



GAMMA RAY

5" = 100' MD

COMPANY : ANADARKO E&P ONSHORE LLC
WELL : HILGERS 33N1-22HZ
FIELD : WATTENBERG
COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05123432620000

COMPANY : ANADARKO E&P ONSHORE LLC
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UWI : 05123432620000

WELL LOCATION NAD83
LAT:40.2101730° LONG:-104.9815630°
N:14603267.88 ft E:1645564.10 ft

SEC:22 TWP:3N RANGE:68W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : RKB

REF. HEIGHT : 17.000 ft RKB to Ground Level

GROUND LEVEL : 4998.000 ft G.L. to MEAN SEA LEVEL

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft	INCLINATION deg	FROM ft	TO ft
13.5	0	1883	0 - 22	0	3986
8.5	1883	12438	22 - 0	4075	6651
			11 - 90	6740	7736
			90 +/- 5	7825	12438

CASING RECORD

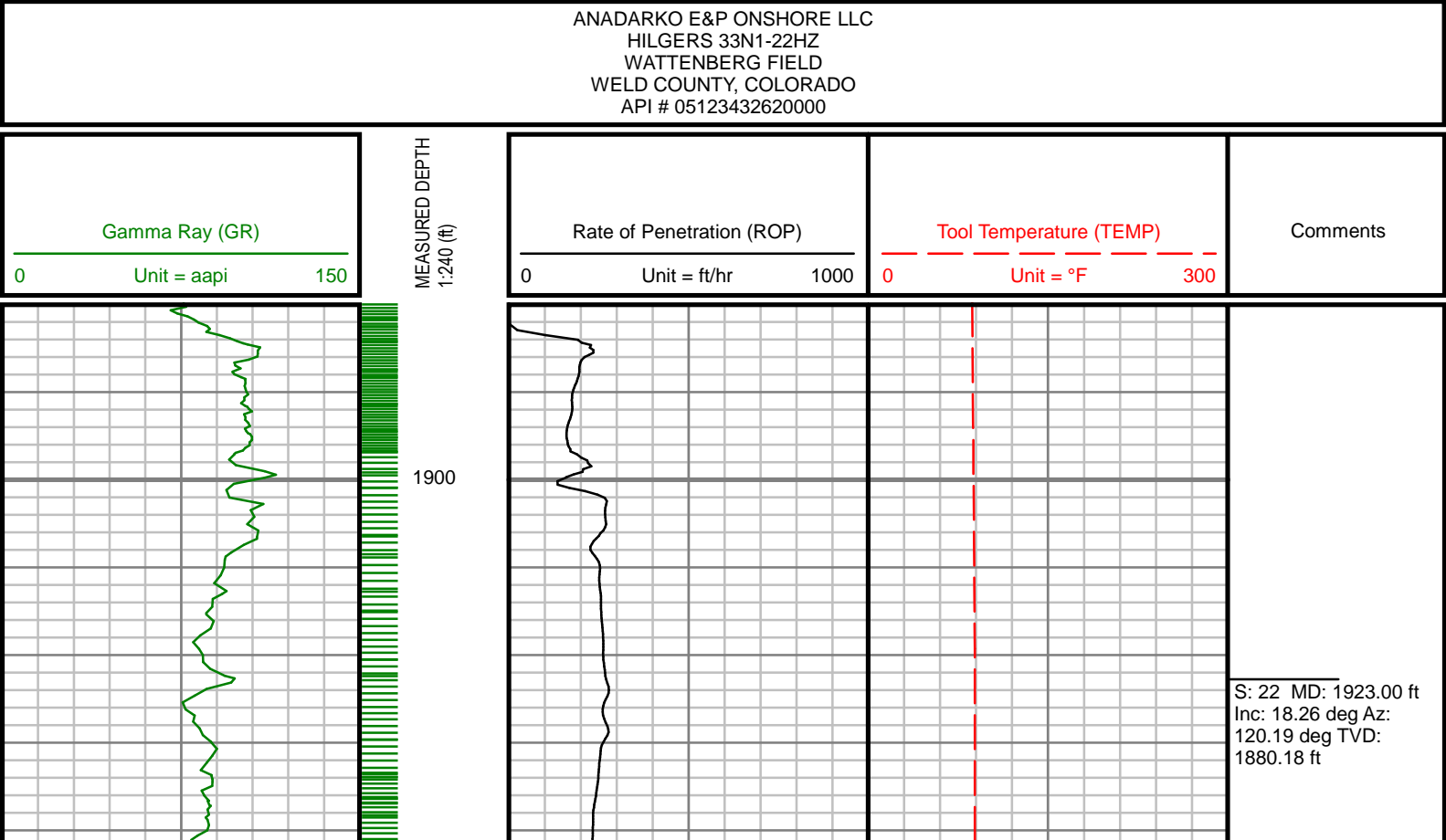
CASING SIZE in	FROM ft	TO ft	DRILLING CO. : XTREME RIG : 24 LWD UNIT NO. : FIELD KIT,DISTRICT : CASPER SPUD DATE : 05/06/2017 LWD START DATE : 05/22/2017 DEPTH : 1883 ft LWD END DATE : 05/26/2017 DEPTH : 12438 ft TOTAL DEPTH : 12438 ft
9.625	0	1880	

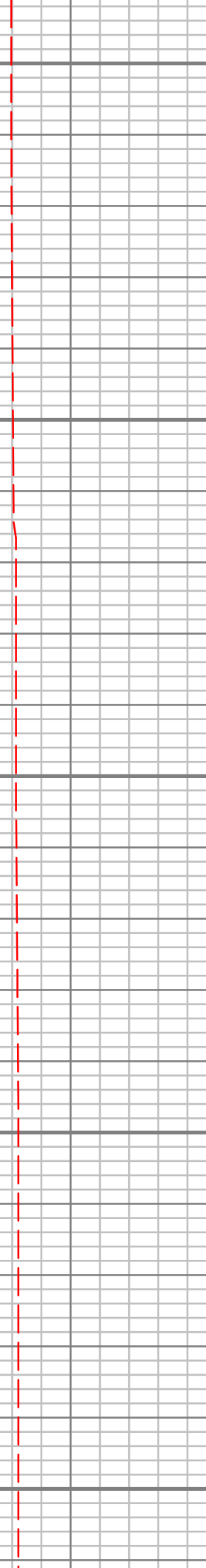
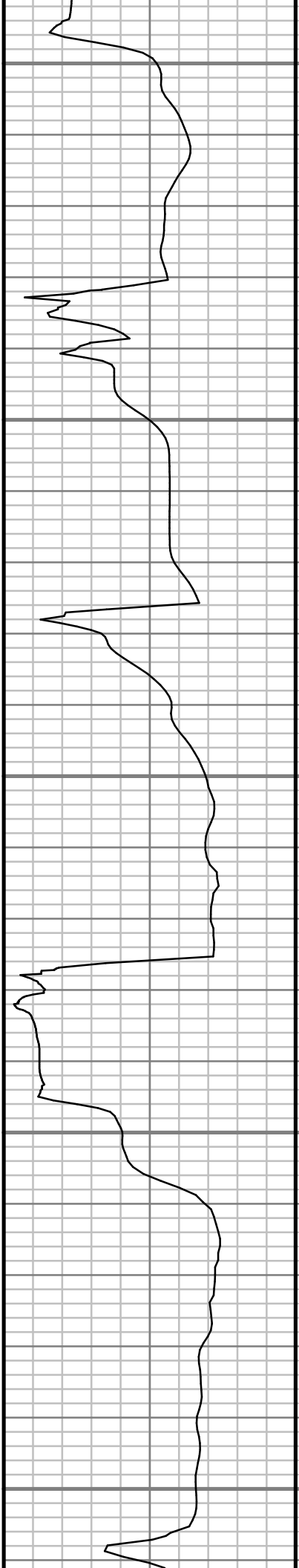
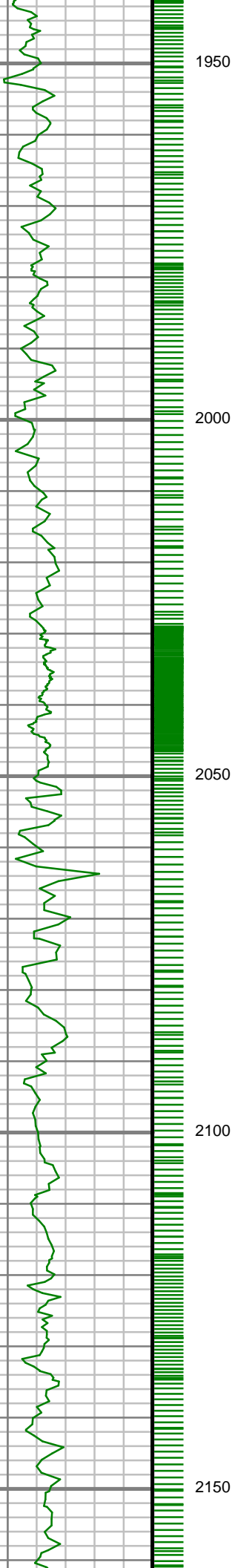
Run Data

RUN NUMBER	1	2		
START DATE	05/22/2017	05/23/2017		
START TIME	10:00	11:20		
END DATE	05/23/2017	05/26/2017		
END TIME	11:15	02:30		
DEPTH IN (ft)	1883	3700		
DEPTH OUT (ft)	3700	12438		
LOG TOP (ft)	1883	3655		
LOG BOTTOM (ft)	3655	12385		
HOLE SIZE (in)	8.5	8.5		
MUD DATA @ (ft)	2255	8956		
MUD TYPE	OIL-BASED	OIL-BASED		
DENSITY (lb / gal)	9	9.1		
VISCOSITY (s / qt)	81	59		
pH	-	-		
FLUID LOSS (cm ³ / 30)	-	-		
SALINITY (ppm)	30000	32000		
Rm (ohmm @ deg F)	-	-		
Rmf (ohmm @ deg F)	-	-		
MAX TEMP (deg F)	119	212		
Rm @ MAX TEMP (ohmm)	-	-		
LWD ENGINEER #1	J. WALSH	J. WALSH		
LWD ENGINEER #2	M. BAILY	M. BAILY		
LWD ENGINEER #3	-	-		
LOG WITNESS #1	-	-		
LOG WITNESS #2	-	-		

Remarks
ANADARKO E&P ONSHORE LLC PRODUCTION AFE# 2115839
SCIENTIFIC DRILLING INTERNATIONAL JOB# OP.001534
ALL REFERENCES IN THE DEPTH TRACK ARE AT BIT DEPTH.
ALL DATA IS MEMORY DATA UNLESS STATED OTHERWISE.
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO GAMMA RAY CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO RATE OF PENETRATION CURVE
RUN #1: MWD / GAMMA RAY / PRT LOGGING RUN
SENSORS S/N: PULSER=128-044 / CONTROLLER=738 / MWD EYE=918 / GAMMA RAY=1156 / PRT=49.96
BIT TO SENSOR OFFSETS: MWD EYE=60.66 FT. / GAMMA RAY=43.56 FT. / PRT=49.96
RUN #2: MWD / GAMMA RAY / PRT LOGGING RUN
SENSORS S/N: PULSER=128-044 / CONTROLLER=738 / MWD EYE=918 / GAMMA RAY=1156 / PRT=49.96
BIT TO SENSOR OFFSETS: MWD EYE=60.66 FT. / GAMMA RAY=43.56 FT. / PRT=49.96
MNEMONICS LIST:
GR = GAMMA RAY
ROP = RATE OF PENETRATION
TEMP = TOOL TEMPERATURE

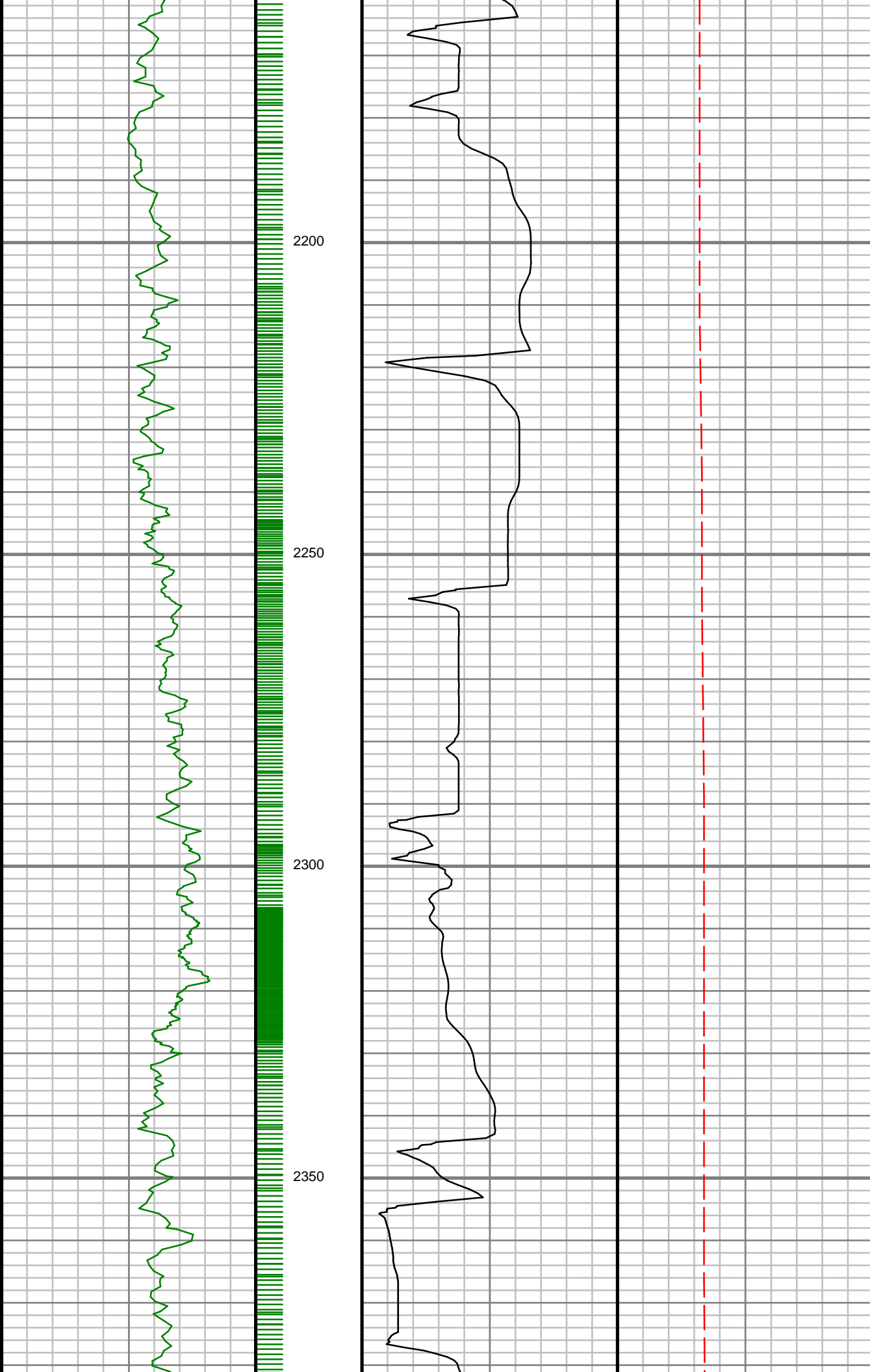
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions as set out in our current price schedule.





S: 23 MD: 2011.00 ft
Inc: 17.45 deg Az:
117.69 deg TVD:
1963.94 ft

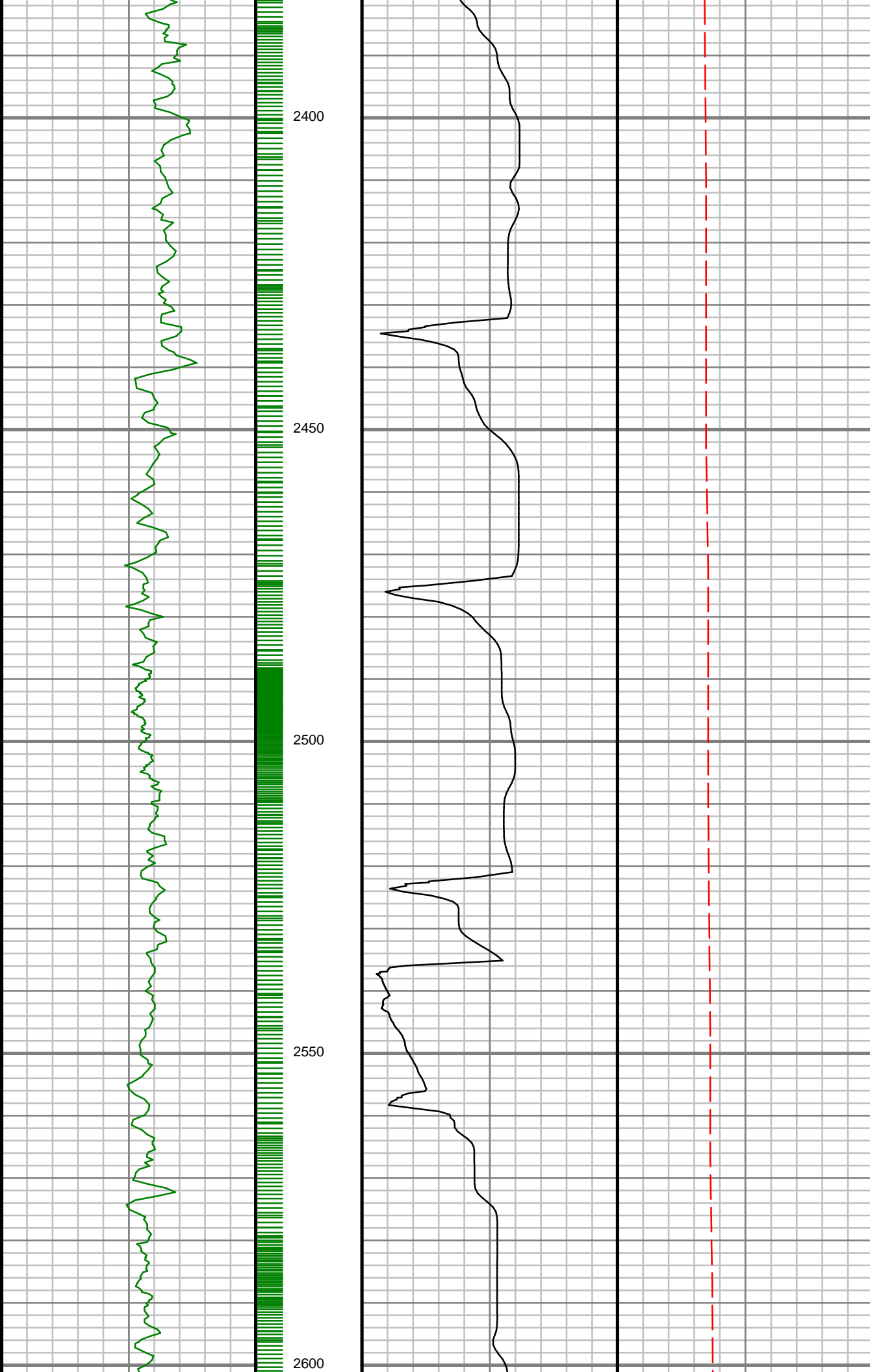
S: 24 MD: 2099.00 ft
Inc: 19.64 deg Az:
115.23 deg TVD:
2047.36 ft



S: 25 MD: 2188.00 ft
Inc: 18.68 deg Az:
113.93 deg TVD:
2131.43 ft

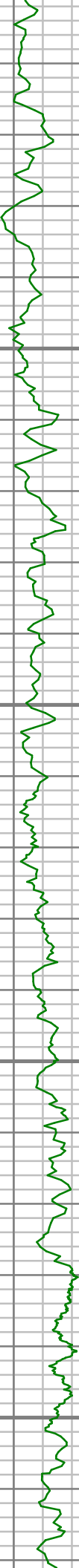
S: 26 MD: 2277.00 ft
Inc: 17.53 deg Az:
111.80 deg TVD:
2216.02 ft

