

PCGC: Pressure Case Gamma

1:600 / 1:240

Country : USA																																																	
Field : Wattenberg																																																	
Location : Lat: 40° 42' 53.75" North Long: 104° 0' 1.26" West																																																	
Well : Trisha LC29-75HNB																																																	
Company : Noble Energy																																																	
Rig : H&P 273																																																	
LOCATION										Company : Noble Energy Rig : H&P 273 Well : Trisha LC29-75HNB Field : Wattenberg Country : USA API Number : 05-123-38780																																							
Latitude : 40° 42' 53.75" North Longitude : 104° 0' 1.26" West UTM Easting = 3,415,707.910 ft UTM Northing = 1,506,808,200 ft																																																	
Permanent Datum : Ground Level										Elevation : 4873.00 ft										Elev. KB N/A																													
Log Measured From : Drill Floor										24.00 ft Above Permanent Datum										DF 4897.00 ft																													
Drilling Measured From : Drill Floor										MD LOG										GL 4873.00 ft WD N/A																													
Depth Logged : 632.00 ft To 10,255.00 ft										Unit No. : 11703717										Job No. : CA-XX-0901285296																													
Date Logged : 18-Jun-14 To 24-Jun-14										Plot Type : Final																																							
Total Depth MD : 10,255.00 ft TVD : 6,124.52 ft										Plot Date : 24-Jun-14																																							
Spud Date : 18-Jun-14																																																	
Run No.	Borehole Record (MD)					Run No.	Casing Record (MD)																																										
	Size		From				To			Size		From			To																																		
	8.750 in		632.00 ft				5,490.00 ft																																										
	3		8.750 in				5,490.00 ft			6,518.00 ft																																							
	4		6,125 in				6,518.00 ft			10,255.00 ft																																							
										Size										Weight										From										To									
										9.625 in										36.00 lbpf										SURFACE										632.00 ft									
										7.000 in										26.00 lbpf										SURFACE										6,508.00 ft									

WELL INFORMATION

MWD Run Number	200	300	400		
Date run completed	20-Jun-14	21-Jun-14	24-Jun-14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	632.00	5,490.00	6,518.00		
Log End Depth (MD, ft)	5,490.00	6,518.00	10,255.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	19-Jun-14 02:50	20-Jun-14 14:10	22-Jun-14 14:10		
Drill/Wipe End Date and Time	19-Jun-14 22:45	21-Jun-14 05:40	23-Jun-14 17:10		
Min Inc (deg) @ Depth (MD, ft)	1.01 @ 4,486.00	2.86 @ 5,526.00	85.74 @ 8,732.00		
Max Inc (deg) @ Depth (MD, ft)	13.41 @ 3,727.00	84.05 @ 6,464.00	94.38 @ 9,110.00		
Bit TFA(in2) / Bit Type	0.74 / PDC	0.86 / PDC	0.46 / PDC		
Flow Rate (gpm)	565.24	520.88	285.00		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Lignosulfanate	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.40 / 27.00	10.50 / 40.00	10.25 / 37.00		
Filtrate CL (ppm)	200.00	200.00	200.00		
pH / Fluid Loss (mptm)	9.00 / 22	9.50 / 7	9.80 / 59		
PV (cP) / YP (lbf2)	13 / 6.00	15 / 9.00	9 / 8.00		
% Solids / % Sand	0.50 / 0.1	9.90 / 0.20	8.90 / 8.90		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (degF) / S	151.00 / PGM	127.00 / PGM	210.10 / PGM		

Max Tool Temp (degF) / Source	154.30 / PCM	167.00 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Juan Pablo Centeno	Juan Pablo Centeno	Juan Pablo Centeno		
Customer Representative	Dave Nielsen	Dave Nielsen	Dave Nielsen		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	233811	233811	12310745		
Insert Serial Number	11620315	11620315	12001048		
Date and Time Initialized	18-Jun-14 17:25	18-Jun-14 17:25	21-Jun-14 07:49		
Date and Time Read	22-Jun-14 03:15	22-Jun-14 03:21	24-Jun-14 06:15		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	53.76	51.70	61.20		
Software Version	6.21	6.21	6.21		
Sub Serial Number	233811	233811	12310745		
Sonde Serial Number	11638628	11638628	11297623		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	333.23	336.47	288.00		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	48.66	46.60	56.10		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	233811	233811	12310745		
Insert/Sonde Serial Number	11579806	11579806	11293276		

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - 2" (1:600) log - 1 ft. interval, 3 ft. coercion distance, 5 ft. gap fill.
 - 5" (1:240) log for ROP - 0.5 ft. interval, 1.2 ft. coercion distance, 3 ft. gap fill.
 - 5" (1:240) log for Gamma Ray - 0.5 ft. interval, 0.6 ft. coercion distance, 3 ft. gap fill.
5. INSITE version 8.0.20.
6. Gamma presented inside casing/cement from 6470 ft. MD to 6508 ft. MD.
7. Third party trouble shooting EDR system. Lost time/depth data intermittently for one stand. Company representative did not want to stop drilling or wipe for gamma data.
8. Third party trouble shooting EDR system. Lost time/depth data intermittently for one stand. Company representative did not want to stop

Intermittently for one stand. Company Representative did not want to stop drilling or wipe for gamma data.

WARRANTY

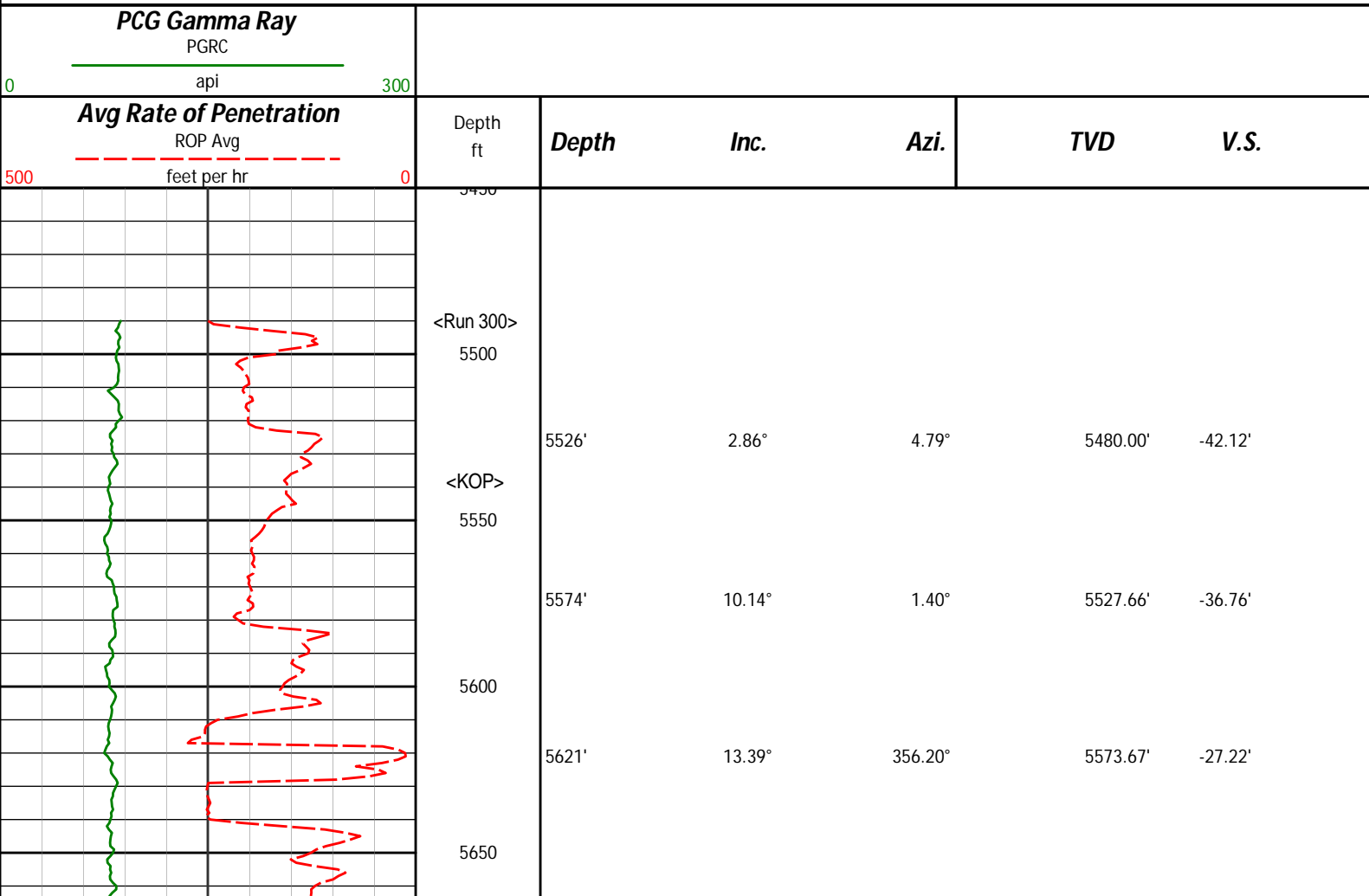
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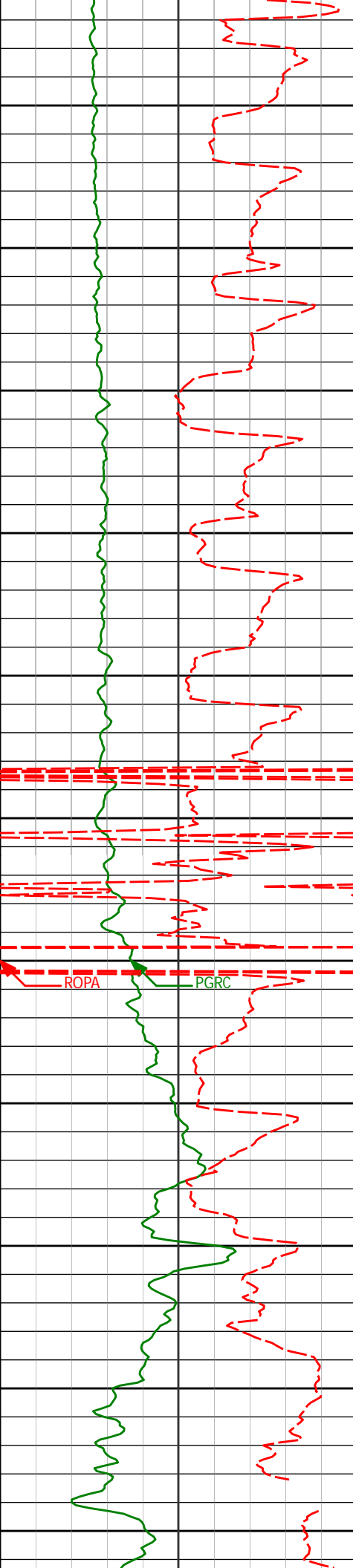
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Sperry Drilling Services

