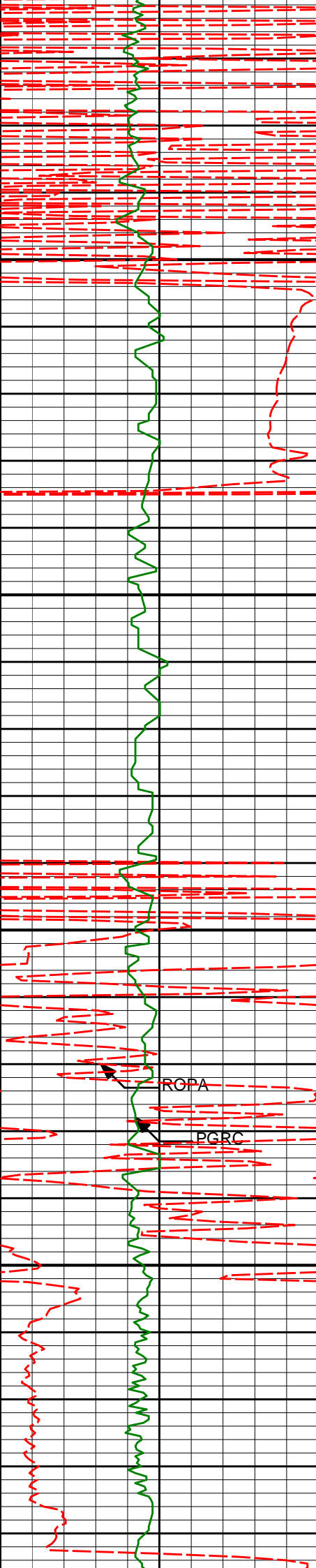
200.52°

5334.43'

-35.51'

ROPA

PGRC



5400

5438'

13.17°

198.45°

5427.11'

-39.61'

5450

5500

ROPA

PGRC

5532'

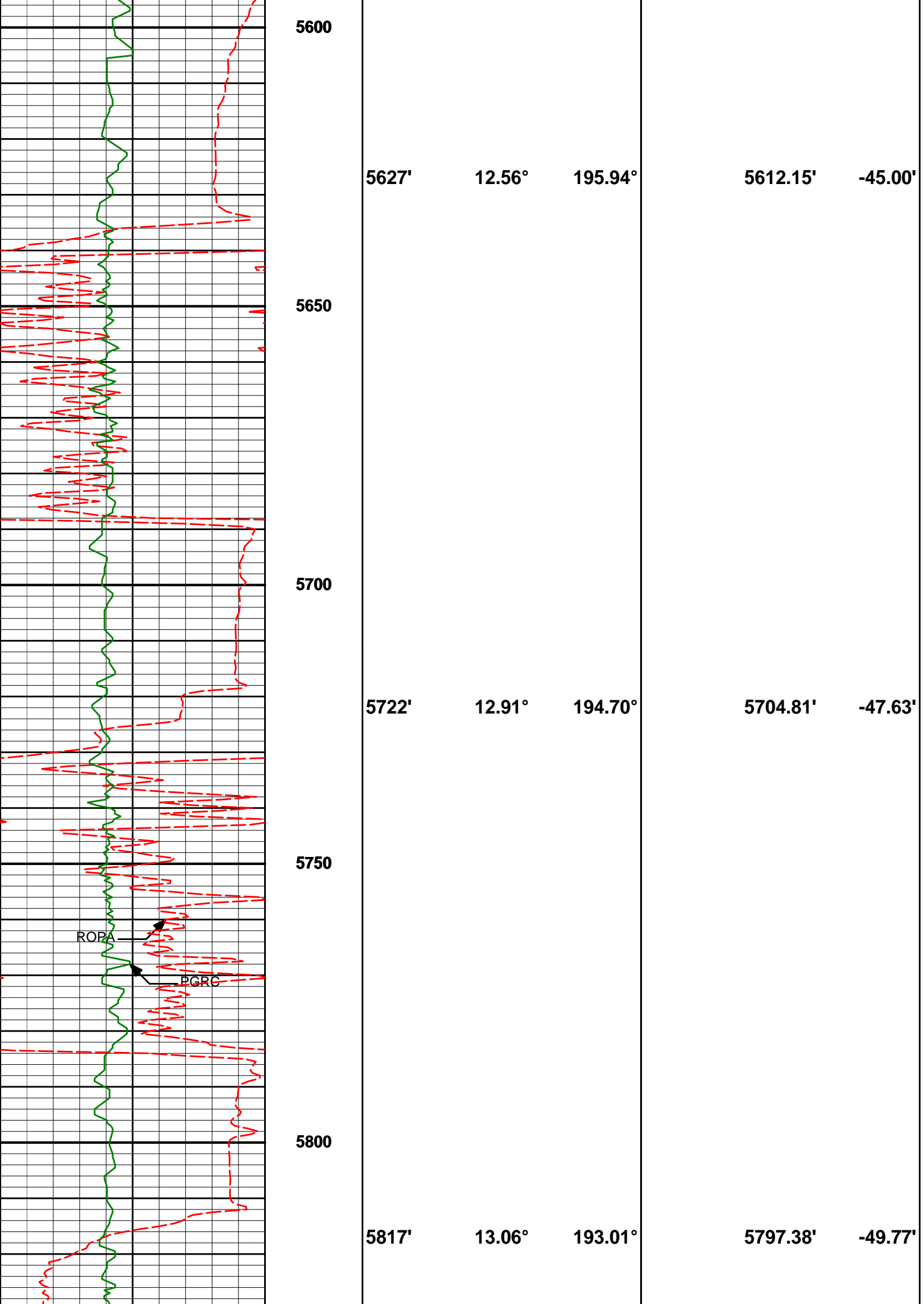
10.60°

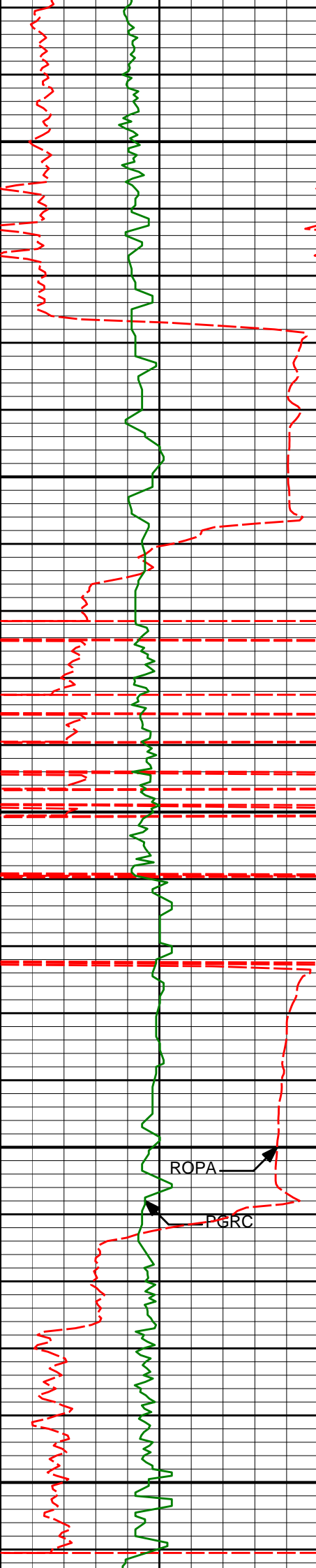
194.85°

5519.09'

-42.56'

5550





5850

5900

5950

6000

6050

5912'

12.56°

196.57°

5890.02'

-52.22'

6007'

12.81°

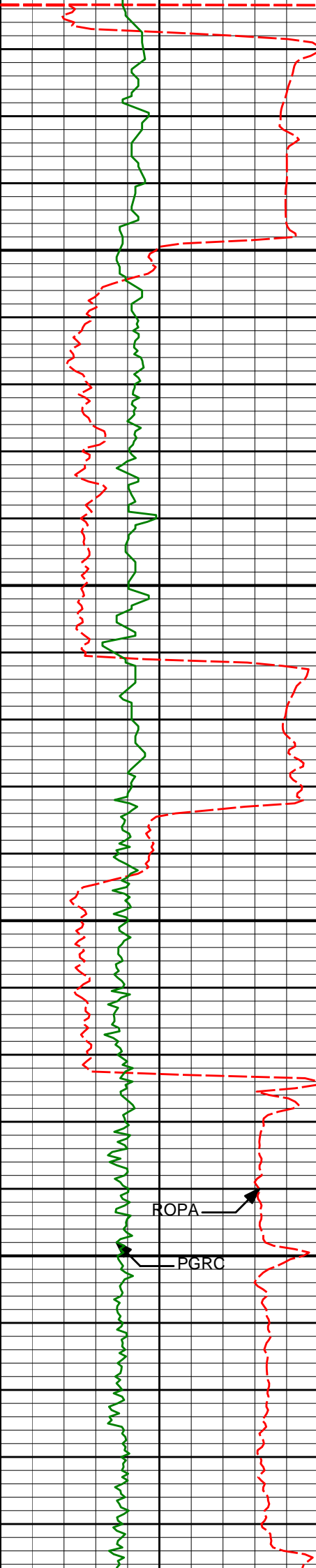
201.49°

5982.70'