S: 27 MD: 2366.00 ft
Inc: 18.90 deg Az:
110.60 deg TVD:
2300.56 ft



S: 28 MD: 2454.00 ft
Inc: 18.12 deg Az:
110.72 deg TVD:
2384.01 ft

S: 29 MD: 2543.00 ft
Inc: 18.94 deg Az:
114.93 deg TVD:
2468.40 ft

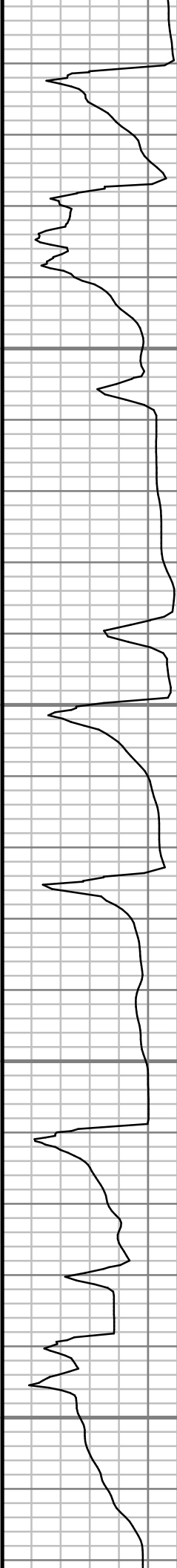


2650

2700

2750

2800



S: 30 MD: 2632.00 ft
Inc: 18.71 deg Az:
115.72 deg TVD:
2552.64 ft

S: 31 MD: 2720.00 ft
Inc: 17.82 deg Az:
116.26 deg TVD:
2636.20 ft

S: 32 MD: 2809.00 ft
Inc: 16.05 deg Az:
115.98 deg TVD:
2721.34 ft

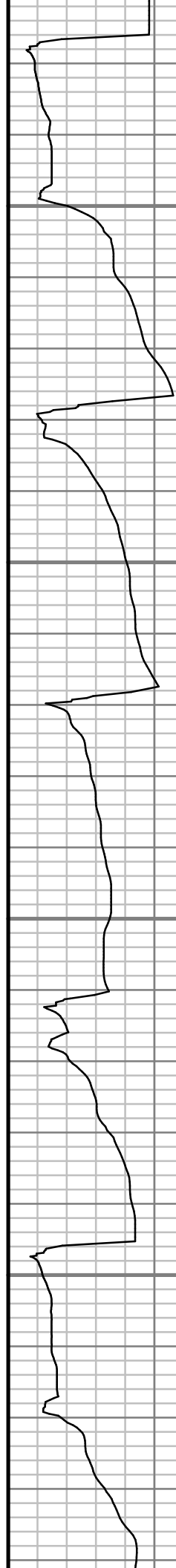


2850

2900

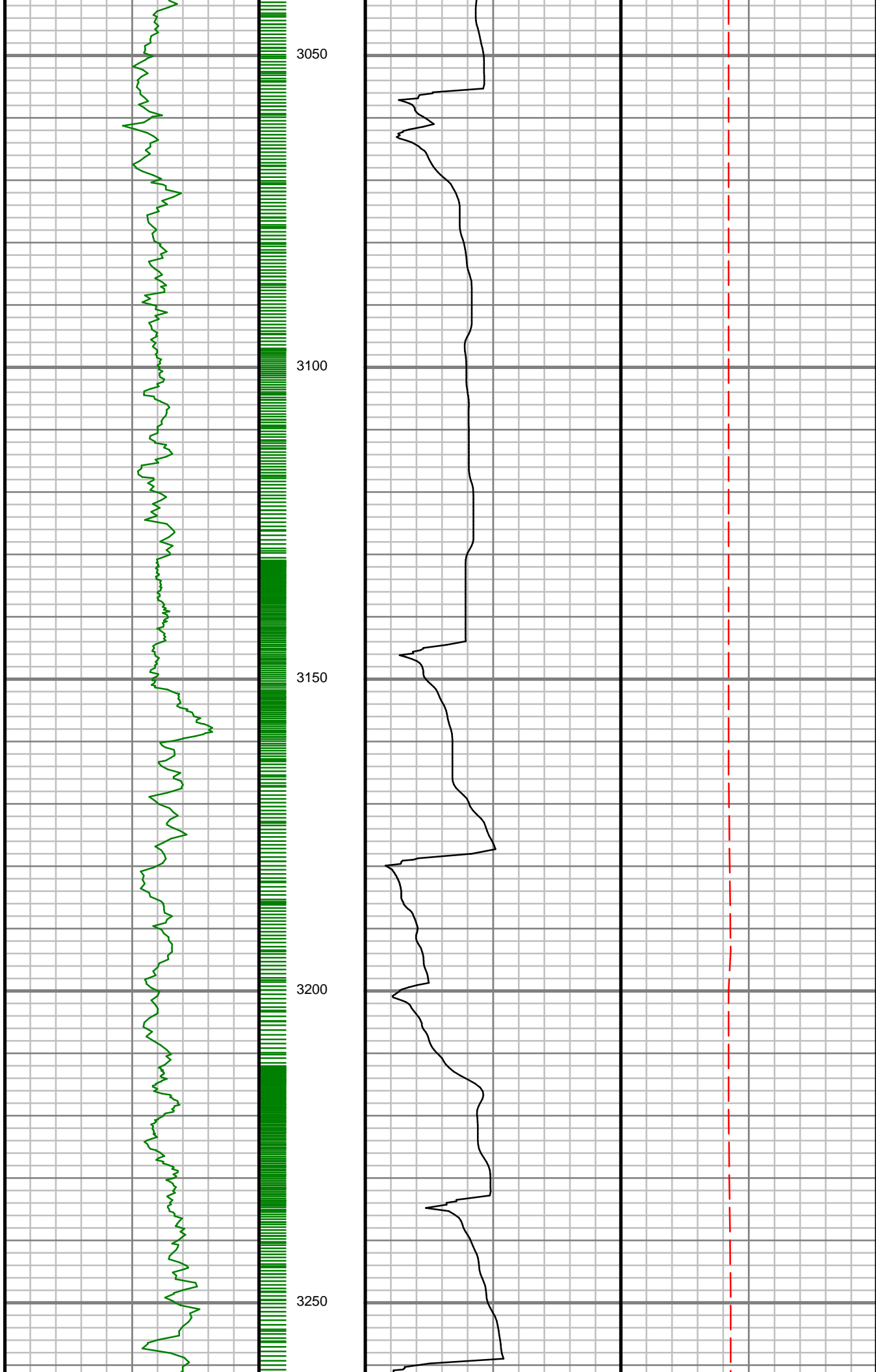
2950

3000



S: 33 MD: 2897.00 ft
Inc: 18.30 deg Az:
114.67 deg TVD:
2805.41 ft

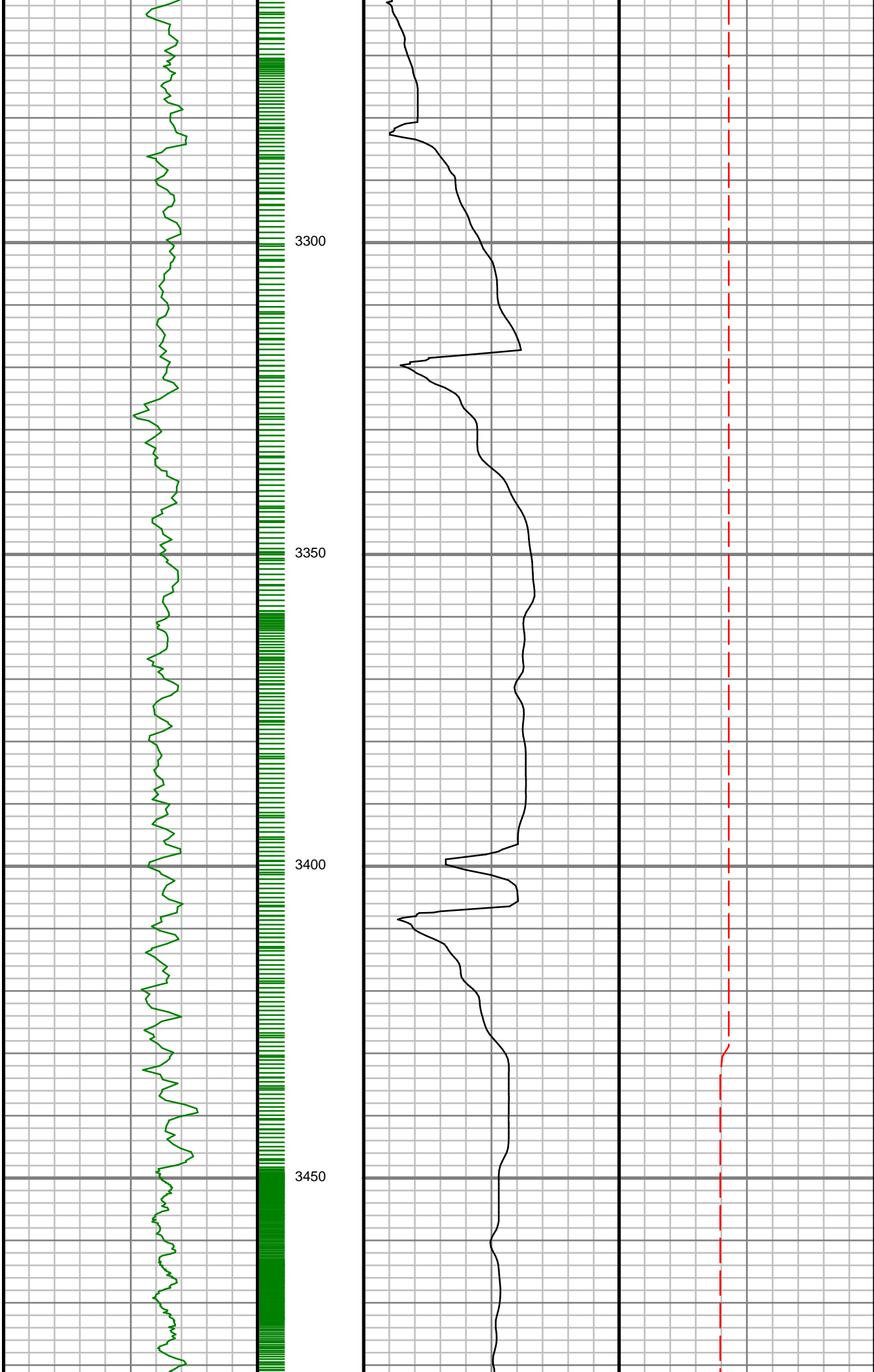
S: 34 MD: 2986.00 ft
Inc: 17.62 deg Az:
114.51 deg TVD:
2890.07 ft



S: 35 MD: 3075.00 ft
Inc: 18.31 deg Az:
111.53 deg TVD:
2974.73 ft

S: 36 MD: 3163.00 ft
Inc: 16.26 deg Az:
110.64 deg TVD:
3058.75 ft

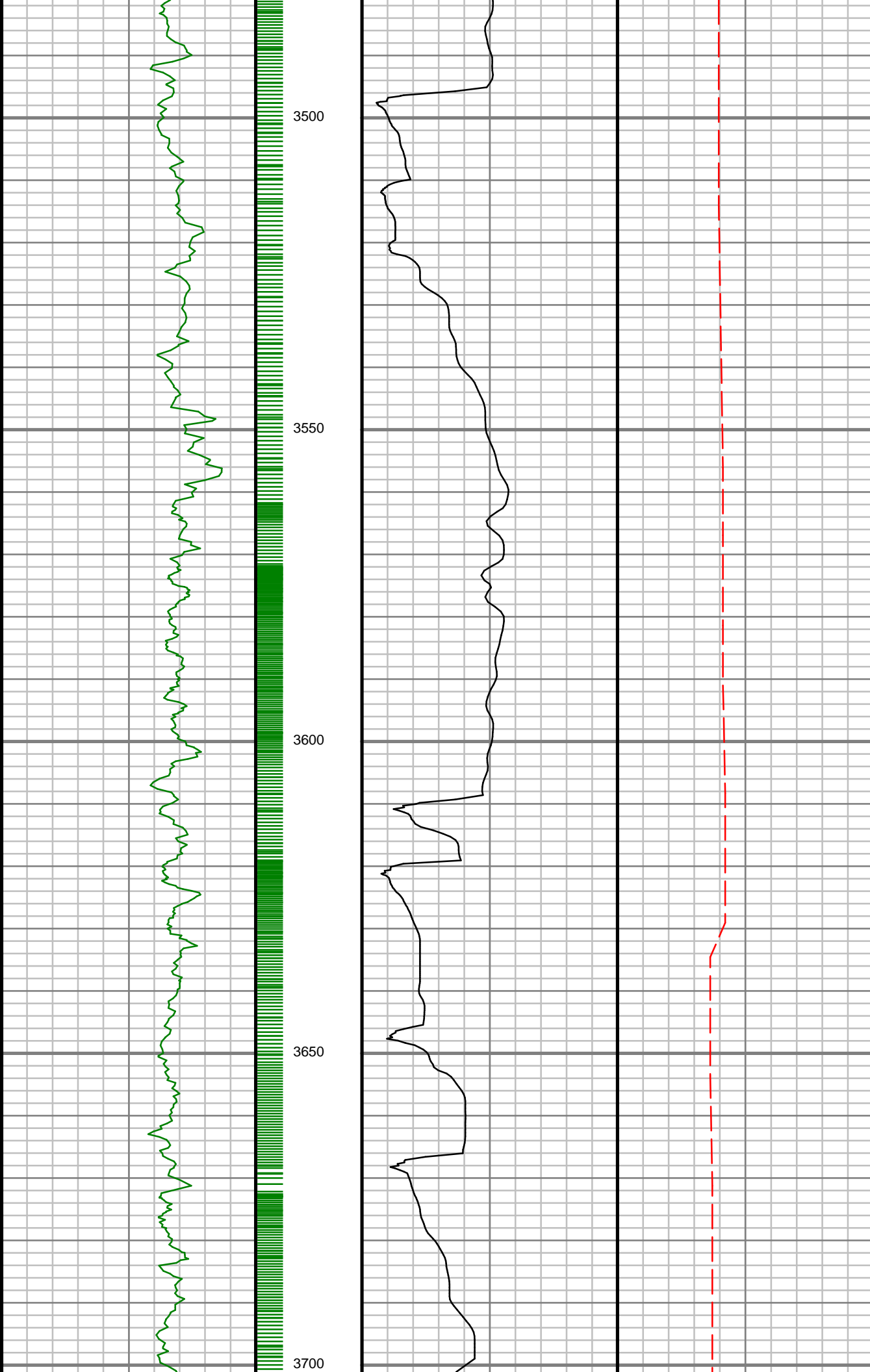
S: 37 MD: 3252.00 ft
Inc: 17.87 deg Az:
107.94 deg TVD:
3143.83 ft



S: 38 MD: 3341.00 ft
Inc: 18.14 deg Az:
106.60 deg TVD:
3228.48 ft

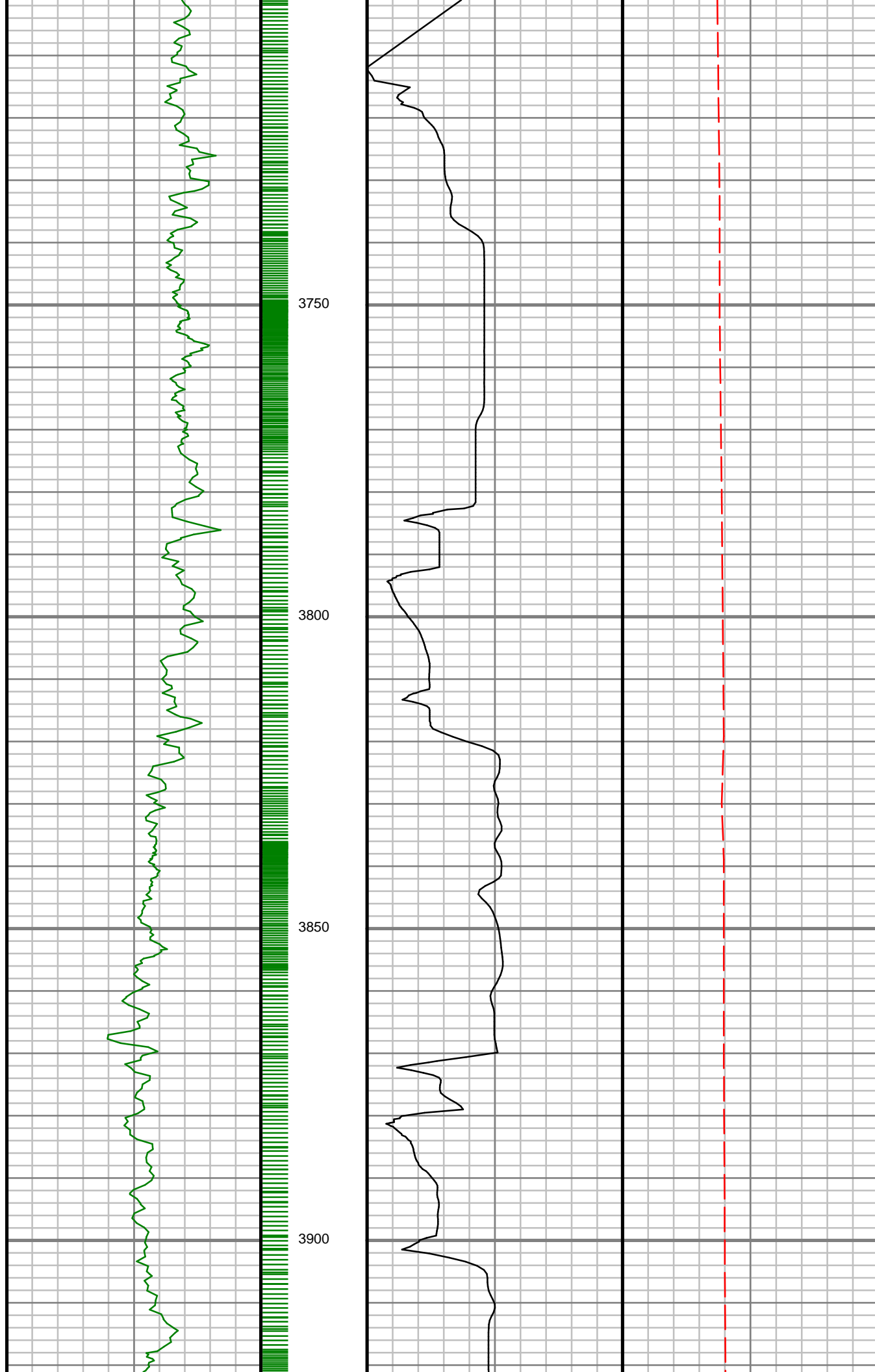
S: 39 MD: 3429.00 ft
Inc: 15.46 deg Az:
106.61 deg TVD:
3312.71 ft

S: 40 MD: 3455.00 ft
Inc: 15.04 deg Az:
105.69 deg TVD:
3337.80 ft



S: 41 MD: 3544.00 ft
Inc: 16.08 deg Az:
108.90 deg TVD:
3423.54 ft

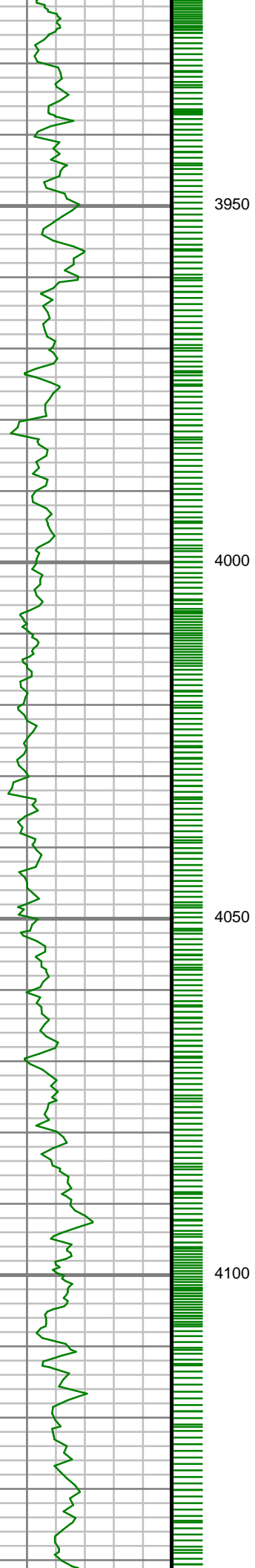
S: 42 MD: 3633.00 ft
Inc: 16.36 deg Az:
110.07 deg TVD:
3508.99 ft



S: 43 MD: 3720.00 ft
Inc: 17.69 deg Az:
114.23 deg TVD:
3592.18 ft

S: 44 MD: 3809.00 ft
Inc: 18.25 deg Az:
115.79 deg TVD:
3676.84 ft

S: 45 MD: 3897.00 ft
Inc: 21.22 deg Az:
116.66 deg TVD:
3759.66 ft

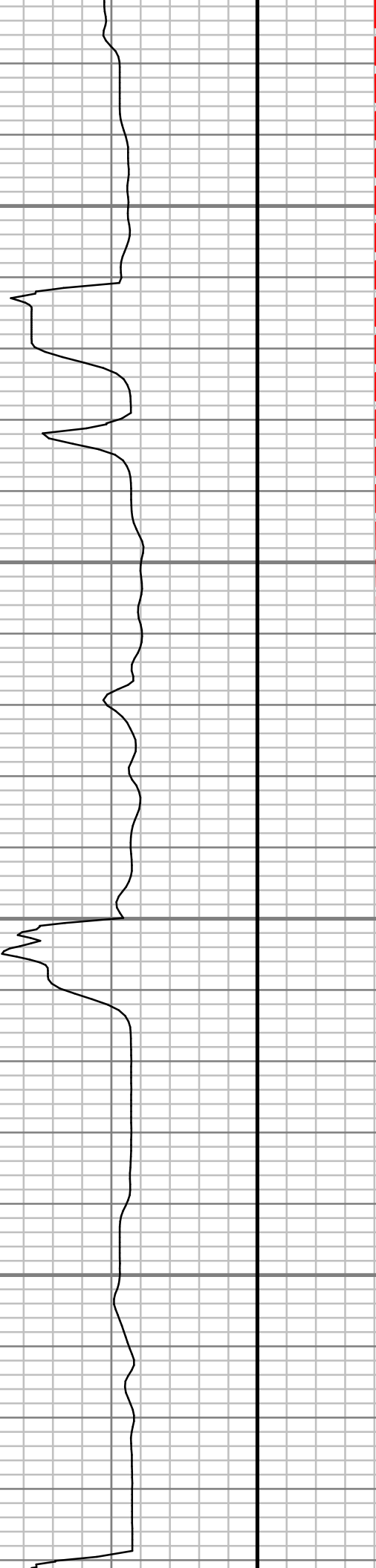


3950

4000

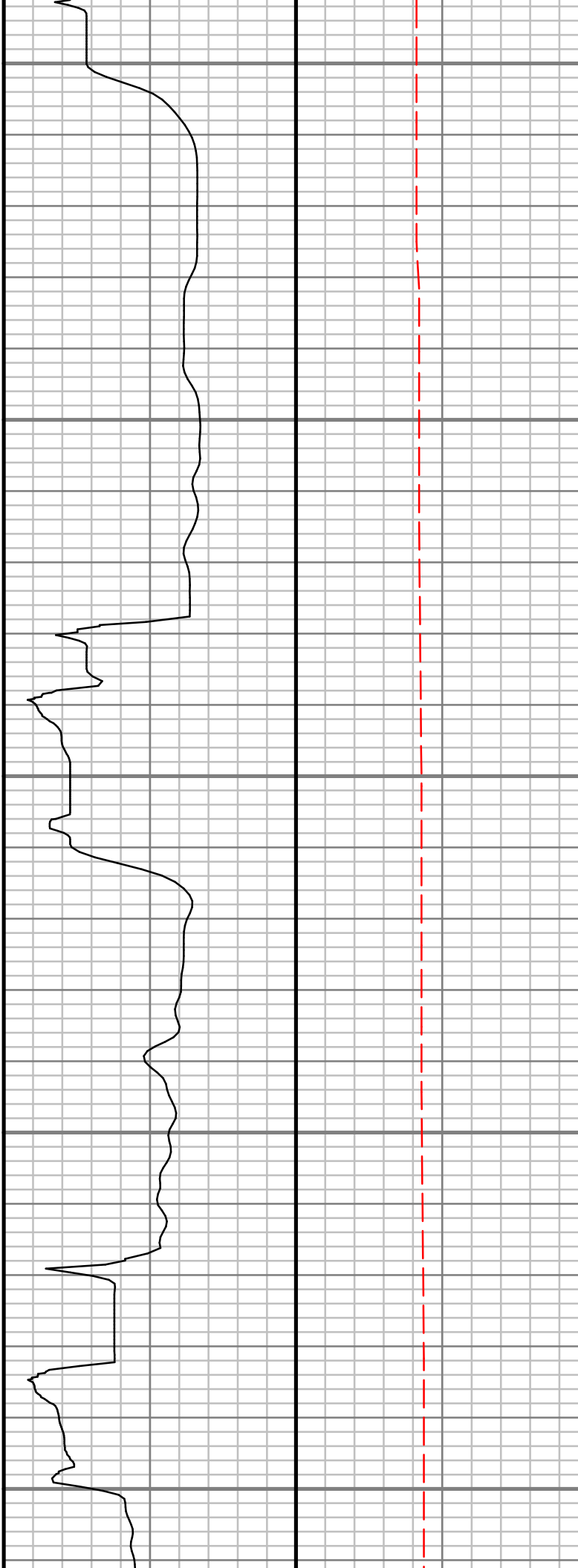
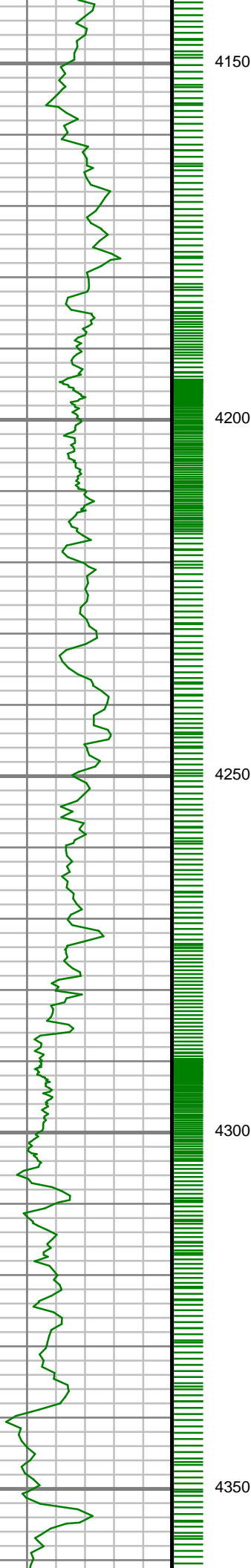
4050

