HALLIBURTON | **Sperry Drilling**

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Country	: USA
Field	: Wattenberg
Location	: Lat: 40° 46' 30.65" North Long: 103° 51' 40.46" West
Well	: Rohn State LD03-62HN
Company	: Noble Energy
Rig	: H&P 273

Company	:	**Noble Energy**
Rig	:	**H&P 273**
Well	:	**Rohn State LD03-62HN**
Field	:	**Wattenberg**
Country	:	**USA**
API Number	:	**05-123-37475**

LOCATION

Latitude : **40° 46' 30.65" North**
Longitude : **103° 51' 40.46" West**

UTM Easting = **3,453,859.810 ft**
UTM Northing = **1,529,437.800 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4706.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4730.00 ft**
GL **4706.00 ft**
WD **N/A**

Depth Logged : **1,228.00 ft** To **10,095.00 ft**
Date Logged : **15-Sep-14** To **20-Sep-14**
Total Depth MD : **10,095.00 ft** TVD : **5,664.83 ft**
Spud Date : **14-Sep-14**

Unit No. : **11703717**
Job No. :**CA-XX-0901663416**
Plot Type : **Final**
Plot Date : **22-Sep-14**

Run No.	Borehole Record (MD) Size	From	To
2	8.750 in	1,228.00 ft	5,995.00 ft
3	6.125 in	5,995.00 ft	10,095.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD) Size	Weight	From	To
7.000 in	26.00 lbpf	SURFACE	5,985.00 ft

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	17-Sep-14	20-Sep-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	1,228.00	5,995.00			
Log End Depth (MD, ft)	5,995.00	10,095.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	15-Sep-14 21:40	18-Sep-14 12:40			
Drill/Wipe End Date and Time	16-Sep-14 18:10	20-Sep-14 04:40			
Min Inc (deg) @ Depth (MD, ft)	0.18 @ 4,384.00	85.49 @ 9,484.00			
Max Inc (deg) @ Depth (MD, ft)	81.19 @ 5,942.00	93.39 @ 10,031.00			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.75 / PDC			
Flow Rate (gpm)	566.98	288.07			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.70 / 49.00	10.60 / 39.00			
Filtrate CL (ppm)	200.00	200.00			
pH / Fluid Loss (mptm)	9.40 / 6	9.70 / 0			
PV (cP) / YP (lhf2)	18 / 21.00	12 / 7.00			
% Solids / % Sand	10.60 / 0.25	10.7 / .25			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			

Max Tool Temp (degF) / Source	154.30 / PCM	209.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	JP Centeno	Paul Kock			
Customer Representative	Dave Nielsen	Dave Nielsen			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404274	12310756			
Insert Serial Number	11400845	11055866			
Date and Time Initialized	15-Sep-14 11:40	17-Sep-14 18:15			
Date and Time Read	17-Sep-14 19:29	22-Sep-14 11:55			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	50.99	62.21			
Software Version	6.21	6.21			
Sub Serial Number	11404274	12310756			
Sonde Serial Number	11297588	11833253			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	67.98	10.68			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	45.89	57.11			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404274	12310756			
Insert/Sonde Serial Number	11680972	11293339			

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 8.0.20

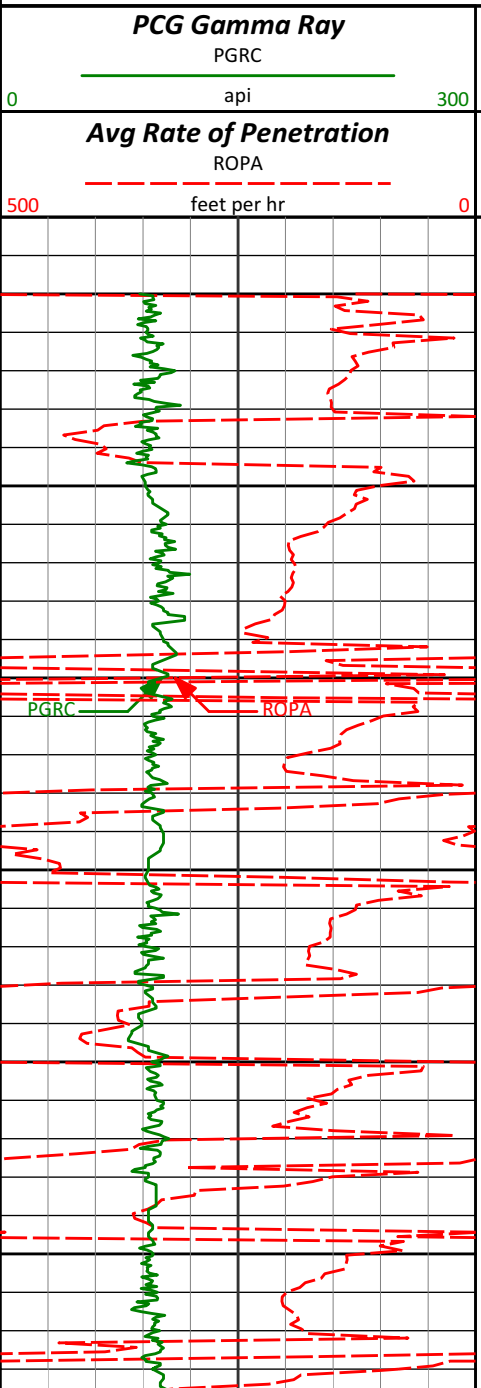
6. Gamma presented inside casing/cement from 5949 ft. MD to 5995 ft. MD.

WARRANTY

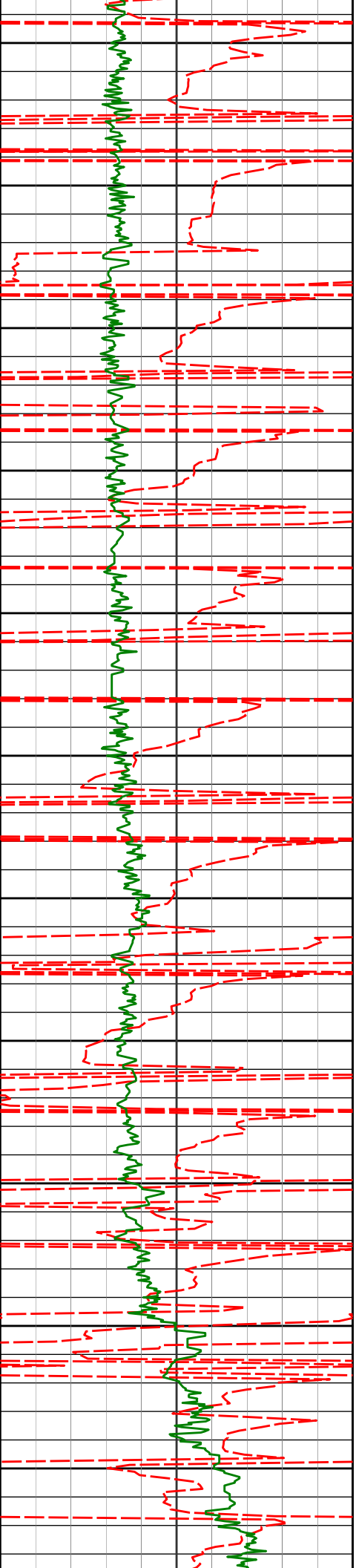
HALLIBURTON
Sperry Drilling Services

MD Main Log 1:600

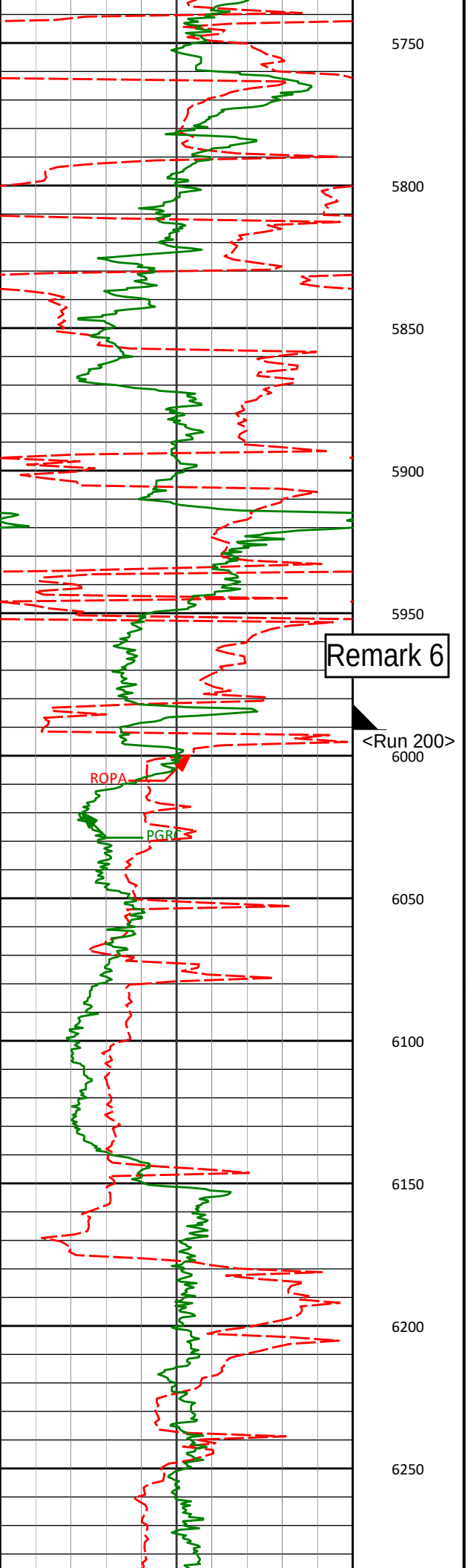
Noble Energy, Inc
Rohn State LD03-62HN
H&P 273
T9N R58W



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
4900 <KOP>	4907'	2.01°	90.57°	4894.57'	176.82'
4950	4953'	5.40°	96.30°	4940.47'	179.78'
5000	5001'	9.87°	97.43°	4988.03'	186.09'
5050	5048'	12.87°	94.17°	5034.10'	195.30'
5100	5096'	15.81°	93.43°	5080.60'	207.15'
5150	5143'	17.81°	93.71°	5125.59'	220.71'



