

## PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	09-Feb-14	10-Feb-14			
<b>Rig Bit Number</b>	2	3			
<b>Bit Size (in)</b>	8.750	8.750			
<b>Tool Nominal OD (in)</b>	6.750	6.750			
<b>Log Start Depth (TVD, ft)</b>	631.99	5,898.27			
<b>Log End Depth (TVD, ft)</b>	5,898.27	6,536.96			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	08-Feb-14 08:00	09-Feb-14 14:30			
<b>Drill/Wipe End Date and Time</b>	09-Feb-14 05:00	10-Feb-14 01:30			
<b>Min Inc (deg) @ Depth (TVD, ft)</b>	0.11 @ 4,555.34	3.28 @ 5,976.21			
<b>Max Inc (deg) @ Depth (TVD, ft)</b>	10.16 @ 3,145.60	88.27 @ 6,536.16			
<b>Bit TFA(in2) / Bit Type</b>	1.24 / PDC	1.24 / PDC			
<b>Flow Rate (gpm)</b>	600.00	549.00			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	400.0 / 477.0	288.0 / 477.0			
<b>Fluid Type</b>	Fresh Water Gel	Fresh Water Gel			
<b>Density (ppg) / Viscosity (spqt)</b>	8.90 / 29.00	10.20 / 34.00			
<b>Filtrate CL (ppm)</b>	120.00	2,500.00			
<b>pH / Fluid Loss (mptm)</b>	9.50 / 14	8.50 / 14			
<b>PV (cP) / YP (lbf2)</b>	5 / 3.00	7 / 4.00			
<b>% Solids / % Sand</b>	2.70 / 2.70	2 / 0.25			
<b>% Oil / Oil:Water Ratio</b>	N/A / N/A	N/A / N/A			
<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>Max Tool Temp (degF) @ Depth (ft)</b>	128.00 / 128.00	128.00 / 128.00			

Max Tool Temp (degF) / Source	160.83 / PCM	160.83 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	adam sampon	adam sampon			
Customer Representative	matt settles	matt settles			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11342275	11342275			
Insert Serial Number	11619995	11619995			
Date and Time Initialized	06-Feb-14 16:48	01-Jan-70 00:00			
Date and Time Read	10-Feb-14 05:58	10-Feb-14 06:03			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	53.00			
Software Version	6.21	6.21			
Sub Serial Number	11342275	11342275			
Sonde Serial Number	11833228	11833228			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	235.94	320.00			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.63	46.31			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11342275	11342275			
Insert/Sonde Serial Number	11681019	11681019			