4100



S: 46 MD: 3986.00 ft
Inc: 20.63 deg Az:
117.54 deg TVD:
3842.80 ft

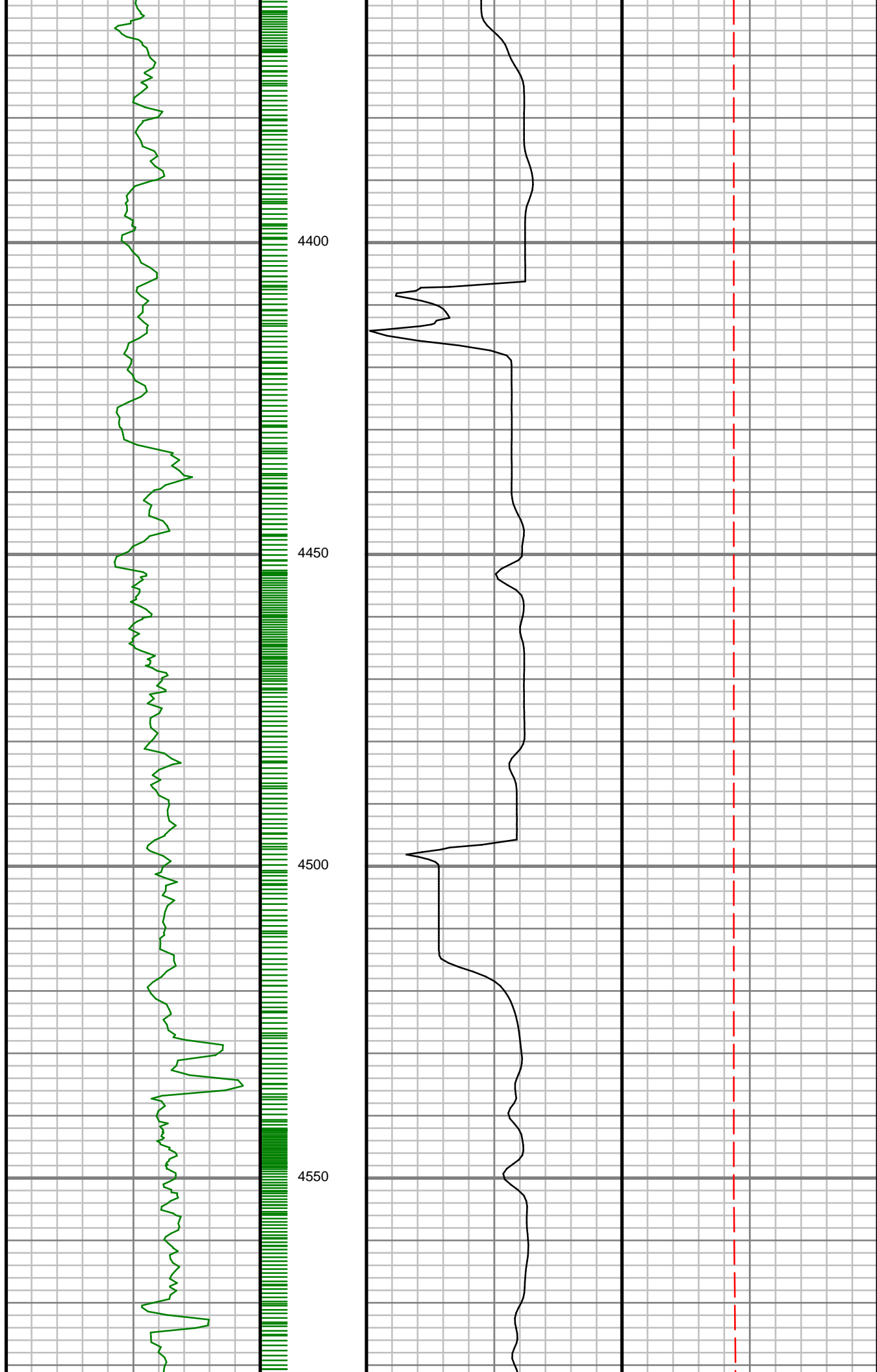
S: 47 MD: 4075.00 ft
Inc: 19.81 deg Az:
118.64 deg TVD:
3926.31 ft



S: 48 MD: 4164.00 ft
Inc: 17.66 deg Az:
117.00 deg TVD:
4010.59 ft

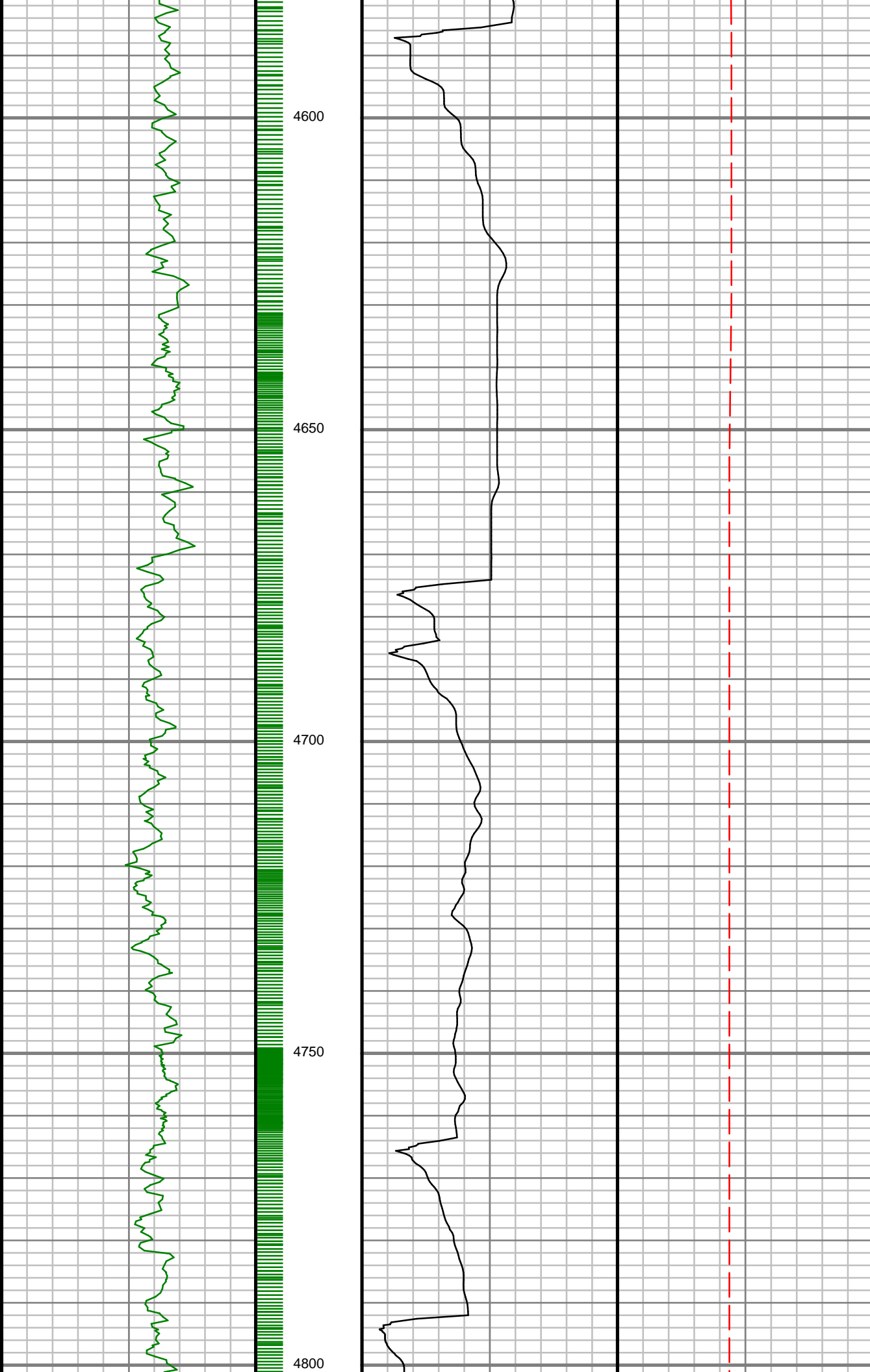
S: 49 MD: 4253.00 ft
Inc: 18.21 deg Az:
111.54 deg TVD:
4095.27 ft

S: 50 MD: 4342.00 ft
Inc: 18.78 deg Az:
109.83 deg TVD:
4179.68 ft



S: 51 MD: 4431.00 ft
Inc: 18.34 deg Az:
110.78 deg TVD:
4264.05 ft

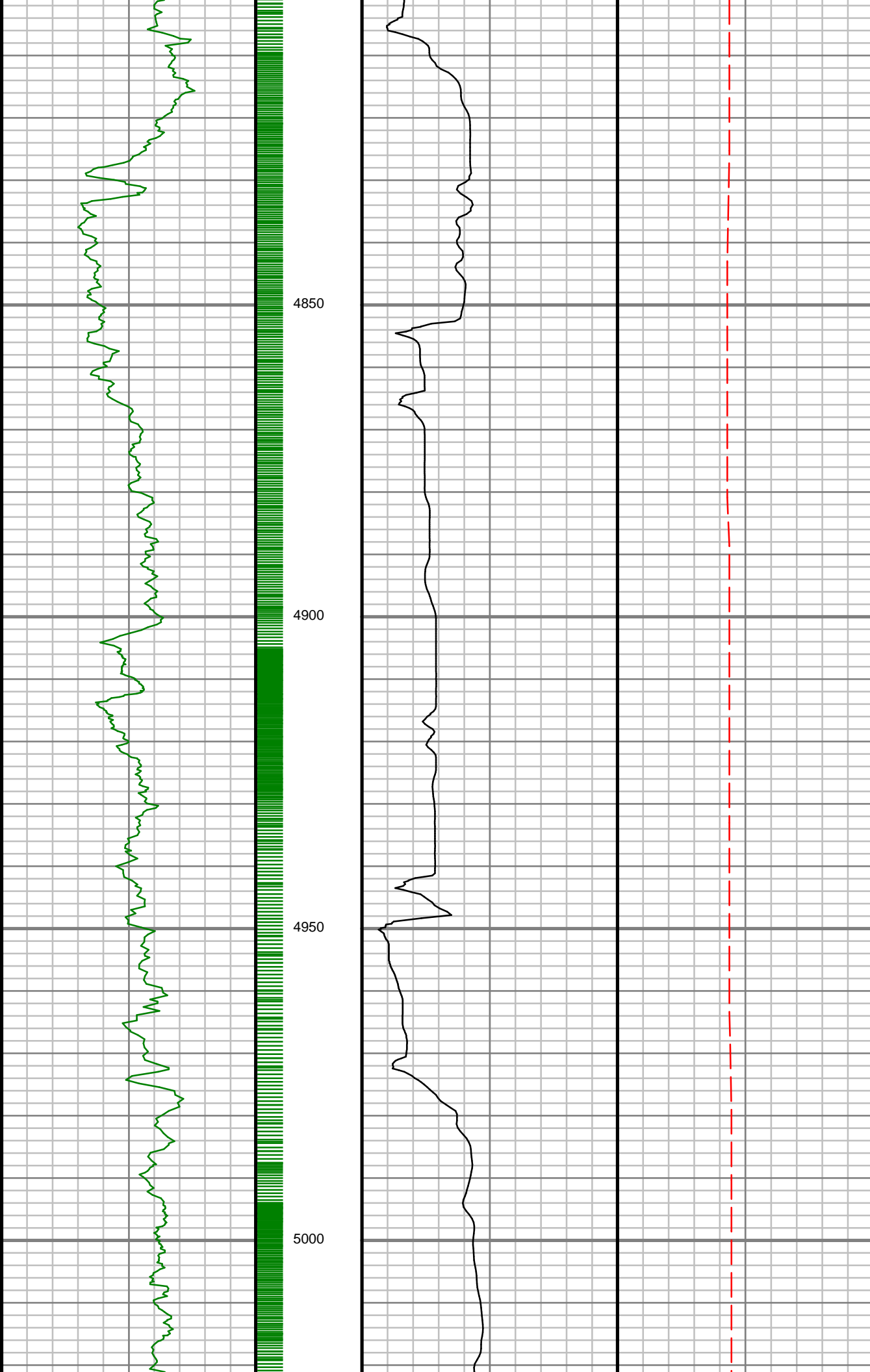
S: 52 MD: 4520.00 ft
Inc: 17.47 deg Az:
111.33 deg TVD:
4348.74 ft



S: 53 MD: 4609.00 ft
Inc: 15.77 deg Az:
111.32 deg TVD:
4434.02 ft

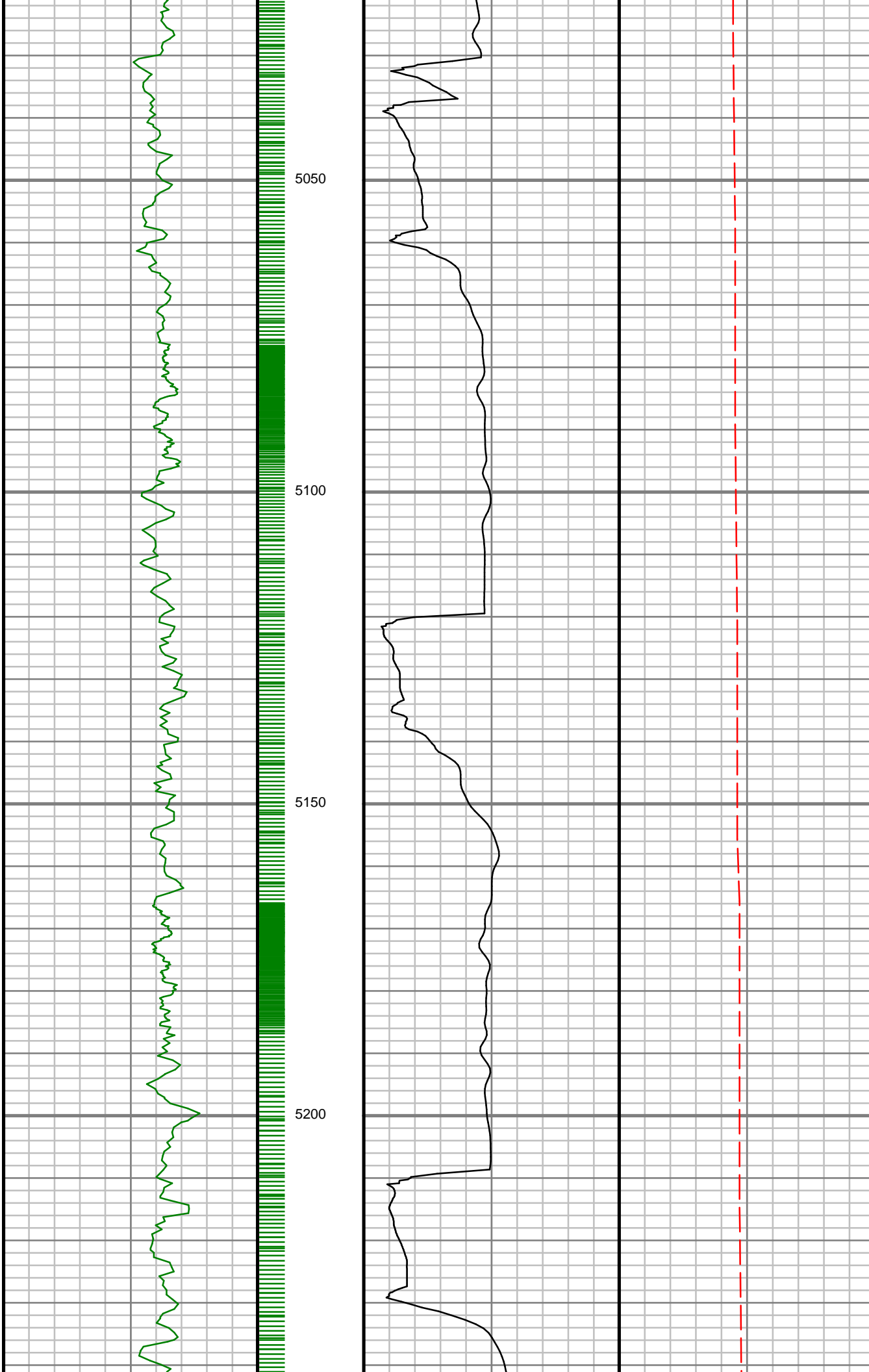
S: 54 MD: 4698.00 ft
Inc: 13.96 deg Az:
112.53 deg TVD:
4520.03 ft

S: 55 MD: 4787.00 ft
Inc: 12.77 deg Az:
114.78 deg TVD:
4606.62 ft



S: 56 MD: 4876.00 ft
Inc: 11.61 deg Az:
116.15 deg TVD:
4693.61 ft

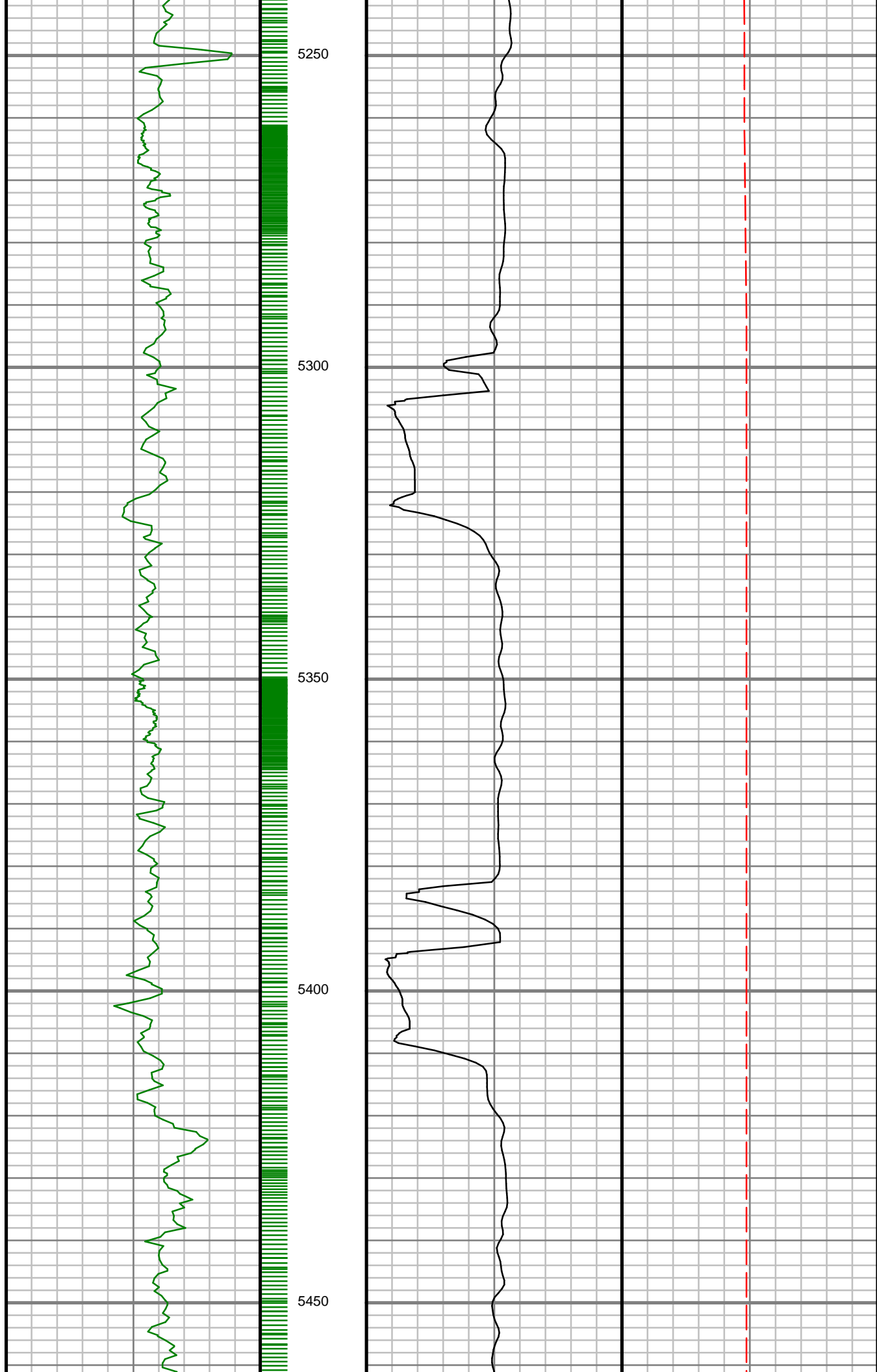
S: 57 MD: 4965.00 ft
Inc: 9.32 deg Az:
127.24 deg TVD:
4781.13 ft

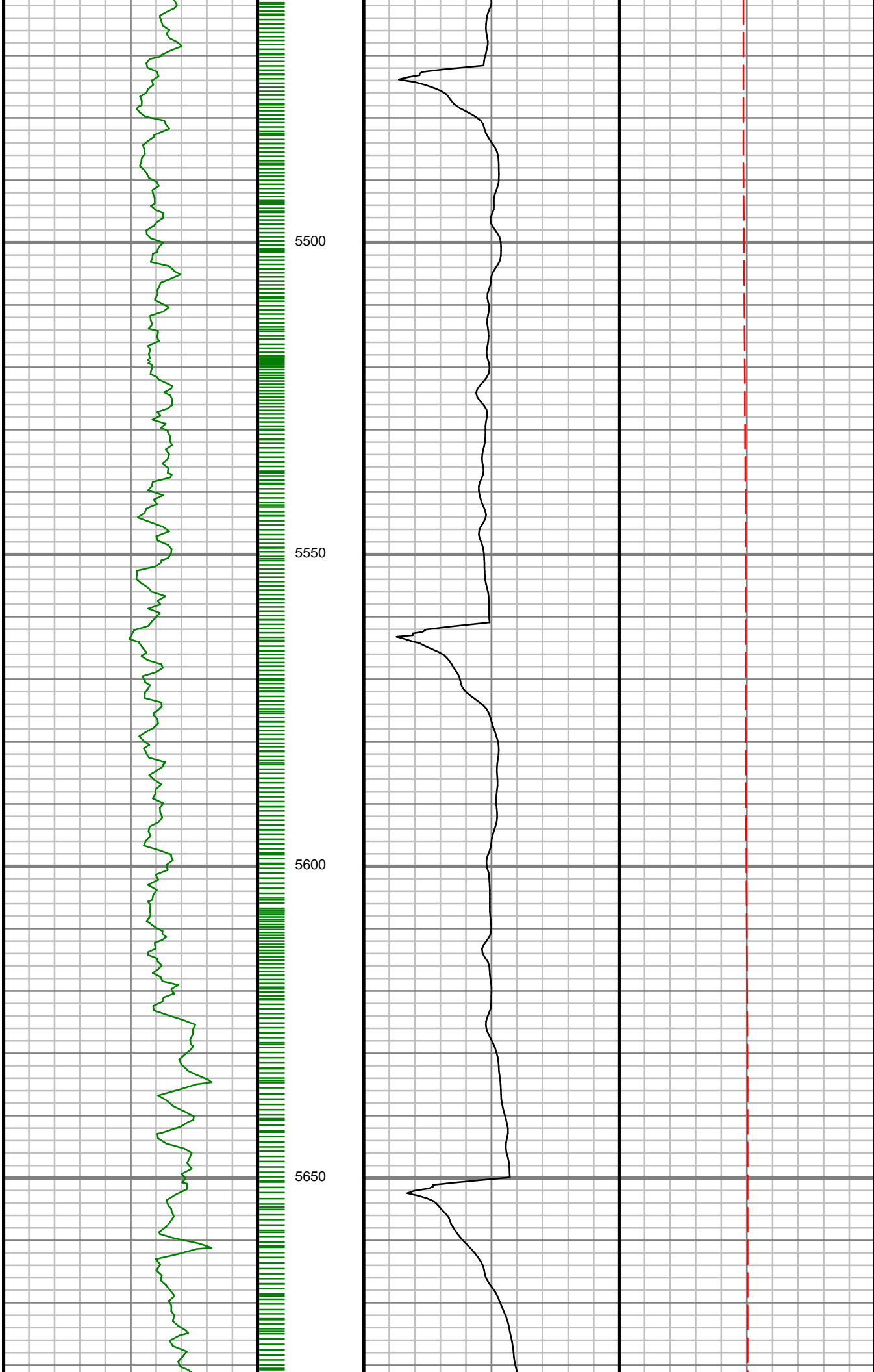


S: 58 MD: 5054.00 ft
Inc: 5.43 deg Az:
139.18 deg TVD:
4869.39 ft

S: 59 MD: 5143.00 ft
Inc: 3.03 deg Az:
136.97 deg TVD:
4958.14 ft

S: 60 MD: 5232.00 ft
Inc: 0.53 deg Az:
226.45 deg TVD:
5047.09 ft

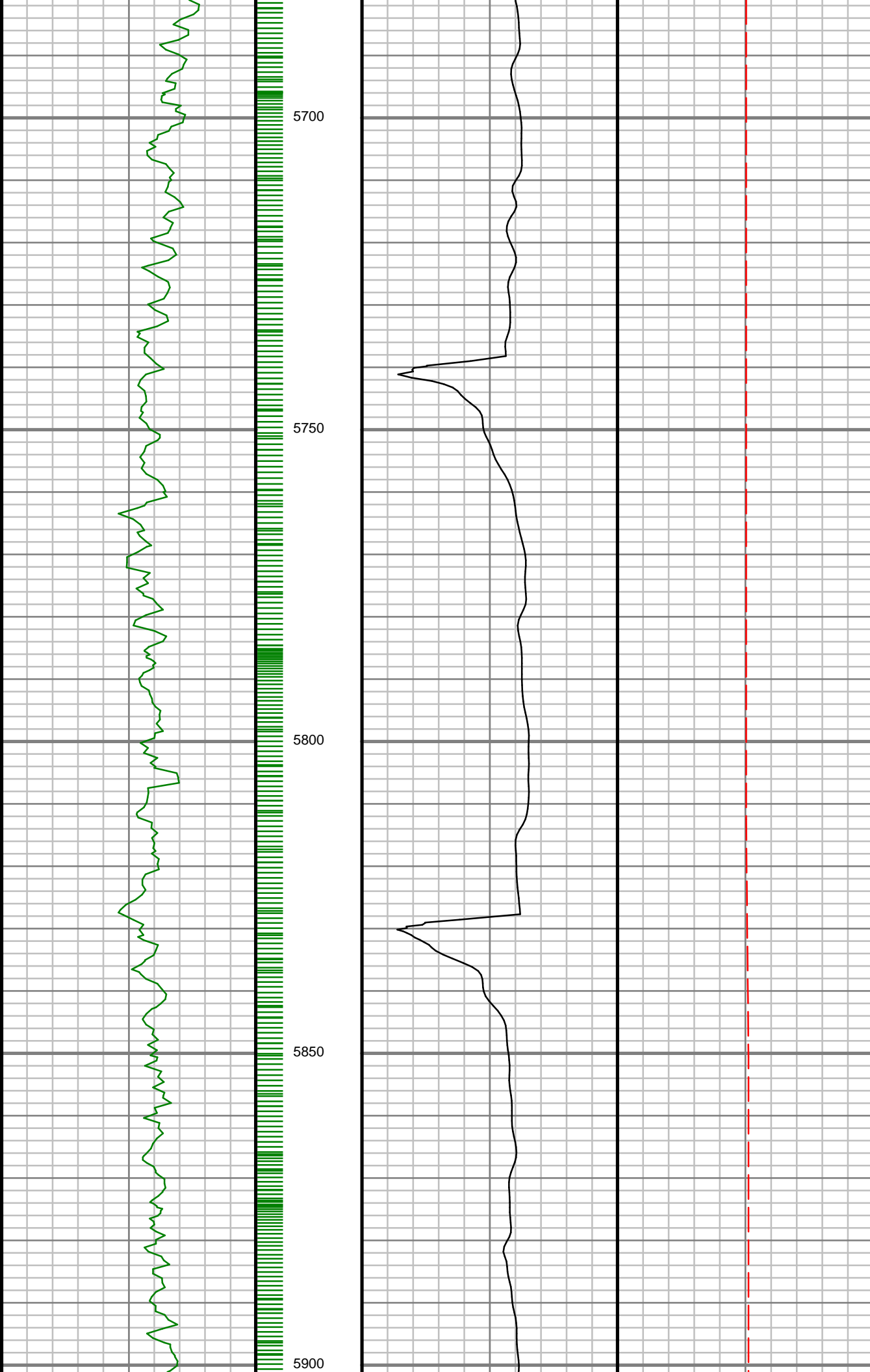




S: 63 MD: 5498.00 ft
Inc: 2.56 deg Az:
348.25 deg TVD:
5312.92 ft

S: 64 MD: 5587.00 ft
Inc: 1.89 deg Az:
354.60 deg TVD:
5401.86 ft

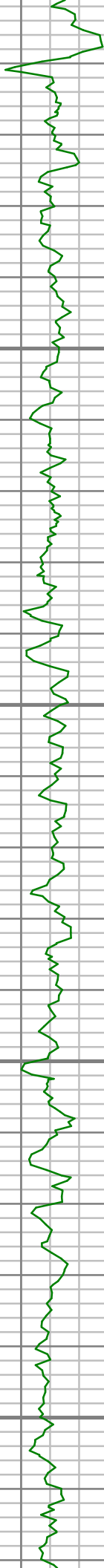
S: 65 MD: 5676.00 ft
Inc: 1.43 deg Az:



