



WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	08-Sep-13	09-Sep-13	12-Sep-13		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.75		
Log Start Depth (MD, ft)	972.00	5,885.00	7,118.00		
Log End Depth (MD, ft)	5,885.00	7,118.00	11,002.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	07-Sep-13 03:15	08-Sep-13 08:15	10-Sep-13 12:00		
Drill/Wipe End Date and Time	08-Sep-13 00:15	09-Sep-13 01:15	11-Sep-13 15:00		
Min Inc (deg) @ Depth (MD, ft)	.04 @ 1,364.00	10.82 @ 5,900.00	86.80 @ 7,161.00		
Max Inc (deg) @ Depth (MD, ft)	16.55 @ 3,909.00	82.63 @ 7,065.00	94.32 @ 10,940.00		
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC	.65 / PDC		
Flow Rate (gpm)	595.51	542.86	300.00		
Max AV (fpm) / CV (fpm) @ MWD	417.4 / NA	380.0 / NA	448.0 / NA		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.75 / 27.00	9.90 / 36.00	9.50 / 30.00		
Filtrate CL (ppm)	2,400.00	2,600.00	2,900.00		
pH / Fluid Loss (mptm)	9.50 / NA	9.80 / NA	10.00 / NA		
PV (cP) / YP (lbf2)	2 / 3.00	12 / 11.00	8 / 6.00		
% Solids / % Sand	3.2 / .25	8.50 / 0.20	4.9 / 0.15		
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95	0 / 0:95		
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Max Tool Temp (deg F) / S	167.00 / PDM	170.70 / PDM	220.00 / PDM		

Max Tool Temp (degF) / Source	167.00 / PCM	172.78 / PCM	226.00 / PCM		
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Lead MWD Engineer	Brett Vandergon	Brett Vandergon	Brett Vandergon		
Customer Representative	Johnny Sanchez	Johnny Sanchez	Johnny Sanchez		

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11341325	11341325	12134697		
Insert Serial Number	11400826	11400826	11399998		
Date and Time Initialized	06-Sep-13 17:34	06-Sep-13 17:34	09-Sep-13 15:46		
Date and Time Read	09-Sep-13 13:47	09-Sep-13 13:53	12-Sep-13 00:43		
ECMB SW Version	N/A	N/A	N/A		

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	57.00	53.00	62.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341325	11341325	12134697		
Sonde Serial Number	11145627	11145627	11062116		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	272.26	247.80	34.11		

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.82	46.64	55.64		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341325	11341325	12134697		
Insert/Sonde Serial Number	11293298	11293298	11579774		

## REMARKS

1. All depths are measured bit depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:  
PGRC (Corrected Gamma Ray):  
Interval Resolution: 0.5 ft  
Interval Distance: 0.6 ft  
Gap Fill: 3.0 ft  
ROPA (Average Rate of Penetration)  
Interval Resolution: 0.5 ft  
Interval Distance: 1.2 ft  
Gap Fill: 3.0 ft
6. INSITE version 7.4.2

WARRANTY

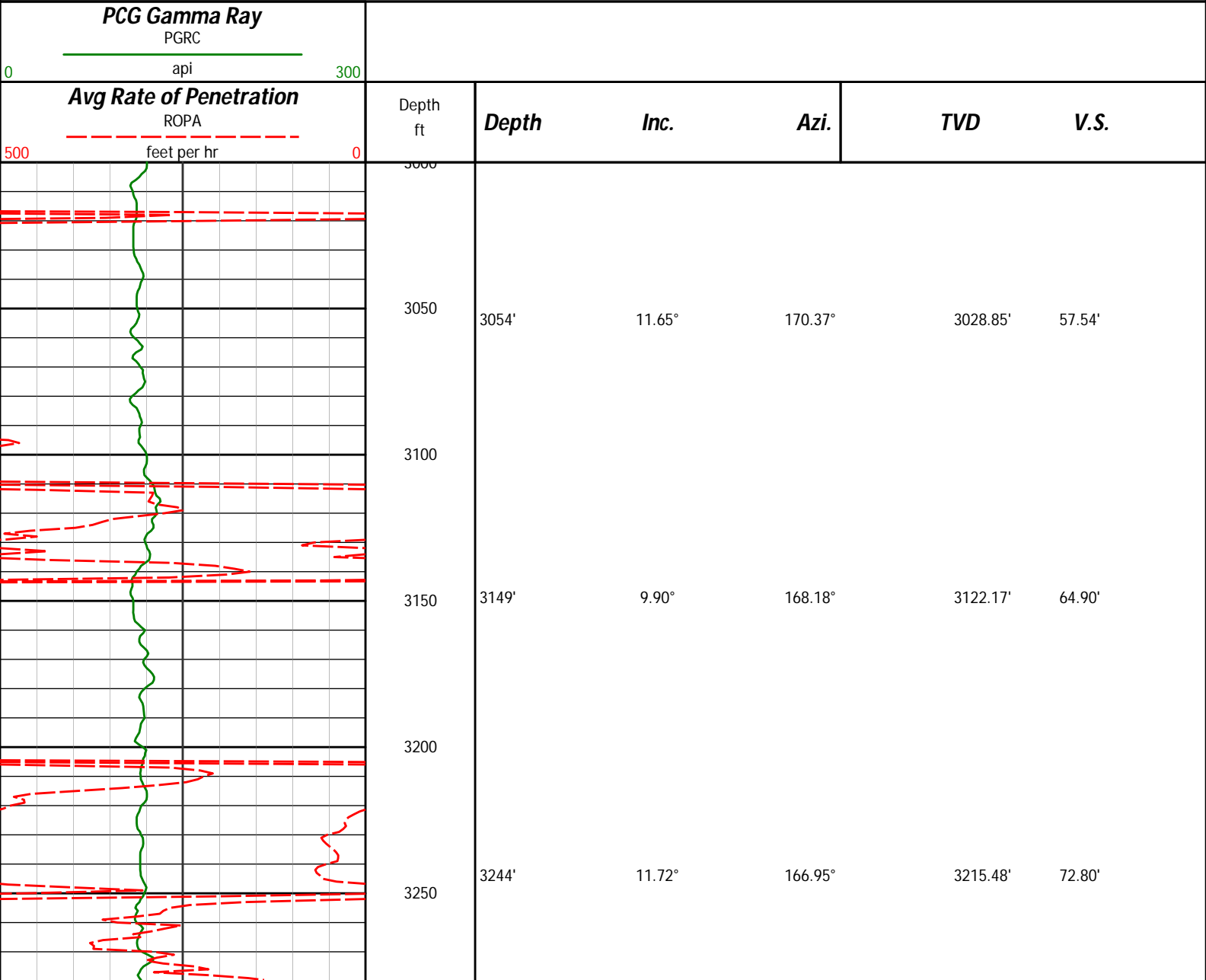
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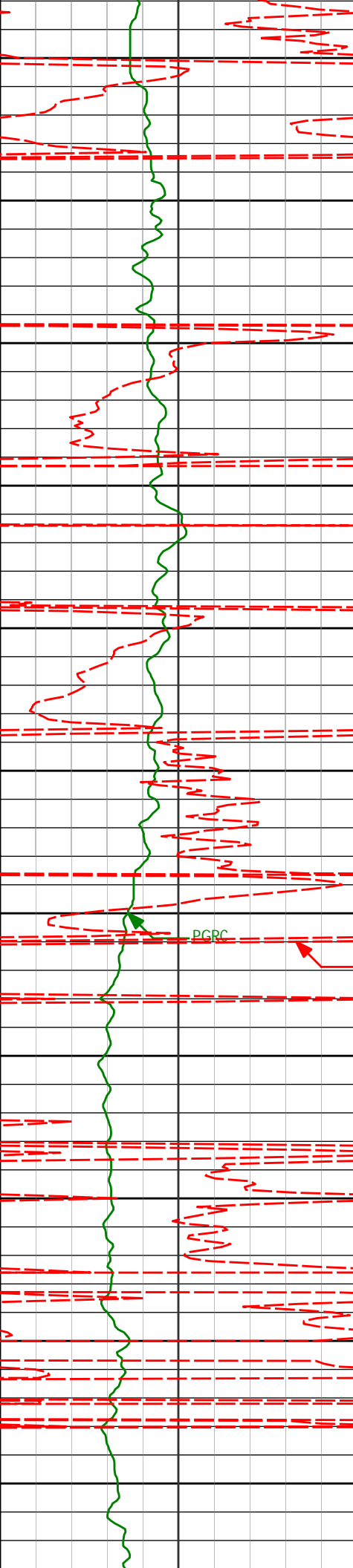
HALLIBURTON

Sperry Drilling Services

MD Main Log 1:600

Noble Energy  
Wells Ranch USX AE20-62-1HN  
H&P 343  
T6N-R62W





3300

3350

3400

3450

3500

3529'

13.46°

182.05°

3493.69'

92.67'

3550

3600

PGRC

ROPA

3624'

14.16°

176.38°

3585.95'

98.42'

3650

3700

3719'

14.43°

178.29°

3678.01'

105.08'

3750

3800

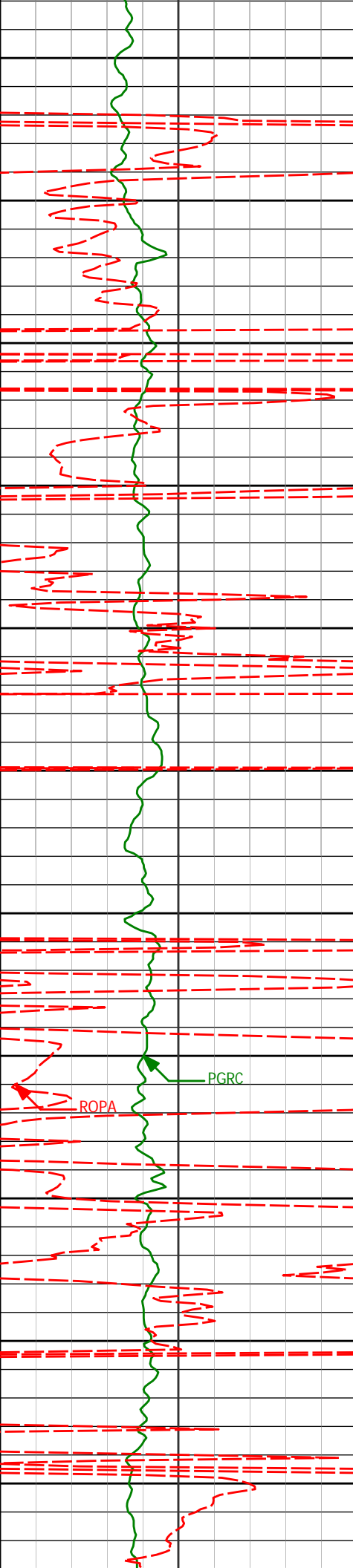
3814'

15.90°

179.40°

3769.70'

111.50'



3850

3900

3950

4000

4050

4100

4150

4200

4250

4300

4350

3909'

16.55°

176.63°

3860.91'

118.75'

4004'

13.90°

172.76°

3952.57'

126.86'

4099'

11.37°

171.03°

4045.27'

134.59'

4194'

8.81°

172.06°

4138.79'

140.92'

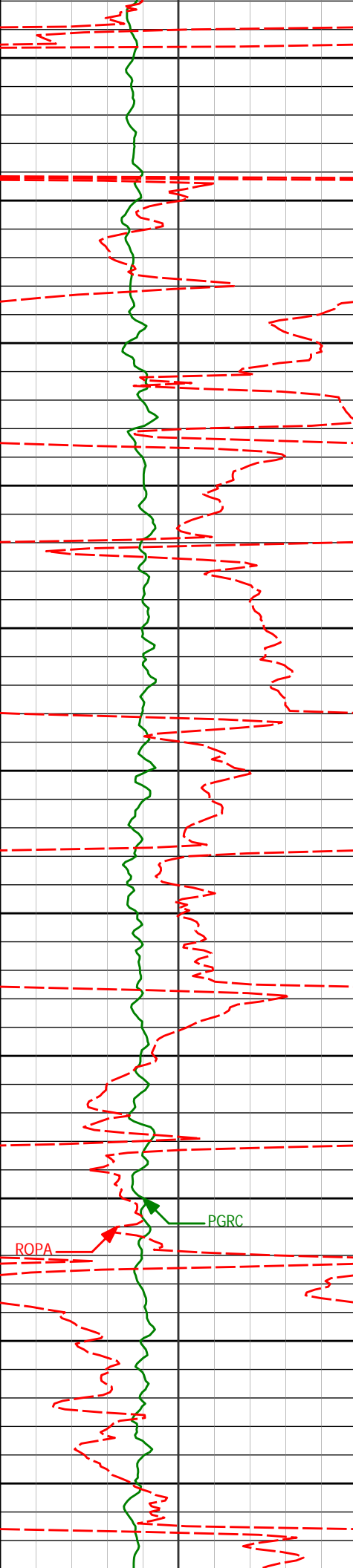
4289'

9.10°

175.06°

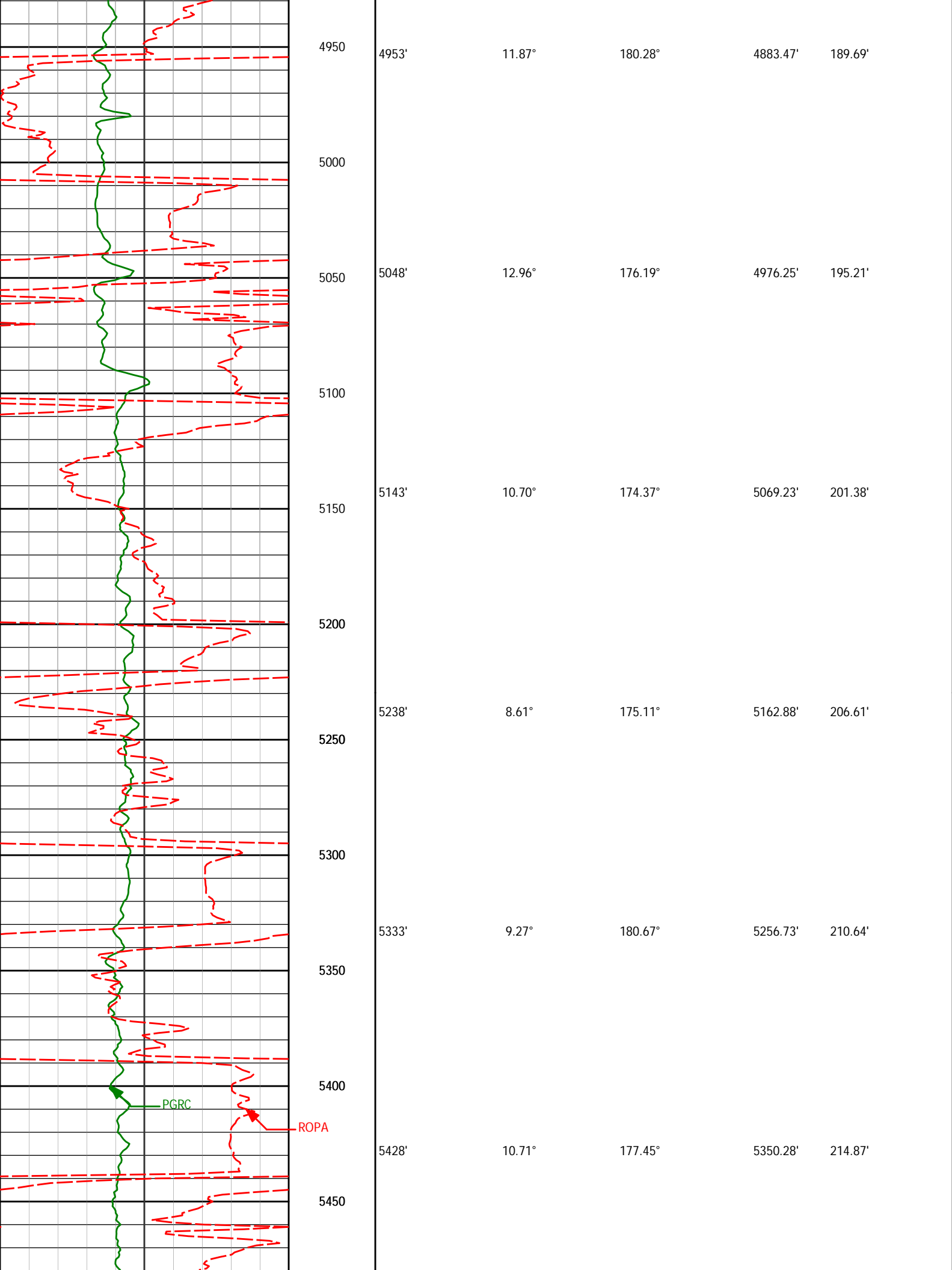
4232.63'

