



GAMMA RAY

5" = 100' FEET MD

COMPANY : ANADARKO E&P ONSHORE LLC  
WELL : COBRA 4N-14HZ  
FIELD : WATTENBERG  
COUNTY : WELD  
STATE : COLORADO  
COUNTRY : U.S.A.  
UWI : 05-123-40407

COMPANY : ANADARKO E&P ONSHORE LLC  
WELL : COBRA 4N-14HZ  
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COUNTRY : U.S.A.  
UWI : 05-123-40407

WELL LOCATION  
LAT:40°7'22.134"N LONG:104°51'53.244"W  
N:1288221.65 ft E:3177634.36 ft

OTHER SERVICES

SEC:23 TWP:2N RANGE:67W DIRECTIONAL ROP

DEPTH REF. : RKB

REF. HEIGHT : 25.000 ft

RKB to Ground Level

GROUND LEVEL : 4977.000 ft

G.L. to MEAN SEA LEVEL

BOREHOLE RECORD

DEVIATION RECORD

HOLE SIZE in	FROM ft	TO ft	INCLINATION deg	FROM ft	TO ft
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12.25	0	1223	0-27	0	7472
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8.75	1223	8276	27-90	7472	8276
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6.125	8276	13411	90-92	8276	13411
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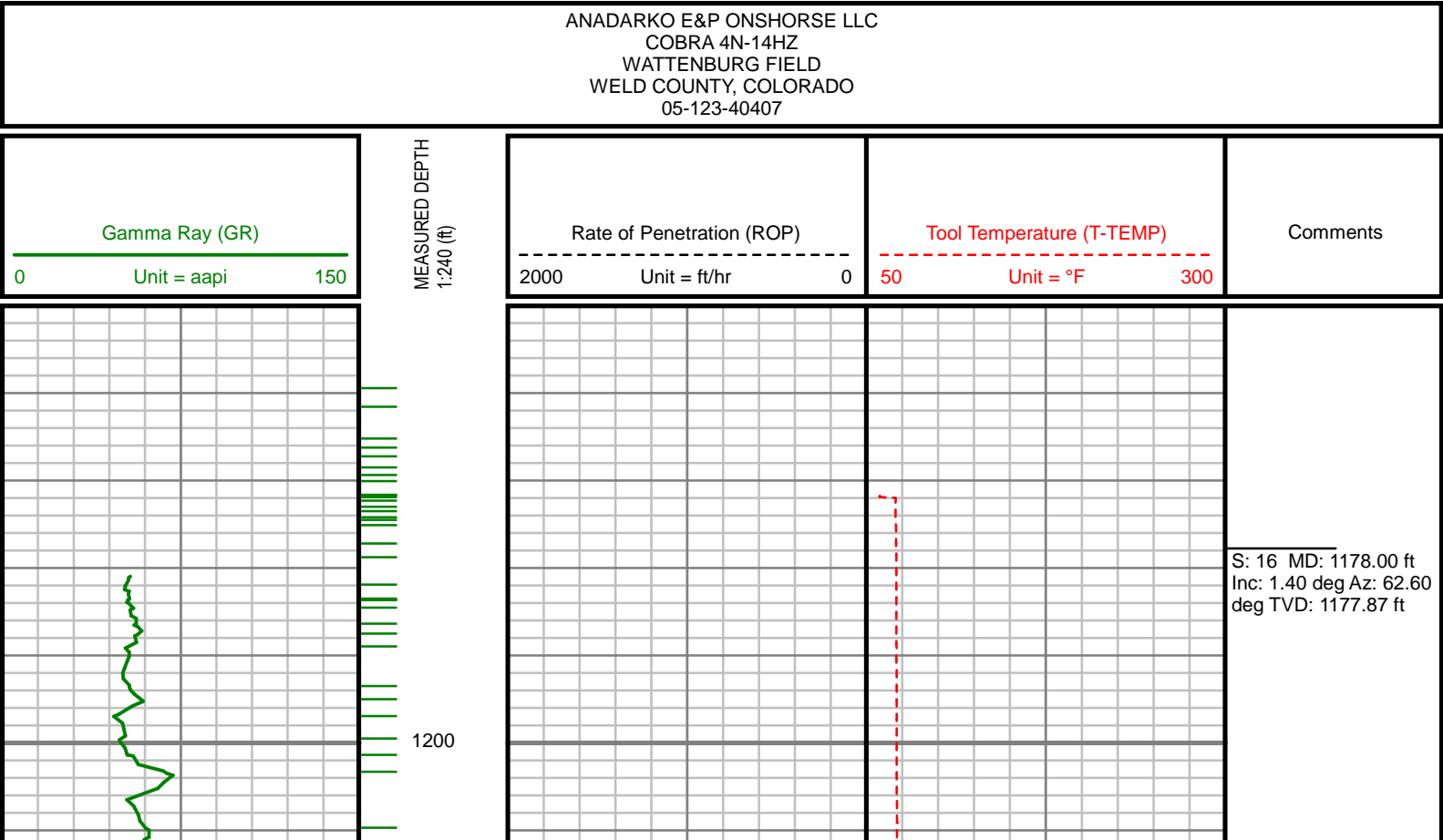
DRILLING CO. : H&P  
RIG : 311  
LWD UNIT NO. : C-46  
SPUD DATE : 02/16/2015  
LWD START DATE : 02/17/2015  
LWD END DATE : 02/25/2015  
DISTRICT : CASPER  
DEPTH : 1182 ft  
DEPTH : 13411 ft  
TOTAL DEPTH : 13411 ft

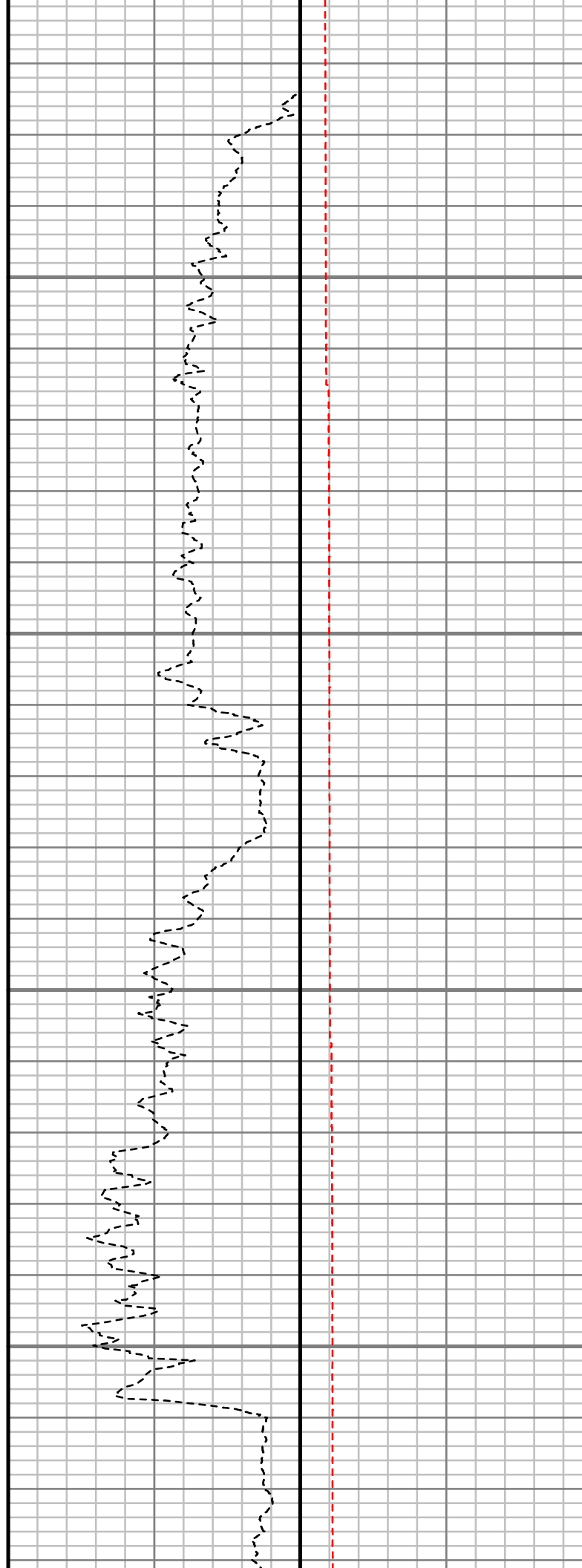
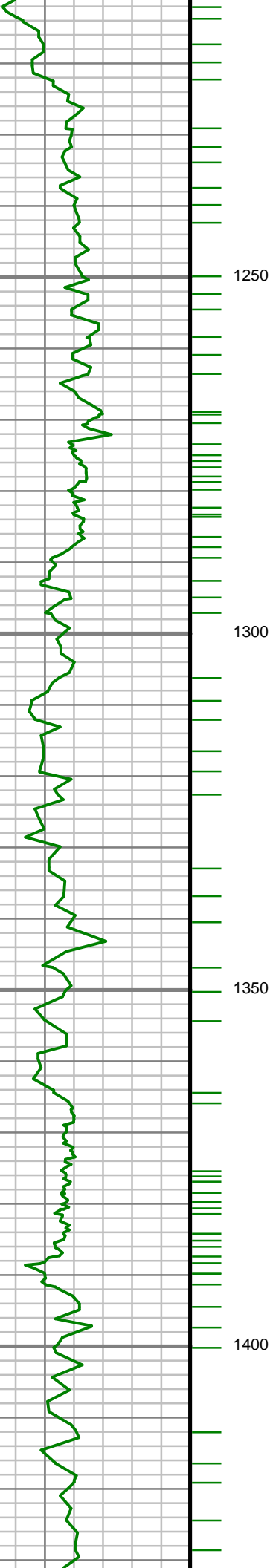
Run Data

RUN NUMBER	1	2	3			
START DATE	02/17/2015	02/20/2015	02/21/2015			
START TIME	1500	1530	0100			
END DATE	02/20/2015	02/21/2015	02/25/2015			
END TIME	1400	1930	2230			
DEPTH IN (ft)	1223	7586	8276			
DEPTH OUT (ft)	7686	8276	13411			
LOG TOP (ft)	1182	7645	7608			
LOG BOTTOM (ft)	7645	7608	13359			
HOLE SIZE (in)	8.75	8.75	6.125			
MUD DATA @ (ft)	1198	7586	10029			
MUD TYPE	WATER-BASED	WATER-BASED	WATER-BASED			
DENSITY (lb / gal)	8.4	10.55	9.6			
VISCOSITY (s / qt)	27	47	48			
pH	8.0	9.8	9.7			
FLUID LOSS (cm3 / 30)	40.0	3.6	5.0			
SALINITY (ppm)	2900	2900	2800			
Rm (ohmm @ deg F)	-	-	-			
Rmf (ohmm @ deg F)	-	-	-			
MAX TEMP (deg F)	168	172	233			
Rm @ MAX TEMP (ohmm)	-	-	-			
LWD ENGINEER #1	B. GREER	B. GREER	B. GREER			
LWD ENGINEER #2	B. FRANTZ	B. FRANTZ	B. MILBURN			
LWD ENGINEER #3	-	-	-			
LOG WITNESS #1	Z. HEIDER	Z. HEIDER	Z. HEIDER			
LOG WITNESS #2	-	-	-			

Remarks
ANADARKO E&P ONSHORE LLC PRODUCTION AFE# 2088918
SCIENTIFIC DRILLING INTERNATIONAL JOB# 256115
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 LOGGING RUN
SENSORS S/N: PULSER = 128-150 / CONT = 605 / MWD EYE = 774 / GAMMA RAY = 1264
BIT TO SENSOR OFFSETS: SURVEY= 51.15 FT. / GAMMA RAY= 41.90 FT.
RUN # 2: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-380 / CONT = 277 / MWD EYE = 894 / GAMMA RAY = 1031
BIT TO SENSOR OFFSETS: SURVEY = 47.23 FT. / GAMMA RAY = 37.98 FT.
RUN # 3: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 078-255 / CONT = 807 / MWD EYE = 1071 / GAMMA RAY = 1060
BIT TO SENSOR OFFSETS: SURVEY = 60.92 FT. / GAMMA RAY = 52.42 FT.
MNEMONICS LIST:
GR = GAMMA RAY
ROP = RATE OF PENETRATION
T-TEMP = TOOL TEMPERATURE

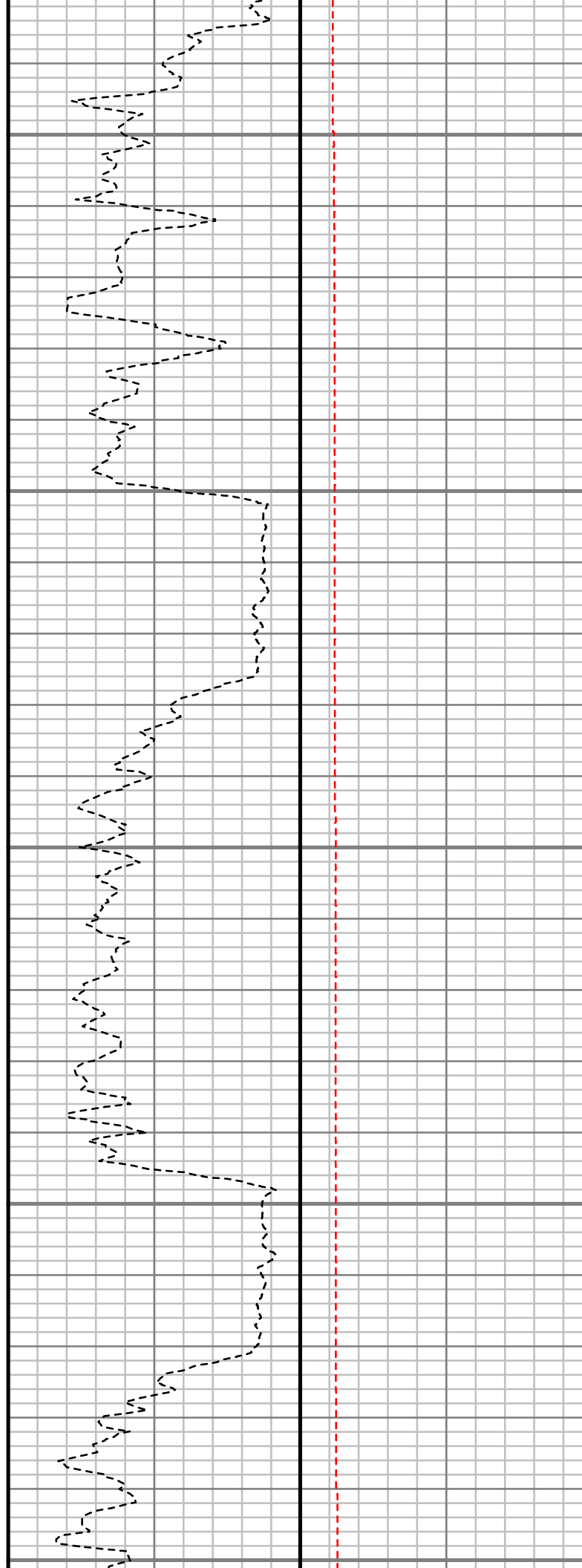
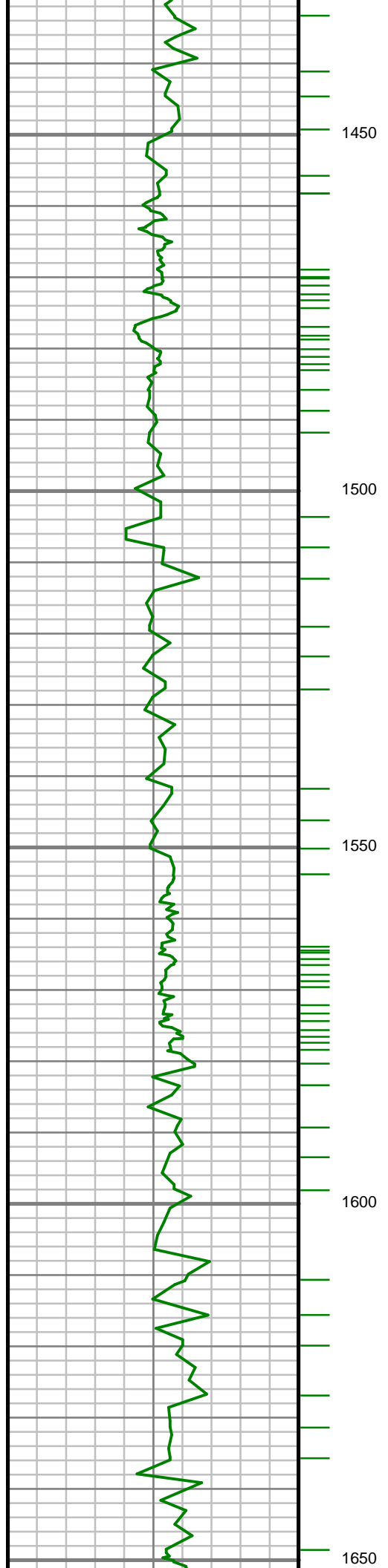
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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: 17 MD: 1261.00 ft  
Inc: 0.17 deg Az:  
268.09 deg TVD:  
1260.87 ft

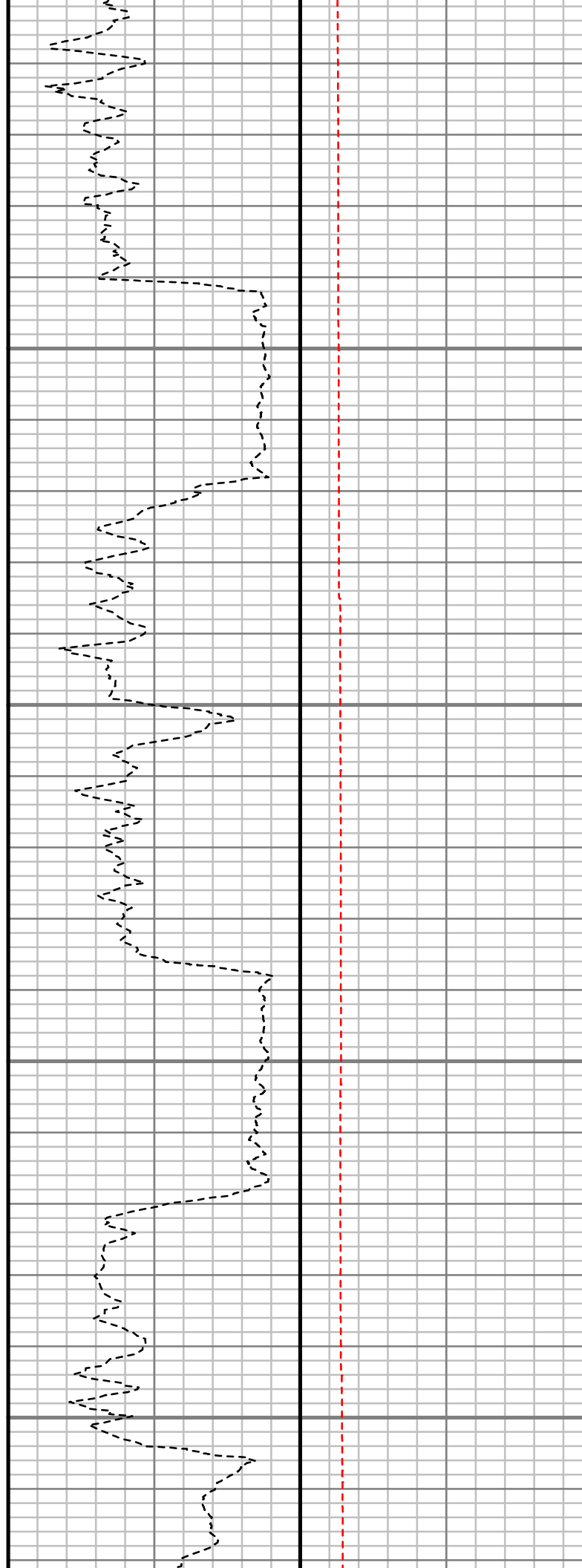
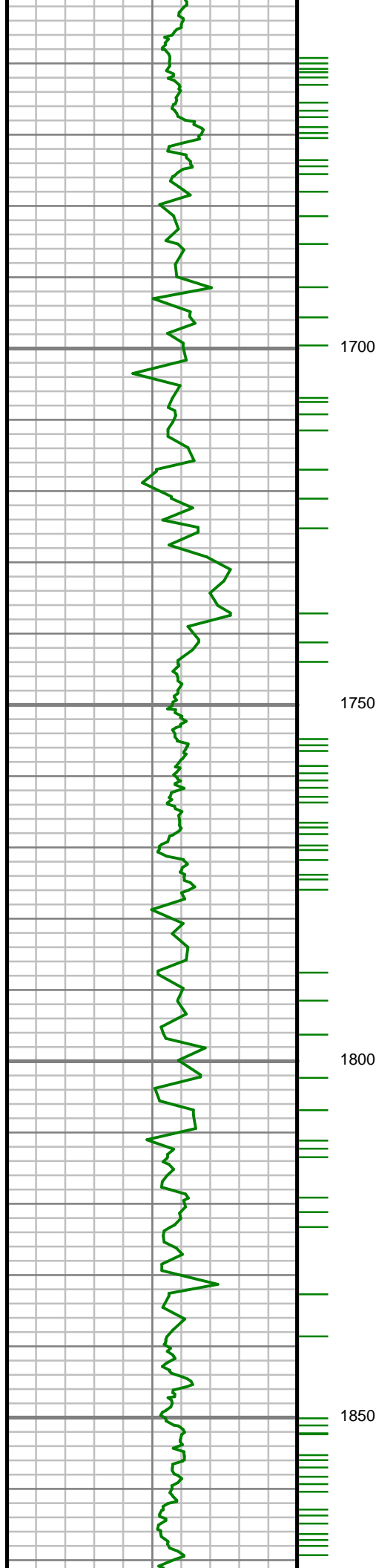
S: 18 MD: 1353.00 ft  
Inc: 1.57 deg Az: 72.08  
deg TVD: 1352.85 ft



S: 19 MD: 1444.00 ft  
Inc: 3.34 deg Az: 42.18  
deg TVD: 1443.77 ft

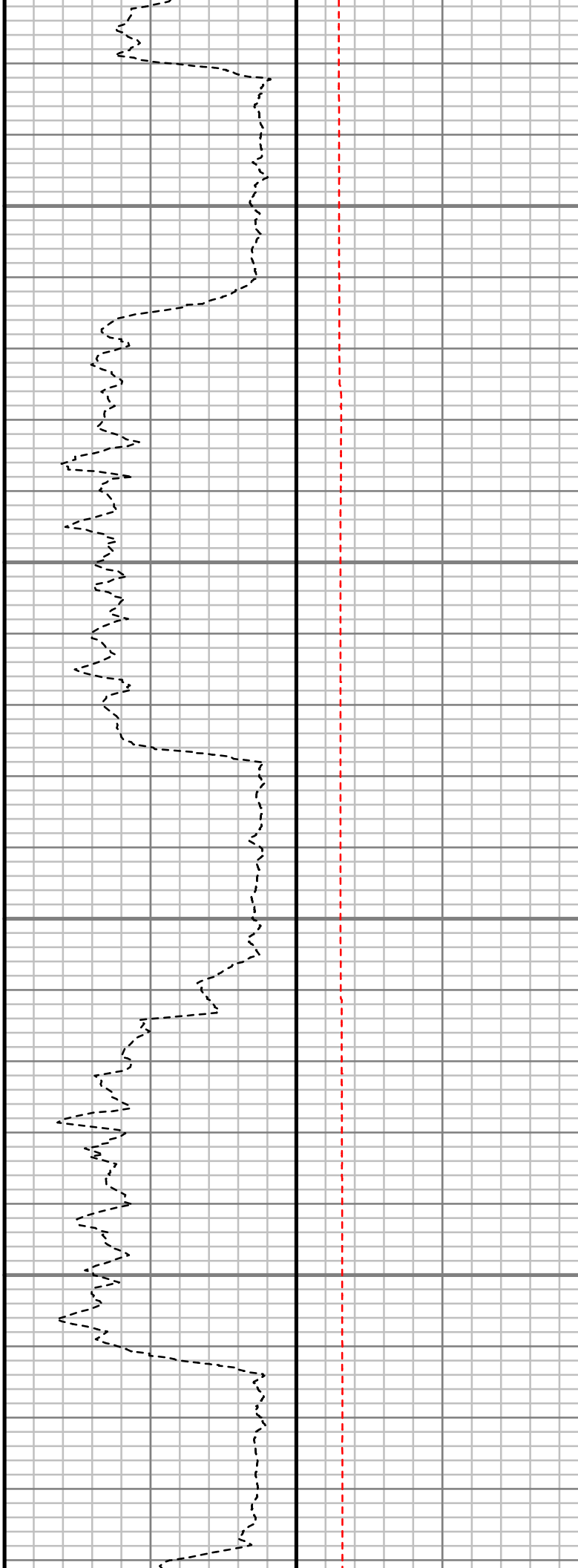
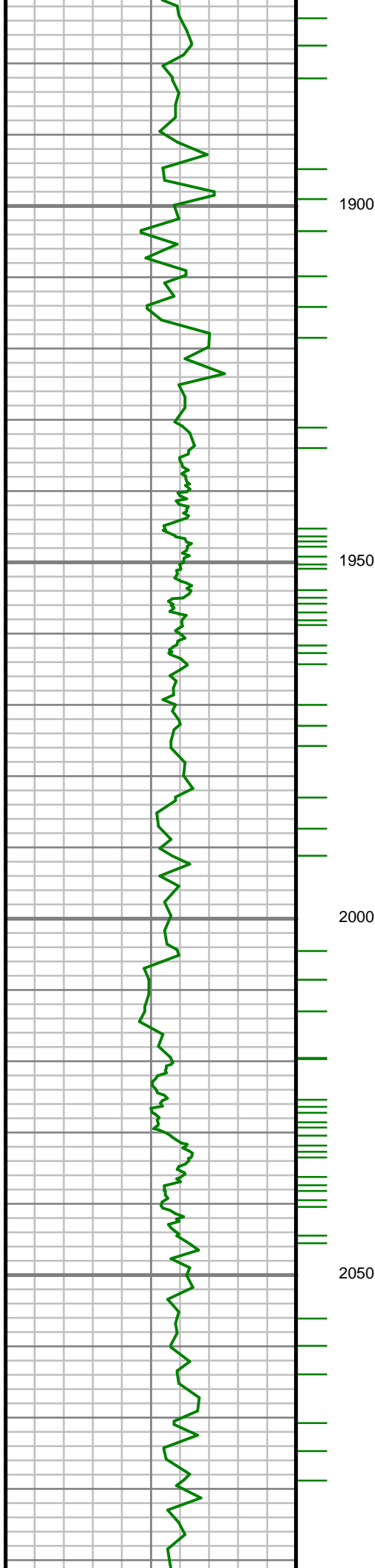
S: 20 MD: 1538.00 ft  
Inc: 5.66 deg Az: 26.80  
deg TVD: 1537.48 ft

S: 21 MD: 1632.00 ft  
Inc: 8.08 deg Az: 20.08  
deg TVD: 1630.80 ft



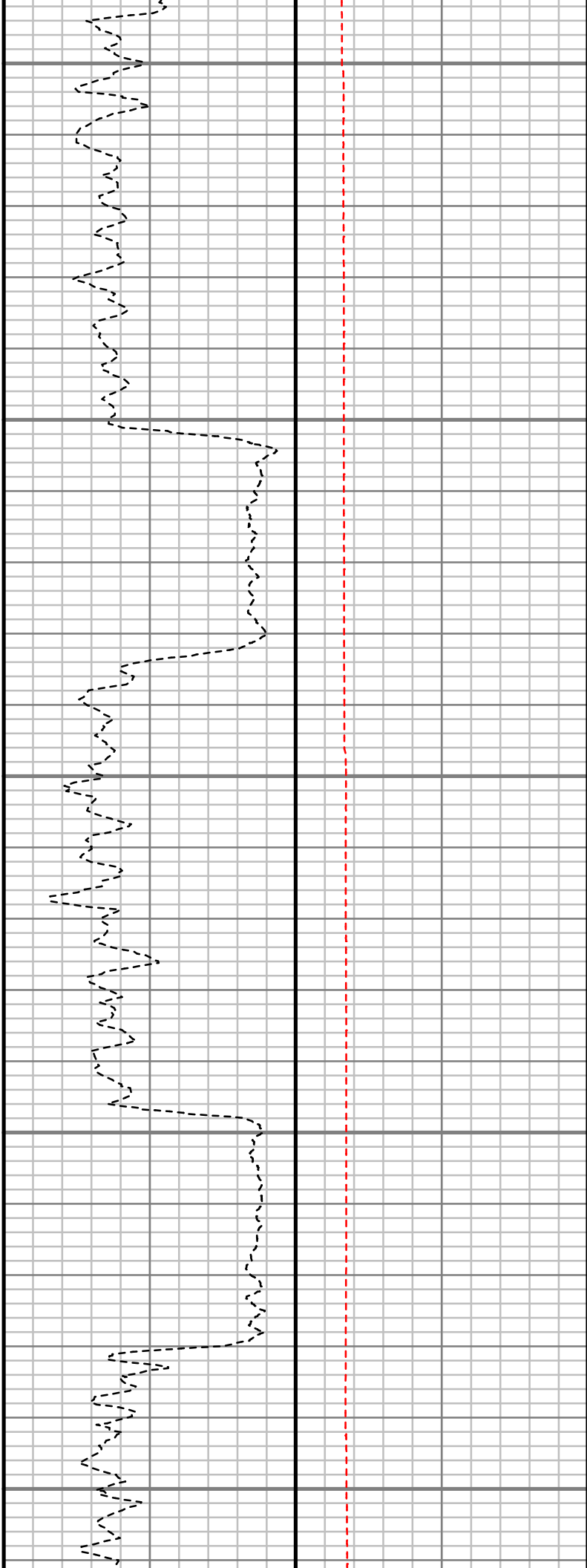
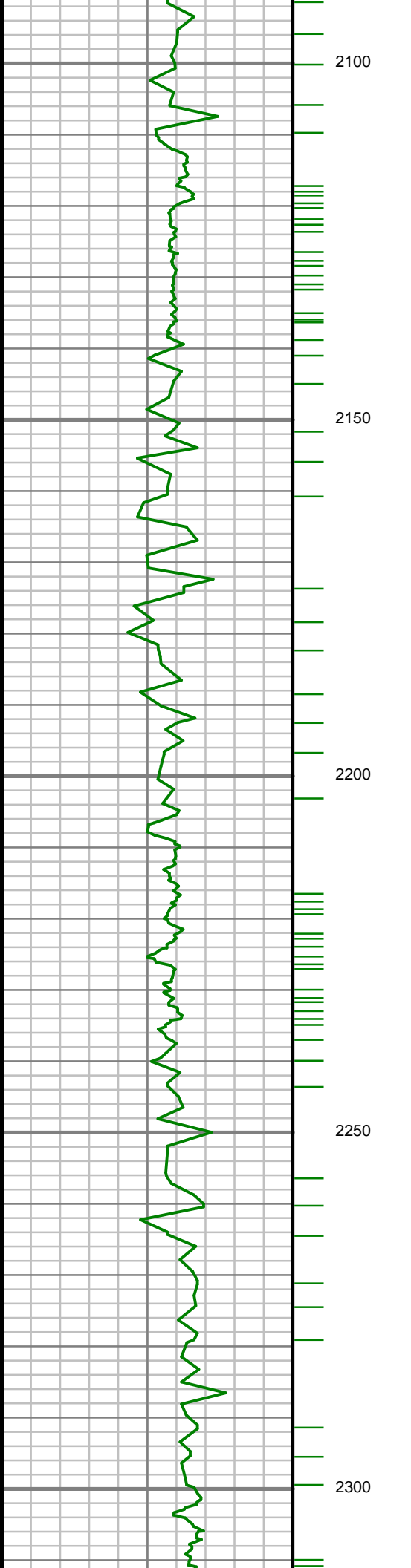
S: 22 MD: 1726.00 ft  
Inc: 10.10 deg Az:  
15.67 deg TVD:  
1723.61 ft

S: 23 MD: 1821.00 ft  
Inc: 12.20 deg Az: 5.94  
deg TVD: 1816.83 ft



S: 24 MD: 1915.00 ft  
Inc: 14.51 deg Az:  
359.38 deg TVD:  
1908.28 ft

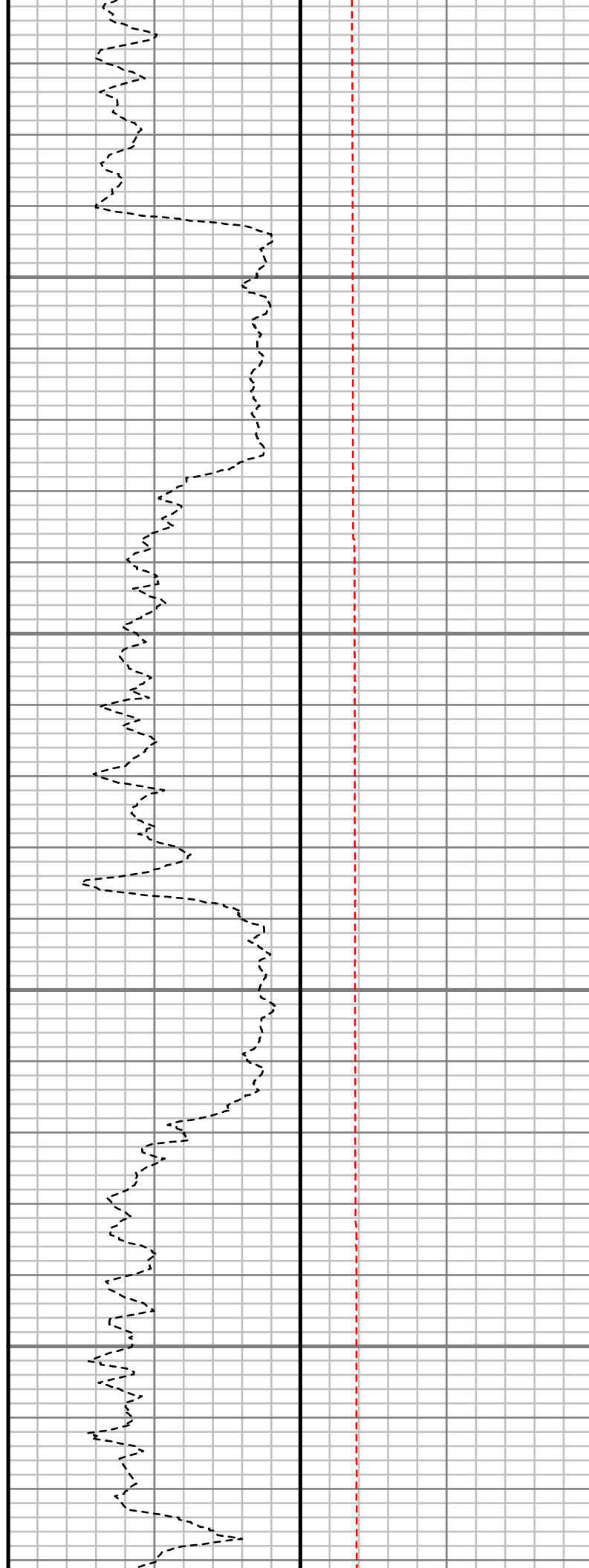
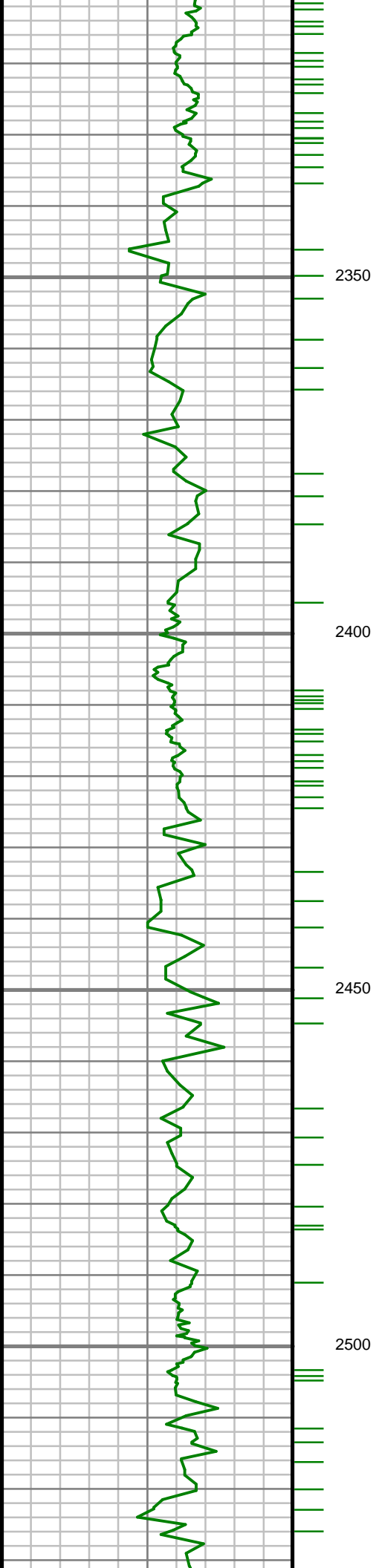
S: 25 MD: 2009.00 ft  
Inc: 16.44 deg Az:  
358.52 deg TVD:  
1998.87 ft



