

5" = 100' FEET MD

COMPANY : ANADARKO E&P ONSHORE LLC WELL : BUFFALO 13C-15HZ FIELD : WATTENBERG COUNTY : WELD STATE : COLORADO COUNTRY : U.S.A. UWI : 05-123-36459										COMPANY : ANADARKO E&P ONSHORE LLC WELL : BUFFALO 13C-15HZ FIELD : WATTENBERG COUNTY : WELD STATE : COLORADO COUNTRY : U.S.A. UWI : 05-123-36459									
DEPTH REF. : RKB REF. HEIGHT : 20.000 ft GROUND LEVEL : 5141.000 ft										RKB to Ground Level G.L. to MEAN SEA LEVEL									
BOREHOLE RECORD										DEVIATION RECORD									
HOLE SIZE in		FROM ft		TO ft		INCLINATION deg		FROM ft		TO ft									
12.25		0		1332		0 - 12		0		3369									
8.75		1332		8238		12 - 0		3369		5344									
6.125		8238		12442		0 - 86		5344		8238									
						86 - 93		8238		12442									
CASING RECORD																			
CASING SIZE in		FROM ft		TO ft															
9.625		0		1303															
7		0		8227															
DRILLING CO. : PRECISION RIG : 461 LWD UNIT NO. : MWD 00282-DISTRICT : CASPER SPUD DATE : 06/06/2015 LWD START DATE : 06/06/2015 LWD END DATE : 06/13/2015 TOTAL DEPTH : 12442 ft										DEPTH : 1310 ft DEPTH : 12442 ft TOTAL DEPTH : 12442 ft									

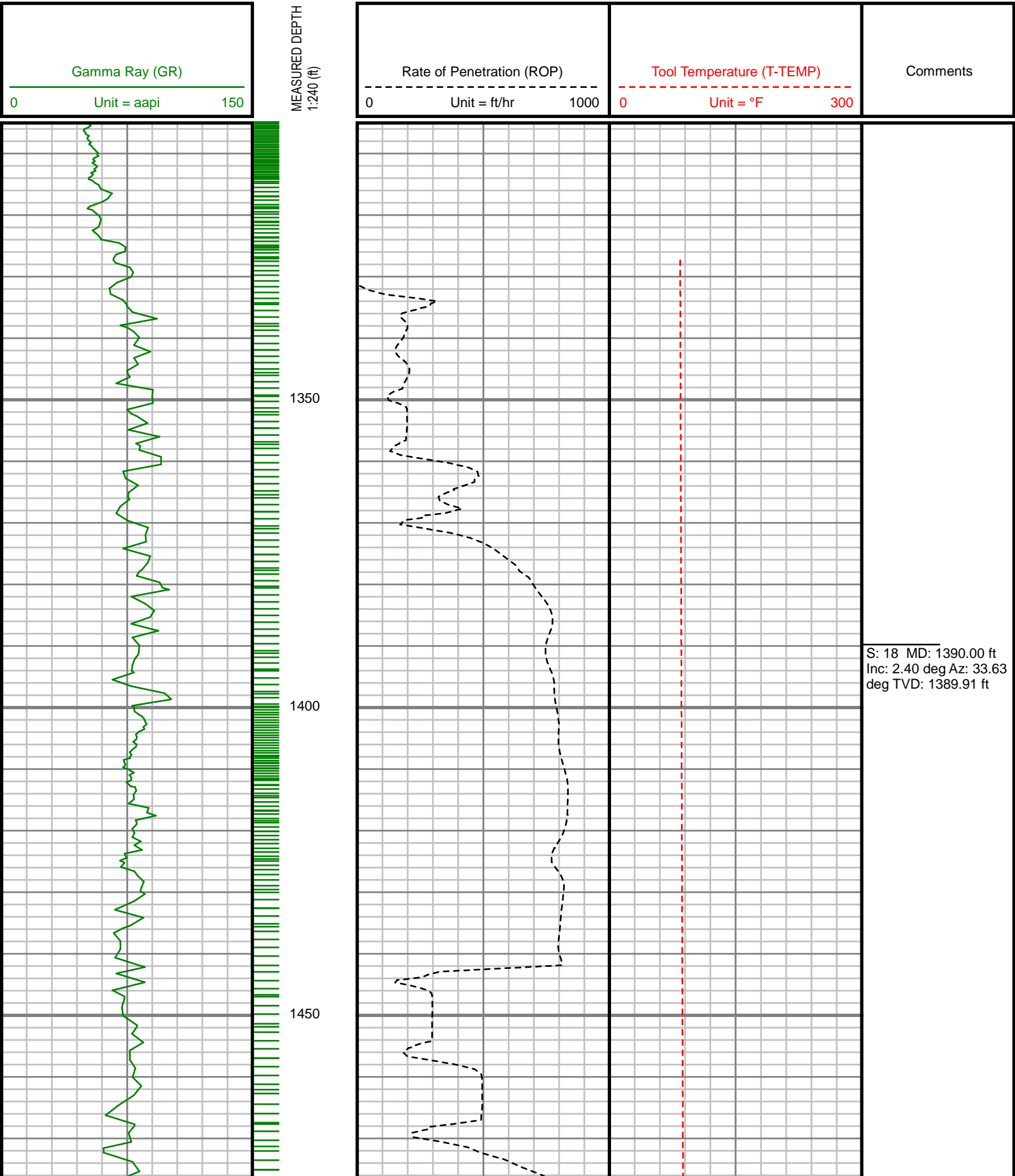
Run Data						
RUN NUMBER	1	2	3	4		
START DATE	06/06/2015	06/07/2015	06/10/2015	06/13/2015		
START TIME	1525	1405	1150	0235		
END DATE	06/07/2015	06/09/2015	06/13/2015	06/14/2015		
END TIME	1545	0840	0220	0130		
DEPTH IN (ft)	1332	5423	8238	12082		
DEPTH OUT (ft)	5423	8238	12082	12442		
LOG TOP (ft)	1310	5380	8195	12033		
LOG BOTTOM (ft)	5380	8195	12033	12392		
HOLE SIZE (in)	8.75	8.75	6.125	6.125		
MUD DATA @ (ft)	1322	5423	8238	12082		
MUD TYPE	WATER-BASED	WATER-BASED	WATER-BASED	WATER-BASED		
DENSITY (lb / gal)	8.7	9.3	10	10.05		
VISCOSITY (s / qt)	30	42	53	58		
pH	8.0	9.3	9.5	9.5		
FLUID LOSS (cm3 / 30)	-	8.1	4.8	4		
SALINITY (ppm)	3500	3500	3800	3000		
Rm (ohmm @ deg F)	-	-	-	-		
Rmf (ohmm @ deg F)	-	-	-	-		
MAX TEMP (deg F)	136	173	230	222		
Rm @ MAX TEMP (ohmm)	-	-	-	-		
LWD ENGINEER #1	C. COLLINS	C. COLLINS	C. COLLINS	H. ORAHOOD		
LWD ENGINEER #2	H. ORAHOOD	H. ORAHOOD	H. ORAHOOD	S. NEJAD		
LWD ENGINEER #3	-	-	-	-		
LOG WTINNESS #1	J. MORGAN	J. MORGAN	J. MORGAN	J. MORGAN		
LOG WTINNESS #2	-	-	-	-		

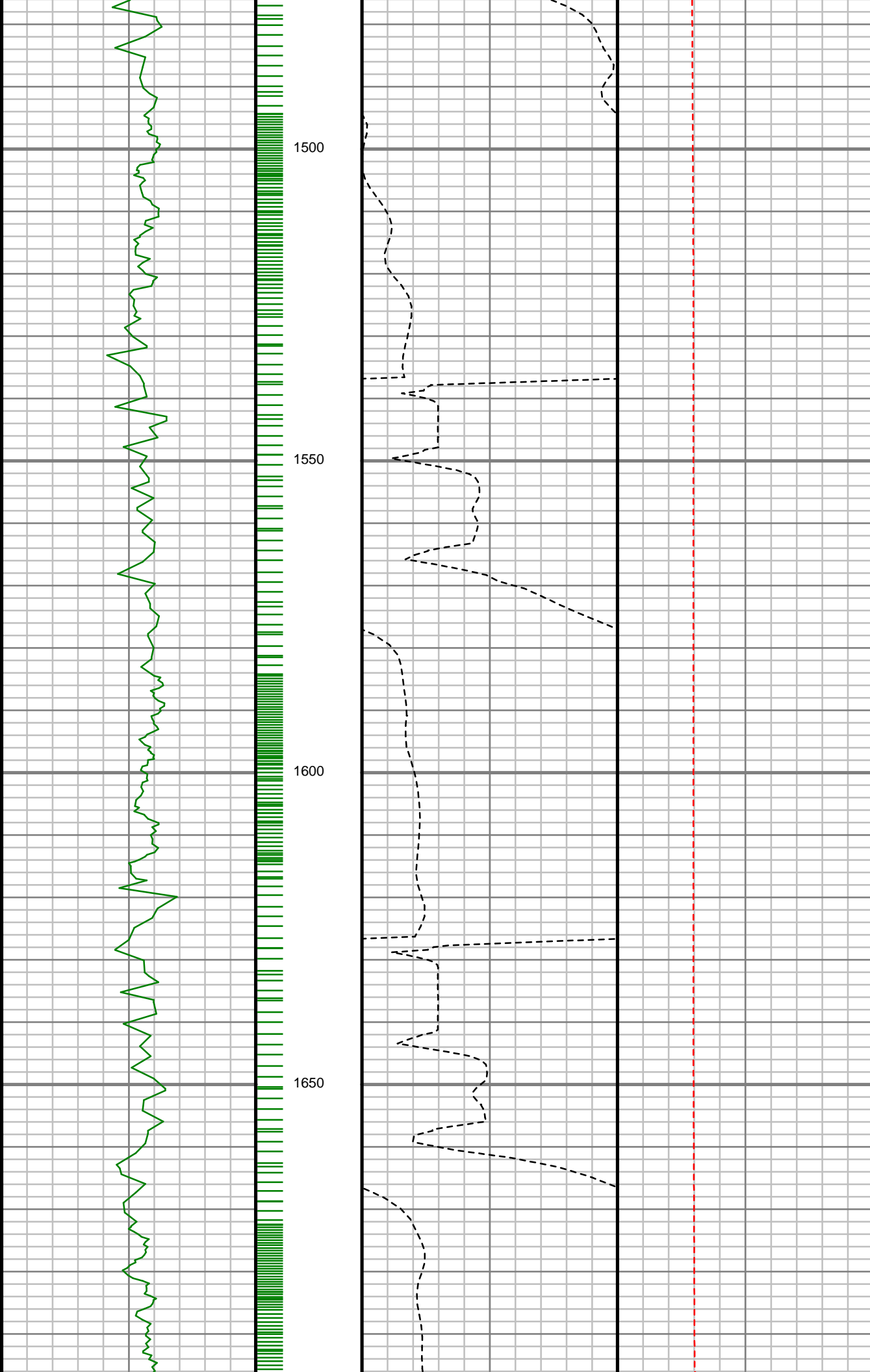
Remarks
ANADARKO E&P ONSHORE LLC PRODUCTION AFE# 2063246
SCIENTIFIC DRILLING INTERNATIONAL JOB# 287391
ALL REFERENCES IN THE DEPTH TRACK ARE AT BIT DEPTH.
ALL DATA IS MEMORY DATA UNLESS STATED OTHERWISE.
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO GAMMA RAY CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO RATE OF PENETRATION CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO TOOL TEMPERATURE CURVE
RUN # 1: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-242 / CONT = 863 / MWD EYE = 0280 / GAMMA RAY = 1344
BIT TO SENSOR OFFSETS: SURVEY = 51.89 FT. / GAMMA RAY = 43.24 FT.
RUN # 2: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-328 / CONT = 225 / MWD EYE = 1029 / GAMMA RAY = 1060
BIT TO SENSOR OFFSETS: SURVEY = 50.73 FT. / GAMMA RAY = 42.08 FT.
RUN # 3: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 78-220 / CONT = 211 / MWD EYE = 0367 / GAMMA RAY = 1091
BIT TO SENSOR OFFSETS: SURVEY = 58.64 FT. / GAMMA RAY = 49.93 FT.
RUN # 4: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 78-220 / CONT = 211 / MWD EYE = 0367 / GAMMA RAY = 1091
BIT TO SENSOR OFFSETS: SURVEY = 58.68 FT. / GAMMA RAY = 49.97 FT.

[illegible]

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.

ANADARKO E&P ONSHORE LLC
BUFFALO 13C-15HZ
WATTENBERG FIELD
WELD COUNTY, COLORADO
05-123-36459

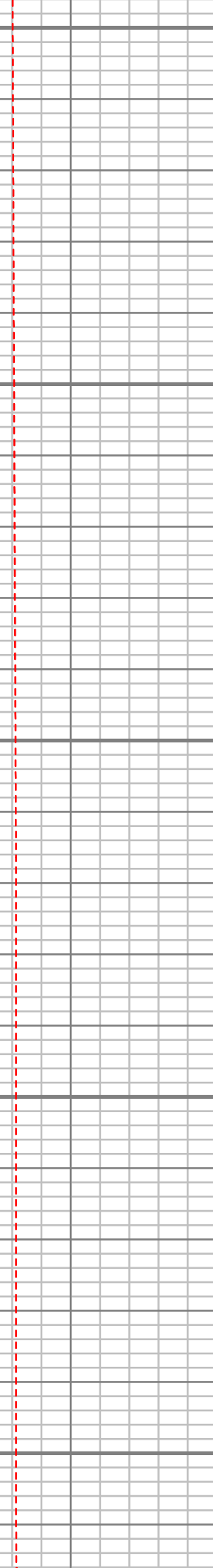
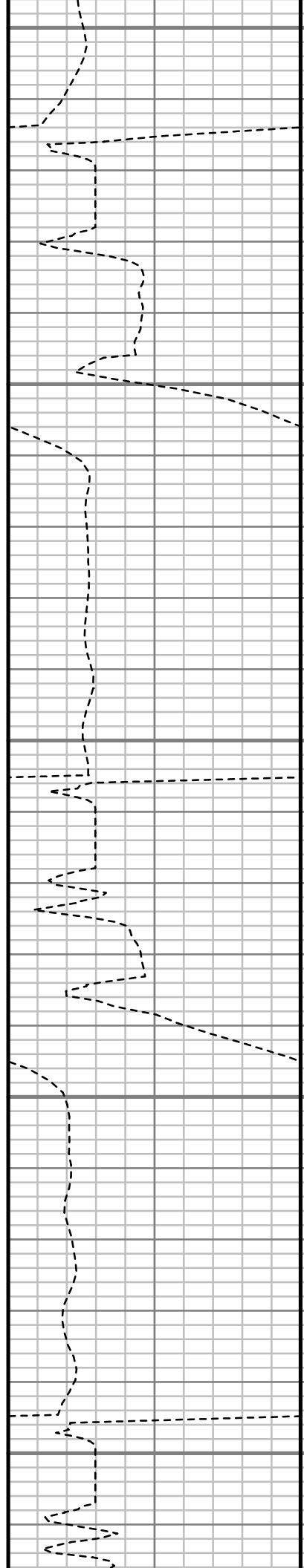
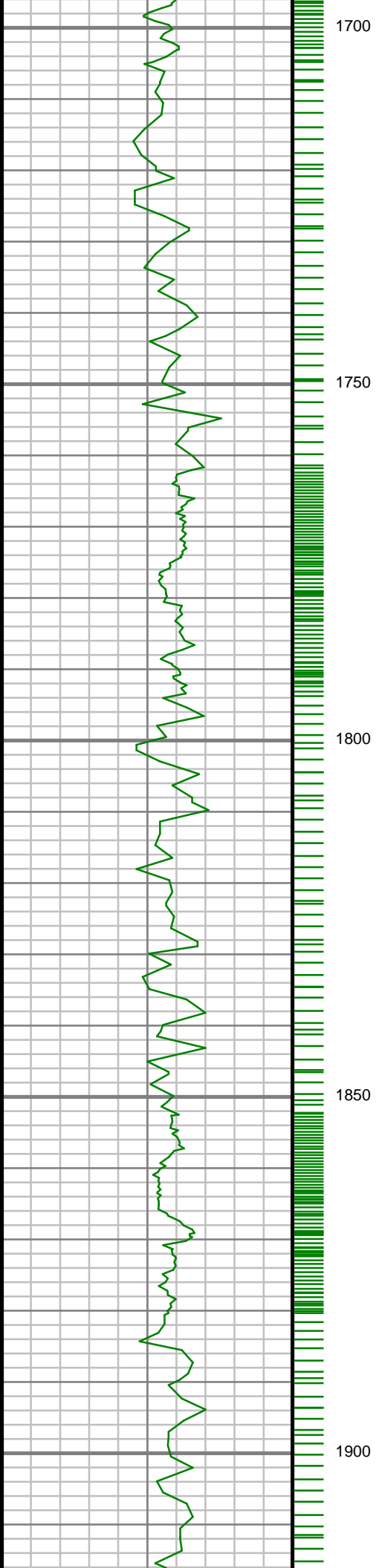




S: 19 MD: 1484.00 ft
Inc: 4.16 deg Az: 21.36
deg TVD: 1483.76 ft

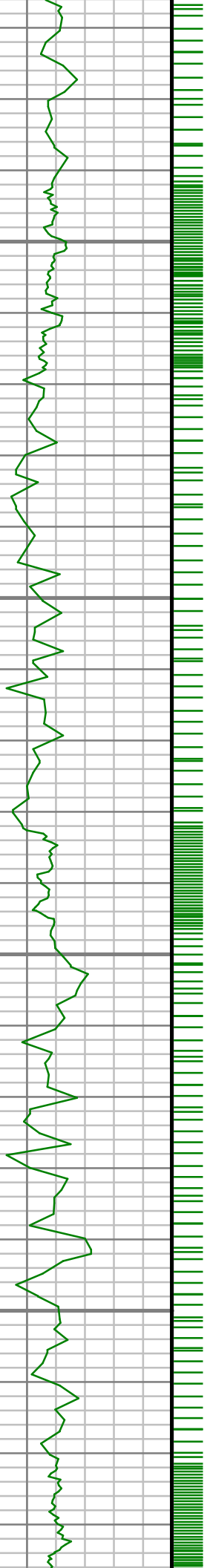
S: 20 MD: 1574.00 ft
Inc: 6.01 deg Az: 7.16
deg TVD: 1573.40 ft

S: 21 MD: 1664.00 ft
Inc: 7.25 deg Az:
351.15 deg TVD:
1662.81 ft



S: 22 MD: 1754.00 ft
Inc: 8.61 deg Az:
339.37 deg TVD:
1751.95 ft

S: 23 MD: 1843.00 ft
Inc: 8.86 deg Az:
326.94 deg TVD:
1839.93 ft

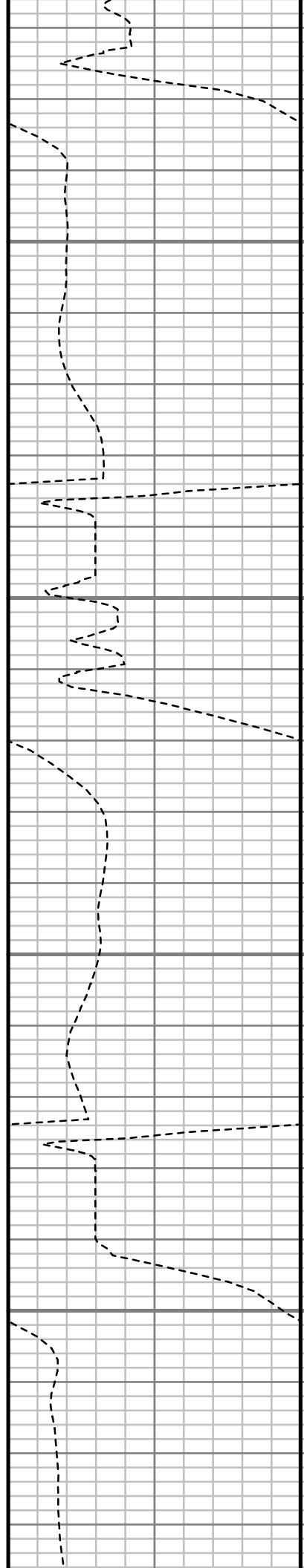


1950

2000

2050

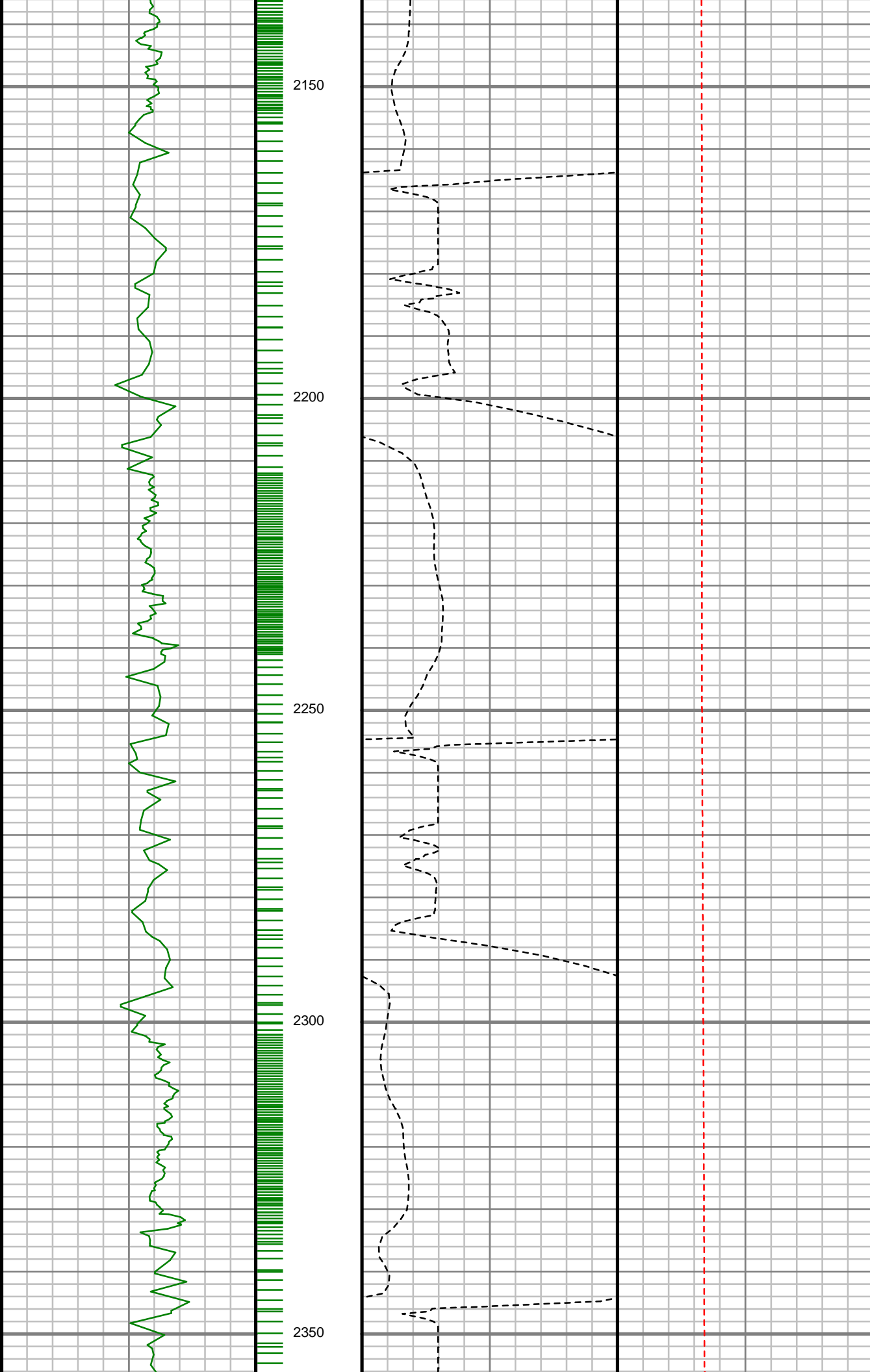
2100



S: 24 MD: 1933.00 ft
Inc: 10.18 deg Az:
329.09 deg TVD:
1928.68 ft

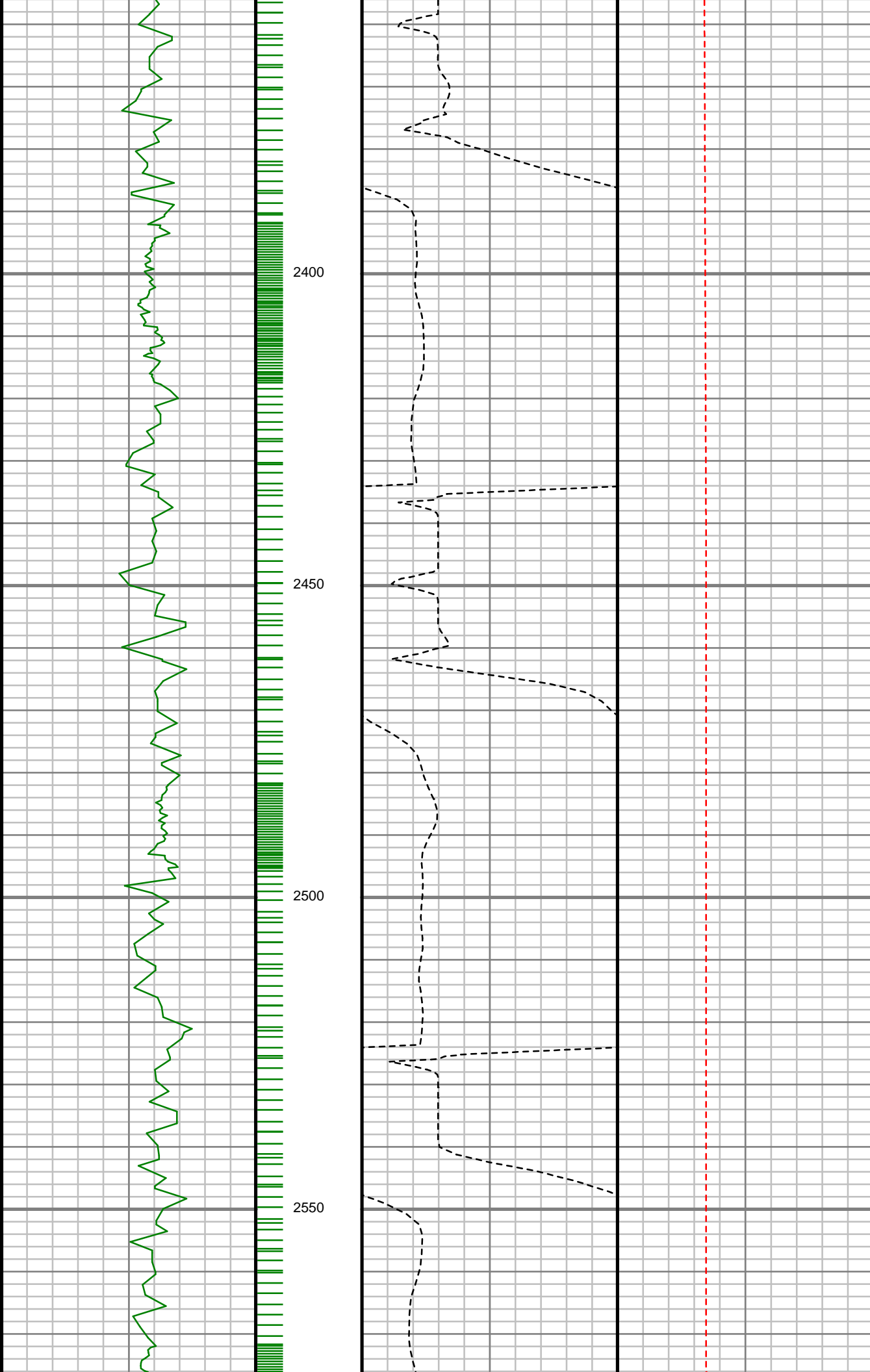
S: 25 MD: 2023.00 ft
Inc: 11.55 deg Az:
329.03 deg TVD:
2017.07 ft

