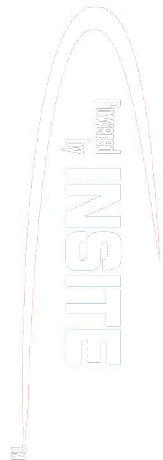


PCDC - Pressure Case Directional
PCGK - Pressure Case Gamma

1 : 240

Country : USA			
Field : Wattenburg			
Location : Lat: 40° 27' 51.19" North Long: 104° 21' 21.49" West			
Well : Wells Ranch AE30-69HNB			
Company : Noble Energy			
Rig : H&P 322			
LOCATION			
Latitude : 40° 27' 51.19" North Longitude : 104° 21' 21.49" West			
UTM Easting = 3,318,313.540 ft UTM Northing = 1,414,009.080 ft			
Company : Noble Energy			
Rig : H&P 322			
Well : Wells Ranch AE30-69HNB			
Field : Wattenburg			
Country : USA			
API Number : 05-123-38675			
Permanent Datum : Ground Level			
Log Measured From : Drill Floor			
Drilling Measured From : Drill Floor			
Depth Logged : 627.00 ft			
Date Logged : 27-Apr-14			
Total Depth MD : 12,113.00 ft			
Spud Date : 27-Apr-14			
Unit No. : 11210425			
Job No. : CA-XX-0901116552			
Plot Type : Final			
Plot Date : 04-May-14			
Borehole Record (MD)			
Run No.	Size	From	To
2	8.750 in	627.00 ft	5,868.00 ft
3	8.750 in	5,868.00 ft	6,864.00 ft
4	6.125 in	6,864.00 ft	12113.00 ft
Casing Record (MD)			
Run No.	Size	Weight	To
	9.625 in	36.00 lbpf	SURFACE
	7.000 in	26.00 lbpf	SURFACE
Directional Drilling			
Elev. : 4776.00 ft			
Elevation : 24.00 ft			
Above Permanent Datum			
MD LOG			
Elev. : N/A			
KB : 4800.00 ft			
DF : 4776.00 ft			
GL : N/A			
WD : N/A			

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	30-Apr-14	01-May-14	04-May-14		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	4.750	4.750		
Log Start Depth (MD, ft)	627.00	5,868.00	6,864.00		
Log End Depth (MD, ft)	5,868.00	6,864.00	12,113.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	29-Apr-14 04:00	30-Apr-14 13:18	02-May-14 11:04		
Drill/Wipe End Date and Time	30-Apr-14 03:56	01-May-14 00:20	04-May-14 04:54		
Min Inc (deg) @ Depth (MD, ft)	0.10 @ 235.00	2.92 @ 5,943.00	84.97 @ 6,921.00		
Max Inc (deg) @ Depth (MD, ft)	10.68 @ 2,997.00	81.53 @ 6,819.00	91.91 @ 10,749.00		
Bit TFA(in2) / Bit Type	0.91 / PDC	0.98 / PDC	0.98 / PDC		
Flow Rate (gpm)	574.00	585.00	270.00		
Max AV (fpm) / CV (fpm) @ MWD	462.9 / 462.9	462.9 / 462.9	429.3 / 429.3		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.53 / 27.00	9.18 / 34.00	9.65 / 39.00		
Filtrate CL (ppm)	1,900.00	1,900.00	1,900.00		
pH / Fluid Loss (mptm)	8.80 / N/A	9.40 / N/A	9.50 / N/A		
PV (cP) / YP (lbf/ft2)	1 / 3.00	9 / 4.00	11 / 10.00		
% Solids / % Sand	1.70 / 0.10	4.50 / 0.25	6.70 / 0.05		
% Oil / Oil:Water Ratio	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		
Rmf @ Measured Temp (degF)	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		

Max Tool Temp (degF) / Source	137.50 / PCM	154.30 / PCM	213.40 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Osahon Igunbor	Osahon Igunbor	Osahon Igunbor		
Customer Representative	Jeremy Stolz	Jeremy Stolz	Jeremy Stolz		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11341333	11341333	12334783		
Insert Serial Number	11680106	11680106	11400989		
Date and Time Initialized	28-Apr-14 09:47	28-Apr-14 09:47	01-May-14 14:47		
Date and Time Read	01-May-14 06:58	01-May-14 06:43	04-May-14 17:35		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	60.00	59.00	63.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341333	11341333	12334783		
Sonde Serial Number	11478090	11478090	11833224		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	267.38	7.91	319.83		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	53.08	51.49	55.63		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341333	11341333	12334783		
Insert/Sonde Serial Number	12071281	12071281	12071509		

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"
5. The gamma trace has 10ft of missing data between 8587-8597ft.

PGXR (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

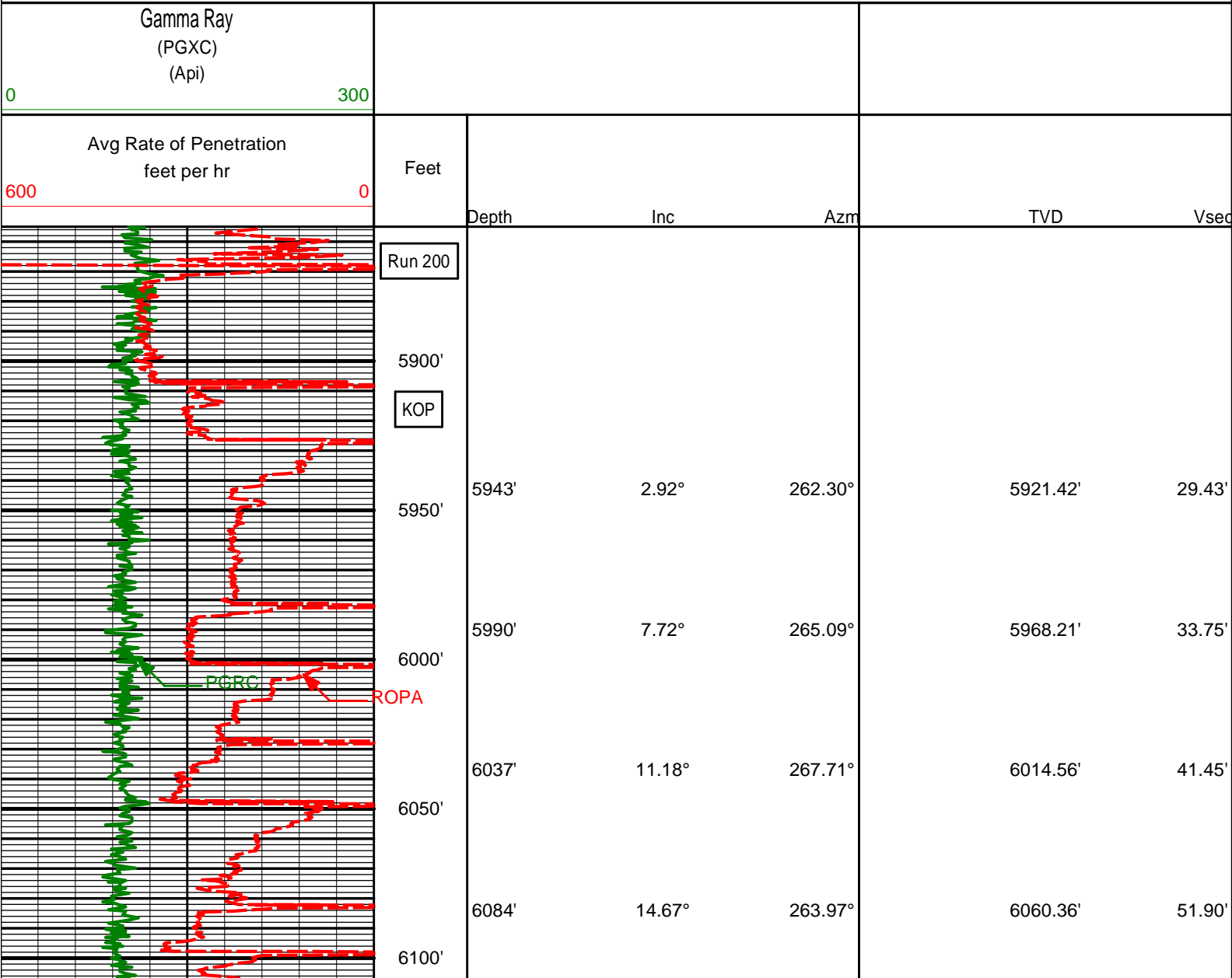
Coercion Distance: 1.2 feet

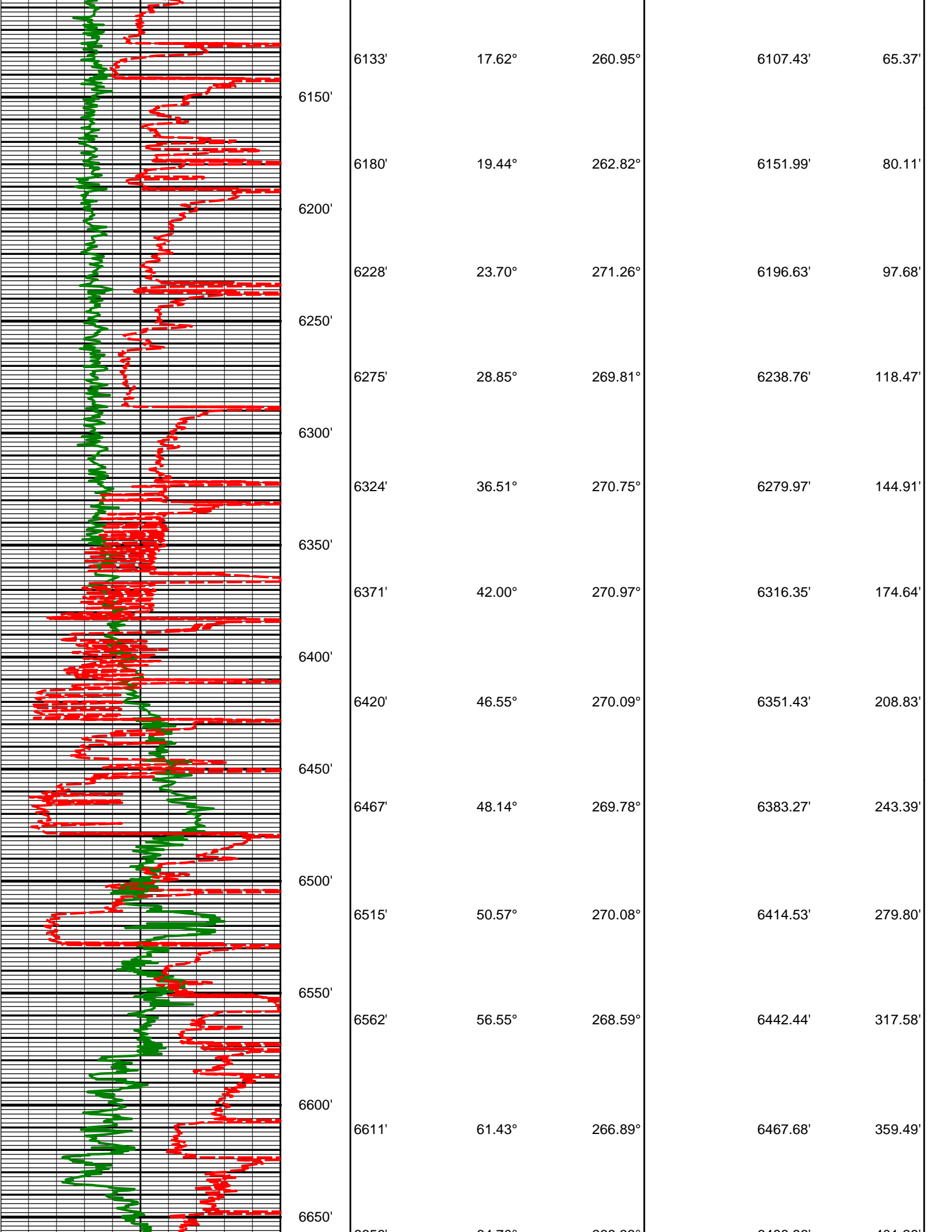
WARRANTY

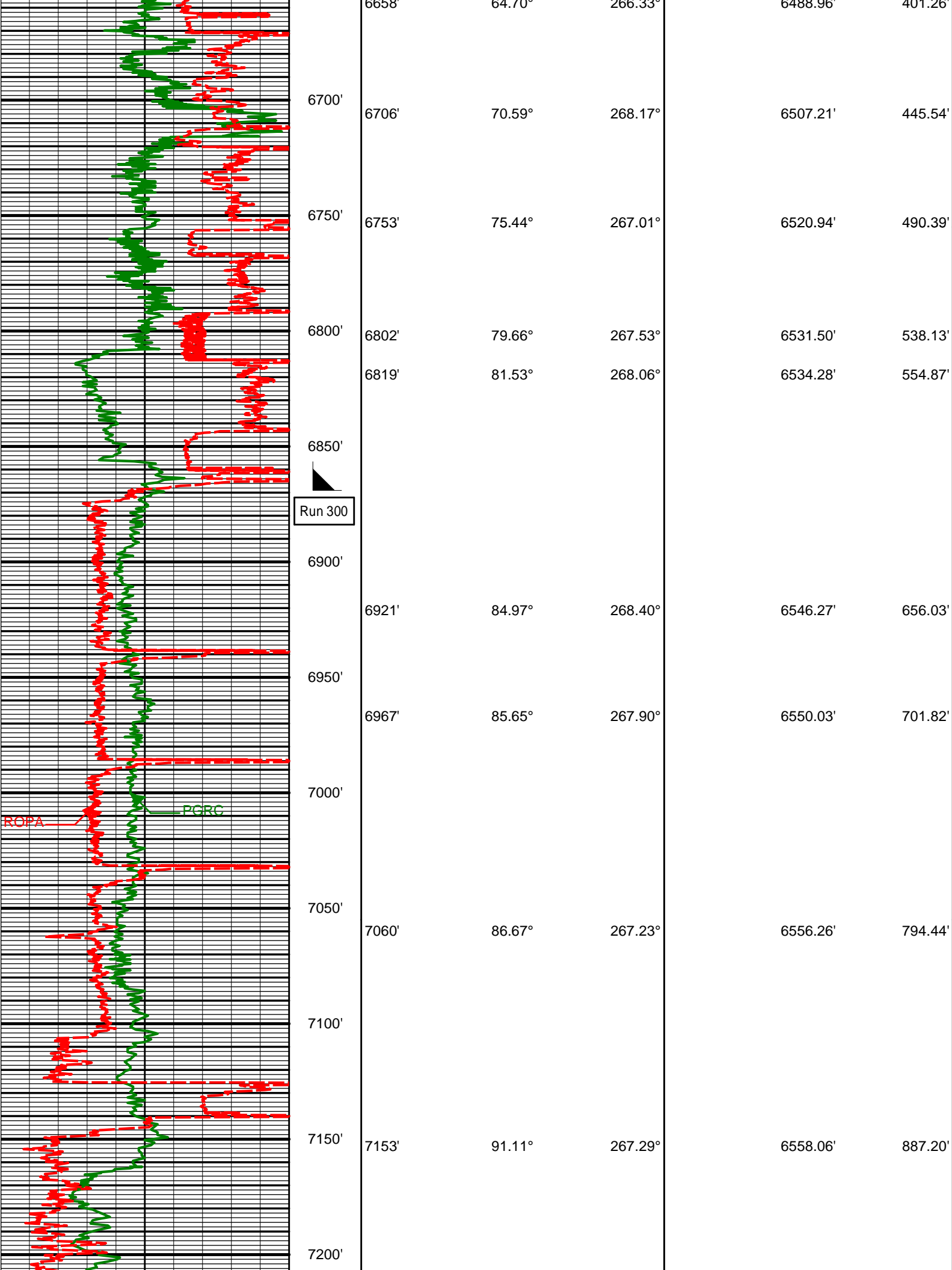
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

