HALLIBURTON | Sperry Drilling

PCDC - Pressure Case Directional
PCGK - Pressure Case Gamma

Powered by INSITE™

1 : 600 / 1 : 240

Company	**Noble**
Rig	**H&P 321**
Well	**NCLP AA06-69-1HNA**
Field	**Wattenberg**
Country	**USA**
API Number	**05-123-39121**

Country : **USA**
Field : **Wattenberg**
Location : **Lat: 40° 31' 15.92" North** **Long: 104° 27' 3.10" West**
Well : **NCLP AA06-69-1HNA**
Company : **Noble**
Rig : **H&P 321**

LOCATION
Latitude : **40° 31' 15.92" North**
Longitude : **104° 27' 3.10" West**
UTM Easting = **3,291,667.630 ft**
UTM Northing = **1,434,399.130 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4711.00 ft**
Log Measured From : **Drill Floor** **30.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4741.00 ft**
GL **4711.00 ft**
WD **N/A**

Depth Logged : **889.00 ft** To **11,242.00 ft**
Date Logged : **27-Jun-14** To **01-Jul-14**
Total Depth MD : **11,242.00 ft** TVD : **6,646.78 ft**
Spud Date : **27-Jun-14**

Unit No. : **11210424** Job No. : **CA-XX-0901288051**

Plot Type : **Final**
Plot Date : **02-Jul-14**

Run No.	Borehole Record (MD) Size	From	To
100	8.750 in	889.00 ft	5,488.00 ft
200	8.750 in	5,488.00 ft	7,006.00 ft
300	6.125 in	7,006.00 ft	11,242.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD) Size	Weight	From	To
9.625 in	37.90 lbpf	SURFACE	879.00 ft
7.000 in	25.70 lbpf	SURFACE	6,997.00 ft

WELL INFORMATION

MWD Run Number	100	200	300
Date run completed	28-Jun-14	29-Jun-14	01-Jul-14
Rig Bit Number	2	3	4
Bit Size (in)	8.750	8.750	6.125
Tool Nominal OD (in)	6.840	6.840	4.750
Log Start Depth (MD, ft)	889.00	5,488.00	7,006.00
Log End Depth (MD, ft)	5,488.00	7,006.00	11,242.00
Drill or Wipe	Drill	Drill	Drill
Drill/Wipe Start Date and Time	27-Jun-14 21:50	28-Jun-14 22:05	30-Jun-14 17:12
Drill/Wipe End Date and Time	28-Jun-14 14:56	29-Jun-14 10:50	01-Jul-14 15:56
Min Inc (deg) @ Depth (MD, ft)	0.13 @ 5,432.00	0.53 @ 5,526.00	87.60 @ 8,125.00
Max Inc (deg) @ Depth (MD, ft)	10.92 @ 3,915.00	89.70 @ 7,006.00	91.91 @ 7,556.00
Bit TFA(in2) / Bit Type	0.98 / PDC	1.74 / PDC	0.00 / PDC
Flow Rate (gpm)	599.09	585.49	327.98
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A
Fluid Type	Fresh Water Gel	Fresh Water Gel	Native/Spud Mud
Density (ppg) / Viscosity (spqt)	8.93 / 35.00	10.50 / 40.00	9.20 / 34.00
Filtrate CL (ppm)	1,900.00	2,000.00	2,000.00
pH / Fluid Loss (mptm)	9.80 / 9	8.70 / 8	8.40 / 9
PV (cP) / YP (lhf2)	6 / 3.00	10 / 6.00	7 / 6.00
% Solids / % Sand	4.40 / 0.15	11.00 / 0.15	3.00 / 0.01
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	150.10 / PCM	162.80 / PCM	226.10 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 150.10	N/A @ 162.80	N/A @ 226.10		
Lead MWD Engineer	Robert Barnes	Robert Barnes	Robert Barnes		
Customer Representative	Stetson Nielsen	Stetson Nielsen	Stetson Nielsen		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	12365886	12365886	12365886		
Insert Serial Number	11145581	11145581	11145581		
Date and Time Initialized	27-Jun-14 13:38	01-Jan-70 00:00	29-Jun-14 19:11		
Date and Time Read	29-Jun-14 16:03	29-Jun-14 16:18	02-Jul-14 00:04		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	56.00	54.00	65.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	12365886	12365886	12365886		
Sonde Serial Number	11638573	11638573	11638573		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	346.63	193.81	151.50		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	48.80	47.08	68.21		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	12365886	12365886	12365886		
Insert/Sonde Serial Number	11120591	11120591	11120591		

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" modelforwater based fluids and the "Brigham Plastic"model for oil and synthetic based fluids.

4. All data presented is recorded data unless otherwice specified.

5. The following smoothing parameters have been applied to the data:

1:600 Log
PGRC (Gamma CG) and ROPA (Average Rate of Penetration)
Interval Resolution: 1.0 ft
Interval Distance: 3.0 ft

1:240 Log
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft

ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft

Interval Distance: 1.2 ft

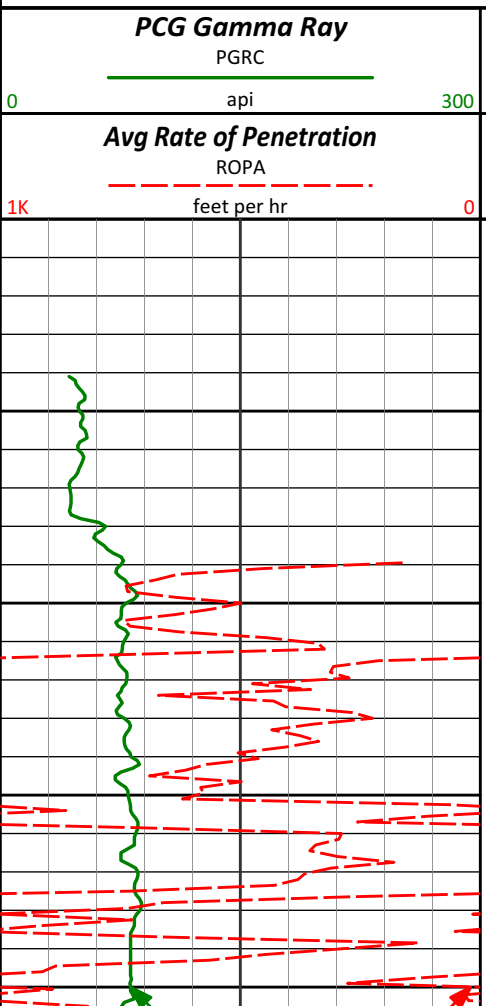
6. Insite Version V8.0.10

WARRANTY

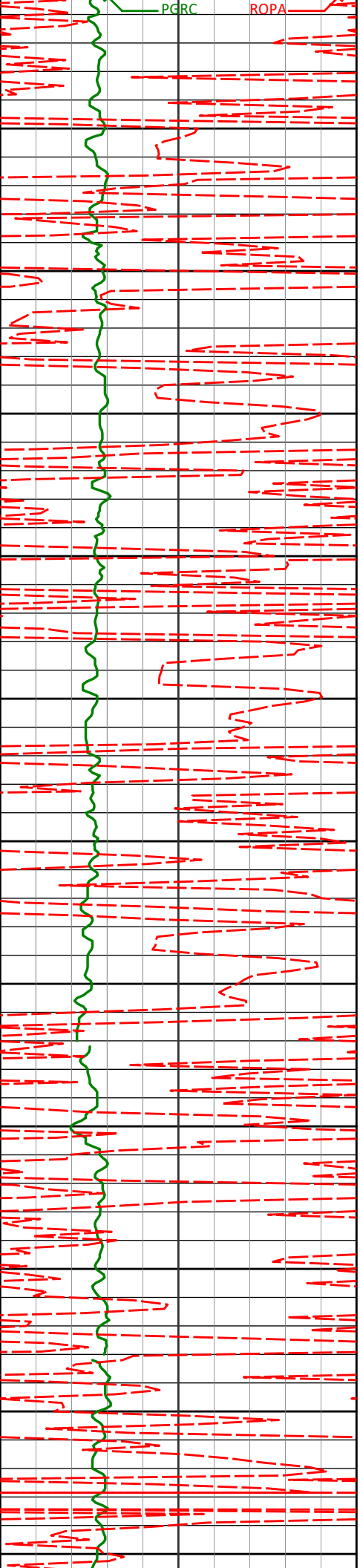
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON
Sperry Drilling Services
MD Correlation Log 1:600

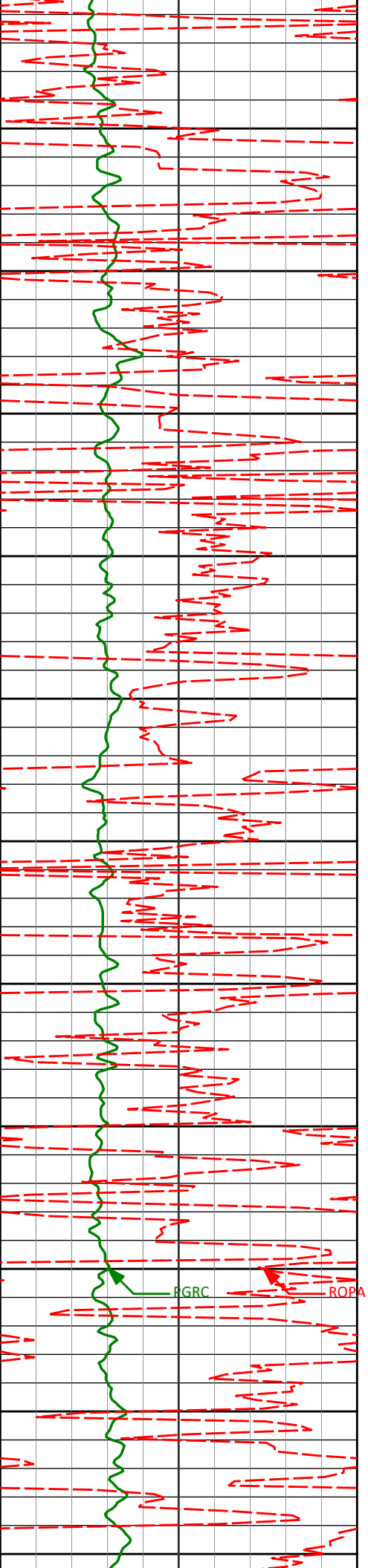
Noble Energy
NCLP AA06-69-1HNA
H&P 321
Sec. 4-T6N-R63W



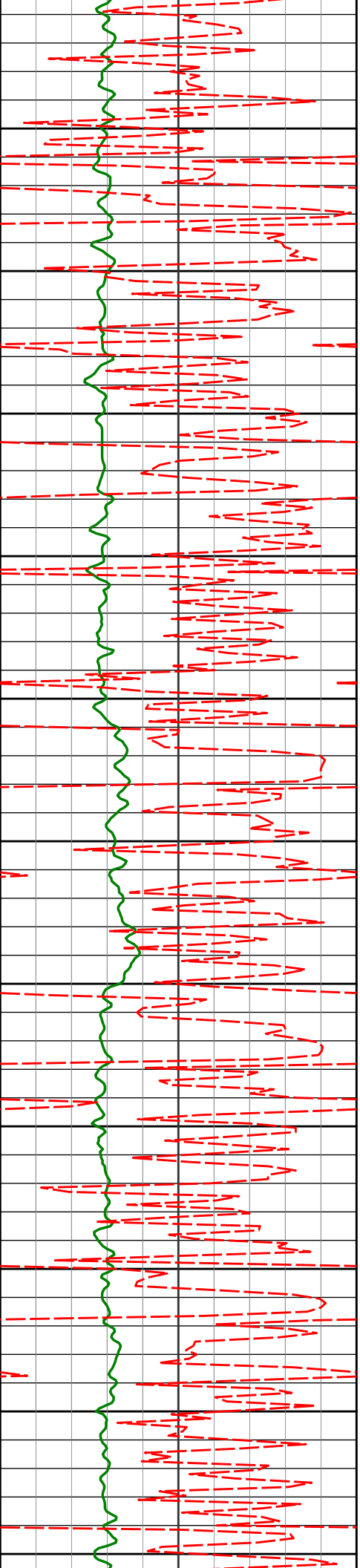
Depth ft	Depth	Inc.	Azi.	TVD	V.S.
	844'	1.00°	331.47°	843.98'	0.99'
	905'	0.78°	335.78°	904.97'	1.46'
	996'	0.83°	334.25°	995.96'	2.06'



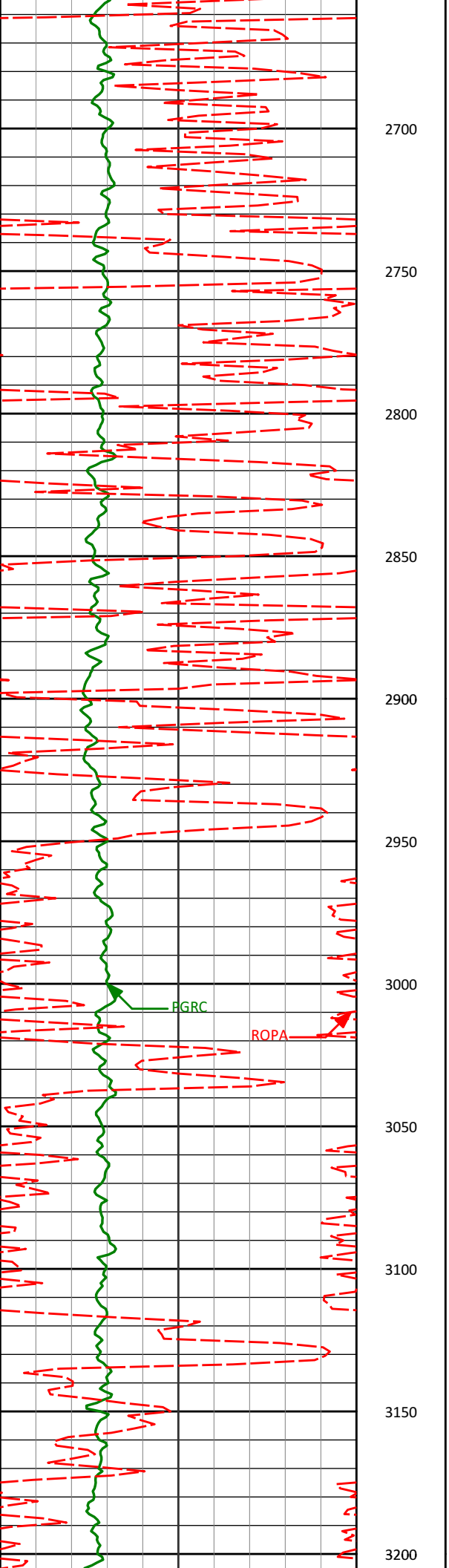
1089'	0.96°	354.46°	1088.95'	2.50'
1182'	0.98°	221.65°	1181.95'	3.11'
1273'	2.29°	66.32°	1272.93'	1.97'
1365'	0.98°	306.55°	1364.90'	0.99'
1456'	0.92°	278.65°	1455.89'	2.36'
1549'	1.40°	66.12°	1548.88'	2.09'



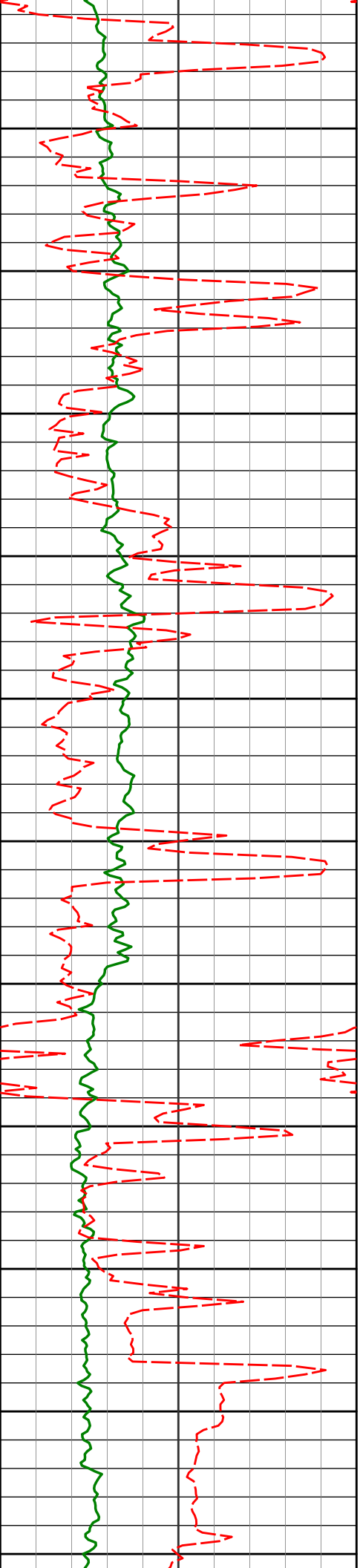
1641'	0.56°	296.31°	1640.87'	1.50'
1736'	0.60°	289.34°	1735.87'	2.41'
1830'	0.71°	282.37°	1829.86'	3.45'
1925'	0.85°	292.10°	1924.85'	4.70'
2020'	0.79°	286.42°	2019.84'	6.00'



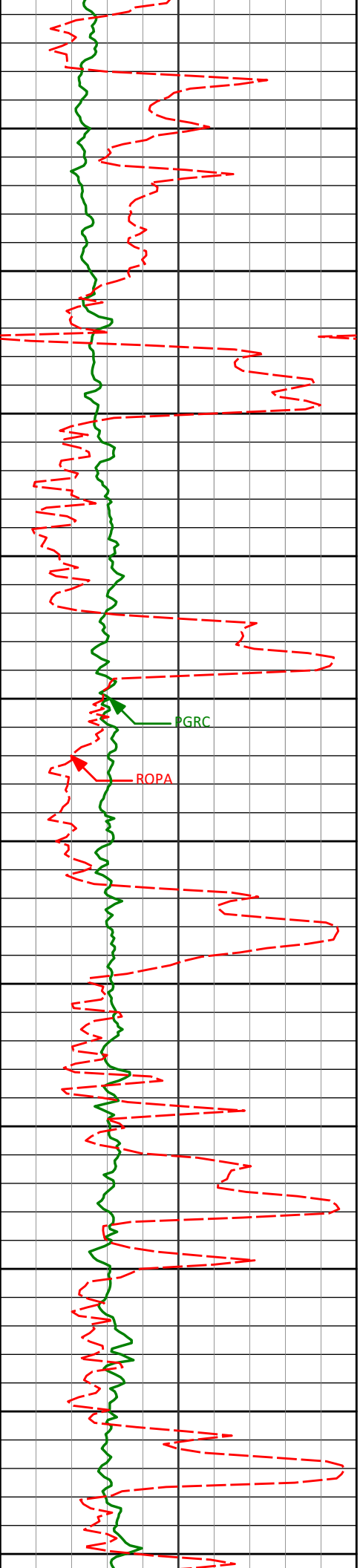
2115'	0.78°	300.96°	2114.84'	7.21'
2209'	0.68°	292.22°	2208.83'	8.30'
2304'	0.62°	274.89°	2303.82'	9.35'
2399'	2.16°	349.00°	2398.80'	10.30'
2493'	3.90°	355.76°	2492.66'	11.13'
2588'	5.54°	359.50°	2587.34'	11.82'



