

## PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200			
<b>Date run completed</b>	26-May-14	27-May-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>	640.98	5,762.37			
<b>Log End Depth (TVD, ft)</b>	5,762.37	6,560.68			
<b>Drill or Wipe</b>	Drill	Drill			
<b>Drill/Wipe Start Date and Time</b>	25-May-14 21:00	26-May-14 23:15			
<b>Drill/Wipe End Date and Time</b>	26-May-14 14:00	27-May-14 09:15			
<b>Min Inc (deg) @ Depth (TVD, ft)</b>	0.04 @ 4,929.56	0.44 @ 5,876.36			
<b>Max Inc (deg) @ Depth (TVD, ft)</b>	10.52 @ 2,205.07	77.26 @ 6,549.17			
<b>Bit TFA(in2) / Bit Type</b>	1.20 / PDC	1.24 / PDC			
<b>Flow Rate (gpm)</b>	593.71	586.25			
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	411.1 / 400.0	408.0 / 400.0			
<b>Fluid Type</b>	Fresh Water Gel	Fresh Water Gel			
<b>Density (ppg) / Viscosity (spqt)</b>	8.90 / 29.00	10.10 / 39.00			
<b>Filtrate CL (ppm)</b>	2,200.00	2,500.00			
<b>pH / Fluid Loss (mptm)</b>	9.30 / 28	9.60 / 8			
<b>PV (cP) / YP (lbf2)</b>	4 / 2.00	12 / 13.00			
<b>% Solids / % Sand</b>	3.70 / 0.25	8.90 / 0.15			
<b>% Oil / Oil:Water Ratio</b>	NA / NA	NA / NA			
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	NA @ NA			
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	NA @ NA			
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	NA @ NA			
<b>Max Tool Temp (in F) / S</b>	170.07 / PCM	170.07 / PCM			

Max Tool Temp (degF) / Source	170.37 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	NA @ NA			
Lead MWD Engineer	Brett Vandergon	Brett Vandergon			
Customer Representative	Matt Settles	Matt Settles			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341327	11341327			
Insert Serial Number	11400994	11400994			
Date and Time Initialized	25-May-14 13:24	01-Jan-70 00:00			
Date and Time Read	27-May-14 16:25	27-May-14 16:19			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	54.00			
Software Version	6.21	6.21			
Sub Serial Number	11341327	11341327			
Sonde Serial Number	11062120	11062120			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	260.31	280.53			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.48	47.23			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341327	11341327			
Insert/Sonde Serial Number	11579775	11579775			

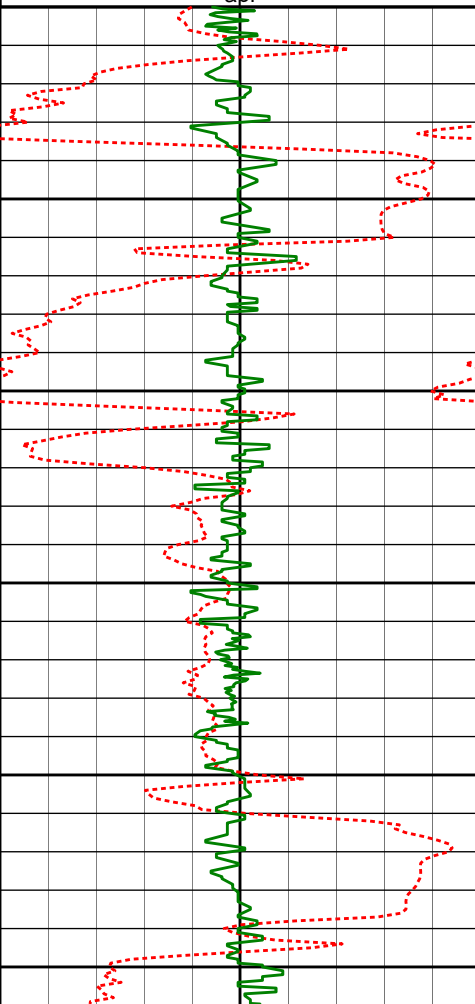
## REMARKS

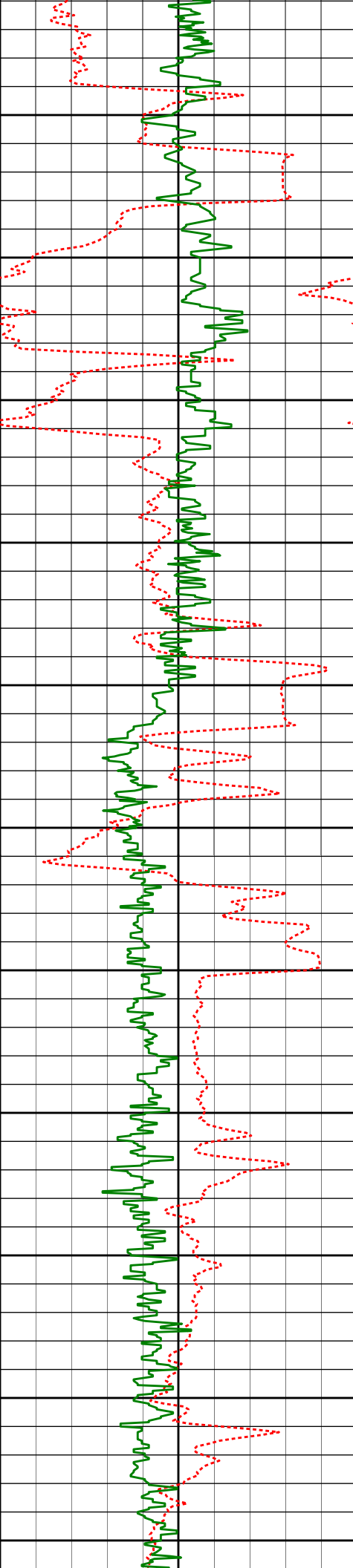
1. All depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water 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 8.0

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON

TVD Main Log 1:600

Average Rate of Penetration ROPA						
1K	0					
feet per hr						
PCG Gamma Ray BCorr PGRC		True Vertical Depth (ft) 1:600	Depth	Inc	Azi.	TVD      V.S.
0	200					
api						
						
		3050'	3062'	7.60°	347.40°	3048.13'      42.28'
		3100'				
		3150'	3157'	8.05°	349.13°	3142.24'      45.31'
		3200'				
		3250'				



3300'

3346'

8.84°

343.52°

3329.19'

52.78'

3350'

3400'

3441'

7.67°

344.38°

3423.21'

56.98'

3450'

3500'

3536'

8.56°

349.68°

3517.26'

60.37'

3550'

3600'

3630'

10.19°

351.18°

3610.00'

63.38'

3650'

3700'

3725'

10.40°

347.34°

3703.47'

67.08'

3750'

3800'

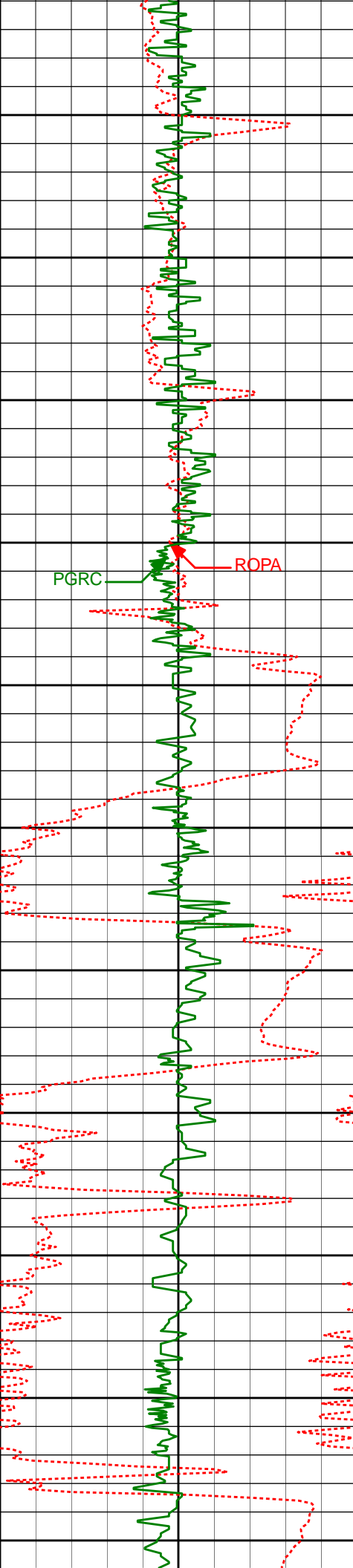
3820'