S: 26 MD: 2103.00 ft  
Inc: 18.64 deg Az:  
357.05 deg TVD:  
2088.50 ft

S: 27 MD: 2198.00 ft  
Inc: 20.50 deg Az:  
359.09 deg TVD:  
2178.01 ft

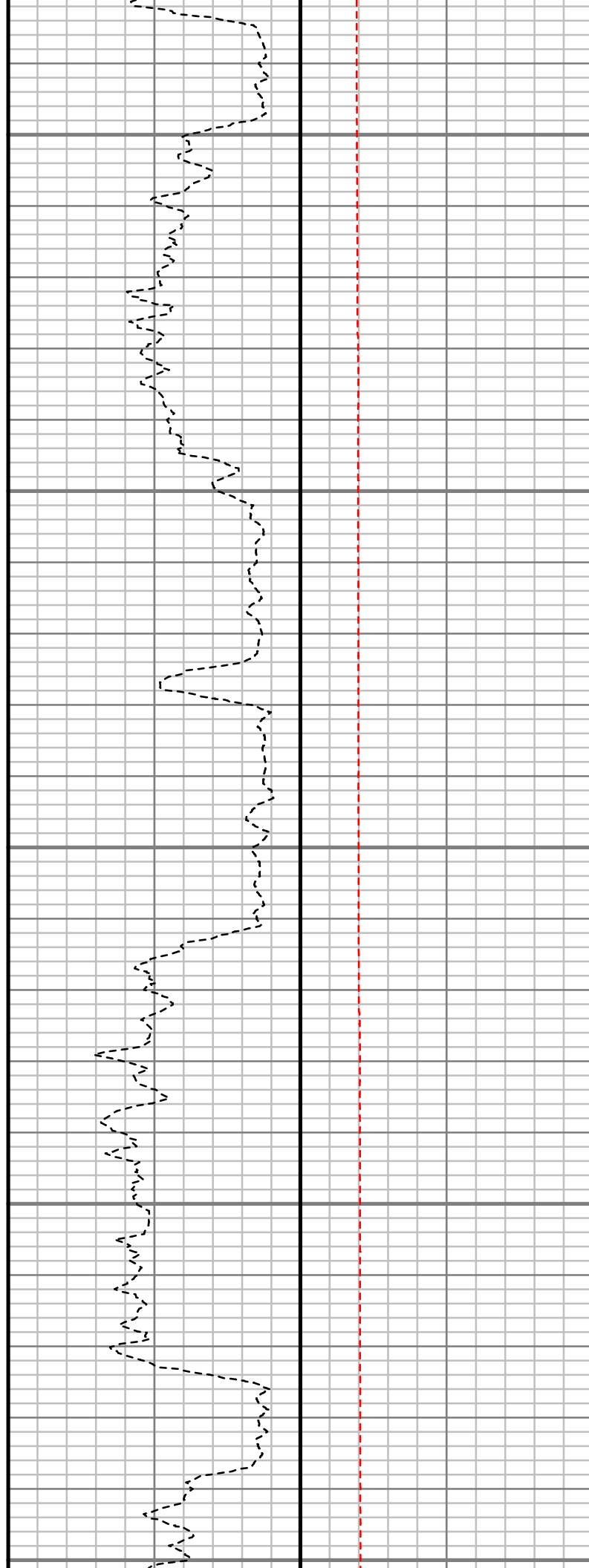
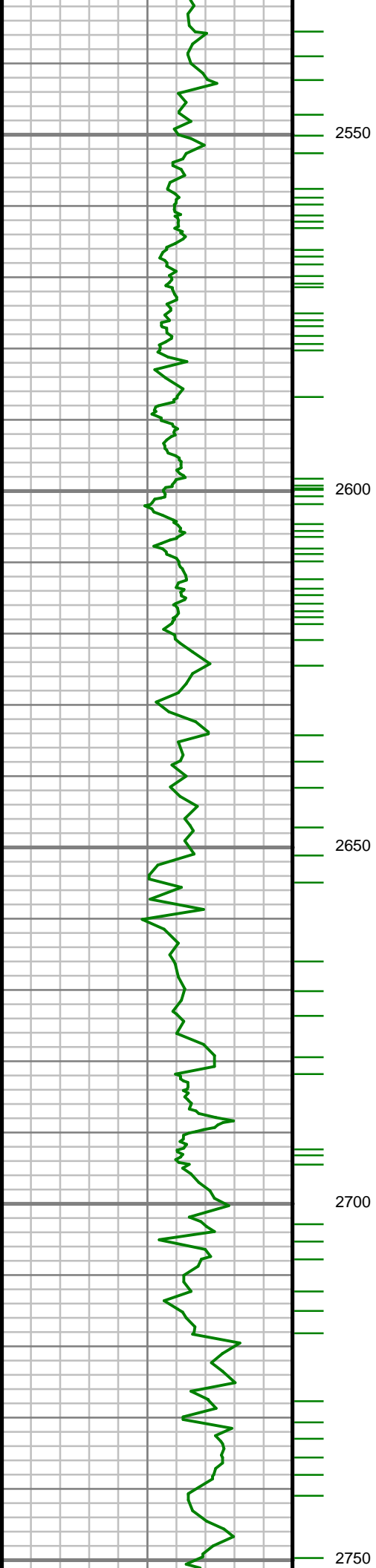
S: 28 MD: 2292.00 ft  
Inc: 22.10 deg Az:  
356.65 deg TVD:  
2265.59 ft



S: 29 MD: 2386.00 ft  
Inc: 24.59 deg Az:  
359.08 deg TVD:  
2351.89 ft

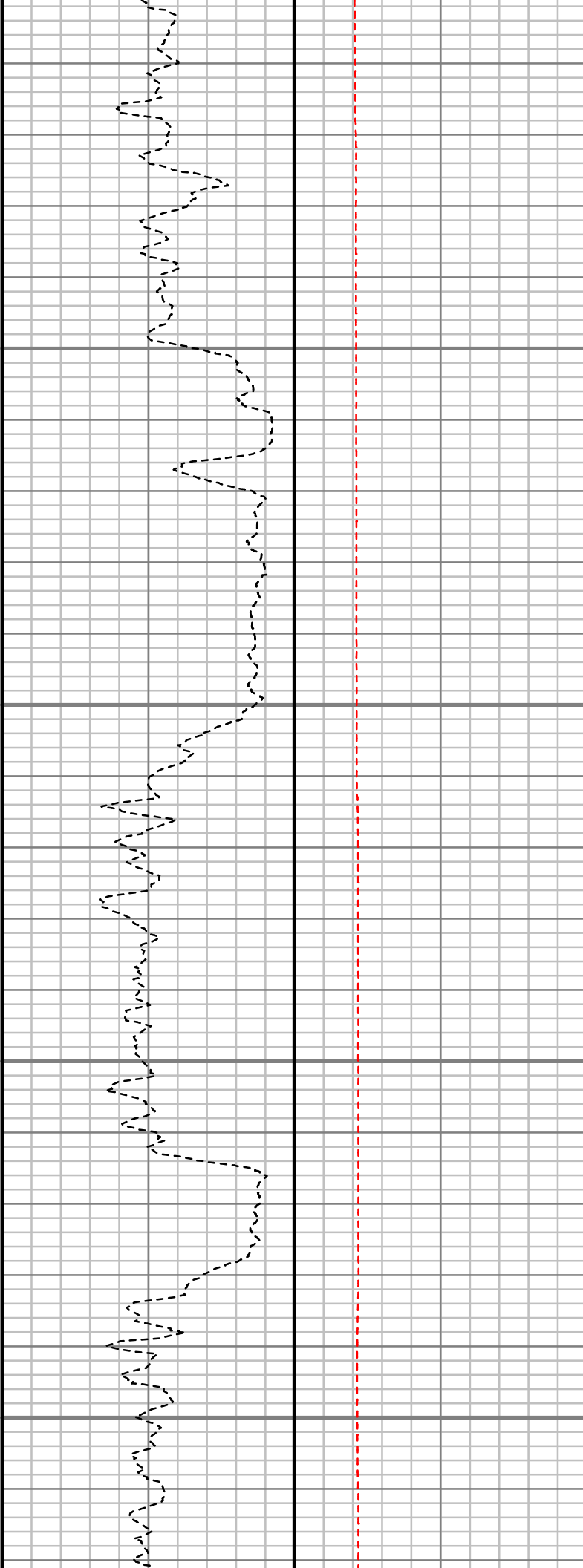
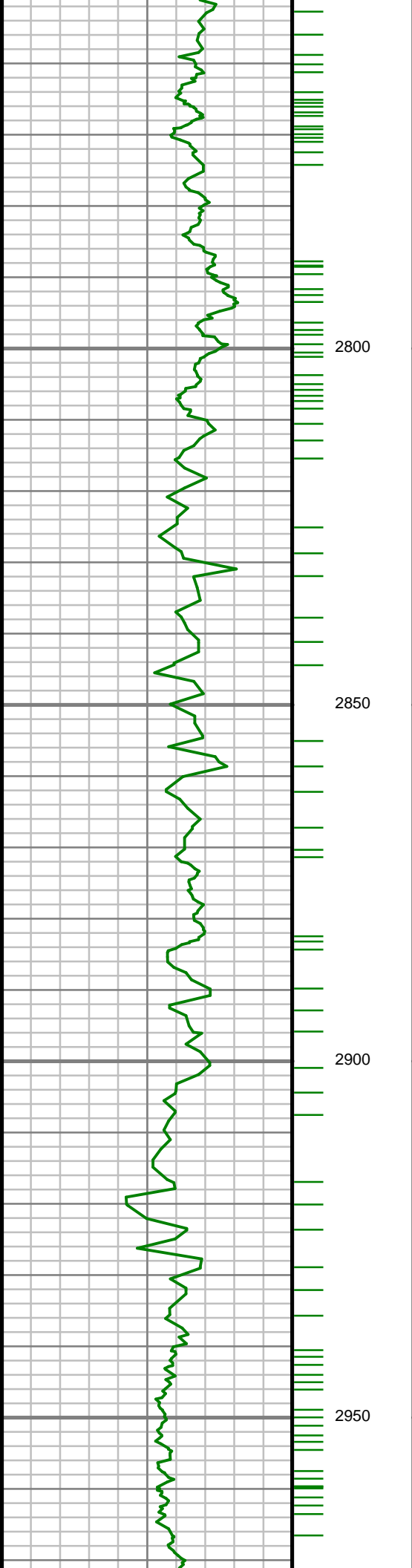
S: 30 MD: 2480.00 ft  
Inc: 25.78 deg Az:  
358.56 deg TVD:  
2436.95 ft





S: 31 MD: 2575.00 ft  
Inc: 24.30 deg Az:  
357.74 deg TVD:  
2523.02 ft

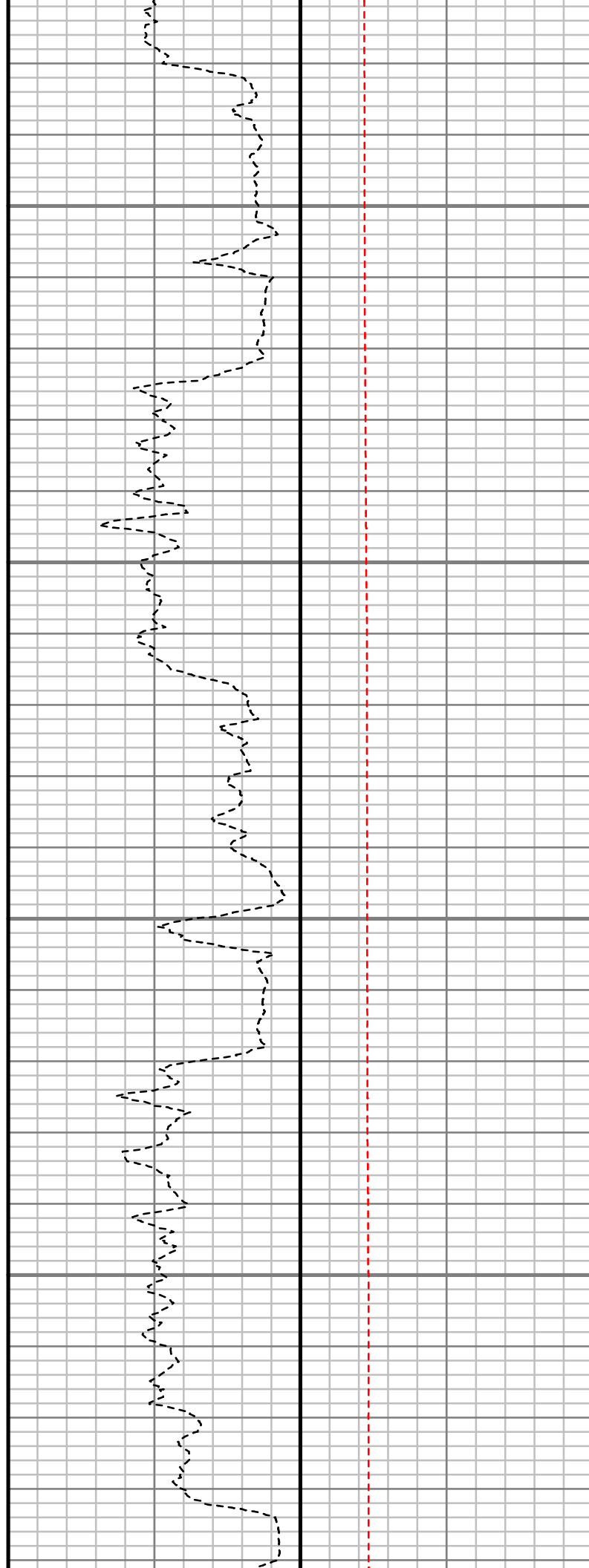
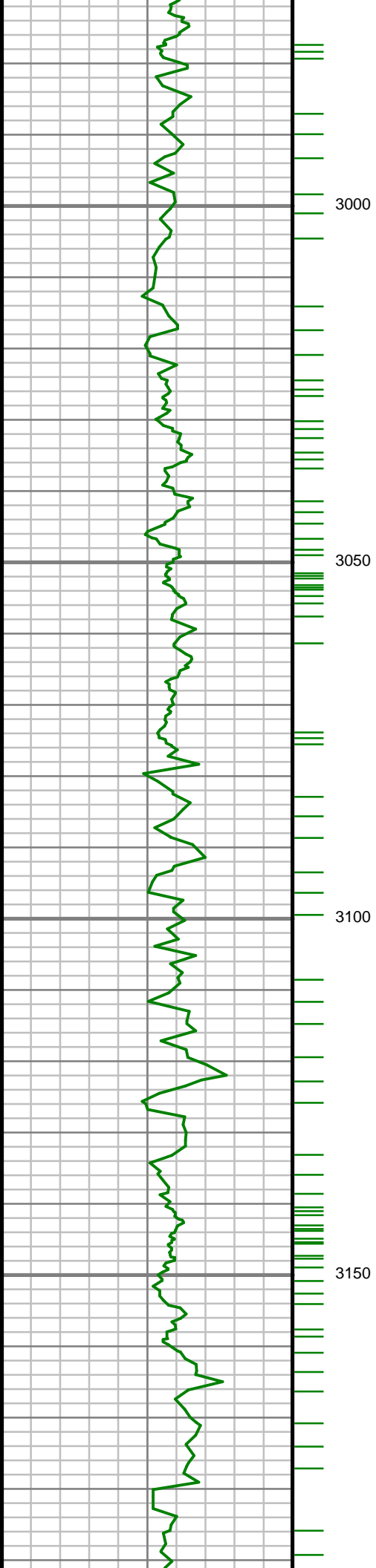
S: 32 MD: 2669.00 ft  
Inc: 26.21 deg Az:  
358.56 deg TVD:  
2608.03 ft



S: 33 MD: 2763.00 ft  
Inc: 24.84 deg Az:  
358.26 deg TVD:  
2692.86 ft

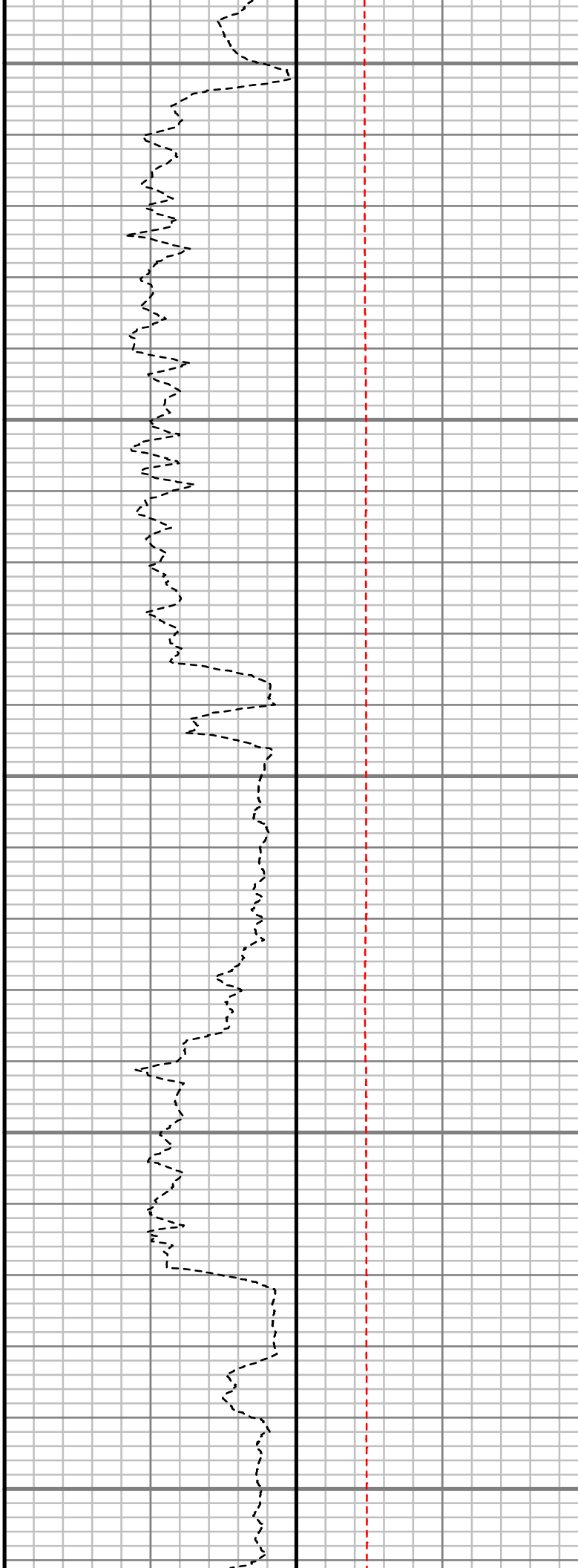
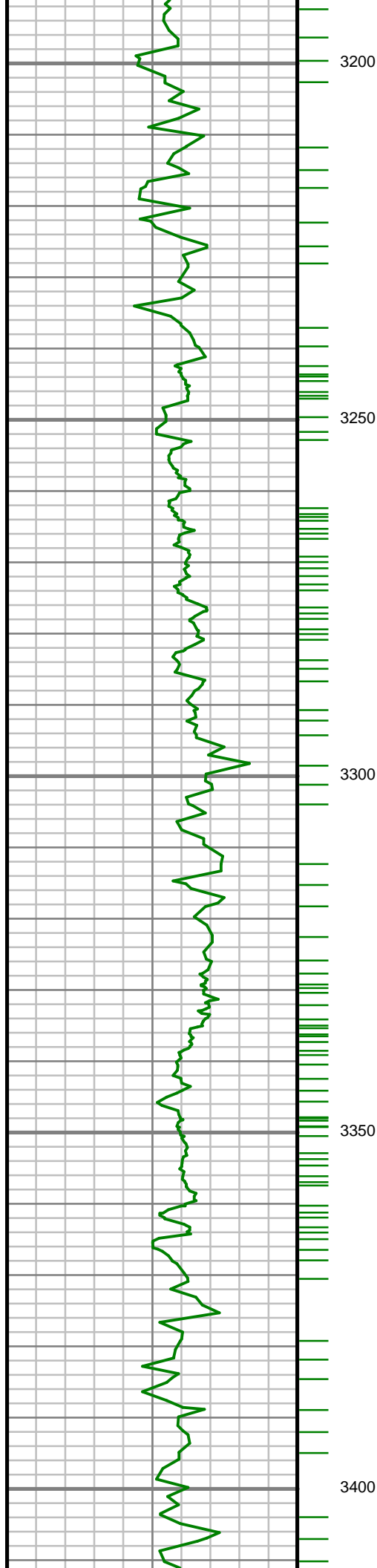
S: 34 MD: 2857.00 ft  
Inc: 26.63 deg Az:  
359.88 deg TVD:  
2777.54 ft

S: 35 MD: 2951.00 ft  
Inc: 26.39 deg Az:  
359.43 deg TVD:  
2861.66 ft



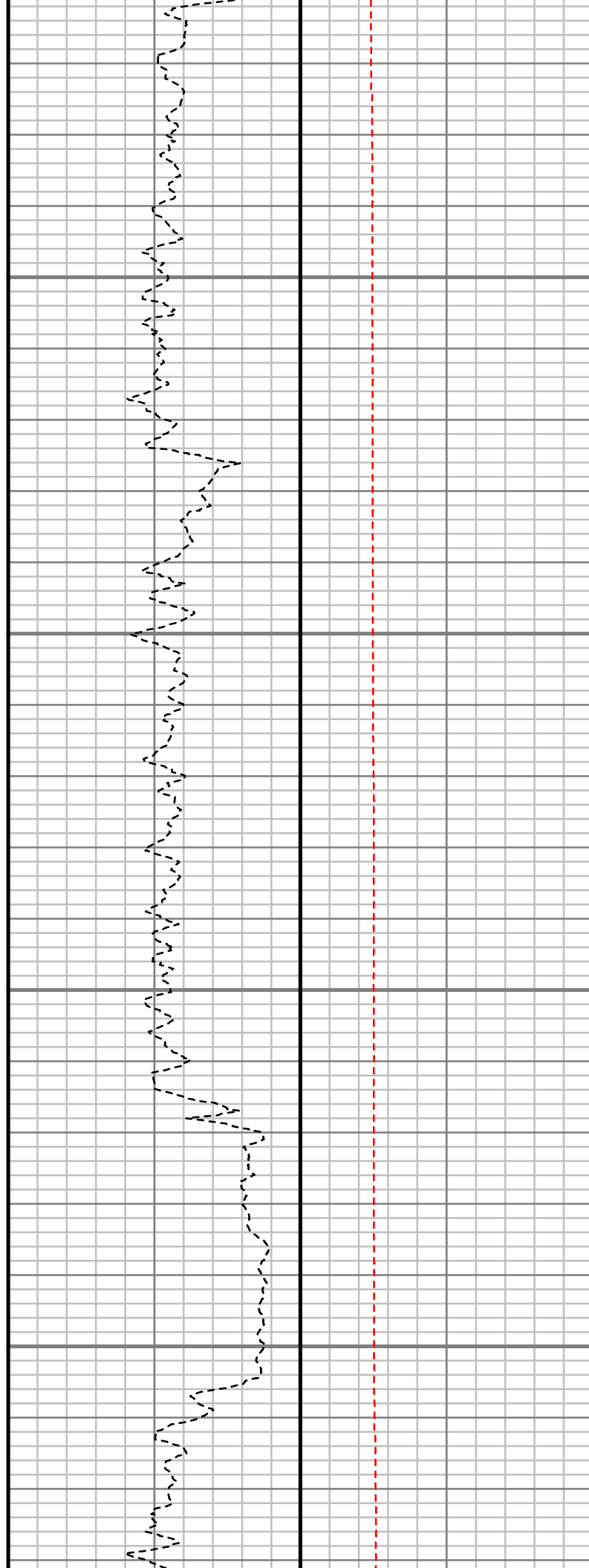
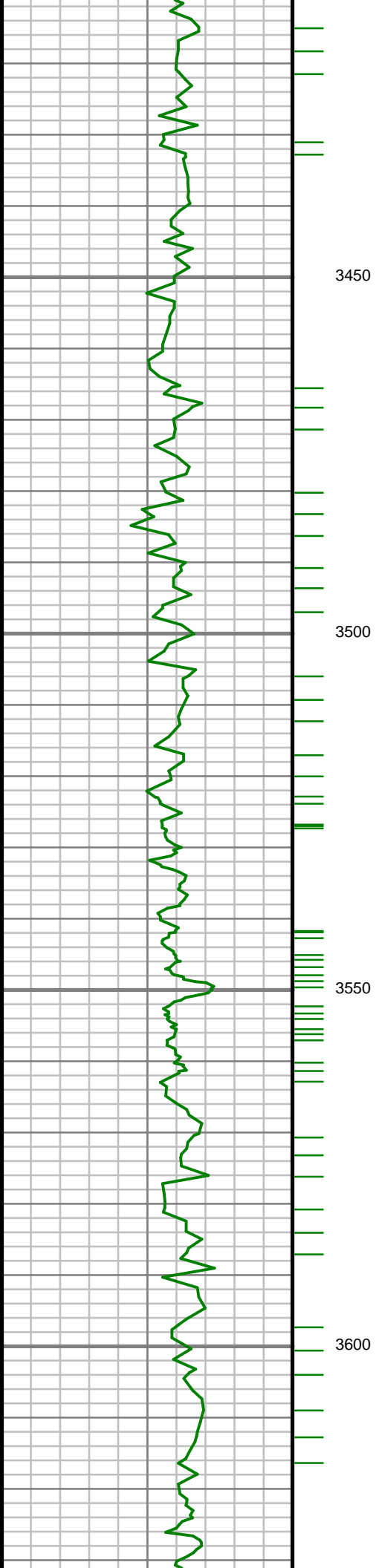
S: 36 MD: 3045.00 ft  
Inc: 26.12 deg Az:  
358.74 deg TVD:  
2945.96 ft

S: 37 MD: 3139.00 ft  
Inc: 25.71 deg Az:  
357.93 deg TVD:  
3030.51 ft



S: 38 MD: 3233.00 ft  
Inc: 24.39 deg Az:  
356.32 deg TVD:  
3115.66 ft

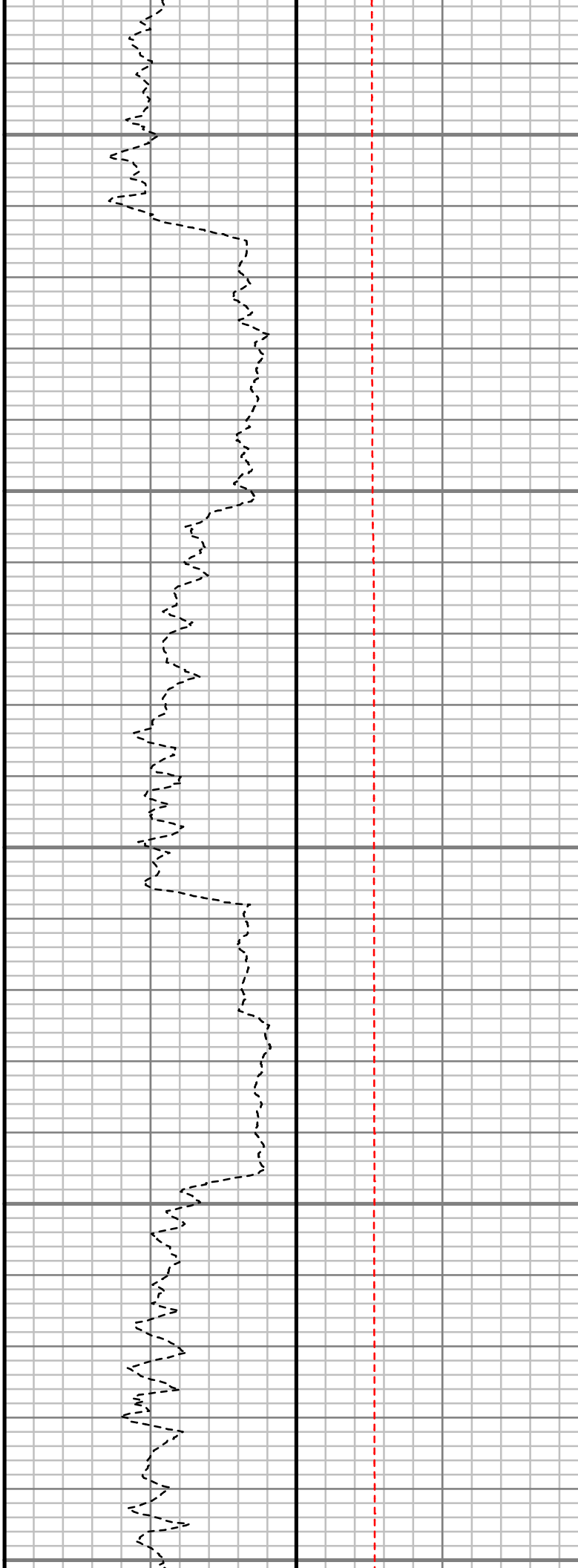
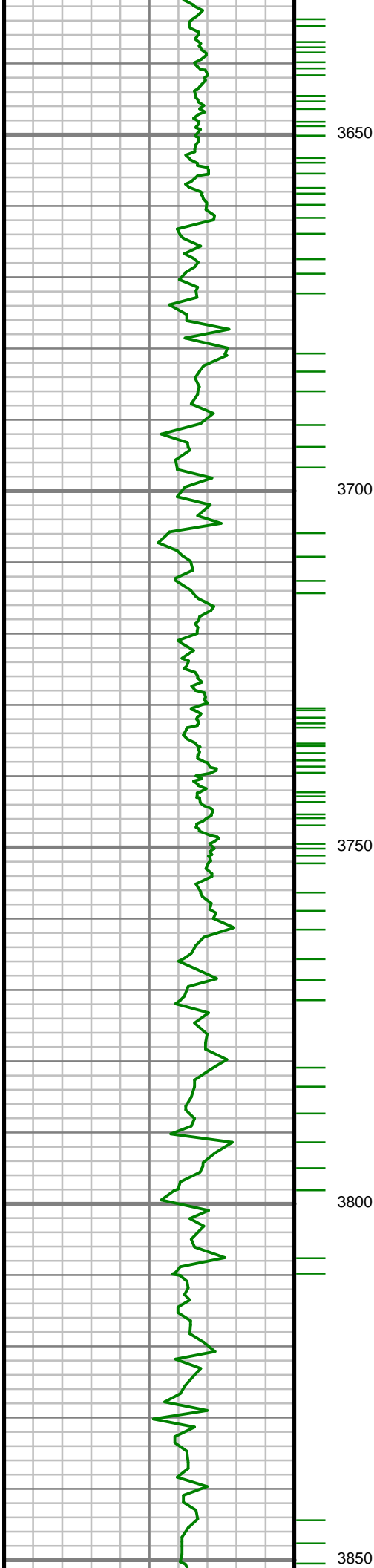
S: 39 MD: 3328.00 ft  
Inc: 25.02 deg Az:  
355.72 deg TVD:  
3201.97 ft



S: 40 MD: 3421.00 ft  
Inc: 26.36 deg Az:  
357.14 deg TVD:  
3285.78 ft

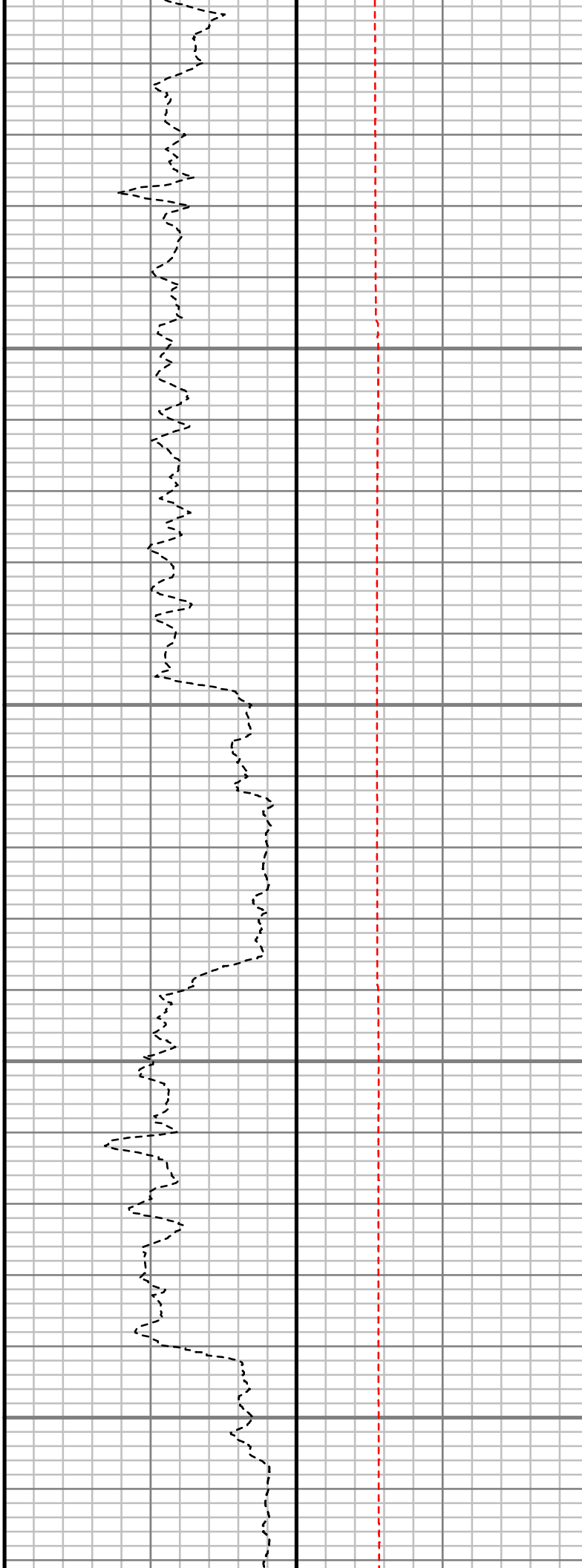
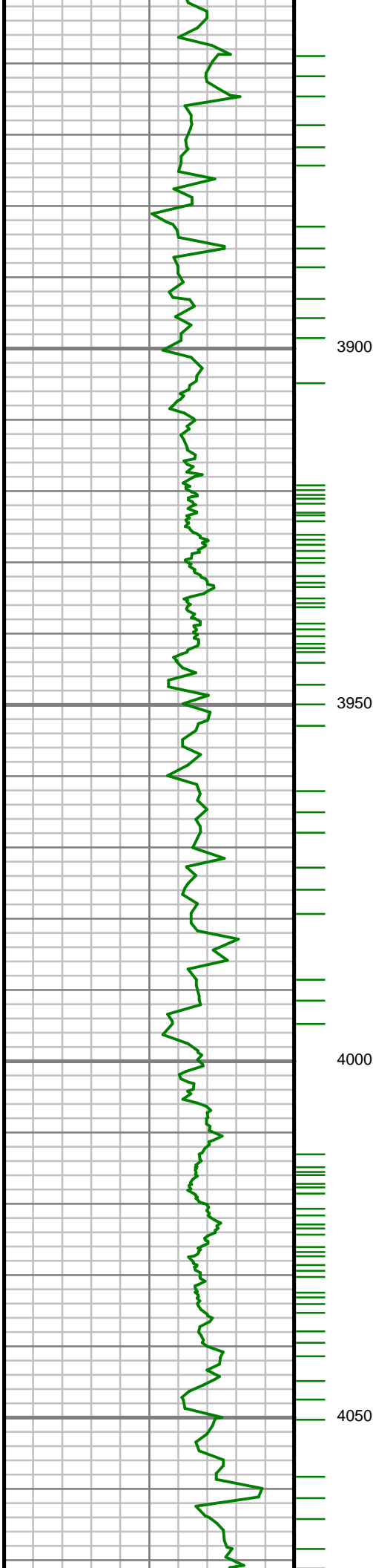
S: 41 MD: 3515.00 ft  
Inc: 24.61 deg Az:  
355.55 deg TVD:  
3370.63 ft

