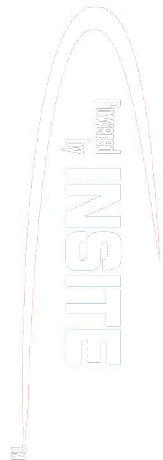


**PCG Pressure Case Gamma Ray
PCD Pressure Case Directional**


Country		: USA			
Field		: Wattenberg			
Location		: Lat: 40° 9' 29.29" North Long: 104° 52' 44.12" West			
Well		: Butterball 29C-15HZ			
Company		: Anadarko Petroleum Corp.			
Rig		: Xtreme 22			
LOCATION		Latitude : 40° 9' 29.29" North Longitude : 104° 52' 44.12" West		Company : Anadarko Petroleum Corp. Rig : Xtreme 22 Well : Butterball 29C-15HZ Field : Wattenberg Country : USA API Number : 05123379080000	
		UTM Easting = 3,173,592.283 ft UTM Northing = 1,301,060.120 ft			
Permanent Datum : Ground Level		Elevation : 4935.00 ft		Other Services	
Log Measured From : Drill Floor		16.00 ft Above Permanent Datum		Directional Drilling	
Drilling Measured From : Drill Floor		MD LOG		KB 4951.00 ft DF 4952.00 ft GL 4935.00 ft WD N/A	
Depth Logged : 992.00 ft To 16,715.00 ft		Unit No. : 11610117		Job No. :CA-XX-0900754404	
Date Logged : 13-Oct-13 To 16-Oct-13		Plot Type : Final			
Total Depth MD : 16,715.00 ft TVD : 7,503.63 ft		Plot Date : 03-Dec-13			
Spud Date : 12-Oct-13					
Run No.	Borehole Record (MD)		Run No.	Borehole Record (MD)	
	Size	From To		Size	From To
100	8.750 in	941.00 ft 7,948.00 ft			
0200	6.125 in	7,948.00 ft 16,715.00 ft			

MD LOG
WELL INFORMATION

MWD Run Number	100	200		
Date run completed	16-Oct-13	23-Nov-13		
Rig Bit Number	100	0200		
Bit Size (in)	8.750	6.125		
Tool Nominal OD (in)	6.750	4.870		
Log Start Depth (MD, ft)	992.00	7,948.00		
Log End Depth (MD, ft)	7,948.00	16,715.00		
Drill or Wipe	Drill	Drill		
Drill/Wipe Start Date and Time	13-Oct-13 17:53	17-Nov-13 11:30		
Drill/Wipe End Date and Time	16-Oct-13 17:53	22-Nov-13 04:30		
Min Inc (deg) @ Depth (MD, ft)	0.34 @ 6,900.00	88.12 @ 11,997.00		
Max Inc (deg) @ Depth (MD, ft)	86.11 @ 7,900.00	91.63 @ 14,397.00		
Bit TFA(in2) / Bit Type	1.04 / PDC	1.53 / PDC		
Flow Rate (gpm)	574.08	261.86		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	268.0 / 0.0		
Fluid Type	Native/Spud Mud	Mineral Oil Bas		
Density (ppg) / Viscosity (spqt)	8.30 / 27.00	9.20 / 64.00		
Filtrate CL (ppm)	1,200.00	52,500.00		
pH / Fluid Loss (mptm)	8.90 / 0	N/A / N/A		
PV (cP) / YP (Ihf2)	15 / 1.00	20 / 11.00		
% Solids / % Sand	0.00 / 0.00	10.7 / 0.03		
% Oil / Oil:Water Ratio	N/A / N/A	62.3 / 71:29		
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	177.64 / PCM	242.90 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ 177.64	N/A @ 242.90			
Lead MWD Engineer	Reuben Edgington	Clay Wass			
Customer Representative	Dave Cornett	Dave Cornett			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11404261	12134679			
Insert Serial Number	11400901	11400829			
Date and Time Initialized	12-Oct-13 22:21	16-Nov-13 21:38			
Date and Time Read	16-Oct-13 22:02	23-Nov-13 03:53			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	48.00	43.46			
Software Version	6.21	6.21			
Sub Serial Number	11404261	12134679			
Sonde Serial Number	11297555	11145708			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	207.01	45.37			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	51.18	48.25			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404261	12134679			
Insert/Sonde Serial Number	12035849	11681003			

REMARKS

1. All depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Kelly Bushing, unless otherwise specified.

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 "Bingham 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 (Corrected Gamma Ray):
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

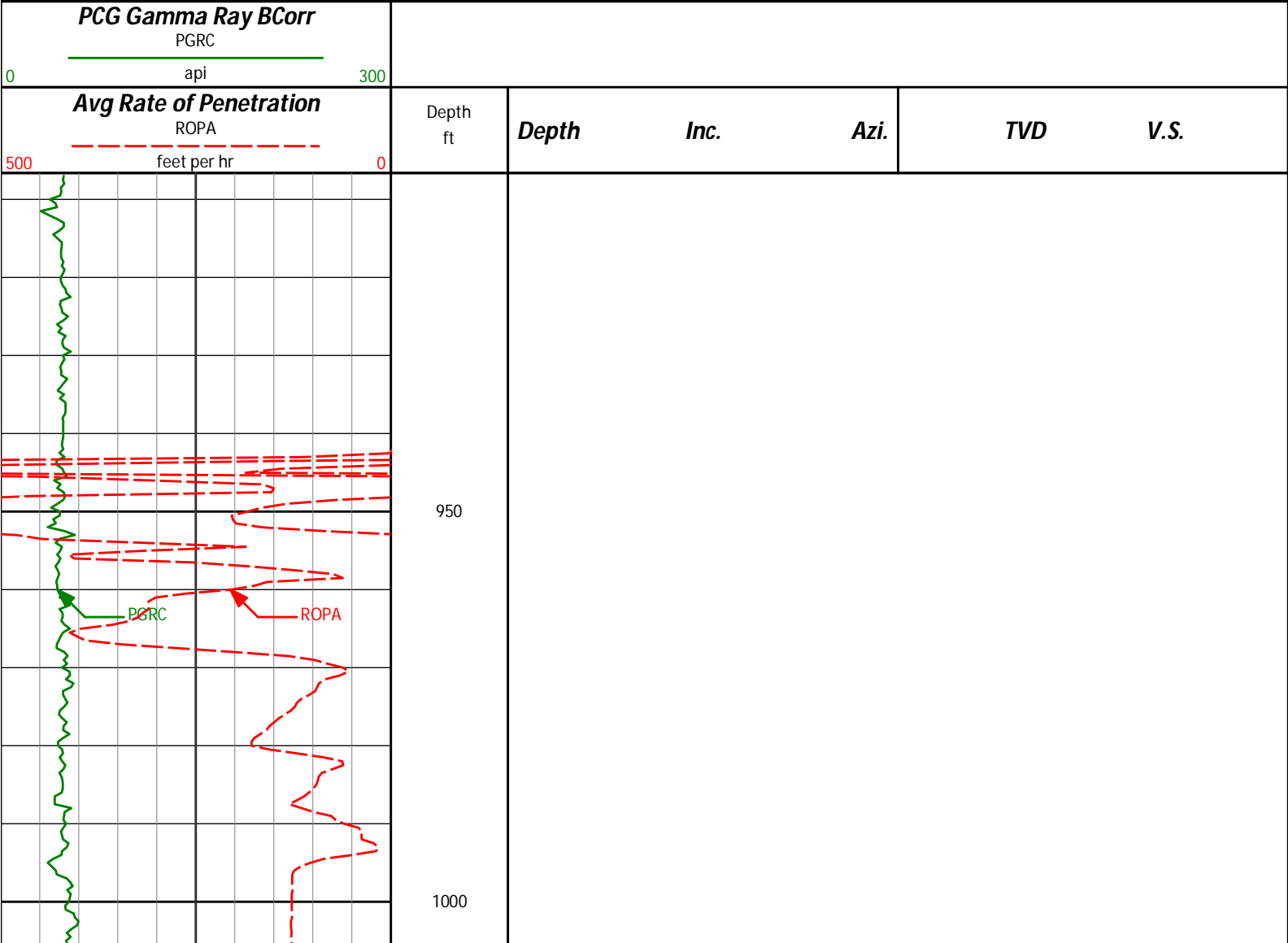
Insite version: 8.0

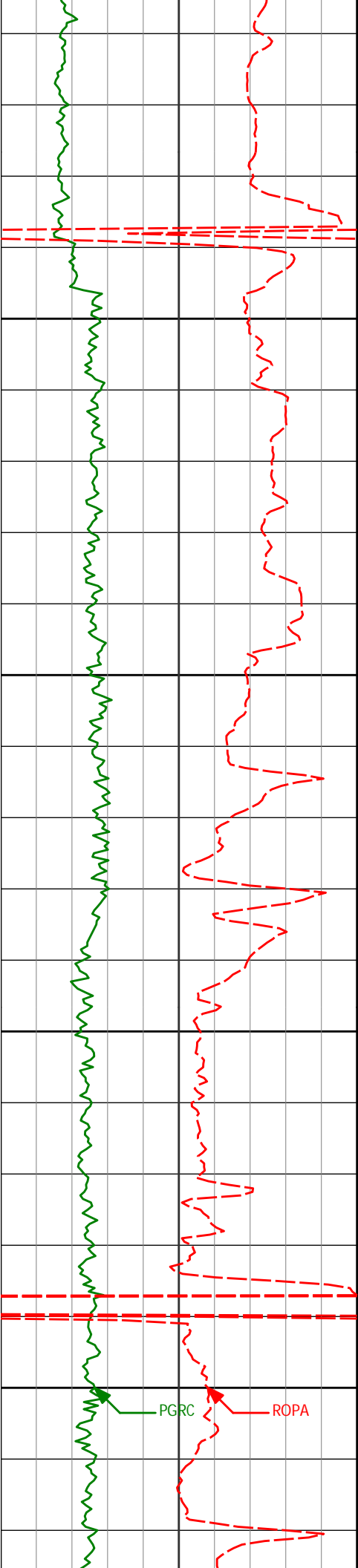
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HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Anadarko
Butterball 29C-15HZ
Xtreme 22
05123379080000





1050

1083'

0.82°

273.74°

1082.98'

-1.29'

1100

1150

1174'

0.99°

274.28°

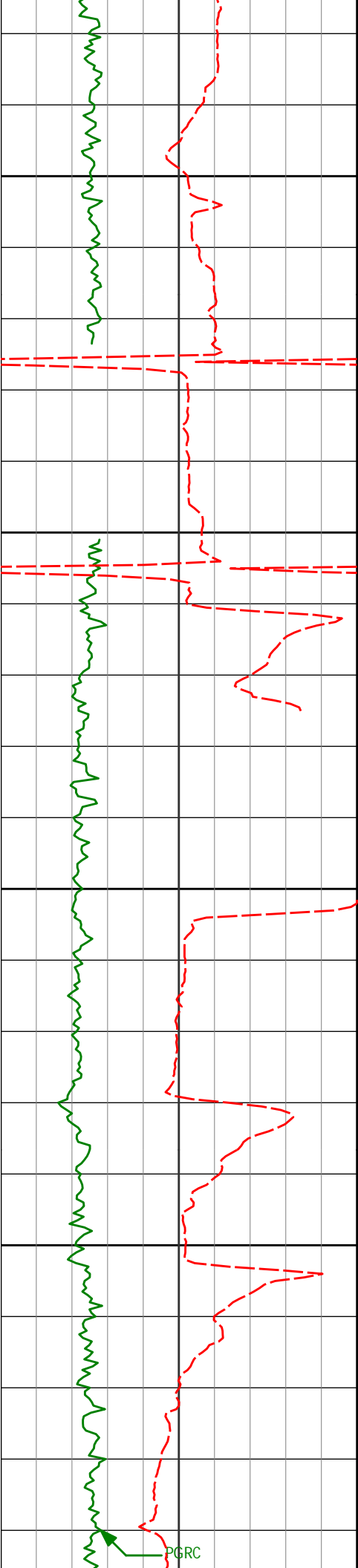
1173.97'

-1.39'

1200

PGRC

ROPA



1250

1266'

1.10°

275.98°

1265.95'

-1.54'

1300

1350

1359'

1.13°

206.94°

1358.94'

-0.82'

1400

1444'

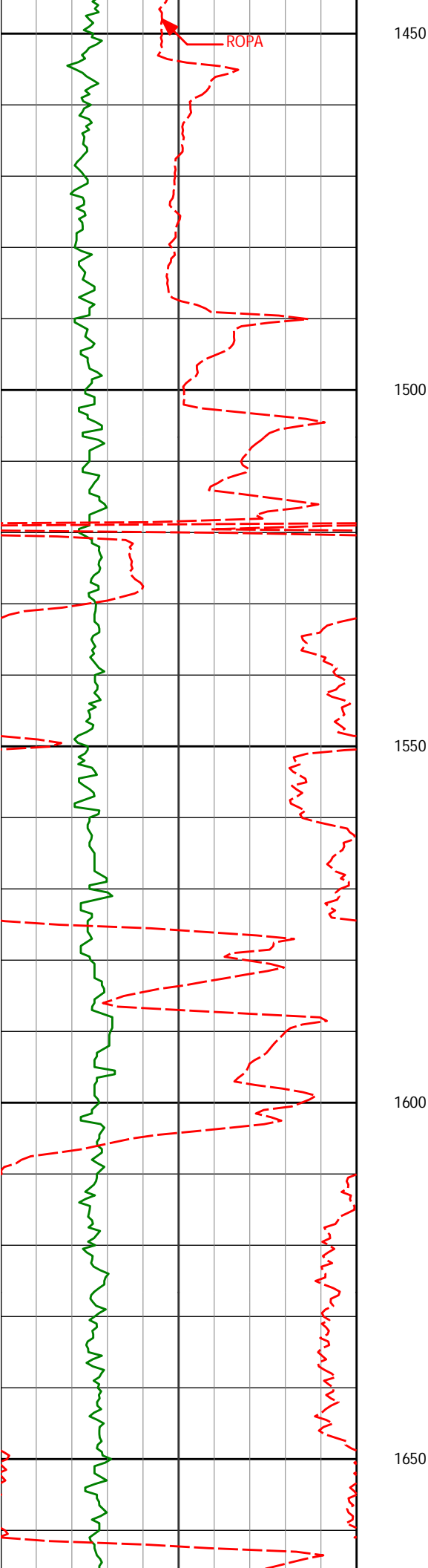
1.44°

210.49°

1443.92'

0.85'

PGRC



1530'

1.74°

249.13°

1529.89'

2.25'

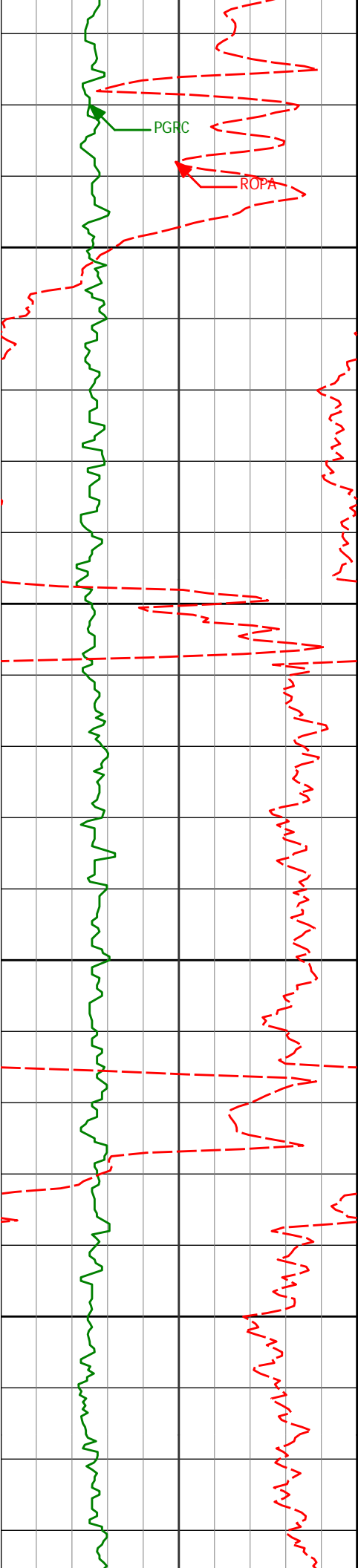
1615'

3.02°

272.56°

1614.81'

2.61'



1700

1701'

4.87°

283.10°

1700.61'

1.68'

1750

1800

1850

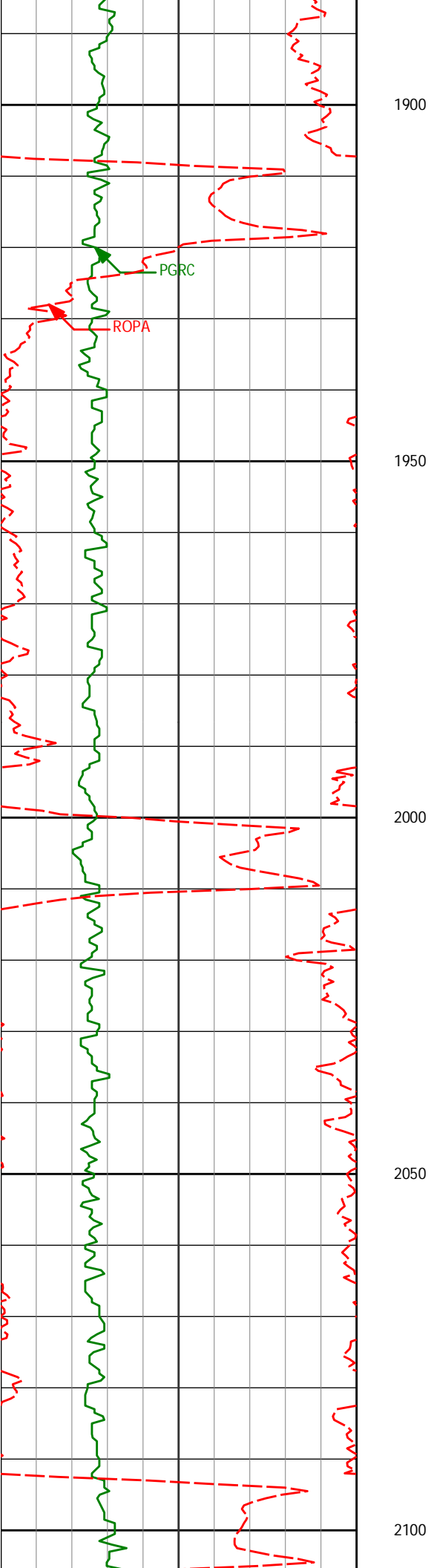
1860'

7.86°

279.89°

1858.61'

-1.72'



1952'

9.51°

284.07°

1949.55'

-4.65'

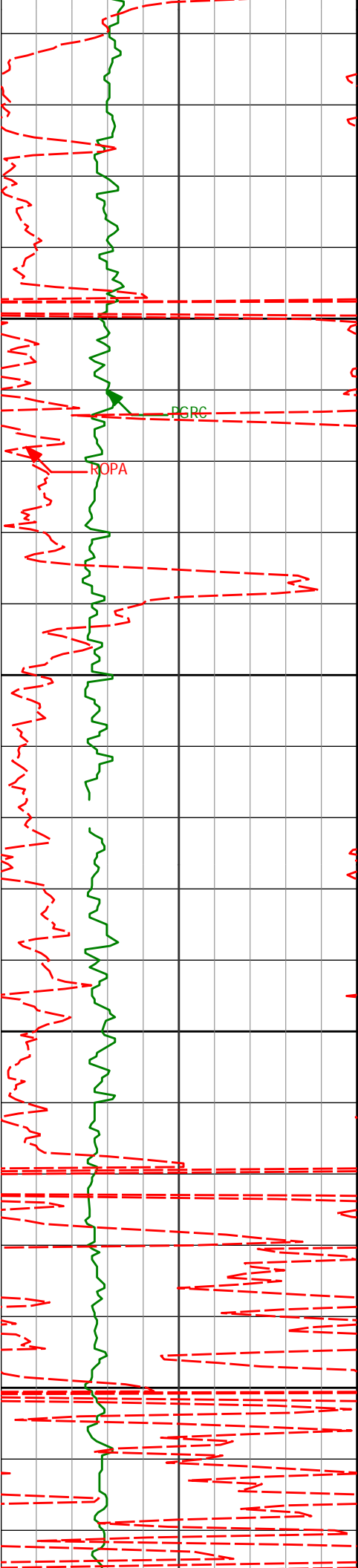
2044'

10.36°

278.13°

2040.17'

-7.66'



2137'

11.07°

266.86°

2131.56'

-8.36'

2150

2200

2228'

10.67°

265.23°

2220.93'

-7.18'

