



WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	20-May-13	21-May-13	24-May-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)	639.00	5,975.00	7,130.00		
Log End Depth (MD, ft)	5,975.00	7,130.00	11,126.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	19-May-13 14:30	20-May-13 22:30	23-May-13 08:30		
Drill/Wipe End Date and Time	20-May-13 09:00	21-May-13 16:00	24-May-13 13:45		
Min Inc (deg) @ Depth (MD, ft)	.36 @ 5,253.00	.14 @ 6,012.00	86.24 @ 9,148.00		
Max Inc (deg) @ Depth (MD, ft)	17.55 @ 4,019.00	86.05 @ 7,075.00	92.56 @ 10,477.00		
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC	.46 / PDC		
Flow Rate (gpm)	585.36	558.33	271.63		
Max AV (fpm) / CV (fpm) @ MWD	357.0 / NA	374.0 / NA	392.0 / NA		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.75 / 26.00	9.93 / 38.00	9.10 / 29.00		
Filtrate CL (ppm)	2,600.00	2,300.00	3,100.00		
pH / Fluid Loss (mptm)	8.60 / NA	9.70 / NA	10.00 / NA		
PV (cP) / YP (Ihf2)	1 / 4.00	14 / 13.00	5 / 5.00		
% Solids / % Sand	2.4 / 0.25	11.2 / 0.20	4.0 / .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		
Mud Weight (lb / gal)	15.84 / PDM	15.87 / PDM	15.88 / PDM		

Max Tool Temp (degF) / Source	150.10 / PCM	167.97 / PCM	217.60 / PCM		
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Lead MWD Engineer	Gary Eifert	Gary Eifert	Gary Eifert		
Customer Representative	Johnny Sanchez	Johnny Sanchez	Matt Settles		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11342299	11342299	12145499		
Insert Serial Number	11055831	11055831	11680747		
Date and Time Initialized	18-May-13 22:52	01-Jan-70 00:00	21-May-13 19:59		
Date and Time Read	22-May-13 00:46	22-May-13 01:05	25-May-13 10:14		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	57.00	55.00	67.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11342299	11342299	12145499		
Sonde Serial Number	11833235	11833235	11638501		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	319.76	300.00	227.65		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.58	48.23	60.67		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11342299	11342299	12145499		
Insert/Sonde Serial Number	11681007	11681007	11293345		

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. Surveys at MD 366' and 639' were done by gyro.
7. INSITE version 7.4.01

WARRANTY

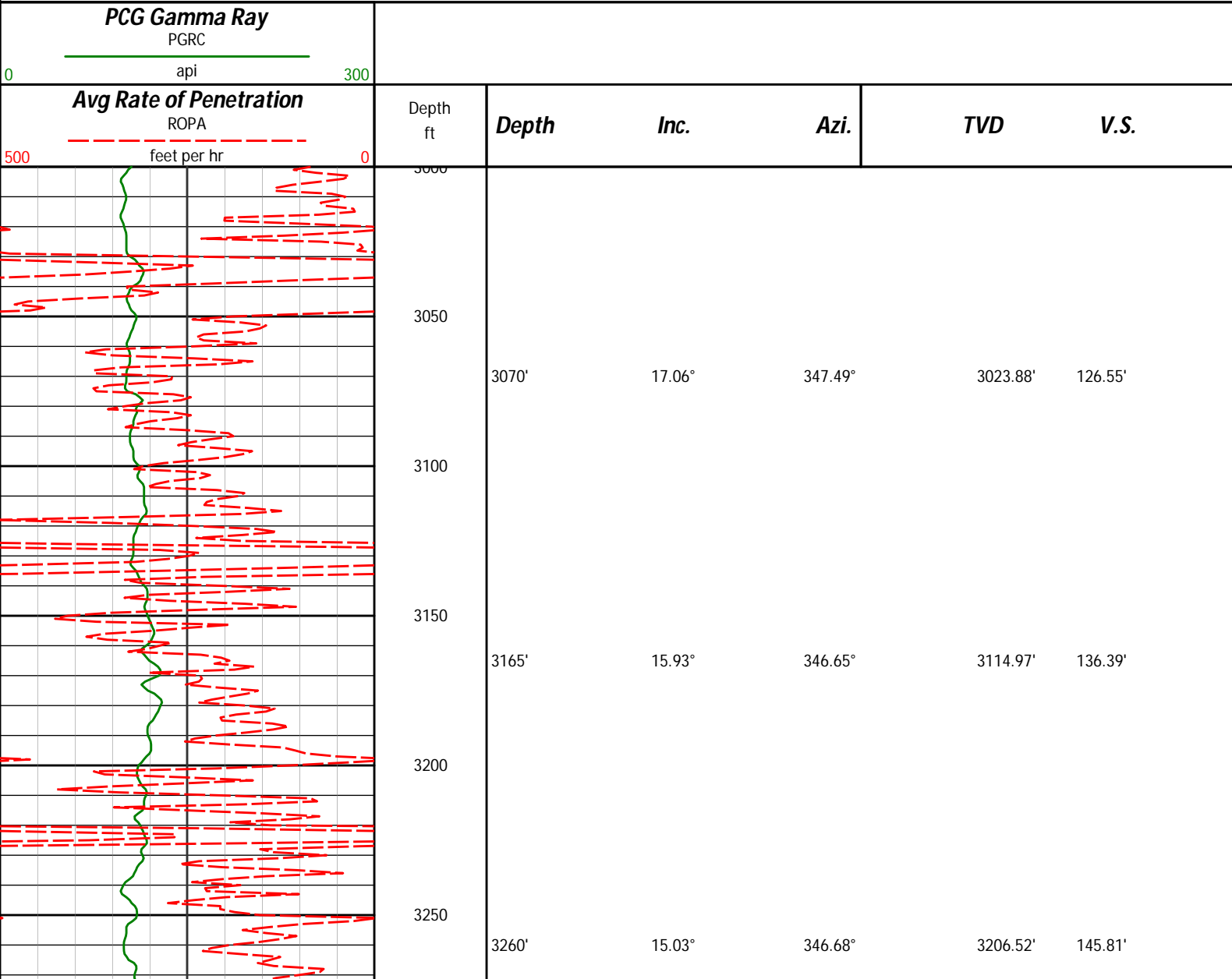
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES 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.

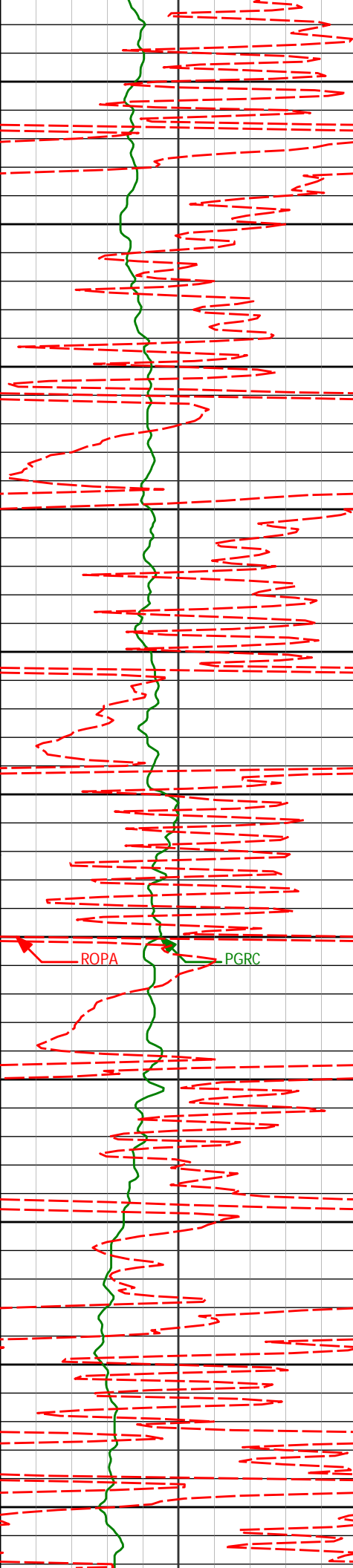
HALLIBURTON

Sperry Drilling Services

MD Main Log 1:600

Noble Energy
Wells Ranch USX AA23-64-1HN
H&P 343
T6N-R63W





3300

3350

3400

3450

3500

3550

3600

3650

3700

3750

3800

3354'

13.49°

347.07°

3297.62'

154.33'

3449'

14.19°

345.72°

3389.86'

162.87'

3544'

12.84°

343.65°

3482.23'

171.81'

3639'

12.68°

349.45°

3574.89'

179.63'

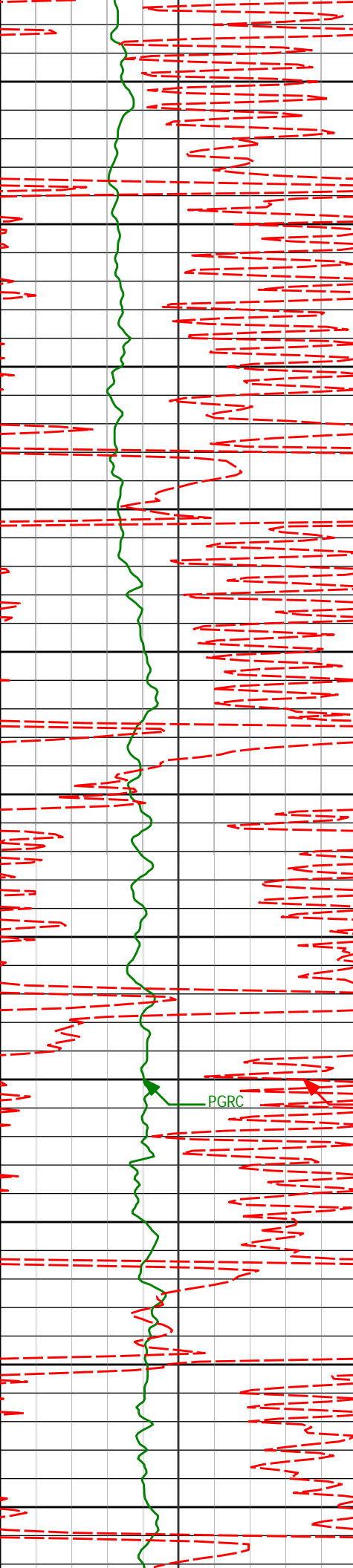
3734'

14.36°

351.74°

3667.26'

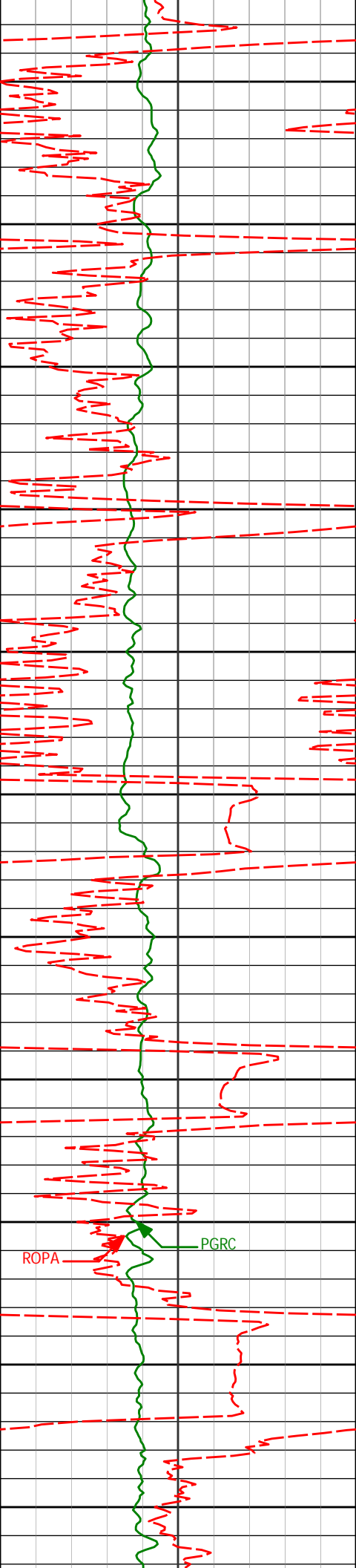
186.42'



3829'	15.57°	352.49°	3759.03'	193.32'
3850				
3900				
3924'	15.95°	352.99°	3850.46'	200.31'
3950				
4000				
4019'	17.55°	350.38°	3941.43'	208.25'
4050				
4100				
4114'	16.09°	349.14°	4032.37'	217.05'
4150				
4200				
4208'	14.64°	349.28°	4123.00'	225.26'
4250				
4300				
4303'	15.56°	350.93°	4214.72'	233.05'
4350				

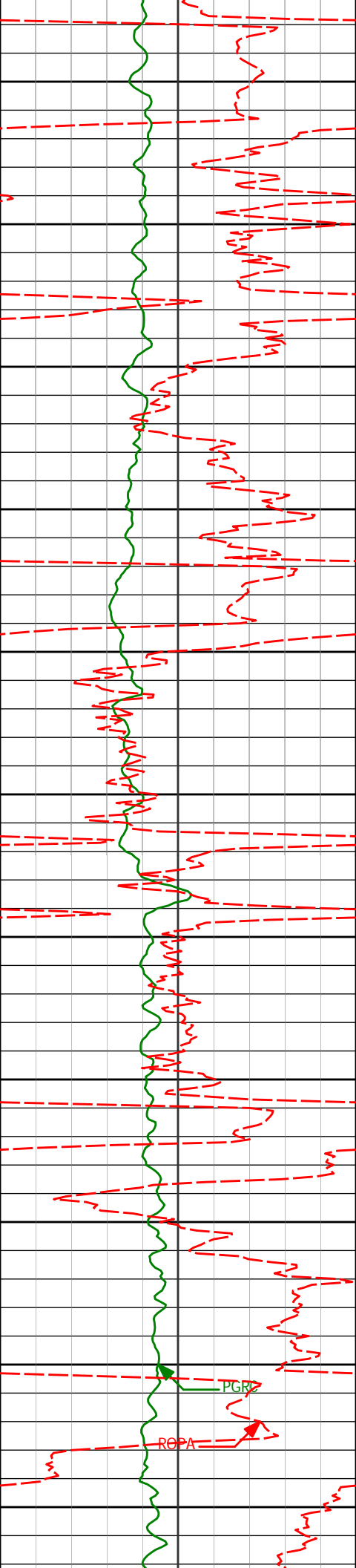
PGRC

ROPA



4400
4450
4500
4550
4600
4650
4700
4750
4800
4850
4900

4398'	13.52°	342.89°	4306.69'	241.69'
4493'	11.30°	343.06°	4399.46'	250.48'
4587'	10.89°	341.61°	4491.70'	258.44'
4682'	8.71°	343.68°	4585.31'	265.51'
4778'	5.79°	340.80°	4680.53'	270.81'
4873'	3.64°	349.58°	4775.21'	274.01'



4950

4968'

1.62°

303.04°

4870.11'

276.21'

5000

5050

5062'

1.67°

305.64°

4964.07'

278.63'

5100

5150

5157'

0.46°

328.78°

5059.06'

280.10'

5200

5250

5253'

0.36°

308.88°

5155.05'

280.61'

5300

5350

5347'

0.76°

334.72°

5249.05'

281.21'

5400

5450

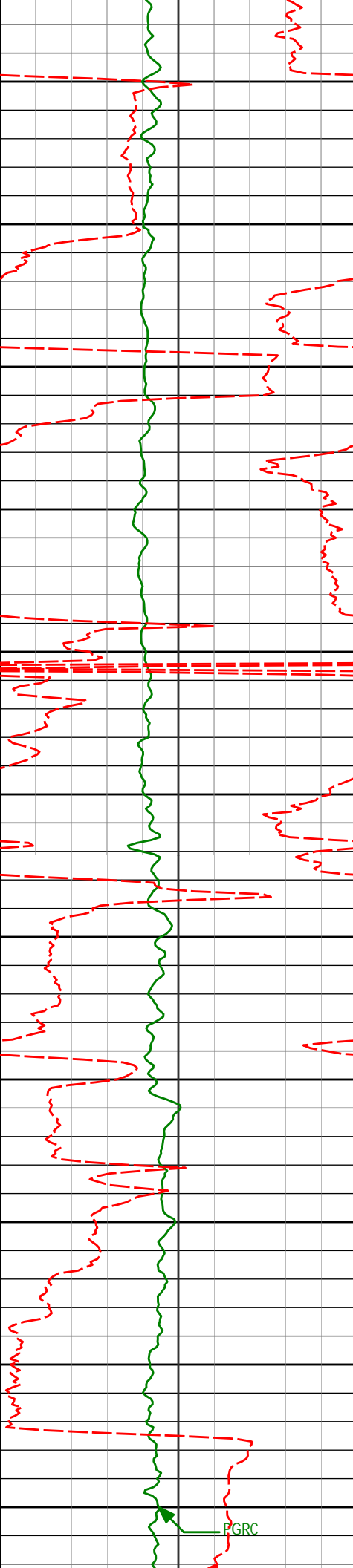
5443'