S: 42 MD: 3609.00 ft  
Inc: 24.26 deg Az:  
357.36 deg TVD:  
3456.21 ft



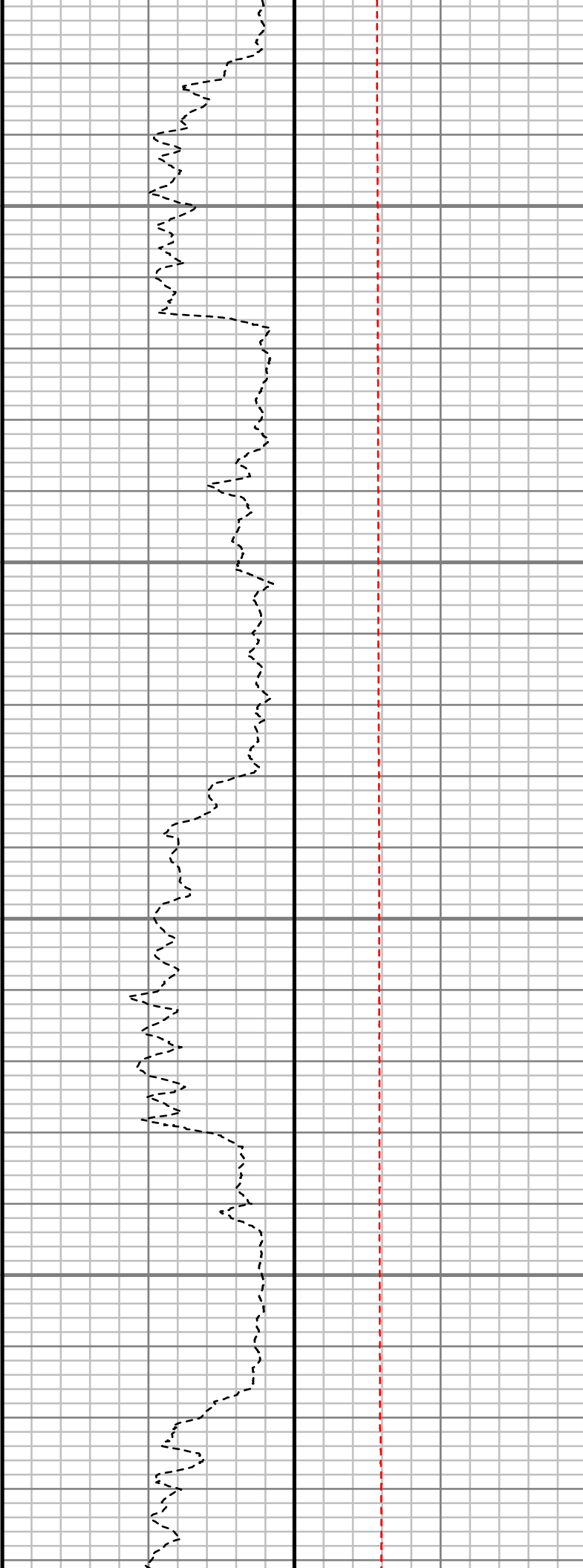
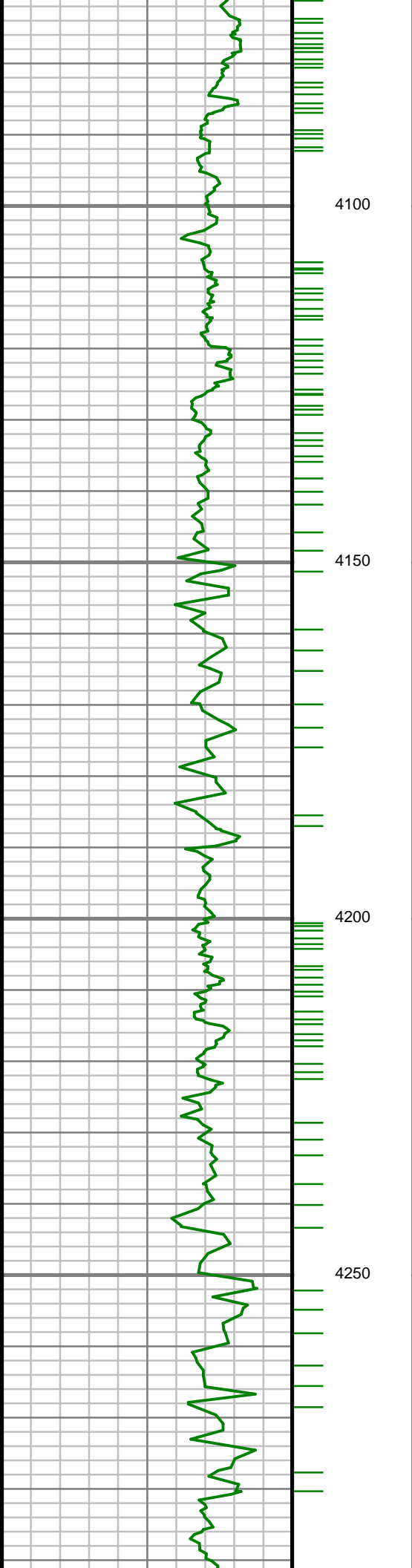
S: 43 MD: 3703.00 ft  
Inc: 24.90 deg Az:  
359.71 deg TVD:  
3541.69 ft

S: 44 MD: 3798.00 ft  
Inc: 25.61 deg Az: 0.57  
deg TVD: 3627.61 ft



S: 45 MD: 3892.00 ft  
Inc: 23.11 deg Az:  
358.65 deg TVD:  
3713.23 ft

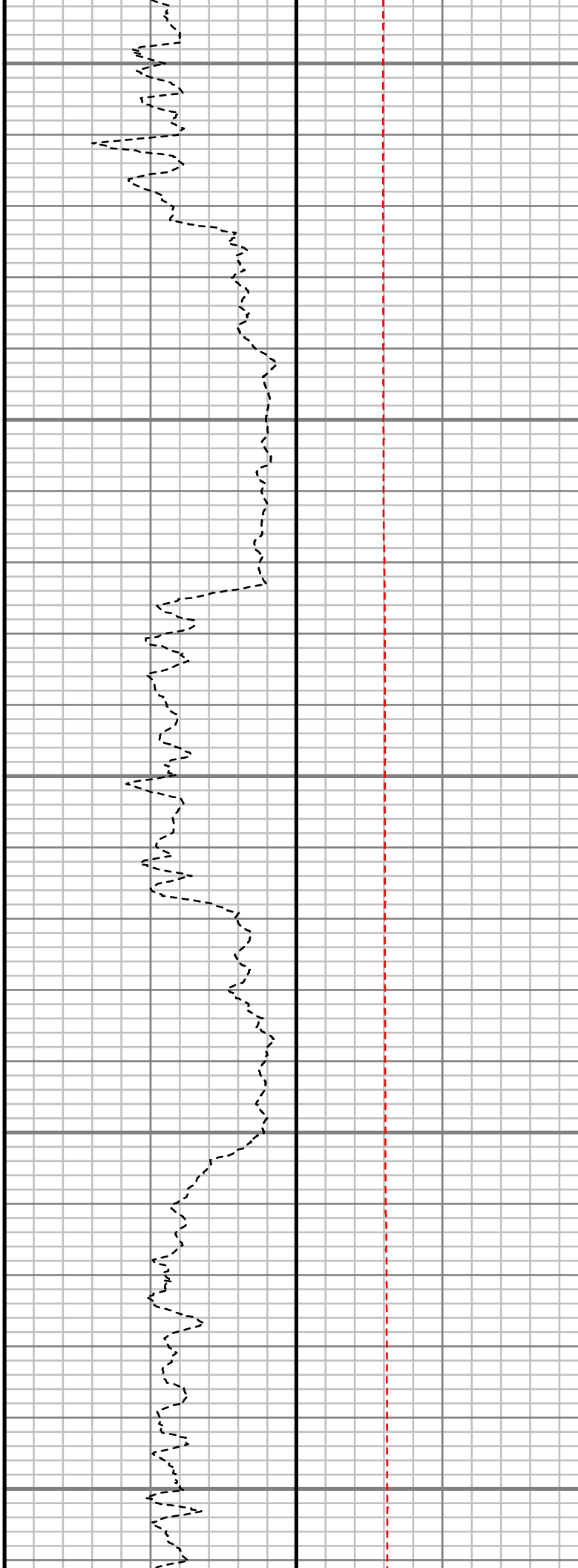
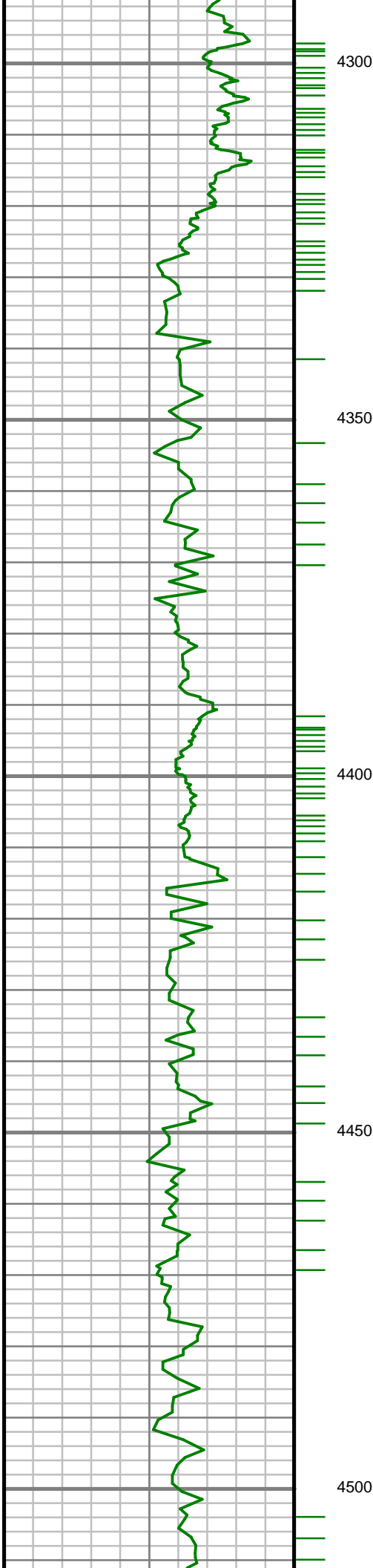
S: 46 MD: 3986.00 ft  
Inc: 23.16 deg Az:  
356.42 deg TVD:  
3799.68 ft



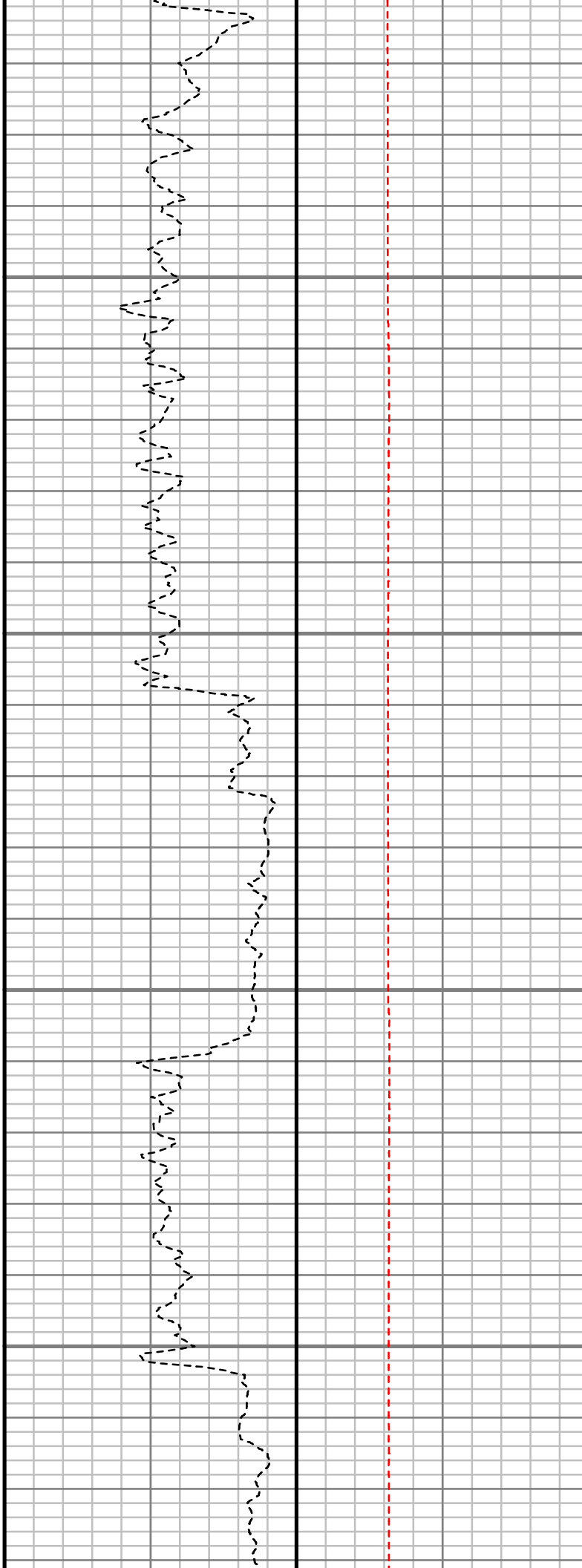
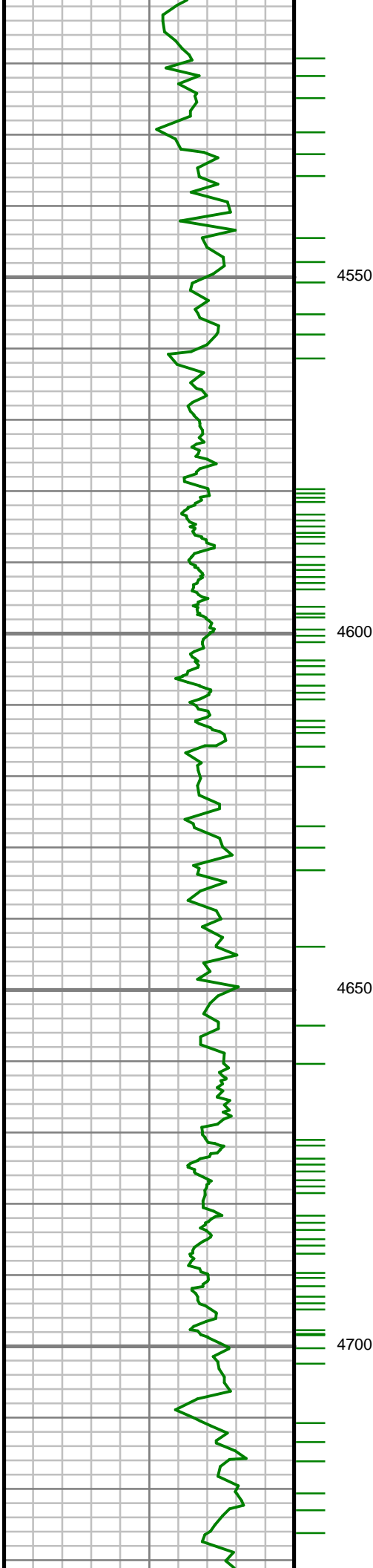
S: 47 MD: 4175.00 ft  
Inc: 24.63 deg Az:  
359.11 deg TVD:  
3972.48 ft

S: 48 MD: 4269.00 ft  
Inc: 25.15 deg Az: 1.03  
deg TVD: 4057.75 ft



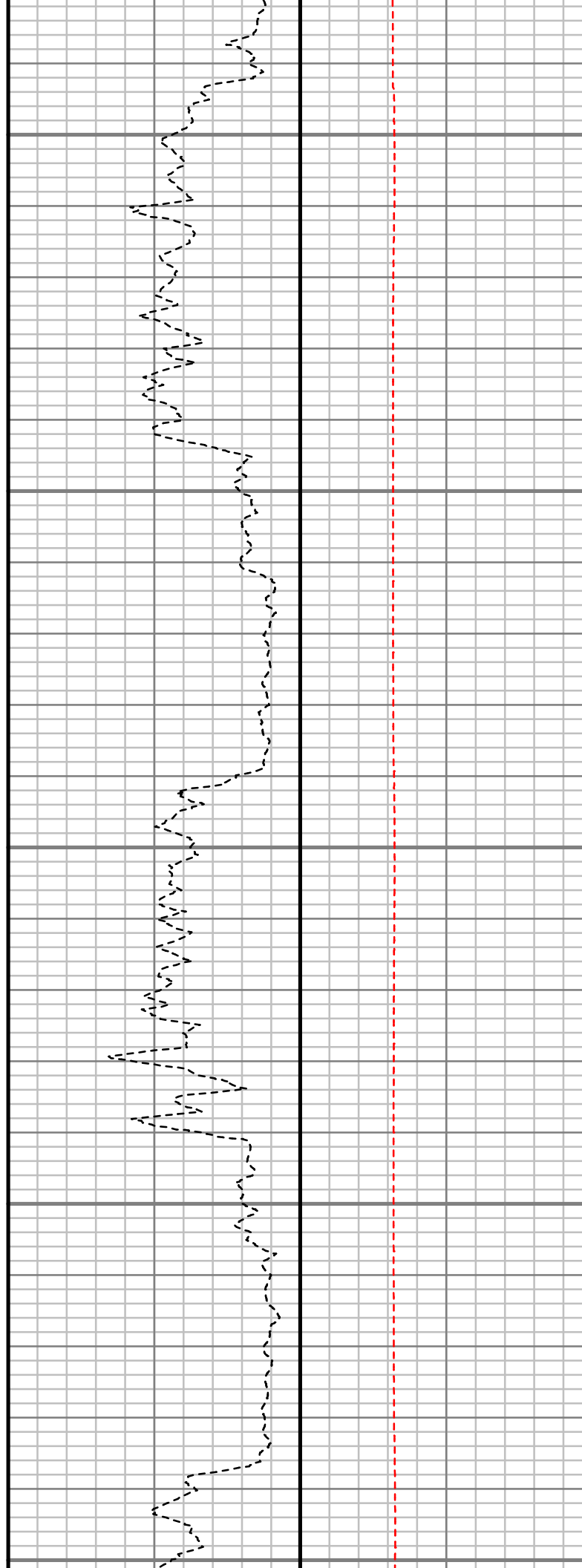
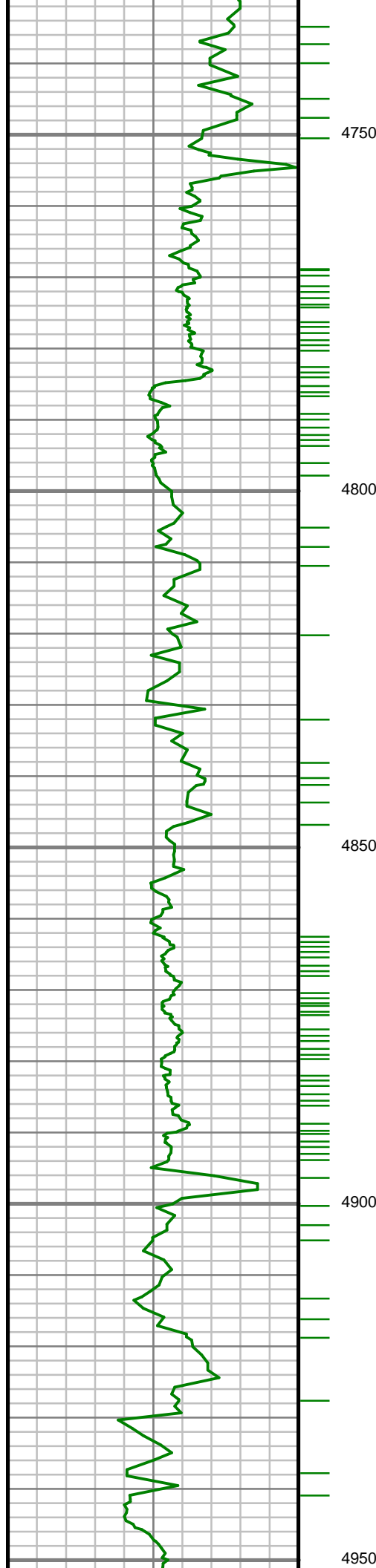


S: 49 MD: 4364.00 ft  
Inc: 25.91 deg Az:  
359.31 deg TVD:  
4143.47 ft



S: 50 MD: 4552.00 ft  
Inc: 25.58 deg Az:  
357.79 deg TVD:  
4312.81 ft

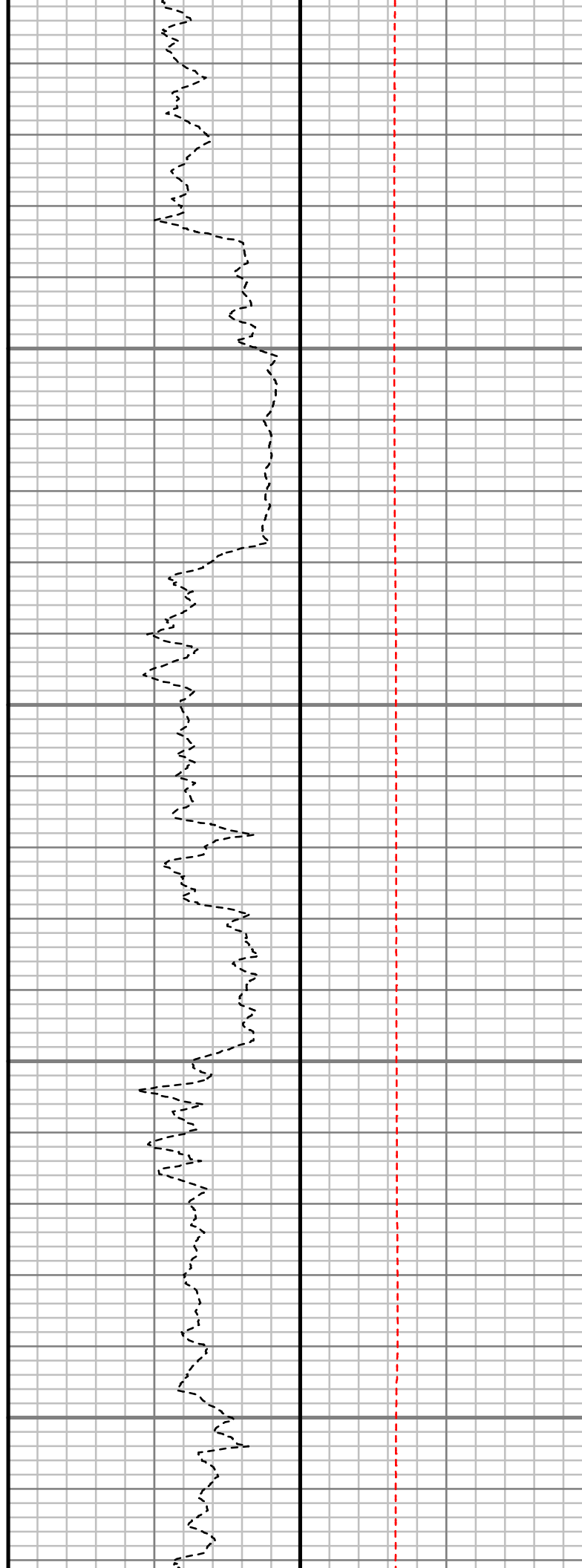
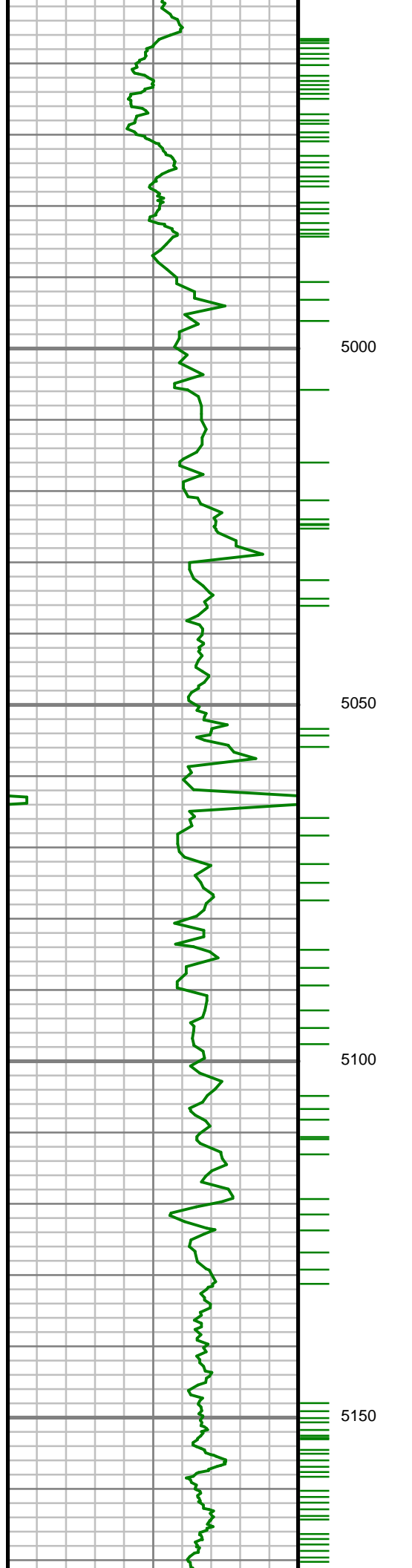
S: 51 MD: 4646.00 ft  
Inc: 26.09 deg Az:  
356.91 deg TVD:  
4397.42 ft



S: 52 MD: 4741.00 ft  
Inc: 24.99 deg Az:  
355.06 deg TVD:  
4483.13 ft

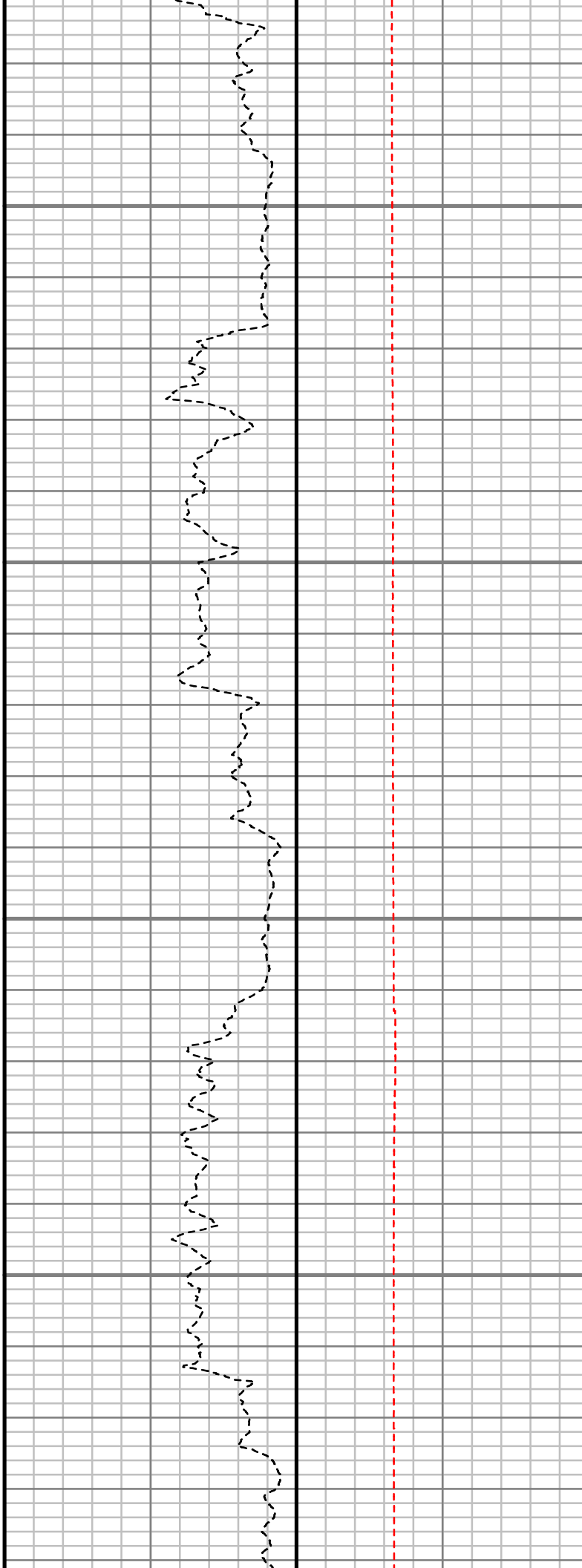
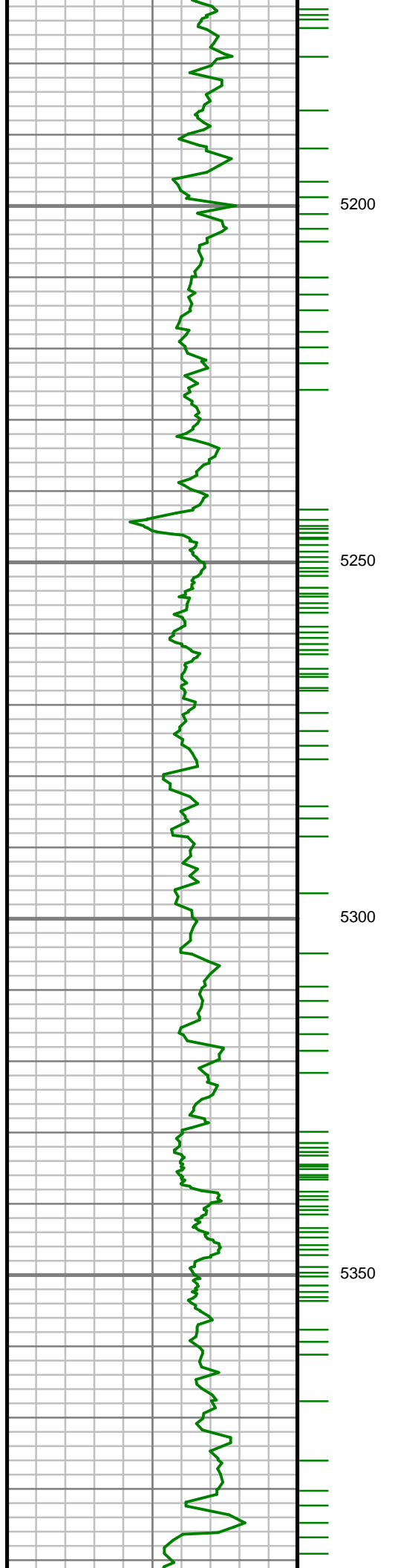
S: 53 MD: 4835.00 ft  
Inc: 24.44 deg Az:  
357.16 deg TVD:  
4568.53 ft

S: 54 MD: 4929.00 ft  
Inc: 25.79 deg Az:  
356.65 deg TVD:  
4653.64 ft



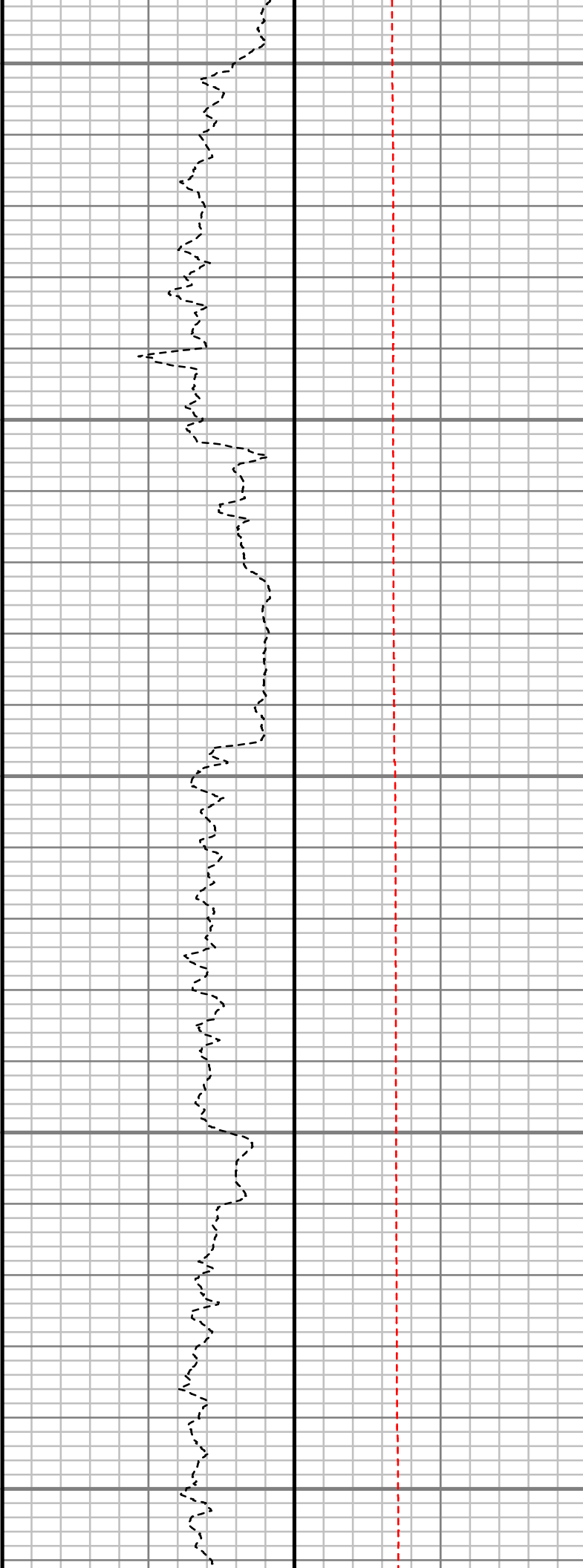
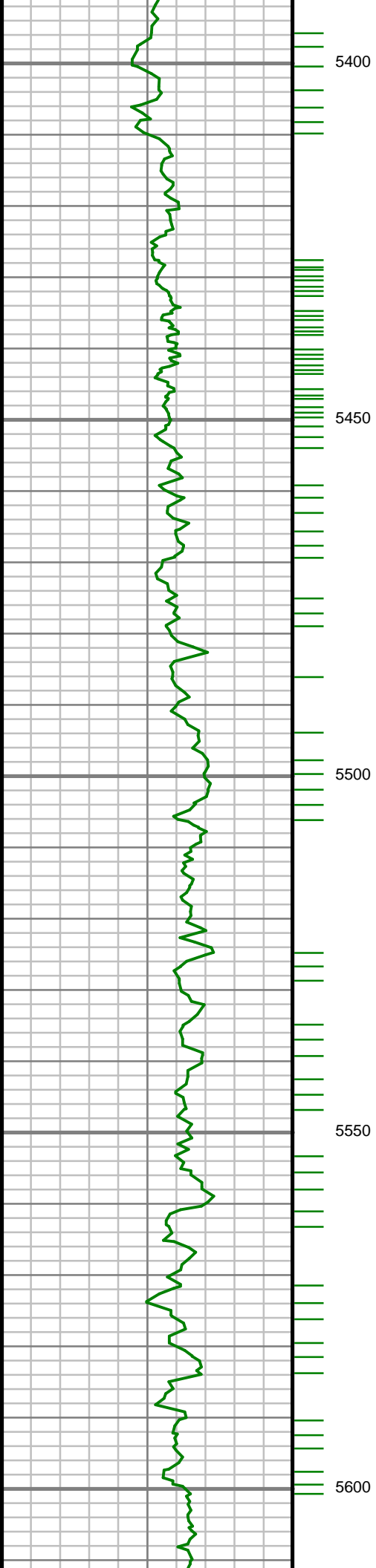
S: 55 MD: 5024.00 ft  
Inc: 28.33 deg Az:  
356.93 deg TVD:  
4738.23 ft

S: 56 MD: 5118.00 ft  
Inc: 27.62 deg Az:  
354.57 deg TVD:  
4821.25 ft



S: 57 MD: 5212.00 ft  
Inc: 26.21 deg Az:  
356.22 deg TVD:  
4905.07 ft

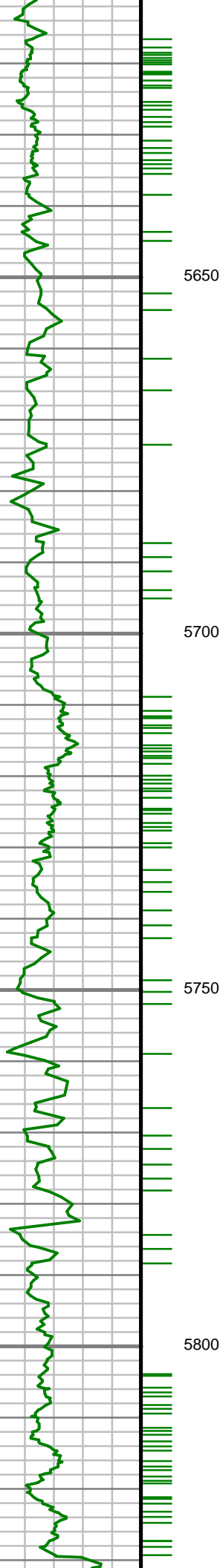
S: 58 MD: 5306.00 ft  
Inc: 25.74 deg Az: 0.19  
deg TVD: 4989.58 ft