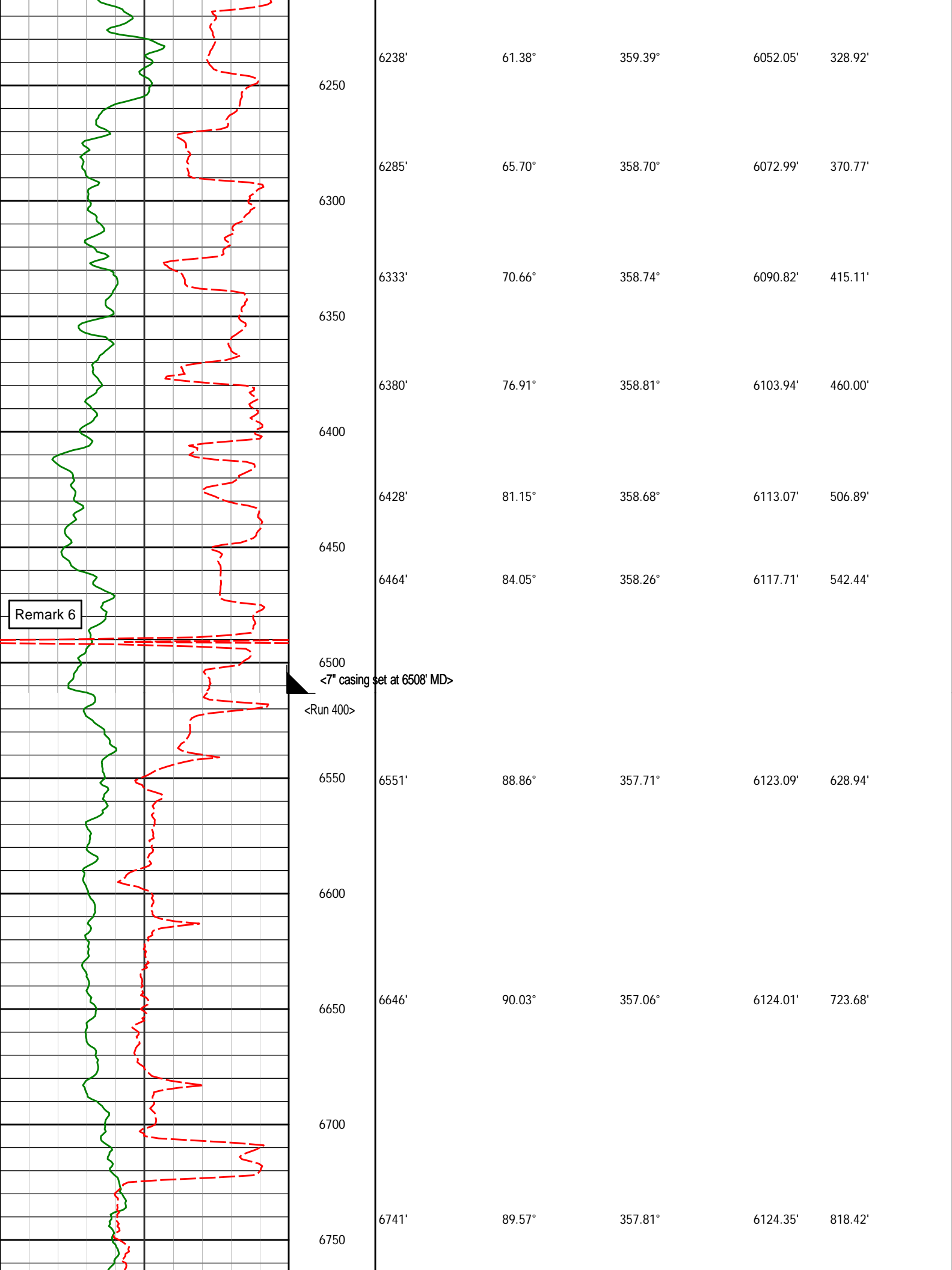
MD Main Log 1:600

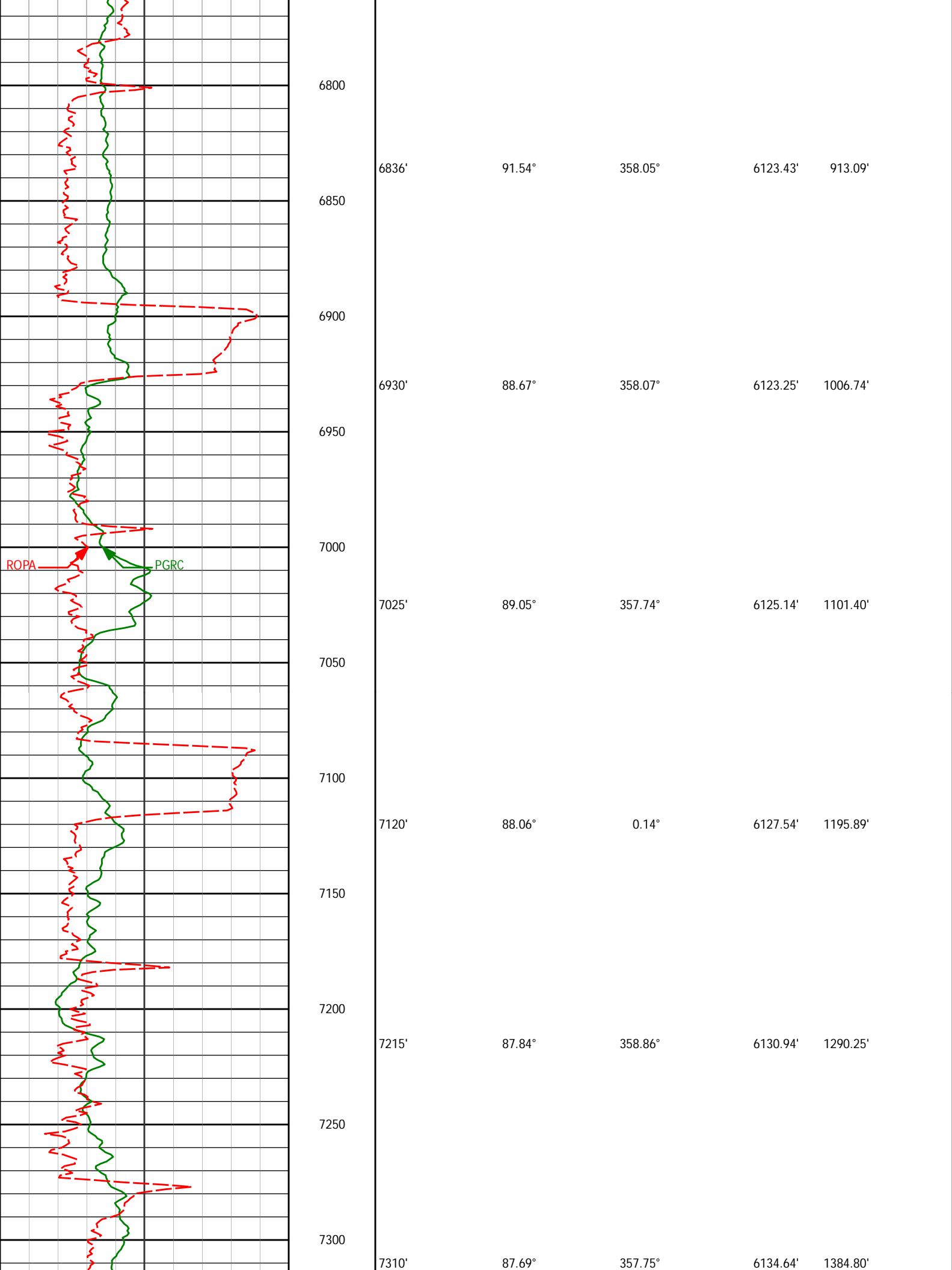
Noble Energy
Trisha LC29-75HNB
H&P 273
T9N, R59W

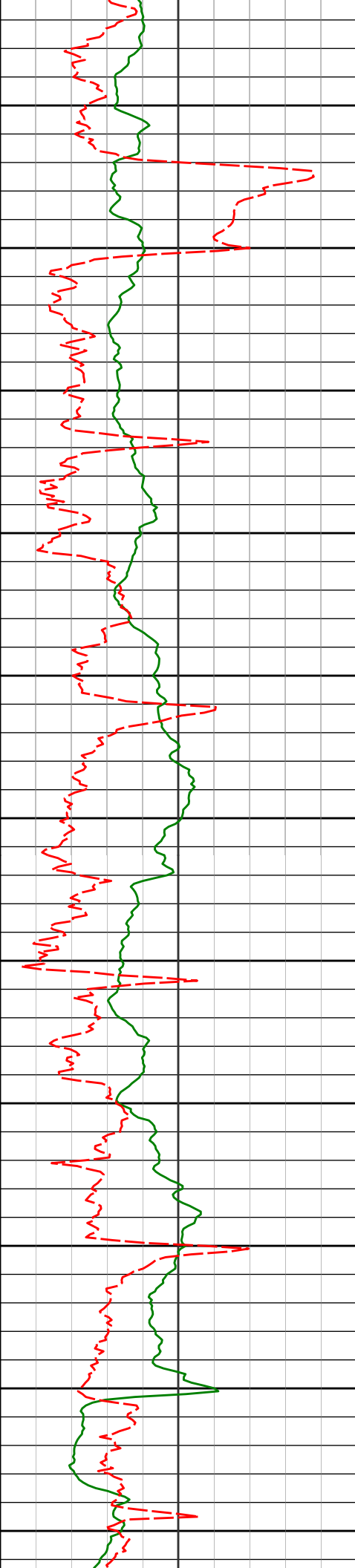




	5669'	15.26°	354.75°	5620.17'	-15.35'
5700	5716'	18.63°	357.68°	5665.13'	-1.68'
5750	5764'	23.28°	1.23°	5709.94'	15.36'
5800	5811'	27.20°	359.50°	5752.45'	35.25'
5850	5859'	31.46°	359.15°	5794.28'	58.62'
5900	5906'	35.70°	359.98°	5833.43'	84.45'
5950	5954'	38.85°	359.05°	5871.62'	113.34'
6000	6000'	42.27°	358.37°	5906.56'	143.11'
6050	6048'	45.68°	358.09°	5941.10'	176.31'
6100	6095'	49.77°	359.06°	5972.71'	210.92'
6150	6143'	54.77°	359.52°	6002.07'	248.66'
6200	6190'	58.36°	359.34°	6027.96'	287.65'







7350

7400

7450

7500

7550

7600

7650

7700

7750

7800

7850

7404'

89.88°

0.66°

6136.64'

1478.25'

7499'

89.97°

0.64°

6136.77'

1572.45'

7594'

89.97°

0.72°

6136.82'

1666.64'

7689'

90.12°

0.01°

6136.74'

1760.90'

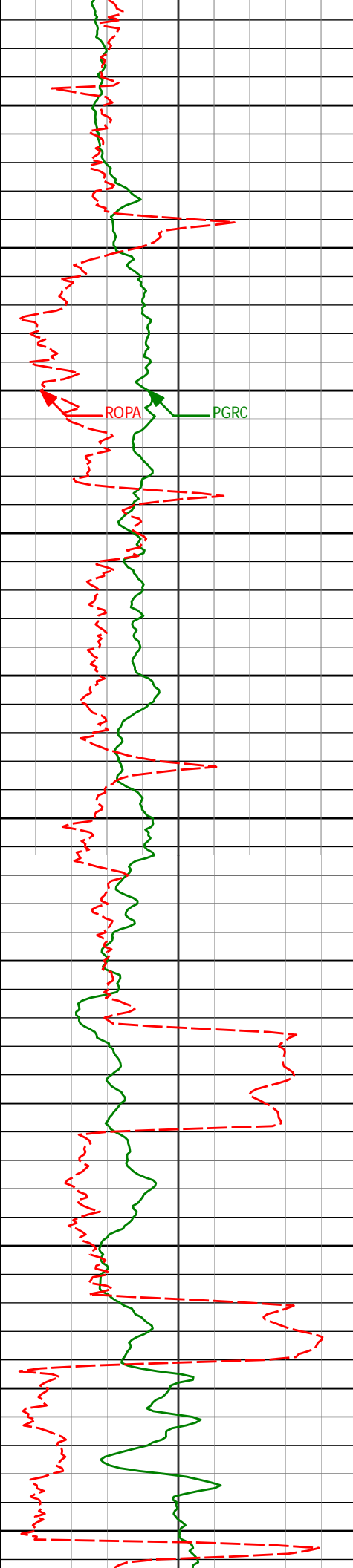
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89.11°

