

**PCGC : Pressure Case Gamma**  
**PCDC: Pressure Case Directional**



**1 : 600 / 1 : 240**

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	100	200	300		
<b>Date run completed</b>	23-Sep-12	24-Sep-12	27-Sep-12		
<b>Rig Bit Number</b>	2	3	4		
<b>Bit Size (in)</b>	8.750	8.750	8.750		
<b>Tool Nominal OD (in)</b>	6.750	6.750	4.750		
<b>Log Start Depth (MD, ft)</b>	707.00	5,928.00	7,125.00		
<b>Log End Depth (MD, ft)</b>	5,928.00	7,125.00	11,235.00		
<b>Drill or Wipe</b>	Drill	Drill	Drill		
<b>Drill/Wipe Start Date and Time</b>	22-Sep-12 08:50	23-Sep-12 06:00	25-Sep-12 07:15		
<b>Drill/Wipe End Date and Time</b>	22-Sep-12 23:30	24-Sep-12 05:20	27-Sep-12 02:15		
<b>Min Inc (deg) @ Depth (MD, ft)</b>	.18 @ 5,532.00	.35 @ 5,933.00	87.37 @ 10,798.00		
<b>Max Inc (deg) @ Depth (MD, ft)</b>	10.41 @ 2,686.00	89.10 @ 7,125.00	91.82 @ 7,288.00		
<b>Bit TFA(in2) / Bit Type</b>	.75 / PDC	.75 / PDC	.46 / PDC		
<b>Flow Rate (gpm)</b>	593.00	585.00	269.00		
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	N/A / N/A	N/A / N/A	N/A / N/A		
<b>Fluid Type</b>	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
<b>Density (ppg) / Viscosity (spqt)</b>	8.50 / 27.00	10.50 / 36.00	9.27 / 34.00		
<b>Filtrate CL (ppm)</b>	1,500.00	1,500.00	1,500.00		
<b>pH / Fluid Loss (mptm)</b>	10.30 / 0	9.50 / 8	9.30 / 10		
<b>PV (cP) / YP (lbf2)</b>	1 / 4.00	10 / 11.00	7 / 8.00		
<b>% Solids / % Sand</b>	1 / 0.25	11 / 0.25	5 / 0.20		
<b>% Oil / Oil:Water Ratio</b>	N/A / N/A	N/A / N/A	N/A / N/A		
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A	N/A @ N/A	N/A @ N/A		
<b>Max Tool Temp (in) @ Temp (degF)</b>	115.00 / 200	175.10 / 200	210.40 / 200		

Max Tool Temp (degF) / Source	145.90 / PCM	175.40 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 145.90	N/A @ 175.40	N/A @ 213.40		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Nielsen	Dave Nielsen	Martin Suarez		

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11404279	11404279	11634141		
Insert Serial Number	11145558	11145558	11400989		
Date and Time Initialized	22-Sep-12 04:06	22-Sep-12 04:06	24-Sep-12 21:30		
Date and Time Read	24-Sep-12 10:36	24-Sep-12 10:43	27-Sep-12 12:31		
ECMB SW Version	N/A	N/A	N/A		

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	55.67	52.80	62.72		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11404279	11404279	11634141		
Sonde Serial Number	11478107	11478107	11638507		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	326.51	294.40	290.27		

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.87	48.00	67.29		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11404279	11404279	11634141		
Insert/Sonde Serial Number	11579773	11579773	11293277		

## 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 7.4.01
6. End of Run 200. Gap between build and lateral section is due to Gamma sensor measure point to bit distance during the build run. Last Gamma datapoint is at 7077 ft. MD. Gamma cannot be measured within cased hole, and collection resumes after drilling through cement at 7125 ft. MD.

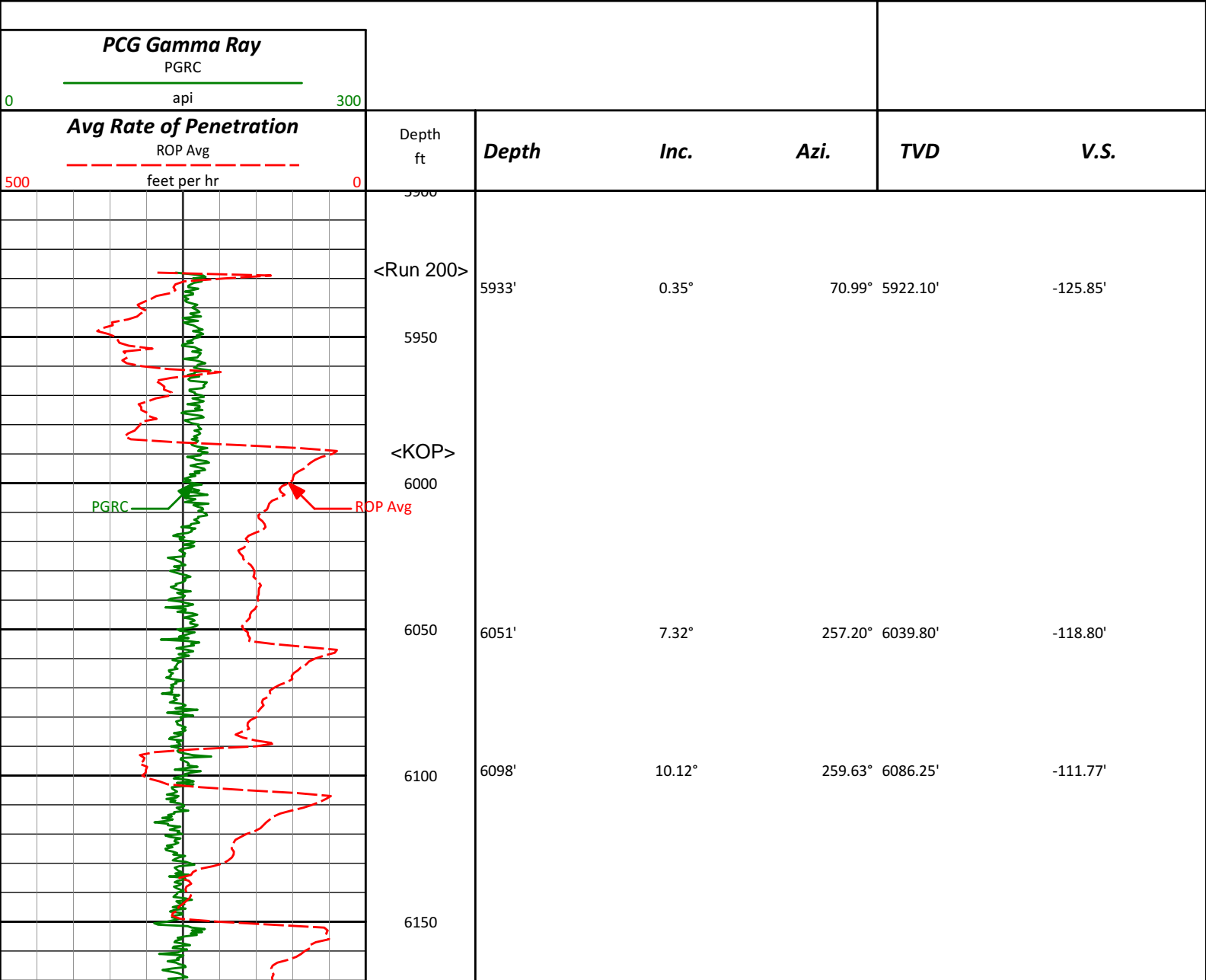
WARRANTY

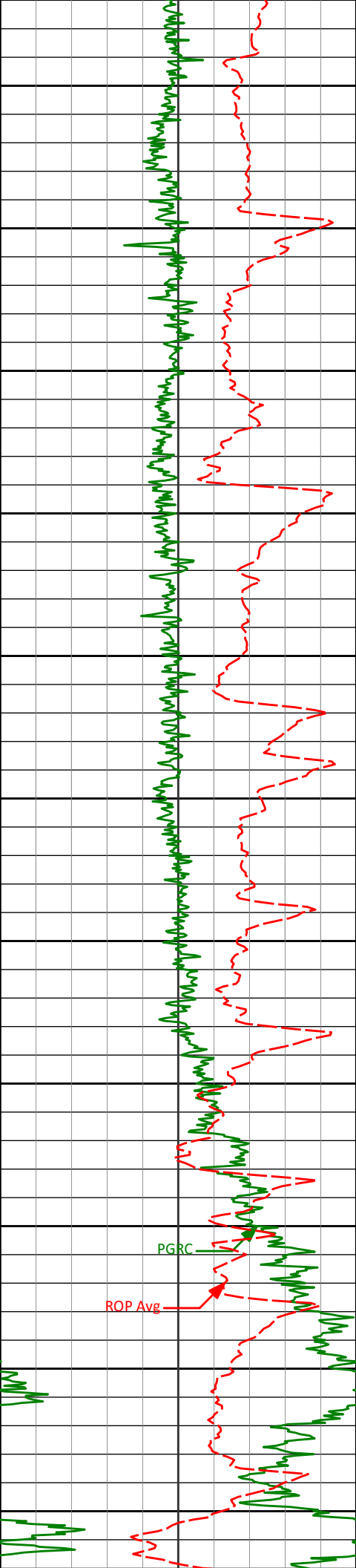
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Sperry Drilling Services

