

**PCGC : Pressure Case Gamma**  
**PCDC: Pressure Case Directional**

**1 : 600 / 1 : 240**

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200	300		
<b>Date run completed</b>	30-Jul-14	31-Jul-14	03-Aug-14		
<b>Rig Bit Number</b>	2	3	4		
<b>Bit Size (in)</b>	8.750	8.750	6.125		
<b>Tool Nominal OD (in)</b>	6.750	6.750	4.750		
<b>Log Start Depth (MD, ft)</b>	632.00	5,460.00	6,496.00		
<b>Log End Depth (MD, ft)</b>	5,460.00	6,496.00	10,474.00		
<b>Drill or Wipe</b>	Drill	Drill	Drill		
<b>Drill/Wipe Start Date and Time</b>	29-Jul-14 06:10	30-Jul-14 20:00	01-Aug-14 11:00		
<b>Drill/Wipe End Date and Time</b>	29-Jul-14 21:30	31-Jul-14 07:40	03-Aug-14 10:46		
<b>Min Inc (deg) @ Depth (MD, ft)</b>	0.03 @ 1,460.00	0.60 @ 5,432.00	86.61 @ 9,115.00		
<b>Max Inc (deg) @ Depth (MD, ft)</b>	7.67 @ 2,307.00	89.60 @ 6,496.00	94.07 @ 9,494.00		
<b>Bit TFA(in2) / Bit Type</b>	0.75 / PDC	0.86 / PDC	0.65 / PDC		
<b>Flow Rate (gpm)</b>	573.92	534.86	297.00		
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	N/A / N/A	N/A / N/A	N/A / N/A		
<b>Fluid Type</b>	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
<b>Density (ppg) / Viscosity (spqt)</b>	8.90 / 150.00	10.60 / 46.00	10.25 / 35.00		
<b>Filtrate CL (ppm)</b>	150.00	150.00	150.00		
<b>pH / Fluid Loss (mptm)</b>	9.50 / 43	9.60 / 43	9.40 / 29		
<b>PV (cP) / YP (lbf2)</b>	16 / 31.00	16 / 12.00	10 / 7.00		
<b>% Solids / % Sand</b>	9.5 / .25	0.20 / 0.20	9.10 / .1		
<b>% Oil / Oil:Water Ratio</b>	N/A / N/A	N/A / N/A	N/A / N/A		
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Max Tool Temp (in F) / S</b>	151.45 / PDM	150.40 / PDM	210.40 / PDM		

Max Tool Temp (degF) / Source	151.47 / PCM	158.10 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Juan Pablo Centeno	Juan Pablo Centeno	Juan Pablo Centeno		
Customer Representative	Dave Nielsen	Dave Nielsen	Justin Fields		

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	245494	245494	11670083		
Insert Serial Number	12001048	11620315	12001048		
Date and Time Initialized	27-Jul-14 01:49	30-Jul-14 00:52	31-Jul-14 11:04		
Date and Time Read	30-Jul-14 09:35	01-Aug-14 07:40	05-Aug-14 13:28		
ECMB SW Version	N/A	N/A	N/A		

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	53.84	53.14	62.50		
Software Version	6.21	6.21	6.21		
Sub Serial Number	245494	245494	11670083		
Sonde Serial Number	11297623	11638628	11297623		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	118.62	228.43	75.51		

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	48.74	48.04	57.40		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	245494	245494	11670083		
Insert/Sonde Serial Number	11293276	11579806	11293276		

## REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rig 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.
  - ROPA: Average Rate of Penetration is real time data.
  - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
  - All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
  - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.0.20
6. Gamma presented inside casing/cement from 6428 ft. MD to 6486 ft. MD.

