

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



1 : 240

Country	: USA
Field	: Wattenberg
Location	: Lat: 40° 36' 34.92" North Long: 104° 25' 47.60" West
Well	: Ball Ranch AC04-72HN
Company	: Noble Energy
Rig	: H&P 322
LOCATION	Company : Noble Energy Rig : H&P 322 Well : Ball Ranch AC04-72HN Field : Wattenberg Country : USA API Number : 05-123-35248
	Latitude : 40° 36' 34.92" North Longitude : 104° 25' 47.60" West UTM Easting = 1445482.03 ft UTM Northing = 3290110.84 ft
	Other Services Directional Drilling

Permanent Datum	: Ground Level	Elevation	: 4890.00 ft
Log Measured From	: Drill Floor	24.00 ft	Above Permanent Datum
Drilling Measured From	: Drill Floor	MD LOG	

Depth Logged	: 880.00 ft	To	11,303.00 ft	Unit No.	: 11210425	Job No.	: CA-XX-0009691519
Date Logged	: 11-Aug-12	To	21-Aug-12	Plot Type	: Final		
Total Depth MD	: 11,303.00 ft	TVD	: 6,832.29 ft	Plot Date	: 21-Aug-12		
Spud Date	: 11-Aug-12						

Run No.	Borehole Record (MD)		Run No.		Borehole Record (MD)	
	Size	From	To	Size	From	To
100	8.750 in	880.00 ft	4,959.00 ft			
200	8.750 in	4,959.00 ft	7,449.00 ft			
300	6.125 in	7,449.00 ft	8,975.00 ft			
400	6.125 in	8,978.06 ft	11,303.00 ft			
				Casing Record (MD)		
				Size	Weight	From
				9.625 in	36.00 lppf	SURFACE
				7.000 in	24.00 lppf	SURFACE
						880.00 ft
						7,439.00 ft

WELL INFORMATION

MWD Run Number	100	200	300	400
Date run completed	13-Aug-12	16-Aug-12	18-Aug-12	21-Aug-12
Rig Bit Number	100	200	300	400
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 (MD, ft)	880.00	4,959.00	7,749.00	8,975.00
Log End Depth (MD, ft)	4,959.00	7,449.00	8,975.00	11,303.00
Drill or Wipe	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	12-Aug-12 23:00	14-Aug-12 00:30	17-Aug-12 15:30	19-Aug-12 02:30
Drill/Wipe End Date and Time	13-Aug-12 19:00	15-Aug-12 20:00	18-Aug-12 13:00	21-Aug-12 00:00
Min Inc (deg) @ Depth (MD, ft)	.61 @ 1,101.00	.65 @ 5,549.00	84.79 @ 7,446.00	86.73 @ 10,359.00
Max Inc (deg) @ Depth (MD, ft)	24.63 @ 4,036.00	81.04 @ 7,394.00	92.47 @ 8,079.00	94.85 @ 11,246.00
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC	.46 / PDC	.46 / PDC
Flow Rate (gpm)	550.00	550.00	268.00	270.00
Max AV (fpm) / CV (fpm) @ MWD	436.8 / 436.8	436.8 / 436.8	451.5 / 451.5	218.4 / 218.4
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	8.60 / 27.00	10.00 / 27.00	9.70 / 39.00	9.75 / 39.00
Filtrate CL (ppm)	500.00	500.00	500.00	500.00
pH / Fluid Loss (mptm)	8.30 / N/A	8.60 / N/A	9.50 / N/A	9.50 / N/A
PV (cP) / YP (lbf/ft)	1 / 3.00	1 / 3.00	11 / 10.00	10 / 12.00
% Solids / % Sand	1.70 / 0.10	1.75 / 0.10	7.40 / 0.50	7.80 / 0.50
% 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	172.78 / PCM	172.78 / PCM	212.92 / PCM	212.92 / PCM	
Rm @ Max Tool Temp (degF)	.7401 @ 172.78	.5999 @ 172.78	.5253 @ 212.92	.4849 @ 212.92	
Lead MWD Engineer	Osahon Igunbor	John Parisee	Robert Ley	Robert Ley	
Customer Representative	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	202467	202467	11768603	11768603	
Insert Serial Number	11680784	11680784	11680784	11680784	
Date and Time Initialized	11-Aug-12 05:31	11-Aug-12 05:31	16-Aug-12 08:37	16-Aug-12 08:37	
Date and Time Read	16-Aug-12 02:14	16-Aug-12 02:06	21-Aug-12 07:26	21-Aug-12 07:19	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	55.00	55.00	57.00	57.00	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	202467	202467	11768603	11768603	
Sonde Serial Number	11062060	11062060	11062060	11062060	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	307.06	275.64	326.23	213.44	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	PCG	
Distance From Bit (ft)	48.33	48.17	49.60	49.51	
Recorded Sample Period (sec)	10	10	10	10	
Software Version	8.15	8.15	8.15	8.15	
Sub Serial Number	202467	202467	11768603	11768603	
Insert/Sonde Serial Number	11121365	11121365	11121365	11121365	

REMARKS

1. All depths are measured bit 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"

PGRC (Gamma Ray):
 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

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

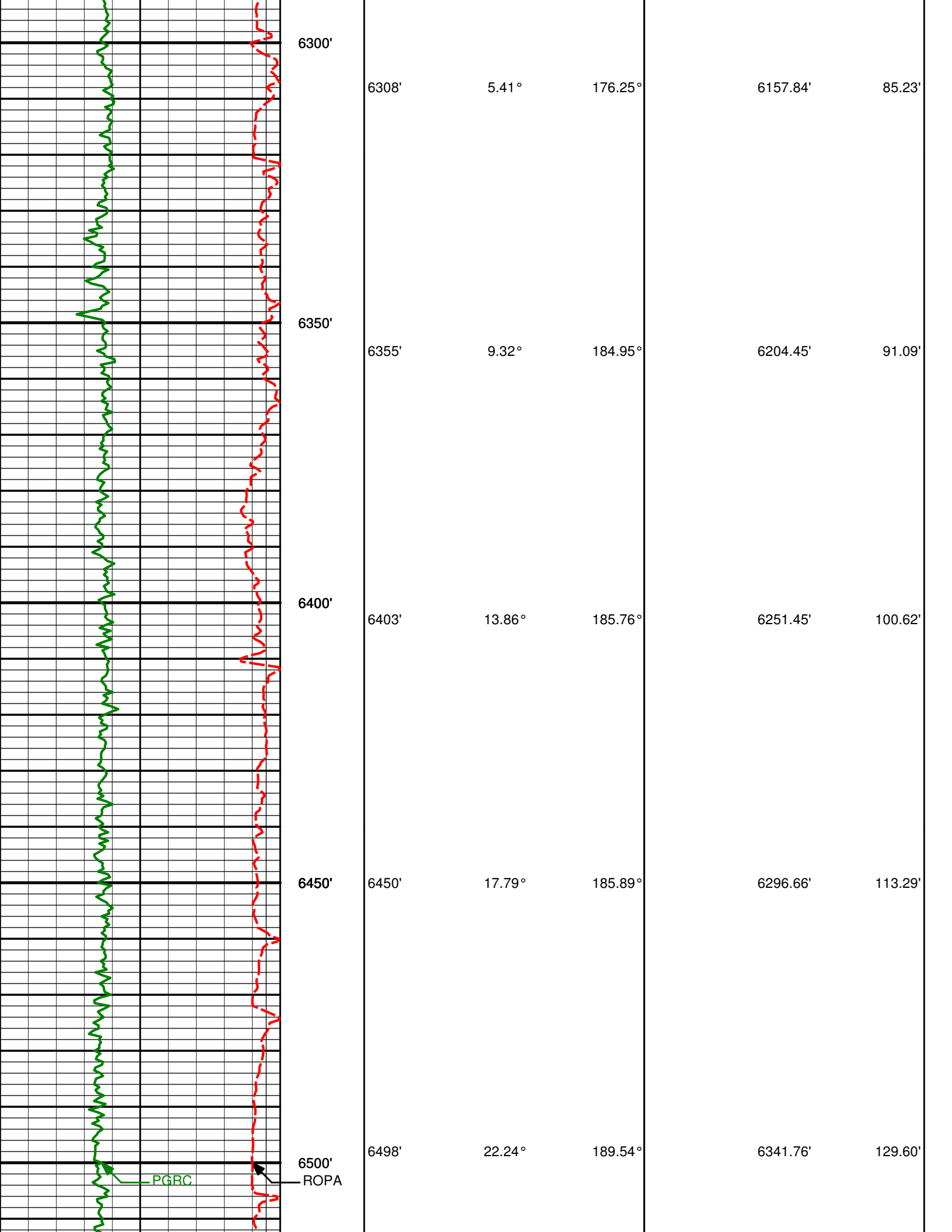
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HALLIBURTON

MD Detail Log 1:240

Gamma Ray (PGRC) (Api)	0	300
Avg Rate of Penetration feet per hr	1K	0

	Feet	Depth	Inc	Azml	TVD	Vsec
	6200					
		6213'	1.64°	73.38°	6062.96'	82.76'
	6250' KOP					
		6260'	1.86°	129.96°	6109.94'	82.74'





6545'	27.46°	186.50°	6384.39'	149.22'
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6550'

