



1 : 240 / 1 : 600

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	17-Feb-13	18-Feb-13	12-Mar-13		
Rig Bit Number	2	3	4		
Bit Size (in)	8.75	8.75	6.125		
Tool Nominal OD (in)	6.75	6.75	4.75		
Log Start Depth (MD, ft)	648	6,220	7,355		
Log End Depth (MD, ft)	6,220	7,355	11,357		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	16-Feb-13 06:50	17-Feb-13 15:27	15-Feb-13 17:16		
Drill/Wipe End Date and Time	17-Feb-13 08:20	18-Feb-13 09:39	15-Feb-13 17:16		
Min Inc (deg) @ Depth (MD, ft)	.28 @ 1,550	1.05 @ 6,225	85.96 @ 7,375		
Max Inc (deg) @ Depth (MD, ft)	17.23 @ 3,826	83.05 @ 7,300	92.22 @ 11,357		
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC	.46 / PDC		
Flow Rate (gpm)	567.29	556.77	269.16		
Max AV (fpm) / CV (fpm) @ MWD	NA / NA	NA / NA	423 / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.6 / 29	9.4 / 36	9.15 / 36		
Filtrate CL (ppm)	2,400	2,850	2,200		
pH / Fluid Loss (mptm)	9 / 9	9 / 9	10.3 / 10.3		
PV (cP) / YP (Ihf2)	1 / 4	9 / 9	8 / 2		
% Solids / % Sand	1.70 / 0.30	7.00 / 0.30	6.5 / 0.1		
% Oil / Oil:Water Ratio	NA / NA	NA / NA	N/A / N/A		
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ NA	NA @ NA	N/A @ N/A		
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	N/A @ N/A		
Max Tool Temp (deg F) / S	167.05 / PDM	188.28 / PDM	222.51 / PDM		

Max Tool Temp (degF) / Source	167.97 / PCM	168.00 / PCM	239.54 / PCM		
Rm @ Max Tool Temp (degF)	NA @ 167.97	NA @ 168.00	N/A @ 239.54		
Lead MWD Engineer	Christopher Befort	Christopher Befort	Christopher Befort		
Customer Representative	Jim Turner	Jim Turner	Roger Foster		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11964411	113413322	12134689		
Insert Serial Number	11400838	11400838	11680788		
Date and Time Initialized	14-Feb-13 19:40	14-Feb-13 19:40	08-Mar-13 12:56		
Date and Time Read	18-Feb-13 15:14	18-Feb-13 15:14	12-Mar-13 07:54		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	58	55	61		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11964411	11341332	12134689		
Sonde Serial Number	11833225	11833225	11297583		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	60.35	132.32	153.21		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.75	48.31	63.98		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11964411	11341332	12134689		
Insert/Sonde Serial Number	11293307	11293307	11680938		

REMARKS

1. All depths are calibrated to driller's pipe tally and are true vertical depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill: 3.0 ft
6. Insite Version 7.4.1

WARRANTY

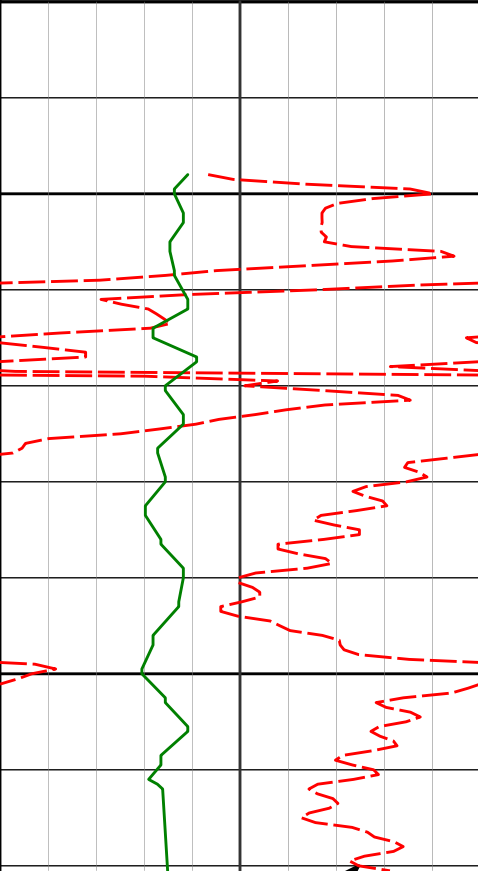
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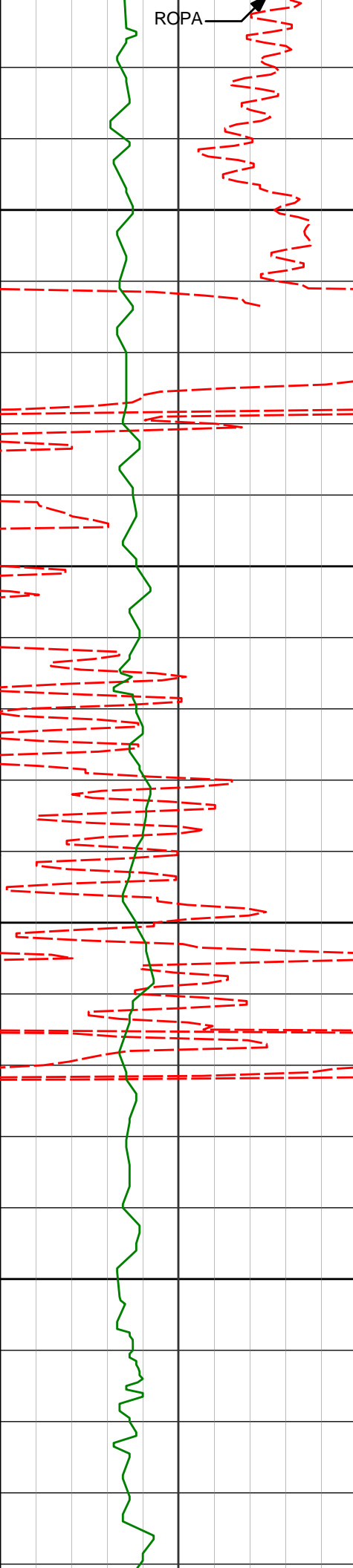
HALLIBURTON

Sperry Drilling Services

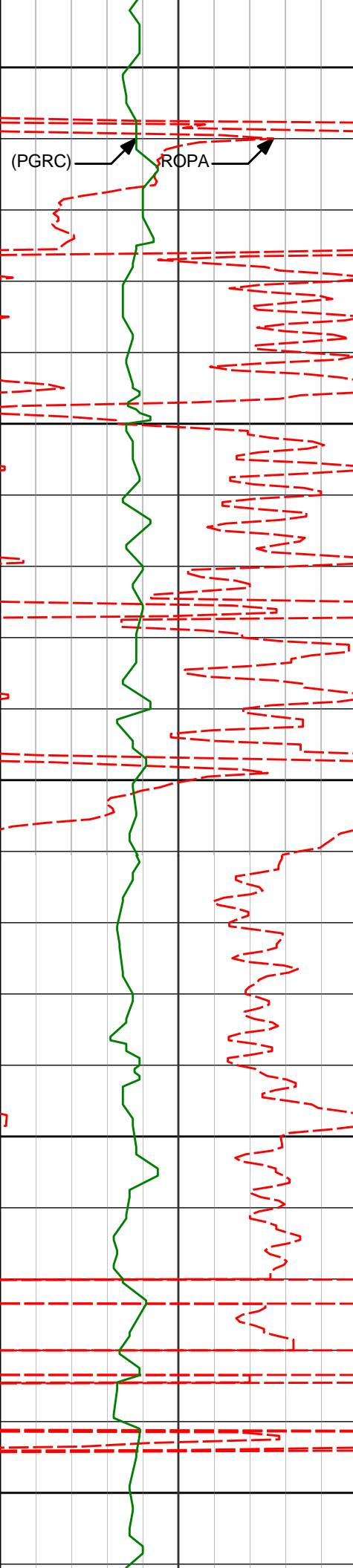
MD Detail Log 1:240

Noble Energy
Knaub PC G04-66-A2
HP 321
T4N R65W

PCG Gamma Ray BCor (PGRC) api						
0300						
Average Rate of Penetration (ROPA) feet per hr		Depth ft	Depth	Inc	Azi	TVDV/S
1K0						
		100 650				
		700				



730'	0.37°	283.93°	729.95'	7.06'
750				
800				
830'	0.47°	280.00°	829.94'	6.37'
850				
900				
930'	0.60°	241.51°	929.94'	5.50'



950

1000

1050

1100

1150

1030'

0.78°

220.85°

1029.93'

4.51'

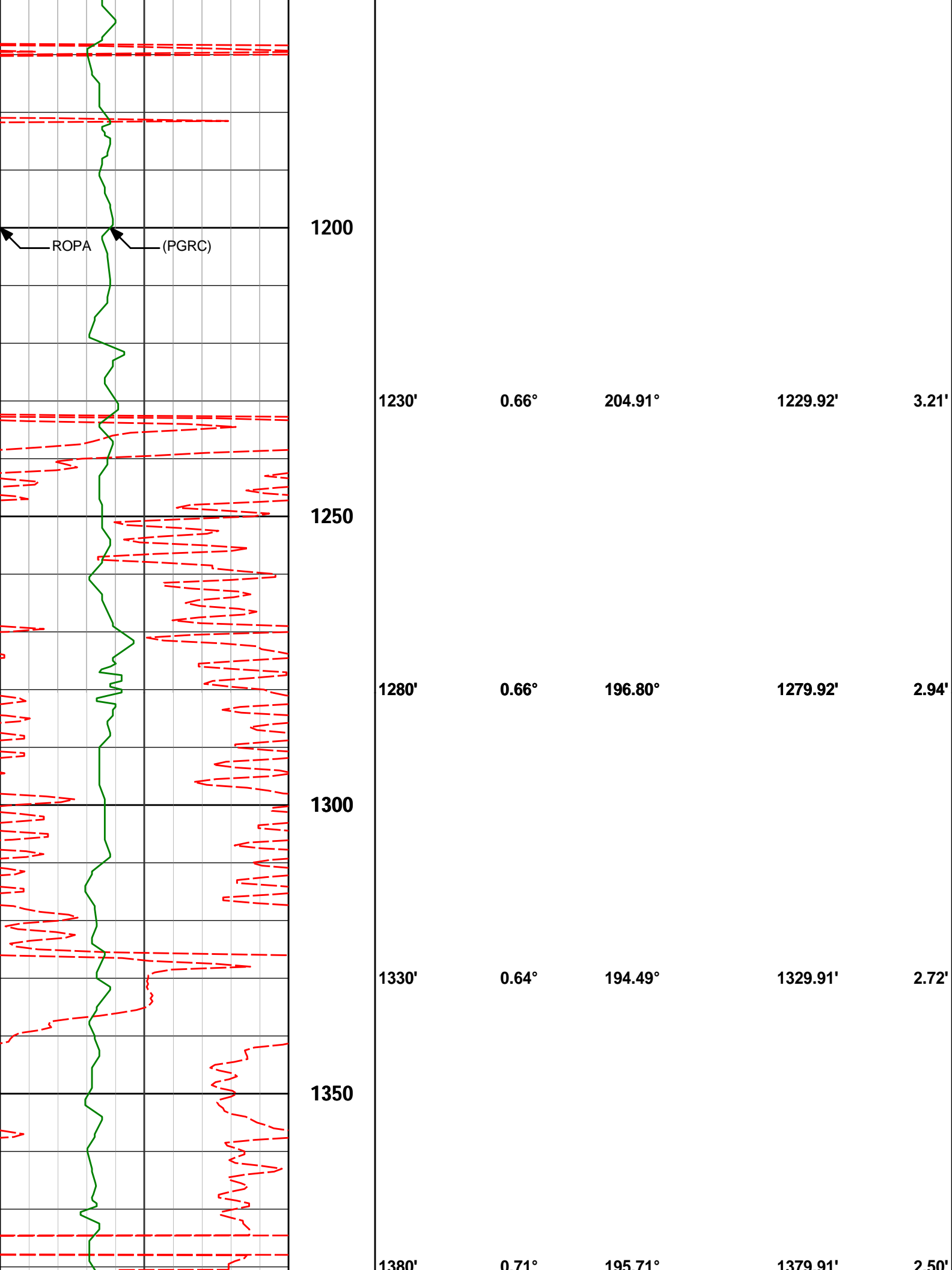
1130'

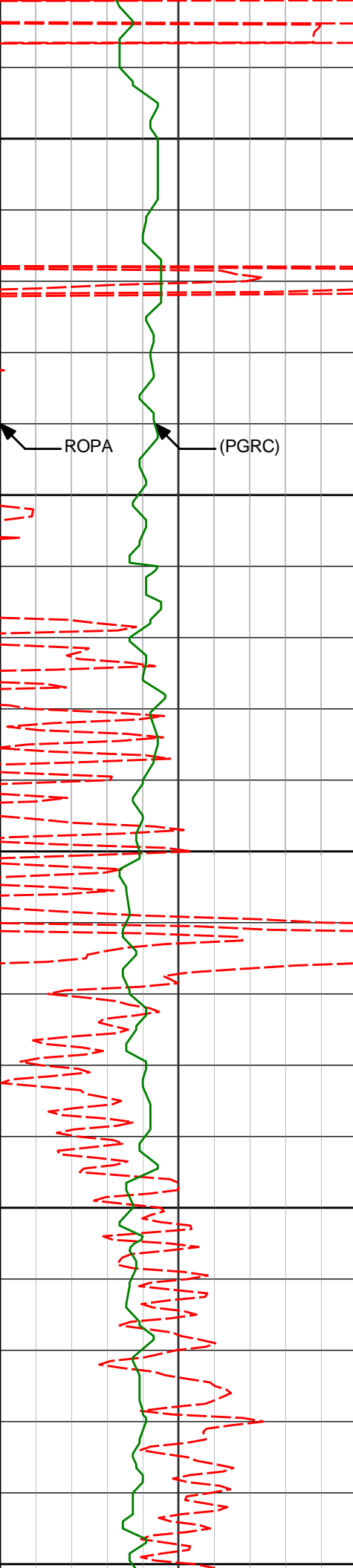
0.60°

201.50°

1129.93'

3.76'





1400

1450

1500

1550

1600

ROPA

(PGRC)

1430'

0.60°

215.11°

1429.91'

2.21'

1480'

0.33°

240.65°

1479.90'

1.90'

1530'

0.34°

242.62°

1529.90'

1.63'

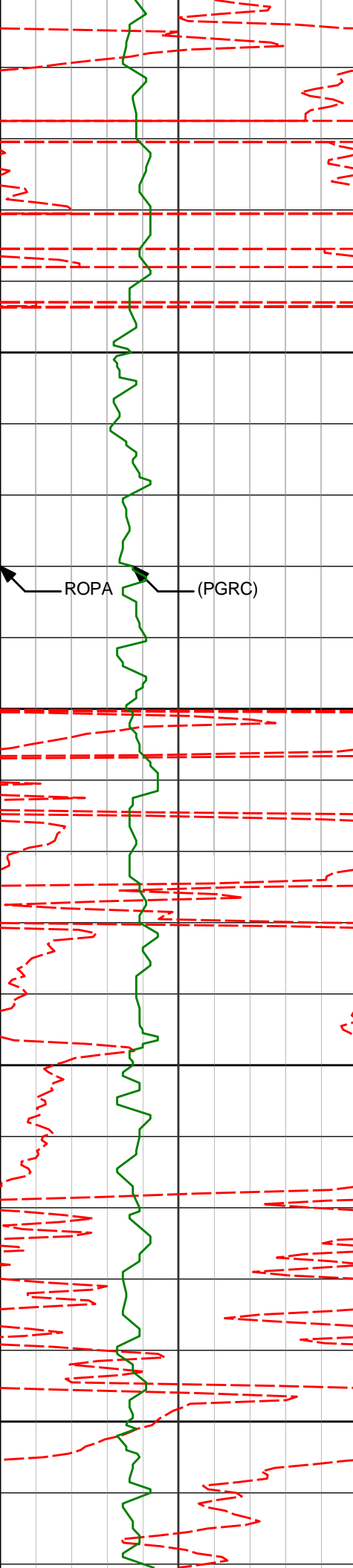
1580'

0.25°

294.83°

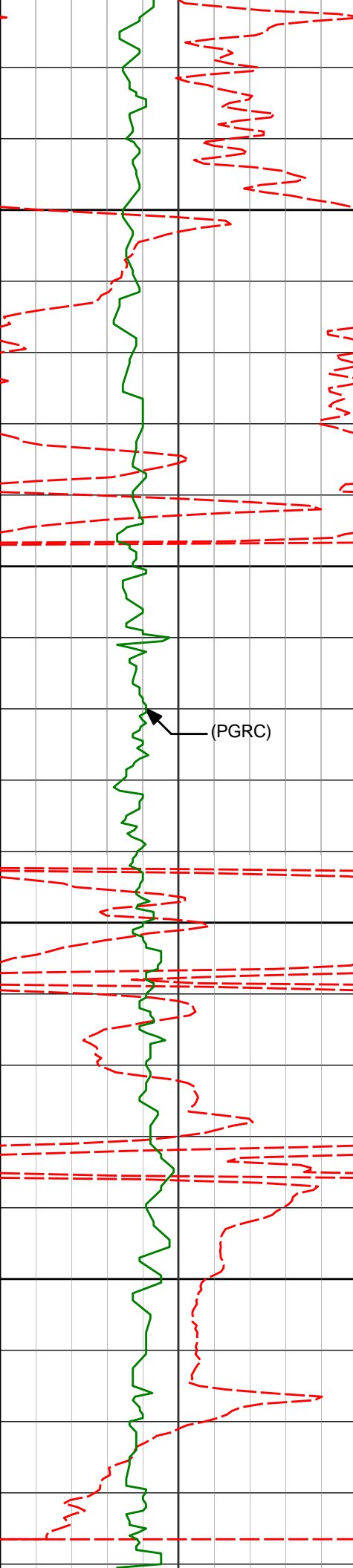
1579.90'

