

**PCGK : Pressure Case Gamma**  
**PCDC: Pressure Case Directional**

**1 : 600 / 1 : 240**

Country : <b>USA</b>			
Field : <b>Wattenberg</b>			
Location : <b>Lat: 40° 28' 40.15" North</b> <b>Long: 104° 36' 22.97" West</b>			
Well : <b>Storis E24-75-1HC</b>			
Company : <b>Noble Energy</b>			
Rig : <b>H&amp;P 315</b>			
LOCATION			
Latitude : <b>40° 28' 40.15" North</b> Longitude : <b>104° 36' 22.97" West</b>			
UTM Easting = <b>3,248,592.522 ft</b> UTM Northing = <b>1,418,162.829 ft</b>			
Company : <b>Noble Energy</b> Rig : <b>H&amp;P 315</b> Well : <b>Storis E24-75-1HC</b> Field : <b>Wattenberg</b> Country : <b>USA</b> API Number : <b>05-123-38144</b>			
Other Services <b>Directional Drilling</b>			
Permanent Datum : <b>Ground Level</b>	Elevation : <b>4684.00 ft</b>		
Log Measured From : <b>Drill Floor</b>	4708.00 ft Above Permanent Datum		
Drilling Measured From : <b>Drill Floor</b>	<b>MD LOG</b>		
Depth Logged : <b>800.00 ft</b> To <b>11,784.00 ft</b>	Unit No. : <b>11610113</b>		
Date Logged : <b>27-Apr-14</b> To <b>04-May-14</b>	Job No. : <b>CA-XX-0901173064</b>		
Total Depth MD : <b>11,784.00 ft</b> TVD : <b>6,948.80 ft</b>	Plot Type : <b>Final</b>		
Spud Date : <b>27-Apr-14</b>	Plot Date : <b>05-May-14</b>		
Borehole Record (MD)			
Run No.	Size	From	To
2	8.750 in	800.00 ft	7,465.00 ft
3	6.125 in	7,465.00 ft	9,445.00 ft
4	6.125 in	9,445.00 ft	11,784.00 ft
Casing Record (MD)			
Run No.	Size	Weight	From
	7.000 in	26.00 lbpf	SURFACE
			7,460.00 ft

**WELL INFORMATION**

MWD Run Number	100	200	300		
Date run completed	30-Apr-14	02-May-14	04-May-14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	6.125	6.125		
Tool Nominal OD (in)	6.750	4.750	4.750		
Log Start Depth (MD, ft)	800.00	7,465.00	9,445.00		
Log End Depth (MD, ft)	7,465.00	9,445.00	11,784.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	28-Apr-14 12:10	01-May-14 06:50	03-May-14 03:00		
Drill/Wipe End Date and Time	29-Apr-14 23:40	02-May-14 00:20	04-May-14 08:30		
Min Inc (deg) @ Depth (MD, ft)	0.21 @ 1,572.00	88.33 @ 9,122.00	88.43 @ 9,597.00		
Max Inc (deg) @ Depth (MD, ft)	80.12 @ 7,407.00	92.90 @ 7,889.00	91.91 @ 11,589.00		
Bit TFA(in2) / Bit Type	1.84 / PDC	0.75 / PDC	0.65 / PDC		
Flow Rate (gpm)	623.76	295.92	300.00		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Polymer	Polymer	Polymer		
Density (ppg) / Viscosity (spqt)	10.20 / 40.00	9.50 / 36.00	9.55 / 35.00		
Filtrate CL (ppm)	1,200.00	1,300.00	1,300.00		
pH / Fluid Loss (mptm)	8.50 / 16	9.20 / 6	9.00 / 6		
PV (cP) / YP (Ihf2)	13 / 11.00	9 / 10.00	10 / 9.00		
% Solids / % Sand	4.3 / 0.35	5.2 / 0.75	2.7 / 0.25		
% 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) / Source	170.37 / PCM	215.51 / PCM	236.82 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Henry Schmeidler	Henry Schmeidler	Henry Schmeidler		
Customer Representative	Steve Record	Steve Record	Steve Record		

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11254959	12361802	12361802		
Insert Serial Number	11620295	11227487	11620295		
Date and Time Initialized	28-Apr-14 06:51	30-Apr-14 20:35	02-May-14 04:23		
Date and Time Read	30-Apr-14 06:41	02-May-14 07:53	04-May-14 17:26		
ECMB SW Version	N/A	N/A	N/A		

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	56.50	56.12	56.28		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11254959	12361802	12361802		
Sonde Serial Number	11297574	11145688	11297574		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	19.70	62.64	4.52		

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	51.50	51.14	51.30		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11254959	12361802	12361802		
Insert/Sonde Serial Number	11293380	11579802	11293380		

## 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:
  - All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
  - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.0.0
6. Gamma presented inside casing/cement from 7412 ft. MD to 7460 ft. MD

## WARRANTY

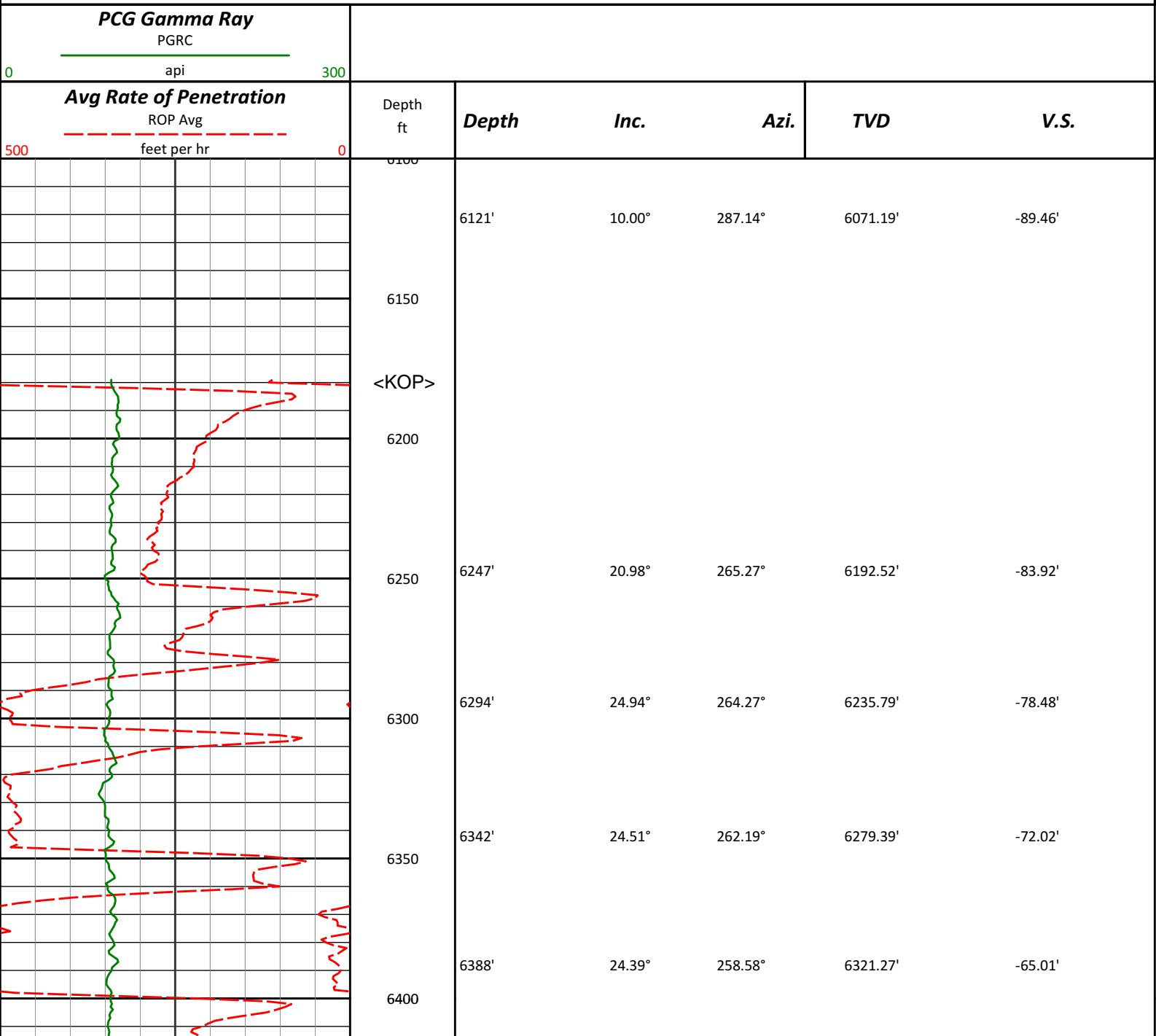
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS

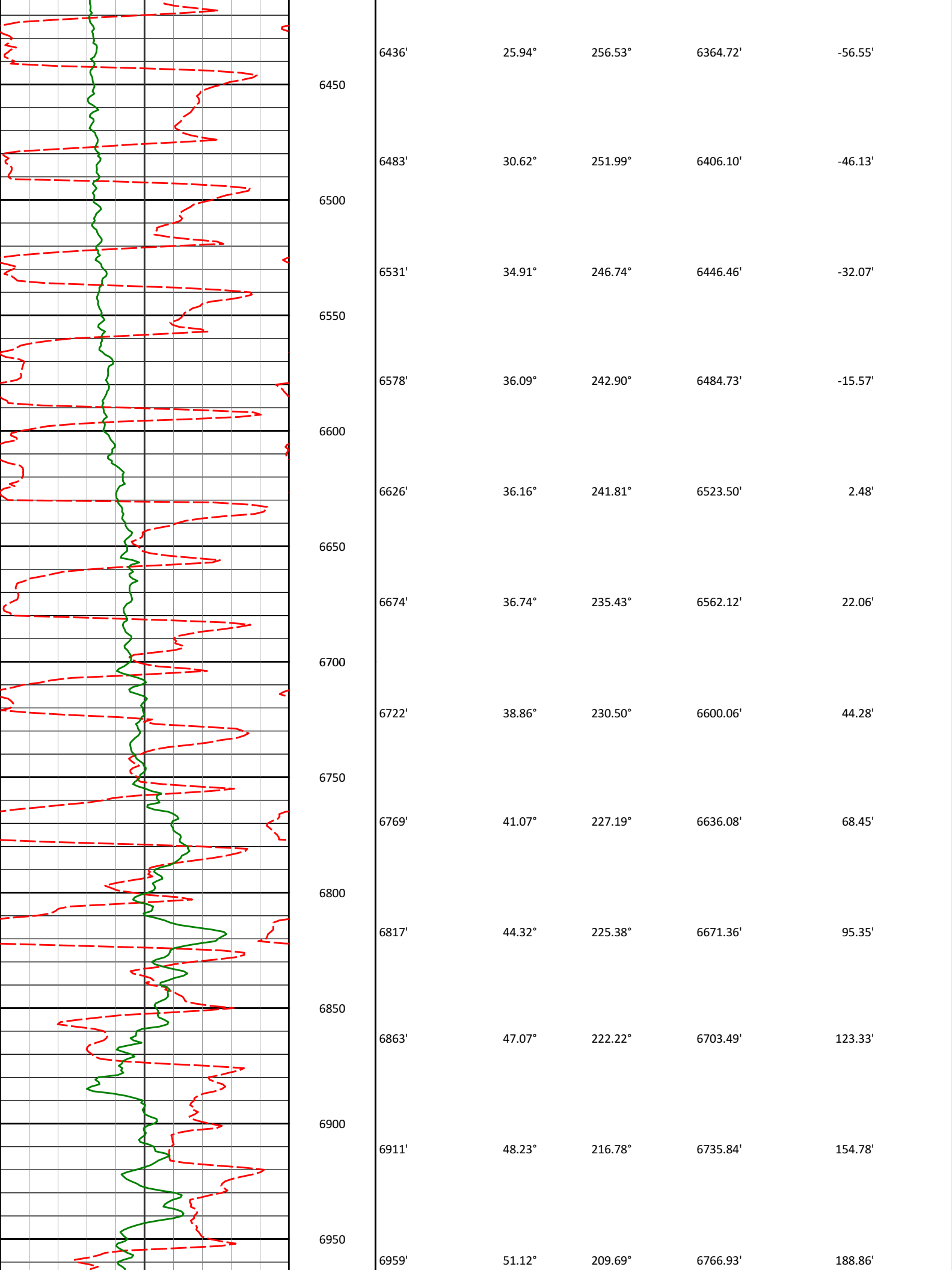
THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, 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.

