HALLIBURTON | Sperry Drilling

PCG Pressure Case Gamma
PCDC Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Country	: USA
Field	: Wattenburg
Location	: Lat: 40° 42' 59.33" North Long: 103° 52' 20.78" West
Well	: Greyson LD28-760
Company	: Noble Energy
Rig	: H&P 343

Company : **Noble Energy**
Rig : **H&P 343**
Well : **Greyson LD28-760**
Field : **Wattenburg**
Country : **USA**
API Number : **05-123-41587**

LOCATION
Latitude : **40° 42' 59.33" North**
Longitude : **103° 52' 20.78" West**
UTM Easting = **3,451,151.093 usft**
UTM Northing = **1,507,998.240 usft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4854.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4878.00 ft**
GL **4854.00 ft**
WD **N/A**

Depth Logged : **1,146.00 ft** To **10,624.00 ft**
Date Logged : **05-Aug-15** To **10-Aug-15**
Total Depth MD : **10,624.00 ft** TVD : **5,871.92 ft**
Spud Date : **05-Aug-15**

Unit No. : **11610115**
Job No. : **CA-XX-0902594950**
Plot Type : **Final**
Plot Date : **10-Aug-15**

Run No.	Borehole Record (MD)			Casing Record (MD)			
	Size	From	To	Size	Weight	From	To
0100	8.750 in	1,146.00 ft	6,243.00 ft	9.625 in	36.60 lbpf	SURFACE	1,135.00 ft
3	6.125 in	6,243.00 ft	10,624.00 ft	7.000 in	34.70 lbpf	SURFACE	6,235.00 ft

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	06-Aug-15	09-Aug-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	1,146.00	6,243.00			
Log End Depth (MD, ft)	6,243.00	10,624.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	05-Aug-15 20:00	07-Aug-15 16:45			
Drill/Wipe End Date and Time	06-Aug-15 15:30	09-Aug-15 16:00			
Min Inc (deg) @ Depth (MD, ft)	0.31 @ 1,202.00	84.82 @ 6,266.00			
Max Inc (deg) @ Depth (MD, ft)	81.40 @ 6,179.00	91.88 @ 7,100.00			
Bit TFA(in2) / Bit Type	0.98 / PDC	0.98 / PDC			
Flow Rate (gpm)	597.40	330.00			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	8.75 / 28.00	10.48 / 37.00			
Filtrate CL (ppm)	14.00	2,100.00			
pH / Fluid Loss (mptm)	9.40 / 91	9.60 / 7			
PV (cP) / YP (lhf2)	2 / 3.00	13 / 15.00			
% Solids / % Sand	3.00 / 0.15	10 / 0.15			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			

Max Tool Temp (degF) / Source	165.58 / PCM	215.51 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Brian Neu	Brian Neu			
Customer Representative	Beau	Beau			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11303511	12361803			
Insert Serial Number	11400870	11619985			
Date and Time Initialized	05-Aug-15 12:12	06-Aug-15 17:38			
Date and Time Read	06-Aug-15 21:49	09-Aug-15 23:05			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	64.00	69.00			
Software Version	6.21	6.33			
Sub Serial Number	11303511	12361803			
Sonde Serial Number	11478016	10859920			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	181.40	96.80			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	57.03	61.80			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11303511	12361803			
Insert/Sonde Serial Number	12037418	11680918			

REMARKS

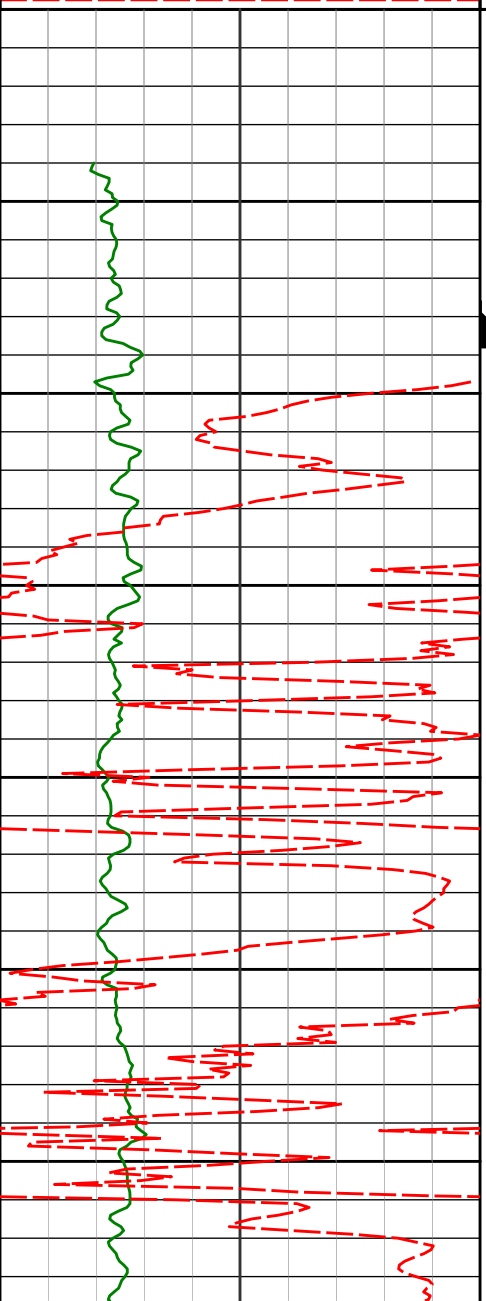
1. All depths are calibrated to driller's pipe tally and are total vertical depth from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Environmental parameters used in gamma and resistance processing:
Hole Size: 6.125"
Mud Density: 9.9-10.3
5. The following smoothing parameters have been applied to the data:
Interval: 0.5 ft
Coercion Distance: 1.2 ft (ROPA)
Interval: 0.5 ft
Coercion Distance: 0.6 ft (Gamma Ray)

WARRANTY

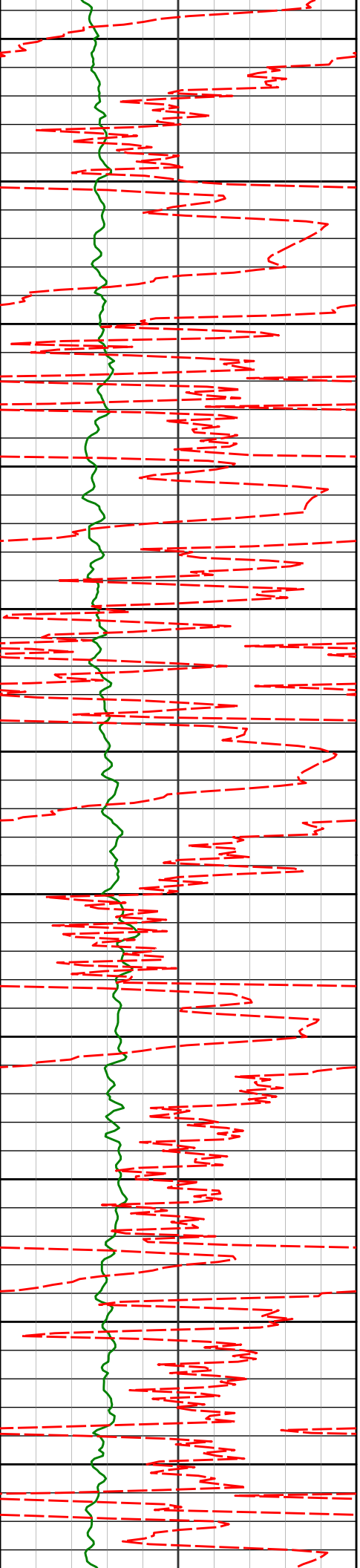
MD Detail 1:600 Scale

PCG Gamma Ray BCorr
PGRC
0 api 300

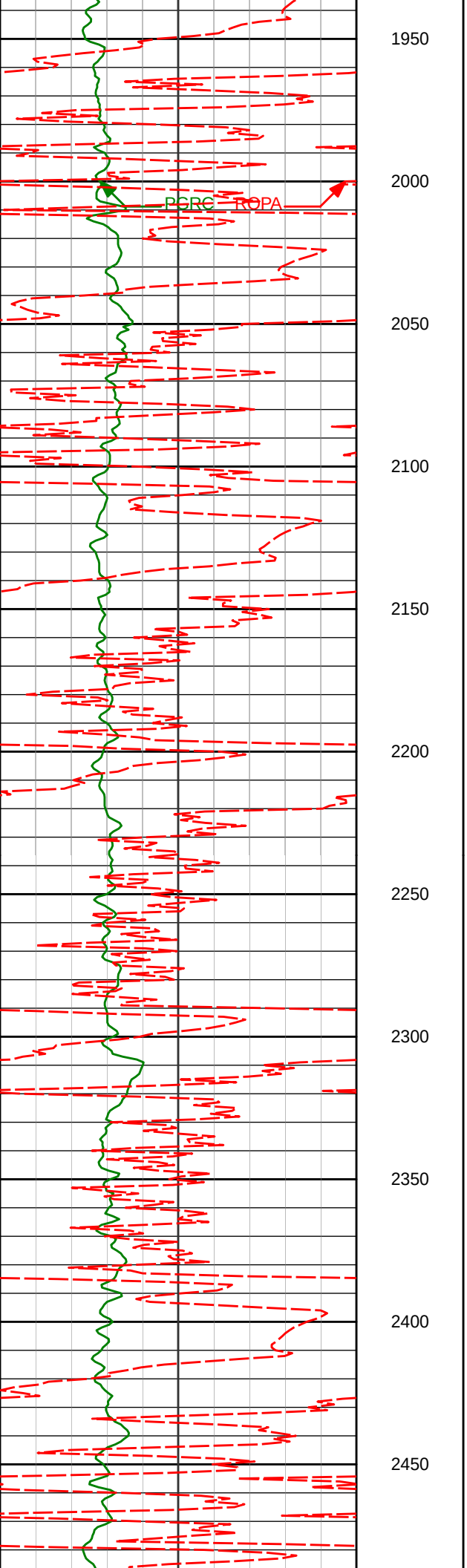
Avg Rate of Penetration
ROPA
1K feet per hr 0



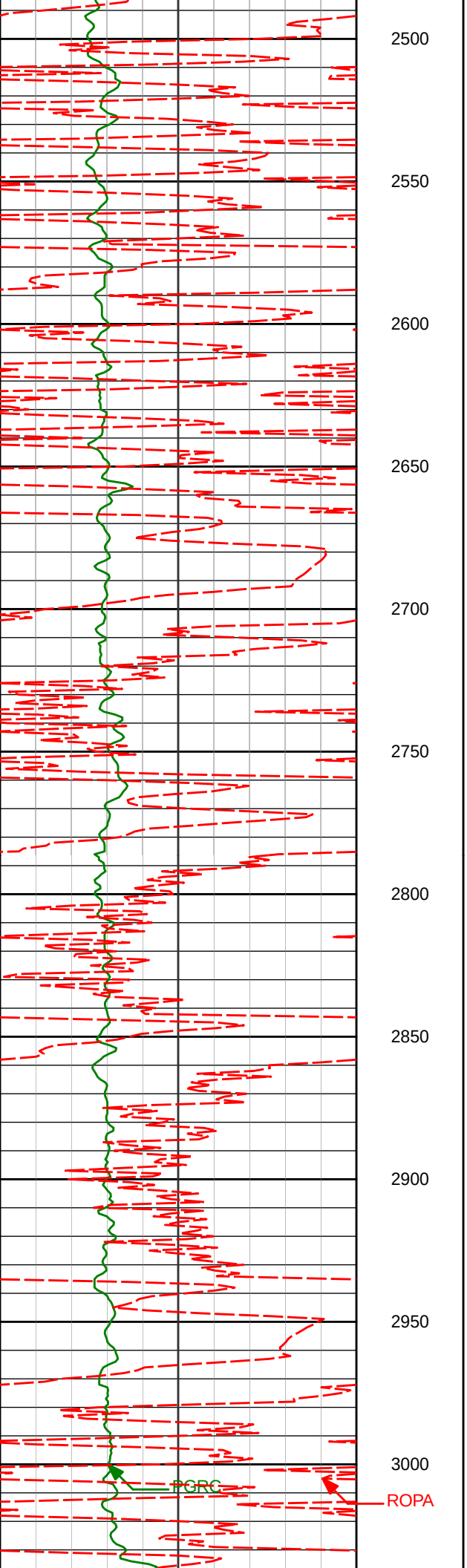
Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
1100	1103'	0.30°	308.49°	1103.37'	4.70'	
Surface Casing @ 1135' MD						
Run 100	1135'	0.32°	331.32°	1134.97'	4.83'	
1150						
1200	1202'	0.31°	346.49°	1201.97'	5.16'	
1250						
1300	1294'	1.05°	178.30°	1293.97'	4.56'	
1350						
	1386'	3.23°	172.66°	1385.90'	1.17'	



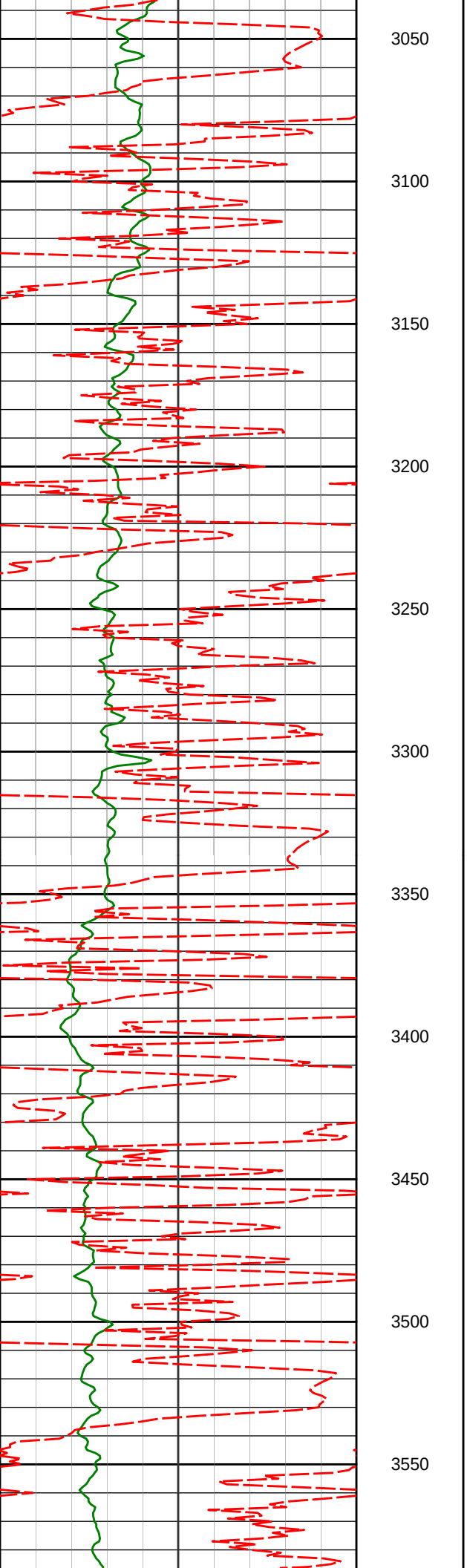
1479'	6.09°	173.25°	1478.58'	-6.28'
1572'	7.90°	172.58°	1570.88'	-17.44'
1665'	9.14°	166.95°	1662.86'	-30.84'
1758'	9.33°	170.42°	1754.65'	-45.32'
1850'	8.61°	163.05°	1845.53'	-59.09'



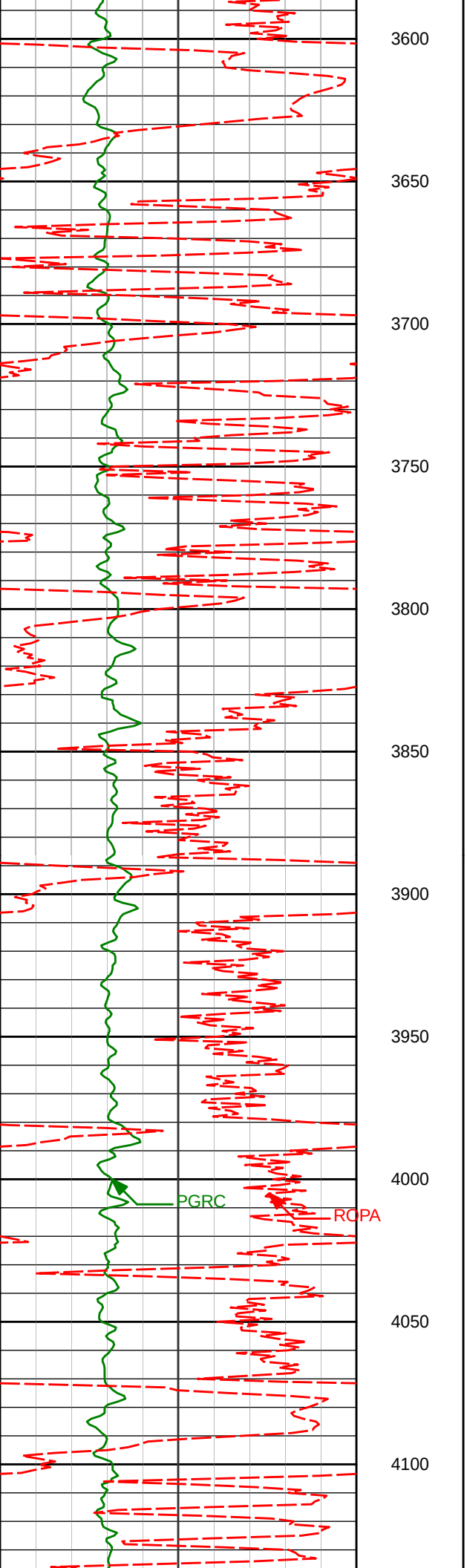
1943'	9.25°	168.89°	1937.40'	-72.91'
2034'	9.14°	172.50°	2027.23'	-87.13'
2126'	9.73°	176.73°	2117.99'	-102.06'
2218'	9.86°	172.96°	2208.65'	-117.55'
2310'	9.47°	167.38°	2299.35'	-132.62'
2404'	10.86°	168.87°	2391.87'	-148.68'



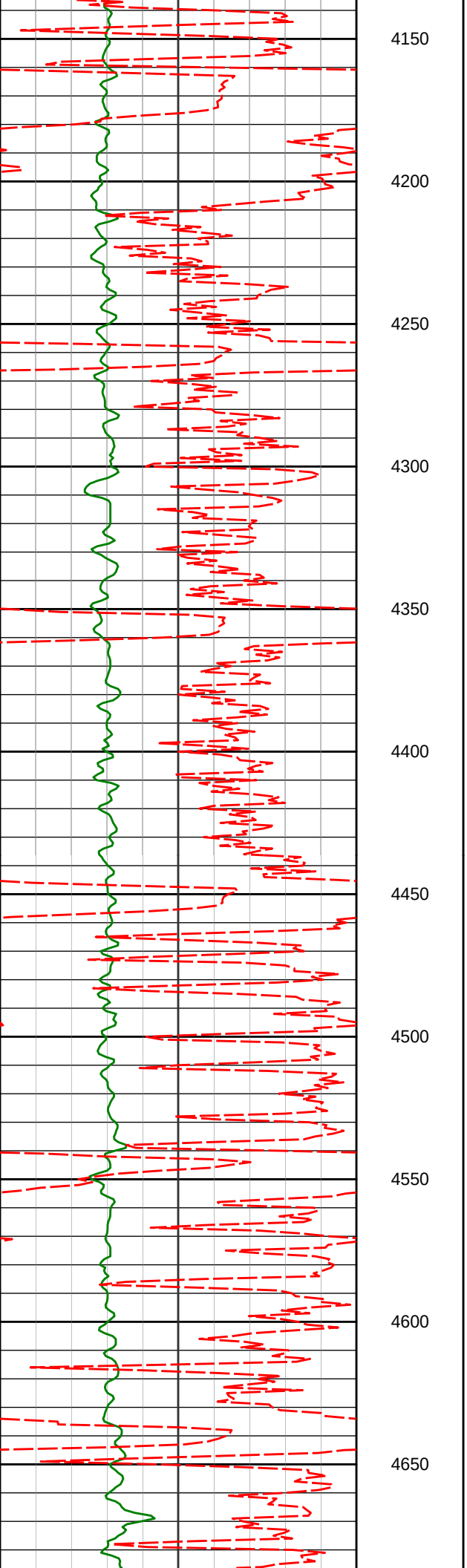
2496'	10.79°	162.10°	2482.23'	-165.17'
2589'	10.65°	157.65°	2573.61'	-181.11'
2682'	10.48°	165.97°	2665.04'	-197.00'
2776'	10.24°	171.44°	2757.51'	-213.38'
2869'	10.75°	168.48°	2848.96'	-229.89'
2963'	8.64°	169.36°	2941.61'	-245.26'