1.40'



1630
1650
1680
1700
1730
1750
1780
1800

1630'	0.40°	265.05°	1629.90'	1.13'
1680'	0.47°	256.63°	1679.90'	0.75'
1730'	0.34°	280.09°	1729.90'	0.41'
1780'	0.38°	232.48°	1779.90'	0.12'



1850

1900

1950

2000

1830'

0.52°

205.72°

1829.90'

-0.15'

1880'

0.69°

204.40°

1879.89'

-0.42'

1930'

0.78°

204.44°

1929.89'

-0.76'

1980'

0.84°

218.56°

1979.89'

-1.20'

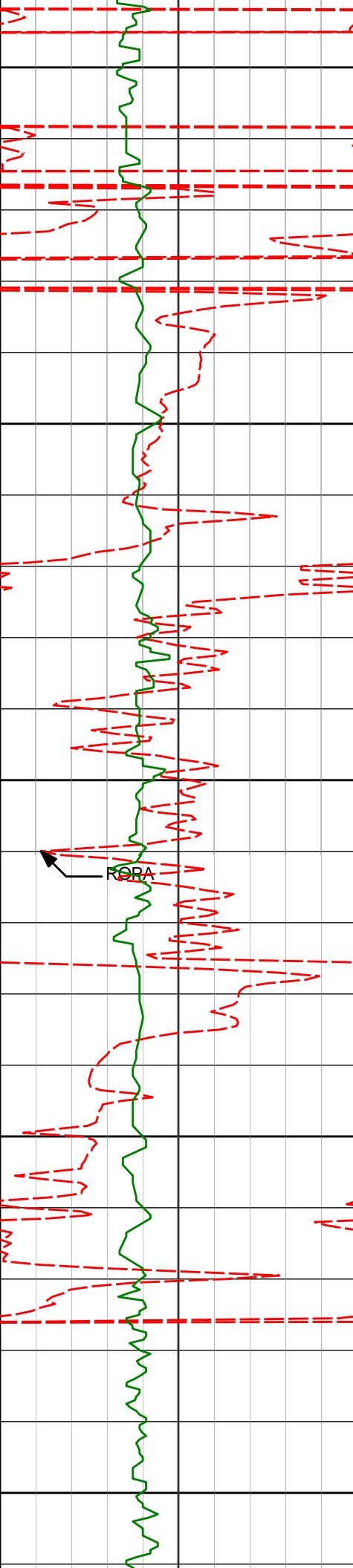
2030'

1.63°

314.17°

2029.88'

-1.91'



2050

2100

2150

2200

2250

2130'

3.43°

317.91°

2129.78'

-4.53'

2230'

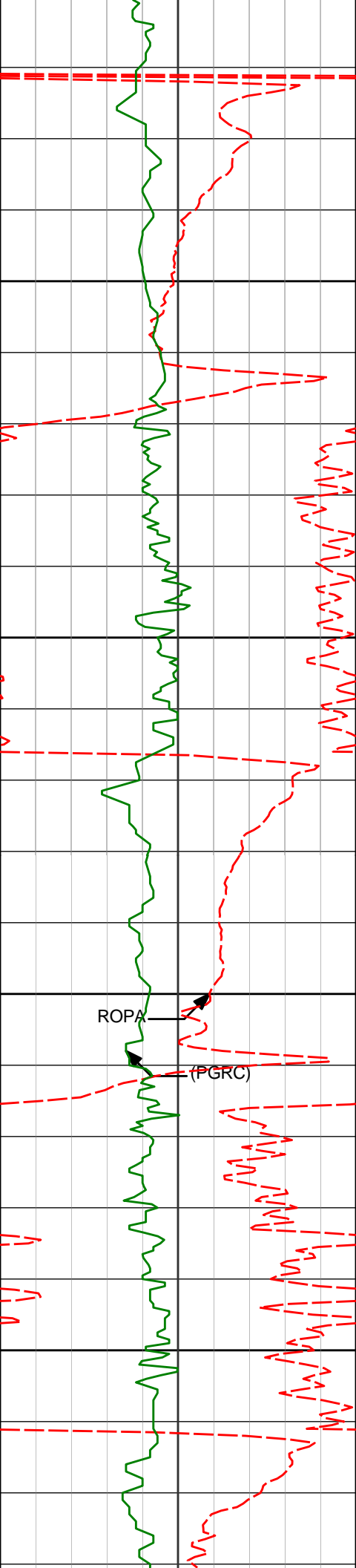
6.07°

335.35°

2229.43'

-7.87'

NOBA



2300

2350

2400

2450

2330'

8.72°

342.77°

2328.59'

-10.85'

ROPA

(PGRC)

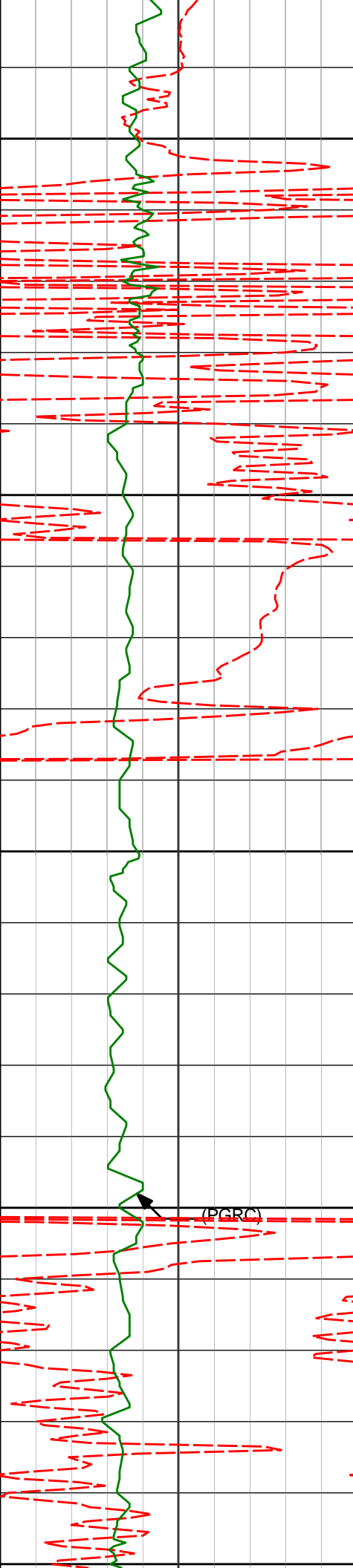
2430'

11.27°

338.35°

2427.07'

-14.71'



2500

2530'

14.08°

336.43°

2524.62'

-20.70'

2550

2600

2630'

16.21°

338.87°

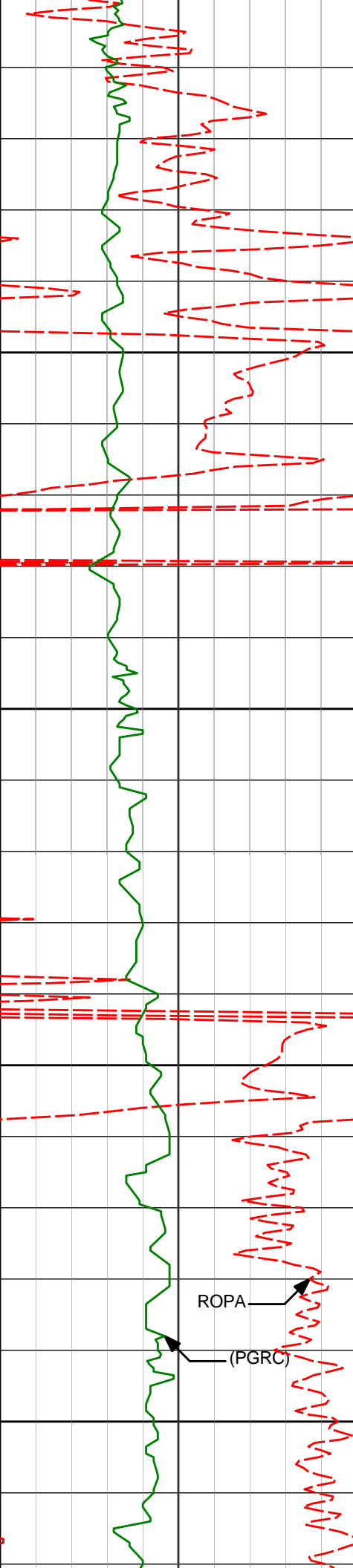
2621.14'

-27.64'

2650

(PGRC)

2700



2700

2730'

16.81°

338.93°

2717.02'

-34.63'

2750

2800

2830'

16.56°

333.75°

2812.81'

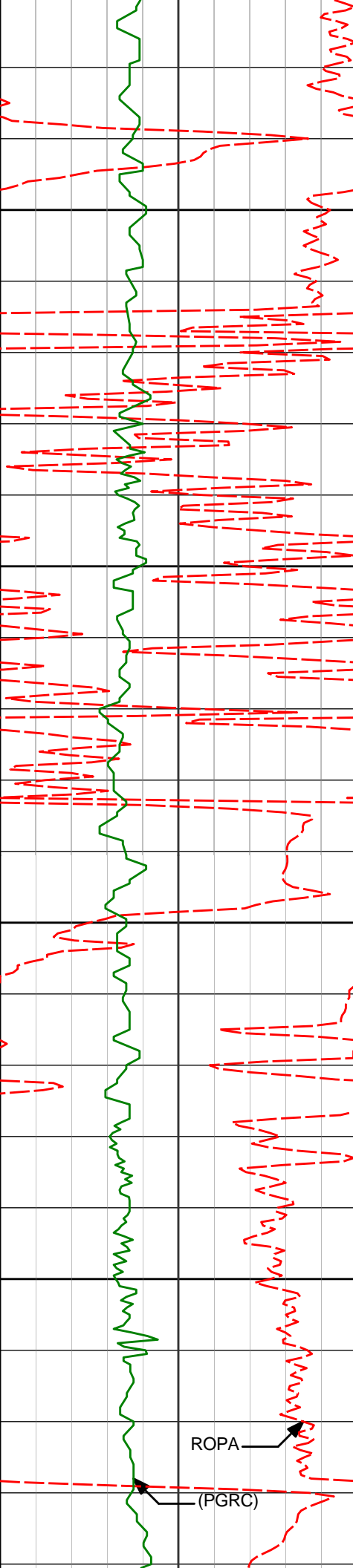
-42.92'

2850

ROPA

(PGRC)

2900



2930'	13.26°	333.49°	2909.43'	-51.50'
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2950

3000

3030'	12.61°	332.68°	3006.90'	-59.18'
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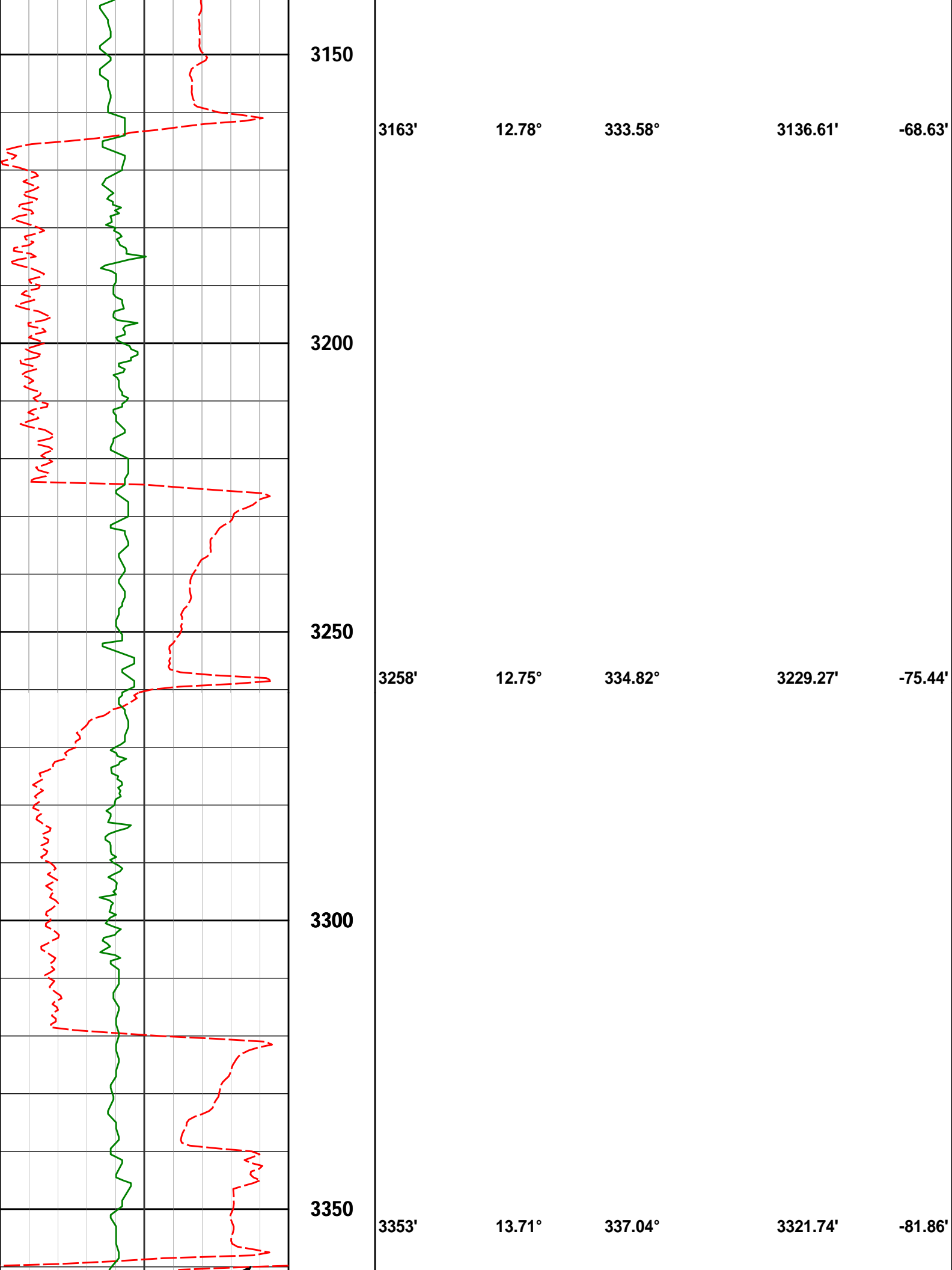
3050

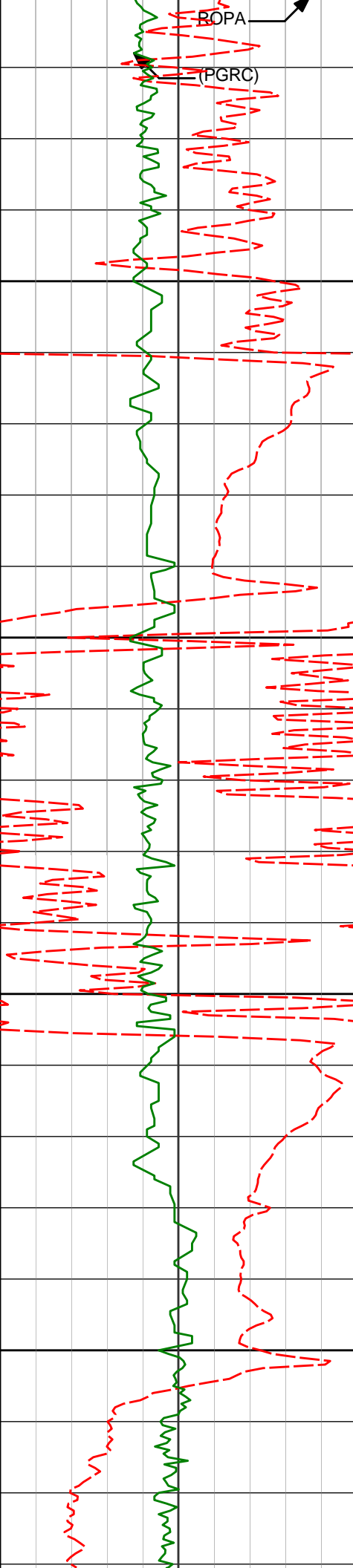
3068'	12.79°	335.39°	3043.97'	-61.91'
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3100

ROPA

(PGRC)





3400

3450

3500

3550

3447'

13.73°

336.02°

3413.06'

-88.24'