358.14 deg TVD:
5490.82 ft

S: 66 MD: 5765.00 ft
Inc: 0.72 deg Az:
355.96 deg TVD:
5579.80 ft

S: 67 MD: 5853.00 ft
Inc: 0.68 deg Az:
320.61 deg TVD:
5667.80 ft

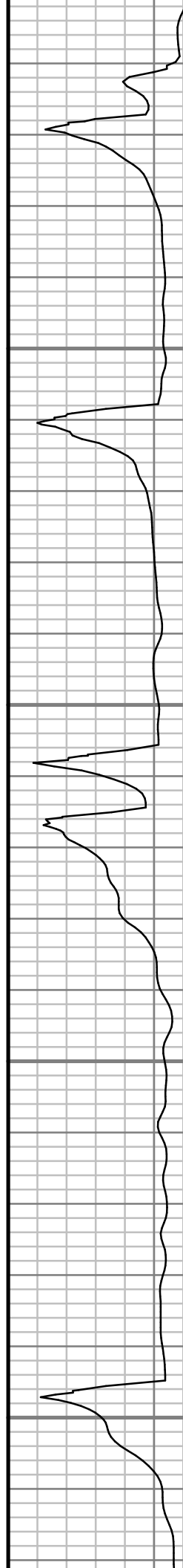


5950

6000

6050

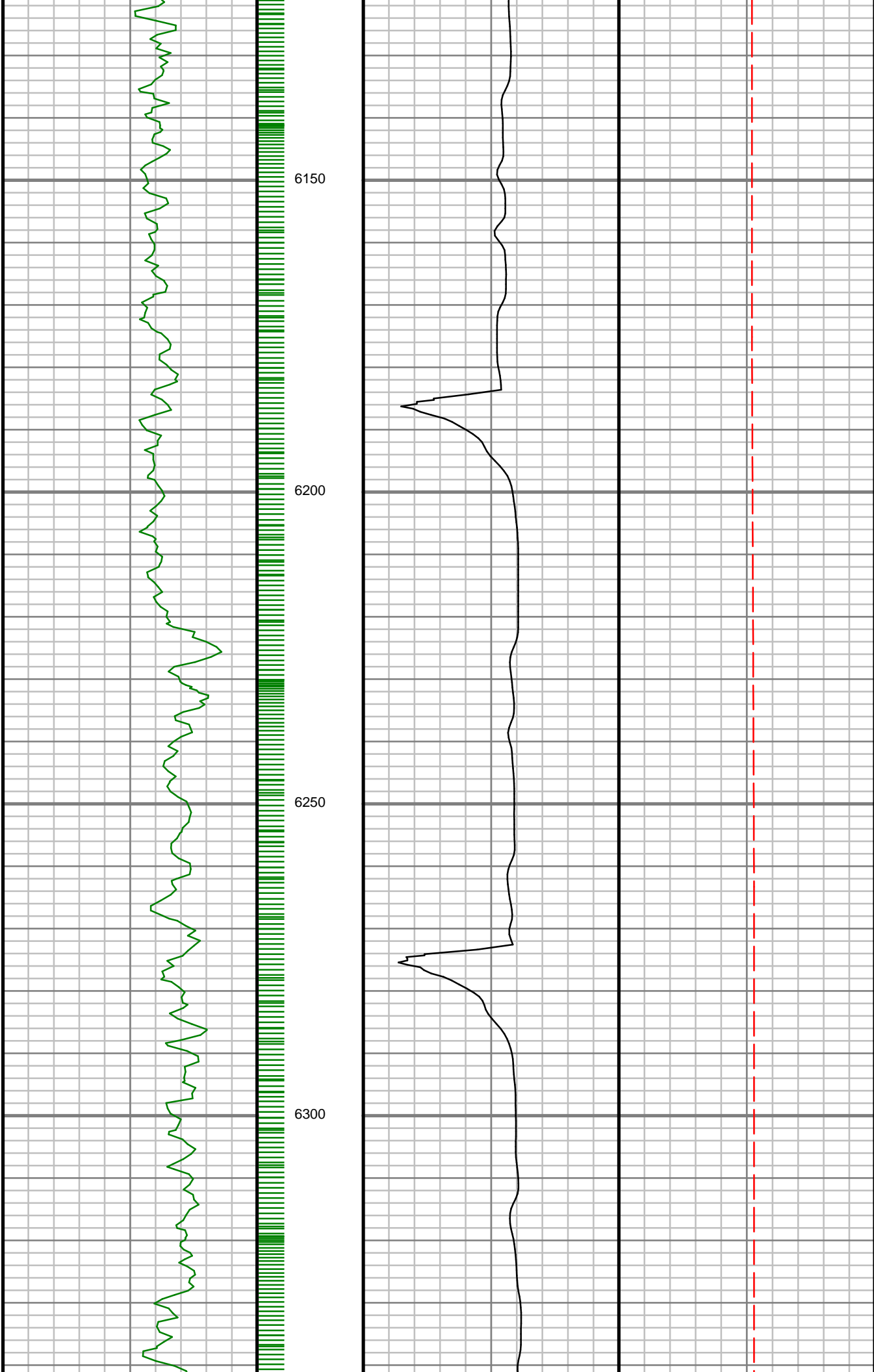
6100



S: 68 MD: 5942.00 ft
Inc: 0.76 deg Az:
264.94 deg TVD:
5756.79 ft

S: 69 MD: 6031.00 ft
Inc: 0.42 deg Az:
270.81 deg TVD:
5845.78 ft

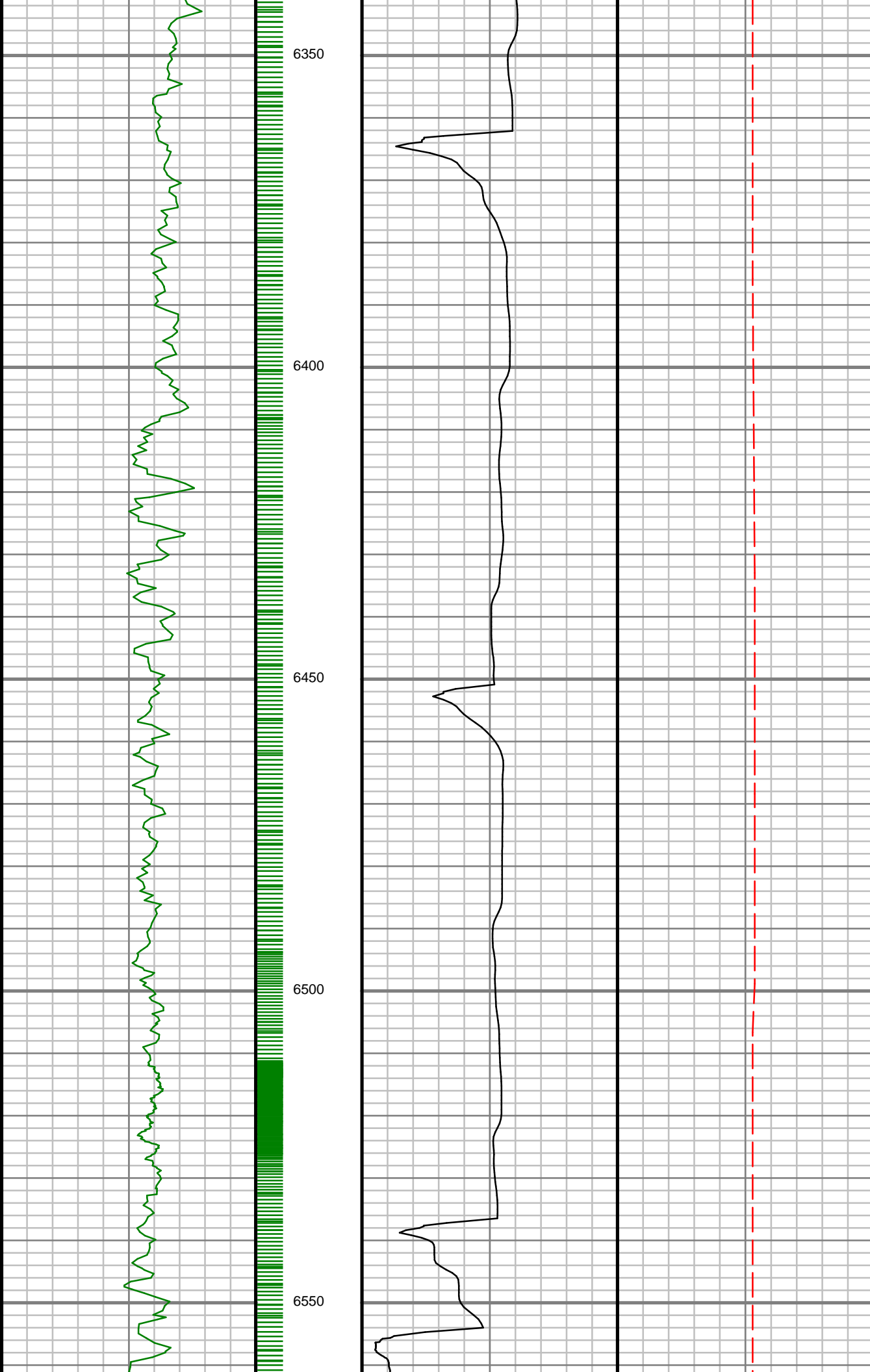
S: 70 MD: 6119.00 ft



Inc: 0.81 deg Az:
241.81 deg TVD:
5933.78 ft

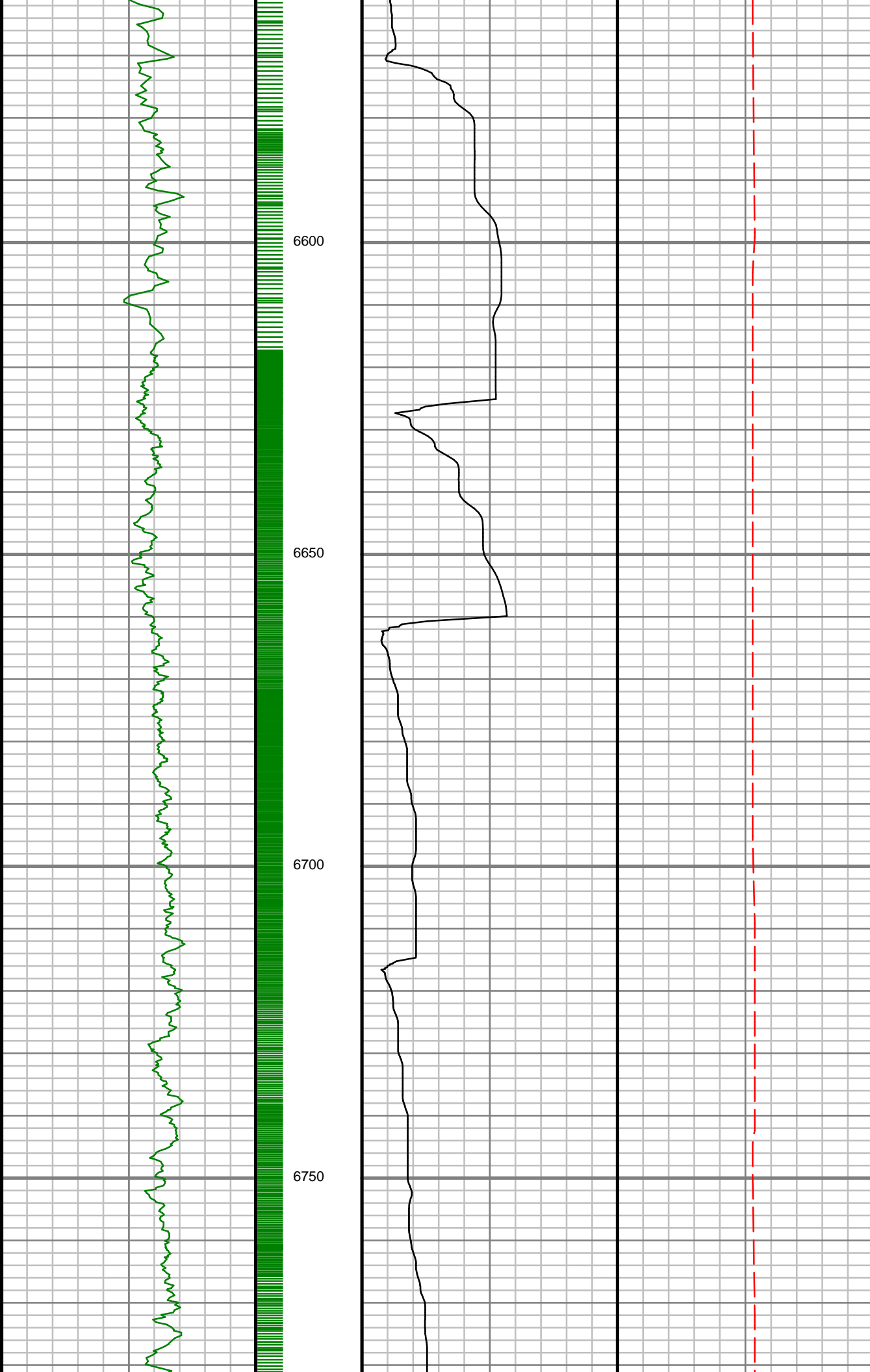
S: 71 MD: 6208.00 ft
Inc: 1.33 deg Az:
250.74 deg TVD:
6022.76 ft

S: 72 MD: 6297.00 ft
Inc: 1.09 deg Az:
233.34 deg TVD:
6111.74 ft



S: 73 MD: 6385.00 ft
Inc: 1.22 deg Az:
232.02 deg TVD:
6199.73 ft

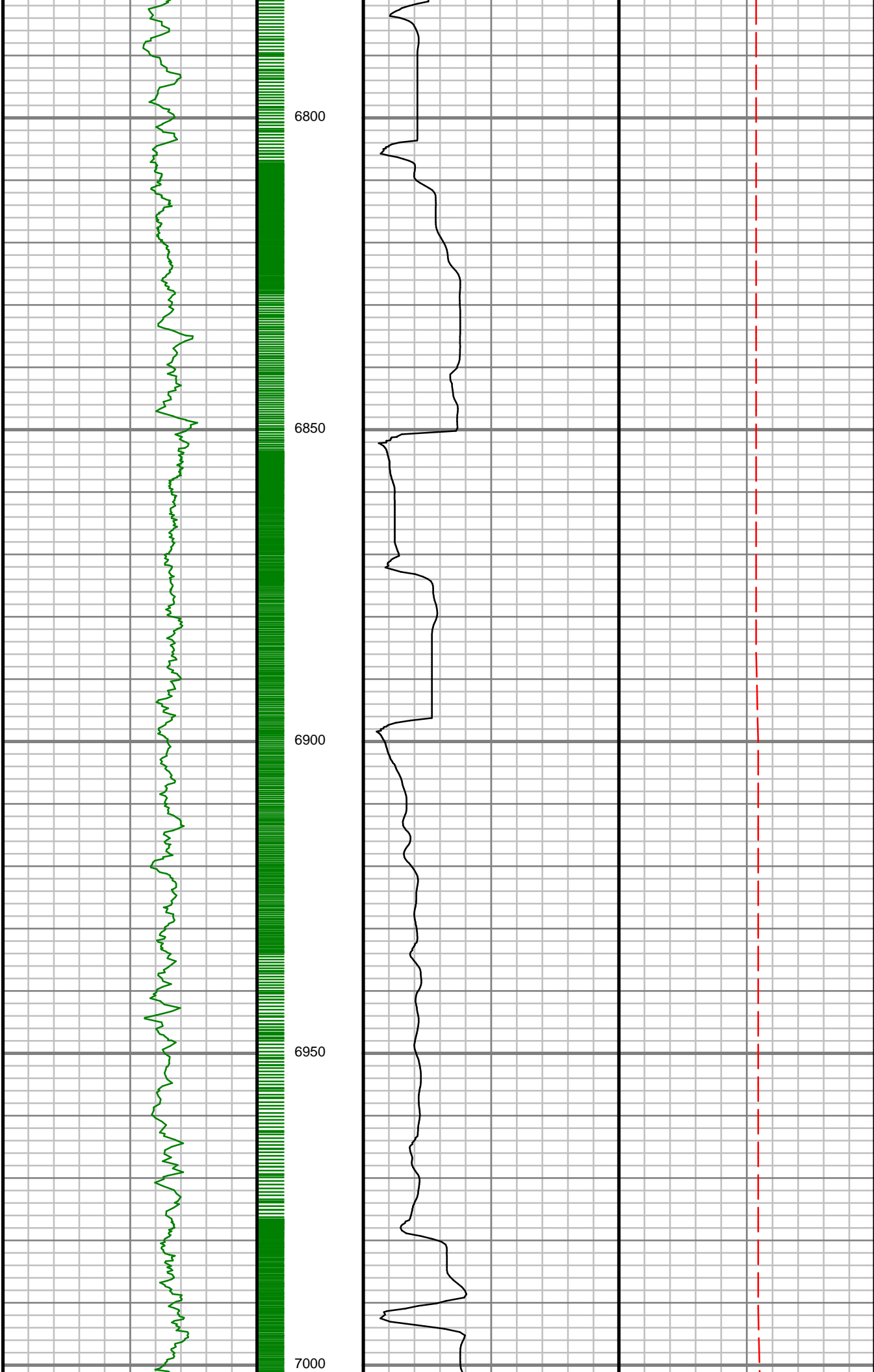
S: 74 MD: 6474.00 ft
Inc: 1.42 deg Az:
242.88 deg TVD:
6288.70 ft



S: 75 MD: 6562.00 ft
Inc: 0.36 deg Az:
164.91 deg TVD:
6376.69 ft

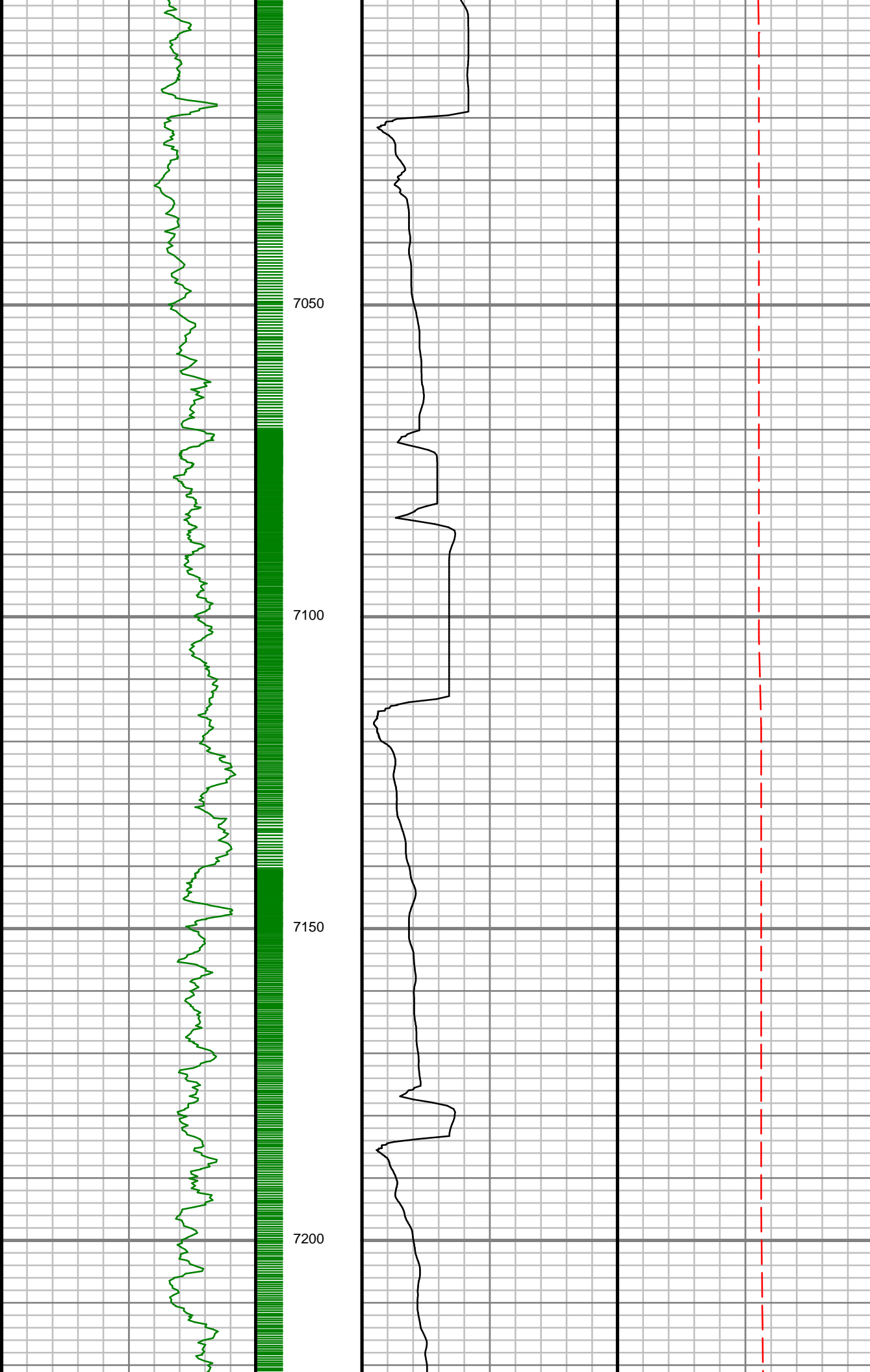
S: 76 MD: 6651.00 ft
Inc: 0.31 deg Az:
204.43 deg TVD:
6465.69 ft