0.43°

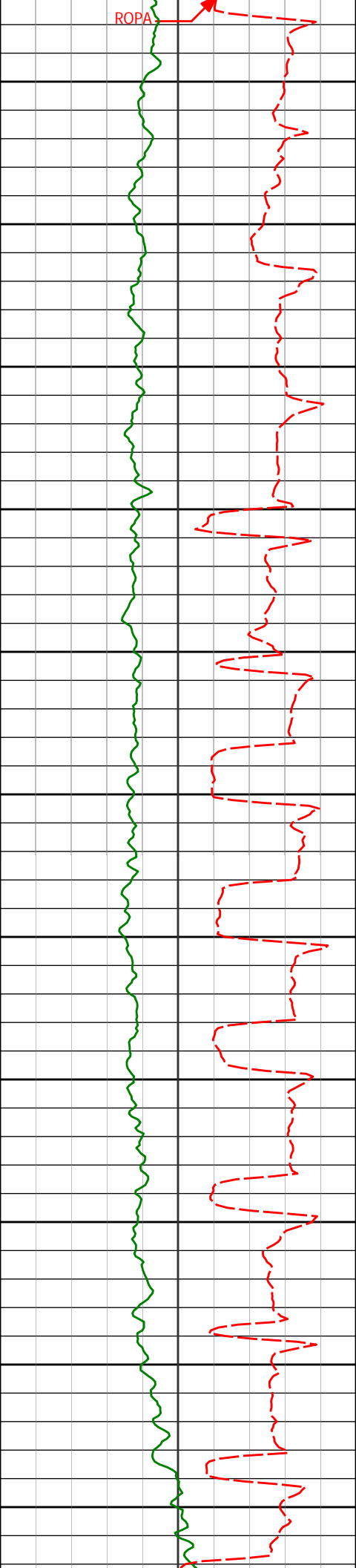
115.45°

5345.05'

281.21'



5500				
5538'	1.00°	61.13°	5440.04'	280.21'
5550				
5600				
5633'	1.17°	82.50°	5535.02'	278.61'
5650				
5700				
5728'	1.05°	83.63°	5630.00'	276.84'
5750				
5800				
5823'	1.03°	77.16°	5724.99'	275.20'
5850				
5900				
5918'	0.57°	105.21°	5819.98'	273.94'
5950				
<Run 200>				
6000				
6012'	0.14°	116.06°	5913.98'	273.37'



6050

6060'

4.83°

241.60°

5961.92'

274.93'

6100

6107'

10.50°

244.63°

6008.48'

280.07'

6150

6155'

15.03°

248.38°

6055.29'

289.09'

6200

6202'

19.36°

255.19°

6100.18'

301.53'

6250

6250'

23.33°

253.17°

6144.88'

317.44'

6300

6297'

25.80°

256.12°

6187.62'

335.31'

6350

6345'

26.37°

262.16°

6230.74'

355.21'

6400

6392'

28.87°

264.56°

6272.38'

376.24'

6450

6440'

32.04°

267.17°

6313.76'

399.99'

6500

6487'

36.46°

272.37°

6352.60'

426.12'

6550

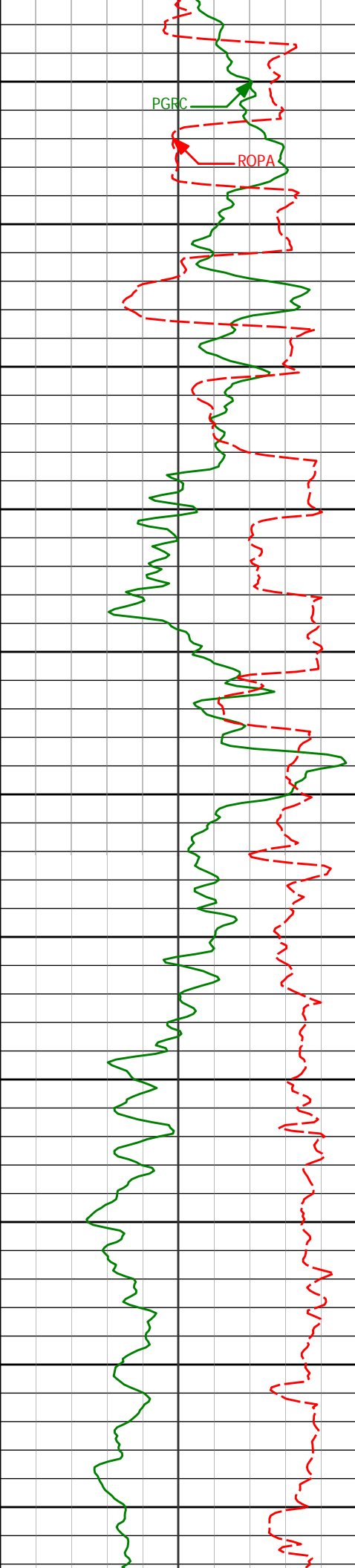
6535'

41.19°

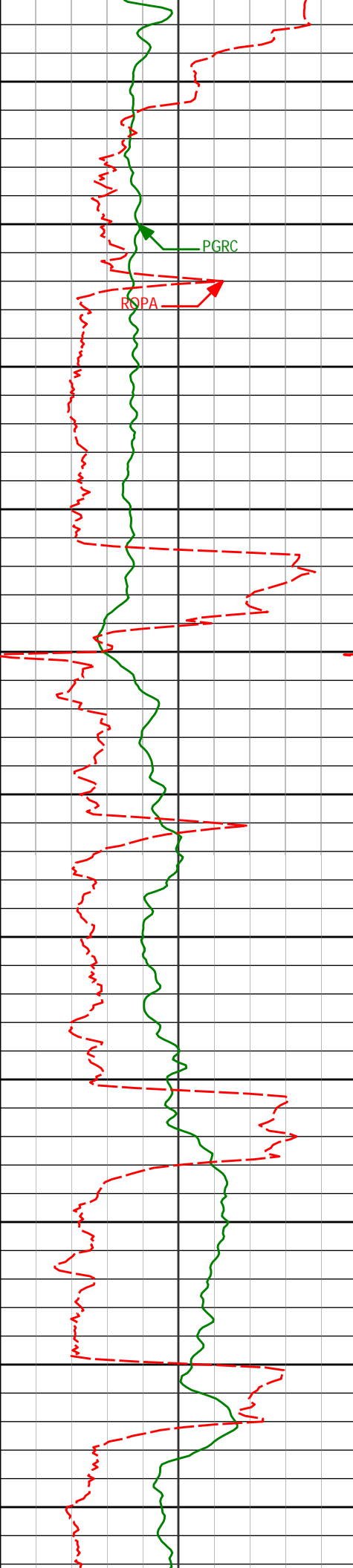
275.07°

6389.99'

456.10'



6582'	45.71°	275.50°	6424.10'	488.36'
6600				
6630'	49.26°	273.77°	6456.54'	523.65'
6650				
6677'	51.59°	271.86°	6486.48'	559.69'
6700				
6725'	53.50°	270.54°	6515.67'	597.49'
6750				
6772'	55.27°	270.57°	6543.04'	635.33'
6800				
6820'	57.35°	269.82°	6569.67'	674.85'
6850				
6867'	60.93°	269.59°	6593.77'	714.72'
6900				
6915'	65.65°	268.94°	6615.34'	757.03'
6950				
6962'	71.53°	268.09°	6632.49'	800.11'
7000				
7010'	77.58°	266.89°	6645.27'	845.50'
7050				
7057'	83.44°	267.11°	6653.01'	890.91'
7075'	86.05°	267.10°	6654.66'	908.49'
7100				



<Run 300>

7150

7200

7250

7300

7350

7400

7450

7500

7550

7600

7650

PGRC

ROPA

7248'

90.40°

270.76°

6660.02'

1078.94'

7343'

88.74°

274.37°

6660.74'

1173.42'

7438'

86.64°

273.85°

6664.57'

1268.06'

7533'

87.75°

273.35°

6669.22'

1362.60'

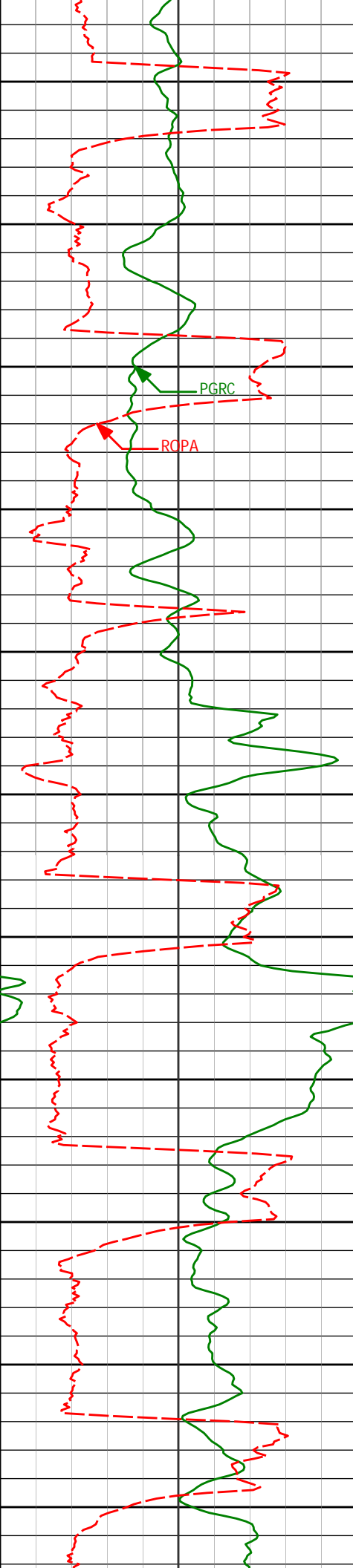
7628'

88.21°

271.08°

6672.57'

1456.97'



7700

7723'

89.04°

269.35°

6674.85'

1550.96'

7750

7800

7818'

90.86°

268.90°

6674.93'

1644.69'

7850

7900

7913'

92.40°

269.01°

6672.22'

1738.34'

7950

8000

8008'

87.81°

268.65°

6672.04'

1831.98'

8050

8100

8103'

88.18°

269.02°

6675.36'

1925.58'

8150

8200

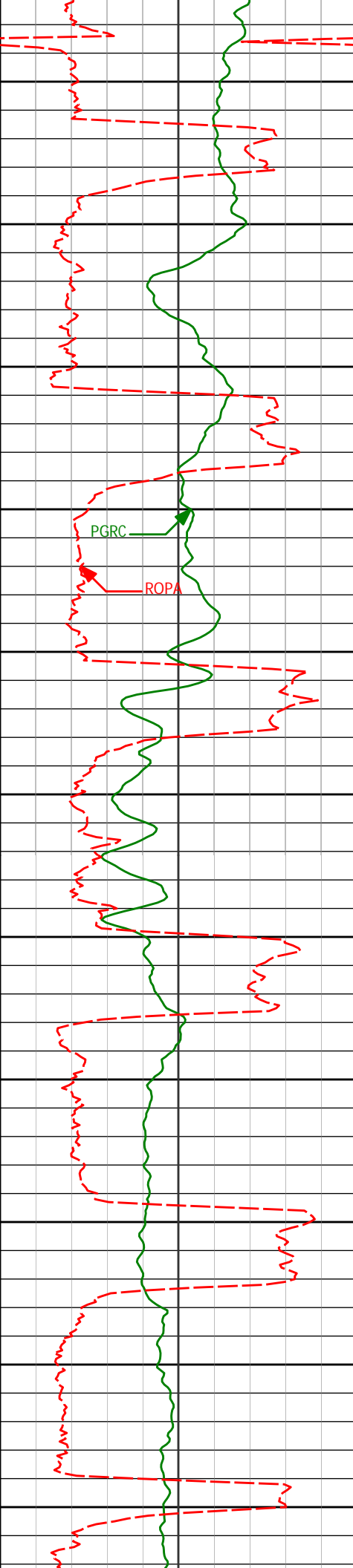
8198'

89.17°

267.69°

6677.55'

2019.08'



8250

8293'

88.98°

267.61°

6679.09'

2112.38'

8300

8350

8388'

89.63°

267.20°

6680.24'

2205.60'

8400

8450

8483'

89.01°

268.23°

6681.37'

2298.93'

8500

8550

8578'

90.15°

268.62°

6682.06'

2392.47'

8600

8650

8673'

91.23°

269.82°

6680.91'

2486.22'

8700

8750

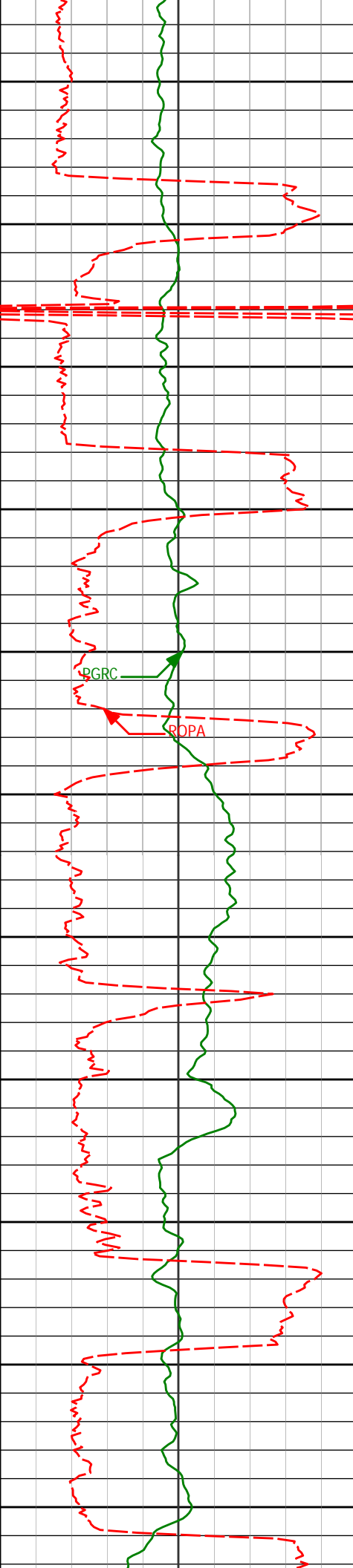
8768'

91.51°

270.90°

6678.64'

2580.24'



8800

8850

8900

8950

9000

9050

9100

9150

9200

9250

9300

8863'

90.96°

267.79°

6676.59'

2674.01'

8958'

89.20°

268.48°

6676.46'

2767.46'

9053'

87.78°

269.51°

6678.96'

2861.13'

9148'

86.24°

268.49°

6683.92'

2954.70'