-56.18'

ROPA

PGRC



6100

6150

6200

6250

6102'

13.39°

198.82°

6075.23'

-60.67'

6165'

11.81°

198.44°

6136.71'

-63.19'

6238'

10.45°

194.80°

6208.34'

-65.30'

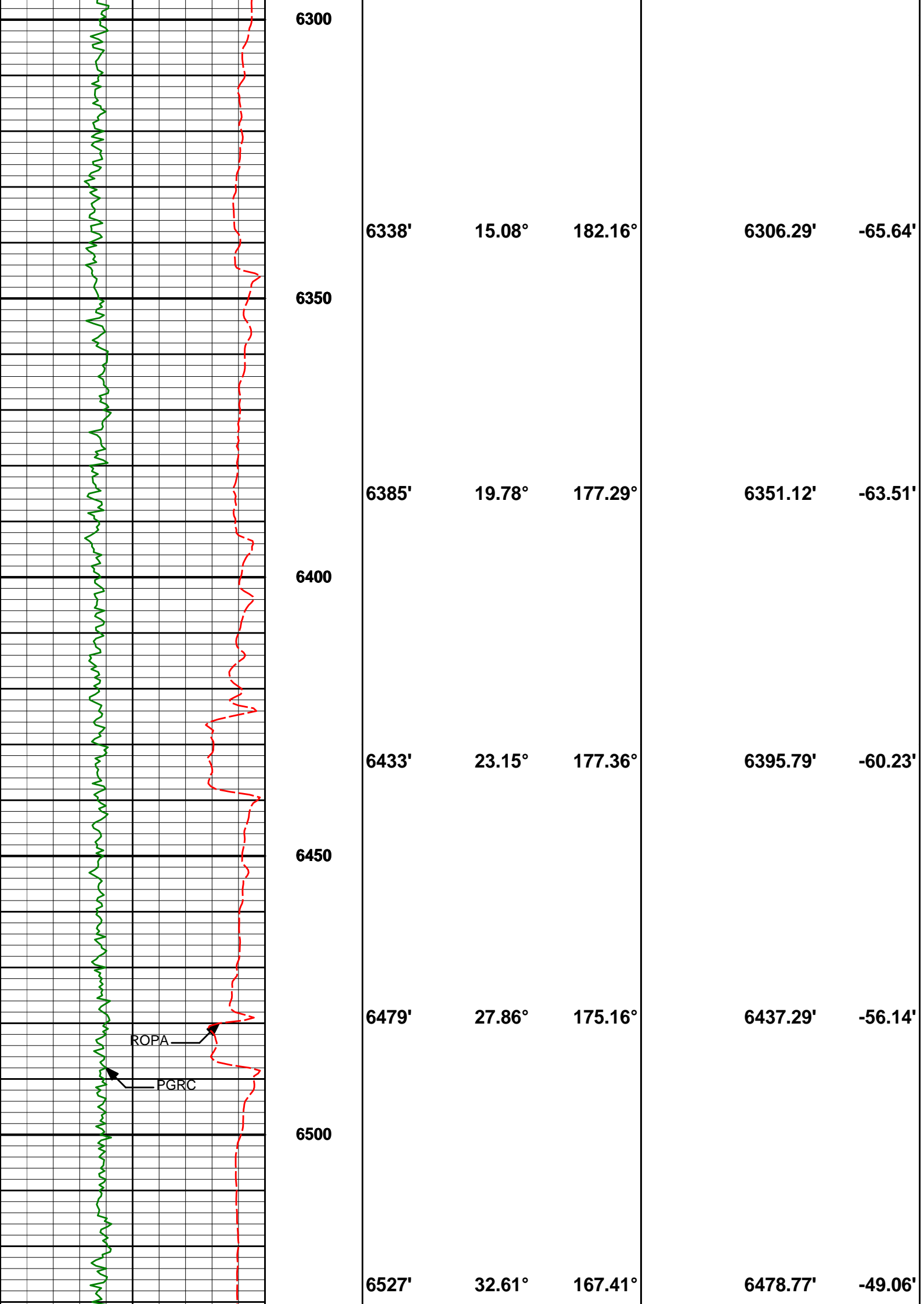
6290'

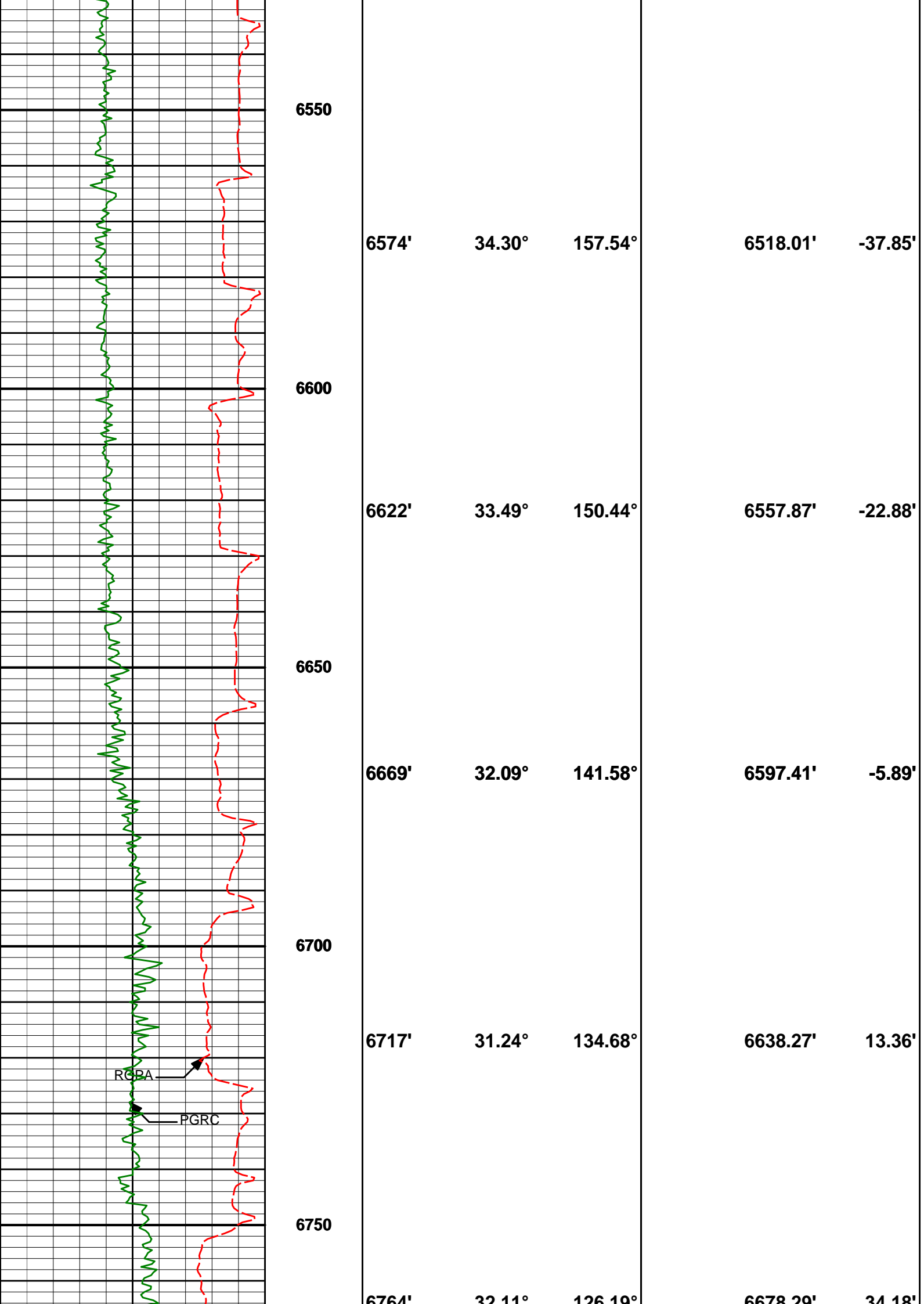
10.40°

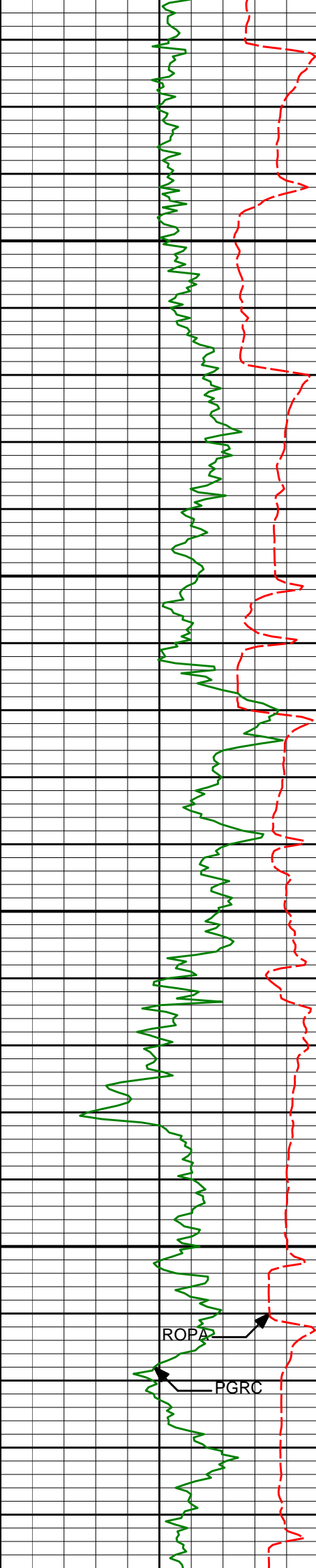
190.79°

6259.48'