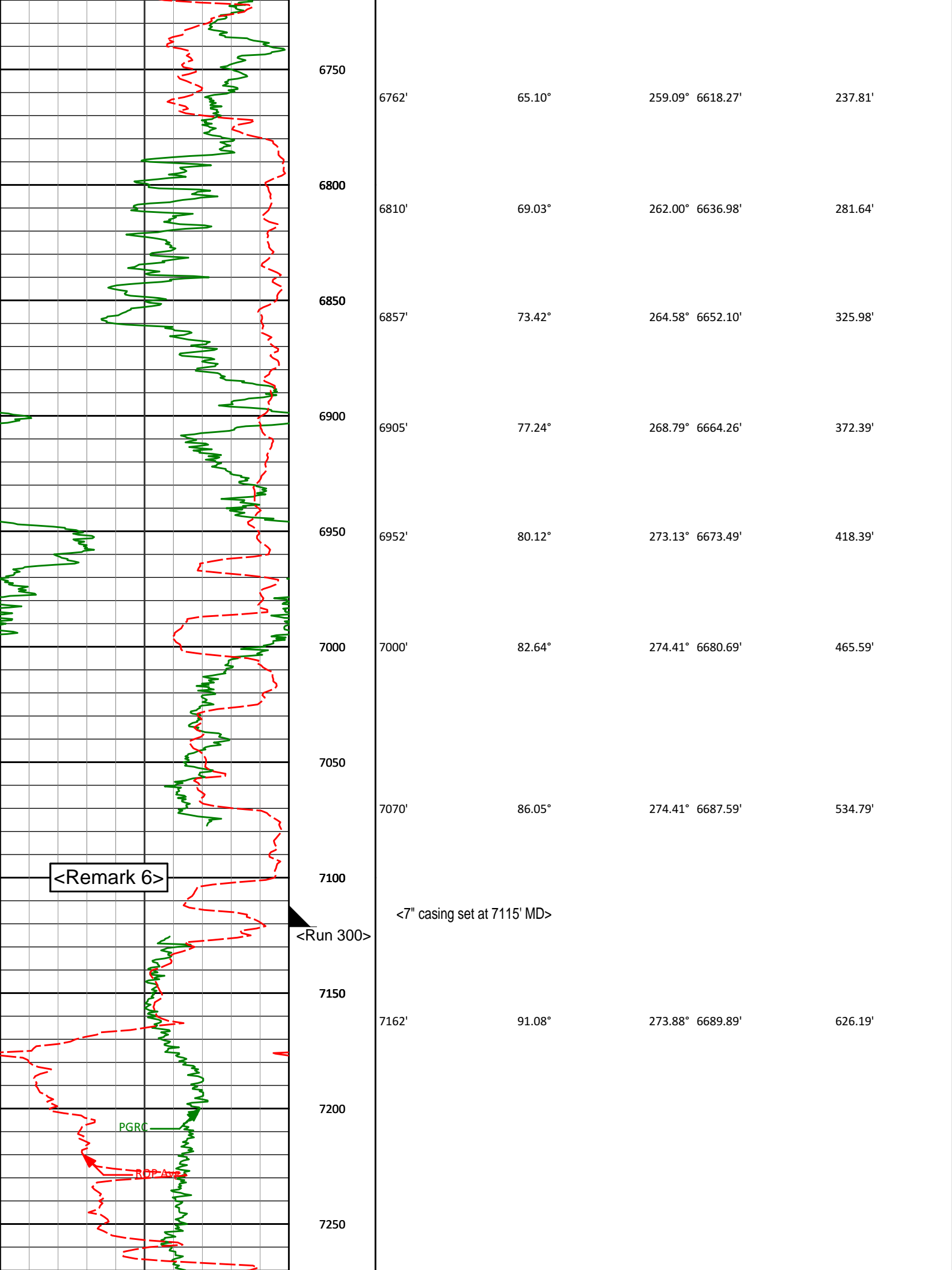
MD Main Log 1:600

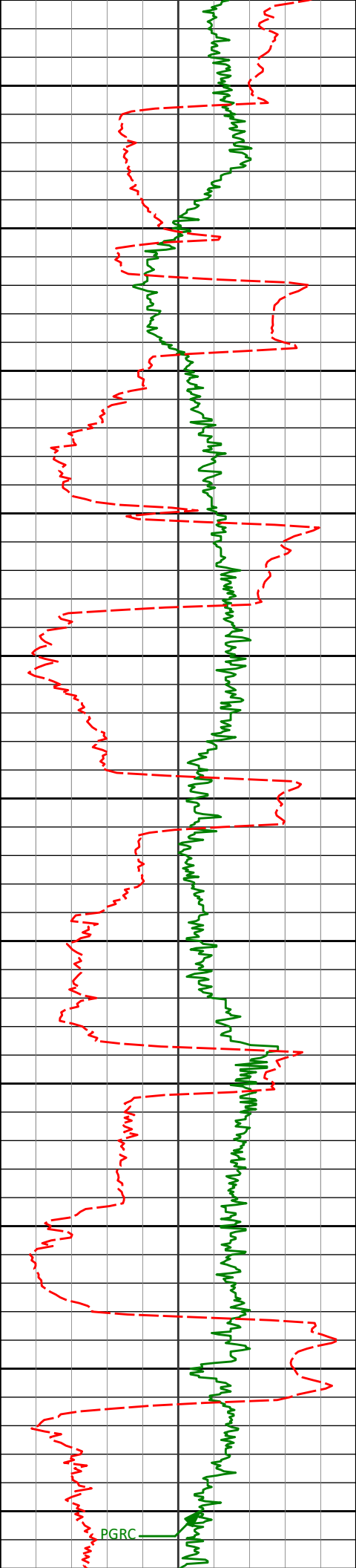
Noble Energy, Inc  
Wells Ranch AA12-68-1HN  
H&P 315  
T6N R63W





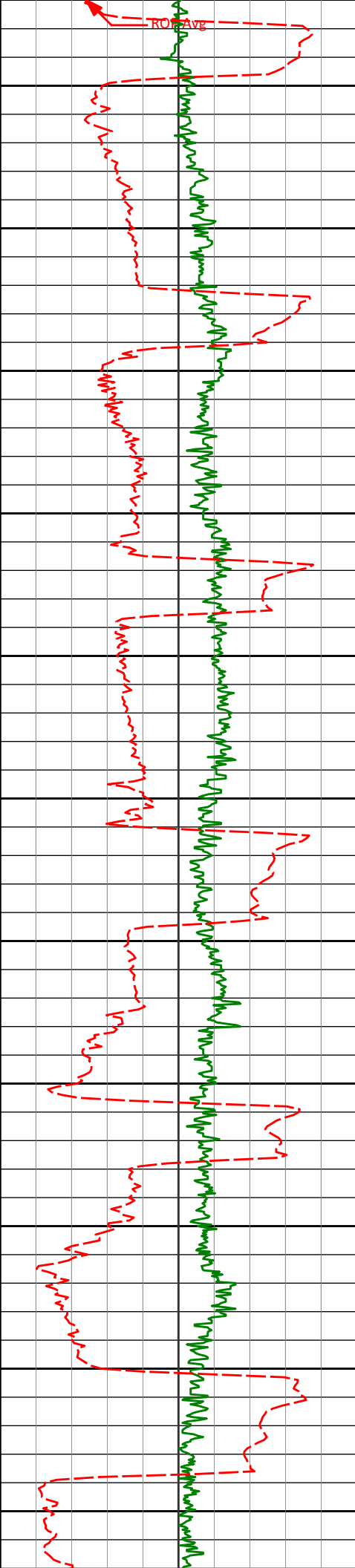
6200	6193'	16.05°	261.03°	6178.74'	-90.46'
6250					
6300	6287'	22.21°	262.34°	6267.51'	-59.85'
6350					
6400	6382'	27.88°	262.48°	6353.54'	-19.83'
6450	6430'	31.23°	260.25°	6395.29'	3.68'
6500	6477'	34.66°	258.58°	6434.73'	28.95'
6550	6525'	39.46°	256.28°	6473.02'	57.38'
6600	6573'	43.92°	254.92°	6508.86'	88.56'
6650	6621'	49.16°	254.30°	6541.86'	122.46'
6700	6667'	53.92°	255.12°	6570.46'	157.52'
	6715'	60.02°	255.90°	6596.62'	196.80'





7288'	91.82°	272.42°	6686.70'	751.61'
7300				
7350				
7383'	91.17°	270.65°	6684.23'	846.39'
7400				
7450				
7478'	90.03°	268.83°	6683.23'	941.33'
7500				
7550				
7573'	89.69°	268.50°	6683.46'	1036.32'
7600				
7650				
7668'	90.40°	268.62°	6683.38'	1131.31'
7700				
7750				
7763'	89.08°	269.30°	6683.82'	1226.29'
7800				

PGRC



7850

7857'

89.08°

269.68° 6685.33'

1320.24'

7900

7950

7952'

89.07°

270.29° 6686.86'

1415.17'

8000

8050

8047'

89.75°

270.45° 6687.83'

1510.07'

8100

8150

8142'

89.04°

269.61° 6688.83'

1605.00'

8200

8250

8237'

89.57°

271.49° 6689.98'

1699.89'

8300

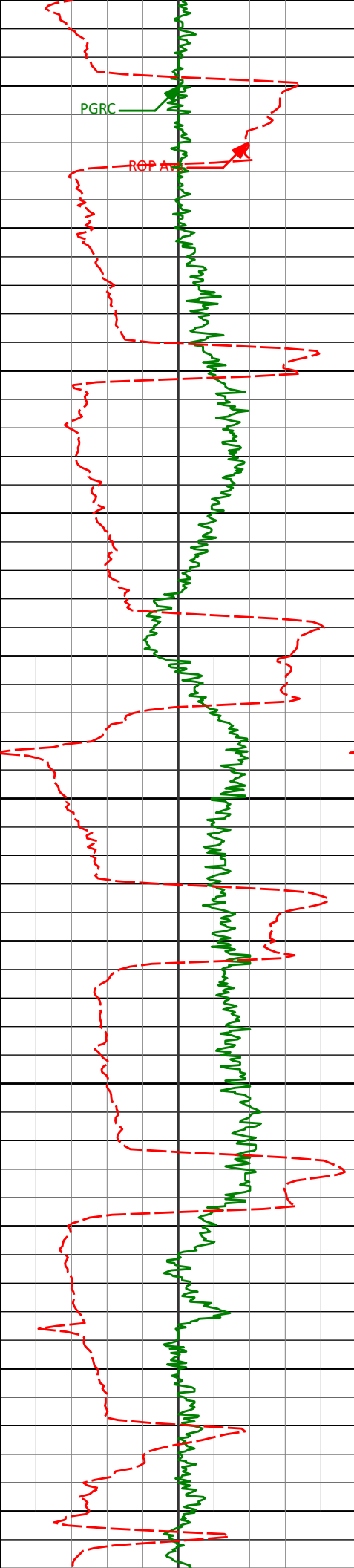
8350

8332'

89.48°

271.70° 6690.77'

1794.69'



8400

8427'

88.67°

271.40° 6692.31'

1889.48'

8450

8500

8521'

90.52°

271.75° 6692.97'

1983.28'

8550

8600

8616'

89.85°

270.04° 6692.66'

2078.15'

8650

8700

8711'

88.71°

270.27° 6693.86'

2173.06'

8750

8800

8806'

88.18°

268.98° 6696.44'

2267.98'

8850

8900

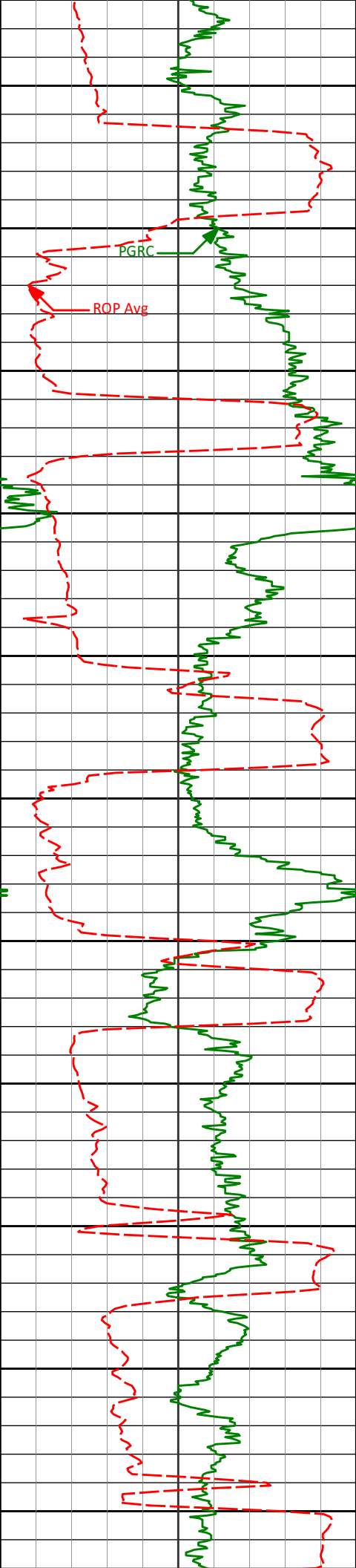
8901'

91.14°

269.61° 6697.00'

2362.94'





8950

9000

9050

9100

9150

9200

9250

9300

9350

9400

9450

8996'

90.52°

269.88° 6695.62'

2457.88'

9091'

91.11°

268.43° 6694.26'

2552.85'

9185'

90.19°

267.46° 6693.20'

2646.84'

9280'

90.12°

269.13° 6692.94'

2741.83'

9375'

90.68°

269.63° 6692.28'

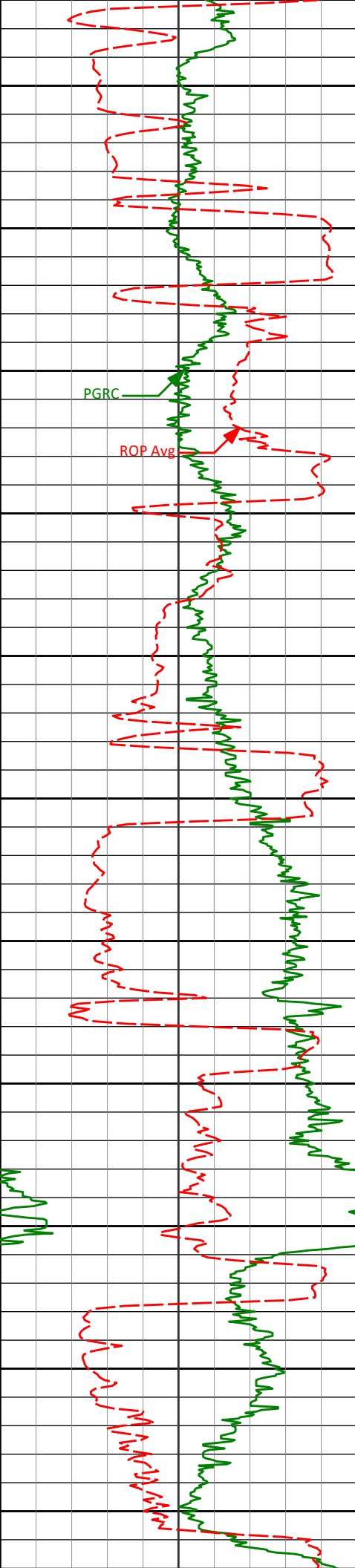
2836.80'

