

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

Country		: USA					
Field		: Wattenberg					
Location		: Lat: 40°29' 49.16" North Long: 104°22' 33.53" West					
Well		: Wells Ranch AA12-65-1HN					
Company		: Noble Energy					
Rig		: H&P 315					
LOCATION		Latitude : 40°29' 49.16" North Longitude : 104°22' 33.53" West					
		UTM Easting = 3,312,594.81 ft UTM Northing = 1,425,874.74 ft					
				Other Services Directional Drilling			
Permanent Datum		: Ground Level		Elevation : 4858.00 ft		Elev. KB N/A	
Log Measured From		: Drill Floor		24.00 ft Above Permanent Datum		DF 4882.00 ft GL 4858.00 ft WD N/A	
Drilling Measured From		: Drill Floor		MD LOG			
Depth Logged		: 674.00 ft To 11,208.00 ft		Unit No. : 11610113		Job No. :CA-XX-0009680581	
Date Logged		: 15-Aug-12 To 19-Aug-12		Plot Type : Final			
Total Depth MD		: 11,208.00 ft TVD : 6,655.50 ft		Plot Date : 20-Aug-12			
Spud Date		: 14-Aug-12					
Run No.	Borehole Record (MD)			Run No.	Borehole Record (MD)		
	Size	From	To		Size	From	To
2	8.750 in	674.00 ft	6,002.00 ft				
3	8.750 in	6,002.00 ft	7,154.00 ft				
4	6.130 in	7,154.00 ft	11,208.00 ft				

Max Tool Temp (degF) / Source	150.10 / PCM	172.78 / PCM	226.10 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 150.10	N/A @ 172.78	N/A @ 226.10		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Neilson	Dave Neilson	Dave Neilson		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11341320	11341320	11751282		
Insert Serial Number	11680781	11680781	11680751		
Date and Time Initialized	15-Aug-12 08:42	15-Aug-12 08:42	18-Aug-12 06:10		
Date and Time Read	17-Aug-12 14:26	17-Aug-12 14:44	20-Aug-12 03:30		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.50	51.74	61.06		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341320	11341320	11751282		
Sonde Serial Number	11833225	11833225	11062056		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	95.07	315.27	268.68		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.70	46.94	56.26		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341320	11341320	11751282		
Insert/Sonde Serial Number	11681000	11681000	11680975		

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 7.3.5
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 7107 ft. MD. Gamma cannot be measured within cased hole, and collection resumes after drilling through cement at 7154 ft MD.

WARRANTY

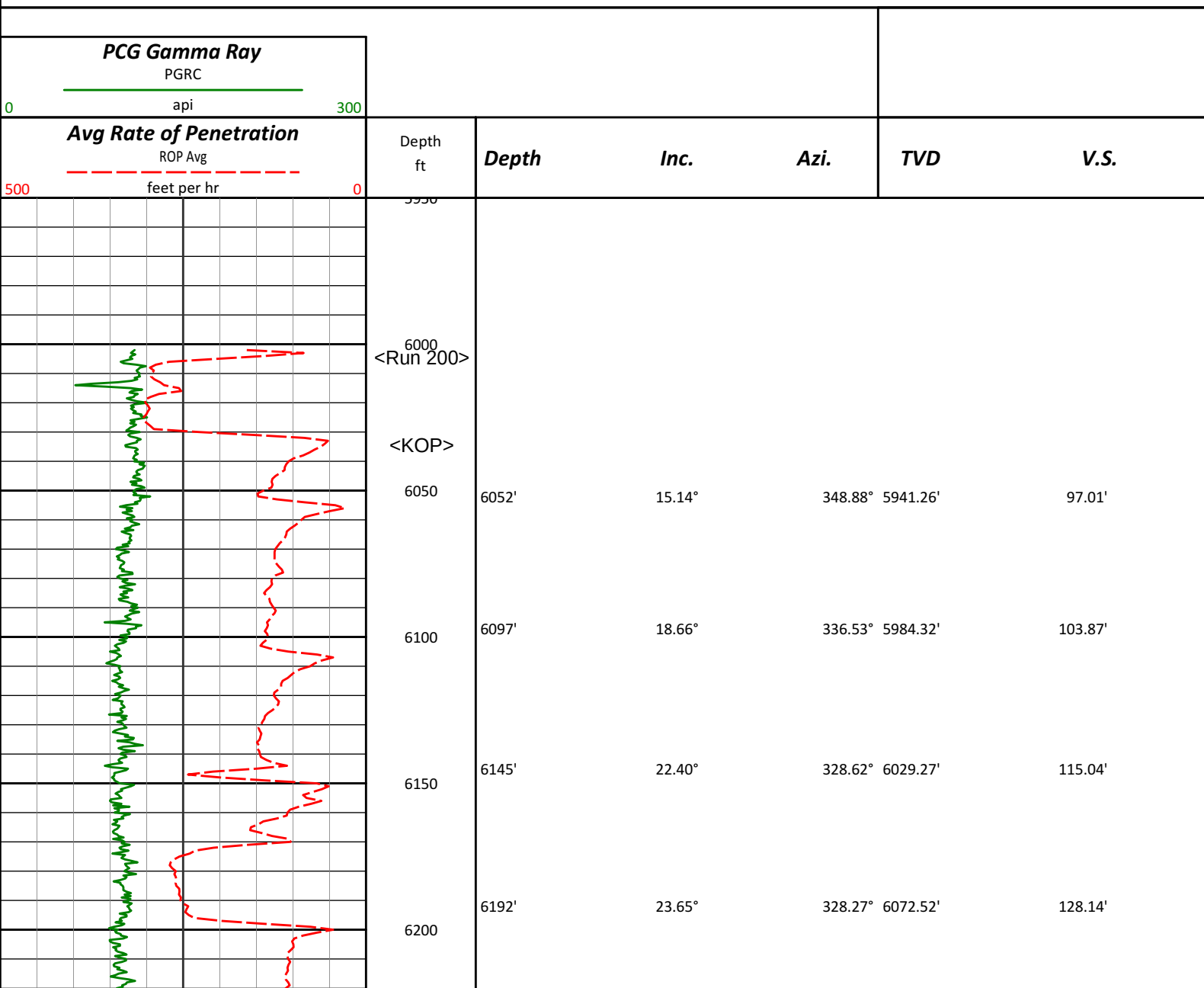
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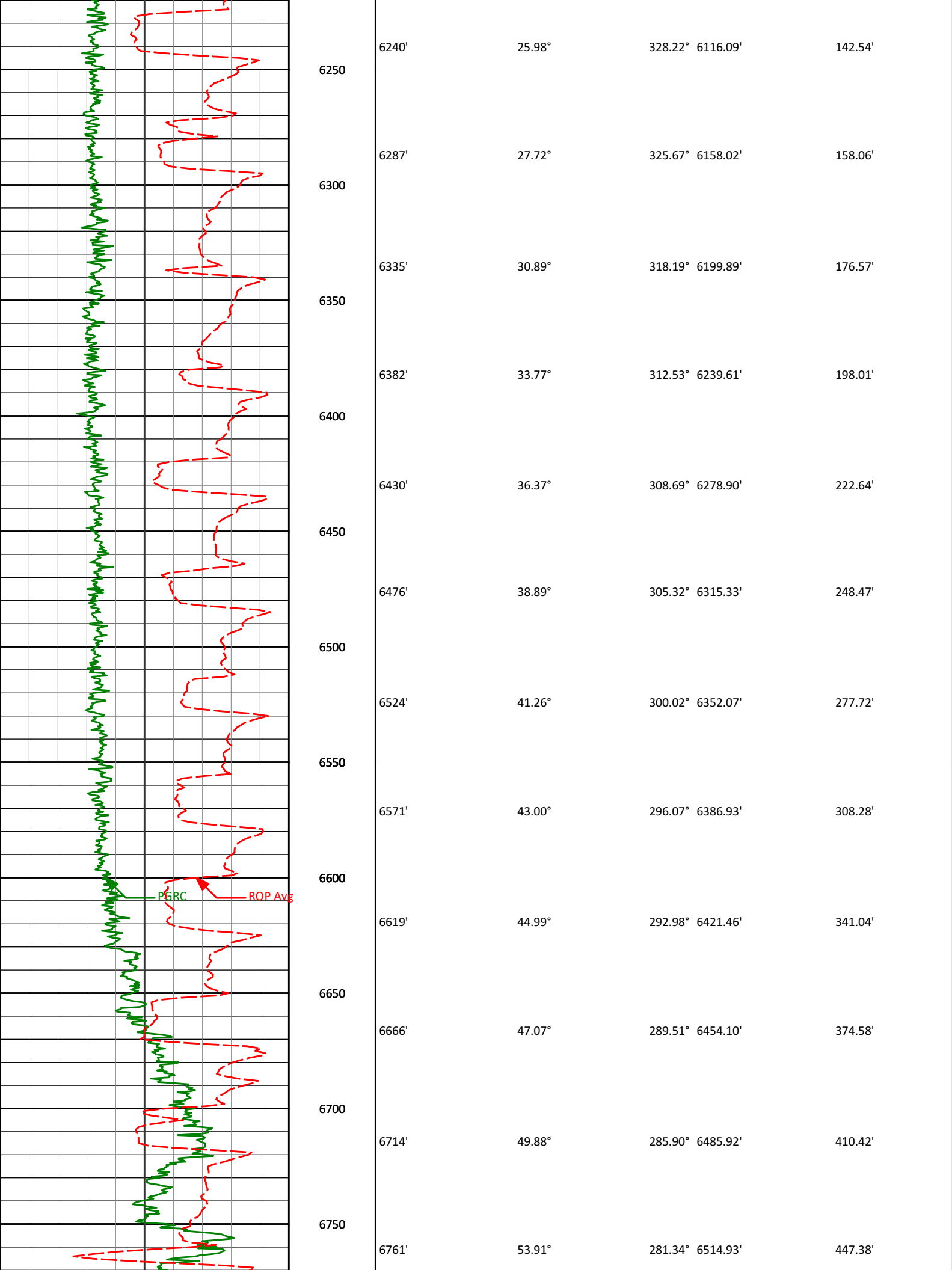
HALLIBURTON