## REMARKS

1. All depths are true vertical 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

Gap Fill: 3.0 ft  
Gap Fill: 3.0 ft

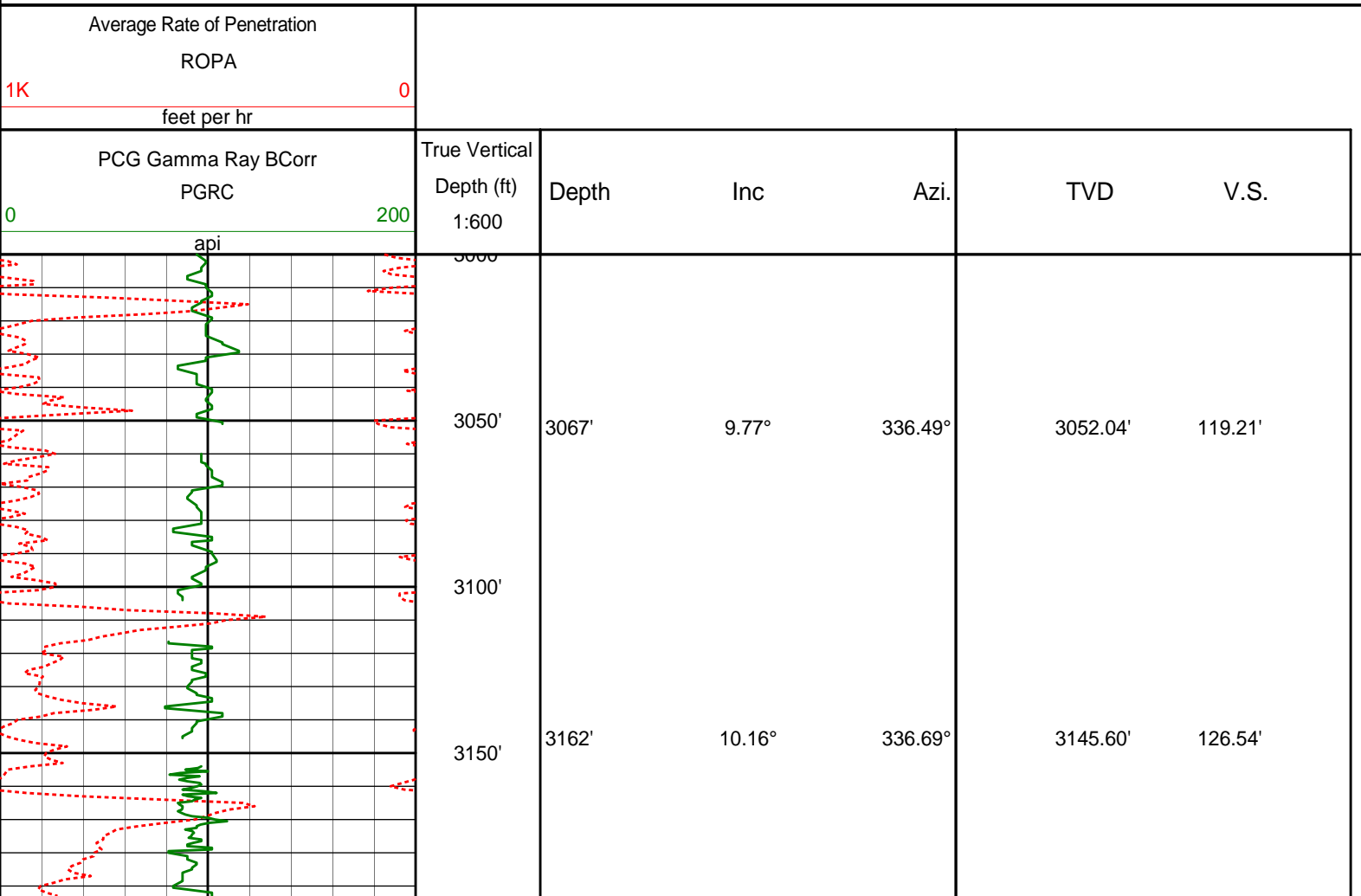
6.INSITE version 8.0

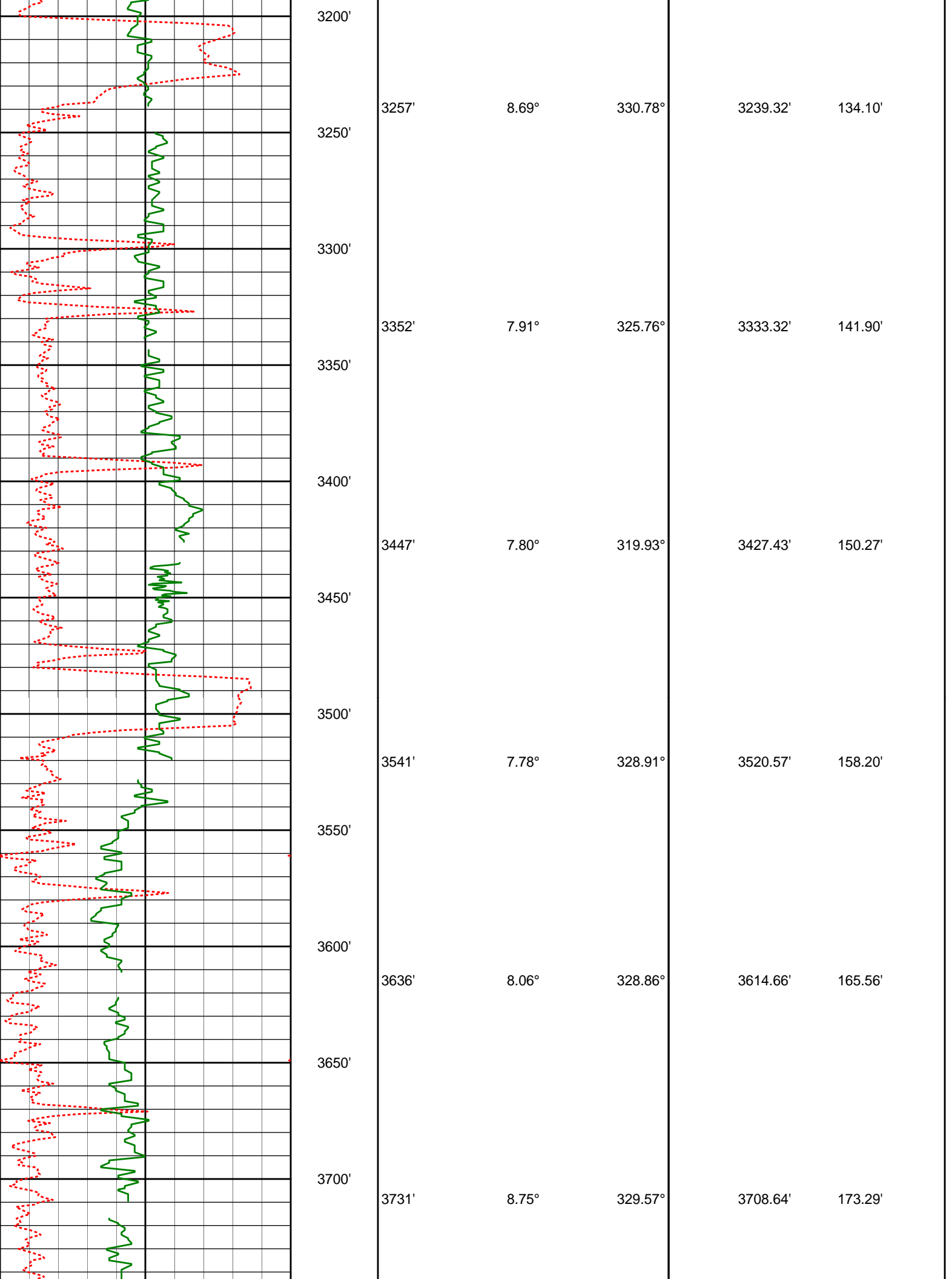
## WARRANTY

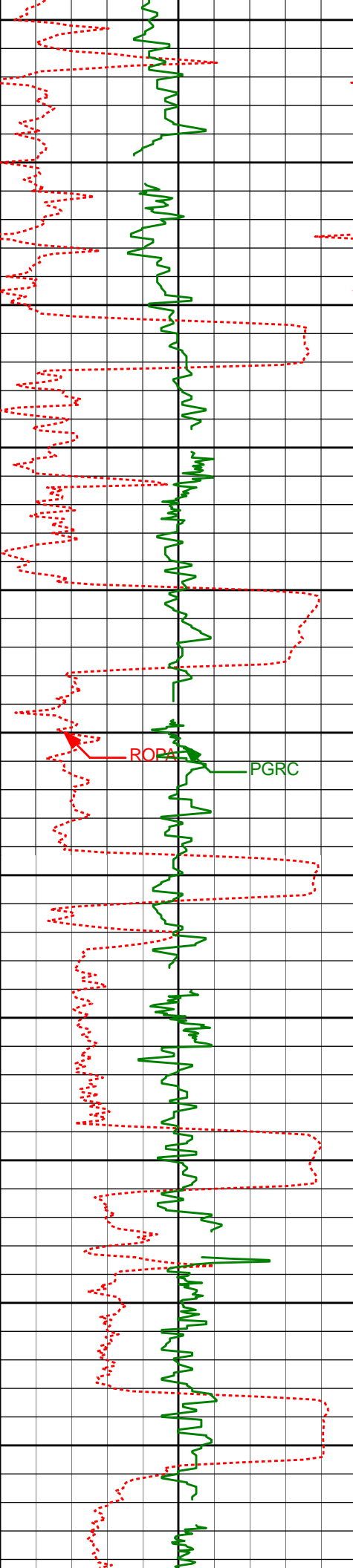
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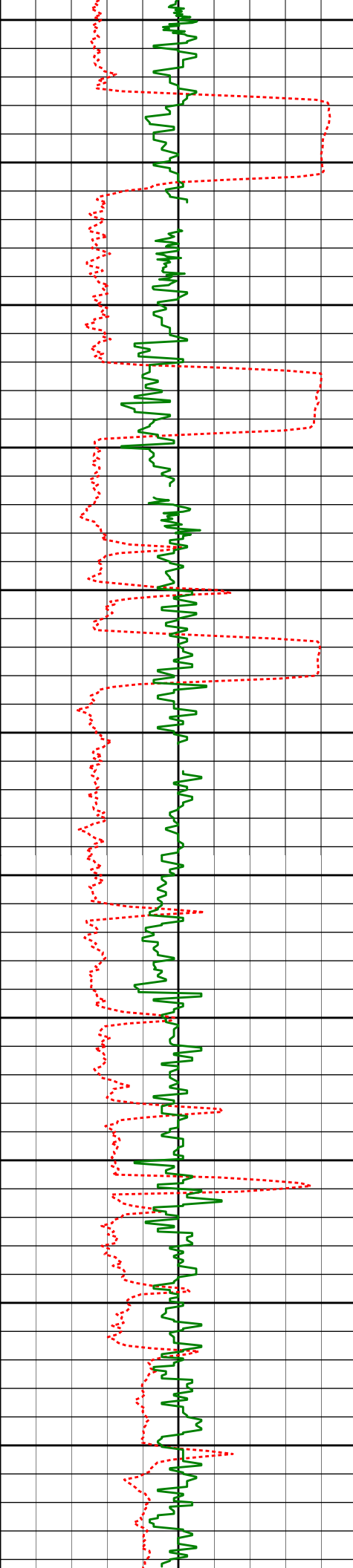
## TVD Main Log 1:600