-66.08'







6800

6850

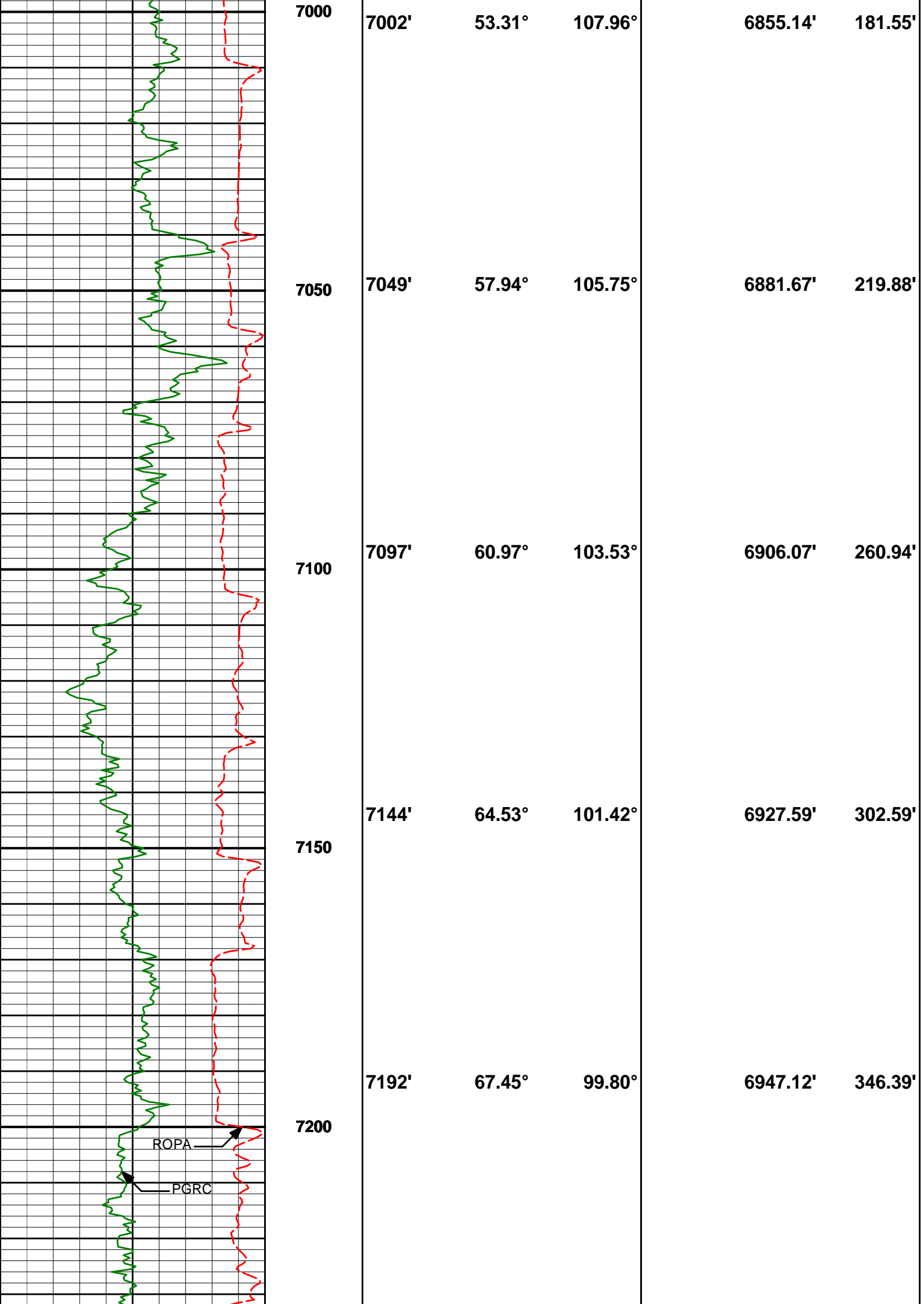
6900

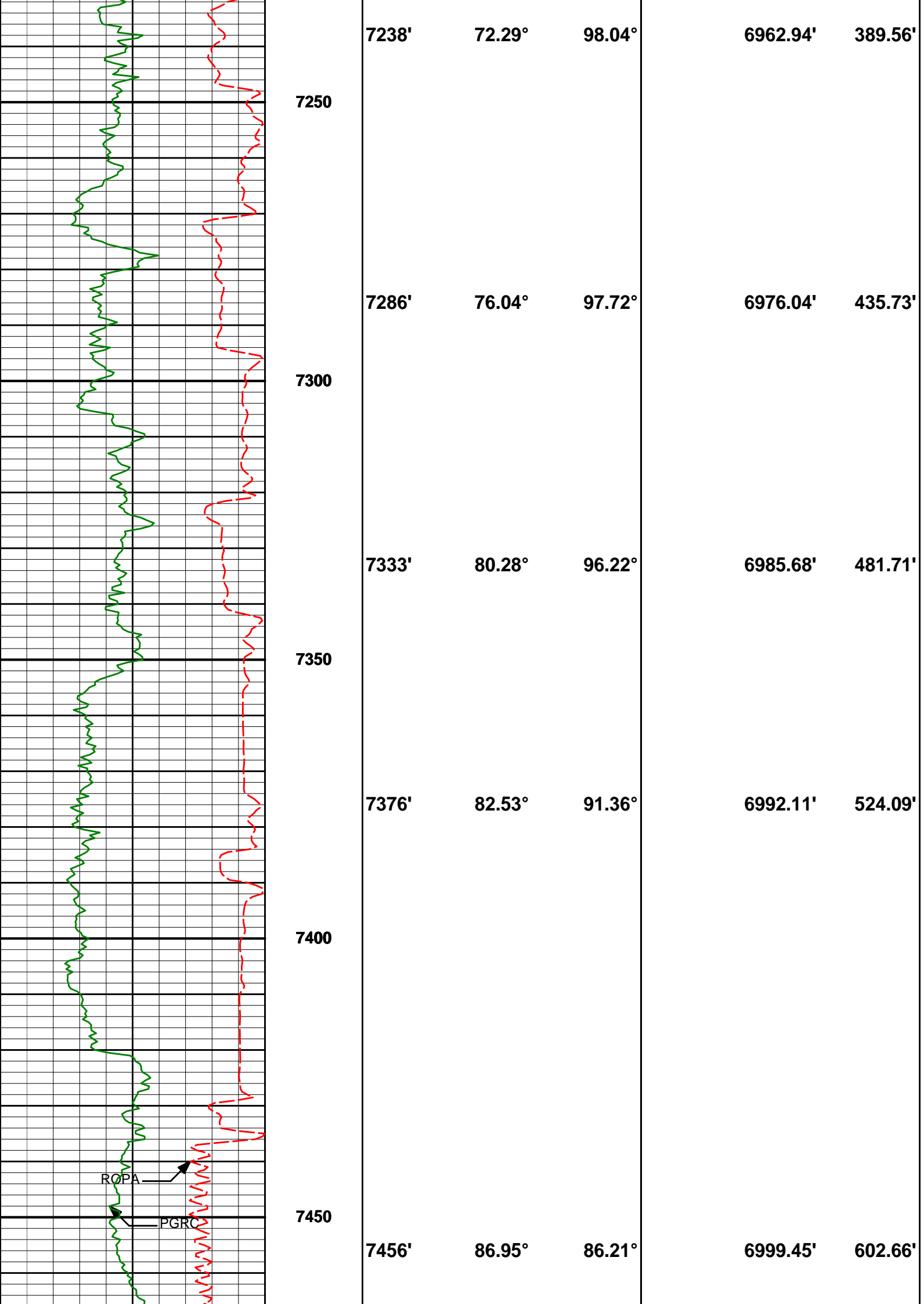
6950

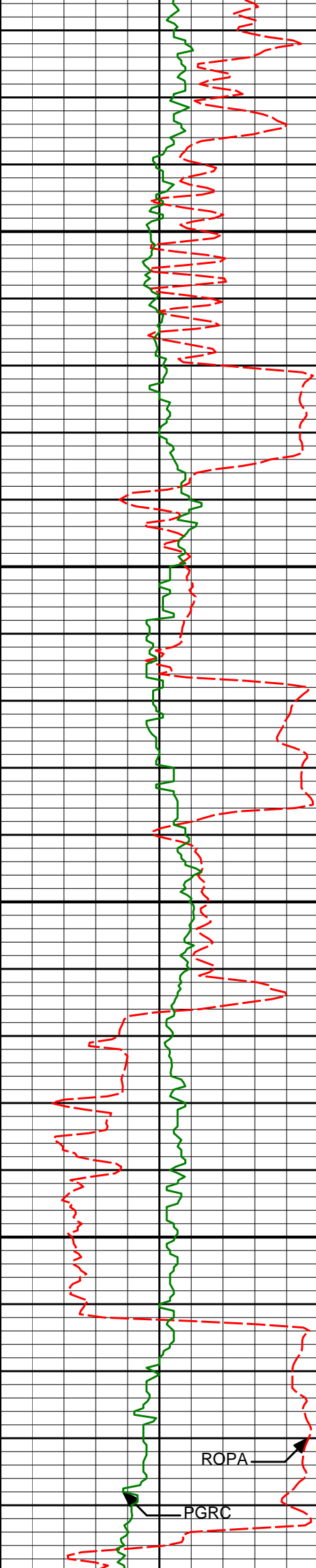
ROP

PGRC

6764'	32.11°	120.19°	6878.29'	34.18°
6812'	34.38°	123.72°	6718.43'	57.65'
6859'	38.49°	121.21°	6756.24'	83.08'
6907'	43.76°	116.83°	6792.39'	112.56'
6954'	48.65°	112.24°	6824.92'	145.09'







7500

7550

7600

7650

7700

7504'

87.00°