Sperry Drilling Services

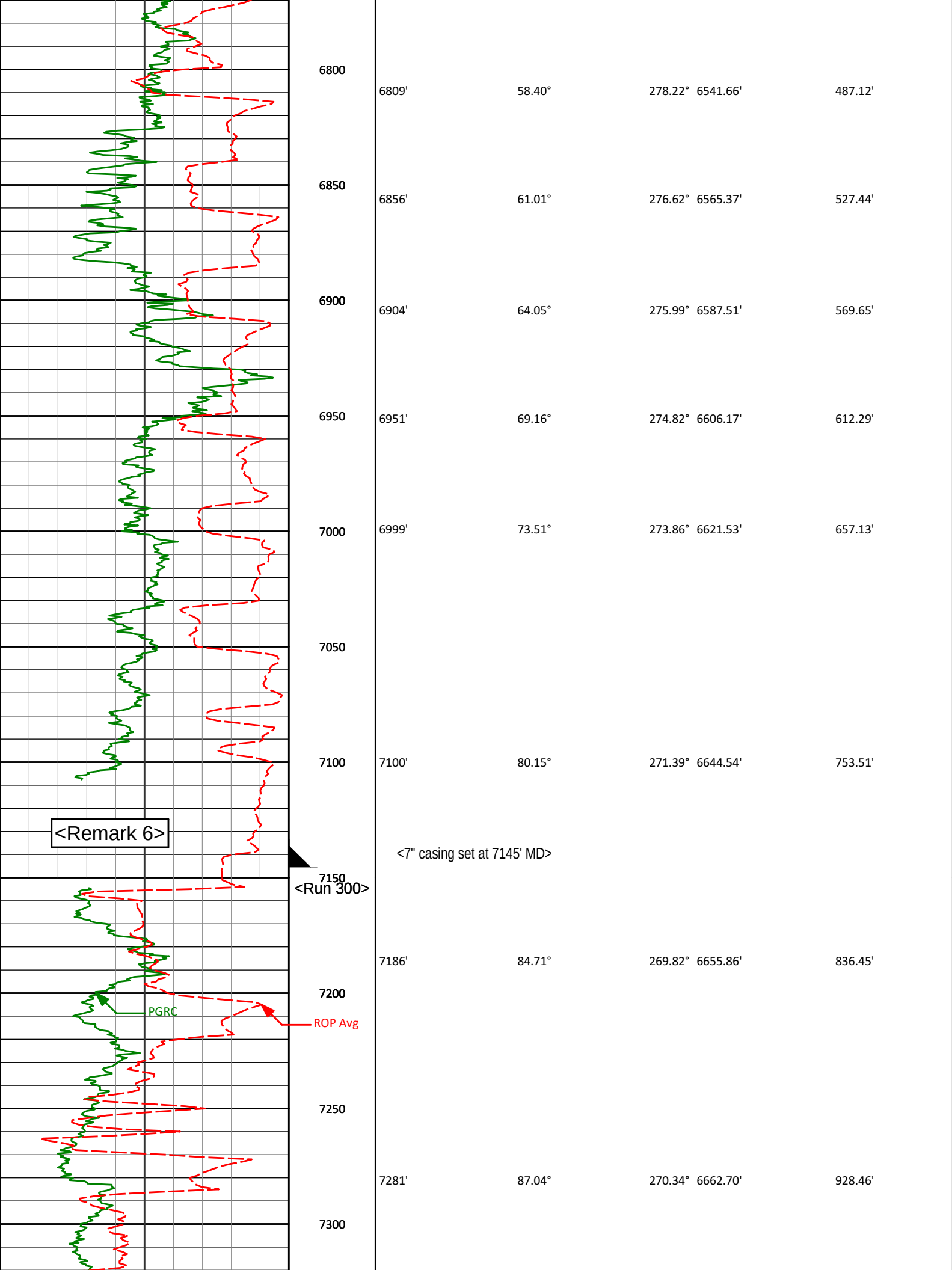
MD Main Log 1:600

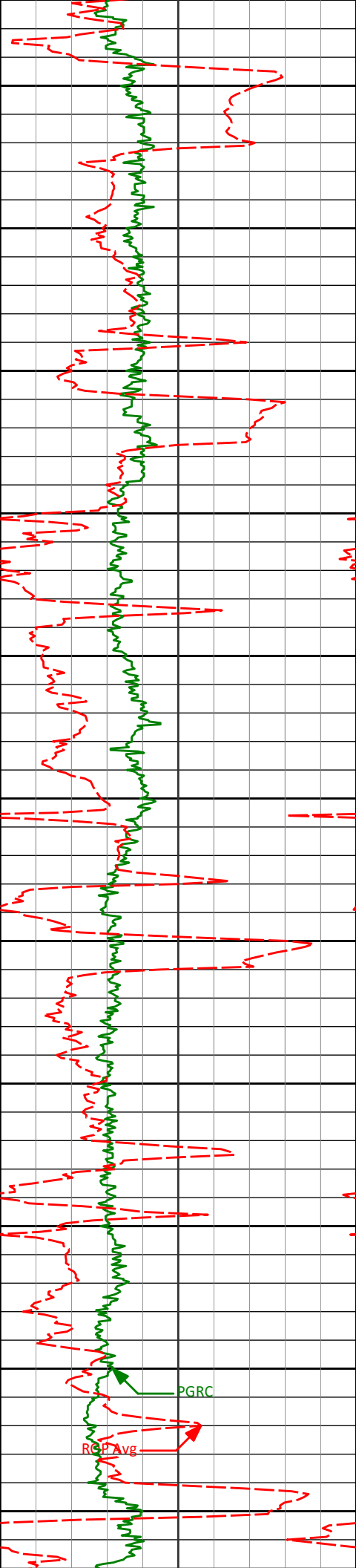
Noble Energy, Inc
Wells Ranch AA12-65-1HN
H&P 315
T6N R63W





6240'	25.98°	328.22°	6116.09'	142.54'
6250				
6287'	27.72°	325.67°	6158.02'	158.06'
6300				
6335'	30.89°	318.19°	6199.89'	176.57'
6350				
6382'	33.77°	312.53°	6239.61'	198.01'
6400				
6430'	36.37°	308.69°	6278.90'	222.64'
6450				
6476'	38.89°	305.32°	6315.33'	248.47'
6500				
6524'	41.26°	300.02°	6352.07'	277.72'
6550				
6571'	43.00°	296.07°	6386.93'	308.28'
6600				
6619'	44.99°	292.98°	6421.46'	341.04'
6650				
6666'	47.07°	289.51°	6454.10'	374.58'
6700				
6714'	49.88°	285.90°	6485.92'	410.42'
6750				
6761'	53.91°	281.34°	6514.93'	447.38'





7350

7376'

90.71°

270.82° 6664.56'

1020.87'

7400

7450

7471'

89.26°

269.34° 6664.59'

1113.12'

7500

7550

7566'

91.17°

270.39° 6664.23'

1205.28'

7600

7650

7660'

89.75°

270.01° 6663.47'

1296.61'

7700

7750

7755'

90.40°

270.83° 6663.34'

1388.99'

7800

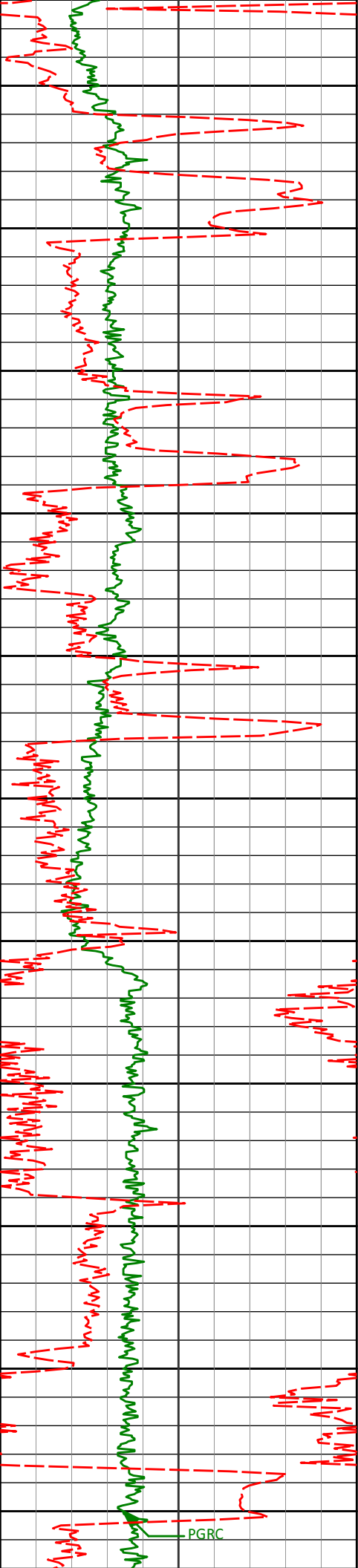
7850

7850'

91.35°

270.77° 6661.89'

1481.51'



7900

7950

8000

8050

8100

8150

8200

8250

8300

8350

8400

7945'

8040'

8135'

8230'

8324'

8419'

90.49°

88.55°

89.32°

89.38°

90.96°

86.30°

269.86° 6660.36'

268.59° 6661.15'

269.31° 6662.91'

269.79° 6663.99'

271.61° 6663.71'

267.31° 6665.98'

1573.84'

1665.74'

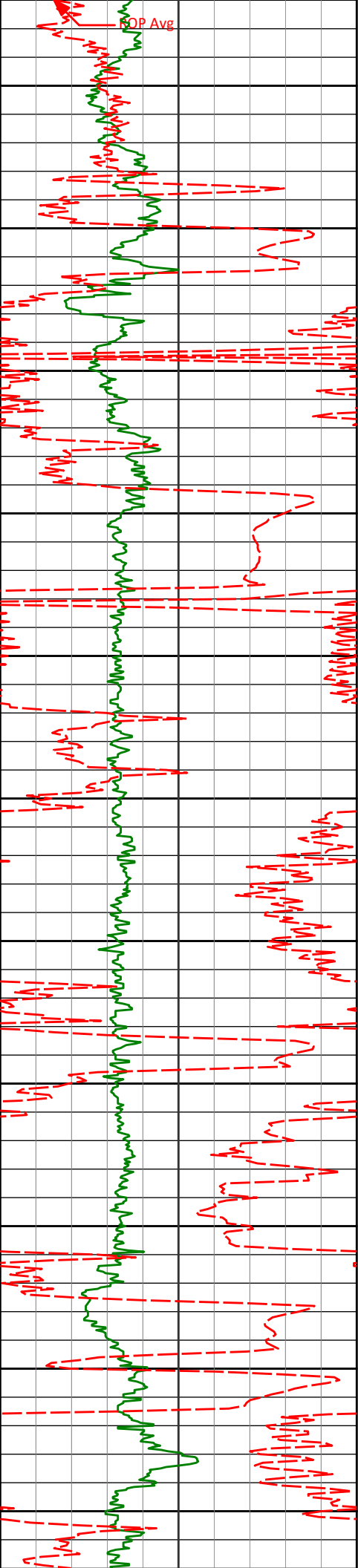
1757.51'

1849.55'

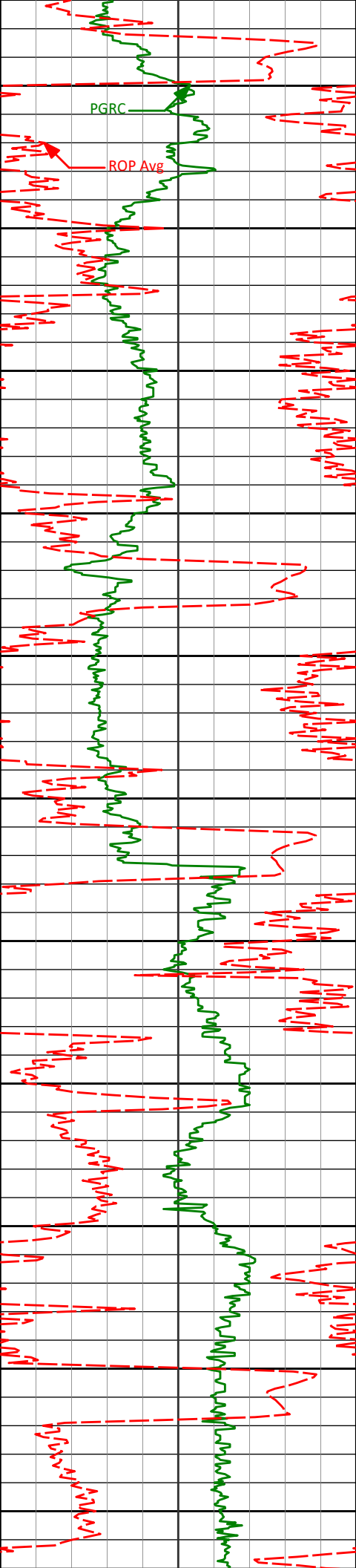
1941.06'

2032.99'

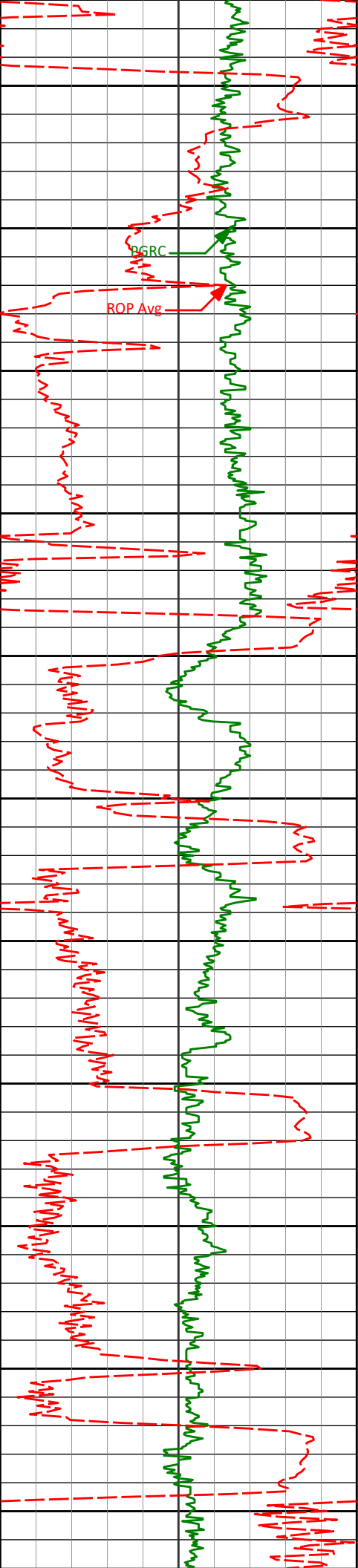
PGRC



8450				
8500	8514'	86.51°	268.05° 6671.93'	2124.03'
8550				
8600	8609'	88.09°	268.36° 6676.41'	2215.39'
8650				
8700	8704'	91.94°	271.00° 6676.38'	2307.46'
8750				
8800	8799'	92.90°	271.50° 6672.37'	2400.07'
8850				
8900	8894'	90.83°	271.12° 6669.28'	2492.73'
8950				