6593'	33.54°	185.56°	6425.73'	173.31'
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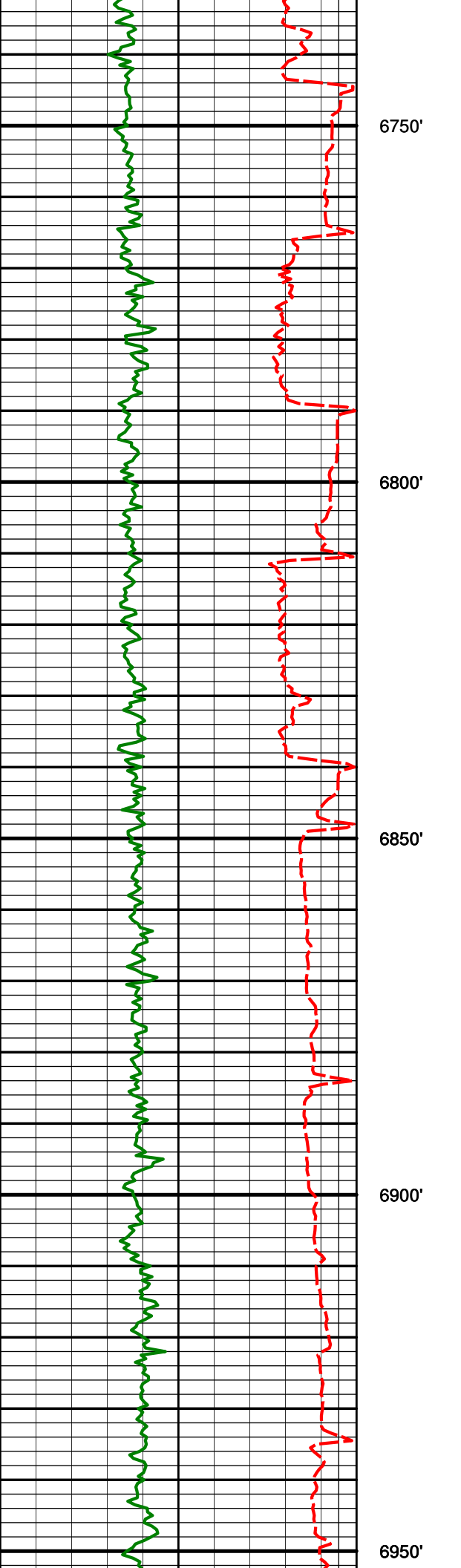
6600'

6640'	39.34°	184.98°	6463.53'	200.86'
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6650'

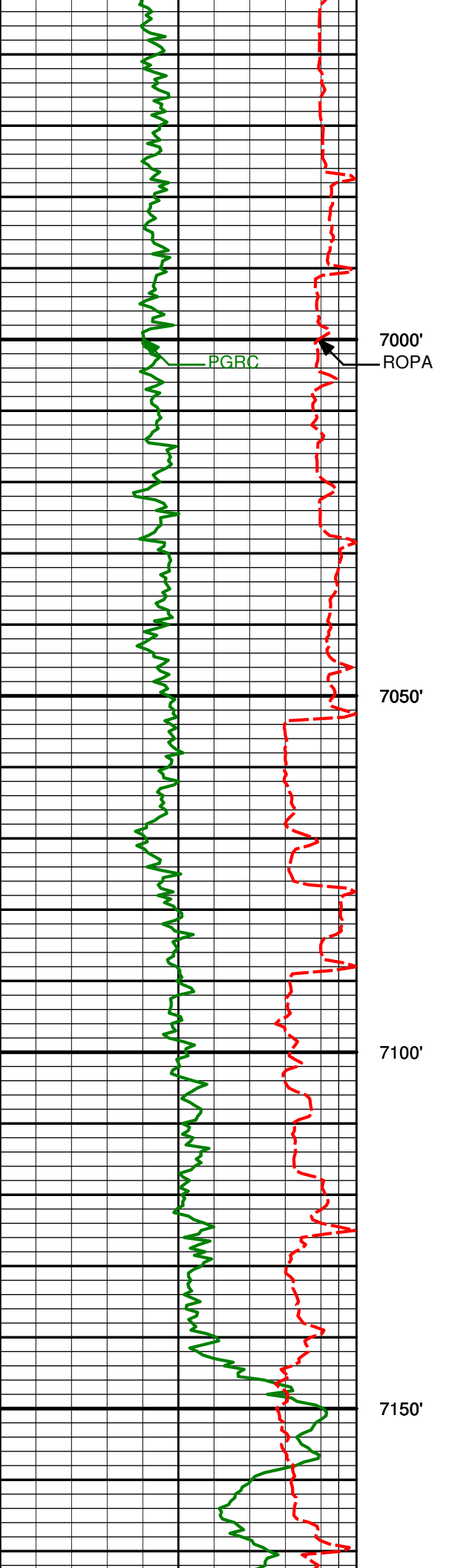
6688'	46.60°	183.99°	6498.63'	233.07'
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6700'

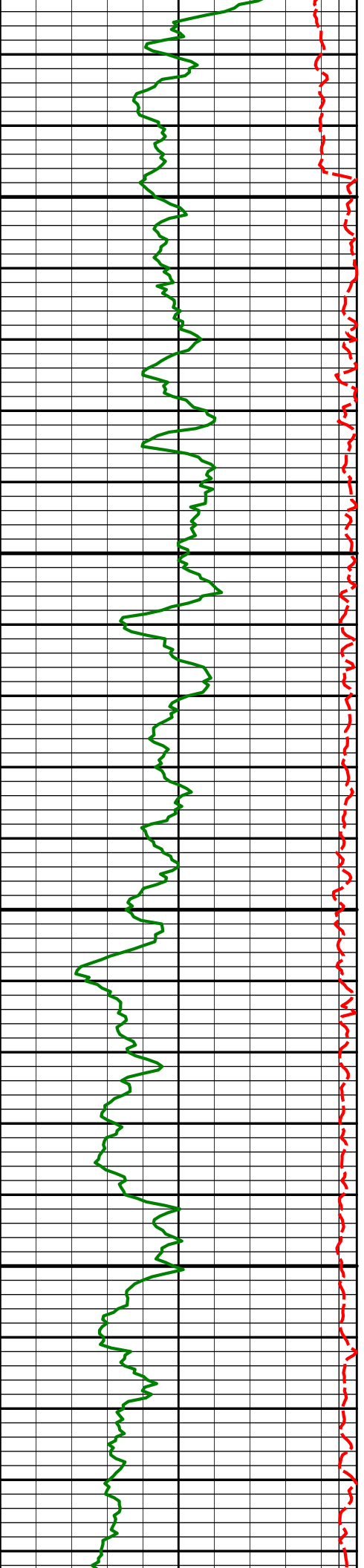


6735'	50.75°	183.87°
6750'		
6783'	54.60°	183.92°
6800'		
6830'	56.79°	182.97°
6850'		
6877'	58.68°	182.65°
6900'		
6924'	59.02°	182.38°
6950'		

6529.66'	267.78'
6558.75'	305.31'
6585.24'	343.43'
6610.33'	382.37'
6634.64'	421.75'



6972'	60.26°	181.29°	6658.90'	462.18'
7019'	62.02°	181.65°	6681.58'	502.31'
7067'	64.33°	181.66°	6703.24'	544.10'
7114'	65.60°	182.20°	6723.13'	585.69'
7162'	65.45°	182.09°	6743.01'	628.39'



7200'

7209'

66.12°

182.66°

6762.29'

670.32'

7250'

7256'

67.82°

183.26°

6780.68'

712.73'

7300'

7303'

71.76°

183.31°

6796.92'

756.01'

7350'

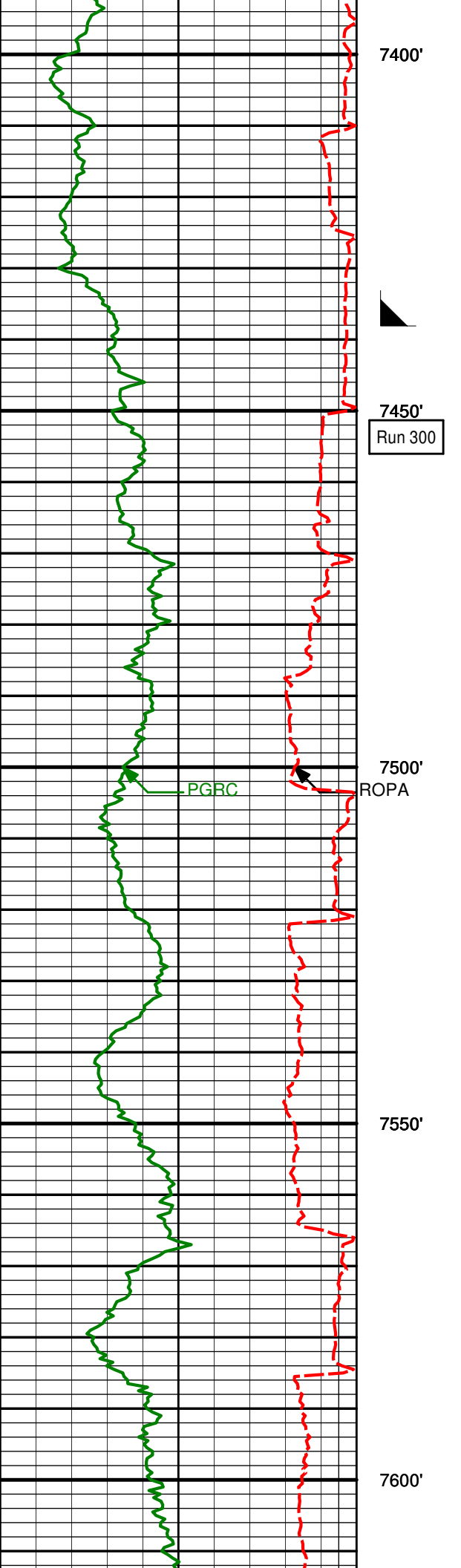
7351'

