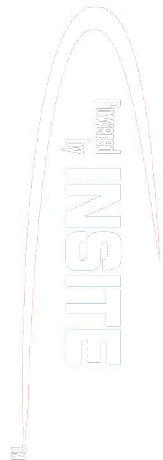


**PCDC - Pressure Case Directional**  
**PCGK - Pressure Case Gamma**

**1 : 240**

Country		: USA		Company : Noble Energy			
Field		: Wattenberg		Rig : H&P 322			
Location		: Lat: 40° 13' 7.93" North Long: 104° 28' 10.81" West		Well : Guttersen State DD17-79-1HN			
Well		: Guttersen State DD17-79-1HN		Field : Wattenberg			
Company		: Noble Energy		Country : USA			
Rig		: H&P 322		API Number : 05-123-38013			
LOCATION		Latitude : 40° 13' 7.93" North Longitude : 104° 28' 10.81" West		Other Services Directional Drilling			
		UTM Easting = 3287717.938 ft UTM Northing = 1324247.835 ft					
Permanent Datum : Ground Level		Elevation : 4820.00 ft		Elev.		KB N/A	
Log Measured From : Drill Floor		24.00 ft Above Permanent Datum		DF 4844.00 ft GL 4820.00 ft WD N/A			
Drilling Measured From : Drill Floor		MD LOG					
Depth Logged : 851.00 ft To 11,502.00 ft		Unit No. : 11210425		Job No. :CA-XX-0900894765			
Date Logged : 09-Dec-13 To 16-Dec-13		Plot Type : Final					
Total Depth MD : 11,502.00 ft TVD : 6,605.78 ft		Plot Date : 17-Dec-13					
Spud Date : 08-Dec-13							
Run No.	Borehole Record (MD)			Run No.	Borehole Record (MD)		
	Size	From	To		Size	From	To
2	8.750 in	851.00 ft	5,833.00 ft				
3	8.750 in	5,833.00 ft	6,973.00 ft				
4	6.125 in	6,973.00 ft	10,532.00 ft				
5	6.125 in	10,532.00 ft	11,502.00 ft				
				Casing Record (MD)			
	Size	Weight	From	To			

**WELL INFORMATION**

MWD Run Number	100	200	300	400	
Date run completed	11-Dec-13	12-Dec-13	15-Dec-13	16-Dec-13	
Rig Bit Number	2	3	4	5	
Bit Size (in)	8.750	8.750	6.125	6.125	
Tool Nominal OD (in)	6.750	6.750	4.750	4.750	
Log Start Depth (TVD, ft)	850.98	5,811.24	6,590.35	6,601.84	
Log End Depth (TVD, ft)	5,811.24	6,590.35	6,601.84	6,605.78	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	10-Dec-13 06:00	11-Dec-13 05:30	13-Dec-13 14:25	15-Dec-13 14:42	
Drill/Wipe End Date and Time	10-Dec-13 21:15	12-Dec-13 03:30	15-Dec-13 01:30	16-Dec-13 00:45	
Min Inc (deg) @ Depth (TVD, ft)	0.00 @ 0.00	1.90 @ 5,810.24	85.53 @ 6,598.03	89.01 @ 6,602.82	
Max Inc (deg) @ Depth (TVD, ft)	13.28 @ 2,696.00	85.00 @ 6,590.35	92.68 @ 6,612.27	90.77 @ 6,606.49	
Bit TFA(in2) / Bit Type	0.75 / PDC	0.90 / PDC	0.86 / PDC	0.86 / PDC	
Flow Rate (gpm)	541.41	534.90	271.00	271.00	
Max AV (fpm) / CV (fpm) @ MWD	462.9 / 462.9	405.9 / 405.9	529.2 / 529.2	529.2 / 529.2	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	9.00 / 34.00	10.75 / 38.00	9.70 / 35.00	9.70 / 36.00	
Filtrate CL (ppm)	22.00	2,400.00	2,400.00	2,200.00	
pH / Fluid Loss (mptm)	8.20 / N/A	9.60 / N/A	8.80 / N/A	8.50 / N/A	
PV (cP) / YP (lbf2)	3 / 3.00	10 / 9.00	8 / 8.00	8 / 9.00	
% Solids / % Sand	0.90 / 0.10	11.20 / 0.50	7.00 / 0.90	6.80 / 0.60	
% Oil / Oil:Water Ratio	N/A / N/A	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	N/A @ N/A	
Rmf @ Measured Temp (degF)	N/A @ N/A	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	N/A @ N/A	

Max Tool Temp (degF) / Source	145.90 / PCM	162.80 / PCM	217.60 / PCM	221.80 / PCM	
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Lead MWD Engineer	Robert Ley	Robert Ley	Garry Igunbor	Garry Igunbor	
Customer Representative	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz	

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.84	5.84	5.84	5.84	
Sub Serial Number	11341341	11341341	12187587	12187587	
Insert Serial Number	11680106	11680106	12001055	11680106	
Date and Time Initialized	09-Dec-13 11:42	09-Dec-13 11:42	12-Dec-13 13:26	15-Dec-13 05:14	
Date and Time Read	12-Dec-13 09:50	12-Dec-13 09:40	15-Dec-13 11:02	16-Dec-13 12:07	
ECMB SW Version	N/A	N/A	N/A	N/A	

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	59.00	56.00	53.00	53.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11341341	11341341	12187587	12187587	
Sonde Serial Number	12174582	12174582	11833221	12174582	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	309.60	93.08	301.00	347.25	

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	51.98	49.41	46.34	46.41	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	11341341	11341341	12187587	12187587	
Insert/Sonde Serial Number	12037396	12037396	12071301	12037396	

## REMARKS

1. All depths are measured depths and are calibrated to the driller' pipe tally and are measured from the 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.
4. The Following smoothing parameters have been applied to the data"

PGXR (Gamma Ray CG):  
Interval Resolution: 0.5 feet  
Coercion Distance: 0.6 feet  
Gap Fill: 3.0 feet

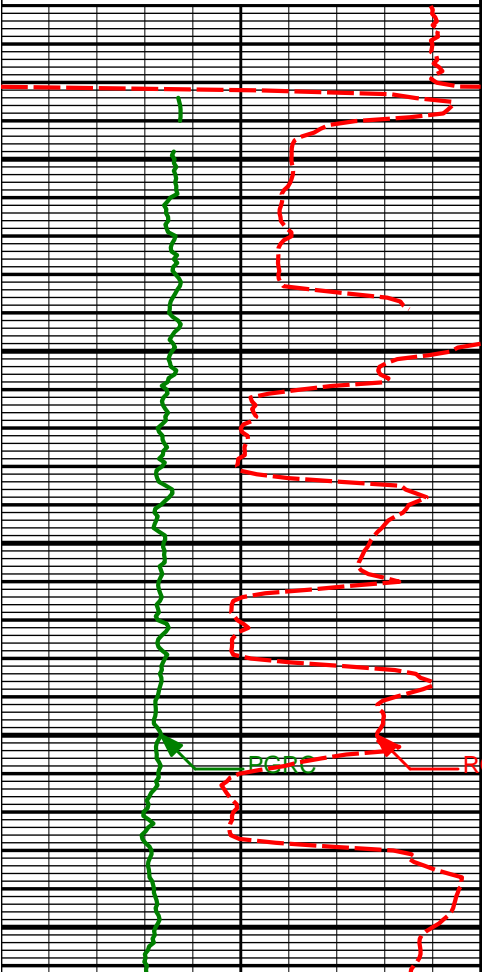
ROPA (Rate of Penetration):  
Interval Resolution: 0.5 feet  
Coercion Distance: 1.2 feet

