



WELL INFORMATION					
MWD Run Number	100	200	300	400	
Date run completed	07-Dec-12	09-Dec-12	11-Dec-12	15-Dec-12	
Rig Bit Number	2	3	4	5	
Bit Size (in)	8.750	8.750	6.125	6.125	
Tool Nominal OD (in)	6.750	6.750	4.750	4.750	
Log Start Depth (MD, ft)	643.00	5,900.00	7,111.00	10,271.00	
Log End Depth (MD, ft)	5,900.00	7,111.00	10,271.00	16,215.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	06-Dec-12 21:30	08-Dec-12 01:00	10-Dec-12 14:15	11-Dec-12 22:00	
Drill/Wipe End Date and Time	07-Dec-12 17:00	09-Dec-12 03:00	11-Dec-12 10:30	14-Dec-12 20:19	
Min Inc (deg) @ Depth (MD, ft)	0 @ 684.00	3.59 @ 5,980.00	87.38 @ 9,099.00	87.13 @ 10,873.00	
Max Inc (deg) @ Depth (MD, ft)	13.81 @ 2,955.00	86.32 @ 7,051.00	92.81 @ 9,571.00	92.19 @ 16,215.00	
Bit TFA(in2) / Bit Type	.90 / PDC	.98 / PDC	.75 / PDC	.75 / PDC	
Flow Rate (gpm)	523.75	556.40	270.00	270.30	
Max AV (fpm) / CV (fpm) @ MWD	427.2 / NA	395.3 / NA	393.6 / NA	393.0 / 245.0	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	8.75 / 29.00	9.85 / 36.00	8.80 / 29.00	9.05 / 33.00	
Filtrate CL (ppm)	1,800.00	2,000.00	2,000.00	2,400.00	
pH / Fluid Loss (mptm)	9.80 / NA	12.50 / NA	8.20 / NA	8.40 / 7	
PV (cP) / YP (lbf2)	4 / 4.00	12 / 11.00	4 / 4.00	9 / 10.00	
% Solids / % Sand	3.2 / .40	8.9 / .15	2.70 / 0.10	3.70 / 0.20	
% Oil / Oil:Water Ratio	0 / 0:96.5	0 / 0:94.5	2 / 2:93.5	2 / 2:94.5	
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA	NA @ NA	
Max Tool Temp (deg F) @ S	454.00 / PCM	422.00 / PCM	310.11 / PCM	310.00 / PCM	

Max Tool Temp (degF) / Source	154.30 / PCM	162.80 / PCM	218.14 / PCM	242.90 / PCM	
Rm @ Max Tool Temp (degF)	NA @ 154.30	NA @ 162.80	NA @ 218.14	NA @ 242.90	
Lead MWD Engineer	Ryan Brunkhorst	Ryan Brunkhorst	Ryan Brunkhorst	Ryan Brunkhorst	
Customer Representative	Matt Settles	Matt Settles	Matt Settles	Matt Settles	

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	11331929	11331929	11633669	11633669	
Insert Serial Number	11055839	11055839	11400826	11400826	
Date and Time Initialized	01-Dec-12 23:53	01-Dec-12 23:53	09-Dec-12 05:11	09-Dec-12 05:11	
Date and Time Read	09-Dec-12 08:40	09-Dec-12 08:46	11-Dec-12 16:55	15-Dec-12 06:40	
ECMB SW Version	N/A	N/A	N/A	N/A	

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	56.00	57.00	63.00	65.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11331929	11331929	11633669	11633669	
Sonde Serial Number	11638498	11638498	10859920	11638498	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	69.27	195.54	356.21	78.36	

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	48.65	49.69	55.67	58.12	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11331929	11331929	11633669	11633669	
Insert/Sonde Serial Number	11681015	11681015	11579836	11579836	

## 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 7.4.01

WARRANTY

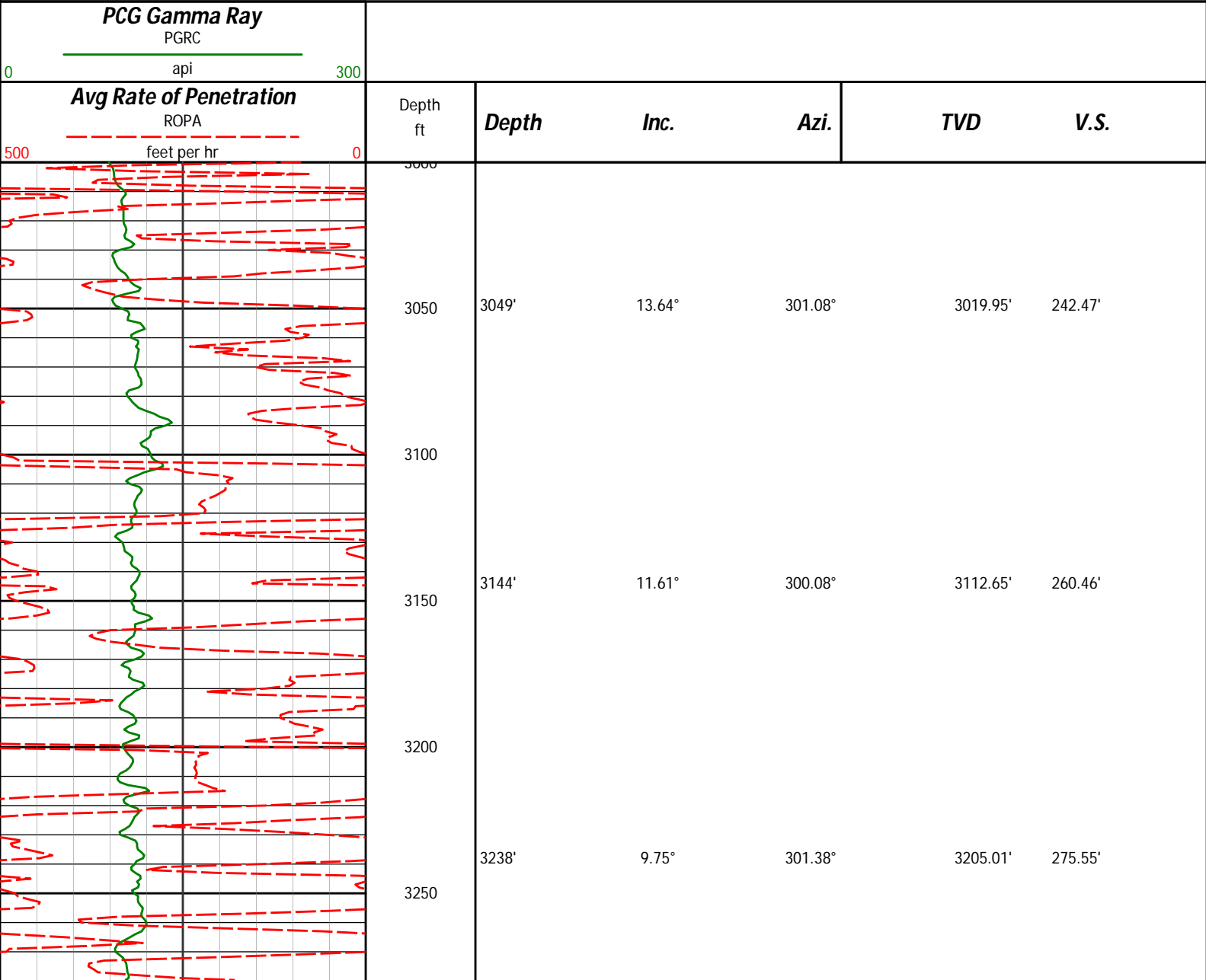
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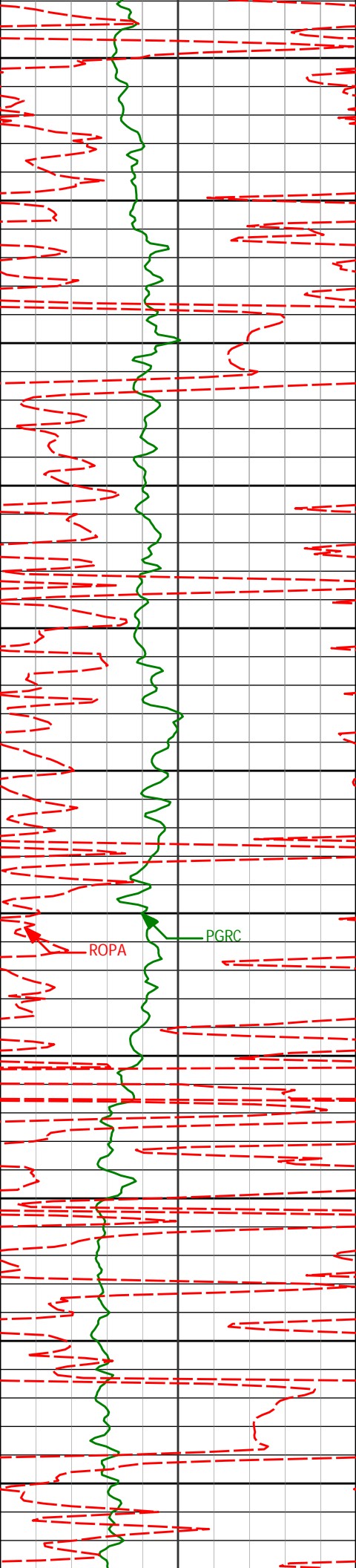
HALLIBURTON

Sperry Drilling Services

MD Main Log 1:600

Noble Energy  
Wells Ranch State USX AA16-67-1HNL  
H&P 343  
T6N-R63W





3300

3333'

8.26°

304.99°

3298.84'

288.11'

3350

3400

3427'

6.39°

299.30°

3392.07'

298.28'

3450

3500

3522'

5.13°

297.15°

3486.59'

306.72'

3550

3600

3616'

4.78°

293.69°

3580.24'

314.10'

3650

3700

3710'

5.09°

293.97°

3673.89'

321.53'

3750

3800

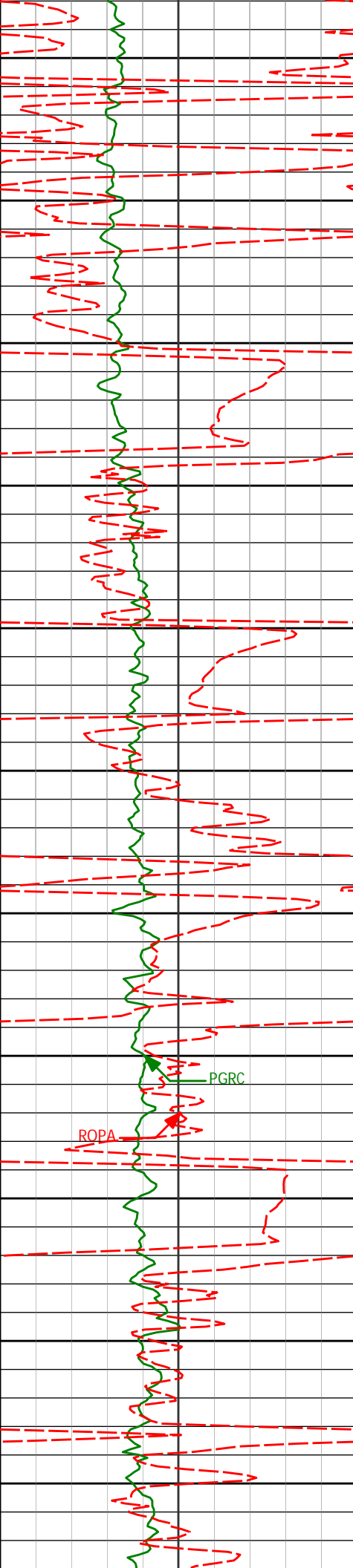
3804'

3.60°

294.57°

3767.61'

328.06'



3850

3900

3950

4000

4050

4100

4150

4200

4250

4300

4350

3899'

3.85°

290.64°

3862.41'

333.78'

3993'

2.46°

264.91°

3956.27'

338.75'

4088'

1.63°

196.60°

4051.22'

341.15'

4182'

1.51°

65.81°

4145.21'

340.39'

4276'

0.46°

123.05°

4239.19'

338.95'

4371'

1.27°

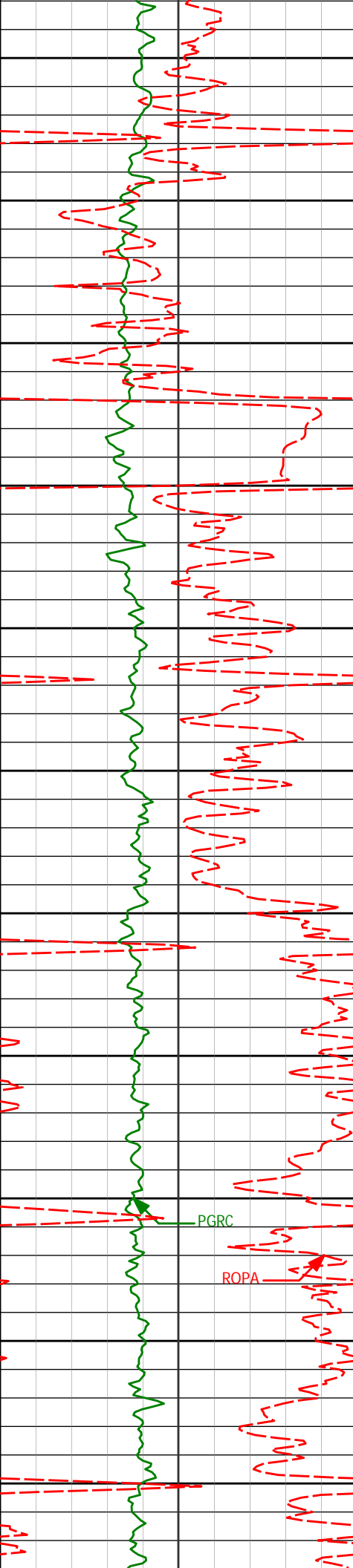
112.71°

4334.18'

337.65'

PGRC

ROPA



4400

4450

4500

4550

4600

4650

4700

4750

4800

4850

4900

4466'

2.14°

113.99°

4429.14'

335.05'

4560'

0.86°

143.23°

4523.11'

333.01'

4655'

1.76°

142.49°

4618.08'

331.67'

4749'

1.64°

116.34°

4712.04'

329.57'

4843'

1.32°

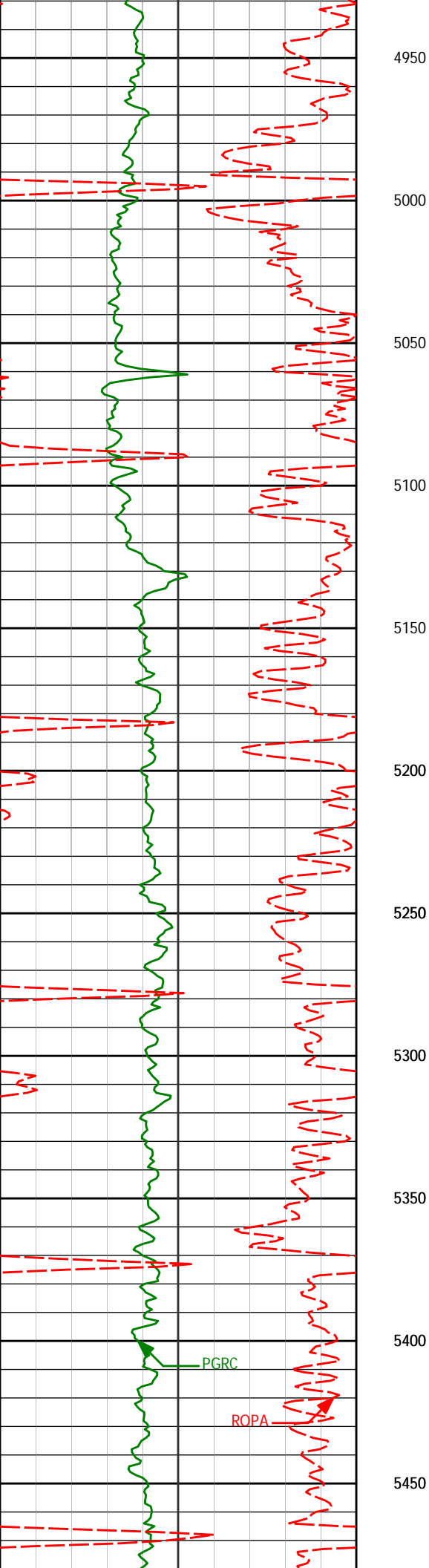
99.18°

4806.01'

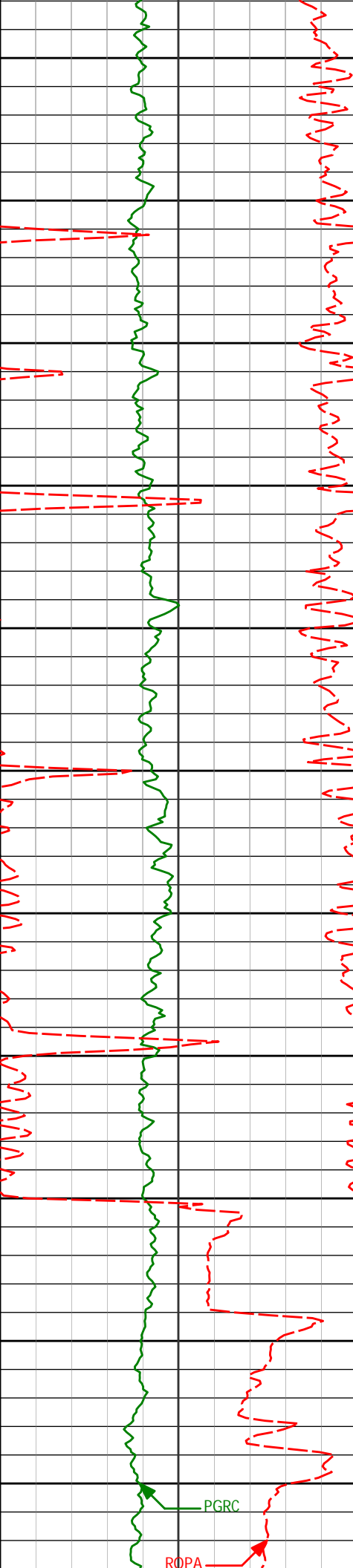
327.29'

PGRC

ROPA

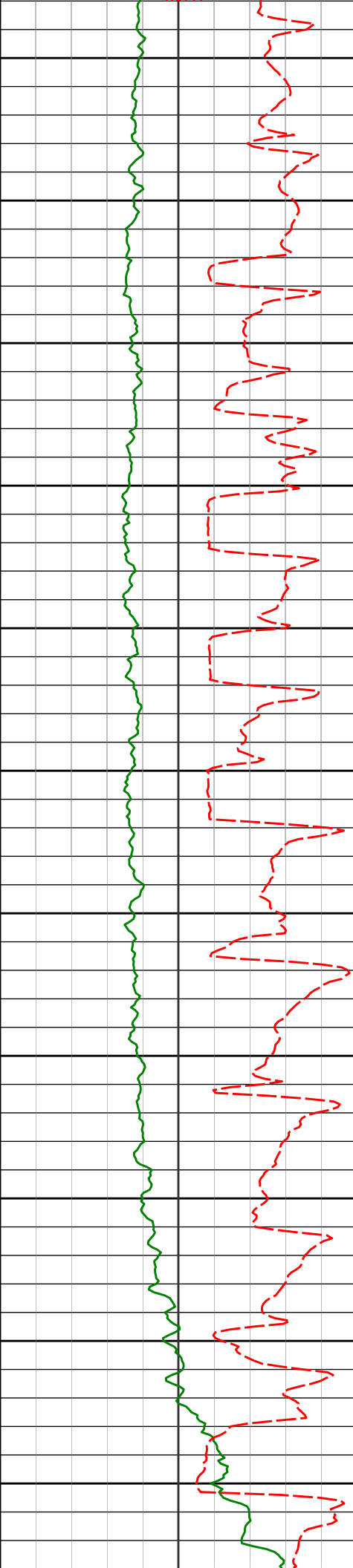


4938'	1.69°	54.82°	4900.98'	325.08'
4950				
5000				
5032'	1.55°	49.04°	4994.94'	323.00'
5050				
5100				
5127'	1.40°	40.93°	5089.91'	321.29'
5150				
5200				
5221'	1.25°	39.83°	5183.89'	319.90'
5250				
5300				
5316'	1.14°	52.12°	5278.87'	318.51'
5350				
5400				
5411'	1.09°	24.40°	5373.85'	317.40'
5450				



5500	5504'	1.32°	31.46°	5466.83'	316.50'
5550					
5600	5599'	1.28°	31.14°	5561.80'	315.40'
5650					
5700	5693'	1.42°	43.19°	5655.78'	314.08'
5750					
5800	5788'	1.46°	47.86°	5750.75'	312.39'
5850	5844'	1.36°	52.62°	5806.73'	311.35'
5900	5886'	1.39°	54.27°	5848.72'	310.55'
<Run 200>					
5950					
5980'	5980'	3.59°	280.73°	5942.66'	312.53'
6000					
6027'	6027'	8.98°	272.38°	5989.37'	317.65'





6050

6074'

14.46°

266.77°

6035.37'

327.18'

6100

6121'

18.13°

262.51°

6080.48'

340.27'

6150

6169'

20.95°

259.93°

6125.71'

356.10'

6200

6216'

22.91°

261.67°

6169.31'

373.39'

6250

6263'

24.97°

261.85°

6212.26'

392.23'

6300

6310'

27.73°

262.04°

6254.37'

412.85'

6350

6358'

30.33°

262.48°

6296.34'

435.89'

6400

6405'

35.80°

261.19°

6335.71'

461.22'

6450

6453'

42.47°

261.44°

6372.92'

491.09'

6500

6500'

46.21°

264.61°

6406.53'

523.64'

6550

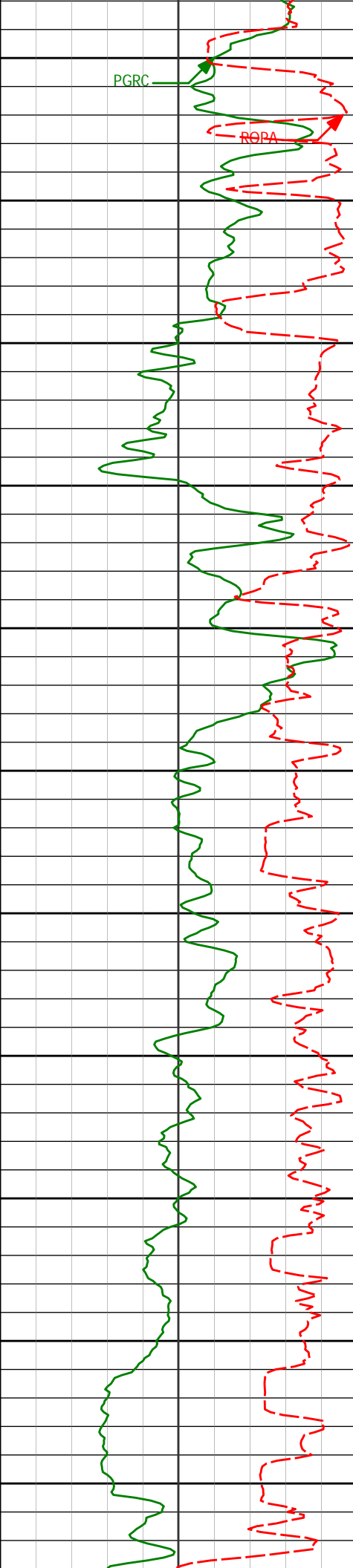
6547'

47.90°

267.17°

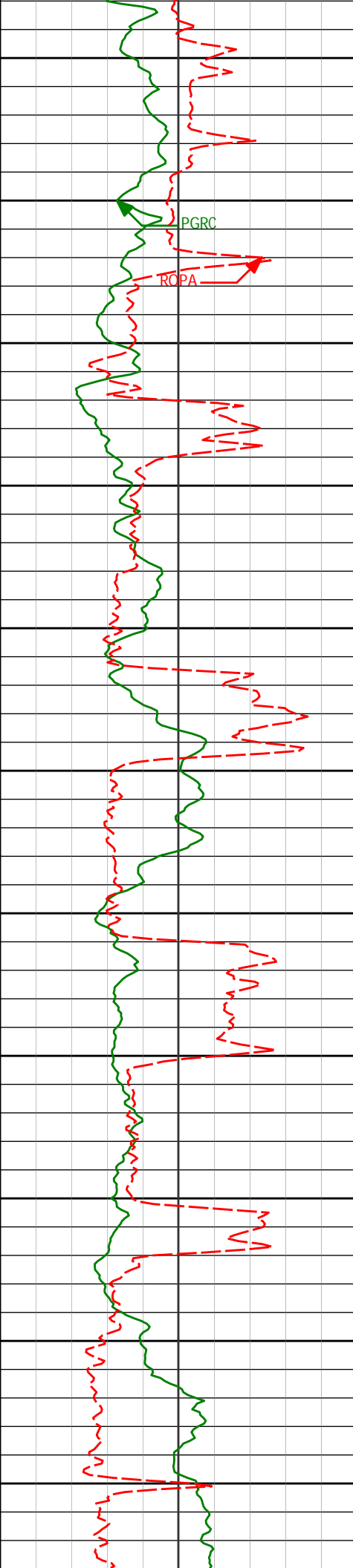
6438.56'

557.92'



6600	6594'	50.79°	269.31°	6469.18'	593.53'
6650	6641'	53.68°	267.90°	6497.96'	630.66'
6700	6688'	57.45°	267.42°	6524.53'	669.36'
6750	6736'	60.94°	267.40°	6549.11'	710.51'
6800	6783'	65.25°	267.55°	6570.37'	752.35'
6850	6830'	68.63°	271.16°	6588.79'	795.57'
6900	6877'	71.25°	273.74°	6604.91'	839.69'
6950	6925'	76.04°	274.16°	6618.42'	885.66'
7000	6972'	80.74°	273.24°	6627.88'	931.62'
7050	7019'	83.82°	270.27°	6634.19'	978.17'
	7051'	86.32°	268.81°	6636.94'	1010.04'