77.60°

181.35°

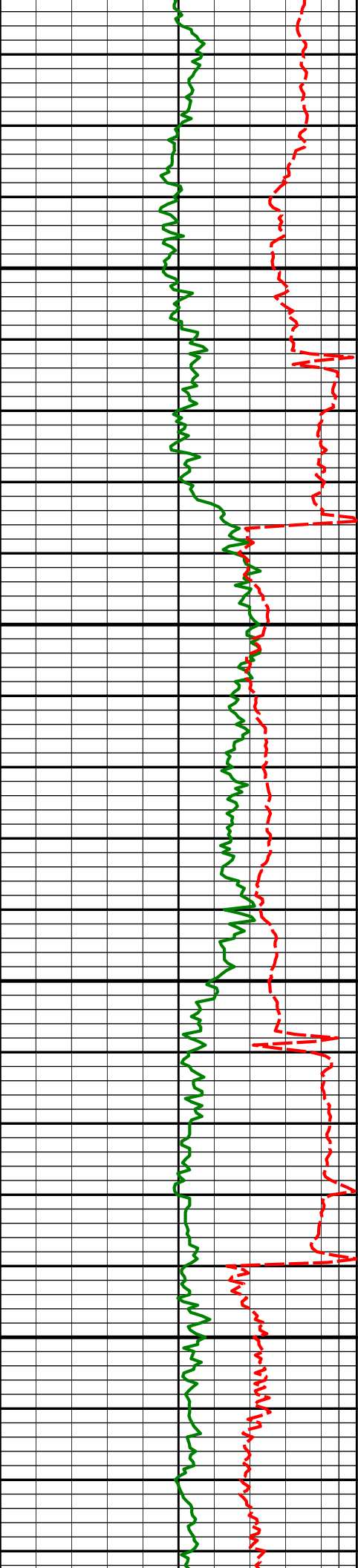
6809.59'

801.27'



7394'	81.04°	179.48°
7510'	85.34°	179.42°
7604'	85.49°	181.46°

6817.56'	842.27'
6829.48'	953.58'
6836.99'	1044.53'



7650'

7700'

7750'

7800'

7699'

7794'

85.77°

87.66°

182.91°

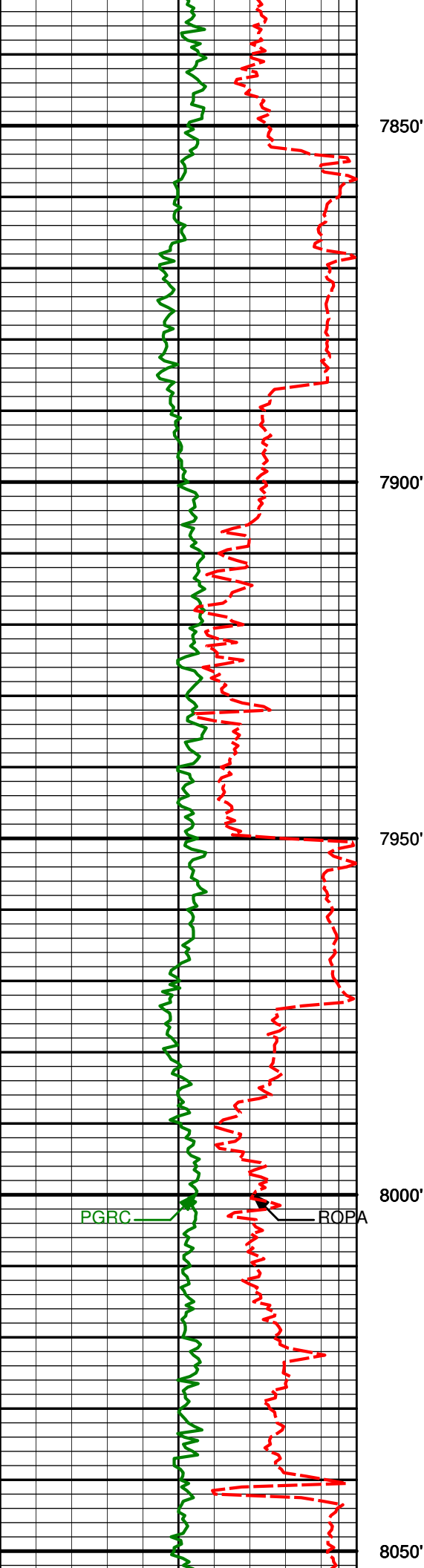
184.34°

6844.22'

6849.67'

1137.13'

1230.32'

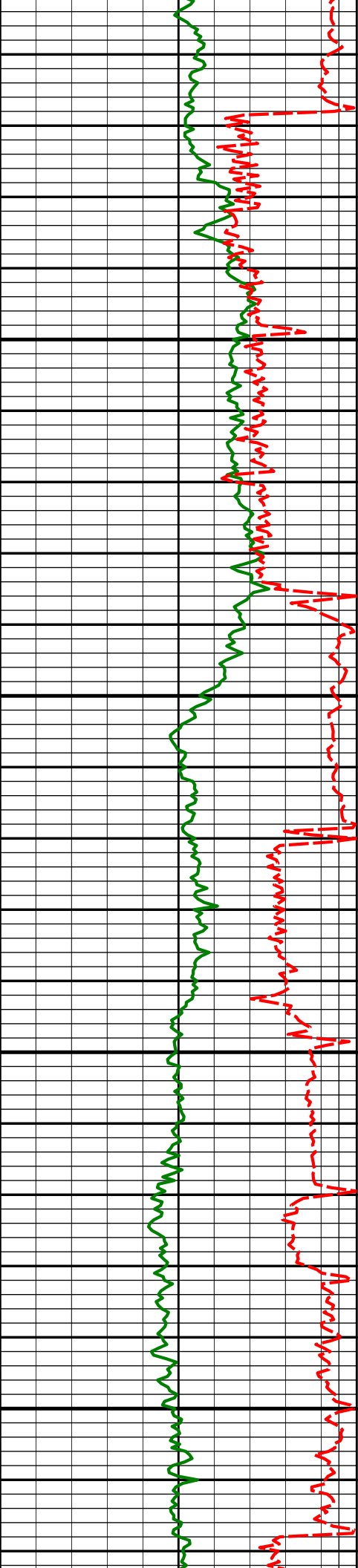


7889' 89.08° 185.01° 6852.37' 1323.93'

7984' 92.13° 186.12° 6851.38' 1417.80'

PGRC

ROPA



8079'

92.47°

184.26°

6847.57'

1511.52'

8100'

8150'

8174'

91.69°

182.82°

6844.12'

1604.77'

8200'

8250'

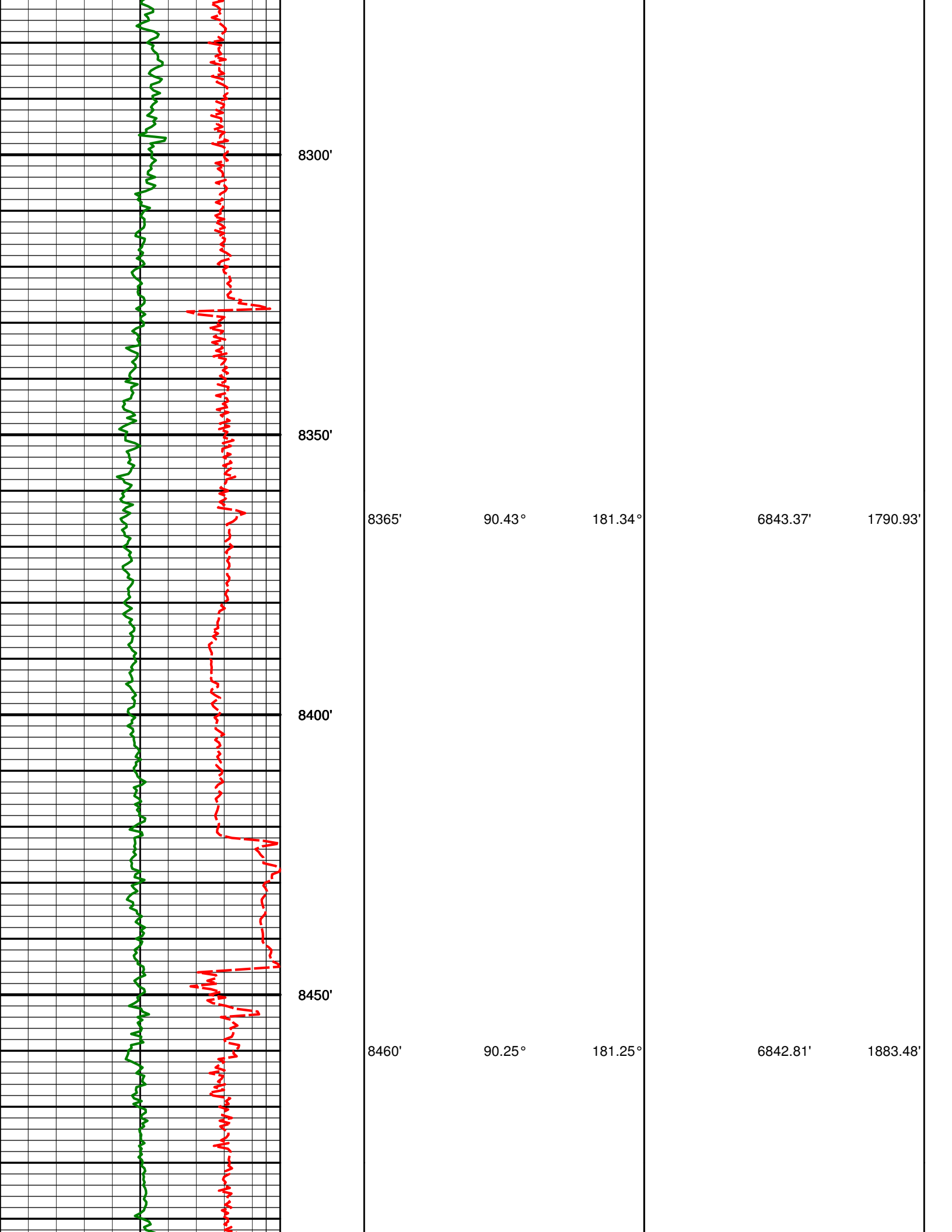
8270'