2250

2300

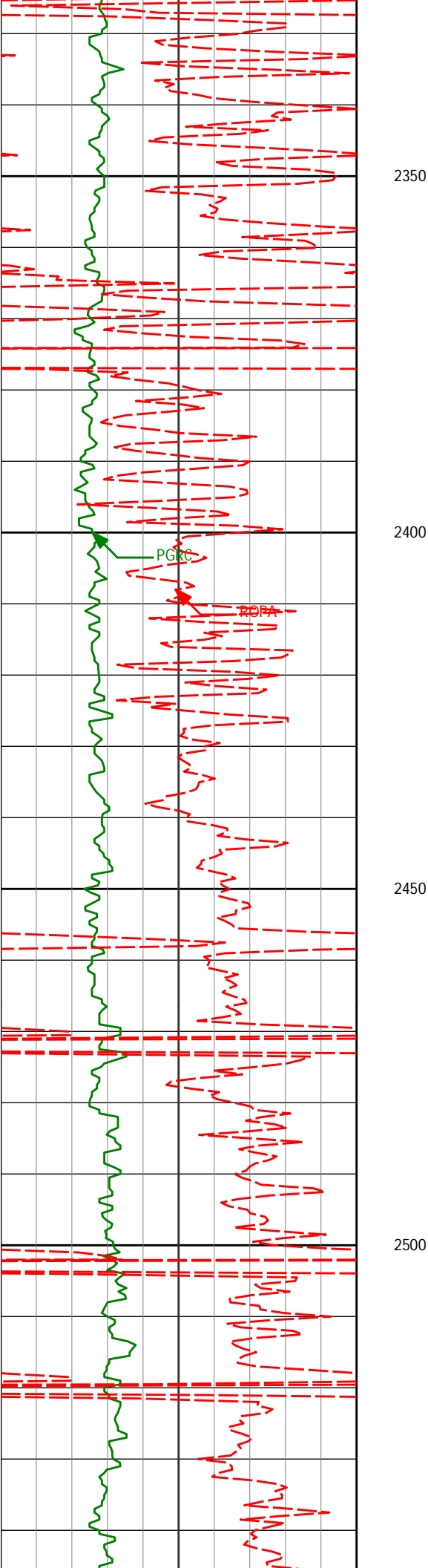
2320'

10.36°

267.13°

2311.39'

-6.06'



2413'

9.85°

267.79°

2402.94'

-5.33'

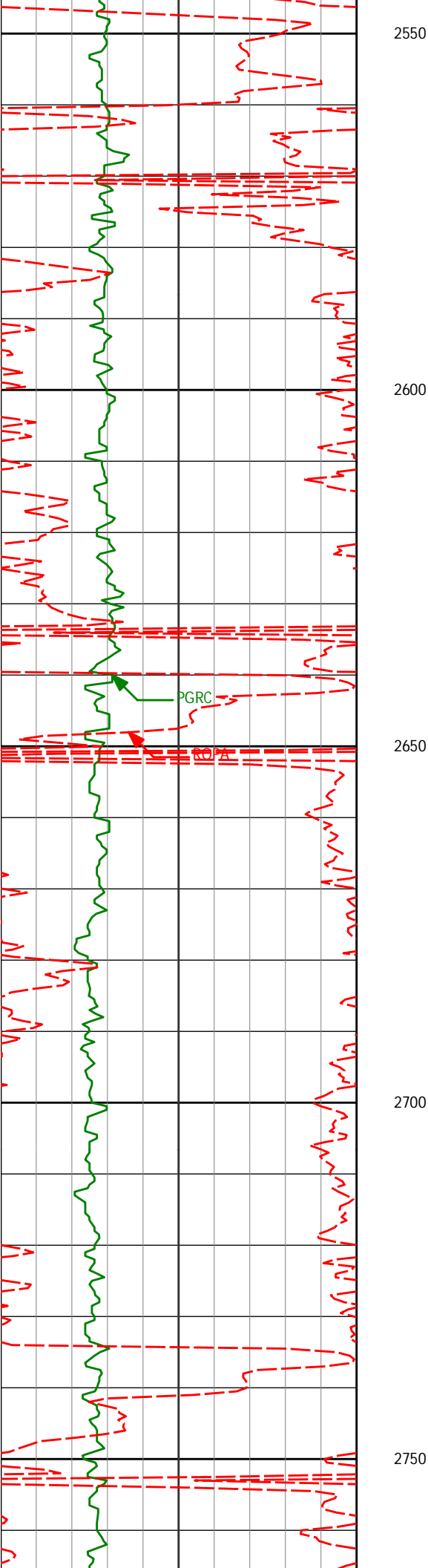
2505'

9.18°

267.13°

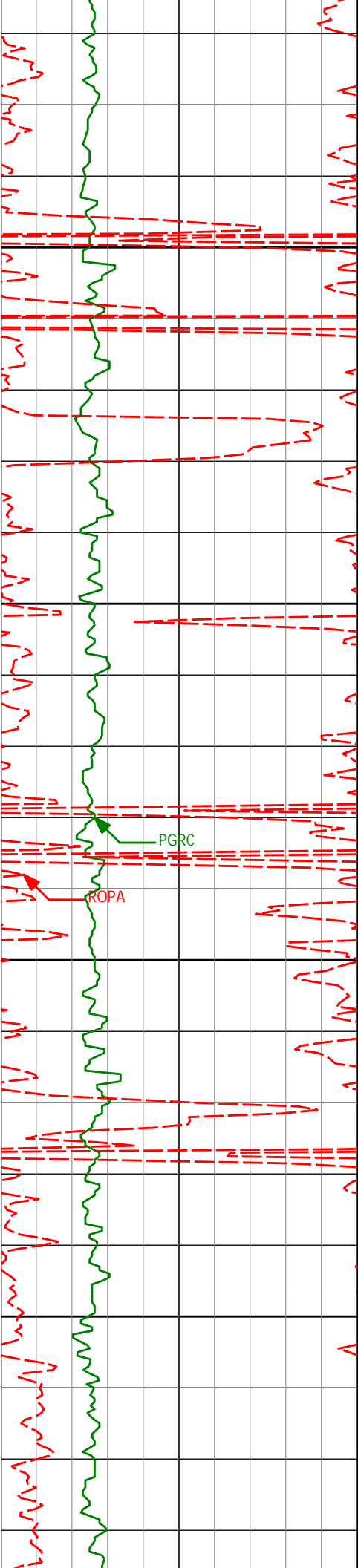
2493.68'

-4.66'

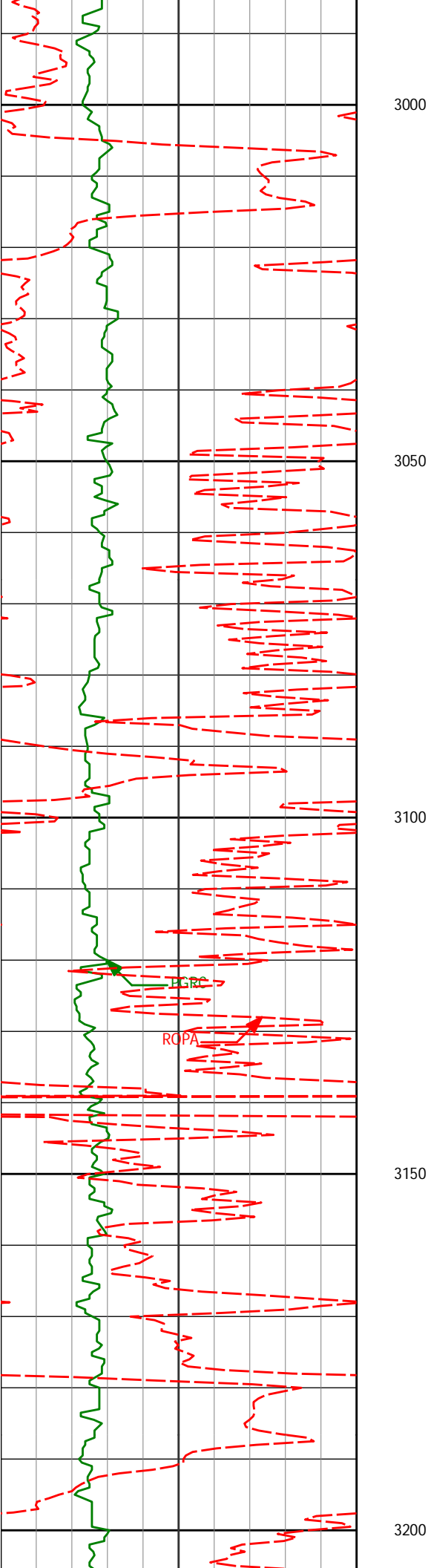


2597'	10.07°	267.01°	2584.38'	-3.87'
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2689'	9.84°	268.66°	2675.00'	-3.27'
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2781'	9.90°	269.38°	2765.63'	-3.00'
2800				
2850				
2873'	9.83°	270.30°	2856.27'	-2.96'
2900				
2950				
2959'	9.37°	270.25°	2941.07'	-3.02'



3045'

10.20°

266.55°

3025.82'

-2.60'

3130'

9.69°

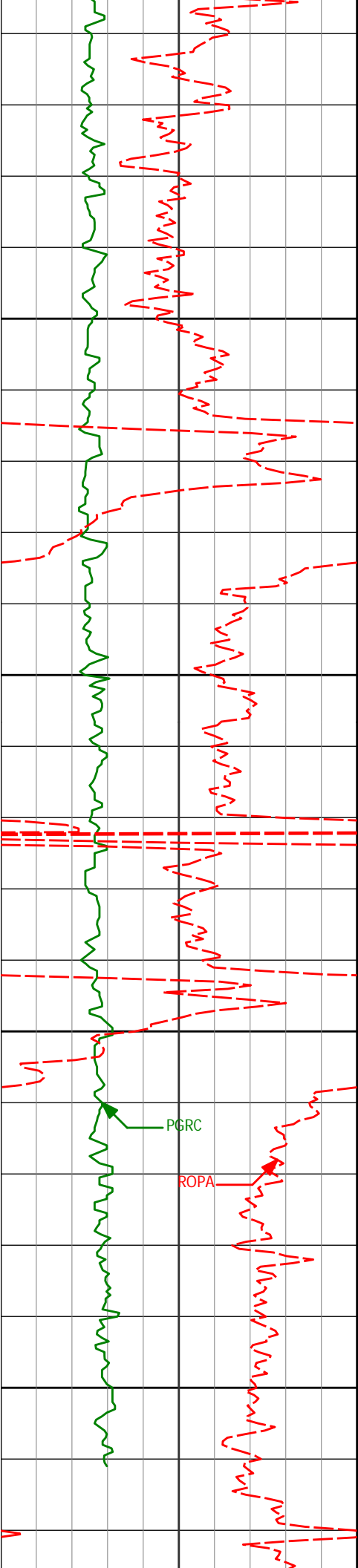
265.99°

3109.54'

-1.64'

ECRC

ROPA



3215'

9.97°

269.53°

3193.29'

-1.08'

3250

3300

3301'

10.25°

270.92°

3277.96'

-1.15'

3350

PGRC

ROPA

3387'

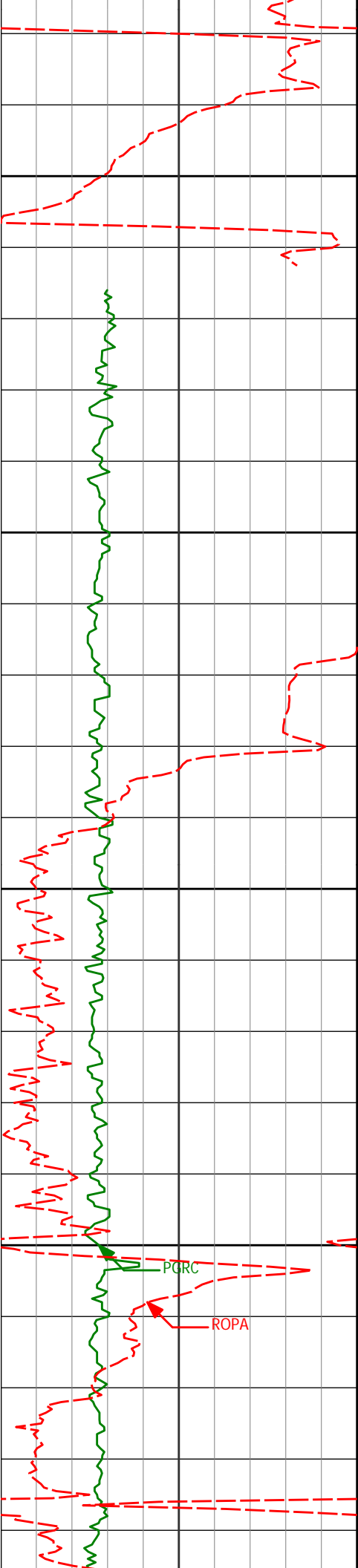
9.50°

271.86°

3362.68'

-1.50'

3400



3450

3472'

9.79°

273.28°

3446.48'

-2.14'

3500

3550

3558'

11.36°

268.90°

3531.02'

-2.40'

3600

PORC

ROPA

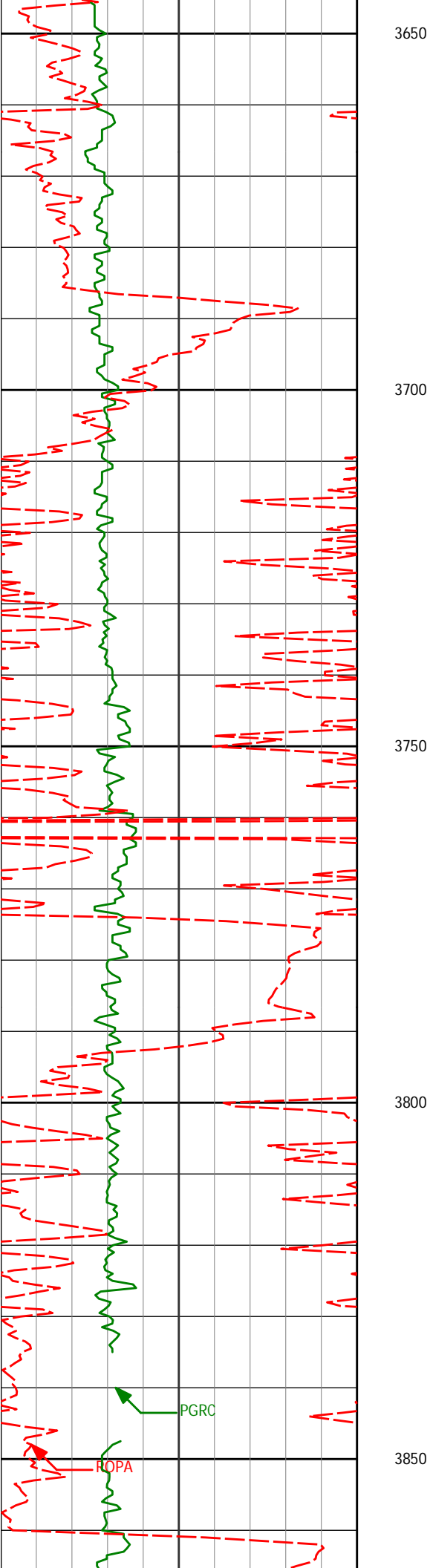
3643'

10.56°

265.70°

3614.47'

-1.65'



3729'

9.66°

264.63°

3699.13'

-0.38'

3815'

9.42°

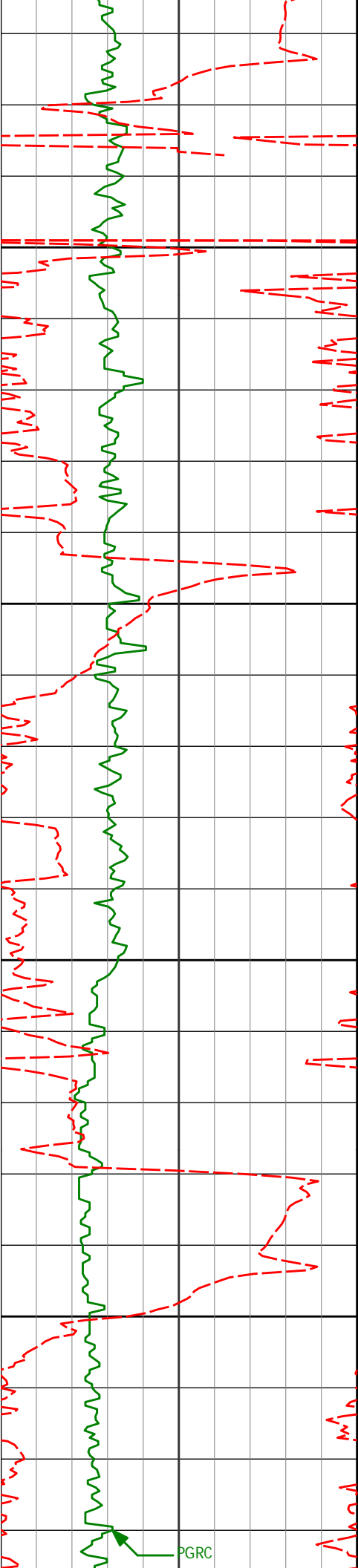
270.42°

3783.95'

0.24'

PGRC

ROPA



3900

3900'

10.14°

277.53°

3867.71'

-0.79'

3950

3986'

9.23°

277.86°

3952.49'

-2.73'

4000

4050

4071'

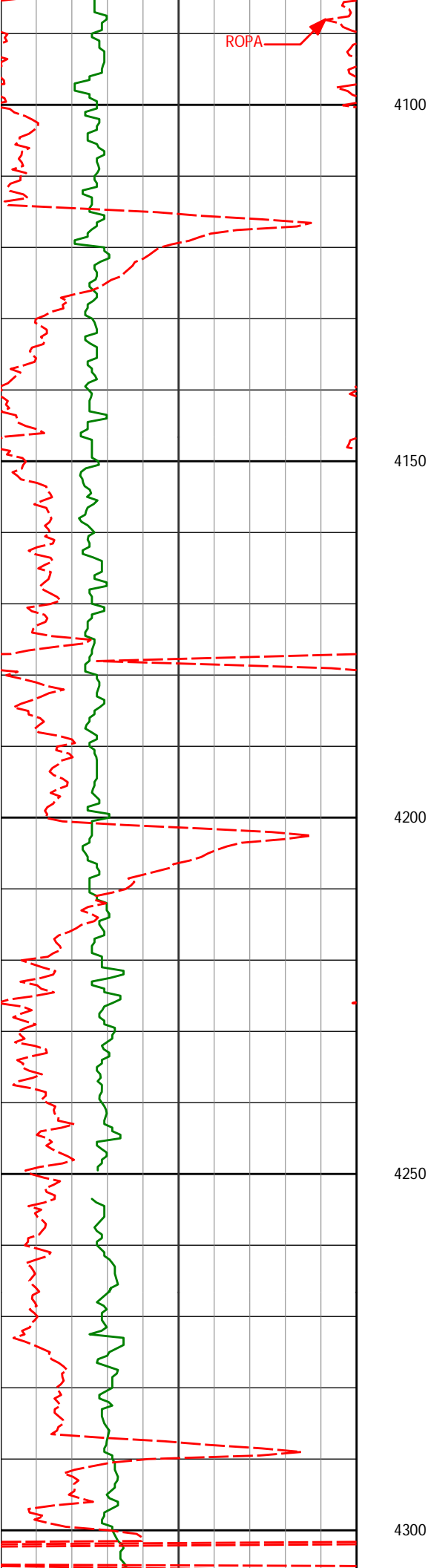
10.04°

274.28°

4036.29'

-4.21'

PGRC



4157'

9.83°

273.57°

4121.00'

-5.23'

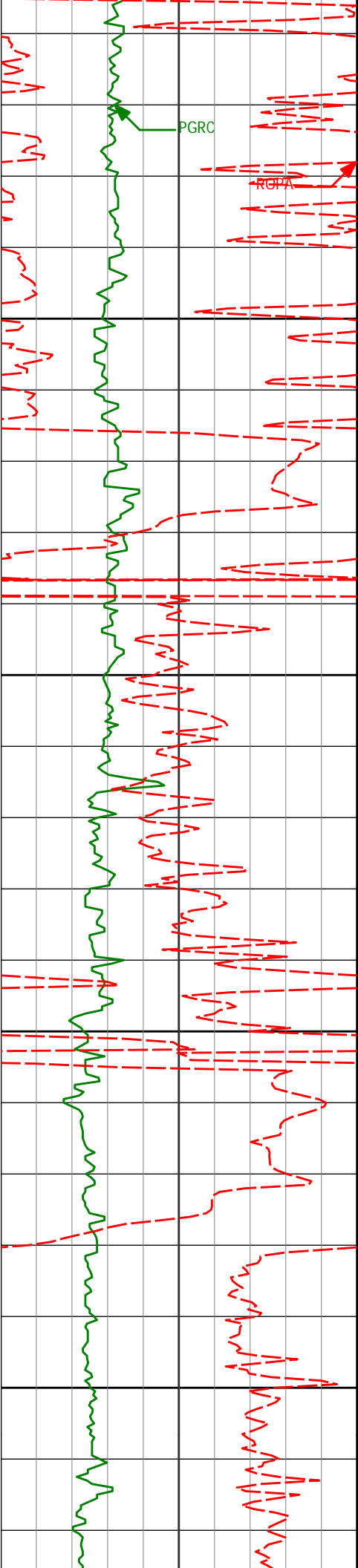
4243'

9.51°

273.16°

4205.78'

-6.08'



4329'

8.53°

273.30°

4290.71'

-6.84'

4350

4400

4414'

9.02°

273.10°

4374.72'

-7.56'