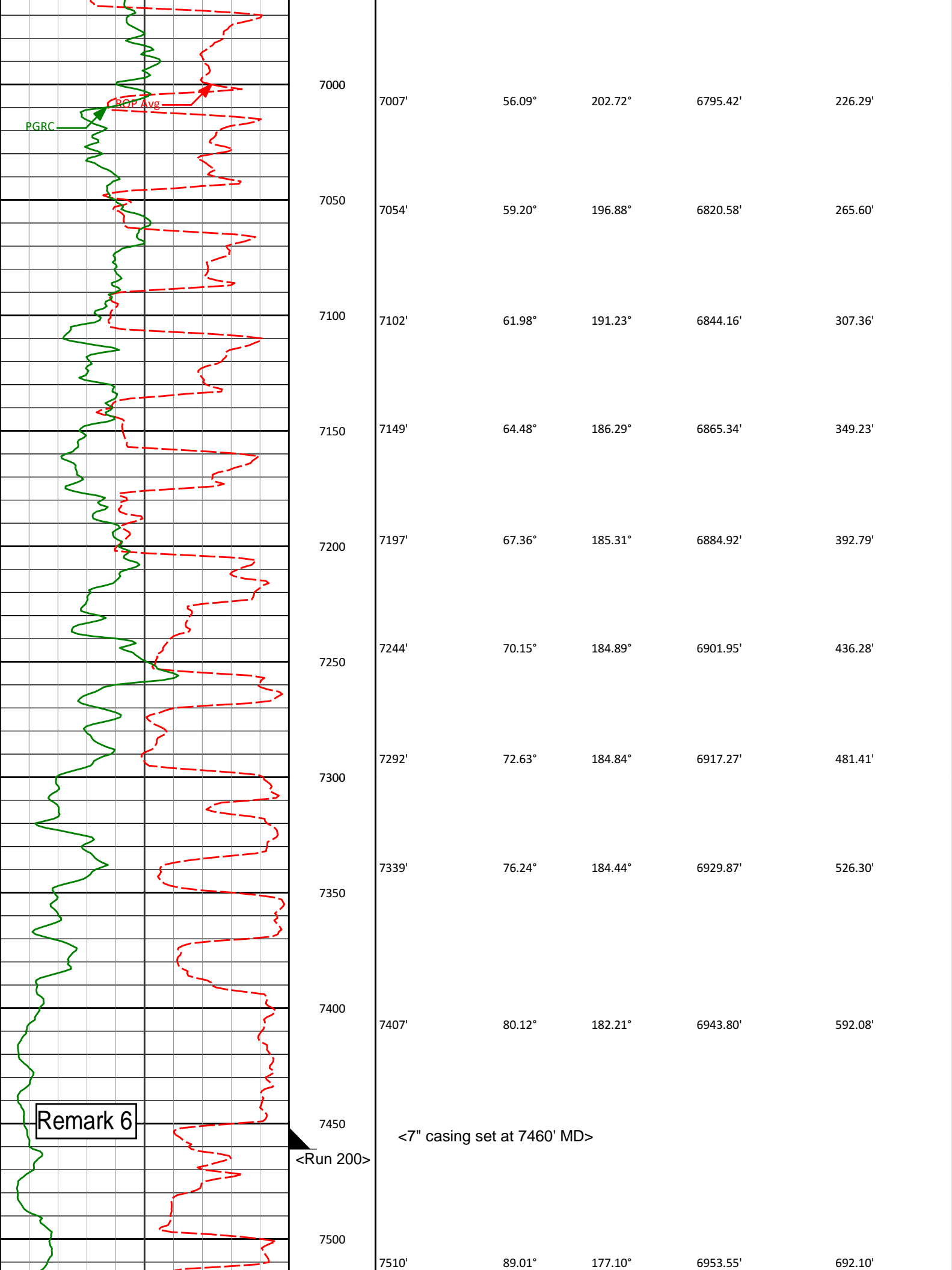
**HALLIBURTON**  
**Sperry Drilling Services**

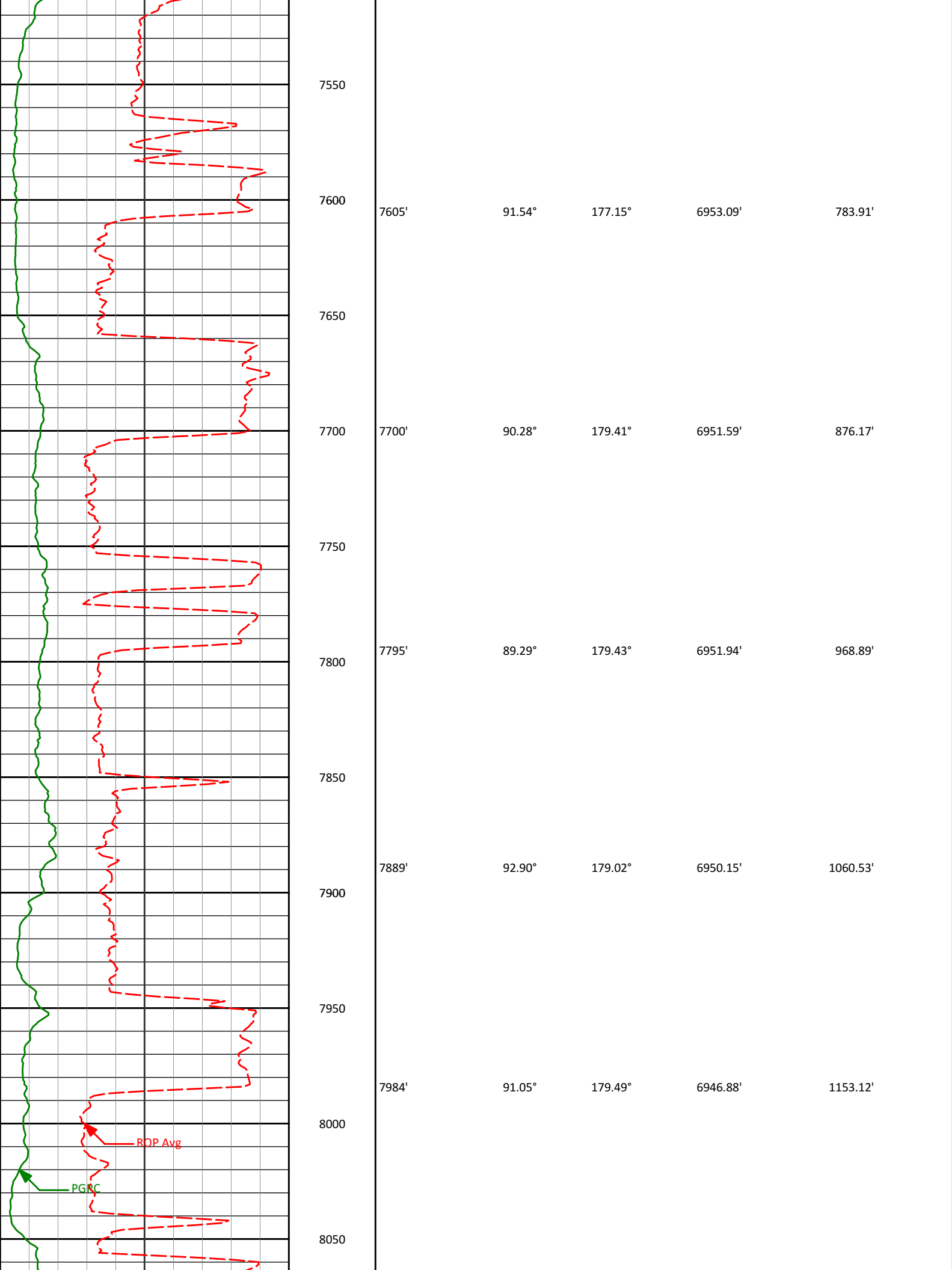
**MD Main Log 1:600**

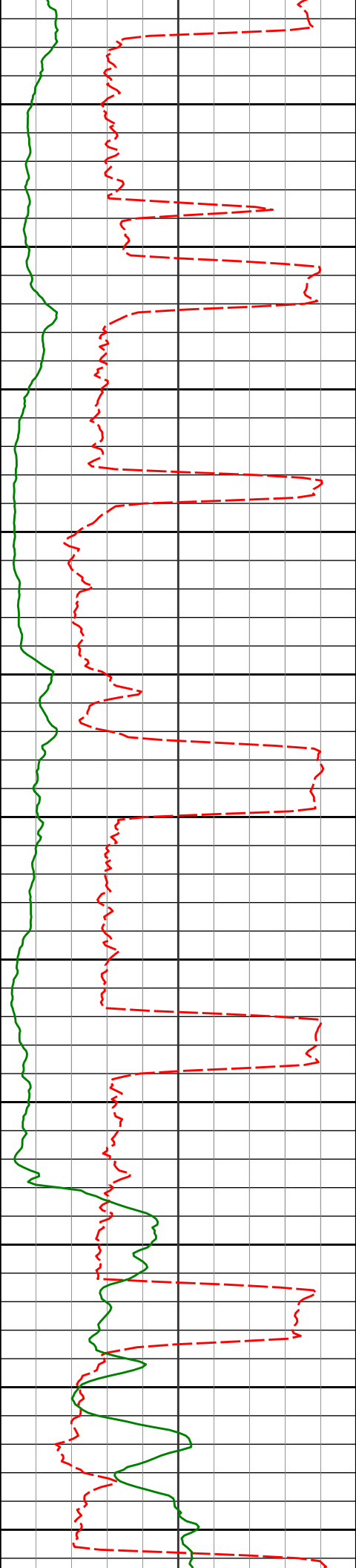
Noble Energy, Inc  
Storis E24-75-1HC  
H&P 315  
T6N R65W











8079'

90.46°

180.61°

6945.63'

1246.05'

8100

8150

8174'

89.29°

179.74°

6945.83'

1339.03'

8200

8250

8269'

91.14°

178.93°

6945.48'

1431.71'

8300

8350

8363'

90.34°

178.94°

6944.26'

1523.26'

8400

8450

8458'

90.65°

180.25°

6943.44'

1616.03'

8500

8550

8553'

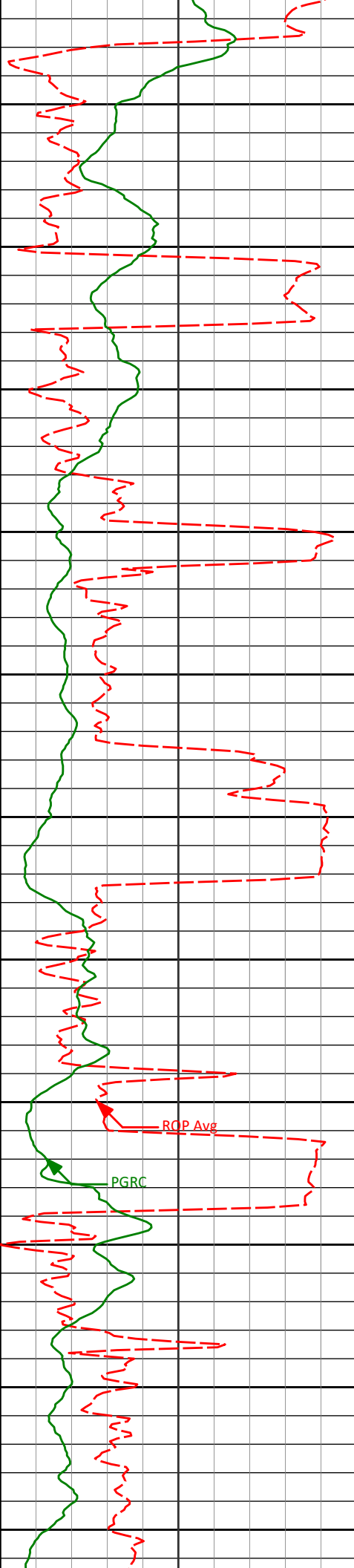
90.15°

180.37°

6942.78'

1709.06'

8600



8650

8700

8750

8800

8850

8900

8950

9000

9050

9100

9150

8648'

8743'

8838'

8932'

9027'

9122'

90.59°

89.75°

90.83°

89.38°

88.55°

88.33°

181.12°

180.60°

179.98°

180.62°

180.51°

180.77°

6942.17'

6941.89'

6941.40'

6941.22'

6942.93'

6945.52'

1802.22'

1895.43'

1988.45'

2080.49'