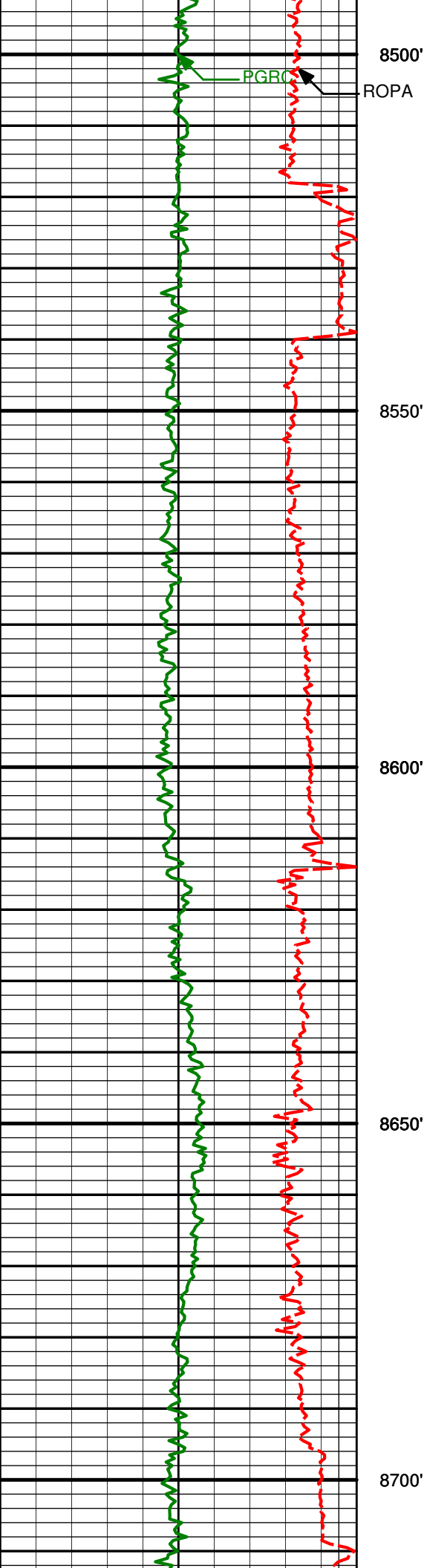
89.38°

180.77°

6843.21'

1698.47'





8500'

PGR

ROPA

8550'

8555'

88.80°

181.13°

6843.60'

1975.98'

8600'

8650'

8649'

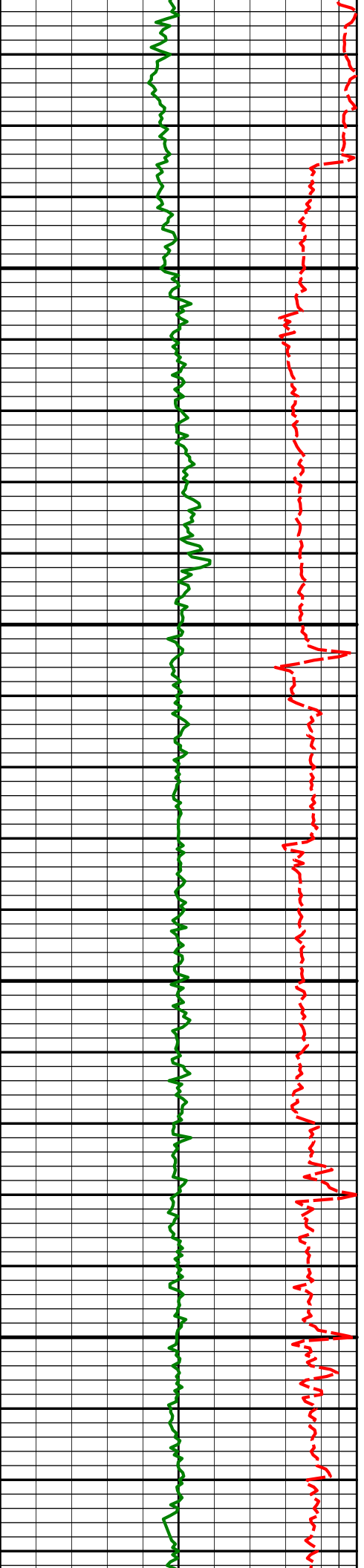
89.97°

182.14°

6844.61'

2067.68'

8700'



8744'

89.08°

181.72°

6845.40'

2160.46'

8750'

8800'

8839'

89.85°

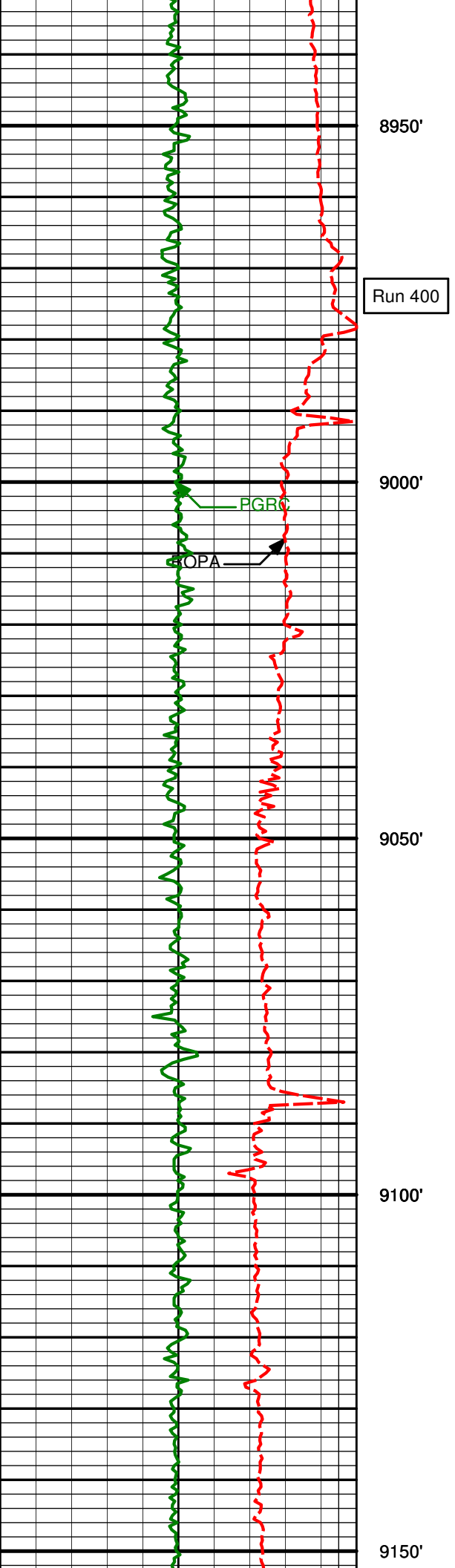
182.42°

6846.29'

2253.28'

8850'

8900'



8950'

Run 400

9000'

PGR

POPA

9029'

90.31°

182.28°

6846.01'

2438.96'

9050'

9100'

9124'

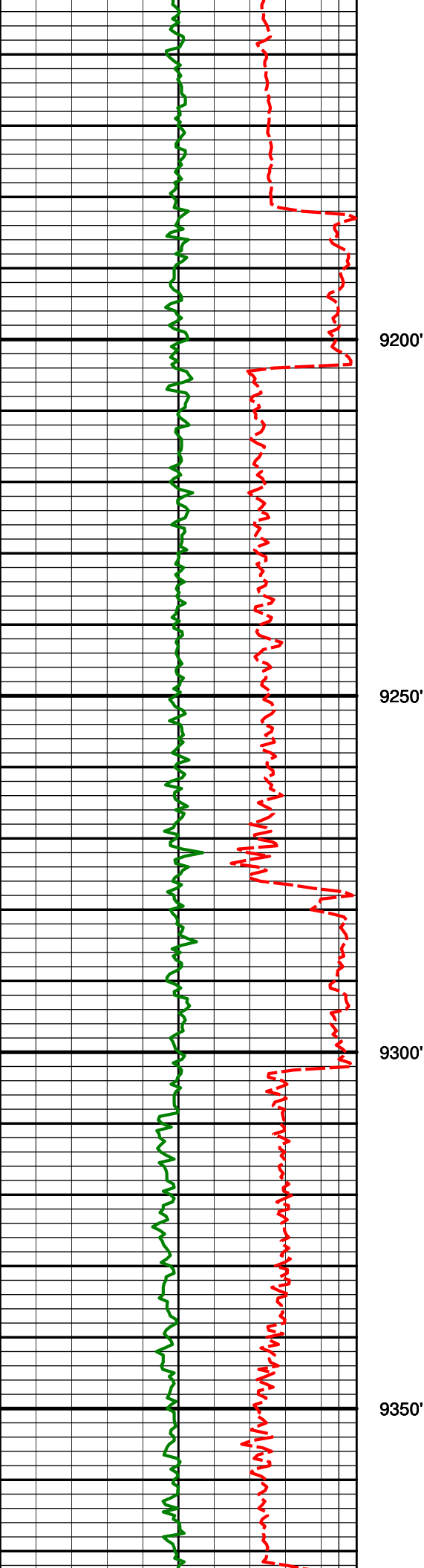
89.54°

181.99°

6846.14'