9470'

90.40°

270.31° 6691.31'

2931.72'



9500

9550

9600

9650

9700

9750

9800

9850

9900

9950

10000

PGRC

ROP Avg

9470

90.49°

270.51° 6691.31'

2931.73'

9565'

90.31°

270.55° 6690.64'

3026.64'

9660'

89.63°

269.47° 6690.69'

3121.57'

9754'

89.63°

269.72° 6691.30'

3215.53'

9849'

88.43°

269.77° 6692.91'

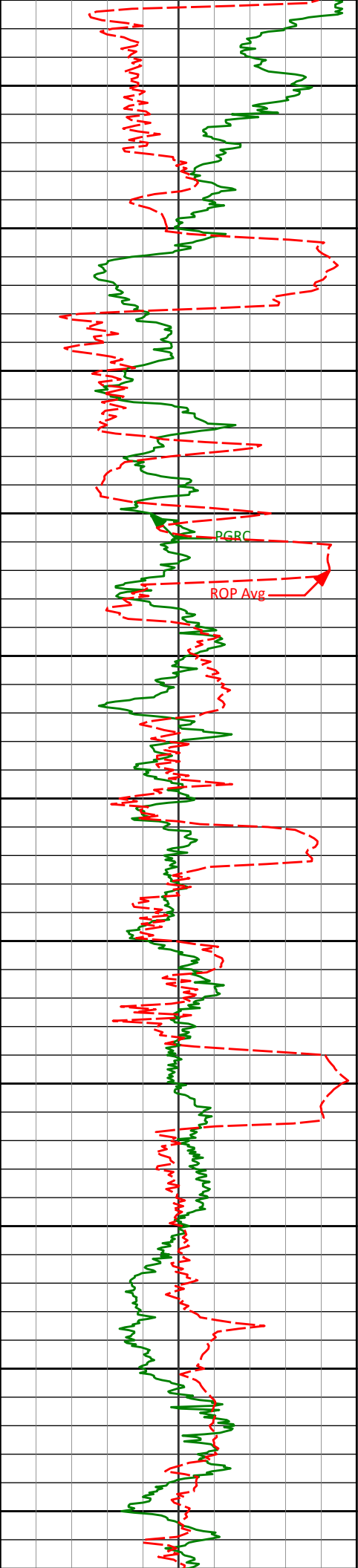
3310.46'

9944'

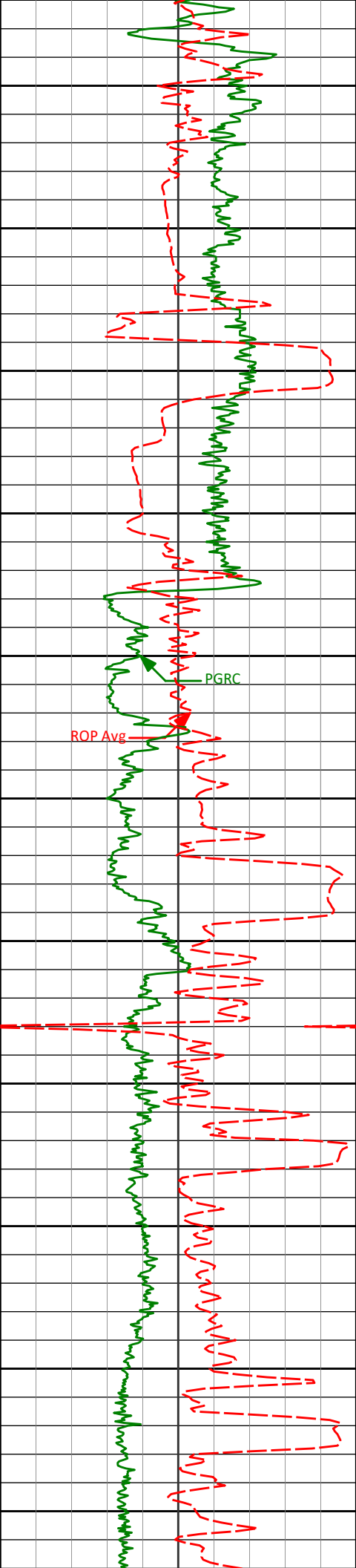
88.58°

268.88° 6695.39'

3405.40'



10039'	88.80°	268.22° 6697.57'	3500.37'
10050			
10100			
10134'	89.75°	270.30° 6698.77'	3595.33'
10150			
10200			
10229'	89.75°	270.72° 6699.18'	3690.23'
10250			
10300			
10323'	90.80°	271.22° 6698.73'	3784.09'
10350			
10400			
10418'	88.71°	271.27° 6699.14'	3878.92'
10450			
10500			
10513'	87.47°	270.70° 6702.31'	3973.73'
10550			



10600

10608'

89.26°

270.50° 6705.02'

4068.58'

10650

10700

10703'

87.78°

269.92° 6707.47'

4163.47'

10750

10800

10798'

87.37°

270.95° 6711.48'

4258.29'

10850

10900

10893'

89.66°

271.00° 6713.94'

4353.11'

10950

11000

10987'

90.65°

272.01° 6713.68'

4446.93'

11050

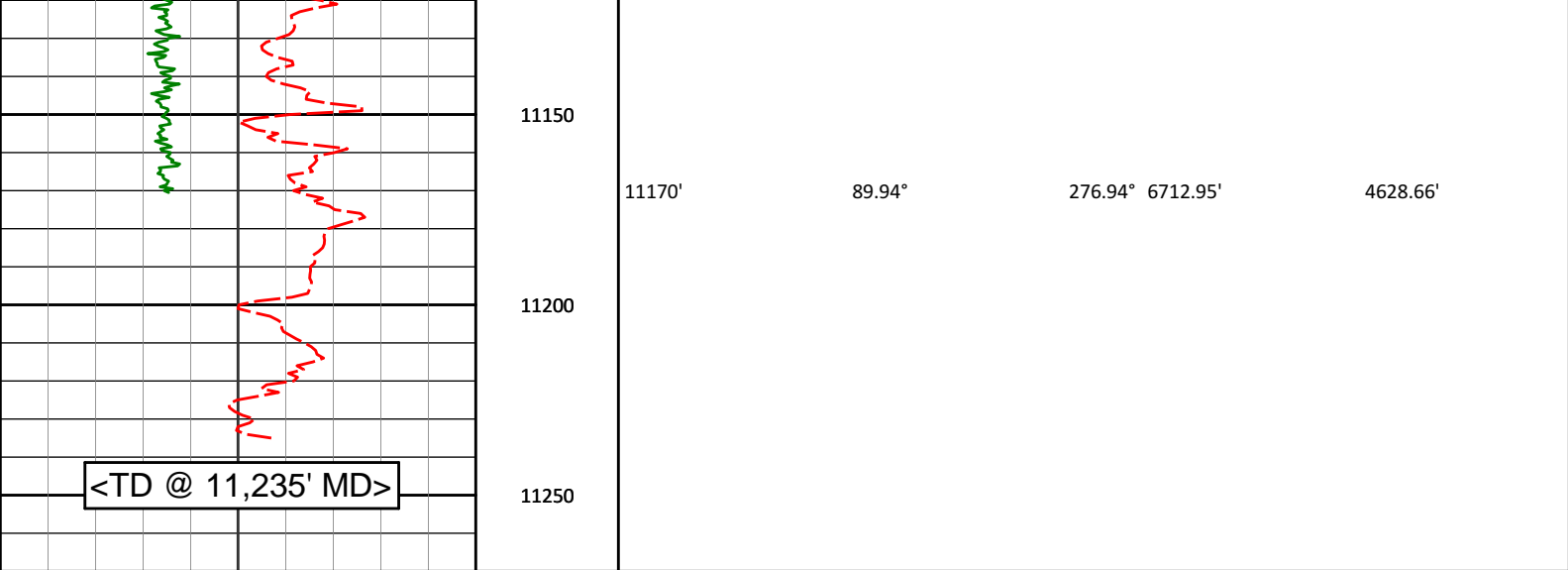
11100

11082'

90.15°

274.59° 6713.02'

4541.49'



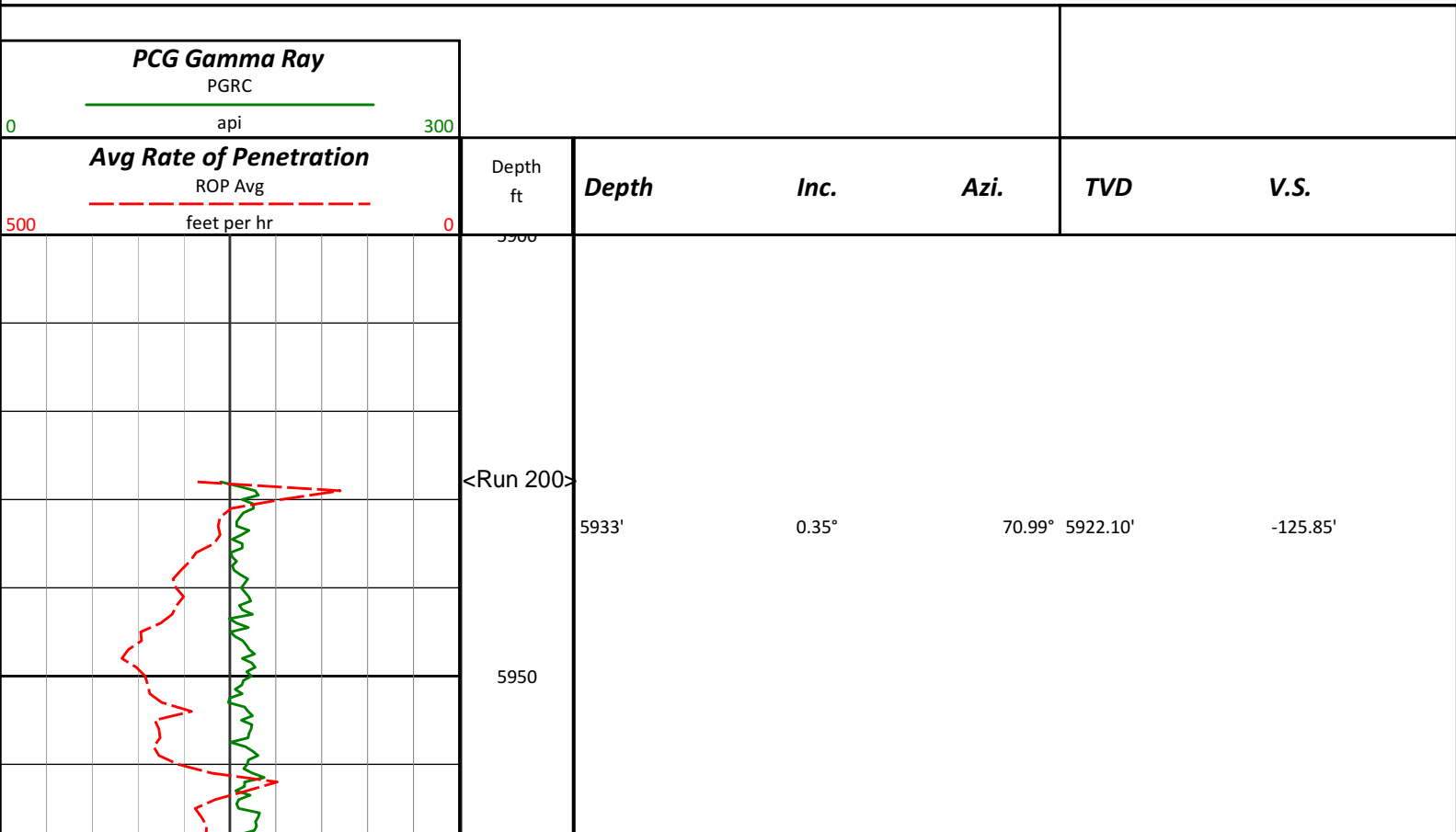
Avg Rate of Penetration		Depth				TVD	V.S.
ROP Avg		ft	Depth	Inc.	Azi.		
feet per hr							
PCG Gamma Ray							
PGRC							
api							

