

**Cathedral Energy Services**

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405-261-6011 (Office)
405-261-6188 (Fax)

SAM 3N-25H-M166**Scale 5":100' - MD****9/20/2018 11:35 AM****Oper. Company:** Crestone Peak Resources**Well:** SAM 3N-25H-M166**Field:** DJ Basin**Rig:** Ensign 140**Well ID:** 05-123-46122**Job Number:** 185269

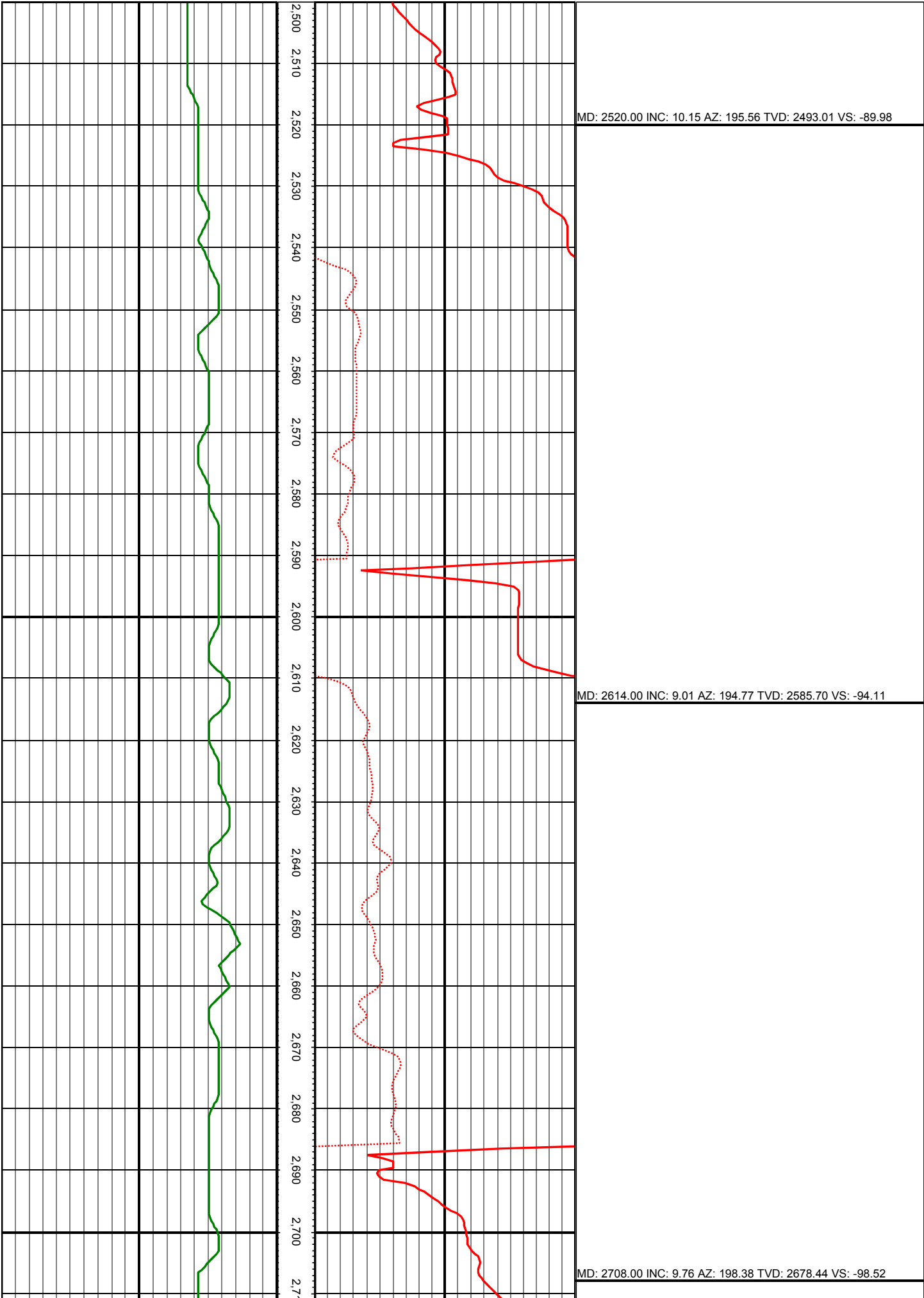
Notes: Gamma Ray Log
Section Plan: 89.91°
Datum: NAD 1983 (NADCON CONUS)
Magnetic North: 8.18°
Grid Convergence: -.51°
Gamma Averaging: 7% Smoothing

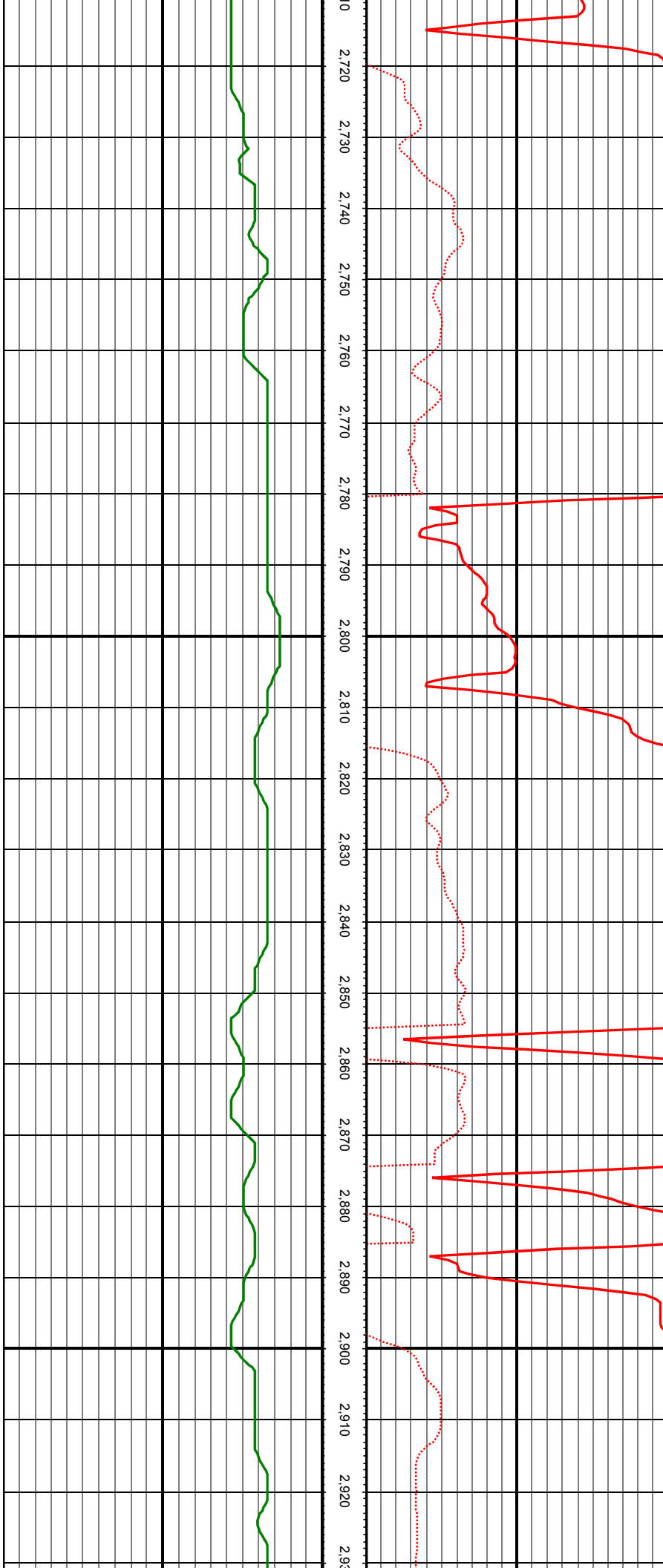
State: Colorado**County:** Adams**Country:** United States**Location:** S25-T1N-R66W**Start Date:** 09/17/2018 17:00:00**End Date:** 09/20/2018 11:00:00**Latitude:** 40.018538**Longitude:** -104.733856**Elev GL:** 5,086.00**Elev DF:** 5,109.00**Elev KB:** 5,109.00**Notes:** Log & Survey Depths Relative to Kelly Bushing (KB) Depth**Operator 1:** Daniel Stevens**Operator 2:** Riley Rasmussen**Notes:** Maximum Temperature: 235.00°F

Tool Run Data	Run #1	Run #2	Run #3	Run #4	Run #5
Tool S/N	BTDM-1874	BTDM-1528			
Bit Size	8.50	8.50			
Cal Factor	5.360	5.640			
Survey Offset	72.00	72.00			
Gamma Offset	55.37	55.37			
Resistivity Offset	0.00	0.00			
Start Depth	2438.00	2495.00			
StartDate	9/17/2018	9/18/2018			
StartTime	17:00	02:00			
EndDepth	2495.00	12098.00			
EndDate	9/18/2018	9/20/2018			
EndTime	01:00	18:00			
Mud Type	OBM / INVERT	OBM / INVERT			
Mud Weight	9.85 PPG	9.70 PPG			
Funnel Viscosity	50.00 SEC/QT	43.00 SEC/QT			
Plastic Viscosity	18.00 CP	20.00 CP			
Yield Point	11.00 LBS/100FT2	7.00 LBS/100FT2			
Gel Strength	8.00/10.00/12.00 LBS/100FT2	5.00/7.00/8.00 LBS/100FT2			
Solids Content	8.30 %	7.00 %			
Sand Content	0.01 %	0.01 %			
Mud Alkalinity	3.50 PPG	3.50 PPG			
Filtrate Alkalinity	0.00 API	0.00 API			
Chlorides	30,000.00 MG/L	33,000.00 MG/L			
Temperature	109.00° F	235.00° F			

Hole Data			Casing Data		
Size	From	To	Size	From	To
12.25	0.00	2438.00	9 5/8	0.00	2438.00
8.50	2438.00	12000.00			

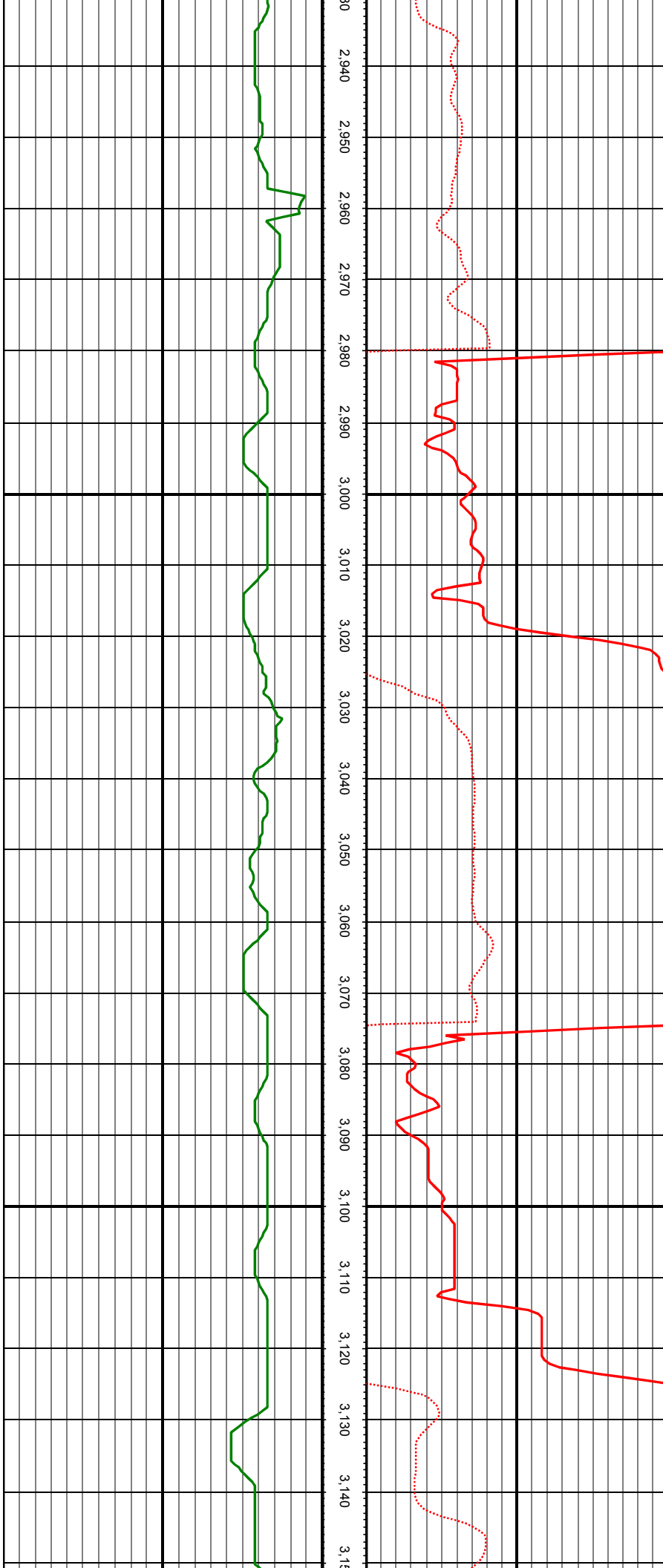
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost damages or expenses incurred or sustained by anyone resulting from an interpretation made by any of our officers, agents, or employees.





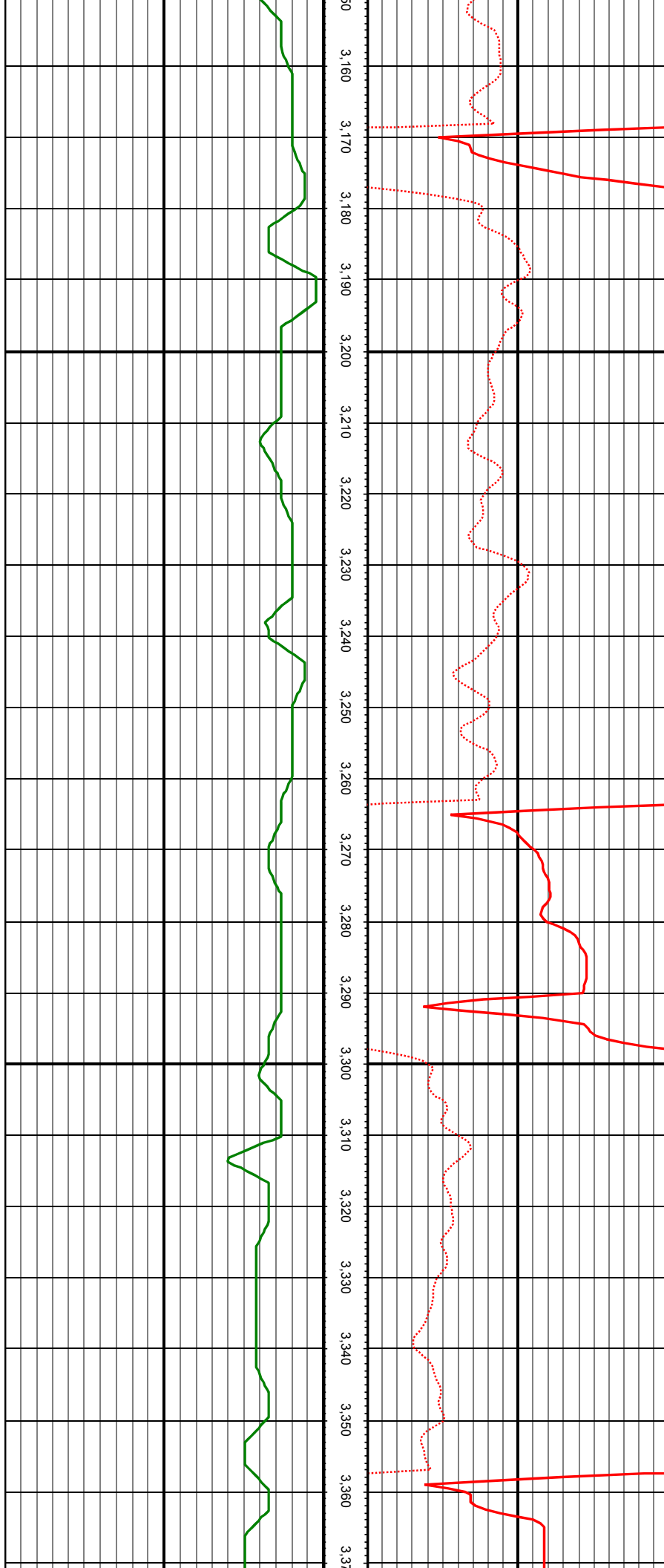
MD: 2814.00 INC: 10.51 AZ: 190.38 TVD: 2782.79 VS: -103.12