8989'	89.63°	269.21° 6668.90'	2585.02'
9000			
9050			
9084'	89.38°	269.25° 6669.72'	2676.92'
9100			
9150			
9178'	89.41°	268.78° 6670.70'	2767.77'
9200			
9250			
9273'	89.91°	268.40° 6671.26'	2859.40'
9300			
9350			
9368'	89.88°	268.73° 6671.44'	2951.02'
9400			
9450			
9463'	90.71°	268.58° 6670.96'	3042.68'
9500			



9550

9558'

91.51°

267.30° 6669.12'

3134.00'

9600

9650

9653'

91.23°

266.29° 6666.84'

3224.78'

9700

9750

9748'

91.30°

267.01° 6664.75'

3315.48'

9800

9850

9843'

92.47°

267.88° 6661.63'

3406.55'

9900

9950

9938'

92.25°

268.30° 6657.72'

3497.88'

10000

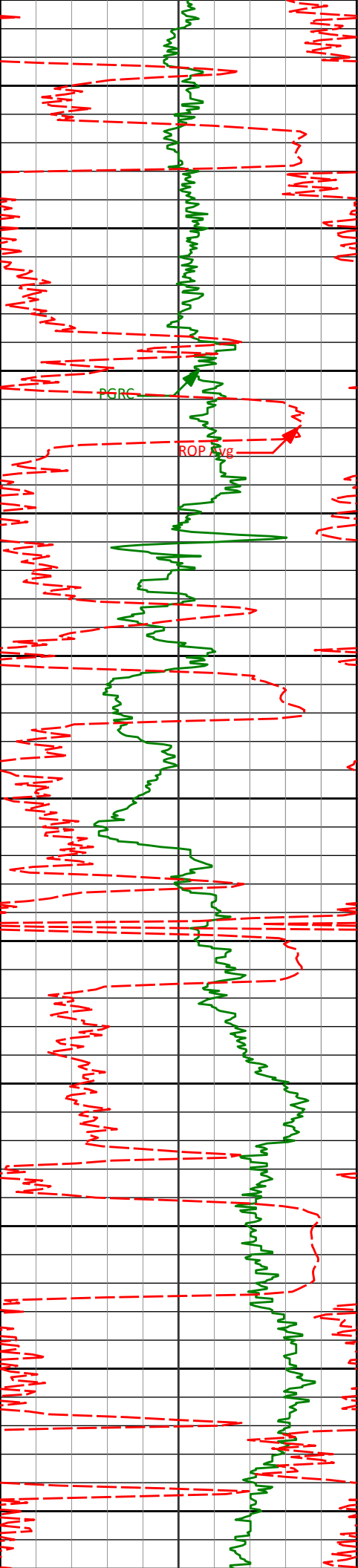
10050

10033'

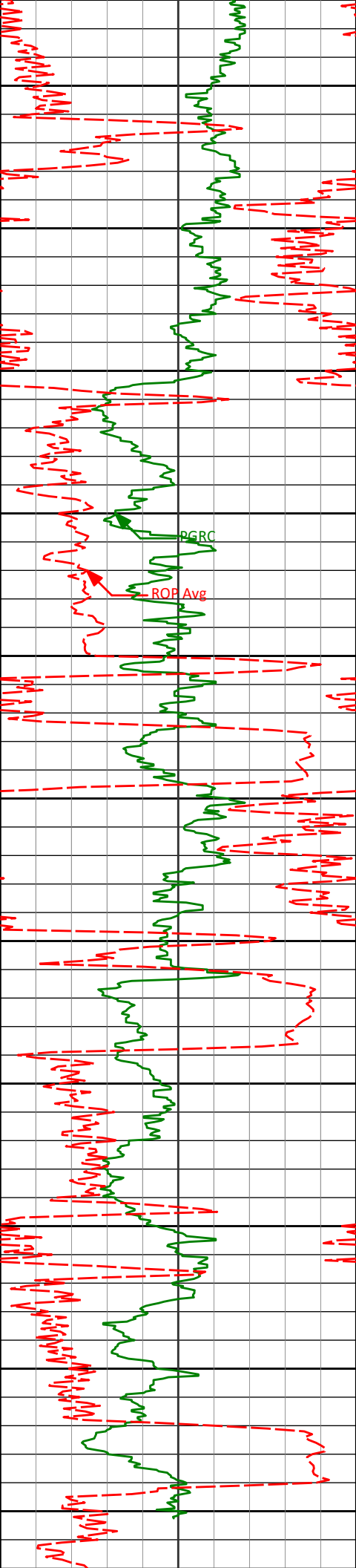
91.08°

268.81° 6654.96'

3589.46'



10100				
10128'	89.75°	267.89°	6654.27'	3680.98'
10150				
10200				
10223'	88.70°	268.79°	6655.55'	3772.49'
10250				
10300				
10318'	87.70°	269.73°	6658.54'	3864.36'
10350				
10400				
10412'	87.35°	269.94°	6662.60'	3955.46'
10450				
10500				
10507'	88.46°	270.32°	6666.08'	4047.67'
10550				
10600				
10602'	89.97°	270.46°	6667.38'	4140.04'



10650

10700

10750

10800

10850

10900

10950

11000

11050

11100

11150

10697'

10792'

10887'

10982'

11145'

90.06°

91.36°

92.65°

90.46°

91.63°

270.13° 6667.36'

269.15° 6666.18'

269.05° 6662.86'

269.16° 6660.27'

269.53° 6657.29'

4232.37'

4324.44'

4416.24'

4508.05'

4665.80'

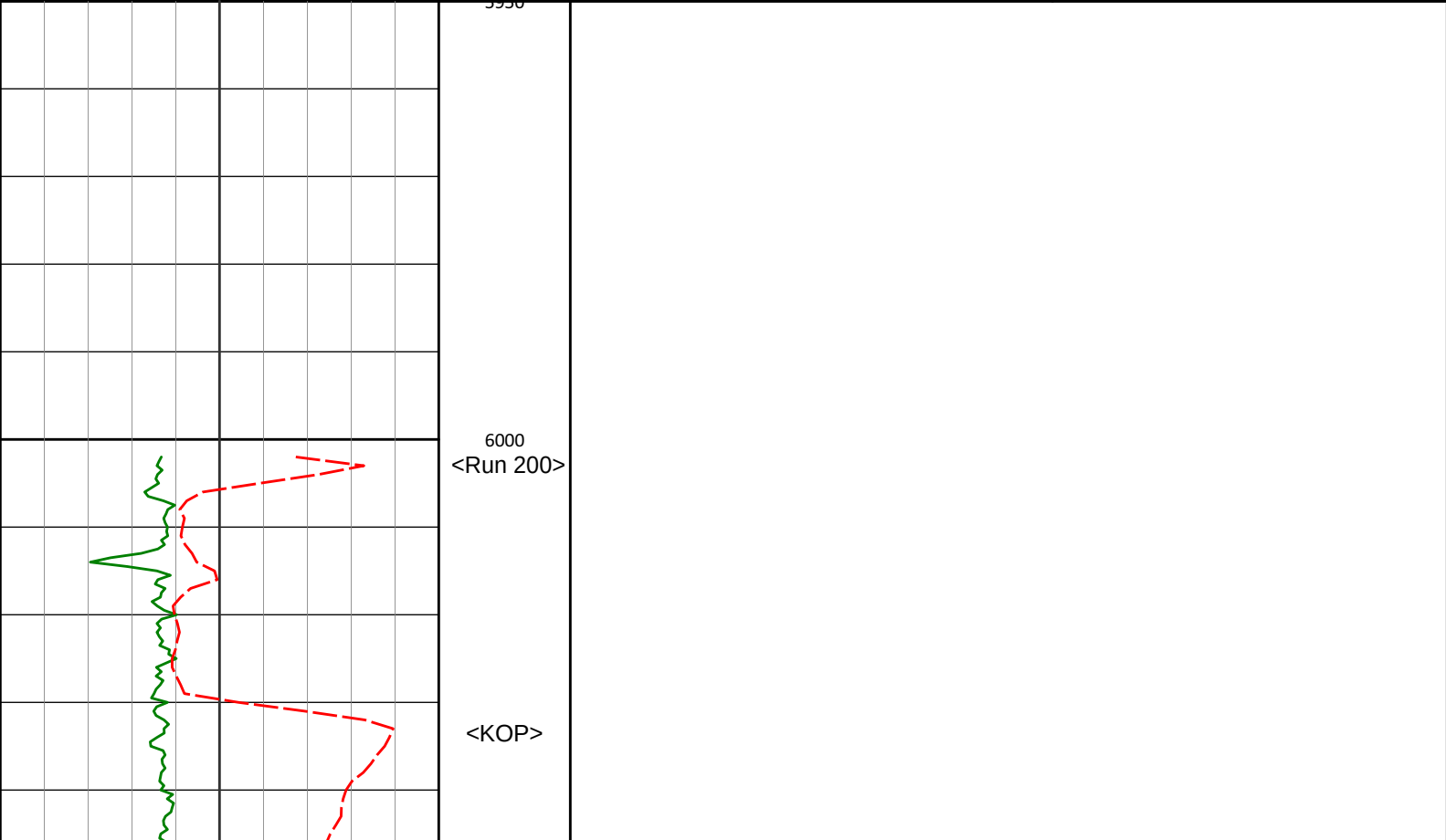


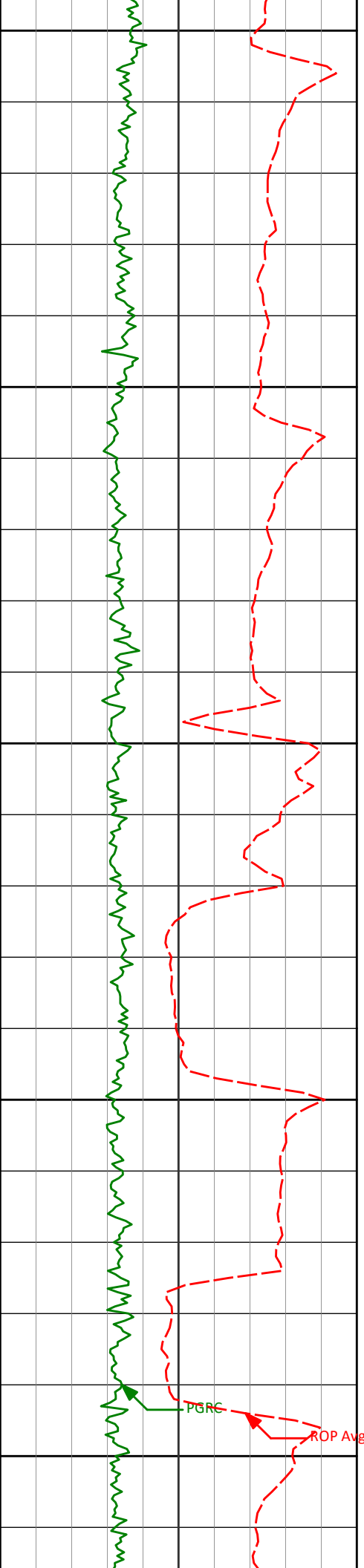
Avg Rate of Penetration ROP Avg feet per hr		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
PCG Gamma Ray PGRC api							

