GAMMA RAY

Scientific Drilling

5" = 100' FEET MD

COMPANY : BILL BARRETT CORP.
WELL : ANSCHUTZ STATE 05-62-22-3225B2
FIELD : WATTENBERG
COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05-123-41753

COMPANY : BILL BARRETT CORP.
WELL : ANSCHUTZ STATE 05-62-22-3225B2
FIELD : WATTENBERG
COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05-123-41753

WELL LOCATION
LAT:40°23'13.120"N LONG:104°19'5.459"W
N:1386010.26 ft E:3329201.76 ft

SEC:22 TWP:5N RANGE:62W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : RKB
REF. HEIGHT : 16.000 ft RKB to Ground Level
GROUND LEVEL : 4719.000 ft G.L. to MEAN SEA LEVEL

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft

CASING RECORD

CASING SIZE in	FROM ft	TO ft
9.625	0	805
7	0	6667

DEVIATION RECORD

INCLINATION deg	FROM ft	TO ft
0 - 8	805	5890
8 - 88	5890	6679
88 - 93	6679	16404

DRILLING CO. : CADE
RIG : 24
LWD UNIT NO. : MWD-00267-DISTRICT : CASPER
SPUD DATE : 10/09/2015
LWD START DATE : 10/11/2015 DEPTH : 4000 ft
LWD END DATE : DEPTH : 16404 ft
TOTAL DEPTH : 16404 ft

Run Data

RUN NUMBER	1	2	3
START DATE	10/10/2015	10/11/2015	10/13/2015
START TIME	2240	2305	0810
END DATE	10/11/2015	10/12/2015	
END TIME	2305	1515	
DEPTH IN (ft)	805	5890	6679
DEPTH OUT (ft)	5890	6679	16404
LOG TOP (ft)	4000	5849	6625
LOG BOTTOM (ft)	5849	6625	16356
HOLE SIZE (in)	8.75	8.75	6.125
MUD DATA @ (ft)	3640	6679	16252
MUD TYPE	WATER-BASED	WATER-BASED	WATER-BASED
DENSITY (lb / gal)	9.55	9.8	9
VISCOSITY (s / qt)	31	32	29
pH	9.5	8.3	8.4
FLUID LOSS (cm3 / 30)	-	-	-
SALINITY (ppm)	-	-	-
Rm (ohmm @ deg F)	-	-	-
Rmf (ohmm @ deg F)	-	-	-
MAX TEMP (deg F)	160	165	230
Rm @ MAX TEMP (ohmm)	-	-	-
LWD ENGINEER #1	R. KLASSEN	R. KLASSEN	R. KLASSEN
LWD ENGINEER #2	C. COLLINS	Z. BROWN	Z. BROWN
LWD ENGINEER #3	-	-	-
LOG WITNESS #1	T. BARNES	T. BARNES	T. BARNES
LOG WITNESS #2	V. SPIKES	V. SPIKES	V. SPIKES

Remarks

BILL BARRETT CORP. PRODUCTION AFE# 19440D

SCIENTIFIC DRILLING INTERNATIONAL JOB# 316943

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 HOOKLOAD (MAX) CURVE

FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO WEIGHT-ON-BIT (SURF,MAX) CURVE

RUN #1 : MWD / GAMMA RAY LOGGING RUN

SENSORS S/N: PULSER = 128-377MHC / CONT = 143 / MWD EYE = 1029 / GAMMA RAY = 1141

BIT TO SENSOR OFFSETS: SURVEY = 59.00 FT. / GAMMA RAY = 40.85 FT.

RUN #2 : MWD / GAMMA RAY LOGGING RUN

SENSORS S/N: PULSER = 128-424 / CONT = 159 / MWD EYE = 0510 / GAMMA RAY = 1188

BIT TO SENSOR OFFSETS: SURVEY = 57.22 FT. / GAMMA RAY = 53.64 FT.

RUN #3 : MWD / GAMMA RAY LOGGING RUN

SENSORS S/N: PULSER = 78-246C / CONT = 919 / MWD EYE = 1094 / GAMMA RAY = 1209

BIT TO SENSOR OFFSETS: SURVEY = 56.82 FT. / GAMMA RAY = 48.20 FT.

Remarks

MNEMONICS LIST:

GR = GAMMA RAY

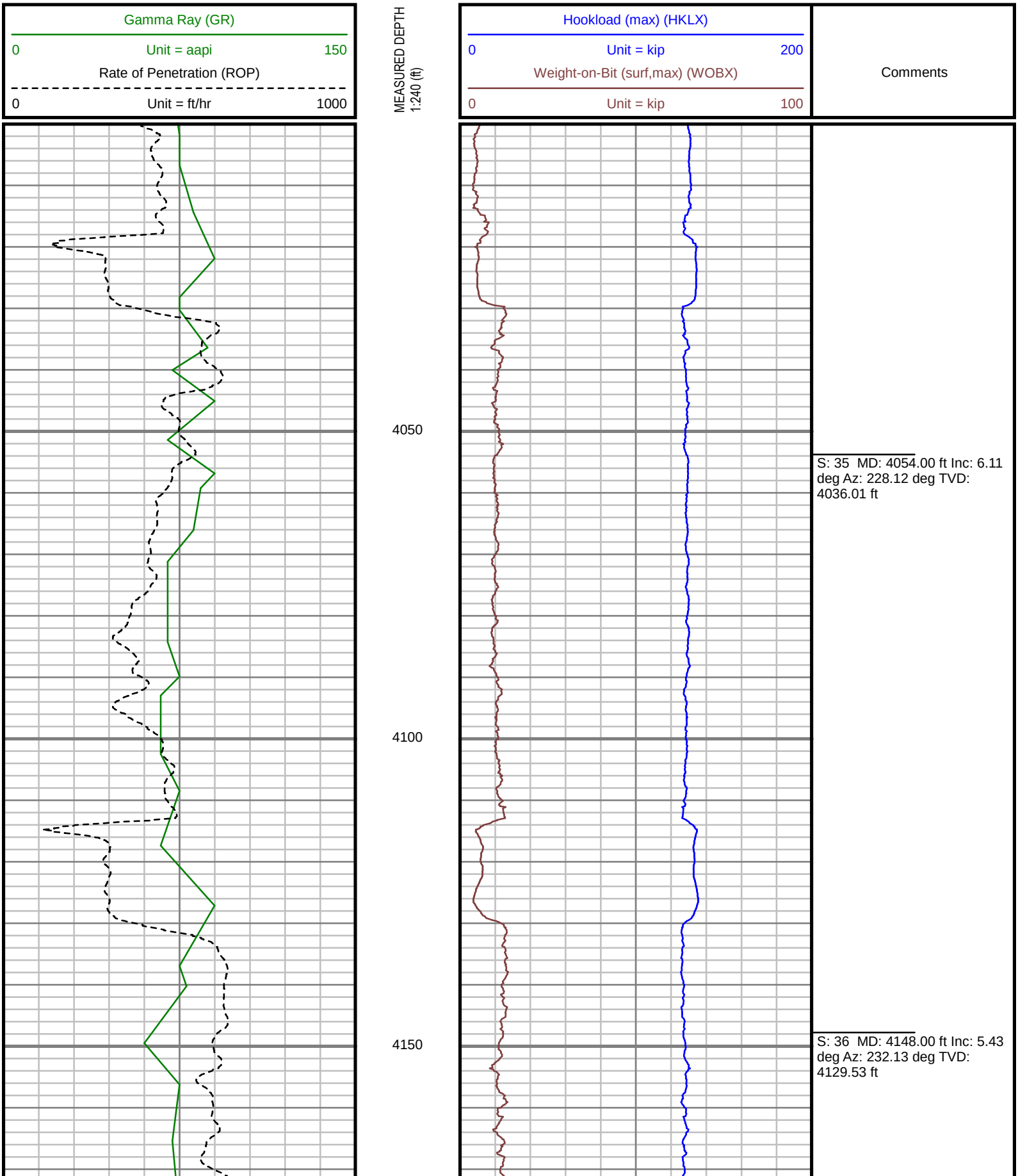
ROP = RATE OF PENETRATION

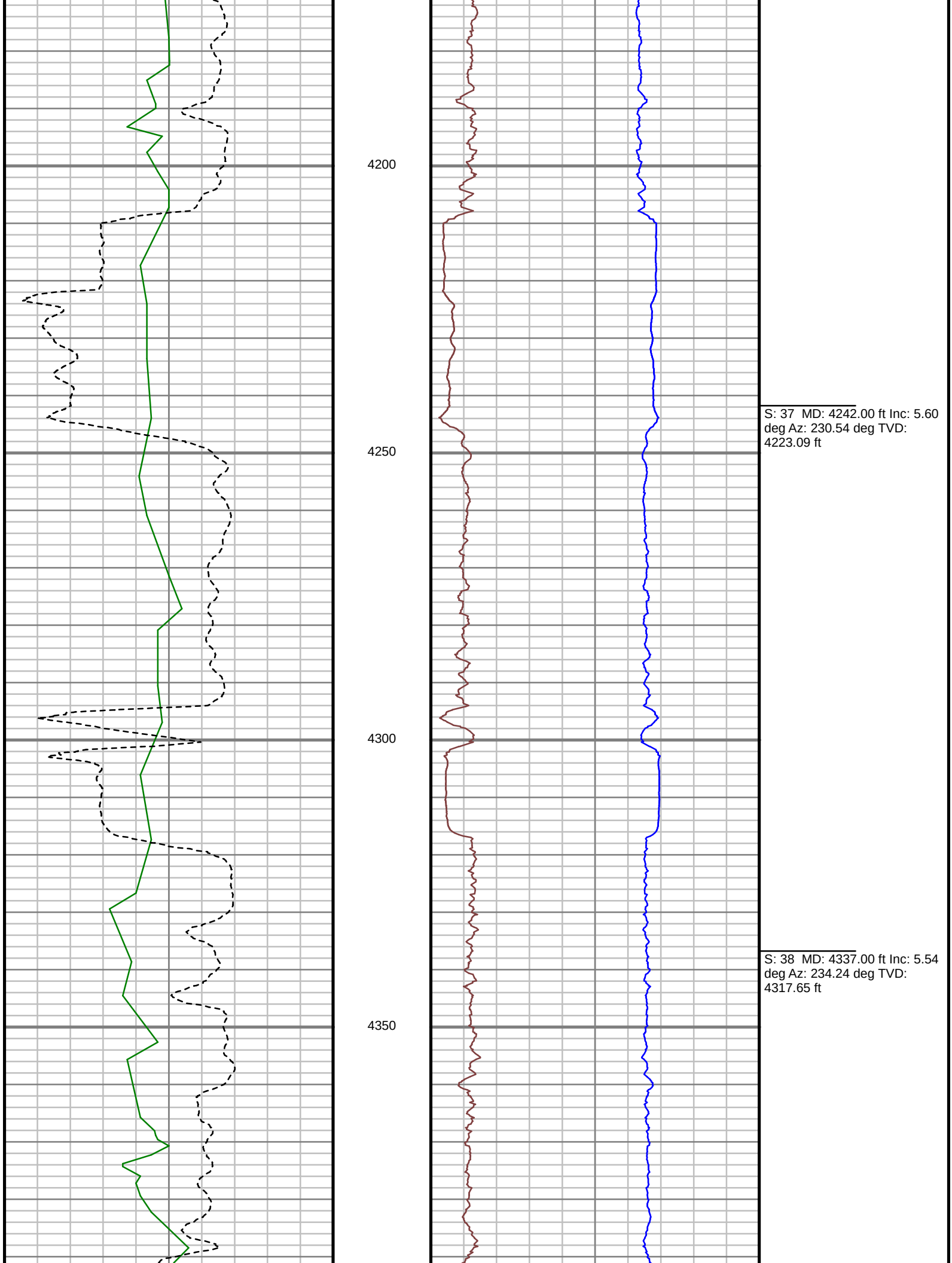
HKLX = HOOKLOAD (MAX)

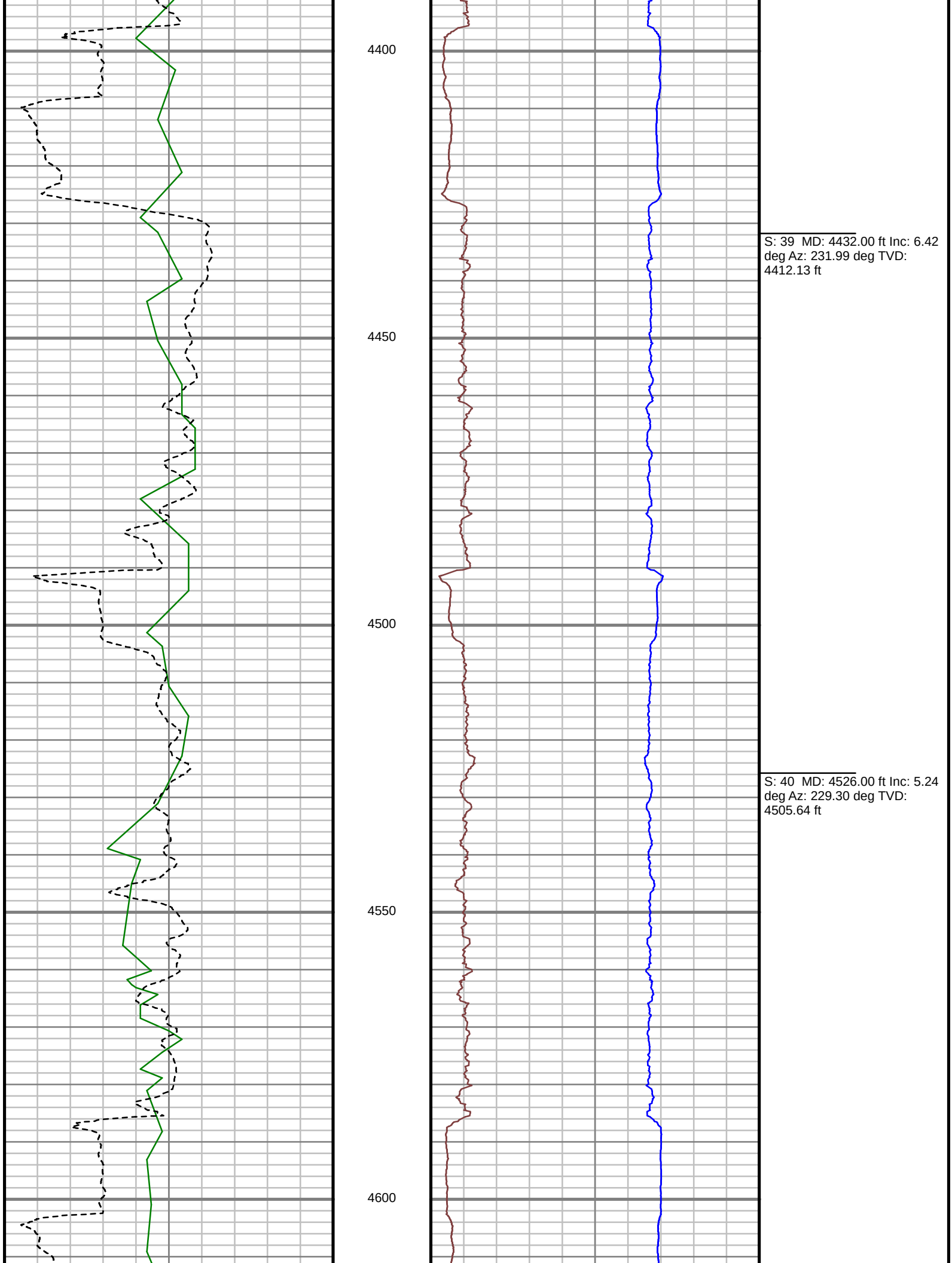
WOBX = WEIGHT-ON-BIT (SURF,MAX)

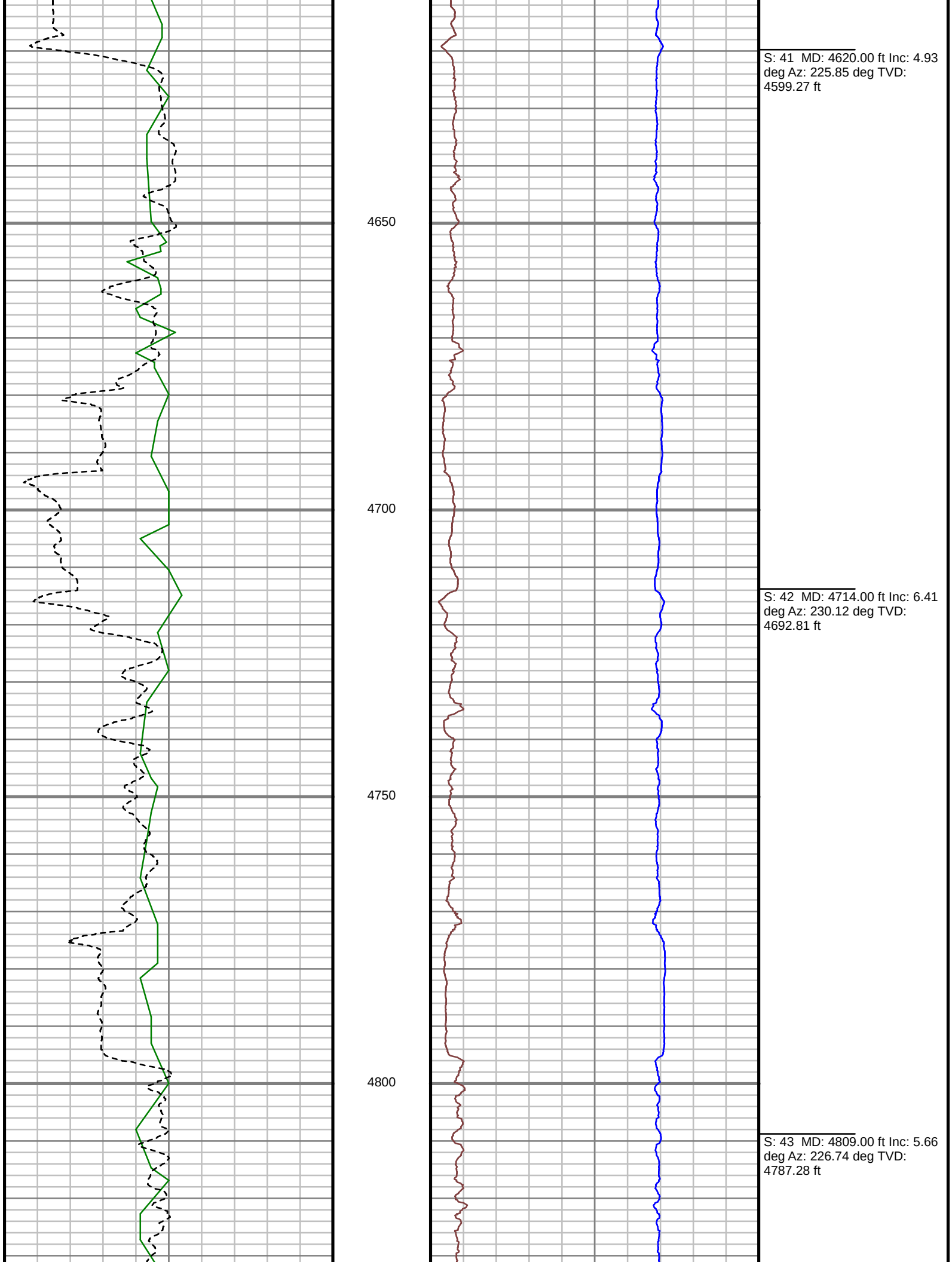
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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.

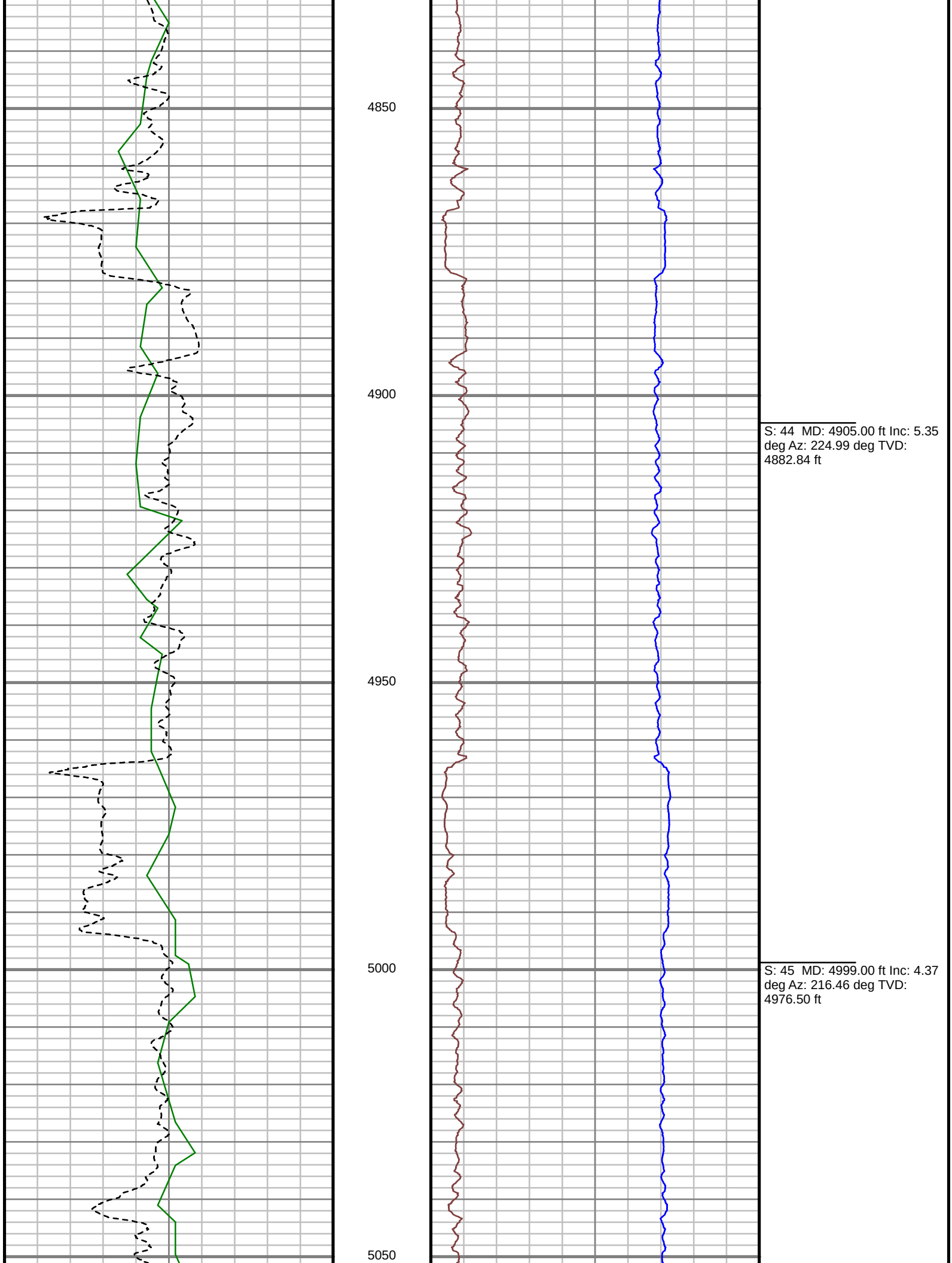
BILL BARRETT CORPORATION
ANSCHUTZ STATE 05-62-22-3225B2
WATTENBERG FIELD
WELD COUNTY, COLORADO
05-123-41753

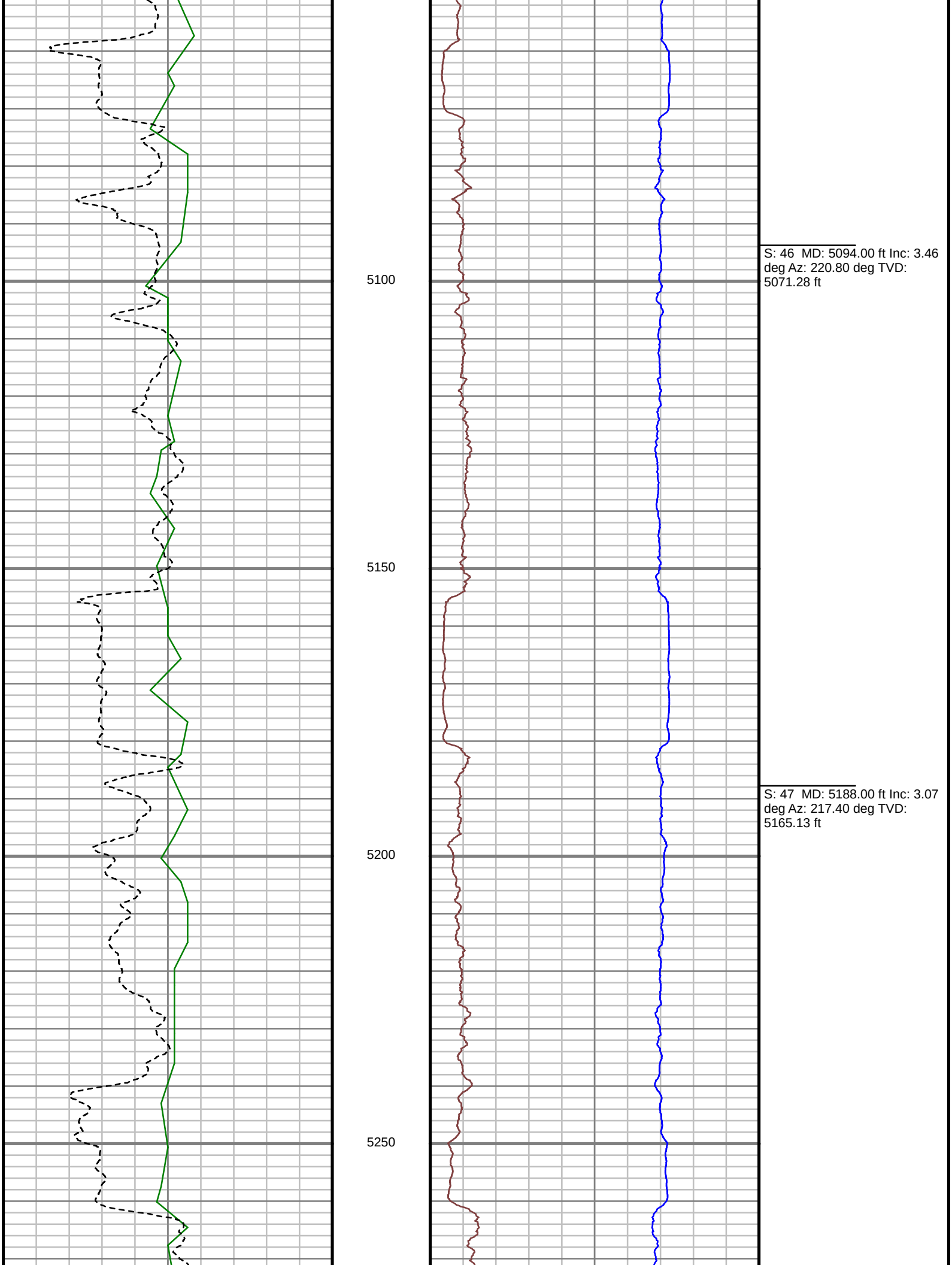


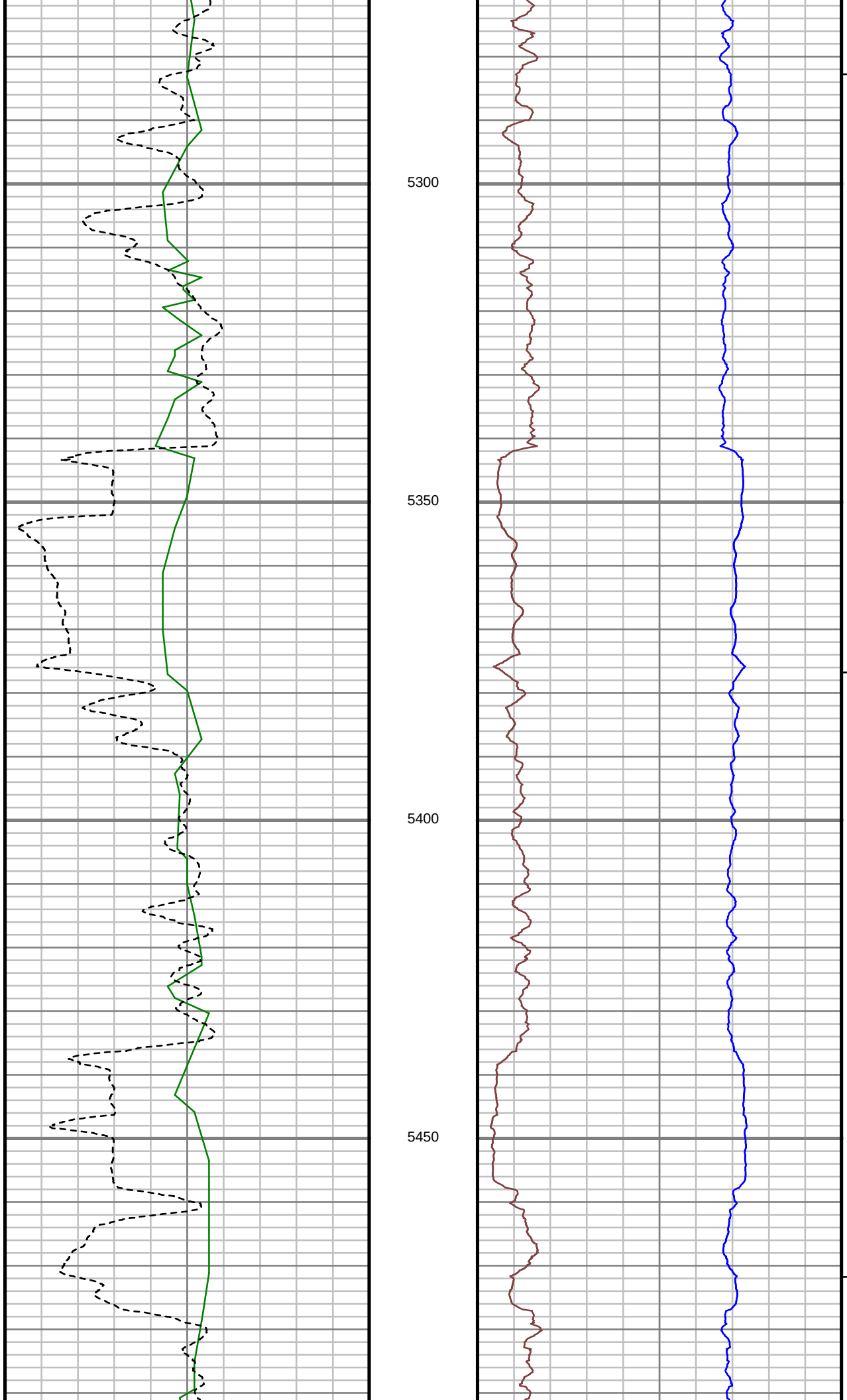

4200
4250
4300
4350
S: 37 MD: 4242.00 ft Inc: 5.60 deg Az: 230.54 deg TVD: 4223.09 ft
S: 38 MD: 4337.00 ft Inc: 5.54 deg Az: 234.24 deg TVD: 4317.65 ft