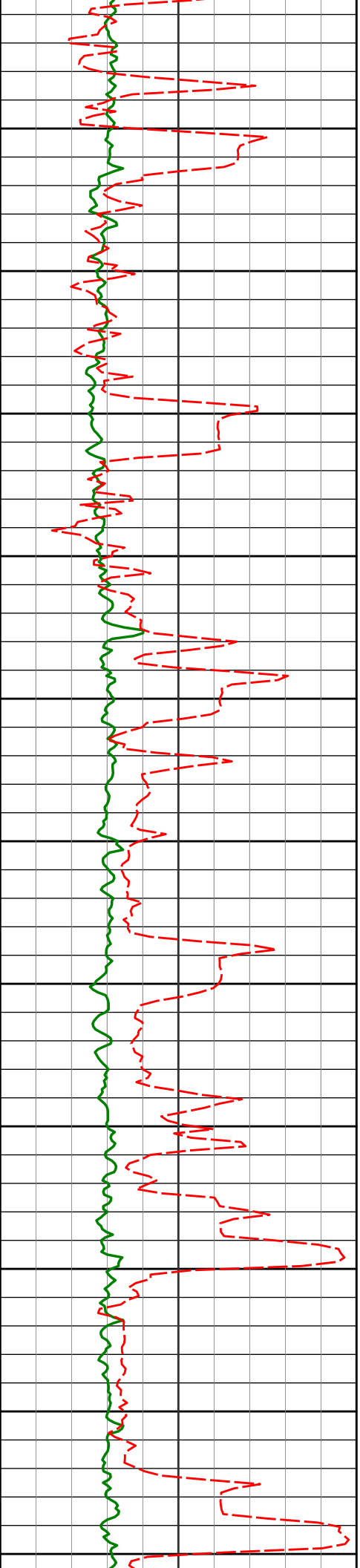
2683'	5.48°	358.46°	2681.90'	12.46'
2778'	6.91°	1.11°	2776.34'	13.01'
2873'	8.23°	359.05°	2870.51'	13.67'
2967'	10.11°	356.44°	2963.30'	15.08'
3062'	10.35°	356.43°	3056.79'	17.01'
3157'	9.33°	358.79°	3150.40'	18.55'



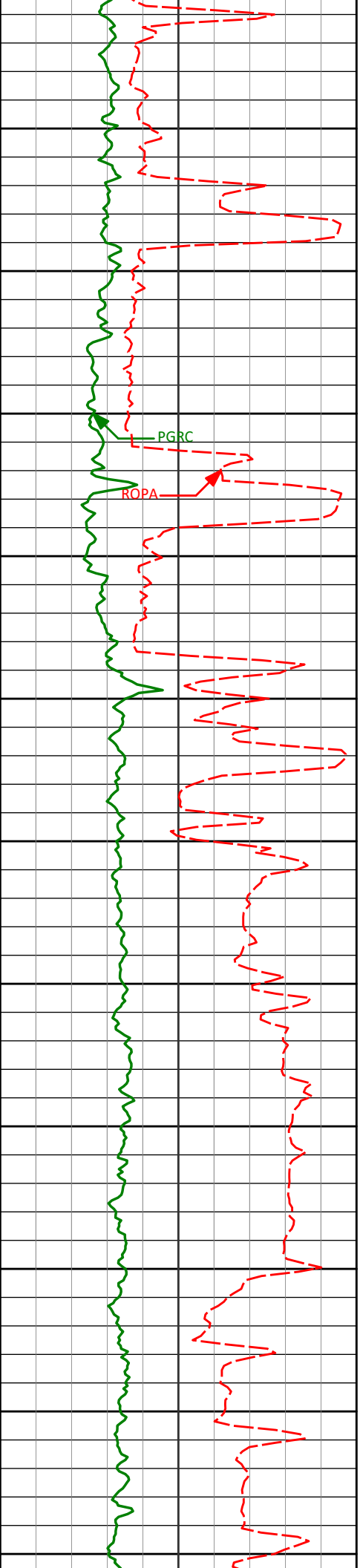
3251'	8.01°	1.53°	3243.32'	19.28'	
3346'	7.09°	2.76°	3337.50'	19.48'	
3441'	7.81°	349.52°	3431.70'	21.01'	
3536'	8.73°	354.50°	3525.71'	23.58'	
3631'	9.23°	355.22°	3619.55'	25.68'	
3725'	9.81°	354.88°	3712.25'	27.84'	



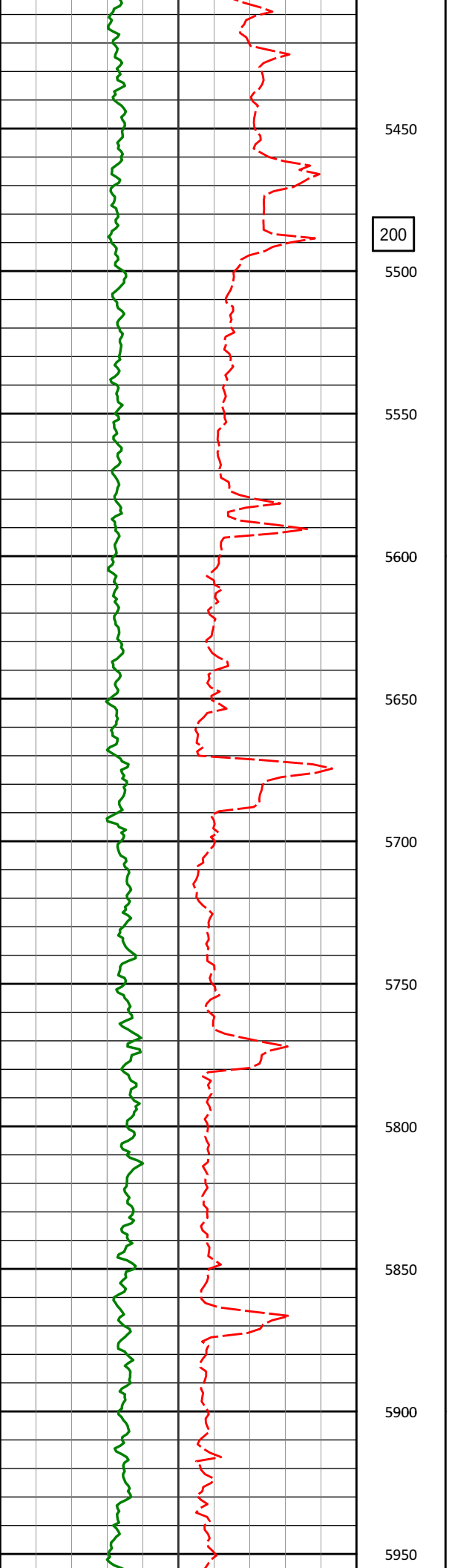
3820'	10.49°	356.07°	3805.77'	30.03'
3915'	10.92°	355.65°	3899.11'	32.22'
4010'	10.25°	353.04°	3992.50'	34.84'
4105'	9.01°	351.58°	4086.16'	37.78'
4199'	8.19°	354.45°	4179.10'	40.23'
4294'	7.83°	2.80°	4273.17'	41.26'



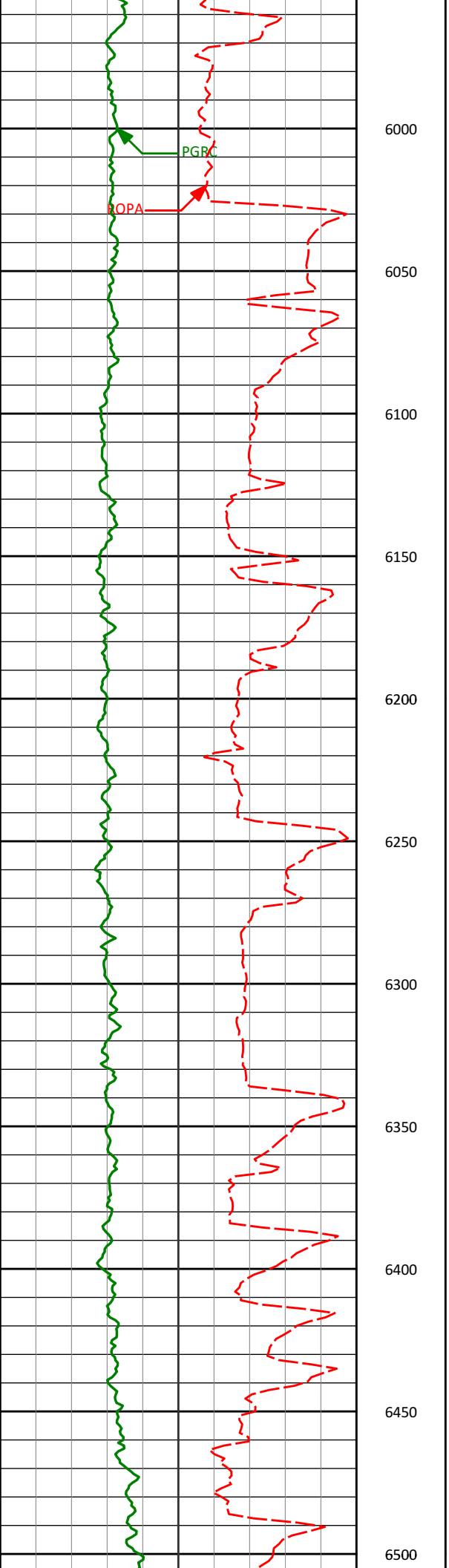
4389'	7.84°	0.84°	4367.29'	41.53'
4484'	7.75°	359.80°	4461.41'	42.14'
4579'	7.23°	356.56°	4555.60'	43.17'
4674'	6.59°	349.81°	4649.91'	45.08'
4769'	6.01°	357.91°	4744.34'	46.77'



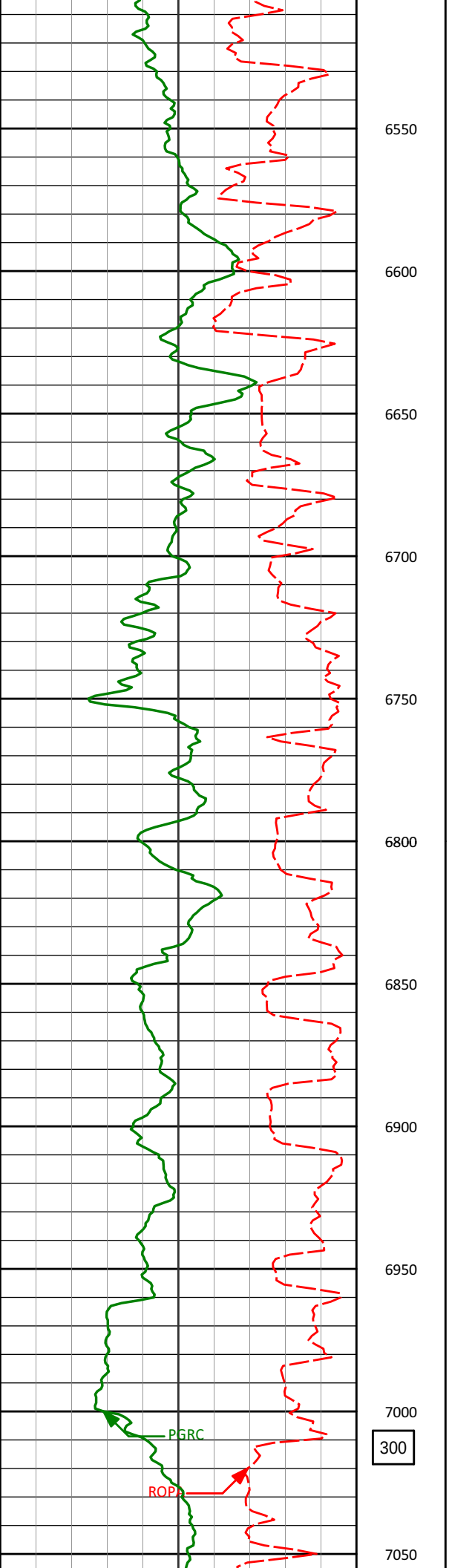
4863'	4.81°	359.29°	4837.92'	47.46'
4958'	3.21°	8.07°	4932.68'	47.49'
5053'	1.53°	27.70°	5027.60'	46.72'
5148'	0.57°	70.94°	5122.58'	45.76'
5243'	0.66°	99.70°	5217.58'	44.77'
5337'	0.65°	92.59°	5311.57'	43.70'



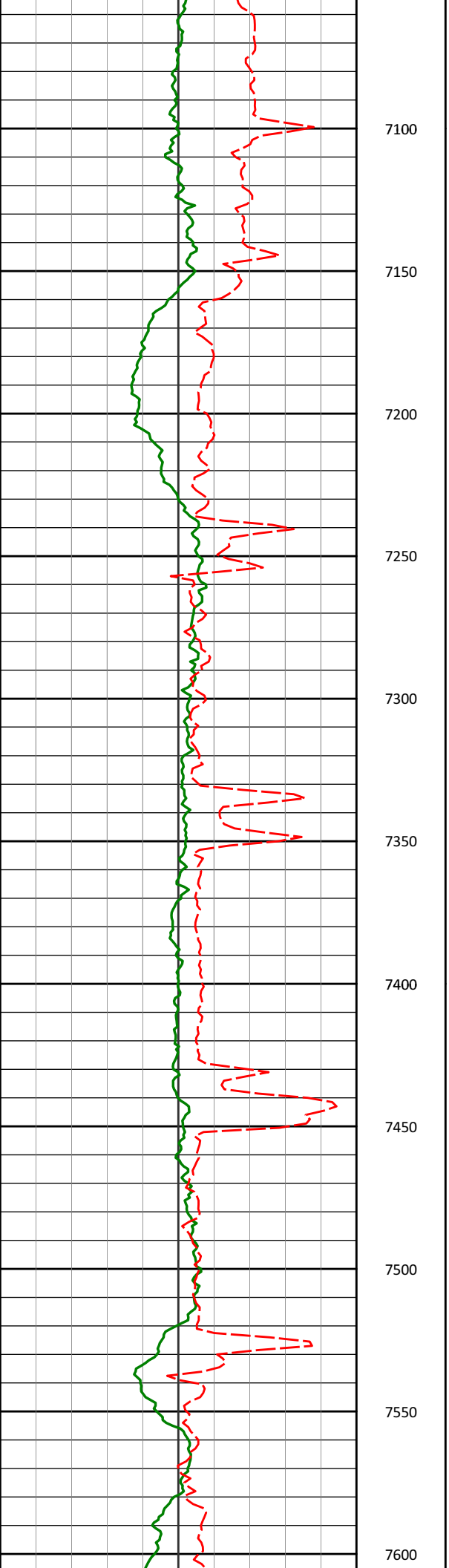
5432'	0.13°	16.30°	5406.57'	43.14'
5526'	0.53°	11.33°	5500.57'	43.05'
5621'	0.74°	354.81°	5595.56'	43.08'
5717'	0.75°	338.43°	5691.55'	43.43'
5811'	0.74°	310.23°	5785.55'	44.17'
5906'	0.89°	296.94°	5880.54'	45.33'



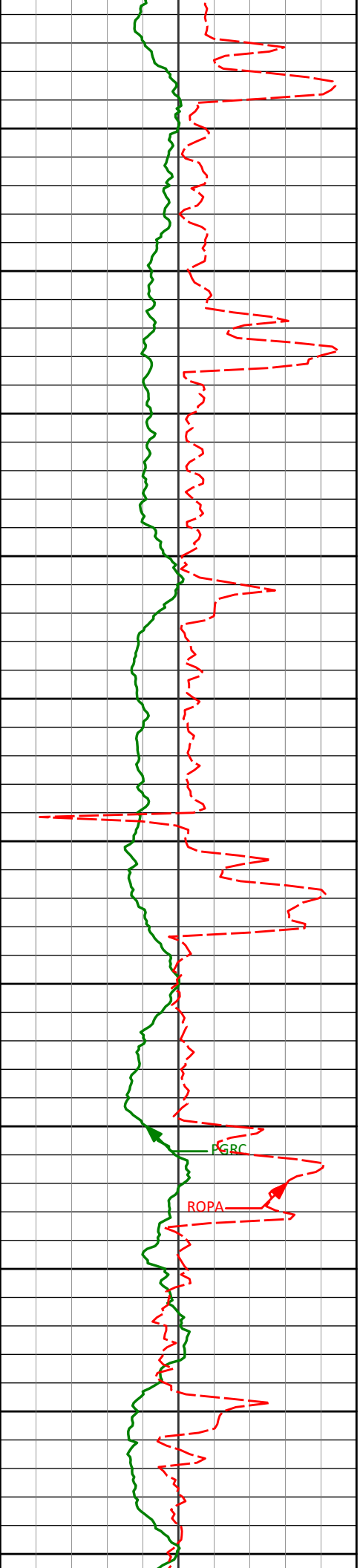
5974'	0.73°	293.96°	5948.53'	46.22'
6001'	0.66°	291.60°	5975.53'	46.52'
6096'	11.53°	271.60°	6069.85'	56.56'
6191'	18.07°	265.79°	6161.66'	80.70'
6285'	19.69°	263.38°	6250.60'	110.78'
6333'	18.61°	259.79°	6295.94'	126.21'
6380'	21.69°	260.76°	6340.06'	142.00'
6428'	29.06°	263.33°	6383.40'	162.19'
6475'	36.84°	271.43°	6422.83'	187.58'



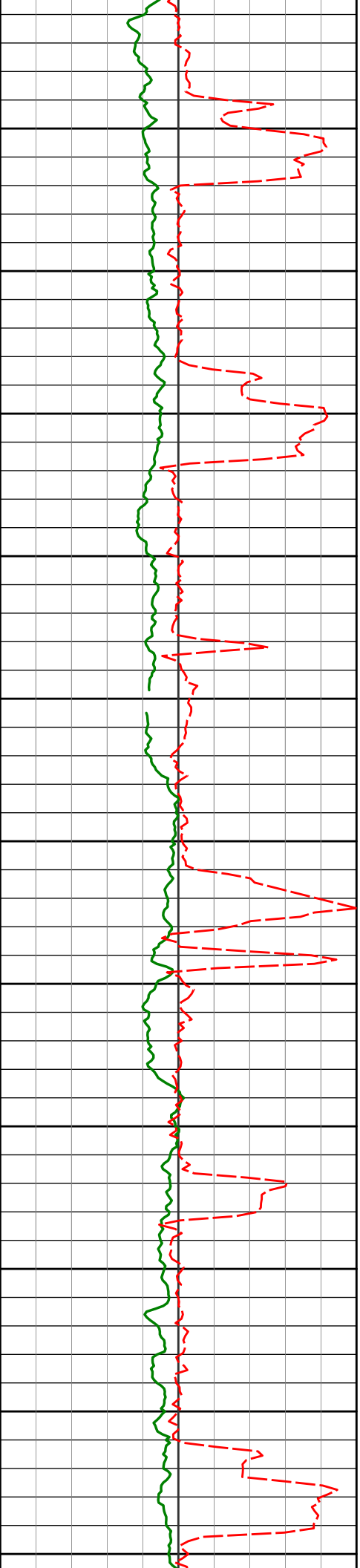
6523'	41.80°	275.37°	6459.96'	217.97'
6569'	46.90°	276.06°	6492.84'	250.08'
6617'	51.88°	276.07°	6524.07'	286.45'
6664'	58.31°	271.22°	6550.96'	324.96'
6712'	63.30°	269.81°	6574.37'	366.80'
6759'	68.78°	267.78°	6593.45'	409.62'
6807'	72.56°	267.41°	6609.34'	454.70'
6854'	76.75°	267.94°	6621.77'	499.82'
6902'	80.28°	267.93°	6631.33'	546.66'
6952'	86.45°	266.70°	6637.10'	596.06'
7034'	89.66°	267.11°	6639.89'	677.54'