4450

4500

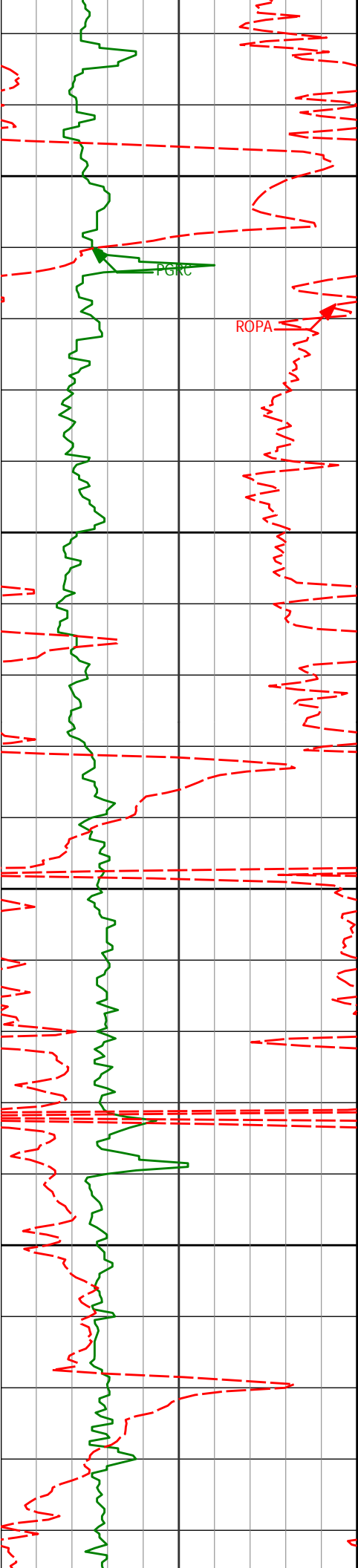
4500'

9.83°

274.76°

4459.55'

-8.53'



4550

PGRC

ROPA

4586'

10.87°

273.78°

4544.15'

-9.68'

4600

4650

4671'

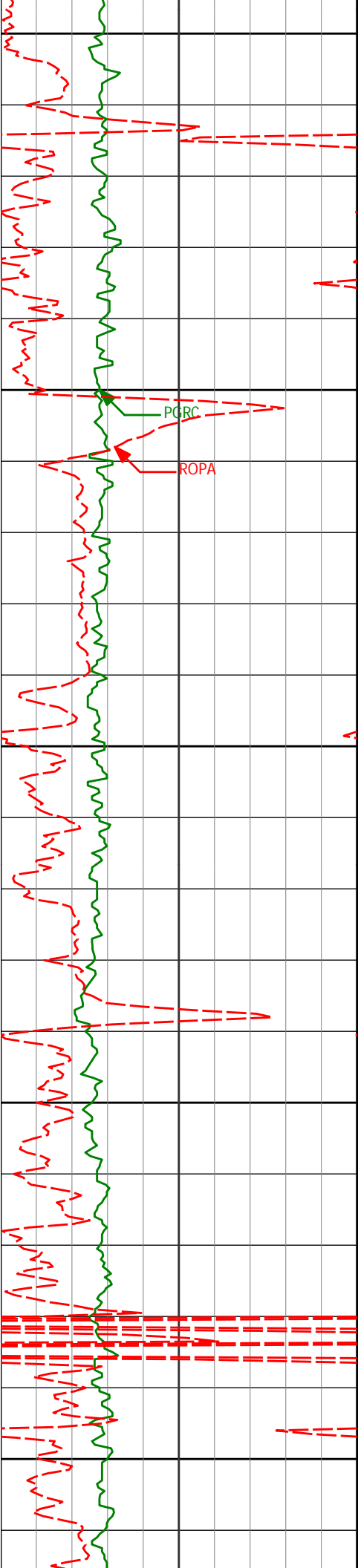
10.60°

273.99°

4627.67'

-10.75'

4700



4750

4757'

10.70°

273.72°

4712.19'

-11.82'

4800

PGRC

ROPA

4843'

10.07°

273.25°

4796.78'

-12.76'

4850

4900

4928'

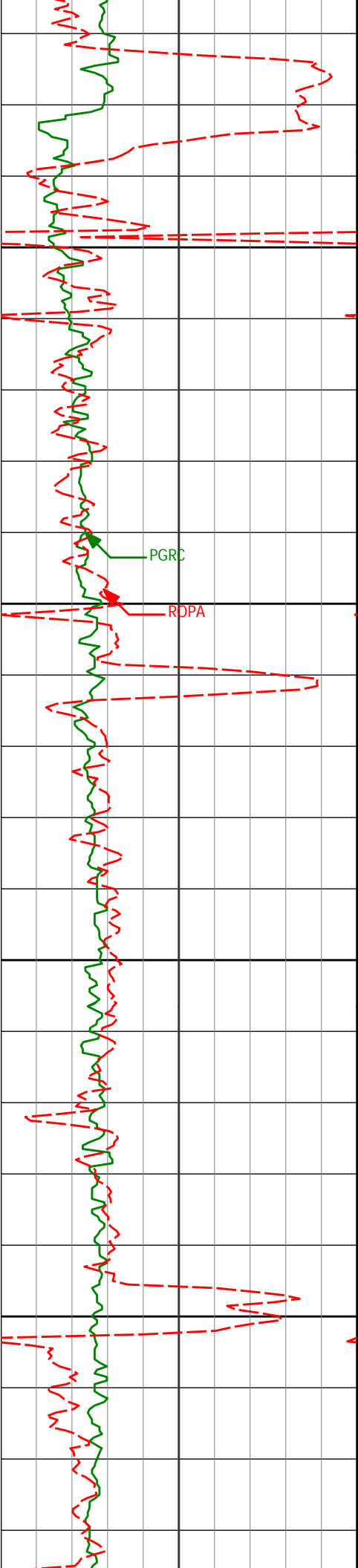
9.79°

274.81°

4880.50'

-13.79'

4950



5000

5014'

10.40°

269.50°

4965.17'

-14.34'

5050

PGRC

RDPA

5100

5100'

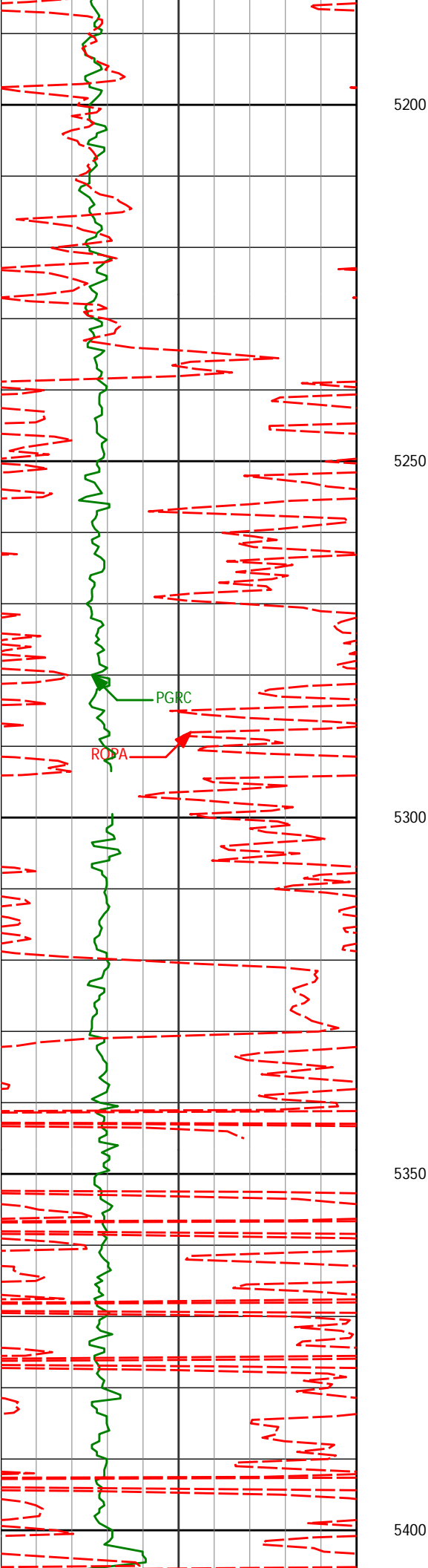
10.45°

268.82°

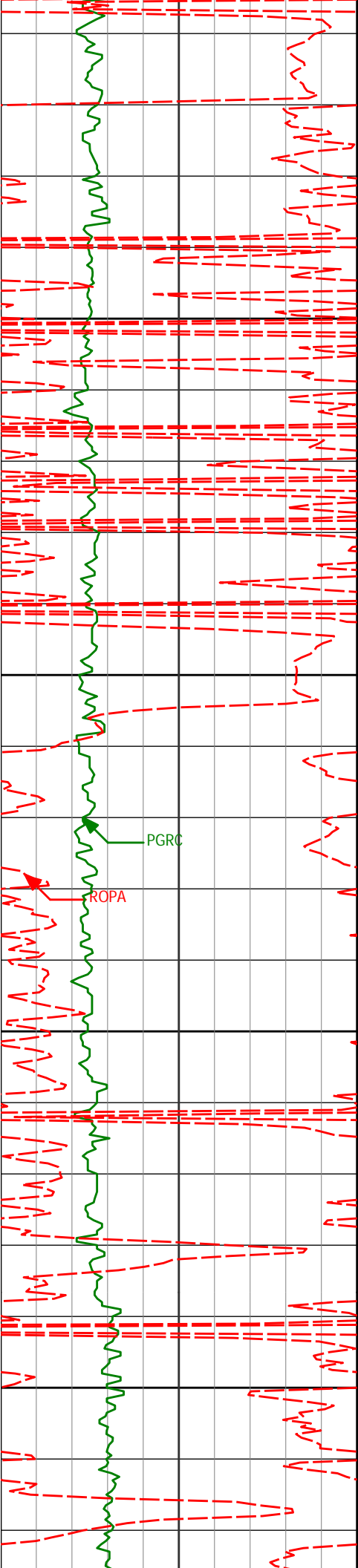
5049.75'

-14.11'

5150



5186'	9.89°	268.16°	5134.40'	-13.71'
5271'	8.94°	268.38°	5218.26'	-13.29'
5357'	8.82°	265.67°	5303.23'	-12.60'



5443'	9.59°	266.01°	5388.12'	-11.61'
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5450

5500

PGR

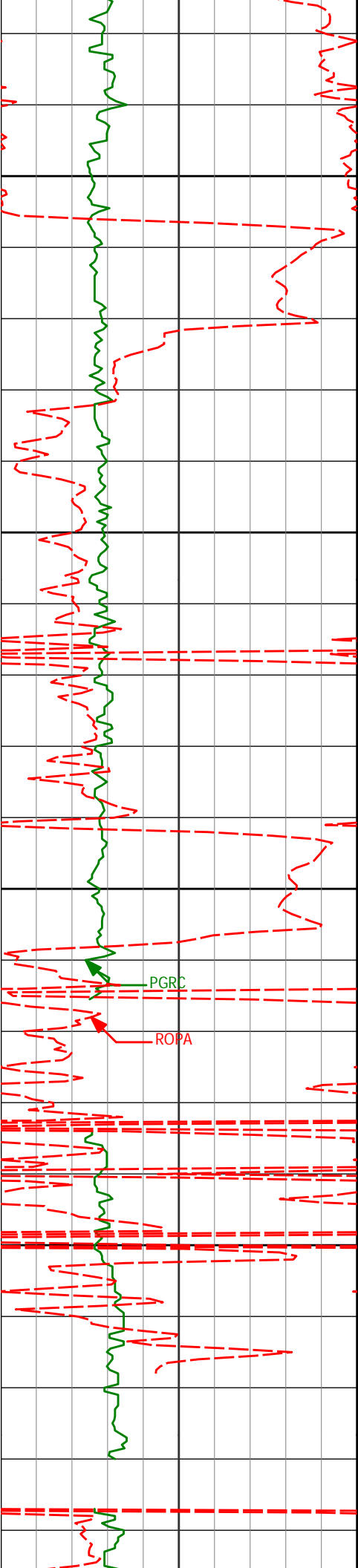
5528'	10.35°	265.73°	5471.83'	-10.54'
-------	--------	---------	----------	---------

ROPA

5550

5600

5614'	8.95°	264.35°	5556.61'	-9.31'
-------	-------	---------	----------	--------



5650

5700

5750

5800

5700'

5785'

9.47°

10.58°

266.51°

268.72°

5641.51'

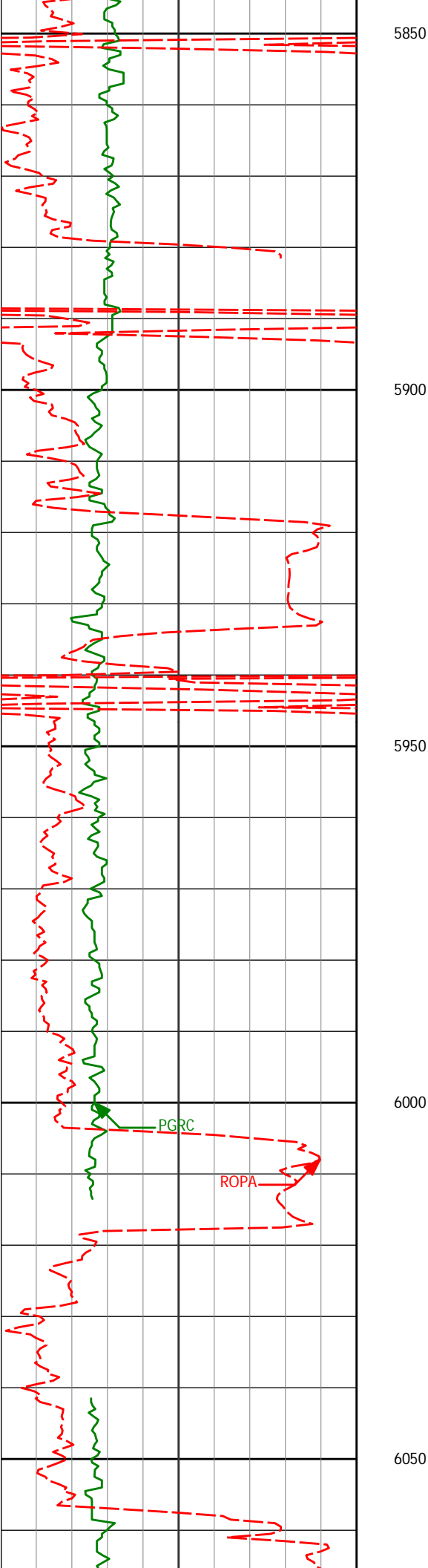
5725.21'

-8.22'

-7.62'

PGRC

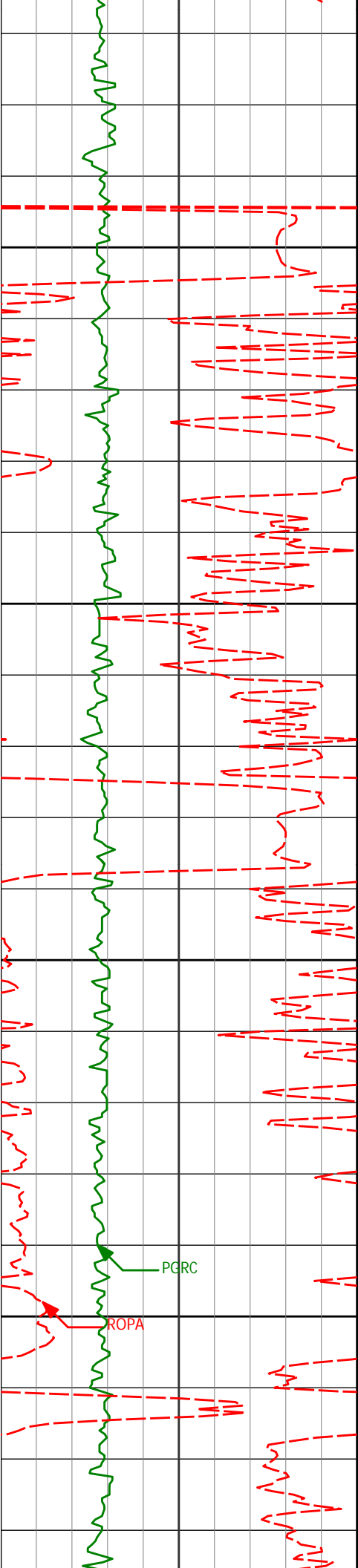
ROPA



5871' 9.43° 265.67° 5809.90' -6.91'

5957' 10.08° 262.97° 5894.65' -5.46'

6042' 9.33° 268.83° 5978.44' -4.41'



6100

6128'

9.39°

272.03°

6063.29'

-4.51'

6150

6200

6214'

9.24°

272.40°

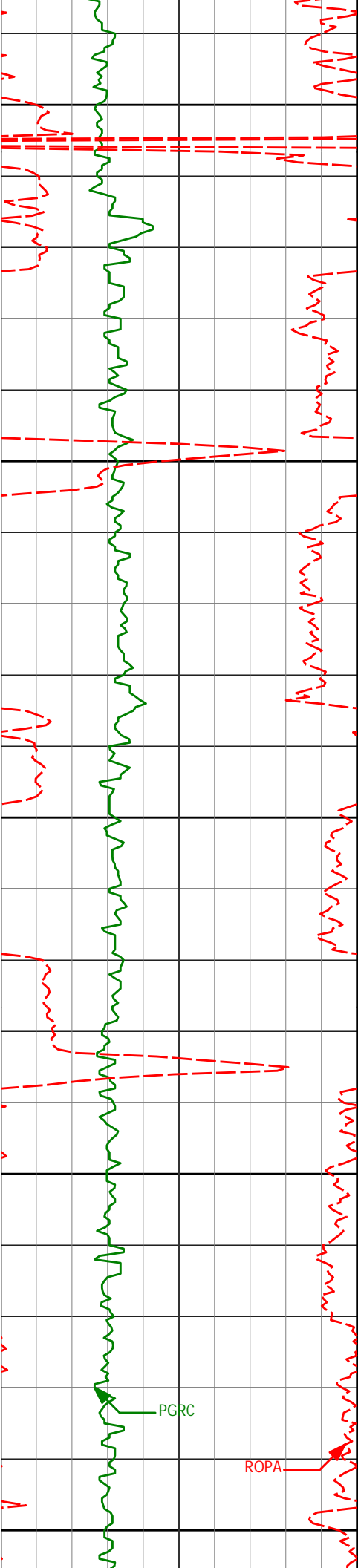
6148.16'

-5.05'

6250

PGRC

ROPA



6300

6300'

7.89°

272.02°

6233.20'

-5.55'

6350

6386'

6.75°

270.53°

6318.50'

-5.80'

6400

6450

6471'

5.66°

268.86°

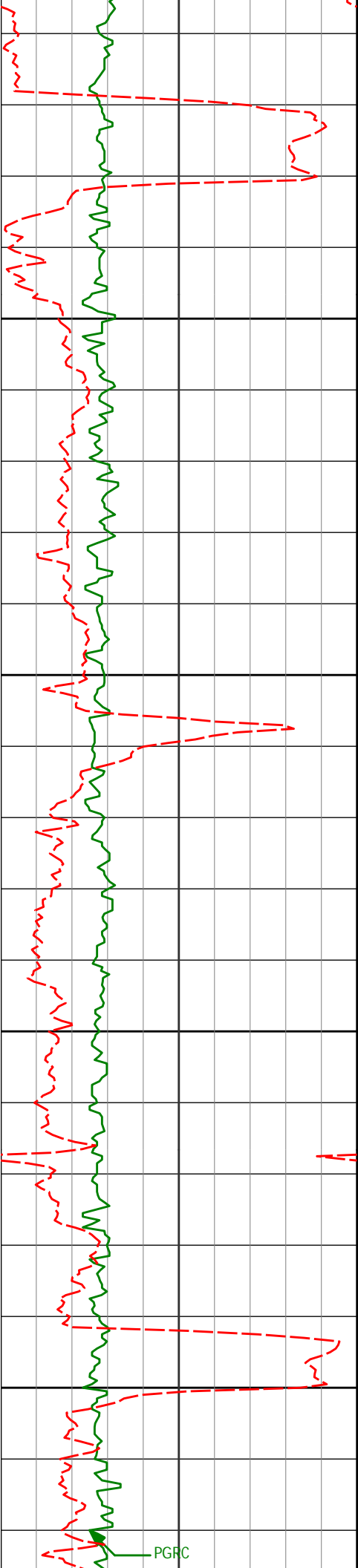
6403.00'

-5.77'

6500

PGRC

ROPA



6550

6557'

5.01°

281.75°

6488.63'

-6.45'

6600

6643'