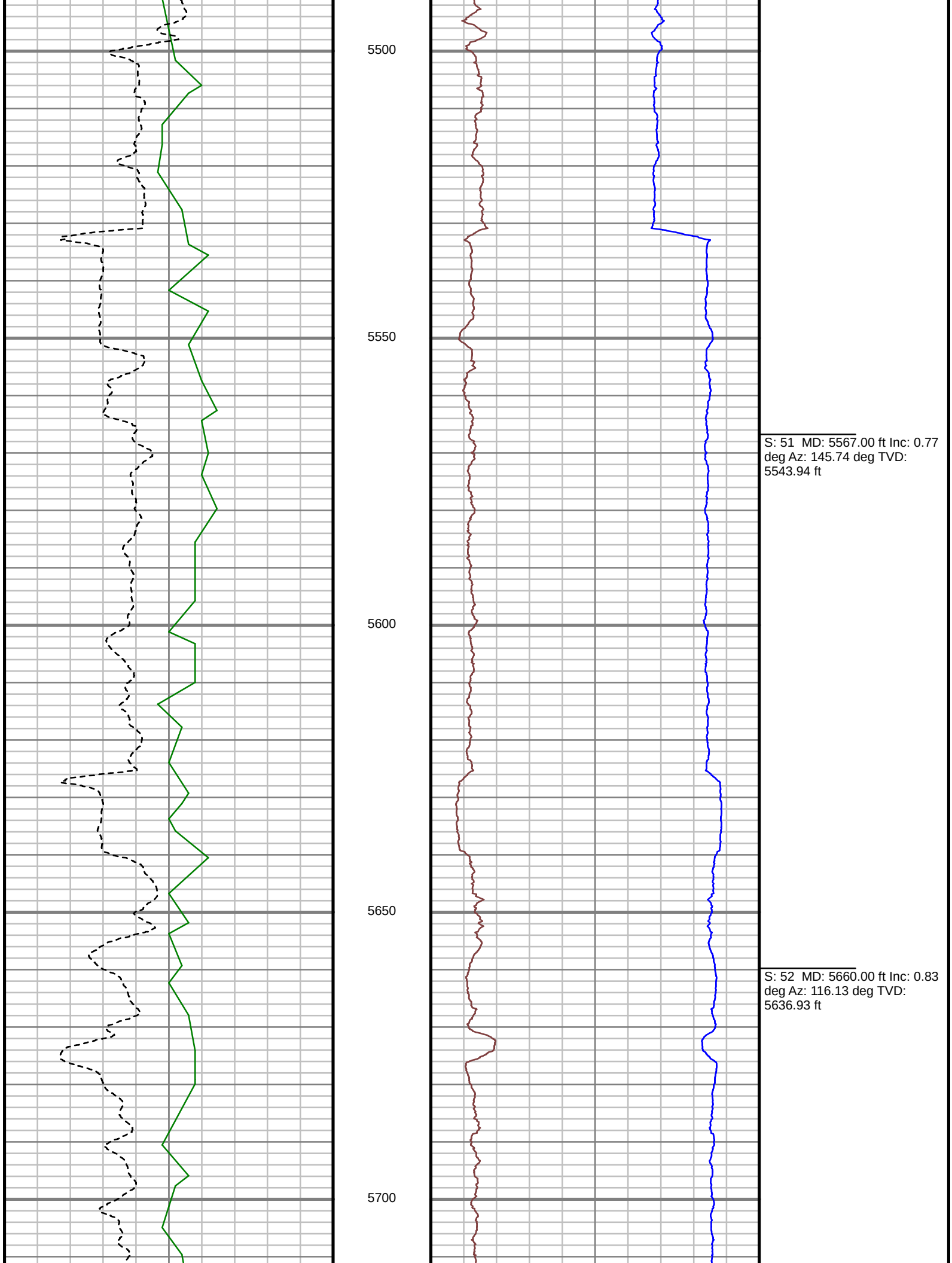

4400
4450
4500
4550
4600
S: 39 MD: 4432.00 ft Inc: 6.42 deg Az: 231.99 deg TVD: 4412.13 ft
S: 40 MD: 4526.00 ft Inc: 5.24 deg Az: 229.30 deg TVD: 4505.64 ft

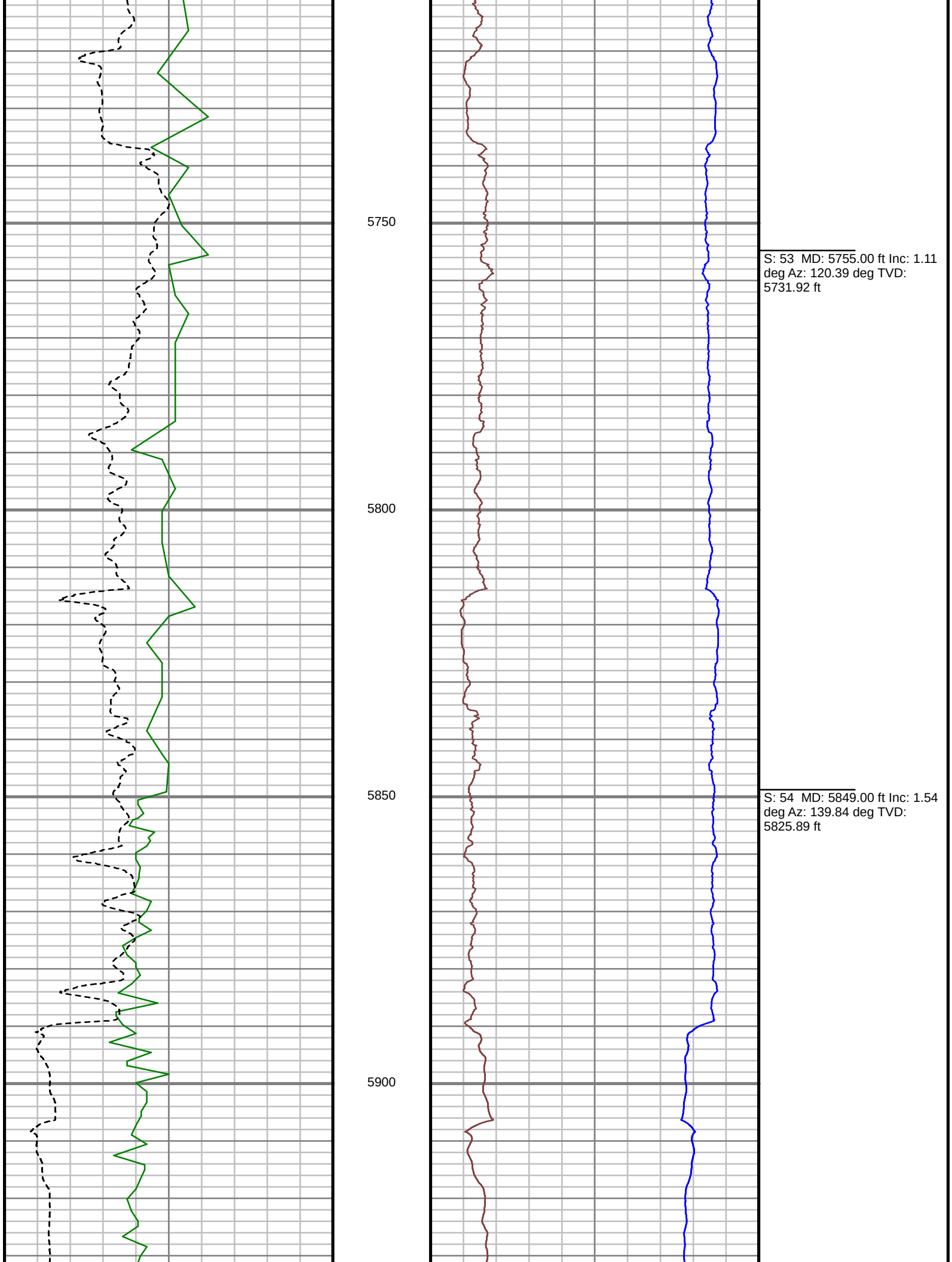

S: 41 MD: 4620.00 ft Inc: 4.93 deg Az: 225.85 deg TVD: 4599.27 ft
4650
4700
S: 42 MD: 4714.00 ft Inc: 6.41 deg Az: 230.12 deg TVD: 4692.81 ft
4750
4800
S: 43 MD: 4809.00 ft Inc: 5.66 deg Az: 226.74 deg TVD: 4787.28 ft


4850
4900
4950
5000
5050
S: 44 MD: 4905.00 ft Inc: 5.35 deg Az: 224.99 deg TVD: 4882.84 ft
S: 45 MD: 4999.00 ft Inc: 4.37 deg Az: 216.46 deg TVD: 4976.50 ft


5100
5150
5200
5250
S: 46 MD: 5094.00 ft Inc: 3.46 deg Az: 220.80 deg TVD: 5071.28 ft
S: 47 MD: 5188.00 ft Inc: 3.07 deg Az: 217.40 deg TVD: 5165.13 ft


5300
5350
5400
5450
S: 48 MD: 5283.00 ft Inc: 2.85 deg Az: 198.90 deg TVD: 5260.00 ft
S: 49 MD: 5377.00 ft Inc: 0.61 deg Az: 172.69 deg TVD: 5353.95 ft
S: 50 MD: 5472.00 ft Inc: 0.51 deg Az: 157.00 deg TVD: 5448.95 ft


5500
5550
5600
5650
5700
S: 51 MD: 5567.00 ft Inc: 0.77 deg Az: 145.74 deg TVD: 5543.94 ft
S: 52 MD: 5660.00 ft Inc: 0.83 deg Az: 116.13 deg TVD: 5636.93 ft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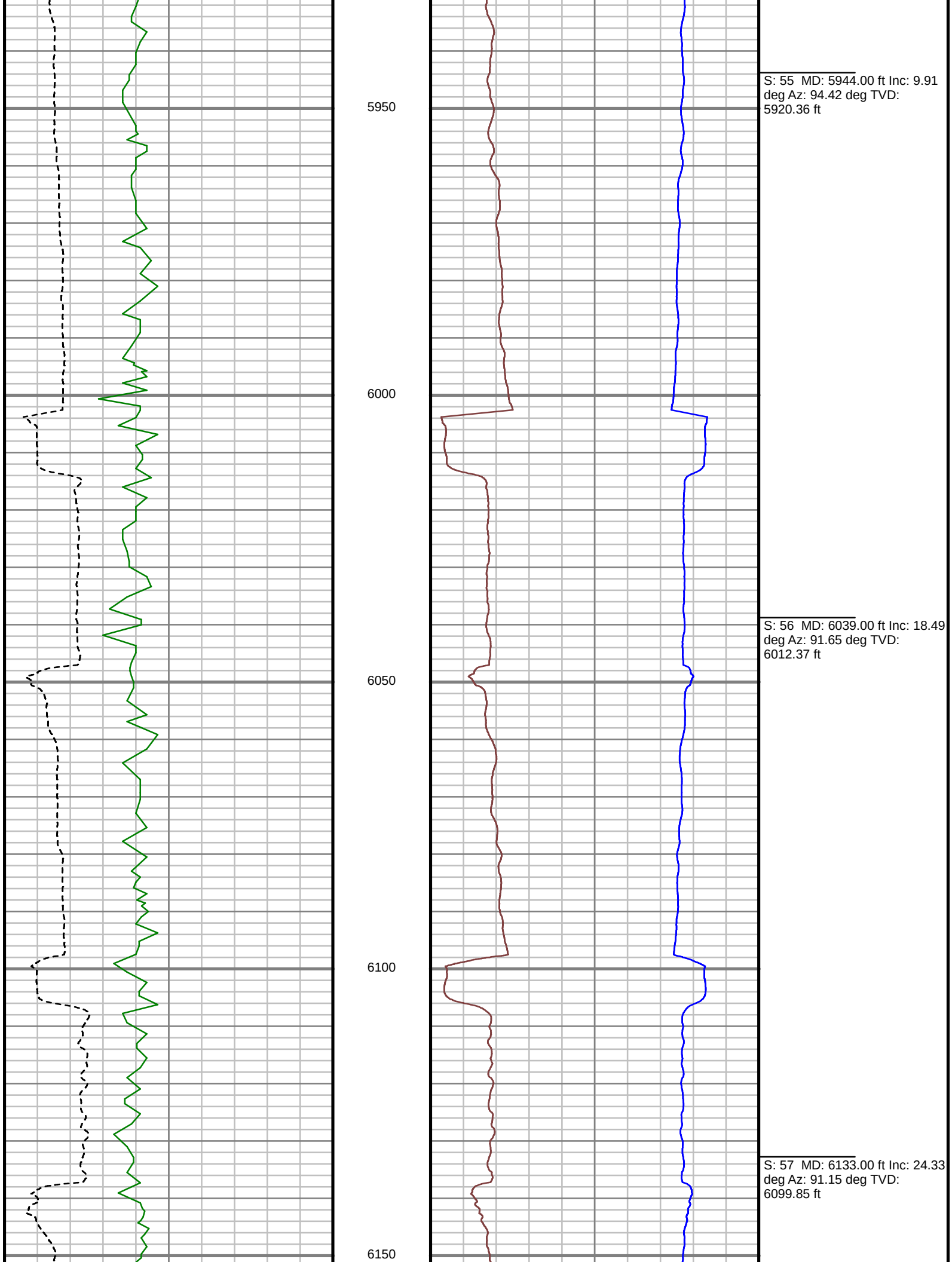
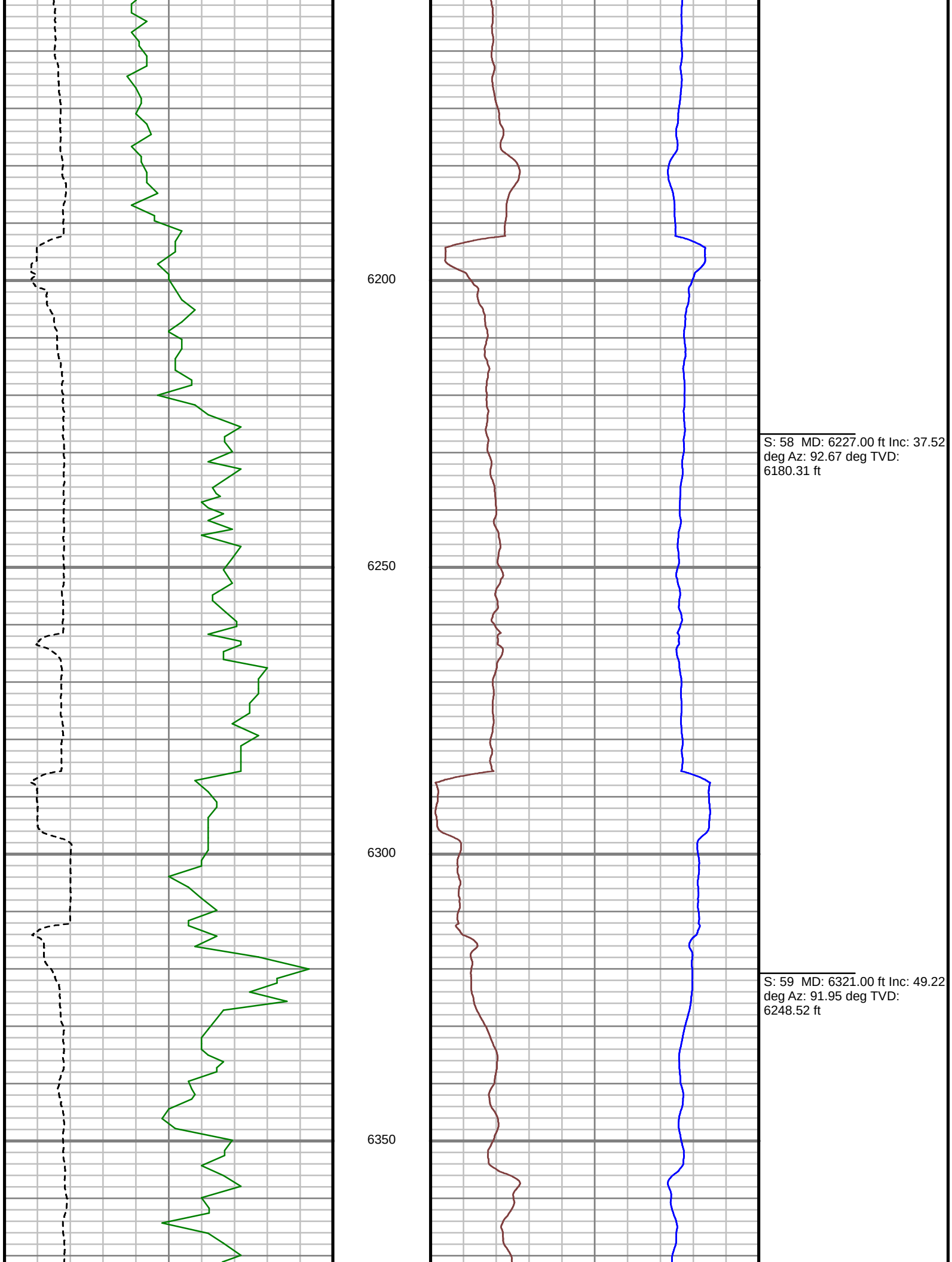
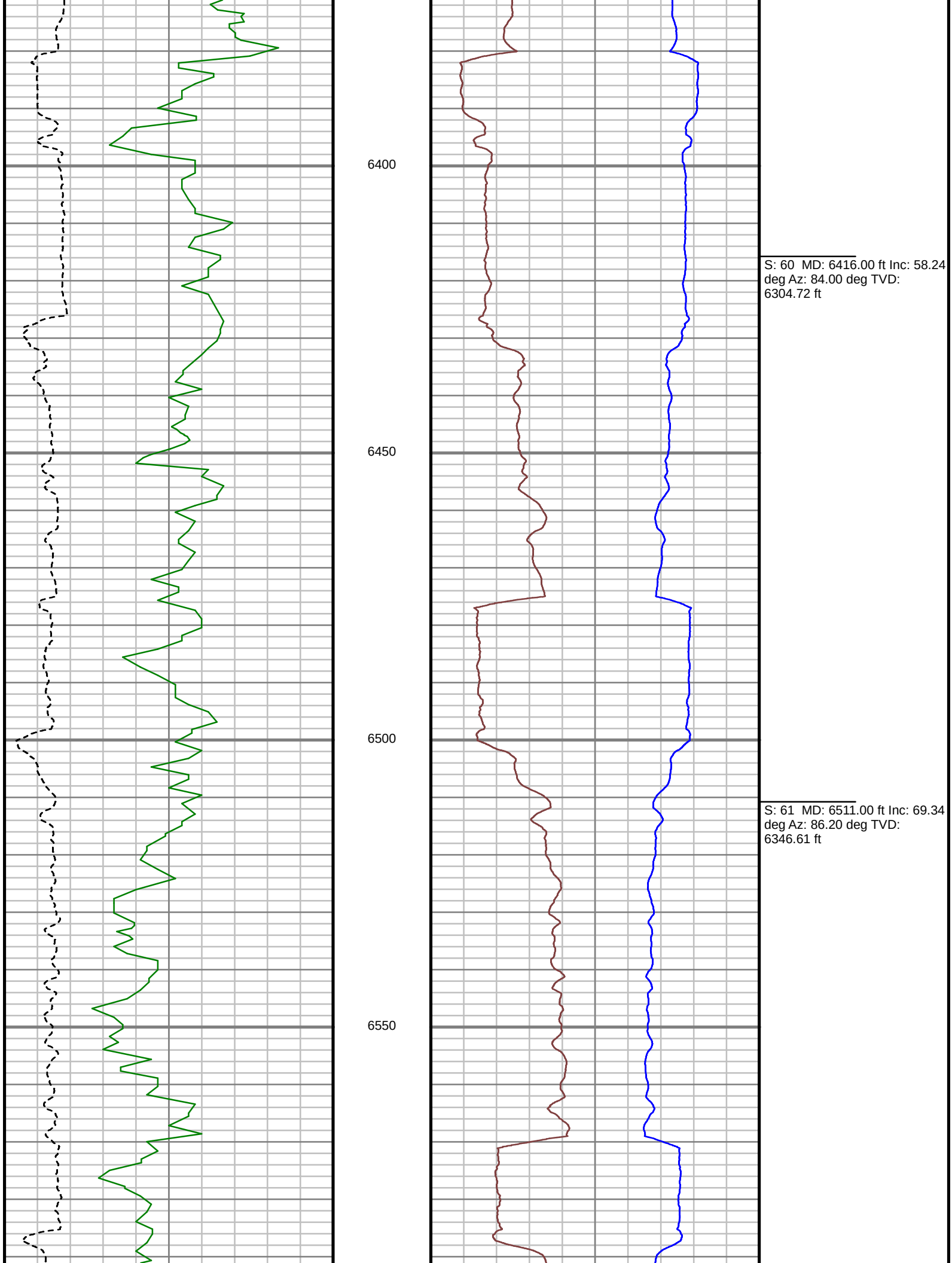
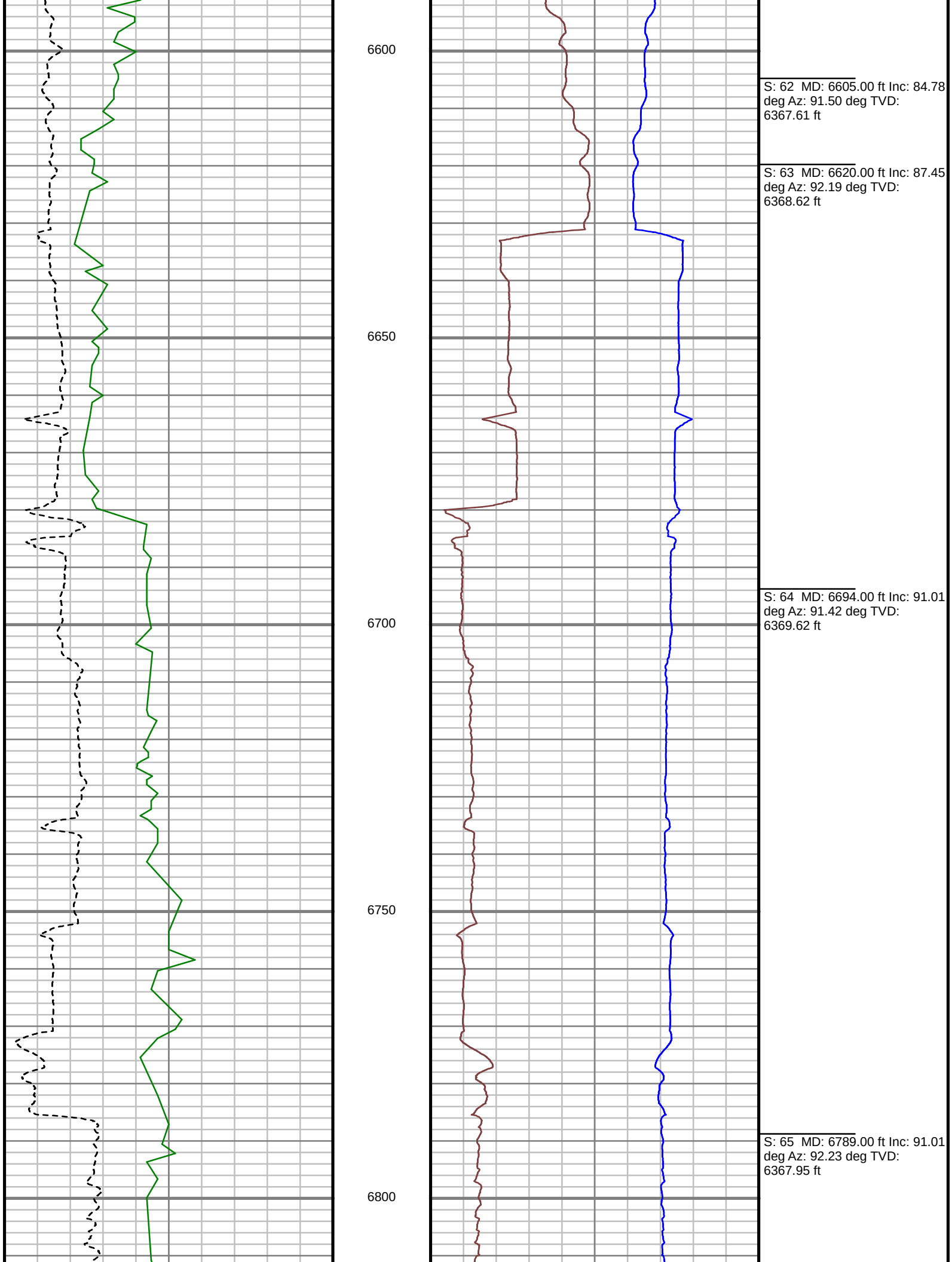
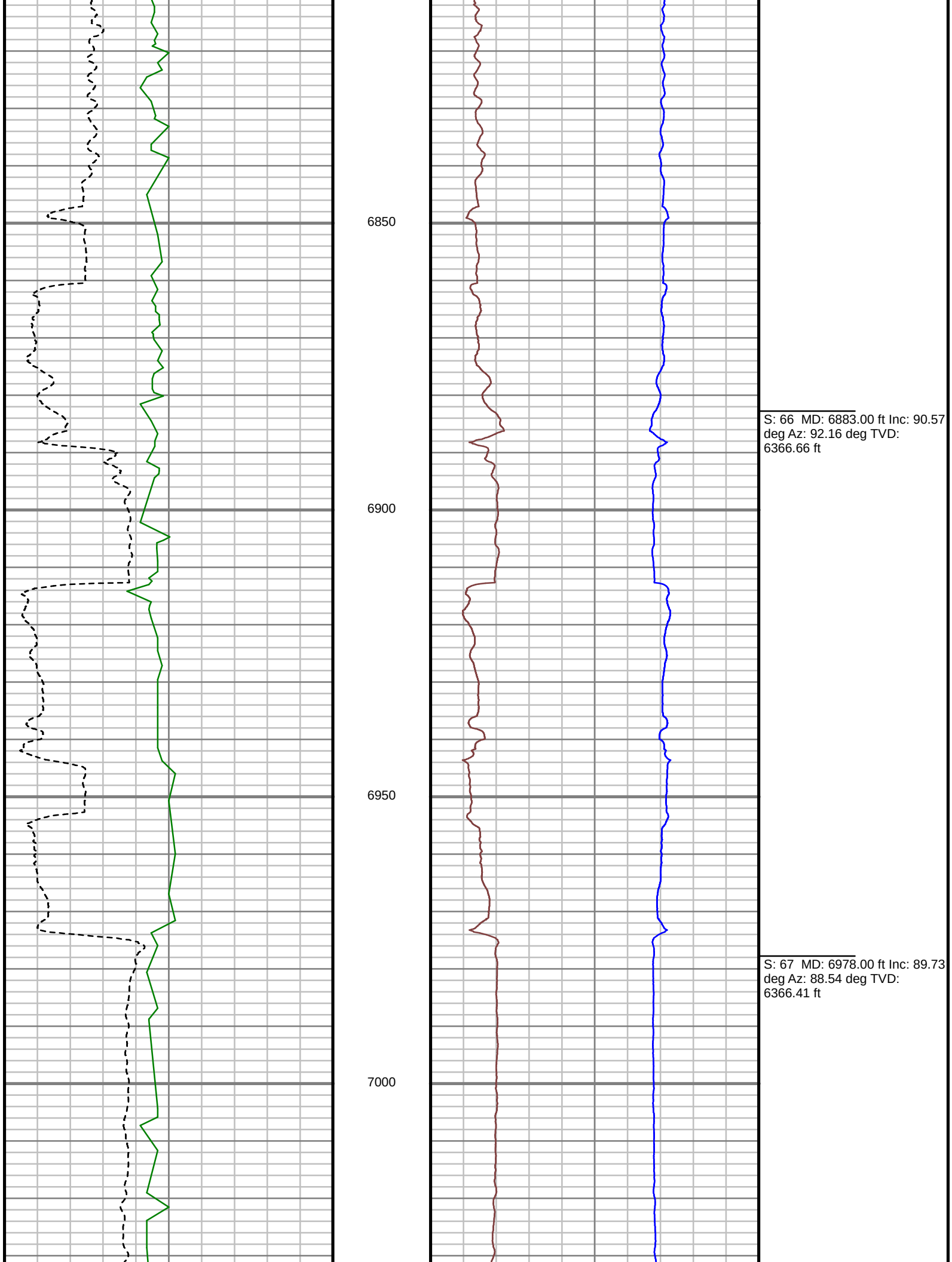
5800
5850
5900
S: 53 MD: 5755.00 ft Inc: 1.11 deg Az: 120.39 deg TVD: 5731.92 ft
S: 54 MD: 5849.00 ft Inc: 1.54 deg Az: 139.84 deg TVD: 5825.89 ft

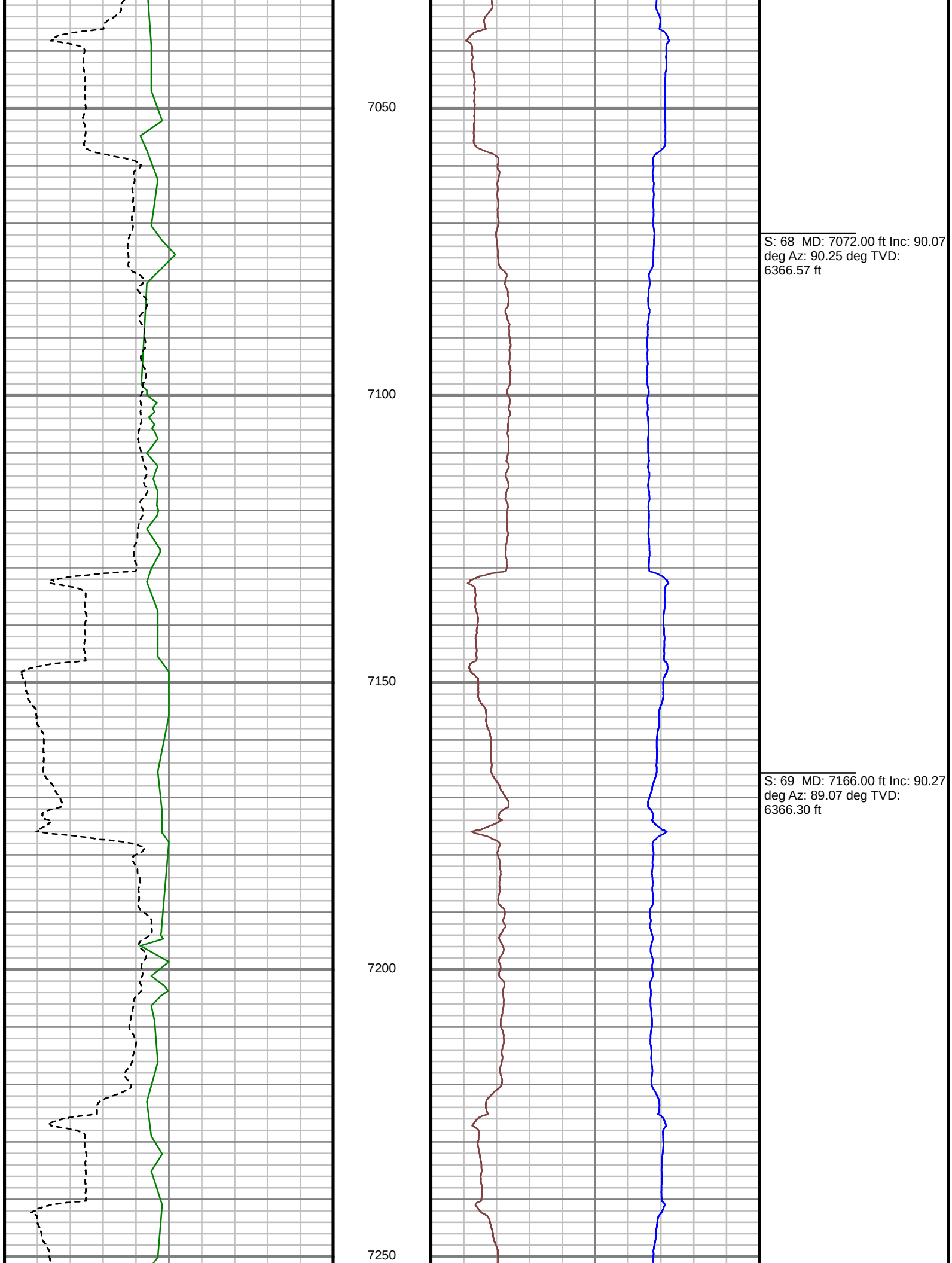

5950
6000
6050
6100
6150
S: 55 MD: 5944.00 ft Inc: 9.91 deg Az: 94.42 deg TVD: 5920.36 ft
S: 56 MD: 6039.00 ft Inc: 18.49 deg Az: 91.65 deg TVD: 6012.37 ft
S: 57 MD: 6133.00 ft Inc: 24.33 deg Az: 91.15 deg TVD: 6099.85 ft