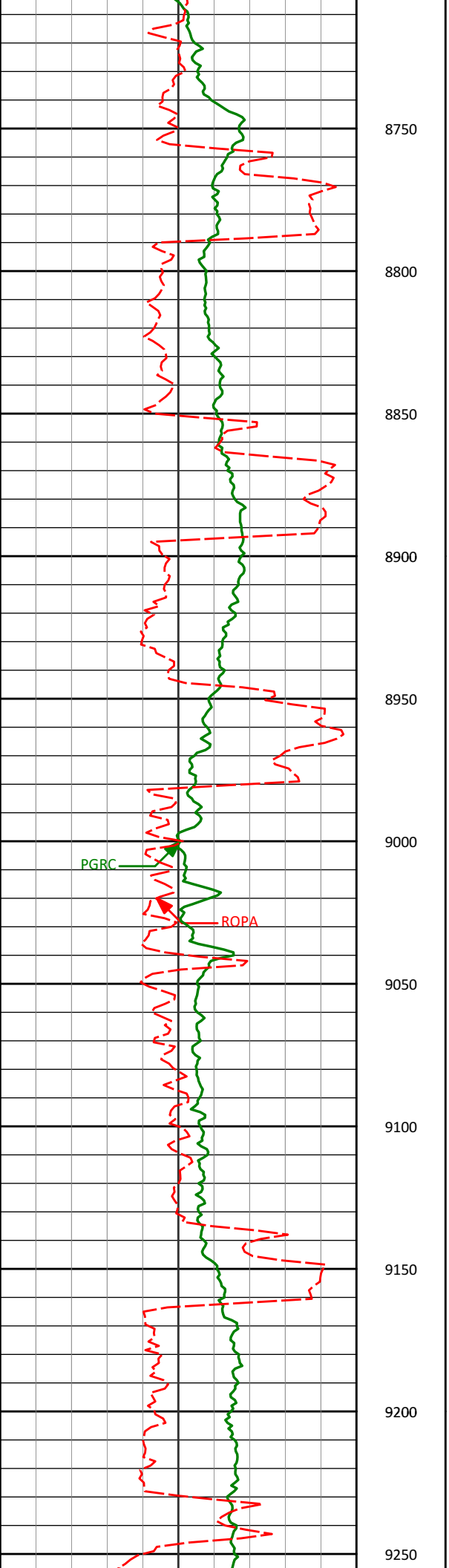
7081'	89.20°	267.80°	6640.35'	724.31'
7176'	88.64°	268.65°	6642.14'	818.96'
7271'	88.46°	268.37°	6644.55'	913.64'
7366'	88.98°	268.04°	6646.67'	1008.28'
7461'	91.45°	268.52°	6646.31'	1102.95'
7556'	91.91°	268.19°	6643.53'	1197.60'



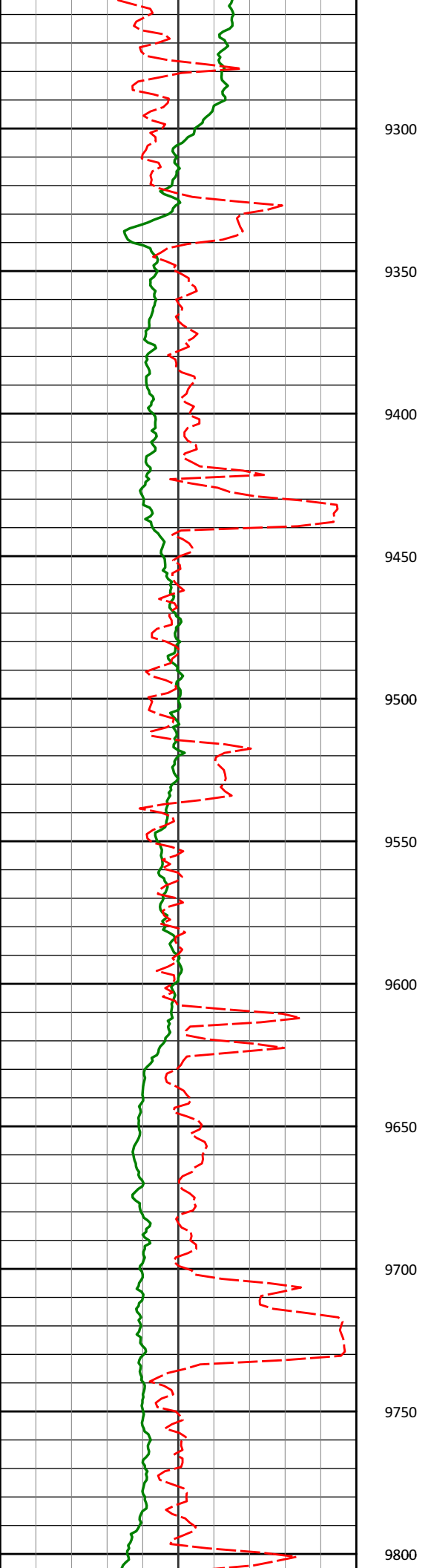
7650'	7650'	91.26°	267.99°	6640.93'	1291.21'
7745'	7745'	90.40°	268.12°	6639.55'	1385.85'
7840'	7840'	91.57°	267.74°	6637.92'	1480.46'
7935'	7935'	90.99°	268.60°	6635.80'	1575.10'
8030'	8030'	88.24°		6636.44'	1669.78'
8125'	8125'	87.60°		6639.88'	1764.31'



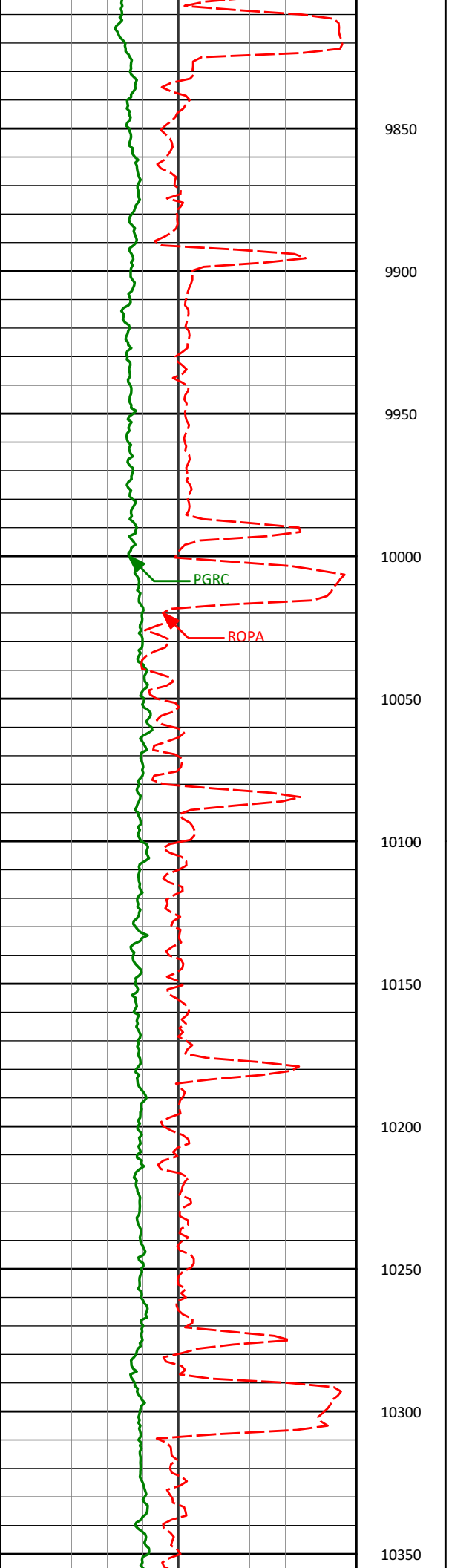
8220'	88.30°	6643.28'	1858.77'
8314'	89.11°	6645.41'	1952.44'
8409'	89.54°	6646.53'	2047.21'
8504'	90.80°	6646.24'	2142.00'
8598'	90.86°	6644.88'	2235.69'
8693'	89.63°	6644.48'	2330.28'



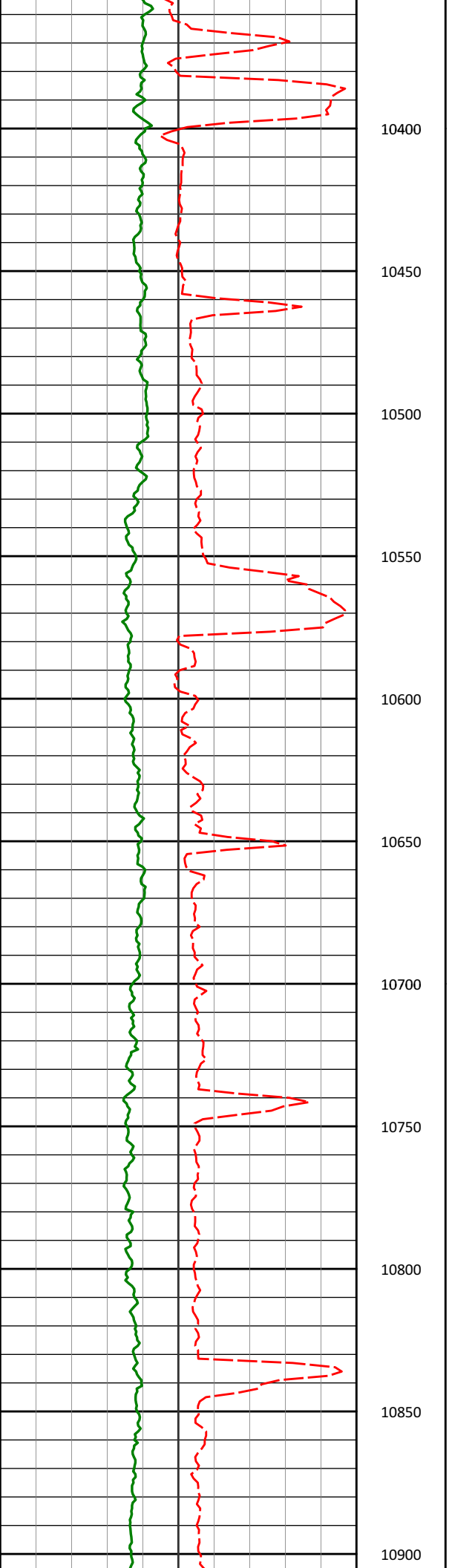
8787'	89.32°	6645.34'	2423.89'
8882'	89.32°	6646.46'	2518.54'
8977'	89.48°	6647.46'	2613.37'
9071'	88.67°	6648.98'	2707.27'
9166'	90.62°	6649.57'	2802.18'



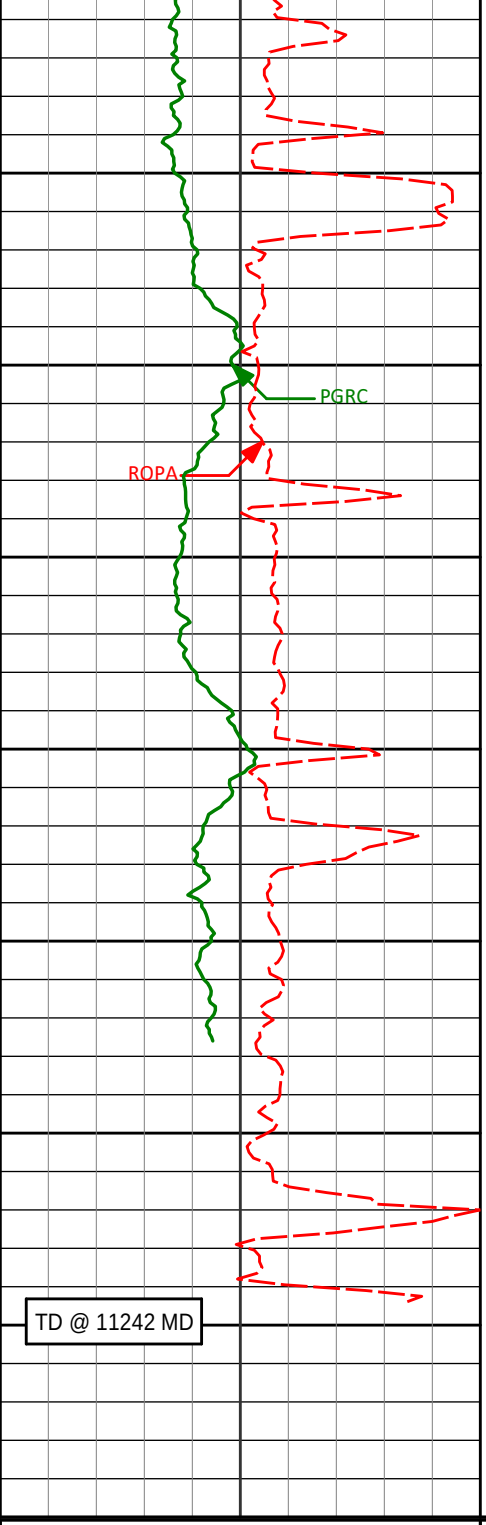
9261'	90.12°	6648.95'	2897.09'
9356'	89.20°	6649.52'	2991.99'
9451'	90.12°	6650.08'	3086.85'
9546'	90.77°	6649.34'	3181.64'
9641'	91.67°	6647.32'	3276.38'
9735'	90.77°	6645.32'	3370.11'



9830'	89.41°	6645.17'	3464.74'
9925'	90.03°	6645.63'	3559.27'
10020'	88.98°	6646.45'	3653.84'
10114'	89.29°	6647.87'	3747.42'
10209'	89.69°	6648.72'	3841.95'
10304'	89.54°	6649.36'	3936.57'



10399'	90.00°	6649.74'	4031.33'
10494'	90.71°	6649.15'	4126.14'
10589'	89.78°	6648.74'	4220.98'
10683'	89.38°	6649.43'	4314.82'
10778'	89.51°	6650.35'	4409.62'
10873'	88.95°	6651.63'	4504.38'



10950
11000
11050
11100
11150
11200
11250

Depth	Inc.	Azi.	TVD	V.S.
10968'	90.15°		6652.38'	4599.10'
11062'	91.05°		6651.39'	4692.80'
11157'	91.60°		6649.19'	4787.48'
11177'	91.63°		6648.63'	4807.41'
11242'	91.63°		6646.78'	4872.17'

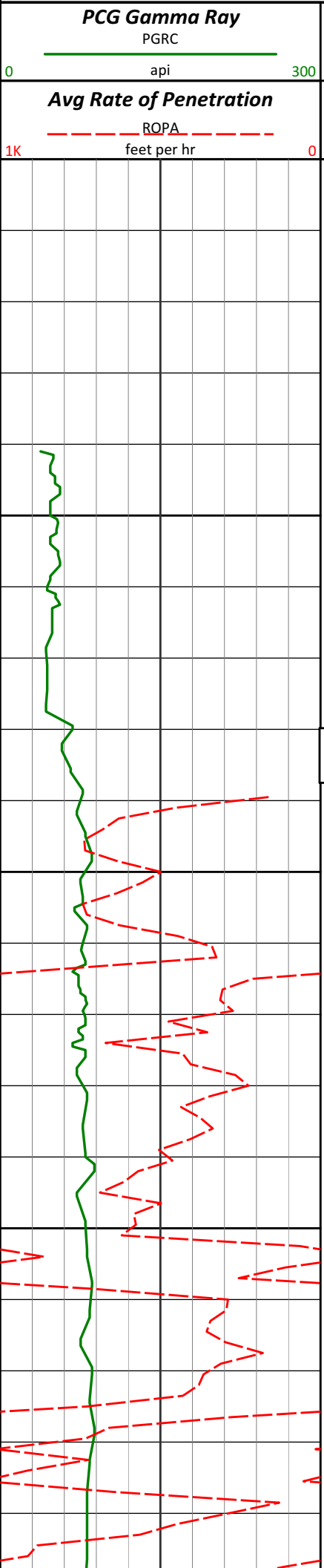
Avg Rate of Penetration
ROPA
1K feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

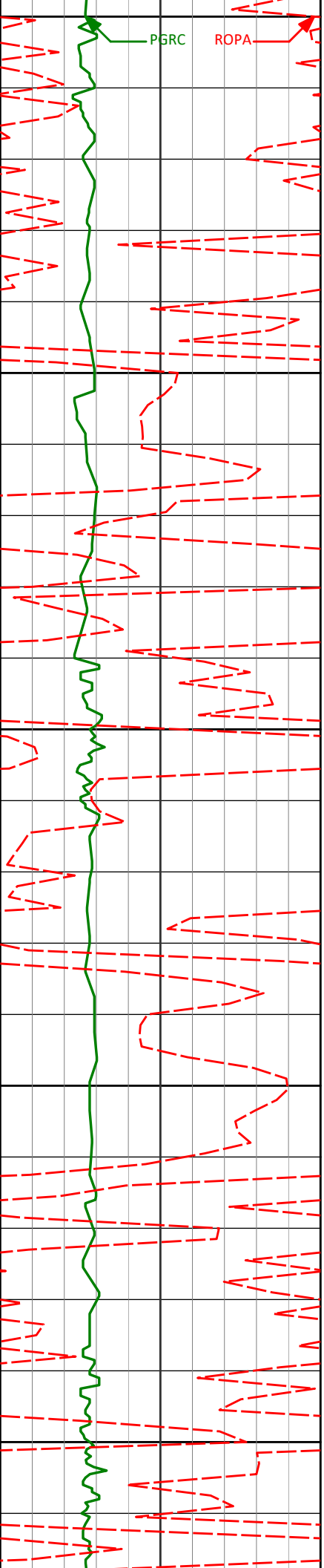
Depth ft

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

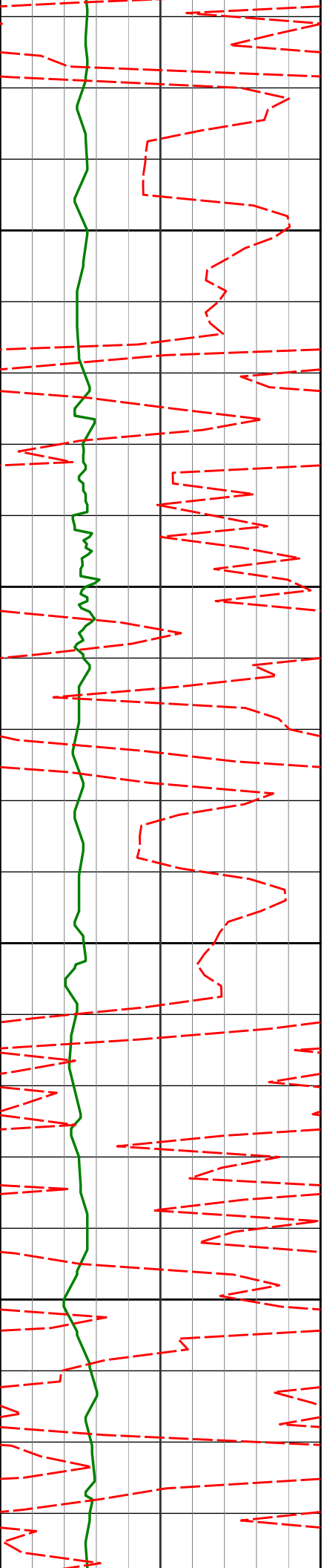
Noble Energy
NCLP AA06-69-1HNA
H&P 321
Sec. 4-T6N-R63W