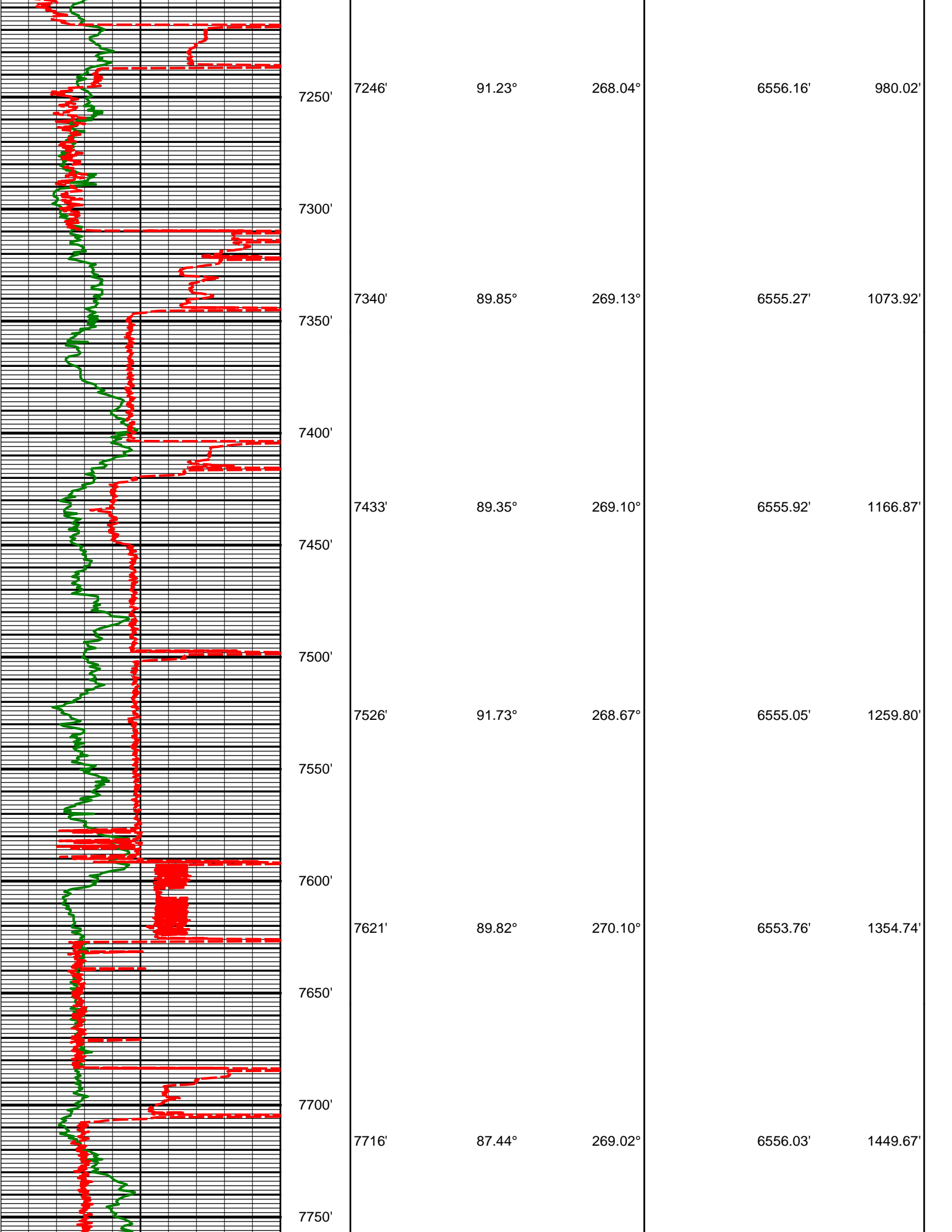
HALLIBURTON

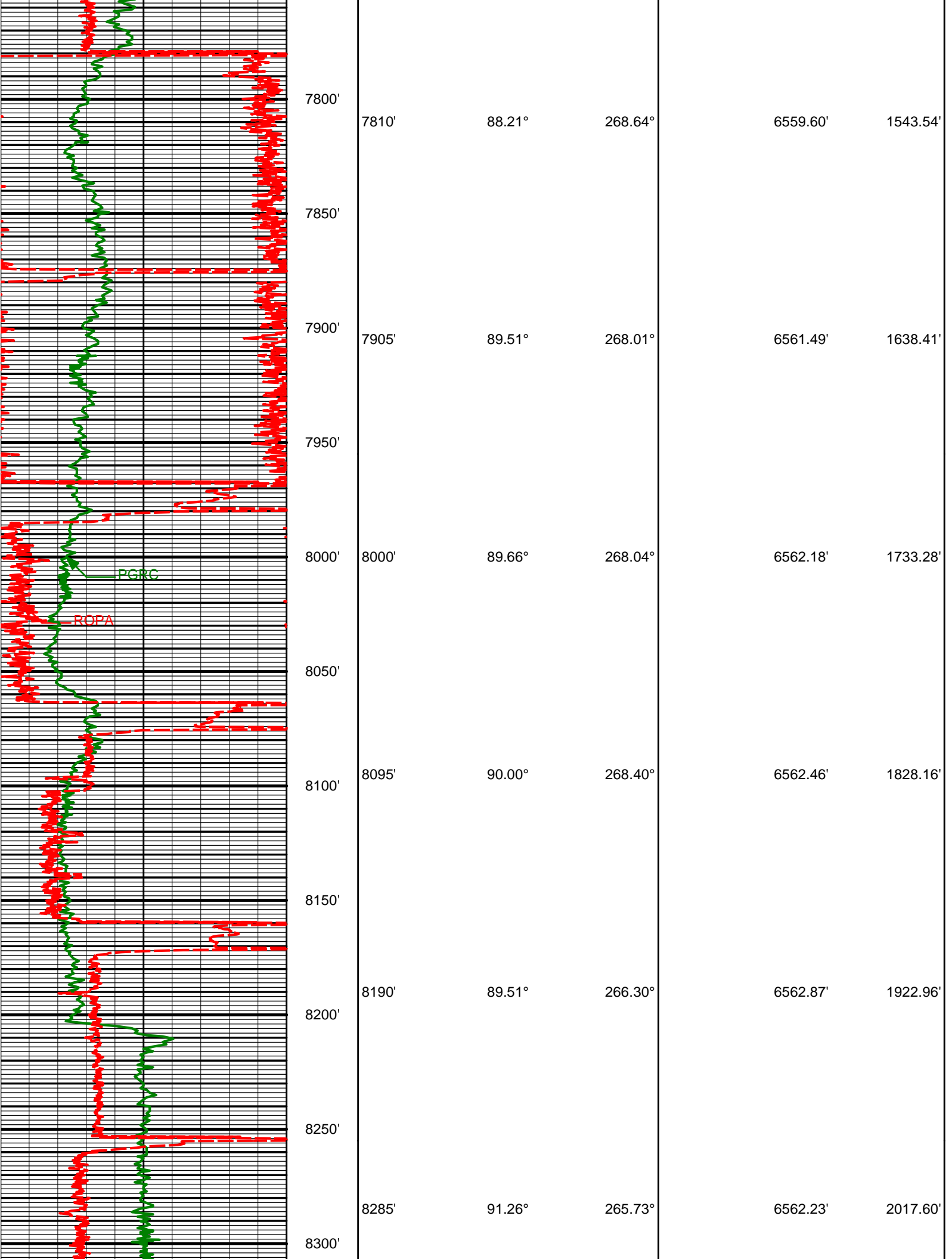
MD Detail Log 1:600

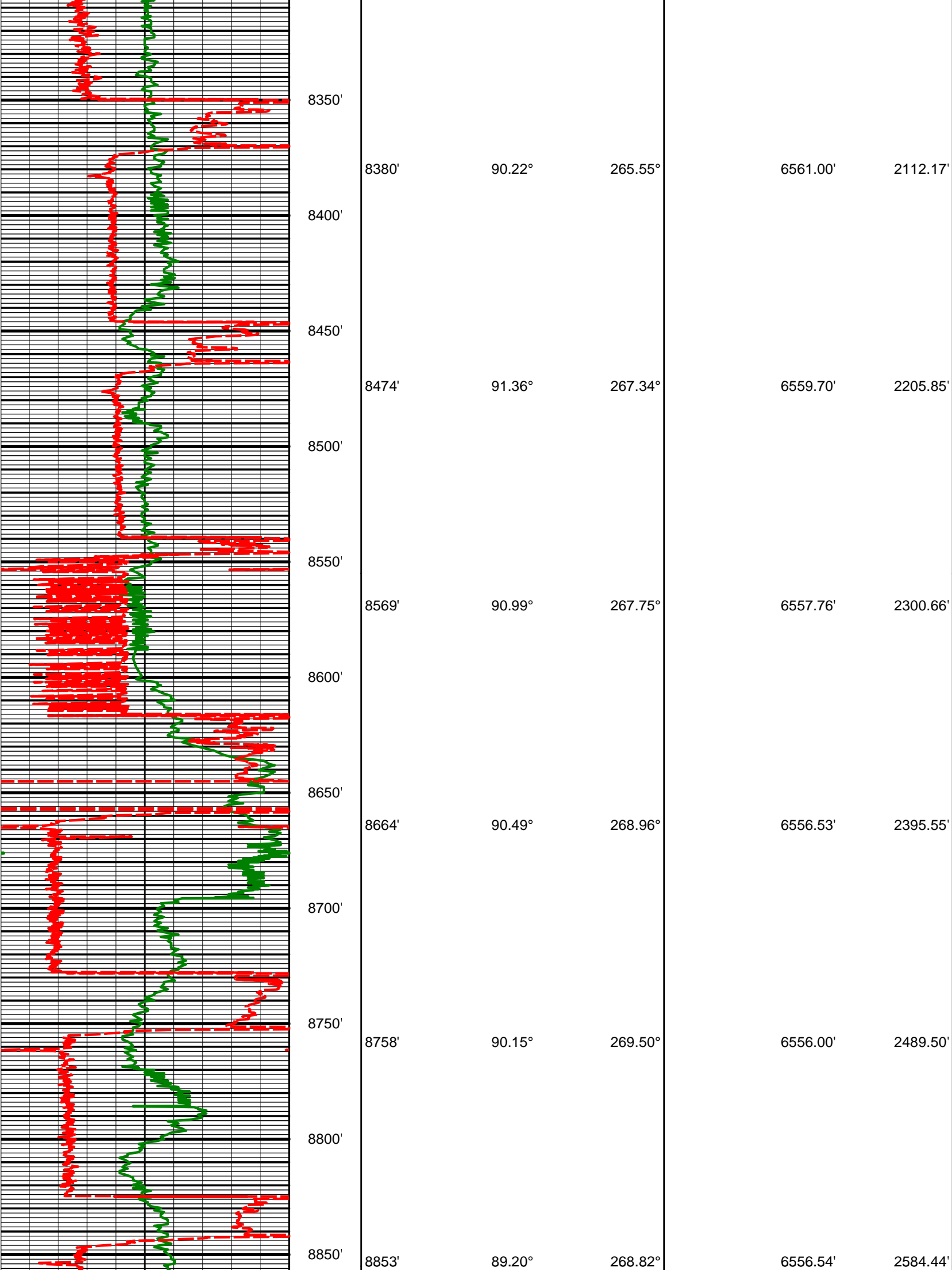


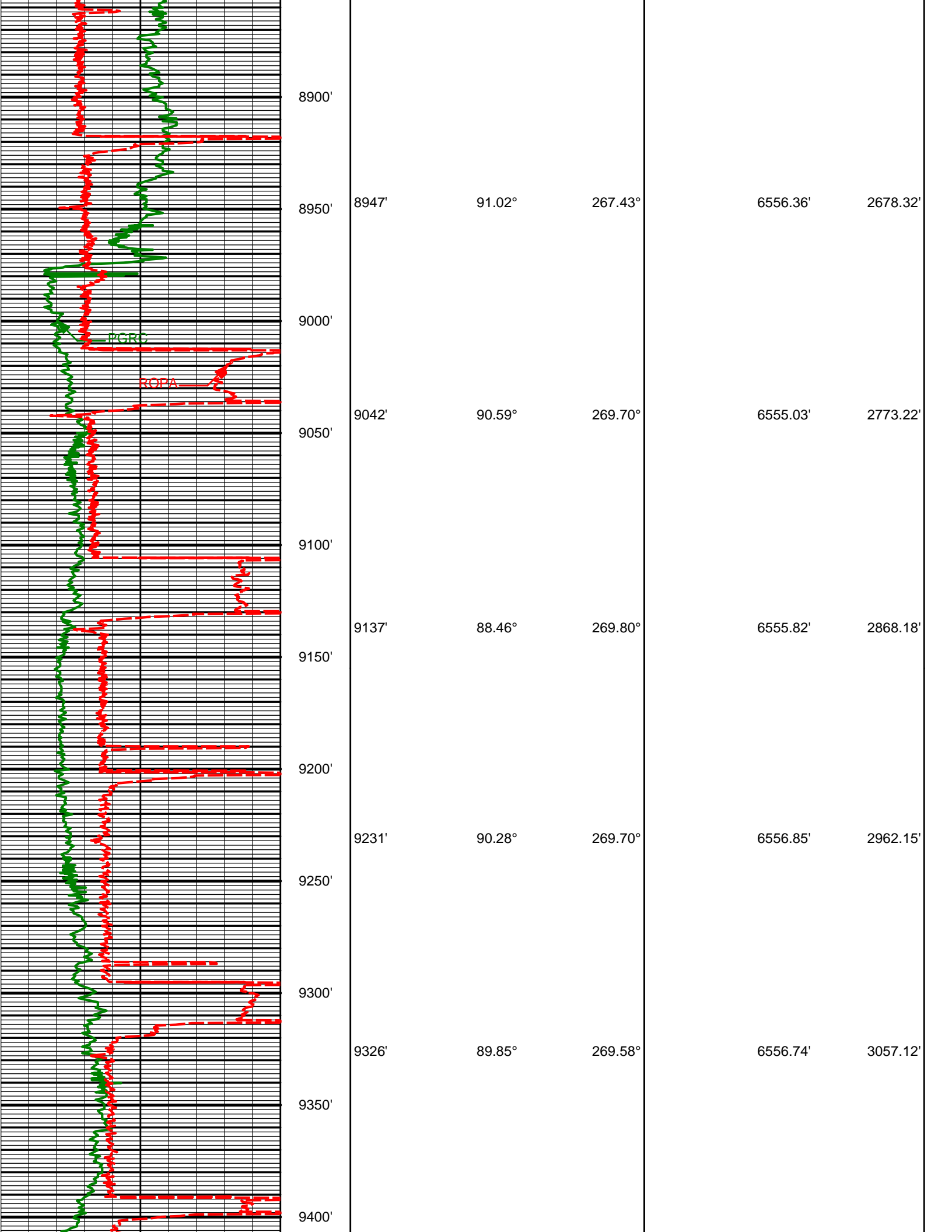


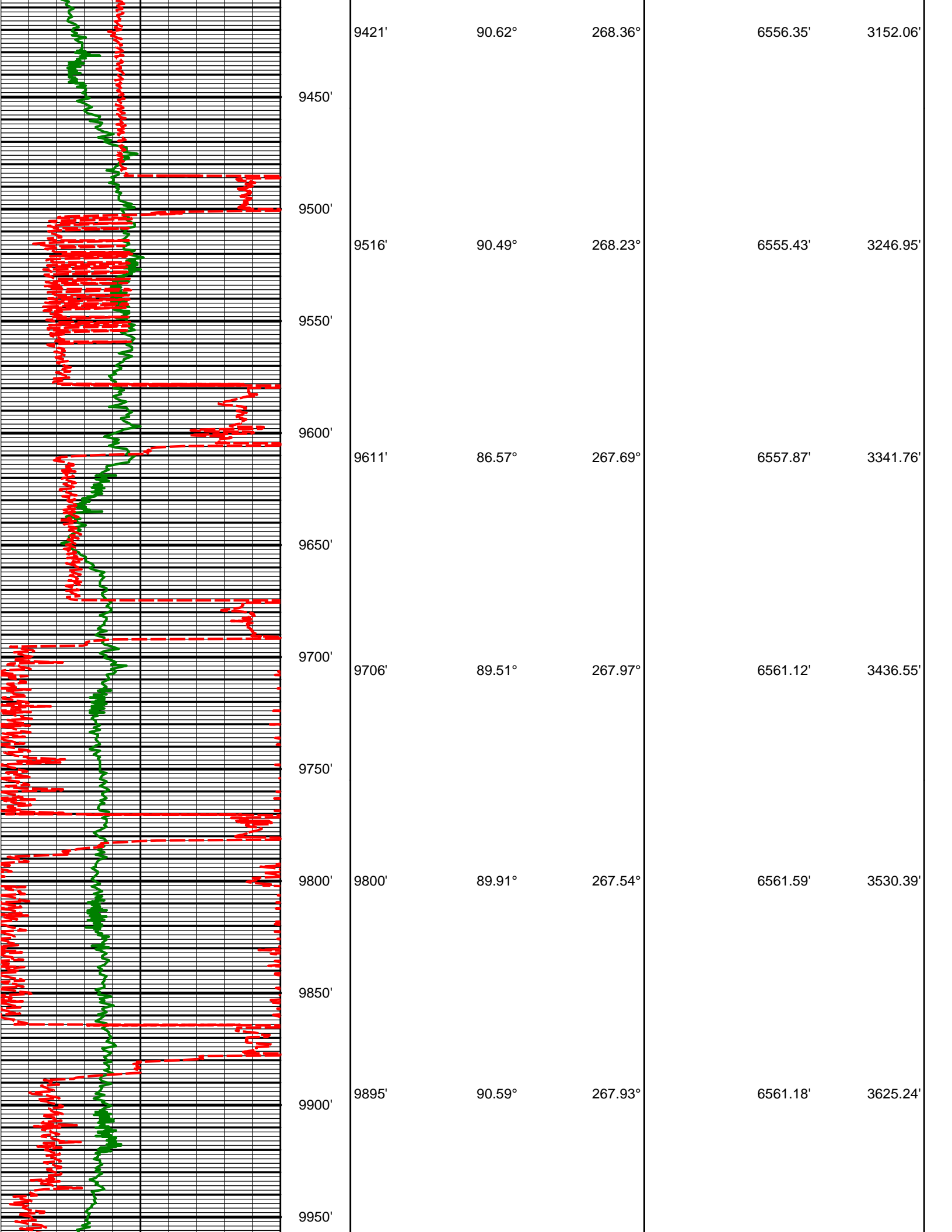


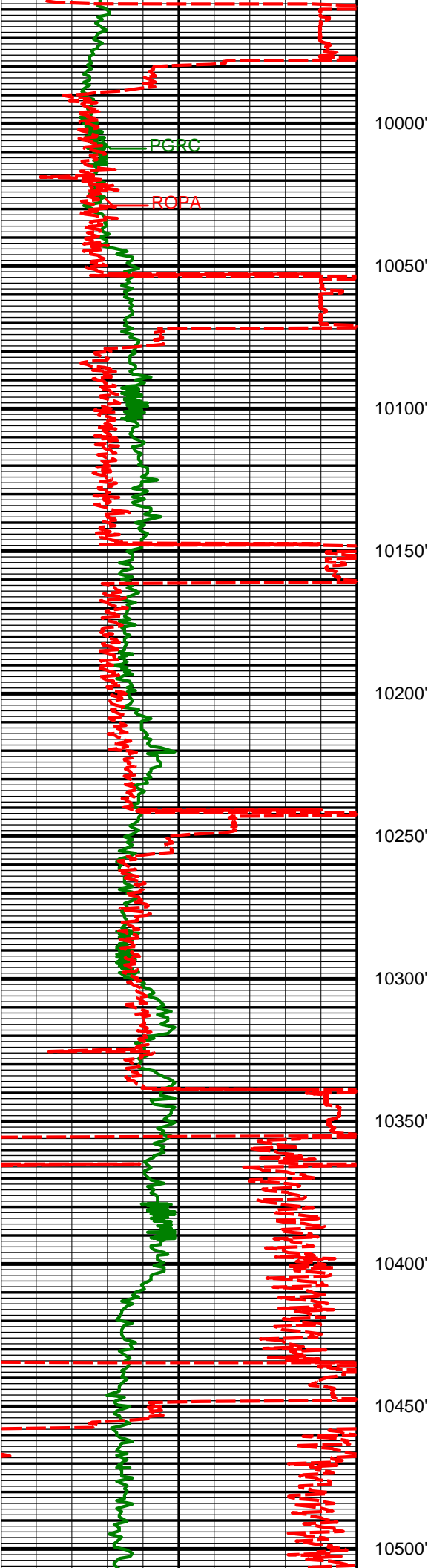




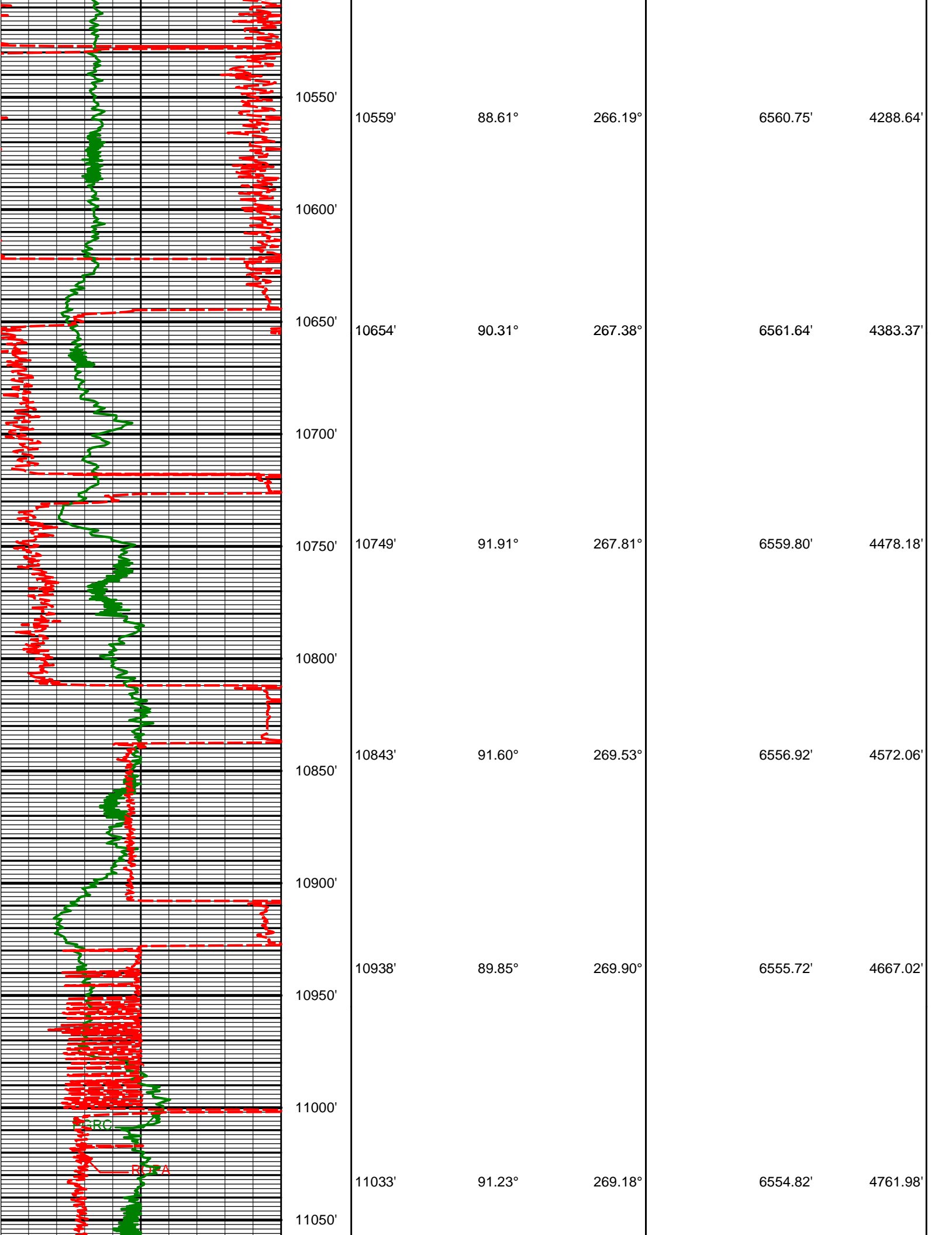


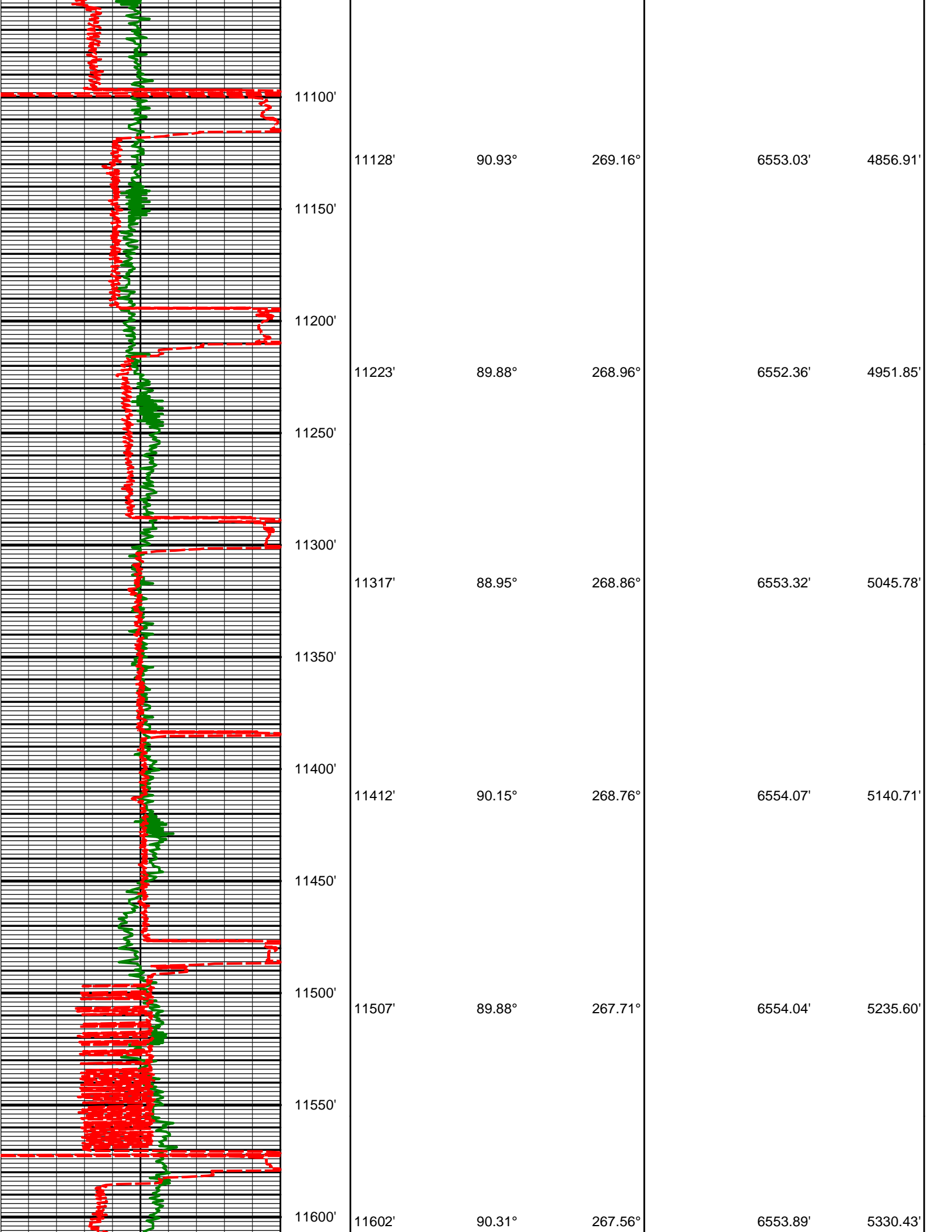


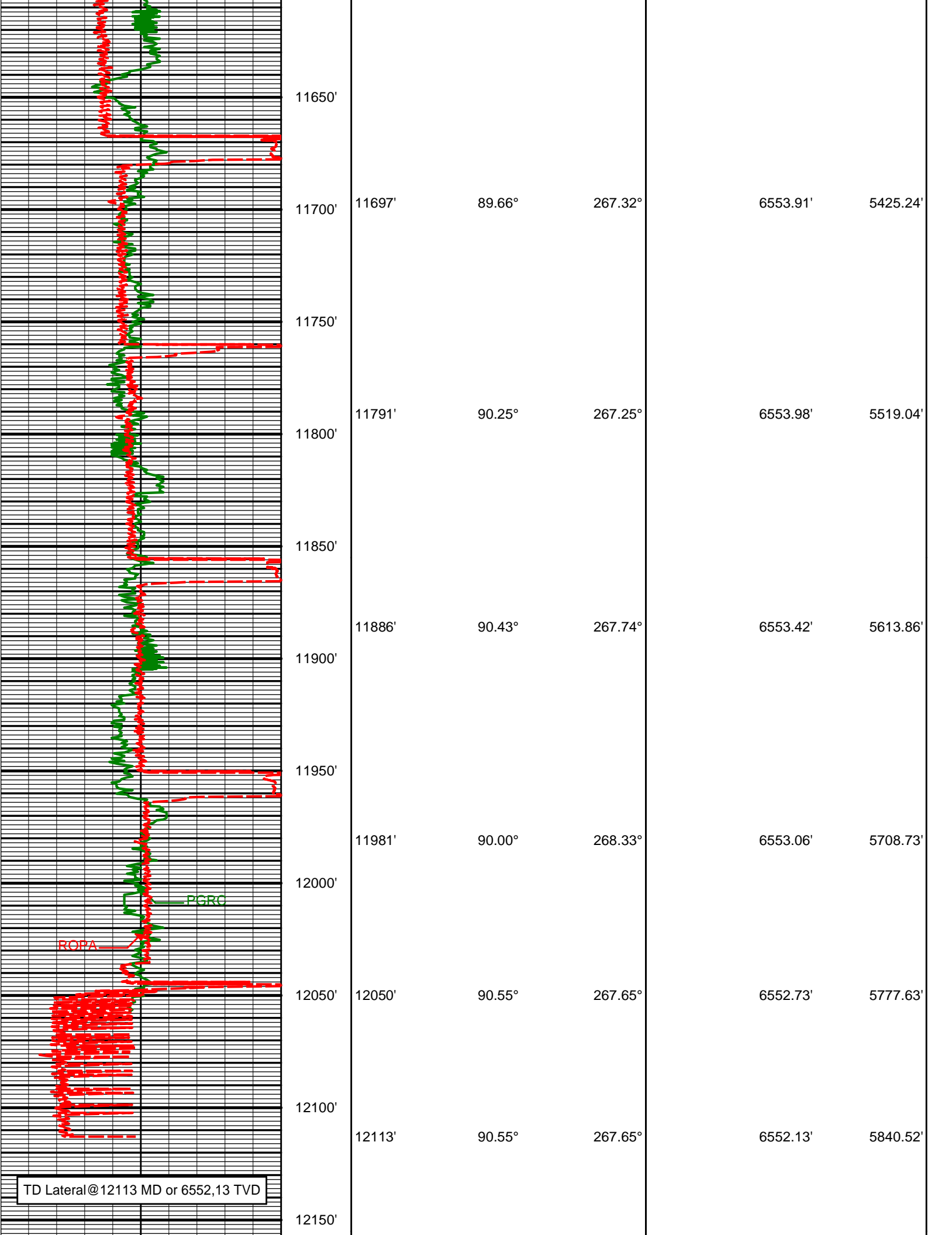


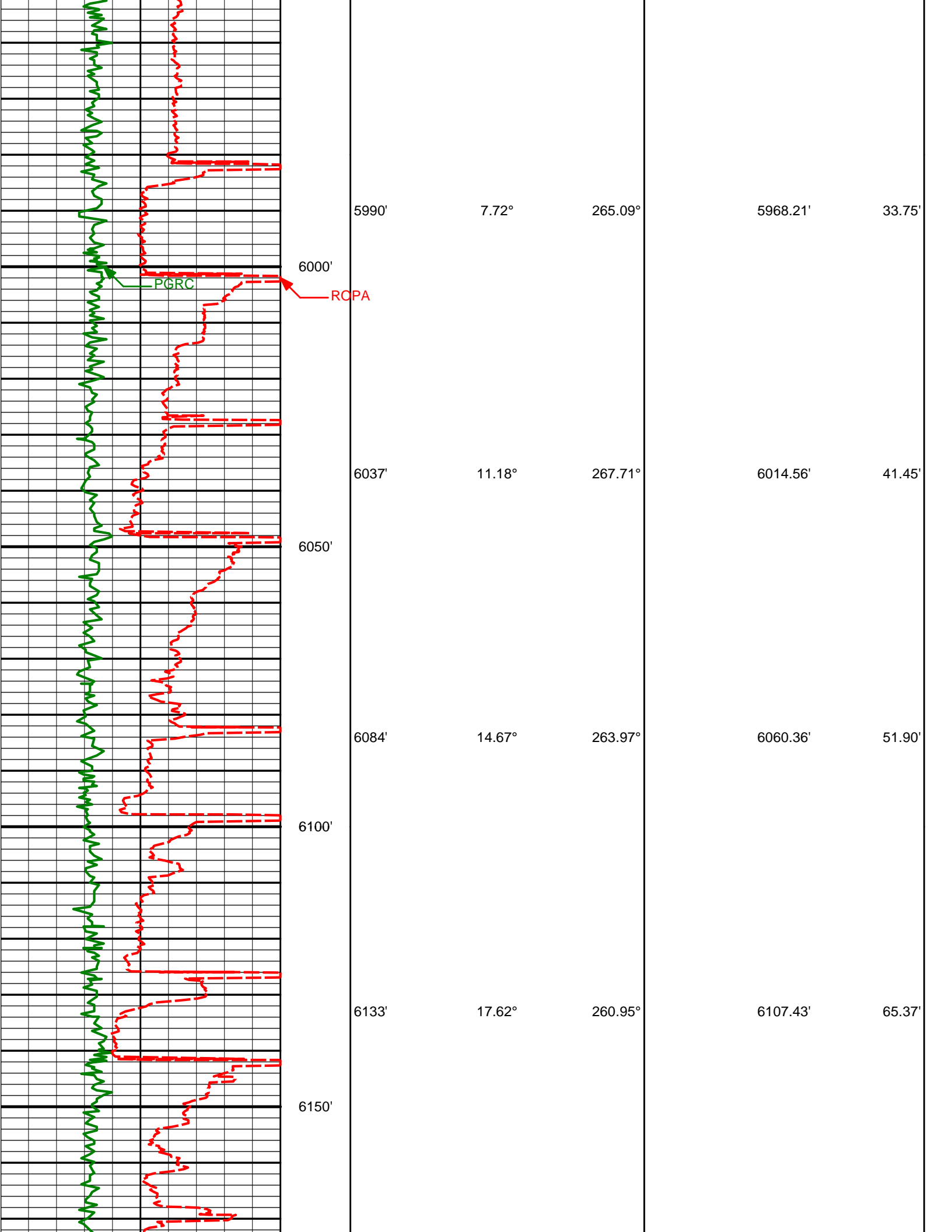


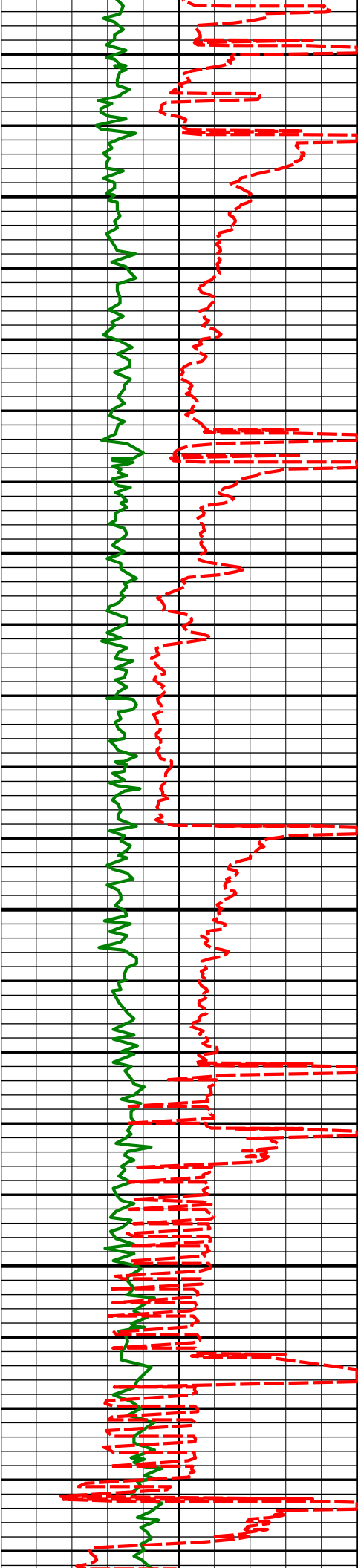
9990'	90.77°	269.78°	6560.05'	3720.16'
10000'				
10050'				
10085'	90.15°	269.99°	6559.29'	3815.14'
10100'				
10150'				
10180'	89.38°	268.53°	6559.68'	3910.09'