85.93°

7001.98'

649.54'

7599'

86.79°

88.47°

7007.12'

742.68'

7694'

88.92°

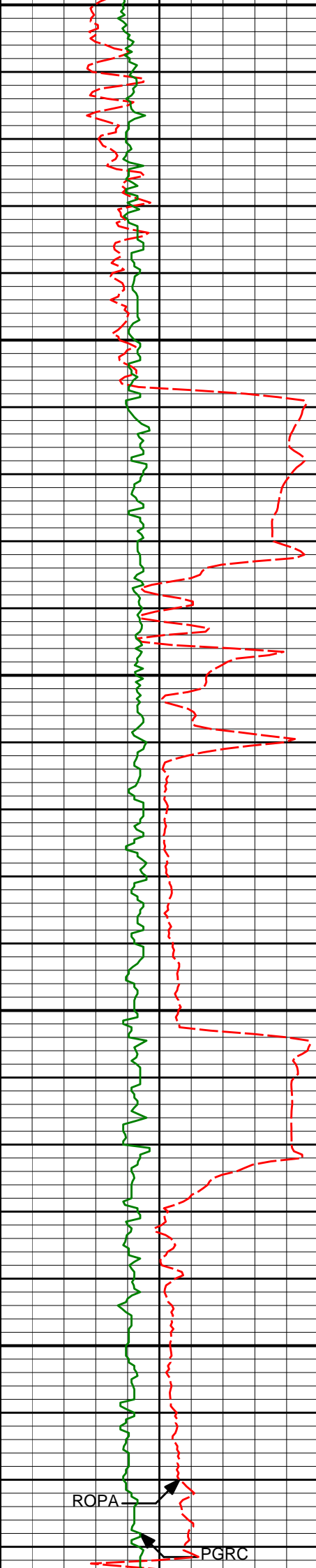
88.98°

7010.68'

836.34'

ROPA

PGRC



7700

7750

300

7800

7850

7900

7789'

90.46°

90.04°

7011.19'

930.28'

7884'

91.33°

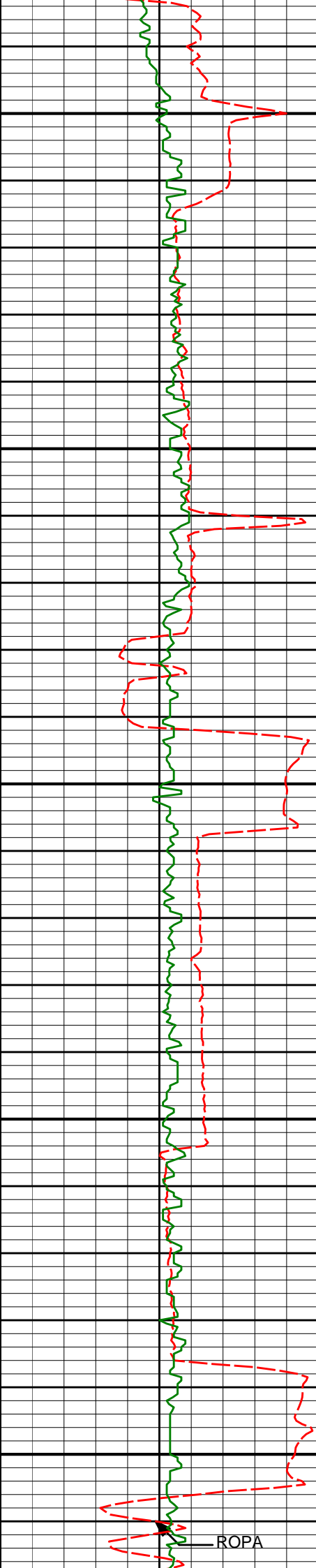
91.55°

7009.71'

1024.49'

ROPA

PGRC



7950

7979'

91.97°

91.03°

7006.98'

1118.78'

8000

8050

8073'