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Sperry Drilling Services
MD Detail Log 1:240

Noble Energy, Inc
Wells Ranch AA12-65-1HN
H&P 315
T6N R63W

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





6050

6052'

15.14°

348.88° 5941.26'

97.01'

6100

6097'

18.66°

336.53° 5984.32'

103.87'

6150

6145'

22.40°

328.62° 6029.27'

115.04'

6200

6192'

23.65°

328.27° 6072.52'

128.14'

6250

6240'

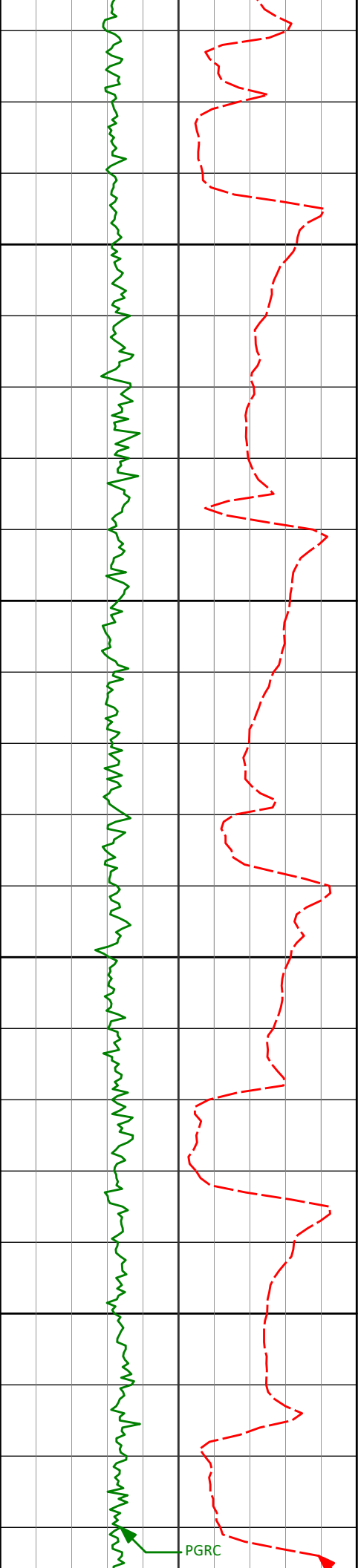
25.98°

328.22° 6116.09'

142.54'

PGRC

ROP Avg



6300

6350

6400

6450

6287'

27.72°

325.67° 6158.02'

158.06'

6335'

30.89°

318.19° 6199.89'

176.57'

6382'

33.77°

312.53° 6239.61'

198.01'

6430'

36.37°

308.69° 6278.90'

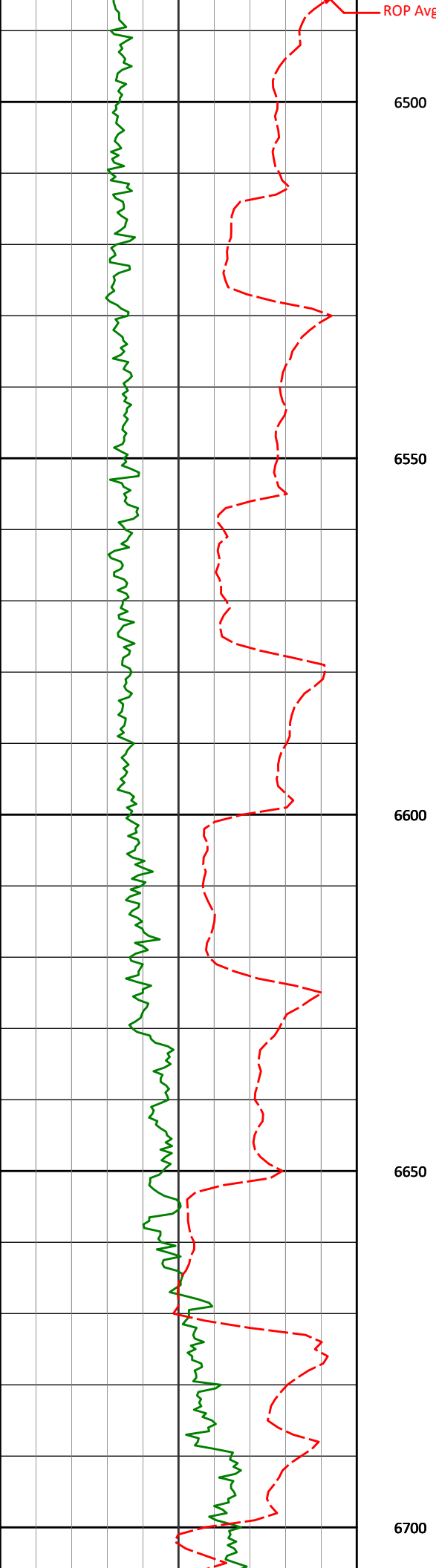
222.64'

6476'

38.89°

305.32° 6315.33'

248.47'



6524'

41.26°

300.02° 6352.07'

277.72'

6571'

43.00°

296.07° 6386.93'

308.28'

6619'

44.99°

292.98° 6421.46'

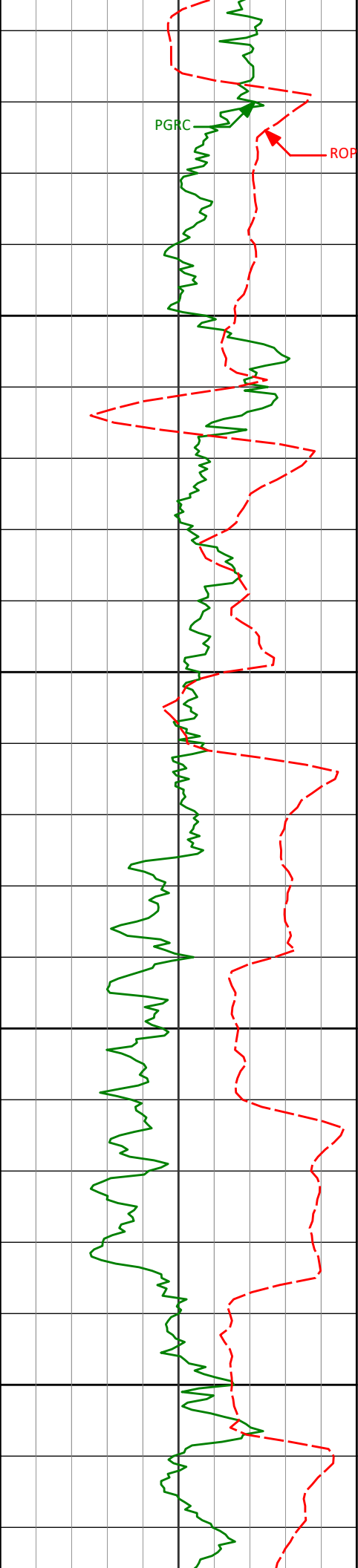
341.04'

6666'

47.07°

289.51° 6454.10'

374.58'



6750

6800

6850

6900

6714'

49.88°

285.90° 6485.92'

410.42'

6761'

53.91°

281.34° 6514.93'

447.38'

6809'

58.40°

278.22° 6541.66'

487.12'

6856'

61.01°

276.62° 6565.37'

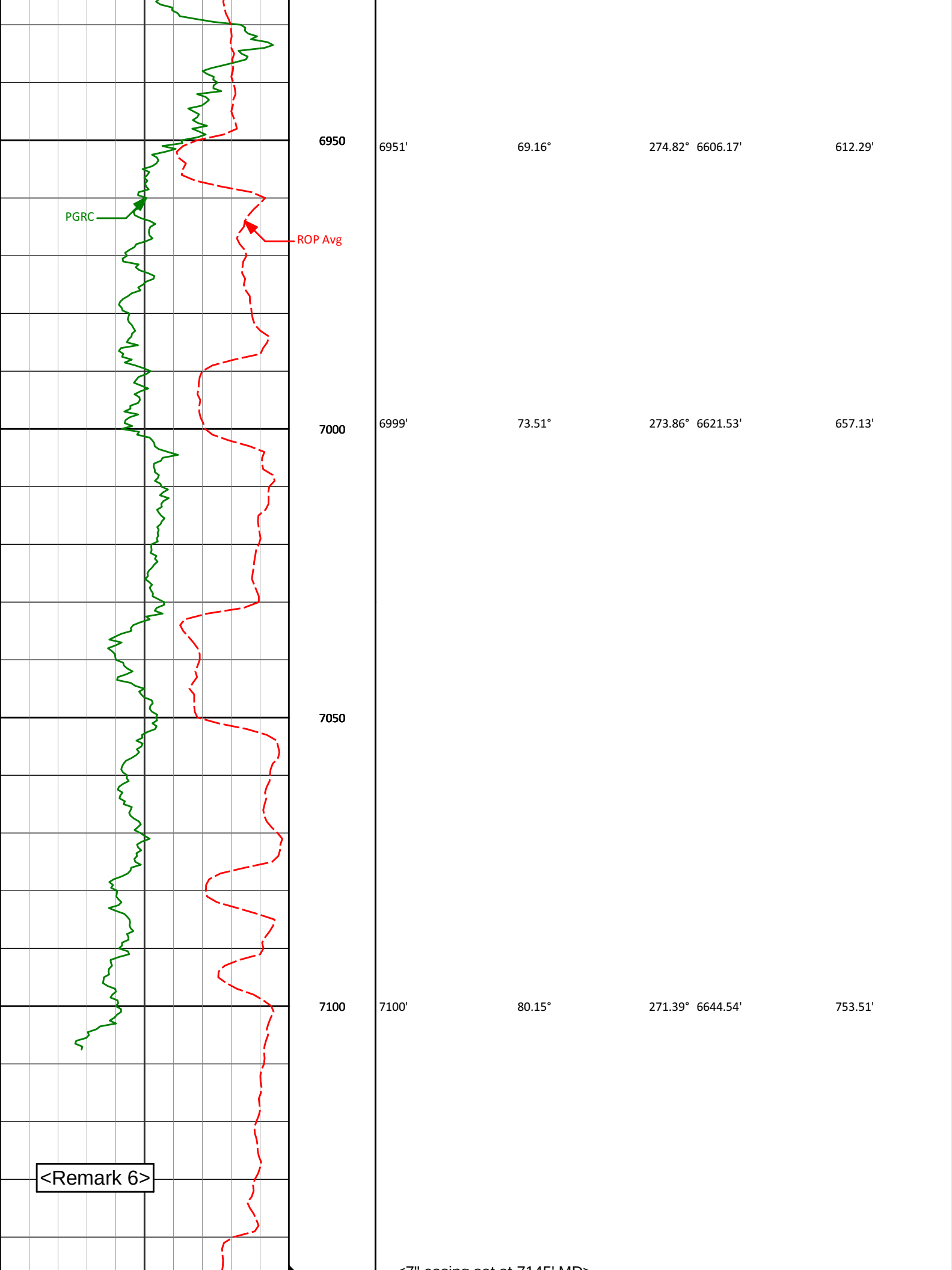
527.44'