S: 77 MD: 6740.00 ft
Inc: 11.69 deg Az:
282.39 deg TVD:
6554.07 ft



S: 78 MD: 6833.00 ft
Inc: 15.45 deg Az:
283.68 deg TVD:
6644.46 ft

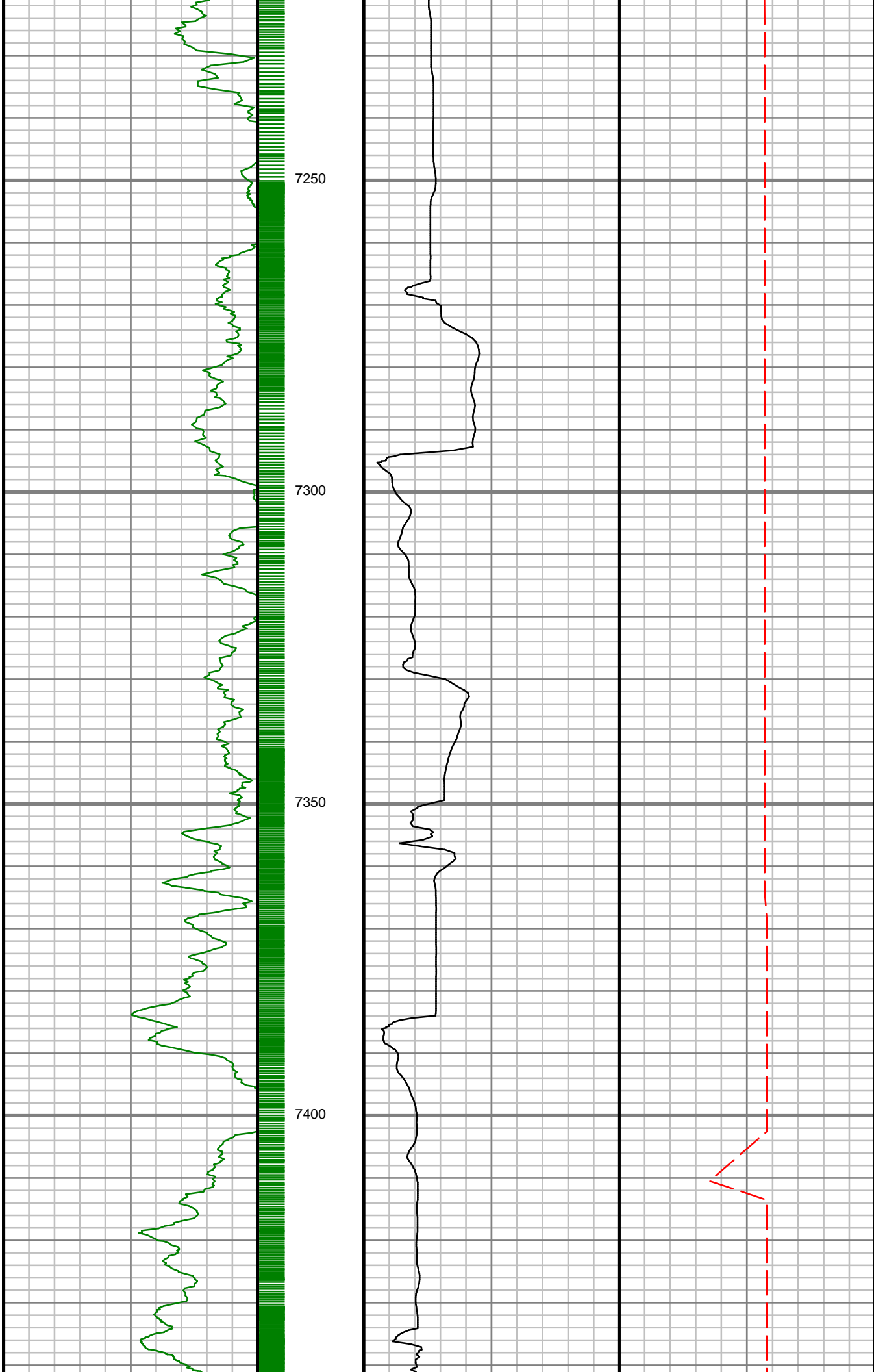
S: 79 MD: 6925.00 ft
Inc: 20.32 deg Az:
270.67 deg TVD:
6732.02 ft



S: 80 MD: 7018.00 ft
Inc: 25.58 deg Az:
263.72 deg TVD:
6817.64 ft

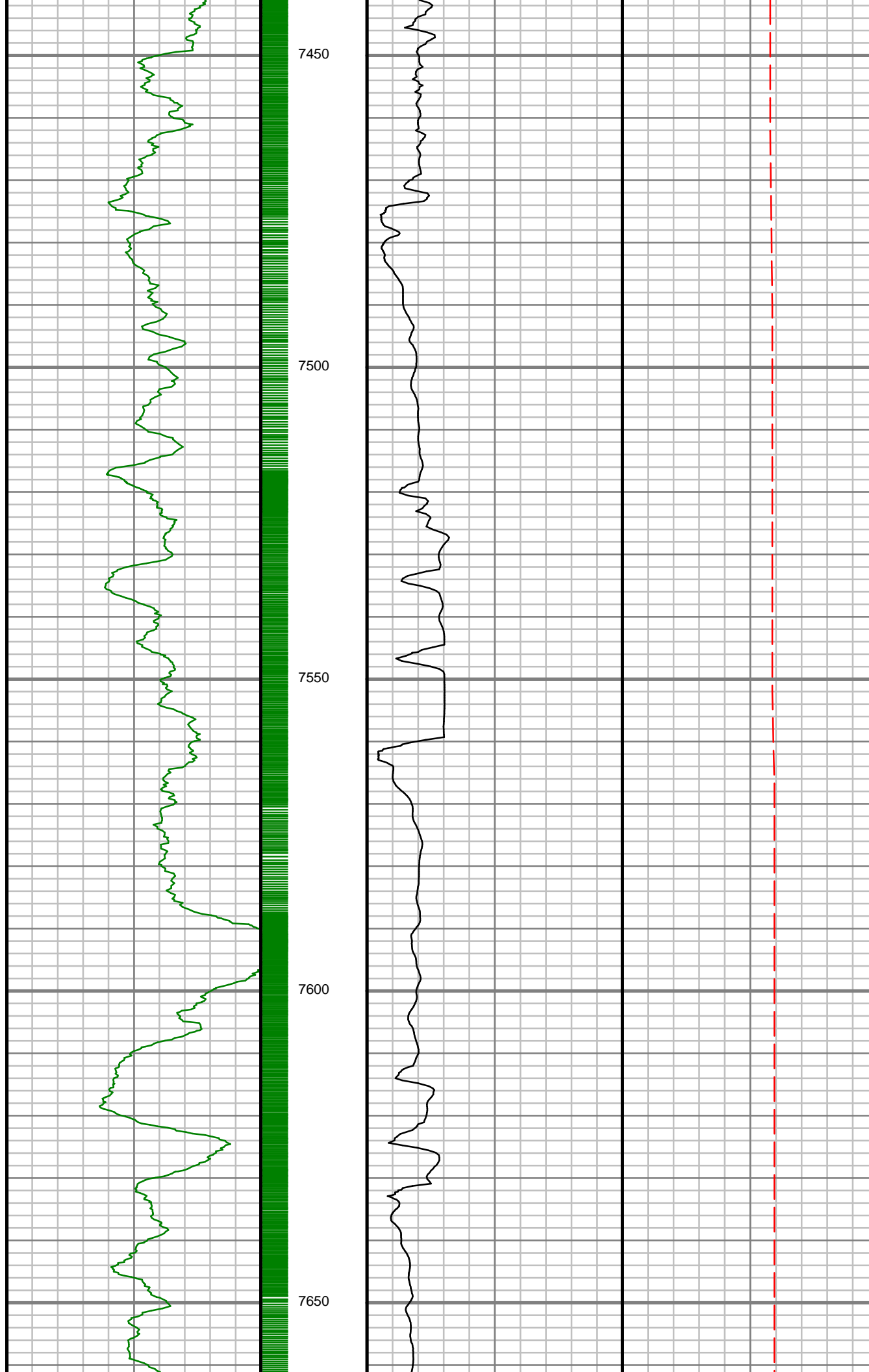
S: 81 MD: 7110.00 ft
Inc: 30.86 deg Az:
265.52 deg TVD:
6898.68 ft

S: 82 MD: 7203.00 ft
Inc: 40.74 deg Az:
268.20 deg TVD:
6974.02 ft



S: 83 MD: 7292.00 ft
Inc: 50.11 deg Az:
269.67 deg TVD:
7036.42 ft

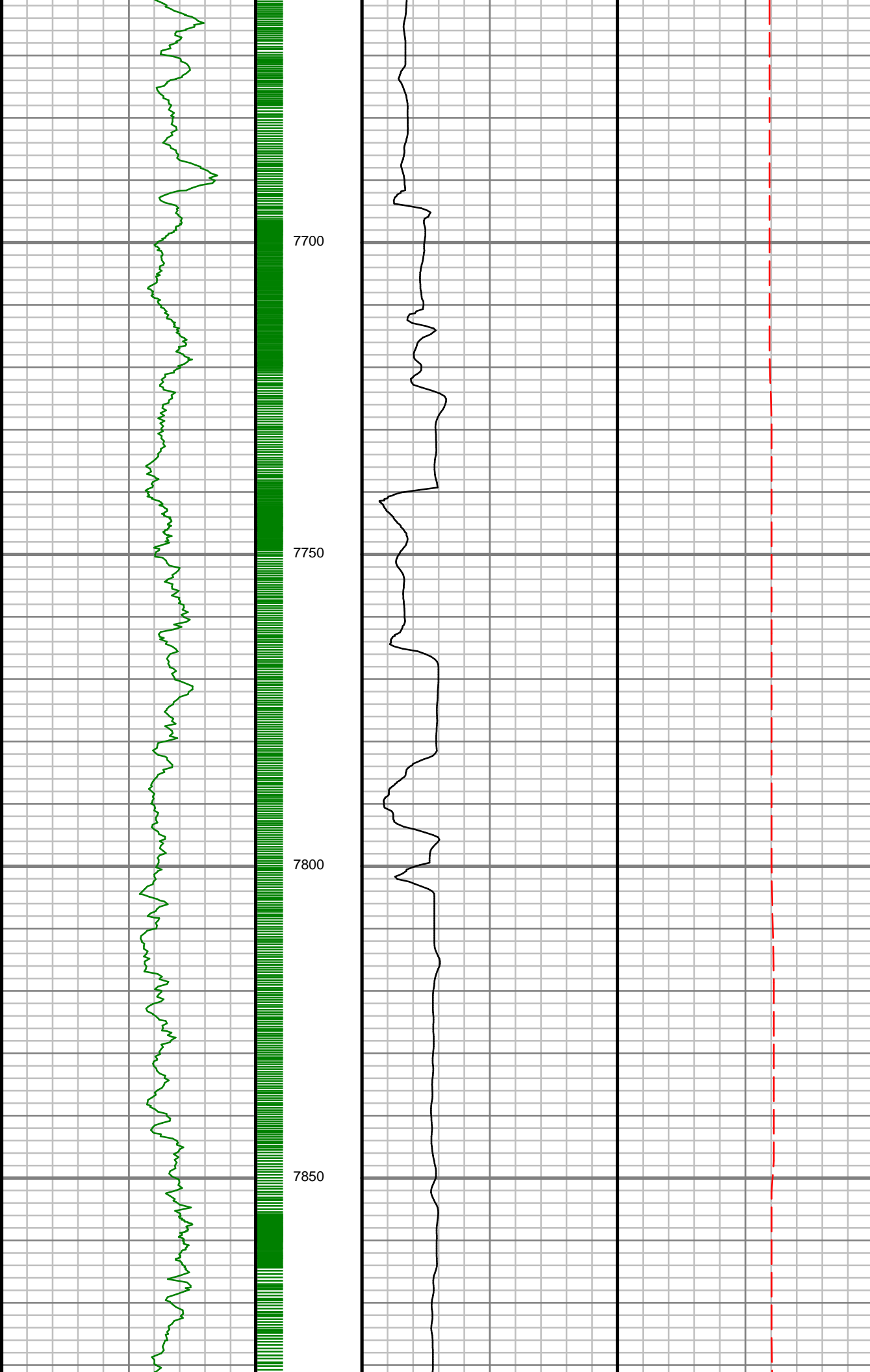
S: 84 MD: 7381.00 ft
Inc: 54.13 deg Az:
267.90 deg TVD:
7091.06 ft



S: 85 MD: 7470.00 ft
Inc: 62.30 deg Az:
266.46 deg TVD:
7137.90 ft

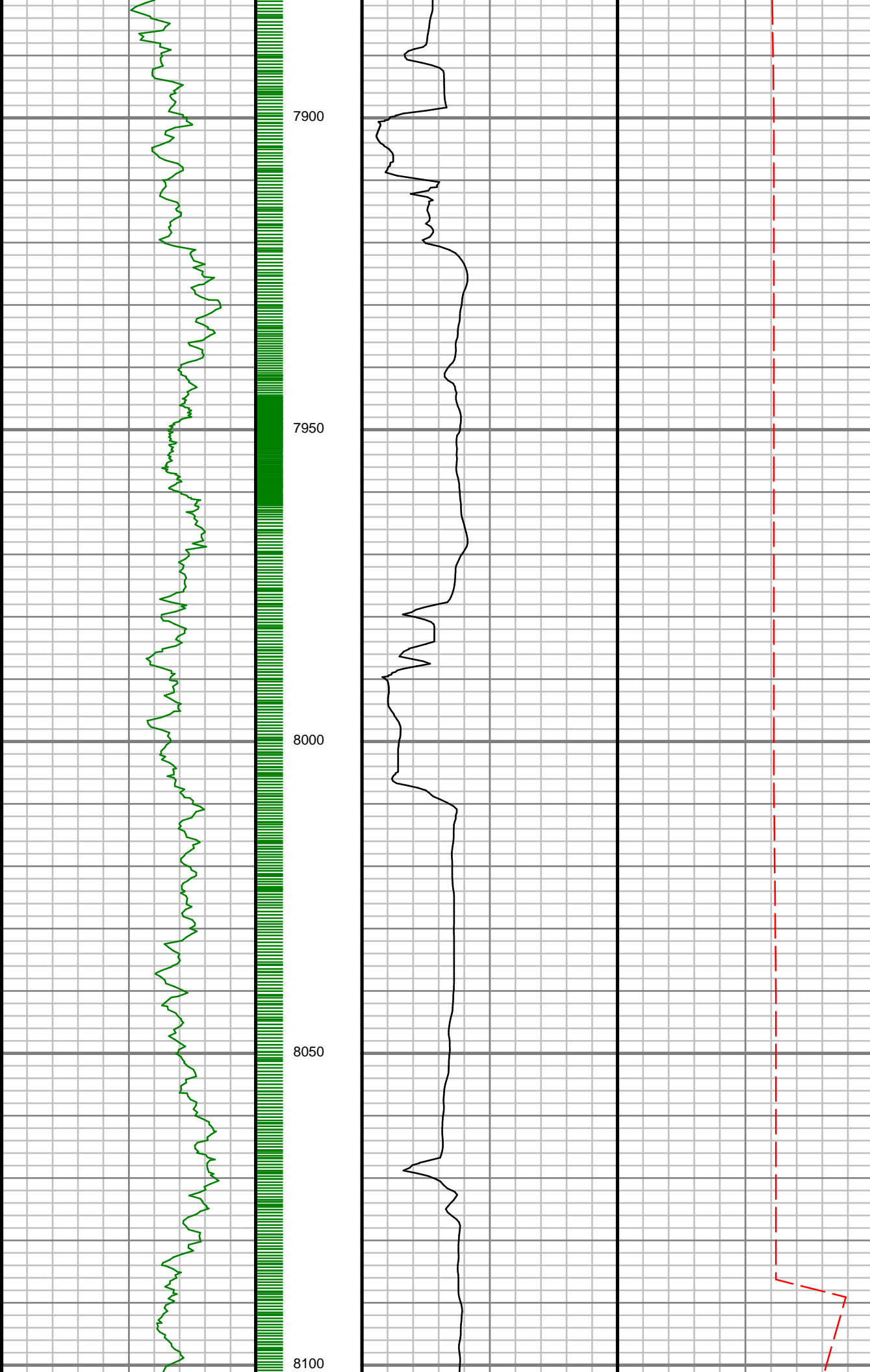
S: 86 MD: 7559.00 ft
Inc: 68.63 deg Az:
266.49 deg TVD:
7174.83 ft

S: 87 MD: 7647.00 ft
Inc: 79.69 deg Az:
269.75 deg TVD:
7198.82 ft



S: 88 MD: 7736.00 ft
Inc: 87.54 deg Az:
271.45 deg TVD:
7208.71 ft

S: 89 MD: 7825.00 ft
Inc: 91.34 deg Az:
270.13 deg TVD:
7209.58 ft



7900

7950

8000

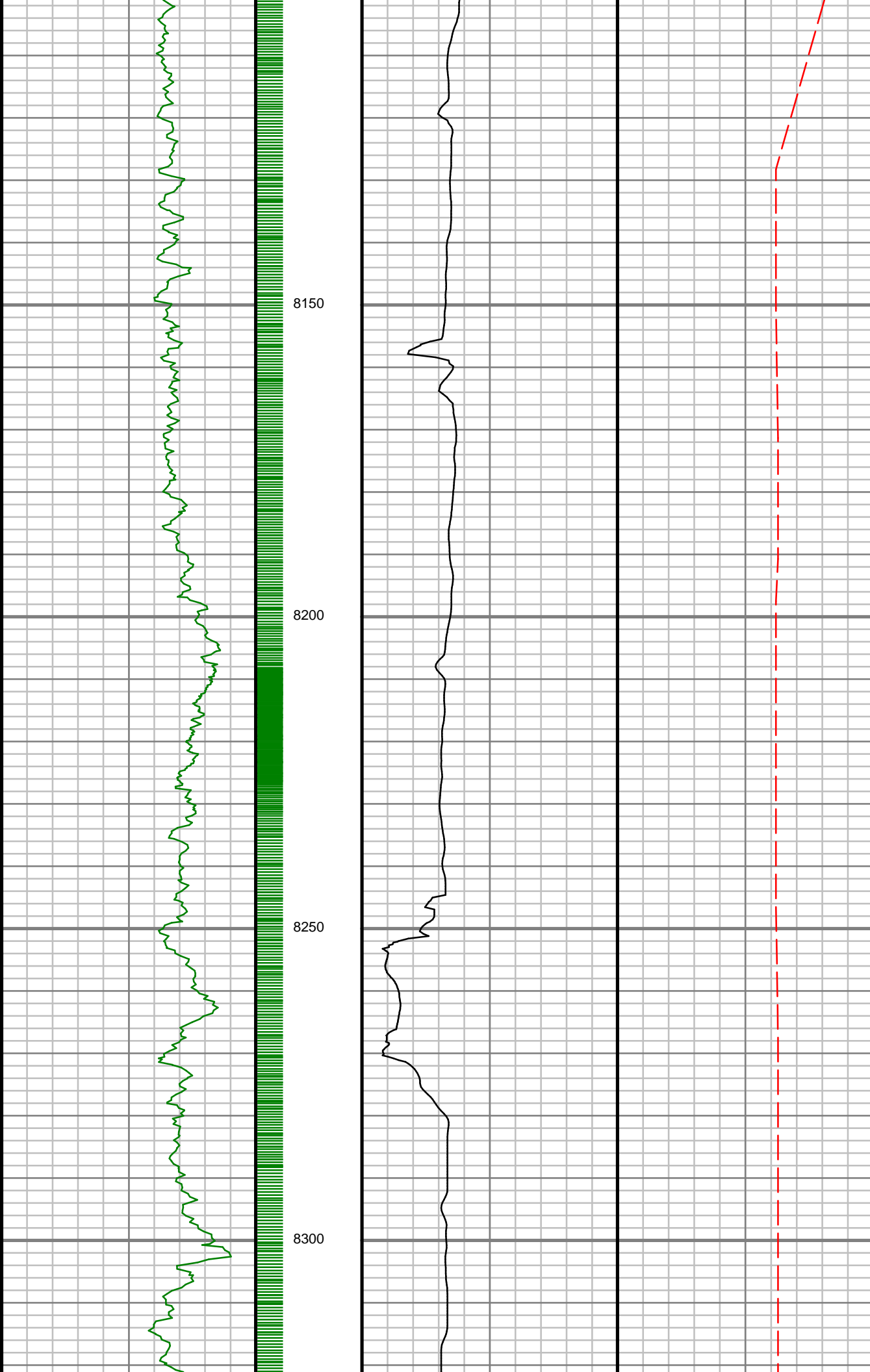
8050

8100

S: 90 MD: 7913.00 ft
Inc: 91.38 deg Az:
271.14 deg TVD:
7207.49 ft

S: 91 MD: 8002.00 ft
Inc: 89.19 deg Az:
272.06 deg TVD:
7207.04 ft

S: 92 MD: 8090.00 ft
Inc: 89.43 deg Az:
273.01 deg TVD:
7208.10 ft



8150

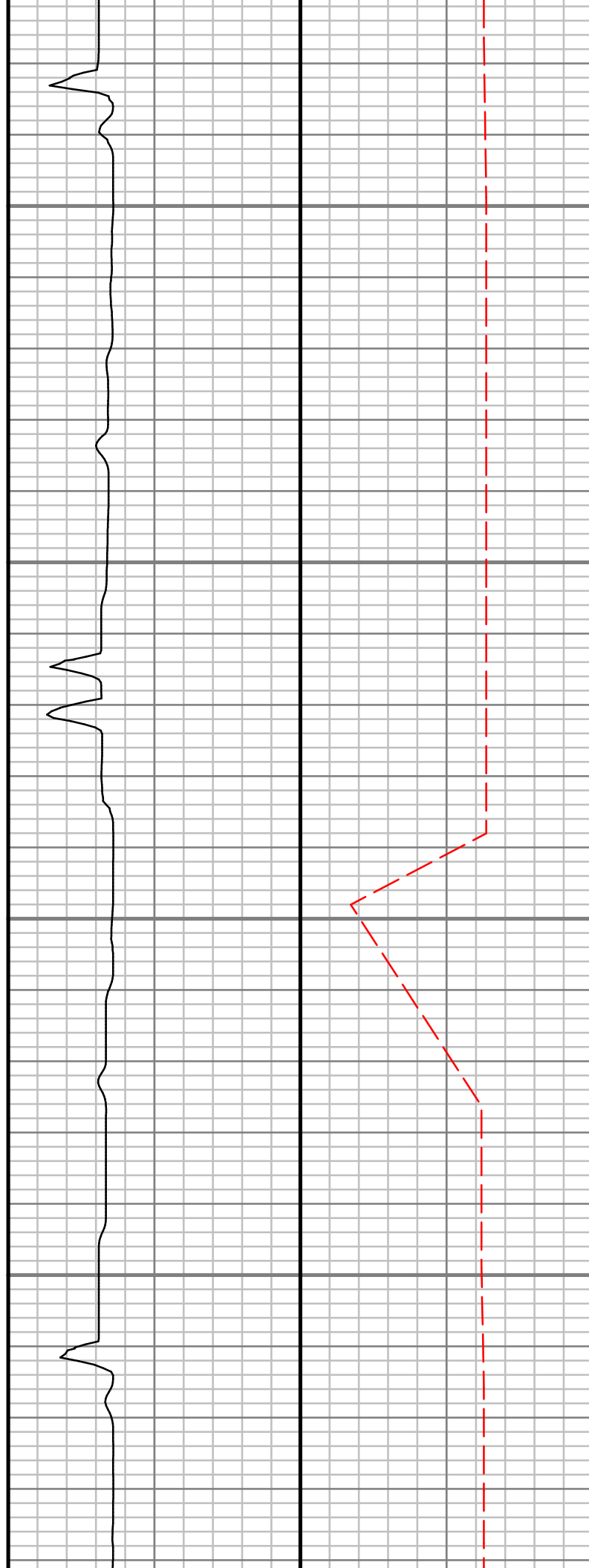
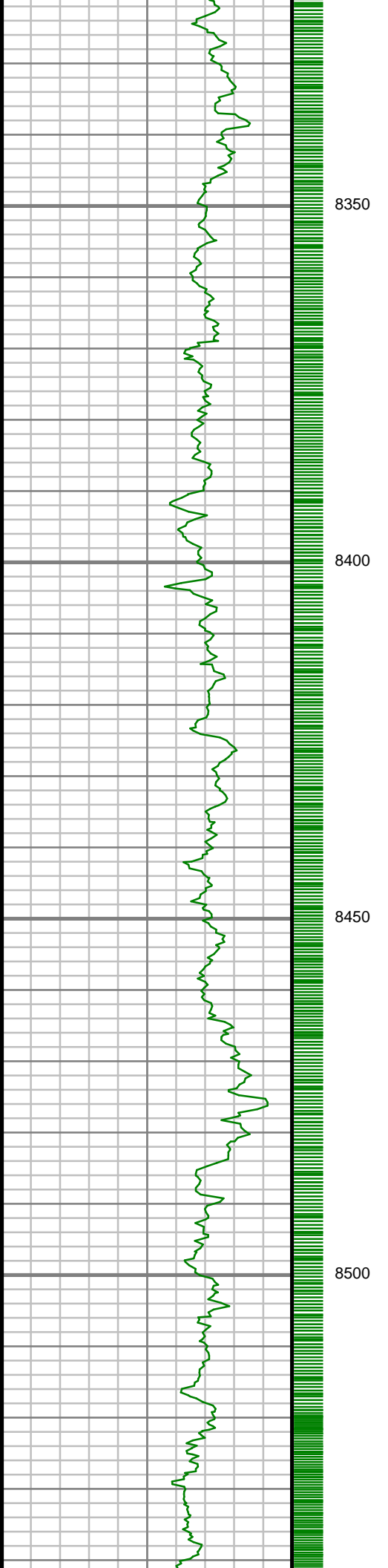
8200