10.36°

344.95°

3796.91'

71.70'



3850'

3915'

9.53°

344.14°

3890.49'

76.57'

3900'

3950'

4010'

9.01°

343.51°

3984.25'

81.30'

4000'

4105'

6.96°

338.16°

4078.32'

85.95'

4100'

4150'

4200'

3.53°

343.93°

4172.91'

89.16'

4200'

4250'

4294'

2.90°

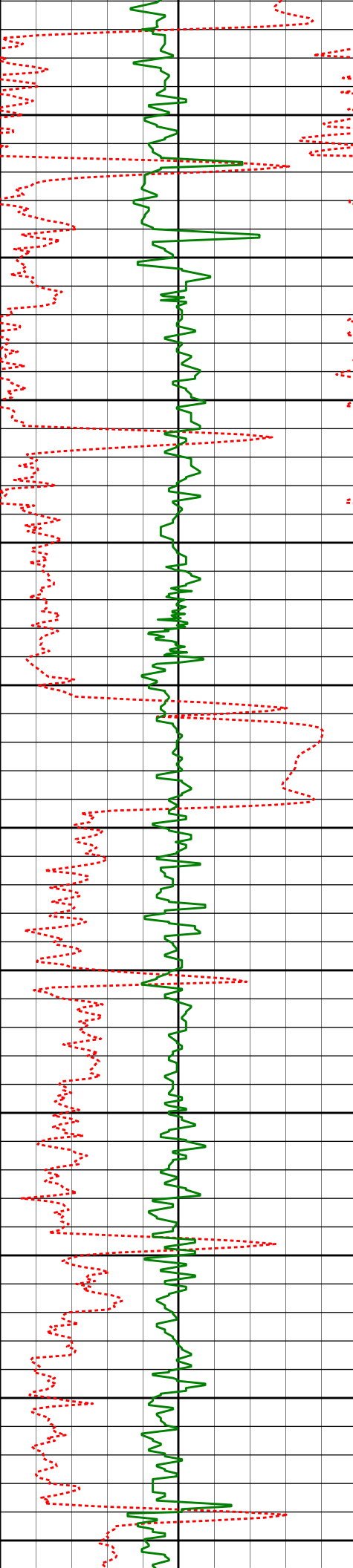
347.20°

4266.76'

90.65'

4300'

4350'



4400'

4450'

4500'

4550'

4600'

4650'

4700'

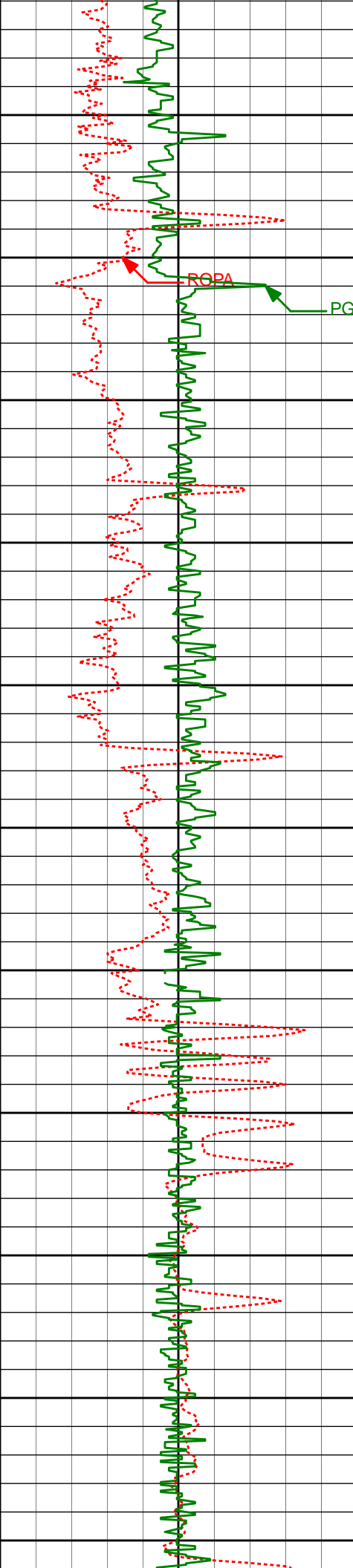
4750'

4800'

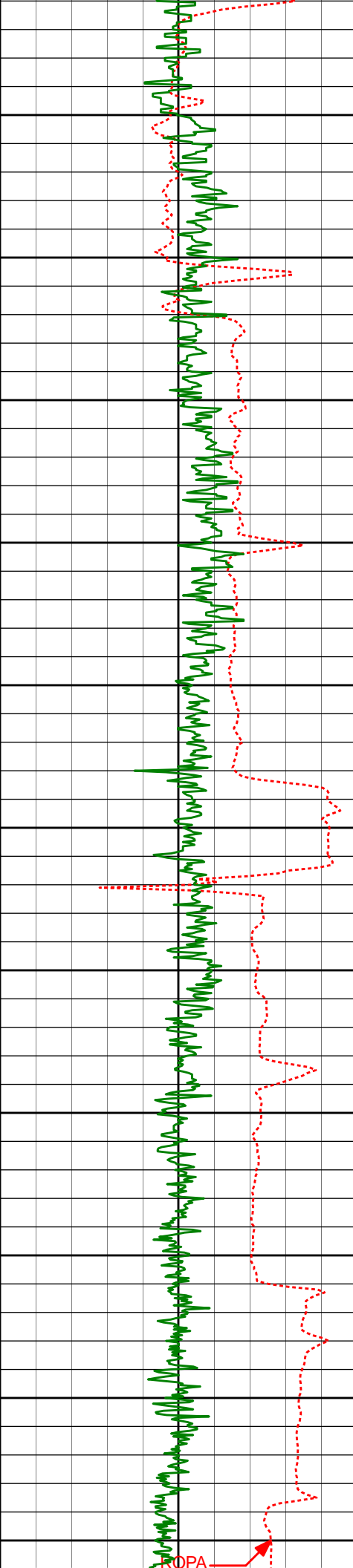
4850'

4900'

4389'	2.09°	344.24°	4361.67'	91.78'
4484'	1.54°	324.87°	4456.62'	93.07'
4578'	1.66°	335.45°	4550.59'	94.44'
4673'	0.64°	43.38°	4645.57'	94.70'
4768'	0.50°	93.87°	4740.57'	93.93'
4862'	0.07°	80.80°	4834.56'	93.46'