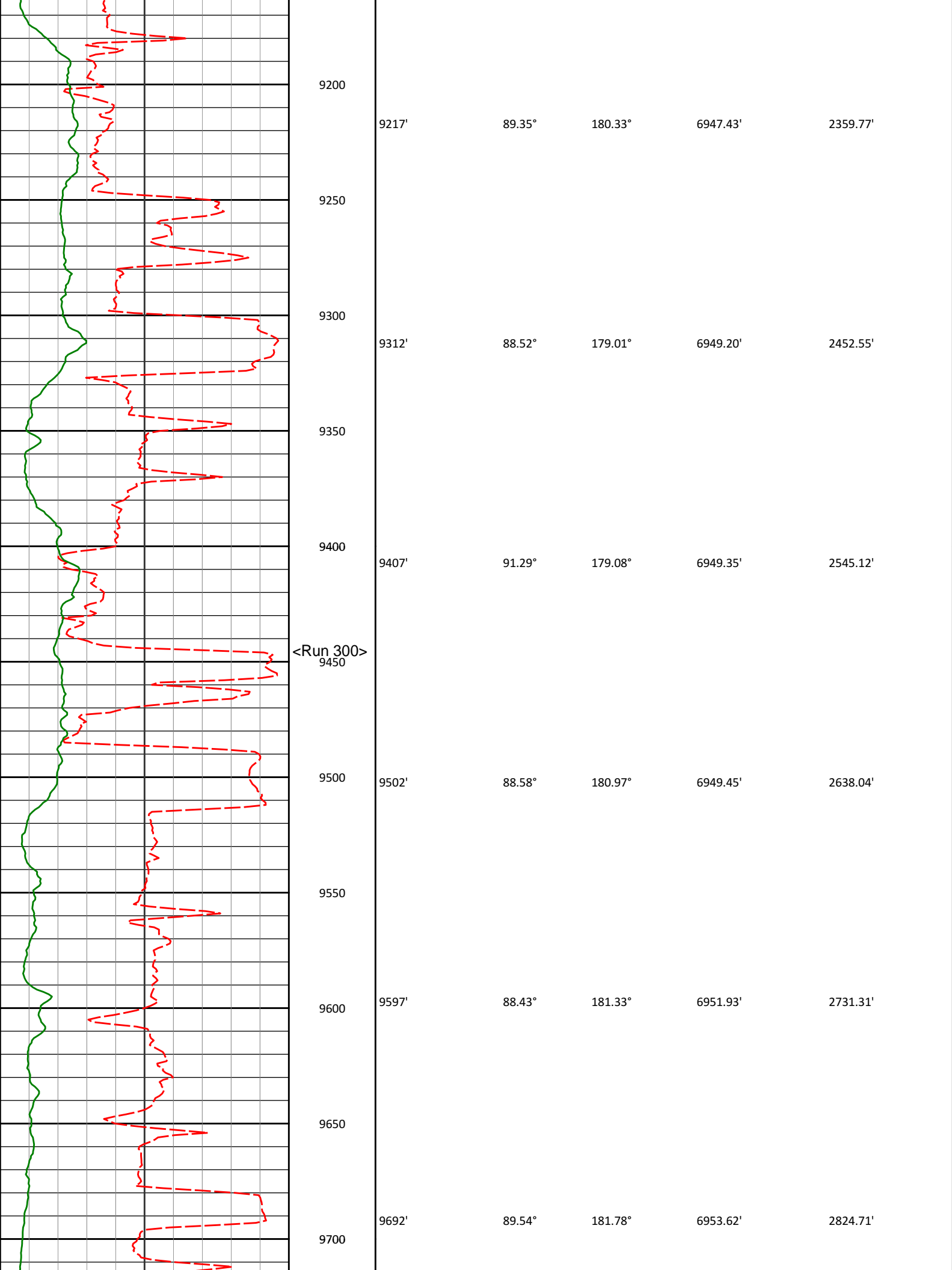
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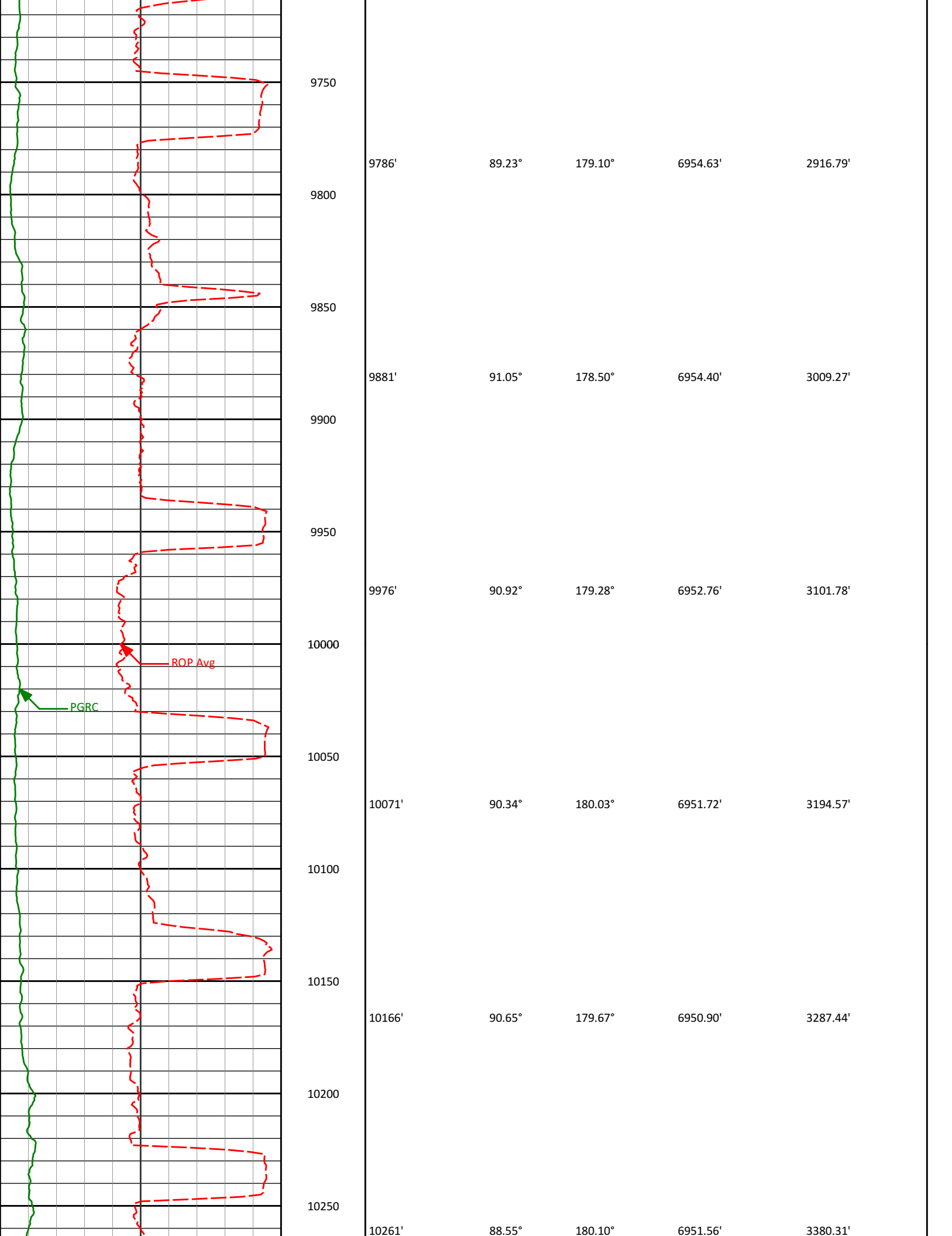
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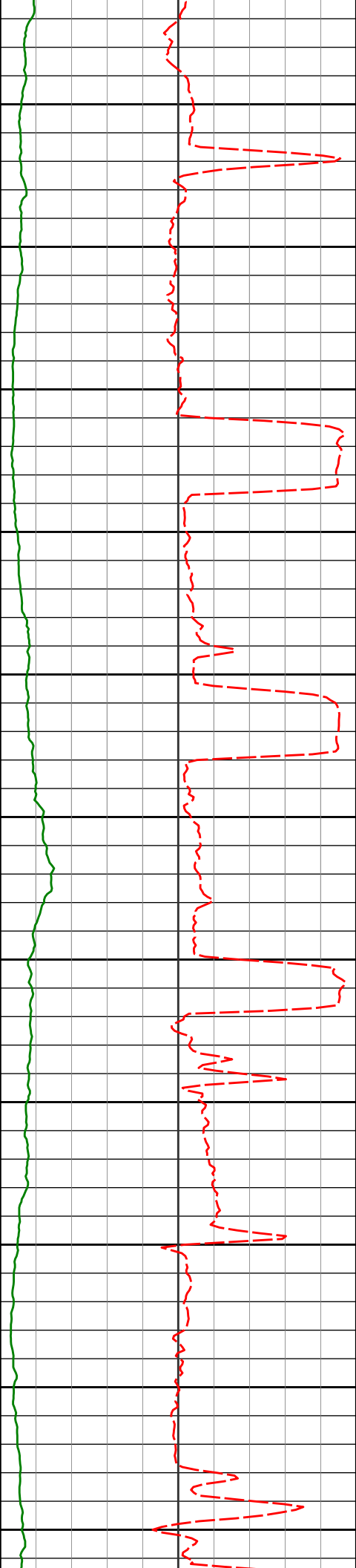
RCP Avg

PGRC









10300

10350

10400

10450

10500

10550

10600

10650

10700

10750

10800

10356'

89.17°

181.22°

6953.45'

3473.44'

10451'

89.63°

180.19°

6954.45'

3566.59'

10545'

89.23°

179.24°

6955.39'

3658.42'

10640'

89.81°

177.69°

6956.18'

3750.77'

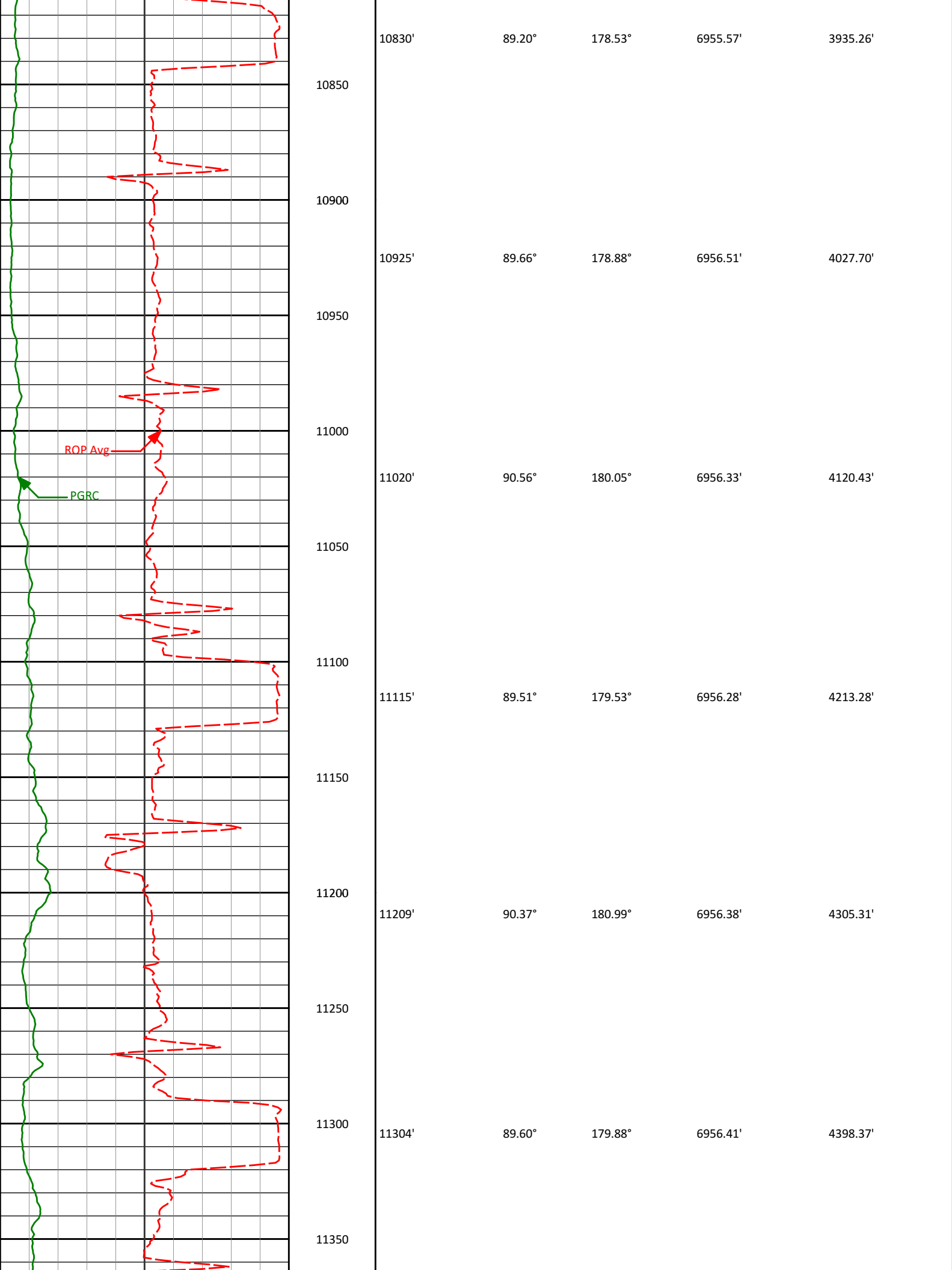
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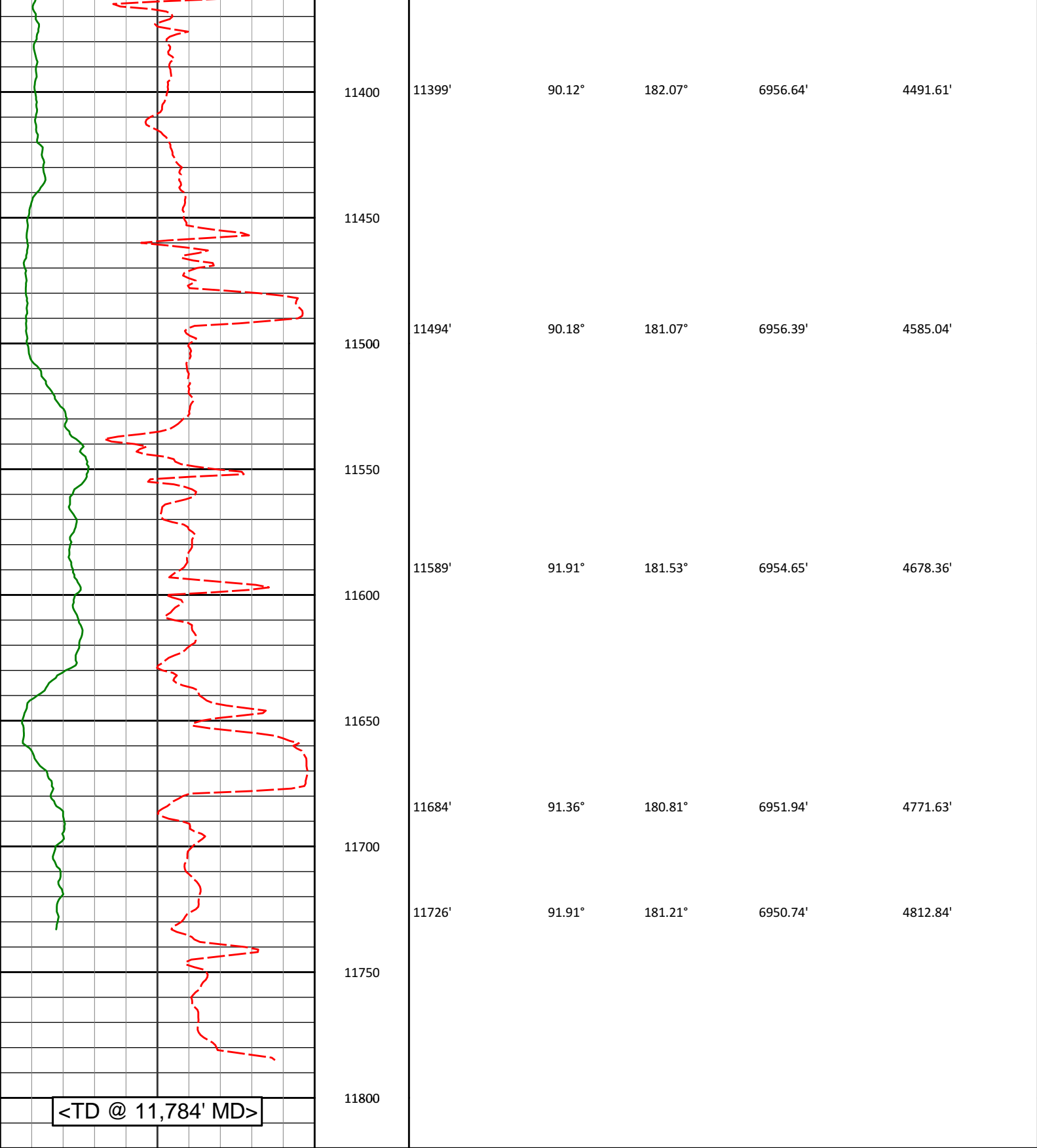
90.86°

178.25°

6955.62'

3842.93'