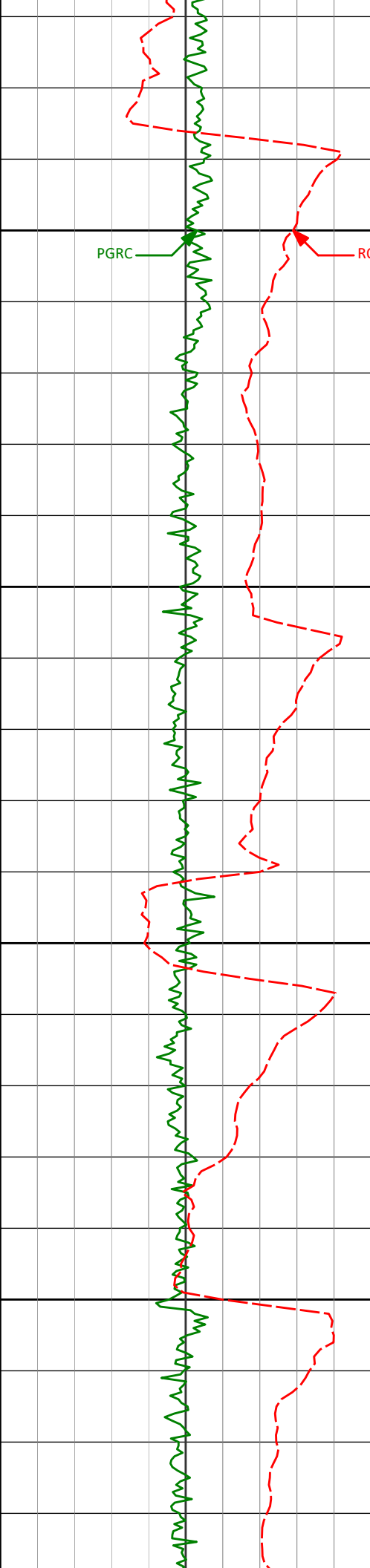
# HALLIBURTON

## Sperry Drilling Services

### MD Detail Log 1:240

Noble Energy, Inc  
Wells Ranch AA12-68-1HN  
H&P 315  
T6N R63W





<KOP>

6000

PGRC

ROP Avg

6050

6051'

7.32°

257.20° 6039.80'

-118.80'

6100

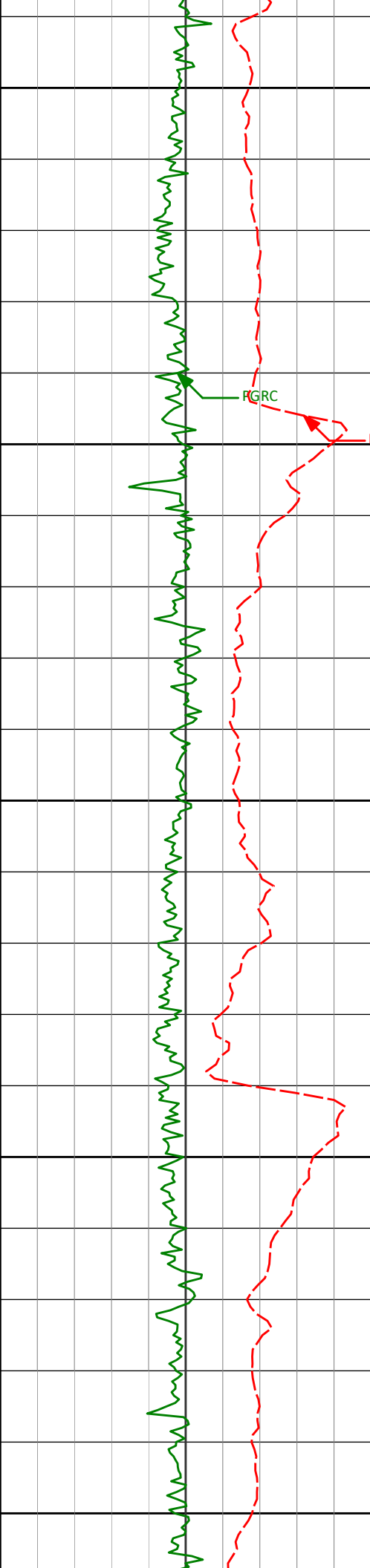
6098'

10.12°

259.63° 6086.25'

-111.77'

6150



6200

6250

6300

6350

6400

6193'

6287'

6382'

16.05°

22.21°

27.88°

261.03° 6178.74'

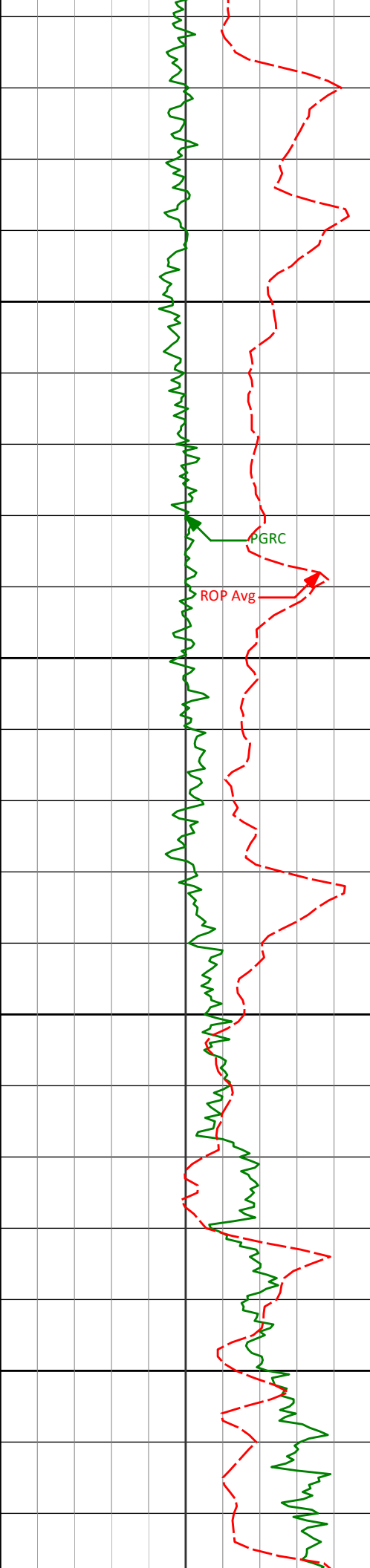
262.34° 6267.51'

262.48° 6353.54'

-90.46'

-59.85'

-19.83'



6450

6500

6550

6600

6430'

31.23°

260.25° 6395.29'

3.68'

6477'

34.66°

258.58° 6434.73'

28.95'

6525'

39.46°

256.28° 6473.02'

57.38'

6573'

43.92°

254.92° 6508.86'

88.56'

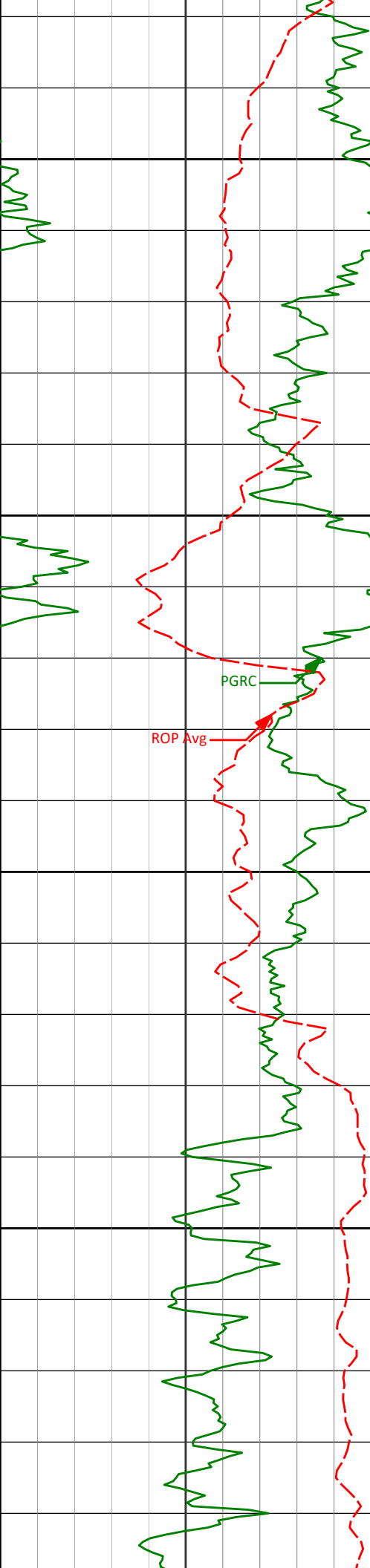
6621'

49.16°

254.30° 6541.86'

122.46'





6650

6667'

53.92°

255.12° 6570.46'

157.52'

6700

6715'

60.02°

255.90° 6596.62'

196.80'

6750

6762'

65.10°

259.09° 6618.27'

237.81'

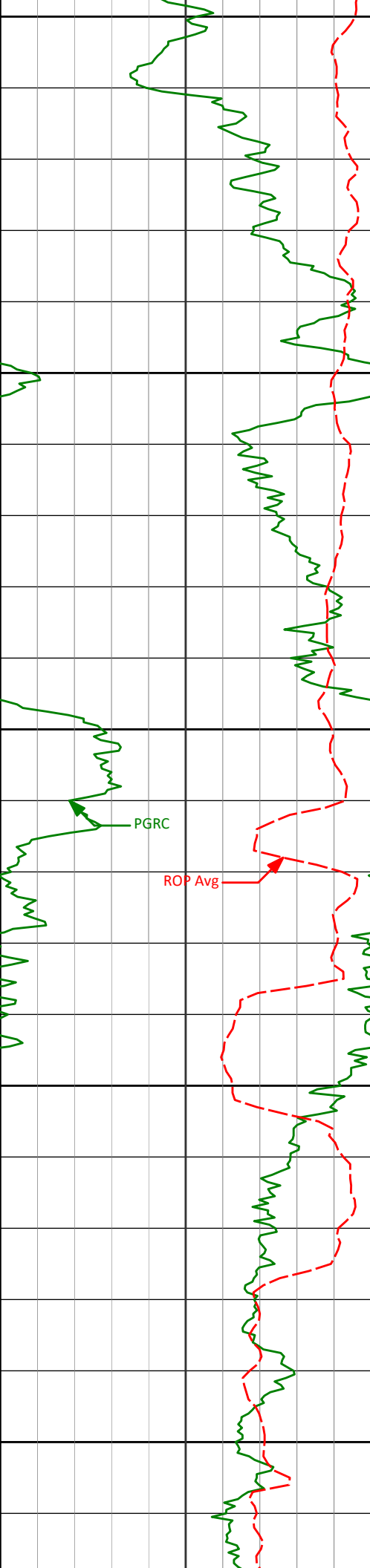
6800

6810'

69.03°

262.00° 6636.98'

281.64'



6850

6857'

73.42°

264.58° 6652.10'

325.98'

6900

6905'

77.24°

268.79° 6664.26'

372.39'

6950

6952'

80.12°

273.13° 6673.49'

418.39'

