



1 : 240

[illegible]

## WELL INFORMATION

MWD Run Number	100	200			
Date run completed	13-Jun-12	16-Jun-12			
Rig Bit Number	100	200			
Bit Size (in)	8.750	6.125			
Tool Nominal OD (in)	6.750	4.750			
Log Start Depth (MD, ft)	624.00	7,302.00			
Log End Depth (MD, ft)	7,302.00	11,010.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	10-Jun-12 07:15	14-Jun-12 14:00			
Drill/Wipe End Date and Time	12-Jun-12 21:30	16-Jun-12 11:45			
Min Inc (deg) @ Depth (MD, ft)	.11 @ 736.00	84.02 @ 7,316.00			
Max Inc (deg) @ Depth (MD, ft)	79.00 @ 7,249.00	92.87 @ 10,449.00			
Bit TFA(in2) / Bit Type	.75 / PDC	.46 / PDC			
Flow Rate (gpm)	600.00	270.00			
Max AV (fpm) / CV (fpm) @ MWD	477.0 / 477.0	505.1 / 505.1			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.00 / 28.00	9.50 / 39.00			
Filtrate CL (ppm)	600.00	700.00			
pH / Fluid Loss (mptm)	8.50 / N/A	10.70 / N/A			
PV (cP) / YP (lbf2)	1 / 4.00	10 / 8.50			
% Solids / % Sand	0.70 / 0.10	7.40 / 0.35			
% 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 (deg F) / S	474.00 / PDM	310.44 / PDM			

Max Tool Temp (degF) / Source	174.20 / PCM	218.14 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Robert Ley	Robert Ley			
Customer Representative	Charles Culver	Charles Culver			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11331930	11744836			
Insert Serial Number	10809548	10809548			
Date and Time Initialized	09-Jun-12 11:42	13-Jun-12 17:10			
Date and Time Read	12-Jun-12 04:02	16-Jun-12 21:38			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.00	63.00			
Software Version	6.21	6.21			
Sub Serial Number	11331930	11744836			
Sonde Serial Number	11062085	11062085			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	68.02	140.67			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	47.05	55.84			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11331930	11744836			
Insert/Sonde Serial Number	11579802	11579802			

## REMARKS

1. All depths are true vertical 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  
Gap Fill: 3.0 feet

Insite Version 7.3.40 build 25

5. Survey at TD is projected to the bit

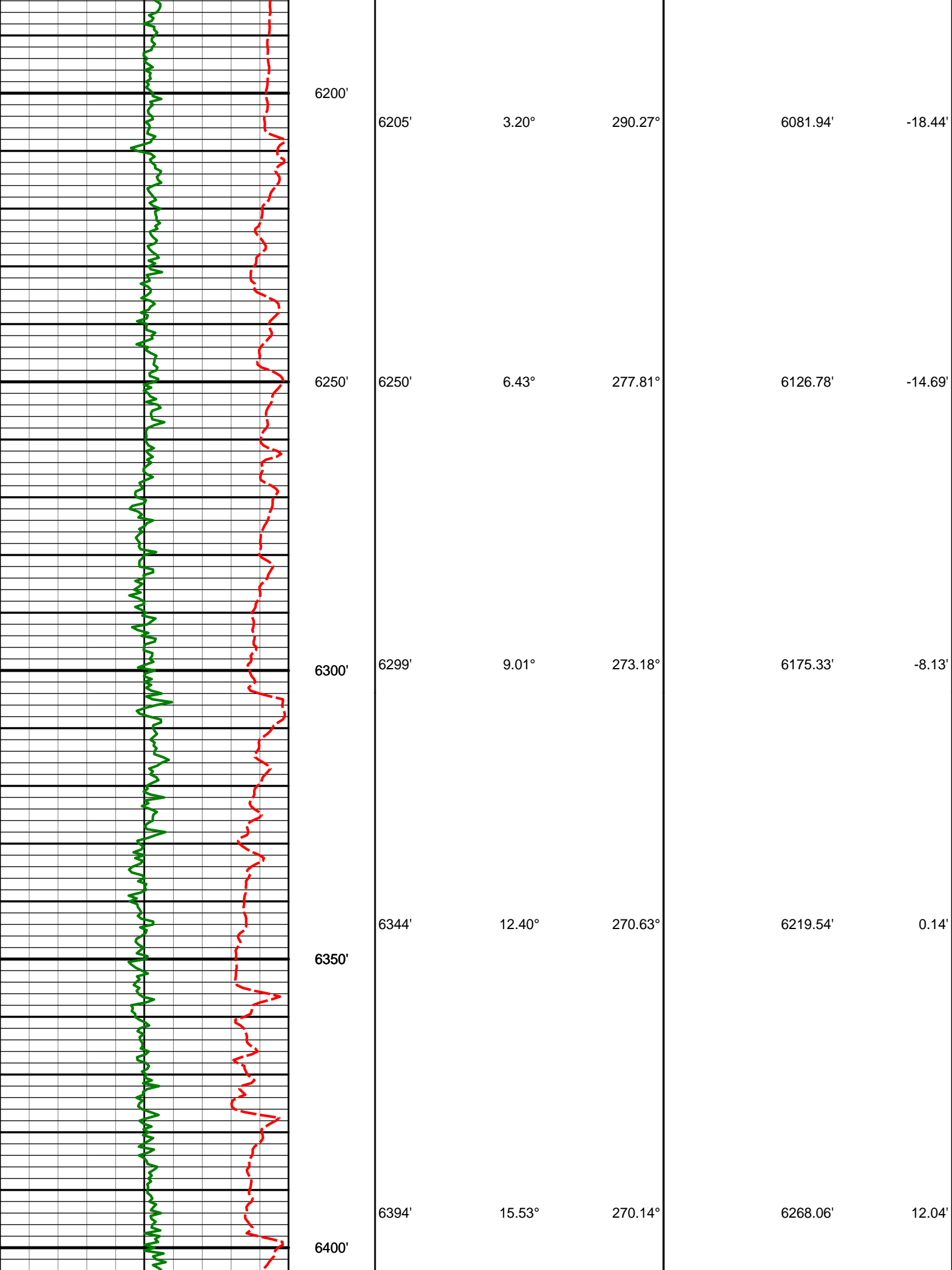
WARRANTY

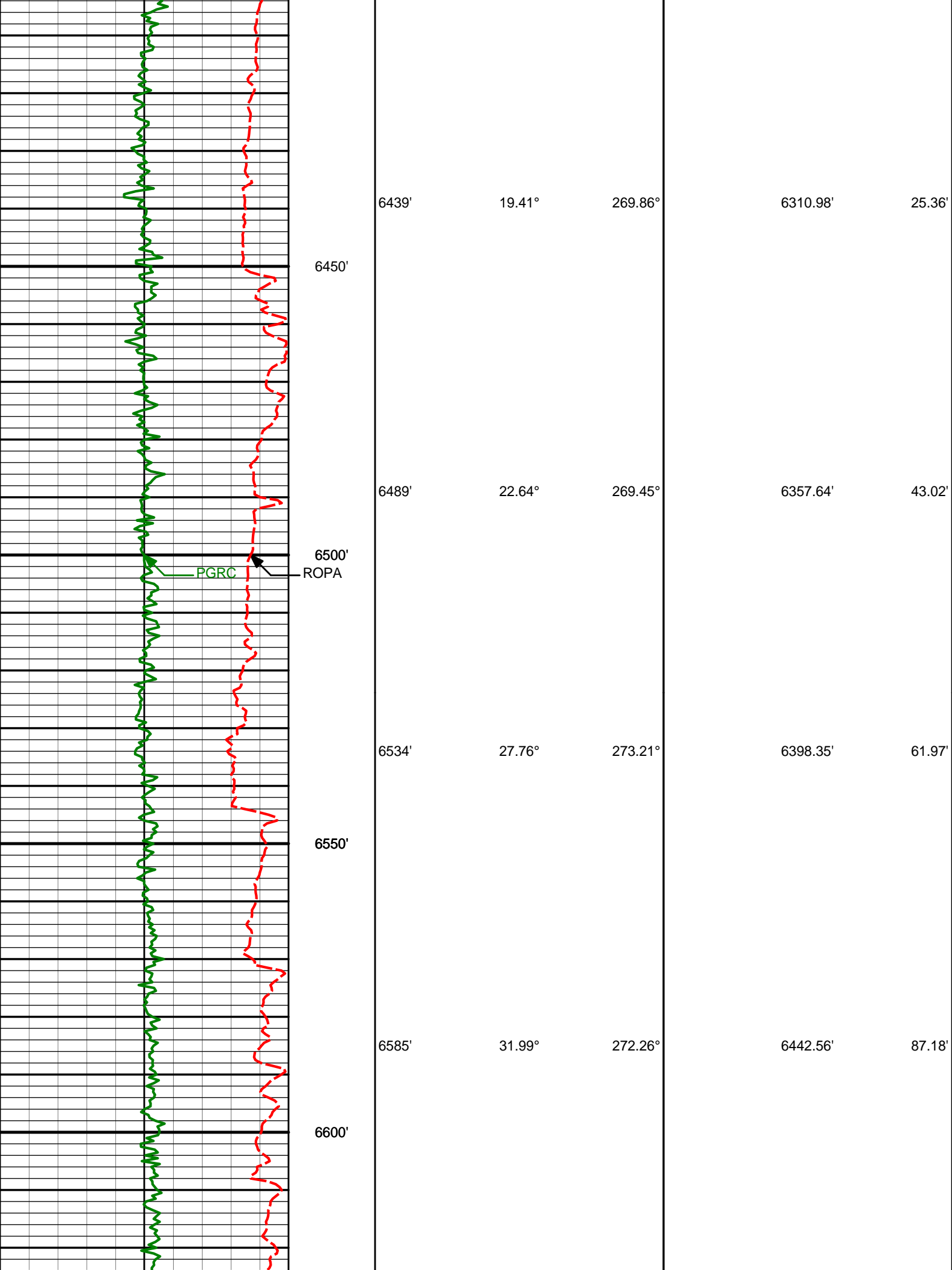
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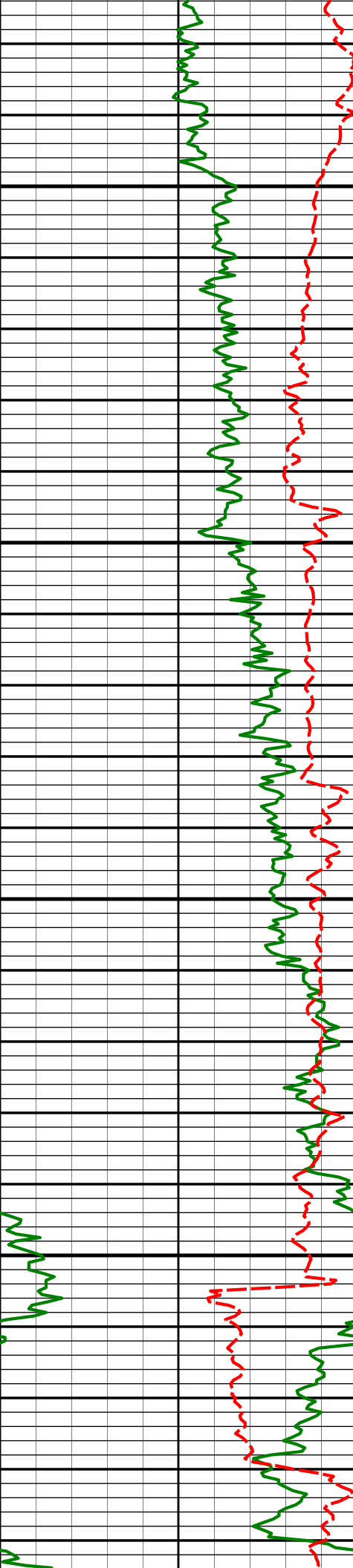
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MD Detail Log 1:240