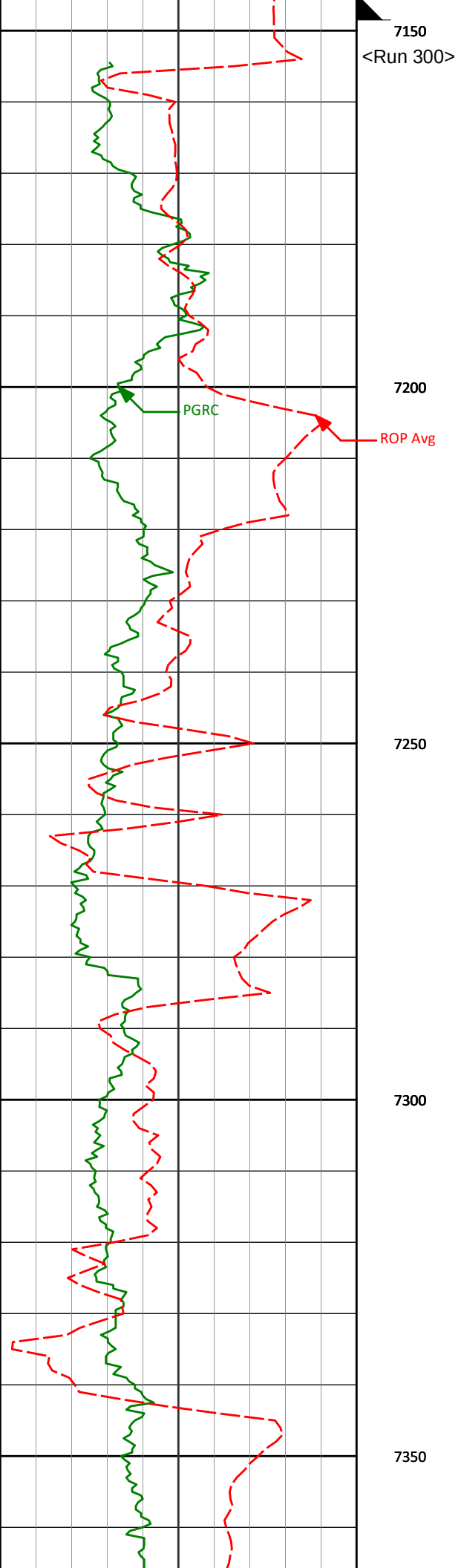
6904'

64.05°

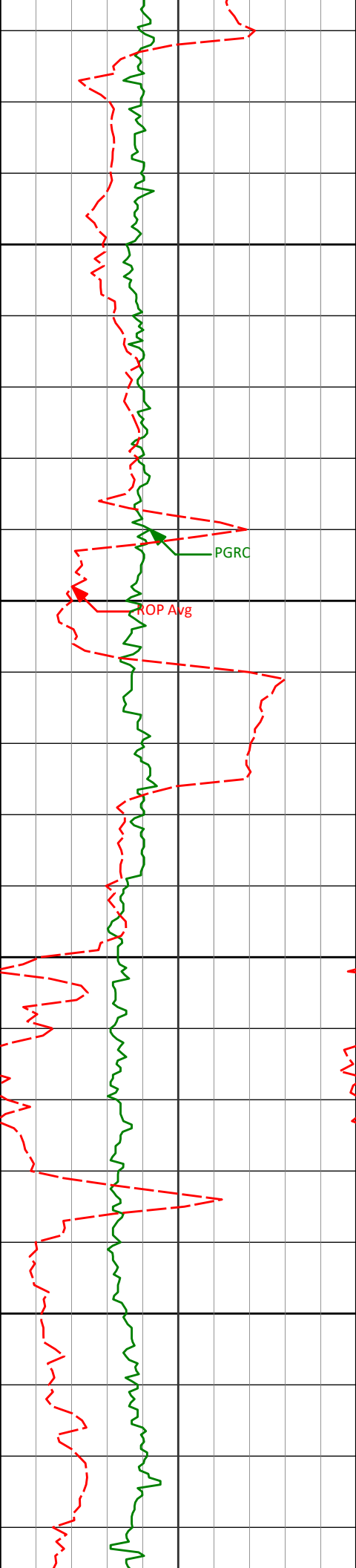
275.99° 6587.51'

569.65'





<7' casing set at 7145 MD>				
7186'	84.71°	269.82°	6655.86'	836.45'
7281'	87.04°	270.34°	6662.70'	928.46'



7376'

90.71°

270.82° 6664.56'

1020.87'

7400

7450

7471'

89.26°

269.34° 6664.59'

1113.12'

7500

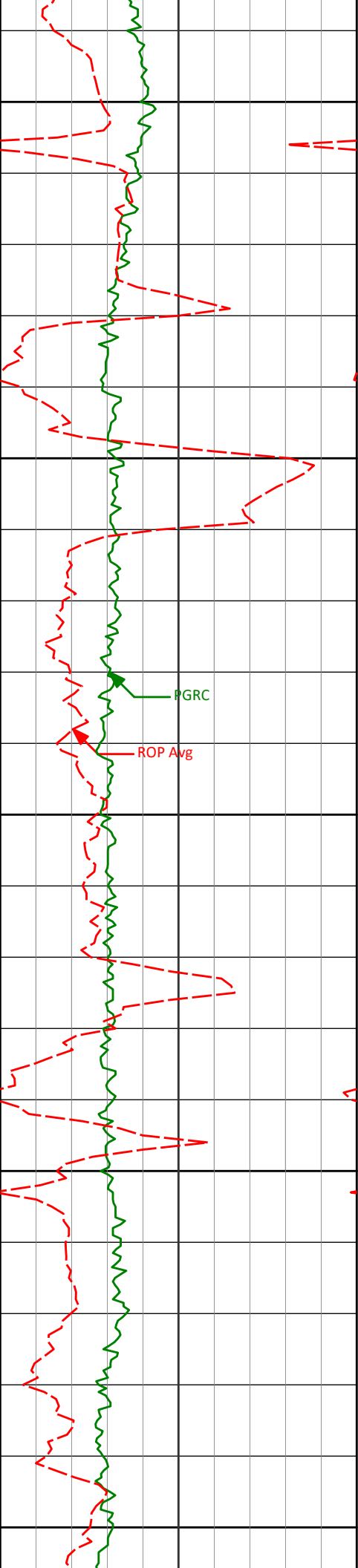
7550

7566'

91.17°

270.39° 6664.23'

1205.28'



7600

7650

7700

7750

7800

7660'

89.75°

270.01° 6663.47'

1296.61'

GRC

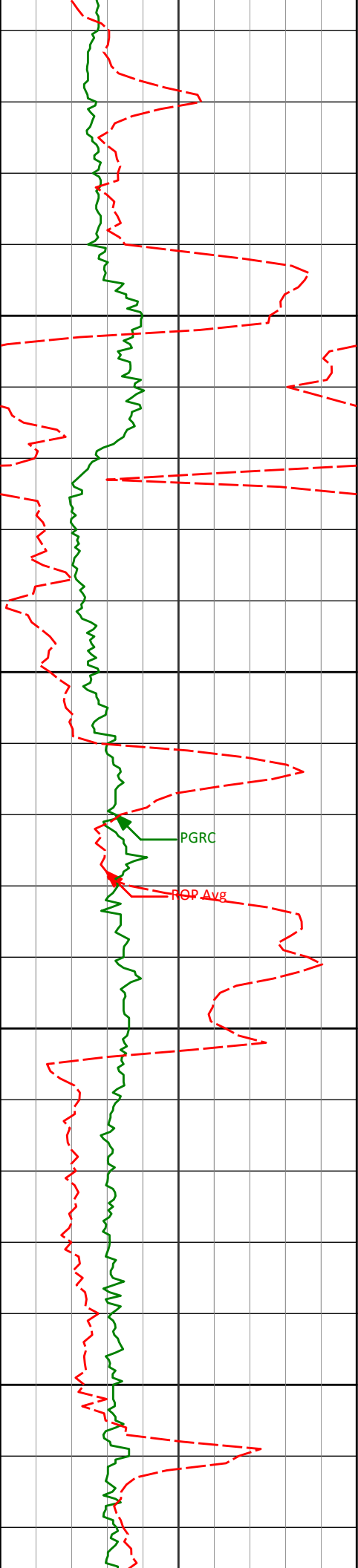
ROP Avg

7755'

90.40°

270.83° 6663.34'

1388.99'



7850

7850'

91.35°

270.77° 6661.89'

1481.51'

7900

7950

8000

7945'

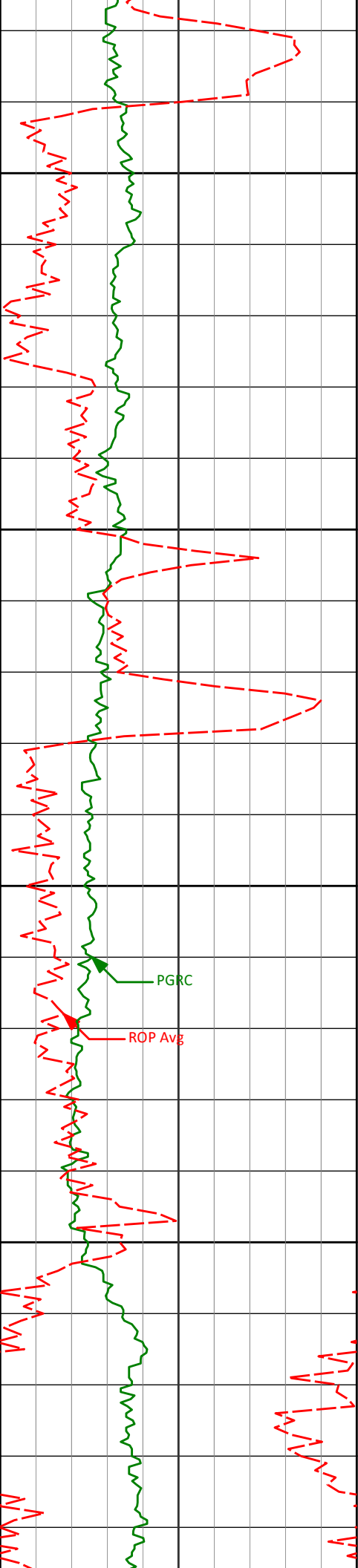
90.49°

269.86° 6660.36'

1573.84'

PGRC

ROP Avg



8040'

88.55°

268.59° 6661.15'

1665.74'

8050

8100

8135'

89.32°

269.31° 6662.91'

1757.51'

8150

PGRC

ROP Avg

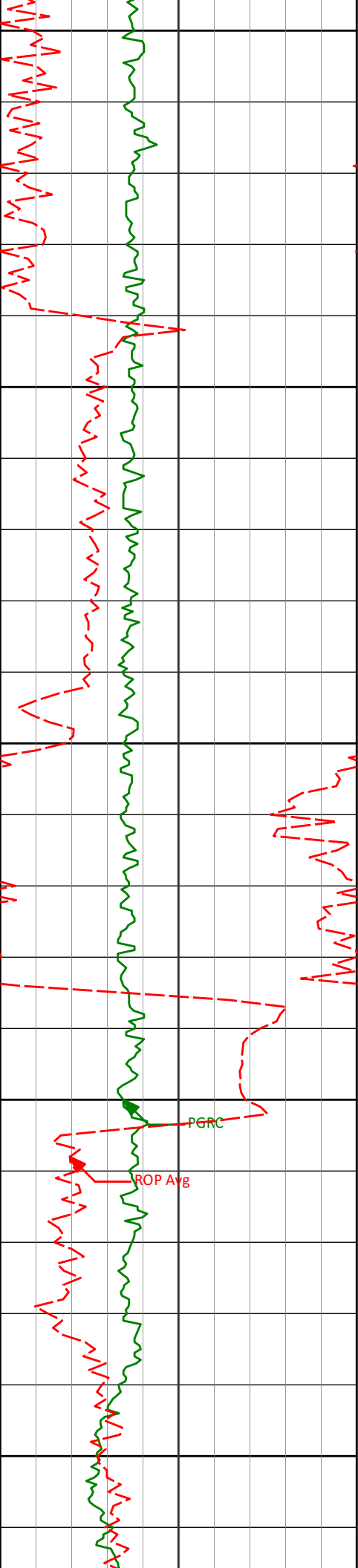
8200

8230'

89.38°

269.79° 6663.99'

1849.55'



8250

8300

8324'

90.96°

271.61° 6663.71'

1941.06'