MD: 2908.00 INC: 9.32 AZ: 190.29 TVD: 2875.39 VS: -106.05



MD: 3002.00 INC: 9.54 AZ: 197.85 TVD: 2968.12 VS: -109.82

MD: 3097.00 INC: 11.38 AZ: 201.19 TVD: 3061.54 VS: -115.65



MD: 3192.00 INC: 10.46 AZ: 201.19 TVD: 3154.82 VS: -122.18

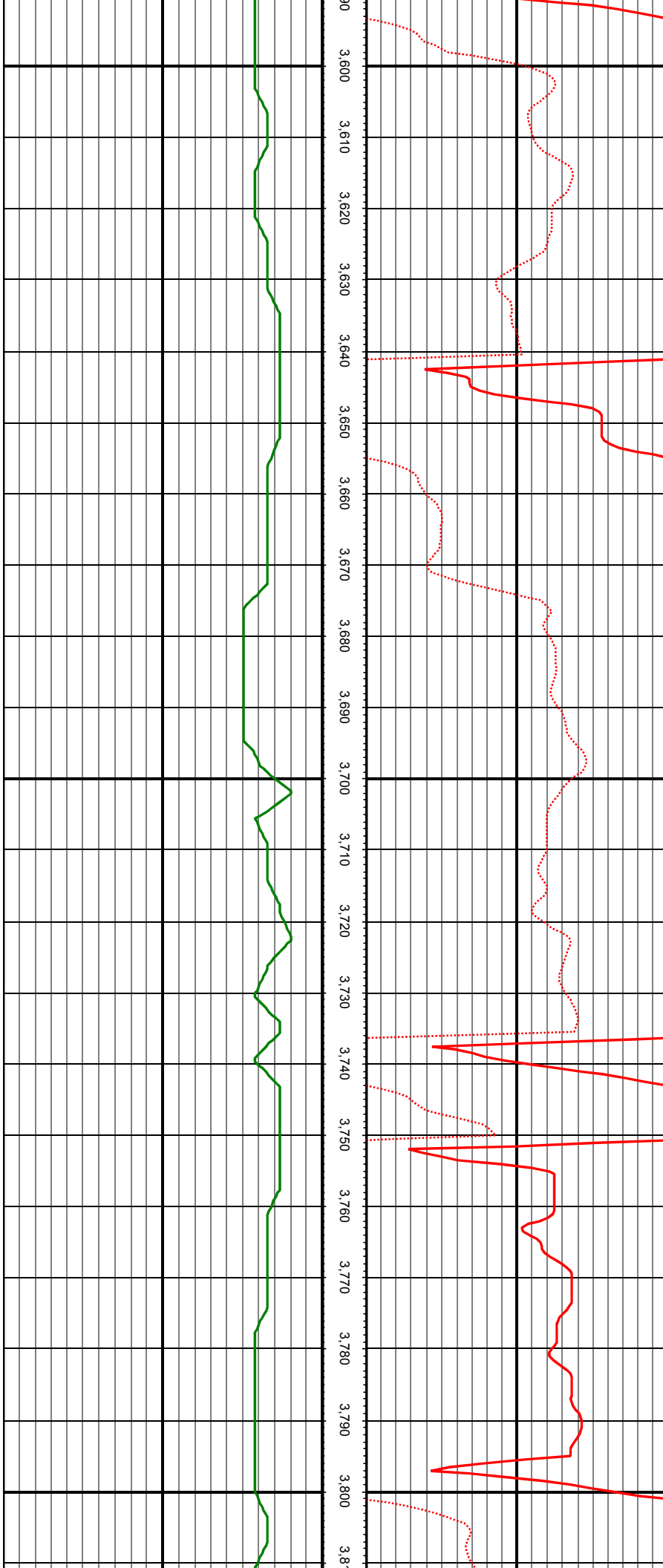
MD: 3287.00 INC: 10.90 AZ: 195.91 TVD: 3248.17 VS: -127.79



MD: 3381.00 INC: 9.76 AZ: 194.24 TVD: 3340.65 VS: -132.21

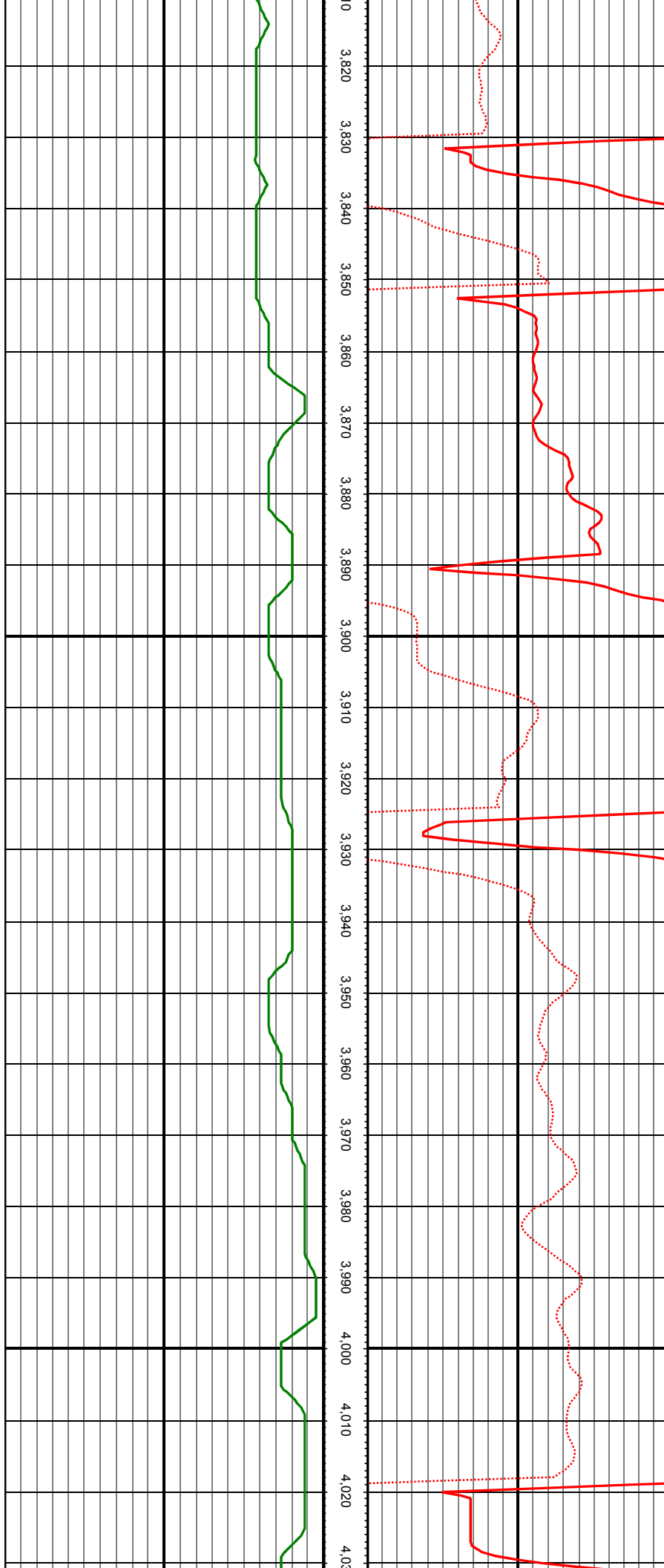
MD: 3476.00 INC: 7.96 AZ: 196.00 TVD: 3434.51 VS: -136.02

MD: 3571.00 INC: 9.49 AZ: 190.11 TVD: 3528.41 VS: -139.23



MD: 3666.00 INC: 8.66 AZ: 189.23 TVD: 3622.22 VS: -141.78

MD: 3760.00 INC: 8.13 AZ: 181.59 TVD: 3715.22 VS: -143.12



MD: 3854.00 INC: 11.65 AZ: 188.71 TVD: 3807.81 VS: -144.77

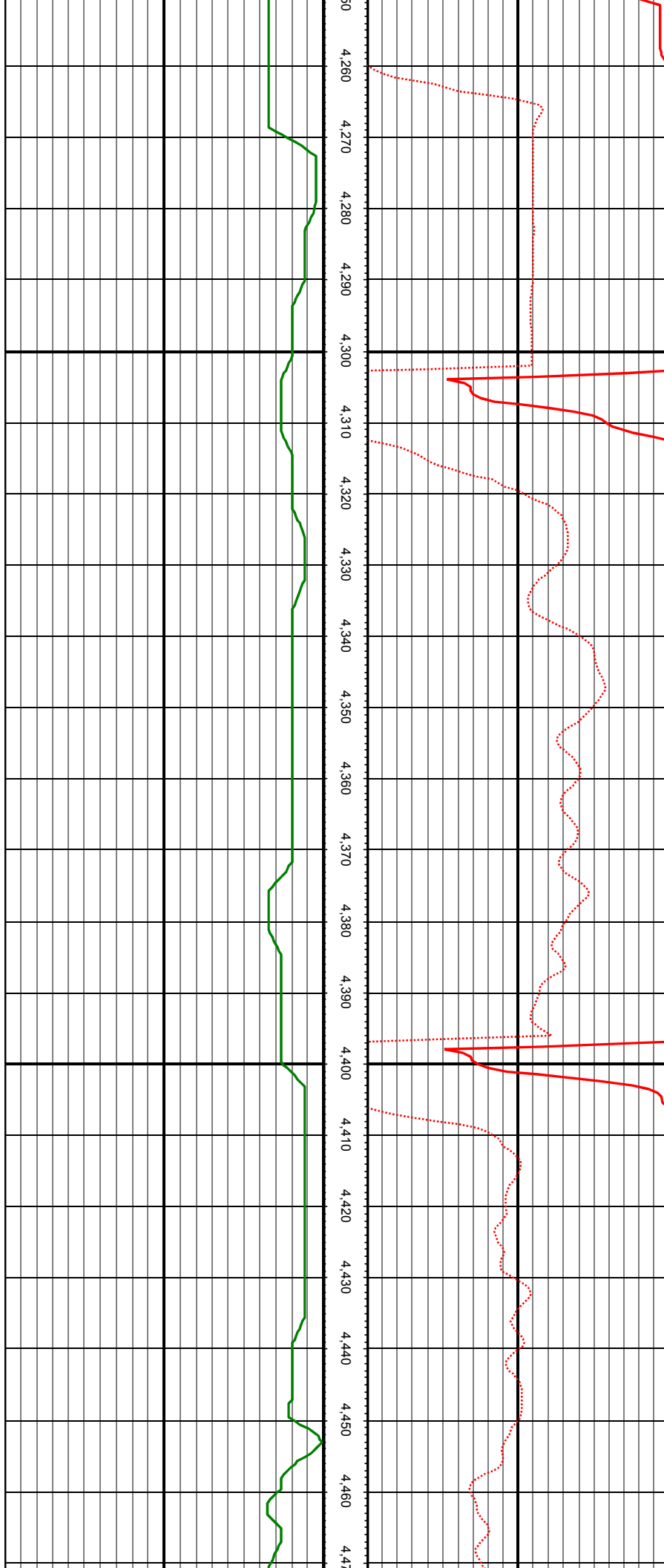
MD: 3949.00 INC: 11.96 AZ: 194.60 TVD: 3900.80 VS: -148.73



MD: 4043.00 INC: 9.19 AZ: 196.62 TVD: 3993.20 VS: -153.36

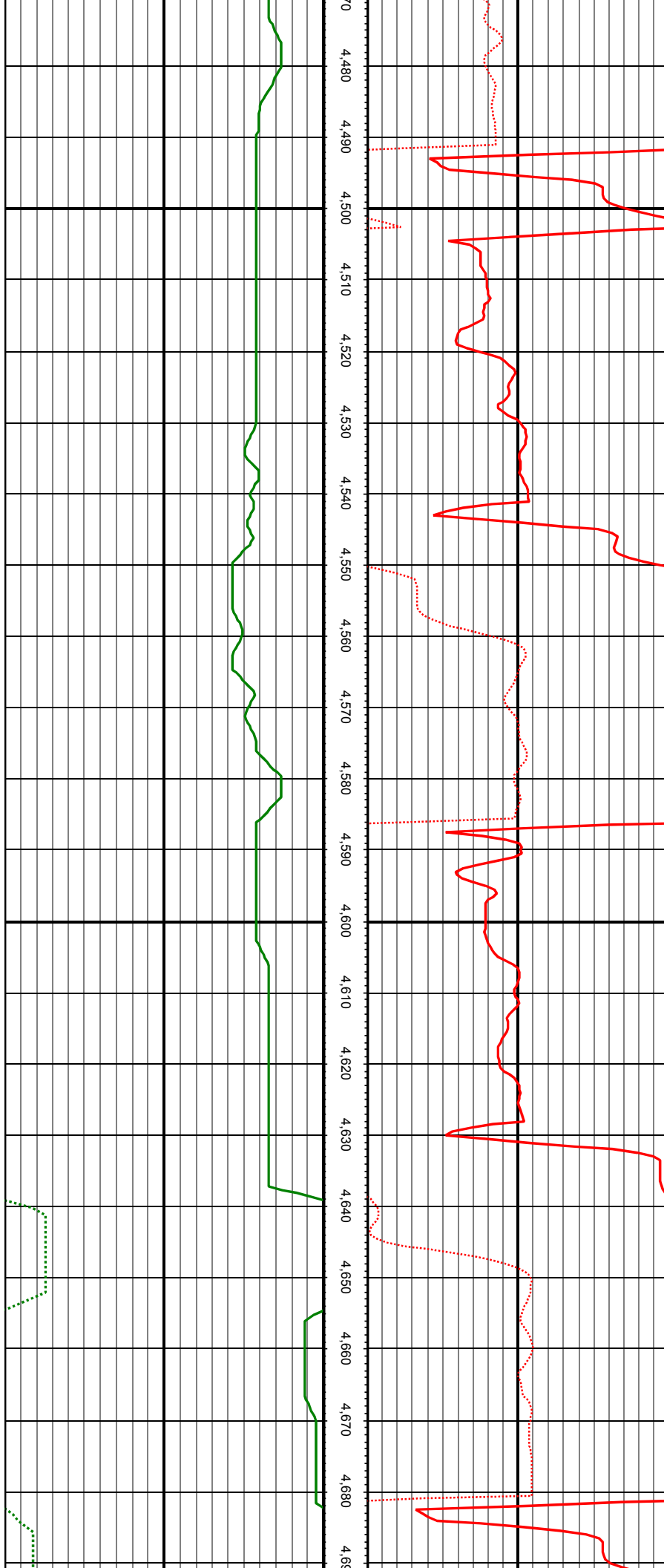
MD: 4138.00 INC: 9.54 AZ: 203.12 TVD: 4086.93 VS: -158.64

MD: 4233.00 INC: 12.53 AZ: 199.08 TVD: 4180.17 VS: -165.13



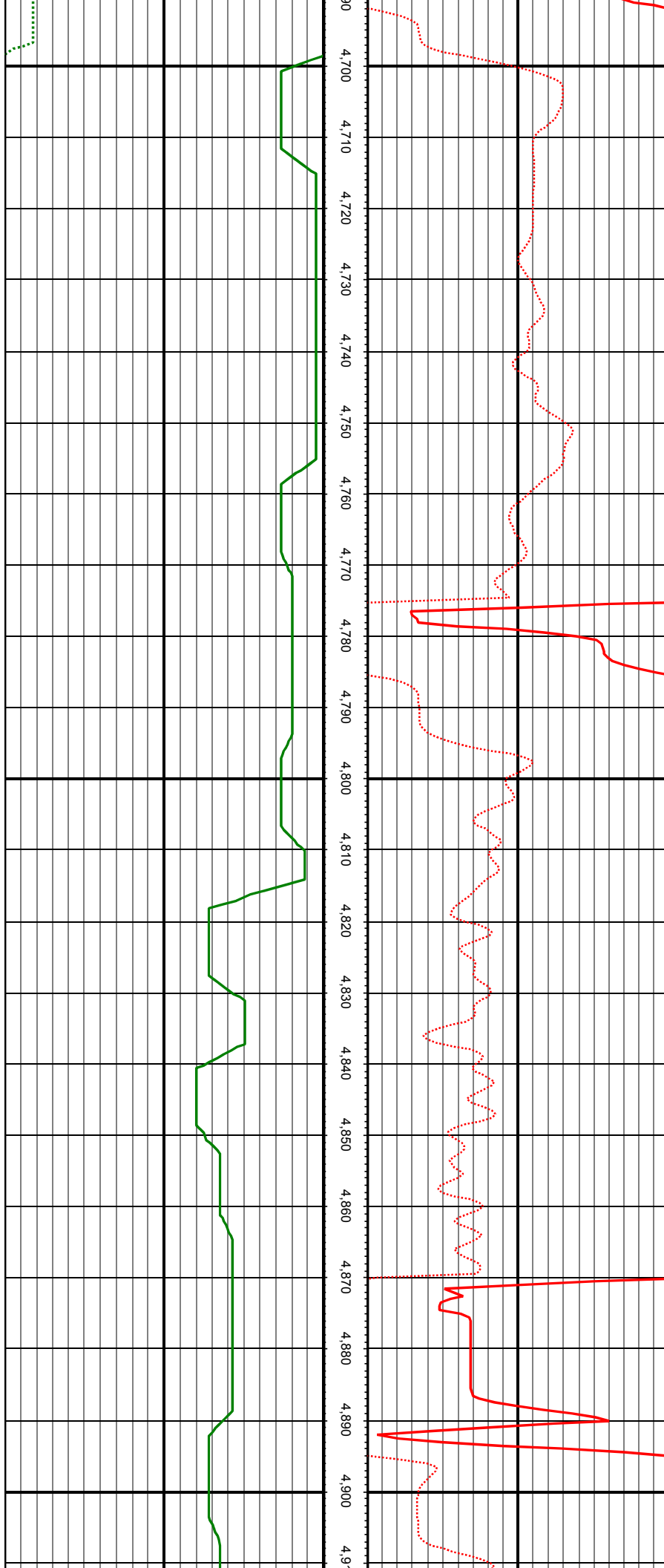
MD: 4327.00 INC: 10.81 AZ: 197.41 TVD: 4272.22 VS: -171.13