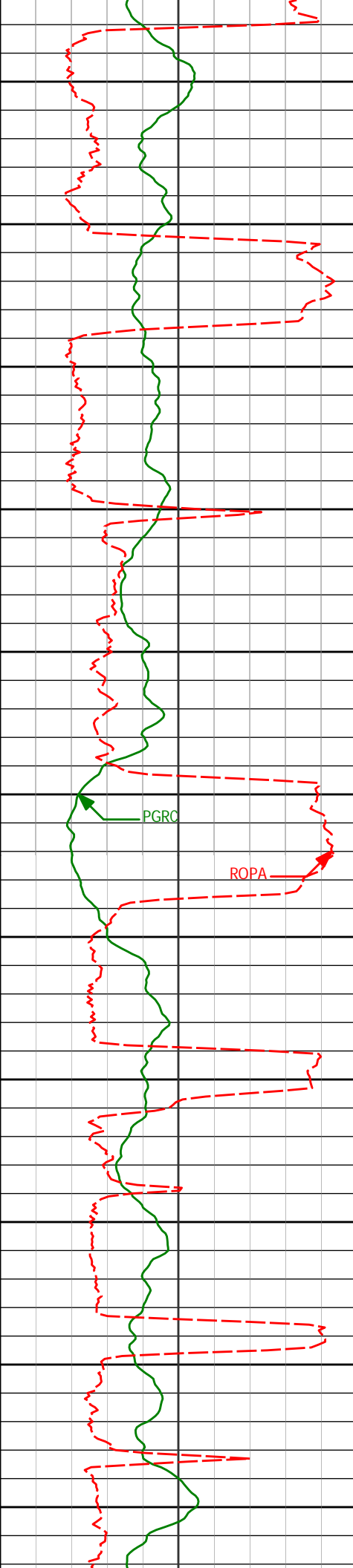
9243'

87.47°

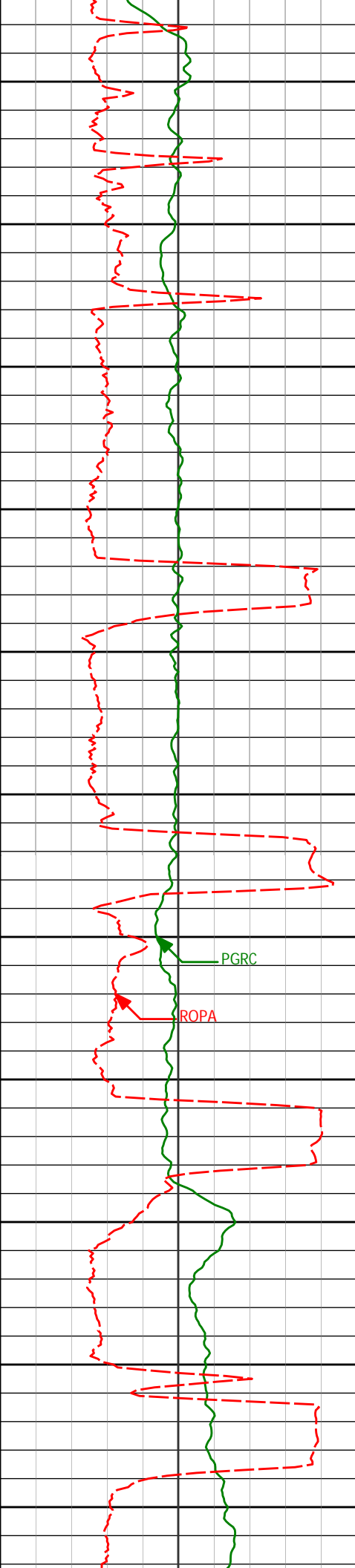
269.18°

6689.13'

3048.22'



9338'	87.47°	269.54°	6693.32'	3141.93'
9350				
9400				
9433'	89.63°	270.13°	6695.73'	3235.81'
9450				
9500				
9528'	87.75°	268.38°	6697.90'	3329.56'
9550				
9600				
9623'	90.95°	269.95°	6698.98'	3423.28'
9650				
9671'	91.02°	269.67°	6698.15'	3470.73'
9700				
9718'	92.28°	270.53°	6696.80'	3517.21'
9750				
9766'	91.97°	270.40°	6695.02'	3564.71'
9800				
9813'	92.55°	271.06°	6693.16'	3611.24'
9850				
9861'	92.13°	270.32°	6691.20'	3658.76'



9900

9908'

92.04°

270.64°

6689.49'

3705.27'

9950

10000

10002'

90.52°

268.83°

6687.39'

3798.15'

10050

10100

10097'

89.48°

269.25°

6687.39'

3891.87'

10150

10200

10192'

91.42°

266.52°

6686.65'

3985.23'

10250

10300

10287'

92.43°

268.54°

6683.46'

4078.45'

10350

10400

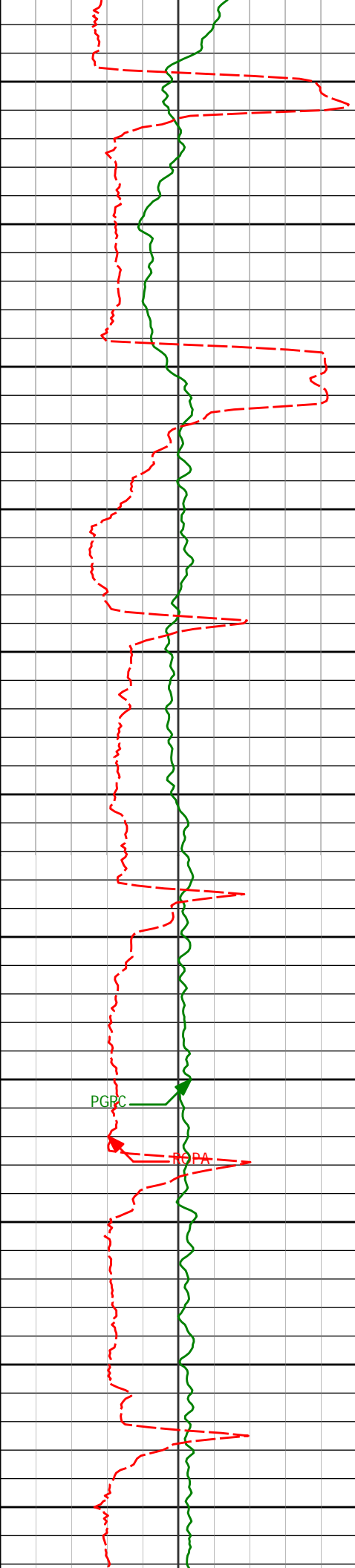
10382'

92.37°

269.82°

6679.47'

4172.12'



10450

10477'

92.56°

270.33°

6675.38'

4266.01'

10500

10550

10572'

89.97°

270.54°

6673.29'

4360.05'

10600

10650

10667'

89.11°

269.37°

6674.05'

4454.00'

10700

10750

10762'

88.98°

271.02°

6675.64'

4547.99'

10800

PGRC

ROPA

10850

10857'

89.66°

272.57°

6676.76'

4642.34'

10900

10950

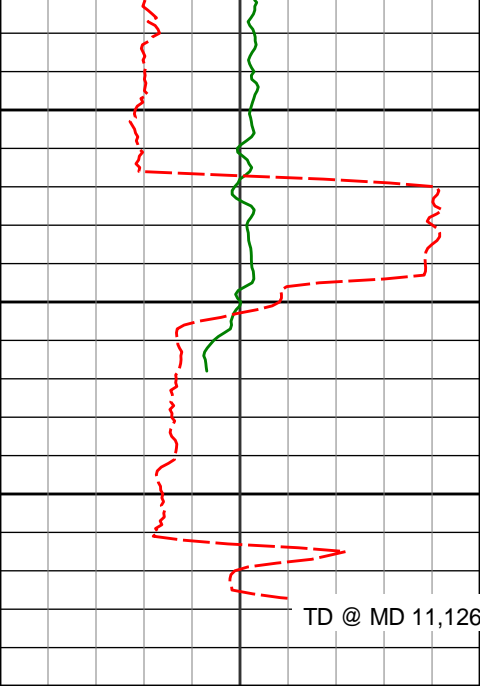
10952'

90.31°

274.13°

6676.79'

4736.96'



11000

11050

11100

11059'

88.49°

274.61°

6677.91'

4843.67'

11126'

88.49°

274.61°

6679.67'

4910.50'

11150

Avg Rate of Penetration

ROPA

feet per hr

500

0

PCG Gamma Ray

PGRC

api

0

300

Depth
ft**Depth****Inc.****Azi.****TVD****V.S.****HALLIBURTON****Sperry Drilling Services****MD Detail Log 1:240**Noble Energy
Wells Ranch USX AA23-64-1HN
H&P 343
T6N-R63W**PCG Gamma Ray**

PGRC

api

0

300

Avg Rate of Penetration

ROPA

feet per hr

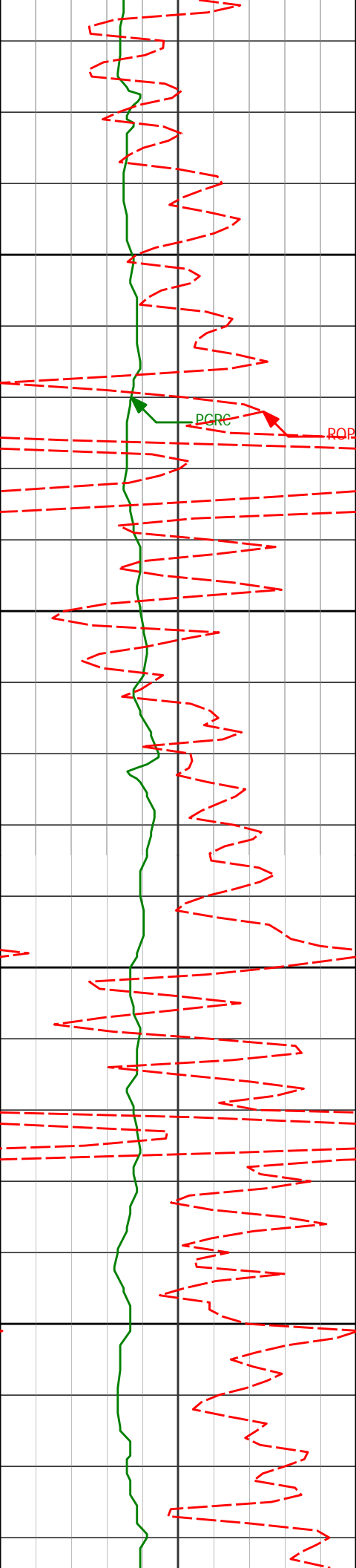
500

0

Depth
ft**Depth****Inc.****Azi.****TVD****V.S.**

3000

3050



3070'

17.06°

347.49°

3023.88'

126.55'

3165'

15.93°

346.65°

3114.97'

136.39'

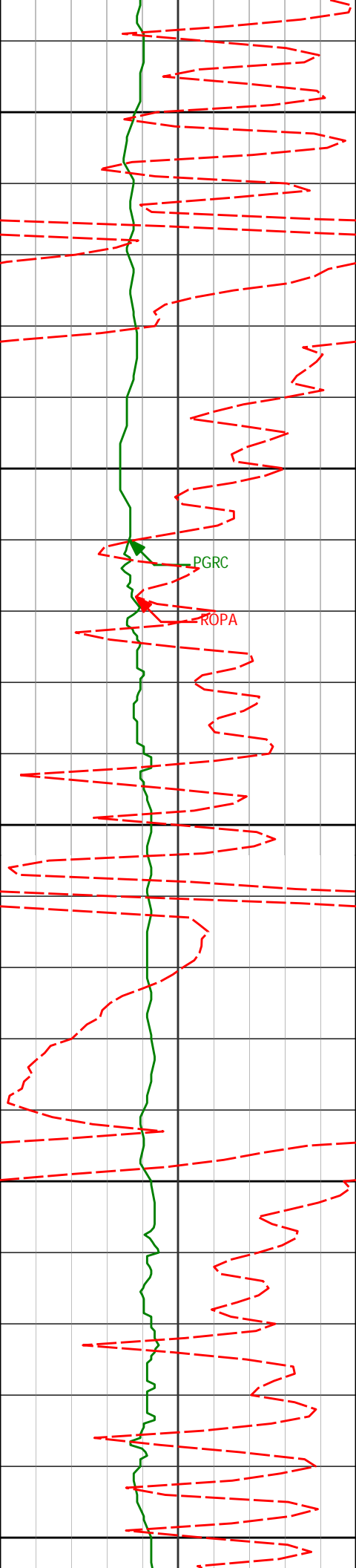
3260'

15.03°

346.68°

3206.52'

145.81'



3300

3350

3400

3450

3500

3354'

13.49°

347.07°

3297.62'

154.33'

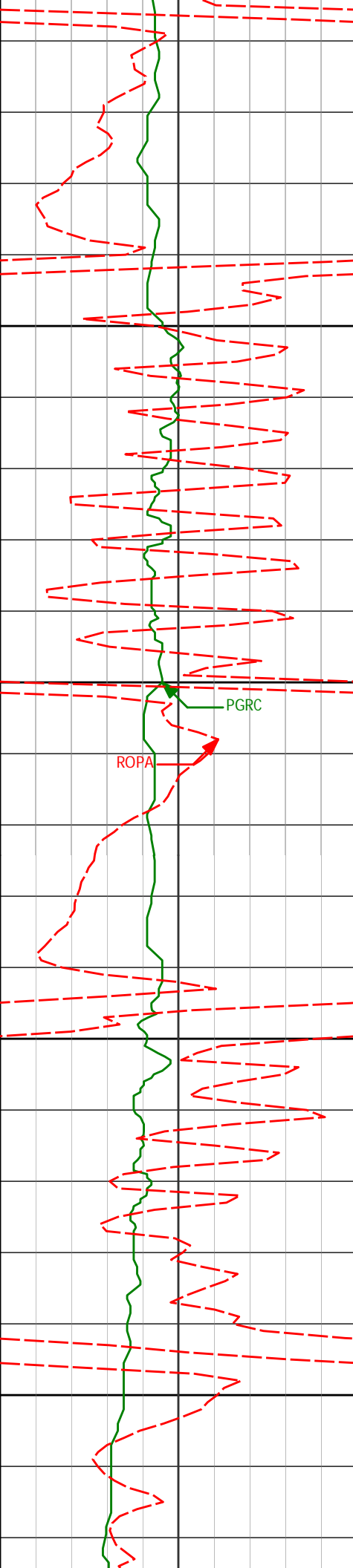
3449'

14.19°

345.72°

3389.86'

162.87'



3544'	12.84°	343.65°	3482.23'	171.81'
-------	--------	---------	----------	---------

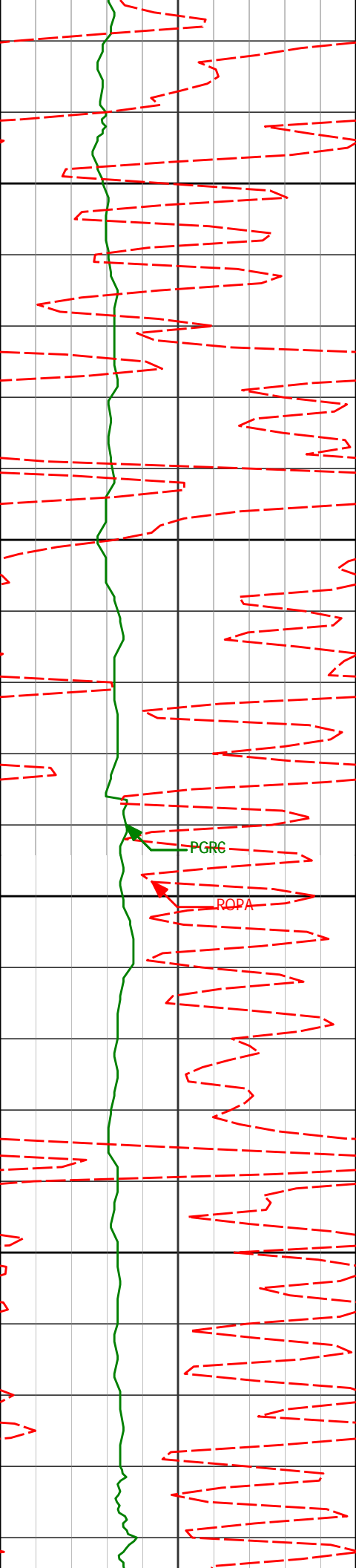
3550

3600

3650

3700

3639'	12.68°	349.45°	3574.89'	179.63'
-------	--------	---------	----------	---------



3734'

14.36°

351.74°

3667.26'

186.42'

3750

3800

3829'

15.57°

352.49°

3759.03'

193.32'