2531.81'

9150'



9200'

9219'

89.38°

180.66°

6847.03'

2624.37'

9250'

9300'

9313'

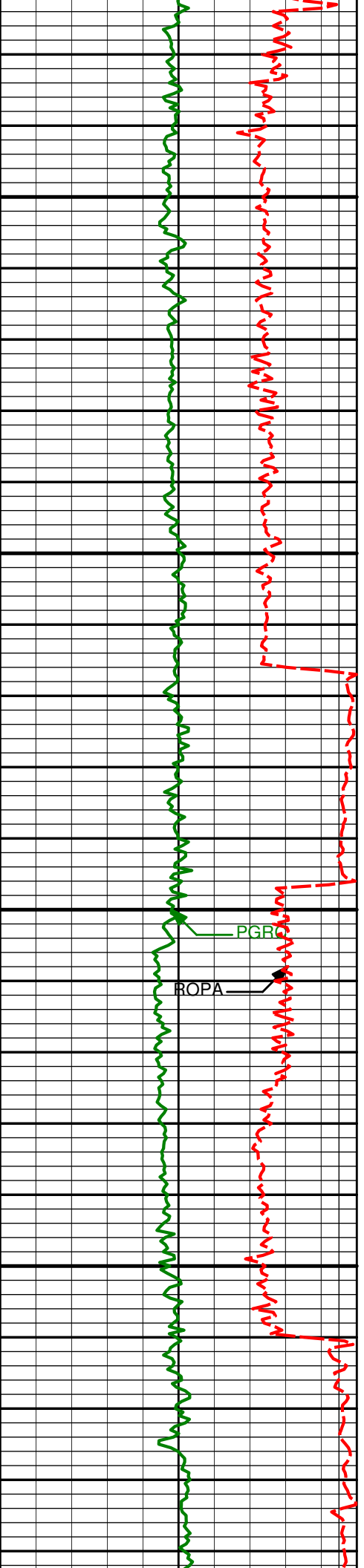
90.55°

179.16°

6847.08'

2715.40'

9350'



9400'

9408'

89.81°

176.12°

6846.78'

2806.39'

9450'

9500'

9503'

90.59°

175.36°

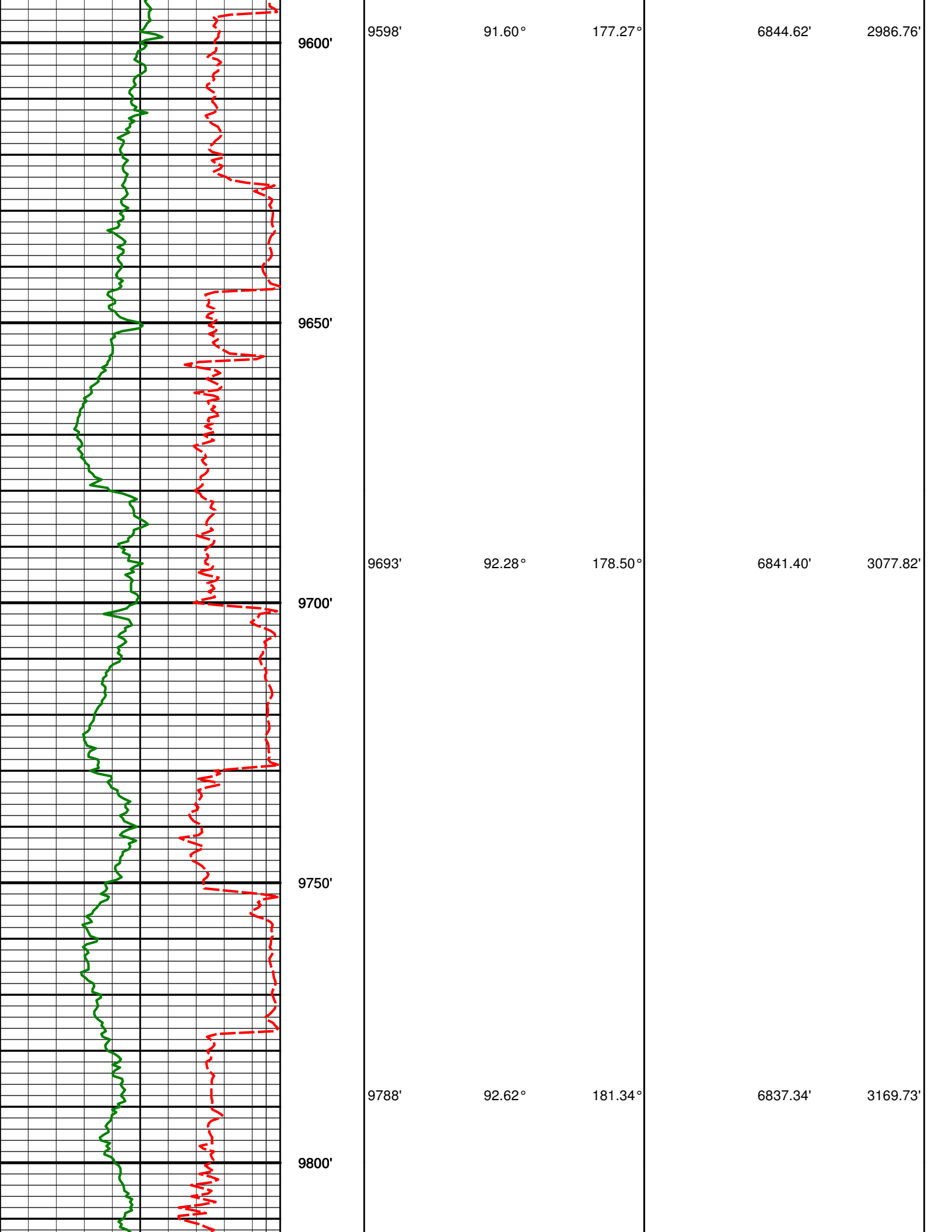
6846.44'

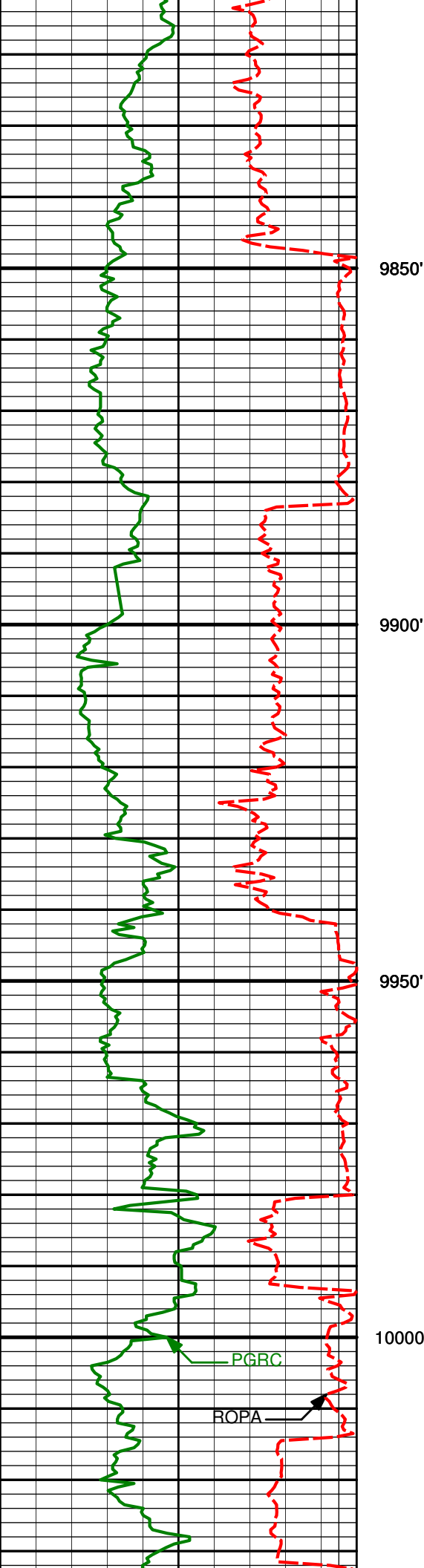
2896.43'

9550'

PGR

ROPA





9884'

92.04°

182.14°

6833.44'

3263.35'

9850'

9900'

9950'

9979'