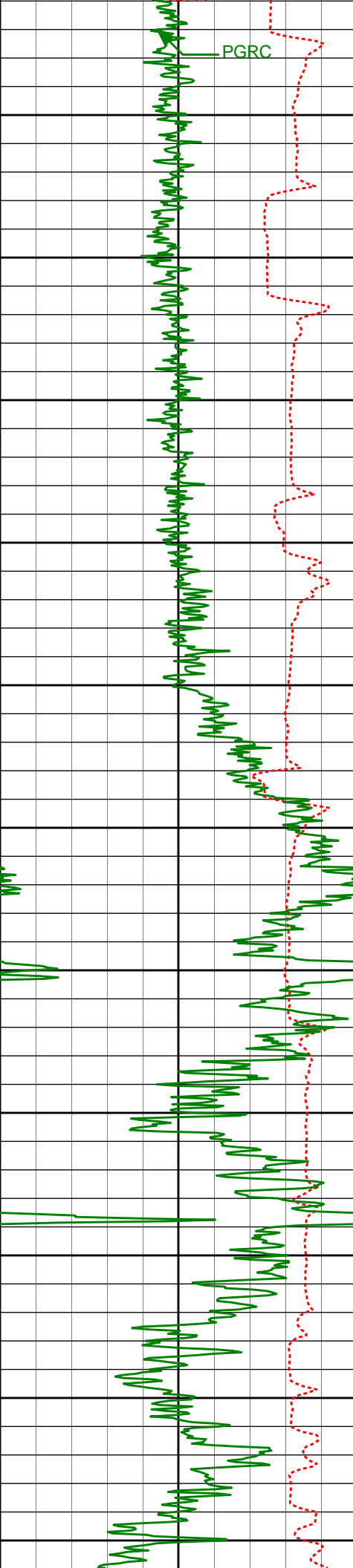


4957'	0.04°	167.97°	4929.56'	93.40'
4950'				
5000'				
5051'	0.14°	207.42°	5023.56'	93.44'
5050'				
5100'				
5146'	0.34°	172.76°	5118.56'	93.45'
5150'				
5200'				
5242'	0.93°	191.04°	5214.56'	93.53'
5250'				
5300'				
5336'	0.96°	227.25°	5308.54'	94.21'
5350'				
5400'	1.93°	227.50°	5403.51'	95.92'
5450'				



5500'	5526'	2.12°	221.52°	5498.45'	98.19'
5550'					
5600'	5621'	1.55°	224.83°	5593.41'	100.19'
5650'					
5700'	5716'	1.14°	225.30°	5688.38'	101.71'
5750'					
<div>Run 200</div>	5810'	0.61°	220.27°	5782.37'	102.67'
5800'					
5850'					
5900'	5904'	0.44°	251.49°	5876.36'	103.32'
5950'					
6000'	5999'	7.91°	275.28°	5971.05'	110.19'





PGRC

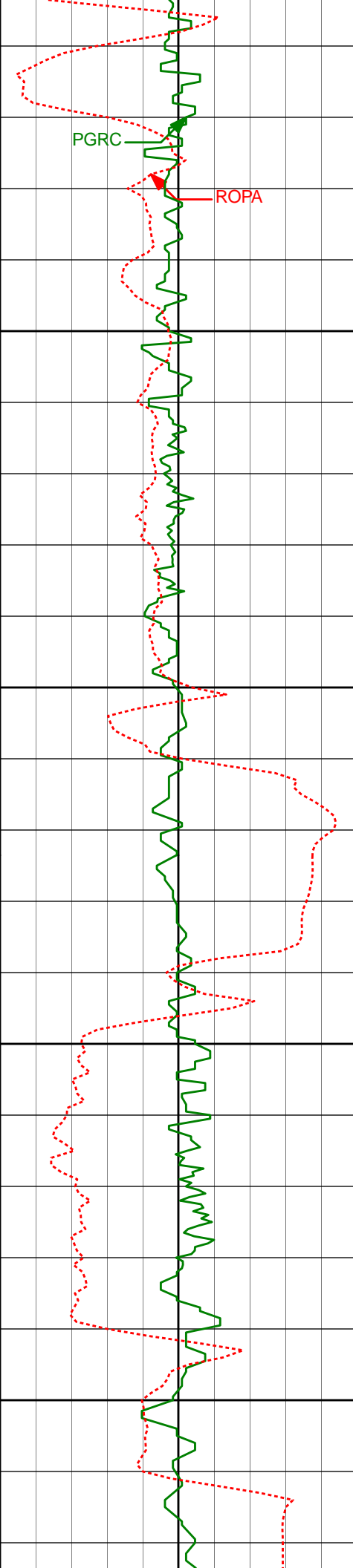
6050'	6093'	13.55°	268.16°	6063.37'	127.65'
6100'					
6150'	6188'	17.96°	267.01°	6154.78'	153.37'
6200'					
6250'	6283'	23.61°	270.70°	6243.56'	187.01'
6300'					
6350'	6378'	33.35°	275.97°	6326.98'	232.19'
6400'	6473'	47.78°	275.45°	6398.96'	293.67'
6450'	6568'	62.05°	270.86°	6453.44'	371.16'
6500'	6663'	67.90°	267.72°	6493.62'	457.10'
	6758'	73.41°	266.58°	6525.08'	546.40'
	6806'	75.00°	266.50°	6538.14'	592.39'
6550'	6852'	77.26°	265.62°	6549.17'	636.82'

Casino Shoe @ 6559'

**HALLIBURTON**

TVD Main Log 1:240

The graph displays two time series: 'Actual' (solid green line) and 'Predicted' (dashed red line). The x-axis is labeled from 0 to 100 in increments of 10. The y-axis is labeled from 0 to 10 in increments of 2. The 'Actual' series shows a highly volatile pattern with frequent sharp peaks and troughs. The 'Predicted' series follows the overall trend of the 'Actual' series but is much smoother, capturing the general direction while missing the fine-grained details. Notable divergences occur around x=10, x=40, x=60, and x=80.



3150'

3200'

3250'

3300'

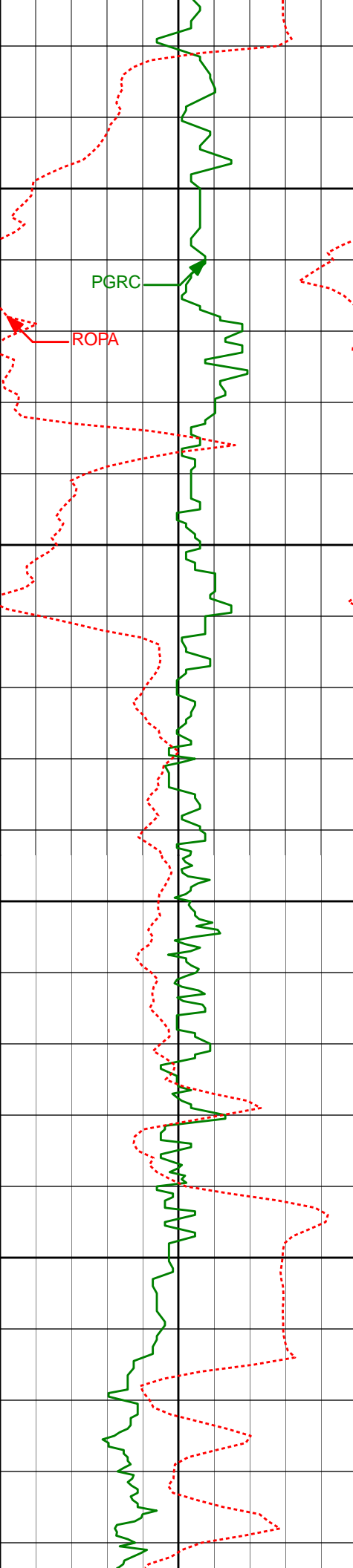
3157'

8.05°

349.13°

3142.24'

45.31'



3350'

3400'

3450'

3500'

3346'

8.84°

343.52°

3329.19'

52.78'

3441'

7.67°

344.38°

3423.21'

56.98'

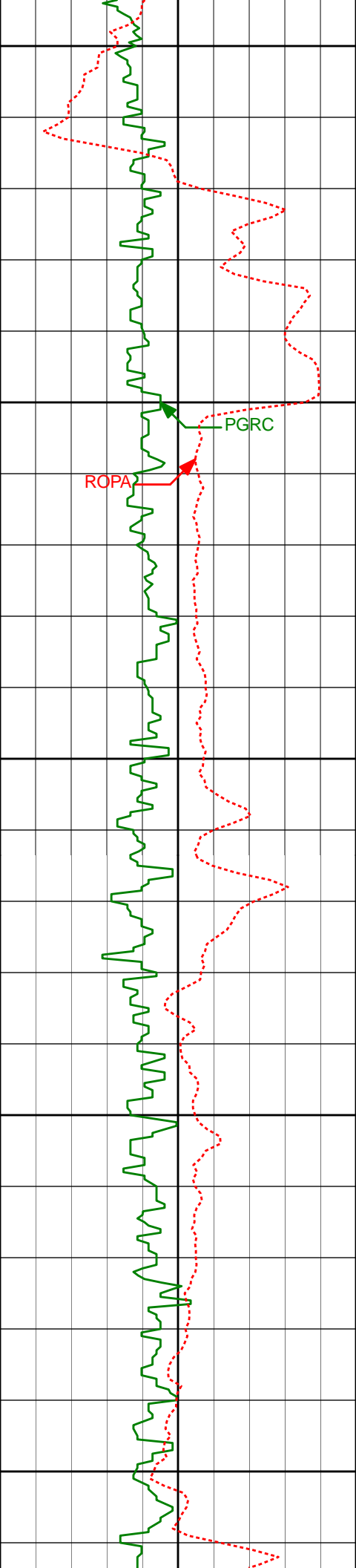
3536'

