

## PCGK Pressure Case Gamma

1 : 240

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	24-Jan-14	28-Jan-14			
<b>Rig Bit Number</b>	0100	0200			
<b>Bit Size (in)</b>	8.750	6.125			
<b>Tool Nominal OD (in)</b>	6.750	4.750			
<b>Log Start Depth (MD, ft)</b>	1,024.00	7,720.00			
<b>Log End Depth (MD, ft)</b>	7,720.00	11,876.00			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	21-Jan-14 15:00	25-Jan-14 15:38			
<b>Drill/Wipe End Date and Time</b>	23-Jan-14 14:19	28-Jan-14 00:39			
<b>Min Inc (deg) @ Depth (MD, ft)</b>	N/A @ N/A	87.22 @ 10,324.00			
<b>Max Inc (deg) @ Depth (MD, ft)</b>	N/A @ N/A	93.83 @ 7,945.00			
<b>Bit TFA(in2) / Bit Type</b>	1.18 / PDC	0.98 / PDC			
<b>Flow Rate (gpm)</b>	593.65	300.00			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	N/A / N/A	N/A / N/A			
<b>Fluid Type</b>	Native/Spud Mud	Native/Spud Mud			
<b>Density (ppg) / Viscosity (spqt)</b>	8.40 / 30.00	9.50 / 44.00			
<b>Filtrate CL (ppm)</b>	1,500.00	15,000.00			
<b>pH / Fluid Loss (mptm)</b>	8.80 / 18	9.00 / 3			
<b>PV (cP) / YP (lbf2)</b>	1 / 4.00	10 / 20.00			
<b>% Solids / % Sand</b>	8.7 / 0.25	6.7 / 1.00			
<b>% Oil / Oil:Water Ratio</b>	1.5 / 89.85	9 / 91			
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A			
<b>Min Tool Temp (in F) / S</b>	474.00 / PDM	210.40 / PDM			

Max Tool Temp (degF) / Source	171.20 / PCM	213.40 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Reuben Edgington	Reuben Edgington			
Customer Representative	Sam Taylor	Sam Taylor			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341320	12334775			
Insert Serial Number	11680724	11227549			
Date and Time Initialized	20-Jan-14 22:33	25-Jan-14 07:13			
Date and Time Read	24-Jan-14 12:39	28-Jan-14 17:41			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	44.46	43.09			
Software Version	6.21	6.21			
Sub Serial Number	11341320	11833232			
Sonde Serial Number	11062085	11833232			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	225.32	202.36			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.40	48.02			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341320	11579787			
Insert/Sonde Serial Number	11681026	11579787			

## REMARKS

1. All depths are Measured depths, referenced the Driller's pipe tally and are measure from the drill floor, unless otherwise speci fied.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular 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 speci fied.
5. The following smoothing parameters have been applied to the data:

PGRC (Corrected Gamma Ray):  
Interval Resolution: 0.5ft  
Interval Distance: 0.6ft  
Gap Fill: 3.0ft

ROPA (Average Rate of Penetration):  
Interval Resolution: 0.5ft  
Interval Distance: 1.2ft  
Gap Fill: 3.0ft

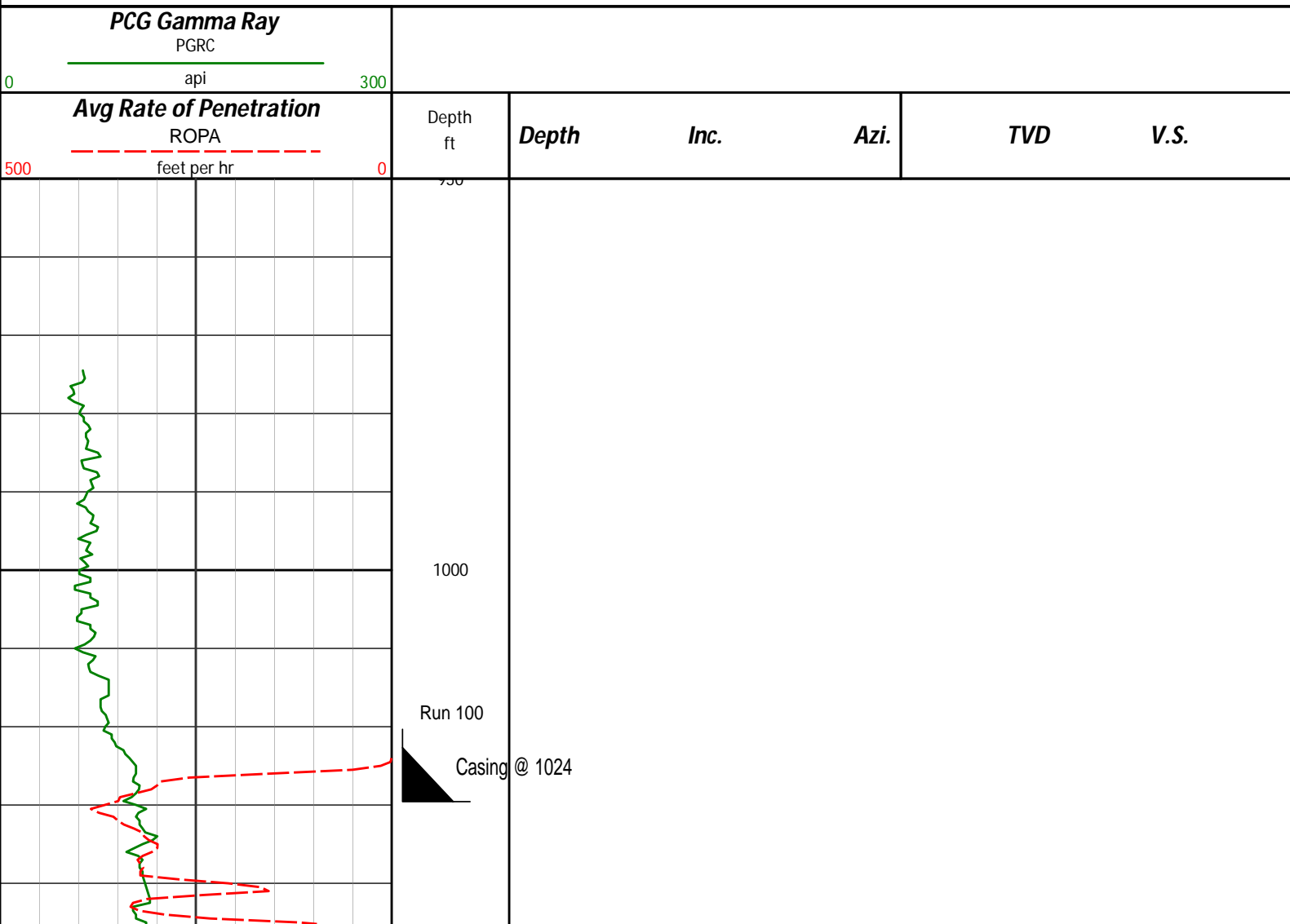
INSITE Version 8.0 b38

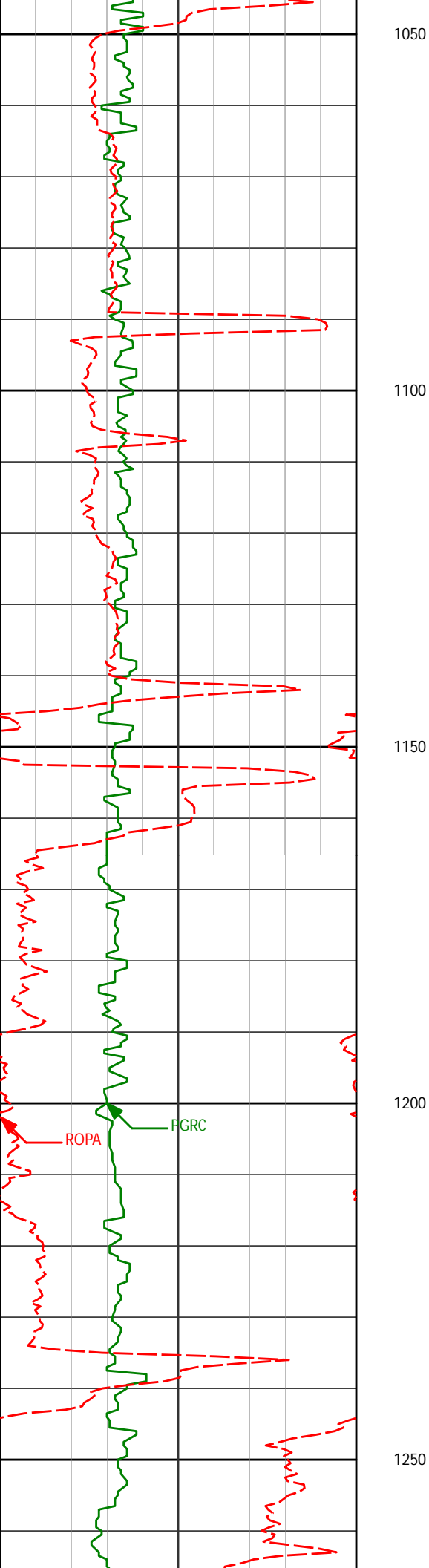
WARRANTY

## WARRANT 1

**HALLIBURTON**  
**Sperry Drilling Services**  
TVD Main Log 1:240

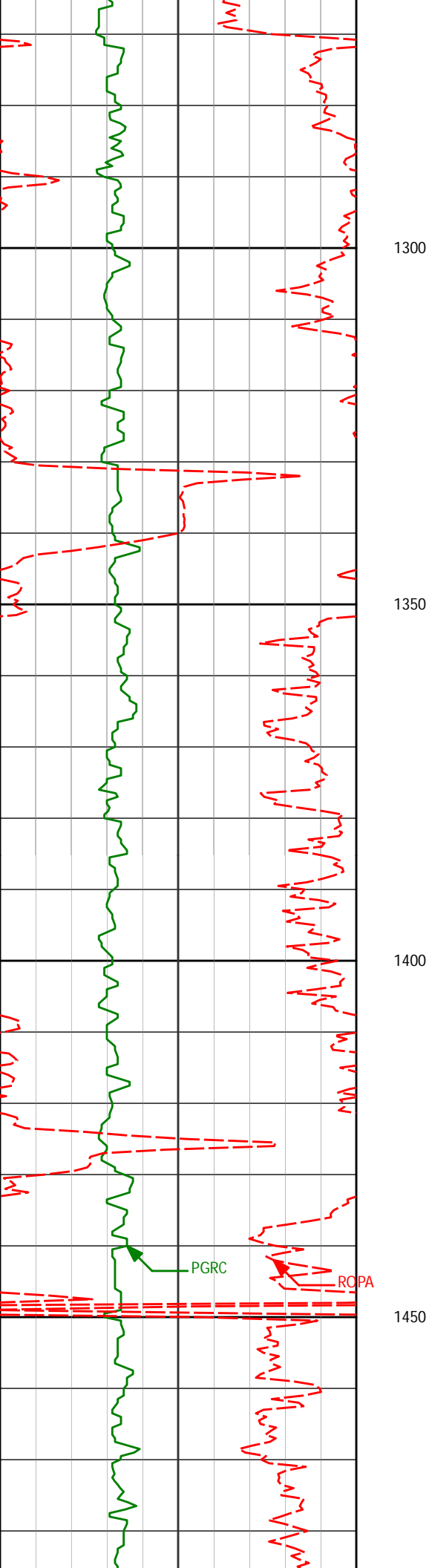
Anadarko  
Dreiling 27C-32HZ  
Ensign 132  
Sec. 32-T2N-R65W





1097'	0.13°	311.79°	1096.95'	-3.81'
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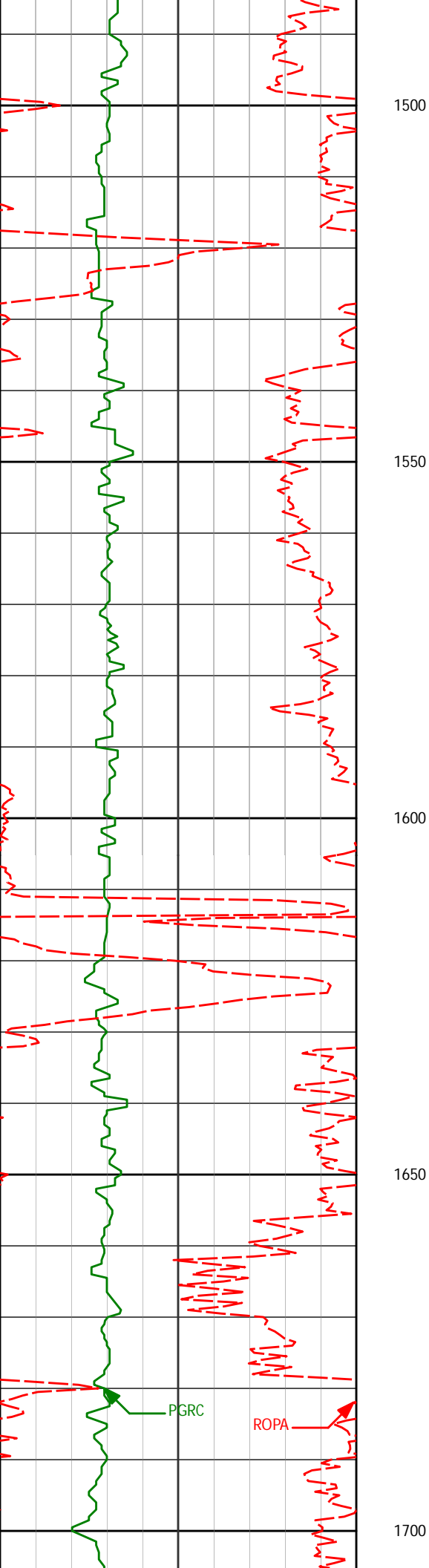
1192'	0.13°	115.48°	1191.95'	-3.79'
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1287'	0.06°	120.67°	1286.95'	-3.86'
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1381'	0.22°	41.48°	1380.95'	-3.75'
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1478'	0.28°	21.08°	1477.95'	-3.39'
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1572'

0.03°

214.45°

1571.95'

-3.20'

1600

1650

1667'