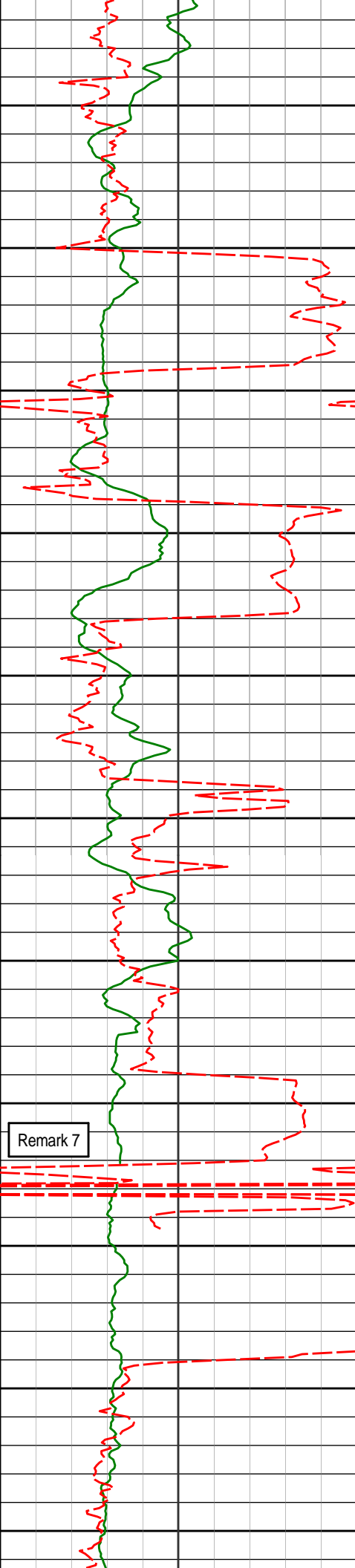
359.92°

6137.38'

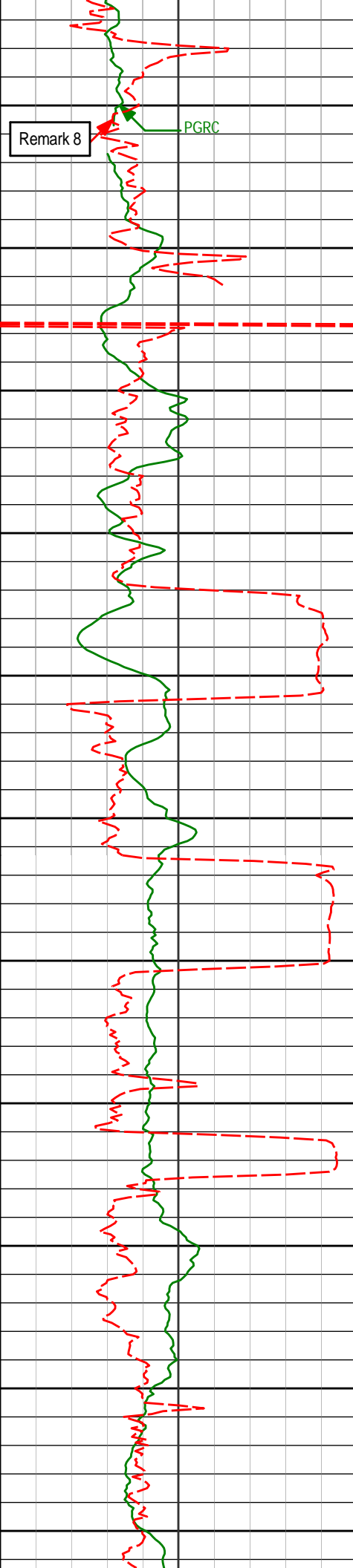
1855.23'



7878'	90.09°	359.08°	6138.04'	1948.66'
7900				
7950				
7973'	91.29°	358.78°	6136.89'	2043.18'
8000				
8050				
8068'	91.45°	356.79°	6134.62'	2137.84'
8100				
8150				
8163'	94.29°	359.87°	6129.86'	2232.32'
8200				
8250	92.28°	359.95°	6124.48'	2325.52'
8300				
8350	90.37°	0.29°	6122.28'	2419.80'
8400				



8450	8447'	92.41°	0.53°	6119.98'	2514.01'
8500					
8550	8542'	91.26°	0.11°	6116.94'	2608.23'
8600					
8650	8637'	86.76°	357.78°	6118.57'	2702.71'
8700					
8750	8732'	85.74°	356.82°	6124.78'	2797.26'
8800					
8850	8826'	89.01°	0.68°	6129.09'	2890.69'
8900					
8950	8921'	89.11°	358.54°	6130.64'	2985.08'



Remark 8

PGRC

9000

9050

9100

9150

9200

9250

9300

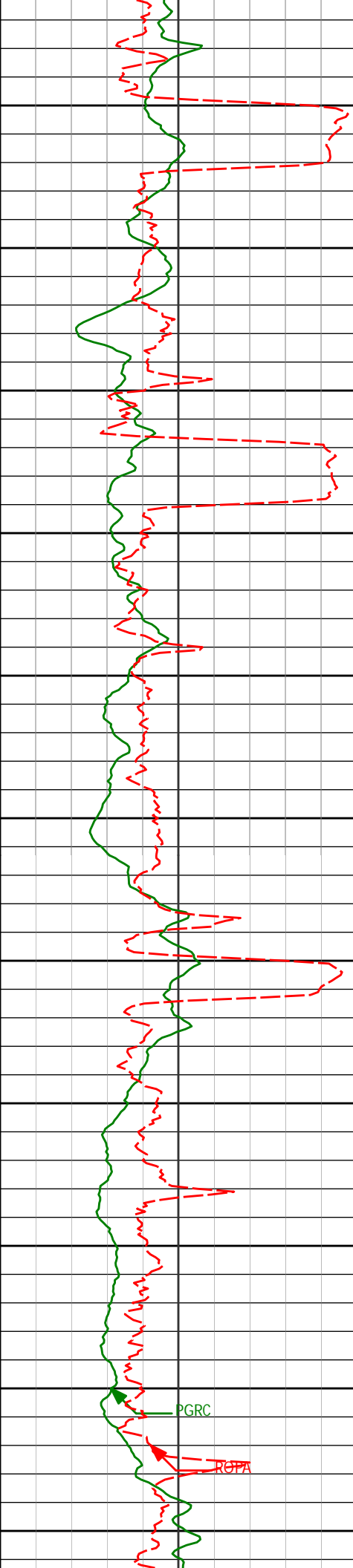
9350

9400

9450

9500

9016'	91.14°	358.00°	6130.44'	3079.70'
9110'	94.38°	357.95°	6125.91'	3173.25'
9205'	92.62°	358.31°	6120.10'	3267.72'
9300'	89.94°	359.86°	6117.98'	3362.19'
9394'	88.80°	0.79°	6119.02'	3455.45'
9489'	89.94°	0.73°	6120.06'	3549.62'



9550

9584'

87.07°

0.62°

6122.54'

3643.77'

9600

9650

9679'

87.35°

359.48°

6127.17'

3737.98'

9700

9750

9774'

88.12°

358.54°

6130.92'

3832.41'

9800

9850

9869'

89.04°

356.97°

6133.28'

3927.08'

9900

9950

9963'

90.49°

357.32°

6133.66'

4020.86'

10000

PGRC

ROPA

10050

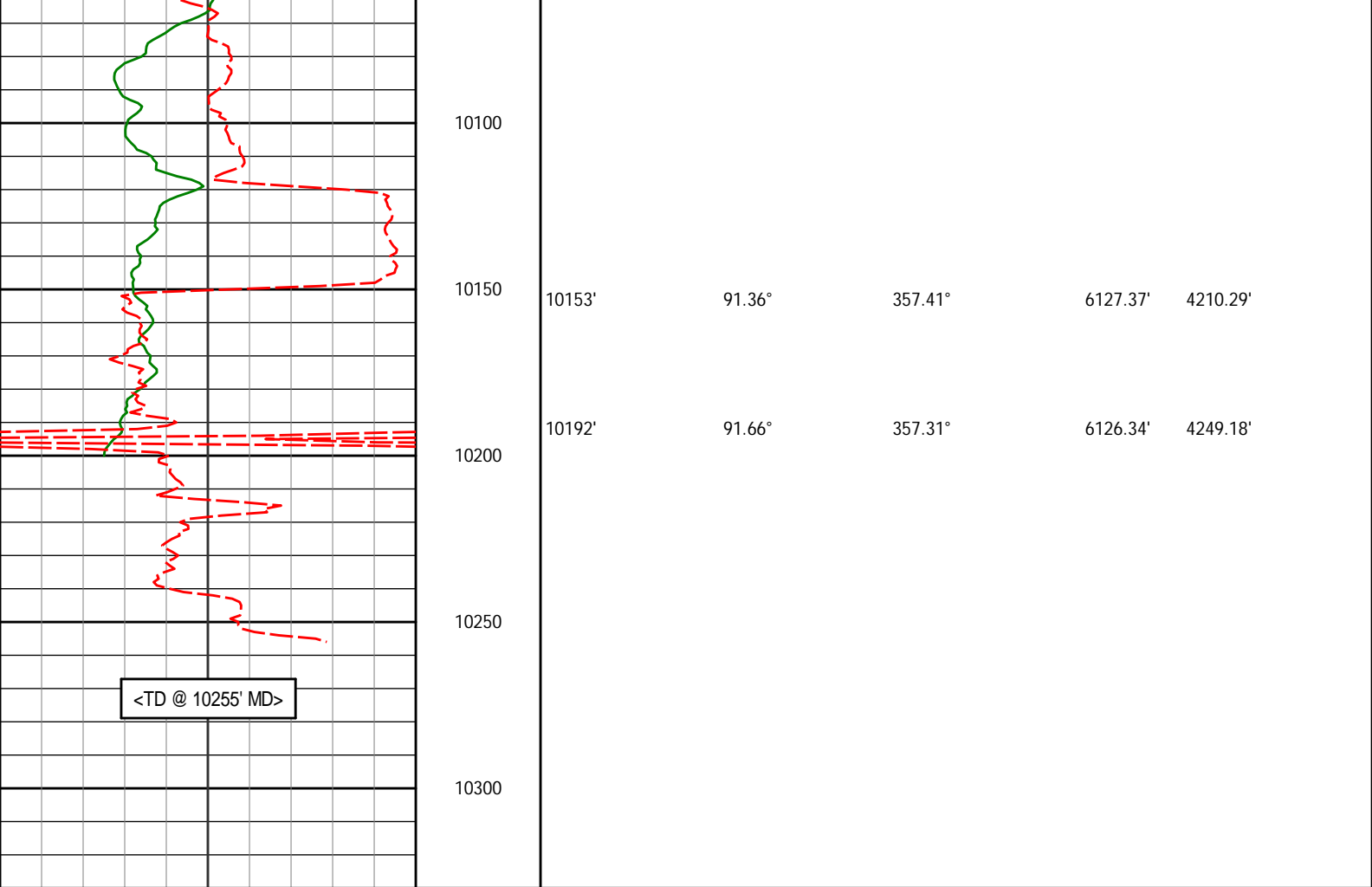
10058'

92.87°

356.88°

6130.87'

4115.59'



<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>feet per hr</div><div>0</div></div>	Depth ft	Depth	Inc.	Azi.	TVD	V.S.
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<div><div>PCG Gamma Ray</div><div>PGRC</div><div>api</div><div>0</div><div>300</div></div>	
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Sperry Drilling Services