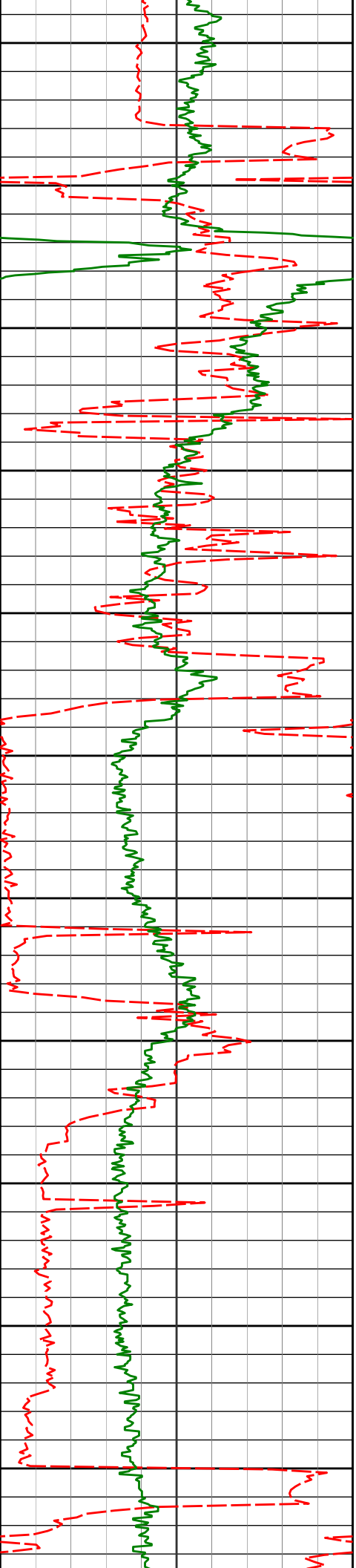
5191'	20.35°	93.16°	5170.95'	236.36'
5238'	24.27°	90.81°	5214.43'	254.18'
5286'	28.41°	88.46°	5257.43'	275.47'
5333'	32.11°	87.45°	5298.02'	299.14'
5381'	35.19°	87.82°	5337.98'	325.72'
5428'	37.79°	87.85°	5375.76'	353.66'
5476'	41.90°	88.28°	5412.60'	384.40'
5522'	47.19°	88.82°	5445.38'	416.65'
5570'	52.66°	88.43°	5476.27'	453.36'
5617'	55.75°	87.69°	5503.75'	491.47'
5665'	59.89°	87.78°	5529.31'	532.07'
5712'	63.73°	87.48°	5551.51'	573.46'



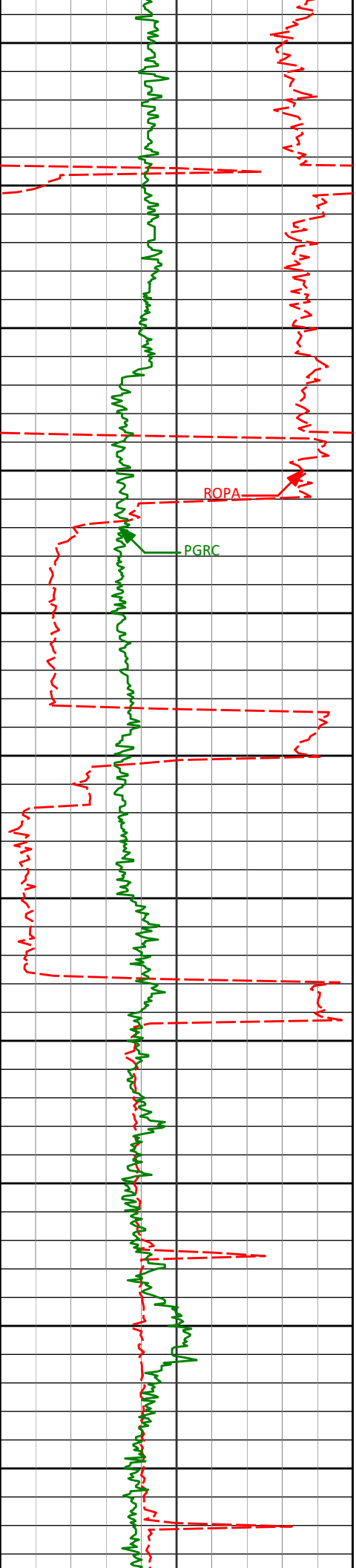
5760'	66.84°	89.63°	5571.58'	617.05'
5807'	70.23°	91.23°	5588.78'	660.78'
5855'	72.68°	91.23°	5604.04'	706.26'
5902'	77.42°	90.05°	5616.16'	751.64'
5942'	81.19°	89.02°	5623.59'	790.94'

<7" casing set at 5985' MD>

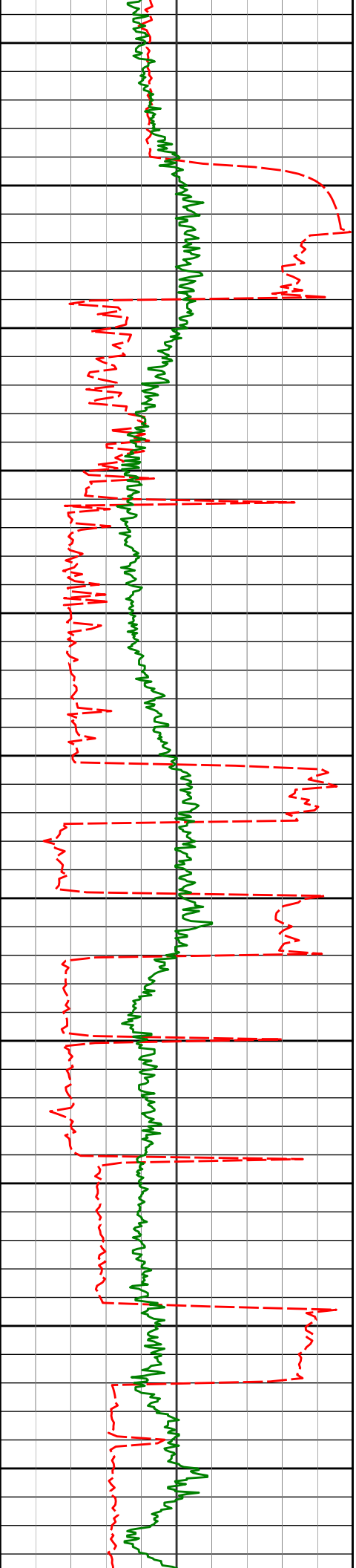
6082'	86.67°	86.39°	5638.39'	930.02'
6174'	88.67°	87.13°	5642.13'	1021.84'
6267'	89.20°	87.63°	5643.86'	1114.76'



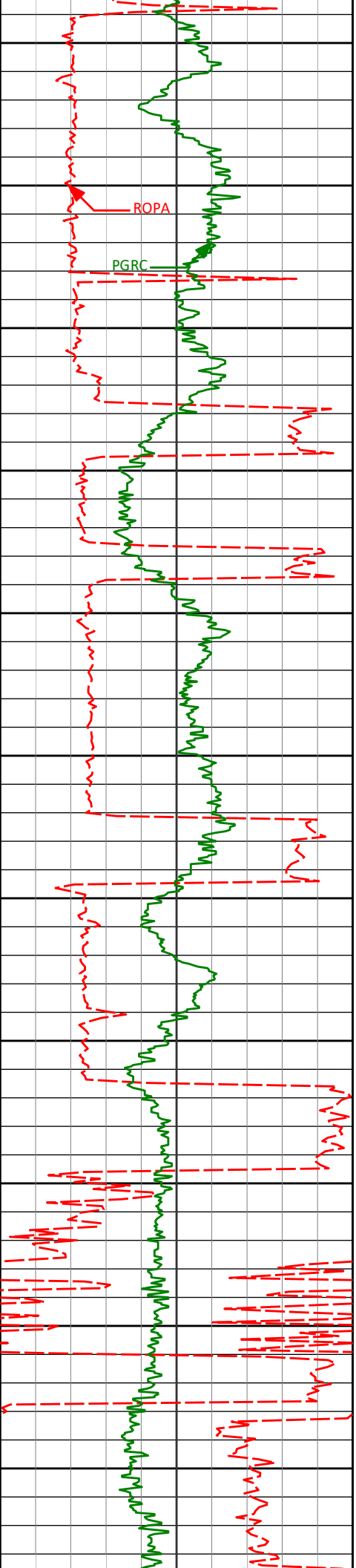
6359'	89.26°	88.53°	5645.10'	1206.72'
6452'	89.01°	87.34°	5646.50'	1299.68'
6547'	89.54°	88.76°	5647.70'	1394.64'
6642'	89.94°	88.71°	5648.13'	1489.63'
6736'	90.83°	89.18°	5647.50'	1583.62'
6831'	90.22°	88.37°	5646.63'	1678.61'



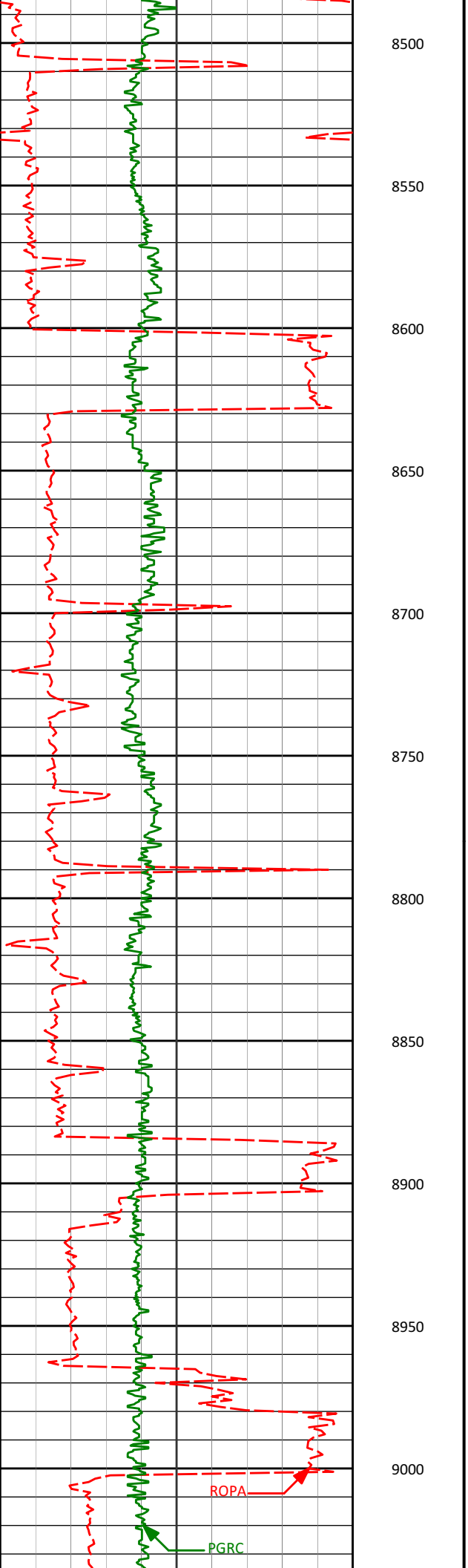
6926'	91.45°	88.23°	5645.25'	1773.58'
7021'	90.55°	87.72°	5643.58'	1868.53'
7116'	89.97°	87.82°	5643.15'	1963.48'
7211'	89.04°	87.56°	5643.97'	2058.43'
7305'	89.72°	88.29°	5644.98'	2152.39'