3850

3900

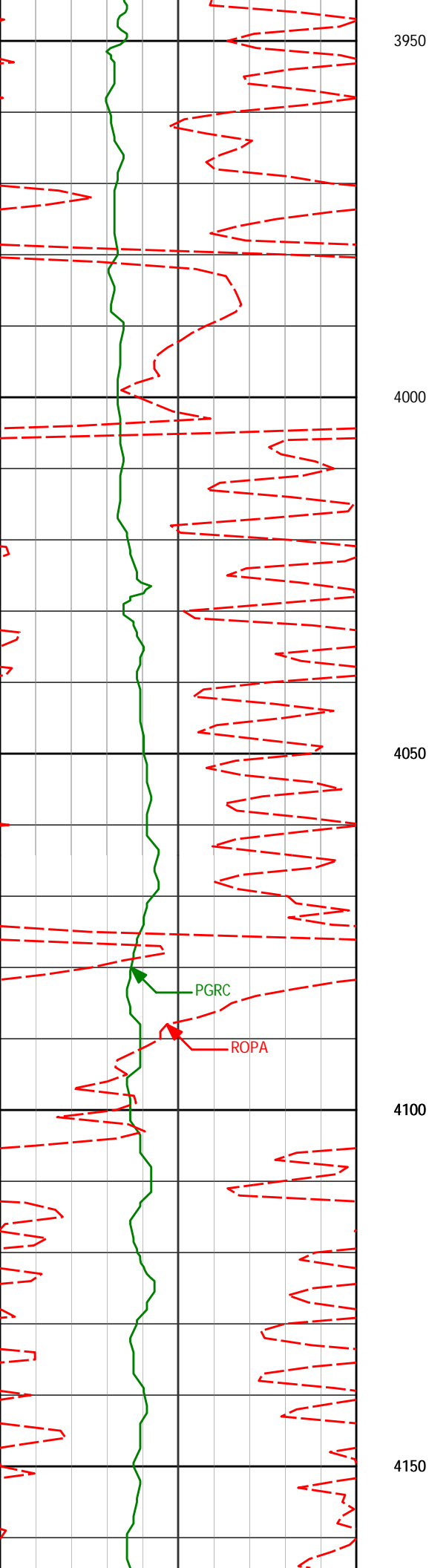
3924'

15.95°

352.99°

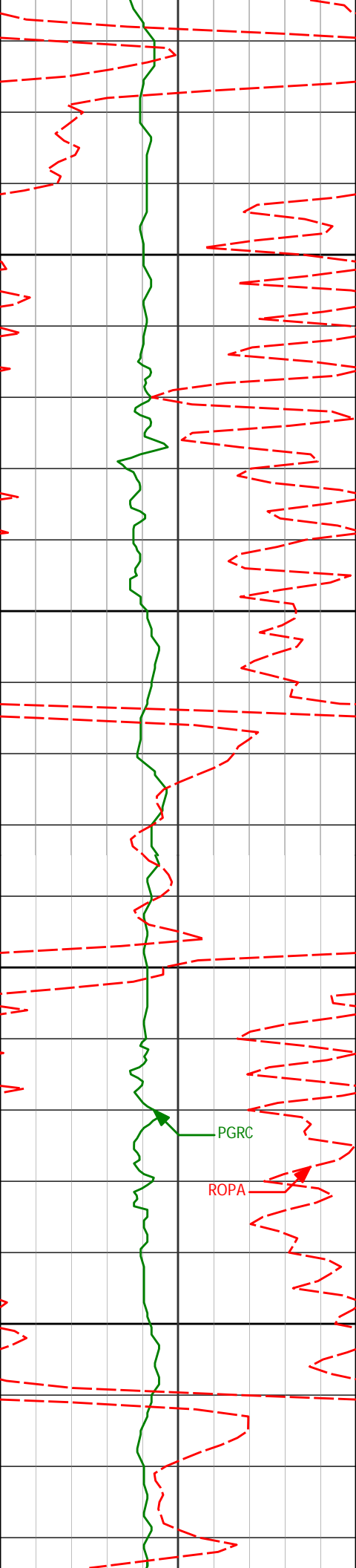
3850.46'

200.31'



4019' 17.55° 350.38° 3941.43' 208.25'

4114' 16.09° 349.14° 4032.37' 217.05'



4200

4208'

14.64°

349.28°

4123.00'

225.26'

4250

4300

4303'

15.56°

350.93°

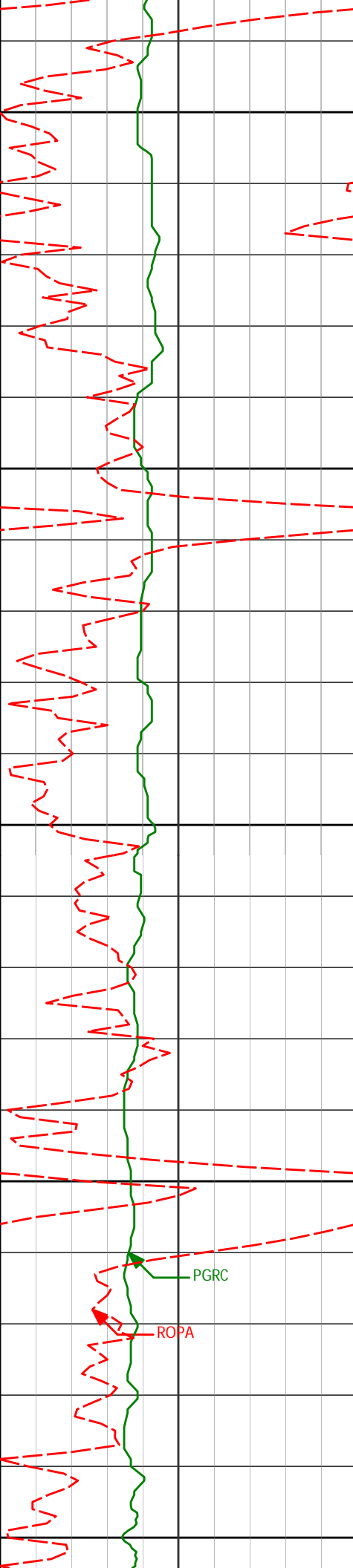
4214.72'

233.05'

4350

PGRC

ROPA



4400

4450

4500

4550

4600

4398'

13.52°

342.89°

4306.69'

241.69'

4493'

11.30°

343.06°

4399.46'

250.48'

4587'

10.89°

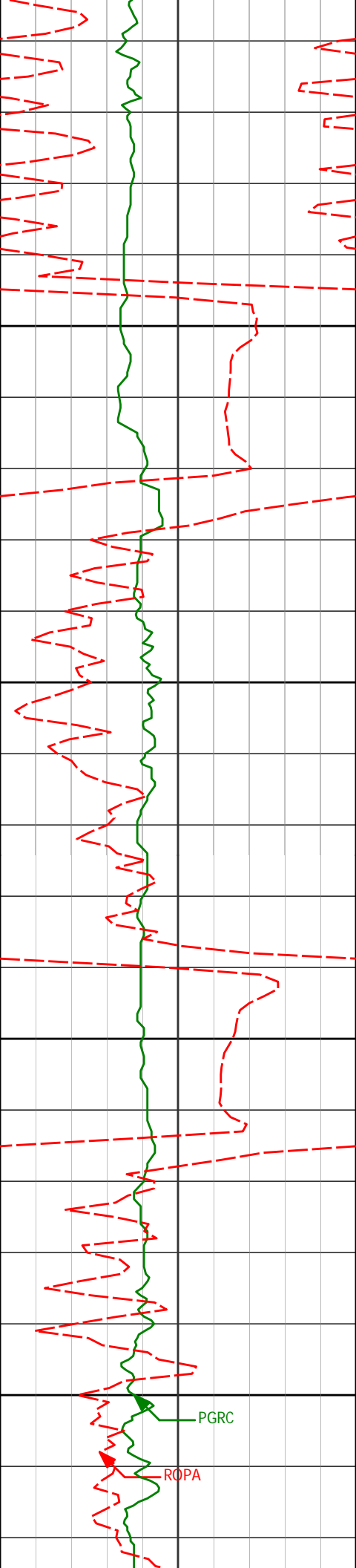
341.61°

4491.70'

258.44'

PGRC

ROPA



4650

4682'

8.71°

343.68°

4585.31'

265.51'

4700

4750

4778'

5.79°

340.80°

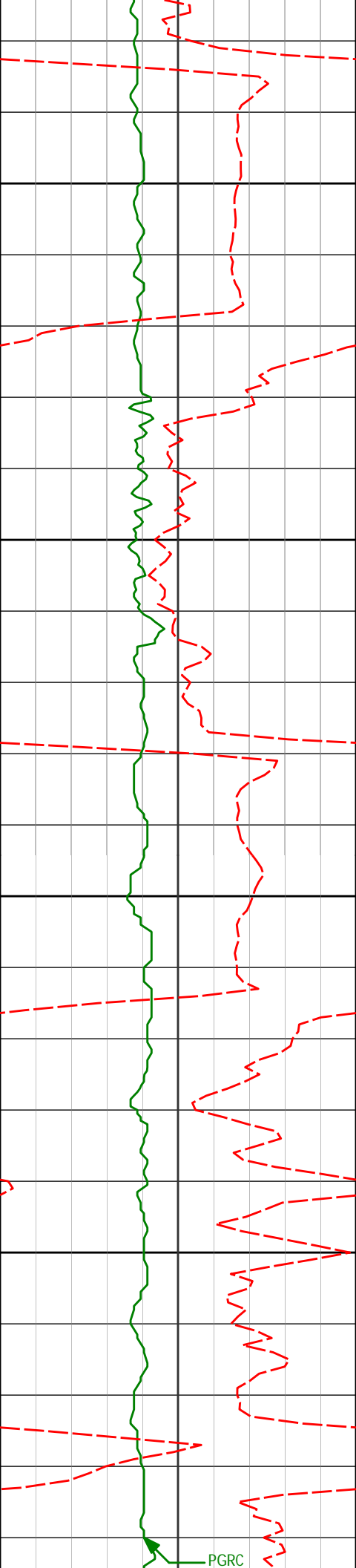
4680.53'

270.81'

4800

PGRC

ROPA



4850

4873'

3.64°

349.58°

4775.21'

274.01'

4900

4950

4968'

1.62°

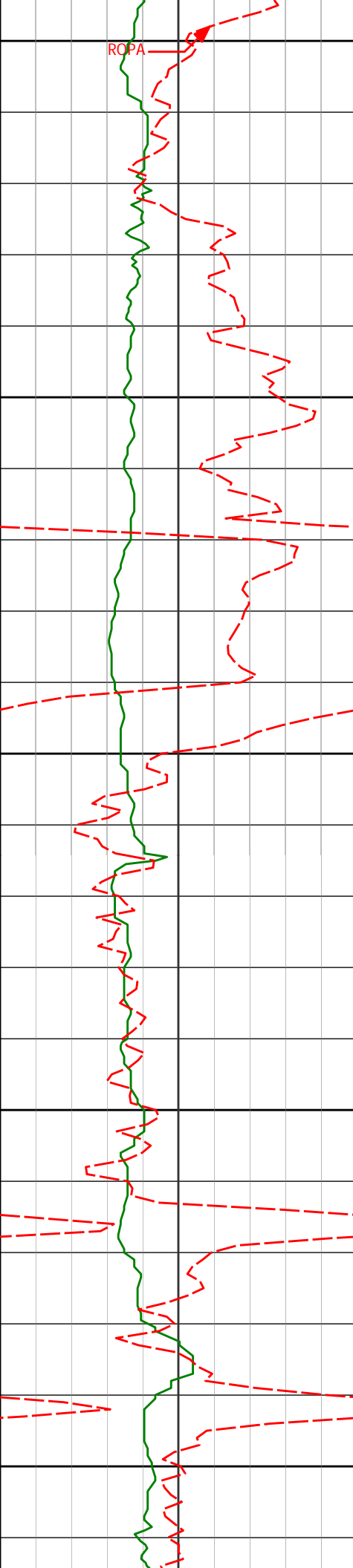
303.04°

4870.11'

276.21'

5000

PGRC



5050

5062'

1.67°

305.64°

4964.07'

278.63'

5100

5150

5157'

0.46°

328.78°

5059.06'

280.10'

5200

5250

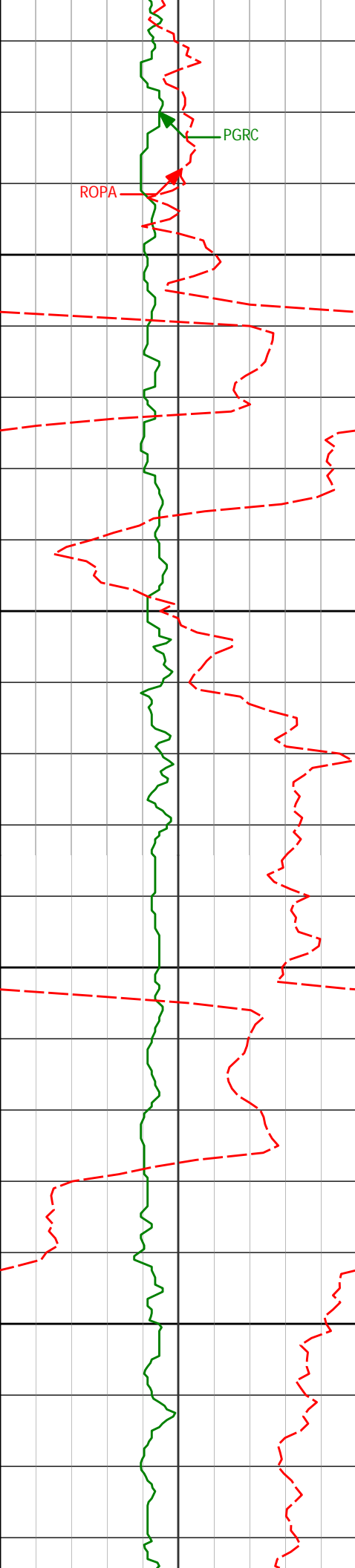
5253'

0.36°

308.88°

5155.05'

280.61'



5300

5350

5400

5450

5347'

0.76°

334.72°

5249.05'

281.21'

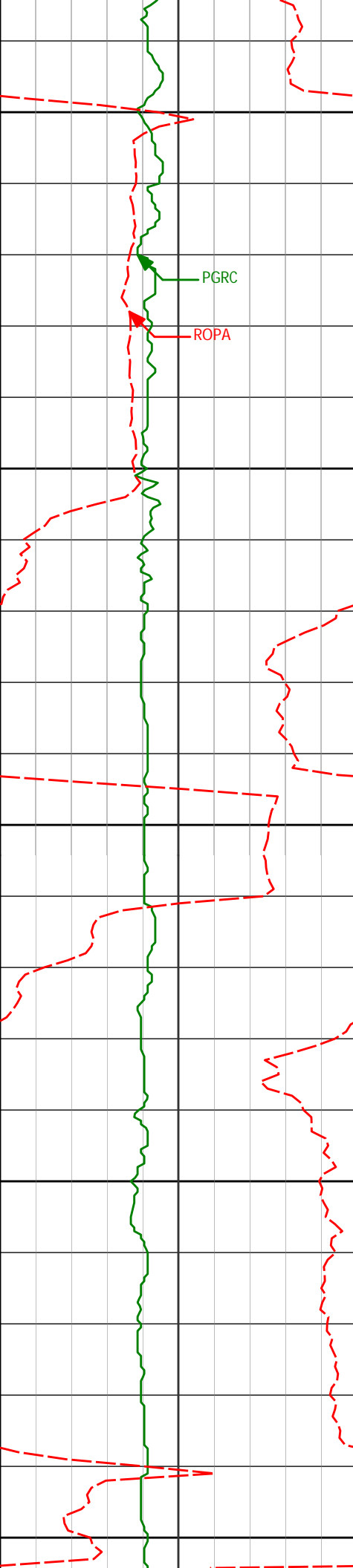
5443'

0.43°

115.45°

5345.05'

281.21'



5500

PGRC

ROPA

5550

5600

5650

5700

5538'