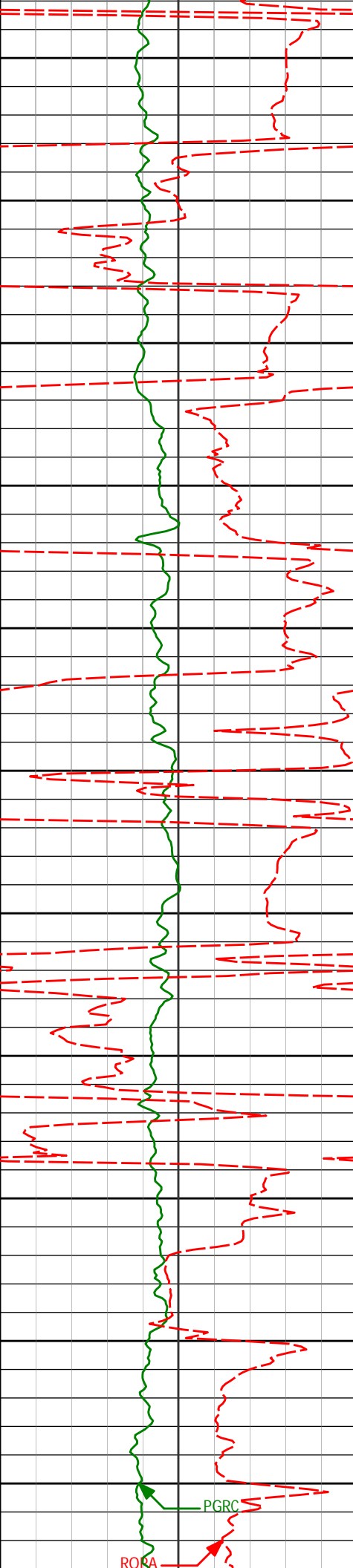
146.04'



4400  
4450  
4500  
4550  
4600  
4650  
4700  
4750  
4800  
4850  
4900

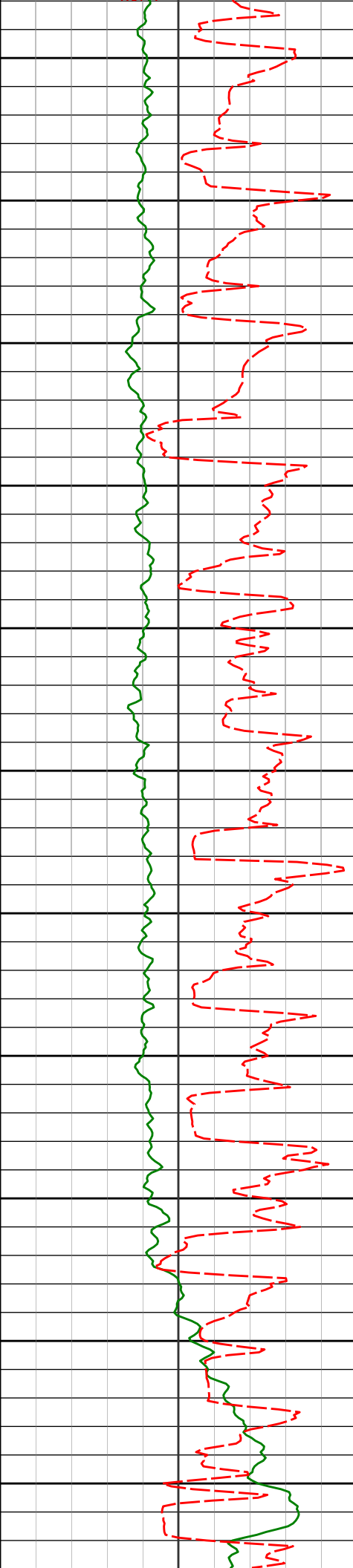
4384'	10.74°	168.39°	4326.21'	152.26'
4479'	11.04°	170.29°	4419.50'	159.70'
4574'	11.01°	172.77°	4512.75'	166.60'
4668'	11.39°	174.88°	4604.96'	172.84'
4763'	13.28°	178.34°	4697.76'	178.80'
4858'	11.80°	176.83°	4790.49'	184.56'



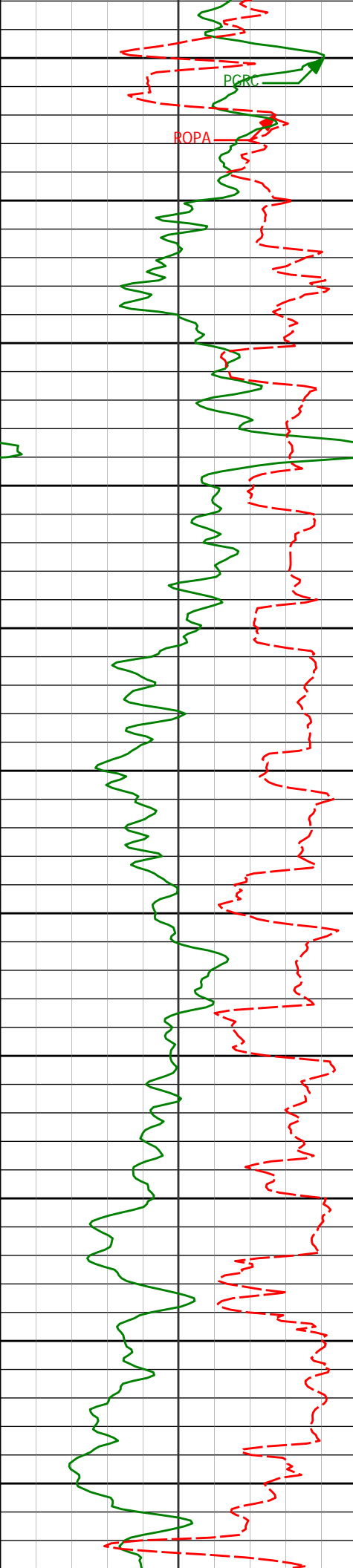


5500					
	5523'	12.25°	173.44°	5443.38'	220.87'
5550					
5600					
	5618'	12.12°	171.56°	5536.24'	228.17'
5650					
5700					
	5713'	11.37°	176.41°	5629.25'	234.75'
5750					
5800					
	5828'	11.60°	178.09°	5741.95'	241.29'
5850					
<Run 200>					
5900	5900'	10.82°	175.19°	5812.58'	245.41'
5950	5948'	11.54°	172.28°	5859.67'	248.62'
6000	5995'	16.38°	174.40°	5905.27'	252.56'



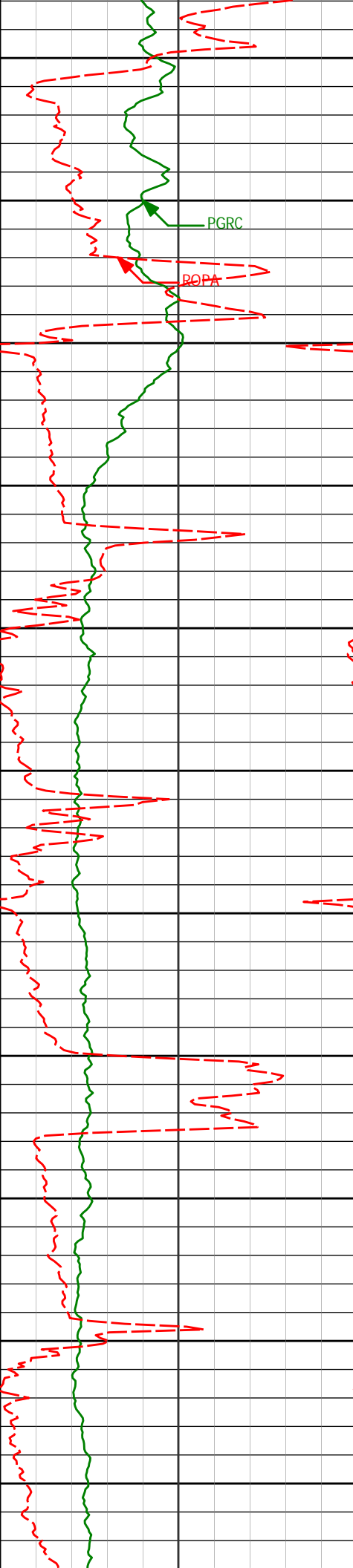


6043'	21.77°	174.92°	5950.61'	257.70'
6050				
6090'	25.26°	175.47°	5993.70'	263.69'
6100				
6138'	29.27°	174.21°	6036.36'	270.86'
6150				
6185'	32.78°	172.01°	6076.63'	279.45'
6200				
6233'	36.09°	168.23°	6116.22'	290.40'
6250				
6280'	38.04°	161.66°	6153.74'	304.10'
6300				
6328'	38.03°	152.38°	6191.58'	321.78'
6350				
6375'	37.67°	144.08°	6228.71'	342.35'
6400				
6423'	37.96°	136.86°	6266.65'	365.93'
6450				
6470'	38.25°	130.41°	6303.65'	391.07'
6500				
6518'	39.95°	124.09°	6340.91'	418.83'
6550				
6565'	42.80°	120.78°	6376.18'	448.28'



6600	6613'	46.14°	115.95°	6410.44'	480.81'
6650	6660'	49.24°	112.14°	6442.08'	515.01'
6700	6708'	53.17°	108.51°	6472.16'	552.17'
6750	6755'	57.30°	105.88°	6498.95'	590.70'
6800	6803'	61.42°	103.88°	6523.41'	631.98'
6850	6849'	65.65°	101.34°	6543.91'	673.13'
6900	6897'	68.70°	99.79°	6562.53'	717.29'
6950	6944'	72.54°	97.74°	6578.12'	761.45'
7000	6992'	77.79°	95.48°	6590.41'	807.46'
7050	7065'	82.63°	90.87°	6602.83'	878.10'
7100					

▲ Casing Set @ 7,108' MD  
<Run 300>



7150

7161'

86.80°

87.96°

6611.67'

970.65'

7200

PGRC

BOPA

7250

7253'

88.92°

89.82°

6615.11'

1059.47'

7300

7350

7346'

89.35°

90.33°

6616.51'

1149.78'

7400

7450

7439'

90.96°

91.56°

6616.26'

1240.43'

7500

7550

7600

7650

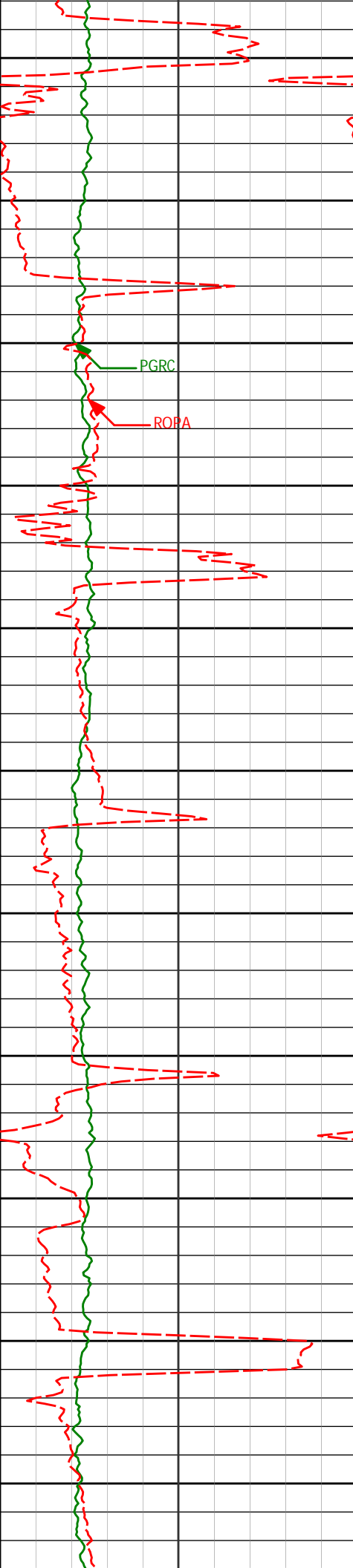
7624'

91.02°

89.29°

6615.56'

1419.57'



7700

7718'

89.44°

86.38°

6615.19'

1509.91'

7750

7800

7810'

91.11°

87.37°

6614.74'

1597.90'

7850

7900

7902'

89.63°

86.08°

6614.15'

1685.82'

7950

8000

7993'

90.62°

87.00°

6613.95'

1772.70'

8050

8100

8086'

90.34°

85.79°

6613.17'

1861.42'

8150

8200

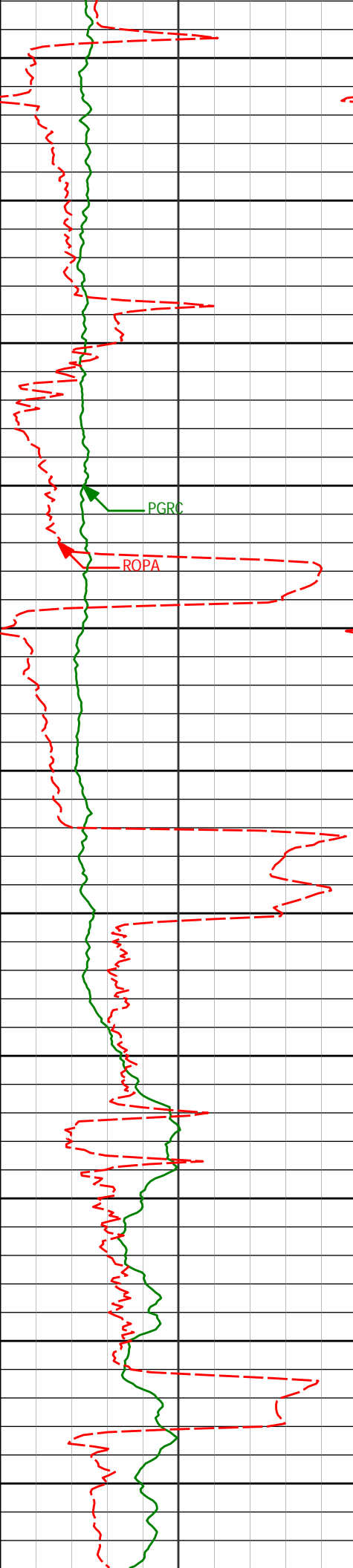
8179'

90.12°

87.04°

6612.80'

1950.15'



8250

8272'

91.60°

87.70°

6611.40'

2039.32'

8300

8350

8366'