S: 59 MD: 5400.00 ft  
Inc: 24.98 deg Az:  
359.02 deg TVD:  
5074.52 ft

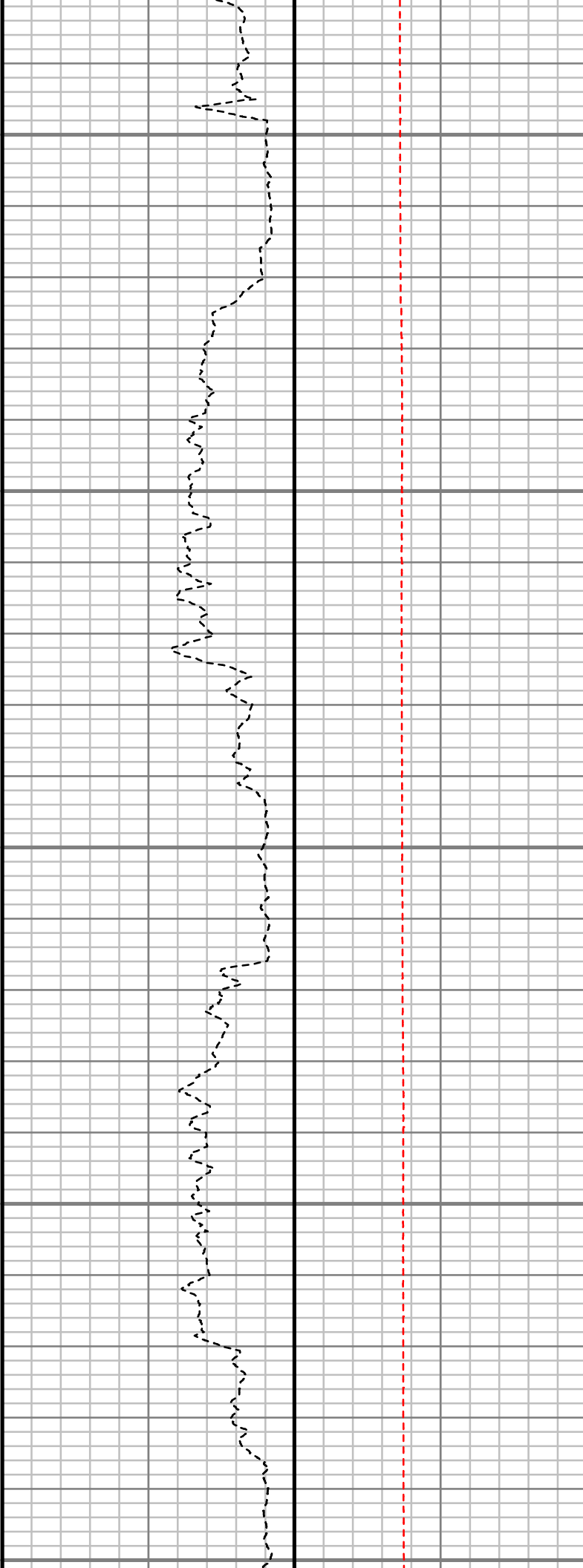
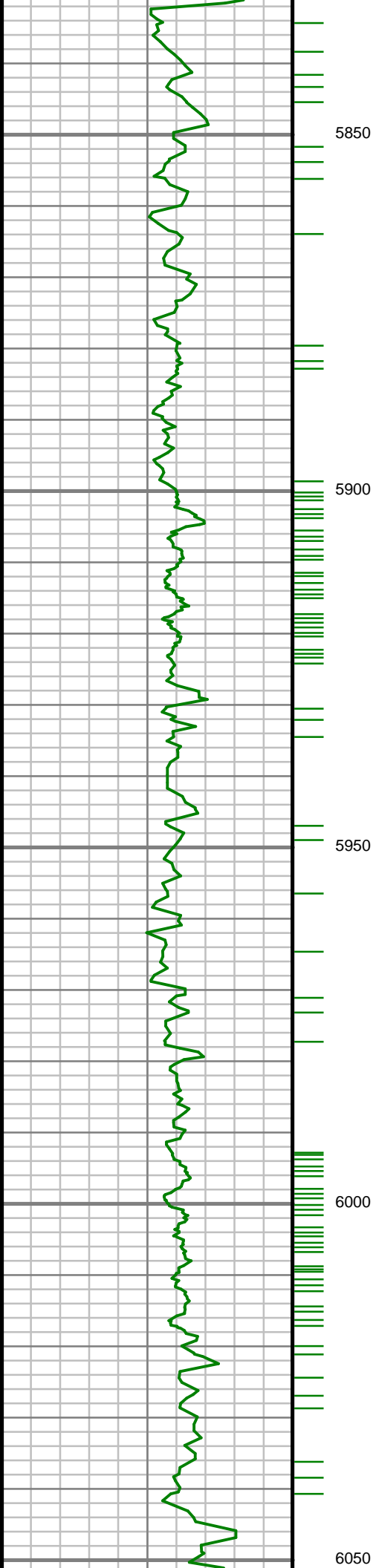
S: 60 MD: 5495.00 ft  
Inc: 27.40 deg Az:  
359.57 deg TVD:  
5159.76 ft

S: 61 MD: 5589.00 ft  
Inc: 26.10 deg Az:  
357.44 deg TVD:  
5243.70 ft



S: 62 MD: 5683.00 ft  
Inc: 24.95 deg Az:  
358.34 deg TVD:  
5328.53 ft

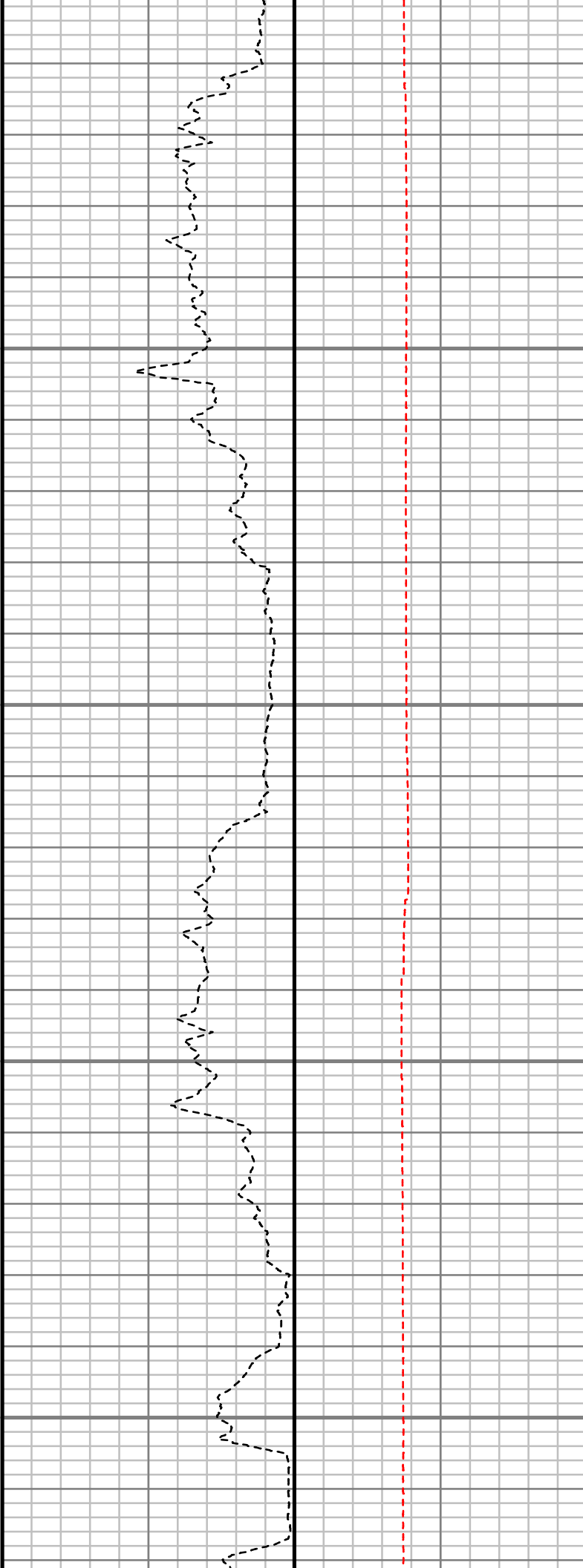
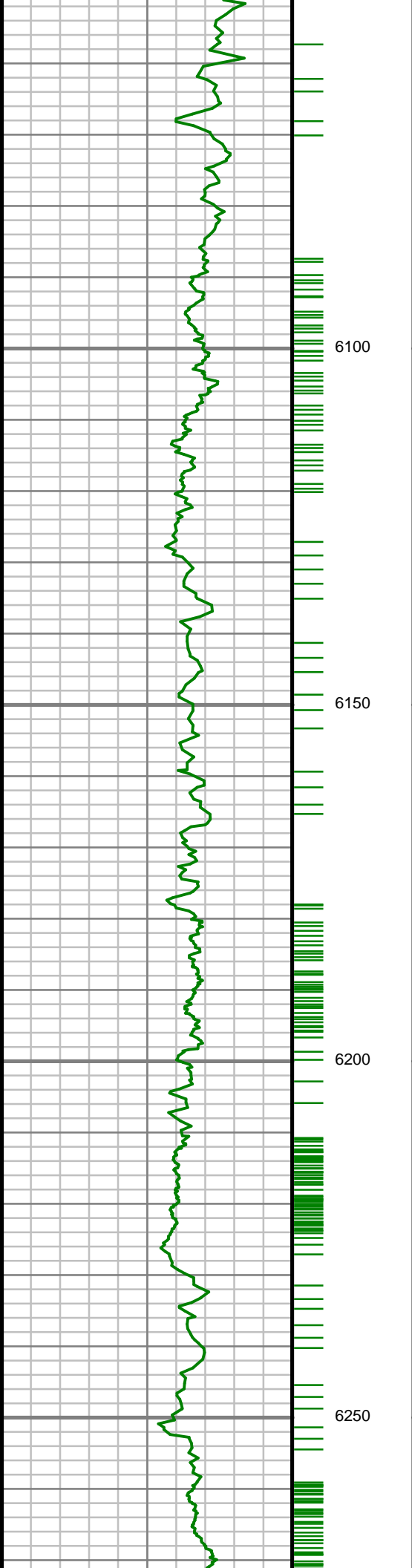
S: 63 MD: 5777.00 ft  
Inc: 23.69 deg Az:  
359.02 deg TVD:  
5414.19 ft



S: 64 MD: 5871.00 ft  
Inc: 24.10 deg Az:  
358.16 deg TVD:  
5500.13 ft

S: 65 MD: 5965.00 ft  
Inc: 24.32 deg Az:  
358.94 deg TVD:  
5585.86 ft

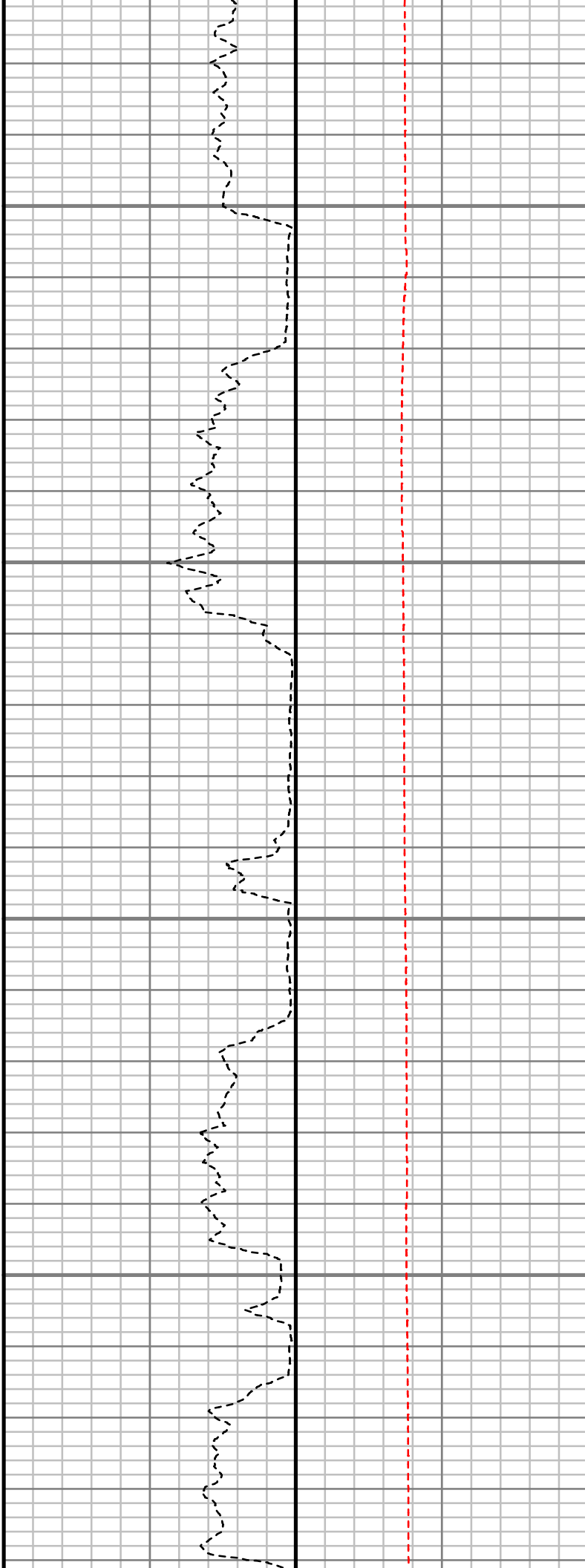
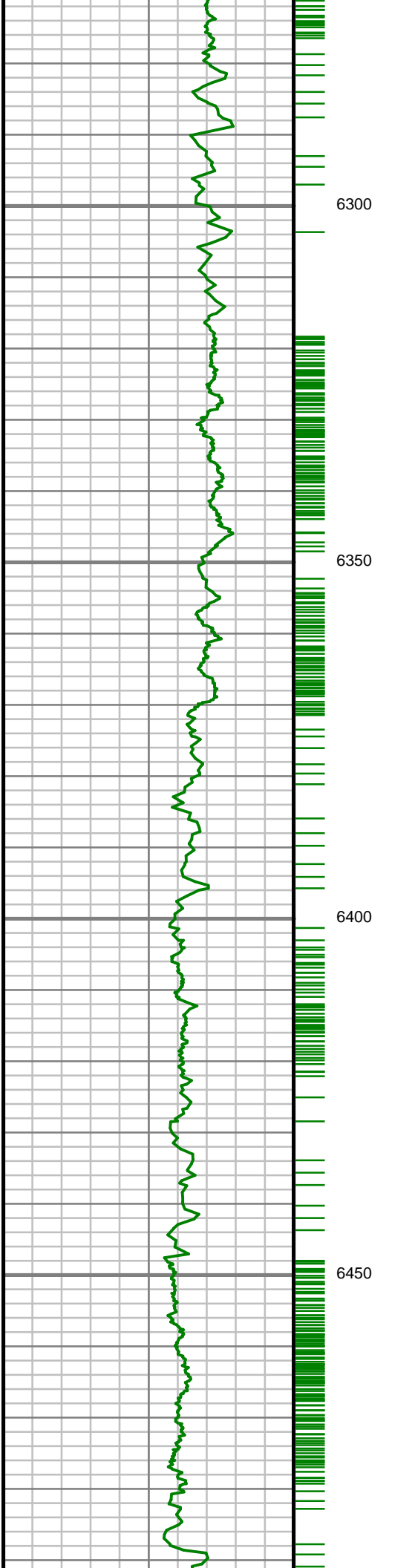




S: 66 MD: 6060.00 ft  
Inc: 23.00 deg Az:  
358.21 deg TVD:  
5672.87 ft

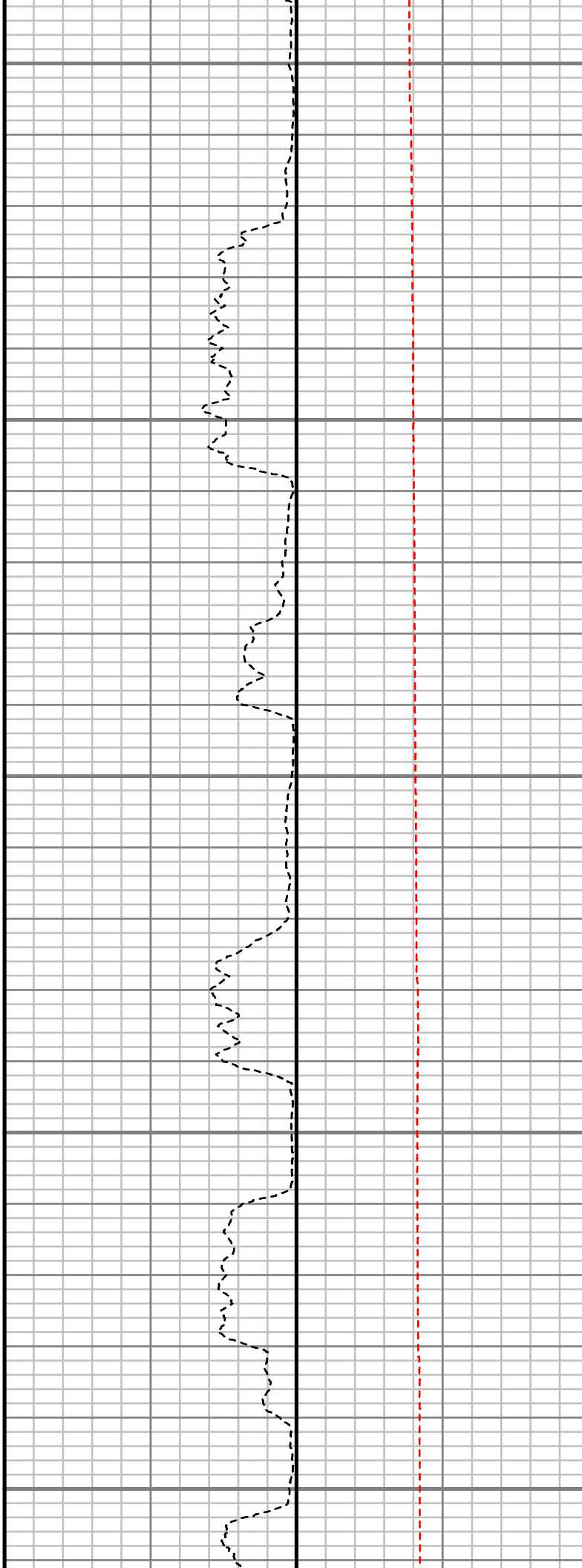
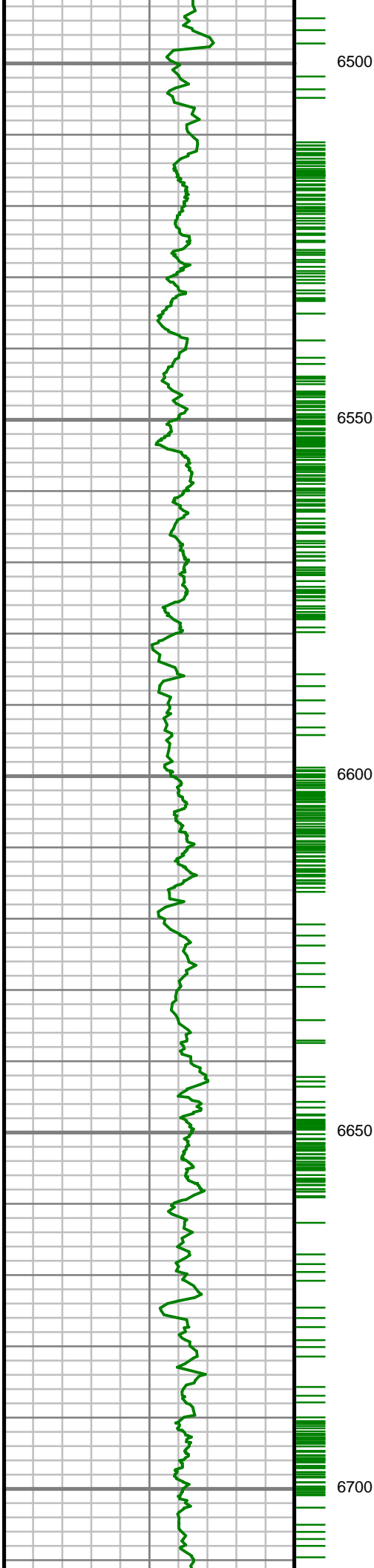
S: 67 MD: 6154.00 ft  
Inc: 22.11 deg Az:  
355.32 deg TVD:  
5759.69 ft

S: 68 MD: 6248.00 ft  
Inc: 21.24 deg Az:  
355.66 deg TVD:  
5847.04 ft



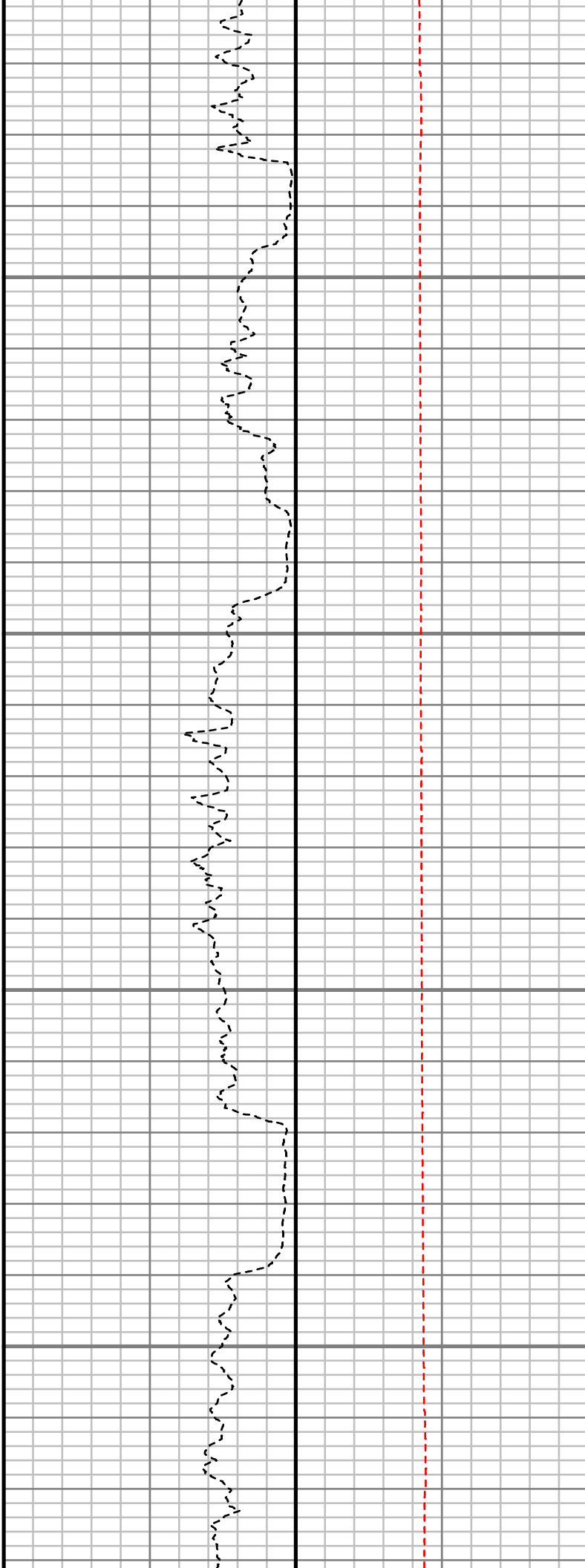
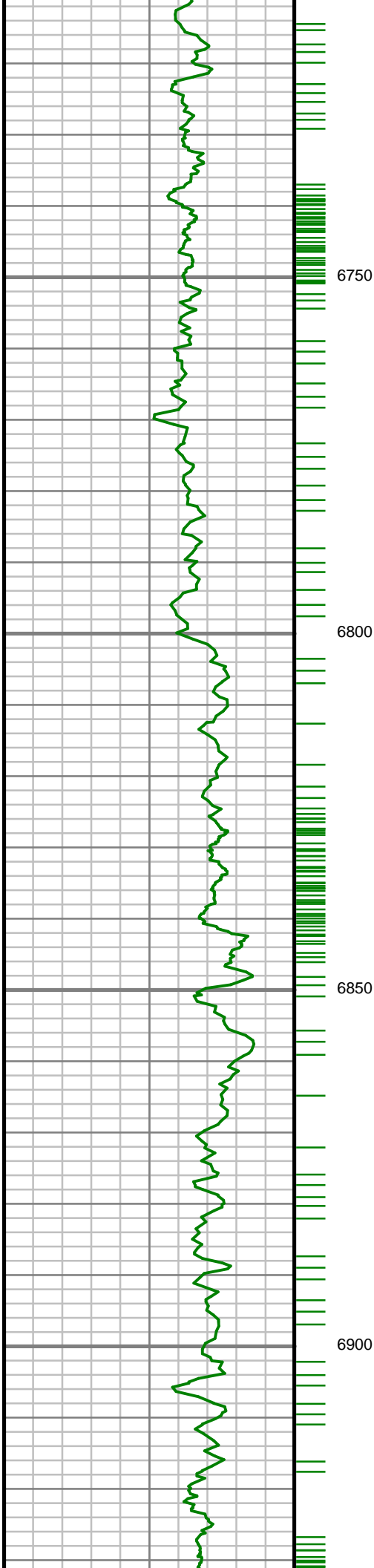
S: 69 MD: 6342.00 ft  
Inc: 20.75 deg Az:  
359.35 deg TVD:  
5934.81 ft

S: 70 MD: 6436.00 ft  
Inc: 22.90 deg Az:  
358.56 deg TVD:  
6022.06 ft



S: 71 MD: 6531.00 ft  
Inc: 24.33 deg Az: 0.61  
deg TVD: 6109.11 ft

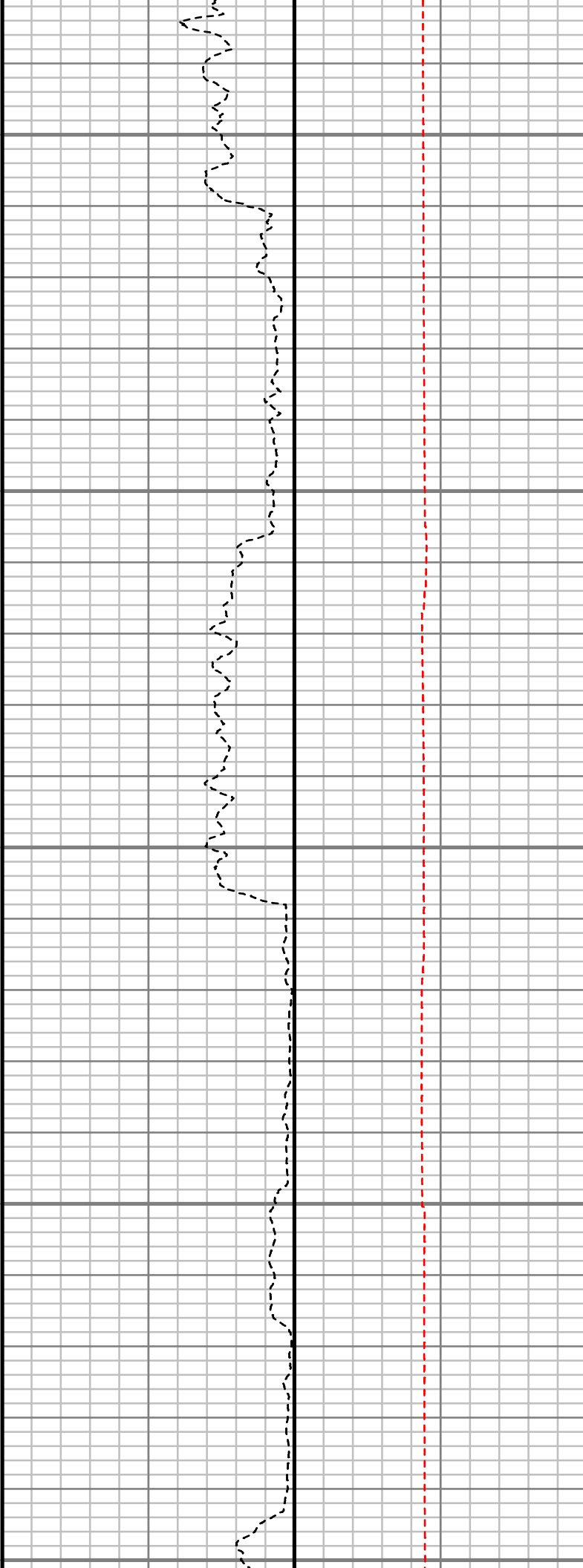
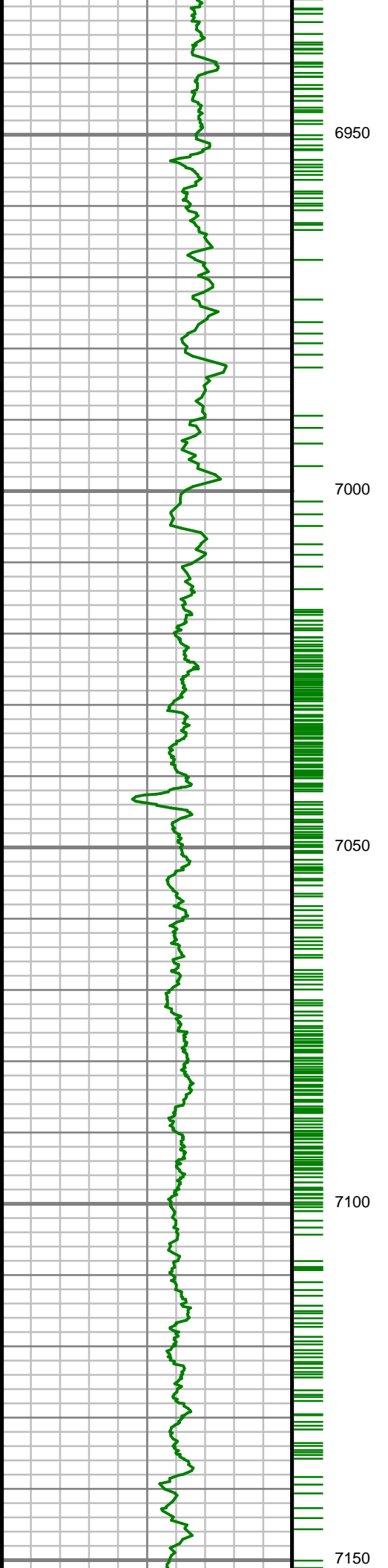
S: 72 MD: 6625.00 ft  
Inc: 26.48 deg Az:  
358.30 deg TVD:  
6194.01 ft



S: 73 MD: 6719.00 ft  
Inc: 27.55 deg Az: 355.97 deg TVD: 6277.76 ft

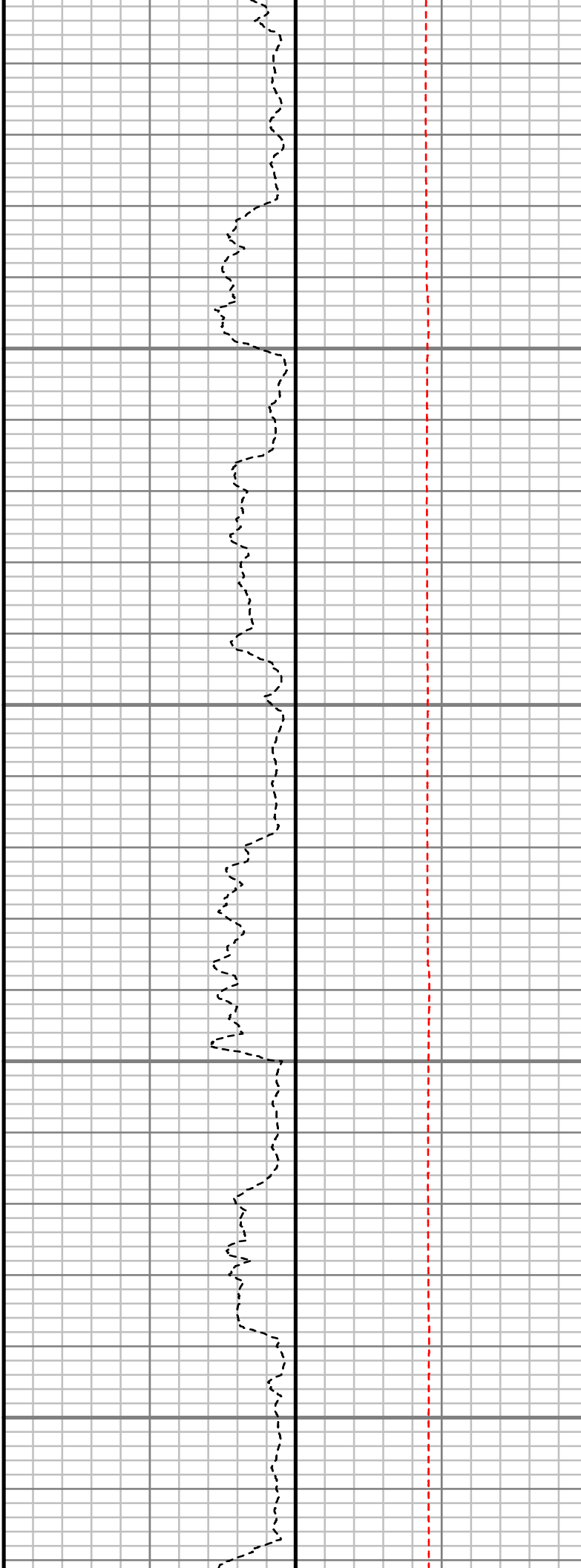
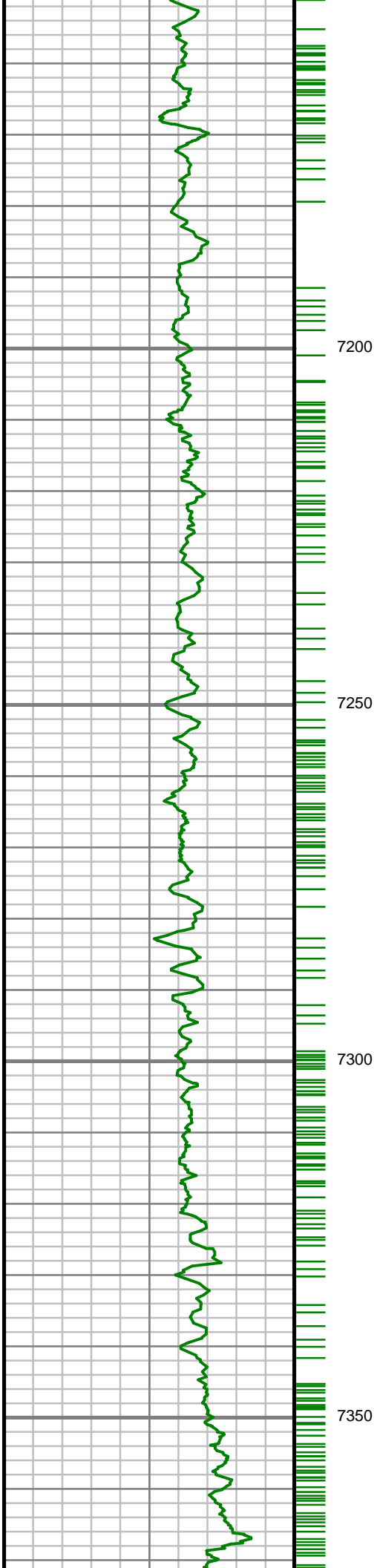
S: 74 MD: 6813.00 ft  
Inc: 26.08 deg Az: 0.86 deg TVD: 6361.66 ft