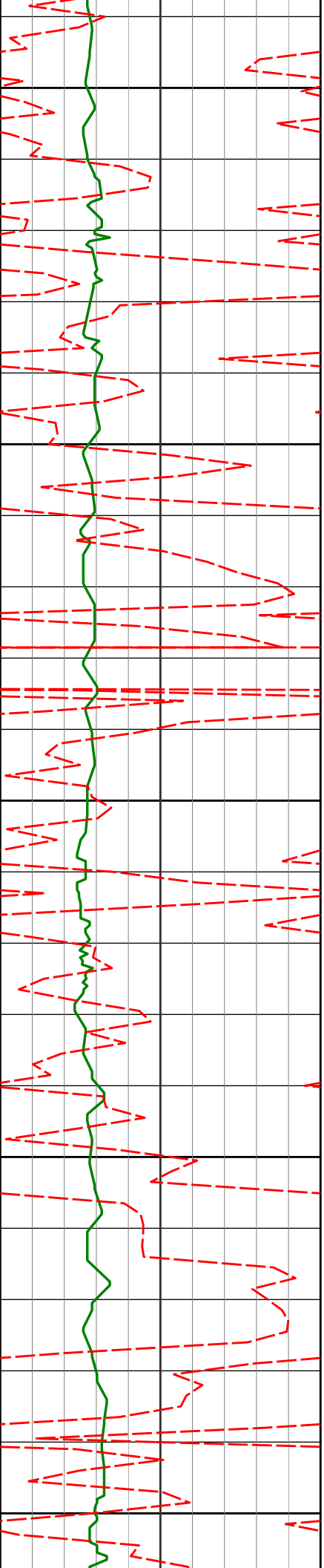
Depth	Inc.	Azi.	TVD	V.S.
844'	1.00°	331.47°	843.98'	0.99'
905'	0.78°	335.78°	904.97'	1.46'
996'	0.83°	334.25°	995.96'	2.06'



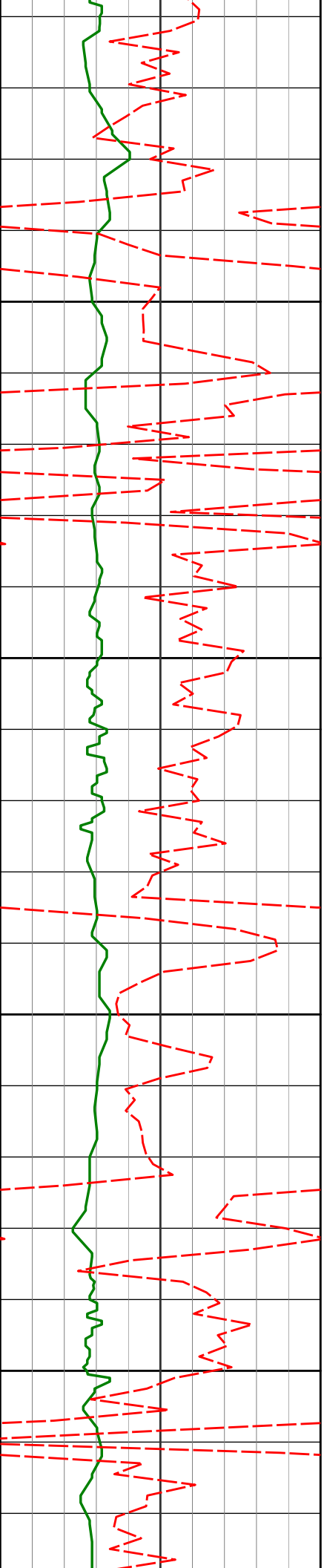
1089'	0.96°	354.46°	1088.95'	2.50'
1182'	0.98°	221.65°	1181.95'	3.11'



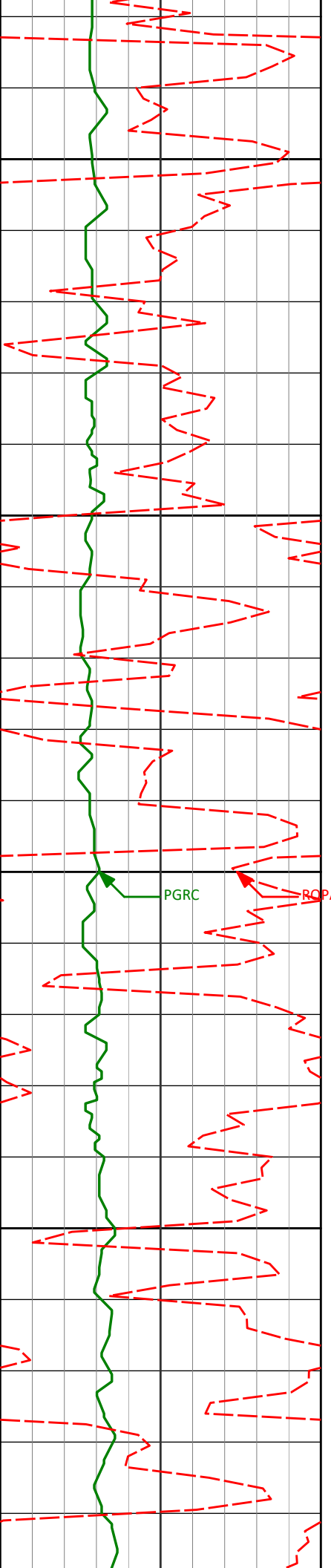
1273'	2.29°	66.32°	1272.93'	1.97'
1365'	0.98°	306.55°	1364.90'	0.99'



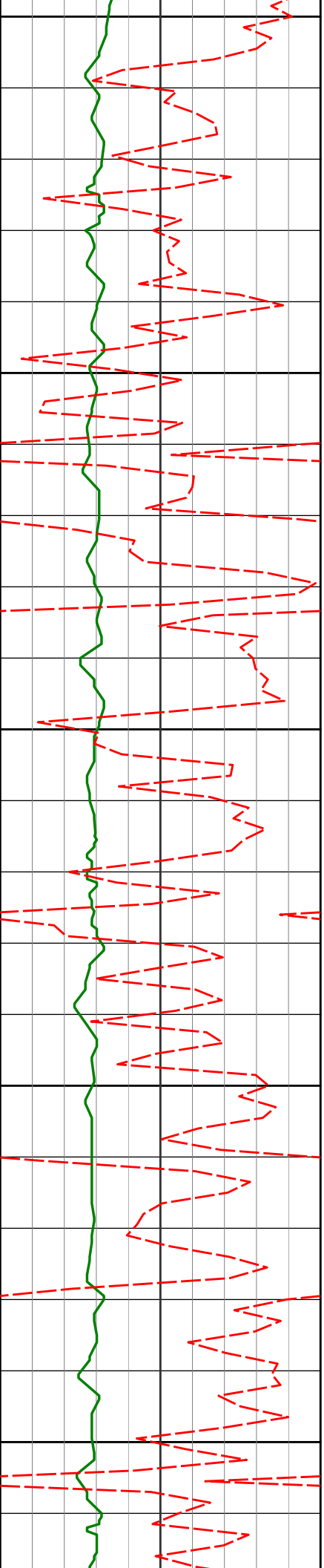
1456'	0.92°	278.65°	1455.89'	2.36'
1549'	1.40°	66.12°	1548.88'	2.09'
1641'	0.56°	296.31°	1640.87'	1.50'



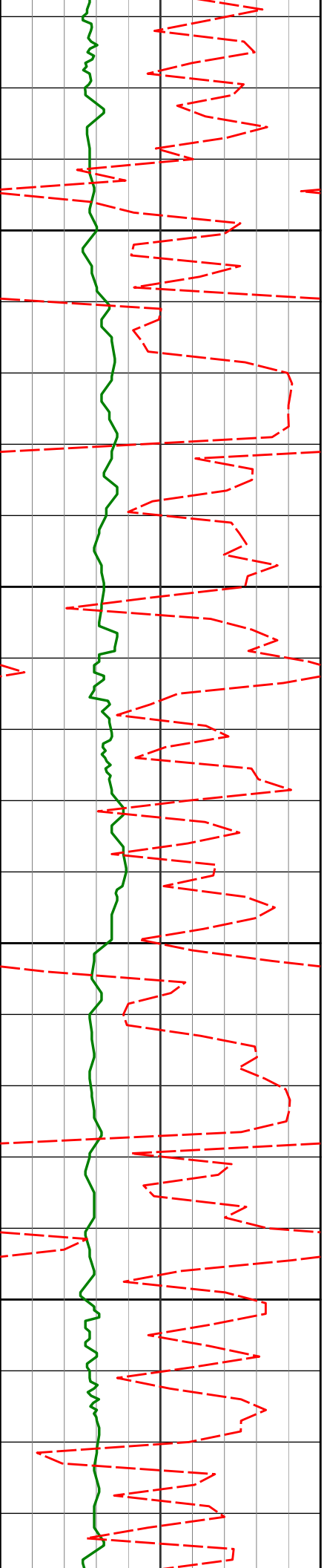
1736'	0.60°	289.34°	1735.87'	2.41'
1830'	0.71°	282.37°	1829.86'	3.45'



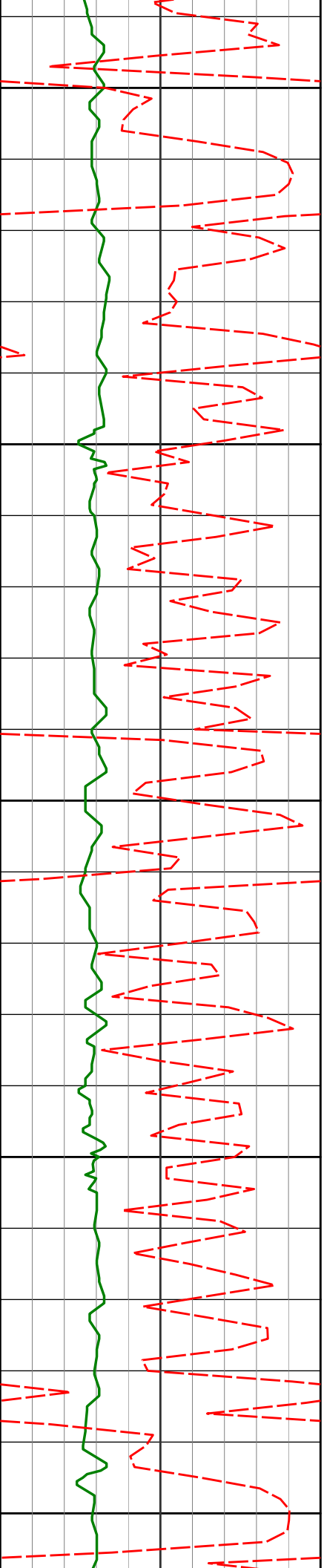
1925'	0.85°	292.10°	1924.85'	4.70'
2020'	0.79°	286.42°	2019.84'	6.00'



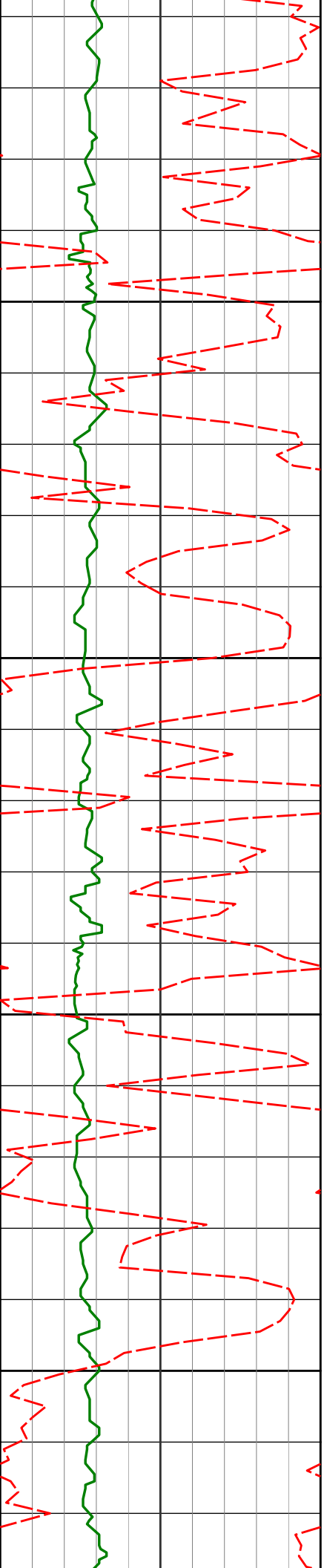
2115'	0.78°	300.96°	2114.84'	7.21'
2209'	0.68°	292.22°	2208.83'	8.30'
2304'	0.62°	274.89°	2303.82'	9.35'



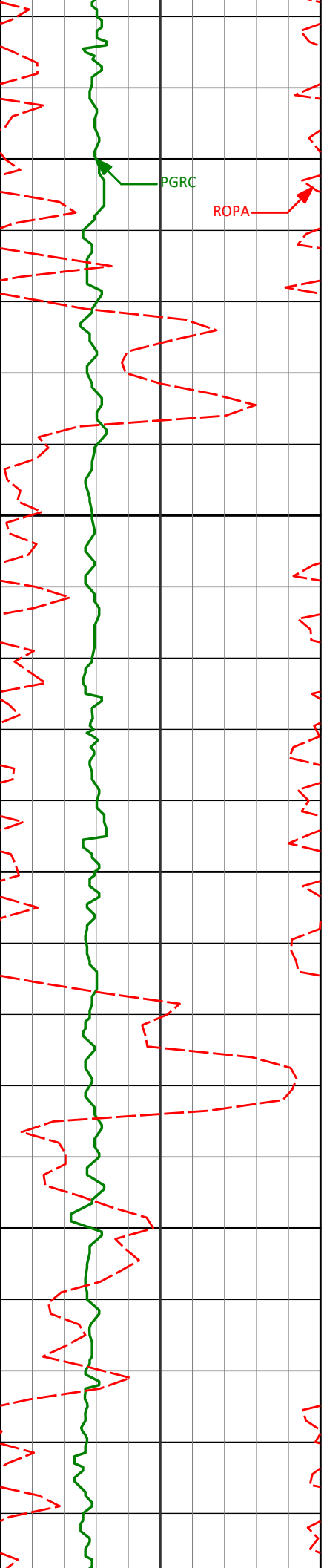
2399'	2.16°	349.00°	2398.80'	10.30'
2493'	3.90°	355.76°	2492.66'	11.13'



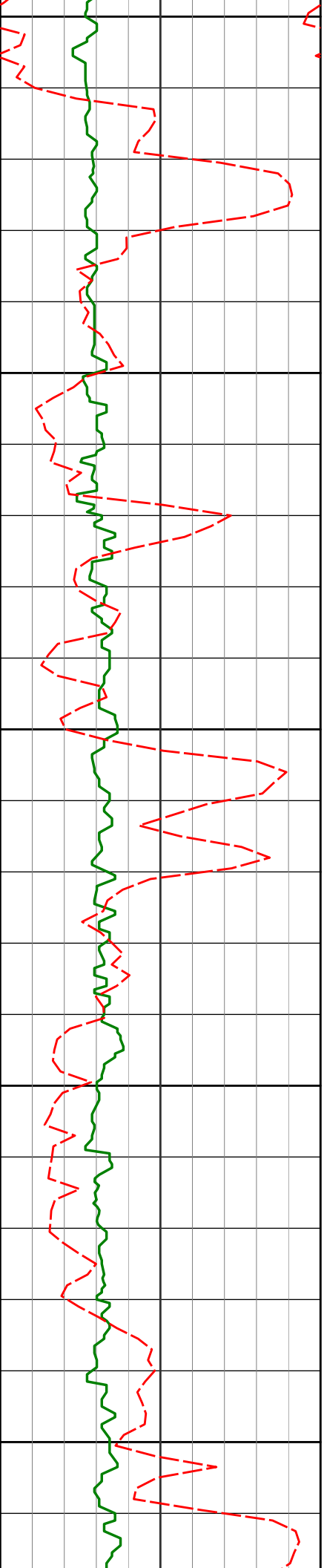
2588'	5.54°	359.50°	2587.34'	11.82'
2683'	5.48°	358.46°	2681.90'	12.46'



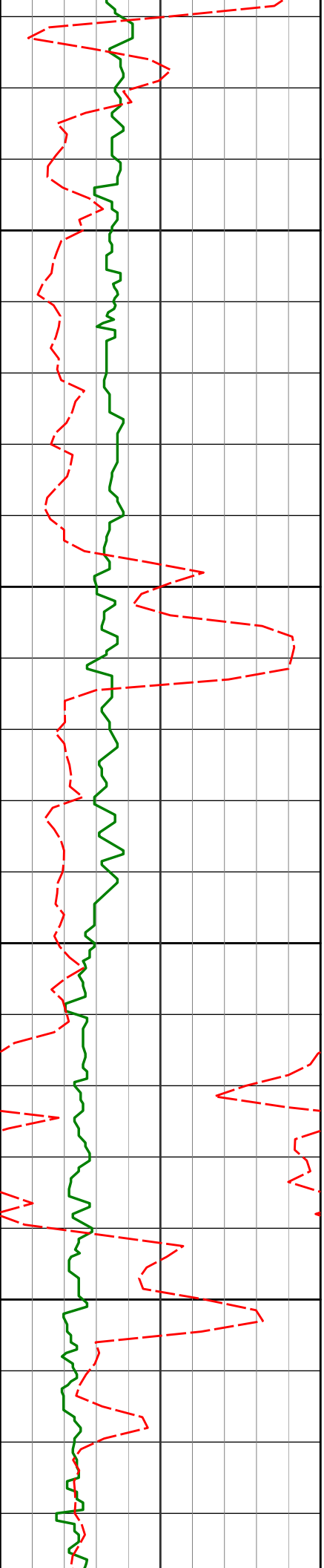
2778'	6.91°	1.11°	2776.34'	13.01'
2873'	8.23°	359.05°	2870.51'	13.67'
2967'	10.11°	356.44°	2963.30'	15.08'