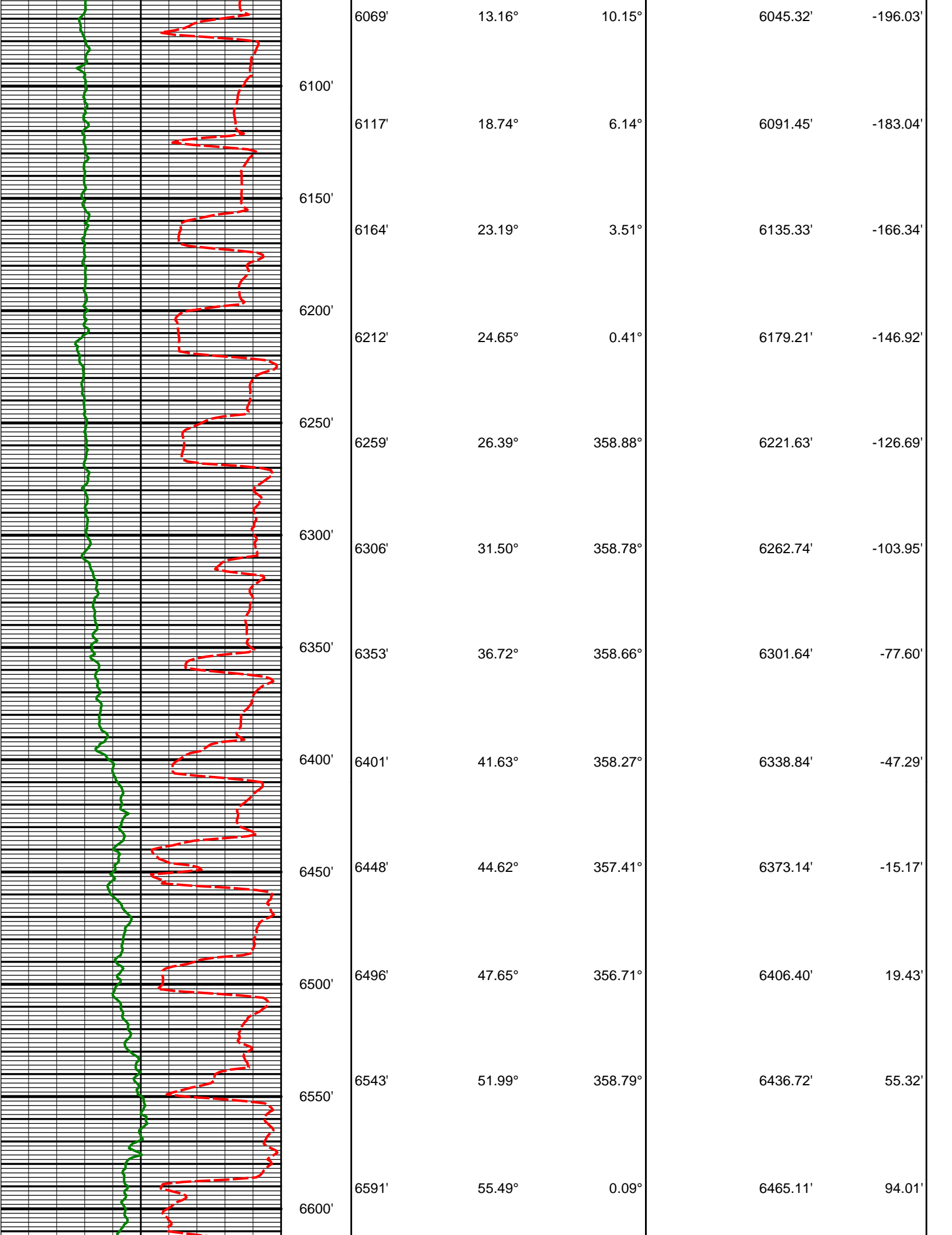
## WARRANTY

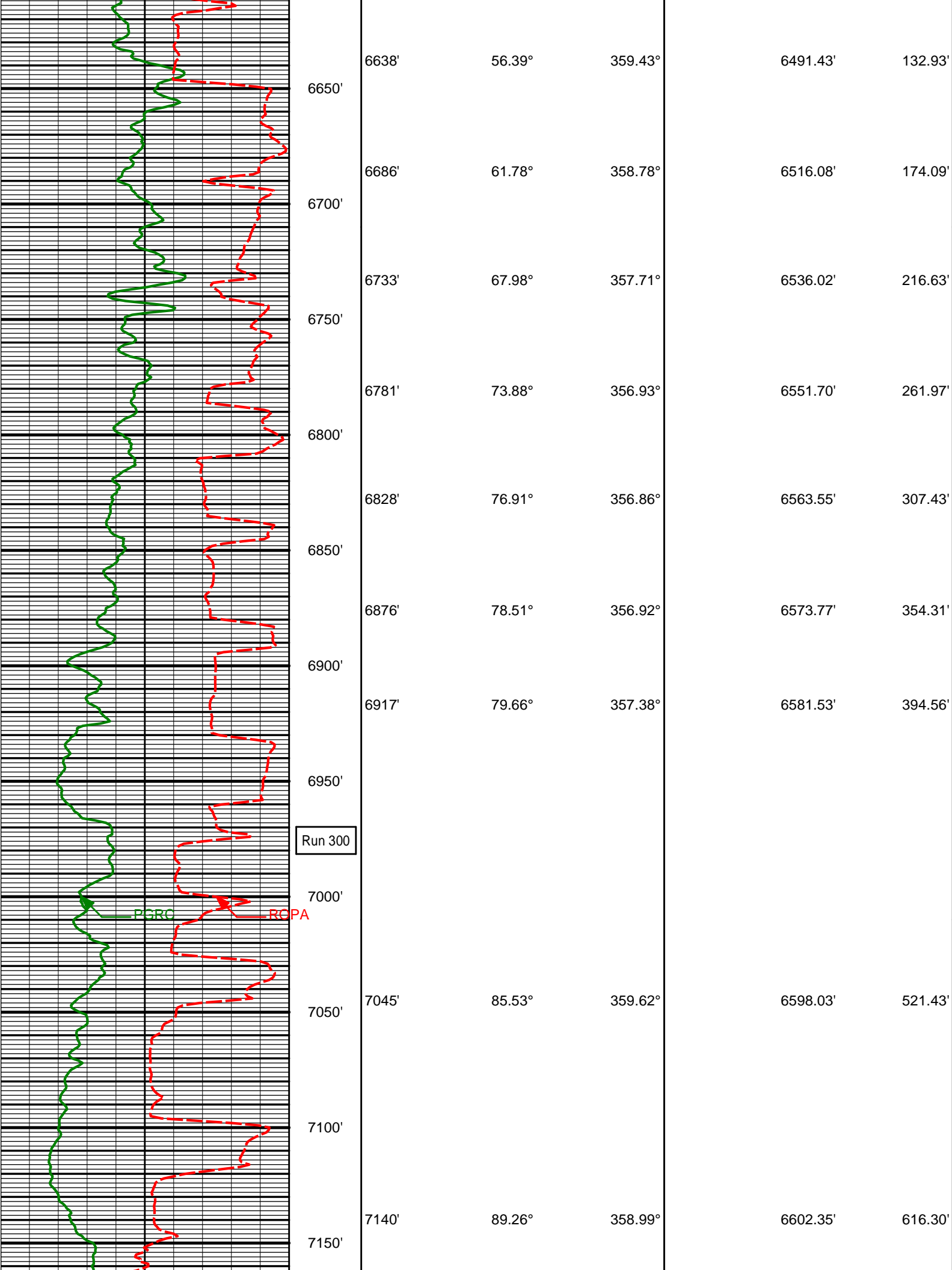
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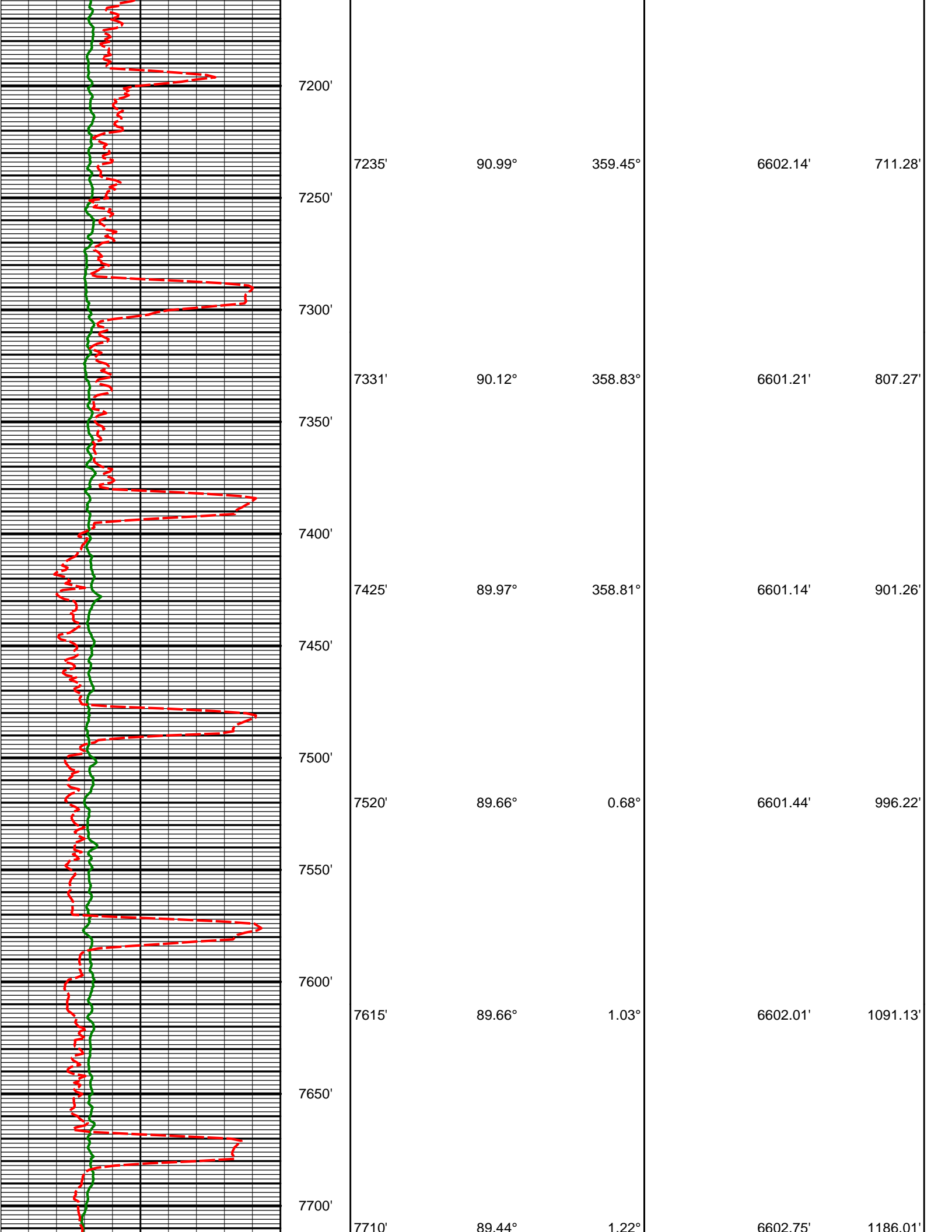
# HALLIBURTON

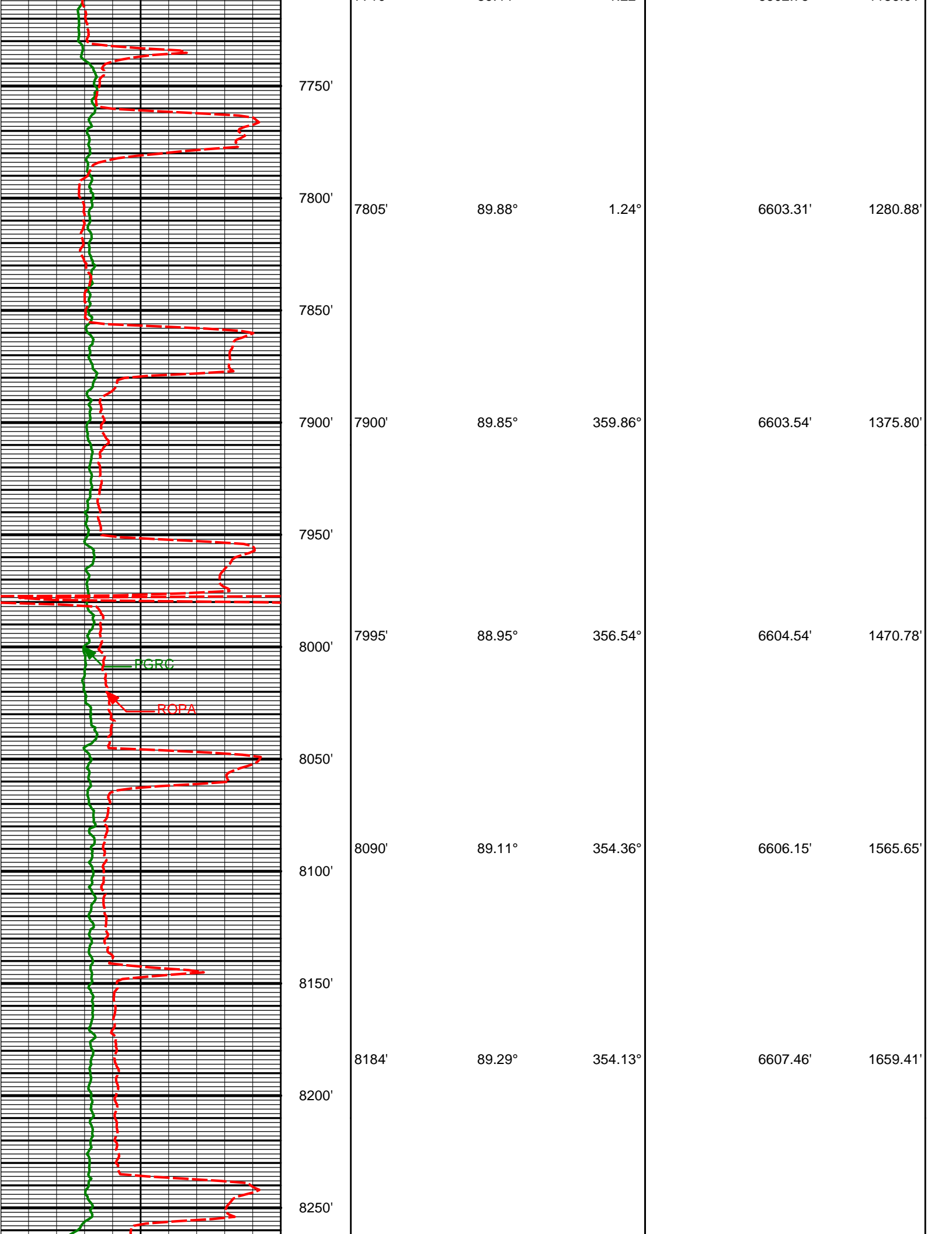
## MD Detail Log 1:600

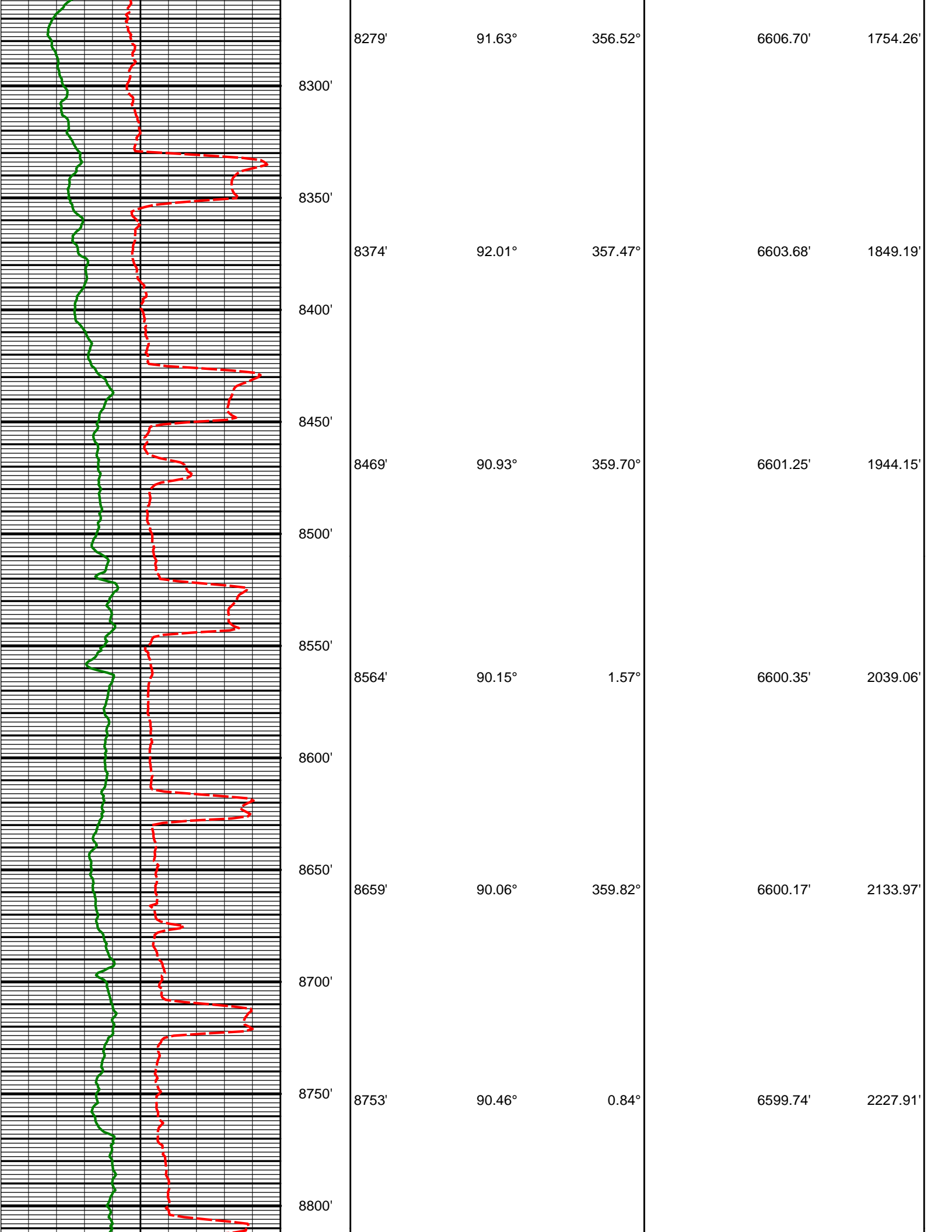
Gamma Ray (PGXC) (Api)						
0300						
Avg Rate of Penetration feet per hr	Feet					
6000						
		Depth	Inc	Azm	TVD	Vsec
	Run 200	5832'	1.90°	357.82°	5810.24'	-222.32'
	5850'					
		5879'	2.56°	350.21°	5857.20'	-220.50'
	KOP	5900'				
		5927'	5.14°	6.75°	5905.09'	-217.31'
	5950'					
		5974'	8.16°	11.20°	5951.77'	-211.98'
	6000'					
	ROP	6022'	9.20°	11.76°	5999.22'	-204.93'
	6050'					