Avg Rate of Penetration feet per hr					
1K0					
PCG Gamma Ray api		Feet			
0300					
		Depth	Inc	Azm	TVDVsec
		6110'	0.83°	72.87°	5986.97'-19.18'
		6150'			
		6155'	0.43°	85.75°	6031.97'-19.63'
		KOP			







6650'

6700'

6750'

6800'

6630'

35.04°

269.56°

6480.07'

111.72'

6679'

40.83°

268.32°

6518.70'

141.30'

6724'

47.27°

268.32°

6551.03'

171.96'

6775'

53.92°

268.96°

6583.38'

210.62'

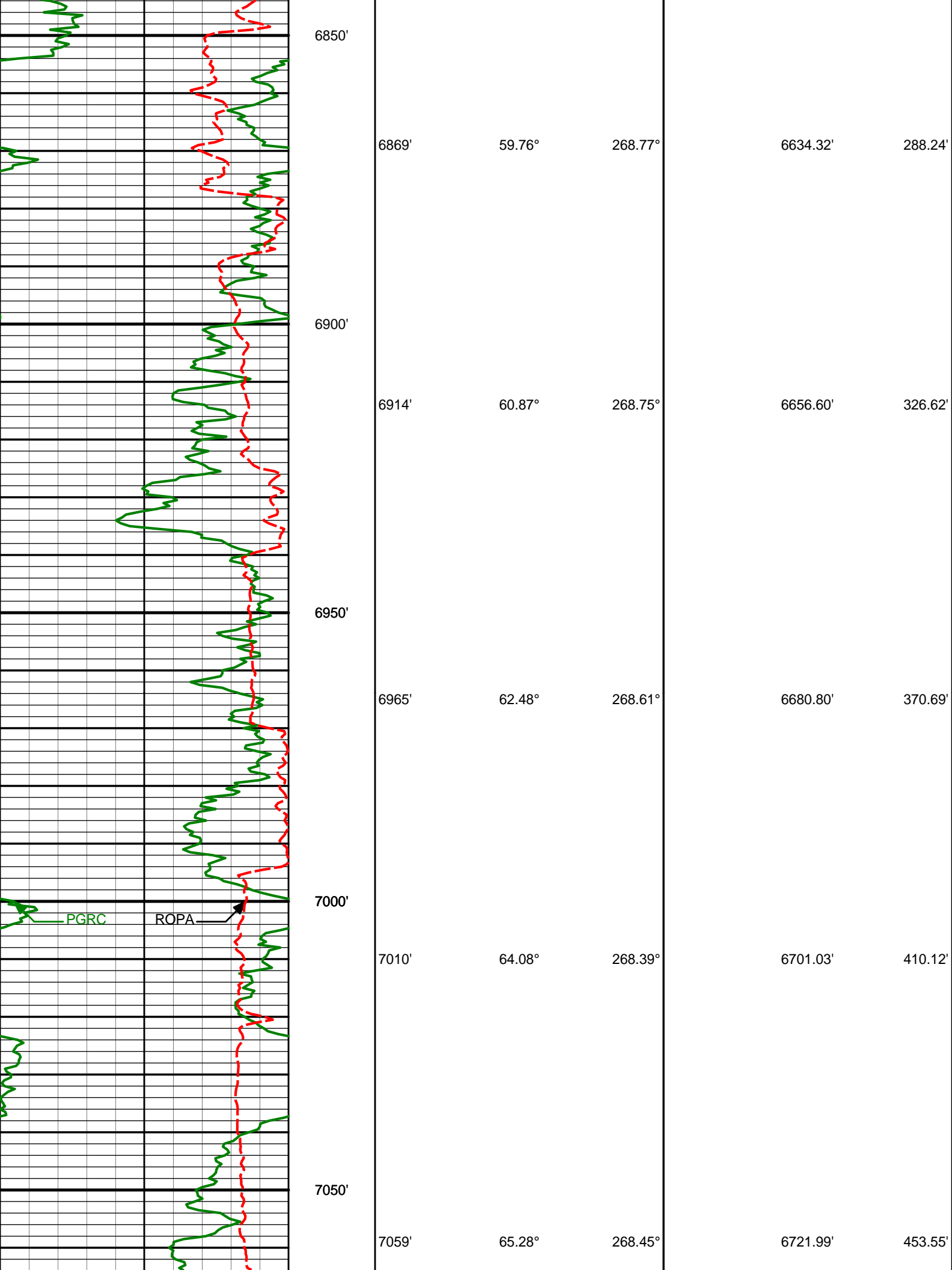
6820'