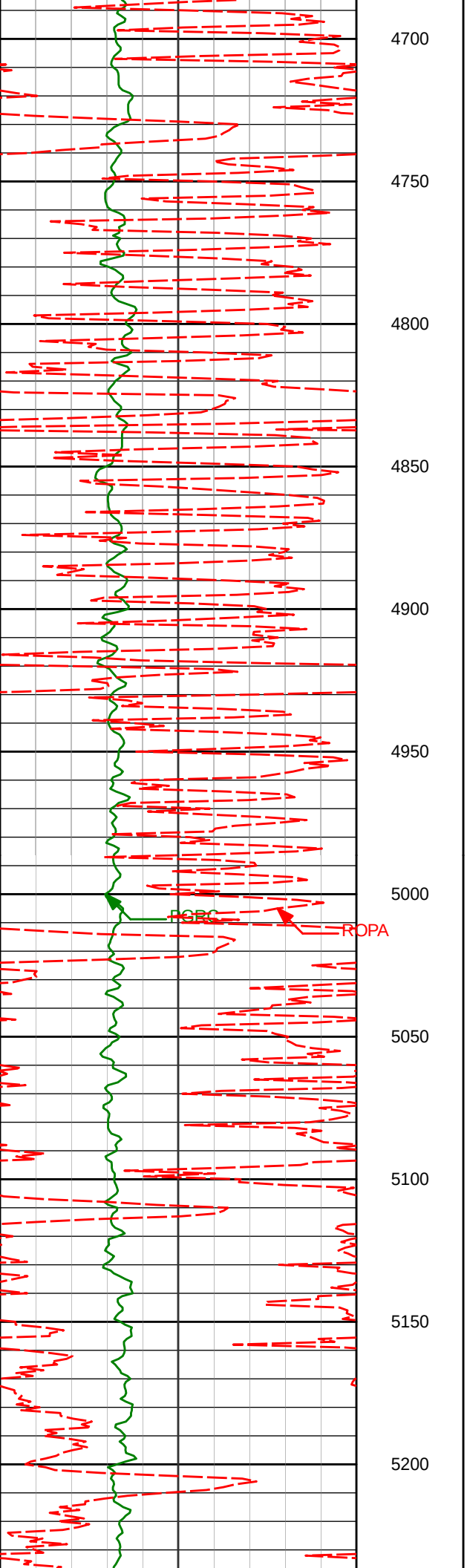
3058'	10.40°	169.48°	3035.30'	-260.55'
3153'	10.40°	161.67°	3128.74'	-276.91'
3247'	10.73°	160.48°	3221.15'	-292.93'
3342'	9.86°	167.03°	3314.62'	-308.96'
3437'	10.42°	169.41°	3408.14'	-325.16'
3531'	10.26°	175.36°	3500.61'	-341.74'



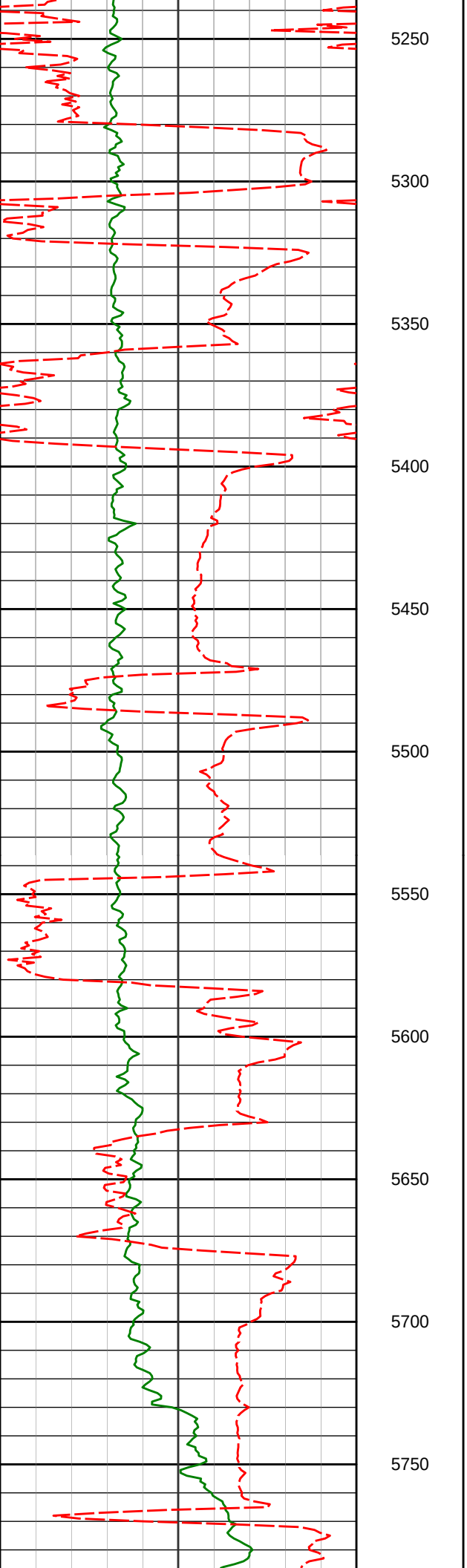
3626'	9.13°	177.41°	3594.26'	-357.64'
3721'	8.97°	176.63°	3688.07'	-372.51'
3815'	9.16°	176.50°	3780.90'	-387.23'
3910'	8.98°	174.32°	3874.71'	-402.09'
4004'	8.22°	172.32°	3967.66'	-415.96'
4099'	9.37°	173.92°	4061.54'	-430.28'



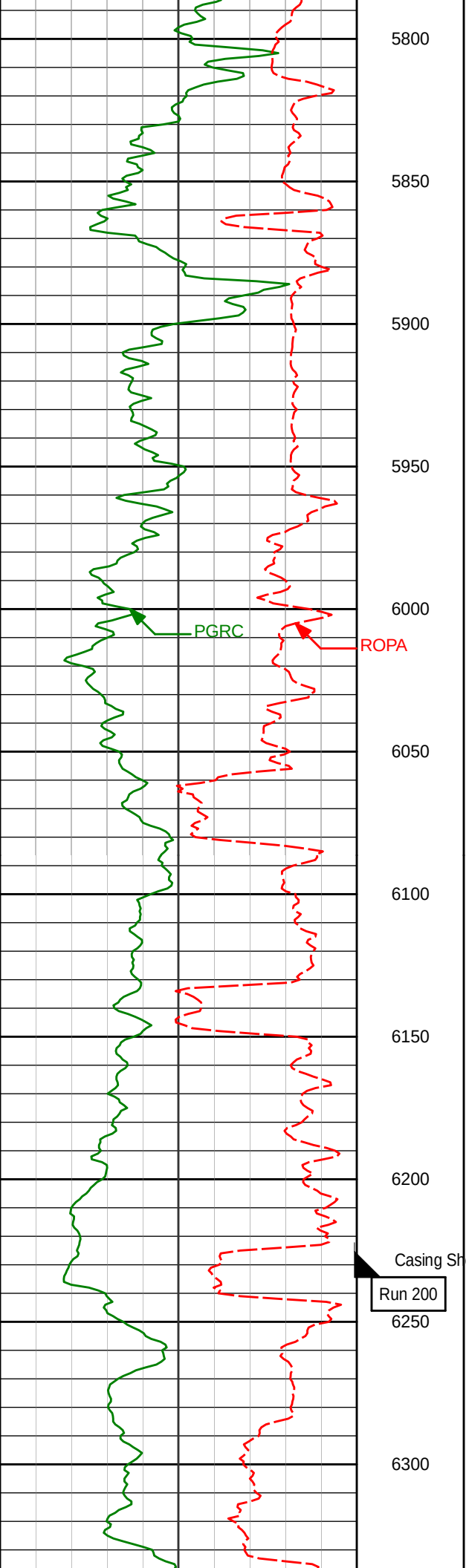
4193'	9.06°	172.61°	4154.32'	-445.13'
4288'	8.68°	172.05°	4248.19'	-459.54'
4382'	8.26°	169.40°	4341.16'	-473.09'
4477'	7.60°	164.15°	4435.26'	-485.69'
4571'	6.97°	163.87°	4528.50'	-496.99'
4666'	6.04°	163.74°	4622.88'	-507.17'



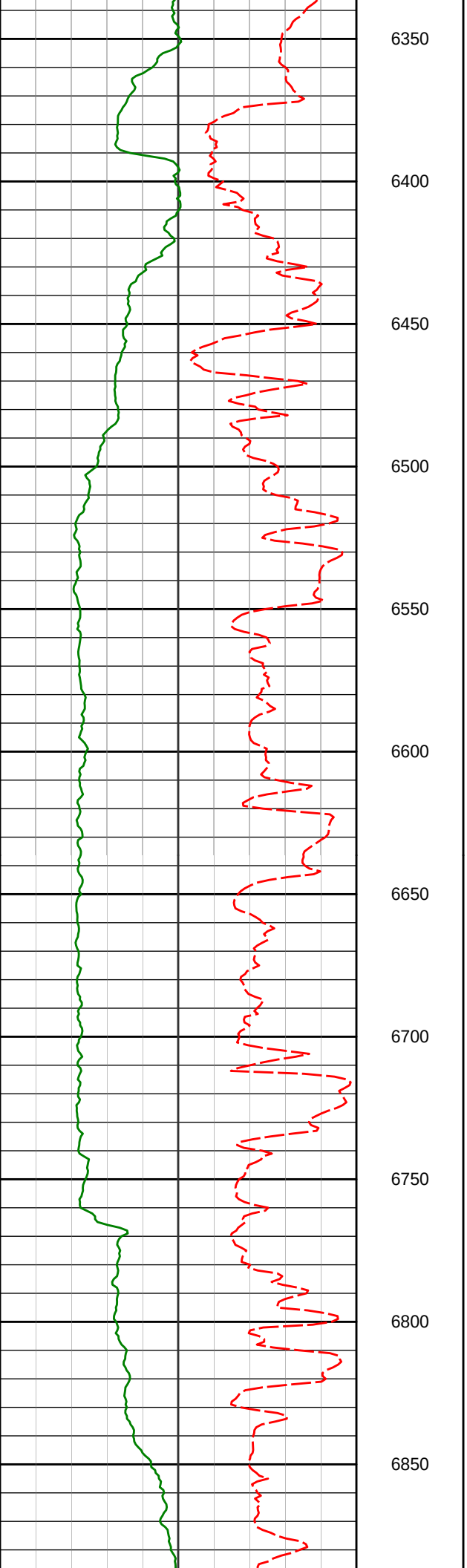
4761'	5.22°	160.35°	4717.42'	-515.90'
4856'	4.68°	160.83°	4812.07'	-523.50'
4950'	4.07°	157.57°	4905.79'	-530.08'
5045'	3.88°	152.41°	5000.57'	-535.91'
5140'	3.48°	144.13°	5095.37'	-540.94'
5234'	3.60°	135.86°	5189.19'	-545.20'



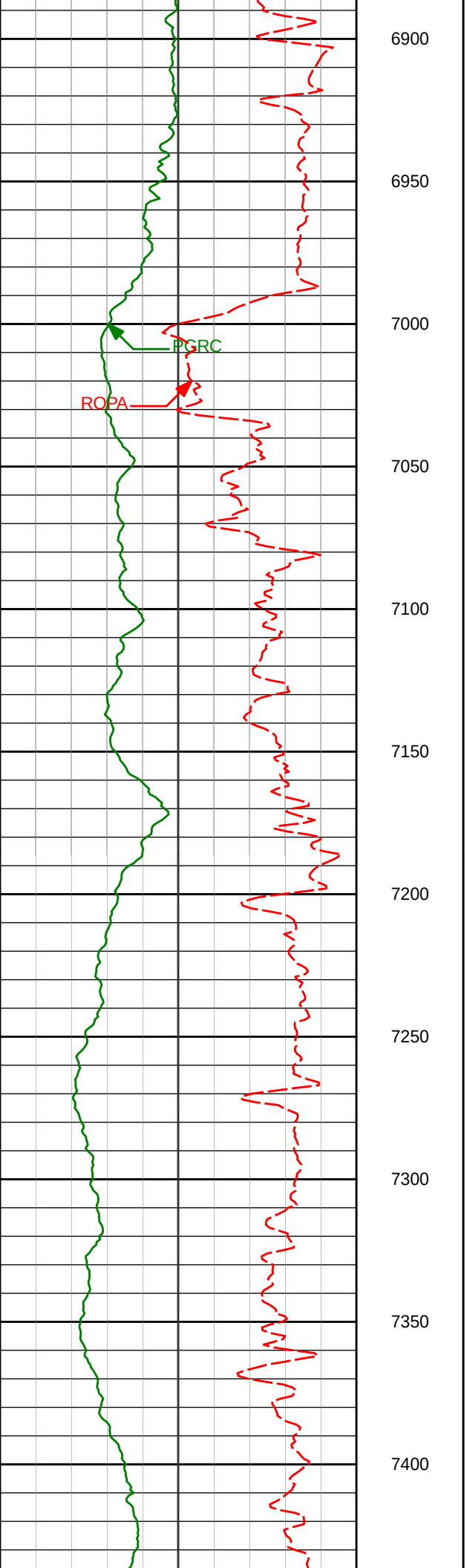
5329'	2.18°	63.54°	5284.10'	-546.36'
5423'	9.44°	6.62°	5377.60'	-537.79'
5518'	22.37°	3.15°	5468.77'	-511.83'
5613'	25.46°	354.87°	5555.63'	-473.51'
5707'	28.39°	357.05°	5639.43'	-431.24'



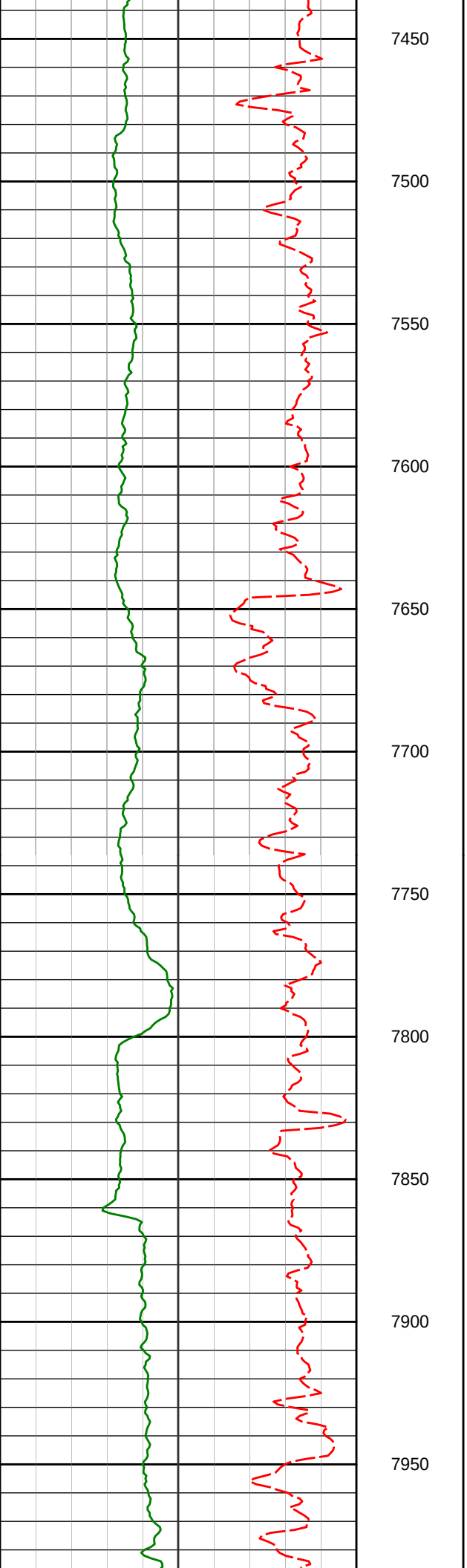
5802'	39.01°	3.44°	5718.38'	-378.70'
5896'	48.24°	4.07°	5786.35'	-313.93'
5991'	64.19°	1.22°	5839.01'	-235.24'
6086'	71.04°	357.07°	5875.17'	-147.64'
6179'	81.40°	354.15°	5897.29'	-58.13'
6266'	84.82°	354.00°	5907.73'	27.26'



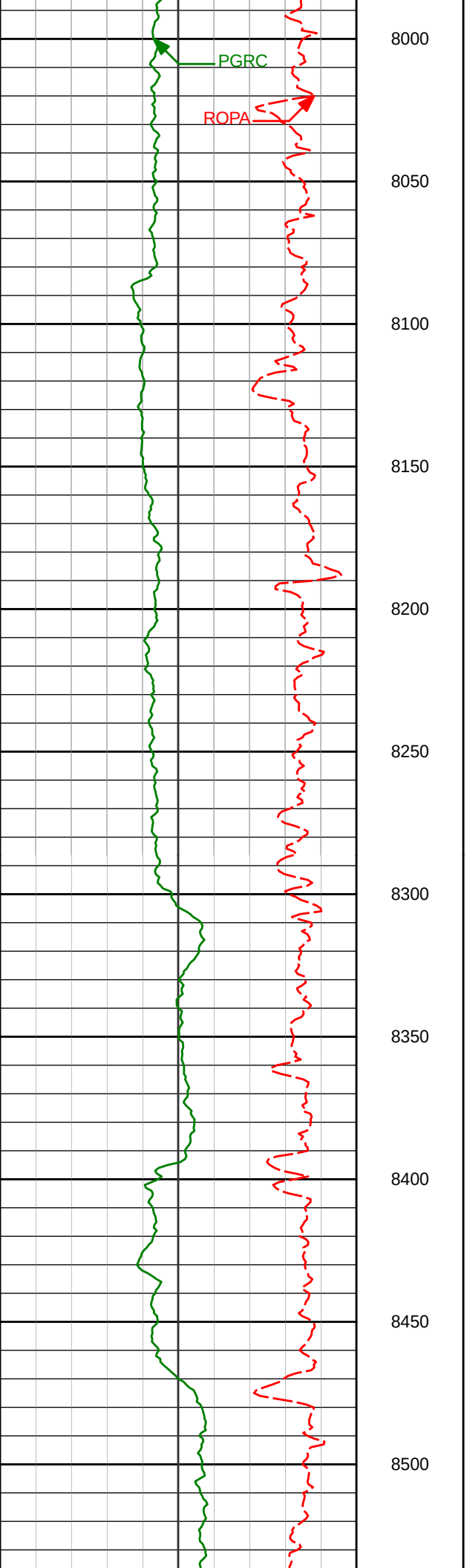
6358'	88.52°	355.37°	5913.07'	118.20'
6449'	88.55°	357.00°	5915.40'	208.59'
6542'	90.00°	357.98°	5916.57'	301.20'
6634'	89.54°	359.14°	5916.94'	392.97'
6727'	91.23°	0.74°	5916.32'	485.85'
6820'	90.80°	0.93°	5914.67'	578.79'



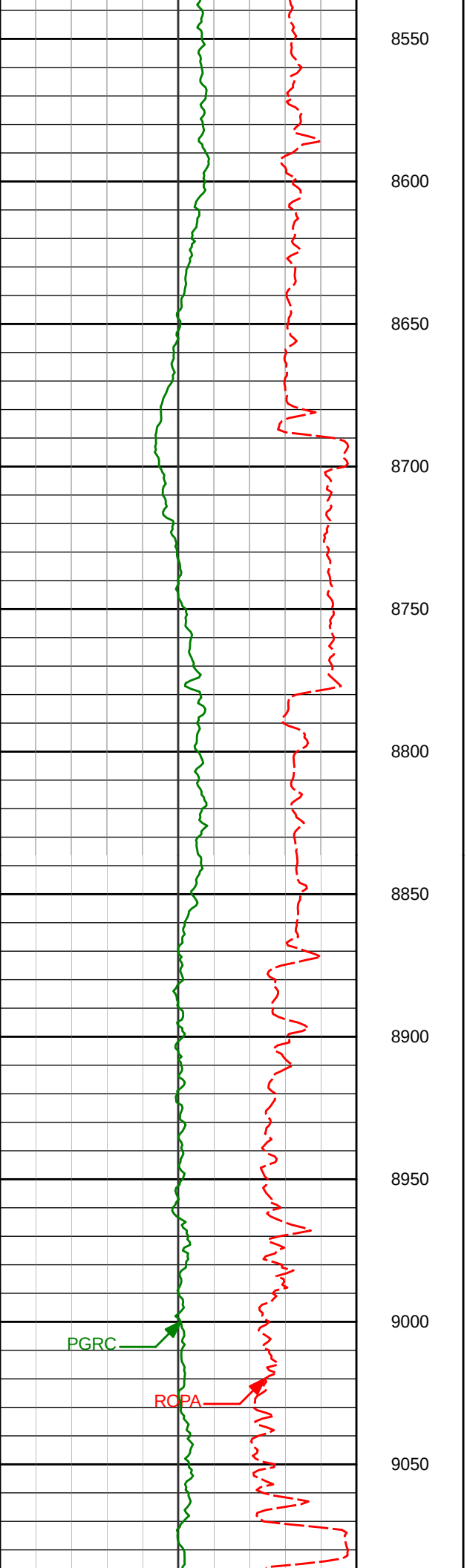
6913'	90.65°	4.01°	5913.49'	671.77'
7006'	91.02°	3.59°	5912.14'	764.75'
7100'	91.88°	3.84°	5909.77'	858.70'
7192'	90.83°	3.35°	5907.59'	950.66'
7287'	91.14°	3.12°	5905.95'	1045.64'
7381'	90.99°	2.85°	5904.21'	1139.62'