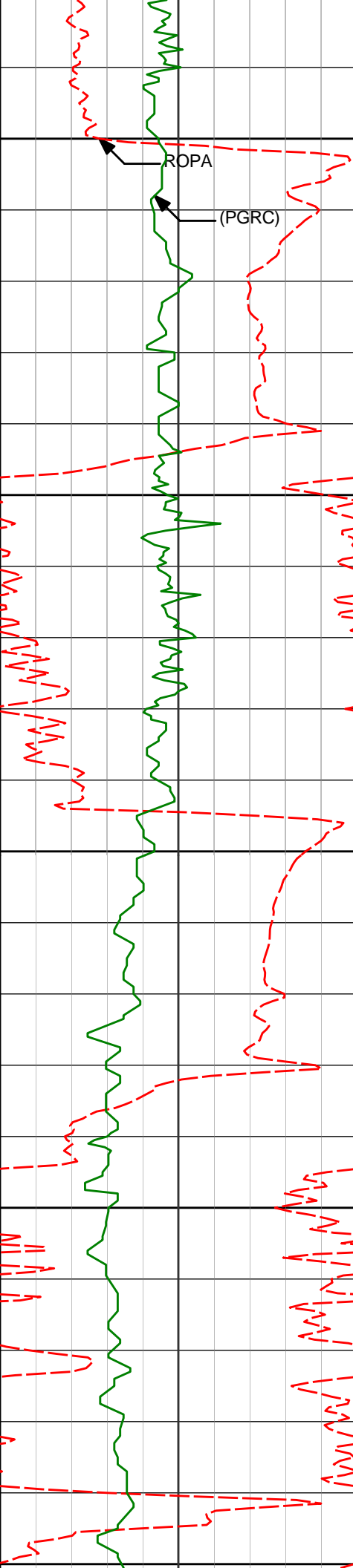
3542'

14.39°

334.26°

3505.21'

-95.38'



3600

ROPA

(PGRC)

3637'

15.13°

335.69°

3597.08'

-102.92'

3650

3700

3732'

16.14°

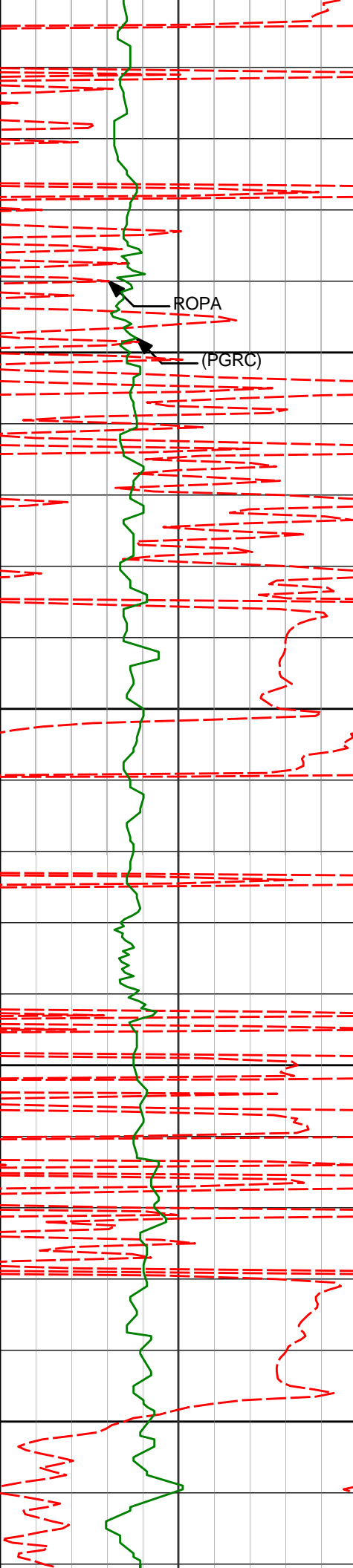
339.85°

3688.56'

-109.67'

3750

3800



3800

3826'

17.23°

340.29°

3778.60'

-115.77'

3850

ROPA

(PGRC)

3900

3921'

16.14°

337.33°

3869.60'

-122.50'

3950

4000

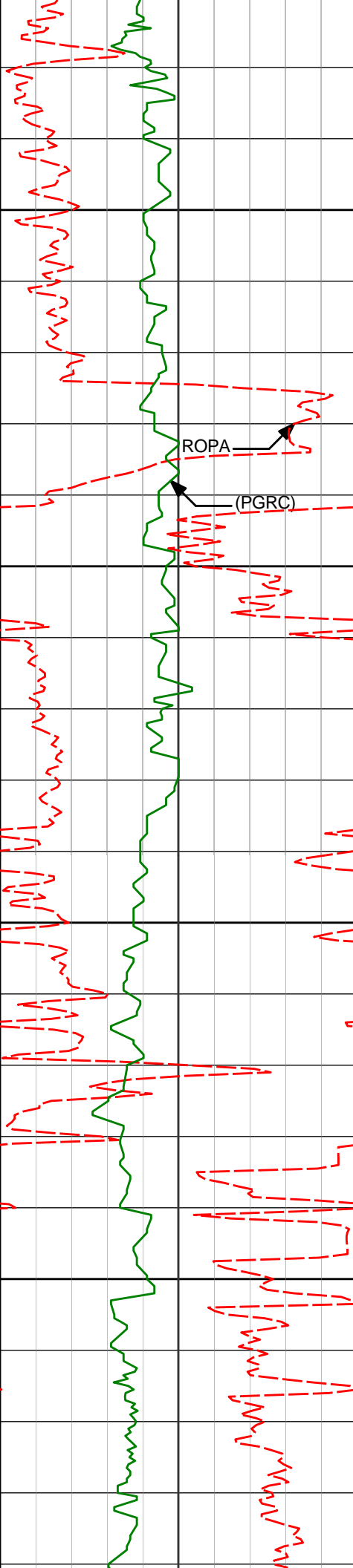
4016'

13.09°

337.50°

3961.52'

-129.00'



4050

4100

4150

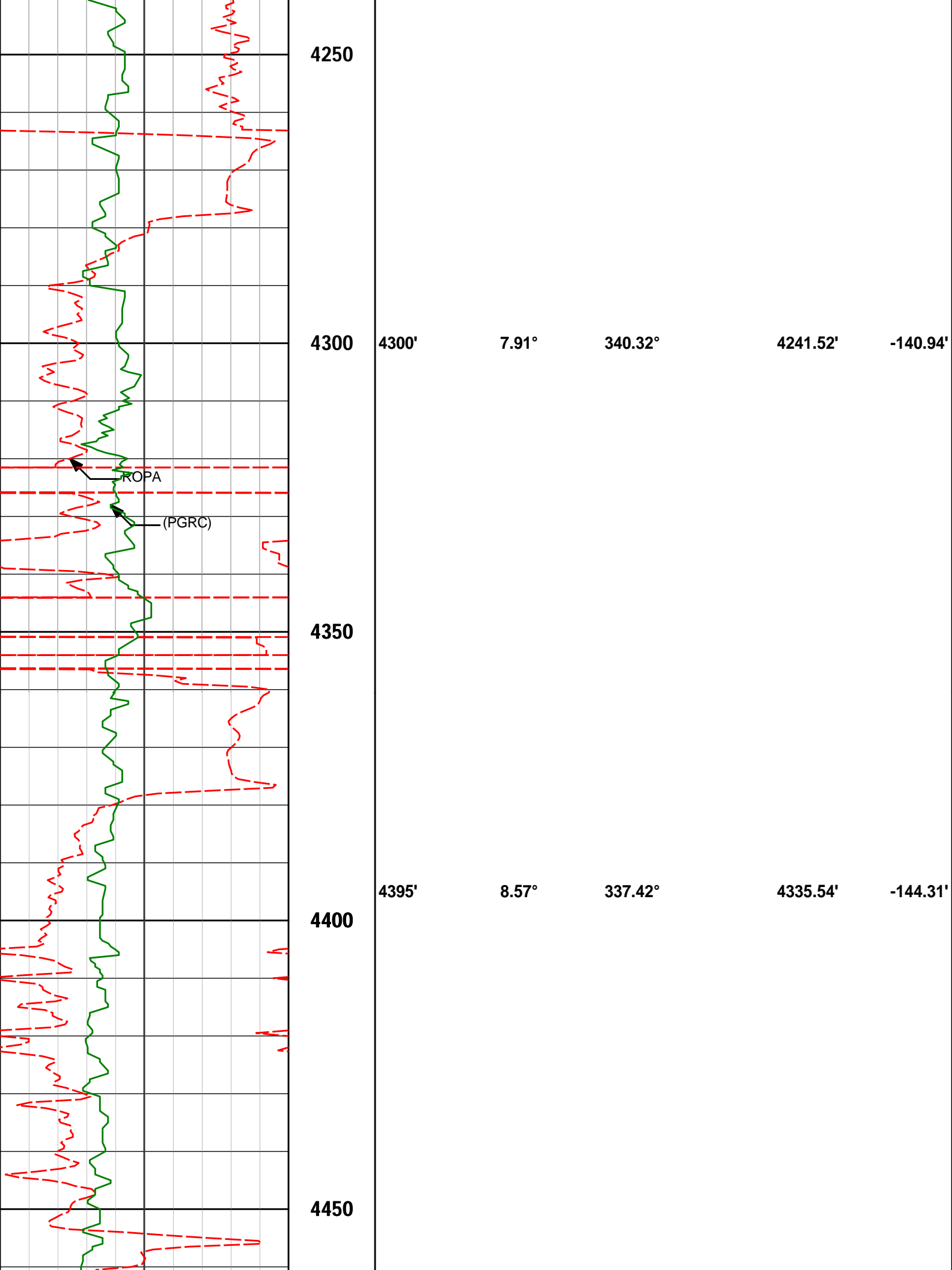
4200

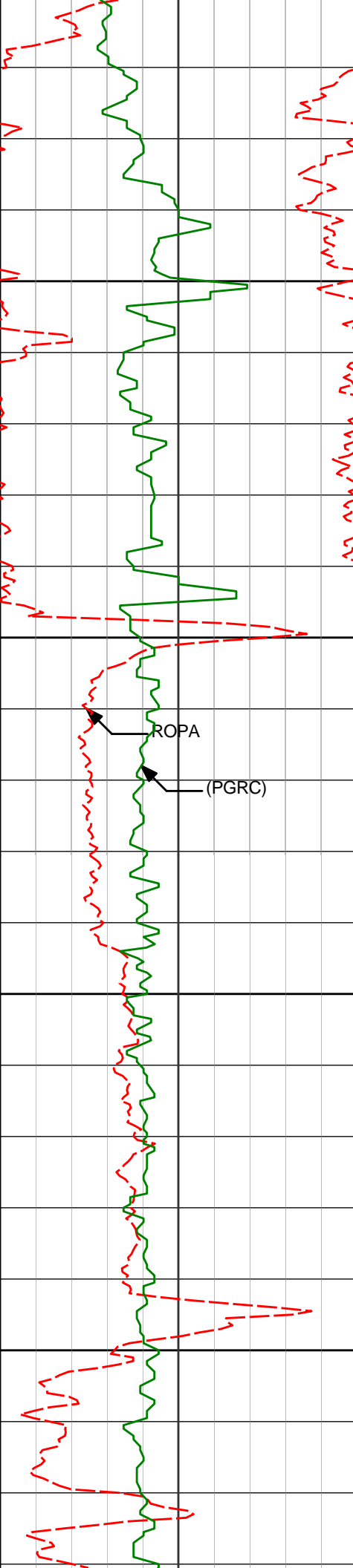
ROPA

(PGRC)

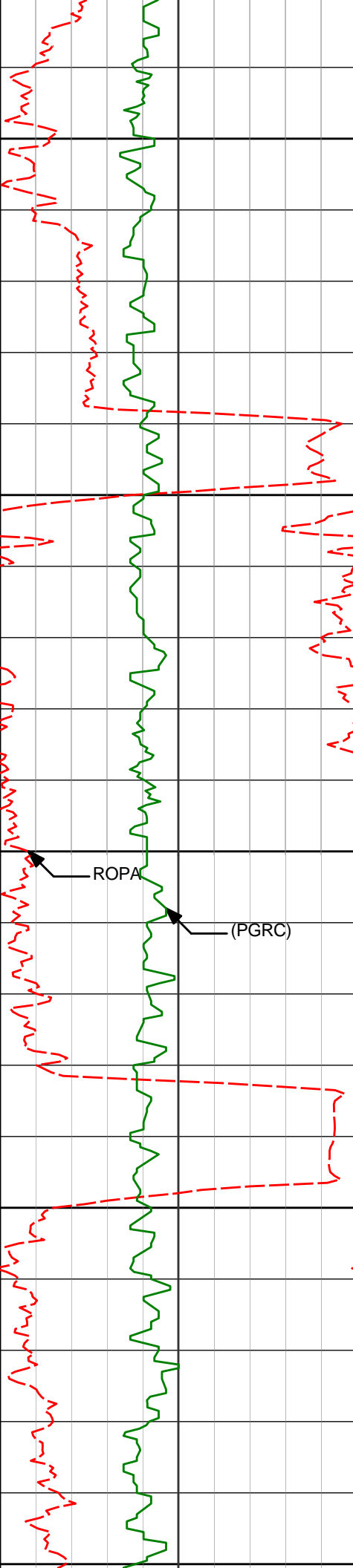
4111'	9.79°	338.26°	4054.62'	-133.97'
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4206'	8.19°	338.26°	4148.45'	-137.78'
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4490'	7.69°	337.69°	4429.59'	-147.92'
4500				
4550				
4585'	6.43°	341.96°	4523.86'	-150.64'
4600				
4650				
4680'	4.74°	343.67°	4618.41'	-152.32'



4700

4750

4800

4850

4900

4774'

3.80°

342.10°

4712.15'

-153.56'

ROPA

(PGRC)

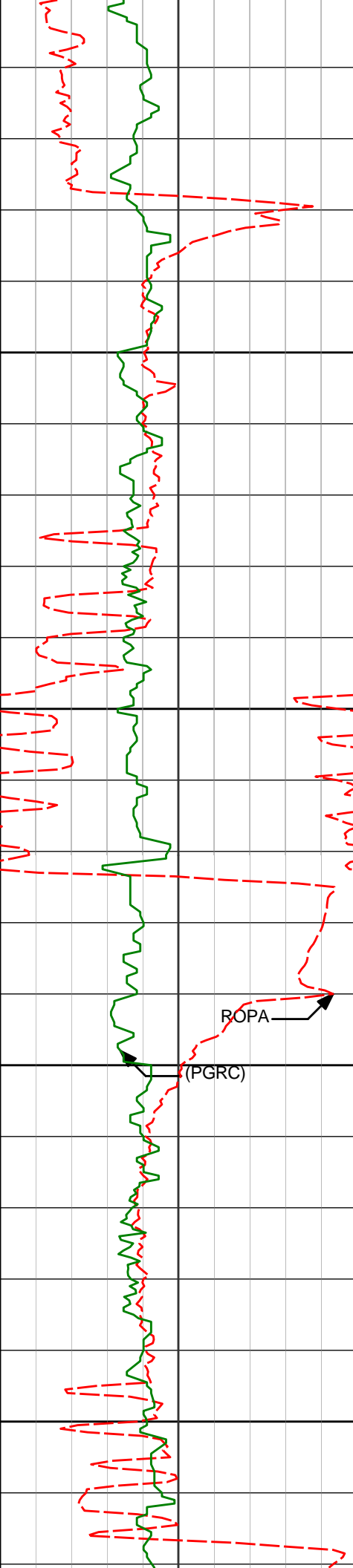
4869'

3.58°

334.53°

4806.95'

-155.11'



4950

4964'

3.14°

336.59°

4901.79'

-156.80'

5000

5050

(PGRC)

ROPA

5059'

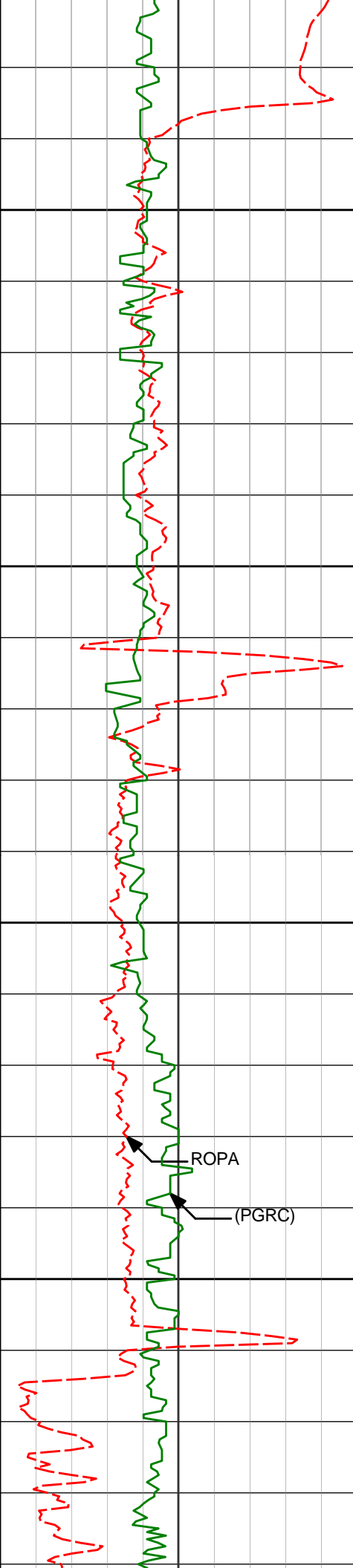
2.01°

310.83°

4996.69'