MD: 4422.00 INC: 8.13 AZ: 197.85 TVD: 4365.92 VS: -175.88



MD: 4516.00 INC: 8.40 AZ: 190.90 TVD: 4458.95 VS: -179.24

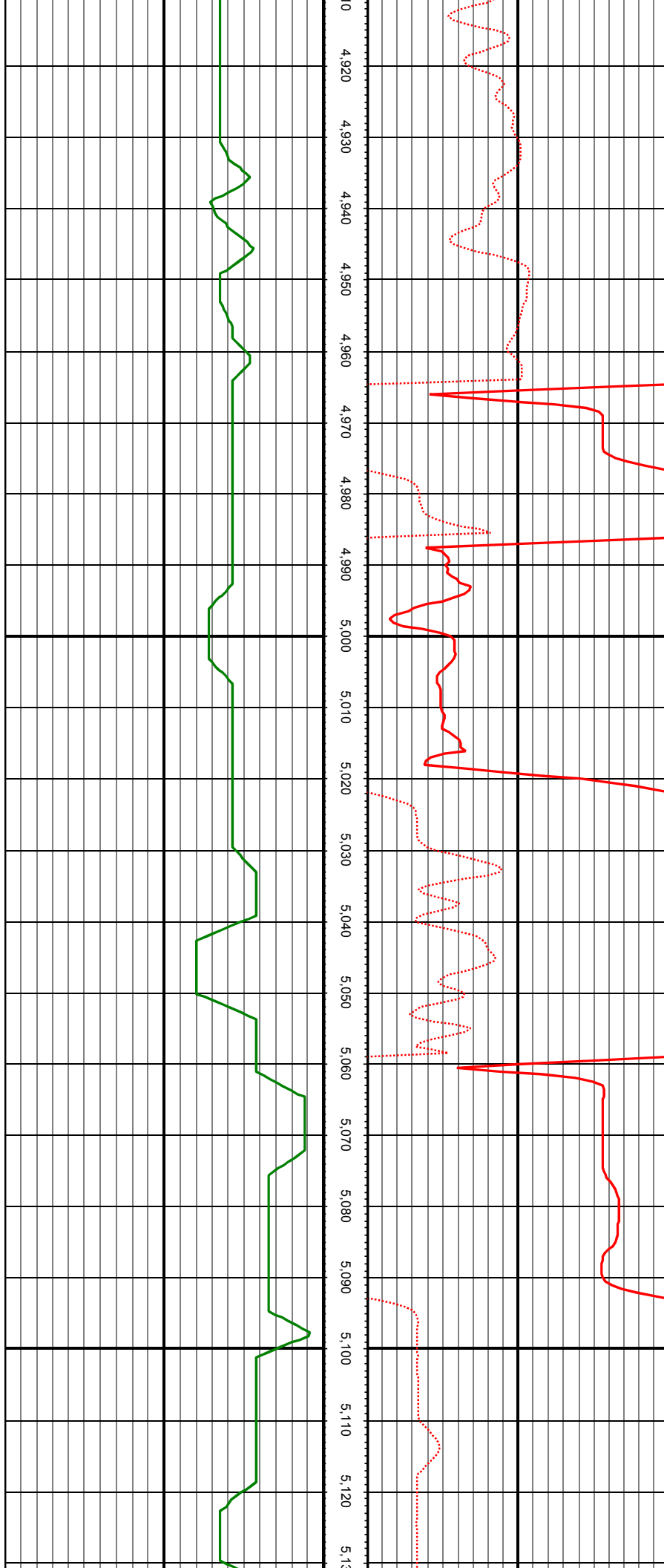
MD: 4611.00 INC: 13.89 AZ: 193.01 TVD: 4552.12 VS: -183.15



MD: 4705.00 INC: 13.63 AZ: 196.53 TVD: 4643.42 VS: -188.87

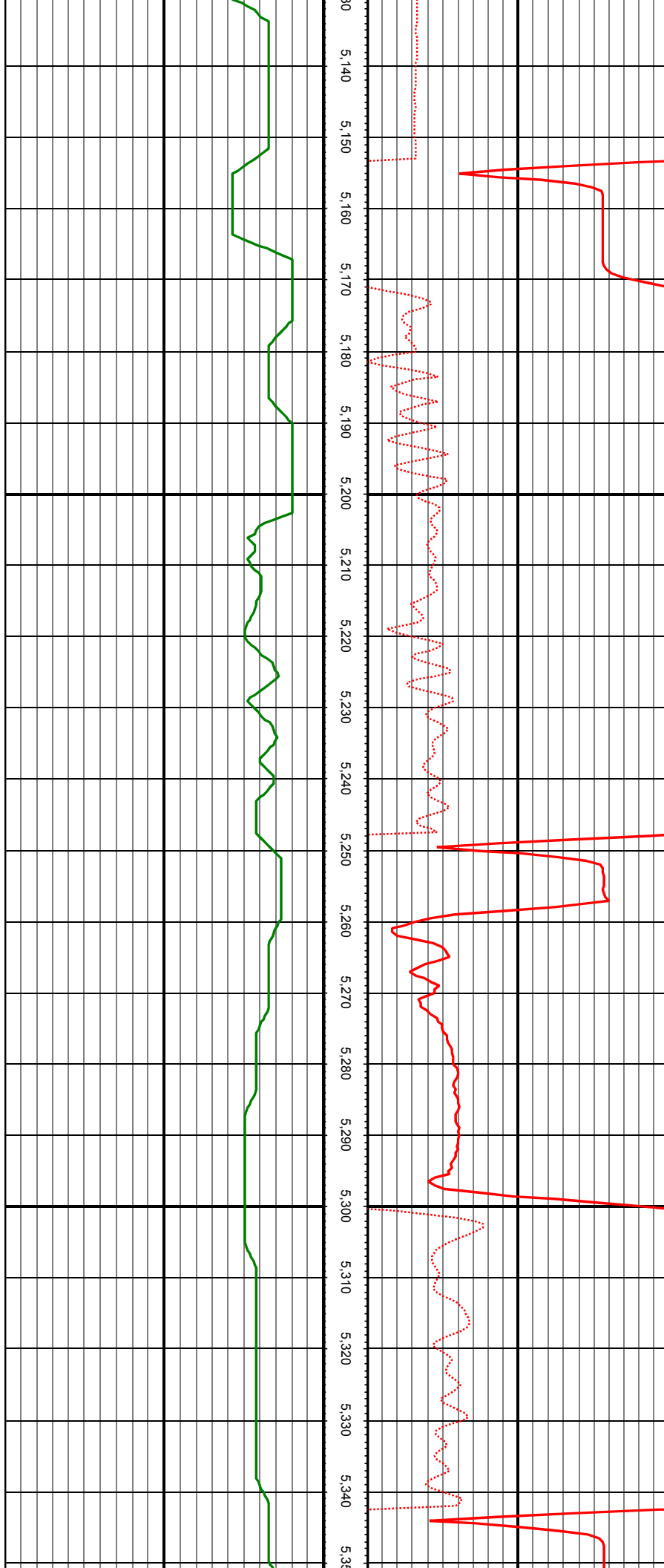
MD: 4800.00 INC: 10.86 AZ: 197.67 TVD: 4736.25 VS: -194.81

MD: 4894.00 INC: 9.49 AZ: 198.81 TVD: 4828.77 VS: -200.02



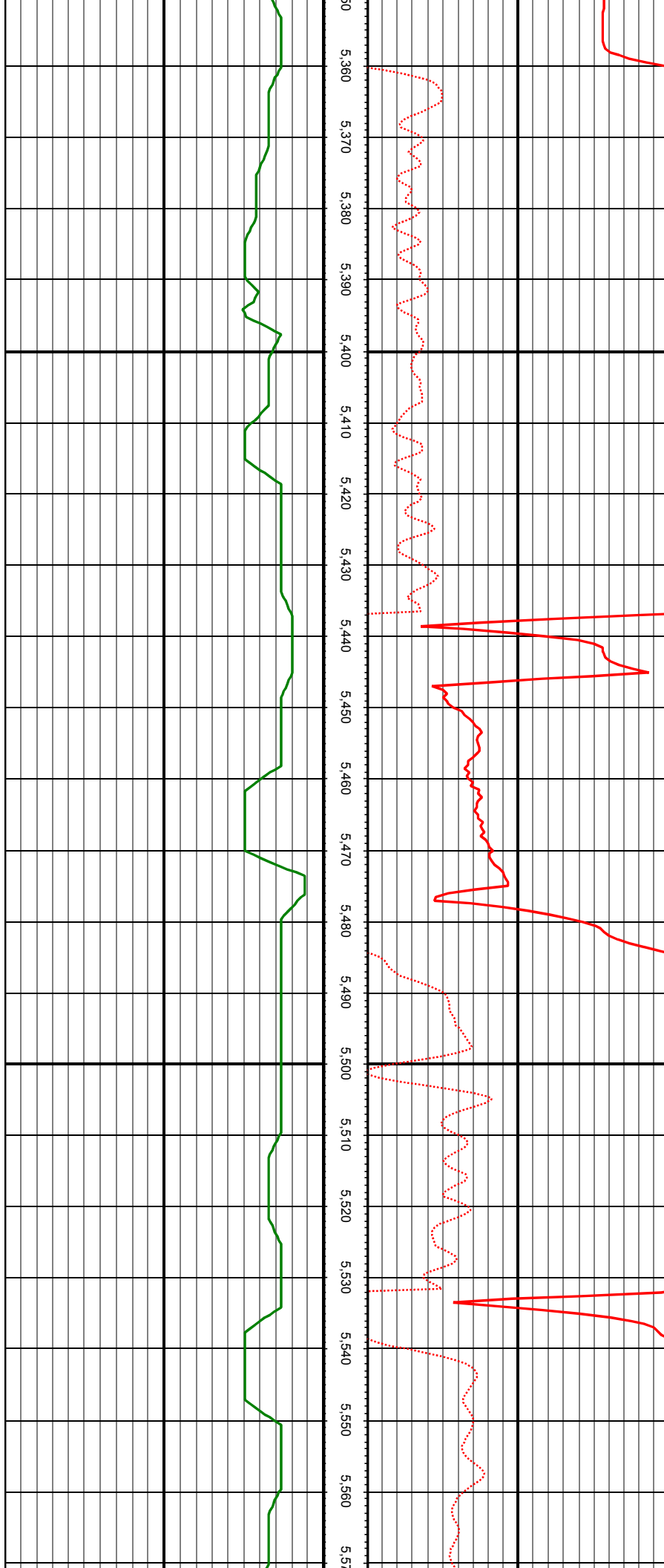
MD: 4989.00 INC: 9.41 AZ: 204.35 TVD: 4922.48 VS: -205.77

MD: 5084.00 INC: 9.76 AZ: 208.22 TVD: 5016.16 VS: -212.80



MD: 5179.00 INC: 8.75 AZ: 210.59 TVD: 5109.92 VS: -220.30

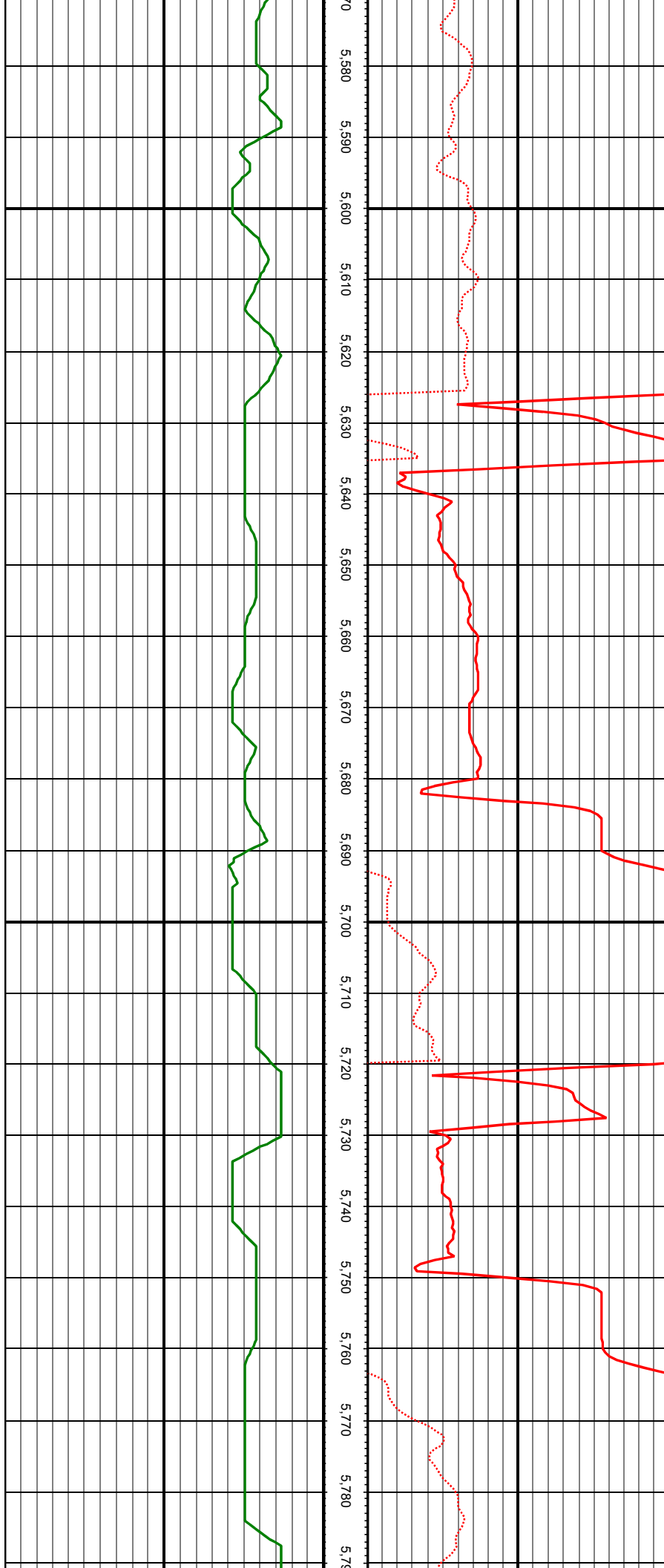
MD: 5274.00 INC: 8.22 AZ: 207.78 TVD: 5203.88 VS: -227.17



MD: 5368.00 INC: 7.91 AZ: 200.22 TVD: 5296.95 VS: -232.55

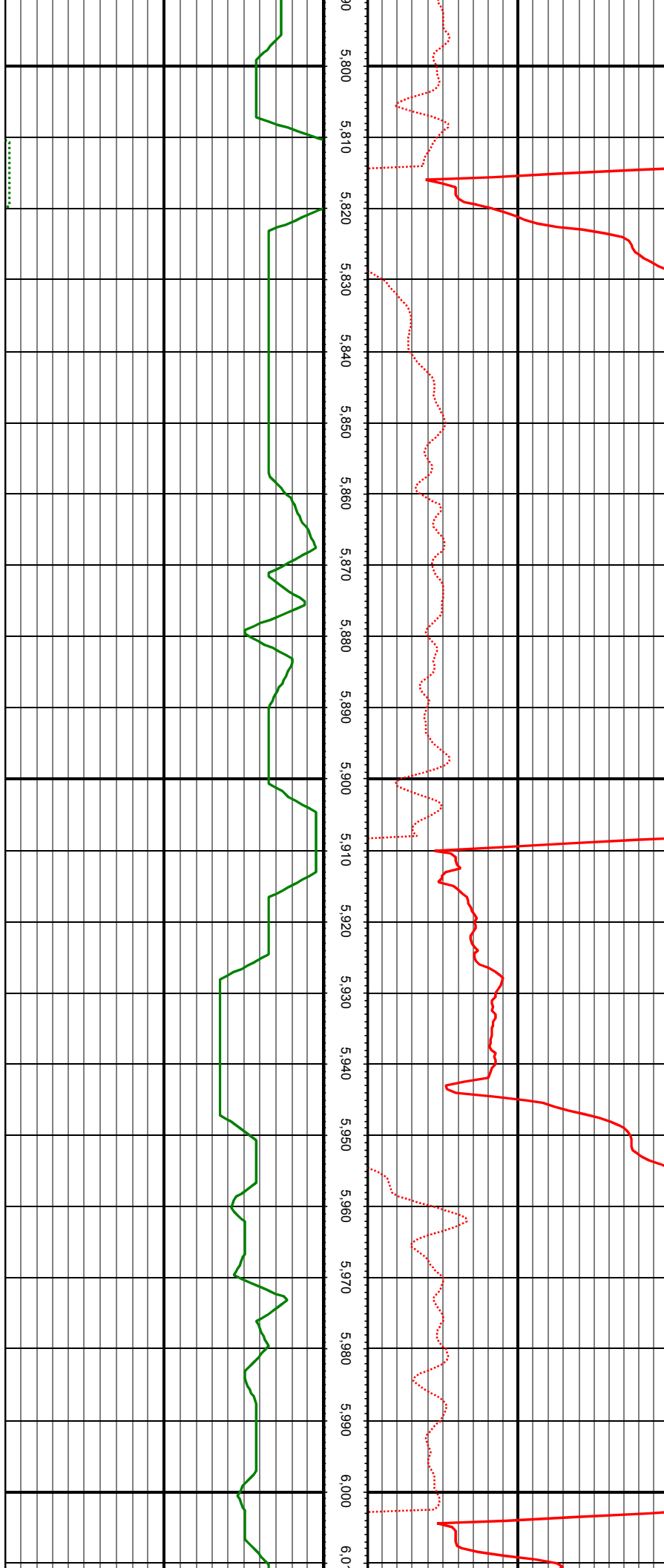
MD: 5462.00 INC: 8.04 AZ: 194.24 TVD: 5390.05 VS: -236.43

MD: 5557.00 INC: 7.08 AZ: 195.47 TVD: 5484.22 VS: -239.64



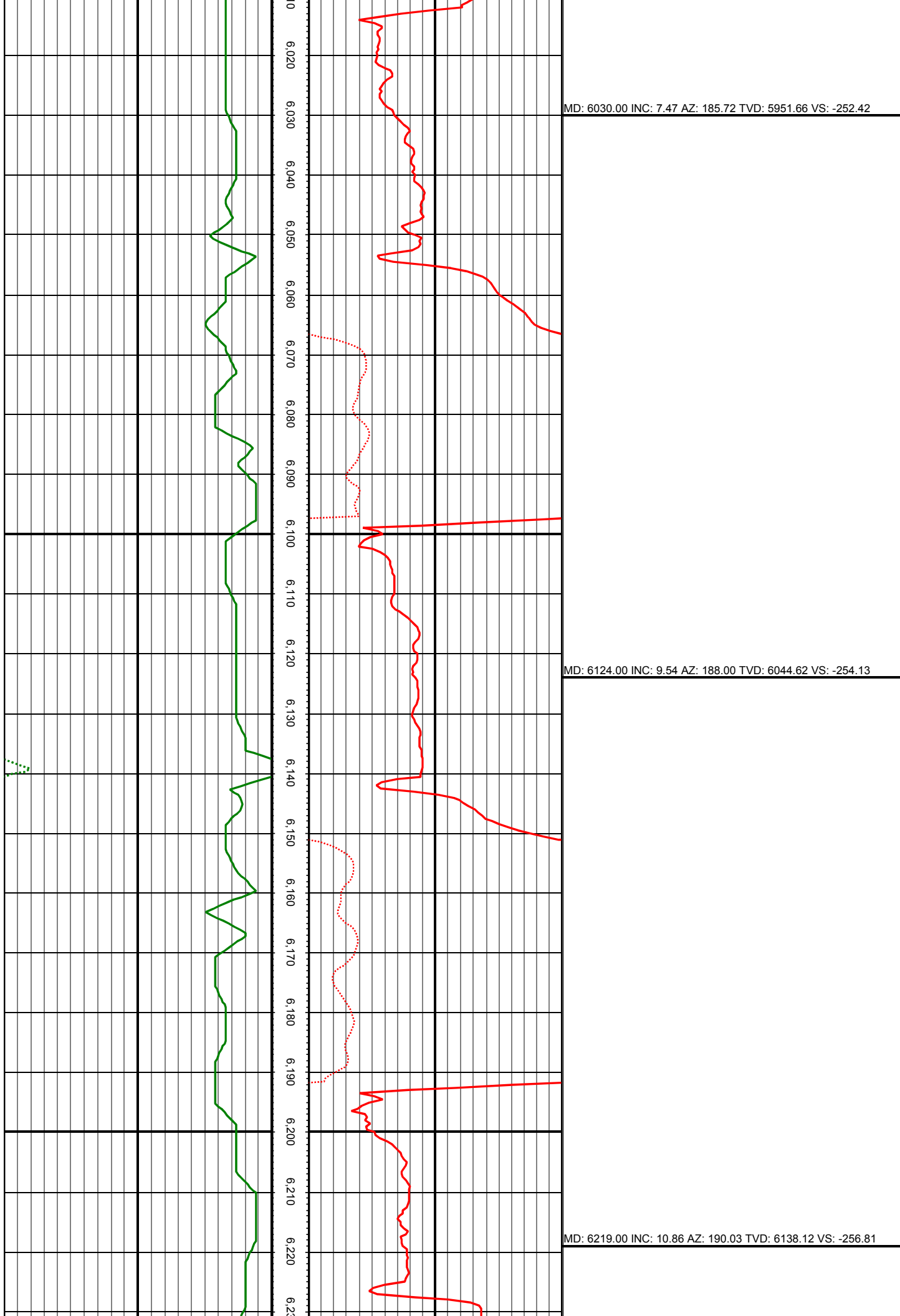
MD: 5651.00 INC: 7.87 AZ: 192.31 TVD: 5577.42 VS: -242.58