S: 26 MD: 2113.00 ft
Inc: 10.44 deg Az:
328.61 deg TVD:
2105.42 ft



S: 27 MD: 2202.00 ft
Inc: 10.26 deg Az:
337.72 deg TVD:
2192.97 ft

S: 28 MD: 2292.00 ft
Inc: 10.21 deg Az:
343.52 deg TVD:
2281.54 ft



S: 29 MD: 2382.00 ft
Inc: 11.17 deg Az:
348.47 deg TVD:
2369.98 ft

S: 30 MD: 2472.00 ft
Inc: 11.22 deg Az:
346.37 deg TVD:
2458.27 ft

S: 31 MD: 2562.00 ft
Inc: 8.81 deg Az:
345.74 deg TVD:
2546.90 ft

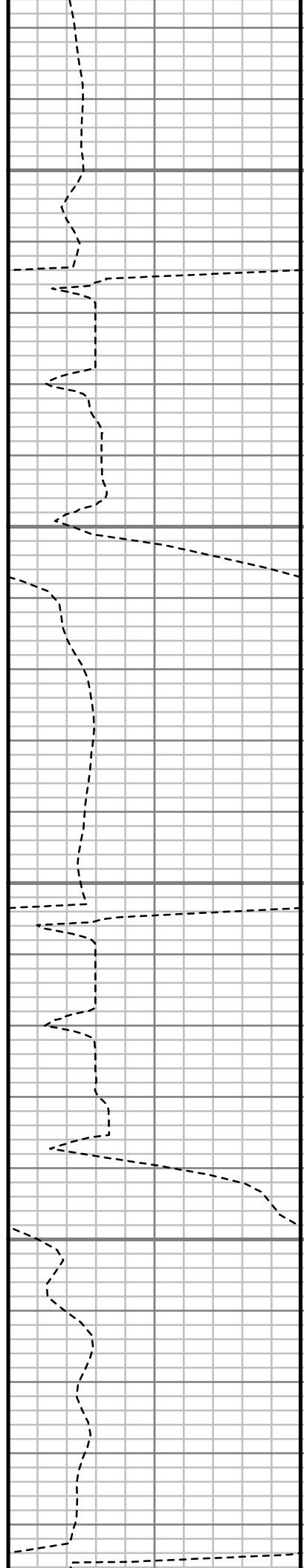


2600

2650

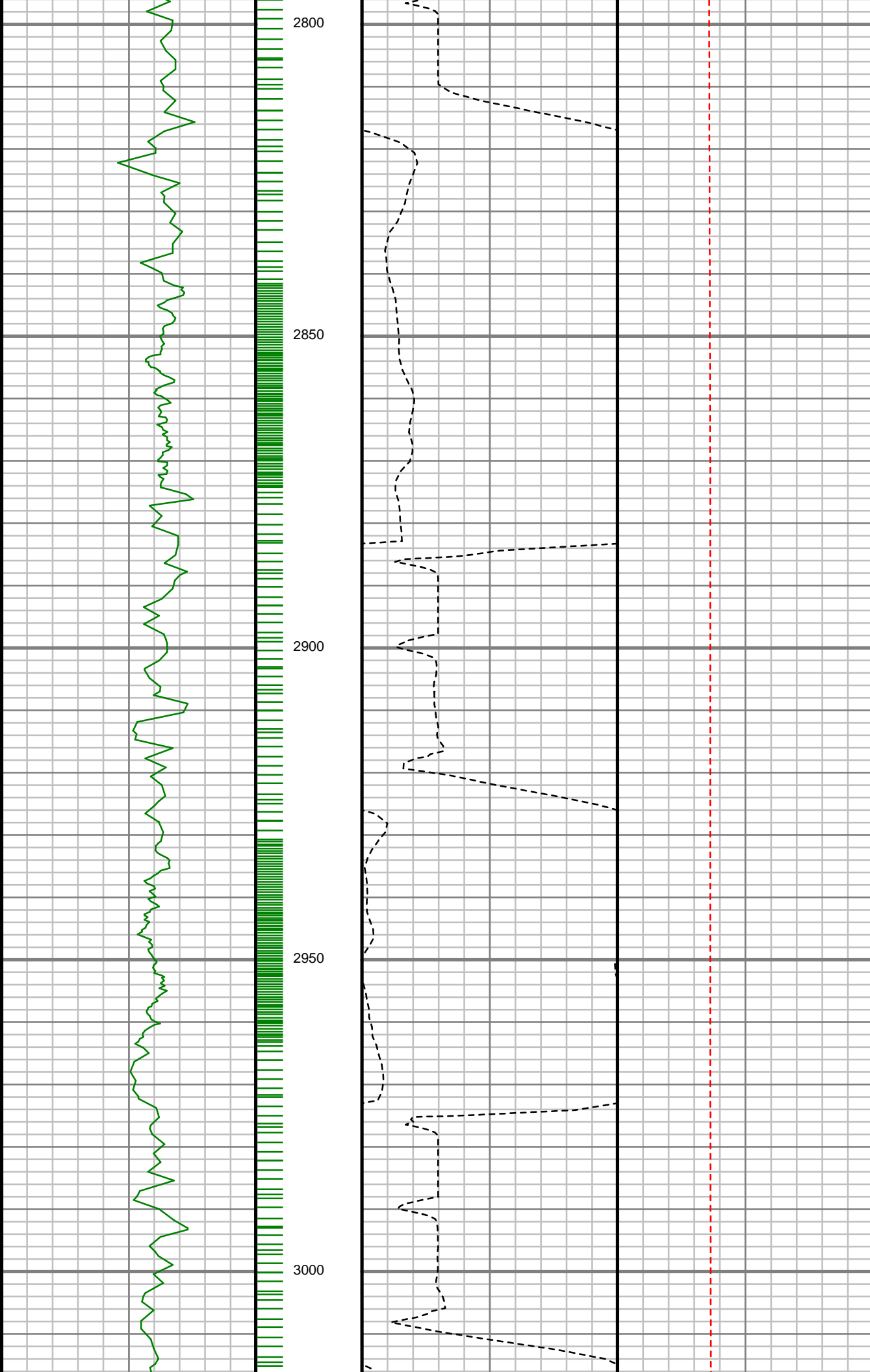
2700

2750



S: 32 MD: 2651.00 ft
Inc: 10.13 deg Az:
340.81 deg TVD:
2634.68 ft

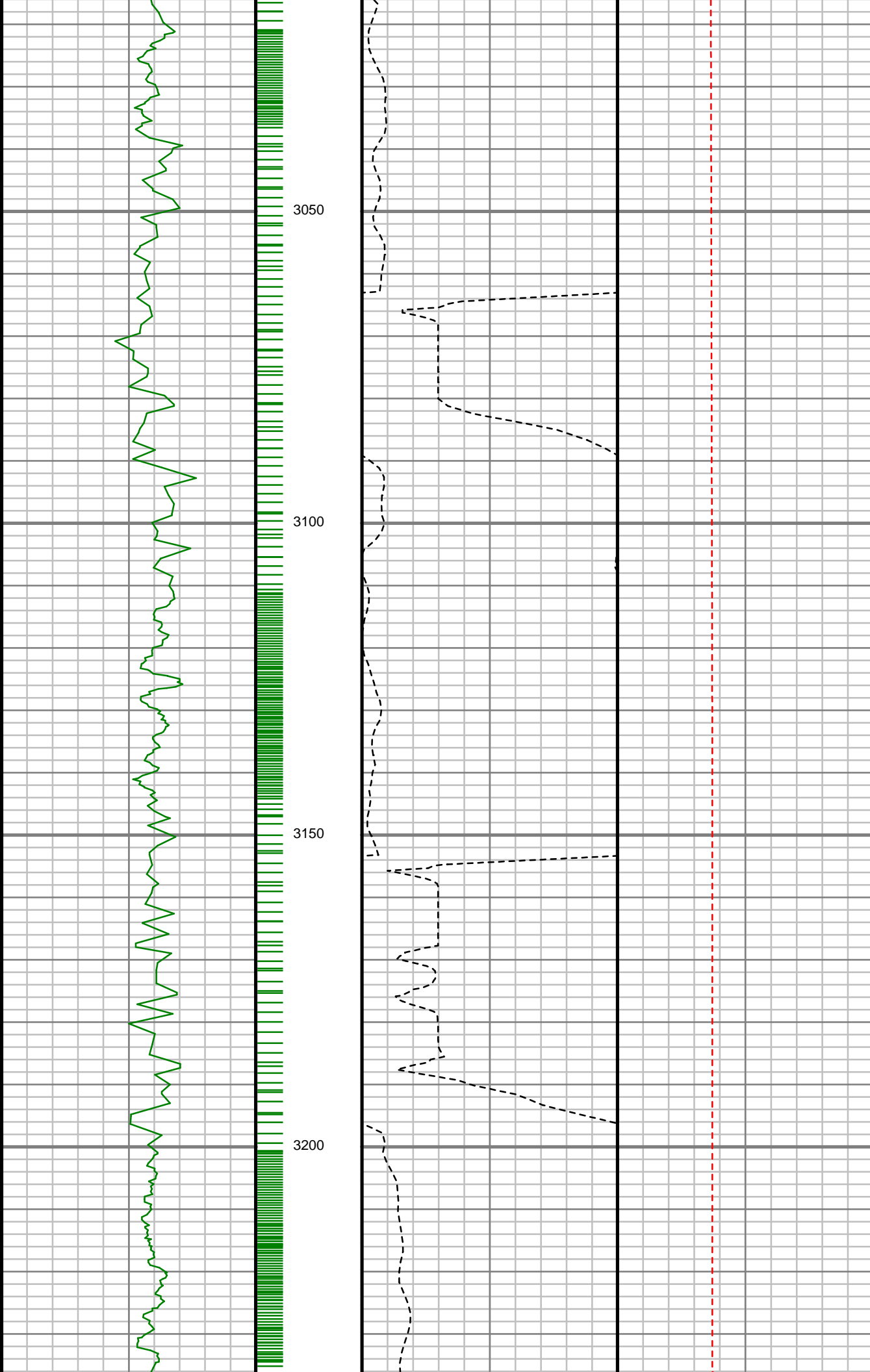
S: 33 MD: 2741.00 ft
Inc: 11.15 deg Az:
341.23 deg TVD:
2723.14 ft



S: 34 MD: 2831.00 ft
Inc: 8.93 deg Az:
337.43 deg TVD:
2811.75 ft

S: 35 MD: 2921.00 ft
Inc: 10.10 deg Az:
337.18 deg TVD:
2900.51 ft

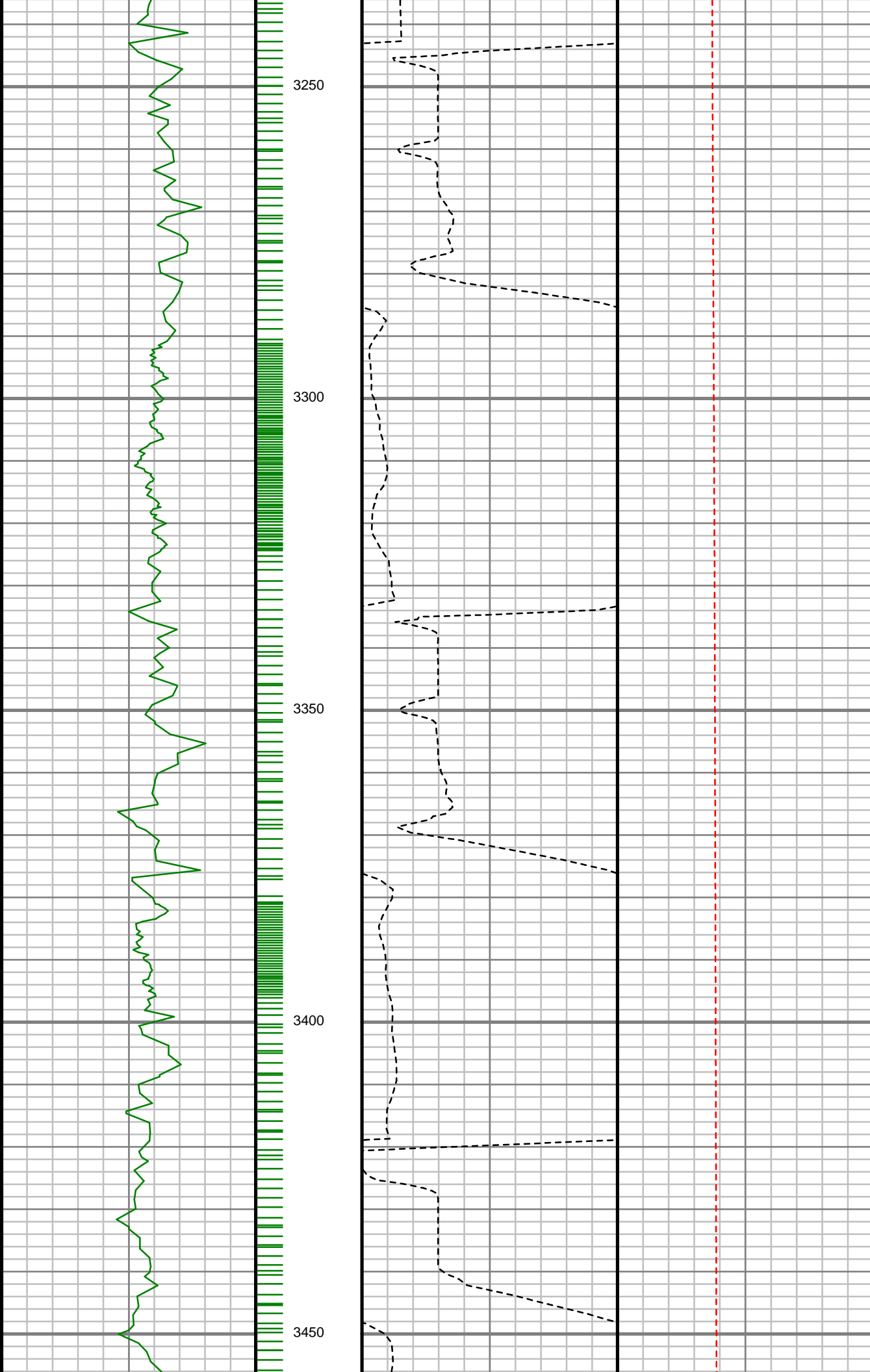
S: 36 MD: 3010.00 ft
Inc: 11.16 deg Az:
338.49 deg TVD:



338.49 deg TVD:
2987.98 ft

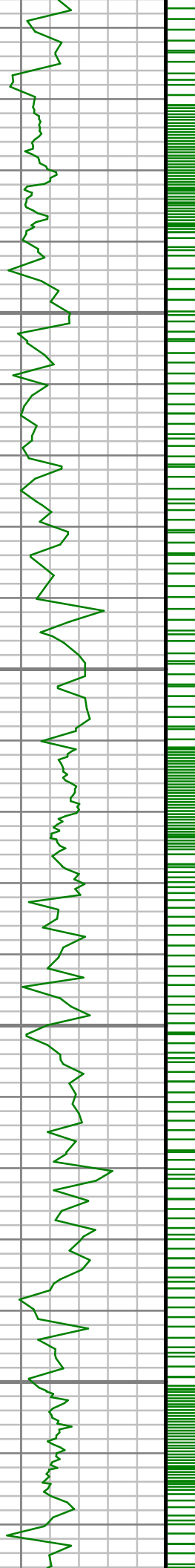
S: 37 MD: 3100.00 ft
Inc: 9.12 deg Az:
336.48 deg TVD:
3076.57 ft

S: 38 MD: 3190.00 ft
Inc: 9.22 deg Az:
337.66 deg TVD:
3165.42 ft



S: 39 MD: 3279.00 ft
Inc: 10.23 deg Az:
343.89 deg TVD:
3253.14 ft

S: 40 MD: 3369.00 ft
Inc: 11.48 deg Az:
338.83 deg TVD:
3341.53 ft



3500

3550

3600

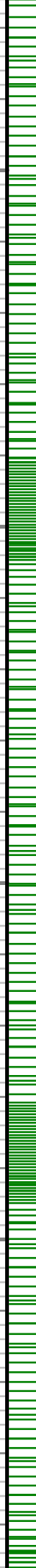
3650



S: 41 MD: 3459.00 ft
Inc: 9.61 deg Az:
336.52 deg TVD:
3430.01 ft

S: 42 MD: 3549.00 ft
Inc: 7.80 deg Az:
337.25 deg TVD:
3518.97 ft

S: 43 MD: 3638.00 ft
Inc: 6.15 deg Az:
339.57 deg TVD:
3607.31 ft

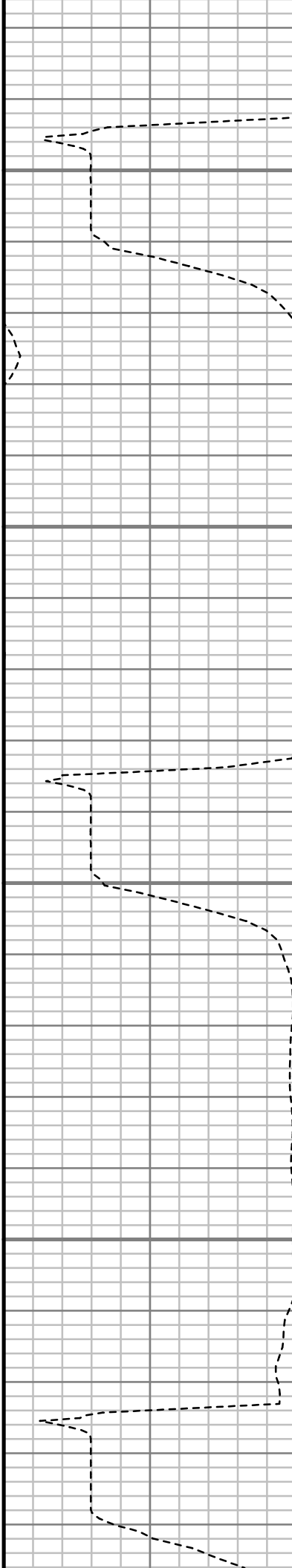


3700

3750

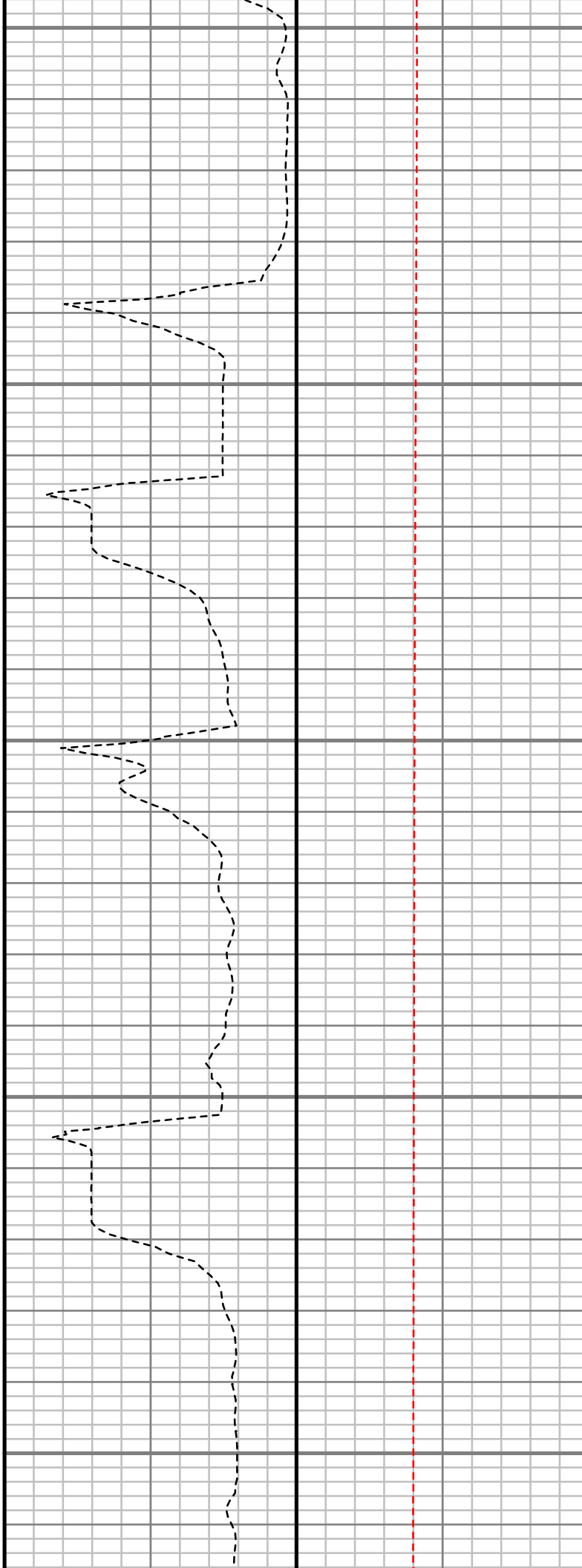
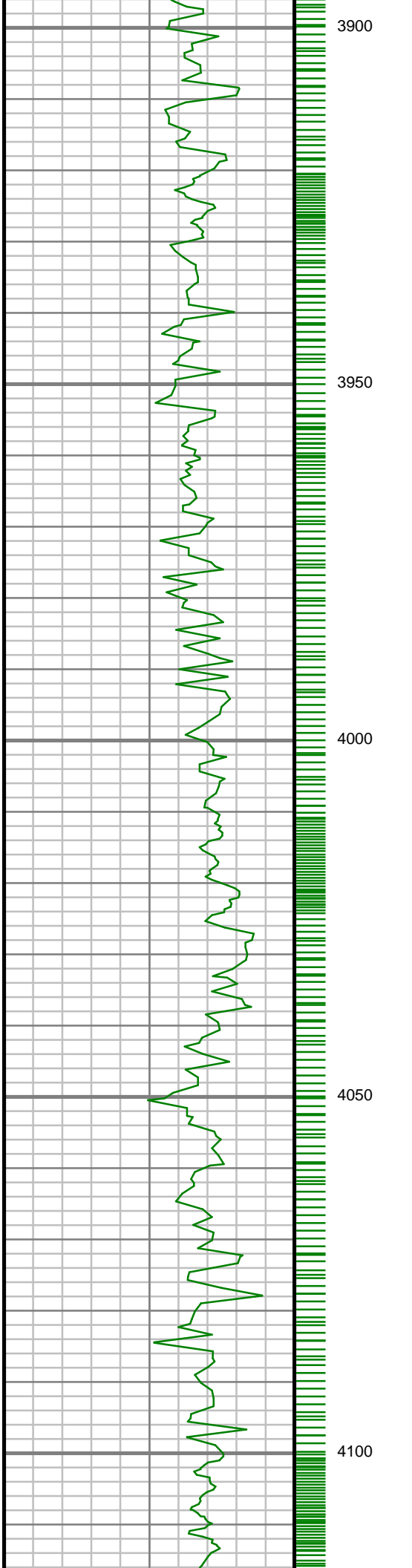
3800

3850



S: 44 MD: 3728.00 ft
Inc: 5.04 deg Az:
335.59 deg TVD:
3696.88 ft

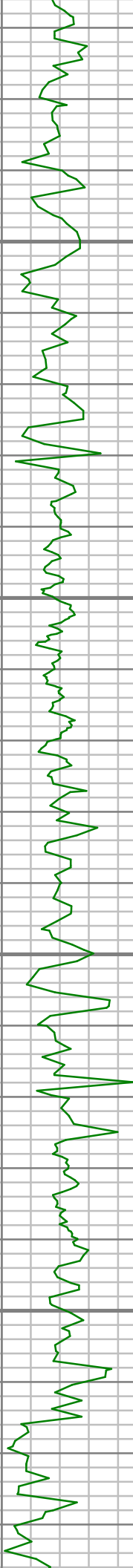
S: 45 MD: 3818.00 ft
Inc: 4.15 deg Az:
330.30 deg TVD:
3786.59 ft



S: 46 MD: 3908.00 ft
Inc: 3.42 deg Az:
322.88 deg TVD:
3876.39 ft

S: 47 MD: 3997.00 ft
Inc: 3.22 deg Az:
310.93 deg TVD:
3965.24 ft

S: 48 MD: 4087.00 ft
Inc: 3.46 deg Az:
307.33 deg TVD:
4055.09 ft

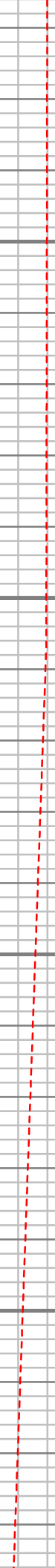
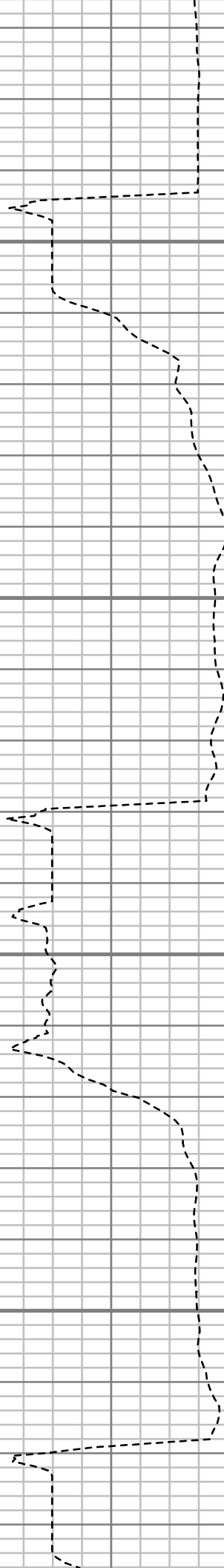