## 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

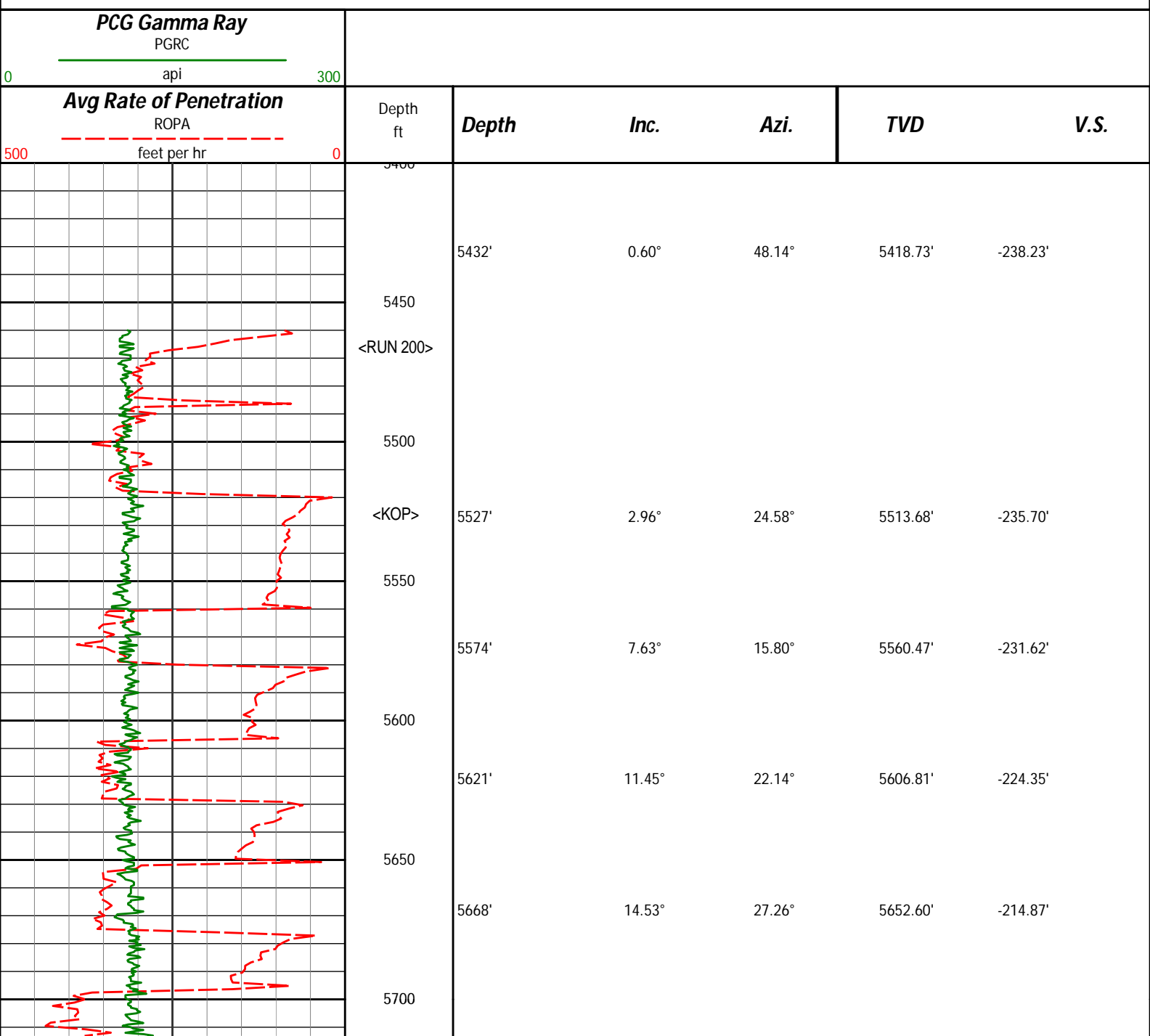
MD Main Log 1:600

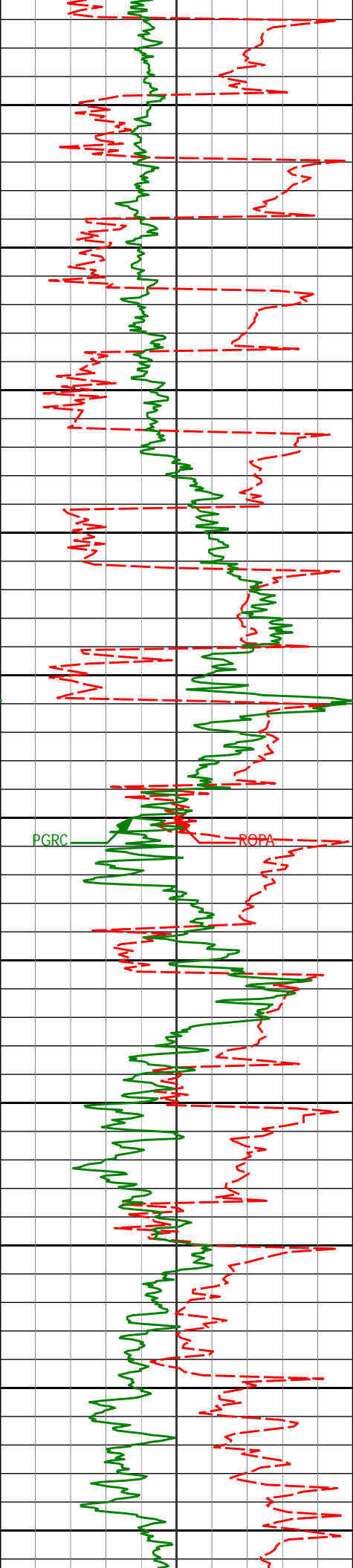
Noble Energy, Inc

Brook LC28-74-1AHNO

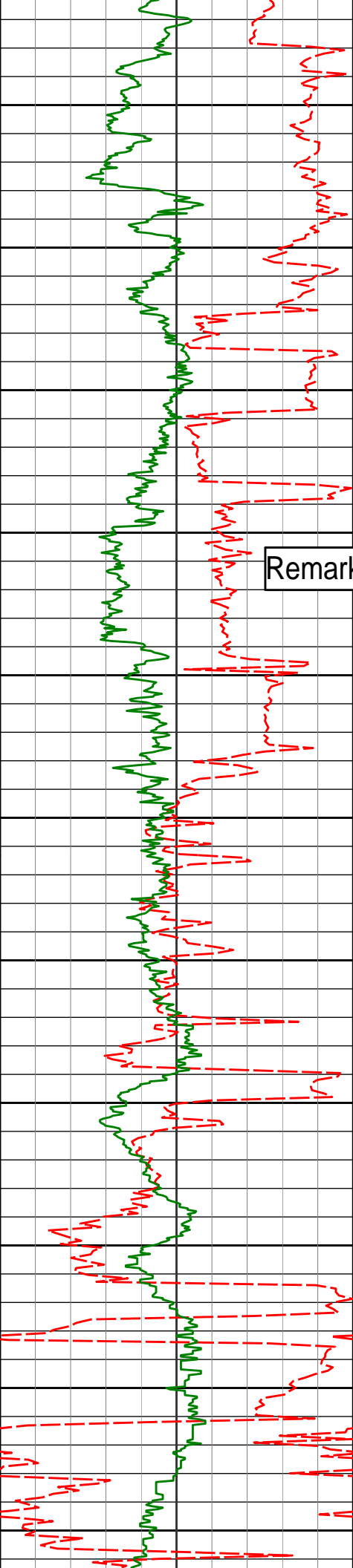
H&P 273

T9N R59W





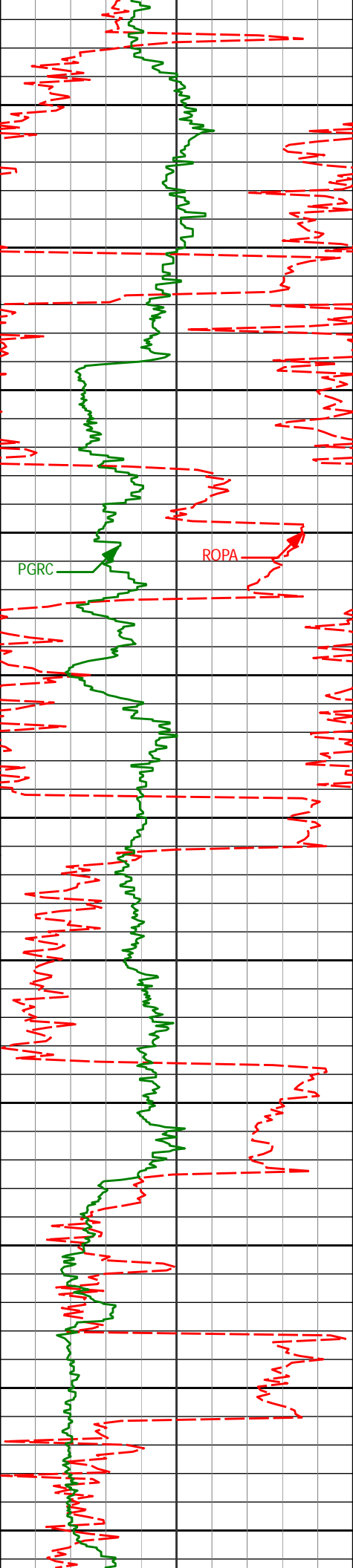
	5716'	18.45°	26.41°	5698.62'	-202.84'
5750	5763'	22.50°	24.63°	5742.64'	-188.15'
5800	5811'	25.07°	19.74°	5786.56'	-170.37'
5850	5858'	26.13°	11.62°	5828.96'	-150.97'
5900	5906'	29.29°	4.39°	5871.47'	-128.97'
5950	5953'	33.54°	359.49°	5911.57'	-104.53'
6000	6001'	37.34°	352.27°	5950.69'	-76.78'
6050	6048'	41.81°	349.89°	5986.91'	-47.13'
6100	6096'	47.08°	349.81°	6021.16'	-13.94'
6150	6143'	51.91°	351.76°	6051.69'	21.43'
6200	6190'	58.55°	356.40°	6078.48'	59.88'
6250	6237'	64.79°	359.67°	6100.78'	101.22'



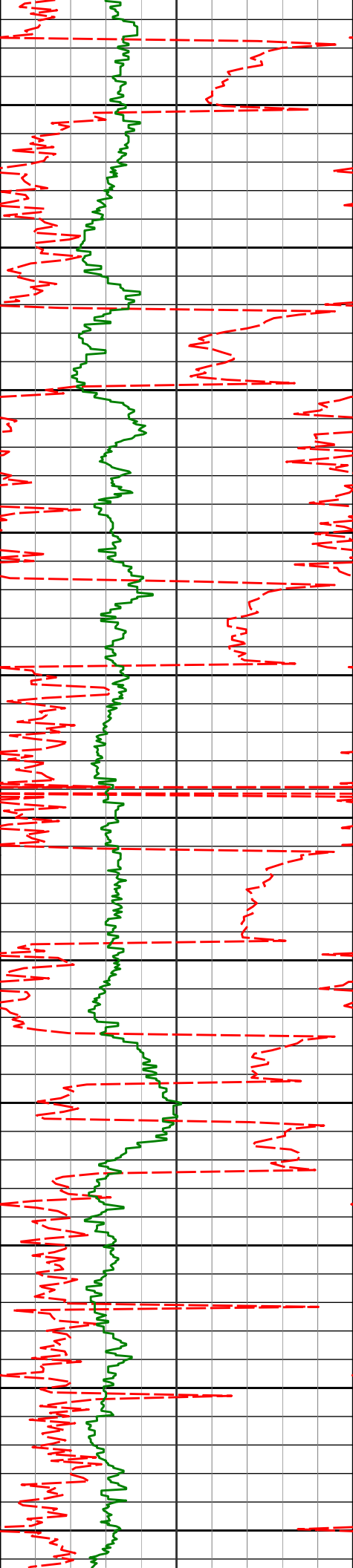
Remark 6

◀Run 300▶  
6500

6285'	72.40°	2.24°	6118.29'	145.83'
6300				
6332'	79.44°	2.87°	6129.71'	191.30'
6350				
6380'	86.05°	3.52°	6135.77'	238.75'
6400				
6441'	89.60°	2.25°	6138.09'	299.54'
6450				
<7" casing set at 6486' MD>				
6500				
6555'	90.89°	0.78°	6137.60'	413.41'
6600				
6650'	92.81°	358.98°	6134.53'	508.34'
6700				
6745'	91.54°	359.16°	6130.93'	603.26'
6750				
6800				



6839'	92.07°	359.38°	6127.97'	697.21'
6850				
6900				
6934'	92.77°	357.44°	6123.96'	792.12'
6950				
7000				
7029'	91.73°	357.63°	6120.23'	887.02'
7050				
7100				
7124'	91.51°	358.20°	6117.55'	981.97'
7150				
7200				
7219'	90.74°	359.15°	6115.68'	1076.95'
7250				
7300				
7313'	89.81°	358.21°	6115.23'	1170.95'
7350				



7400

7408'

90.06°

357.36°

6115.33'

1265.93'

7450

7500

7503'

90.15°

356.07°

6115.15'

1360.86'

7550

7600

7598'

90.00°

355.67°

6115.03'

1455.74'

7650

7700

7693'

90.06°

357.60°

6114.97'

1550.66'

7750

7800

7788'

88.00°

358.81°

6116.58'

1645.64'

7850

7900

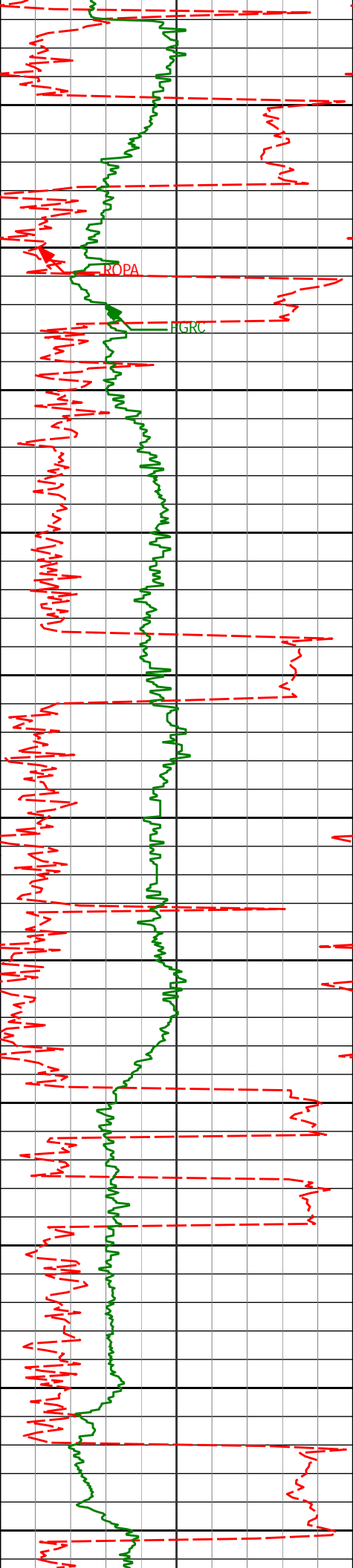
7883'

90.59°

358.02°

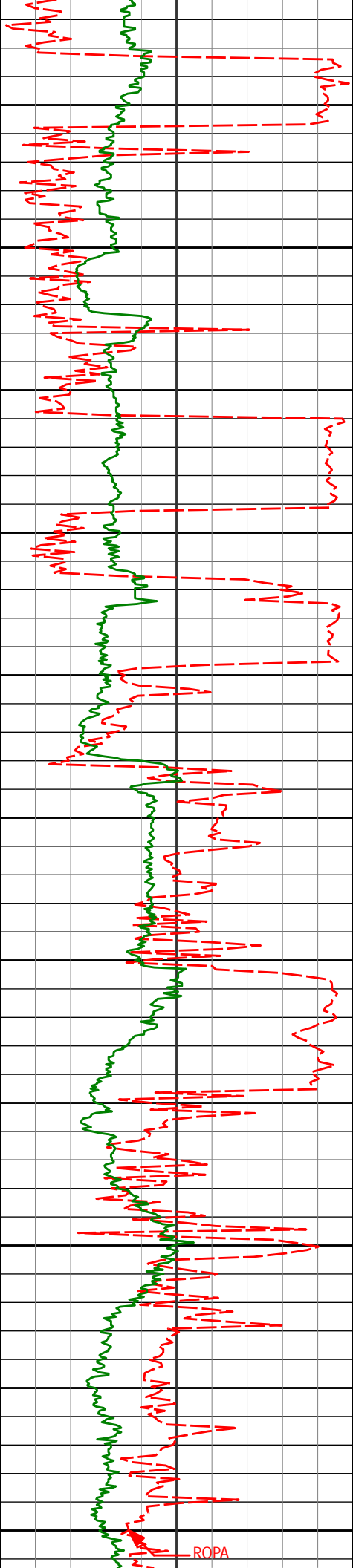
6117.76'

1740.62'



7950				
7978'	89.91°	359.46°	6117.35'	1835.61'
8000				
8073'	89.38°	359.31°	6117.94'	1930.61'
8100				
8150				
8168'	88.70°	358.92°	6119.52'	2025.59'
8200				
8250				
8262'	91.88°	359.90°	6119.05'	2119.57'
8300				
8350				
8357'	90.62°	0.77°	6116.98'	2214.52'
8400				
8450				
8452'	90.06°	359.77°	6116.41'	2309.48'





8500

8550

8600

8650

8700

8750

8800

8850

8900

8950

9000

8546'

89.82°

358.93°

6116.52'

2403.48'

8641'

89.20°

358.76°

6117.33'

2498.47'

8736'

89.91°

359.57°

6118.08'

2593.47'

8831'

89.85°

0.93°

6118.28'

2688.44'

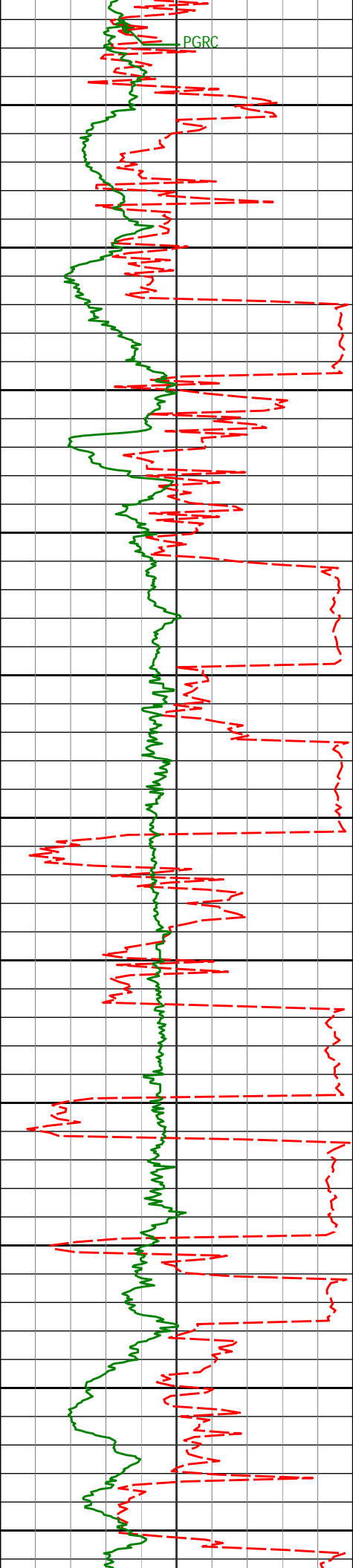
8925'