8350

8400

ROP Avg

PGRC

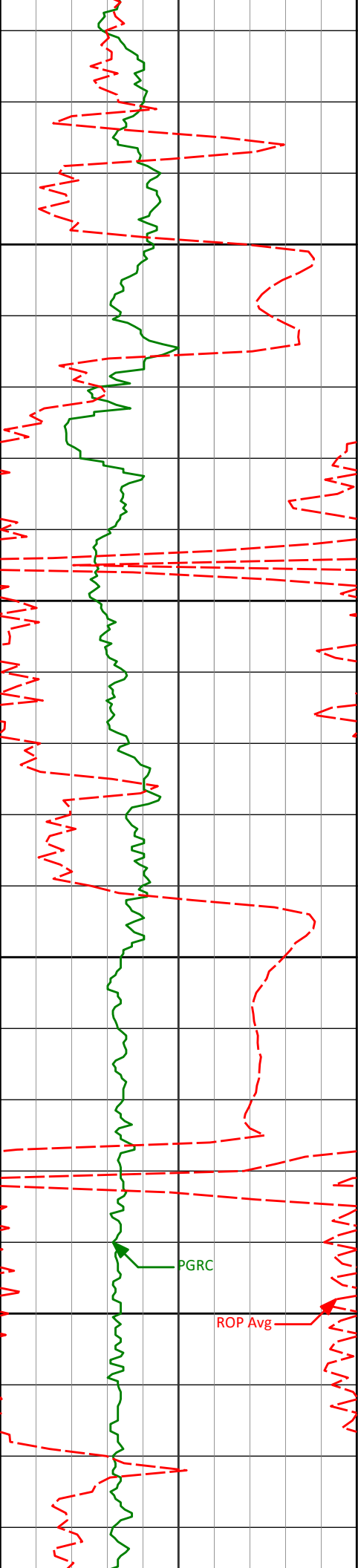
8419'

86.30°

267.31° 6665.98'

2032.99'

8450



8500

8514'

86.51°

268.05° 6671.93'

2124.03'

8550

8600

8609'

88.09°

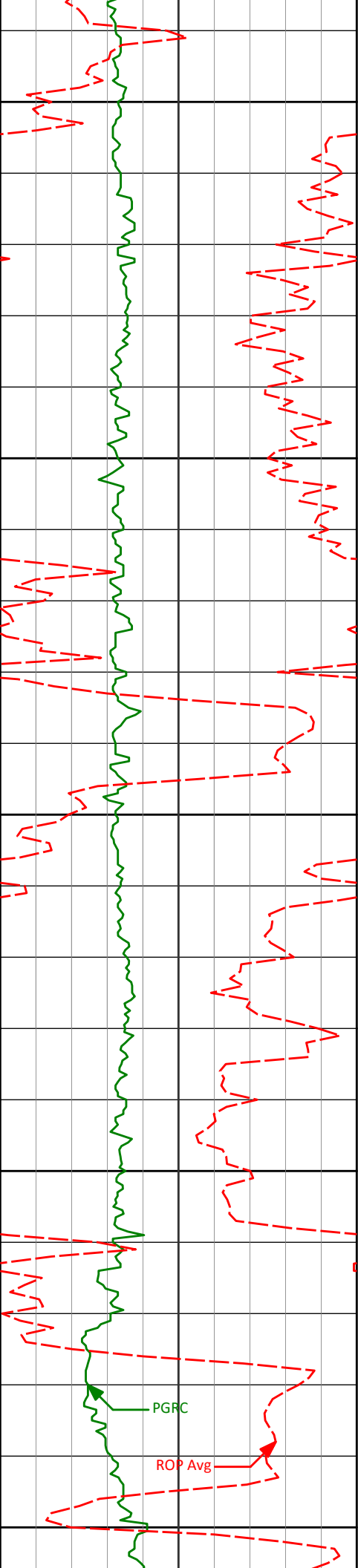
268.36° 6676.41'

2215.39'

PGRC

ROP Avg

8650



8700

8704'

91.94°

271.00° 6676.38'

2307.46'

8750

8800

8799'

92.90°

271.50° 6672.37'

2400.07'

8850

8900

8894'

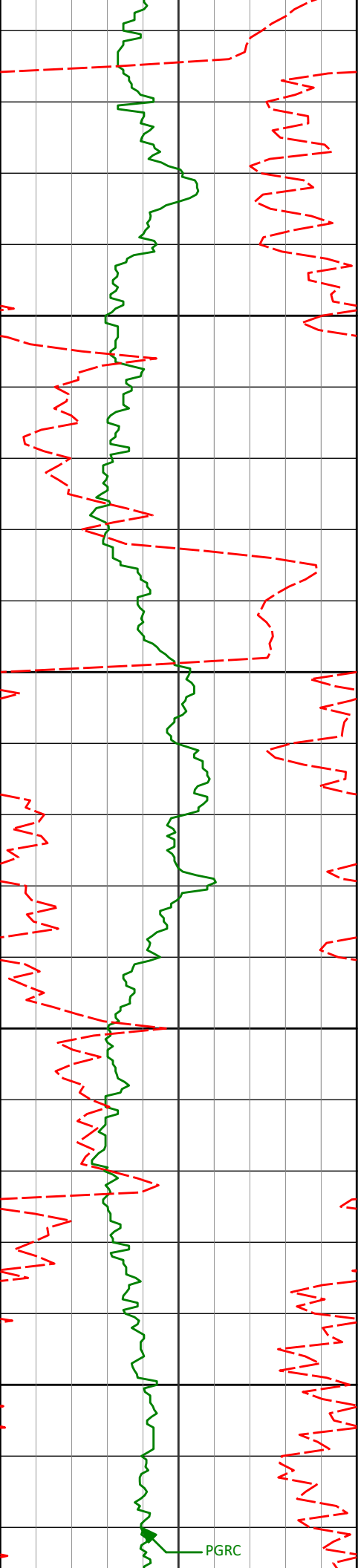
90.83°

271.12° 6669.28'

2492.73'

PGRC

ROP Avg



8950

8989'

89.63°

269.21° 6668.90'

2585.02'

9000

9050

9084'

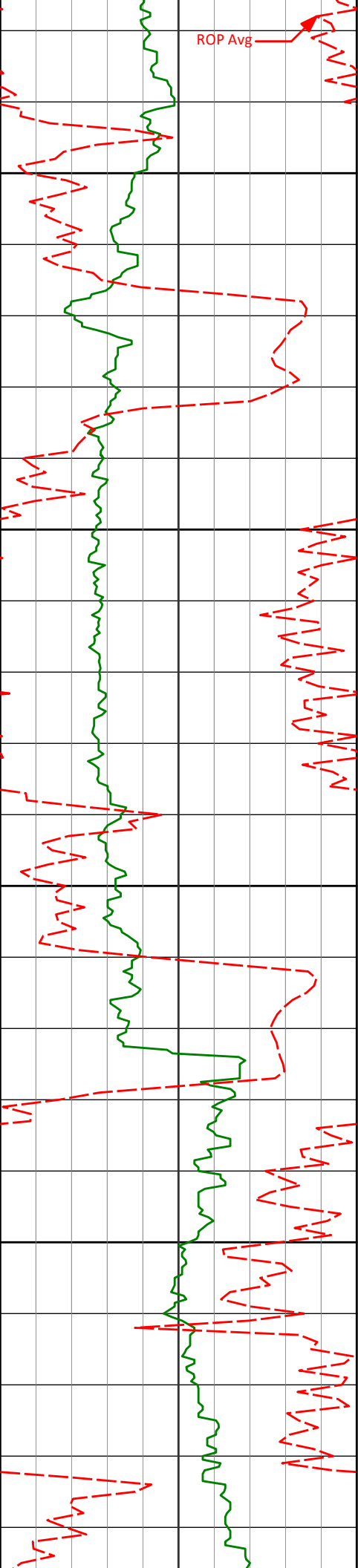
89.38°

269.25° 6669.72'

2676.92'

9100

PGRC



9150

9178'

89.41°

268.78° 6670.70'

2767.77'

9200

9250

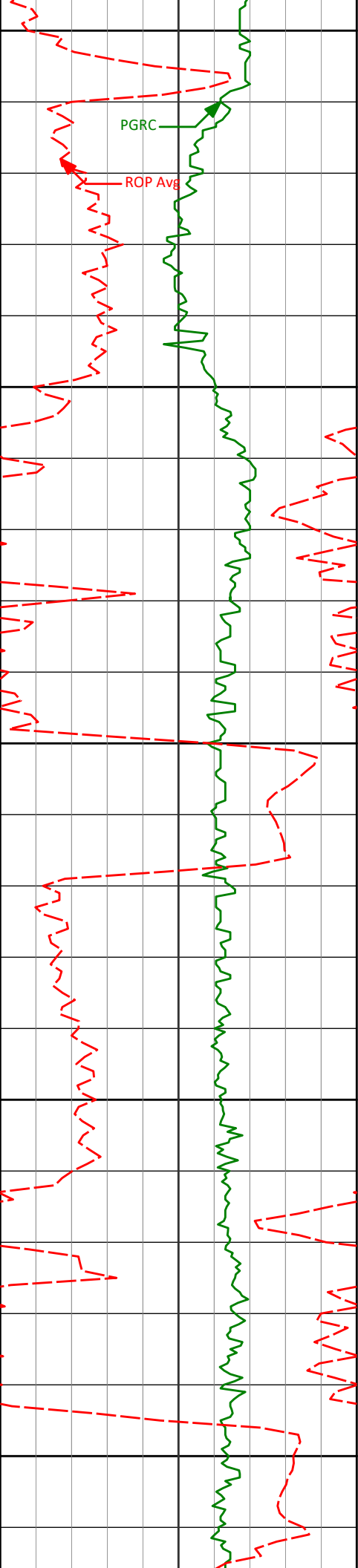
9273'

89.91°

268.40° 6671.26'

2859.40'

9300



9350

9368' 89.88° 268.73° 6671.44' 2951.02'

9400

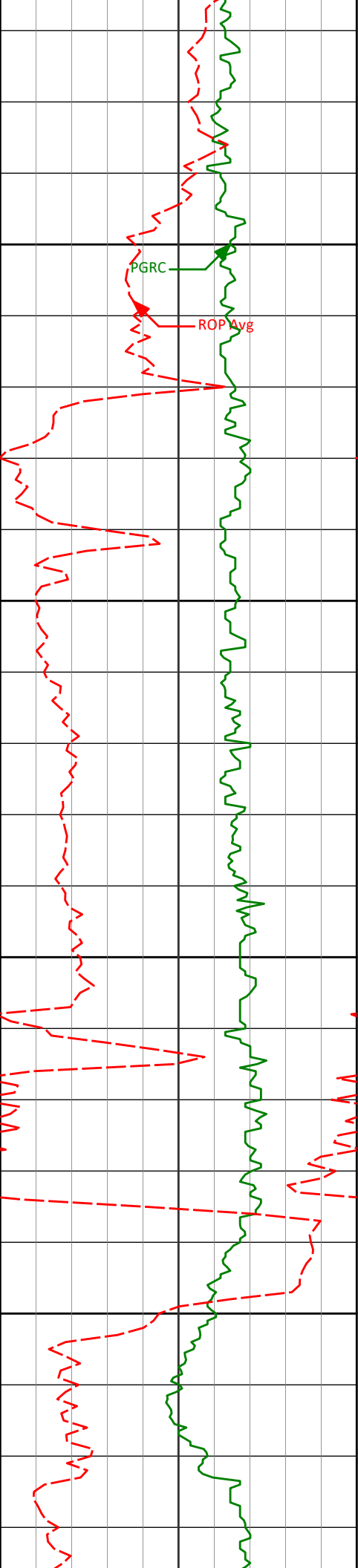
9450

9463' 90.71° 268.58° 6670.96' 3042.68'

9500

9550

9558' 91.51° 267.30° 6669.12' 3134.00'



9600

9650

9700

9750

9653'

91.23°

266.29° 6666.84'

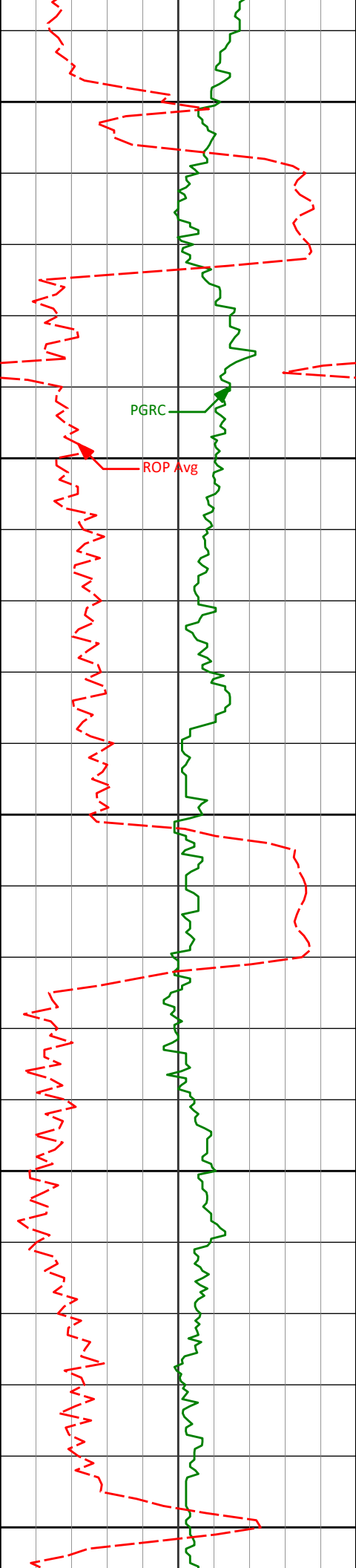
3224.78'