-158.66'

5100



5150

5200

5250

5300

5154'

0.63°

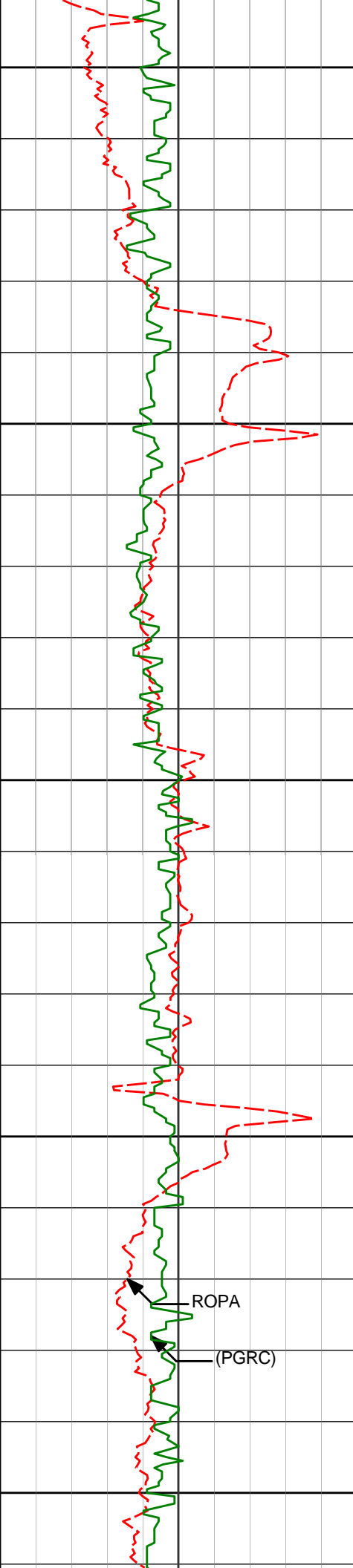
253.65°

5091.67'

-160.30'

ROPA

(PGRC)



5350

5400

5450

5500

5550

5438'

0.85°

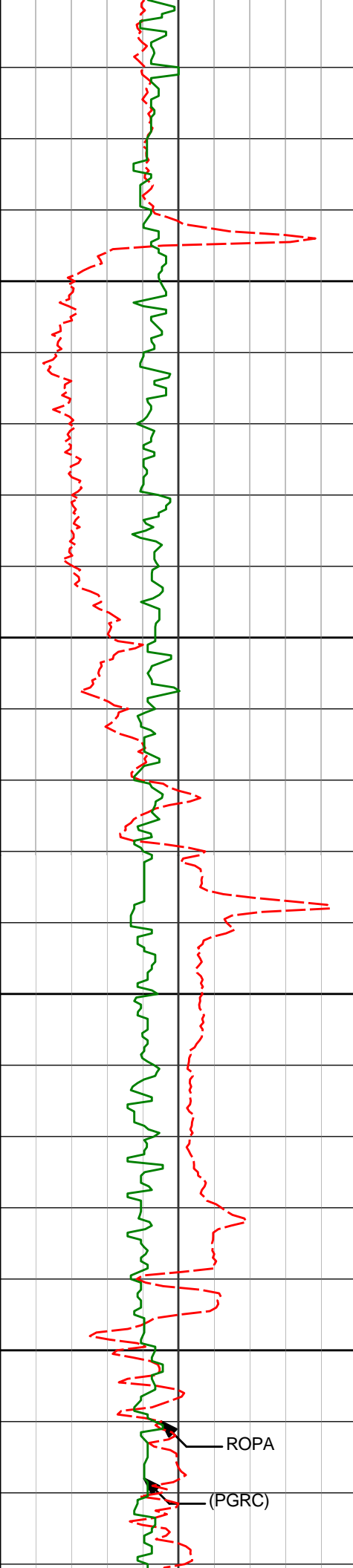
303.27°

5375.65'

-163.47'

ROPA

(PGRC)



5600

5650

5700

5750

5722'

0.40°

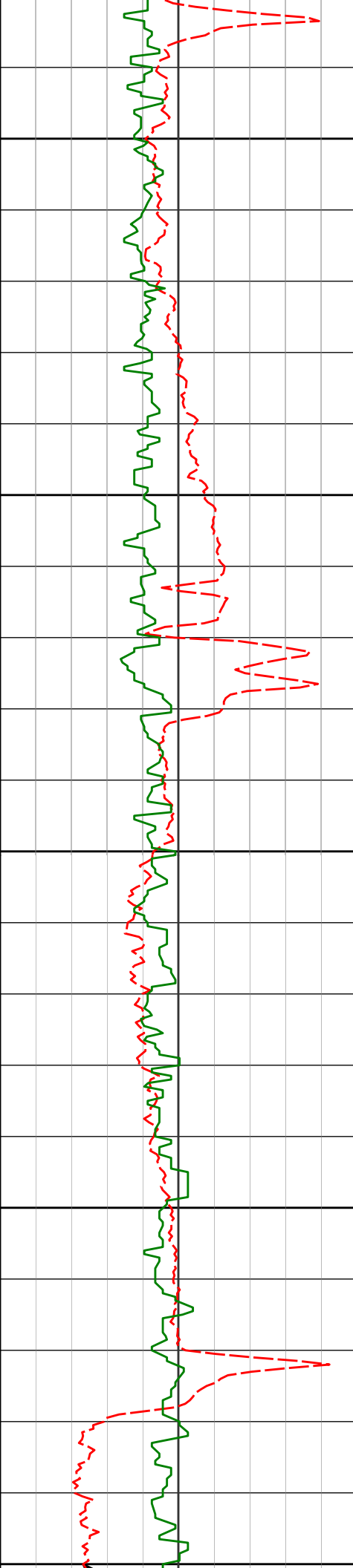
351.98°

5659.63'

-165.10'

ROPA

(PGRC)



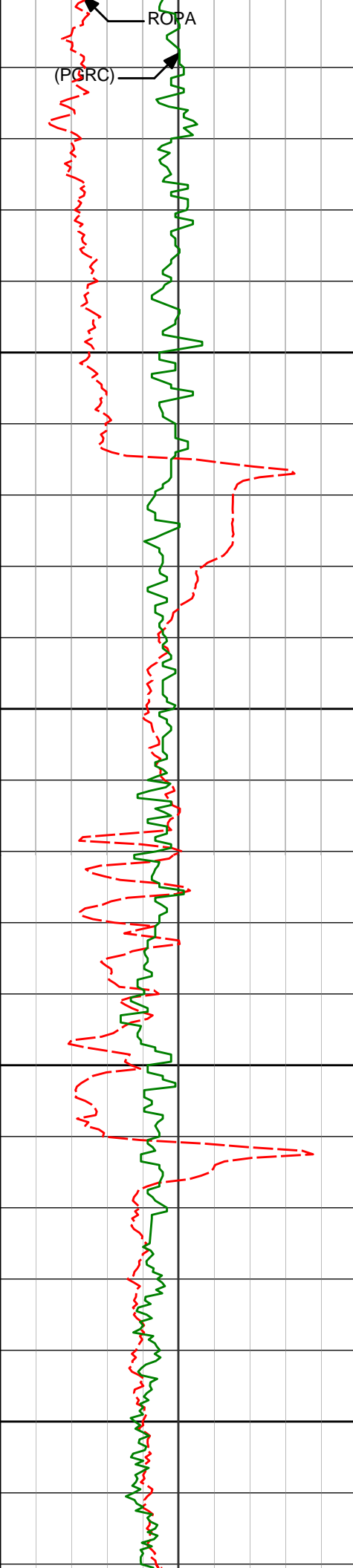
5800

5850

5900

5950

6000



6000

6050

6100

6150

6200

6007'

0.73°

122.46°

5944.62'

-163.72'

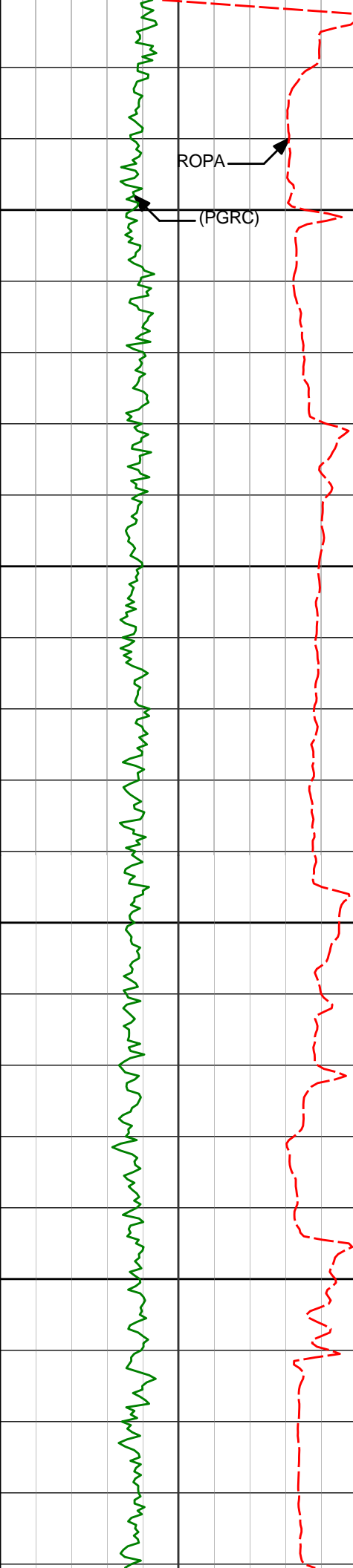
6162'

1.13°

125.56°

6099.60'

-161.83'



Run 200

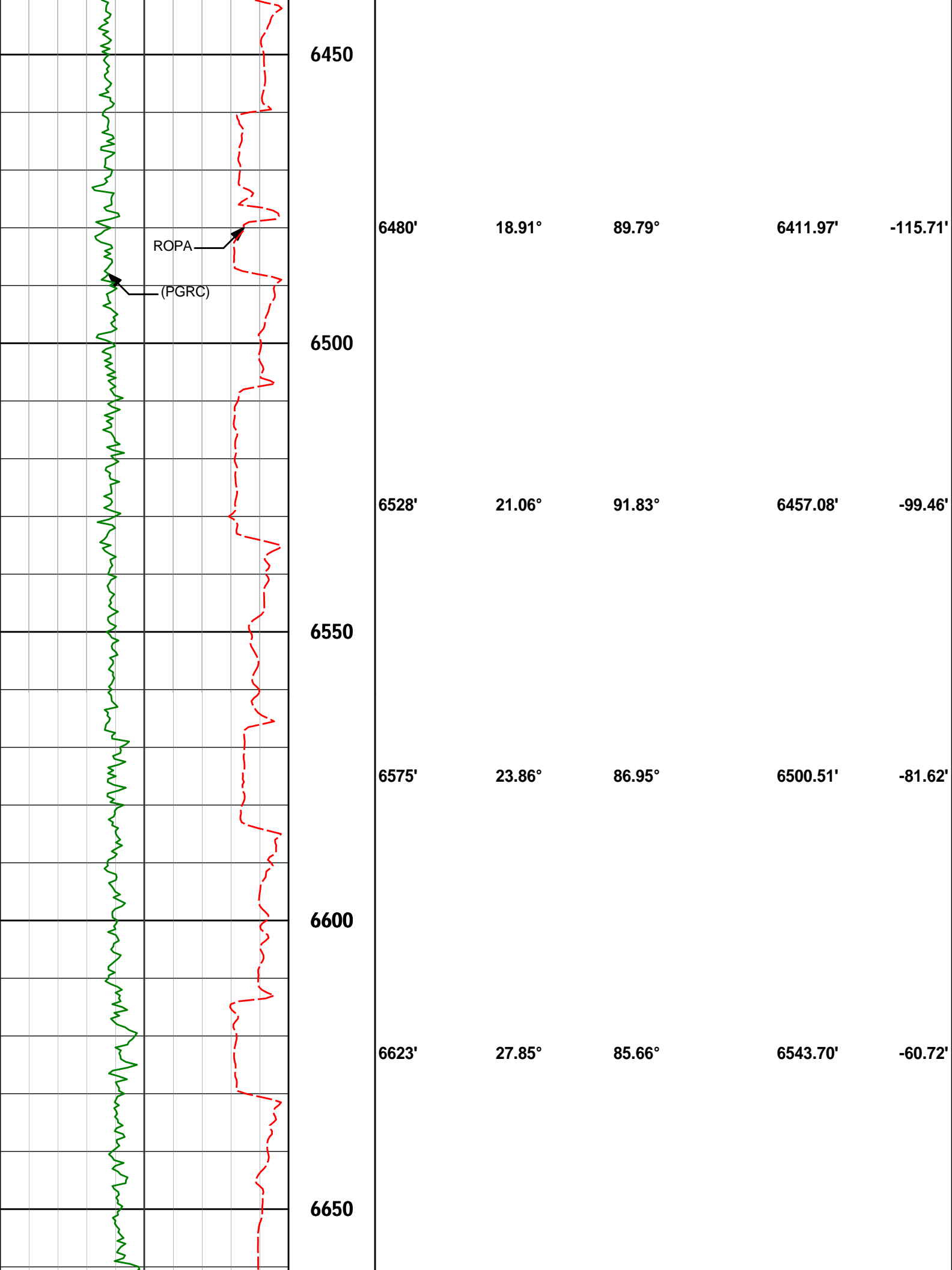
6250

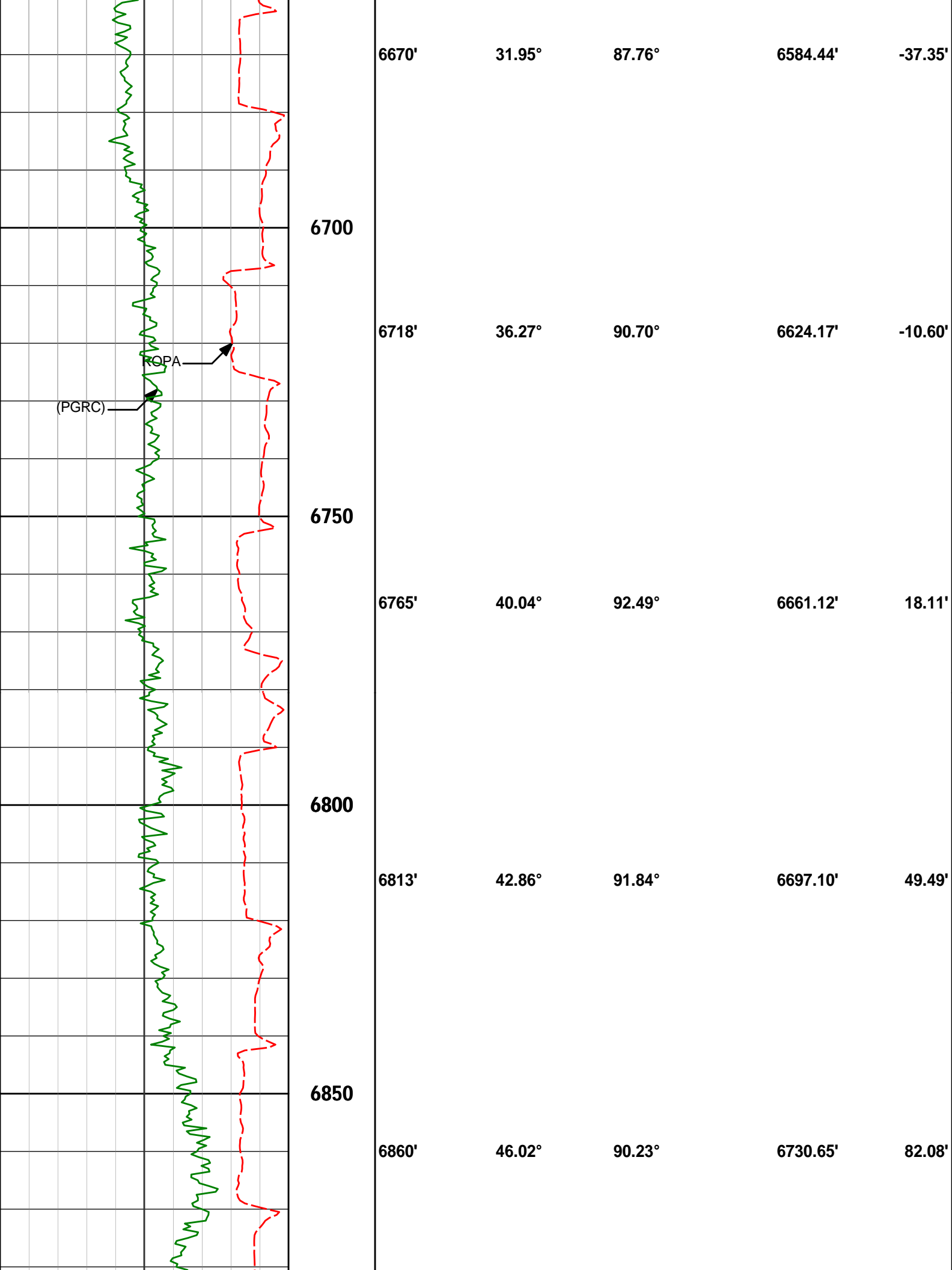
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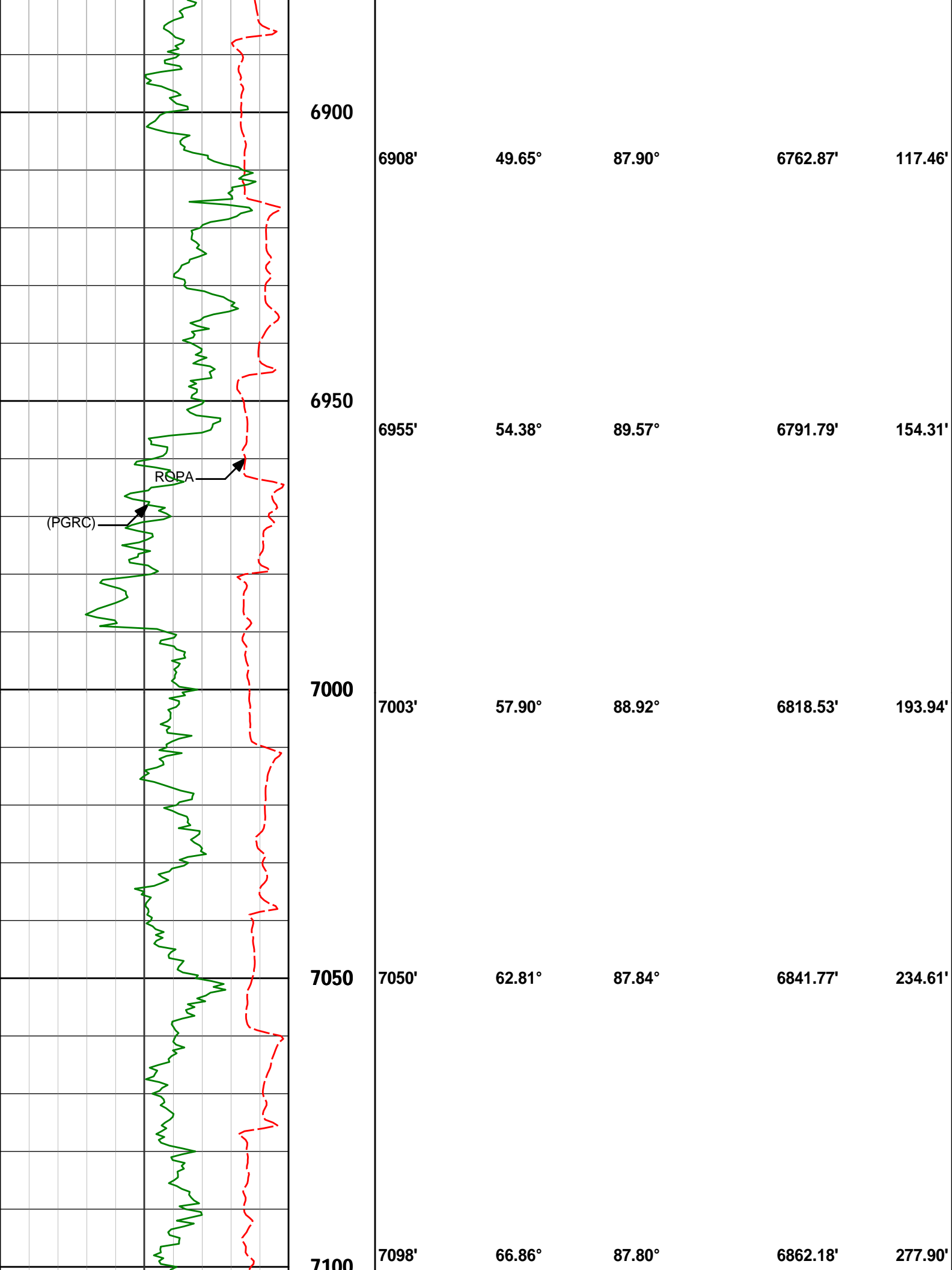
6350