8.56°

349.68°

3517.26'

60.37'



3550'

3600'

3650'

3700'

3750'

ROPA

PGRC

3630'

10.19°

351.18°

3610.00'

63.38'

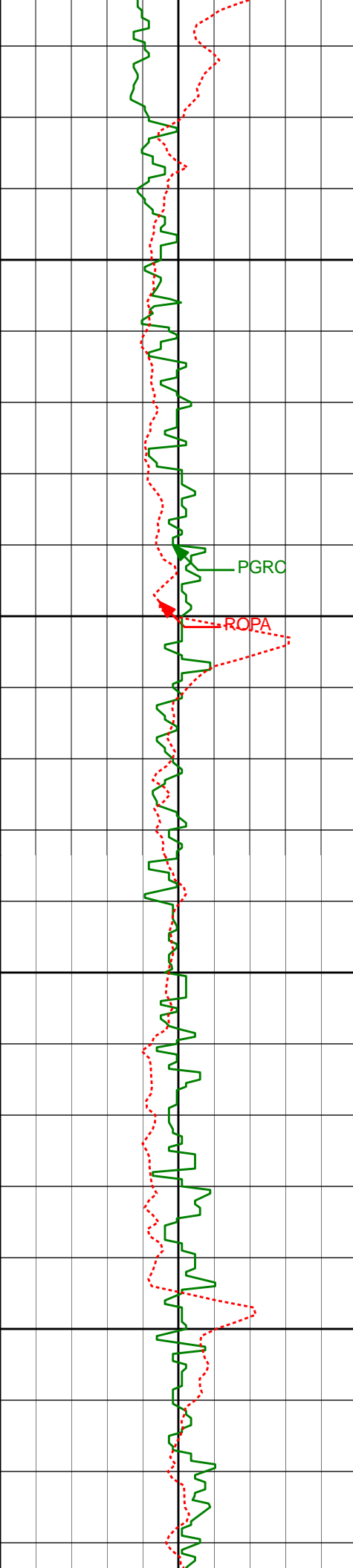
3725'

10.40°

347.34°

3703.47'

67.08'



3800'

3820'

10.36°

344.95°

3796.91'

71.70'

3850'

3915'

9.53°

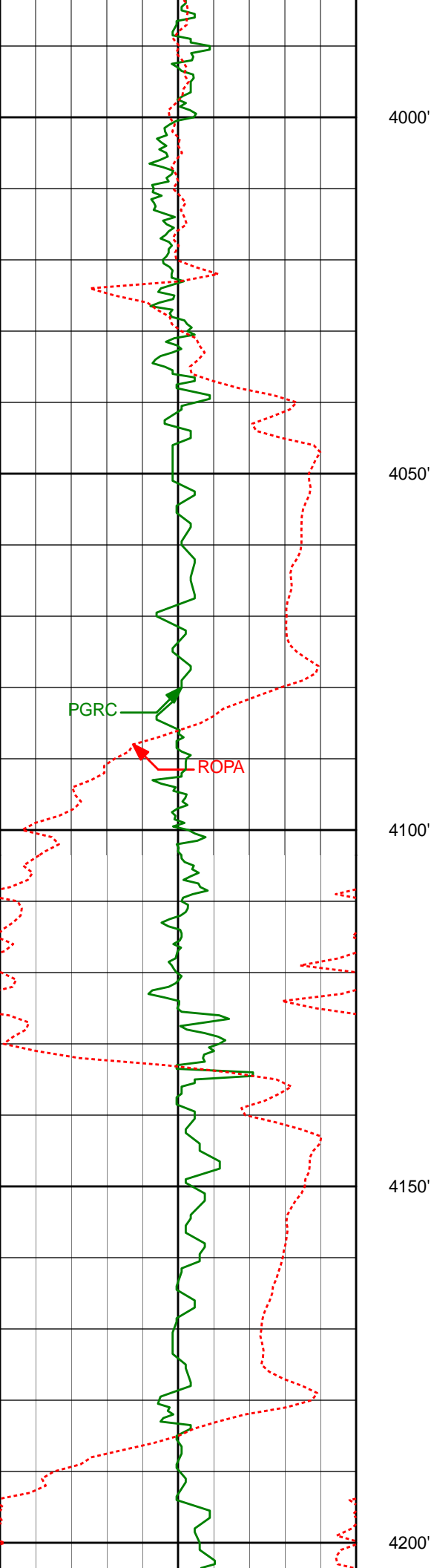
344.14°

3890.49'

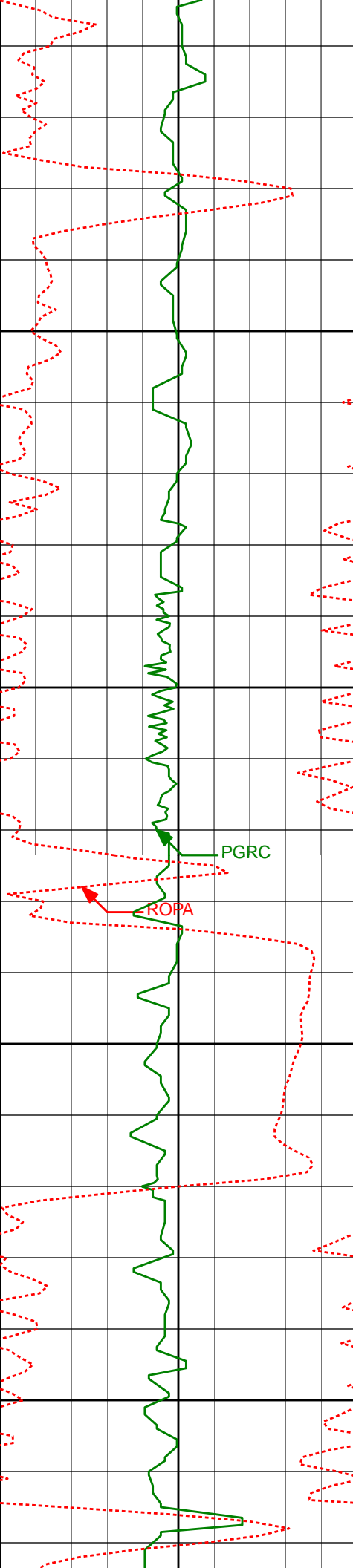
76.57'

3900'

3950'



4010'	9.01°	343.51°	3984.25'	81.30'
4105'	6.96°	338.16°	4078.32'	85.95'
4200'	3.53°	343.93°	4172.91'	89.16'



4250'

4294'

2.90°

347.20°

4266.76'

90.65'

4300'

PGRC

ROPA

4350'

4389'