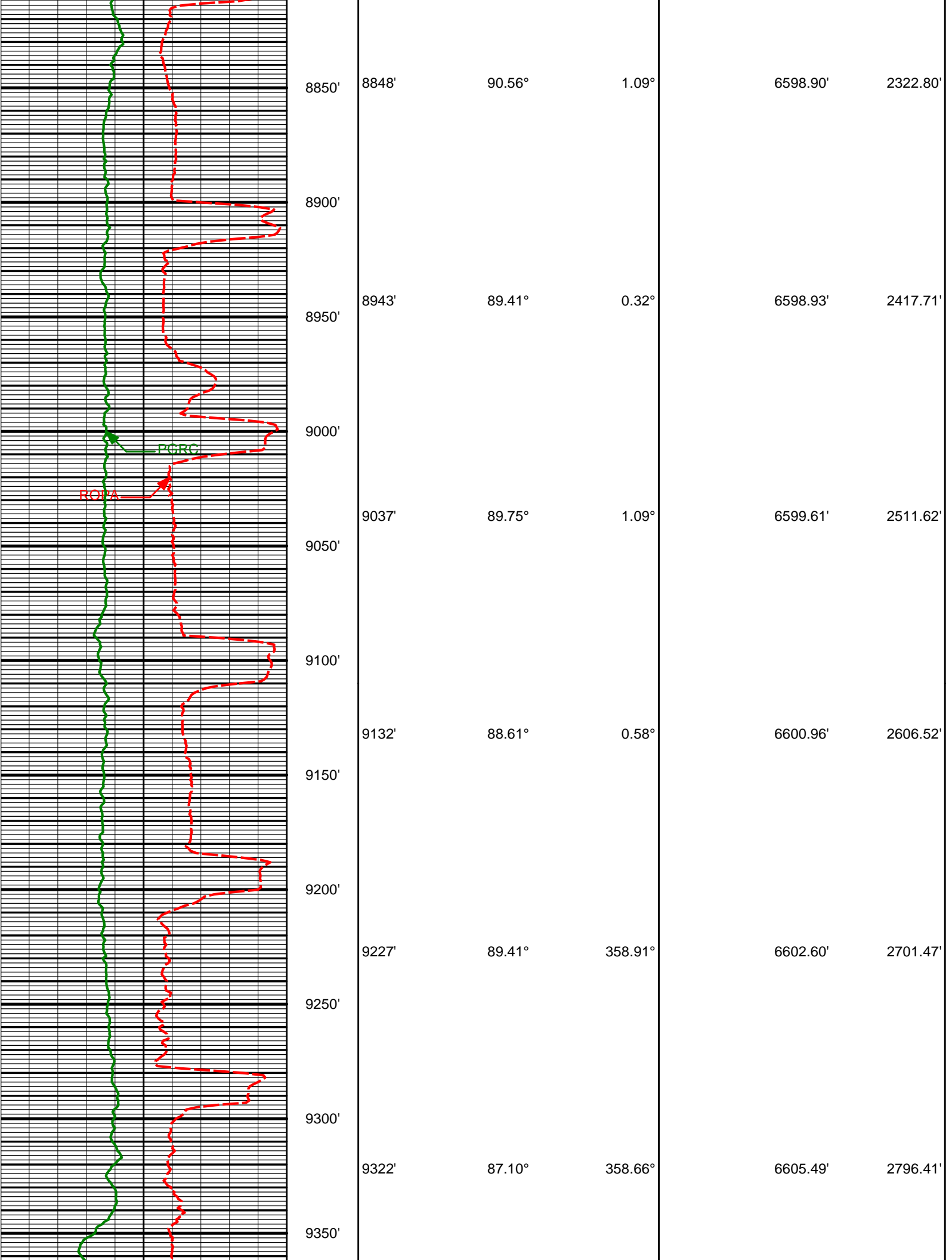


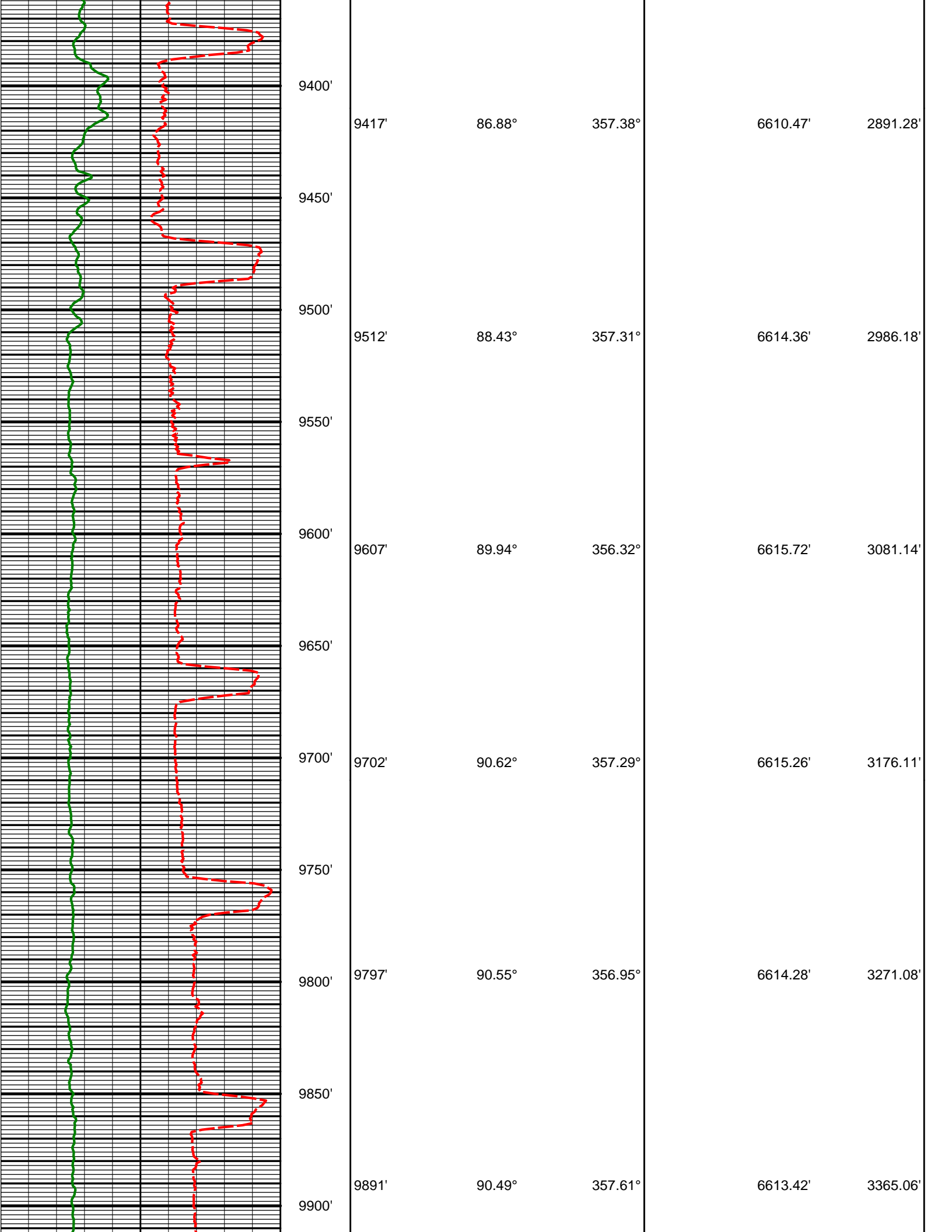


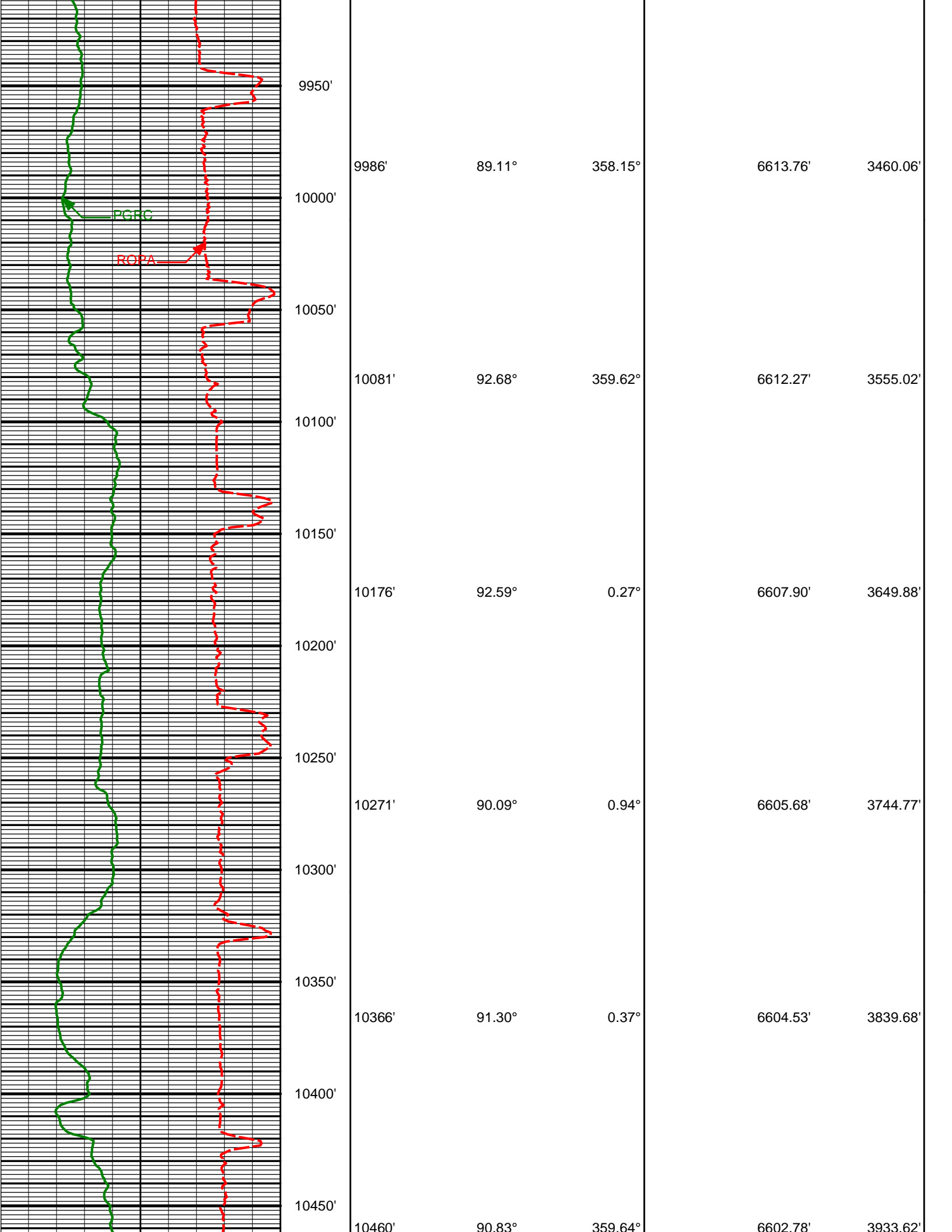


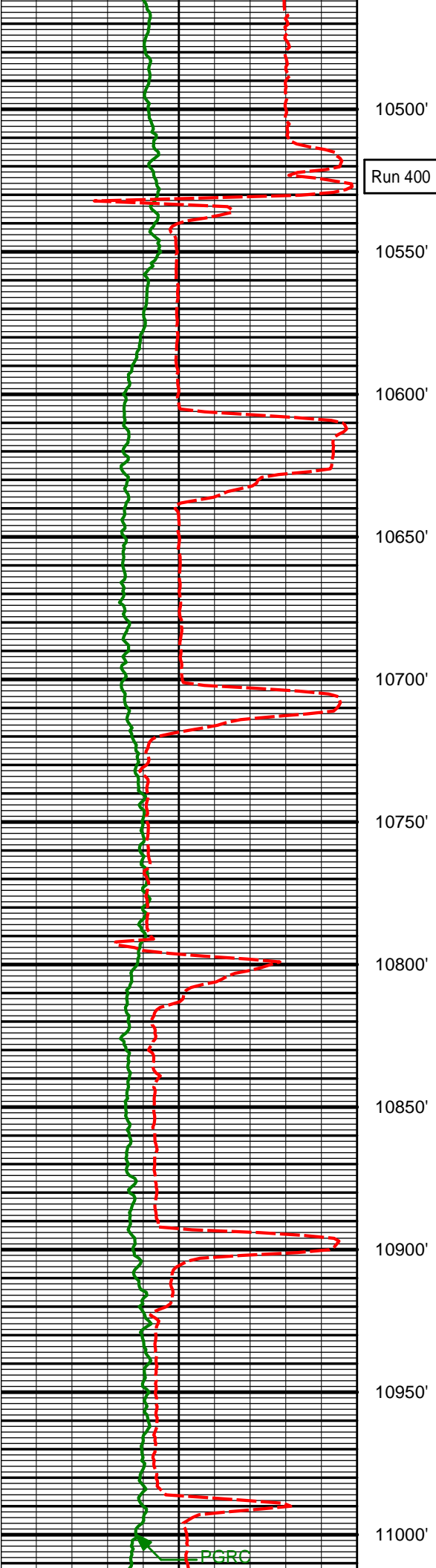








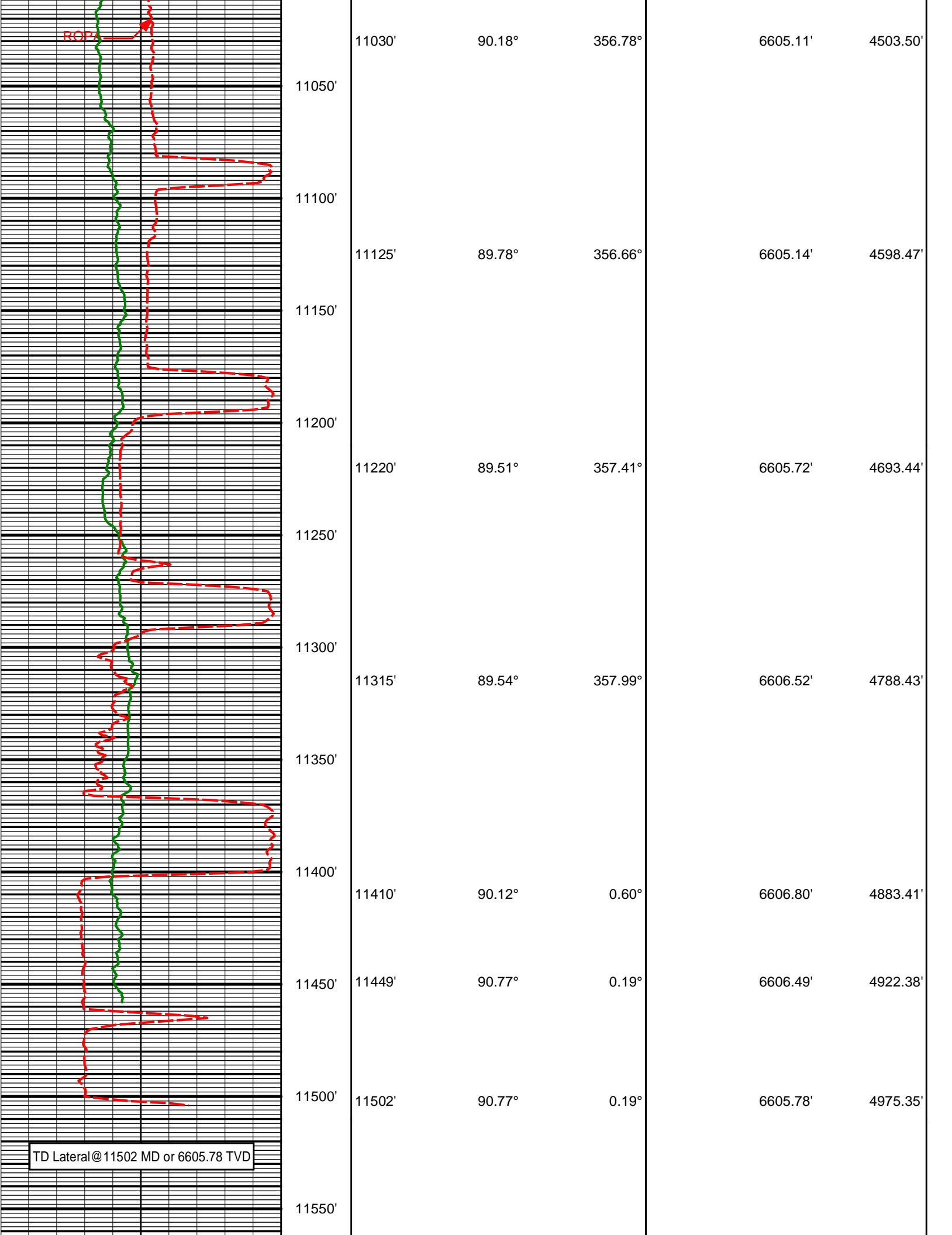




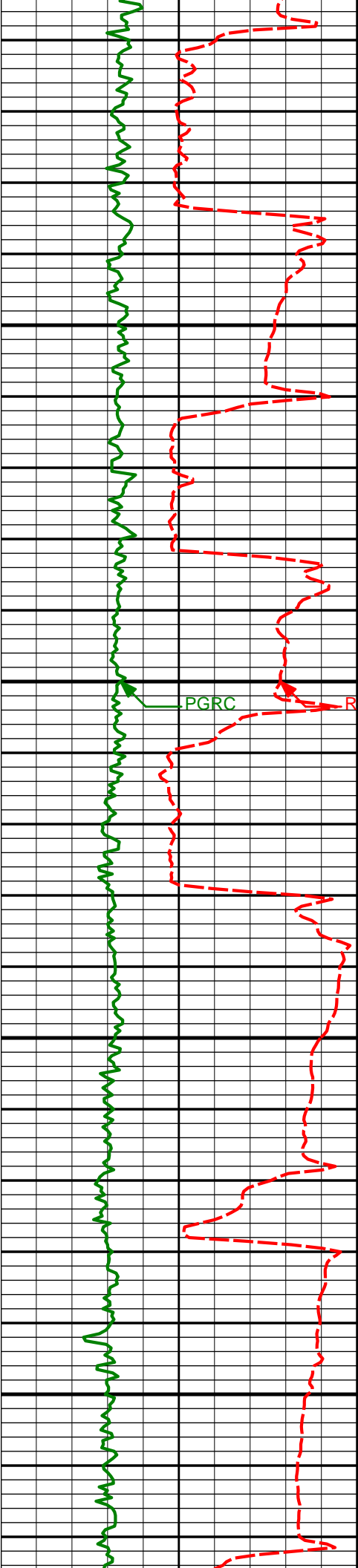
Run 400

PGRC

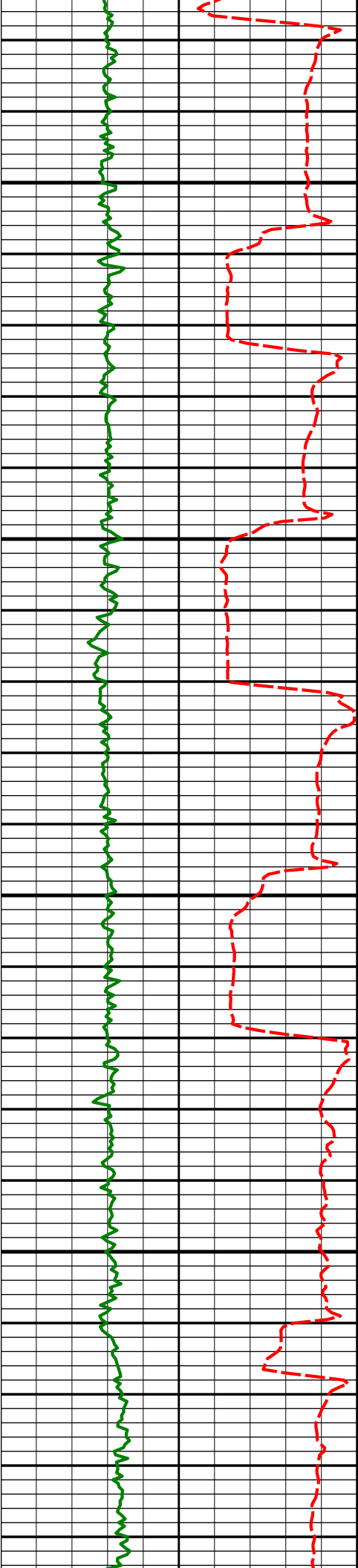
10555'	90.62°	359.50°	6601.58'	4028.58'
10650'	89.44°	359.59°	6601.53'	4123.56'
10746'	89.01°	358.34°	6602.82'	4219.54'
10840'	89.78°	357.85°	6603.80'	4313.53'
10935'	89.23°	357.40°	6604.62'	4408.52'







5927'	5.14°	6.75°	5905.09'	-217.31'
5950'				
5974'	8.16°	11.20°	5951.77'	-211.98'
6000'				
6022'	9.20°	11.76°	5999.22'	-204.93'
6050'				
6069'	13.16°	10.15°	6045.32'	-196.03'
6100'				
6117'	18.74°	6.14°	6091.45'	-183.04'