1.00°

61.13°

5440.04'

280.21'

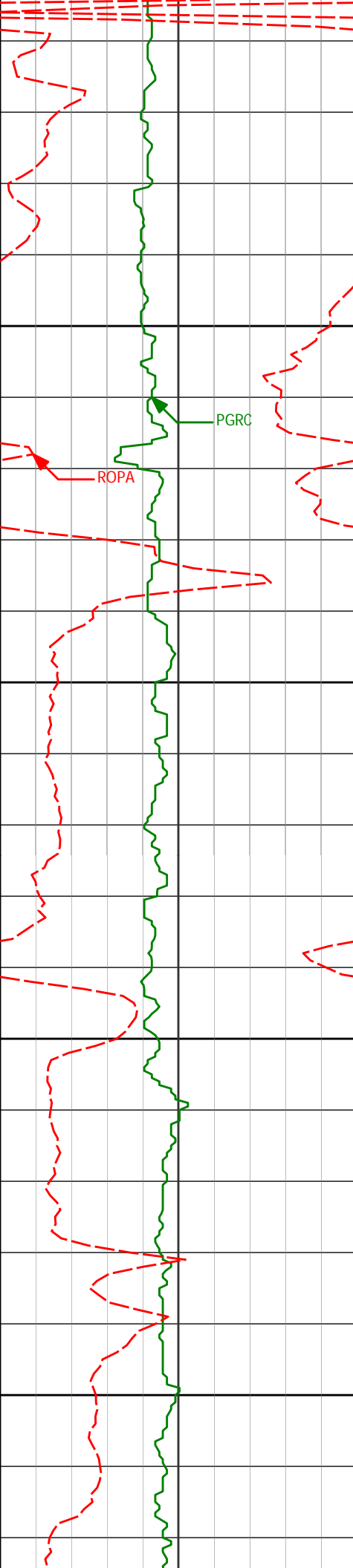
5633'

1.17°

82.50°

5535.02'

278.61'



5750

5800

5850

5900

5728'

1.05°

83.63°

5630.00'

276.84'

5823'

1.03°

77.16°

5724.99'

275.20'

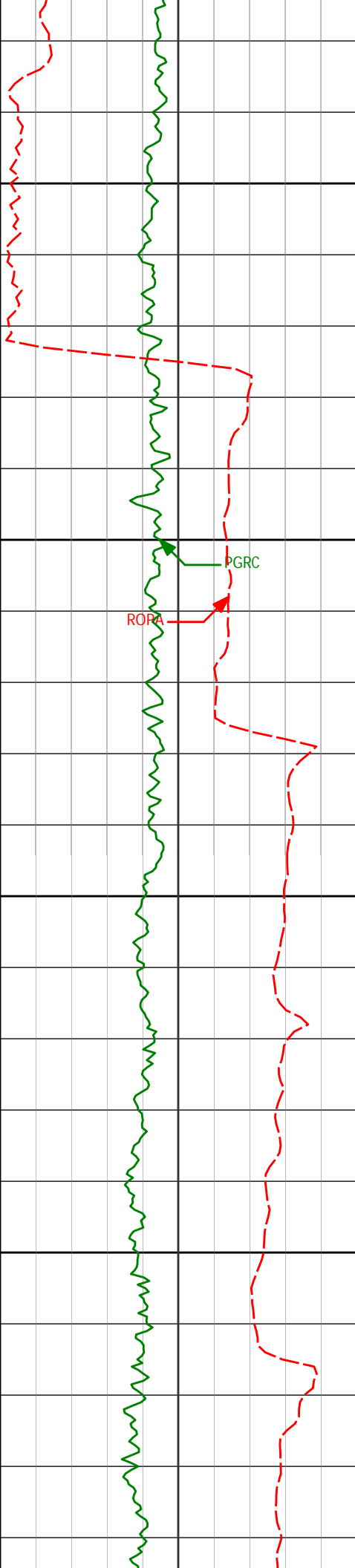
5918'

0.57°

105.21°

5819.98'

273.94'



5950

<Run 200>

6000

ROPA

PGRC

6012'

0.14°

116.06°

5913.98'

273.37'

6050

6060'

4.83°

241.60°

5961.92'

274.93'

6100

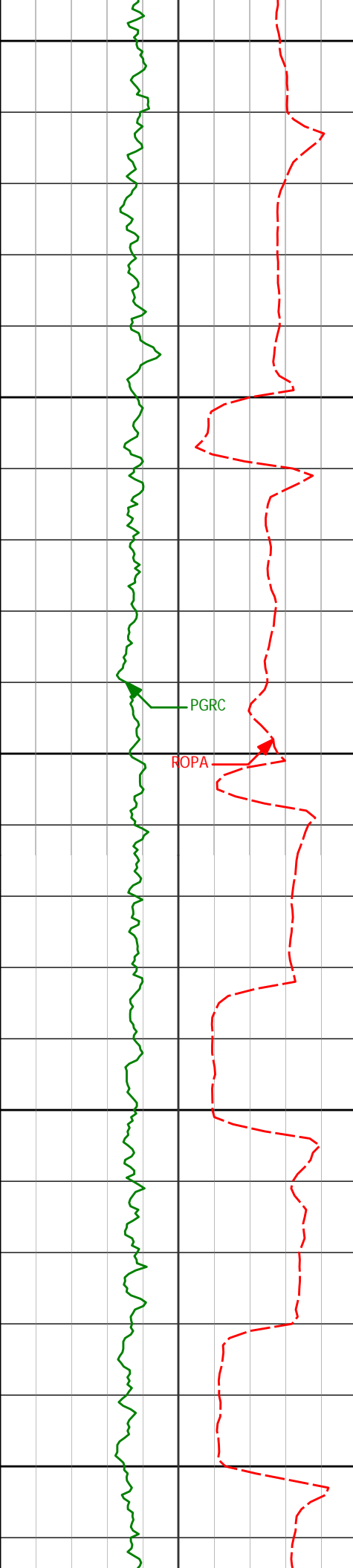
6107'

10.50°

244.63°

6008.48'

280.07'



6150

6155'

15.03°

248.38°

6055.29'

289.09'

6200

6202'

19.36°

255.19°

6100.18'

301.53'

6250

6250'

23.33°

253.17°

6144.88'

317.44'

6300

6297'

25.80°

256.12°

6187.62'

335.31'

6350

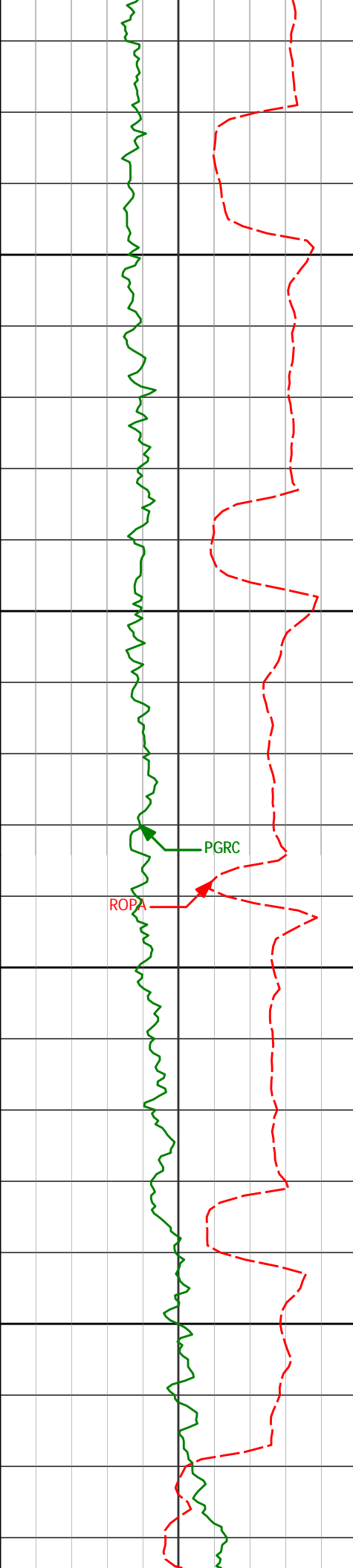
6345'

26.37°

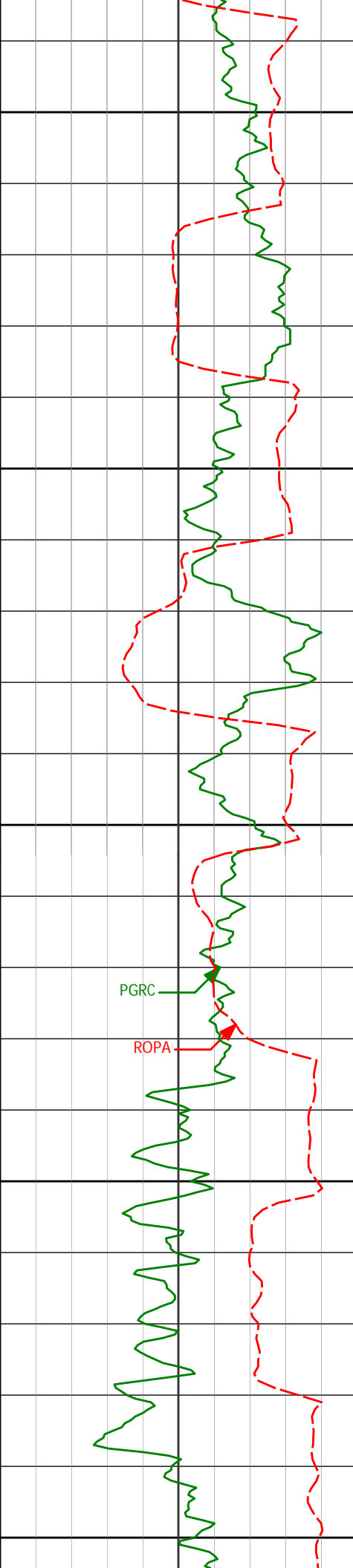
262.16°

6230.74'

355.21'



6392'	28.87°	264.56°	6272.38'	376.24'
6400				
6440'	32.04°	267.17°	6313.76'	399.99'
6450				
6487'	36.46°	272.37°	6352.60'	426.12'
6500				
6535'	41.19°	275.07°	6389.99'	456.10'
6550				
6582'	45.71°	275.50°	6424.10'	488.36'



6600

6630'

49.26°

273.77°

6456.54'

523.65'

6650

6677'

51.59°

271.86°

6486.48'

559.69'

6700

6725'

53.50°

270.54°

6515.67'

597.49'

6750

6772'

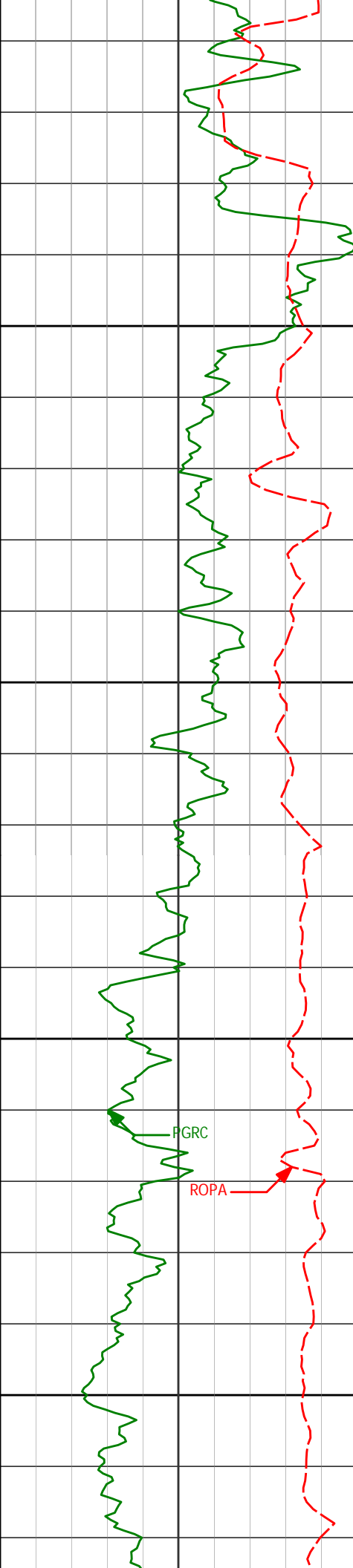
55.27°

270.57°

6543.04'

635.33'

6800



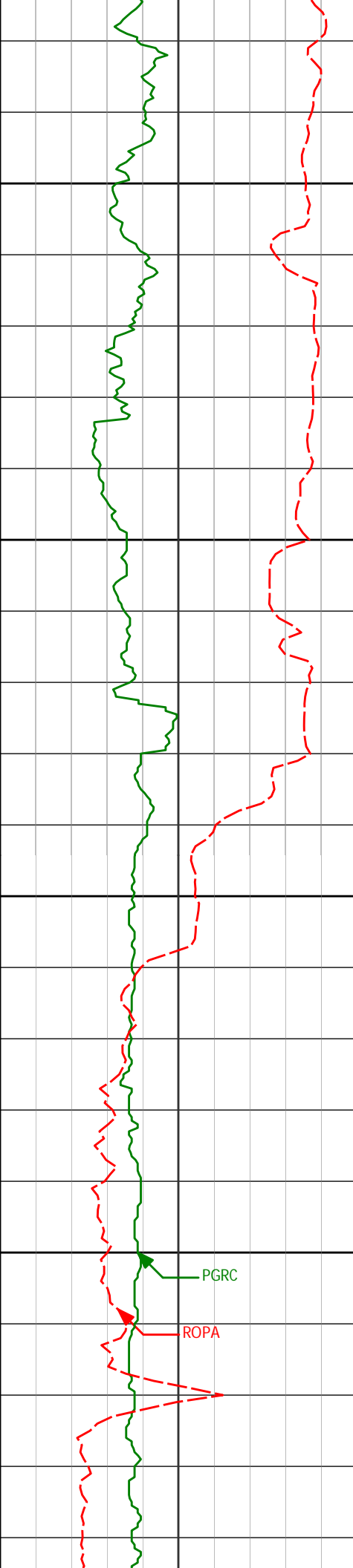
6850

6900

6950

7000

6820'	57.35°	269.82°	6569.67'	674.85'
6867'	60.93°	269.59°	6593.77'	714.72'
6915'	65.65°	268.94°	6615.34'	757.03'
6962'	71.53°	268.09°	6632.49'	800.11'
7010'	77.58°	266.89°	6645.27'	845.50'



7050

7057'

83.44°

267.11°

6653.01'

890.91'

7075'

86.05°

267.10°

6654.66'

908.49'

7100



Casing Set @ 7,120' MD

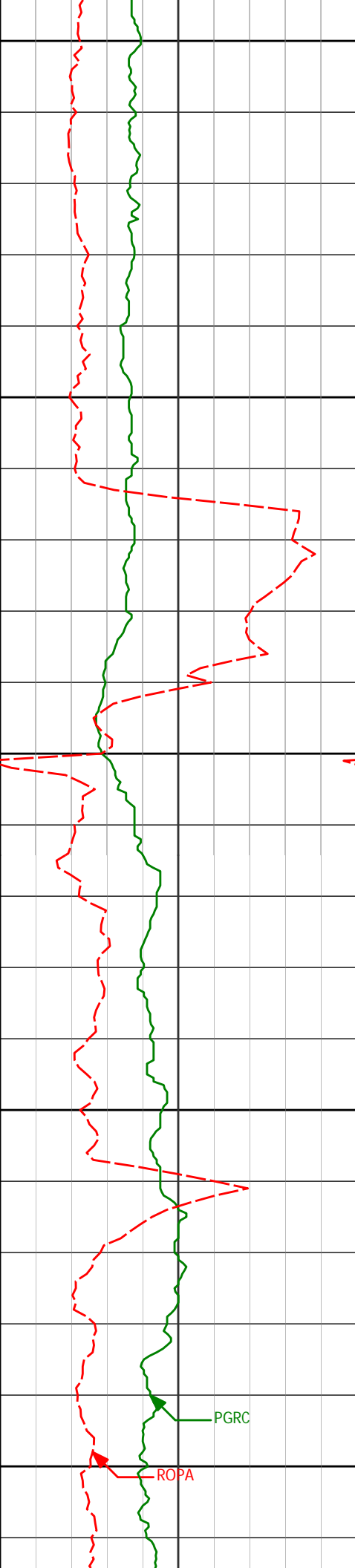
<Run 300>

7150

7200

PGRC

ROPA



7250

7300

7350

7400

7450

7248'