4.39°

281.91°

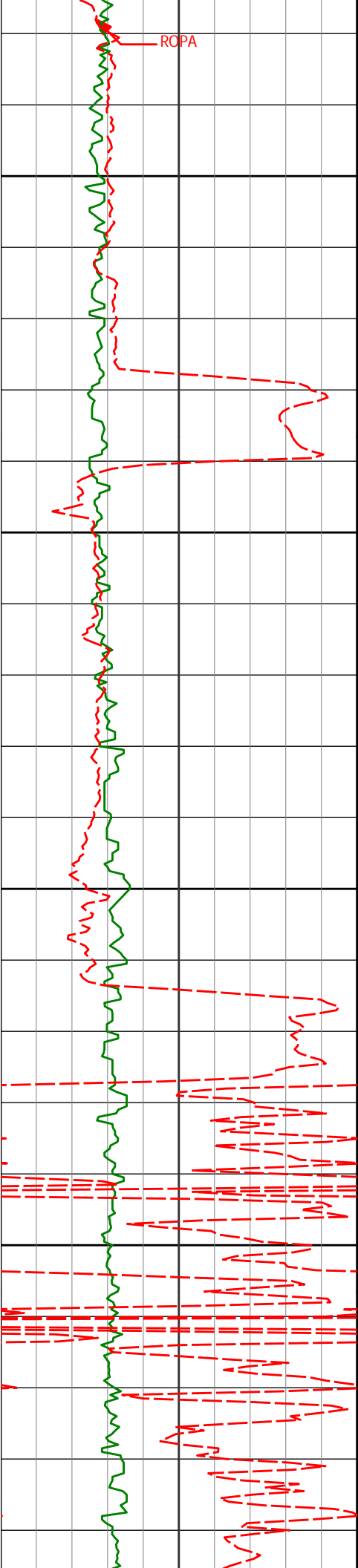
6574.34'

-7.89'

6650

6700

PGRC



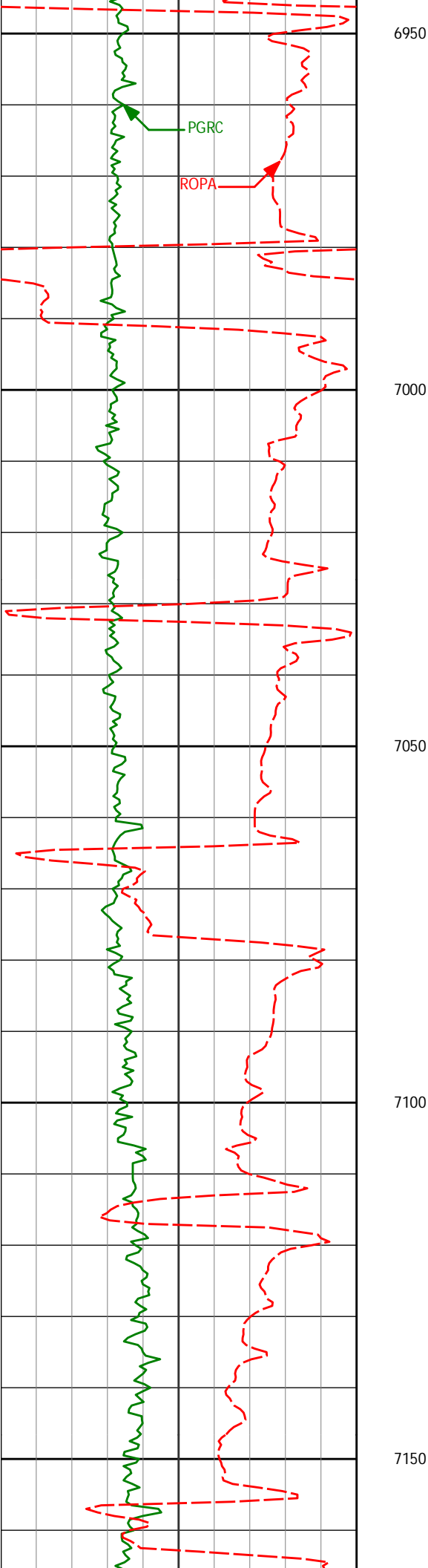
6750

6800

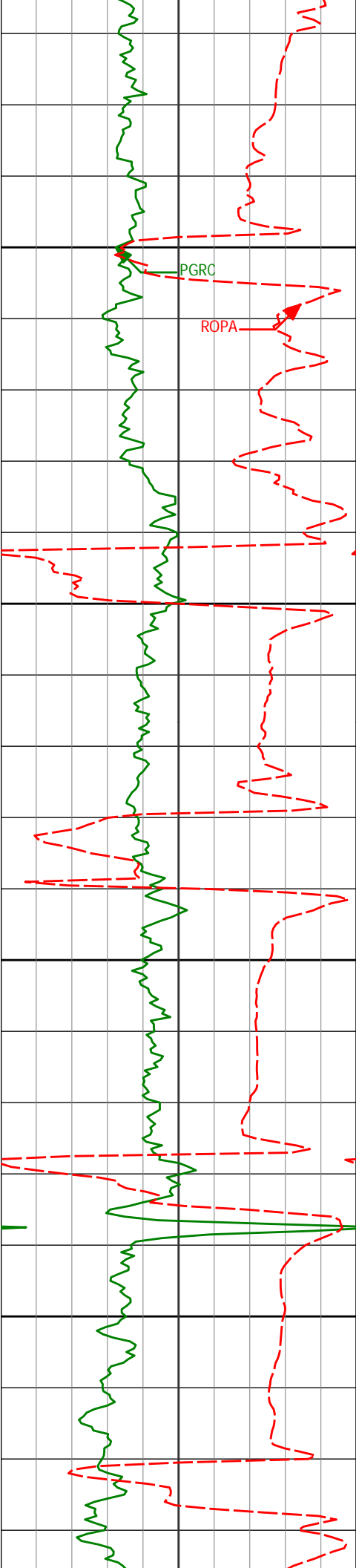
6850

6900

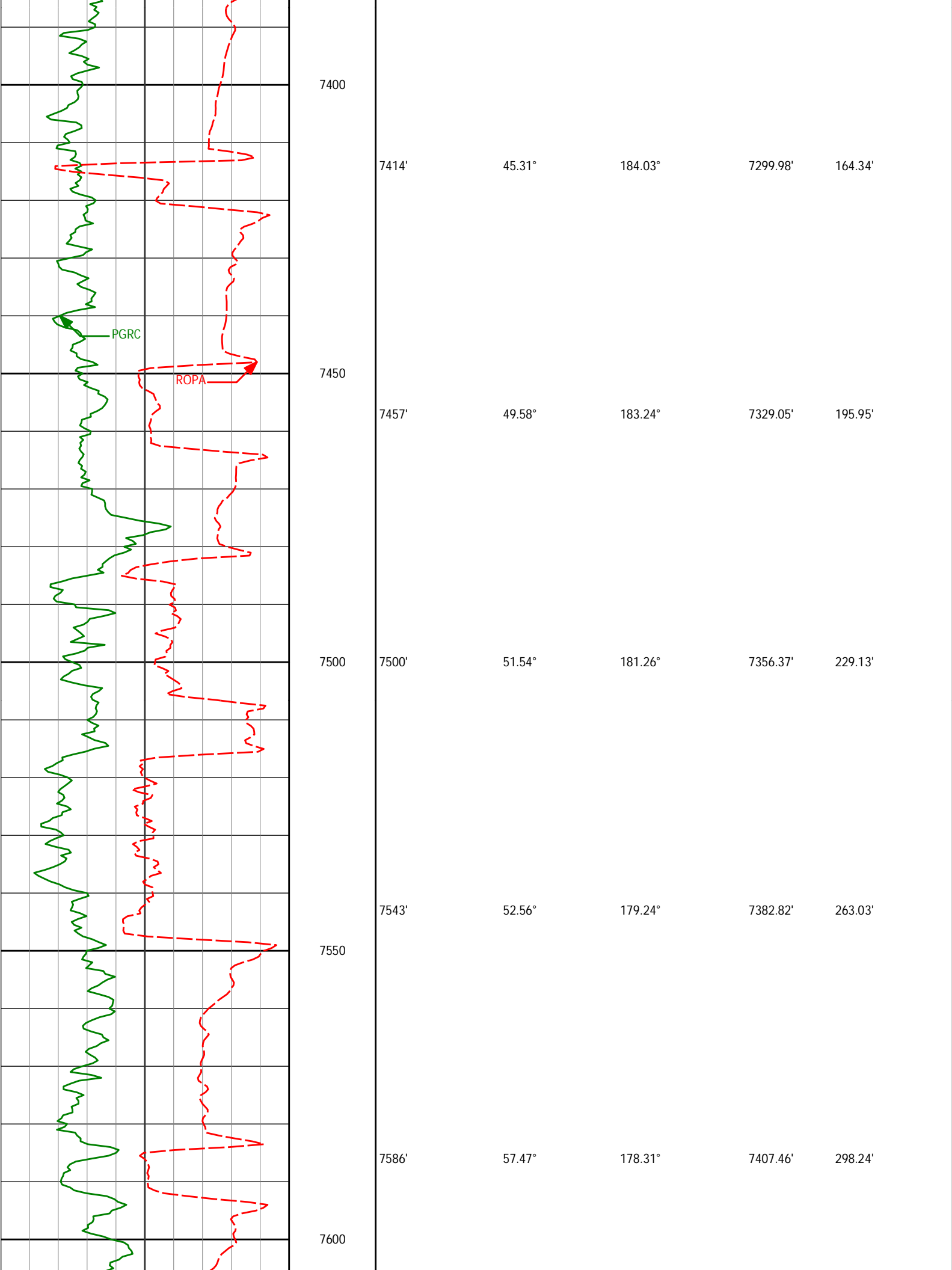
6728'	3.22°	275.11°	6659.15'	-8.78'
6814'	1.85°	261.38°	6745.06'	-8.78'
6900'	0.34°	229.51°	6831.05'	-8.41'
6943'	0.52°	194.51°	6874.05'	-8.14'



6986'	4.32°	181.17°	6917.00'	-6.33'
7029'	8.14°	186.99°	6959.74'	-1.69'
7072'	12.06°	185.25°	7002.06'	5.81'
7114'	15.92°	188.20°	7042.81'	15.89'
7157'	20.27°	184.37°	7083.68'	29.16'

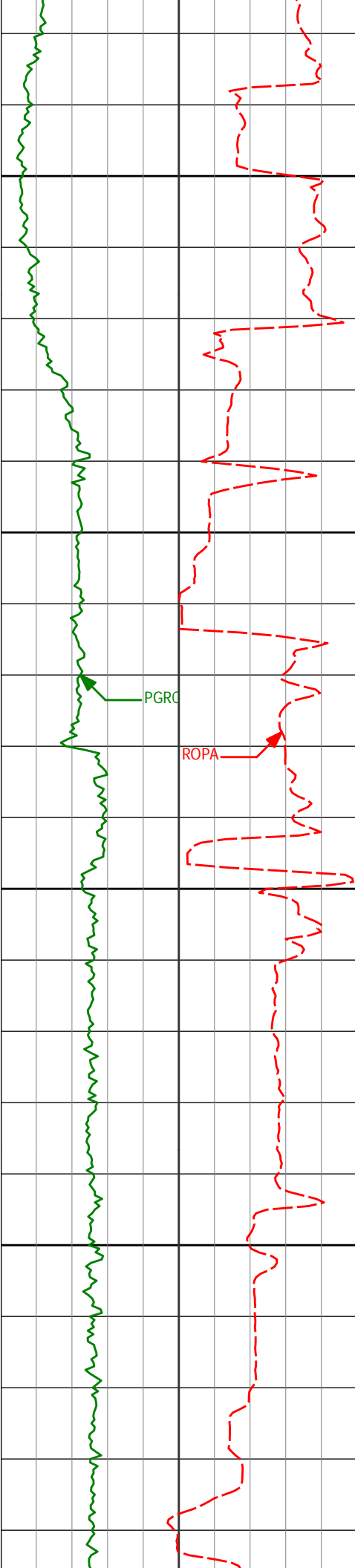


7200	7200'	25.30°	180.43°	7123.31'	45.78'
7243'	7243'	27.49°	177.27°	7161.83'	64.89'
7250	7250'				
7286'	7286'	31.04°	178.09°	7199.33'	85.89'
7300	7300'				
7329'	7329'	35.69°	181.55°	7235.24'	109.52'
7350	7350'				
7371'	7371'	40.07°	183.96°	7268.38'	135.27'





7629'	61.62°	180.10°	7429.25'	335.29'
7672'	65.51°	181.10°	7448.39'	373.79'
7714'	69.47°	180.51°	7464.47'	412.57'
7757'	73.34°	179.65°	7478.18'	453.32'
7800'	77.98°	179.20°	7488.83'	494.97'



7850

7900

7950

8000

7843'

7900'

7952'

82.98°

86.11°

89.48°

178.87°

178.58°

178.75°

7495.94'

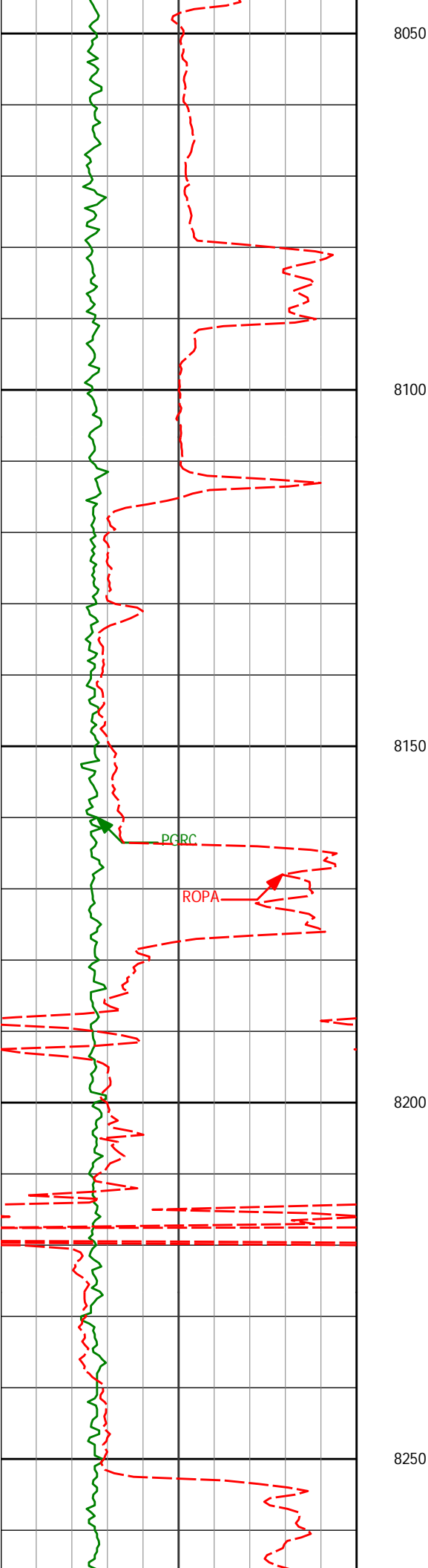
7501.35'

7503.35'

537.36'

594.08'

646.02'



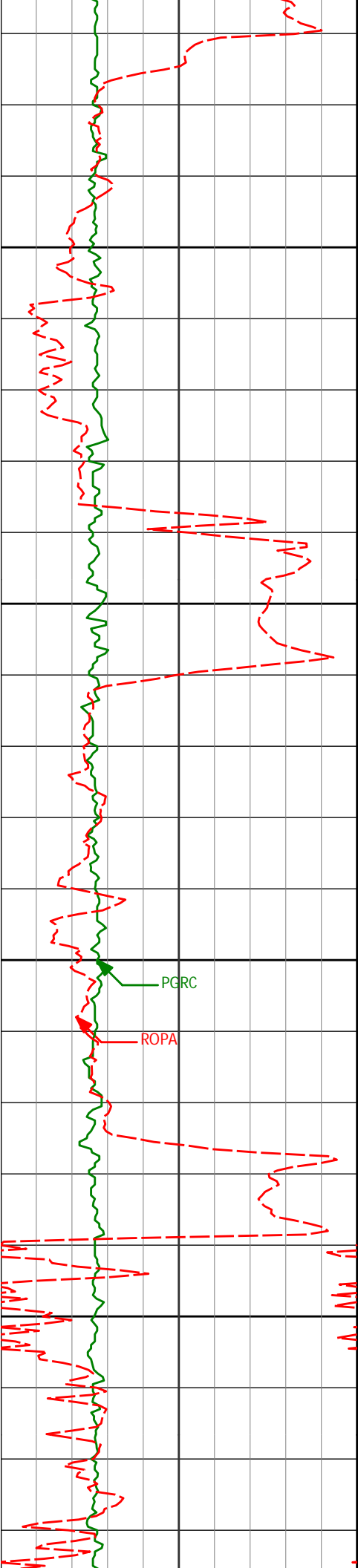
8123'

89.54°

178.67°

7504.82'

816.97'



8295'	89.78°	178.79°	7505.84'	988.92'
-------	--------	---------	----------	---------

8300

8350

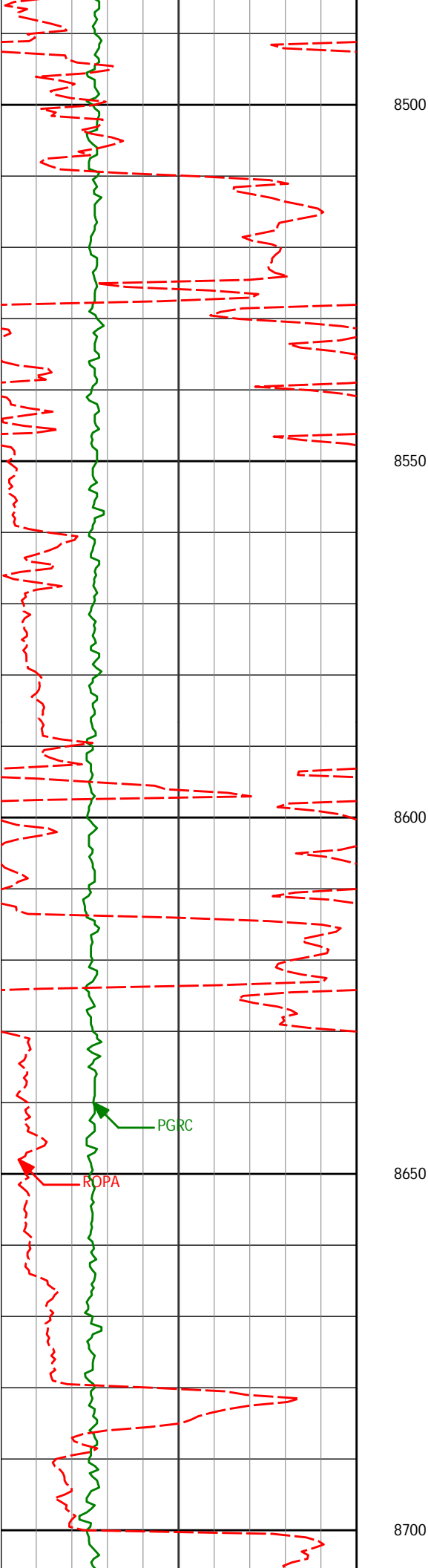
8400

PGRC

ROPA

8450

8466'	90.25°	180.33°	7505.79'	1159.91'
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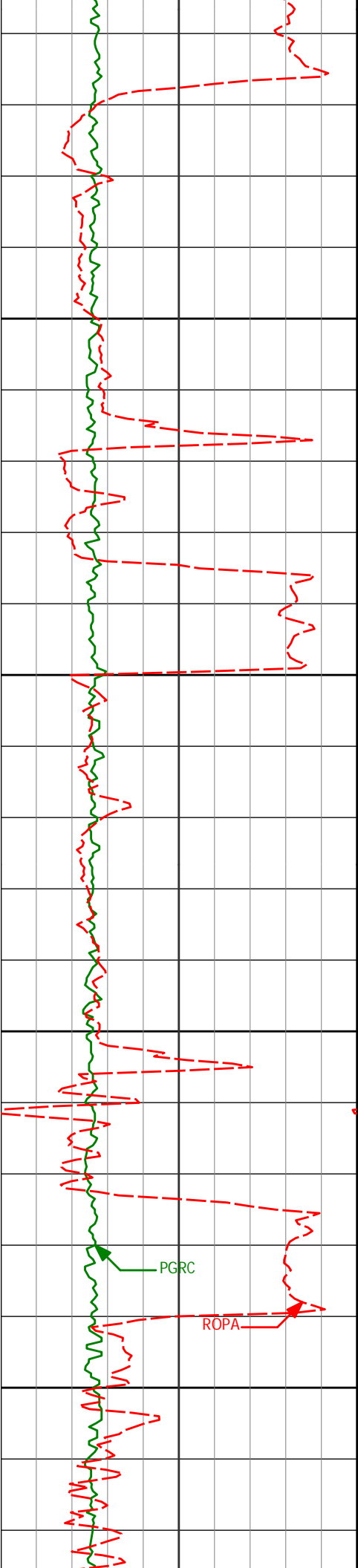
8637'

90.06°

180.44°

7505.33'

1330.91'



8750

8800

8850

8900

8809'