S: 75 MD: 6908.00 ft  
Inc: 25.24 deg Az: 1.33 deg TVD: 6447.29 ft



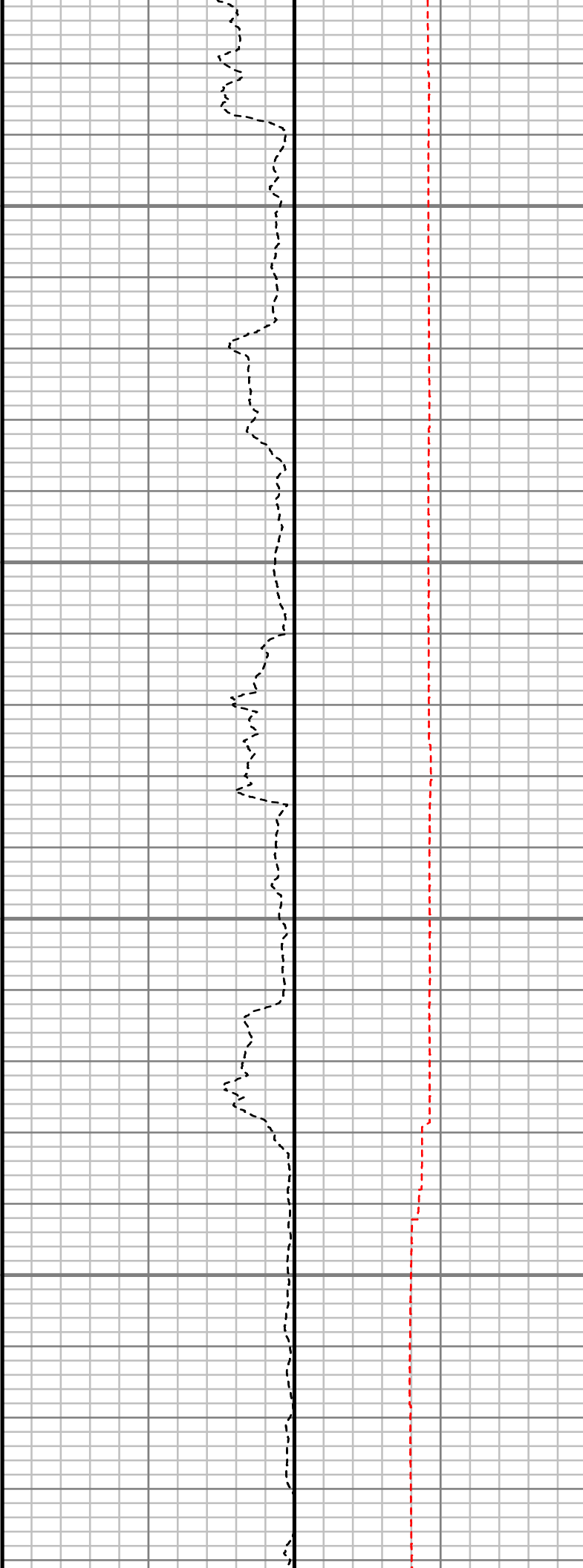
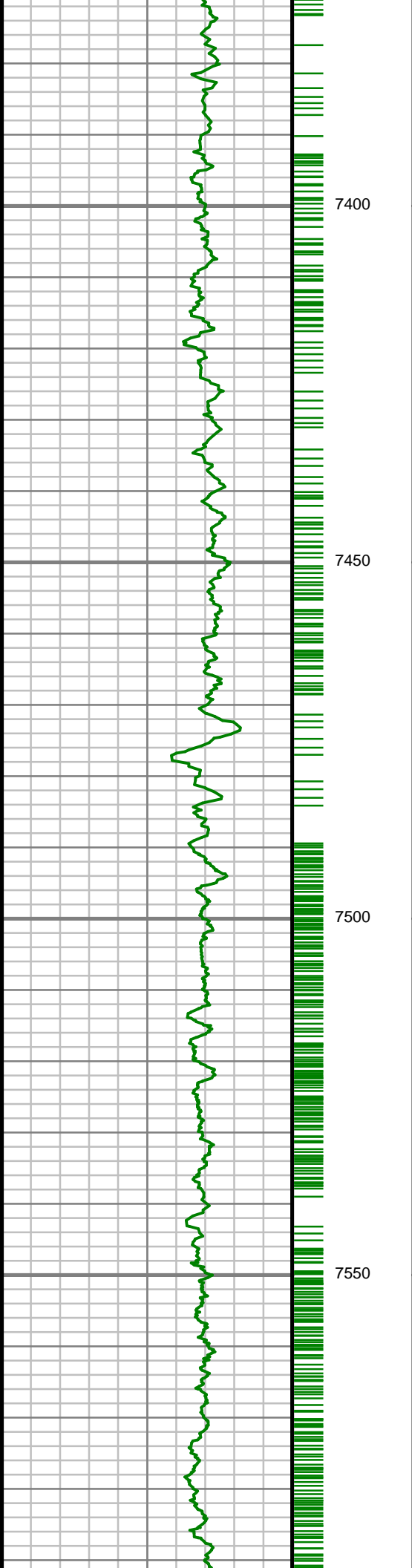
S: 76 MD: 7002.00 ft  
Inc: 23.77 deg Az: 2.86  
deg TVD: 6532.82 ft

S: 77 MD: 7096.00 ft  
Inc: 24.87 deg Az:  
357.97 deg TVD:  
6618.49 ft



S: 78 MD: 7190.00 ft  
Inc: 26.47 deg Az:  
355.39 deg TVD:  
6703.21 ft

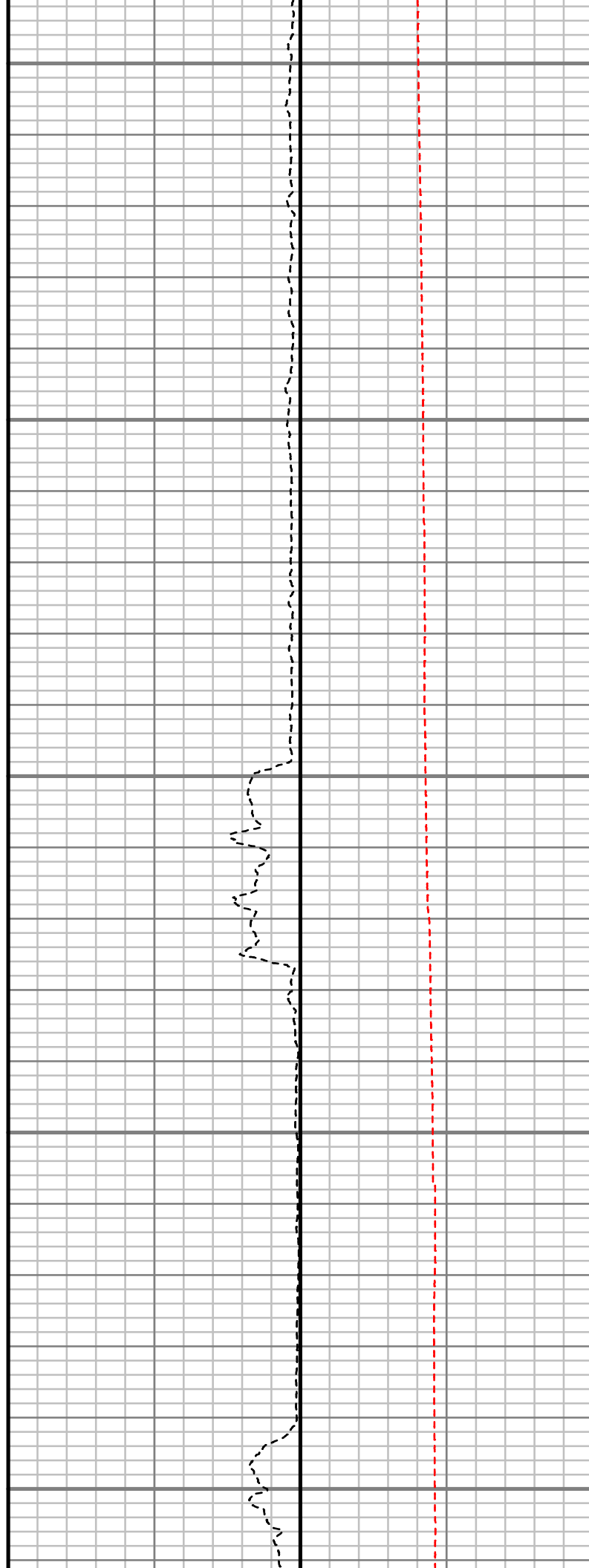
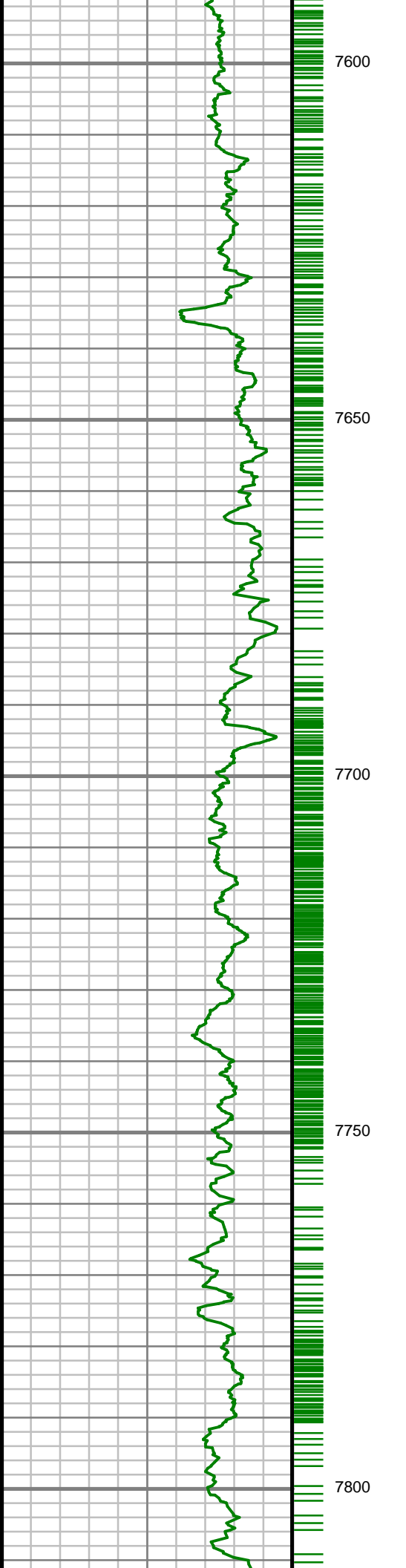
S: 79 MD: 7284.00 ft  
Inc: 24.60 deg Az:  
355.22 deg TVD:  
6788.03 ft



S: 80 MD: 7378.00 ft  
Inc: 25.55 deg Az:  
356.33 deg TVD:  
6873.17 ft

S: 81 MD: 7472.00 ft  
Inc: 26.46 deg Az:  
354.55 deg TVD:  
6957.66 ft

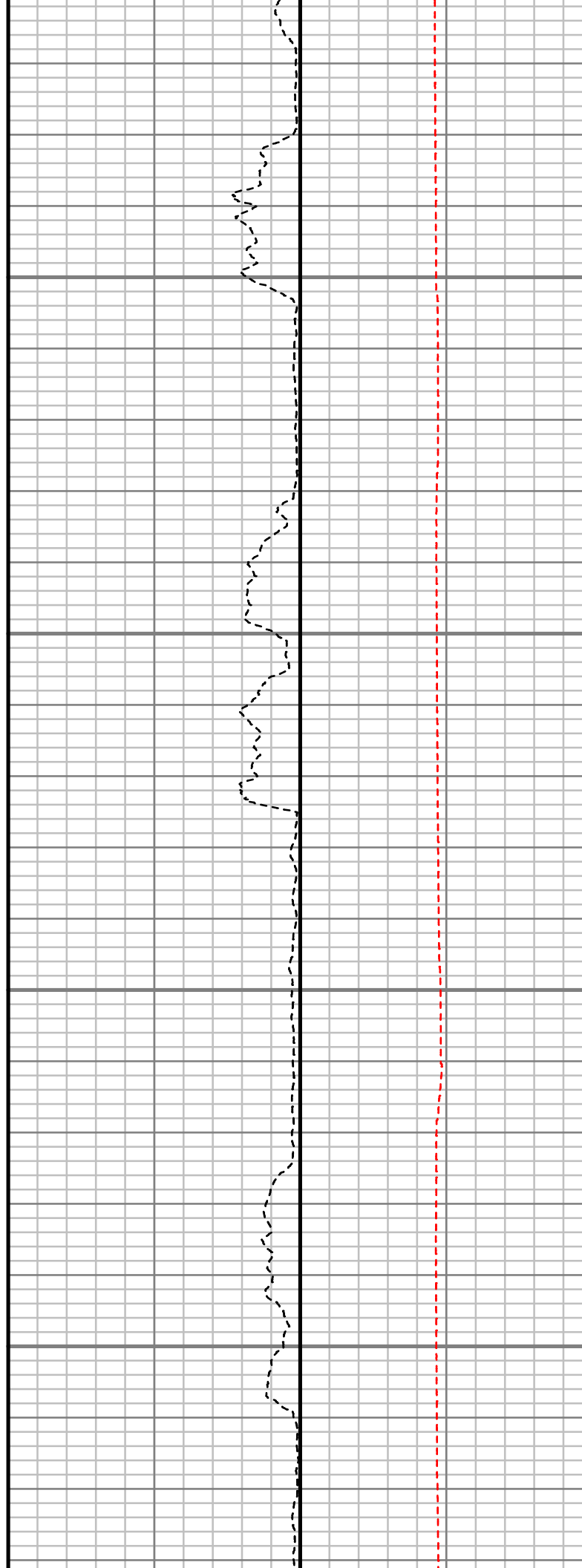
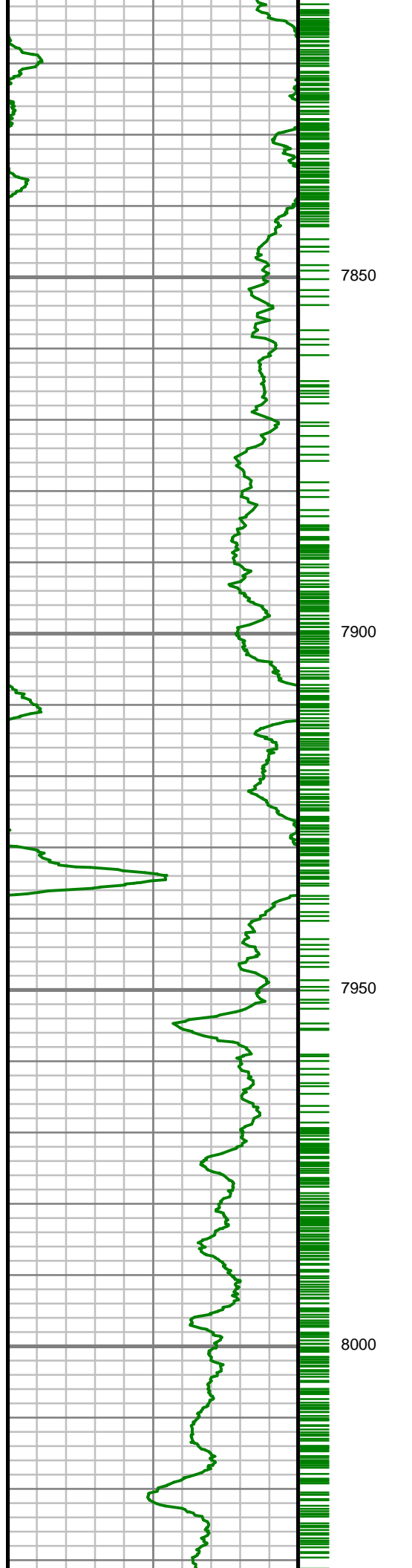
S: 82 MD: 7567.00 ft  
Inc: 27.80 deg Az:  
358.98 deg TVD:  
7042.21 ft



S: 83 MD: 7661.00 ft  
Inc: 36.85 deg Az: 1.36  
deg TVD: 7121.56 ft

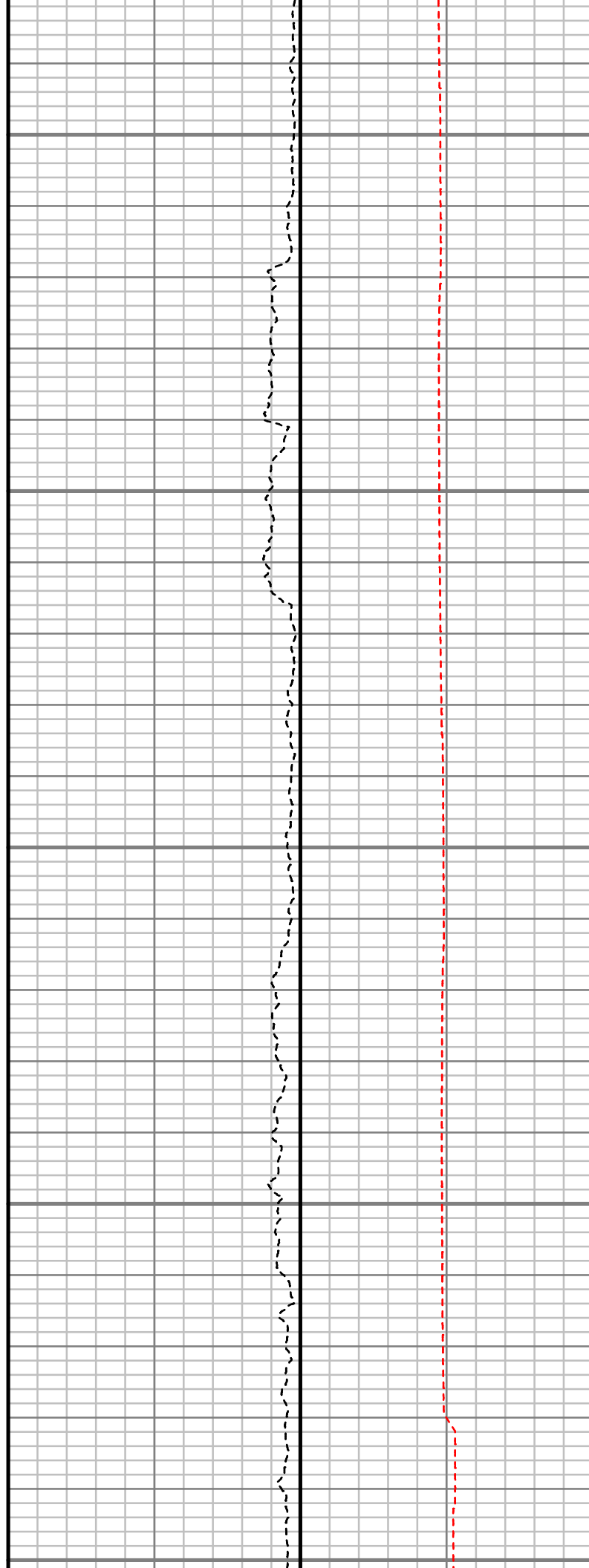
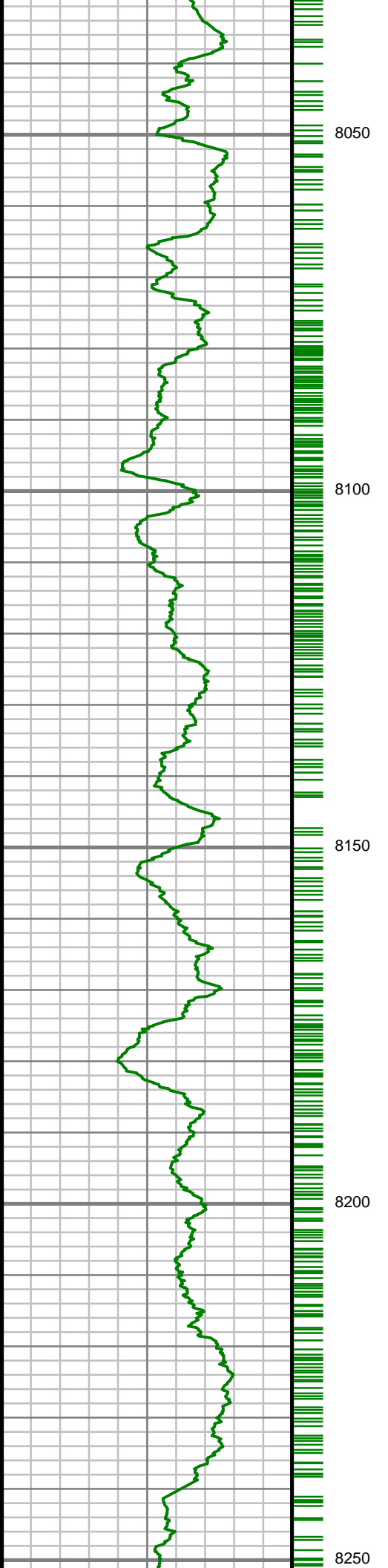
S: 84 MD: 7755.00 ft  
Inc: 44.43 deg Az:  
358.42 deg TVD:  
7192.85 ft





S: 85 MD: 7849.00 ft  
Inc: 51.65 deg Az:  
359.21 deg TVD:  
7255.66 ft

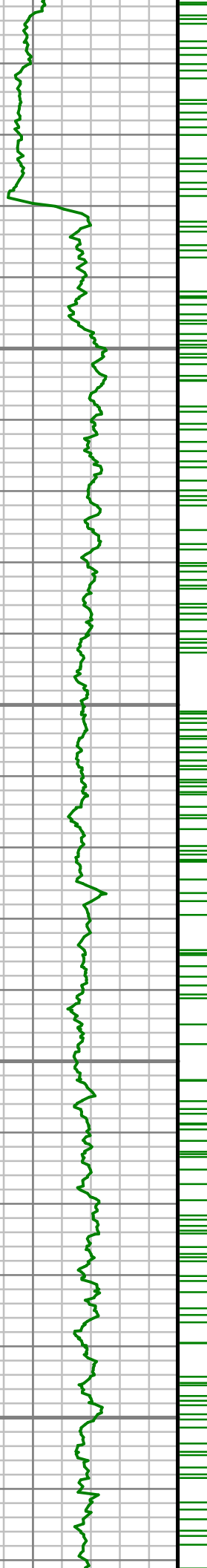
S: 86 MD: 7943.00 ft  
Inc: 58.97 deg Az:  
359.58 deg TVD:  
7309.11 ft



S: 87 MD: 8038.00 ft  
Inc: 68.18 deg Az:  
359.21 deg TVD:  
7351.34 ft

S: 88 MD: 8132.00 ft  
Inc: 75.84 deg Az:  
357.40 deg TVD:  
7380.36 ft

S: 89 MD: 8226.00 ft  
Inc: 84.35 deg Az:  
356.90 deg TVD:  
7396.52 ft

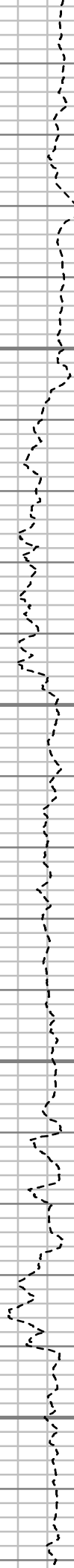


8300

8350

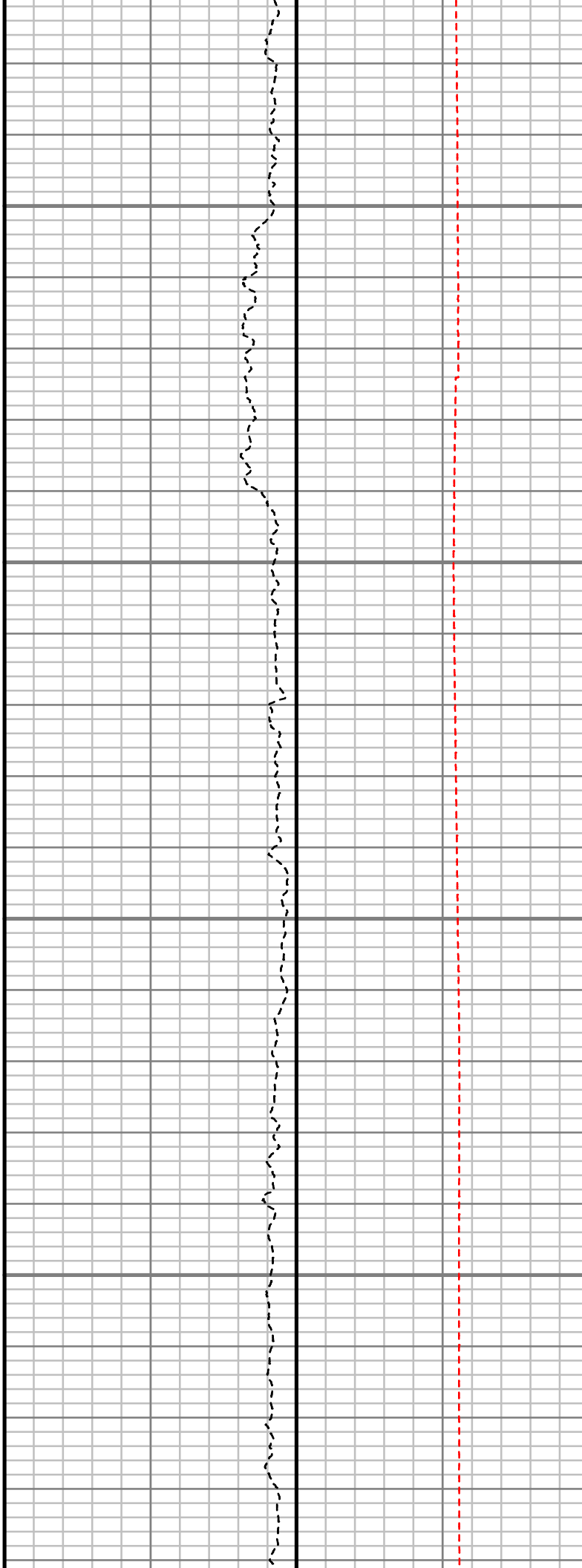
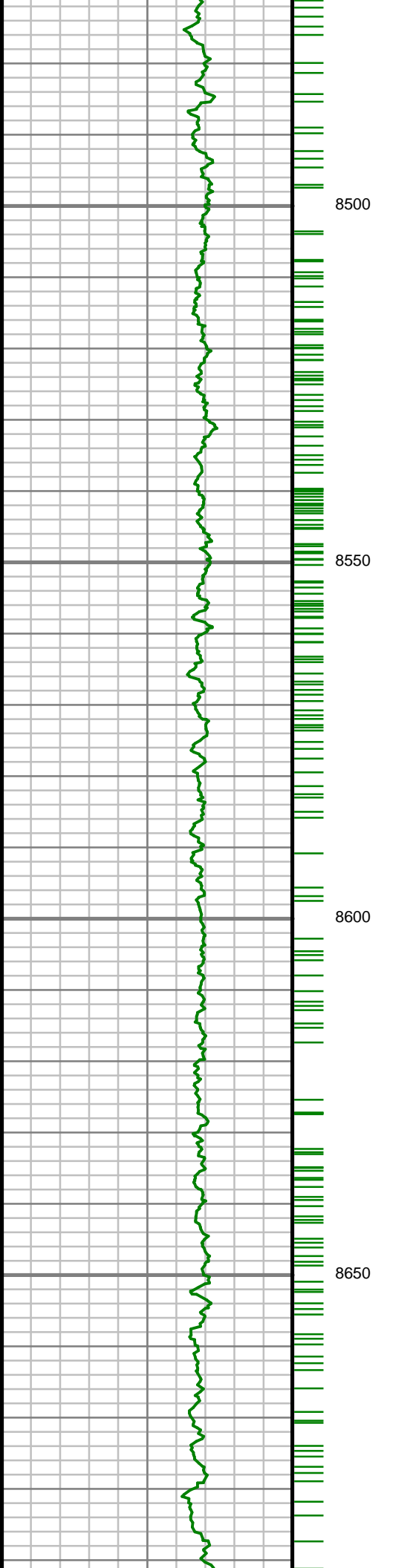
8400

8450

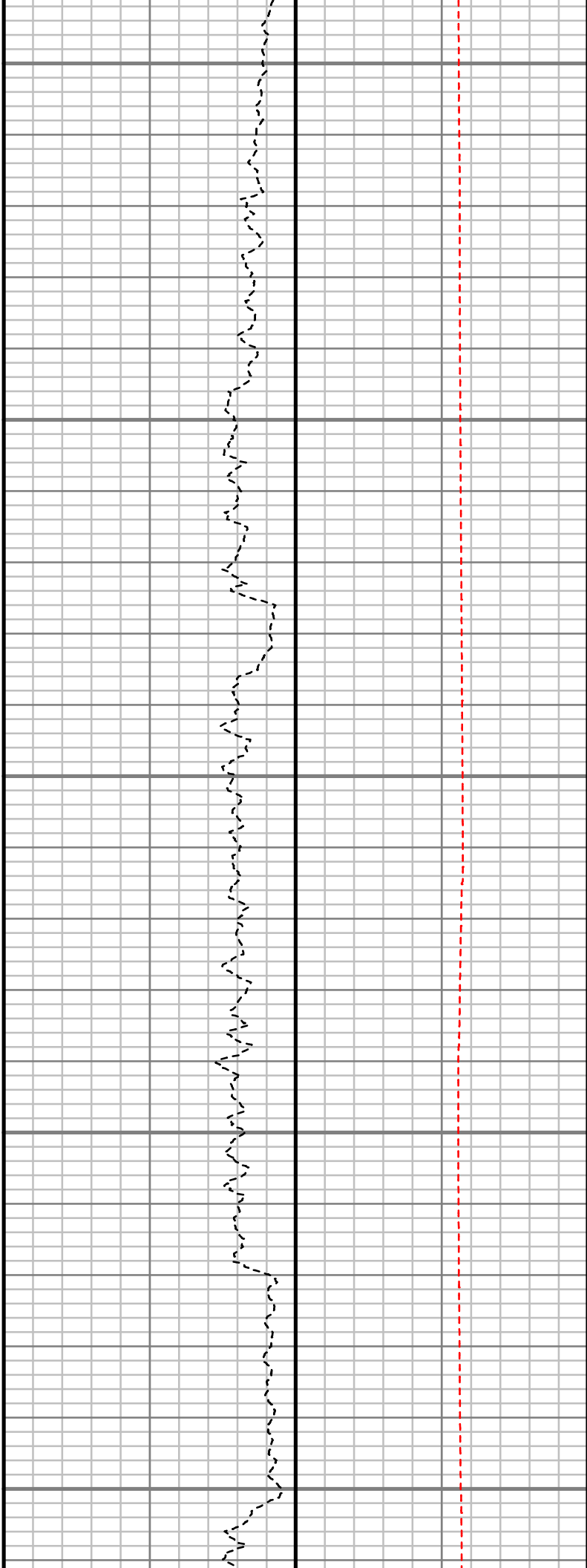
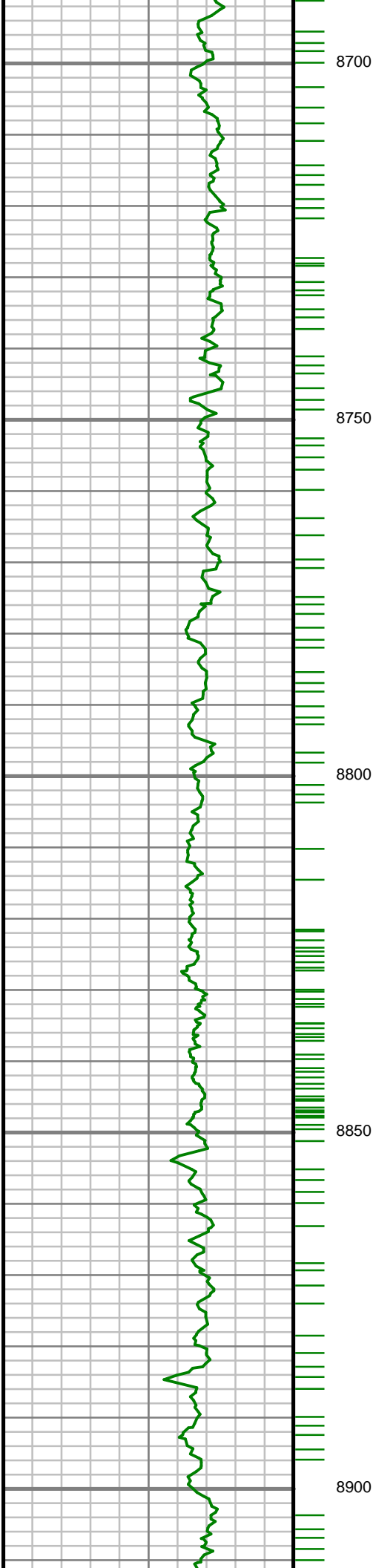


S: 90 MD: 8334.00 ft  
Inc: 90.03 deg Az:  
357.40 deg TVD:  
7401.81 ft

S: 91 MD: 8429.00 ft  
Inc: 90.74 deg Az:  
358.49 deg TVD:  
7401.17 ft

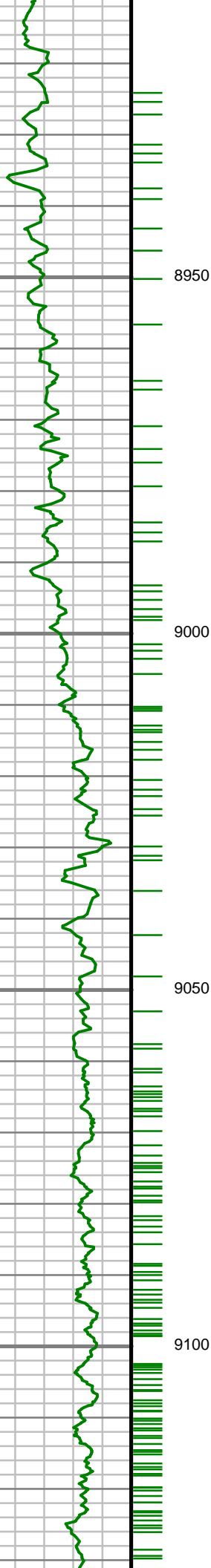


S: 92 MD: 8523.00 ft  
Inc: 89.83 deg Az:  
357.95 deg TVD:  
7400.70 ft

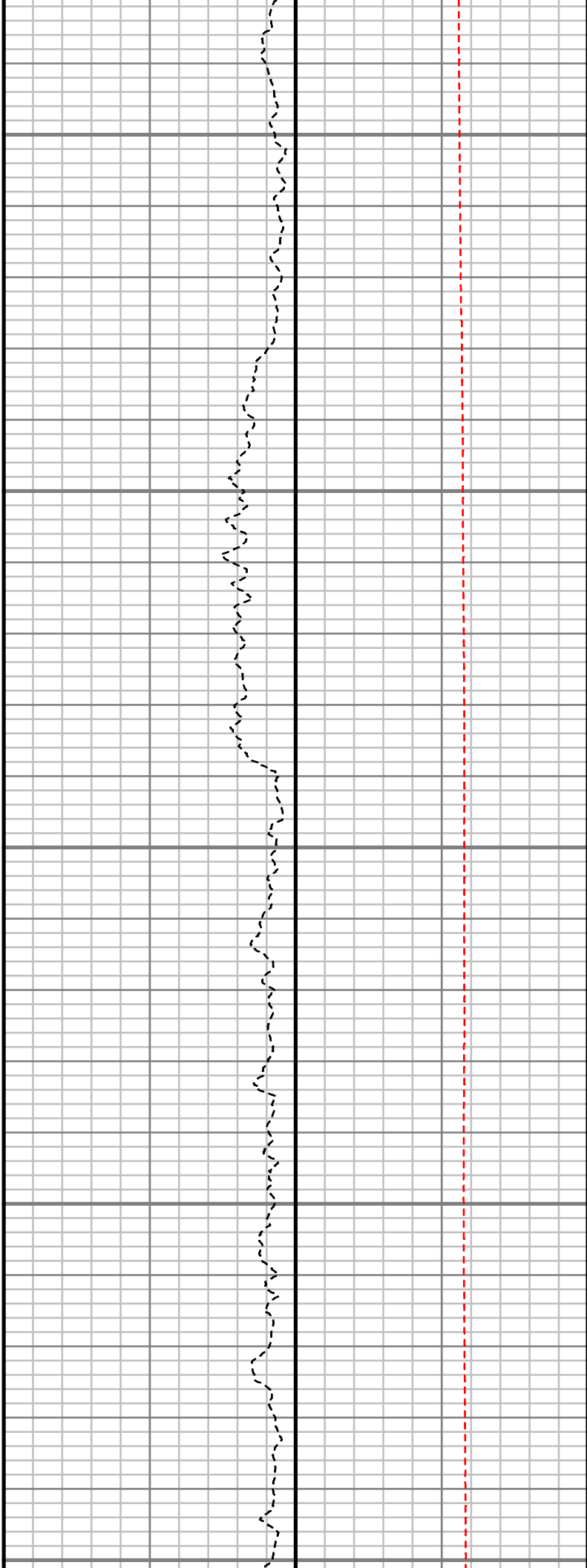
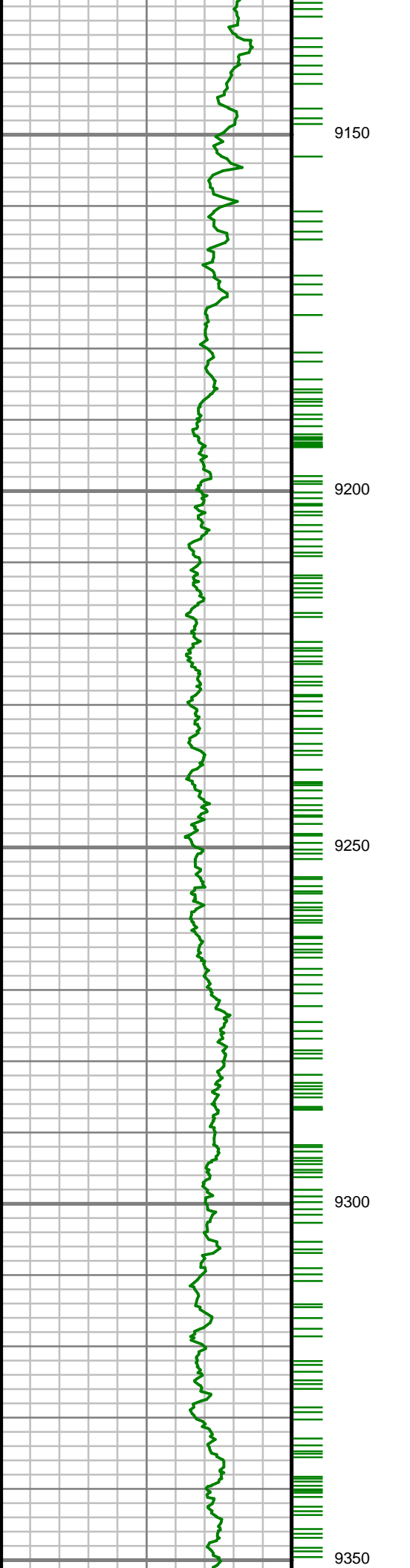