7343'

7438'

90.40°

88.74°

86.64°

270.76°

274.37°

273.85°

6660.02'

6660.74'

6664.57'

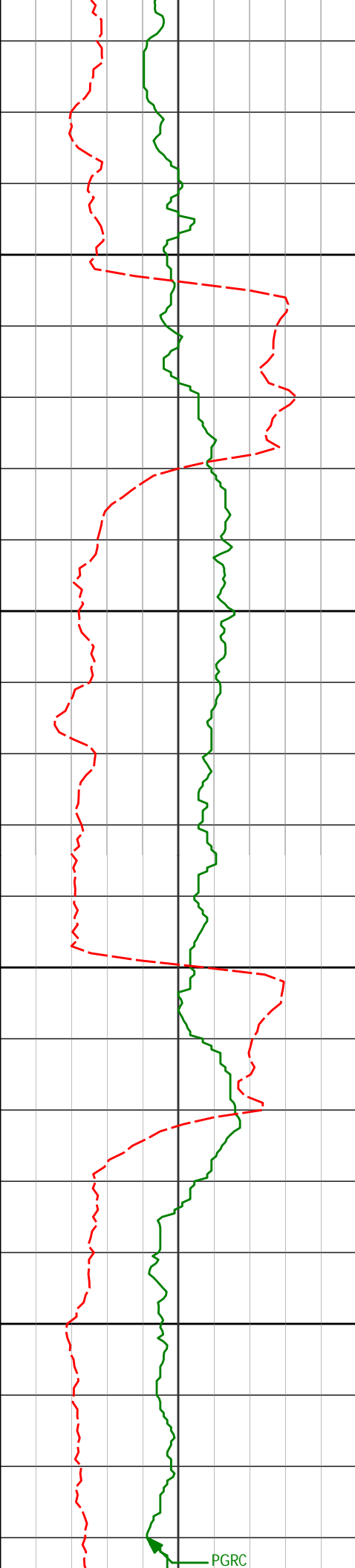
1078.94'

1173.42'

1268.06'

PGRC

ROPA



7500

7533'

87.75°

273.35°

6669.22'

1362.60'

7550

7600

7628'

88.21°

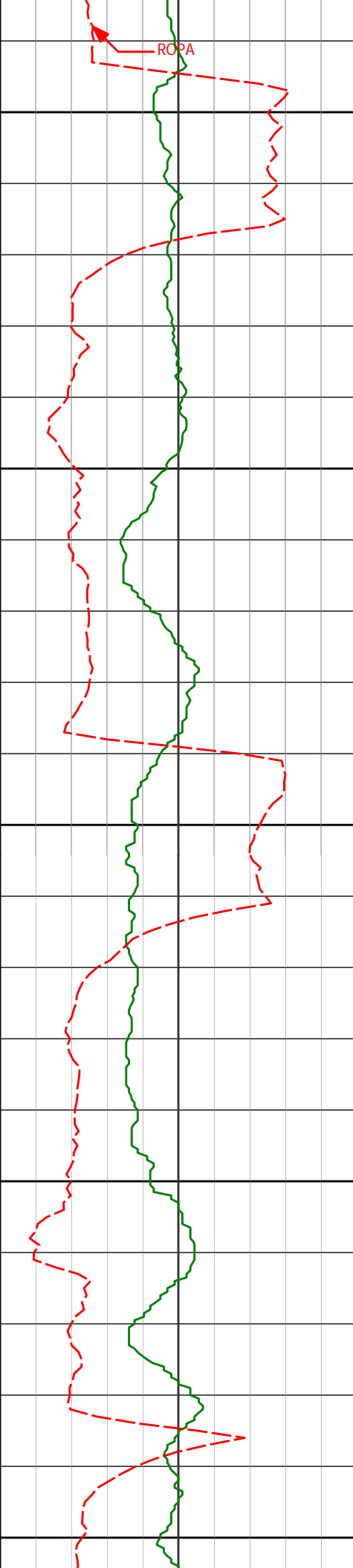
271.08°

6672.57'

1456.97'

7650

PGRC



7700

7723'

89.04°

269.35°

6674.85'

1550.96'

7750

7800

7818'

90.86°

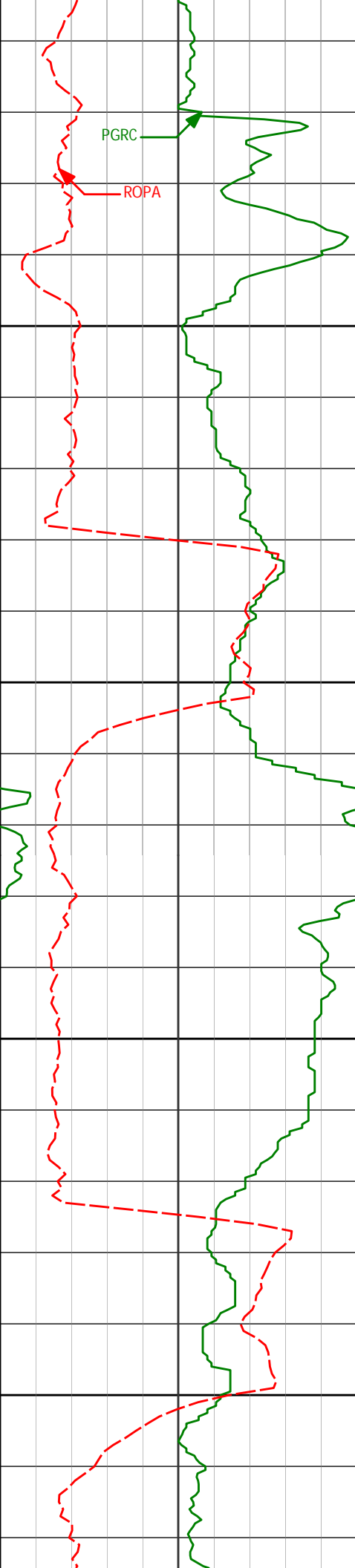
268.90°

6674.93'

1644.69'

7850

7900



7913'

92.40°

269.01°

6672.22'

1738.34'

7950

8000

8008'

87.81°

268.65°

6672.04'

1831.98'

8050

8100

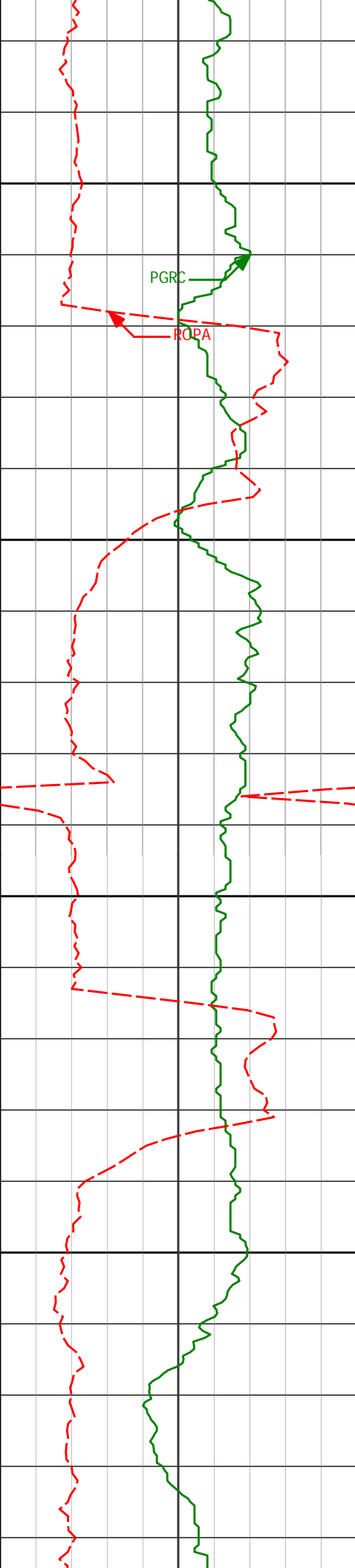
8103'

88.18°

269.02°

6675.36'

1925.58'



8150

PGRC

ROPA

8200

8250

8300

8198'

89.17°

267.69°

6677.55'

2019.08'

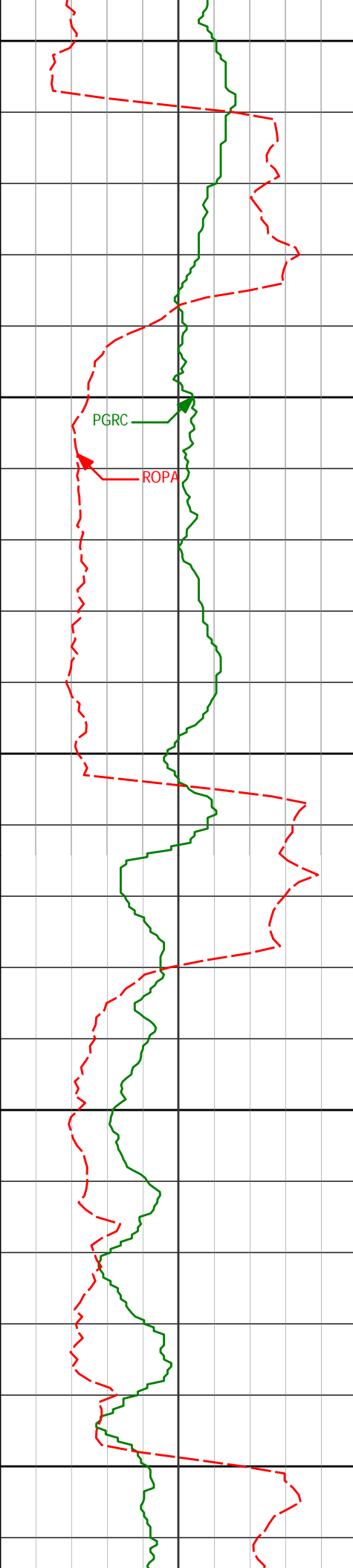
8293'

88.98°

267.61°

6679.09'

2112.38'



8350

8388'

89.63°

267.20°

6680.24'

2205.60'

8400

PGRC

ROPA

8450

8483'

89.01°

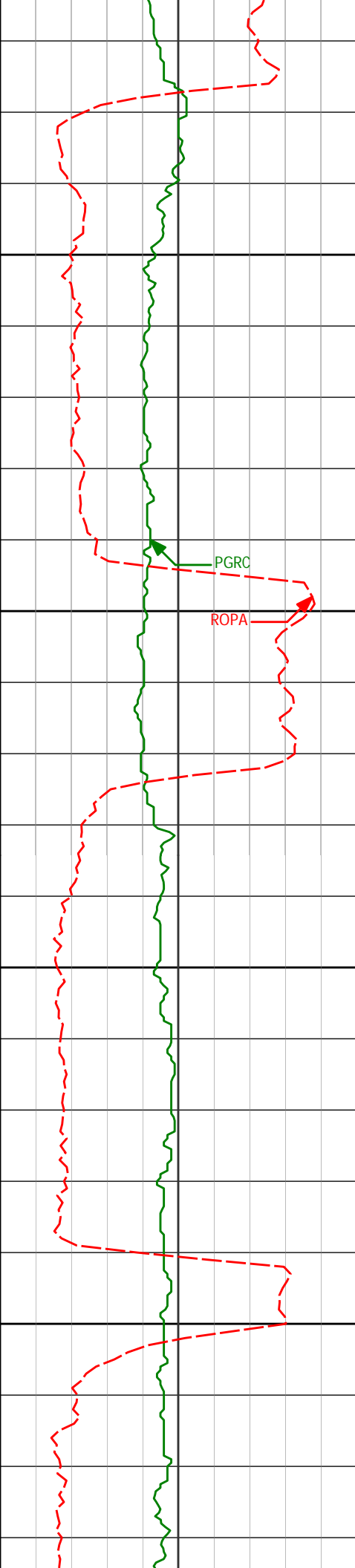
268.23°

6681.37'

2298.93'

8500

8550



8578'

90.15°

268.62°

6682.06'

2392.47'

8600

8650

8673'

91.23°

269.82°

6680.91'

2486.22'

8700

8750

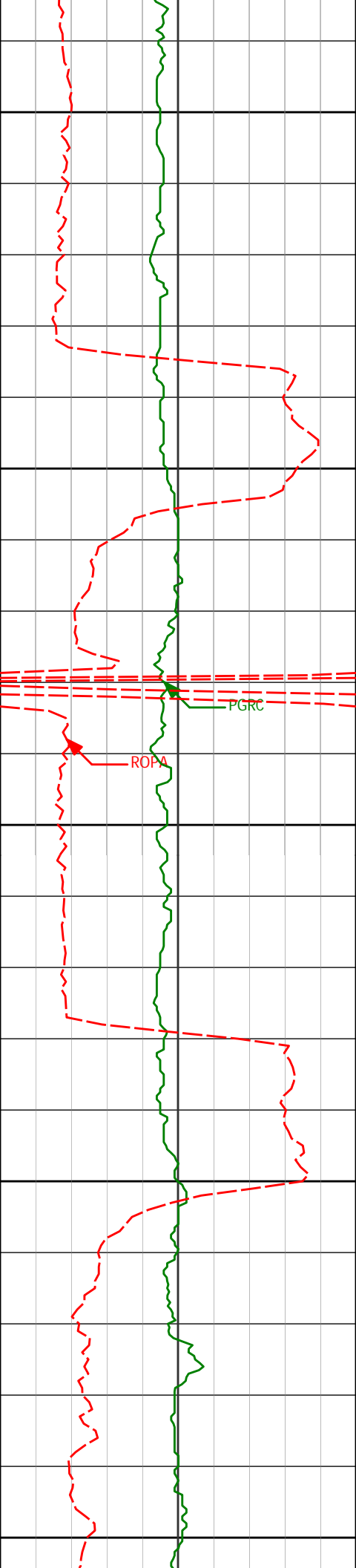
8768'

91.51°

270.90°

6678.64'

2580.24'



8800

8850

8900

8950

9000

8863'

90.96°

267.79°

6676.59'

2674.01'

8958'

89.20°

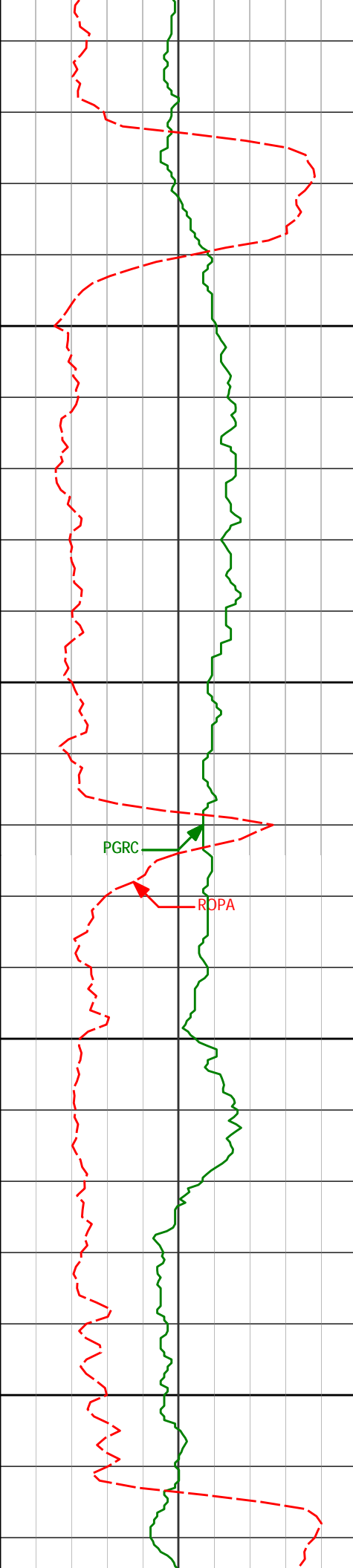
268.48°

6676.46'