0.15°

333.04°

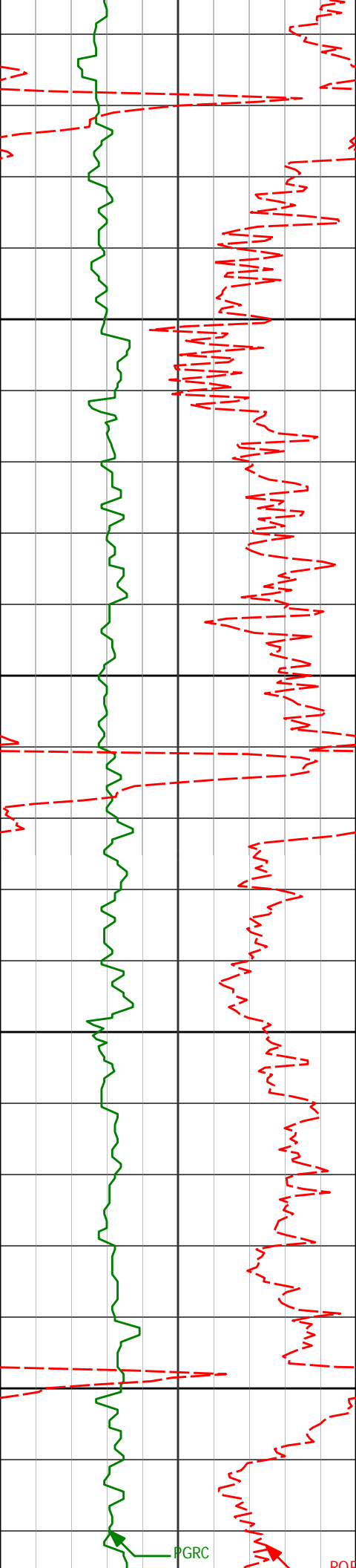
1666.95'

-3.11'

PGRC

ROPA

1700



1750

1800

1850

1900

1761'

0.03°

244.71°

1760.95'

-3.01'

1855'

0.06°

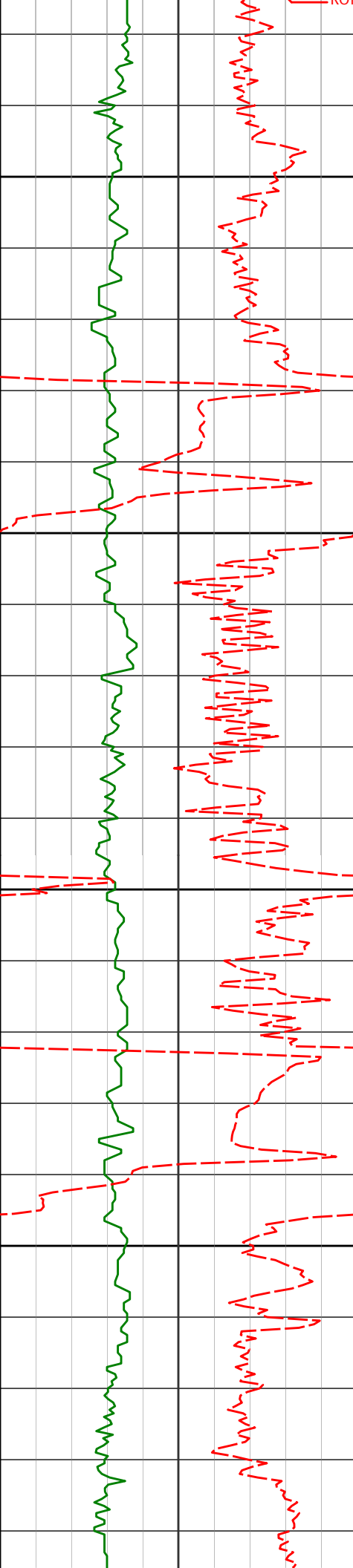
182.14°

1854.95'

-3.07'

PGRC

POBA



1950

2000

2050

2100

2043'

1.91°

240.78°

2042.91'

-4.69'

2138'

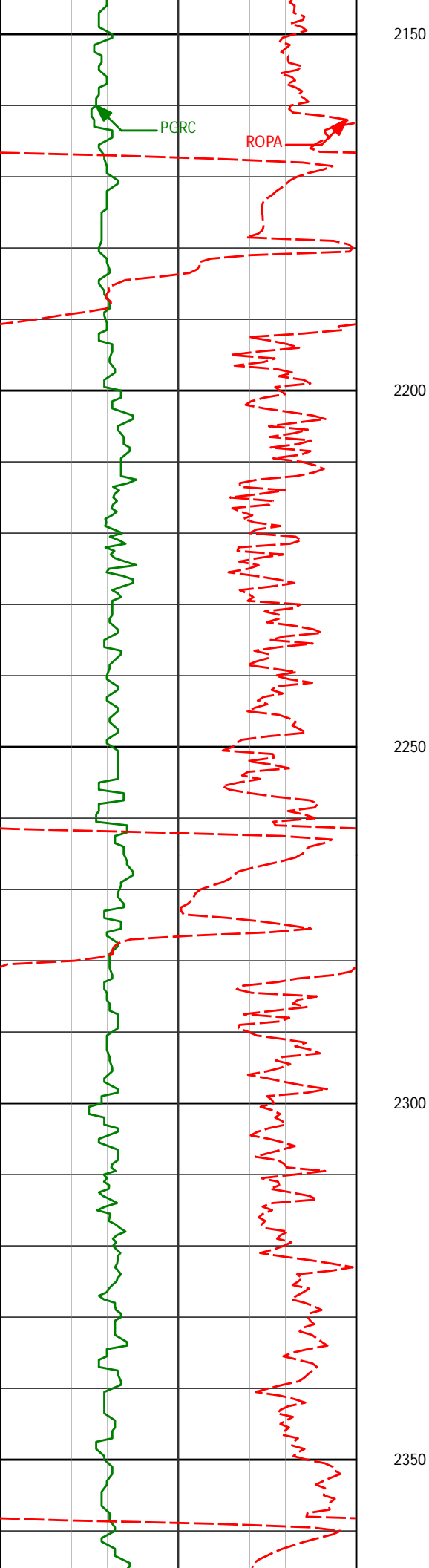
3.47°

231.63°

2137.80'

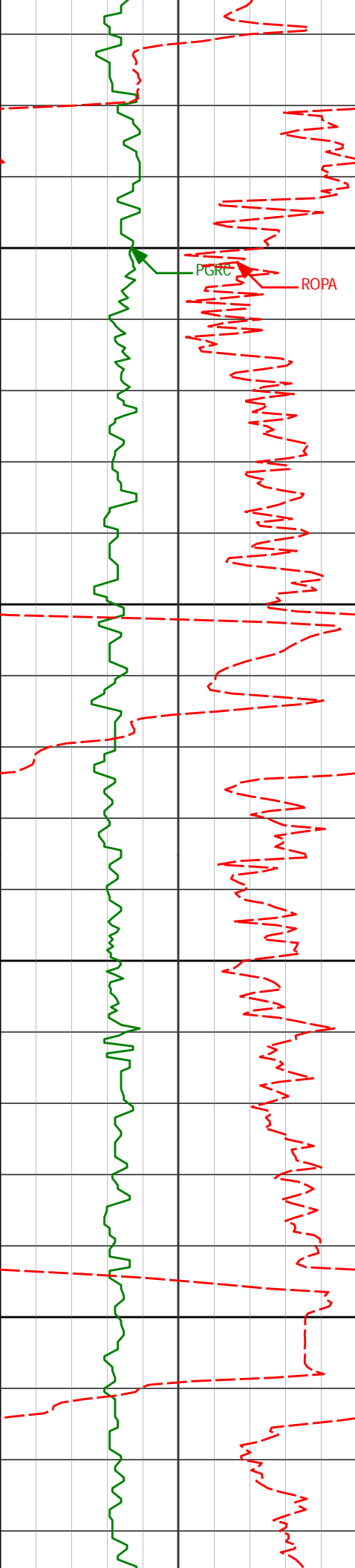
-7.25'





2231'	5.20°	225.66°	2230.54'	-11.95'
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2325'	6.93°	228.47°	2324.01'	-18.68'
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2400

2419'

7.86°

225.16°

2417.22'

-26.97'

2450

2500

2513'

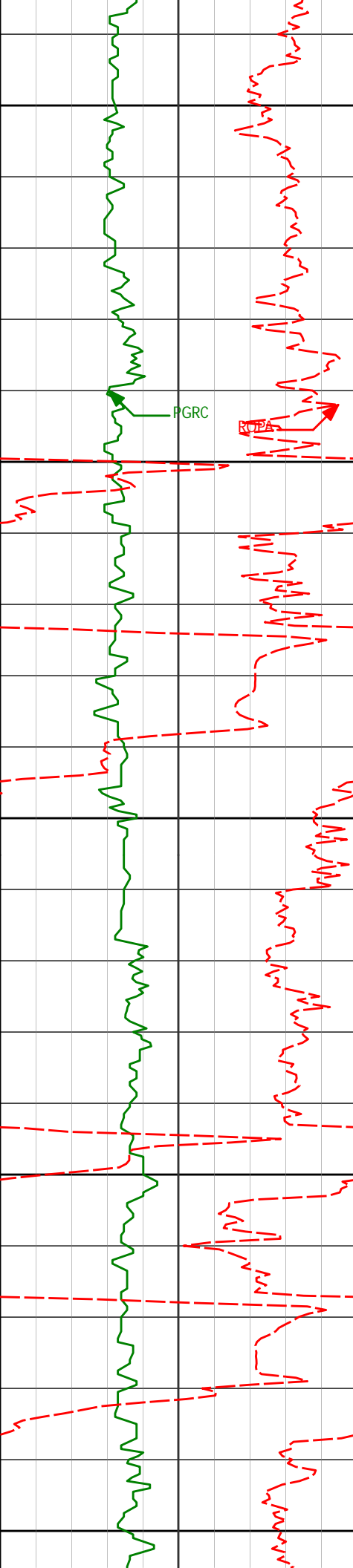
9.08°

216.35°

2510.20'

-37.48'

2550



2600

2607'

9.81°

206.74°

2602.93'

-50.61'

2650

2700

2702'

11.30°

212.29°

2696.32'

-65.71'

2750

2800

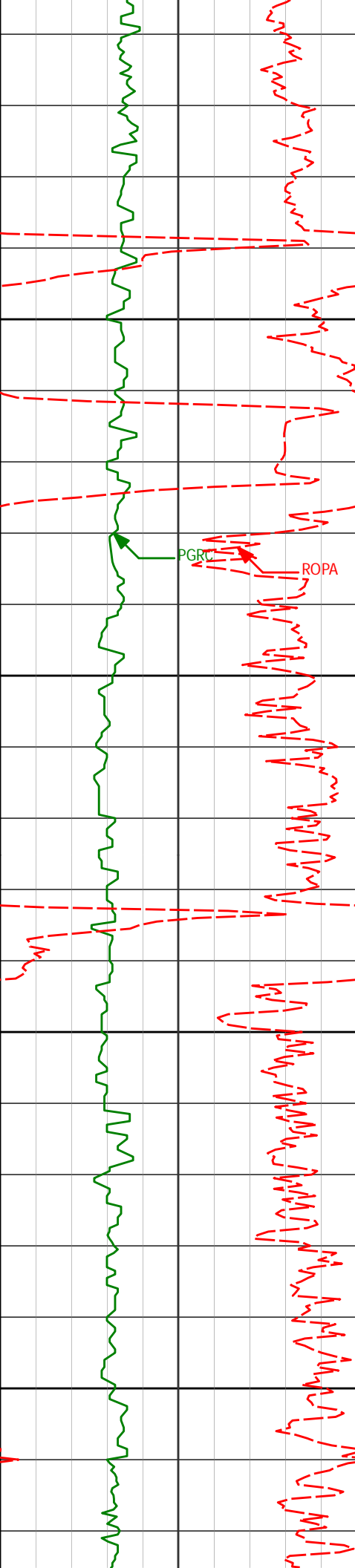
2796'

12.11°

213.09°

2788.37'

-81.75'



2850

2900

2950

3000

2890'

12.46°

215.60°

2880.22'

-98.26'

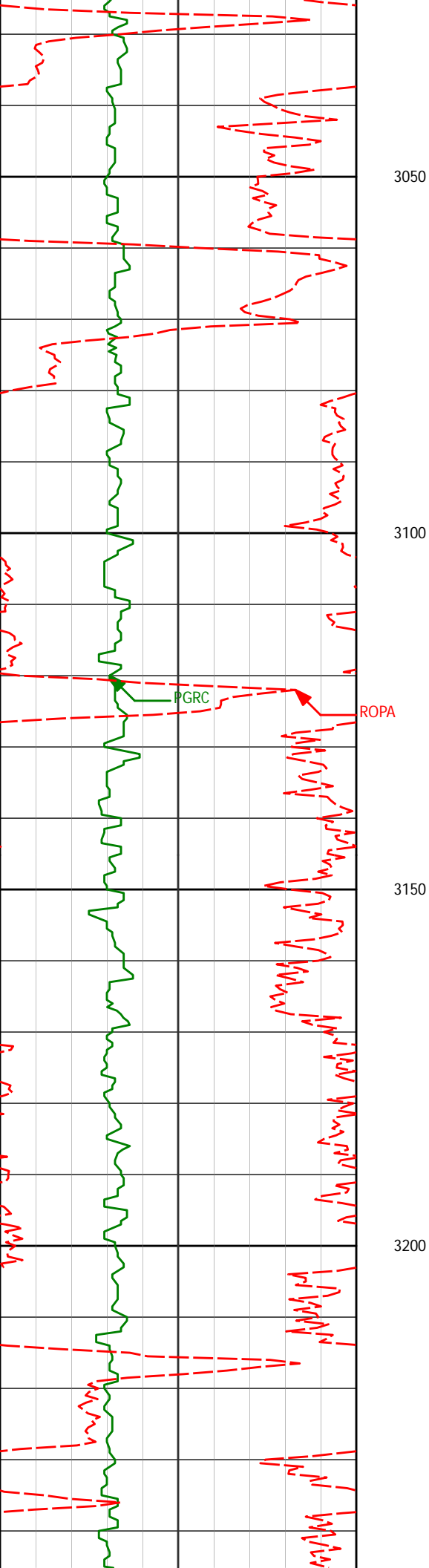
2985'