MD Detail Log 1:240

Noble Energy

Trisha LC29-75HNB

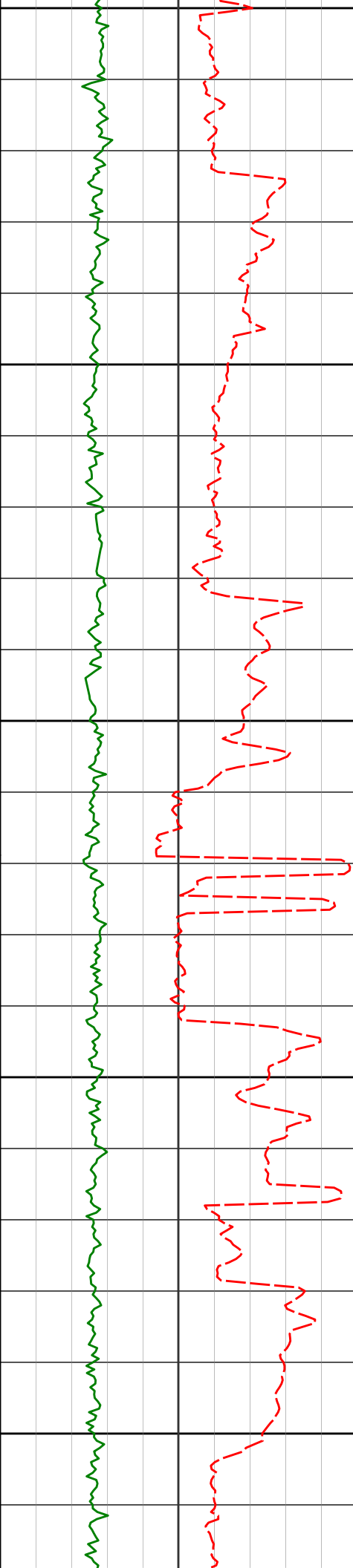
H&P 273

T9N, R59W

<div><div>PCG Gamma Ray</div><div>PGRC</div><div>api</div><div>0</div><div>300</div></div>	
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<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>feet per hr</div><div>0</div></div>	Depth ft	Depth	Inc.	Azi.	TVD	V.S.
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5500

5526'

2.86°

4.79°

5480.00'

-42.12'

<KOP>

5550

5574'

10.14°

1.40°

5527.66'

-36.76'

5600

5621'

13.39°

356.20°

5573.67'

-27.22'

5650

5669'

15.26°

354.75°

5620.17'

-15.35'

5700

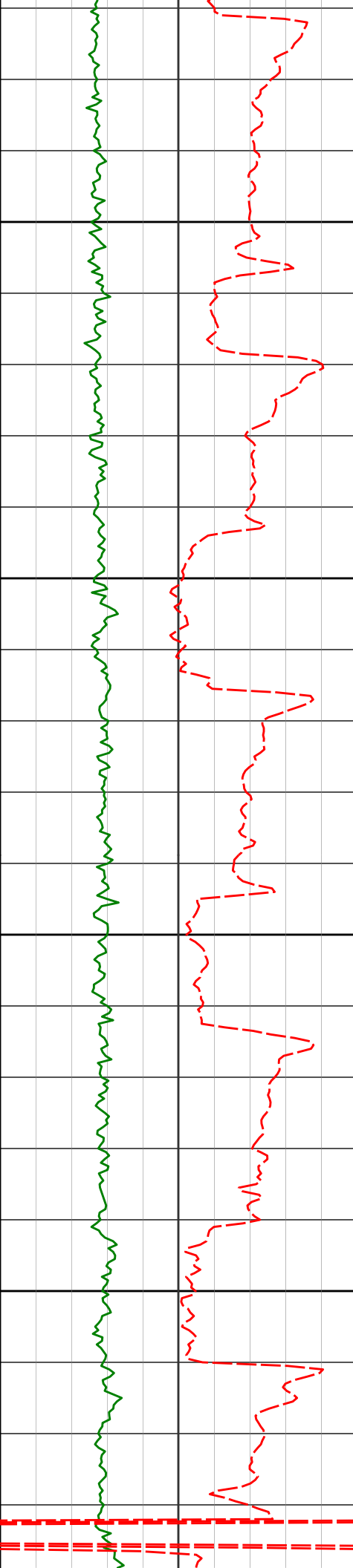
5716'

18.63°

357.68°

5665.13'

-1.68'



5750

5764'

23.28°

1.23°

5709.94'

15.36'

5800

5811'

27.20°

359.50°

5752.45'

35.25'

5850

5859'

31.46°

359.15°

5794.28'

58.62'

5900

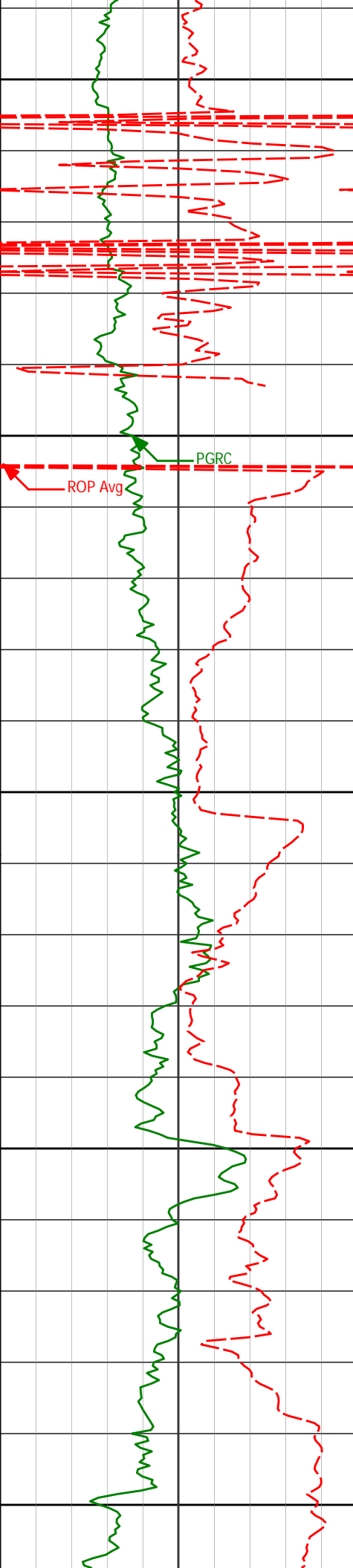
5906'

35.70°

359.98°

5833.43'

84.45'



5950

5954'

38.85°

359.05°

5871.62'

113.34'

6000

6000'

42.27°

358.37°

5906.56'

143.11'

6050

6048'

45.68°

358.09°

5941.10'

176.31'

6100

6095'

49.77°

359.06°

5972.71'

210.92'

6150

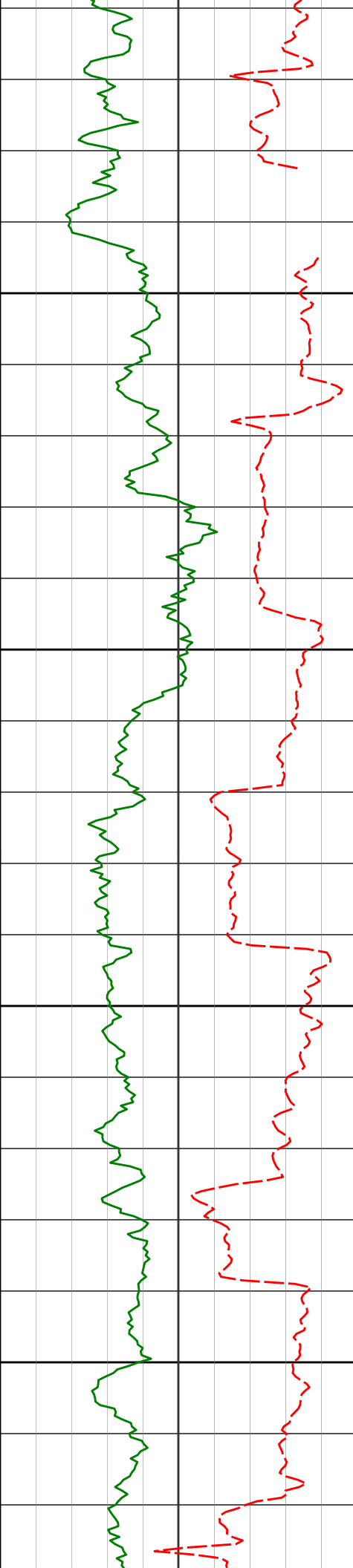
6143'

54.77°

359.52°

6002.07'

248.66'