PGRC

ROP Avg

7000

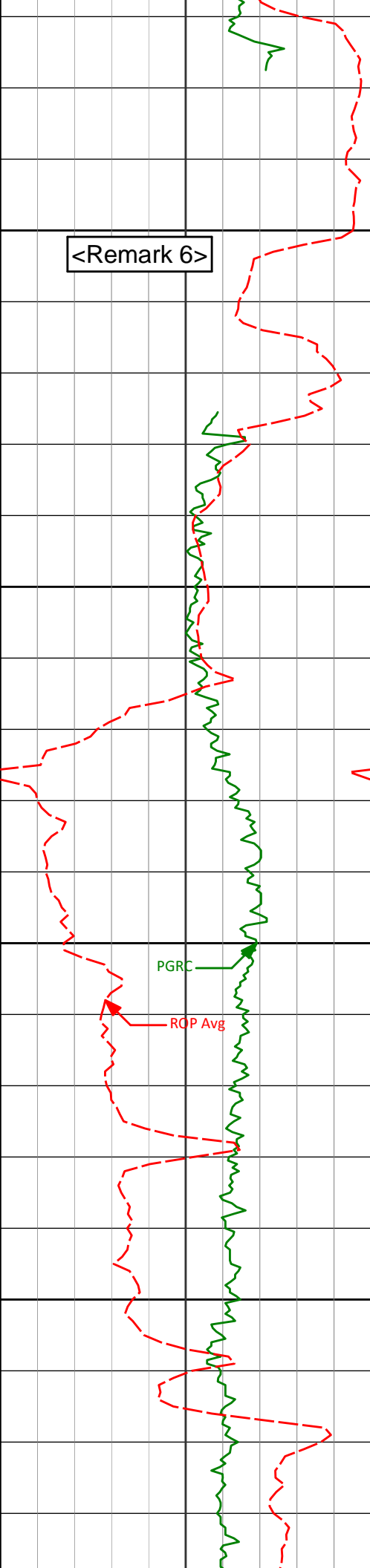
7000'

82.64°

274.41° 6680.69'

465.59'

7050



<Remark 6>

7100

<7" casing set at 7115' MD>

<Run 300>

7150

7162'

91.08°

273.88° 6689.89'

626.19'

7200

PGRC

ROP Avg

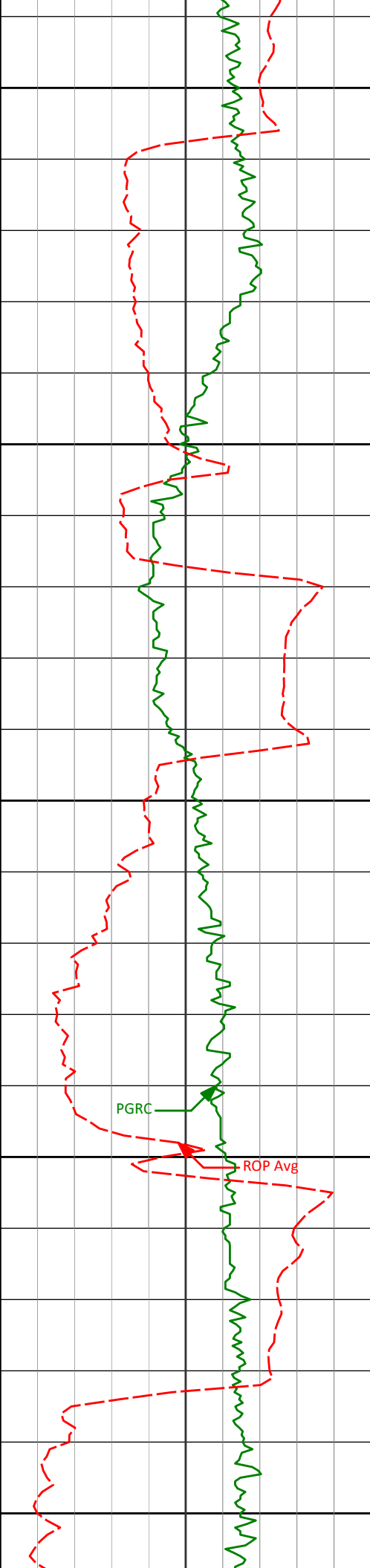
7250

7300'

91.08°

273.88° 6689.89'

626.19'



7300

7350

7400

7450

7500

7383'

7478'

91.17°

90.03°

270.65° 6684.23'

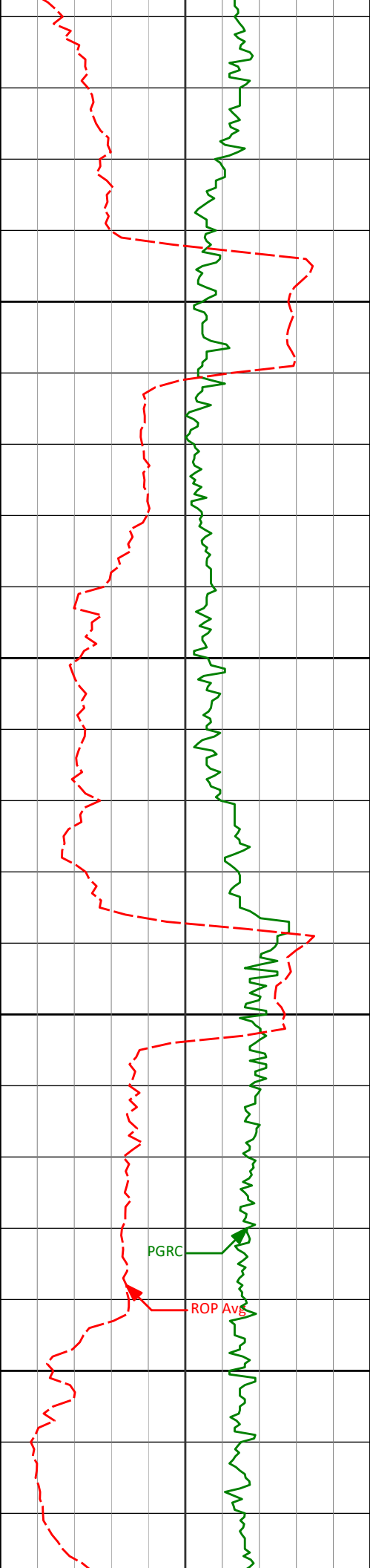
268.83° 6683.23'

846.39'

941.33'

PGRC

ROP Avg



7550

7573'

89.69°

268.50° 6683.46'

1036.32'

7600

7650

7668'

90.40°

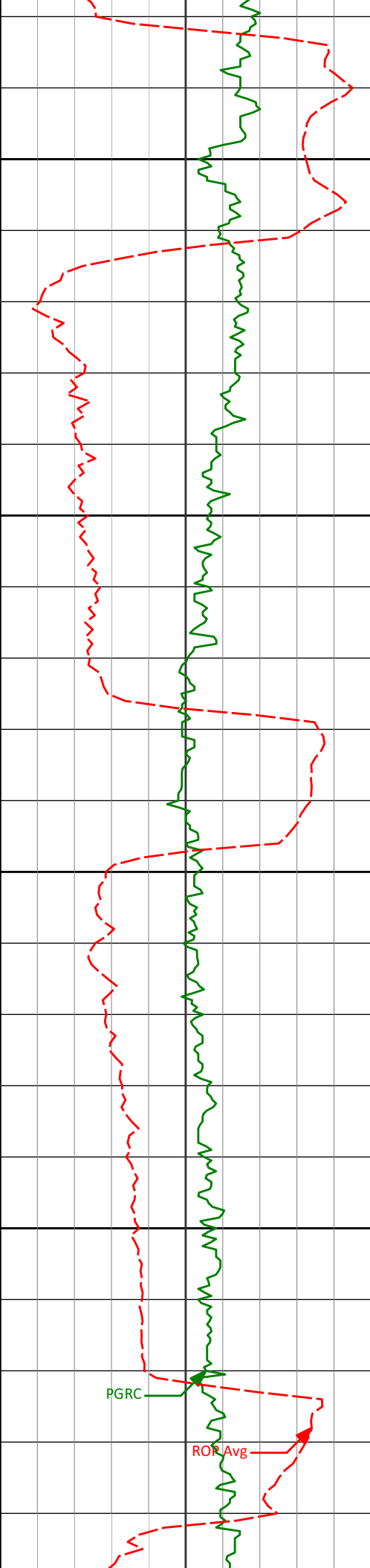
268.62° 6683.38'

1131.31'

7700

PGRC

ROP Avg



7750

7763'

89.08°

269.30° 6683.82'

1226.29'

7800

7850

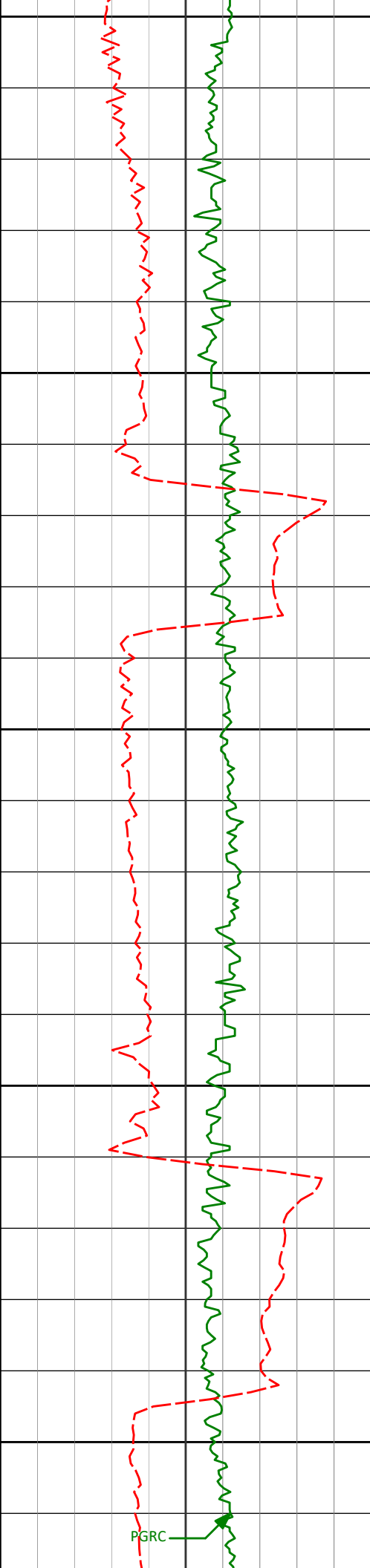
7857'

89.08°

269.68° 6685.33'

1320.24'

7900



7950

8000

8050

8100

8150

PGRC

7952'

8047'

8142'

89.07°

89.75°

89.04°

270.29° 6686.86'

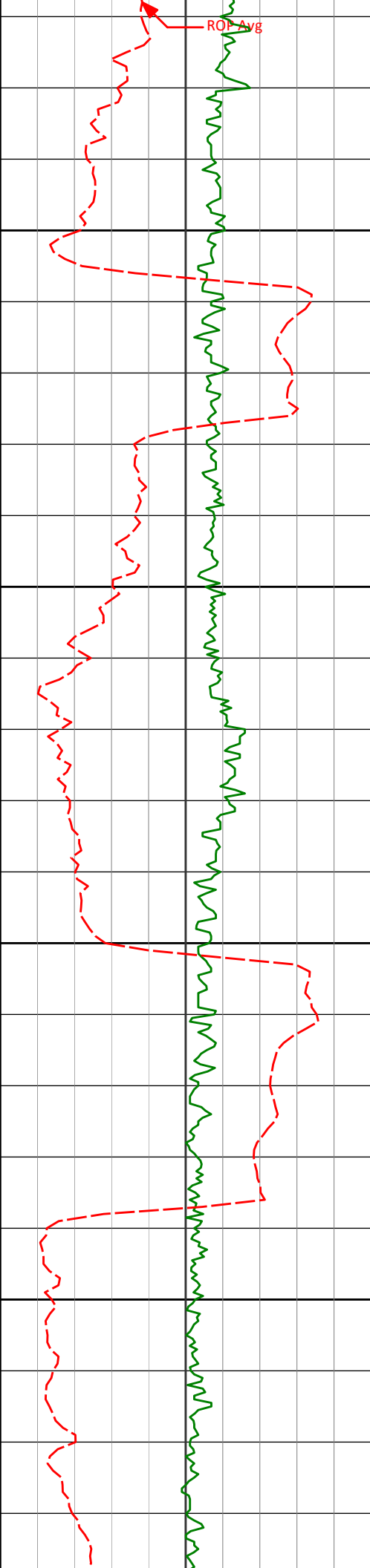
270.45° 6687.83'