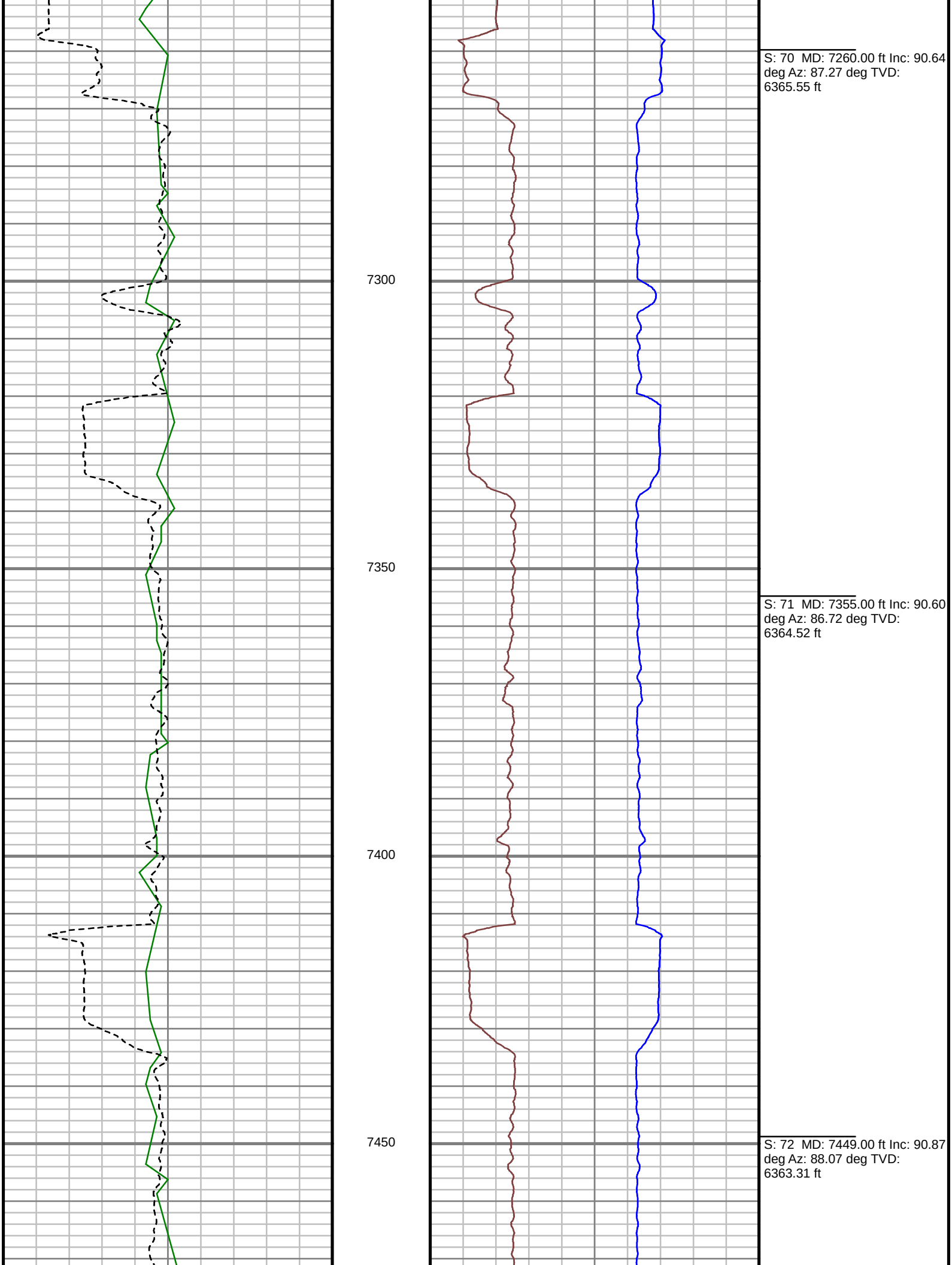

6200
6250
6300
6350
S: 58 MD: 6227.00 ft Inc: 37.52 deg Az: 92.67 deg TVD: 6180.31 ft
S: 59 MD: 6321.00 ft Inc: 49.22 deg Az: 91.95 deg TVD: 6248.52 ft

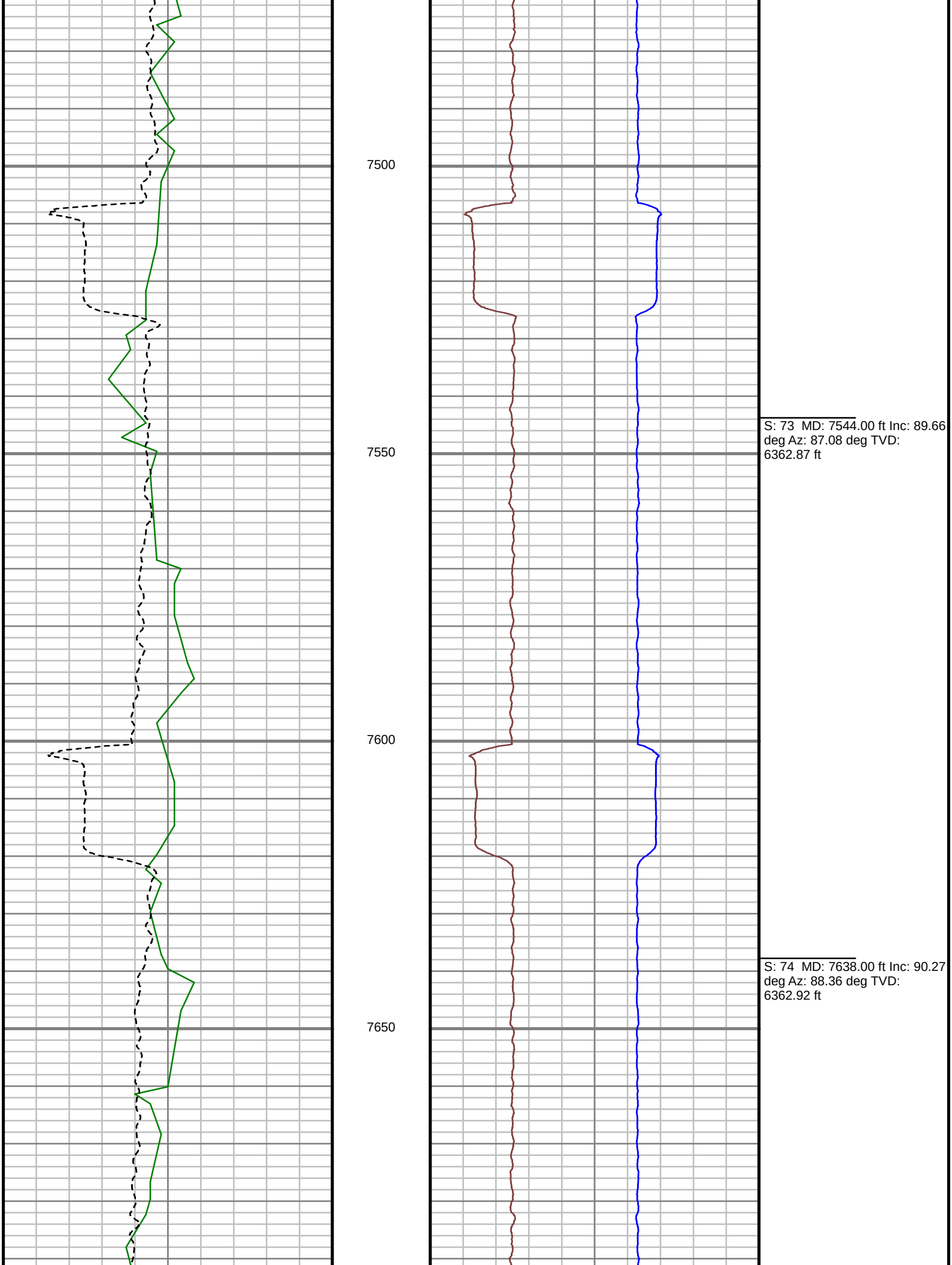

6400
6450
6500
6550
S: 60 MD: 6416.00 ft Inc: 58.24 deg Az: 84.00 deg TVD: 6304.72 ft
S: 61 MD: 6511.00 ft Inc: 69.34 deg Az: 86.20 deg TVD: 6346.61 ft

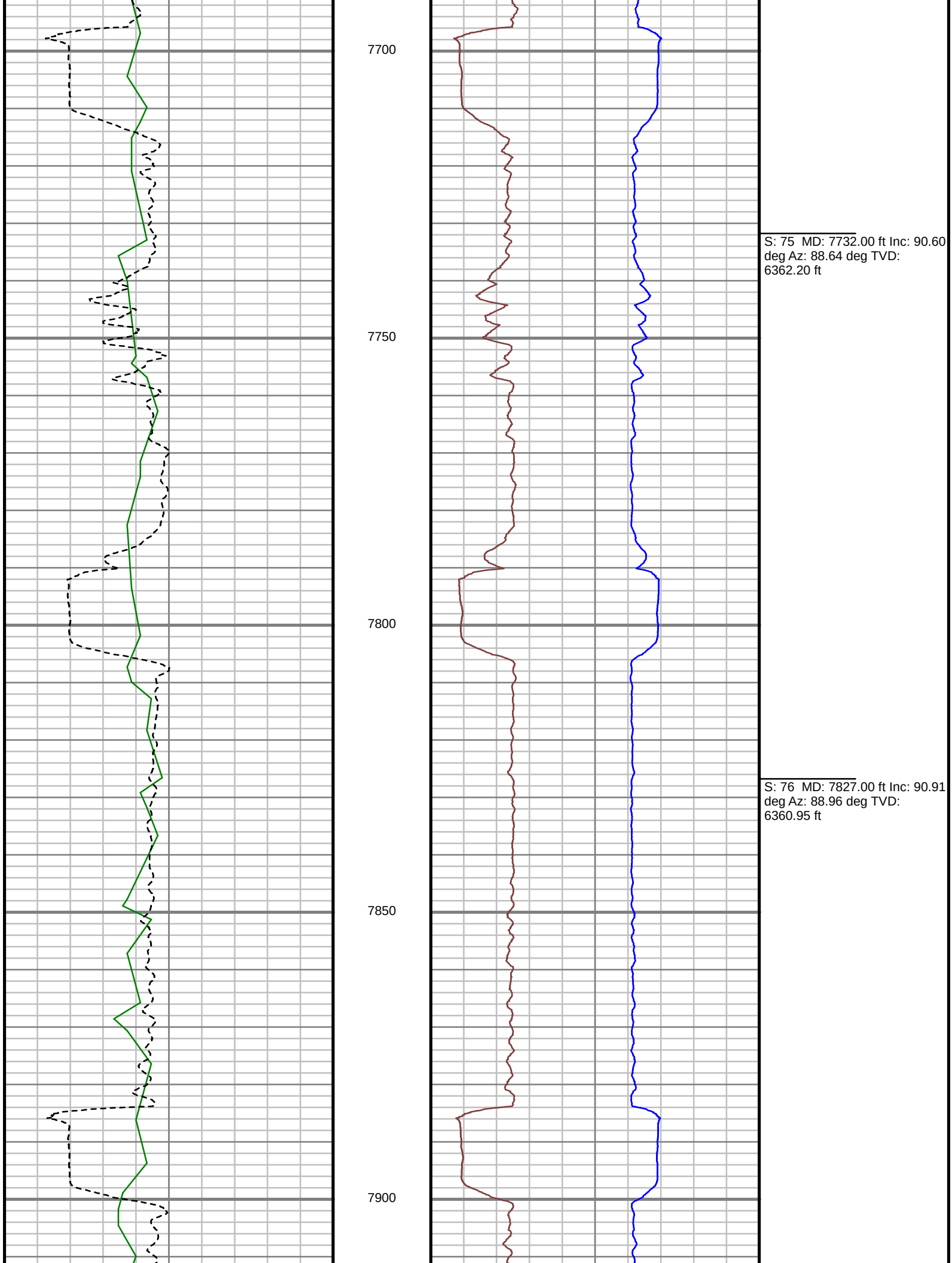

6600
6650
6700
6750
6800
S: 62 MD: 6605.00 ft Inc: 84.78 deg Az: 91.50 deg TVD: 6367.61 ft
S: 63 MD: 6620.00 ft Inc: 87.45 deg Az: 92.19 deg TVD: 6368.62 ft
S: 64 MD: 6694.00 ft Inc: 91.01 deg Az: 91.42 deg TVD: 6369.62 ft
S: 65 MD: 6789.00 ft Inc: 91.01 deg Az: 92.23 deg TVD: 6367.95 ft

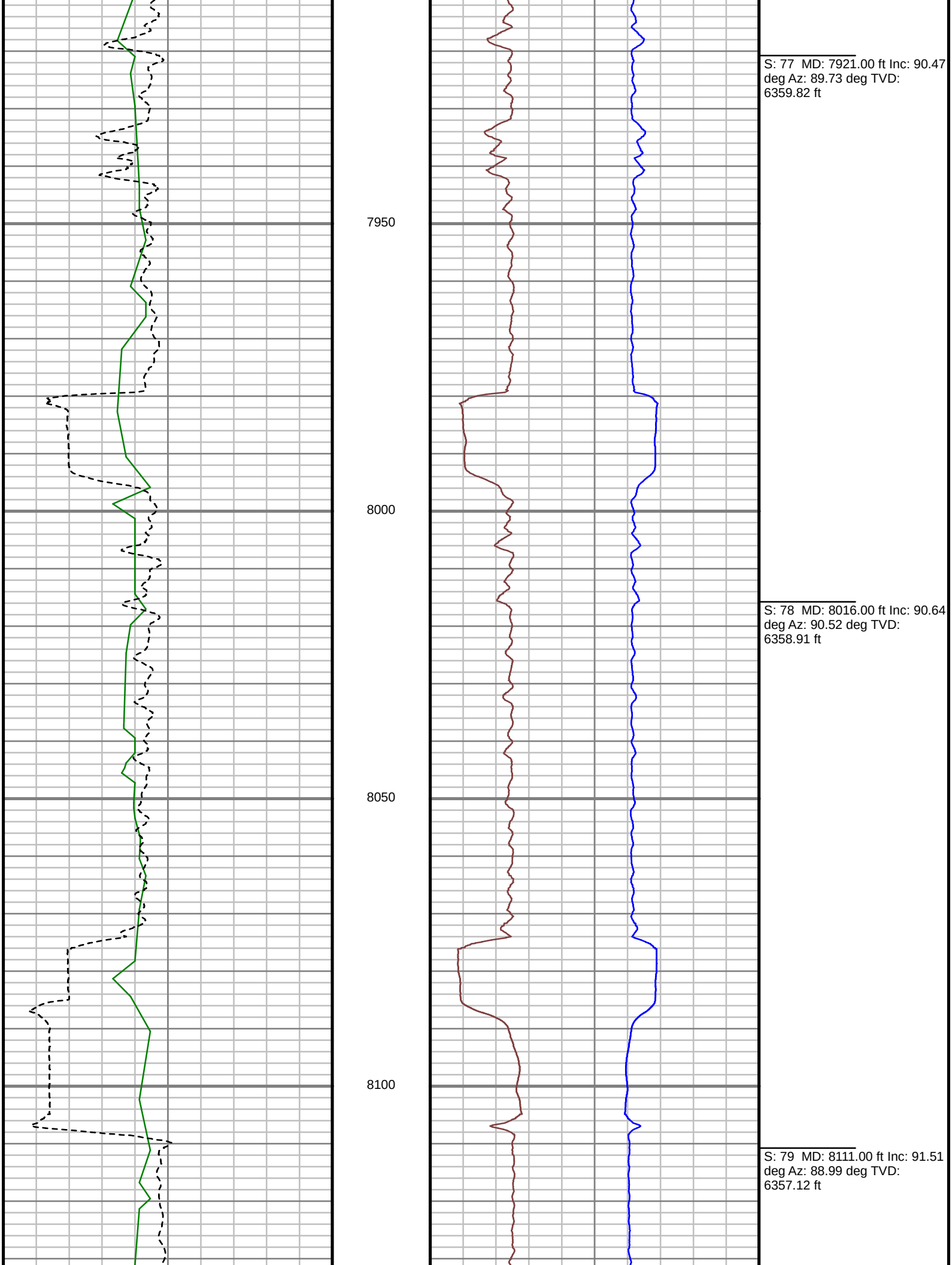

6850
6900
6950
7000
S: 66 MD: 6883.00 ft Inc: 90.57 deg Az: 92.16 deg TVD: 6366.66 ft
S: 67 MD: 6978.00 ft Inc: 89.73 deg Az: 88.54 deg TVD: 6366.41 ft

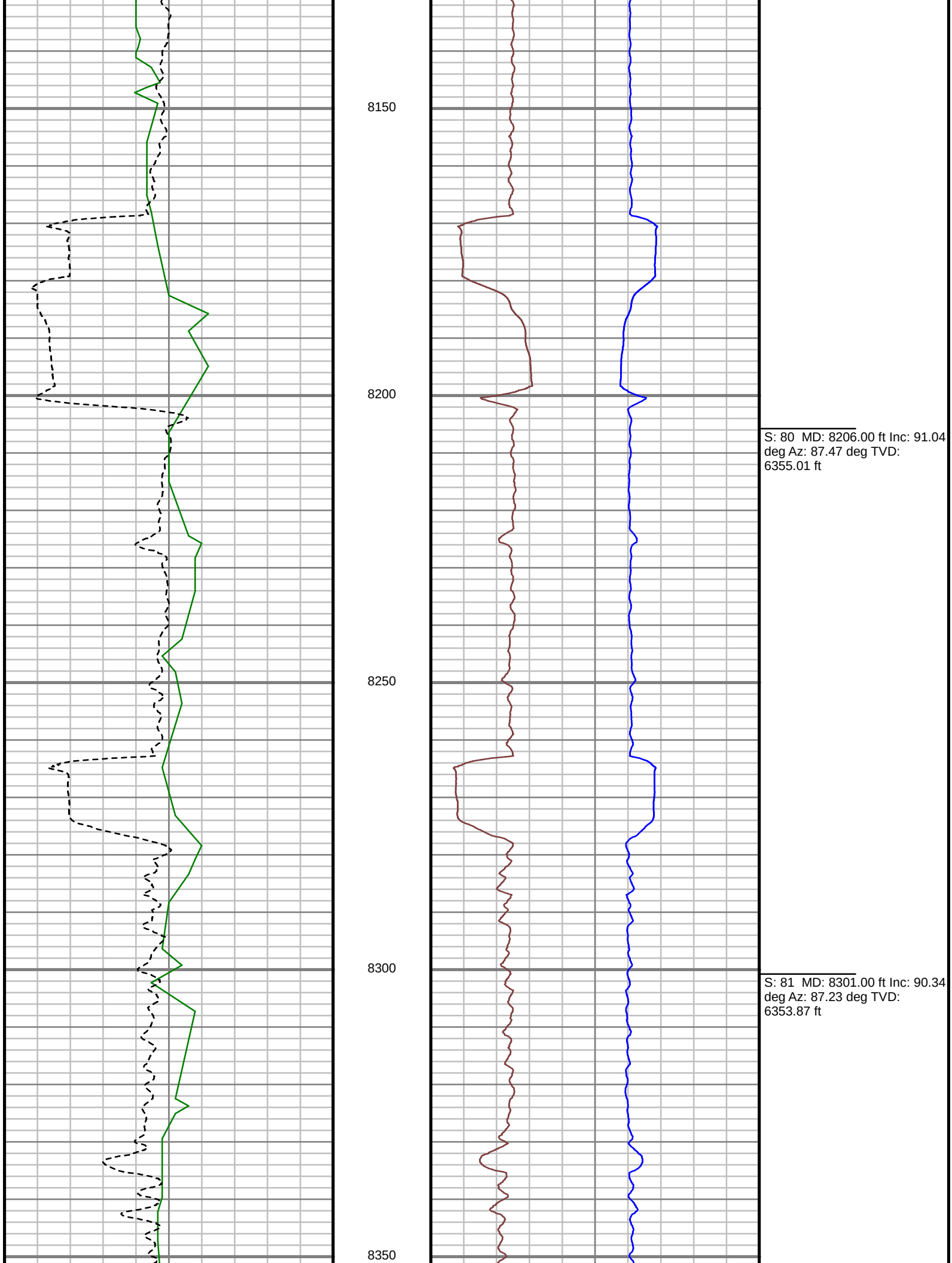

7050
7100
7150
7200
7250
S: 68 MD: 7072.00 ft Inc: 90.07 deg Az: 90.25 deg TVD: 6366.57 ft
S: 69 MD: 7166.00 ft Inc: 90.27 deg Az: 89.07 deg TVD: 6366.30 ft

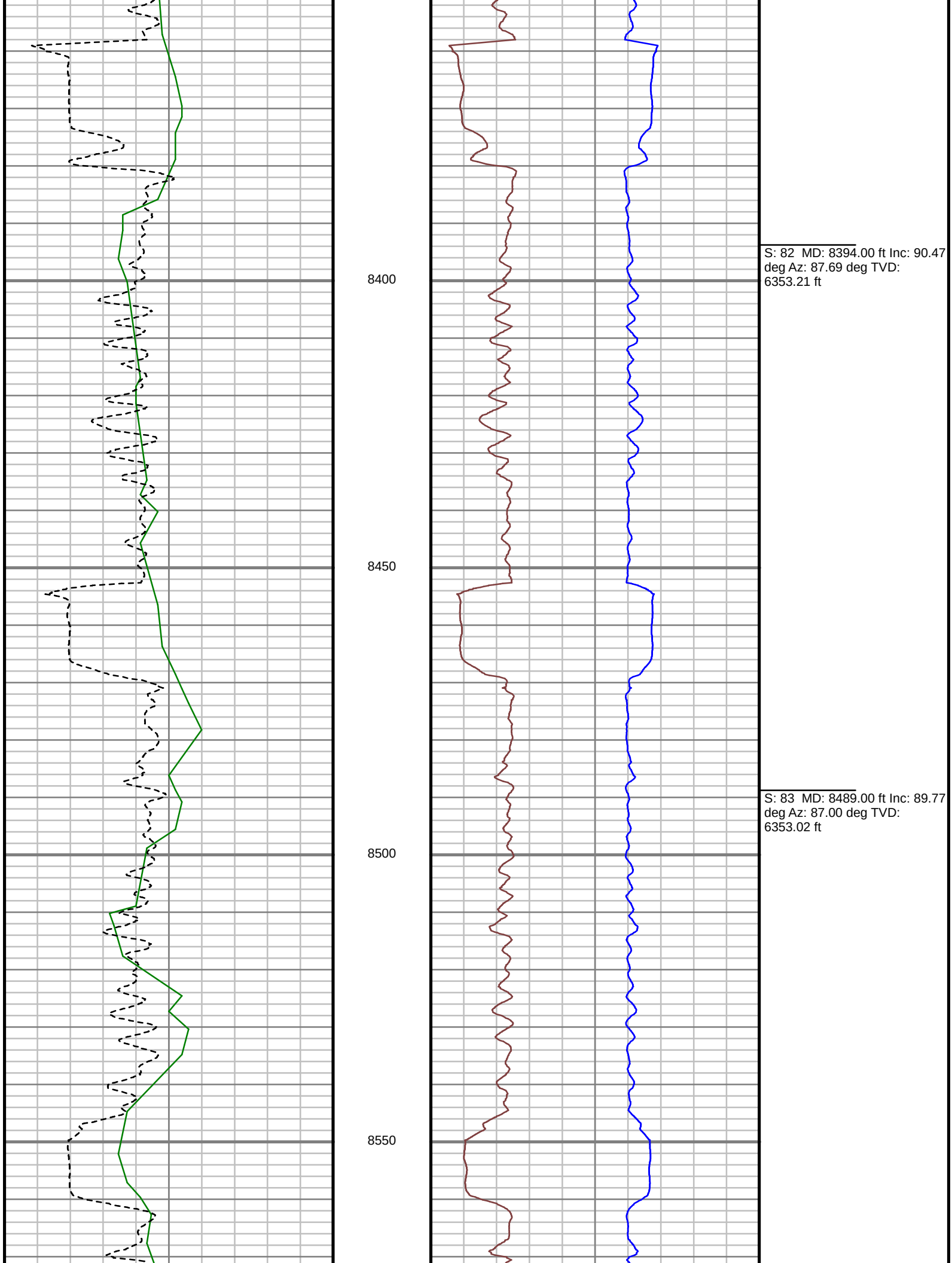

S: 70 MD: 7260.00 ft Inc: 90.64 deg Az: 87.27 deg TVD: 6365.55 ft
7300
7350
S: 71 MD: 7355.00 ft Inc: 90.60 deg Az: 86.72 deg TVD: 6364.52 ft
7400
7450
S: 72 MD: 7449.00 ft Inc: 90.87 deg Az: 88.07 deg TVD: 6363.31 ft

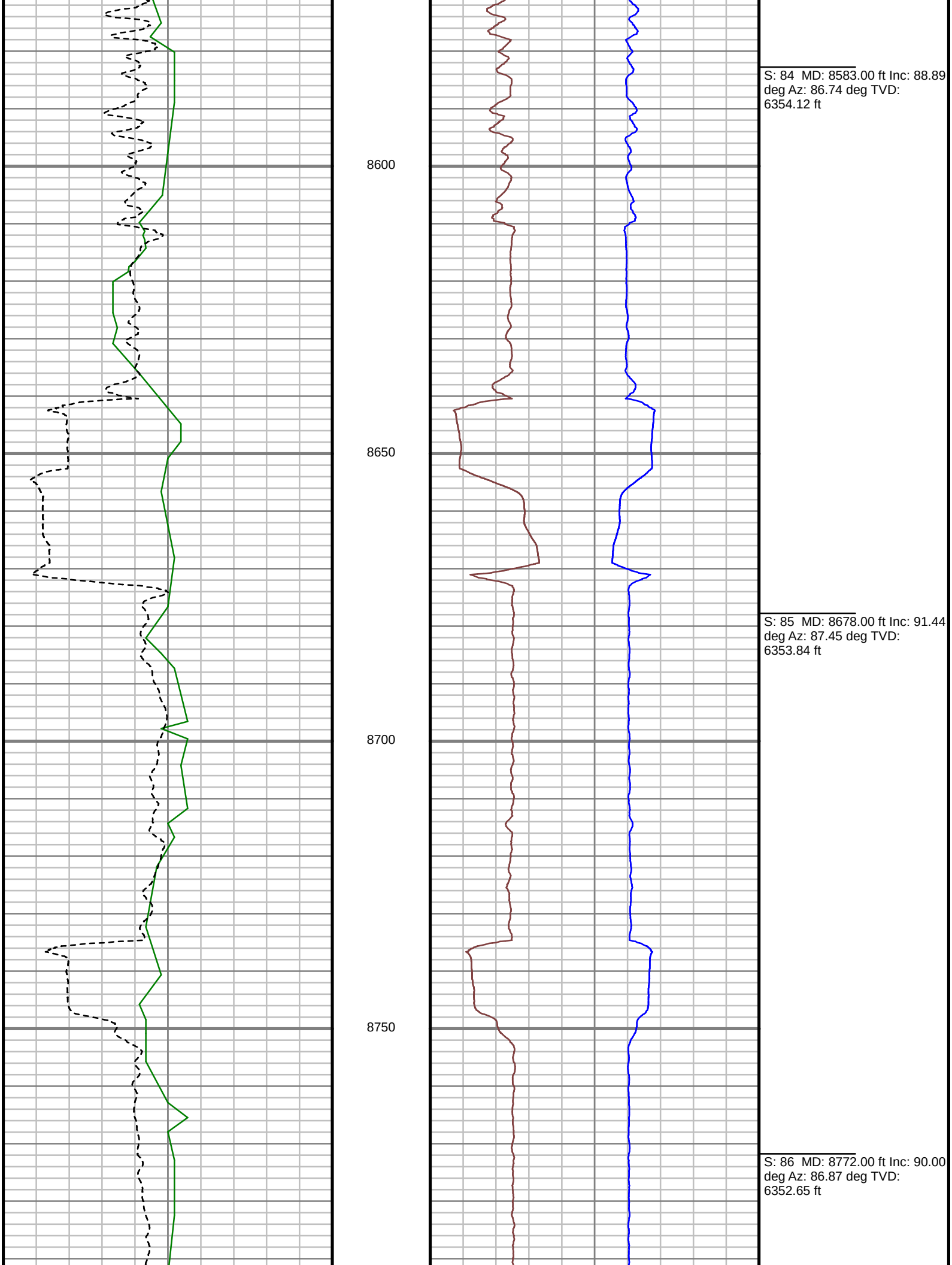

7500
7550
7600
7650
S: 73 MD: 7544.00 ft Inc: 89.66 deg Az: 87.08 deg TVD: 6362.87 ft
S: 74 MD: 7638.00 ft Inc: 90.27 deg Az: 88.36 deg TVD: 6362.92 ft

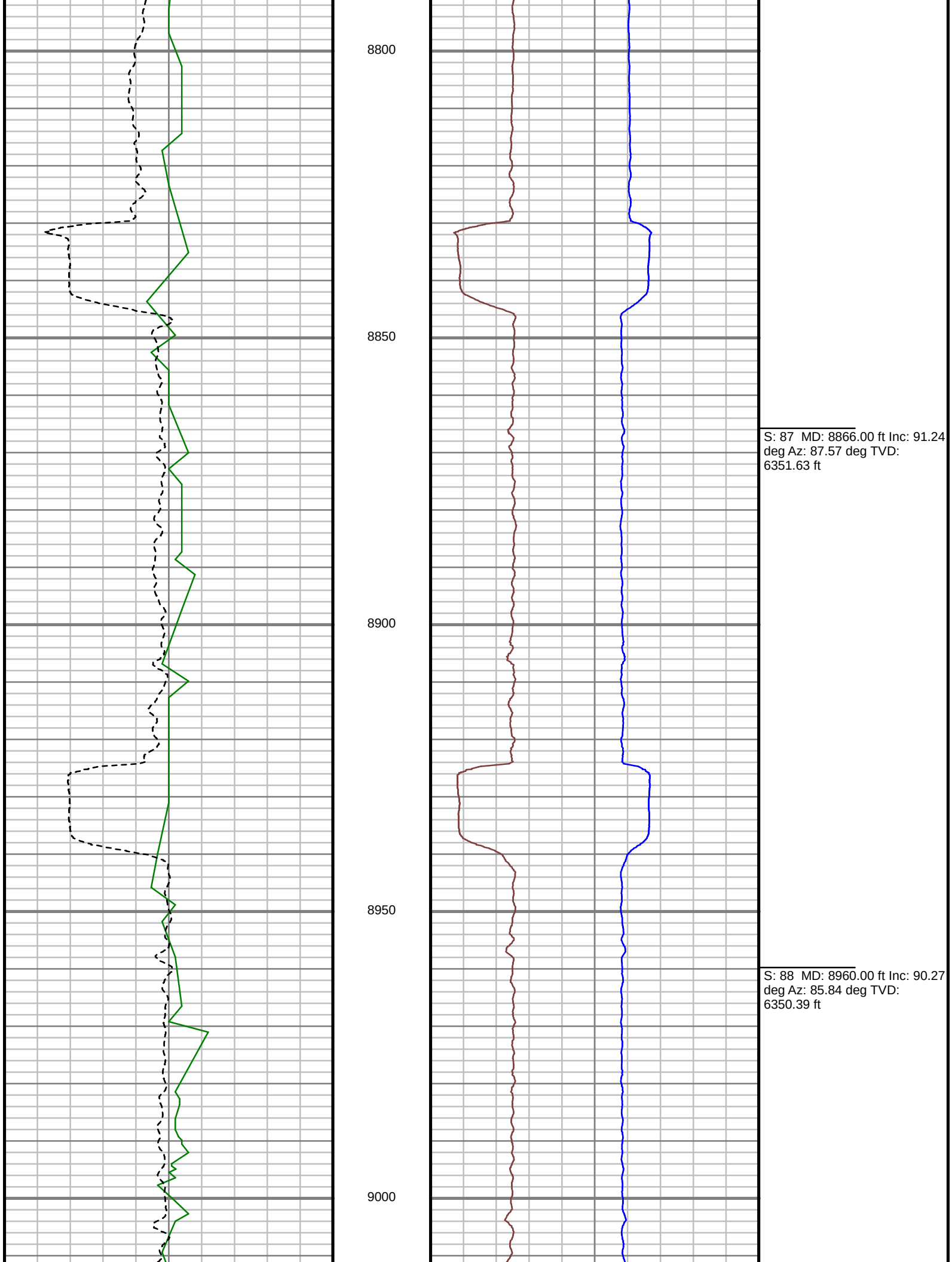

7700
7750
7800
7850
7900
S: 75 MD: 7732.00 ft Inc: 90.60 deg Az: 88.64 deg TVD: 6362.20 ft
S: 76 MD: 7827.00 ft Inc: 90.91 deg Az: 88.96 deg TVD: 6360.95 ft