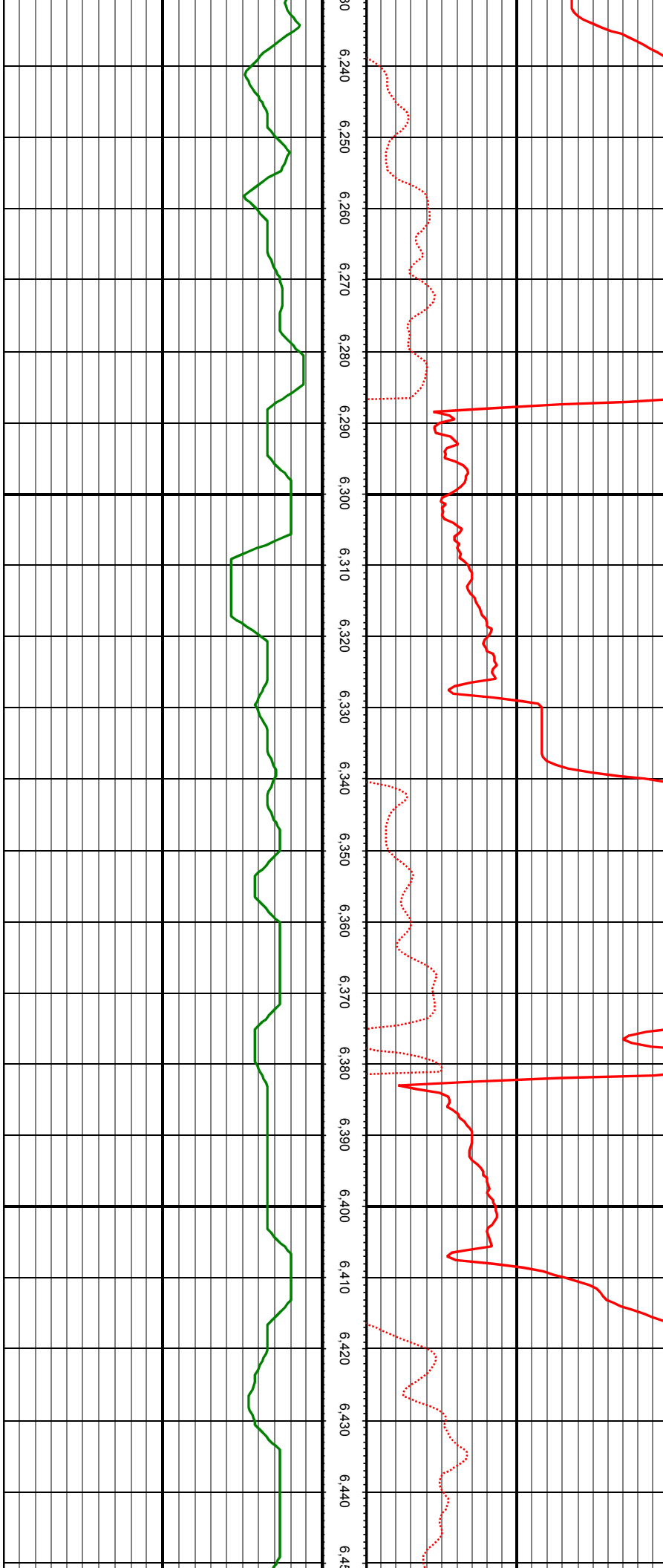
MD: 5745.00 INC: 11.34 AZ: 191.52 TVD: 5670.09 VS: -245.82



MD: 5840.00 INC: 8.40 AZ: 190.20 TVD: 5763.67 VS: -248.94

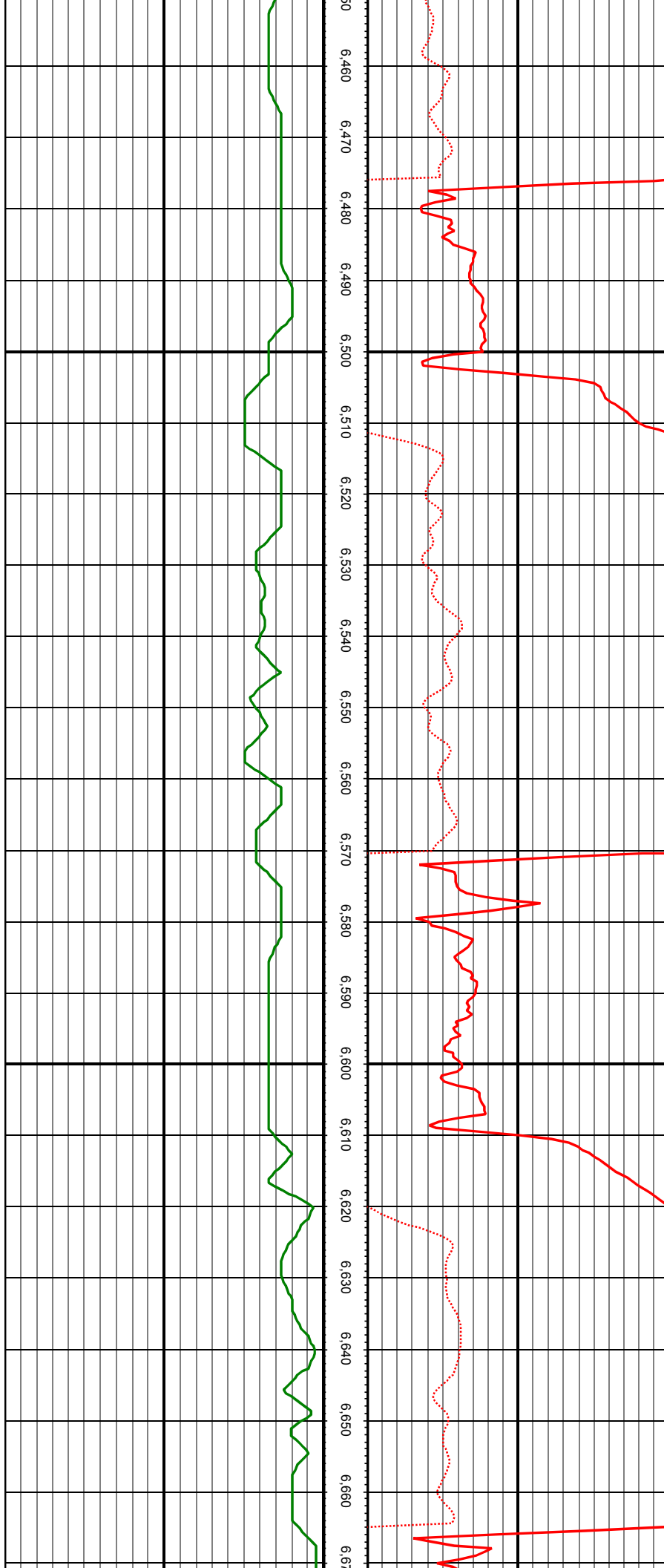
MD: 5935.00 INC: 8.75 AZ: 186.33 TVD: 5857.61 VS: -250.99





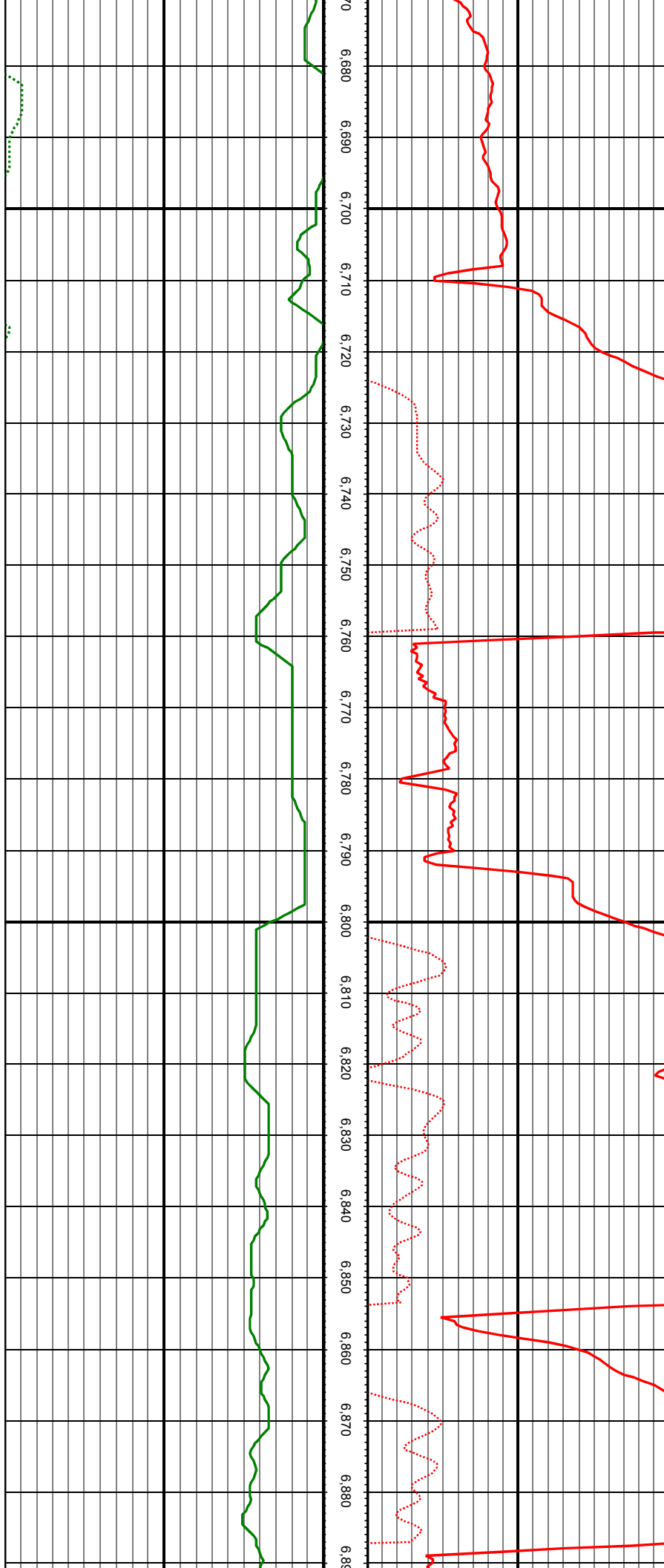
MD: 6314.00 INC: 9.76 AZ: 185.10 TVD: 6231.58 VS: -259.12

MD: 6408.00 INC: 10.24 AZ: 194.51 TVD: 6324.16 VS: -261.94



MD: 6502.00 INC: 9.93 AZ: 188.09 TVD: 6416.71 VS: -265.20

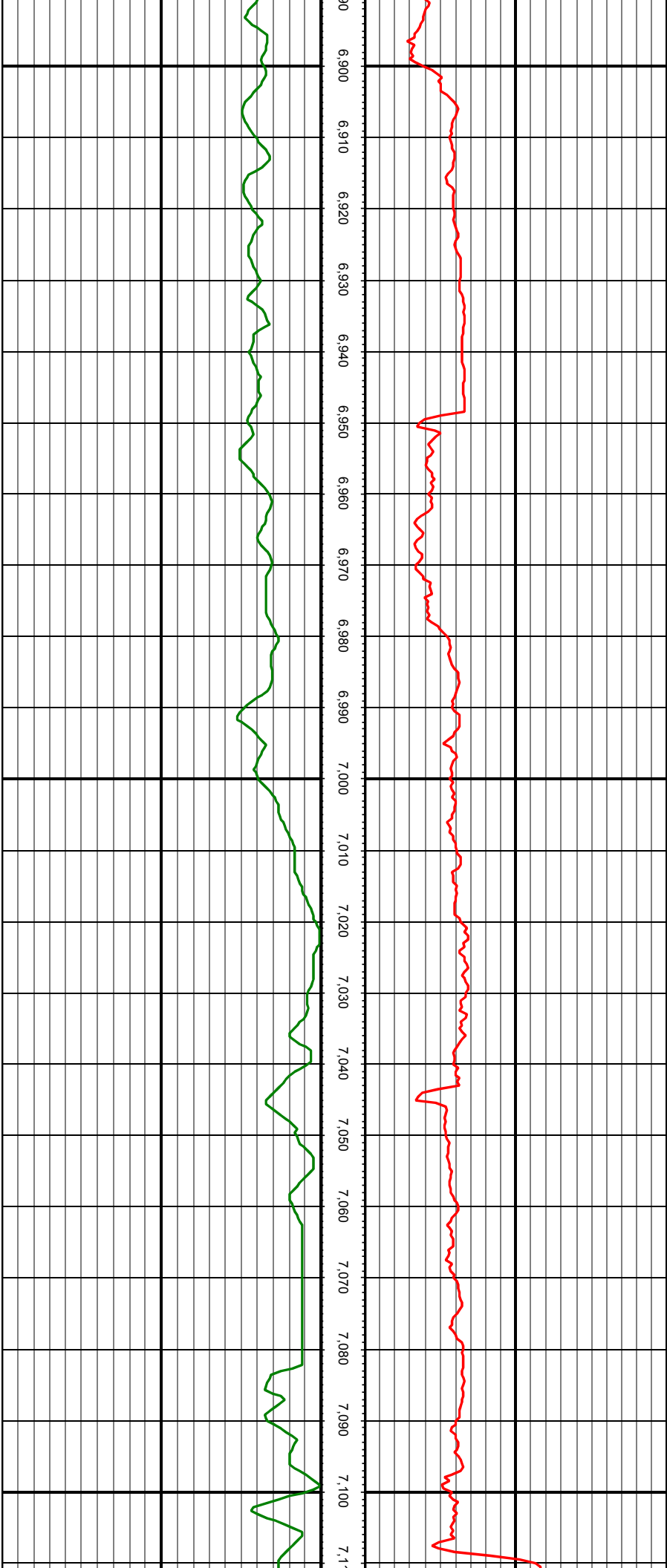
MD: 6597.00 INC: 9.67 AZ: 185.72 TVD: 6510.33 VS: -267.18



MD: 6691.00 INC: 11.16 AZ: 187.92 TVD: 6602.78 VS: -269.24

MD: 6786.00 INC: 12.53 AZ: 179.13 TVD: 6695.76 VS: -270.38

MD: 6880.00 INC: 9.32 AZ: 176.40 TVD: 6788.04 VS: -269.78



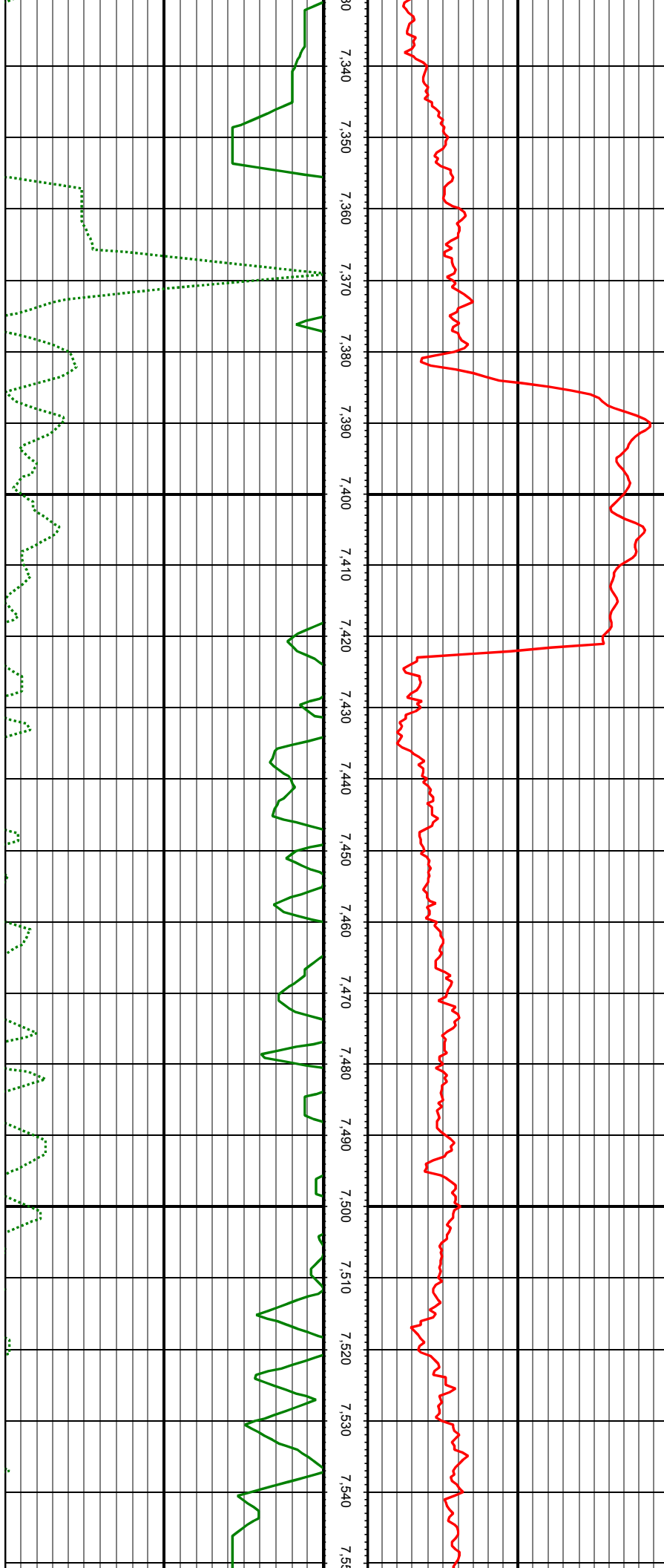
MD: 6975.00 INC: 16.26 AZ: 138.96 TVD: 6880.77 VS: -260.56