4150

4200

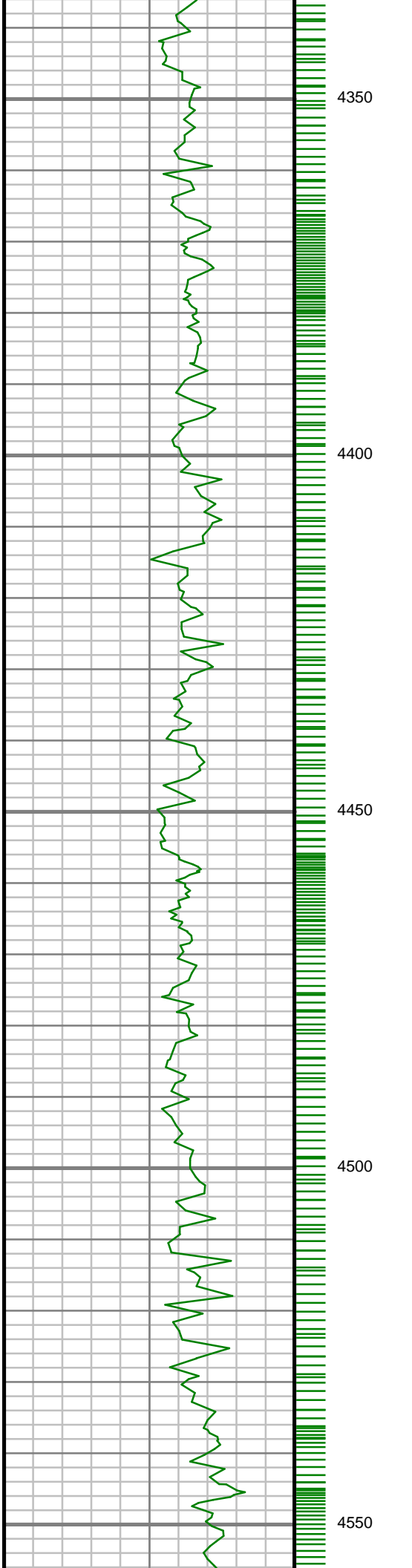
4250

4300



S: 49 MD: 4177.00 ft
Inc: 3.51 deg Az:
306.09 deg TVD:
4144.93 ft

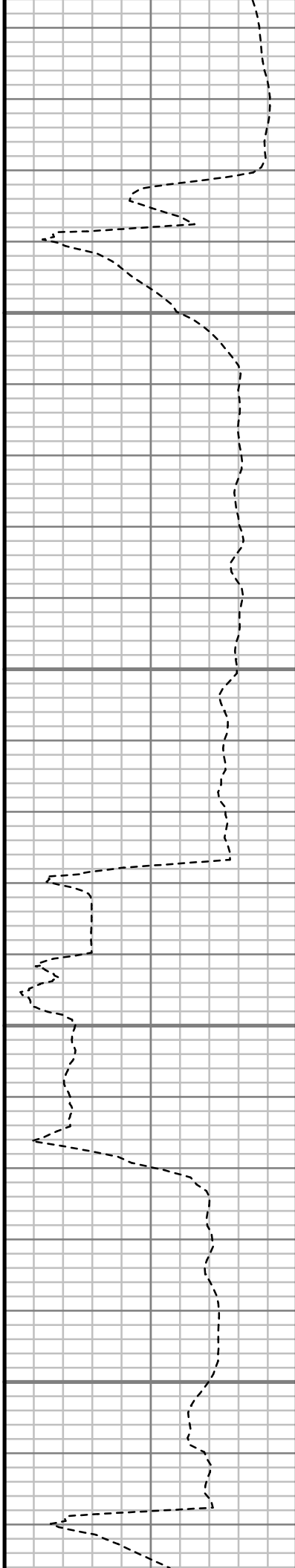
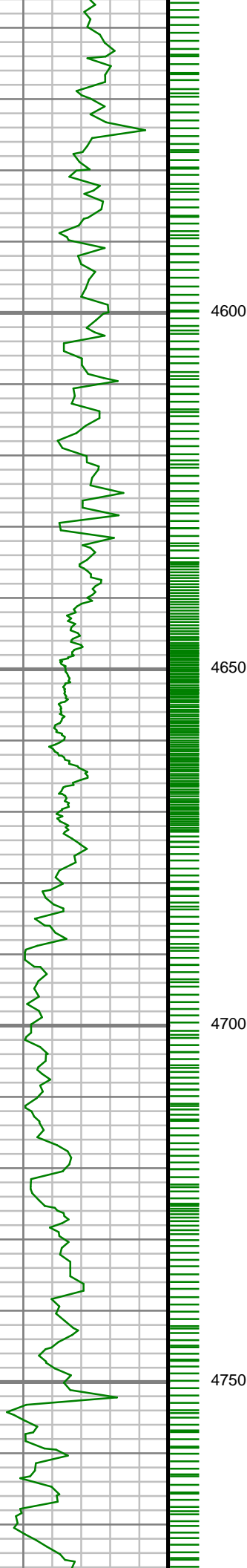
S: 50 MD: 4267.00 ft
Inc: 2.22 deg Az:
251.86 deg TVD:
4234.83 ft



S: 51 MD: 4357.00 ft
Inc: 1.95 deg Az:
257.59 deg TVD:
4324.77 ft

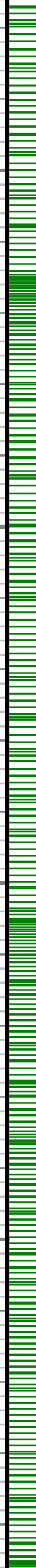
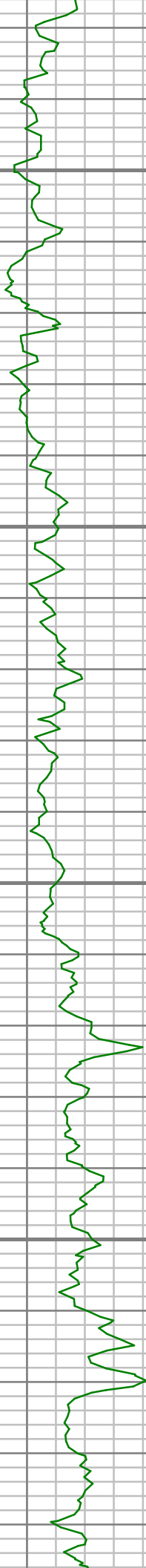
S: 52 MD: 4446.00 ft
Inc: 2.38 deg Az:
253.69 deg TVD:
4413.70 ft

S: 53 MD: 4536.00 ft
Inc: 2.46 deg Az:
246.47 deg TVD:
4503.62 ft



S: 54 MD: 4626.00 ft
Inc: 1.72 deg Az:
244.27 deg TVD:
4593.56 ft

S: 55 MD: 4716.00 ft
Inc: 0.96 deg Az:
202.70 deg TVD:
4683.54 ft

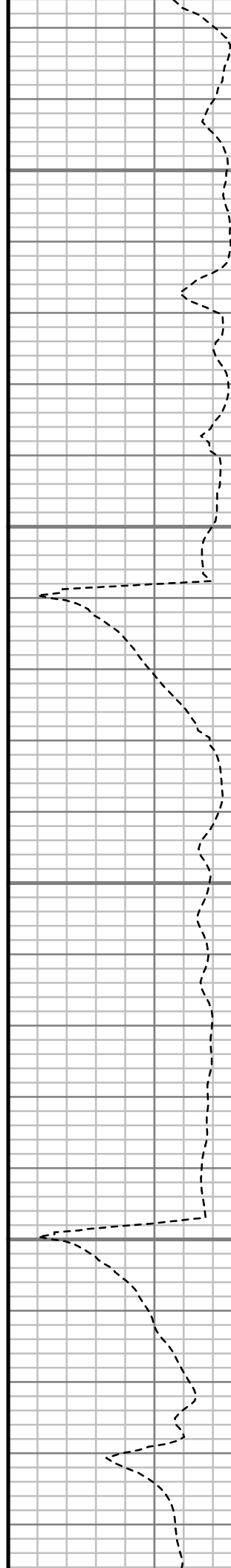


4800

4850

4900

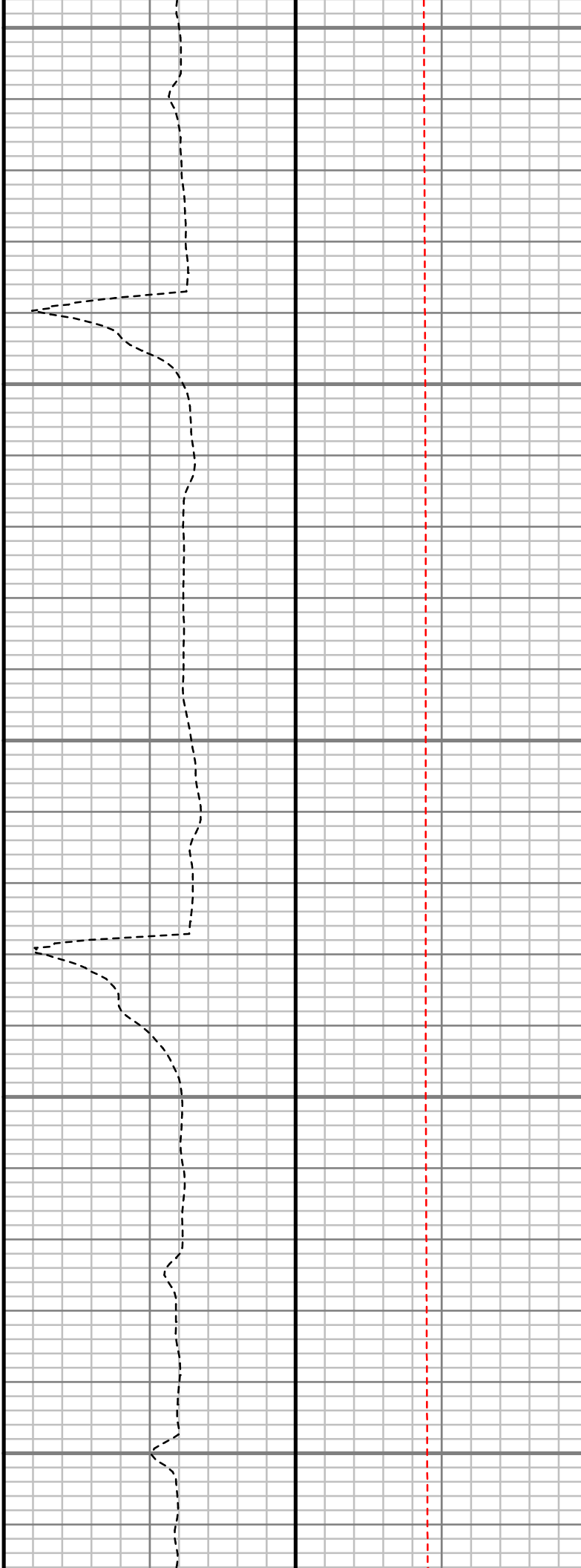
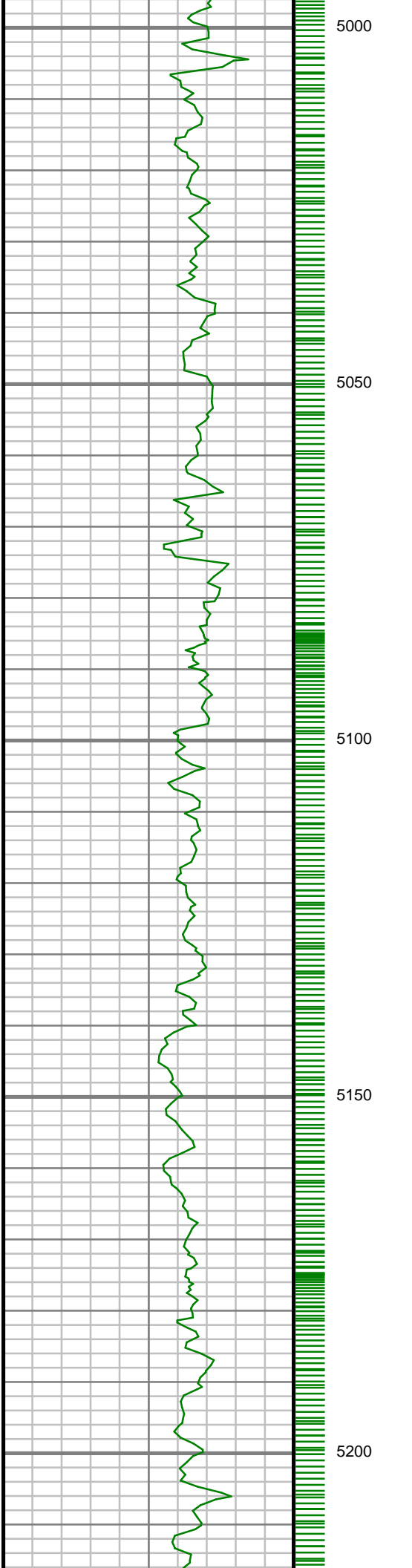
4950



S: 56 MD: 4806.00 ft
Inc: 0.71 deg Az:
179.21 deg TVD:
4773.53 ft

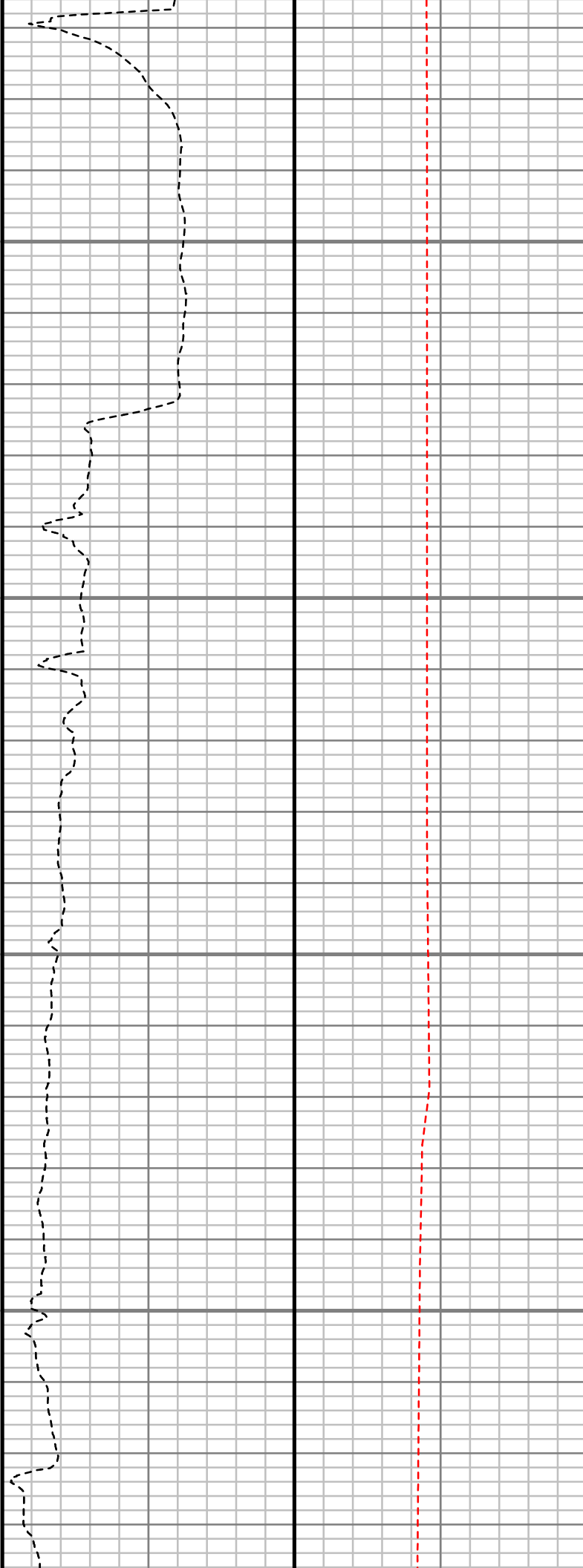
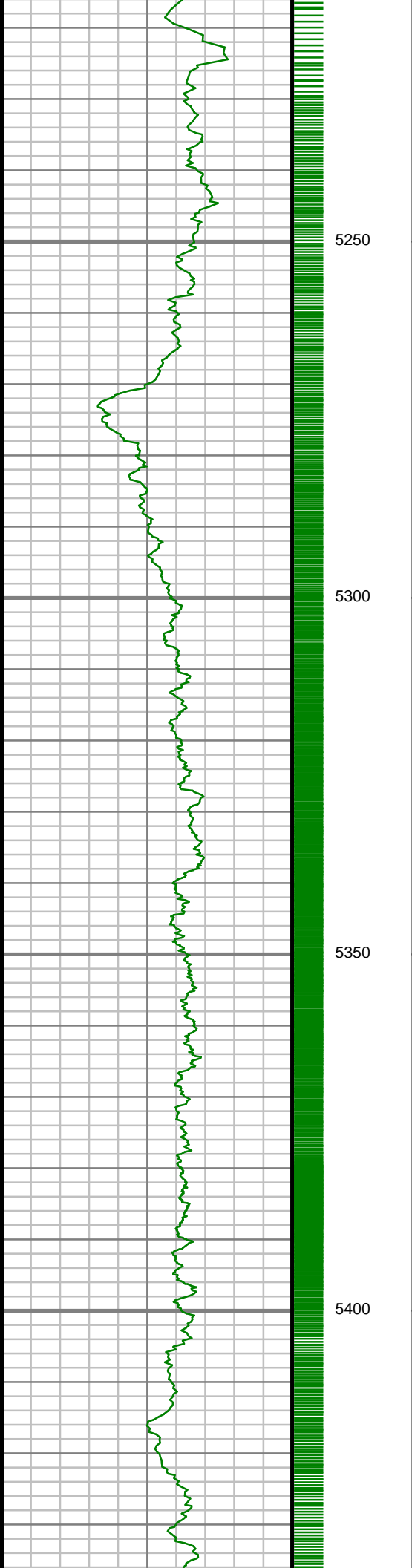
S: 57 MD: 4895.00 ft
Inc: 0.78 deg Az:
177.68 deg TVD:
4862.52 ft

S: 58 MD: 4985.00 ft
Inc: 0.75 deg Az:
194.60 deg TVD:
4952.51 ft



S: 59 MD: 5075.00 ft
Inc: 0.45 deg Az:
205.06 deg TVD:
5042.51 ft

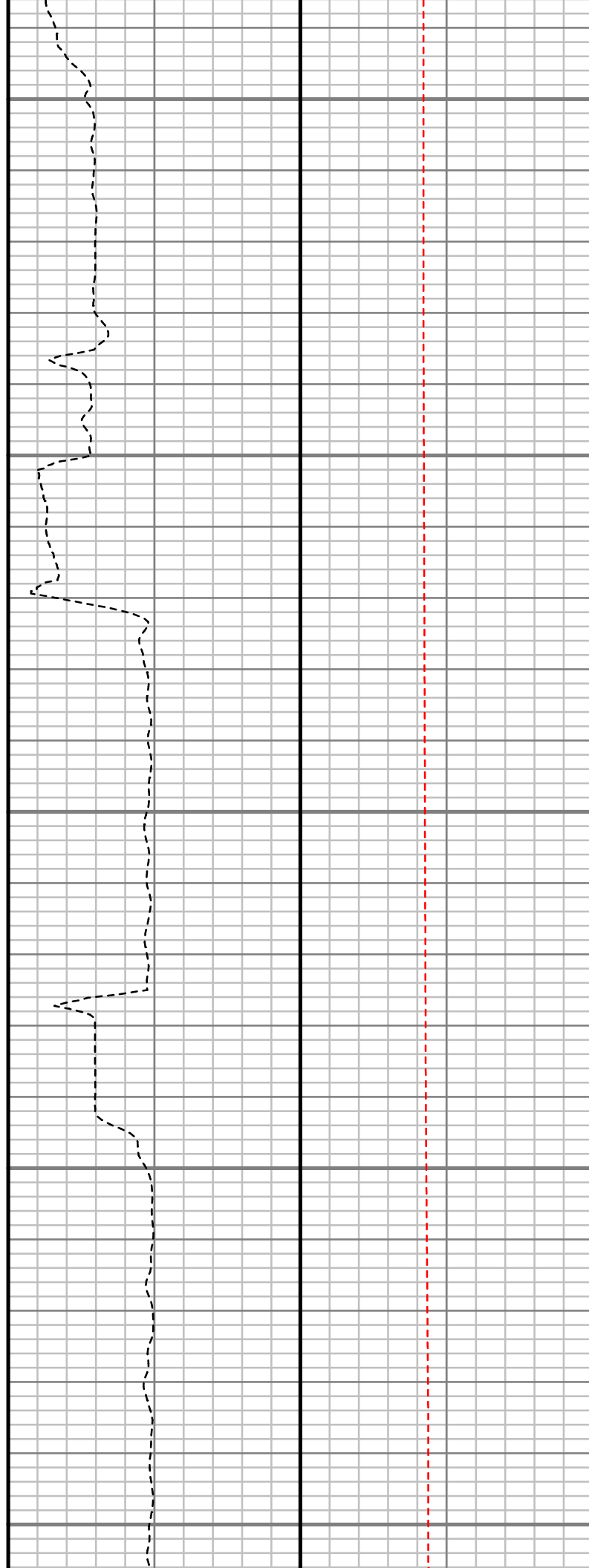
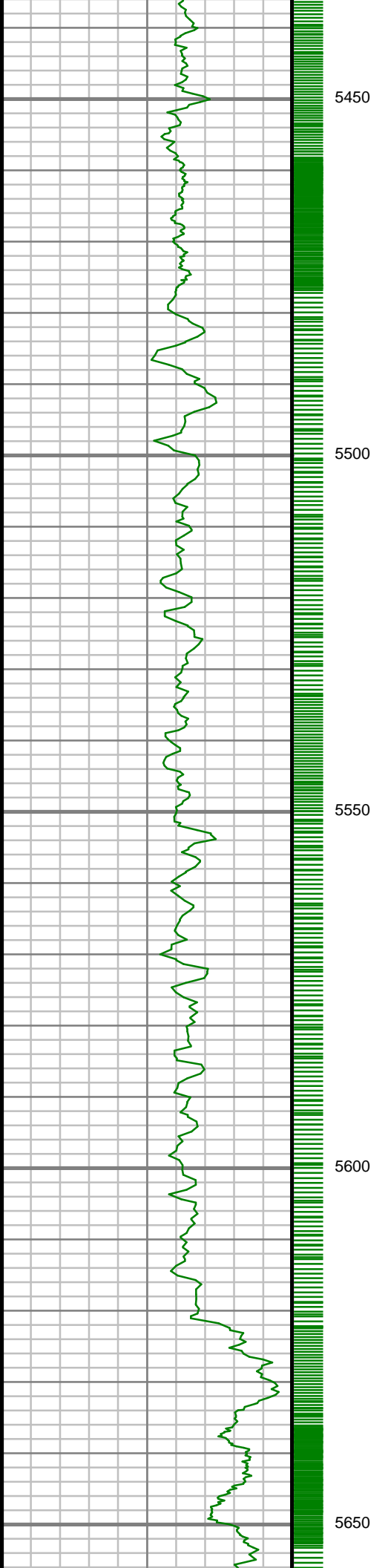
S: 60 MD: 5165.00 ft
Inc: 0.66 deg Az:
246.22 deg TVD:
5132.51 ft



S: 61 MD: 5255.00 ft
Inc: 0.69 deg Az:
249.53 deg TVD:
5222.50 ft

S: 62 MD: 5344.00 ft
Inc: 0.63 deg Az:
269.19 deg TVD:
5311.49 ft

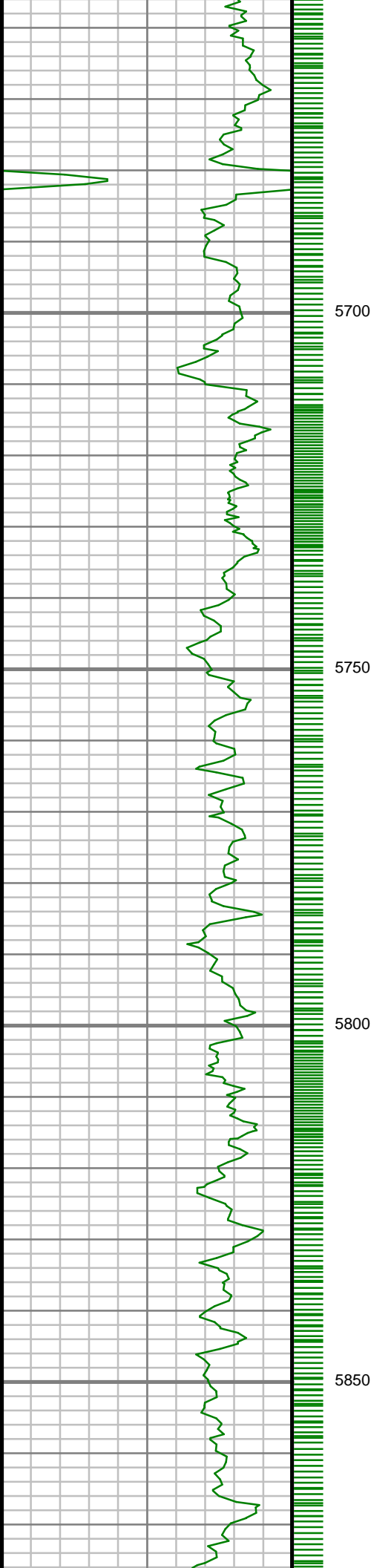
S: 63 MD: 5434.00 ft



Inc: 0.65 deg Az:
253.31 deg TVD:
5401.49 ft

S: 64 MD: 5524.00 ft
Inc: 1.39 deg Az: 3.17
deg TVD: 5491.48 ft

S: 65 MD: 5614.00 ft
Inc: 1.75 deg Az: 0.76
deg TVD: 5581.44 ft



5700

5750

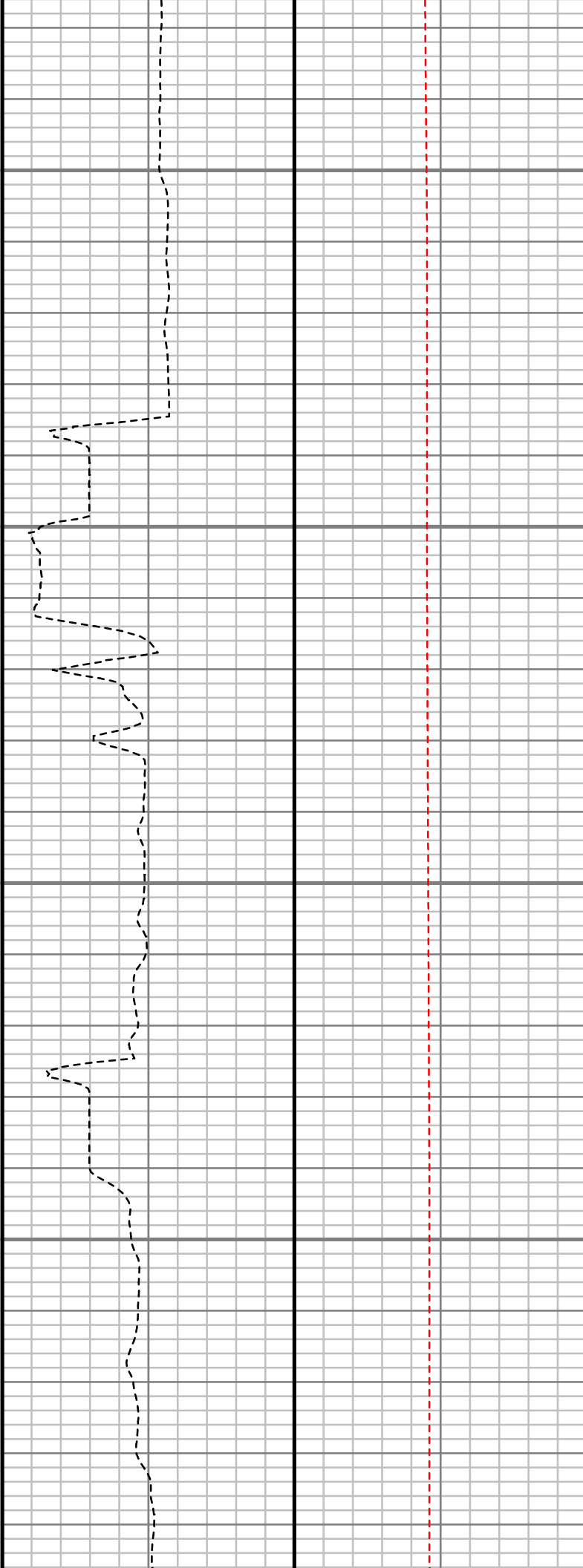
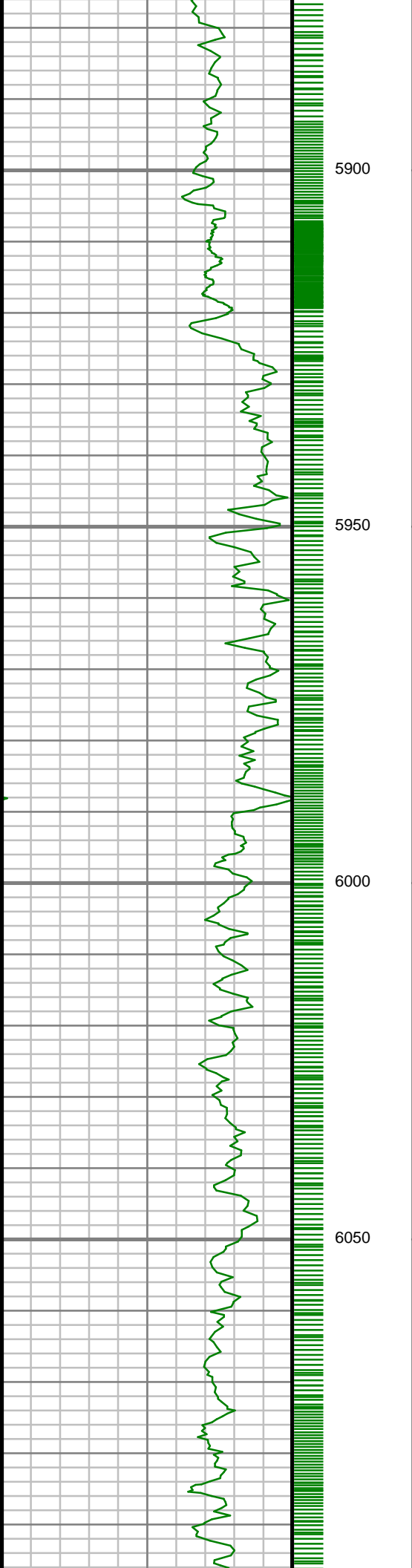
5800

