

**CATHEDRAL ENERGY SERVICES**

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Oklahoma City, OK 73179
405-261-6011 (Office)
405-261-6188 (Fax)

SAM 3O-25H-M166**Scale 5":100' - MD****9/25/2018 3:02 AM****Oper. Company:** CRESTONE PEAK RESOURCES**Well:** SAM 3O-25H-M166**Field:** DJ BASIN**Rig:** ENSIGN 140**Well ID:** 05-123-46133**Job Number:** 185270

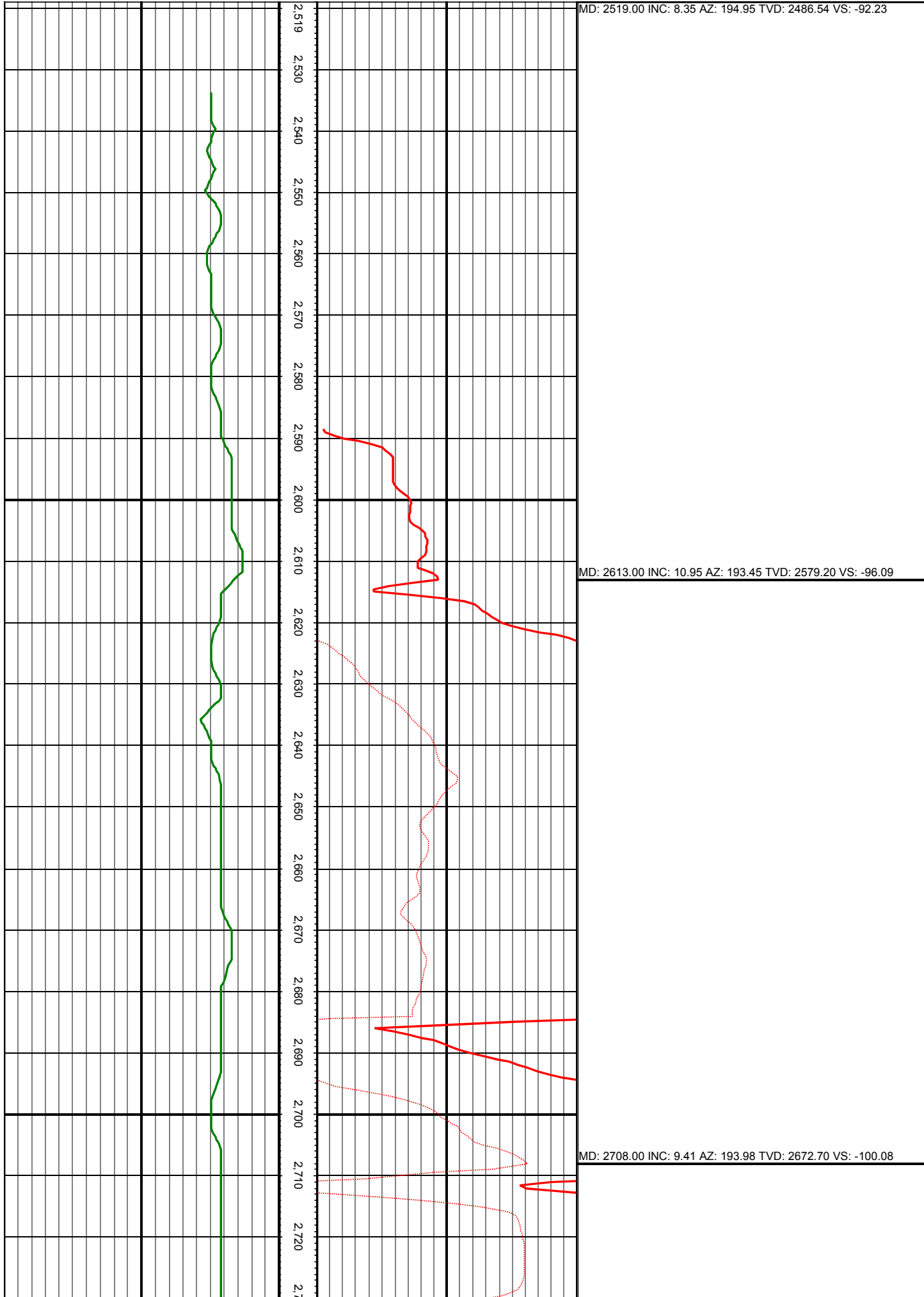
Notes: Gamma Ray Log
Section Plan: 89.92°
Datum: NAD 1927 (NADCON CONUS)
Magnetic North: 8.18°
Grid Convergence: 0.51°
Gamma Averaging: 7% Smoothing

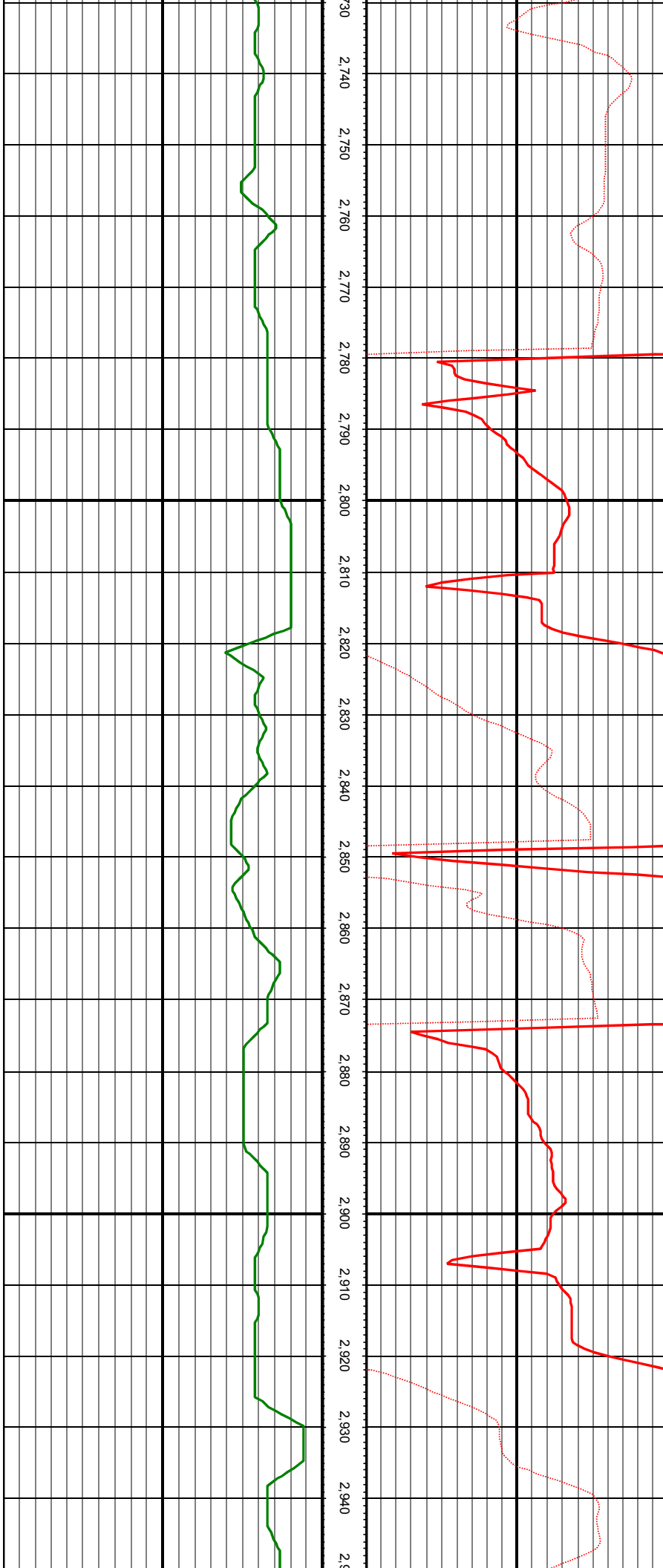
State: COLORADO**County:** ADAMS**Country:** UNITED STATES**Location:** S25-T1N-R66W**Start Date:** 09/22/2018 08:00:00**End Date:** 09/25/2018 03:00:00**Latitude:** 40.018510**Longitude:** -104.733857**Elev GL:** 5,086.00**Elev DF:** 5,109.00**Elev KB:** 5,109.00**Notes:** Log & Survey Depths Relative to Kelly Bushing (KB) Depth**Operator 1:** Daniel Stevens**Operator 2:** Riley Rasmussen**Notes:** Maximun Temperature: 230.00 °f

Tool Run Data	Run #1	Run #2	Run #3	Run #4	Run #5
Tool S/N	BTDM-1182	BTDM-1528			
Bit Size	8.50	8.50			
Cal Factor	5.64	5.64			
Survey Offset	72.00	72.00			
Gamma Offset	54.79	54.79			
Resistivity Offset	0.00	0.00			
Start Depth	2439.00	2439.00			
StartDate	9/22/2018	9/22/2018			
StartTime	08:00	17:00			
EndDepth	2439.00	11892.00			
EndDate	9/22/2018	9/25/2018			
EndTime	16:30	03:00			
Mud Type	OBM / INVERT	OBM / INVERT			
Mud Weight	9.40 PPG	9.45 PPG			
Funnel Viscosity	54.00 SEC/QT	46.00 SEC/QT			
Plastic Viscosity	16.00 CP	16.00 CP			
Yield Point	11.00 LBS/100FT2	7.00 LBS/100FT2			
Gel Strength	7.00 / 8.00 / 9.00 LBS/100FT2	5.00 / 6.00 / 7.00 LBS/100FT2			
Solids Content	6.20 %	6.70 %			
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	35,000.00 MG/L			
Temperature	147° F	230° F			

Hole Data			Casing Data		
Size	From	To	Size	From	To
12.5	0.00	2400.00	9 5/8	0.00	2370.00
8.5	2400.00	11892.00		0.00	0.00

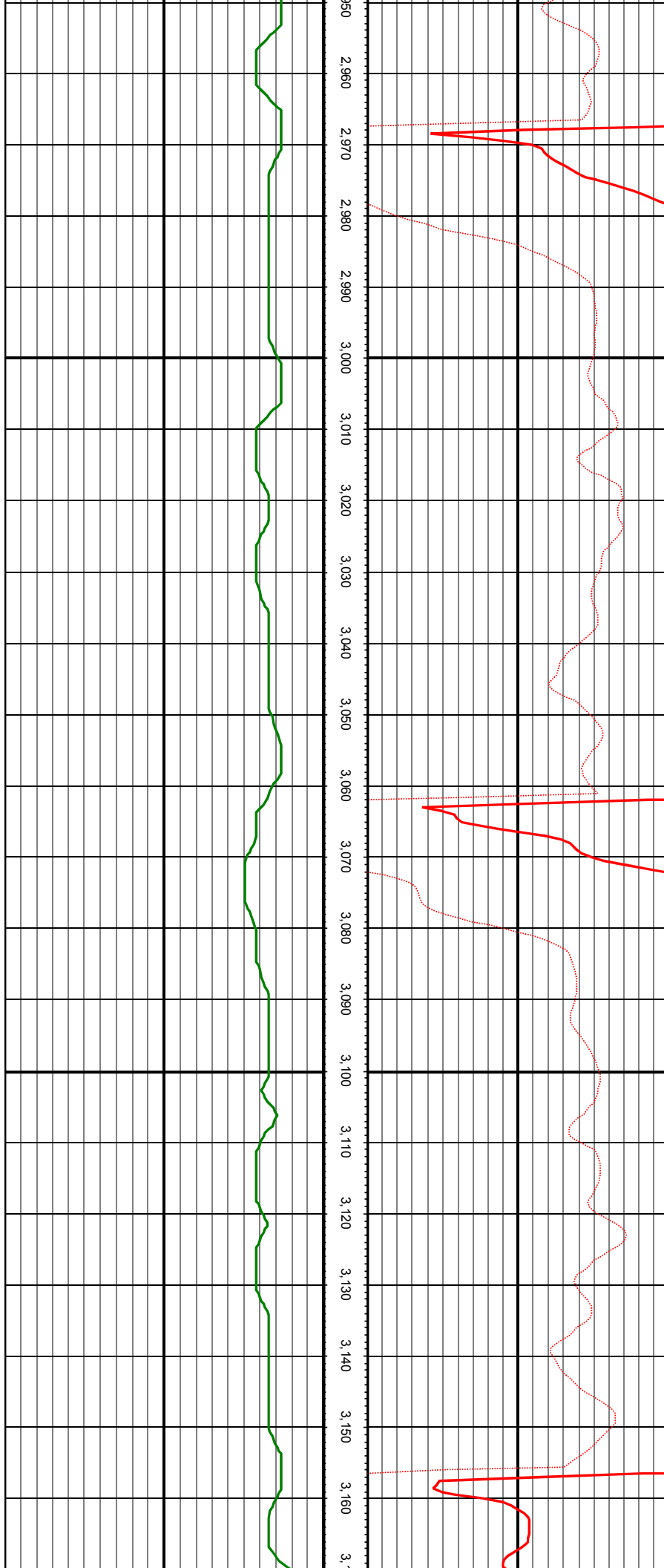
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost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