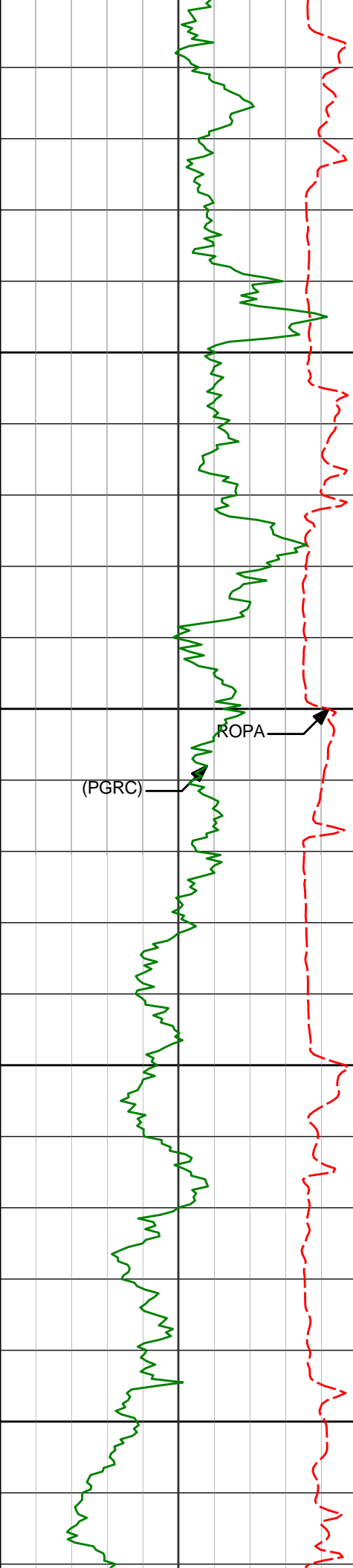
6400

6225'	1.05°	120.11°	6162.59'	-160.91'
6291'	3.06°	92.78°	6228.55'	-158.69'
6339'	10.40°	91.05°	6276.18'	-153.12'
6385'	14.75°	86.82°	6321.07'	-143.16'
6433'	16.90°	85.70°	6367.25'	-130.10'

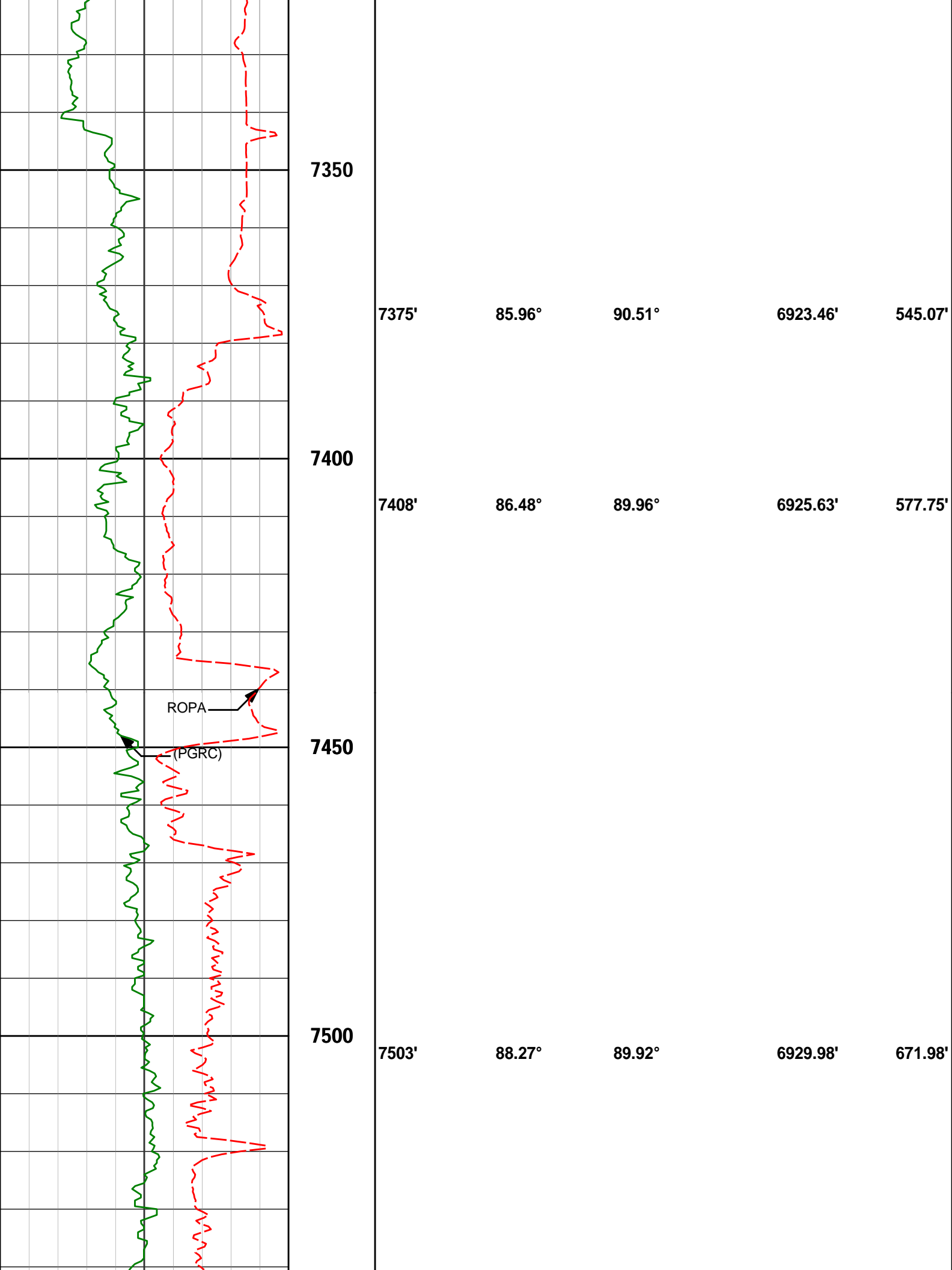


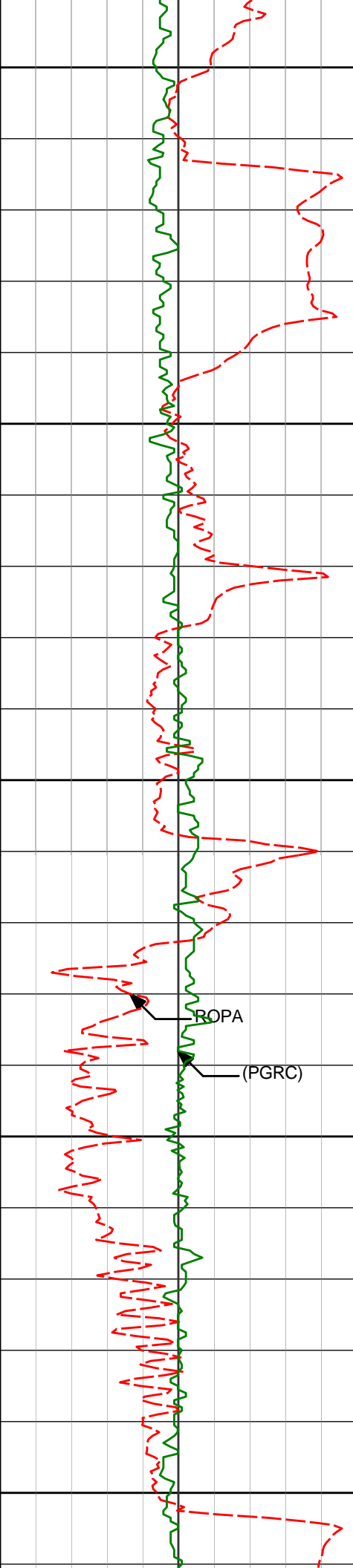






7100					
7150	7145'	70.09°	88.46°	6879.42'	321.45'
7200	7193'	73.80°	88.85°	6894.29'	366.86'
7250	7239'	77.46°	88.77°	6905.71'	411.20'
	7287'	81.38°	88.95°	6914.52'	458.14'
7300	7300'	83.05°	89.31°	6916.28'	470.95'





7550

7600

7650

7700

7750

7597'

91.51°

89.04°

6930.16'

765.39'

7692'

91.57°

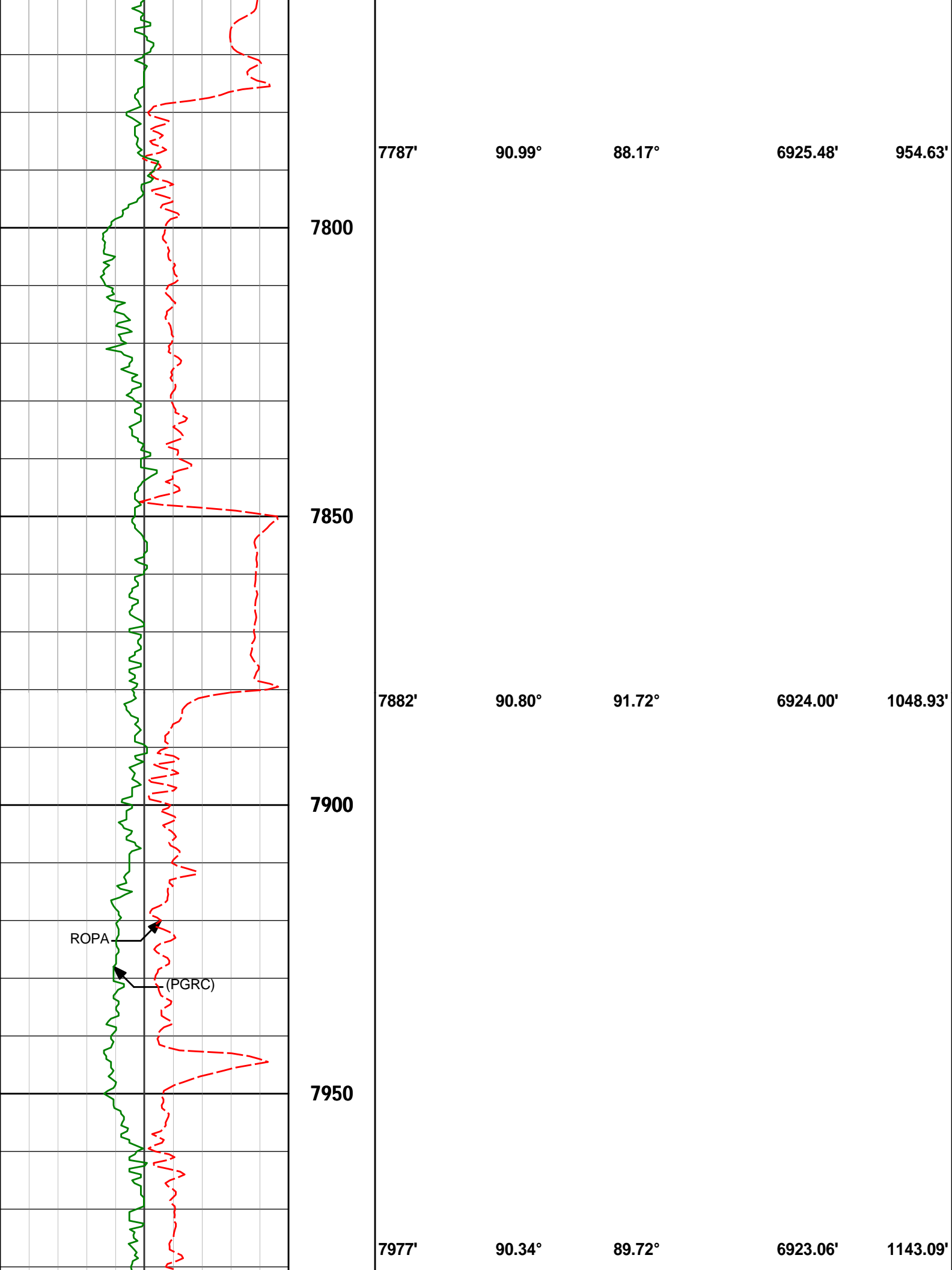
87.50°

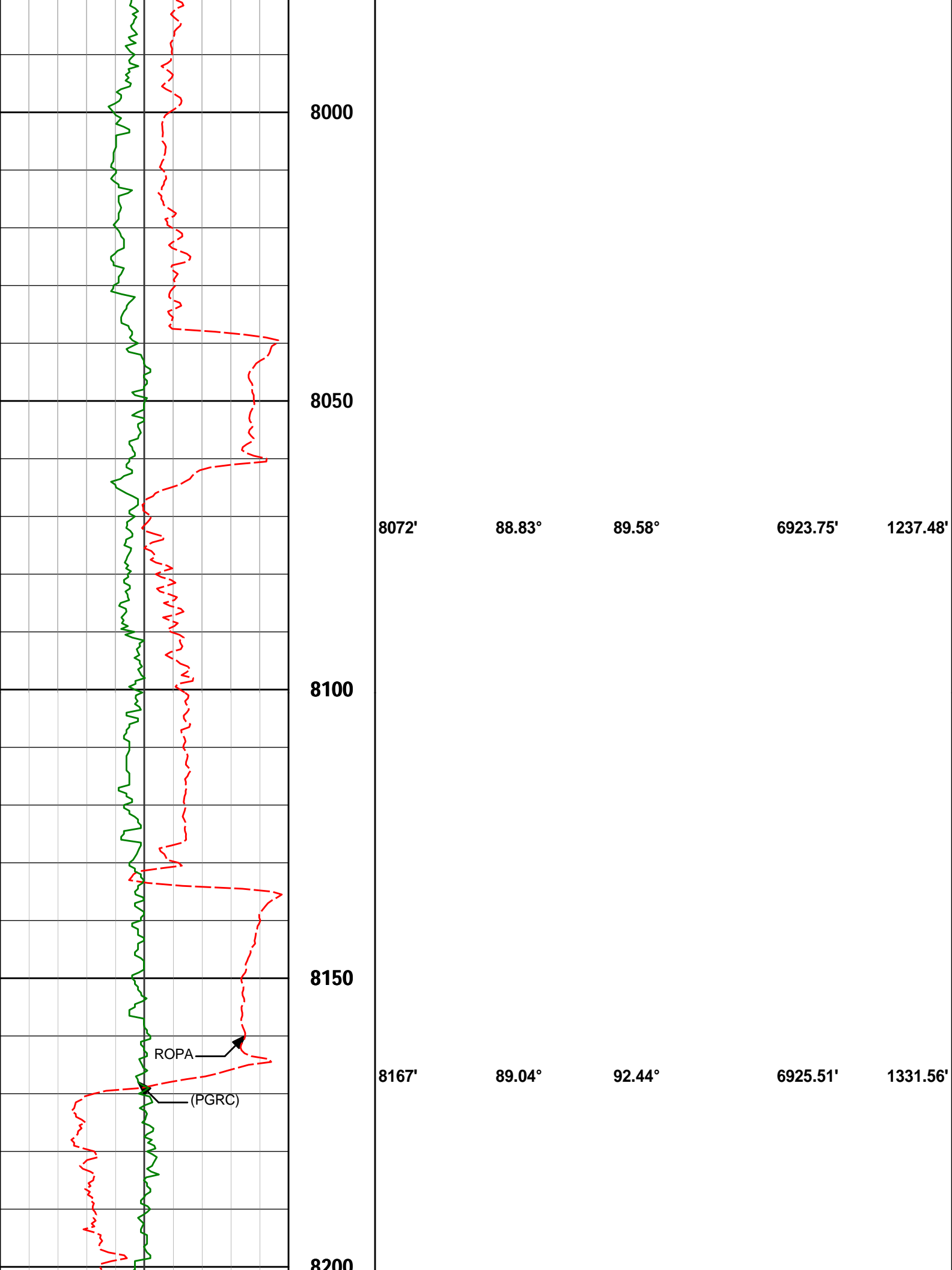
6927.60'