5850



S: 66 MD: 5704.00 ft
Inc: 1.27 deg Az: 37.83
deg TVD: 5671.42 ft

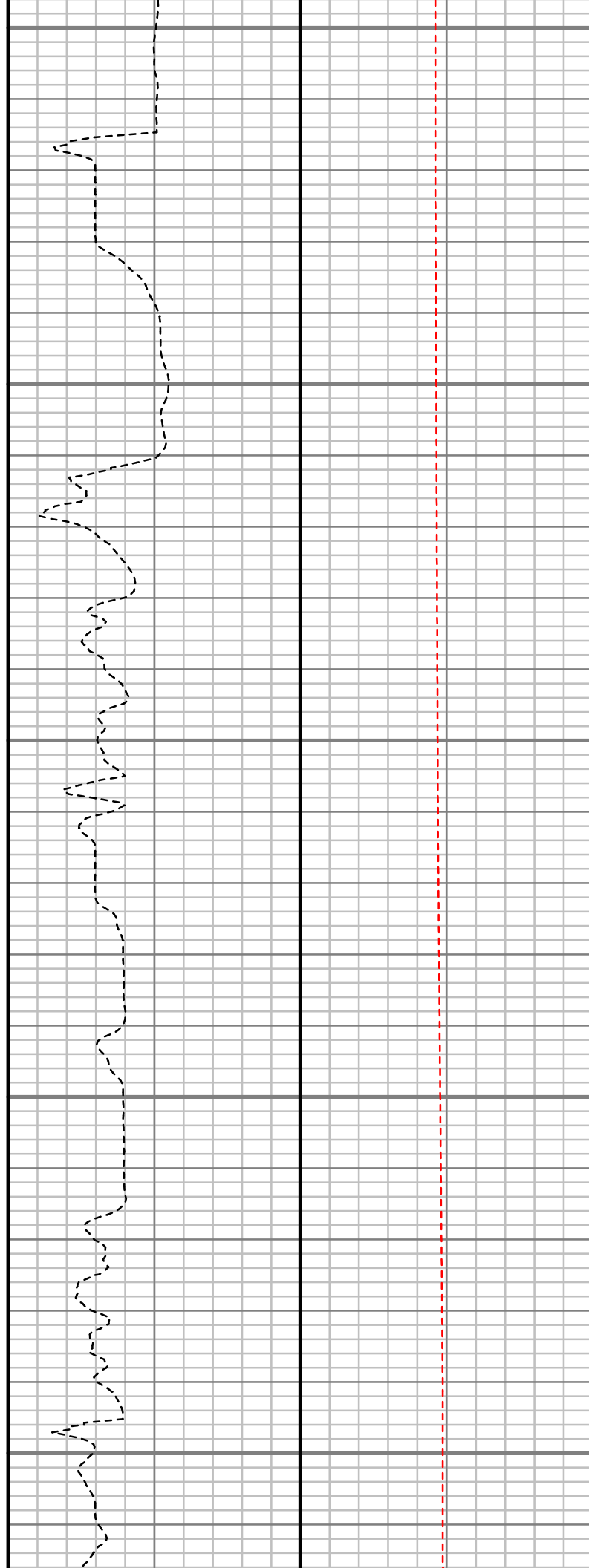
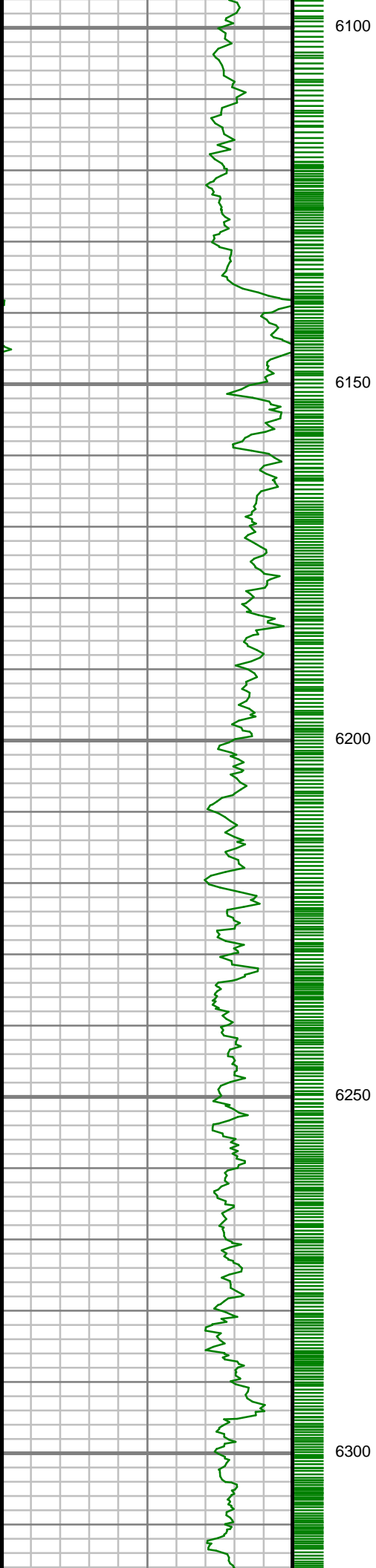
S: 67 MD: 5793.00 ft
Inc: 1.31 deg Az: 18.90
deg TVD: 5760.39 ft

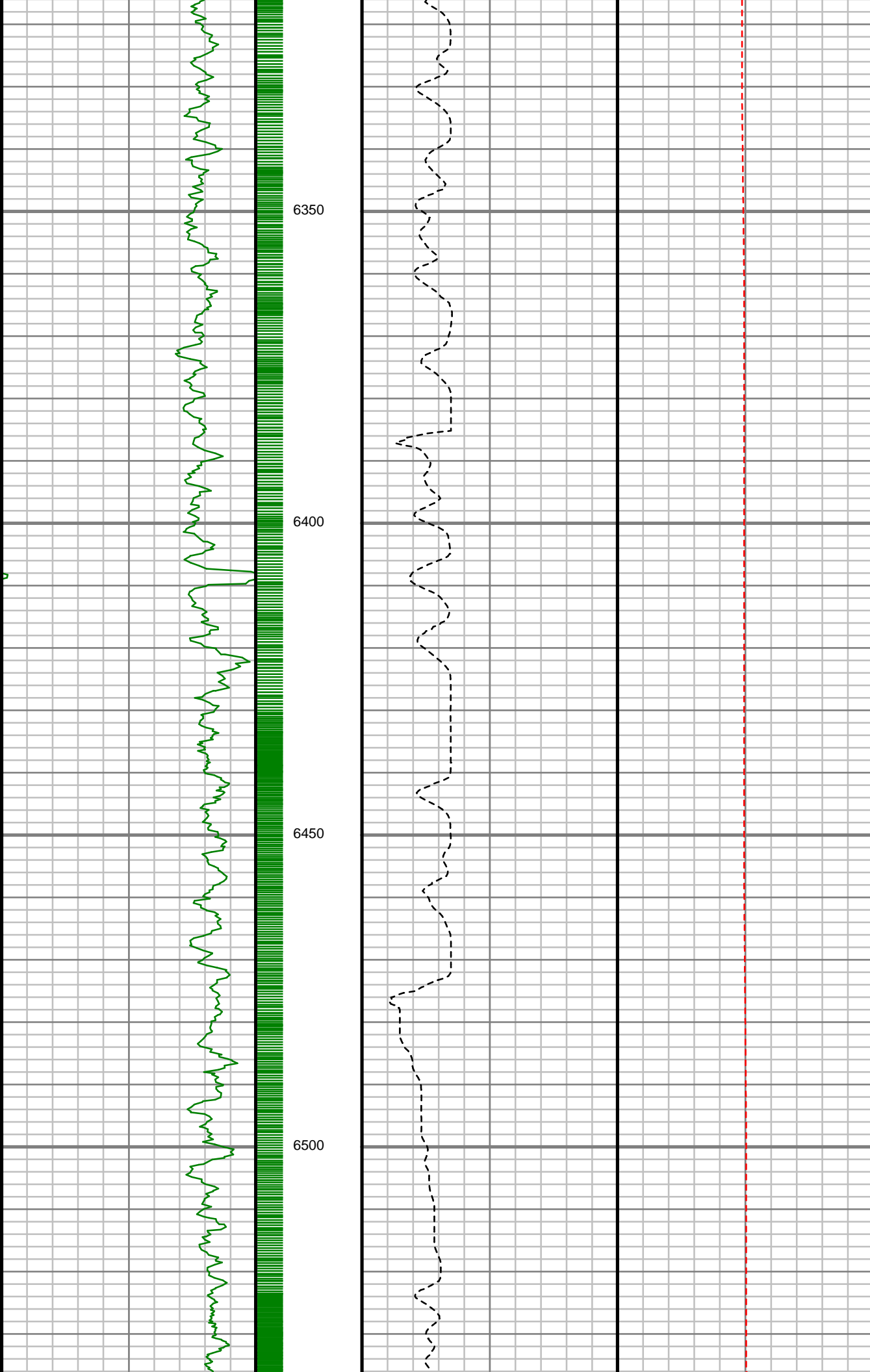


S: 68 MD: 5883.00 ft
Inc: 1.21 deg Az: 0.89
deg TVD: 5850.37 ft

S: 69 MD: 5973.00 ft
Inc: 1.47 deg Az: 91.89
deg TVD: 5940.36 ft

S: 70 MD: 6063.00 ft
Inc: 1.02 deg Az: 88.03
deg TVD: 6030.33 ft

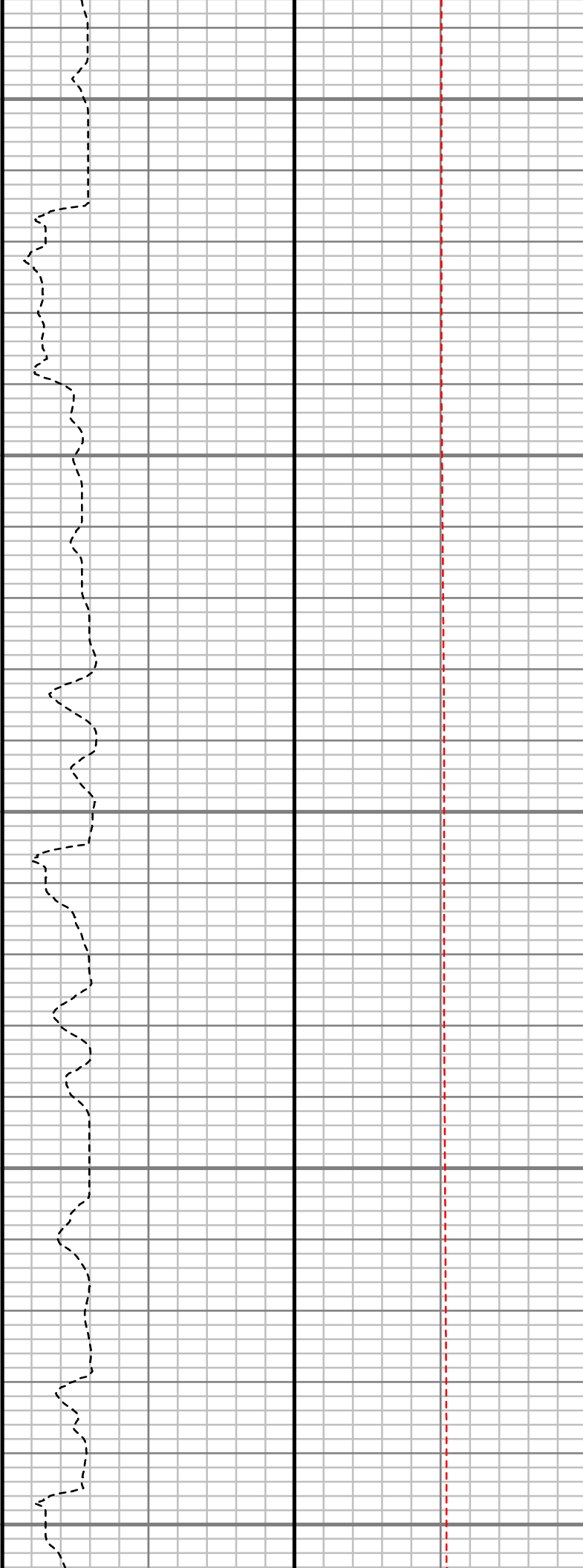
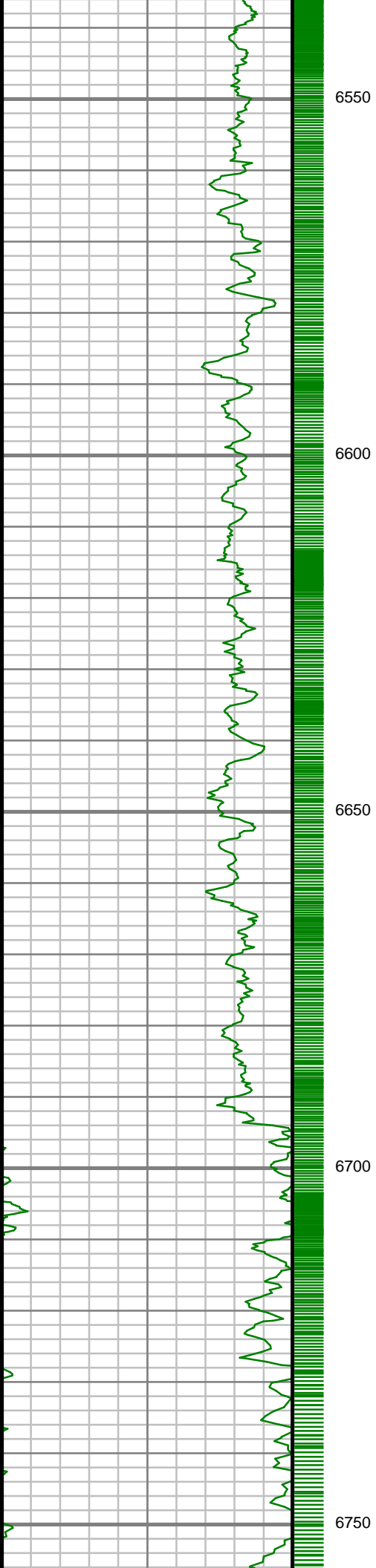




S: 71 MD: 6332.00 ft
Inc: 1.29 deg Az: 21.80
deg TVD: 6299.29 ft

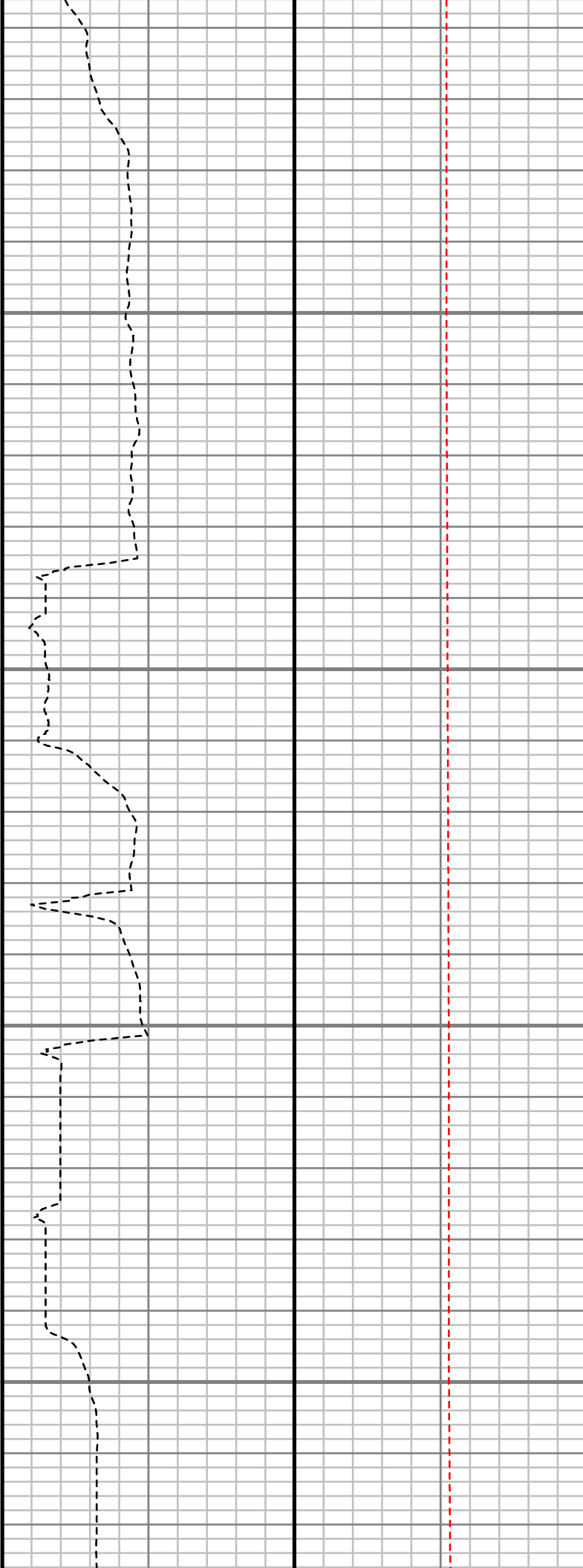
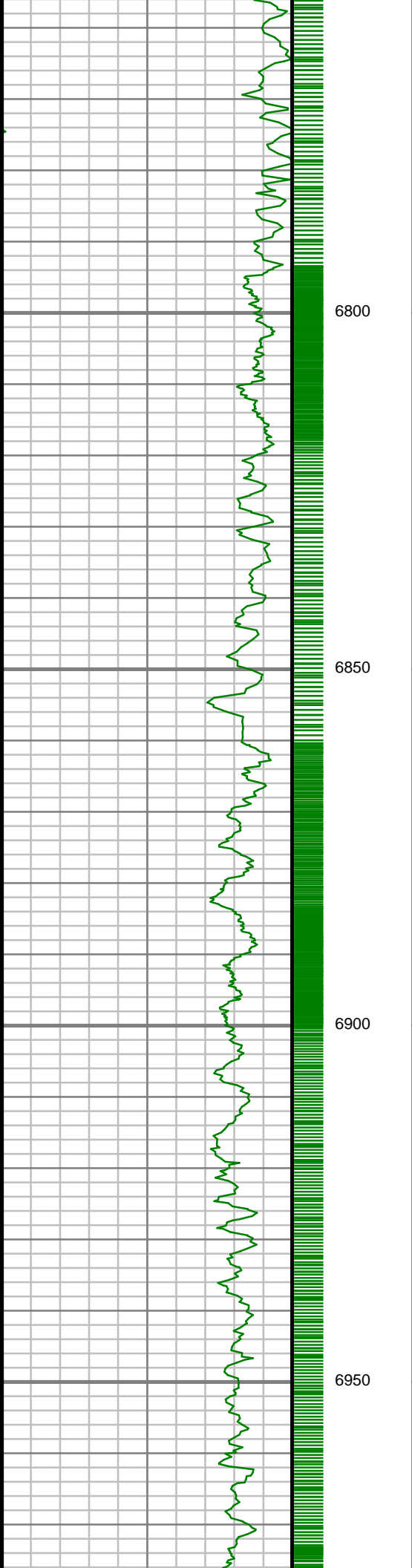
S: 72 MD: 6422.00 ft
Inc: 1.55 deg Az: 3.25
deg TVD: 6389.26 ft

S: 73 MD: 6512.00 ft
Inc: 1.70 deg Az:
327.28 deg TVD:
6479.23 ft



S: 74 MD: 6602.00 ft
Inc: 0.33 deg Az: 50.58
deg TVD: 6569.21 ft

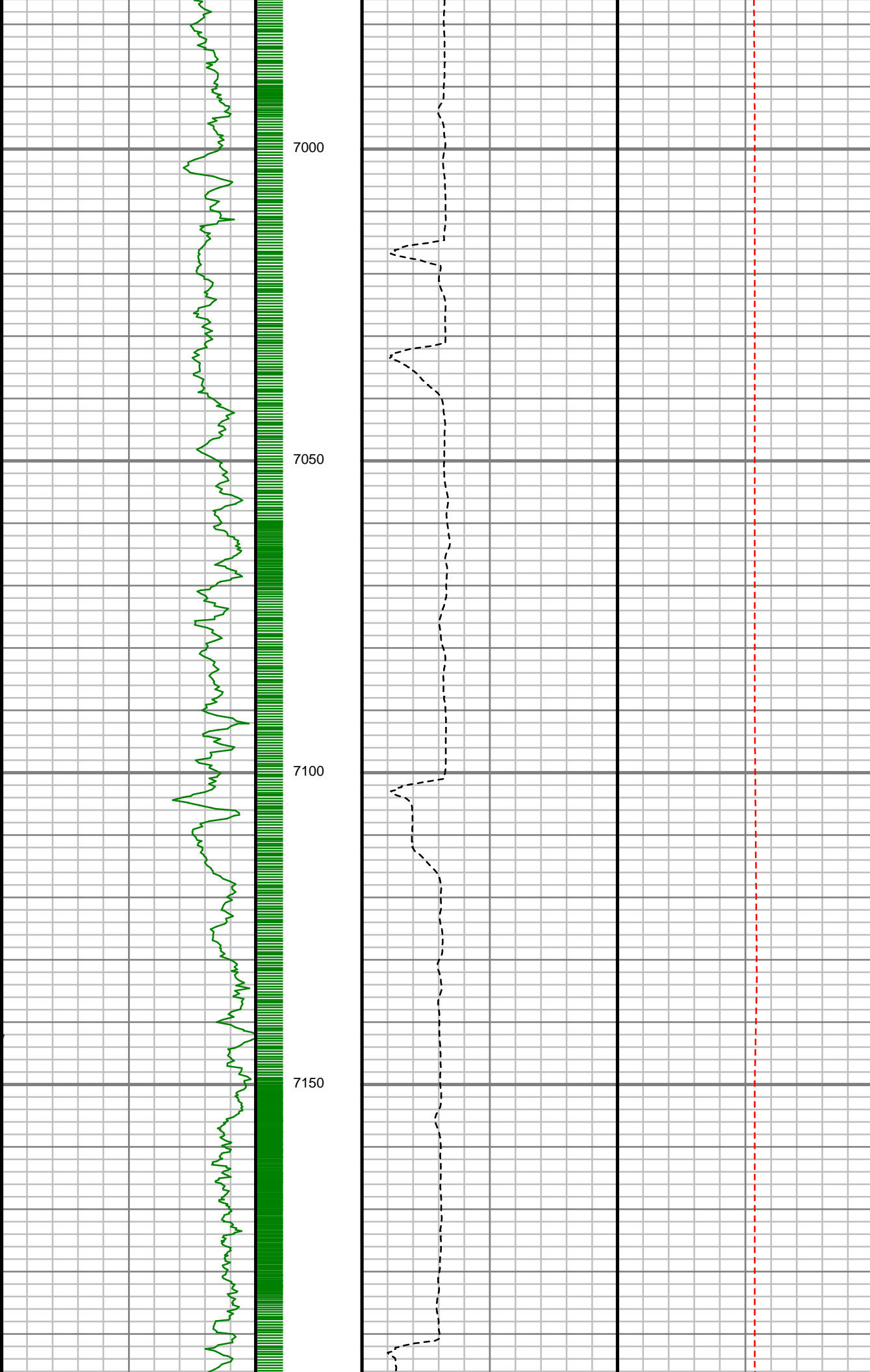
S: 75 MD: 6691.00 ft
Inc: 0.86 deg Az:
358.59 deg TVD:
6658.21 ft