MD: 7069.00 INC: 25.10 AZ: 120.86 TVD: 6968.72 VS: -234.76



MD: 7164.00 INC: 29.54 AZ: 115.58 TVD: 7053.11 VS: -196.35

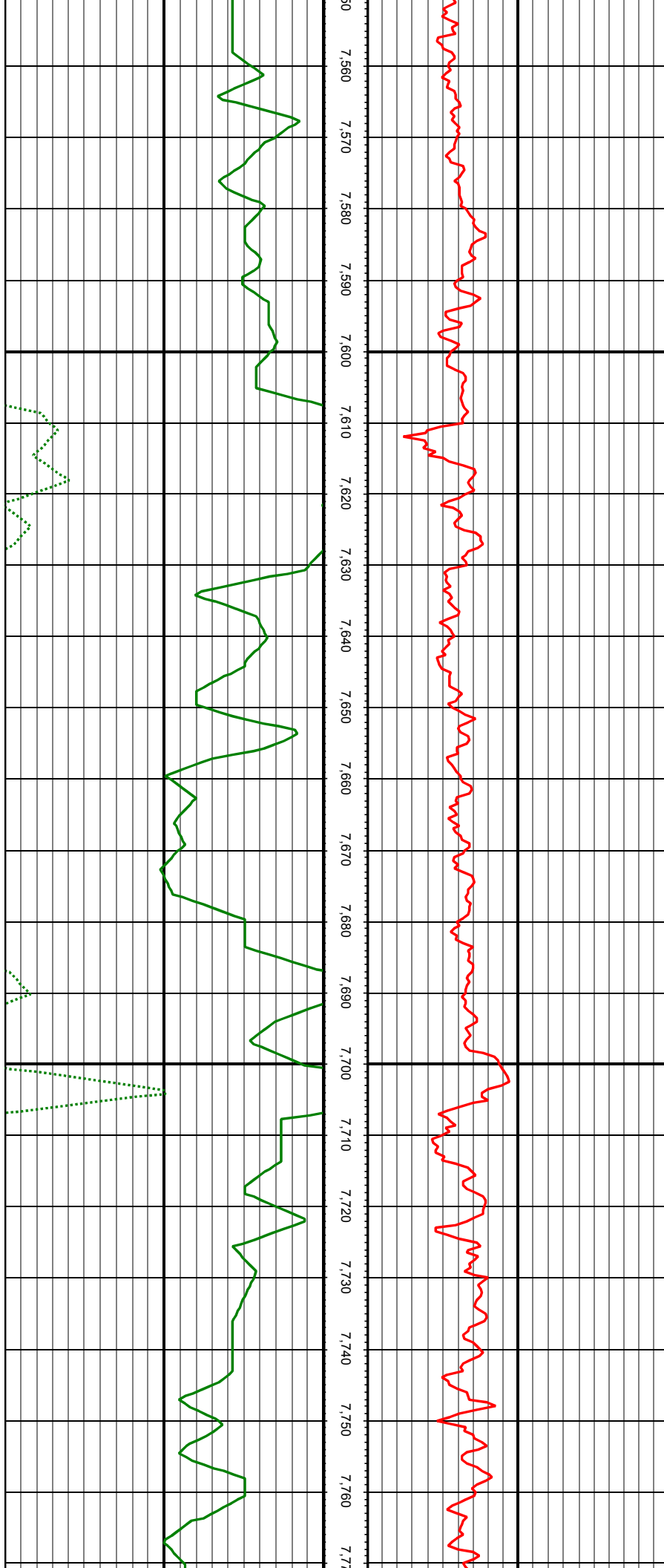
MD: 7259.00 INC: 30.95 AZ: 109.96 TVD: 7135.20 VS: -152.28



MD: 7353.00 INC: 31.52 AZ: 104.24 TVD: 7215.59 VS: -105.76

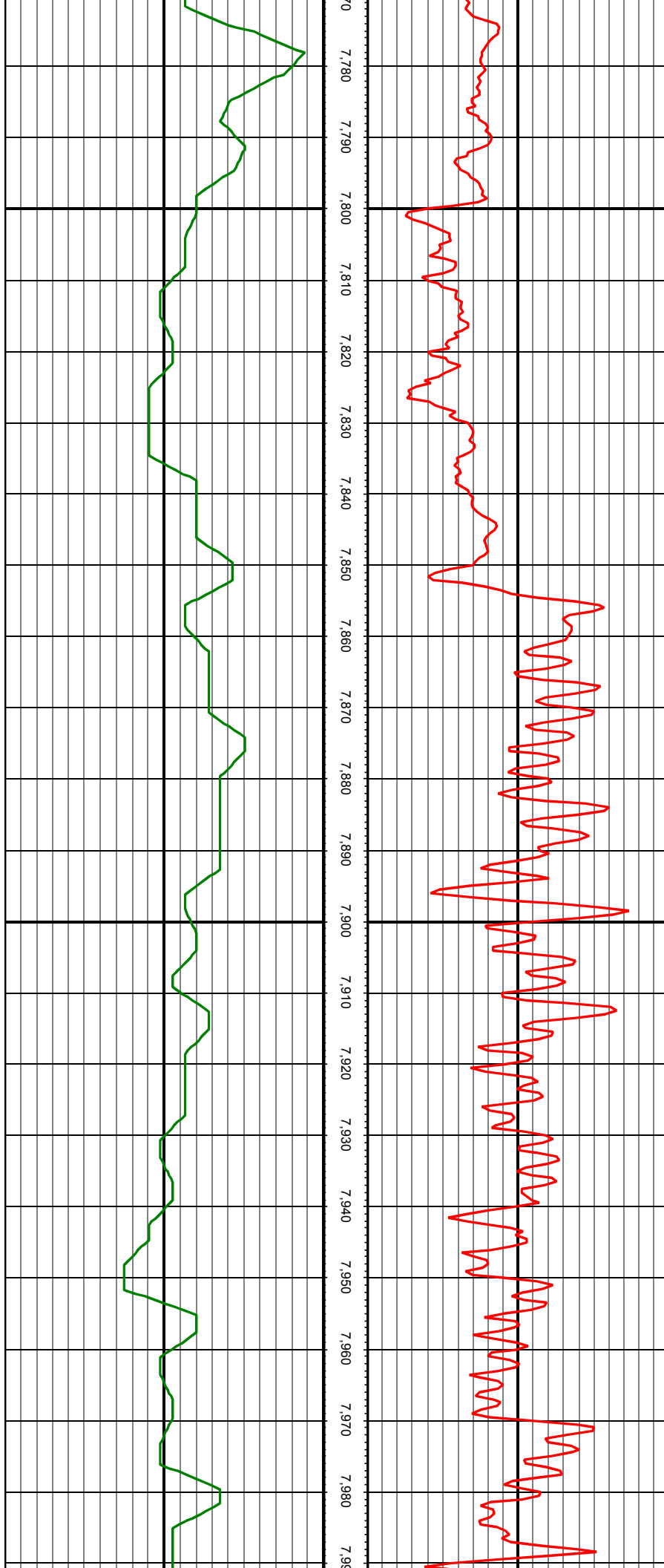
MD: 7448.00 INC: 32.53 AZ: 101.70 TVD: 7296.13 VS: -56.69

MD: 7543.00 INC: 41.63 AZ: 98.27 TVD: 7371.85 VS: -0.34



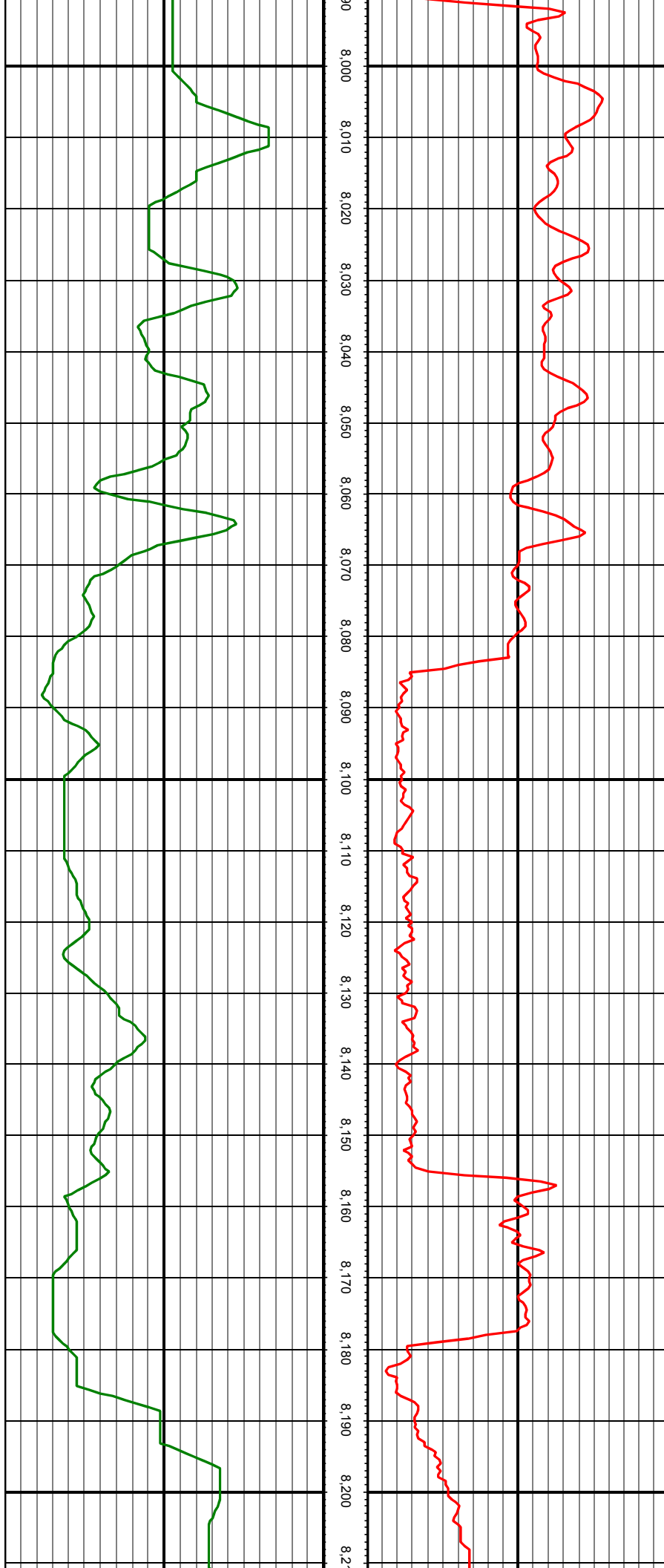
MD: 7637.00 INC: 50.68 AZ: 98.97 TVD: 7436.90 VS: 66.59

MD: 7732.00 INC: 61.45 AZ: 97.92 TVD: 7489.86 VS: 144.43



MD: 7826.00 INC: 74.46 AZ: 93.43 TVD: 7525.08 VS: 230.92

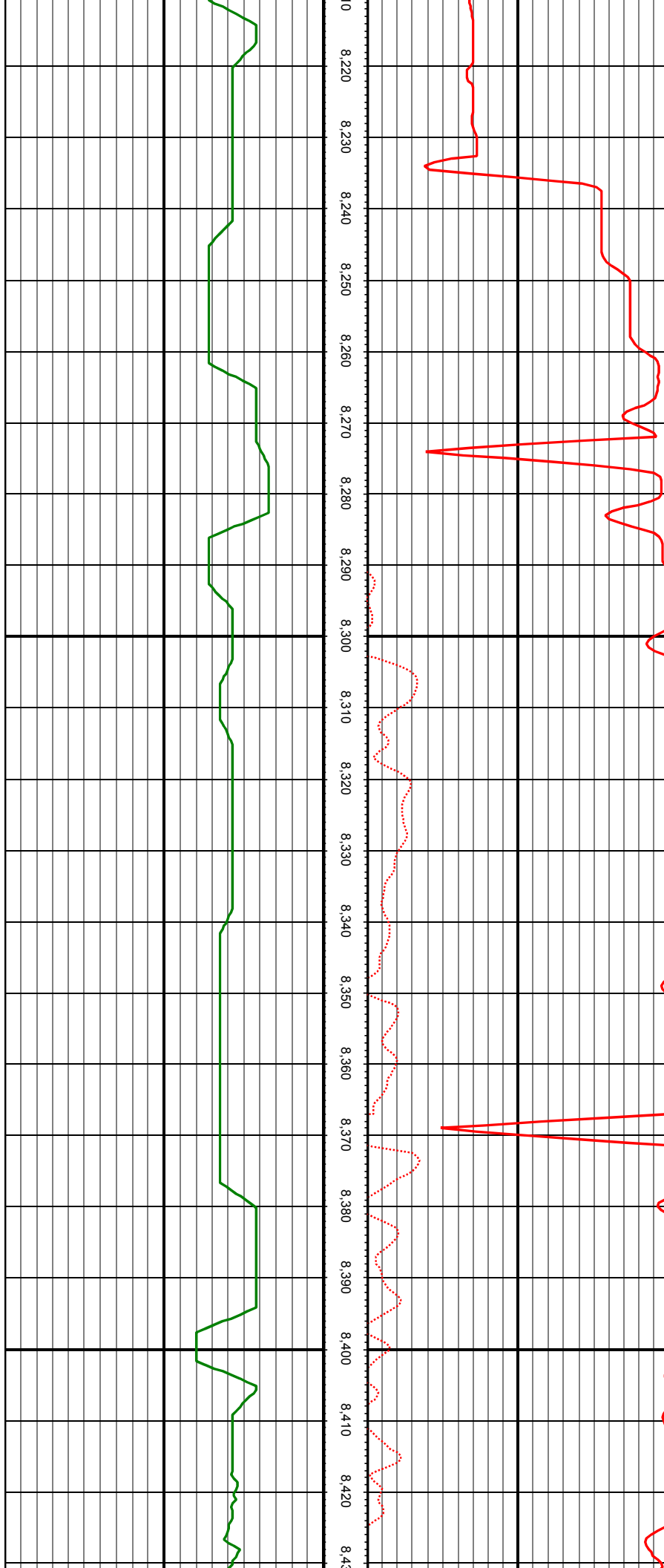
MD: 7921.00 INC: 77.05 AZ: 91.06 TVD: 7548.46 VS: 322.90



MD: 8015.00 INC: 75.74 AZ: 91.24 TVD: 7570.57 VS: 414.24

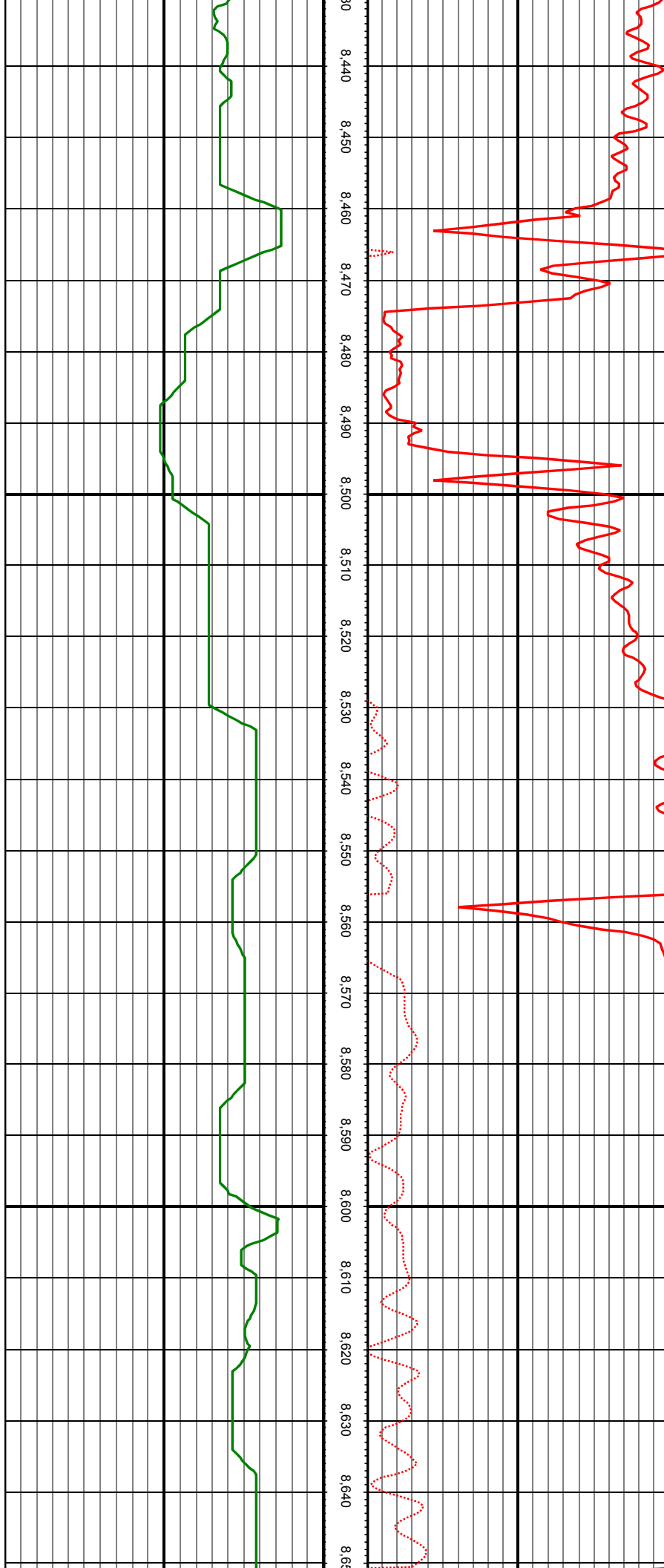
MD: 8110.00 INC: 78.11 AZ: 91.59 TVD: 7592.06 VS: 506.74