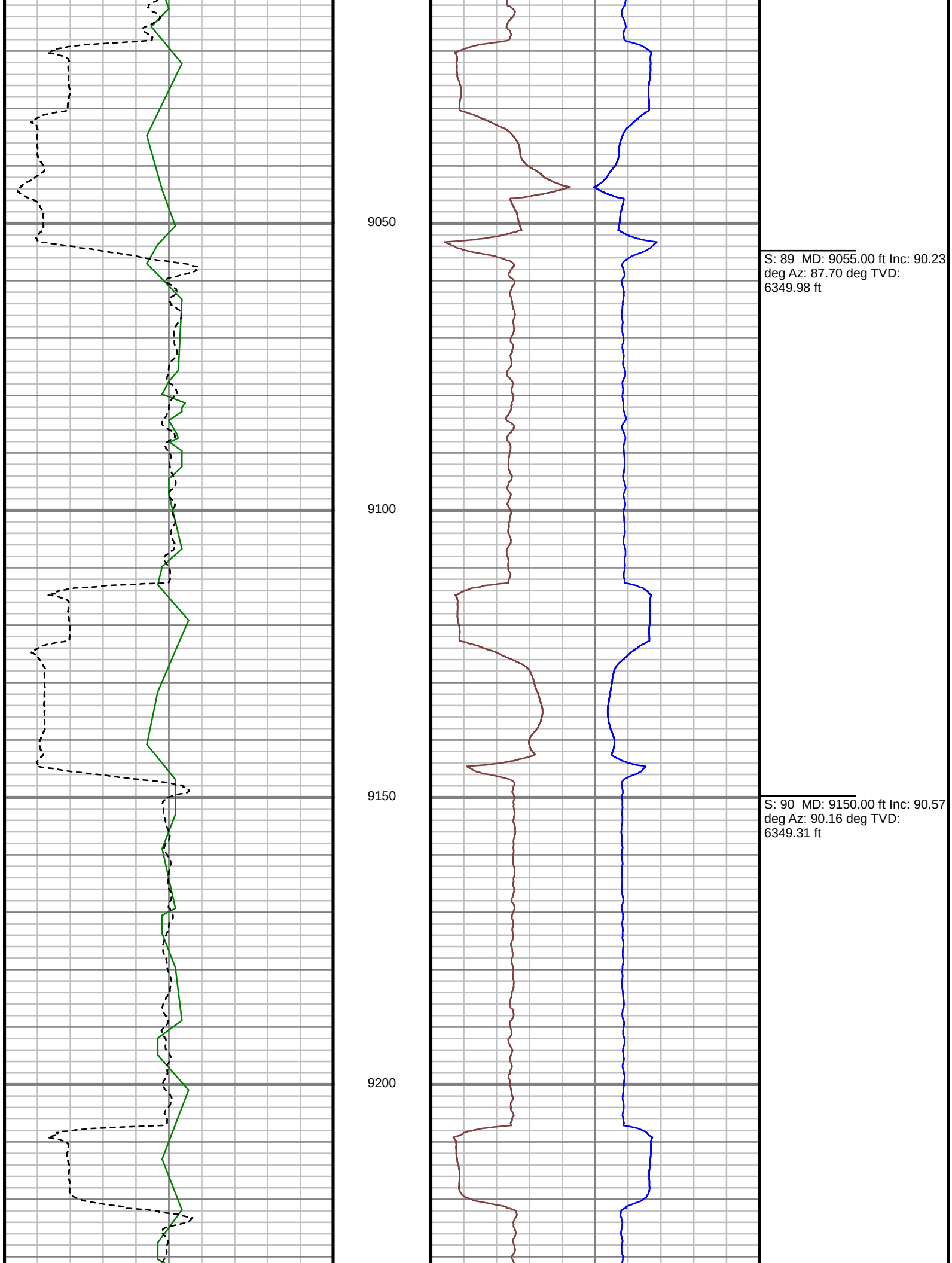

S: 77 MD: 7921.00 ft Inc: 90.47 deg Az: 89.73 deg TVD: 6359.82 ft
7950
8000
S: 78 MD: 8016.00 ft Inc: 90.64 deg Az: 90.52 deg TVD: 6358.91 ft
8050
8100
S: 79 MD: 8111.00 ft Inc: 91.51 deg Az: 88.99 deg TVD: 6357.12 ft

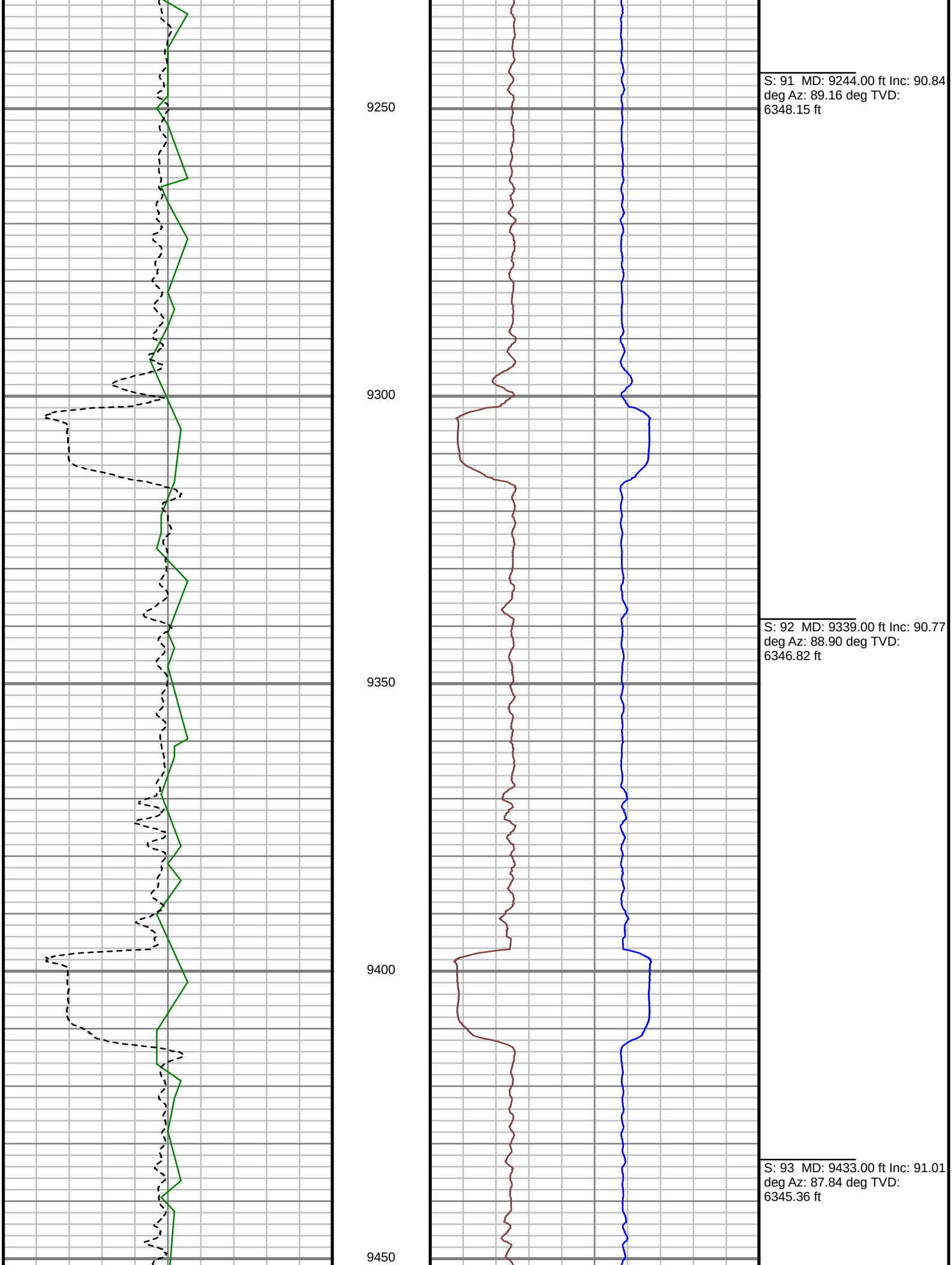

8150
8200
8250
8300
8350
S: 80 MD: 8206.00 ft Inc: 91.04 deg Az: 87.47 deg TVD: 6355.01 ft
S: 81 MD: 8301.00 ft Inc: 90.34 deg Az: 87.23 deg TVD: 6353.87 ft


8400
8450
8500
8550
S: 82 MD: 8394.00 ft Inc: 90.47 deg Az: 87.69 deg TVD: 6353.21 ft
S: 83 MD: 8489.00 ft Inc: 89.77 deg Az: 87.00 deg TVD: 6353.02 ft


S: 84 MD: 8583.00 ft Inc: 88.89 deg Az: 86.74 deg TVD: 6354.12 ft
8600
8650
S: 85 MD: 8678.00 ft Inc: 91.44 deg Az: 87.45 deg TVD: 6353.84 ft
8700
8750
S: 86 MD: 8772.00 ft Inc: 90.00 deg Az: 86.87 deg TVD: 6352.65 ft


8800
8850
8900
8950
9000
S: 87 MD: 8866.00 ft Inc: 91.24 deg Az: 87.57 deg TVD: 6351.63 ft
S: 88 MD: 8960.00 ft Inc: 90.27 deg Az: 85.84 deg TVD: 6350.39 ft


9050
9100
9150
9200
S: 89 MD: 9055.00 ft Inc: 90.23 deg Az: 87.70 deg TVD: 6349.98 ft
S: 90 MD: 9150.00 ft Inc: 90.57 deg Az: 90.16 deg TVD: 6349.31 ft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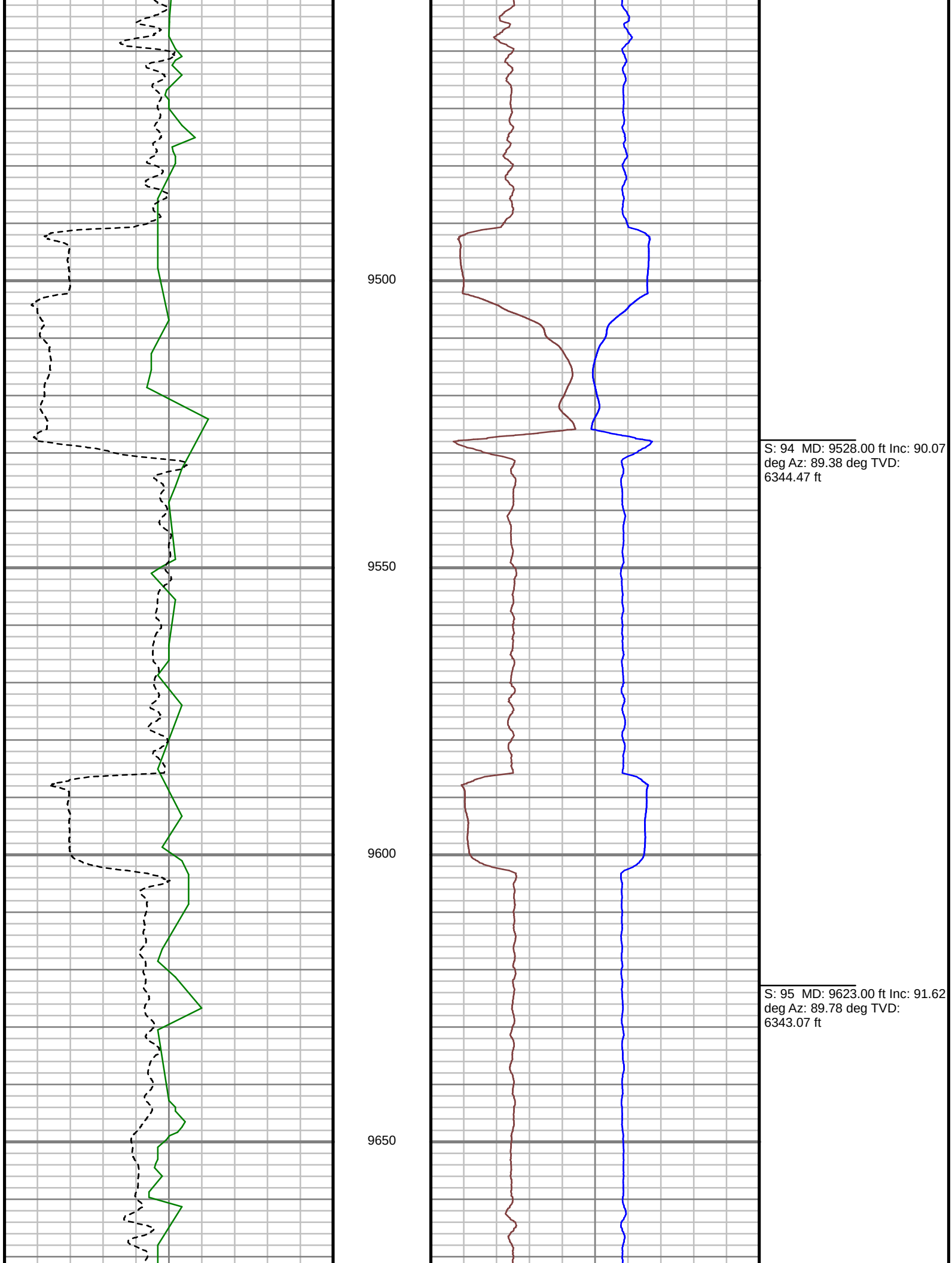
9300
9350
9400
9450
S: 91 MD: 9244.00 ft Inc: 90.84 deg Az: 89.16 deg TVD: 6348.15 ft
S: 92 MD: 9339.00 ft Inc: 90.77 deg Az: 88.90 deg TVD: 6346.82 ft
S: 93 MD: 9433.00 ft Inc: 91.01 deg Az: 87.84 deg TVD: 6345.36 ft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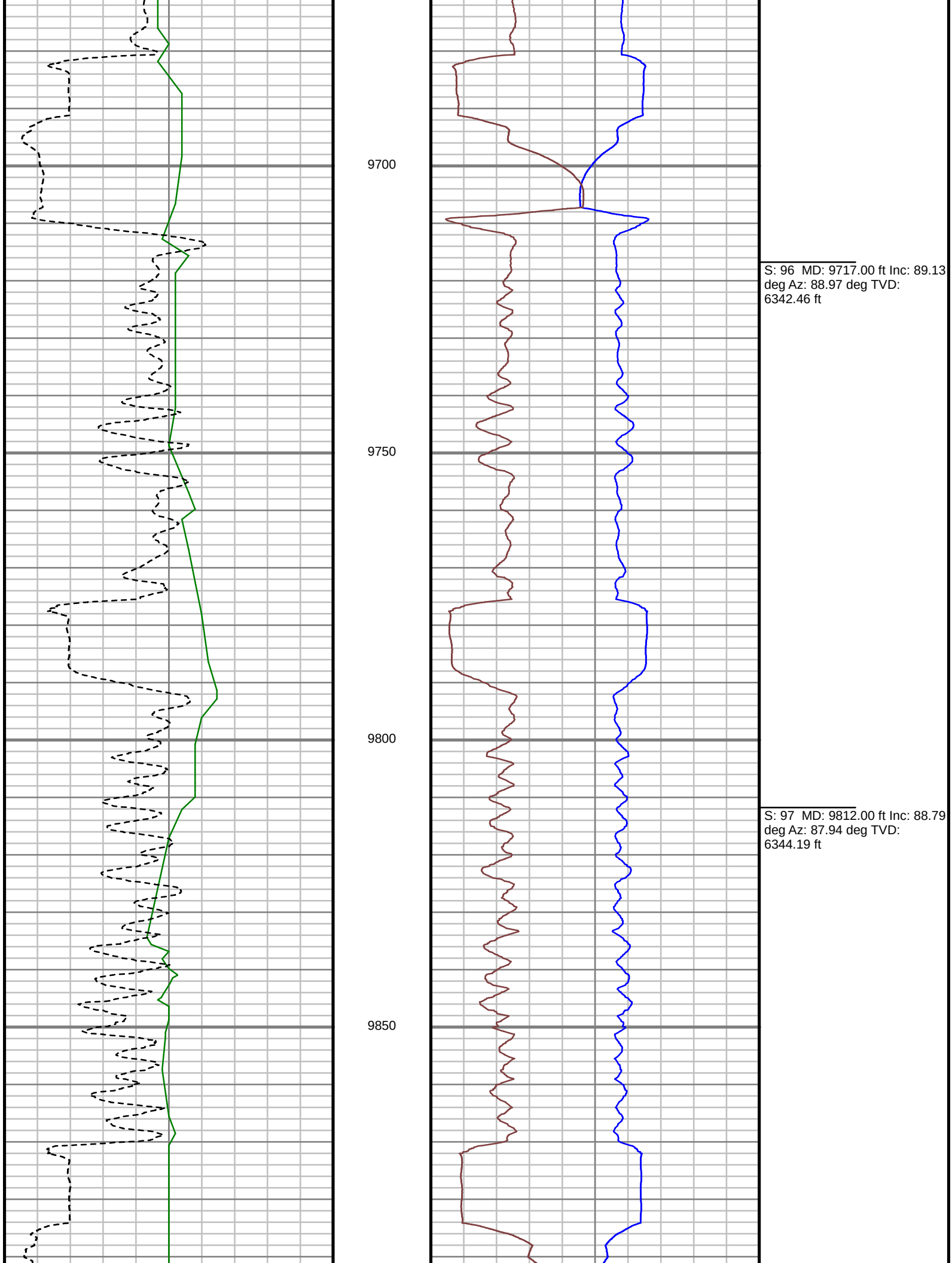
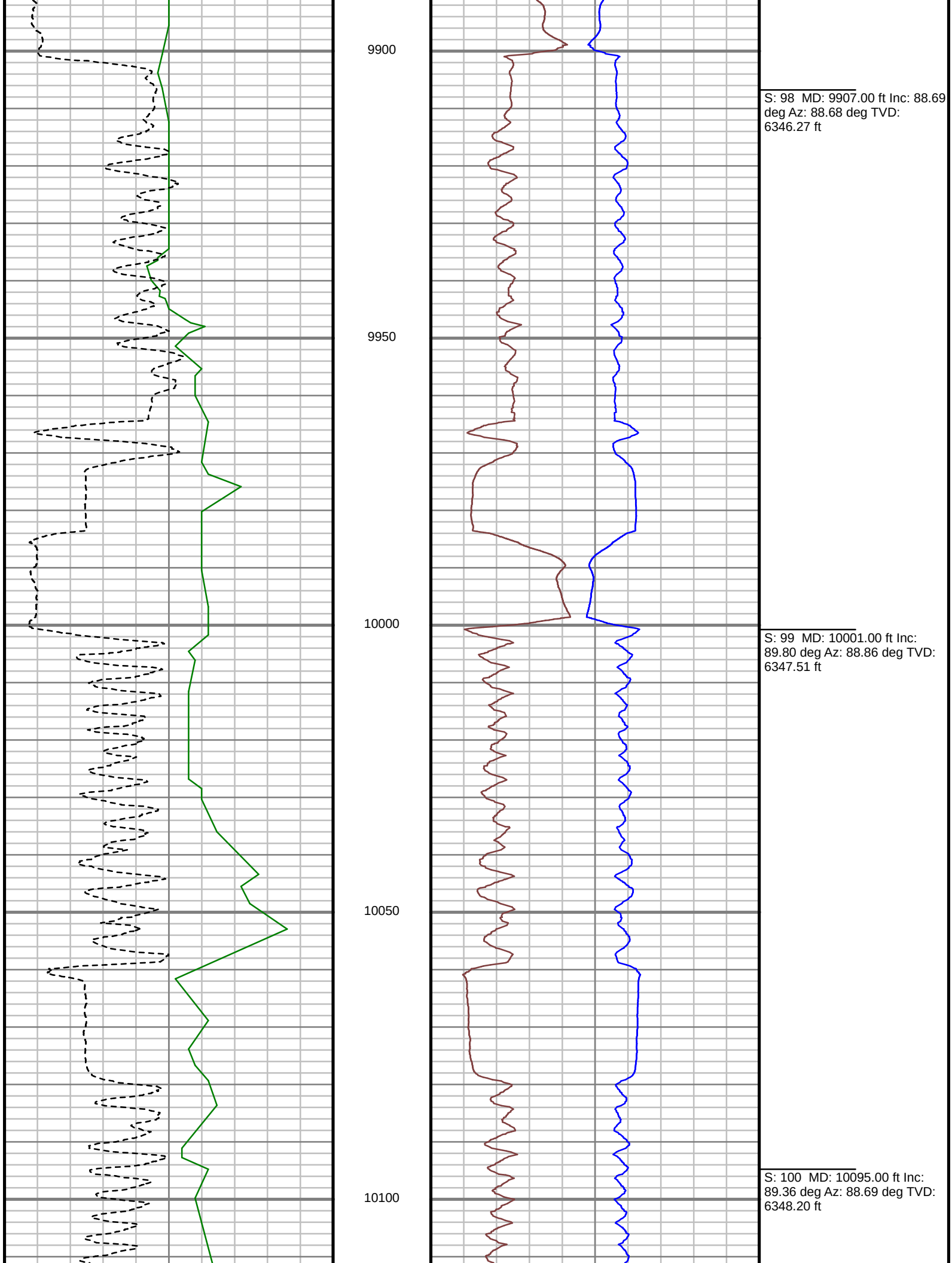
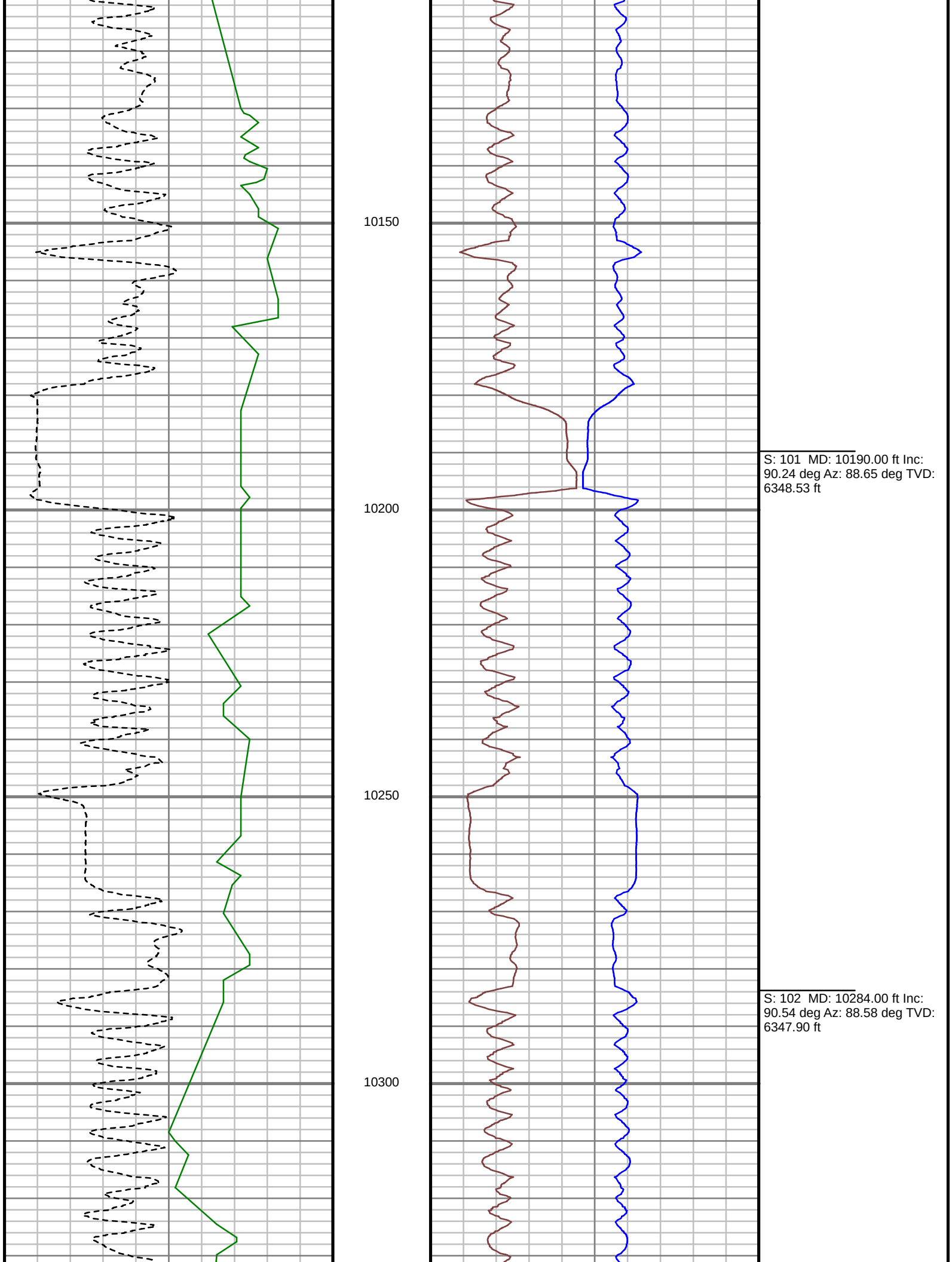
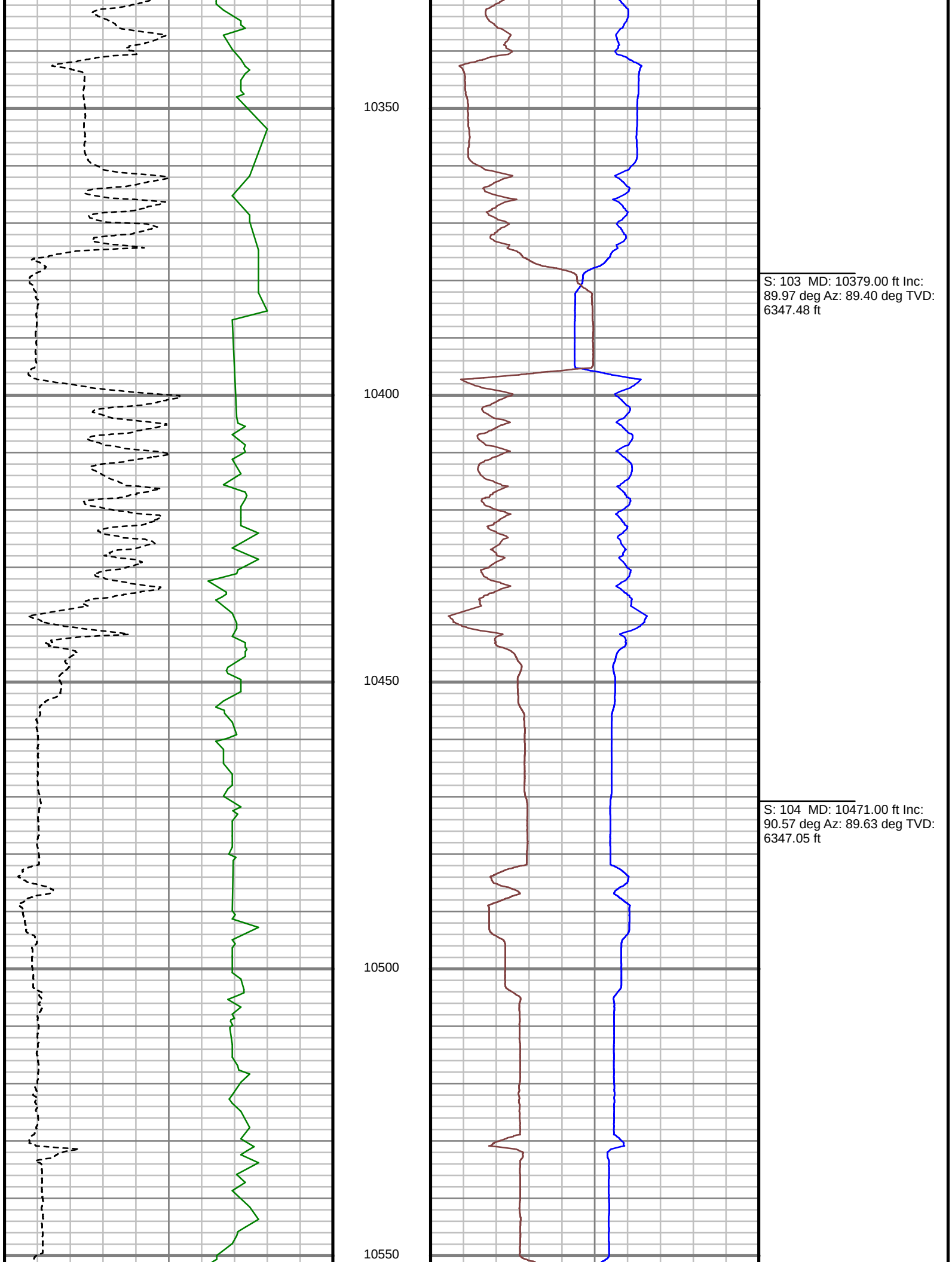
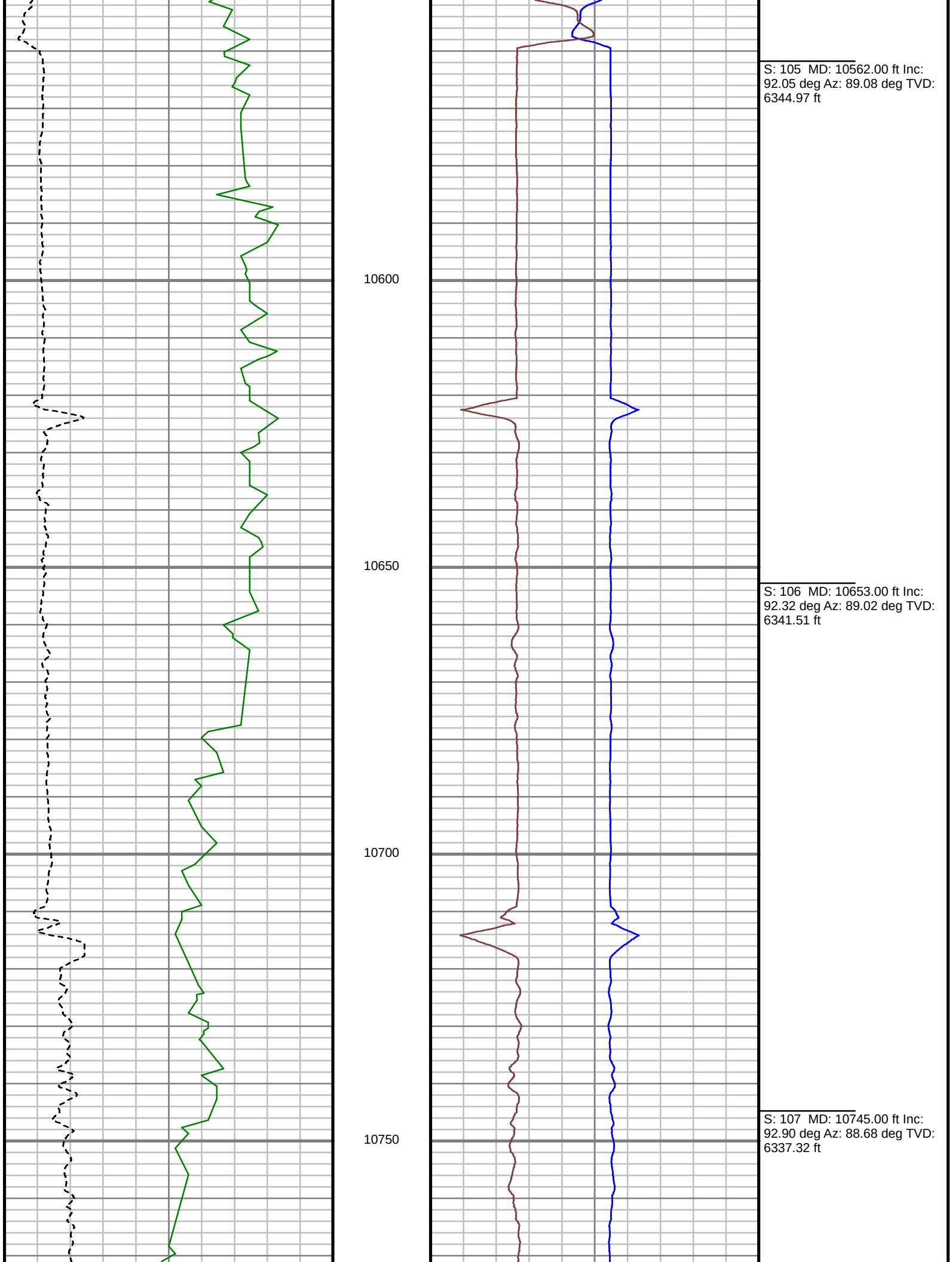
9550
9600
9650
S: 94 MD: 9528.00 ft Inc: 90.07 deg Az: 89.38 deg TVD: 6344.47 ft
S: 95 MD: 9623.00 ft Inc: 91.62 deg Az: 89.78 deg TVD: 6343.07 ft