89.48°

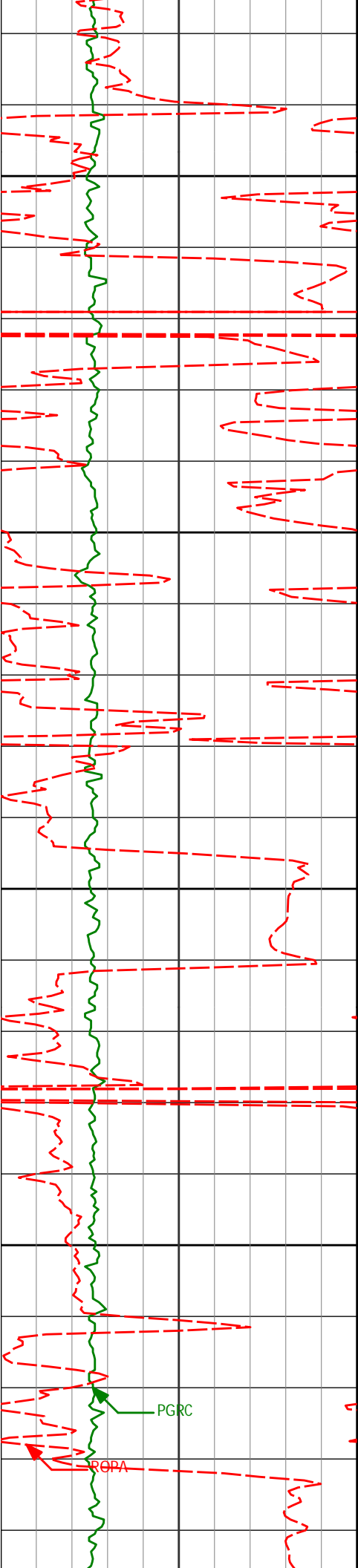
180.86°

7506.02'

1502.89'

PGRC

ROPA



8950

8980'

90.49°

180.11°

7506.07'

1673.88'

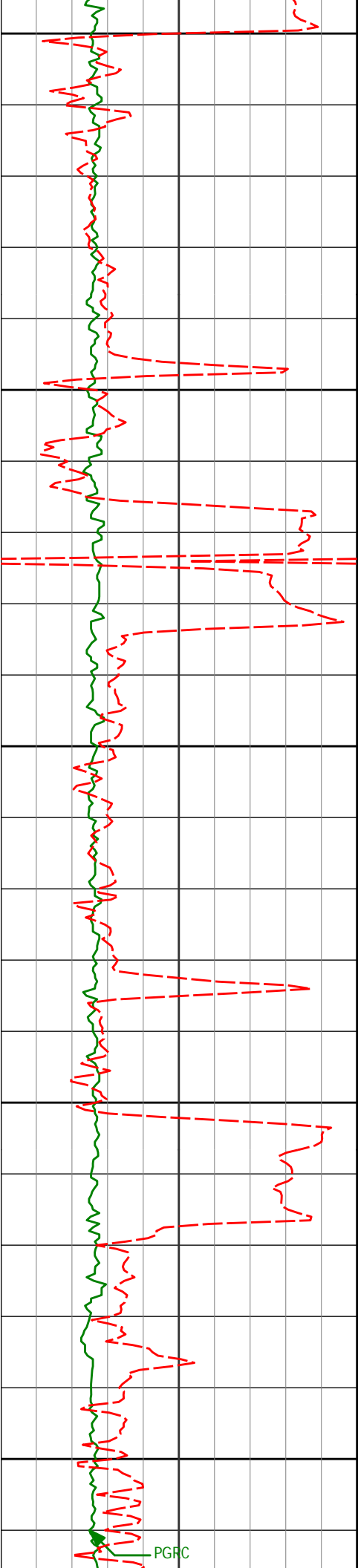
9000

9050

9100

PGRC

PROPA



9150

9152'

89.85°

179.68°

7505.56'

1845.88'

9200

9250

9300

9350

9323'

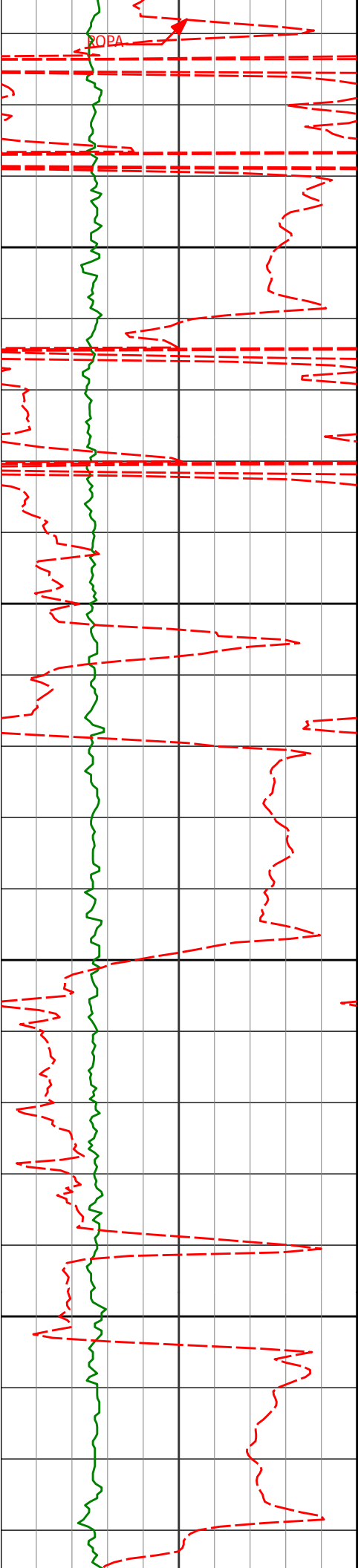
89.38°

179.08°

7506.70'

2016.87'

PGFC



9400

9450

9494'

89.88°

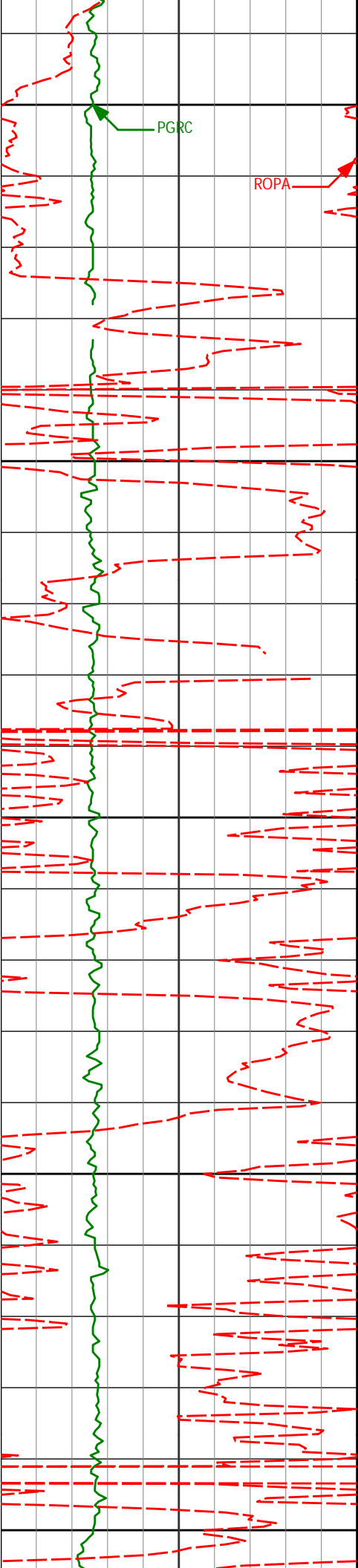
179.57°

7507.81'

2187.85'

9500

9550



9600

PGRC

ROPA

9650

9666'

90.59°

180.64°

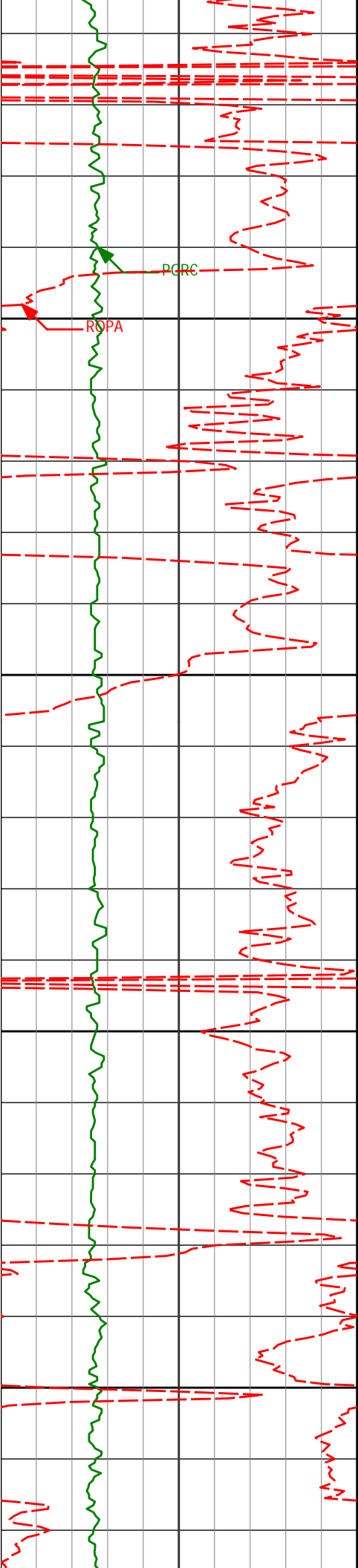
7507.10'

2359.84'

9700

9750

9800



9850

9900

9950

10000

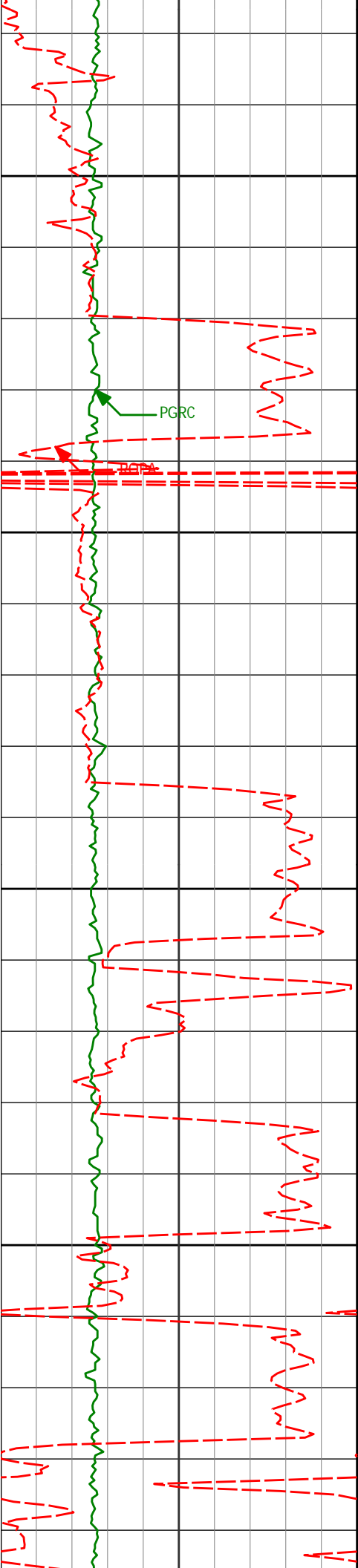
9849'

90.49°

181.61°

7505.38'

2542.80'



10033'

90.40°

181.11°

7503.95'

2726.74'

10050

10100

10150

10200

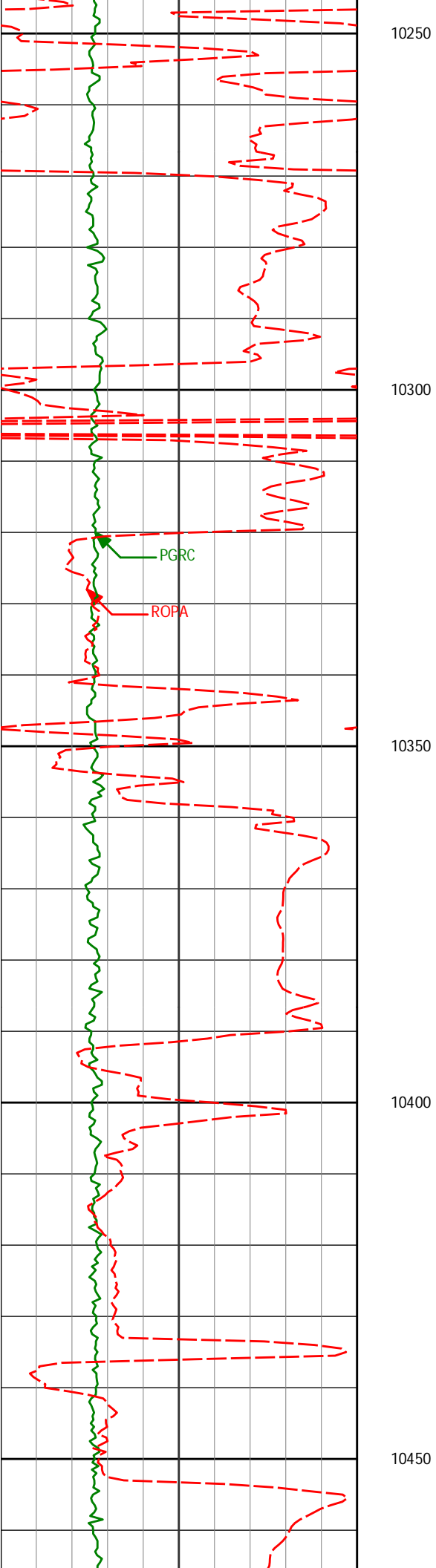
10218'

88.40°

178.58°

7505.89'

2911.71'



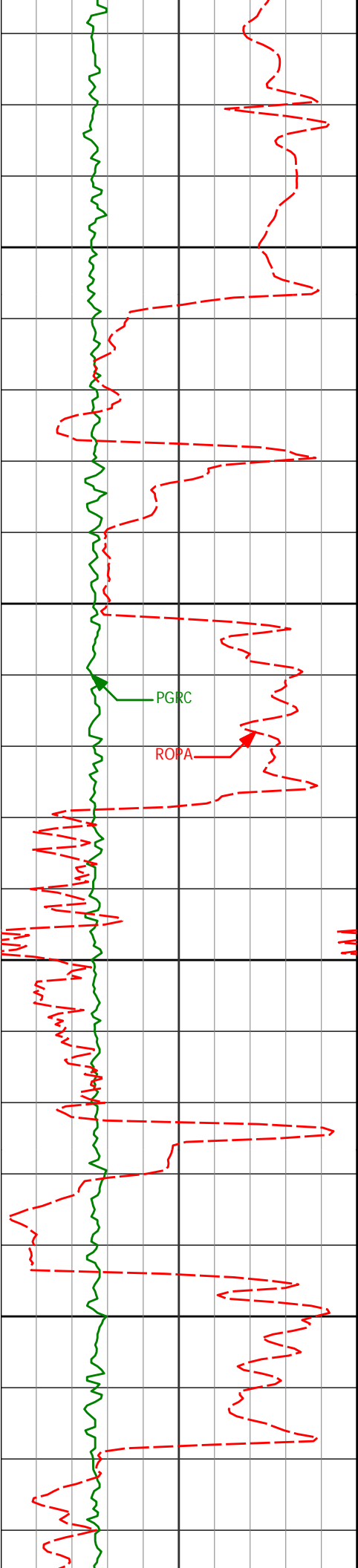
10402'

89.01°

177.20°

7510.05'

3095.53'



10500

10550

10600

10650

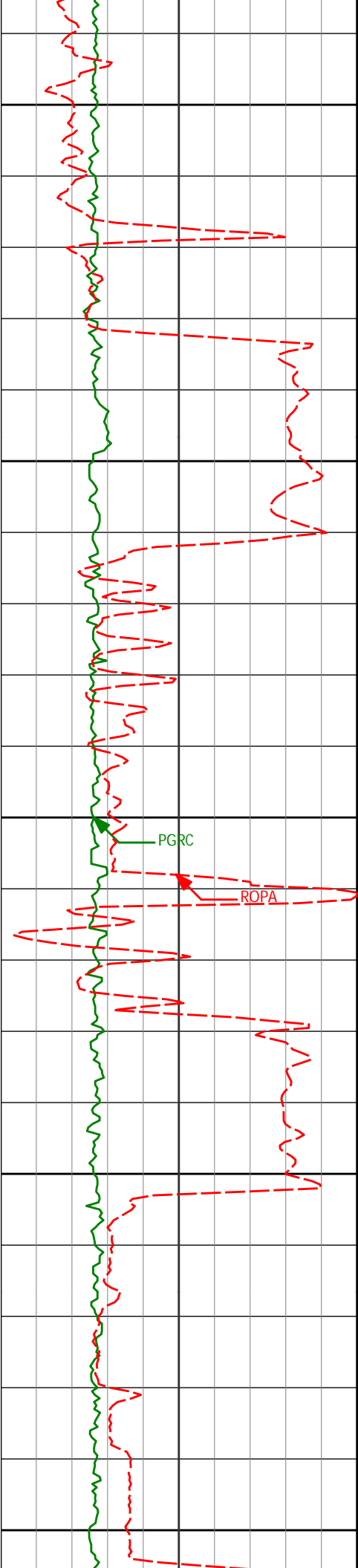
10587'

89.60°

178.88°

7512.29'

3280.40'



10700

10750

10800

10850

10900

10771'

89.44°

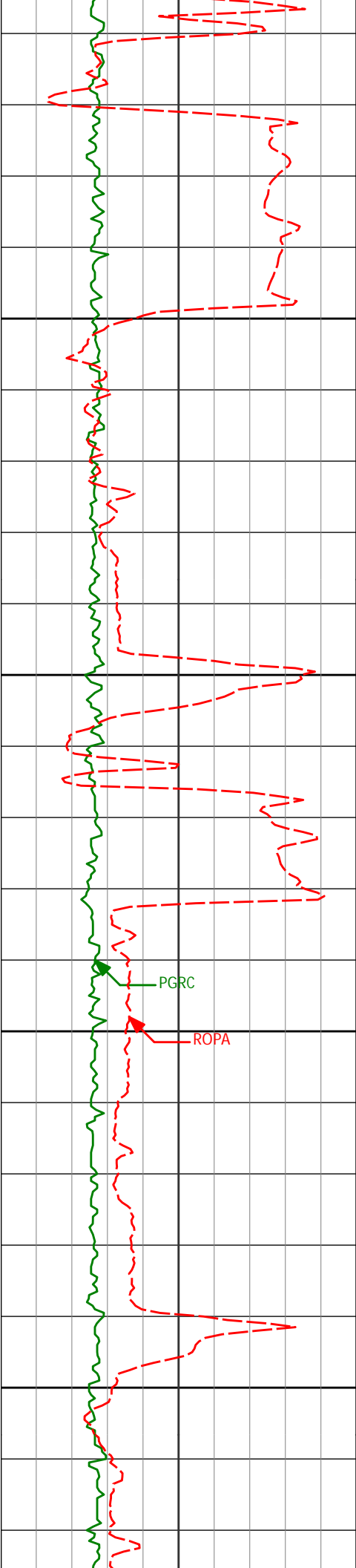
179.89°

7513.83'

3464.38'

PGRC

ROPA



10950

10953'

90.00°

181.45°

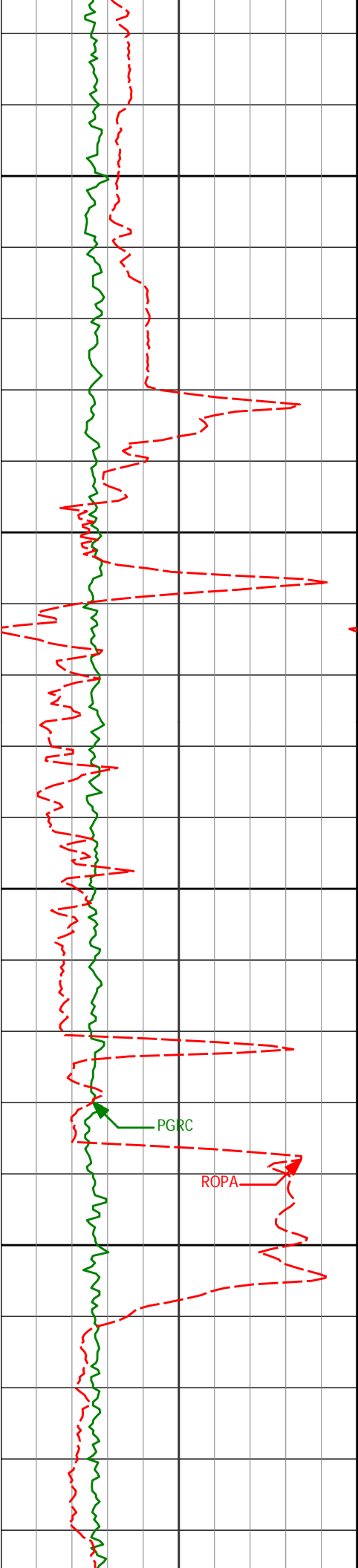
7514.72'

3646.36'

11000

11050

11100



11135'

90.06°

180.61°

7514.63'

3828.33'

11150

11200

11250

11300

11312'