MD: 8204.00 INC: 87.78 AZ: 90.01 TVD: 7603.59 VS: 599.91



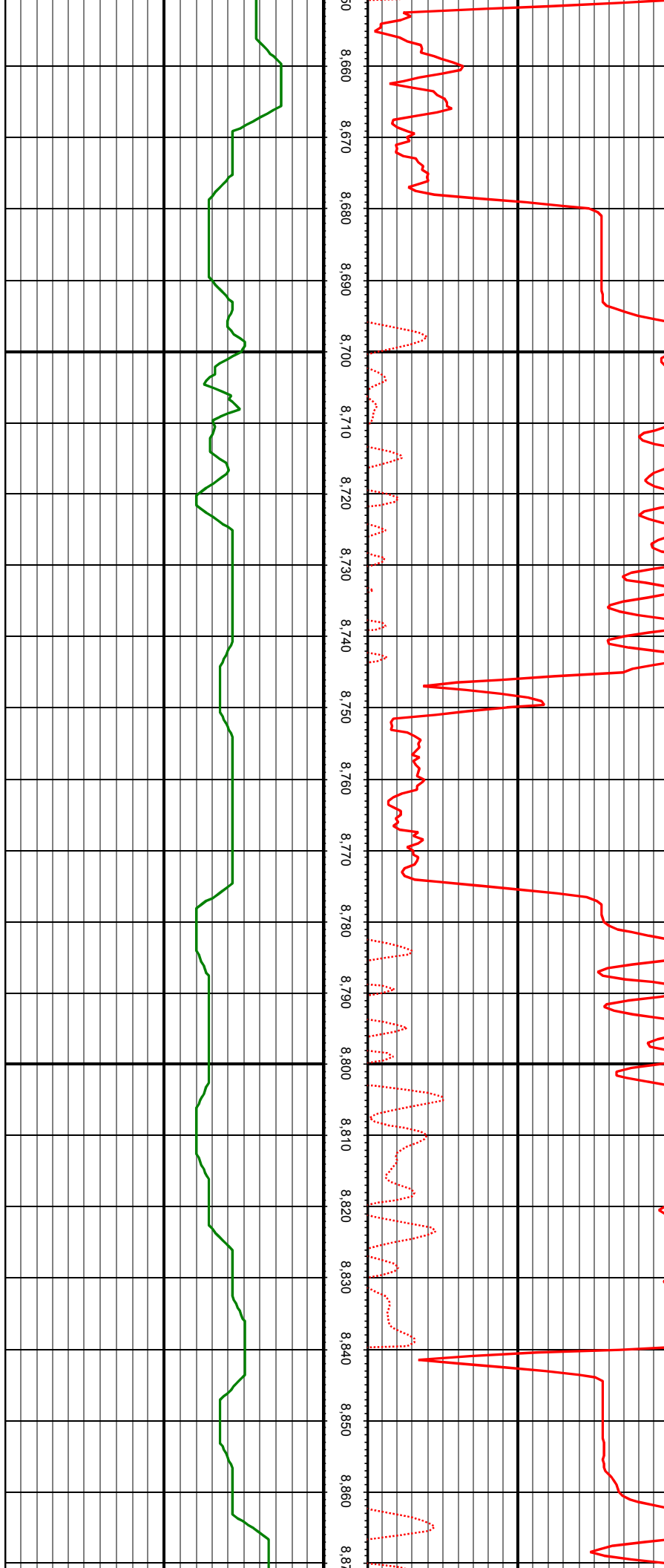
MD: 8299.00 INC: 92.13 AZ: 88.16 TVD: 7603.66 VS: 694.87

MD: 8393.00 INC: 92.66 AZ: 88.07 TVD: 7599.74 VS: 788.74



MD: 8488.00 INC: 89.85 AZ: 85.96 TVD: 7597.65 VS: 883.58

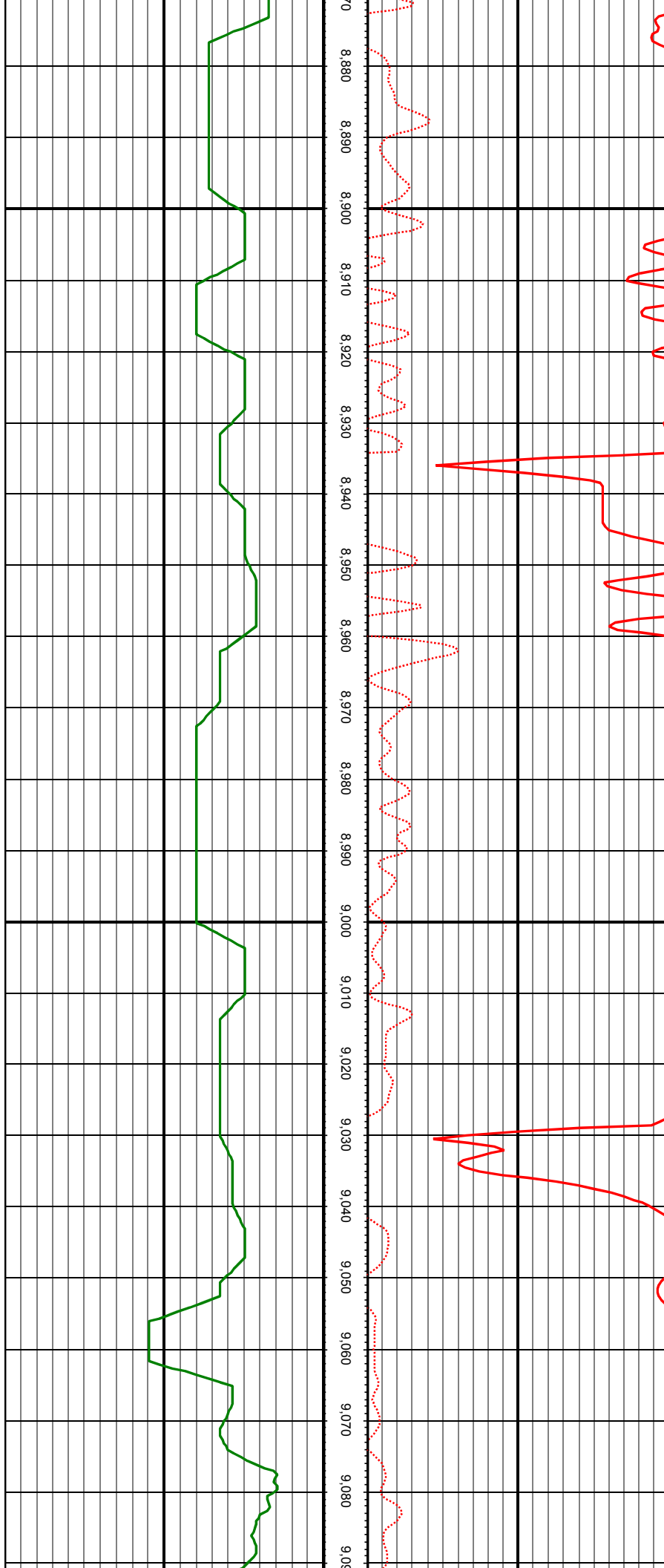
MD: 8582.00 INC: 88.70 AZ: 84.56 TVD: 7598.84 VS: 977.26



MD: 8676.00 INC: 89.19 AZ: 86.84 TVD: 7600.57 VS: 1070.98

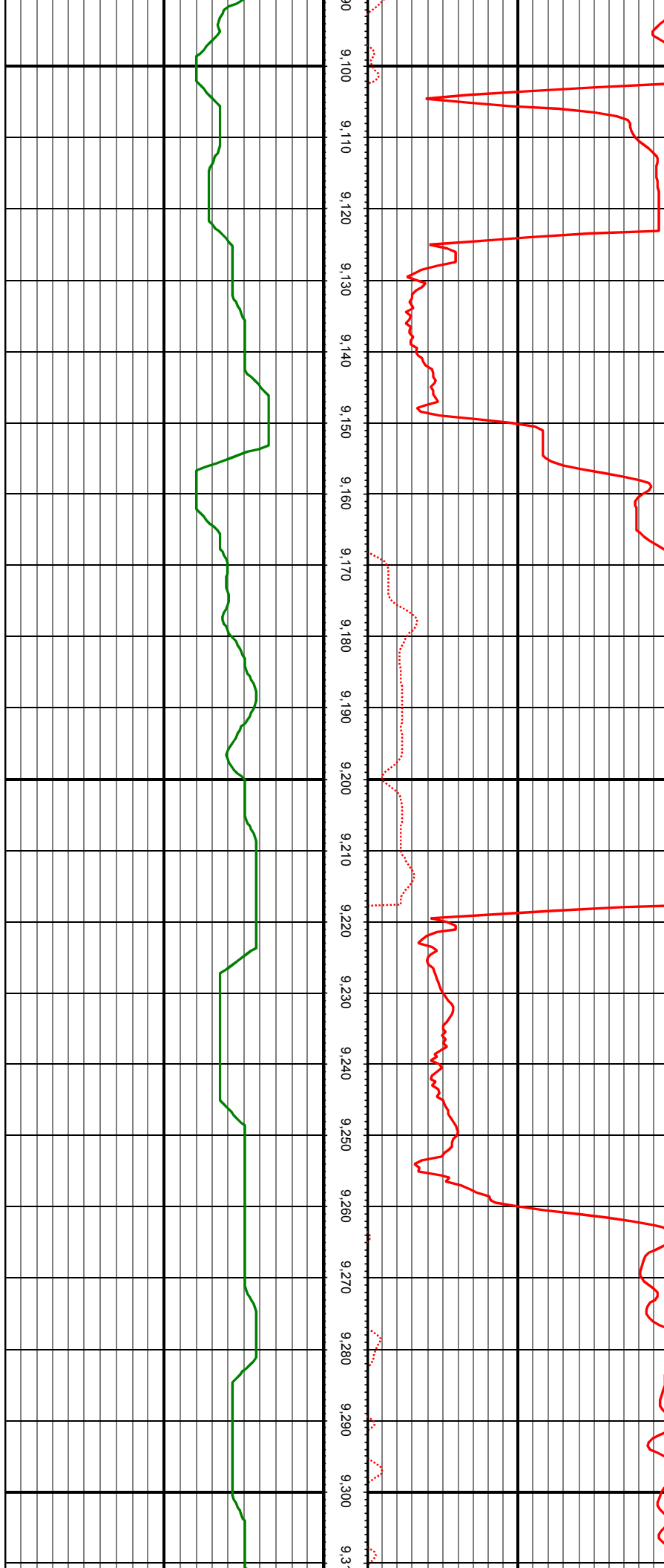
MD: 8771.00 INC: 90.20 AZ: 90.36 TVD: 7601.08 VS: 1165.94

MD: 8866.00 INC: 90.24 AZ: 89.57 TVD: 7600.72 VS: 1260.94



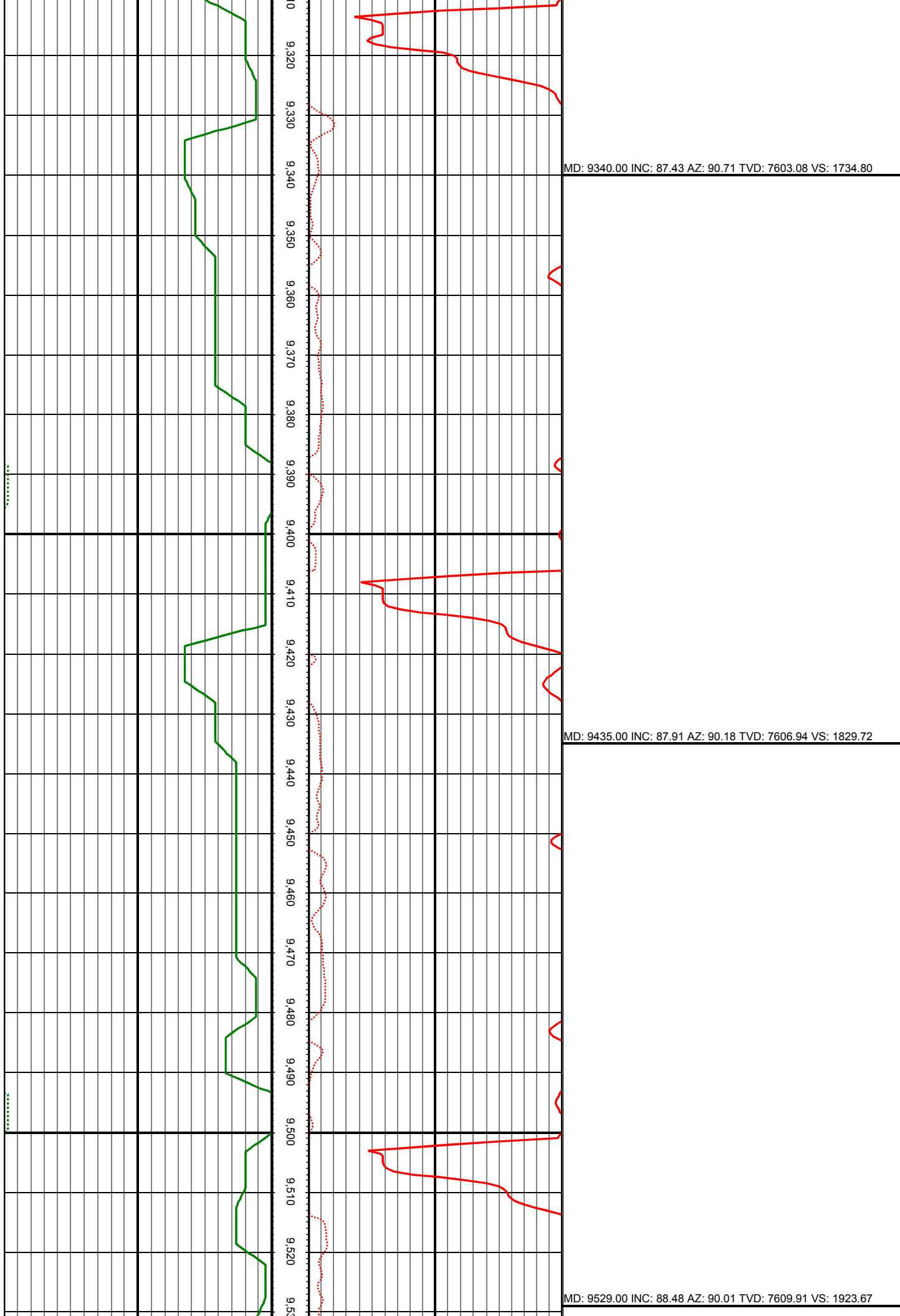
MD: 8960.00 INC: 90.55 AZ: 89.30 TVD: 7600.07 VS: 1354.94

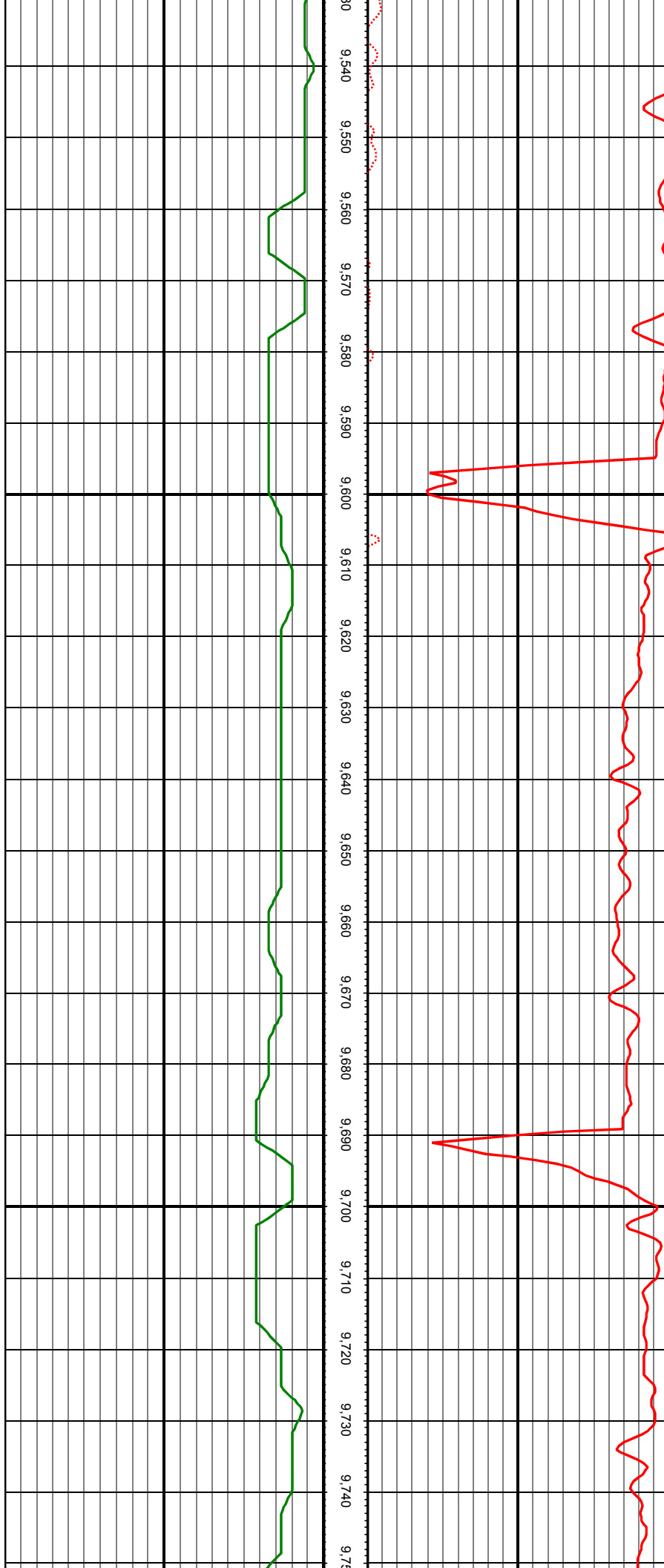
MD: 9056.00 INC: 90.86 AZ: 89.22 TVD: 7598.89 VS: 1450.92