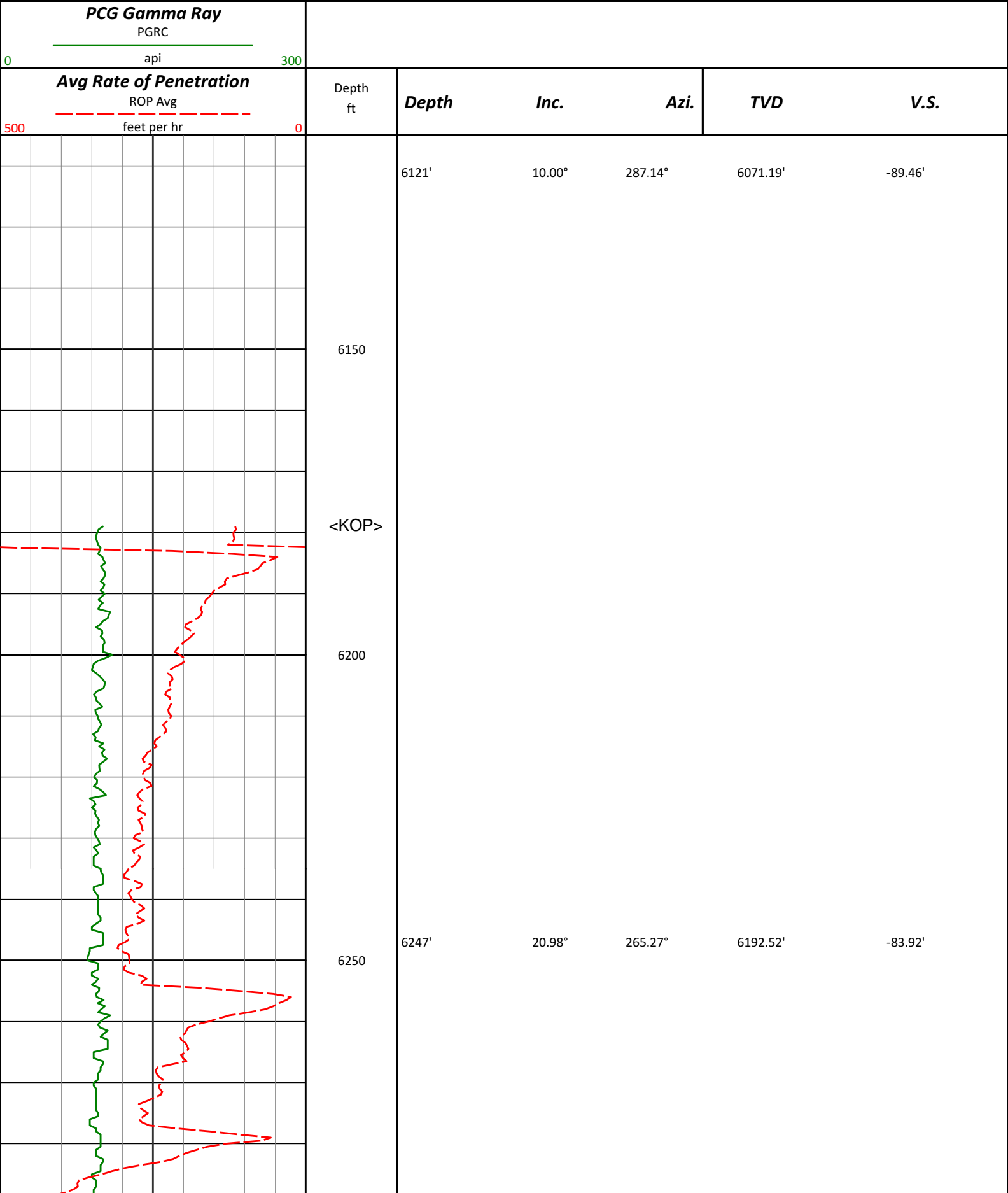


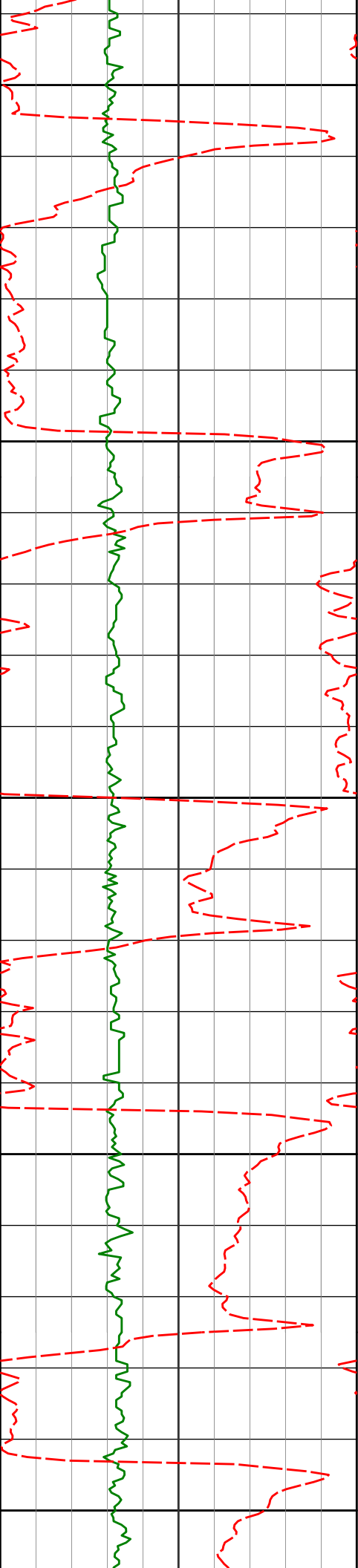


<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>5000feet per hr</div></div>		Depth ft	DepthInc.		Azi.	TVD	V.S.
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>0300api</div></div>							

# MD Detail Log 1:240

Noble Energy, Inc  
Storis E24-75-1HC  
H&P 315  
T6N R65W





6300

6350

6400

6450

6500

6294'

24.94°

264.27°

6235.79'

-78.48'

6342'

24.51°

262.19°

6279.39'

-72.02'

6388'

24.39°

258.58°

6321.27'

-65.01'

6436'

25.94°

256.53°

6364.72'

-56.55'

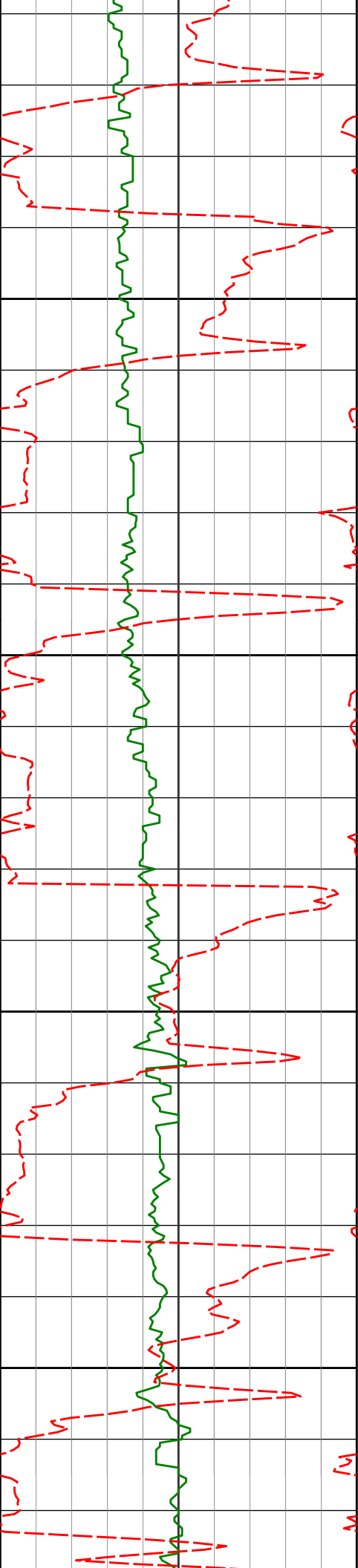
6483'

30.62°

251.99°

6406.10'

-46.13'



6531'

34.91°

246.74°

6446.46'

-32.07'

6550

6578'

36.09°

242.90°

6484.73'

-15.57'

6600

6626'

36.16°

241.81°

6523.50'

2.48'

6650

6674'

36.74°

235.43°

6562.12'

22.06'

6700

6722'

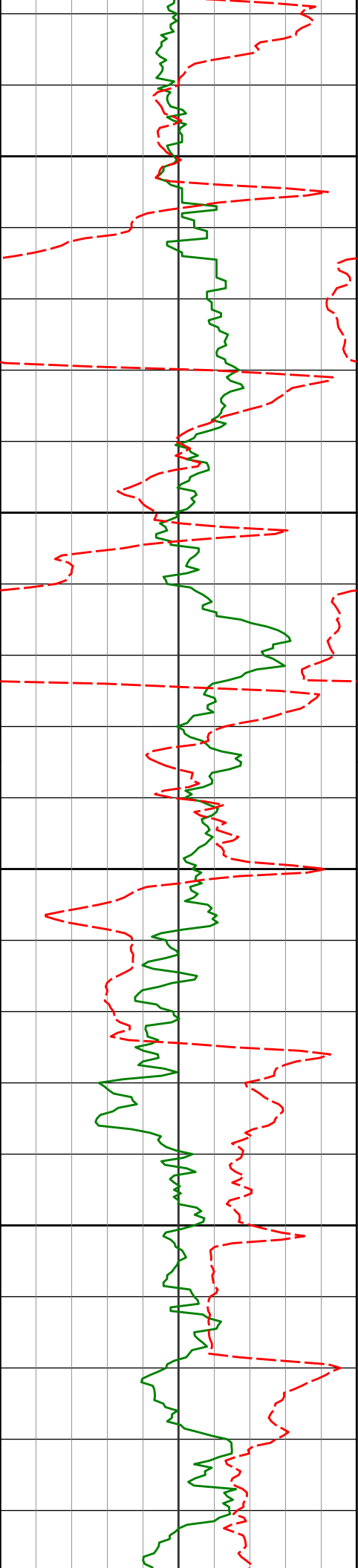
38.86°

230.50°

6600.06'

44.28'





6750

6769'

41.07°

227.19°

6636.08'

68.45'

6800

6817'

44.32°

225.38°

6671.36'

95.35'

6850

6863'

47.07°

222.22°

6703.49'

123.33'

6900

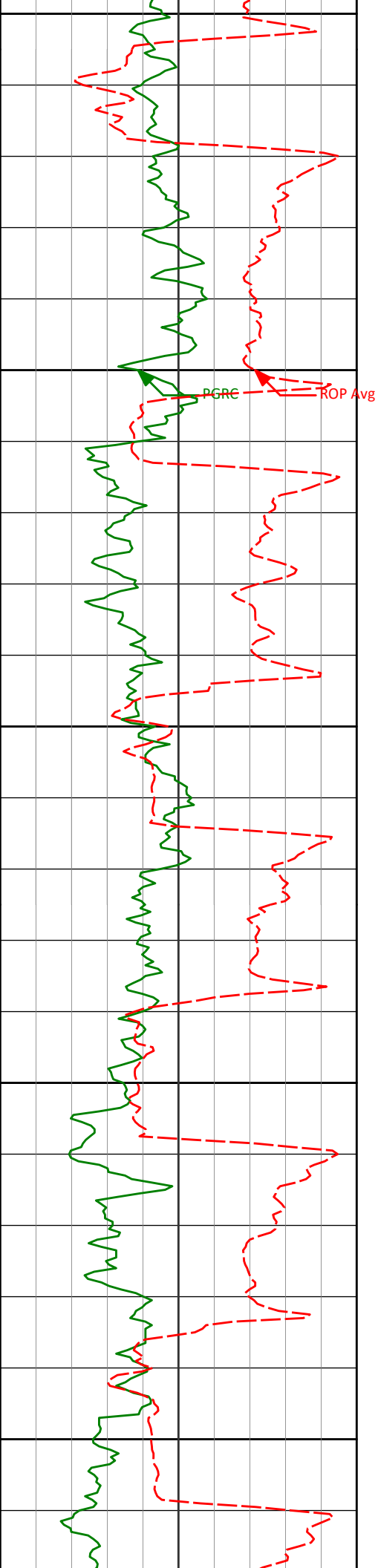
6911'

48.23°

216.78°

6735.84'

154.78'



6950

6959'

51.12°

209.69°

6766.93'

188.86'

7000

7007'

56.09°

202.72°

6795.42'

226.29'

7050

7054'

59.20°

196.88°

6820.58'

265.60'

7100

7102'

61.98°

191.23°

6844.16'

307.36'

7150

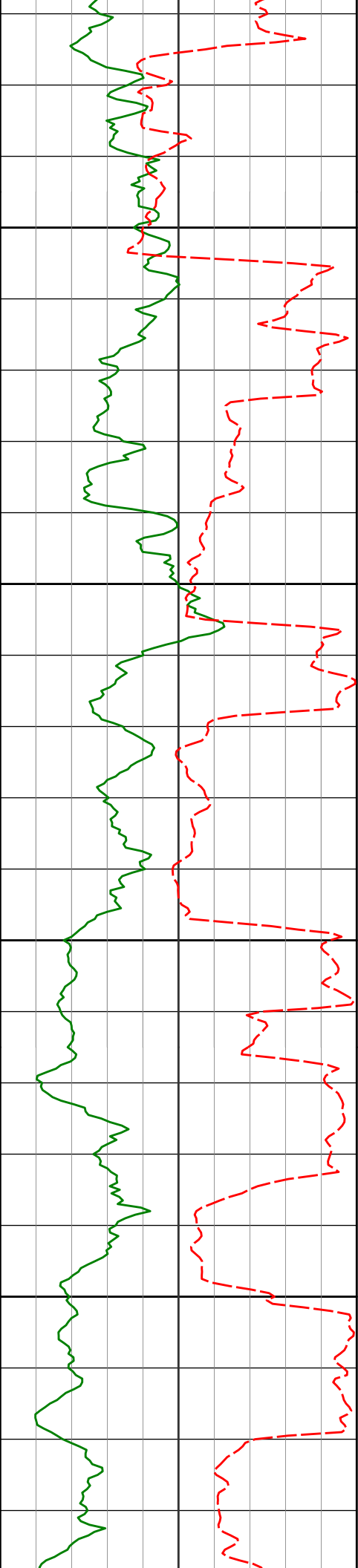
7149'

64.48°

186.29°

6865.34'

349.23'



7200

7197'

67.36°

185.31°

6884.92'

392.79'

7250

7244'

70.15°

184.89°

6901.95'

436.28'

7300

7292'

72.63°

184.84°

6917.27'

481.41'