7100  
▲ Casing Set @ 7,101'  
<Run 300>



7150

7157'

90.40°

268.17°

6639.97'

1115.90'

7200

7208'

91.29°

267.57°

6639.22'

1166.83'

7250

7300

7303'

92.47°

268.00°

6636.10'

1261.66'

7350

7400

7397'

92.22°

269.39°

6632.26'

1355.52'

7450

7500

7492'

89.29°

270.75°

6631.01'

1450.50'

7550

7600

7650

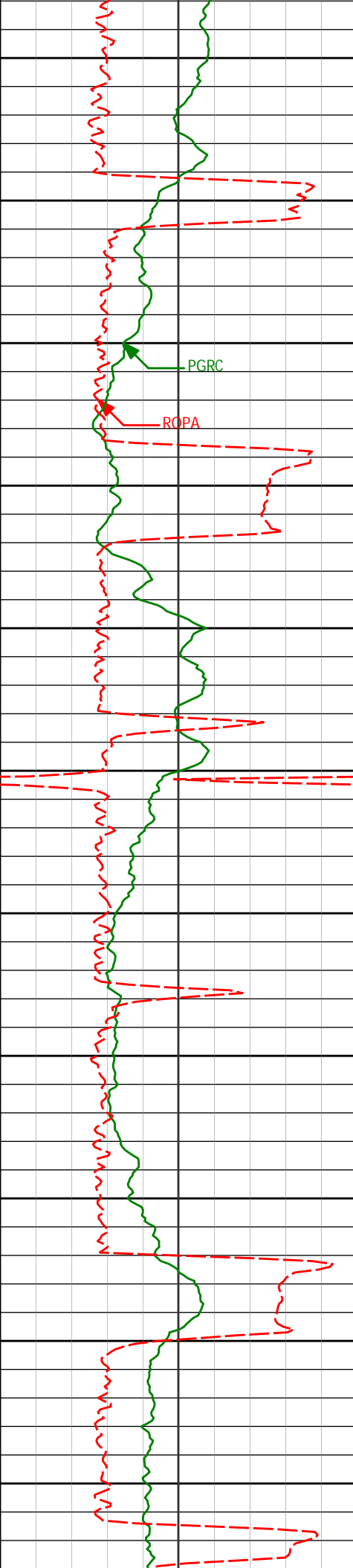
7586'

88.24°

270.40°

6633.03'

1544.47'



7700

7750

7800

7850

7900

7950

8000

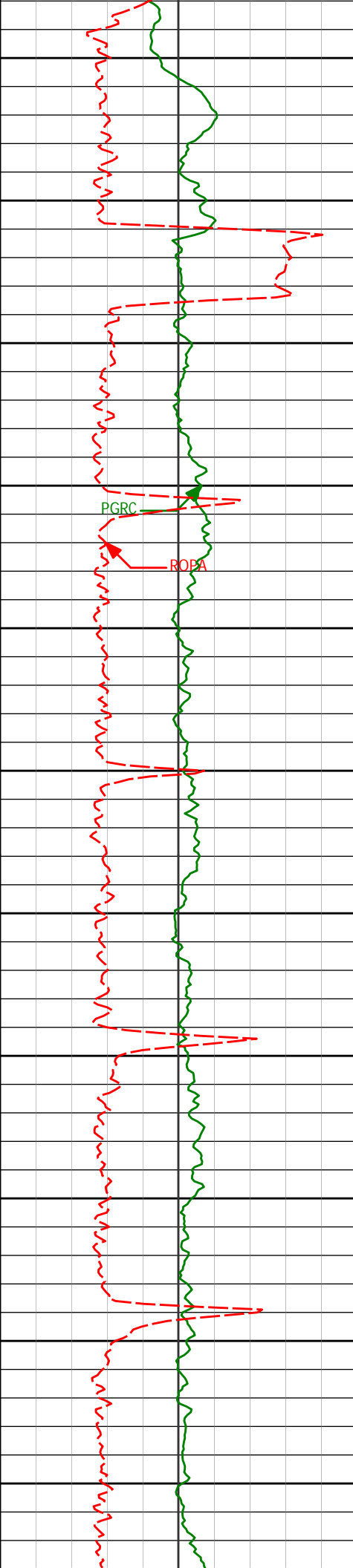
8050

8100

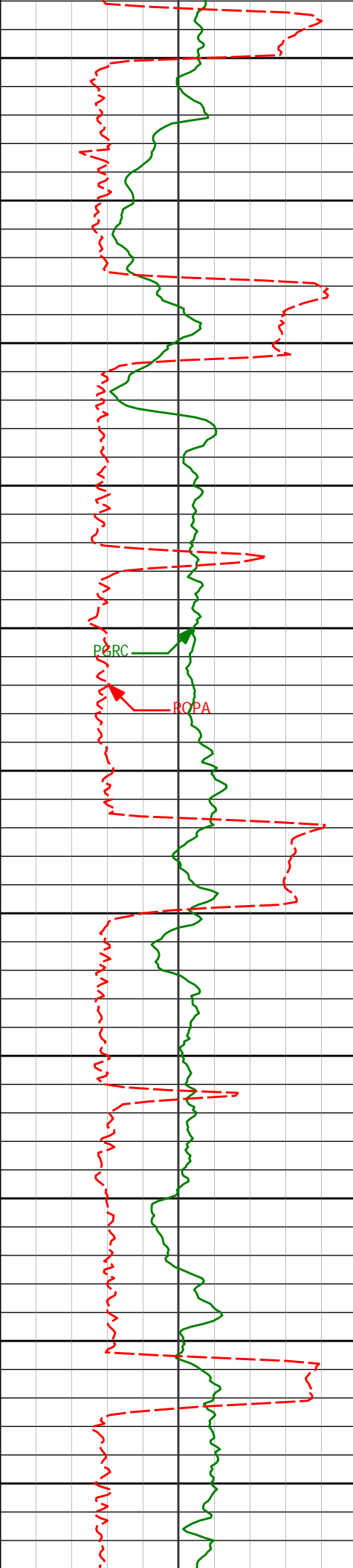
8150

8200

7680'	89.94°	270.89°	6634.32'	1638.40'
7775'	90.34°	269.86°	6634.29'	1733.45'
7869'	87.44°	268.81°	6636.12'	1827.40'
7964'	88.49°	268.74°	6639.49'	1922.29'
8058'	90.25°	268.77°	6640.52'	2016.22'
8153'	88.43°	269.95°	6641.62'	2111.19'



8250	8247'	90.52°	271.87°	6642.48'	2205.17'
8300					
8350	8342'	89.48°	271.11°	6642.48'	2300.16'
8400					
8450	8436'	88.83°	270.08°	6643.87'	2394.15'
8500					
8550	8532'	89.01°	268.36°	6645.68'	2490.10'
8600					
8650	8626'	89.32°	267.48°	6647.05'	2583.98'
8700					
8750	8721'	90.40°	268.41°	6647.28'	2678.86'



8800

8816'

90.74°

268.77°

6646.33'

2773.80'

8850

8900

8911'

88.80°

269.05°

6646.71'

2868.75'

8950

9000

9005'

90.06°

268.64°

6647.65'

2962.69'

9050

9100

9099'

87.38°

269.75°

6649.75'

3056.63'

9150

9200

9193'

88.24°

269.16°

6653.34'

3150.53'

9250

9300

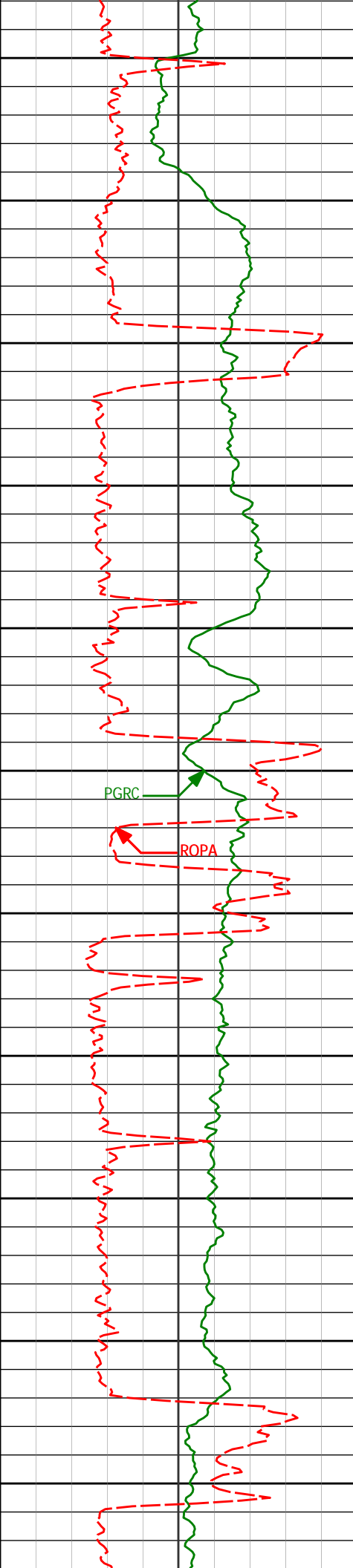
9288'

89.14°

270.13°

6655.51'

3245.49'



9350

9382'

90.99°

270.06°

6655.41'

3339.48'

9400

9450

9476'

90.86°

271.05°

6653.89'

3433.47'

9500

9550

9571'

92.81°

270.78°

6650.85'

3528.42'

9600

PGRC

ROPA

9650

9665'

88.67°

270.36°

6649.64'

3622.39'

9700

9750

9759'

90.31°

269.72°

6650.47'

3716.37'

9800

9850

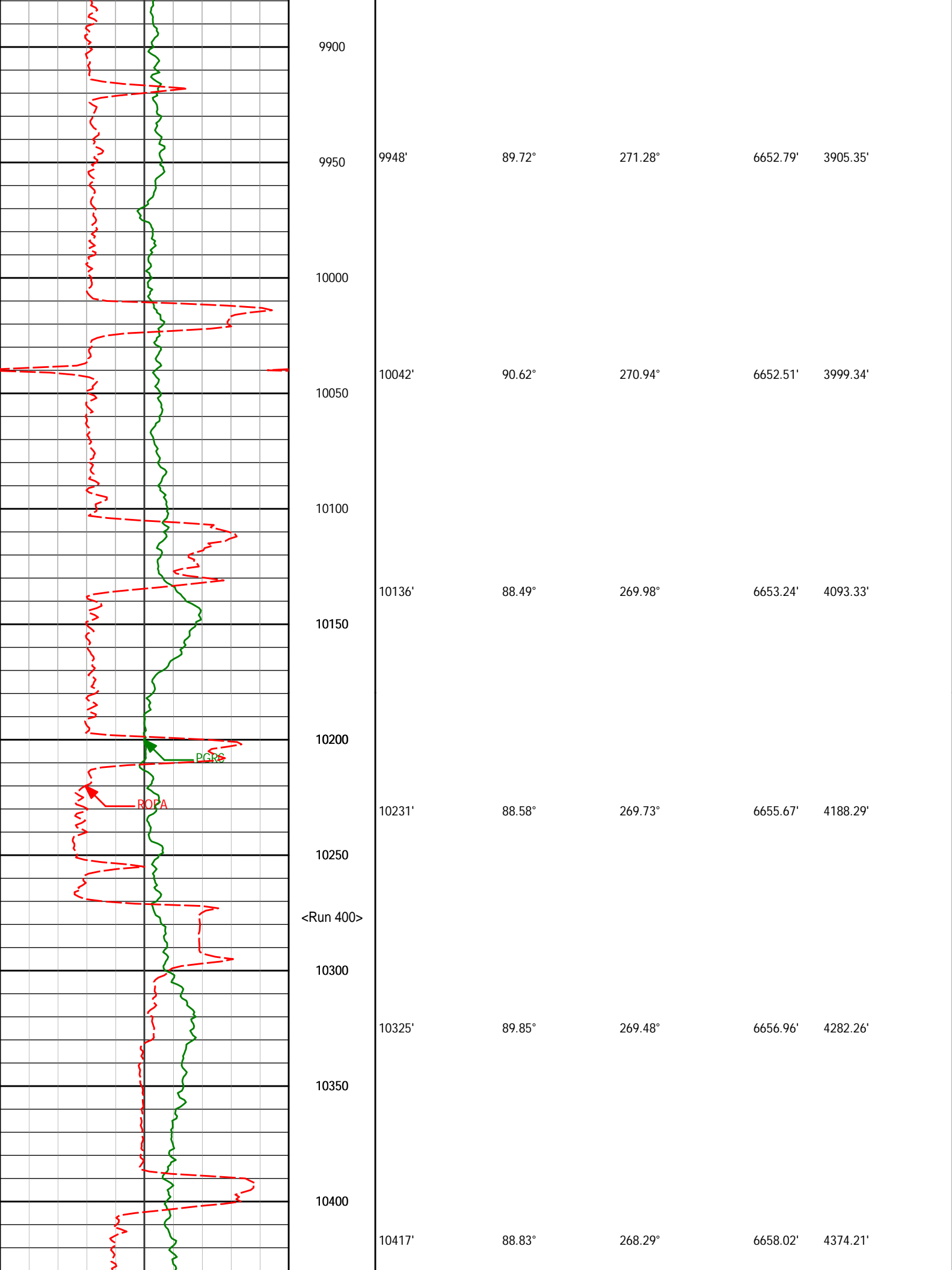
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88.58°

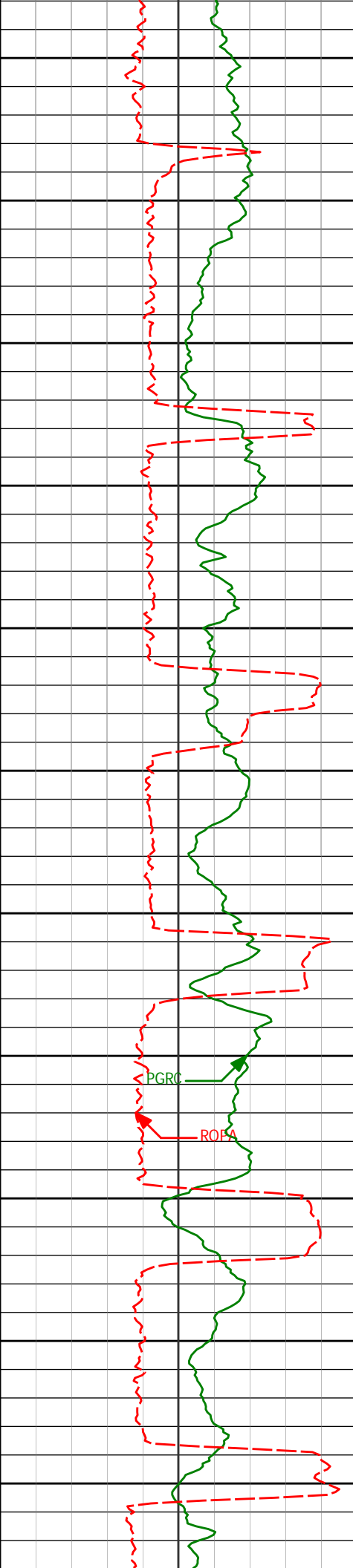
271.15°

6651.39'

3811.36'







10450

10500

10550

10600

10650

10700

10750

10800

10850

10900

10950

10508'

88.80°

267.40°

6659.90'

4465.08'

10600'

89.17°

267.22°

6661.53'

4556.90'

10690'

88.02°

266.88°

6663.74'

4646.69'

10782'

87.35°

268.21°

6667.45'

4738.48'

10873'

87.13°

270.19°

6671.83'

4829.34'

10965'

88.49°

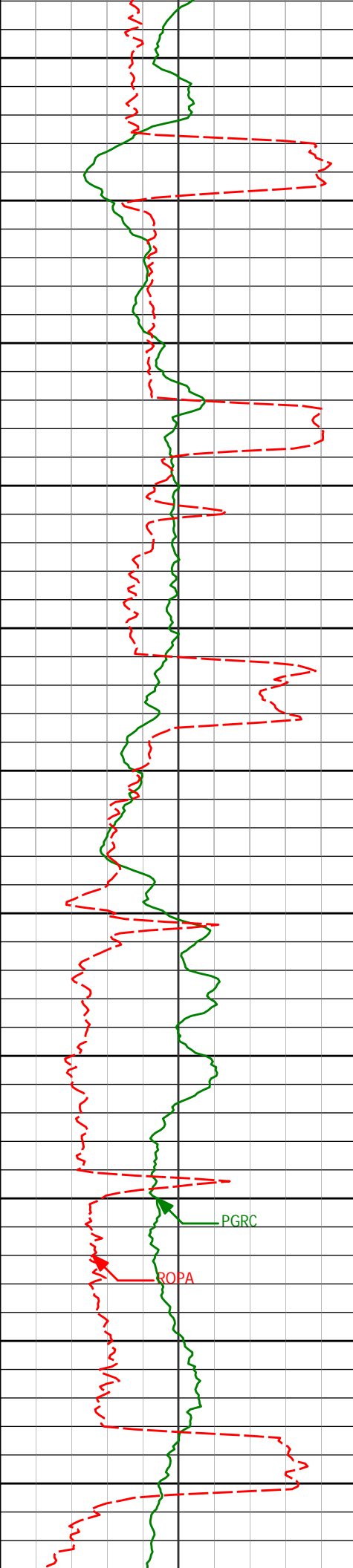
271.00°

6675.35'

4921.27'

PGRC

ROFA



11000

11050

11100

11150

11200

11250

11300

11350

11400

11450

11500

11056'

89.51°

270.58°

6676.94'

5012.25'

11147'

91.30°

270.29°

6676.30'

5103.25'

11237'

88.74°

268.58°

6676.27'

5193.21'

11327'

89.17°

268.50°

6677.92'

5283.14'

11418'

90.49°

268.00°

6678.19'

5374.05'

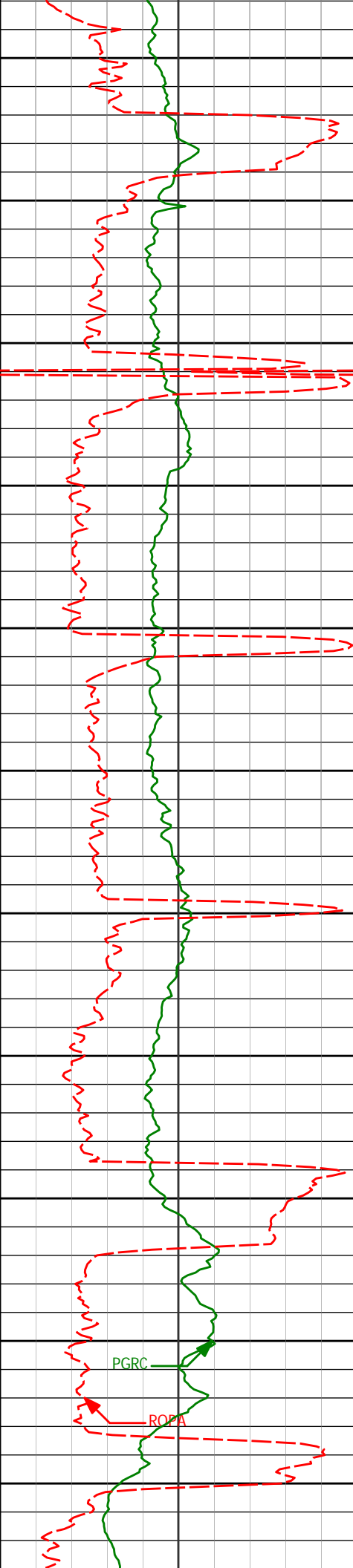
11510'

89.63°

269.12°

6678.09'

5465.99'



11550

11600

11650

11700

11750

11800

11850

11900

11950

12000

12050

11601'

11693'

11785'

11877'

11971'

12065'

88.89°

89.01°

89.75°

89.35°

90.93°

90.68°

269.95°

269.14°

269.63°

268.59°

270.63°

271.76°

6679.27'

6680.95'

6681.94'

6682.66'

6682.43'

6681.11'

5556.96'

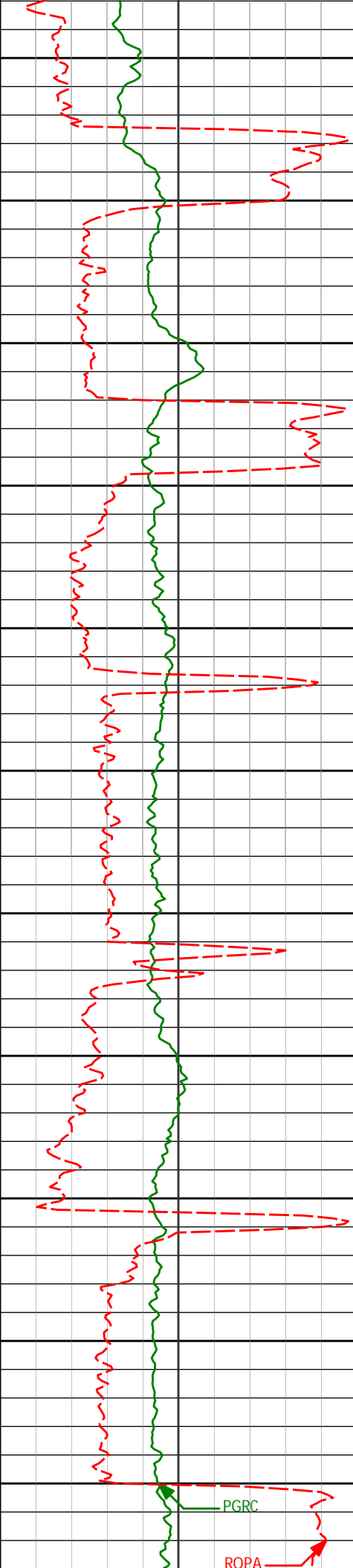
5648.93'

5740.90'

5832.86'

5926.83'

6020.82'



12100

12150

12200

12250

12300

12350

12400

12450

12500

12550

12600

12160'

90.03°

272.09°

6680.53'

6115.79'

12254'

89.05°

269.81°

6681.28'

6209.78'

12348'

89.66°

269.56°

6682.34'

6303.76'

12443'

89.08°

267.51°

6683.39'

6398.68'

12537'

89.29°

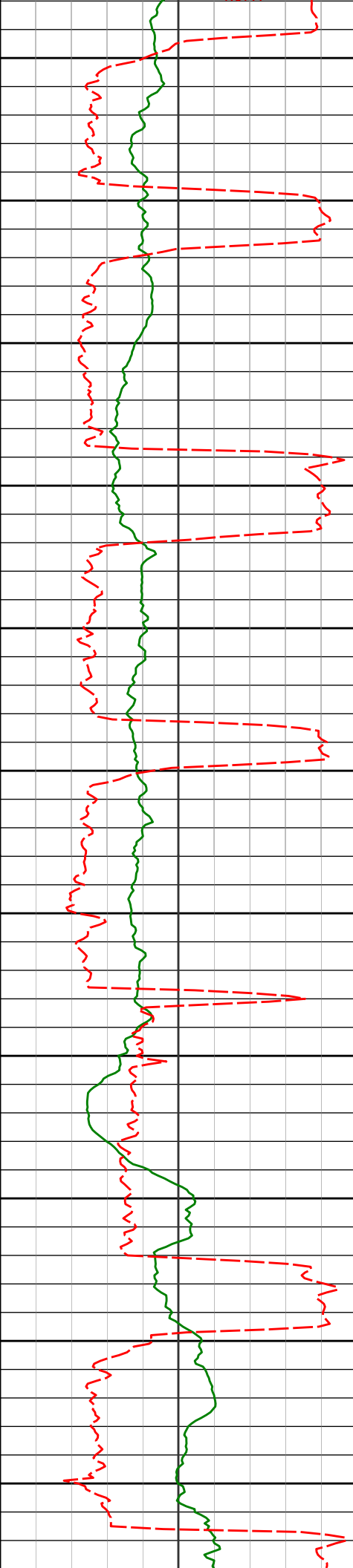
266.72°

6684.73'

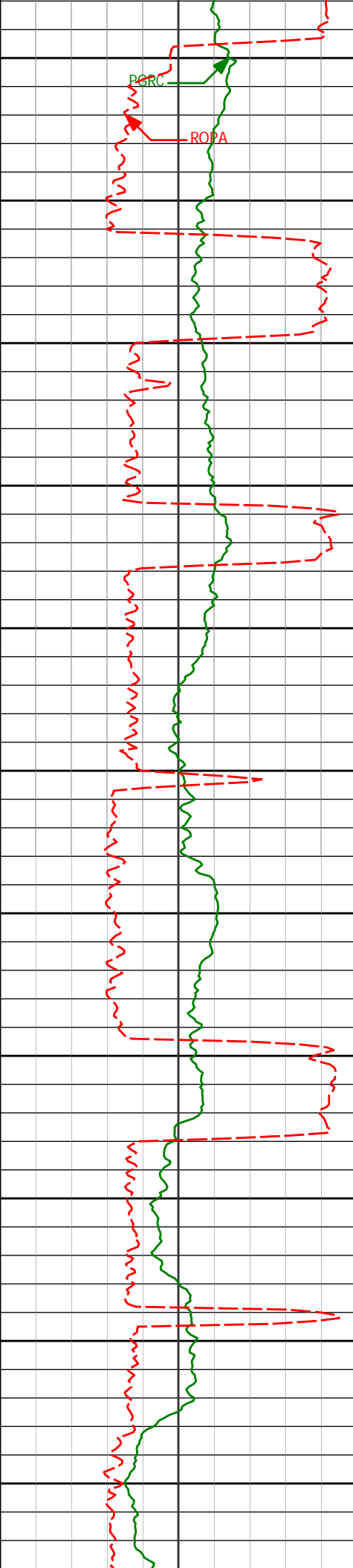
6492.49'