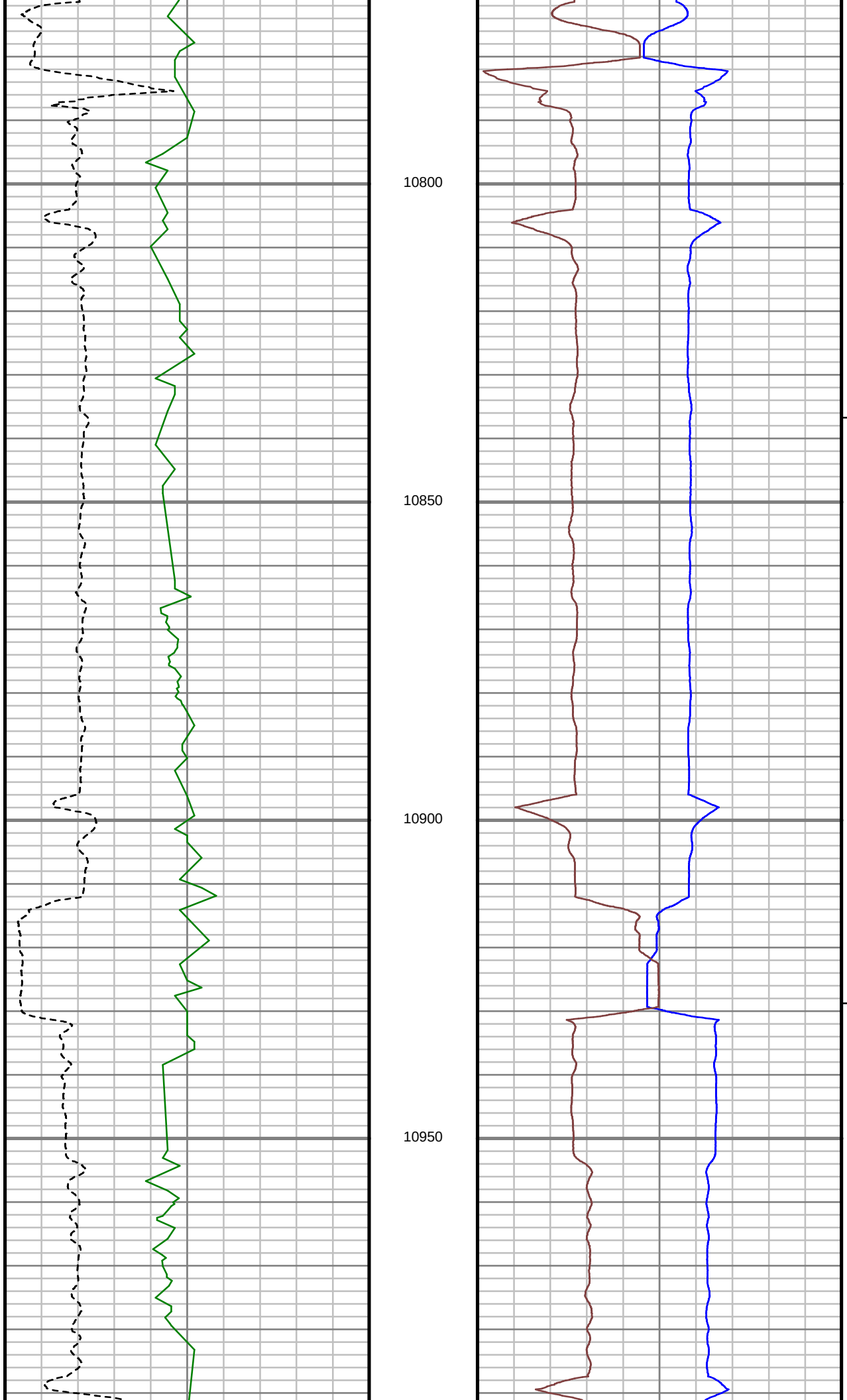

9700
9750
9800
9850
S: 96 MD: 9717.00 ft Inc: 89.13 deg Az: 88.97 deg TVD: 6342.46 ft
S: 97 MD: 9812.00 ft Inc: 88.79 deg Az: 87.94 deg TVD: 6344.19 ft

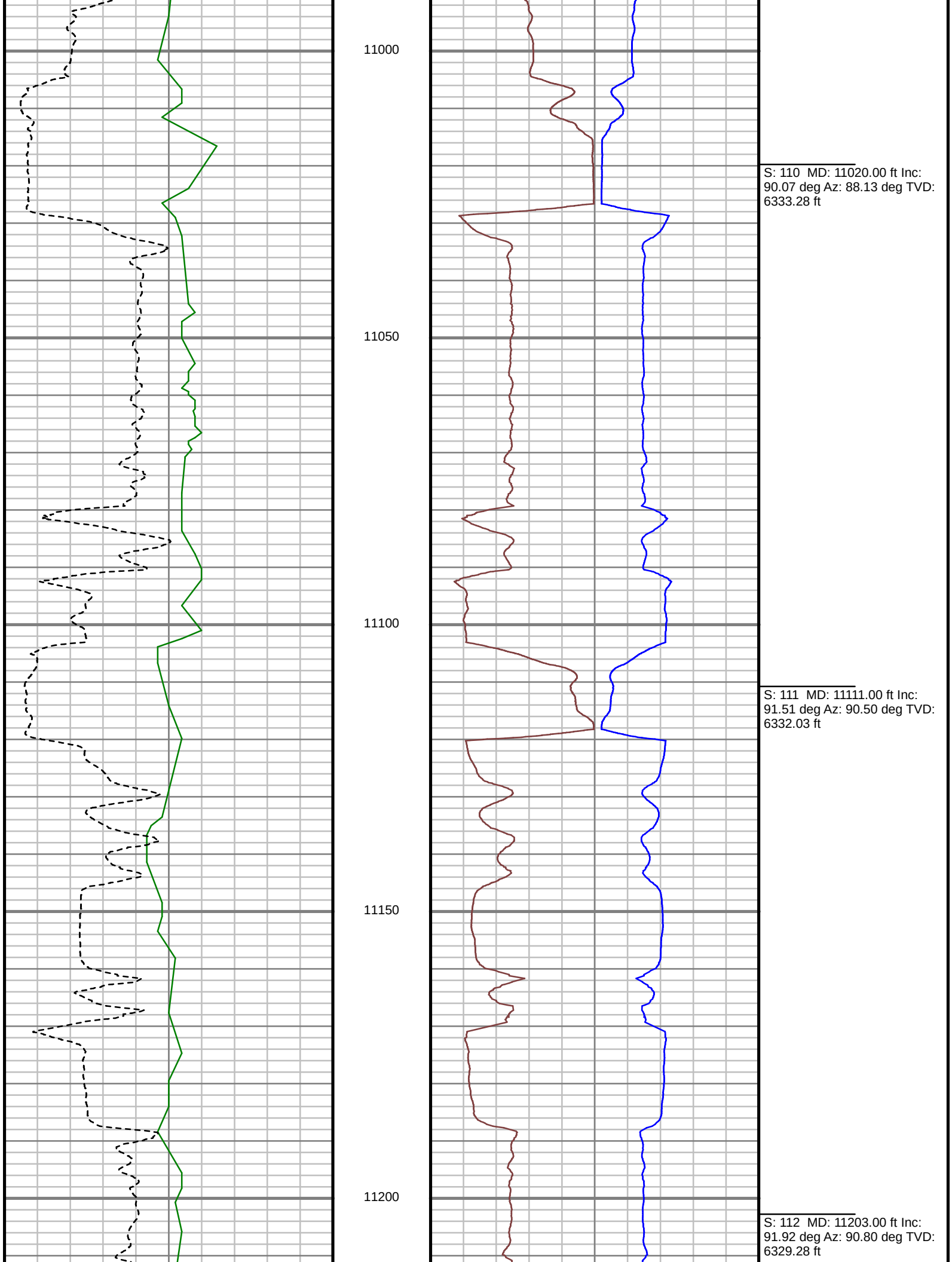

9900
9950
10000
10050
10100
S: 98 MD: 9907.00 ft Inc: 88.69 deg Az: 88.68 deg TVD: 6346.27 ft
S: 99 MD: 10001.00 ft Inc: 89.80 deg Az: 88.86 deg TVD: 6347.51 ft
S: 100 MD: 10095.00 ft Inc: 89.36 deg Az: 88.69 deg TVD: 6348.20 ft

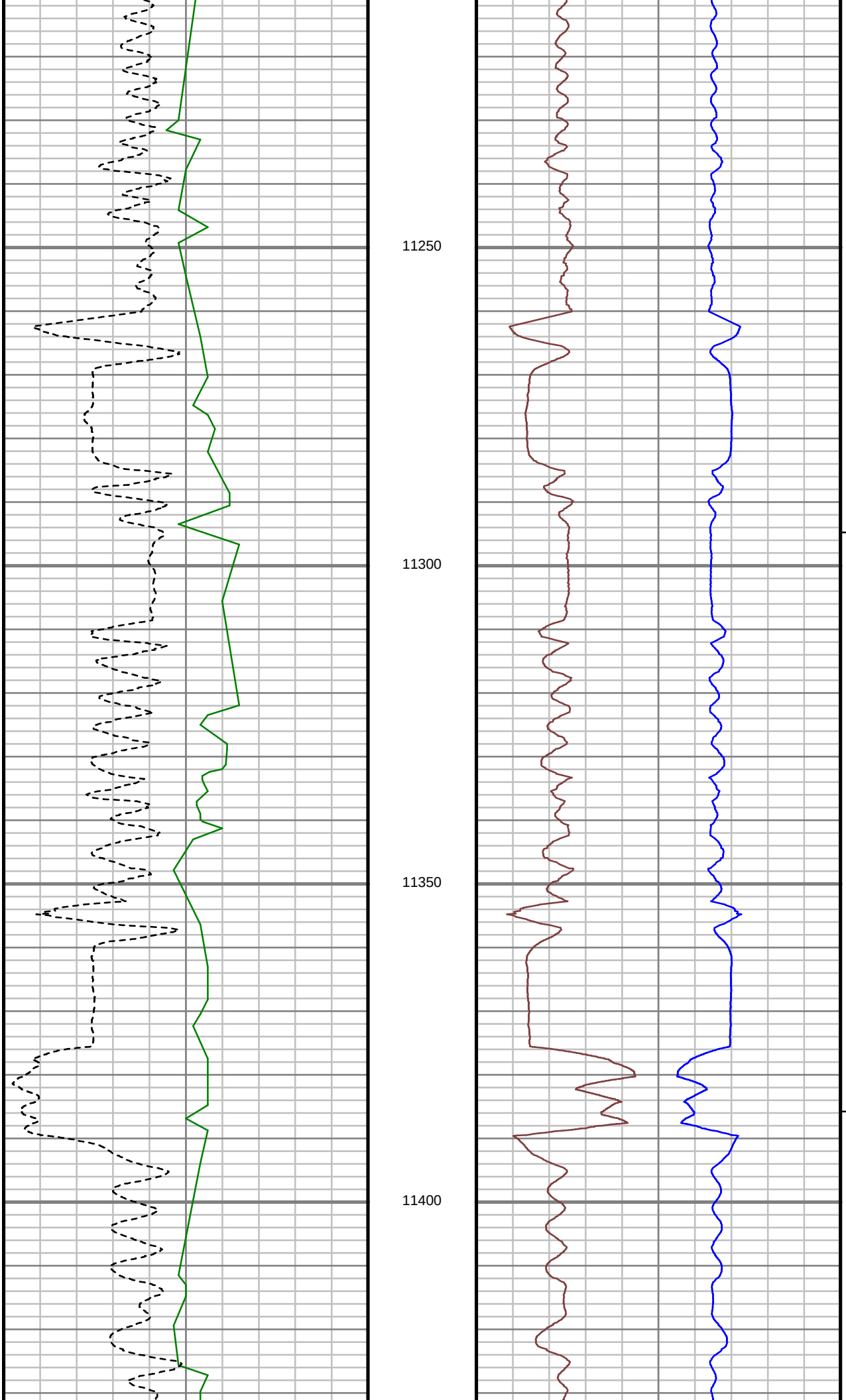

10150
10200
10250
10300
S: 101 MD: 10190.00 ft Inc: 90.24 deg Az: 88.65 deg TVD: 6348.53 ft
S: 102 MD: 10284.00 ft Inc: 90.54 deg Az: 88.58 deg TVD: 6347.90 ft

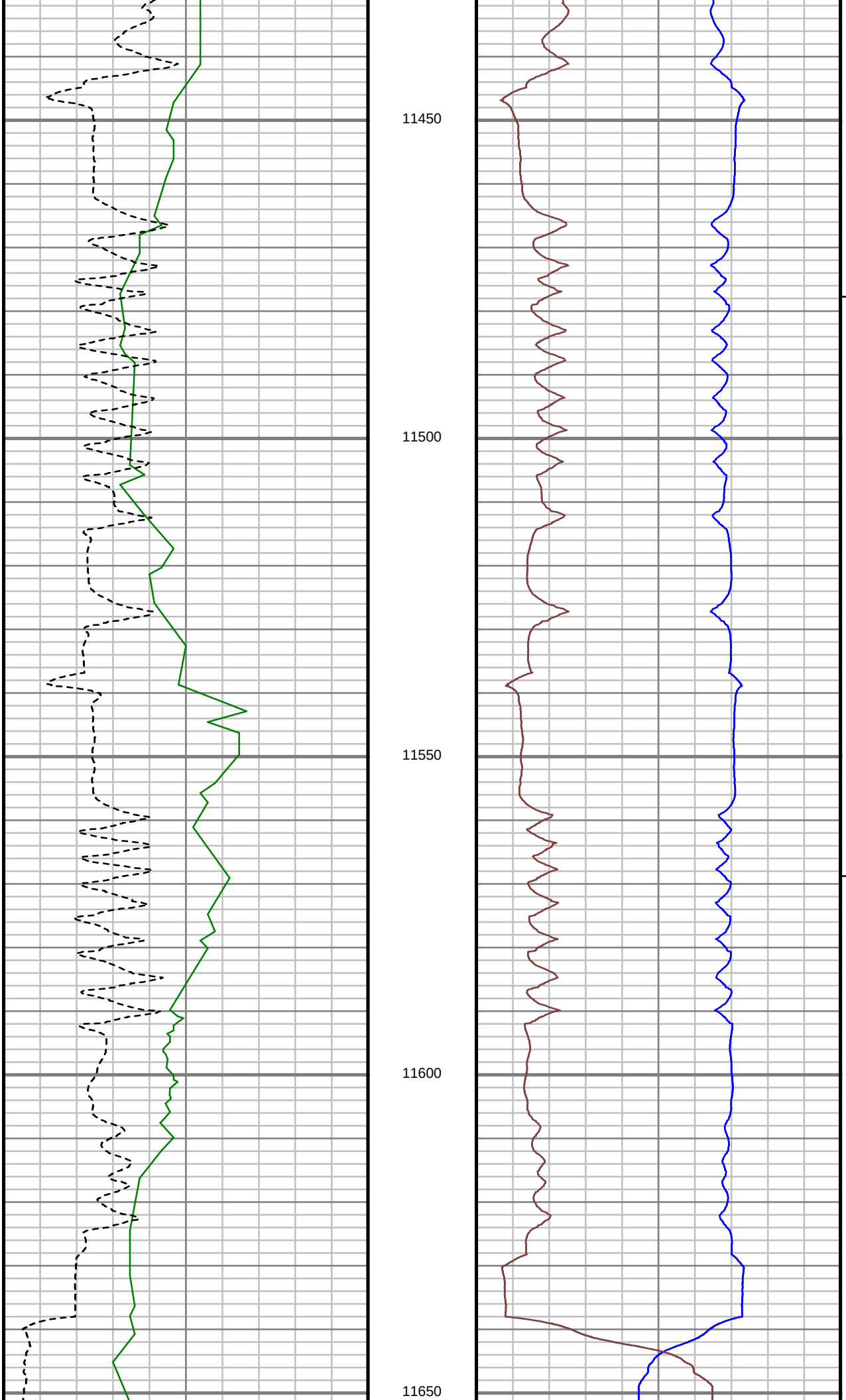

10350
10400
10450
10500
10550
S: 103 MD: 10379.00 ft Inc: 89.97 deg Az: 89.40 deg TVD: 6347.48 ft
S: 104 MD: 10471.00 ft Inc: 90.57 deg Az: 89.63 deg TVD: 6347.05 ft

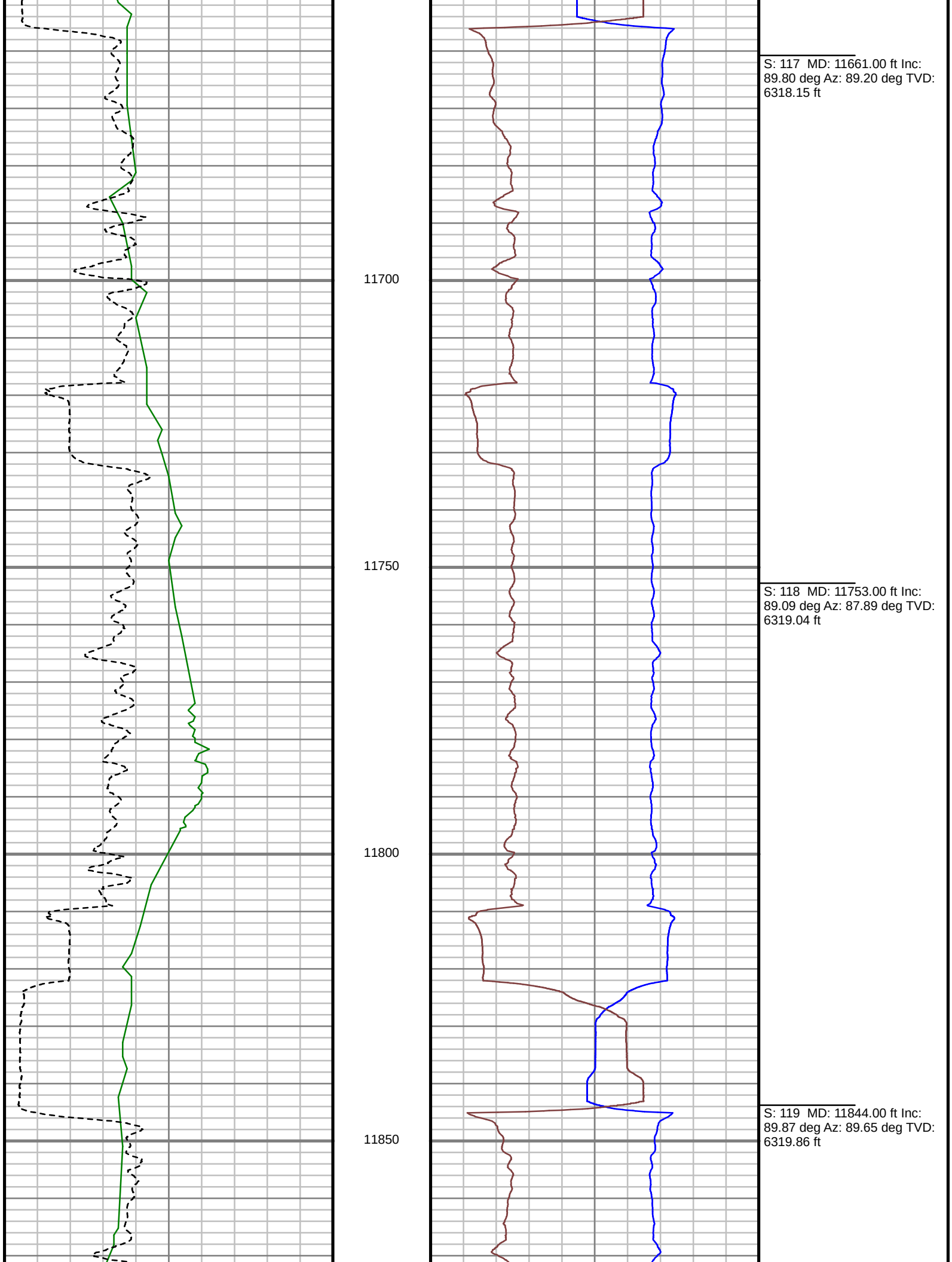

S: 105 MD: 10562.00 ft Inc: 92.05 deg Az: 89.08 deg TVD: 6344.97 ft
10600
10650
S: 106 MD: 10653.00 ft Inc: 92.32 deg Az: 89.02 deg TVD: 6341.51 ft
10700
10750
S: 107 MD: 10745.00 ft Inc: 92.90 deg Az: 88.68 deg TVD: 6337.32 ft

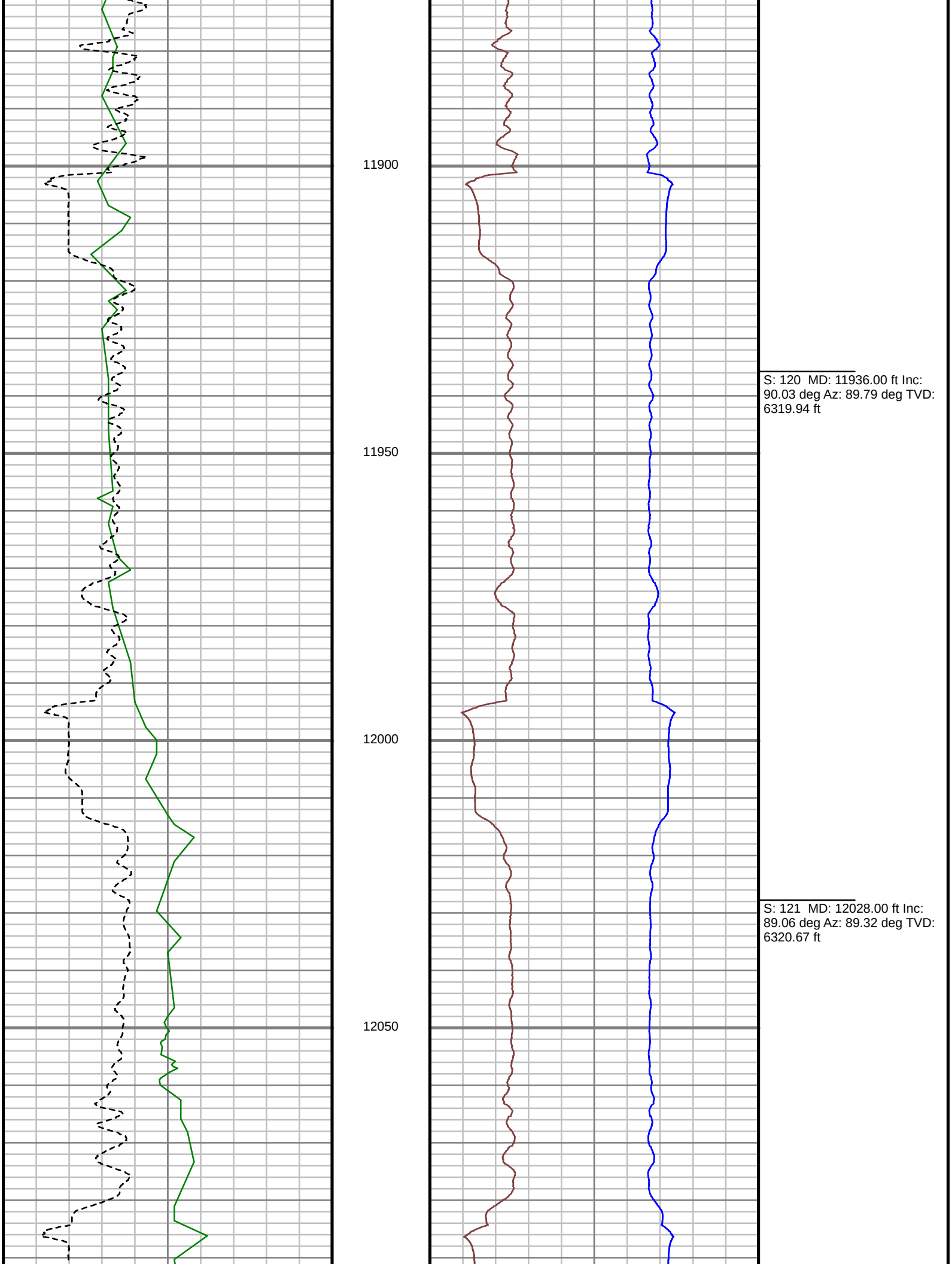

10800
10850
10900
10950
S: 108 MD: 10837.00 ft Inc: 91.14 deg Az: 87.13 deg TVD: 6334.09 ft
S: 109 MD: 10929.00 ft Inc: 89.90 deg Az: 87.97 deg TVD: 6333.25 ft

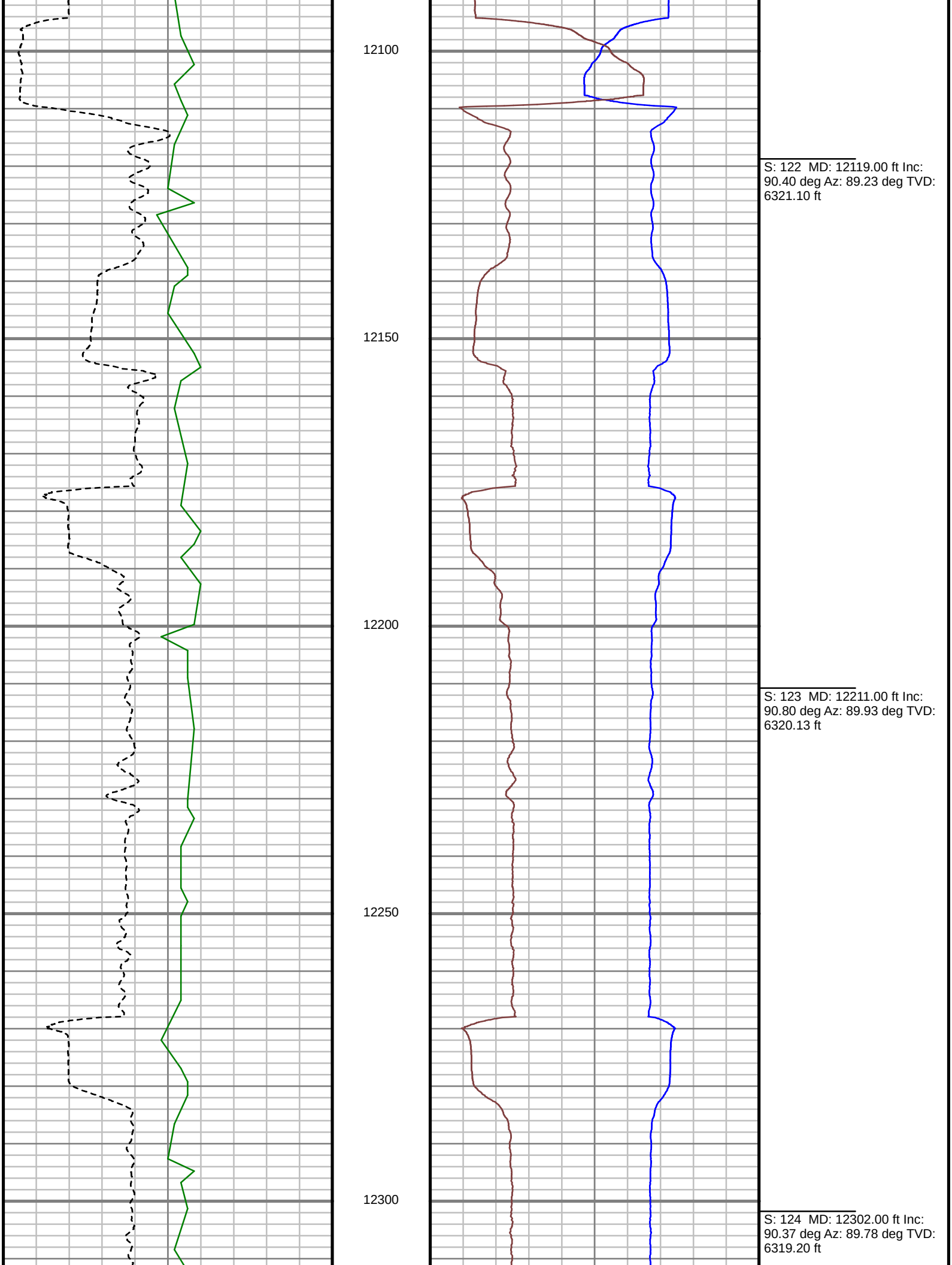

11000
11050
11100
11150
11200
S: 110 MD: 11020.00 ft Inc: 90.07 deg Az: 88.13 deg TVD: 6333.28 ft
S: 111 MD: 11111.00 ft Inc: 91.51 deg Az: 90.50 deg TVD: 6332.03 ft
S: 112 MD: 11203.00 ft Inc: 91.92 deg Az: 90.80 deg TVD: 6329.28 ft