90.52°

85.84°

6609.66'

2129.16'

8400

PGRC

ROPA

8450

8461'

89.78°

85.35°

6609.42'

2219.38'

8500

8550

8556'

91.33°

88.65°

6608.50'

2310.29'

8600

8650

8650'

93.27°

89.21°

6604.72'

2401.05'

8700

8750

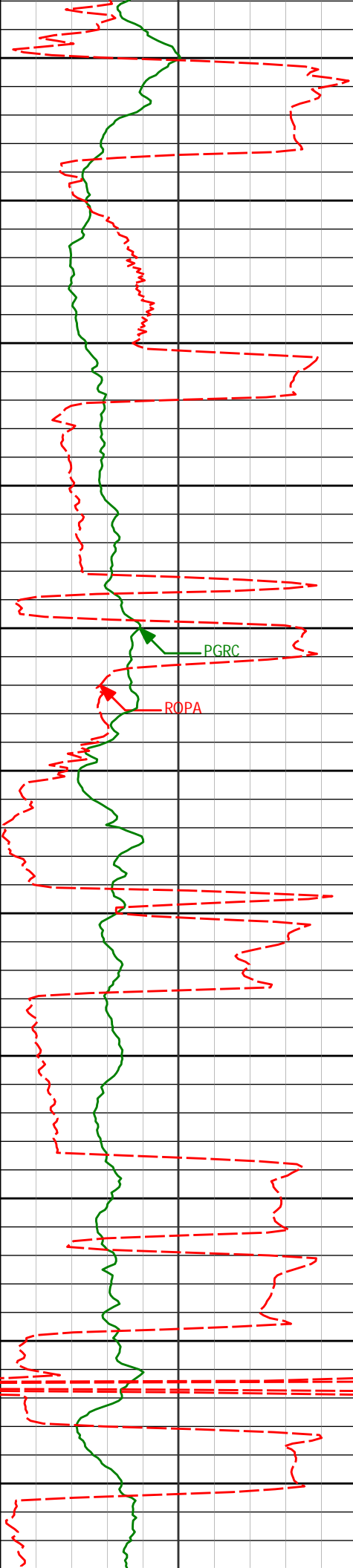
8745'

93.30°

89.02°

6599.28'

2492.78'



8800

8840'

92.16°

89.32°

6594.75'

2584.57'

8850

8900

8935'

90.89°

88.22°

6592.23'

2676.27'

8950

9000

PGRC

9030'

92.75°

88.65°

6589.21'

2767.81'

9050

9100

9125'

92.07°

88.78°

6585.21'

2859.43'

9150

9200

9219'

88.86°

88.22°

6584.45'

2950.07'

9250

9300

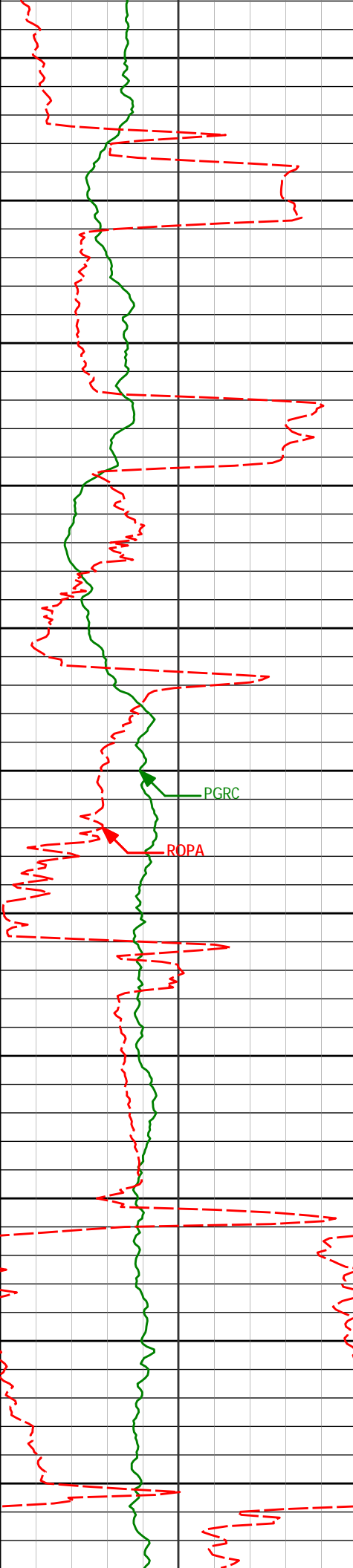
9314'

89.07°

90.38°

6586.17'

3042.01'



9350

9400

9450

9500

9550

9600

9650

9700

9750

9800

9850

9409'

90.37°

89.79°

6586.63'

3134.28'

9504'

89.01°

89.89°

6587.15'

3226.45'

9599'

89.54°

88.80°

6588.35'

3318.42'

9694'

89.94°

88.62°

6588.78'

3410.13'

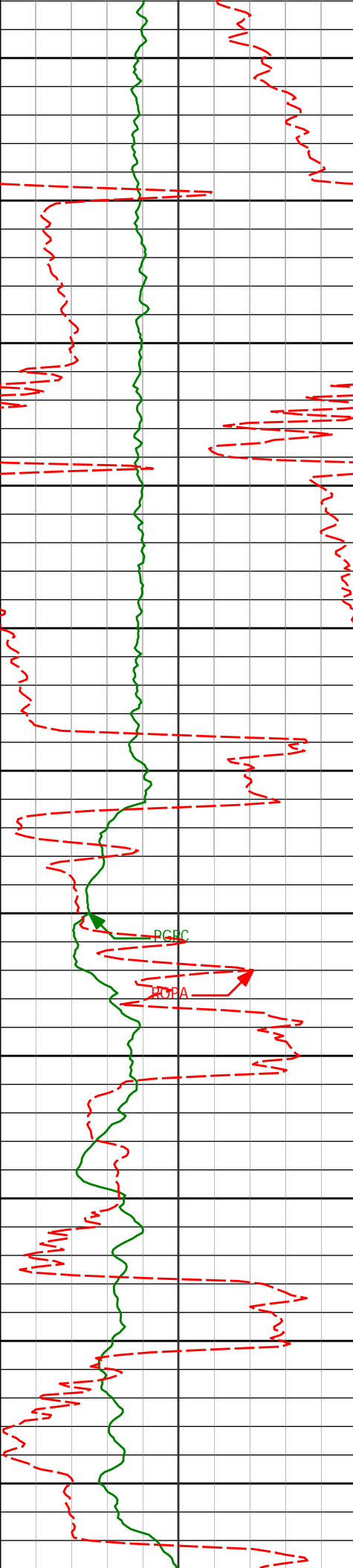
9789'

90.28°

87.90°

6588.60'

3501.63'



9900

9950

10000

10050

10100

10150

10200

10250

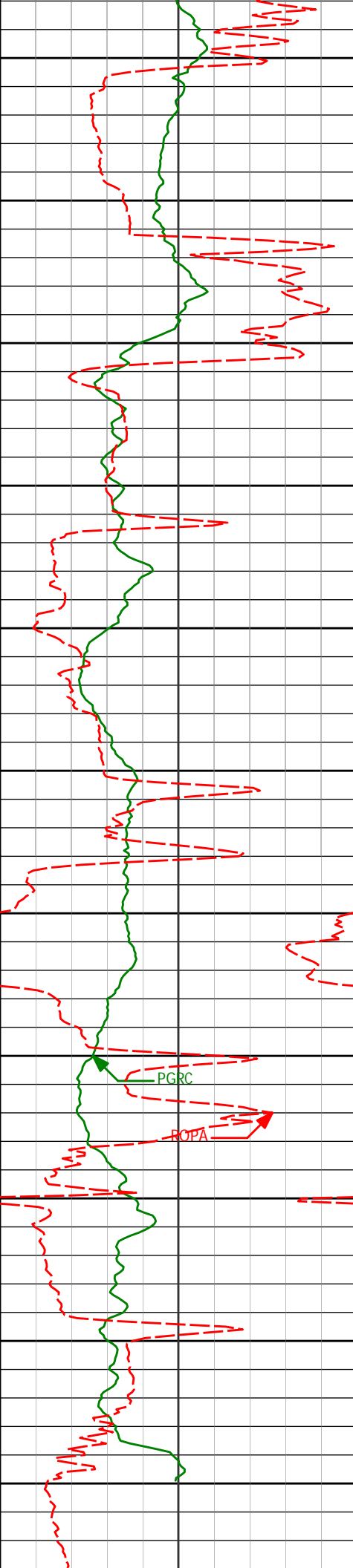
10300

10350

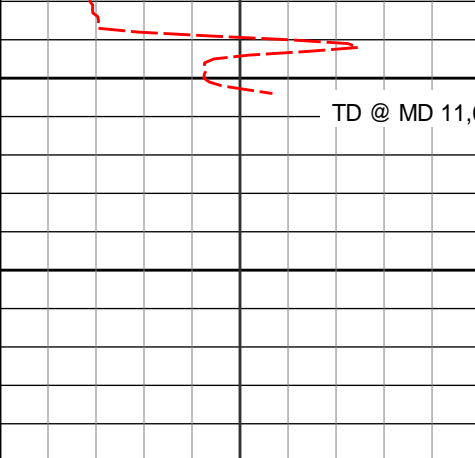
10400

9884'	90.34°	87.83°	6588.08'	3592.96'
9979'	90.37°	87.27°	6587.49'	3684.15'
10074'	90.62°	86.19°	6586.67'	3774.94'
10169'	91.45°	87.44°	6584.96'	3865.76'
10264'	92.50°	88.67°	6581.68'	3957.12'
10359'	91.88°	89.09°	6578.05'	4048.83'





10450	10453'	91.64°	90.25°	6575.17'	4139.93'
10500					
10550	10548'	88.27°	88.15°	6575.24'	4231.82'
10600					
10650	10643'	88.80°	88.82°	6577.67'	4323.40'
10700					
10750	10738'	90.65°	88.52°	6578.13'	4415.09'
10800					
10850	10833'	91.94°	88.24°	6575.98'	4506.62'
10900					
10950	10940'	94.32°	87.14°	6570.14'	4609.24'



TD @ MD 11,002'

11000

11002'

94.32°

87.14°

6565.47'

4668.46'

11050

11100

Depth  
ft

## Depth

***Inc.***

***Azi.***

***TVD***

**V.S.**

### ***Avg Rate of Penetration***

ROPA

feet per hr

0

**PCG Gamma Ray**

PGRC

api

300

# HALLIBURTON

## Sperry Drilling Services

# MD Detail Log 1:240

Noble Energy  
Wells Ranch USX AE20-62-1HN  
H&P 343  
T6N-R62W

***PCG Gamma Ray***

PGRC

api

300

### ***Avg Rate of Penetration***

ROPA

feet per hr

0

Depth  
ft

## Depth

***Inc.***

***Azi.***

***TVD***

**V.S.**

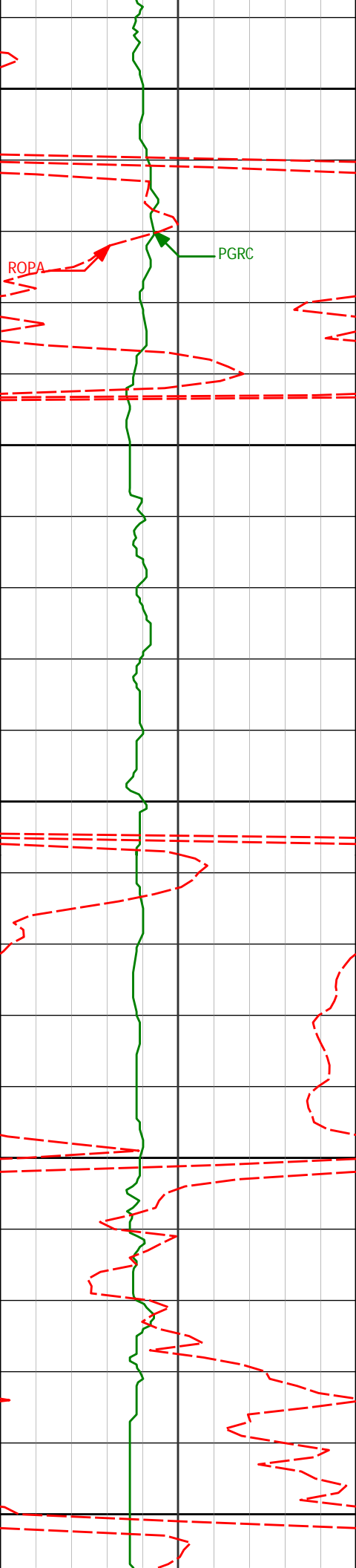
3050

3054'

 $11.65^\circ$  $170.37^\circ$ 

3028.85'

57.54'



3100

3150

3200

3250

3300

3149'

9.90°

168.18°

3122.17'

64.90'

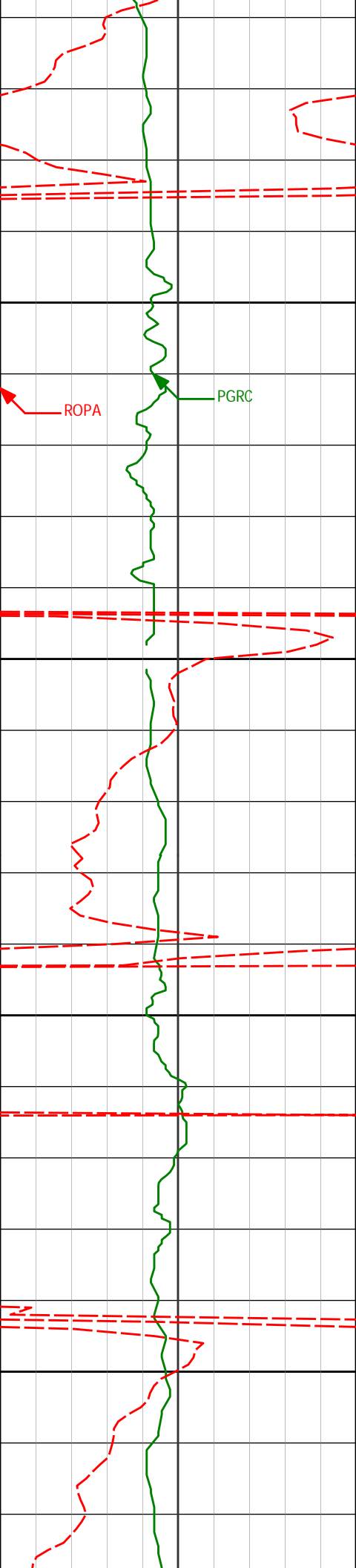
3244'

11.72°

166.95°

3215.48'

72.80'