90.52°

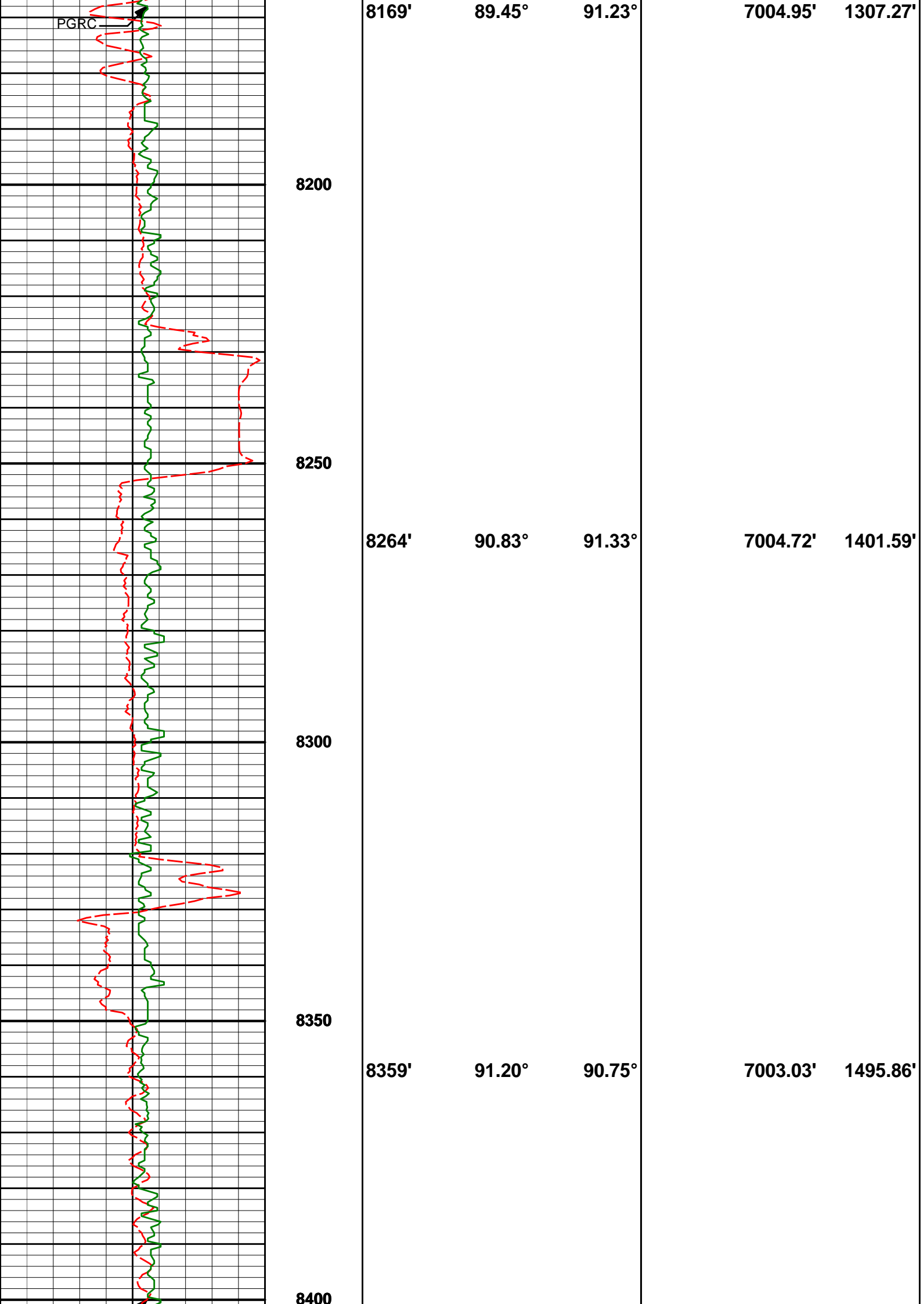
90.70°

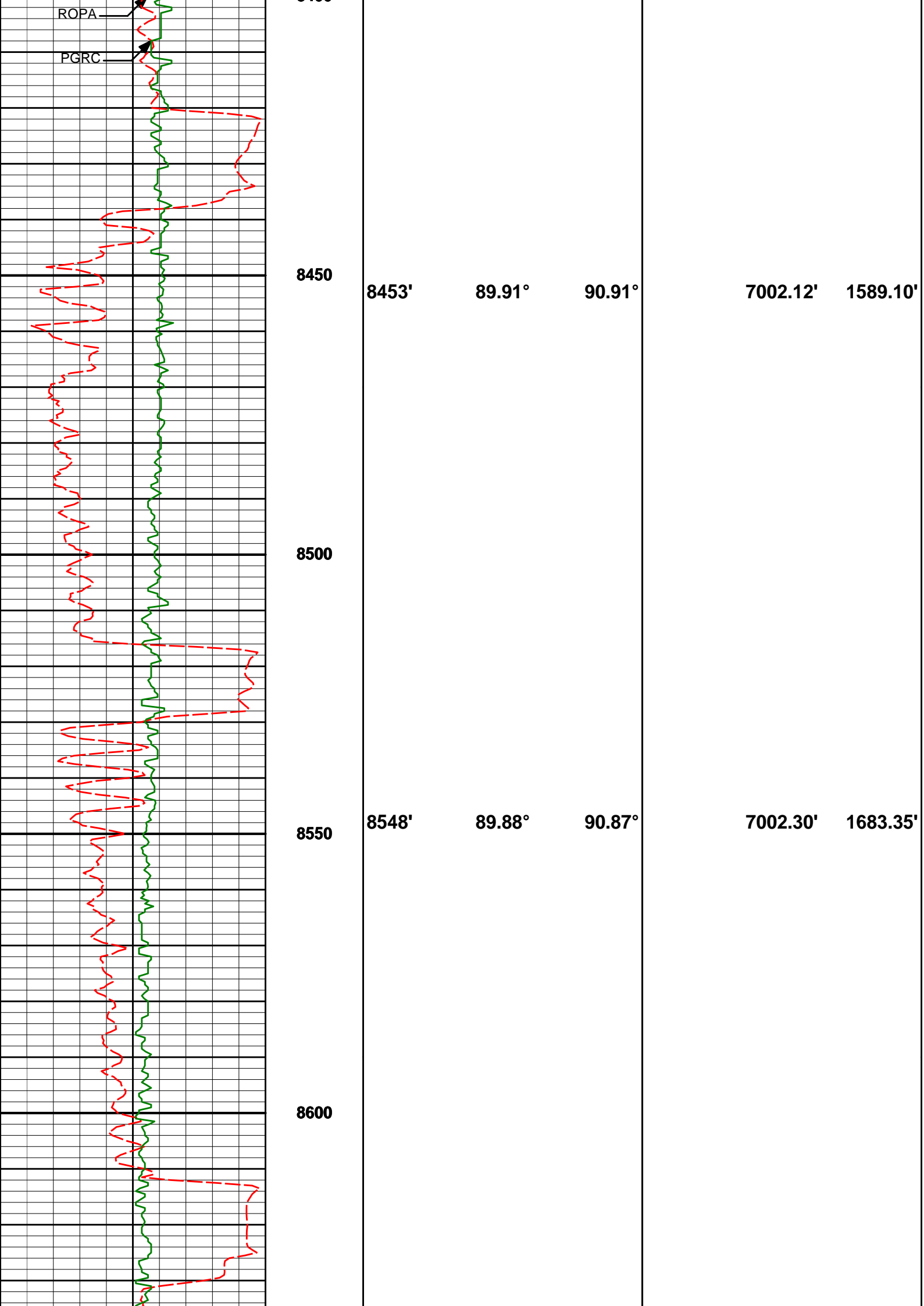
7004.93'

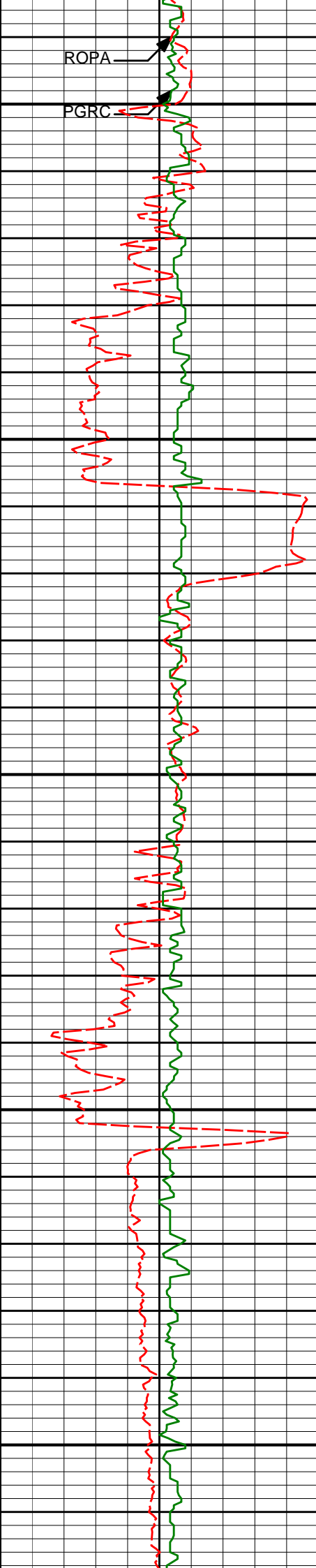
1212.01'

8100

8150







8650

8700

8750

8800

8850

8643'

89.94°

91.29°

7002.45'

1777.64'

8738'

91.05°

91.10°

7001.63'

1871.95'

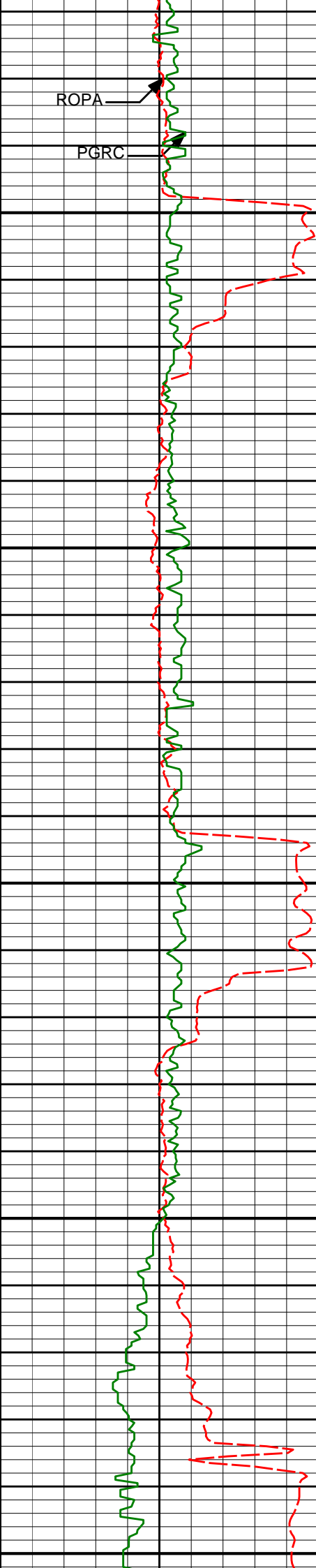
8833'

90.37°

90.24°

7000.45'

1966.14'



8900

8928'

90.22°

89.72°

6999.97'

2060.19'

8950

9000

9022'