2.09°

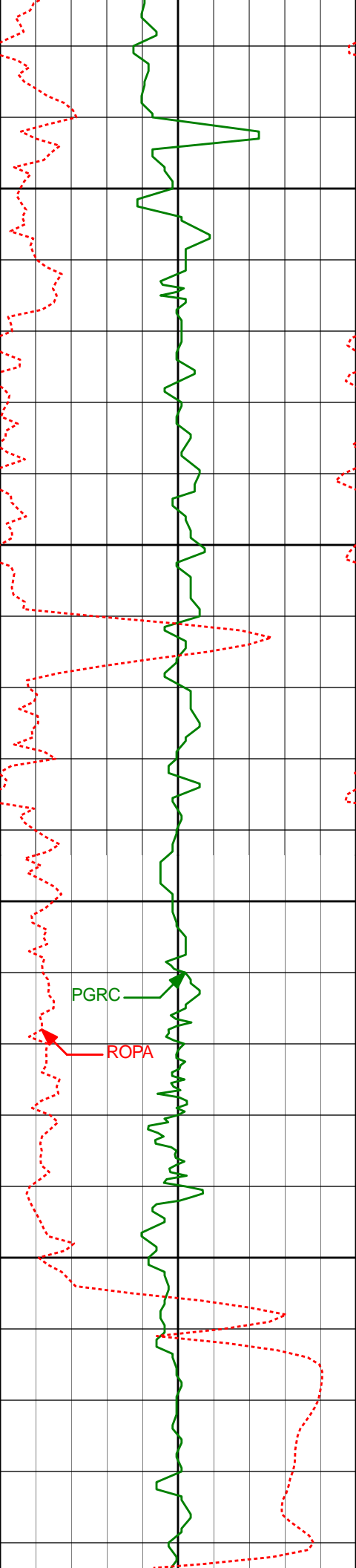
344.24°

4361.67'

91.78'

4400'





4450'

4484'

1.54°

324.87°

4456.62'

93.07'

4500'

4550'

4578'

1.66°

335.45°

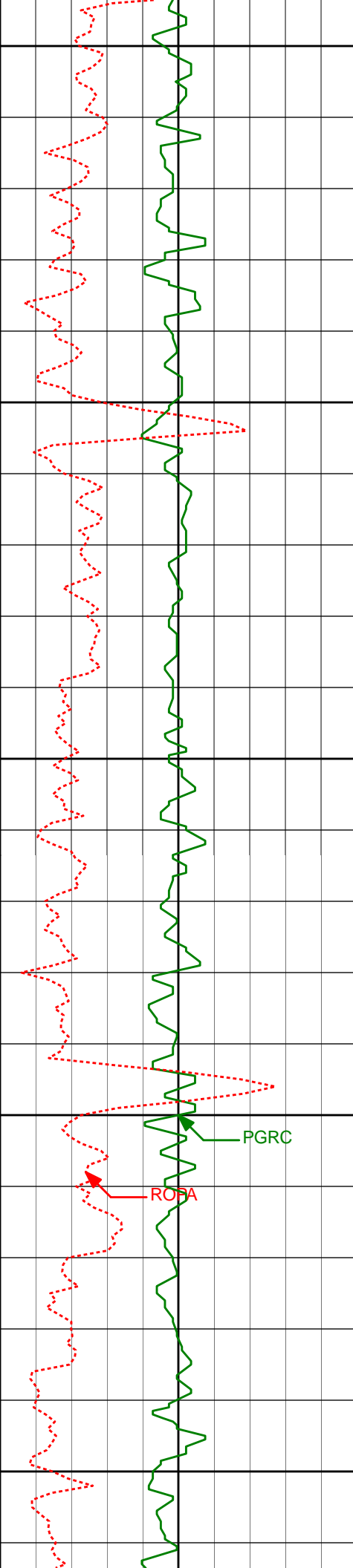
4550.59'

94.44'

4600'

PGRC

ROPA



4650'

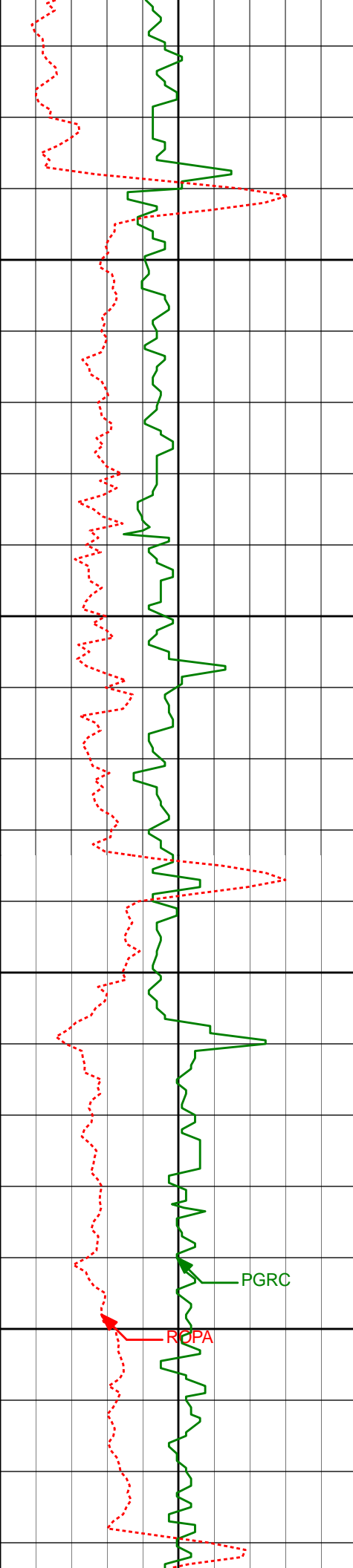
4700'

4750'

4800'

4850'

4673'	0.64°	43.38°	4645.57'	94.70'
4768'	0.50°	93.87°	4740.57'	93.93'
4862'	0.07°	80.80°	4834.56'	93.46'



4900'

4957'

0.04°

167.97°

4929.56'

93.40'

4950'

5000'

5051'

0.14°

207.42°

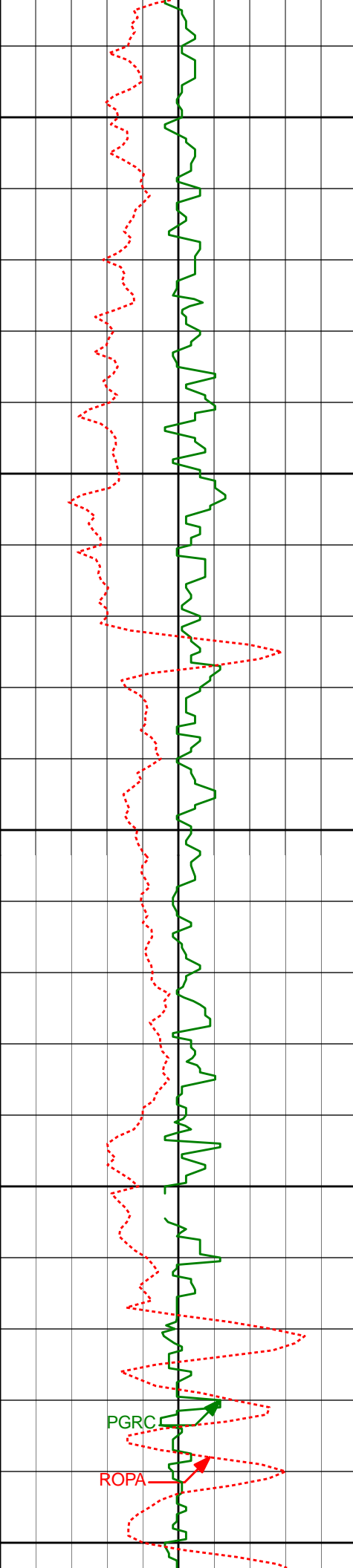
5023.56'

93.44'

PGRC

ROPA

5050'



5100'

5146'

0.34°

172.76°

5118.56'

93.45'

5150'

5200'

5242'

0.93°

191.04°

5214.56'