6150'

6164'

23.19°

3.51°

6135.33'

-166.34'

6200'

6212'

24.65°

0.41°

6179.21'

-146.92'

6250'

6259'

26.39°

358.88°

6221.63'

-126.69'

6300'

6306'

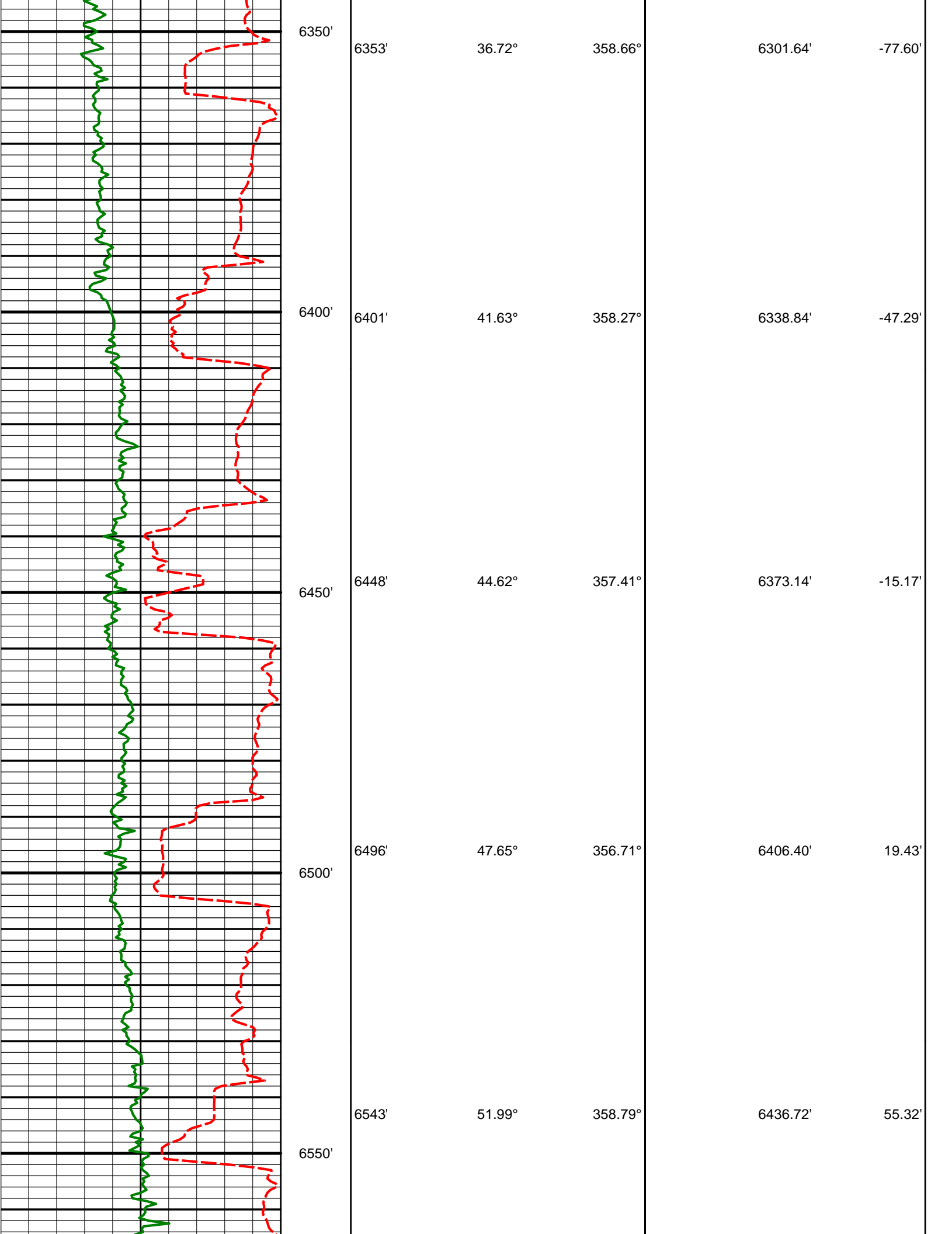
31.50°

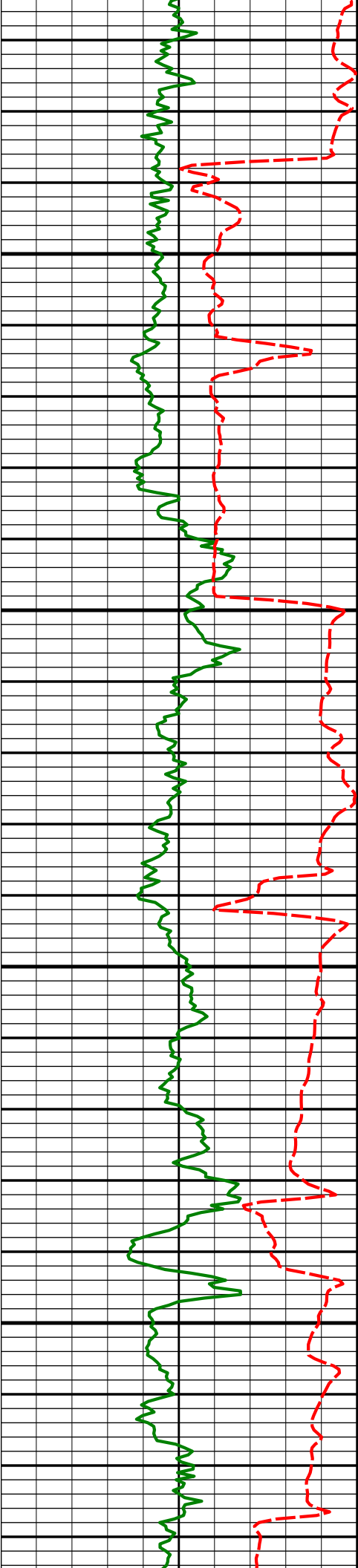
358.78°

6262.74'

-103.95'







6600'

6650'

6700'

6750'

6591'

6638'

6686'

6733'

6781'

55.49°

56.39°

61.78°

67.98°

73.88°

0.09°

359.43°

358.78°

357.71°

356.93°

6465.11'

6491.43'

6516.08'

6536.02'

6551.70'

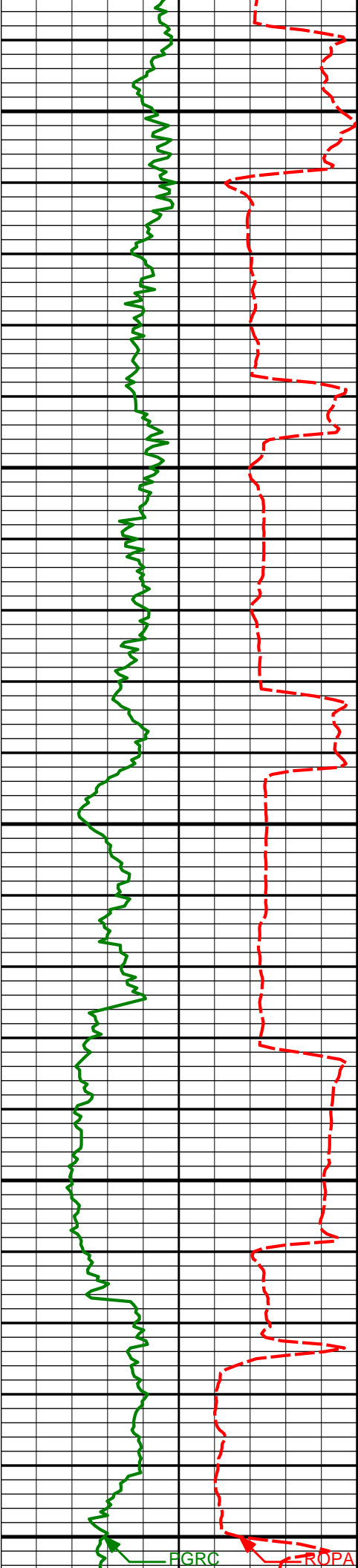
94.01'

132.93'

174.09'

216.63'

261.97'



6800'

6828'

76.91°

356.86°

6563.55'

307.43'

6850'

6876'

78.51°

356.92°

6573.77'

354.31'

6900'

6917'

79.66°

357.38°

6581.53'

394.56'