88.58°

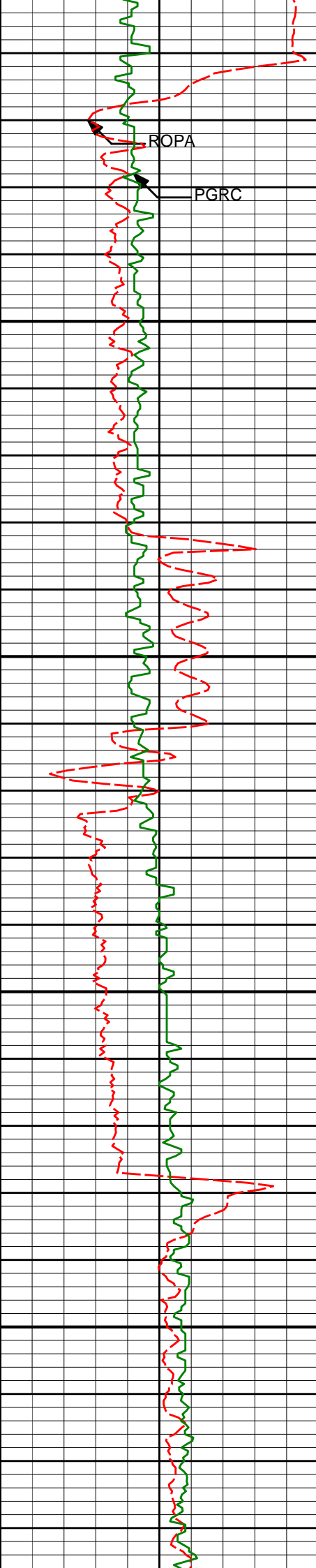
90.24°

7000.95'

2153.24'

9050

9100



9117'

90.31°

91.02°

7001.87'

2247.43'

9150

9200

9212'

90.59°

90.68°

7001.13'

2341.67'

9250

9300

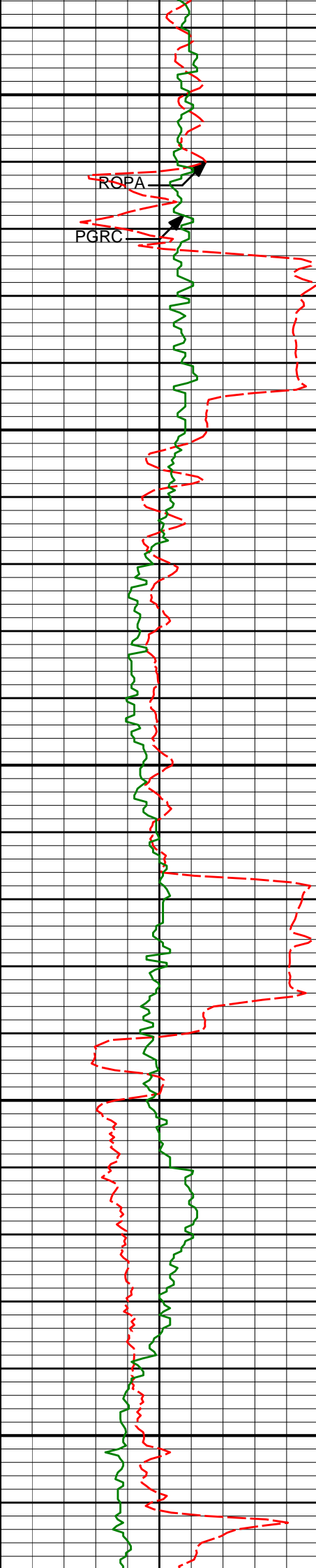
9307'

90.37°

89.14°

7000.33'

2435.70'



9350

ROPA

PGRC

9400

9450

9500

9550

9401'

89.41°

90.35°

7000.51'

2528.70'

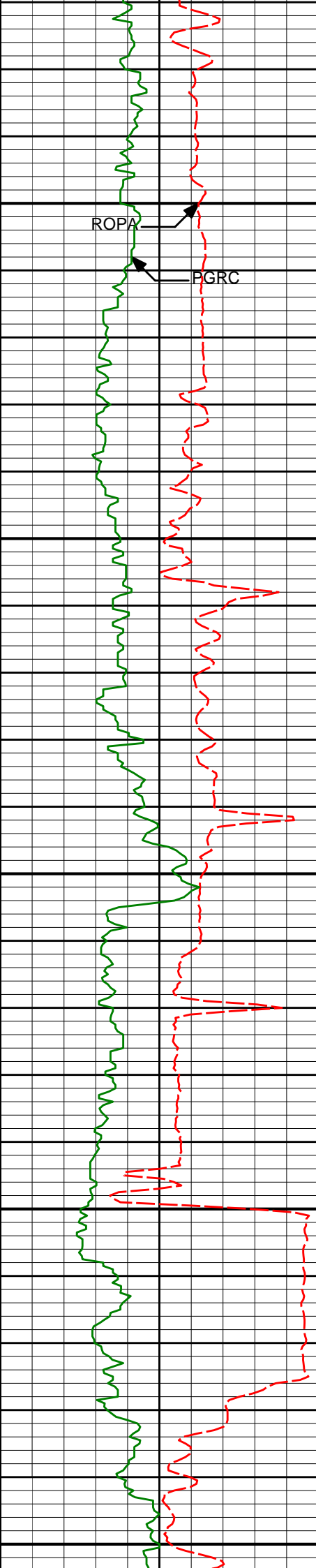
9496'

90.12°

90.85°

7000.89'

2622.89'



9600

9650

9700

9750

9800

9591'

90.06°

90.57°

7000.74'

2717.10'

9686'

91.17°

89.23°

6999.72'

2811.12'

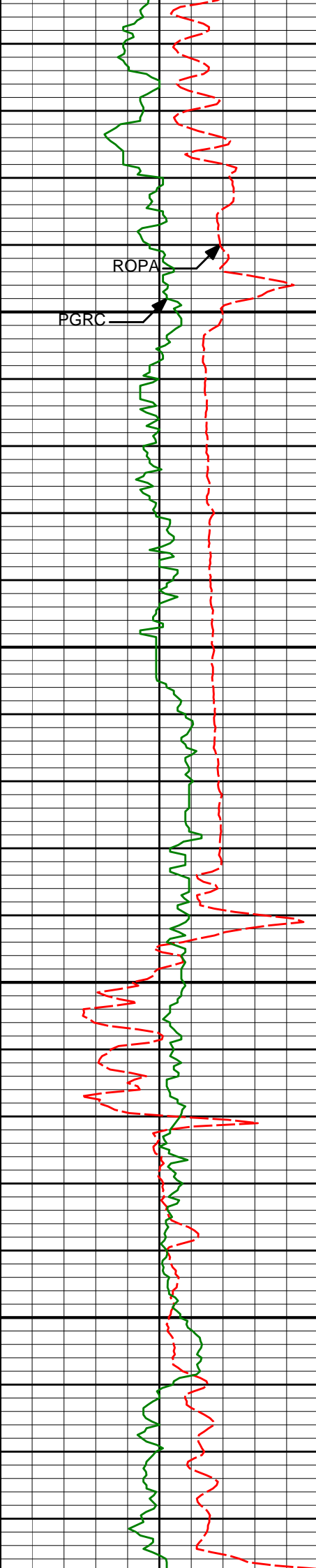
9781'

90.77°

91.55°

6998.11'

2905.24'



9850

9900

9950

10000

9876'

89.48°

90.61°

6997.91'

2999.53'