12.10°

215.75°

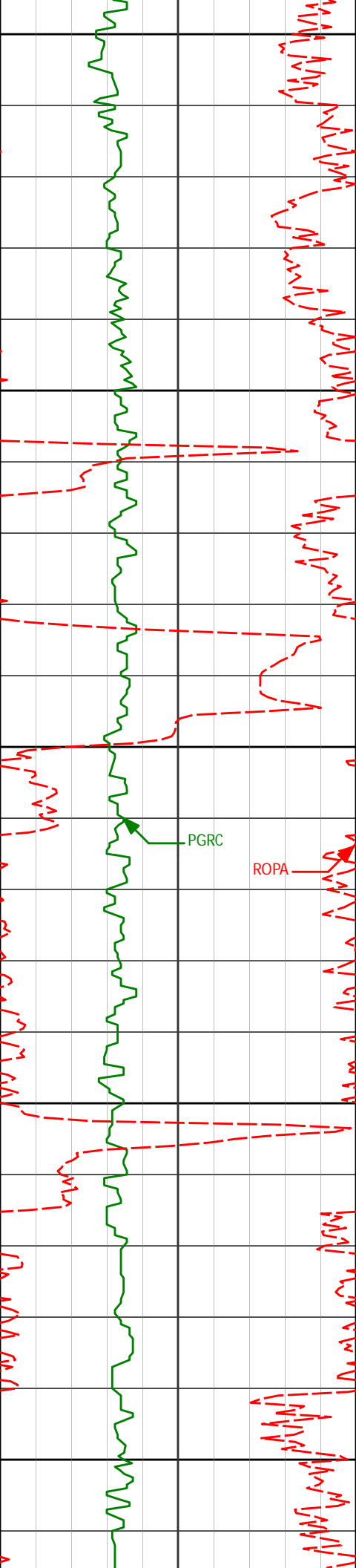
2973.04'

-114.67'



3079'      13.19°      217.70°      3064.76'      -131.15'

3174'      12.59°      218.83°      3157.37'      -147.80'



3250

3268'

12.17°

219.88°

3249.18'

-163.38'

3300

3350

3362'

13.30°

218.66°

3340.87'

-179.43'

3400

3450

3457'

12.52°

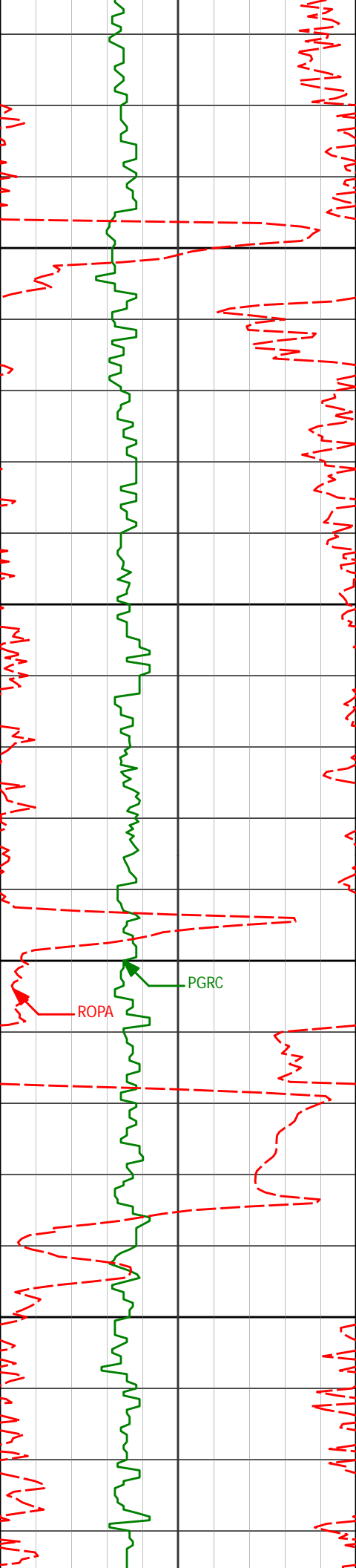
219.88°

3433.47'

-195.86'

PGRC

ROPA



3500

3550

3600

3650

3552'

10.99°

219.26°

3526.47'

-210.78'

ROPA

PGRC

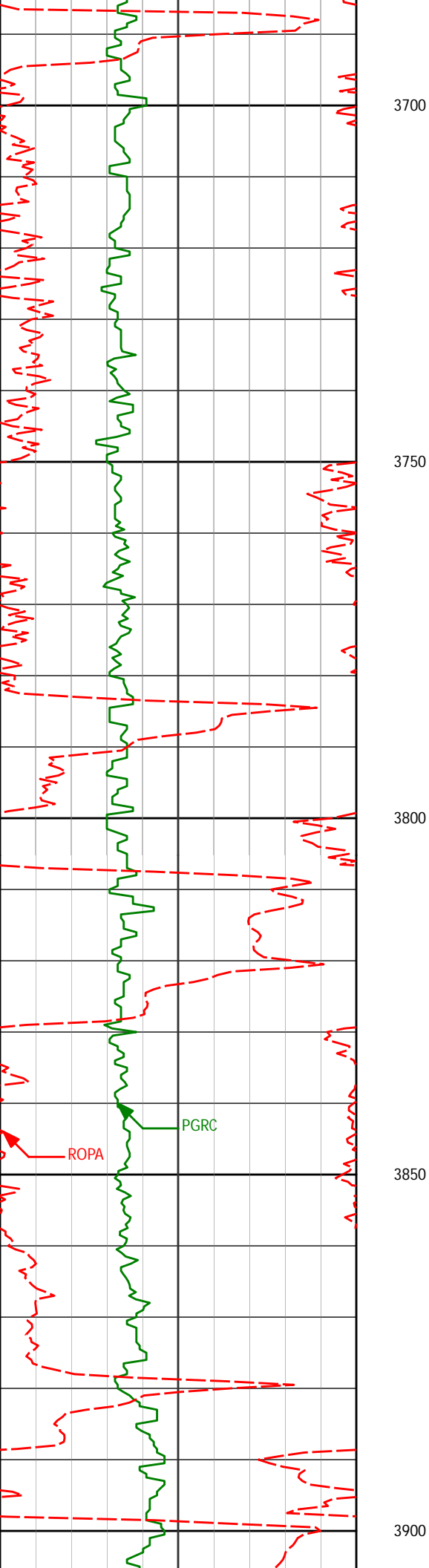
3647'

12.37°

220.73°

3619.50'

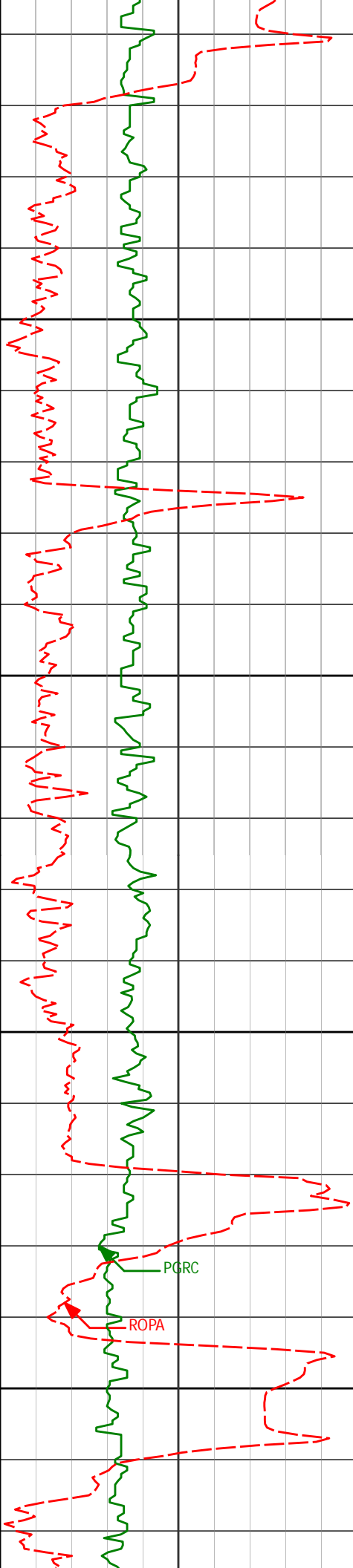
-225.50'



3742' 11.53° 220.26° 3712.44' -240.46'

3837' 12.06° 224.51° 3805.44' -254.78'





3932'	12.32°	222.91°	3898.30'	-269.28'
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3950

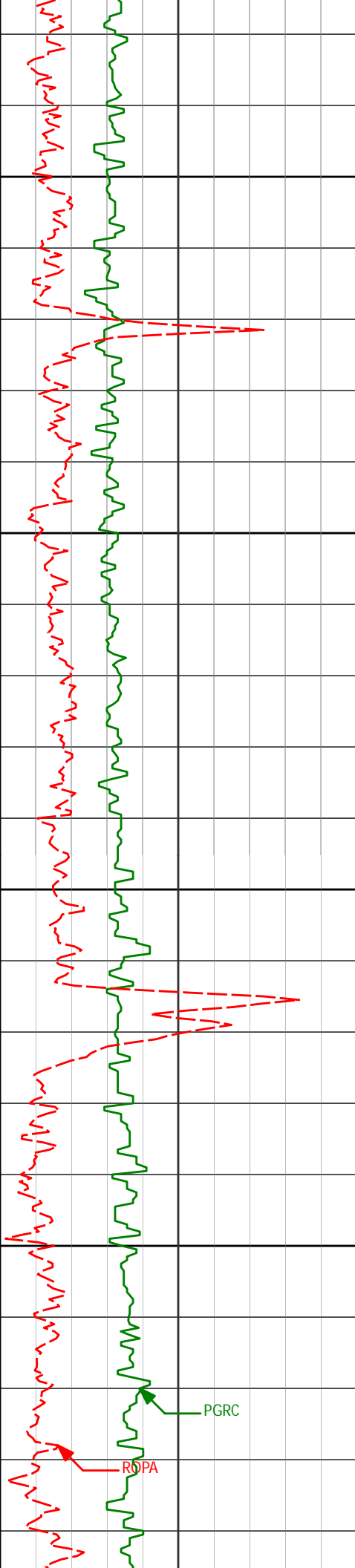
4000

4028'	11.83°	224.28°	3992.17'	-283.83'
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4050

4100

4123'	12.91°	220.54°	4084.97'	-298.86'
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4150

4200

4250

4300

4218'

13.51°

220.95°

4177.45'

-315.31'

4313'

13.01°

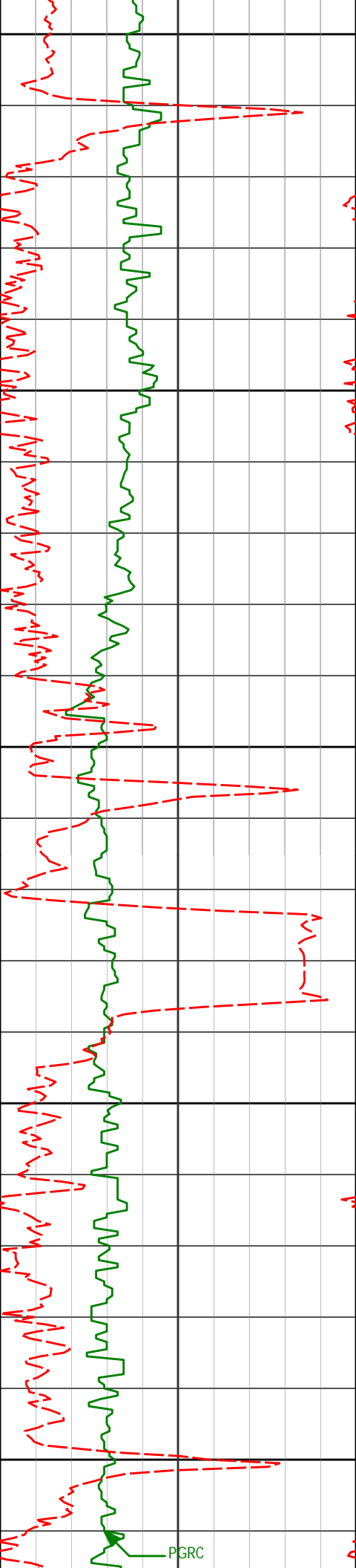
221.90°

4269.92'

-331.65'

PGRC

ROPA



4350

4400

4450

4500

4550

PGRC

4408'

12.10°

222.55°

4362.65'

-346.94'

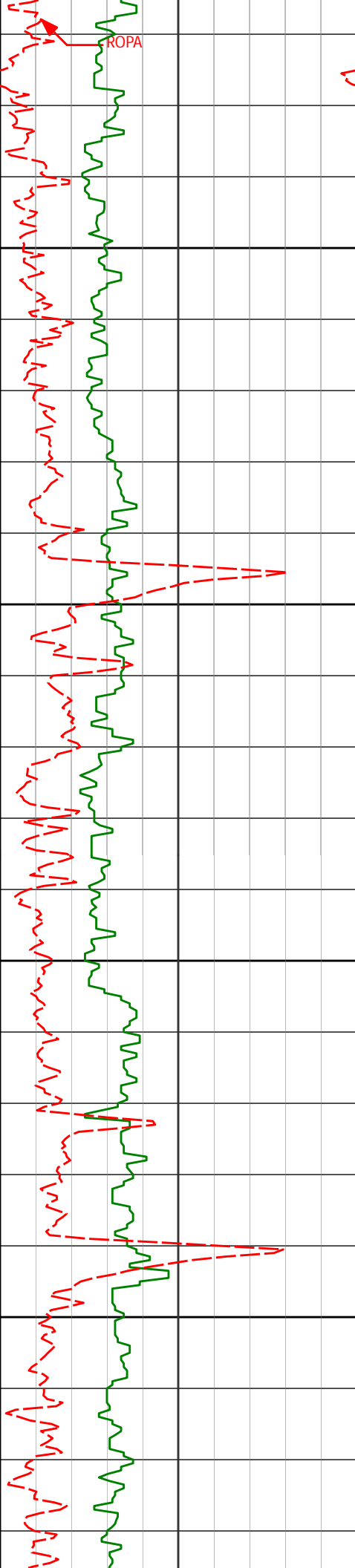
4503'

13.15°

218.66°

4455.35'

-362.72'