2767.46'

ROPA

PGRC



9050

9053'

87.78°

269.51°

6678.96'

2861.13'

9100

PGRC

ROPA

9150

9148'

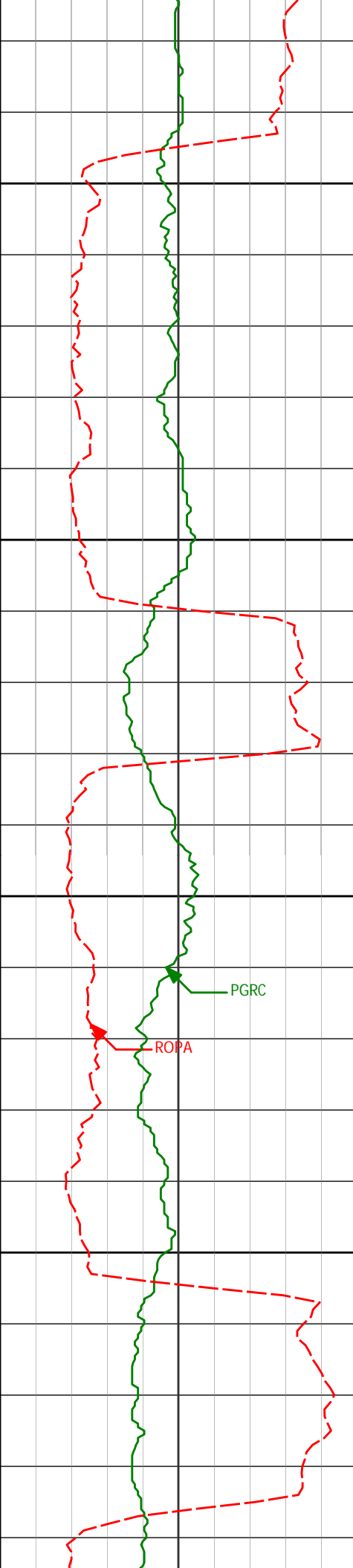
86.24°

268.49°

6683.92'

2954.70'

9200



9250

9300

9350

9400

9243'

87.47°

269.18°

6689.13'

3048.22'

9338'

87.47°

269.54°

6693.32'

3141.93'

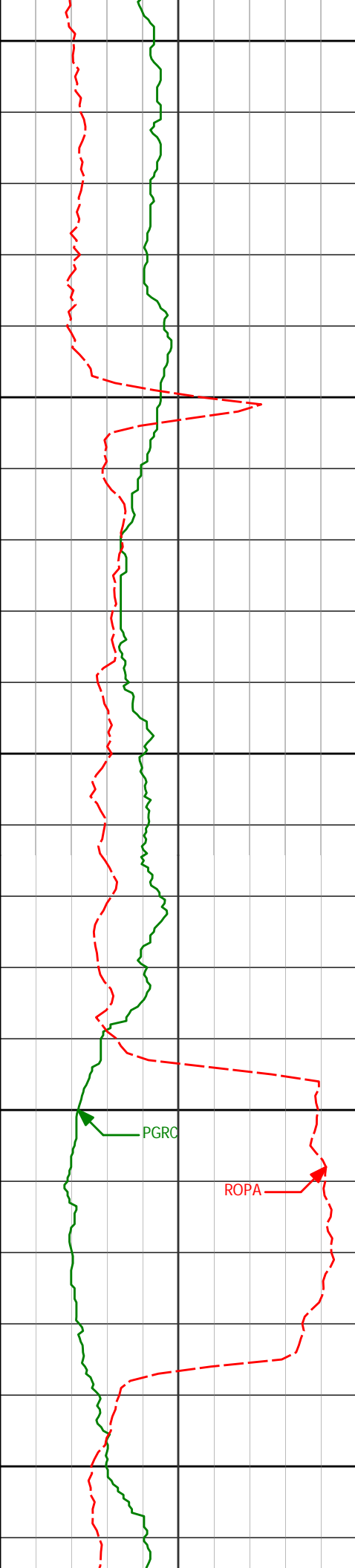
9433'

89.63°

270.13°

6695.73'

3235.81'



9450

9500

9550

9600

9650

9528'

87.75°

268.38°

6697.90'

3329.56'

9623'

90.95°

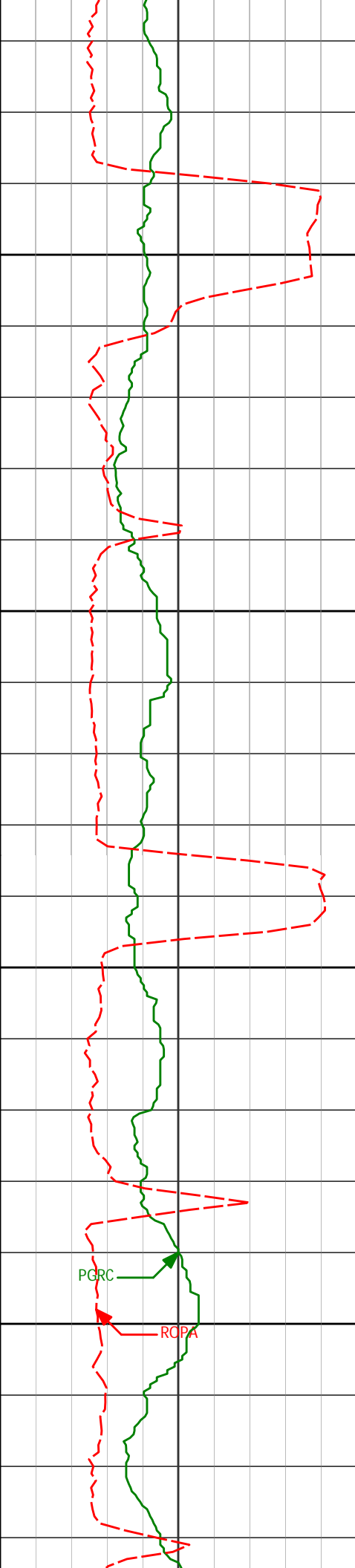
269.95°

6698.98'

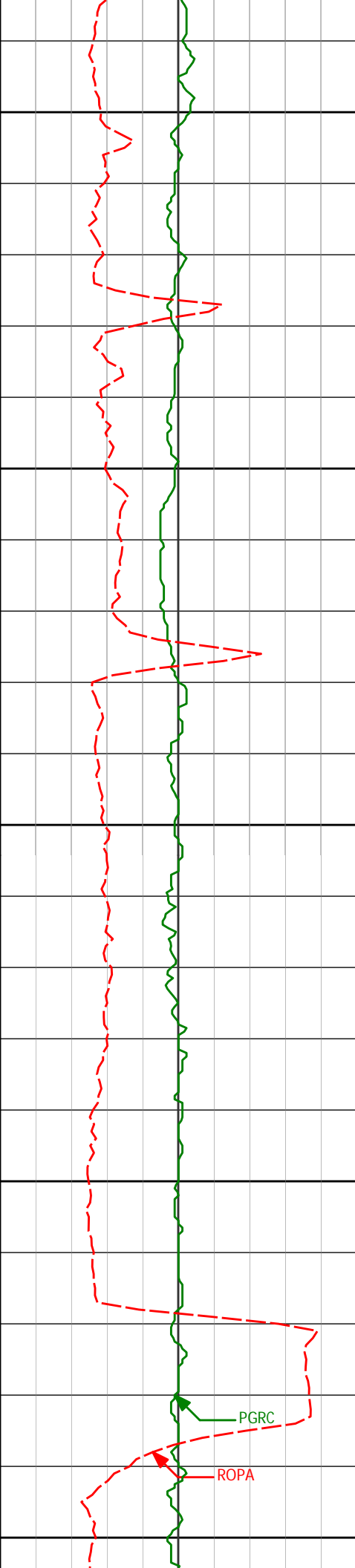
3423.28'

PGRC

ROPA



9671'	91.02°	269.67°	6698.15'	3470.73'
9700				
9718'	92.28°	270.53°	6696.80'	3517.21'
9750				
9766'	91.97°	270.40°	6695.02'	3564.71'
9800				
9813'	92.55°	271.06°	6693.16'	3611.24'
9850				
9861'	92.13°	270.32°	6691.20'	3658.76'



9900

9908'

92.04°

270.64°

6689.49'

3705.27'

9950

10000

10002'

90.52°

268.83°

6687.39'

3798.15'

10050

10100

10097'

89.48°

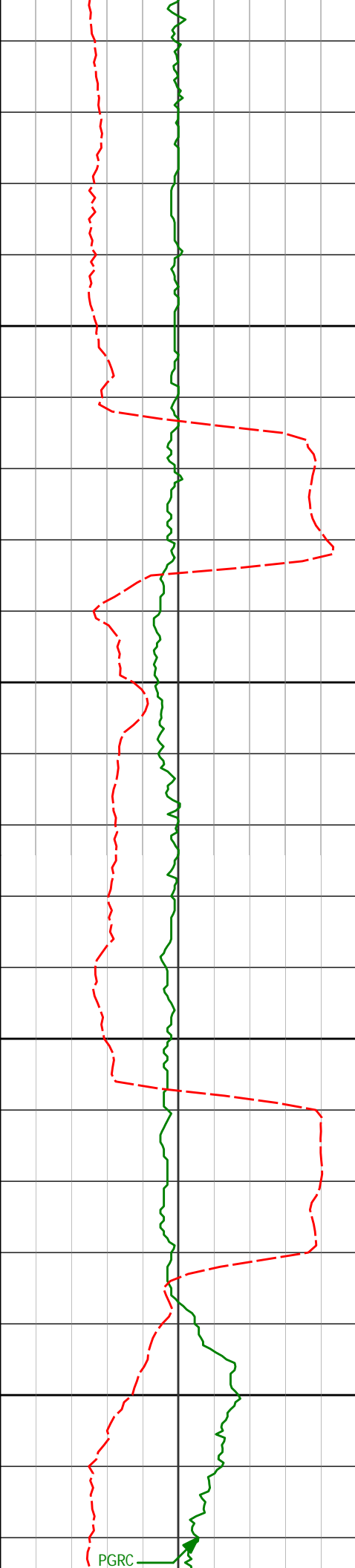
269.25°

6687.39'

3891.87'

PGRC

ROPA



10150

10200

10250

10300

10192'

91.42°

266.52°

6686.65'

3985.23'

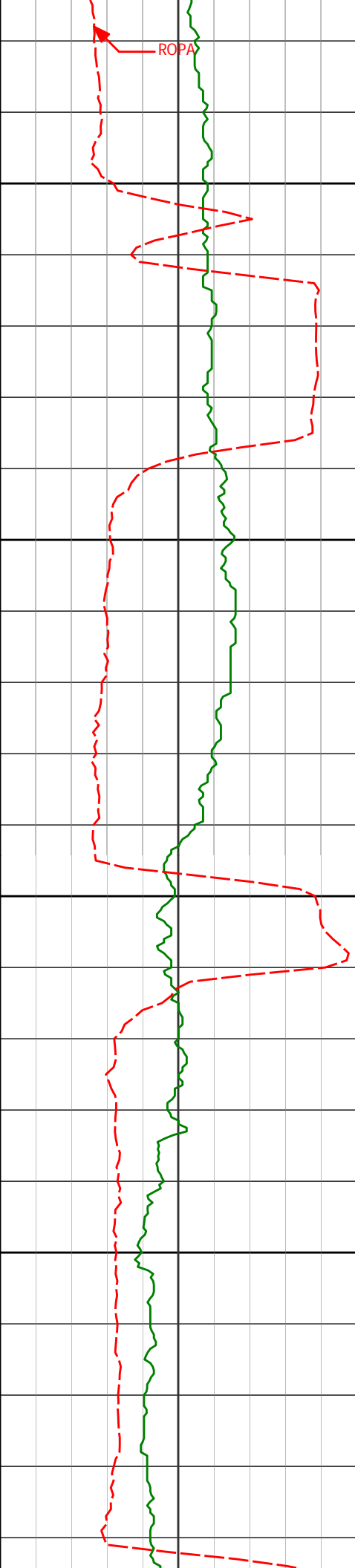
10287'

92.43°

268.54°

6683.46'

4078.45'



10350

10382'

92.37°

269.82°

6679.47'

4172.12'

10400

10450

10477'

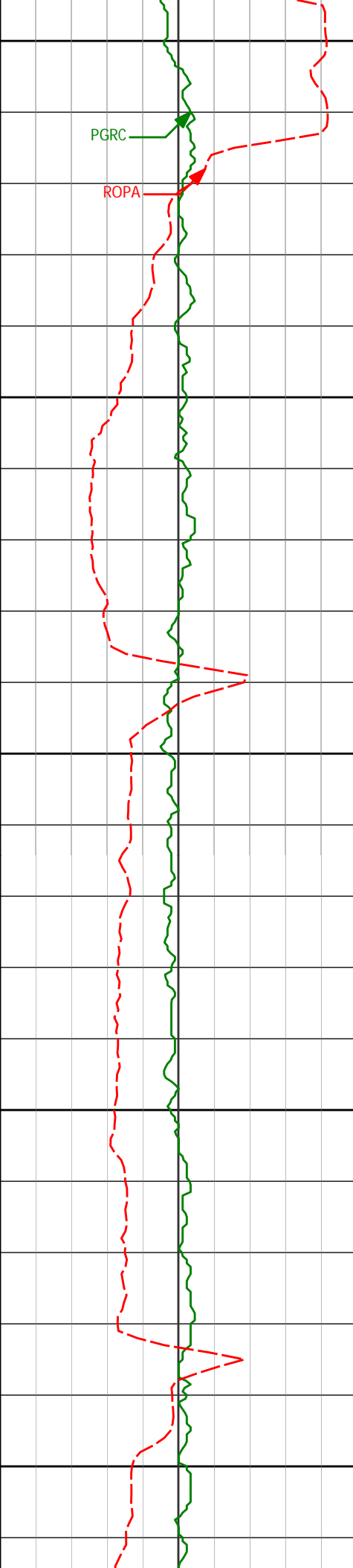
92.56°

270.33°

6675.38'

4266.01'

10500



10550

PGRC

ROPA

10600

10650

10700

10750

10572'

89.97°

270.54°

6673.29'

4360.05'

10667'

89.11°

269.37°

6674.05'

4454.00'

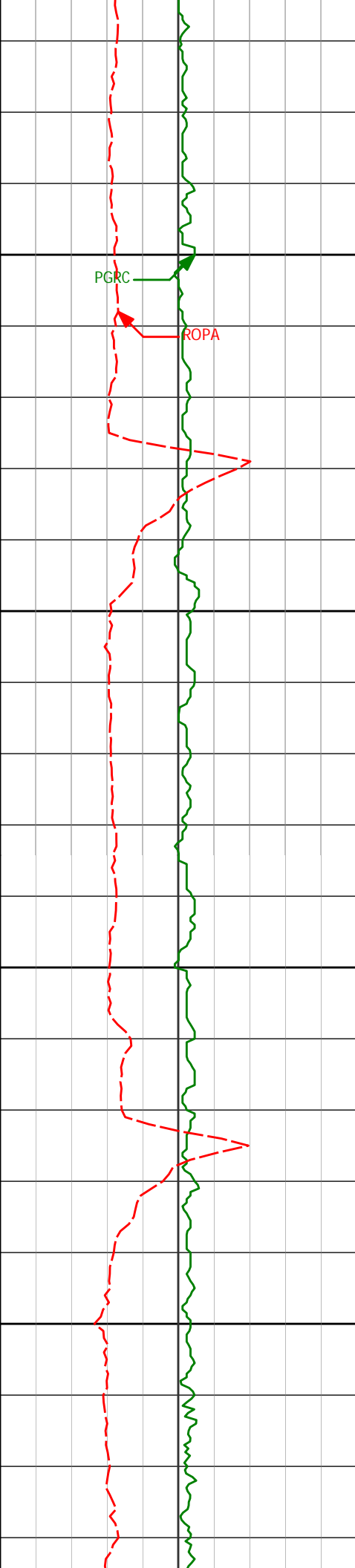
10762'

88.98°

271.02°

6675.64'

4547.99'