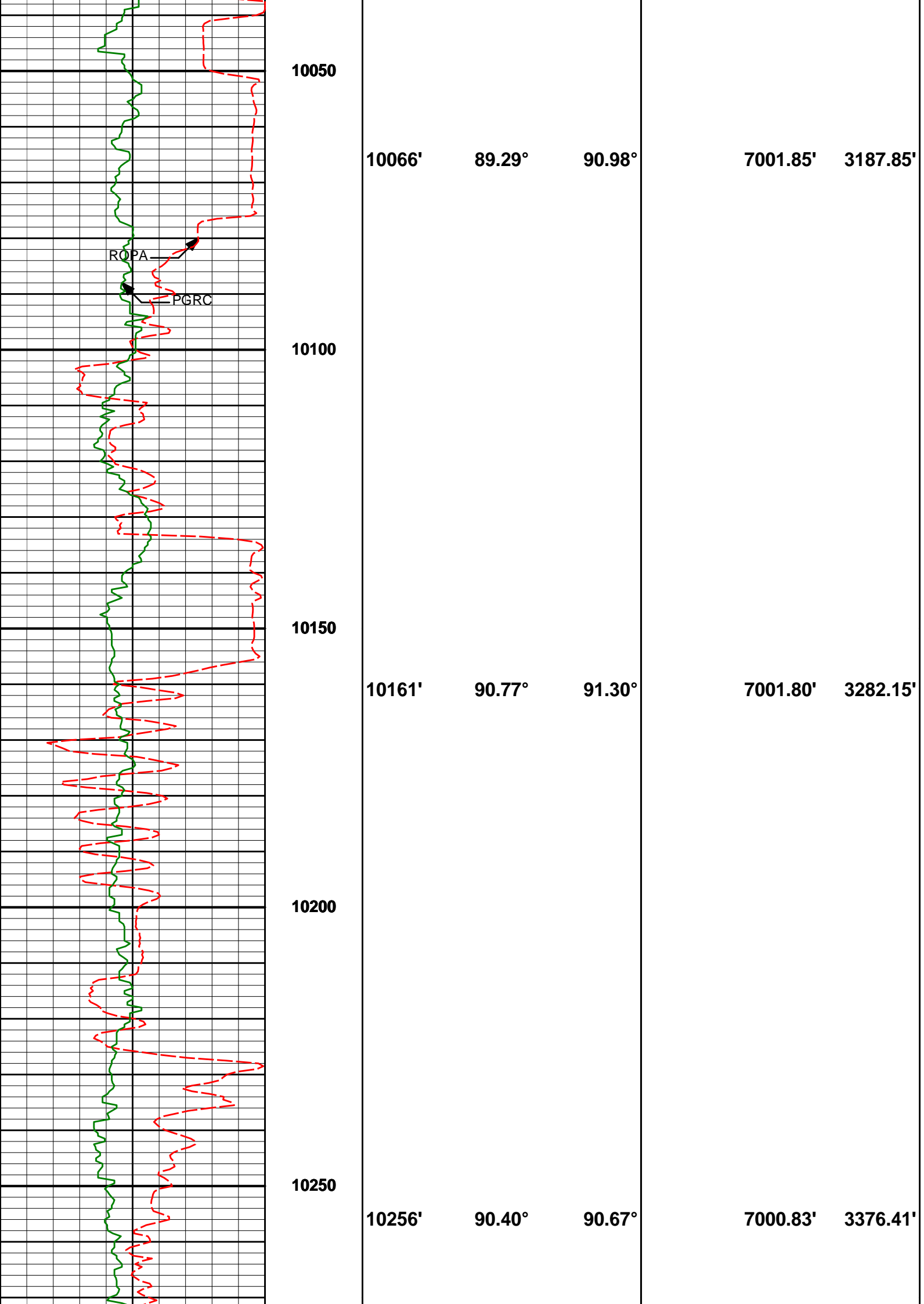
9971'

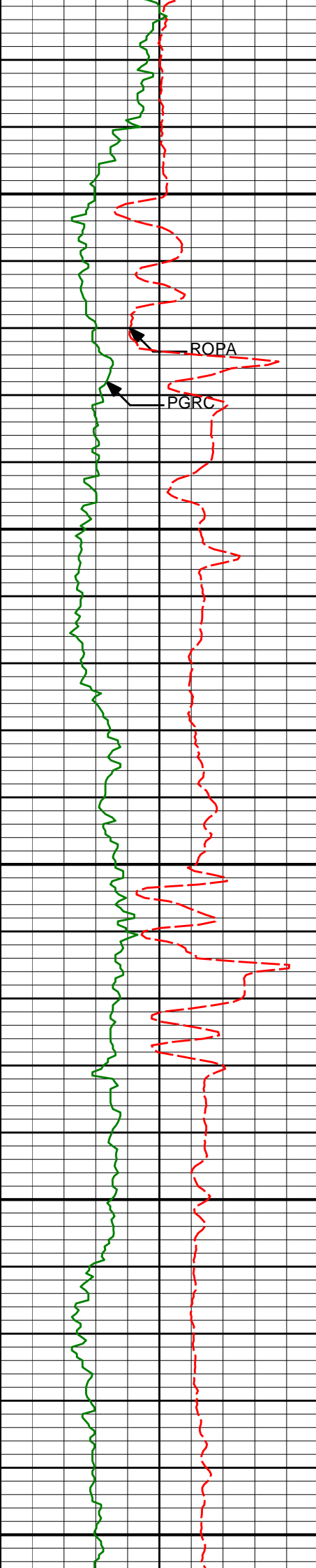
88.24°

90.33°

6999.80'

3093.67'





10300

10350

10400

10450

10500

ROPA

PGRC

10351'

90.37°

90.03°

7000.19'

3470.55'

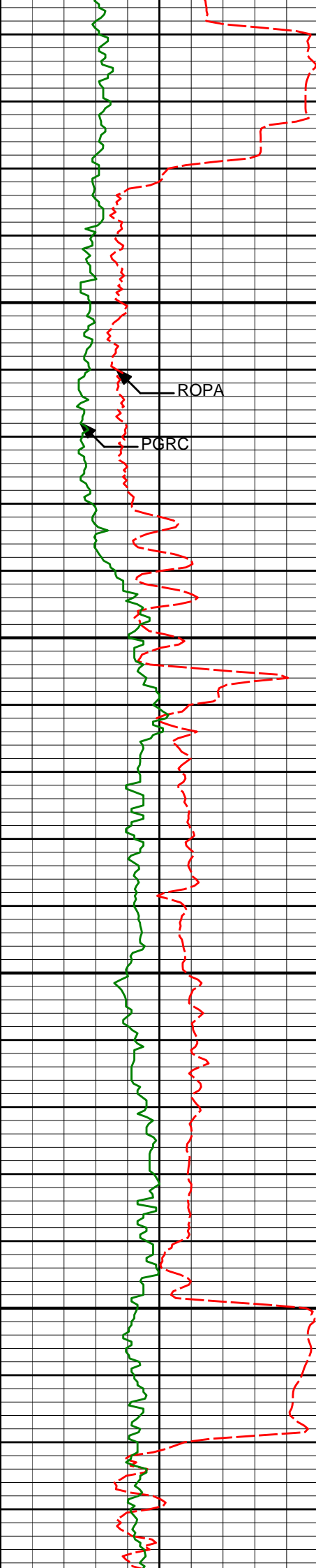
10445'

91.11°

89.45°

6998.98'

3563.54'



10550

10600

10650

10700

10540'

90.86°

90.86°

6997.34'

3657.62'

10635'

91.54°

89.61°

6995.35'

3751.70'

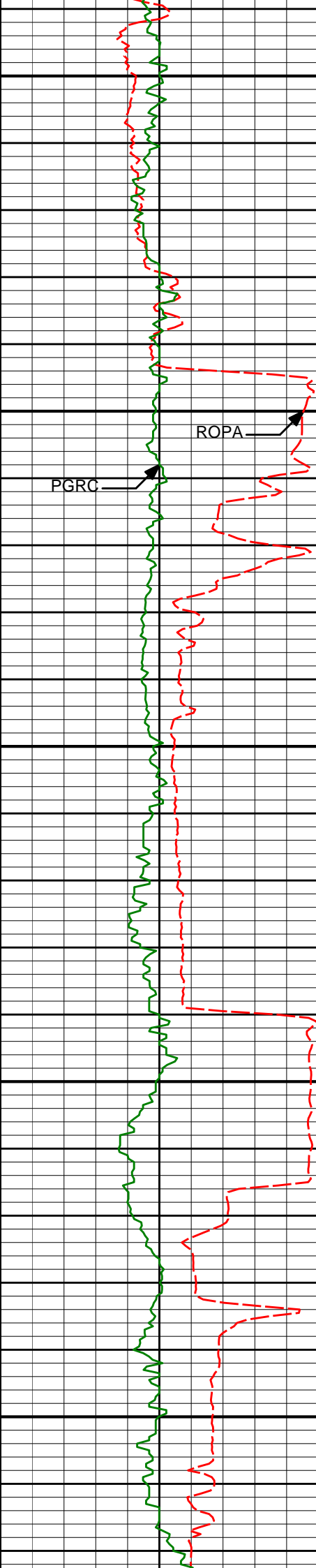
10730'

90.46°

90.51°

6993.69'

3845.75'



10750

10800

10850

10900

10950

ROPA

PGRC

10825'

87.56°

88.46°

6995.32'

3939.66'

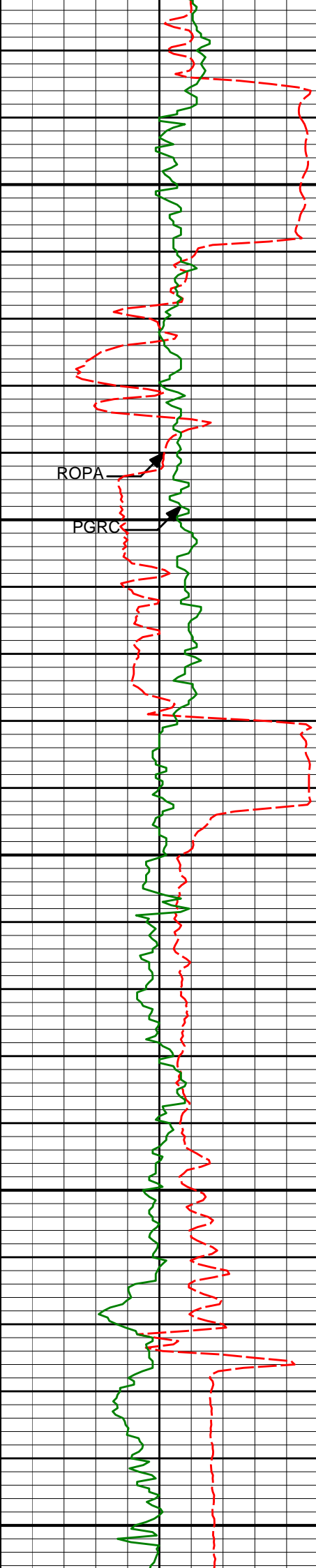
10919'