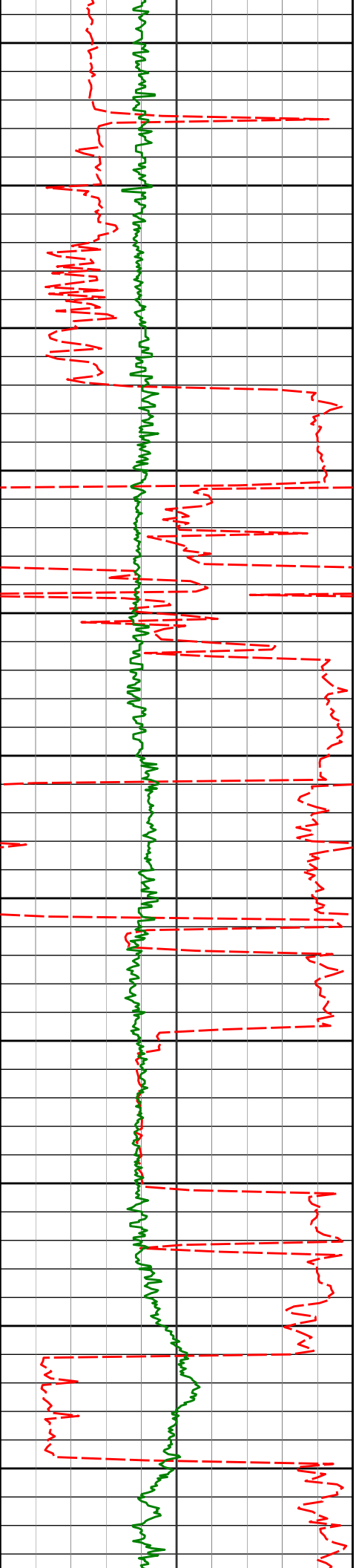
7400'	90.86°	88.75°	5644.49'	2247.38'
7495'	89.66°	89.17°	5644.06'	2342.37'
7590'	90.89°	90.00°	5643.60'	2437.36'
7684'	91.02°	89.24°	5642.03'	2531.35'
7779'	89.54°	88.42°	5641.57'	2626.34'
7874'	87.07°	89.12°	5644.38'	2721.28'



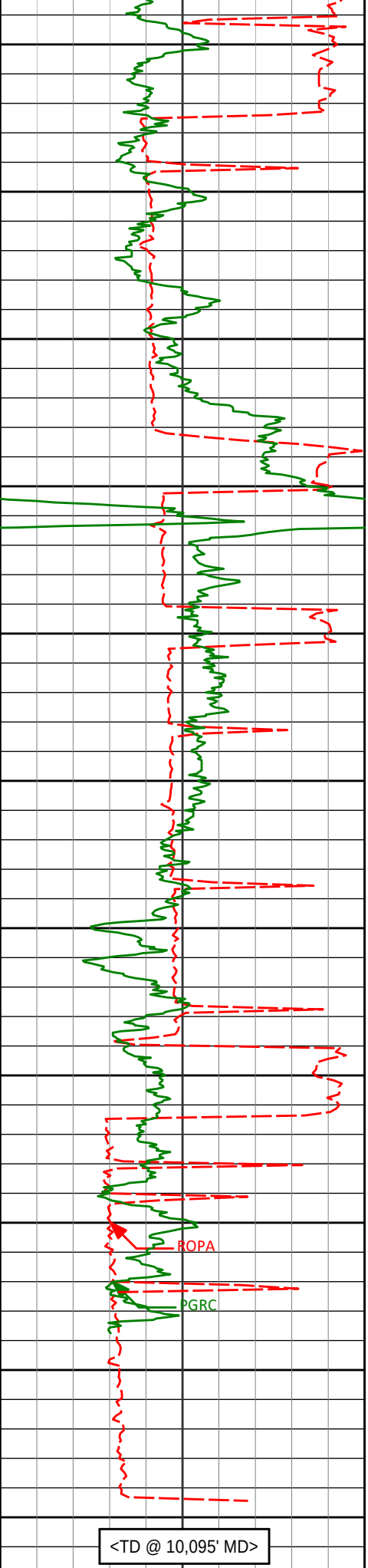
7950				
7969'	87.50°	90.21°	5648.88'	2816.17'
8000				
8050				
8064'	87.96°	91.44°	5652.64'	2911.07'
8100				
8150				
8158'	92.65°	92.81°	5652.13'	3004.94'
8200				
8250				
8253'	92.31°	90.71°	5648.02'	3099.77'
8300				
8350				
8347'	90.37°	90.12°	5645.82'	3193.73'
8400				
8450				
8442'	89.63°	90.12°	5645.82'	3288.72'



8537'	90.37°	91.30°	5645.82'	3383.70'
8632'	90.19°	88.63°	5645.36'	3478.68'
8727'	89.78°	88.05°	5645.38'	3573.67'
8822'	89.14°	85.11°	5646.28'	3668.53'
8916'	88.98°	84.50°	5647.82'	3762.20'
9011'	88.58°	86.07°	5649.84'	3856.92'



9106'	87.62°	81.31°	5652.99'	3951.36'
9200'	86.85°	80.71°	5657.52'	4044.23'
9295'	86.54°	83.68°	5662.99'	4138.29'
9390'	85.59°	83.48°	5669.51'	4232.57'
9484'	85.49°	83.10°	5676.82'	4325.73'
9579'	88.83°	87.94°	5681.53'	4420.35'



9674'	91.63°	92.69°	5681.15'	4515.30'
9769'	92.04°	91.81°	5678.10'	4610.14'
9863'	91.97°	91.79°	5674.81'	4704.01'
9958'	91.64°	91.67°	5671.82'	4798.89'
10031'	93.39°	91.88°	5668.62'	4871.75'

Avg Rate of Penetration
ROPA

Depth

Depth	***Inc***	***Azi***	***TVD***	***V.S.***

ROP Avg

500 feet per hr 0

ft

Depth	Inc.	Azi.	TVD	V.S.