3350

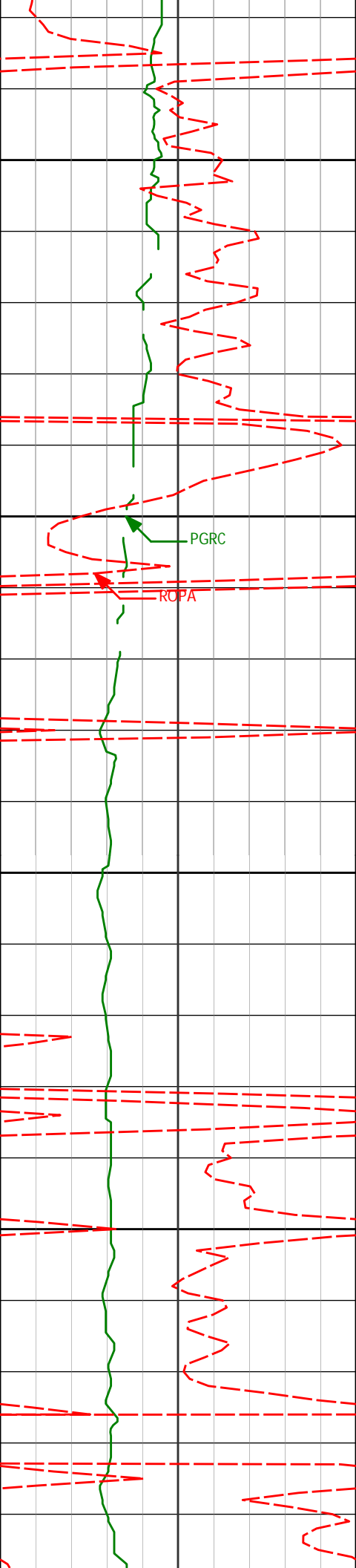
3400

3450

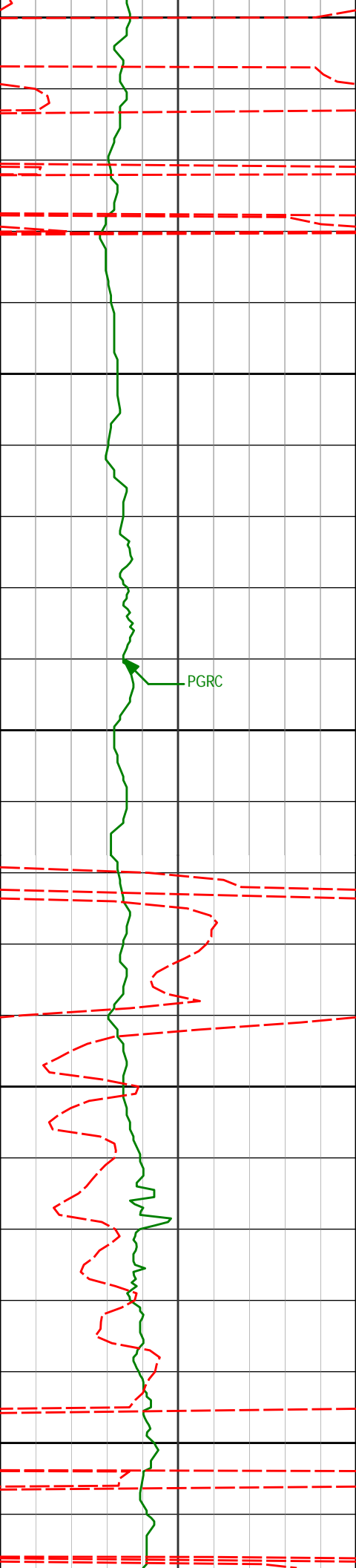
3500

ROPA

PGRC



3529'	13.46°	182.05°	3493.69'	92.67'
3550				
3600				
3624'	14.16°	176.38°	3585.95'	98.42'
3650				
3700				
3719'	14.43°	178.29°	3678.01'	105.08'



3750

3800

3850

3900

3950

3814'

15.90°

179.40°

3769.70'

111.50'

PGRC

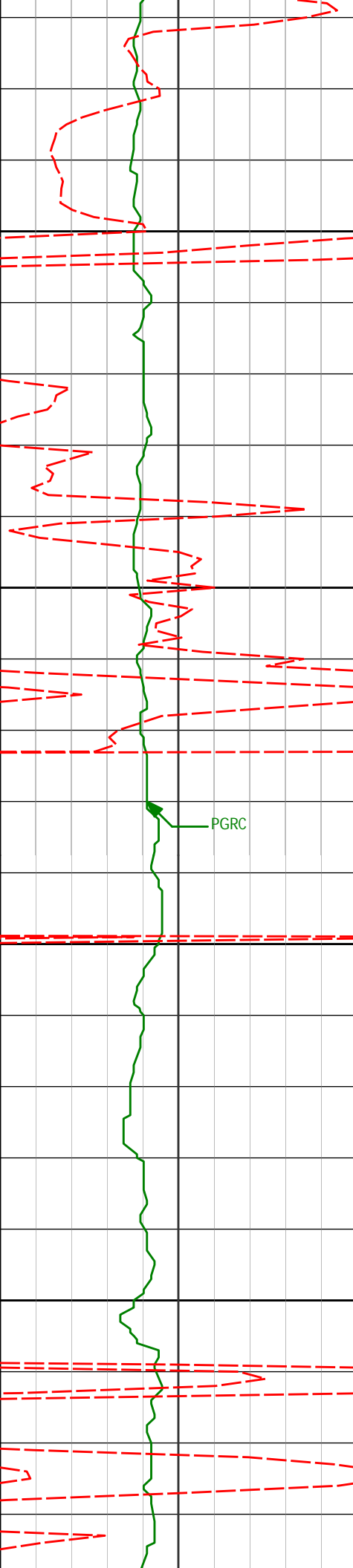
3909'

16.55°

176.63°

3860.91'

118.75'



4000

4050

4100

4150

PGRC

4004'

13.90°

172.76°

3952.57'

126.86'

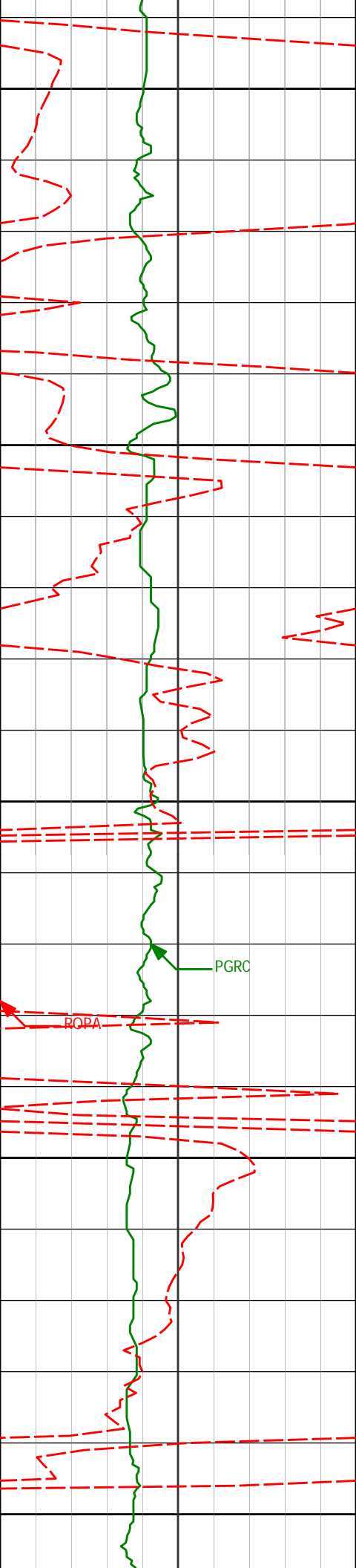
4099'

11.37°

171.03°

4045.27'

134.59'



4194'

8.81°

172.06°

4138.79'

140.92'

4200

4250

4289'

9.10°

175.06°

4232.63'

146.04'

4300

PGRC

ROPA

4350

4384'

10.74°

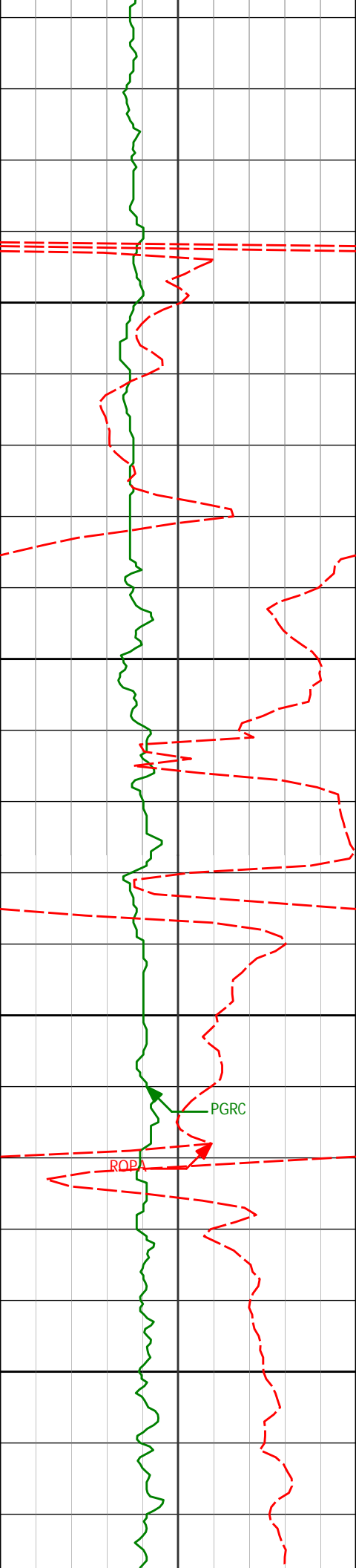
168.39°

4326.21'

152.26'

4400





4450

4500

4550

4600

4479'

11.04°

170.29°

4419.50'

159.70'

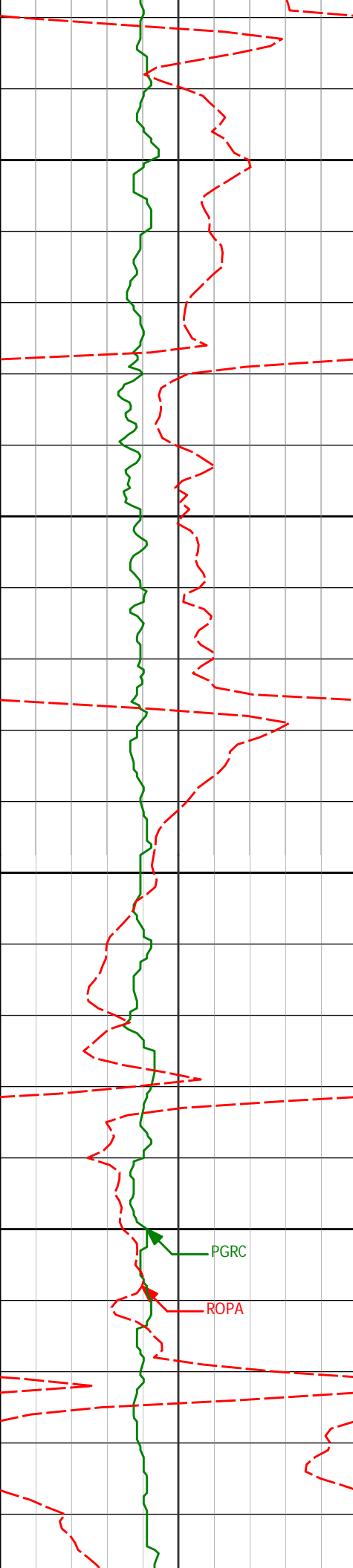
4574'

11.01°

172.77°

4512.75'

166.60'



4650

4668'

11.39°

174.88°

4604.96'

172.84'

4700

4750

4763'

13.28°

178.34°

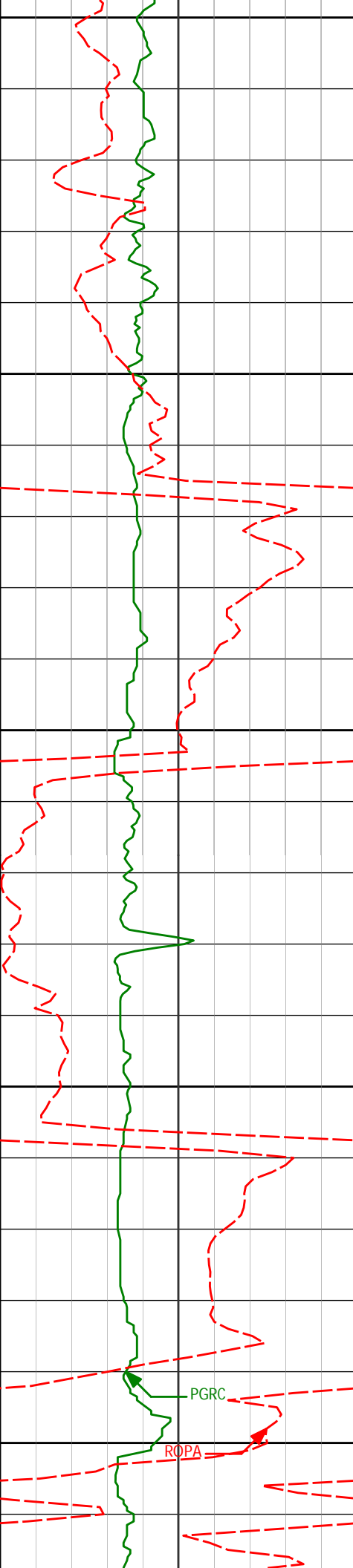
4697.76'

178.80'

4800

PGRC

ROPA



4850

4858'

11.80°

176.83°

4790.49'

184.56'

4900

4950

4953'

11.87°

180.28°

4883.47'

189.69'

5000

5050

PGRC

ROPA

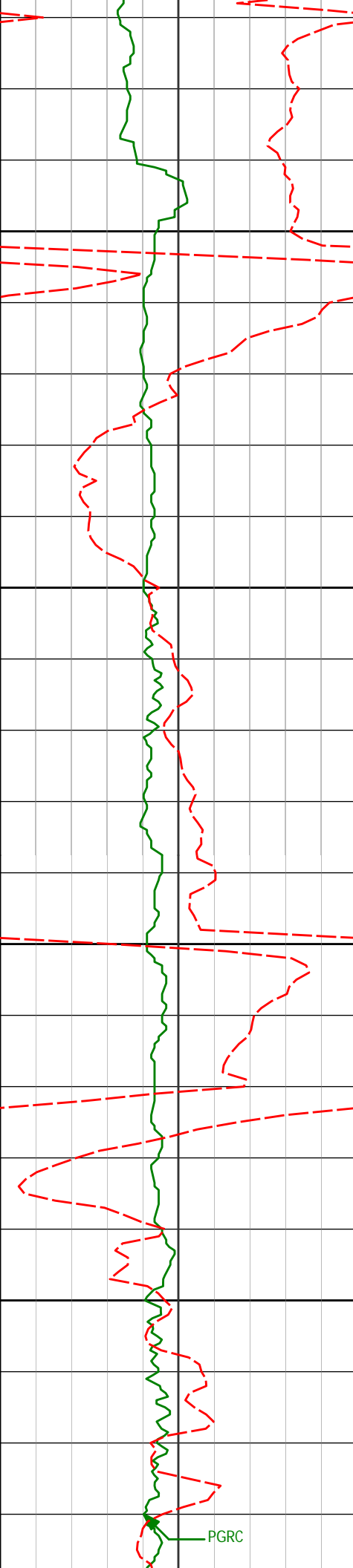
5048'

12.96°

176.19°

4976.25'

195.21'



5100

5150

5200

5250

PGRC

5143'

10.70°

174.37°

5069.23'

201.38'