9748'

91.30°

267.01° 6664.75'

3315.48'



9800

9843'

92.47°

267.88° 6661.63'

3406.55'

9850

9900

9938'

92.25°

268.30° 6657.72'

3497.88'

9950

10000



10033'

91.08°

268.81° 6654.96'

3589.46'

10050

PGRC

ROP Avg

10100

10128'

89.75°

267.89° 6654.27'

3680.98'

10150

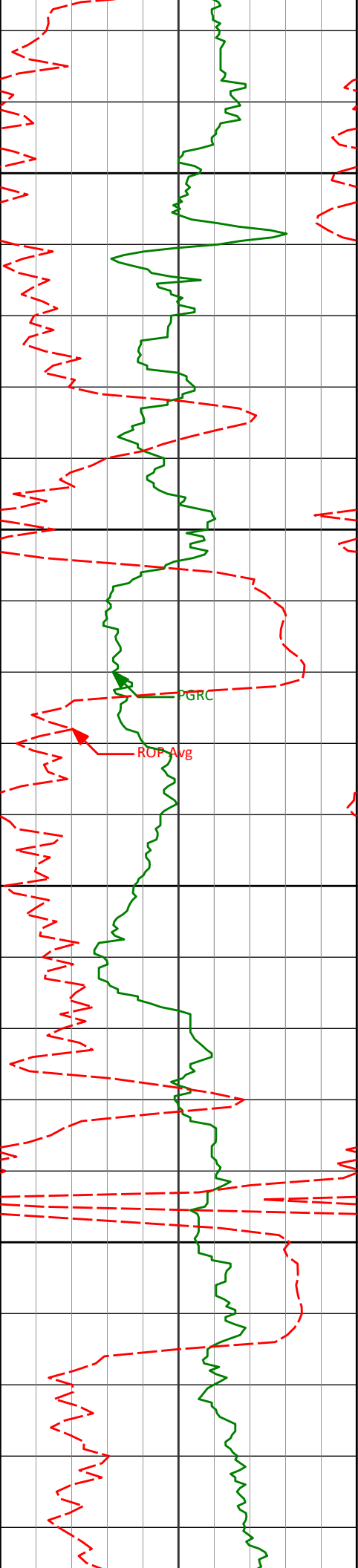
10200

10223'

88.70°

268.79° 6655.55'

3772.49'



10250

10300

10350

10400

10318'

87.70°

269.73° 6658.54'

3864.36'

GRC

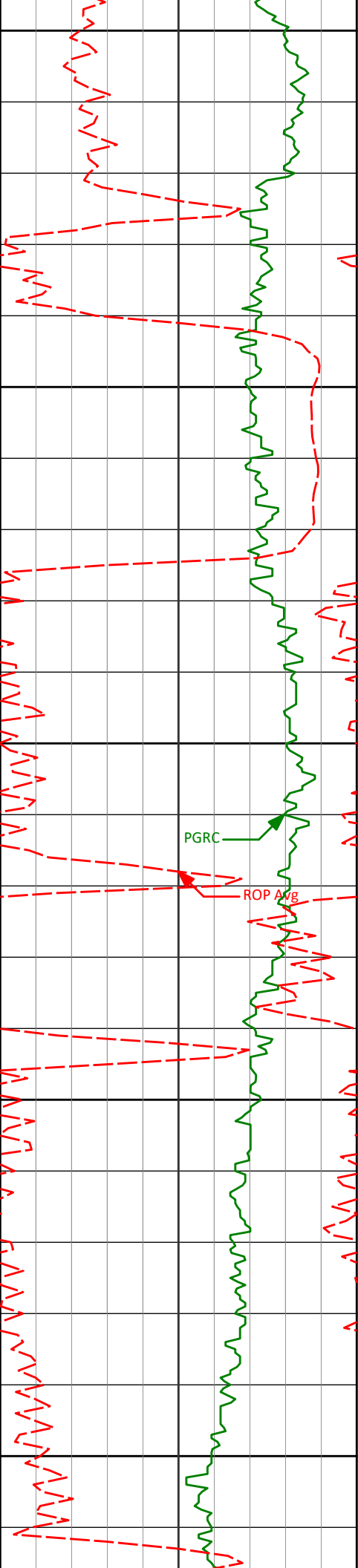
ROP Avg

10412'

87.35°

269.94° 6662.60'

3955.46'



10450

10500

10550

10600

10650

10507'

88.46°

270.32° 6666.08'

4047.67'

PGRC

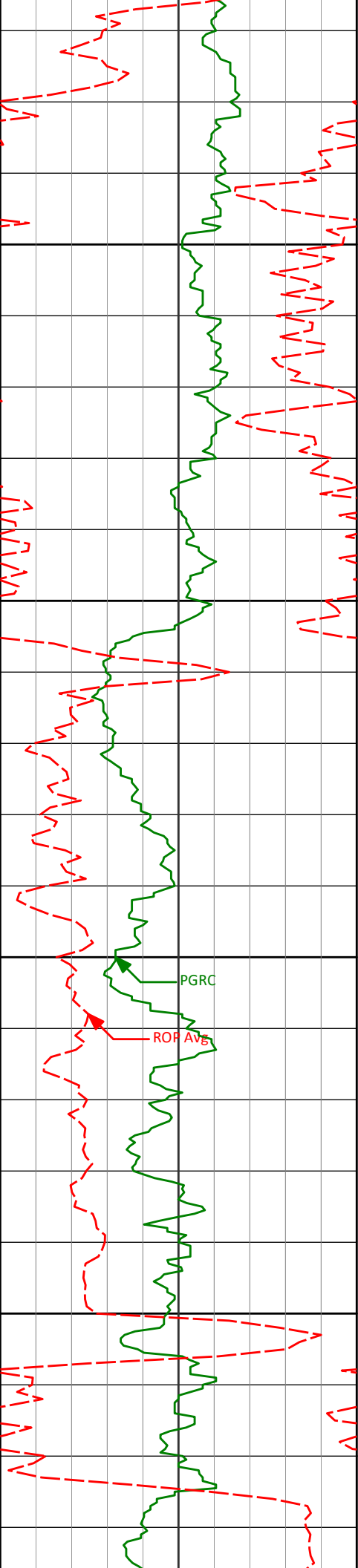
ROP Avg

10602'

89.97°

270.46° 6667.38'

4140.04'



10700

10750

10800

10850

10697'

90.06°

270.13° 6667.36'

4232.37'

10792'

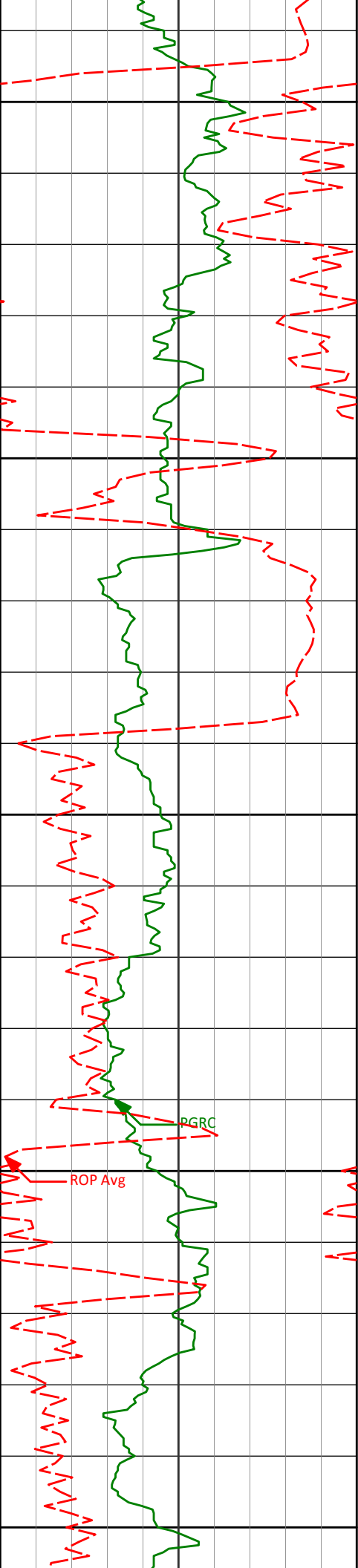
91.36°

269.15° 6666.18'

4324.44'

PGRC

ROP AVG



10900

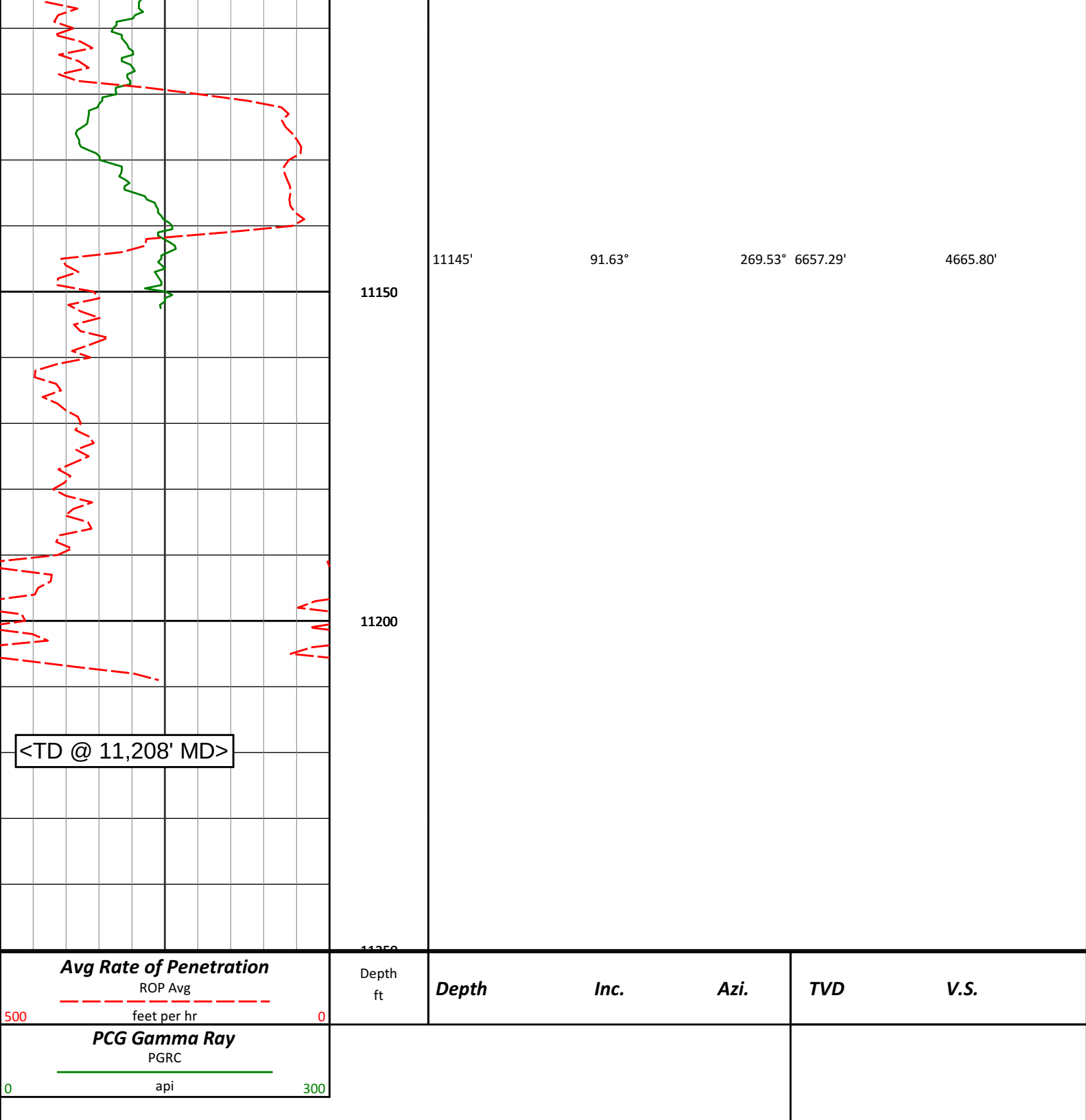
10950

11000

11050

11100

10887'	92.65°	269.05°	6662.86'	4416.24'
10982'	90.46°	269.16°	6660.27'	4508.05'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