89.23°

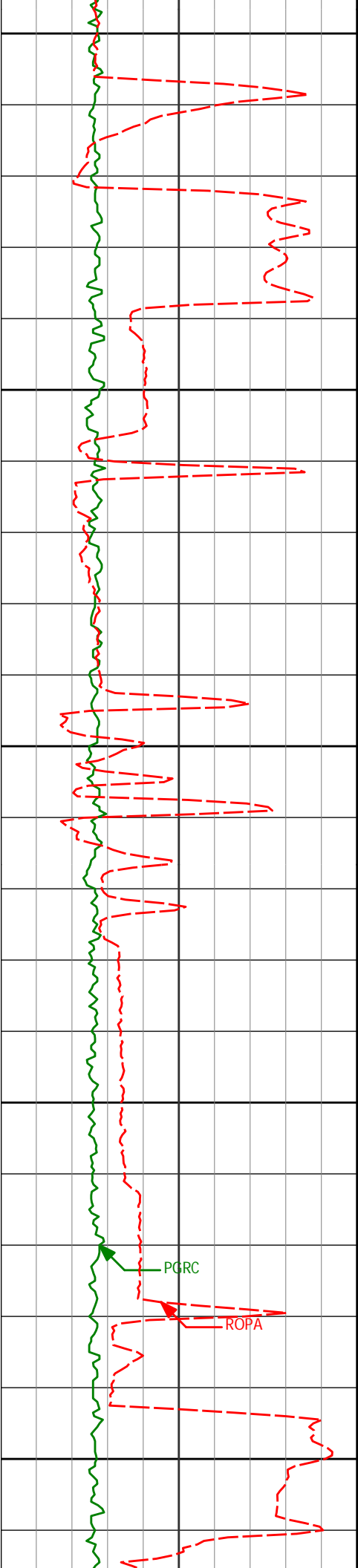
179.51°

7515.72'

4005.32'

PGRC

ROPA



11350

11400

11450

11483'

11500

11550

89.11°

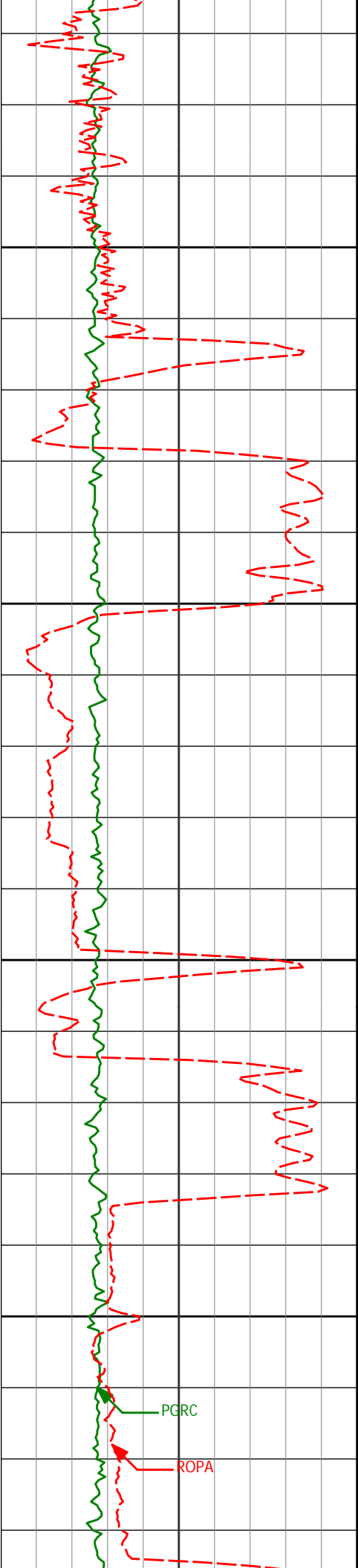
177.97°

7518.20'

4176.26'

PGRC

ROPA



11600

11650

11700

11750

11654'

88.95°

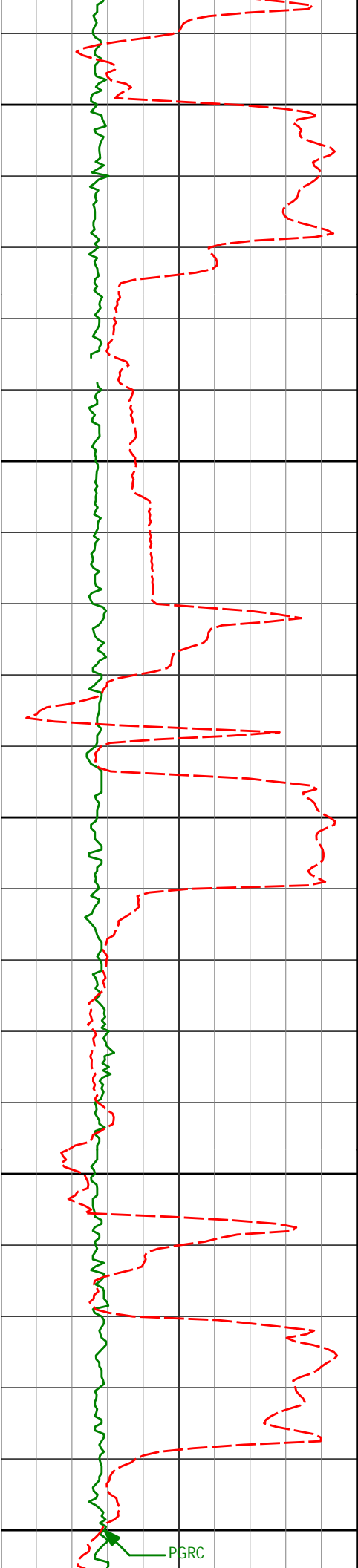
178.67°

7521.10'

4347.16'

PGRC

ROPA



11800

11850

11900

11950

12000

11826'

90.43°

180.79°

7522.03'

4519.14'

11997'

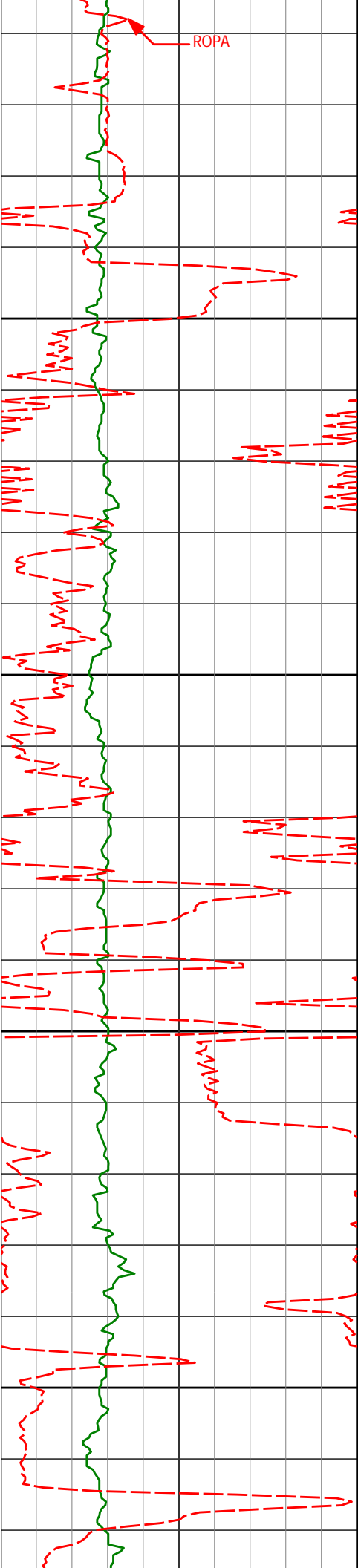
88.12°

182.09°

7524.19'

4690.05'

PGRC



ROPA

12050

12100

12150

12169'

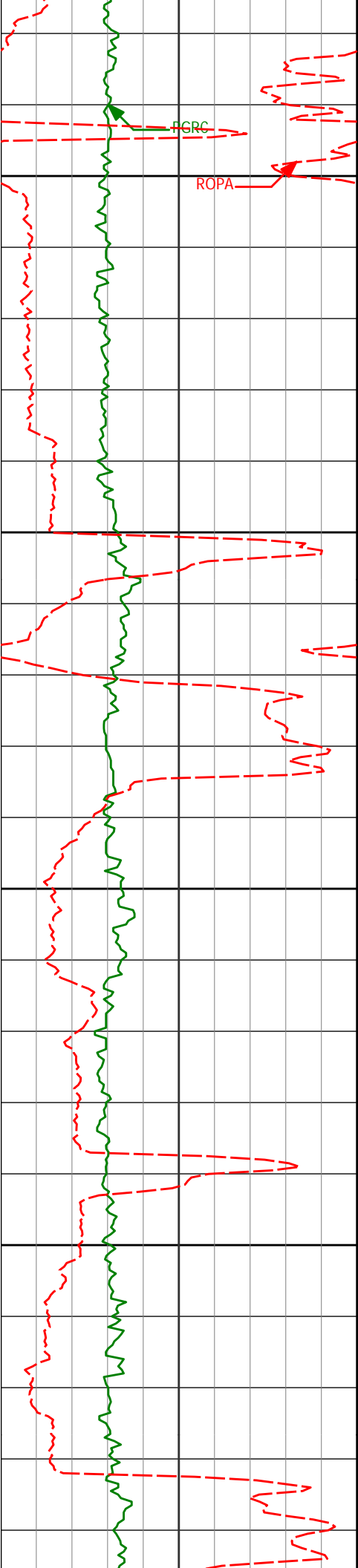
88.43°

181.45°

7529.37'

4861.89'

12200



12250

12300

12350

12400

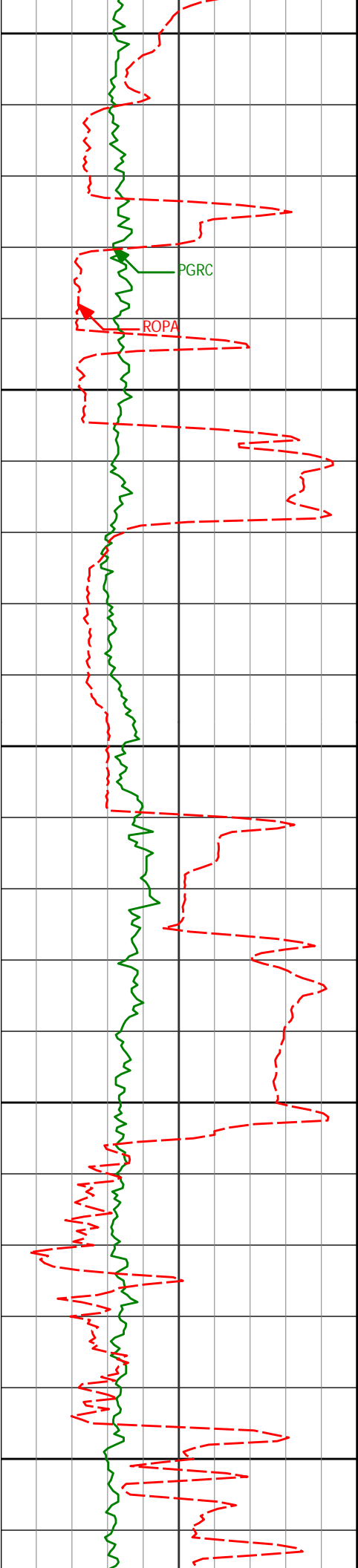
12341'

90.18°

183.11°

7531.45'

5033.73'



12450

PGRC

ROPA

12500

12512'

89.04°

183.06°

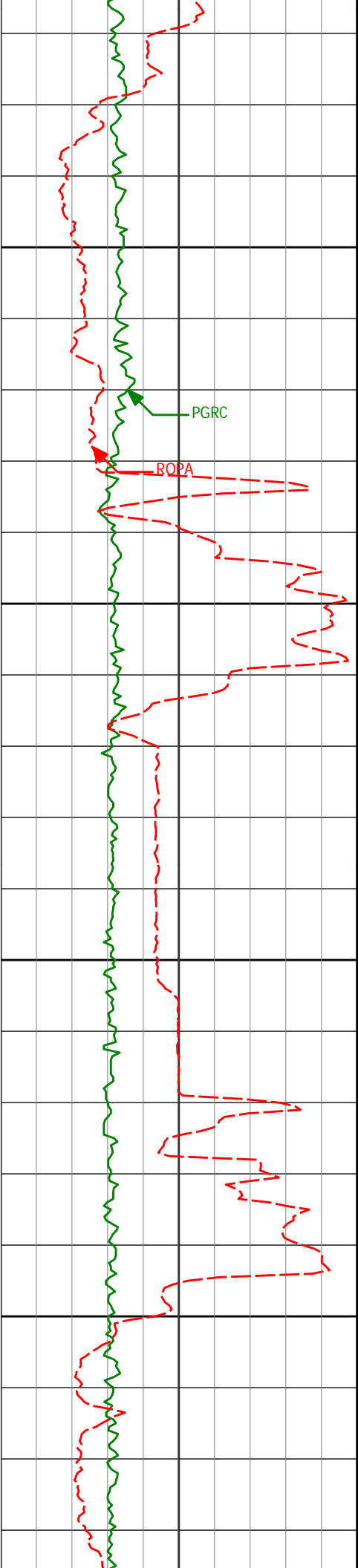
7532.62'

5204.48'

12550

12600

12650



12684'

88.27°

180.16°

7536.66'

5376.34'

12700

12750

12800

12850

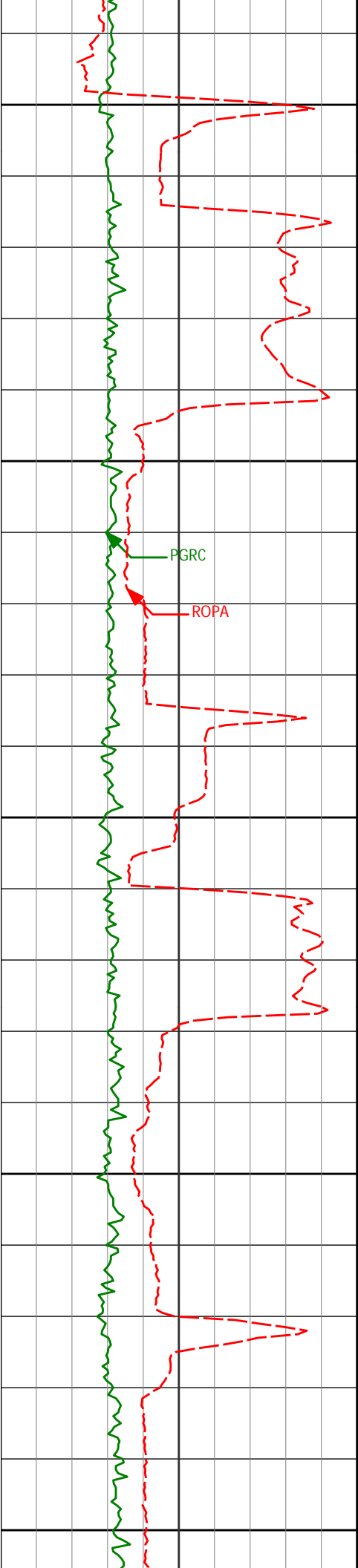
12855'

89.35°

179.61°

7540.21'

5547.30'



12900

12950

13000

13050

13100

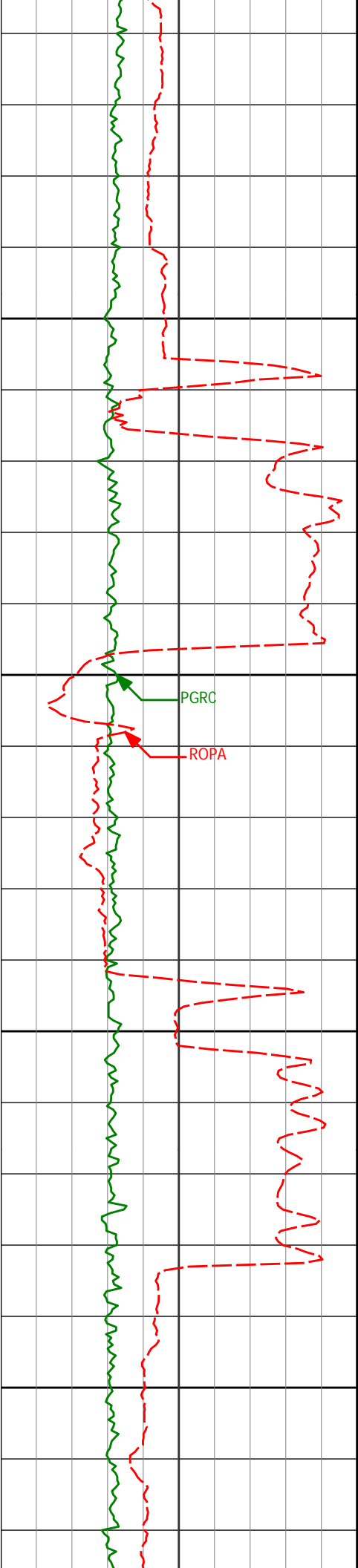
13026'

90.15°

177.23°

7540.95'

5718.22'



13150

13200

13250

13300

13198'

88.89°

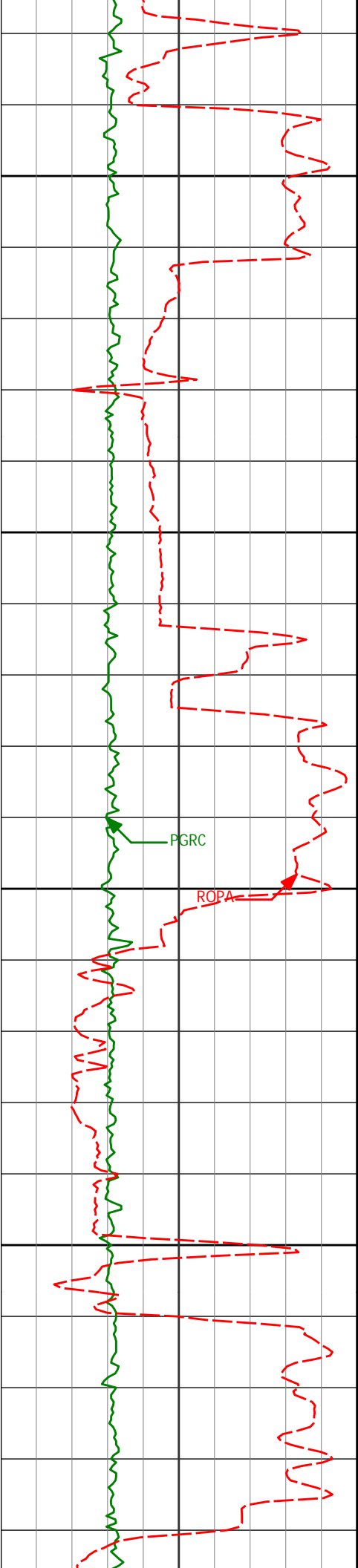
177.12°

7542.39'

5890.00'

PGRC

ROPA



13350

13369'

89.78°

178.82°

7544.38'

6060.88'

13400

PGRC

13450

ROPA

13500

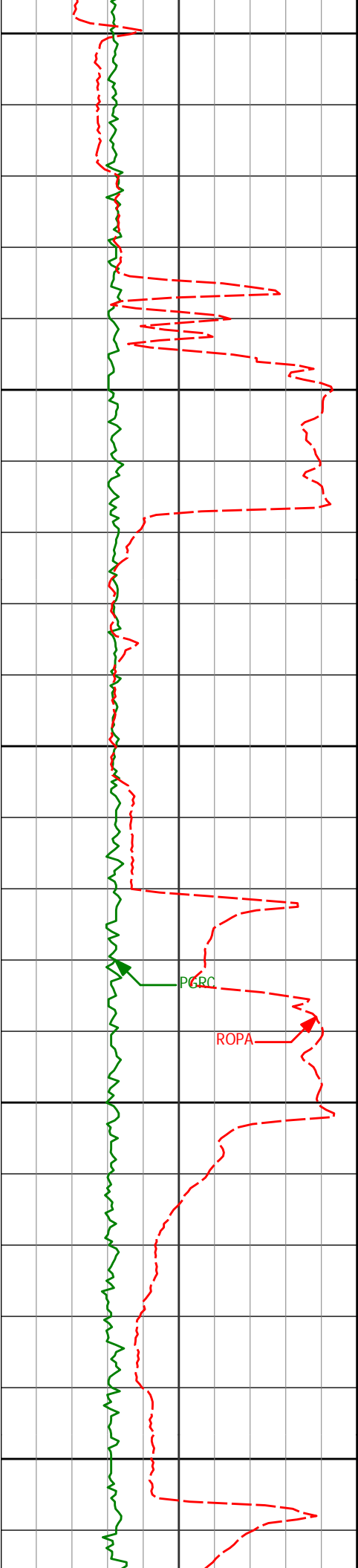
13540'

89.04°

179.81°

7546.14'

6231.85'



13550

13600

13650

13700

13750

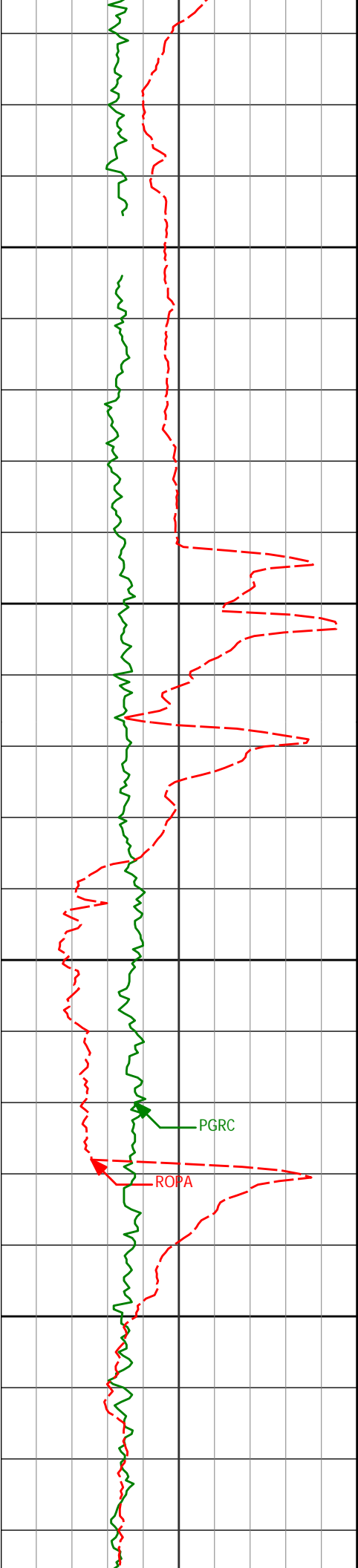
13712'