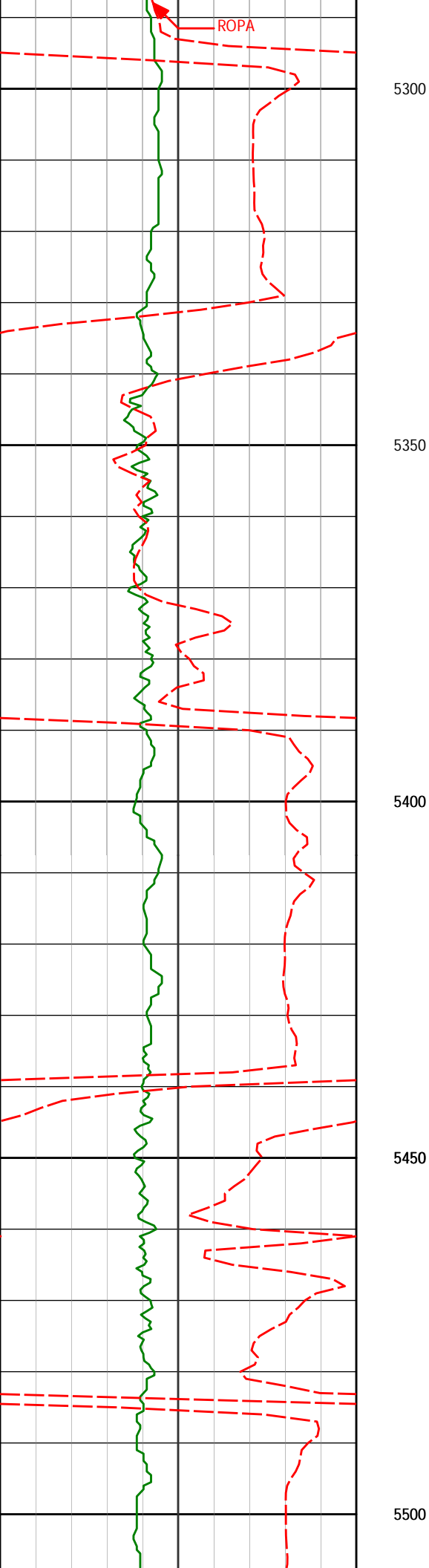
5238'

8.61°

175.11°

5162.88'

206.61'



5333'

9.27°

180.67°

5256.73'

210.64'

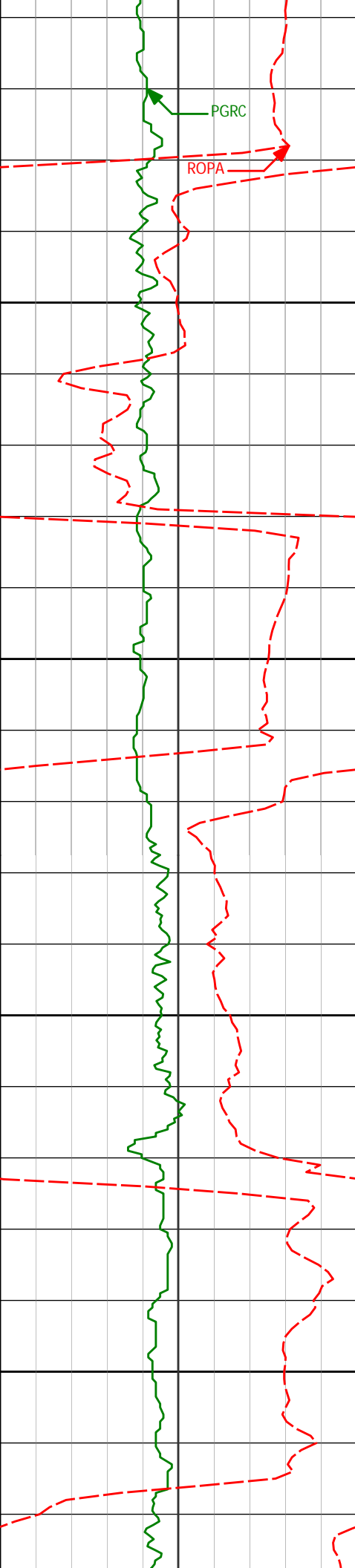
5428'

10.71°

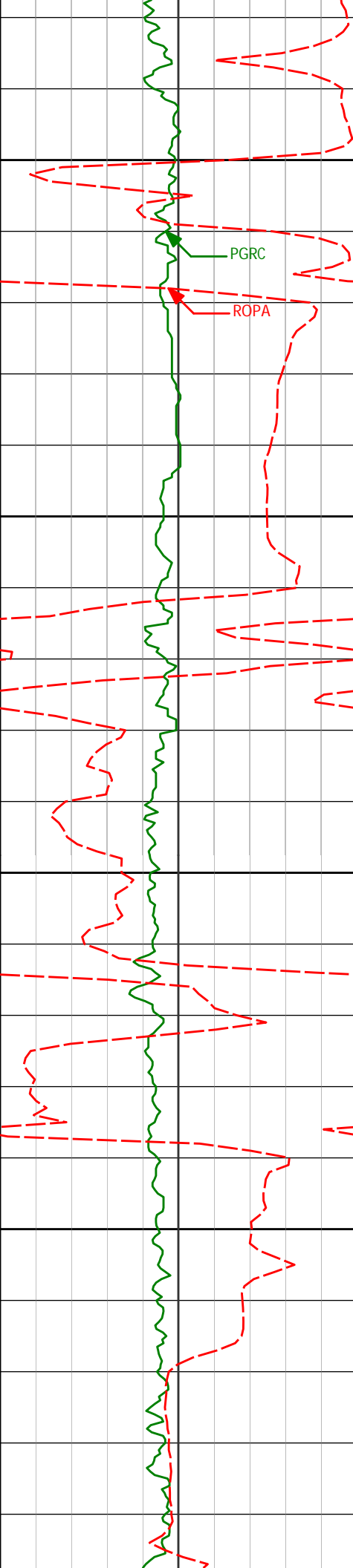
177.45°

5350.28'

214.87'



5523'	12.25°	173.44°	5443.38'	220.87'
5550				
5600				
5618'	12.12°	171.56°	5536.24'	228.17'
5650				
5700				
5713'	11.37°	176.41°	5629.25'	234.75'



5750

PGRC

ROPA

5800

5828'

11.60°

178.09°

5741.95'

241.29'

5850

<Run 200>

5900

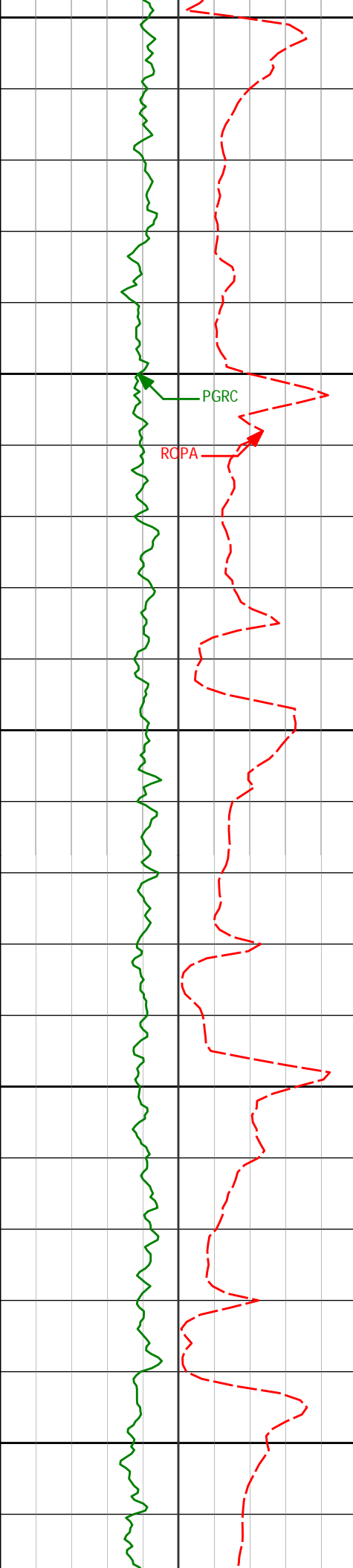
5900'

10.82°

175.19°

5812.58'

245.41'



5950

6000

6050

6100

6150

5948'

5995'

6043'

6090'

6138'

11.54°

16.38°

21.77°

25.26°

29.27°

172.28'

174.40'

174.92'

175.47'

174.21'

5859.67'

5905.27'

5950.61'

5993.70'

6036.36'

248.62'

252.56'

257.70'

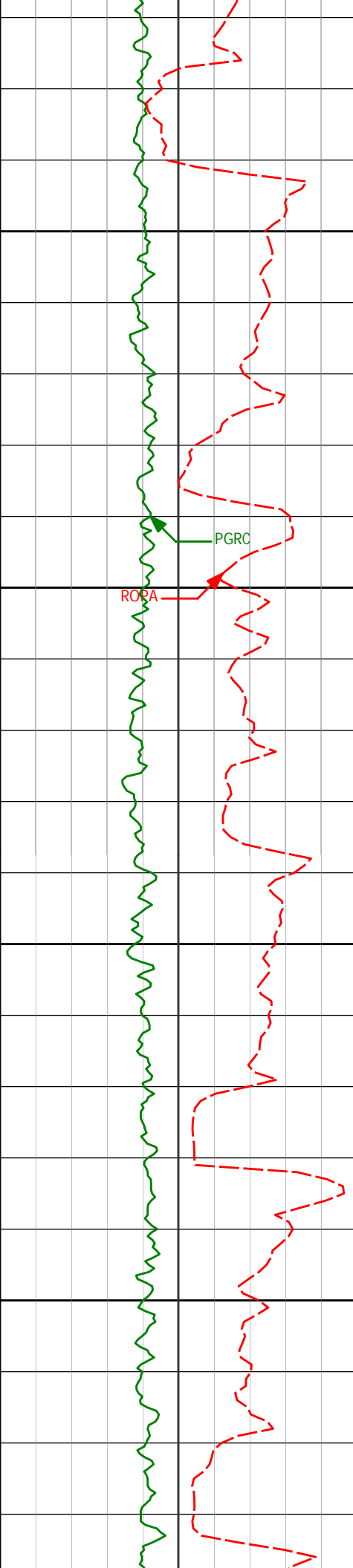
263.69'

270.86'

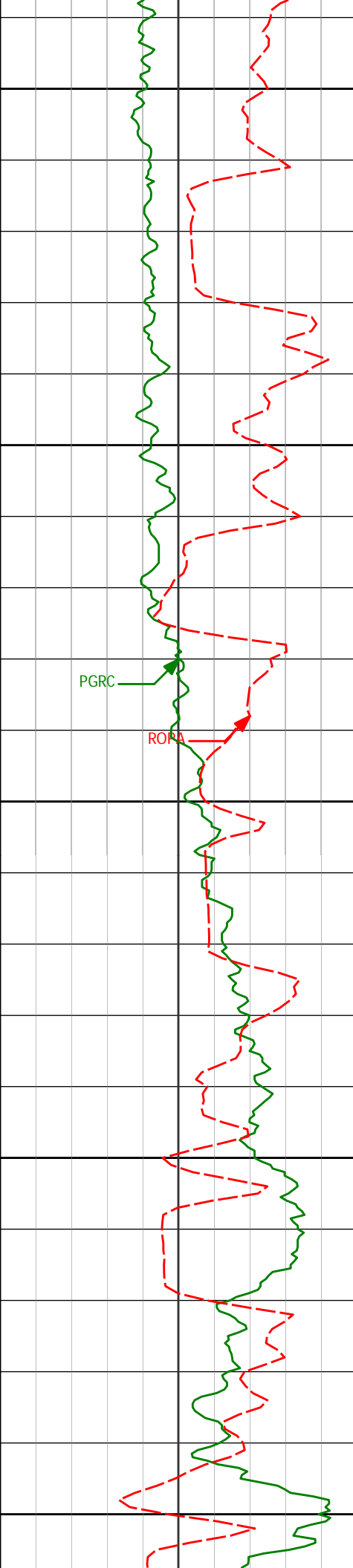
PGRC

RCPA





6185'	32.78°	172.01°	6076.63'	279.45'
6200				
6233'	36.09°	168.23°	6116.22'	290.40'
6250				
6280'	38.04°	161.66°	6153.74'	304.10'
6300				
6328'	38.03°	152.38°	6191.58'	321.78'
6350				
6375'	37.67°	144.08°	6228.71'	342.35'



6400

6423'

37.96°

136.86°

6266.65'

365.93'

6450

6470'

38.25°

130.41°

6303.65'

391.07'

PGRC

ROPA

6500

6518'

39.95°

124.09°

6340.91'

418.83'

6550

6565'

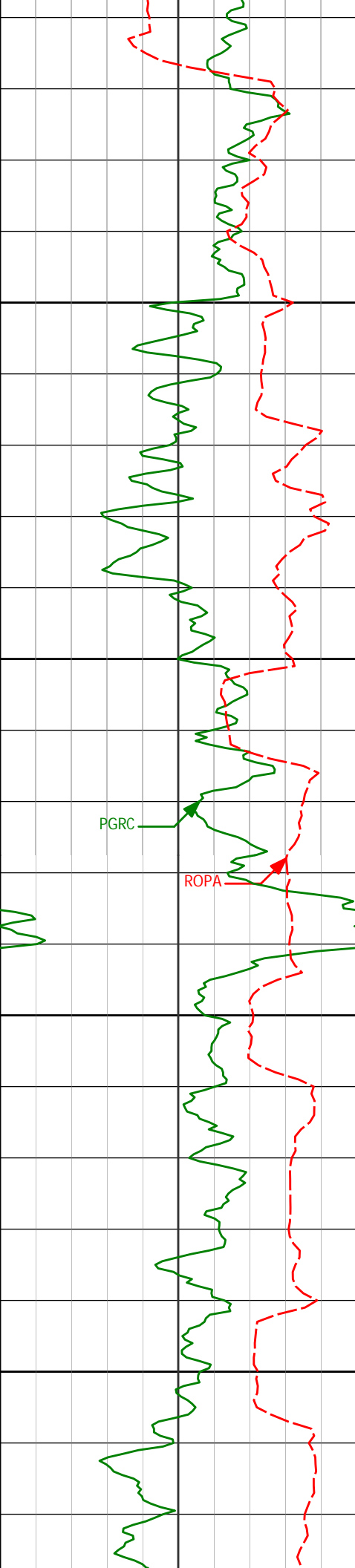
42.80°

120.78°

6376.18'

448.28'

6600



6650

6700

6750

6800

6613'

46.14°

115.95°

6410.44'

480.81'

6660'

49.24°

112.14°

6442.08'

515.01'

6708'

53.17°

108.51°

6472.16'

552.17'

6755'

57.30°

105.88°

6498.95'

590.70'

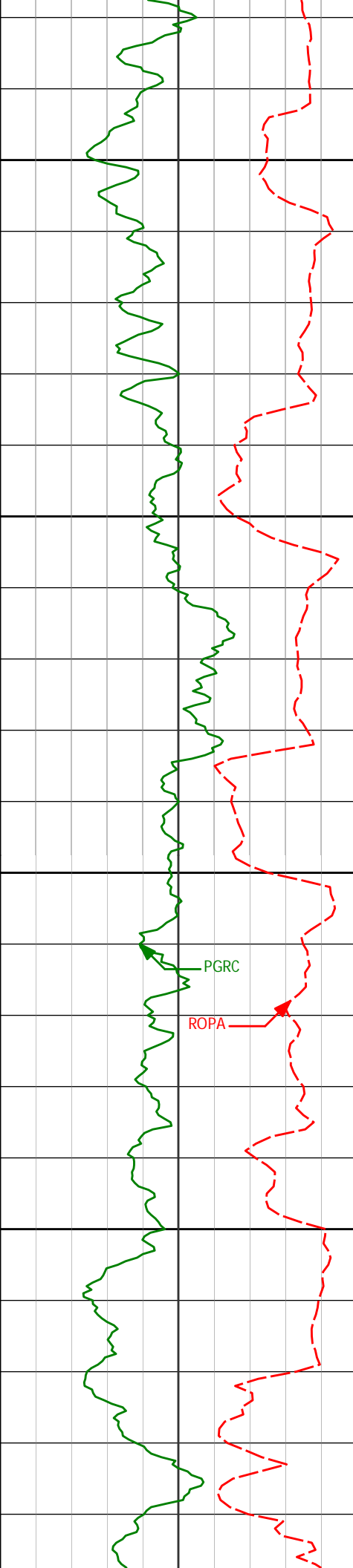
6803'