S: 93 MD: 8711.00 ft  
Inc: 91.34 deg Az:  
358.72 deg TVD:  
7398.78 ft

S: 94 MD: 8899.00 ft  
Inc: 91.01 deg Az:  
359.48 deg TVD:  
7394.92 ft

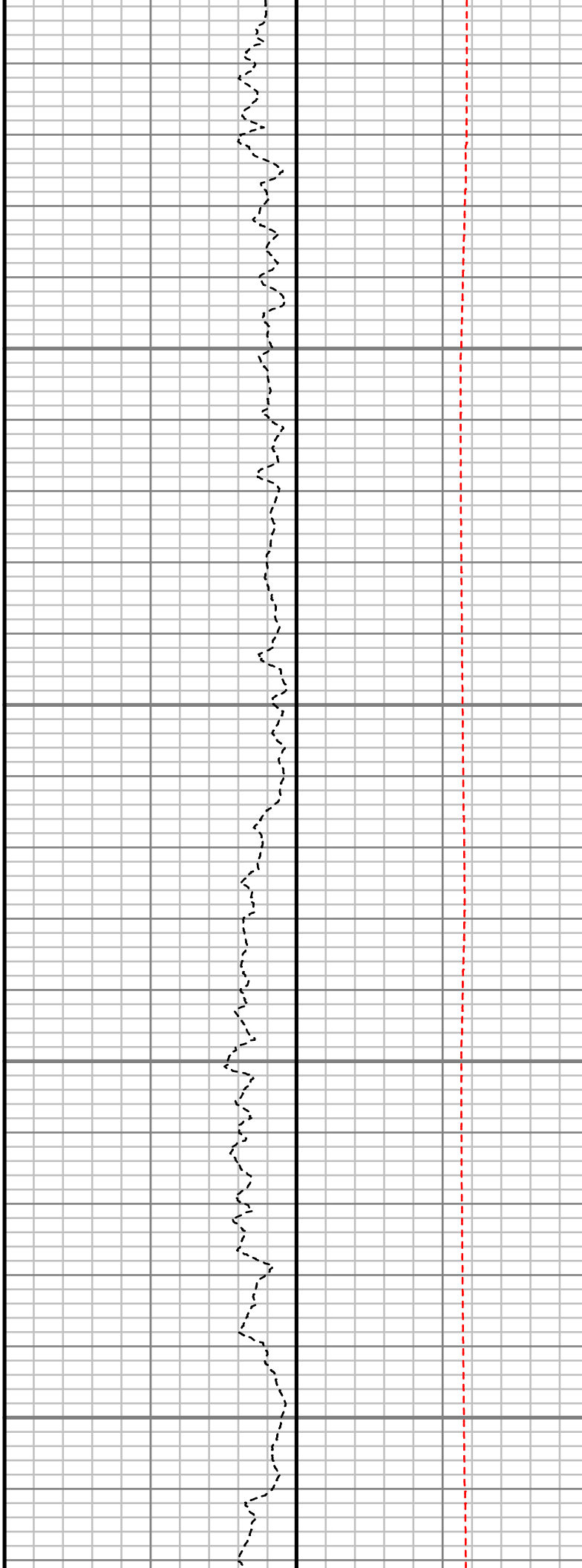
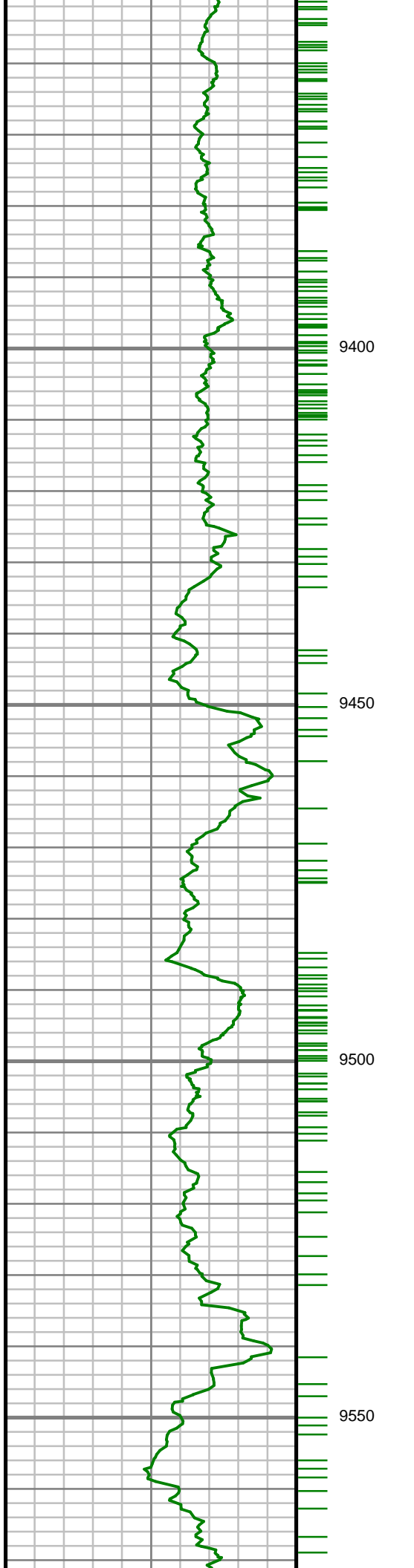


S: 95 MD: 9088.00 ft  
Inc: 90.37 deg Az:  
358.08 deg TVD:  
7392.66 ft



S: 96 MD: 9182.00 ft  
Inc: 91.21 deg Az:  
359.96 deg TVD:  
7391.36 ft

S: 97 MD: 9276.00 ft  
Inc: 90.84 deg Az:  
359.25 deg TVD:  
7389.68 ft

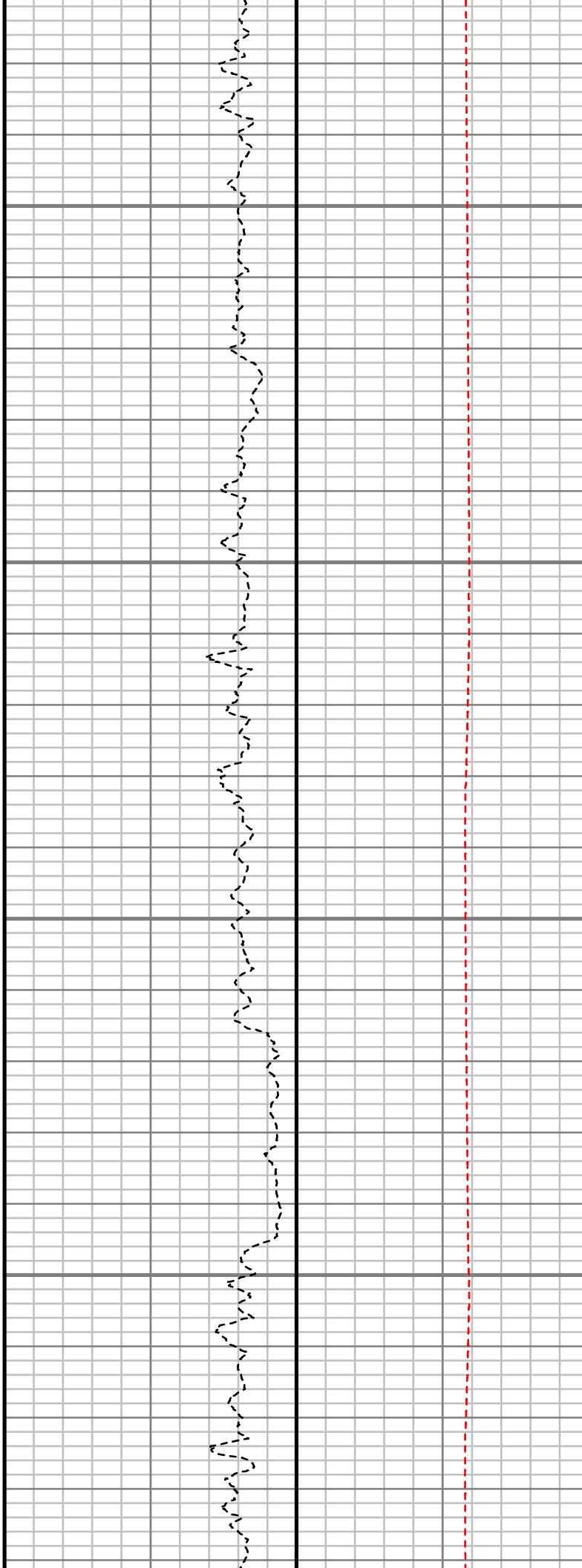
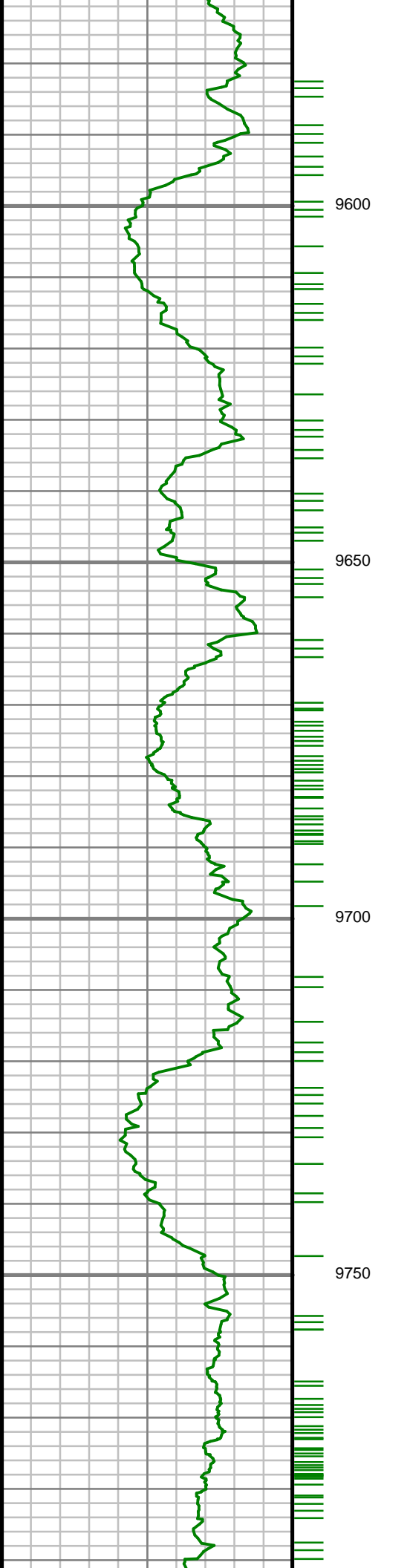


S: 98 MD: 9370.00 ft  
Inc: 90.27 deg Az: 359.22 deg TVD: 7388.77 ft

S: 99 MD: 9464.00 ft  
Inc: 90.60 deg Az: 0.13 deg TVD: 7388.06 ft

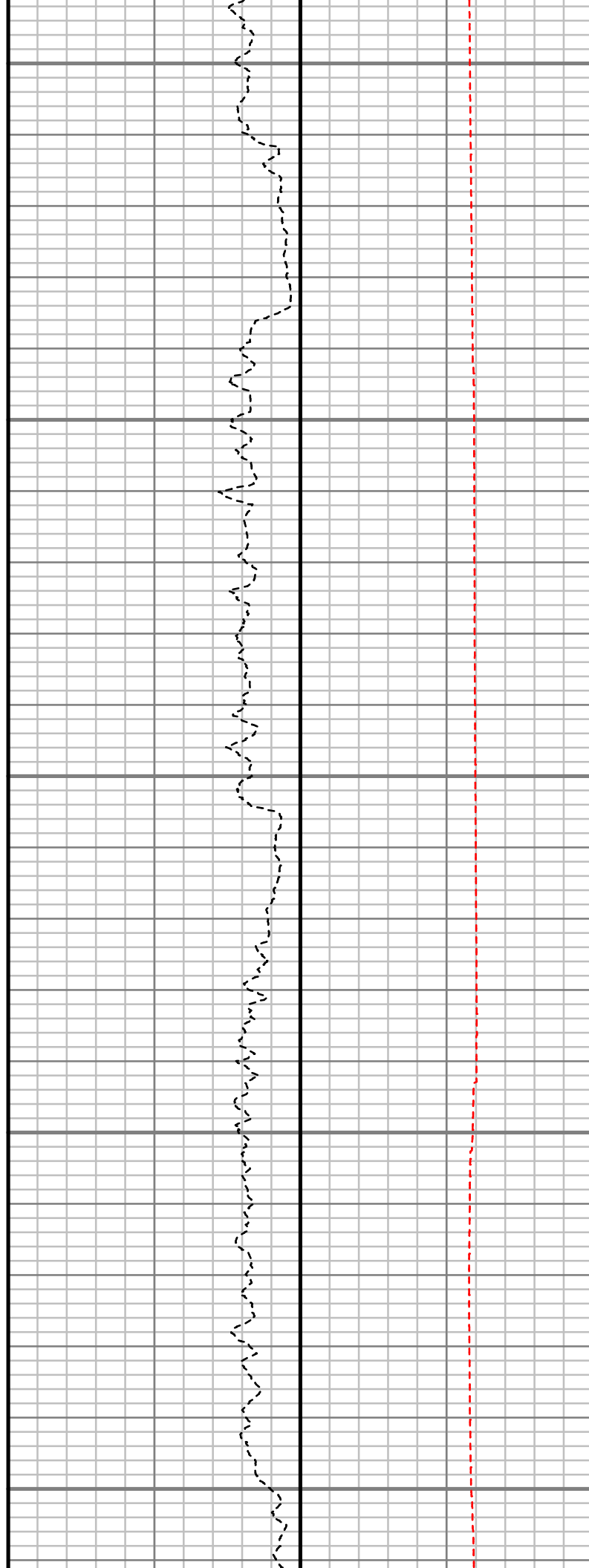
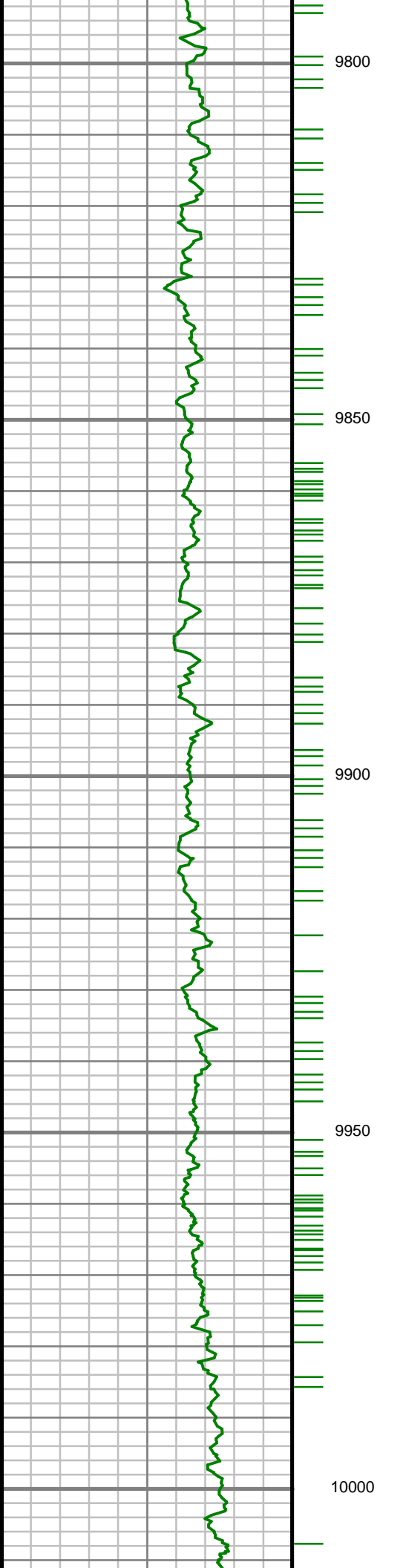
S: 100 MD: 9559.00 ft  
Inc: 90.74 deg Az: 1.91 deg TVD: 7386.94 ft





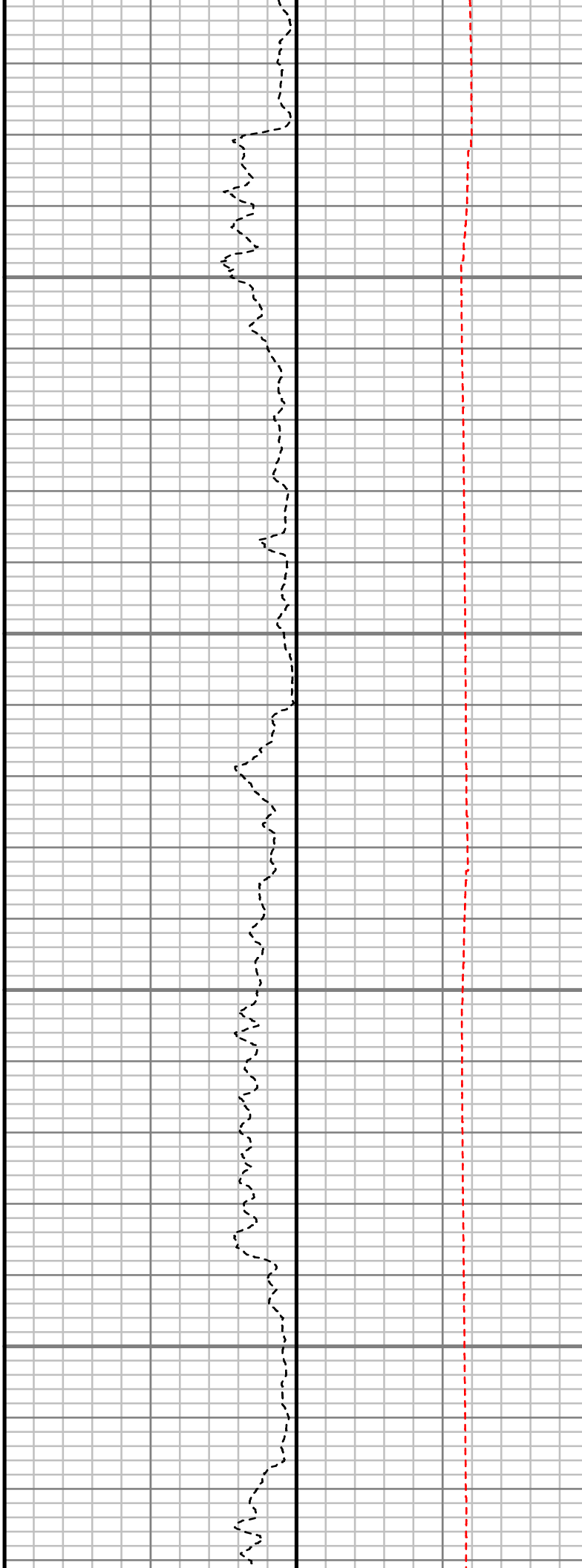
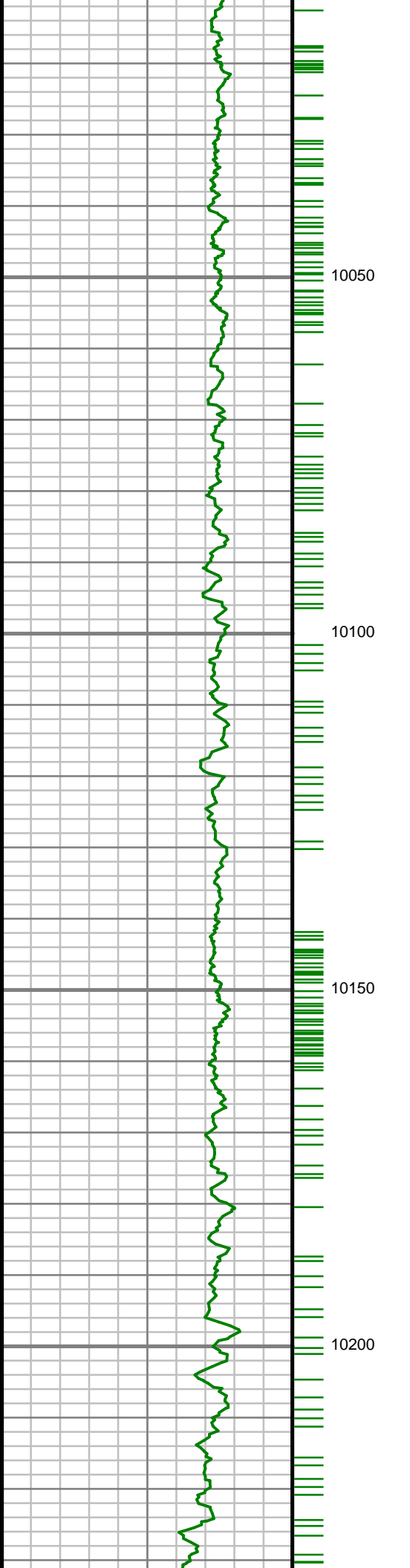
S: 101 MD: 9653.00 ft  
Inc: 89.60 deg Az: 2.13  
deg TVD: 7386.67 ft

S: 102 MD: 9747.00 ft  
Inc: 90.00 deg Az: 1.65  
deg TVD: 7387.00 ft



S: 103 MD: 9841.00 ft  
Inc: 91.17 deg Az: 1.37  
deg TVD: 7386.03 ft

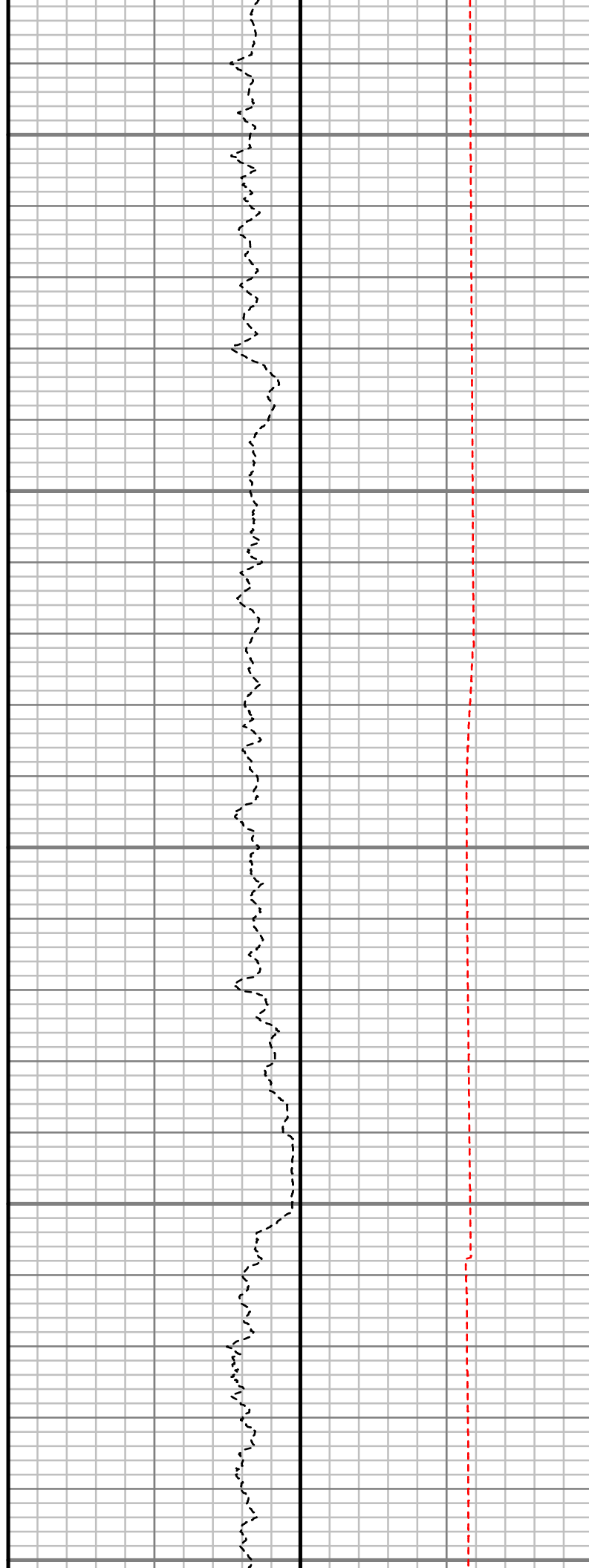
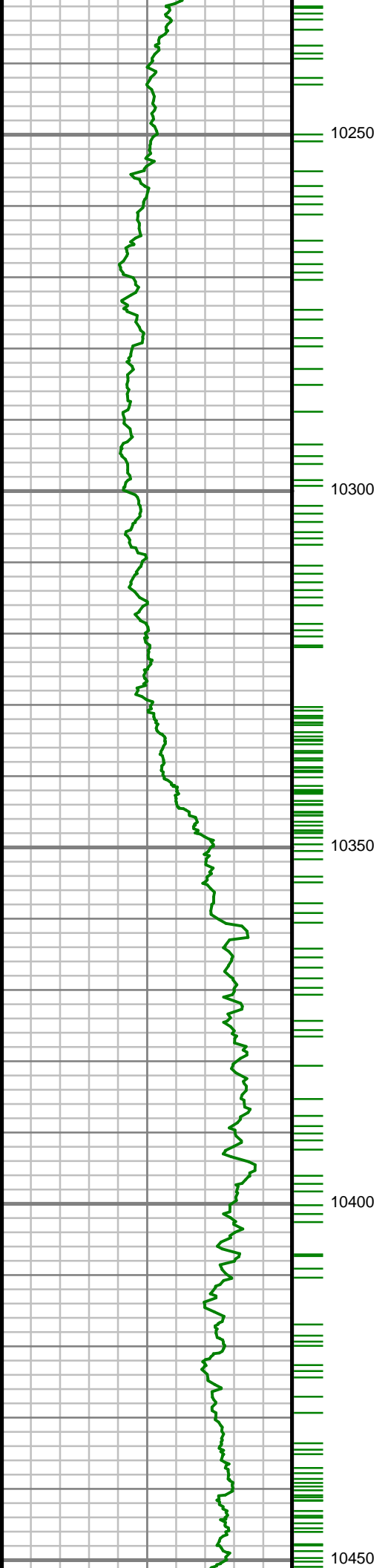
S: 104 MD: 9935.00 ft  
Inc: 91.92 deg Az: 2.31  
deg TVD: 7383.50 ft



S: 105 MD: 10029.00 ft  
Inc: 91.04 deg Az: 0.99  
deg TVD: 7381.07 ft

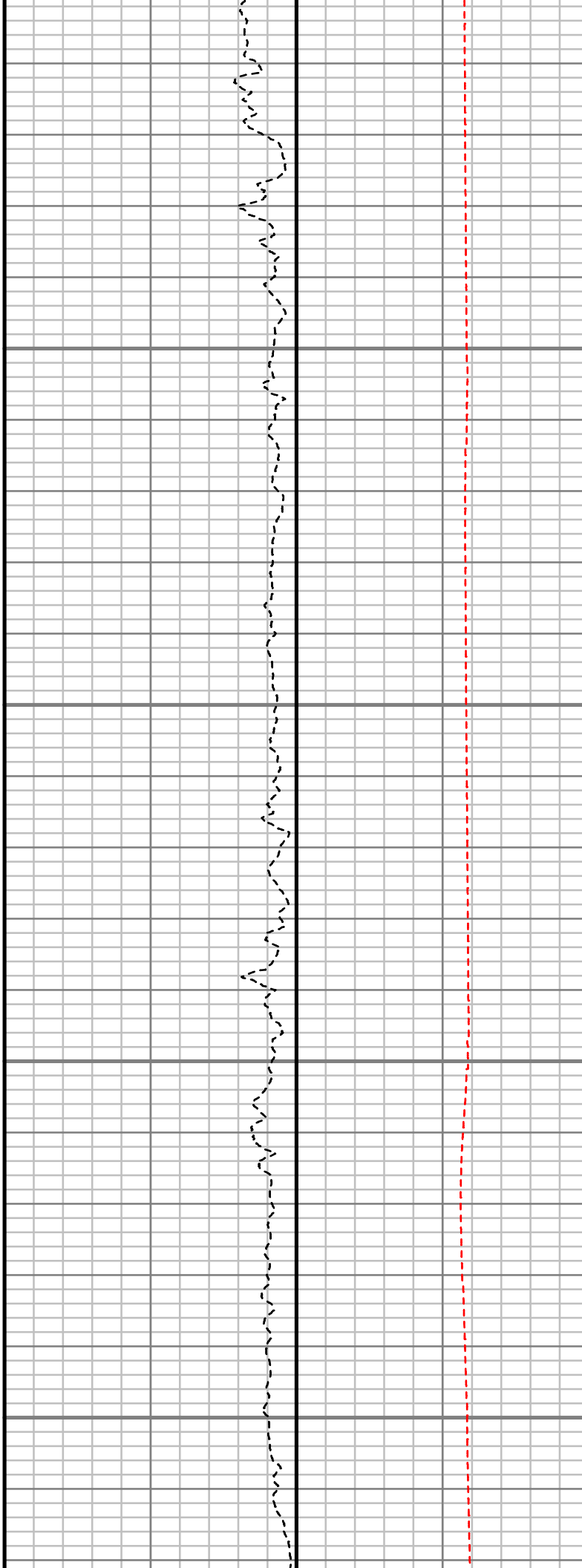
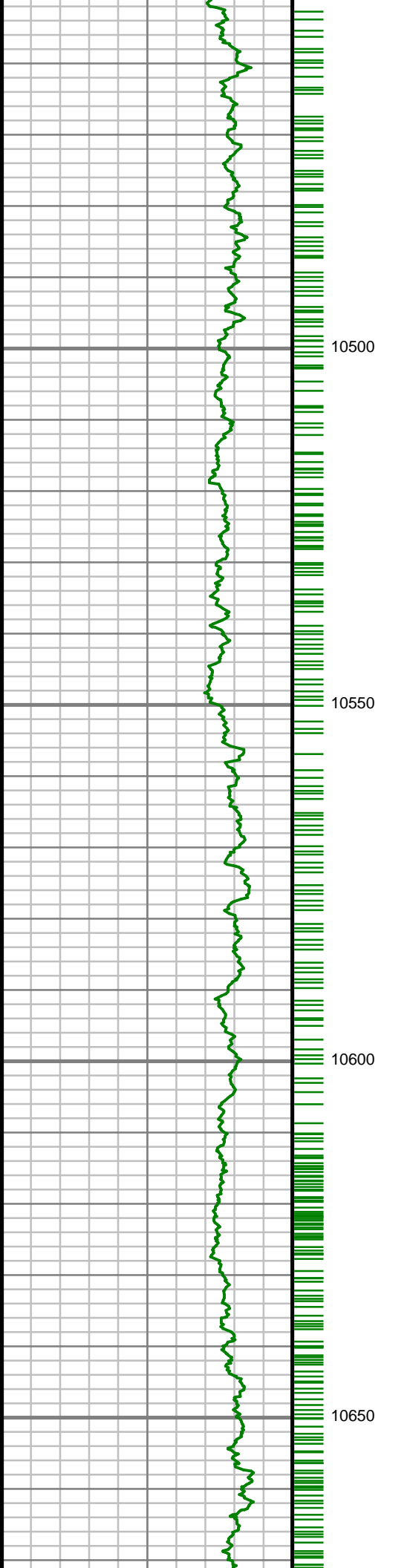
S: 106 MD: 10124.00 ft  
Inc: 90.24 deg Az: 1.05  
deg TVD: 7380.01 ft

S: 107 MD: 10218.00 ft  
Inc: 91.78 deg Az:  
359.80 deg TVD:  
7378.36 ft



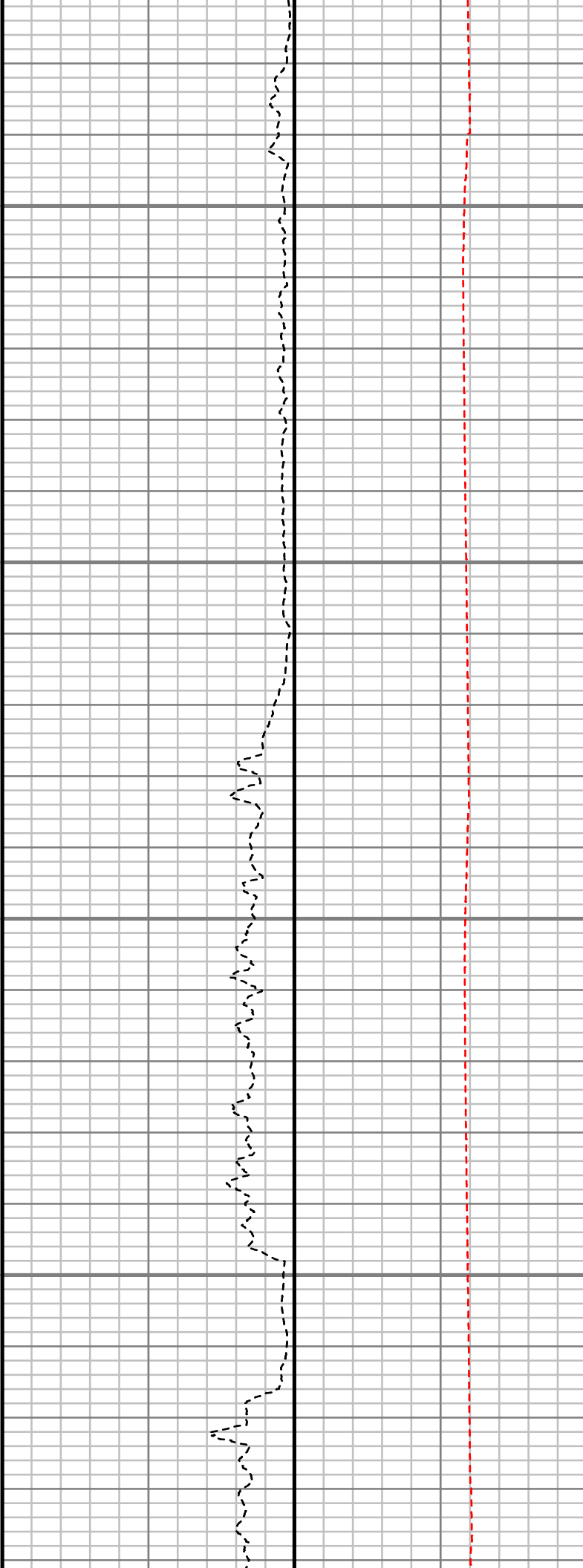
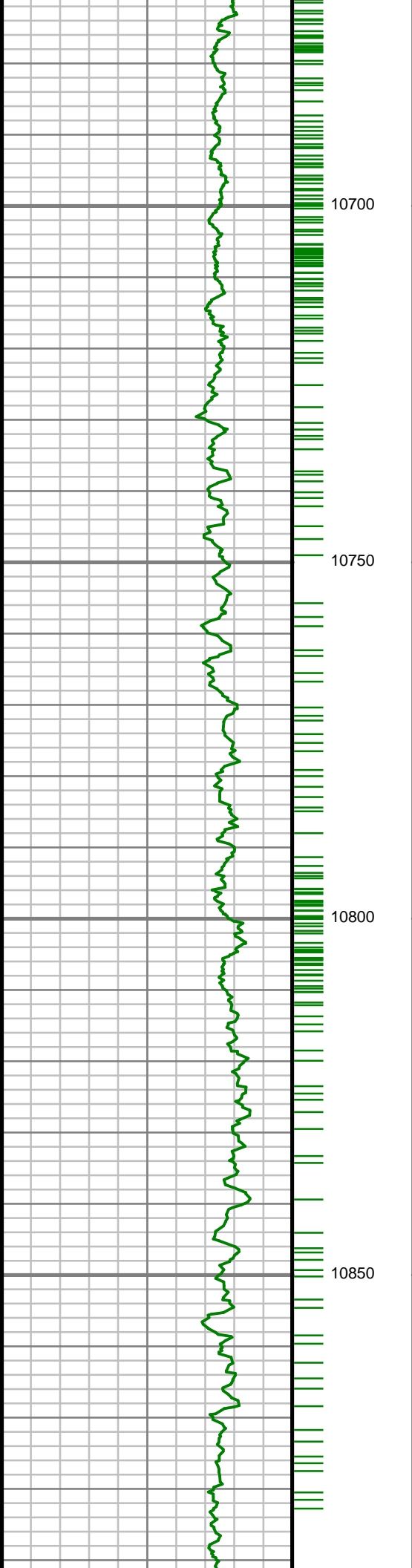
S: 108 MD: 10313.00 ft  
Inc: 91.68 deg Az: 0.16  
deg TVD: 7375.50 ft