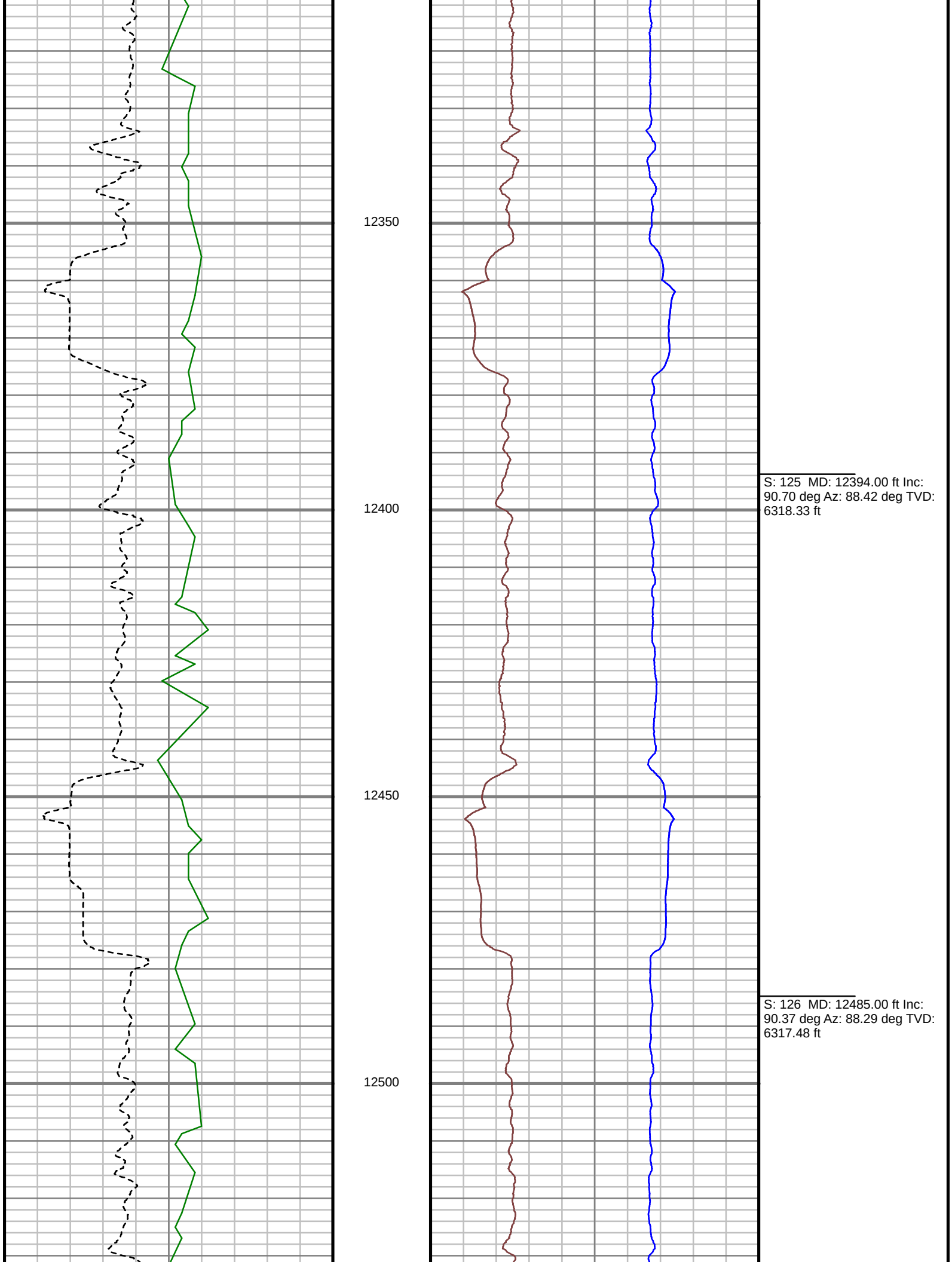

11250
11300
11350
11400
S: 113 MD: 11295.00 ft Inc: 92.08 deg Az: 90.17 deg TVD: 6326.07 ft
S: 114 MD: 11386.00 ft Inc: 91.14 deg Az: 89.61 deg TVD: 6323.51 ft

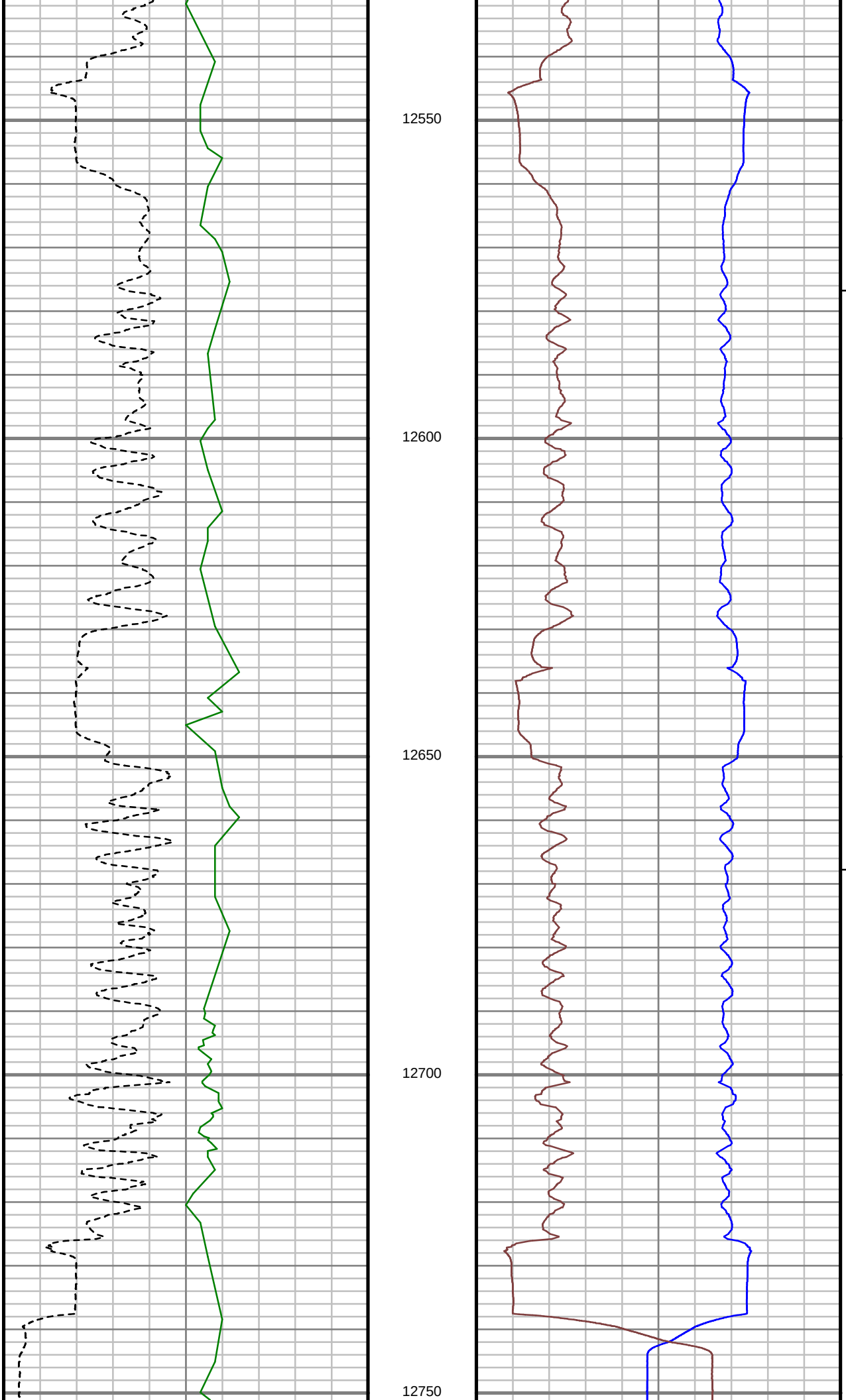

11450
11500
11550
11600
11650
S: 115 MD: 11478.00 ft Inc: 91.21 deg Az: 88.92 deg TVD: 6321.62 ft
S: 116 MD: 11569.00 ft Inc: 91.68 deg Az: 88.83 deg TVD: 6319.33 ft

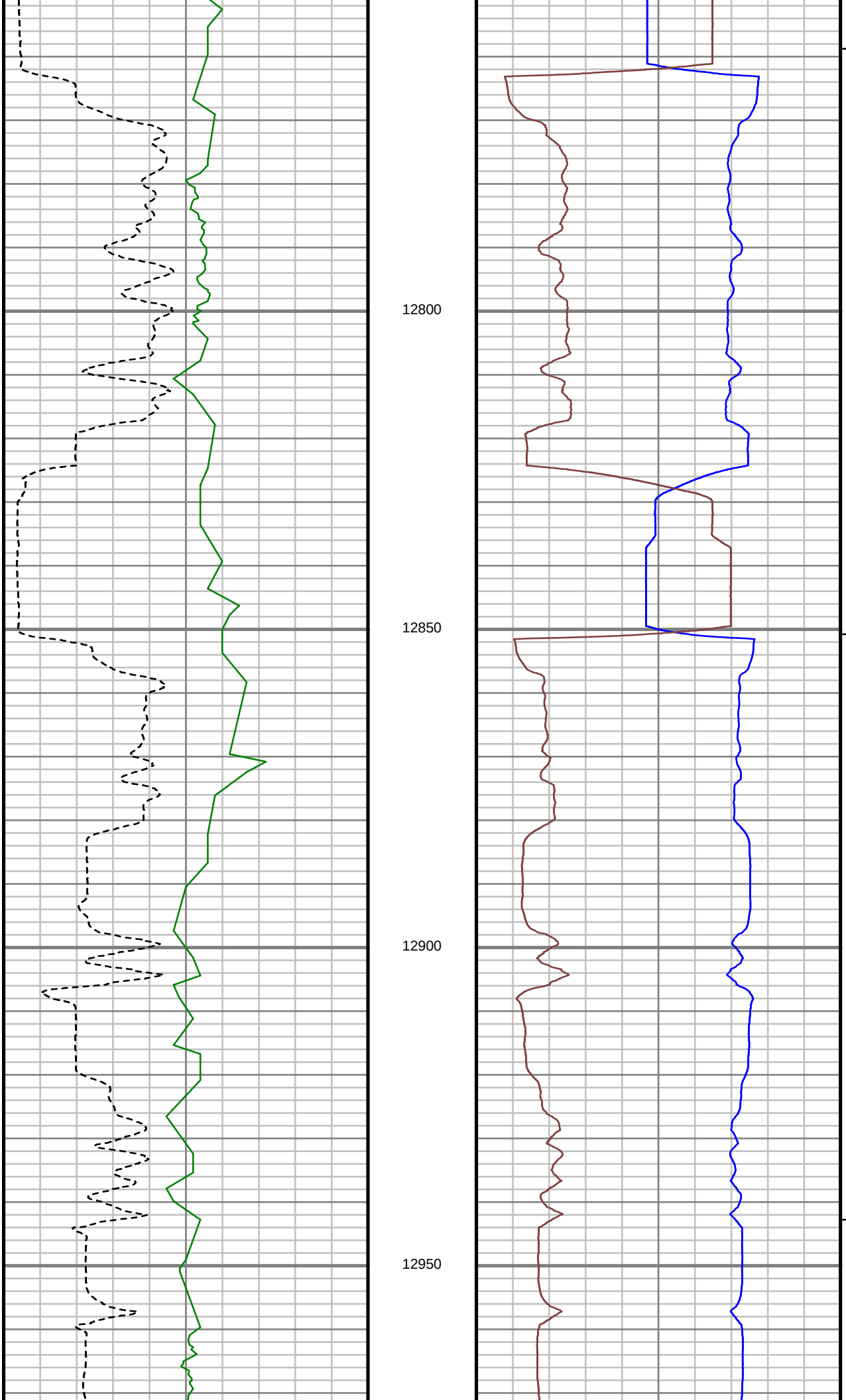

S: 117 MD: 11661.00 ft Inc: 89.80 deg Az: 89.20 deg TVD: 6318.15 ft
11700
11750
S: 118 MD: 11753.00 ft Inc: 89.09 deg Az: 87.89 deg TVD: 6319.04 ft
11800
S: 119 MD: 11844.00 ft Inc: 89.87 deg Az: 89.65 deg TVD: 6319.86 ft
11850


11900
11950
12000
12050
S: 120 MD: 11936.00 ft Inc: 90.03 deg Az: 89.79 deg TVD: 6319.94 ft
S: 121 MD: 12028.00 ft Inc: 89.06 deg Az: 89.32 deg TVD: 6320.67 ft


12100
12150
12200
12250
12300
S: 122 MD: 12119.00 ft Inc: 90.40 deg Az: 89.23 deg TVD: 6321.10 ft
S: 123 MD: 12211.00 ft Inc: 90.80 deg Az: 89.93 deg TVD: 6320.13 ft
S: 124 MD: 12302.00 ft Inc: 90.37 deg Az: 89.78 deg TVD: 6319.20 ft


12350
12400
12450
12500
S: 125 MD: 12394.00 ft Inc: 90.70 deg Az: 88.42 deg TVD: 6318.33 ft
S: 126 MD: 12485.00 ft Inc: 90.37 deg Az: 88.29 deg TVD: 6317.48 ft

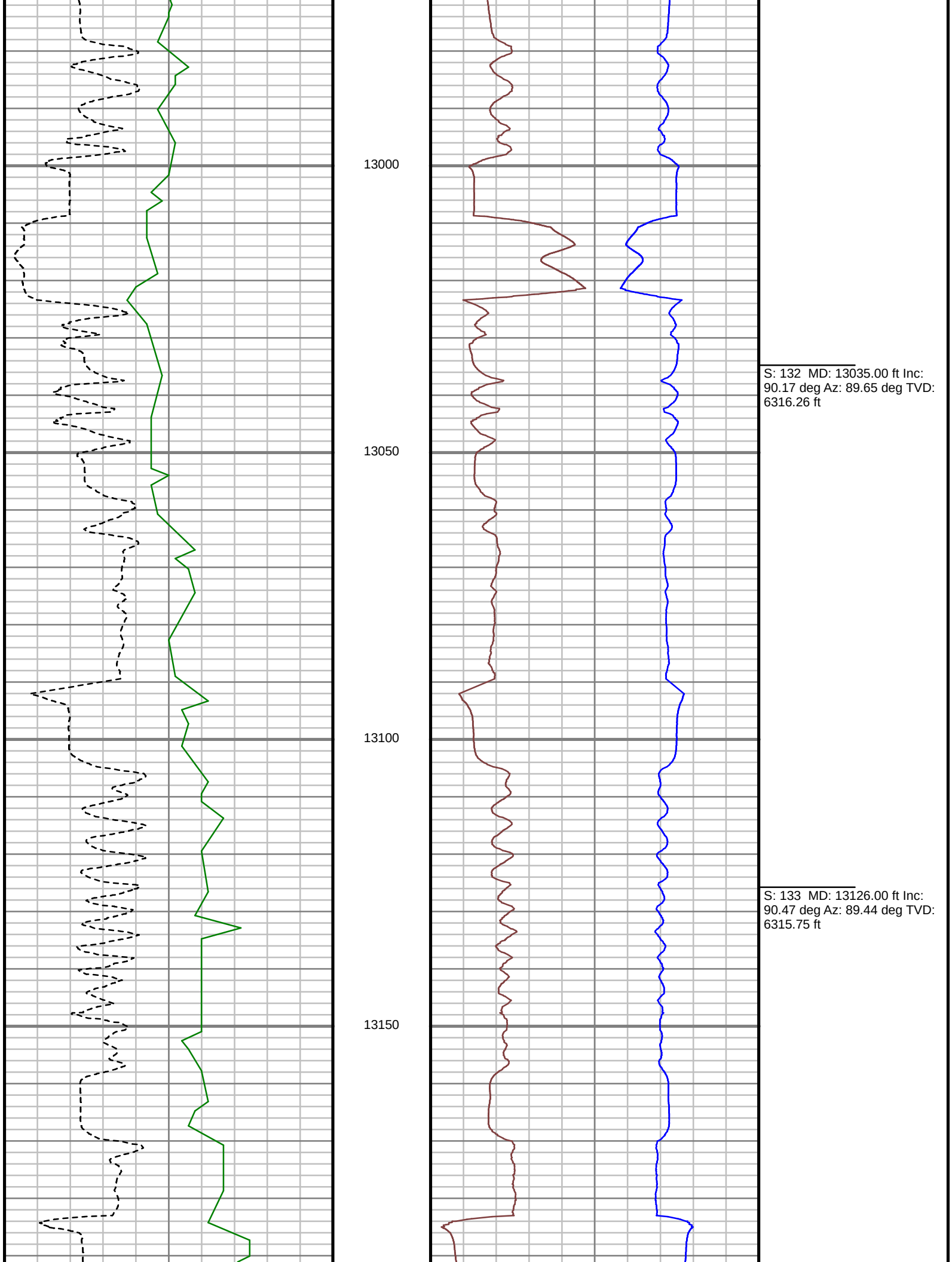

12550
12600
12650
12700
12750
S: 127 MD: 12577.00 ft Inc: 90.44 deg Az: 87.47 deg TVD: 6316.84 ft
S: 128 MD: 12668.00 ft Inc: 90.64 deg Az: 86.14 deg TVD: 6315.98 ft

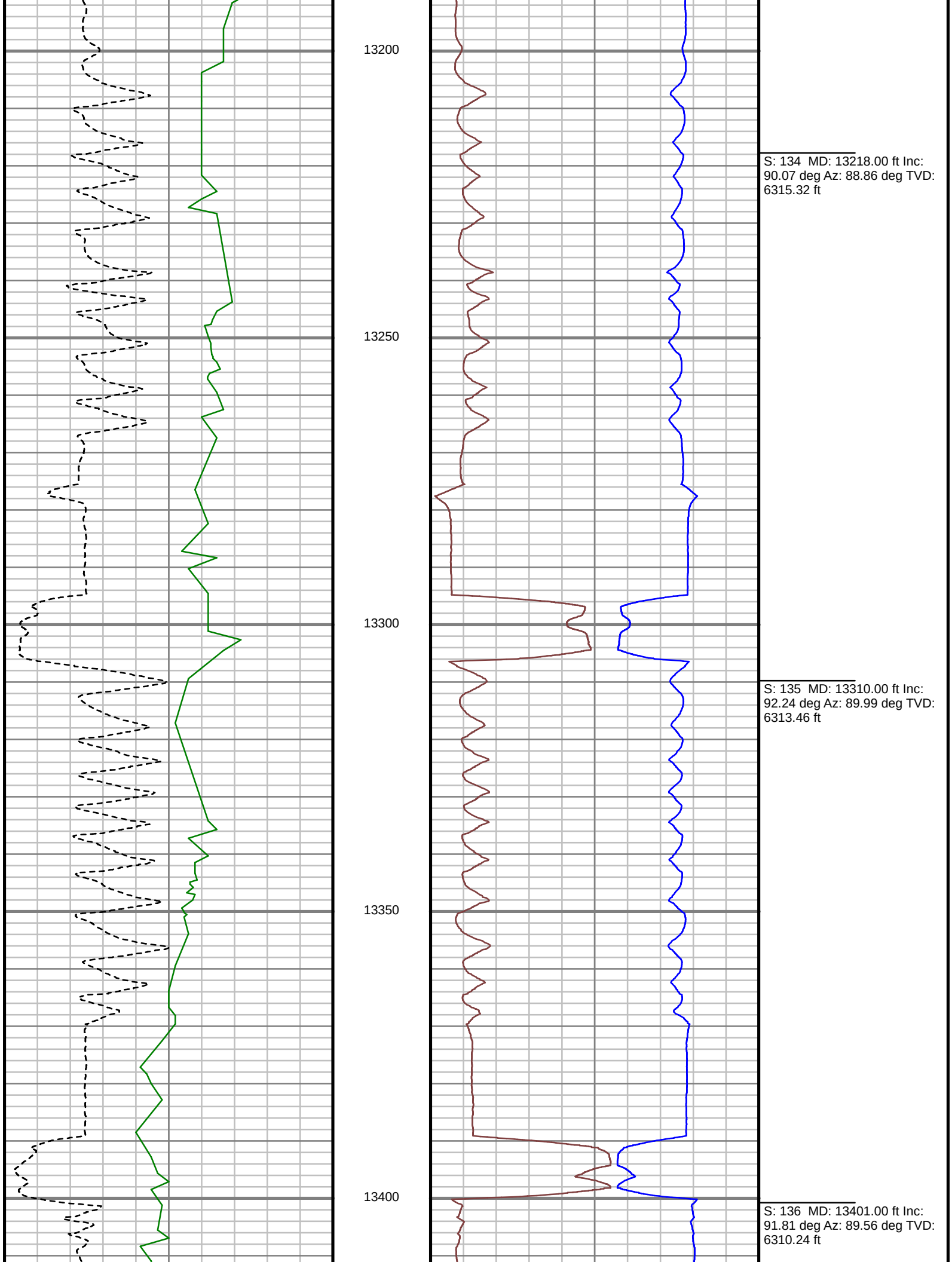


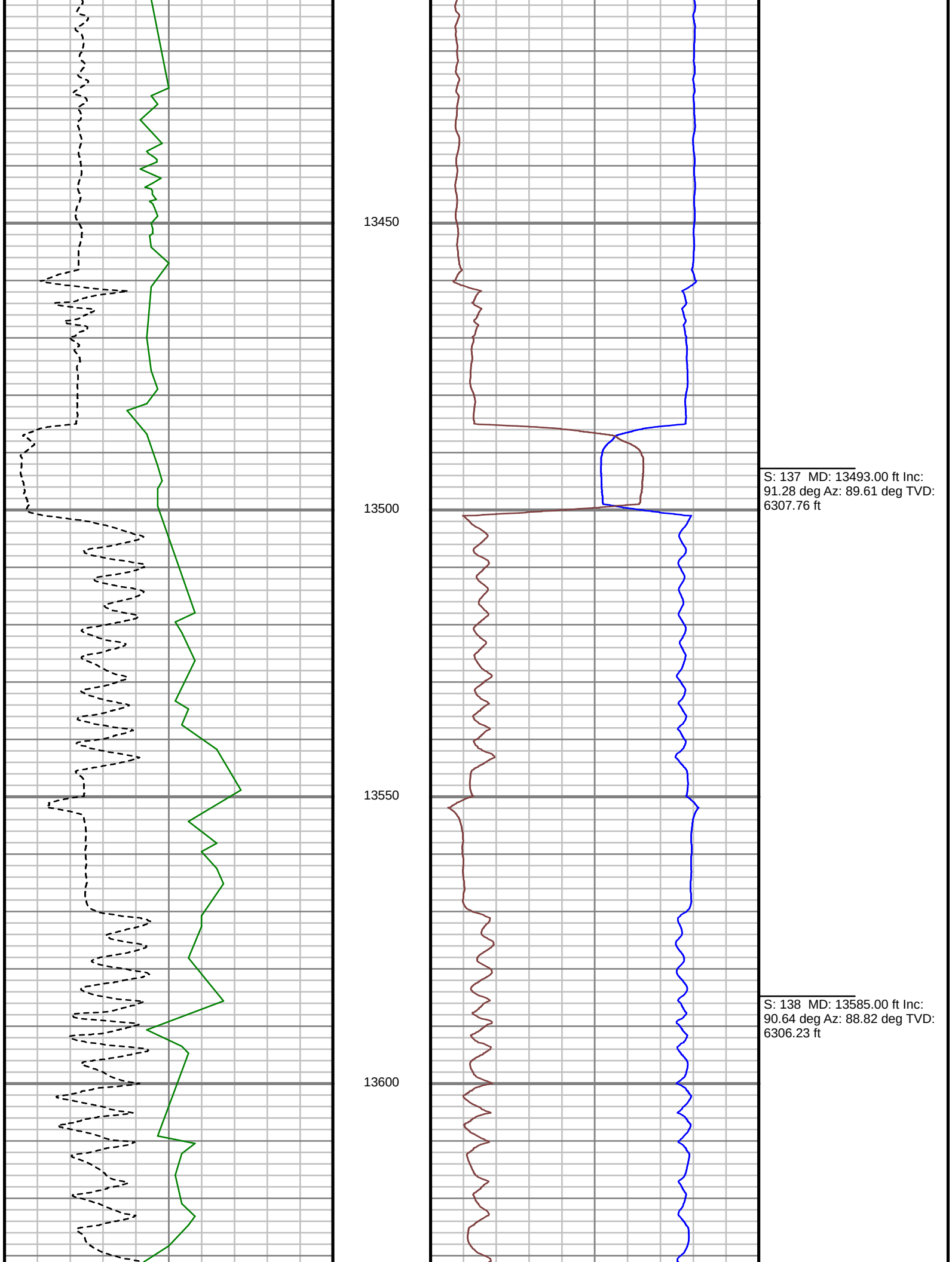
S: 129 MD: 12759.00 ft Inc: 90.30 deg Az: 88.32 deg TVD: 6315.24 ft

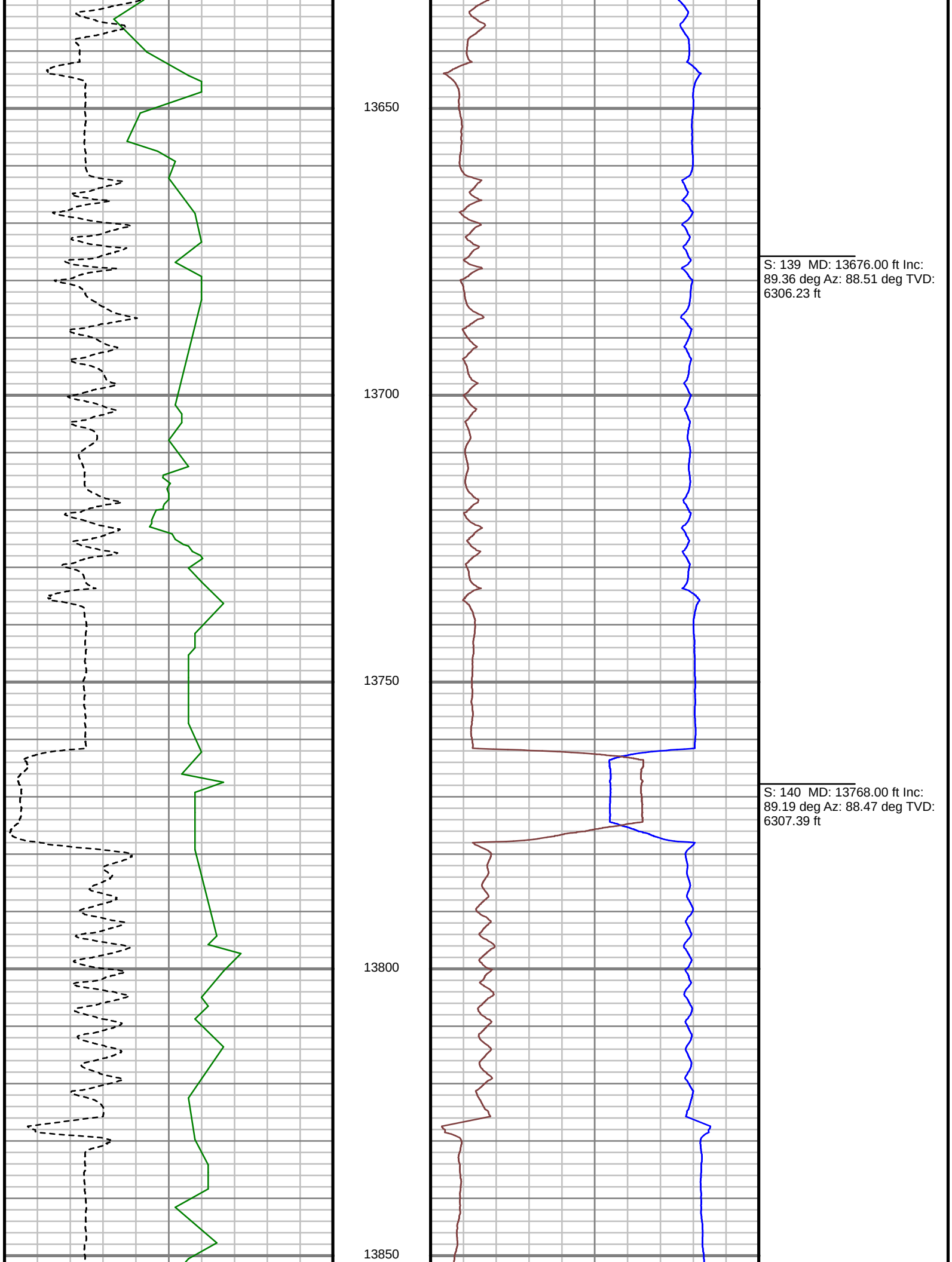
S: 130 MD: 12851.00 ft Inc: 89.66 deg Az: 89.99 deg TVD: 6315.26 ft

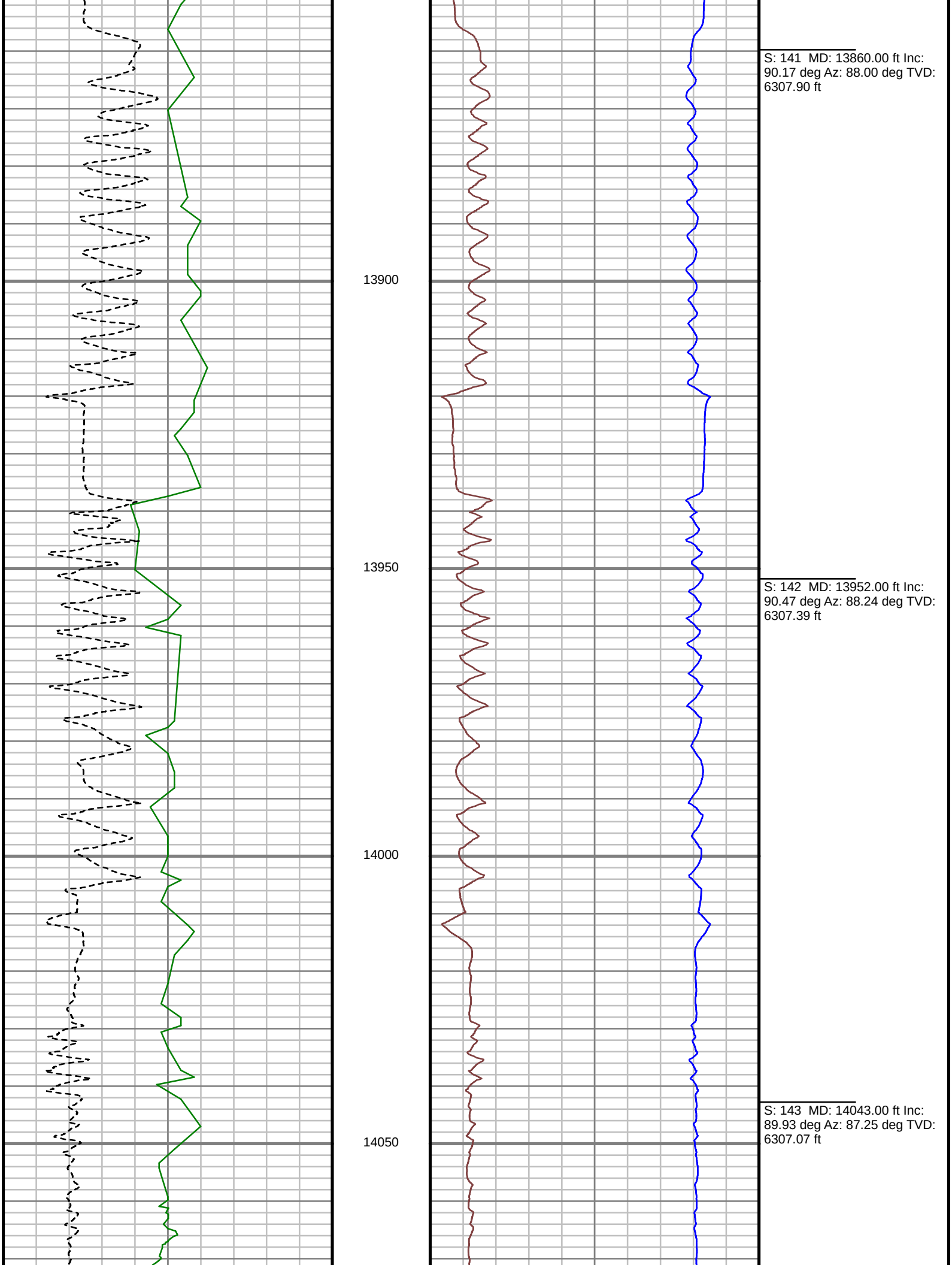
S: 131 MD: 12943.00 ft Inc: 89.46 deg Az: 90.01 deg TVD: 6315.96 ft