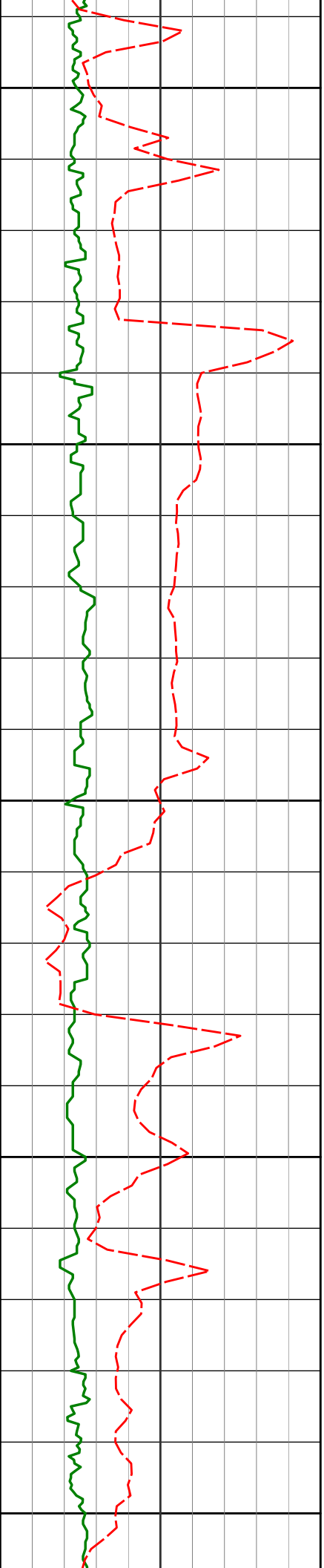
3062'	10.35°	356.43°	3056.79'	17.01'
3157'	9.33°	358.79°	3150.40'	18.55'



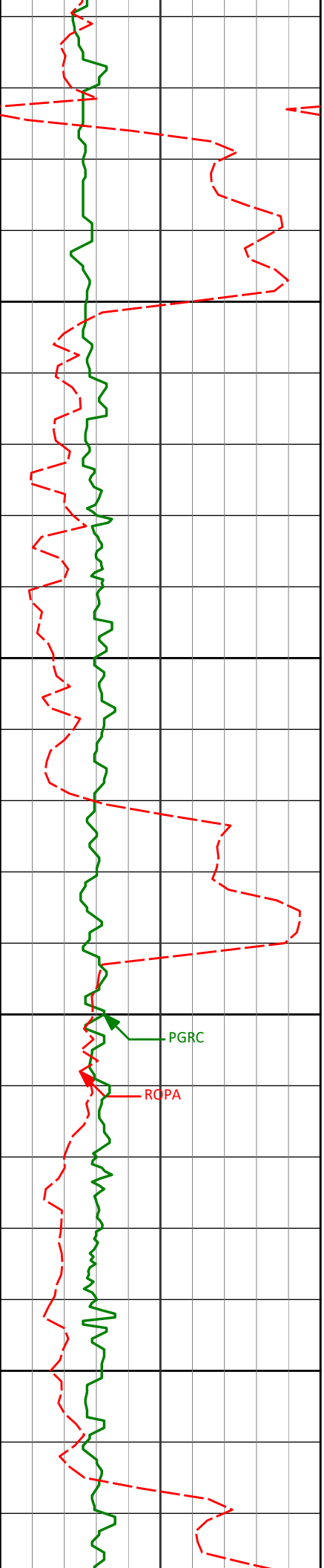
3251'	8.01°	1.53°	3243.32'	19.28'	
3346'	7.09°	2.76°	3337.50'	19.48'	



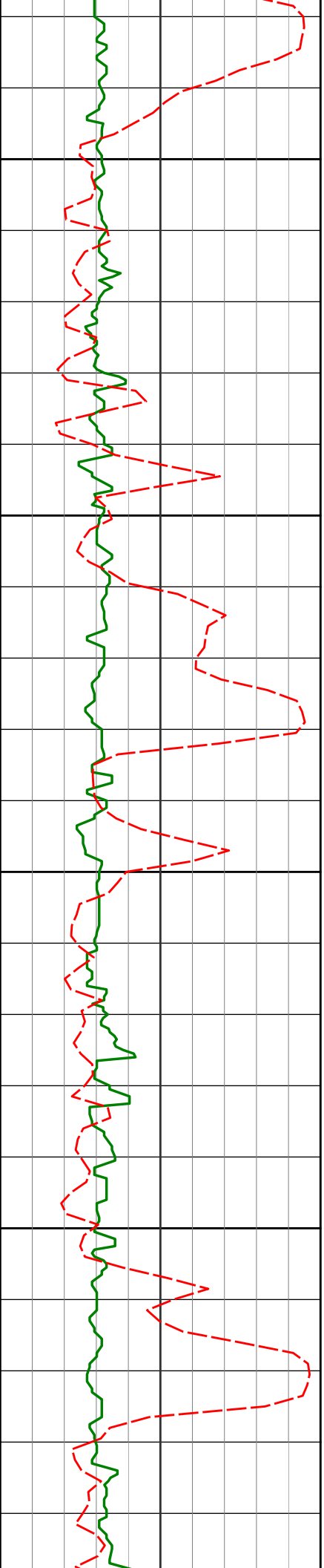
3441'	7.81°	349.52°	3431.70'	21.01'
3536'	8.73°	354.50°	3525.71'	23.58'
3631'	9.23°	355.22°	3619.55'	25.68'



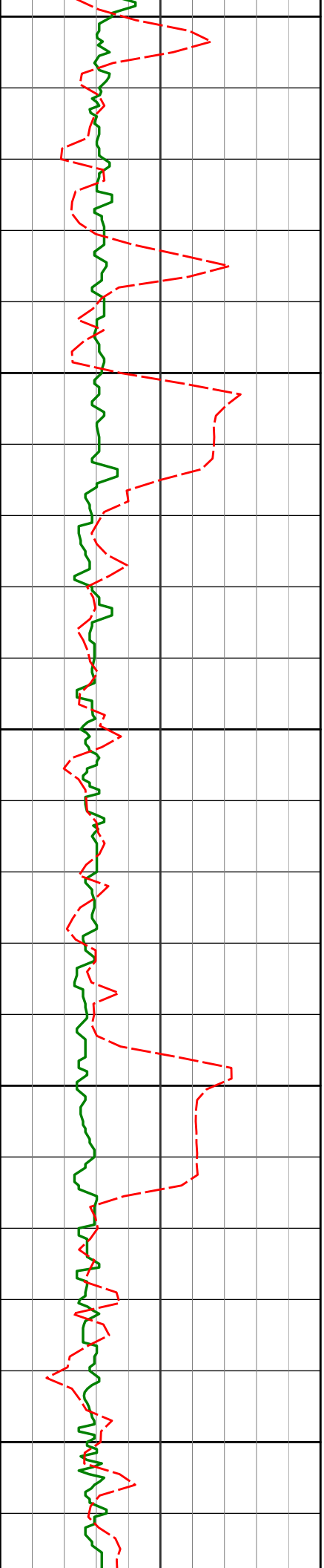
3725'	9.81°	354.88°	3712.25'	27.84'
3820'	10.49°	356.07°	3805.77'	30.03'



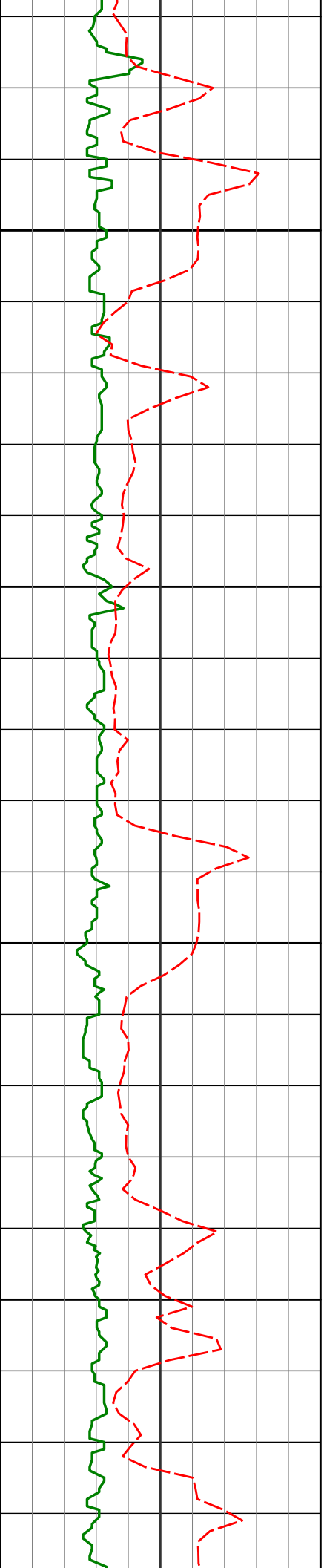
3915'	10.92°	355.65°	3899.11'	32.22'
4010'	10.25°	353.04°	3992.50'	34.84'



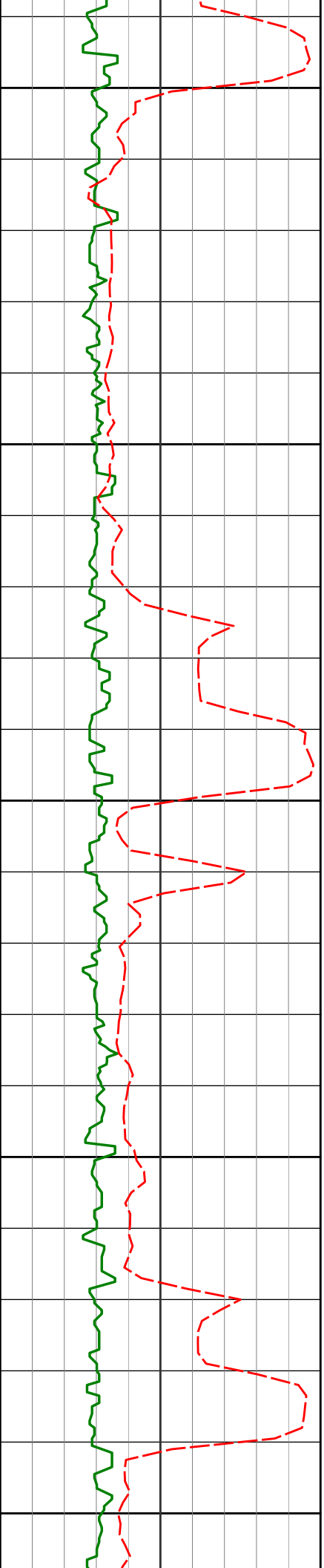
4105'	9.01°	351.58°	4086.16'	37.78'
4199'	8.19°	354.45°	4179.10'	40.23'
4294'	7.83°	2.80°	4273.17'	41.26'



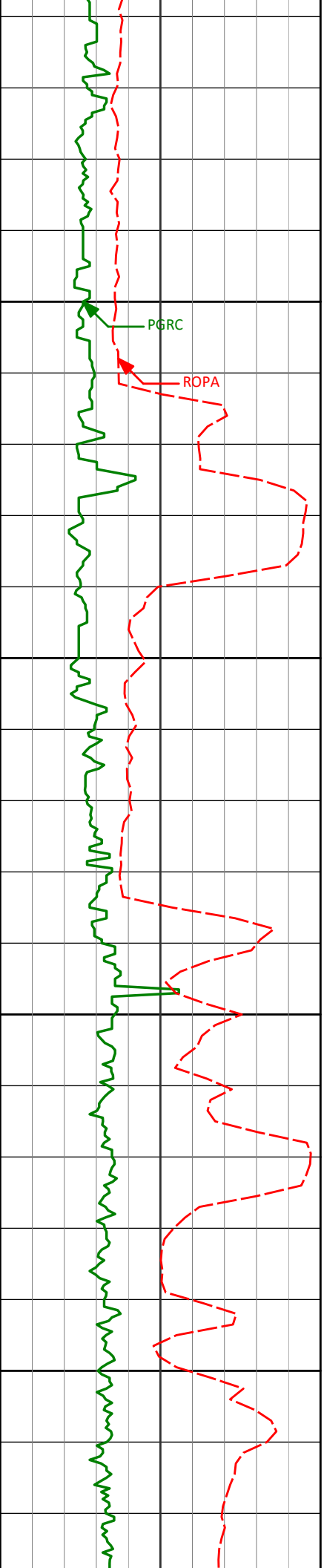
4389'	7.84°	0.84°	4367.29'	41.53'
4484'	7.75°	359.80°	4461.41'	42.14'



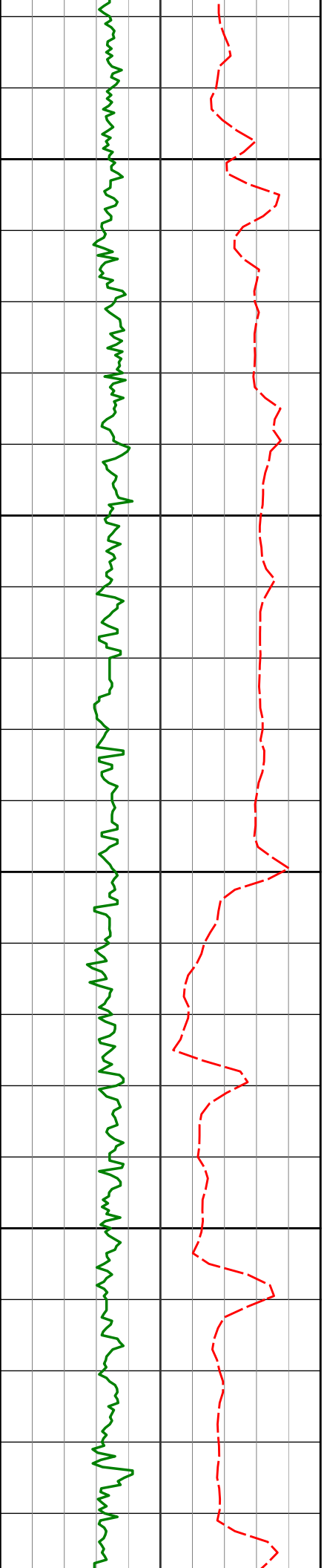
4579'	7.23°	356.56°	4555.60'	43.17'
4674'	6.59°	349.81°	4649.91'	45.08'



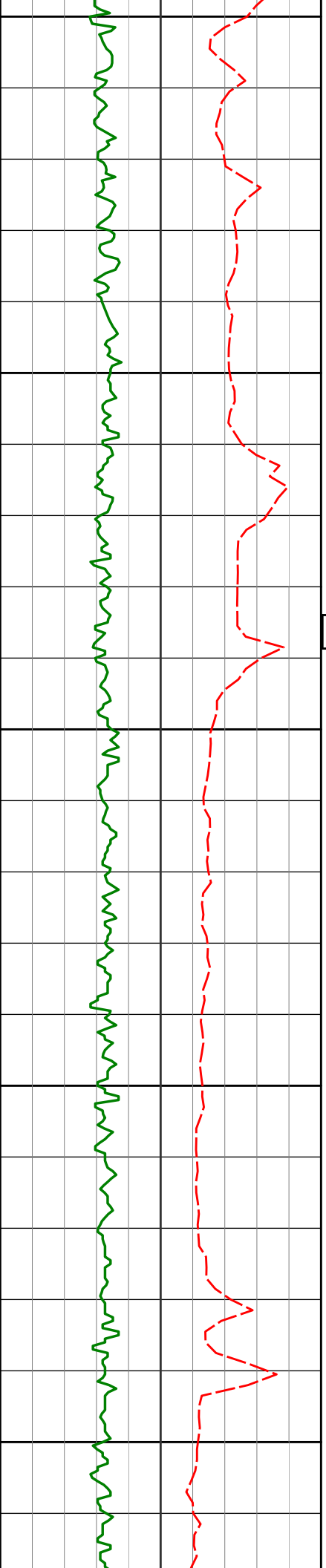
4769'	6.01°	357.91°	4744.34'	46.77'
4863'	4.81°	359.29°	4837.92'	47.46'



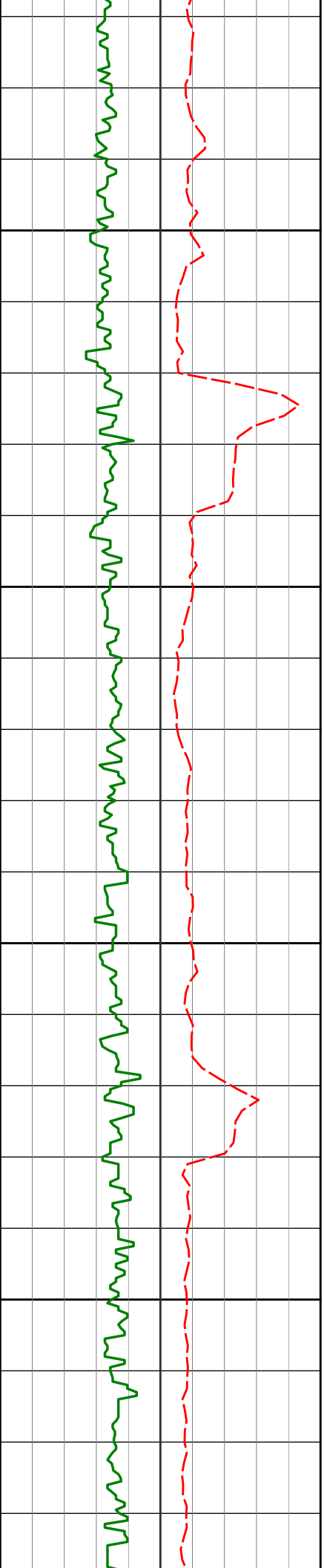
4958'	3.21°	8.07°	4932.68'	47.49'
5053'	1.53°	27.70°	5027.60'	46.72'
5148'	0.57°	70.94°	5122.58'	45.76'



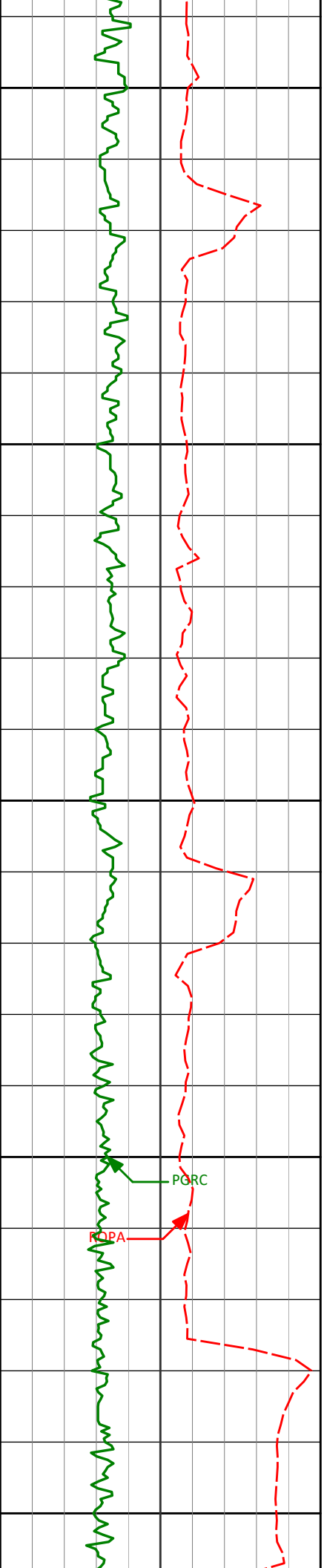
5243'	0.66°	99.70°	5217.58'	44.77'
5337'	0.65°	92.59°	5311.57'	43.70'