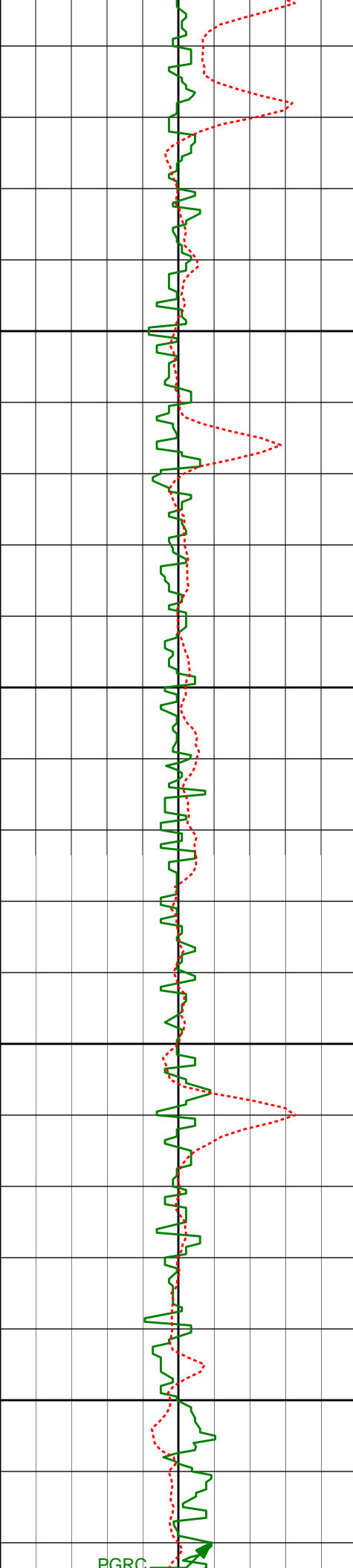
93.53'

5250'

PGRC

ROPA

5300'



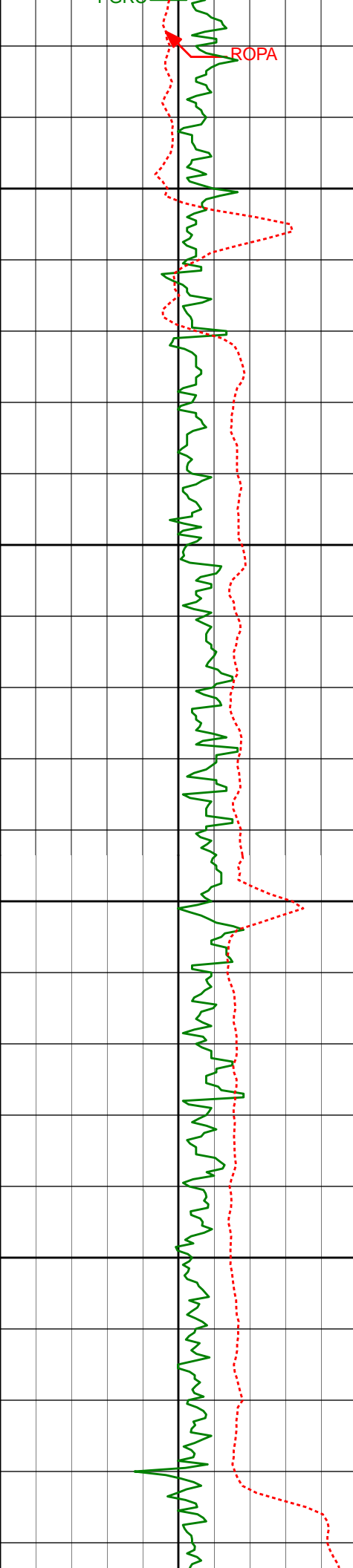
5350'

5400'

5450'

5500'

5336'	0.96°	227.25°	5308.54'	94.21'
5431'	1.93°	227.50°	5403.51'	95.92'
5526'	2.12°	221.52°	5498.45'	98.19'



ROPA

5550'

5600'

5650'

5700'

5621'

1.55°

224.83°

5593.41'

100.19'

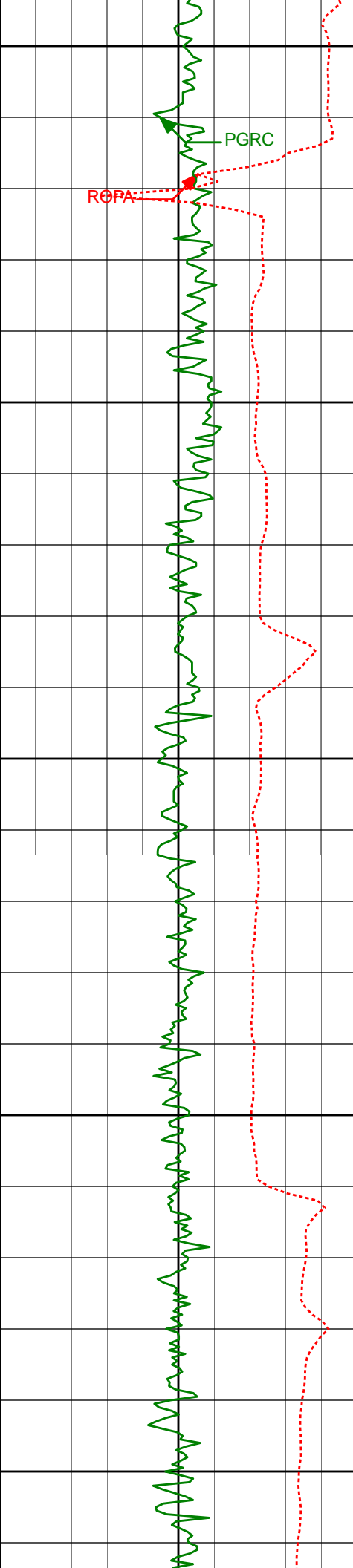
5716'

1.14°

225.30°

5688.38'

101.71'



5750'

Run 200

PGRC

ROPA

5800'

5850'

5900'

5950'

5810'

0.61°

220.27°

5782.37'

102.67'

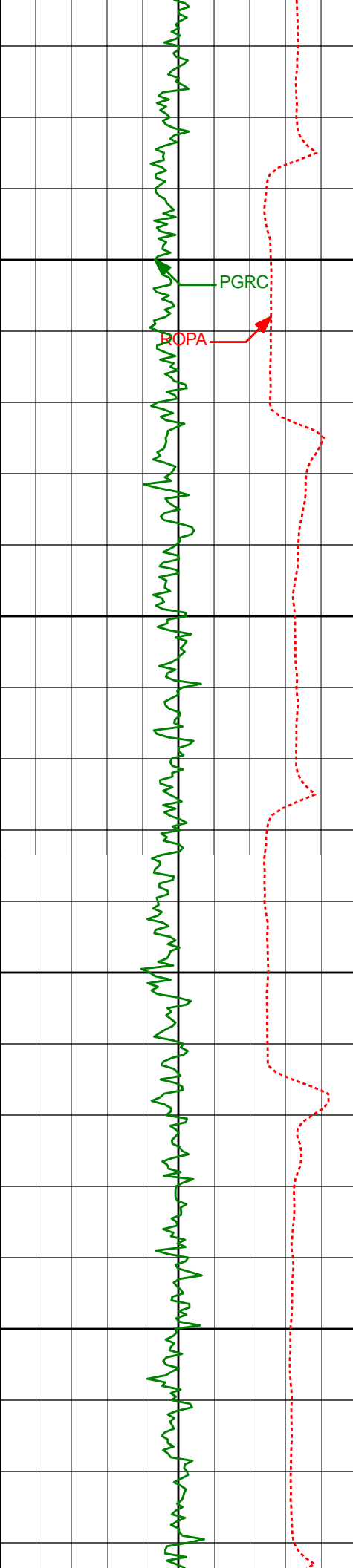
5904'

0.44°

251.49°

5876.36'

103.32'



6000'

6050'

6100'

6150'

5999'

7.91°

275.28°

5971.05'

110.19'

6093'

13.55°

268.16°

6063.37'

127.65'

6188'