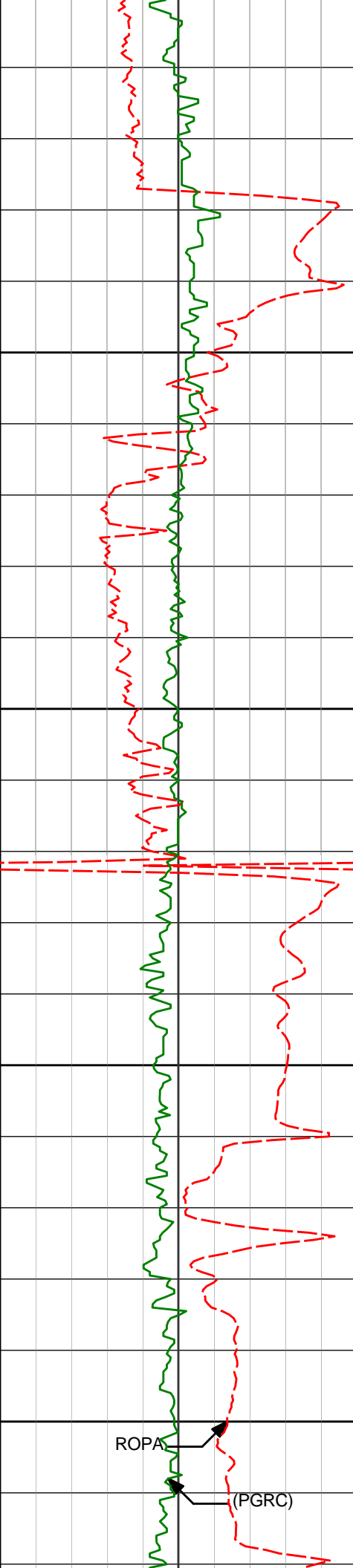
859.97'

ROPA

(PGRC)







8200

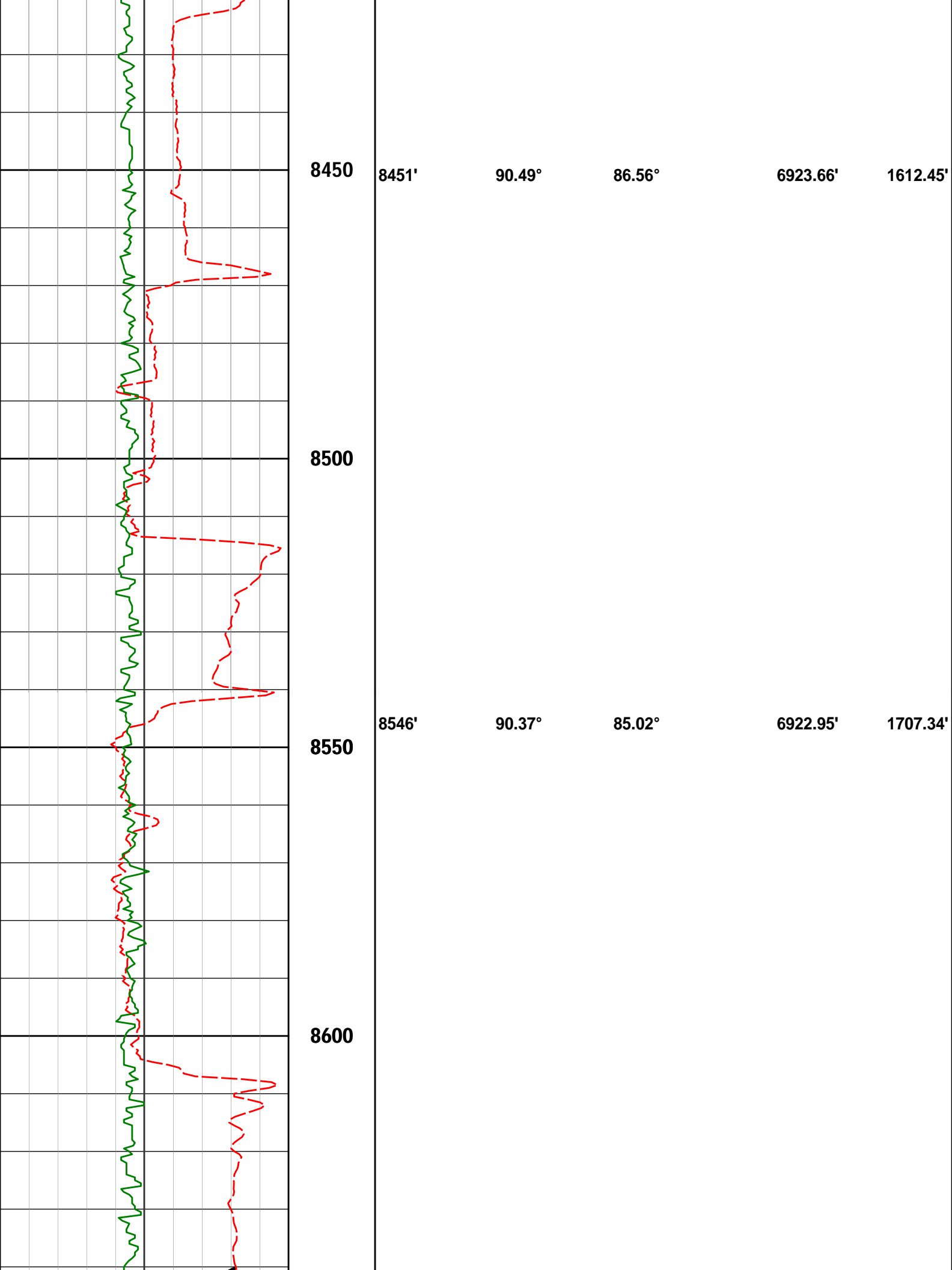
8250

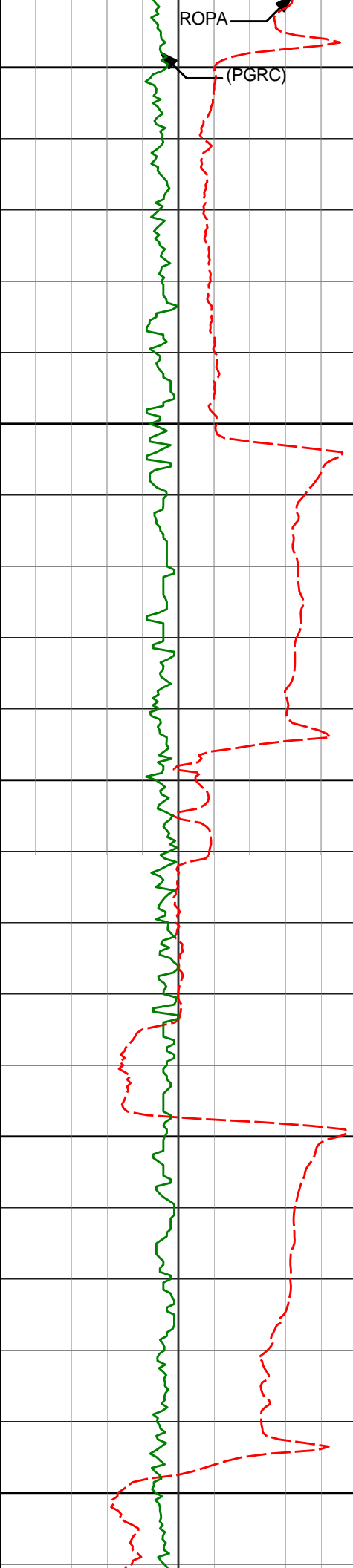
8300

8350

8400

8262'	91.23°	94.84°	6925.28'	1424.95'
8356'	90.12°	89.16°	6924.17'	1517.78'





8650

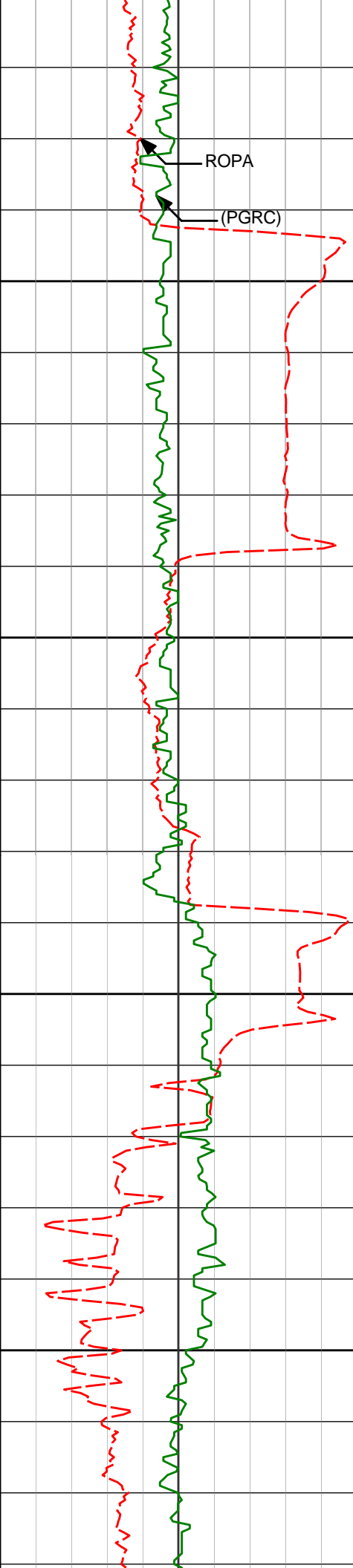
8700

8750

8800

8850

8641'	89.91°	85.04°	6922.72'	1802.29'
8736'	90.25°	86.19°	6922.59'	1897.20'
8831'	89.11°	88.11°	6923.12'	1991.96'



ROPA

(PGRC)

8900

8950

9000

9050

8926'

89.51°

92.75°

6924.27'

2086.16'

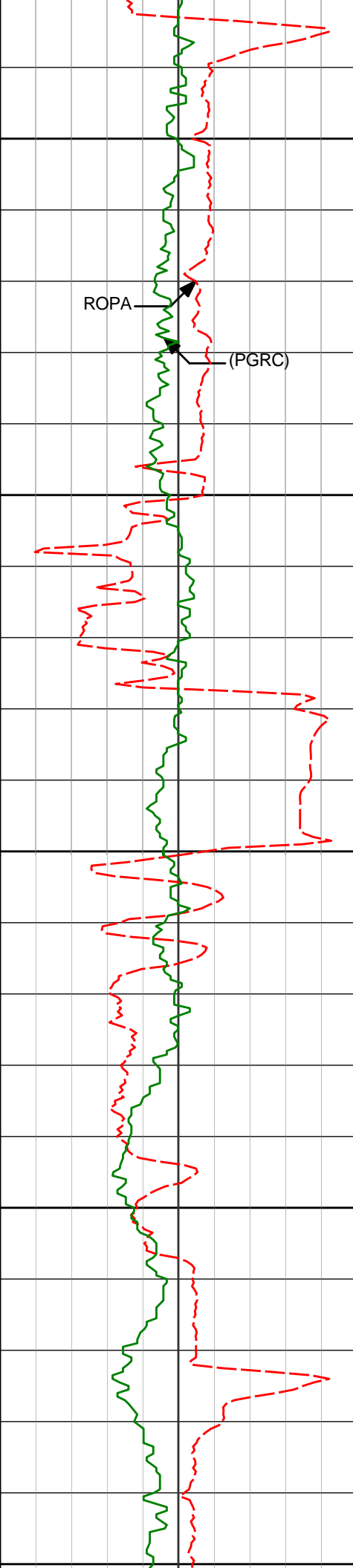
9021'

91.69°

92.23°

6923.28'

2179.89'



9100

9115'

92.22°

92.60°

6920.07'

2272.60'

ROPA

(PGRC)

9150

9200

9210'

90.37°

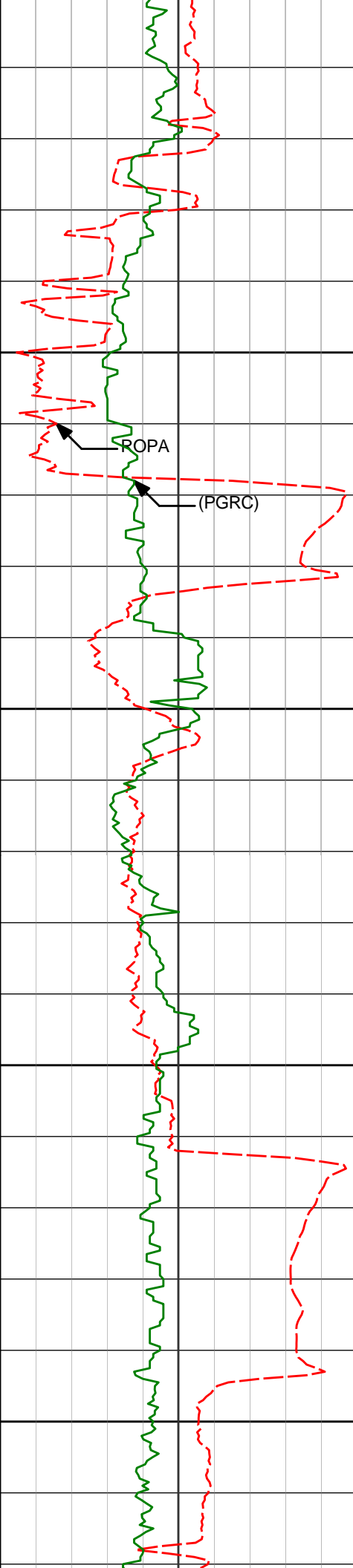
90.83°

6917.92'

2366.51'

9250

9300



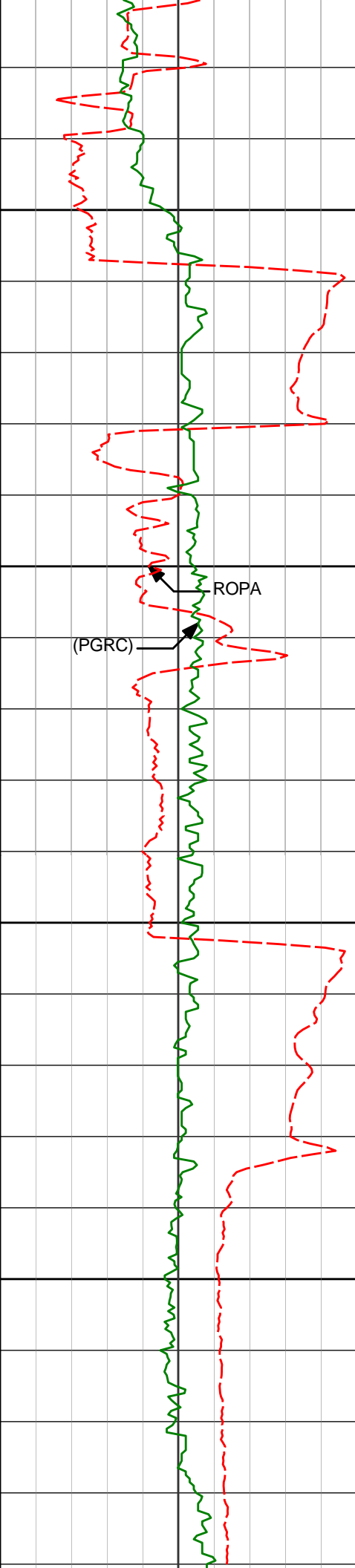
9350

9400

9450

9500

9305'	91.63°	90.82°	6916.26'	2460.64'
9400'	91.82°	89.50°	6913.40'	2554.88'
9495'	90.89°	92.57°	6911.15'	2648.94'