10200'				
10250'				
10275'	90.74°	268.48°	6559.58'	4004.99'
10300'				
10350'				
10369'	90.83°	269.55°	6558.29'	4098.92'
10400'				
10450'				
10464'	88.80°	268.59°	6558.60'	4193.86'
10500'				



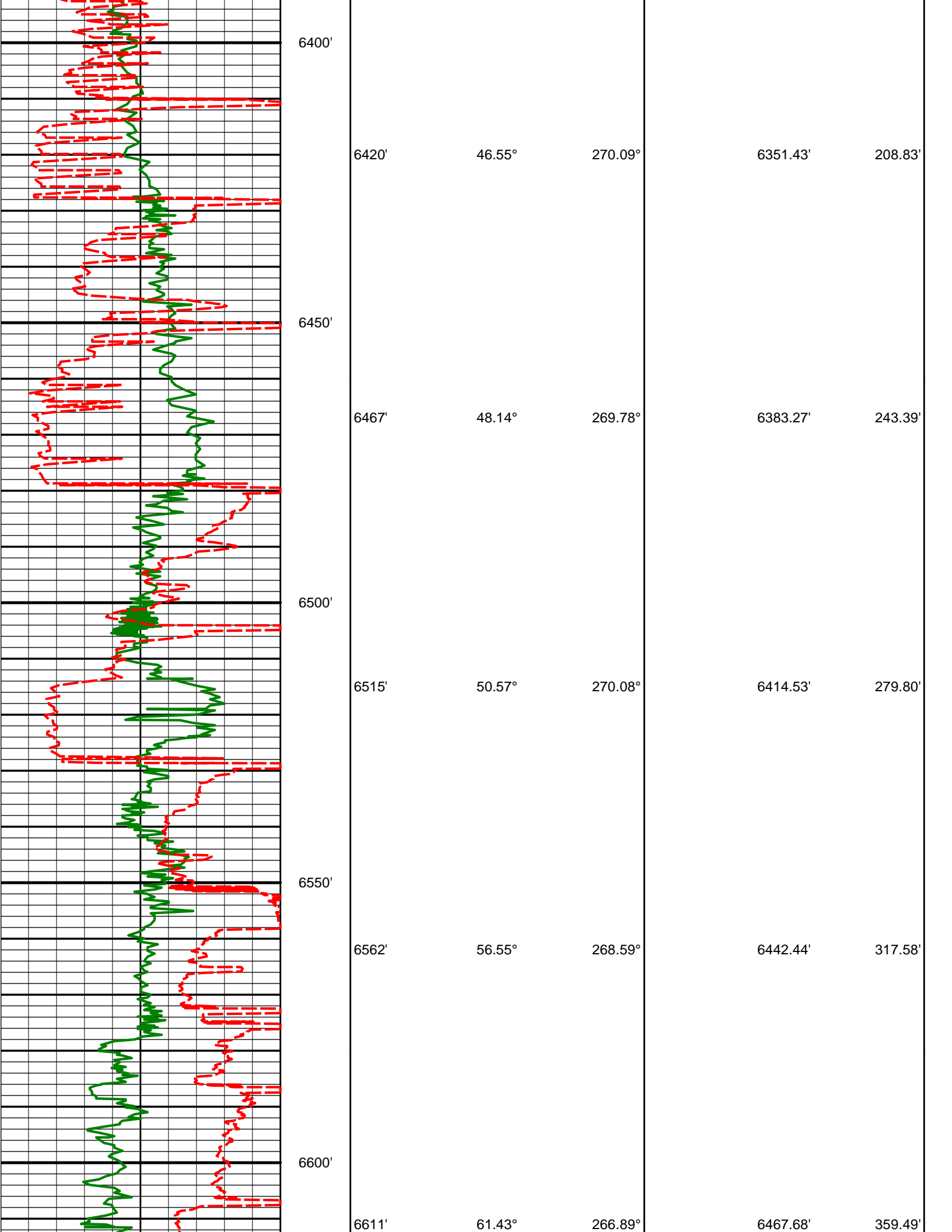


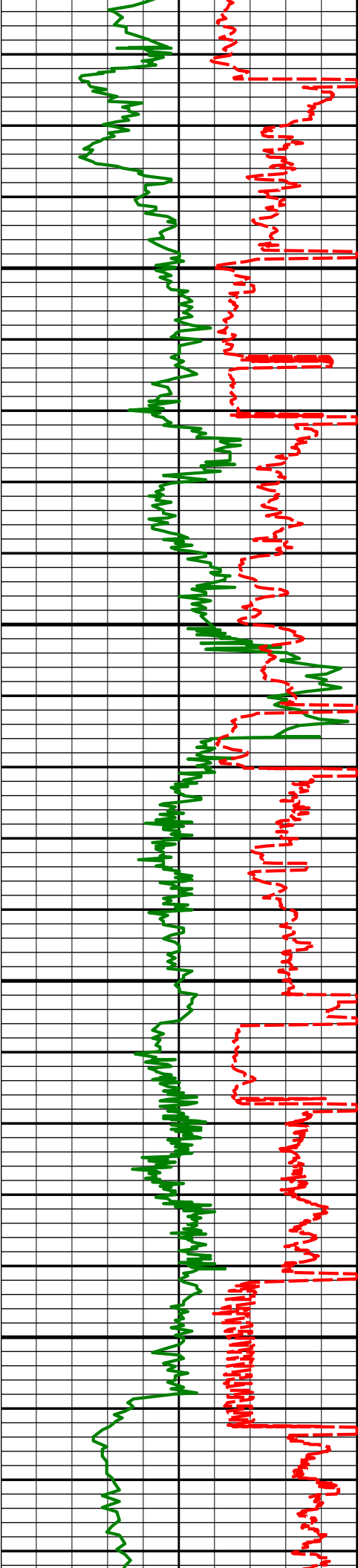






6180'	19.44°	262.82°	6151.99'	80.11'
6200'				
6228'	23.70°	271.26°	6196.63'	97.68'
6250'				
6275'	28.85°	269.81°	6238.76'	118.47'
6300'				
6324'	36.51°	270.75°	6279.97'	144.91'
6350'				
6371'	42.00°	270.97°	6316.35'	174.64'





6650'

6658'

64.70°

266.33°

6488.96'

401.26'

6700'

6706'

70.59°

268.17°

6507.21'

445.54'

6750'

6753'

75.44°

267.01°