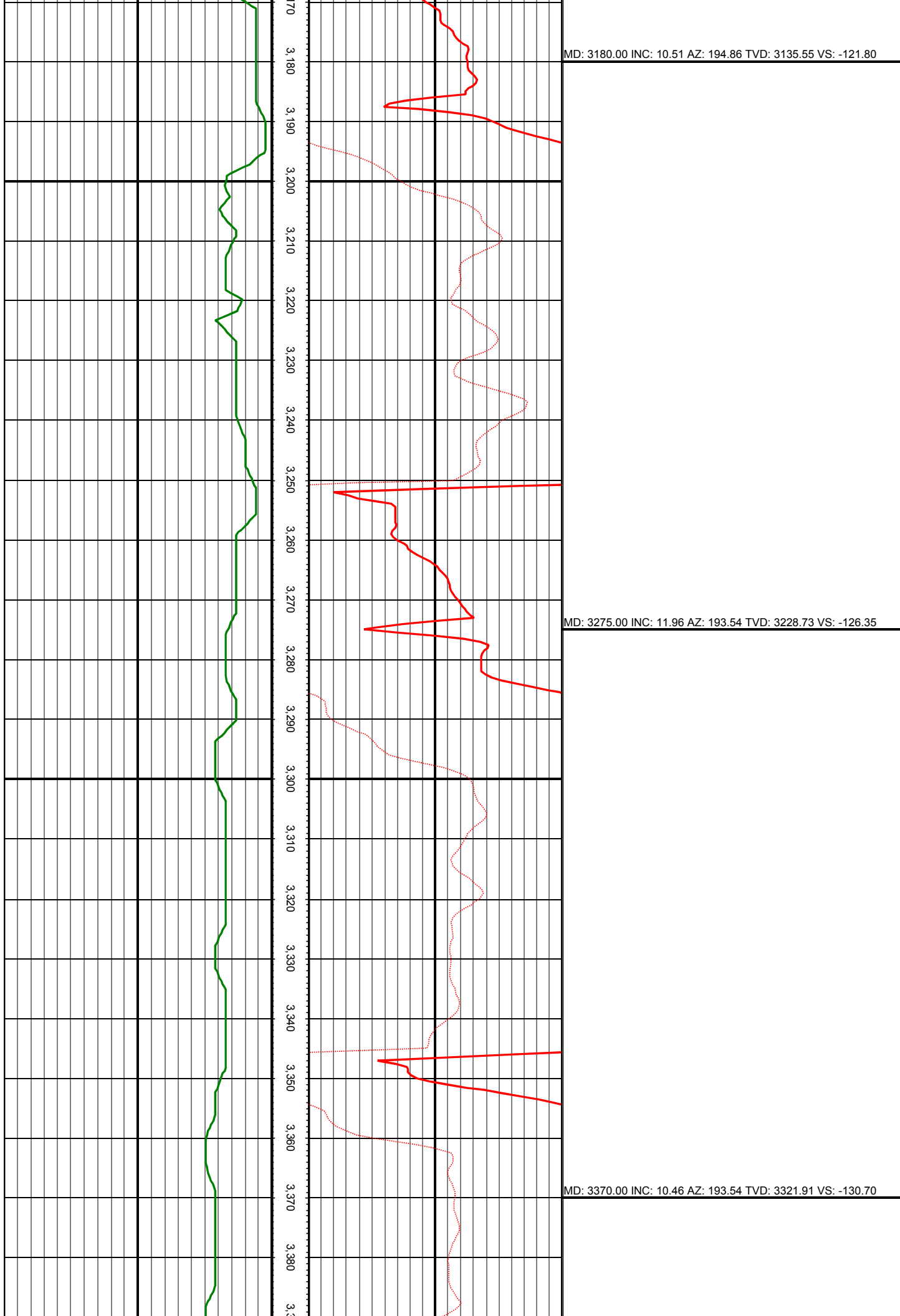
MD: 2802.00 INC: 9.98 AZ: 192.84 TVD: 2765.36 VS: -103.77

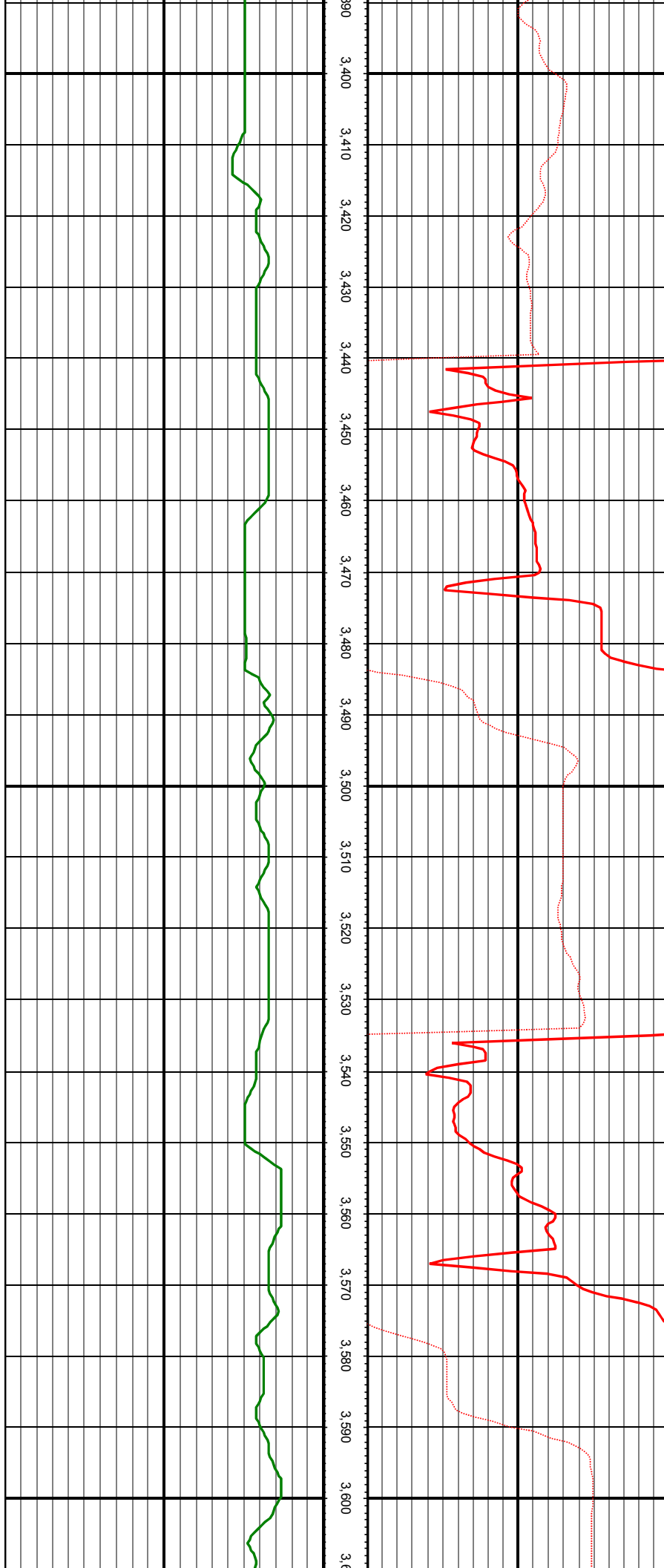
MD: 2897.00 INC: 14.07 AZ: 193.19 TVD: 2858.25 VS: -108.26



MD: 2991.00 INC: 12.35 AZ: 193.45 TVD: 2949.76 VS: -113.24

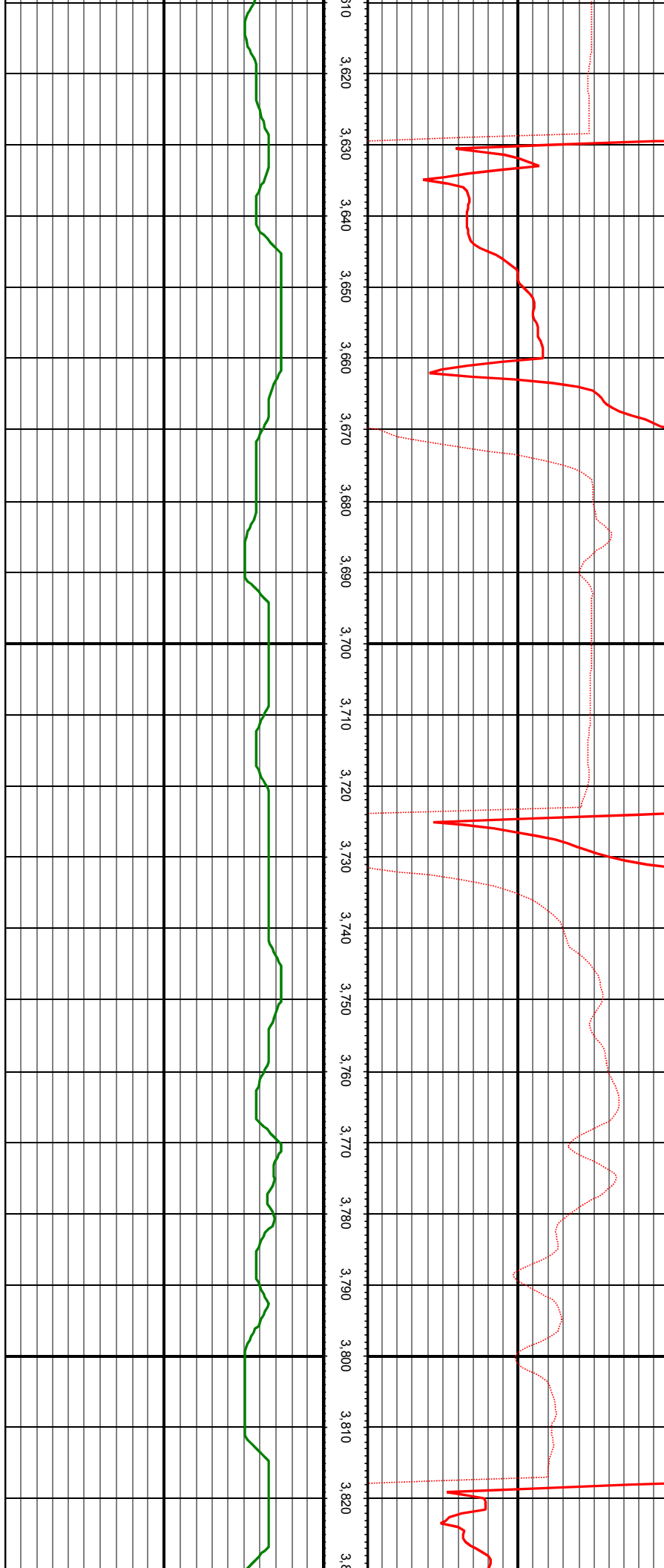
MD: 3086.00 INC: 9.67 AZ: 194.42 TVD: 3043.01 VS: -117.61





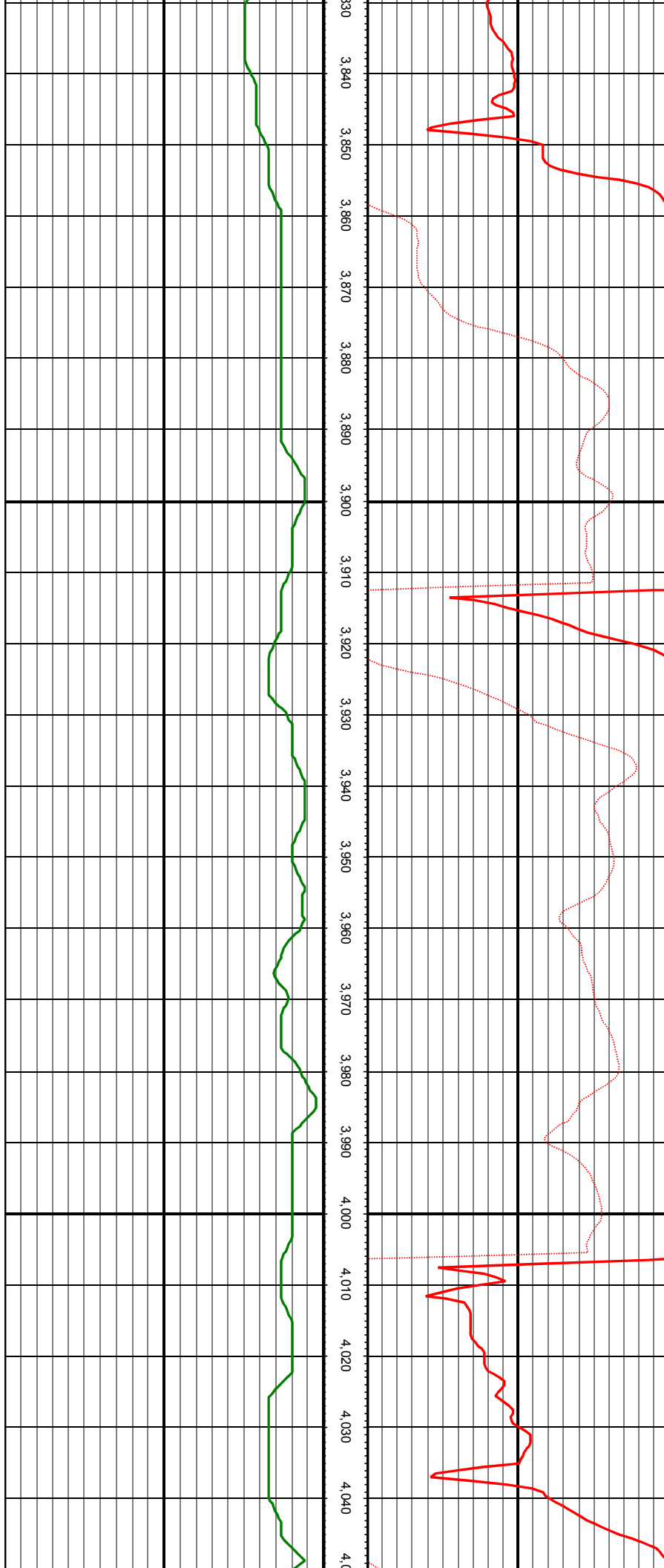
MD: 3465.00 INC: 10.37 AZ: 191.87 TVD: 3415.35 VS: -134.50