PGRC

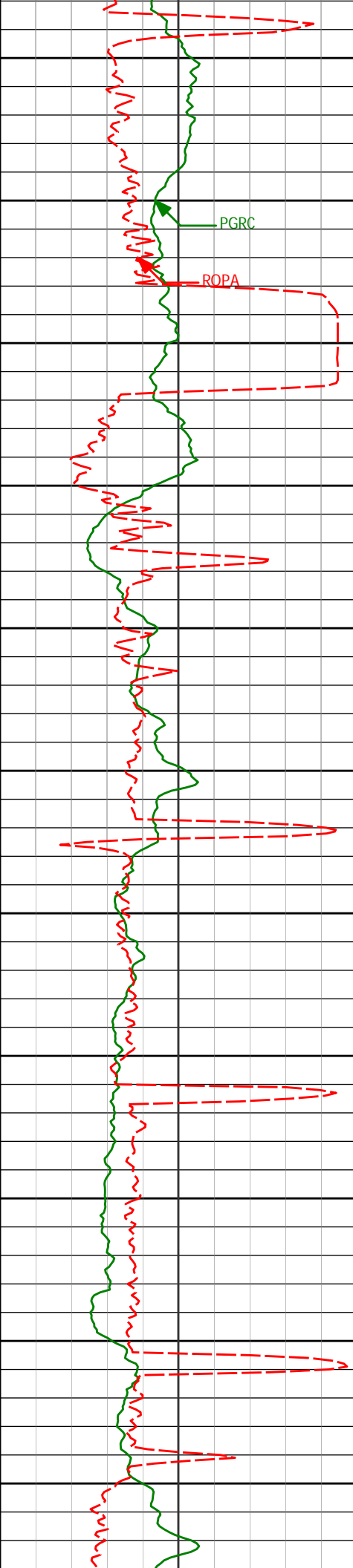
ROPA



12631'	90.31°	269.96°	6685.06'	6586.40'
12650				
12700				
12725'	90.03°	268.61°	6684.78'	6680.37'
12750				
12800				
12820'	88.71°	269.68°	6685.83'	6775.32'
12850				
12900				
12914'	89.88°	270.00°	6686.99'	6869.30'
12950				
13000				
13009'	91.29°	269.24°	6686.02'	6964.28'
13050				
13100				
13103'	91.45°	269.85°	6683.77'	7058.23'
13150				



13200	13198'	90.46°	269.36°	6682.18'	7153.20'
13250					
13300	13293'	88.71°	269.16°	6682.87'	7248.17'
13350					
13400	13387'	88.24°	269.02°	6685.38'	7342.10'
13450					
13500	13482'	88.55°	268.44°	6688.04'	7437.01'
13550					
13600	13577'	88.28°	270.94°	6690.67'	7531.95'
13650					
13700	13671'	88.61°	270.18°	6693.22'	7625.91'



13750

13766'

90.46°

270.00°

6693.98'

7720.90'

13800

PGRC

ROPA

13850

13861'

87.71°

271.00°

6695.49'

7815.88'

13900

13950

13954'

87.62°

270.47°

6699.28'

7908.80'

14000

14050

14048'

88.43°

269.95°

6702.51'

8002.74'

14100

14150

14143'

89.63°

269.15°

6704.12'

8097.70'

14200

14250

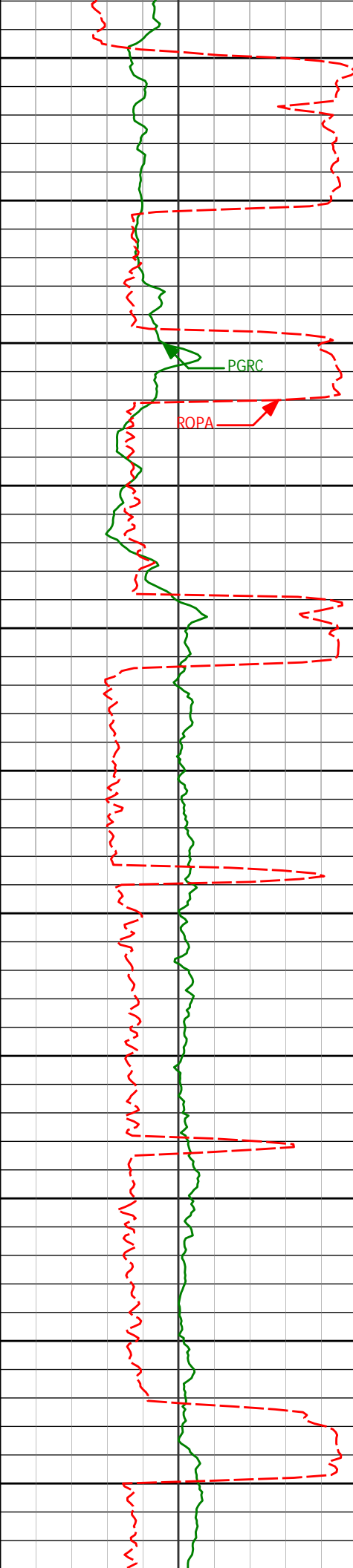
14237'

90.77°

269.07°

6703.79'

8191.67'



14300

14332'

89.17°

269.20°

6703.85'

8286.63'

14350

14400

PGRC

14427'

87.19°

269.69°

6706.87'

8381.55'

14450

14500

14521'

89.35°

270.15°

6709.70'

8475.50'

14550

14600

14615'

89.57°

269.27°

6710.59'

8569.48'

14650

14700

14710'

89.63°

268.36°

6711.25'

8664.42'

14750

14800

14804'

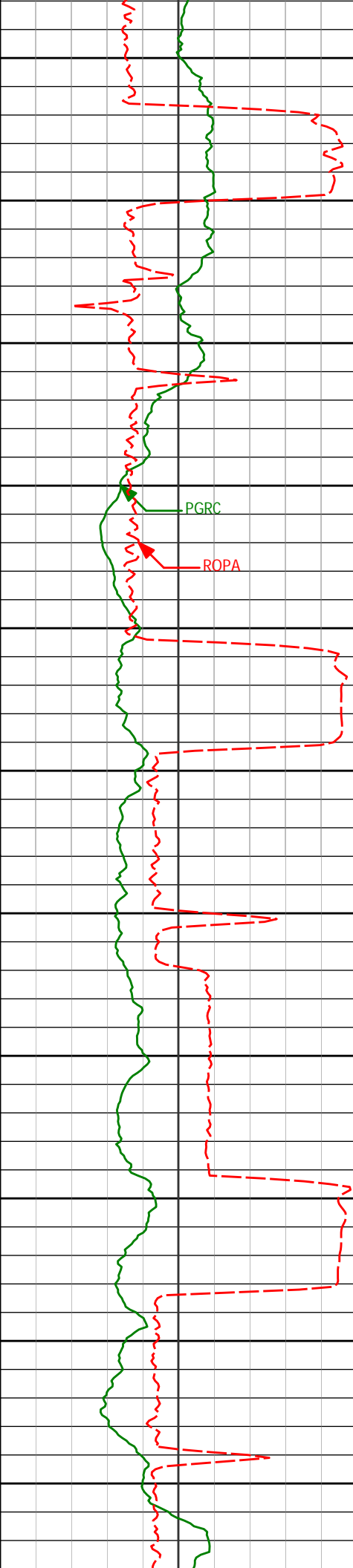
89.48°

269.49°

6711.99'

8758.38'





14850

14900

14950

15000

15050

15100

15150

15200

15250

15300

15350

14898'

90.37°

271.30°

6712.11'

8852.37'

14992'

91.30°

270.91°

6710.74'

8946.36'

15086'

89.38°

271.43°

6710.19'

9040.35'

15181'

90.46°

271.35°

6710.31'

9135.34'

15275'

87.96°

272.50°

6711.60'

9229.30'

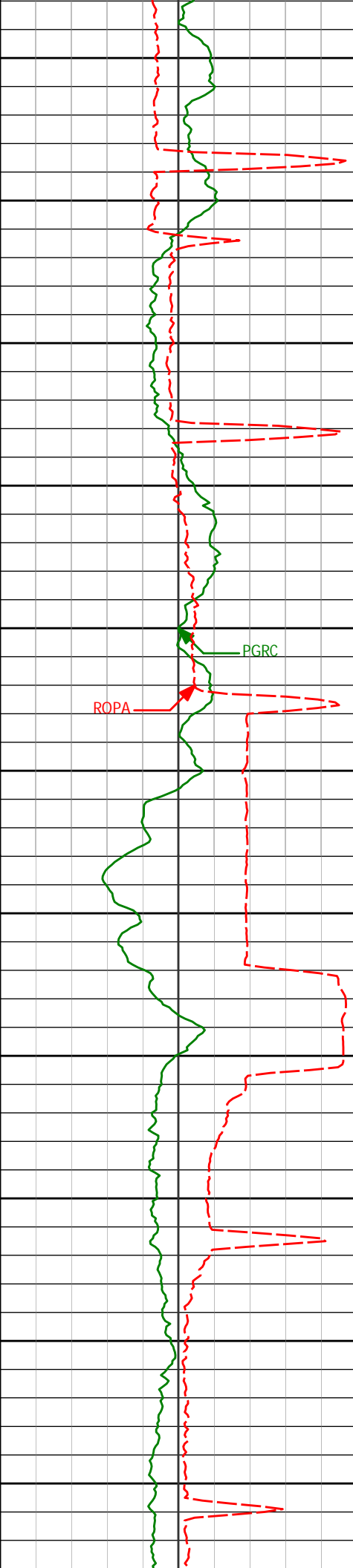
15370'

88.21°

271.93°

6714.77'

9324.21'



15400

15450

15500

15550

15600

15650

15700

15750

15800

15850

15900

15465'

88.80°

271.20°

6717.25'

9419.17'

15560'

89.78°

270.80°

6718.42'

9514.16'

15654'

91.05°

270.06°

6717.74'

9608.15'

15749'

88.74°

269.23°

6717.92'

9703.13'

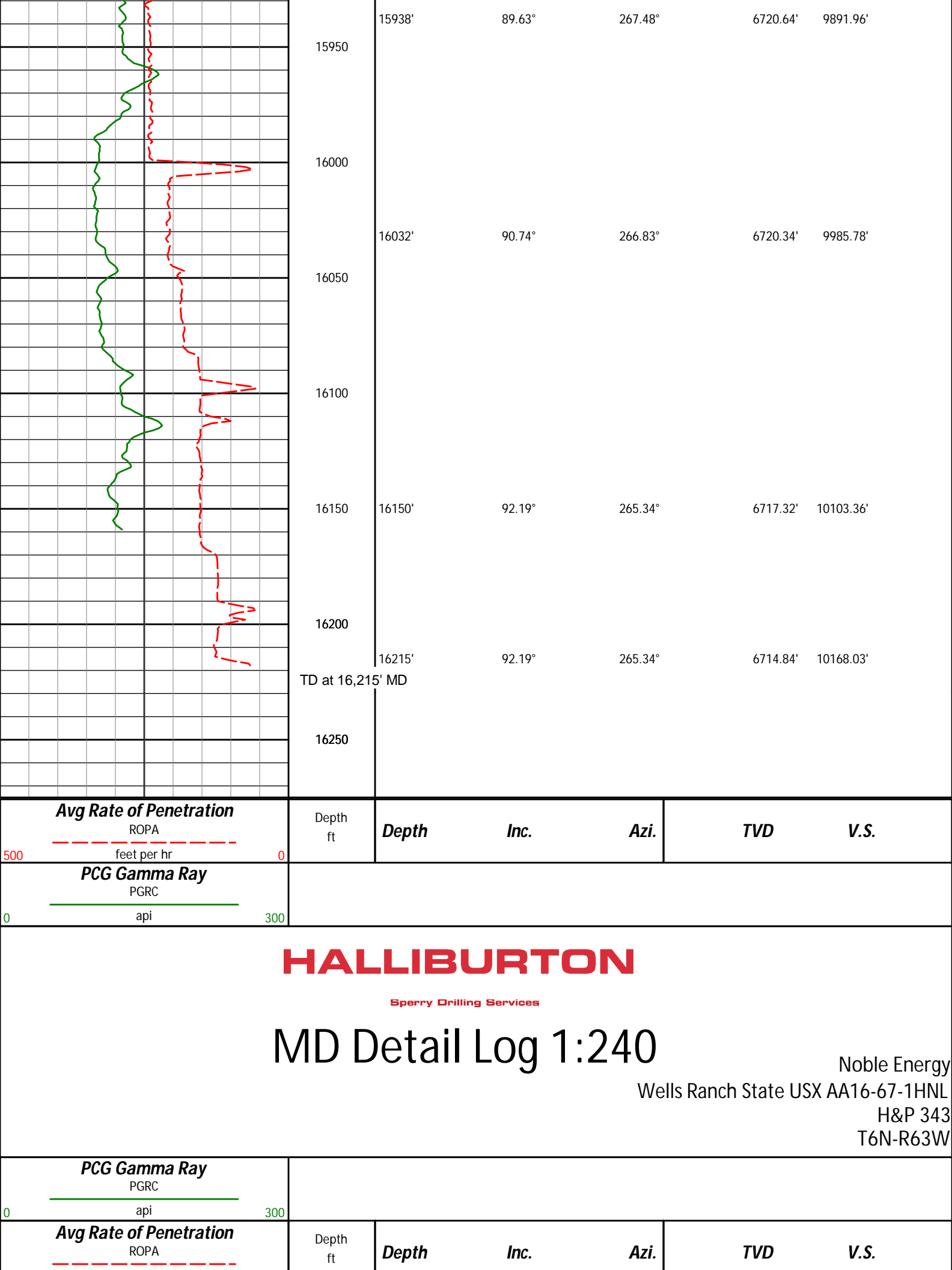
15843'

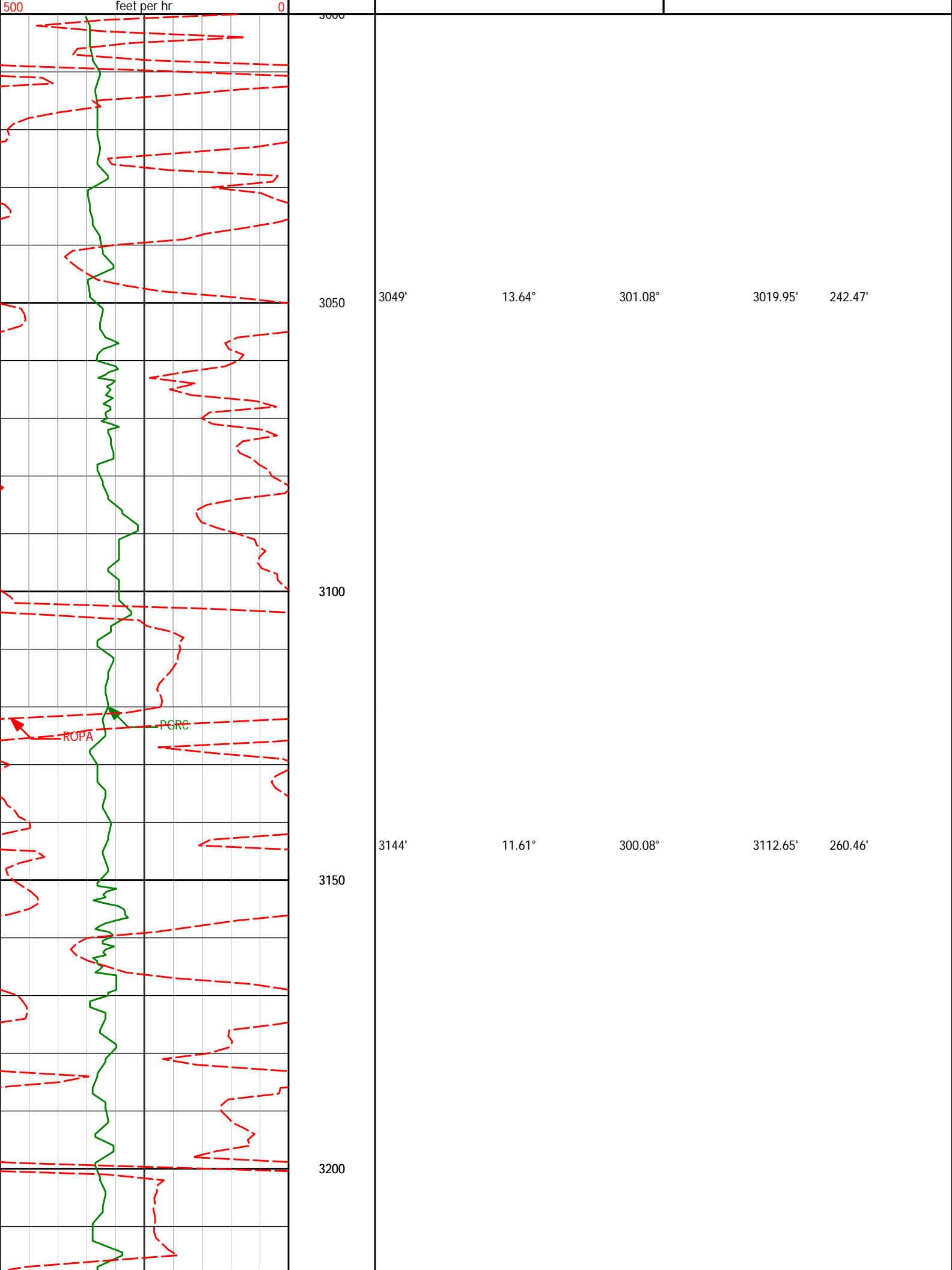
89.17°

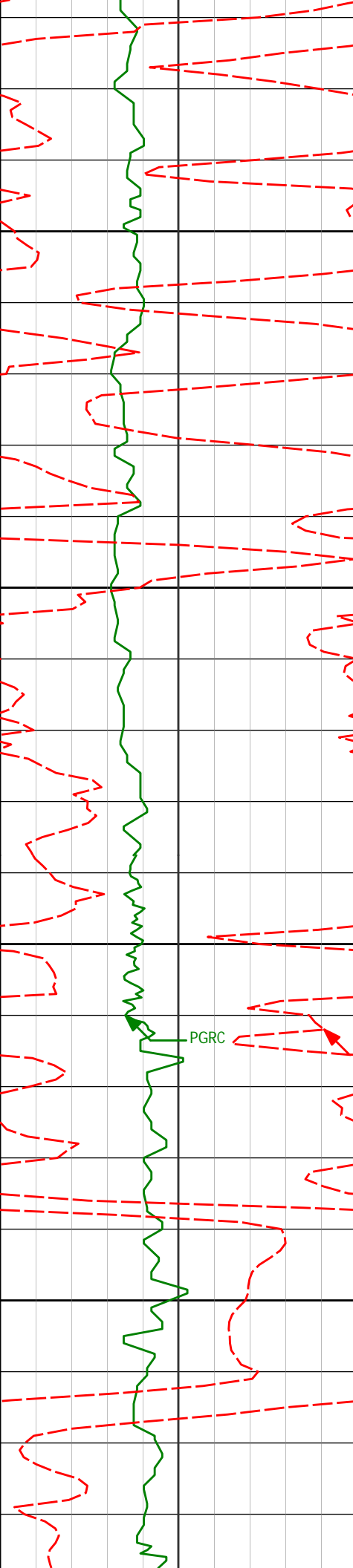
268.70°

6719.64'

9797.07'







3238'	9.75°	301.38°	3205.01'	275.55'
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3250

3300

3333'	8.26°	304.99°	3298.84'	288.11'
-------	-------	---------	----------	---------

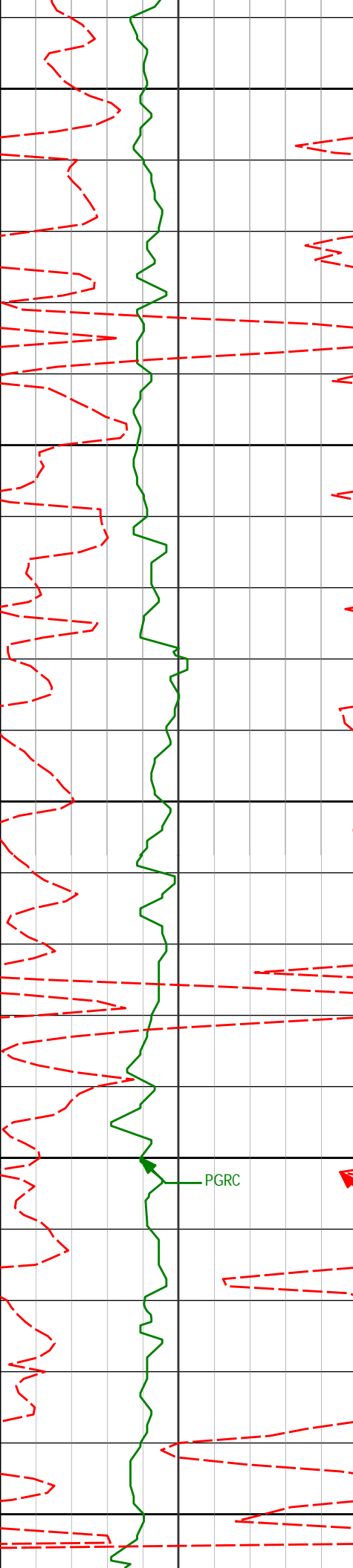
3350

PGRC

ROPA

3400

3427'	6.39°	299.30°	3392.07'	298.28'
-------	-------	---------	----------	---------



3450

3500

3550

3600

3650

3522'

5.13°

297.15°

3486.59'

306.72'

PGRC

ROPA

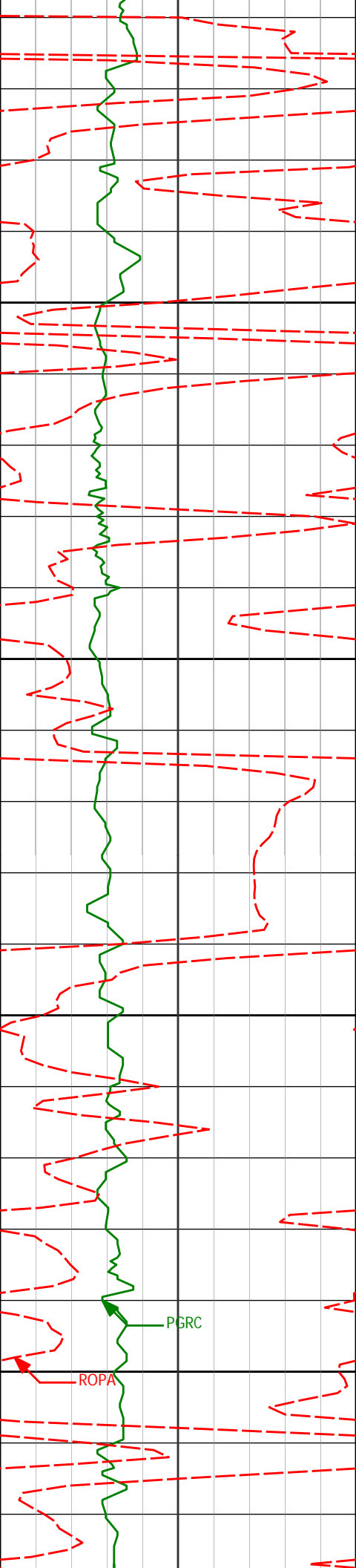
3616'

4.78°

293.69°

3580.24'

314.10'



3700

3710'

5.09°

293.97°

3673.89'

321.53'

3750

3800

3804'

3.60°

294.57°

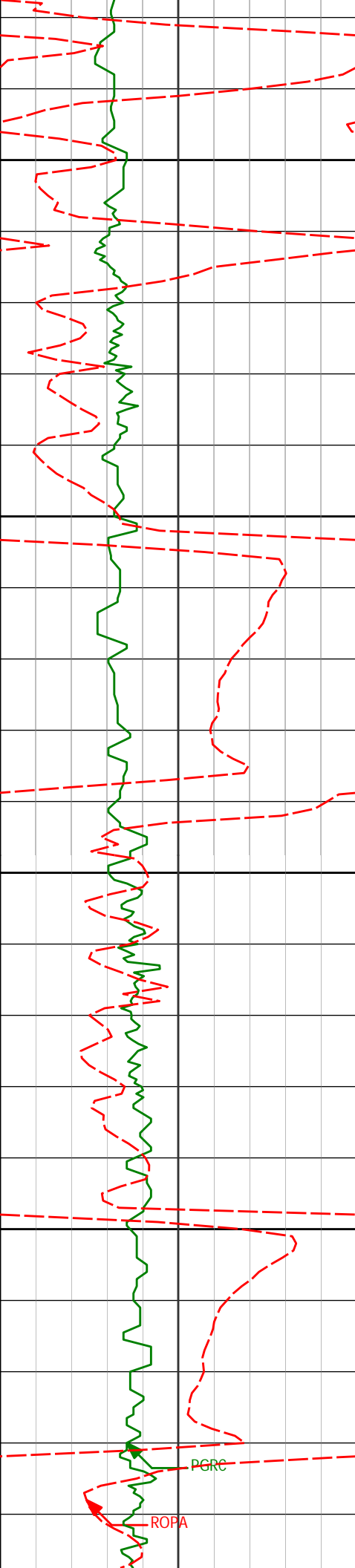
3767.61'

328.06'

3850

PGRC

ROPA



3900

3950

4000

4050

3899'

3993'

4088'

3.85°

2.46°

1.63°

290.64°

264.91°

196.60°

3862.41'

3956.27'

4051.22'

333.78'

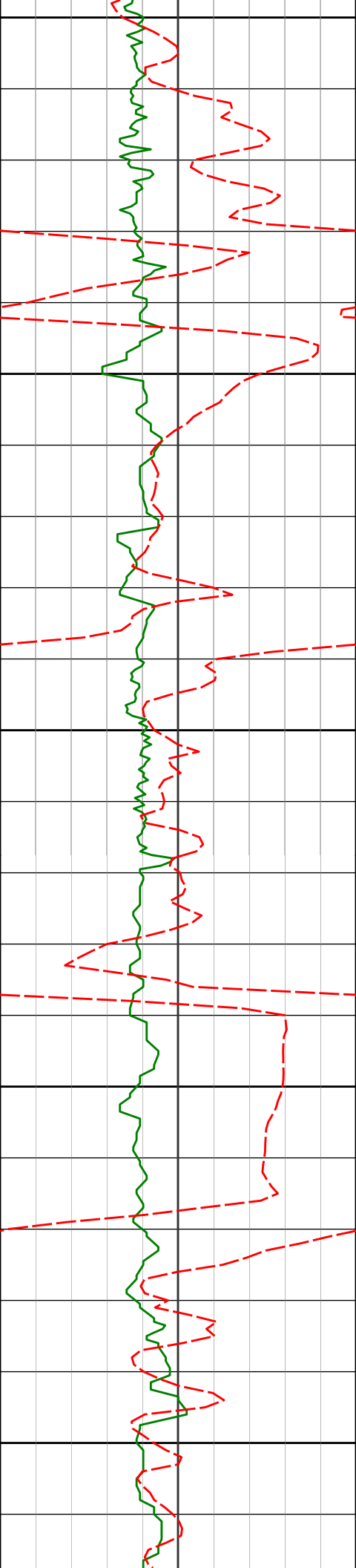
338.75'