6520.94'

490.39'

6800'

6802'

79.66°

267.53°

6531.50'

538.13'

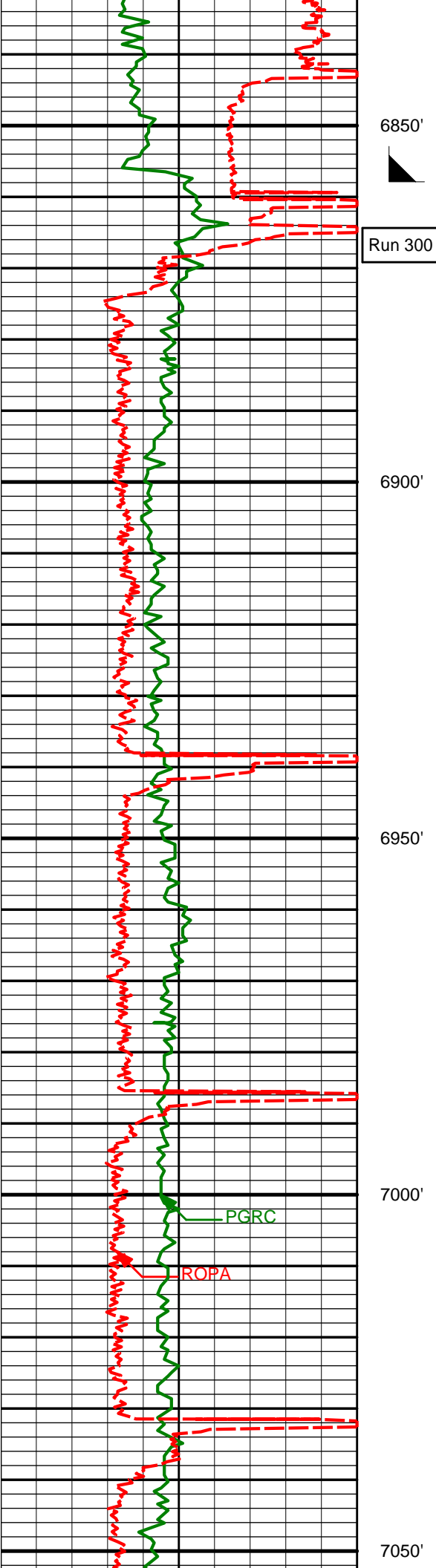
6819'

81.53°

268.06°

6534.28'

554.87'



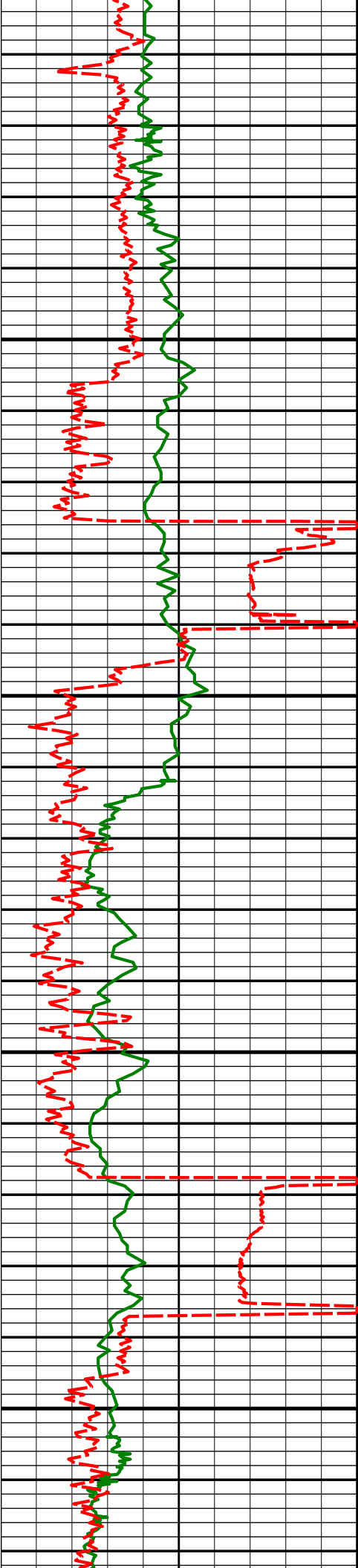
Run 300

6921'	84.97°	268.40°	6546.27'	656.03'
-------	--------	---------	----------	---------

6967'	85.65°	267.90°	6550.03'	701.82'
-------	--------	---------	----------	---------

PGRC

ROPA



7060'

86.67°

267.23°

6556.26'

794.44'

7100'

7150'

7153'

91.11°

267.29°

6558.06'

887.20'

7200'

7250'

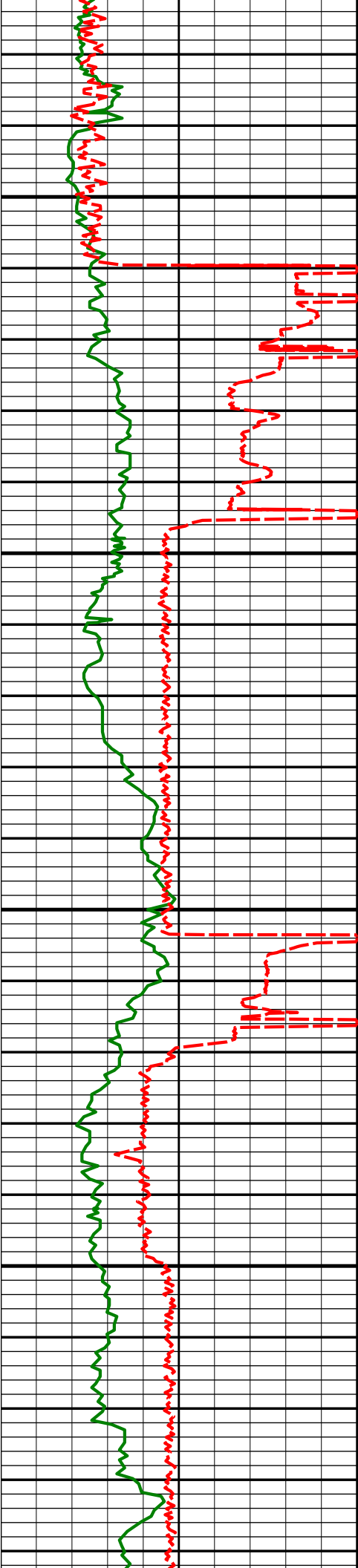
7246'

91.23°

268.04°

6556.16'

980.02'



7300'

7340'

89.85°

269.13°

6555.27'

1073.92'

7350'

7400'

7433'