MD: 3560.00 INC: 10.95 AZ: 197.85 TVD: 3508.71 VS: -139.05



MD: 3654.00 INC: 12.00 AZ: 193.80 TVD: 3600.83 VS: -144.14

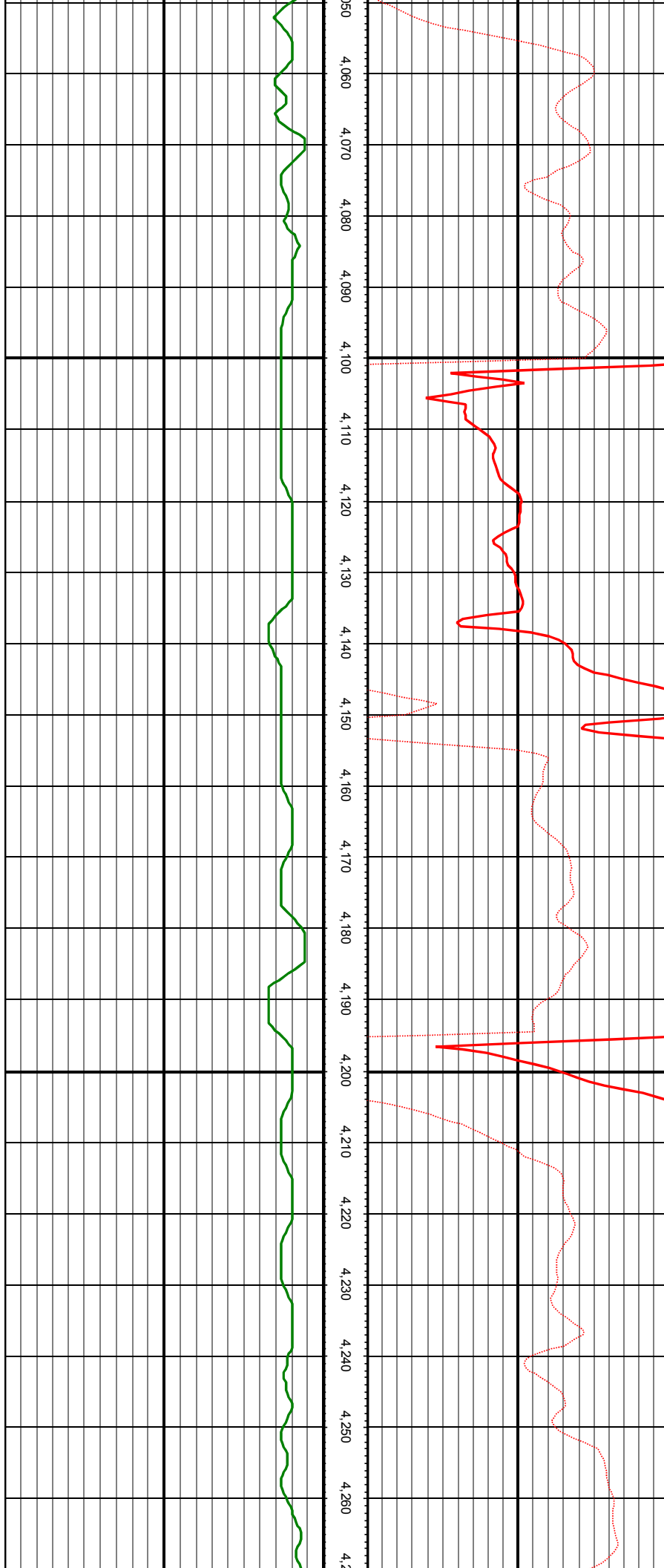
MD: 3748.00 INC: 10.11 AZ: 193.80 TVD: 3693.08 VS: -148.47



MD: 3843.00 INC: 11.91 AZ: 194.24 TVD: 3786.33 VS: -152.89

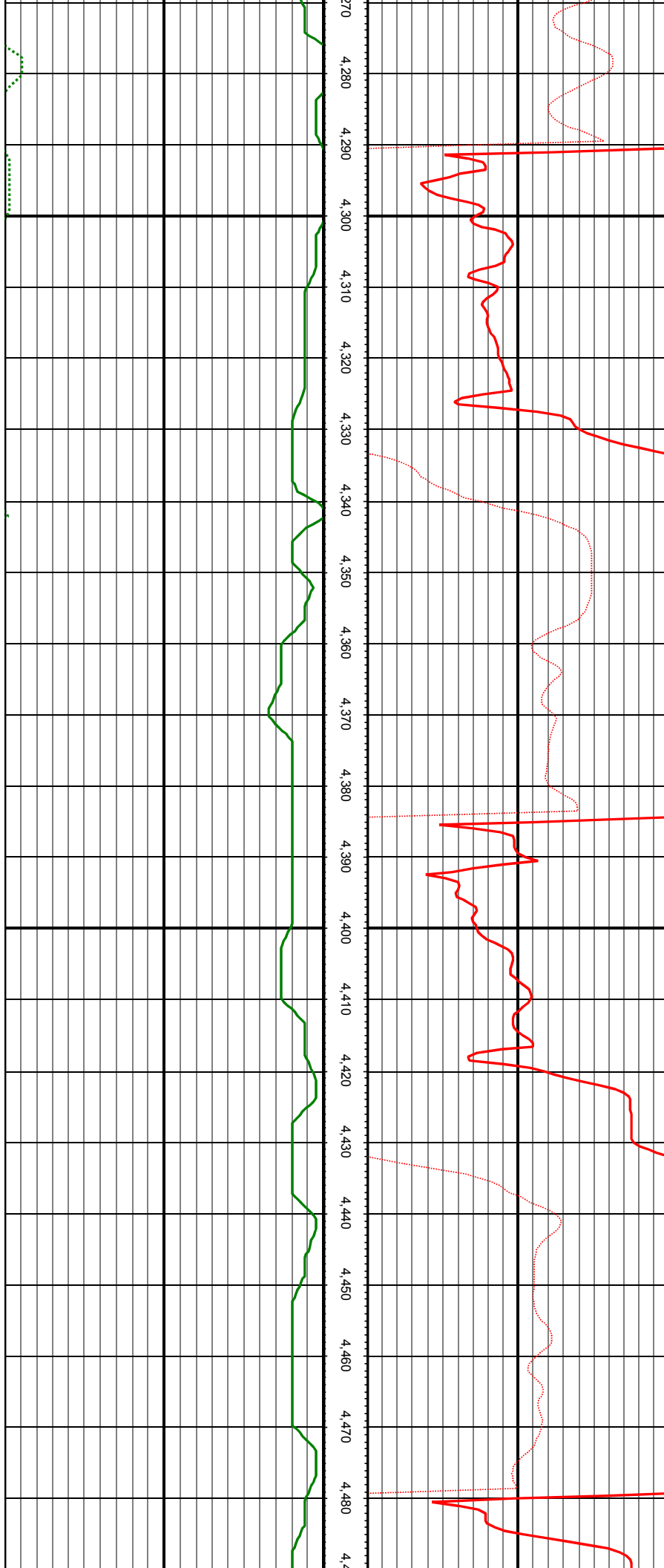
MD: 3938.00 INC: 9.85 AZ: 195.30 TVD: 3879.62 VS: -157.47

MD: 4032.00 INC: 9.76 AZ: 192.14 TVD: 3972.25 VS: -161.29



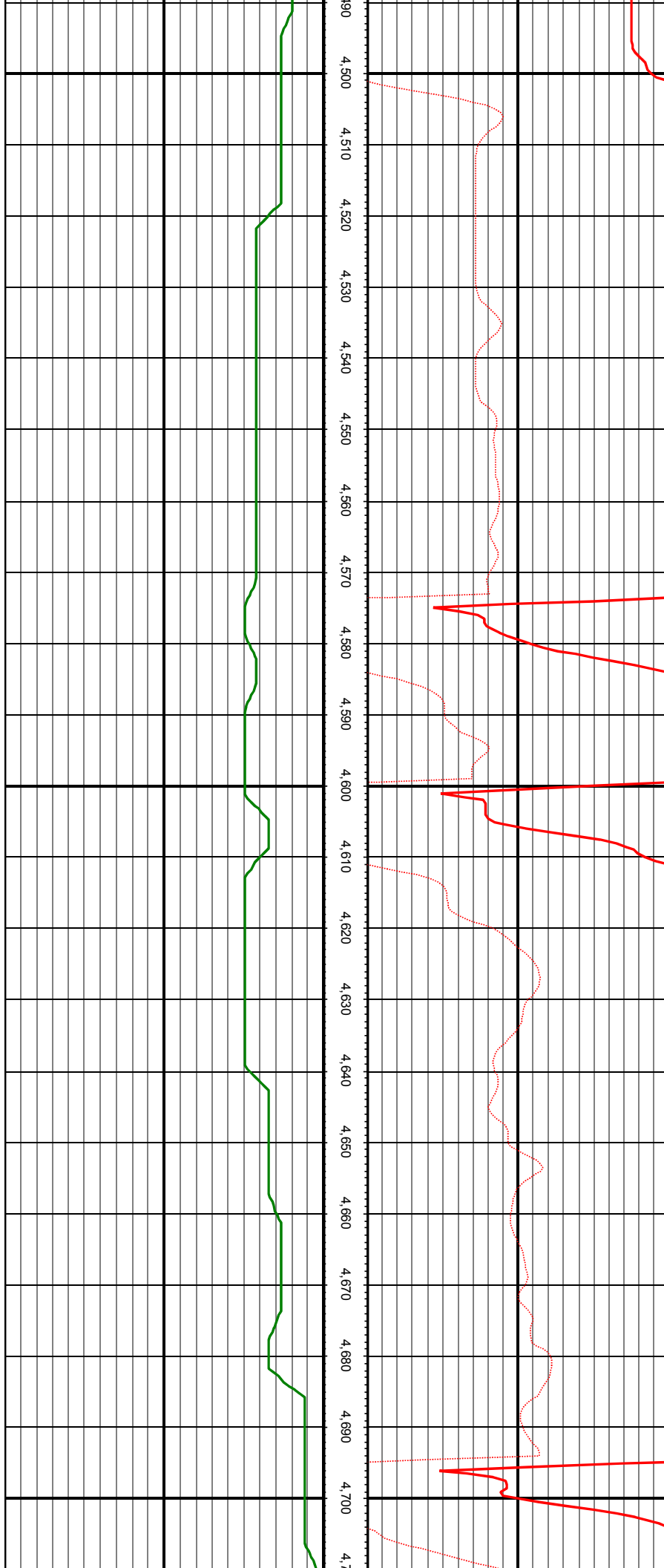
MD: 4127.00 INC: 11.82 AZ: 195.04 TVD: 4065.56 VS: -165.54

MD: 4221.00 INC: 9.89 AZ: 192.14 TVD: 4157.88 VS: -169.76



MD: 4316.00 INC: 10.20 AZ: 186.33 TVD: 4251.42 VS: -172.42

MD: 4411.00 INC: 12.53 AZ: 187.65 TVD: 4344.55 VS: -174.75



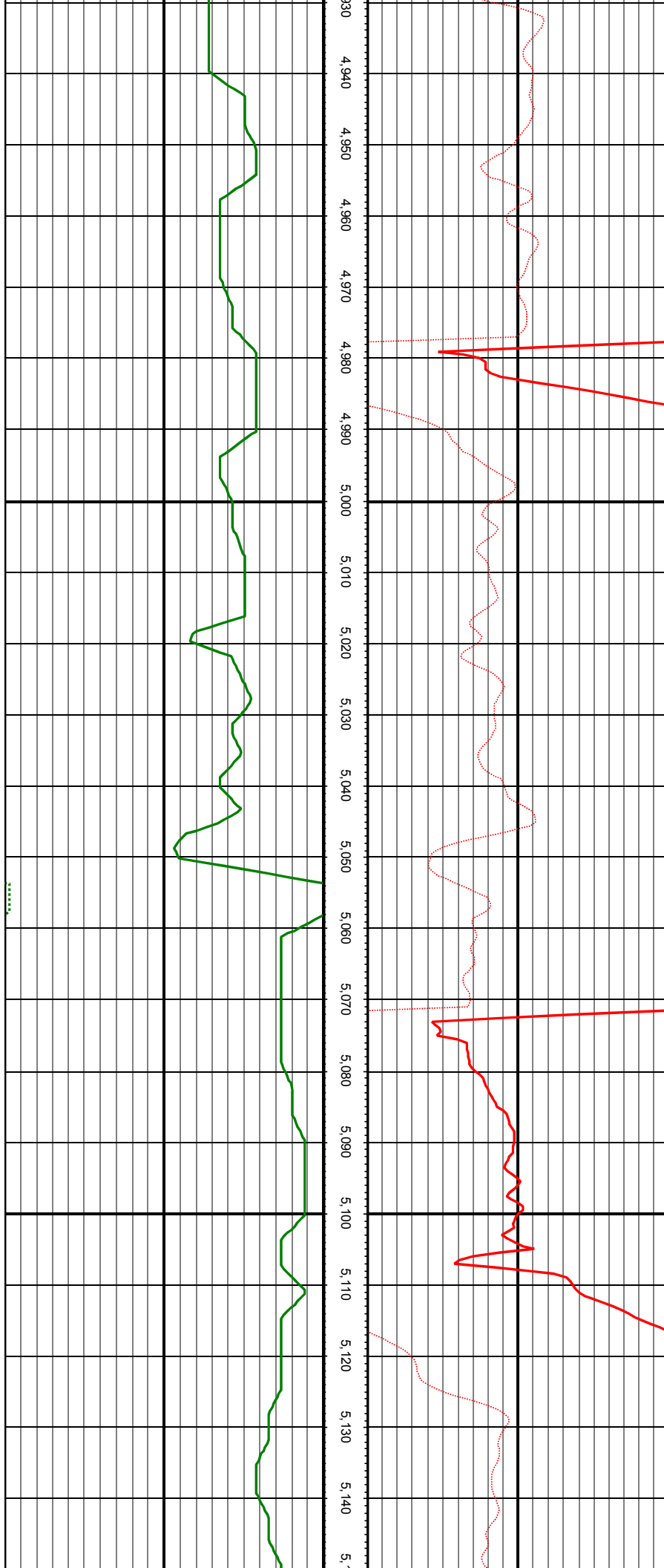
MD: 4528.00 INC: 11.78 AZ: 189.76 TVD: 4458.93 VS: -178.50