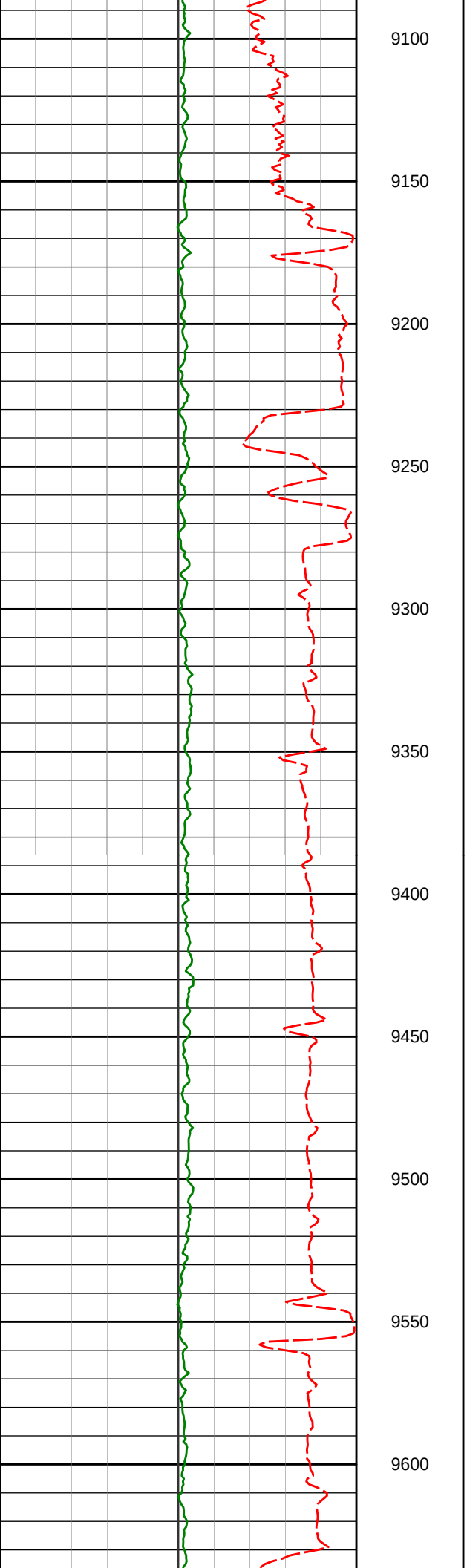
7476'	90.80°	2.76°	5902.73'	1234.61'
7570'	91.08°	3.28°	5901.19'	1328.59'
7665'	91.26°	3.20°	5899.24'	1423.57'
7760'	91.02°	3.01°	5897.35'	1518.55'
7854'	90.92°	3.18°	5895.76'	1612.53'
7949'	90.83°	1.74°	5894.30'	1707.52'



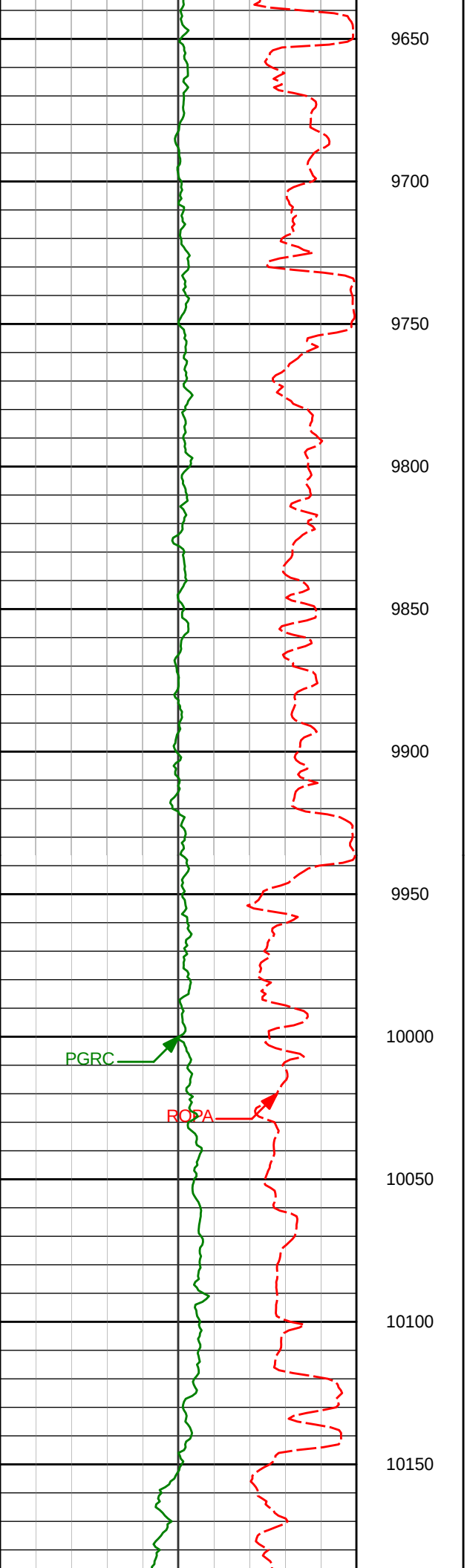
8044'	90.40°	0.23°	5893.28'	1802.47'
8138'	90.99°	1.31°	5892.14'	1896.41'
8233'	91.05°	0.89°	5890.45'	1991.36'
8328'	90.52°	0.55°	5889.15'	2086.30'
8422'	90.52°	0.54°	5888.29'	2180.23'
8517'	90.34°	0.03°	5887.58'	2275.14'



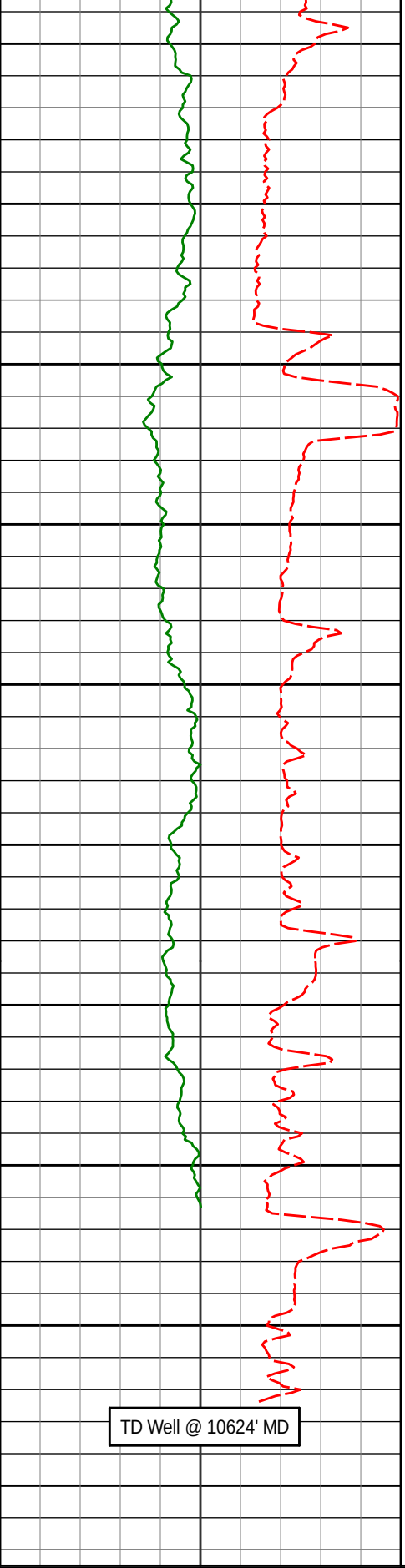
8612'	89.60°	0.25°	5887.63'	2370.05'
8706'	90.46°	0.38°	5887.58'	2463.97'
8801'	90.74°	0.78°	5886.58'	2558.91'
8896'	90.68°	0.04°	5885.41'	2653.82'
8990'	90.49°	0.15°	5884.45'	2747.73'
9085'	90.22°	1.03°	5883.86'	2842.66'



9180'	90.12°	0.37°	5883.58'	2937.61'
9274'	90.71°	0.41°	5882.90'	3031.53'
9369'	90.65°	1.19°	5881.77'	3126.47'
9463'	89.88°	359.35°	5881.34'	3220.39'
9558'	89.66°	359.51°	5881.73'	3315.24'



9653'	89.63°	0.18°	5882.31'	3410.12'
9747'	90.03°	0.91°	5882.59'	3504.05'
9842'	89.63°	0.22°	5882.87'	3598.99'
9937'	90.99°	0.54°	5882.36'	3693.91'
10031'	90.62°	0.20°	5881.05'	3787.83'
10126'	90.80°	0.36°	5879.88'	3882.74'



Depth	Inc	Azi	TVD	V.S.	Temp
10220'	90.74°	0.05°	5878.61'	3976.65'	
10315'	91.26°	1.31°	5876.95'	4071.57'	
10410'	91.70°	1.66°	5874.50'	4166.52'	
10504'	90.49°	0.48°	5872.70'	4260.46'	
10555'	90.34°	0.40°	5872.33'	4311.43'	
10624'	90.34°	0.40°	5871.92'	4380.37'	

Avg Rate of Penetration
ROPA
1K feet per hr 0

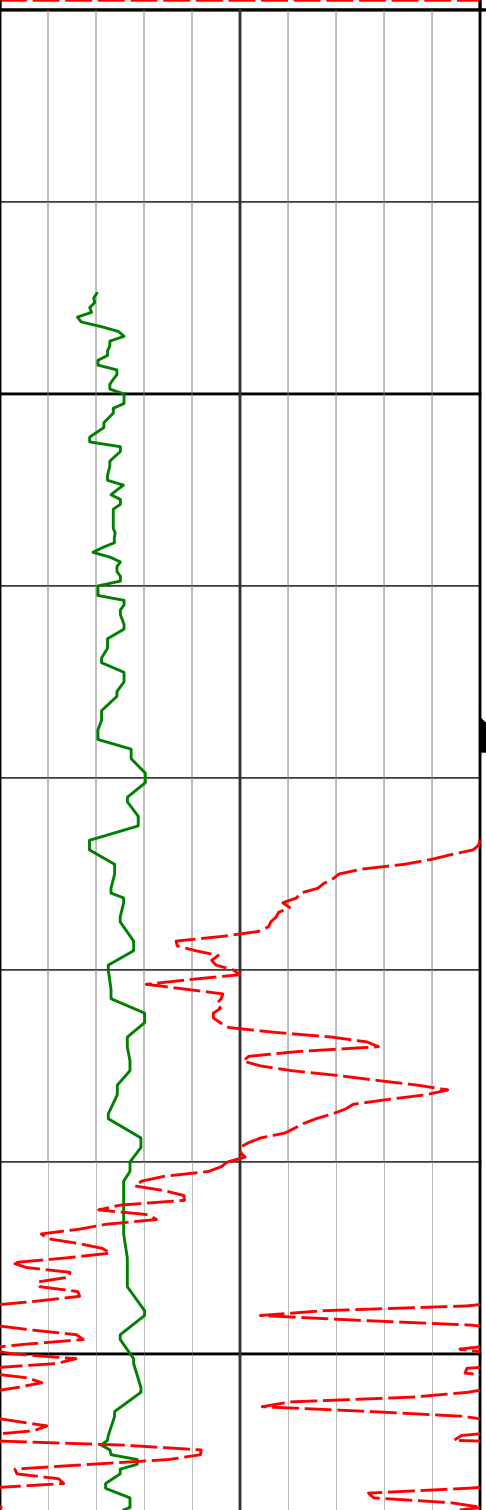
PCG Gamma Ray BCorr
PGRC
0 api 300

Depth
MD
ft

MD Detail 1:240 Scale

PCG GR XHi-Range RT
PGRC
0 api 300

Avg Rate of Penetration
ROPA
1K feet per hr 0



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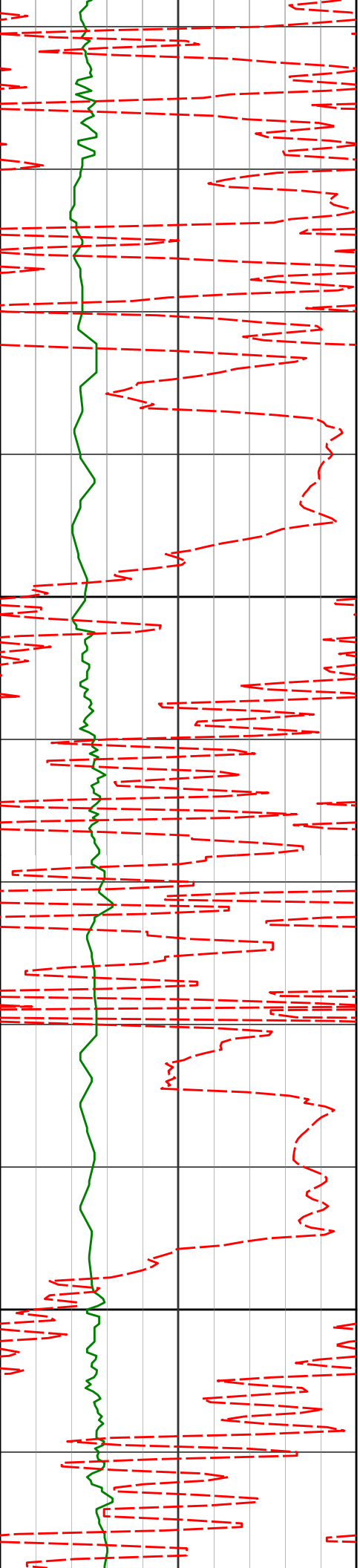
1100	1103'	0.30°	308.49°	1103.37'	4.70'	
Surface Casing @ 1135' MD	1135'	0.32°	331.32°	1134.97'	4.83'	
Run 100						
1200	1202'	0.31°	346.49°	1201.97'	5.16'	



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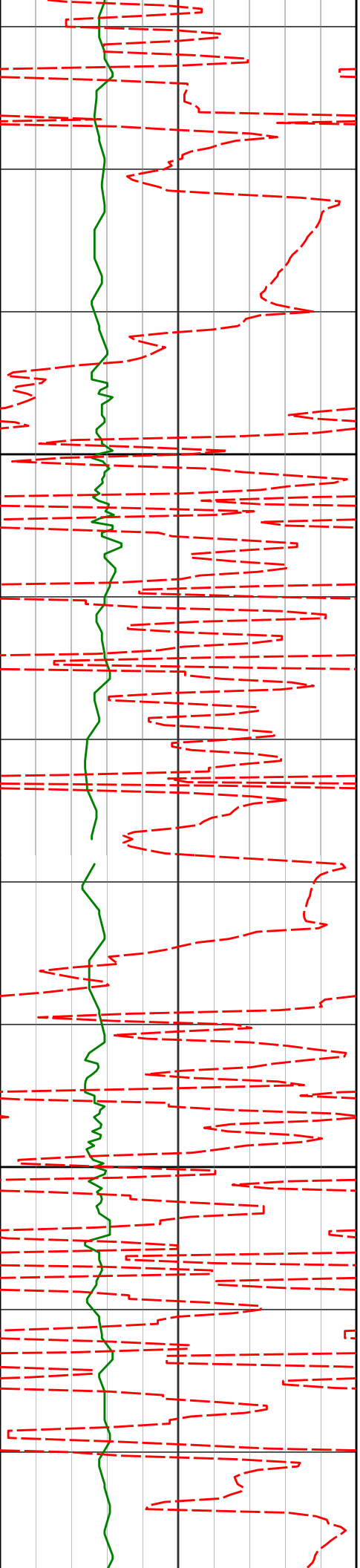
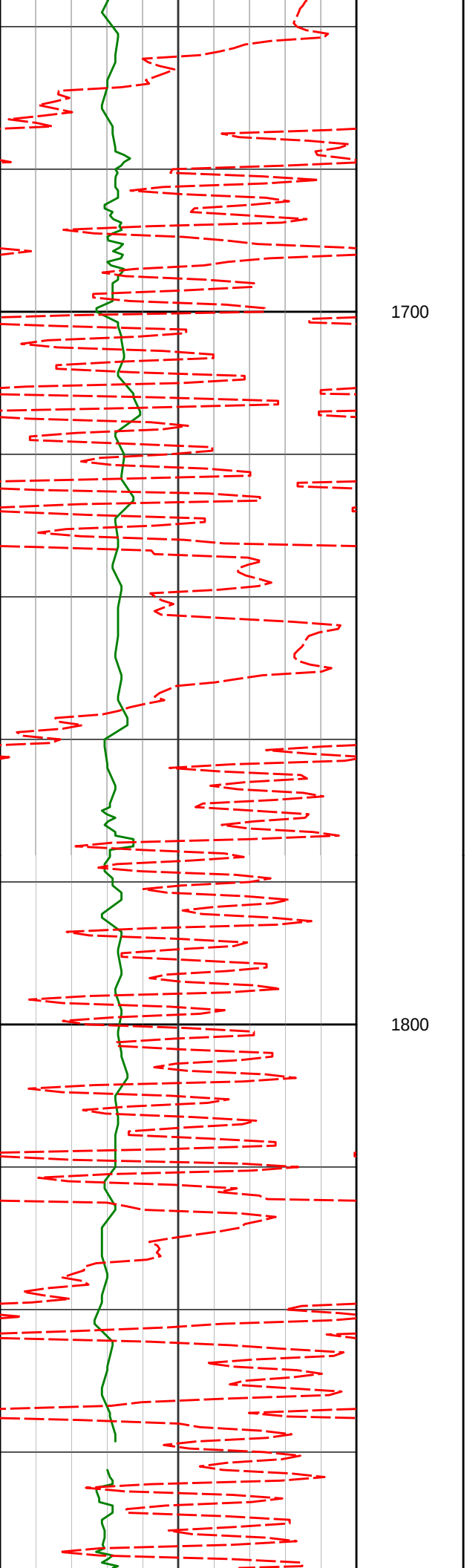
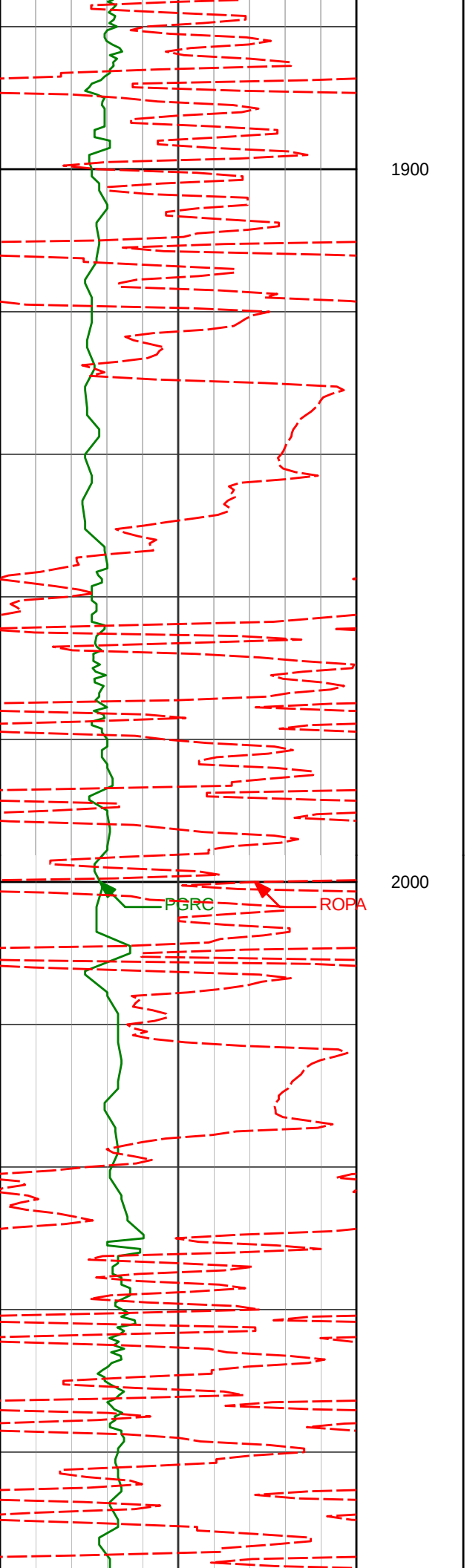