8250

8300

S: 93 MD: 8179.00 ft
Inc: 90.84 deg Az:
273.60 deg TVD:
7207.90 ft

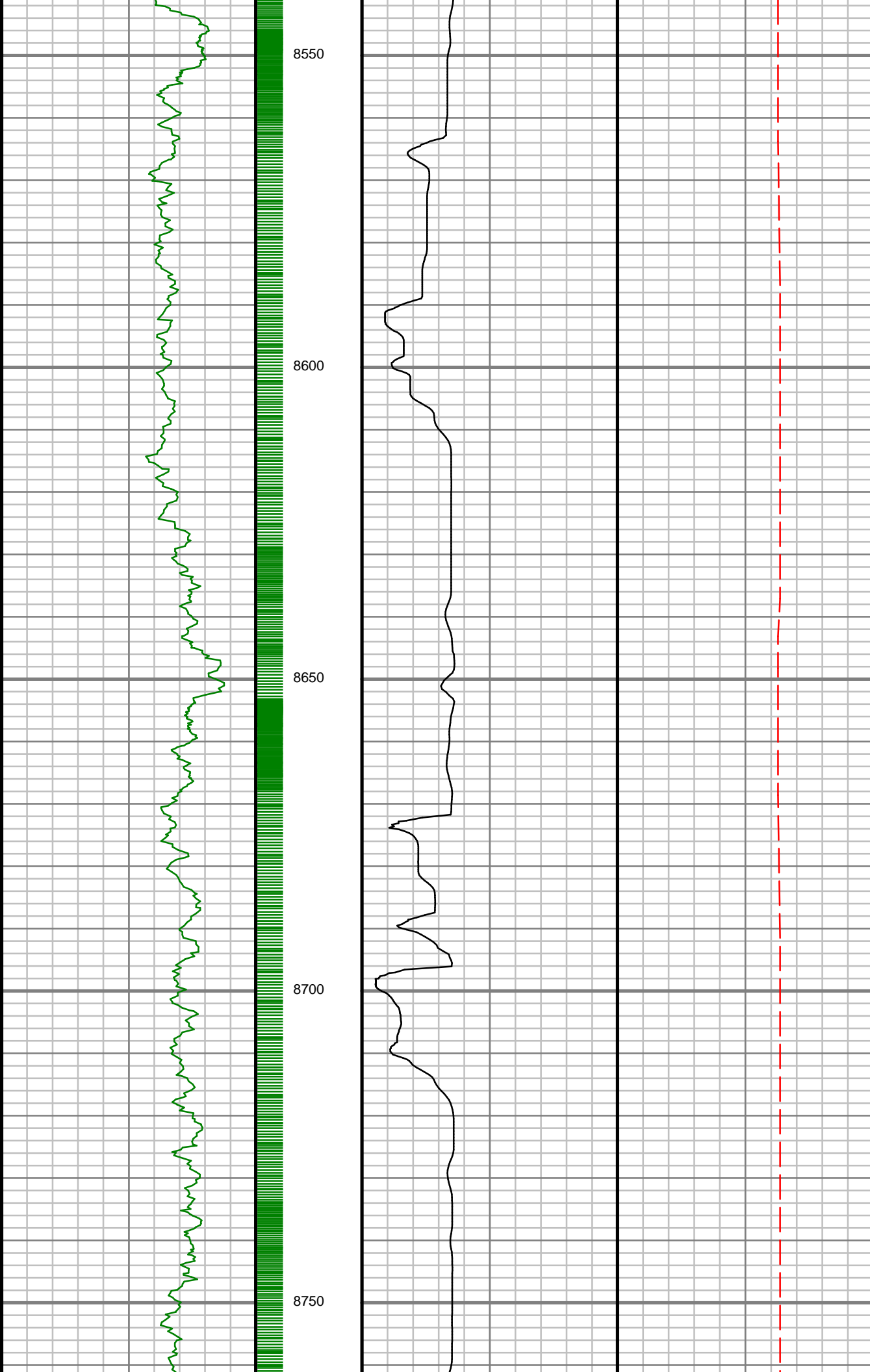
S: 94 MD: 8268.00 ft
Inc: 89.60 deg Az:
271.91 deg TVD:
7207.56 ft



S: 95 MD: 8357.00 ft
Inc: 89.87 deg Az:
271.77 deg TVD:
7207.98 ft

S: 96 MD: 8446.00 ft
Inc: 89.90 deg Az:
271.02 deg TVD:
7208.16 ft

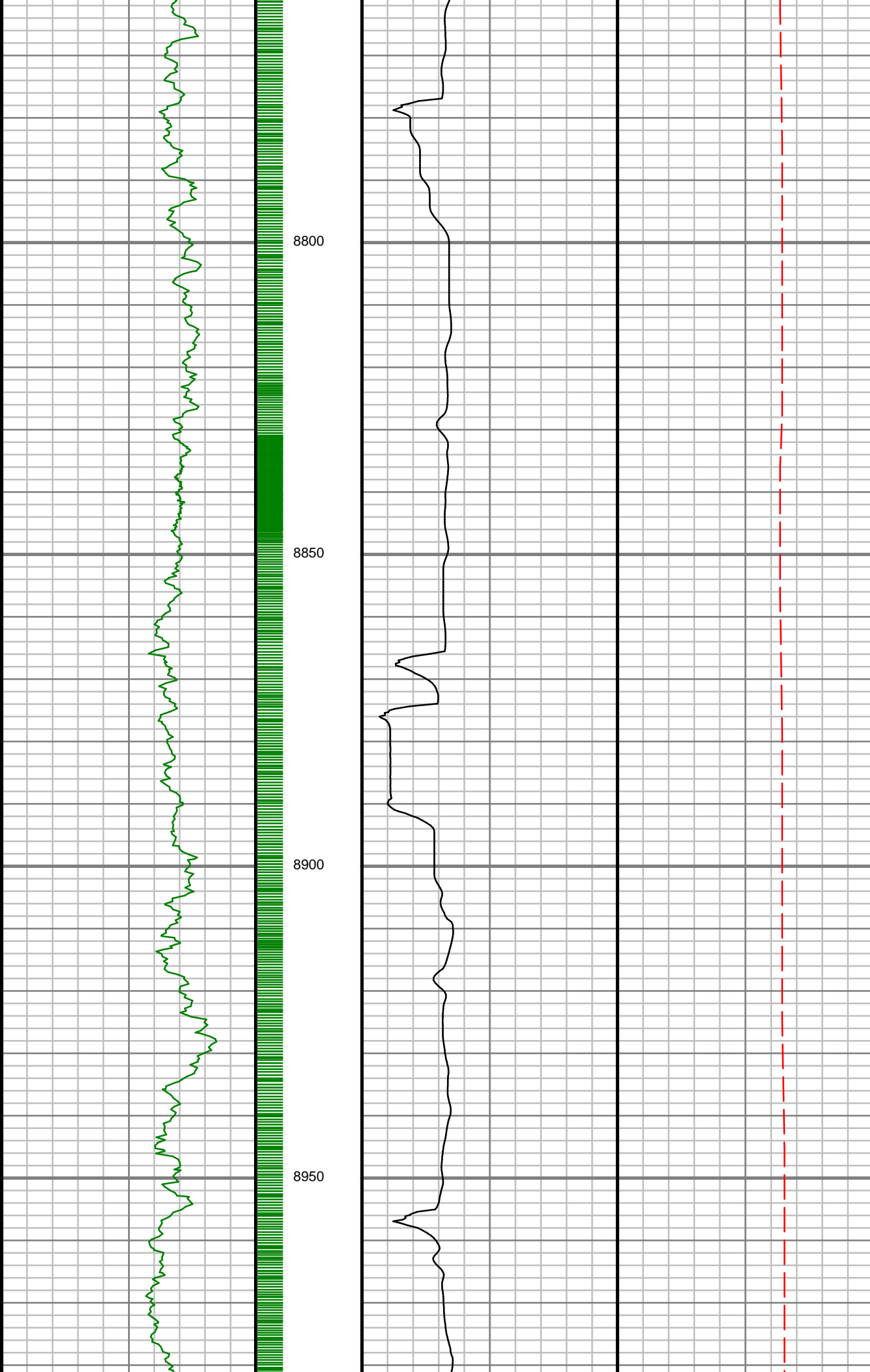
S: 97 MD: 8535.00 ft
Inc: 89.97 deg Az:
270.42 deg TVD:



270.43 deg TVD:
7208.26 ft

S: 98 MD: 8624.00 ft
Inc: 91.04 deg Az:
270.64 deg TVD:
7207.48 ft

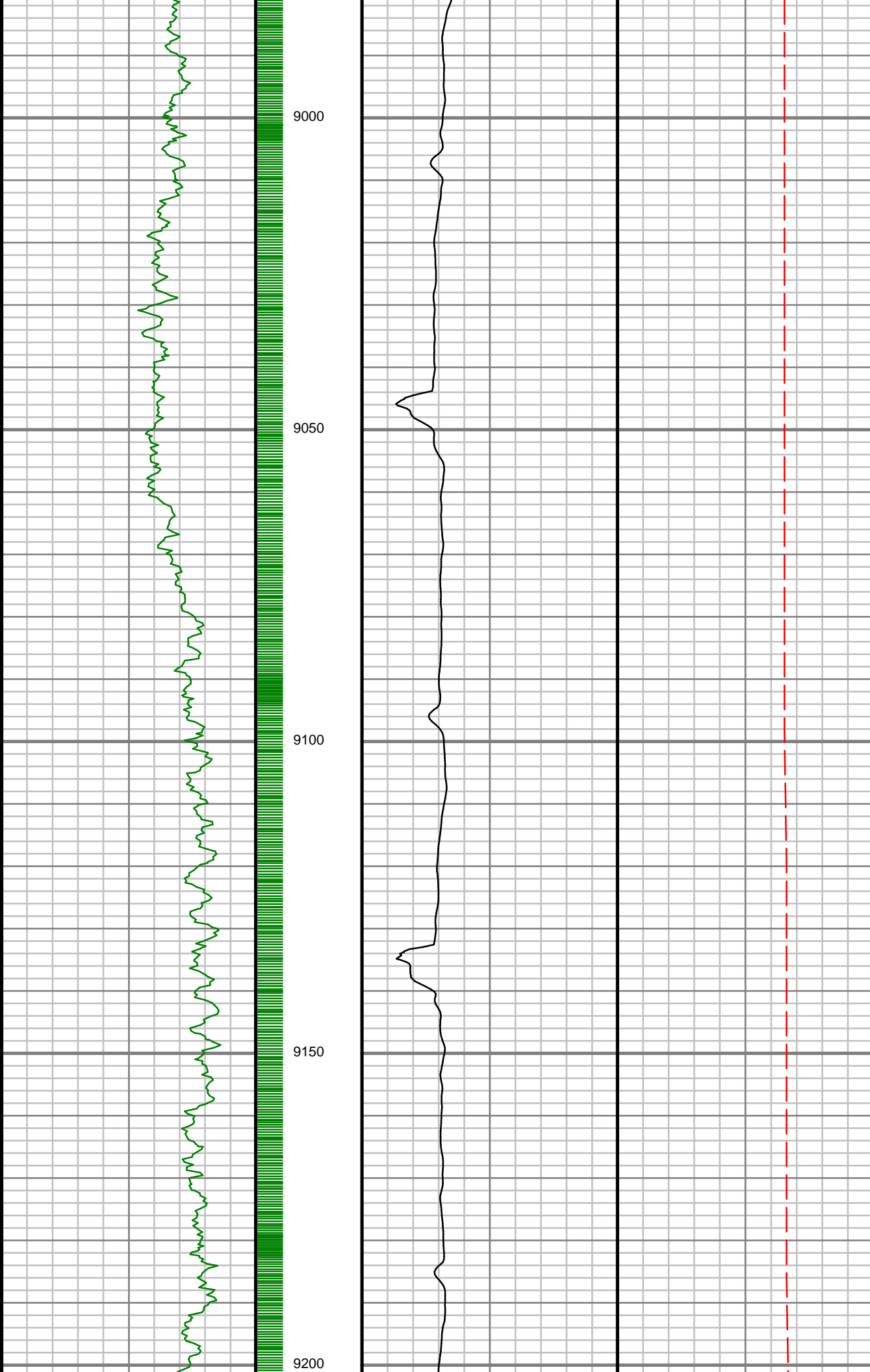
S: 99 MD: 8713.00 ft
Inc: 90.07 deg Az:
270.17 deg TVD:
7206.62 ft



S: 100 MD: 8802.00 ft
Inc: 90.50 deg Az:
269.97 deg TVD:
7206.18 ft

S: 101 MD: 8891.00 ft
Inc: 88.96 deg Az:
269.35 deg TVD:
7206.60 ft

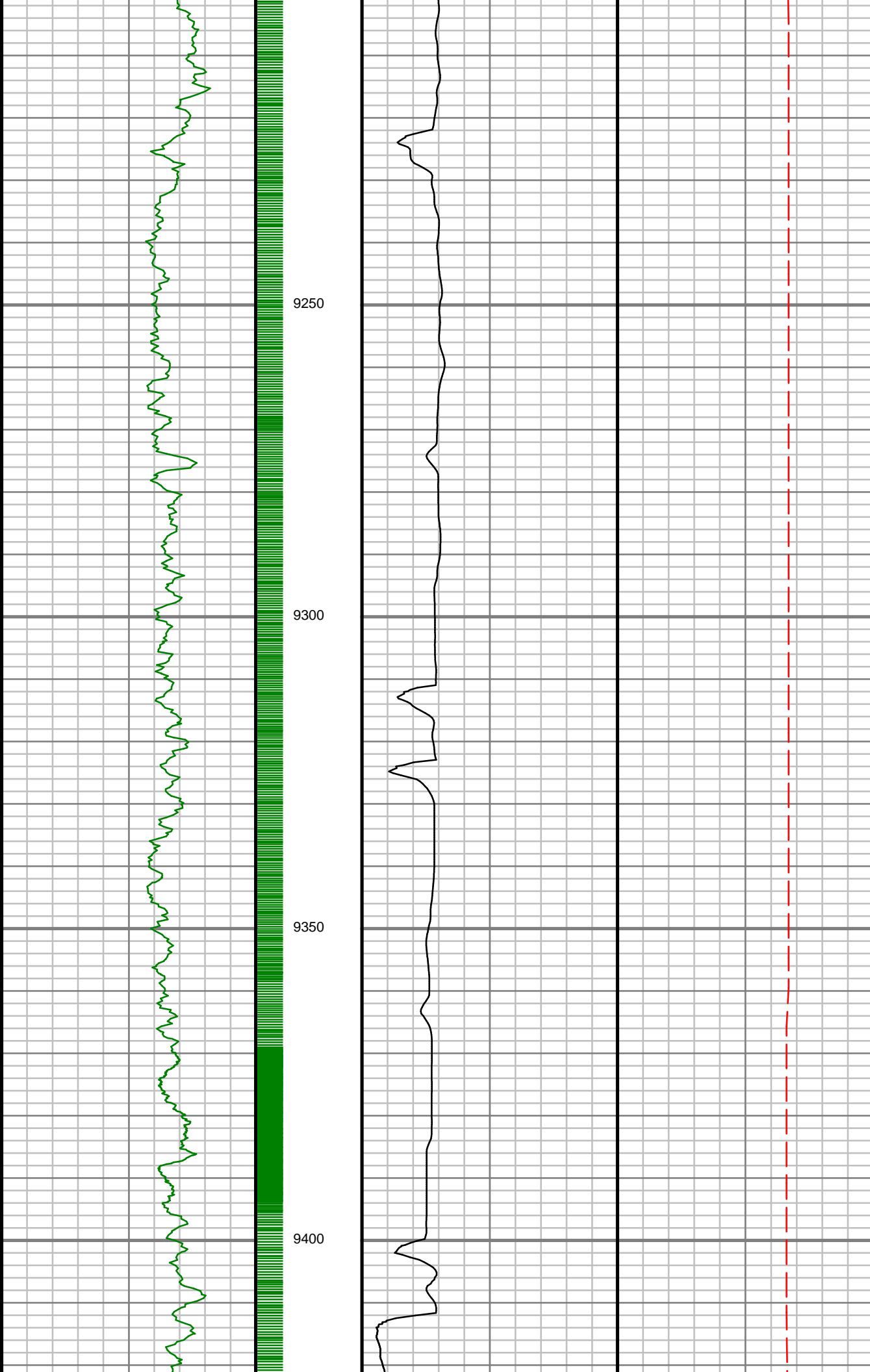
S: 102 MD: 8979.00 ft



Inc: 88.92 deg Az:
269.78 deg TVD:
7208.22 ft

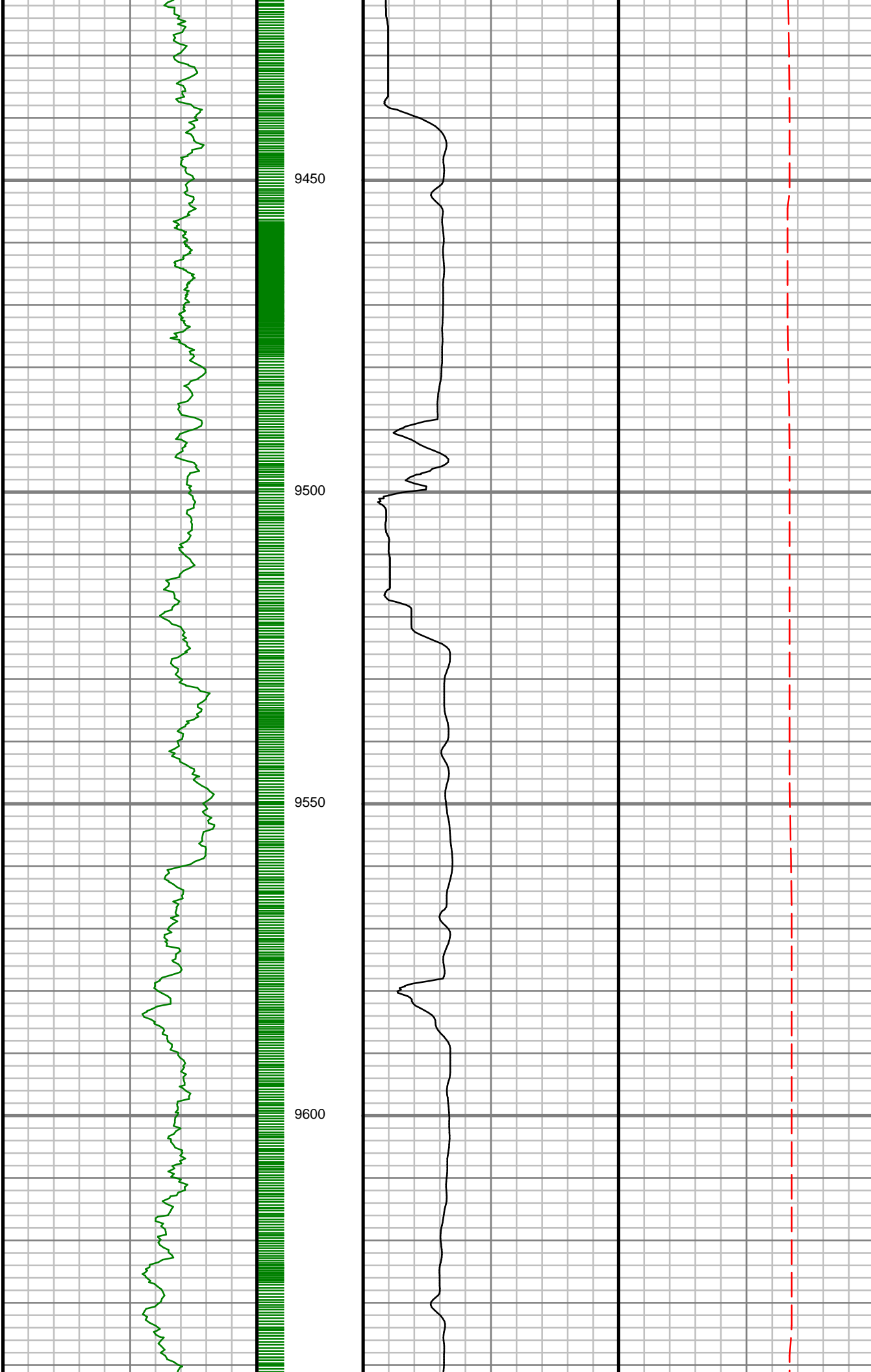
S: 103 MD: 9068.00 ft
Inc: 89.50 deg Az:
269.94 deg TVD:
7209.45 ft