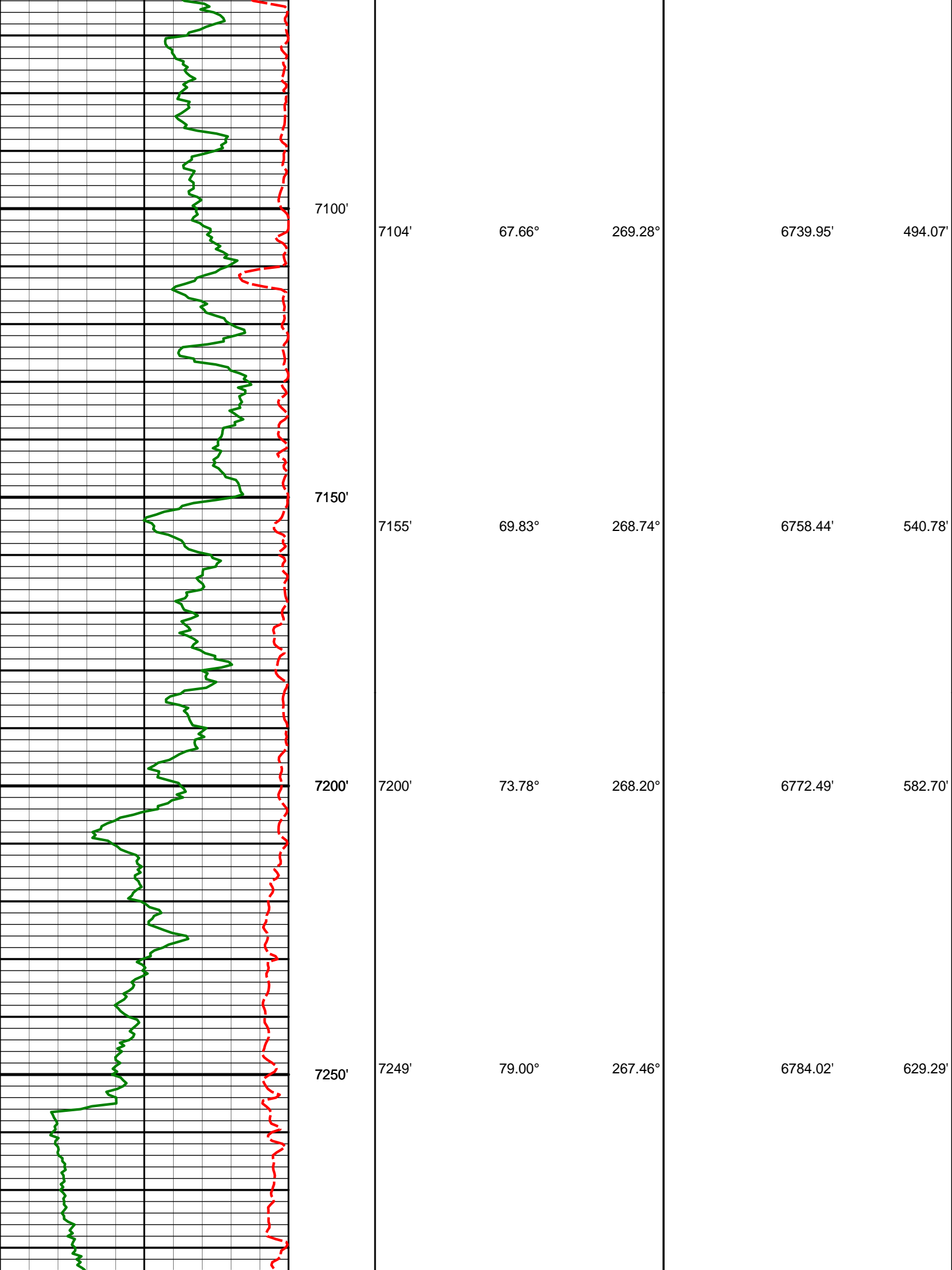
57.39°

269.39°

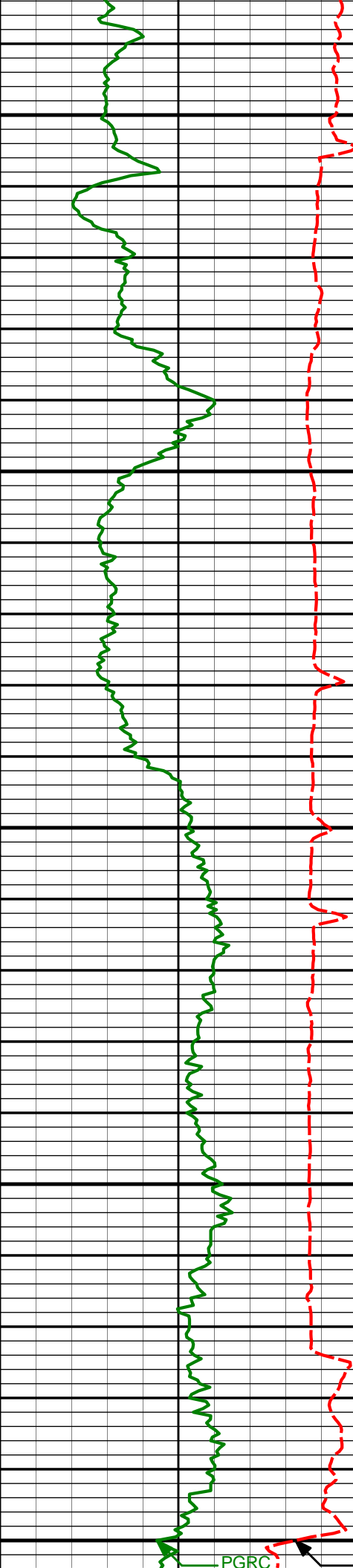
6608.77'

247.14'









7300'

Run 200

7316'

84.02°

266.83°

6793.91'

693.96'

7350'

7400'

7410'

85.78°

265.70°

6802.27'

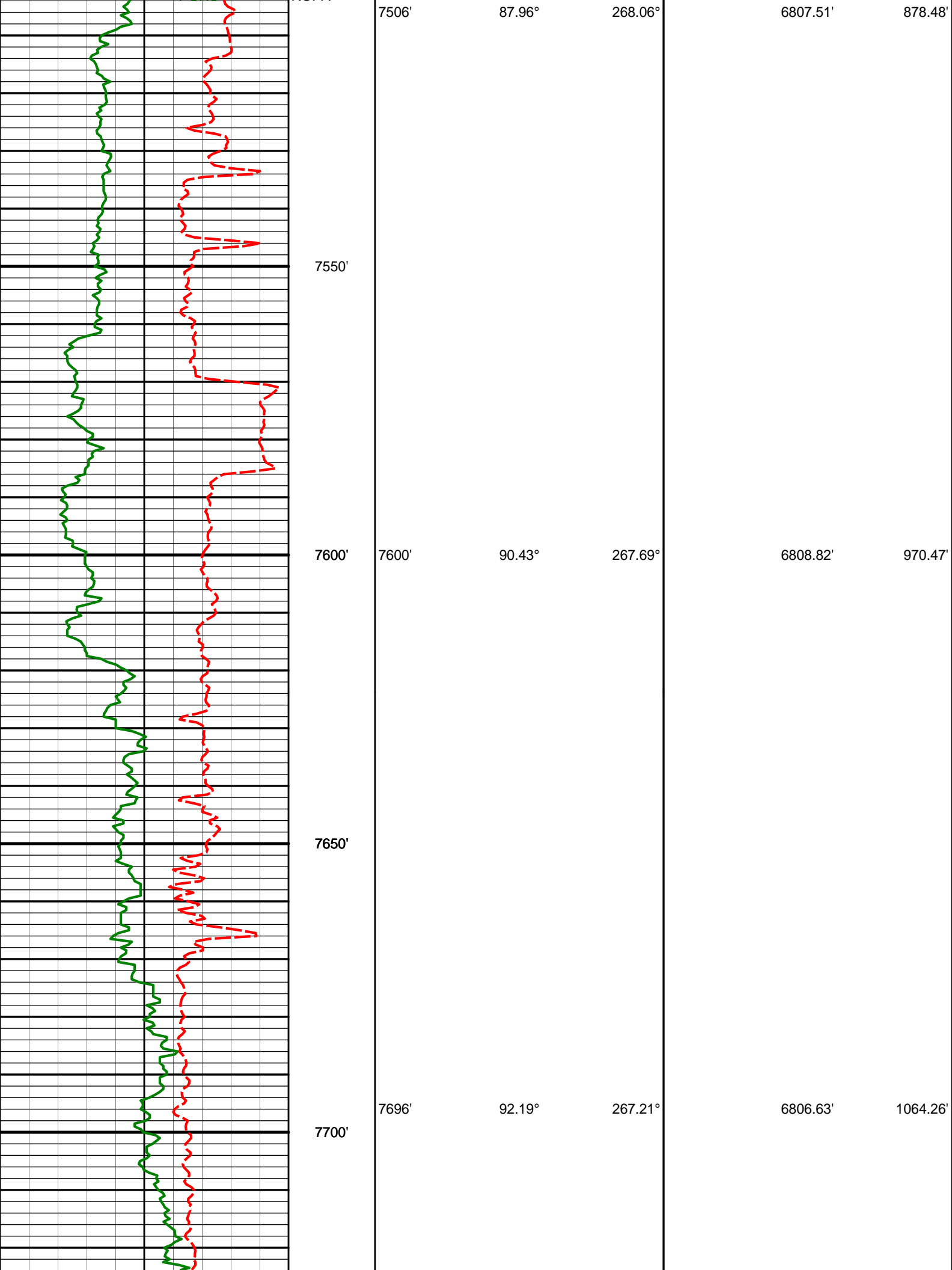
785.02'

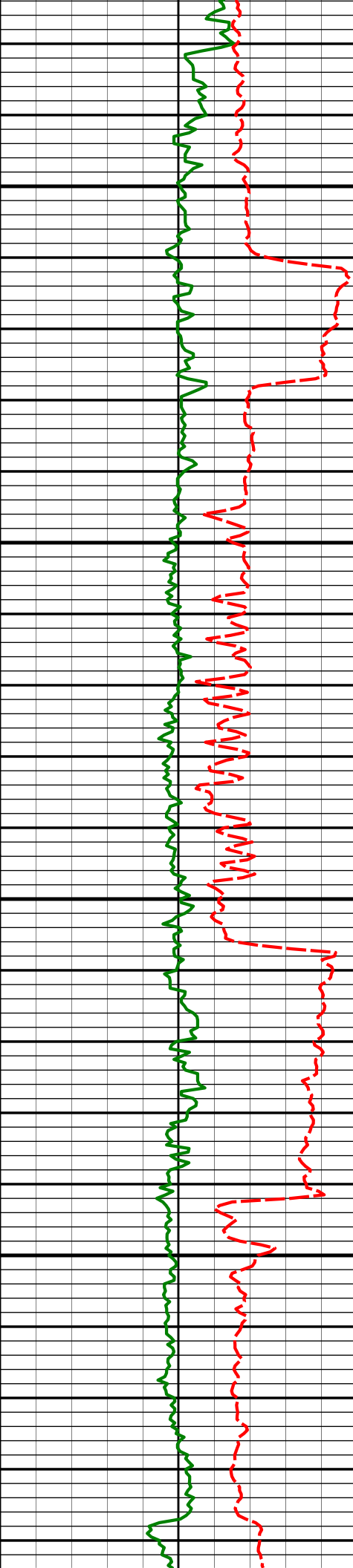
7450'

7500'

PGRC

ROPA





7750'

7790'

92.37°

268.08°

6802.89'

1156.12'

7800'

7850'

7885'