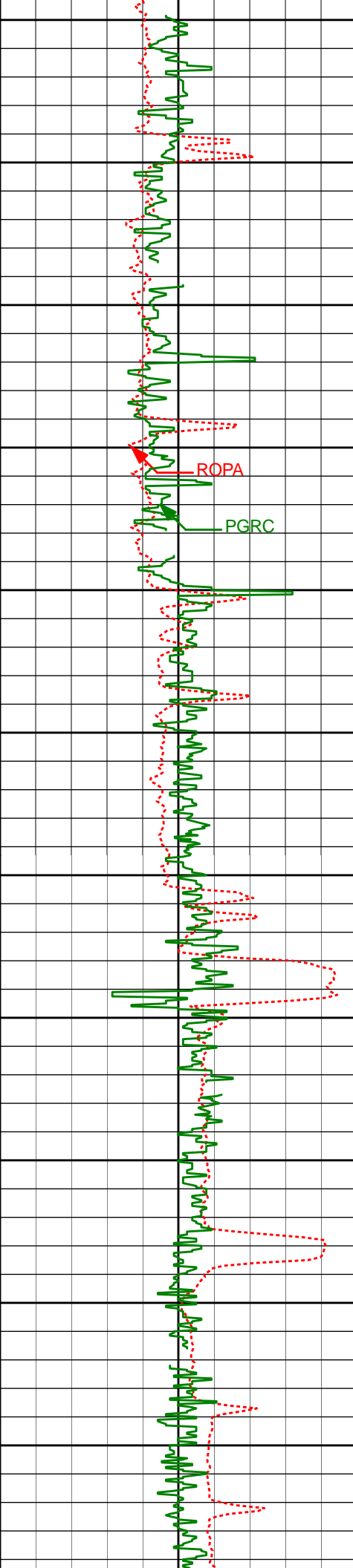




3750'					
3800'	3825'	9.50°	328.53°	3801.45'	181.63'
3850'					
3900'	3920'	10.07°	338.00°	3895.08'	189.60'
3950'					
4000'	4015'	7.75°	341.25°	3988.93'	195.50'
4050'					
4100'	4110'	6.45°	343.68°	4083.19'	199.65'
4150'					
4200'	4204'	5.11°	342.02°	4176.71'	202.91'
4250'					
4299'	4299'	2.97°	339.83°	4271.47'	205.40'



4300'				
4350'				
4394'	2.18°	7.40°	4366.38'	206.23'
4400'				
4450'				
4489'	1.16°	78.27°	4461.35'	205.17'
4500'				
4550'				
4583'	0.11°	199.38°	4555.34'	204.27'
4600'				
4650'				
4678'	0.26°	59.05°	4650.34'	204.12'
4700'				
4750'				
4773'	0.37°	251.12°	4745.34'	204.23'
4800'				
4868'	0.66°	228.88°	4840.34'	204.90'



4850'

4900'

4963'

0.51°

231.99°

4935.33'

205.61'

4950'

5000'

ROPA

PGRC

5058'

0.72°

237.23°

5030.33'

206.42'

5050'

5100'

5153'

0.84°

245.74°

5125.32'

207.52'

5150'

5200'

5248'

0.57°

214.39°

5220.31'

208.38'

5250'

5300'

5343'

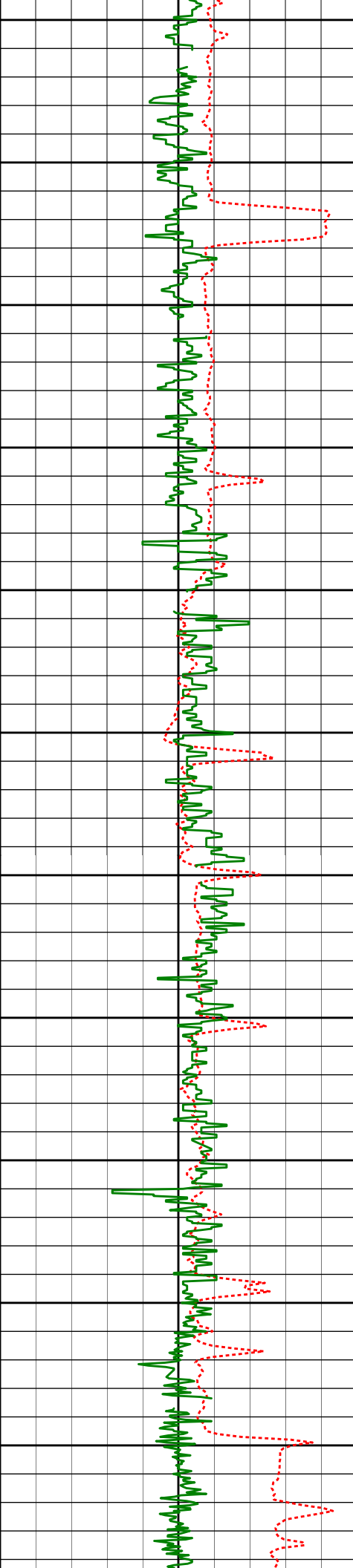
0.44°

195.94°

5315.31'

208.71'

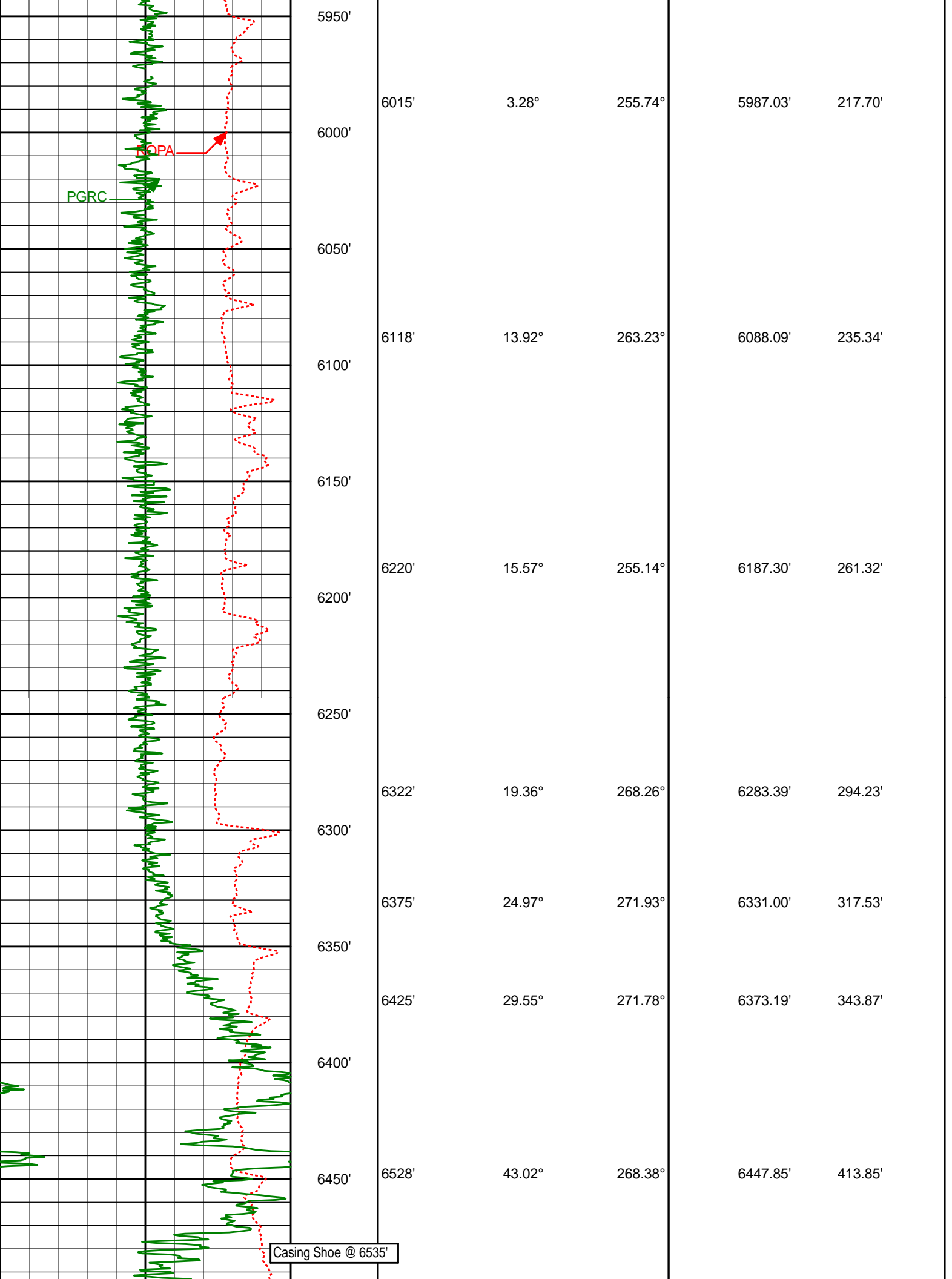
5350'