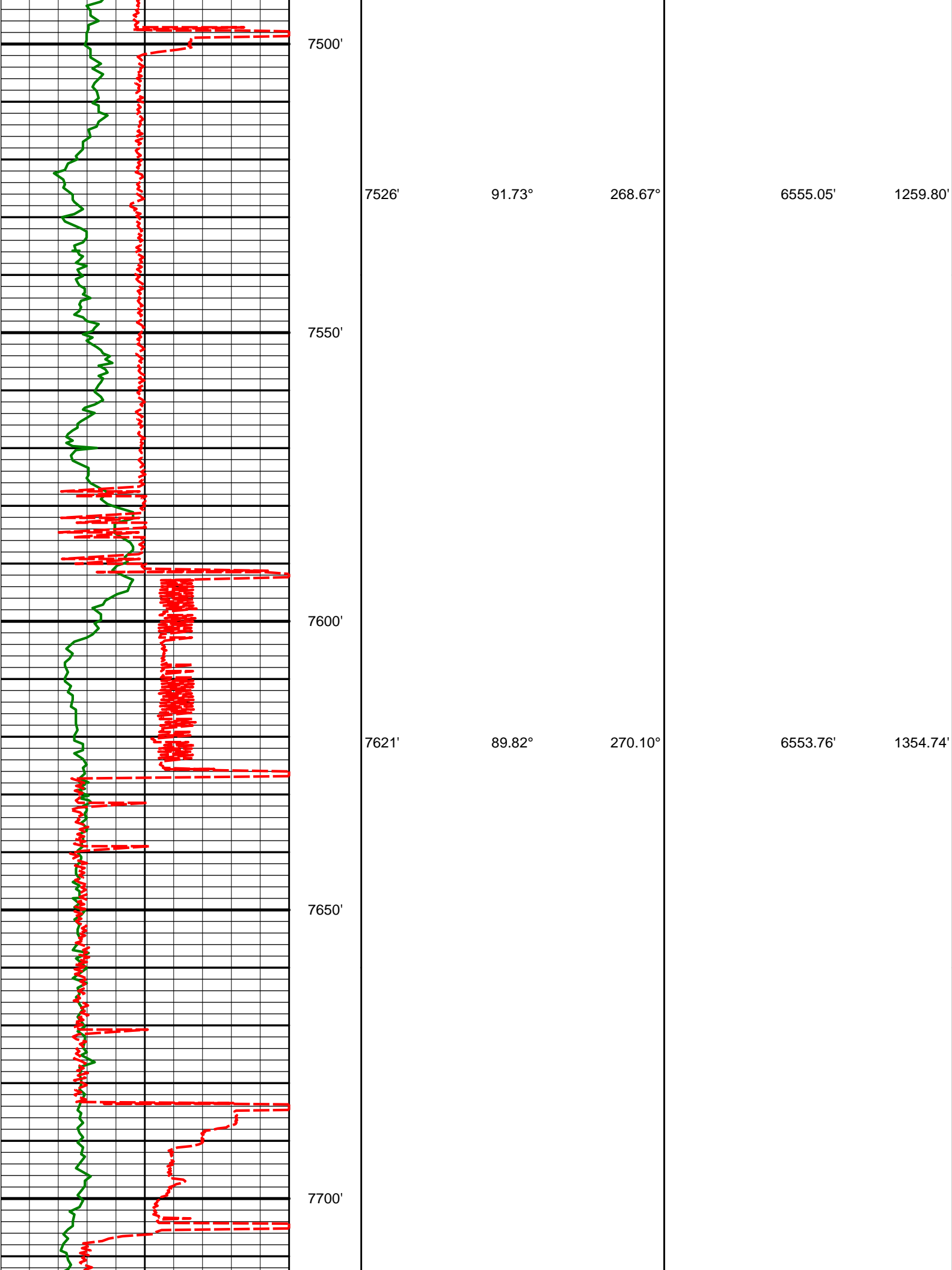
89.35°

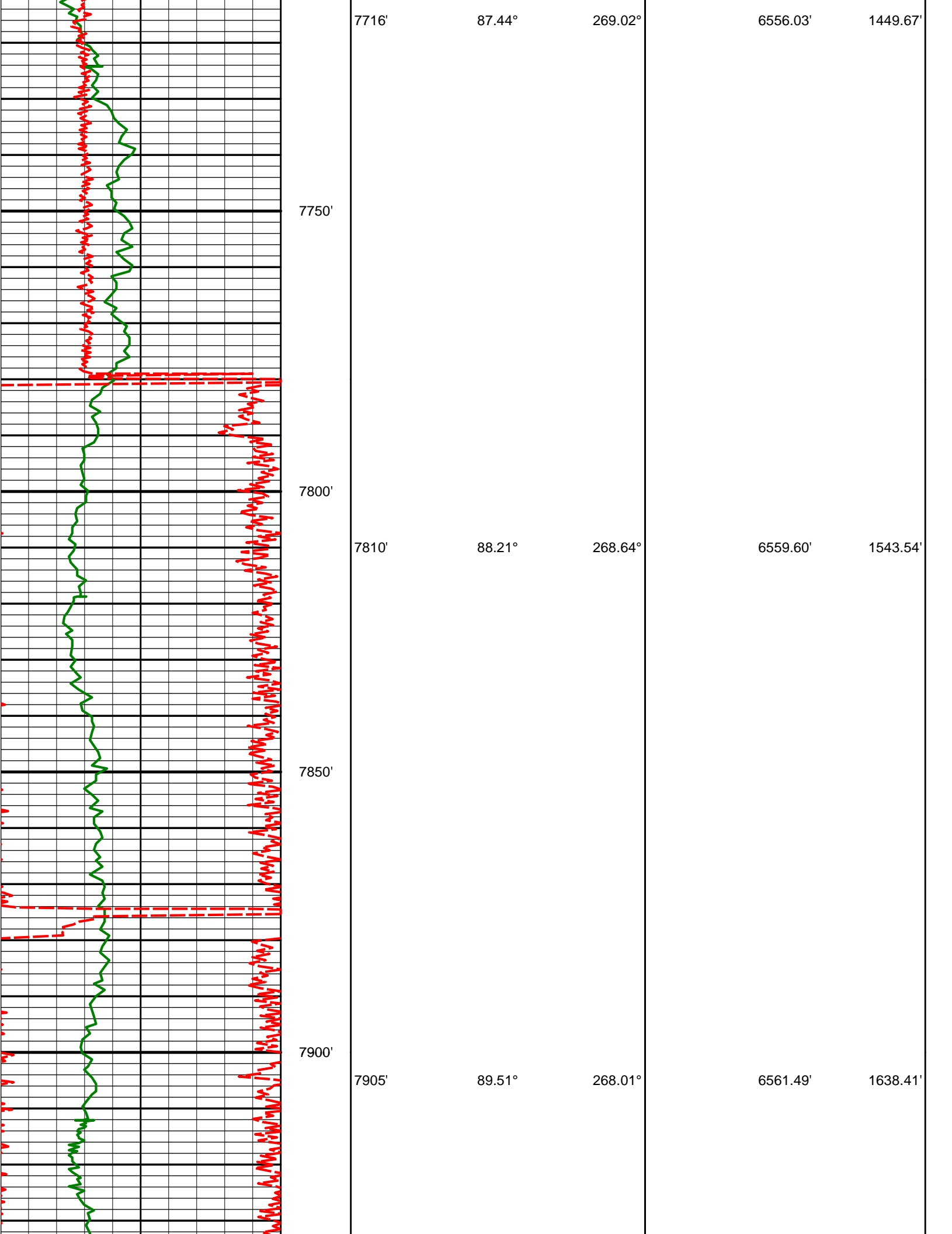
269.10°

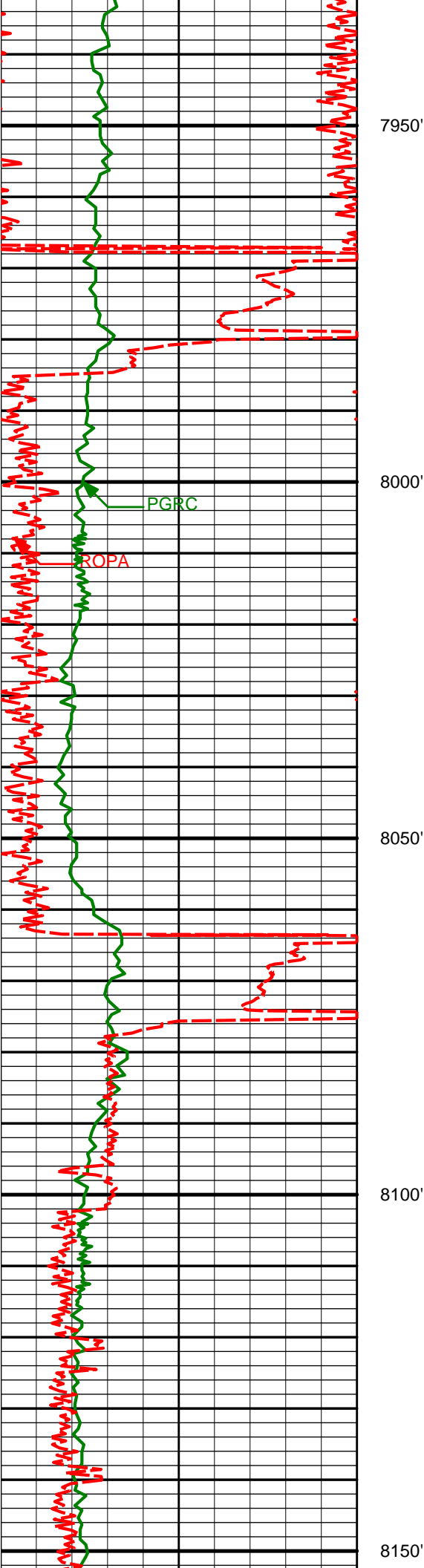
6555.92'

1166.87'

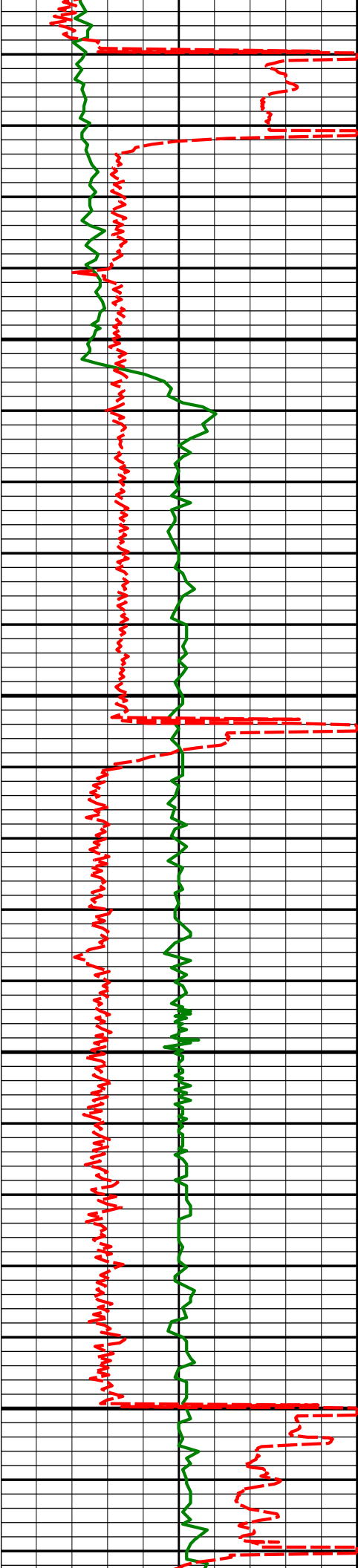
7450'



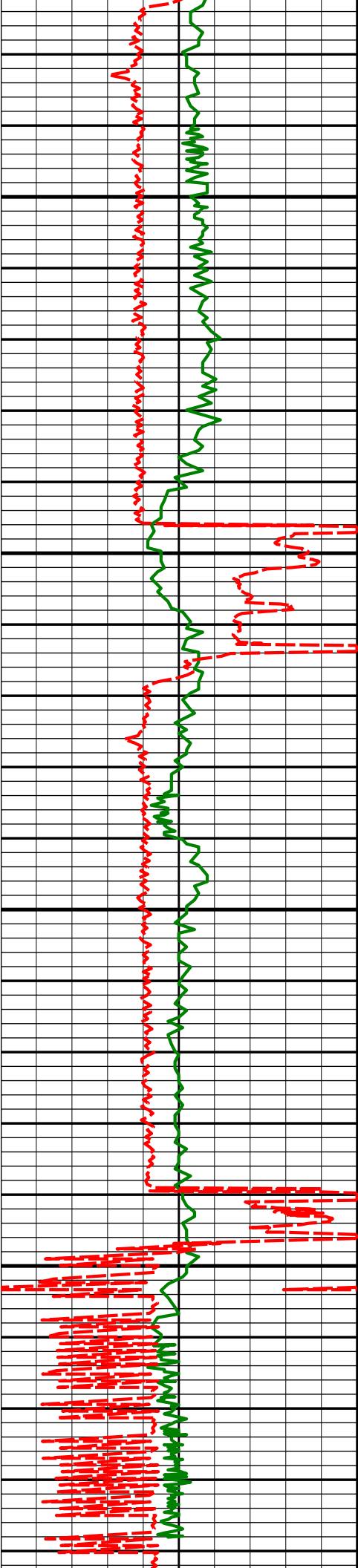




7950'					
8000'	8000'	89.66°	268.04°	6562.18'	1733.28'
8050'					
8100'	8095'	90.00°	268.40°	6562.46'	1828.16'
8150'					



8190'	89.51°	266.30°	6562.87'	1922.96'
8200'				
8250'				
8285'	91.26°	265.73°	6562.23'	2017.60'
8300'				
8350'				



8380'	90.22°	265.55°	6561.00'	2112.17'
-------	--------	---------	----------	----------

8400'

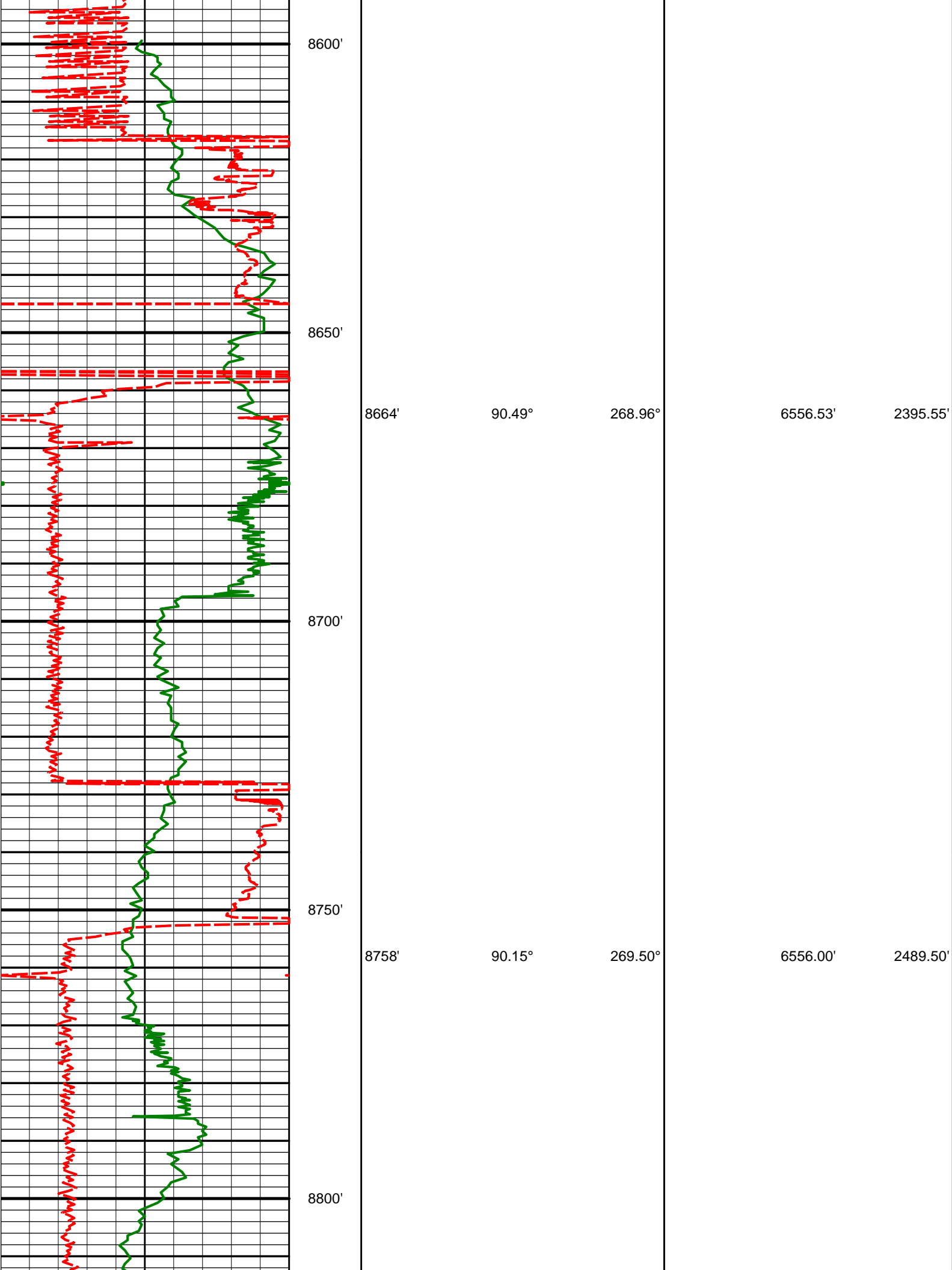
8450'