88.74°

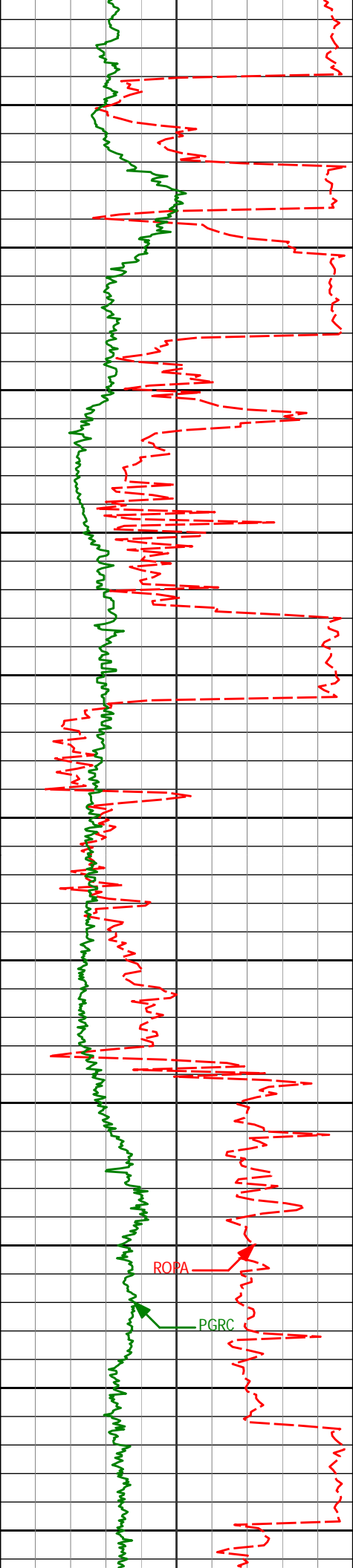
0.03°

6119.44'

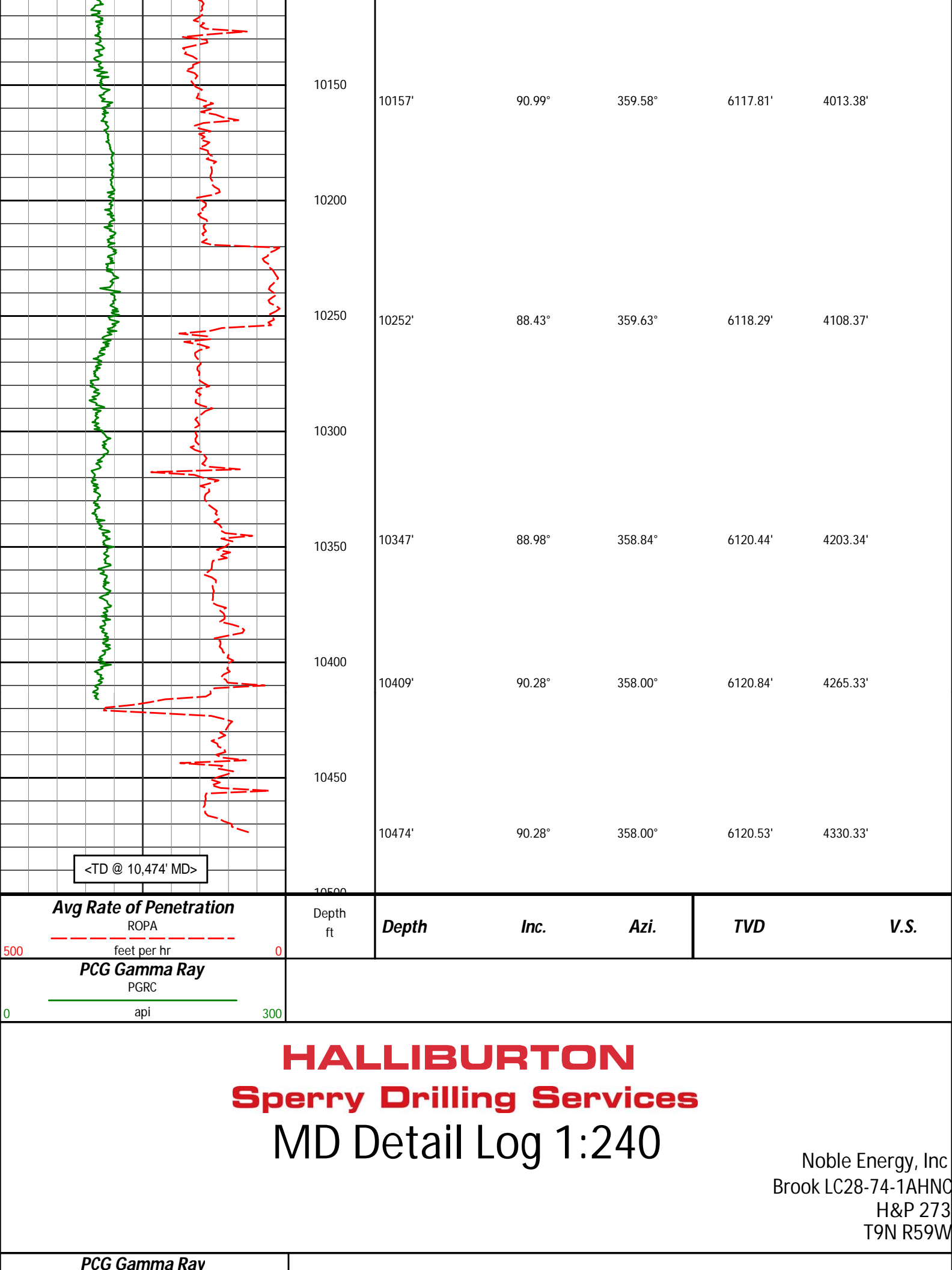
2782.39'



9020'	87.66°	358.67°	6122.43'	2877.33'
9050				
9100				
9115'	86.61°	357.97°	6127.19'	2972.21'
9150				
9200				
9209'	87.29°	357.53°	6132.20'	3066.06'
9250				
9300				
9304'	89.29°	358.58°	6135.03'	3161.00'
9350				
9400				
9399'	90.83°	358.20°	6134.93'	3255.99'
9450				
9494'	94.07°	359.04°	6130.87'	3350.89'
9500				
9550				

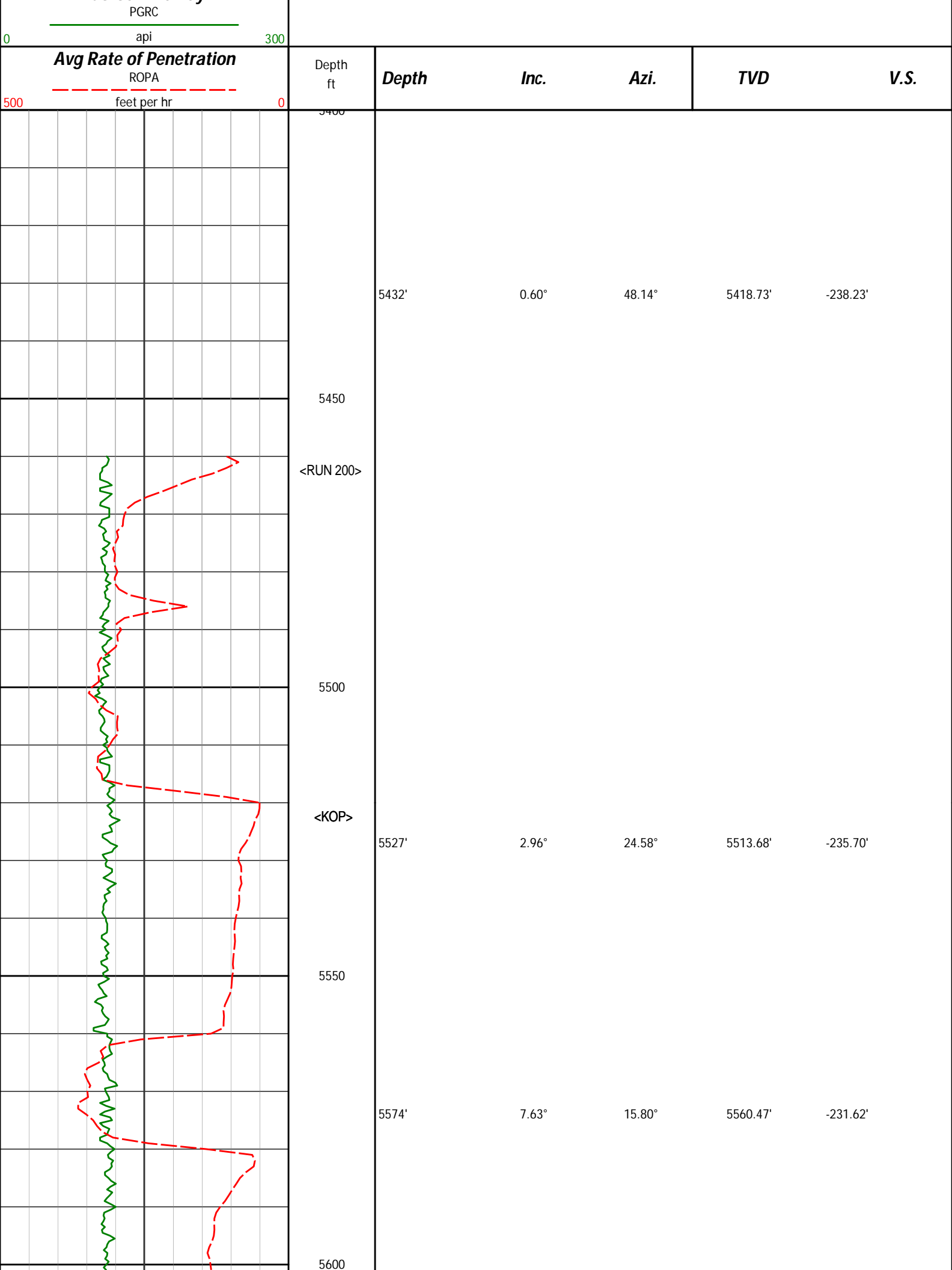


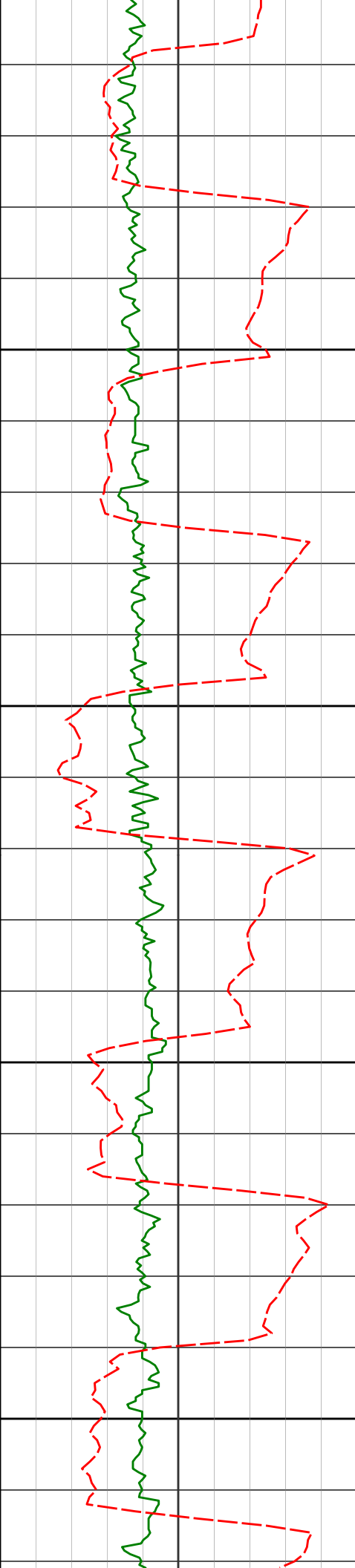
9588'	92.75°	359.53°	6125.28'	3444.72'
9600				
9650				
9683'	90.52°	1.05°	6122.57'	3539.64'
9700				
9750				
9778'	90.43°	0.54°	6121.77'	3634.58'
9800				
9850				
9873'	88.89°	0.75°	6122.34'	3729.53'
9900				
9950				
9968'	91.14°	0.48°	6122.31'	3824.48'
10000				
10050				
10062'	91.67°	359.91°	6120.01'	3918.42'
10100				