4600

4650

4700

4750

4598'

12.85°

217.42°

4547.92'

-379.55'

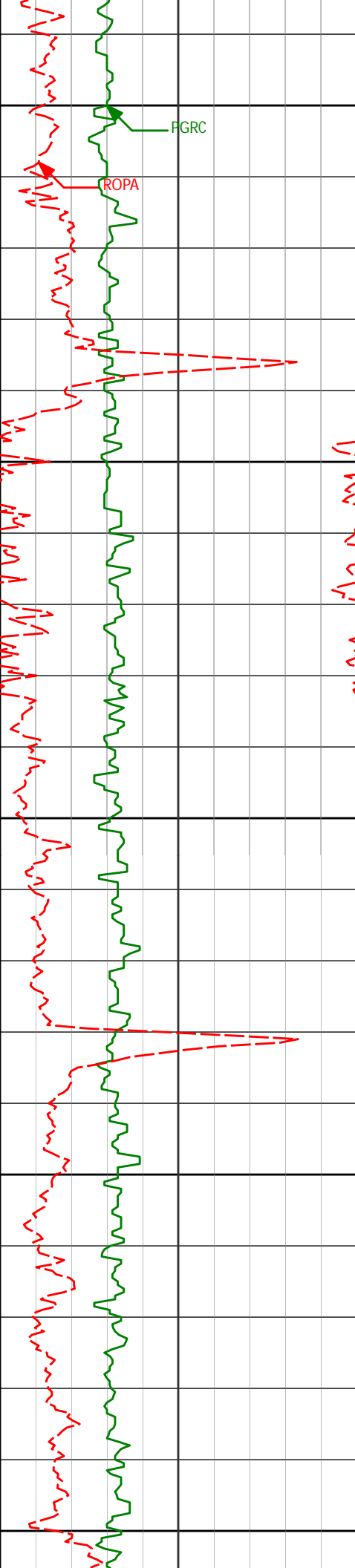
4694'

12.35°

218.63°

4641.60'

-396.05'



4789'

12.52°

220.55°

4734.37'

-411.81'

4800

FGRC

ROPA

4850

4884'

12.37°

220.55°

4827.14'

-427.36'

4900

4950

4979'

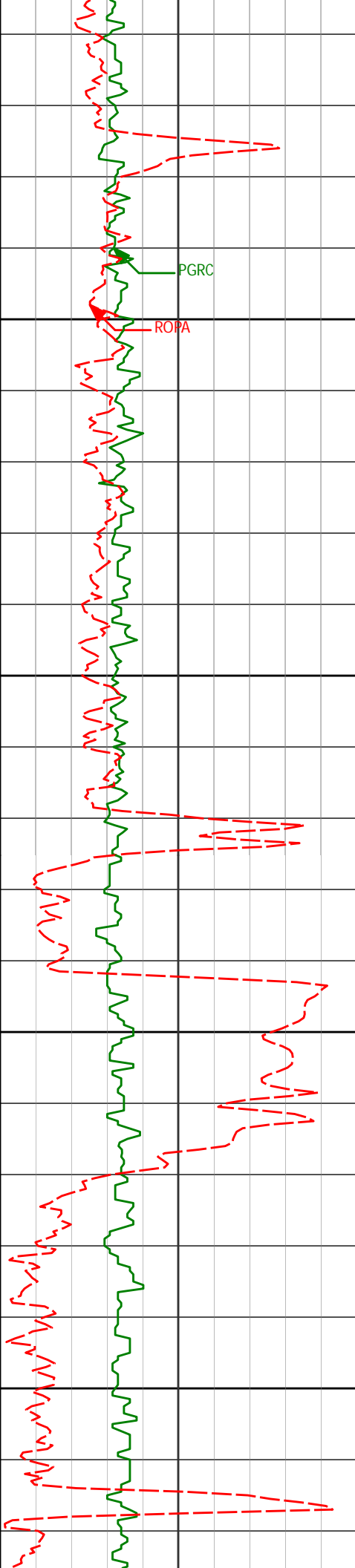
11.09°

222.46°

4920.16'

-441.83'

5000



5050

5074'

10.42°

223.98°

5013.49'

-454.76'

5100

5150

5169'

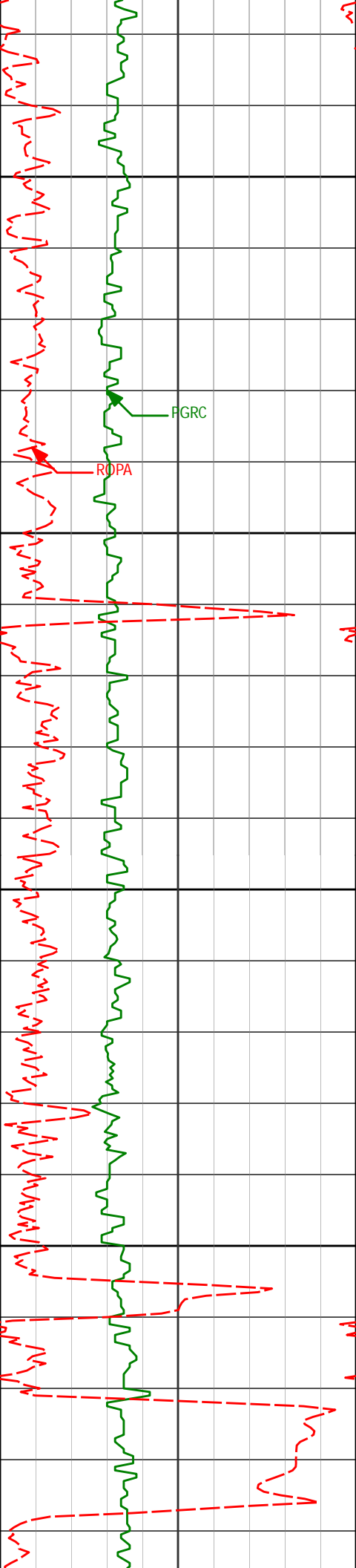
11.88°

218.17°

5106.70'

-468.63'

5200



5250

5264'

11.12°

218.94°

5199.79'

-483.44'

FGRC

ROPA

5300

5350

5359'

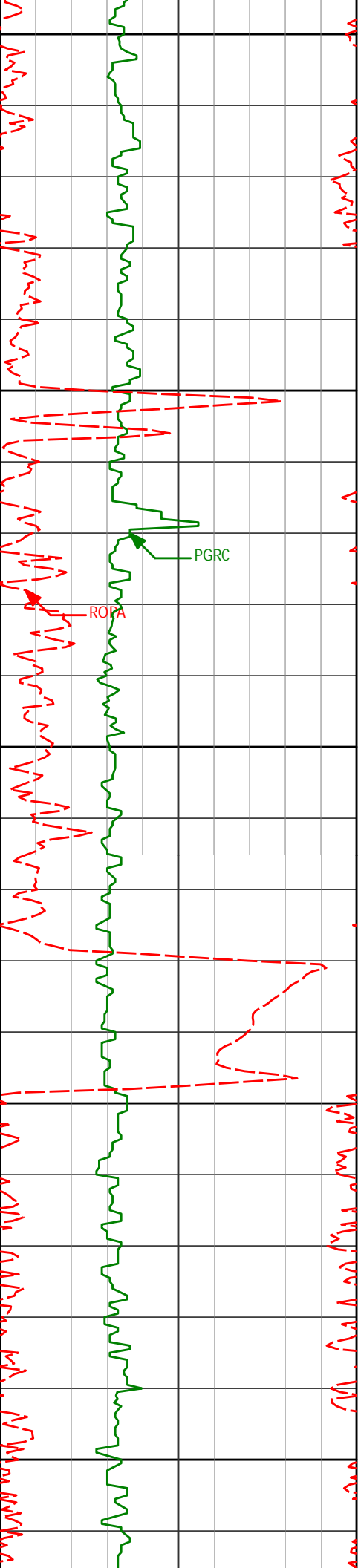
10.55°

220.00°

5293.09'

-497.23'

5400



5450

5454'

11.34°

217.62°

5386.37'

-511.29'

5500

PGR

ROPA

5550

5600

5650

5644'

11.43°

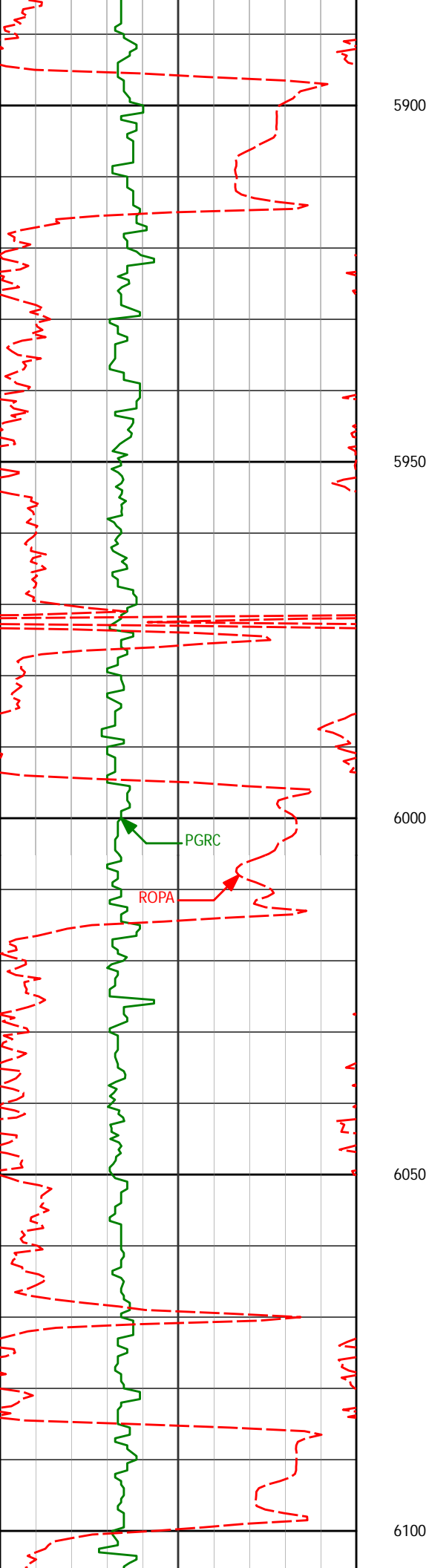
217.09°

5572.63'

-541.10'

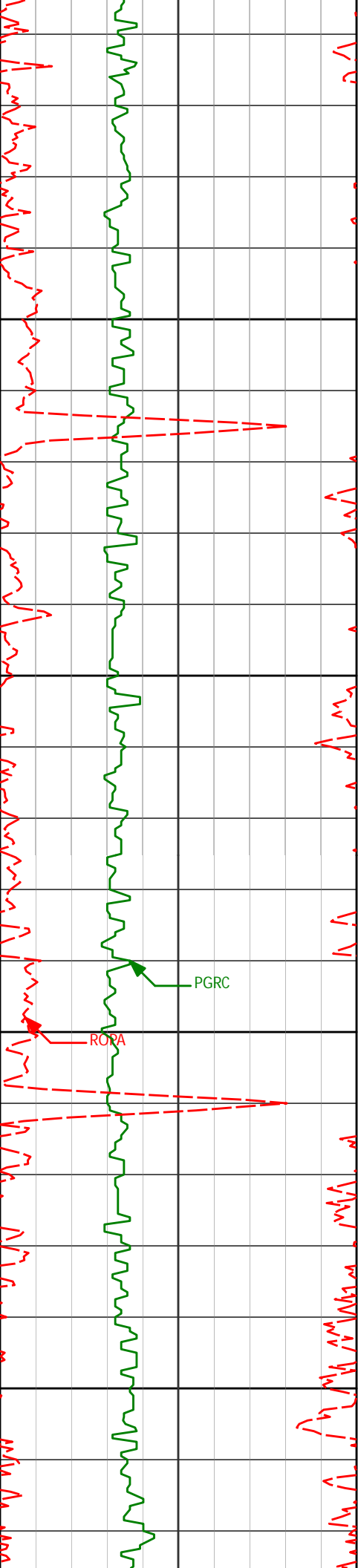






5928' 10.83° 211.91° 5852.08' -583.20'

6023' 10.55° 208.26° 5945.43' -598.43'



6118'

10.87°

209.31°

6038.78'

-613.90'

6150

6200

6213'

9.10°

209.24°

6132.33'

-628.27'

PGRC

ROPA

6250

6300

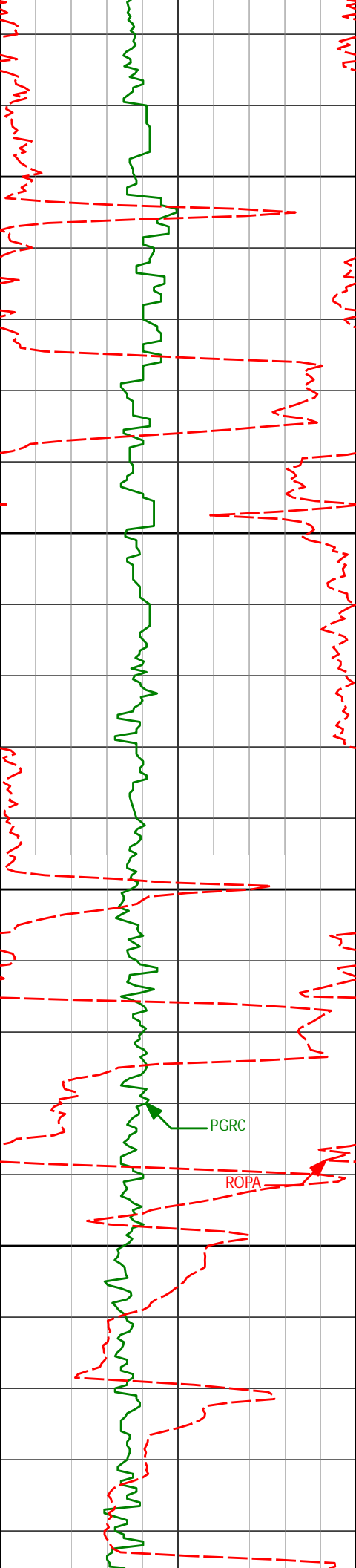
6307'

7.23°

207.36°

6225.38'

-640.01'



6350

6400

6450

6500

6402'