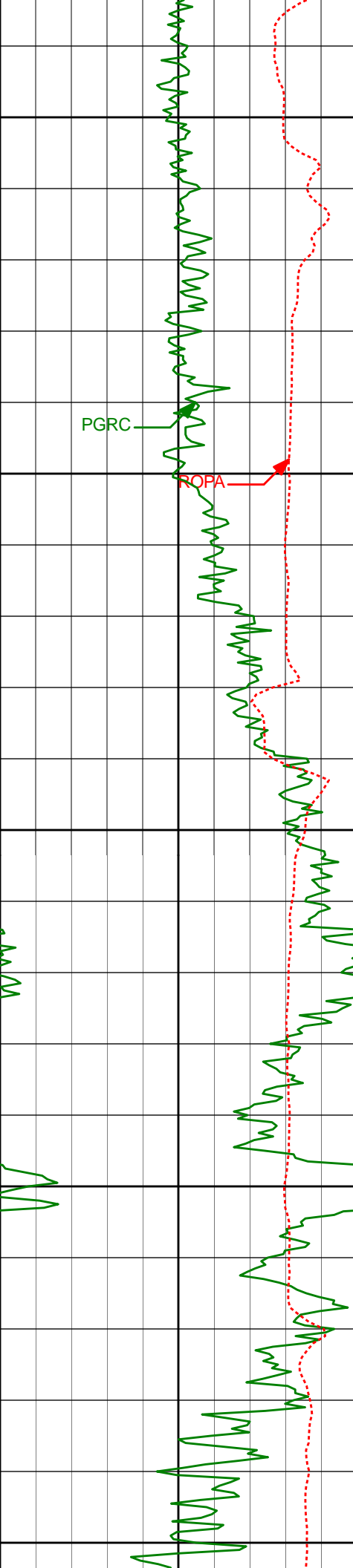
17.96°

267.01°

6154.78'

153.37'





PGRC

ROPA

6200'

6250'

6300'

6350'

6400'

6283'

23.61°

270.70°

6243.56'

187.01'

6378'

33.35°

275.97°

6326.98'

232.19'

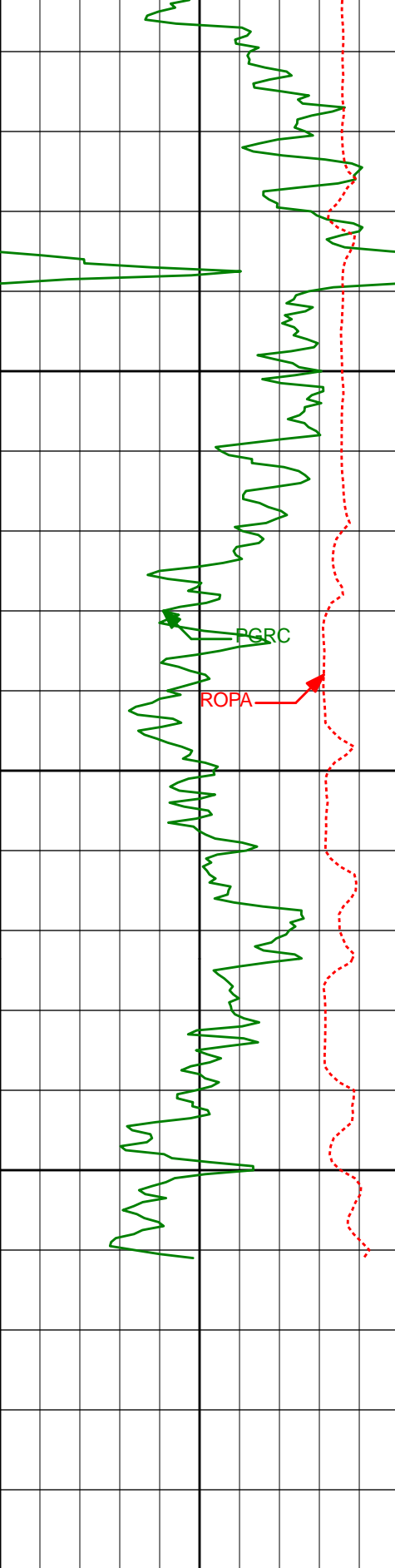
6473'

47.78°

275.45°

6398.96'

293.67'



6450'	6568'	62.05°	270.86°	6453.44'	371.16'
6500'	6663'	67.90°	267.72°	6493.62'	457.10'
6758'	6758'	73.41°	266.58°	6525.08'	546.40'
6806'	6806'	75.00°	266.50°	6538.14'	592.39'
6550'	6852'	77.26°	265.62°	6549.17'	636.82'
Casing Shoe @ 6559'					

PCG Gamma Ray BCorr PGRC 0200 api		Measured Depth (ft) 1:240	Depth	Inc	Azi.	TVD	V.S.
Average Rate of Penetration ROPA							

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy  
Wells Ranch AE30-62HNC  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0901136504

The first two surveys at 370' and 613' are provided by HP.

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
370.00	0.40	314.43	370.00	0.90 N	0.92 W	0.95	0.11
613.00	0.70	281.53	612.99	1.79 N	2.98 W	3.04	0.17
803.00	0.44	261.93	802.98	1.92 N	4.84 W	4.90	0.17
895.00	0.46	243.57	894.97	1.71 N	5.52 W	5.57	0.16
987.00	0.36	252.25	986.97	1.46 N	6.13 W	6.17	0.13
1080.00	0.32	176.82	1079.97	1.11 N	6.39 W	6.42	0.45
1172.00	0.09	337.42	1171.97	0.92 N	6.41 W	6.43	0.44
1265.00	0.32	45.15	1264.97	1.17 N	6.25 W	6.28	0.32
1358.00	0.57	66.87	1357.97	1.54 N	5.64 W	5.69	0.32
1452.00	0.80	88.72	1451.96	1.73 N	4.55 W	4.61	0.37
1545.00	0.70	120.59	1544.95	1.46 N	3.42 W	3.46	0.45
1638.00	0.73	127.75	1637.95	0.81 N	2.46 W	2.48	0.10
1733.00	0.77	1.16	1732.94	1.07 N	1.97 W	2.00	1.41
1828.00	2.07	346.94	1827.91	3.38 N	2.34 W	2.45	1.41
1923.00	3.97	356.46	1922.77	8.34 N	2.93 W	3.20	2.06
2018.00	6.26	353.35	2017.39	16.77 N	3.74 W	4.27	2.43
2113.00	9.35	353.37	2111.50	29.58 N	5.23 W	6.17	3.25
2208.00	10.52	351.66	2205.07	45.83 N	7.38 W	8.84	1.27
2302.00	10.00	349.57	2297.57	62.34 N	10.10 W	12.08	0.68
2397.00	8.93	347.42	2391.28	77.65 N	13.20 W	15.67	1.19
2492.00	10.03	345.78	2484.98	92.87 N	16.84 W	19.79	1.19
2587.00	9.94	347.37	2578.54	108.89 N	20.66 W	24.13	0.31
2682.00	9.25	347.18	2672.21	124.33 N	24.15 W	28.11	0.73
2777.00	8.80	346.15	2766.03	138.84 N	27.58 W	32.00	0.50
2872.00	8.37	347.62	2859.97	152.64 N	30.80 W	35.66	0.51
2967.00	7.98	347.07	2954.00	165.83 N	33.76 W	39.04	0.42
3062.00	7.60	347.40	3048.13	178.38 N	36.61 W	42.28	0.40
3157.00	8.05	349.13	3142.24	191.05 N	39.23 W	45.31	0.53
3346.00	8.84	343.52	3329.19	217.97 N	45.85 W	52.78	0.60
3441.00	7.67	344.38	3423.21	231.08 N	49.63 W	56.98	1.24
3536.00	8.56	349.68	3517.26	244.14 N	52.60 W	60.37	1.22
3630.00	10.19	351.18	3610.00	259.24 N	55.13 W	63.38	1.75
3725.00	10.40	347.34	3703.47	275.91 N	58.30 W	67.08	0.76
3820.00	10.36	344.95	3796.91	292.52 N	62.39 W	71.70	0.46
3915.00	9.53	344.14	3890.49	308.34 N	66.76 W	76.57	0.89
4010.00	9.01	343.51	3984.25	323.03 N	71.02 W	81.30	0.56
4105.00	6.96	338.16	4078.32	335.51 N	75.27 W	85.95	2.29
4200.00	3.53	343.93	4172.91	343.67 N	78.23 W	89.16	3.65
4294.00	2.90	347.20	4266.76	348.77 N	79.55 W	90.65	0.70
4389.00	2.09	344.24	4361.67	352.78 N	80.56 W	91.78	0.86
4484.00	1.54	324.87	4456.62	355.49 N	81.76 W	93.07	0.86
4578.00	1.66	335.45	4550.59	357.76 N	83.05 W	94.44	0.34
4673.00	0.64	43.38	4645.57	359.40 N	83.26 W	94.70	1.62
4768.00	0.50	93.87	4740.57	359.76 N	82.48 W	93.93	0.53
4862.00	0.07	80.80	4834.56	359.74 N	82.02 W	93.46	0.46
4957.00	0.04	167.97	4929.56	359.71 N	81.95 W	93.40	0.08
5051.00	0.14	207.42	5023.56	359.58 N	82.00 W	93.44	0.12
5146.00	0.34	172.76	5118.56	359.20 N	82.02 W	93.45	0.25
5242.00	0.93	191.04	5214.56	358.15 N	82.13 W	93.53	0.64
5336.00	0.96	227.25	5308.54	356.87 N	82.86 W	94.21	0.63
5431.00	1.93	227.50	5403.51	355.25 N	84.62 W	95.92	1.02
5526.00	2.12	221.52	5498.45	352.85 N	86.96 W	98.19	0.30