90.56°

182.43°

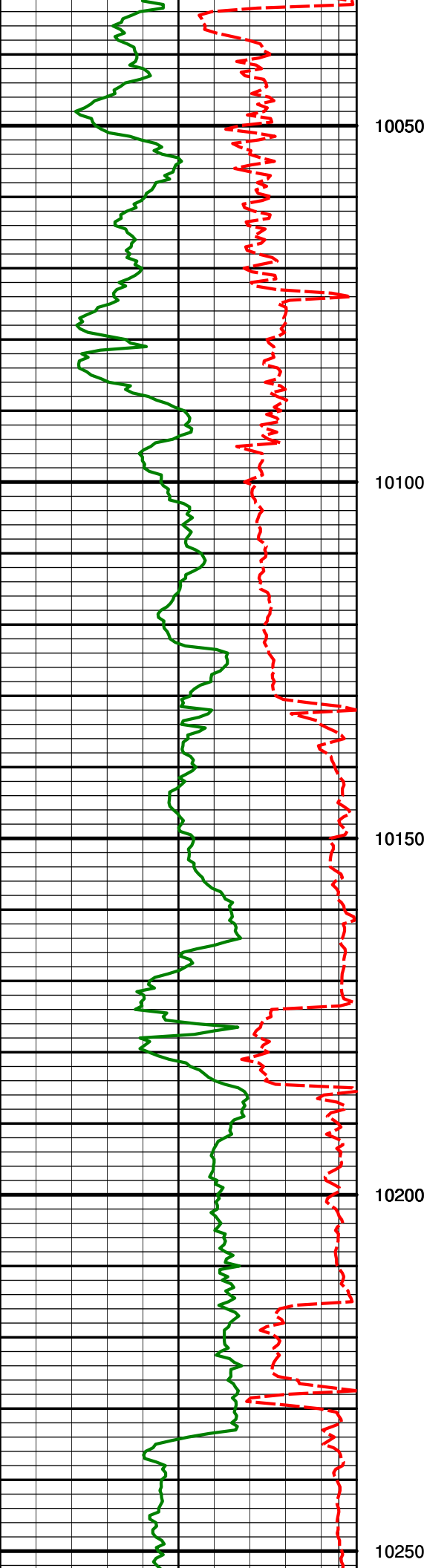
6831.29'

3356.23'

10000'

PGRC

ROPA



10050'

10074' 90.92° 183.82° 6830.06' 3449.41'

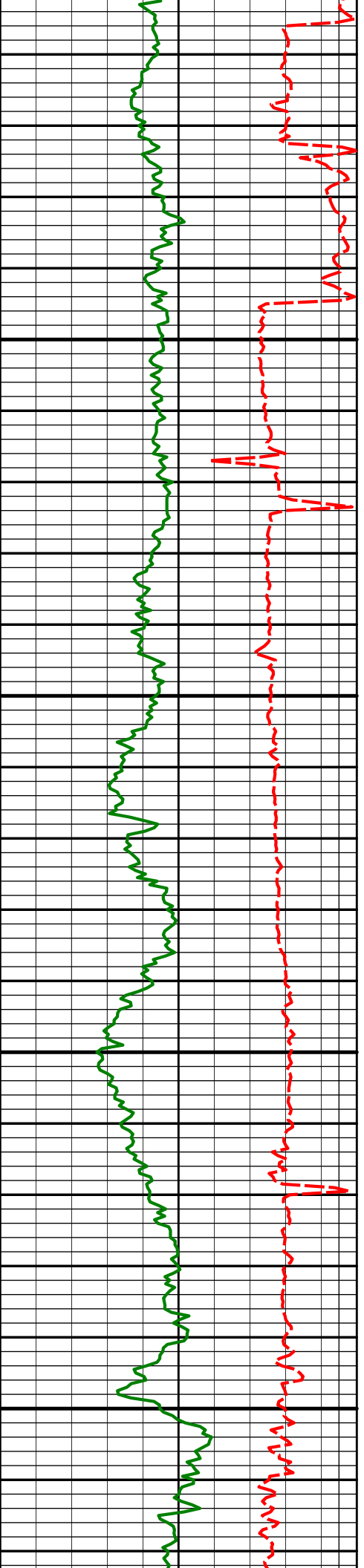
10100'

10150'

10169' 91.42° 184.83° 6828.12' 3542.94'

10200'

10250'



10264'

88.15°

186.36°

6828.47'

3636.82'

10300'

10359'

86.73°

186.92°

6832.71'

3730.87'

10400'

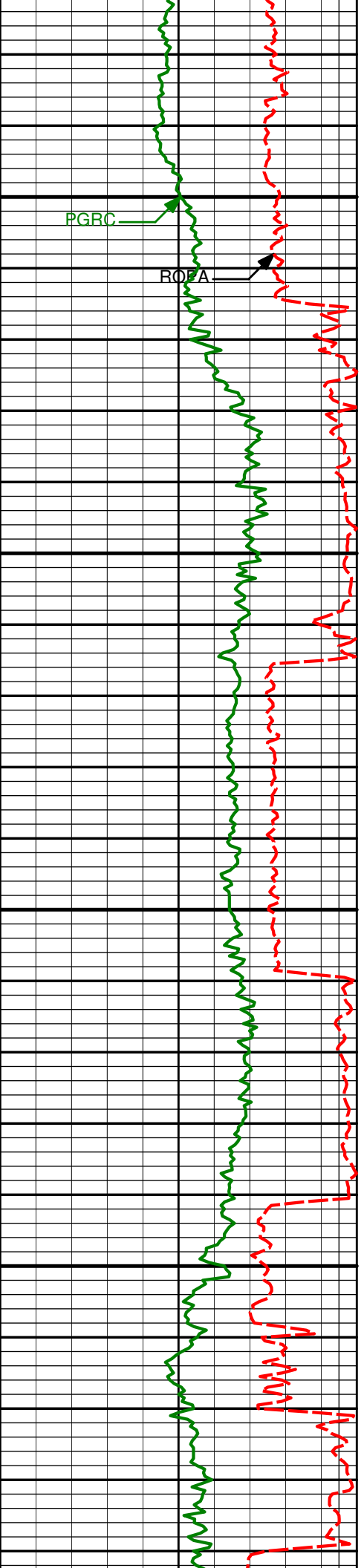
10454'

86.76°

187.41°

6838.11'

3824.98'



10500'

PGRC

ROPA

10550'

10549'

87.41°

186.22°

6842.94'

3919.04'

10600'

10644'