MD: 4623.00 INC: 11.56 AZ: 191.26 TVD: 4551.97 VS: -182.02

MD: 4717.00 INC: 9.27 AZ: 188.18 TVD: 4644.41 VS: -184.96

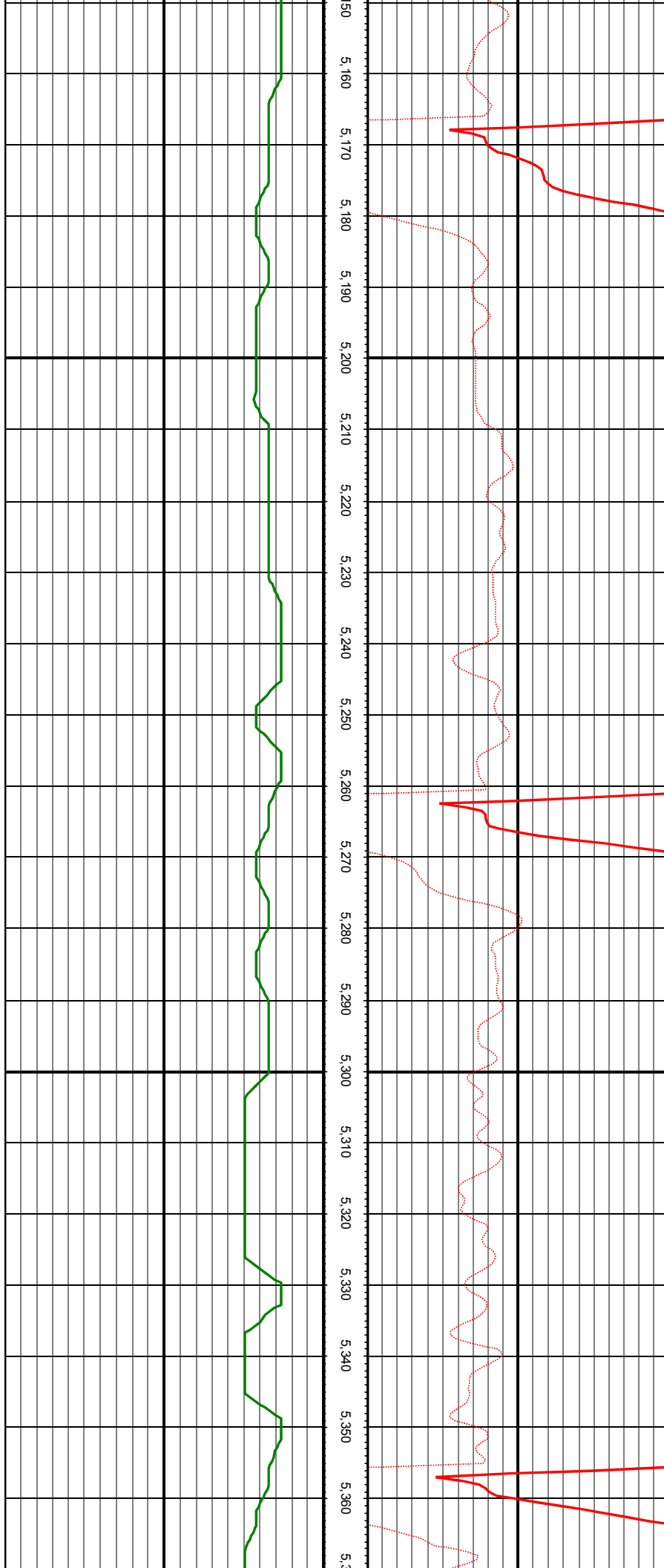
MD: 4812.00 INC: 10.95 AZ: 195.47 TVD: 4737.94 VS: -188.48

MD: 4906.00 INC: 10.29 AZ: 198.29 TVD: 4830.33 VS: -193.52



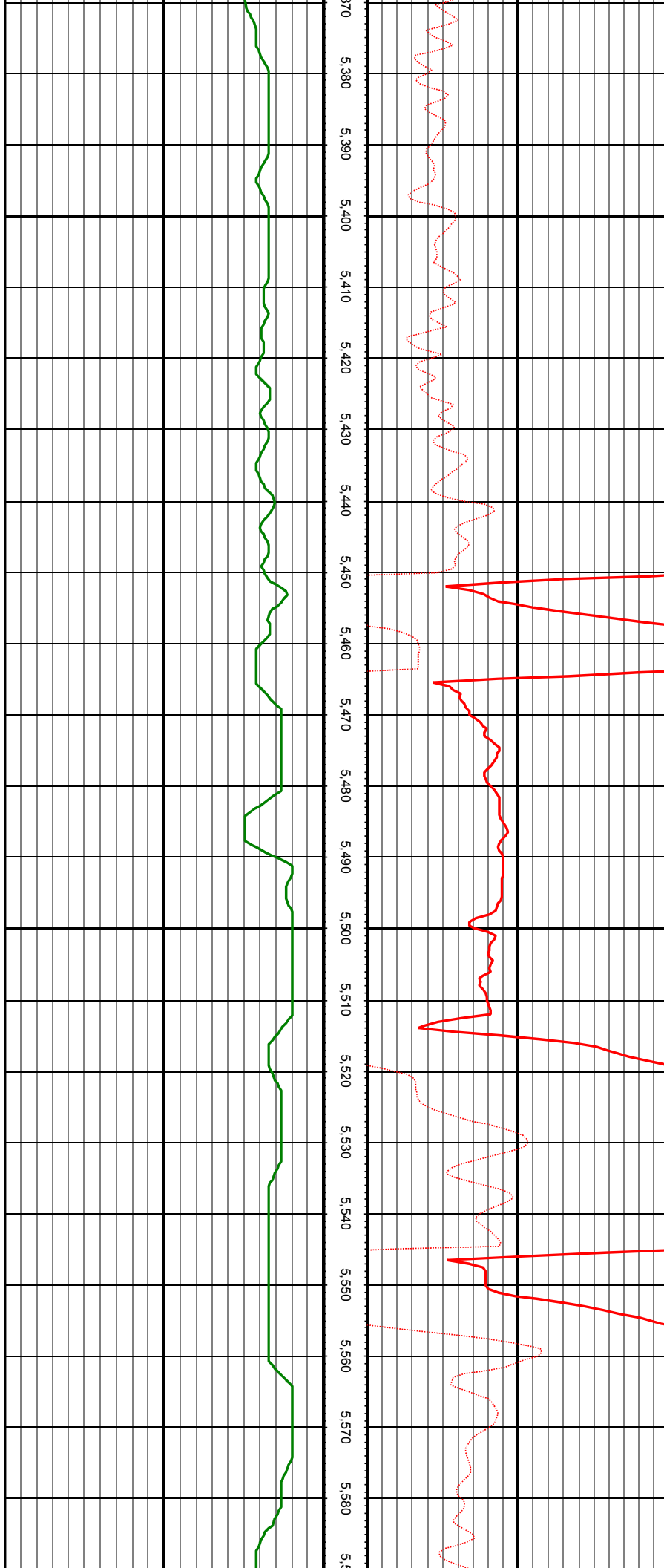
MD: 5001.00 INC: 8.84 AZ: 200.92 TVD: 4924.01 VS: -198.81

MD: 5096.00 INC: 10.95 AZ: 196.97 TVD: 5017.59 VS: -204.08



MD: 5191.00 INC: 10.86 AZ: 196.18 TVD: 5110.87 VS: -209.23

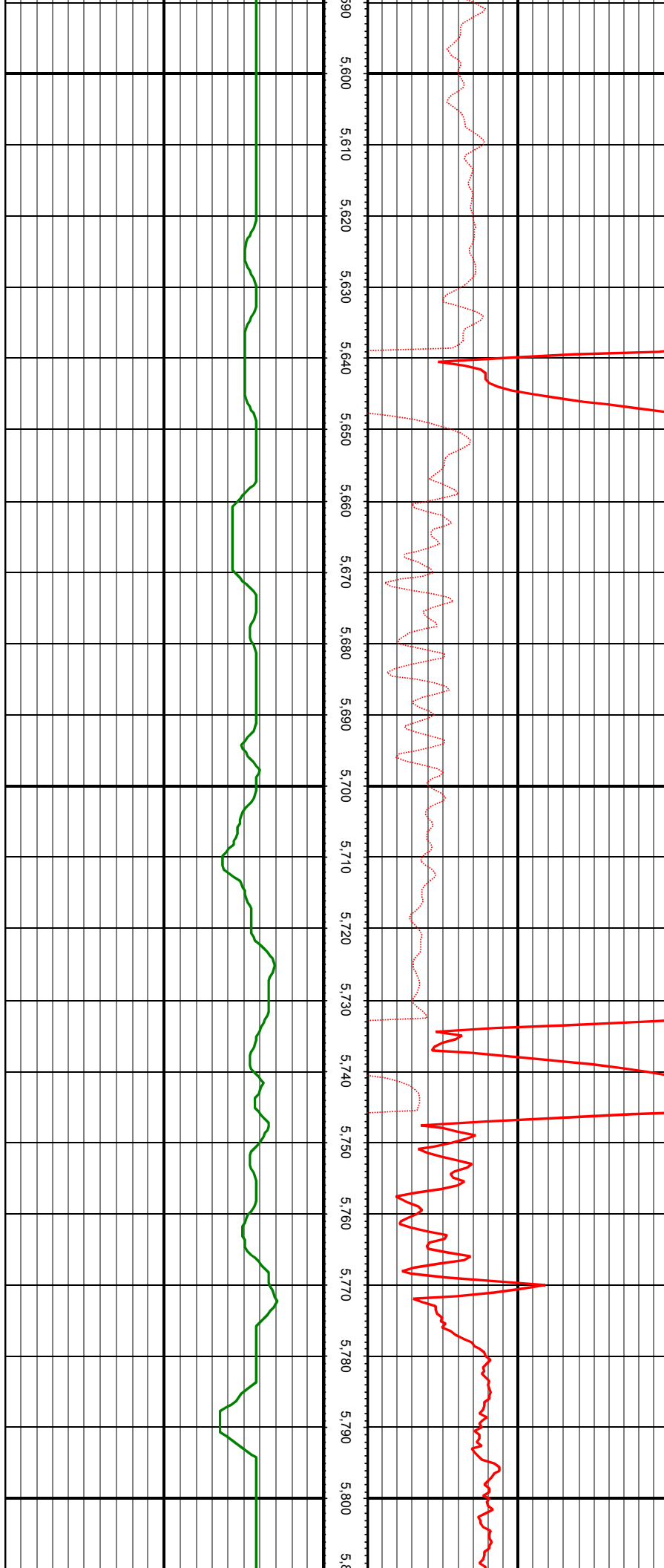
MD: 5286.00 INC: 9.27 AZ: 196.00 TVD: 5204.41 VS: -213.85



MD: 5380.00 INC: 7.87 AZ: 198.11 TVD: 5297.36 VS: -217.96

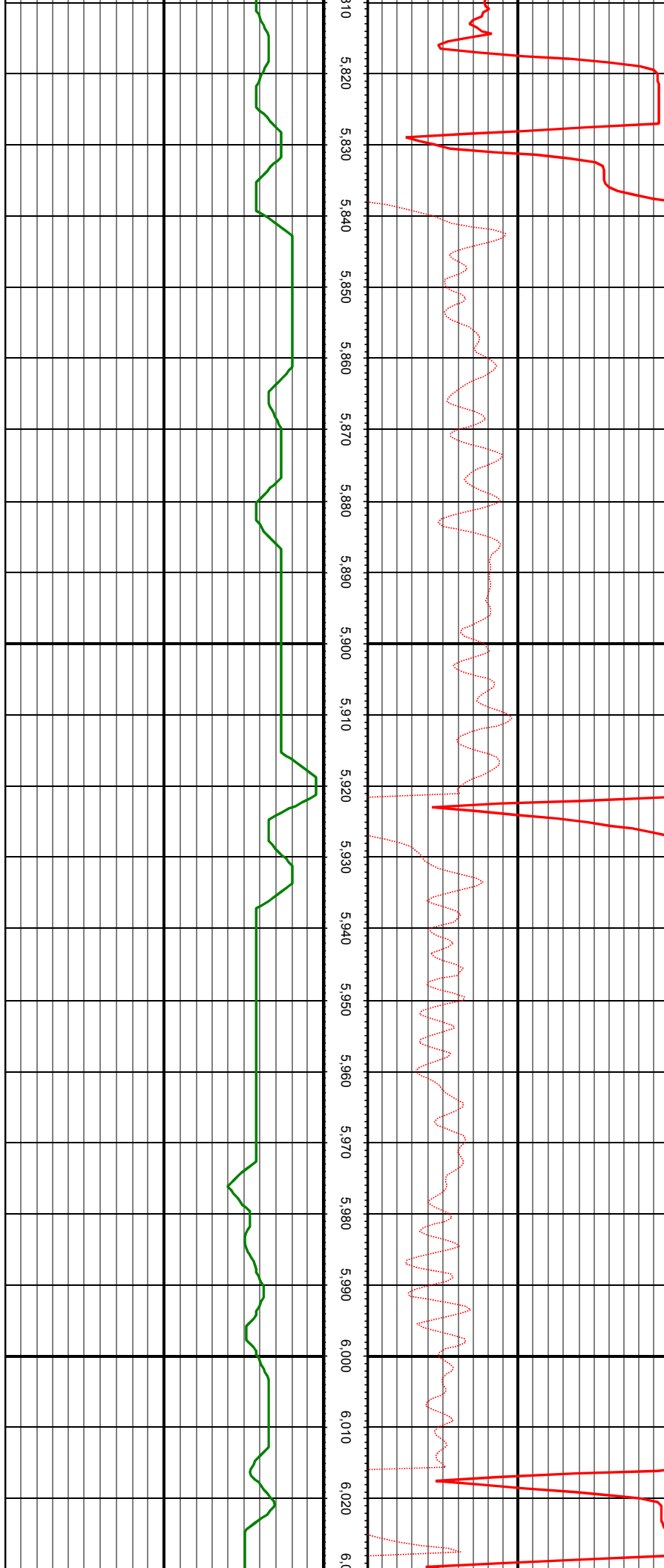
MD: 5474.00 INC: 8.57 AZ: 204.26 TVD: 5390.39 VS: -222.85