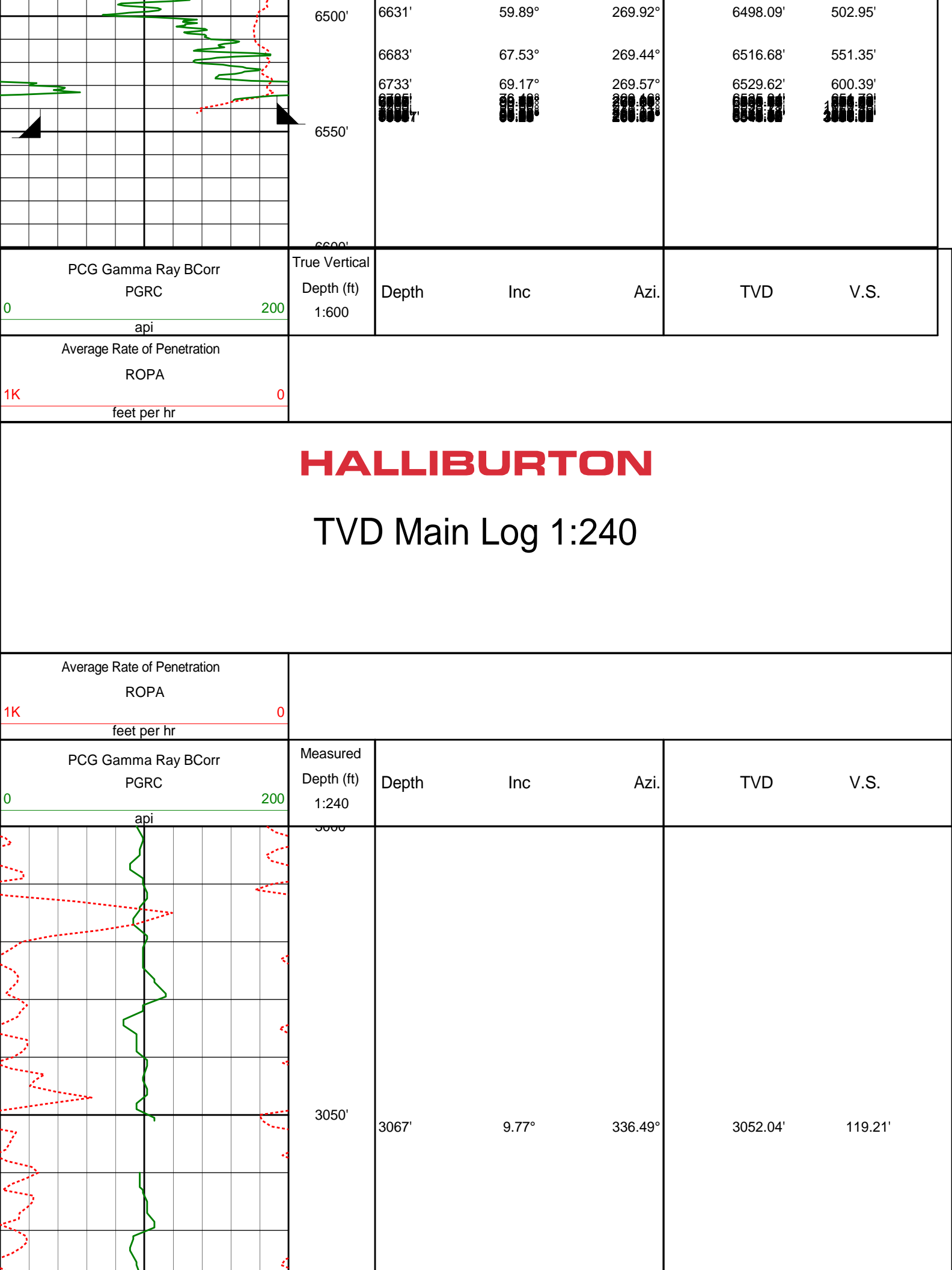


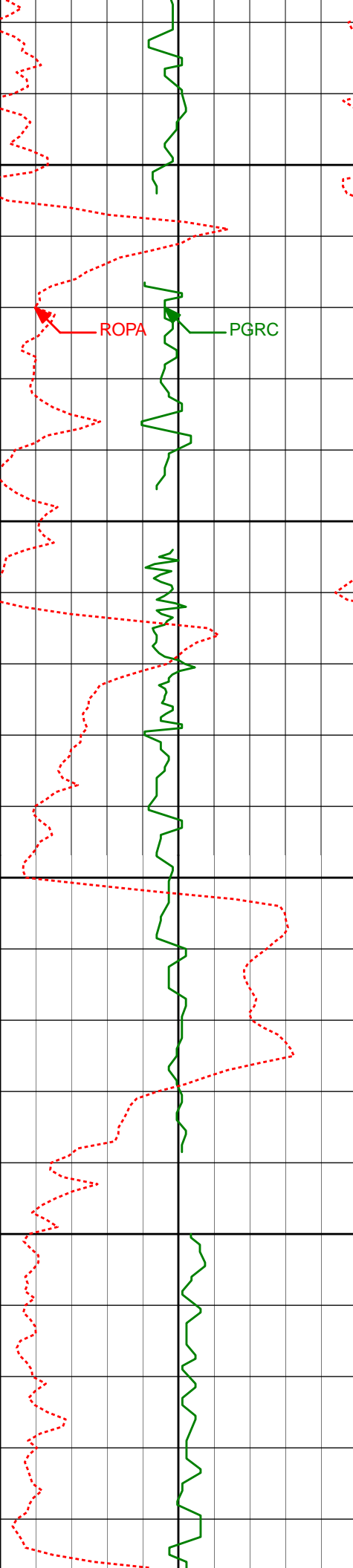
5400'	5437'	0.41°	233.70°	5409.30'	209.05'
5450'					
5500'	5532'	0.93°	312.21°	5504.30'	209.91'
5550'					
5600'	5627'	0.87°	294.63°	5599.29'	211.18'
5650'					
5700'	5722'	0.47°	266.22°	5694.28'	212.24'
5750'					
5800'	5817'	0.62°	239.10°	5789.28'	213.05'
5850'	5870'	0.75°	248.21°	5842.27'	213.60'
5900'	5912'	0.52°	250.88°	5884.31'	214.03'

Run 200









3100'

ROPA

PGRC

3150'

3200'

3250'

3162'

10.16°

336.69°

3145.60'

126.54'