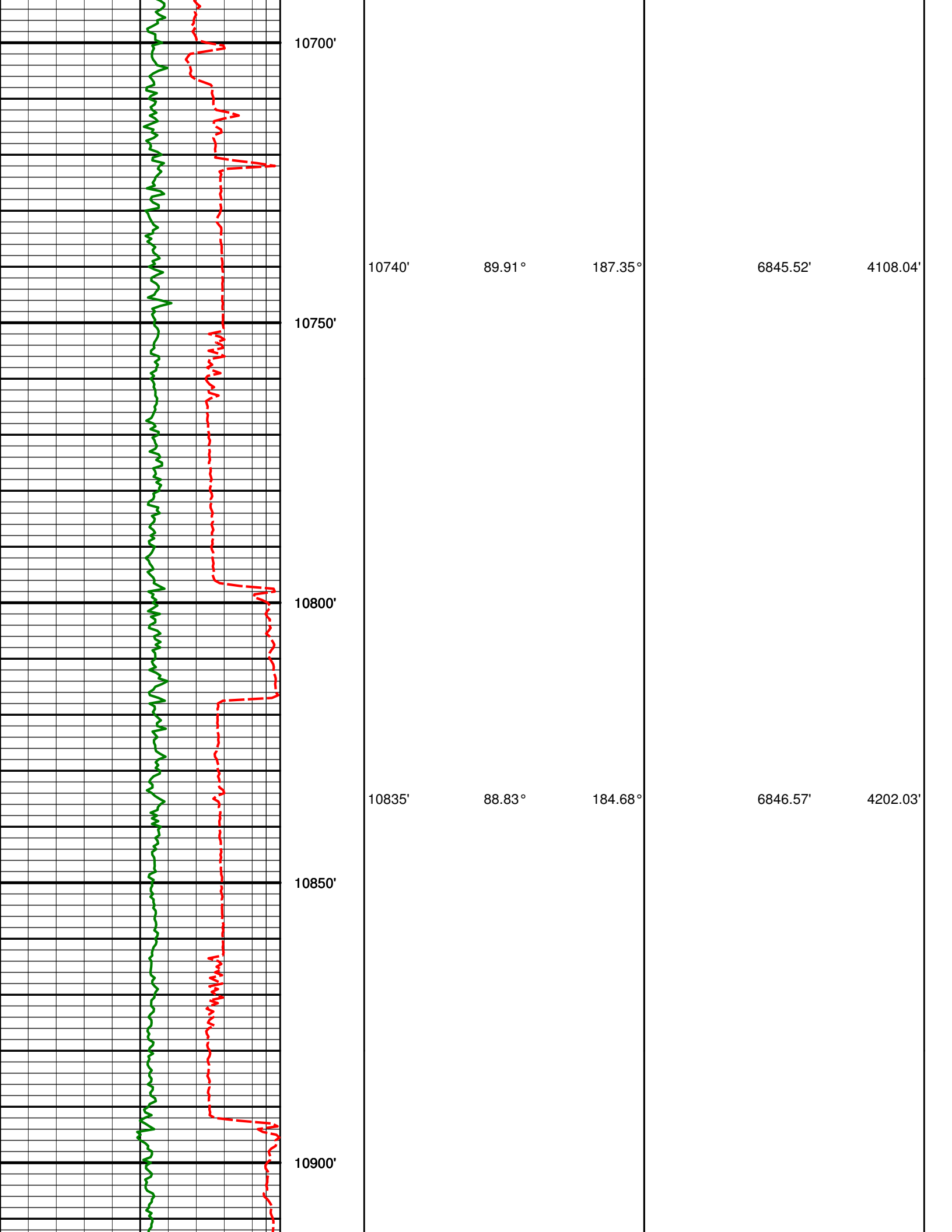
89.78°

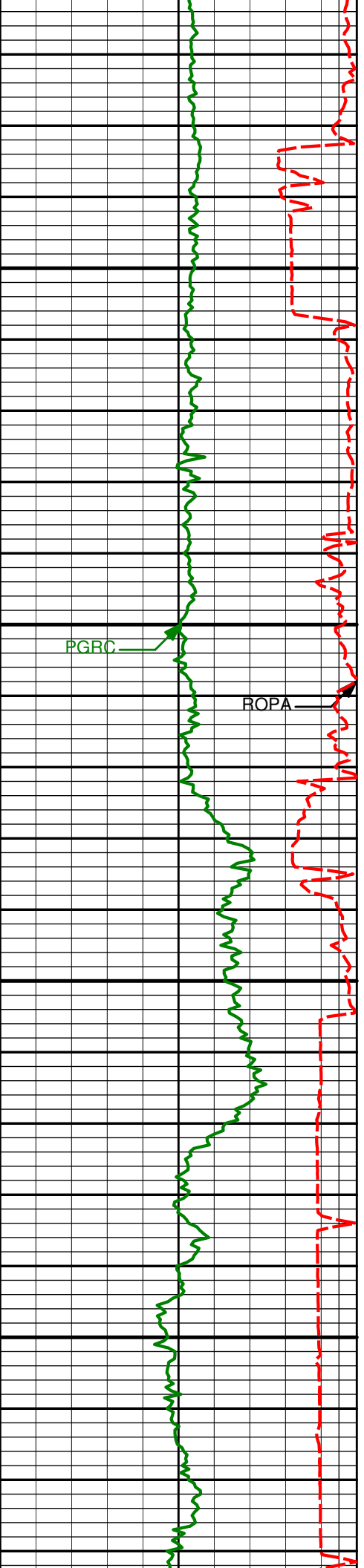
185.47°

6845.26'

4012.96'

10650'





10930' 89.17° 182.83° 6848.23' 4295.40'

10950'

11000'

PGRC

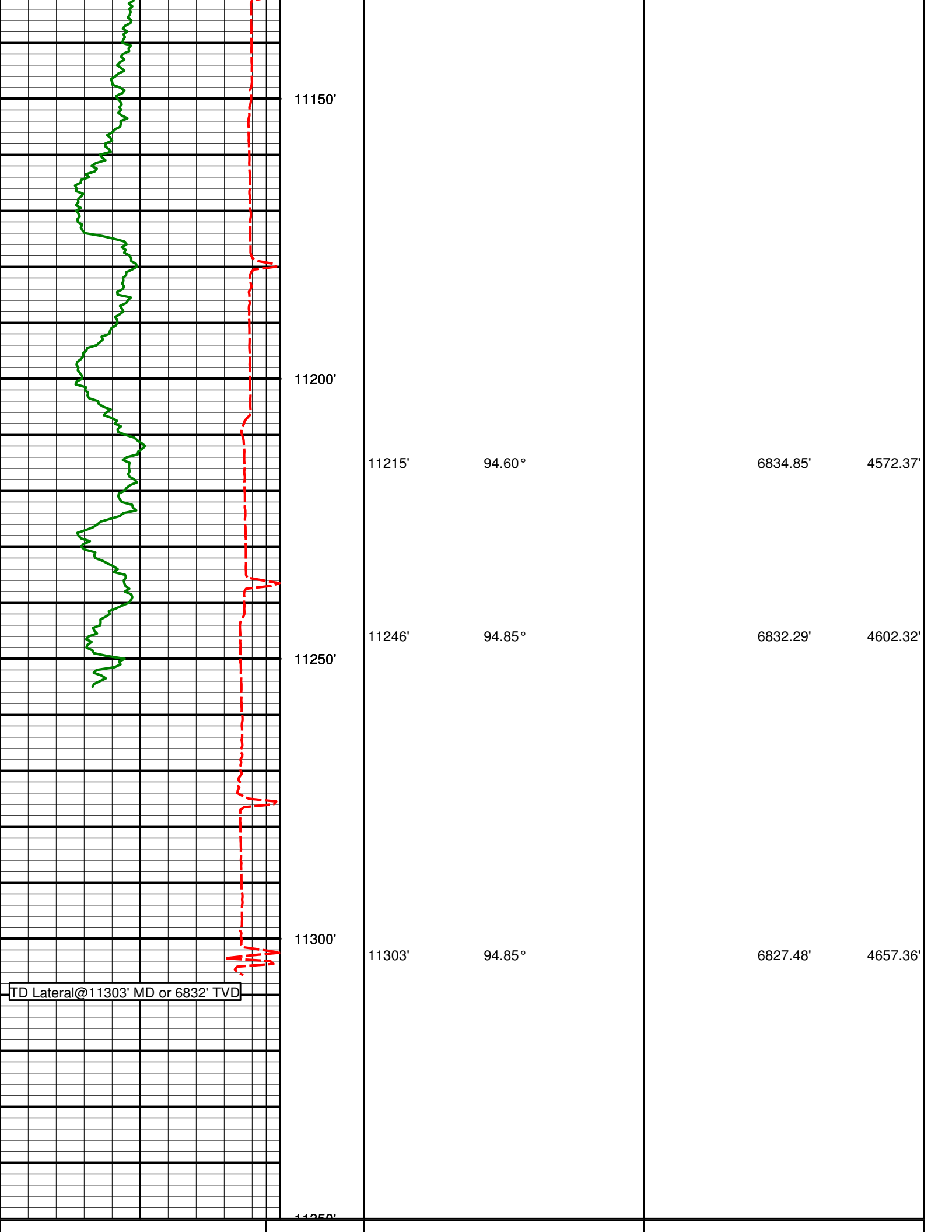
ROPA

11025' 92.06° 181.12° 6847.21' 4388.18'

11050'

11100'

11120' 94.13° 180.66° 6842.08' 4480.44'



11150'

11200'

11215'

94.60°

6834.85'

4572.37'

11246'

94.85°

6832.29'

4602.32'

11250'

11300'

11303'

94.85°

6827.48'

4657.36'

TD Lateral@11303' MD or 6832' TVD

11250'

	Feet						
	Depth	Inc	Azm	TVD	Vsec		
Avg Rate of Penetration feet per hr	1K	0					
Gamma Ray (PGRC) (Api)	0	300					



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Ball Ranch AC04-72HN
Wattenberg
Weld CO
USA
CA-XX-0009691519

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
880.00	0.00	0.00	880.00	0.00 N	0.00 E	0.00	TIE-IN
915.00	0.65	135.51	915.00	0.14 S	0.14 E	0.10	1.85
1008.00	0.68	153.82	1007.99	1.01 S	0.75 E	0.79	0.23
1101.00	0.61	150.89	1100.99	1.93 S	1.23 E	1.57	0.08
1195.00	0.74	210.13	1194.98	2.89 S	1.17 E	2.51	0.72
1288.00	2.87	260.55	1287.93	3.79 S	1.43 W	4.03	2.65
1381.00	4.08	273.22	1380.76	3.99 S	7.03 W	5.60	1.54
1474.00	5.29	273.45	1473.45	3.54 S	14.61 W	7.05	1.30
1568.00	6.95	273.20	1566.91	2.96 S	24.61 W	8.96	1.77
1663.00	9.06	276.90	1660.98	1.75 S	37.77 W	11.04	2.29
1758.00	11.19	276.09	1754.50	0.13 N	54.36 W	13.33	2.25
1852.00	13.49	272.40	1846.32	1.56 N	74.39 W	16.90	2.59
1947.00	15.85	273.84	1938.22	2.89 N	98.41 W	21.55	2.51
2042.00	16.91	272.06	2029.36	4.26 N	125.16 W	26.85	1.23
2137.00	19.36	273.02	2119.64	5.58 N	154.70 W	32.88	2.60
2232.00	18.72	278.04	2209.44	8.55 N	185.52 W	37.64	1.85
2326.00	16.53	276.00	2299.03	12.05 N	213.76 W	41.23	2.41
2421.00	18.07	279.39	2389.73	15.87 N	241.74 W	44.46	1.93
2515.00	18.11	284.13	2479.09	21.81 N	270.29 W	45.76	1.57
2610.00	15.58	282.63	2570.00	28.21 N	297.06 W	46.19	2.70
2705.00	17.23	277.14	2661.14	32.75 N	323.47 W	48.33	2.38
2800.00	19.49	285.66	2751.32	38.78 N	352.70 W	49.73	3.69
2895.00	17.89	285.75	2841.30	47.02 N	382.00 W	48.99	1.69
2990.00	16.59	285.76	2932.04	54.66 N	409.09 W	48.29	1.37
3085.00	17.56	284.98	3022.85	62.05 N	435.98 W	47.79	1.05
3180.00	16.86	283.90	3113.60	69.06 N	463.20 W	47.73	0.81
3275.00	19.71	282.58	3203.79	75.86 N	492.21 W	48.33	3.04
3371.00	19.96	281.99	3294.09	82.79 N	524.04 W	49.49	0.33
3465.00	18.48	282.95	3382.85	89.46 N	554.25 W	50.51	1.61
3561.00	16.25	282.15	3474.47	95.70 N	582.21 W	51.38	2.33
3656.00	16.17	279.92	3565.70	100.77 N	608.24 W	52.90	0.66
3751.00	16.57	281.83	3656.85	105.83 N	634.53 W	54.51	0.71
3846.00	20.42	278.91	3746.92	111.18 N	664.17 W	56.67	4.16
3941.00	22.79	277.78	3835.25	116.24 N	698.78 W	60.33	2.53
4036.00	24.63	283.74	3922.24	123.43 N	736.24 W	62.63	3.18
4131.00	23.53	284.21	4008.97	132.79 N	773.85 W	62.88	1.18
4226.00	21.82	284.65	4096.62	141.91 N	809.32 W	62.82	1.81
4321.00	19.43	280.03	4185.53	149.13 N	841.97 W	63.90	3.05
4416.00	16.90	281.50	4275.79	154.64 N	871.07 W	65.77	2.70
4511.00	13.99	284.91	4367.35	160.34 N	895.70 W	66.34	3.21