S: 76 MD: 6781.00 ft
Inc: 0.75 deg Az: 323.46 deg TVD: 6748.20 ft

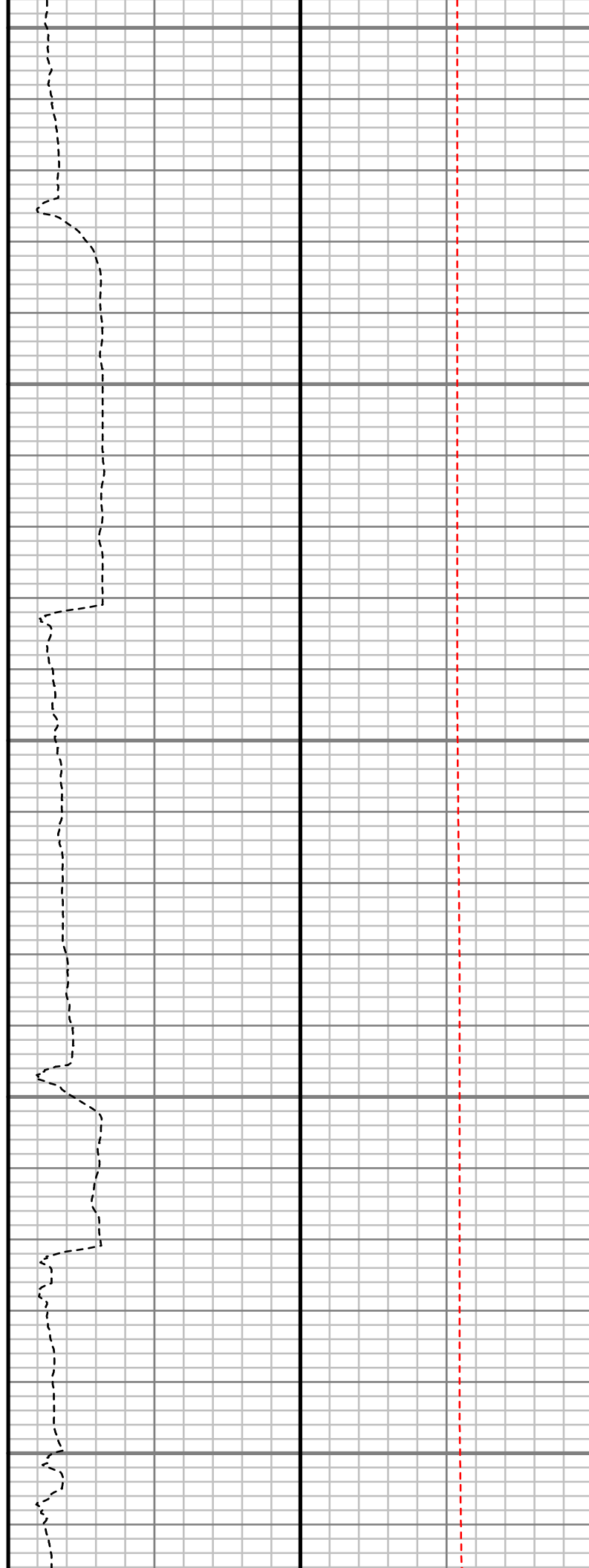
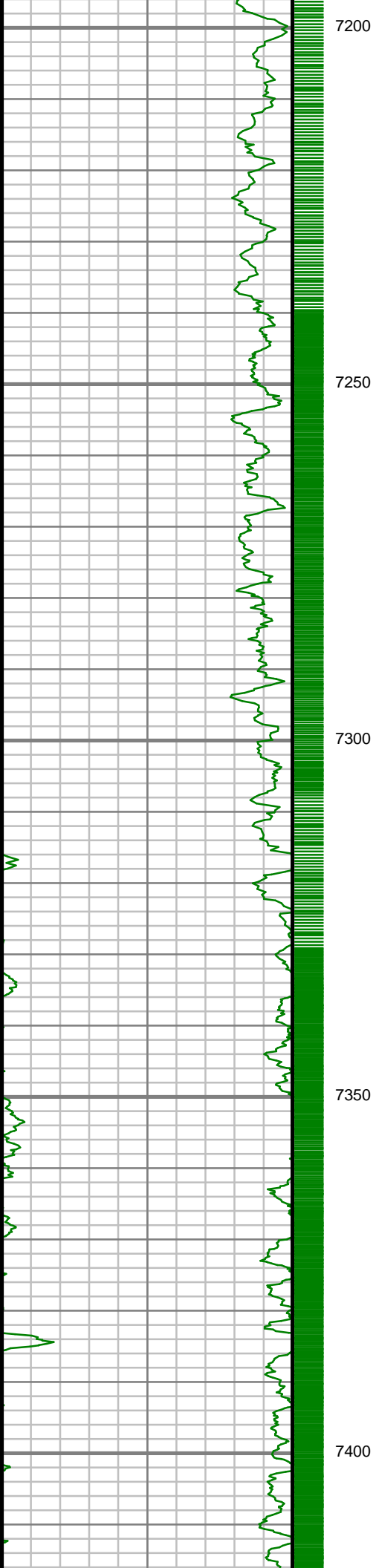
S: 77 MD: 6871.00 ft
Inc: 1.21 deg Az: 28.50 deg TVD: 6838.19 ft

S: 78 MD: 6961.00 ft
Inc: 1.53 deg Az: 20.05 deg TVD: 6928.16 ft



S: 79 MD: 7051.00 ft
Inc: 0.92 deg Az: 3.04
deg TVD: 7018.14 ft

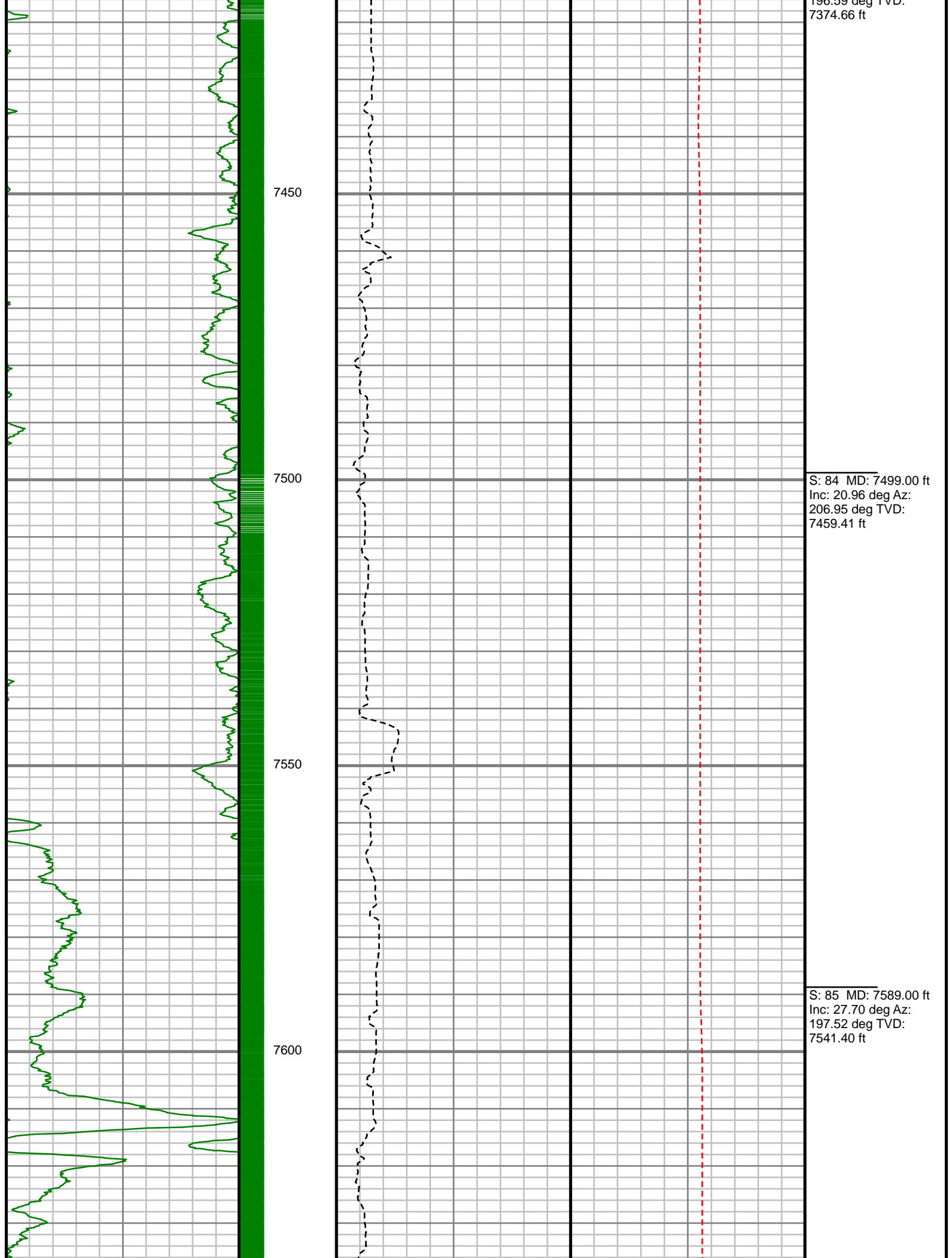
S: 80 MD: 7140.00 ft
Inc: 0.76 deg Az:
340.41 deg TVD:
7107.13 ft

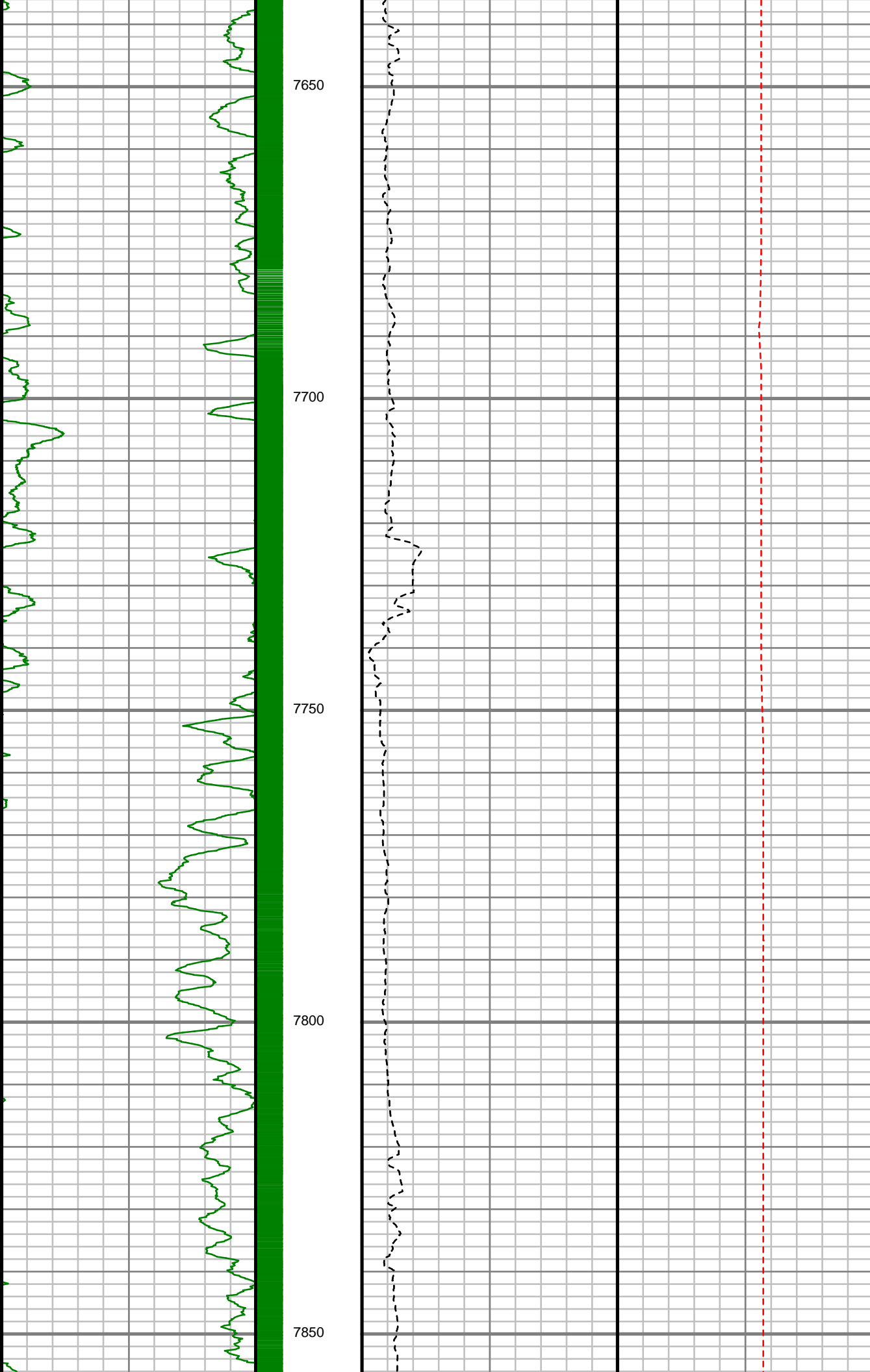


S: 81 MD: 7230.00 ft
Inc: 3.69 deg Az:
185.07 deg TVD:
7197.08 ft

S: 82 MD: 7320.00 ft
Inc: 8.70 deg Az:
190.41 deg TVD:
7286.53 ft

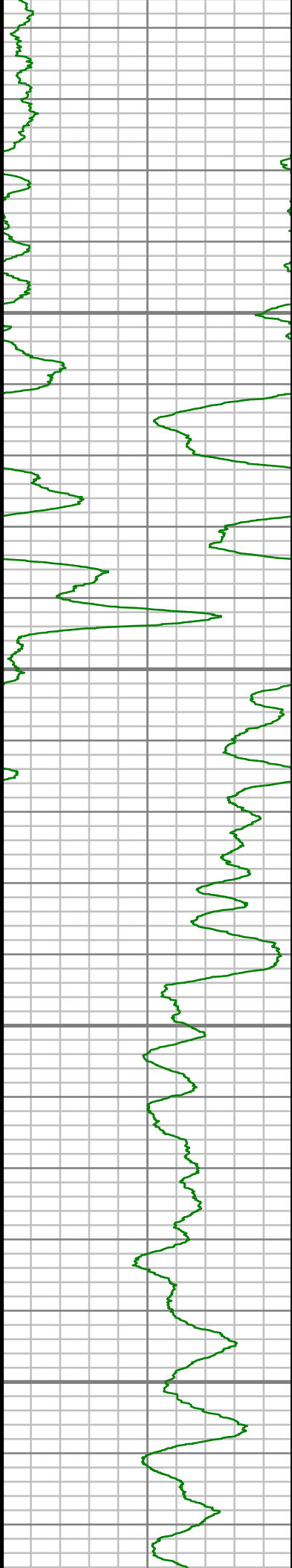
S: 83 MD: 7410.00 ft
Inc: 14.48 deg Az:
106.50 deg TVD:





S: 86 MD: 7679.00 ft
Inc: 35.58 deg Az:
190.26 deg TVD:
7617.99 ft

S: 87 MD: 7769.00 ft
Inc: 38.13 deg Az:
179.74 deg TVD:
7690.07 ft

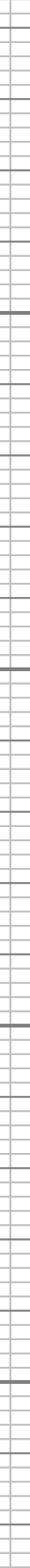
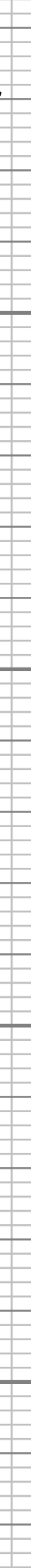
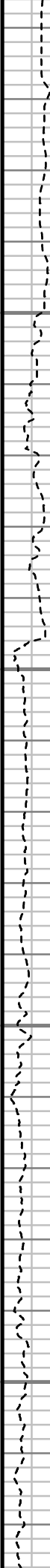


7900

7950

8000

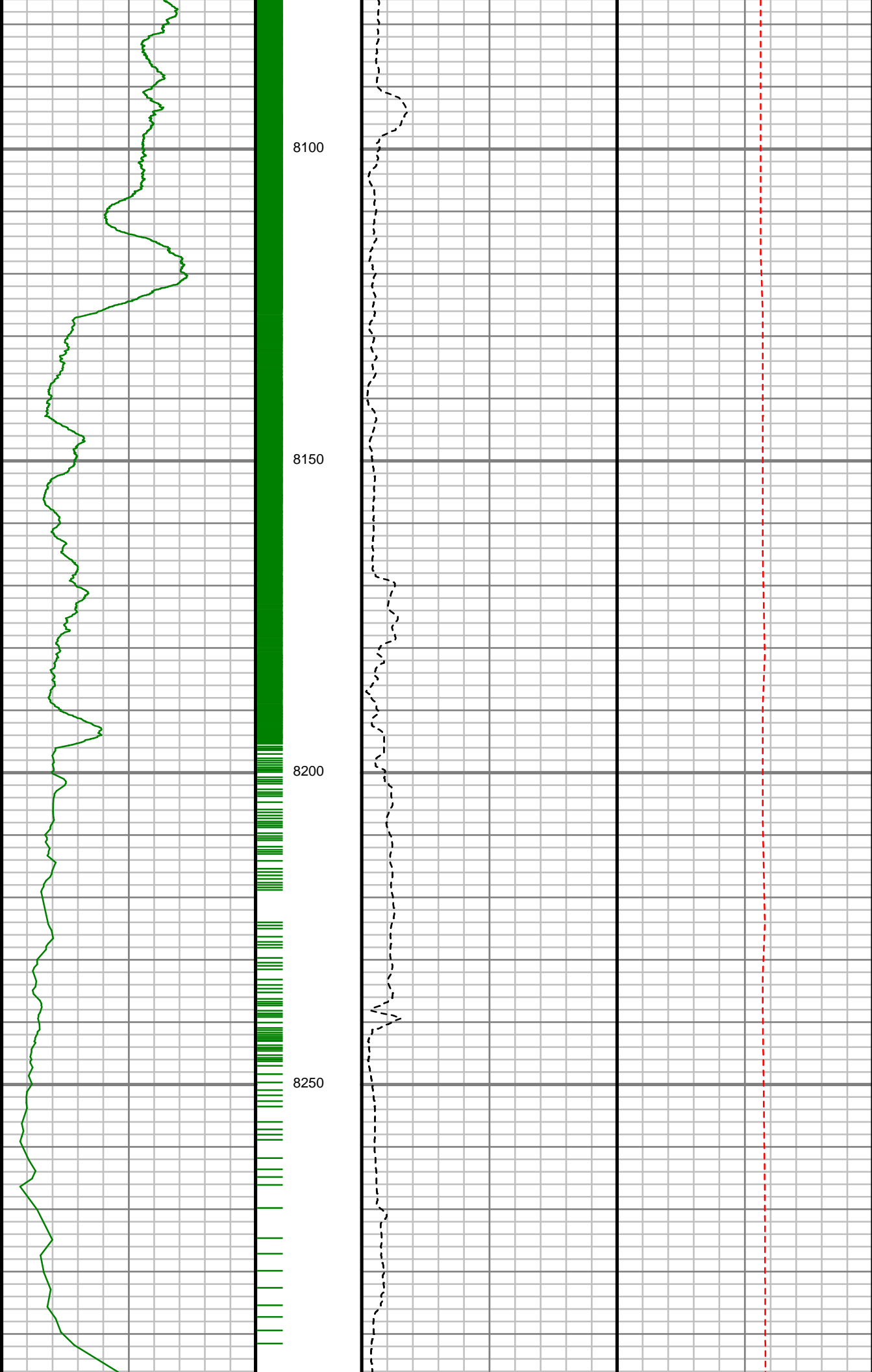
8050



S: 88 MD: 7858.00 ft
Inc: 43.99 deg Az:
182.56 deg TVD:
7757.15 ft

S: 89 MD: 7948.00 ft
Inc: 53.53 deg Az:
182.00 deg TVD:
7816.41 ft

S: 90 MD: 8038.00 ft
Inc: 66.17 deg Az:
178.95 deg TVD:
7861.54 ft



8100

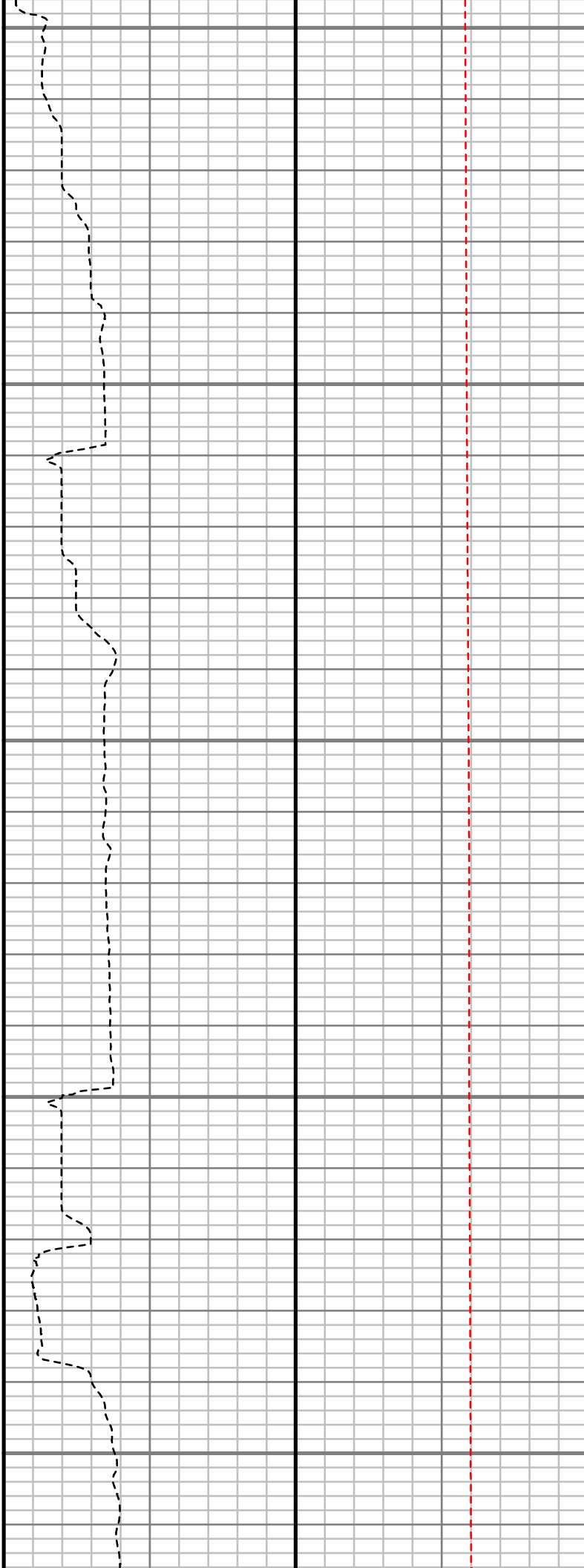
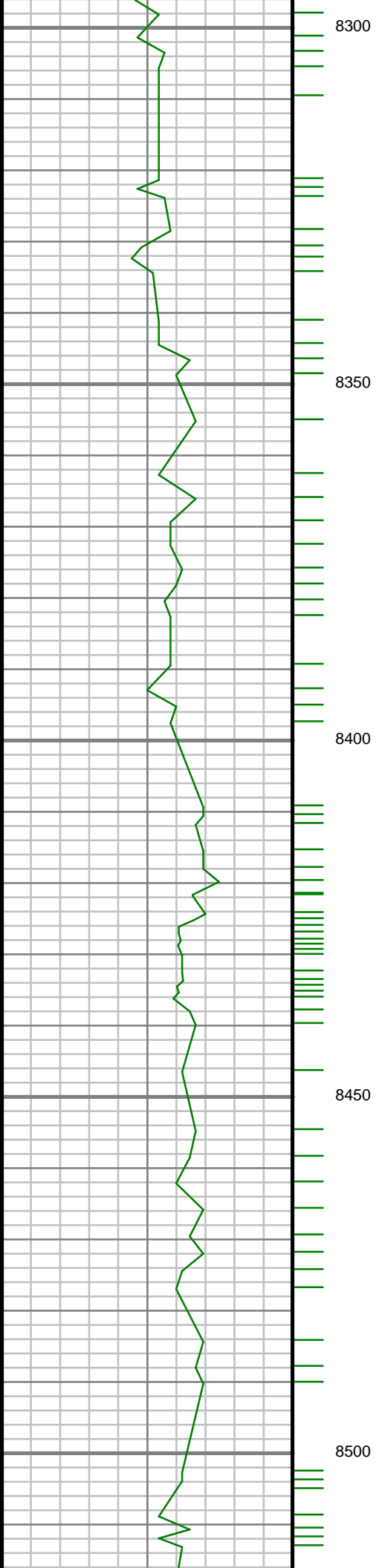
8150

8200

8250

S: 91 MD: 8128.00 ft
Inc: 79.14 deg Az:
178.85 deg TVD:
7888.31 ft

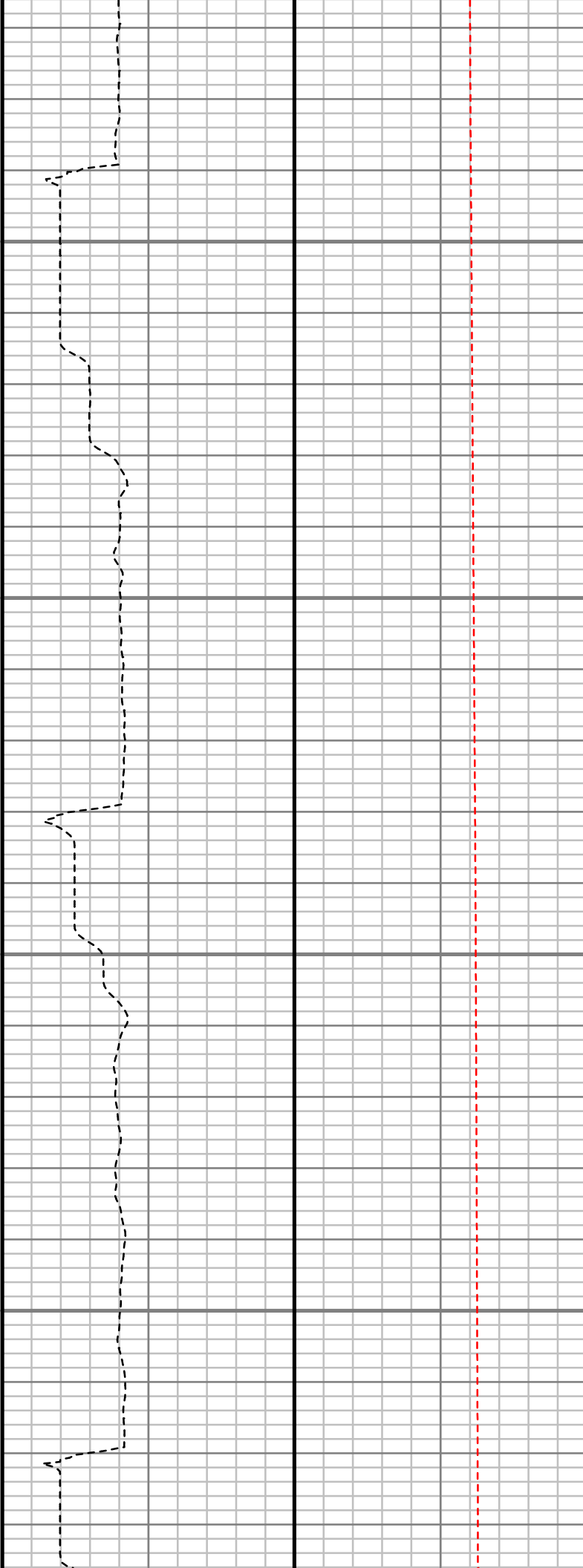
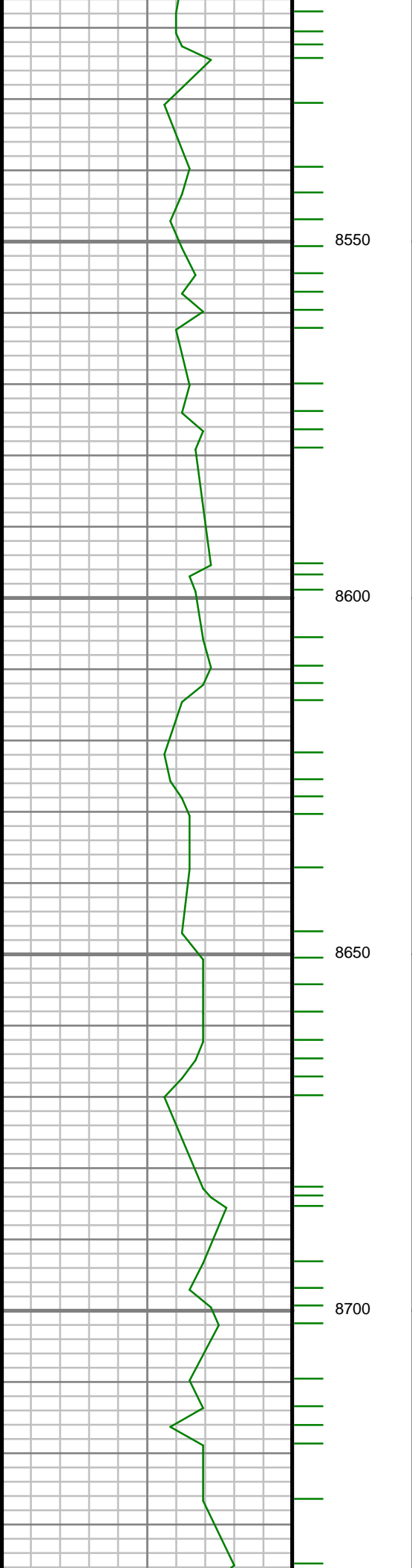
S: 92 MD: 8185.00 ft
Inc: 86.00 deg Az:
177.94 deg TVD:
7895.68 ft