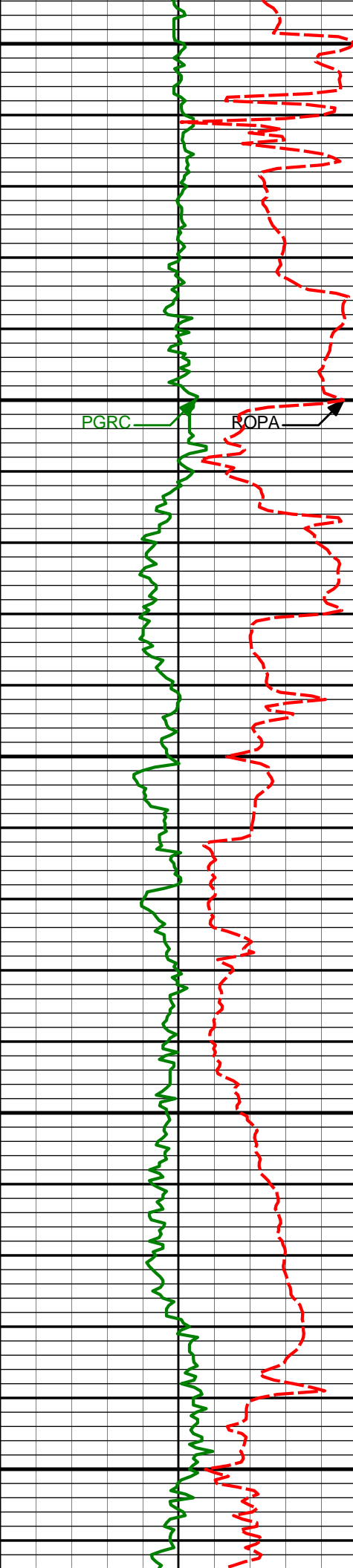
90.83°

265.90°

6800.23'

1248.75'

7900'



7950'

7979'

90.25°

266.40°

6799.35'

1340.13'

8000'

PGRC

ROPA

8050'

8074'

89.97°

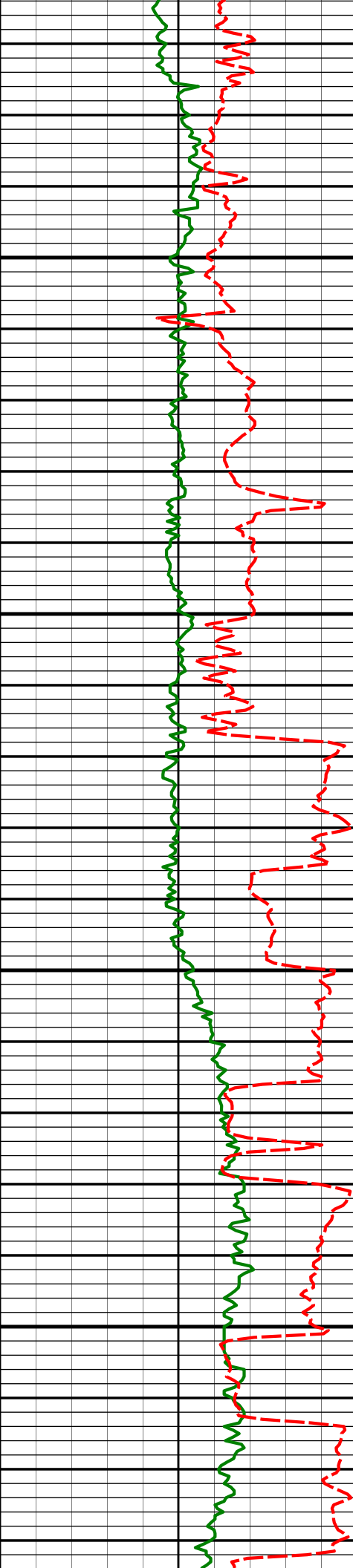
267.82°

6799.17'

1432.85'

8100'

8150'



8200'

8250'

8300'

8350'

8169'

91.20°

267.28°

6798.20'

1525.72'

8265'

92.62°

266.24°

6794.99'

1619.23'

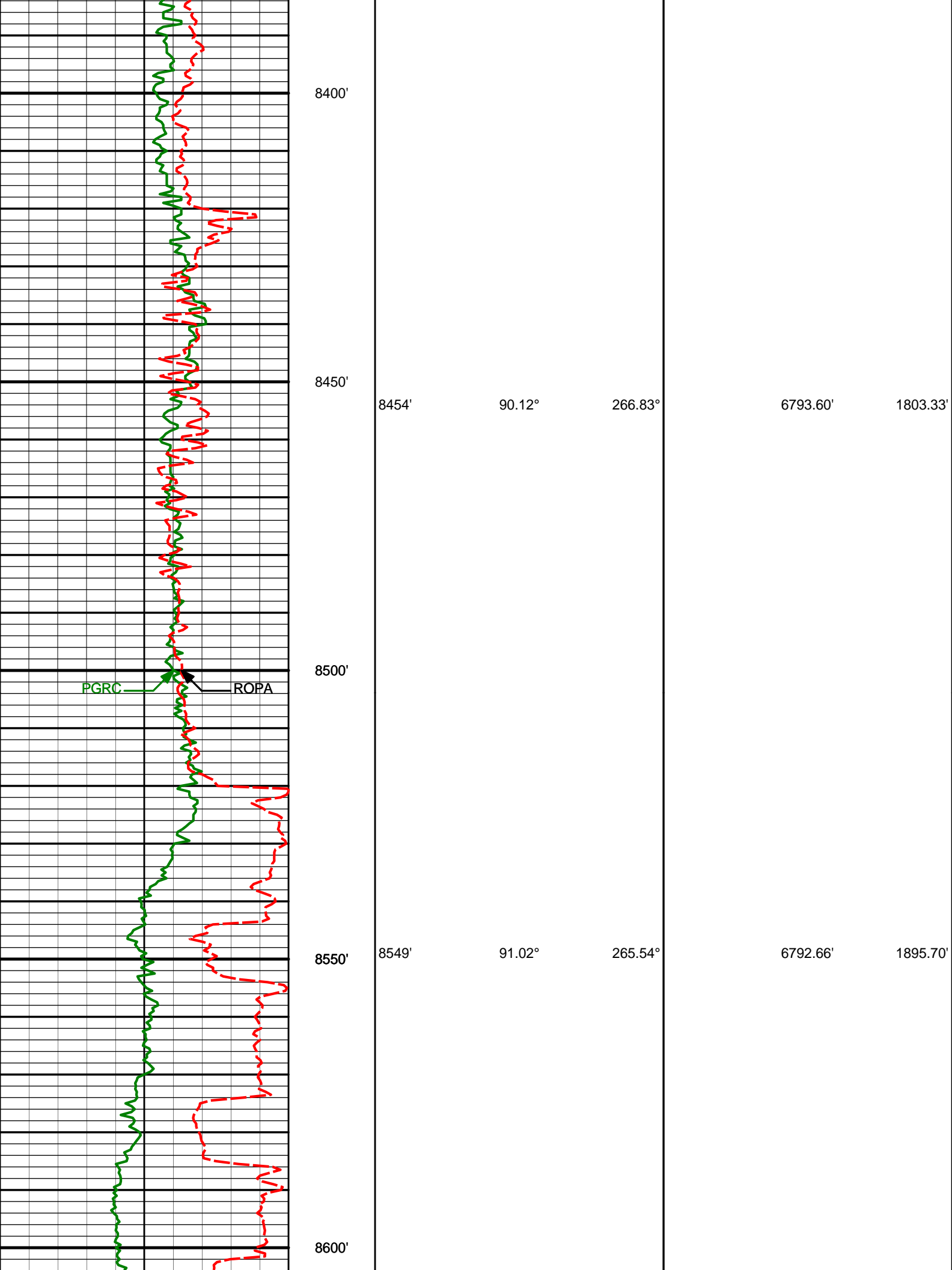
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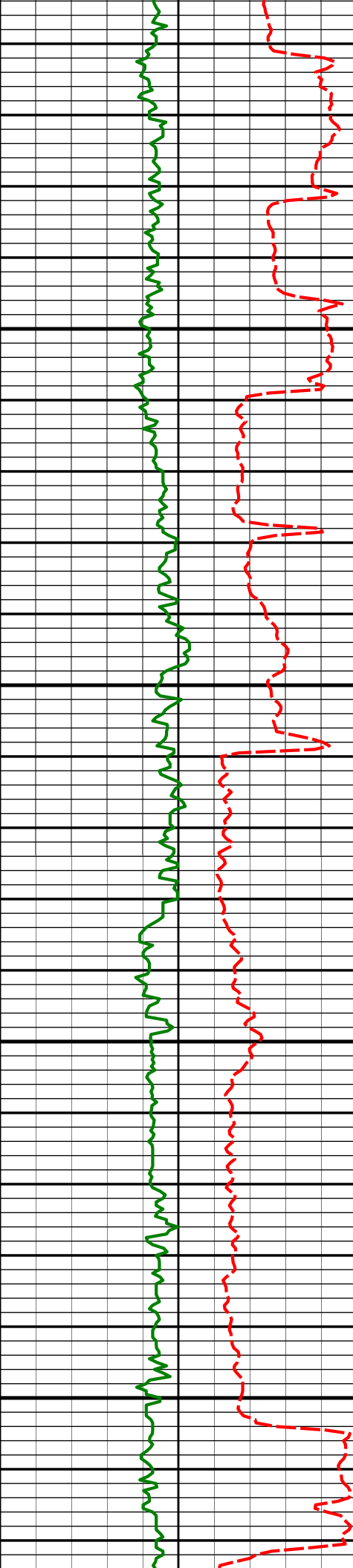
89.48°

266.78°

6793.27'

1710.73'





8644'

88.27°

266.18°

6793.25'

1987.93'

8650'

8700'

8739'