9550

9600

9650

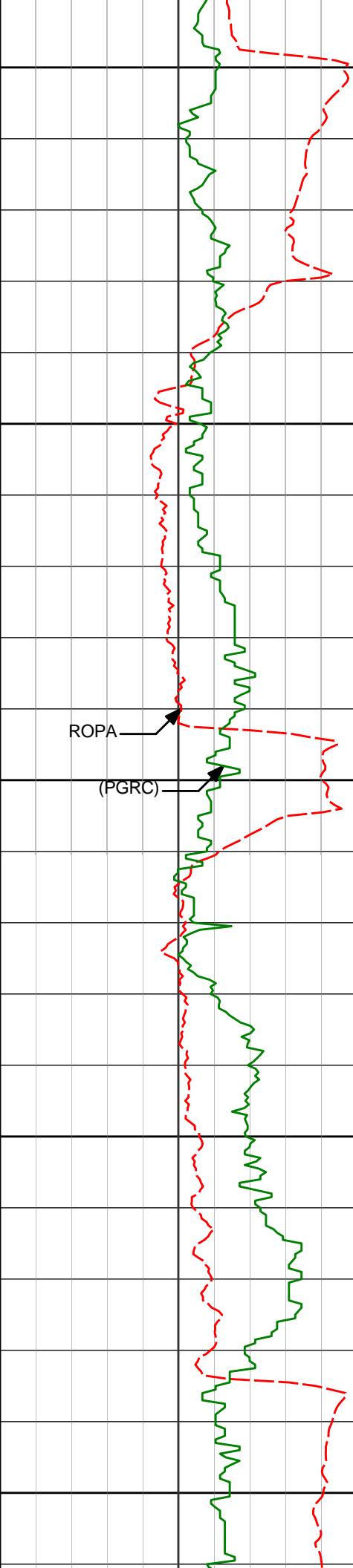
9700

ROPA

(PGRC)

9590'	88.74°	92.64°	6911.46'	2742.65'
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9684'	88.86°	91.37°	6913.43'	2835.50'
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9750

9779'

91.42°

88.30°

6913.20'

2929.83'

9800

ROPA

(PGRC)

9850

9874'

91.67°

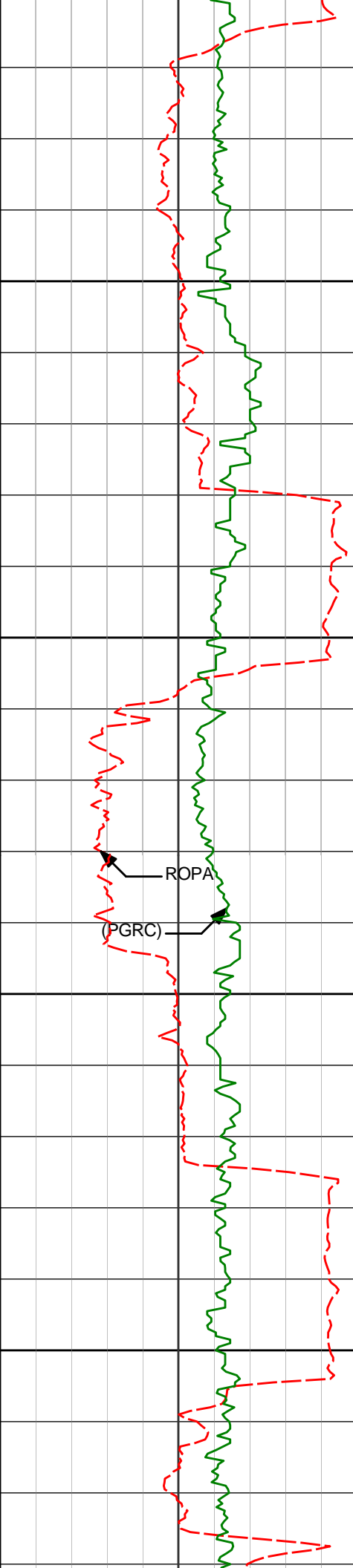
87.41°

6910.64'

3024.48'

9900

9950



10000

10050

10100

10150

9969'

89.88°

87.61°

6909.36'

3119.19'

10064'

90.68°

87.57°

6908.90'

3213.90'

ROPA

(PGRC)

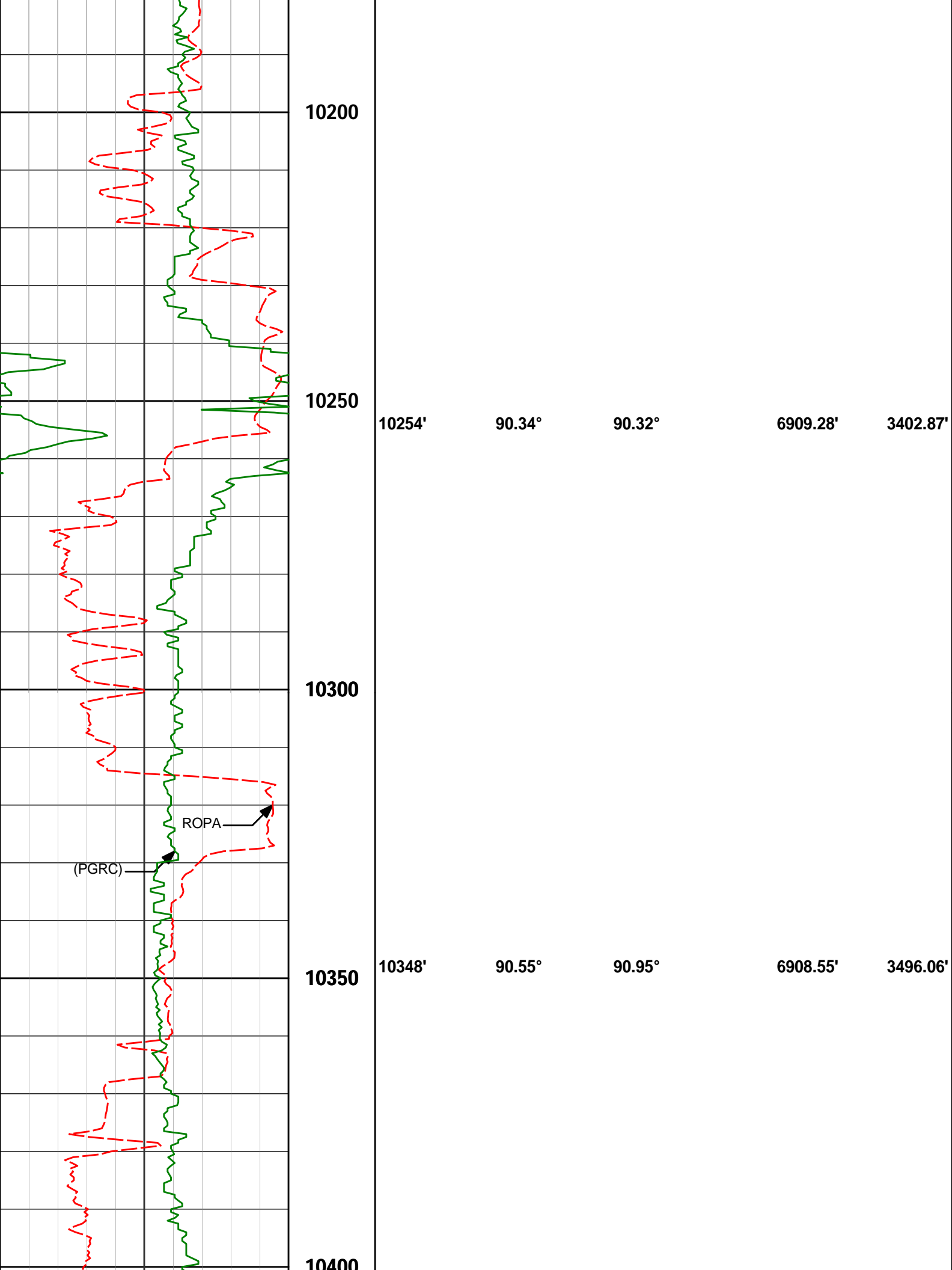
10159'

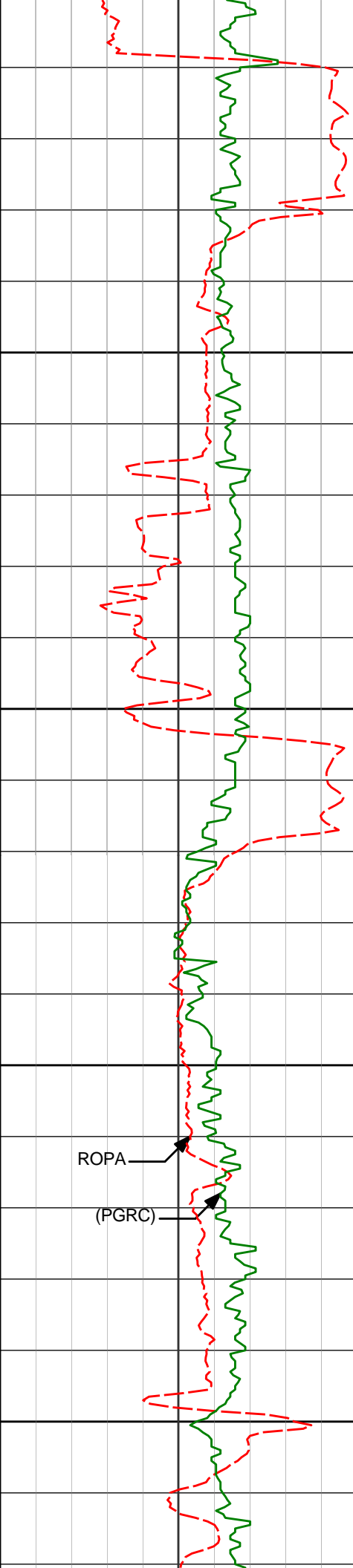
89.26°

89.17°

6908.95'

3308.50'





10400

10450

10500

10550

10600

10443'

89.91°

91.79°

6908.17'

3590.08'

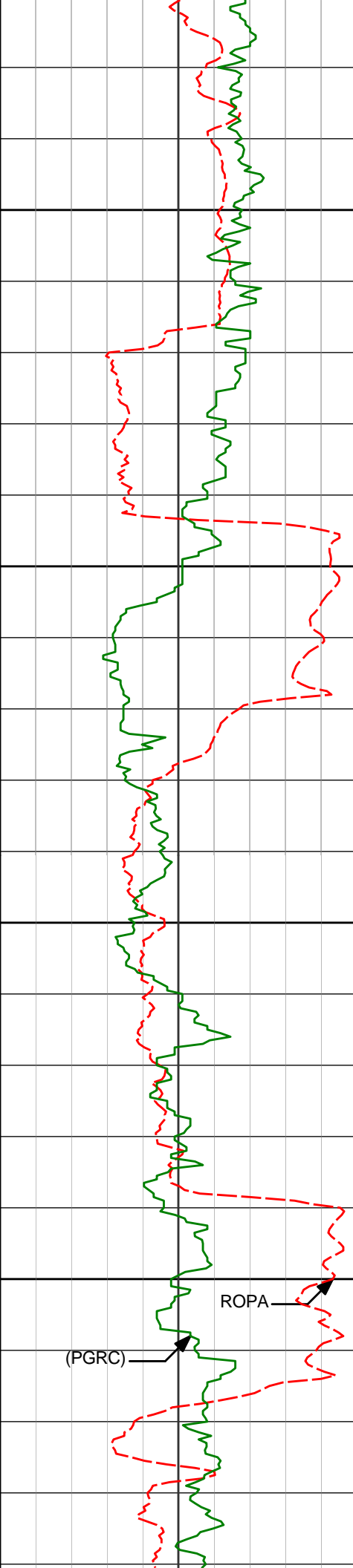
10538'

89.29°

90.54°

6908.83'

3684.14'



10650

10700

10750

10800

10633'

91.02°

89.59°

6908.58'

3778.45'

10728'

90.12°

90.30°

6907.63'

3872.77'

10823'

90.59°

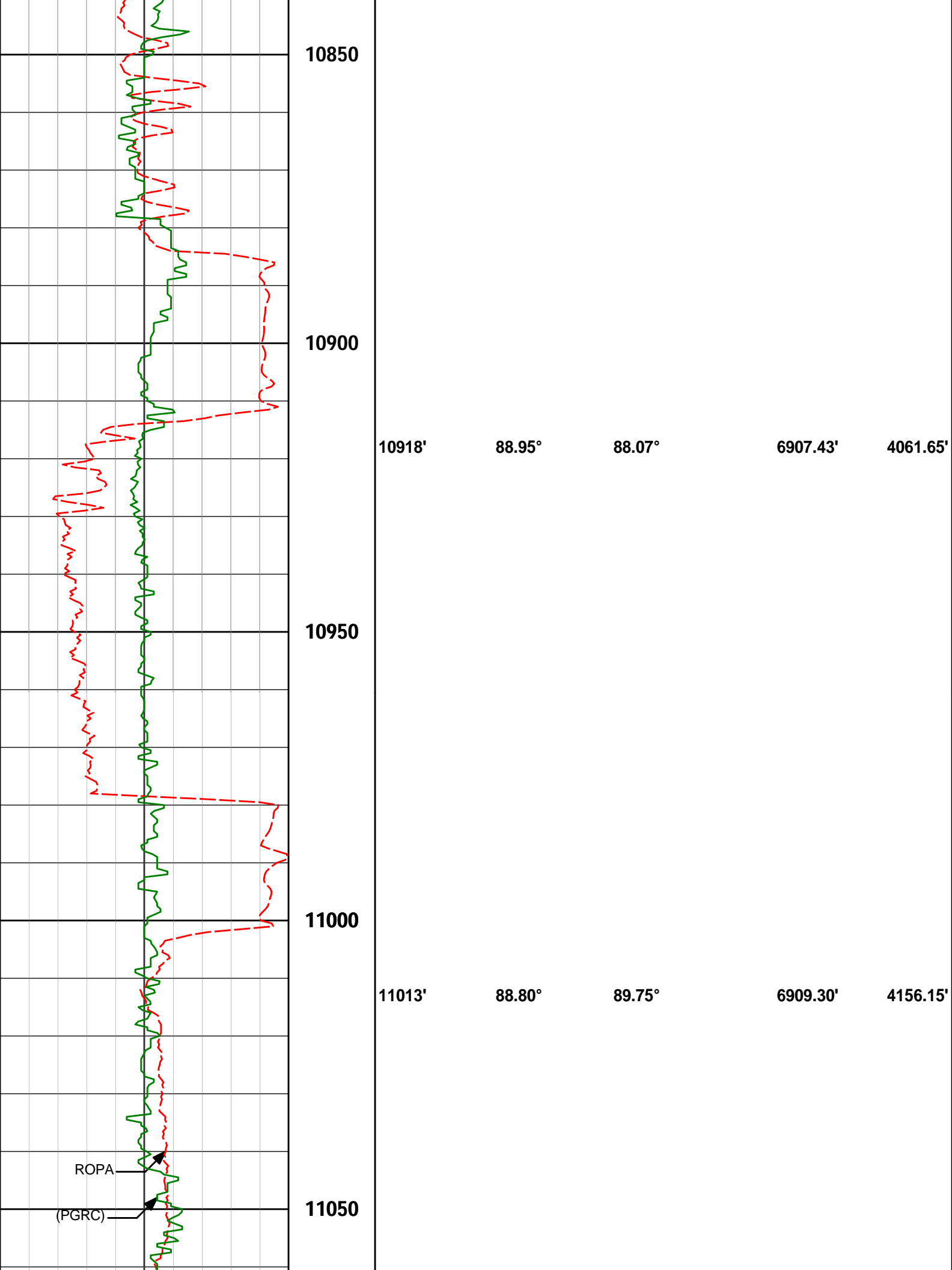
89.46°

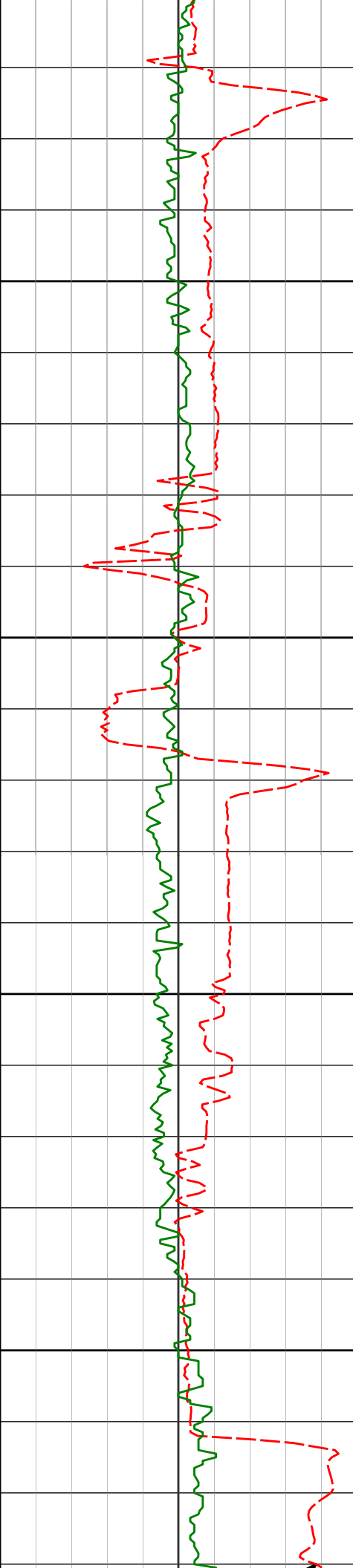
6907.05'