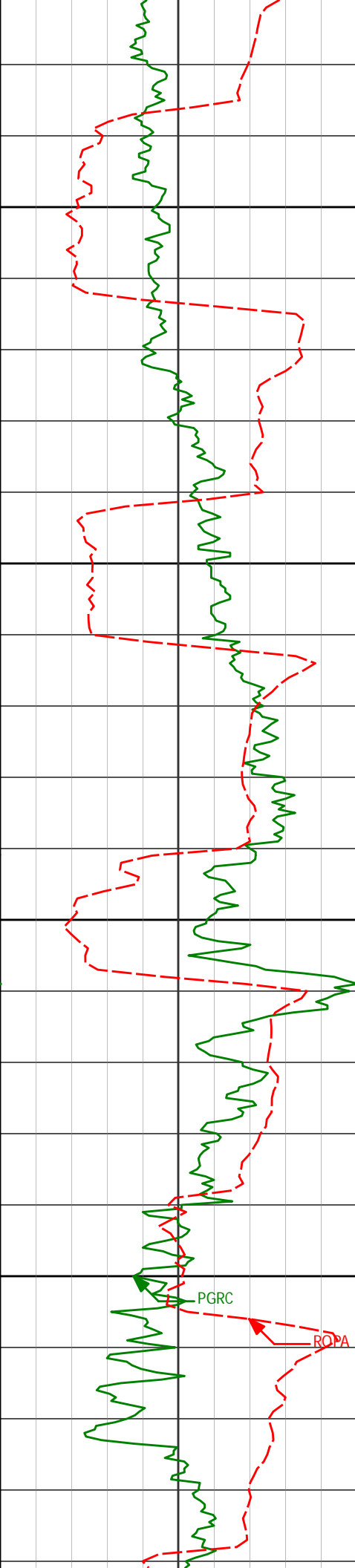
**HALLIBURTON**  
**Sperry Drilling Services**  
**MD Detail Log 1:240**

Noble Energy, Inc  
Brook LC28-74-1AHNO  
H&P 273  
T9N R59W





5621'	11.45°	22.14°	5606.81'	-224.35'
5668'	14.53°	27.26°	5652.60'	-214.87'
5716'	18.45°	26.41°	5698.62'	-202.84'
5763'	22.50°	24.63°	5742.64'	-188.15'
5811'	25.07°	19.74°	5786.56'	-170.37'



5850

5858'

26.13°

11.62°

5828.96'

-150.97'

5900

5906'

29.29°

4.39°

5871.47'

-128.97'

5950

5953'

33.54°

359.49°

5911.57'

-104.53'

6000

6001'

37.34°

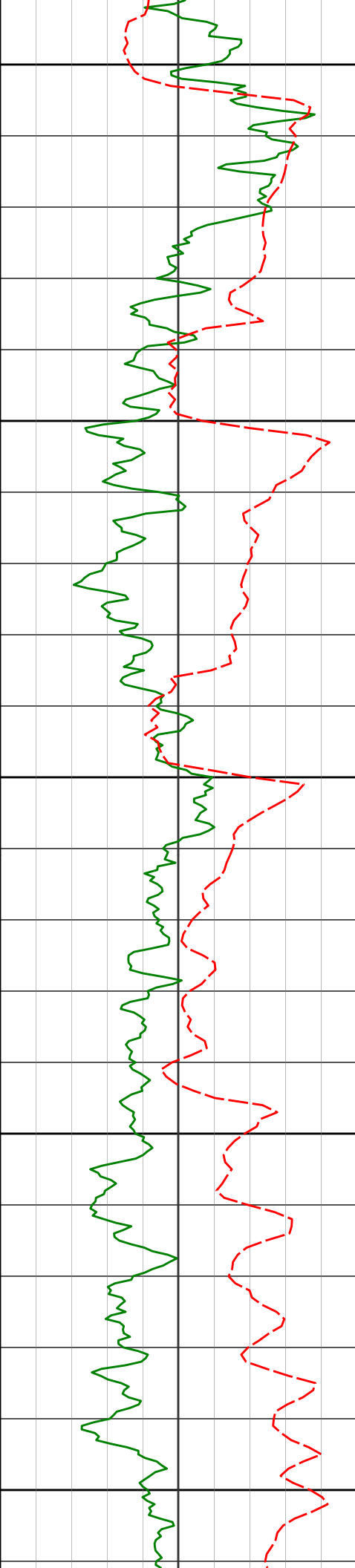
352.27°

5950.69'

-76.78'

PGRC

ROPA



6050

6048'

41.81°

349.89°

5986.91'

-47.13'

6096'

47.08°

349.81°

6021.16'

-13.94'

6100

6143'

51.91°

351.76°

6051.69'

21.43'

6150

6190'

58.55°

356.40°

6078.48'

59.88'

6200

6237'

64.79°

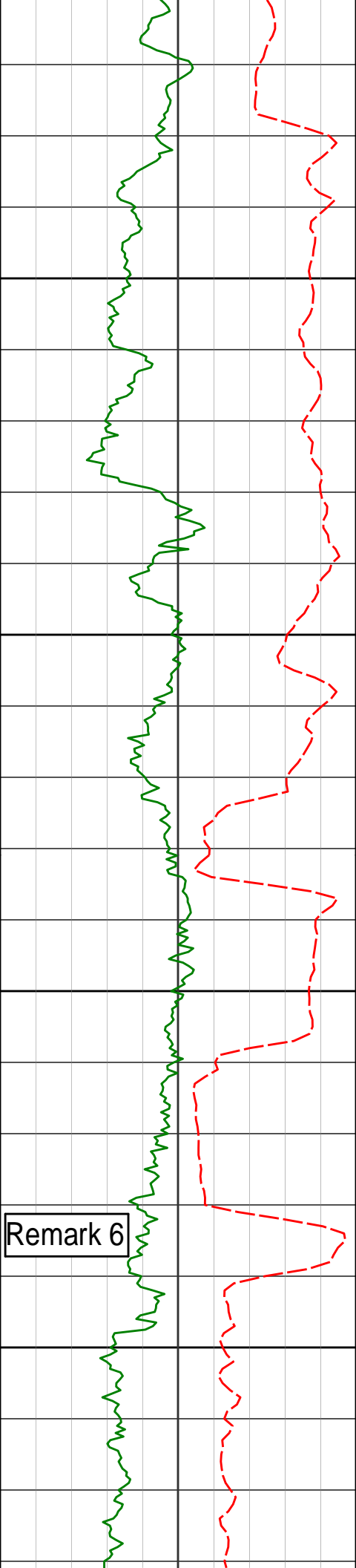
359.67°

6100.78'

101.22'

6250





6300

6350

6400

6450

6285'

72.40°

2.24°

6118.29'

145.83'

6332'

79.44°

2.87°

6129.71'

191.30'

6380'

86.05°

3.52°

6135.77'

238.75'

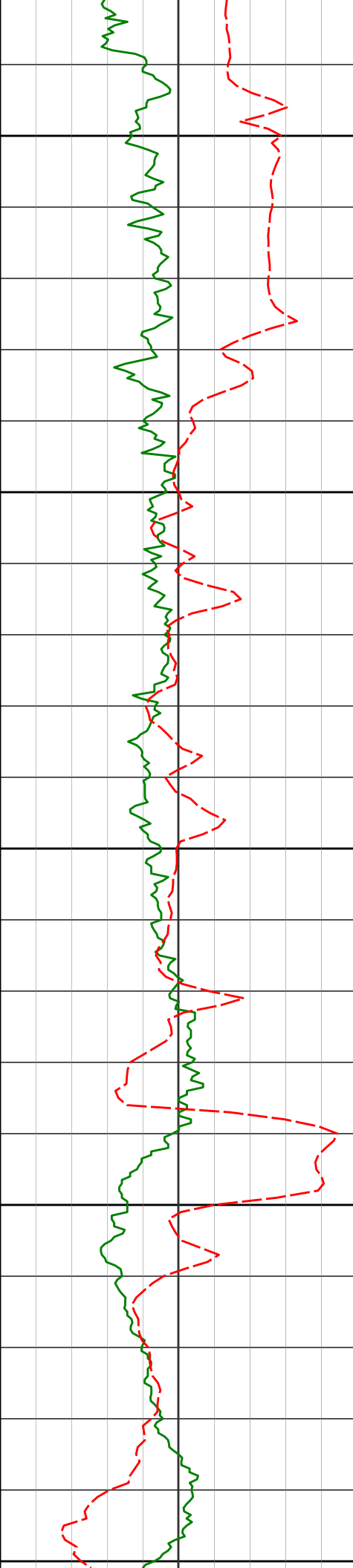
6441'

89.60°

2.25°

6138.09'

299.54'



<Run 300>

6500

6550

6600

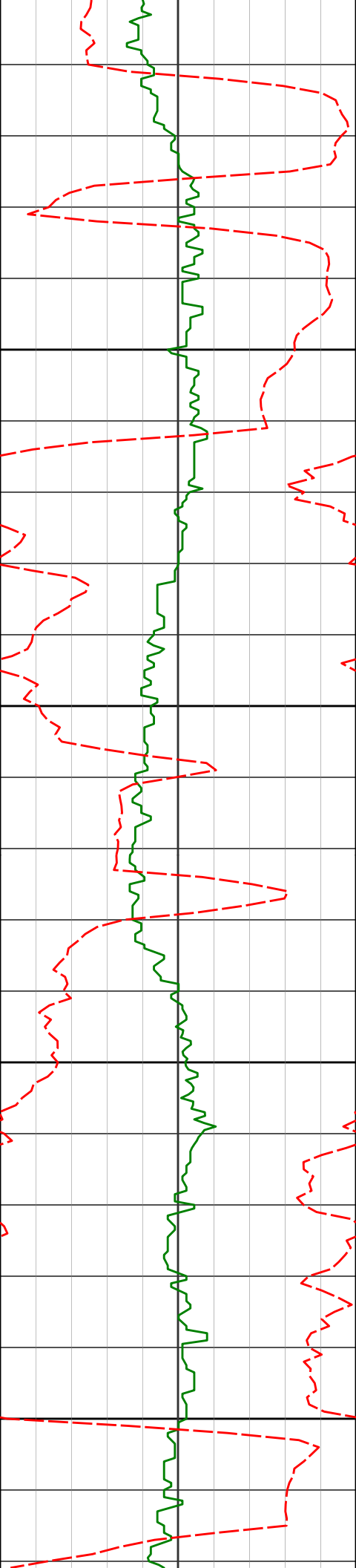
6650

6700

<7" casing set at 6486' MD>

6555'      90.89°      0.78°      6137.60'      413.41'

6650'      92.81°      358.98°      6134.53'      508.34'



6750

6800

6850

6900

6745'

91.54°

359.16°

6130.93'

603.26'