89.44°

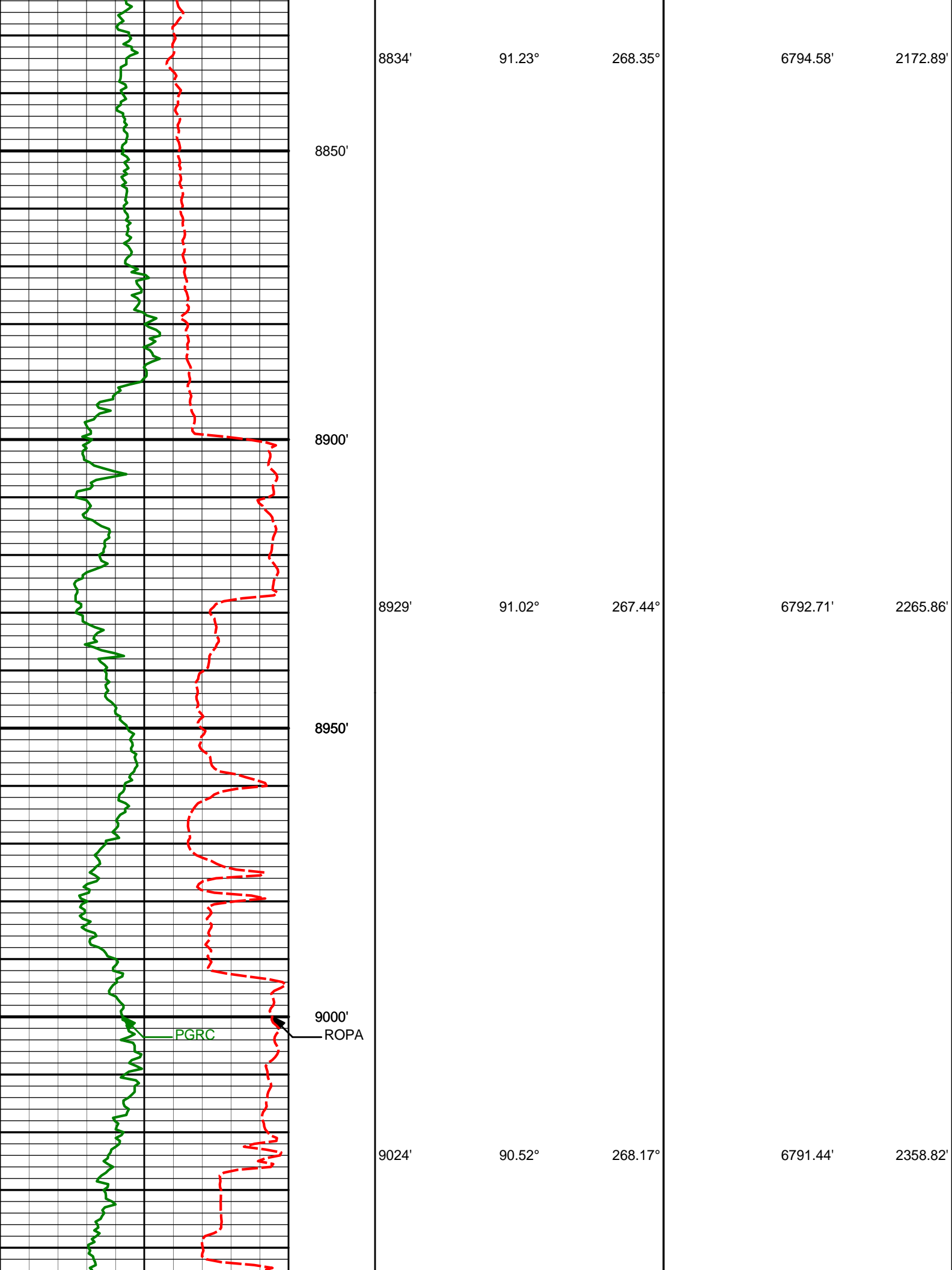
265.77°

6795.14'

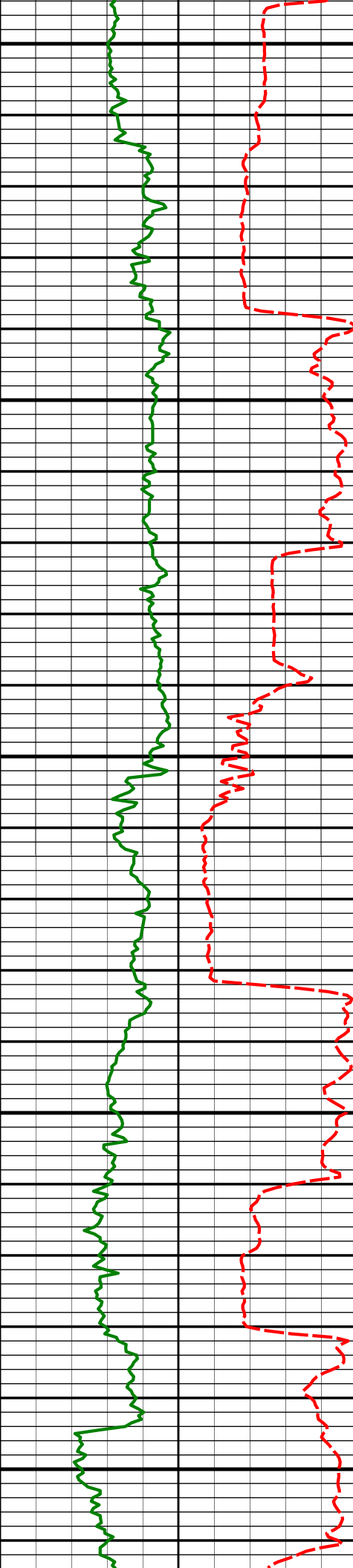
2080.20'

8750'

8800'







9050'

9100'

9150'

9200'

9250'

9119'

90.31°

269.00°

6790.75'

2452.04'

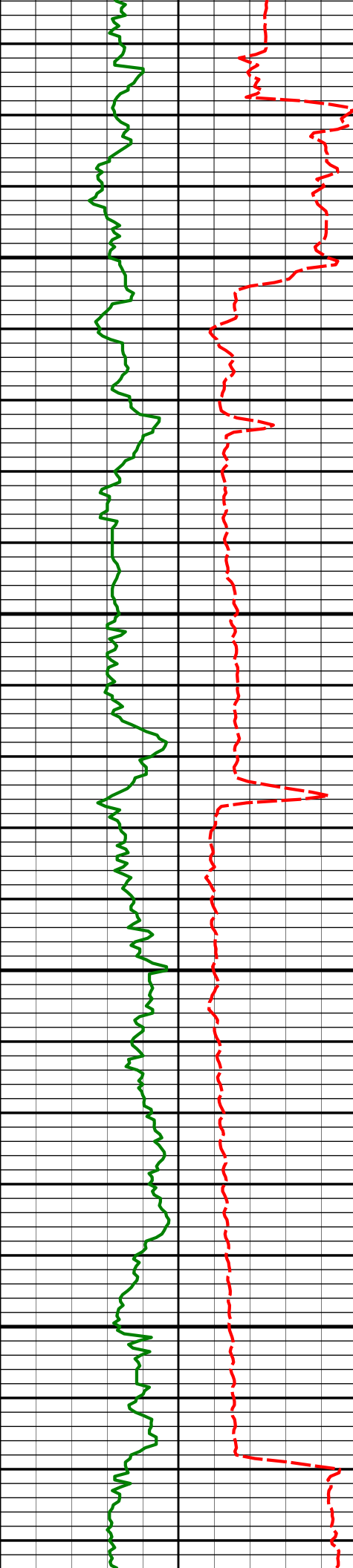
9214'

91.17°

269.58°

6789.52'

2545.47'



9300'

9350'

9400'

9450'

9309'

88.49°

270.67°

6789.80'

2639.13'

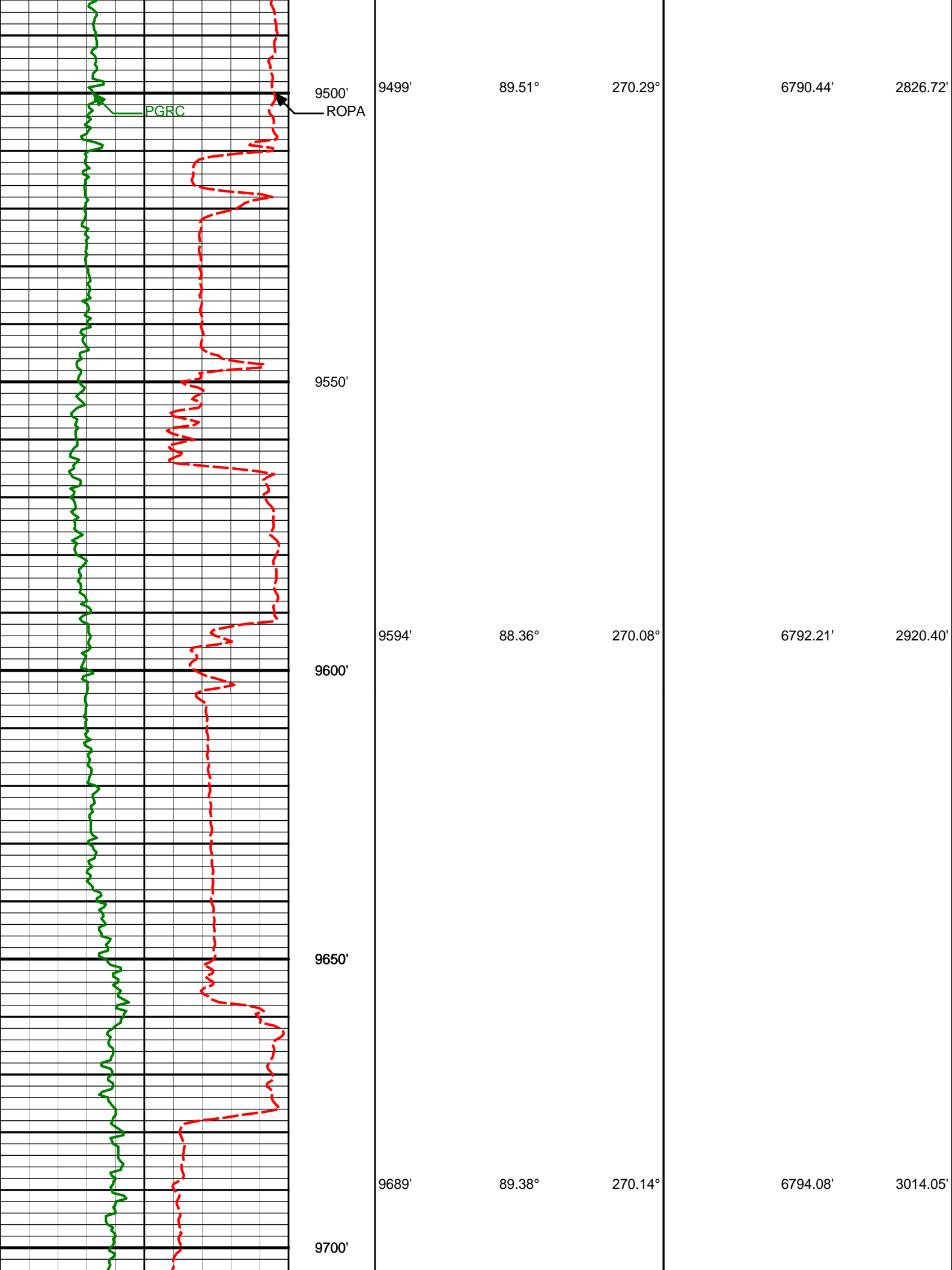
9404'