91.11°

182.00°

7545.91'

6403.81'



13800

13850

13900

13950

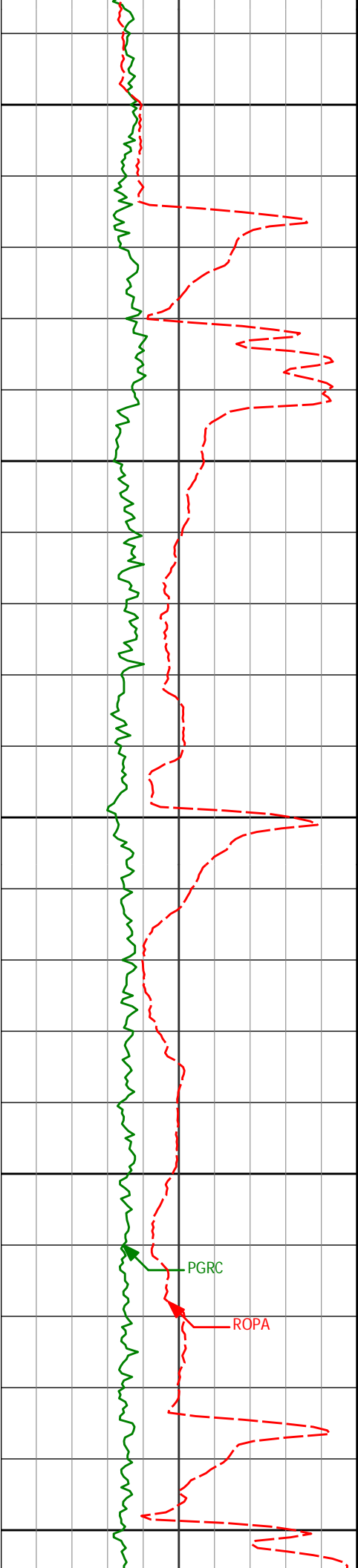
13883'

90.59°

180.94°

7543.38'

6574.73'



14000

14050

14100

14150

14200

14054'

90.15°

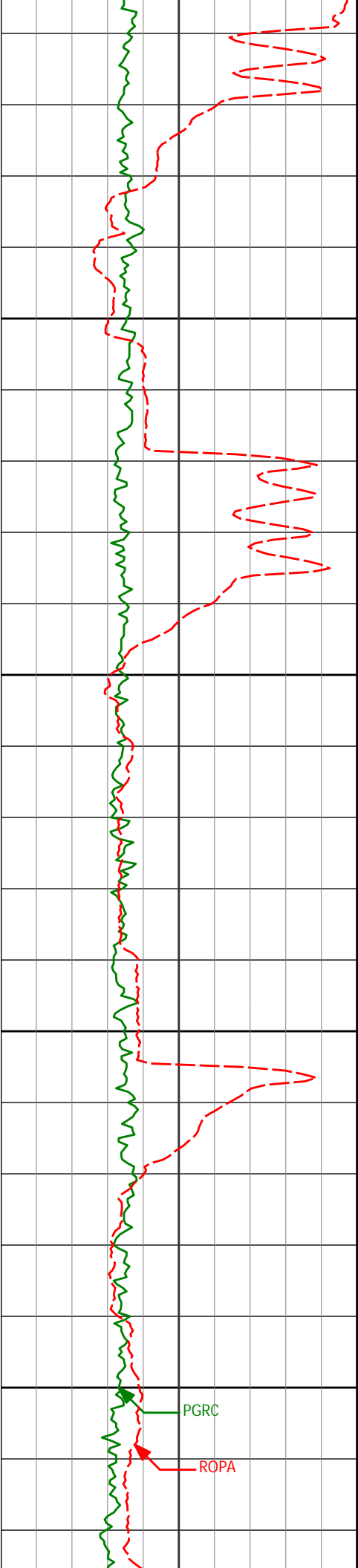
181.39°

7542.27'

6745.69'

PGRC

ROPA



14226'

89.85°

180.33°

7542.27'

6917.67'

14250

14300

14350

14400

14397'

91.63°

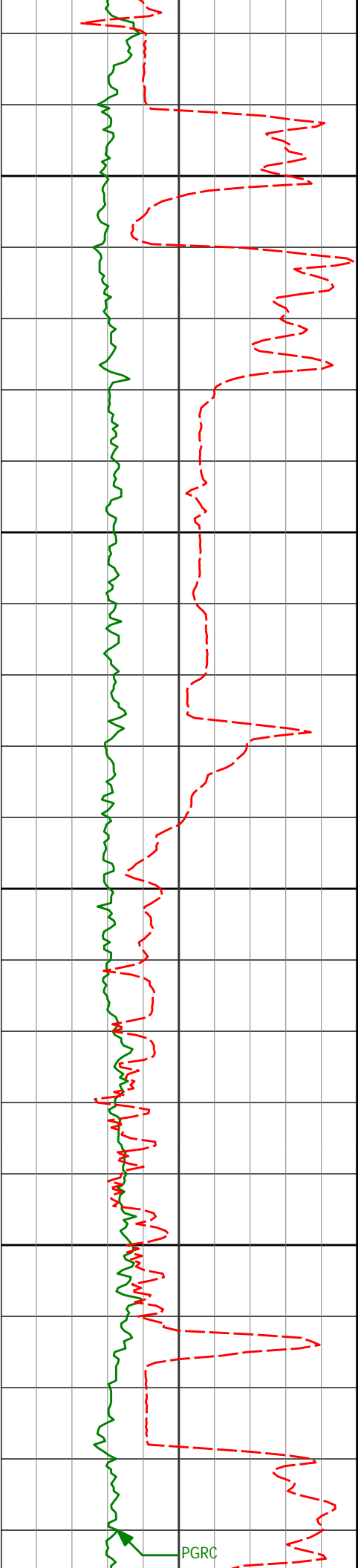
182.15°

7540.07'

7088.60'

PGRC

ROPA



14450

14500

14550

14568'

89.20°

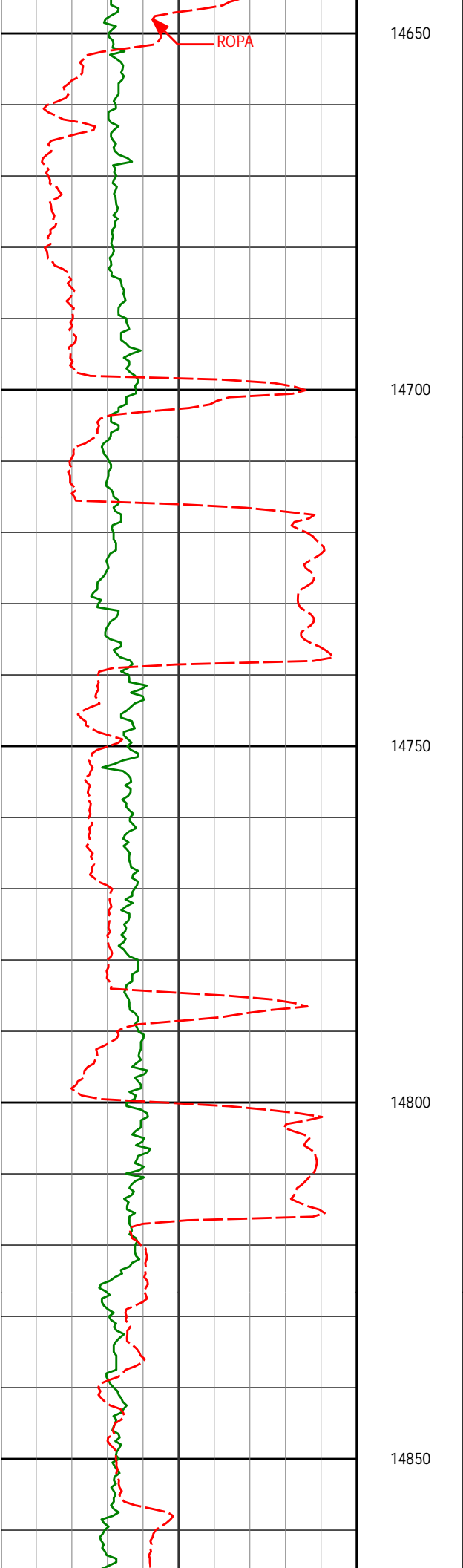
180.36°

7538.83'

7259.54'

14600

PGRC



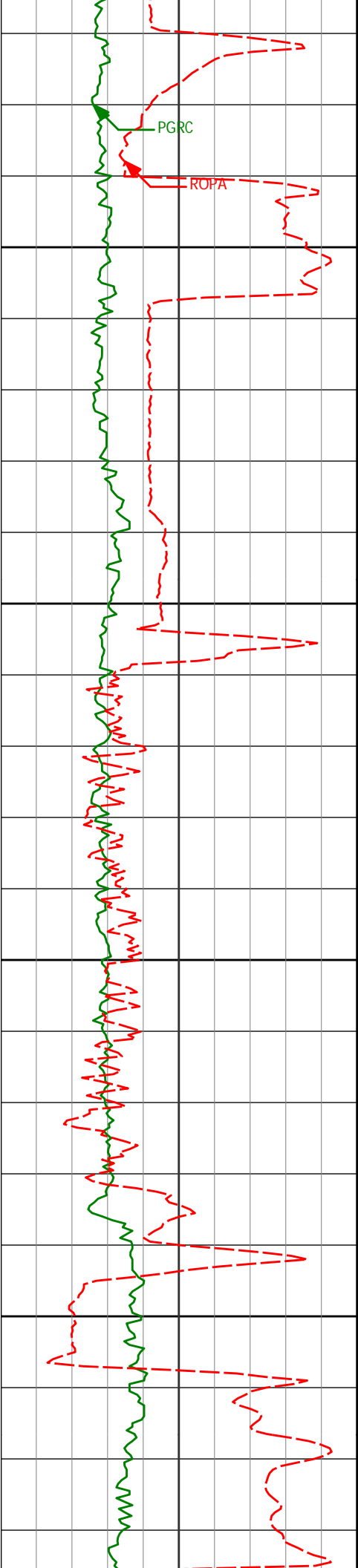
14740'

89.57°

179.39°

7540.67'

7431.52'



PGRC

ROPA

14900

14950

15000

15050

14911'

90.18°

179.74°

7541.05'

7602.52'

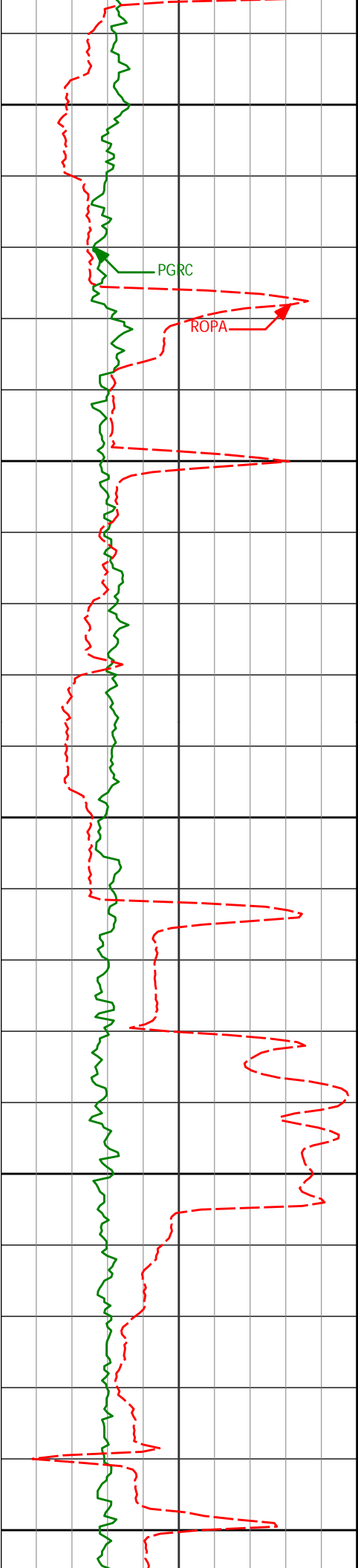
15082'

90.43°

178.10°

7540.14'

7773.48'



15100

PGRC

ROPA

15150

15200

15250

15300

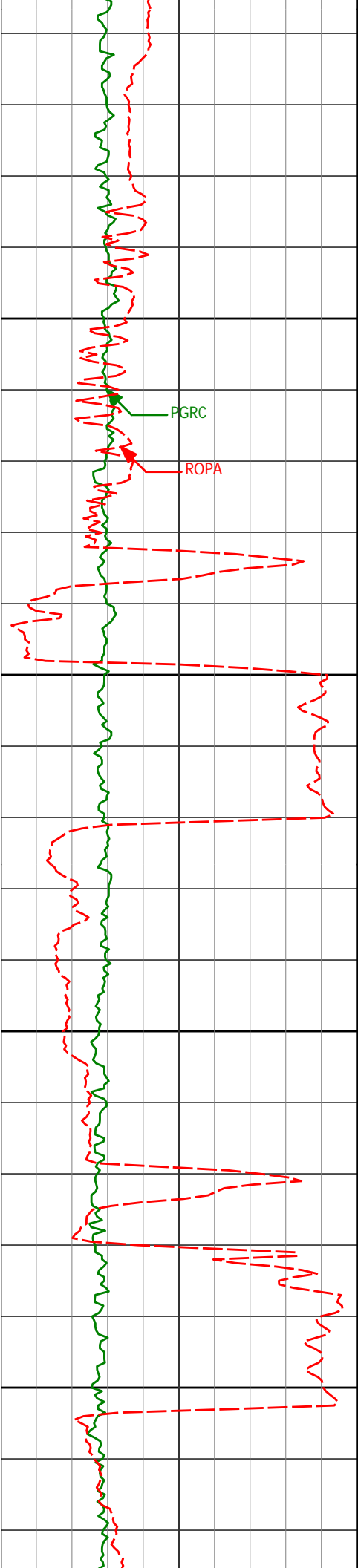
15253'

89.60°

178.47°

7540.09'

7944.40'



15350

PGRC

ROPA

15400

15425'

89.38°

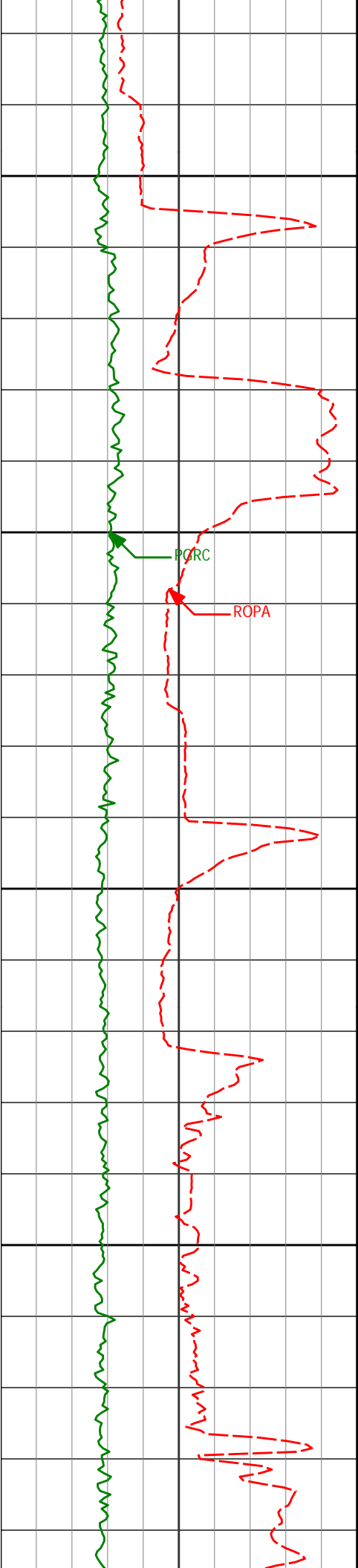
179.57°

7541.62'

8116.37'

15450

15500



15550

15600

15650

15700

15596'

90.18°

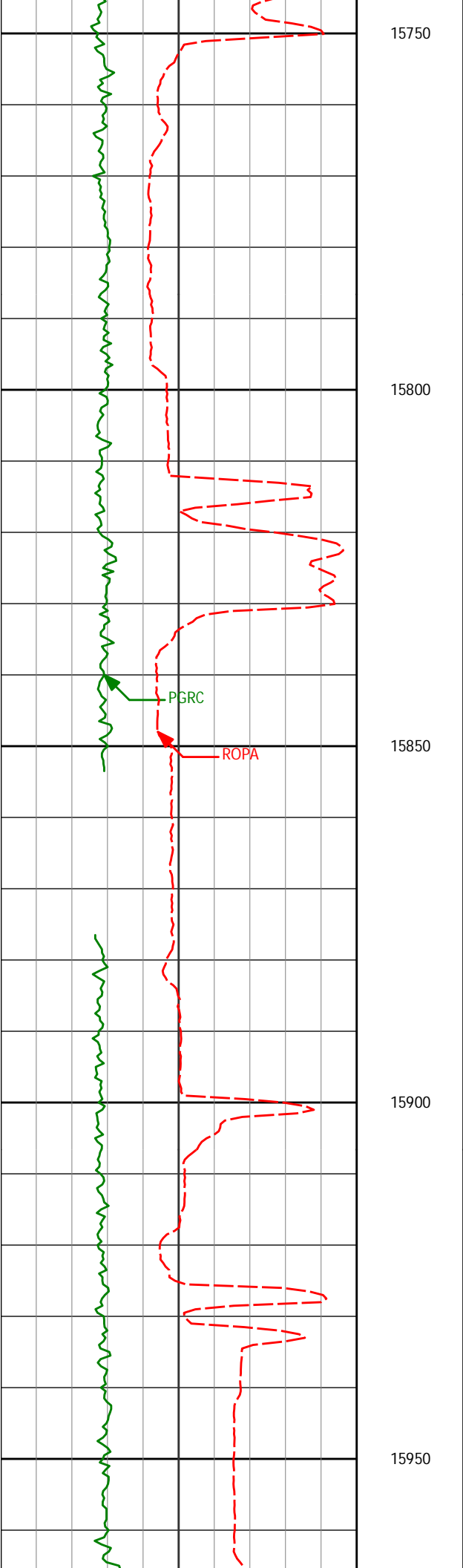
179.42°

7542.28'

8287.36'

PGRC

ROPA



15767'

89.88°

179.61°

7542.19'

8458.35'

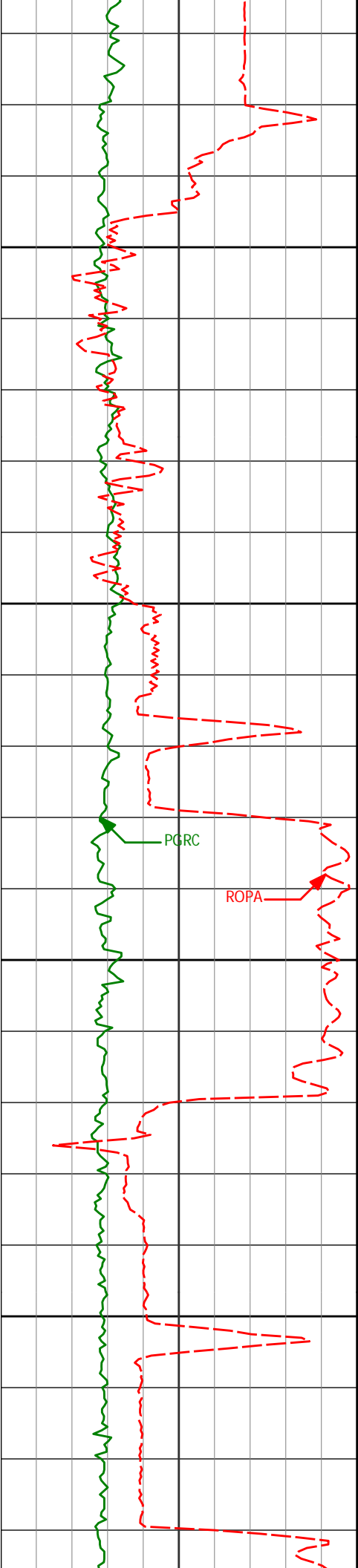
15936'

90.12°

179.07°

7542.19'

8627.34'