7350

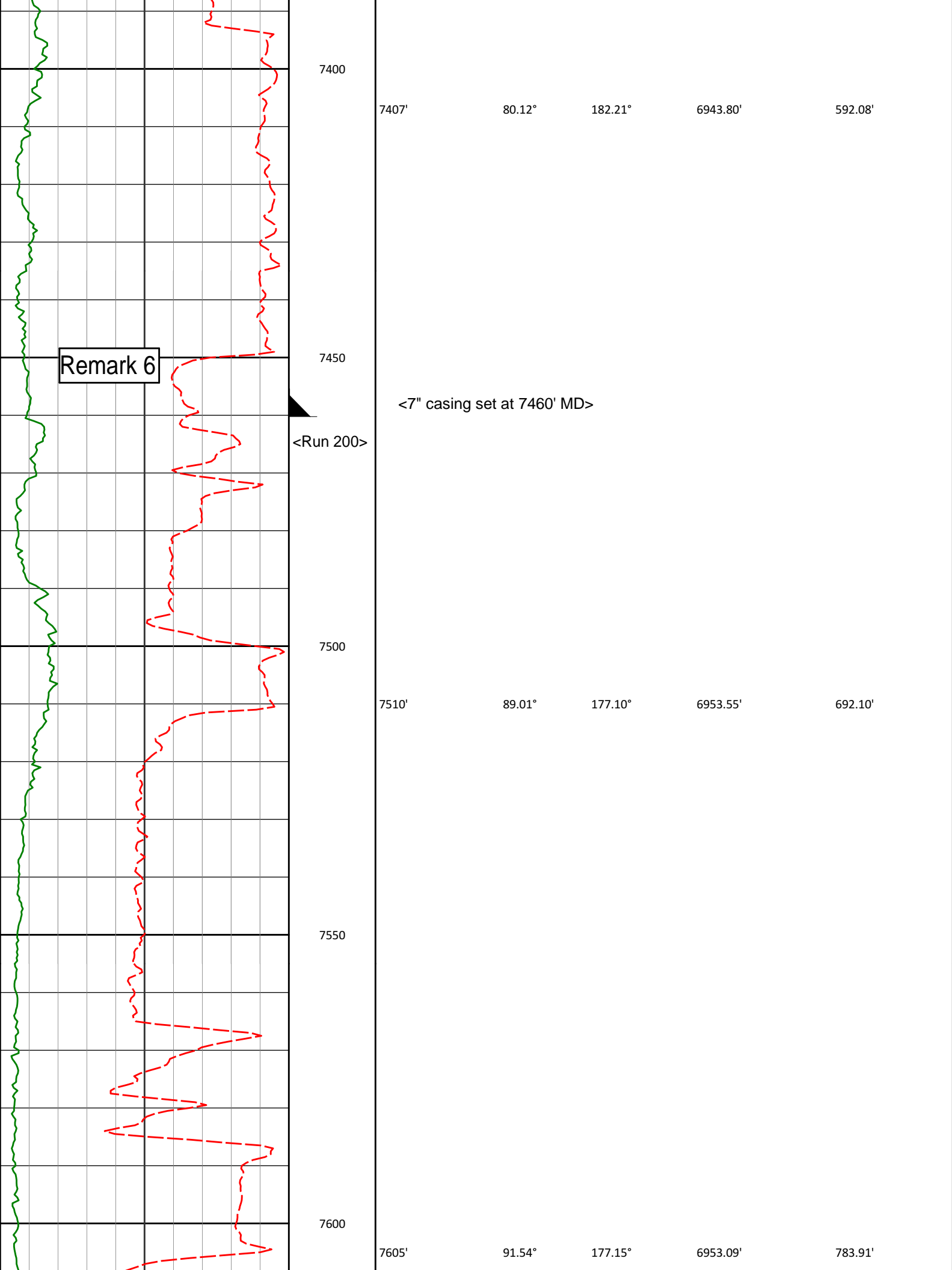
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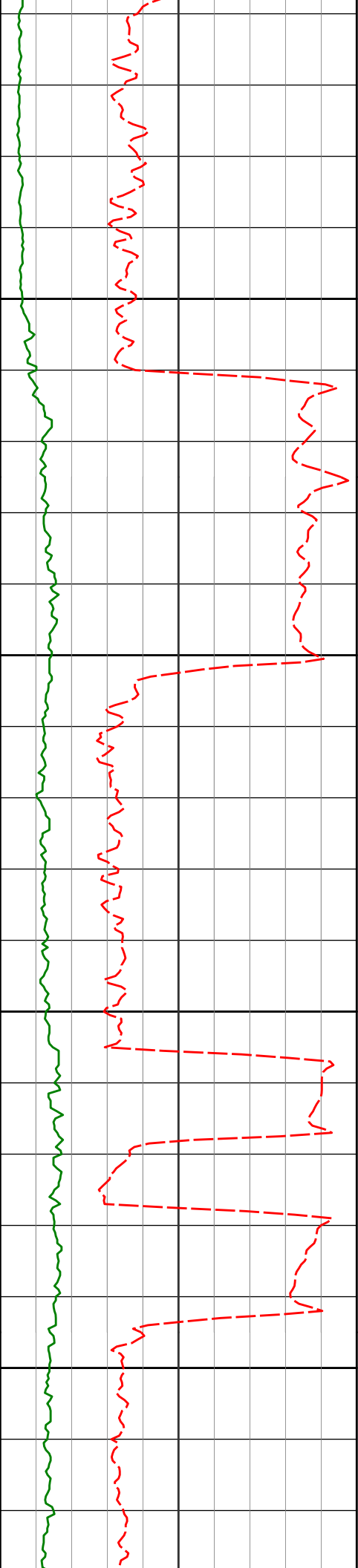
76.24°

184.44°

6929.87'

526.30'





7650

7700

7750

7800

7700'

7795'

90.28°

89.29°

179.41°

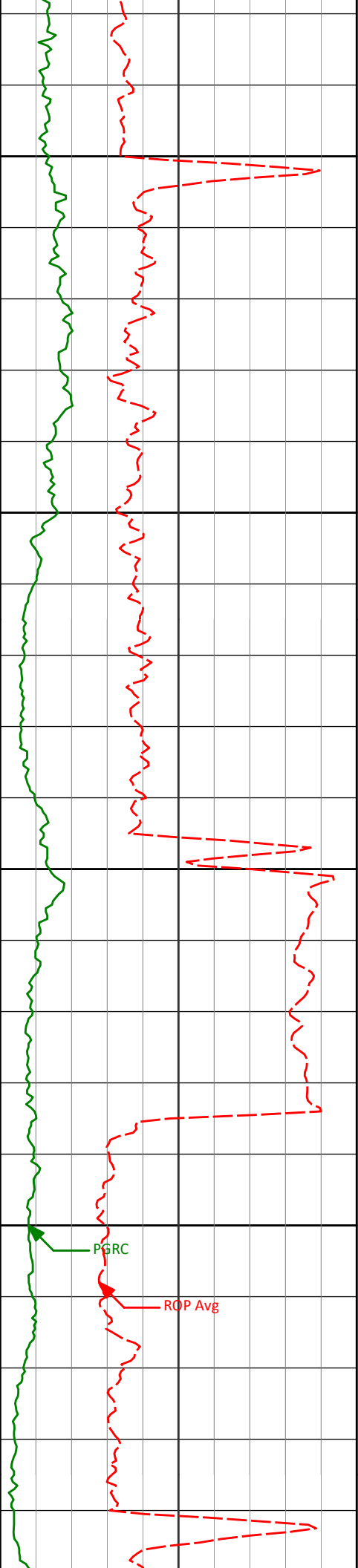
179.43°

6951.59'

6951.94'

876.17'

968.89'



7850

7889'

92.90°

179.02°

6950.15'

1060.53'

7900

7950

7984'

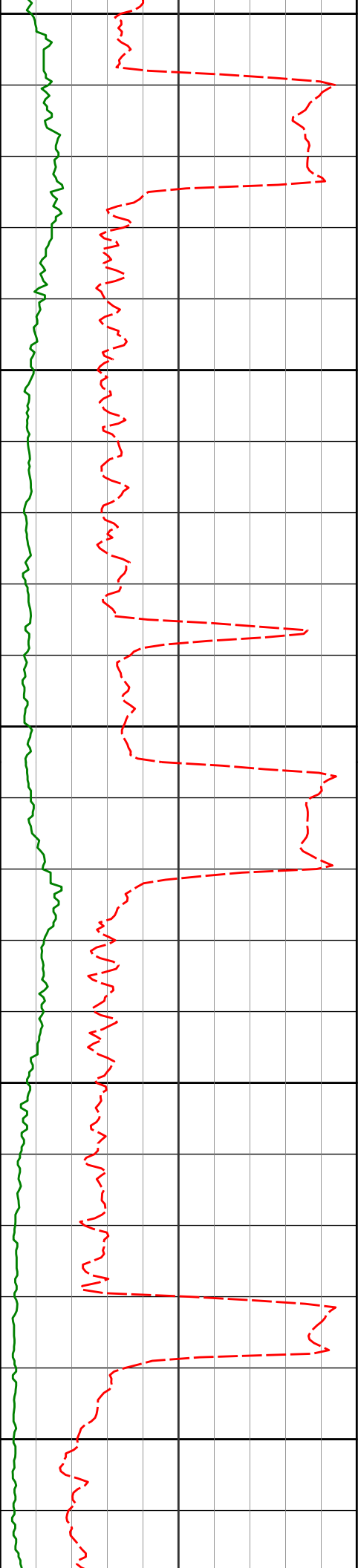
91.05°

179.49°

6946.88'

1153.12'

8000



8050

8079'

90.46°

180.61°

6945.63'

1246.05'

8100

8150

8174'

89.29°

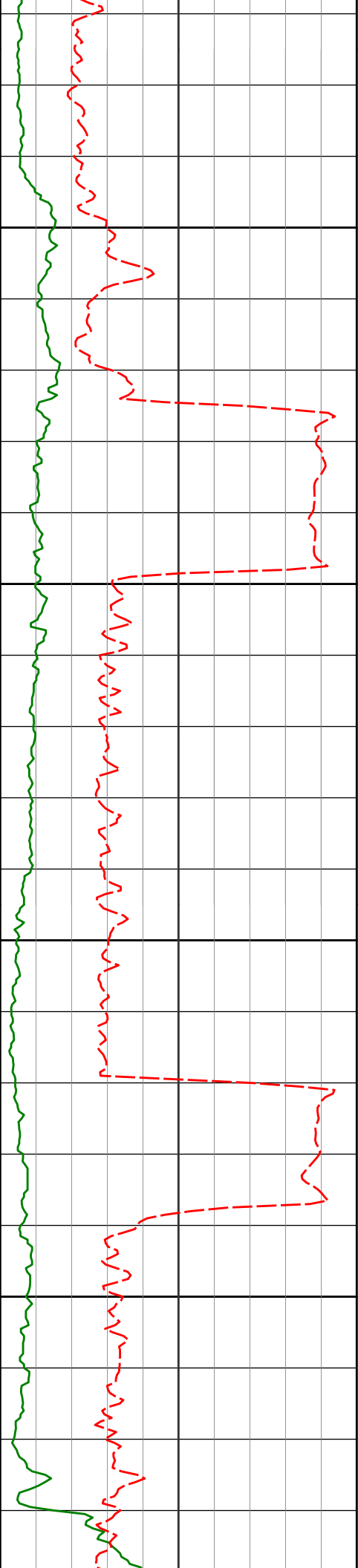
179.74°

6945.83'

1339.03'

8200

8250



8300

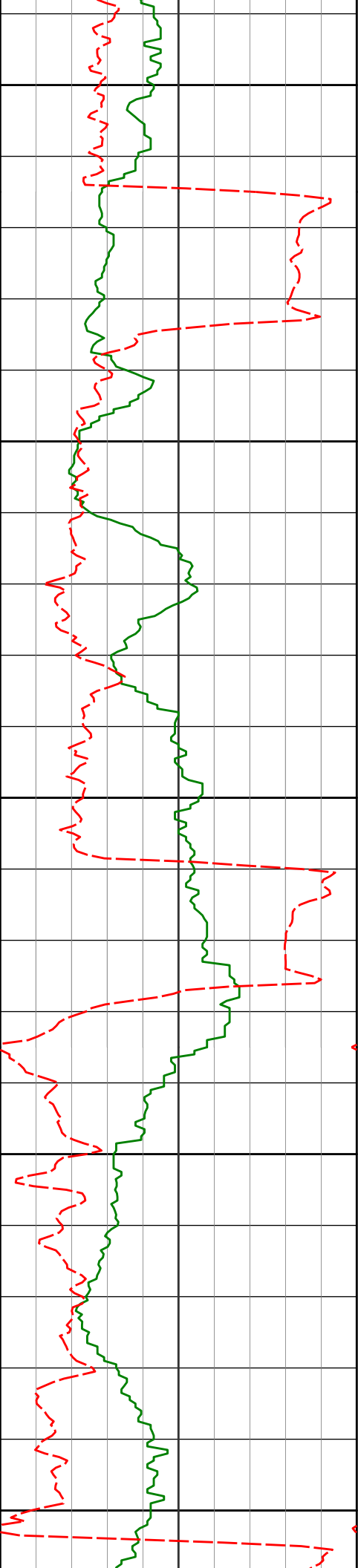
8350

8400

8450

8269'	91.14°	178.93°	6945.48'	1431.71'
8363'	90.34°	178.94°	6944.26'	1523.26'
8458'	90.65°	180.25°	6943.44'	1616.03'





8500

8550

8600

8650

8700

8553'

90.15°

180.37°

6942.78'

1709.06'

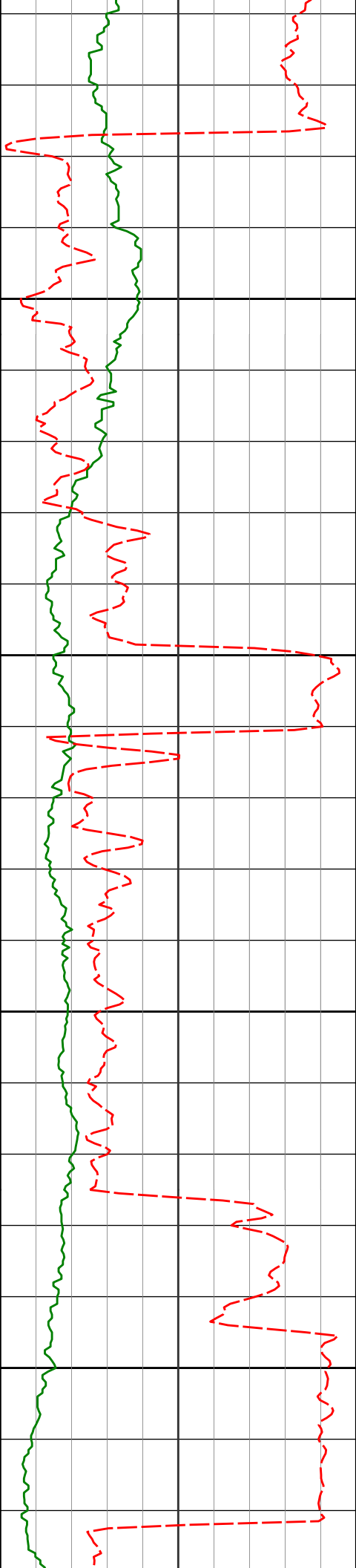
8648'