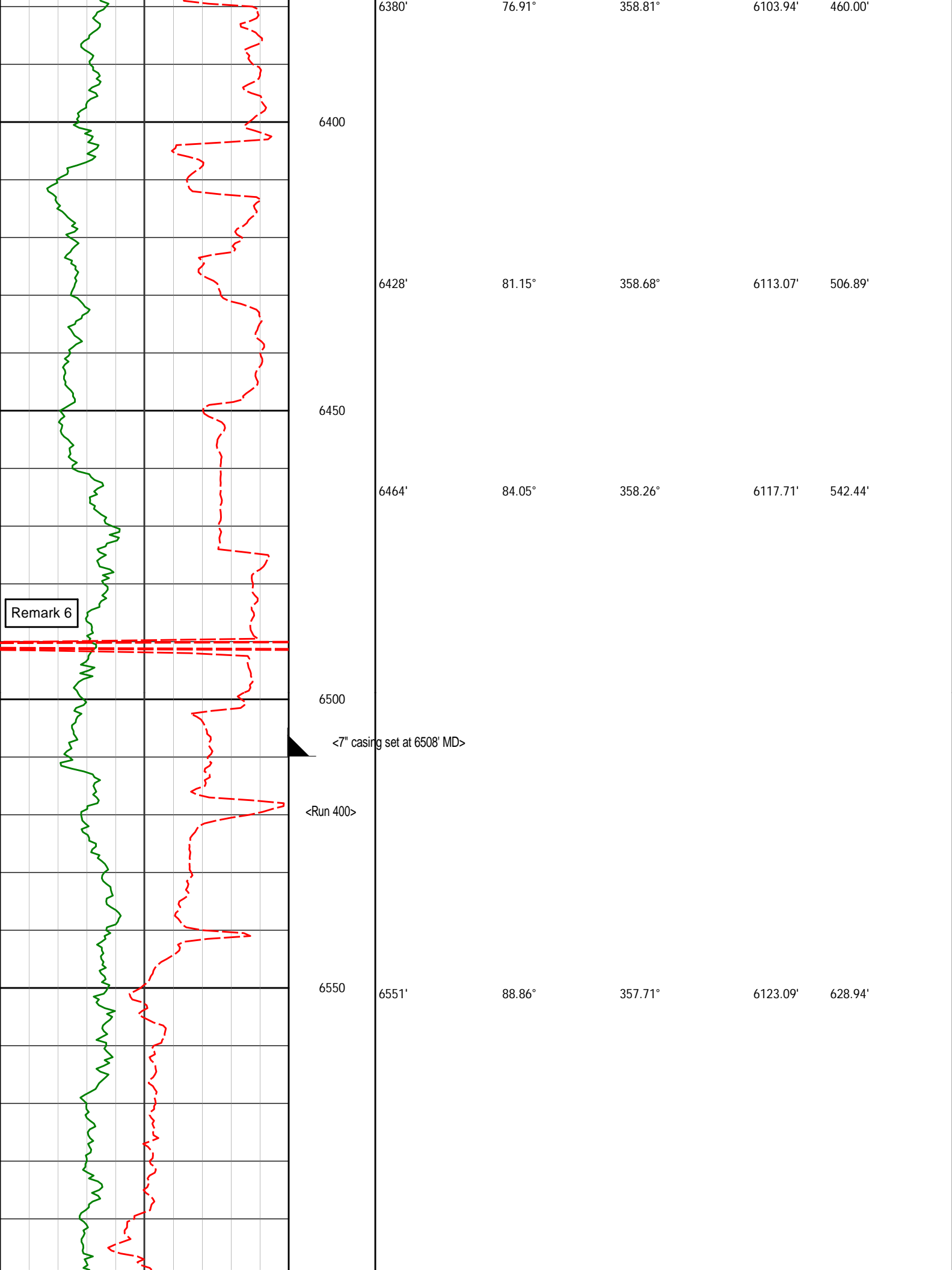


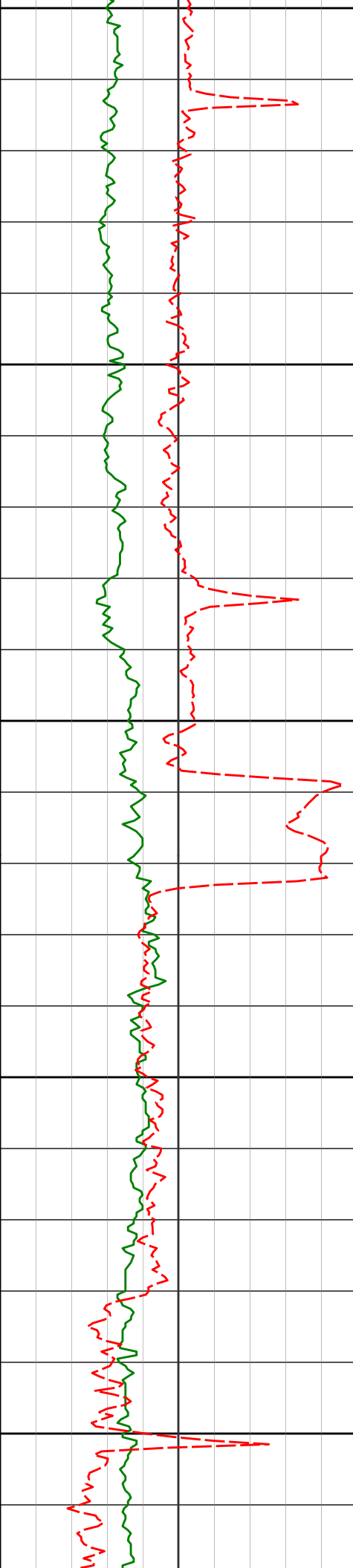
6190'	58.36°	359.34°	6027.96'	287.65'
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6238'	61.38°	359.39°	6052.05'	328.92'
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6285'	65.70°	358.70°	6072.99'	370.77'
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6333'	70.66°	358.74°	6090.82'	415.11'
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6600

6650

6700

6750

6800

6646'

90.03°

357.06°

6124.01'

723.68'

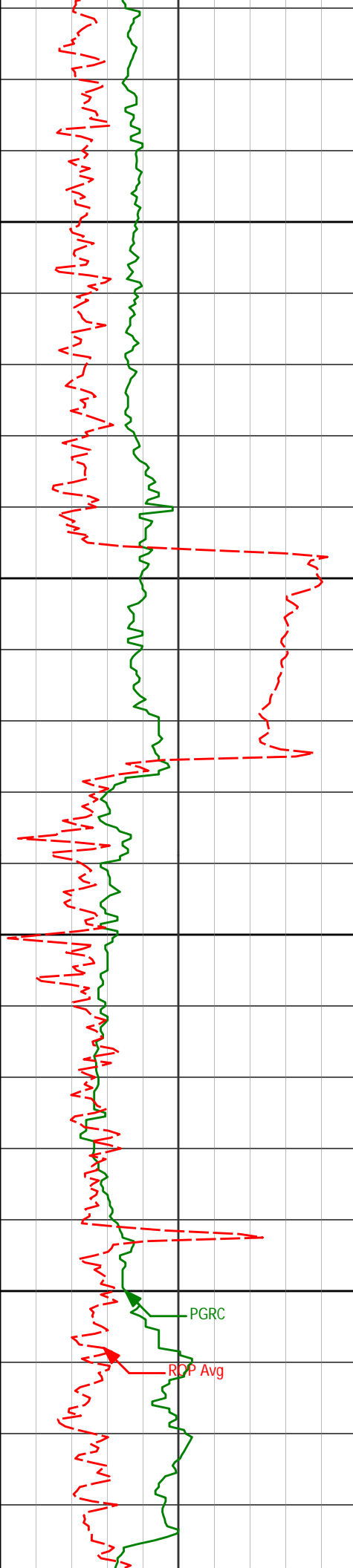
6741'

89.57°

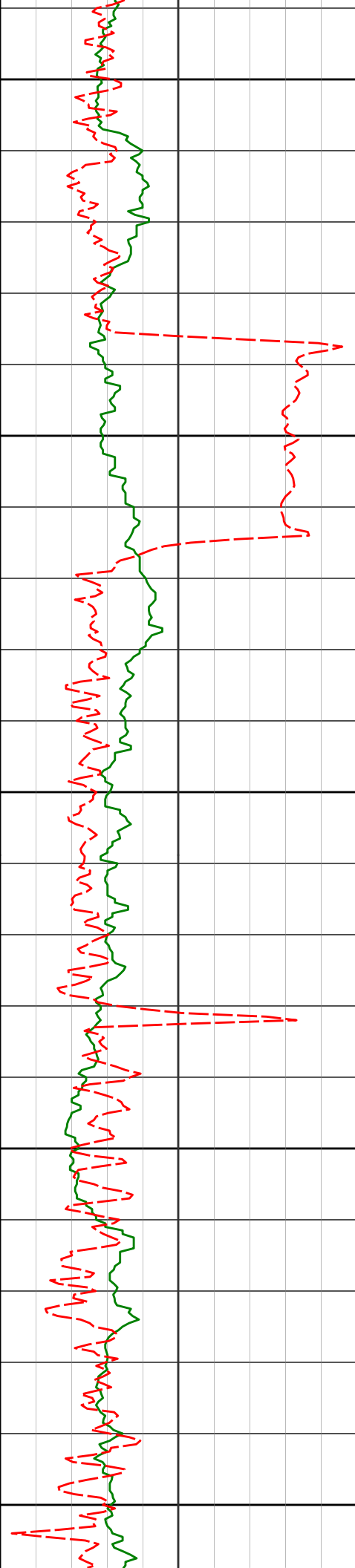
357.81°

6124.35'

818.42'



6836'	91.54°	358.05°	6123.43'	913.09'
6850				
6900				
6930'	88.67°	358.07°	6123.25'	1006.74'
6950				
7000				
7025'	89.05°	357.74°	6125.14'	1101.40'



7050

7100

7150

7200

7250

7120'

88.06°

0.14°

6127.54'

1195.89'

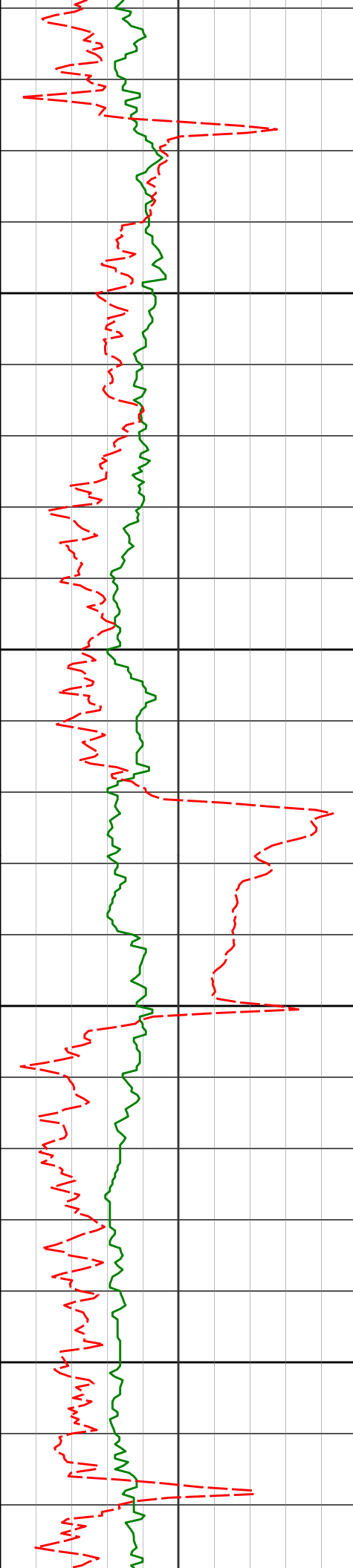
7215'

87.84°

358.86°

6130.94'

1290.25'



7300

7350

7400

7450

7310'

87.69°

357.75°

6134.64'

1384.80'

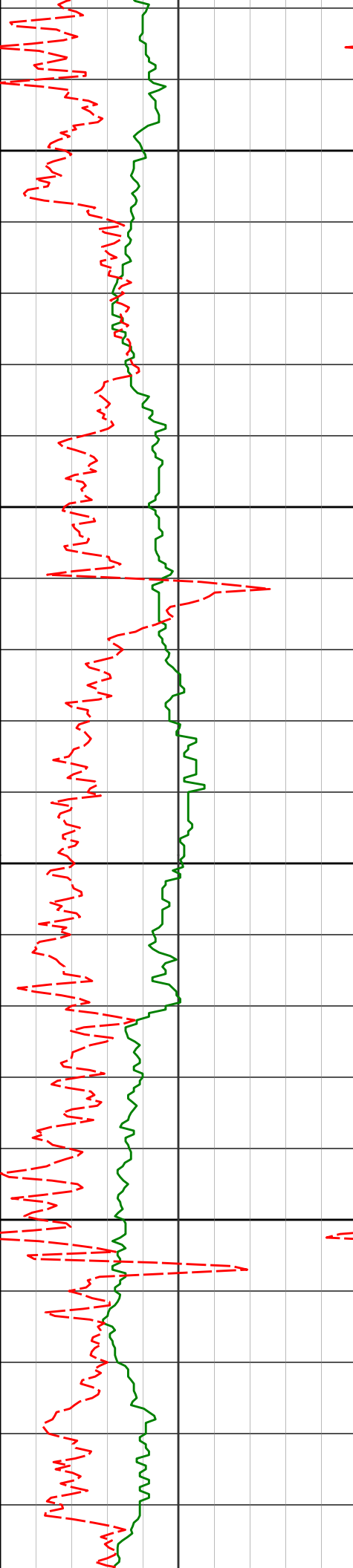
7404'

89.88°

0.66°

6136.64'

1478.25'



7500

7550

7600

7650

7499'

7594'

7689'

89.97°

89.97°

90.12°

0.64°

0.72°

0.01°

6136.77'