PCG Gamma Ray

PGRC

0 api 300

HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240

Noble Energy, Inc
Rohn State LD03-62HN
H&P 273
T9N R58W

PCG Gamma Ray

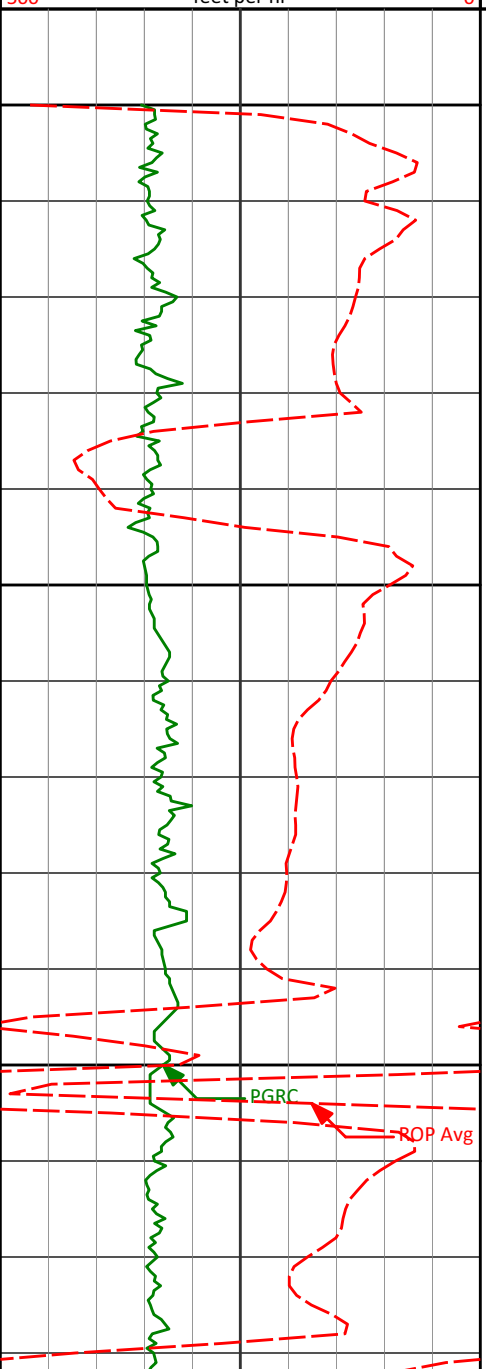
PGRC

0 api 300

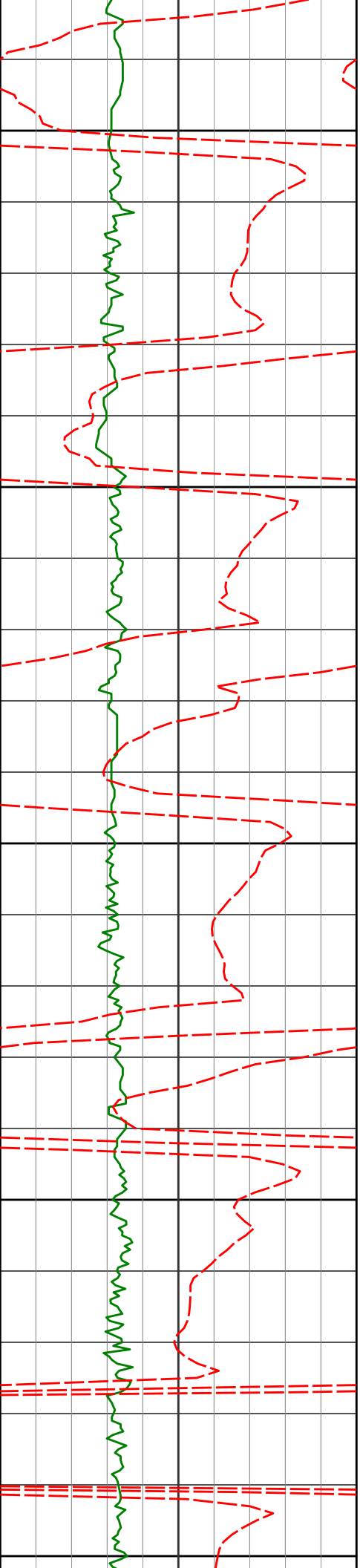
Avg Rate of Penetration

ROP Avg

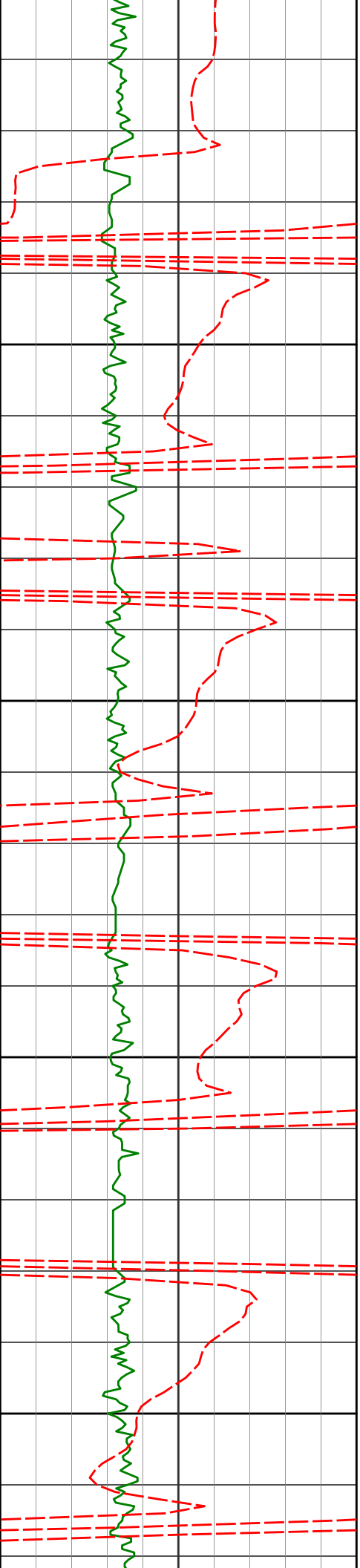
500 feet per hr 0



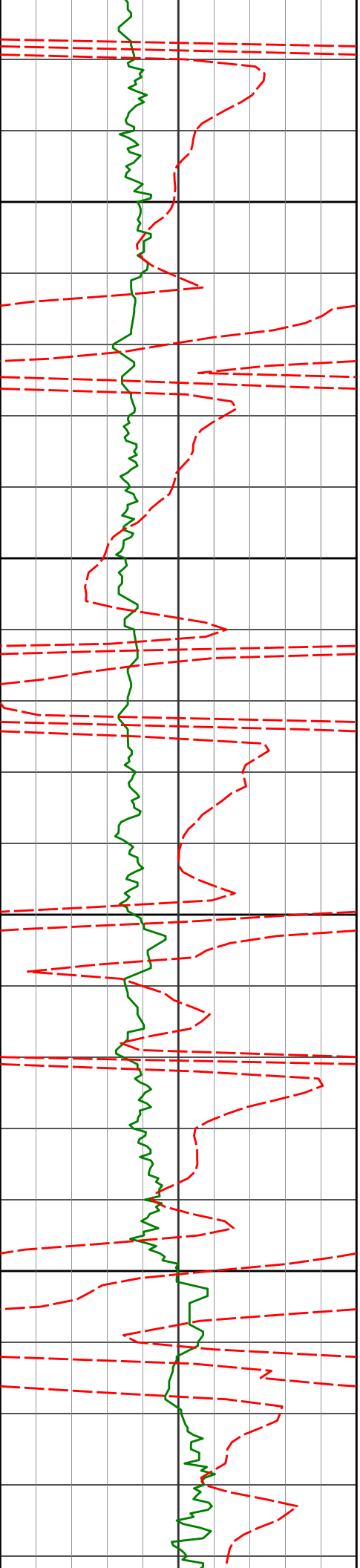
Depth ft	Depth	Inc.	Azi.	TVD	V.S.
4900 <KOP>	4907'	2.01°	90.57°	4894.57'	176.82'
4950	4953'	5.40°	96.30°	4940.47'	179.78'
5000	5001'	9.87°	97.43°	4988.03'	186.09'



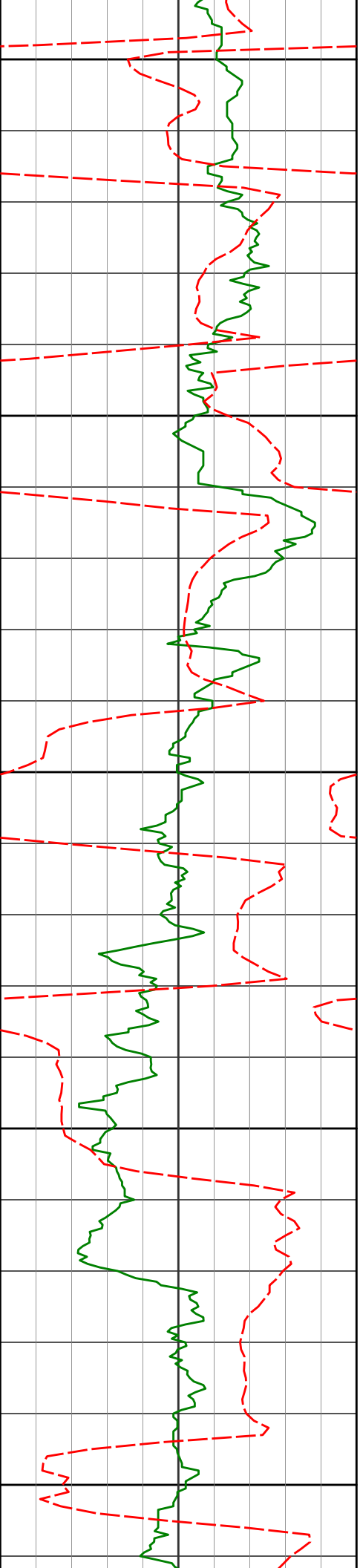
5048'	12.87°	94.17°	5034.10'	195.30'
5096'	15.81°	93.43°	5080.60'	207.15'
5143'	17.81°	93.71°	5125.59'	220.71'
5191'	20.35°	93.16°	5170.95'	236.36'
5238'	24.27°	90.81°	5214.43'	254.18'



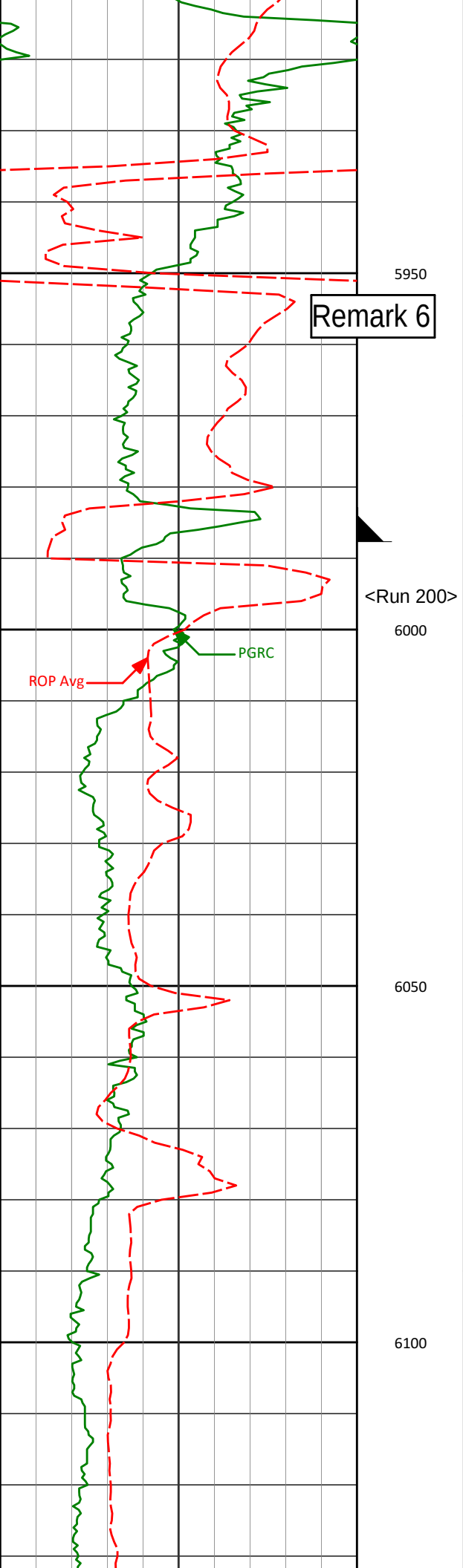
5286'	28.41°	88.46°	5257.43'	275.47'
5333'	32.11°	87.45°	5298.02'	299.14'
5381'	35.19°	87.82°	5337.98'	325.72'
5428'	37.79°	87.85°	5375.76'	353.66'



5476'	41.90°	88.28°	5412.60'	384.40'
5522'	47.19°	88.82°	5445.38'	416.65'
5570'	52.66°	88.43°	5476.27'	453.36'
5617'	55.75°	87.69°	5503.75'	491.47'
5665'	59.89°	87.78°	5529.31'	532.07'



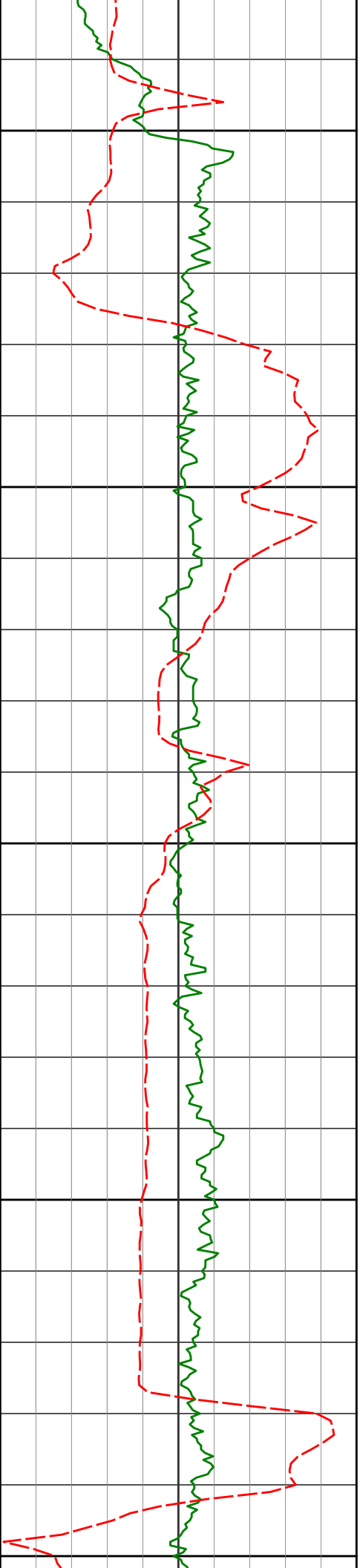
5712'	63.73°	87.48°	5551.51'	573.46'
5760'	66.84°	89.63°	5571.58'	617.05'
5807'	70.23°	91.23°	5588.78'	660.78'
5855'	72.68°	91.23°	5604.04'	706.26'
5902'	77.42°	90.05°	5616.16'	751.64'