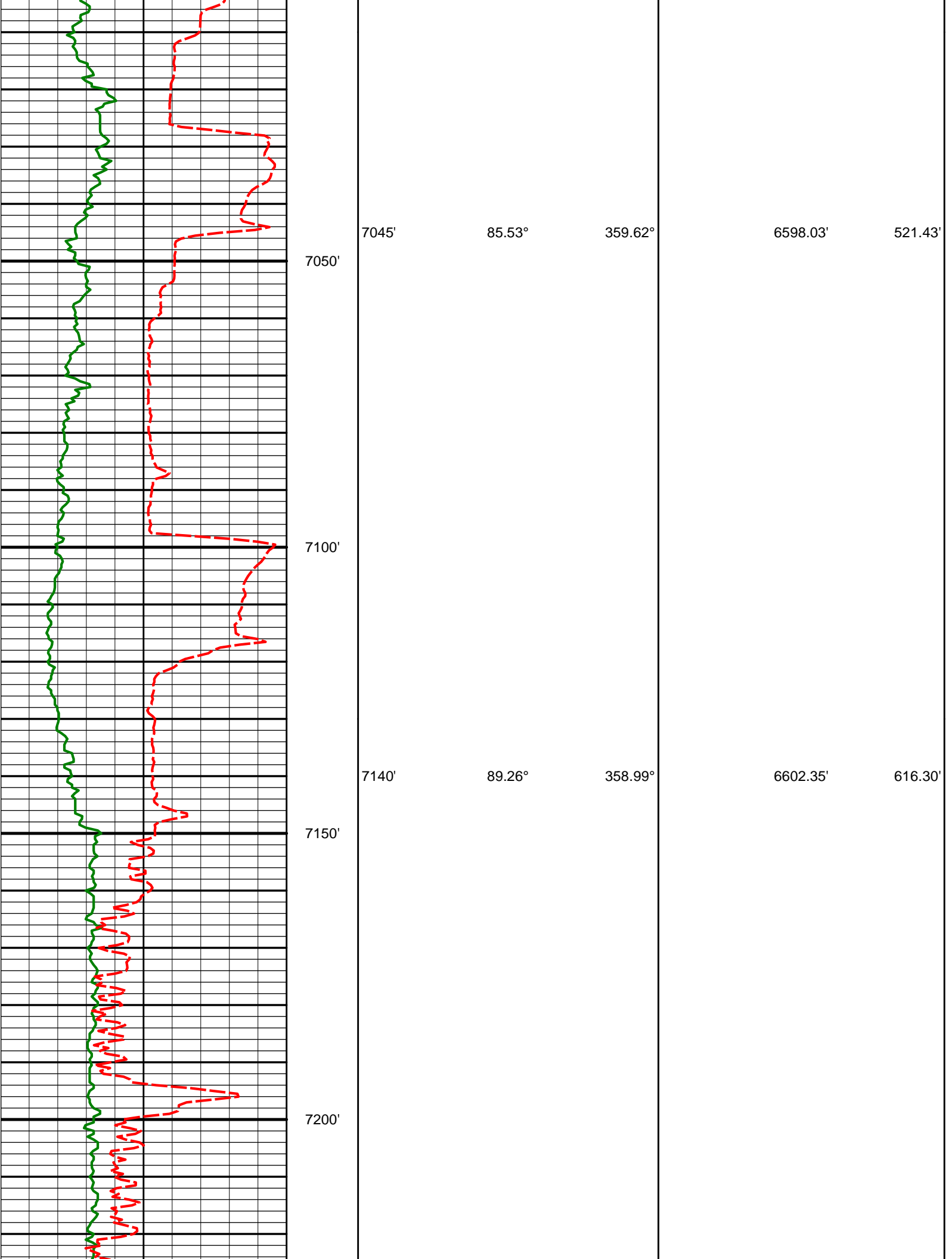
6950'

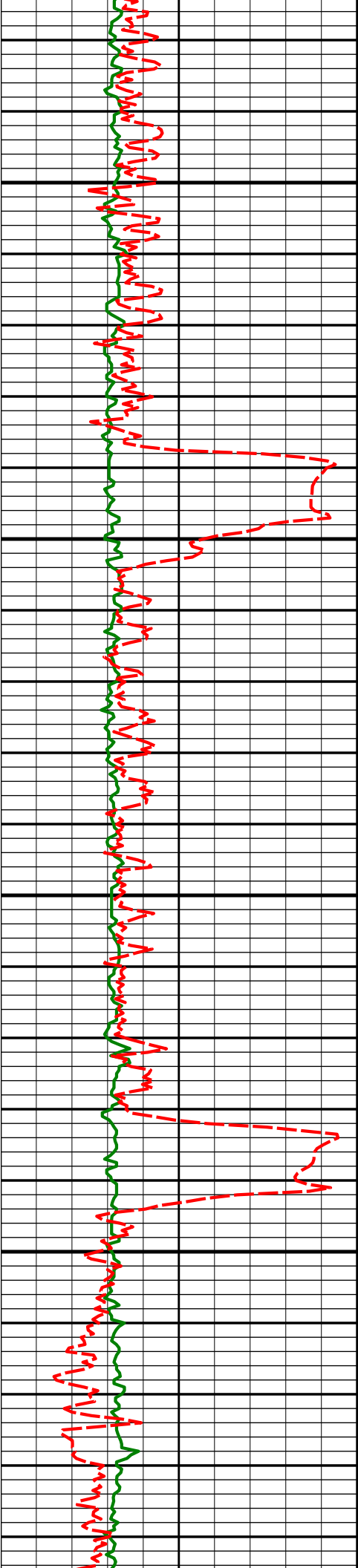
Run 300

7000'

FGRC

ROPA





7235'

90.99°

359.45°

6602.14'

711.28'

7250'

7300'

7331'

90.12°

358.83°

6601.21'

807.27'

7350'

7400'

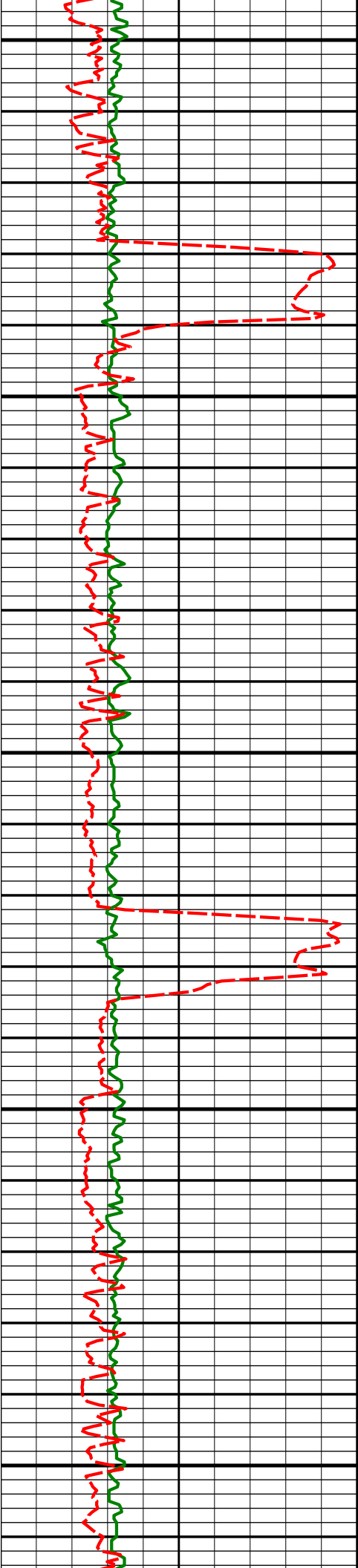
7425'

89.97°

358.81°

6601.14'

901.26'



7450'

7500'

7520'

89.66°

0.68°

6601.44'

996.22'

7550'

7600'

7615'

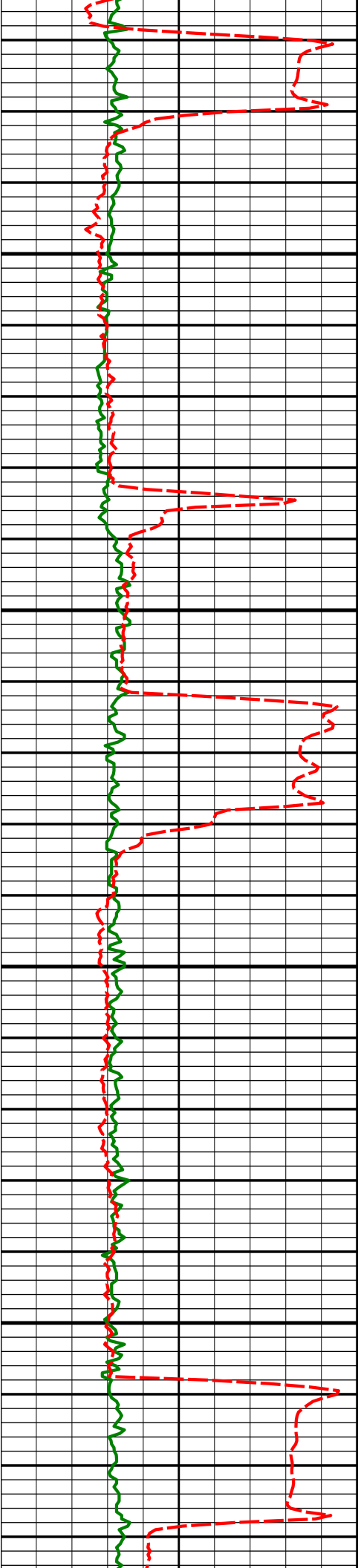
89.66°

1.03°

6602.01'

1091.13'

7650'



7700'

7710'

89.44°

1.22°

6602.75'

1186.01'

7750'

7800'

7805'

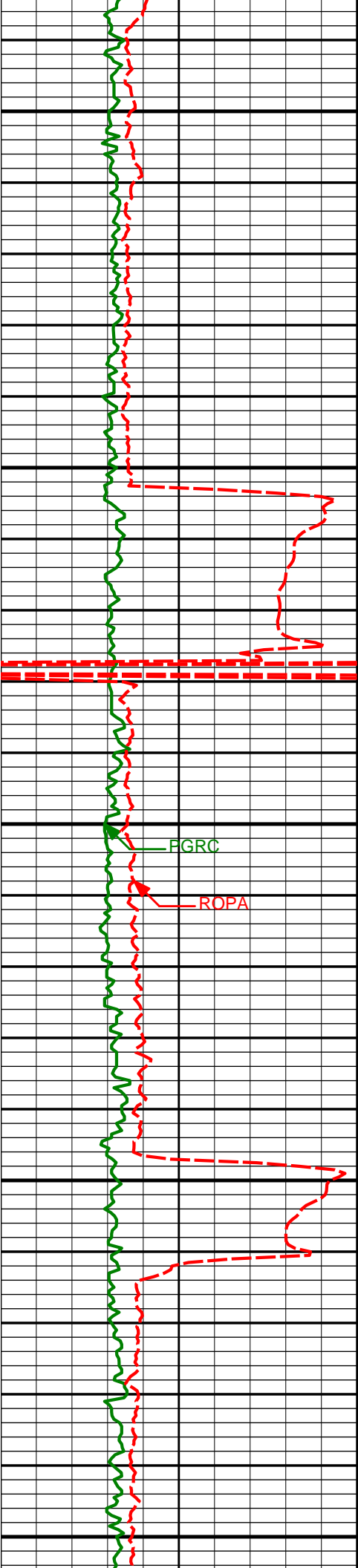
89.88°

1.24°

6603.31'

1280.88'

7850'



7900'

7900'

89.85°

359.86°

6603.54'

1375.80'

7950'

8000'

7995'

88.95°

356.54°

6604.54'

1470.78'

8050'

8090'

89.11°

354.36°

6606.15'

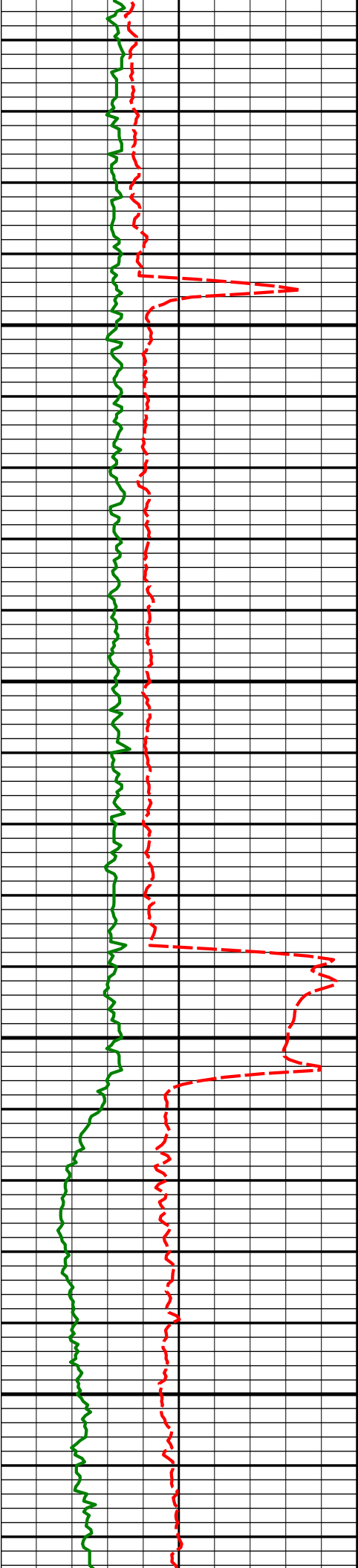
1565.65'

8100'

FGRC

ROPA





8150'

8184'

89.29°

354.13°

6607.46'

1659.41'

8200'

8250'

8279'

91.63°

356.52°

6606.70'

1754.26'

8300'



8350'

8374'

92.01°

357.47°

6603.68'

1849.19'

8400'

8450'

8469'