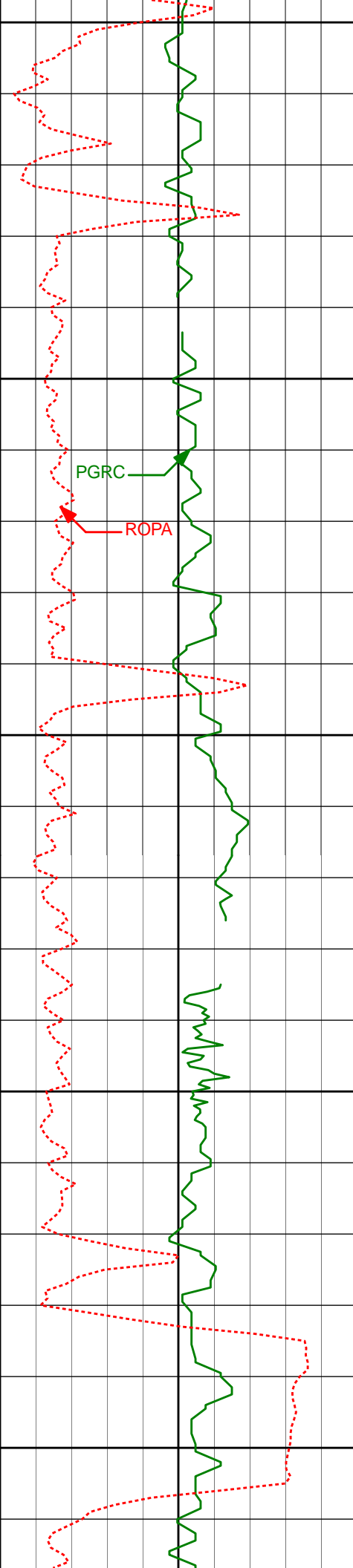
3257'

8.69°

330.78°

3239.32'

134.10'



3300'

3352'

7.91°

325.76°

3333.32'

141.90'

3350'

PGRC

ROPA

3400'

3447'

7.80°

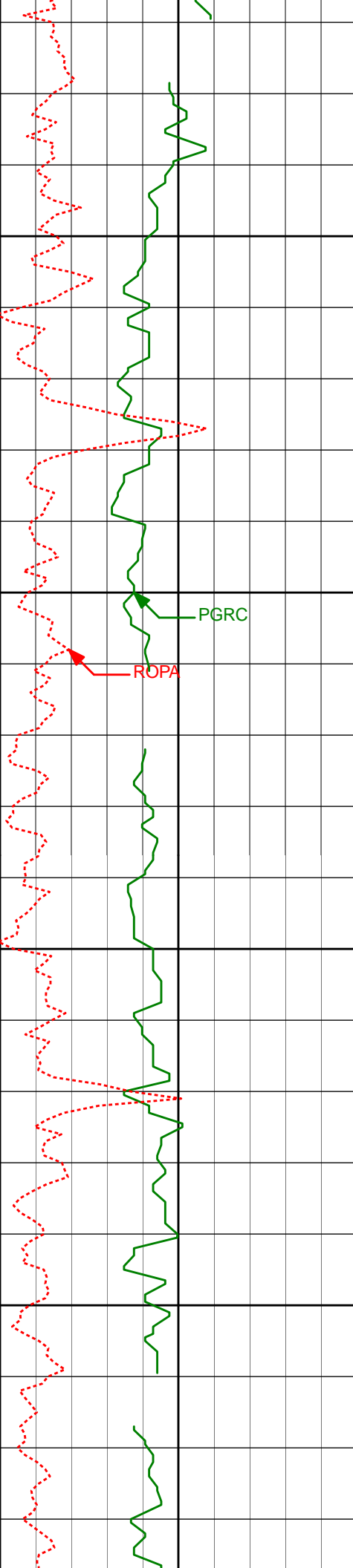
319.93°

3427.43'

150.27'

3450'

3500'



3550'

3600'

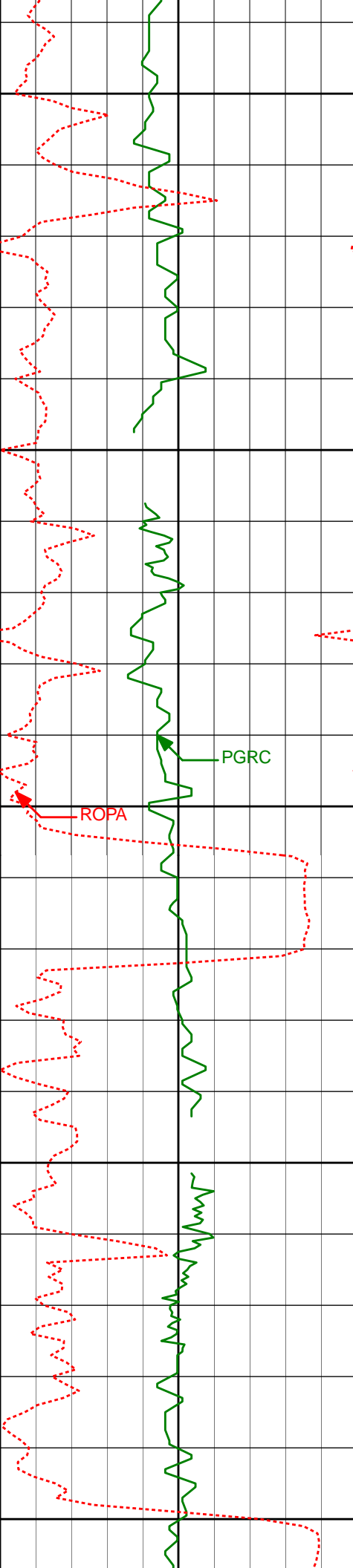
3650'

3700'

3541'	7.78°	328.91°	3520.57'	158.20'
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3636'	8.06°	328.86°	3614.66'	165.56'
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3731'	8.75°	329.57°	3708.64'	173.29'
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3750'

3800'

3850'

3900'

3950'

3825'

9.50°

328.53°

3801.45'

181.63'

3920'

10.07°

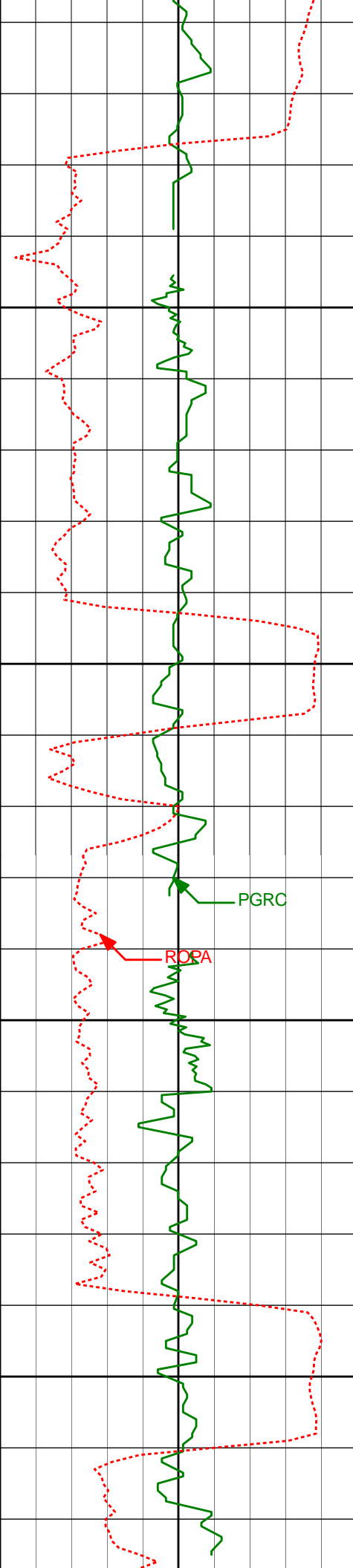
338.00°

3895.08'