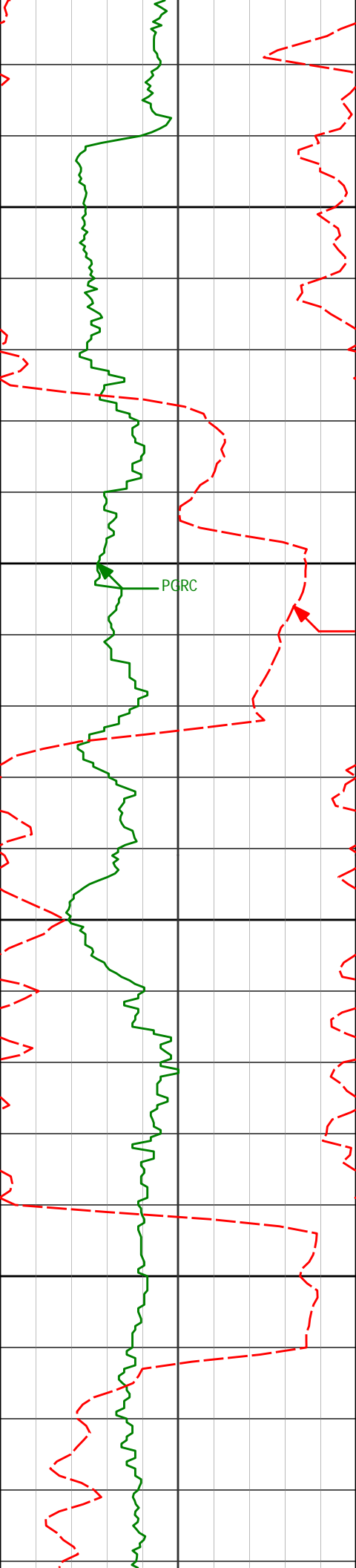
6839'

92.07°

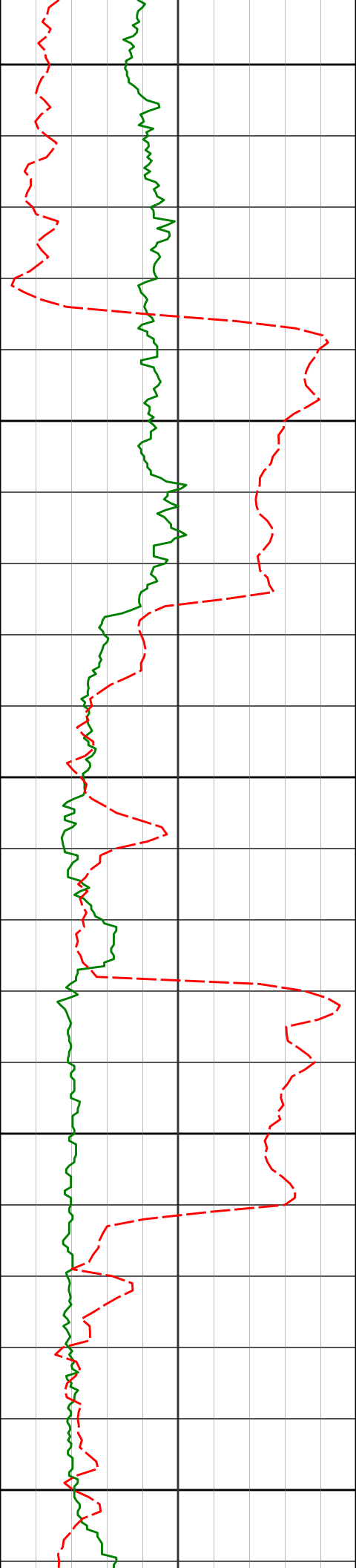
359.38°

6127.97'

697.21'



6934'	92.77°	357.44°	6123.96'	792.12'
6950				
7000				
7029'	91.73°	357.63°	6120.23'	887.02'
7050				
7100				
7124'	91.51°	358.20°	6117.55'	981.97'



7150

7200

7250

7300

7350

7219'

90.74°

359.15°

6115.68'

1076.95'

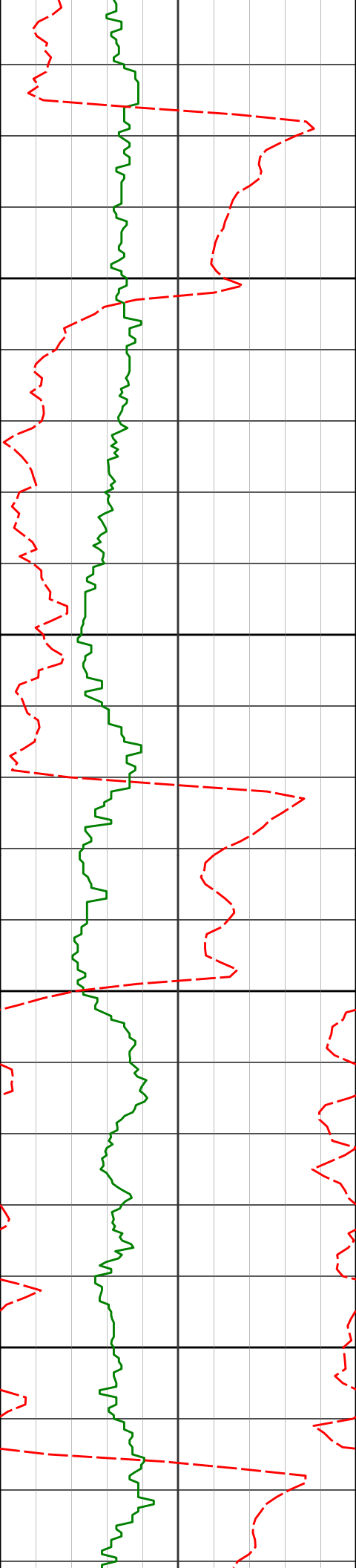
7313'

89.81°

358.21°

6115.23'

1170.95'



7400

7408'

90.06°

357.36°

6115.33'

1265.93'

7450

7500

7503'

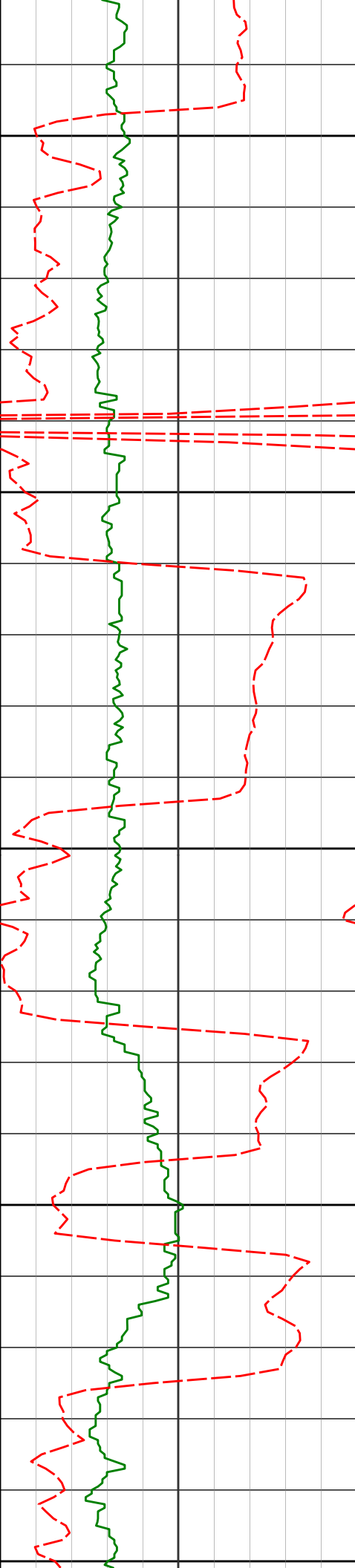
90.15°

356.07°

6115.15'

1360.86'

7550



7600

7650

7700

7750

7800

7598'

7693'

7788'

90.00°

90.06°

88.00°

355.67°

357.60°

358.81°

6115.03'

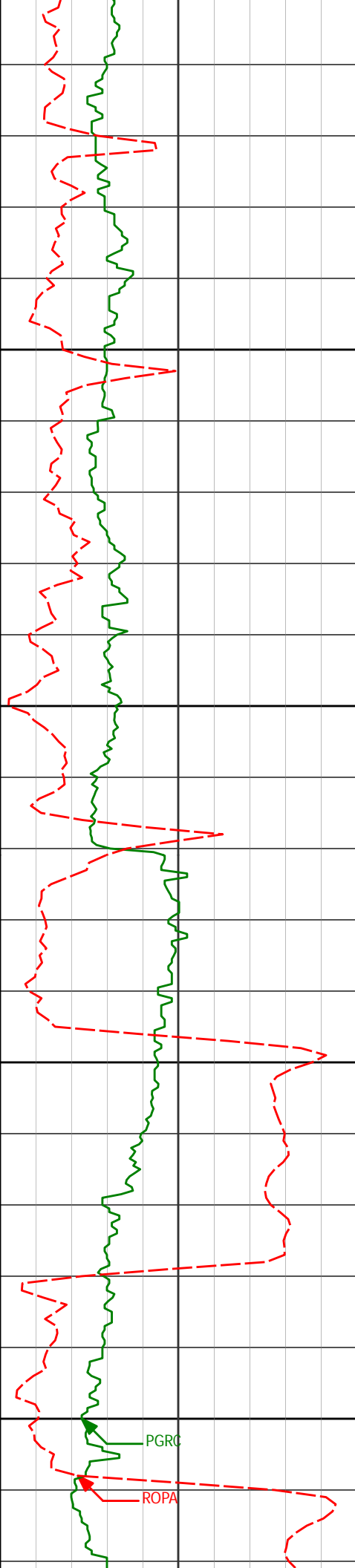
6114.97'

6116.58'

1455.74'

1550.66'

1645.64'



7850

7883'

90.59°

358.02°

6117.76'

1740.62'

7900

7950

7978'

89.91°

359.46°

6117.35'

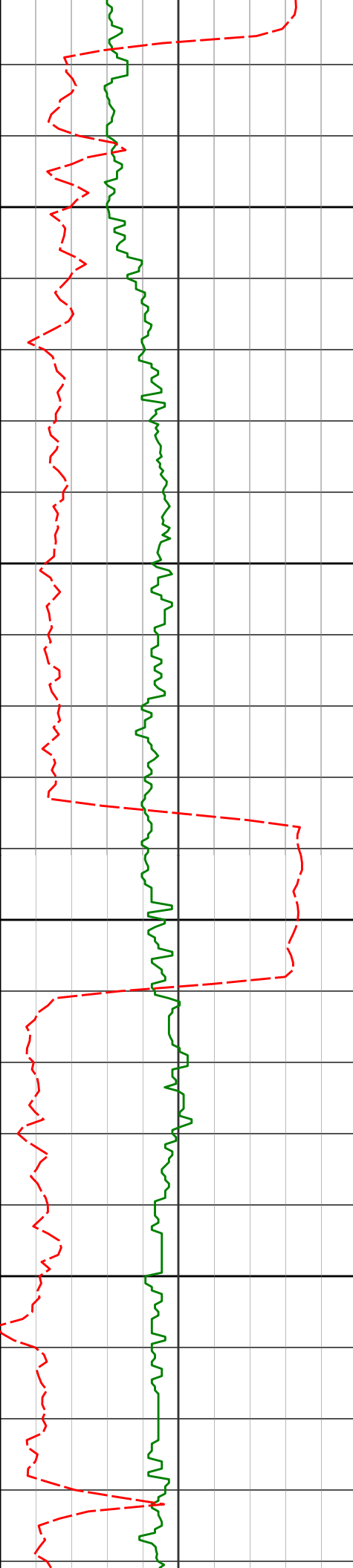
1835.61'

8000

PGRC

ROPA





8050

8073'