MD: 5569.00 INC: 10.59 AZ: 195.39 TVD: 5484.07 VS: -228.10



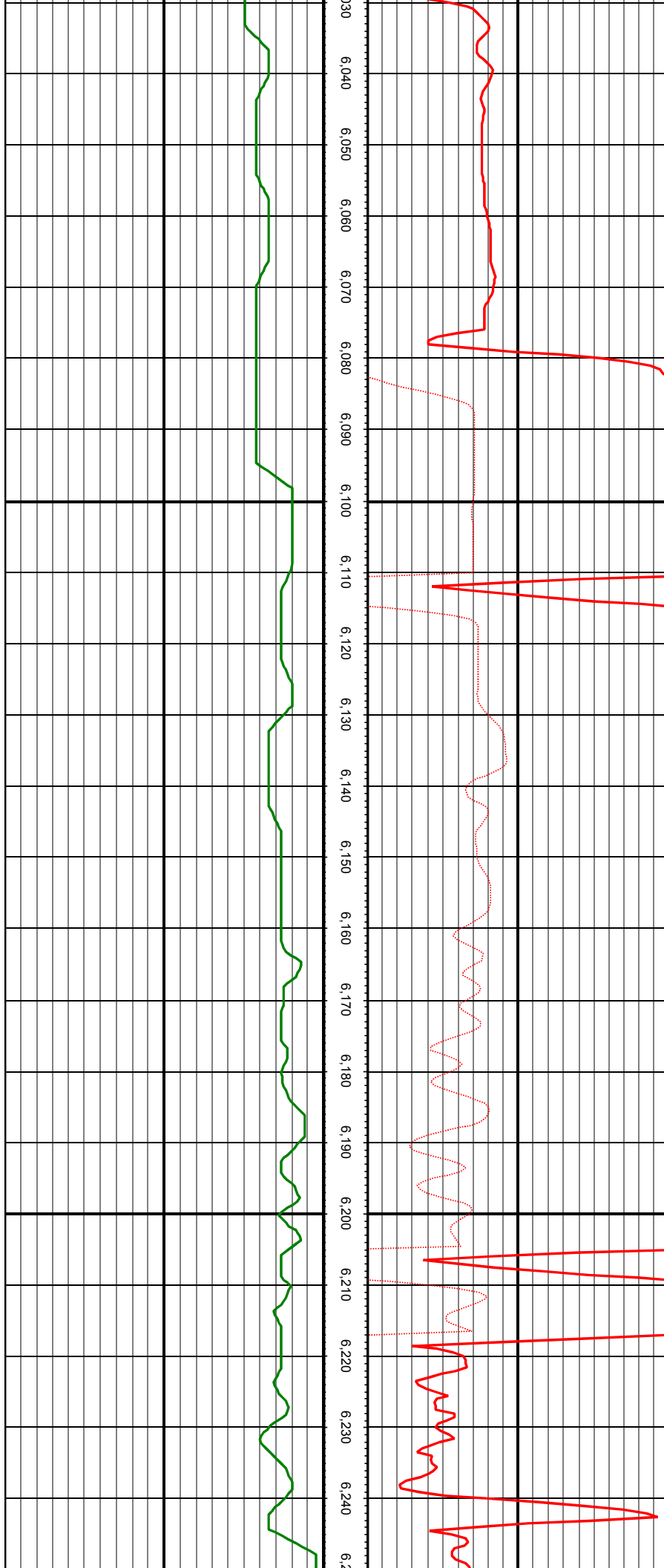
MD: 5663.00 INC: 9.27 AZ: 195.21 TVD: 5576.66 VS: -232.40

MD: 5757.00 INC: 7.74 AZ: 191.26 TVD: 5669.62 VS: -235.64



MD: 5852.00 INC: 11.38 AZ: 199.43 TVD: 5763.29 VS: -240.03

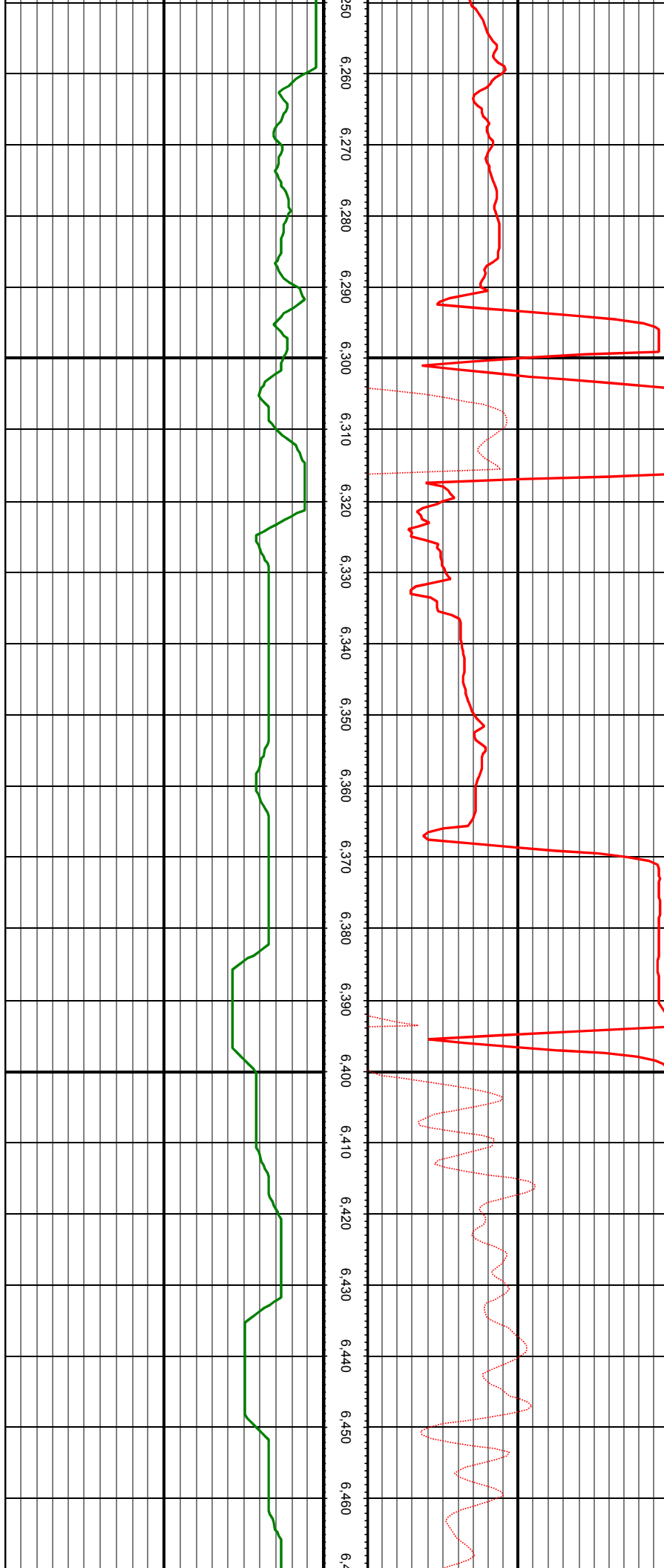
MD: 5947.00 INC: 8.31 AZ: 199.08 TVD: 5856.88 VS: -245.42



MD: 6042.00 INC: 8.75 AZ: 200.22 TVD: 5950.83 VS: -250.18

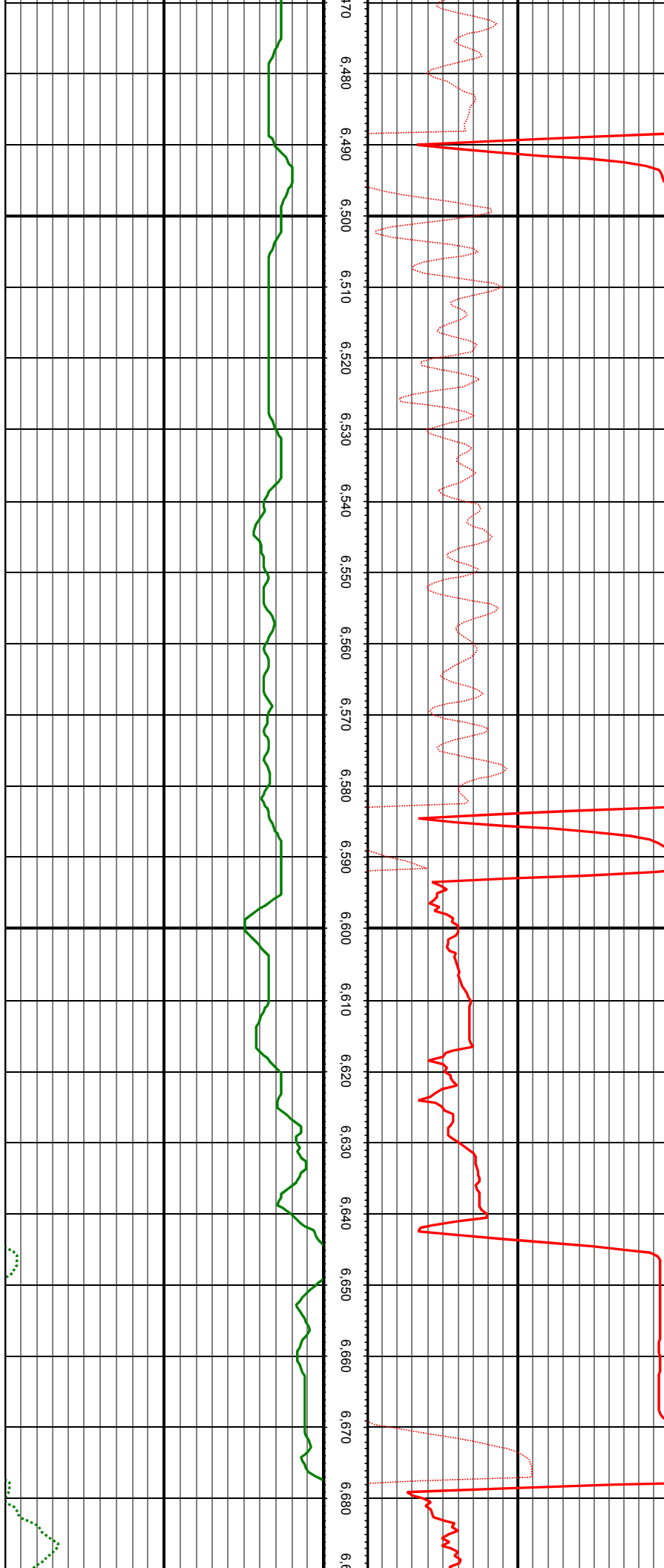
MD: 6136.00 INC: 9.67 AZ: 198.90 TVD: 6043.62 VS: -255.23

MD: 6231.00 INC: 6.42 AZ: 193.37 TVD: 6137.67 VS: -259.06



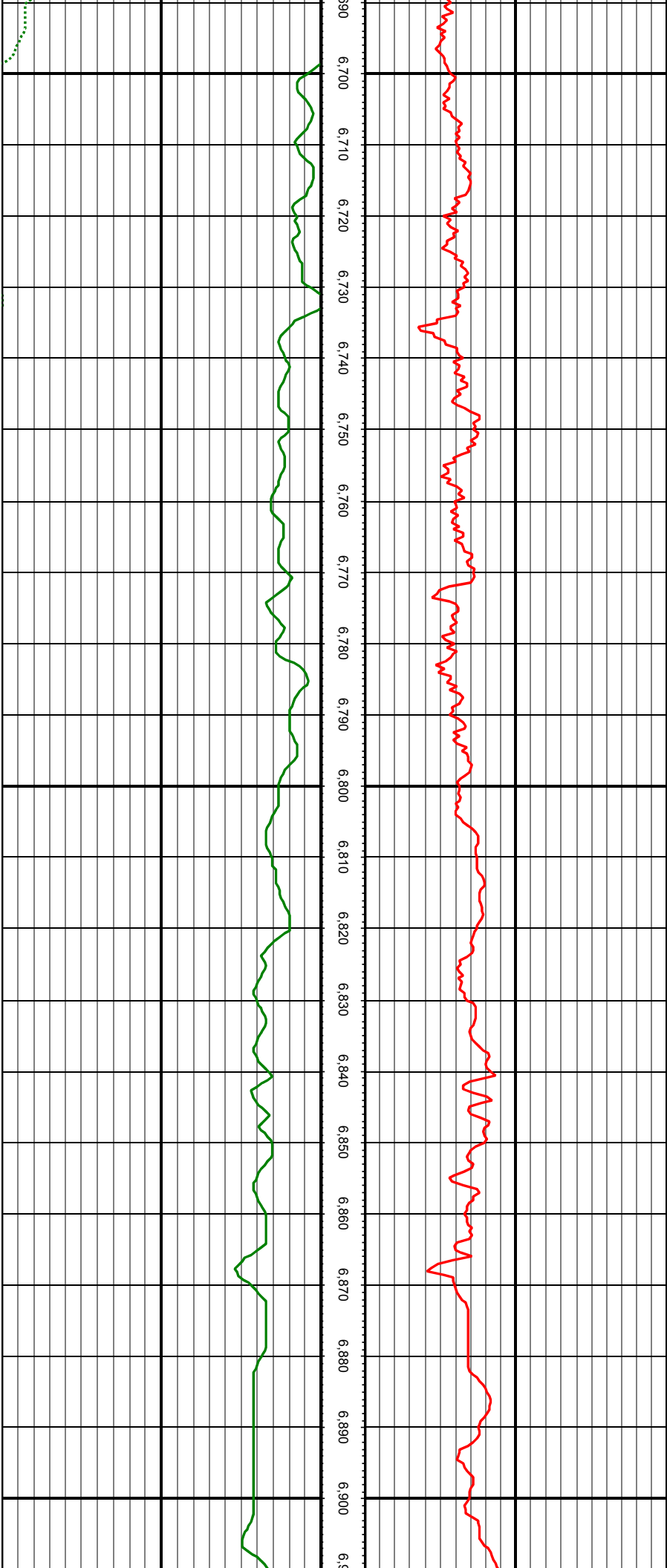
MD: 6326.00 INC: 10.33 AZ: 203.21 TVD: 6231.64 VS: -263.66