189.60'

PGRC

ROPA



4015'	7.75°	341.25°	3988.93'	195.50'
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4000'

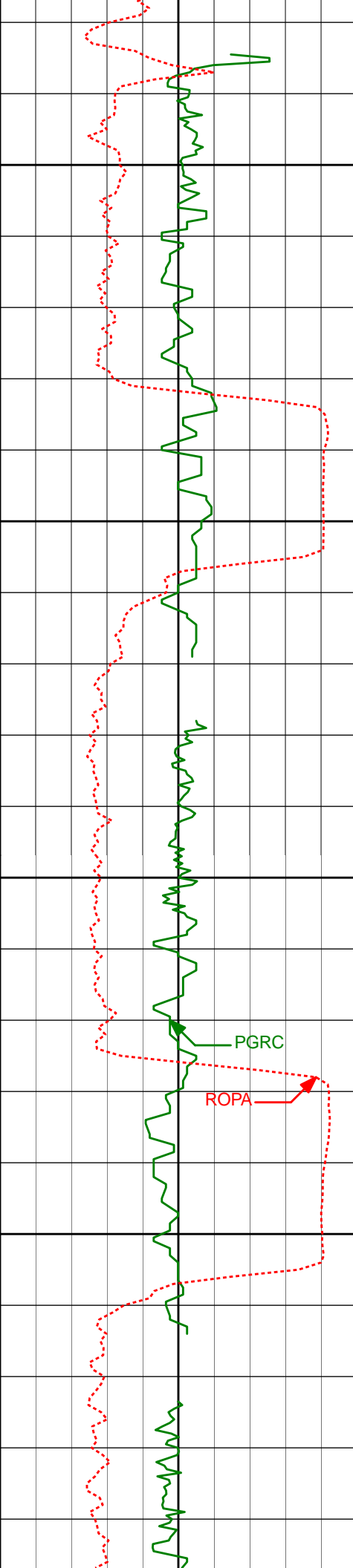
4050'

4110'	6.45°	343.68°	4083.19'	199.65'
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4100'

4150'

4204'	5.11°	342.02°	4176.71'	202.91'
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4200'

4250'

4300'

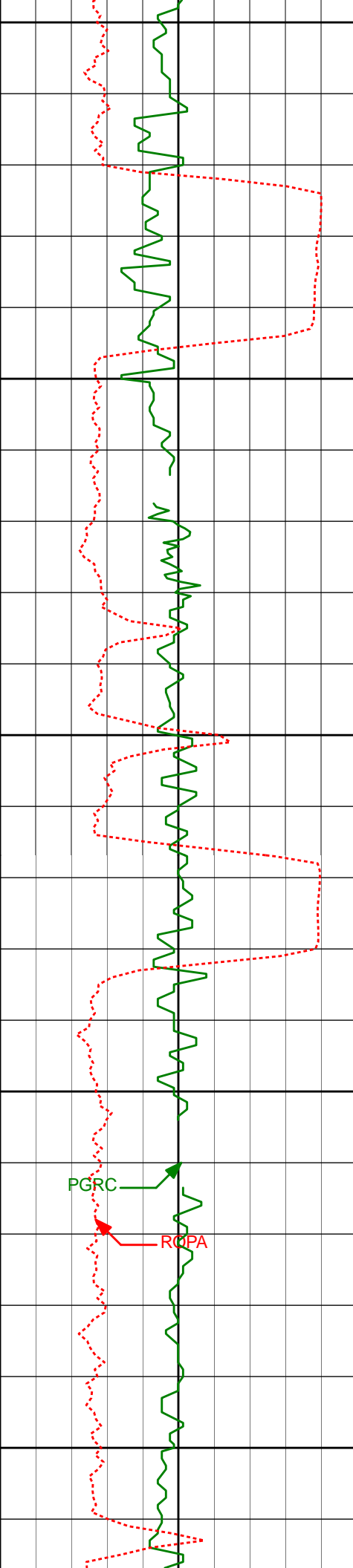
4350'

PGRC

ROPA

4204'	3.11°	342.02°	4170.71'	202.31'
4299'	2.97°	339.83°	4271.47'	205.40'
4394'	2.18°	7.40°	4366.38'	206.23'





4400'

4450'

4500'

4550'

4600'

4489'

1.16°

78.27°

4461.35'

205.17'

4583'

0.11°

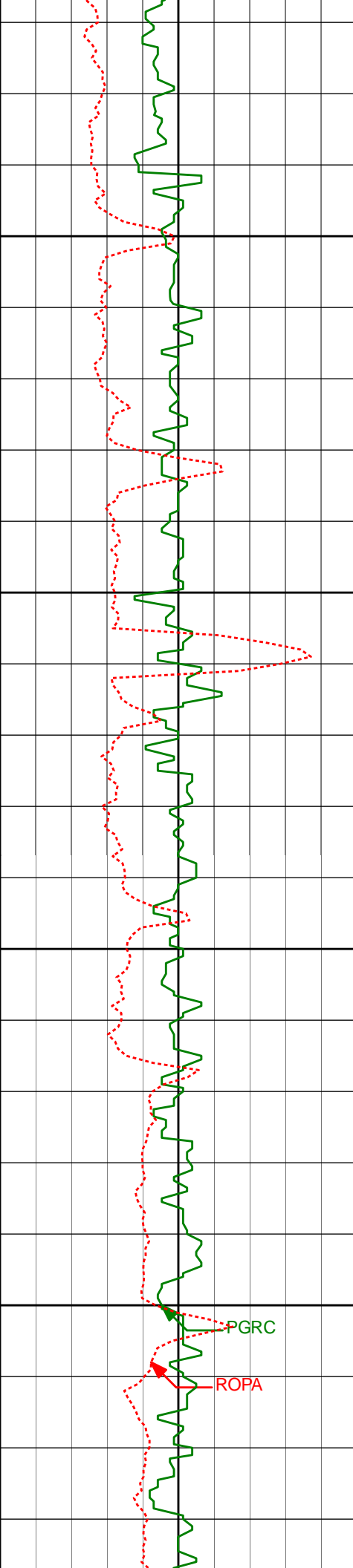
199.38°

4555.34'

204.27'

PGRC

ROPA



4650'

4678'

0.26°

59.05°

4650.34'

204.12'

4700'

4750'

4773'

0.37°

251.12°

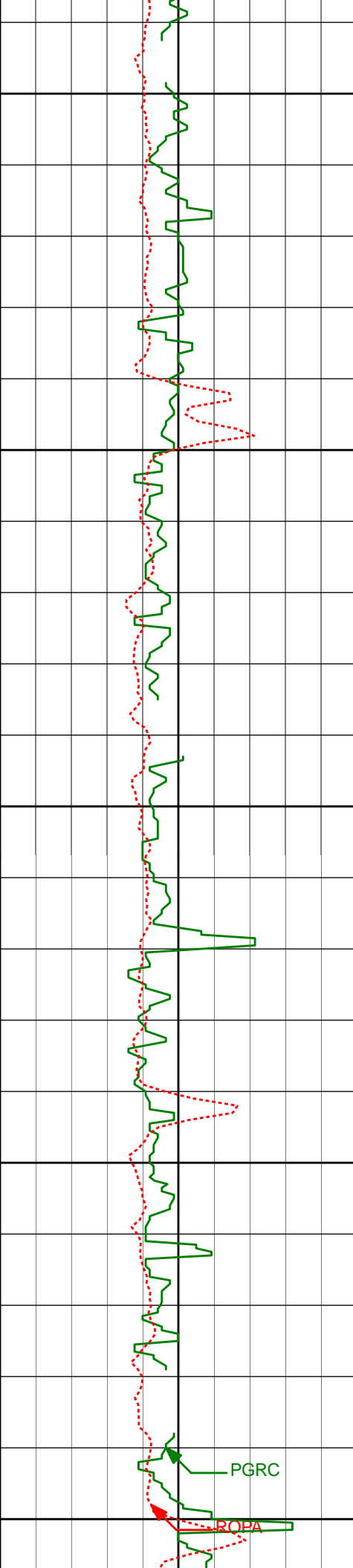
4745.34'