341.15'

PGRC

ROPA





4100

4150

4200

4250

4300

4182'

1.51°

65.81°

4145.21'

340.39'

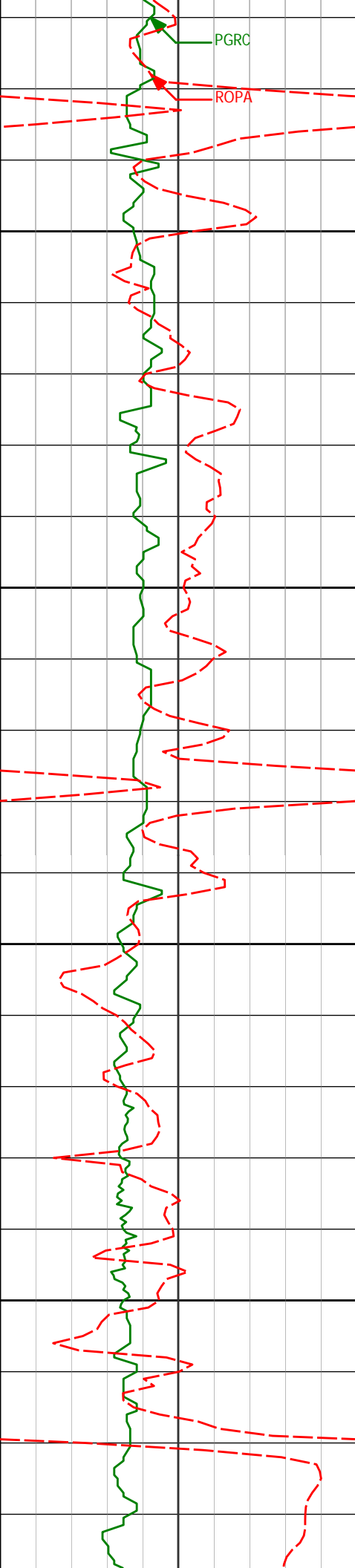
4276'

0.46°

123.05°

4239.19'

338.95'



PGRC

ROPA

4350

4371'

1.27°

112.71°

4334.18'

337.65'

4400

4450

4466'

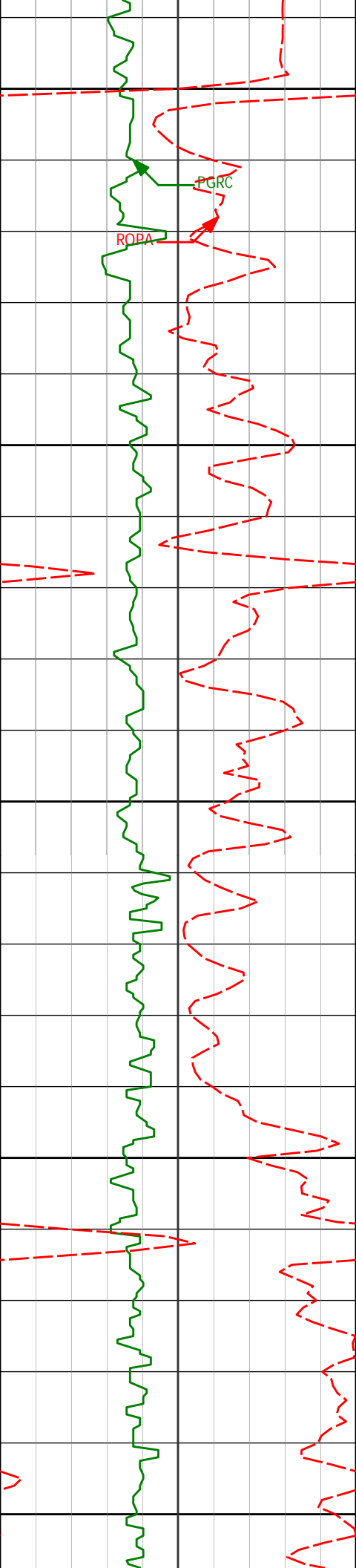
2.14°

113.99°

4429.14'

335.05'

4500



4550

4560'

0.86°

143.23°

4523.11'

333.01'

4600

4650

4655'

1.76°

142.49°

4618.08'

331.67'

4700

4750

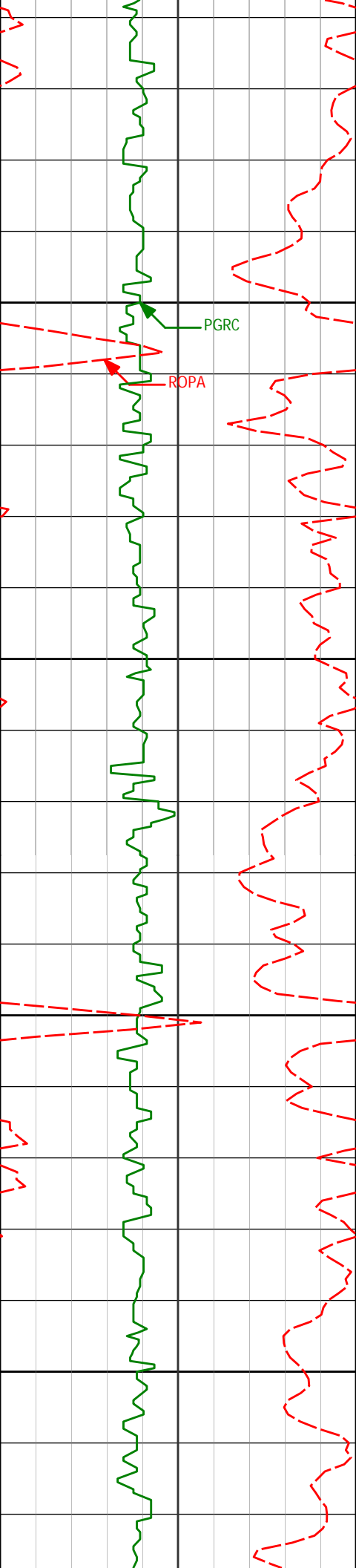
4749'

1.64°

116.34°

4712.04'

329.57'



4800

PGRC

ROPA

4850

4900

4950

4843'

1.32°

99.18°

4806.01'

327.29'

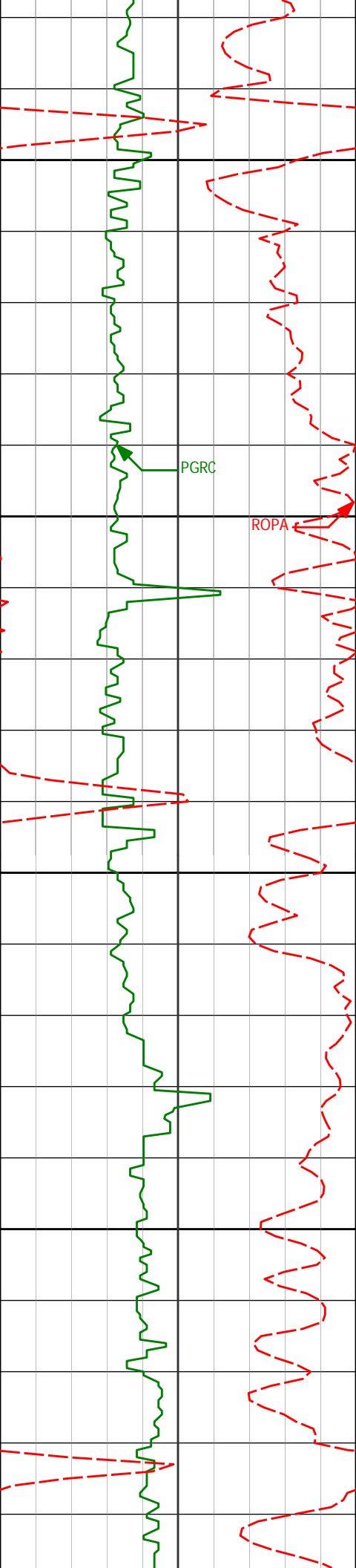
4938'

1.69°

54.82°

4900.98'

325.08'



5000

5032'

1.55°

49.04°

4994.94'

323.00'

5050

ROPA

5100

5127'

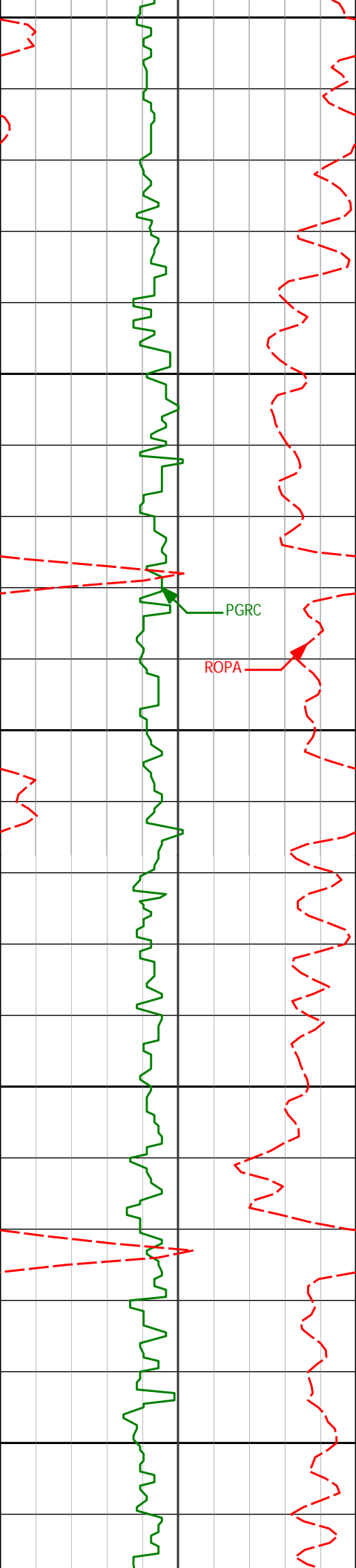
1.40°

40.93°

5089.91'

321.29'

5150



5200

5221'

1.25°

39.83°

5183.89'

319.90'

5250

PGRC

ROPA

5300

5316'

1.14°

52.12°

5278.87'

318.51'

5350

5400

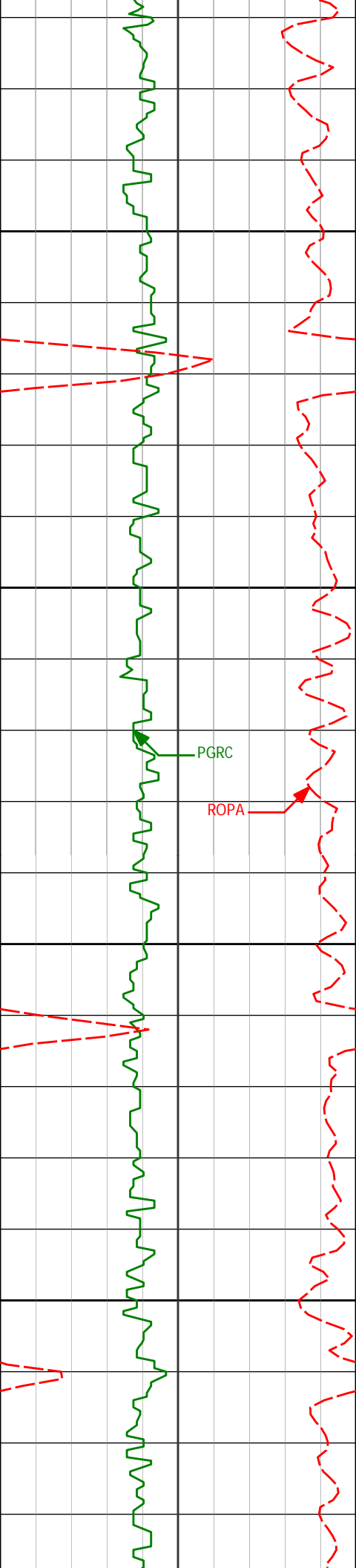
5411'

1.09°

24.40°

5373.85'

317.40'



5450

5500

5550

5600

5504'

1.32°

31.46°

5466.83'

316.50'

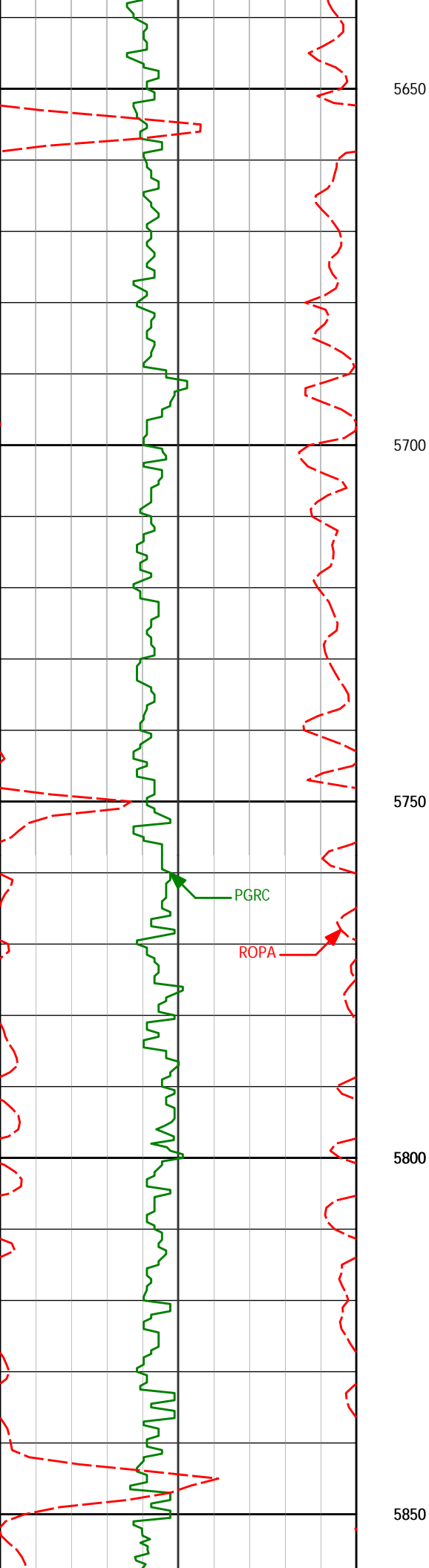
5599'

1.28°

31.14°

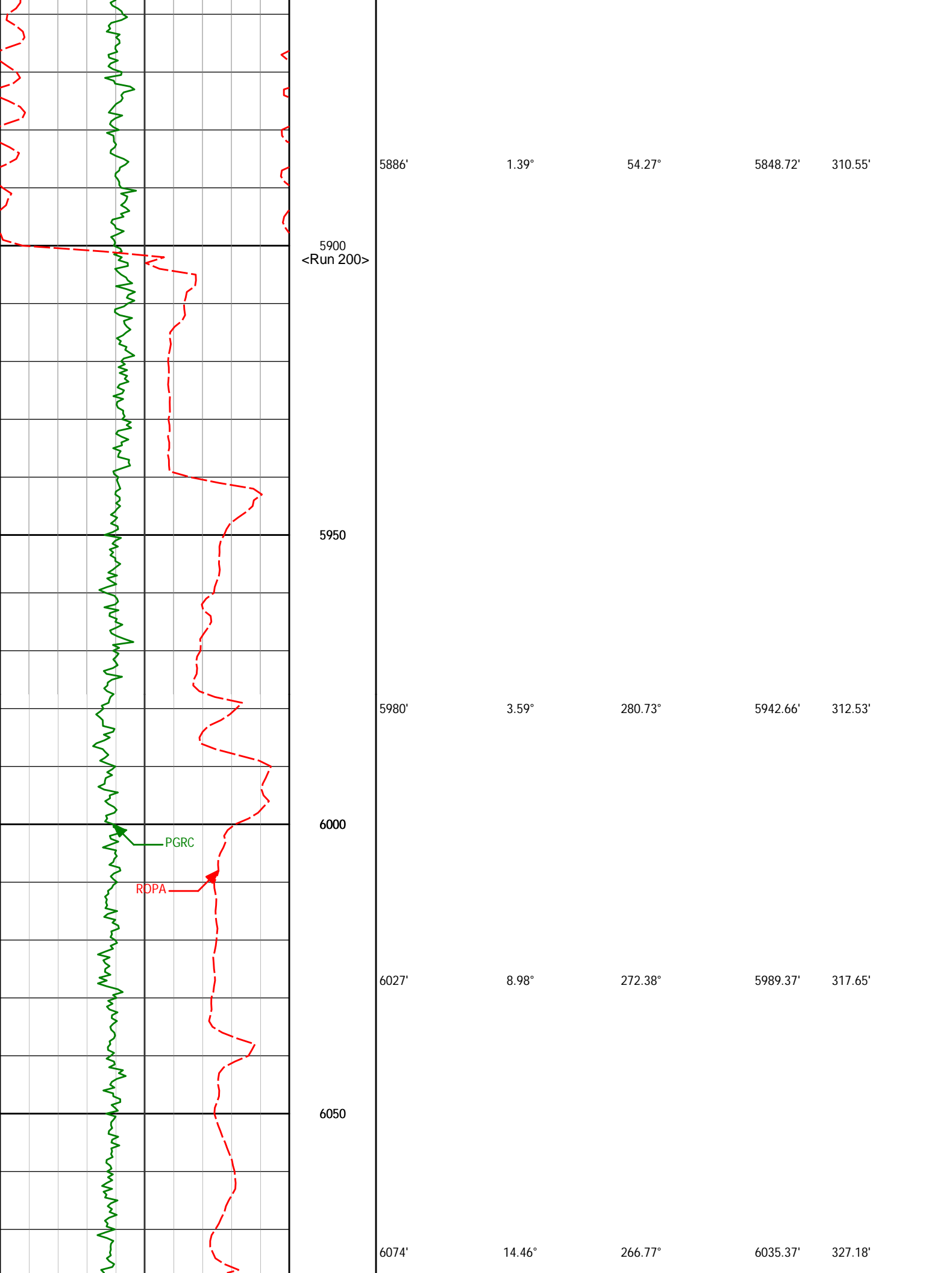
5561.80'

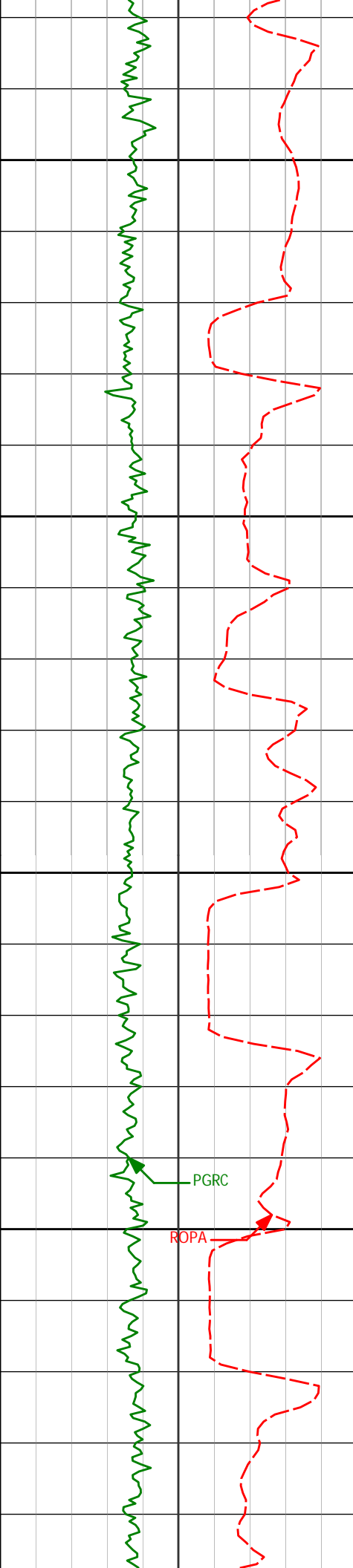
315.40'



5650				
5693'	1.42°	43.19°	5655.78'	314.08'
5700				
5750				
5788'	1.46°	47.86°	5750.75'	312.39'
5800				
5844'	1.36°	52.62°	5806.73'	311.35'
5850				







6100

6121'

18.13°

262.51°

6080.48'

340.27'

6150

6169'

20.95°

259.93°

6125.71'

356.10'

6200

6216'

22.91°

261.67°

6169.31'

373.39'

6250

6263'

24.97°

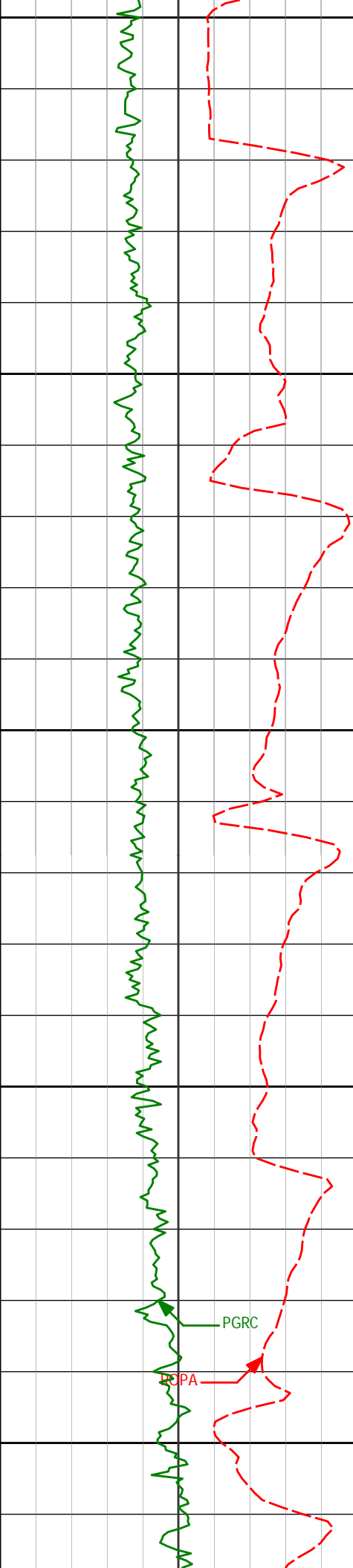
261.85°

6212.26'

392.23'

PGRC

ROPA



6300

6310'

27.73°

262.04°

6254.37'

412.85'

6350

6358'

30.33°

262.48°

6296.34'

435.89'

6400

6405'

35.80°

261.19°

6335.71'

461.22'

6450

6453'

42.47°

261.44°

6372.92'

491.09'

PGRC

PPA

6500

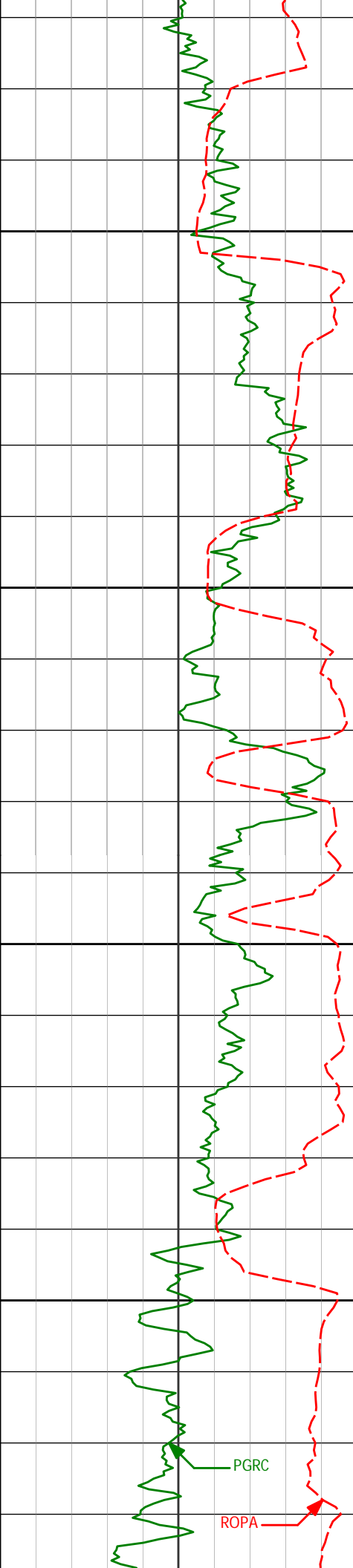
6500'

46.21°

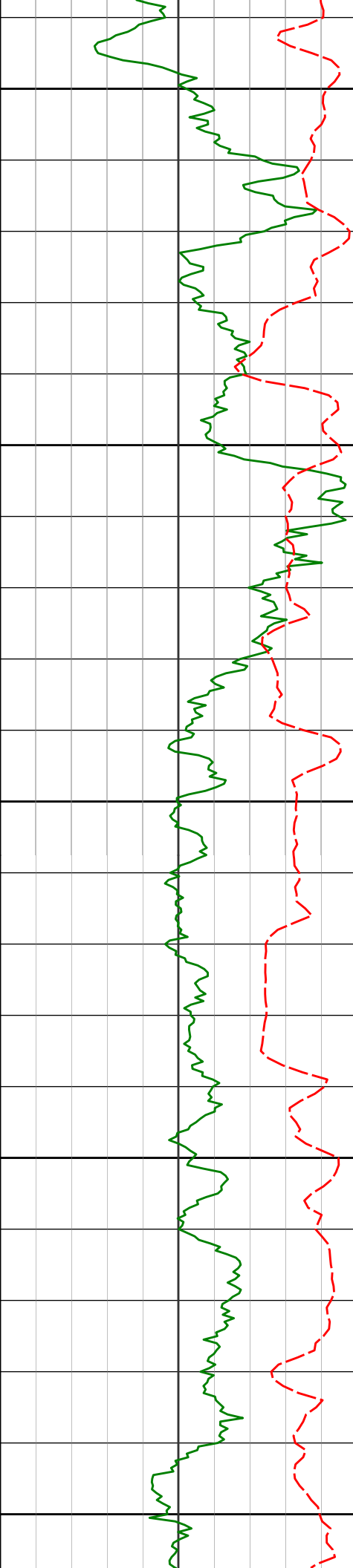
264.61°

6406.53'