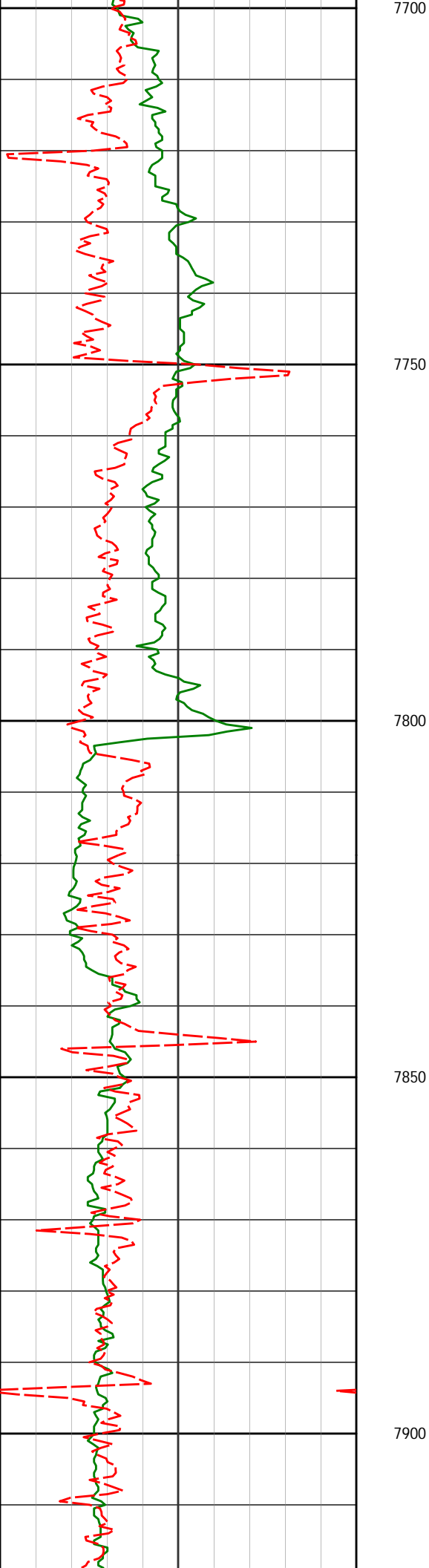
6136.82'

6136.74'

1572.45'

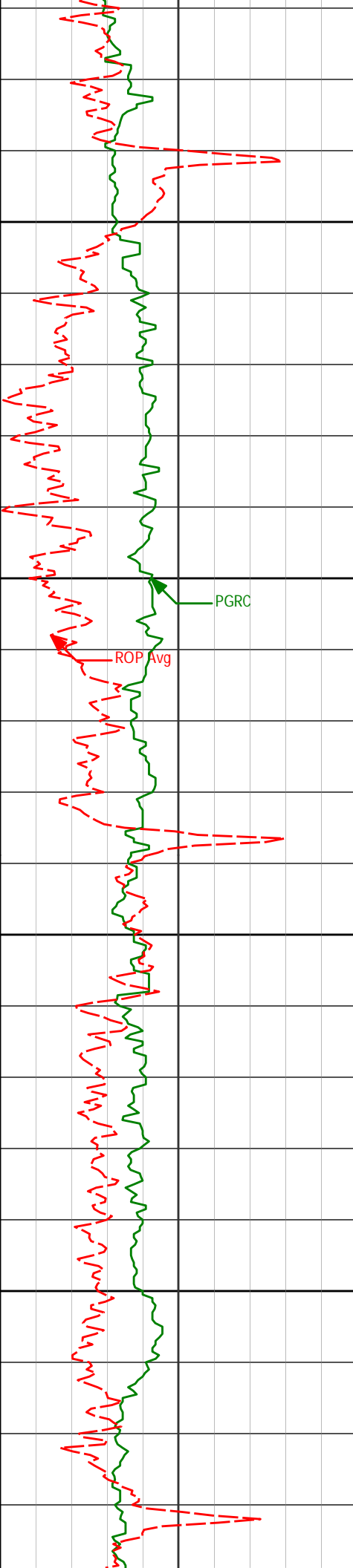
1666.64'

1760.90'



7784'	89.11°	359.92°	6137.38'	1855.23'
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7878'	90.09°	359.08°	6138.04'	1948.66'
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7950

7973'

91.29°

358.78°

6136.89'

2043.18'

8000

PGRC

ROP Avg

8050

8068'

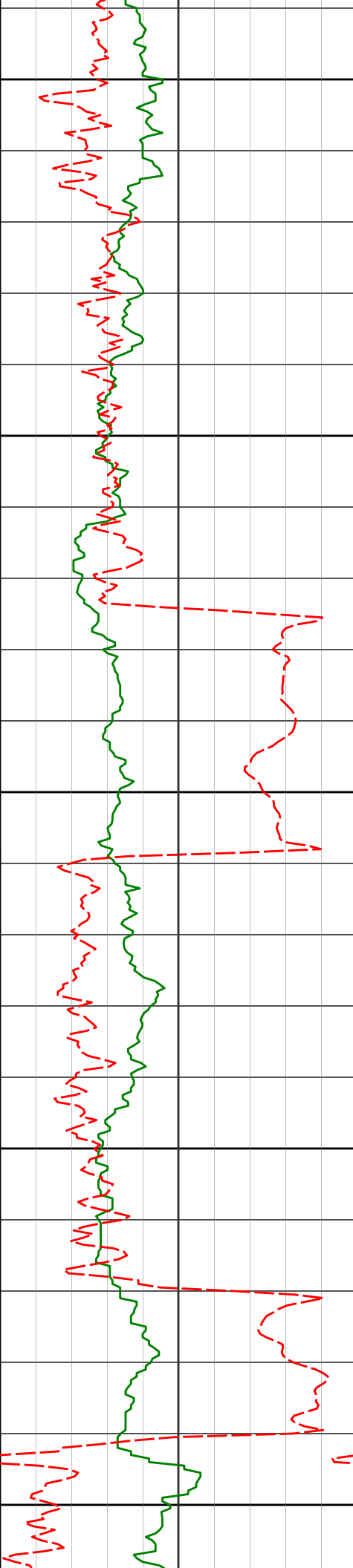
91.45°

356.79°

6134.62'

2137.84'

8100



8150

8163'

94.29°

359.87°

6129.86'

2232.32'

8200

8250

8257'

92.28°

359.95°

6124.48'

2325.52'

8300

8350

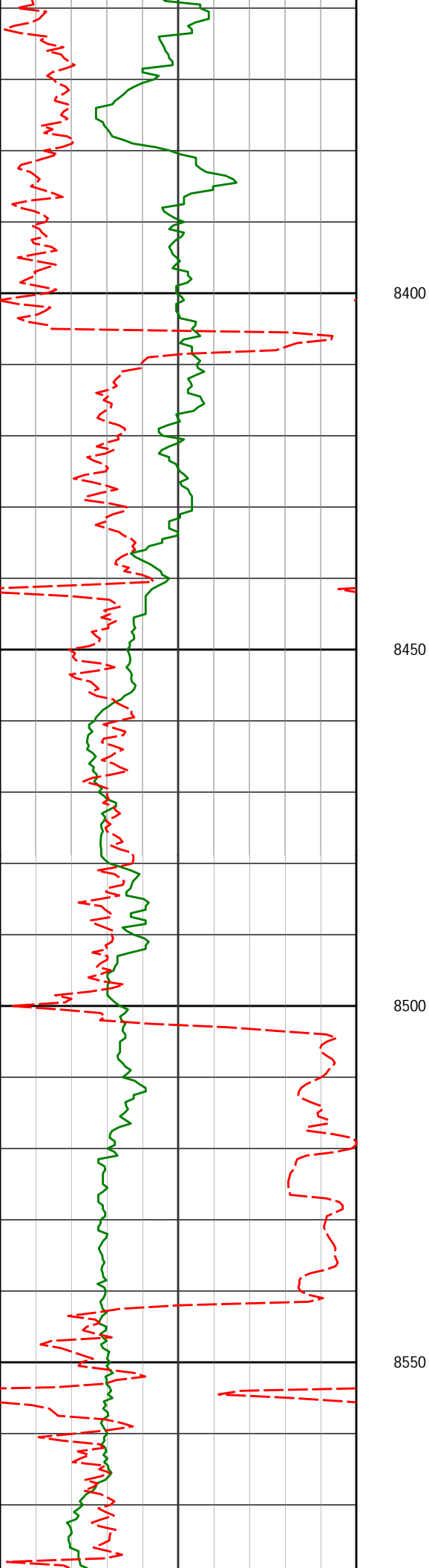
8352'

90.37°

0.29°

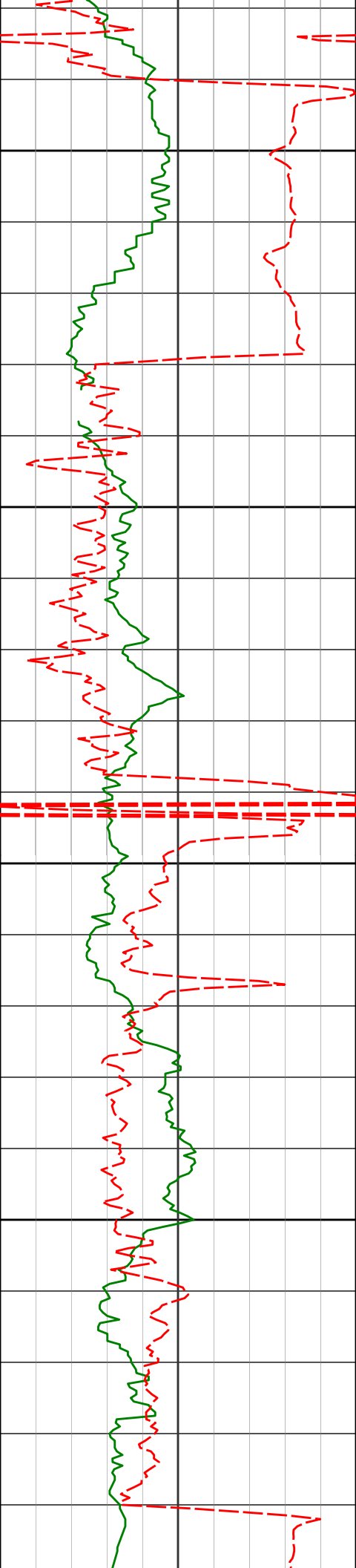
6122.28'

2419.80'



8447'	92.41°	0.53°	6119.98'	2514.01'
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8542'	91.26°	0.11°	6116.94'	2608.23'
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8600

8637'

86.76°

357.78°

6118.57'

2702.71'

8650

8700

8732'

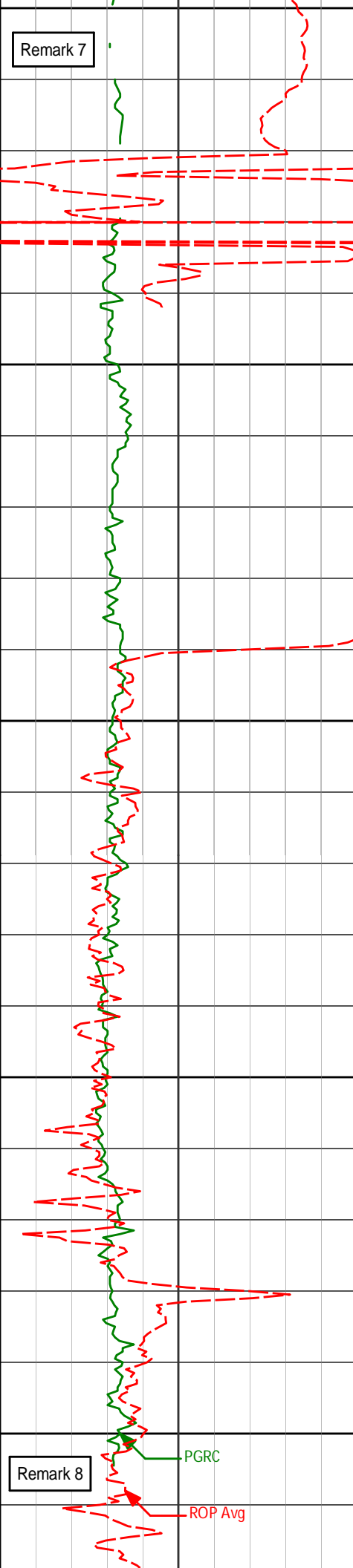
85.74°

356.82°

6124.78'

2797.26'

8750



Remark 7

Remark 8

PGRC

ROP Avg

8800

8850

8900

8950

9000

8826'