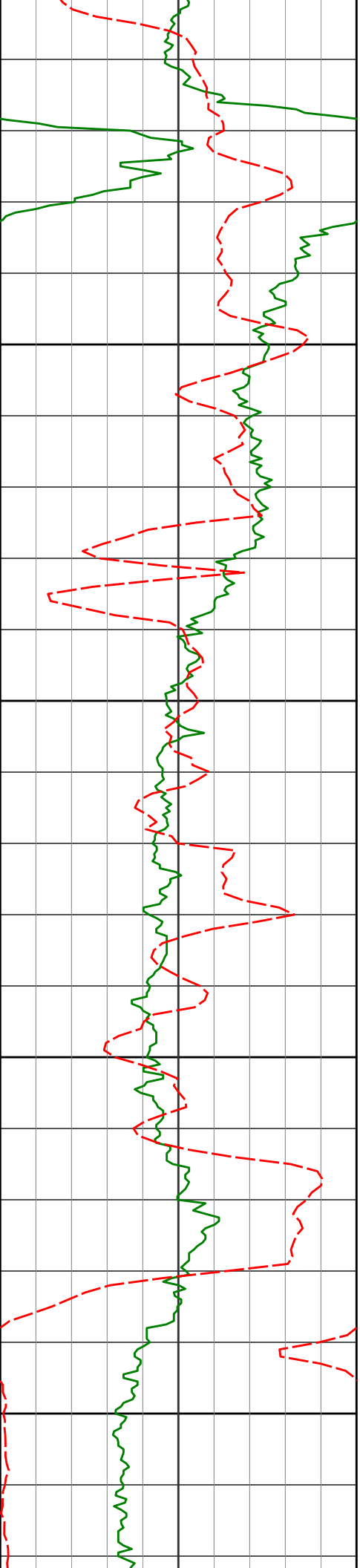
5942'	81.19°	89.02°	5623.59'	790.94'

<7" casing set at 5985' MD>

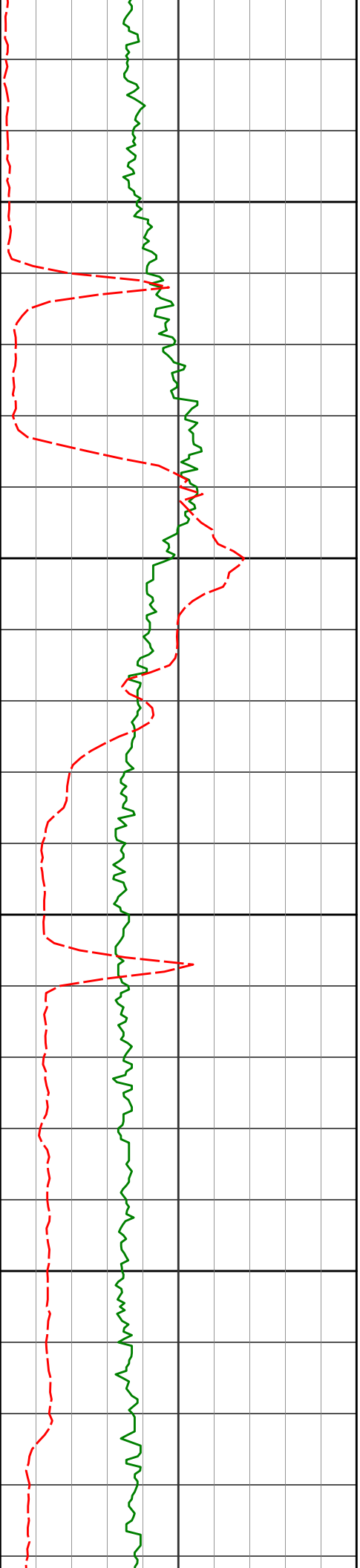
6082'	86.67°	86.39°	5638.39'	930.02'



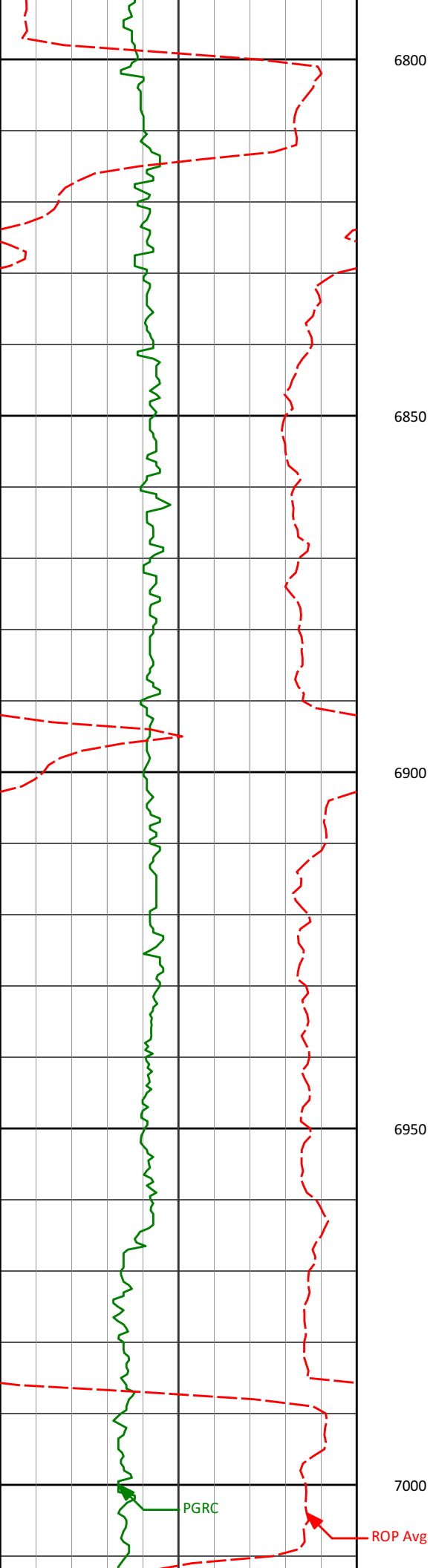
6174'	88.67°	87.13°	5642.13'	1021.84'
6267'	89.20°	87.63°	5643.86'	1114.76'



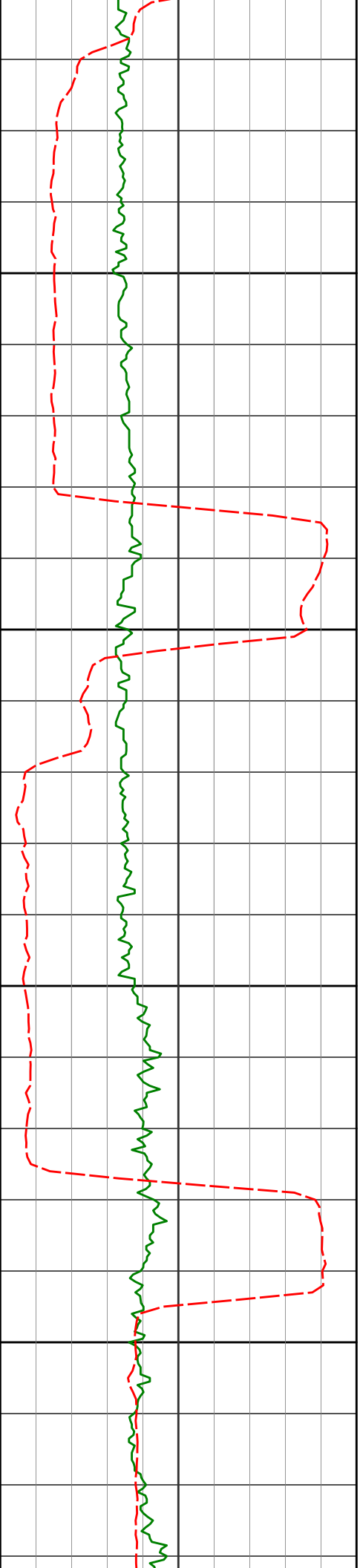
6359'	89.26°	88.53°	5645.10'	1206.72'
6452'	89.01°	87.34°	5646.50'	1299.68'
6547'	89.54°	88.76°	5647.70'	1394.64'



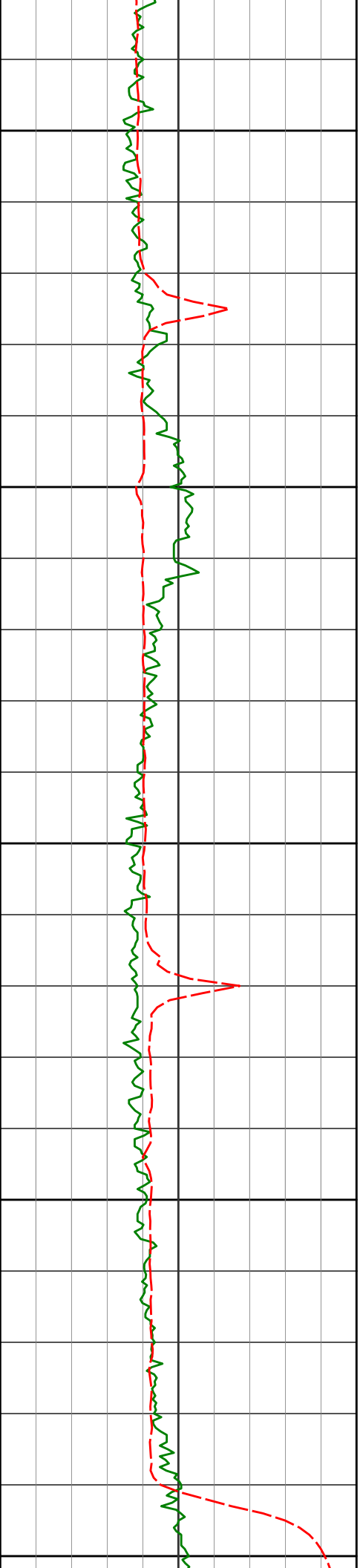
6642'	89.94°	88.71°	5648.13'	1489.63'
6736'	90.83°	89.18°	5647.50'	1583.62'



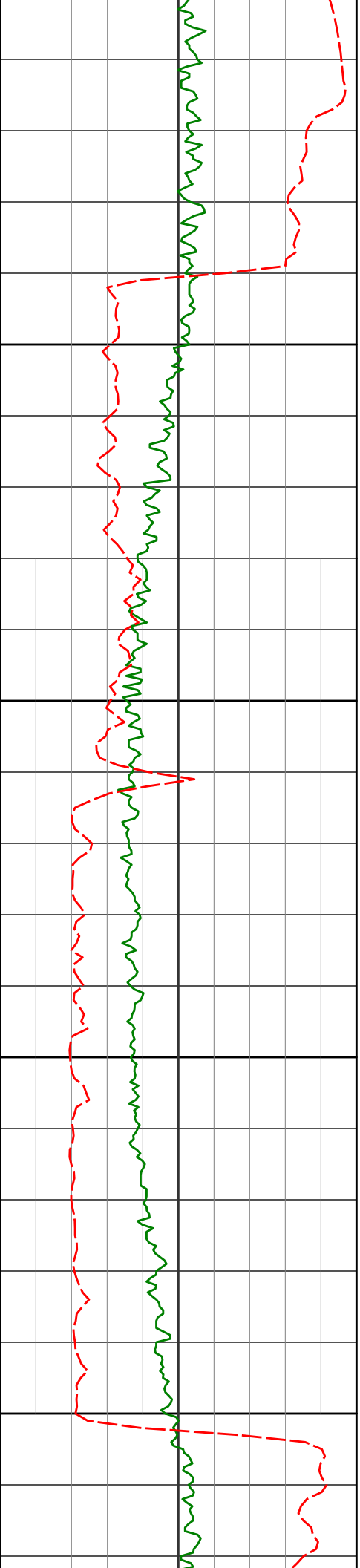
6831'	90.22°	88.37°	5646.63'	1678.61'
6926'	91.45°	88.23°	5645.25'	1773.58'