90.59°

181.12°

6942.17'

1802.22'



8750

8800

8850

8900

8743'

89.75°

180.60°

6941.89'

1895.43'

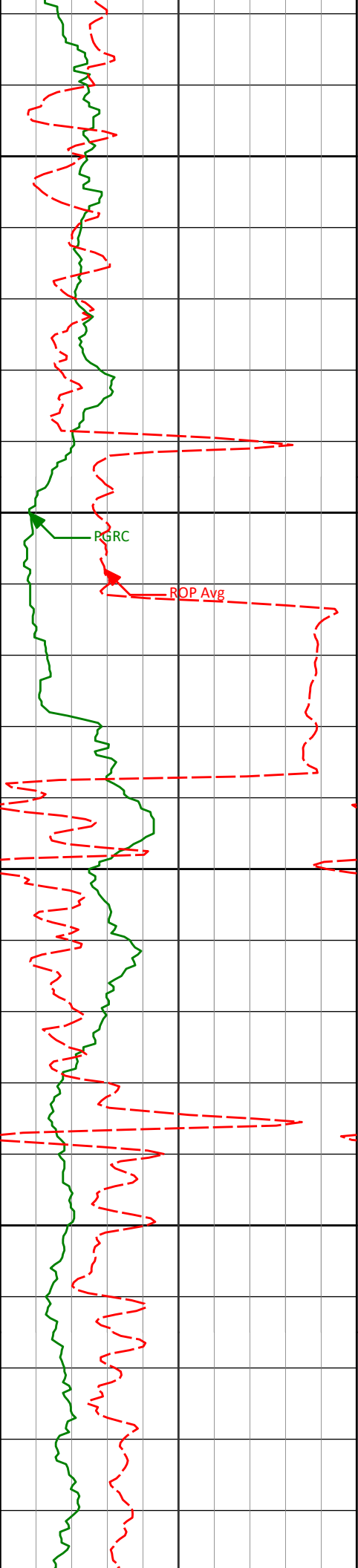
8838'

90.83°

179.98°

6941.40'

1988.45'



8932'

89.38°

180.62°

6941.22'

2080.49'

8950

9000

PGRC

ROP Avg

9027'

88.55°

180.51°

6942.93'

2173.58'

9050

9100

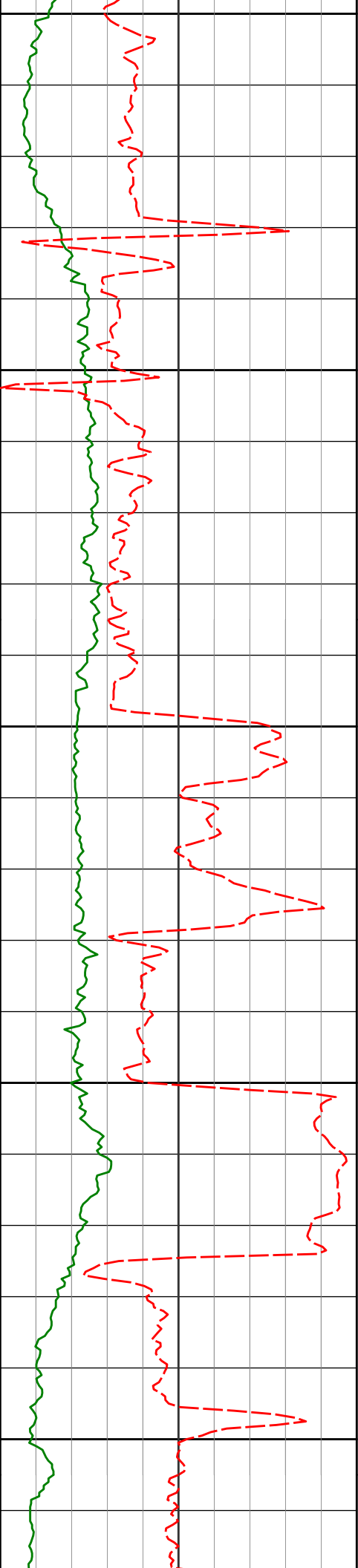
9122'

88.33°

180.77°

6945.52'

2266.68'



9150

9200

9250

9300

9350

9217'

89.35°

180.33°

6947.43'

2359.77'

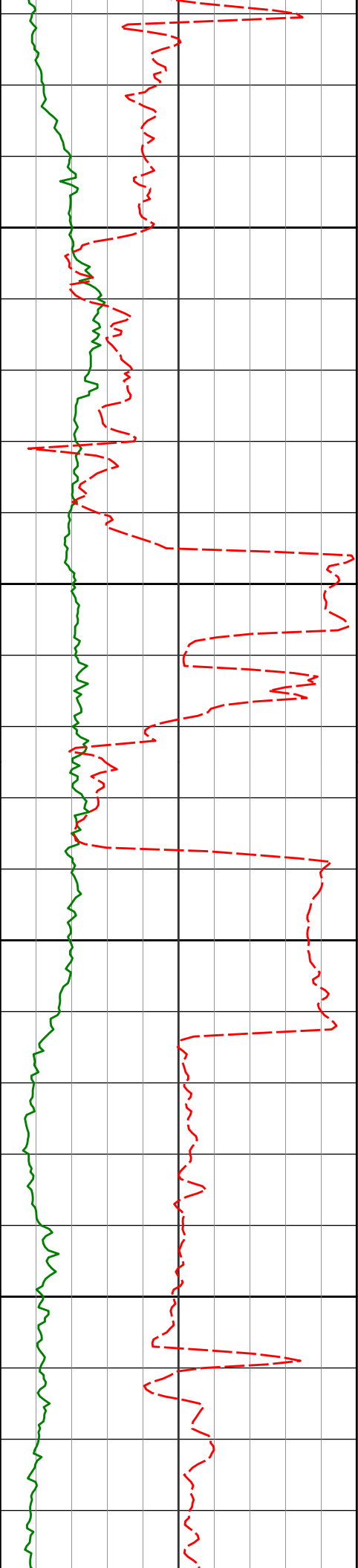
9312'

88.52°

179.01°

6949.20'

2452.55'



9400

9407'

91.29°

179.08°

6949.35'

2545.12'

<Run 300>  
9450

9500

9502'

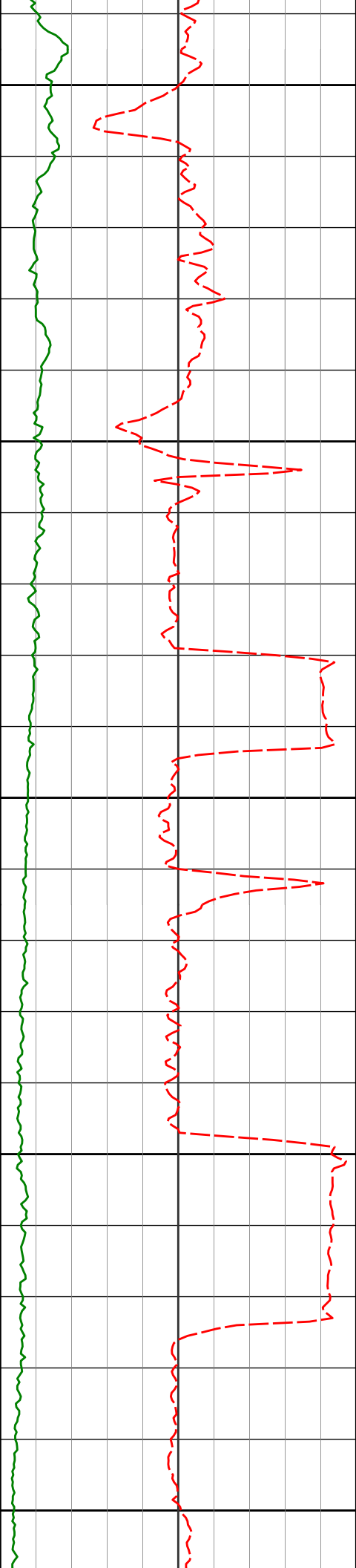
88.58°

180.97°

6949.45'

2638.04'

9550



9600

9650

9700

9750

9800

9597'

9692'

9786'

88.43°

89.54°

89.23°

181.33°

181.78°

179.10°

6951.93'

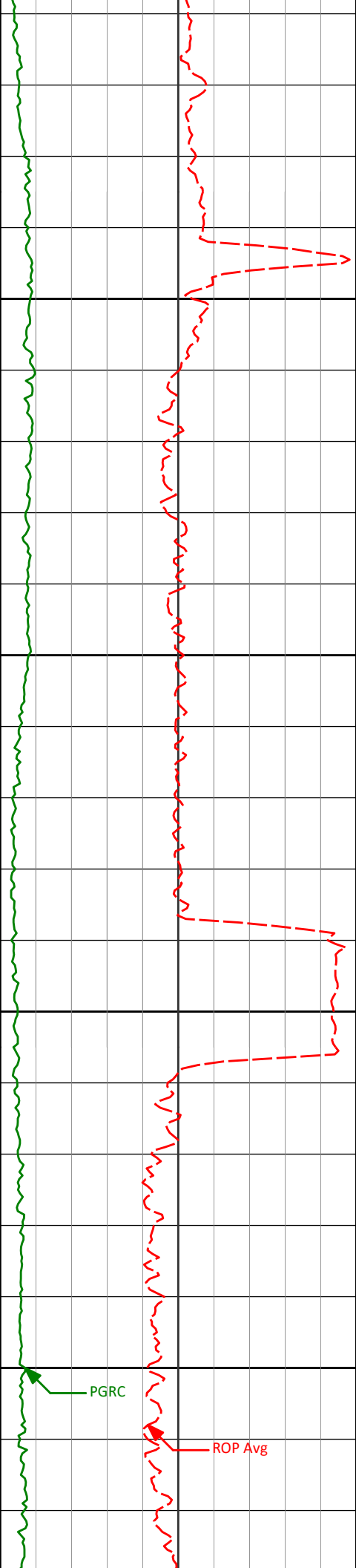
6953.62'

6954.63'

2731.31'

2824.71'

2916.79'



9850

9881'

91.05°

178.50°

6954.40'

3009.27'

9900

9950

9976'

90.92°

179.28°

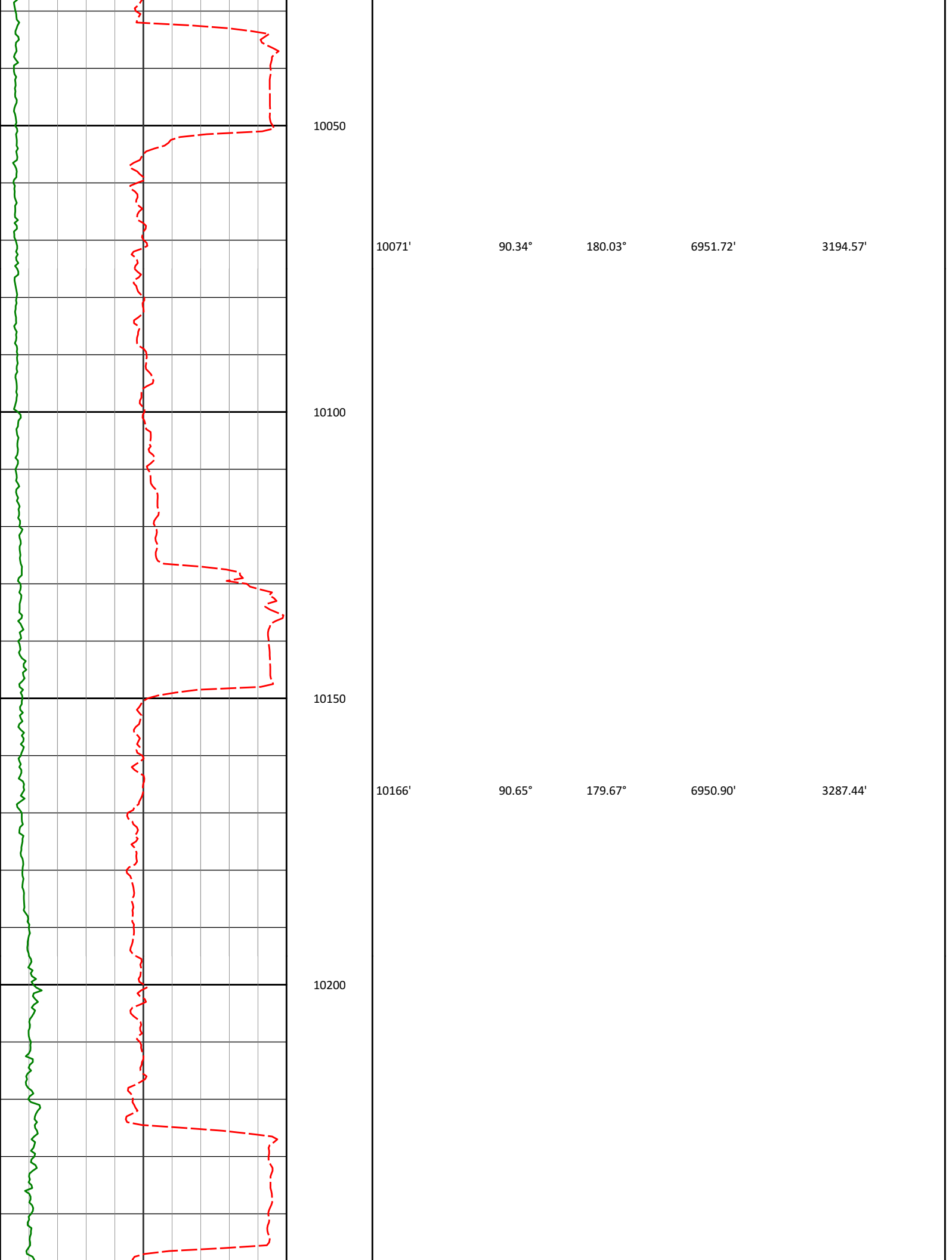
6952.76'