61.42°

103.88°

6523.41'

631.98'



6850

6849'

65.65°

101.34°

6543.91'

673.13'

6900

6897'

68.70°

99.79°

6562.53'

717.29'

6950

6944'

72.54°

97.74°

6578.12'

761.45'

7000

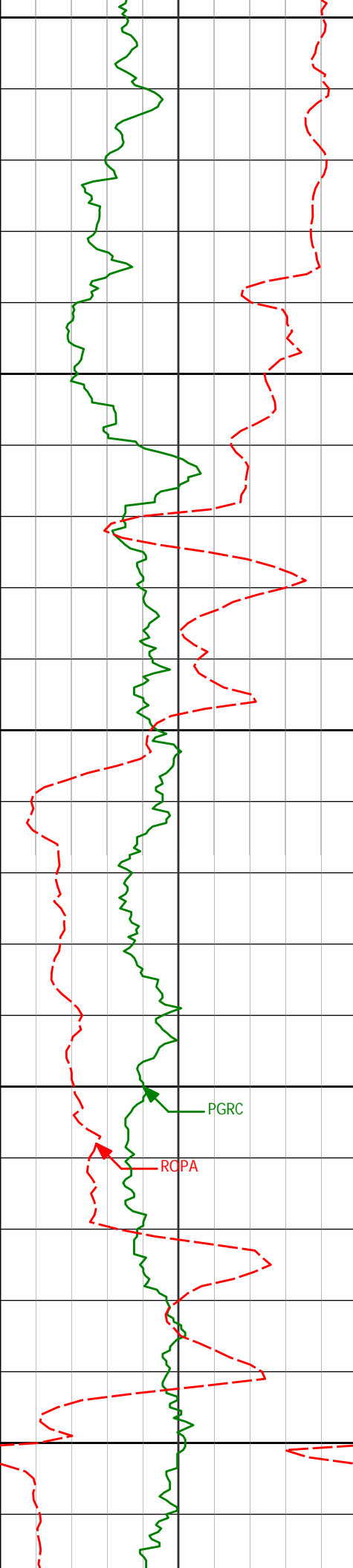
6992'

77.79°

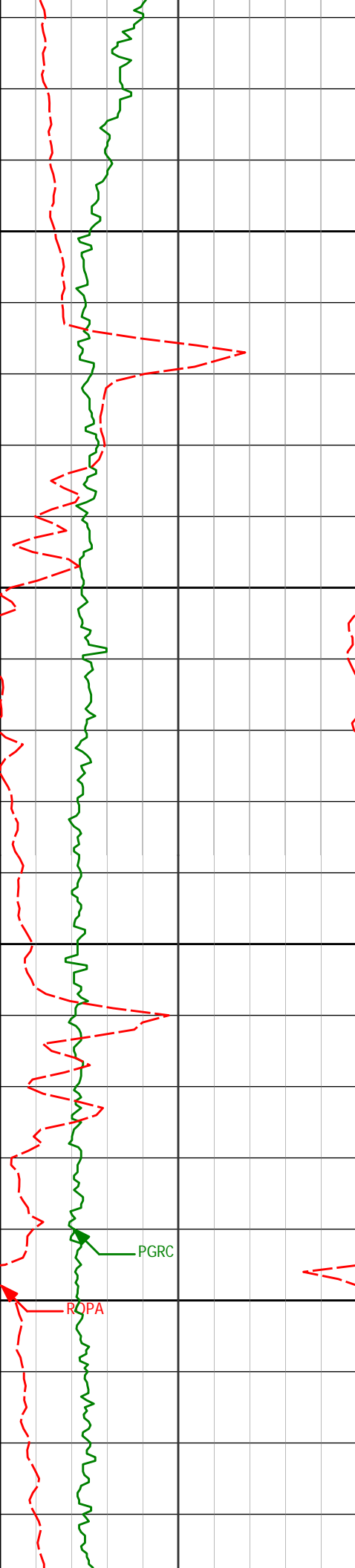
95.48°

6590.41'

807.46'



7050				
7065'	82.63°	90.87°	6602.83'	878.10'
7100				
<Run 300>				
7150				
7161'	86.80°	87.96°	6611.67'	970.65'
7200				
7250				
7253'	88.92°	89.82°	6615.11'	1059.47'



7300

7350

7400

7450

7346'

89.35°

90.33°

6616.51'

1149.78'

7439'

90.96°

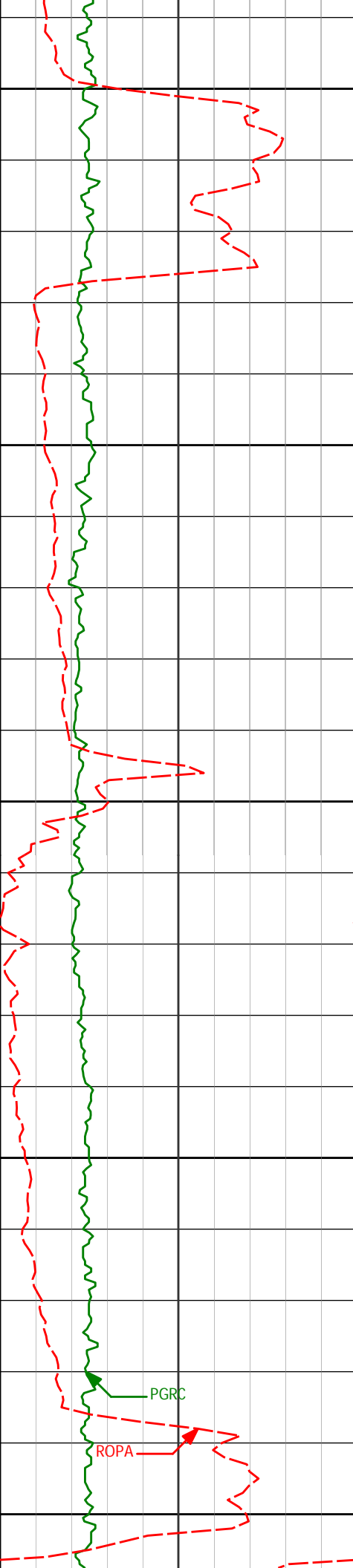
91.56°

6616.26'

1240.43'

PGRC

ROPA



7500

7531'

89.44°

88.40°

6615.94'

1329.74'

7550

7600

7624'

91.02°

89.29°

6615.56'

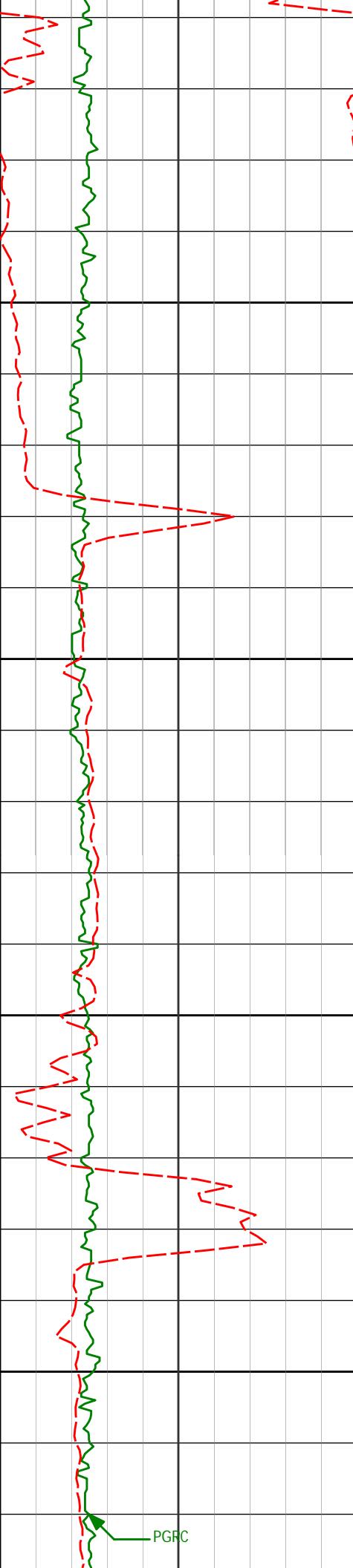
1419.57'

7650

7700

PGRC

ROPA



7750

7800

7850

7900

7718'

89.44°

86.38°

6615.19'

1509.91'

7810'

91.11°

87.37°

6614.74'

1597.90'

7902'

89.63°

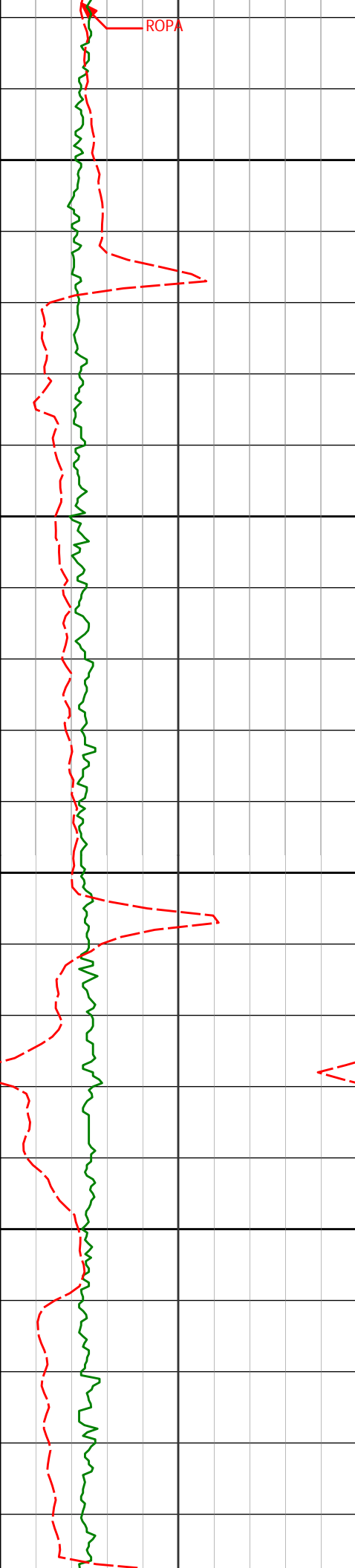
86.08°

6614.15'

1685.82'

PGRC





7950

8000

8050

8100

7993'

90.62°

87.00°

6613.95'

1772.70'

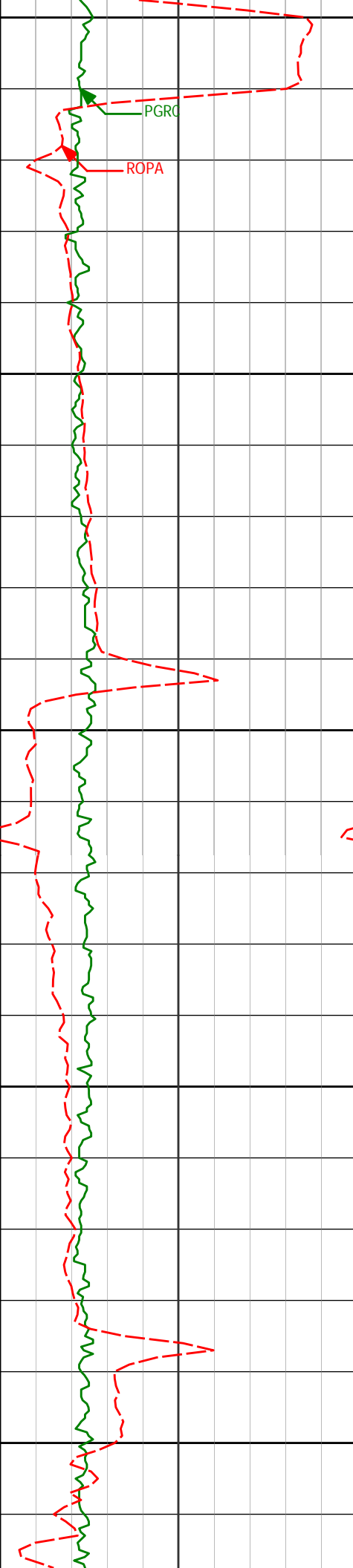
8086'

90.34°

85.79°

6613.17'

1861.42'



8150

8179'

90.12°

87.04°

6612.80'

1950.15'

8200

8250

8272'

91.60°

87.70°

6611.40'

2039.32'

8300

8350

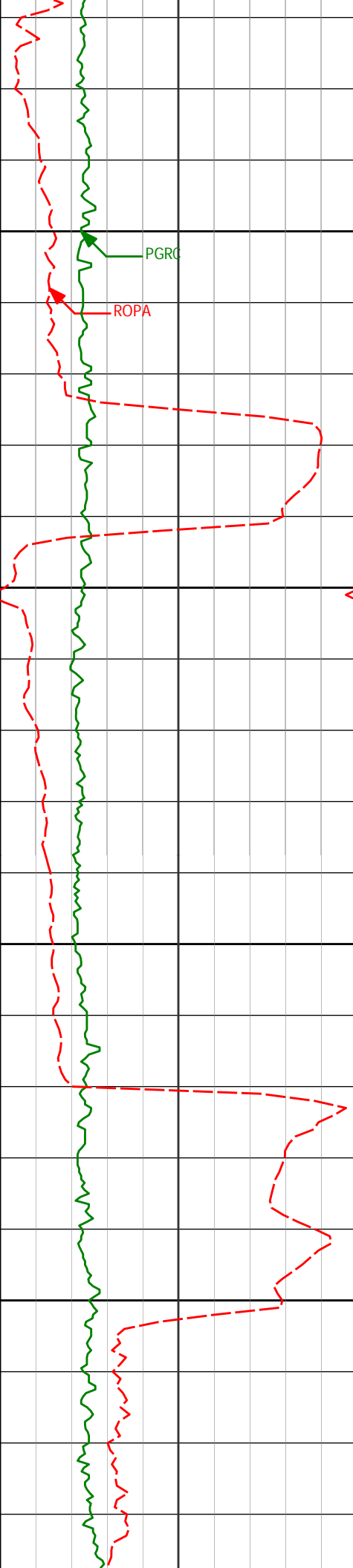
8366'

90.52°

85.84°

6609.66'

2129.16'



8400

PGRC

ROPA

8450

8461'

89.78°

85.35°

6609.42'

2219.38'

8500

8550

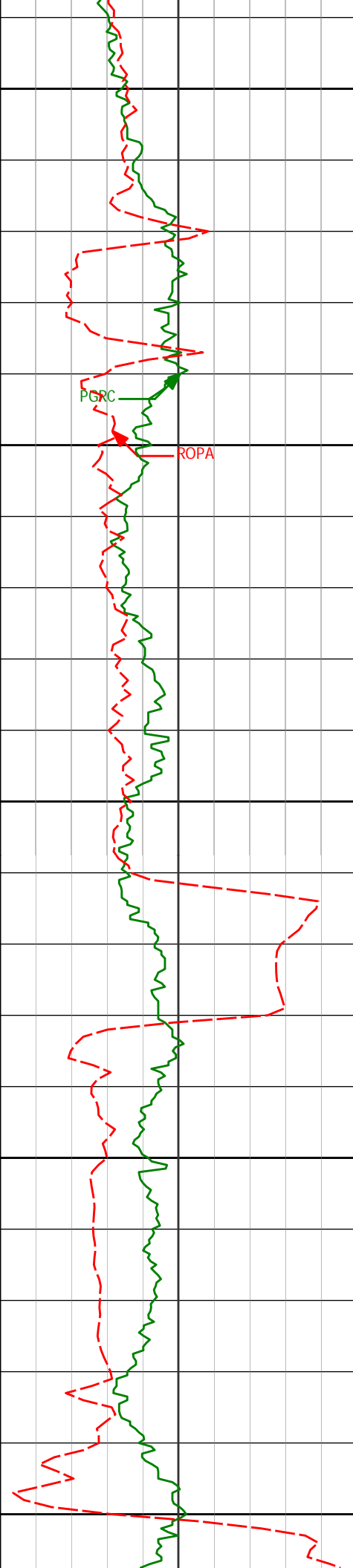
8556'