5.09°

219.05°

6319.83'

-648.60'

PGRC

ROPA

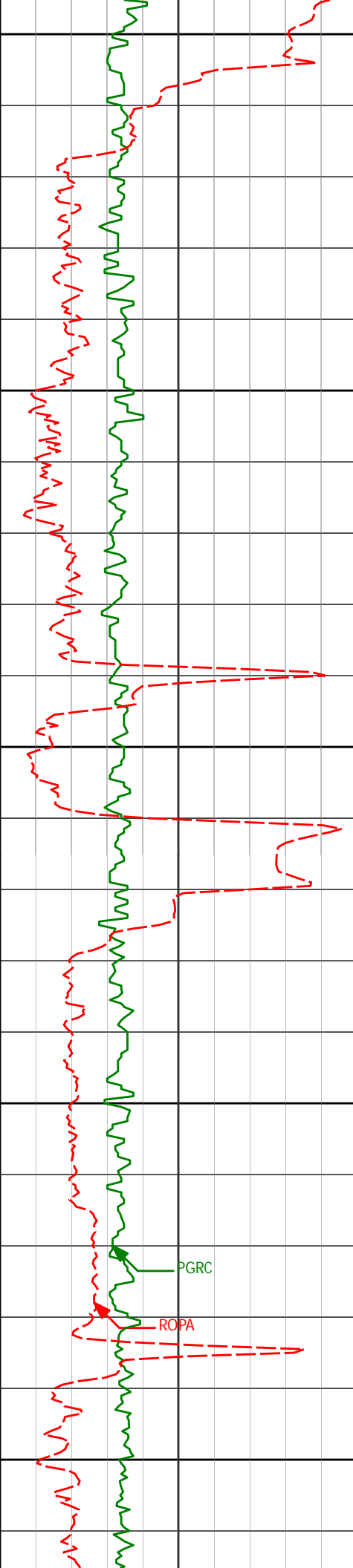
6497'

3.64°

237.48°

6414.55'

-653.49'



6550

6592'

2.21°

262.46°

6509.43'

-655.35'

6600

6650

6687'

1.63°

284.45°

6604.38'

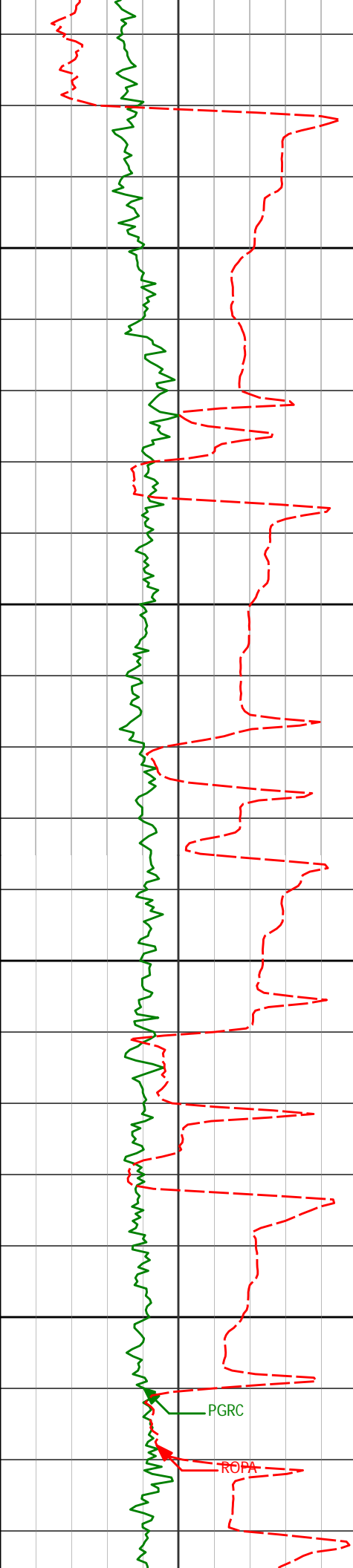
-655.26'

6700

6750

PGRC

ROPA



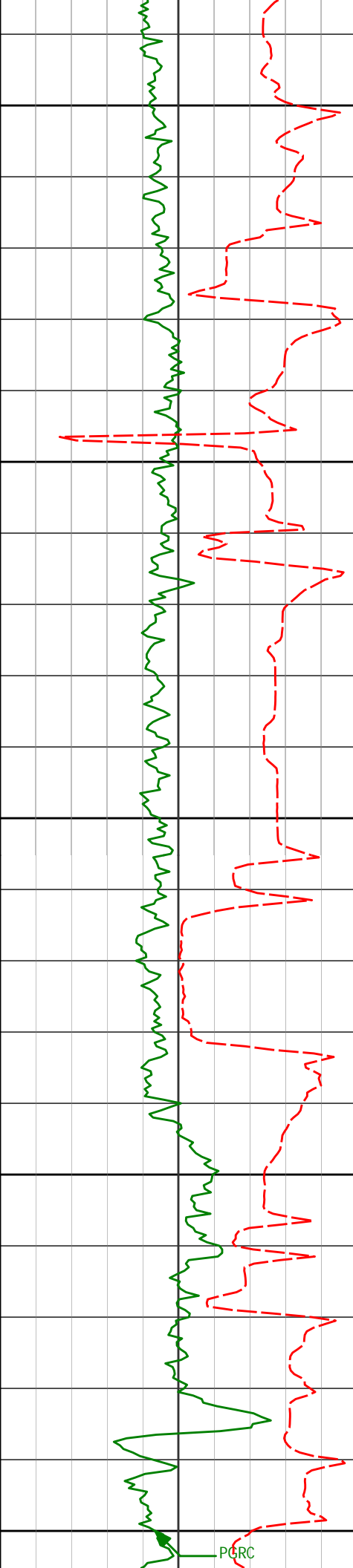
6800

6850

6900

6950

6782'	2.73°	325.71°	6699.31'	-653.05'
6830'	8.93°	343.87°	6747.05'	-648.52'
6877'	14.07°	342.76°	6793.09'	-639.55'
6925'	16.36°	346.89°	6839.40'	-627.40'
6972'	19.84°	352.03°	6884.07'	-613.05'



7000

7020'

23.82°

355.79°

6928.62'

-595.30'

7050

7067'

30.51°

358.33°

6970.42'

-573.89'

7100

7115'

36.60°

0.13°

7010.40'

-547.37'

7150

7162'

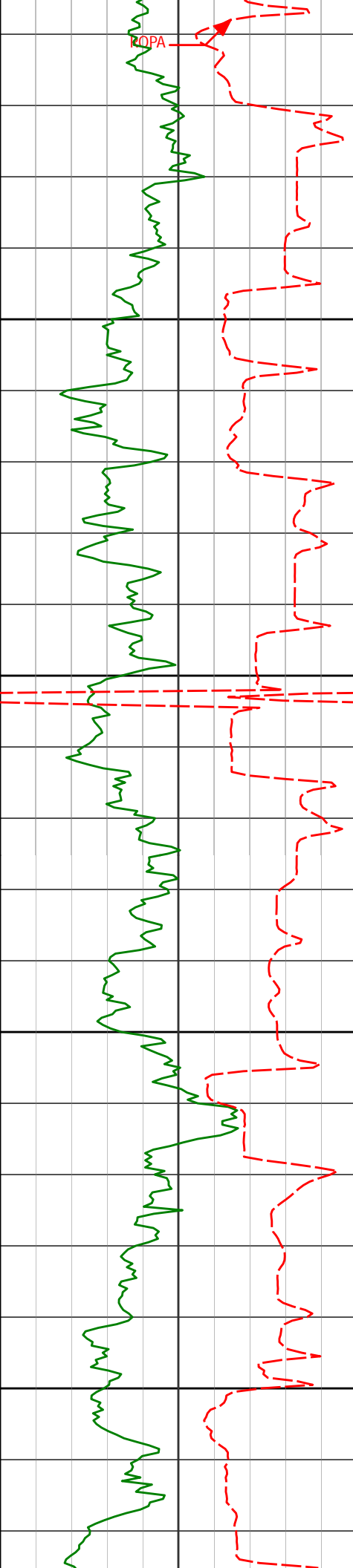
40.09°

358.92°

7047.26'

-518.22'

7200



7250

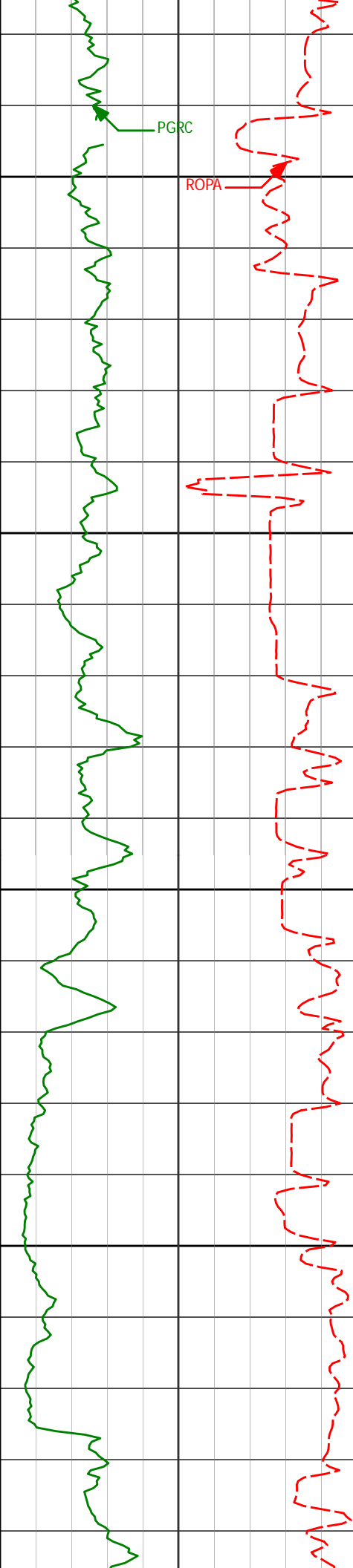
7300

7350

7400

7210'	44.79°	357.03°	7082.67'	-485.86'
7257'	48.01°	356.58°	7115.08'	-451.89'
7305'	51.57°	356.70°	7146.06'	-415.30'
7353'	59.57°	357.25°	7173.18'	-375.79'
7401'	64.49°	359.37°	7195.69'	-333.43'





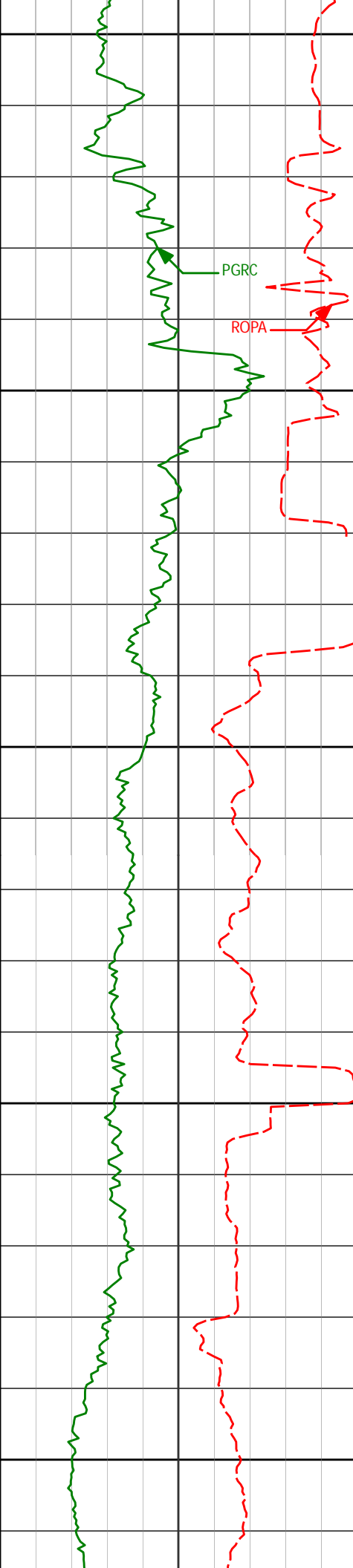
7450

7500

7550

7600

7448'	68.11°	0.24°	7214.58'	-290.41'
7496'	71.33°	0.85°	7231.21'	-245.39'
7543'	73.72°	1.45°	7245.32'	-200.57'
7591'	77.07°	3.12°	7257.43'	-154.17'
7638'	81.99°	2.54°	7265.96'	-108.02'



7650

7670'

85.74°

2.62°

7269.38'

-76.24'

7700

7" Casing Shoe @ 7710' MD

7750

7755'

90.83°

2.04°

7271.93'

8.62'

7800

7850

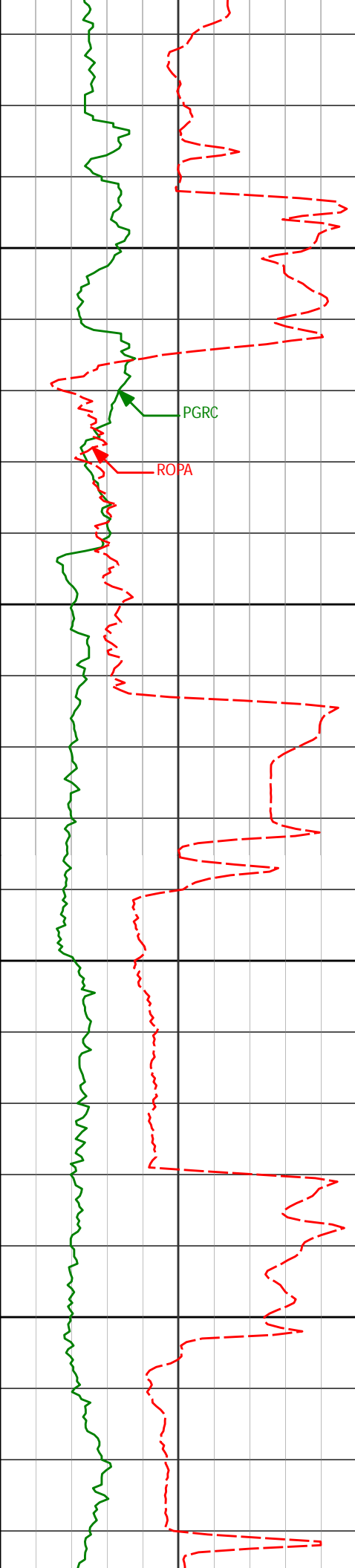
7850'