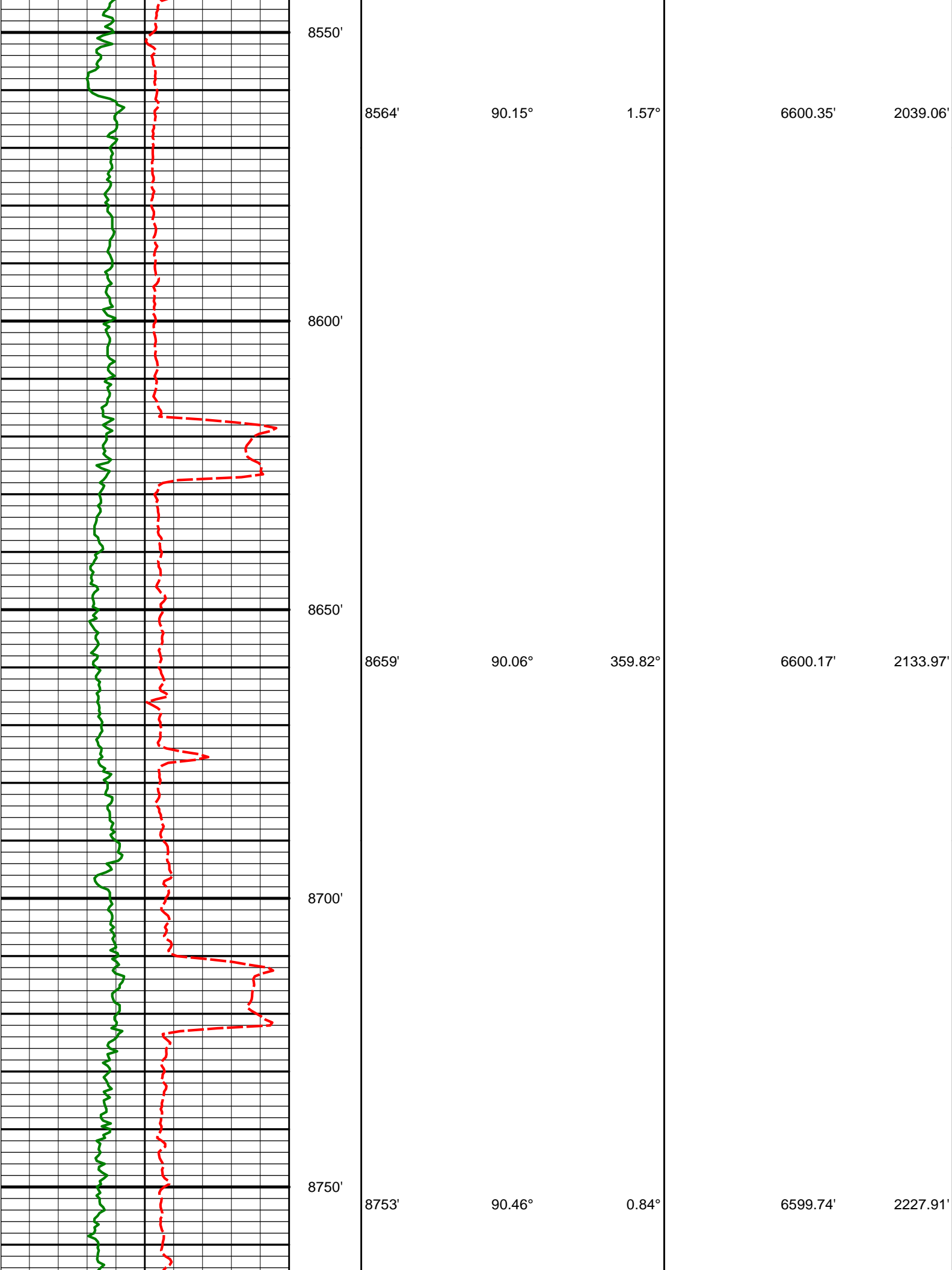
90.93°

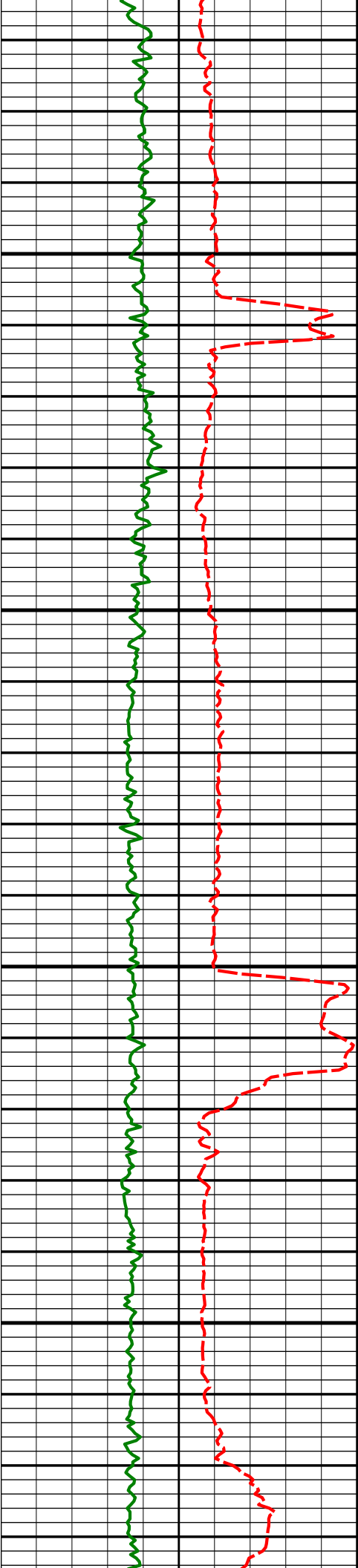
359.70°

6601.25'

1944.15'

8500'





8800'

8850'

8900'

8950'

8848'

8943'

90.56°

89.41°

1.09°

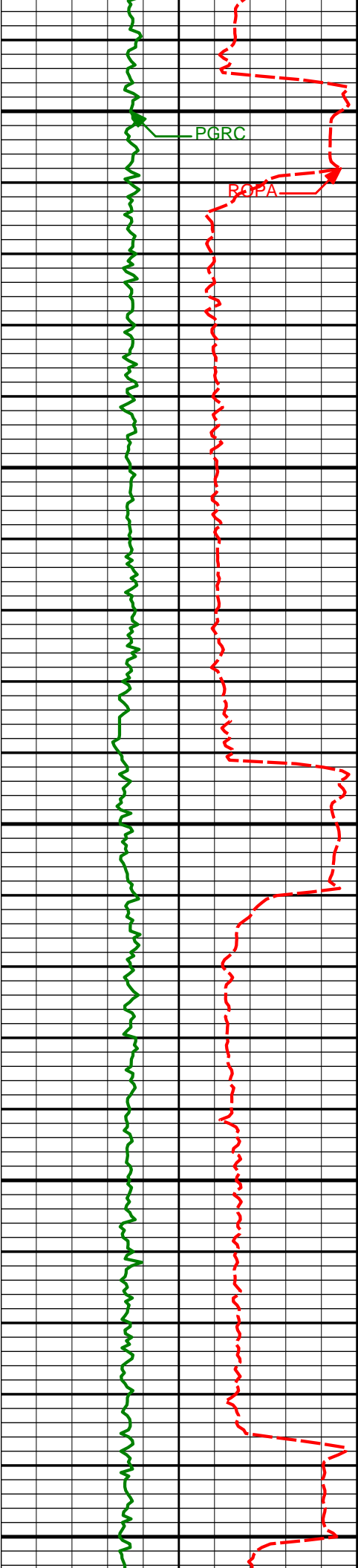
0.32°

6598.90'

6598.93'

2322.80'

2417.71'



9000'

9037'

9050'

9100'

9132'

9150'

9200'

89.75°

1.09°

6599.61'

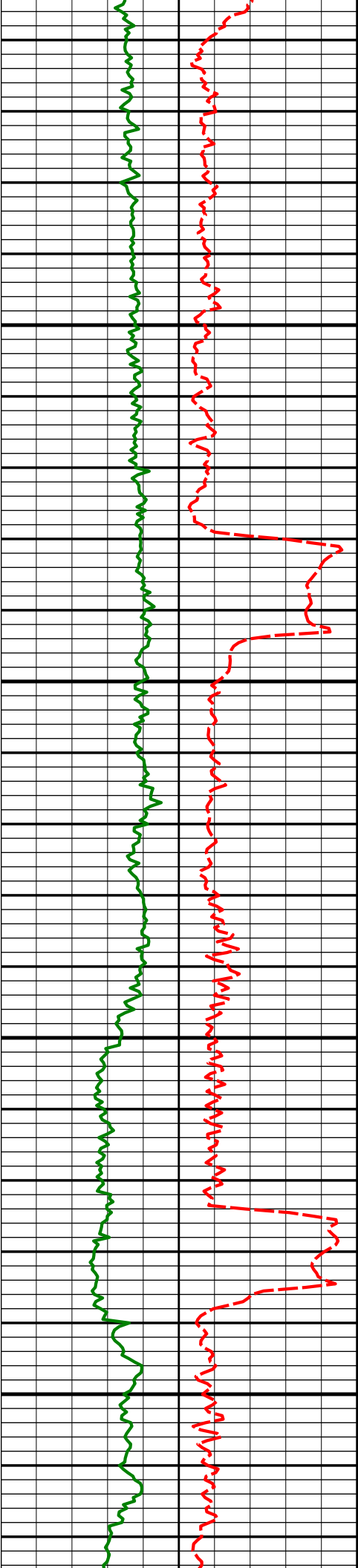
2511.62'

88.61°

0.58°

6600.96'

2606.52'



9227'

89.41°

358.91°

6602.60'

2701.47'

9250'

9300'

9322'

87.10°

358.66°

6605.49'

2796.41'

9350'

9400'

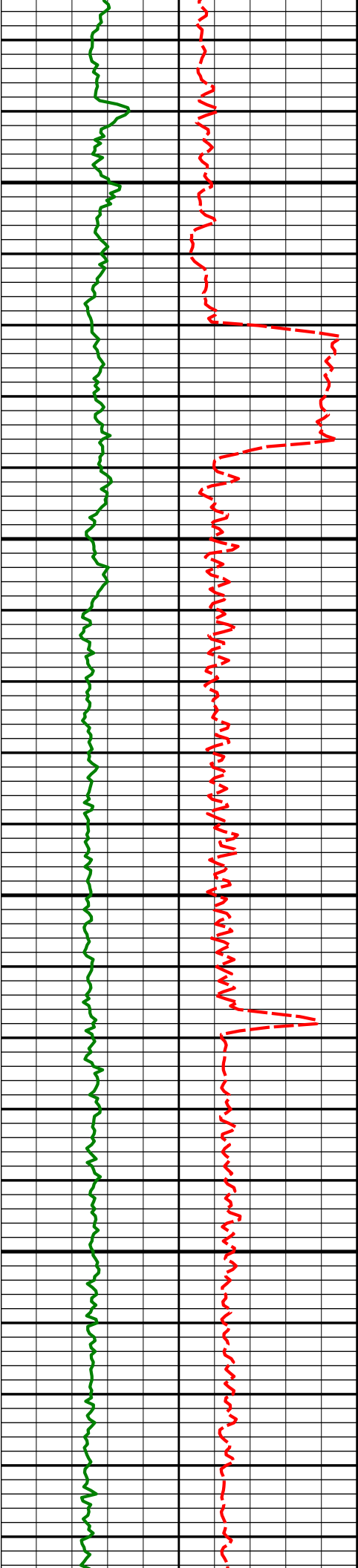
9417'

86.88°

357.38°

6610.47'

2891.28'



9450'

9500'

9550'

9600'

9512'

88.43°

357.31°

6614.36'

2986.18'

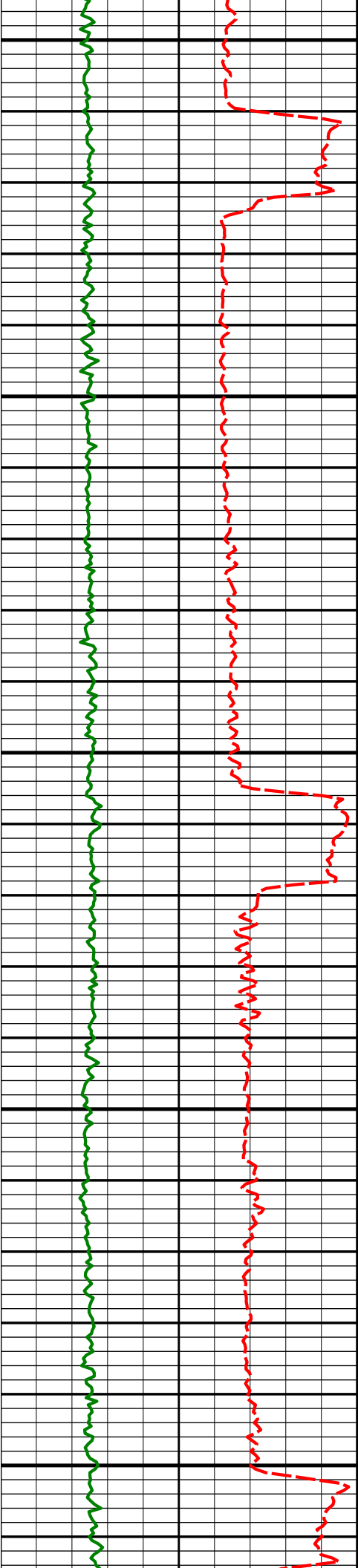
9607'

89.94°

356.32°

6615.72'

3081.14'



9650'

9700'

9750'

9800'

9850'

9702'

90.62°

357.29°

6615.26'

3176.11'

9797'

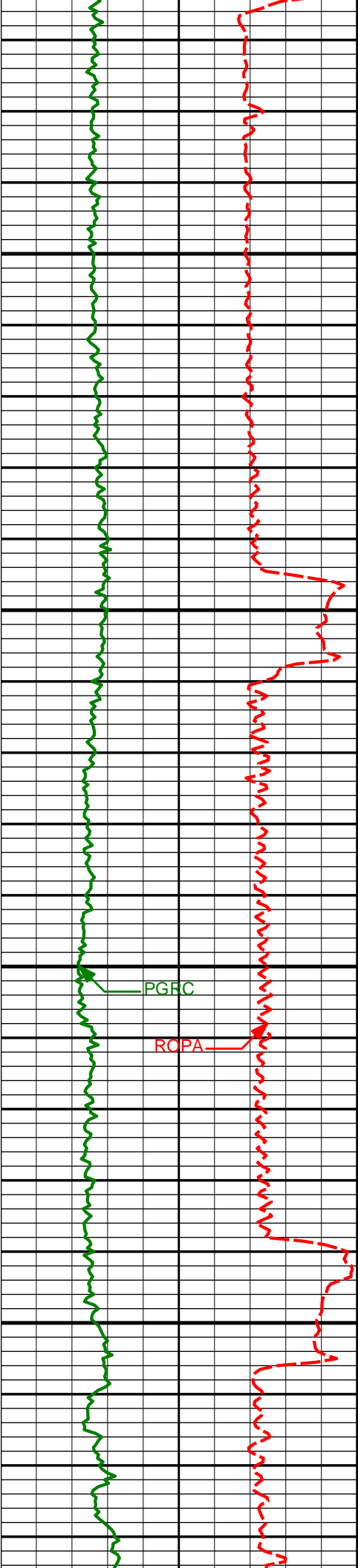
90.55°

356.95°

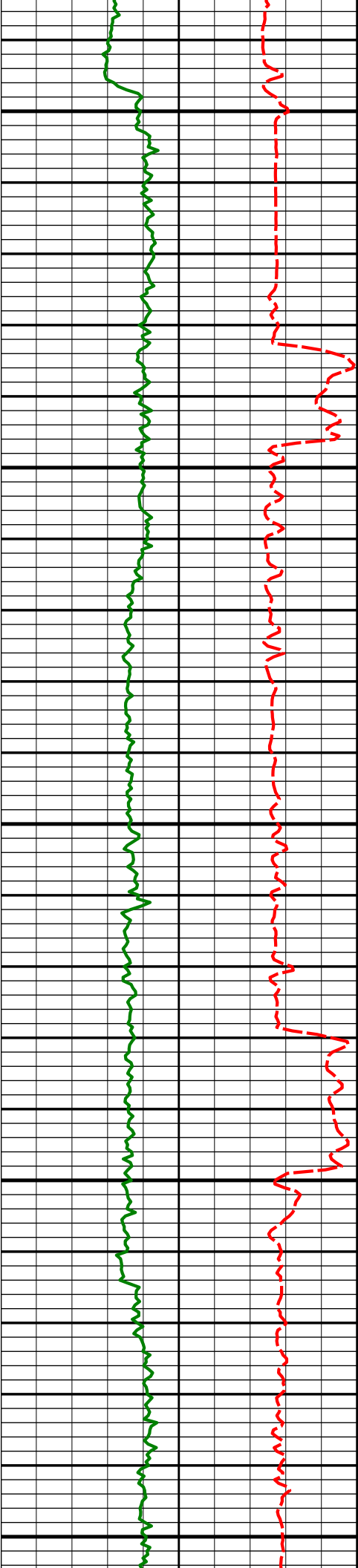
6614.28'