S: 104 MD: 9157.00 ft
Inc: 90.64 deg Az:
270.47 deg TVD:
7209.34 ft



S: 105 MD: 9246.00 ft
Inc: 91.31 deg Az:
270.69 deg TVD:
7207.83 ft

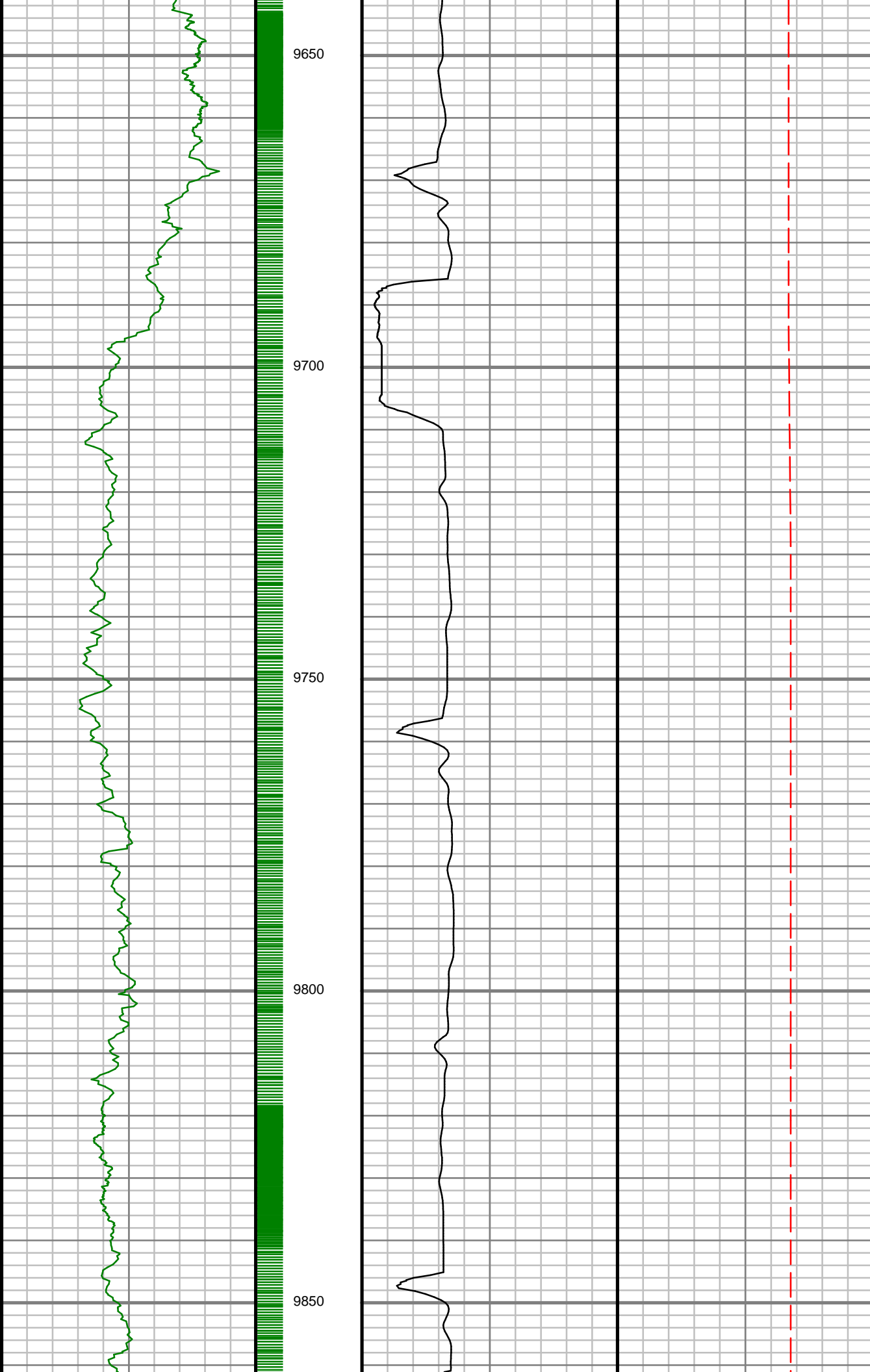
S: 106 MD: 9335.00 ft
Inc: 92.19 deg Az:
271.26 deg TVD:
7205.11 ft



S: 107 MD: 9424.00 ft
Inc: 91.31 deg Az:
270.07 deg TVD:
7202.39 ft

S: 108 MD: 9512.00 ft
Inc: 88.42 deg Az:
270.74 deg TVD:
7202.59 ft

S: 109 MD: 9601.00 ft
Inc: 88.25 deg Az:
270.94 deg TVD:
7205.18 ft



9650

9700

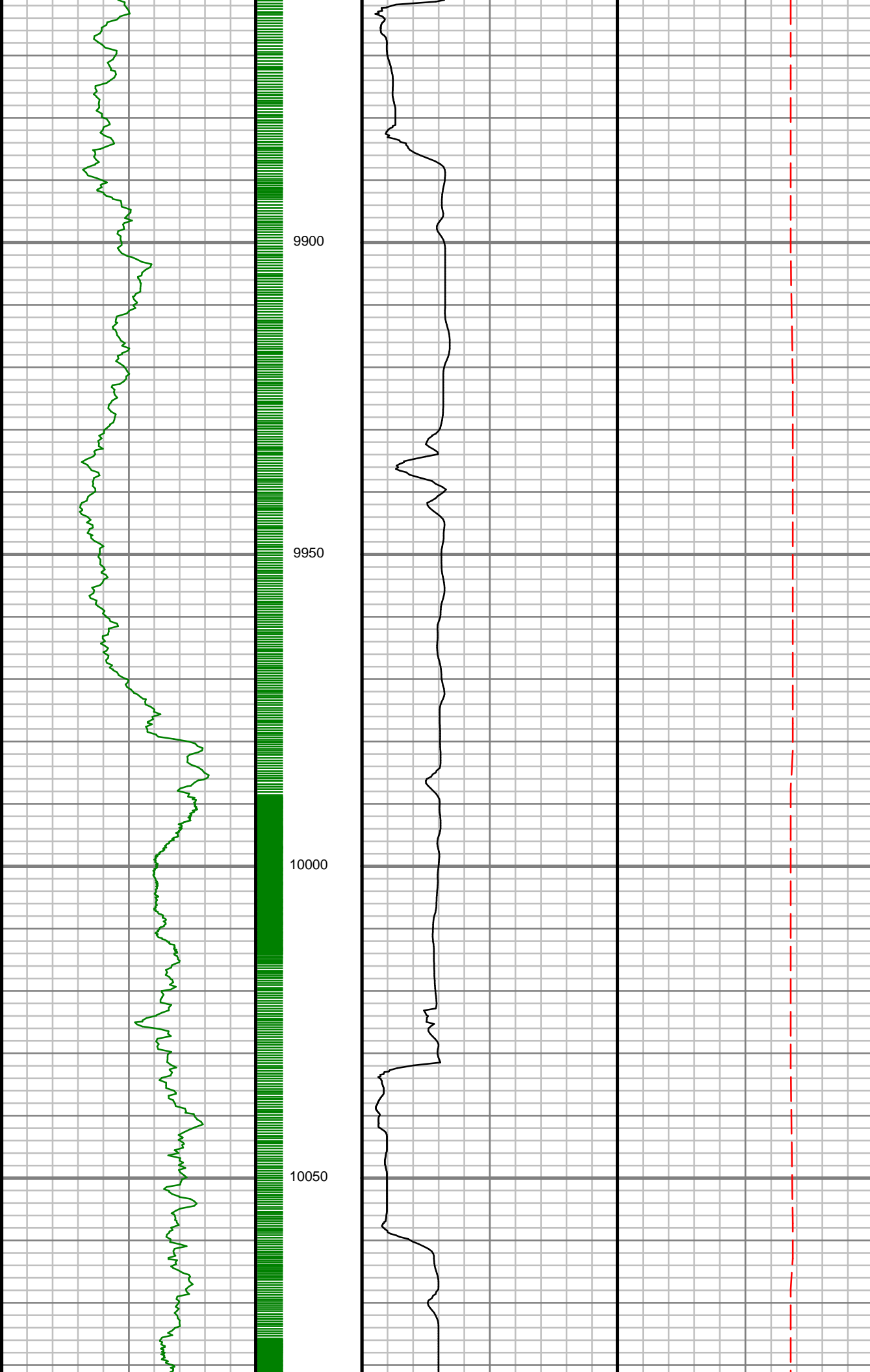
9750

9800

9850

S: 110 MD: 9690.00 ft
Inc: 88.55 deg Az:
270.21 deg TVD:
7207.66 ft

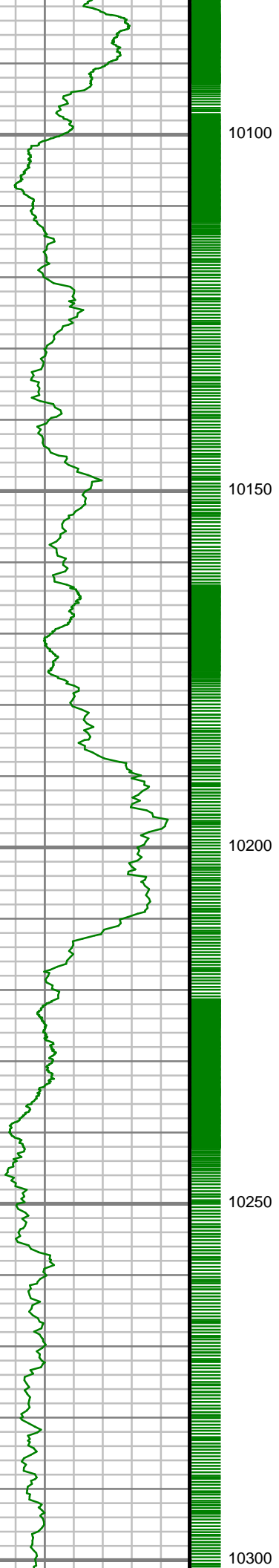
S: 111 MD: 9779.00 ft
Inc: 88.82 deg Az:
269.02 deg TVD:
7209.69 ft



S: 112 MD: 9867.00 ft
Inc: 91.31 deg Az:
268.99 deg TVD:
7209.59 ft

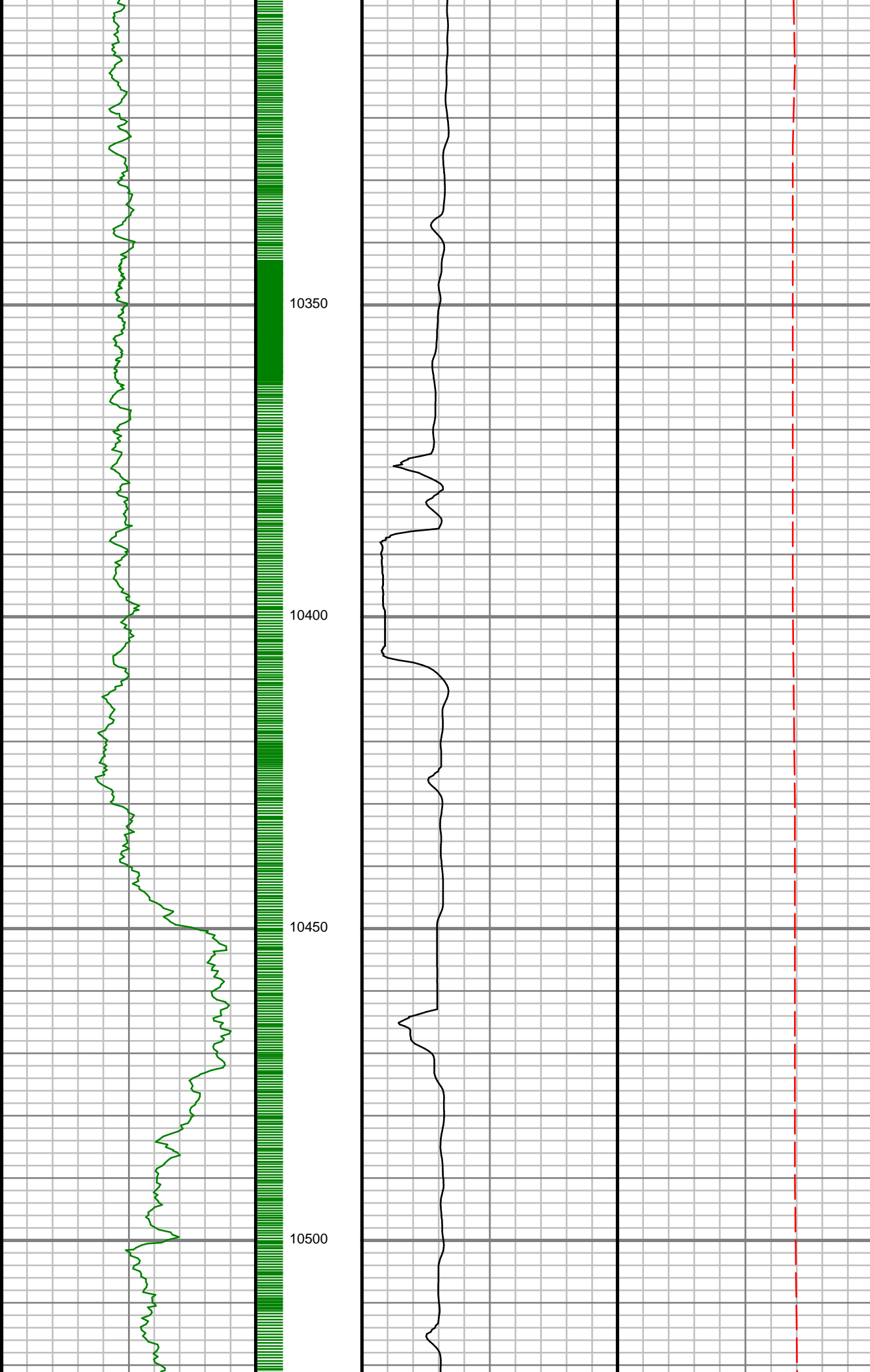
S: 113 MD: 9956.00 ft
Inc: 93.56 deg Az:
268.53 deg TVD:
7205.80 ft

S: 114 MD: 10045.00 ft
Inc: 94.24 deg Az:
268.62 deg TVD:
7199.75 ft



S: 115 MD: 10134.00 ft
Inc: 95.08 deg Az:
269.19 deg TVD:
7192.52 ft

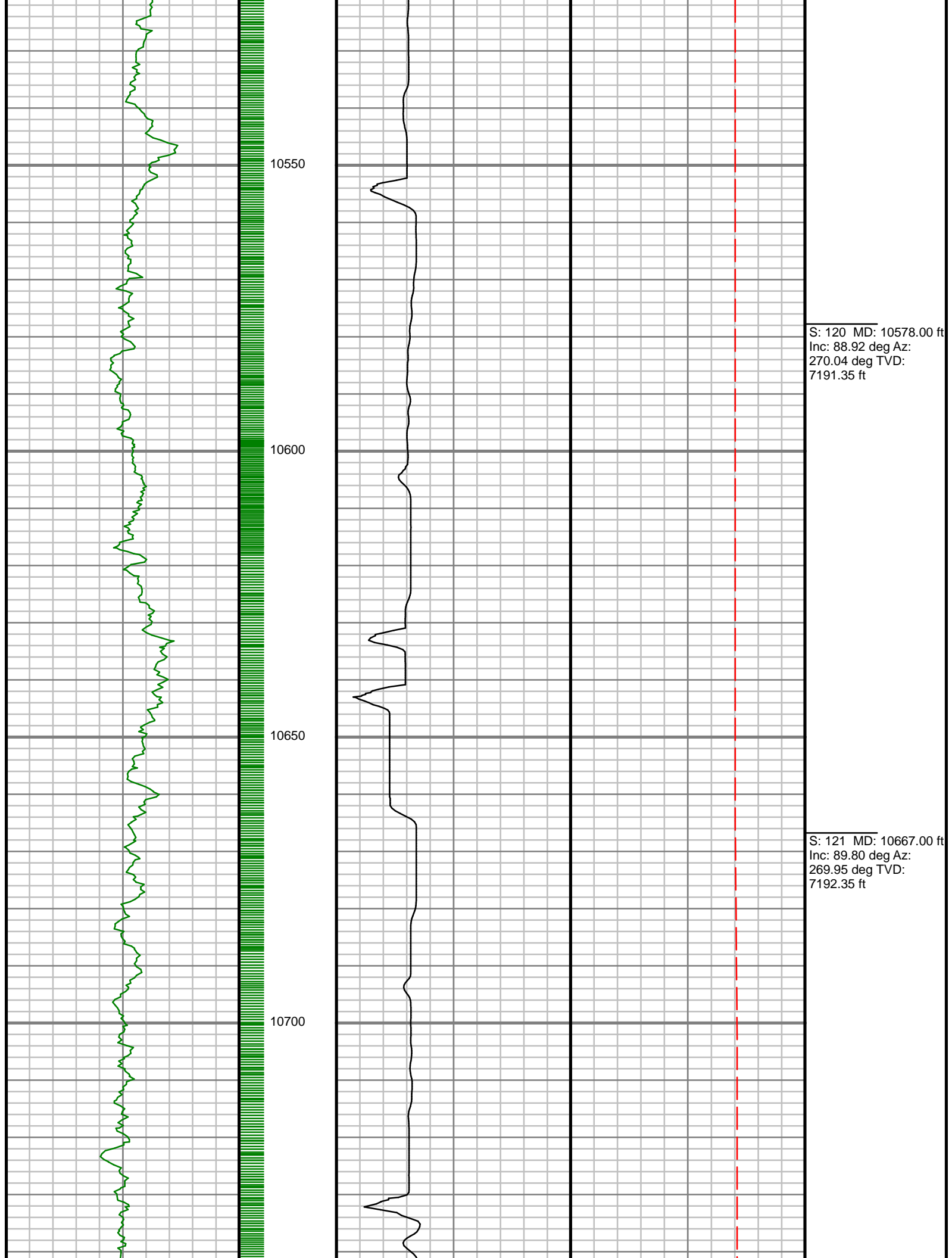
S: 116 MD: 10222.00 ft
Inc: 92.09 deg Az:
268.43 deg TVD:
7187.02 ft