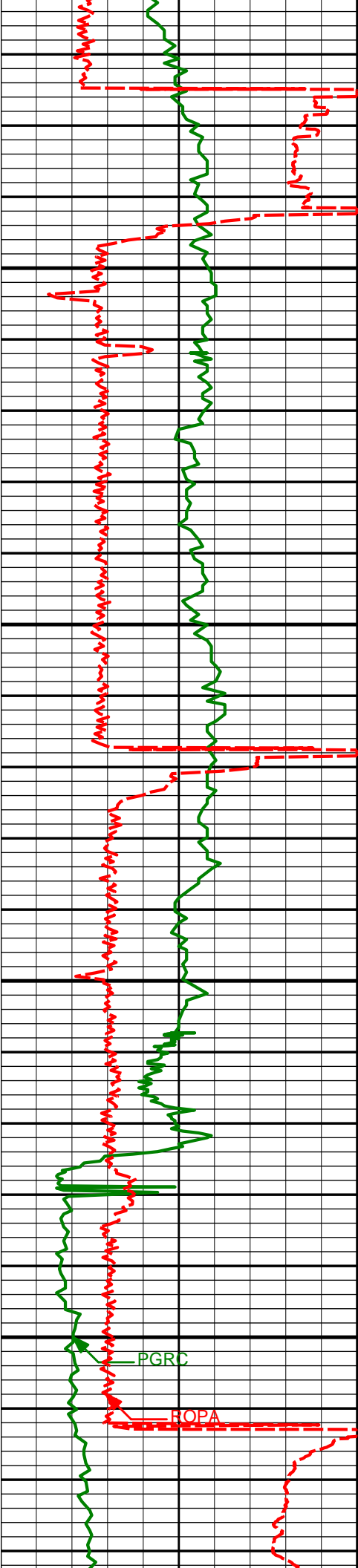
8474'	91.36°	267.34°	6559.70'	2205.85'
-------	--------	---------	----------	----------

8500'

8550'

8569'	90.99°	267.75°	6557.76'	2300.66'
-------	--------	---------	----------	----------





8850'

8853'

89.20°

268.82°

6556.54'

2584.44'

8900'

8950'

8947'

91.02°

267.43°

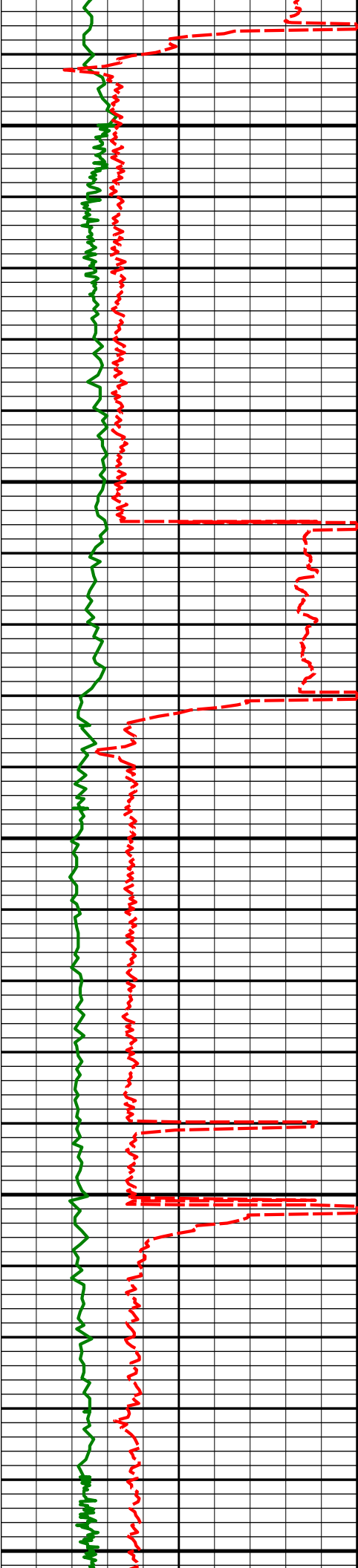
6556.36'

2678.32'

9000'

PGRC

BOPA



9042'

90.59°

269.70°

6555.03'

2773.22'

9050'

9100'

9137'

88.46°

269.80°

6555.82'

2868.18'

9150'

9200'

9231'

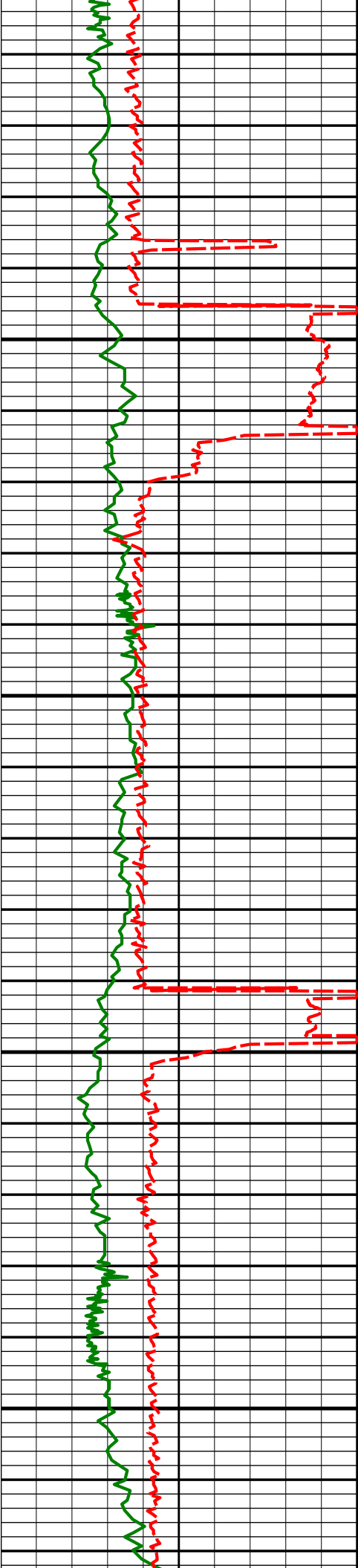
90.28°

269.70°

6556.85'

2962.15'

9250'



9300'

9326'

89.85°

269.58°

6556.74'

3057.12'

9350'

9400'

9421'

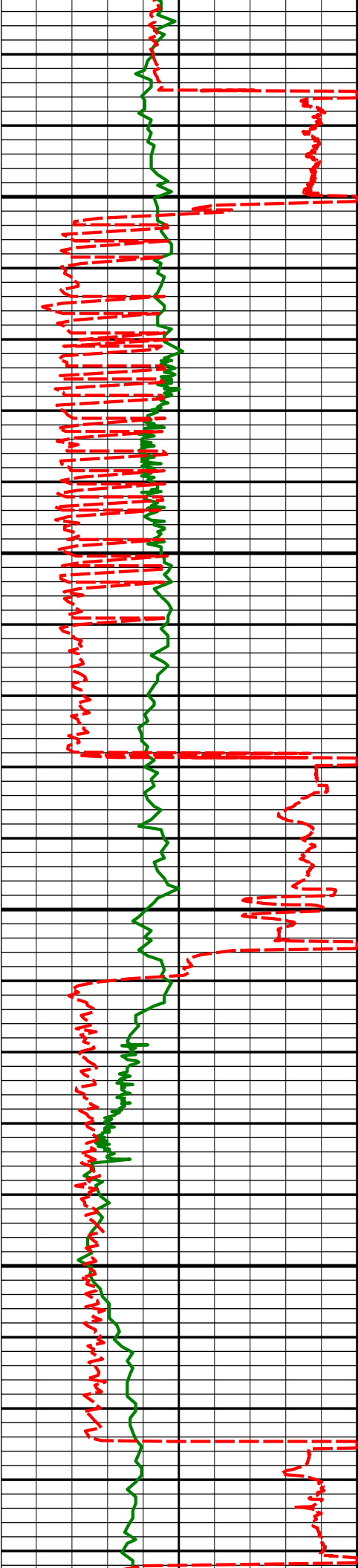
90.62°

268.36°

6556.35'

3152.06'

9450'



9500'

9516'

90.49°

268.23°

6555.43'

3246.95'

9550'

9600'

9611'

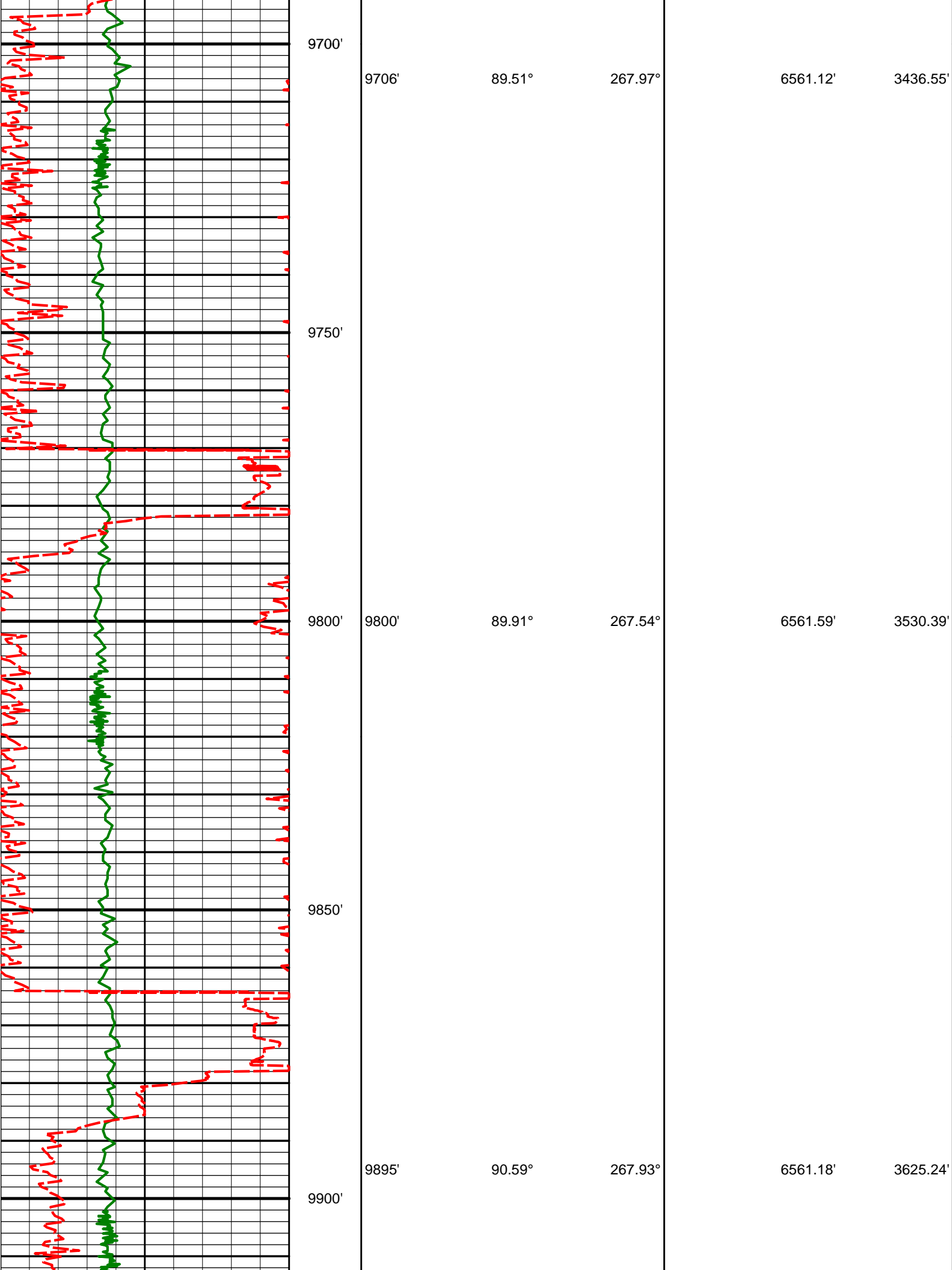
86.57°

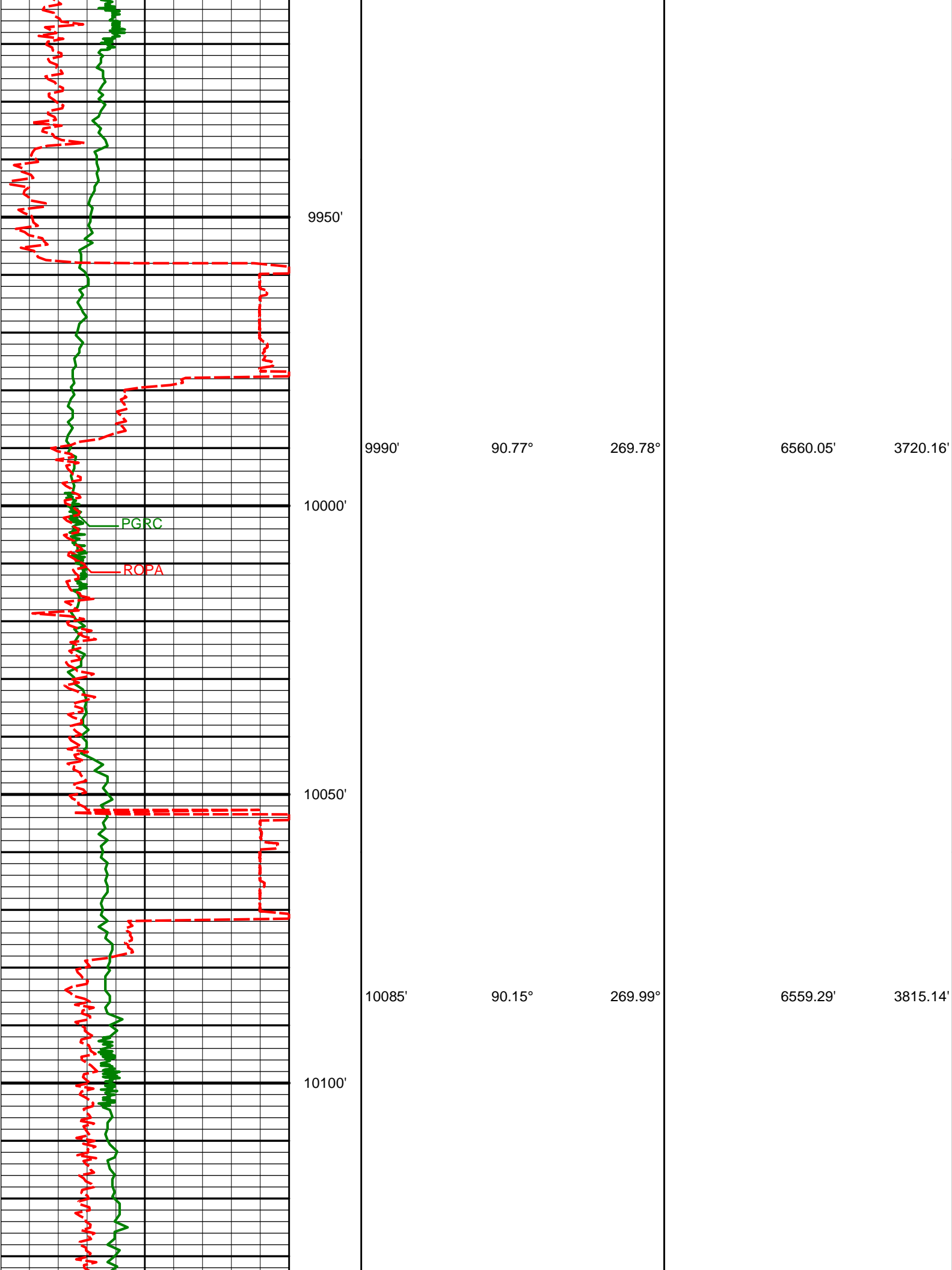
267.69°

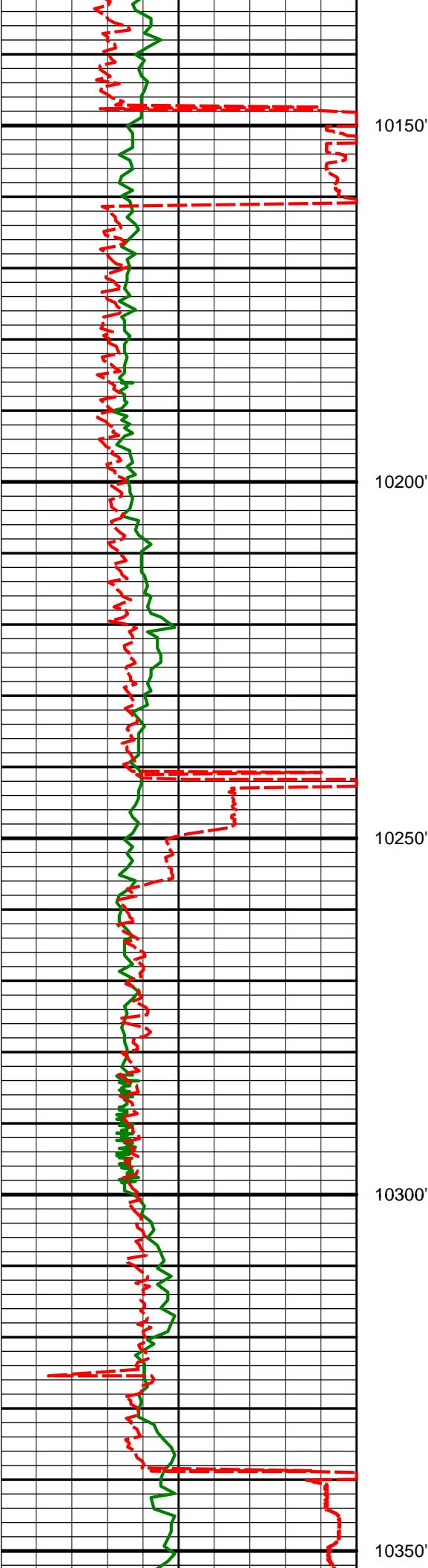
6557.87'