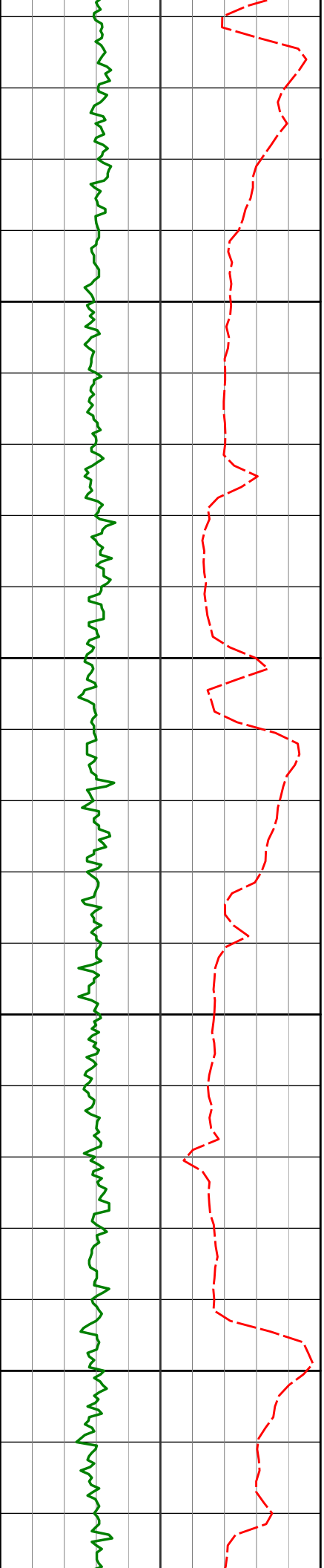
5432'	0.13°	16.30°	5406.57'	43.14'
5526'	0.53°	11.33°	5500.57'	43.05'



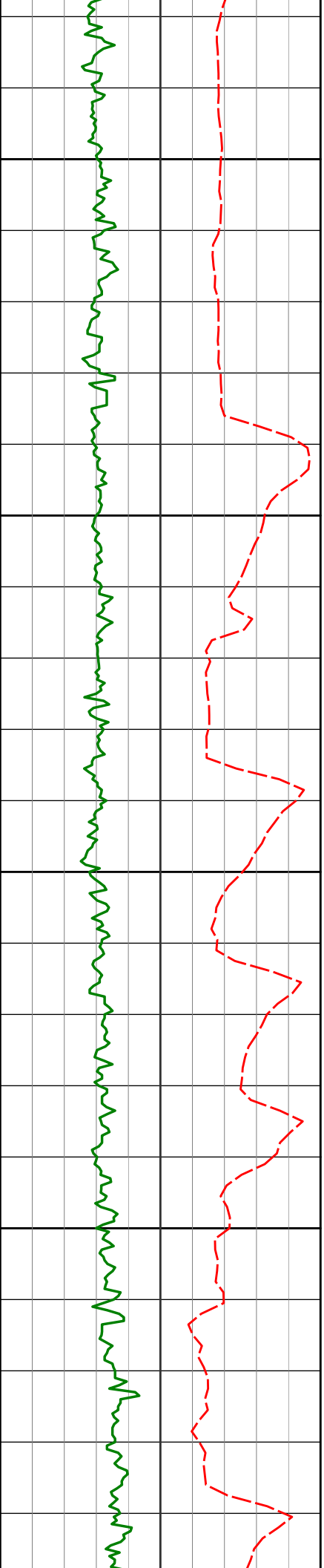
5621'	0.74°	354.81°	5595.56'	43.08'
5717'	0.75°	338.43°	5691.55'	43.43'
5811'	0.74°	310.23°	5785.55'	44.17'



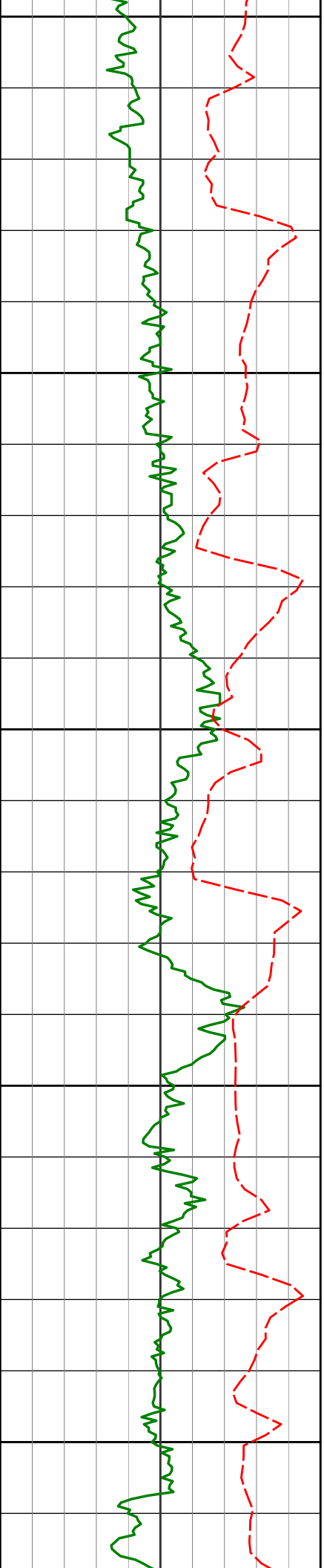
5906'	0.89°	296.94°	5880.54'	45.33'
5974'	0.73°	293.96°	5948.53'	46.22'
6001'	0.66°	291.60°	5975.53'	46.52'



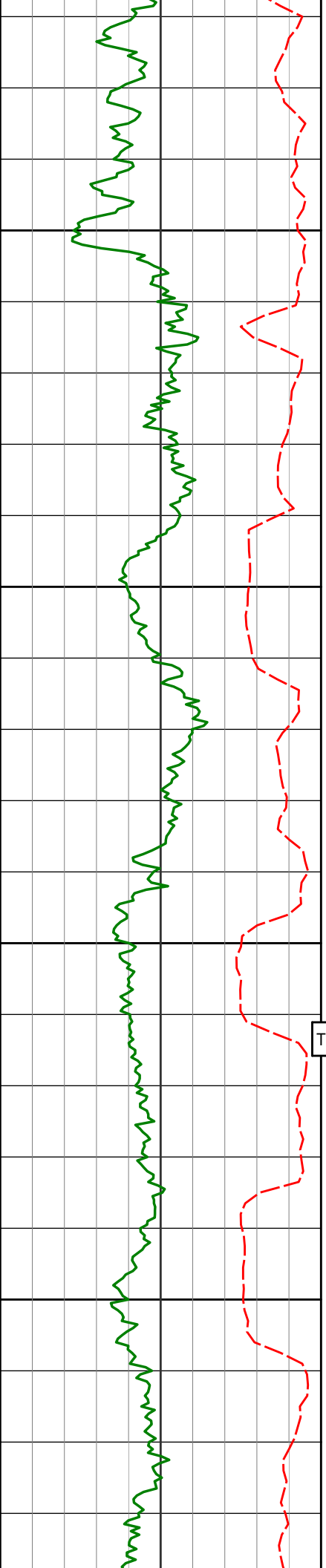
6096'	11.53°	271.60°	6069.85'	56.56'
6191'	18.07°	265.79°	6161.66'	80.70'



6285'	19.69°	263.38°	6250.60'	110.78'
6333'	18.61°	259.79°	6295.94'	126.21'
6380'	21.69°	260.76°	6340.06'	142.00'
6428'	29.06°	263.33°	6383.40'	162.19'
6475'	36.84°	271.43°	6422.83'	187.58'

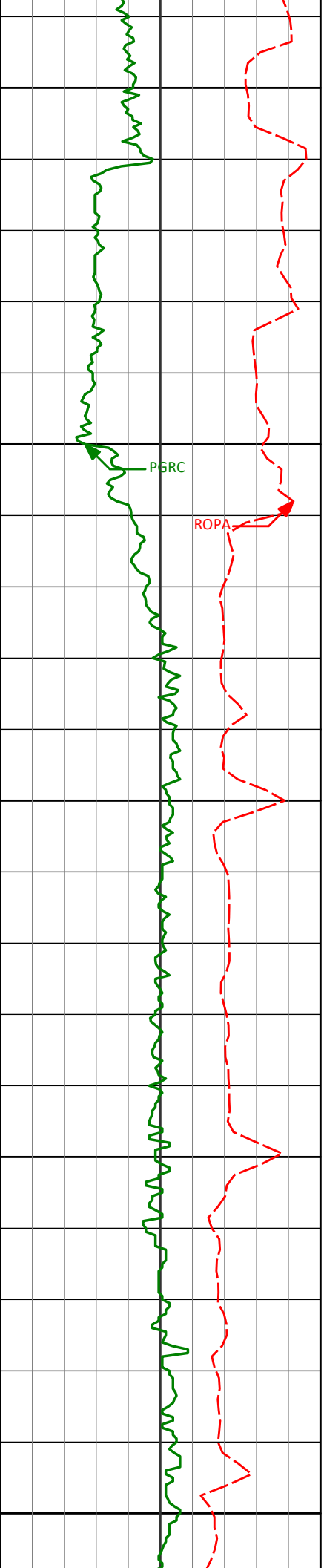


6523'	41.80°	275.37°	6459.96'	217.97'
6569'	46.90°	276.06°	6492.84'	250.08'
6617'	51.88°	276.07°	6524.07'	286.45'
6664'	58.31°	271.22°	6550.96'	324.96'
6712'	63.30°	269.81°	6574.37'	366.80'

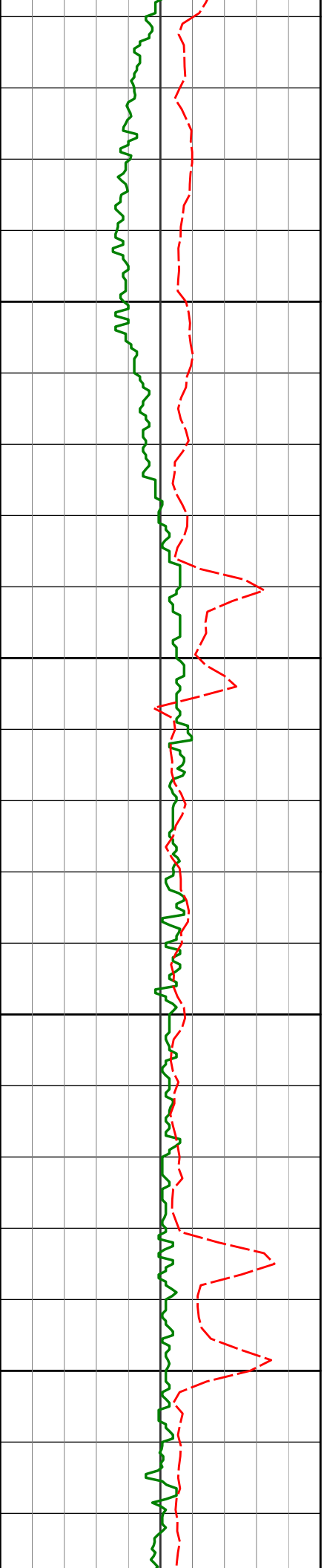


6759'	68.78°	267.78°	6593.45'	409.62'
6807'	72.56°	267.41°	6609.34'	454.70'
6854'	76.75°	267.94°	6621.77'	499.82'
6902'	80.28°	267.93°	6631.33'	546.66'

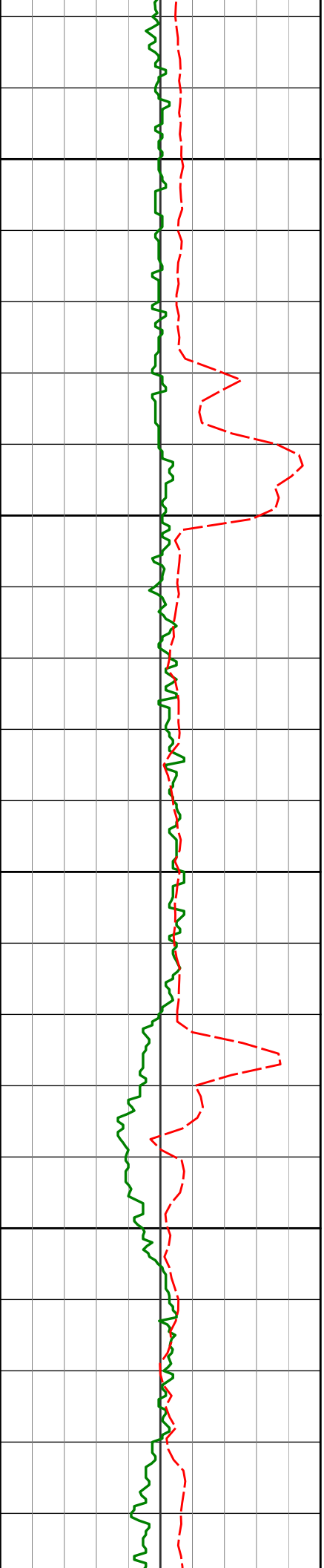
TD Build @ 7006 MD



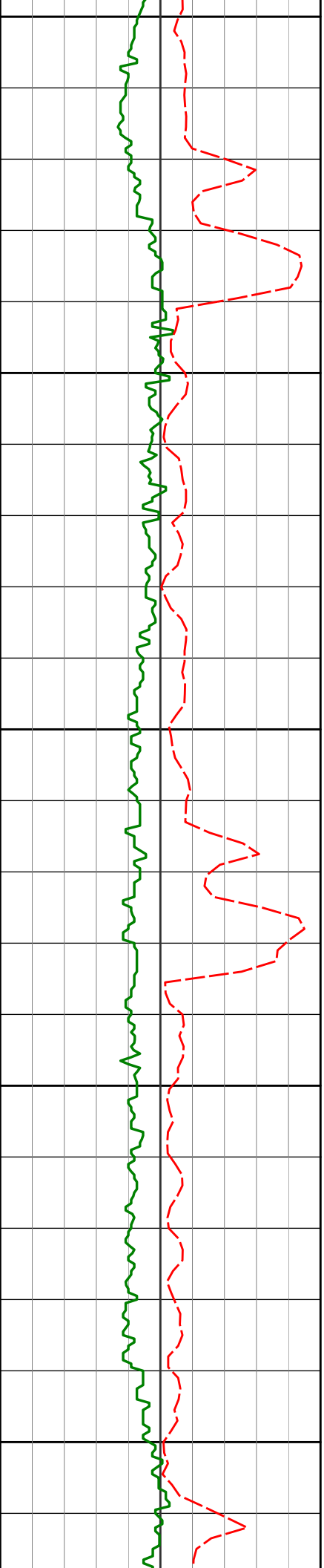
6952'	86.45°	266.70°	6637.10'	596.06'
7034'	89.66°	267.11°	6639.89'	677.54'
7081'	89.20°	267.80°	6640.35'	724.31'



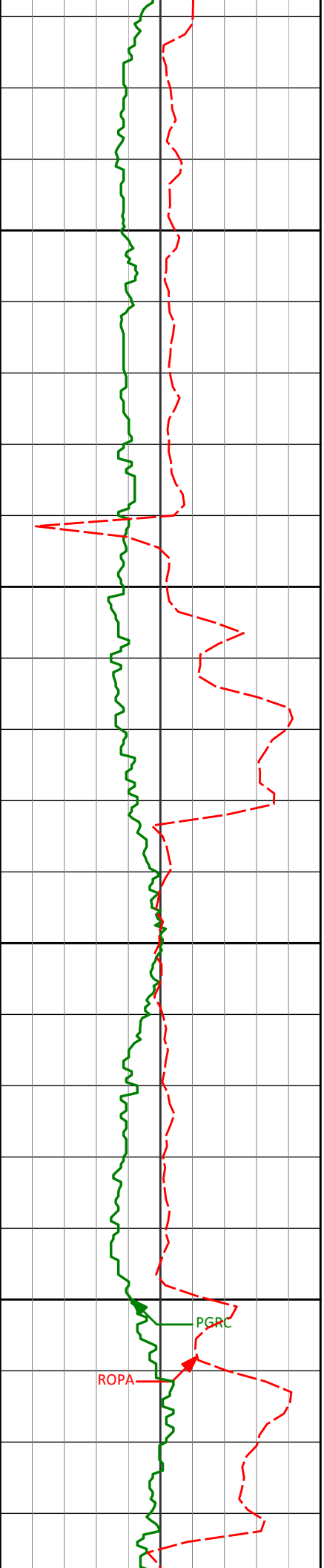
7176'	88.64°	268.65°	6642.14'	818.96'
7271'	88.46°	268.37°	6644.55'	913.64'
7366'	88.98°	268.04°	6646.67'	1008.28'



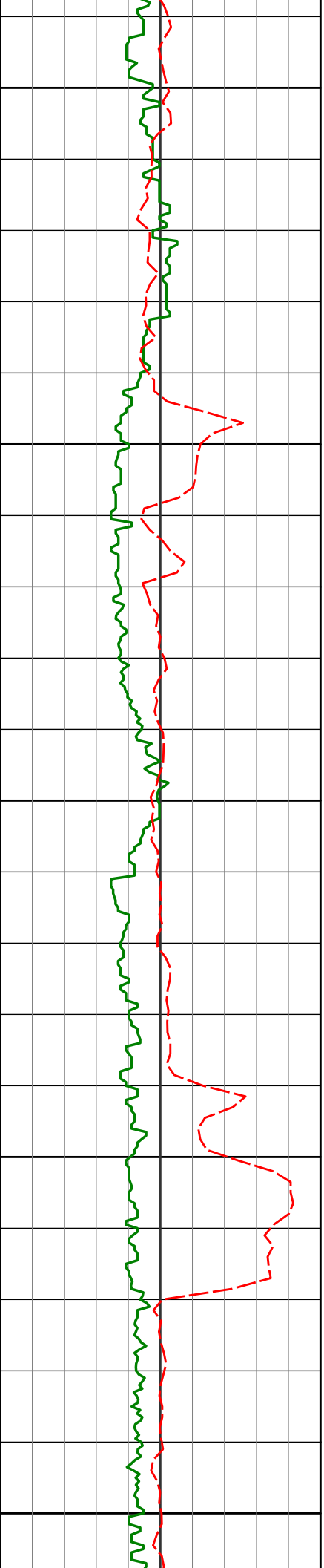
7461'	91.45°	268.52°	6646.31'	1102.95'
7556'	91.91°	268.19°	6643.53'	1197.60'