89.01°

0.68°

6129.09'

2890.69'

8921'

89.11°

358.54°

6130.64'

2985.08'

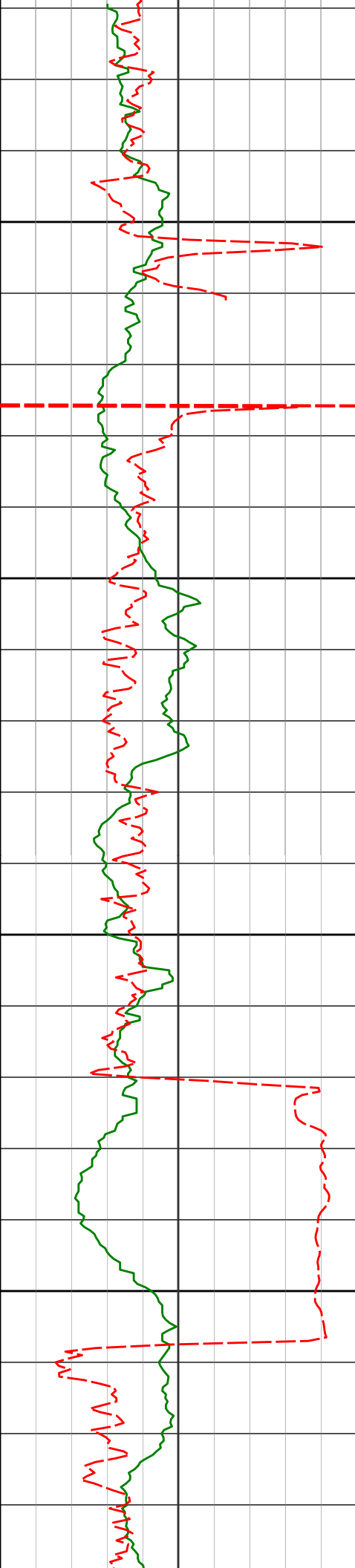
9016'

91.14°

358.00°

6130.44'

3079.70'



9050

9100

9150

9200

9110'

94.38°

357.95°

6125.91'

3173.25'

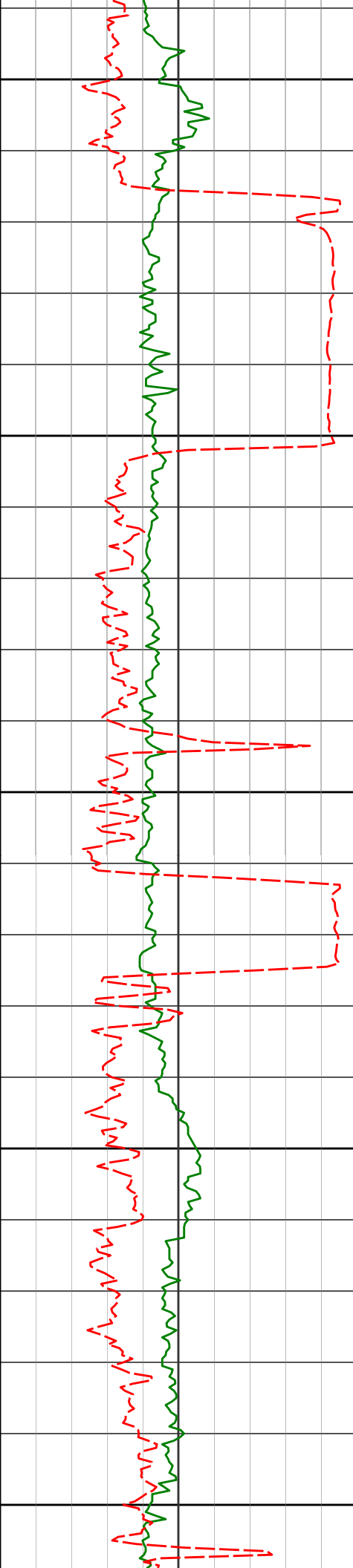
9205'

92.62°

358.31°

6120.10'

3267.72'



9250

9300

9350

9400

9450

9300'

89.94°

359.86°

6117.98'

3362.19'

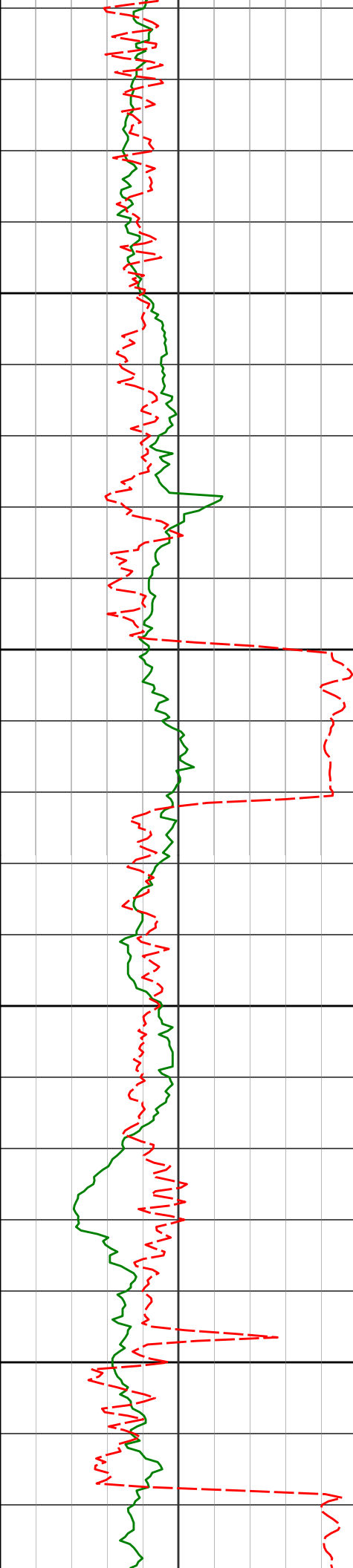
9394'

88.80°

0.79°

6119.02'

3455.45'



9489'

89.94°

0.73°

6120.06'

3549.62'

9500

9550

9584'

87.07°

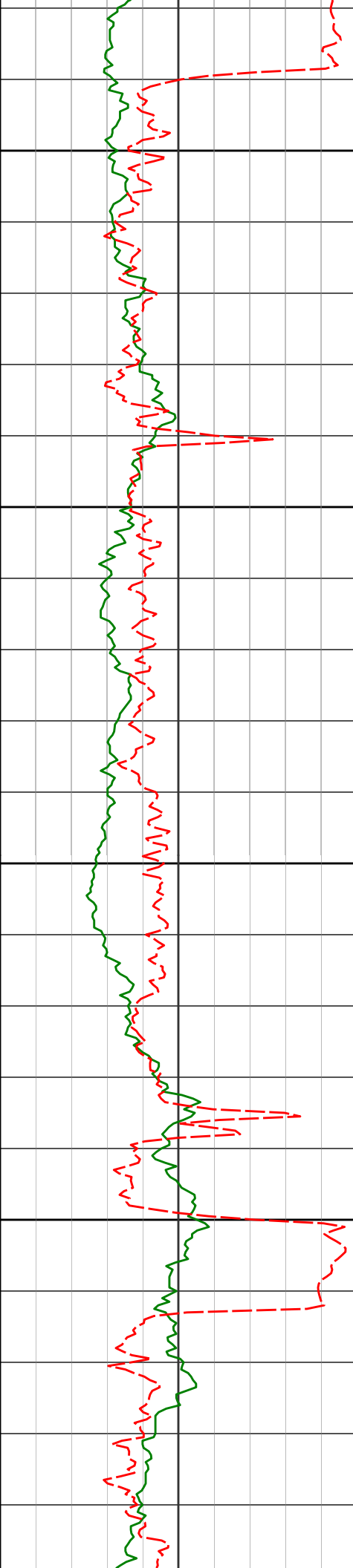
0.62°

6122.54'

3643.77'

9600

9650



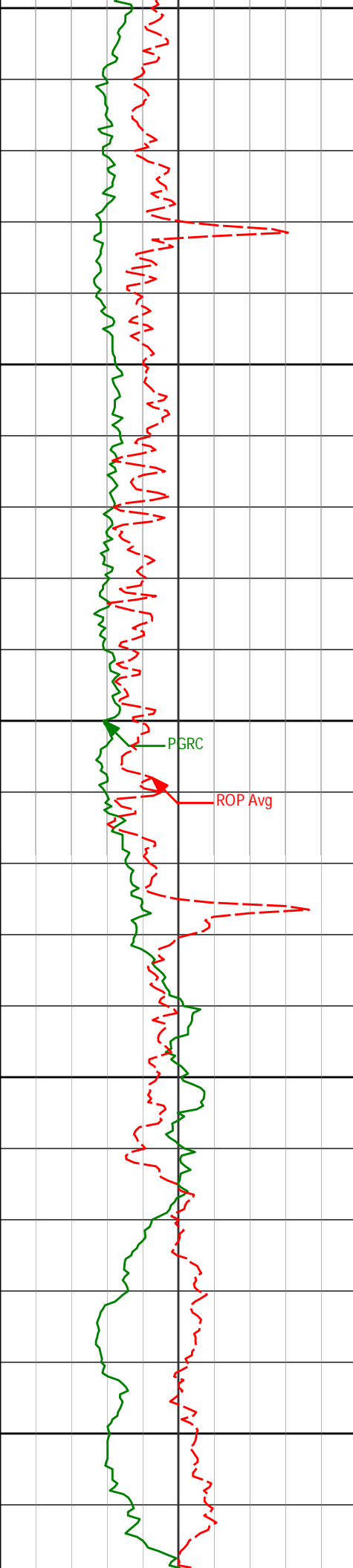
9700

9750

9800

9850

9679	87.33	359.48	6127.17	3737.98
9774'	88.12°	358.54°	6130.92'	3832.41'
9869'	89.04°	356.97°	6133.28'	3927.08'



9900

9950

10000

10050

10100

9963'

90.49°

357.32°

6133.66'

4020.86'

PGRC

ROP Avg

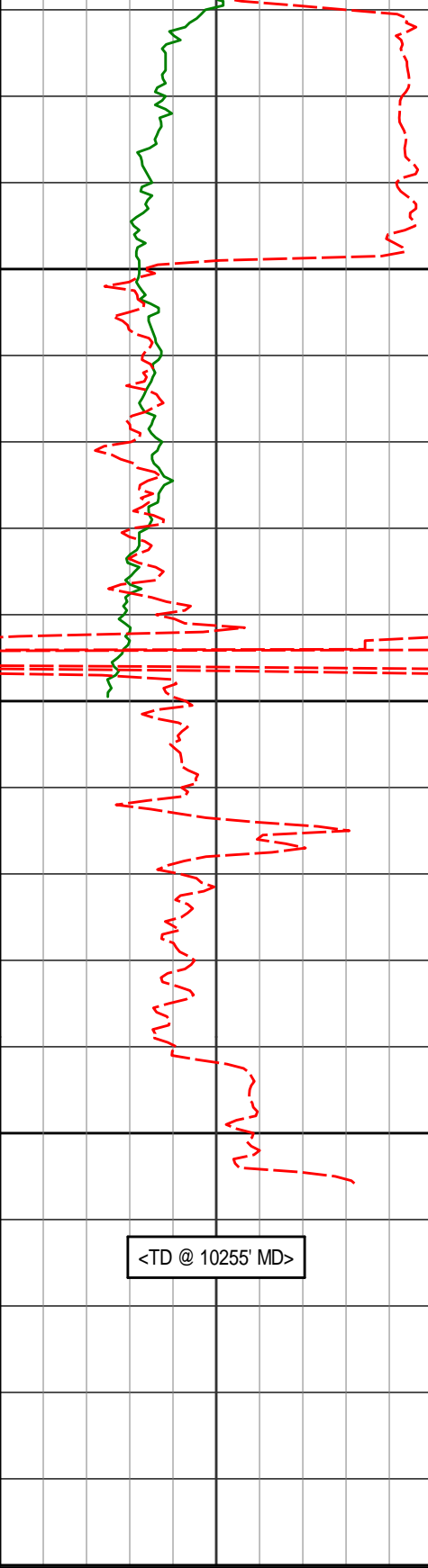
10058'