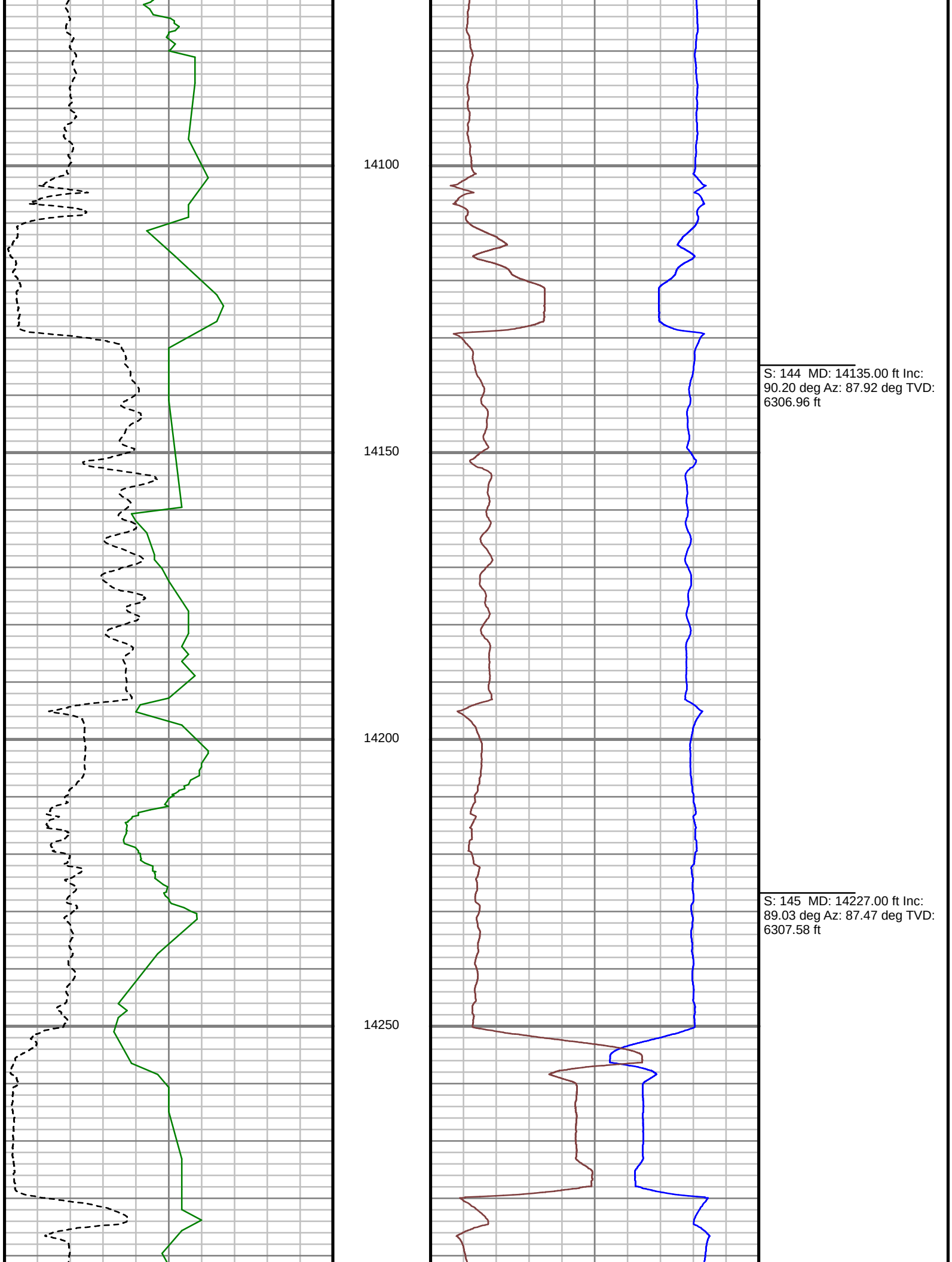

13000
13050
13100
13150
S: 132 MD: 13035.00 ft Inc: 90.17 deg Az: 89.65 deg TVD: 6316.26 ft
S: 133 MD: 13126.00 ft Inc: 90.47 deg Az: 89.44 deg TVD: 6315.75 ft

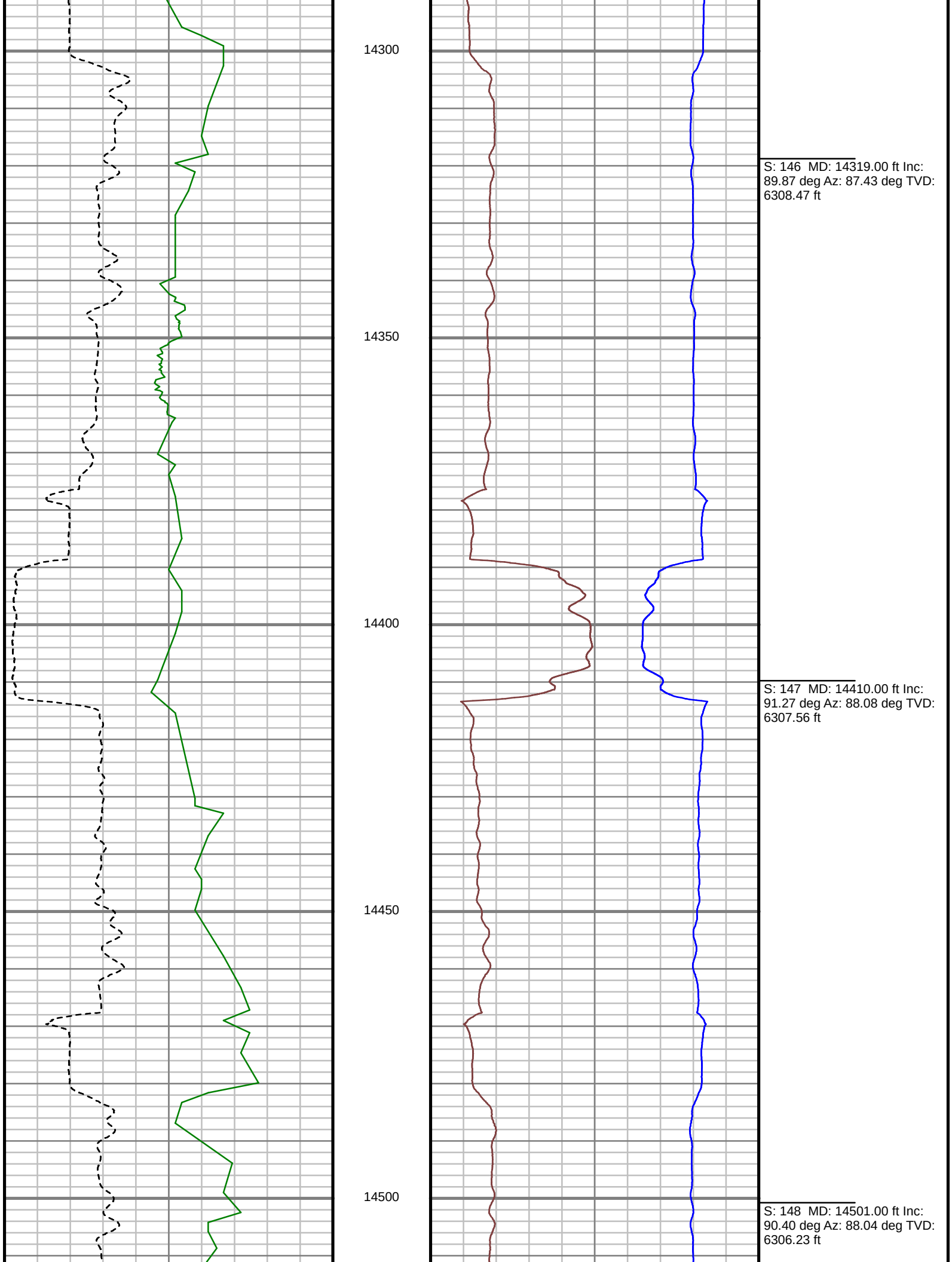

13200
13250
13300
13350
13400
S: 134 MD: 13218.00 ft Inc: 90.07 deg Az: 88.86 deg TVD: 6315.32 ft
S: 135 MD: 13310.00 ft Inc: 92.24 deg Az: 89.99 deg TVD: 6313.46 ft
S: 136 MD: 13401.00 ft Inc: 91.81 deg Az: 89.56 deg TVD: 6310.24 ft

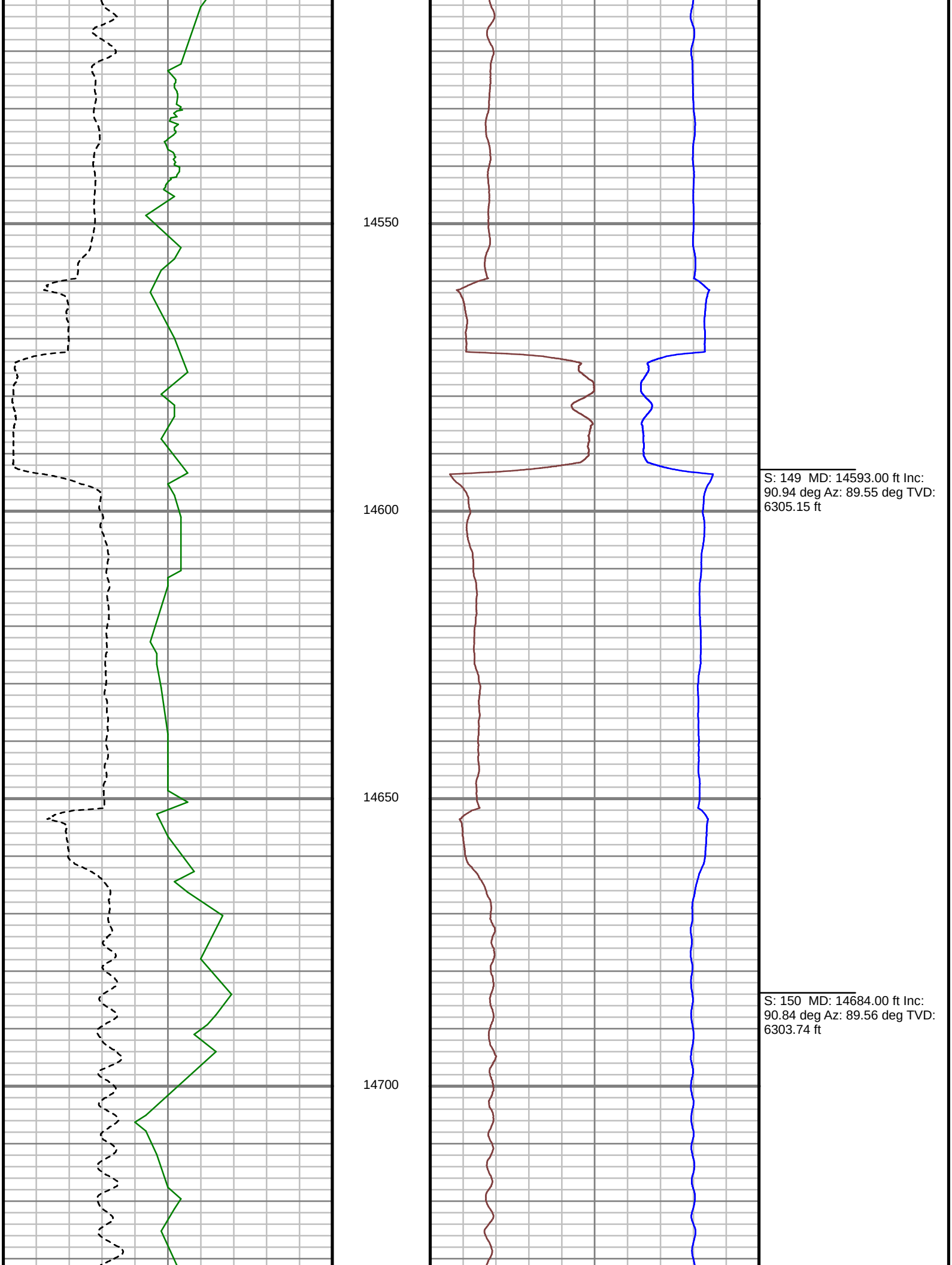

13450
13500
13550
13600
S: 137 MD: 13493.00 ft Inc: 91.28 deg Az: 89.61 deg TVD: 6307.76 ft
S: 138 MD: 13585.00 ft Inc: 90.64 deg Az: 88.82 deg TVD: 6306.23 ft

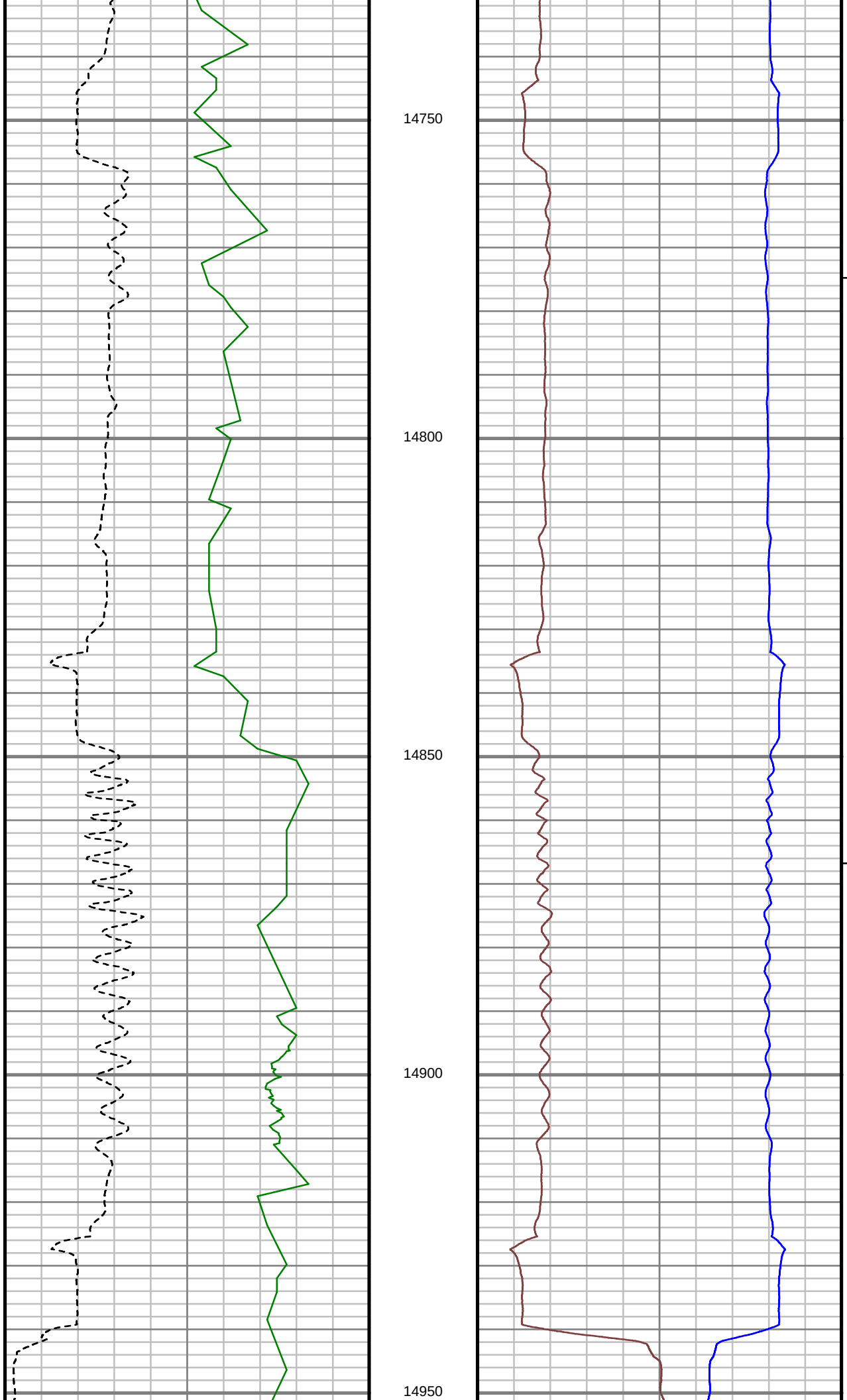

13650
13700
13750
13800
13850
S: 139 MD: 13676.00 ft Inc: 89.36 deg Az: 88.51 deg TVD: 6306.23 ft
S: 140 MD: 13768.00 ft Inc: 89.19 deg Az: 88.47 deg TVD: 6307.39 ft

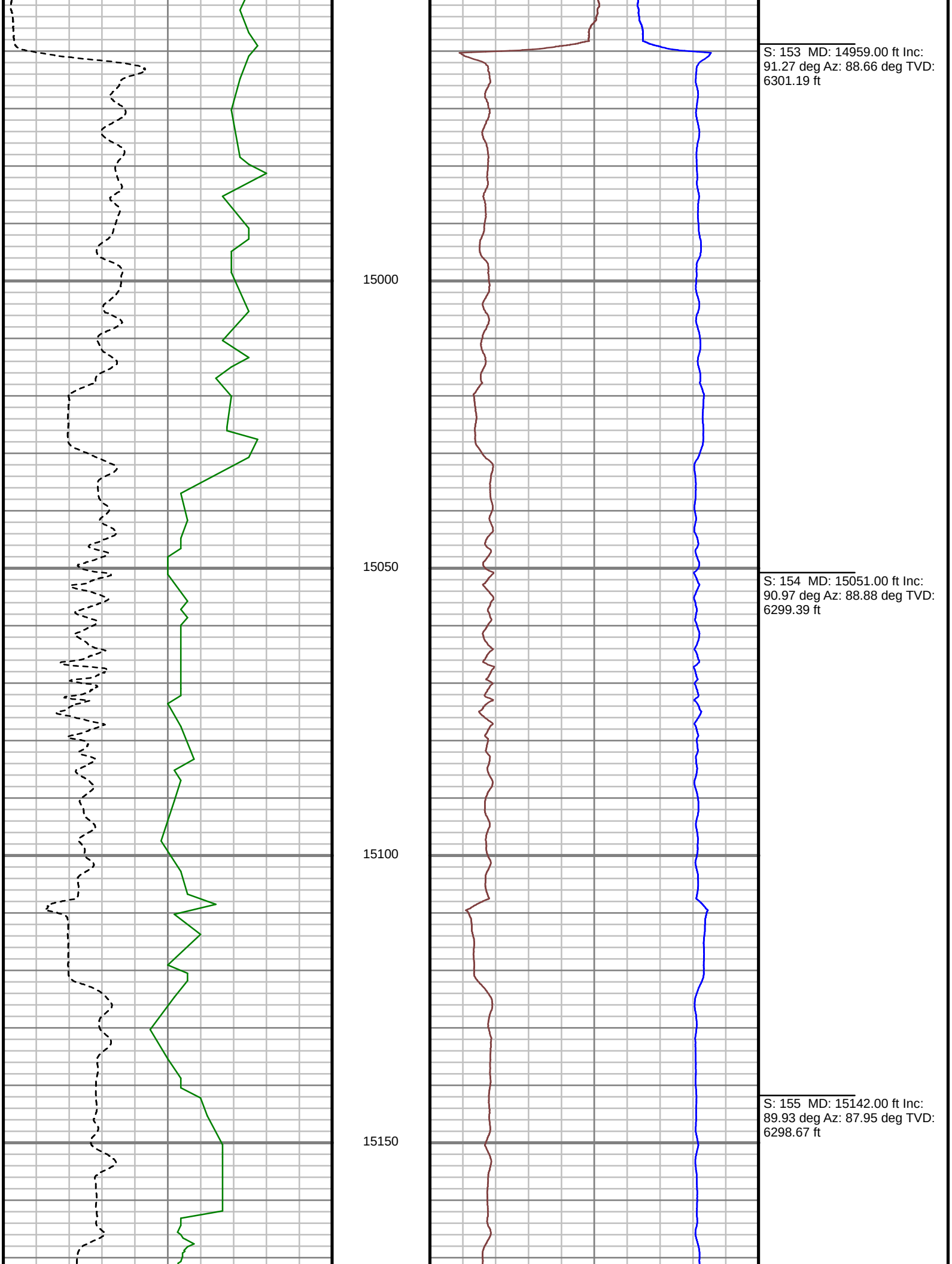

S: 141 MD: 13860.00 ft Inc: 90.17 deg Az: 88.00 deg TVD: 6307.90 ft
13900
13950
S: 142 MD: 13952.00 ft Inc: 90.47 deg Az: 88.24 deg TVD: 6307.39 ft
14000
S: 143 MD: 14043.00 ft Inc: 89.93 deg Az: 87.25 deg TVD: 6307.07 ft
14050

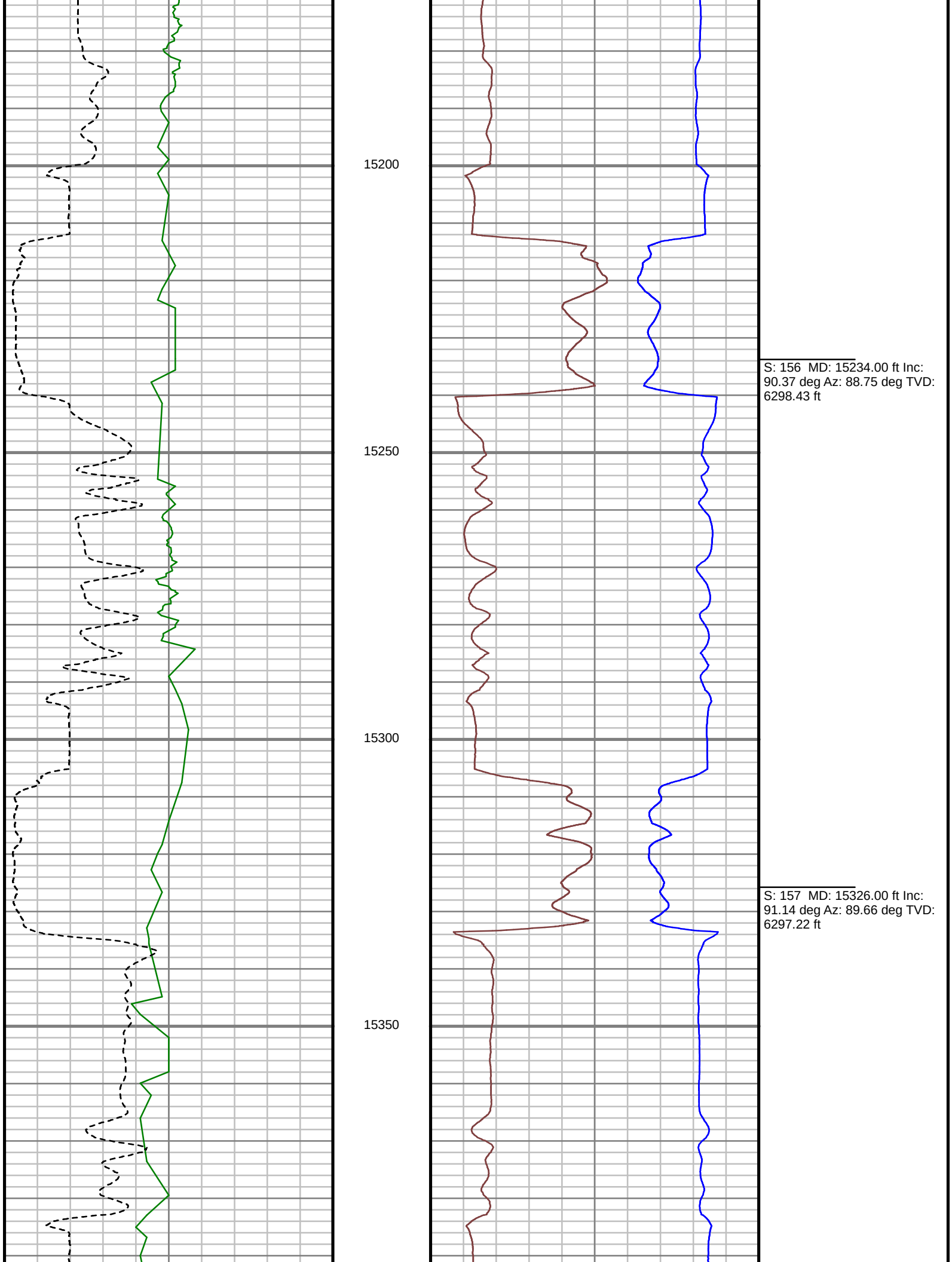

14100
14150
14200
14250
S: 144 MD: 14135.00 ft Inc: 90.20 deg Az: 87.92 deg TVD: 6306.96 ft
S: 145 MD: 14227.00 ft Inc: 89.03 deg Az: 87.47 deg TVD: 6307.58 ft

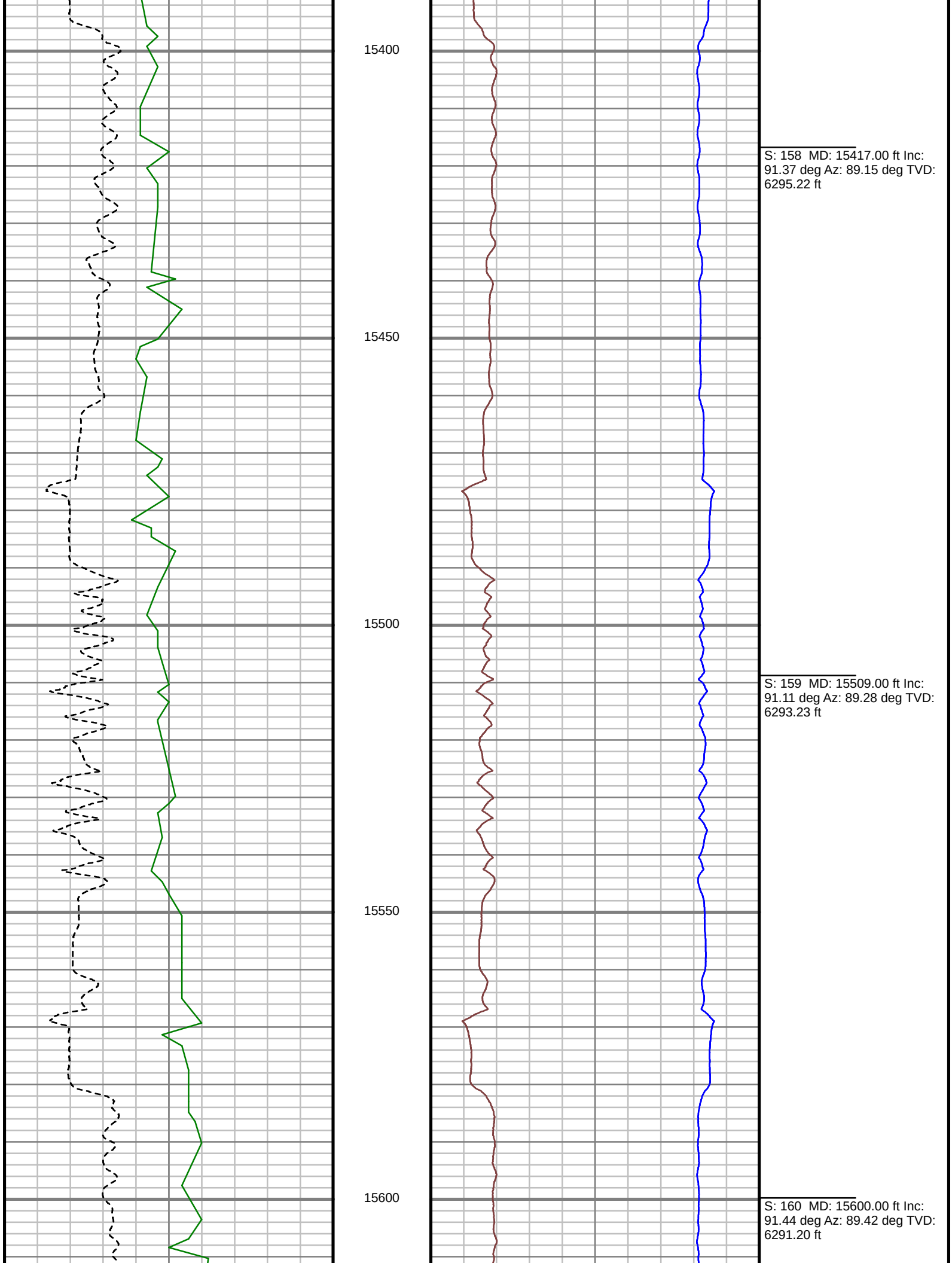

14300
14350
14400
14450
14500
S: 146 MD: 14319.00 ft Inc: 89.87 deg Az: 87.43 deg TVD: 6308.47 ft
S: 147 MD: 14410.00 ft Inc: 91.27 deg Az: 88.08 deg TVD: 6307.56 ft
S: 148 MD: 14501.00 ft Inc: 90.40 deg Az: 88.04 deg TVD: 6306.23 ft

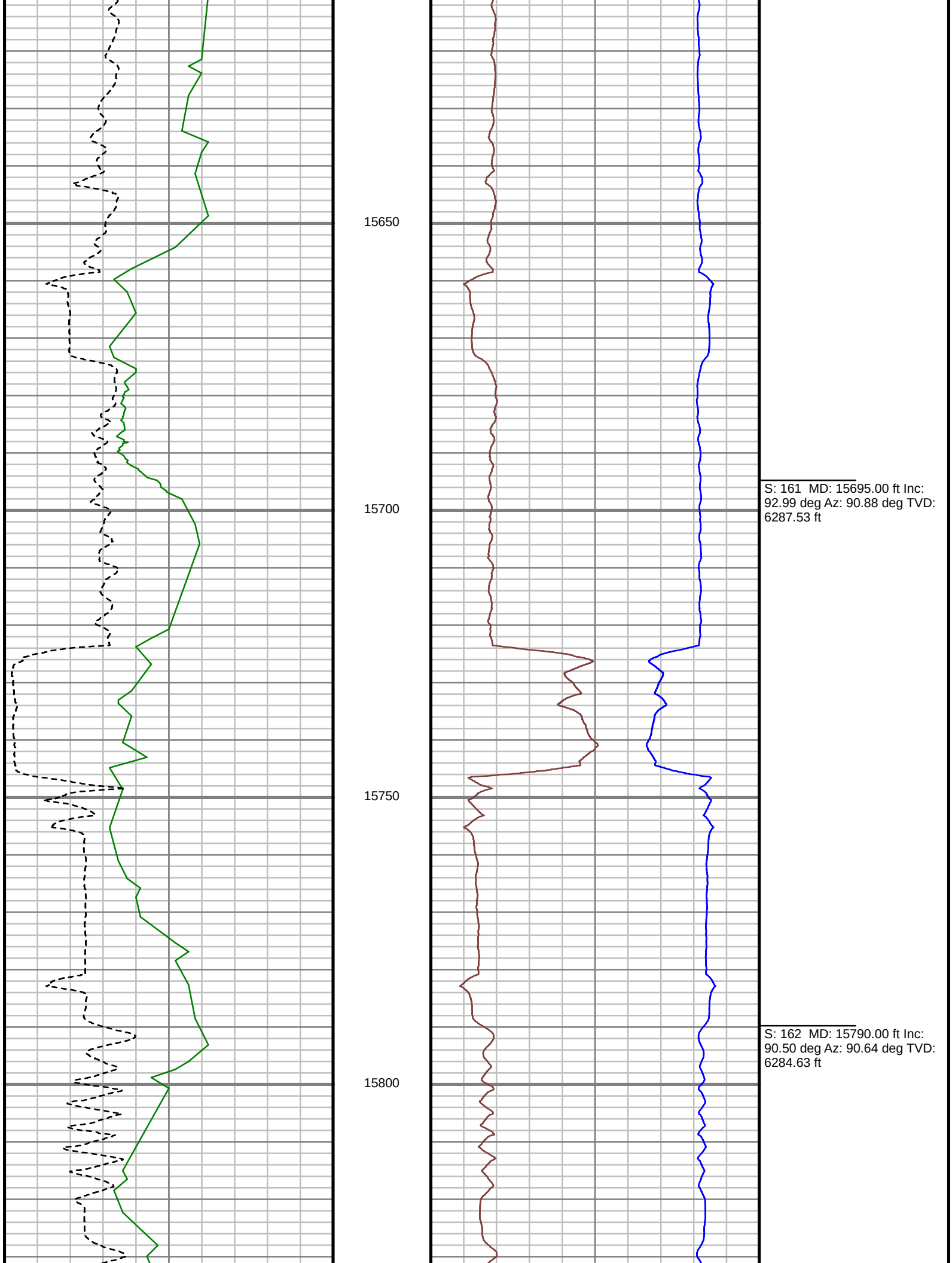

14550
14600
14650
14700
S: 149 MD: 14593.00 ft Inc: 90.94 deg Az: 89.55 deg TVD: 6305.15 ft
S: 150 MD: 14684.00 ft Inc: 90.84 deg Az: 89.56 deg TVD: 6303.74 ft