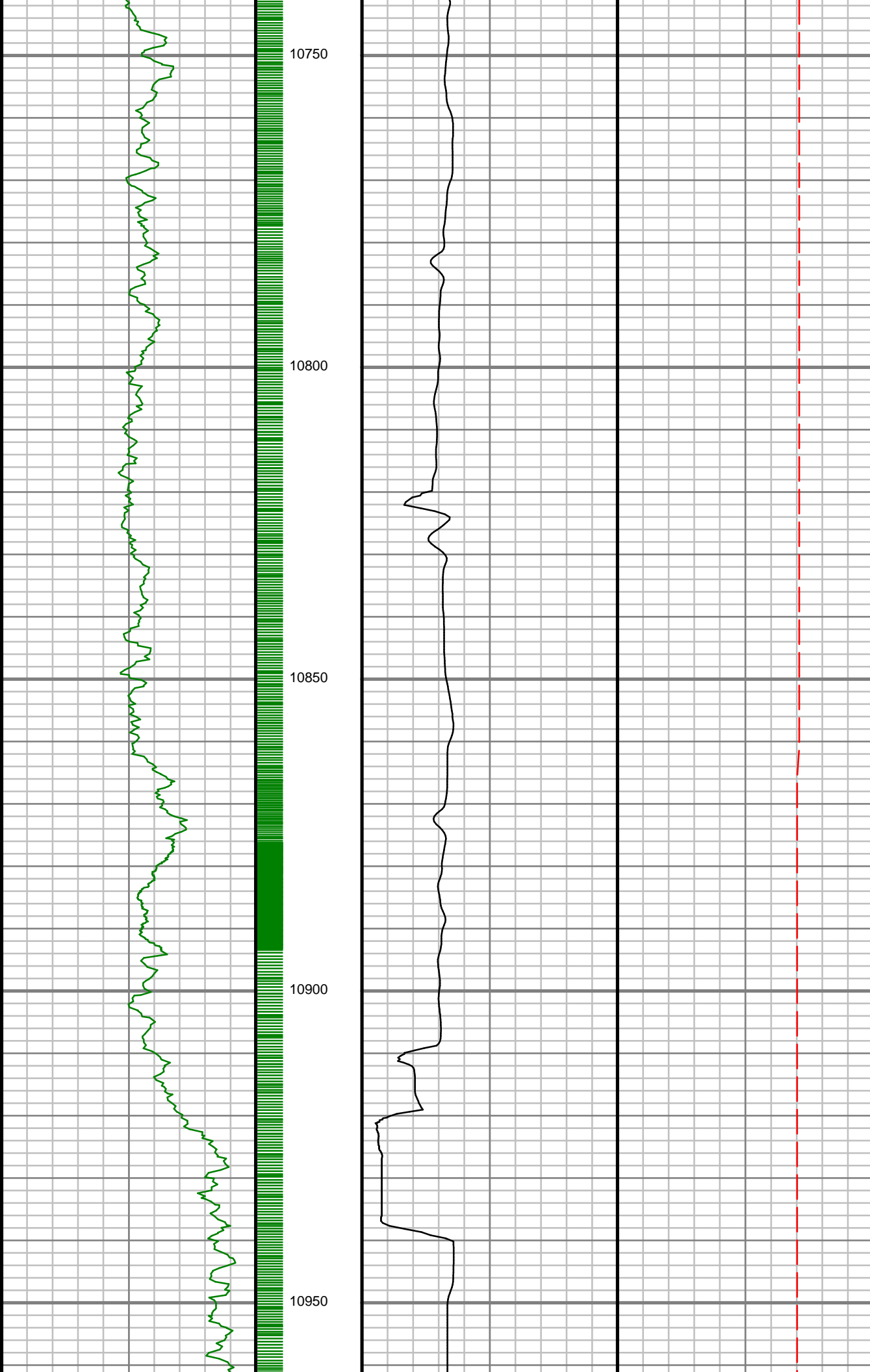


S: 117 MD: 10311.00 ft
Inc: 90.03 deg Az:
269.04 deg TVD:
7185.37 ft

S: 118 MD: 10400.00 ft
Inc: 88.55 deg Az:
269.09 deg TVD:
7186.47 ft

S: 119 MD: 10489.00 ft
Inc: 88.11 deg Az:
269.58 deg TVD:
7189.05 ft

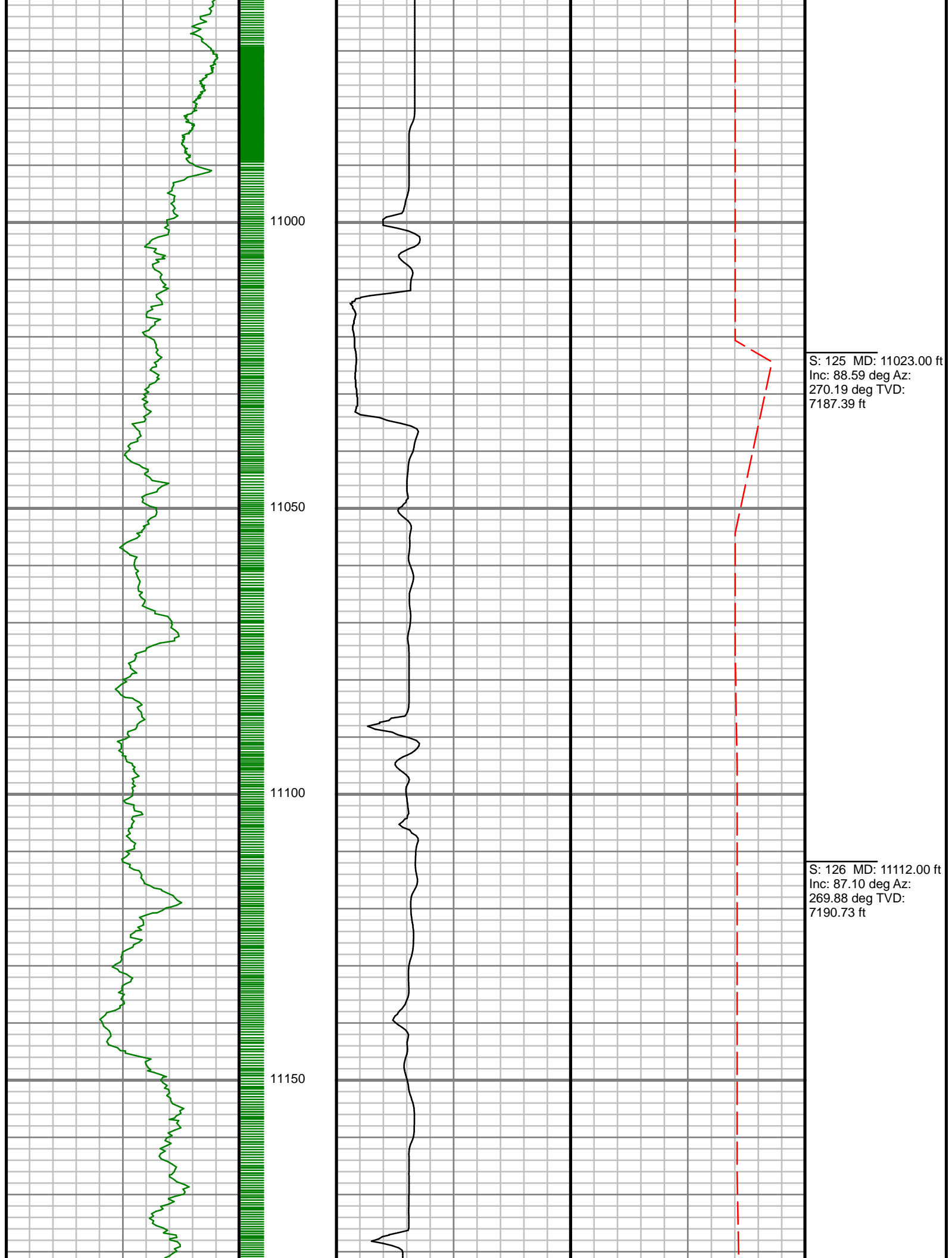


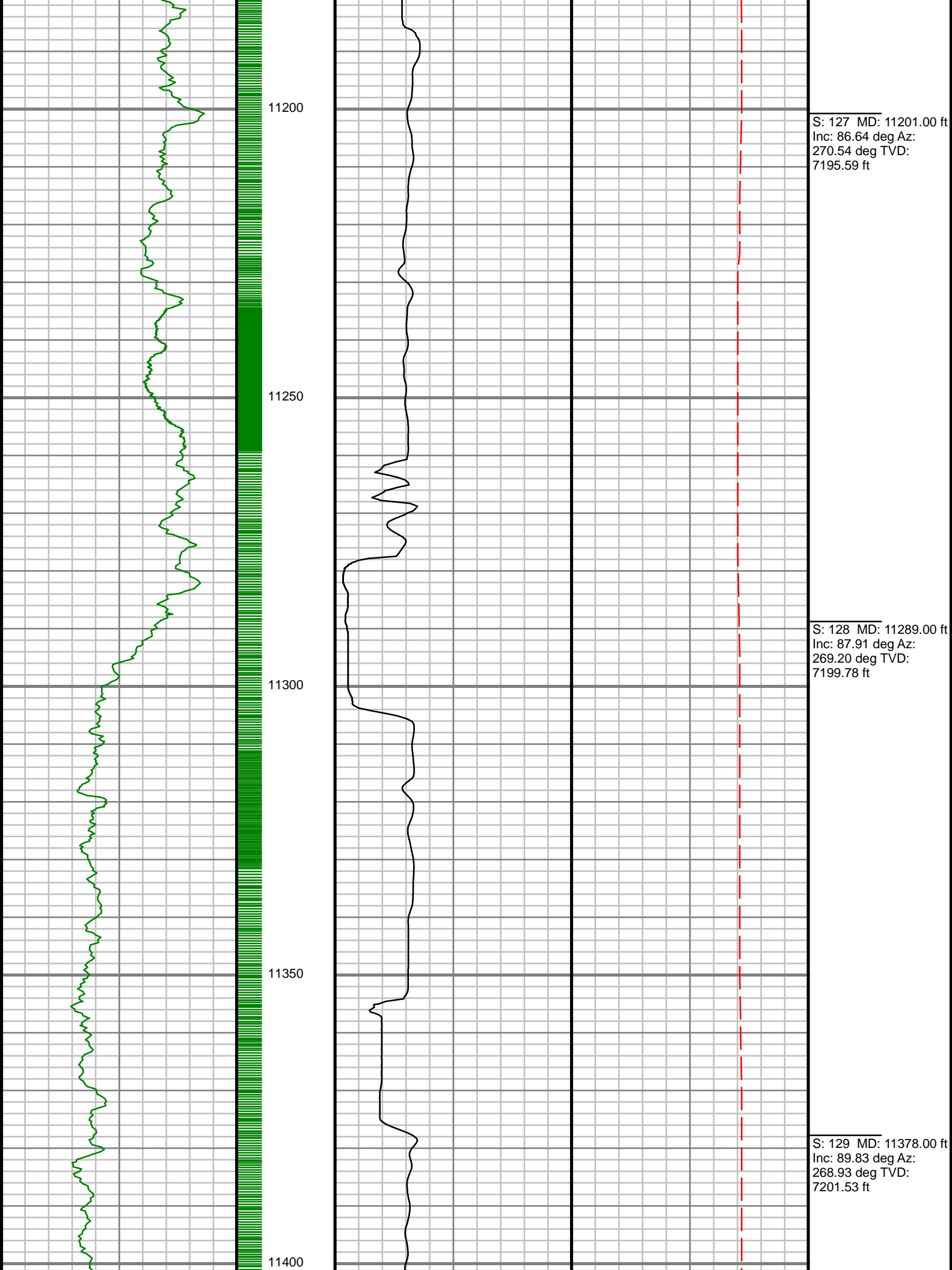


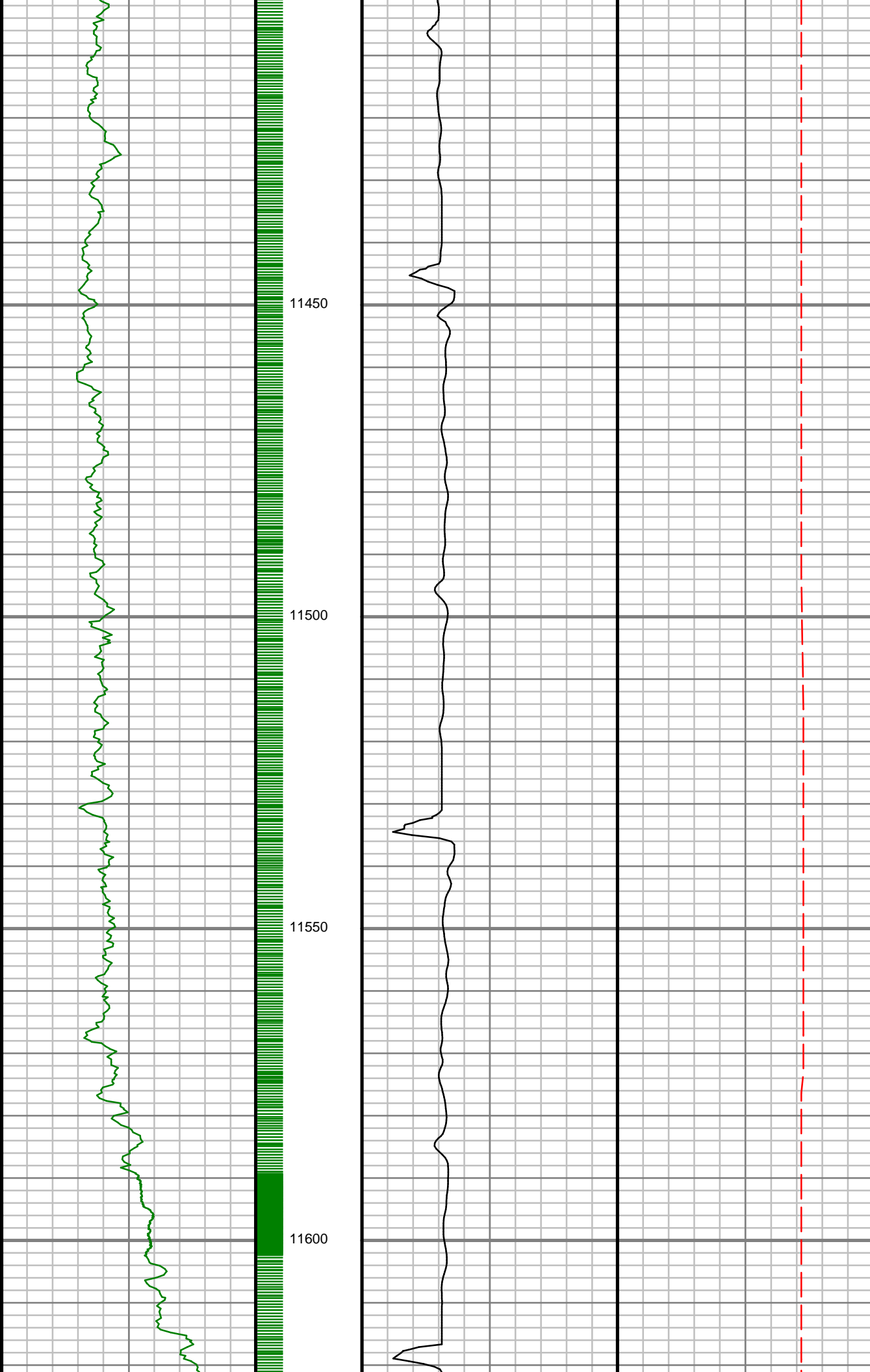
S: 122 MD: 10756.00 ft
Inc: 91.31 deg Az:
271.69 deg TVD:
7191.48 ft

S: 123 MD: 10845.00 ft
Inc: 91.95 deg Az:
271.94 deg TVD:
7188.95 ft

S: 124 MD: 10934.00 ft
Inc: 90.74 deg Az:
271.36 deg TVD:
7186.87 ft

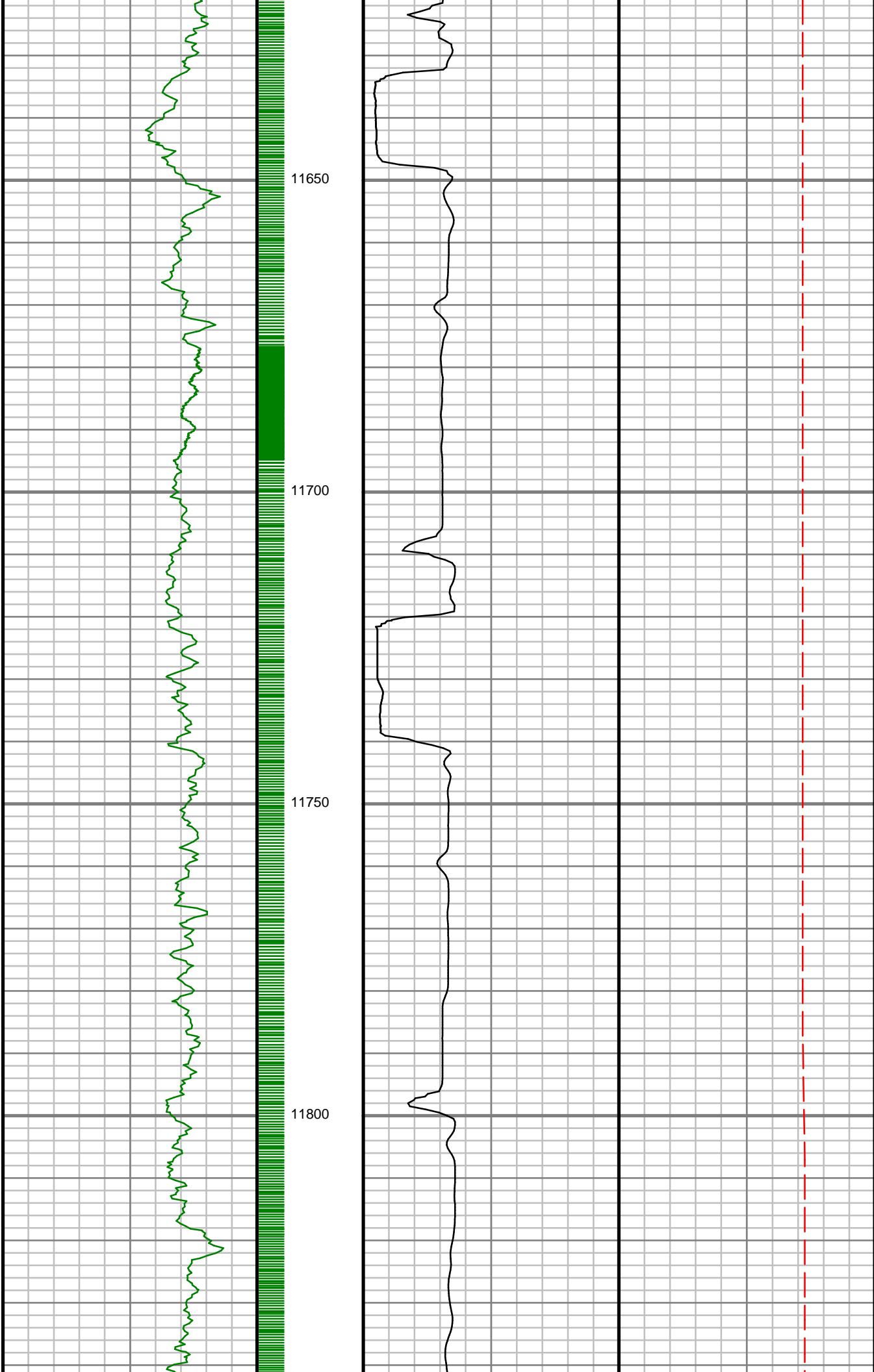






S: 130 MD: 11467.00 ft
Inc: 91.18 deg Az:
269.33 deg TVD:
7200.75 ft

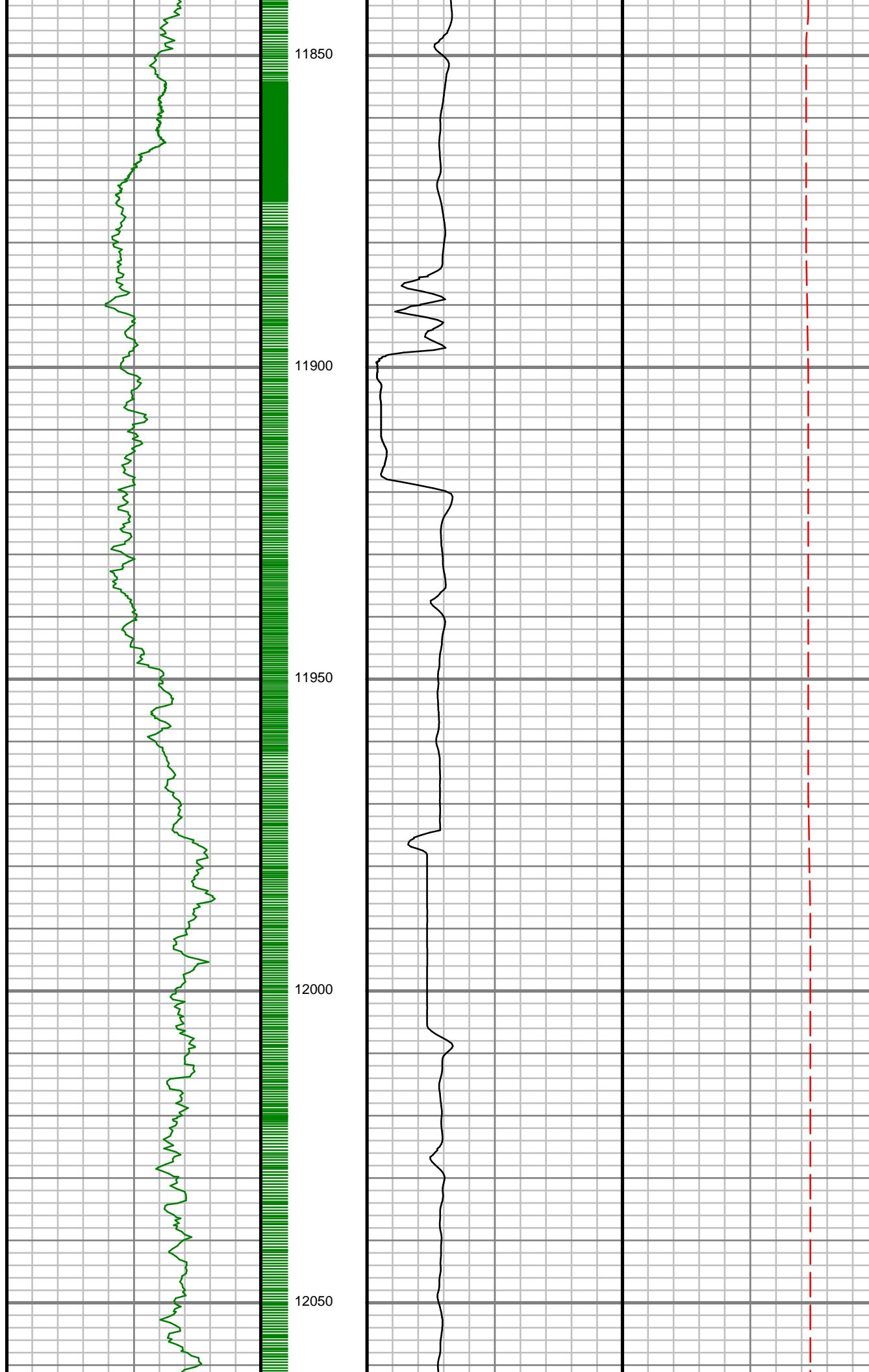
S: 131 MD: 11556.00 ft
Inc: 92.39 deg Az:
269.21 deg TVD:
7197.98 ft



S: 132 MD: 11645.00 ft
Inc: 91.95 deg Az:
268.71 deg TVD:
7194.61 ft

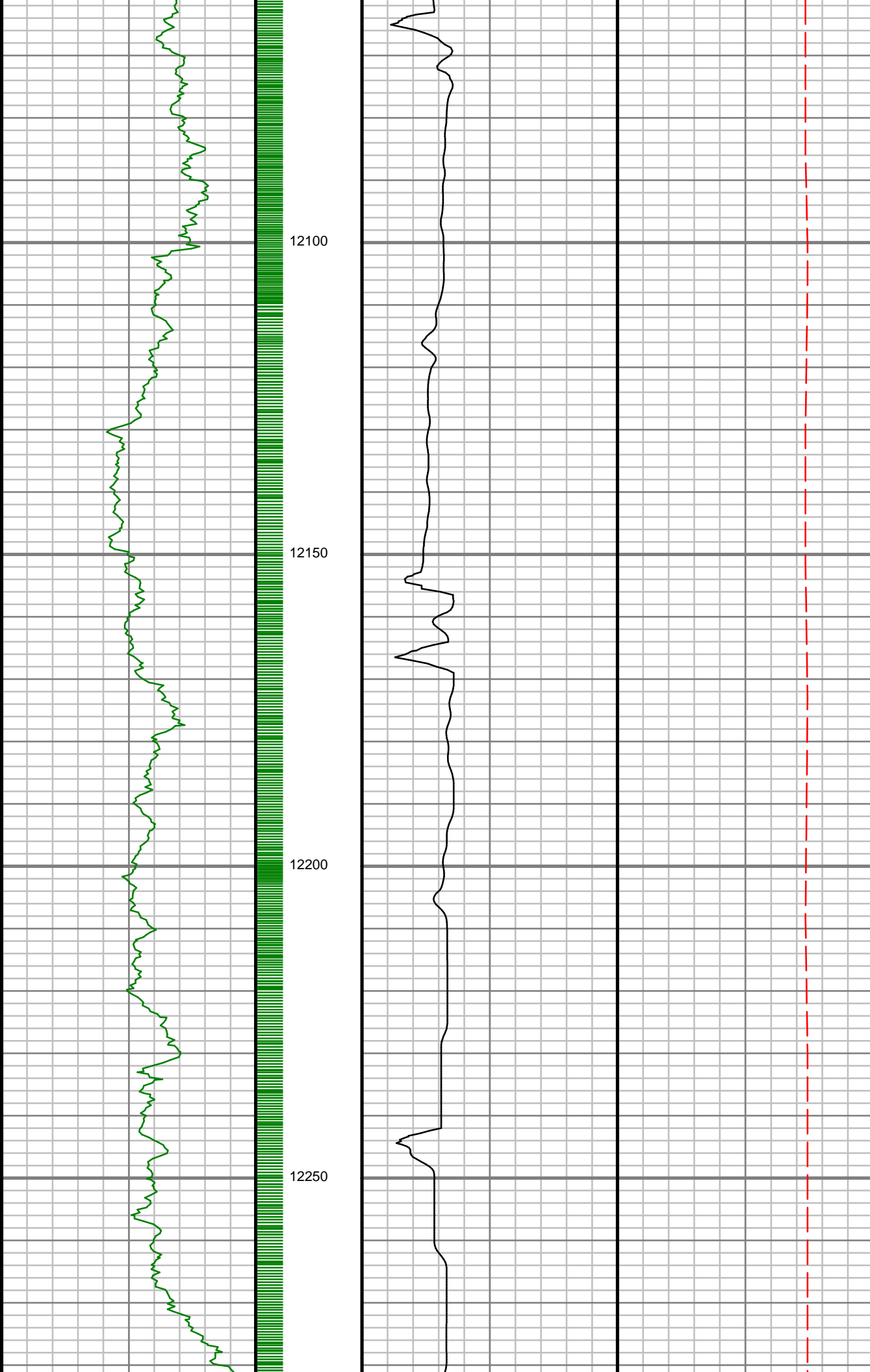
S: 133 MD: 11733.00 ft
Inc: 90.30 deg Az:
269.48 deg TVD:
7192.88 ft

S: 134 MD: 11822.00 ft
Inc: 90.87 deg Az:
270.37 deg TVD:
7191.97 ft



S: 135 MD: 11911.00 ft
Inc: 88.99 deg Az:
270.38 deg TVD:
7192.08 ft

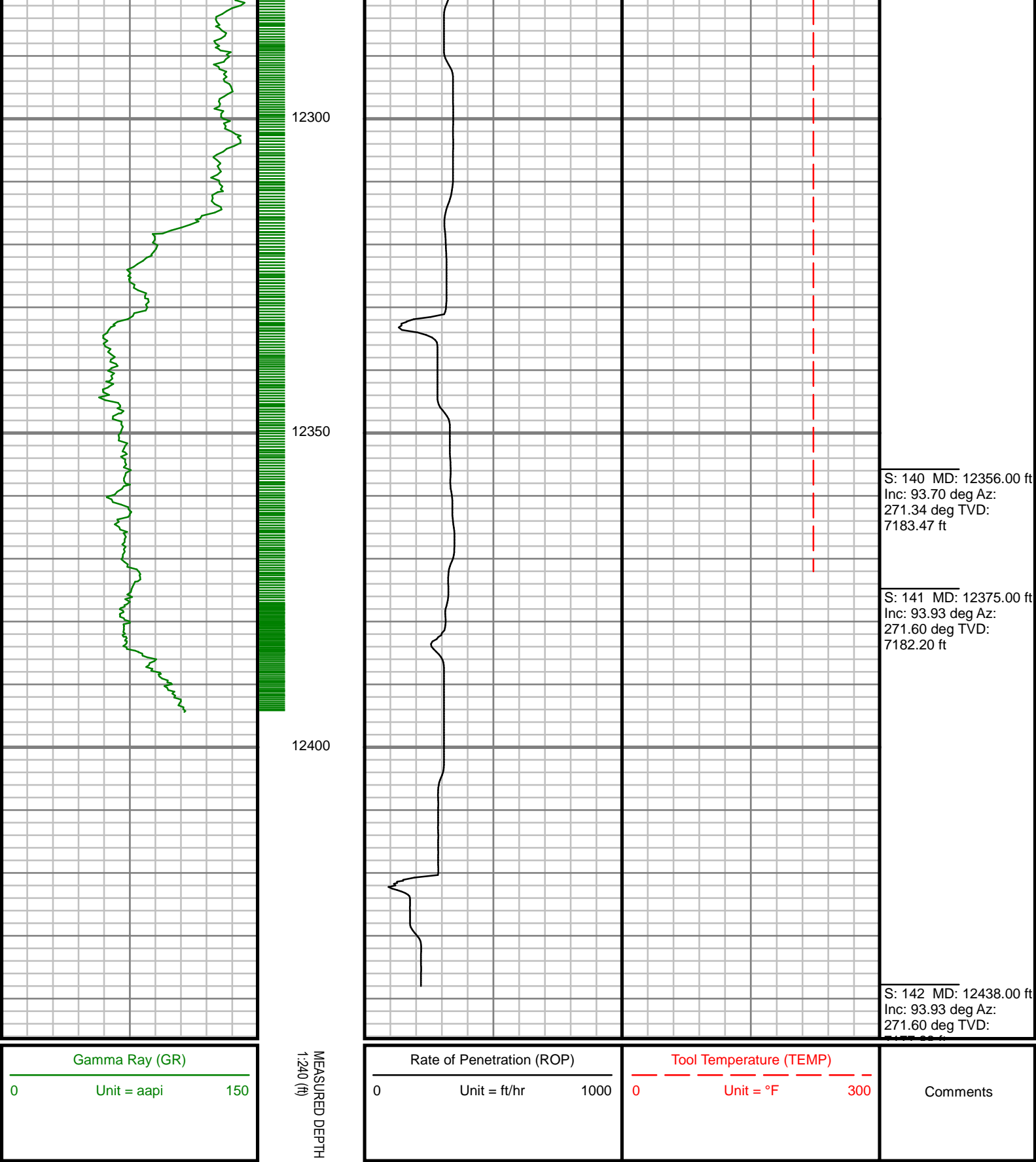
S: 136 MD: 12000.00 ft
Inc: 88.86 deg Az:
270.43 deg TVD:
7193.75 ft



S: 137 MD: 12089.00 ft
Inc: 90.67 deg Az:
271.77 deg TVD:
7194.11 ft

S: 138 MD: 12178.00 ft
Inc: 91.51 deg Az:
271.39 deg TVD:
7192.41 ft

S: 139 MD: 12267.00 ft
Inc: 93.15 deg Az:
272.02 deg TVD:
7188.79 ft



5" = 100' MD