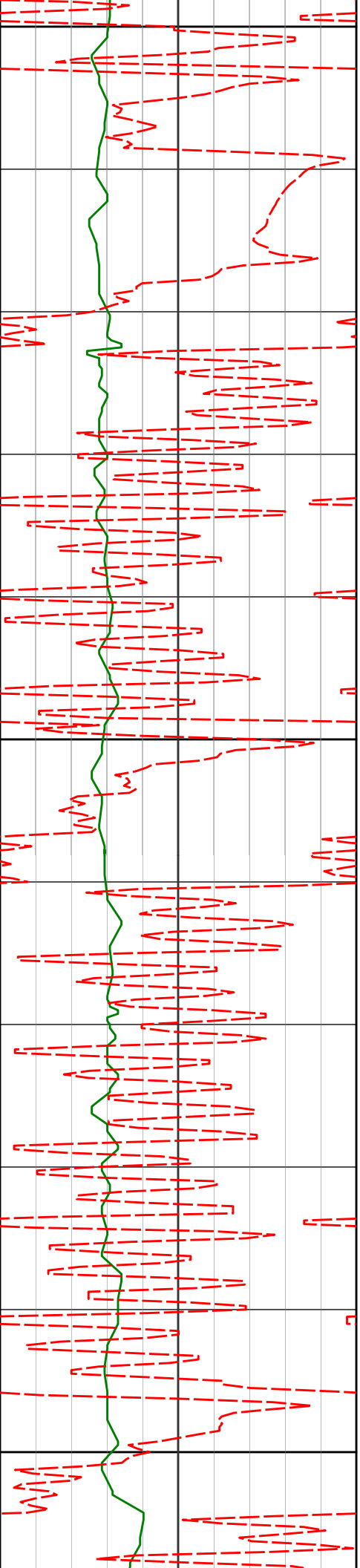
1479'	6.09°	173.25°	1478.58'	-6.28'
1572'	7.90°	172.58°	1570.88'	-17.44'



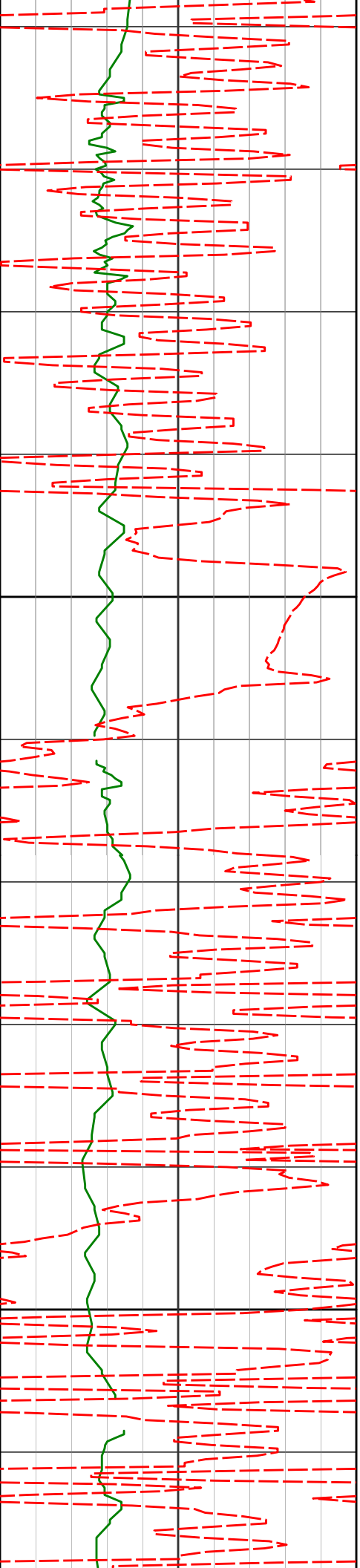
1665'	9.14°	166.95°	1662.86'	-30.84'
1758'	9.33°	170.42°	1754.65'	-45.32'
1850'	8.61°	163.05°	1845.53'	-59.09'



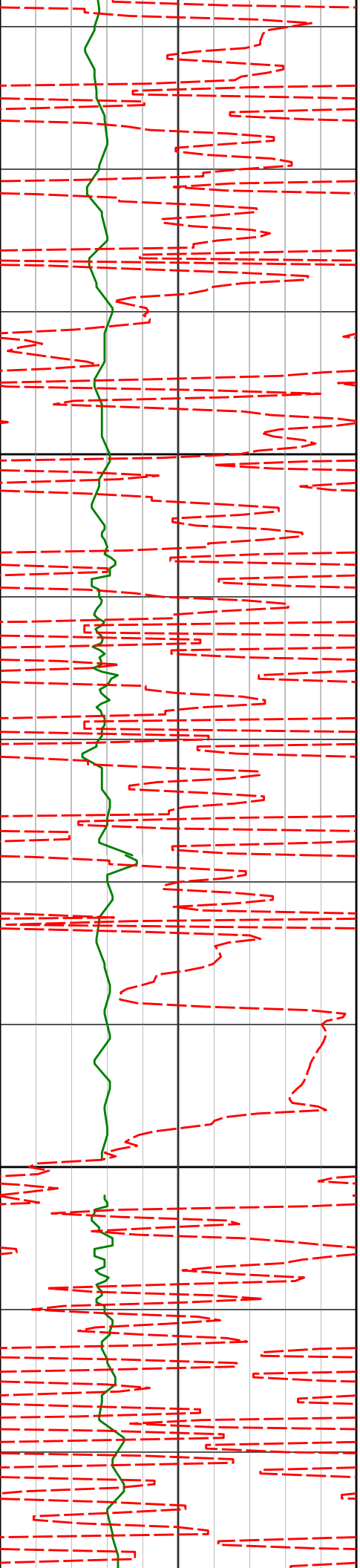
1943'	9.25°	168.89°	1937.40'	-72.91'
2034'	9.14°	172.50°	2027.23'	-87.13'



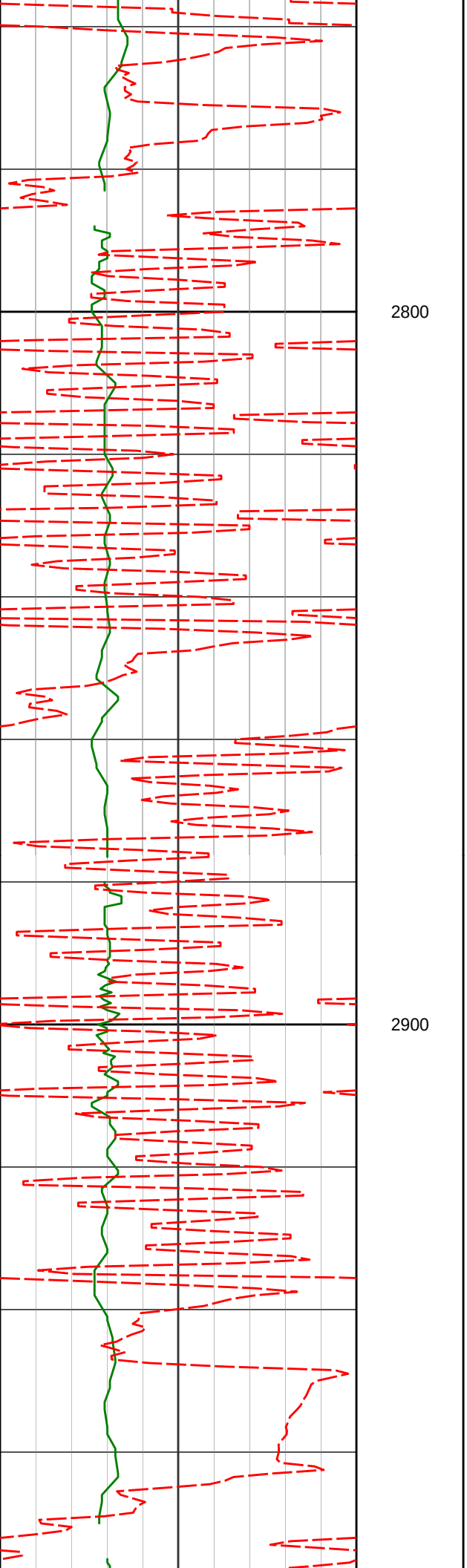
2126'	9.73°	176.73°	2117.99'	-102.06'
2218'	9.86°	172.96°	2208.65'	-117.55'
2310'	9.47°	167.38°	2299.35'	-132.62'



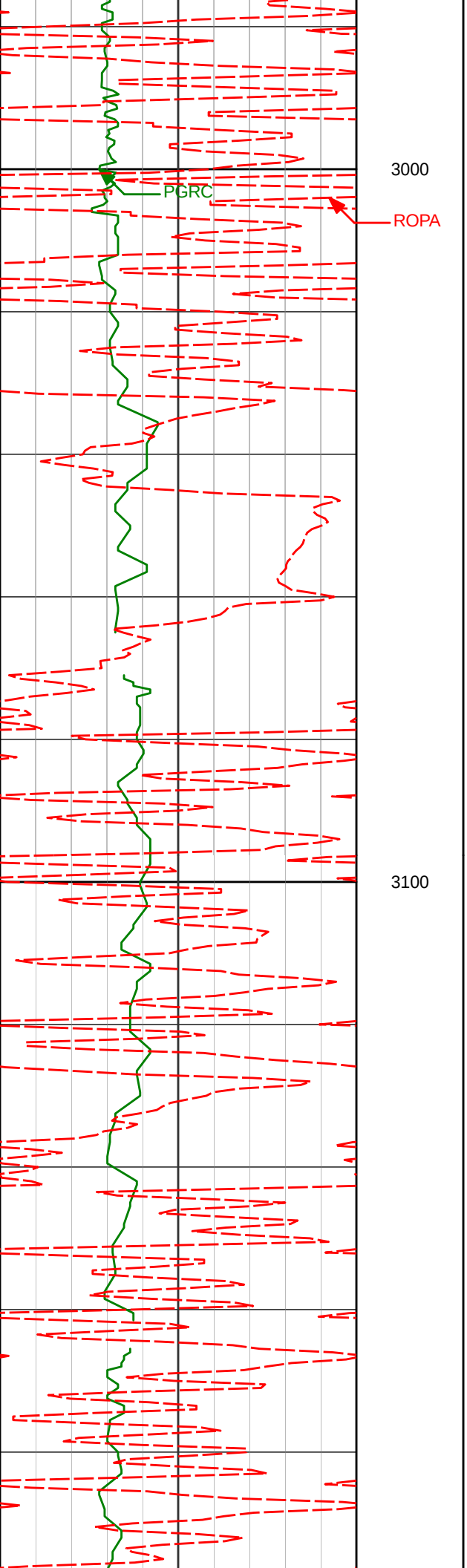
2404'	10.86°	168.87°	2391.87'	-148.68'
2496'	10.79°	162.10°	2482.23'	-165.17'



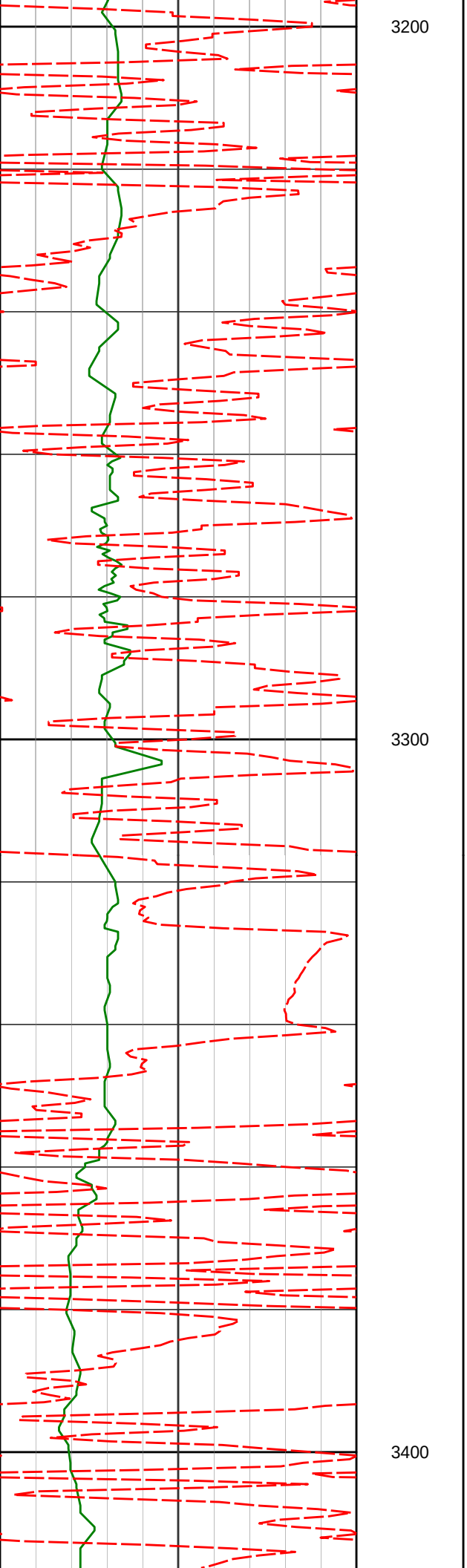
2589'	10.65°	157.65°	2573.61'	-181.11'
2682'	10.48°	165.97°	2665.04'	-197.00'



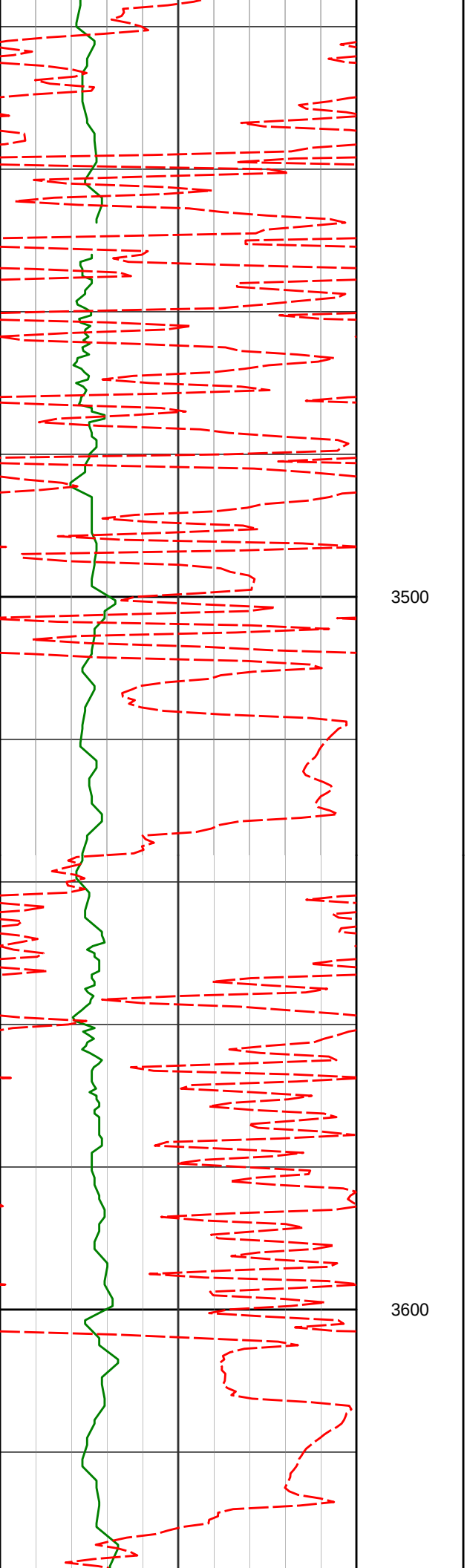
2776'	10.24°	171.44°	2757.51'	-213.38'
2869'	10.75°	168.48°	2848.96'	-229.89'
2963'	8.64°	169.36°	2941.61'	-245.26'



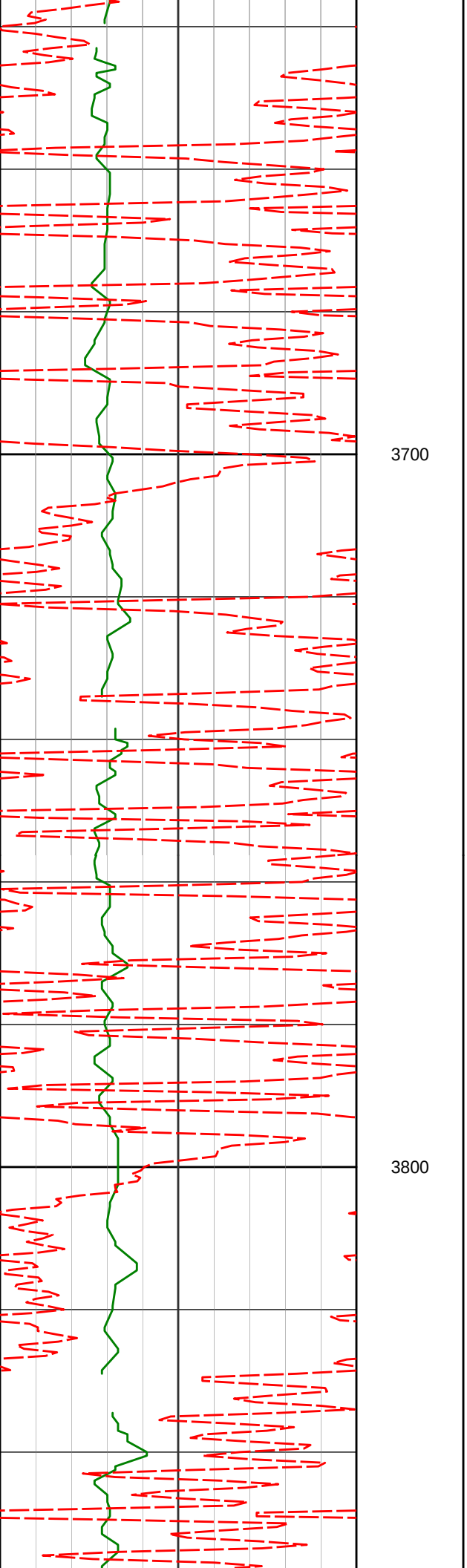
3058'	10.40°	169.48°	3035.30'	-260.55'
3153'	10.40°	161.67°	3128.74'	-276.91'



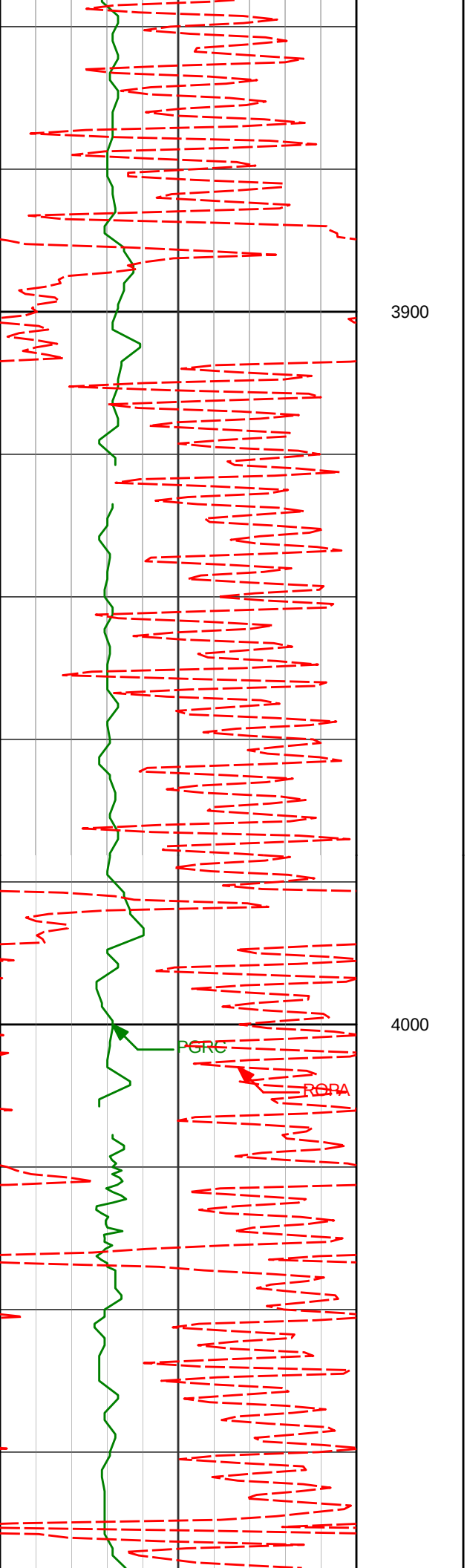
3247'	10.73°	160.48°	3221.15'	-292.93'
3342'	9.86°	167.03°	3314.62'	-308.96'