92.87°

356.88°

6130.87'

4115.59'



10150

10153' 91.36° 357.41° 6127.37' 4210.29'

10200

10192' 91.66° 357.31° 6126.34' 4249.18'

10250

<TD @ 10255' MD>

Avg Rate of Penetration
ROP Avg
feet per hr

500 0

PCG Gamma Ray
PGRC
api

0 300

Depth
ft

Depth	Inc.	Azi.	TVD	V.S.
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0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
350.00	0.20	216.77	350.00	0.49 S	0.37 W	-0.44	0.06
592.00	0.50	9.37	592.00	0.21 N	0.45 W	0.27	0.28
809.00	1.27	88.05	808.97	1.23 N	2.11 E	0.97	0.59
995.00	1.23	88.69	994.93	1.35 N	6.17 E	0.61	0.02
1087.00	1.34	98.70	1086.91	1.21 N	8.22 E	0.22	0.27
1180.00	1.25	85.15	1179.88	1.13 N	10.31 E	-0.10	0.34
1459.00	1.29	81.24	1458.82	1.86 N	16.45 E	-0.10	0.03
1737.00	1.33	85.89	1736.74	2.57 N	22.76 E	-0.14	0.04
1831.00	1.29	276.05	1830.73	2.76 N	22.79 E	0.04	2.78
1926.00	3.52	276.19	1925.64	3.19 N	18.82 E	0.94	2.34
2021.00	5.35	273.40	2020.36	3.77 N	11.50 E	2.38	1.94
2115.00	6.96	262.69	2113.81	3.30 N	1.47 E	3.10	2.10
2210.00	8.91	263.03	2207.90	1.68 N	11.55 W	3.03	2.05
2305.00	11.20	254.67	2301.44	1.66 S	27.75 W	1.64	2.85
2399.00	13.30	253.64	2393.29	7.12 S	46.93 W	-1.51	2.25
2494.00	13.09	255.43	2485.78	12.90 S	67.84 W	-4.78	0.48
2589.00	13.35	256.43	2578.27	18.18 S	88.91 W	-7.53	0.36
2684.00	13.36	256.48	2670.70	23.32 S	110.25 W	-10.10	0.01
2779.00	12.87	256.49	2763.22	28.36 S	131.20 W	-12.62	0.51
2873.00	12.71	257.83	2854.89	32.98 S	151.49 W	-14.81	0.36
3063.00	11.85	257.77	3040.54	41.52 S	190.98 W	-18.61	0.45
3158.00	11.45	259.77	3133.58	45.26 S	209.79 W	-20.10	0.60
3253.00	10.72	260.42	3226.81	48.40 S	227.79 W	-21.09	0.78
3347.00	12.62	256.61	3318.86	52.23 S	246.40 W	-22.69	2.18
3442.00	12.76	255.86	3411.54	57.20 S	266.67 W	-25.22	0.23
3537.00	12.86	255.40	3504.18	62.43 S	287.07 W	-28.00	0.15
3632.00	12.97	253.77	3596.78	68.07 S	307.53 W	-31.18	0.40
3727.00	13.41	253.64	3689.27	74.15 S	328.35 W	-34.75	0.46
3822.00	12.41	255.03	3781.87	79.89 S	348.78 W	-38.03	1.11
3917.00	11.22	255.18	3874.85	84.89 S	367.58 W	-40.77	1.24
4011.00	9.35	249.92	3967.34	89.86 S	383.60 W	-43.81	2.22
4106.00	6.96	257.72	4061.37	93.73 S	396.47 W	-46.13	2.78
4201.00	4.72	255.27	4155.88	95.95 S	405.88 W	-47.22	2.36
4296.00	4.39	253.64	4250.57	97.97 S	413.15 W	-48.36	0.38
4391.00	3.03	217.97	4345.39	100.97 S	418.18 W	-50.75	2.75
4486.00	1.01	172.87	4440.33	103.78 S	419.62 W	-53.36	2.55
4581.00	1.24	169.23	4535.31	105.62 S	419.33 W	-55.23	0.26
4676.00	1.48	192.45	4630.28	107.83 S	419.40 W	-57.41	0.63
4770.00	1.14	192.85	4724.26	109.93 S	419.87 W	-59.44	0.36
4865.00	1.71	28.76	4819.25	109.61 S	419.40 W	-59.18	2.97
4960.00	1.71	14.48	4914.20	107.00 S	418.36 W	-56.71	0.45
5055.00	1.45	7.68	5009.17	104.43 S	417.85 W	-54.22	0.33
5245.00	1.33	359.17	5199.11	99.84 S	417.56 W	-49.69	0.13
5339.00	1.37	1.63	5293.09	97.63 S	417.54 W	-47.50	0.07
5434.00	1.23	355.56	5388.06	95.47 S	417.59 W	-45.36	0.20
5526.00	2.86	4.79	5480.00	92.20 S	417.47 W	-42.12	1.79
5574.00	10.14	1.40	5527.66	86.77 S	417.27 W	-36.76	15.20
5621.00	13.39	356.20	5573.67	77.20 S	417.53 W	-27.22	7.26
5669.00	15.26	354.75	5620.17	65.36 S	418.48 W	-15.35	3.97
5716.00	18.63	357.68	5665.13	51.70 S	419.35 W	-1.68	7.38
5764.00	23.28	1.23	5709.94	34.55 S	419.46 W	15.36	10.04
5811.00	27.20	359.50	5752.45	14.51 S	419.35 W	35.25	8.50
5859.00	31.46	359.15	5794.28	9.00 N	419.64 W	58.62	8.88
5906.00	35.70	359.98	5833.43	34.99 N	419.82 W	84.45	9.08
5954.00	38.85	359.05	5871.62	64.06 N	420.08 W	113.34	6.66
6000.00	42.27	358.37	5906.56	93.96 N	420.76 W	143.11	7.50
6048.00	45.68	358.09	5941.10	127.26 N	421.80 W	176.31	7.11
6095.00	49.77	359.06	5972.71	162.02 N	422.65 W	210.92	8.85
6143.00	54.77	359.52	6002.07	199.97 N	423.12 W	248.66	10.44
6190.00	58.36	359.34	6027.96	239.18 N	423.51 W	287.65	7.64
6238.00	61.38	359.39	6052.05	280.69 N	423.97 W	328.92	6.30

6230.00	81.38	359.39	6032.03	288.09 N	423.97 W	328.92	0.30
6285.00	65.70	358.70	6072.99	322.75 N	424.67 W	370.77	9.28
6333.00	70.66	358.74	6090.82	367.29 N	425.67 W	415.11	10.32
6380.00	76.91	358.81	6103.94	412.39 N	426.63 W	460.00	13.31
6428.00	81.15	358.68	6113.07	459.49 N	427.66 W	506.89	8.84
6464.00	84.05	358.26	6117.71	495.17 N	428.62 W	542.44	8.12
6551.00	88.86	357.71	6123.09	581.92 N	431.67 W	628.94	5.57
6646.00	90.03	357.06	6124.01	676.82 N	436.01 W	723.68	1.41
6741.00	89.57	357.81	6124.35	771.72 N	440.27 W	818.42	0.93
6836.00	91.54	358.05	6123.43	866.65 N	443.70 W	913.09	2.09
6930.00	88.67	358.07	6123.25	960.59 N	446.89 W	1006.74	3.05
7025.00	89.05	357.74	6125.14	1055.50 N	450.36 W	1101.40	0.52
7120.00	88.06	0.14	6127.54	1150.45 N	452.12 W	1195.89	2.73
7215.00	87.84	358.86	6130.94	1245.38 N	452.95 W	1290.25	1.36
7310.00	87.69	357.75	6134.64	1340.27 N	455.76 W	1384.80	1.18
7404.00	89.88	0.66	6136.64	1434.22 N	457.06 W	1478.25	3.87
7499.00	89.97	0.64	6136.77	1529.21 N	455.99 W	1572.45	0.10
7594.00	89.97	0.72	6136.82	1624.21 N	454.87 W	1666.64	0.09
7689.00	90.12	0.01	6136.74	1719.21 N	454.26 W	1760.90	0.77
7784.00	89.11	359.92	6137.38	1814.20 N	454.32 W	1855.23	1.07
7878.00	90.09	359.08	6138.04	1908.19 N	455.15 W	1948.66	1.38
7973.00	91.29	358.78	6136.89	2003.17 N	456.93 W	2043.18	1.30
8068.00	91.45	356.79	6134.62	2098.07 N	460.60 W	2137.84	2.10
8163.00	94.29	359.87	6129.86	2192.88 N	463.36 W	2232.32	4.41
8257.00	92.28	359.95	6124.48	2286.73 N	463.50 W	2325.52	2.14
8352.00	90.37	0.29	6122.28	2381.70 N	463.30 W	2419.80	2.04
8447.00	92.41	0.53	6119.98	2476.66 N	462.62 W	2514.01	2.16
8542.00	91.26	0.11	6116.94	2571.61 N	462.09 W	2608.23	1.28
8637.00	86.76	357.78	6118.57	2666.55 N	463.83 W	2702.71	5.34
8732.00	85.74	356.82	6124.78	2761.24 N	468.30 W	2797.26	1.47
8826.00	89.01	0.68	6129.09	2855.08 N	470.35 W	2890.69	5.38
8921.00	89.11	358.54	6130.64	2950.06 N	470.99 W	2985.08	2.26
9016.00	91.14	358.00	6130.44	3045.02 N	473.86 W	3079.70	2.21
9110.00	94.38	357.95	6125.91	3138.83 N	477.18 W	3173.25	3.45
9205.00	92.62	358.31	6120.10	3233.60 N	480.27 W	3267.72	1.89
9300.00	89.94	359.86	6117.98	3328.56 N	481.79 W	3362.19	3.26
9394.00	88.80	0.79	6119.02	3422.55 N	481.25 W	3455.45	1.57
9489.00	89.94	0.73	6120.06	3517.53 N	479.99 W	3549.62	1.20
9584.00	87.07	0.62	6122.54	3612.48 N	478.87 W	3643.77	3.02
9679.00	87.35	359.48	6127.17	3707.37 N	478.79 W	3737.98	1.24
9774.00	88.12	358.54	6130.92	3802.28 N	480.44 W	3832.41	1.28
9869.00	89.04	356.97	6133.28	3897.17 N	484.16 W	3927.08	1.91
9963.00	90.49	357.32	6133.66	3991.05 N	488.83 W	4020.86	1.58
10058.00	92.87	356.88	6130.87	4085.88 N	493.63 W	4115.59	2.54
10153.00	91.36	357.41	6127.37	4180.70 N	498.36 W	4210.29	1.68
10192.00	91.66	357.31	6126.34	4219.64 N	500.15 W	4249.18	0.83
10255.00	91.66	357.31	6124.52	4282.55 N	503.11 W	4311.99	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 353.20 DEGREES (GRID)
A TOTAL CORRECTION OF 7.17 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10255.00 FEET
IS 4312.00 FEET ALONG 353.30 DEGREES (GRID)

Surface surveys at 350 ft and 592 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Final survey is a projection from 10192' MD to TD at 10255' MD.