S: 93 MD: 8300.00 ft
Inc: 88.49 deg Az:
177.04 deg TVD:
7901.21 ft

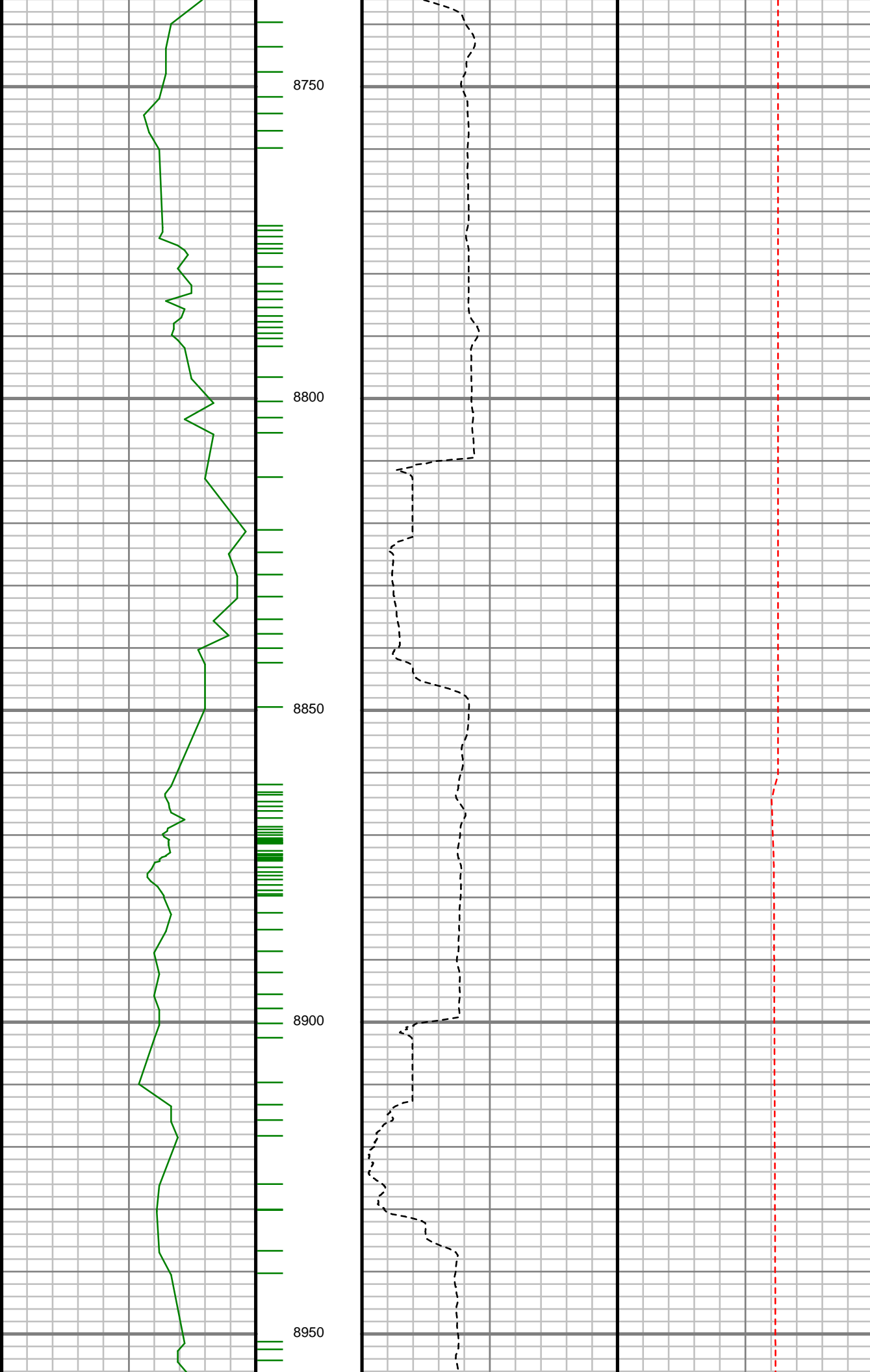
S: 94 MD: 8390.00 ft
Inc: 88.92 deg Az:
176.44 deg TVD:
7903.24 ft

S: 95 MD: 8480.00 ft
Inc: 88.79 deg Az:
176.78 deg TVD:
7905.03 ft



S: 96 MD: 8570.00 ft
Inc: 88.49 deg Az:
176.89 deg TVD:
7907.17 ft

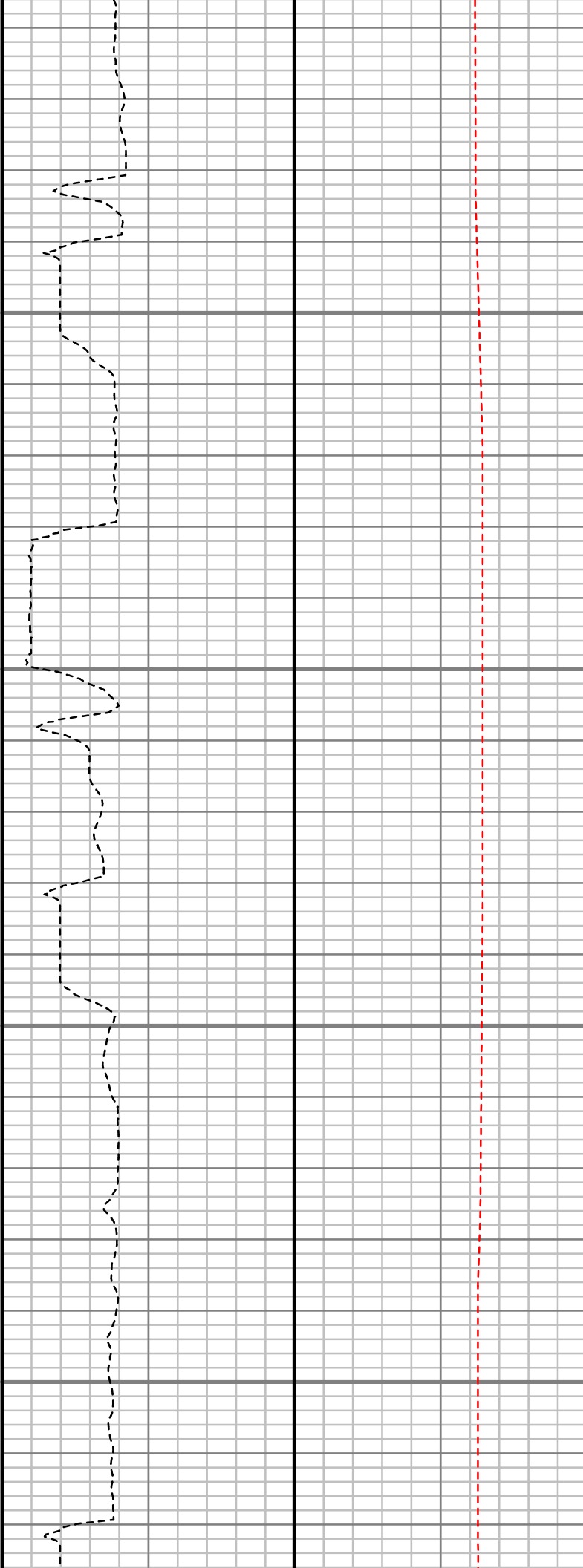
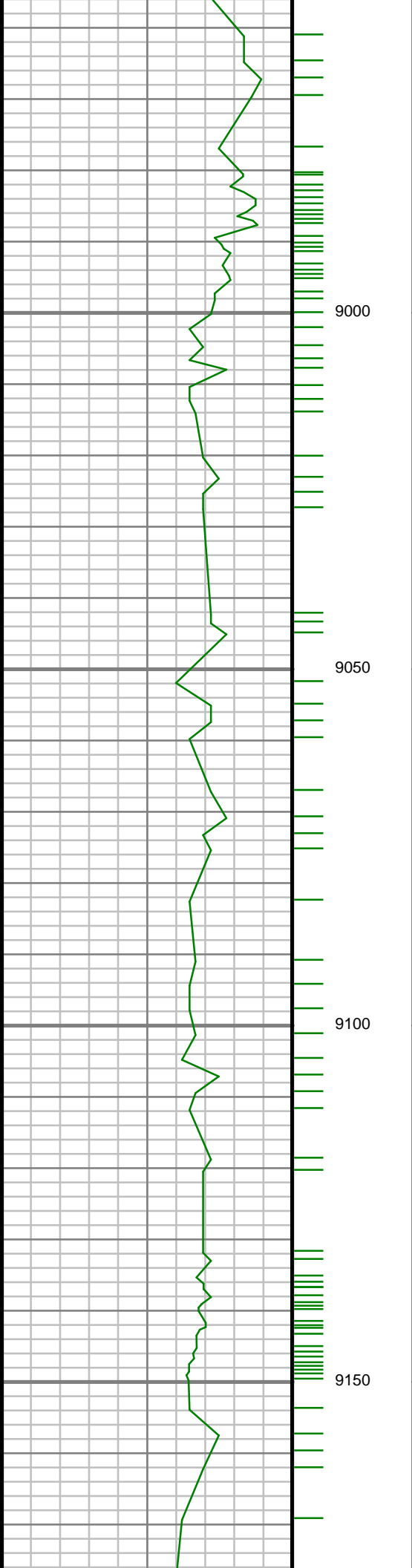
S: 97 MD: 8659.00 ft
Inc: 88.69 deg Az:
176.62 deg TVD:
7909.36 ft



S: 98 MD: 8749.00 ft
Inc: 88.09 deg Az:
175.91 deg TVD:
7911.89 ft

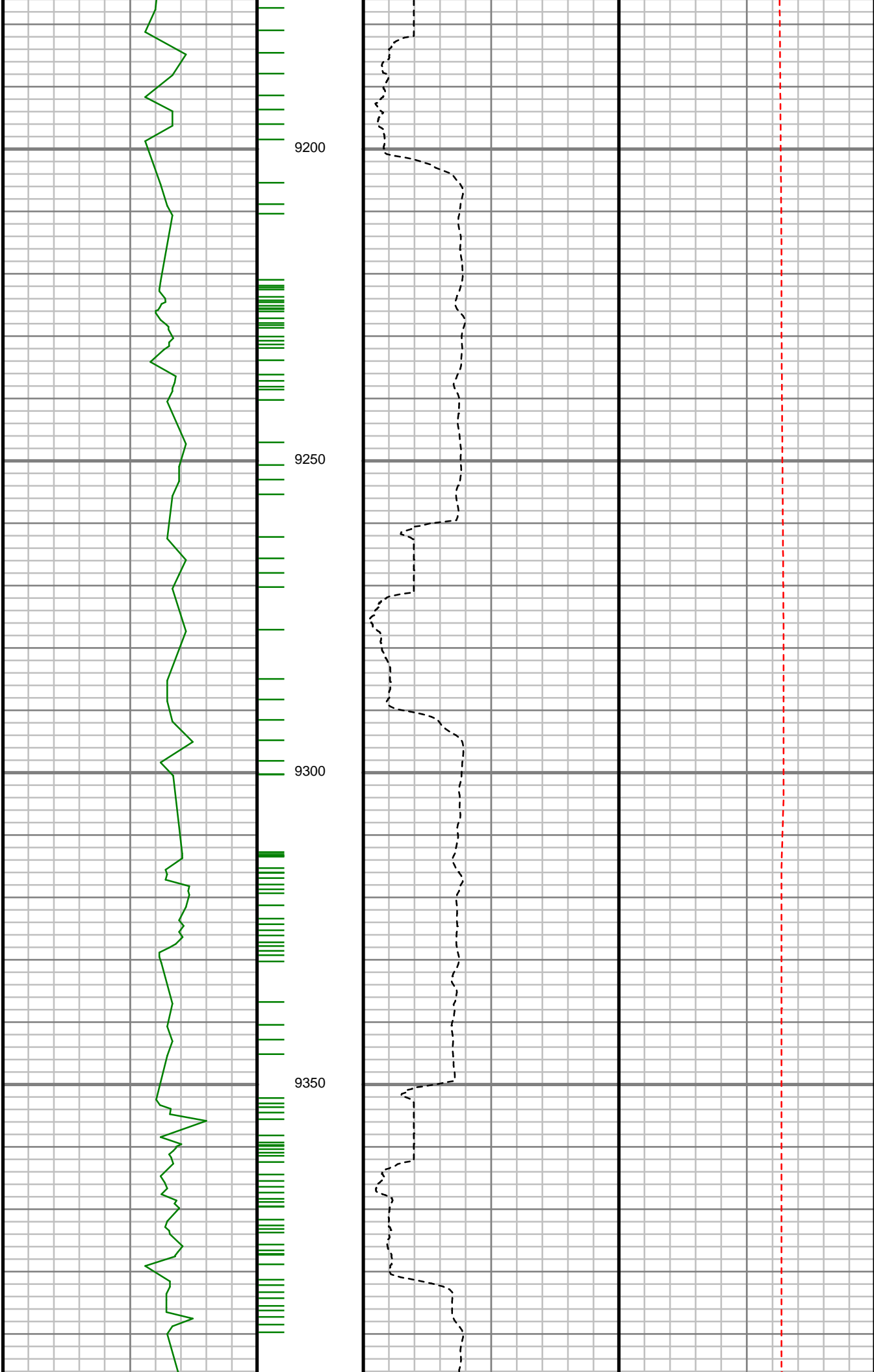
S: 99 MD: 8839.00 ft
Inc: 89.03 deg Az:
176.36 deg TVD:
7914.16 ft

S: 100 MD: 8929.00 ft
Inc: 90.84 deg Az:
177.76 deg TVD:
7914.27 ft



S: 101 MD: 9018.00 ft
Inc: 88.62 deg Az:
176.10 deg TVD:
7914.68 ft

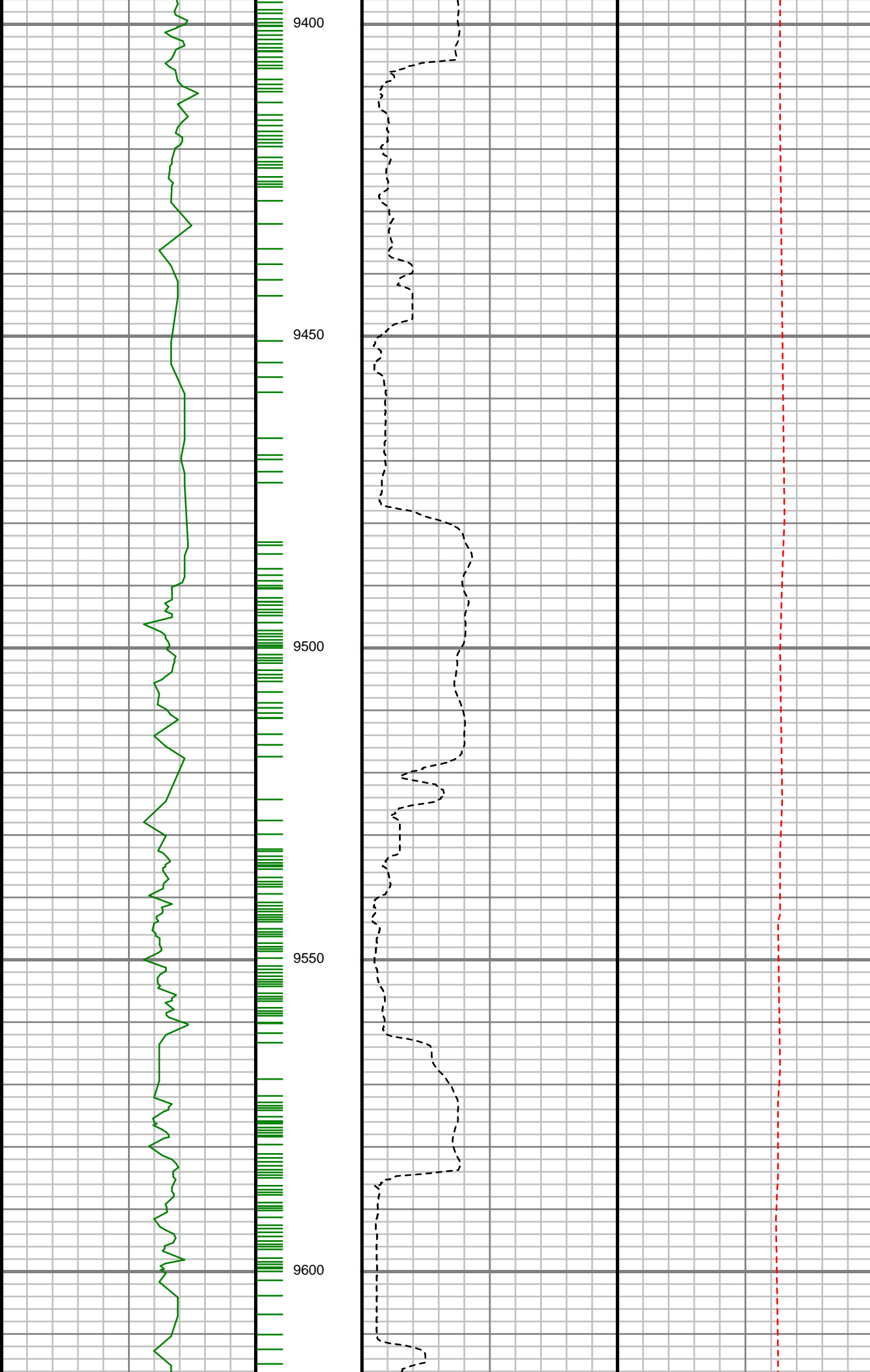
S: 102 MD: 9108.00 ft
Inc: 88.42 deg Az:
175.69 deg TVD:
7917.00 ft



S: 103 MD: 9198.00 ft
Inc: 88.62 deg Az:
175.33 deg TVD:
7919.33 ft

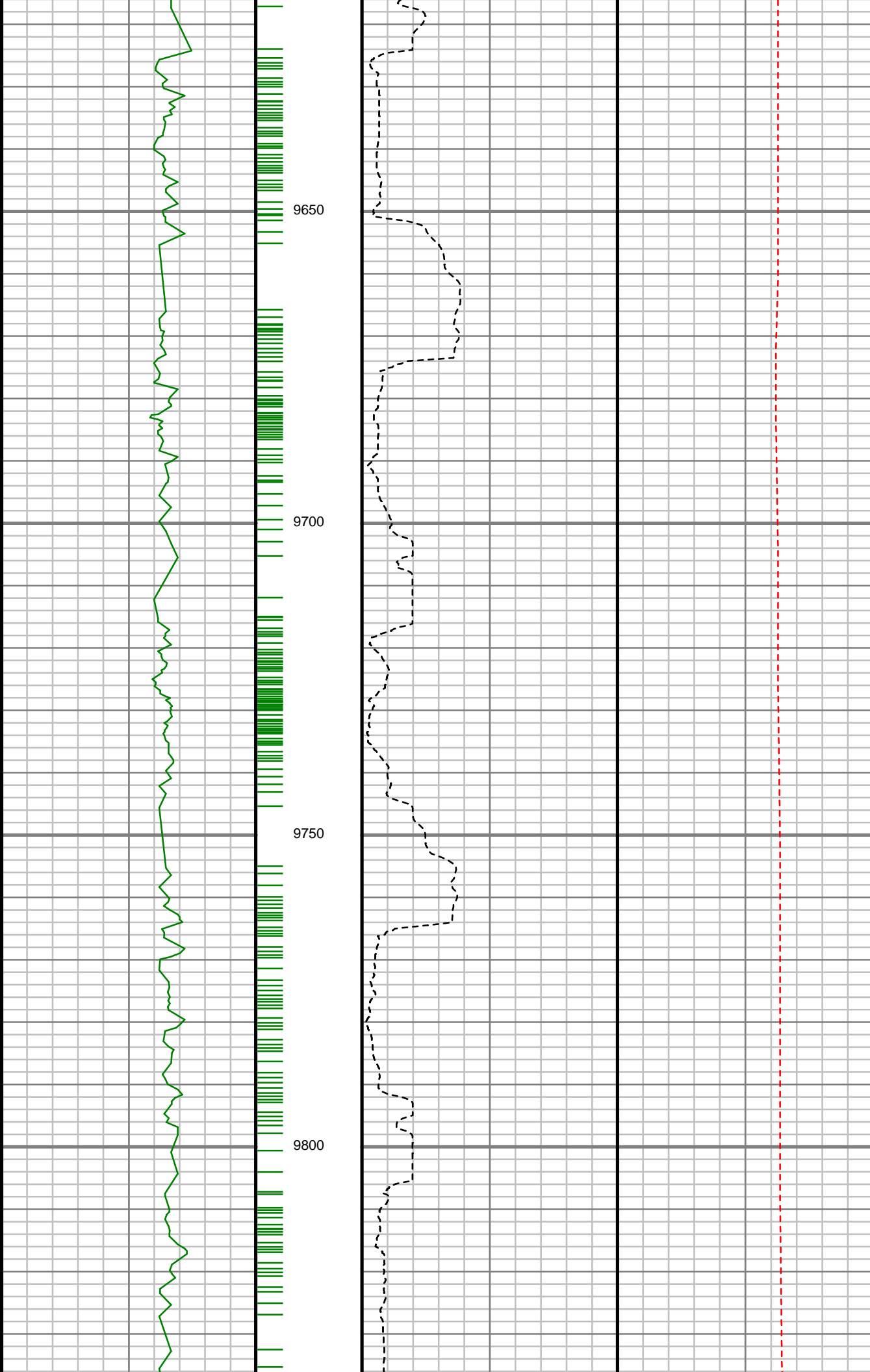
S: 104 MD: 9288.00 ft
Inc: 88.39 deg Az:
174.90 deg TVD:
7921.68 ft

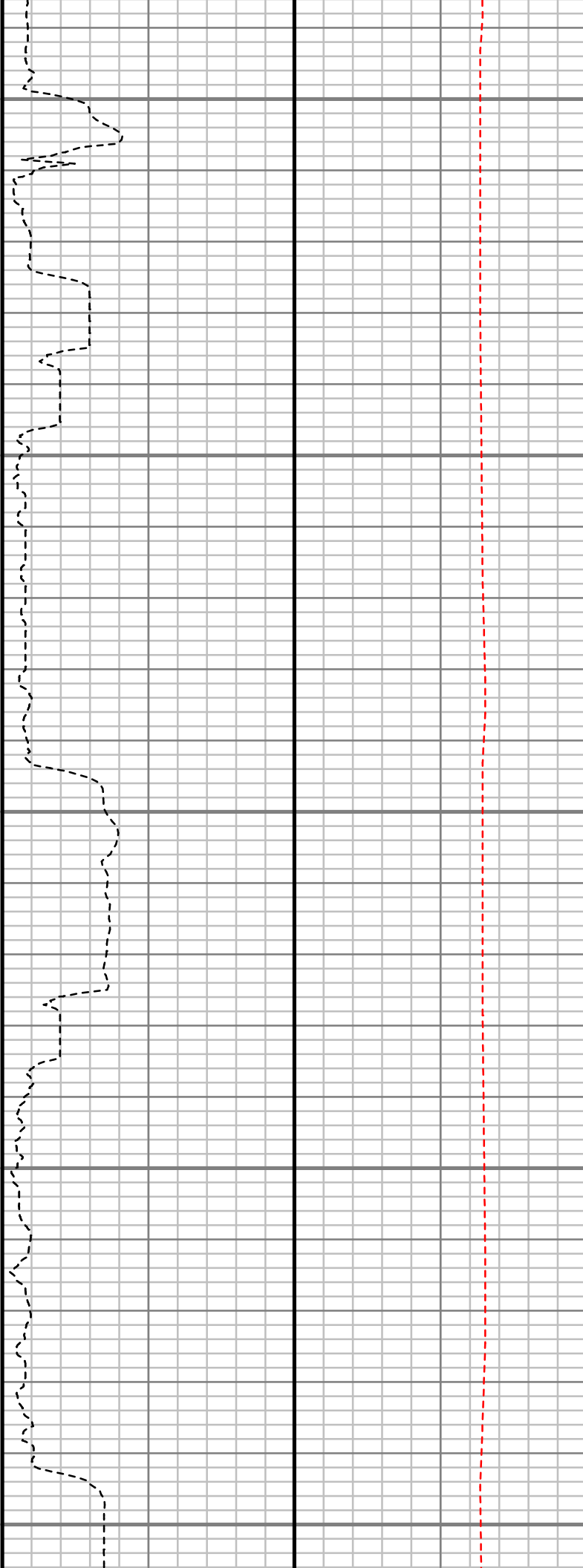
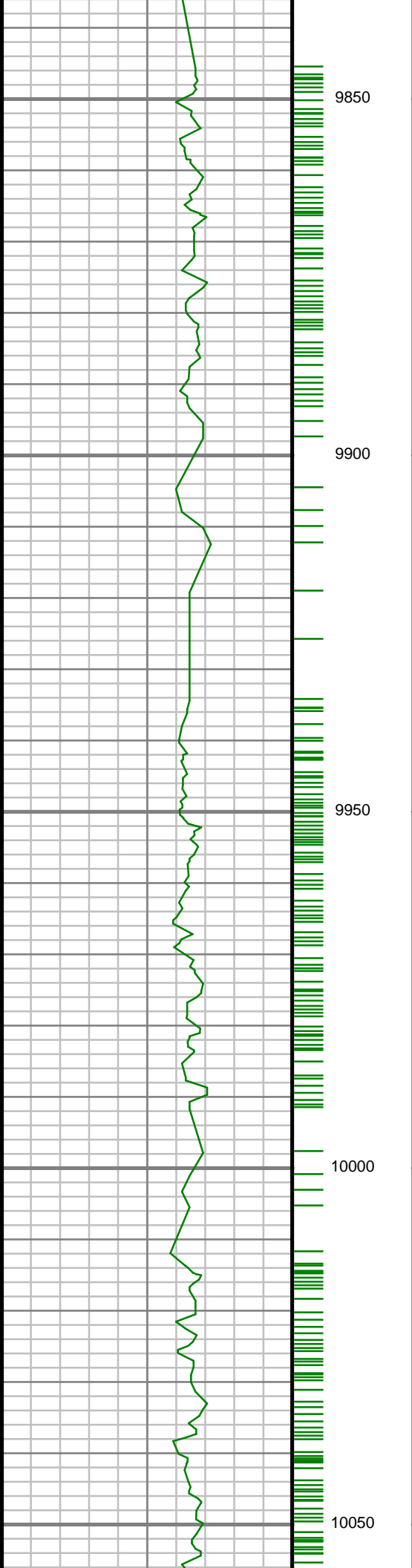
S: 105 MD: 9378.00 ft
Inc: 88.35 deg Az:
174.25 deg TVD:
7924.24 ft