523.64'



6550	6547'	47.90°	267.17°	6438.56'	557.92'
6600	6594'	50.79°	269.31°	6469.18'	593.53'
6650	6641'	53.68°	267.90°	6497.96'	630.66'
6700	6688'	57.45°	267.42°	6524.53'	669.36'
	6736'	60.94°	267.40°	6549.11'	710.51'



6750

6783'

65.25°

267.55°

6570.37'

752.35'

6800

6830'

68.63°

271.16°

6588.79'

795.57'

6850

6877'

71.25°

273.74°

6604.91'

839.69'

6900

6925'

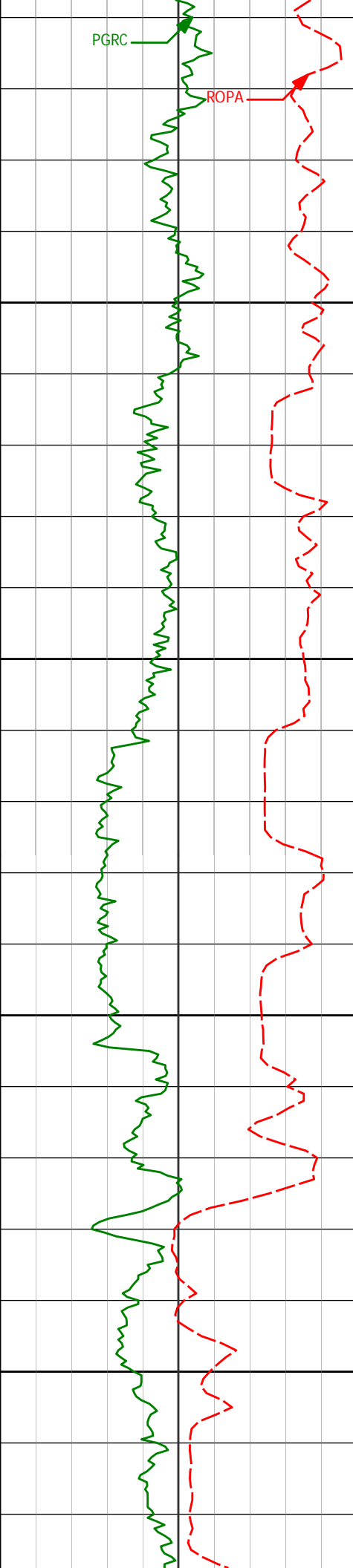
76.04°

274.16°

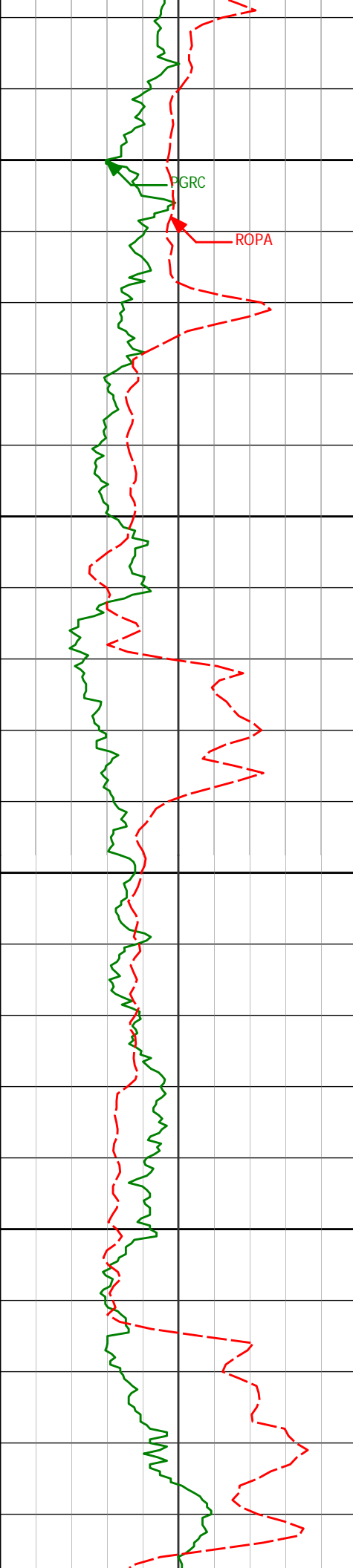
6618.42'

885.66'

6950



7000	6972'	80.74°	273.24°	6627.88'	931.62'
	7019'	83.82°	270.27°	6634.19'	978.17'
7050	7051'	86.32°	268.81°	6636.94'	1010.04'
7100	<div><div></div><div>Casing Set @ 7,101'</div></div> <div>&lt;Run 300&gt;</div>				
7150	7157'	90.40°	268.17°	6639.97'	1115.90'



7200

7208'

91.29°

267.57°

6639.22'

1166.83'

7250

7300

7303'

92.47°

268.00°

6636.10'

1261.66'

7350

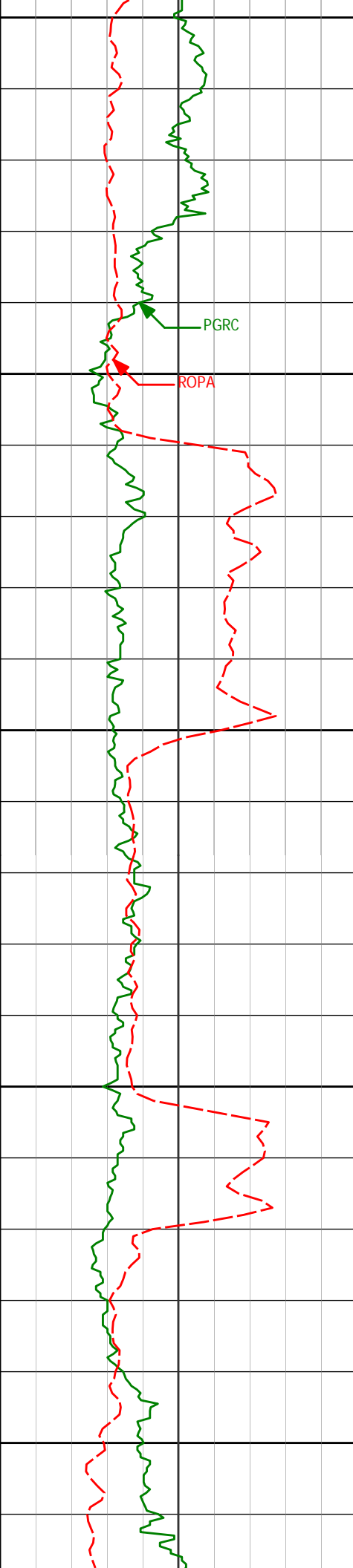
7397'

92.22°

269.39°

6632.26'

1355.52'



7400

7450

7500

7550

7600

PGRC

ROPA

7492'

89.29°

270.75°

6631.01'

1450.50'

7586'

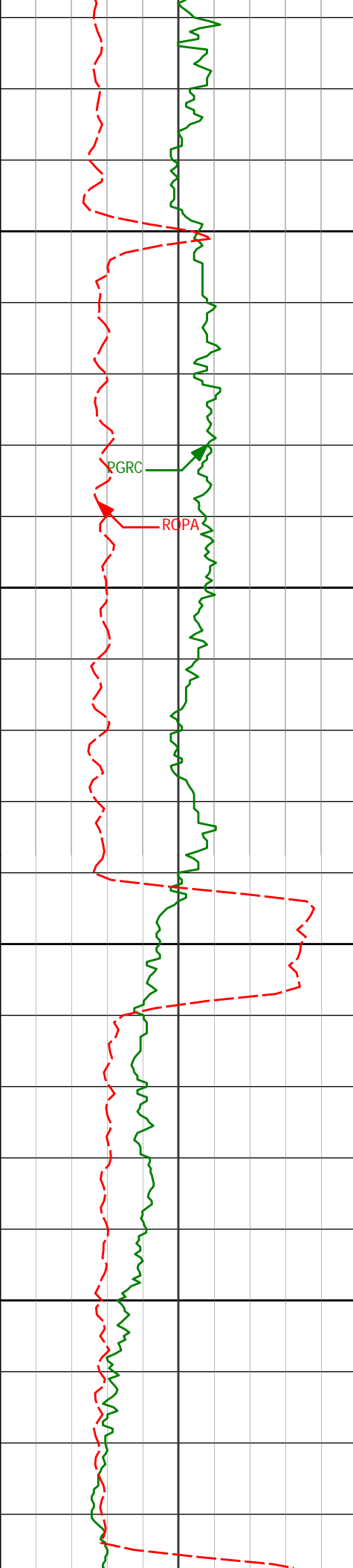
88.24°

270.40°

6633.03'

1544.47'





7650

7680'

89.94°

270.89°

6634.52'

1638.46'

7700

7750

7775'

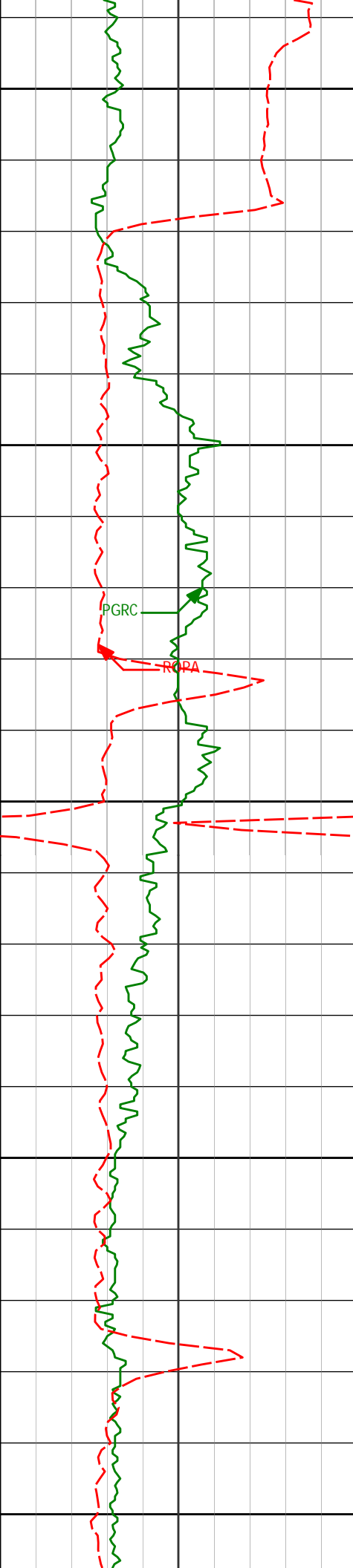
90.34°

269.86°

6634.29'

1733.45'

7800



7850

7869'

87.44°

268.81°

6636.12'

1827.40'

7900

7950

7964'

88.49°

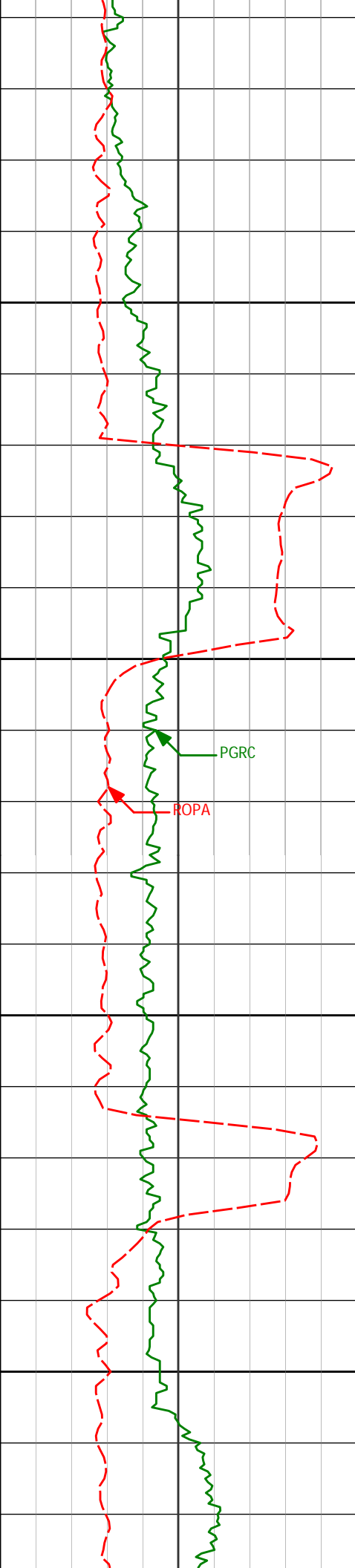
268.74°

6639.49'

1922.29'

8000

8050



8100

8150

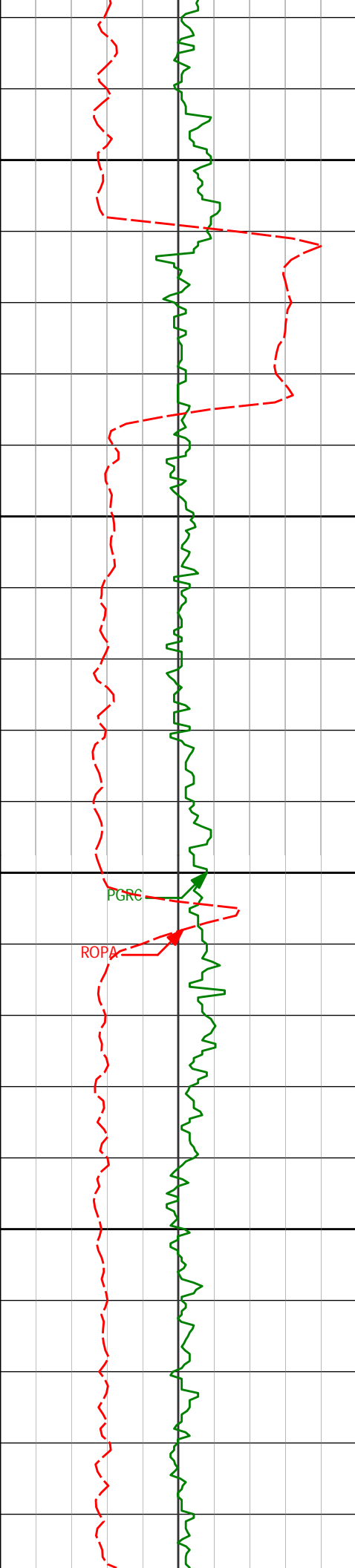
8200

8250

PGRC

ROPA

8058'	90.25°	268.77°	6640.52'	2016.22'
8153'	88.43°	269.95°	6641.62'	2111.19'
8247'	90.52°	271.87°	6642.48'	2205.17'



8300

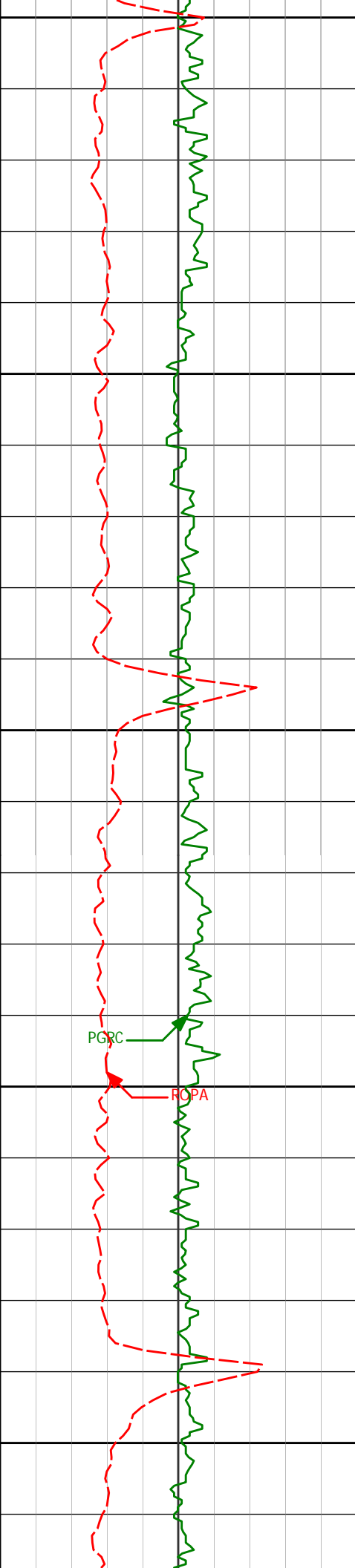
8342'      89.48°      271.11°      6642.48'      2300.16'

8350

8400

8436'      88.83°      270.08°      6643.87'      2394.15'

8450



8500

8532'

89.01°

268.36°

6645.68'

2490.10'

8550

8600

8626'

89.32°

267.48°

6647.05'

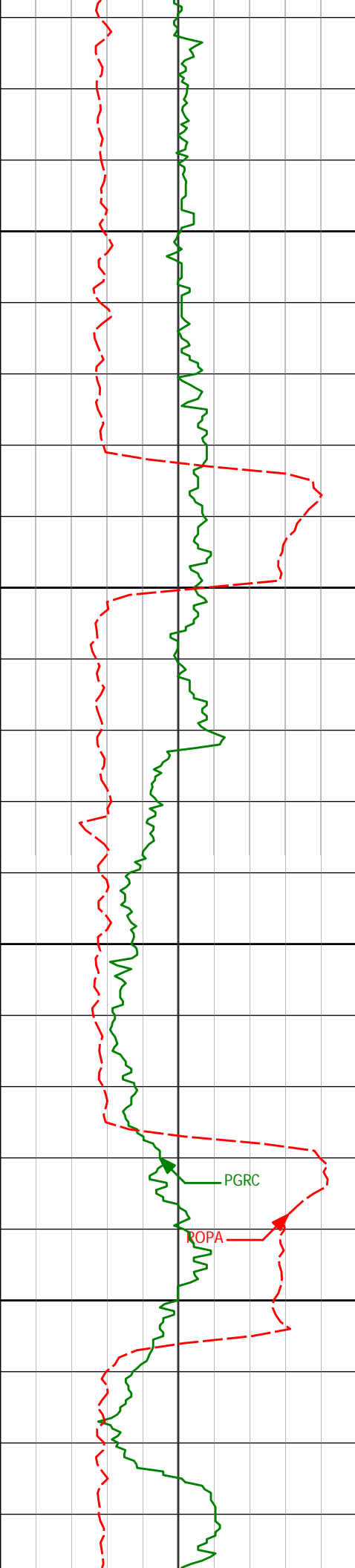
2583.98'

8650

PGRC

ROPA

8700



8721'

90.40°

268.41°

6647.28'

2678.86'

8750

8800

8816'

90.74°

268.77°

6646.33'

2773.80'

8850

8900

8911'

88.80°

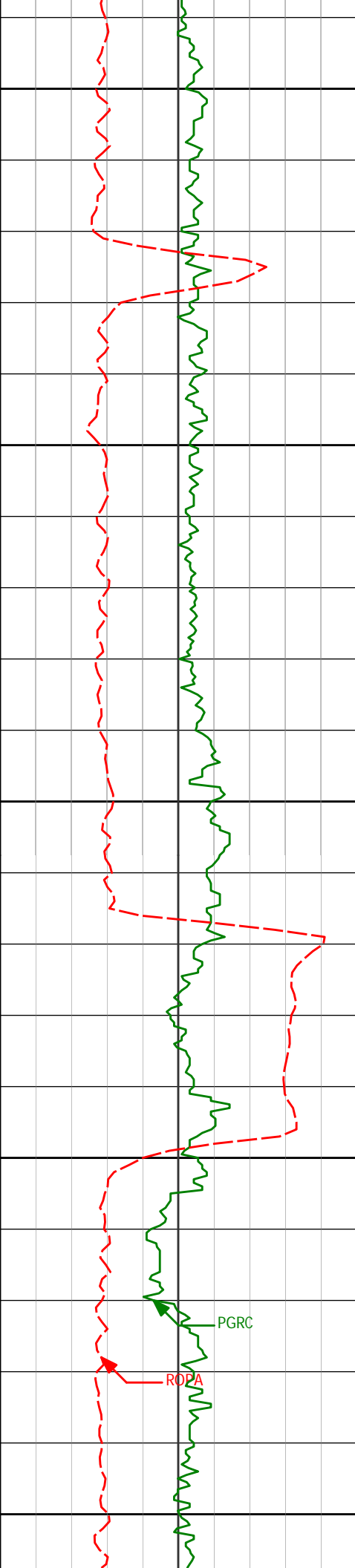
269.05°

6646.71'

2868.75'

PGRC

ROPA



8950

9000

9050

9100

9150

9005'

90.06°

268.64°

6647.65'

2962.69'

9099'

87.38°

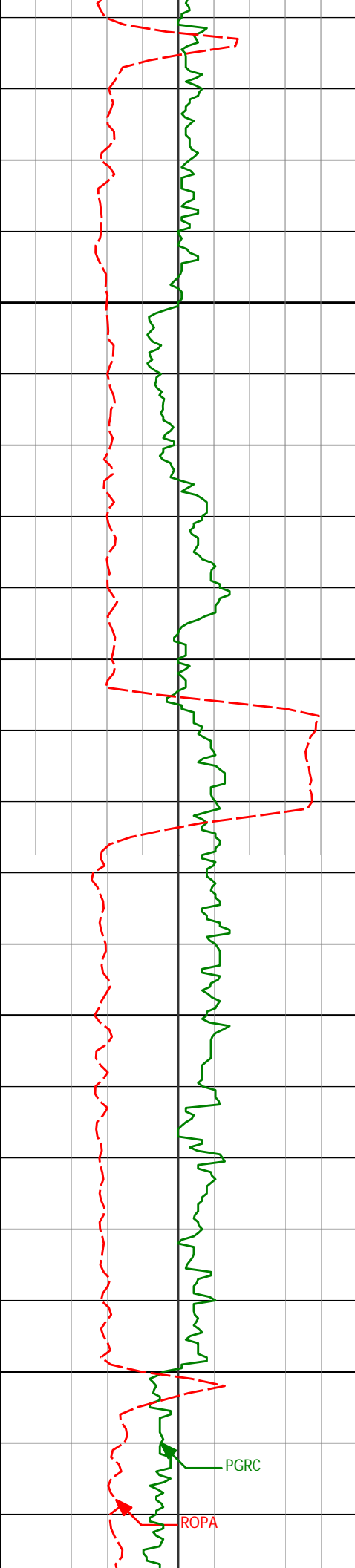
269.75°

6649.75'

3056.63'

PGRC

ROPA



9193'

88.24°

269.16°

6653.34'

3150.53'

9200

9250

9300

9350

9288'

89.14°

270.13°

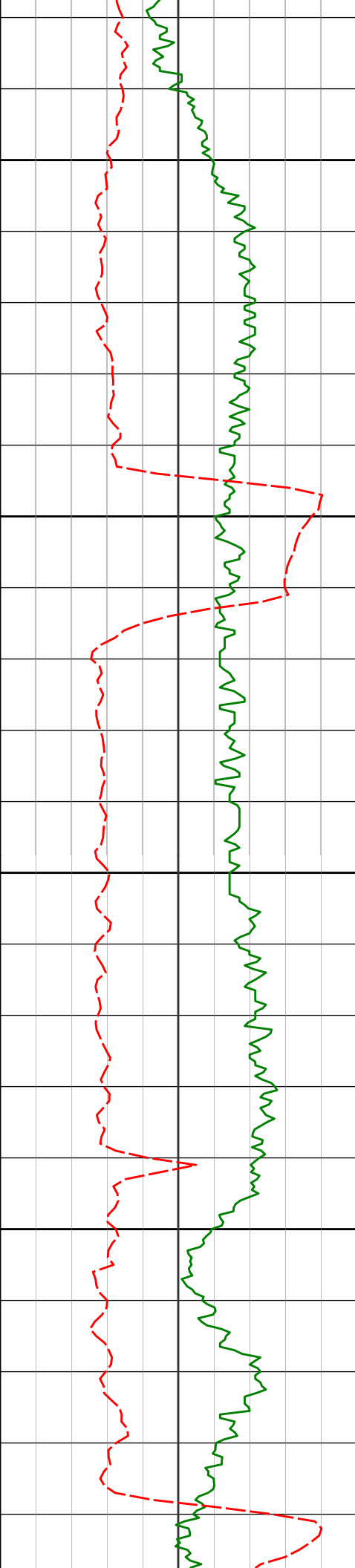
6655.51'

3245.49'

PGRC

ROPA





9382'

90.99°

270.06°

6655.41'

3339.48'

9400

9450

9476'

90.86°

271.05°

6653.89'

3433.47'

9500

9550

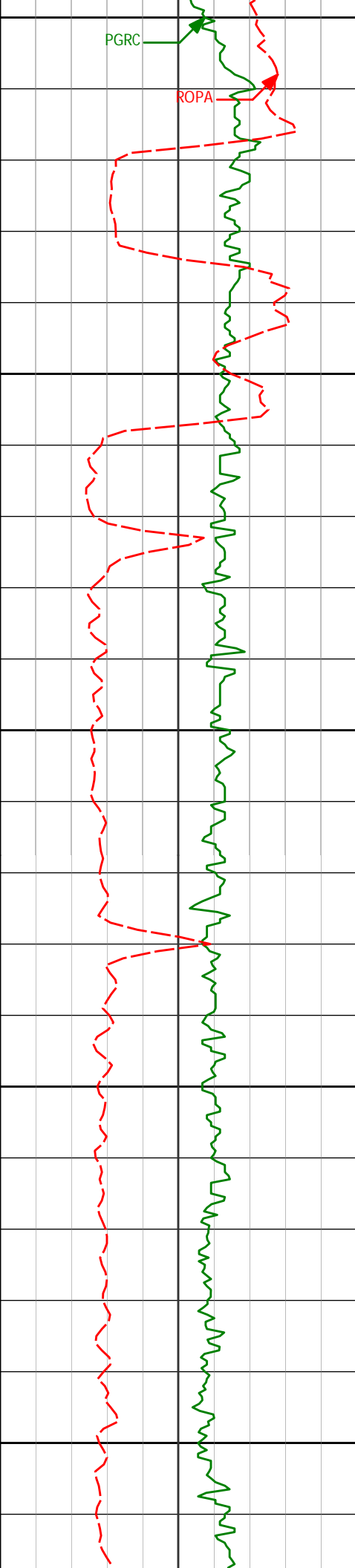
9571'