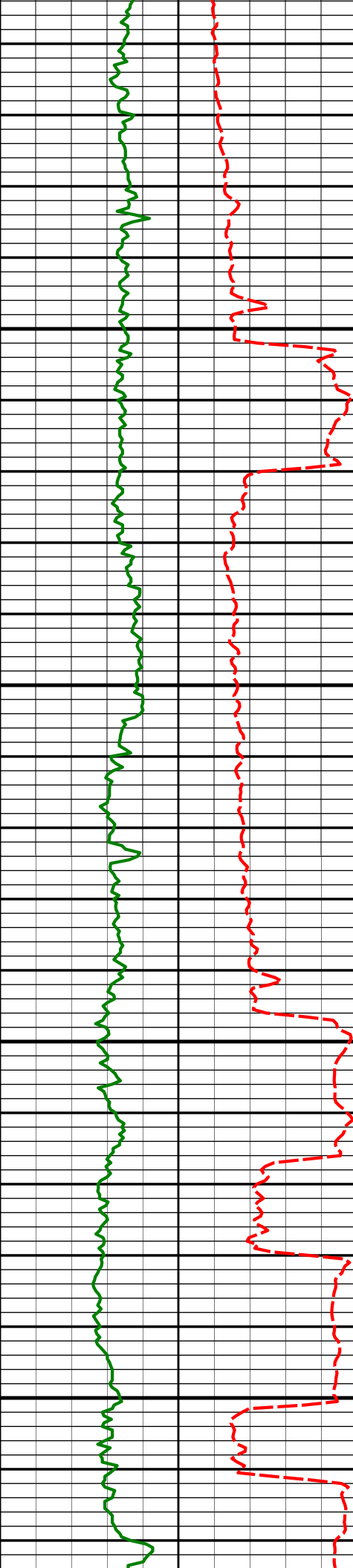
90.62°

270.64°

6790.54'

2732.95'





9750'

9784'

91.73°

269.74°

6793.16'

3107.67'

9800'

9850'

9879'

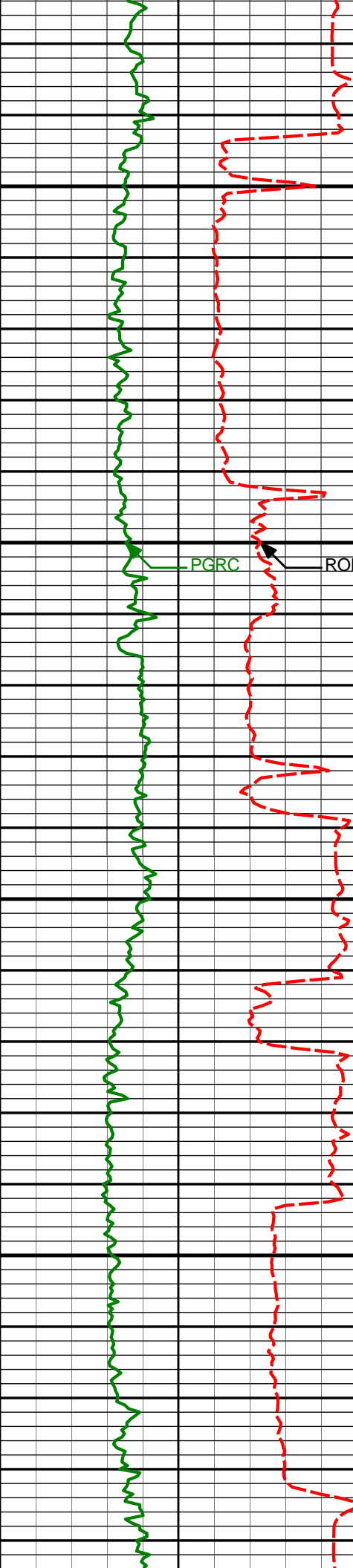
92.10°

269.65°

6789.99'

3201.17'

9900'



9950'

9974'

89.88°

267.98°

6788.35'

3294.45'

10000'

PGRC

ROPA

10050'

10069'