**Noble Energy
Wells Ranch AA12-65-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0009680581**

Survey depth 664 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)
664.00	0.00	0.00	664.00	0.00 N	0.00 E	0.00	TIE-IN
708.00	0.22	268.74	708.00	0.00 S	0.09 W	0.08	0.51
987.00	0.24	255.50	987.00	0.16 S	1.20 W	1.12	0.02
1264.00	0.15	250.96	1264.00	0.43 S	2.11 W	1.95	0.03
1546.00	0.45	231.53	1545.99	1.25 S	3.35 W	2.95	0.11
1736.00	0.60	275.85	1735.98	1.61 S	4.92 W	4.39	0.22
1831.00	1.71	341.11	1830.97	0.22 S	5.88 W	5.65	1.64
1925.00	4.00	9.67	1924.85	4.34 N	5.78 W	6.65	2.79
2020.00	6.17	9.96	2019.47	12.63 N	4.34 W	7.25	2.29
2115.00	6.42	19.36	2113.90	22.68 N	1.70 W	7.09	1.11
2210.00	8.52	26.27	2208.09	34.00 N	3.18 E	5.08	2.40
2305.00	9.99	19.41	2301.85	48.08 N	9.03 E	2.78	1.93
2400.00	11.80	15.25	2395.14	65.23 N	14.33 E	1.75	2.08
2495.00	13.20	7.92	2487.89	85.35 N	18.38 E	2.65	2.22
2590.00	13.82	7.17	2580.26	107.34 N	21.29 E	5.11	0.68
2685.00	14.50	5.38	2672.37	130.45 N	23.82 E	8.19	0.86
2780.00	12.96	5.26	2764.65	152.90 N	25.91 E	11.55	1.62
2874.00	13.45	7.60	2856.17	174.24 N	28.32 E	14.33	0.77
2969.00	14.21	11.40	2948.41	196.62 N	32.09 E	16.05	1.25
3064.00	14.61	10.25	3040.43	219.84 N	36.52 E	17.32	0.51
3159.00	14.05	9.73	3132.47	242.99 N	40.61 E	18.91	0.60
3254.00	13.26	10.17	3224.78	265.09 N	44.48 E	20.46	0.84
3349.00	13.39	12.36	3317.23	286.56 N	48.76 E	21.46	0.55
3444.00	13.15	12.78	3409.69	307.85 N	53.51 E	21.96	0.27
3538.00	12.57	10.93	3501.33	328.32 N	57.81 E	22.69	0.76
3633.00	12.76	8.97	3594.02	348.83 N	61.41 E	24.13	0.49
3728.00	14.09	9.36	3686.42	370.60 N	64.92 E	25.94	1.41
3823.00	14.73	9.71	3778.43	393.92 N	68.84 E	27.73	0.67
3918.00	15.57	9.95	3870.13	418.38 N	73.08 E	29.49	0.89
4013.00	16.30	9.78	3961.48	444.07 N	77.55 E	31.32	0.77
4108.00	15.23	8.52	4052.91	469.54 N	81.66 E	33.45	1.18
4203.00	14.52	7.56	4144.72	493.69 N	85.08 E	35.93	0.79
4298.00	13.36	6.72	4236.92	516.40 N	87.93 E	38.61	1.24
4392.00	13.35	4.63	4328.38	538.00 N	90.08 E	41.71	0.51
4487.00	13.26	2.58	4420.83	559.82 N	91.45 E	45.61	0.51
4582.00	13.11	1.70	4513.33	581.47 N	92.26 E	50.02	0.26
4677.00	12.68	4.39	4605.93	602.64 N	93.38 E	54.02	0.78
4772.00	12.23	6.58	4698.70	623.03 N	95.33 E	57.02	0.69
4867.00	12.84	5.66	4791.43	643.52 N	97.52 E	59.81	0.68
4962.00	13.91	3.82	4883.86	665.43 N	99.33 E	63.32	1.21
5057.00	14.65	9.33	4975.92	688.68 N	102.04 E	66.27	1.63
5151.00	13.66	8.94	5067.07	711.37 N	105.69 E	68.17	1.07
5246.00	13.17	12.97	5159.48	733.00 N	109.86 E	69.31	1.11
5341.00	12.61	12.70	5252.08	753.66 N	114.57 E	69.70	0.60
5436.00	13.33	10.95	5344.66	774.53 N	118.93 E	70.48	0.86
5531.00	12.94	6.58	5437.18	795.85 N	122.23 E	72.39	1.12
5626.00	13.89	5.94	5529.58	817.75 N	124.63 E	75.32	1.00
5721.00	14.94	7.60	5621.59	841.23 N	127.43 E	78.24	1.19
5816.00	15.44	5.77	5713.28	865.95 N	130.32 E	81.37	0.73
5945.00	14.71	359.77	5837.84	899.41 N	131.98 E	87.79	1.34
6052.00	15.14	348.88	5941.26	926.71 N	129.23 E	97.01	2.65
6097.00	18.66	336.53	5984.32	939.09 N	125.23 E	103.87	11.14
6145.00	22.40	328.62	6029.27	953.95 N	117.40 E	115.04	9.69
6192.00	23.65	328.27	6072.52	969.62 N	107.78 E	128.14	2.66
6240.00	25.98	328.22	6116.09	986.74 N	97.18 E	142.54	4.86
6287.00	27.72	325.67	6158.02	1004.52 N	85.59 E	158.06	4.43
6335.00	30.89	318.19	6199.89	1022.94 N	71.07 E	176.57	10.08
6382.00	33.77	312.53	6239.61	1040.77 N	53.40 E	198.01	8.89
6430.00	36.37	308.69	6278.90	1058.69 N	32.45 E	222.64	7.11
6476.00	38.89	305.32	6315.33	1075.56 N	10.02 E	248.47	7.06
6524.00	41.26	300.02	6352.07	1092.20 N	15.99 W	277.72	8.65
6571.00	43.00	296.07	6386.93	1107.00 N	43.81 W	308.28	6.75
6619.00	44.99	292.98	6421.46	1120.82 N	74.15 W	341.04	6.09
6666.00	47.07	289.51	6454.10	1133.05 N	105.67 W	374.58	6.91
6714.00	49.88	285.90	6485.92	1143.96 N	139.90 W	410.42	8.13
6761.00	53.91	281.34	6514.93	1152.62 N	175.83 W	447.38	11.47
6809.00	58.40	278.22	6541.66	1159.36 N	215.10 W	487.12	10.79

6856.00	61.01	276.62	6565.37	1164.59 N	255.34 W	527.44	6.29
6904.00	64.05	275.99	6587.51	1169.26 N	297.66 W	569.65	6.44
6951.00	69.16	274.82	6606.17	1173.31 N	340.59 W	612.29	11.11
6999.00	73.51	273.86	6621.53	1176.75 N	385.92 W	657.13	9.25
7100.00	80.15	271.39	6644.54	1181.22 N	484.10 W	753.51	6.99
7186.00	84.71	269.82	6655.86	1182.11 N	569.32 W	836.45	5.60
7281.00	87.04	270.34	6662.70	1182.25 N	664.07 W	928.46	2.51
7376.00	90.71	270.82	6664.56	1183.21 N	759.03 W	1020.87	3.89
7471.00	89.26	269.34	6664.59	1183.34 N	854.02 W	1113.12	2.18
7566.00	91.17	270.39	6664.23	1183.12 N	949.02 W	1205.28	2.30
7660.00	89.75	270.01	6663.47	1183.45 N	1043.01 W	1296.61	1.56
7755.00	90.40	270.83	6663.34	1184.14 N	1138.01 W	1388.99	1.10
7850.00	91.35	270.77	6661.89	1185.47 N	1232.99 W	1481.51	1.01
7945.00	90.49	269.86	6660.36	1185.99 N	1327.97 W	1573.84	1.32
8040.00	88.55	268.59	6661.15	1184.70 N	1422.95 W	1665.74	2.44
8135.00	89.32	269.31	6662.91	1182.96 N	1517.92 W	1757.51	1.11
8230.00	89.38	269.79	6663.99	1182.22 N	1612.91 W	1849.55	0.51
8324.00	90.96	271.61	6663.71	1183.37 N	1706.89 W	1941.06	2.56
8419.00	86.30	267.31	6665.98	1182.47 N	1801.81 W	2032.99	6.67
8514.00	86.51	268.05	6671.93	1178.63 N	1896.55 W	2124.03	0.81
8609.00	88.09	268.36	6676.41	1175.66 N	1991.39 W	2215.39	1.69
8704.00	91.94	271.00	6676.38	1175.13 N	2086.37 W	2307.46	4.91
8799.00	92.90	271.50	6672.37	1177.20 N	2181.26 W	2400.07	1.14
8894.00	90.83	271.12	6669.28	1179.37 N	2276.18 W	2492.73	2.21
8989.00	89.63	269.21	6668.90	1179.64 N	2371.17 W	2585.02	2.38
9084.00	89.38	269.25	6669.72	1178.37 N	2466.16 W	2676.92	0.26
9178.00	89.41	268.78	6670.70	1176.75 N	2560.14 W	2767.77	0.50
9273.00	89.91	268.40	6671.26	1174.42 N	2655.11 W	2859.40	0.66
9368.00	89.88	268.73	6671.44	1172.04 N	2750.08 W	2951.02	0.35
9463.00	90.71	268.58	6670.96	1169.81 N	2845.05 W	3042.68	0.89
9558.00	91.51	267.30	6669.12	1166.40 N	2939.97 W	3134.00	1.59
9653.00	91.23	266.29	6666.84	1161.09 N	3034.79 W	3224.78	1.10
9748.00	91.30	267.01	6664.75	1155.53 N	3129.60 W	3315.48	0.76
9843.00	92.47	267.88	6661.63	1151.30 N	3224.45 W	3406.55	1.54
9938.00	92.25	268.30	6657.72	1148.14 N	3319.32 W	3497.88	0.49
10033.00	91.08	268.81	6654.96	1145.74 N	3414.25 W	3589.46	1.34
10128.00	89.75	267.89	6654.27	1143.00 N	3509.20 W	3680.98	1.70
10223.00	88.70	268.79	6655.55	1140.25 N	3604.15 W	3772.49	1.46
10318.00	87.70	269.73	6658.54	1139.03 N	3699.10 W	3864.36	1.45
10412.00	87.35	269.94	6662.60	1138.76 N	3793.01 W	3955.46	0.43
10507.00	88.46	270.32	6666.08	1138.97 N	3887.94 W	4047.67	1.23
10602.00	89.97	270.46	6667.38	1139.61 N	3982.93 W	4140.04	1.60
10697.00	90.06	270.13	6667.36	1140.11 N	4077.93 W	4232.37	0.36
10792.00	91.36	269.15	6666.18	1139.51 N	4172.91 W	4324.44	1.71
10887.00	92.65	269.05	6662.86	1138.03 N	4267.84 W	4416.24	1.37
10982.00	90.46	269.16	6660.27	1136.54 N	4362.79 W	4508.05	2.31
11145.00	91.63	269.53	6657.29	1134.68 N	4525.75 W	4665.80	0.75
11208.00	91.63	269.53	6655.50	1134.16 N	4588.72 W	4726.81	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 283.88 DEGREES (GRID)
A TOTAL CORRECTION OF 7.83 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11208.00 FEET
IS 4726.81 FEET ALONG 283.88 DEGREES (GRID)**