89.38°

359.31°

6117.94'

1930.61'

8100

8150

8168'

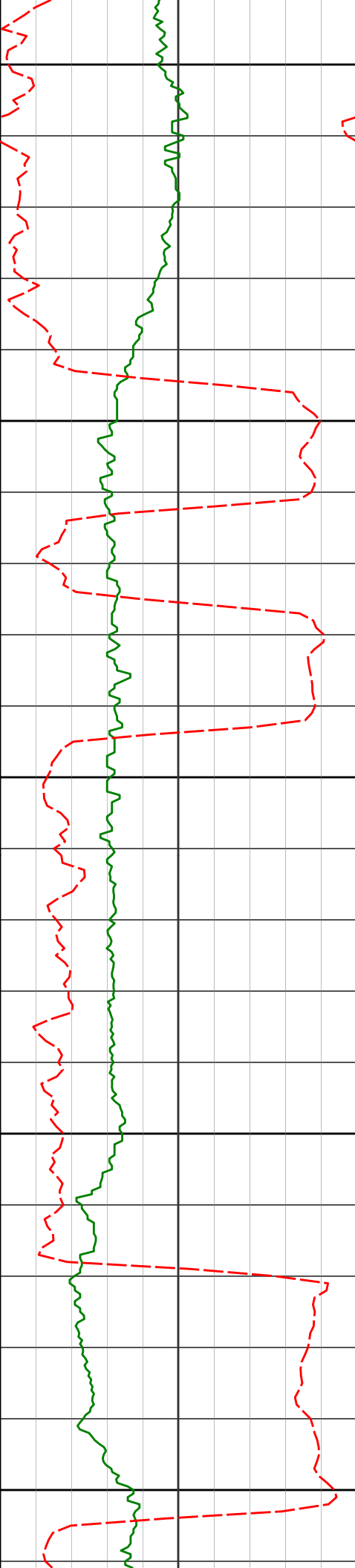
88.70°

358.92°

6119.52'

2025.59'

8200



8250

8262'

91.88°

359.90°

6119.05'

2119.57'

8300

8350

8357'

90.62°

0.77°

6116.98'

2214.52'

8400

8450

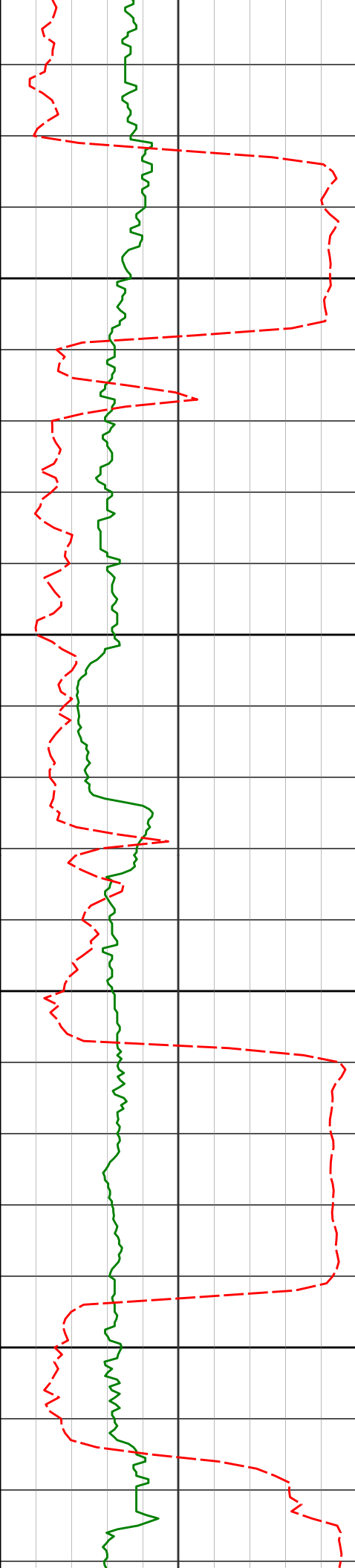
8452'

90.06°

359.77°

6116.41'

2309.48'



8500

8550

8600

8650

8546'

89.82°

358.93°

6116.52'

2403.48'

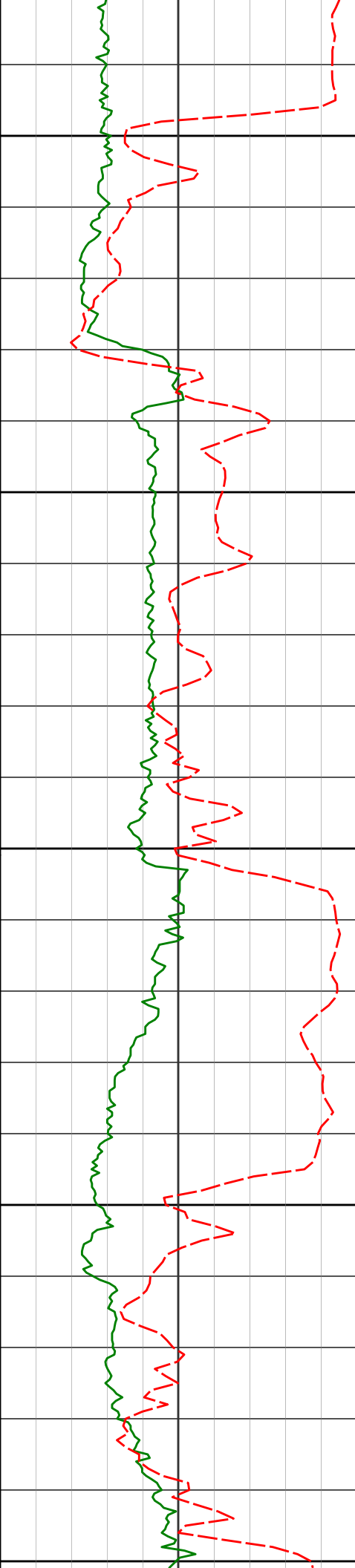
8641'

89.20°

358.76°

6117.33'

2498.47'



8700

8736'

89.91°

359.57°

6118.08'

2593.47'

8750

8800

8831'

89.85°

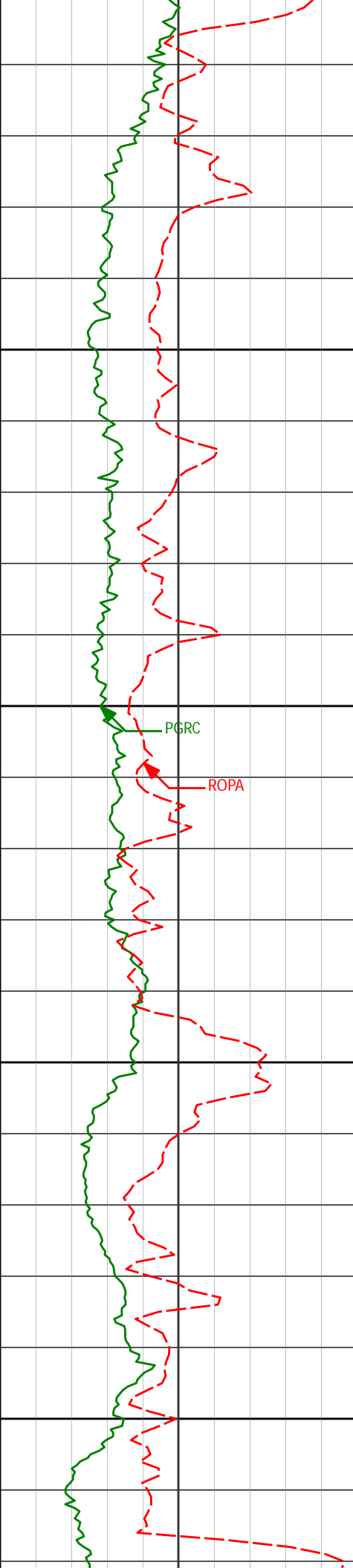
0.93°

6118.28'

2688.44'

8850

8900



8925'

88.74°

0.03°

6119.44'

2782.39'

8950

9000

PGRC

ROPA

9020'

87.66°

358.67°

6122.43'

2877.33'

9050

9100

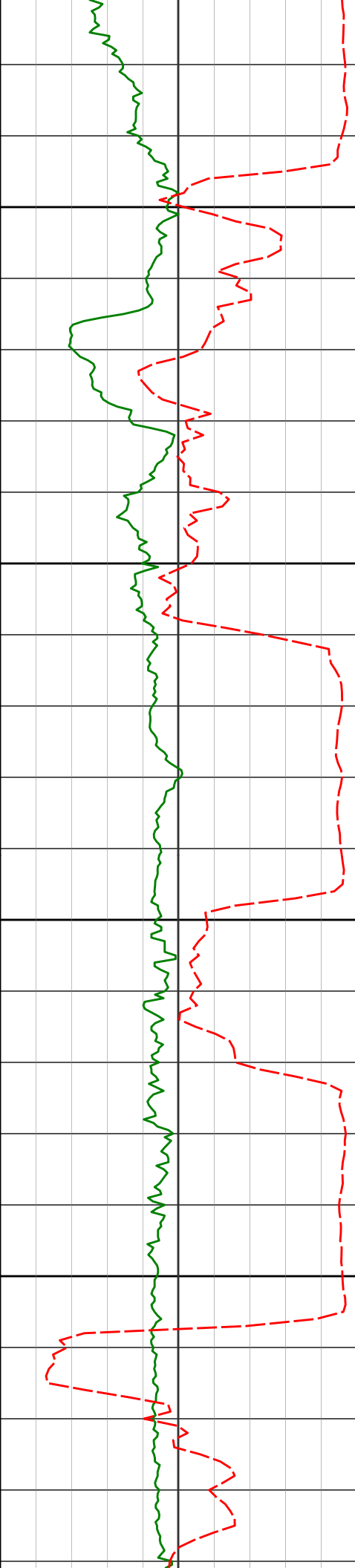
9115'

86.61°

357.97°

6127.19'

2972.21'



9150

9200

9250

9300

9209'

87.29°

357.53°

6132.20'

3066.06'

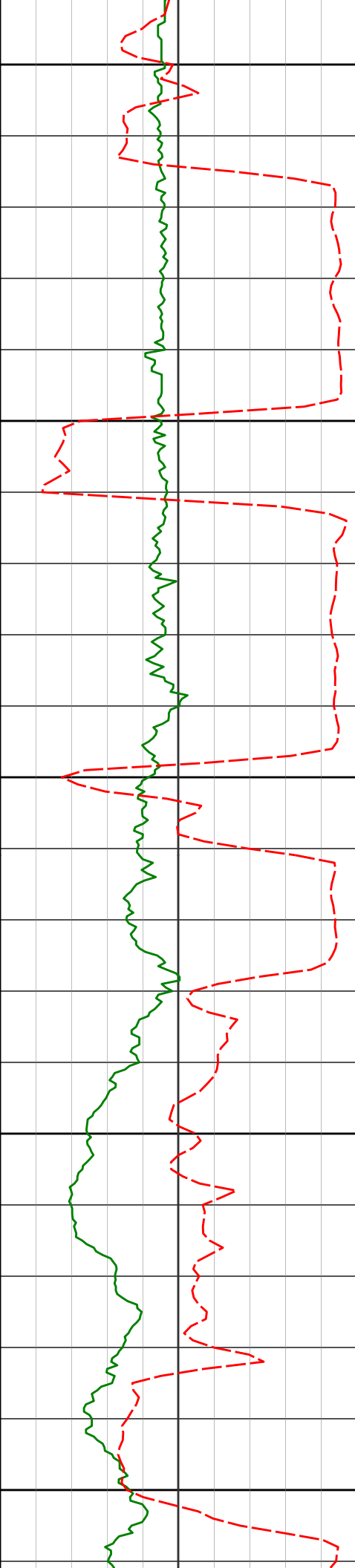
9304'