MD: 6420.00 INC: 11.12 AZ: 200.05 TVD: 6324.00 VS: -270.11



MD: 6514.00 INC: 8.00 AZ: 194.86 TVD: 6416.69 VS: -274.92

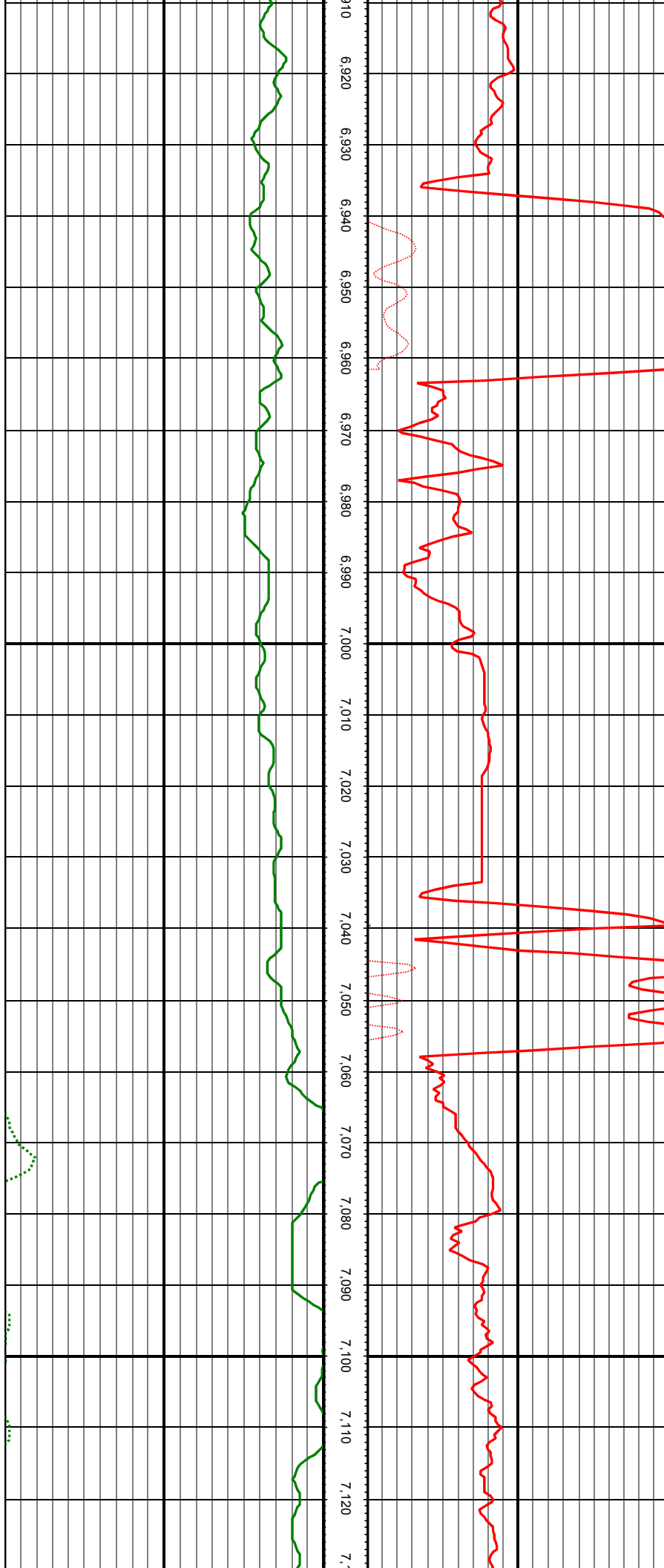
MD: 6609.00 INC: 7.74 AZ: 180.01 TVD: 6510.80 VS: -276.64



MD: 6703.00 INC: 12.18 AZ: 169.11 TVD: 6603.37 VS: -274.78

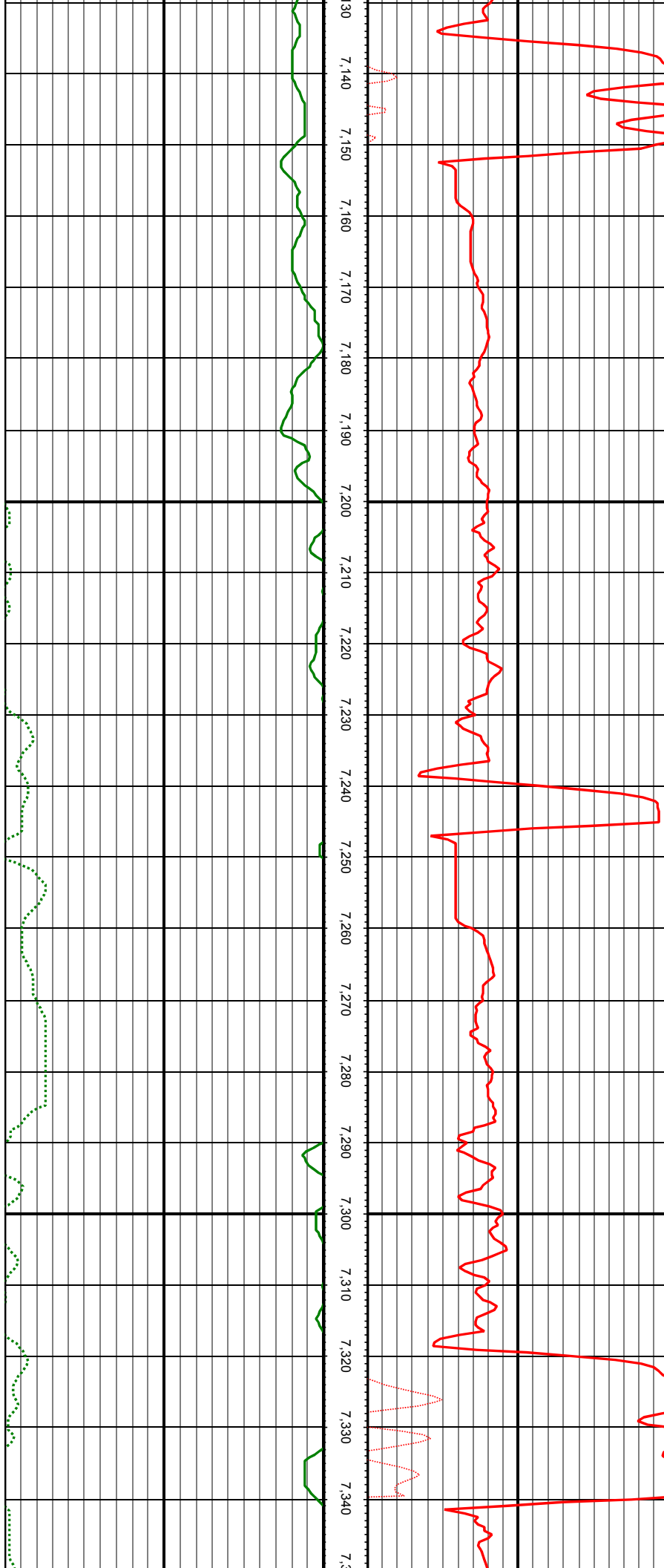
MD: 6798.00 INC: 19.43 AZ: 143.36 TVD: 6694.82 VS: -263.46

MD: 6892.00 INC: 28.04 AZ: 129.12 TVD: 6780.86 VS: -236.96



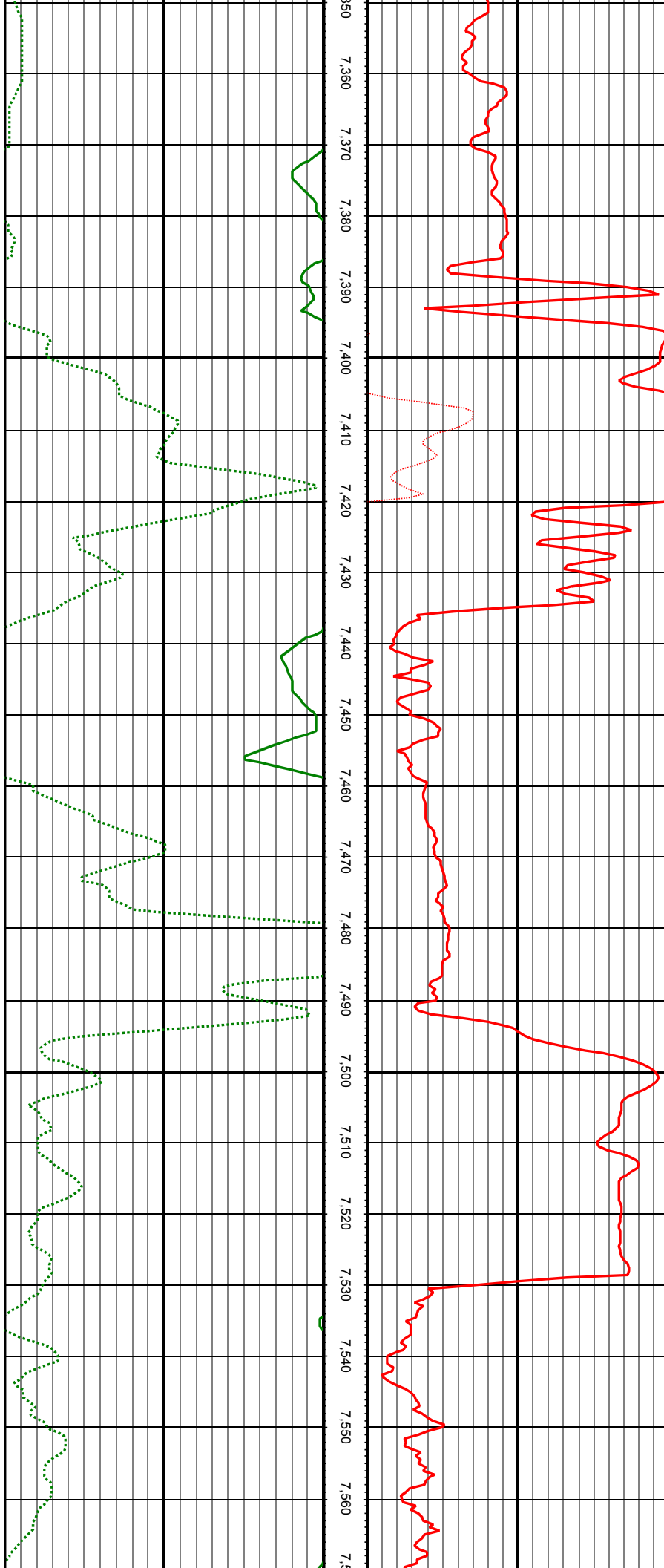
MD: 6987.00 INC: 28.04 AZ: 122.70 TVD: 6864.73 VS: -200.87