MD: 9150.00 INC: 90.37 AZ: 90.62 TVD: 7597.88 VS: 1544.91

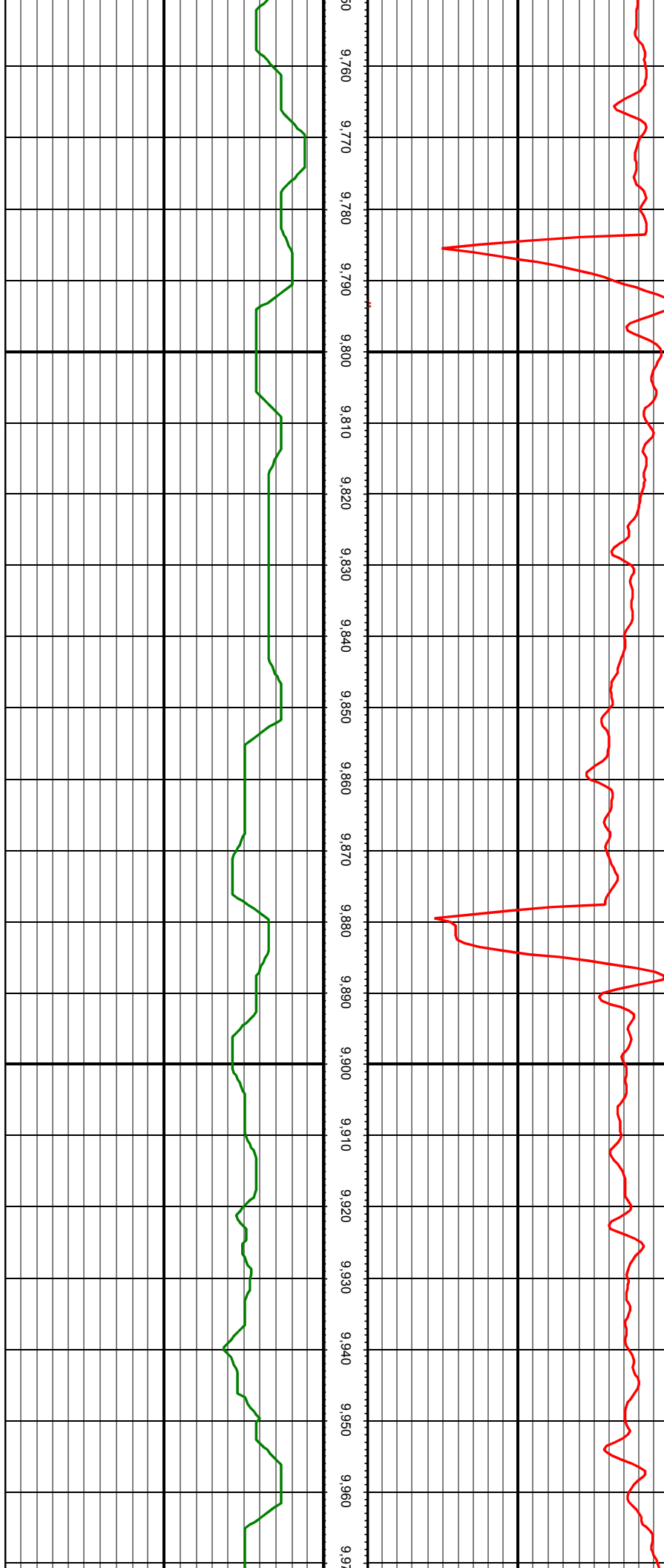
MD: 9245.00 INC: 87.96 AZ: 90.80 TVD: 7599.26 VS: 1639.89





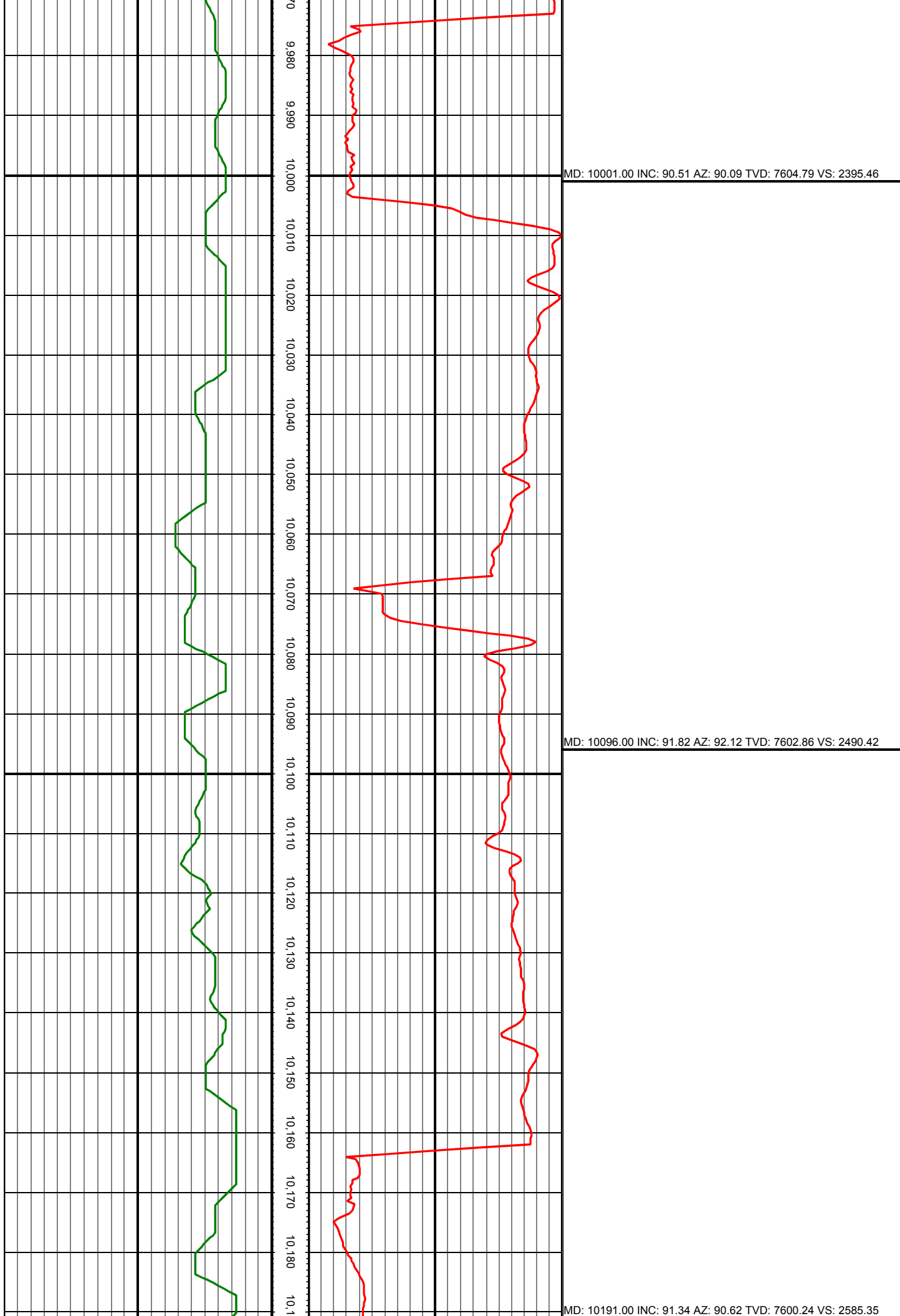
MD: 9623.00 INC: 89.49 AZ: 90.09 TVD: 7611.57 VS: 2017.65

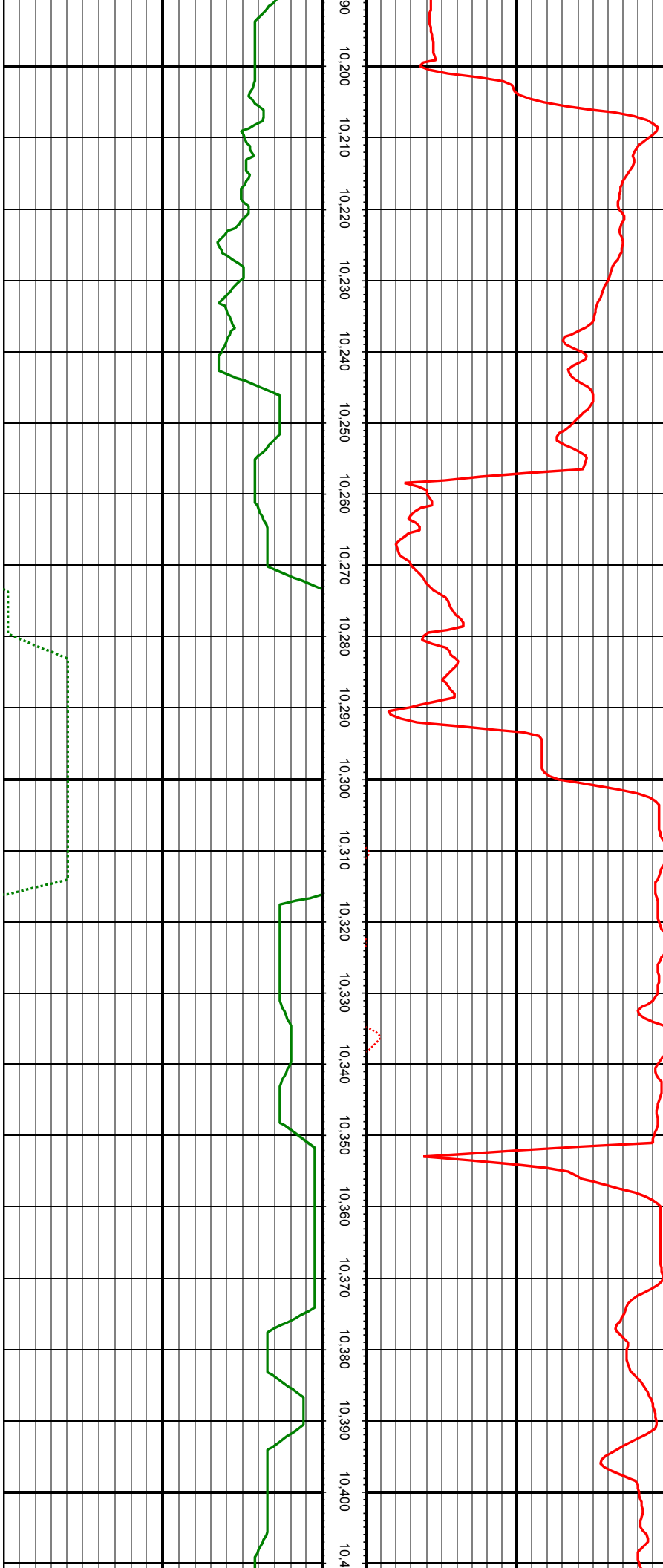
MD: 9717.00 INC: 90.42 AZ: 90.62 TVD: 7611.64 VS: 2111.65



MD: 9812.00 INC: 91.25 AZ: 91.15 TVD: 7610.26 VS: 2206.62

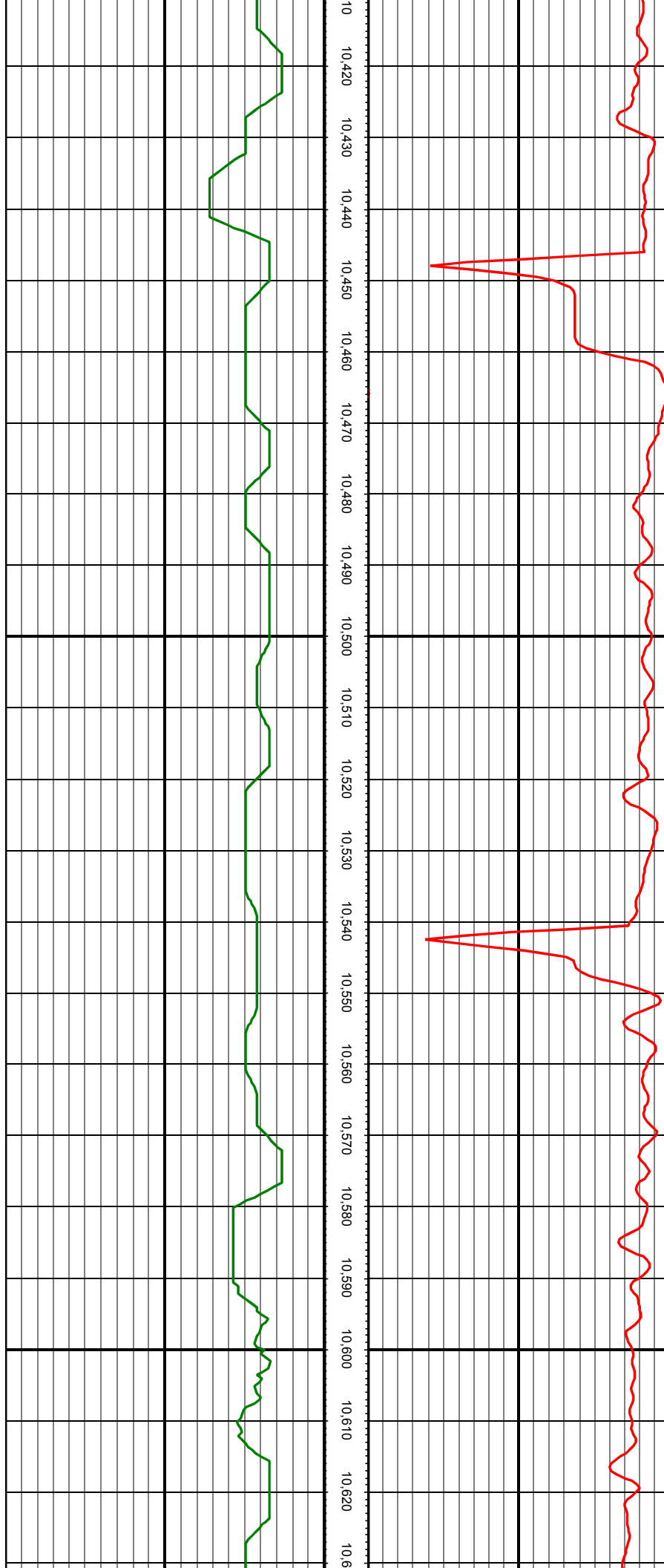
MD: 9906.00 INC: 92.44 AZ: 92.20 TVD: 7607.23 VS: 2300.53





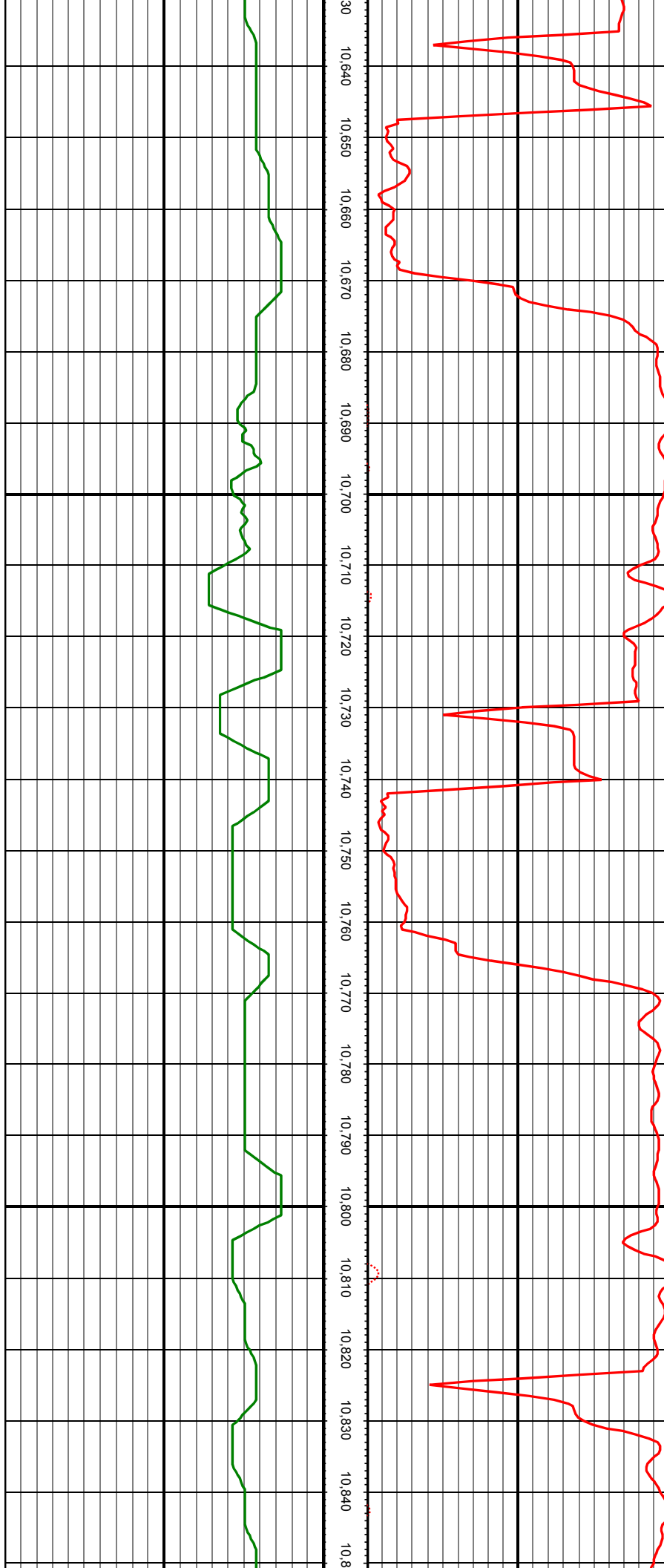
MD: 10285.00 INC: 88.88 AZ: 89.39 TVD: 7600.06 VS: 2679.34