89.29°

358.58°

6135.03'

3161.00'



9350

9400

9450

9500

9550

9399'

90.83°

358.20°

6134.93'

3255.99'

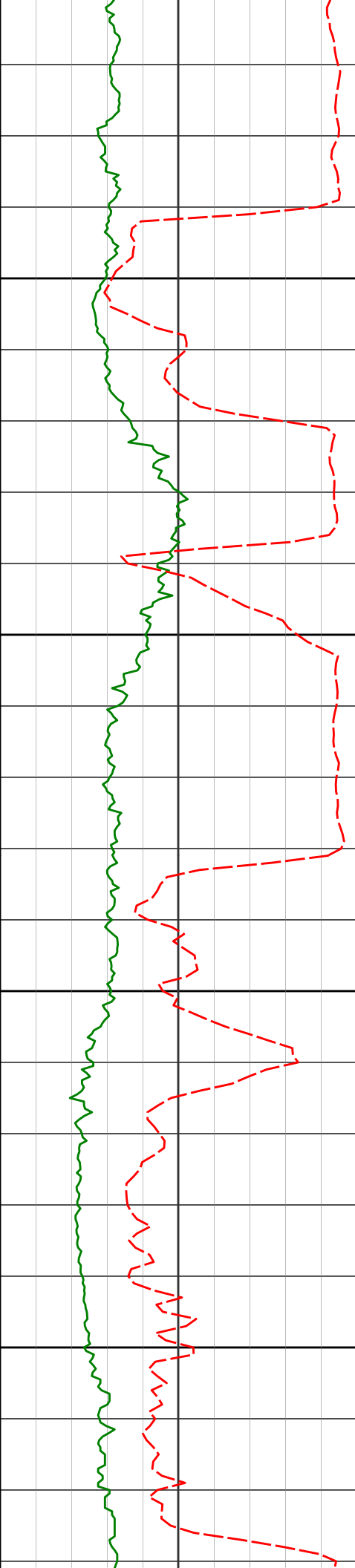
9494'

94.07°

359.04°

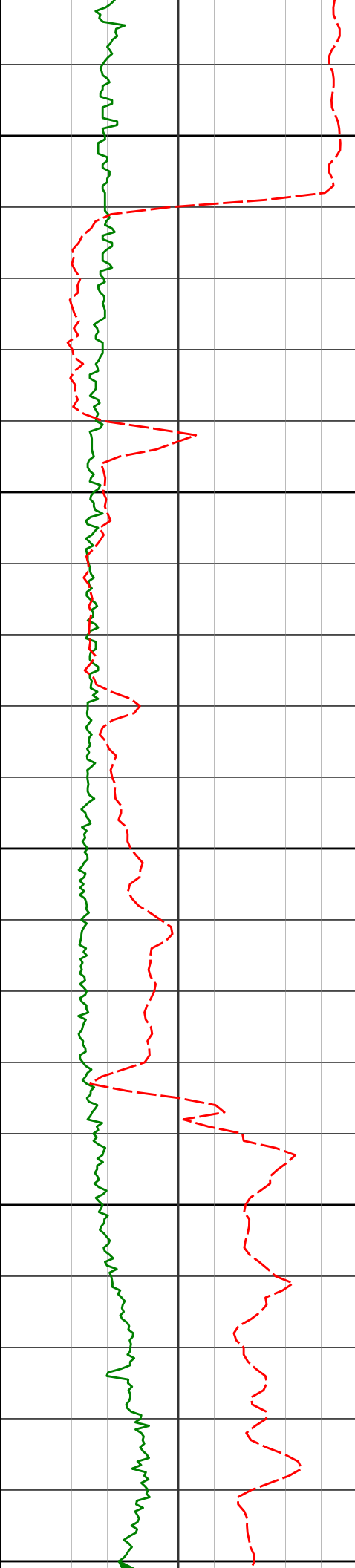
6130.87'

3350.89'



	9588'	92.75°	359.53°	6125.28'	3444.72'
9600					
9650					
9683'	9683'	90.52°	1.05°	6122.57'	3539.64'
9700					
9750					
	9778'	90.43°	0.54°	6121.77'	3634.58'





9800

9850

9900

9950

10000

9873'

88.89°

0.75°

6122.34'

3729.53'

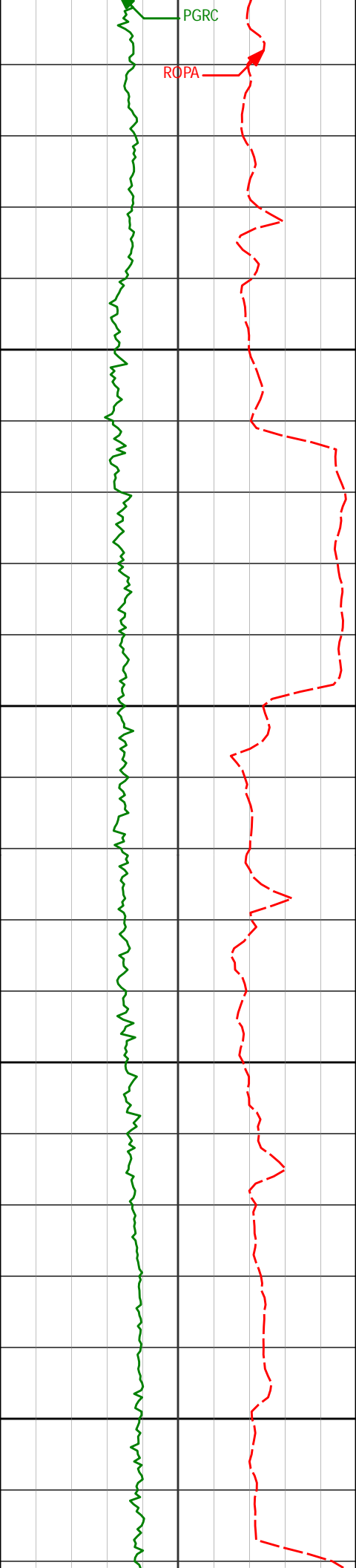
9968'

91.14°

0.48°

6122.31'

3824.48'



10050

10062'

91.67°

359.91°

6120.01'

3918.42'

10100

10150

10157'

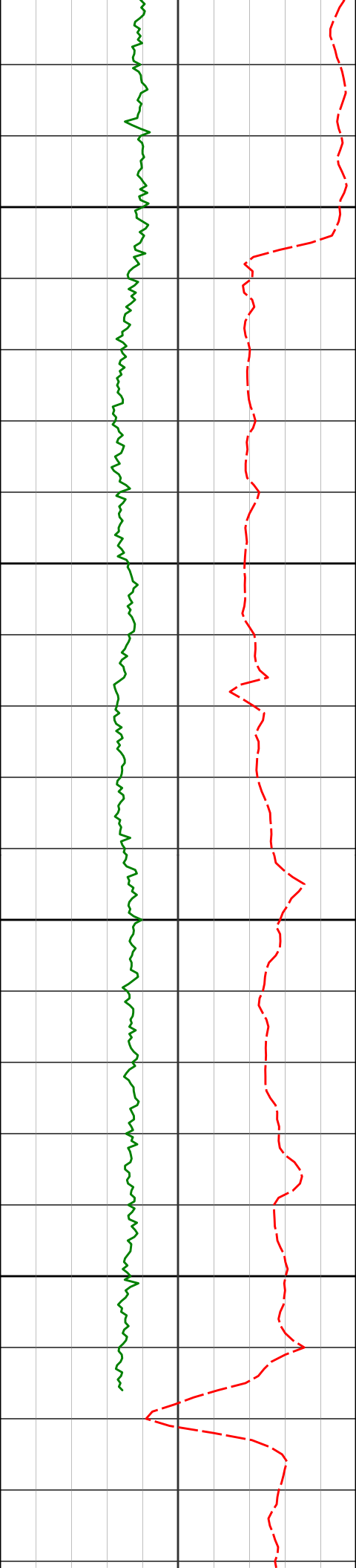
90.99°

359.58°

6117.81'

4013.38'

10200



10250

10300

10350

10400

10252'

88.43°

359.63°

6118.29'

4108.37'

10347'

88.98°

358.84°

6120.44'

4203.34'

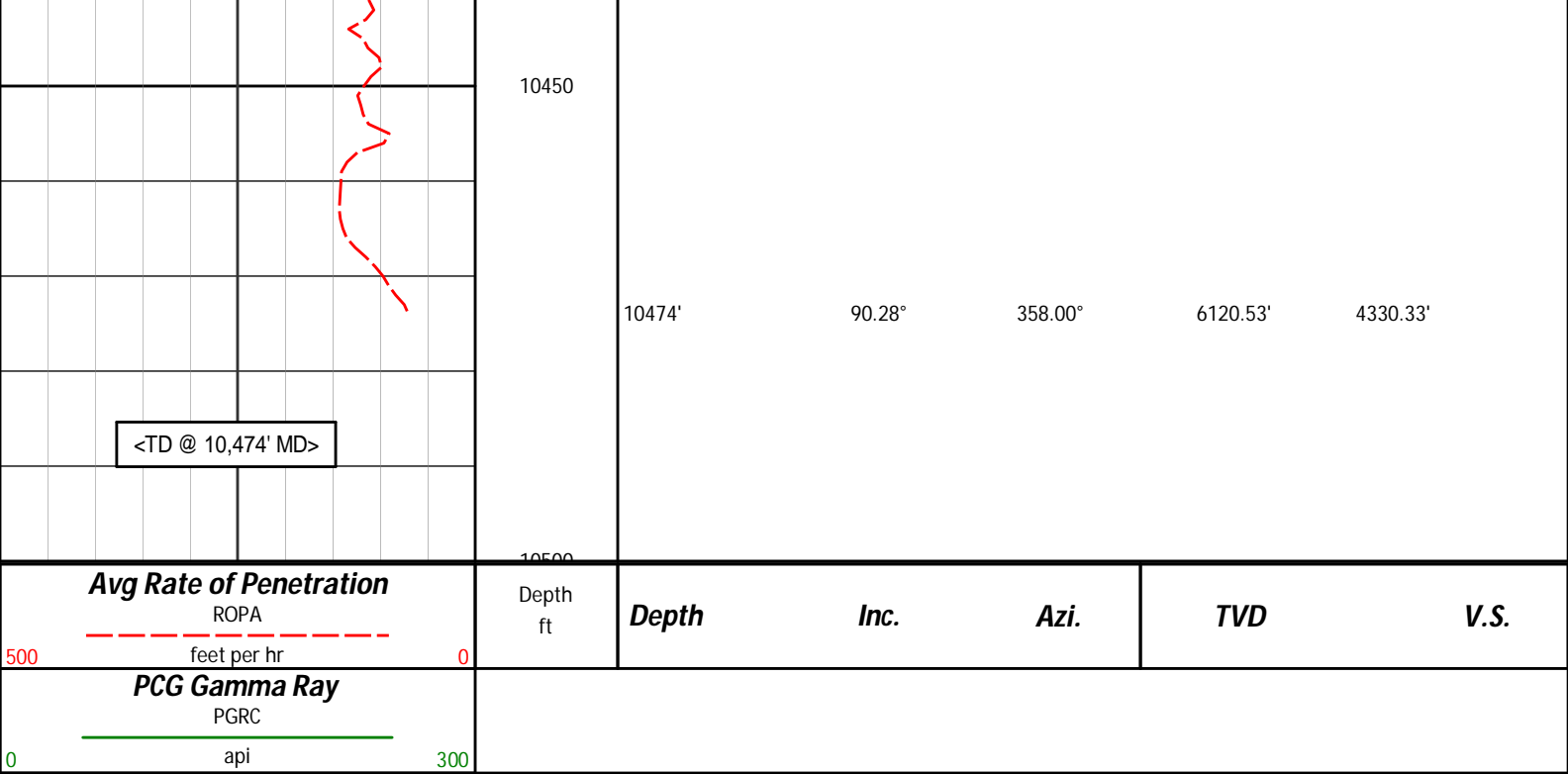
10409'