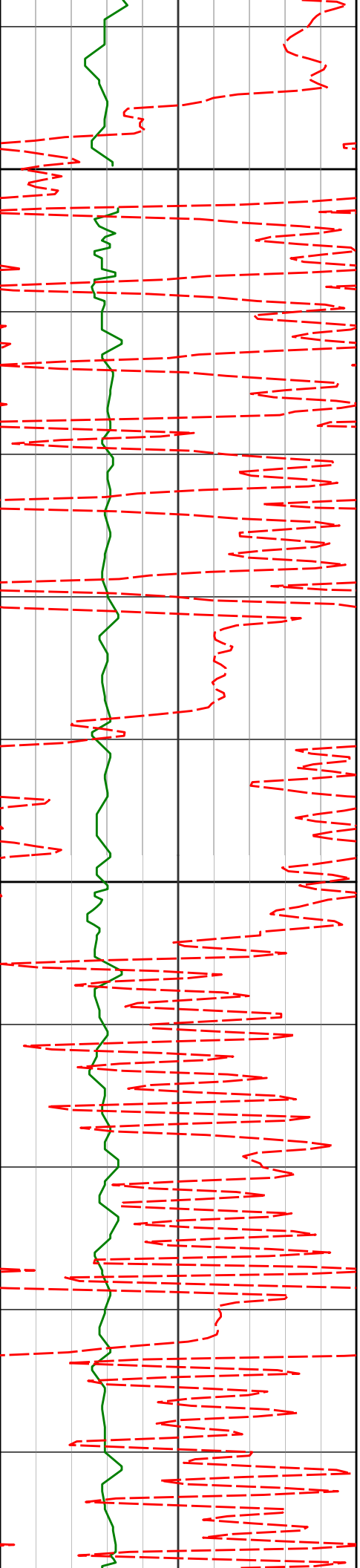
3437'	10.42°	169.41°	3408.14'	-325.16'
3531'	10.26°	175.36°	3500.61'	-341.74'
3626'	9.13°	177.41°	3594.26'	-357.64'



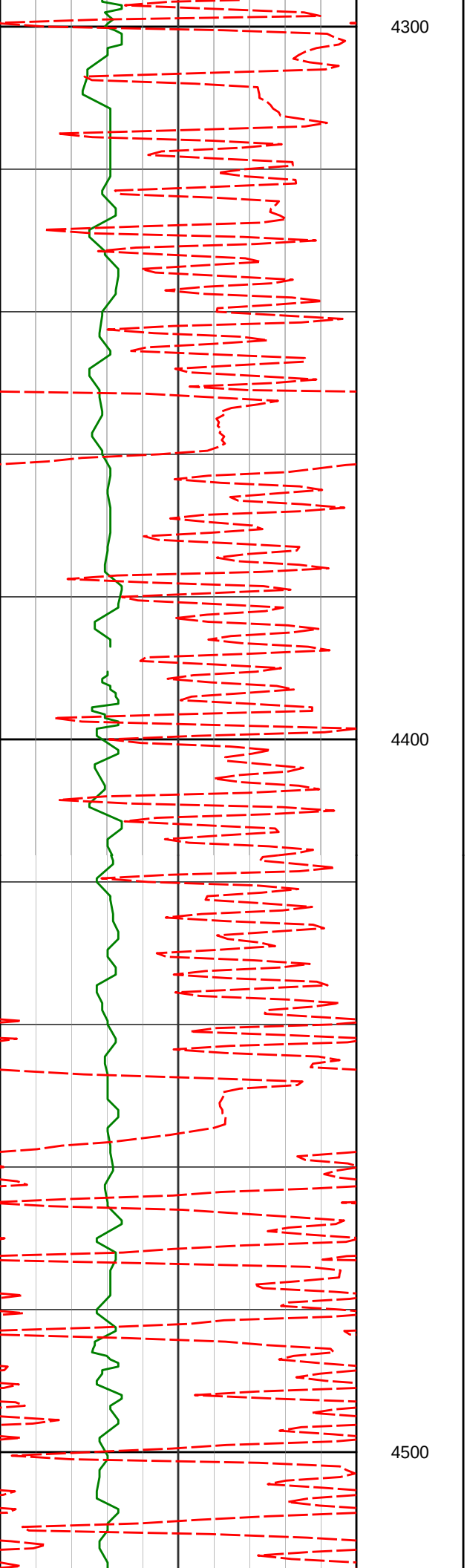
3721'	8.97°	176.63°	3688.07'	-372.51'
3815'	9.16°	176.50°	3780.90'	-387.23'



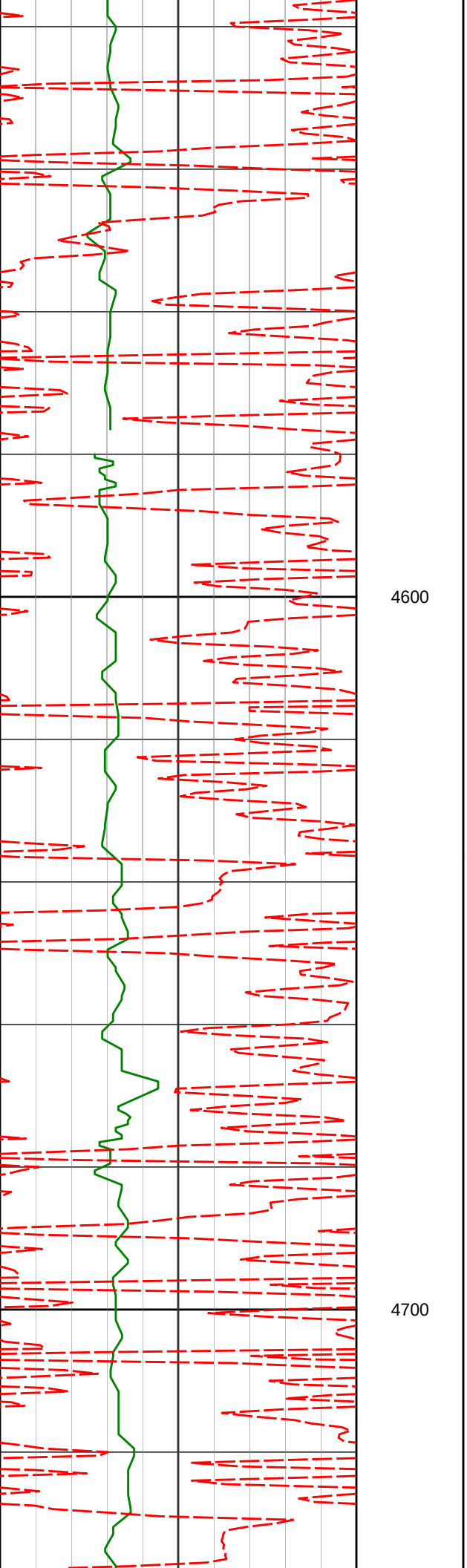
3910'	8.98°	174.32°	3874.71'	-402.09'
4004'	8.22°	172.32°	3967.66'	-415.96'



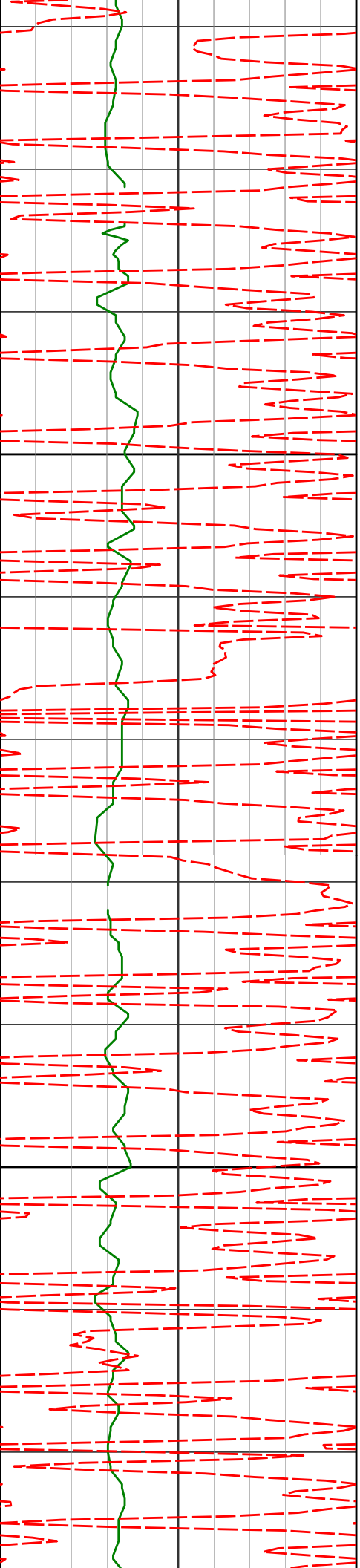
4099'	9.37°	173.92°	4061.54'	-430.28'
4193'	9.06°	172.61°	4154.32'	-445.13'
4288'	8.68°	172.05°	4248.19'	-459.54'



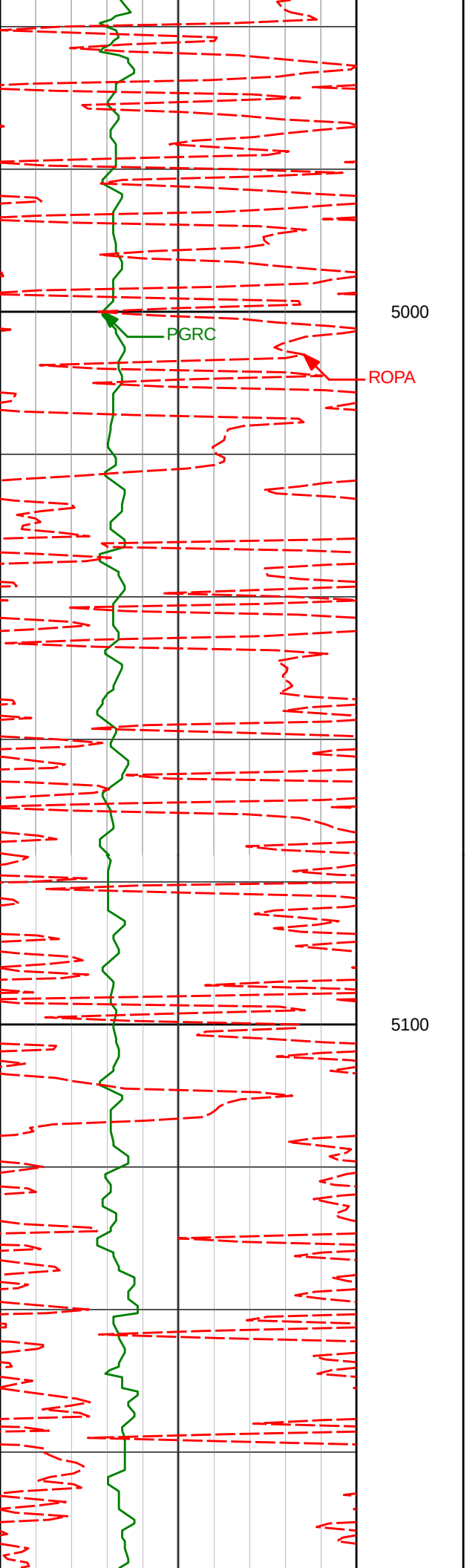
4382'	8.26°	169.40°	4341.16'	-473.09'
4477'	7.60°	164.15°	4435.26'	-485.69'



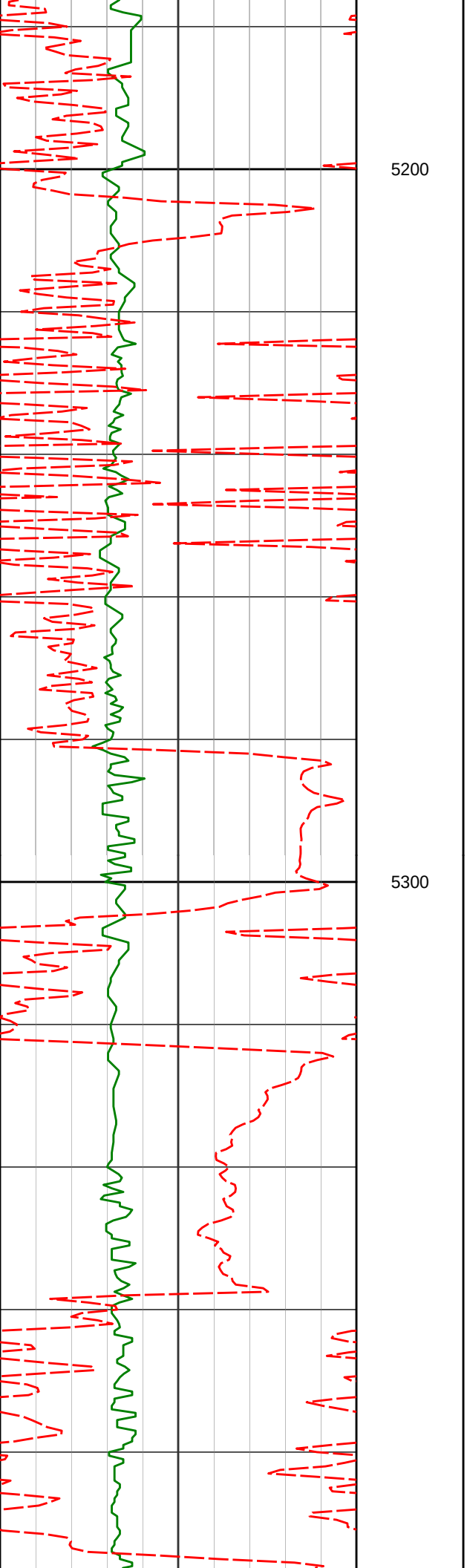
4571'	6.97°	163.87°	4528.50'	-496.99'
4666'	6.04°	163.74°	4622.88'	-507.17'



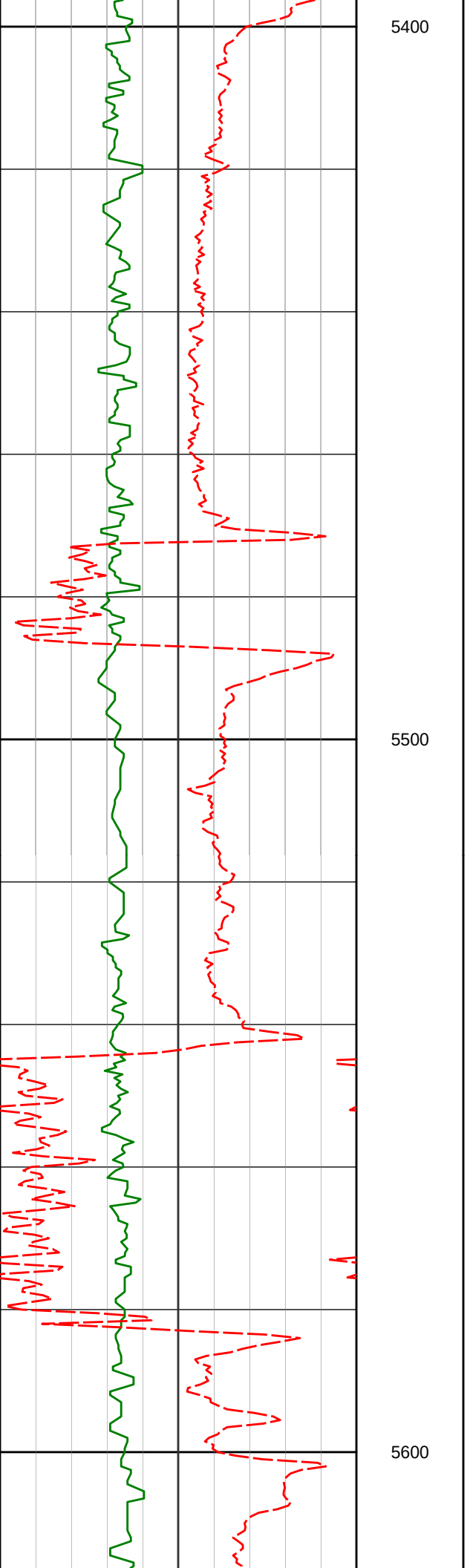
4761'	5.22°	160.35°	4717.42'	-515.90'
4856'	4.68°	160.83°	4812.07'	-523.50'
4950'	4.07°	157.57°	4905.79'	-530.08'



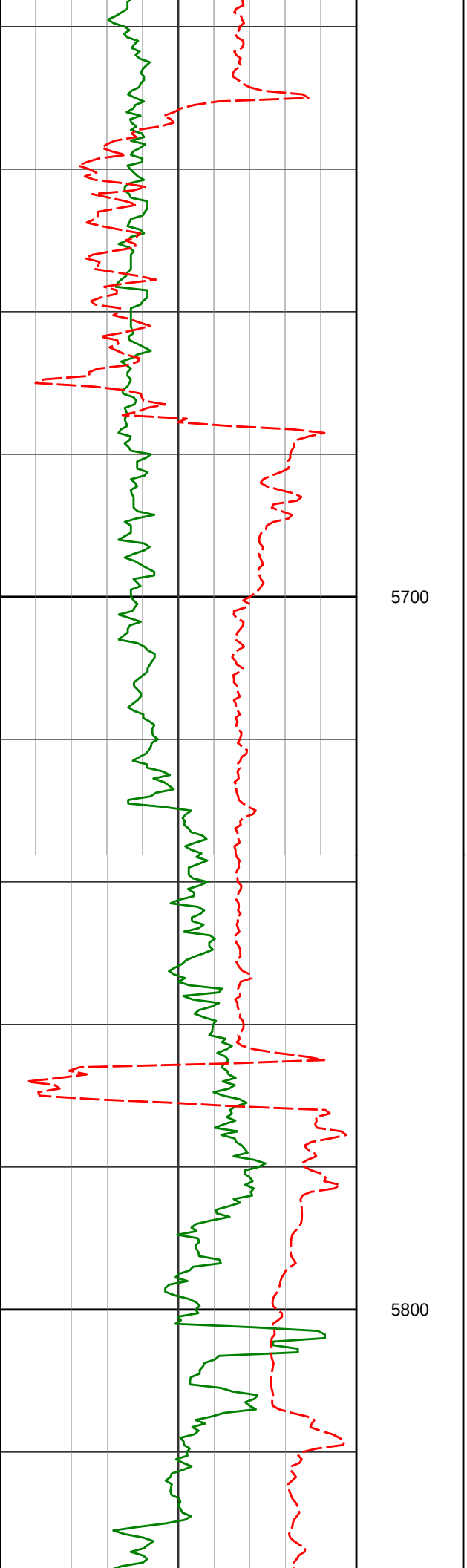
5045'	3.88°	152.41°	5000.57'	-535.91'
5140'	3.48°	144.13°	5095.37'	-540.94'



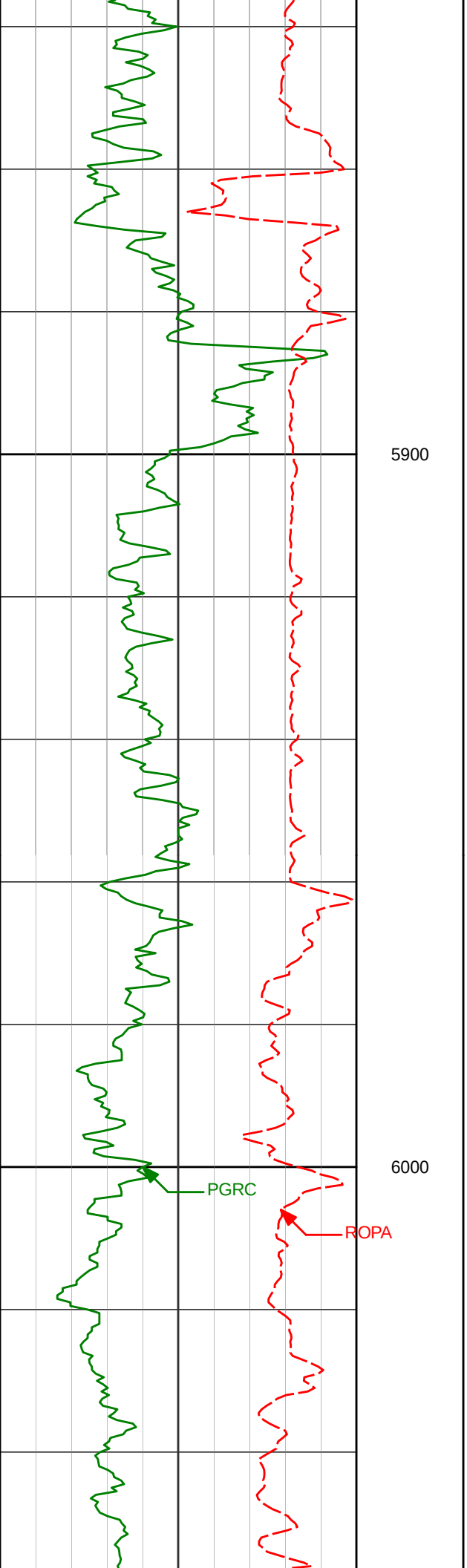
5234'	3.60°	135.86°	5189.19'	-545.20'
5329'	2.18°	63.54°	5284.10'	-546.36'