3271.08'





9891'	90.49°	357.61°	6613.42'	3365.06'
9900'				
9950'				
9986'	89.11°	358.15°	6613.76'	3460.06'
10000'				
10050'				
10081'	92.68°	359.62°	6612.27'	3555.02'



10100'

10150'

10200'

10250'

10300'

10176'

92.59°

0.27°

6607.90'

3649.88'

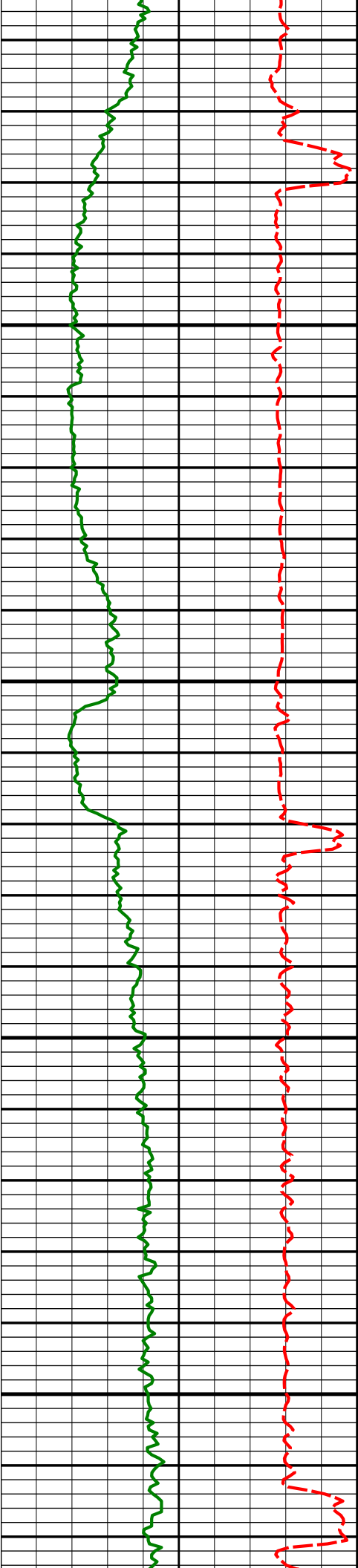
10271'

90.09°

0.94°

6605.68'

3744.77'



10350'

10366'

91.30°

0.37°

6604.53'

3839.68'

10400'

10450'

10460'

90.83°

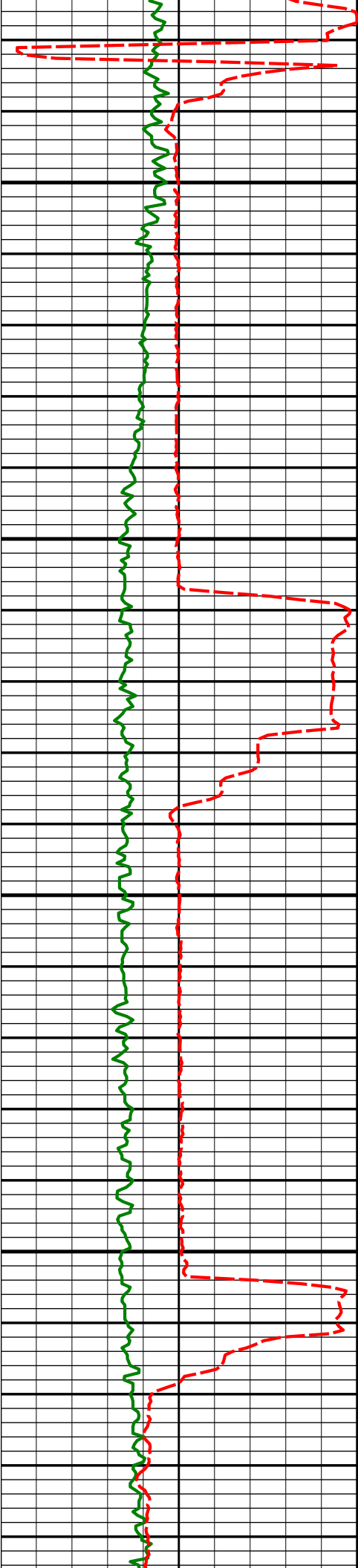
359.64°

6602.78'

3933.62'

10500'

Run 400



10550'

10555'

90.62°

359.50°

6601.58'

4028.58'

10600'

10650'

10650'

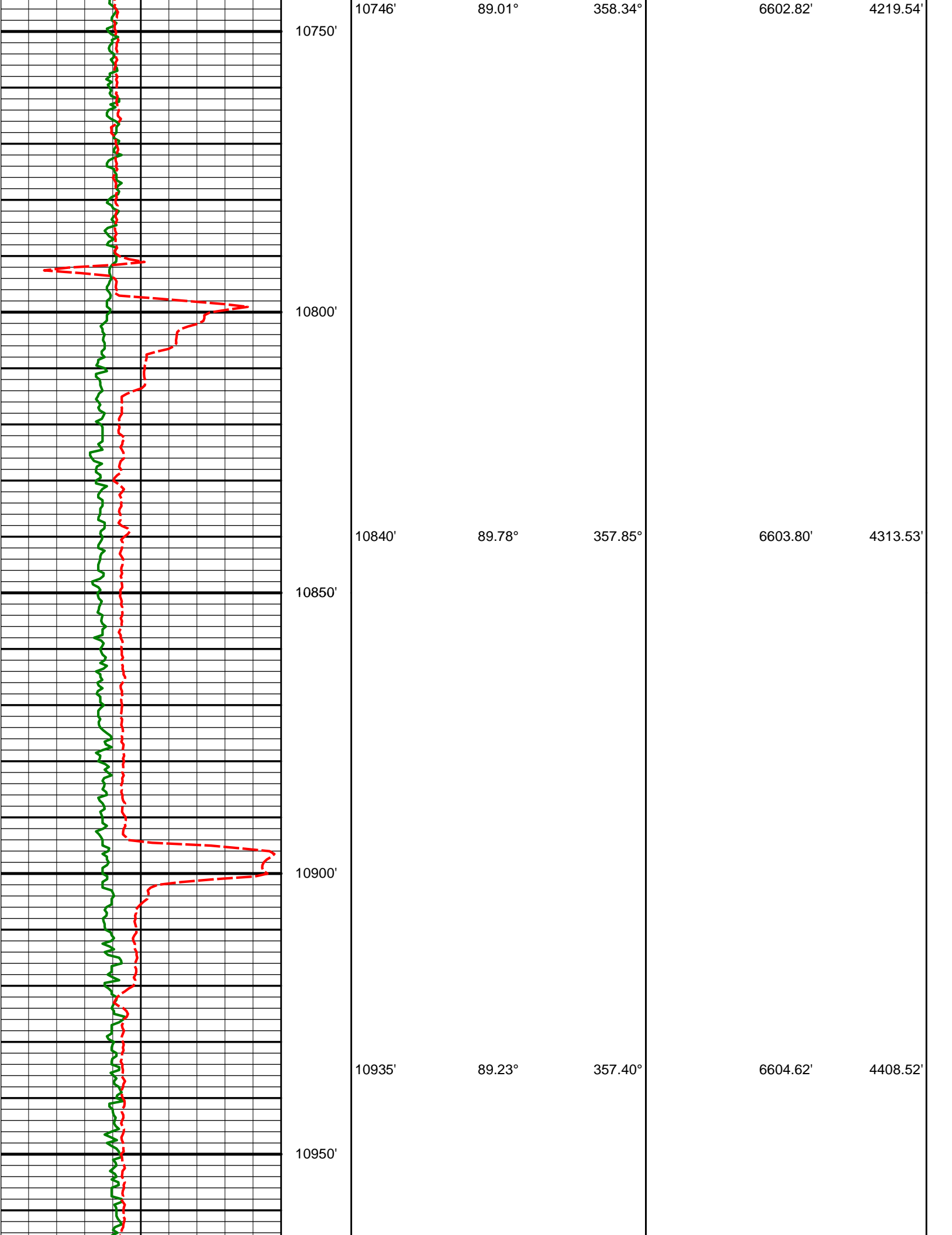
89.44°

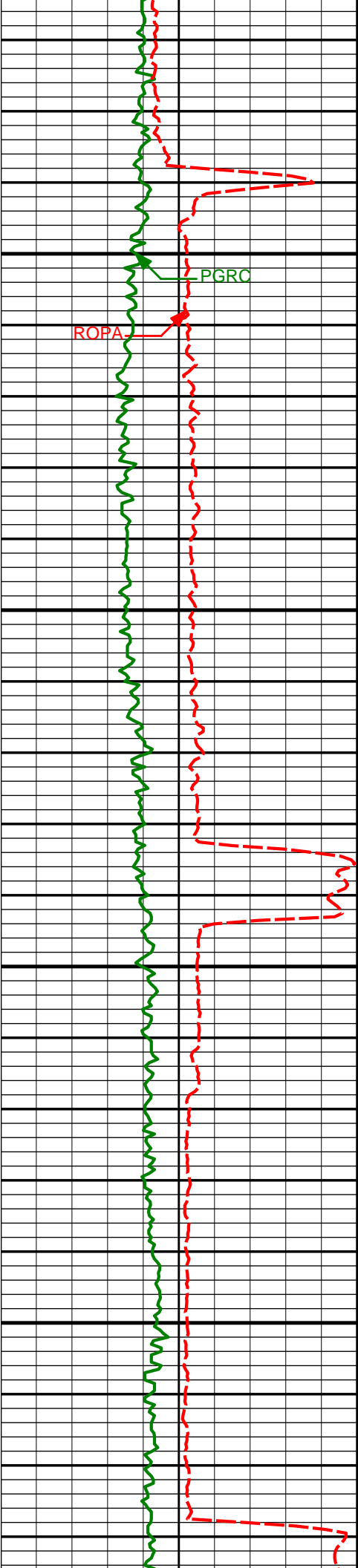
359.59°

6601.53'

4123.56'

10700'





11000'

11050'

11100'

11150'

11030'

11125'

90.18°

89.78°

356.78°

356.66°

6605.11'

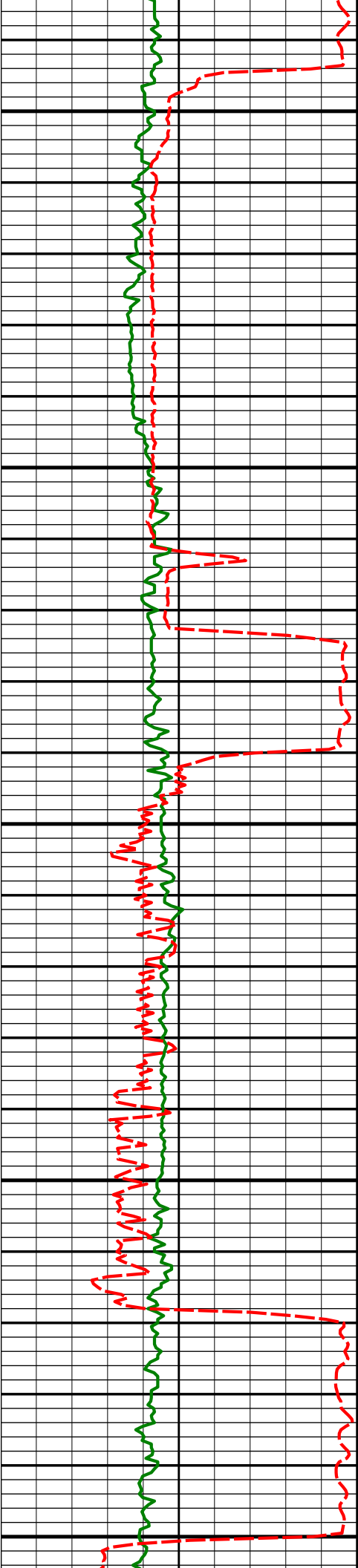
6605.14'

4503.50'

4598.47'

PGRC

ROPA



11200'

11220'

89.51°

357.41°

6605.72'

4693.44'

11250'

11300'

11315'

89.54°

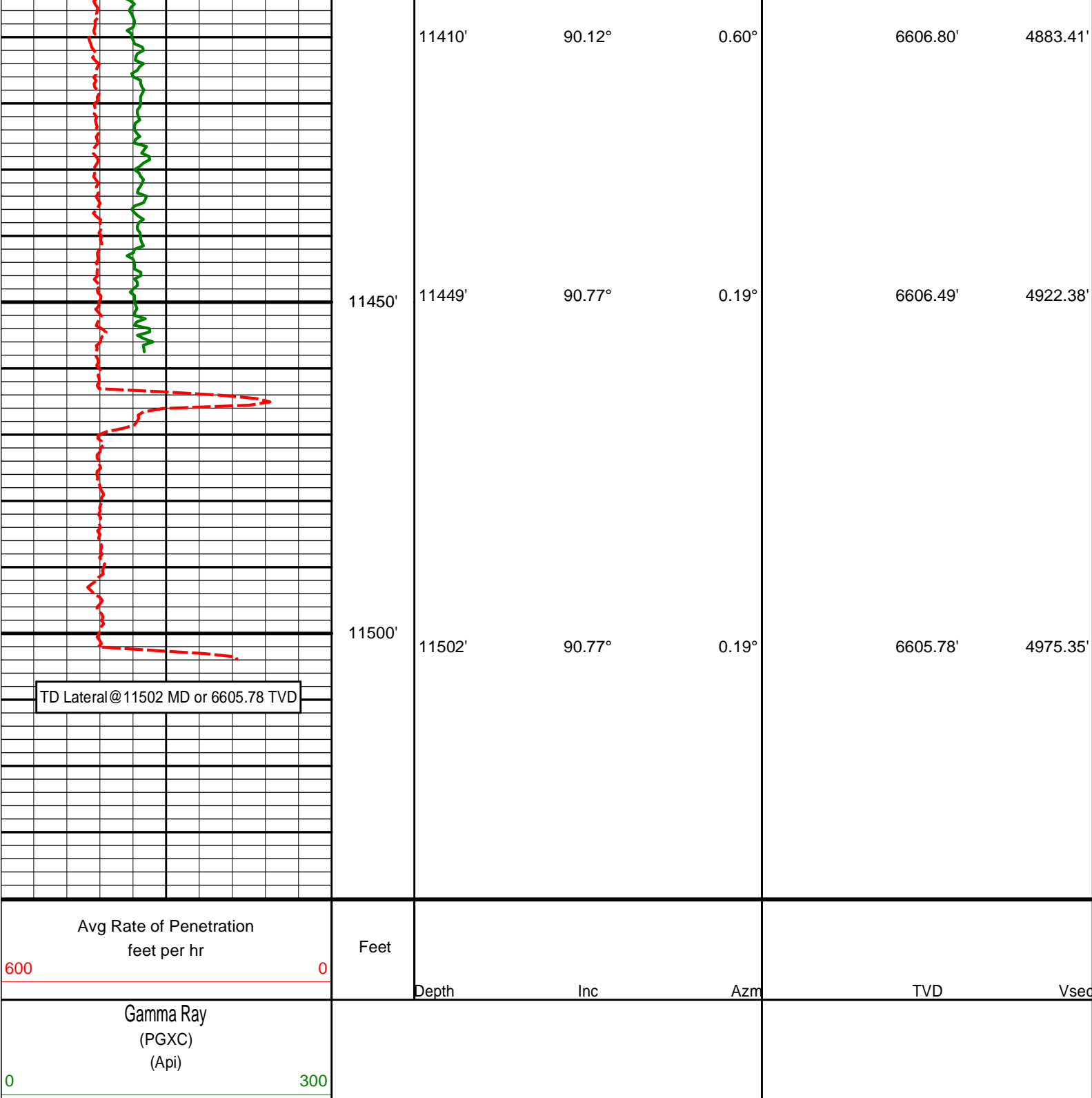
357.99°

6606.52'