92.81°

270.78°

6650.85'

3528.42'



9600

9650

9700

9750

9800

9665'

88.67°

270.36°

6649.64'

3622.39'

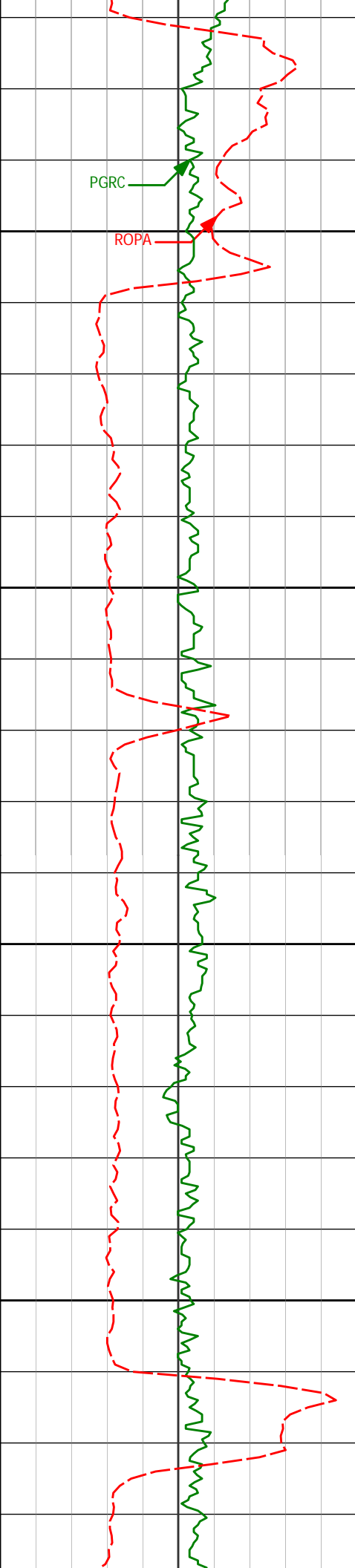
9759'

90.31°

269.72°

6650.47'

3716.37'



9850

9900

9950

10000

9854'

88.58°

271.15°

6651.39'

3811.36'

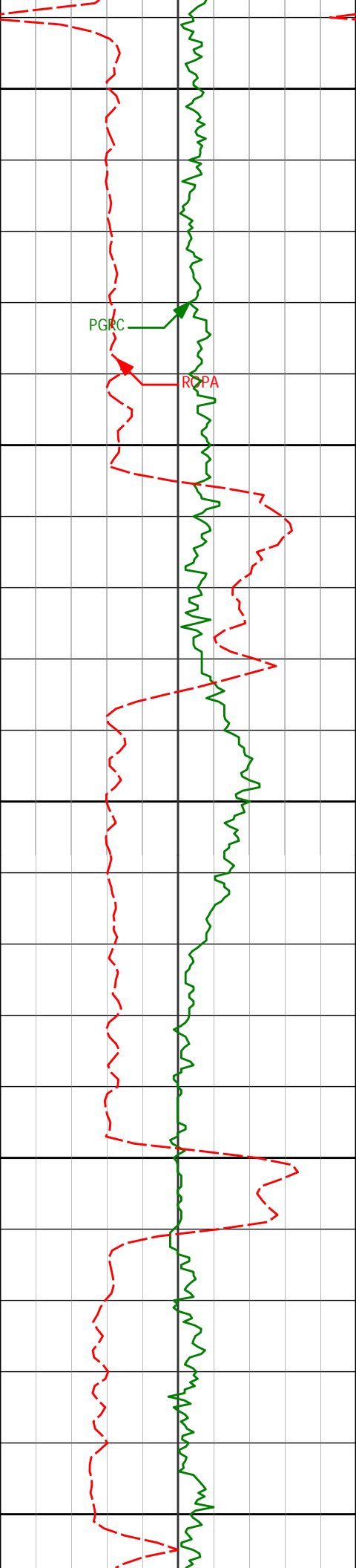
9948'

89.72°

271.28°

6652.79'

3905.35'



10042'	90.62°	270.94°	6652.51'	3999.34'
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10050

10100

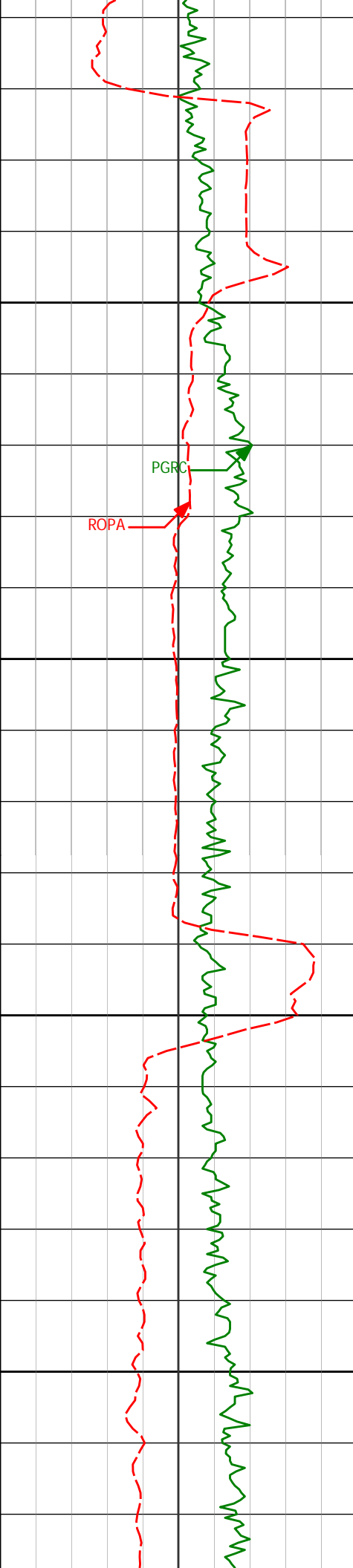
10136'	88.49°	269.98°	6653.24'	4093.33'
--------	--------	---------	----------	----------

10150

10200

10231'	88.58°	269.73°	6655.67'	4188.29'
--------	--------	---------	----------	----------

10250



<Run 400>

10300

10350

10400

10450

PGRC

ROPA

10325'

89.85°

269.48°

6656.96'

4282.26'

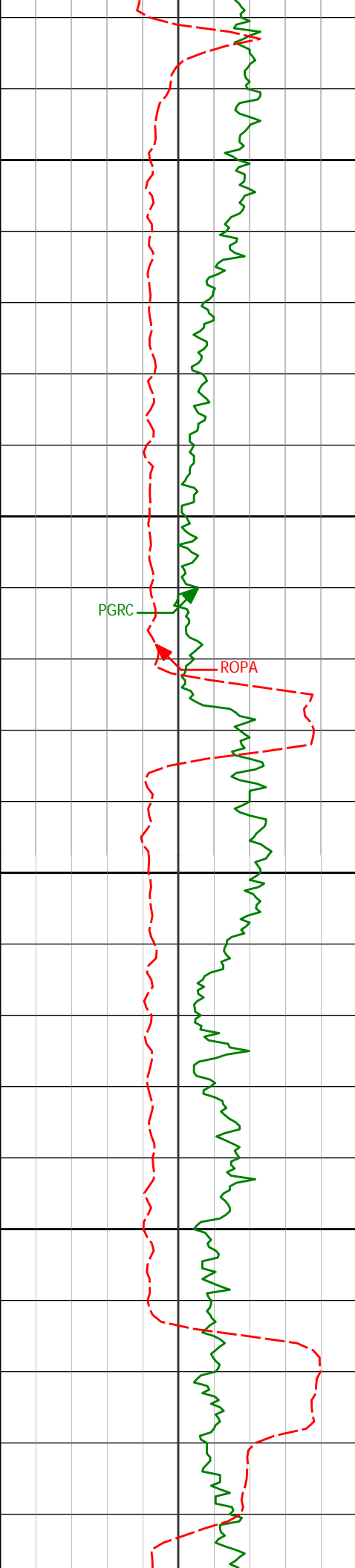
10417'

88.83°

268.29°

6658.02'

4374.21'



10500

10508'

88.80°

267.40°

6659.90'

4465.08'

10550

PGRC

ROPA

10600

10600'

89.17°

267.22°

6661.53'

4556.90'

10650

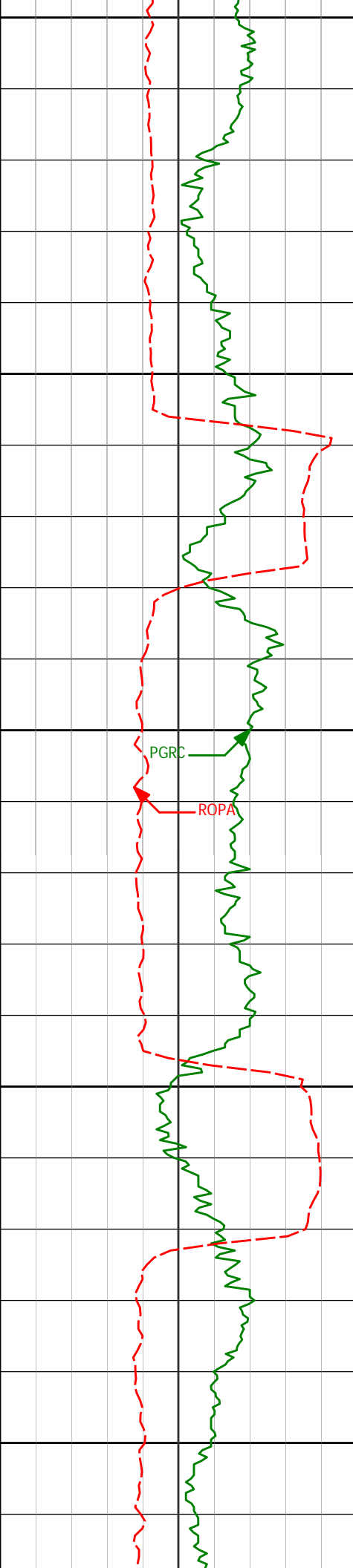
10690'

88.02°

266.88°

6663.74'

4646.69'



10700

10750

10800

10850

10900

10782'

87.35°

268.21°

6667.45'

4738.48'

10873'

87.13°

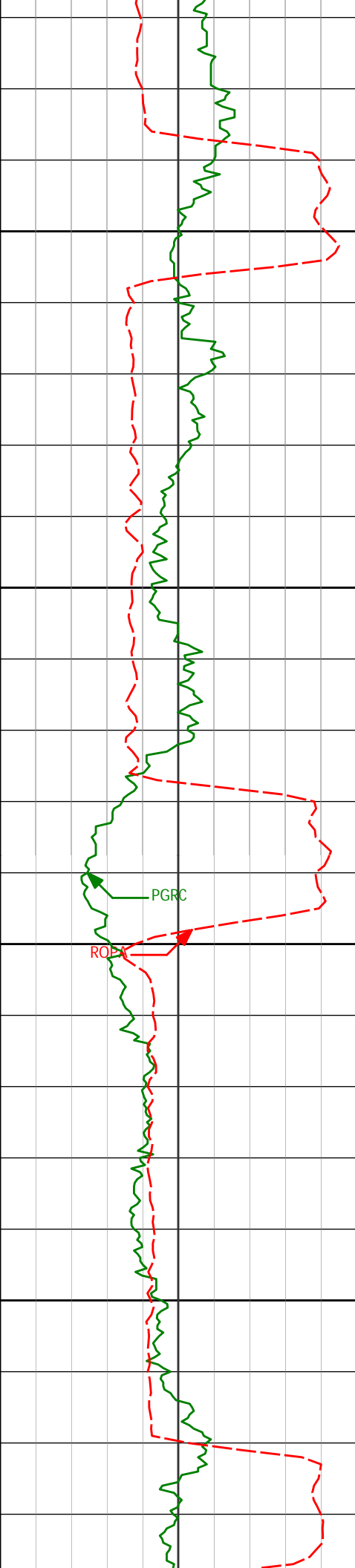
270.19°

6671.83'

4829.34'

PGRC

ROPA



10950

11000

11050

11100

10965'

88.49°

271.00°

6675.35'

4921.27'

11056'

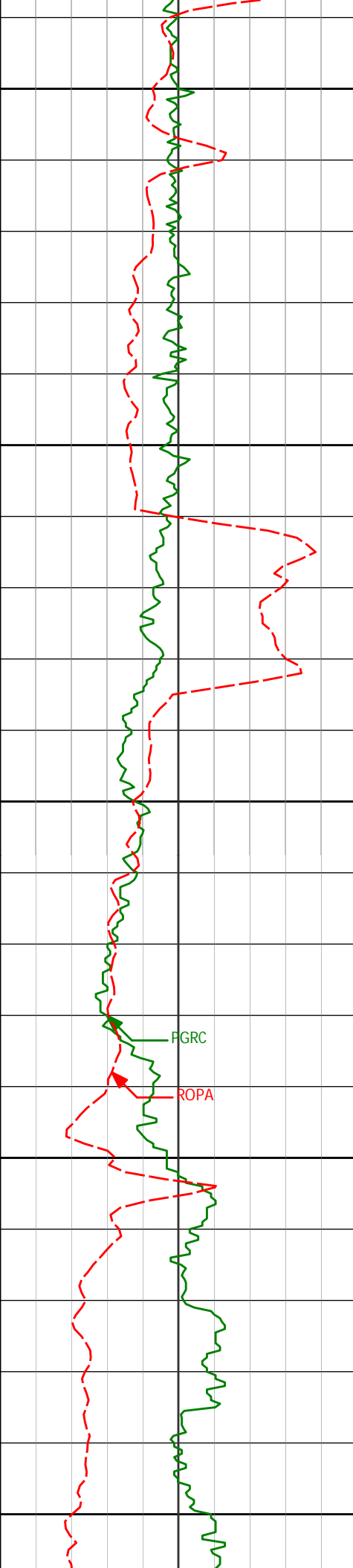
89.51°

270.58°

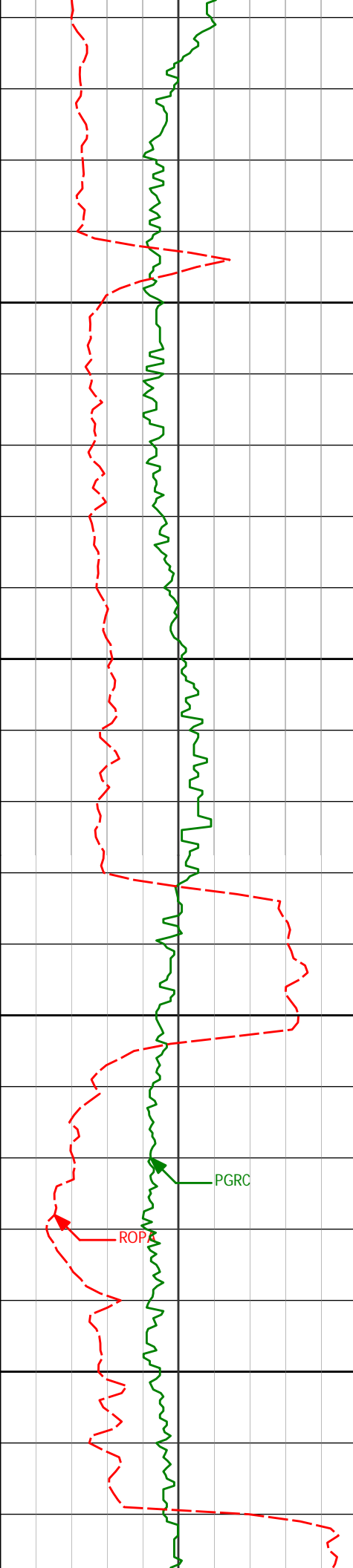
6676.94'

5012.25'





11150	11147'	91.30°	270.29°	6676.30'	5103.25'
11200					
11250	11237'	88.74°	268.58°	6676.27'	5193.21'
11300					
11350	11327'	89.17°	268.50°	6677.92'	5283.14'



11400

11450

11500

11550

11418'

90.49°

268.00°

6678.19'

5374.05'

11510'

89.63°

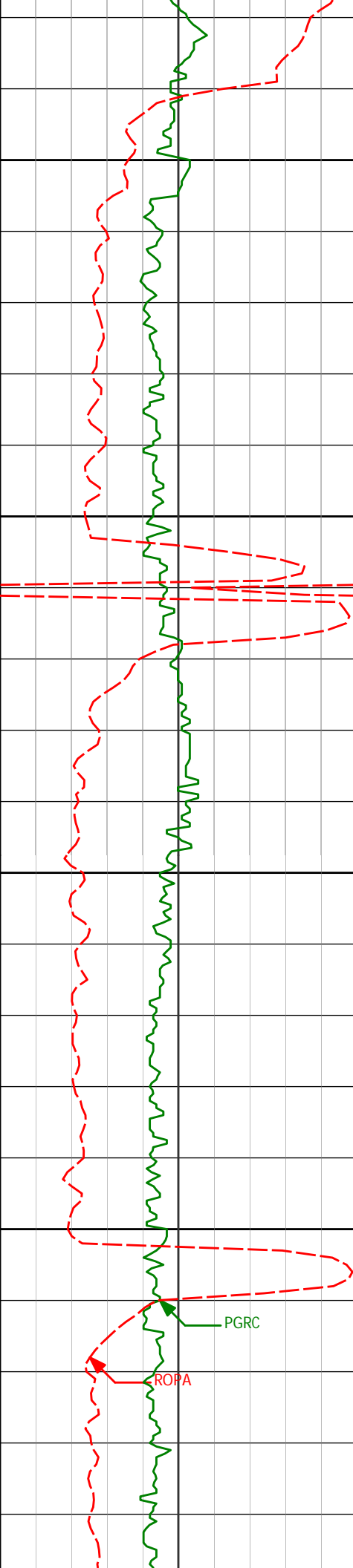
269.12°

6678.09'

5465.99'

PGRC

ROP



11600

11601'

88.89°

269.95°

6679.27'

5556.96'

11650

11693'

89.01°

269.14°

6680.95'

5648.93'

11700

11750

PGRC

ROPA

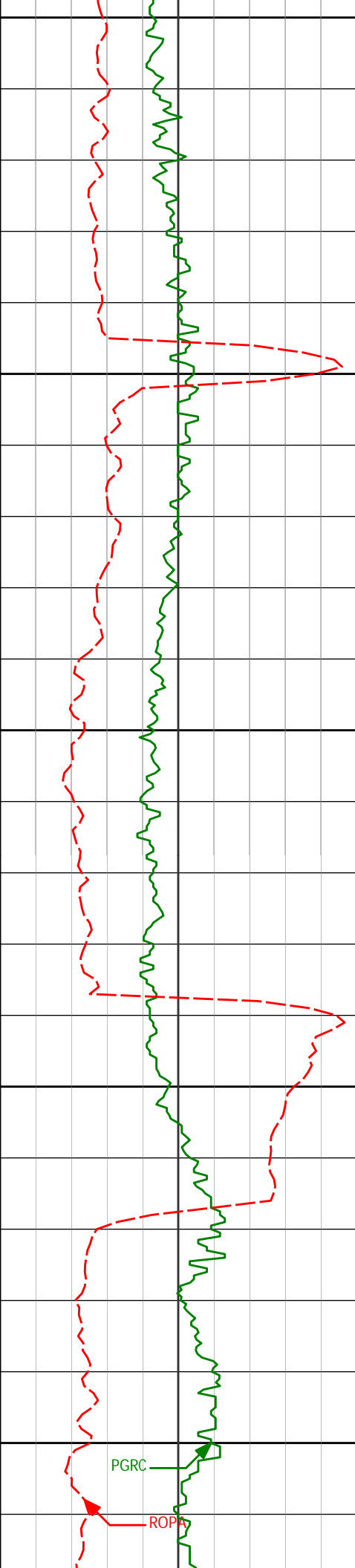
11785'

89.75°

269.63°

6681.94'

5740.90'



11800

11850

11900

11950

12000

11877'

89.35°

268.59°

6682.66'

5832.86'

11971'

90.93°

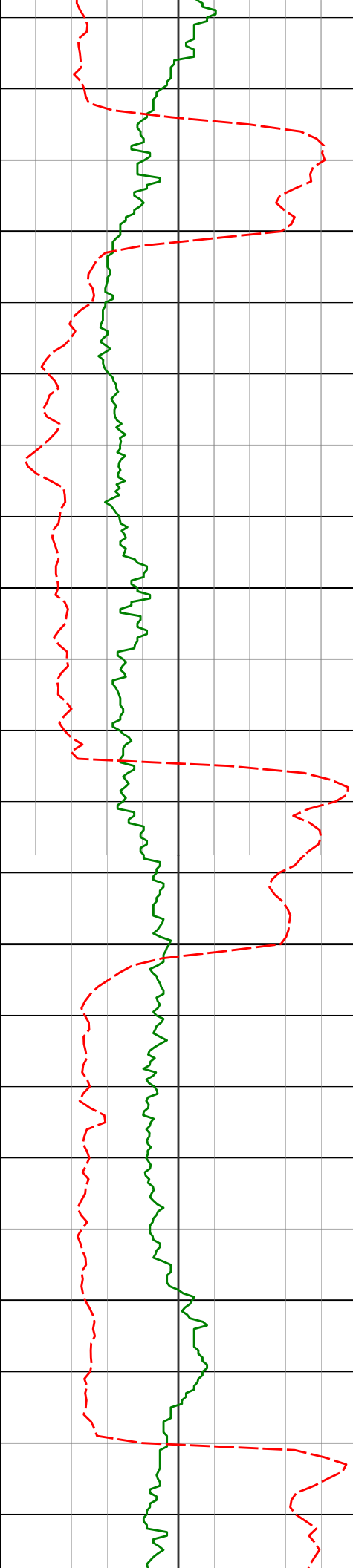
270.63°

6682.43'

5926.83'

PGRC

ROPA



12050

12065'

90.68°

271.76°

6681.11'

6020.82'

12100

12150

12160'

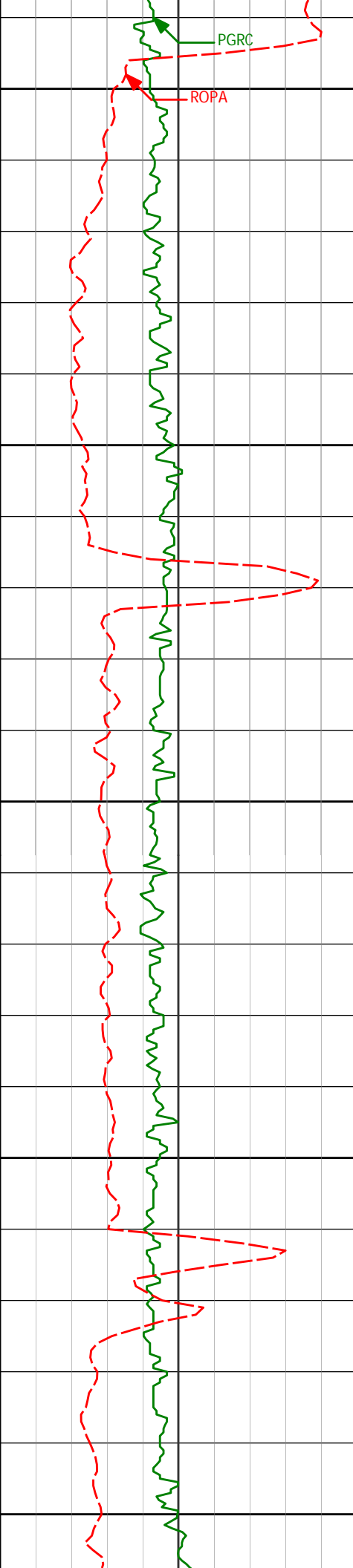
90.03°

272.09°

6680.53'

6115.79'

12200



12250

12254'

89.05°

269.81°

6681.28'

6209.78'

12300

12350

12348'

89.66°

269.56°

6682.34'

6303.76'

12400

12450

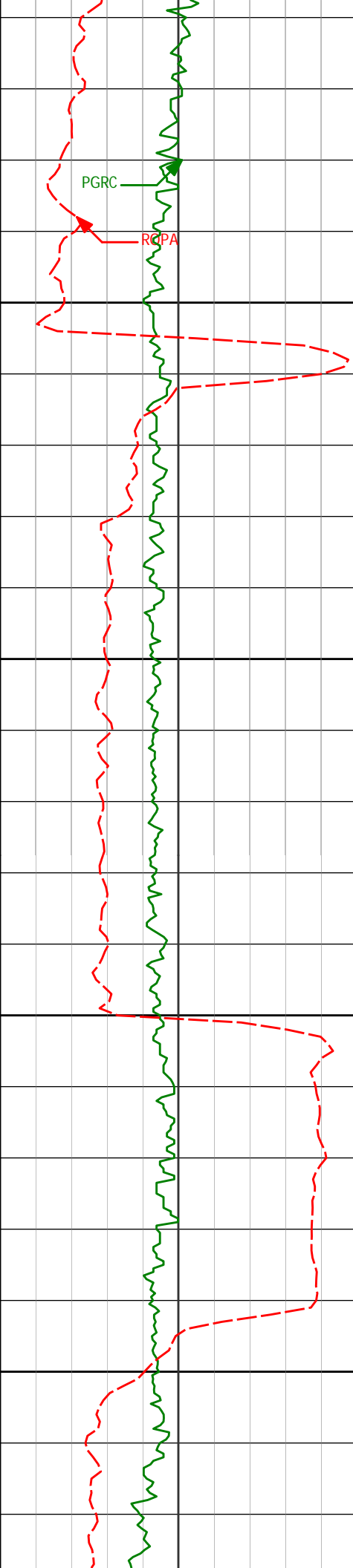
12443'