S: 106 MD: 9467.00 ft
Inc: 90.07 deg Az:
174.15 deg TVD:
7925.46 ft

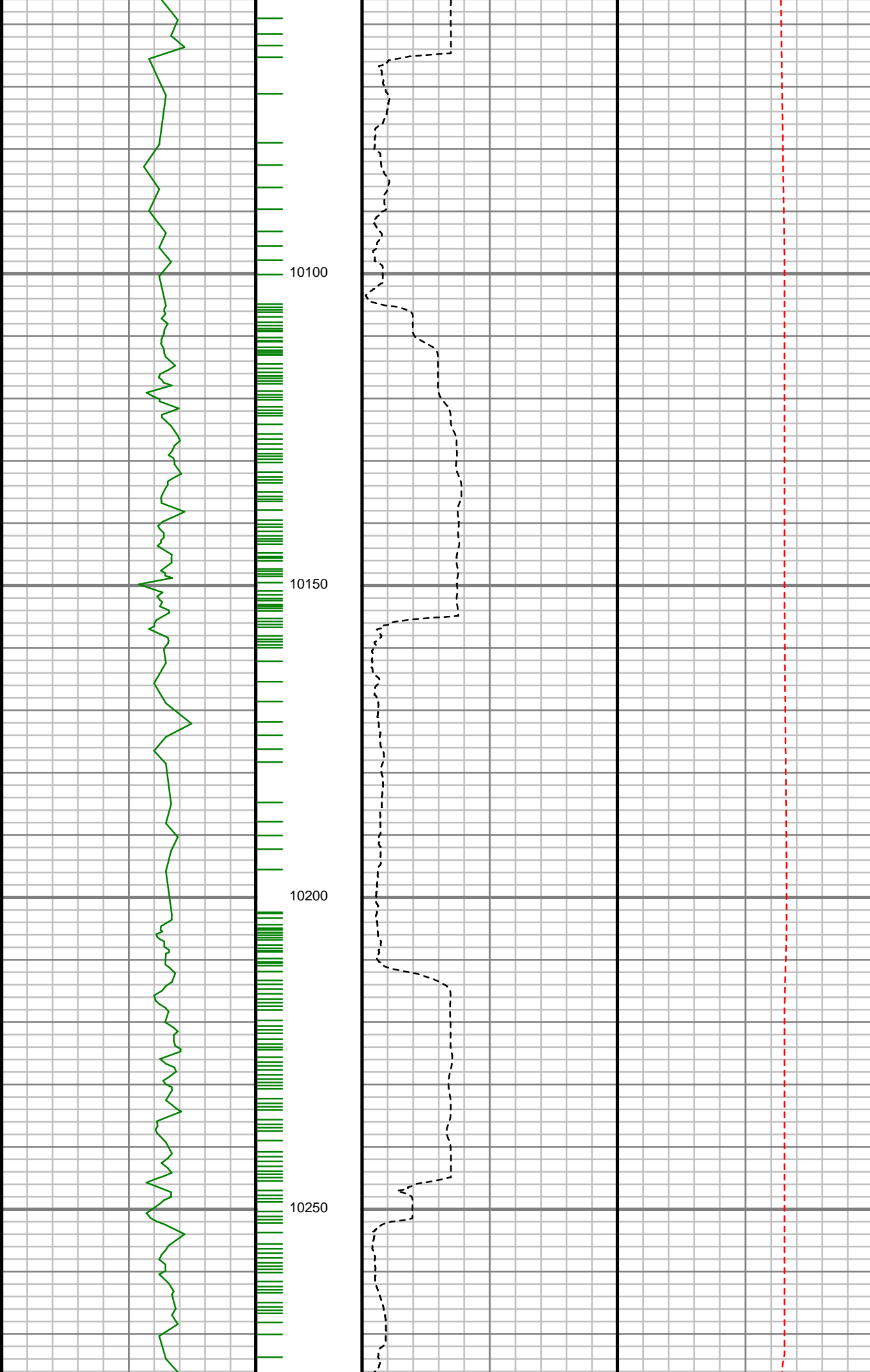
S: 107 MD: 9557.00 ft
Inc: 90.24 deg Az:
174.75 deg TVD:
7925.22 ft





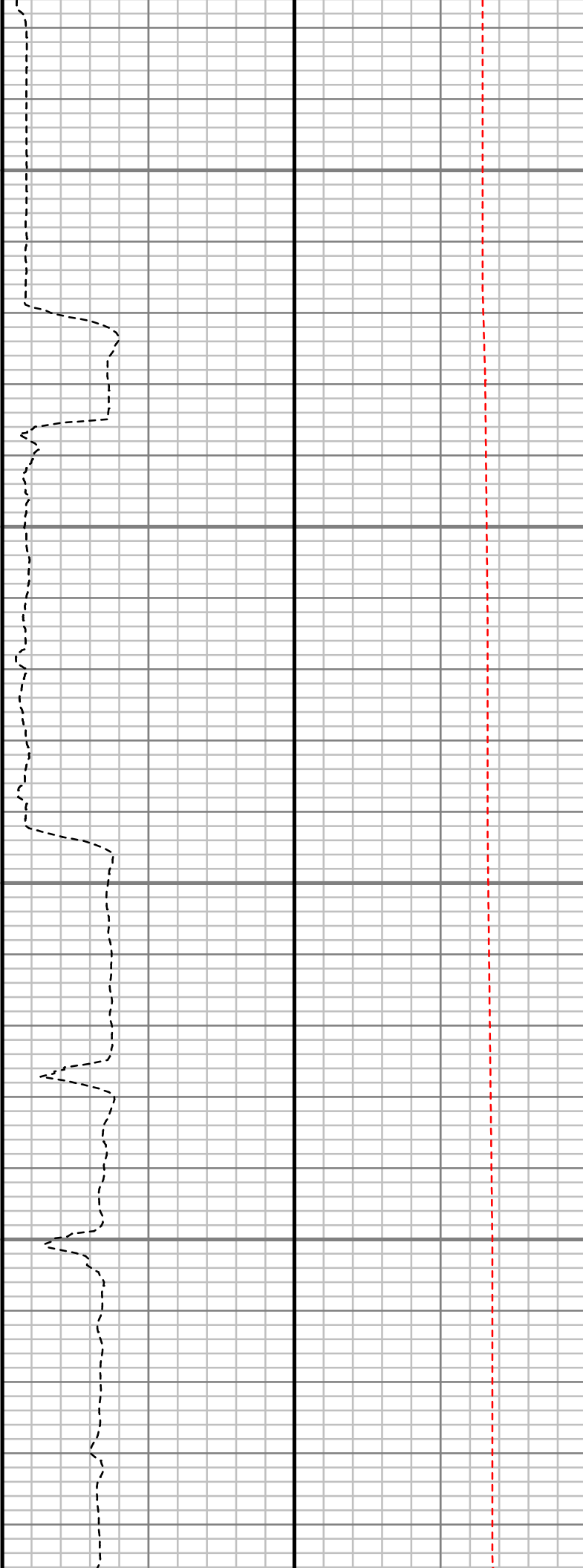
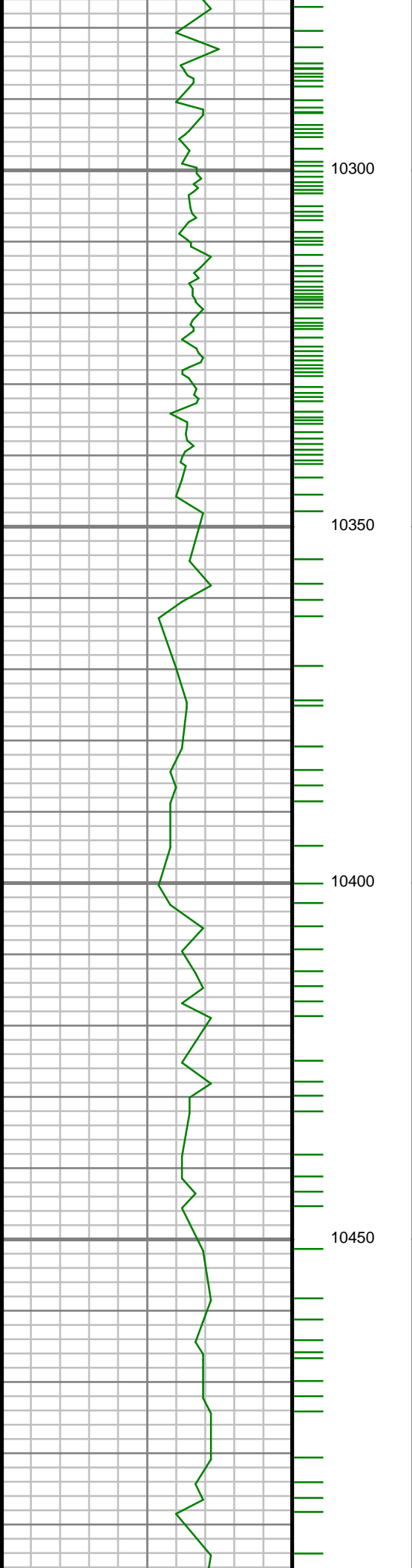
S: 111 MD: 9917.00 ft
Inc: 90.77 deg Az:
179.52 deg TVD:
7922.90 ft

S: 112 MD: 10006.00 ft
Inc: 89.60 deg Az:
179.52 deg TVD:
7922.62 ft



S: 113 MD: 10096.00 ft
Inc: 90.03 deg Az:
180.87 deg TVD:
7922.91 ft

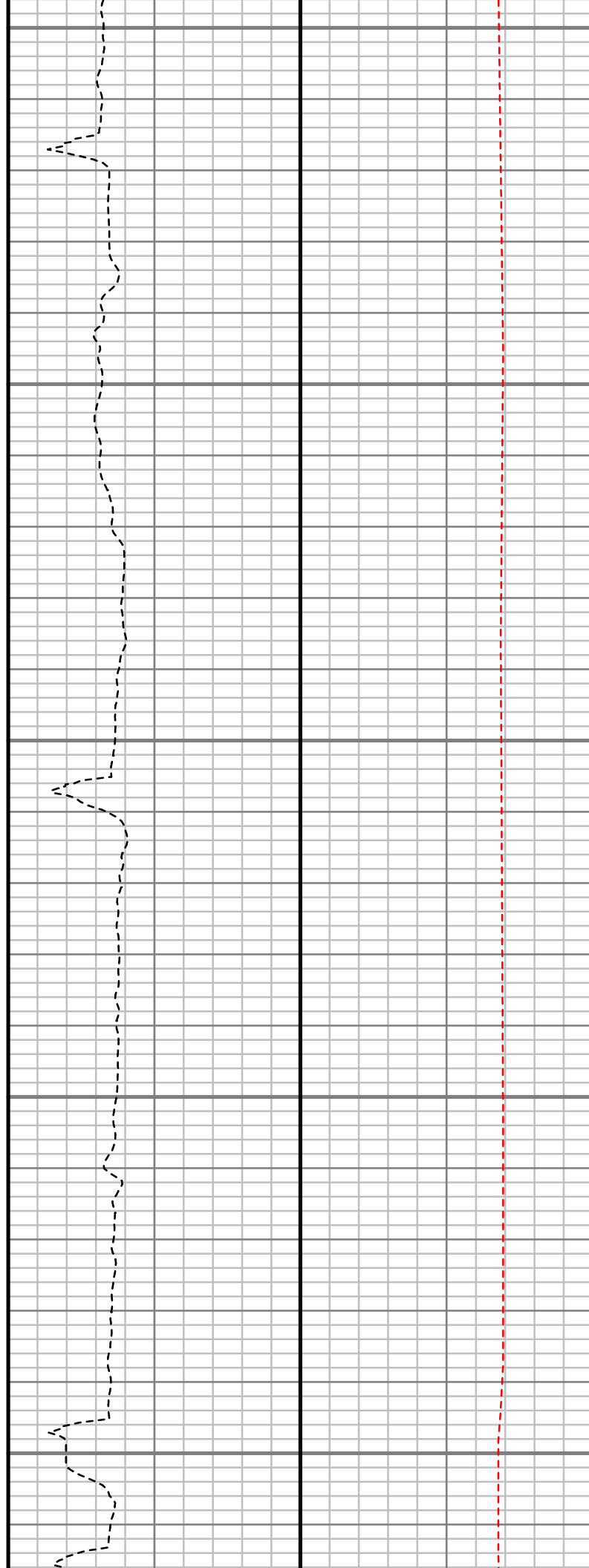
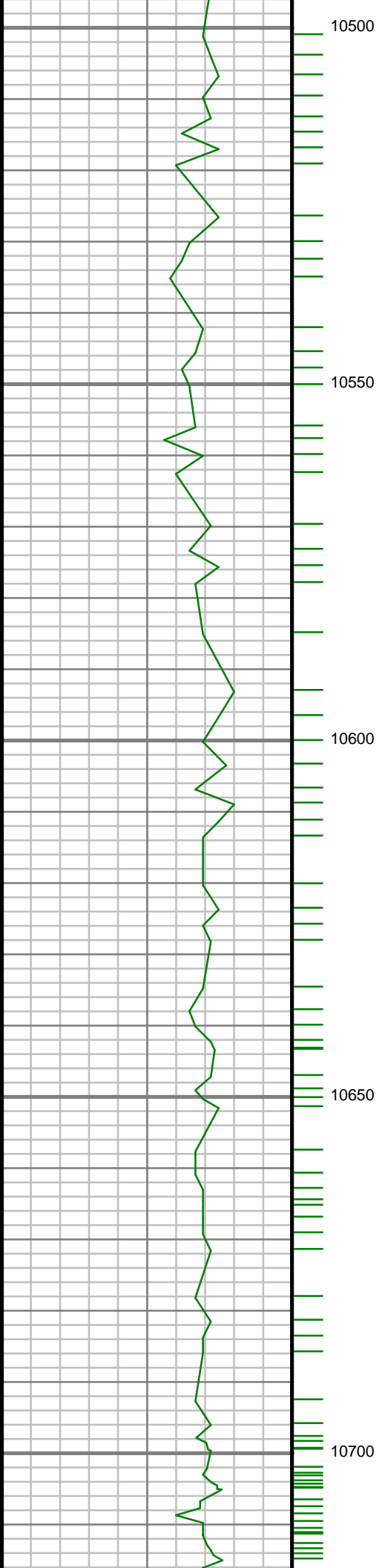
S: 114 MD: 10186.00 ft
Inc: 89.73 deg Az:
180.84 deg TVD:
7923.09 ft



S: 115 MD: 10276.00 ft
Inc: 89.36 deg Az:
181.58 deg TVD:
7923.80 ft

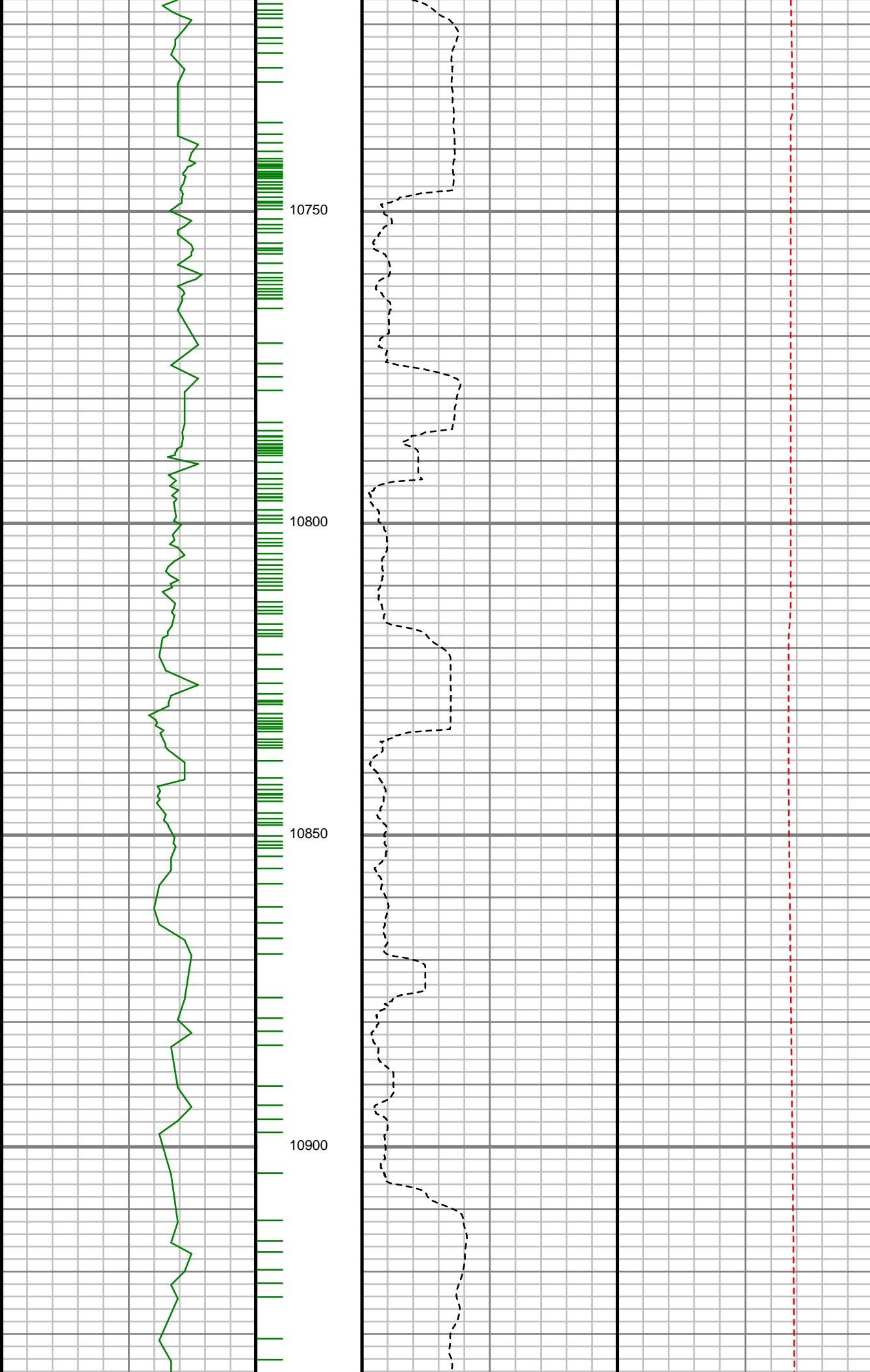
S: 116 MD: 10366.00 ft
Inc: 90.67 deg Az:
182.99 deg TVD:
7923.78 ft

S: 117 MD: 10455.00 ft
Inc: 91.11 deg Az:
183.64 deg TVD:
7922.39 ft



S: 118 MD: 10545.00 ft
Inc: 90.50 deg Az:
183.21 deg TVD:
7921.13 ft

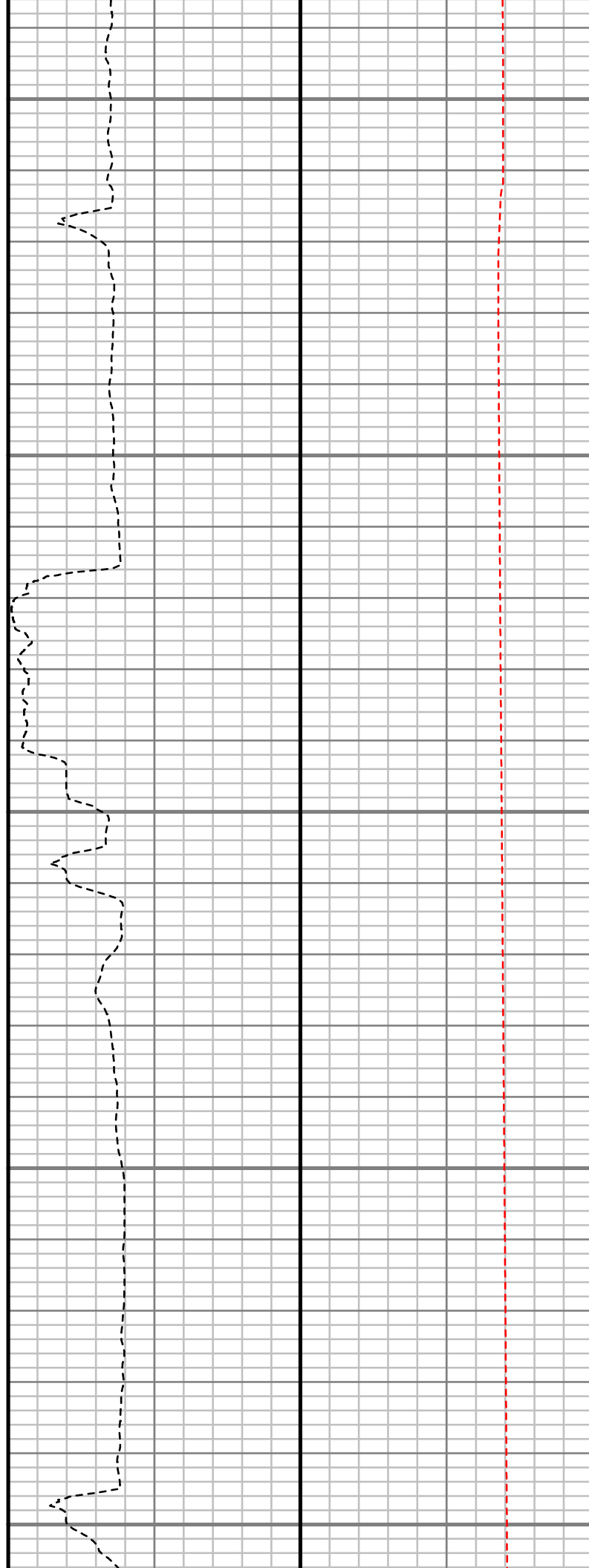
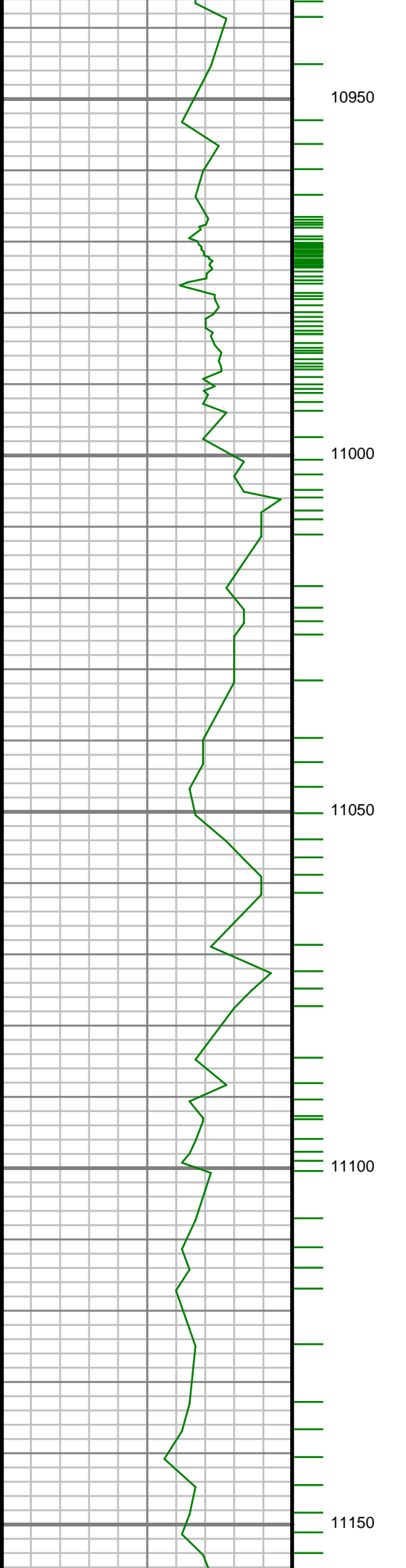
S: 119 MD: 10635.00 ft
Inc: 90.40 deg Az:
183.80 deg TVD:
7920.42 ft