S: 109 MD: 10406.00 ft  
Inc: 90.97 deg Az:  
358.64 deg TVD:  
7373.35 ft



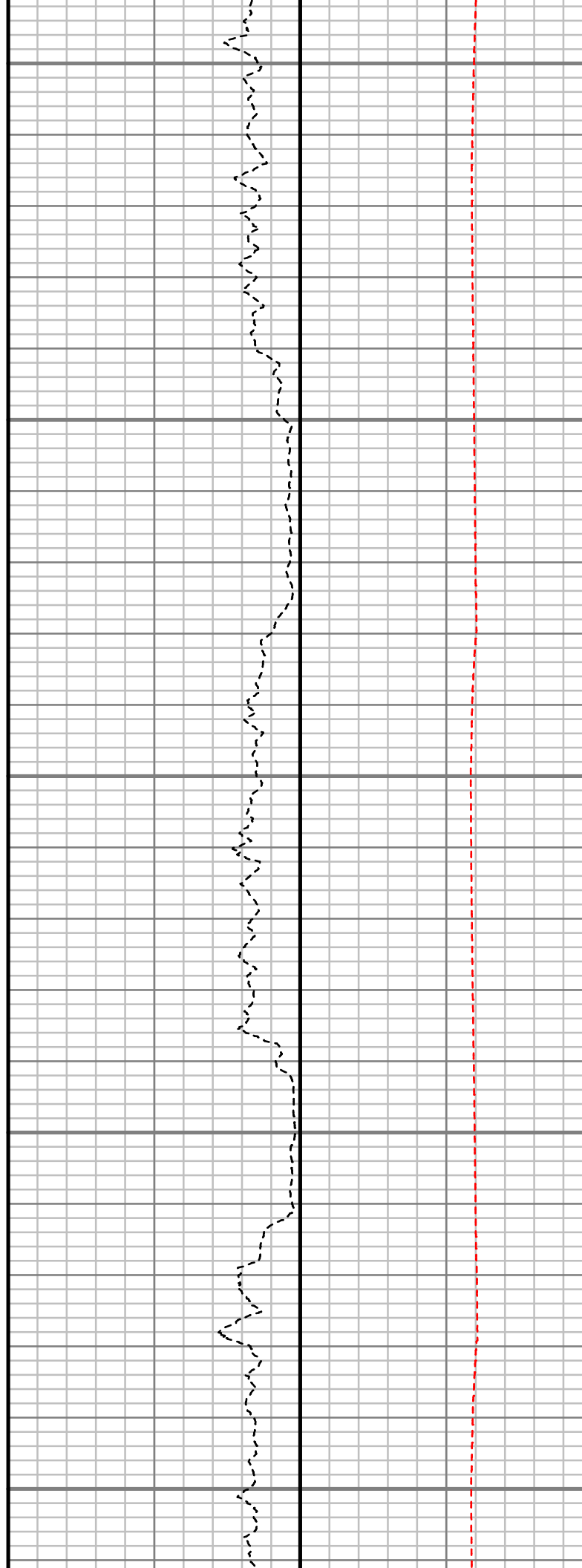
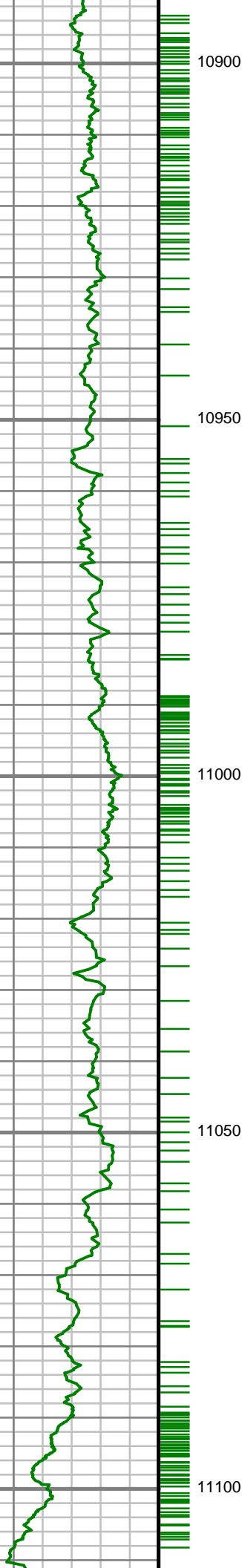
S: 110 MD: 10501.00 ft  
Inc: 90.84 deg Az:  
358.66 deg TVD:  
7371.85 ft

S: 111 MD: 10595.00 ft  
Inc: 89.77 deg Az:  
357.75 deg TVD:  
7371.35 ft

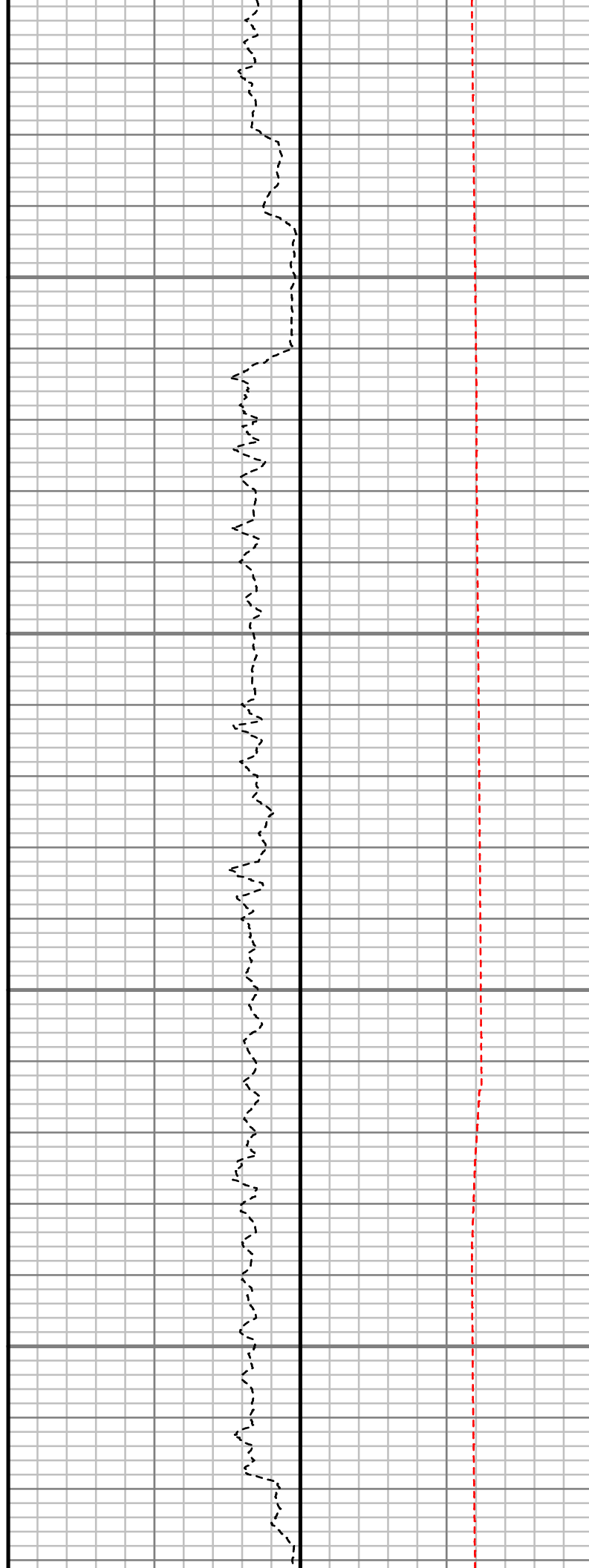
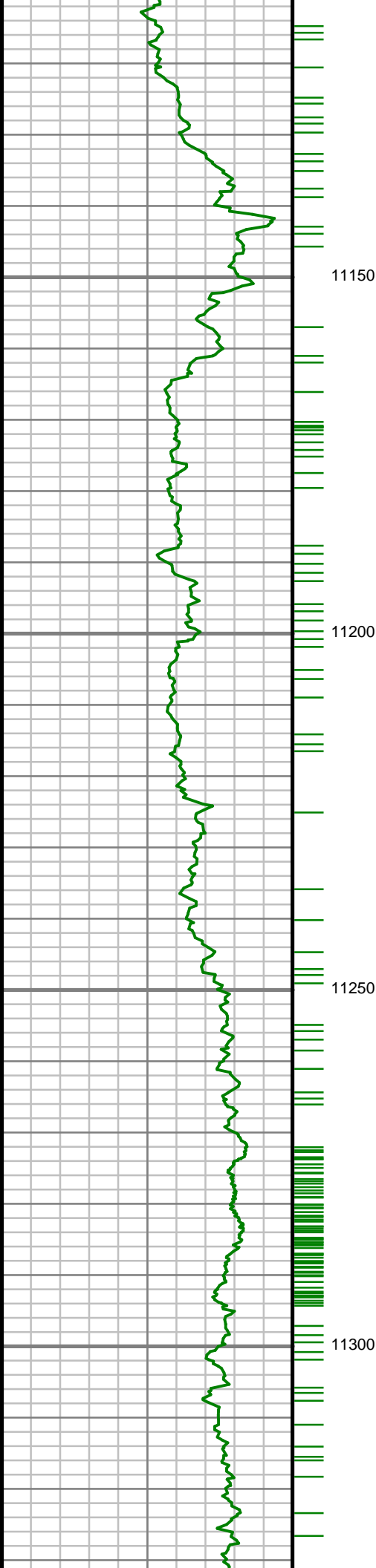


S: 112 MD: 10689.00 ft  
Inc: 90.54 deg Az:  
358.35 deg TVD:  
7371.10 ft

S: 113 MD: 10784.00 ft  
Inc: 91.04 deg Az:  
358.35 deg TVD:  
7369.80 ft



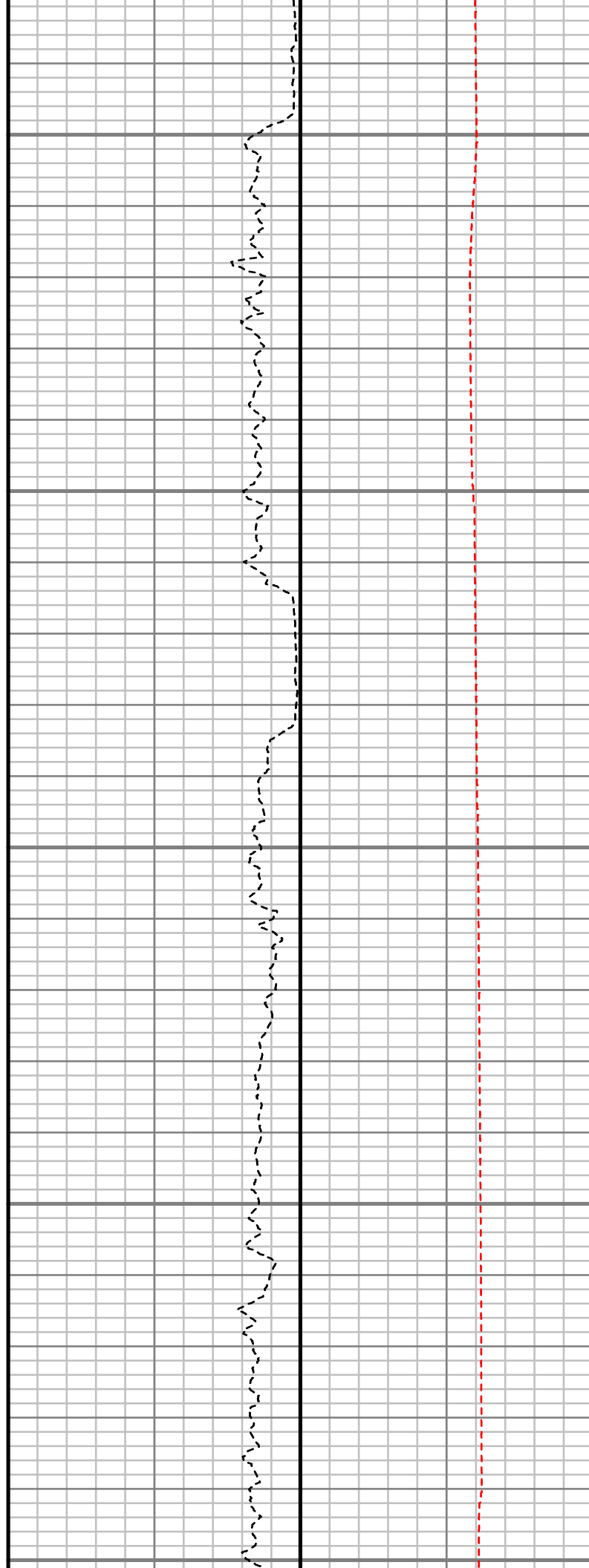
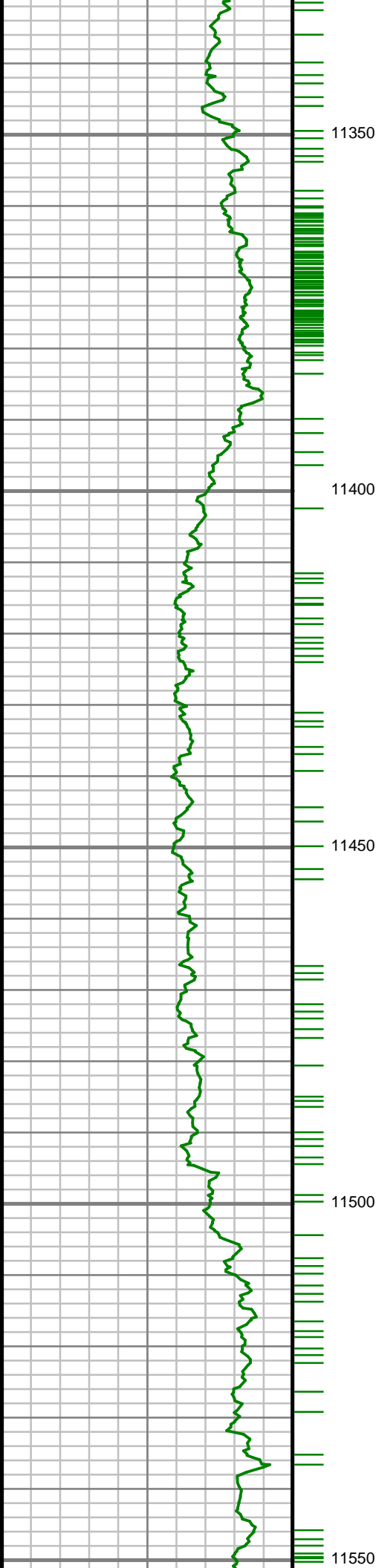
S: 114 MD: 10972.00 ft  
Inc: 91.07 deg Az:  
358.03 deg TVD:  
7366.33 ft



S: 115 MD: 11161.00 ft  
Inc: 91.78 deg Az:  
358.23 deg TVD:  
7361.62 ft

S: 116 MD: 11255.00 ft  
Inc: 91.54 deg Az:  
358.27 deg TVD:  
7358.90 ft

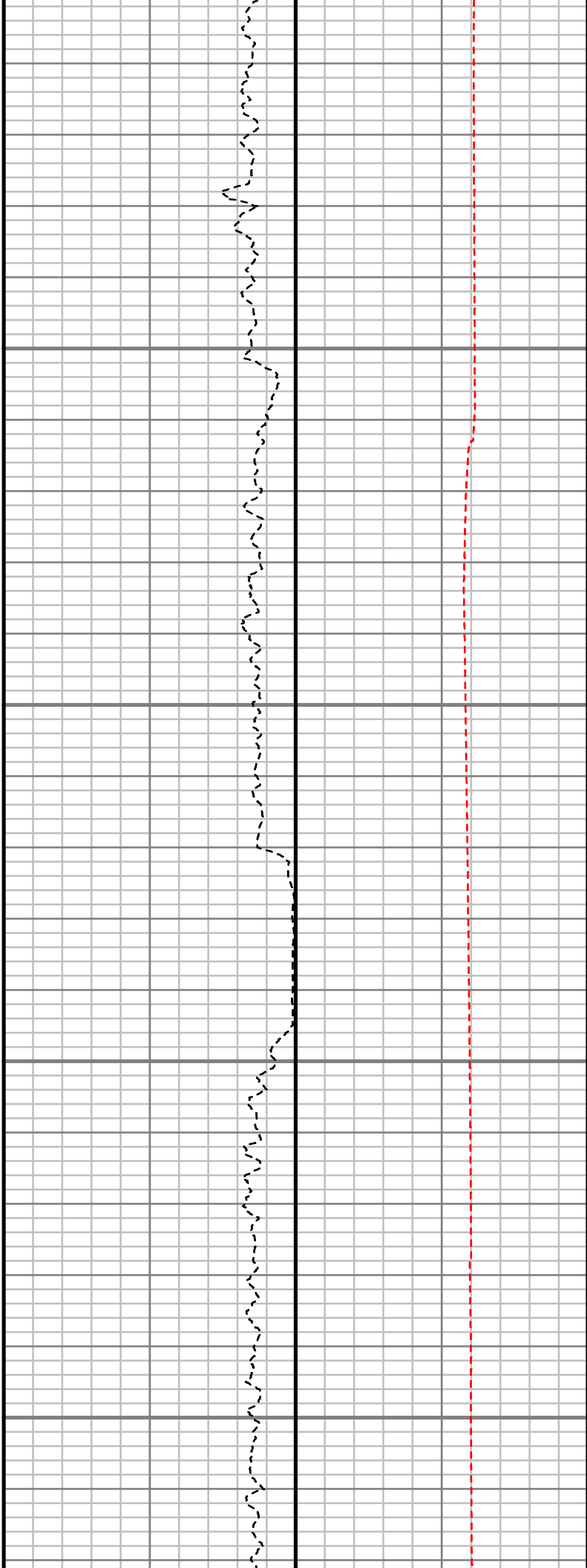
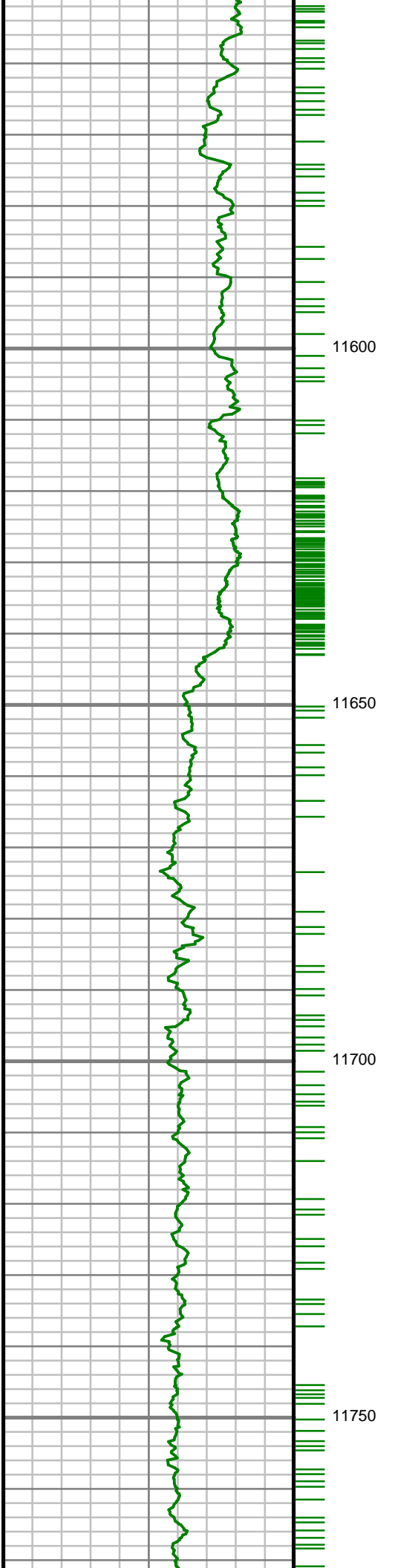




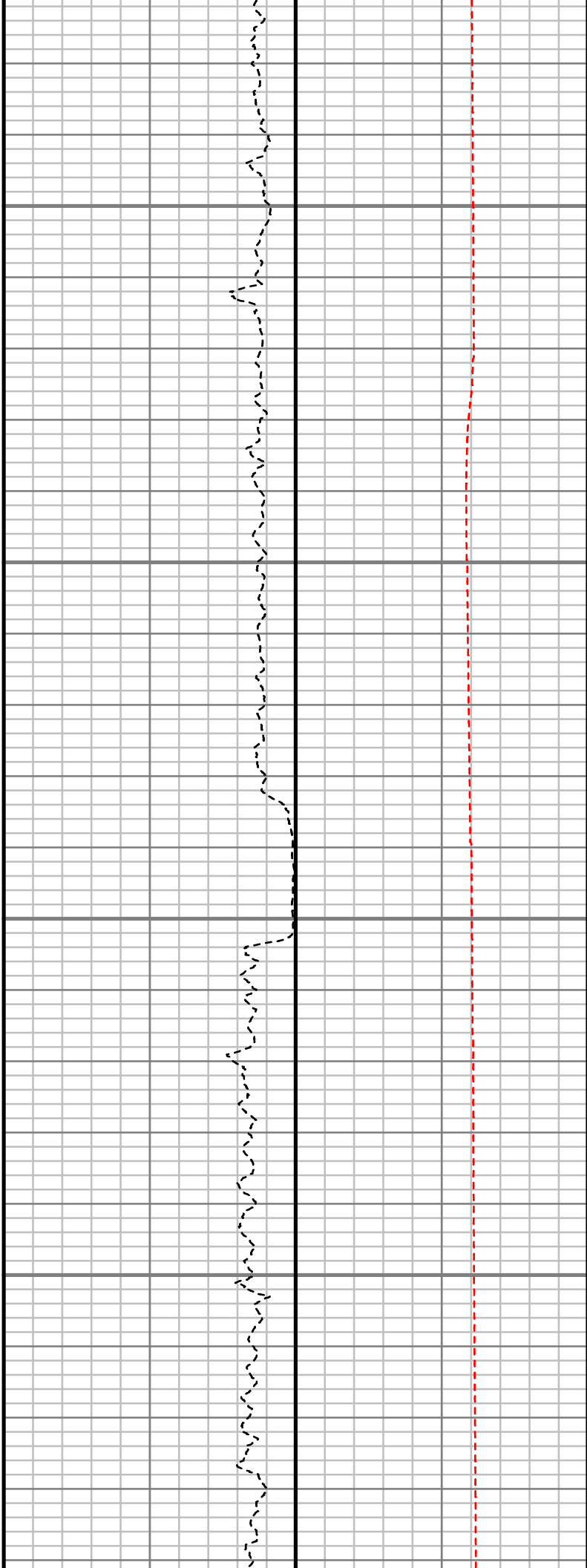
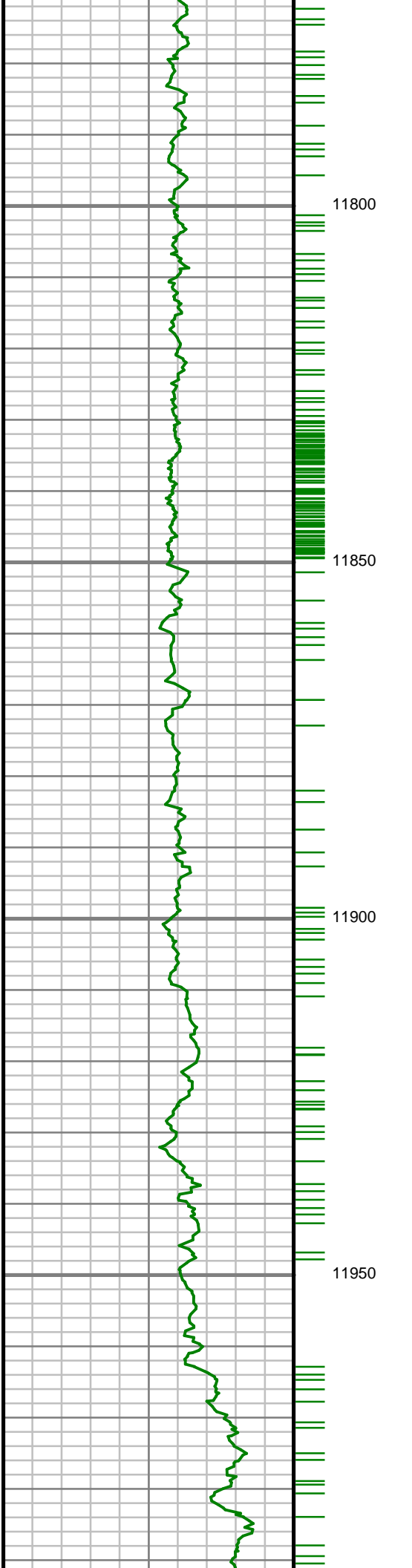
S: 117 MD: 11350.00 ft  
Inc: 91.88 deg Az:  
359.71 deg TVD:  
7356.06 ft

S: 118 MD: 11444.00 ft  
Inc: 90.00 deg Az: 0.80  
deg TVD: 7354.52 ft

S: 119 MD: 11538.00 ft  
Inc: 88.83 deg Az: 0.70  
deg TVD: 7355.49 ft

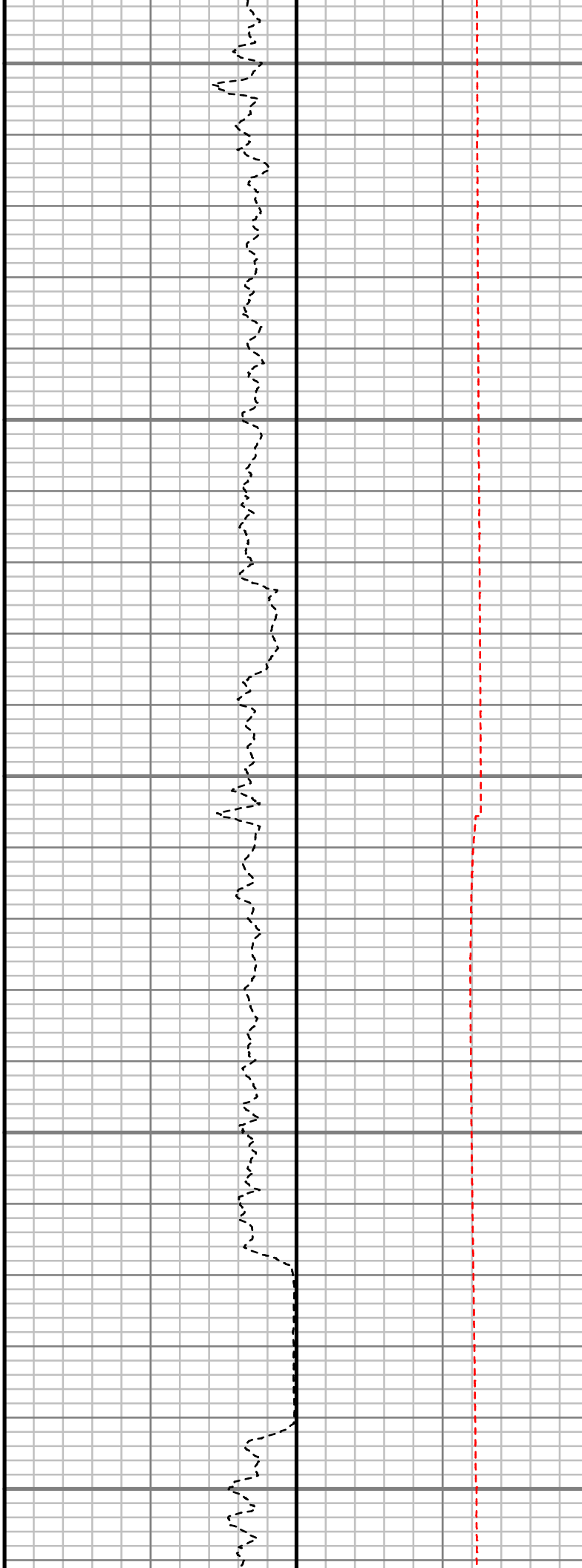
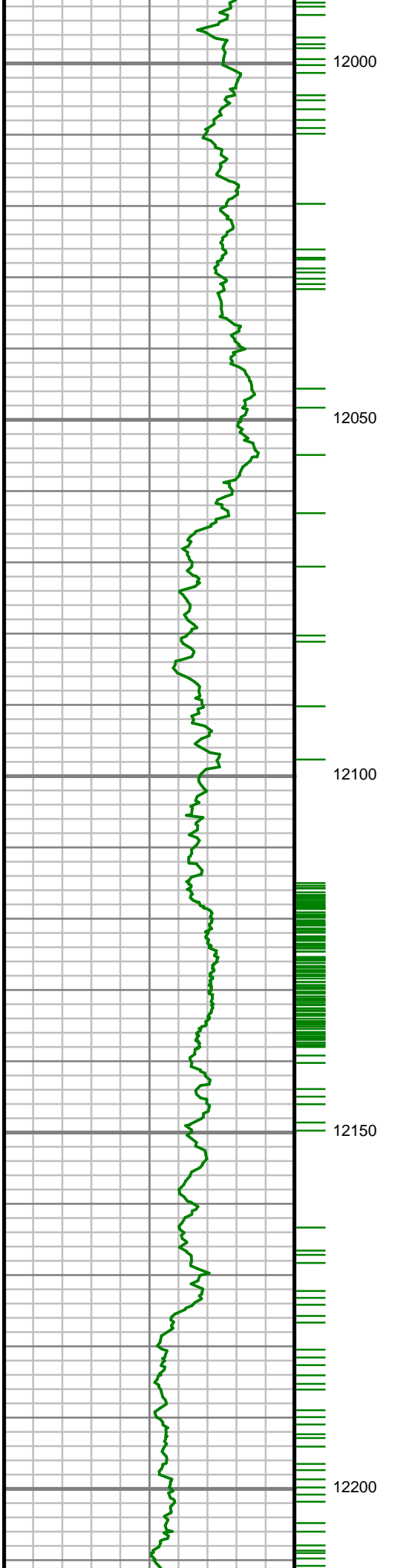


S: 120 MD: 11727.00 ft  
Inc: 90.37 deg Az: 0.45  
deg TVD: 7356.81 ft



S: 121 MD: 11821.00 ft  
Inc: 89.43 deg Az:  
359.76 deg TVD:  
7356.98 ft

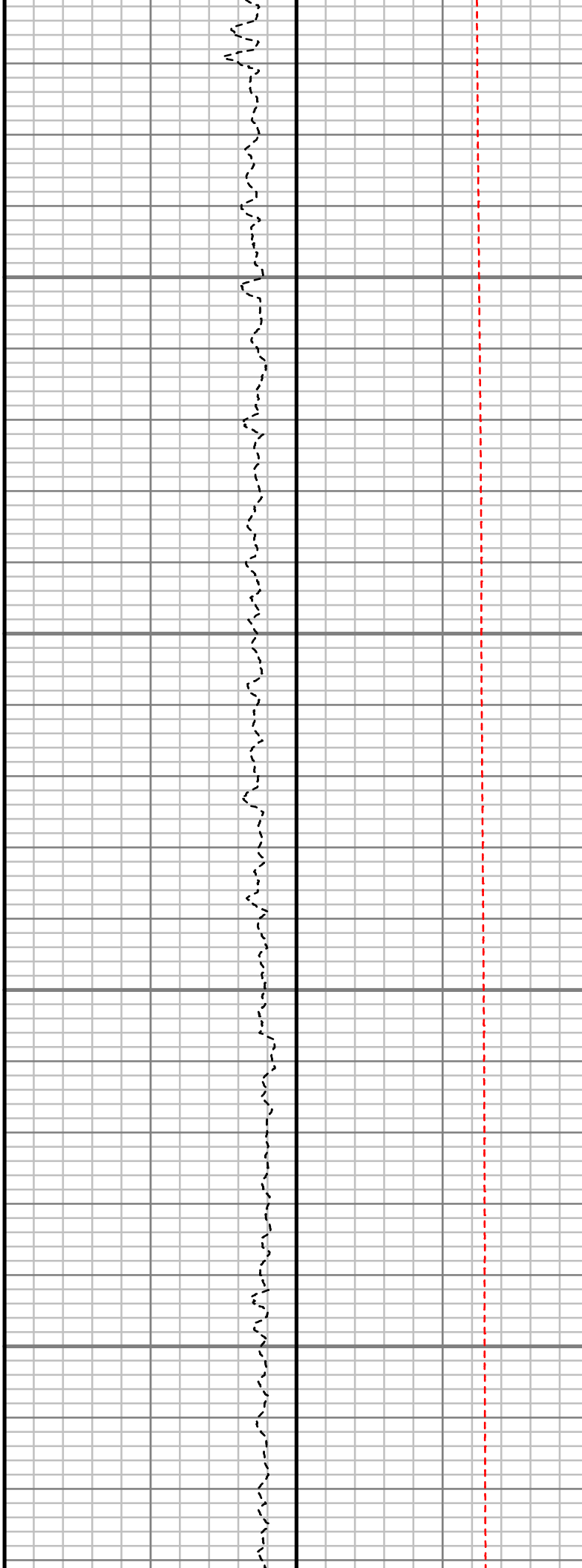
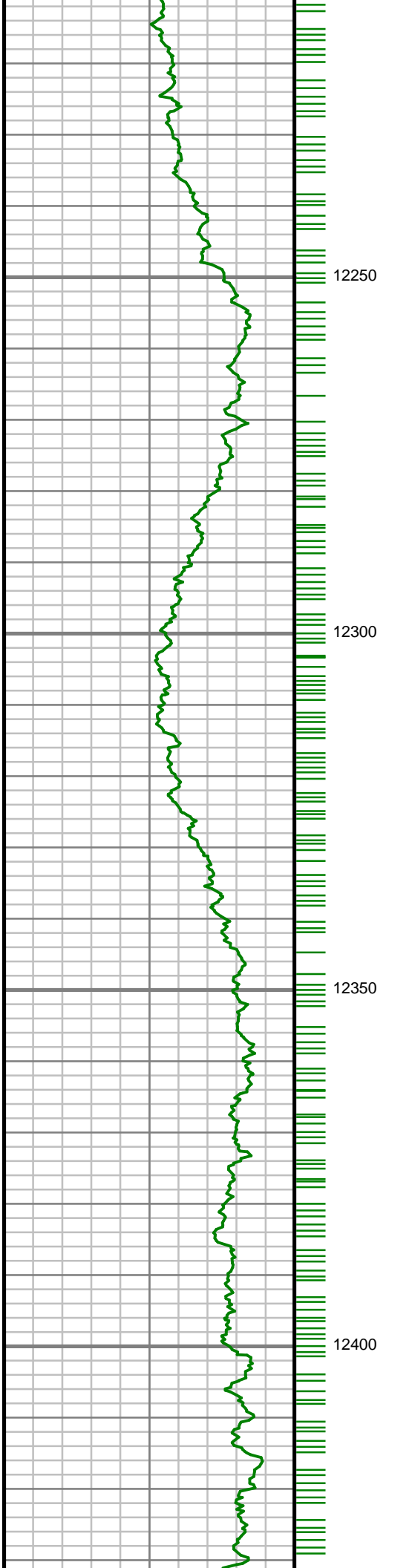
S: 122 MD: 11915.00 ft  
Inc: 91.11 deg Az:  
357.89 deg TVD:  
7356.54 ft