3341.76'

9650'







10180'

89.38°

268.53°

6559.68'

3910.09'

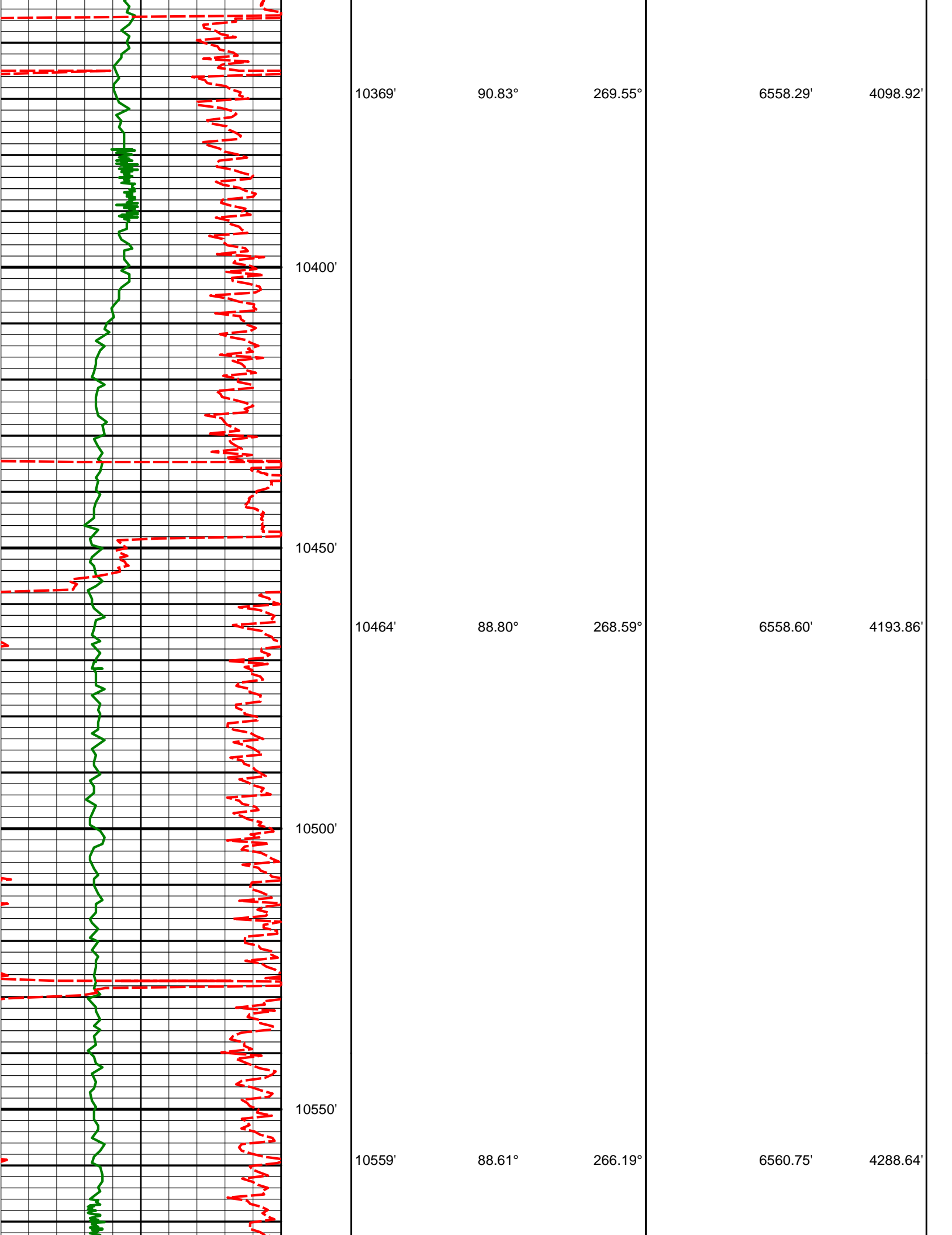
10275'

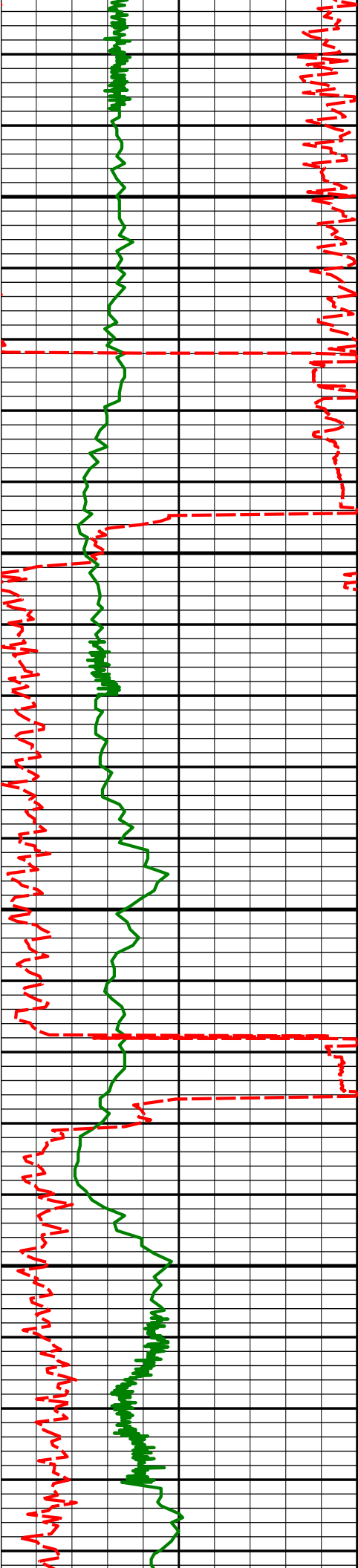
90.74°

268.48°

6559.58'

4004.99'





10600'

10650'

10700'

10750'

10654'

90.31°

267.38°

6561.64'

4383.37'

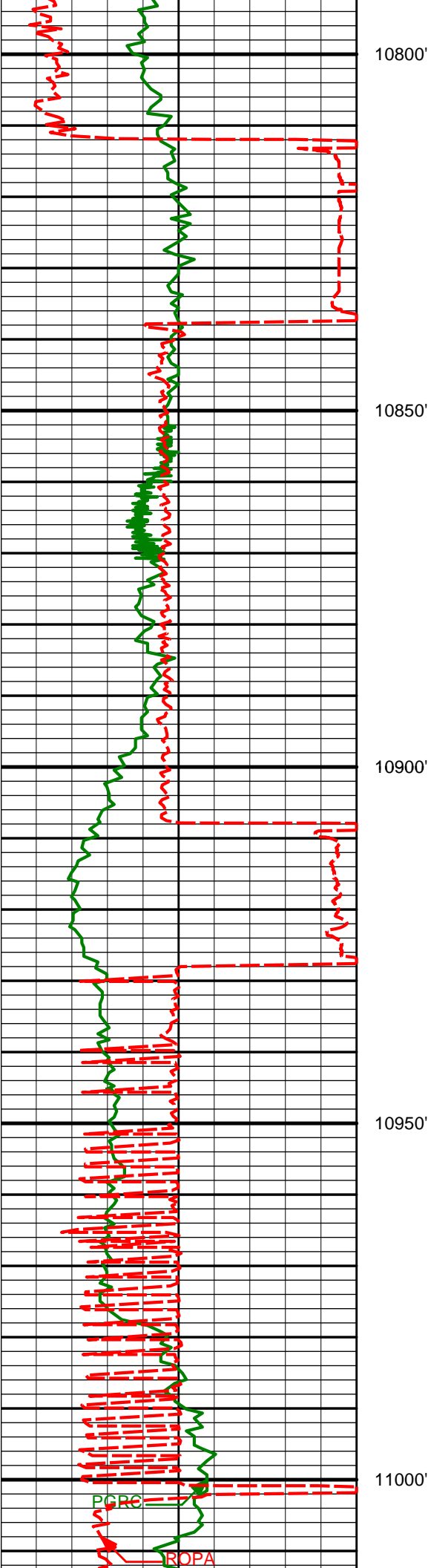
10749'

91.91°

267.81°

6559.80'

4478.18'



10843'

91.60°

269.53°

6556.92'

4572.06'

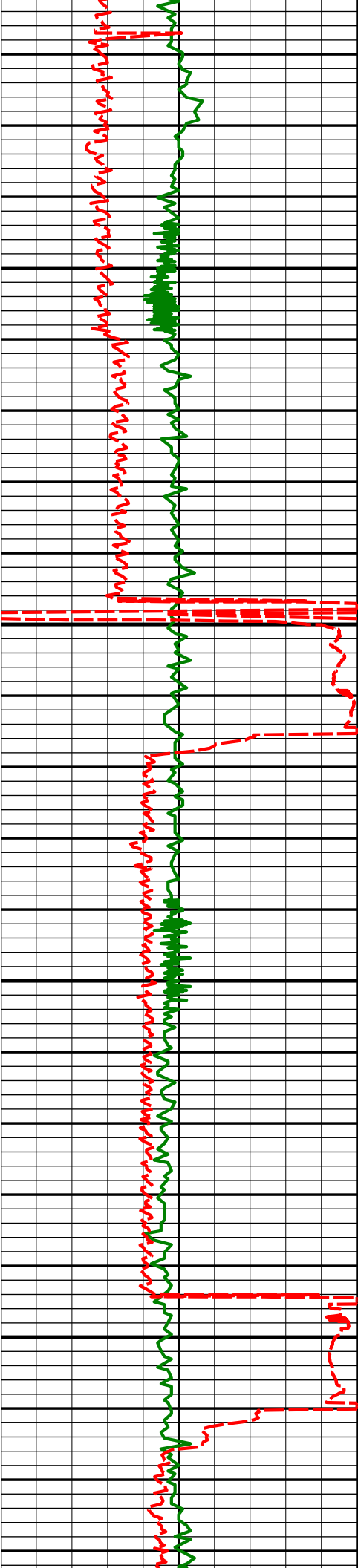
10938'

89.85°

269.90°

6555.72'

4667.02'



11033'	91.23°	269.18°	6554.82'	4761.98'
--------	--------	---------	----------	----------

11050'

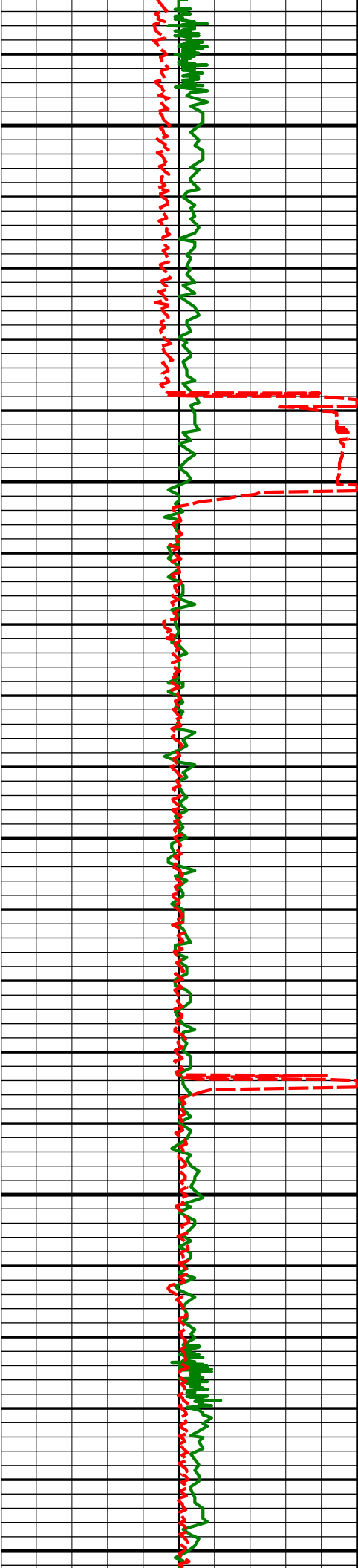
11100'

11128'	90.93°	269.16°	6553.03'	4856.91'
--------	--------	---------	----------	----------

11150'

11200'

11223'	89.88°	268.96°	6552.36'	4951.85'
--------	--------	---------	----------	----------



11250'

11300'

11350'

11400'

11450'

11317'

88.95°

268.86°

6553.32'

5045.78'

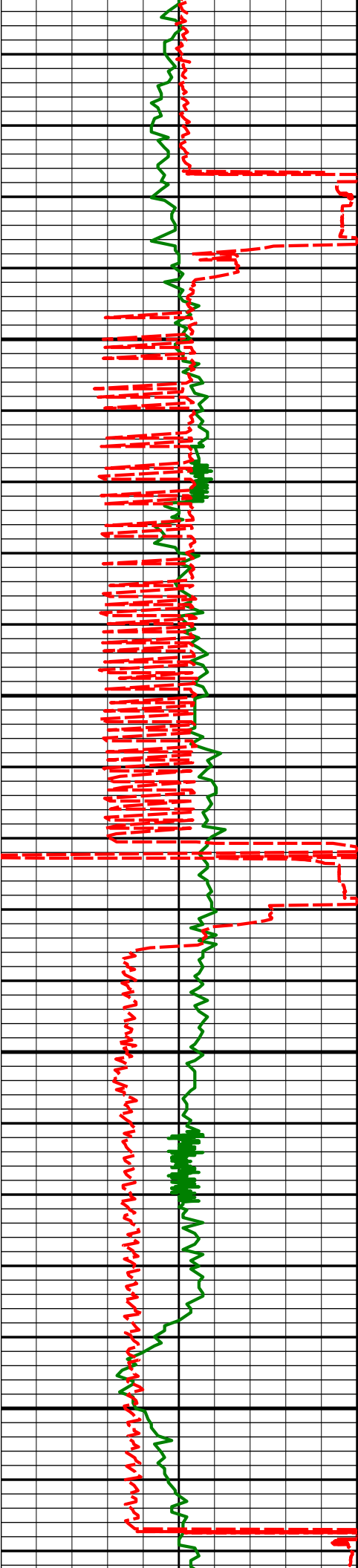
11412'

90.15°

268.76°

6554.07'

5140.71'



11500'

11507'

89.88°

267.71°

6554.04'

5235.60'

11550'

11600'

11602'