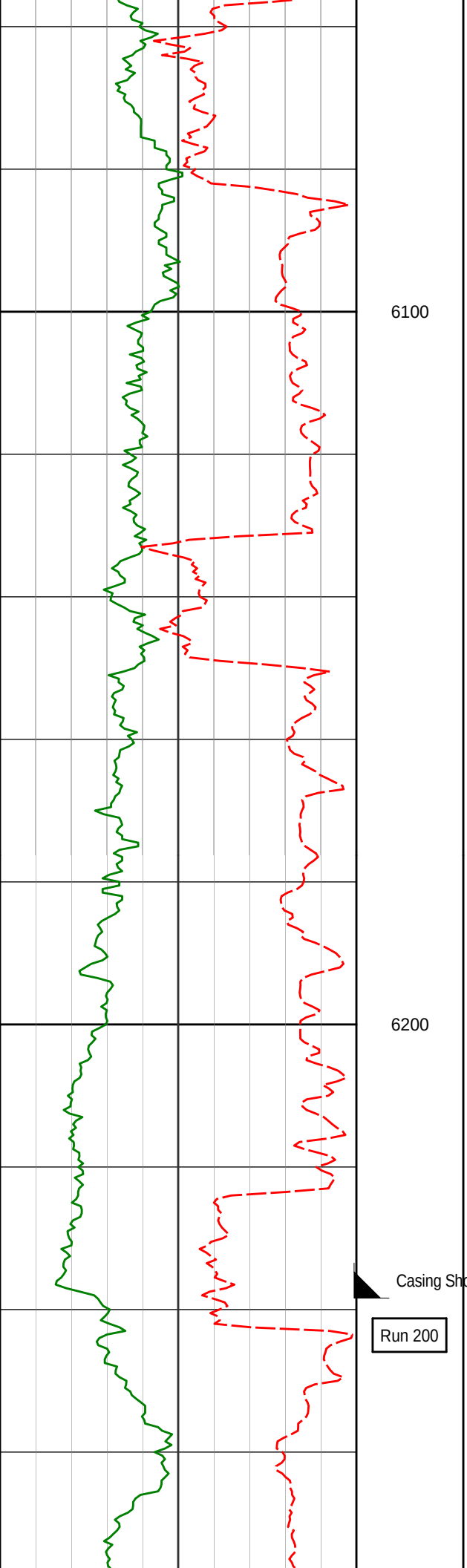
5423'	9.44°	6.62°	5377.60'	-537.79'
5518'	22.37°	3.15°	5468.77'	-511.83'
5613'	25.46°	354.87°	5555.63'	-473.51'



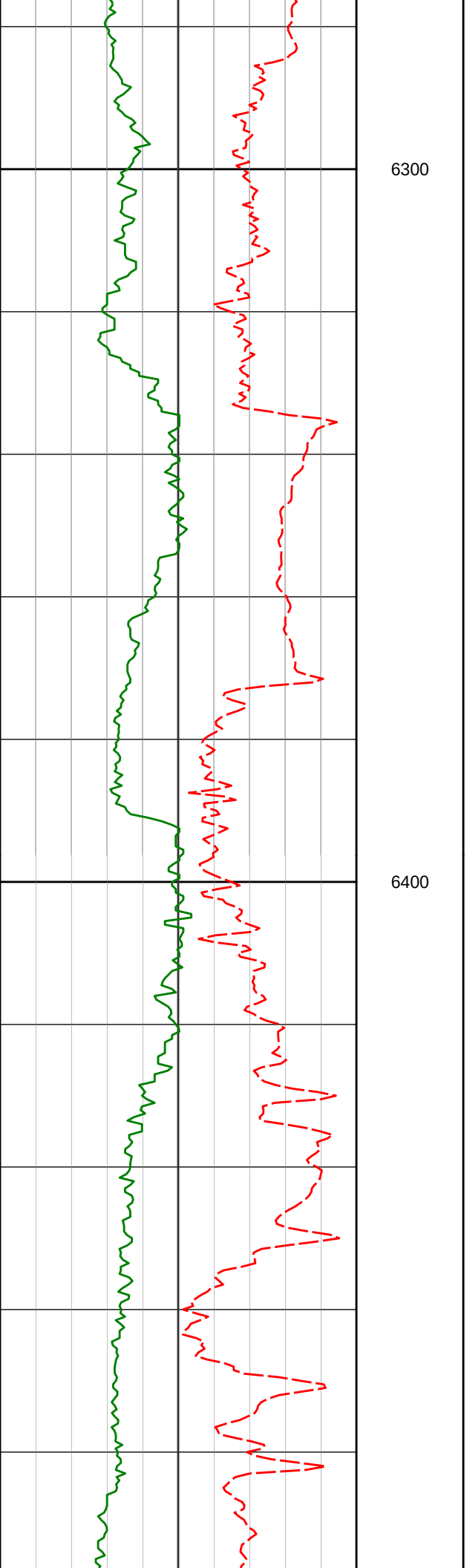
5707'	28.39°	357.05°	5639.43'	-431.24'
5802'	39.01°	3.44°	5718.38'	-378.70'



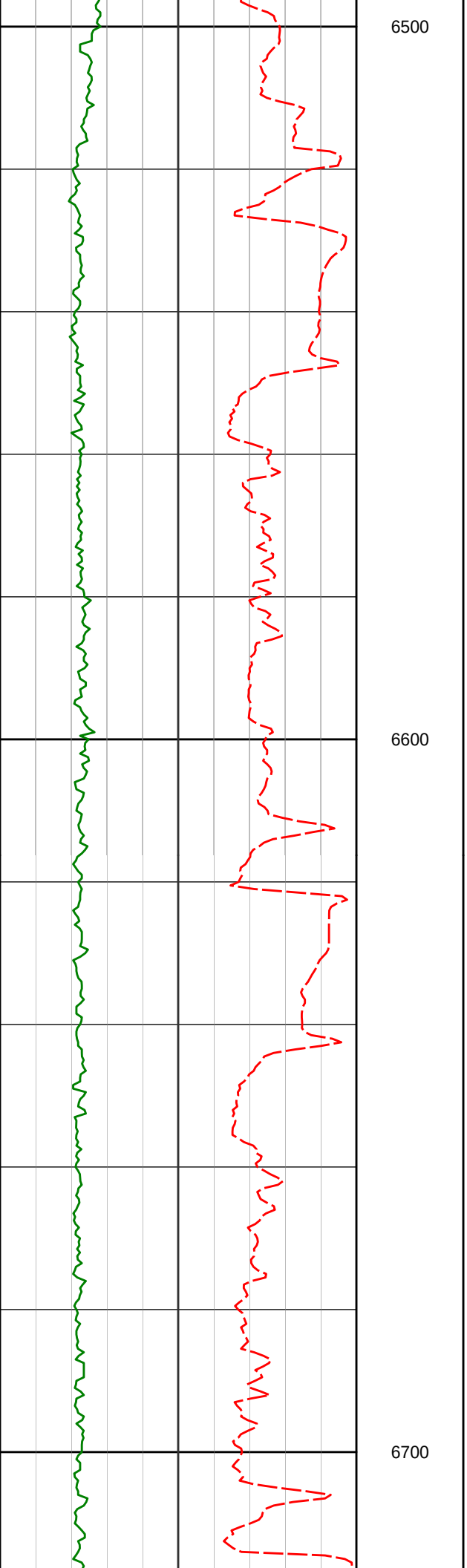
5896'	48.24°	4.07°	5786.35'	-313.93'
5991'	64.19°	1.22°	5839.01'	-235.24'



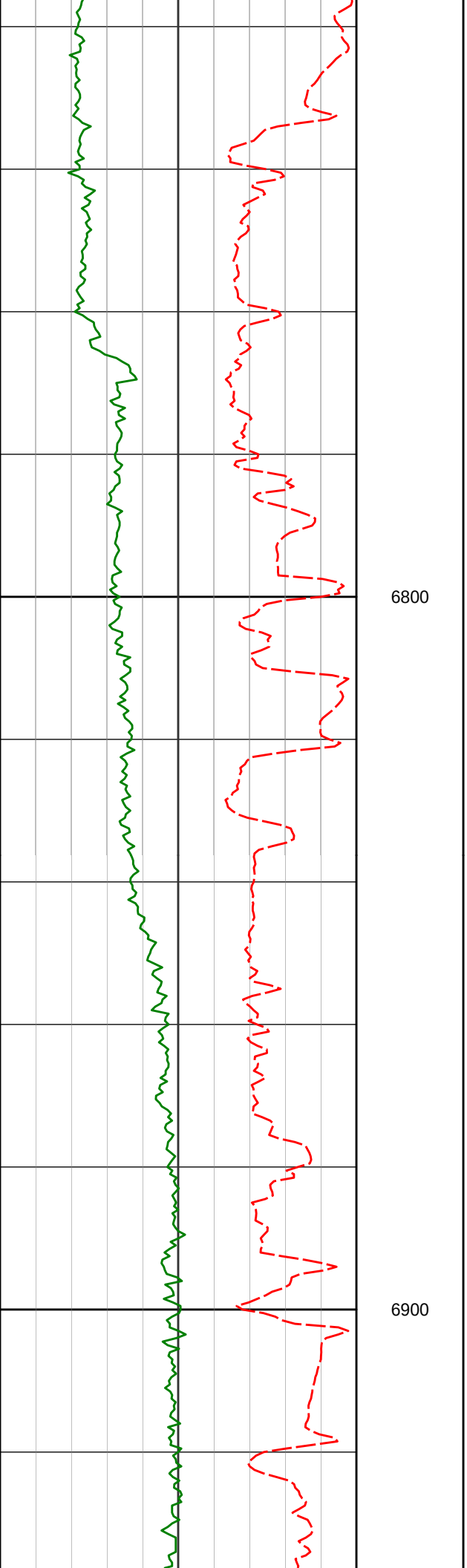
6086'	71.04°	357.07°	5875.17'	-147.64'
6179'	81.40°	354.15°	5897.29'	-58.13'
6266'	84.82°	354.00°	5907.73'	27.26'



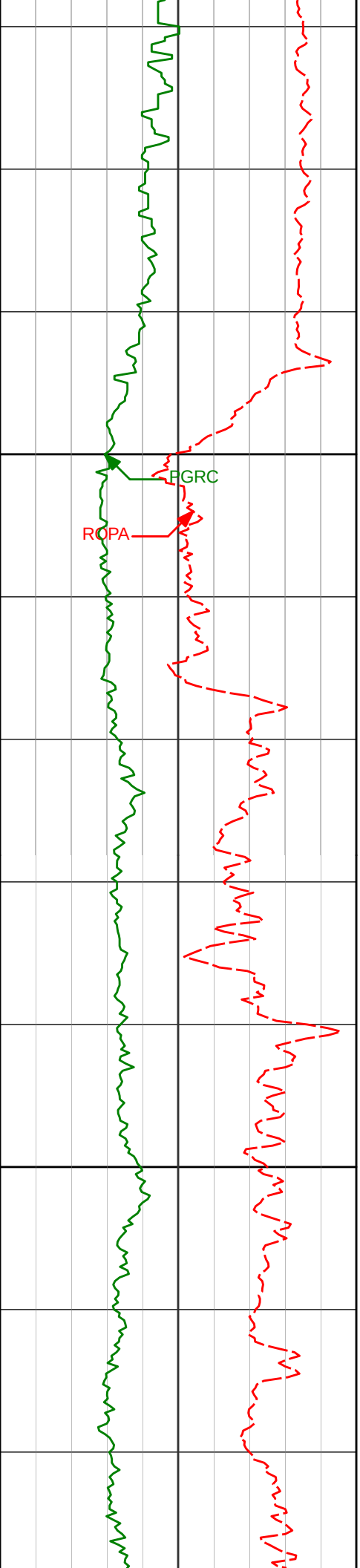
6358'	88.52°	355.37°	5913.07'	118.20'
6449'	88.55°	357.00°	5915.40'	208.59'



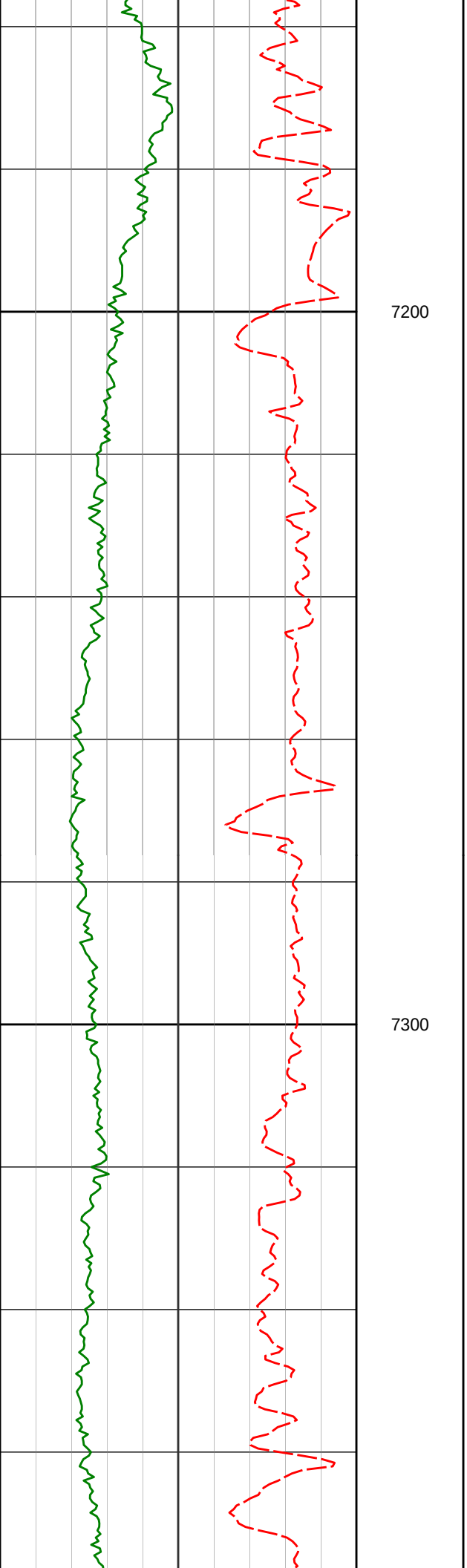
6542'	90.00°	357.98°	5916.57'	301.20'
6634'	89.54°	359.14°	5916.94'	392.97'



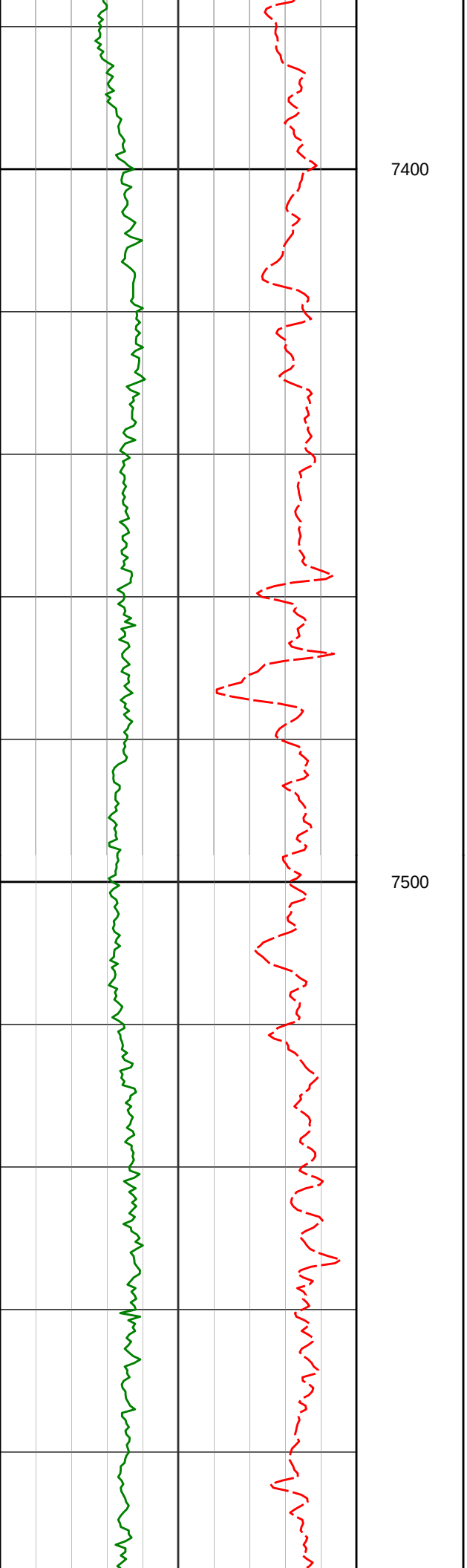
6727'	91.23°	0.74°	5916.32'	485.85'
6820'	90.80°	0.93°	5914.67'	578.79'
6913'	90.65°	4.01°	5913.49'	671.77'



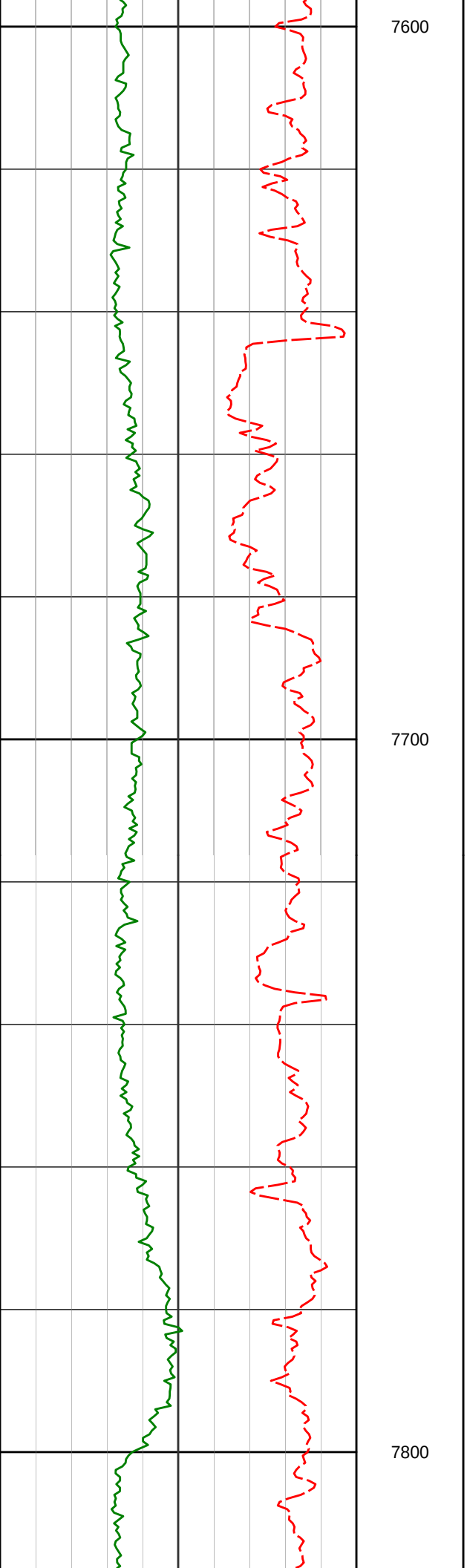
7000	7006'	91.02°	3.59°	5912.14'	764.75'
7100	7100'	91.88°	3.84°	5909.77'	858.70'



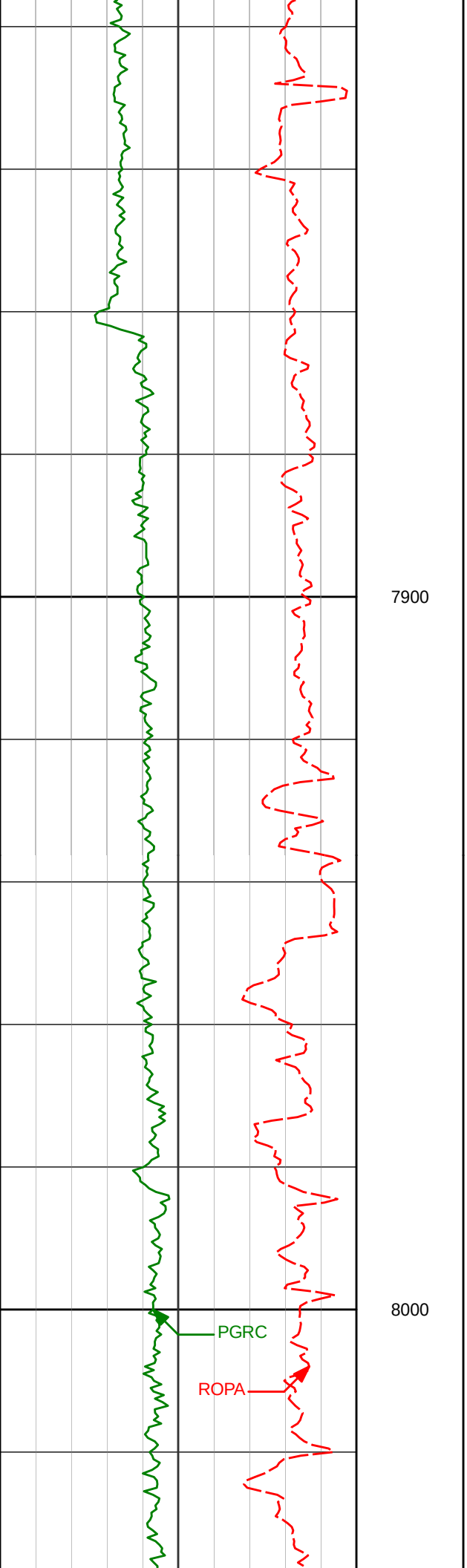
7192'	90.83°	3.35°	5907.59'	950.66'
7287'	91.14°	3.12°	5905.95'	1045.64'