4788.43'

11350'

11400'



**DIRECTIONAL SURVEY REPORT**

Noble Energy  
Guttersen State DD17-79-1HN  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0900894765

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
240.00	0.60	318.30	240.00	0.94 N	0.84 W	0.96	0.25
502.00	0.10	186.70	501.99	1.74 N	1.78 W	1.79	0.26



750.00	0.50	15.60	749.99	2.56 N	1.51 W	2.61	0.24
850.00	0.80	0.90	849.98	3.68 N	1.38 W	3.72	0.34
918.00	0.64	18.04	917.98	4.51 N	1.26 W	4.55	0.40
1104.00	0.72	10.70	1103.96	6.64 N	0.72 W	6.66	0.07
1197.00	1.03	339.82	1196.95	8.00 N	0.90 W	8.02	0.59
1290.00	0.94	340.26	1289.94	9.50 N	1.44 W	9.54	0.09
1383.00	1.19	343.00	1382.92	11.13 N	1.98 W	11.19	0.27
1476.00	1.63	346.78	1475.90	13.34 N	2.57 W	13.42	0.49
1571.00	1.78	294.53	1570.86	15.27 N	4.22 W	15.39	1.59
1665.00	0.96	237.76	1664.83	15.46 N	6.22 W	15.64	1.58
1760.00	0.25	209.93	1759.83	14.85 N	7.00 W	15.05	0.79
1855.00	2.21	210.28	1854.80	13.08 N	8.03 W	13.32	2.06
1949.00	3.69	205.97	1948.68	8.80 N	10.26 W	9.11	1.58
2044.00	6.19	196.84	2043.32	1.16 N	13.08 W	1.55	2.75
2139.00	7.26	195.08	2137.66	9.54 S	16.13 W	-9.05	1.15
2234.00	8.64	190.87	2231.75	22.35 S	19.04 W	-21.76	1.58
2329.00	10.54	193.01	2325.41	37.83 S	22.34 W	-37.13	2.03
2423.00	13.02	192.55	2417.43	56.54 S	26.58 W	-55.72	2.64
2518.00	11.53	190.61	2510.25	76.32 S	30.65 W	-75.36	1.63
2613.00	11.85	189.34	2603.28	95.28 S	33.99 W	-94.21	0.44
2708.00	13.28	190.90	2696.00	115.63 S	37.63 W	-114.44	1.54
2803.00	12.87	190.20	2788.54	136.76 S	41.57 W	-135.44	0.46
2898.00	12.36	187.32	2881.25	157.26 S	44.74 W	-155.84	0.85
2993.00	10.60	186.51	2974.34	176.03 S	47.02 W	-174.53	1.86
3088.00	8.53	183.99	3068.02	191.74 S	48.51 W	-190.19	2.22
3183.00	6.29	183.18	3162.22	203.96 S	49.29 W	-202.38	2.36
3277.00	4.21	184.26	3255.82	212.55 S	49.83 W	-210.94	2.22
3372.00	1.91	186.36	3350.68	217.60 S	50.26 W	-215.98	2.42
3467.00	2.17	229.39	3445.62	220.35 S	51.80 W	-218.68	1.60
3562.00	0.63	178.48	3540.59	222.04 S	53.15 W	-220.33	1.93
3657.00	1.91	198.18	3635.57	224.07 S	53.63 W	-222.34	1.41
3752.00	1.36	158.41	3730.53	226.62 S	53.71 W	-224.90	1.29
3847.00	0.44	104.09	3825.52	227.76 S	52.94 W	-226.06	1.22
3941.00	0.25	130.38	3919.52	227.98 S	52.43 W	-226.30	0.26
4036.00	0.71	169.91	4014.51	228.70 S	52.17 W	-227.02	0.57
4131.00	1.36	85.86	4109.50	229.19 S	50.94 W	-227.55	1.55
4226.00	0.64	47.04	4204.49	228.75 S	49.43 W	-227.15	1.00
4321.00	0.22	97.55	4299.49	228.41 S	48.85 W	-226.83	0.56
4415.00	0.62	350.34	4393.48	227.94 S	48.76 W	-226.36	0.76
4510.00	0.60	14.67	4488.48	226.95 S	48.72 W	-225.38	0.27
4605.00	0.13	262.13	4583.48	226.49 S	48.70 W	-224.92	0.69
4700.00	0.70	178.81	4678.47	227.09 S	48.79 W	-225.51	0.74
4795.00	1.28	355.28	4773.47	226.61 S	48.86 W	-225.03	2.09
4890.00	1.47	350.82	4868.44	224.35 S	49.15 W	-222.76	0.23
4984.00	1.91	312.23	4962.40	222.10 S	50.50 W	-220.47	1.27
5079.00	0.89	225.34	5057.38	221.55 S	52.20 W	-219.87	2.17
5174.00	1.82	219.66	5152.35	223.23 S	53.68 W	-221.50	0.99
5269.00	0.96	292.01	5247.33	224.09 S	55.39 W	-222.32	1.88
5364.00	1.10	223.60	5342.32	224.45 S	56.76 W	-222.63	1.22
5459.00	1.13	195.63	5437.30	226.01 S	57.63 W	-224.17	0.57
5554.00	0.66	170.35	5532.29	227.45 S	57.80 W	-225.60	0.64
5649.00	0.57	84.95	5627.29	227.94 S	57.23 W	-226.11	0.88
5744.00	1.51	355.96	5722.27	226.65 S	56.85 W	-224.83	1.68
5774.00	1.51	358.58	5752.26	225.86 S	56.89 W	-224.04	0.23
5832.00	1.90	357.82	5810.24	224.14 S	56.95 W	-222.32	0.67
5879.00	2.56	350.21	5857.20	222.33 S	57.15 W	-220.50	1.53
5927.00	5.14	6.75	5905.09	219.13 S	57.08 W	-217.31	5.80
5974.00	8.16	11.20	5951.77	213.77 S	56.19 W	-211.98	6.51
6022.00	9.20	11.76	5999.22	206.67 S	54.74 W	-204.93	2.18
6069.00	13.16	10.15	6045.32	197.72 S	53.03 W	-196.03	8.44
6117.00	18.74	6.14	6091.45	184.67 S	51.24 W	-183.04	11.84
6164.00	23.19	3.51	6135.33	167.92 S	49.87 W	-166.34	9.69
6212.00	24.65	0.41	6179.21	148.48 S	49.22 W	-146.92	4.00
6259.00	26.39	358.88	6221.63	128.23 S	49.35 W	-126.69	3.96
6306.00	31.50	358.78	6262.74	105.50 S	49.82 W	-103.95	10.88
6353.00	36.72	358.66	6301.64	79.16 S	50.41 W	-77.60	11.11
6401.00	41.63	358.27	6338.84	48.86 S	51.23 W	-47.29	10.23
6448.00	44.62	357.41	6373.14	16.76 S	52.45 W	-15.17	6.48
6496.00	47.65	356.71	6406.40	17.80 N	54.23 W	19.43	6.41
6543.00	51.99	358.79	6436.72	53.67 N	55.62 W	55.32	9.82
6591.00	55.49	0.09	6465.11	92.36 N	55.98 W	94.01	7.63
6638.00	58.48	358.48	6494.42	124.23 N	58.45 W	122.22	9.22

6638.00	56.39	359.43	6491.43	131.30 N	56.15 W	132.93	2.23
6686.00	61.78	358.78	6516.08	172.46 N	56.80 W	174.09	11.29
6733.00	67.98	357.71	6536.02	214.97 N	58.11 W	216.63	13.36
6781.00	73.88	356.93	6551.70	260.27 N	60.24 W	261.97	12.38
6828.00	76.91	356.86	6563.55	305.68 N	62.70 W	307.43	6.44
6876.00	78.51	356.92	6573.77	352.50 N	65.25 W	354.31	3.35
6917.00	79.66	357.38	6581.53	392.71 N	67.25 W	394.56	3.01
7045.00	85.53	359.62	6598.03	519.54 N	70.55 W	521.43	4.90
7140.00	89.26	358.99	6602.35	614.42 N	71.70 W	616.30	3.98
7235.00	90.99	359.45	6602.14	709.40 N	72.99 W	711.28	1.88
7331.00	90.12	358.83	6601.21	805.39 N	74.43 W	807.27	1.11
7425.00	89.97	358.81	6601.14	899.37 N	76.36 W	901.26	0.17
7520.00	89.66	0.68	6601.44	994.36 N	76.79 W	996.22	2.00
7615.00	89.66	1.03	6602.01	1089.35 N	75.38 W	1091.13	0.37
7710.00	89.44	1.22	6602.75	1184.33 N	73.52 W	1186.01	0.30
7805.00	89.88	1.24	6603.31	1279.30 N	71.49 W	1280.88	0.45
7900.00	89.85	359.86	6603.54	1374.30 N	70.58 W	1375.80	1.45
7995.00	88.95	356.54	6604.54	1469.23 N	73.56 W	1470.78	3.62
8090.00	89.11	354.36	6606.15	1563.91 N	81.09 W	1565.65	2.30
8184.00	89.29	354.13	6607.46	1657.43 N	90.51 W	1659.41	0.32
8279.00	91.63	356.52	6606.70	1752.10 N	98.26 W	1754.26	3.52
8374.00	92.01	357.47	6603.68	1846.92 N	103.24 W	1849.19	1.07
8469.00	90.93	359.70	6601.25	1941.85 N	105.59 W	1944.15	2.61
8564.00	90.15	1.57	6600.35	2036.83 N	104.54 W	2039.06	2.13
8659.00	90.06	359.82	6600.17	2131.82 N	103.39 W	2133.97	1.84
8753.00	90.46	0.84	6599.74	2225.82 N	102.85 W	2227.91	1.16
8848.00	90.56	1.09	6598.90	2320.80 N	101.25 W	2322.80	0.29
8943.00	89.41	0.32	6598.93	2415.79 N	100.08 W	2417.71	1.45
9037.00	89.75	1.09	6599.61	2509.78 N	98.92 W	2511.62	0.90
9132.00	88.61	0.58	6600.96	2604.76 N	97.53 W	2606.52	1.32
9227.00	89.41	358.91	6602.60	2699.74 N	97.95 W	2701.47	1.95
9322.00	87.10	358.66	6605.49	2794.67 N	99.96 W	2796.41	2.45
9417.00	86.88	357.38	6610.47	2889.48 N	103.24 W	2891.28	1.37
9512.00	88.43	357.31	6614.36	2984.29 N	107.64 W	2986.18	1.63
9607.00	89.94	356.32	6615.72	3079.13 N	112.92 W	3081.14	1.90
9702.00	90.62	357.29	6615.26	3173.98 N	118.21 W	3176.11	1.25
9797.00	90.55	356.95	6614.28	3268.86 N	122.98 W	3271.08	0.36
9891.00	90.49	357.61	6613.42	3362.75 N	127.44 W	3365.06	0.70
9986.00	89.11	358.15	6613.76	3457.68 N	130.96 W	3460.06	1.57
10081.00	92.68	359.62	6612.27	3552.63 N	132.81 W	3555.02	4.07
10176.00	92.59	0.27	6607.90	3647.53 N	132.90 W	3649.88	0.69
10271.00	90.09	0.94	6605.68	3742.49 N	131.90 W	3744.77	2.73
10366.00	91.30	0.37	6604.53	3837.48 N	130.81 W	3839.68	1.40
10460.00	90.83	359.64	6602.78	3931.46 N	130.81 W	3933.62	0.92
10555.00	90.62	359.50	6601.58	4026.45 N	131.52 W	4028.58	0.27
10650.00	89.44	359.59	6601.53	4121.44 N	132.28 W	4123.56	1.24
10746.00	89.01	358.34	6602.82	4217.42 N	134.01 W	4219.54	1.37
10840.00	89.78	357.85	6603.80	4311.36 N	137.13 W	4313.53	0.97
10935.00	89.23	357.40	6604.62	4406.27 N	141.06 W	4408.52	0.75
11030.00	90.18	356.78	6605.11	4501.15 N	145.89 W	4503.50	1.20
11125.00	89.78	356.66	6605.14	4595.99 N	151.32 W	4598.47	0.44
11220.00	89.51	357.41	6605.72	4690.86 N	156.23 W	4693.44	0.84
11315.00	89.54	357.99	6606.52	4785.78 N	160.04 W	4788.43	0.62
11410.00	90.12	0.60	6606.80	4880.77 N	161.21 W	4883.41	2.81
11449.00	90.77	0.19	6606.49	4919.76 N	160.94 W	4922.38	1.96
11502.00	90.77	0.19	6605.78	4972.76 N	160.76 W	4975.35	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 358.27 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.73 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11502.00 FEET  
IS 4975.36 FEET ALONG 358.15 DEGREES (GRID)

Tie-In @ Surface