89.08°

267.51°

6683.39'

6398.68'



12500

12537'

89.29°

266.72°

6684.73'

6492.49'

12550

12600

12631'

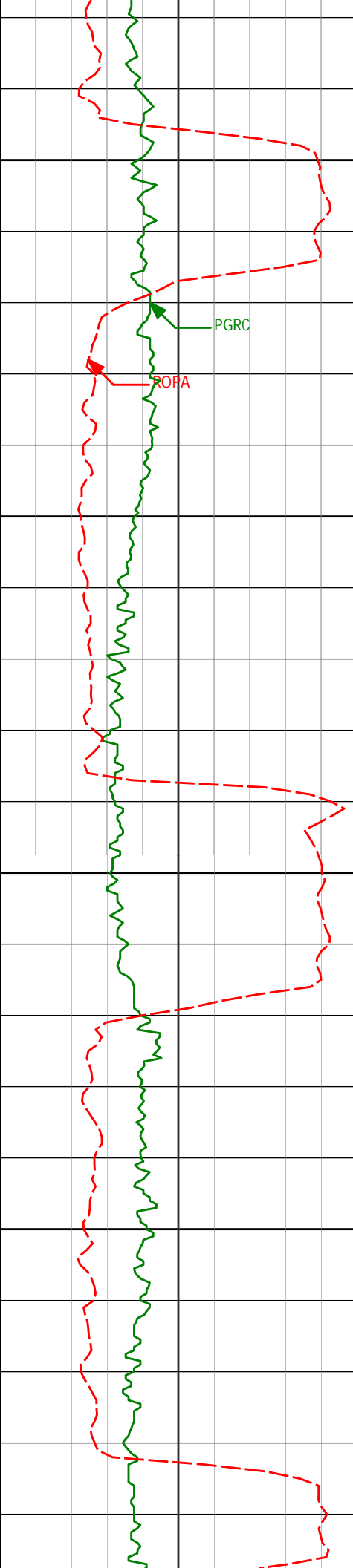
90.31°

269.96°

6685.06'

6586.40'

12650



12700

12725'

90.03°

268.61°

6684.78'

6680.37'

12750

12800

12820'

88.71°

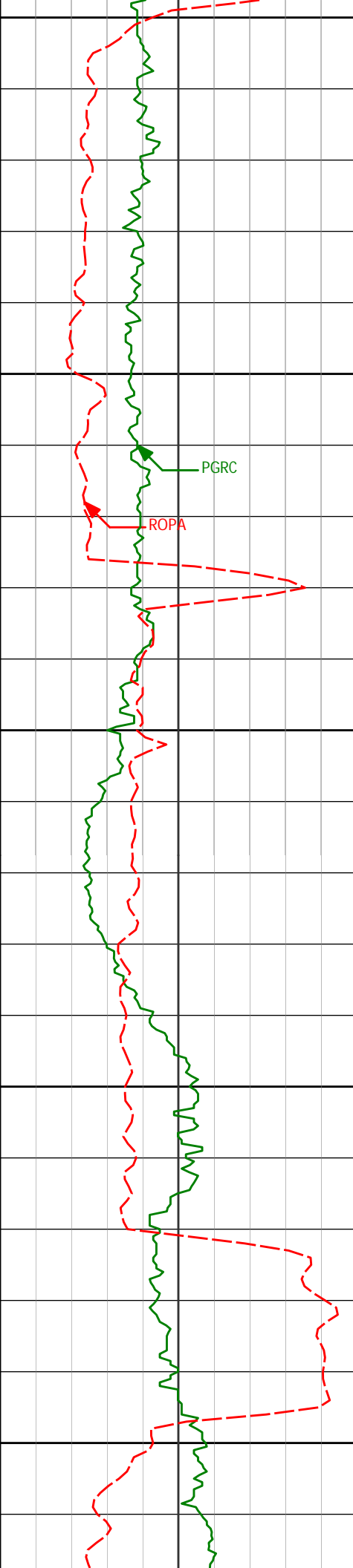
269.68°

6685.83'

6775.32'

12850





12900

12914'

89.88°

270.00°

6686.99'

6869.30'

12950

PGRC

ROPA

13000

13009'

91.29°

269.24°

6686.02'

6964.28'

13050

13100

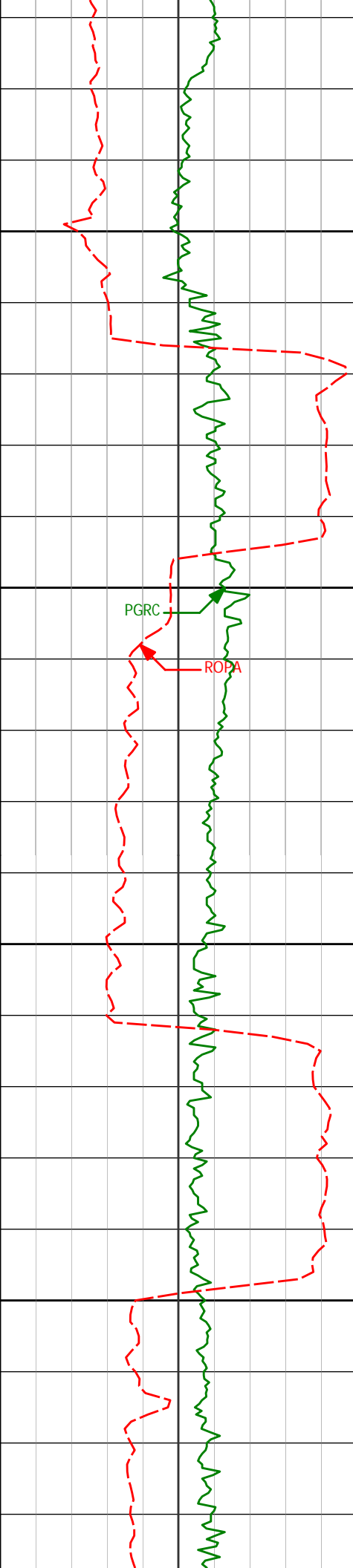
13103'

91.45°

269.85°

6683.77'

7058.23'



13150

13200

13250

13300

PGRC

ROPA

13198'

90.46°

269.36°

6682.18'

7153.20'

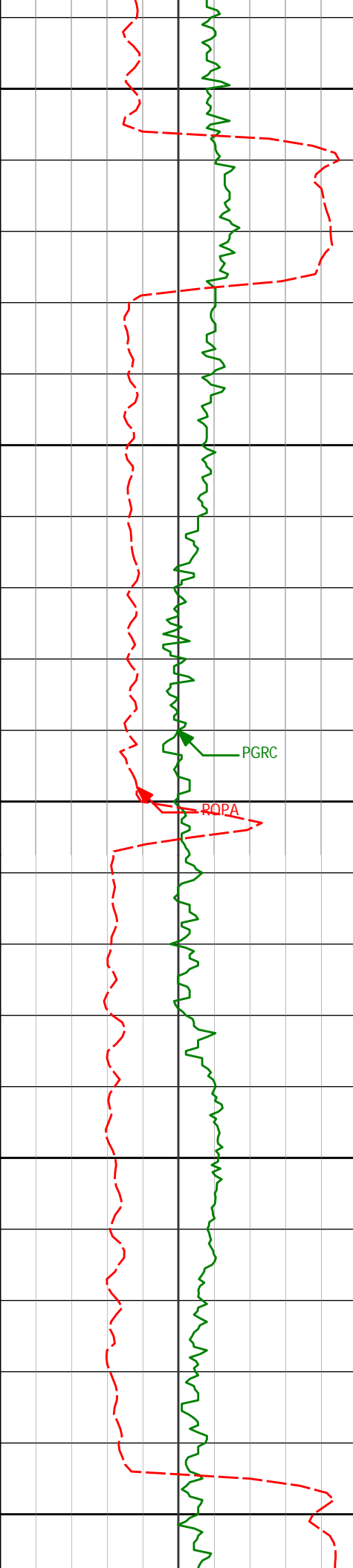
13293'

88.71°

269.16°

6682.87'

7248.17'



13350

13387'

88.24°

269.02°

6685.38'

7342.10'

13400

13450

13482'

88.55°

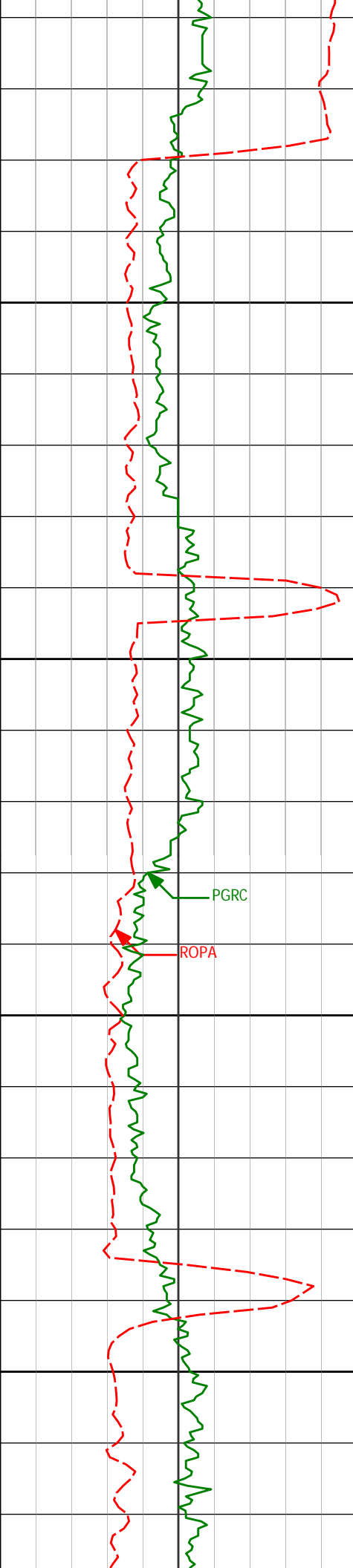
268.44°

6688.04'

7437.01'

13500

13550



13577'	88.28°	270.94°	6690.67'	7531.95'
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13600

13650

13671'	88.61°	270.18°	6693.22'	7625.91'
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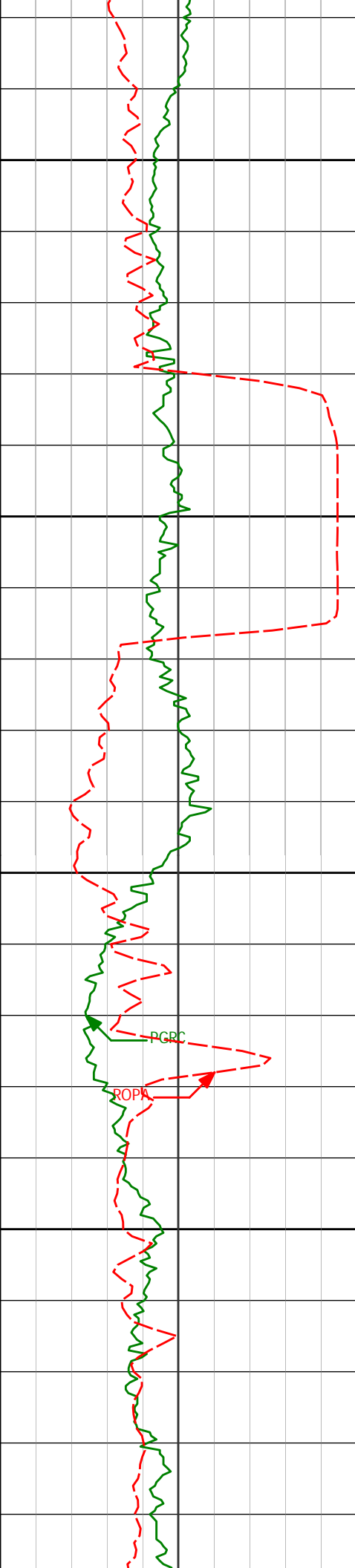
PGRC

ROPA

13700

13750

13766'	90.46°	270.00°	6693.98'	7720.90'
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13800

13850

13900

13950

13861'

87.71°

271.00°

6695.49'

7815.88'

DCRC

ROPA

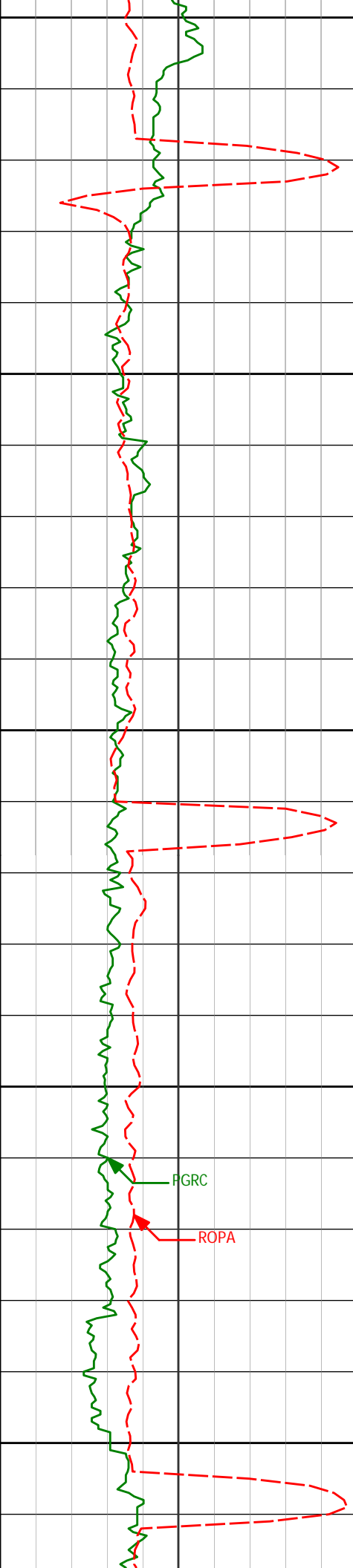
13954'

87.62°

270.47°

6699.28'

7908.80'



14000

14050

14100

14150

14200

14048'

88.43°

269.95°

6702.51'

8002.74'

14143'

89.63°

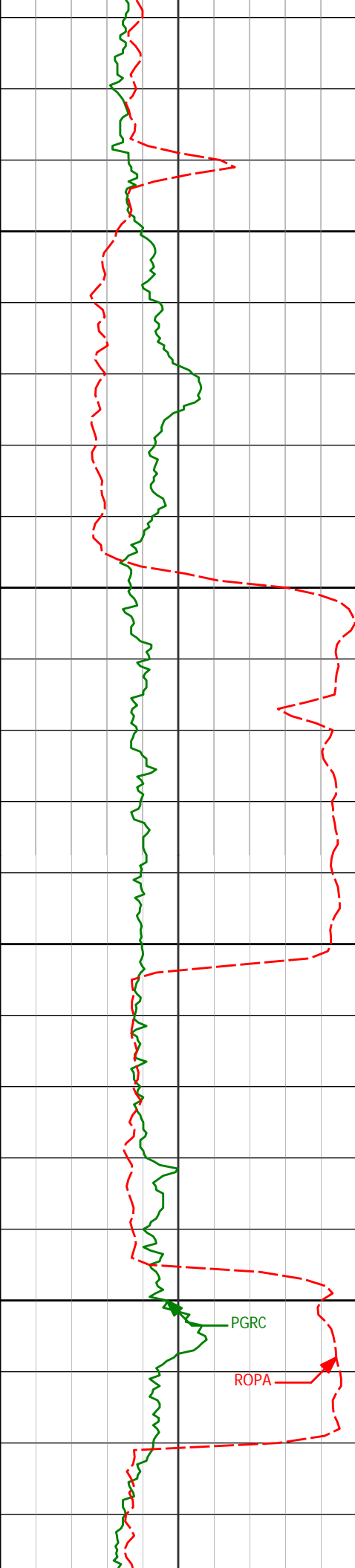
269.15°

6704.12'

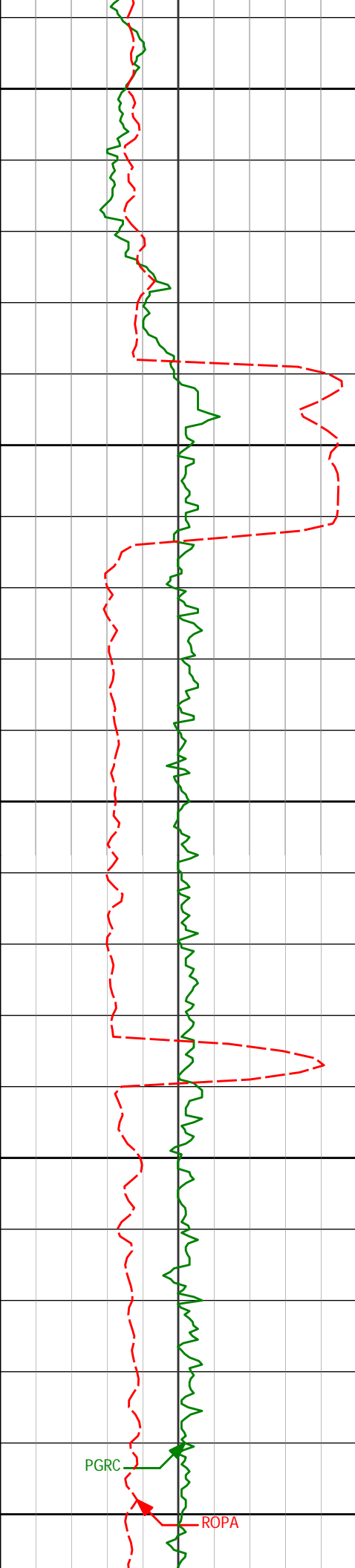
8097.70'

FGRC

ROPA



14237'	90.77°	269.07°	6703.79'	8191.67'
14250				
14300				
14332'	89.17°	269.20°	6703.85'	8286.63'
14350				
14400				
14427'	87.19°	269.69°	6706.87'	8381.55'



14450

14500

14550

14600

14650

14521'

89.35°

270.15°

6709.70'

8475.50'

14615'

89.57°

269.27°

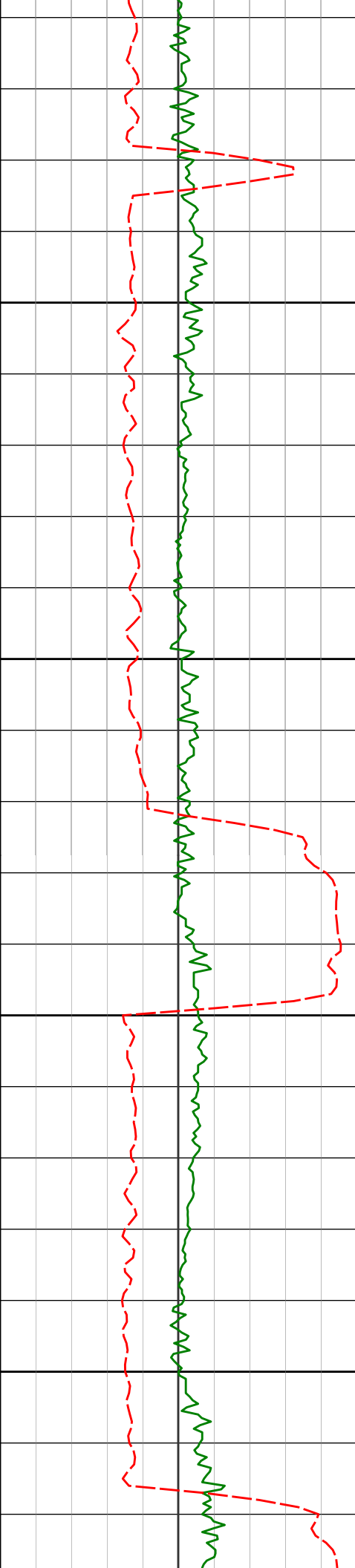
6710.59'

8569.48'

PGRC

ROPA





14700

14710'

89.63°

268.36°

6711.25'

8664.42'

14750

14800

14804'

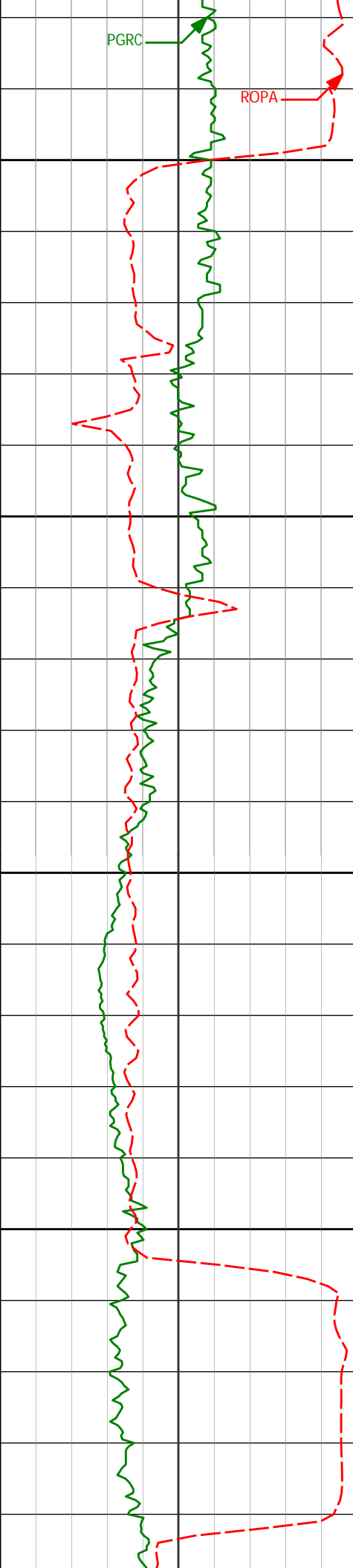
89.48°

269.49°

6711.99'

8758.38'

14850



14900

14950

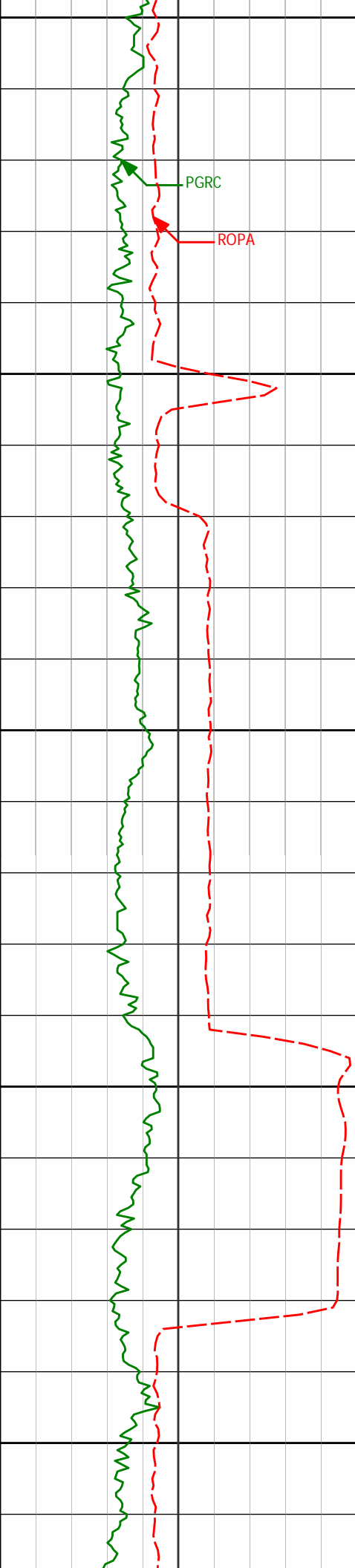
15000

15050

14898'	90.37°	271.30°	6712.11'	8852.37'
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14992'	91.30°	270.91°	6710.74'	8946.36'
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15086'	89.38°	271.43°	6710.19'	9040.35'
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15100

PGRC

ROPA

15150

15181'

90.46°

271.35°

6710.31'

9135.34'

15200

15250

15275'

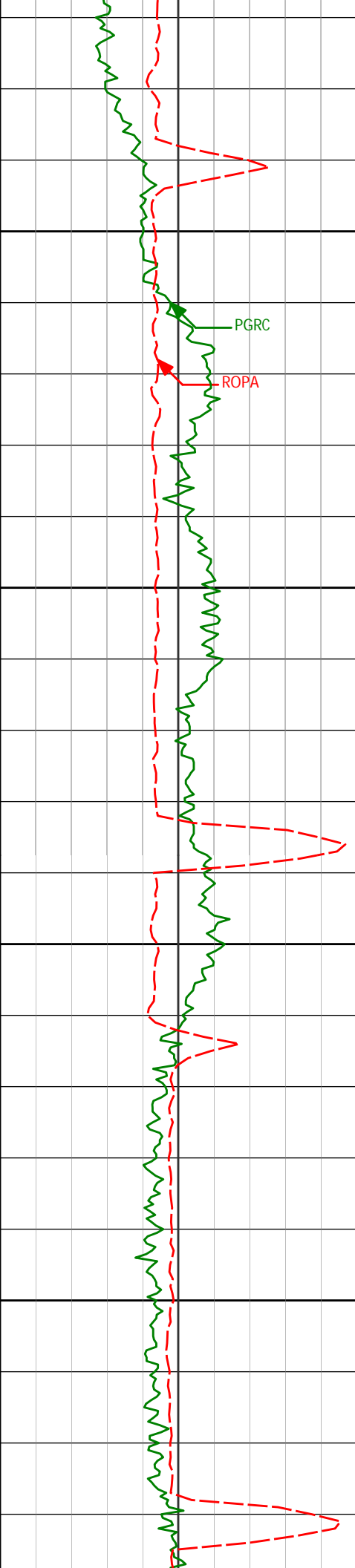
87.96°

272.50°

6711.60'

9229.30'

15300



15350

15400

15450

15500

15370'

88.21°

271.93°

6714.77'

9324.21'