91.33°

88.65°

6608.50'

2310.29'



8600

8650

8700

8750

8800

8650'

93.27°

89.21°

6604.72'

2401.05'

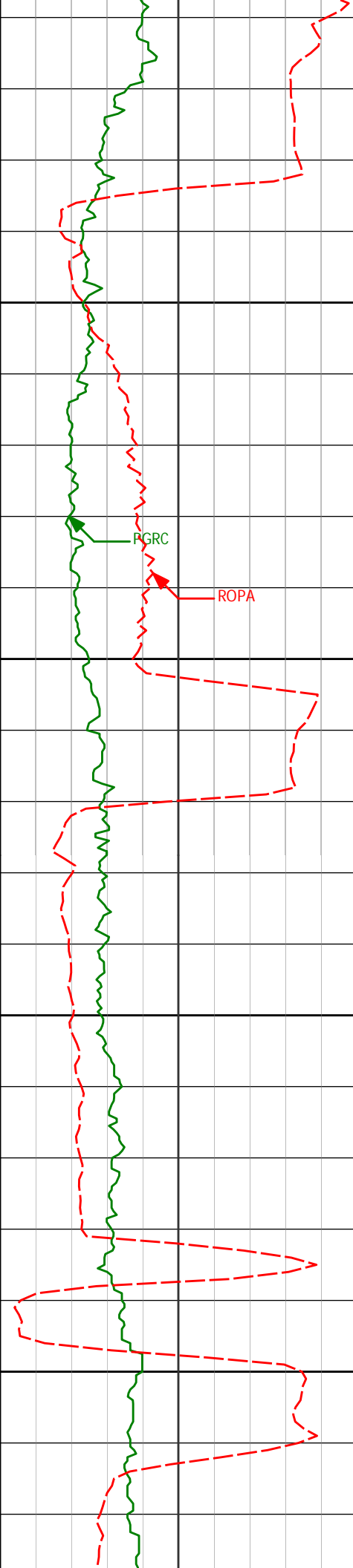
8745'

93.30°

89.02°

6599.28'

2492.78'



8840'	92.16°	89.32°	6594.75'	2584.57'
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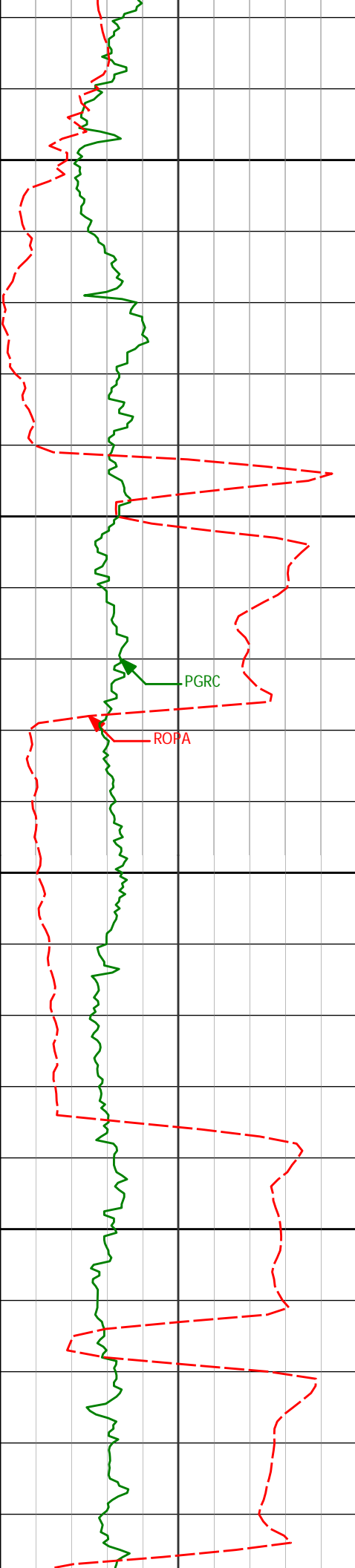
8850

8900

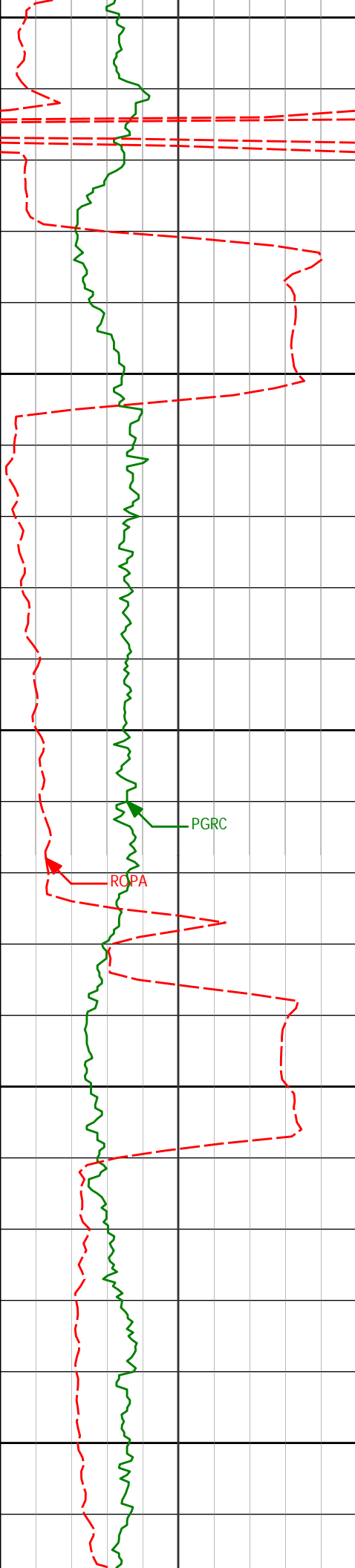
8935'	90.89°	88.22°	6592.23'	2676.27'
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8950

9000



9030'	92.75°	88.65°	6589.21'	2767.81'
9050				
9100				
9125'	92.07°	88.78°	6585.21'	2859.43'
9150				
9200				
9219'	88.86°	88.22°	6584.45'	2950.07'



9250

9300

9350

9400

9450

9314'

89.07°

90.38°

6586.17'

3042.01'

PGRC

ROPA

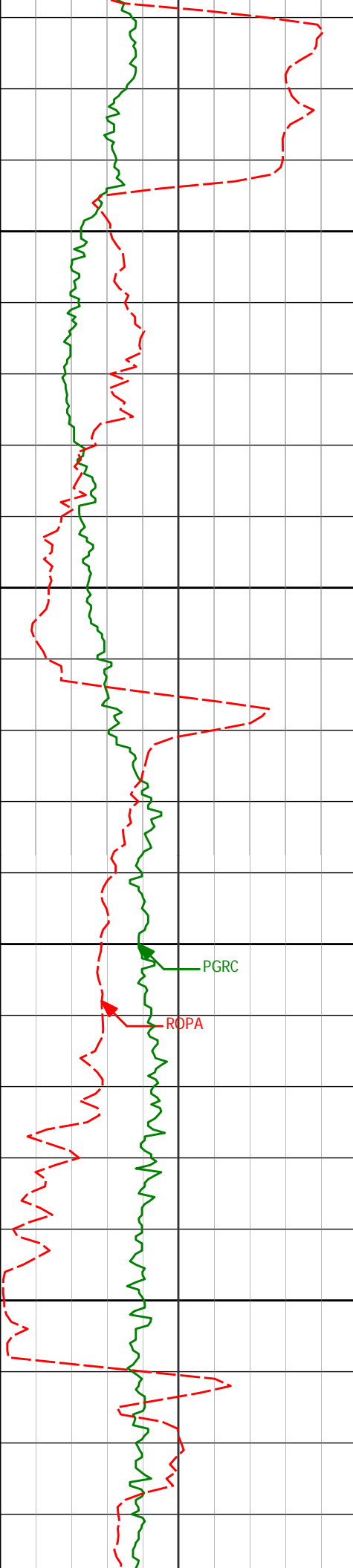
9409'

90.37°

89.79°

6586.63'

3134.28'



9500

9504'

89.01°

89.89°

6587.15'

3226.45'

9550

9600

9599'

89.54°

88.80°

6588.35'

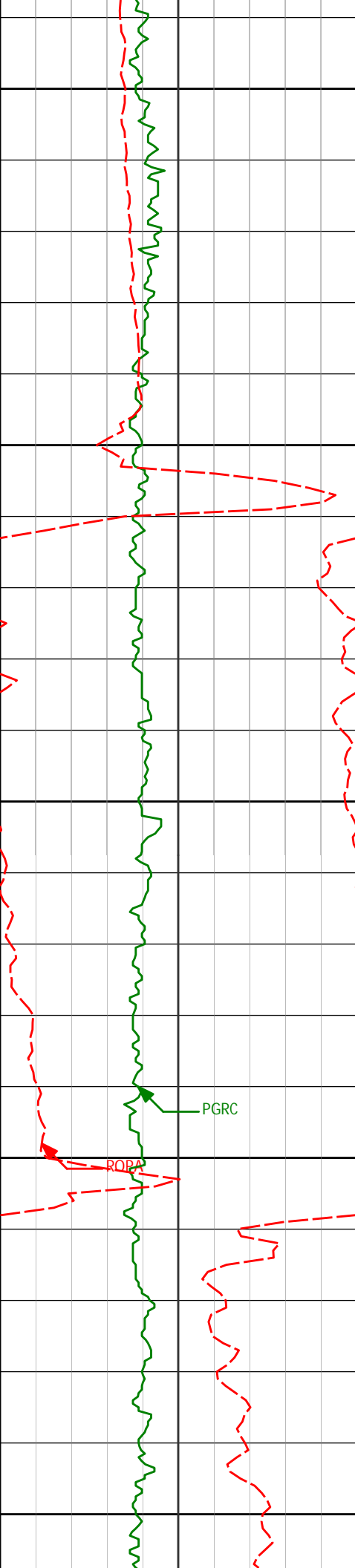
3318.42'

PGRC

ROPA

9650





9694'	89.94°	88.62°	6588.78'	3410.13'
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9700

9750

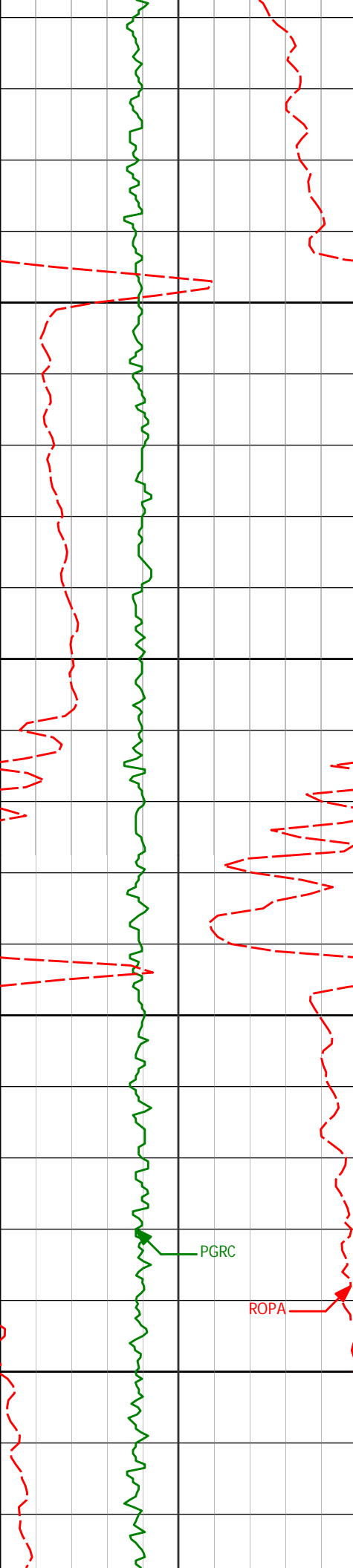
9789'	90.28°	87.90°	6588.60'	3501.63'
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9800

9850

9884'	90.34°	87.83°	6588.08'	3592.96'
-------	--------	--------	----------	----------

9900



9950

10000

10050

10100

9979'

90.37°

87.27°

6587.49'

3684.15'

10074'

90.62°

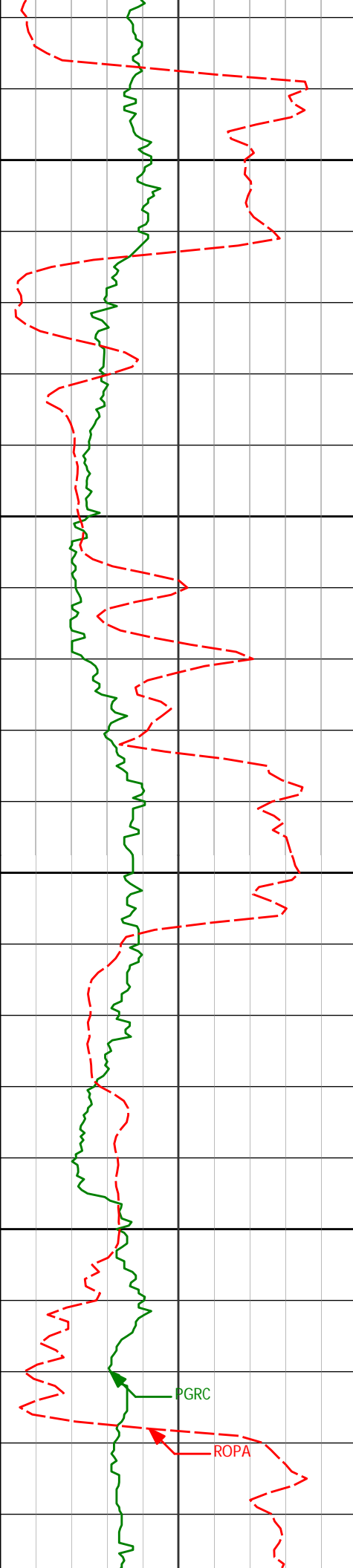
86.19°

6586.67'

3774.94'

PGRC

ROPA



10150

10169'

91.45°

87.44°

6584.96'

3865.76'

10200

10250

10264'