S: 120 MD: 10725.00 ft
Inc: 89.40 deg Az:
182.46 deg TVD:
7920.57 ft

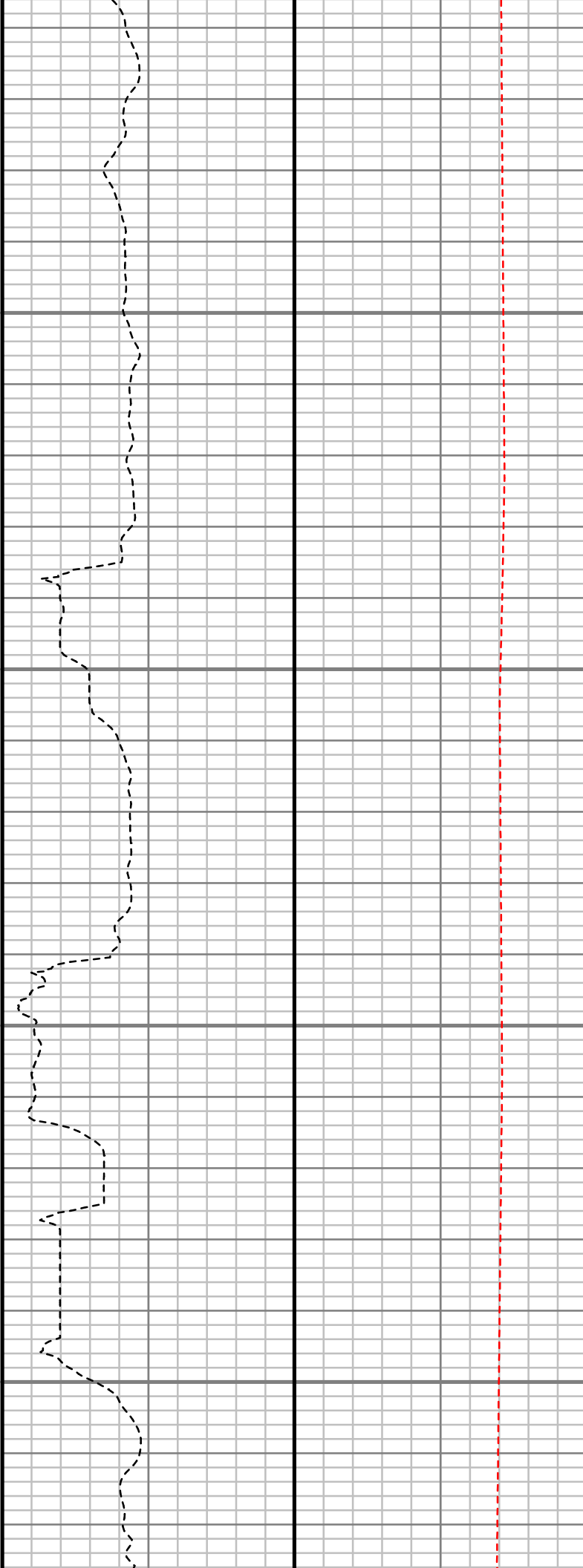
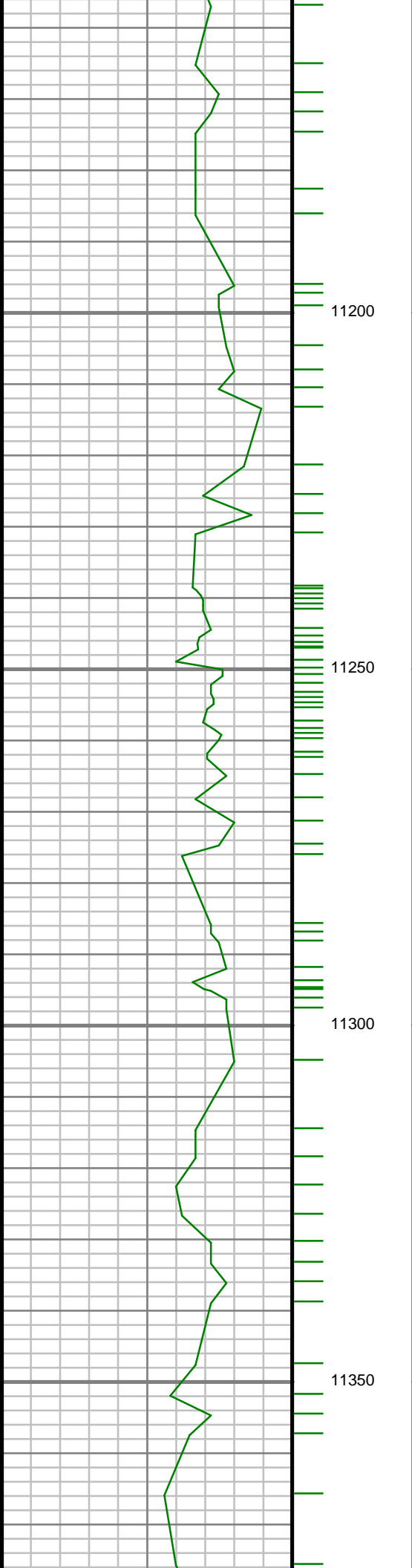
S: 121 MD: 10814.00 ft
Inc: 90.24 deg Az:
181.45 deg TVD:
7920.86 ft

S: 122 MD: 10904.00 ft
Inc: 91.78 deg Az:
181.44 deg TVD:
7919.28 ft



S: 123 MD: 10994.00 ft
Inc: 91.14 deg Az:
181.41 deg TVD:
7916.98 ft

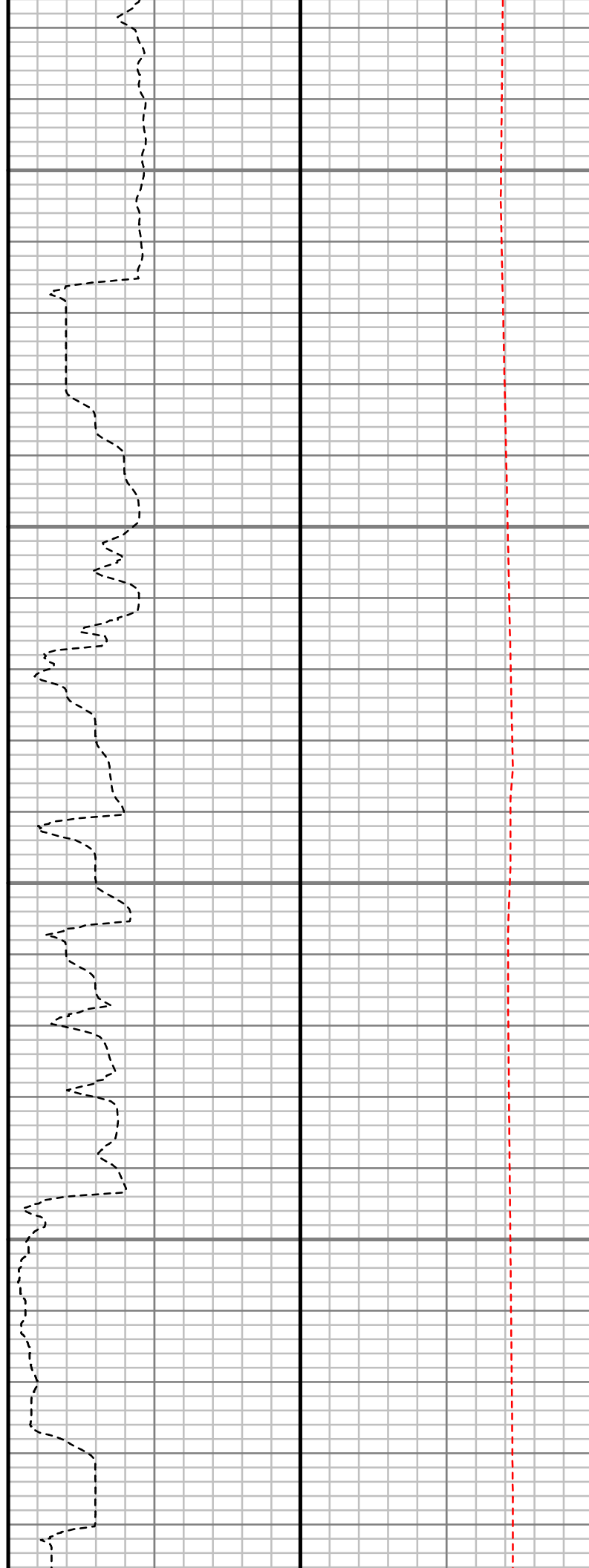
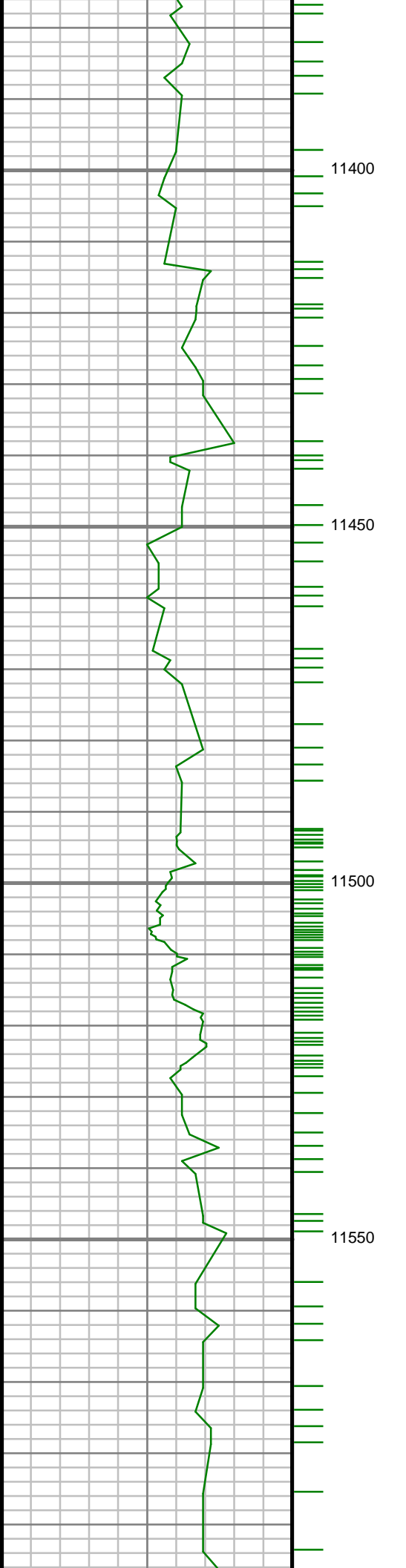
S: 124 MD: 11083.00 ft
Inc: 92.45 deg Az:
182.37 deg TVD:
7914.19 ft



S: 125 MD: 11173.00 ft
Inc: 91.58 deg Az:
182.03 deg TVD:
7911.03 ft

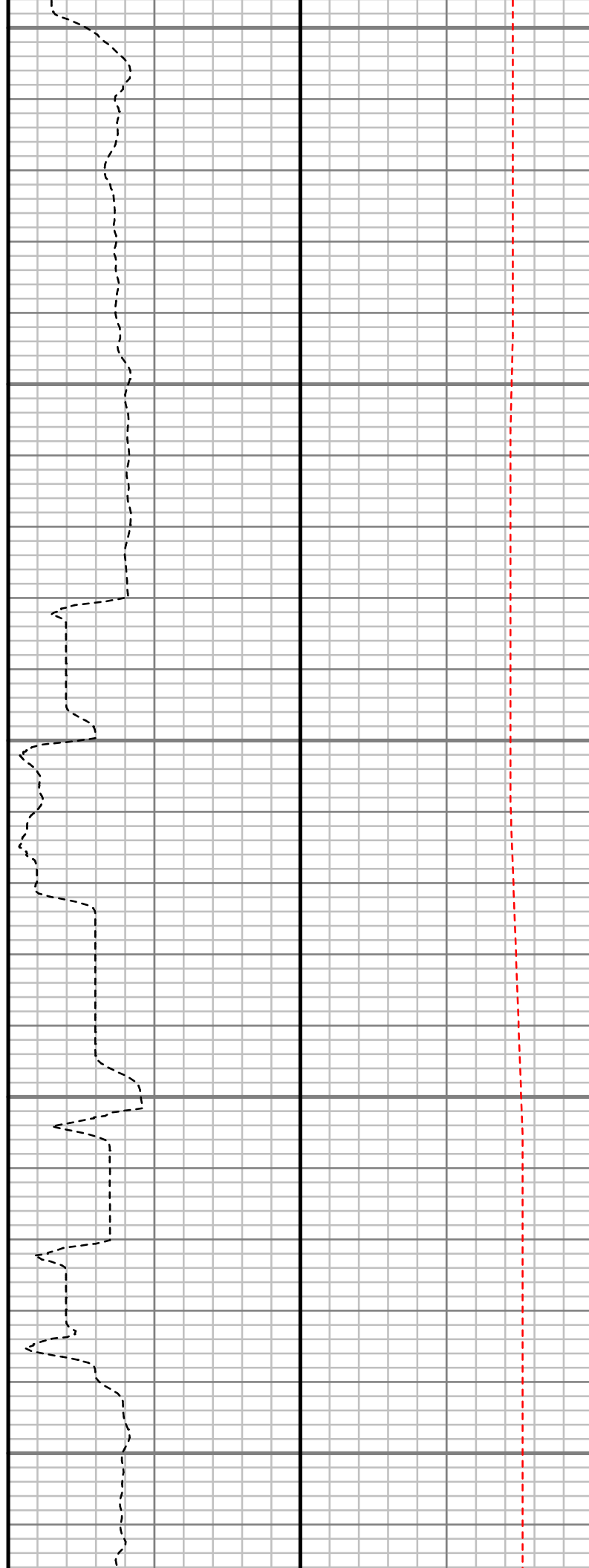
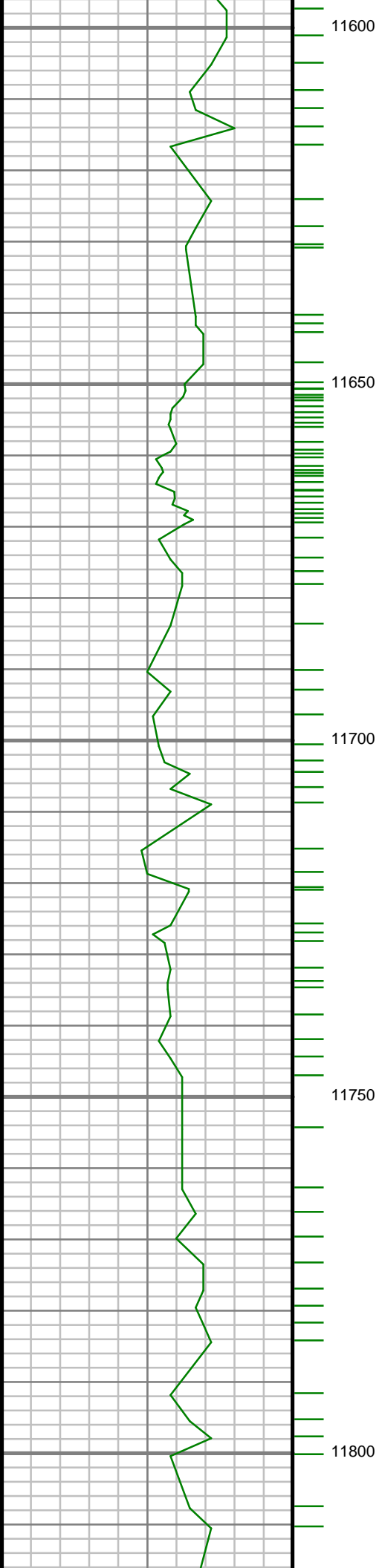
S: 126 MD: 11263.00 ft
Inc: 91.85 deg Az:
182.16 deg TVD:
7908.34 ft

S: 127 MD: 11353.00 ft
Inc: 89.36 deg Az:
181.75 deg TVD:
7907.39 ft



S: 128 MD: 11442.00 ft
Inc: 89.60 deg Az:
181.07 deg TVD:
7908.20 ft

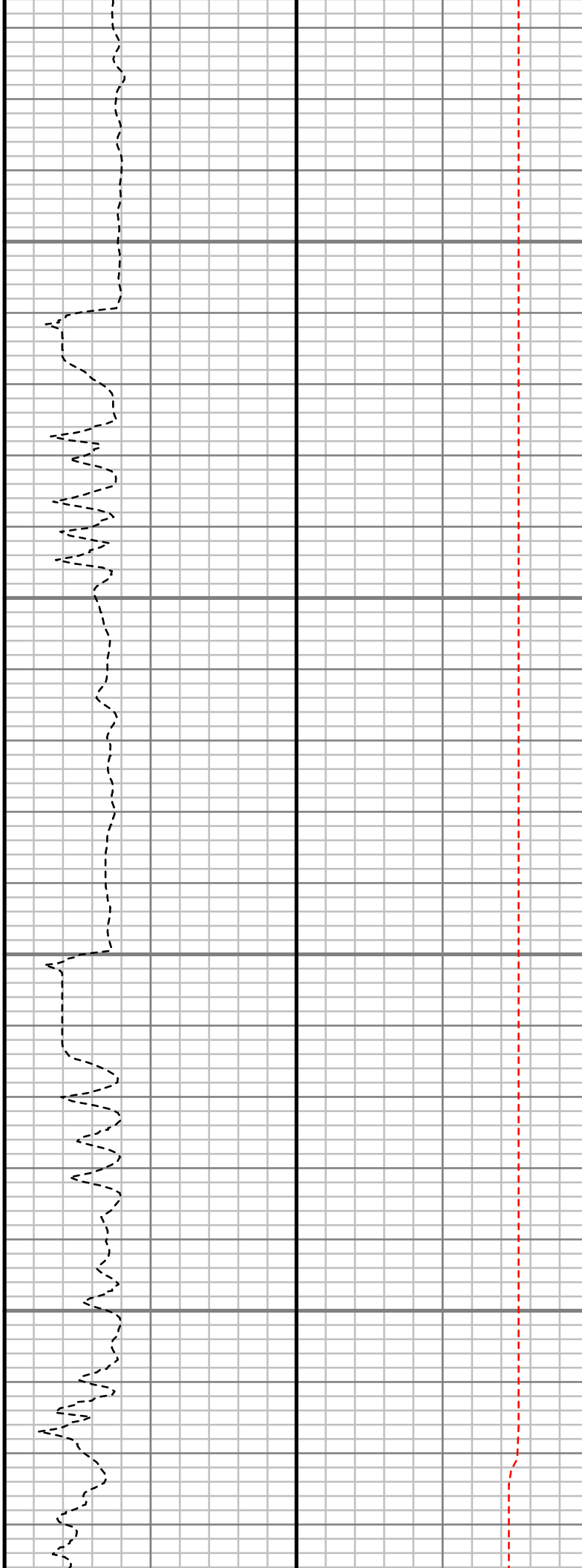
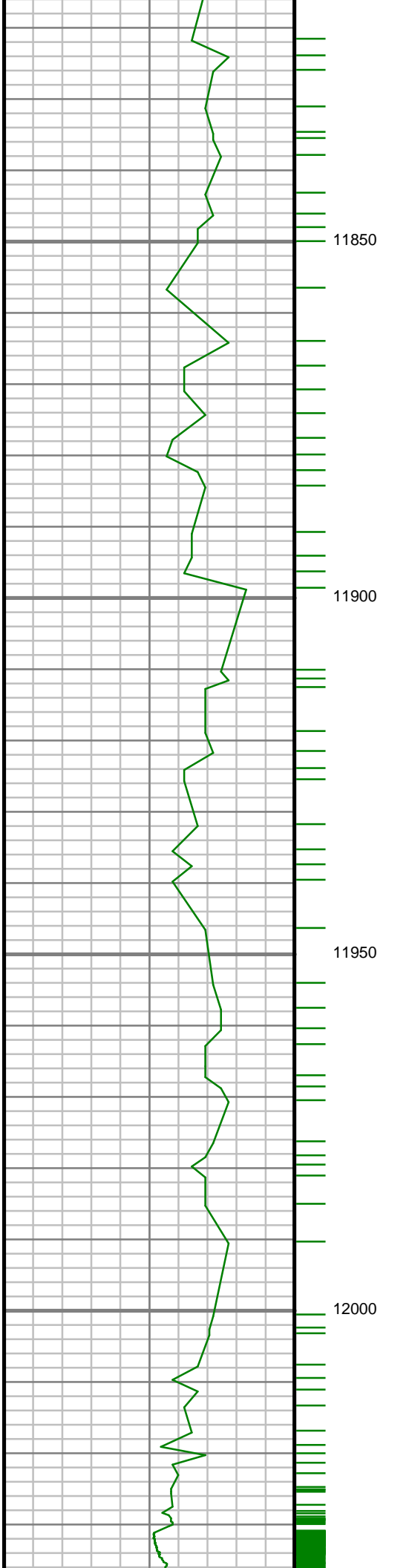
S: 129 MD: 11532.00 ft
Inc: 91.78 deg Az:
181.74 deg TVD:
7907.12 ft



S: 130 MD: 11622.00 ft
Inc: 90.71 deg Az:
183.21 deg TVD:
7905.17 ft

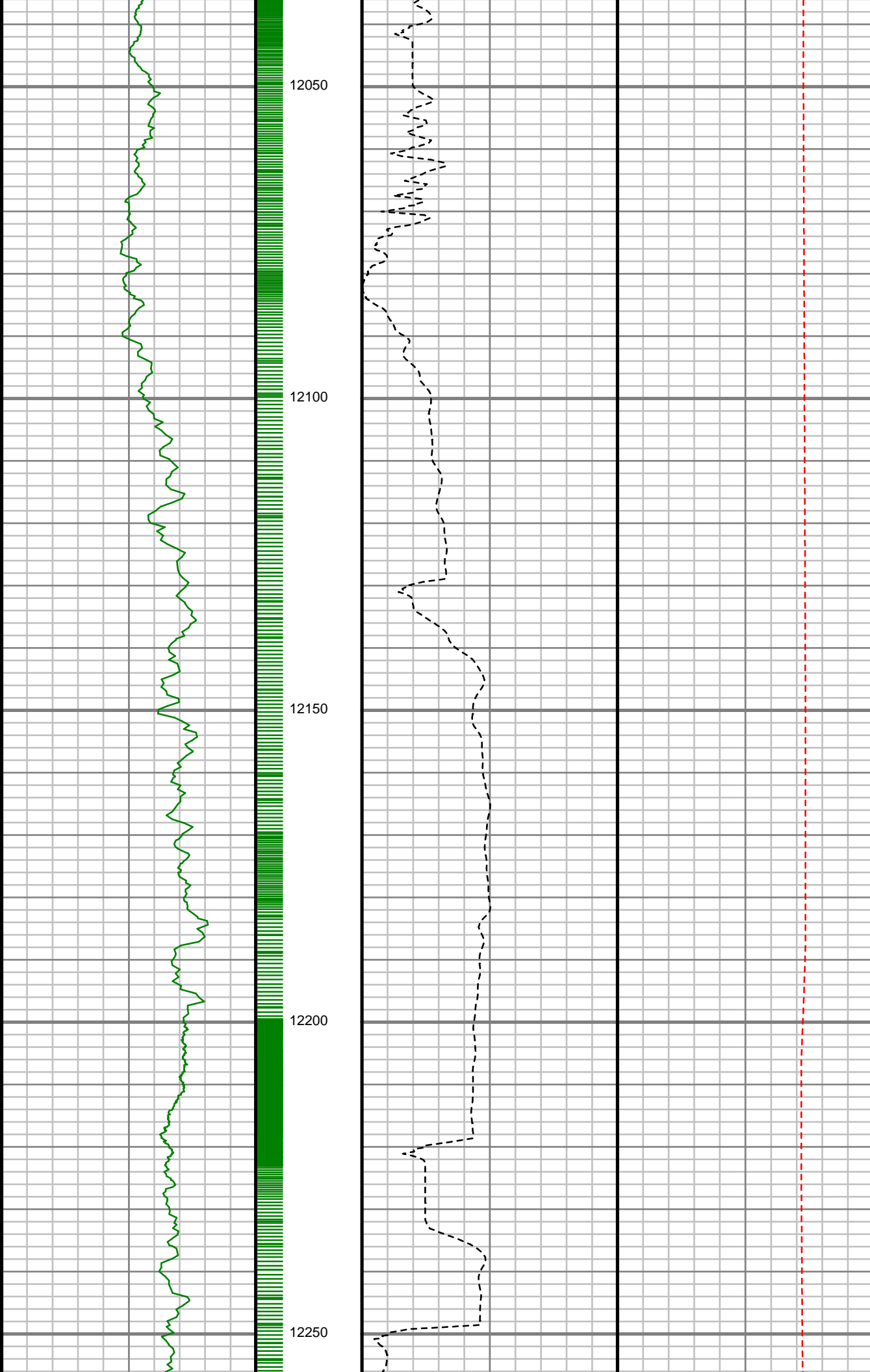
S: 131 MD: 11712.00 ft
Inc: 89.50 deg Az:
182.93 deg TVD:
7905.01 ft

S: 132 MD: 11802.00 ft
Inc: 89.09 deg Az:
182.84 deg TVD:
7906.11 ft



S: 133 MD: 11891.00 ft
Inc: 89.16 deg Az:
182.69 deg TVD:
7907.47 ft

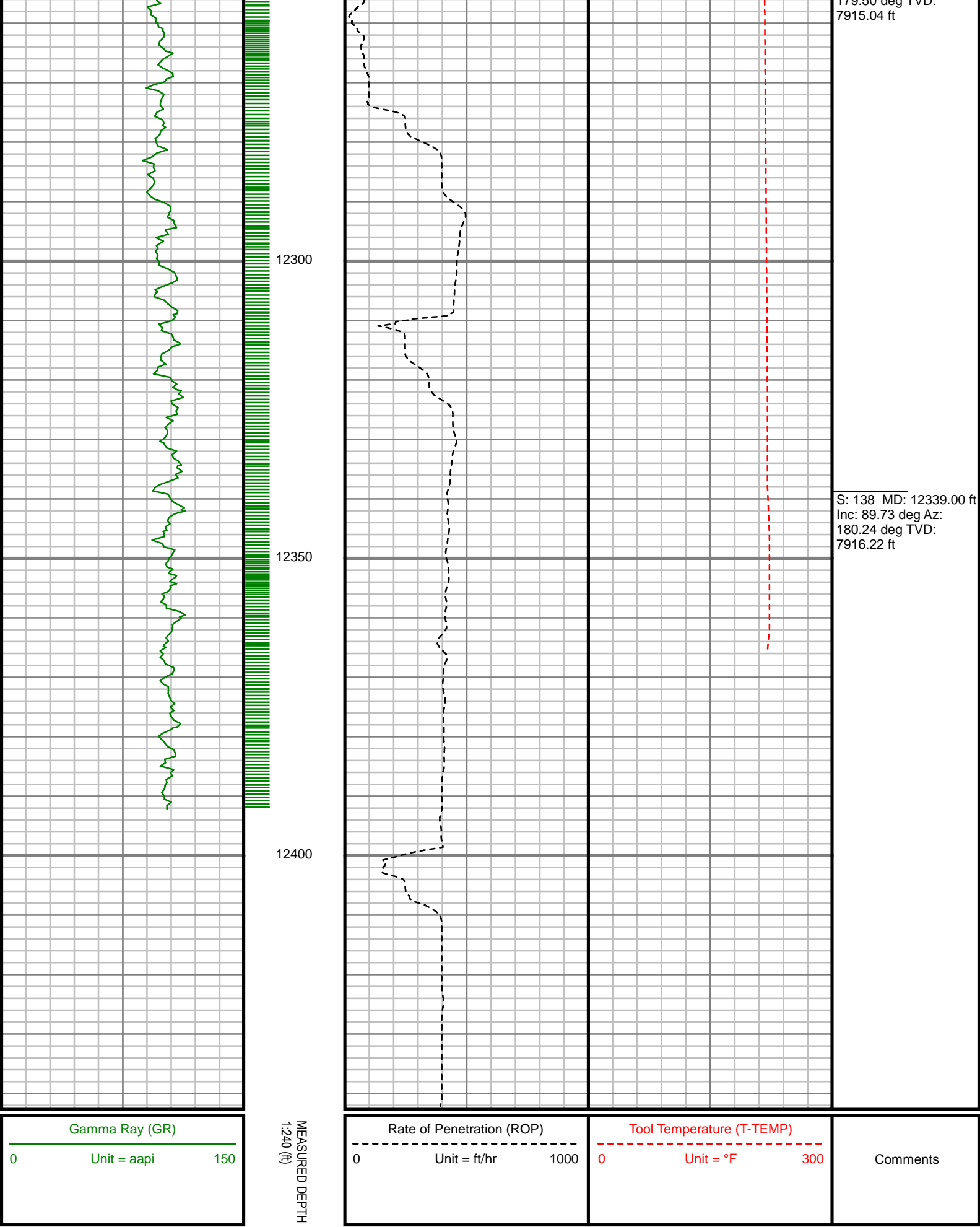
S: 134 MD: 11981.00 ft
Inc: 88.99 deg Az:
181.68 deg TVD:
7908.92 ft



S: 135 MD: 12070.00 ft
Inc: 88.76 deg Az:
180.75 deg TVD:
7910.67 ft

S: 136 MD: 12160.00 ft
Inc: 88.46 deg Az:
180.34 deg TVD:
7912.85 ft

S: 137 MD: 12250.00 ft
Inc: 88.76 deg Az:
179.59 deg TVD:



5" = 100' FEET MD