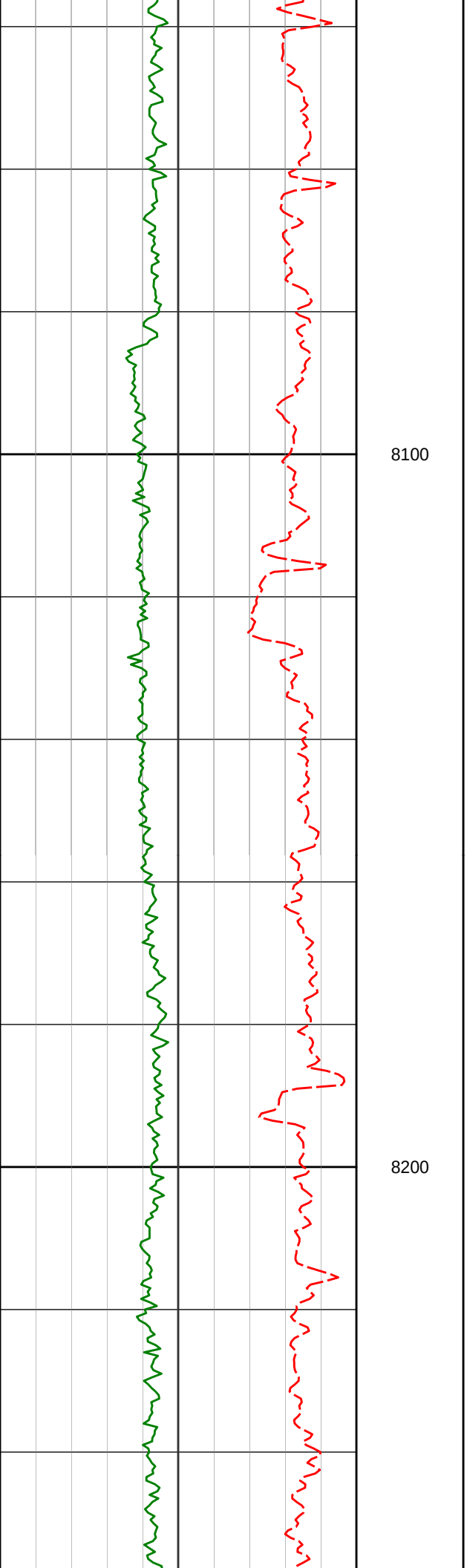
7381'	90.99°	2.85°	5904.21'	1139.62'
7476'	90.80°	2.76°	5902.73'	1234.61'
7570'	91.08°	3.28°	5901.19'	1328.59'



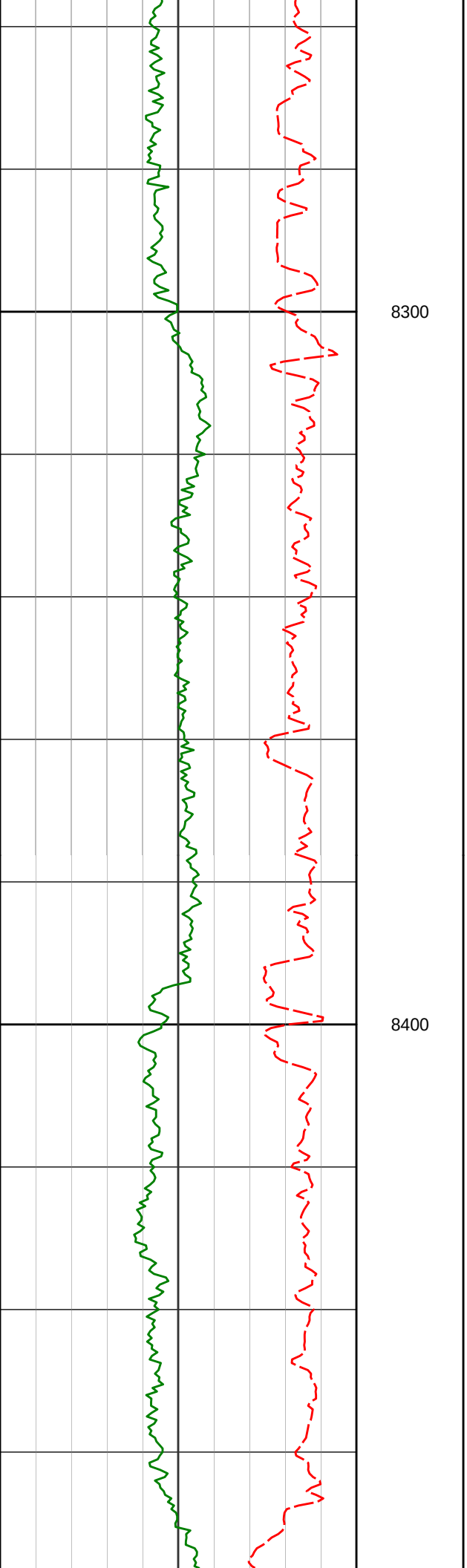
7665'	91.26°	3.20°	5899.24'	1423.57'
7760'	91.02°	3.01°	5897.35'	1518.55'



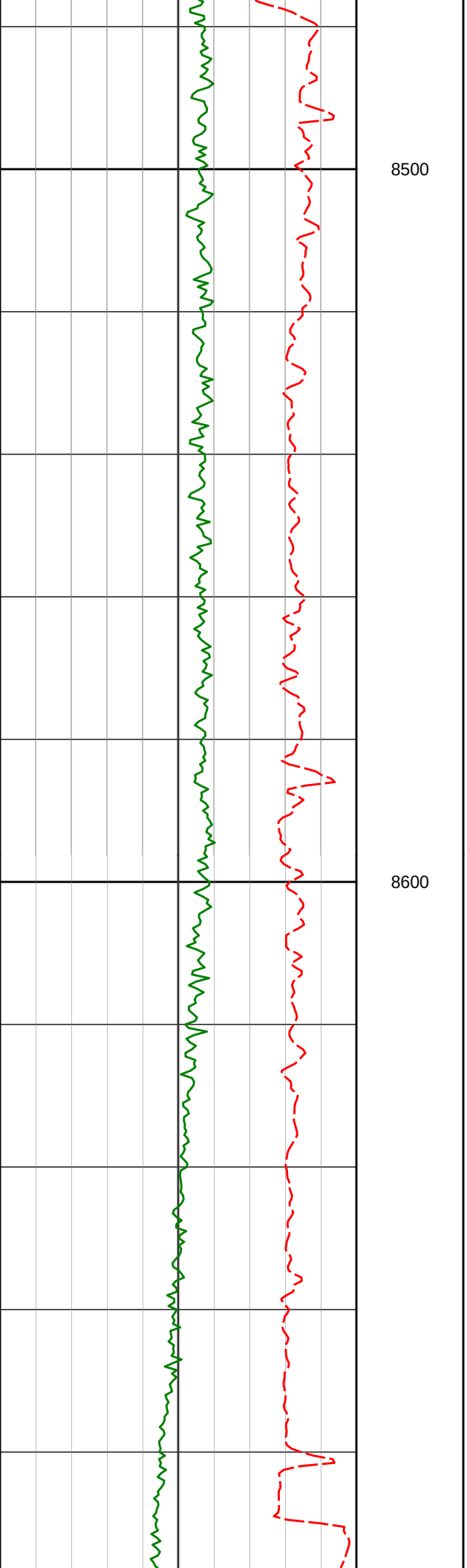
7854'	90.92°	3.18°	5895.76'	1612.53'
7949'	90.83°	1.74°	5894.30'	1707.52'



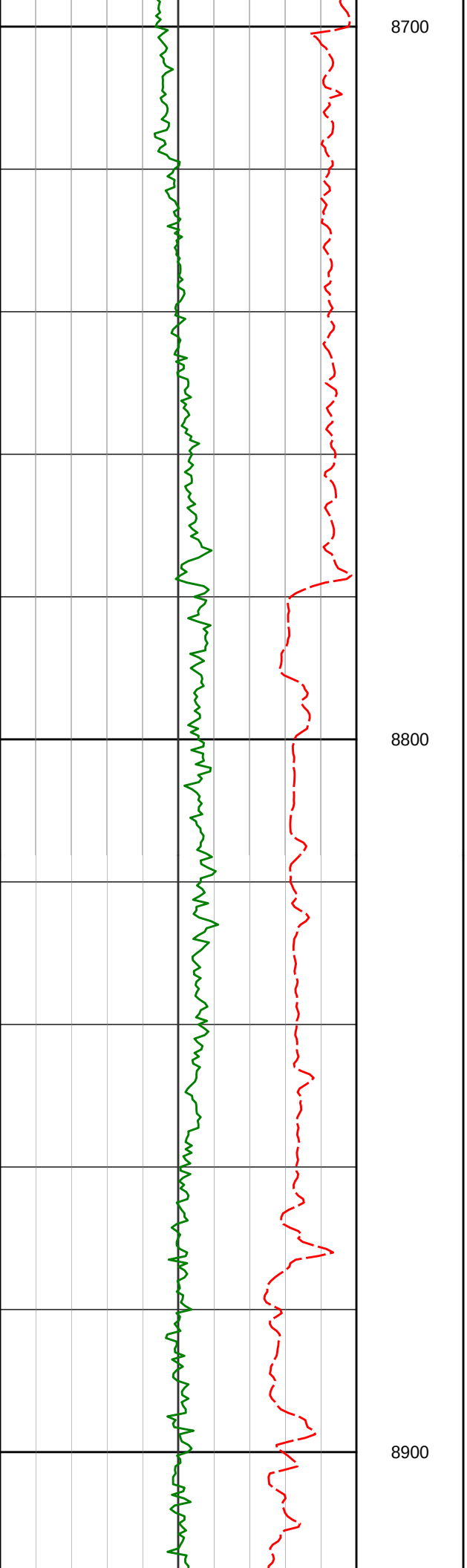
8044'	90.40°	0.23°	5893.28'	1802.47'
8138'	90.99°	1.31°	5892.14'	1896.41'
8233'	91.05°	0.89°	5890.45'	1991.36'



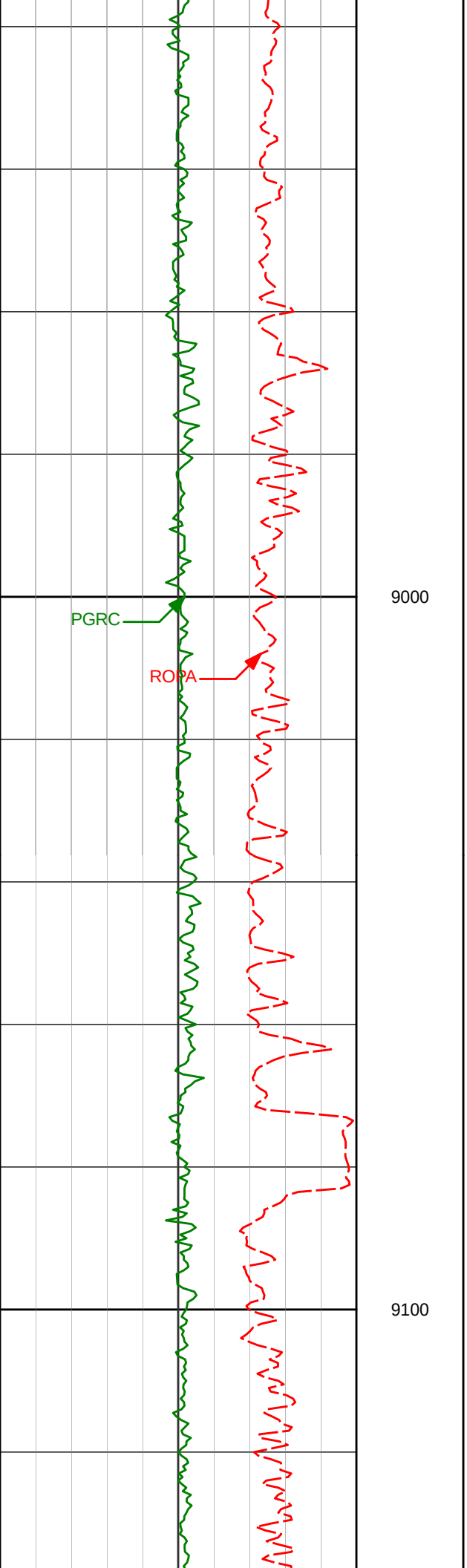
8328'	90.52°	0.55°	5889.15'	2086.30'
8422'	90.52°	0.54°	5888.29'	2180.23'



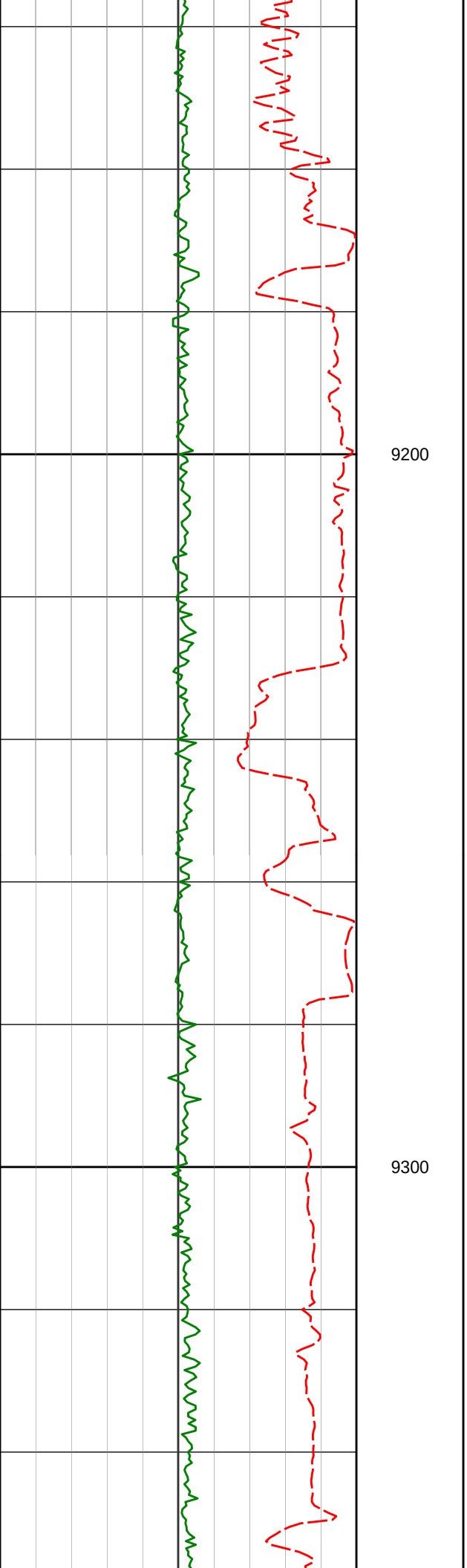
8517'	90.34°	0.03°	5887.58'	2275.14'
8612'	89.60°	0.25°	5887.63'	2370.05'



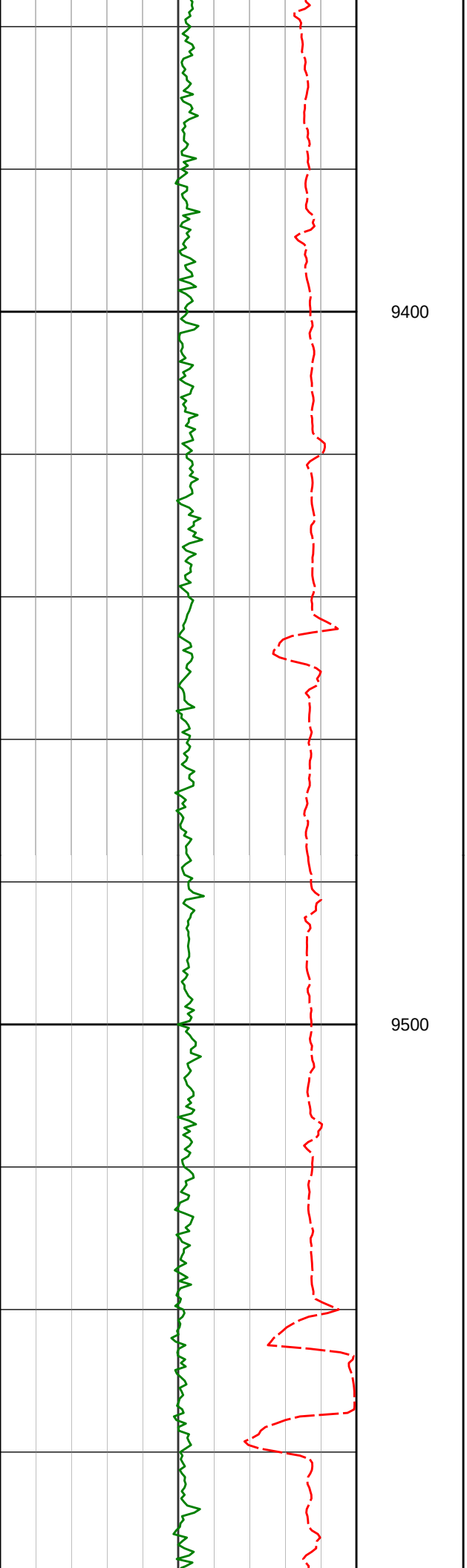
8706'	90.46°	0.38°	5887.58'	2463.97'
8801'	90.74°	0.78°	5886.58'	2558.91'
8896'	90.68°	0.04°	5885.41'	2653.82'



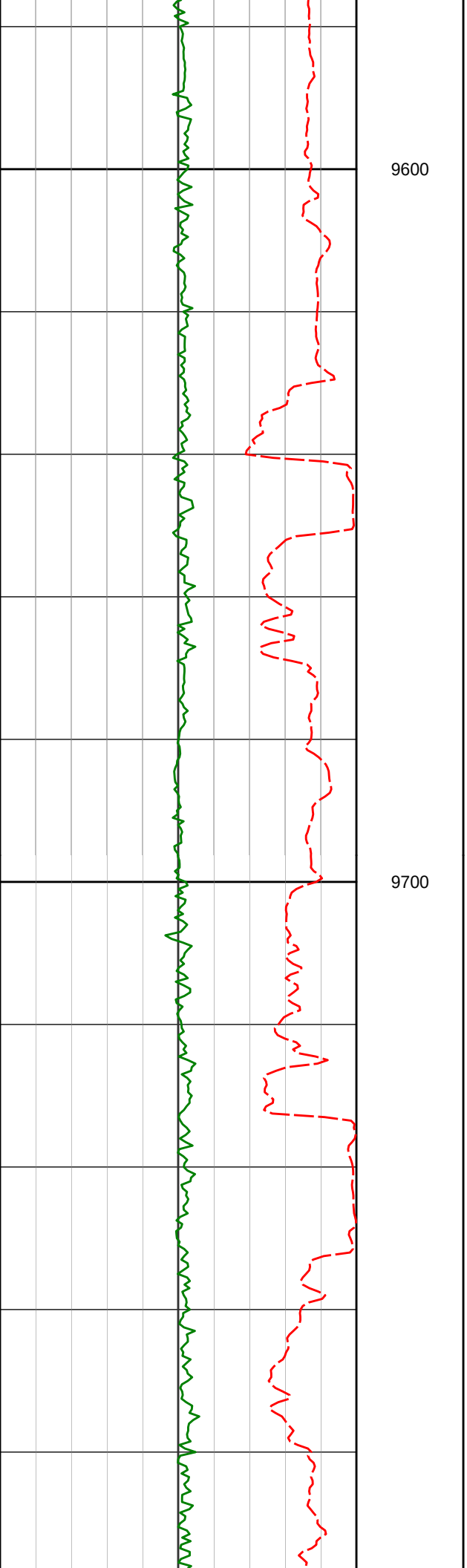
8990'	90.49°	0.15°	5884.45'	2747.73'
9085'	90.22°	1.03°	5883.86'	2842.66'