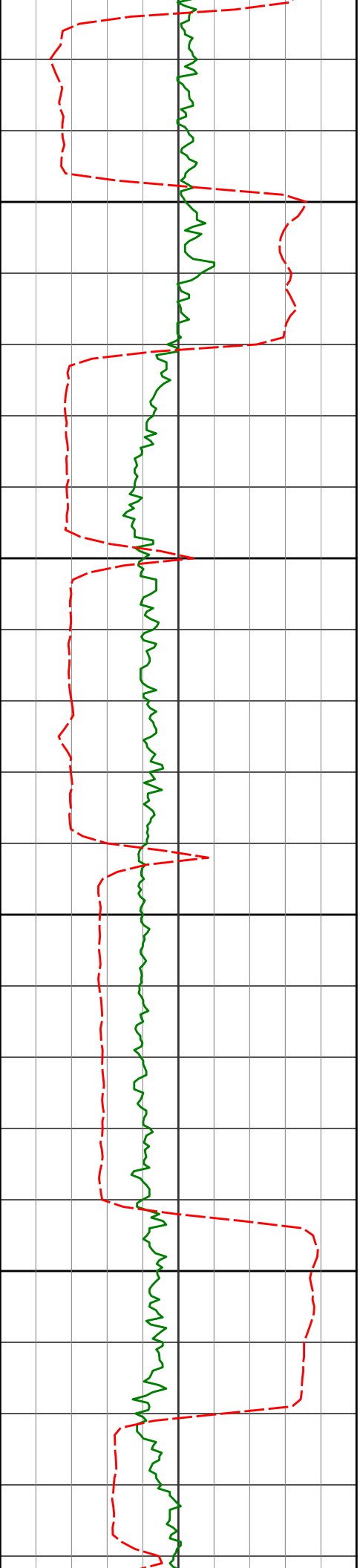
7021'	90.55°	87.72°	5643.58'	1868.53'
7116'	89.97°	87.82°	5643.15'	1963.48'
7211'	89.04°	87.56°	5643.97'	2058.43'



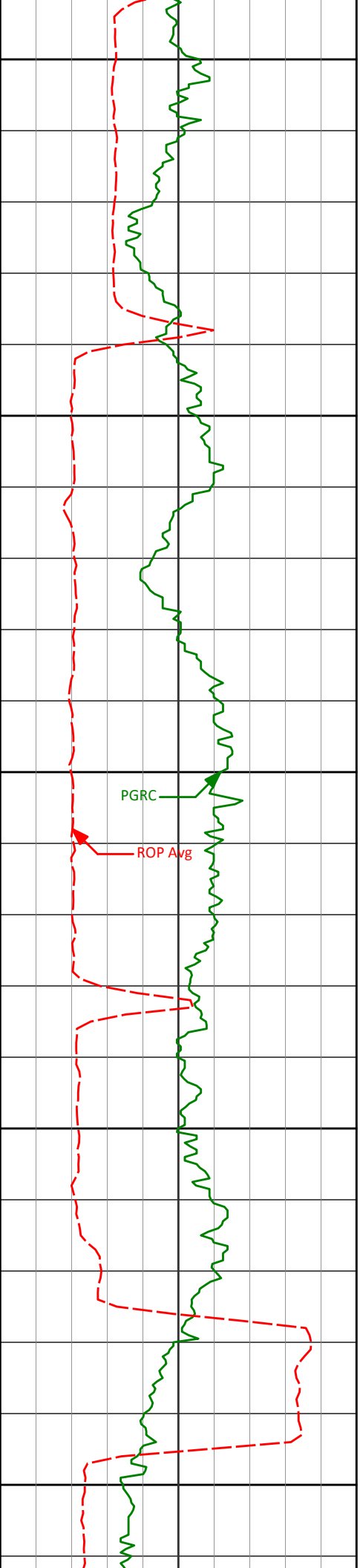
7305'	89.72°	88.29°	5644.98'	2152.39'
7400'	90.86°	88.75°	5644.49'	2247.38'



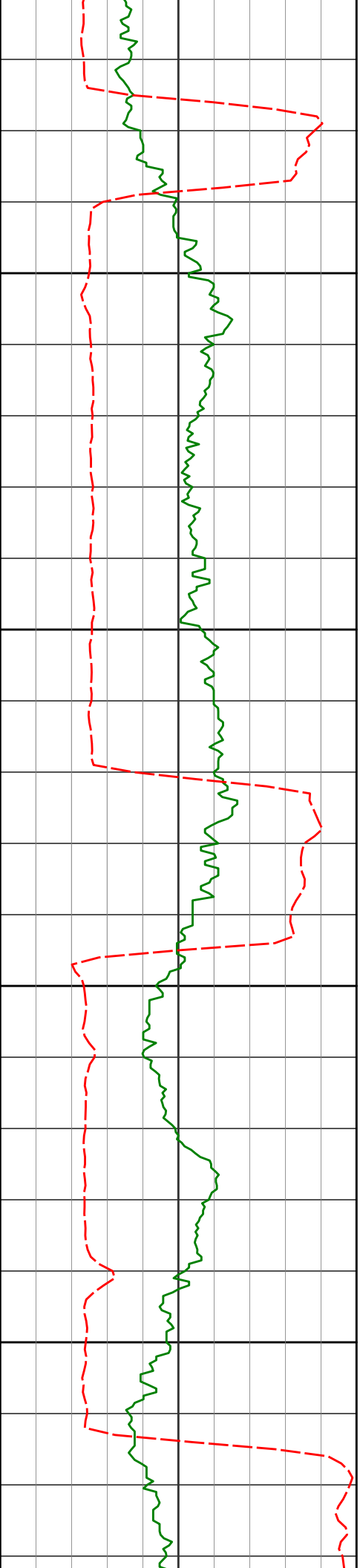
7495'	89.66°	89.17°	5644.06'	2342.37'
7590'	90.89°	90.00°	5643.60'	2437.36'



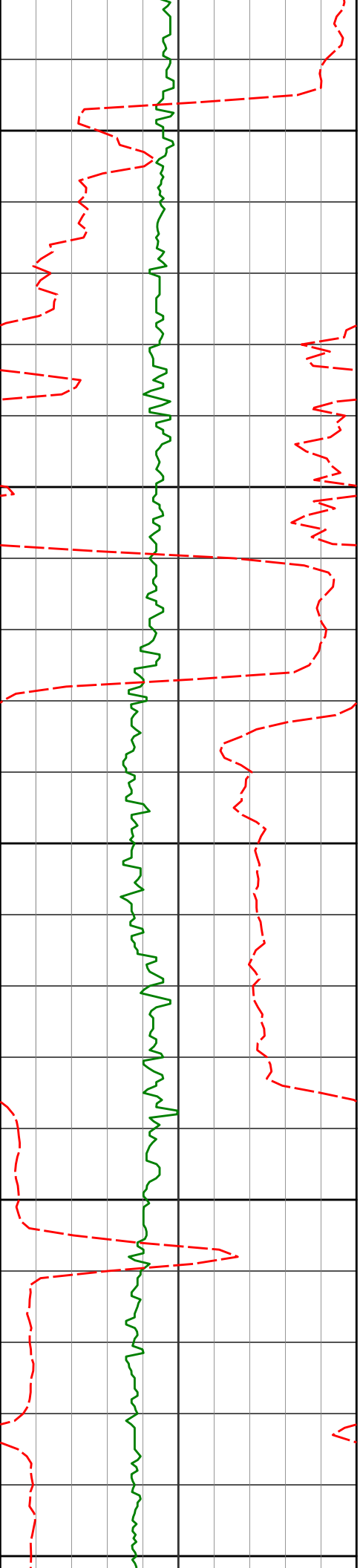
7684'	91.02°	89.24°	5642.03'	2531.35'
7779'	89.54°	88.42°	5641.57'	2626.34'
7874'	87.07°	89.12°	5644.38'	2721.28'



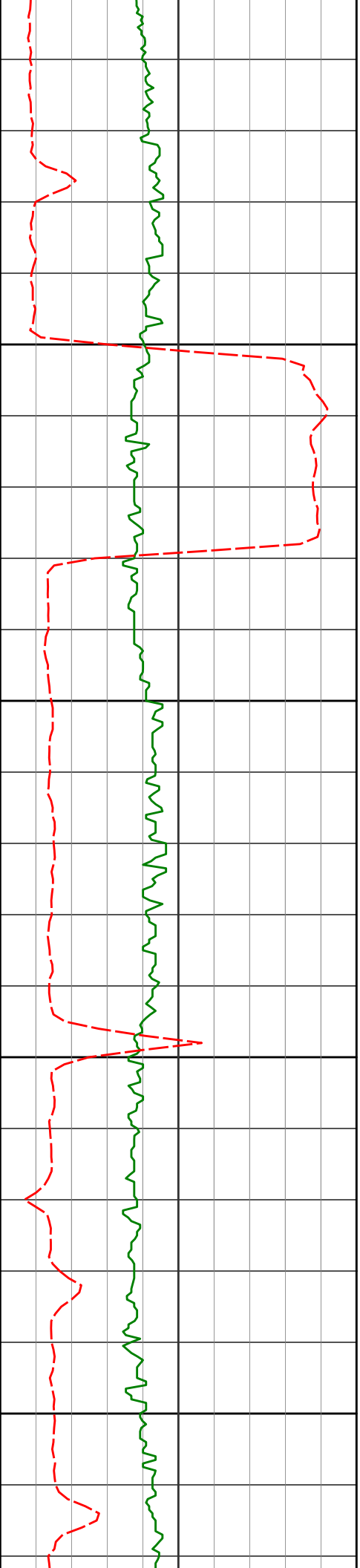
7969'	87.50°	90.21°	5648.88'	2816.17'
8064'	87.96°	91.44°	5652.64'	2911.07'