MD: 7081.00 INC: 32.13 AZ: 118.22 TVD: 6946.06 VS: -160.27



MD: 7176.00 INC: 37.01 AZ: 109.52 TVD: 7024.31 VS: -111.03

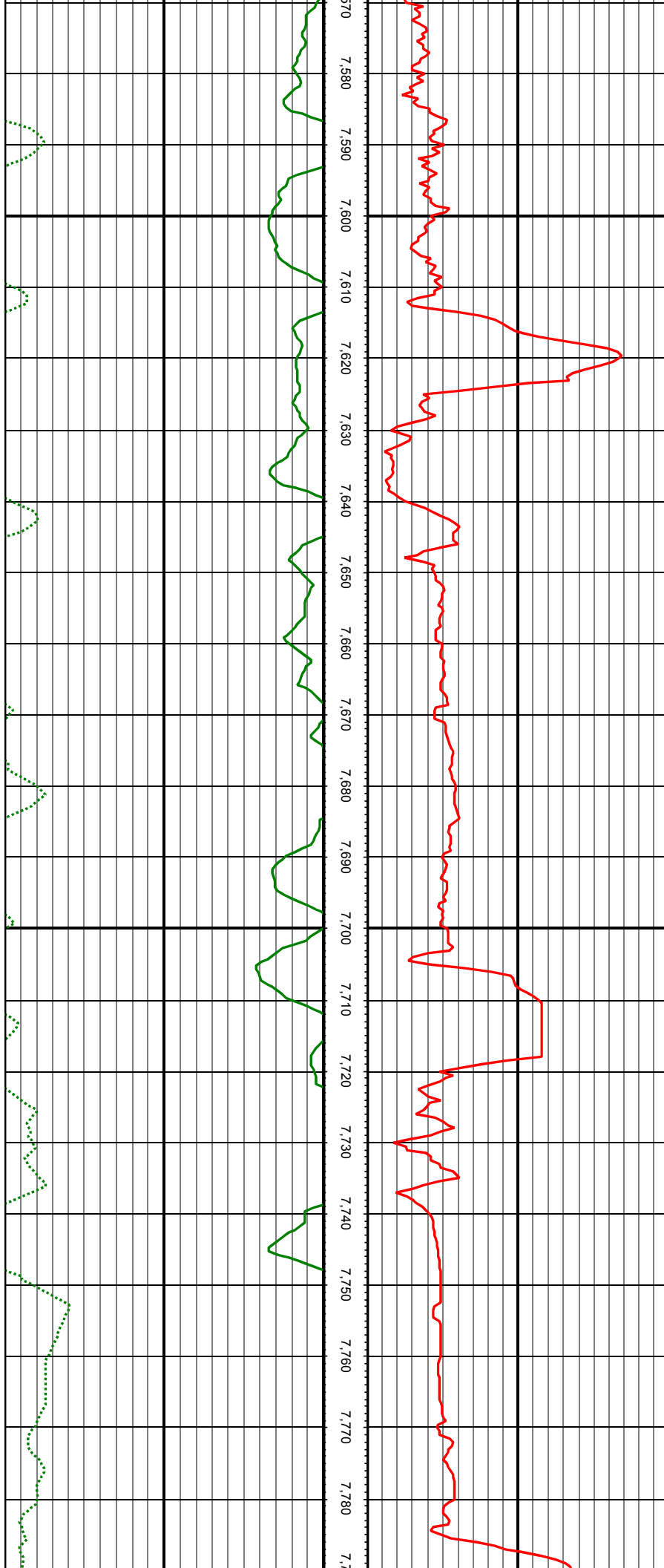
MD: 7271.00 INC: 46.24 AZ: 103.63 TVD: 7095.27 VS: -50.61



MD: 7365.00 INC: 53.67 AZ: 100.99 TVD: 7155.72 VS: 19.64

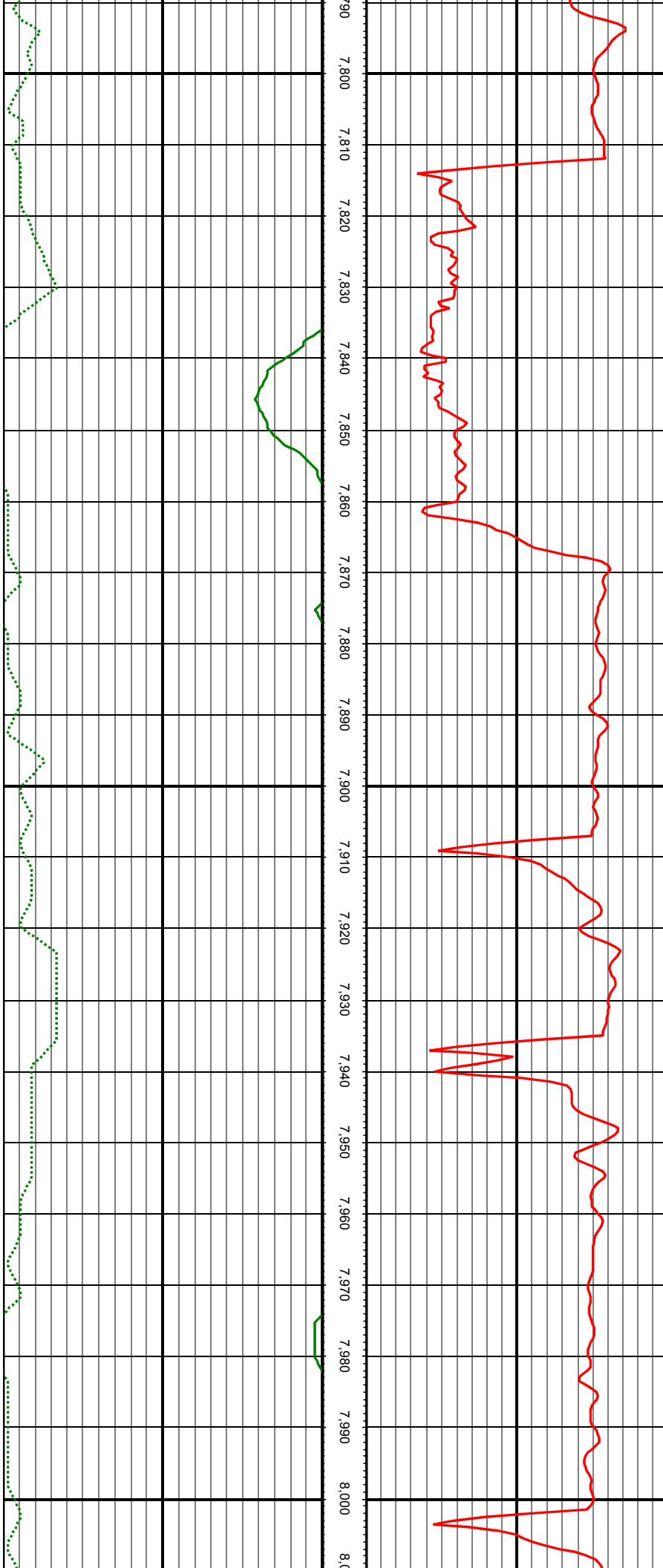
MD: 7460.00 INC: 56.00 AZ: 99.59 TVD: 7210.43 VS: 96.02

MD: 7555.00 INC: 59.60 AZ: 98.00 TVD: 7261.05 VS: 175.44



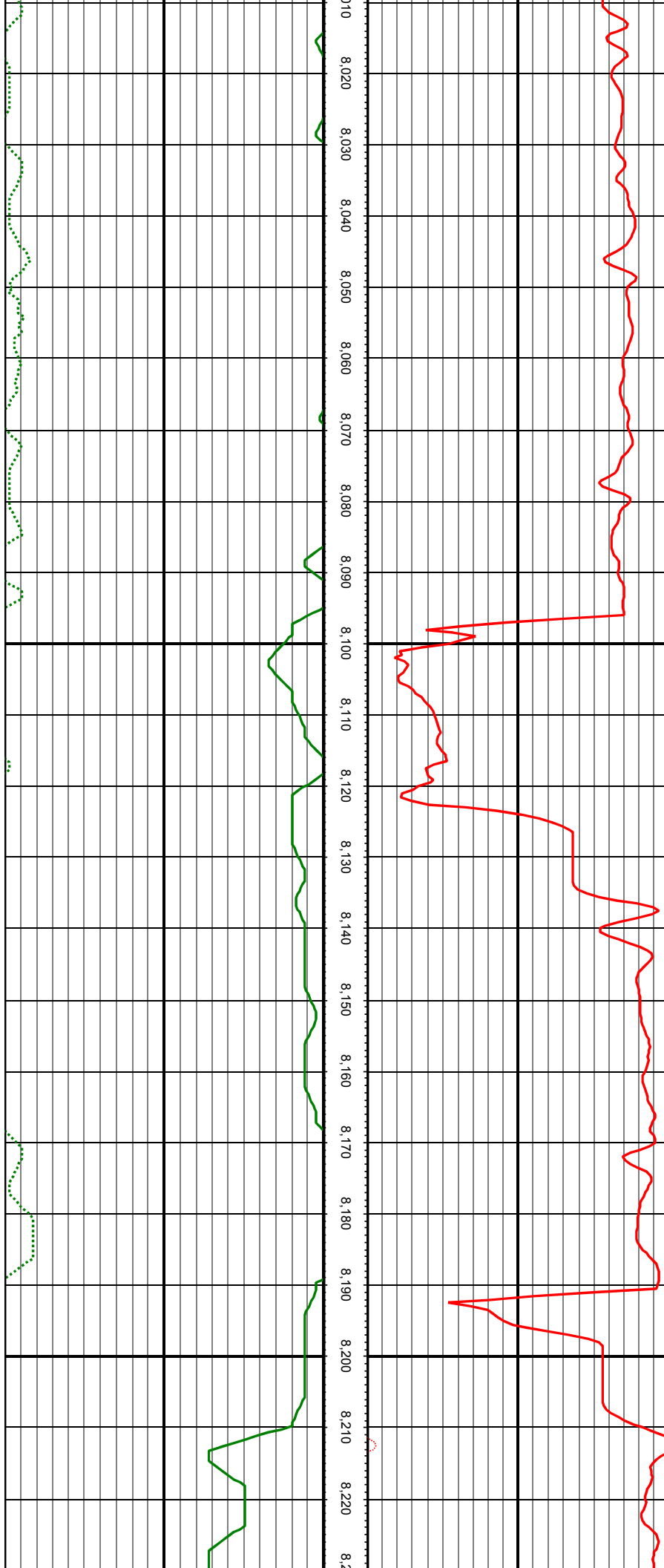
MD: 7649.00 INC: 68.48 AZ: 97.39 TVD: 7302.15 VS: 259.09

MD: 7744.00 INC: 77.80 AZ: 94.93 TVD: 7329.68 VS: 349.37



MD: 7838.00 INC: 83.56 AZ: 89.92 TVD: 7344.91 VS: 441.97

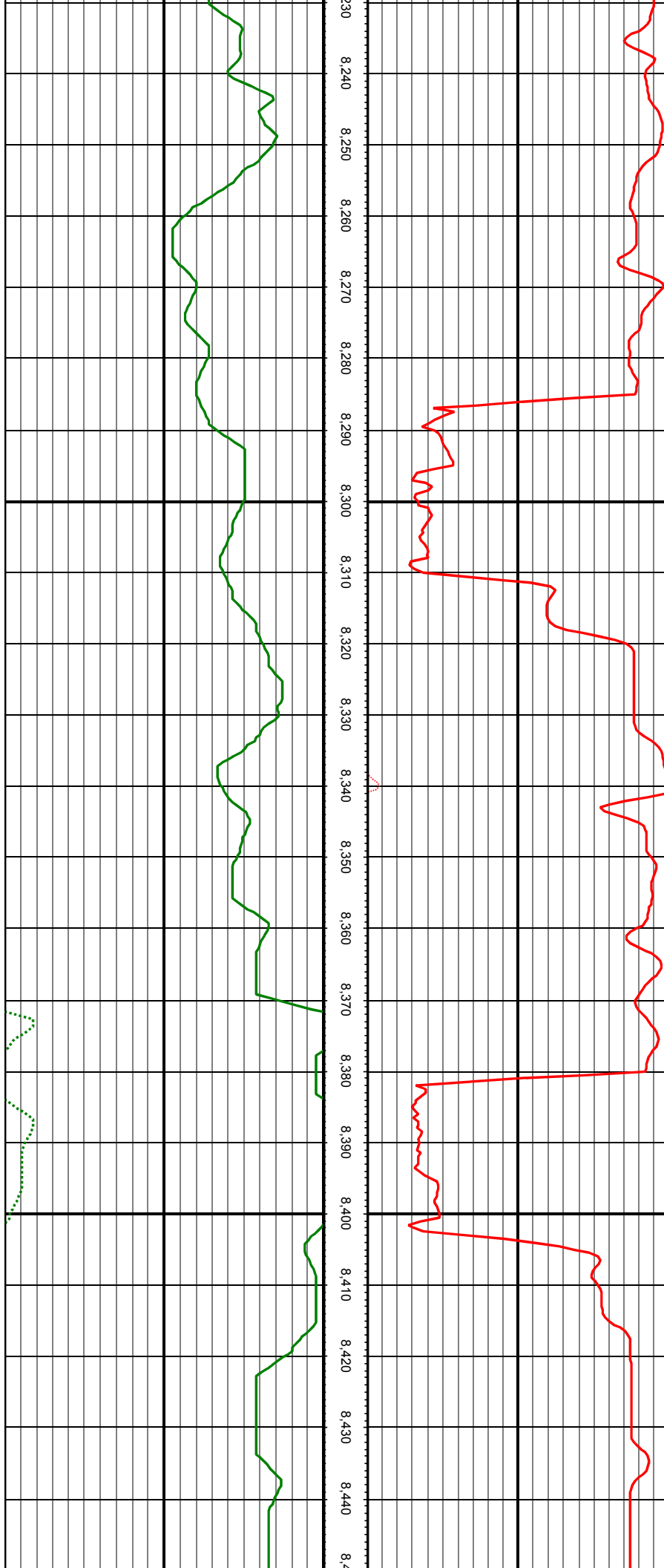
MD: 7933.00 INC: 85.80 AZ: 88.16 TVD: 7353.71 VS: 536.54