10800

PGRC

ROPA

10850

10857'

89.66°

272.57°

6676.76'

4642.34'

10900

10950

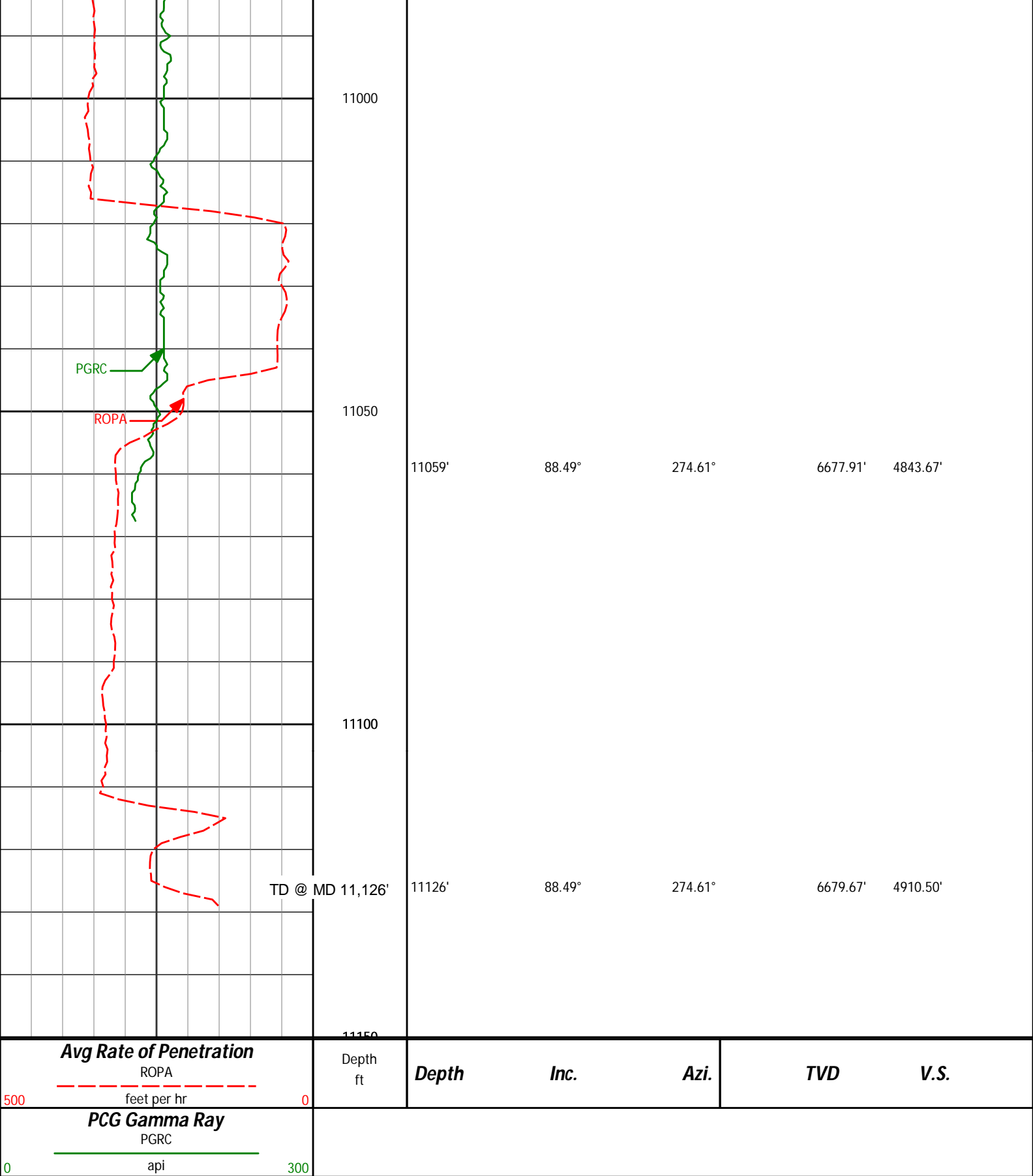
10952'

90.31°

274.13°

6676.79'

4736.96'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch USX AA23-64-1HN
Wattenberg

0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
366.00	1.00	184.40	365.98	3.18 S	0.25 W	-0.23	0.27
639.00	0.60	277.00	638.96	5.39 S	1.85 W	1.03	0.44
713.00	0.36	303.21	712.96	5.21 S	2.43 W	1.63	0.43
806.00	0.57	263.79	805.96	5.10 S	3.13 W	2.34	0.40
898.00	0.92	275.15	897.95	5.08 S	4.32 W	3.53	0.42
990.00	0.46	11.35	989.94	4.66 S	4.99 W	4.25	1.17
1082.00	0.72	253.29	1081.94	4.46 S	5.47 W	4.75	1.11
1176.00	0.37	299.38	1175.94	4.48 S	6.30 W	5.57	0.57
1270.00	0.62	303.64	1269.93	4.05 S	6.99 W	6.32	0.27
1363.00	0.50	330.03	1362.93	3.42 S	7.61 W	7.03	0.30
1457.00	1.12	261.89	1456.92	3.19 S	8.73 W	8.17	1.11
1552.00	2.38	346.52	1551.89	1.40 S	10.11 W	9.79	2.67
1646.00	4.58	359.04	1645.71	4.25 N	10.63 W	11.14	2.46
1741.00	8.42	346.18	1740.09	14.80 N	12.35 W	14.40	4.30
1836.00	9.14	346.02	1833.97	28.87 N	15.84 W	19.92	0.75
1931.00	12.07	349.07	1927.34	45.95 N	19.55 W	26.10	3.14
2026.00	15.20	347.95	2019.65	67.88 N	24.03 W	33.76	3.31
2121.00	15.61	348.27	2111.24	92.58 N	29.23 W	42.54	0.43
2216.00	15.83	347.10	2202.69	117.72 N	34.71 W	51.68	0.41
2310.00	14.91	345.92	2293.32	141.95 N	40.52 W	60.98	1.03
2405.00	16.64	352.73	2384.75	167.30 N	45.21 W	69.36	2.67
2500.00	15.24	352.19	2476.09	193.17 N	48.63 W	76.55	1.49
2595.00	16.36	352.02	2567.51	218.78 N	52.18 W	83.84	1.18
2690.00	15.03	349.19	2658.96	244.13 N	56.35 W	91.69	1.61
2785.00	16.74	350.38	2750.33	269.72 N	60.95 W	100.01	1.83
2880.00	14.99	349.45	2841.71	295.28 N	65.49 W	108.26	1.86
2975.00	16.98	348.89	2933.04	320.97 N	70.41 W	116.92	2.10
3070.00	17.06	347.49	3023.88	348.19 N	76.10 W	126.55	0.44
3165.00	15.93	346.65	3114.97	374.47 N	82.13 W	136.39	1.21
3260.00	15.03	346.68	3206.52	399.14 N	87.98 W	145.81	0.95
3354.00	13.49	347.07	3297.62	421.69 N	93.24 W	154.33	1.65
3449.00	14.19	345.72	3389.86	443.76 N	98.59 W	162.87	0.81
3544.00	12.84	343.65	3482.23	465.17 N	104.43 W	171.81	1.51
3639.00	12.68	349.45	3574.89	485.55 N	109.31 W	179.63	1.36
3734.00	14.36	351.74	3667.26	507.46 N	112.91 W	186.42	1.86
3829.00	15.57	352.49	3759.03	531.76 N	116.27 W	193.32	1.29
3924.00	15.95	352.99	3850.46	557.35 N	119.53 W	200.31	0.42
4019.00	17.55	350.38	3941.43	584.43 N	123.51 W	208.25	1.86
4114.00	16.09	349.14	4032.37	611.47 N	128.38 W	217.05	1.58
4208.00	14.64	349.28	4123.00	635.94 N	133.05 W	225.26	1.54
4303.00	15.56	350.93	4214.72	660.32 N	137.29 W	233.05	1.07
4398.00	13.52	342.89	4306.69	683.52 N	142.57 W	241.69	3.02
4493.00	11.30	343.06	4399.46	703.04 N	148.55 W	250.48	2.34
4587.00	10.89	341.61	4491.70	720.27 N	154.03 W	258.44	0.53
4682.00	8.71	343.68	4585.31	735.70 N	158.88 W	265.51	2.32
4778.00	5.79	340.80	4680.53	747.25 N	162.52 W	270.81	3.07
4873.00	3.64	349.58	4775.21	754.74 N	164.64 W	274.01	2.38
4968.00	1.62	303.04	4870.11	758.44 N	166.31 W	276.21	2.94
5062.00	1.67	305.64	4964.07	759.96 N	168.53 W	278.63	0.10
5157.00	0.46	328.78	5059.06	761.09 N	169.85 W	280.10	1.33
5253.00	0.36	308.88	5155.05	761.61 N	170.28 W	280.61	0.18
5347.00	0.76	334.72	5249.05	762.36 N	170.78 W	281.21	0.49
5443.00	0.43	115.45	5345.05	762.78 N	170.73 W	281.21	1.18
5538.00	1.00	61.13	5440.04	763.02 N	169.67 W	280.21	0.87
5633.00	1.17	82.50	5535.02	763.55 N	167.98 W	278.61	0.46
5728.00	1.05	83.63	5630.00	763.78 N	166.15 W	276.84	0.13
5823.00	1.03	77.16	5724.99	764.06 N	164.46 W	275.20	0.12
5918.00	0.57	105.21	5819.98	764.13 N	163.17 W	273.94	0.63
6012.00	0.14	116.06	5913.98	763.96 N	162.62 W	273.37	0.46
6060.00	4.83	241.60	5961.92	762.97 N	164.34 W	274.93	10.22
6107.00	10.50	244.63	6008.48	760.19 N	169.96 W	280.07	12.10
6155.00	15.03	248.38	6055.29	756.03 N	179.70 W	289.09	9.58
6202.00	19.36	255.19	6100.18	751.79 N	192.90 W	301.53	10.15
6250.00	23.33	253.17	6144.88	747.00 N	209.70 W	317.44	8.42
6297.00	25.80	256.12	6187.62	741.85 N	228.54 W	335.31	5.85

6345.00	26.37	262.16	6230.74	737.89 N	249.24 W	355.21	5.66
6392.00	28.87	264.56	6272.38	735.39 N	270.88 W	376.24	5.83
6440.00	32.04	267.17	6313.76	733.67 N	295.14 W	399.99	7.16
6487.00	36.46	272.37	6352.60	733.63 N	321.57 W	426.12	11.27
6535.00	41.19	275.07	6389.99	735.62 N	351.58 W	456.10	10.46
6582.00	45.71	275.50	6424.10	738.60 N	383.76 W	488.36	9.64
6630.00	49.26	273.77	6456.54	741.44 N	419.01 W	523.65	7.85
6677.00	51.59	271.86	6486.48	743.21 N	455.19 W	559.69	5.87
6725.00	53.50	270.54	6515.67	744.00 N	493.28 W	597.49	4.54
6772.00	55.27	270.57	6543.04	744.37 N	531.49 W	635.33	3.77
6820.00	57.35	269.82	6569.67	744.50 N	571.42 W	674.85	4.52
6867.00	60.93	269.59	6593.77	744.29 N	611.76 W	714.72	7.63
6915.00	65.65	268.94	6615.34	743.74 N	654.62 W	757.03	9.91
6962.00	71.53	268.09	6632.49	742.60 N	698.35 W	800.11	12.62
7010.00	77.58	266.89	6645.27	740.56 N	744.55 W	845.50	12.83
7057.00	83.44	267.11	6653.01	738.14 N	790.82 W	890.91	12.48
7075.00	86.05	267.10	6654.66	737.24 N	808.72 W	908.49	14.50
7248.00	90.40	270.76	6660.02	734.02 N	981.53 W	1078.94	3.29
7343.00	88.74	274.37	6660.74	738.28 N	1076.42 W	1173.42	4.18
7438.00	86.64	273.85	6664.57	745.08 N	1171.09 W	1268.06	2.28
7533.00	87.75	273.35	6669.22	751.04 N	1265.79 W	1362.60	1.28
7628.00	88.21	271.08	6672.57	754.71 N	1360.65 W	1456.97	2.44
7723.00	89.04	269.35	6674.85	755.07 N	1455.62 W	1550.96	2.02
7818.00	90.86	268.90	6674.93	753.62 N	1550.60 W	1644.69	1.97
7913.00	92.40	269.01	6672.22	751.89 N	1645.55 W	1738.34	1.63
8008.00	87.81	268.65	6672.04	749.95 N	1740.50 W	1831.98	4.85
8103.00	88.18	269.02	6675.36	748.02 N	1835.42 W	1925.58	0.56
8198.00	89.17	267.69	6677.55	745.30 N	1930.35 W	2019.08	1.74
8293.00	88.98	267.61	6679.09	741.40 N	2025.26 W	2112.38	0.22
8388.00	89.63	267.20	6680.24	737.11 N	2120.16 W	2205.60	0.81
8483.00	89.01	268.23	6681.37	733.32 N	2215.07 W	2298.93	1.26
8578.00	90.15	268.62	6682.06	730.71 N	2310.03 W	2392.47	1.27
8673.00	91.23	269.82	6680.91	729.42 N	2405.01 W	2486.22	1.70
8768.00	91.51	270.90	6678.64	730.02 N	2499.98 W	2580.24	1.17
8863.00	90.96	267.79	6676.59	728.93 N	2594.94 W	2674.01	3.32
8958.00	89.20	268.48	6676.46	725.84 N	2689.89 W	2767.46	1.99
9053.00	87.78	269.51	6678.96	724.17 N	2784.84 W	2861.13	1.84
9148.00	86.24	268.49	6683.92	722.51 N	2879.69 W	2954.70	1.95
9243.00	87.47	269.18	6689.13	720.58 N	2974.52 W	3048.22	1.49
9338.00	87.47	269.54	6693.32	719.52 N	3069.43 W	3141.93	0.38
9433.00	89.63	270.13	6695.73	719.25 N	3164.39 W	3235.81	2.36
9528.00	87.75	268.38	6697.90	718.01 N	3259.35 W	3329.56	2.70
9623.00	90.95	269.95	6698.98	716.63 N	3354.32 W	3423.28	3.76
9671.00	91.02	269.67	6698.15	716.47 N	3402.31 W	3470.73	0.61
9718.00	92.28	270.53	6696.80	716.55 N	3449.29 W	3517.21	3.26
9766.00	91.97	270.40	6695.02	716.94 N	3497.25 W	3564.71	0.70
9813.00	92.55	271.06	6693.16	717.54 N	3544.21 W	3611.24	1.87
9861.00	92.13	270.32	6691.20	718.12 N	3592.17 W	3658.76	1.78
9908.00	92.04	270.64	6689.49	718.51 N	3639.14 W	3705.27	0.70
10002.00	90.52	268.83	6687.39	718.07 N	3733.10 W	3798.15	2.51
10097.00	89.48	269.25	6687.39	716.48 N	3828.09 W	3891.87	1.19
10192.00	91.42	266.52	6686.65	712.97 N	3923.01 W	3985.23	3.53
10287.00	92.43	268.54	6683.46	708.88 N	4017.86 W	4078.45	2.39
10382.00	92.37	269.82	6679.47	707.52 N	4112.76 W	4172.12	1.35
10477.00	92.56	270.33	6675.38	707.65 N	4207.68 W	4266.01	0.57
10572.00	89.97	270.54	6673.29	708.37 N	4302.64 W	4360.05	2.74
10667.00	89.11	269.37	6674.05	708.29 N	4397.64 W	4454.00	1.53
10762.00	88.98	271.02	6675.64	708.62 N	4492.62 W	4547.99	1.75
10857.00	89.66	272.57	6676.76	711.60 N	4587.56 W	4642.34	1.78
10952.00	90.31	274.13	6676.79	717.16 N	4682.40 W	4736.96	1.77
11059.00	88.49	274.61	6677.91	725.31 N	4789.08 W	4843.67	1.75
11126.00	88.49	274.61	6679.67	730.69 N	4855.84 W	4910.50	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 278.47 DEGREES (GRID)

A TOTAL CORRECTION OF 7.75 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.