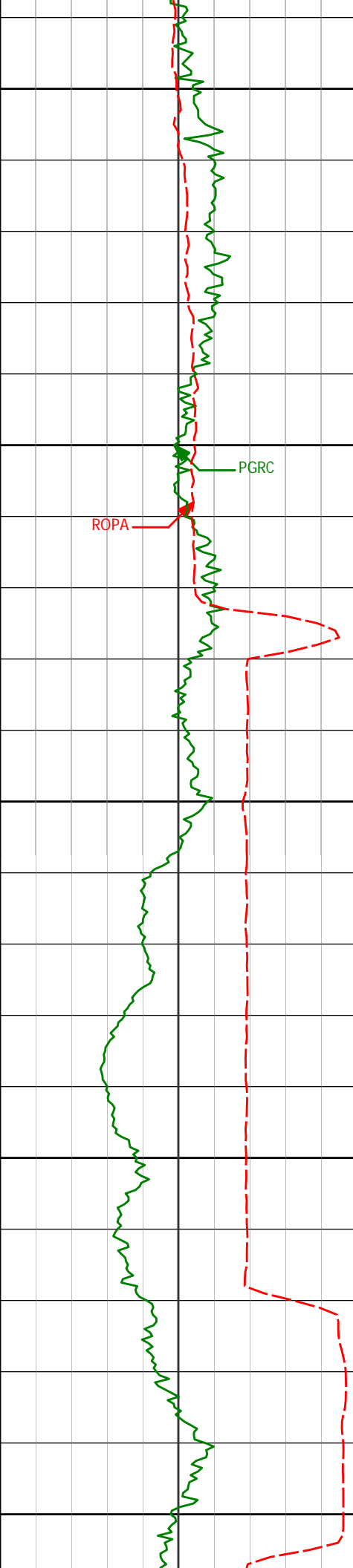
15465'

88.80°

271.20°

6717.25'

9419.17'



15550

15560'

89.78°

270.80°

6718.42'

9514.16'

15600

PGRC

ROPA

15650

15654'

91.05°

270.06°

6717.74'

9608.15'

15700

15750

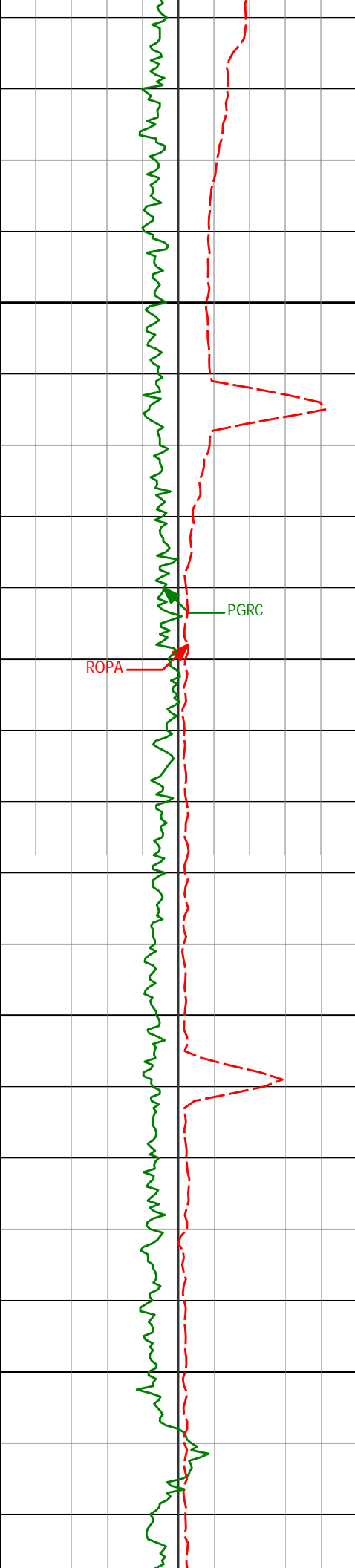
15749'

88.74°

269.23°

6717.92'

9703.13'



15800

15850

15900

15950

15843'

89.17°

268.70°

6719.64'

9797.07'

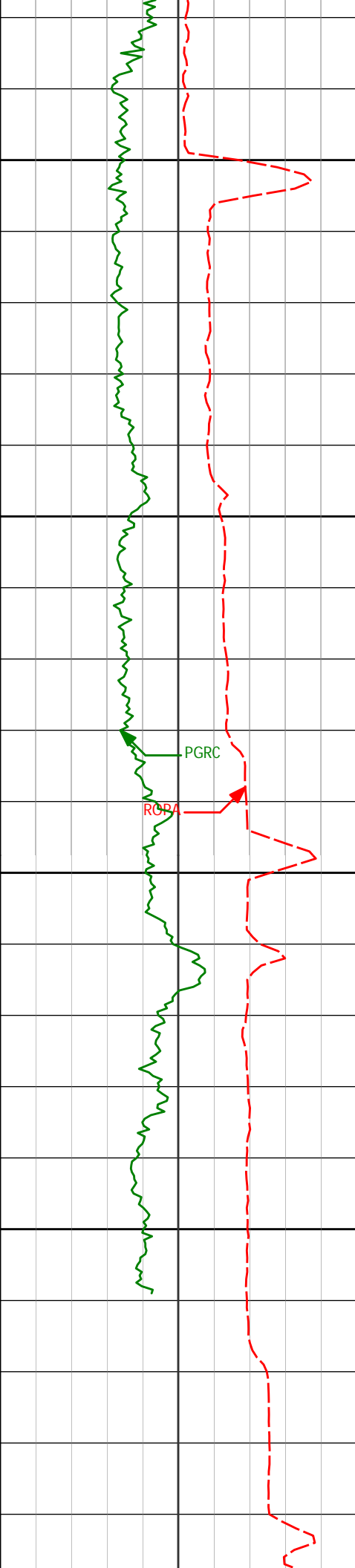
15938'

89.63°

267.48°

6720.64'

9891.96'



16000

16032'

90.74°

266.83°

6720.34'

9985.78'

16050

16100

16150

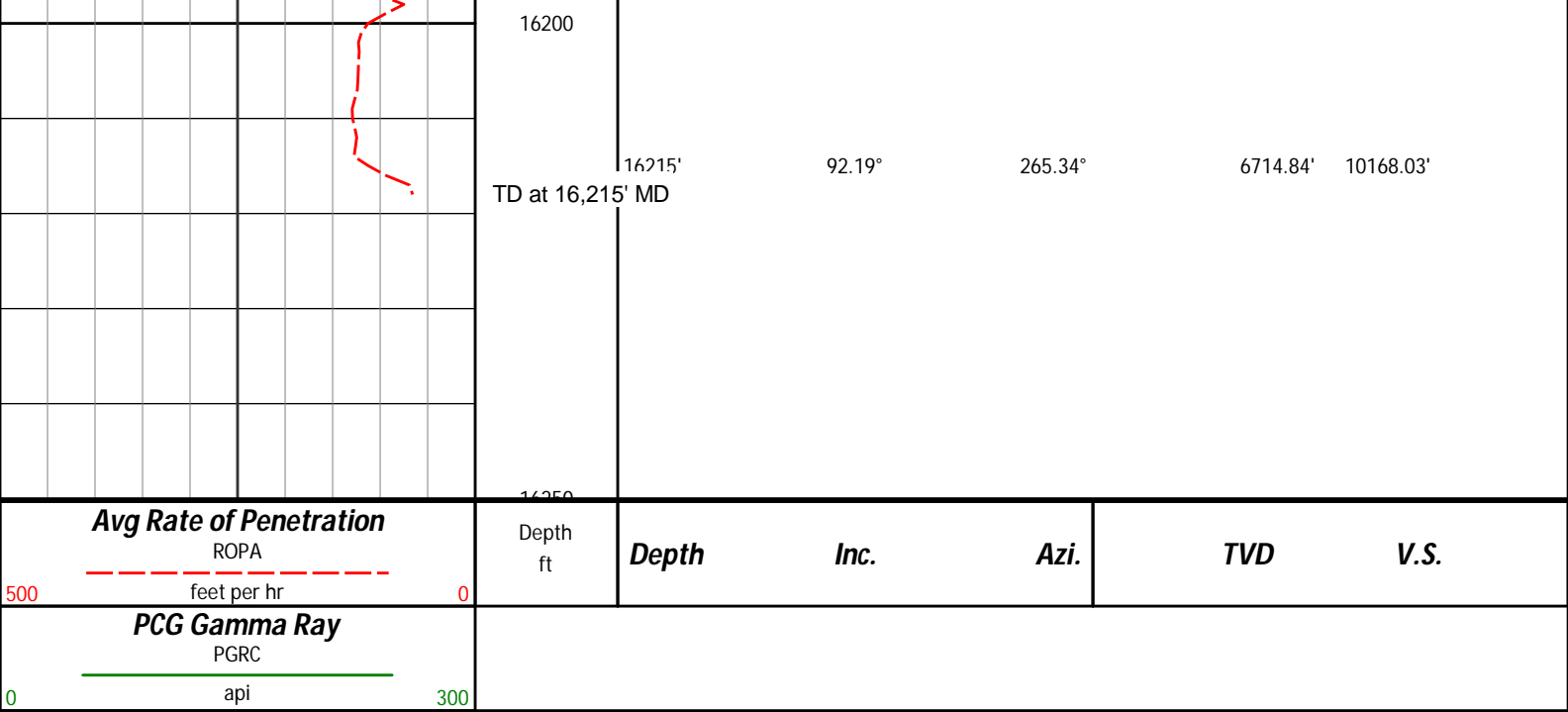
16150'

92.19°

265.34°

6717.32'

10103.36'



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Noble Energy  
Wells Ranch State USX AA16-67-1  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0009957676

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
684.00	0.00	0.00	684.00	0.00 N	0.00 E	0.00	0.00
800.00	0.25	20.59	800.00	0.24 N	0.09 E	-0.09	0.22
891.00	0.43	310.44	891.00	0.65 N	0.10 W	0.11	0.46
981.00	0.40	298.05	981.00	1.02 N	0.63 W	0.65	0.10
1254.00	0.25	305.52	1253.99	1.81 N	1.96 W	1.98	0.06
1440.00	0.49	350.94	1439.99	2.83 N	2.41 W	2.44	0.20
1535.00	1.66	321.92	1534.97	4.32 N	3.32 W	3.37	1.32
1630.00	3.30	301.85	1629.88	6.85 N	6.50 W	6.58	1.93
1725.00	5.54	293.66	1724.59	10.14 N	13.03 W	13.15	2.44
1819.00	6.72	296.63	1818.05	14.42 N	22.10 W	22.27	1.29
1913.00	8.57	298.11	1911.21	20.19 N	33.20 W	33.43	1.98
2008.00	9.70	299.22	2005.01	27.43 N	46.43 W	46.75	1.21
2103.00	11.23	304.82	2098.42	36.63 N	61.01 W	61.44	1.93
2197.00	13.14	306.25	2190.30	48.17 N	77.15 W	77.71	2.05
2292.00	13.54	304.27	2282.74	60.82 N	95.04 W	95.76	0.64
2387.00	13.15	302.58	2375.18	72.90 N	113.34 W	114.20	0.57
2482.00	13.49	303.07	2467.62	84.76 N	131.73 W	132.73	0.37
2577.00	12.65	303.74	2560.16	96.59 N	149.67 W	150.81	0.90
2671.00	13.09	303.06	2651.79	108.11 N	167.15 W	168.42	0.50
2765.00	12.55	301.50	2743.45	119.26 N	184.78 W	186.19	0.68
2860.00	12.67	299.44	2836.16	129.77 N	202.66 W	204.19	0.49
2955.00	13.81	300.42	2928.63	140.64 N	221.52 W	223.17	1.22
3049.00	13.64	301.08	3019.95	152.04 N	240.68 W	242.47	0.25
3144.00	11.61	300.08	3112.65	162.61 N	258.55 W	260.46	2.14
3238.00	9.75	301.38	3205.01	171.50 N	273.53 W	275.55	1.99
3333.00	8.26	304.99	3298.84	179.61 N	286.00 W	288.11	1.68
3427.00	6.39	299.30	3392.07	186.04 N	296.09 W	298.28	2.14
3522.00	5.13	297.15	3486.59	190.57 N	304.48 W	306.72	1.34
3616.00	4.78	293.69	3580.24	194.06 N	311.82 W	314.10	0.49
3710.00	5.00	293.07	3673.80	197.33 N	319.33 W	321.53	0.33



3710.00	5.09	293.97	3673.89	197.33 N	319.22 W	321.33	0.33
3804.00	3.60	294.57	3767.61	200.25 N	325.71 W	328.06	1.59
3899.00	3.85	290.64	3862.41	202.61 N	331.40 W	333.78	0.38
3993.00	2.46	264.91	3956.27	203.54 N	336.36 W	338.75	2.08
4088.00	1.63	196.60	4051.22	202.07 N	338.77 W	341.15	2.52
4182.00	1.51	65.81	4145.21	201.29 N	338.03 W	340.39	3.04
4276.00	0.46	123.05	4239.19	201.59 N	336.58 W	338.95	1.40
4371.00	1.27	112.71	4334.18	200.98 N	335.29 W	337.65	0.86
4466.00	2.14	113.99	4429.14	199.85 N	332.70 W	335.05	0.92
4560.00	0.86	143.23	4523.11	198.57 N	330.67 W	333.01	1.54
4655.00	1.76	142.49	4618.08	196.84 N	329.36 W	331.67	0.94
4749.00	1.64	116.34	4712.04	195.10 N	327.28 W	329.57	0.83
4843.00	1.32	99.18	4806.01	194.34 N	325.01 W	327.29	0.58
4938.00	1.69	54.82	4900.98	194.97 N	322.78 W	325.08	1.25
5032.00	1.55	49.04	4994.94	196.60 N	320.69 W	323.00	0.23
5127.00	1.40	40.93	5089.91	198.32 N	318.96 W	321.29	0.27
5221.00	1.25	39.83	5183.89	199.98 N	317.55 W	319.90	0.17
5316.00	1.14	52.12	5278.87	201.36 N	316.14 W	318.51	0.29
5411.00	1.09	24.40	5373.85	202.76 N	315.02 W	317.40	0.57
5504.00	1.32	31.46	5466.83	204.49 N	314.09 W	316.50	0.29
5599.00	1.28	31.14	5561.80	206.33 N	312.97 W	315.40	0.05
5693.00	1.42	43.19	5655.78	208.07 N	311.63 W	314.08	0.34
5788.00	1.46	47.86	5750.75	209.75 N	309.93 W	312.39	0.13
5844.00	1.36	52.62	5806.73	210.63 N	308.87 W	311.35	0.28
5886.00	1.39	54.27	5848.72	211.23 N	308.06 W	310.55	0.12
5980.00	3.59	280.73	5942.66	212.44 N	310.03 W	312.53	4.96
6027.00	8.98	272.38	5989.37	212.87 N	315.15 W	317.65	11.60
6074.00	14.46	266.77	6035.37	212.69 N	324.68 W	327.18	11.89
6121.00	18.13	262.51	6080.48	211.40 N	337.79 W	340.27	8.22
6169.00	20.95	259.93	6125.71	208.93 N	353.65 W	356.10	6.14
6216.00	22.91	261.67	6169.31	206.14 N	370.97 W	373.39	4.39
6263.00	24.97	261.85	6212.26	203.40 N	389.85 W	392.23	4.38
6310.00	27.73	262.04	6254.37	200.48 N	410.50 W	412.85	5.88
6358.00	30.33	262.48	6296.34	197.35 N	433.58 W	435.89	5.44
6405.00	35.80	261.19	6335.71	193.69 N	458.95 W	461.22	11.73
6453.00	42.47	261.44	6372.92	189.12 N	488.88 W	491.09	13.91
6500.00	46.21	264.61	6406.53	185.16 N	521.48 W	523.64	9.24
6547.00	47.90	267.17	6438.56	182.71 N	555.79 W	557.92	5.38
6594.00	50.79	269.31	6469.18	181.63 N	591.42 W	593.53	7.04
6641.00	53.68	267.90	6497.96	180.72 N	628.56 W	630.66	6.60
6688.00	57.45	267.42	6524.53	179.13 N	667.28 W	669.36	8.07
6736.00	60.94	267.40	6549.11	177.27 N	708.46 W	710.51	7.27
6783.00	65.25	267.55	6570.37	175.42 N	750.32 W	752.35	9.17
6830.00	68.63	271.16	6588.79	174.95 N	793.55 W	795.57	10.08
6877.00	71.25	273.74	6604.91	176.85 N	837.65 W	839.69	7.59
6925.00	76.04	274.16	6618.42	180.02 N	883.58 W	885.66	10.01
6972.00	80.74	273.24	6627.88	182.99 N	929.51 W	931.62	10.18
7019.00	83.82	270.27	6634.19	184.41 N	976.05 W	978.17	9.06
7051.00	86.32	268.81	6636.94	184.16 N	1007.93 W	1010.04	9.04
7157.00	90.40	268.17	6639.97	181.36 N	1113.83 W	1115.90	3.90
7208.00	91.29	267.57	6639.22	179.47 N	1164.79 W	1166.83	2.10
7303.00	92.47	268.00	6636.10	175.80 N	1259.66 W	1261.66	1.32
7397.00	92.22	269.39	6632.26	173.66 N	1353.56 W	1355.52	1.51
7492.00	89.29	270.75	6631.01	173.77 N	1448.54 W	1450.50	3.40
7586.00	88.24	270.40	6633.03	174.72 N	1542.51 W	1544.47	1.18
7680.00	89.94	270.89	6634.52	175.78 N	1636.49 W	1638.46	1.88
7775.00	90.34	269.86	6634.29	176.39 N	1731.48 W	1733.45	1.16
7869.00	87.44	268.81	6636.12	175.30 N	1825.45 W	1827.40	3.28
7964.00	88.49	268.74	6639.49	173.28 N	1920.36 W	1922.29	1.11
8058.00	90.25	268.77	6640.52	171.24 N	2014.33 W	2016.22	1.87
8153.00	88.43	269.95	6641.62	170.18 N	2109.31 W	2111.19	2.28
8247.00	90.52	271.87	6642.48	171.68 N	2203.29 W	2205.17	3.03
8342.00	89.48	271.11	6642.48	174.15 N	2298.25 W	2300.16	1.36
8436.00	88.83	270.08	6643.87	175.13 N	2392.24 W	2394.15	1.29
8532.00	89.01	268.36	6645.68	173.83 N	2488.21 W	2490.10	1.81
8626.00	89.32	267.48	6647.05	170.42 N	2582.14 W	2583.98	0.99
8721.00	90.40	268.41	6647.28	167.01 N	2677.07 W	2678.86	1.49
8816.00	90.74	268.77	6646.33	164.67 N	2772.04 W	2773.80	0.52
8911.00	88.80	269.05	6646.71	162.86 N	2867.01 W	2868.75	2.07
9005.00	90.06	268.64	6647.65	160.97 N	2960.99 W	2962.69	1.41
9099.00	87.38	269.75	6649.75	159.65 N	3054.95 W	3056.63	3.09
9193.00	88.24	269.16	6653.34	158.76 N	3148.87 W	3150.53	1.11
9288.00	89.14	270.13	6655.51	158.17 N	3243.84 W	3245.49	1.39
9382.00	90.99	270.06	6655.41	158.33 N	3337.84 W	3339.48	1.97
9476.00	90.86	271.05	6653.89	159.24 N	3431.82 W	3433.47	1.07

9571.00	92.81	270.78	6650.85	160.76 N	3526.76 W	3528.42	2.06
9665.00	88.67	270.36	6649.64	161.70 N	3620.72 W	3622.39	4.42
9759.00	90.31	269.72	6650.47	161.77 N	3714.72 W	3716.37	1.87
9854.00	88.58	271.15	6651.39	162.49 N	3809.70 W	3811.36	2.36
9948.00	89.72	271.28	6652.79	164.48 N	3903.67 W	3905.35	1.22
10042.00	90.62	270.94	6652.51	166.29 N	3997.65 W	3999.34	1.02
10136.00	88.49	269.98	6653.24	167.05 N	4091.64 W	4093.33	2.48
10231.00	88.58	269.73	6655.67	166.81 N	4186.61 W	4188.29	0.28
10325.00	89.85	269.48	6656.96	166.16 N	4280.59 W	4282.26	1.37
10417.00	88.83	268.29	6658.02	164.37 N	4372.57 W	4374.21	1.70
10508.00	88.80	267.40	6659.90	160.95 N	4463.48 W	4465.08	0.98
10600.00	89.17	267.22	6661.53	156.63 N	4555.37 W	4556.90	0.45
10690.00	88.02	266.88	6663.74	152.00 N	4645.22 W	4646.69	1.32
10782.00	87.35	268.21	6667.45	148.06 N	4737.06 W	4738.48	1.62
10873.00	87.13	270.19	6671.83	146.79 N	4827.94 W	4829.34	2.19
10965.00	88.49	271.00	6675.35	147.75 N	4919.86 W	4921.27	1.72
11056.00	89.51	270.58	6676.94	149.01 N	5010.84 W	5012.25	1.21
11147.00	91.30	270.29	6676.30	149.69 N	5101.83 W	5103.25	1.99
11237.00	88.74	268.58	6676.27	148.80 N	5191.81 W	5193.21	3.42
11327.00	89.17	268.50	6677.92	146.51 N	5281.77 W	5283.14	0.48
11418.00	90.49	268.00	6678.19	143.73 N	5372.72 W	5374.05	1.56
11510.00	89.63	269.12	6678.09	141.42 N	5464.69 W	5465.99	1.54
11601.00	88.89	269.95	6679.27	140.69 N	5555.68 W	5556.96	1.22
11693.00	89.01	269.14	6680.95	139.96 N	5647.66 W	5648.93	0.89
11785.00	89.75	269.63	6681.94	138.97 N	5739.65 W	5740.90	0.97
11877.00	89.35	268.59	6682.66	137.55 N	5831.64 W	5832.86	1.22
11971.00	90.93	270.63	6682.43	136.91 N	5925.63 W	5926.83	2.74
12065.00	90.68	271.76	6681.11	138.87 N	6019.59 W	6020.82	1.23
12160.00	90.03	272.09	6680.53	142.06 N	6114.54 W	6115.79	0.76
12254.00	89.05	269.81	6681.28	143.62 N	6208.51 W	6209.78	2.63
12348.00	89.66	269.56	6682.34	143.11 N	6302.51 W	6303.76	0.71
12443.00	89.08	267.51	6683.39	140.67 N	6397.46 W	6398.68	2.25
12537.00	89.29	266.72	6684.73	135.94 N	6491.33 W	6492.49	0.87
12631.00	90.31	269.96	6685.06	133.21 N	6585.28 W	6586.40	3.61
12725.00	90.03	268.61	6684.78	132.04 N	6679.27 W	6680.37	1.46
12820.00	88.71	269.68	6685.83	130.63 N	6774.25 W	6775.32	1.79
12914.00	89.88	270.00	6686.99	130.37 N	6868.24 W	6869.30	1.29
13009.00	91.29	269.24	6686.02	129.74 N	6963.23 W	6964.28	1.69
13103.00	91.45	269.85	6683.77	129.00 N	7057.20 W	7058.23	0.67
13198.00	90.46	269.36	6682.18	128.34 N	7152.18 W	7153.20	1.16
13293.00	88.71	269.16	6682.87	127.12 N	7247.17 W	7248.17	1.86
13387.00	88.24	269.02	6685.38	125.63 N	7341.12 W	7342.10	0.52
13482.00	88.55	268.44	6688.04	123.53 N	7436.06 W	7437.01	0.70
13577.00	88.28	270.94	6690.67	123.02 N	7531.02 W	7531.95	2.64
13671.00	88.61	270.18	6693.22	123.93 N	7624.98 W	7625.91	0.88
13766.00	90.46	270.00	6693.98	124.08 N	7719.97 W	7720.90	1.96
13861.00	87.71	271.00	6695.49	124.91 N	7814.94 W	7815.88	3.08
13954.00	87.62	270.47	6699.28	126.10 N	7907.86 W	7908.80	0.58
14048.00	88.43	269.95	6702.51	126.44 N	8001.80 W	8002.74	1.02
14143.00	89.63	269.15	6704.12	125.69 N	8096.78 W	8097.70	1.52
14237.00	90.77	269.07	6703.79	124.23 N	8190.77 W	8191.67	1.22
14332.00	89.17	269.20	6703.85	122.79 N	8285.76 W	8286.63	1.70
14427.00	87.19	269.69	6706.87	121.87 N	8380.70 W	8381.55	2.14
14521.00	89.35	270.15	6709.70	121.73 N	8474.65 W	8475.50	2.35
14615.00	89.57	269.27	6710.59	121.25 N	8568.64 W	8569.48	0.96
14710.00	89.63	268.36	6711.25	119.28 N	8663.62 W	8664.42	0.96
14804.00	89.48	269.49	6711.99	117.51 N	8757.60 W	8758.38	1.21
14898.00	90.37	271.30	6712.11	118.16 N	8851.59 W	8852.37	2.16
14992.00	91.30	270.91	6710.74	119.98 N	8945.56 W	8946.36	1.07
15086.00	89.38	271.43	6710.19	121.90 N	9039.54 W	9040.35	2.11
15181.00	90.46	271.35	6710.31	124.21 N	9134.51 W	9135.34	1.14
15275.00	87.96	272.50	6711.60	127.36 N	9228.44 W	9229.30	2.92
15370.00	88.21	271.93	6714.77	131.03 N	9323.31 W	9324.21	0.66
15465.00	88.80	271.20	6717.25	133.62 N	9418.24 W	9419.17	0.98
15560.00	89.78	270.80	6718.42	135.28 N	9513.22 W	9514.16	1.12
15654.00	91.05	270.06	6717.74	135.98 N	9607.21 W	9608.15	1.56
15749.00	88.74	269.23	6717.92	135.39 N	9702.20 W	9703.13	2.59
15843.00	89.17	268.70	6719.64	133.69 N	9796.17 W	9797.07	0.73
15938.00	89.63	267.48	6720.64	130.52 N	9891.11 W	9891.96	1.37
16032.00	90.74	266.83	6720.34	125.86 N	9984.99 W	9985.78	1.37
16150.00	92.19	265.34	6717.32	117.81 N	10102.67 W	10103.36	1.77
16215.00	92.19	265.34	6714.84	112.54 N	10167.41 W	10168.03	0.00

**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 CLOSURE OF 270.63 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.83 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16215.00 FEET  
IS 10168.03 FEET ALONG 270.63 DEGREES (GRID)**

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