204.23'

4800'

PGRC

ROPA



4850'

4900'

4950'

5000'

5050'

4868'

0.66°

228.88°

4840.34'

204.90'

4963'

0.51°

231.99°

4935.33'

205.61'

5058'

0.72°

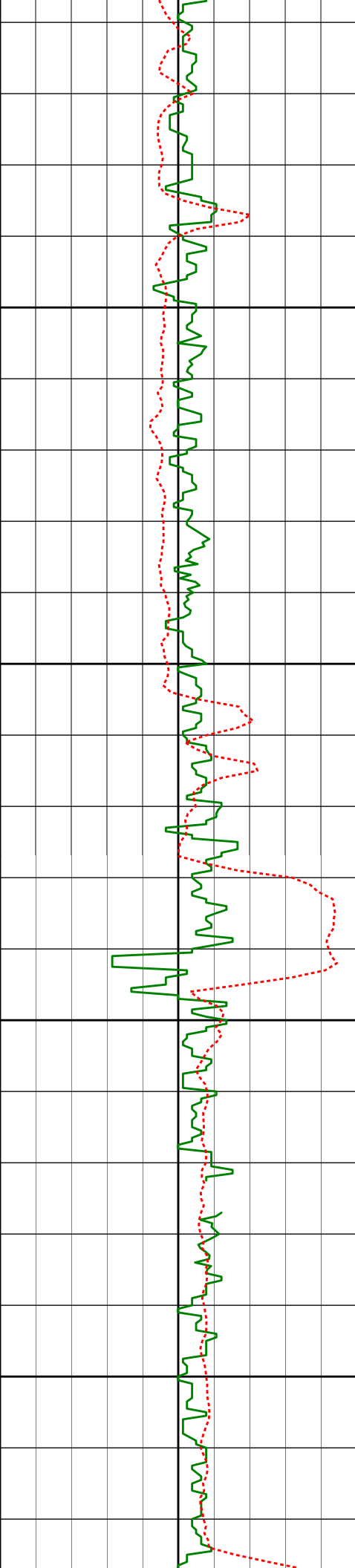
237.23°

5030.33'

206.42'

PGRC

ROPA



5100'

5150'

5200'

5250'

5153'

0.84°

245.74°

5125.32'

207.52'

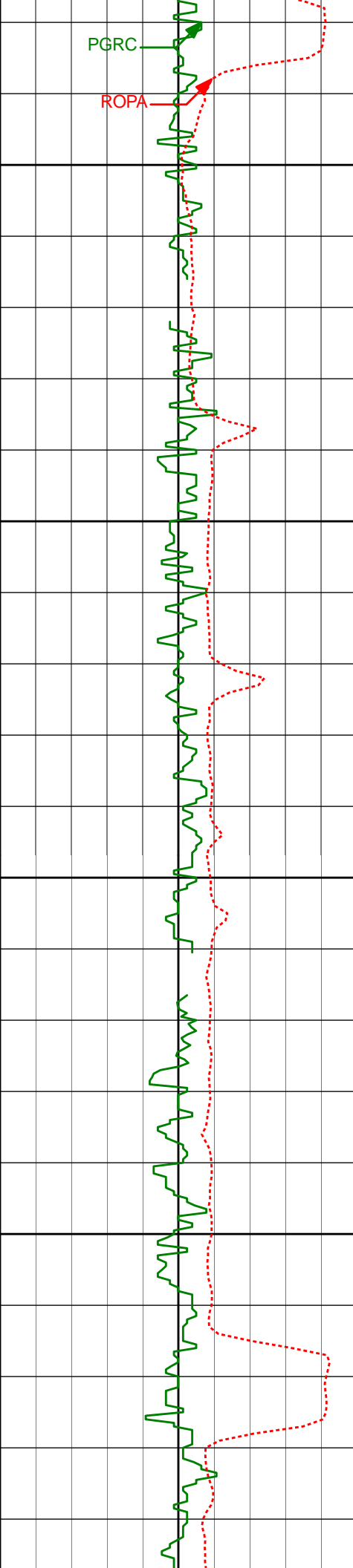
5248'

0.57°

214.39°

5220.31'

208.38'



5300'

5343'

0.44°

195.94°

5315.31'

208.71'

5350'

5400'

5437'

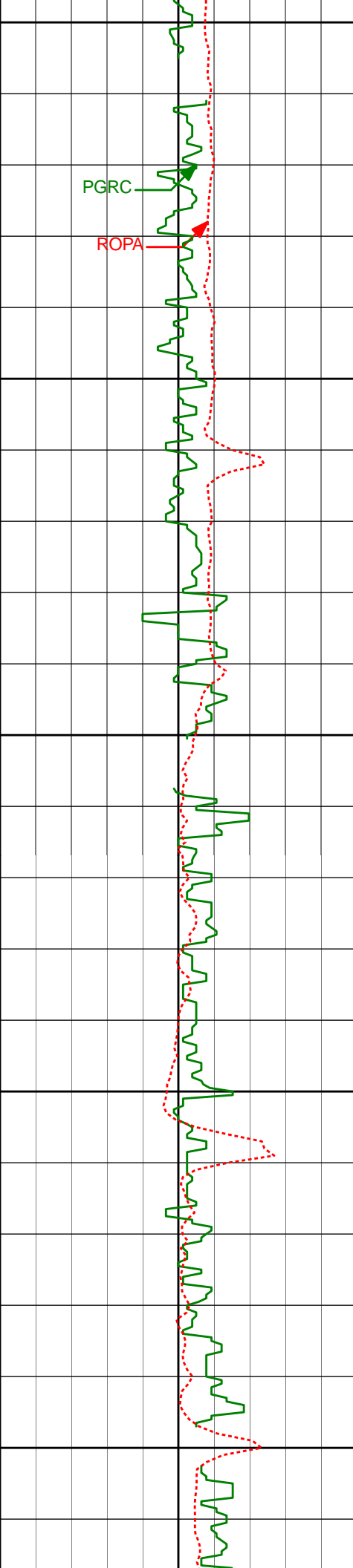
0.41°

233.70°

5409.30'

209.05'

5450'



5500'

5532'

0.93°

312.21°

5504.30'

209.91'

5550'

5600'

5627'

0.87°

294.63°

5599.29'

211.18'

5650'

5700'