90.28°

358.00°

6120.84'

4265.33'



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Noble Energy  
Brook LC28-74-1AHNC  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0901400364

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
340.00	0.60	216.94	339.99	1.42 S	1.07 W	-1.40	0.18
609.00	0.20	12.54	608.99	2.09 S	1.81 W	-2.05	0.29
716.00	0.30	170.36	715.99	2.19 S	1.73 W	-2.15	0.46
809.00	0.41	129.61	808.99	2.65 S	1.43 W	-2.62	0.29
902.00	0.15	193.30	901.99	2.98 S	1.20 W	-2.96	0.40
1088.00	0.11	166.56	1087.99	3.40 S	1.21 W	-3.38	0.04
1274.00	0.28	195.30	1273.99	4.01 S	1.29 W	-3.98	0.10
1460.00	0.03	183.08	1459.98	4.49 S	1.41 W	-4.46	0.13
1553.00	0.22	291.26	1552.98	4.45 S	1.58 W	-4.42	0.25
1645.00	0.29	253.19	1644.98	4.45 S	1.96 W	-4.41	0.20
1737.00	0.22	159.43	1736.98	4.69 S	2.12 W	-4.65	0.41
1832.00	0.04	197.45	1831.98	4.90 S	2.07 W	-4.85	0.20
1927.00	2.06	213.97	1926.96	6.35 S	3.03 W	-6.28	2.12
2022.00	3.84	205.85	2021.83	10.62 S	5.37 W	-10.51	1.92
2117.00	5.84	205.12	2116.49	17.86 S	8.81 W	-17.68	2.10
2212.00	5.53	204.06	2211.02	26.42 S	12.73 W	-26.15	0.34
2307.00	7.67	194.88	2305.39	36.73 S	16.22 W	-36.39	2.50
2401.00	7.17	192.47	2398.60	48.52 S	19.10 W	-48.12	0.62
2496.00	6.72	190.23	2492.90	59.79 S	21.37 W	-59.34	0.55
2591.00	6.69	189.80	2587.25	70.71 S	23.30 W	-70.22	0.06
2686.00	6.47	191.58	2681.63	81.41 S	25.32 W	-80.88	0.32
2781.00	6.36	190.41	2776.03	91.83 S	27.34 W	-91.25	0.18
2875.00	7.45	181.83	2869.35	103.04 S	28.48 W	-102.44	1.59
2970.00	6.92	182.39	2963.61	114.91 S	28.91 W	-114.30	0.56
3065.00	6.27	186.11	3057.98	125.79 S	29.70 W	-125.15	0.82
3160.00	5.25	181.06	3152.50	135.29 S	30.33 W	-134.64	1.19
3255.00	4.10	182.67	3247.18	143.03 S	30.57 W	-142.37	1.22
3350.00	5.22	187.31	3341.86	150.71 S	31.28 W	-150.04	1.24

3445.00	6.64	195.07	3436.35	160.30 S	33.26 W	-159.59	1.72
3540.00	6.55	194.59	3530.73	170.85 S	36.05 W	-170.08	0.12
3635.00	6.56	194.29	3625.11	181.35 S	38.76 W	-180.52	0.04
3730.00	6.93	185.73	3719.45	192.31 S	40.67 W	-191.44	1.12
3825.00	6.28	185.37	3813.82	203.17 S	41.72 W	-202.28	0.69
3920.00	5.68	186.55	3908.30	213.01 S	42.75 W	-212.09	0.64
4014.00	5.08	177.55	4001.89	221.79 S	43.10 W	-220.86	1.10
4109.00	4.66	181.39	4096.55	229.85 S	43.01 W	-228.92	0.56
4204.00	3.24	158.03	4191.33	236.20 S	42.10 W	-235.30	2.23
4394.00	3.25	148.36	4381.02	245.77 S	37.27 W	-244.96	0.29
4489.00	2.38	105.41	4475.92	248.58 S	33.96 W	-247.84	2.33
4583.00	1.45	46.78	4569.87	248.29 S	31.21 W	-247.60	2.17
4678.00	2.02	30.78	4664.83	246.03 S	29.47 W	-245.37	0.78
4773.00	2.30	311.54	4759.78	243.33 S	30.05 W	-242.66	2.91
4868.00	0.25	301.62	4854.75	241.95 S	31.65 W	-241.25	2.16
5058.00	0.44	28.61	5044.75	241.10 S	31.66 W	-240.40	0.26
5152.00	0.62	64.65	5138.74	240.56 S	31.03 W	-239.88	0.40
5247.00	0.50	49.14	5233.74	240.07 S	30.25 W	-239.41	0.21
5342.00	0.55	46.57	5328.73	239.49 S	29.61 W	-238.83	0.07
5432.00	0.60	48.14	5418.73	238.87 S	28.94 W	-238.23	0.06
5527.00	2.96	24.58	5513.68	236.31 S	27.54 W	-235.70	2.54
5574.00	7.63	15.80	5560.47	232.20 S	26.19 W	-231.62	10.06
5621.00	11.45	22.14	5606.81	224.87 S	23.58 W	-224.35	8.42
5668.00	14.53	27.26	5652.60	215.31 S	19.12 W	-214.87	7.00
5716.00	18.45	26.41	5698.62	203.15 S	12.98 W	-202.84	8.17
5763.00	22.50	24.63	5742.64	188.31 S	5.92 W	-188.15	8.72
5811.00	25.07	19.74	5786.56	170.38 S	1.34 E	-170.37	6.74
5858.00	26.13	11.62	5828.96	150.87 S	6.79 E	-150.97	7.79
5906.00	29.29	4.39	5871.47	128.79 S	9.82 E	-128.97	9.61
5953.00	33.54	359.49	5911.57	104.33 S	10.59 E	-104.53	10.55
6001.00	37.34	352.27	5950.69	76.62 S	8.51 E	-76.78	11.75
6048.00	41.81	349.89	5986.91	47.06 S	3.84 E	-47.13	10.05
6096.00	47.08	349.81	6021.16	13.98 S	2.08 W	-13.94	10.97
6143.00	51.91	351.76	6051.69	21.28 N	7.78 W	21.43	10.75
6190.00	58.55	356.40	6078.48	59.65 N	11.70 W	59.88	16.29
6237.00	64.79	359.67	6100.78	100.97 N	13.08 W	101.22	14.62
6285.00	72.40	2.24	6118.29	145.61 N	12.31 W	145.83	16.62
6332.00	79.44	2.87	6129.71	191.13 N	10.27 W	191.30	15.03
6380.00	86.05	3.52	6135.77	238.64 N	7.62 W	238.75	13.85
6441.00	89.60	2.25	6138.09	299.51 N	4.55 W	299.54	6.18
6555.00	90.89	0.78	6137.60	413.46 N	1.53 W	413.41	1.72
6650.00	92.81	358.98	6134.53	508.41 N	1.73 W	508.34	2.77
6745.00	91.54	359.16	6130.93	603.32 N	3.28 W	603.26	1.35
6839.00	92.07	359.38	6127.97	697.27 N	4.48 W	697.21	0.61
6934.00	92.77	357.44	6123.96	792.14 N	7.11 W	792.12	2.17
7029.00	91.73	357.63	6120.23	886.98 N	11.19 W	887.02	1.12
7124.00	91.51	358.20	6117.55	981.88 N	14.65 W	981.97	0.64
7219.00	90.74	359.15	6115.68	1076.83 N	16.85 W	1076.95	1.29
7313.00	89.81	358.21	6115.23	1170.80 N	19.02 W	1170.95	1.41
7408.00	90.06	357.36	6115.33	1265.73 N	22.69 W	1265.93	0.93
7503.00	90.15	356.07	6115.15	1360.57 N	28.14 W	1360.86	1.37
7598.00	90.00	355.67	6115.03	1455.33 N	34.98 W	1455.74	0.45
7693.00	90.06	357.60	6114.97	1550.16 N	40.55 W	1550.66	2.04
7788.00	88.00	358.81	6116.58	1645.09 N	43.53 W	1645.64	2.52
7883.00	90.59	358.02	6117.76	1740.04 N	46.15 W	1740.62	2.85
7978.00	89.91	359.46	6117.35	1835.01 N	48.24 W	1835.61	1.67
8073.00	89.38	359.31	6117.94	1930.00 N	49.26 W	1930.61	0.57
8168.00	88.70	358.92	6119.52	2024.98 N	50.72 W	2025.59	0.82
8262.00	91.88	359.90	6119.05	2118.96 N	51.69 W	2119.57	3.53
8357.00	90.62	0.77	6116.98	2213.93 N	51.13 W	2214.52	1.62
8452.00	90.06	359.77	6116.41	2308.93 N	50.68 W	2309.48	1.21
8546.00	89.82	358.93	6116.52	2402.92 N	51.74 W	2403.48	0.93
8641.00	89.20	358.76	6117.33	2497.90 N	53.66 W	2498.47	0.67
8736.00	89.91	359.57	6118.08	2592.88 N	55.04 W	2593.47	1.13
8831.00	89.85	0.93	6118.28	2687.88 N	54.63 W	2688.44	1.43
8925.00	88.74	0.03	6119.44	2781.87 N	53.84 W	2782.39	1.52
9020.00	87.66	358.67	6122.43	2876.81 N	54.92 W	2877.33	1.83
9115.00	86.61	357.97	6127.19	2971.65 N	57.70 W	2972.21	1.33
9209.00	87.29	357.53	6132.20	3065.44 N	61.39 W	3066.06	0.86
9304.00	89.29	358.58	6135.03	3160.34 N	64.61 W	3161.00	2.38
9399.00	90.83	358.20	6134.93	3255.30 N	67.28 W	3255.99	1.67
9494.00	94.07	359.04	6130.87	3350.17 N	69.57 W	3350.89	3.52
9588.00	92.75	359.53	6125.28	3443.99 N	70.75 W	3444.72	1.51
9683.00	90.52	1.05	6122.57	3538.95 N	70.27 W	3539.64	2.83

9778.00	90.43	0.54	6121.77	3633.93 N	68.95 W	3634.58	0.54
9873.00	88.89	0.75	6122.34	3728.92 N	67.88 W	3729.53	1.64
9968.00	91.14	0.48	6122.31	3823.91 N	66.86 W	3824.48	2.39
10062.00	91.67	359.91	6120.01	3917.88 N	66.54 W	3918.42	0.82
10157.00	90.99	359.58	6117.81	4012.85 N	66.96 W	4013.38	0.80
10252.00	88.43	359.63	6118.29	4107.84 N	67.61 W	4108.37	2.69
10347.00	88.98	358.84	6120.44	4202.81 N	68.89 W	4203.34	1.02
10409.00	90.28	358.00	6120.84	4264.78 N	70.60 W	4265.33	2.48
10474.00	90.28	358.00	6120.53	4329.74 N	72.86 W	4330.33	0.01

**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 358.83 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.14 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10474.00 FEET  
IS 4330.35 FEET ALONG 359.04 DEGREES (GRID)**

**Surface surveys at 340 ft and 609 ft have had azimuths corrected to grid north, but were not taken by Halliburton.**

**Last survey is a projection from 10409 ft MD to TD at 10474 ft MD.**