269.61° 6688.83'

1415.17'

1510.07'

1605.00'



8200

8237'

89.57°

271.49° 6689.98'

1699.89'

8250

8300

8332'

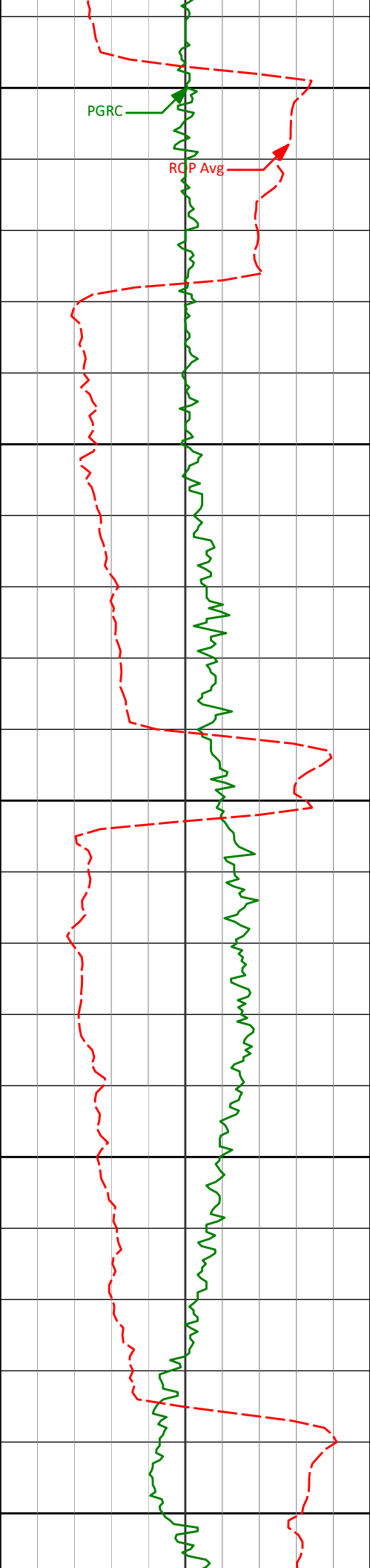
89.48°

271.70° 6690.77'

1794.69'

8350





8400

8427'

88.67°

271.40° 6692.31'

1889.48'

8450

8500

8521'

90.52°

271.75° 6692.97'

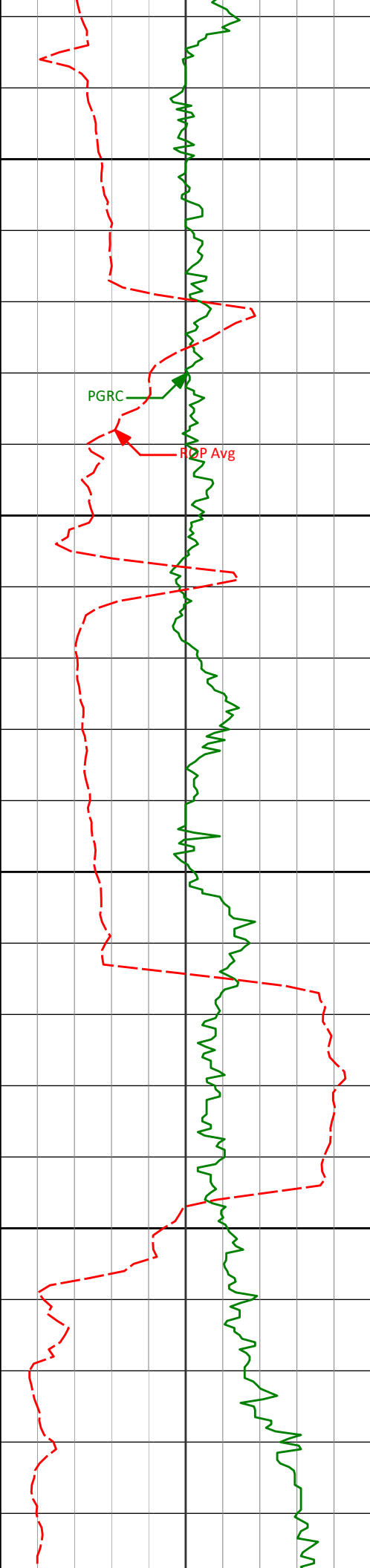
1983.28'

8550

8600



8616'	89.85°	270.04°	6692.66'	2078.15'
8650				
8700				
8711'	88.71°	270.27°	6693.86'	2173.06'
8750				
8800				
8806'	88.18°	268.98°	6696.44'	2267.98'



8850

8900

8950

9000

8901'

8996'

91.14°

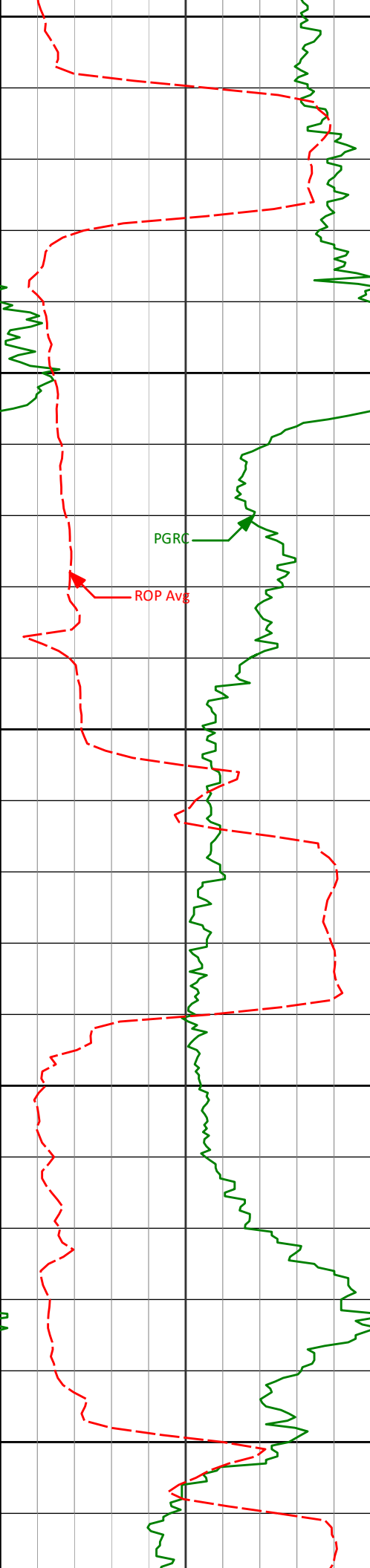
90.52°

269.61° 6697.00'

269.88° 6695.62'

2362.94'

2457.88'



9050

9091'

91.11°

268.43° 6694.26'

2552.85'

9100

9150

9185'

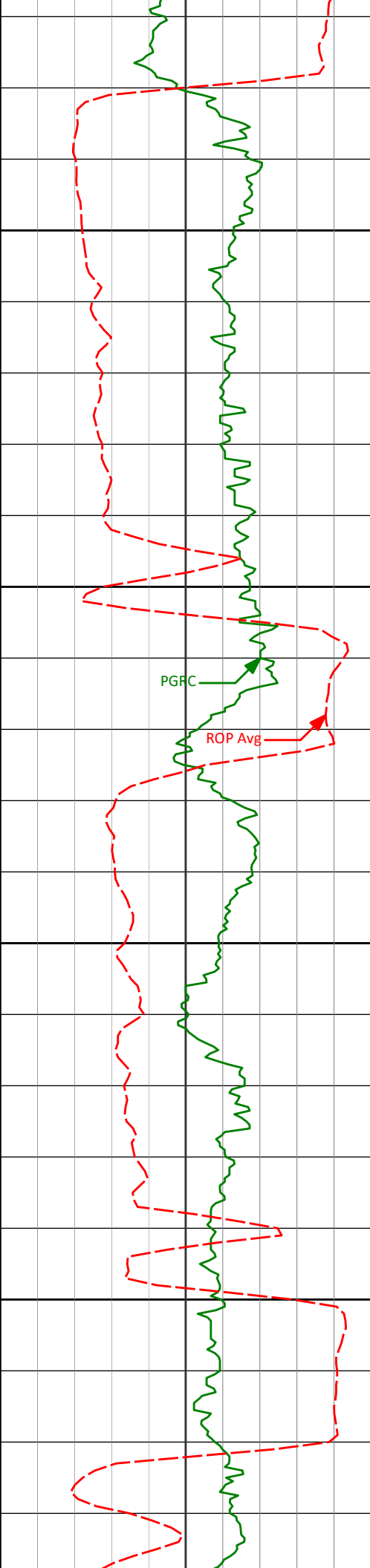
90.19°

267.46° 6693.20'

2646.84'

9200

9250



9300

9350

9400

9450

9280'

90.12°

269.13° 6692.94'

2741.83'

9375'

90.68°

269.63° 6692.28'

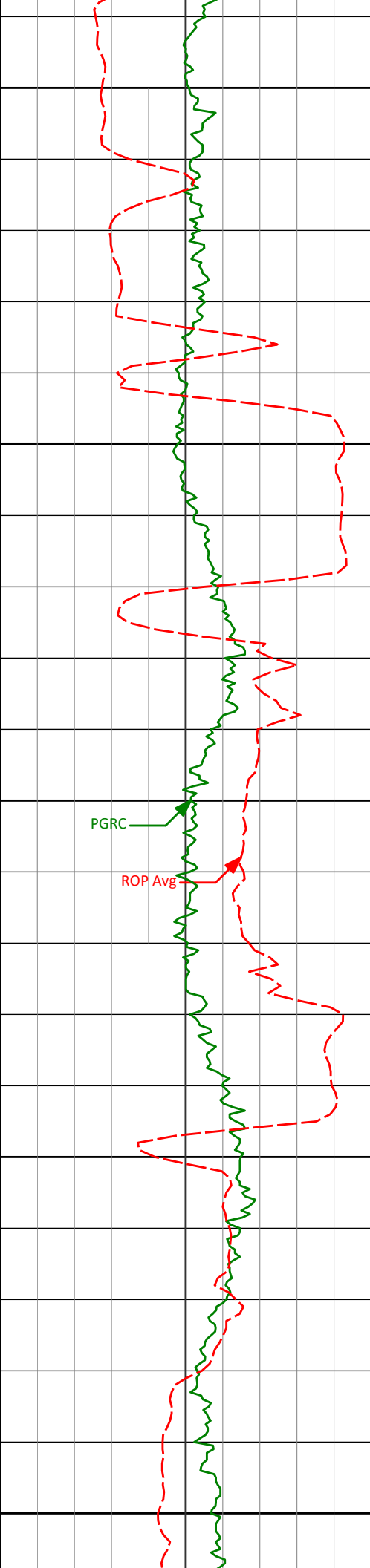
2836.80'

9470'

90.49°

270.31° 6691.31'

2931.73'



9500

9550

9600

9650

9700

9565'

90.31°

270.55° 6690.64'

3026.64'