92.47°

2.78°

7269.19'

103.49'



7900

7945'

93.83°

1.71°

7263.97'

198.27'

7950

8000

8050

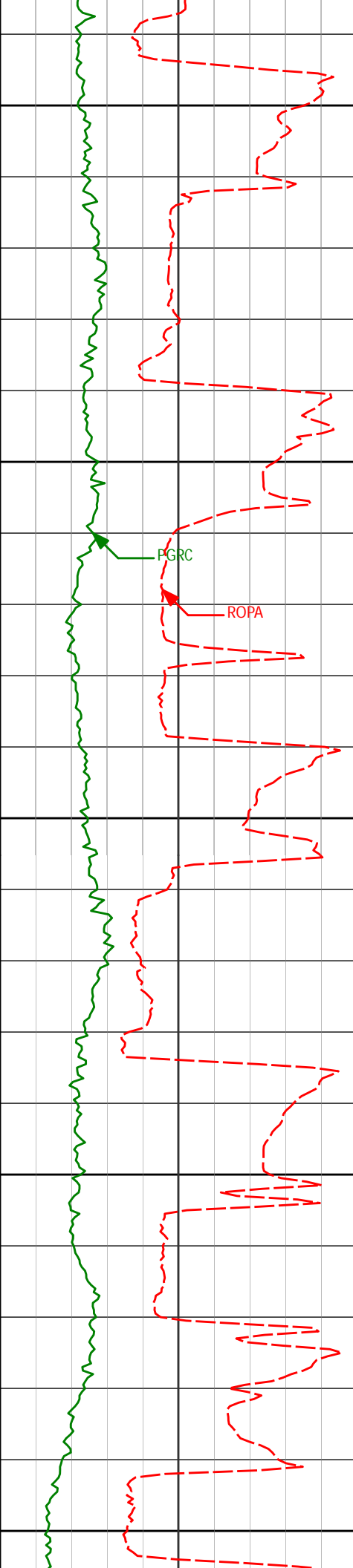
8050'

92.44°

1.94°

7258.23'

303.06'



8100

8135'

91.82°

1.62°

7255.07'

387.96'

8150

PGRC

ROPA

8200

8230'

91.57°

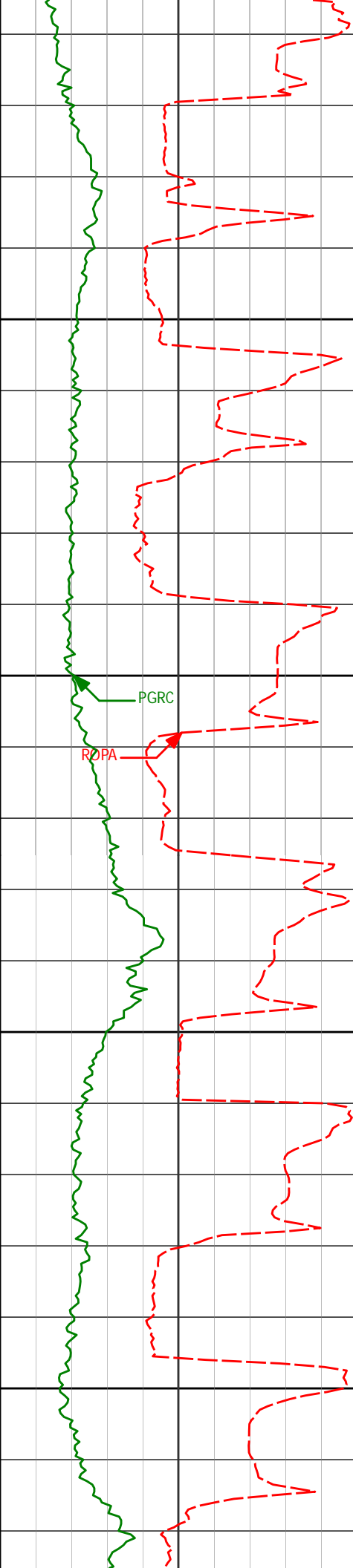
358.98°

7252.26'

482.91'

8250

8300



8326'	90.09°	357.72°	7250.87'	578.85'
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8350

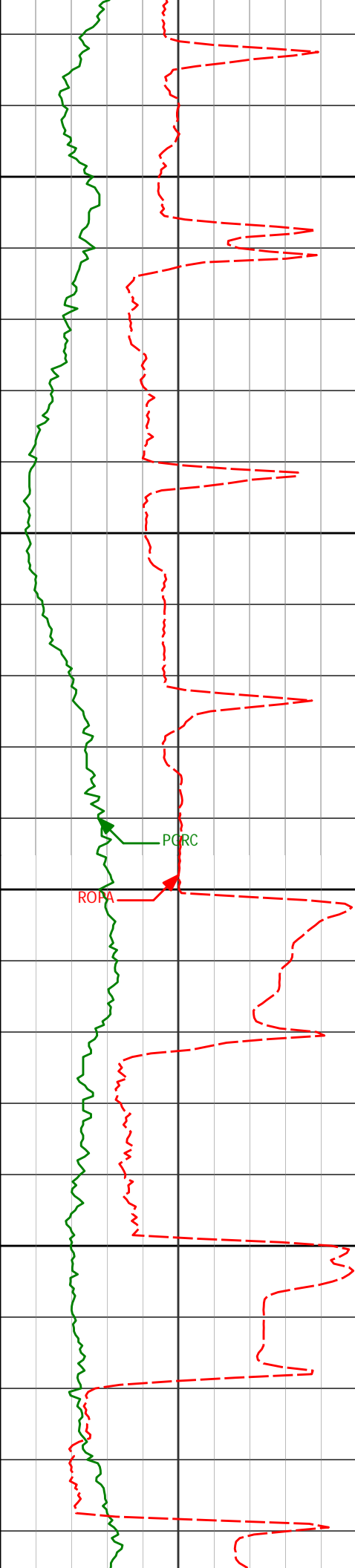
8400

8421'	90.03°	355.65°	7250.77'	673.69'
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8450

8500

8516'	87.29°	357.92°	7252.99'	768.50'
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8550

8600

8650

8700

8611'

90.00°

358.94°

7255.24'

863.43'

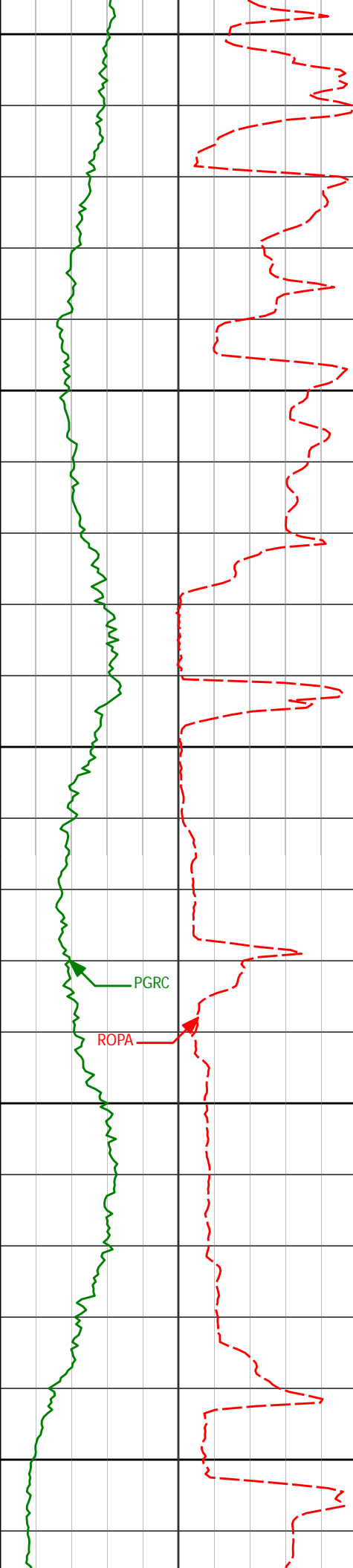
8706'

90.77°

359.00°

7254.60'

958.41'



8750

8800

8850

8900

8950

8801'

90.65°

359.33°

7253.42'

1053.39'

PGRC

ROPA

8896'

90.46°

359.62°

7252.50'

1148.38'



9000

9023'

91.17°

0.07°

7250.70'

1275.37'

9050

9087'

90.34°

359.39°

7249.85'

1339.36'

9100

9150

9182'

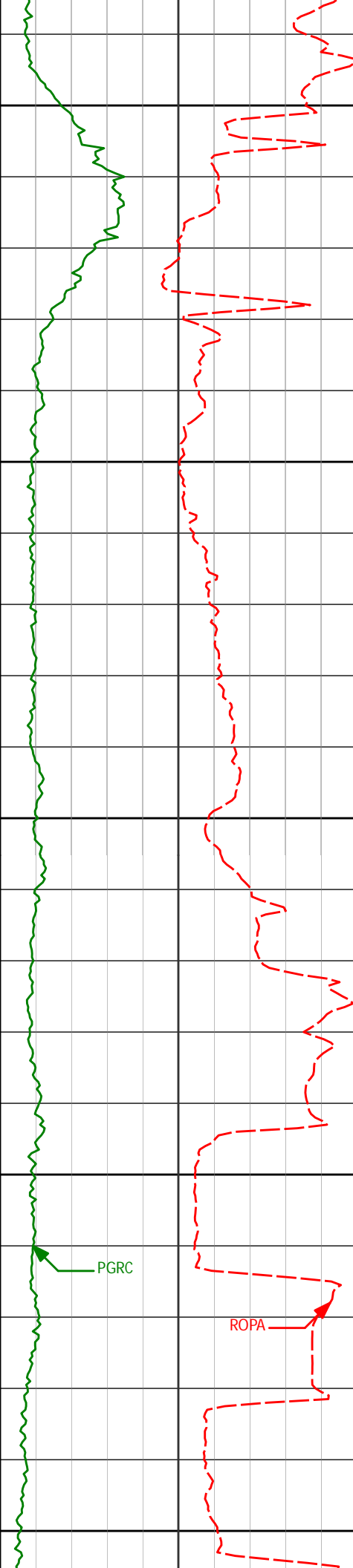
87.69°

1.63°

7251.49'

1434.33'





9200

9250

9300

9350

9400

9277'

89.29°

2.23°

7253.99'

1529.24'

9372'

88.86°

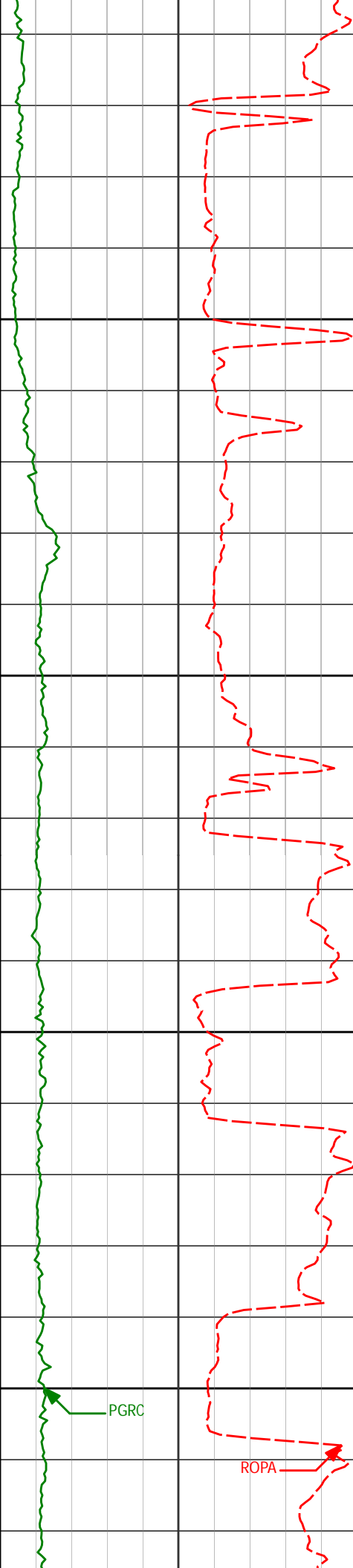
1.34°

7255.52'

1624.18'

PGRC

ROPA



9450

9500

9550

9600

9467'

88.80°

1.18°

7257.46'

1719.14'

9562'

90.71°

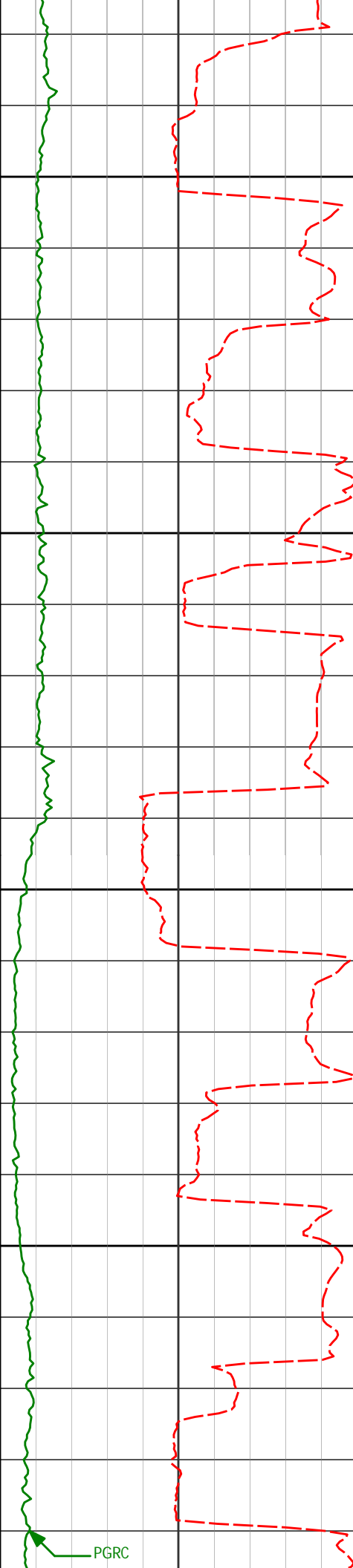
1.66°

7257.87'

1814.10'

PGRC

ROPA



9650

9657'

90.25°

1.33°

7257.07'

1909.06'