3967.11'

ROP A

(PGRC)





11100

11150

11200

11250

11108'

89.94°

89.41°

6910.35'

4250.54'

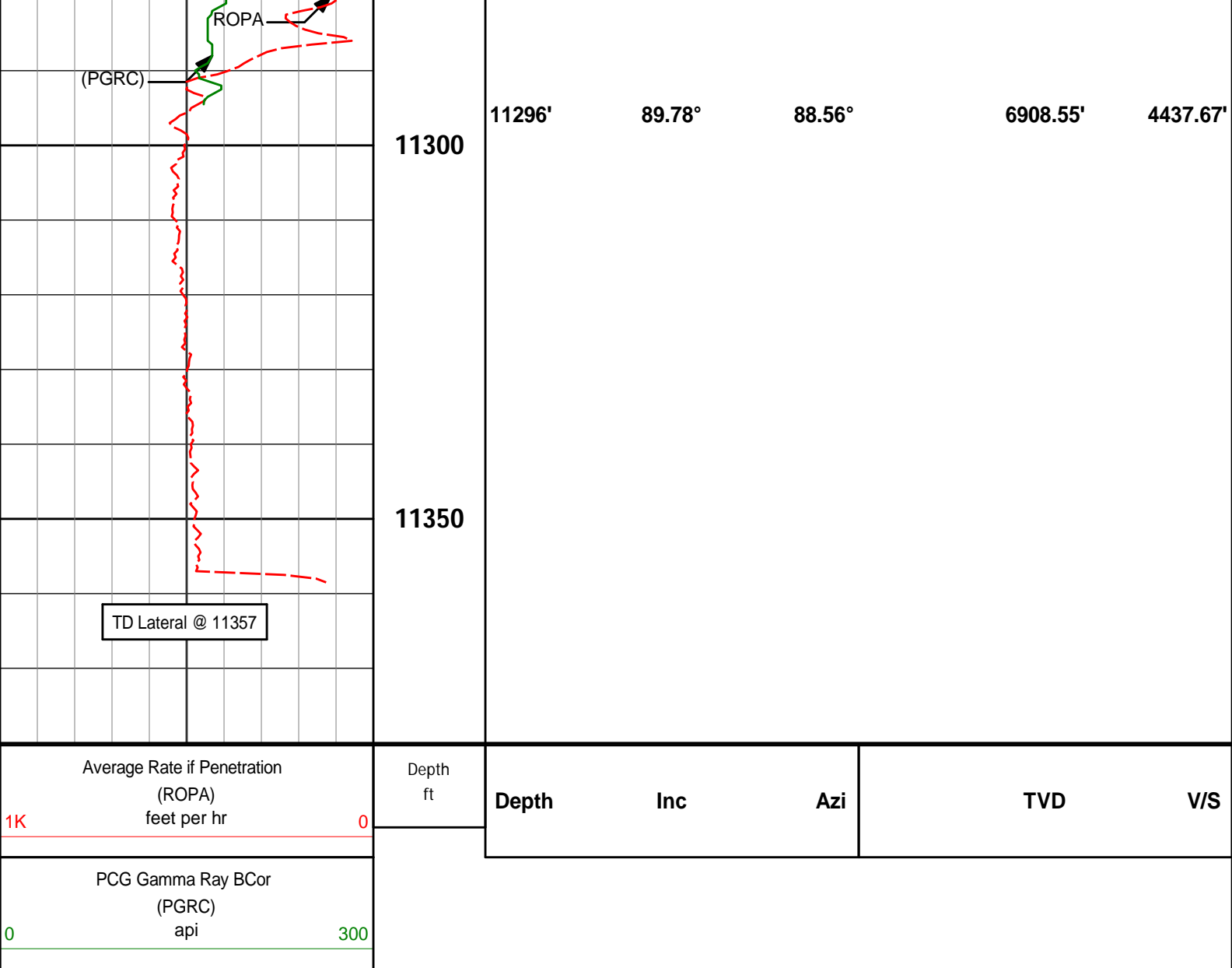
11202'

91.23°

88.24°

6909.39'

4344.07'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Knaub PC G04-66-1HN-A2
Wattenburg
Weld Colorado
USA
CA-XX-0900166420

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
730.00	0.37	283.93	729.95	0.35 N	7.07 E	7.06	0.46
830.00	0.47	280.00	829.94	0.49 N	6.36 E	6.37	0.10
930.00	0.60	241.51	929.94	0.31 N	5.50 E	5.50	0.37
1030.00	0.78	220.85	1029.93	0.45 S	4.60 E	4.51	0.30
1130.00	0.60	201.50	1129.93	1.45 S	3.96 E	3.76	0.29
1230.00	0.66	204.91	1229.92	2.45 S	3.53 E	3.21	0.08
1280.00	0.66	196.80	1279.92	2.99 S	3.32 E	2.94	0.19
1330.00	0.64	194.49	1329.91	3.54 S	3.17 E	2.72	0.06
1380.00	0.71	195.71	1379.91	4.11 S	3.01 E	2.50	0.14
1430.00	0.60	215.11	1429.91	4.62 S	2.78 E	2.21	0.50
1480.00	0.33	240.65	1479.90	4.91 S	2.50 E	1.90	0.66

1530.00	0.34	242.62	1529.90	5.05 S	2.25 E	1.63	0.02
1580.00	0.25	294.83	1579.90	5.07 S	2.02 E	1.40	0.54
1630.00	0.40	265.05	1629.90	5.04 S	1.74 E	1.13	0.44
1680.00	0.47	256.63	1679.90	5.10 S	1.37 E	0.75	0.19
1730.00	0.34	280.09	1729.90	5.12 S	1.03 E	0.41	0.41
1780.00	0.38	232.48	1779.90	5.19 S	0.75 E	0.12	0.59
1830.00	0.52	205.72	1829.90	5.50 S	0.51 E	-0.15	0.49
1880.00	0.69	204.40	1879.89	5.98 S	0.29 E	-0.42	0.34
1930.00	0.78	204.44	1929.89	6.56 S	0.03 E	-0.76	0.19
1980.00	0.84	218.56	1979.89	7.16 S	0.34 W	-1.20	0.42
2030.00	1.63	314.17	2029.88	6.95 S	1.08 W	-1.91	3.82
2130.00	3.43	317.91	2129.78	3.74 S	4.11 W	-4.53	1.80
2230.00	6.07	335.35	2229.43	3.29 N	8.32 W	-7.87	2.98
2330.00	8.72	342.77	2328.59	15.34 N	12.77 W	-10.85	2.81
2430.00	11.27	338.35	2427.07	31.66 N	18.63 W	-14.71	2.66
2530.00	14.08	336.43	2524.62	51.90 N	27.10 W	-20.70	2.84
2630.00	16.21	338.87	2621.14	76.07 N	36.99 W	-27.64	2.22
2730.00	16.81	338.93	2717.02	102.58 N	47.22 W	-34.63	0.61
2830.00	16.56	333.75	2812.81	128.86 N	58.73 W	-42.92	1.51
2930.00	13.26	333.49	2909.43	151.90 N	70.15 W	-51.50	3.30
3030.00	12.61	332.68	3006.90	171.85 N	80.28 W	-59.18	0.67
3068.00	12.79	335.39	3043.97	179.36 N	83.93 W	-61.91	1.64
3163.00	12.78	333.58	3136.61	198.33 N	92.98 W	-68.63	0.42
3258.00	12.75	334.82	3229.27	217.23 N	102.12 W	-75.44	0.29
3353.00	13.71	337.04	3321.74	237.09 N	110.98 W	-81.86	1.14
3447.00	13.73	336.02	3413.06	257.54 N	119.86 W	-88.24	0.26
3542.00	14.39	334.26	3505.21	278.48 N	129.57 W	-95.38	0.83
3637.00	15.13	335.69	3597.08	300.41 N	139.80 W	-102.92	0.87
3732.00	16.14	339.85	3688.56	324.12 N	149.45 W	-109.67	1.59
3826.00	17.23	340.29	3778.60	349.49 N	158.65 W	-115.77	1.16
3921.00	16.14	337.33	3869.60	374.92 N	168.48 W	-122.50	1.45
4016.00	13.09	337.50	3961.52	397.05 N	177.69 W	-129.00	3.21
4111.00	9.79	338.26	4054.62	414.50 N	184.80 W	-133.97	3.48
4206.00	8.19	338.26	4148.45	428.29 N	190.30 W	-137.78	1.69
4300.00	7.91	340.32	4241.52	440.60 N	194.96 W	-140.94	0.43
4395.00	8.57	337.42	4335.54	453.29 N	199.88 W	-144.31	0.82
4490.00	7.69	337.69	4429.59	465.70 N	205.01 W	-147.92	0.93
4585.00	6.43	341.96	4523.86	476.64 N	209.07 W	-150.64	1.44
4680.00	4.74	343.67	4618.41	485.47 N	211.82 W	-152.32	1.79
4774.00	3.80	342.10	4712.15	492.16 N	213.87 W	-153.56	1.01
4869.00	3.58	334.53	4806.95	497.84 N	216.12 W	-155.11	0.56
4964.00	3.14	336.59	4901.79	502.91 N	218.43 W	-156.80	0.48
5059.00	2.01	310.83	4996.69	506.39 N	220.73 W	-158.66	1.68
5154.00	0.63	253.65	5091.67	507.34 N	222.49 W	-160.30	1.85
5438.00	0.85	303.27	5375.65	508.05 N	225.77 W	-163.47	0.23
5722.00	0.40	351.98	5659.63	510.19 N	227.67 W	-165.10	0.23
6007.00	0.73	122.46	5944.62	510.21 N	226.28 W	-163.72	0.36
6162.00	1.13	125.56	6099.60	508.79 N	224.20 W	-161.83	0.26
6225.00	1.05	120.11	6162.59	508.14 N	223.20 W	-160.91	0.21
6291.00	3.06	92.78	6228.55	507.75 N	220.91 W	-158.69	3.31
6339.00	10.40	91.05	6276.18	507.61 N	215.30 W	-153.12	15.29
6385.00	14.75	86.82	6321.07	507.85 N	205.29 W	-143.16	9.66
6433.00	16.90	85.70	6367.25	508.72 N	192.24 W	-130.10	4.52
6480.00	18.91	89.79	6411.97	509.26 N	177.81 W	-115.71	5.05
6528.00	21.06	91.83	6457.08	509.01 N	161.41 W	-99.46	4.71
6575.00	23.86	86.95	6500.51	509.25 N	143.47 W	-81.62	7.15
6623.00	27.85	85.66	6543.70	510.61 N	122.59 W	-60.72	8.39
6670.00	31.95	87.76	6584.44	511.93 N	99.21 W	-37.35	9.01
6718.00	36.27	90.70	6624.17	512.25 N	72.30 W	-10.60	9.64
6765.00	40.04	92.49	6661.12	511.42 N	43.29 W	18.11	8.36
6813.00	42.86	91.84	6697.10	510.23 N	11.54 W	49.49	5.93
6860.00	46.02	90.23	6730.65	509.65 N	21.36 E	82.08	7.15
6908.00	49.65	87.90	6762.87	510.25 N	56.92 E	117.46	8.37
6955.00	54.38	89.57	6791.79	511.05 N	93.94 E	154.31	10.45
7003.00	57.90	88.92	6818.53	511.58 N	133.79 E	193.94	7.41
7050.00	62.81	87.84	6841.77	512.74 N	174.61 E	234.61	10.64
7098.00	66.86	87.80	6862.18	514.39 N	218.02 E	277.90	8.44
7145.00	70.09	88.46	6879.42	515.82 N	261.71 E	321.45	7.00
7193.00	73.80	88.85	6894.29	516.88 N	307.32 E	366.86	7.77
7239.00	77.46	88.77	6905.71	517.81 N	351.87 E	411.20	7.96
7287.00	81.38	88.95	6914.52	518.75 N	399.03 E	458.14	8.17
7300.00	83.05	89.31	6916.28	518.94 N	411.91 E	470.95	13.14
7375.00	85.96	90.51	6923.46	519.06 N	486.56 E	545.07	4.20
7408.00	86.48	89.96	6925.63	518.93 N	519.49 E	577.75	2.29
7503.00	88.27	89.92	6929.98	519.03 N	614.28 E	671.98	1.88

7505.00	88.27	89.32	6929.98	519.03 N	814.38 E	871.98	1.88
7597.00	91.51	89.04	6930.16	519.88 N	708.36 E	765.39	3.57
7692.00	91.57	87.50	6927.60	522.74 N	803.28 E	859.97	1.62
7787.00	90.99	88.17	6925.48	526.33 N	898.19 E	954.63	0.93
7882.00	90.80	91.72	6924.00	526.42 N	993.16 E	1048.93	3.75
7977.00	90.34	89.72	6923.06	525.23 N	1088.15 E	1143.09	2.17
8072.00	88.83	89.58	6923.75	525.81 N	1183.14 E	1237.48	1.60
8167.00	89.04	92.44	6925.51	524.15 N	1278.10 E	1331.56	3.02
8262.00	91.23	94.84	6925.28	518.12 N	1372.89 E	1424.95	3.42
8356.00	90.12	89.16	6924.17	514.84 N	1466.79 E	1517.78	6.15
8451.00	90.49	86.56	6923.66	518.38 N	1561.72 E	1612.45	2.76
8546.00	90.37	85.02	6922.95	525.35 N	1656.45 E	1707.34	1.63
8641.00	89.91	85.04	6922.72	533.57 N	1751.10 E	1802.29	0.49
8736.00	90.25	86.19	6922.59	540.83 N	1845.82 E	1897.20	1.27
8831.00	89.11	88.11	6923.12	545.55 N	1940.69 E	1991.96	2.34
8926.00	89.51	92.75	6924.27	544.84 N	2035.66 E	2086.16	4.90
9021.00	91.69	92.23	6923.28	540.72 N	2130.56 E	2179.89	2.37
9115.00	92.22	92.60	6920.07	536.76 N	2224.42 E	2272.60	0.69
9210.00	90.37	90.83	6917.92	533.91 N	2319.34 E	2366.51	2.70
9305.00	91.63	90.82	6916.26	532.55 N	2414.32 E	2460.64	1.33
9400.00	91.82	89.50	6913.40	532.28 N	2509.27 E	2554.88	1.40
9495.00	90.89	92.57	6911.15	530.57 N	2604.22 E	2648.94	3.37
9590.00	88.74	92.64	6911.46	526.26 N	2699.11 E	2742.65	2.27
9684.00	88.86	91.37	6913.43	522.97 N	2793.03 E	2835.50	1.35
9779.00	91.42	88.30	6913.20	523.24 N	2888.01 E	2929.83	4.21
9874.00	91.67	87.41	6910.64	526.80 N	2982.91 E	3024.48	0.98
9969.00	89.88	87.61	6909.36	530.93 N	3077.81 E	3119.19	1.90
10064.00	90.68	87.57	6908.90	534.93 N	3172.72 E	3213.90	0.84
10159.00	89.26	89.17	6908.95	537.64 N	3267.68 E	3308.50	2.25
10254.00	90.34	90.32	6909.28	538.06 N	3362.67 E	3402.87	1.66
10348.00	90.55	90.95	6908.55	537.01 N	3456.66 E	3496.06	0.71
10443.00	89.91	91.79	6908.17	534.74 N	3551.63 E	3590.08	1.12
10538.00	89.29	90.54	6908.83	532.81 N	3646.61 E	3684.14	1.47
10633.00	91.02	89.59	6908.58	532.70 N	3741.60 E	3778.45	2.07
10728.00	90.12	90.30	6907.63	532.79 N	3836.60 E	3872.77	1.20
10823.00	90.59	89.46	6907.05	532.99 N	3931.59 E	3967.11	1.01
10918.00	88.95	88.07	6907.43	535.05 N	4026.57 E	4061.65	2.26
11013.00	88.80	89.75	6909.30	536.86 N	4121.53 E	4156.15	1.78
11108.00	89.94	89.41	6910.35	537.56 N	4216.52 E	4250.54	1.25
11202.00	91.23	88.24	6909.39	539.48 N	4310.49 E	4344.07	1.86
11296.00	89.78	88.56	6908.55	542.11 N	4404.45 E	4437.67	1.58

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 82.98 DEGREES (GRID)
A TOTAL CORRECTION OF 8.11 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11296.00 FEET
IS 4437.68 FEET ALONG 82.98 DEGREES (GRID)**

Tie In @ Surface Casing Shoe