PGRC

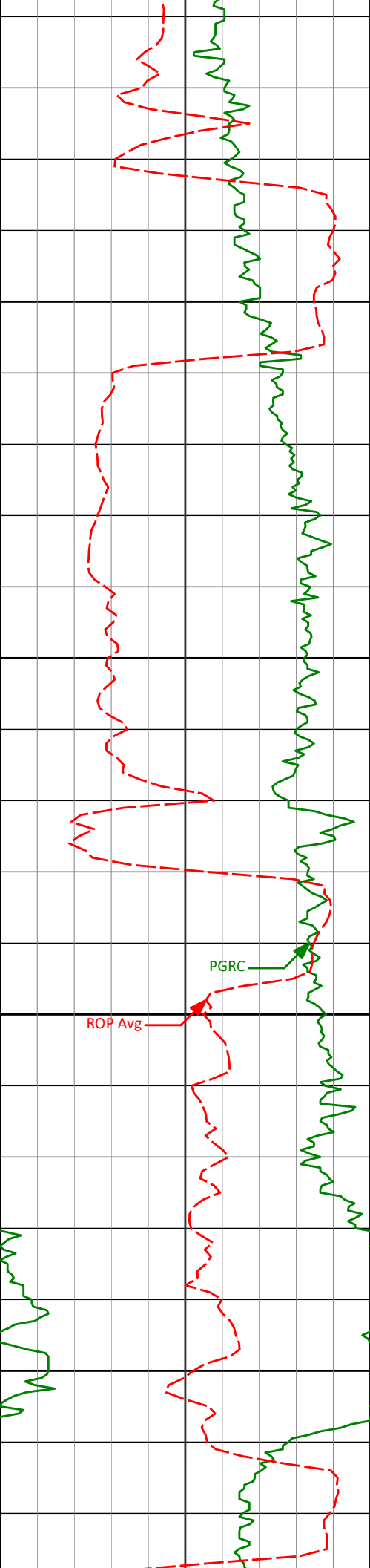
ROP Avg

9660'

89.63°

269.47° 6690.69'

3121.57'



9750

9754'

89.63°

269.72° 6691.30'

3215.53'

9800

9850

9849'

88.43°

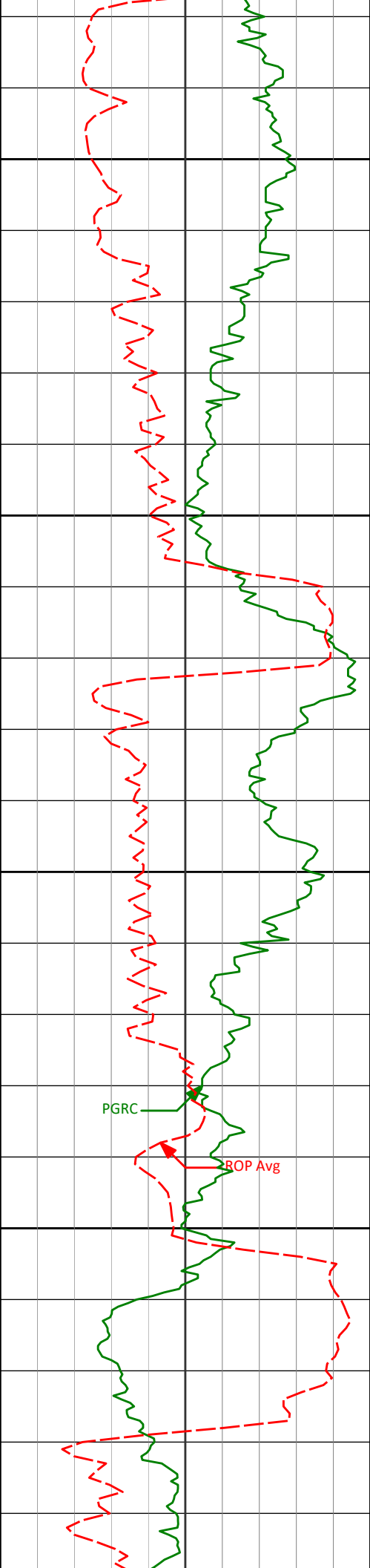
269.77° 6692.91'

3310.46'

9900

ROP Avg

PGRC



9950

10000

10050

10100

9944'

88.58°

268.88° 6695.39'

3405.40'

10039'

88.80°

268.22° 6697.57'

3500.37'

10134'

89.75°

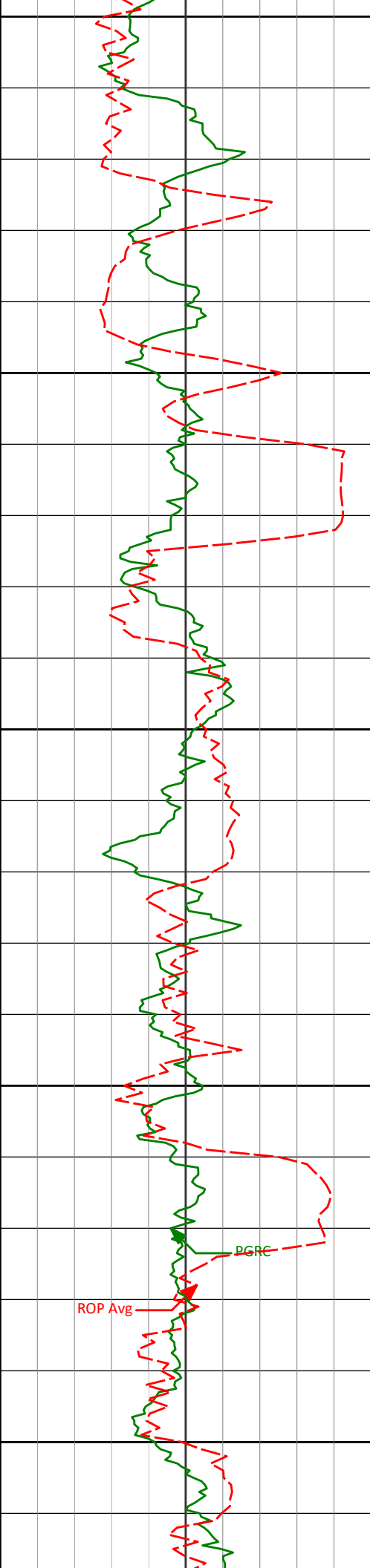
270.30° 6698.77'

3595.33'

PGRC

ROP Avg





10150

10200

10250

10300

10350

10229'

89.75°

270.72° 6699.18'

3690.23'

10323'

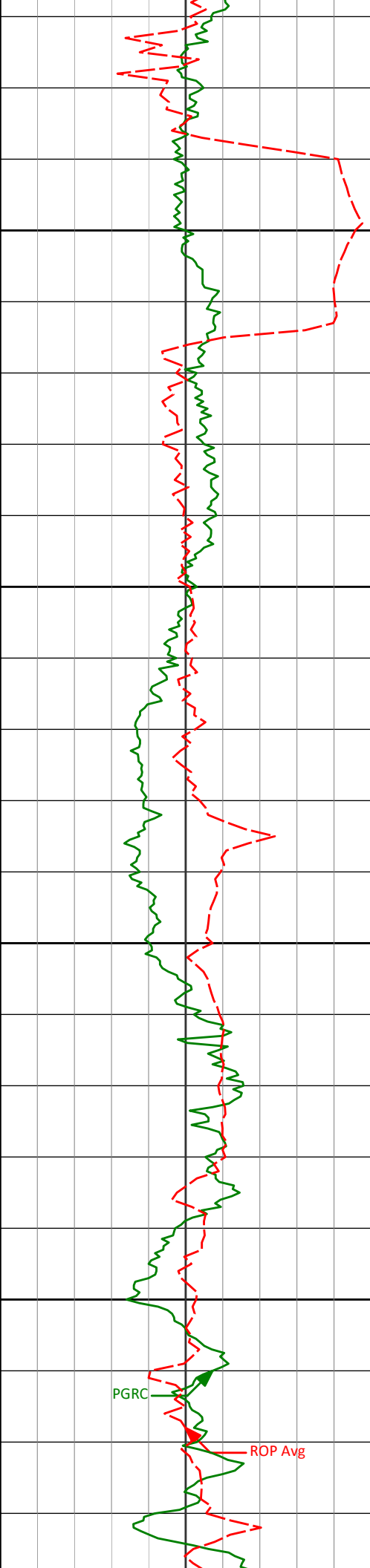
90.80°

271.22° 6698.73'

3784.09'

ROP Avg

PGRC



10400

10450

10500

10550

10418'

88.71°

271.27° 6699.14'

3878.92'

10513'

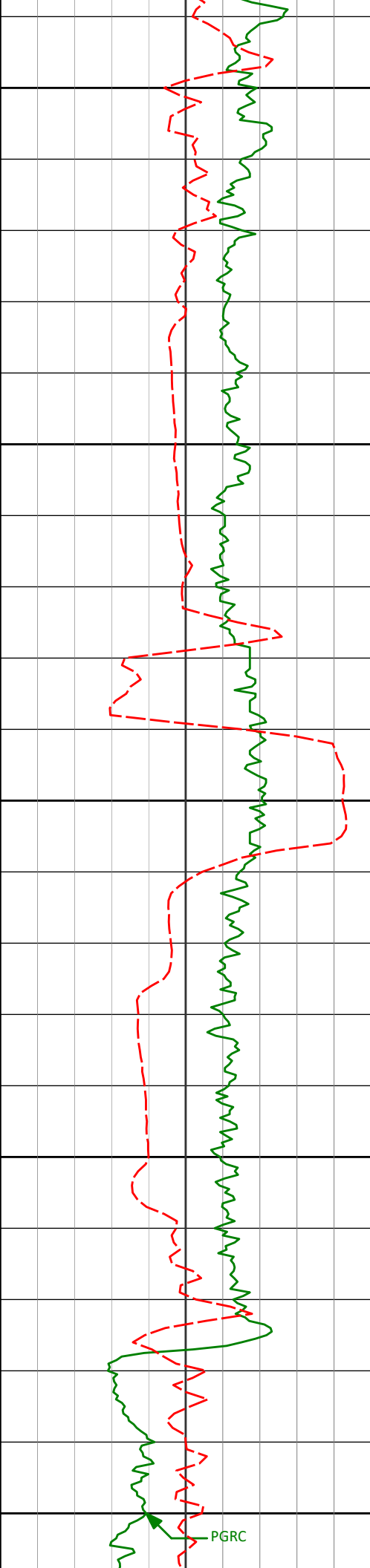
87.47°

270.70° 6702.31'

3973.73'

PGRC

ROP Avg



10600

10608'

89.26°

270.50° 6705.02'

4068.58'

10650

10700

10703'

87.78°

269.92° 6707.47'

4163.47'

10750

10800

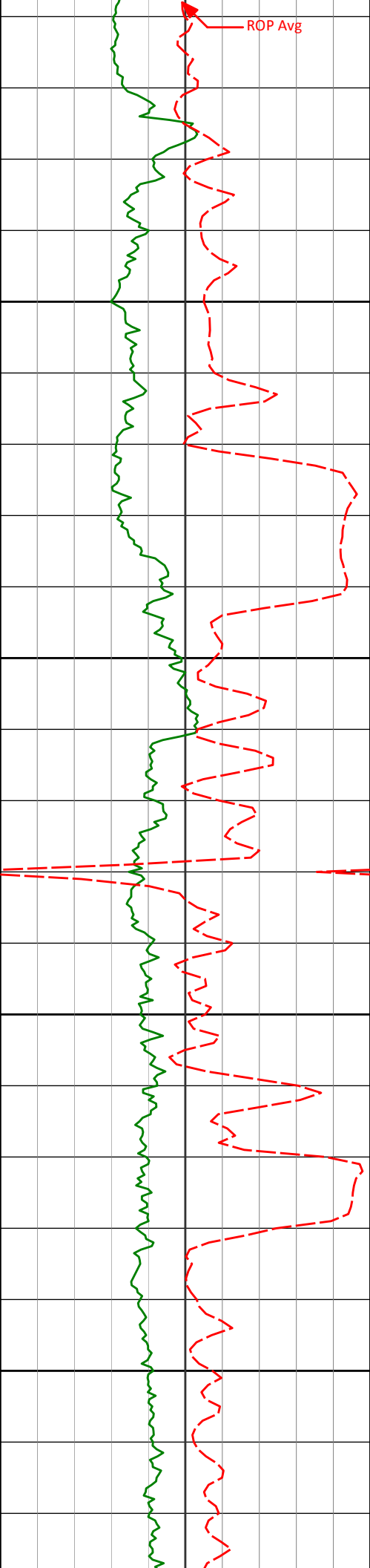
10798'

87.37°

270.95° 6711.48'