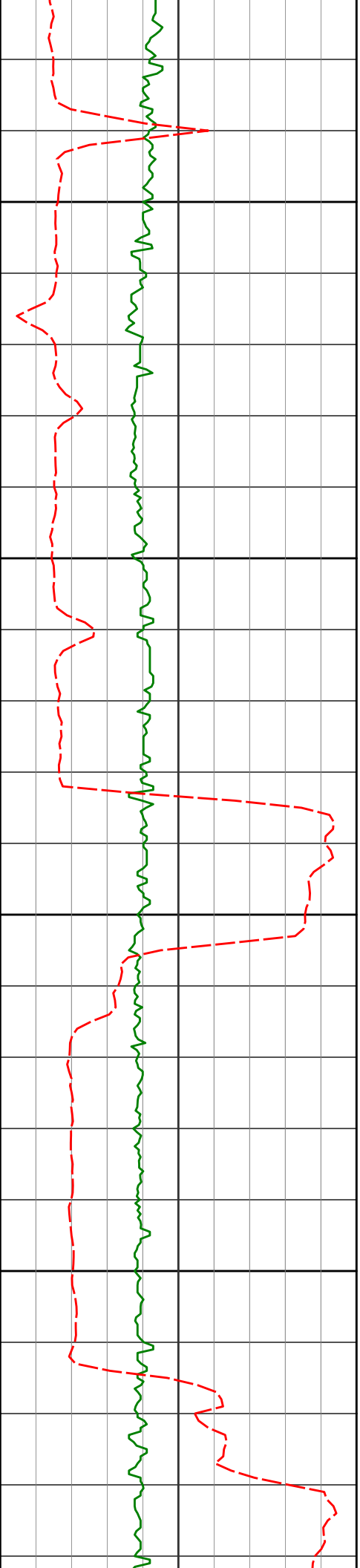
8158'	92.65°	92.81°	5652.13'	3004.94'
8253'	92.31°	90.71°	5648.02'	3099.77'



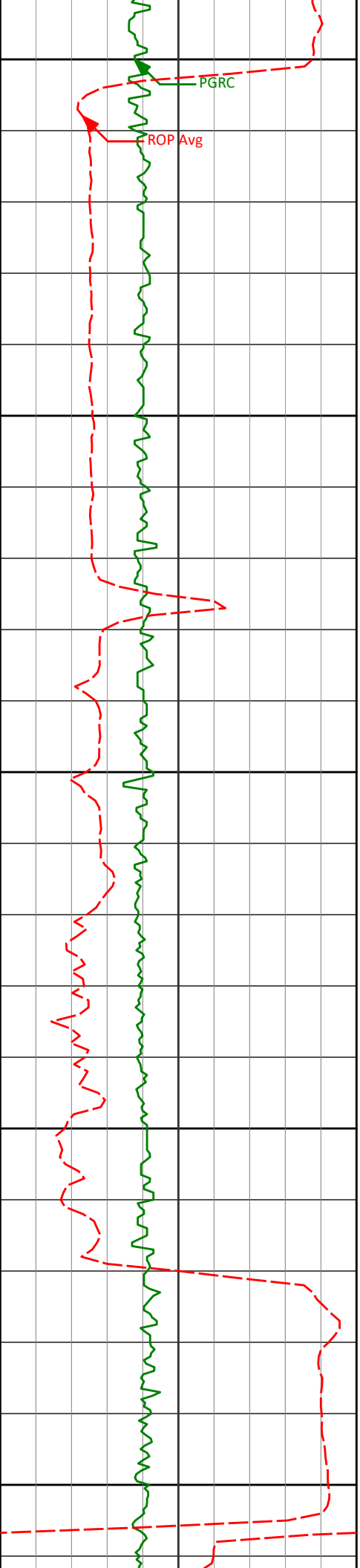
8347'	90.37°	90.12°	5645.82'	3193.73'
8442'	89.63°	90.12°	5645.82'	3288.72'
8537'	90.37°	91.30°	5645.82'	3383.70'



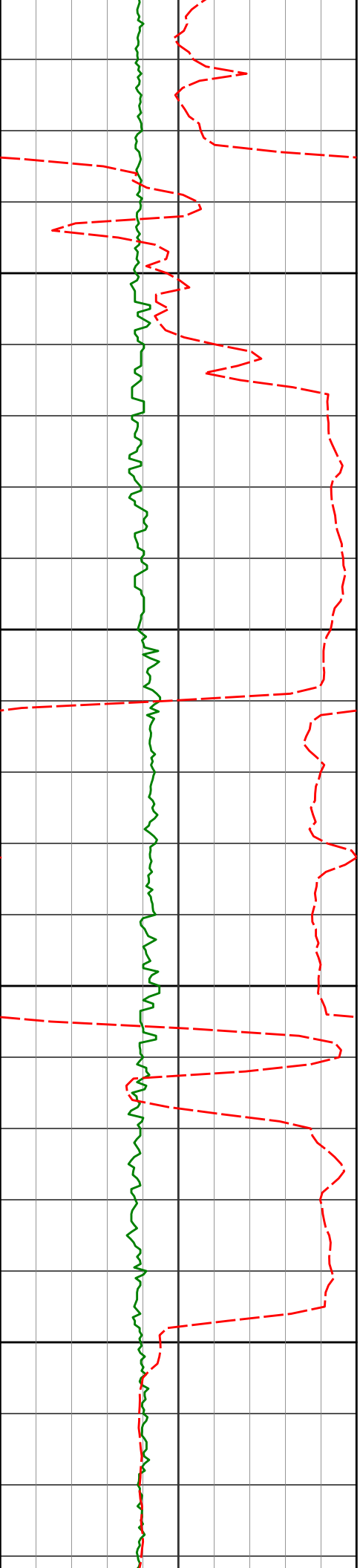
8632'	90.19°	88.63°	5645.36'	3478.68'
8727'	89.78°	88.05°	5645.38'	3573.67'



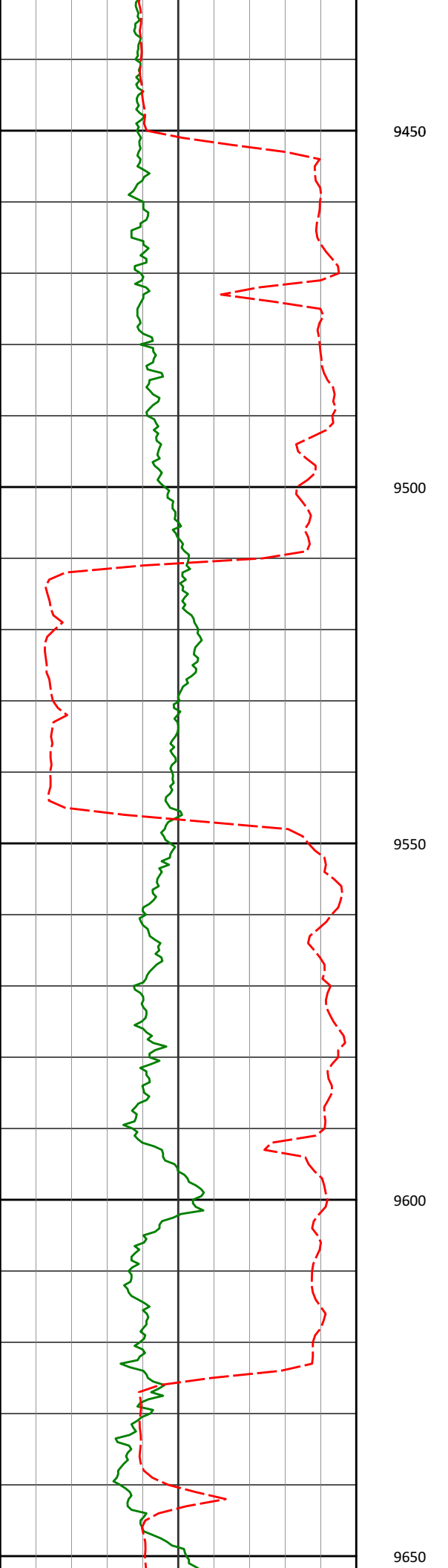
8822'	89.14°	85.11°	5646.28'	3668.53'
8916'	88.98°	84.50°	5647.82'	3762.20'



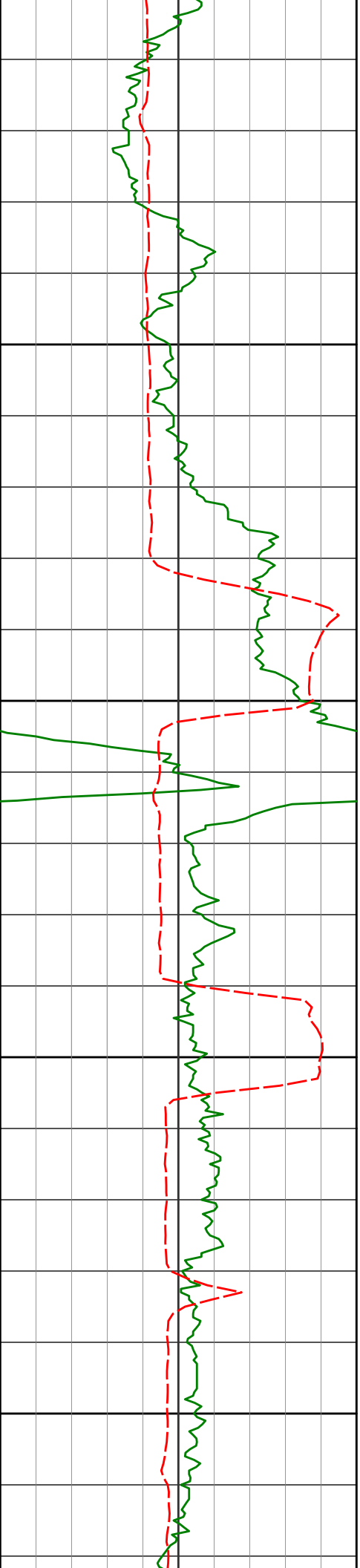
9000					
	9011'	88.58°	86.07°	5649.84'	3856.92'
9050					
9100					
	9106'	87.62°	81.31°	5652.99'	3951.36'
9150					
9200	9200'	86.85°	80.71°	5657.52'	4044.23'



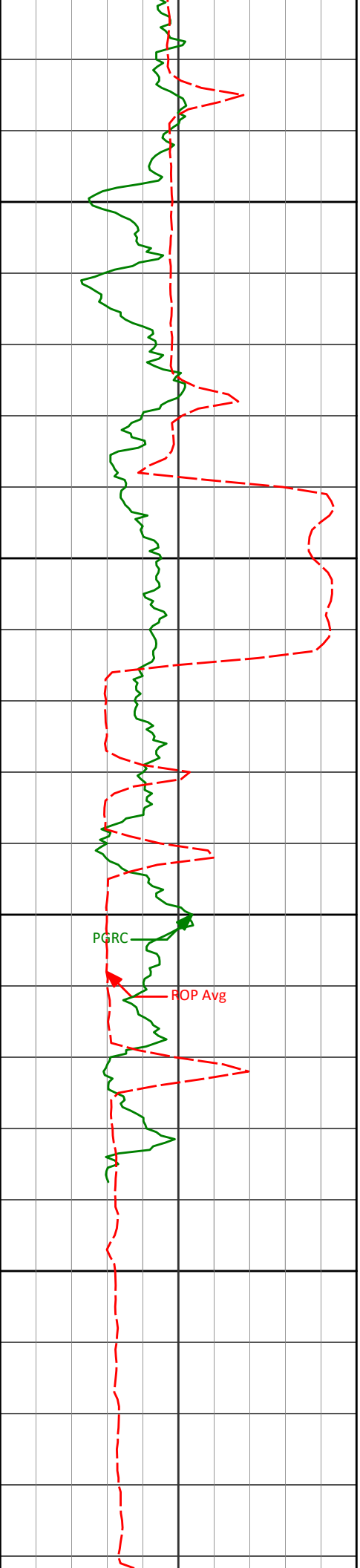
9295'	86.54°	83.68°	5662.99'	4138.29'
9390'	85.59°	83.48°	5669.51'	4232.57'