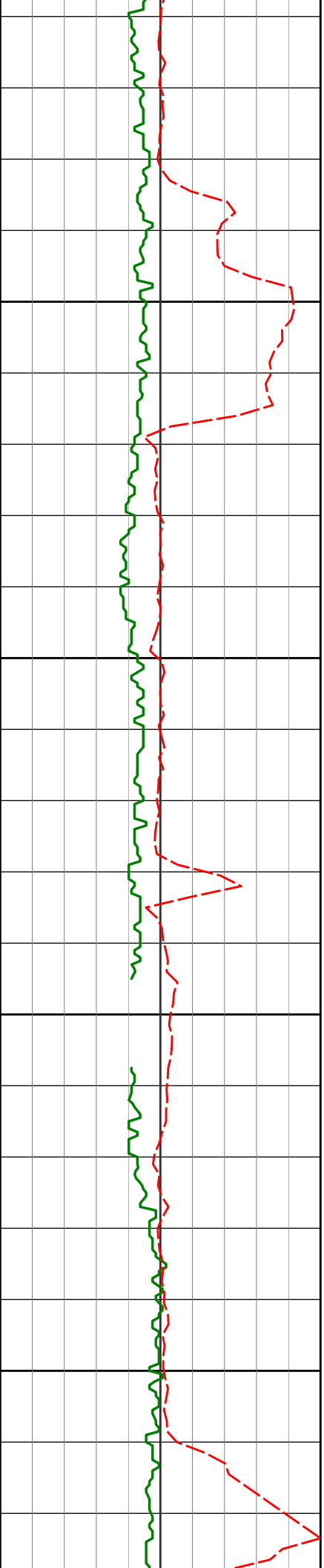
7650	7650'	91.26°	267.99°	6640.93'	1291.21'
	7745'	90.40°	268.12°	6639.55'	1385.85'



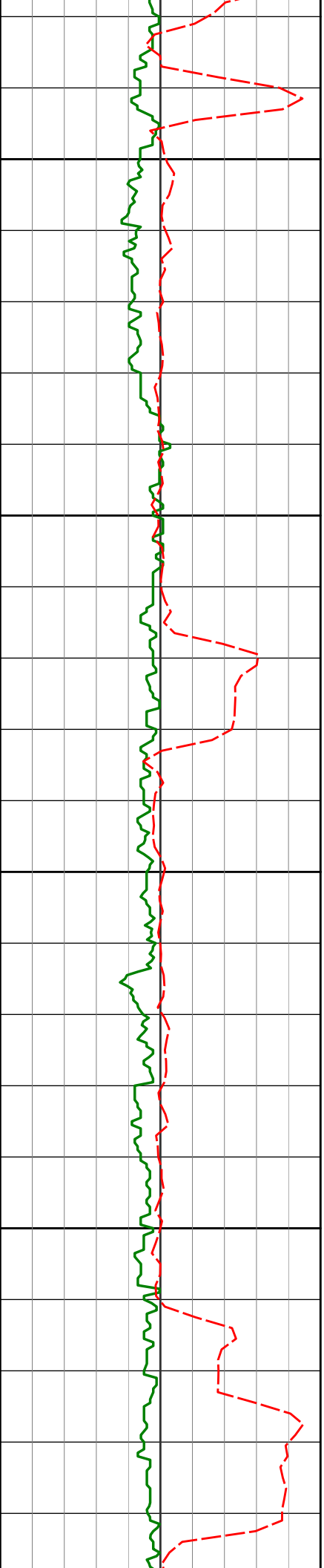
7840'	91.57°	267.74°	6637.92'	1480.46'
7935'	90.99°	268.60°	6635.80'	1575.10'
8030'	88.24°	268.31°	6636.44'	1669.78'



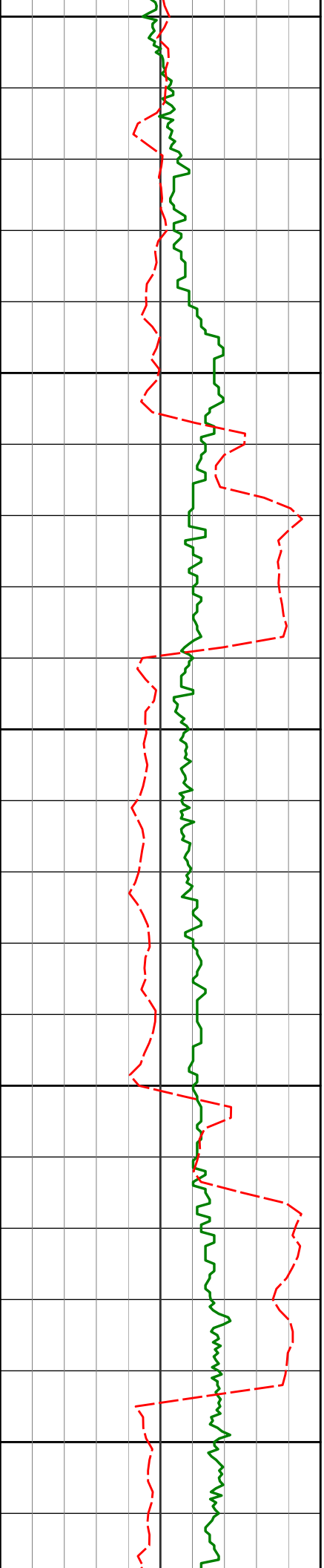
8125'	87.60°	267.05°	6639.88'	1764.31'
8220'	88.30°	267.54°	6643.28'	1858.77'



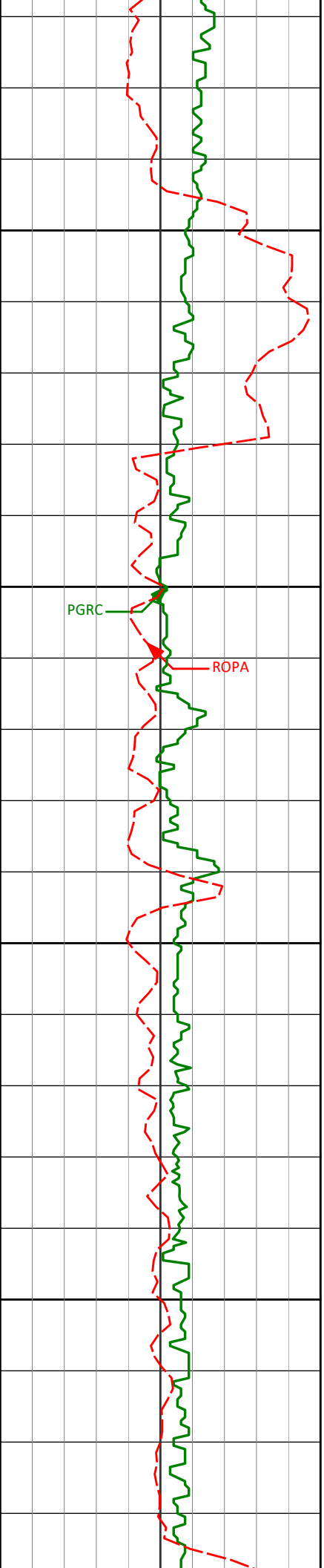
8314'	89.11°	269.22°	6645.41'	1952.44'
8409'	89.54°	269.02°	6646.53'	2047.21'



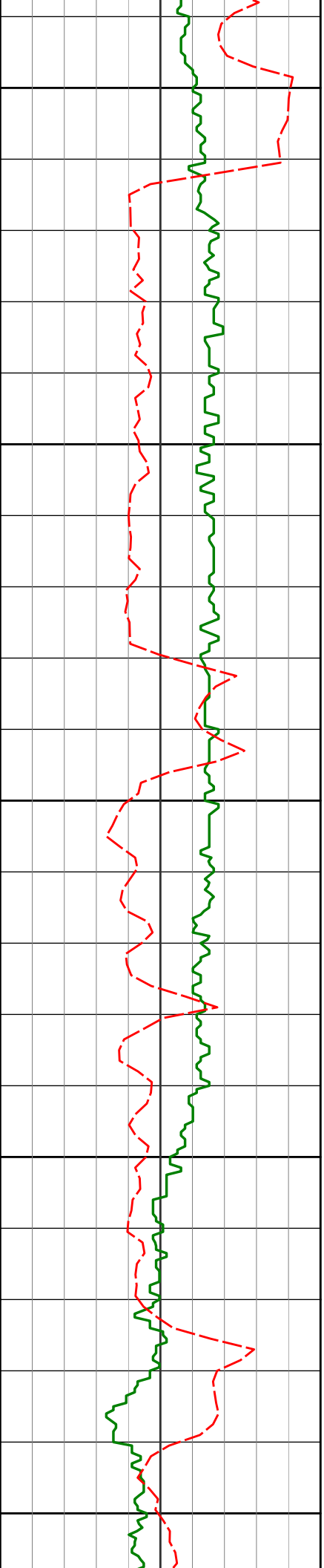
8504'	90.80°	269.33°	6646.24'	2142.00'
8598'	90.86°	267.58°	6644.88'	2235.69'
8693'	89.63°	267.79°	6644.48'	2330.28'



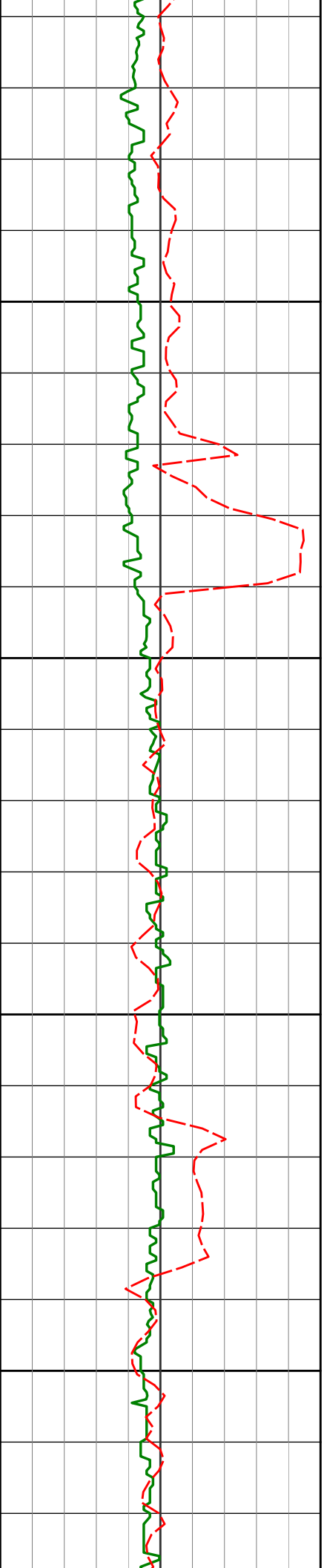
8787'	89.32°	267.84°	6645.34'	2423.89'
8882'	89.32°	268.50°	6646.46'	2518.54'



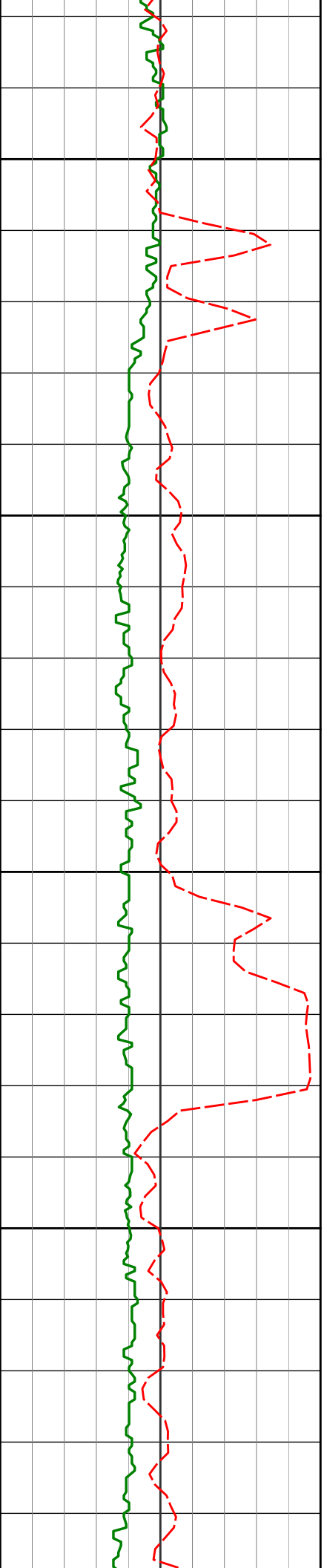
8977'	89.48°	270.86°	6647.46'	2613.37'
9071'	88.67°	270.35°	6648.98'	2707.27'



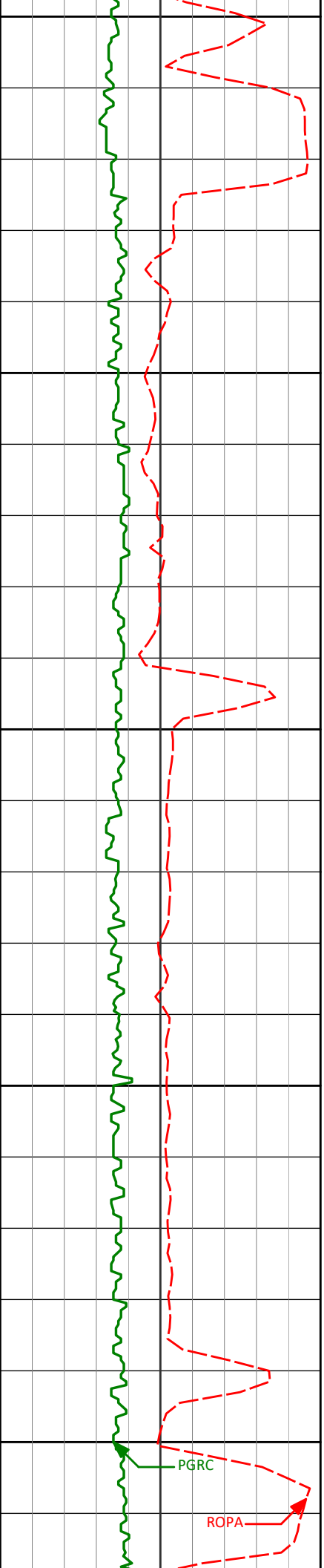
9166'	90.62°	270.70°	6649.57'	2802.18'
9261'	90.12°	270.42°	6648.95'	2897.09'
9356'	89.20°	270.53°	6649.52'	2991.99'



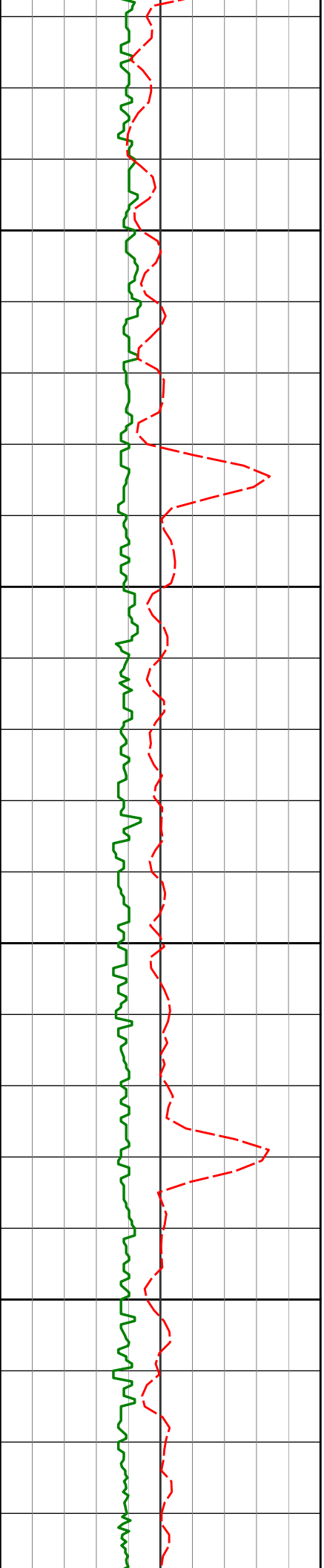
9451'	90.12°	269.42°	6650.08'	3086.85'
9546'	90.77°	268.99°	6649.34'	3181.64'



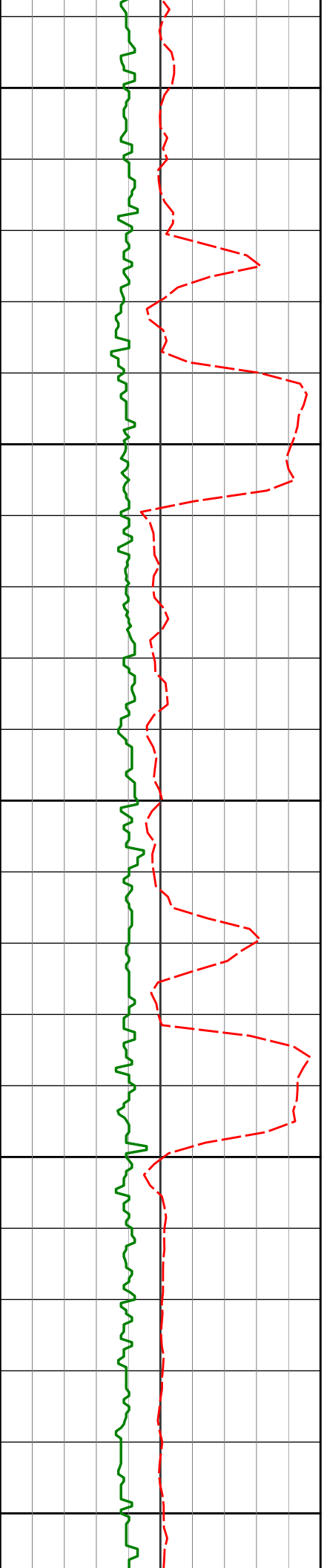
9641'	91.67°	268.99°	6647.32'	3276.38'
9735'	90.77°	268.64°	6645.32'	3370.11'



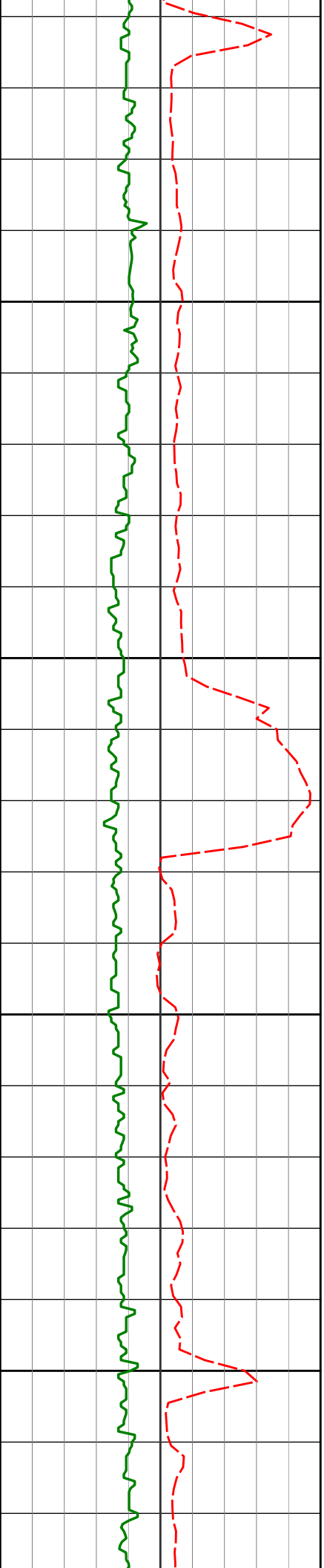
9830'	89.41°	267.35°	6645.17'	3464.74'
9925'	90.03°	267.31°	6645.63'	3559.27'