4258.29'

PGRC



10850

10893'

89.66°

271.00° 6713.94'

4353.11'

10900

10950

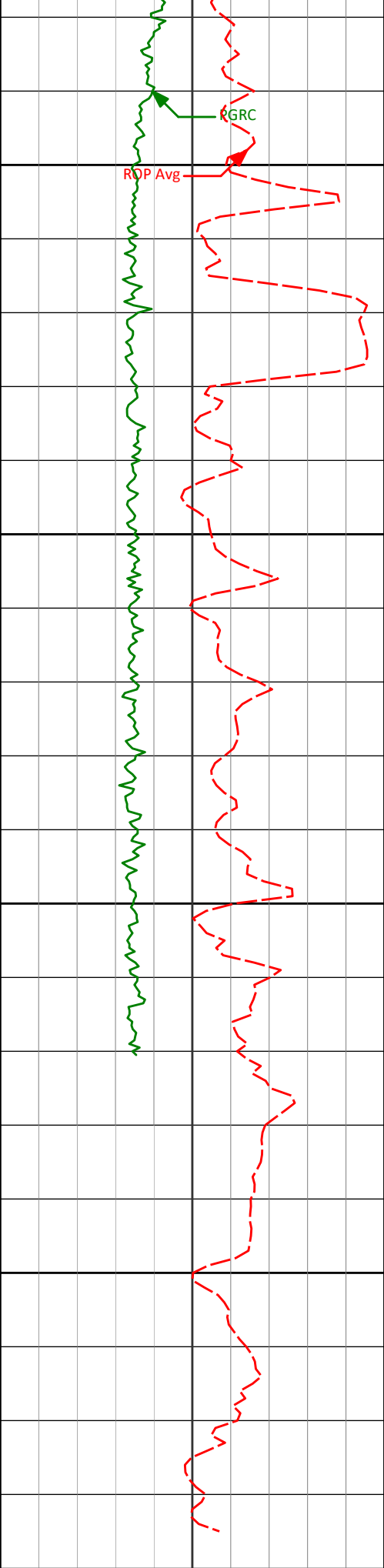
10987'

90.65°

272.01° 6713.68'

4446.93'

11000



11050

11082'

90.15°

274.59° 6713.02'

4541.49'

11100

11150

11170'

89.94°

276.94° 6712.95'

4628.66'

11200

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## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

**Noble Energy**  
**Wells Ranch AA12-68-1HN**  
**Wattenberg**  
**Weld Colorado**  
**USA**  
**CA-XX-0009759276**

Survey depth 694 ft created to tie surveys onto bottom of the surface casing shoe.

Last survey is a projection to TD.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
694.00	0.00	0.00	694.00	0.00 N	0.00 E	0.00	TIE-IN
802.00	0.74	221.75	802.00	0.52 S	0.47 W	0.48	0.69
1080.00	0.47	236.55	1079.98	2.49 S	2.61 W	2.70	0.11
1172.00	1.55	346.66	1171.97	1.48 S	3.20 W	3.26	1.92
1453.00	2.22	13.87	1452.82	7.50 N	2.78 W	2.50	0.39
1643.00	0.62	229.11	1642.78	10.41 N	2.67 W	2.28	1.45
1927.00	0.93	168.16	1926.76	7.16 N	3.35 W	3.08	0.29
2022.00	2.99	144.82	2021.70	4.38 N	1.76 W	1.60	2.29
2117.00	4.25	116.58	2116.52	0.78 N	2.81 E	-2.84	2.26
2212.00	5.40	128.80	2211.18	3.59 S	9.44 E	-9.30	1.62
2307.00	6.77	140.16	2305.65	10.69 S	16.51 E	-16.11	1.91
2402.00	8.00	131.34	2399.86	19.36 S	25.06 E	-24.34	1.76
2496.00	9.25	138.36	2492.80	29.33 S	34.99 E	-33.90	1.74
2591.00	9.63	135.11	2586.51	40.66 S	45.68 E	-44.15	0.69
2686.00	10.41	129.15	2680.07	51.71 S	57.94 E	-56.00	1.36
2781.00	9.44	125.70	2773.64	61.67 S	70.92 E	-68.61	1.20
2876.00	7.99	121.66	2867.55	69.68 S	82.86 E	-80.25	1.65
2970.00	7.36	130.35	2960.71	77.01 S	93.01 E	-90.13	1.40
3065.00	6.47	132.51	3055.01	84.57 S	101.60 E	-98.43	0.98
3160.00	3.64	136.13	3149.64	90.36 S	107.63 E	-104.25	3.00
3255.00	3.19	138.29	3244.47	94.50 S	111.48 E	-107.94	0.49
3350.00	2.54	133.90	3339.35	97.93 S	114.75 E	-111.09	0.72
3445.00	2.11	130.52	3434.27	100.53 S	117.60 E	-113.83	0.48
3539.00	1.34	67.31	3528.23	101.23 S	119.93 E	-116.14	2.04
3824.00	1.02	95.38	3813.18	100.18 S	125.52 E	-121.77	0.23
4109.00	0.64	49.87	4098.15	99.39 S	129.26 E	-125.53	0.26
4393.00	0.25	15.63	4382.14	97.77 S	130.64 E	-126.97	0.16
4678.00	0.68	214.80	4667.13	98.57 S	129.83 E	-126.14	0.32
4963.00	0.49	180.93	4952.12	101.18 S	128.85 E	-125.05	0.14
5247.00	0.53	163.21	5236.11	103.65 S	129.20 E	-125.32	0.06
5532.00	0.18	270.78	5521.10	104.90 S	129.14 E	-125.21	0.21
5816.00	0.23	112.14	5805.10	105.11 S	129.23 E	-125.29	0.14
5933.00	0.35	70.99	5922.10	105.09 S	129.79 E	-125.85	0.20
6051.00	7.32	257.20	6039.80	106.64 S	122.79 E	-118.80	6.50
6098.00	10.12	259.63	6086.25	108.04 S	115.81 E	-111.77	6.00
6193.00	16.05	261.03	6178.74	111.60 S	94.61 E	-90.46	6.25
6287.00	22.21	262.34	6267.51	115.99 S	64.14 E	-59.85	6.57
6382.00	27.88	262.48	6353.54	121.30 S	24.30 E	-19.83	5.96
6430.00	31.23	260.25	6395.29	124.88 S	0.90 E	3.68	7.36
6477.00	34.66	258.58	6434.73	129.59 S	24.22 W	28.95	7.54
6525.00	39.46	256.28	6473.02	135.91 S	52.43 W	57.38	10.41
6573.00	43.03	254.03	6508.86	143.87 S	83.34 W	88.56	9.48

6573.00	43.92	254.92	6508.86	143.87 S	83.34 W	88.36	9.48
6621.00	49.16	254.30	6541.86	153.12 S	116.92 W	122.46	10.96
6667.00	53.92	255.12	6570.46	162.61 S	151.66 W	157.52	10.43
6715.00	60.02	255.90	6596.62	172.67 S	190.60 W	196.80	12.78
6762.00	65.10	259.09	6618.27	181.67 S	231.31 W	237.81	12.37
6810.00	69.03	262.00	6636.98	188.91 S	274.90 W	281.64	9.91
6857.00	73.42	264.58	6652.10	194.10 S	319.08 W	325.98	10.67
6905.00	77.24	268.79	6664.26	196.77 S	365.42 W	372.39	11.64
6952.00	80.12	273.13	6673.49	195.99 S	411.48 W	418.39	10.93
7000.00	82.64	274.41	6680.69	192.87 S	458.83 W	465.59	5.87
7070.00	86.05	274.41	6687.59	187.51 S	528.28 W	534.79	4.87
7162.00	91.08	273.88	6689.89	180.86 S	619.98 W	626.19	5.50
7288.00	91.82	272.42	6686.70	173.93 S	745.74 W	751.61	1.30
7383.00	91.17	270.65	6684.23	171.39 S	840.67 W	846.39	1.99
7478.00	90.03	268.83	6683.23	171.82 S	935.66 W	941.33	2.26
7573.00	89.69	268.50	6683.46	174.03 S	1030.63 W	1036.32	0.50
7668.00	90.40	268.62	6683.38	176.42 S	1125.60 W	1131.31	0.75
7763.00	89.08	269.30	6683.82	178.14 S	1220.58 W	1226.29	1.56
7857.00	89.08	269.68	6685.33	178.97 S	1314.57 W	1320.24	0.40
7952.00	89.07	270.29	6686.86	178.99 S	1409.55 W	1415.17	0.65
8047.00	89.75	270.45	6687.83	178.37 S	1504.55 W	1510.07	0.74
8142.00	89.04	269.61	6688.83	178.31 S	1599.54 W	1605.00	1.16
8237.00	89.57	271.49	6689.98	177.40 S	1694.52 W	1699.89	2.05
8332.00	89.48	271.70	6690.77	174.76 S	1789.48 W	1794.69	0.25
8427.00	88.67	271.40	6692.31	172.19 S	1884.44 W	1889.48	0.91
8521.00	90.52	271.75	6692.97	169.61 S	1978.39 W	1983.28	2.00
8616.00	89.85	270.04	6692.66	168.13 S	2073.38 W	2078.15	1.94
8711.00	88.71	270.27	6693.86	167.88 S	2168.37 W	2173.06	1.22
8806.00	88.18	268.98	6696.44	168.50 S	2263.33 W	2267.98	1.46
8901.00	91.14	269.61	6697.00	169.67 S	2358.31 W	2362.94	3.18
8996.00	90.52	269.88	6695.62	170.09 S	2453.30 W	2457.88	0.71
9091.00	91.11	268.43	6694.26	171.48 S	2548.27 W	2552.85	1.64
9185.00	90.19	267.46	6693.20	174.85 S	2642.21 W	2646.84	1.43
9280.00	90.12	269.13	6692.94	177.68 S	2737.16 W	2741.83	1.76
9375.00	90.68	269.63	6692.28	178.71 S	2832.15 W	2836.80	0.79
9470.00	90.49	270.31	6691.31	178.76 S	2927.15 W	2931.73	0.74
9565.00	90.31	270.55	6690.64	178.05 S	3022.14 W	3026.64	0.32
9660.00	89.63	269.47	6690.69	178.03 S	3117.14 W	3121.57	1.34
9754.00	89.63	269.72	6691.30	178.69 S	3211.13 W	3215.53	0.27
9849.00	88.43	269.77	6692.91	179.12 S	3306.12 W	3310.46	1.27
9944.00	88.58	268.88	6695.39	180.24 S	3401.08 W	3405.40	0.94
10039.00	88.80	268.22	6697.57	182.64 S	3496.02 W	3500.37	0.73
10134.00	89.75	270.30	6698.77	183.86 S	3591.00 W	3595.33	2.41
10229.00	89.75	270.72	6699.18	183.01 S	3686.00 W	3690.23	0.44
10323.00	90.80	271.22	6698.73	181.43 S	3779.98 W	3784.09	1.23
10418.00	88.71	271.27	6699.14	179.36 S	3874.95 W	3878.92	2.20
10513.00	87.47	270.70	6702.31	177.72 S	3969.88 W	3973.73	1.44
10608.00	89.26	270.50	6705.02	176.73 S	4064.83 W	4068.58	1.90
10703.00	87.78	269.92	6707.47	176.38 S	4159.80 W	4163.47	1.67
10798.00	87.37	270.95	6711.48	175.66 S	4254.71 W	4258.29	1.17
10893.00	89.66	271.00	6713.94	174.04 S	4349.66 W	4353.11	2.41
10987.00	90.65	272.01	6713.68	171.57 S	4443.62 W	4446.93	1.50
11082.00	90.15	274.59	6713.02	166.10 S	4538.45 W	4541.49	2.77
11170.00	89.94	276.94	6712.95	157.25 S	4626.00 W	4628.66	2.68
11235.00	89.94	276.94	6713.02	149.39 S	4690.53 W	4692.85	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 CLOSURE OF 268.18 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.82 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11235.00 FEET  
IS 4692.90 FEET ALONG 268.18 DEGREES (GRID)