9700

9750

9753'

89.29°

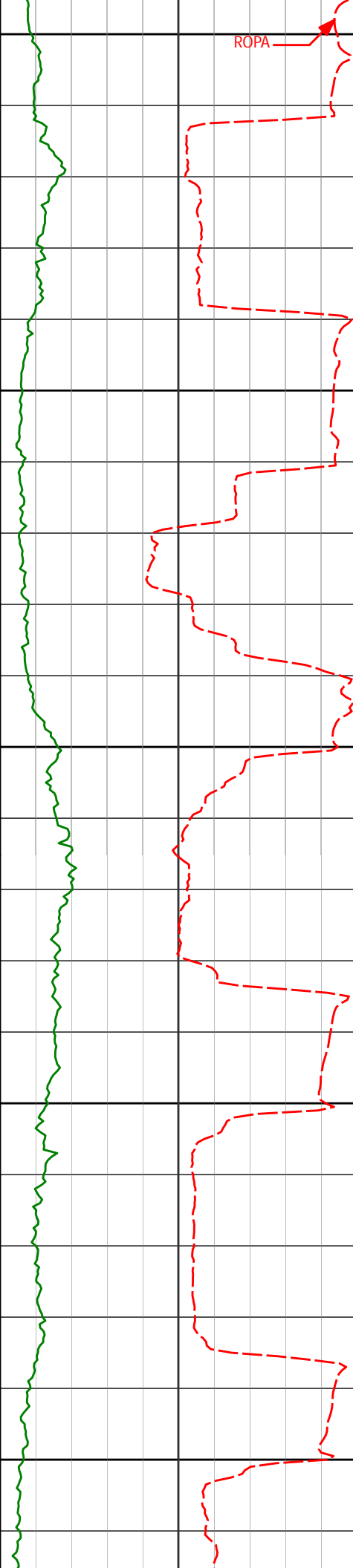
359.92°

7257.46'

2005.05'

9800

PGRC



9850

9900

9950

10000

10050

9848'	88.61°	359.57°	7259.20'	2100.04'
9943'	88.00°	358.95°	7262.01'	2194.99'
10038'	87.87°	359.13°	7265.43'	2289.91'



10100

10150

10200

10250

10134'

89.17°

359.31°

7267.91'

2385.87'

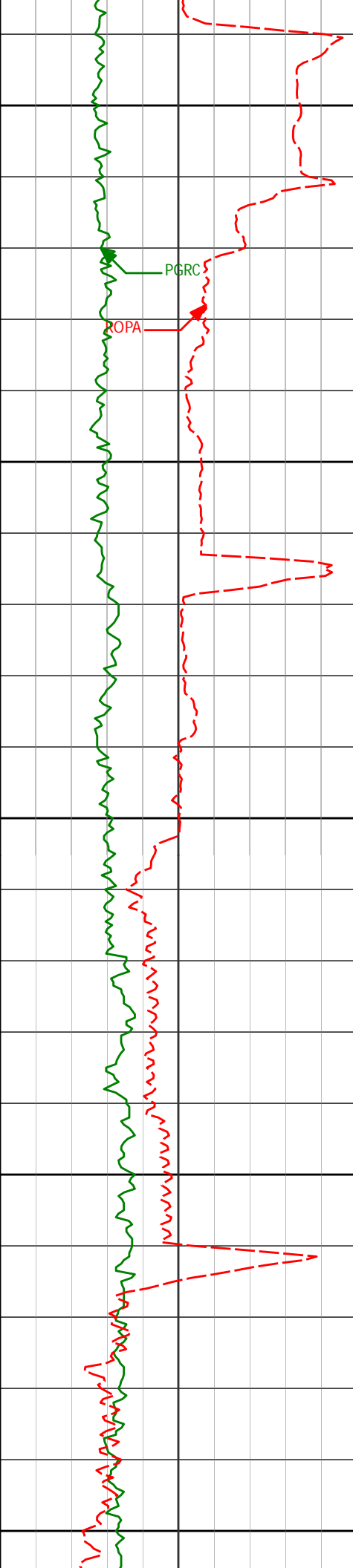
10229'

88.98°

359.54°

7269.45'

2480.85'



10300

10324'

87.22°

359.25°

7272.60'

2575.79'

10350

10400

10419'

87.99°

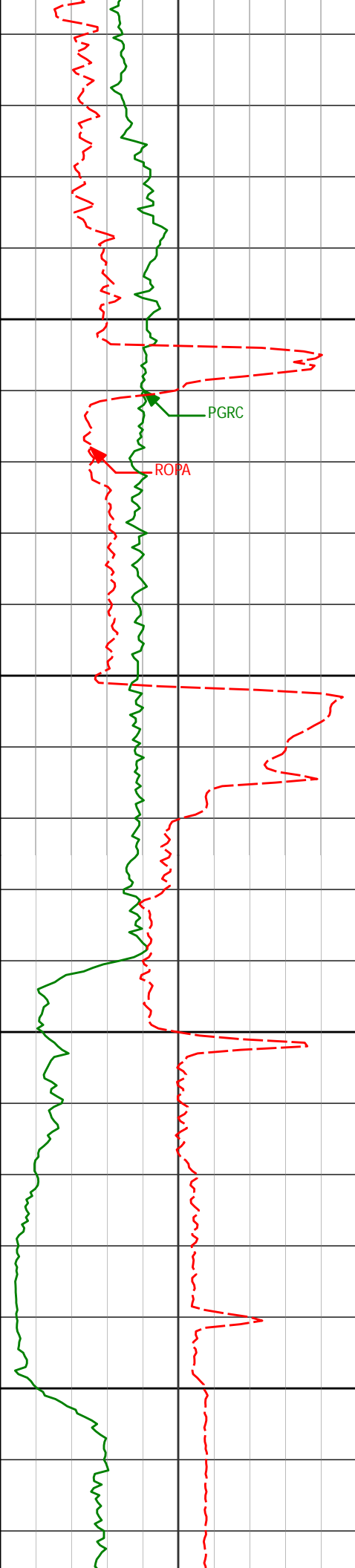
359.36°

7276.56'

2670.70'

10450

10500



10514'

89.60°

359.72°

7278.56'

2765.67'

10550

10600

10609'

89.88°

0.03°

7278.99'

2860.67'

10650

10700

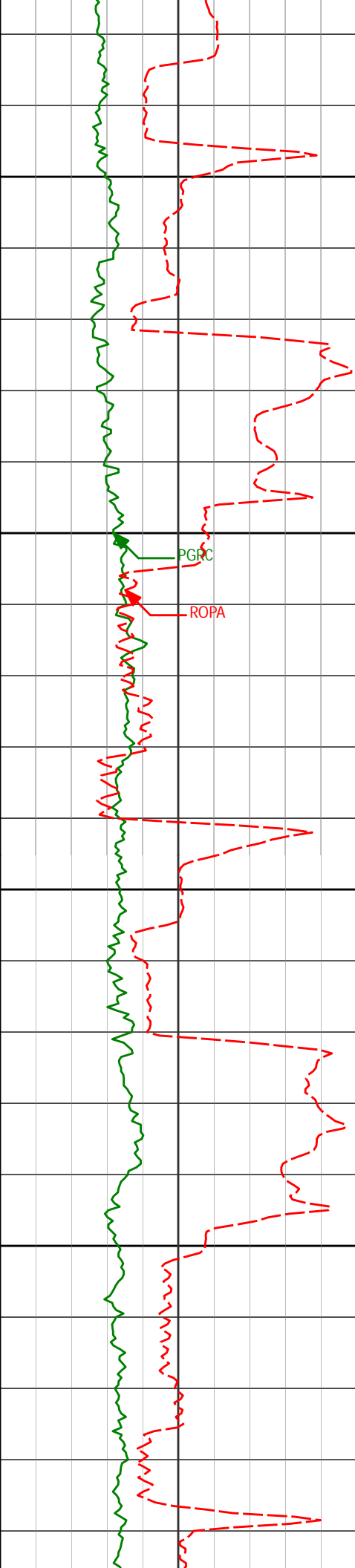
10704'

91.14°

359.57°

7278.15'

2955.66'



10750

10800

10850

10900

10799'

90.46°

359.04°

7276.82'

3050.65'

10894'

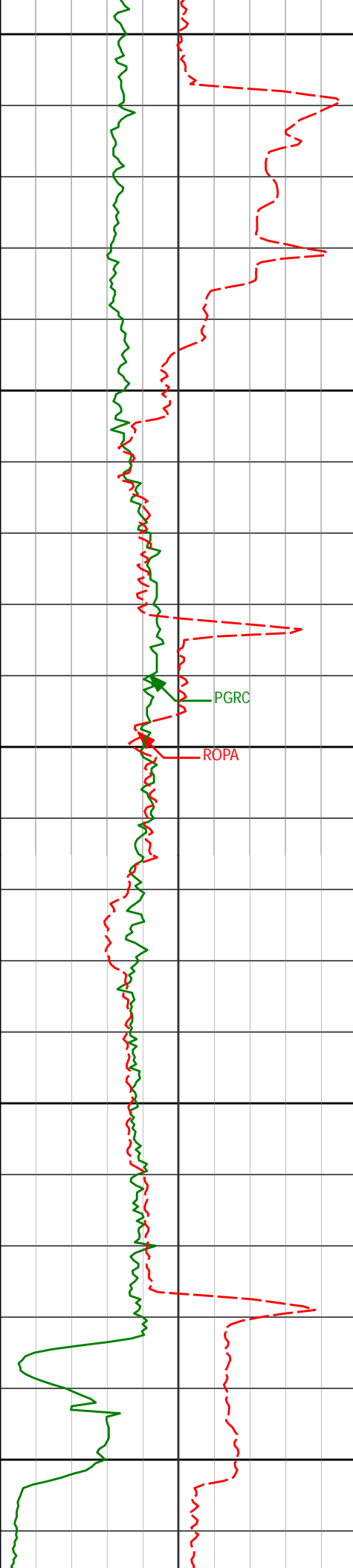
90.06°

359.03°

7276.39'

3145.63'





10950

10989'

88.80°

359.82°

7277.34'

3240.62'

11000

PGRC

ROPA

11050

11084'

89.81°

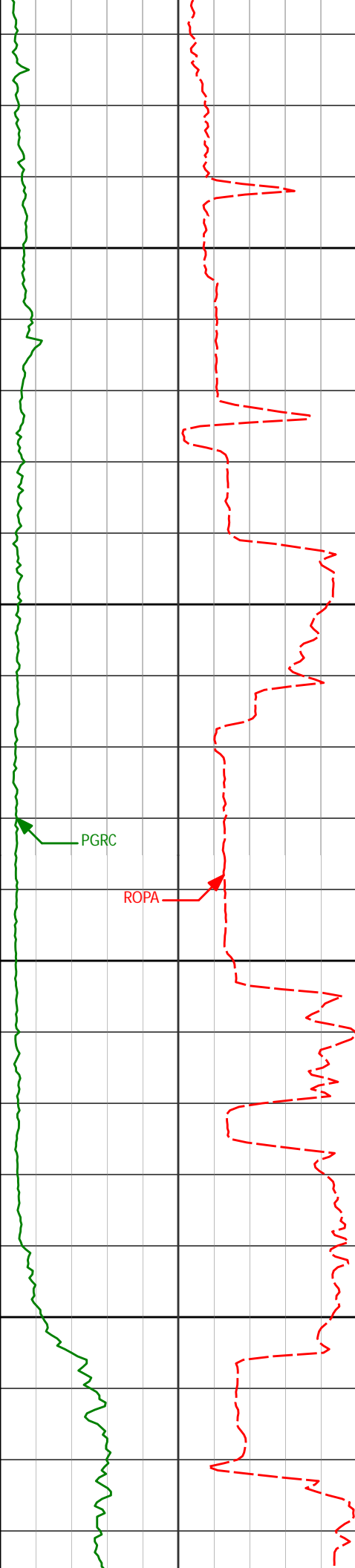
359.93°

7278.49'

3335.61'

11100

11150



11200

11250

11300

11350

11180'

91.08°

0.19°

7277.74'

3431.61'

11275'

92.44°

358.94°

7274.83'

3526.56'

11370'

89.97°

359.85°

7272.83'

3621.52'



11400

11450

11500

11550

11600

11465'

89.08°

359.11°

7273.62'

3716.51'

PGRC

ROPA

11560'

89.51°

358.87°

7274.78'

3811.49'



11650

11656'

88.92°

358.00°

7276.10'

3907.44'

11700

11750

11751'