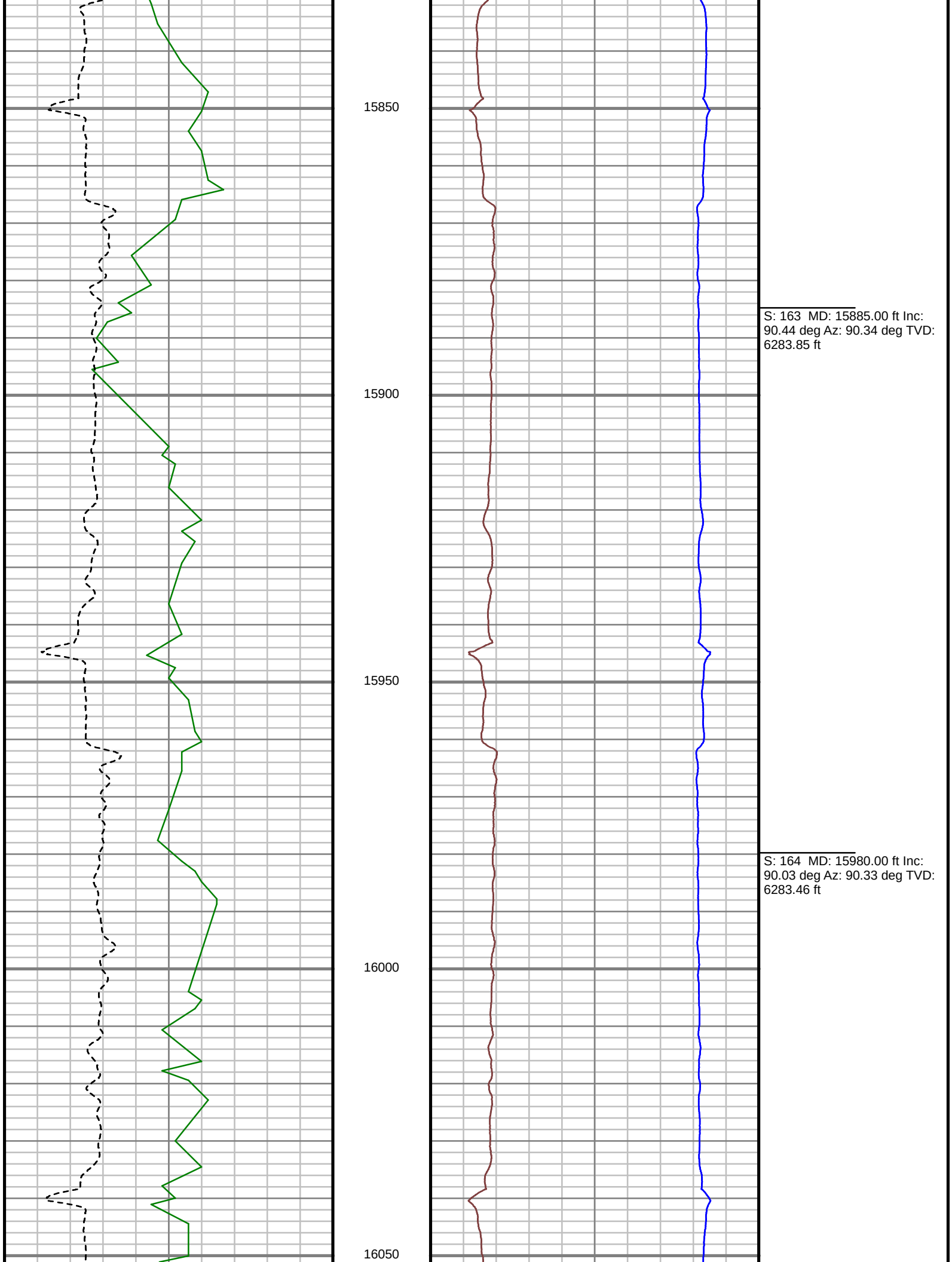

14750
14800
14850
14900
14950
S: 151 MD: 14775.00 ft Inc: 90.57 deg Az: 89.45 deg TVD: 6302.62 ft
S: 152 MD: 14867.00 ft Inc: 89.97 deg Az: 88.71 deg TVD: 6302.19 ft

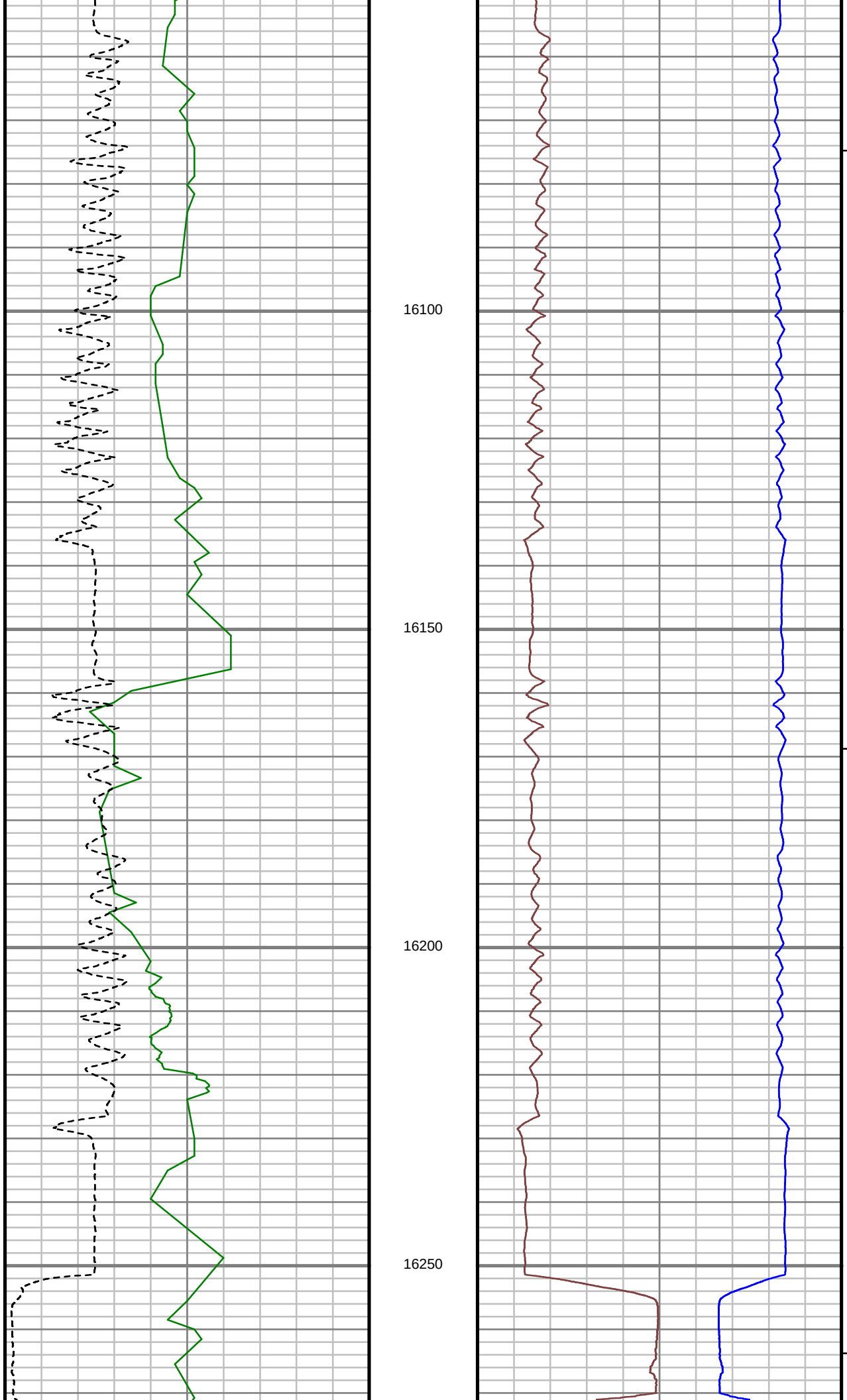

S: 153 MD: 14959.00 ft Inc: 91.27 deg Az: 88.66 deg TVD: 6301.19 ft
15000
15050
S: 154 MD: 15051.00 ft Inc: 90.97 deg Az: 88.88 deg TVD: 6299.39 ft
15100
S: 155 MD: 15142.00 ft Inc: 89.93 deg Az: 87.95 deg TVD: 6298.67 ft
15150

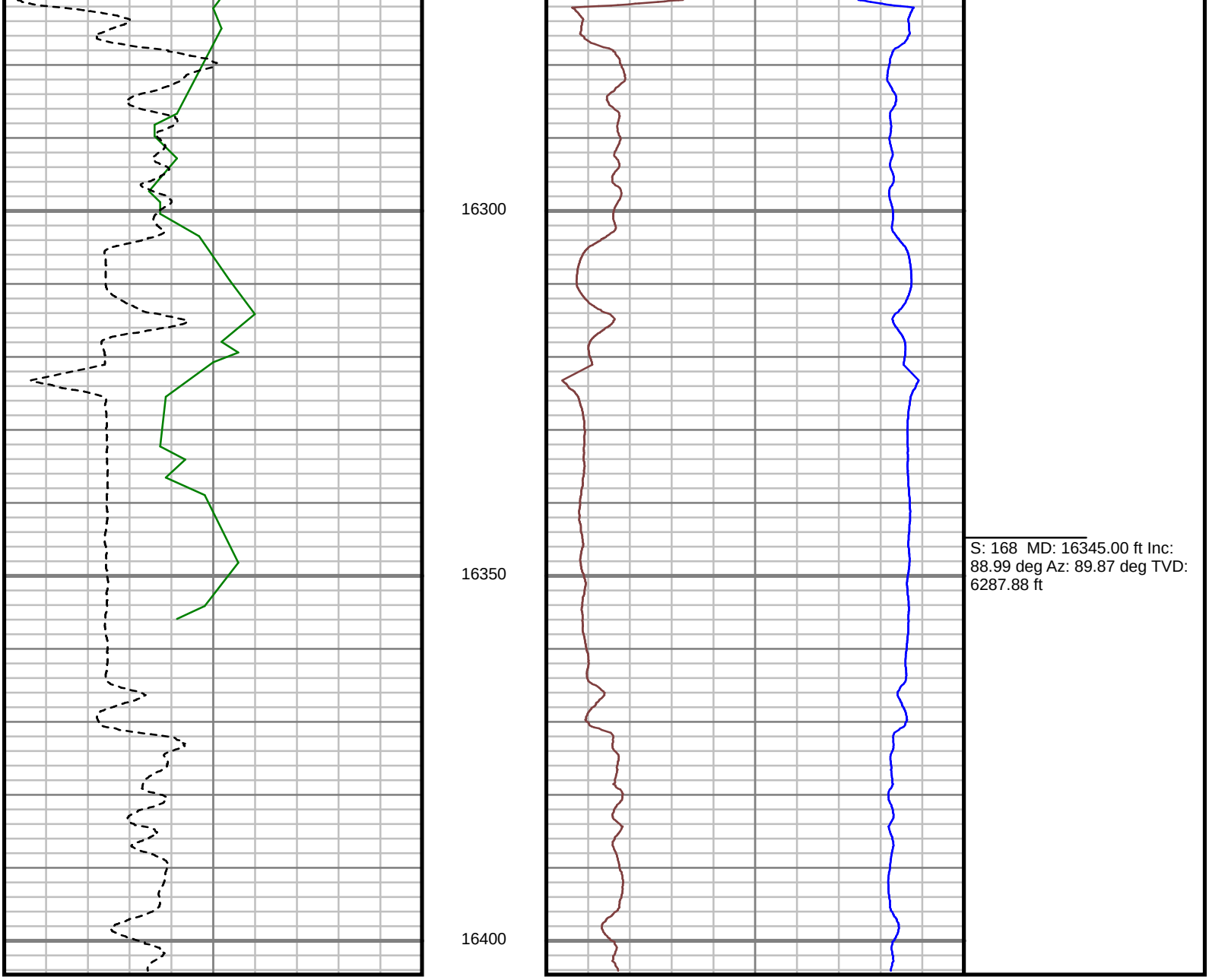

15200
15250
15300
15350
S: 156 MD: 15234.00 ft Inc: 90.37 deg Az: 88.75 deg TVD: 6298.43 ft
S: 157 MD: 15326.00 ft Inc: 91.14 deg Az: 89.66 deg TVD: 6297.22 ft


15400
15450
15500
15550
15600
S: 158 MD: 15417.00 ft Inc: 91.37 deg Az: 89.15 deg TVD: 6295.22 ft
S: 159 MD: 15509.00 ft Inc: 91.11 deg Az: 89.28 deg TVD: 6293.23 ft
S: 160 MD: 15600.00 ft Inc: 91.44 deg Az: 89.42 deg TVD: 6291.20 ft


15650
15700
15750
15800
S: 161 MD: 15695.00 ft Inc: 92.99 deg Az: 90.88 deg TVD: 6287.53 ft
S: 162 MD: 15790.00 ft Inc: 90.50 deg Az: 90.64 deg TVD: 6284.63 ft


15850
15900
15950
16000
16050
S: 163 MD: 15885.00 ft Inc: 90.44 deg Az: 90.34 deg TVD: 6283.85 ft
S: 164 MD: 15980.00 ft Inc: 90.03 deg Az: 90.33 deg TVD: 6283.46 ft


16100
16150
16200
16250
S: 165 MD: 16075.00 ft Inc: 89.29 deg Az: 90.50 deg TVD: 6284.02 ft
S: 166 MD: 16169.00 ft Inc: 89.19 deg Az: 90.22 deg TVD: 6285.26 ft
S: 167 MD: 16264.00 ft Inc: 89.19 deg Az: 90.36 deg TVD: 6286.60 ft



Rate of Penetration (ROP)

0 Unit = ft/hr 1000

Gamma Ray (GR)

0 Unit = aapi 150

MEASURED DEPTH
1:240 (ft)

Weight-on-Bit (surf,max) (WOBX)

0 Unit = kip 100

Hookload (max) (HKLX)

0 Unit = kip 200

Comments

Scientific Drilling

MWD Survey Report

Well Location	ANSCHUTZ STATE 05-62-22_23 SWNW PAD
Well Name	ANSCHUTZ STATE 05-62-22-3225B2
Survey Date	10/9/2015
Latitude	40°23'13.120"N
Longitude	104°19'5.459"W
Btotal	52648 nT
Dip	67.03 deg
Magnetic Declination	8.27 deg
North Reference	True North
Grid Correction	None
Depth Reference	RKB (16.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 88.91Azim (deg)
Operator(s)	C. COLLINS, R. KLASSEN, Z. BROWN

Well Notes

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
800.00	0.00	0.00	800.00	0.00	0.00	0.00	Invalid	Invalid
886.00	0.80	18.01	886.00	0.20	0.57	0.18	0.92	86.00
978.00	1.20	279.56	977.99	-0.54	1.33	-0.57	1.67	92.00
1070.00	3.39	252.27	1069.91	-4.10	0.67	-4.11	2.60	92.00
1161.00	5.32	245.41	1160.64	-10.55	-1.91	-10.51	2.19	91.00
1253.00	6.30	230.94	1252.18	-18.44	-6.86	-18.31	1.91	92.00
1344.00	6.98	231.08	1342.57	-26.74	-13.48	-26.48	0.75	91.00
1436.00	6.70	228.90	1433.91	-35.26	-20.52	-34.88	0.41	92.00
1527.00	7.13	223.92	1524.25	-43.32	-28.08	-42.79	0.81	91.00
1619.00	6.81	229.32	1615.57	-51.56	-35.74	-50.89	0.79	92.00
1711.00	5.49	229.70	1707.04	-59.17	-42.14	-58.38	1.44	92.00
1803.00	4.96	226.51	1798.66	-65.52	-47.73	-64.62	0.65	92.00
1894.00	6.09	234.21	1889.23	-72.39	-53.26	-71.39	1.48	91.00
1986.00	5.38	229.28	1980.77	-79.73	-58.93	-78.62	0.94	92.00
2077.00	3.90	221.97	2071.47	-85.13	-64.01	-83.92	1.74	91.00
2169.00	5.05	230.00	2163.19	-90.41	-68.94	-89.12	1.41	92.00
2260.00	5.31	235.66	2253.82	-97.05	-73.89	-95.66	0.63	91.00
2352.00	6.17	244.17	2345.36	-105.11	-78.45	-103.63	1.31	92.00
2446.00	7.31	231.52	2438.71	-114.45	-84.38	-112.87	1.98	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
2541.00	6.68	231.37	2533.01	-123.64	-91.59	-121.92	0.66	95.00
2636.00	6.37	225.87	2627.39	-131.87	-98.71	-130.02	0.74	95.00
2730.00	6.18	226.96	2720.83	-139.45	-105.79	-137.46	0.24	94.00
2825.00	5.79	227.92	2815.31	-146.87	-112.49	-144.75	0.43	95.00
2919.00	5.69	221.66	2908.84	-153.61	-119.15	-151.37	0.67	94.00
3014.00	4.53	223.34	3003.46	-159.43	-125.40	-157.07	1.23	95.00
3108.00	5.20	239.67	3097.13	-165.74	-130.25	-163.30	1.63	94.00
3202.00	6.53	232.59	3190.63	-173.77	-135.65	-171.22	1.61	94.00
3297.00	5.75	235.23	3285.09	-182.08	-141.64	-179.42	0.87	95.00
3392.00	6.49	235.18	3379.55	-190.51	-147.42	-187.74	0.78	95.00
3486.00	6.78	232.99	3472.92	-199.42	-153.80	-196.53	0.41	94.00
3581.00	7.68	232.11	3567.16	-209.05	-161.08	-206.02	0.95	95.00
3675.00	8.19	233.41	3660.26	-219.53	-168.92	-216.36	0.57	94.00
3769.00	8.42	237.27	3753.27	-230.84	-176.64	-227.53	0.64	94.00
3864.00	7.53	230.78	3847.36	-241.66	-184.33	-238.20	1.34	95.00
3959.00	6.81	230.62	3941.61	-250.98	-191.84	-247.38	0.75	95.00
4054.00	6.11	228.12	4036.01	-259.23	-198.80	-255.50	0.79	95.00
4148.00	5.43	232.13	4129.53	-266.59	-204.87	-262.74	0.84	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
4242.00	5.60	230.54	4223.09	-273.75	-210.52	-269.79	0.24	94.00
4337.00	5.54	234.24	4317.65	-281.15	-216.14	-277.09	0.38	95.00
4432.00	6.42	231.99	4412.13	-289.17	-222.09	-285.00	0.95	95.00
4526.00	5.24	229.30	4505.64	-296.68	-228.13	-292.39	1.29	94.00
4620.00	4.93	225.85	4599.27	-302.94	-233.74	-298.54	0.46	94.00
4714.00	6.41	230.12	4692.81	-309.98	-239.92	-305.47	1.64	94.00
4809.00	5.66	226.74	4787.28	-317.59	-246.54	-312.96	0.87	95.00
4905.00	5.35	224.99	4882.84	-324.33	-252.95	-319.57	0.37	96.00
4999.00	4.37	216.46	4976.50	-329.67	-258.93	-324.80	1.30	94.00
5094.00	3.46	220.80	5071.28	-333.79	-264.01	-328.82	1.00	95.00
5188.00	3.07	217.40	5165.13	-337.25	-268.15	-332.21	0.46	94.00
5283.00	2.85	198.90	5260.00	-339.64	-272.41	-334.52	1.03	95.00
5377.00	0.61	172.69	5353.95	-340.38	-275.12	-335.21	2.47	94.00
5472.00	0.51	157.00	5448.95	-340.17	-276.01	-334.98	0.19	95.00
5567.00	0.77	145.74	5543.94	-339.66	-276.93	-334.45	0.30	95.00
5660.00	0.83	116.13	5636.93	-338.72	-277.75	-333.49	0.44	93.00
5755.00	1.11	120.39	5731.92	-337.32	-278.52	-332.08	0.31	95.00
5849.00	1.54	139.84	5825.89	-335.74	-279.95	-330.48	0.65	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
5944.00	9.91	94.42	5920.36	-326.78	-281.56	-321.48	9.36	95.00
6039.00	18.49	91.65	6012.37	-303.56	-282.62	-298.24	9.06	95.00
6133.00	24.33	91.15	6099.85	-269.29	-283.44	-263.95	6.22	94.00
6227.00	37.52	92.67	6180.31	-221.16	-285.17	-215.78	14.06	94.00
6321.00	49.22	91.95	6248.52	-156.83	-287.72	-151.39	12.46	94.00
6416.00	58.24	84.00	6304.72	-80.44	-284.71	-75.04	11.63	95.00
6511.00	69.34	86.20	6346.61	4.47	-277.52	9.75	11.87	95.00
6605.00	84.78	91.50	6367.61	95.77	-275.81	101.04	17.31	94.00
6620.00	87.45	92.19	6368.62	110.72	-276.29	115.99	18.37	15.00
6694.00	91.01	91.42	6369.62	184.60	-278.62	189.94	4.92	74.00
6789.00	91.01	92.23	6367.95	279.46	-281.65	284.87	0.85	95.00
6883.00	90.57	92.16	6366.66	373.30	-285.25	378.80	0.47	94.00
6978.00	89.73	88.54	6366.41	468.25	-285.83	473.78	3.92	95.00
7072.00	90.07	90.25	6366.57	562.25	-284.84	567.77	1.86	94.00
7166.00	90.27	89.07	6366.30	656.24	-284.28	661.76	1.28	94.00
7260.00	90.64	87.27	6365.55	750.22	-281.28	755.71	1.95	94.00
7355.00	90.60	86.72	6364.52	845.16	-276.30	850.57	0.58	95.00
7449.00	90.87	88.07	6363.31	939.12	-272.03	944.47	1.46	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
7544.00	89.66	87.08	6362.87	1034.09	-268.01	1039.38	1.65	95.00
7638.00	90.27	88.36	6362.92	1128.07	-264.27	1133.30	1.51	94.00
7732.00	90.60	88.64	6362.20	1222.06	-261.81	1227.26	0.47	94.00
7827.00	90.91	88.96	6360.95	1317.05	-259.82	1322.23	0.46	95.00
7921.00	90.47	89.73	6359.82	1411.04	-258.75	1416.22	0.95	94.00
8016.00	90.64	90.52	6358.91	1506.02	-258.96	1511.22	0.85	95.00
8111.00	91.51	88.99	6357.12	1600.99	-258.56	1606.19	1.86	95.00
8206.00	91.04	87.47	6355.01	1695.95	-255.63	1701.12	1.67	95.00
8301.00	90.34	87.23	6353.87	1790.91	-251.24	1796.01	0.78	95.00
8394.00	90.47	87.69	6353.21	1883.88	-247.12	1888.92	0.52	93.00
8489.00	89.77	87.00	6353.02	1978.84	-242.72	1983.82	1.04	95.00
8583.00	88.89	86.74	6354.12	2072.77	-237.59	2077.67	0.97	94.00
8678.00	91.44	87.45	6353.84	2167.72	-232.78	2172.54	2.79	95.00
8772.00	90.00	86.87	6352.65	2261.66	-228.13	2266.41	1.66	94.00
8866.00	91.24	87.57	6351.63	2355.61	-223.58	2360.29	1.52	94.00
8960.00	90.27	85.84	6350.39	2449.53	-218.18	2454.13	2.12	94.00
9055.00	90.23	87.70	6349.98	2544.46	-212.83	2548.97	1.96	95.00
9150.00	90.57	90.16	6349.31	2639.45	-211.05	2643.94	2.61	95.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
9244.00	90.84	89.16	6348.15	2733.43	-210.50	2737.93	1.10	94.00
9339.00	90.77	88.90	6346.82	2828.42	-208.89	2832.91	0.28	95.00
9433.00	91.01	87.84	6345.36	2922.41	-206.22	2926.86	1.15	94.00
9528.00	90.07	89.38	6344.47	3017.40	-203.92	3021.82	1.89	95.00
9623.00	91.62	89.78	6343.07	3112.38	-203.22	3116.81	1.68	95.00
9717.00	89.13	88.97	6342.46	3206.37	-202.19	3210.79	2.79	94.00
9812.00	88.79	87.94	6344.19	3301.35	-199.63	3305.74	1.14	95.00
9907.00	88.69	88.68	6346.27	3396.32	-196.83	3400.68	0.79	95.00
10001.00	89.80	88.86	6347.51	3490.31	-194.81	3494.64	1.19	94.00
10095.00	89.36	88.69	6348.20	3584.30	-192.80	3588.62	0.50	94.00
10190.00	90.24	88.65	6348.53	3679.30	-190.59	3683.59	0.92	95.00
10284.00	90.54	88.58	6347.90	3773.30	-188.32	3777.56	0.33	94.00
10379.00	89.97	89.40	6347.48	3868.30	-186.64	3872.55	1.05	95.00
10471.00	90.57	89.63	6347.05	3960.29	-185.87	3964.54	0.70	92.00
10562.00	92.05	89.08	6344.97	4051.26	-184.85	4055.51	1.73	91.00
10653.00	92.32	89.02	6341.51	4142.19	-183.34	4146.43	0.31	91.00
10745.00	92.90	88.68	6337.32	4234.10	-181.50	4238.32	0.73	92.00
10837.00	91.14	87.13	6334.09	4326.02	-178.14	4330.19	2.54	92.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
10929.00	89.90	87.97	6333.25	4417.99	-174.21	4422.10	1.63	92.00
11020.00	90.07	88.13	6333.28	4508.98	-171.12	4513.05	0.26	91.00
11111.00	91.51	90.50	6332.03	4599.96	-170.03	4604.03	3.05	91.00
11203.00	91.92	90.80	6329.28	4691.87	-171.08	4695.98	0.55	92.00
11295.00	92.08	90.17	6326.07	4783.78	-171.86	4787.92	0.71	92.00
11386.00	91.14	89.61	6323.51	4874.73	-171.69	4878.88	1.21	91.00
11478.00	91.21	88.92	6321.62	4966.71	-170.50	4970.85	0.75	92.00
11569.00	91.68	88.83	6319.33	5057.68	-168.71	5061.81	0.52	91.00
11661.00	89.80	89.20	6318.15	5149.67	-167.13	5153.78	2.08	92.00
11753.00	89.09	87.89	6319.04	5241.66	-164.79	5245.74	1.61	92.00
11844.00	89.87	89.65	6319.86	5332.65	-162.84	5336.72	2.11	91.00
11936.00	90.03	89.79	6319.94	5424.64	-162.39	5428.71	0.24	92.00
12028.00	89.06	89.32	6320.67	5516.63	-161.67	5520.71	1.18	92.00
12119.00	90.40	89.23	6321.10	5607.63	-160.52	5611.70	1.48	91.00
12211.00	90.80	89.93	6320.13	5699.62	-159.84	5703.69	0.88	92.00
12302.00	90.37	89.78	6319.20	5790.60	-159.62	5794.68	0.50	91.00
12394.00	90.70	88.42	6318.33	5882.59	-158.17	5886.67	1.53	92.00
12485.00	90.37	88.29	6317.48	5973.58	-155.56	5977.62	0.39	91.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
12577.00	90.44	87.47	6316.84	6065.56	-152.15	6069.56	0.89	92.00
12668.00	90.64	86.14	6315.98	6156.50	-147.09	6160.41	1.48	91.00
12759.00	90.30	88.32	6315.24	6247.45	-142.69	6251.30	2.42	91.00
12851.00	89.66	89.99	6315.26	6339.45	-141.33	6343.28	1.94	92.00
12943.00	89.46	90.01	6315.96	6431.43	-141.33	6435.28	0.22	92.00
13035.00	90.17	89.65	6316.26	6523.41	-141.06	6527.28	0.86	92.00
13126.00	90.47	89.44	6315.75	6614.41	-140.33	6618.27	0.41	91.00
13218.00	90.07	88.86	6315.32	6706.40	-138.96	6710.26	0.77	92.00
13310.00	92.24	89.99	6313.46	6798.37	-138.04	6802.23	2.67	92.00
13401.00	91.81	89.56	6310.24	6889.31	-137.69	6893.17	0.67	91.00
13493.00	91.28	89.61	6307.76	6981.27	-137.02	6985.14	0.58	92.00
13585.00	90.64	88.82	6306.23	7073.25	-135.76	7077.11	1.11	92.00
13676.00	89.36	88.51	6306.23	7164.25	-133.64	7168.09	1.44	91.00
13768.00	89.19	88.47	6307.39	7256.24	-131.22	7260.05	0.19	92.00
13860.00	90.17	88.00	6307.90	7348.23	-128.39	7352.00	1.18	92.00
13952.00	90.47	88.24	6307.39	7440.22	-125.37	7443.95	0.42	92.00
14043.00	89.93	87.25	6307.07	7531.20	-121.78	7534.88	1.23	91.00
14135.00	90.20	87.92	6306.96	7623.17	-117.90	7626.79	0.78	92.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
14227.00	89.03	87.47	6307.58	7715.15	-114.20	7718.72	1.37	92.00
14319.00	89.87	87.43	6308.47	7807.11	-110.10	7810.62	0.91	92.00
14410.00	91.27	88.08	6307.56	7898.09	-106.53	7901.54	1.70	91.00
14501.00	90.40	88.04	6306.23	7989.07	-103.45	7992.48	0.96	91.00
14593.00	90.94	89.55	6305.15	8081.06	-101.51	8084.45	1.74	92.00
14684.00	90.84	89.56	6303.74	8172.04	-100.80	8175.44	0.11	91.00
14775.00	90.57	89.45	6302.62	8263.03	-100.02	8266.43	0.32	91.00
14867.00	89.97	88.71	6302.19	8355.03	-98.53	8358.41	1.04	92.00
14959.00	91.27	88.66	6301.19	8447.02	-96.42	8450.38	1.42	92.00
15051.00	90.97	88.88	6299.39	8539.00	-94.45	8542.34	0.41	92.00
15142.00	89.93	87.95	6298.67	8629.99	-91.94	8633.30	1.53	91.00
15234.00	90.37	88.75	6298.43	8721.98	-89.29	8725.26	0.99	92.00
15326.00	91.14	89.66	6297.22	8813.97	-88.01	8817.24	1.29	92.00
15417.00	91.37	89.15	6295.22	8904.95	-87.07	8908.22	0.61	91.00
15509.00	91.11	89.28	6293.23	8996.93	-85.80	9000.19	0.32	92.00
15600.00	91.44	89.42	6291.20	9087.90	-84.77	9091.16	0.40	91.00
15695.00	92.99	90.88	6287.53	9182.80	-85.01	9186.08	2.24	95.00
15790.00	90.50	90.64	6284.63	9277.70	-86.28	9281.02	2.63	95.00
15885.00	90.44	90.34	6283.85	9372.66	-87.09	9376.01	0.32	95.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
15980.00	90.03	90.33	6283.46	9467.63	-87.65	9471.01	0.42	95.00
16075.00	89.29	90.50	6284.02	9562.59	-88.34	9566.01	0.80	95.00
16169.00	89.19	90.22	6285.26	9656.56	-88.93	9660.00	0.31	94.00
16264.00	89.19	90.36	6286.60	9751.52	-89.42	9754.99	0.15	95.00
16345.00	88.99	89.87	6287.88	9832.49	-89.59	9835.97	0.65	81.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft

GAMMA RAY

Scientific Drilling

5" = 100' FEET MD