3101.78'

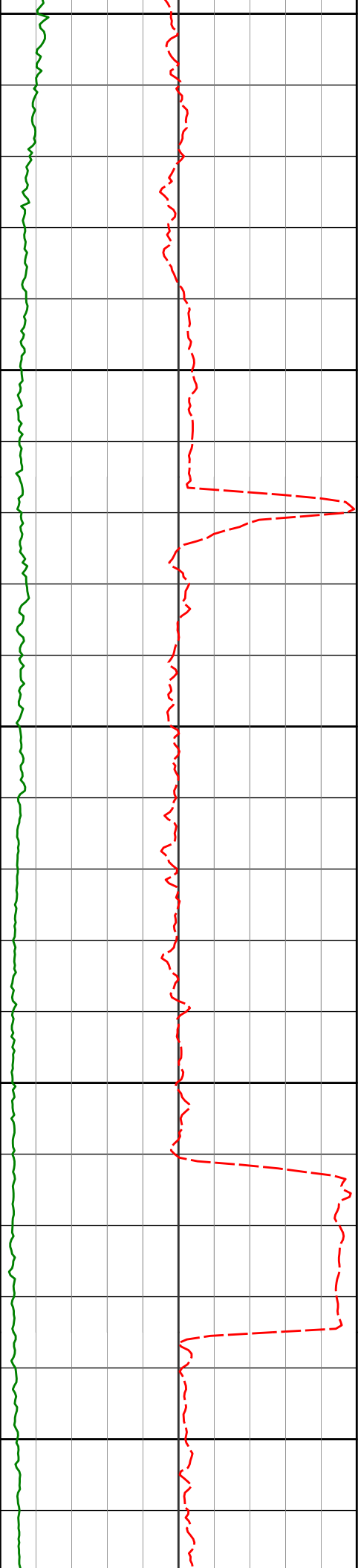
10000

PGRC

ROP Avg







10250

10261'

88.55°

180.10°

6951.56'

3380.31'

10300

10350

10356'

89.17°

181.22°

6953.45'

3473.44'

10400

10450

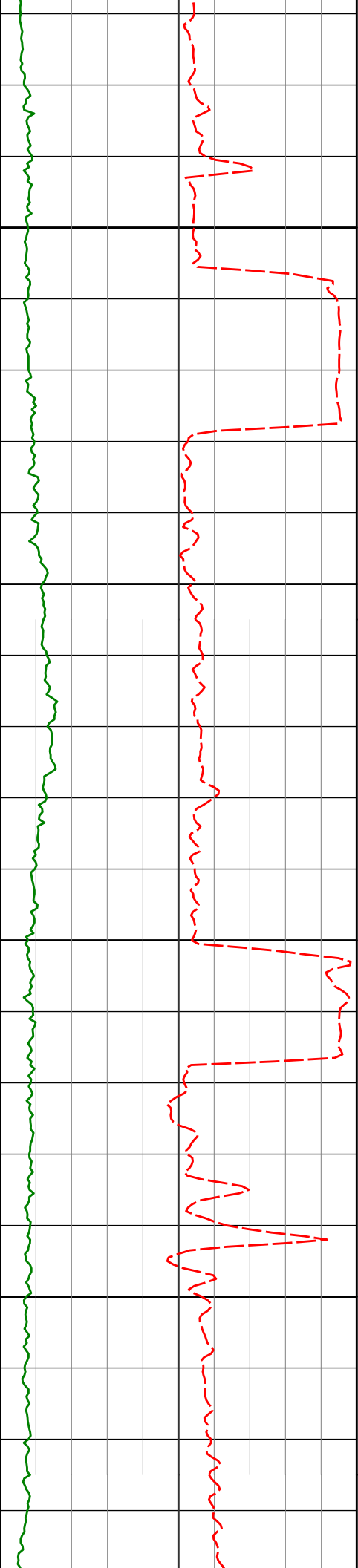
10451'

89.63°

180.19°

6954.45'

3566.59'



10500

10550

10600

10650

10545'

89.23°

179.24°

6955.39'

3658.42'

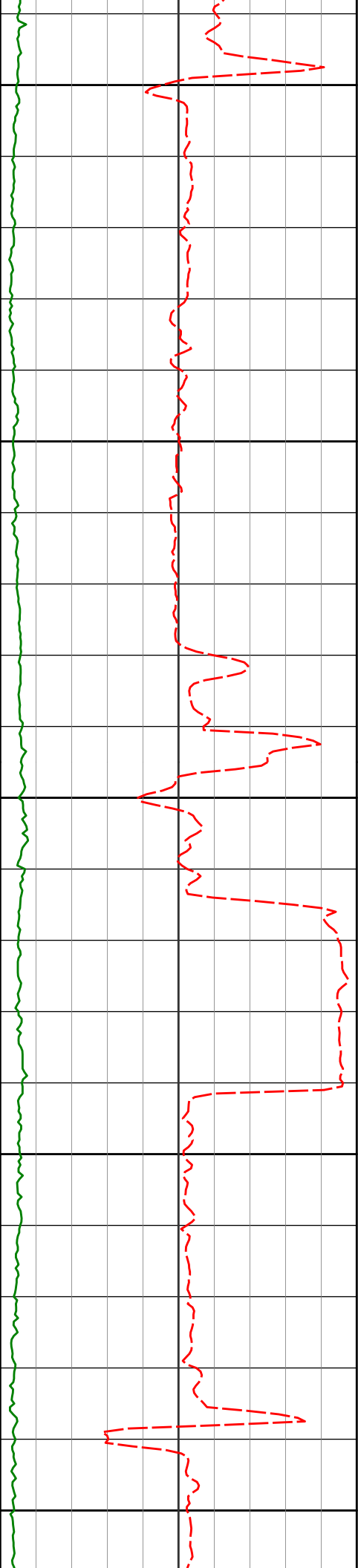
10640'

89.81°

177.69°

6956.18'

3750.77'



10700

10735'

90.86°

178.25°

6955.62'

3842.93'

10750

10800

10830'

89.20°

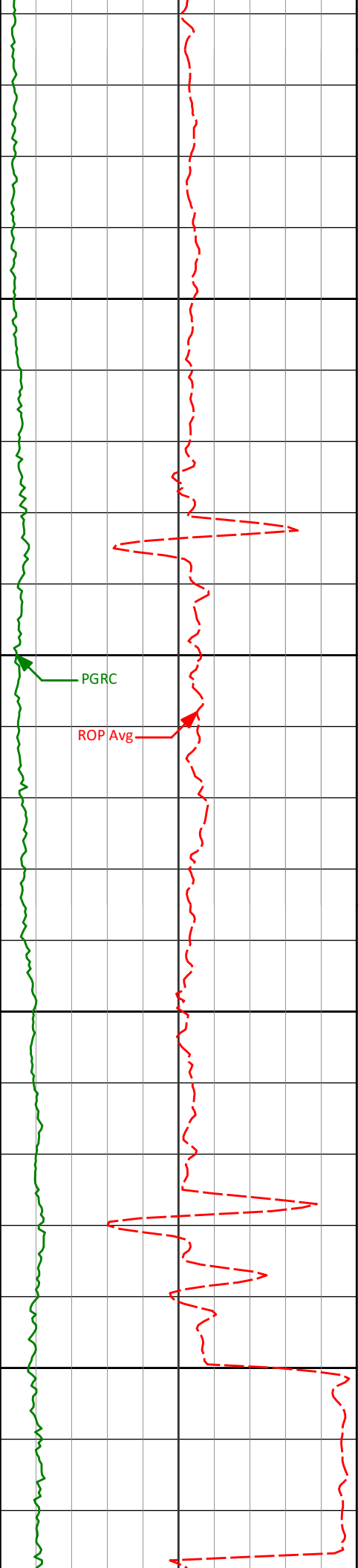
178.53°

6955.57'

3935.26'

10850

10900



10925'

89.66°

178.88°

6956.51'

4027.70'

10950

11000

11020'

90.56°

180.05°

6956.33'

4120.43'

11050

11100

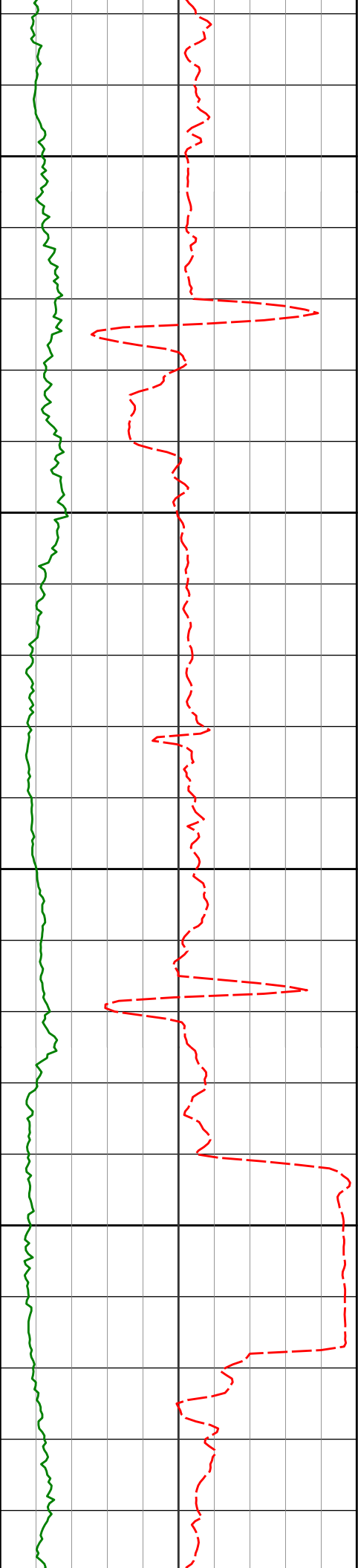
11115'

89.51°

179.53°

6956.28'

4213.28'



11150

11200

11250

11300

11209'

90.37°

180.99°

6956.38'

4305.31'

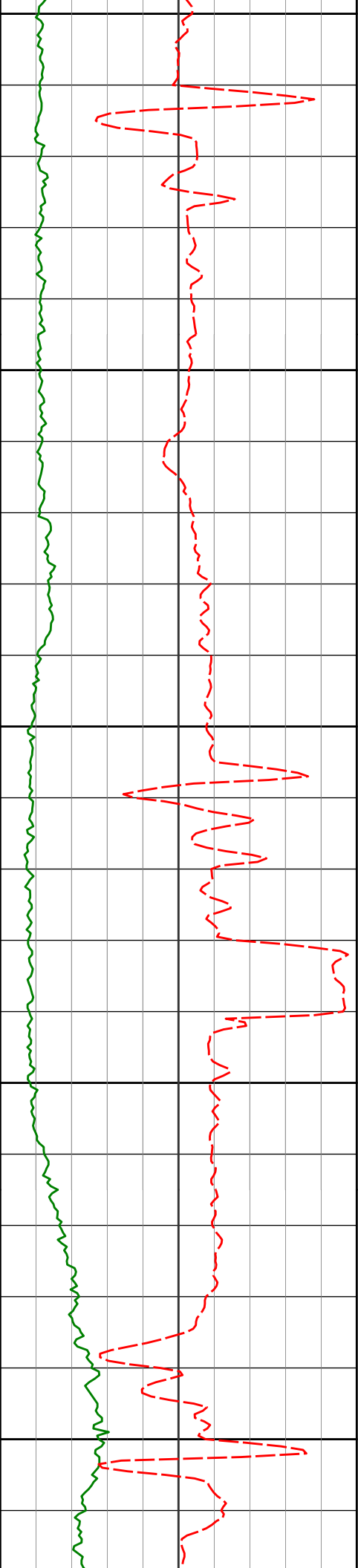
11304'

89.60°

179.88°

6956.41'

4398.37'



11350

11400

11450

11500

11550

11399'

11494'

90.12°

90.18°

182.07°

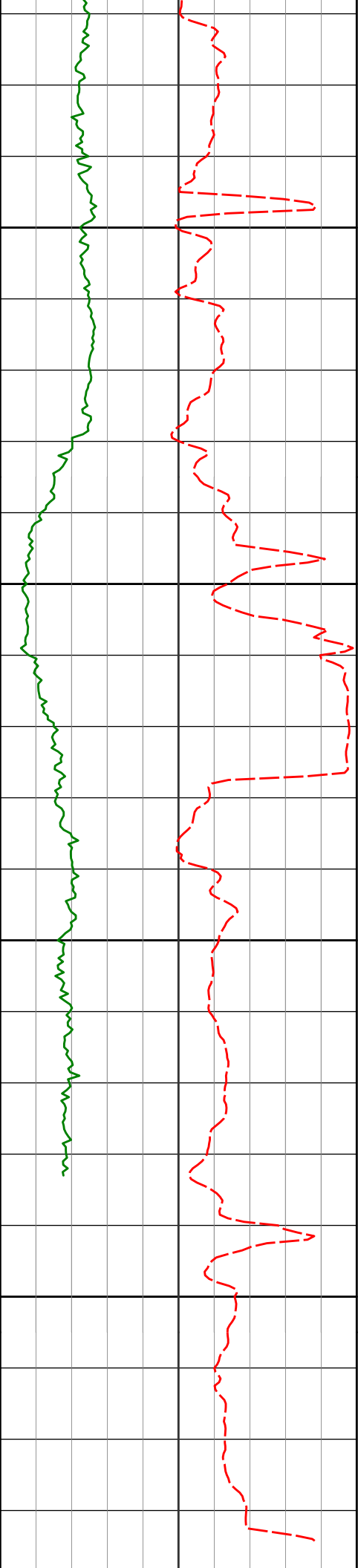
181.07°

6956.64'

6956.39'

4491.61'

4585.04'



11600

11650

11700

11750

11589'

91.91°

181.53°

6954.65'

4678.36'

11684'

91.36°

180.81°

6951.94'

4771.63'

11726'

91.91°

181.21°

6950.74'

4812.84'

<TD @ 11,784' MD>																					
<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>500</div><div>feet per hr</div><div>0</div></div>										11800											
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>0</div><div>api</div><div>300</div></div>										Depth ft		Depth		Inc.		Azi.		TVD		V.S.	