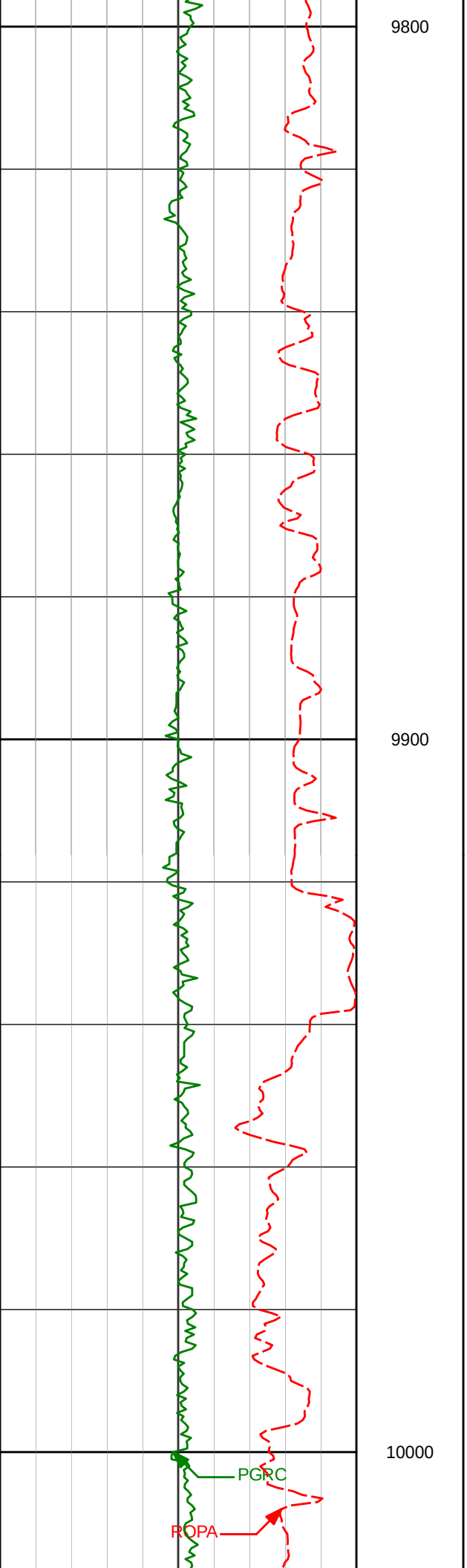
9180'	90.12°	0.37°	5883.58'	2937.61'
9274'	90.71°	0.41°	5882.90'	3031.53'



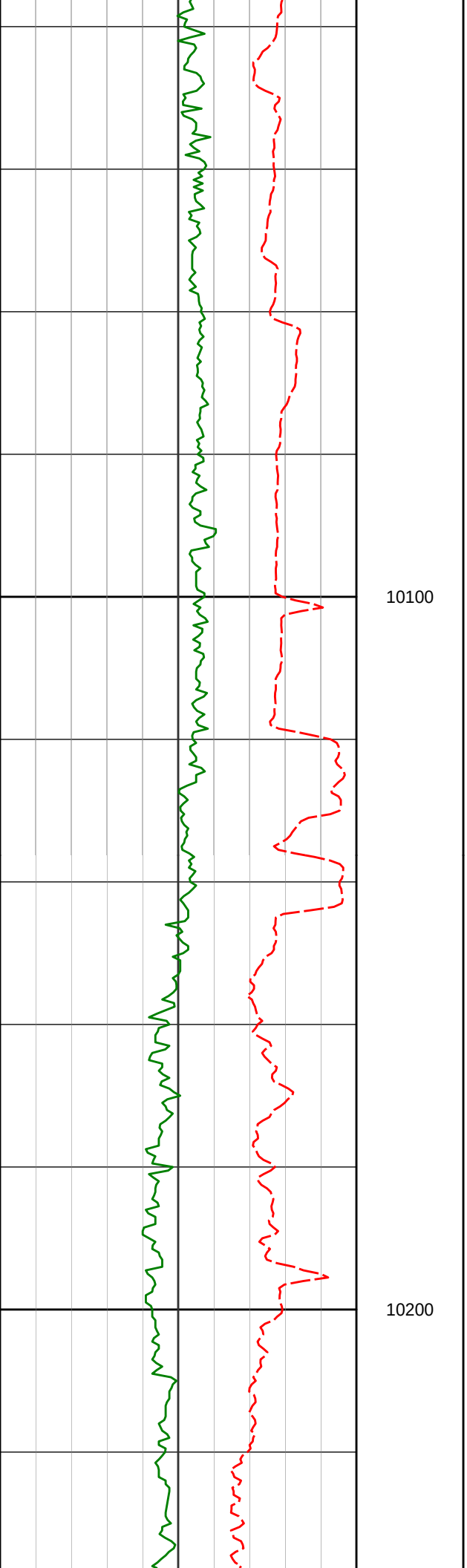
9369'	90.65°	1.19°	5881.77'	3126.47'
9463'	89.88°	359.35°	5881.34'	3220.39'
9558'	89.66°	359.51°	5881.73'	3315.24'



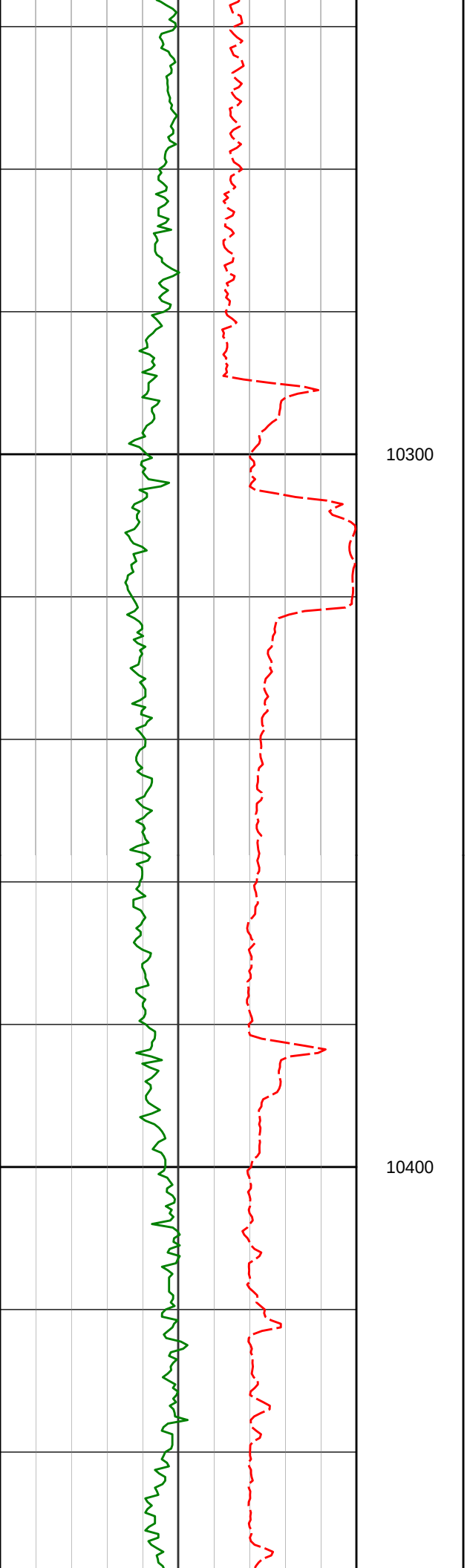
9653'	89.63°	0.18°	5882.31'	3410.12'
9747'	90.03°	0.91°	5882.59'	3504.05'



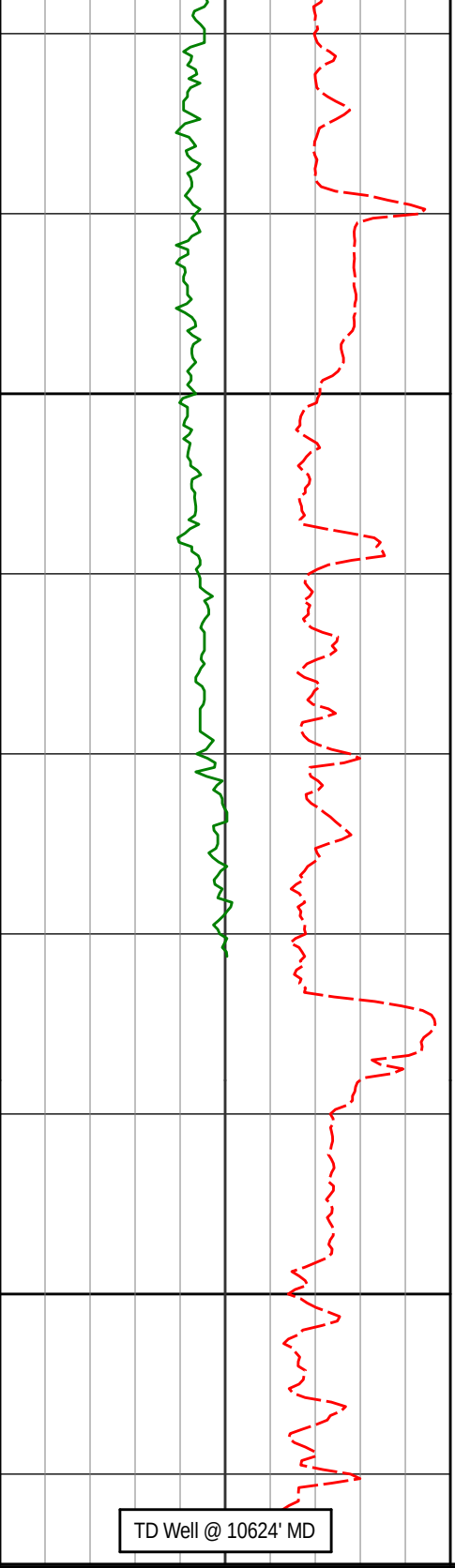
9842'	89.63°	0.22°	5882.87'	3598.99'
9937'	90.99°	0.54°	5882.36'	3693.91'



10031'	90.62°	0.20°	5881.05'	3787.83'
10126'	90.80°	0.36°	5879.88'	3882.74'
10220'	90.74°	0.05°	5878.61'	3976.65'



10315'	91.26°	1.31°	5876.95'	4071.57'
10410'	91.70°	1.66°	5874.50'	4166.52'



Depth MD ft	Depth	Inc	Azi	TVD	V.S.	Temp
	10504'	90.49°	0.48°	5872.70'	4260.46'	
	10555'	90.34°	0.40°	5872.33'	4311.43'	
	10624'	90.34°	0.40°	5871.92'	4380.37'	

Avg Rate of Penetration
ROPA
1K feet per hr 0

PCG GR XHi-Range RT
PGRC
0 api 300

HALLIBURTON

DIRECTIONAL SURVEY REPORT

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
91.51	0.32	160.69	91.51	0.24 S	0.08 E	-0.24	0.35
183.50	0.46	101.94	183.50	0.56 S	0.53 E	-0.54	0.44
275.49	0.40	59.31	275.49	0.47 S	1.17 E	-0.42	0.34
367.48	0.15	340.46	367.47	0.20 S	1.41 E	-0.13	0.44
459.47	0.09	29.11	459.46	0.02 S	1.40 E	0.04	0.12
551.46	0.32	344.57	551.45	0.29 N	1.37 E	0.36	0.29
643.45	0.58	8.83	643.44	1.00 N	1.37 E	1.07	0.34
735.44	0.67	16.18	735.43	1.98 N	1.59 E	2.05	0.13
827.43	0.73	15.20	827.41	3.06 N	1.90 E	3.14	0.06
919.42	0.46	339.66	919.39	3.97 N	1.92 E	4.05	0.48
1011.41	0.23	300.47	1011.38	4.41 N	1.63 E	4.48	0.34
1103.40	0.30	308.49	1103.37	4.65 N	1.29 E	4.70	0.08
1135.00	0.32	331.32	1134.97	4.78 N	1.18 E	4.83	0.40
1202.00	0.31	346.49	1201.97	5.12 N	1.05 E	5.16	0.13
1294.00	1.05	178.30	1293.97	4.52 N	1.02 E	4.56	1.47
1386.00	3.23	172.66	1385.90	1.11 N	1.37 E	1.17	2.38
1479.00	6.09	173.25	1478.58	6.39 S	2.29 E	-6.28	3.08
1572.00	7.90	172.58	1570.88	17.63 S	3.69 E	-17.44	1.95
1665.00	9.14	166.95	1662.86	31.16 S	6.18 E	-30.84	1.61
1758.00	9.33	170.42	1754.65	45.79 S	9.11 E	-45.32	0.63
1850.00	8.61	163.05	1845.53	59.73 S	12.36 E	-59.09	1.47
1943.00	9.25	168.89	1937.40	73.72 S	15.82 E	-72.91	1.20
2034.00	9.14	172.50	2027.23	88.07 S	18.18 E	-87.13	0.65
2126.00	9.73	176.73	2117.99	103.08 S	19.57 E	-102.06	0.99
2218.00	9.86	172.96	2208.65	118.65 S	20.98 E	-117.55	0.71
2310.00	9.47	167.38	2299.35	133.85 S	23.60 E	-132.62	1.10
2404.00	10.86	168.87	2391.87	150.09 S	27.00 E	-148.68	1.51
2496.00	10.79	162.10	2482.23	166.80 S	31.32 E	-165.17	1.38
2589.00	10.65	157.65	2573.61	183.03 S	37.27 E	-181.11	0.90
2682.00	10.48	165.97	2665.04	199.18 S	42.58 E	-197.00	1.65
2776.00	10.24	171.44	2757.51	215.73 S	45.90 E	-213.38	1.08
2869.00	10.75	168.48	2848.96	232.40 S	48.86 E	-229.89	0.80
2963.00	8.64	169.36	2941.61	247.92 S	51.91 E	-245.26	2.25
3058.00	10.40	169.48	3035.30	263.37 S	54.80 E	-260.55	1.86
3153.00	10.40	161.67	3128.74	279.94 S	59.06 E	-276.91	1.48
3247.00	10.73	160.48	3221.15	296.24 S	64.65 E	-292.93	0.42
3342.00	9.86	167.03	3314.62	312.51 S	69.43 E	-308.96	1.53
3437.00	10.42	169.41	3408.14	328.88 S	72.84 E	-325.16	0.73
3531.00	10.26	175.36	3500.61	345.58 S	75.08 E	-341.74	1.15
3626.00	9.13	177.41	3594.26	361.54 S	76.11 E	-357.64	1.25
3721.00	8.97	176.63	3688.07	376.46 S	76.88 E	-372.51	0.21
3815.00	9.16	176.50	3780.90	391.25 S	77.77 E	-387.23	0.21
3910.00	8.98	174.32	3874.71	406.18 S	78.97 E	-402.09	0.41
4004.00	8.22	172.32	3967.66	420.14 S	80.59 E	-415.96	0.87
4099.00	9.37	173.92	4061.54	434.55 S	82.32 E	-430.28	1.24
4193.00	9.06	172.61	4154.32	449.50 S	84.08 E	-445.13	0.39
4288.00	8.68	172.05	4248.19	464.02 S	86.03 E	-459.54	0.42
4382.00	8.26	169.40	4341.16	477.68 S	88.25 E	-473.09	0.61
4477.00	7.60	164.15	4435.26	490.43 S	91.22 E	-485.69	1.03
4571.00	6.97	163.87	4528.50	501.89 S	94.51 E	-496.99	0.68
4666.00	6.04	163.74	4622.88	512.23 S	97.51 E	-507.17	0.97
4761.00	5.22	160.35	4717.42	521.10 S	100.36 E	-515.90	0.93
4856.00	4.68	160.83	4812.07	528.83 S	103.09 E	-523.50	0.57
4950.00	4.07	157.57	4905.79	535.54 S	105.62 E	-530.08	0.70
5045.00	3.88	152.41	5000.57	541.50 S	108.39 E	-535.91	0.43
5140.00	3.48	144.13	5095.37	546.69 S	111.57 E	-540.94	0.70
5234.00	3.60	135.86	5189.19	551.12 S	115.30 E	-545.20	0.56
5329.00	2.18	63.54	5284.10	552.45 S	118.99 E	-546.36	3.78
5423.00	9.44	6.62	5377.60	543.99 S	121.48 E	-537.79	8.98
5518.00	22.37	3.15	5468.77	518.09 S	123.38 E	-511.83	13.64
5613.00	25.46	354.87	5555.63	479.69 S	122.55 E	-473.51	4.80
5707.00	28.39	357.05	5639.43	437.23 S	119.59 E	-431.24	3.29
5802.00	39.01	3.44	5718.38	384.67 S	120.23 E	-378.70	11.77
5896.00	48.24	4.07	5786.35	320.03 S	124.50 E	-313.93	9.83

5991.00	64.19	1.22	5839.01	241.41 S	127.95 E	-235.24	16.97
6086.00	71.04	357.07	5875.17	153.65 S	126.56 E	-147.64	8.26
6179.00	81.40	354.15	5897.29	63.73 S	119.61 E	-58.13	11.55
6266.00	84.82	354.00	5907.73	22.17 N	110.69 E	27.26	3.93
6358.00	88.52	355.37	5913.07	113.60 N	102.19 E	118.20	4.29
6449.00	88.55	357.00	5915.40	204.37 N	96.14 E	208.59	1.79
6542.00	90.00	357.98	5916.57	297.26 N	92.07 E	301.20	1.88
6634.00	89.54	359.14	5916.94	389.23 N	89.76 E	392.97	1.36
6727.00	91.23	0.74	5916.32	482.22 N	89.66 E	485.85	2.50
6820.00	90.80	0.93	5914.67	575.20 N	91.02 E	578.79	0.51
6913.00	90.65	4.01	5913.49	668.09 N	95.03 E	671.77	3.31
7006.00	91.02	3.59	5912.14	760.88 N	101.19 E	764.75	0.60
7100.00	91.88	3.84	5909.77	854.65 N	107.27 E	858.70	0.95
7192.00	90.83	3.35	5907.59	946.44 N	113.04 E	950.66	1.26
7287.00	91.14	3.12	5905.95	1041.28 N	118.40 E	1045.64	0.40
7381.00	90.99	2.85	5904.21	1135.13 N	123.29 E	1139.62	0.34
7476.00	90.80	2.76	5902.73	1230.01 N	127.94 E	1234.61	0.21
7570.00	91.08	3.28	5901.19	1323.87 N	132.90 E	1328.59	0.63
7665.00	91.26	3.20	5899.24	1418.69 N	138.27 E	1423.57	0.21
7760.00	91.02	3.01	5897.35	1513.53 N	143.42 E	1518.55	0.33
7854.00	90.92	3.18	5895.76	1607.38 N	148.49 E	1612.53	0.21
7949.00	90.83	1.74	5894.30	1702.28 N	152.57 E	1707.52	1.52
8044.00	90.40	0.23	5893.28	1797.26 N	154.21 E	1802.47	1.65
8138.00	90.99	1.31	5892.14	1891.24 N	155.47 E	1896.41	1.30
8233.00	91.05	0.89	5890.45	1986.21 N	157.29 E	1991.36	0.44
8328.00	90.52	0.55	5889.15	2081.19 N	158.48 E	2086.30	0.65
8422.00	90.52	0.54	5888.29	2175.19 N	159.38 E	2180.23	0.02
8517.00	90.34	0.03	5887.58	2270.18 N	159.85 E	2275.14	0.57
8612.00	89.60	0.25	5887.63	2365.18 N	160.08 E	2370.05	0.81
8706.00	90.46	0.38	5887.58	2459.18 N	160.59 E	2463.97	0.93
8801.00	90.74	0.78	5886.58	2554.17 N	161.55 E	2558.91	0.51
8896.00	90.68	0.04	5885.41	2649.16 N	162.22 E	2653.82	0.78
8990.00	90.49	0.15	5884.45	2743.15 N	162.38 E	2747.73	0.23
9085.00	90.22	1.03	5883.86	2838.14 N	163.36 E	2842.66	0.97
9180.00	90.12	0.37	5883.58	2933.14 N	164.53 E	2937.61	0.71
9274.00	90.71	0.41	5882.90	3027.13 N	165.17 E	3031.53	0.62
9369.00	90.65	1.19	5881.77	3122.11 N	166.50 E	3126.47	0.82
9463.00	89.88	359.35	5881.34	3216.11 N	166.94 E	3220.39	2.12
9558.00	89.66	359.51	5881.73	3311.10 N	166.00 E	3315.24	0.28
9653.00	89.63	0.18	5882.31	3406.10 N	165.74 E	3410.12	0.71
9747.00	90.03	0.91	5882.59	3500.09 N	166.63 E	3504.05	0.88
9842.00	89.63	0.22	5882.87	3595.09 N	167.57 E	3598.99	0.84
9937.00	90.99	0.54	5882.36	3690.08 N	168.20 E	3693.91	1.47
10031.00	90.62	0.20	5881.05	3784.07 N	168.82 E	3787.83	0.53
10126.00	90.80	0.36	5879.88	3879.06 N	169.28 E	3882.74	0.25
10220.00	90.74	0.05	5878.61	3973.05 N	169.61 E	3976.65	0.34
10315.00	91.26	1.31	5876.95	4068.03 N	170.73 E	4071.57	1.44
10410.00	91.70	1.66	5874.50	4162.97 N	173.19 E	4166.52	0.59
10504.00	90.49	0.48	5872.70	4256.93 N	174.95 E	4260.46	1.80
10555.00	90.34	0.40	5872.33	4307.93 N	175.34 E	4311.43	0.34
10624.00	90.34	0.40	5871.92	4376.92 N	175.82 E	4380.37	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 2.65 DEGREES (GRID)
A TOTAL CORRECTION OF 6.97 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10624.00 FEET
IS 4380.45 FEET ALONG 2.30 DEGREES (GRID)

Surveys to 1135 are flexi-shot surveys. Final survey is a straight line projection to TD.

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