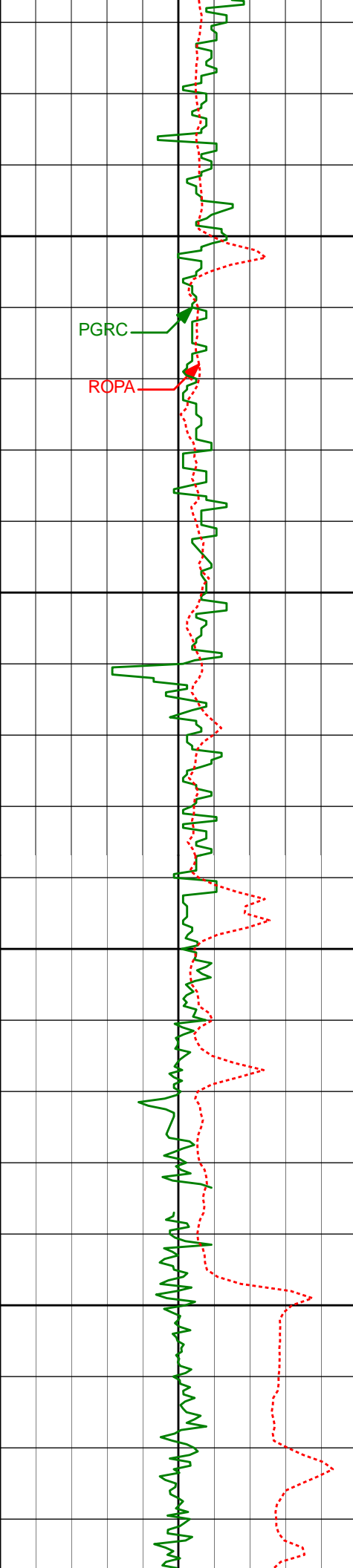
5722'

0.47°

266.22°

5694.28'

212.24'



PGRC

ROPA

5750'

5800'

5850'

Run 200

5900'

5817'

0.62°

239.10°

5789.28'

213.05'

5870'

0.75°

248.21°

5842.27'

213.60'

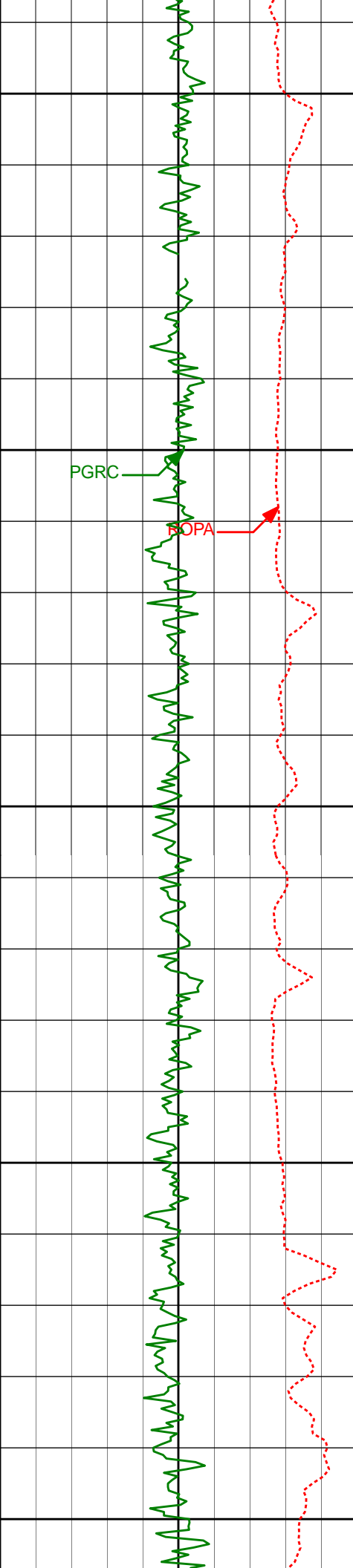
5912'

0.52°

250.88°

5884.31'

214.03'



5950'

6015'

3.28°

255.74°

5987.03'

217.70'

6000'

PGRC

BOPA

6050'

6118'

13.92°

263.23°

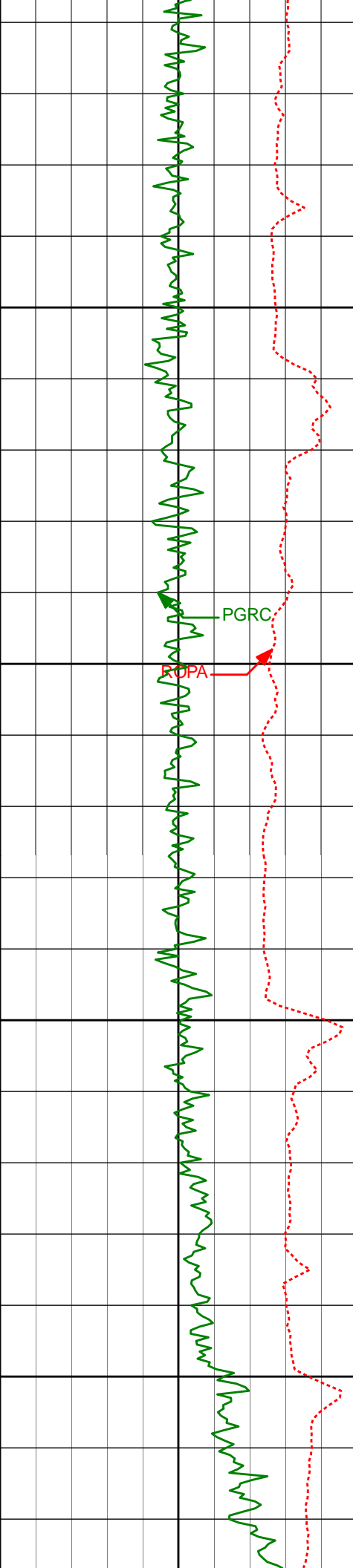
6088.09'

235.34'

6100'

6150'





6220'	15.57°	255.14°	6187.30'	261.32'
6200'				
6250'				
6322'	19.36°	268.26°	6283.39'	294.23'
6300'				
6375'	24.97°	271.93°	6331.00'	317.53'
6350'				
6425'	29.55°	271.78°	6373.19'	343.87'



[illegible]

6288.00	19.36	268.26	6251.57	300.09 N	266.14 W	281.83	5.79
6337.00	24.97	271.93	6296.93	300.19 N	284.61 W	300.28	11.79
6383.00	29.55	271.78	6337.81	300.87 N	305.66 W	321.34	9.96
6478.00	43.02	268.38	6414.22	300.68 N	361.74 W	377.32	14.33
6573.00	59.89	269.92	6473.21	299.70 N	435.76 W	451.18	17.80
6621.00	67.53	269.44	6494.45	299.45 N	478.76 W	494.11	15.94
6668.00	69.17	269.57	6511.79	299.07 N	522.44 W	537.71	3.50
6716.00	76.48	269.16	6525.96	298.56 N	568.27 W	583.44	15.25
6793.00	88.27	267.66	6536.16	296.43 N	644.42 W	659.37	15.43
6851.00	90.15	270.90	6536.96	295.71 N	702.40 W	717.23	6.46
6946.00	90.18	269.63	6536.68	296.15 N	797.40 W	812.11	1.34
7041.00	90.22	268.95	6536.35	294.97 N	892.39 W	906.90	0.72
7136.00	88.73	269.11	6537.22	293.36 N	987.37 W	1001.66	1.58
7230.00	88.74	269.04	6539.30	291.84 N	1081.33 W	1095.41	0.08
7325.00	88.98	268.10	6541.19	289.47 N	1176.28 W	1190.10	1.02
7420.00	89.63	270.04	6542.34	287.93 N	1271.26 W	1284.85	2.15

**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 273.07 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.63 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7420.00 FEET  
IS 1303.46 FEET ALONG 282.76 DEGREES (GRID)**

Date Printed:12 February 2014