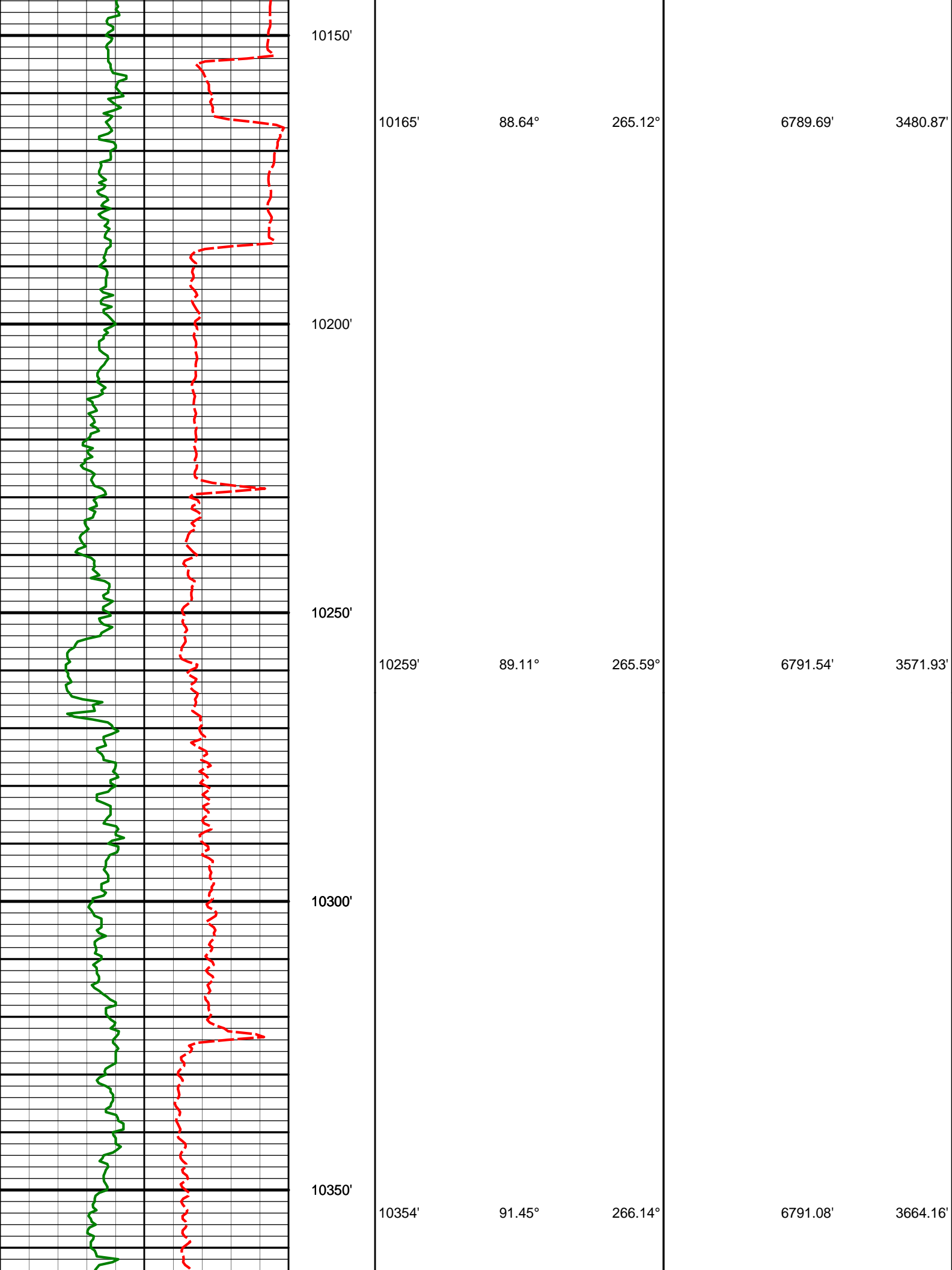
89.94°

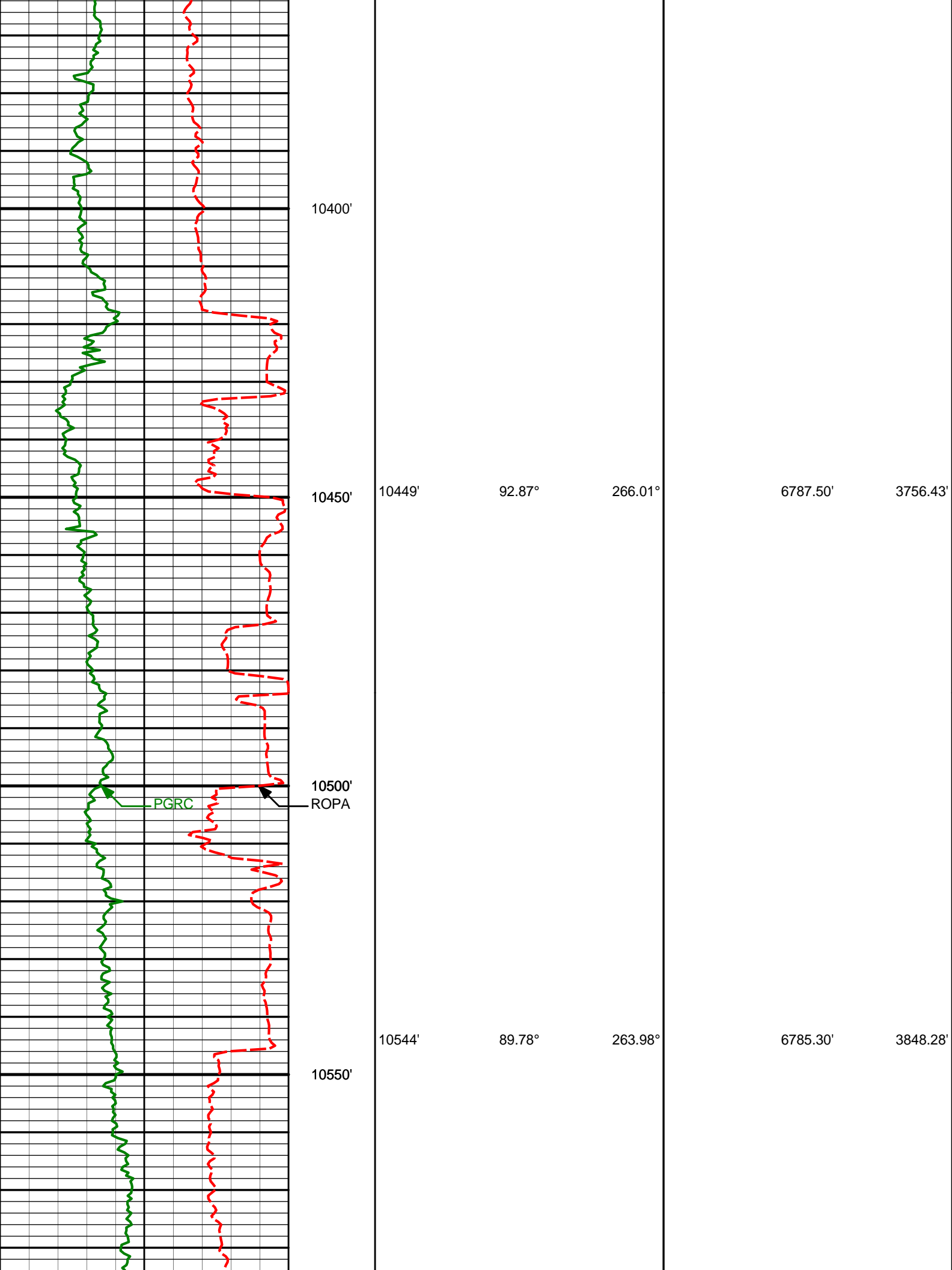
267.80°

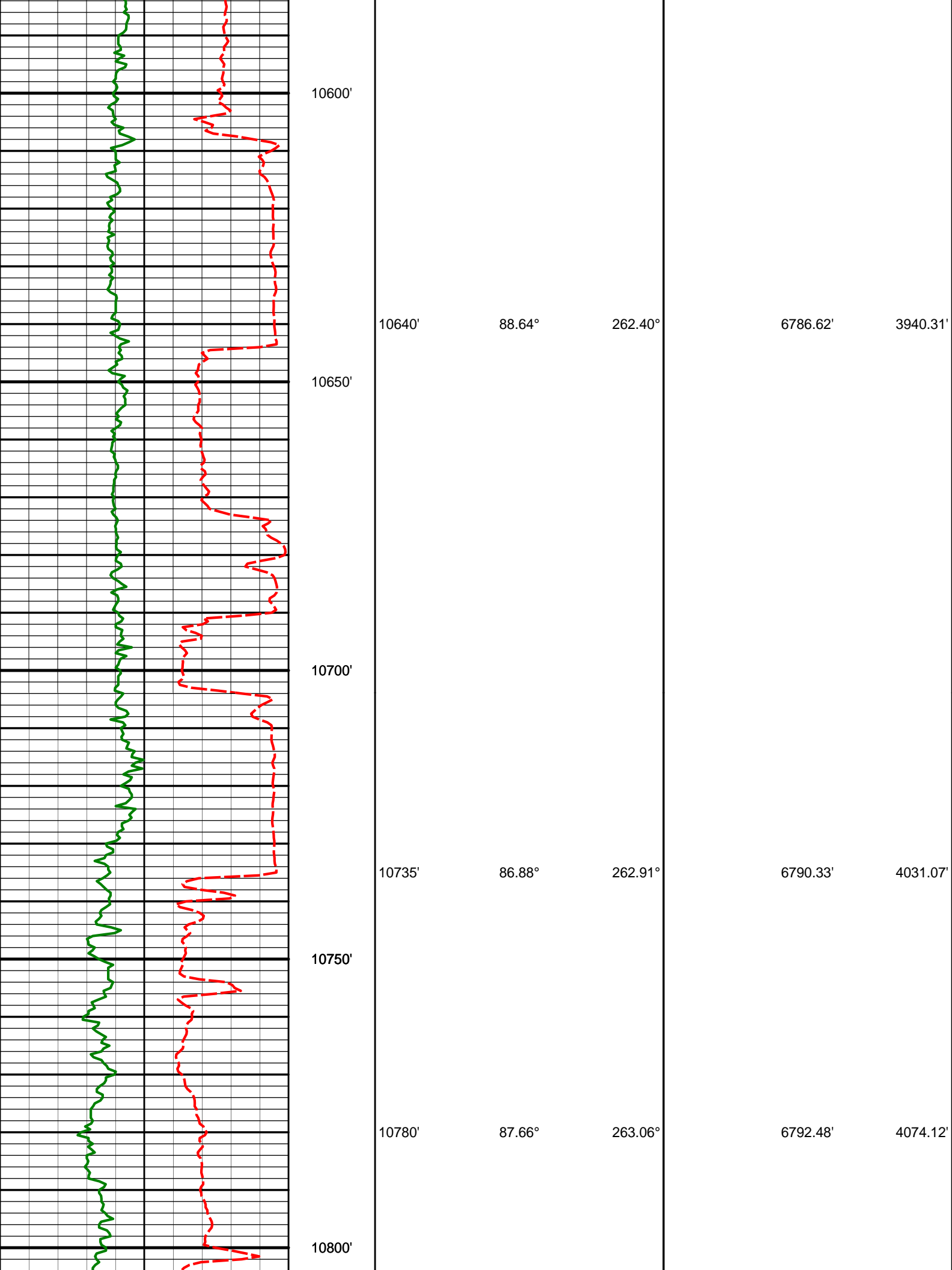
6788.50'

3387.44'

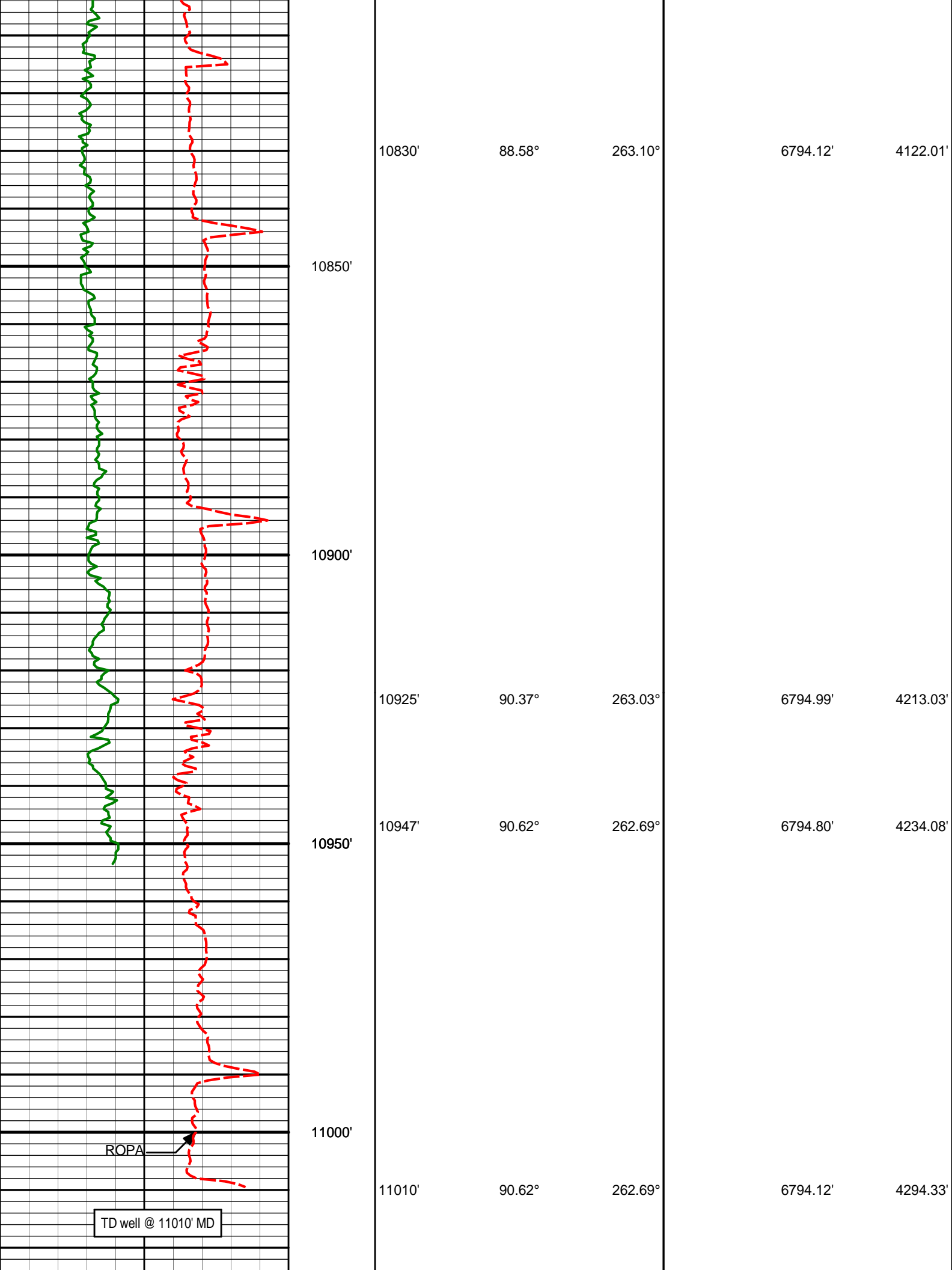
10100'