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy  
Storis E24-75-1HC  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0901173064

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
280.00	0.60	311.86	279.99	0.98 N	1.09 W	-0.73	0.21
562.00	0.40	274.86	561.98	2.05 N	3.17 W	-1.34	0.13
771.00	1.40	10.30	770.96	4.62 N	3.44 W	-3.80	0.71
913.00	1.27	274.58	912.94	6.45 N	4.70 W	-5.33	1.40
1098.00	1.15	267.43	1097.90	6.53 N	8.59 W	-4.60	0.11
1284.00	1.13	247.05	1283.86	5.73 N	12.14 W	-3.08	0.22
1387.00	0.94	253.34	1386.84	5.10 N	13.89 W	-2.09	0.22
1480.00	0.54	267.35	1479.84	4.86 N	15.05 W	-1.62	0.47
1572.00	0.21	173.04	1571.84	4.67 N	15.46 W	-1.35	0.64
1665.00	3.90	300.37	1664.77	6.10 N	18.17 W	-2.19	4.33
1758.00	3.75	279.01	1757.56	8.18 N	23.90 W	-3.03	1.53
1851.00	4.78	290.59	1850.31	10.02 N	30.54 W	-3.44	1.43
1943.00	5.26	283.80	1941.95	12.37 N	38.22 W	-4.15	0.83
2036.00	5.74	294.82	2034.53	15.34 N	46.58 W	-5.31	1.25
2128.00	5.59	289.93	2126.08	18.80 N	54.97 W	-6.95	0.55
2313.00	5.16	292.90	2310.27	25.11 N	71.10 W	-9.76	0.28
2407.00	4.86	300.22	2403.91	28.76 N	78.44 W	-11.81	0.75
2500.00	5.14	288.53	2496.56	32.07 N	85.80 W	-13.51	1.14
2591.00	6.80	282.79	2587.06	34.56 N	94.92 W	-14.05	1.93
2686.00	7.43	281.84	2681.33	37.06 N	106.41 W	-14.11	0.68
2781.00	8.27	287.48	2775.44	40.37 N	118.94 W	-14.74	1.19
2876.00	9.11	291.85	2869.35	45.23 N	132.44 W	-16.68	1.13
2971.00	9.19	291.27	2963.14	50.78 N	146.49 W	-19.18	0.12
3066.00	9.28	290.81	3056.91	56.25 N	160.71 W	-21.58	0.12
3161.00	8.62	289.95	3150.75	61.40 N	174.56 W	-23.73	0.71
3256.00	7.39	284.31	3244.83	65.34 N	187.17 W	-24.96	1.53
3351.00	7.55	279.59	3339.02	67.89 N	199.25 W	-24.94	0.66
3446.00	8.29	270.96	3433.12	69.04 N	212.24 W	-23.37	1.47
3541.00	9.17	286.81	3527.03	71.34 N	226.34 W	-22.69	2.68
3636.00	9.00	294.75	3620.84	76.64 N	240.33 W	-24.96	1.33
3731.00	10.37	298.83	3714.49	83.88 N	254.57 W	-29.07	1.61
3826.00	11.40	297.23	3807.78	92.29 N	270.40 W	-34.01	1.13
4016.00	12.26	296.16	3993.74	109.78 N	305.20 W	-43.87	0.47
4111.00	11.18	292.52	4086.76	117.76 N	322.77 W	-48.02	1.38
4206.00	10.59	289.00	4180.05	124.13 N	339.53 W	-50.76	0.93
4301.00	9.46	283.91	4273.60	128.85 N	355.37 W	-52.08	1.51
4396.00	8.44	278.34	4367.44	131.74 N	369.85 W	-51.89	1.41
4491.00	8.59	282.90	4461.40	134.33 N	383.67 W	-51.56	0.73
4585.00	8.36	288.60	4554.37	138.08 N	396.99 W	-52.45	0.93
4680.00	8.68	299.54	4648.33	143.82 N	409.78 W	-55.40	1.74
4775.00	8.32	301.31	4742.29	150.92 N	421.89 W	-59.83	0.47
4870.00	8.68	298.47	4836.24	157.92 N	434.06 W	-64.14	0.58



4870.00	8.08	298.47	4830.24	157.92 N	434.08 W	-84.14	0.38
4965.00	9.34	297.87	4930.07	164.94 N	447.18 W	-68.28	0.70
5060.00	9.95	298.41	5023.73	172.45 N	461.22 W	-72.70	0.64
5155.00	8.13	298.43	5117.54	179.55 N	474.34 W	-76.92	1.92
5250.00	8.70	295.50	5211.52	185.84 N	486.73 W	-80.49	0.75
5345.00	8.62	288.82	5305.44	191.23 N	499.95 W	-83.01	1.06
5440.00	8.63	279.68	5399.37	194.73 N	513.72 W	-83.57	1.44
5534.00	10.41	286.54	5492.07	198.33 N	528.81 W	-83.95	2.24
5629.00	8.69	283.28	5585.75	202.42 N	544.02 W	-84.79	1.90
5724.00	9.12	283.78	5679.61	205.87 N	558.32 W	-85.18	0.47
5819.00	9.52	285.58	5773.35	209.77 N	573.20 W	-85.90	0.51
5914.00	9.84	286.38	5867.00	214.17 N	588.56 W	-87.01	0.37
6009.00	8.97	285.42	5960.72	218.43 N	603.48 W	-88.07	0.93
6121.00	10.00	287.14	6071.19	223.61 N	621.19 W	-89.46	0.95
6247.00	20.98	265.27	6192.52	224.98 N	654.25 W	-83.92	9.72
6294.00	24.94	264.27	6235.79	223.30 N	672.50 W	-78.48	8.46
6342.00	24.51	262.19	6279.39	220.94 N	692.43 W	-72.02	2.02
6388.00	24.39	258.58	6321.27	217.76 N	711.19 W	-65.01	3.25
6436.00	25.94	256.53	6364.72	213.35 N	731.12 W	-56.55	3.71
6483.00	30.62	251.99	6406.10	207.25 N	752.51 W	-46.13	10.95
6531.00	34.91	246.74	6446.46	198.04 N	776.78 W	-32.07	10.71
6578.00	36.09	242.90	6484.73	186.42 N	801.46 W	-15.57	5.36
6626.00	36.16	241.81	6523.50	173.29 N	826.52 W	2.48	1.34
6674.00	36.74	235.43	6562.12	158.45 N	850.83 W	22.06	7.99
6722.00	38.86	230.50	6600.06	140.72 N	874.28 W	44.28	7.69
6769.00	41.07	227.19	6636.08	120.84 N	896.99 W	68.45	6.51
6817.00	44.32	225.38	6671.36	98.35 N	920.50 W	95.35	7.23
6863.00	47.07	222.22	6703.49	74.58 N	943.26 W	123.33	7.74
6911.00	48.23	216.78	6735.84	47.22 N	965.80 W	154.78	8.72
6959.00	51.12	209.69	6766.93	16.63 N	985.78 W	188.86	12.77
7007.00	56.09	202.72	6795.42	18.03 S	1002.75 W	226.29	15.61
7054.00	59.20	196.88	6820.58	55.37 S	1016.16 W	265.60	12.40
7102.00	61.98	191.23	6844.16	95.91 S	1026.28 W	307.36	11.78
7149.00	64.48	186.29	6865.34	137.36 S	1032.64 W	349.23	10.78
7197.00	67.36	185.31	6884.92	180.96 S	1037.06 W	392.79	6.28
7244.00	70.15	184.89	6901.95	224.59 S	1040.95 W	436.28	6.00
7292.00	72.63	184.84	6917.27	269.91 S	1044.81 W	481.41	5.15
7339.00	76.24	184.44	6929.87	315.03 S	1048.47 W	526.30	7.73
7407.00	80.12	182.21	6943.80	381.46 S	1052.32 W	592.08	6.54
7510.00	89.01	177.10	6953.55	483.86 S	1051.68 W	692.10	9.95
7605.00	91.54	177.15	6953.09	578.73 S	1046.92 W	783.91	2.66
7700.00	90.28	179.41	6951.59	673.67 S	1044.06 W	876.17	2.73
7795.00	89.29	179.43	6951.94	768.66 S	1043.10 W	968.89	1.04
7889.00	92.90	179.02	6950.15	862.62 S	1041.84 W	1060.53	3.86
7984.00	91.05	179.49	6946.88	957.55 S	1040.61 W	1153.12	2.01
8079.00	90.46	180.61	6945.63	1052.54 S	1040.69 W	1246.05	1.32
8174.00	89.29	179.74	6945.83	1147.54 S	1040.97 W	1339.03	1.53
8269.00	91.14	178.93	6945.48	1242.53 S	1039.87 W	1431.71	2.13
8363.00	90.34	178.94	6944.26	1336.50 S	1038.12 W	1523.26	0.85
8458.00	90.65	180.25	6943.44	1431.49 S	1037.45 W	1616.03	1.41
8553.00	90.15	180.37	6942.78	1526.49 S	1037.96 W	1709.06	0.54
8648.00	90.59	181.12	6942.17	1621.48 S	1039.20 W	1802.22	0.91
8743.00	89.75	180.60	6941.89	1716.47 S	1040.63 W	1895.43	1.03
8838.00	90.83	179.98	6941.40	1811.46 S	1041.11 W	1988.45	1.31
8932.00	89.38	180.62	6941.22	1905.46 S	1041.60 W	2080.49	1.68
9027.00	88.55	180.51	6942.93	2000.44 S	1042.53 W	2173.58	0.88
9122.00	88.33	180.77	6945.52	2095.39 S	1043.59 W	2266.68	0.36
9217.00	89.35	180.33	6947.43	2190.37 S	1044.50 W	2359.77	1.16
9312.00	88.52	179.01	6949.20	2285.35 S	1043.95 W	2452.55	1.65
9407.00	91.29	179.08	6949.35	2380.33 S	1042.37 W	2545.12	2.92
9502.00	88.58	180.97	6949.45	2475.31 S	1042.41 W	2638.04	3.48
9597.00	88.43	181.33	6951.93	2570.26 S	1044.32 W	2731.31	0.41
9692.00	89.54	181.78	6953.62	2665.21 S	1046.90 W	2824.71	1.26
9786.00	89.23	179.10	6954.63	2759.19 S	1047.63 W	2916.79	2.87
9881.00	91.05	178.50	6954.40	2854.17 S	1045.65 W	3009.27	2.01
9976.00	90.92	179.28	6952.76	2949.13 S	1043.81 W	3101.78	0.83
10071.00	90.34	180.03	6951.72	3044.13 S	1043.25 W	3194.57	1.00
10166.00	90.65	179.67	6950.90	3139.12 S	1043.00 W	3287.44	0.50
10261.00	88.55	180.10	6951.56	3234.11 S	1042.81 W	3380.31	2.25
10356.00	89.17	181.22	6953.45	3329.09 S	1043.91 W	3473.44	1.35
10451.00	89.63	180.19	6954.45	3424.07 S	1045.08 W	3566.59	1.20
10545.00	89.23	179.24	6955.39	3518.06 S	1044.61 W	3658.42	1.09

<b>10640.00</b>	<b>89.81</b>	<b>177.69</b>	<b>6956.18</b>	<b>3613.02 S</b>	<b>1042.06 W</b>	<b>3750.77</b>	<b>1.75</b>
<b>10735.00</b>	<b>90.86</b>	<b>178.25</b>	<b>6955.62</b>	<b>3707.96 S</b>	<b>1038.70 W</b>	<b>3842.93</b>	<b>1.25</b>
<b>10830.00</b>	<b>89.20</b>	<b>178.53</b>	<b>6955.57</b>	<b>3802.92 S</b>	<b>1036.03 W</b>	<b>3935.26</b>	<b>1.78</b>
<b>10925.00</b>	<b>89.66</b>	<b>178.88</b>	<b>6956.51</b>	<b>3897.89 S</b>	<b>1033.89 W</b>	<b>4027.70</b>	<b>0.61</b>
<b>11020.00</b>	<b>90.56</b>	<b>180.05</b>	<b>6956.33</b>	<b>3992.88 S</b>	<b>1033.00 W</b>	<b>4120.43</b>	<b>1.55</b>
<b>11115.00</b>	<b>89.51</b>	<b>179.53</b>	<b>6956.28</b>	<b>4087.88 S</b>	<b>1032.65 W</b>	<b>4213.28</b>	<b>1.23</b>
<b>11209.00</b>	<b>90.37</b>	<b>180.99</b>	<b>6956.38</b>	<b>4181.88 S</b>	<b>1033.08 W</b>	<b>4305.31</b>	<b>1.81</b>
<b>11304.00</b>	<b>89.60</b>	<b>179.88</b>	<b>6956.41</b>	<b>4276.87 S</b>	<b>1033.80 W</b>	<b>4398.37</b>	<b>1.43</b>
<b>11399.00</b>	<b>90.12</b>	<b>182.07</b>	<b>6956.64</b>	<b>4371.85 S</b>	<b>1035.41 W</b>	<b>4491.61</b>	<b>2.37</b>
<b>11494.00</b>	<b>90.18</b>	<b>181.07</b>	<b>6956.39</b>	<b>4466.82 S</b>	<b>1038.02 W</b>	<b>4585.04</b>	<b>1.06</b>
<b>11589.00</b>	<b>91.91</b>	<b>181.53</b>	<b>6954.65</b>	<b>4561.77 S</b>	<b>1040.17 W</b>	<b>4678.36</b>	<b>1.88</b>
<b>11684.00</b>	<b>91.36</b>	<b>180.81</b>	<b>6951.94</b>	<b>4656.71 S</b>	<b>1042.11 W</b>	<b>4771.63</b>	<b>0.96</b>
<b>11726.00</b>	<b>91.91</b>	<b>181.21</b>	<b>6950.74</b>	<b>4698.69 S</b>	<b>1042.85 W</b>	<b>4812.84</b>	<b>1.64</b>
<b>11784.00</b>	<b>91.91</b>	<b>181.21</b>	<b>6948.80</b>	<b>4756.64 S</b>	<b>1044.07 W</b>	<b>4869.78</b>	<b>0.01</b>

**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 192.01 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.86 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11784.00 FEET  
IS 4869.88 FEET ALONG 192.38 DEGREES (GRID)**

**Surface surveys at 280 ft, 562 ft and 771 ft have had azimuths corrected to grid north, but were not taken by Halliburton.**

**Last survey is a projection from 11726 ft MD to bit at 11784 ft MD.**