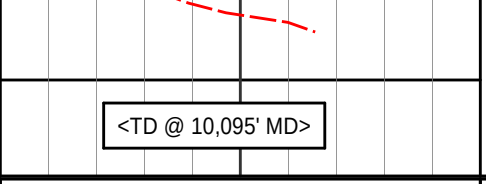
9484'	85.49°	83.10°	5676.82'	4325.73'
9579'	88.83°	87.94°	5681.53'	4420.35'



9674'	91.63°	92.69°	5681.15'	4515.30'
9769'	92.04°	91.81°	5678.10'	4610.14'
9863'	91.97°	91.79°	5674.81'	4704.01'



9958'	91.64°	91.67°	5671.82'	4798.89'
10031'	93.39°	91.88°	5668.62'	4871.75'



10100

Avg Rate of Penetration	Depth	Depth	Inc.	Azi.	TVD	V.S.
ROP Avg	ft					
500 feet per hr 0						
PCG Gamma Ray						
PGRC						
0 api 300						

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Rohn State LD03-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0901663416

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
450.00	1.20	254.23	449.97	1.28 S	4.53 W	-4.55	0.27
850.00	0.50	248.38	849.92	3.06 S	10.19 W	-10.22	0.18
1200.00	1.79	89.38	1199.87	3.57 S	6.14 W	-6.17	0.65
1488.00	1.27	290.96	1487.83	2.38 S	4.62 W	-4.64	1.04
1566.00	1.12	289.82	1565.82	1.81 S	6.15 W	-6.16	0.19
1752.00	1.31	279.34	1751.78	0.85 S	9.95 W	-9.96	0.16
1845.00	2.74	162.34	1844.74	2.80 S	10.33 W	-10.35	3.80
1938.00	4.33	147.14	1937.56	7.87 S	7.75 W	-7.82	1.97
2030.00	6.28	132.86	2029.17	14.21 S	2.17 W	-2.30	2.55
2122.00	8.39	119.78	2120.42	20.97 S	7.34 E	7.15	2.91
2215.00	8.02	119.59	2212.46	27.54 S	18.87 E	18.62	0.40
2309.00	8.05	116.20	2305.54	33.68 S	30.48 E	30.17	0.51
2402.00	7.99	115.84	2397.63	39.38 S	42.14 E	41.78	0.09
2495.00	8.21	114.66	2489.70	44.96 S	53.99 E	53.58	0.30
2679.00	7.97	112.53	2671.87	55.33 S	77.72 E	77.21	0.21
2774.00	7.64	111.30	2765.99	60.15 S	89.69 E	89.14	0.39
2868.00	7.26	109.31	2859.20	64.39 S	101.12 E	100.53	0.49
2963.00	6.34	105.24	2953.53	67.75 S	111.84 E	111.22	1.09
3058.00	6.06	101.40	3047.97	70.12 S	121.81 E	121.17	0.53
3152.00	6.31	102.68	3141.43	72.23 S	131.71 E	131.05	0.31
3247.00	6.53	104.93	3235.83	74.77 S	142.02 E	141.34	0.35
3437.00	4.37	97.59	3424.97	78.51 S	159.63 E	158.91	1.19
3532.00	2.87	75.10	3519.78	78.37 S	165.51 E	164.80	2.14
3626.00	1.89	8.78	3613.71	76.23 S	168.03 E	167.33	2.90
3910.00	0.44	289.93	3897.65	71.23 S	167.71 E	167.06	0.65
4195.00	1.14	125.36	4182.64	72.49 S	168.98 E	168.32	0.55
4384.00	0.18	287.12	4371.63	73.49 S	170.23 E	169.55	0.69
4479.00	0.91	99.59	4466.63	73.57 S	170.83 E	170.15	1.15
4764.00	0.84	82.62	4751.59	73.68 S	175.13 E	174.46	0.09
4859.00	0.66	90.30	4846.58	73.59 S	176.37 E	175.70	0.21
4907.00	2.01	90.57	4894.57	73.60 S	177.49 E	176.82	2.81
4953.00	5.40	96.30	4940.47	73.85 S	180.45 E	179.78	7.40
5001.00	9.87	97.43	4988.03	74.63 S	186.78 E	186.09	9.31
5048.00	12.87	94.17	5034.10	75.53 S	195.99 E	195.30	6.54
5096.00	15.81	93.43	5080.60	76.31 S	207.85 E	207.15	6.12
5143.00	17.81	93.71	5125.59	77.16 S	221.42 E	220.71	4.27
5191.00	20.35	93.16	5170.95	78.09 S	237.08 E	236.36	5.31
5238.00	24.27	90.81	5214.43	78.68 S	254.91 E	254.18	8.55
5286.00	28.41	88.46	5257.43	78.51 S	276.19 E	275.47	8.89

5333.00	32.11	87.45	5298.02	77.65 S	299.86 E	299.14	7.95
5381.00	35.19	87.82	5337.98	76.56 S	326.43 E	325.72	6.44
5428.00	37.79	87.85	5375.76	75.50 S	354.36 E	353.66	5.53
5476.00	41.90	88.28	5412.60	74.47 S	385.09 E	384.40	8.57
5522.00	47.19	88.82	5445.38	73.66 S	417.34 E	416.65	11.53
5570.00	52.66	88.43	5476.27	72.77 S	454.04 E	453.36	11.43
5617.00	55.75	87.69	5503.75	71.48 S	492.14 E	491.47	6.68
5665.00	59.89	87.78	5529.31	69.88 S	532.72 E	532.07	8.63
5712.00	63.73	87.48	5551.51	68.16 S	574.10 E	573.46	8.19
5760.00	66.84	89.63	5571.58	67.07 S	617.68 E	617.05	7.65
5807.00	70.23	91.23	5588.78	67.41 S	661.41 E	660.78	7.88
5855.00	72.68	91.23	5604.04	68.38 S	706.91 E	706.26	5.10
5902.00	77.42	90.05	5616.16	68.89 S	752.30 E	751.64	10.37
5942.00	81.19	89.02	5623.59	68.56 S	791.60 E	790.94	9.76
6082.00	86.67	86.39	5638.39	62.98 S	930.63 E	930.02	4.33
6174.00	88.67	87.13	5642.13	57.78 S	1022.41 E	1021.84	2.33
6267.00	89.20	87.63	5643.86	53.53 S	1115.29 E	1114.76	0.78
6359.00	89.26	88.53	5645.10	50.45 S	1207.23 E	1206.72	0.98
6452.00	89.01	87.34	5646.50	47.10 S	1300.16 E	1299.68	1.30
6547.00	89.54	88.76	5647.70	43.86 S	1395.09 E	1394.64	1.59
6642.00	89.94	88.71	5648.13	41.77 S	1490.07 E	1489.63	0.43
6736.00	90.83	89.18	5647.50	40.04 S	1584.05 E	1583.62	1.08
6831.00	90.22	88.37	5646.63	38.01 S	1679.02 E	1678.61	1.08
6926.00	91.45	88.23	5645.25	35.20 S	1773.97 E	1773.58	1.31
7021.00	90.55	87.72	5643.58	31.85 S	1868.89 E	1868.53	1.09
7116.00	89.97	87.82	5643.15	28.15 S	1963.82 E	1963.48	0.63
7211.00	89.04	87.56	5643.97	24.32 S	2058.74 E	2058.43	1.01
7305.00	89.72	88.29	5644.98	20.92 S	2152.67 E	2152.39	1.06
7400.00	90.86	88.75	5644.49	18.47 S	2247.64 E	2247.38	1.29
7495.00	89.66	89.17	5644.06	16.74 S	2342.62 E	2342.37	1.34
7590.00	90.89	90.00	5643.60	16.05 S	2437.61 E	2437.36	1.56
7684.00	91.02	89.24	5642.03	15.43 S	2531.59 E	2531.35	0.82
7779.00	89.54	88.42	5641.57	13.49 S	2626.57 E	2626.34	1.78
7874.00	87.07	89.12	5644.38	11.45 S	2721.50 E	2721.28	2.70
7969.00	87.50	90.21	5648.88	10.90 S	2816.39 E	2816.17	1.23
8064.00	87.96	91.44	5652.64	12.27 S	2911.30 E	2911.07	1.38
8158.00	92.65	92.81	5652.13	15.75 S	3005.21 E	3004.94	5.19
8253.00	92.31	90.71	5648.02	18.66 S	3100.07 E	3099.77	2.24
8347.00	90.37	90.12	5645.82	19.34 S	3194.04 E	3193.73	2.16
8442.00	89.63	90.12	5645.82	19.55 S	3289.03 E	3288.72	0.78
8537.00	90.37	91.30	5645.82	20.73 S	3384.03 E	3383.70	1.46
8632.00	90.19	88.63	5645.36	20.67 S	3479.02 E	3478.68	2.82
8727.00	89.78	88.05	5645.38	17.92 S	3573.98 E	3573.67	0.74
8822.00	89.14	85.11	5646.28	12.26 S	3668.79 E	3668.53	3.17
8916.00	88.98	84.50	5647.82	3.76 S	3762.39 E	3762.20	0.67
9011.00	88.58	86.07	5649.84	4.04 N	3857.05 E	3856.92	1.70
9106.00	87.62	81.31	5652.99	14.47 N	3951.39 E	3951.36	5.11
9200.00	86.85	80.71	5657.52	29.14 N	4044.13 E	4044.23	1.04
9295.00	86.54	83.68	5662.99	42.02 N	4138.08 E	4138.29	3.14
9390.00	85.59	83.48	5669.51	52.61 N	4232.26 E	4232.57	1.03
9484.00	85.49	83.10	5676.82	63.56 N	4325.34 E	4325.73	0.41
9579.00	88.83	87.94	5681.53	70.96 N	4419.89 E	4420.35	6.19
9674.00	91.63	92.69	5681.15	70.44 N	4514.85 E	4515.30	5.80
9769.00	92.04	91.81	5678.10	66.71 N	4609.73 E	4610.14	1.02
9863.00	91.97	91.79	5674.81	63.76 N	4703.62 E	4704.01	0.07
9958.00	91.64	91.67	5671.82	60.90 N	4798.53 E	4798.89	0.38
10031.00	93.39	91.88	5668.62	58.64 N	4871.42 E	4871.75	2.43
10095.00	93.39	91.88	5664.83	56.54 N	4935.28 E	4935.59	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 89.48 DEGREES (GRID)
A TOTAL CORRECTION OF 6.98 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10095.00 FEET
IS 4935.60 FEET ALONG 89.34 DEGREES (GRID)

Surface surveys at 450 ft, 850 ft and 1200 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 10031 ft MD to TD at 10095 ft MD.

Date Printed:22 September 2014