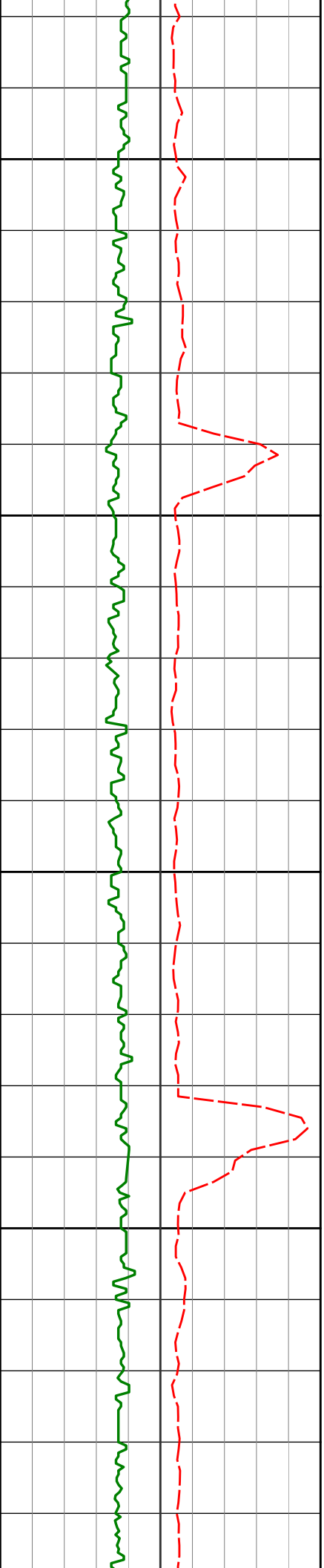
10020'	88.98°	267.86°	6646.45'	3653.84'
10114'	89.29°	267.49°	6647.87'	3747.42'
10209'	89.69°	267.17°	6648.72'	3841.95'



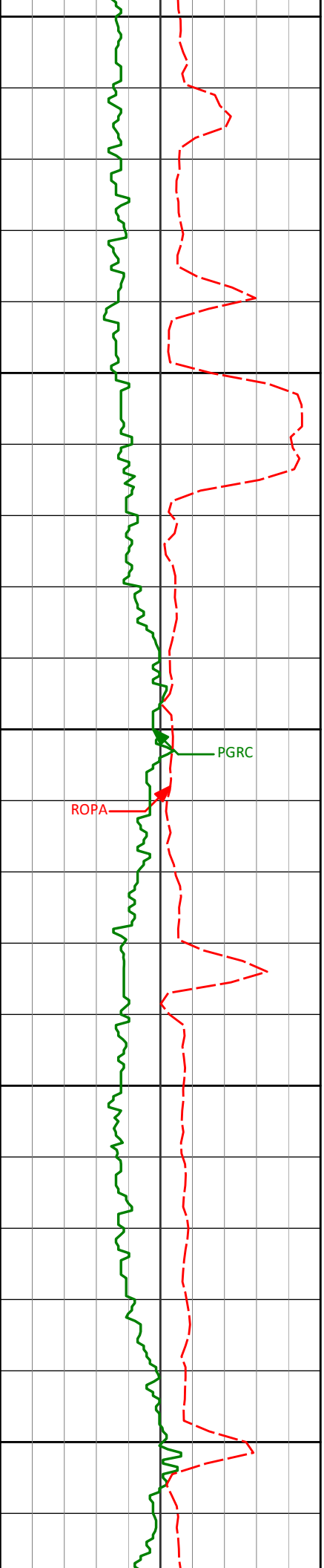
10304'	89.54°	268.56°	6649.36'	3936.57'
10399'	90.00°	269.40°	6649.74'	4031.33'



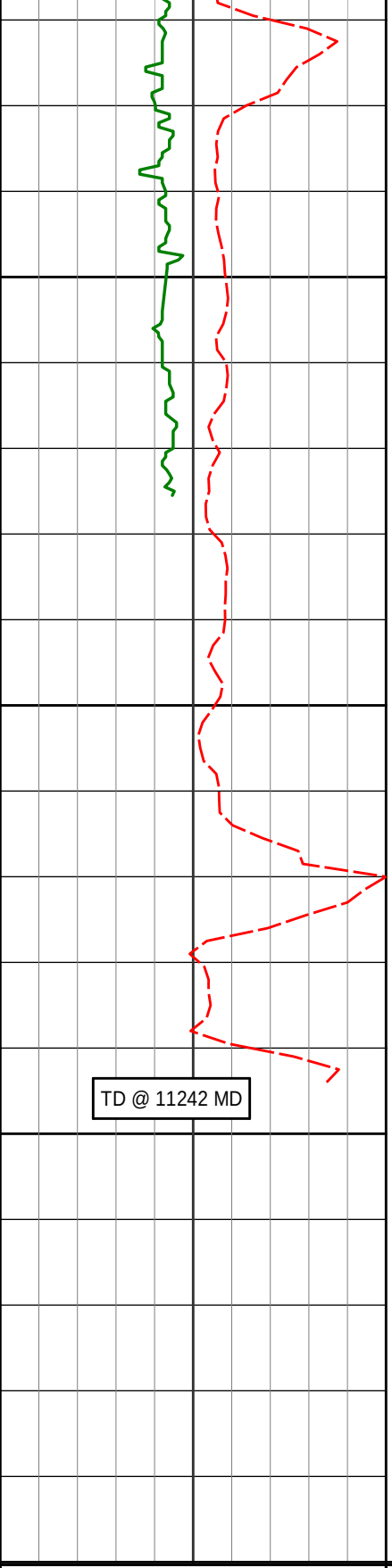
10494'	90.71°	269.48°	6649.15'	4126.14'
10589'	89.78°	269.87°	6648.74'	4220.98'



10683'	89.38°	269.45°	6649.43'	4314.82'
10778'	89.51°	269.31°	6650.35'	4409.62'
10873'	88.95°	268.70°	6651.63'	4504.38'



10968'	90.15°	268.52°	6652.38'	4599.10'
11062'	91.05°	268.54°	6651.39'	4692.80'



Depth	Inc.	Azi.	TVD	V.S.
11157'	91.60°	268.43°	6649.19'	4787.48'
11177'	91.63°	268.40°	6648.63'	4807.41'
11242'	91.63°	268.40°	6646.78'	4872.17'

Avg Rate of Penetration
ROPA
1K feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

Depth ft

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble
NCLP AA06-69-1HNA
Wattenberg
Weld Colorado
USA
CA-XX-0901288051
Other Information:

First Three Survey's from 3rd party source (Muilti Shot EMS)
Survey Depth 270 Inc 0.10 Azi 13.87
Survey Depth 550 Inc 0.30 Azi 12.97
Survey Depth 844 Inc 1.0 Azi 331.47

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
270.00	0.10	13.87	270.00	0.23 N	0.06 E	-0.04	0.04
550.00	0.30	12.97	550.00	1.18 N	0.28 E	-0.22	0.07
844.00	1.00	331.47	843.98	4.18 N	0.77 W	0.99	0.27
905.00	0.78	335.78	904.97	5.03 N	1.20 W	1.46	0.38
996.00	0.83	334.25	995.96	6.19 N	1.74 W	2.06	0.06
1089.00	0.96	354.46	1088.95	7.57 N	2.11 W	2.50	0.36
1182.00	0.98	221.65	1181.95	7.75 N	2.71 W	3.11	1.91
1273.00	2.29	66.32	1272.93	7.90 N	1.56 W	1.97	3.52
1365.00	0.98	306.55	1364.90	9.11 N	0.51 W	0.99	3.16
1456.00	0.92	278.65	1455.89	9.68 N	1.86 W	2.36	0.51
1549.00	1.40	66.12	1548.88	10.25 N	1.56 W	2.09	2.40
1641.00	0.56	296.31	1640.87	10.91 N	0.93 W	1.50	1.97
1736.00	0.60	289.34	1735.87	11.28 N	1.82 W	2.41	0.09
1830.00	0.71	282.37	1829.86	11.57 N	2.85 W	3.45	0.14
1925.00	0.85	292.10	1924.85	11.96 N	4.08 W	4.70	0.20
2020.00	0.79	286.42	2019.84	12.41 N	5.36 W	6.00	0.11
2115.00	0.78	300.96	2114.84	12.93 N	6.54 W	7.21	0.21
2209.00	0.68	292.22	2208.83	13.47 N	7.61 W	8.30	0.16
2304.00	0.62	274.89	2303.82	13.72 N	8.64 W	9.35	0.22
2399.00	2.16	349.00	2398.80	15.52 N	9.50 W	10.30	2.19
2493.00	3.90	355.76	2492.66	20.45 N	10.07 W	11.13	1.89
2588.00	5.54	359.50	2587.34	28.26 N	10.35 W	11.82	1.76
2683.00	5.48	358.46	2681.90	37.38 N	10.51 W	12.46	0.12
2778.00	6.91	1.11	2776.34	47.63 N	10.52 W	13.01	1.53
2873.00	8.23	359.05	2870.51	60.14 N	10.52 W	13.67	1.42
2967.00	10.11	356.44	2963.30	75.10 N	11.15 W	15.08	2.05
3062.00	10.35	356.43	3056.79	91.94 N	12.20 W	17.01	0.25
3157.00	9.33	358.79	3150.40	108.16 N	12.89 W	18.55	1.15
3251.00	8.01	1.53	3243.32	122.33 N	12.88 W	19.28	1.47
3346.00	7.09	2.76	3337.50	134.80 N	12.42 W	19.48	0.98
3441.00	7.81	349.52	3431.70	147.00 N	13.31 W	21.01	1.95
3536.00	8.73	354.50	3525.71	160.53 N	15.17 W	23.58	1.23
3631.00	9.23	355.22	3619.55	175.29 N	16.50 W	25.68	0.54
3725.00	9.81	354.88	3712.25	190.78 N	17.84 W	27.84	0.62
3820.00	10.49	356.07	3805.77	207.47 N	19.16 W	30.03	0.75
3915.00	10.92	355.65	3899.11	225.07 N	20.43 W	32.22	0.46
4010.00	10.25	353.04	3992.50	242.44 N	22.14 W	34.84	0.87
4105.00	9.01	351.58	4086.16	258.18 N	24.25 W	37.78	1.33
4199.00	8.19	354.45	4179.10	272.13 N	25.98 W	40.23	0.98
4294.00	7.83	2.80	4273.17	285.33 N	26.32 W	41.26	1.28
4389.00	7.84	0.84	4367.29	298.27 N	25.91 W	41.53	0.28
4484.00	7.75	359.80	4461.41	311.16 N	25.83 W	42.14	0.18
4579.00	7.23	356.56	4555.60	323.53 N	26.22 W	43.17	0.70
4674.00	6.59	349.81	4649.91	334.86 N	27.54 W	45.08	1.09
4769.00	6.01	357.91	4744.34	345.20 N	28.68 W	46.77	1.12
4863.00	4.81	359.29	4837.92	354.05 N	28.91 W	47.46	1.28
4958.00	3.21	8.07	4932.68	360.67 N	28.59 W	47.49	1.80
5053.00	1.53	27.70	5027.60	364.43 N	27.63 W	46.72	1.94
5148.00	0.57	70.94	5122.58	365.71 N	26.59 W	45.76	1.24

5243.00	0.66	99.70	5217.58	365.77 N	25.60 W	44.77	0.33
5337.00	0.65	92.59	5311.57	365.65 N	24.54 W	43.70	0.09
5432.00	0.13	16.30	5406.57	365.73 N	23.97 W	43.14	0.67
5526.00	0.53	11.33	5500.57	366.26 N	23.85 W	43.05	0.43
5621.00	0.74	354.81	5595.56	367.30 N	23.82 W	43.08	0.29
5717.00	0.75	338.43	5691.55	368.50 N	24.11 W	43.43	0.22
5811.00	0.74	310.23	5785.55	369.47 N	24.80 W	44.17	0.39
5906.00	0.89	296.94	5880.54	370.20 N	25.93 W	45.33	0.25
5974.00	0.73	293.96	5948.53	370.61 N	26.79 W	46.22	0.24
6001.00	0.66	291.60	5975.53	370.74 N	27.09 W	46.52	0.28
6096.00	11.53	271.60	6069.85	371.21 N	37.12 W	56.56	11.49
6191.00	18.07	265.79	6161.66	370.39 N	61.34 W	80.70	7.05
6285.00	19.69	263.38	6250.60	367.49 N	91.61 W	110.78	1.91
6333.00	18.61	259.79	6295.94	365.20 N	107.18 W	126.21	3.33
6380.00	21.69	260.76	6340.06	362.48 N	123.14 W	142.00	6.59
6428.00	29.06	263.33	6383.40	359.70 N	143.50 W	162.19	15.52
6475.00	36.84	271.43	6422.83	358.72 N	168.97 W	187.58	18.99
6523.00	41.80	275.37	6459.96	360.58 N	199.31 W	217.97	11.56
6569.00	46.90	276.06	6492.84	363.79 N	231.29 W	250.08	11.14
6617.00	51.88	276.07	6524.07	367.64 N	267.52 W	286.45	10.38
6664.00	58.31	271.22	6550.96	370.02 N	305.95 W	324.96	16.08
6712.00	63.30	269.81	6574.37	370.39 N	347.83 W	366.80	10.71
6759.00	68.78	267.78	6593.45	369.47 N	390.75 W	409.62	12.31
6807.00	72.56	267.41	6609.34	367.57 N	436.00 W	454.70	7.91
6854.00	76.75	267.94	6621.77	365.73 N	481.28 W	499.82	8.98
6902.00	80.28	267.93	6631.33	364.03 N	528.28 W	546.66	7.35
6952.00	86.45	266.70	6637.10	361.71 N	577.86 W	596.06	12.58
7034.00	89.66	267.11	6639.89	357.28 N	659.69 W	677.54	3.95
7081.00	89.20	267.80	6640.35	355.19 N	706.64 W	724.31	1.76
7176.00	88.64	268.65	6642.14	352.25 N	801.57 W	818.96	1.07
7271.00	88.46	268.37	6644.55	349.78 N	896.51 W	913.64	0.35
7366.00	88.98	268.04	6646.67	346.81 N	991.44 W	1008.28	0.65
7461.00	91.45	268.52	6646.31	343.96 N	1086.39 W	1102.95	2.65
7556.00	91.91	268.19	6643.53	341.23 N	1181.31 W	1197.60	0.60
7650.00	91.26	267.99	6640.93	338.10 N	1275.22 W	1291.21	0.72
7745.00	90.40	268.12	6639.55	334.87 N	1370.15 W	1385.85	0.92
7840.00	91.57	267.74	6637.92	331.44 N	1465.08 W	1480.46	1.29
7935.00	90.99	268.60	6635.80	328.41 N	1560.00 W	1575.10	1.09
8030.00	88.24	268.31	6636.44	325.85 N	1654.96 W	1669.78	2.91
8125.00	87.60	267.05	6639.88	322.01 N	1749.81 W	1764.31	1.49
8220.00	88.30	267.54	6643.28	317.53 N	1844.65 W	1858.77	0.90
8314.00	89.11	269.22	6645.41	314.87 N	1938.58 W	1952.44	1.98
8409.00	89.54	269.02	6646.53	313.41 N	2033.56 W	2047.21	0.50
8504.00	90.80	269.33	6646.24	312.04 N	2128.55 W	2142.00	1.37
8598.00	90.86	267.58	6644.88	309.51 N	2222.50 W	2235.69	1.86
8693.00	89.63	267.79	6644.48	305.67 N	2317.42 W	2330.28	1.31
8787.00	89.32	267.84	6645.34	302.09 N	2411.35 W	2423.89	0.33
8882.00	89.32	268.50	6646.46	299.05 N	2506.29 W	2518.54	0.69
8977.00	89.48	270.86	6647.46	298.52 N	2601.28 W	2613.37	2.49
9071.00	88.67	270.35	6648.98	299.52 N	2695.26 W	2707.27	1.02
9166.00	90.62	270.70	6649.57	300.39 N	2790.25 W	2802.18	2.09
9261.00	90.12	270.42	6648.95	301.31 N	2885.24 W	2897.09	0.60
9356.00	89.20	270.53	6649.52	302.10 N	2980.24 W	2991.99	0.98
9451.00	90.12	269.42	6650.08	302.06 N	3075.23 W	3086.85	1.52
9546.00	90.77	268.99	6649.34	300.74 N	3170.22 W	3181.64	0.82
9641.00	91.67	268.99	6647.32	299.07 N	3265.18 W	3276.38	0.95
9735.00	90.77	268.64	6645.32	297.12 N	3359.14 W	3370.11	1.03
9830.00	89.41	267.35	6645.17	293.80 N	3454.08 W	3464.74	1.97
9925.00	90.03	267.31	6645.63	289.38 N	3548.97 W	3559.27	0.65
10020.00	88.98	267.86	6646.45	285.37 N	3643.89 W	3653.84	1.25
10114.00	89.29	267.49	6647.87	281.56 N	3737.80 W	3747.42	0.51
10209.00	89.69	267.17	6648.72	277.13 N	3832.69 W	3841.95	0.54
10304.00	89.54	268.56	6649.36	273.60 N	3927.62 W	3936.57	1.47
10399.00	90.00	269.40	6649.74	271.90 N	4022.60 W	4031.33	1.01
10494.00	90.71	269.48	6649.15	270.98 N	4117.60 W	4126.14	0.75
10589.00	89.78	269.87	6648.74	270.44 N	4212.59 W	4220.98	1.06
10683.00	89.38	269.45	6649.43	269.88 N	4306.59 W	4314.82	0.62
10778.00	89.51	269.31	6650.35	268.85 N	4401.58 W	4409.62	0.20
10873.00	88.95	268.70	6651.63	267.20 N	4496.55 W	4504.38	0.87
10968.00	90.15	268.52	6652.38	264.90 N	4591.52 W	4599.10	1.28
11062.00	91.05	268.54	6651.39	262.49 N	4685.48 W	4692.80	0.96

11157.00	91.60	268.43	6649.19	259.97 N	4780.42 W	4787.48	0.59
11177.00	91.63	268.40	6648.63	259.42 N	4800.41 W	4807.41	0.21
11242.00	91.63	268.40	6646.78	257.61 N	4865.36 W	4872.17	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 273.01 DEGREES (GRID)
A TOTAL CORRECTION OF 7.47 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11242.00 FEET
IS 4872.17 FEET ALONG 273.03 DEGREES (GRID)

Tied in @ Surface

Date Printed:02 July 2014