5621.00	1.55	224.83	5593.41	350.62 N	89.03 W	100.19	0.61
5716.00	1.14	225.30	5688.38	349.05 N	90.61 W	101.71	0.43
5810.00	0.61	220.27	5782.37	348.01 N	91.60 W	102.67	0.57
5904.00	0.44	251.49	5876.36	347.51 N	92.27 W	103.32	0.35
5999.00	7.91	275.28	5971.05	348.00 N	99.13 W	110.19	7.90
6093.00	13.55	268.16	6063.37	348.24 N	116.59 W	127.65	6.15
6188.00	17.96	267.01	6154.78	347.12 N	142.35 W	153.37	4.65
6283.00	23.61	270.70	6243.56	346.59 N	176.03 W	187.01	6.10
6378.00	33.35	275.97	6326.98	349.54 N	221.14 W	232.19	10.58
6473.00	47.78	275.45	6398.96	355.63 N	282.46 W	293.67	15.19
6568.00	62.05	270.86	6453.44	359.62 N	359.86 W	371.16	15.53
6663.00	67.90	267.72	6493.62	358.50 N	445.88 W	457.10	6.85
6758.00	73.41	266.58	6525.08	354.03 N	535.37 W	546.40	5.91
6806.00	75.00	266.50	6538.14	351.24 N	581.47 W	592.39	3.32
6852.00	77.26	265.62	6549.17	348.17 N	626.02 W	636.82	5.25
7039.00	87.69	267.67	6573.63	337.38 N	810.83 W	821.19	5.68
7132.00	87.57	267.84	6577.47	333.74 N	903.68 W	913.87	0.22
7225.00	89.82	268.09	6579.59	330.44 N	996.59 W	1006.63	2.43
7318.00	89.26	266.94	6580.34	326.41 N	1089.50 W	1099.36	1.38
7412.00	90.06	267.33	6580.89	321.71 N	1183.38 W	1193.05	0.95
7505.00	89.60	266.58	6581.17	316.77 N	1276.24 W	1285.71	0.95
7598.00	89.75	266.31	6581.70	311.00 N	1369.06 W	1378.30	0.33
7693.00	90.52	266.53	6581.47	305.07 N	1463.88 W	1472.87	0.84
7788.00	90.55	266.15	6580.59	299.00 N	1558.68 W	1567.43	0.40
7882.00	90.28	267.20	6579.91	293.55 N	1652.52 W	1661.05	1.15
7977.00	90.65	269.29	6579.13	290.64 N	1747.46 W	1755.85	2.23
8072.00	91.02	269.35	6577.75	289.52 N	1842.45 W	1850.75	0.39
8167.00	90.40	269.42	6576.57	288.50 N	1937.43 W	1945.66	0.66
8262.00	89.85	268.52	6576.37	286.79 N	2032.42 W	2040.54	1.11
8356.00	90.59	268.40	6576.00	284.26 N	2126.38 W	2134.37	0.80
8451.00	91.26	268.50	6574.47	281.69 N	2221.33 W	2229.20	0.71
8546.00	90.52	268.99	6573.00	279.61 N	2316.30 W	2324.05	0.93
8641.00	90.99	268.93	6571.74	277.89 N	2411.27 W	2418.92	0.50
8736.00	89.14	269.46	6571.64	276.55 N	2506.26 W	2513.81	2.03
8831.00	89.48	269.28	6572.78	275.51 N	2601.25 W	2608.72	0.40
8925.00	90.74	269.40	6572.60	274.43 N	2695.24 W	2702.63	1.35
9020.00	88.80	269.46	6572.98	273.48 N	2790.23 W	2797.54	2.04
9115.00	88.28	269.16	6575.40	272.34 N	2885.19 W	2892.42	0.63
9210.00	88.61	269.09	6577.98	270.89 N	2980.14 W	2987.28	0.36
9305.00	89.41	269.22	6579.62	269.49 N	3075.12 W	3082.16	0.85
9399.00	90.65	268.93	6579.57	267.97 N	3169.11 W	3176.05	1.35
9494.00	89.63	268.38	6579.34	265.74 N	3264.08 W	3270.90	1.22
9589.00	89.20	267.42	6580.31	262.26 N	3359.01 W	3365.67	1.11
9684.00	90.00	268.10	6580.97	258.54 N	3453.93 W	3460.43	1.11
9778.00	90.49	268.90	6580.57	256.08 N	3547.90 W	3554.26	1.00
9871.00	88.03	267.51	6581.77	253.17 N	3640.83 W	3647.06	3.04
9967.00	87.75	266.79	6585.31	248.40 N	3736.65 W	3742.68	0.80
10062.00	89.41	267.11	6587.66	243.35 N	3831.48 W	3837.30	1.78
10157.00	89.60	266.50	6588.48	238.05 N	3926.33 W	3931.93	0.67
10251.00	89.45	266.00	6589.26	231.91 N	4020.13 W	4025.48	0.56
10346.00	90.31	266.08	6589.46	225.35 N	4114.90 W	4120.00	0.91
10441.00	90.25	268.22	6589.00	220.62 N	4209.77 W	4214.67	2.25
10536.00	89.97	268.91	6588.81	218.24 N	4304.74 W	4309.52	0.78
10631.00	89.78	268.99	6589.02	216.50 N	4399.73 W	4404.40	0.22
10726.00	89.54	268.77	6589.58	214.65 N	4494.71 W	4499.27	0.34
10821.00	89.51	269.23	6590.37	212.99 N	4589.69 W	4594.15	0.49
10916.00	89.75	271.00	6590.98	213.18 N	4684.68 W	4689.10	1.88
11010.00	89.69	271.76	6591.44	215.44 N	4778.65 W	4783.10	0.81
11105.00	89.91	272.99	6591.78	219.38 N	4873.57 W	4878.09	1.32
11199.00	89.32	273.21	6592.41	224.46 N	4967.43 W	4972.06	0.67
11294.00	89.51	271.31	6593.38	228.21 N	5062.35 W	5067.05	2.01
11389.00	89.54	270.94	6594.17	230.07 N	5157.32 W	5162.04	0.39
11483.00	90.18	268.71	6594.40	229.79 N	5251.32 W	5255.98	2.47
11578.00	90.40	269.58	6593.91	228.37 N	5346.30 W	5350.87	0.94
11673.00	89.57	268.21	6593.94	226.54 N	5441.28 W	5445.74	1.69
11768.00	89.97	267.08	6594.32	222.63 N	5536.20 W	5540.49	1.26
11862.00	89.38	266.41	6594.85	217.29 N	5630.05 W	5634.11	0.95
11961.00	90.92	266.96	6594.59	211.57 N	5728.88 W	5732.71	1.65
12026.00	90.92	266.96	6593.55	208.12 N	5793.78 W	5797.47	0.00

VD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT  
VERTICAL SECTION RELATIVE TO WELL HEAD  
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 271.83 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.43 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 12026.00 FEET  
IS 5797.51 FEET ALONG 272.06 DEGREES (GRID)

Final survey is a straight line projection to TD.

Date Printed:30 May 2014