16000

16050

16100

16150

PGRC

ROPA

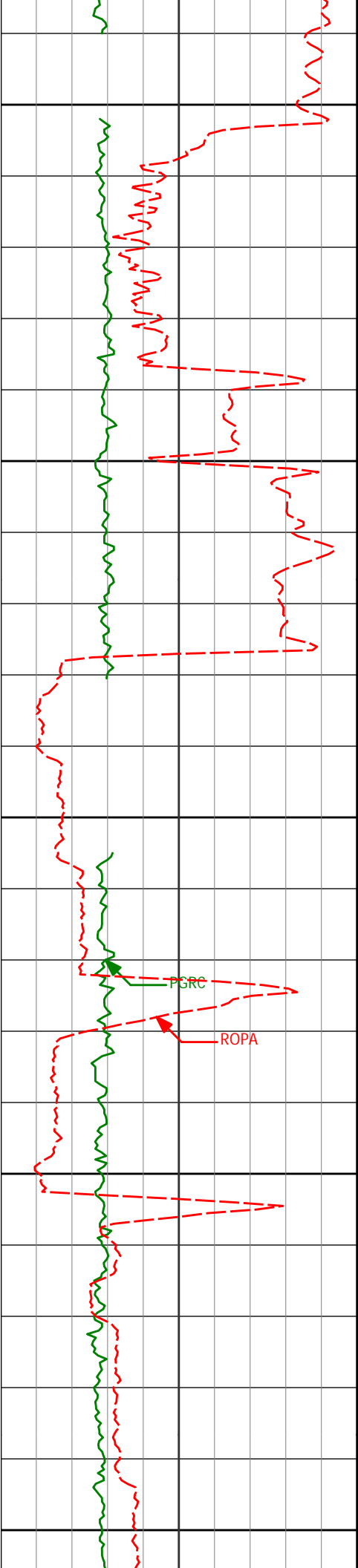
16108'

89.29°

177.18°

7543.08'

8799.23'



16200

16250

16300

16350

16400

16279'

90.31°

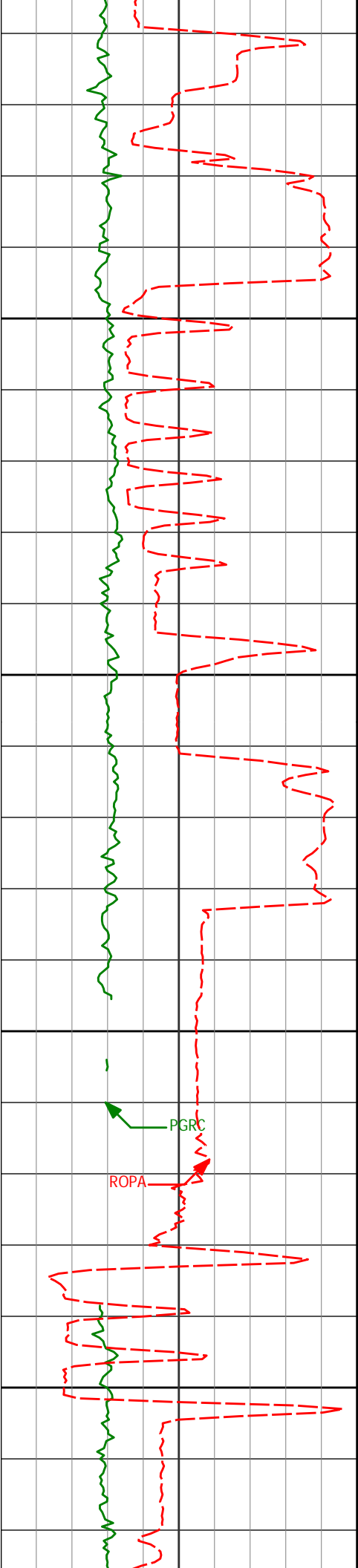
181.24°

7543.67'

8970.18'

PCRC

ROPA



16450

16450'

90.06°

180.74°

7543.12'

9141.15'

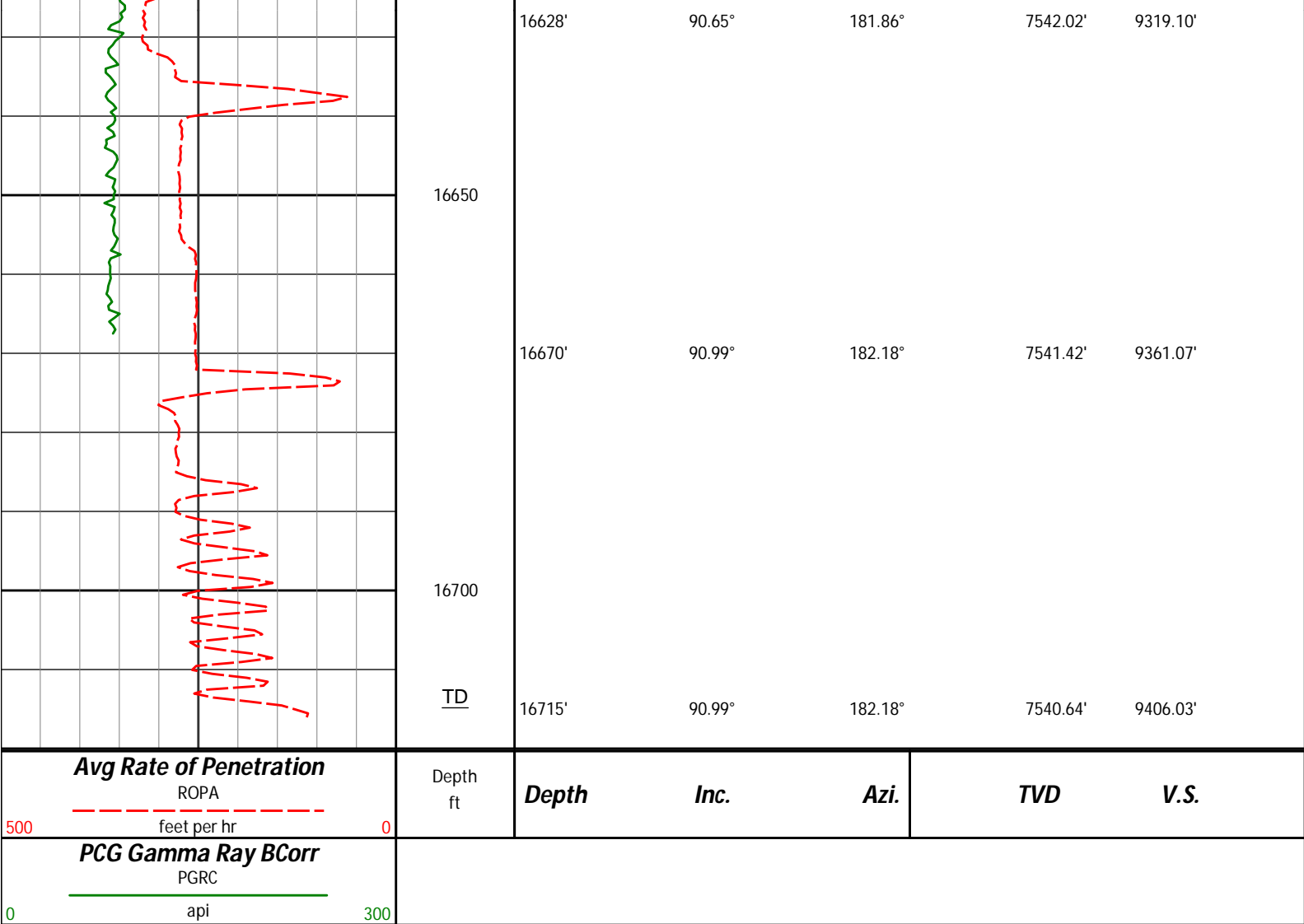
16500

16550

16600

PGR

ROPA



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.
Butterball 29C-15HZ
Wattenberg
Weld Colorado
USA
CA-XX-0900754404

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
926.00	0.46	258.52	925.99	1.34 N	1.58 W	-1.34	TIE-IN
1083.00	0.82	273.74	1082.98	1.29 N	3.32 W	-1.29	0.25
1174.00	0.99	274.28	1173.97	1.39 N	4.75 W	-1.39	0.19
1266.00	1.10	275.98	1265.95	1.54 N	6.42 W	-1.54	0.12
1359.00	1.13	206.94	1358.94	0.82 N	7.73 W	-0.82	1.36
1444.00	1.44	210.49	1443.92	0.85 S	8.65 W	0.85	0.38
1530.00	1.74	249.13	1529.89	2.25 S	10.42 W	2.25	1.27
1615.00	3.02	272.56	1614.81	2.61 S	13.86 W	2.61	1.86
1701.00	4.87	283.10	1700.61	1.68 S	19.68 W	1.68	2.30
1860.00	7.86	279.89	1858.61	1.72 N	36.97 W	-1.72	1.89
1952.00	9.51	284.07	1949.55	4.65 N	50.54 W	-4.65	1.92
2044.00	10.36	278.13	2040.17	7.66 N	66.10 W	-7.66	1.45
2137.00	11.07	266.86	2131.56	8.36 N	83.29 W	-8.36	2.37
2228.00	10.67	265.23	2220.93	7.18 N	100.41 W	-7.18	0.55
2320.00	10.36	267.13	2311.39	6.06 N	117.16 W	-6.06	0.51
2412.00	9.85	267.79	2402.94	5.33 N	132.46 W	-5.33	0.56

2415.00	9.03	287.79	2402.94	5.33 N	133.48 W	-3.33	0.36
2505.00	9.18	267.13	2493.68	4.66 N	148.66 W	-4.66	0.74
2597.00	10.07	267.01	2584.38	3.87 N	164.02 W	-3.87	0.97
2689.00	9.84	268.66	2675.00	3.27 N	179.91 W	-3.27	0.40
2781.00	9.90	269.38	2765.63	3.00 N	195.68 W	-3.00	0.15
2873.00	9.83	270.30	2856.27	2.96 N	211.44 W	-2.96	0.19
2959.00	9.37	270.25	2941.07	3.02 N	225.78 W	-3.02	0.53
3045.00	10.20	266.55	3025.82	2.60 N	240.38 W	-2.60	1.21
3130.00	9.69	265.99	3109.54	1.64 N	255.03 W	-1.64	0.61
3215.00	9.97	269.53	3193.29	1.08 N	269.52 W	-1.08	0.78
3301.00	10.25	270.92	3277.96	1.15 N	284.62 W	-1.15	0.43
3387.00	9.50	271.86	3362.68	1.50 N	299.36 W	-1.50	0.89
3472.00	9.79	273.28	3446.48	2.14 N	313.59 W	-2.14	0.44
3558.00	11.36	268.90	3531.02	2.40 N	329.36 W	-2.40	2.05
3643.00	10.56	265.70	3614.47	1.65 N	345.50 W	-1.65	1.18
3729.00	9.66	264.63	3699.13	0.38 N	360.54 W	-0.38	1.07
3815.00	9.42	270.42	3783.95	0.24 S	374.76 W	0.24	1.15
3900.00	10.14	277.53	3867.71	0.79 N	389.13 W	-0.79	1.65
3986.00	9.23	277.86	3952.49	2.73 N	403.47 W	-2.73	1.06
4071.00	10.04	274.28	4036.29	4.21 N	417.61 W	-4.21	1.18
4157.00	9.83	273.57	4121.00	5.23 N	432.42 W	-5.23	0.28
4243.00	9.51	273.16	4205.78	6.08 N	446.84 W	-6.08	0.38
4329.00	8.53	273.30	4290.71	6.84 N	460.30 W	-6.84	1.14
4414.00	9.02	273.10	4374.72	7.56 N	473.24 W	-7.56	0.58
4500.00	9.83	274.76	4459.55	8.53 N	487.29 W	-8.53	0.99
4586.00	10.87	273.78	4544.15	9.68 N	502.70 W	-9.68	1.23
4671.00	10.60	273.99	4627.67	10.75 N	518.50 W	-10.75	0.32
4757.00	10.70	273.72	4712.19	11.82 N	534.35 W	-11.82	0.13
4843.00	10.07	273.25	4796.78	12.76 N	549.83 W	-12.76	0.74
4928.00	9.79	274.81	4880.50	13.79 N	564.45 W	-13.79	0.46
5014.00	10.40	269.50	4965.17	14.34 N	579.50 W	-14.34	1.29
5100.00	10.45	268.82	5049.75	14.11 N	595.06 W	-14.11	0.15
5186.00	9.89	268.16	5134.40	13.71 N	610.24 W	-13.71	0.67
5271.00	8.94	268.38	5218.26	13.29 N	624.13 W	-13.29	1.12
5357.00	8.82	265.67	5303.23	12.60 N	637.39 W	-12.60	0.51
5443.00	9.59	266.01	5388.12	11.60 N	651.11 W	-11.61	0.90
5528.00	10.35	265.73	5471.83	10.54 N	665.79 W	-10.54	0.90
5614.00	8.95	264.35	5556.61	9.31 N	680.15 W	-9.31	1.65
5700.00	9.47	266.51	5641.51	8.22 N	693.87 W	-8.22	0.73
5785.00	10.58	268.72	5725.21	7.62 N	708.65 W	-7.62	1.38
5871.00	9.43	265.67	5809.90	6.91 N	723.57 W	-6.91	1.47
5957.00	10.08	262.97	5894.65	5.46 N	738.06 W	-5.46	0.92
6042.00	9.33	268.83	5978.44	4.41 N	752.33 W	-4.41	1.46
6128.00	9.39	272.03	6063.29	4.51 N	766.32 W	-4.51	0.61
6214.00	9.24	272.40	6148.16	5.05 N	780.22 W	-5.05	0.19
6300.00	7.89	272.02	6233.20	5.55 N	793.02 W	-5.55	1.57
6386.00	6.75	270.53	6318.50	5.80 N	803.98 W	-5.80	1.34
6471.00	5.66	268.86	6403.00	5.77 N	813.16 W	-5.77	1.30
6557.00	5.01	281.75	6488.63	6.45 N	821.08 W	-6.45	1.58
6643.00	4.39	281.91	6574.34	7.89 N	827.98 W	-7.89	0.72
6728.00	3.22	275.11	6659.15	8.78 N	833.54 W	-8.78	1.47
6814.00	1.85	261.38	6745.06	8.78 N	837.32 W	-8.78	1.73
6900.00	0.34	229.51	6831.05	8.41 N	838.88 W	-8.41	1.83
6943.00	0.52	194.51	6874.05	8.14 N	839.03 W	-8.14	0.72
6986.00	4.32	181.17	6917.00	6.33 N	839.11 W	-6.33	8.87
7029.00	8.14	186.99	6959.74	1.69 N	839.51 W	-1.69	8.99
7072.00	12.06	185.25	7002.06	5.81 S	840.30 W	5.81	9.14
7114.00	15.92	188.20	7042.81	15.89 S	841.52 W	15.89	9.34
7157.00	20.27	184.37	7083.68	29.16 S	842.93 W	29.16	10.48
7200.00	25.30	180.43	7123.31	45.78 S	843.57 W	45.78	12.22
7243.00	27.49	177.27	7161.83	64.89 S	843.16 W	64.89	6.05
7286.00	31.04	178.09	7199.33	85.89 S	842.32 W	85.89	8.31
7329.00	35.69	181.55	7235.24	109.52 S	842.29 W	109.52	11.68
7371.00	40.07	183.96	7268.38	135.27 S	843.55 W	135.27	11.01
7414.00	45.31	184.03	7299.98	164.34 S	845.59 W	164.34	12.19
7457.00	49.58	183.24	7329.05	195.95 S	847.59 W	195.95	10.02
7500.00	51.54	181.26	7356.37	229.13 S	848.88 W	229.13	5.78
7543.00	52.56	179.24	7382.82	263.03 S	849.03 W	263.03	4.40
7586.00	57.47	178.31	7407.46	298.24 S	848.26 W	298.24	11.56
7629.00	61.62	180.10	7429.25	335.29 S	847.76 W	335.29	10.30
7672.00	65.51	181.10	7448.39	373.79 S	848.17 W	373.79	9.28
7714.00	69.47	180.51	7464.47	412.58 S	848.71 W	412.57	9.52

7757.00	73.34	179.65	7478.18	453.32 S	848.77 W	453.32	9.20
7800.00	77.98	179.20	7488.83	494.97 S	848.35 W	494.97	10.84
7843.00	82.98	178.87	7495.94	537.36 S	847.63 W	537.36	11.65
7900.00	86.11	178.58	7501.35	594.08 S	846.37 W	594.08	5.51
7952.00	89.48	178.75	7503.35	646.02 S	845.16 W	646.02	6.49
8123.00	89.54	178.67	7504.82	816.97 S	841.31 W	816.97	0.06
8295.00	89.78	178.79	7505.84	988.92 S	837.50 W	988.92	0.16
8466.00	90.25	180.33	7505.79	1159.91 S	836.18 W	1159.91	0.94
8637.00	90.06	180.44	7505.33	1330.91 S	837.33 W	1330.91	0.13
8809.00	89.48	180.86	7506.02	1502.89 S	839.28 W	1502.89	0.42
8980.00	90.49	180.11	7506.07	1673.88 S	840.73 W	1673.88	0.74
9152.00	89.85	179.68	7505.56	1845.88 S	840.42 W	1845.88	0.45
9323.00	89.38	179.08	7506.70	2016.87 S	838.57 W	2016.87	0.45
9494.00	89.88	179.57	7507.81	2187.85 S	836.55 W	2187.85	0.41
9666.00	90.59	180.64	7507.10	2359.84 S	836.87 W	2359.84	0.75
9849.00	90.49	181.61	7505.38	2542.80 S	840.46 W	2542.80	0.53
10033.00	90.40	181.11	7503.95	2726.74 S	844.83 W	2726.74	0.28
10218.00	88.40	178.58	7505.89	2911.71 S	844.33 W	2911.71	1.74
10402.00	89.01	177.20	7510.05	3095.53 S	837.55 W	3095.53	0.82
10587.00	89.60	178.88	7512.29	3280.40 S	831.23 W	3280.40	0.96
10771.00	89.44	179.89	7513.83	3464.38 S	829.25 W	3464.38	0.56
10953.00	90.00	181.45	7514.72	3646.36 S	831.38 W	3646.36	0.91
11135.00	90.06	180.61	7514.63	3828.33 S	834.65 W	3828.33	0.46
11312.00	89.23	179.51	7515.72	4005.32 S	834.84 W	4005.32	0.78
11483.00	89.11	177.97	7518.20	4176.26 S	831.08 W	4176.26	0.90
11654.00	88.95	178.67	7521.10	4347.16 S	826.06 W	4347.16	0.42
11826.00	90.43	180.79	7522.03	4519.14 S	825.25 W	4519.14	1.50
11997.00	88.12	182.09	7524.19	4690.05 S	829.55 W	4690.05	1.55
12169.00	88.43	181.45	7529.37	4861.89 S	834.86 W	4861.89	0.41
12341.00	90.18	183.11	7531.45	5033.73 S	841.70 W	5033.73	1.40
12512.00	89.04	183.06	7532.62	5204.48 S	850.90 W	5204.48	0.67
12684.00	88.27	180.16	7536.66	5376.34 S	855.74 W	5376.34	1.74
12855.00	89.35	179.61	7540.21	5547.30 S	855.39 W	5547.30	0.71
13026.00	90.15	177.23	7540.95	5718.22 S	850.68 W	5718.22	1.47
13198.00	88.89	177.12	7542.39	5890.00 S	842.20 W	5890.00	0.74
13369.00	89.78	178.82	7544.38	6060.88 S	836.14 W	6060.88	1.12
13540.00	89.04	179.81	7546.14	6231.85 S	834.10 W	6231.85	0.72
13712.00	91.11	182.00	7545.91	6403.81 S	836.82 W	6403.81	1.75
13883.00	90.59	180.94	7543.38	6574.73 S	841.20 W	6574.73	0.69
14054.00	90.15	181.39	7542.27	6745.69 S	844.68 W	6745.69	0.37
14226.00	89.85	180.33	7542.27	6917.67 S	847.26 W	6917.67	0.64
14397.00	91.63	182.15	7540.07	7088.60 S	850.96 W	7088.60	1.49
14568.00	89.20	180.36	7538.83	7259.54 S	854.70 W	7259.54	1.76
14740.00	89.57	179.39	7540.67	7431.52 S	854.33 W	7431.52	0.60
14911.00	90.18	179.74	7541.05	7602.52 S	853.03 W	7602.52	0.41
15082.00	90.43	178.10	7540.14	7773.48 S	849.81 W	7773.48	0.97
15253.00	89.60	178.47	7540.09	7944.40 S	844.69 W	7944.40	0.53
15425.00	89.38	179.57	7541.62	8116.37 S	841.75 W	8116.37	0.65
15596.00	90.18	179.42	7542.28	8287.36 S	840.24 W	8287.36	0.48
15767.00	89.88	179.61	7542.19	8458.35 S	838.79 W	8458.35	0.21
15936.00	90.12	179.07	7542.19	8627.34 S	836.85 W	8627.34	0.35
16108.00	89.29	177.18	7543.08	8799.23 S	831.22 W	8799.23	1.20
16279.00	90.31	181.24	7543.67	8970.18 S	828.86 W	8970.18	2.45
16450.00	90.06	180.74	7543.12	9141.15 S	831.82 W	9141.15	0.33
16628.00	90.65	181.86	7542.02	9319.10 S	835.85 W	9319.10	0.71
16670.00	90.99	182.18	7541.42	9361.07 S	837.33 W	9361.07	1.11
16715.00	90.99	182.18	7540.64	9406.03 S	839.05 W	9406.03	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 180.00 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.63 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16715.00 FEET
IS 9443.38 FEET ALONG 185.10 DEGREES (TRUE)