S: 123 MD: 12010.00 ft  
Inc: 91.68 deg Az:  
357.65 deg TVD:  
7354.22 ft

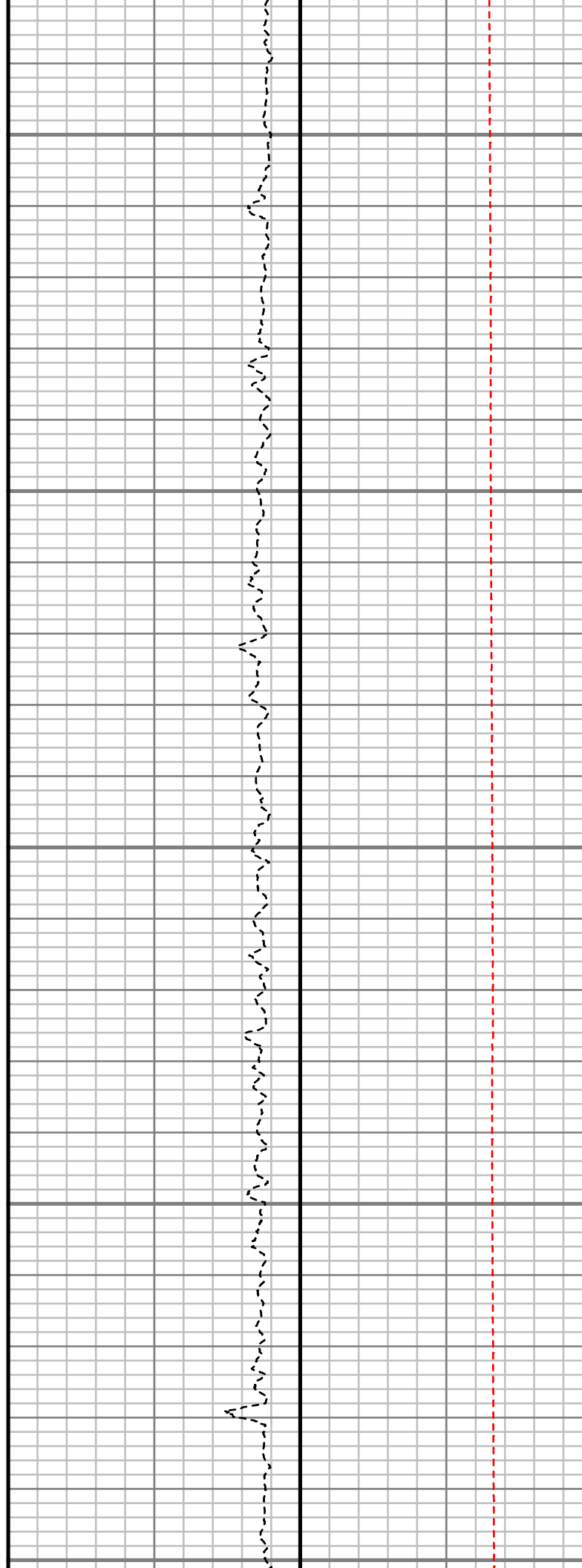
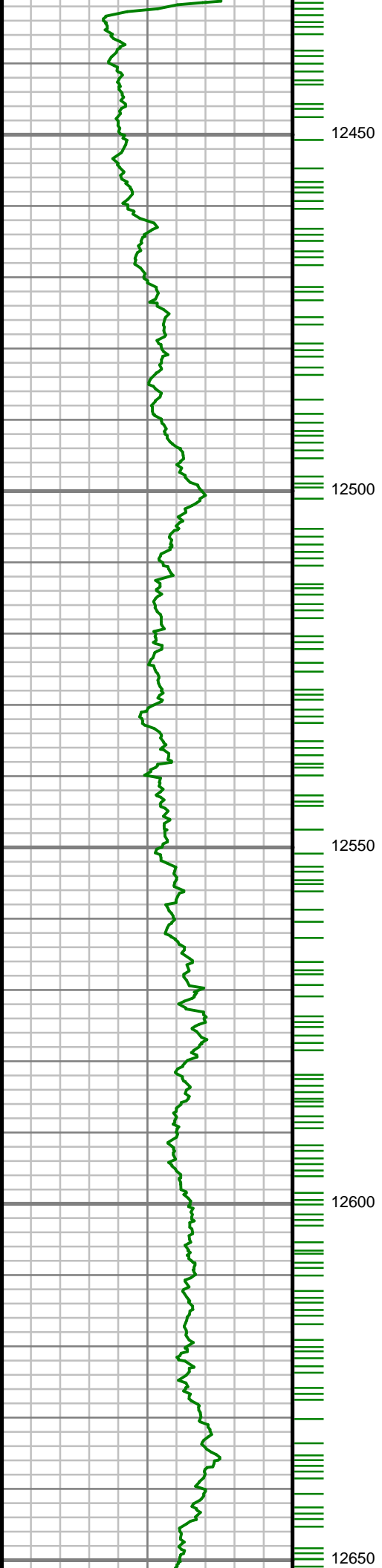
S: 124 MD: 12104.00 ft  
Inc: 92.11 deg Az:  
357.53 deg TVD:  
7351.11 ft

S: 125 MD: 12198.00 ft  
Inc: 90.87 deg Az:  
358.74 deg TVD:  
7348.67 ft



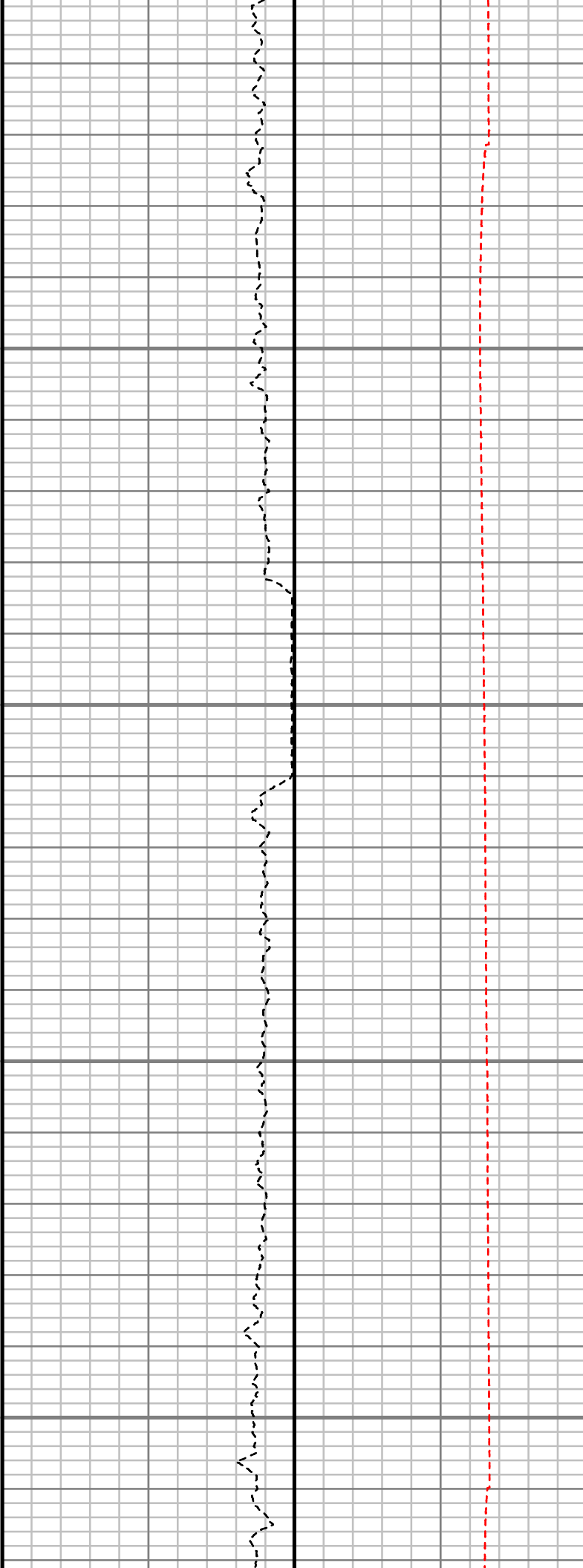
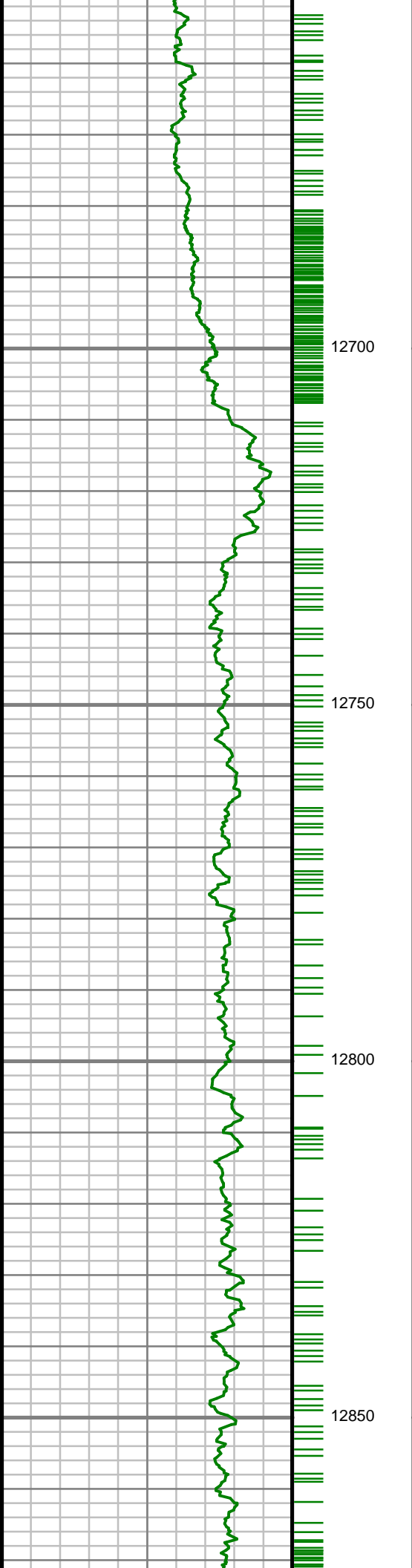
S: 126 MD: 12293.00 ft  
Inc: 90.80 deg Az:  
358.45 deg TVD:  
7347.28 ft

S: 127 MD: 12387.00 ft  
Inc: 90.40 deg Az:  
358.07 deg TVD:  
7346.29 ft



S: 128 MD: 12481.00 ft  
Inc: 91.04 deg Az:  
358.12 deg TVD:  
7345.10 ft

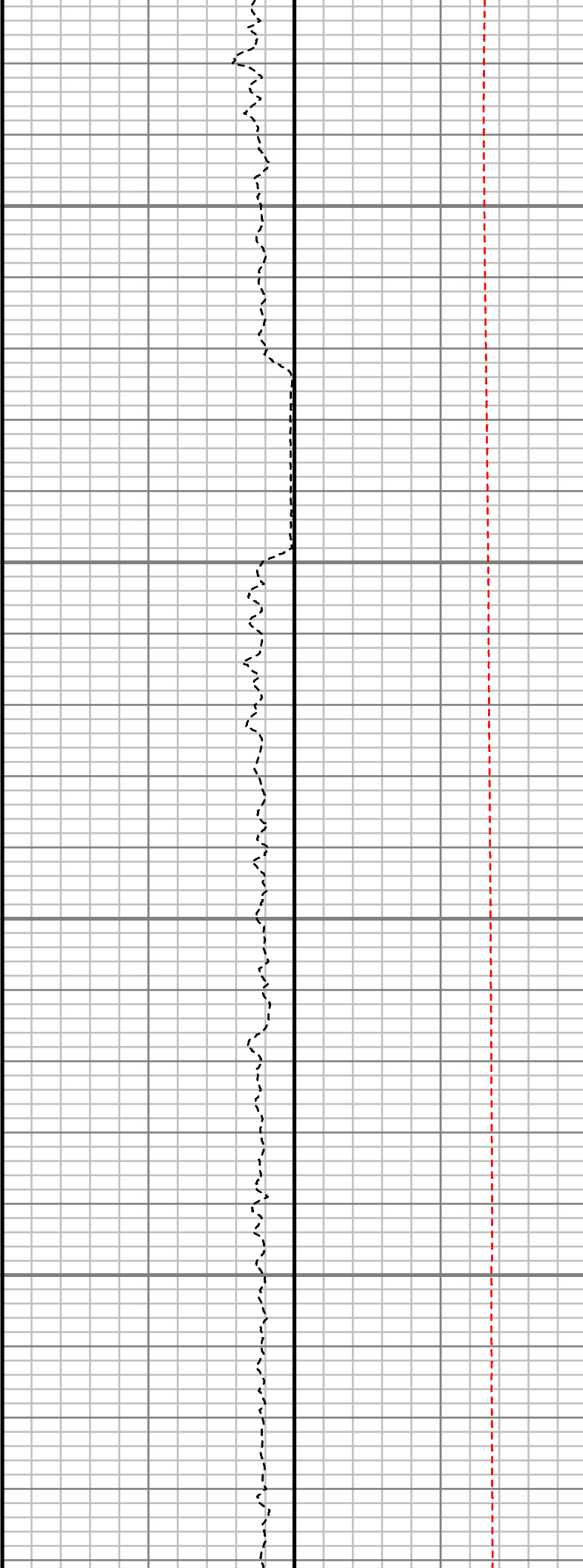
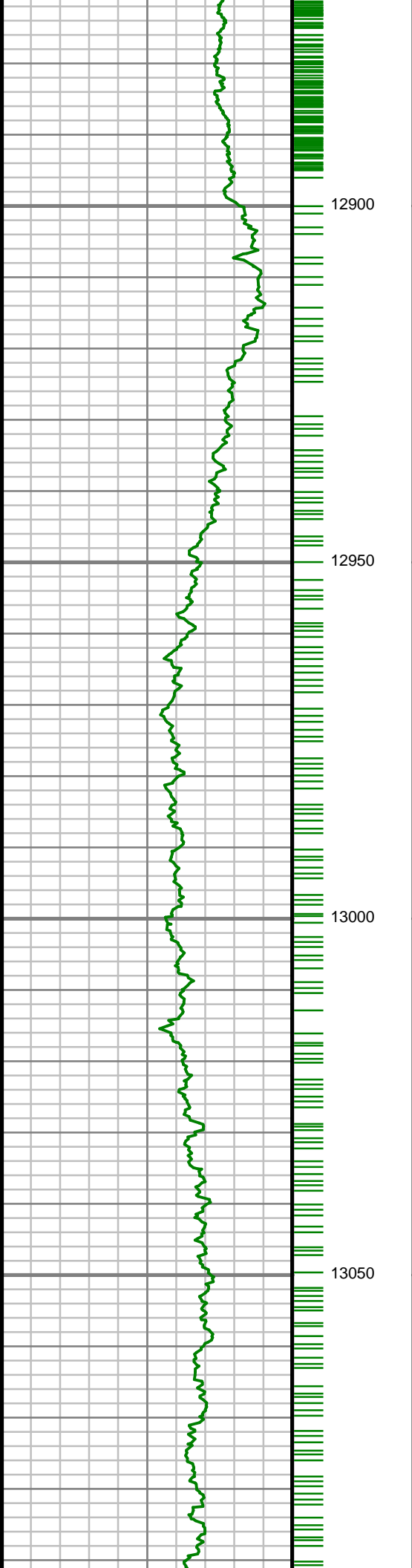
S: 129 MD: 12575.00 ft  
Inc: 91.45 deg Az:  
357.93 deg TVD:  
7343.07 ft



S: 130 MD: 12670.00 ft  
Inc: 91.31 deg Az:  
357.65 deg TVD:  
7340.78 ft

S: 131 MD: 12764.00 ft  
Inc: 89.87 deg Az:  
358.86 deg TVD:  
7339.82 ft

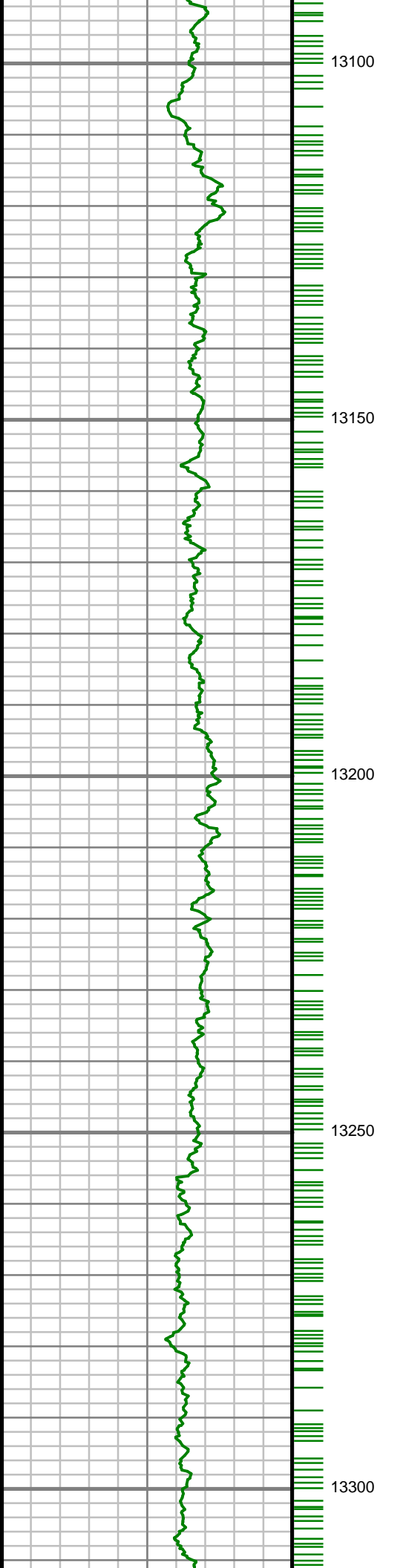
S: 132 MD: 12858.00 ft  
Inc: 90.30 deg Az:  
358.27 deg TVD:  
7339.68 ft



S: 133 MD: 12952.00 ft  
Inc: 90.10 deg Az: 0.34  
deg TVD: 7339.35 ft

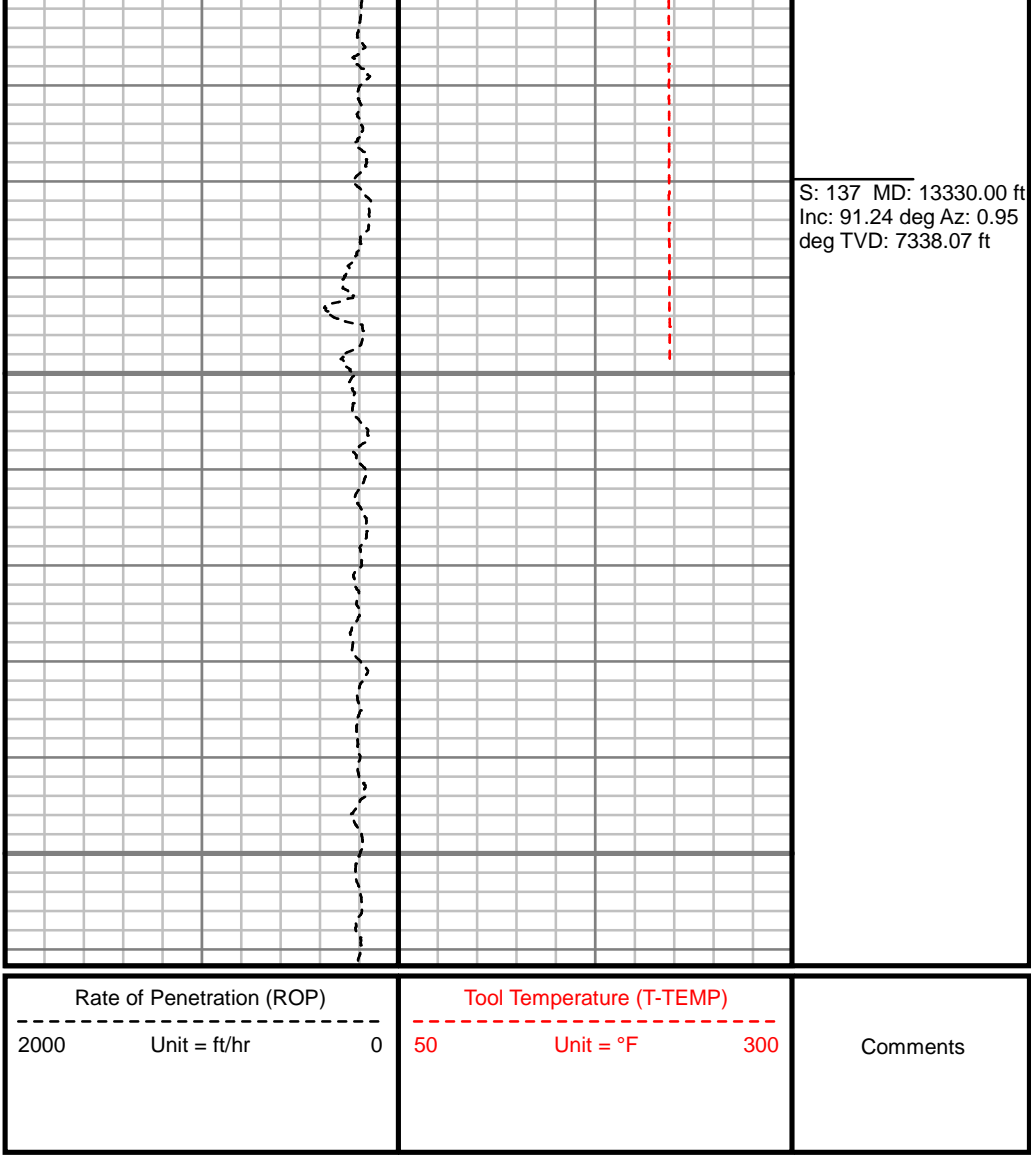
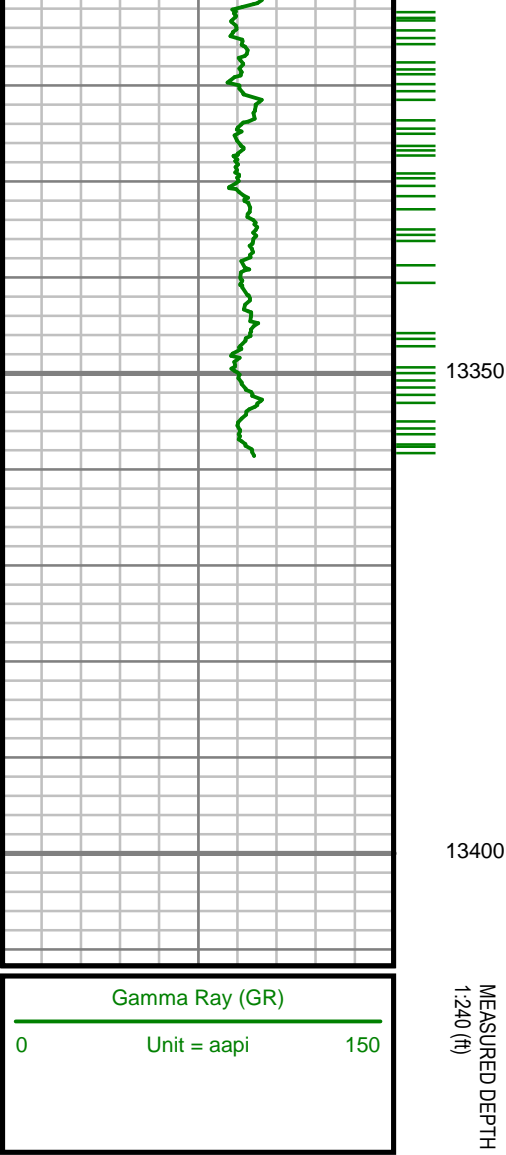
S: 134 MD: 13047.00 ft  
Inc: 91.28 deg Az: 0.40  
deg TVD: 7338.21 ft





S: 135 MD: 13141.00 ft  
Inc: 89.16 deg Az: 1.02  
deg TVD: 7337.85 ft

S: 136 MD: 13235.00 ft  
Inc: 89.66 deg Az: 1.67  
deg TVD: 7338.82 ft



## MWD Survey Report

<b>Well Location</b>	COBRA 12-23 HZ PAD
<b>Well Name</b>	COBRA 4N-14HZ
<b>Survey Date</b>	2/17/2015
<b>Latitude</b>	40°7'22.134"N
<b>Longitude</b>	104°51'53.244"W
<b>Btotal</b>	52677, 52730 nT
<b>Dip</b>	66.78, 66.84 deg
<b>Magnetic Declination</b>	8.56, 8.59 deg
<b>North Reference</b>	True North
<b>Grid Correction</b>	None
<b>Depth Reference</b>	RKB (25.00 ft)
<b>Calculation Method</b>	Minimum Curvature
<b>Section (VS) Ref</b>	0.00N (ft), 0.00E (ft), 0.05Azim (deg)
<b>Operator(s)</b>	B. FRANTZ, B. GREER

### Well Notes

SURVEYS FROM 0 FT. TO 1223 FT. WERE ACQUIRED BY CATHEDRAL MWD.

SURVEYS FROM 1223 FT. TO 13411 FT. WERE ACQUIRED BY SCIENTIFIC DRILLING INTERNATIONAL MWD.

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid
19.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00
71.00	0.10	202.10	71.00	-0.04	-0.04	-0.02	0.19
181.00	1.00	244.30	180.99	-0.55	-0.55	-0.92	0.84
259.00	0.80	267.20	258.98	-0.87	-0.87	-2.08	0.52
340.00	0.10	355.00	339.98	-0.83	-0.83	-2.65	0.99
419.00	0.90	164.80	418.98	-1.36	-1.36	-2.49	1.26
499.00	0.20	236.40	498.98	-2.04	-2.04	-2.44	1.07
579.00	0.40	128.60	578.97	-2.29	-2.29	-2.34	0.62
659.00	0.60	123.10	658.97	-2.70	-2.69	-1.77	0.26
739.00	1.00	193.30	738.97	-3.60	-3.60	-1.58	1.22
819.00	0.20	279.50	818.96	-4.26	-4.26	-1.88	1.26
899.00	1.20	53.00	898.96	-3.73	-3.73	-1.35	1.68
979.00	0.90	35.80	978.94	-2.72	-2.72	-0.31	0.54
1059.00	1.60	65.80	1058.92	-1.75	-1.75	1.08	1.17
1139.00	1.80	60.40	1138.89	-0.67	-0.67	3.19	0.32
1178.00	1.40	62.60	1177.87	-0.15	-0.15	4.14	1.04
1261.00	0.17	268.09	1260.87	0.32	0.31	4.92	1.87
1353.00	1.57	72.08	1352.85	0.70	0.69	5.98	1.88
1444.00	3.34	42.18	1443.77	3.05	3.04	8.94	2.34

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
1538.00	5.66	26.80	1537.48	9.21	9.20	12.87	2.76
1632.00	8.08	20.08	1630.80	19.56	19.54	17.23	2.71
1726.00	10.10	15.67	1723.61	33.70	33.68	21.72	2.27
1821.00	12.20	5.94	1816.83	51.71	51.69	25.01	2.96
1915.00	14.51	359.38	1908.28	73.37	73.34	25.91	2.94
2009.00	16.44	358.52	1998.87	98.44	98.42	25.44	2.07
2103.00	18.64	357.05	2088.50	126.73	126.71	24.32	2.38
2198.00	20.50	359.09	2178.01	158.53	158.51	23.28	2.09
2292.00	22.10	356.65	2265.59	192.64	192.62	21.98	1.95
2386.00	24.59	359.08	2351.89	229.85	229.83	20.63	2.84
2480.00	25.78	358.56	2436.95	269.84	269.82	19.80	1.29
2575.00	24.30	357.74	2523.02	310.02	310.01	18.51	1.61
2669.00	26.21	358.56	2608.03	350.10	350.08	17.23	2.07
2763.00	24.84	358.26	2692.86	390.58	390.57	16.11	1.46
2857.00	26.63	359.88	2777.54	431.38	431.37	15.47	2.04
2951.00	26.39	359.43	2861.66	473.33	473.32	15.21	0.33
3045.00	26.12	358.74	2945.96	514.91	514.90	14.55	0.43
3139.00	25.71	357.93	3030.51	555.97	555.96	13.36	0.57
3233.00	24.39	356.32	3115.66	595.72	595.71	11.38	1.59
3328.00	25.02	355.72	3201.97	635.32	635.31	8.62	0.72

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
3421.00	26.36	357.14	3285.78	675.55	675.54	6.12	1.59
3515.00	24.61	355.55	3370.63	715.90	715.90	3.57	2.00
3609.00	24.26	357.36	3456.21	754.71	754.71	1.16	0.87
3703.00	24.90	359.71	3541.69	793.79	793.79	0.17	1.24
3798.00	25.61	0.57	3627.61	834.33	834.33	0.27	0.84
3892.00	23.11	358.65	3713.23	873.09	873.09	0.04	2.79
3986.00	23.16	356.42	3799.68	909.98	909.98	-1.54	0.93
4175.00	24.63	359.11	3972.48	986.46	986.46	-4.48	0.97
4269.00	25.15	1.03	4057.75	1026.01	1026.01	-4.42	1.02
4364.00	25.91	359.31	4143.47	1066.95	1066.96	-4.31	1.12
4552.00	25.58	357.79	4312.81	1148.58	1148.58	-6.37	0.40
4646.00	26.09	356.91	4397.42	1189.49	1189.50	-8.26	0.68
4741.00	24.99	355.06	4483.13	1230.35	1230.36	-11.12	1.43
4835.00	24.44	357.16	4568.53	1269.55	1269.56	-13.79	1.11
4929.00	25.79	356.65	4653.64	1309.39	1309.40	-15.95	1.46
5024.00	28.33	356.93	4738.23	1352.53	1352.55	-18.37	2.67
5118.00	27.62	354.57	4821.25	1396.49	1396.51	-21.63	1.40
5212.00	26.21	356.22	4905.07	1438.89	1438.92	-25.06	1.70
5306.00	25.74	0.19	4989.58	1480.02	1480.04	-26.36	1.91
5400.00	24.98	359.02	5074.52	1520.28	1520.30	-26.63	0.97

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
5495.00	27.40	359.57	5159.76	1562.19	1562.22	-27.14	2.56
5589.00	26.10	357.44	5243.70	1604.48	1604.51	-28.23	1.72
5683.00	24.95	358.34	5328.53	1644.95	1644.98	-29.73	1.30
5777.00	23.69	359.02	5414.19	1683.65	1683.68	-30.62	1.36
5871.00	24.10	358.16	5500.13	1721.71	1721.74	-31.56	0.57
5965.00	24.32	358.94	5585.86	1760.25	1760.28	-32.53	0.41
6060.00	23.00	358.21	5672.87	1798.36	1798.39	-33.47	1.43
6154.00	22.11	355.32	5759.69	1834.34	1834.38	-35.49	1.51
6248.00	21.24	355.66	5847.04	1868.95	1868.98	-38.22	0.94
6342.00	20.75	359.35	5934.81	1902.57	1902.61	-39.70	1.50
6436.00	22.90	358.56	6022.06	1937.51	1937.54	-40.35	2.31
6531.00	24.33	0.61	6109.11	1975.56	1975.60	-40.61	1.74
6625.00	26.48	358.30	6194.01	2015.87	2015.91	-41.02	2.52
6719.00	27.55	355.97	6277.76	2058.51	2058.55	-43.17	1.60
6813.00	26.08	0.86	6361.66	2100.86	2100.90	-44.39	2.82
6908.00	25.24	1.33	6447.29	2141.99	2142.03	-43.60	0.91
7002.00	23.77	2.86	6532.82	2180.95	2180.99	-42.19	1.71
7096.00	24.87	357.97	6618.49	2219.62	2219.66	-41.95	2.44
7190.00	26.47	355.39	6703.21	2260.25	2260.29	-44.33	2.08
7284.00	24.60	355.22	6788.03	2300.63	2300.67	-47.64	1.99

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
7378.00	25.55	356.33	6873.17	2340.35	2340.40	-50.57	1.13
7472.00	26.46	354.55	6957.66	2381.43	2381.47	-53.85	1.28
7567.00	27.80	358.98	7042.21	2424.65	2424.70	-56.26	2.55
7661.00	36.85	1.36	7121.56	2474.85	2474.90	-55.98	9.72
7755.00	44.43	358.42	7192.85	2536.01	2536.06	-56.22	8.31
7849.00	51.65	359.21	7255.66	2605.85	2605.90	-57.64	7.71
7943.00	58.97	359.58	7309.11	2683.09	2683.14	-58.44	7.79
8038.00	68.18	359.21	7351.34	2768.06	2768.12	-59.35	9.70
8132.00	75.84	357.40	7380.36	2857.36	2857.41	-62.03	8.35
8226.00	84.35	356.90	7396.52	2949.75	2949.81	-66.63	9.07
8334.00	90.03	357.40	7401.81	3057.44	3057.50	-71.98	5.29
8429.00	90.74	358.49	7401.17	3152.37	3152.44	-75.38	1.37
8523.00	89.83	357.95	7400.70	3246.32	3246.39	-78.30	1.12
8711.00	91.34	358.72	7398.78	3434.22	3434.29	-83.76	0.90
8899.00	91.01	359.48	7394.92	3622.15	3622.23	-86.73	0.44
9088.00	90.37	358.08	7392.66	3811.09	3811.17	-90.75	0.81
9182.00	91.21	359.96	7391.36	3905.06	3905.14	-92.36	2.18
9276.00	90.84	359.25	7389.68	3999.04	3999.12	-93.01	0.85
9370.00	90.27	359.22	7388.77	4093.02	4093.11	-94.26	0.61
9464.00	90.60	0.13	7388.06	4187.02	4187.10	-94.79	1.03

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
9559.00	90.74	1.91	7386.94	4281.99	4282.08	-93.10	1.87
9653.00	89.60	2.13	7386.67	4375.94	4376.02	-89.79	1.24
9747.00	90.00	1.65	7387.00	4469.89	4469.96	-86.69	0.67
9841.00	91.17	1.37	7386.03	4563.85	4563.92	-84.22	1.28
9935.00	91.92	2.31	7383.50	4657.77	4657.84	-81.20	1.28
10029.00	91.04	0.99	7381.07	4751.70	4751.77	-78.49	1.69
10124.00	90.24	1.05	7380.01	4846.68	4846.75	-76.81	0.85
10218.00	91.78	359.80	7378.36	4940.66	4940.72	-76.12	2.11
10313.00	91.68	0.16	7375.50	5035.61	5035.68	-76.16	0.39
10406.00	90.97	358.64	7373.35	5128.58	5128.65	-77.14	1.80
10501.00	90.84	358.66	7371.85	5223.54	5223.61	-79.38	0.14
10595.00	89.77	357.75	7371.35	5317.48	5317.56	-82.33	1.50
10689.00	90.54	358.35	7371.10	5411.43	5411.50	-85.53	1.04
10784.00	91.04	358.35	7369.80	5506.37	5506.45	-88.27	0.53
10972.00	91.07	358.03	7366.33	5694.24	5694.33	-94.21	0.17
11161.00	91.78	358.23	7361.62	5883.08	5883.17	-100.37	0.39
11255.00	91.54	358.27	7358.90	5976.99	5977.08	-103.24	0.25
11350.00	91.88	359.71	7356.06	6071.93	6072.02	-104.91	1.55
11444.00	90.00	0.80	7354.52	6165.91	6166.01	-104.50	2.31
11538.00	88.83	0.70	7355.49	6259.90	6259.99	-103.27	1.25

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
11727.00	90.37	0.45	7356.81	6448.88	6448.97	-101.37	0.83
11821.00	89.43	359.76	7356.98	6542.88	6542.97	-101.20	1.24
11915.00	91.11	357.89	7356.54	6636.85	6636.94	-103.13	2.68
12010.00	91.68	357.65	7354.22	6731.74	6731.84	-106.83	0.65
12104.00	92.11	357.53	7351.11	6825.61	6825.71	-110.77	0.48
12198.00	90.87	358.74	7348.67	6919.52	6919.62	-113.82	1.84
12293.00	90.80	358.45	7347.28	7014.48	7014.58	-116.15	0.32
12387.00	90.40	358.07	7346.29	7108.43	7108.53	-119.00	0.58
12481.00	91.04	358.12	7345.10	7202.36	7202.47	-122.12	0.68
12575.00	91.45	357.93	7343.07	7296.28	7296.39	-125.36	0.48
12670.00	91.31	357.65	7340.78	7391.18	7391.30	-129.02	0.33
12764.00	89.87	358.86	7339.82	7485.13	7485.24	-131.89	2.01
12858.00	90.30	358.27	7339.68	7579.09	7579.21	-134.24	0.78
12952.00	90.10	0.34	7339.35	7673.08	7673.20	-135.38	2.21
13047.00	91.28	0.40	7338.21	7768.07	7768.19	-134.76	1.24
13141.00	89.16	1.02	7337.85	7862.06	7862.18	-133.59	2.35
13235.00	89.66	1.67	7338.82	7956.03	7956.14	-131.38	0.87
13330.00	91.24	0.95	7338.07	8051.00	8051.11	-129.22	1.83

5" = 100' FEET MD