MD: 10380.00 INC: 88.09 AZ: 89.04 TVD: 7602.57 VS: 2774.30



MD: 10475.00 INC: 88.13 AZ: 88.69 TVD: 7605.70 VS: 2869.23

MD: 10570.00 INC: 88.48 AZ: 88.60 TVD: 7608.51 VS: 2964.16



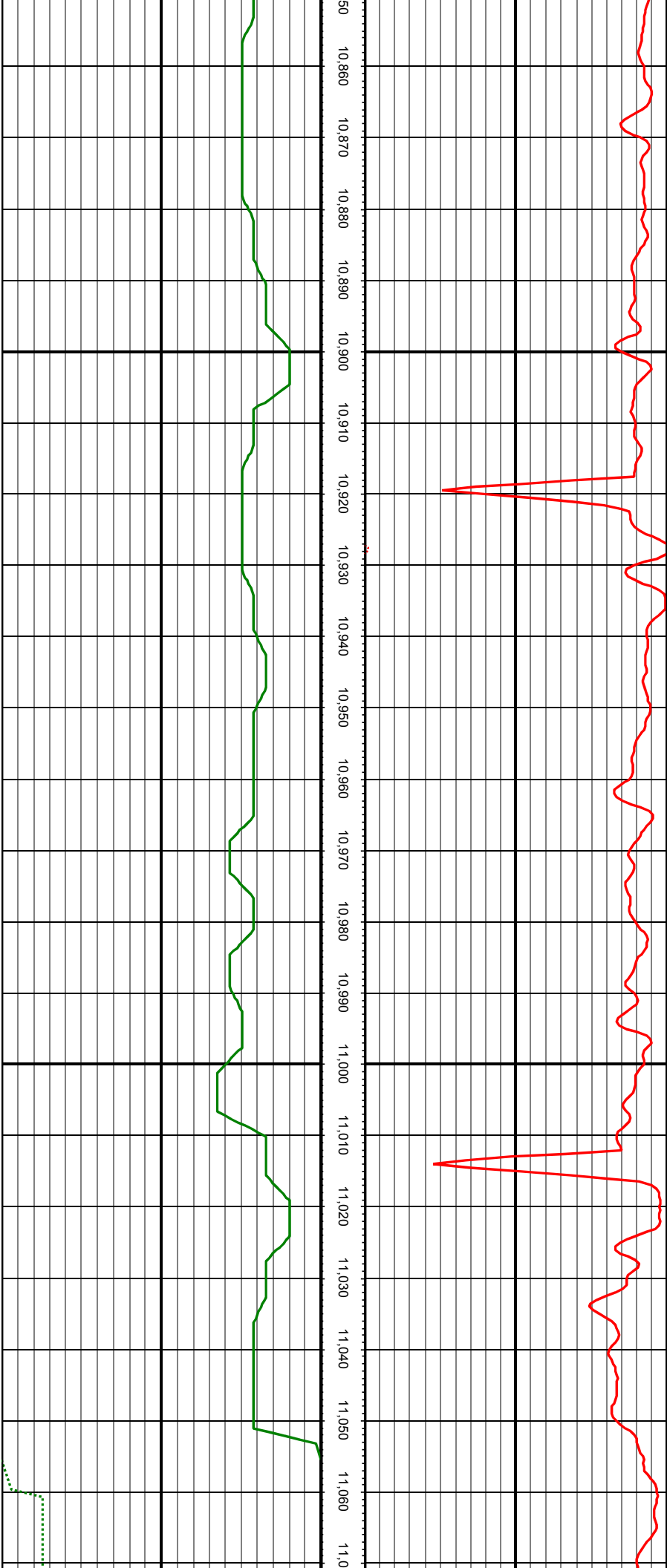
MD: 10665.00 INC: 89.05 AZ: 87.46 TVD: 7610.56 VS: 3059.09

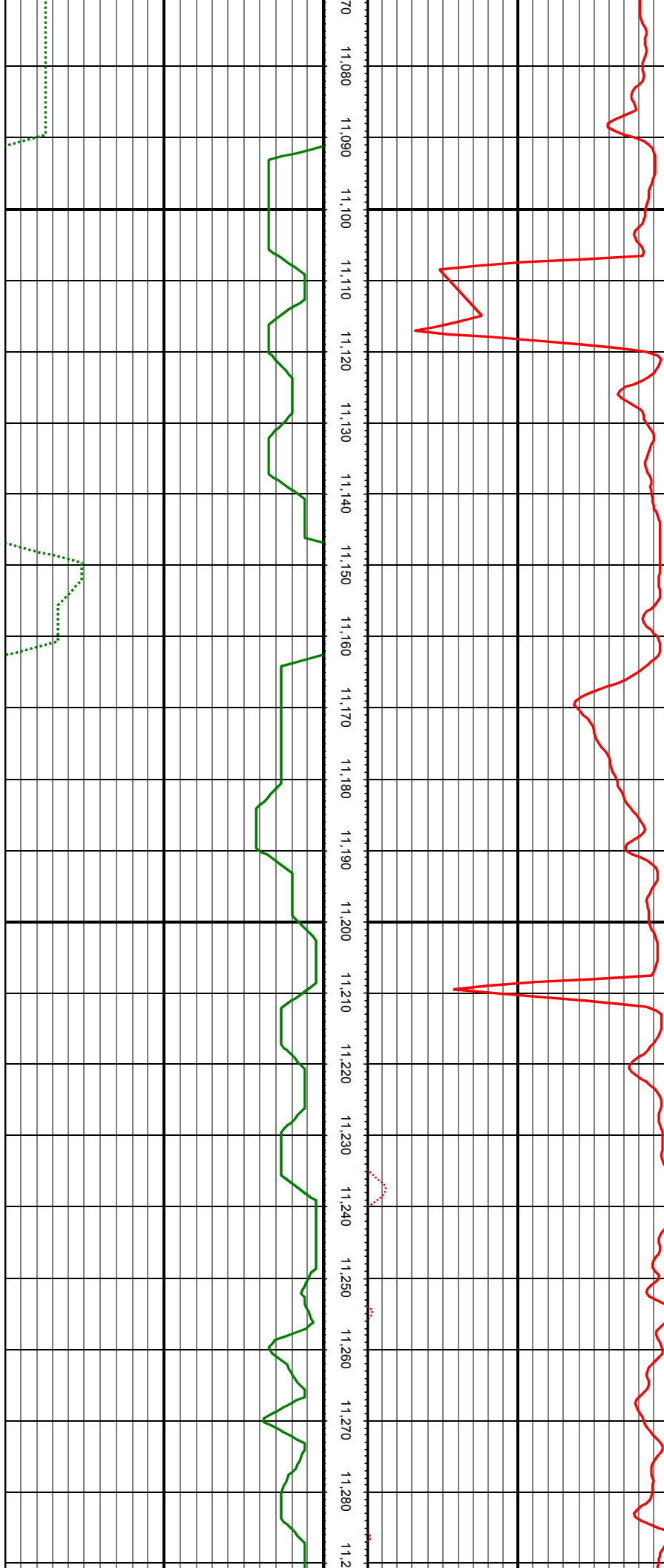
MD: 10759.00 INC: 89.93 AZ: 88.60 TVD: 7611.40 VS: 3153.03

MD: 10854.00 INC: 90.55 AZ: 88.78 TVD: 7611.00 VS: 3248.01

MD: 10948.00 INC: 90.95 AZ: 88.34 TVD: 7609.77 VS: 3341.97

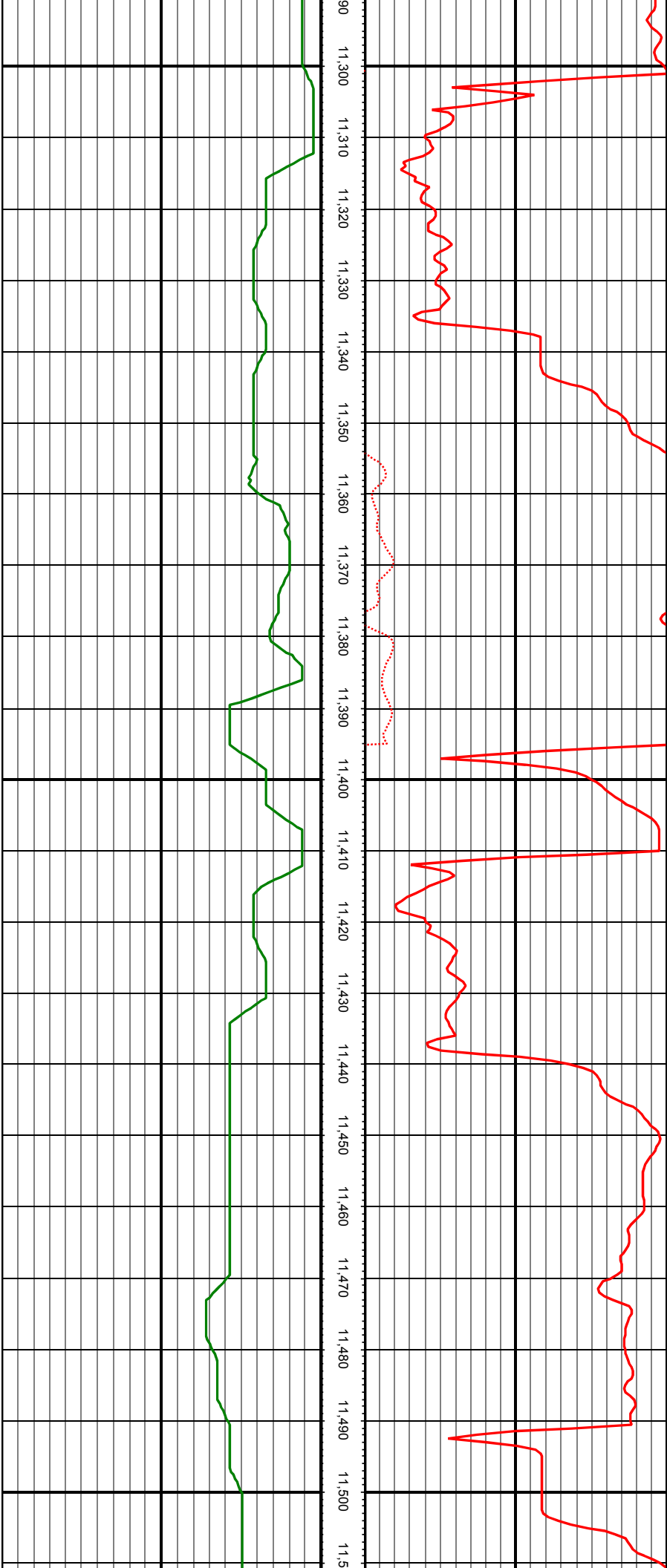
MD: 11043.00 INC: 91.34 AZ: 87.72 TVD: 7607.87 VS: 3436.90





MD: 11137.00 INC: 91.60 AZ: 87.28 TVD: 7605.46 VS: 3530.79

MD: 11232.00 INC: 92.13 AZ: 86.93 TVD: 7602.37 VS: 3625.62



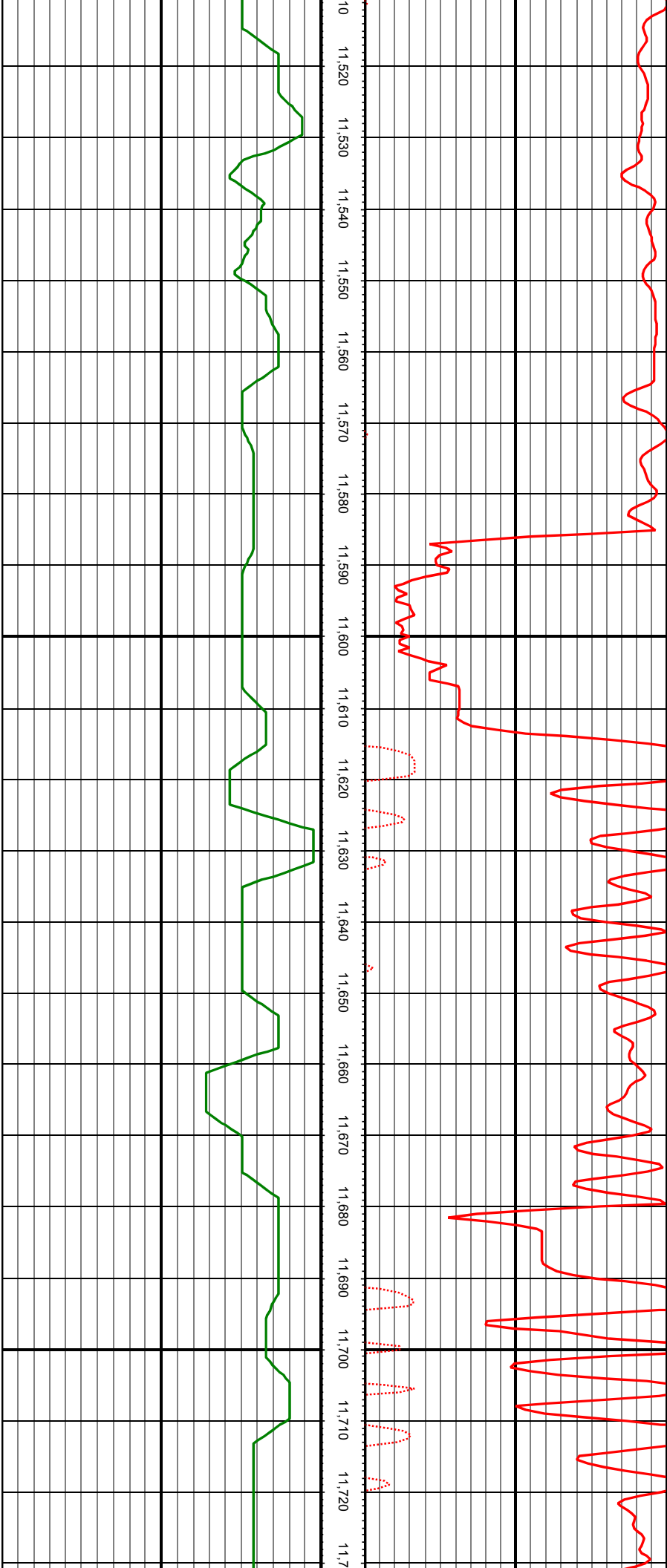
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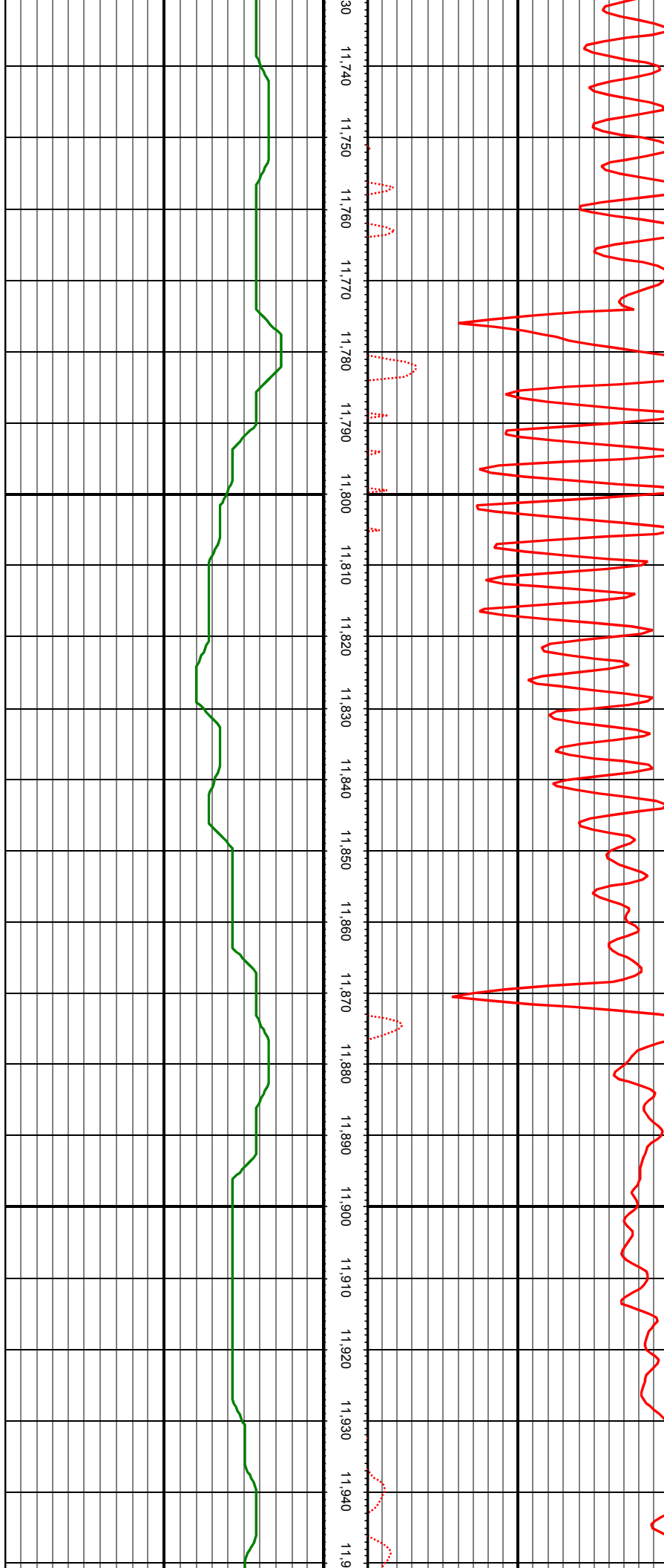
MD: 11421.00 INC: 91.12 AZ: 89.74 TVD: 7596.96 VS: 3814.47

MD: 11516.00 INC: 90.77 AZ: 90.45 TVD: 7595.39 VS: 3909.45

MD: 11611.00 INC: 88.48 AZ: 90.53 TVD: 7596.02 VS: 4004.44

MD: 11705.00 INC: 88.31 AZ: 90.45 TVD: 7598.65 VS: 4098.40





MD: 11800.00 INC: 88.57 AZ: 90.53 TVD: 7601.23 VS: 4193.36

MD: 11894.00 INC: 88.57 AZ: 90.36 TVD: 7603.58 VS: 4287.33