4778.00	7.27	9.68	4656.16	861.74 N	161.44 E	-14.09	2.21
4874.00	5.08	9.45	4751.60	871.92 N	163.16 E	-14.07	2.28
4969.00	4.32	14.46	4846.28	879.54 N	164.74 E	-14.35	0.90
5064.00	2.58	15.71	4941.10	885.07 N	166.22 E	-14.87	1.83
5159.00	1.36	11.22	5036.05	888.24 N	167.02 E	-15.13	1.30
5254.00	1.03	7.43	5131.03	890.19 N	167.35 E	-15.12	0.35
5349.00	0.86	25.54	5226.01	891.69 N	167.77 E	-15.29	0.36
5539.00	0.69	21.74	5416.00	894.04 N	168.80 E	-15.91	0.10
5729.00	0.43	31.33	5605.99	895.70 N	169.59 E	-16.41	0.14
5920.00	0.46	71.46	5796.98	896.55 N	170.69 E	-17.35	0.16
6015.00	0.59	72.22	5891.98	896.82 N	171.52 E	-18.12	0.14
6110.00	0.83	72.87	5986.97	897.18 N	172.65 E	-19.18	0.25
6155.00	0.43	85.75	6031.97	897.29 N	173.13 E	-19.63	0.95
6205.00	3.20	290.27	6081.94	897.78 N	172.01 E	-18.44	7.20
6250.00	6.43	277.81	6126.78	898.56 N	168.33 E	-14.69	7.49
6299.00	9.01	273.18	6175.33	899.15 N	161.78 E	-8.13	5.42
6344.00	12.40	270.63	6219.54	899.40 N	153.43 E	0.14	7.60
6394.00	15.53	270.14	6268.06	899.47 N	141.37 E	12.04	6.27
6439.00	19.41	269.86	6310.98	899.47 N	127.86 E	25.36	8.62
6489.00	22.64	269.45	6357.64	899.35 N	109.93 E	43.02	6.48
6534.00	27.76	273.21	6398.35	899.86 N	90.79 E	61.97	11.92
6585.00	31.99	272.26	6442.56	901.05 N	65.42 E	87.18	8.34
6630.00	35.04	269.56	6480.07	901.42 N	40.58 E	111.72	7.55
6679.00	40.83	268.32	6518.70	900.84 N	10.48 E	141.30	11.91
6724.00	47.27	268.32	6551.03	899.93 N	20.78 W	171.96	14.32
6775.00	53.92	268.96	6583.38	899.01 N	60.16 W	210.62	13.07
6820.00	57.39	269.39	6608.77	898.47 N	97.30 W	247.14	7.75
6869.00	59.76	268.77	6634.32	897.80 N	139.11 W	288.24	4.96
6914.00	60.87	268.75	6656.60	896.96 N	178.19 W	326.62	2.46
6965.00	62.48	268.61	6680.80	895.92 N	223.07 W	370.69	3.17
7010.00	64.08	268.39	6701.03	894.87 N	263.25 W	410.12	3.59
7059.00	65.28	268.45	6721.99	893.65 N	307.52 W	453.55	2.45
7104.00	67.66	269.28	6739.95	892.83 N	348.77 W	494.07	5.56
7155.00	69.83	268.74	6758.44	892.01 N	396.29 W	540.78	4.36
7200.00	73.78	268.20	6772.49	890.87 N	439.02 W	582.70	8.84
7249.00	79.00	267.46	6784.02	889.07 N	486.59 W	629.29	10.77
7316.00	84.02	266.83	6793.91	885.77 N	552.75 W	693.96	7.54
7410.00	85.78	265.70	6802.27	879.67 N	646.18 W	785.02	2.23
7506.00	87.96	268.06	6807.51	874.44 N	741.88 W	878.48	3.35
7600.00	90.43	267.69	6808.82	870.96 N	835.80 W	970.47	2.65
7696.00	92.19	267.21	6806.63	866.69 N	931.67 W	1064.26	1.90
7790.00	92.37	268.08	6802.89	862.84 N	1025.52 W	1156.12	0.95
7885.00	90.83	265.90	6800.23	857.86 N	1120.34 W	1248.75	2.81
7979.00	90.25	266.40	6799.35	851.55 N	1214.12 W	1340.13	0.82
8074.00	89.97	267.82	6799.17	846.77 N	1309.00 W	1432.85	1.52
8169.00	91.20	267.28	6798.20	842.71 N	1403.91 W	1525.72	1.42
8265.00	92.62	266.24	6794.99	837.29 N	1499.70 W	1619.23	1.84
8359.00	89.48	266.78	6793.27	831.56 N	1593.49 W	1710.73	3.40
8454.00	90.12	266.83	6793.60	826.26 N	1688.35 W	1803.33	0.68
8549.00	91.02	265.54	6792.66	819.94 N	1783.13 W	1895.70	1.66
8644.00	88.27	266.18	6793.25	813.08 N	1877.87 W	1987.93	2.97
8739.00	89.44	265.77	6795.14	806.40 N	1972.61 W	2080.20	1.31
8834.00	91.23	268.35	6794.58	801.53 N	2067.47 W	2172.89	3.31
8929.00	91.02	267.44	6792.71	798.04 N	2162.39 W	2265.86	0.99
9024.00	90.52	268.17	6791.44	794.40 N	2257.31 W	2358.82	0.93
9119.00	90.31	269.00	6790.75	792.06 N	2352.28 W	2452.04	0.90
9214.00	91.17	269.58	6789.52	790.88 N	2447.26 W	2545.47	1.10
9309.00	88.49	270.67	6789.80	791.09 N	2542.25 W	2639.13	3.05
9404.00	90.62	270.64	6790.54	792.18 N	2637.24 W	2732.95	2.24
9499.00	89.51	270.29	6790.44	792.96 N	2732.23 W	2826.72	1.23
9594.00	88.36	270.08	6792.21	793.27 N	2827.21 W	2920.40	1.23
9689.00	89.38	270.14	6794.08	793.45 N	2922.19 W	3014.05	1.08
9784.00	91.73	269.74	6793.16	793.35 N	3017.18 W	3107.67	2.50
9879.00	92.10	269.65	6789.99	792.84 N	3112.13 W	3201.17	0.40
9974.00	89.88	267.98	6788.35	790.87 N	3207.08 W	3294.45	2.92
10069.00	89.94	267.80	6788.50	787.37 N	3302.02 W	3387.44	0.21
10165.00	88.64	265.12	6789.69	781.45 N	3397.82 W	3480.87	3.09
10259.00	89.11	265.59	6791.54	773.83 N	3491.49 W	3571.93	0.70
10354.00	91.45	266.14	6791.08	766.98 N	3586.23 W	3664.16	2.53
10449.00	92.87	266.01	6787.50	760.48 N	3680.94 W	3756.43	1.50
10544.00	89.78	263.98	6785.30	752.19 N	3775.54 W	3848.28	3.89
10640.00	88.64	262.40	6786.62	740.80 N	3870.85 W	3940.31	2.03
10735.00	86.88	262.91	6790.33	728.66 N	3964.99 W	4031.07	1.93
10780.00	87.66	263.06	6792.48	723.17 N	4009.60 W	4074.12	1.76
10829.00	88.58	263.19	6794.13	717.45 N	4059.34 W	4123.04	1.85

10830.00	88.38	263.10	6794.12	717.13 N	4039.21 W	4122.01	1.83
10925.00	90.37	263.03	6794.99	705.68 N	4153.51 W	4213.03	1.88
10947.00	90.62	262.69	6794.80	702.95 N	4175.34 W	4234.08	1.91
11010.00	90.62	262.69	6794.12	694.93 N	4237.82 W	4294.33	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 279.69 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.91 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11010.00 FEET  
IS 4294.42 FEET ALONG 279.31 DEGREES (GRID)**

Date Printed:18 June 2012