92.50°

88.67°

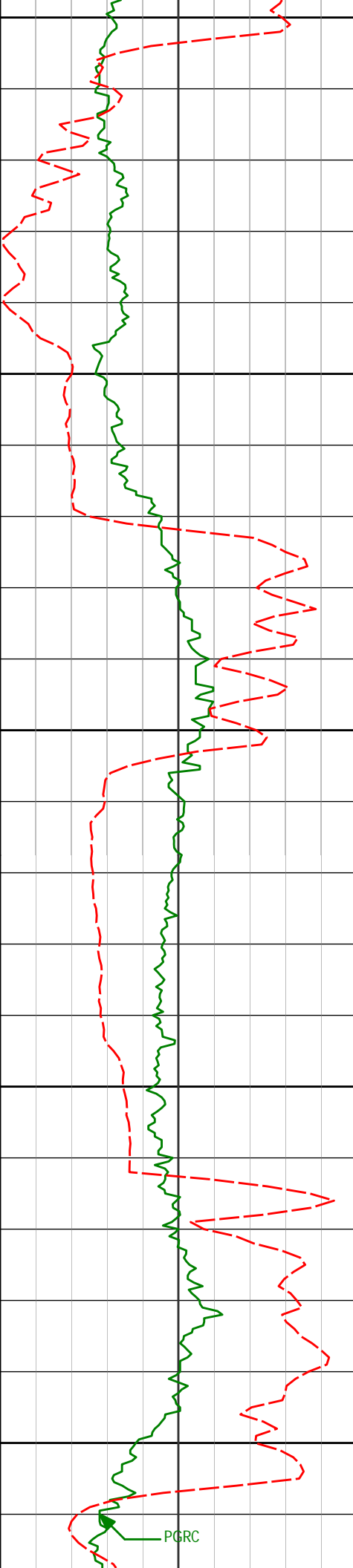
6581.68'

3957.12'

10300

PGRC

ROPA



10350

10359'

91.88°

89.09°

6578.05'

4048.83'

10400

10450

10453'

91.64°

90.25°

6575.17'

4139.93'

10500

10550

10548'

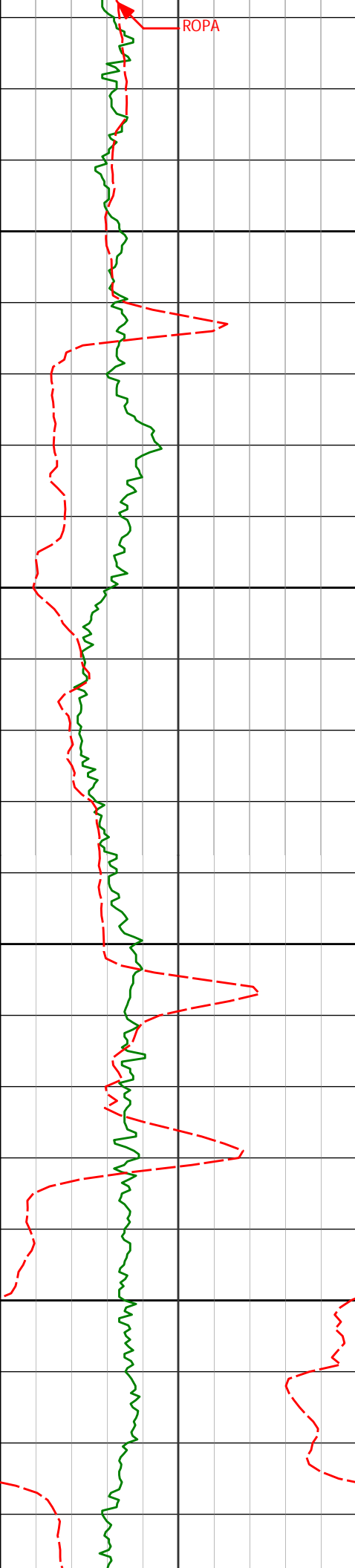
88.27°

88.15°

6575.24'

4231.82'

PGRC



10600

10650

10700

10750

10643'

88.80°

88.82°

6577.67'

4323.40'

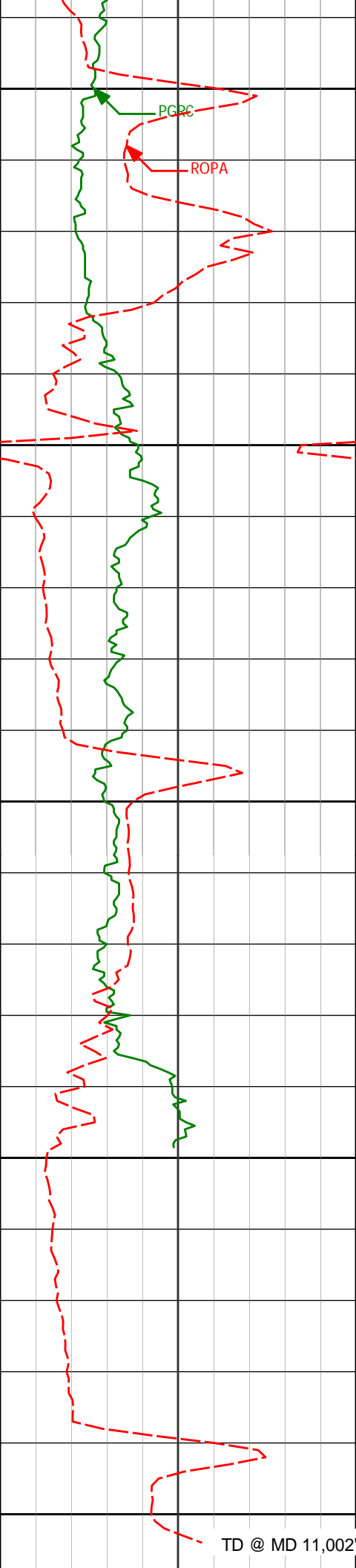
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90.65°

88.52°

6578.13'

4415.09'



10800

10833'

91.94°

88.24°

6575.98'

4506.62'

10850

10900

10940'

94.32°

87.14°

6570.14'

4609.24'

10950

11000

11002'

94.32°

87.14°

6565.47'

4668.46'

TD @ MD 11,002'



	2012.00	10.25	181.73	2009.04	45.27 S	6.71 W	4.31	2.56
	2105.00	12.41	191.91	2100.23	63.32 S	9.02 W	6.38	3.16
	2295.00	11.95	190.58	2285.95	102.63 S	16.85 W	8.19	0.28
	2390.00	11.80	185.39	2378.92	121.97 S	19.57 W	10.18	1.13
	2485.00	13.11	172.64	2471.70	142.33 S	19.10 W	15.50	3.20
	2580.00	12.76	173.67	2564.29	163.45 S	16.56 W	23.02	0.44
	2674.00	11.03	171.71	2656.27	182.66 S	14.12 W	29.98	1.89
	2864.00	10.71	172.39	2842.86	218.15 S	9.16 W	43.29	0.18
	2959.00	12.40	173.16	2935.93	237.03 S	6.78 W	50.12	1.79
	3054.00	11.65	170.37	3028.85	256.61 S	3.96 W	57.54	1.00
	3149.00	9.90	168.18	3122.17	274.06 S	0.68 W	64.90	1.89
	3244.00	11.72	166.95	3215.48	291.46 S	3.17 E	72.80	1.93
	3529.00	13.46	182.05	3493.69	352.83 S	8.52 E	92.67	1.30
	3624.00	14.16	176.38	3585.95	375.47 S	8.86 E	98.42	1.60
	3719.00	14.43	178.29	3678.01	398.90 S	9.95 E	105.08	0.57
	3814.00	15.90	179.40	3769.70	423.75 S	10.44 E	111.50	1.58
	3909.00	16.55	176.63	3860.91	450.27 S	11.37 E	118.75	1.06
	4004.00	13.90	172.76	3952.57	475.10 S	13.60 E	126.86	2.99
	4099.00	11.37	171.03	4045.27	495.67 S	16.50 E	134.59	2.69
	4194.00	8.81	172.06	4138.79	512.13 S	18.97 E	140.92	2.70
	4289.00	9.10	175.06	4232.63	526.82 S	20.62 E	146.04	0.58
	4384.00	10.74	168.39	4326.21	542.98 S	23.05 E	152.26	2.11
	4479.00	11.04	170.29	4419.50	560.61 S	26.36 E	159.70	0.49
	4574.00	11.01	172.77	4512.75	578.58 S	29.04 E	166.60	0.50
	4668.00	11.39	174.88	4604.96	596.73 S	30.99 E	172.84	0.59
	4763.00	13.28	178.34	4697.76	616.98 S	32.15 E	178.80	2.14
	4858.00	11.80	176.83	4790.49	637.59 S	33.00 E	184.56	1.60
	4953.00	11.87	180.28	4883.47	657.06 S	33.49 E	189.69	0.75
	5048.00	12.96	176.19	4976.25	677.46 S	34.15 E	195.21	1.47
	5143.00	10.70	174.37	5069.23	696.86 S	35.72 E	201.38	2.41
	5238.00	8.61	175.11	5162.88	712.73 S	37.20 E	206.61	2.20
	5333.00	9.27	180.67	5256.73	727.47 S	37.71 E	210.64	1.14
	5428.00	10.71	177.45	5350.28	743.94 S	38.02 E	214.87	1.63
	5523.00	12.25	173.44	5443.38	762.77 S	39.56 E	220.87	1.82
	5618.00	12.12	171.56	5536.24	782.65 S	42.18 E	228.17	0.44
	5713.00	11.37	176.41	5629.25	801.86 S	44.23 E	234.75	1.30
	5828.00	11.60	178.09	5741.95	824.73 S	45.32 E	241.29	0.35
	5900.00	10.82	175.19	5812.58	838.70 S	46.13 E	245.41	1.34
	5948.00	11.54	172.28	5859.67	847.94 S	47.15 E	248.62	1.91
	5995.00	16.38	174.40	5905.27	859.20 S	48.43 E	252.56	10.35
	6043.00	21.77	174.92	5950.61	874.82 S	49.88 E	257.70	11.23
	6090.00	25.26	175.47	5993.70	893.50 S	51.44 E	263.69	7.44
	6138.00	29.27	174.21	6036.36	915.40 S	53.44 E	270.86	8.44
	6185.00	32.78	172.01	6076.63	939.43 S	56.37 E	279.45	7.85
	6233.00	36.09	168.23	6116.22	966.15 S	61.06 E	290.40	8.21
	6280.00	38.04	161.66	6153.74	993.46 S	68.44 E	304.10	9.39
	6328.00	38.03	152.38	6191.58	1020.62 S	79.96 E	321.78	11.90
	6375.00	37.67	144.08	6228.71	1045.10 S	95.11 E	342.35	10.86
	6423.00	37.96	136.86	6266.65	1067.76 S	113.82 E	365.93	9.24
	6470.00	38.25	130.41	6303.65	1087.75 S	134.79 E	391.07	8.49
	6518.00	39.95	124.09	6340.91	1106.03 S	158.87 E	418.83	9.02
	6565.00	42.80	120.78	6376.18	1122.66 S	185.10 E	448.28	7.64
	6613.00	46.14	115.95	6410.44	1138.59 S	214.68 E	480.81	9.90
	6660.00	49.24	112.14	6442.08	1152.71 S	246.42 E	515.01	8.91
	6708.00	53.17	108.51	6472.16	1165.67 S	281.50 E	552.17	10.09
	6755.00	57.30	105.88	6498.95	1177.06 S	318.37 E	590.70	9.92
	6803.00	61.42	103.88	6523.41	1187.65 S	358.28 E	631.98	9.30
	6849.00	65.65	101.34	6543.91	1196.62 S	398.46 E	673.13	10.44
	6897.00	68.70	99.79	6562.53	1204.72 S	441.94 E	717.29	7.02
	6944.00	72.54	97.74	6578.12	1211.47 S	485.75 E	761.45	9.15
	6992.00	77.79	95.48	6590.41	1216.80 S	531.82 E	807.46	11.85
	7065.00	82.63	90.87	6602.83	1220.76 S	603.61 E	878.10	9.09
	7161.00	86.80	87.96	6611.67	1219.77 S	699.17 E	970.65	5.29
	7253.00	88.92	89.82	6615.11	1217.99 S	791.08 E	1059.47	3.06
	7346.00	89.35	90.33	6616.51	1218.11 S	884.06 E	1149.78	0.72
	7439.00	90.96	91.56	6616.26	1219.65 S	977.05 E	1240.43	2.18
	7531.00	89.44	88.40	6615.94	1219.62 S	1069.03 E	1329.74	3.81
	7624.00	91.02	89.29	6615.56	1217.74 S	1162.01 E	1419.57	1.95
	7718.00	89.44	86.38	6615.19	1214.19 S	1255.93 E	1509.91	3.52
	7810.00	91.11	87.37	6614.74	1209.18 S	1347.78 E	1597.90	2.11
	7902.00	89.63	86.08	6614.15	1203.92 S	1439.63 E	1685.82	2.13
	7993.00	90.62	87.00	6613.95	1198.43 S	1530.46 E	1772.70	1.49
	8086.00	90.34	85.79	6613.17	1192.58 S	1623.27 E	1861.42	1.34
	8179.00	90.12	87.04	6612.80	1186.77 S	1716.09 E	1950.15	1.36
	8272.00	91.60	87.70	6611.40	1182.50 S	1808.97 E	2039.32	1.74



8366.00	90.52	85.84	6609.66	1177.20 S	1902.80 E	2129.16	2.29
8461.00	89.78	85.35	6609.42	1169.91 S	1997.52 E	2219.38	0.93
8556.00	91.33	88.65	6608.50	1164.94 S	2092.37 E	2310.29	3.84
8650.00	93.27	89.21	6604.72	1163.18 S	2186.27 E	2401.05	2.15
8745.00	93.30	89.02	6599.28	1161.72 S	2281.11 E	2492.78	0.20
8840.00	92.16	89.32	6594.75	1160.34 S	2375.99 E	2584.57	1.24
8935.00	90.89	88.22	6592.23	1158.30 S	2470.93 E	2676.27	1.77
9030.00	92.75	88.65	6589.21	1155.71 S	2565.84 E	2767.81	2.01
9125.00	92.07	88.78	6585.21	1153.58 S	2660.73 E	2859.43	0.73
9219.00	88.86	88.22	6584.45	1151.12 S	2754.68 E	2950.07	3.47
9314.00	89.07	90.38	6586.17	1149.96 S	2849.66 E	3042.01	2.28
9409.00	90.37	89.79	6586.63	1150.10 S	2944.65 E	3134.28	1.50
9504.00	89.01	89.89	6587.15	1149.84 S	3039.65 E	3226.45	1.44
9599.00	89.54	88.80	6588.35	1148.75 S	3134.63 E	3318.42	1.28
9694.00	89.94	88.62	6588.78	1146.61 S	3229.61 E	3410.13	0.46
9789.00	90.28	87.90	6588.60	1143.73 S	3324.56 E	3501.63	0.84
9884.00	90.34	87.83	6588.08	1140.19 S	3419.49 E	3592.96	0.10
9979.00	90.37	87.27	6587.49	1136.13 S	3514.41 E	3684.15	0.59
10074.00	90.62	86.19	6586.67	1130.71 S	3609.25 E	3774.94	1.17
10169.00	91.45	87.44	6584.96	1125.43 S	3704.08 E	3865.76	1.58
10264.00	92.50	88.67	6581.68	1122.21 S	3798.97 E	3957.12	1.70
10359.00	91.88	89.09	6578.05	1120.35 S	3893.88 E	4048.83	0.79
10453.00	91.64	90.25	6575.17	1119.81 S	3987.83 E	4139.93	1.26
10548.00	88.27	88.15	6575.24	1118.49 S	4082.80 E	4231.82	4.18
10643.00	88.80	88.82	6577.67	1115.97 S	4177.74 E	4323.40	0.90
10738.00	90.65	88.52	6578.13	1113.77 S	4272.71 E	4415.09	1.97
10833.00	91.94	88.24	6575.98	1111.09 S	4367.64 E	4506.62	1.39
10940.00	94.32	87.14	6570.14	1106.78 S	4474.39 E	4609.24	2.45
11002.00	94.32	87.14	6565.47	1103.70 S	4536.13 E	4668.46	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 103.84 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.64 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11002.00 FEET  
IS 4668.47 FEET ALONG 103.68 DEGREES (GRID)**