88.67°

90.02°

6998.41'

4032.48'



11000

11014'

89.94°

90.91°

6999.56'

4126.63'

ROPA

PGRC

11050

11100

11109'

90.12°

90.85°

6999.51'

4220.88'

11150

11200

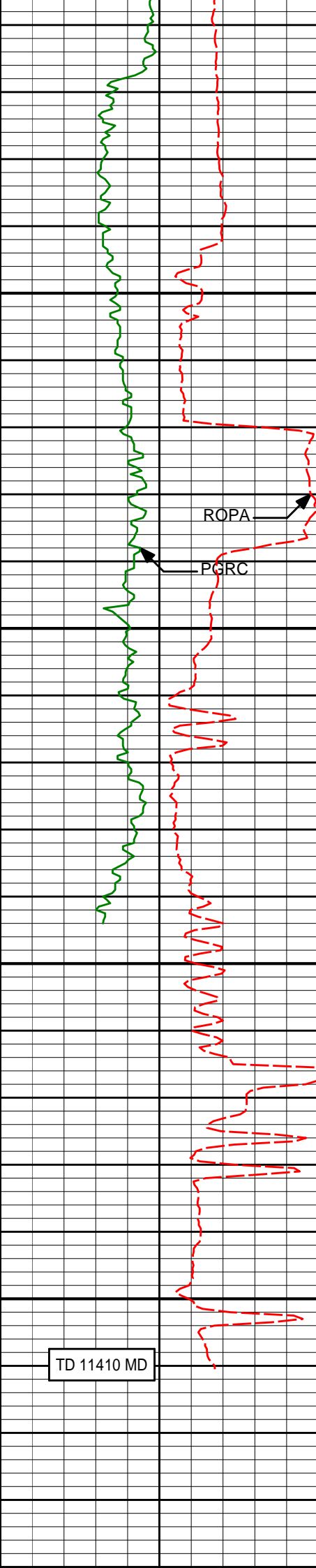
11204'

91.14°

89.30°

6998.46'

4314.94'



11250

11300

11350

11400

ROP

PGRC

TD 11410 MD

11299'

89.72°

90.17°

6997.74'

4408.93'

11346'

90.12°

90.94°

6997.81'

4455.52'

6622.00	33.49	150.44	6557.87	423.36 S	83.29 W	-22.88	8.42
6669.00	32.09	141.58	6597.41	444.44 S	69.12 W	-5.89	10.62
6717.00	31.24	134.68	6638.27	463.18 S	52.34 W	13.36	7.74
6764.00	32.11	126.19	6678.29	479.14 S	33.59 W	34.18	9.66
6812.00	34.38	123.72	6718.43	494.20 S	12.02 W	57.65	5.50
6859.00	38.49	121.21	6756.24	509.15 S	11.54 E	83.08	9.30
6907.00	43.76	116.83	6792.39	524.40 S	39.15 E	112.56	12.52
6954.00	48.65	112.24	6824.92	538.42 S	70.01 E	145.09	12.55
7002.00	53.31	107.96	6855.14	551.19 S	105.03 E	181.55	11.93
7049.00	57.94	105.75	6881.67	562.41 S	142.14 E	219.88	10.59
7097.00	60.97	103.53	6906.07	572.84 S	182.14 E	260.94	7.46
7144.00	64.53	101.42	6927.59	581.85 S	222.93 E	302.59	8.56
7192.00	67.45	99.80	6947.12	589.92 S	266.02 E	346.39	6.82
7238.00	72.29	98.04	6962.94	596.60 S	308.67 E	389.56	11.12
7286.00	76.04	97.72	6976.04	602.93 S	354.41 E	435.73	7.84
7333.00	80.28	96.22	6985.68	608.51 S	400.06 E	481.71	9.55
7376.00	82.53	91.36	6992.11	611.31 S	442.46 E	524.09	12.34
7456.00	86.95	86.21	6999.45	609.61 S	522.06 E	602.66	8.46
7504.00	87.00	85.93	7001.98	606.33 S	569.88 E	649.54	0.59
7599.00	86.79	88.47	7007.12	601.69 S	664.62 E	742.68	2.68
7694.00	88.92	88.98	7010.68	599.58 S	759.53 E	836.34	2.31
7789.00	90.46	90.04	7011.19	598.76 S	854.52 E	930.28	1.97
7884.00	91.33	91.55	7009.71	600.08 S	949.49 E	1024.49	1.83
7979.00	91.97	91.03	7006.98	602.21 S	1044.43 E	1118.78	0.87
8073.00	90.52	90.70	7004.93	603.62 S	1138.39 E	1212.01	1.58
8169.00	89.45	91.23	7004.95	605.23 S	1234.38 E	1307.27	1.25
8264.00	90.83	91.33	7004.72	607.35 S	1329.35 E	1401.59	1.46
8359.00	91.20	90.75	7003.03	609.07 S	1424.32 E	1495.86	0.72
8453.00	89.91	90.91	7002.12	610.43 S	1518.30 E	1589.10	1.39
8548.00	89.88	90.87	7002.30	611.90 S	1613.29 E	1683.35	0.06
8643.00	89.94	91.29	7002.45	613.69 S	1708.27 E	1777.64	0.45
8738.00	91.05	91.10	7001.63	615.68 S	1803.25 E	1871.95	1.19
8833.00	90.37	90.24	7000.45	616.79 S	1898.23 E	1966.14	1.15
8928.00	90.22	89.72	6999.97	616.77 S	1993.23 E	2060.19	0.57
9022.00	88.58	90.24	7000.95	616.74 S	2087.22 E	2153.24	1.82
9117.00	90.31	91.02	7001.87	617.78 S	2182.21 E	2247.43	1.99
9212.00	90.59	90.68	7001.13	619.19 S	2277.20 E	2341.67	0.46
9307.00	90.37	89.14	7000.33	619.04 S	2372.19 E	2435.70	1.64
9401.00	89.41	90.35	7000.51	618.61 S	2466.19 E	2528.70	1.64
9496.00	90.12	90.85	7000.89	619.60 S	2561.18 E	2622.89	0.92
9591.00	90.06	90.57	7000.74	620.78 S	2656.17 E	2717.10	0.30
9686.00	91.17	89.23	6999.72	620.62 S	2751.16 E	2811.12	1.83
9781.00	90.77	91.55	6998.11	621.27 S	2846.14 E	2905.24	2.47
9876.00	89.48	90.61	6997.91	623.06 S	2941.12 E	2999.53	1.68
9971.00	88.24	90.33	6999.80	623.84 S	3036.09 E	3093.67	1.33
10066.00	89.29	90.98	7001.85	624.93 S	3131.06 E	3187.85	1.30
10161.00	90.77	91.30	7001.80	626.82 S	3226.04 E	3282.15	1.59
10256.00	90.40	90.67	7000.83	628.45 S	3321.02 E	3376.41	0.76
10351.00	90.37	90.03	7000.19	629.03 S	3416.02 E	3470.55	0.68
10445.00	91.11	89.45	6998.98	628.61 S	3510.01 E	3563.54	0.99
10540.00	90.86	90.86	6997.34	628.87 S	3604.99 E	3657.62	1.51
10635.00	91.54	89.61	6995.35	629.26 S	3699.97 E	3751.70	1.50
10730.00	90.46	90.51	6993.69	629.36 S	3794.95 E	3845.75	1.48
10825.00	87.56	88.46	6995.32	628.51 S	3889.92 E	3939.66	3.73
10919.00	88.67	90.02	6998.41	627.27 S	3983.85 E	4032.48	2.04
11014.00	89.94	90.91	6999.56	628.04 S	4078.84 E	4126.63	1.62
11109.00	90.12	90.85	6999.51	629.49 S	4173.83 E	4220.88	0.20
11204.00	91.14	89.30	6998.46	629.62 S	4268.82 E	4314.94	1.95
11299.00	89.72	90.17	6997.74	629.18 S	4363.81 E	4408.93	1.75
11346.00	90.12	90.94	6997.81	629.64 S	4410.81 E	4455.52	1.84

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 98.12 DEGREES (GRID)
A TOTAL CORRECTION OF 8.10 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11346.00 FEET
IS 4455.52 FEET ALONG 98.12 DEGREES (GRID)

Tied in to Surface Casing @ 637