88.83°

358.19°

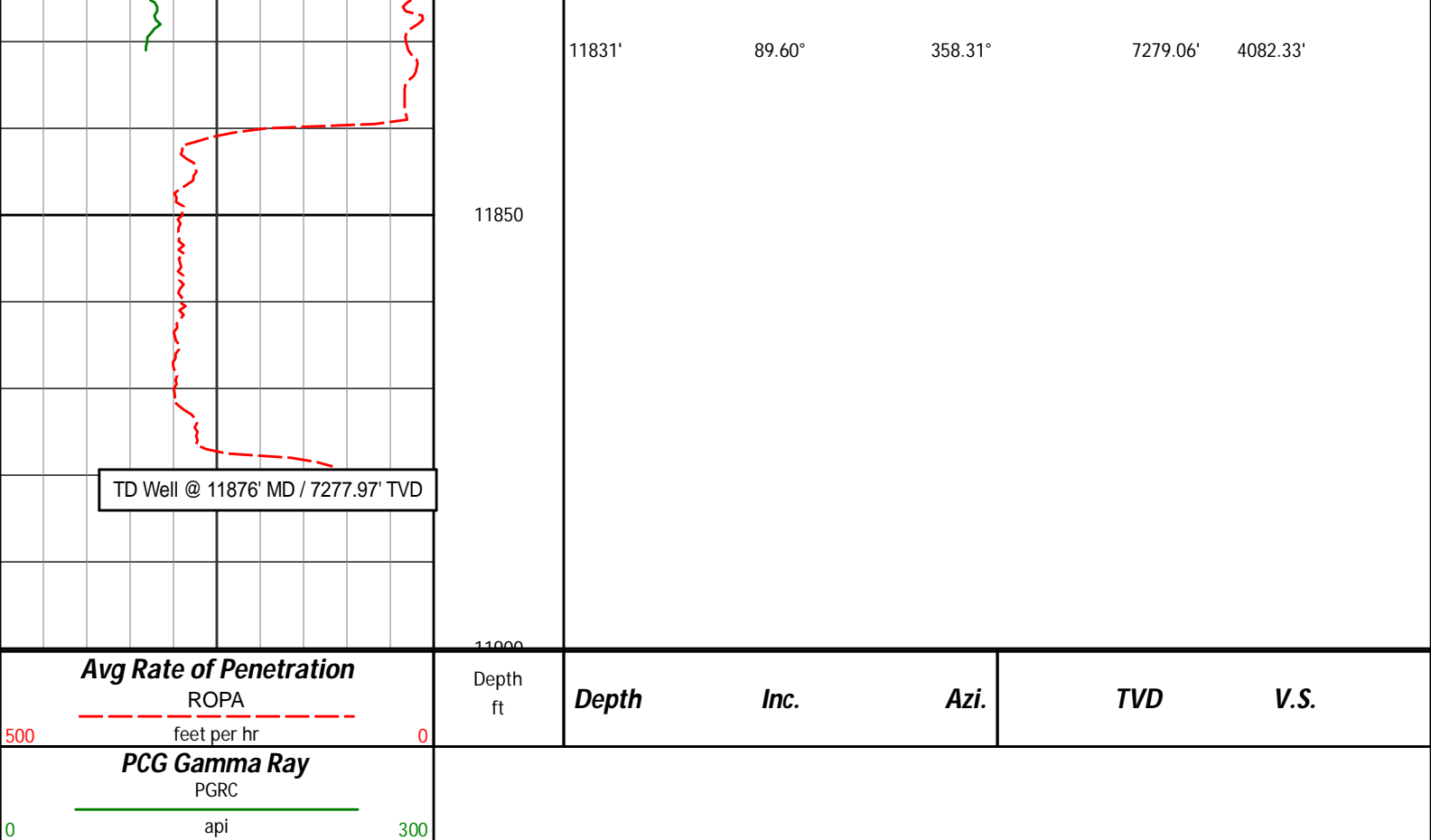
7277.96'

4002.37'

11800

PGRU

ROPA



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corporation  
Dreiling 27C-32HZ  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0900901380

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
948.00	0.33	23.84	947.95	4.32 S	6.56 E	-4.32	TIE-IN
1097.00	0.13	311.79	1096.95	3.81 S	6.61 E	-3.81	0.21
1192.00	0.13	115.48	1191.95	3.79 S	6.62 E	-3.79	0.27
1287.00	0.06	120.67	1286.95	3.86 S	6.76 E	-3.86	0.07
1381.00	0.22	41.48	1380.95	3.75 S	6.93 E	-3.75	0.23
1478.00	0.28	21.08	1477.95	3.39 S	7.13 E	-3.39	0.11
1572.00	0.03	214.45	1571.95	3.20 S	7.20 E	-3.20	0.33
1667.00	0.15	333.04	1666.95	3.11 S	7.13 E	-3.11	0.18
1761.00	0.03	244.71	1760.95	3.01 S	7.06 E	-3.01	0.16
1855.00	0.06	182.14	1854.95	3.07 S	7.03 E	-3.07	0.06
2043.00	1.91	240.78	2042.91	4.69 S	4.29 E	-4.69	1.00
2138.00	3.47	231.63	2137.80	7.25 S	0.66 E	-7.25	1.70
2231.00	5.20	225.66	2230.54	11.95 S	4.56 W	-11.95	1.92
2325.00	6.93	228.47	2324.01	18.68 S	11.86 W	-18.68	1.87
2419.00	7.86	225.16	2417.22	26.97 S	20.66 W	-26.97	1.09
2513.00	9.08	216.35	2510.20	37.48 S	29.61 W	-37.48	1.89
2607.00	9.81	206.74	2602.93	50.61 S	37.61 W	-50.61	1.85
2702.00	11.30	212.29	2696.32	65.71 S	46.23 W	-65.71	1.90
2796.00	12.11	213.09	2788.37	81.75 S	56.53 W	-81.75	0.88
2890.00	12.46	215.60	2880.22	98.26 S	67.82 W	-98.26	0.68
2985.00	12.10	215.75	2973.04	114.67 S	79.60 W	-114.67	0.38
3079.00	13.19	217.70	3064.76	131.15 S	91.92 W	-131.15	1.25
3174.00	12.59	218.83	3157.37	147.80 S	105.04 W	-147.80	0.69
3268.00	12.47	218.83	3249.36	163.88 S	117.81 W	-163.88	0.54

3268.00	12.17	219.88	3249.18	163.38 S	117.81 W	-163.38	0.51
3362.00	13.30	218.66	3340.87	179.43 S	130.92 W	-179.43	1.24
3457.00	12.52	219.88	3433.47	195.86 S	144.35 W	-195.86	0.87
3552.00	10.99	219.26	3526.47	210.78 S	156.68 W	-210.78	1.62
3647.00	12.37	220.73	3619.50	225.50 S	169.05 W	-225.50	1.49
3742.00	11.53	220.26	3712.44	240.46 S	181.83 W	-240.46	0.89
3837.00	12.06	224.51	3805.44	254.78 S	194.92 W	-254.78	1.07
3932.00	12.32	222.91	3898.30	269.28 S	208.78 W	-269.28	0.45
4028.00	11.83	224.28	3992.17	283.83 S	222.62 W	-283.83	0.59
4123.00	12.91	220.54	4084.97	298.86 S	236.32 W	-298.86	1.41
4218.00	13.51	220.95	4177.45	315.31 S	250.49 W	-315.31	0.64
4313.00	13.01	221.90	4269.92	331.65 S	264.91 W	-331.65	0.57
4408.00	12.10	222.55	4362.65	346.94 S	278.78 W	-346.94	0.97
4503.00	13.15	218.66	4455.35	362.72 S	292.27 W	-362.72	1.42
4598.00	12.85	217.42	4547.92	379.55 S	305.44 W	-379.55	0.43
4694.00	12.35	218.63	4641.60	396.05 S	318.33 W	-396.05	0.59
4789.00	12.52	220.55	4734.37	411.81 S	331.37 W	-411.81	0.47
4884.00	12.37	220.55	4827.14	427.36 S	344.68 W	-427.36	0.16
4979.00	11.09	222.46	4920.16	441.83 S	357.46 W	-441.83	1.41
5074.00	10.42	223.98	5013.49	454.76 S	369.60 W	-454.76	0.77
5169.00	11.88	218.17	5106.70	468.63 S	381.61 W	-468.63	1.94
5264.00	11.12	218.94	5199.79	483.44 S	393.41 W	-483.44	0.82
5359.00	10.55	220.00	5293.09	497.23 S	404.75 W	-497.23	0.64
5454.00	11.34	217.62	5386.37	511.29 S	416.05 W	-511.29	0.96
5644.00	11.43	217.09	5572.63	541.10 S	438.80 W	-541.10	0.07
5738.00	9.22	213.89	5665.10	554.79 S	448.62 W	-554.79	2.43
5833.00	10.41	212.26	5758.71	568.36 S	457.44 W	-568.36	1.29
5928.00	10.83	211.91	5852.08	583.20 S	466.74 W	-583.20	0.45
6023.00	10.55	208.26	5945.43	598.43 S	475.58 W	-598.43	0.77
6118.00	10.87	209.31	6038.78	613.90 S	484.08 W	-613.90	0.39
6213.00	9.10	209.24	6132.33	628.27 S	492.14 W	-628.27	1.86
6307.00	7.23	207.36	6225.38	640.01 S	498.49 W	-640.01	2.01
6402.00	5.09	219.05	6319.83	648.60 S	503.89 W	-648.60	2.60
6497.00	3.64	237.48	6414.55	653.49 S	509.09 W	-653.49	2.11
6592.00	2.21	262.46	6509.43	655.35 S	513.45 W	-655.35	1.98
6687.00	1.63	284.45	6604.38	655.26 S	516.57 W	-655.26	0.98
6782.00	2.73	325.71	6699.31	653.05 S	519.16 W	-653.05	1.95
6830.00	8.93	343.87	6747.05	648.52 S	520.84 W	-648.52	13.32
6877.00	14.07	342.76	6793.09	639.55 S	523.54 W	-639.55	10.95
6925.00	16.36	346.89	6839.40	627.40 S	526.81 W	-627.40	5.28
6972.00	19.84	352.03	6884.07	613.05 S	529.42 W	-613.05	8.14
7020.00	23.82	355.79	6928.62	595.30 S	531.26 W	-595.30	8.78
7067.00	30.51	358.33	6970.42	573.89 S	532.30 W	-573.89	14.44
7115.00	36.60	0.13	7010.40	547.37 S	532.63 W	-547.37	12.85
7162.00	40.09	358.92	7047.26	518.22 S	532.88 W	-518.22	7.60
7210.00	44.79	357.03	7082.67	485.86 S	534.05 W	-485.86	10.14
7257.00	48.01	356.58	7115.08	451.89 S	535.95 W	-451.89	6.89
7305.00	51.57	356.70	7146.06	415.30 S	538.10 W	-415.30	7.42
7353.00	59.57	357.25	7173.18	375.79 S	540.17 W	-375.79	16.69
7401.00	64.49	359.37	7195.69	333.43 S	541.41 W	-333.43	10.97
7448.00	68.11	0.24	7214.58	290.41 S	541.55 W	-290.41	7.89
7496.00	71.33	0.85	7231.21	245.39 S	541.12 W	-245.39	6.81
7543.00	73.72	1.45	7245.32	200.57 S	540.22 W	-200.57	5.23
7591.00	77.07	3.12	7257.43	154.17 S	538.36 W	-154.17	7.75
7638.00	81.99	2.54	7265.96	108.02 S	536.08 W	-108.02	10.54
7670.00	85.74	2.62	7269.38	76.24 S	534.65 W	-76.24	11.72
7755.00	90.83	2.04	7271.93	8.62 N	531.20 W	8.62	6.03
7850.00	92.47	2.78	7269.19	103.49 N	527.20 W	103.49	1.89
7945.00	93.83	1.71	7263.97	198.27 N	523.49 W	198.27	1.82
8050.00	92.44	1.94	7258.23	303.06 N	520.15 W	303.06	1.34
8135.00	91.82	1.62	7255.07	387.96 N	517.51 W	387.96	0.82
8230.00	91.57	358.98	7252.26	482.91 N	517.01 W	482.91	2.79
8326.00	90.09	357.72	7250.87	578.85 N	519.78 W	578.85	2.02
8421.00	90.03	355.65	7250.77	673.69 N	525.27 W	673.69	2.18
8516.00	87.29	357.92	7252.99	768.50 N	530.60 W	768.50	3.74
8611.00	90.00	358.94	7255.24	863.43 N	533.20 W	863.43	3.05
8706.00	90.77	359.00	7254.60	958.41 N	534.91 W	958.41	0.81
8801.00	90.65	359.33	7253.42	1053.39 N	536.29 W	1053.39	0.37
8896.00	90.46	359.62	7252.50	1148.38 N	537.16 W	1148.38	0.36
9023.00	91.17	0.07	7250.70	1275.37 N	537.50 W	1275.37	0.66
9087.00	90.34	359.39	7249.85	1339.36 N	537.81 W	1339.36	1.68
9182.00	87.69	1.63	7251.49	1434.33 N	536.96 W	1434.33	3.65
9277.00	89.29	2.23	7253.99	1529.24 N	533.76 W	1529.24	1.80
9372.00	88.86	1.34	7255.52	1624.18 N	530.80 W	1624.18	1.04
9467.00	88.80	1.18	7257.46	1719.14 N	528.72 W	1719.14	0.18

9562.00	90.71	1.66	7257.87	1814.10 N	526.36 W	1814.10	2.07
9657.00	90.25	1.33	7257.07	1909.06 N	523.88 W	1909.06	0.60
9753.00	89.29	359.92	7257.46	2005.05 N	522.84 W	2005.05	1.78
9848.00	88.61	359.57	7259.20	2100.04 N	523.26 W	2100.04	0.81
9943.00	88.00	358.95	7262.01	2194.99 N	524.48 W	2194.99	0.92
10038.00	87.87	359.13	7265.43	2289.91 N	526.08 W	2289.91	0.23
10134.00	89.17	359.31	7267.91	2385.87 N	527.38 W	2385.87	1.37
10229.00	88.98	359.54	7269.45	2480.85 N	528.34 W	2480.85	0.31
10324.00	87.22	359.25	7272.60	2575.79 N	529.34 W	2575.79	1.88
10419.00	87.99	359.36	7276.56	2670.70 N	530.49 W	2670.70	0.82
10514.00	89.60	359.72	7278.56	2765.67 N	531.25 W	2765.67	1.74
10609.00	89.88	0.03	7278.99	2860.67 N	531.46 W	2860.67	0.44
10704.00	91.14	359.57	7278.15	2955.66 N	531.79 W	2955.66	1.41
10799.00	90.46	359.04	7276.82	3050.65 N	532.94 W	3050.65	0.91
10894.00	90.06	359.03	7276.39	3145.63 N	534.54 W	3145.63	0.42
10989.00	88.80	359.82	7277.34	3240.62 N	535.49 W	3240.62	1.57
11084.00	89.81	359.93	7278.49	3335.61 N	535.70 W	3335.61	1.07
11180.00	91.08	0.19	7277.74	3431.61 N	535.60 W	3431.61	1.35
11275.00	92.44	358.94	7274.83	3526.56 N	536.32 W	3526.56	1.94
11370.00	89.97	359.85	7272.83	3621.52 N	537.32 W	3621.52	2.77
11465.00	89.08	359.11	7273.62	3716.51 N	538.18 W	3716.51	1.22
11560.00	89.51	358.87	7274.78	3811.49 N	539.86 W	3811.49	0.52
11656.00	88.92	358.00	7276.10	3907.44 N	542.48 W	3907.44	1.09
11751.00	88.83	358.19	7277.96	4002.37 N	545.64 W	4002.37	0.22
11831.00	89.60	358.31	7279.06	4082.33 N	548.08 W	4082.33	0.97

# **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 0.00 DEGREES (TRUE)  
A TOTAL CORRECTION OF 8.48 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11831.00 FEET  
IS 4118.95 FEET ALONG 352.35 DEGREES (TRUE)**