4606.00	10.39	280.74	4460.20	164.90 N	915.22 W	66.76	3.89
4701.00	8.23	276.83	4553.94	167.30 N	930.39 W	68.18	2.37
4796.00	8.11	277.05	4647.98	168.93 N	943.80 W	69.92	0.13
4891.00	7.76	283.28	4742.07	171.23 N	956.69 W	70.88	0.98
4978.00	4.73	292.03	4828.54	173.92 N	965.73 W	70.51	3.63
5074.00	1.91	295.29	4924.37	176.09 N	970.84 W	69.68	2.95
5169.00	2.13	172.33	5019.35	175.02 N	972.04 W	71.02	3.74
5264.00	3.59	229.75	5114.24	171.34 N	974.07 W	75.08	3.19
5359.00	1.79	224.78	5209.13	168.37 N	977.38 W	78.77	1.91
5454.00	1.56	205.66	5304.09	166.16 N	978.98 W	81.32	0.63
5549.00	0.65	177.06	5399.08	164.46 N	979.51 W	83.09	1.09
5644.00	0.85	216.04	5494.07	163.35 N	979.90 W	84.26	0.56
5739.00	0.90	150.04	5589.06	162.14 N	979.94 W	85.44	1.00
5834.00	0.81	106.12	5684.05	161.31 N	978.93 W	86.00	0.68
5929.00	1.21	74.34	5779.04	161.40 N	977.32 W	85.52	0.71
6024.00	1.29	83.79	5874.01	161.78 N	975.29 W	84.64	0.23
6119.00	1.32	80.94	5968.99	162.07 N	973.15 W	83.83	0.07
6195.00	1.60	77.24	6044.96	162.44 N	971.25 W	83.00	0.39
6213.00	1.64	73.38	6062.96	162.57 N	970.76 W	82.76	0.65
6260.00	1.86	129.96	6109.94	162.27 N	969.53 W	82.74	3.55
6308.00	5.41	176.25	6157.84	159.51 N	968.78 W	85.23	9.05
6355.00	9.32	184.95	6204.45	153.51 N	968.97 W	91.09	8.62
6403.00	13.86	185.76	6251.45	143.91 N	969.88 W	100.62	9.46
6450.00	17.79	185.89	6296.66	131.16 N	971.18 W	113.29	8.37
6498.00	22.24	189.54	6341.76	114.90 N	973.44 W	129.60	9.61
6545.00	27.46	186.50	6384.39	95.35 N	976.14 W	149.22	11.43
6593.00	33.54	185.56	6425.73	71.14 N	978.69 W	173.31	12.71
6640.00	39.34	184.98	6463.53	43.35 N	981.24 W	200.86	12.36
6688.00	46.60	183.99	6498.63	10.75 N	983.77 W	233.07	15.20
6735.00	50.75	183.87	6529.66	24.45 S	986.19 W	267.78	8.82
6783.00	54.60	183.92	6558.75	62.53 S	988.79 W	305.31	8.03
6830.00	56.79	182.97	6585.24	101.28 S	991.12 W	343.43	4.95
6877.00	58.68	182.65	6610.33	140.97 S	993.06 W	382.37	4.07
6924.00	59.02	182.38	6634.64	181.16 S	994.82 W	421.75	0.87
6972.00	60.26	181.29	6658.90	222.55 S	996.15 W	462.18	3.25
7019.00	62.02	181.65	6681.58	263.70 S	997.20 W	502.31	3.80
7067.00	64.33	181.66	6703.24	306.52 S	998.43 W	544.10	4.81
7114.00	65.60	182.20	6723.13	349.08 S	999.87 W	585.69	2.89
7162.00	65.45	182.09	6743.01	392.73 S	1001.50 W	628.39	0.38
7209.00	66.12	182.66	6762.29	435.56 S	1003.28 W	670.32	1.81
7256.00	67.82	183.26	6780.68	478.75 S	1005.51 W	712.73	3.80
7303.00	71.76	183.31	6796.92	522.78 S	1008.04 W	756.01	8.38
7351.00	77.60	181.35	6809.59	569.01 S	1009.91 W	801.27	12.80
7394.00	81.04	179.48	6817.56	611.26 S	1010.21 W	842.27	9.06
7446.00	84.79	178.76	6823.97	662.85 S	1009.42 W	892.06	7.34
7510.00	85.34	179.42	6829.48	726.60 S	1008.40 W	953.58	1.34
7604.00	85.49	181.46	6836.99	820.29 S	1009.12 W	1044.53	2.17
7699.00	85.77	182.91	6844.22	914.94 S	1012.73 W	1137.13	1.55
7794.00	87.66	184.34	6849.67	1009.59 S	1018.73 W	1230.32	2.49
7889.00	89.08	185.01	6852.37	1104.23 S	1026.46 W	1323.93	1.65
7984.00	92.13	186.12	6851.38	1198.77 S	1035.67 W	1417.80	3.42
8079.00	92.47	184.26	6847.57	1293.30 S	1044.25 W	1511.52	2.00
8174.00	91.69	182.82	6844.12	1388.05 S	1050.11 W	1604.77	1.72
8270.00	89.38	180.77	6843.21	1483.99 S	1053.12 W	1698.47	3.22
8365.00	90.43	181.34	6843.37	1578.97 S	1054.86 W	1790.93	1.26
8460.00	90.25	181.25	6842.81	1673.95 S	1057.00 W	1883.48	0.22
8555.00	88.80	181.13	6843.60	1768.92 S	1058.97 W	1975.98	1.53
8649.00	89.97	182.14	6844.61	1862.87 S	1061.66 W	2067.68	1.64
8744.00	89.08	181.72	6845.40	1957.81 S	1064.85 W	2160.46	1.04
8839.00	89.85	182.42	6846.29	2052.75 S	1068.27 W	2253.28	1.10
8934.00	90.09	181.82	6846.34	2147.68 S	1071.78 W	2346.13	0.68
9029.00	90.31	182.28	6846.01	2242.62 S	1075.18 W	2438.96	0.54
9124.00	89.54	181.99	6846.14	2337.55 S	1078.72 W	2531.81	0.87
9219.00	89.38	180.66	6847.03	2432.52 S	1080.91 W	2624.37	1.41
9313.00	90.55	179.16	6847.08	2526.52 S	1080.76 W	2715.40	2.02
9408.00	89.81	176.12	6846.78	2621.42 S	1076.86 W	2806.39	3.29
9503.00	90.59	175.36	6846.44	2716.16 S	1069.80 W	2896.43	1.15
9598.00	91.60	177.27	6844.62	2810.94 S	1063.70 W	2986.76	2.28
9693.00	92.28	178.50	6841.40	2905.82 S	1060.20 W	3077.82	1.48
9788.00	92.62	181.34	6837.34	3000.72 S	1060.07 W	3169.73	3.00
9884.00	92.04	182.14	6833.14	3096.60 S	1060.08 W	3263.25	1.02

9884.00	92.04	182.14	6833.44	3096.60 S	1062.98 W	3263.39	1.03
9979.00	90.56	182.43	6831.29	3191.50 S	1066.76 W	3356.23	1.59
10074.00	90.92	183.82	6830.06	3286.34 S	1071.95 W	3449.41	1.52
10169.00	91.42	184.83	6828.12	3381.05 S	1079.11 W	3542.94	1.18
10264.00	88.15	186.36	6828.47	3475.58 S	1088.38 W	3636.82	3.80
10359.00	86.73	186.92	6832.71	3569.85 S	1099.36 W	3730.87	1.61
10454.00	86.76	187.41	6838.11	3663.95 S	1111.19 W	3824.98	0.52
10549.00	87.41	186.22	6842.94	3758.16 S	1122.45 W	3919.04	1.43
10644.00	89.78	185.47	6845.26	3852.63 S	1132.11 W	4012.96	2.62
10740.00	89.91	187.35	6845.52	3948.02 S	1142.83 W	4108.04	1.96
10835.00	88.83	184.68	6846.57	4042.49 S	1152.78 W	4202.03	3.03
10930.00	89.17	182.83	6848.23	4137.26 S	1159.00 W	4295.40	1.98
11025.00	92.06	181.12	6847.21	4232.19 S	1162.27 W	4388.18	3.54
11120.00	94.13	180.66	6842.08	4327.03 S	1163.75 W	4480.44	2.23
11215.00	94.60	180.12	6834.85	4421.75 S	1164.40 W	4572.37	0.75
11246.00	94.85	180.04	6832.29	4452.65 S	1164.44 W	4602.32	0.84
11303.00	94.85	180.04	6827.48	4509.44 S	1164.49 W	4657.36	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 194.33 DEGREES (GRID)
A TOTAL CORRECTION OF 7.90 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11303.00 FEET
IS 4657.37 FEET ALONG 194.48 DEGREES (GRID)**