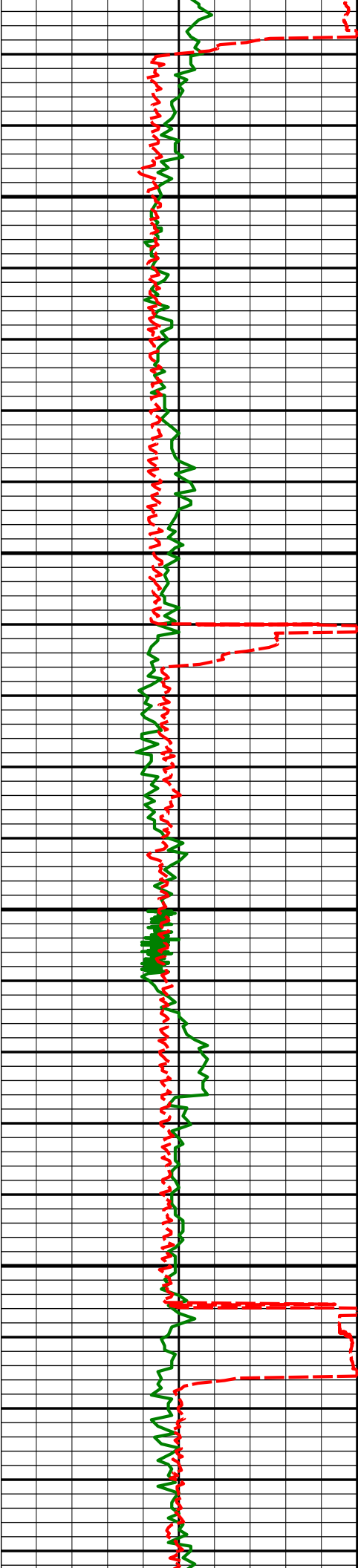
90.31°

267.56°

6553.89'

5330.43'

11650'



11700'

11750'

11800'

11850'

11697'

89.66°

267.32°

6553.91'

5425.24'

11791'

90.25°

267.25°

6553.98'

5519.04'

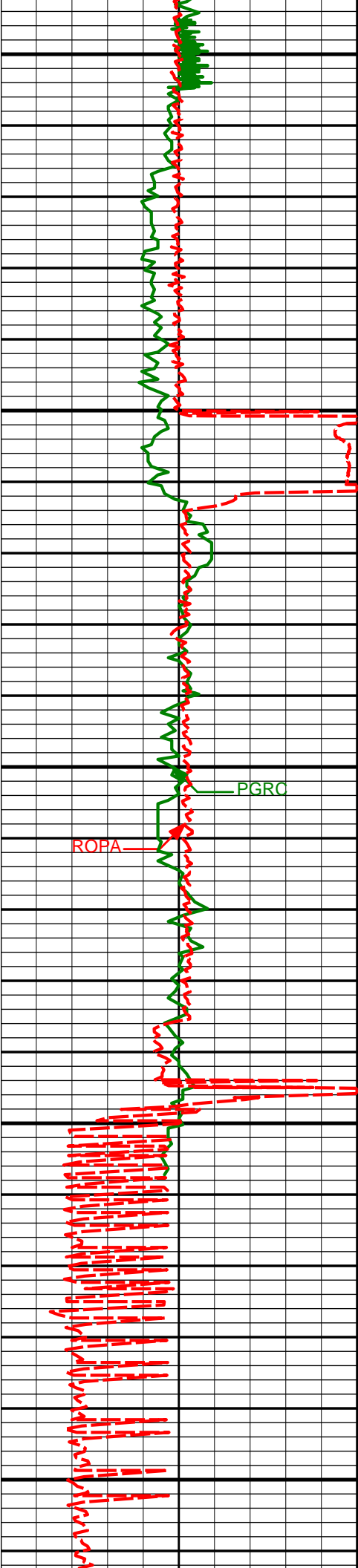
11886'

90.43°

267.74°

6553.42'

5613.86'



11900'

11950'

12000'

12050'

12100'

PGRC

ROPA

11981'	90.00°	268.33°	6553.06'	5708.73'
--------	--------	---------	----------	----------

12050'	90.55°	267.65°	6552.73'	5777.63'
--------	--------	---------	----------	----------

12110'	90.55°	267.25°	6552.10'	5810.50'
--------	--------	---------	----------	----------

<div><div></div></div>		12150'	12113'	90.55°	267.65°	6552.13'	5840.52'
TD Lateral@12113 MD or 6552.13 TVD							

DIRECTIONAL SURVEY REPORT

Noble Energy

Wells Ranch AE30-69HNB

Wattenburg

Weld Colorado

USA

CA-XX-0901116552

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
235.00	0.10	64.04	235.00	0.09 N	0.18 E	-0.18	0.04
485.00	0.20	240.84	485.00	0.03 S	0.00 W	0.00	0.12
585.00	0.40	249.04	585.00	0.24 S	0.48 W	0.47	0.20
735.00	0.30	160.15	735.00	0.79 S	0.83 W	0.82	0.33
828.00	0.21	168.78	828.00	1.19 S	0.72 W	0.70	0.10
921.00	0.19	204.87	920.99	1.50 S	0.75 W	0.72	0.13
1014.00	0.31	214.40	1013.99	1.84 S	0.96 W	0.92	0.14
1107.00	0.24	254.55	1106.99	2.10 S	1.29 W	1.25	0.21
1294.00	0.44	253.93	1293.99	2.41 S	2.35 W	2.31	0.11
1480.00	0.34	248.13	1479.99	2.81 S	3.55 W	3.50	0.06
1575.00	0.20	247.79	1574.98	2.98 S	3.97 W	3.91	0.15
1669.00	0.36	208.83	1668.98	3.30 S	4.26 W	4.20	0.26
1764.00	0.62	306.19	1763.98	3.26 S	4.82 W	4.76	0.80
1859.00	0.94	264.81	1858.97	3.02 S	6.01 W	5.96	0.66
1954.00	2.84	330.30	1953.92	1.05 S	7.95 W	7.93	2.73
2049.00	5.06	347.69	2048.70	5.09 N	10.01 W	10.10	2.63
2144.00	6.44	356.88	2143.22	14.50 N	11.20 W	11.45	1.74
2239.00	7.42	358.53	2237.52	25.95 N	11.64 W	12.10	1.05

2288.00	7.92	358.85	2289.02	28.38 N	11.84 W	12.18	1.88
2333.00	8.04	358.54	2330.67	38.59 N	11.97 W	12.65	0.66
2428.00	8.26	356.34	2424.71	52.05 N	12.57 W	13.50	0.40
2523.00	9.74	356.01	2518.54	66.87 N	13.57 W	14.76	1.56
2618.00	10.61	353.32	2612.04	83.58 N	15.14 W	16.63	1.04
2712.00	10.00	352.61	2704.52	100.27 N	17.20 W	18.98	0.66
2807.00	10.26	357.94	2798.05	116.90 N	18.57 W	20.64	1.02
2902.00	9.46	356.92	2891.64	133.15 N	19.29 W	21.66	0.86
2997.00	10.68	1.48	2985.18	149.75 N	19.48 W	22.14	1.53
3092.00	9.55	357.98	3078.70	166.42 N	19.53 W	22.49	1.35
3187.00	9.51	349.93	3172.39	182.03 N	21.18 W	24.42	1.40
3282.00	6.59	338.12	3266.45	194.82 N	24.59 W	28.05	3.52
3377.00	6.92	340.25	3360.79	205.26 N	28.55 W	32.20	0.44
3471.00	6.40	356.00	3454.17	215.82 N	30.83 W	34.67	2.01
3566.00	7.73	358.33	3548.44	227.49 N	31.39 W	35.43	1.43
3661.00	8.80	352.51	3642.46	241.08 N	32.52 W	36.81	1.43
3756.00	8.66	0.99	3736.36	255.44 N	33.34 W	37.89	1.36
3851.00	7.95	17.24	3830.38	268.86 N	31.27 W	36.05	2.57
3946.00	4.37	19.14	3924.81	278.56 N	28.14 W	33.09	3.77
4041.00	2.73	24.43	4019.63	284.04 N	26.02 W	31.07	1.76
4137.00	1.24	78.14	4115.58	286.34 N	24.05 W	29.15	2.33
4232.00	0.73	185.51	4210.57	285.94 N	23.11 W	28.19	1.70
4328.00	0.81	184.64	4306.56	284.66 N	23.22 W	28.28	0.08
4423.00	0.53	215.94	4401.55	283.64 N	23.53 W	28.58	0.48
4518.00	0.85	201.65	4496.54	282.63 N	24.05 W	29.07	0.38
4614.00	0.56	238.53	4592.54	281.72 N	24.71 W	29.72	0.54
4710.00	0.34	216.96	4688.53	281.25 N	25.28 W	30.29	0.29
4805.00	1.17	136.20	4783.53	280.32 N	24.78 W	29.77	1.23
4900.00	0.68	158.62	4878.51	279.10 N	23.91 W	28.87	0.63
4996.00	0.62	156.29	4974.51	278.09 N	23.49 W	28.44	0.07
5092.00	0.46	184.72	5070.50	277.23 N	23.31 W	28.24	0.32
5187.00	0.25	227.52	5165.50	276.70 N	23.50 W	28.42	0.35
5283.00	0.64	238.35	5261.50	276.28 N	24.10 W	29.02	0.41
5379.00	0.89	178.91	5357.49	275.26 N	24.54 W	29.44	0.82
5474.00	0.35	125.08	5452.49	274.35 N	24.29 W	29.17	0.78
5666.00	0.68	118.84	5644.48	273.46 N	22.81 W	27.68	0.17
5761.00	0.50	140.70	5739.47	272.87 N	22.06 W	26.91	0.30
5808.00	0.49	107.06	5786.47	272.65 N	21.73 W	26.58	0.61
5943.00	2.92	262.30	5921.42	272.02 N	24.59 W	29.43	2.50
5990.00	7.72	265.09	5968.21	271.59 N	28.92 W	33.75	10.22
6037.00	11.18	267.71	6014.56	271.14 N	36.62 W	41.45	7.42
6084.00	14.67	263.97	6060.36	270.33 N	47.10 W	51.90	7.63
6133.00	17.62	260.95	6107.43	268.51 N	60.60 W	65.37	6.26
6180.00	19.44	262.82	6151.99	266.41 N	75.38 W	80.11	4.07
6228.00	23.70	271.26	6196.63	265.63 N	92.96 W	97.68	10.96
6275.00	28.85	269.81	6238.76	265.80 N	113.76 W	118.47	11.04
6324.00	36.51	270.75	6279.97	265.95 N	140.20 W	144.91	15.67
6371.00	42.00	270.97	6316.35	266.40 N	169.92 W	174.64	11.68
6420.00	46.55	270.09	6351.43	266.71 N	204.12 W	208.83	9.37
6467.00	48.14	269.78	6383.27	266.66 N	238.68 W	243.39	3.42
6515.00	50.57	270.08	6414.53	266.62 N	275.10 W	279.80	5.08
6562.00	56.55	268.59	6442.44	266.16 N	312.89 W	317.58	12.98
6611.00	61.43	266.89	6467.68	264.49 N	354.84 W	359.49	10.39
6658.00	64.70	266.33	6488.96	262.01 N	396.66 W	401.26	7.04
6706.00	70.59	268.17	6507.21	259.90 N	440.98 W	445.54	12.77
6753.00	75.44	267.01	6520.94	258.00 N	485.88 W	490.39	10.59
6802.00	79.66	267.53	6531.50	255.73 N	533.66 W	538.13	8.67
6819.00	81.53	268.06	6534.28	255.08 N	550.42 W	554.87	11.42
6921.00	84.97	268.40	6546.27	251.95 N	651.65 W	656.03	3.39
6967.00	85.65	267.90	6550.03	250.47 N	697.47 W	701.82	1.83
7060.00	86.67	267.23	6556.26	246.53 N	790.17 W	794.44	1.31
7153.00	91.11	267.29	6558.06	242.09 N	883.03 W	887.20	4.77
7246.00	91.23	268.04	6556.16	238.30 N	975.93 W	980.02	0.82
7340.00	89.85	269.13	6555.27	235.98 N	1069.89 W	1073.92	1.87
7433.00	89.35	269.10	6555.92	234.54 N	1162.88 W	1166.87	0.54
7526.00	91.73	268.67	6555.05	232.73 N	1255.85 W	1259.80	2.60
7621.00	89.82	270.10	6553.76	231.71 N	1350.83 W	1354.74	2.51
7716.00	87.44	269.02	6556.03	230.98 N	1445.79 W	1449.67	2.75
7810.00	88.21	268.64	6559.60	229.07 N	1539.70 W	1543.54	0.91
7905.00	89.51	268.01	6561.49	226.29 N	1634.64 W	1638.41	1.52
8000.00	89.66	268.04	6562.18	223.02 N	1729.58 W	1733.28	0.16
8095.00	90.00	268.40	6562.46	220.06 N	1824.54 W	1828.16	0.52

8190.00	89.51	266.30	6562.87	215.67 N	1919.43 W	1922.96	2.27
8285.00	91.26	265.73	6562.23	209.07 N	2014.19 W	2017.60	1.94
8380.00	90.22	265.55	6561.00	201.85 N	2108.91 W	2112.17	1.11
8474.00	91.36	267.34	6559.70	196.02 N	2202.71 W	2205.85	2.26
8569.00	90.99	267.75	6557.76	191.95 N	2297.61 W	2300.66	0.58
8664.00	90.49	268.96	6556.53	189.23 N	2392.56 W	2395.55	1.38
8758.00	90.15	269.50	6556.00	187.96 N	2486.55 W	2489.50	0.68
8853.00	89.20	268.82	6556.54	186.57 N	2581.53 W	2584.44	1.23
8947.00	91.02	267.43	6556.36	183.49 N	2675.48 W	2678.32	2.44
9042.00	90.59	269.70	6555.03	181.12 N	2770.43 W	2773.22	2.43
9137.00	88.46	269.80	6555.82	180.70 N	2865.42 W	2868.18	2.24
9231.00	90.28	269.70	6556.85	180.29 N	2959.41 W	2962.15	1.94
9326.00	89.85	269.58	6556.74	179.69 N	3054.41 W	3057.12	0.47
9421.00	90.62	268.36	6556.35	177.99 N	3149.39 W	3152.06	1.52
9516.00	90.49	268.23	6555.43	175.16 N	3244.34 W	3246.95	0.19
9611.00	86.57	267.69	6557.87	171.78 N	3339.23 W	3341.76	4.17
9706.00	89.51	267.97	6561.12	168.19 N	3434.10 W	3436.55	3.11
9800.00	89.91	267.54	6561.59	164.50 N	3528.02 W	3530.39	0.62
9895.00	90.59	267.93	6561.18	160.75 N	3622.95 W	3625.24	0.83
9990.00	90.77	269.78	6560.05	158.85 N	3717.92 W	3720.16	1.96
10085.00	90.15	269.99	6559.29	158.66 N	3812.92 W	3815.14	0.69
10180.00	89.38	268.53	6559.68	157.43 N	3907.90 W	3910.09	1.74
10275.00	90.74	268.48	6559.58	154.96 N	4002.87 W	4004.99	1.43
10369.00	90.83	269.55	6558.29	153.34 N	4096.84 W	4098.92	1.14
10464.00	88.80	268.59	6558.60	151.80 N	4191.83 W	4193.86	2.36
10559.00	88.61	266.19	6560.75	147.47 N	4286.70 W	4288.64	2.53
10654.00	90.31	267.38	6561.64	142.15 N	4381.54 W	4383.37	2.18
10749.00	91.91	267.81	6559.80	138.16 N	4476.43 W	4478.18	1.74
10843.00	91.60	269.53	6556.92	135.98 N	4570.36 W	4572.06	1.86
10938.00	89.85	269.90	6555.72	135.51 N	4665.35 W	4667.02	1.88
11033.00	91.23	269.18	6554.82	134.74 N	4760.34 W	4761.98	1.64
11128.00	90.93	269.16	6553.03	133.37 N	4855.31 W	4856.91	0.32
11223.00	89.88	268.96	6552.36	131.81 N	4950.29 W	4951.85	1.13
11317.00	88.95	268.86	6553.32	130.02 N	5044.27 W	5045.78	1.00
11412.00	90.15	268.76	6554.07	128.05 N	5139.24 W	5140.71	1.27
11507.00	89.88	267.71	6554.04	125.12 N	5234.20 W	5235.60	1.14
11602.00	90.31	267.56	6553.89	121.20 N	5329.12 W	5330.43	0.48
11697.00	89.66	267.32	6553.91	116.96 N	5424.02 W	5425.24	0.73
11791.00	90.25	267.25	6553.98	112.51 N	5517.92 W	5519.04	0.63
11886.00	90.43	267.74	6553.42	108.35 N	5612.82 W	5613.86	0.55
11981.00	90.00	268.33	6553.06	105.10 N	5707.77 W	5708.73	0.77
12050.00	90.55	267.65	6552.73	102.68 N	5776.72 W	5777.63	1.27
12113.00	90.55	267.65	6552.13	100.09 N	5839.67 W	5840.52	0.00

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 271.02 DEGREES (GRID)
A TOTAL CORRECTION OF 7.44 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 12113.00 FEET
IS 5840.52 FEET ALONG 270.98 DEGREES (GRID)**

Tie-In @ Surface

Surveys at 235 ft, 485 ft and 585 ft, were taken and provided by HP 322 while they were drilling the surface hole and have been converted from magnetic north to grid north.