MD: 8027.00 INC: 85.63 AZ: 87.55 TVD: 7360.74 VS: 630.22

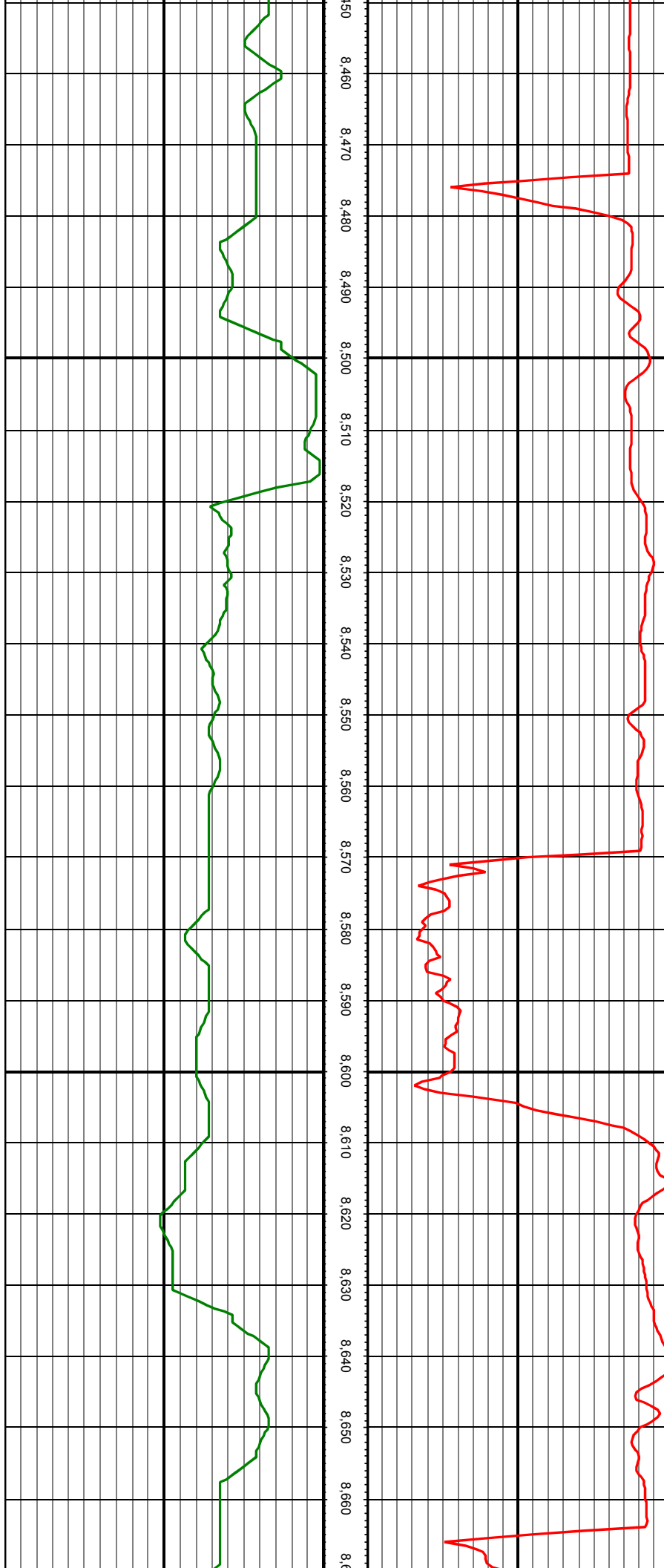
MD: 8122.00 INC: 88.04 AZ: 86.93 TVD: 7365.98 VS: 724.96

MD: 8216.00 INC: 89.49 AZ: 86.14 TVD: 7368.01 VS: 818.77



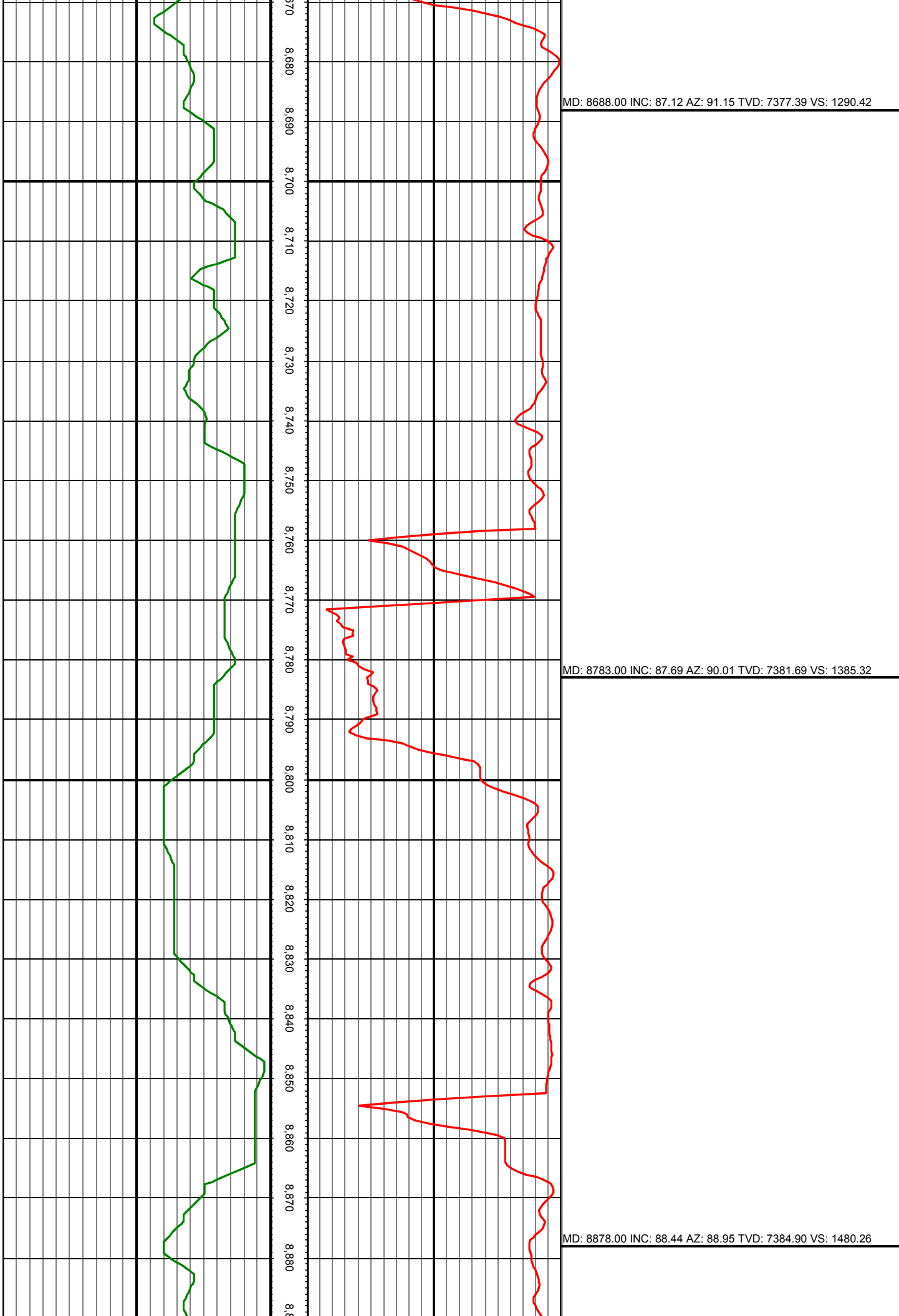
MD: 8311.00 INC: 89.71 AZ: 87.28 TVD: 7368.67 VS: 913.62

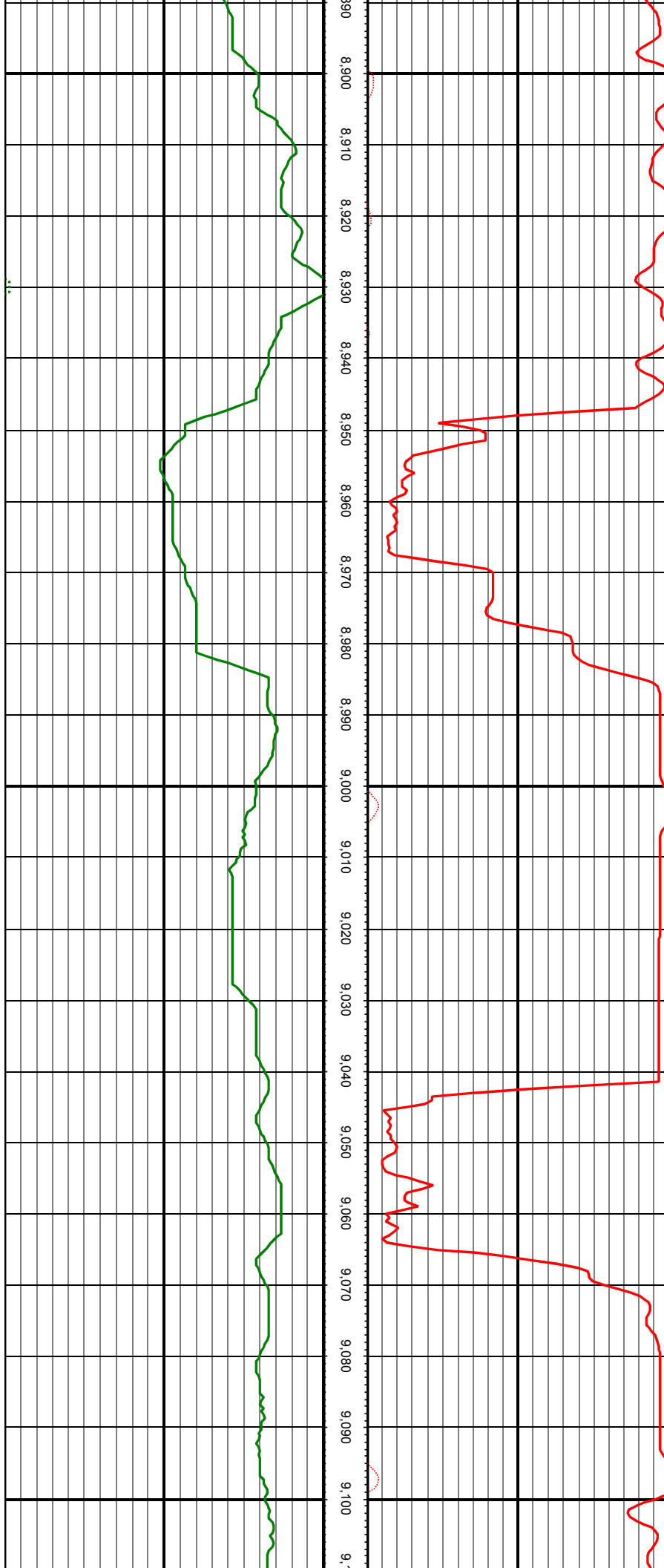
MD: 8405.00 INC: 88.88 AZ: 89.39 TVD: 7369.83 VS: 1007.57



MD: 8500.00 INC: 89.14 AZ: 88.86 TVD: 7371.47 VS: 1102.54

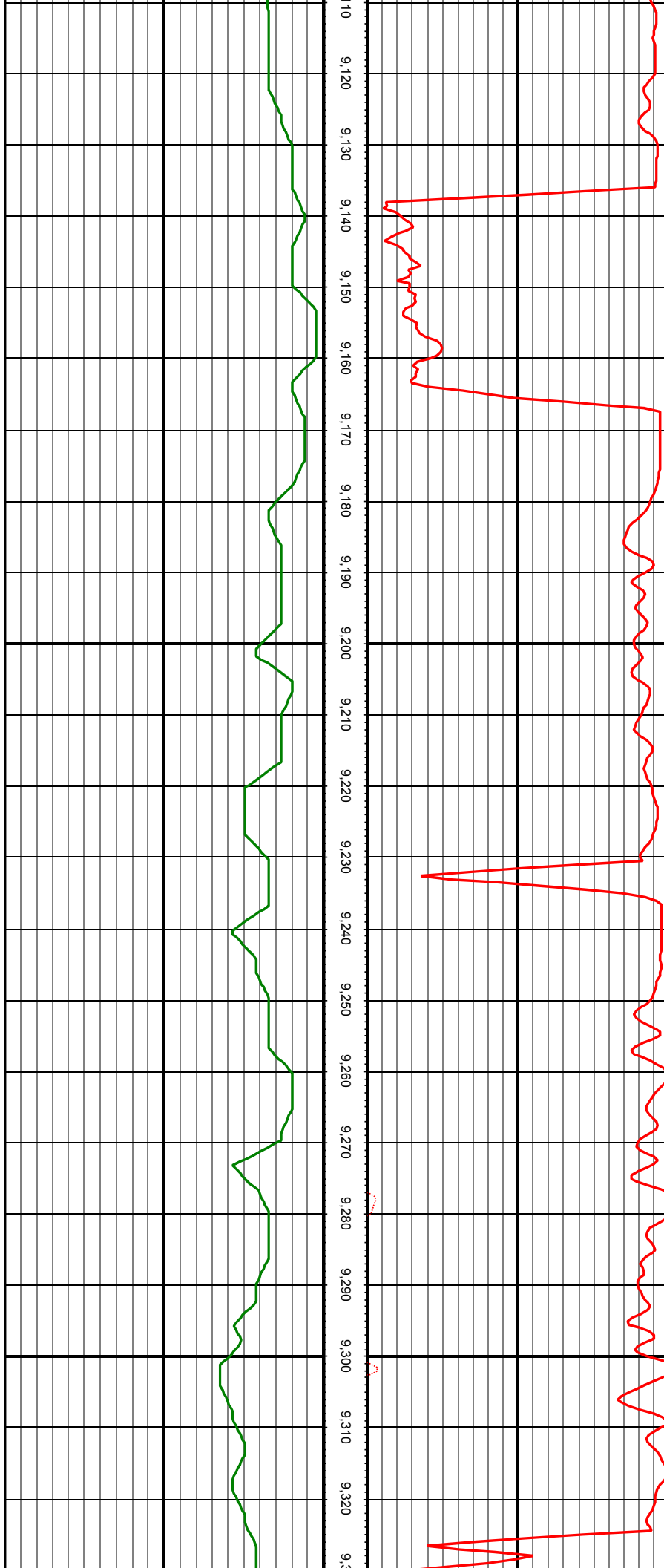
MD: 8594.00 INC: 88.26 AZ: 90.71 TVD: 7373.60 VS: 1196.51





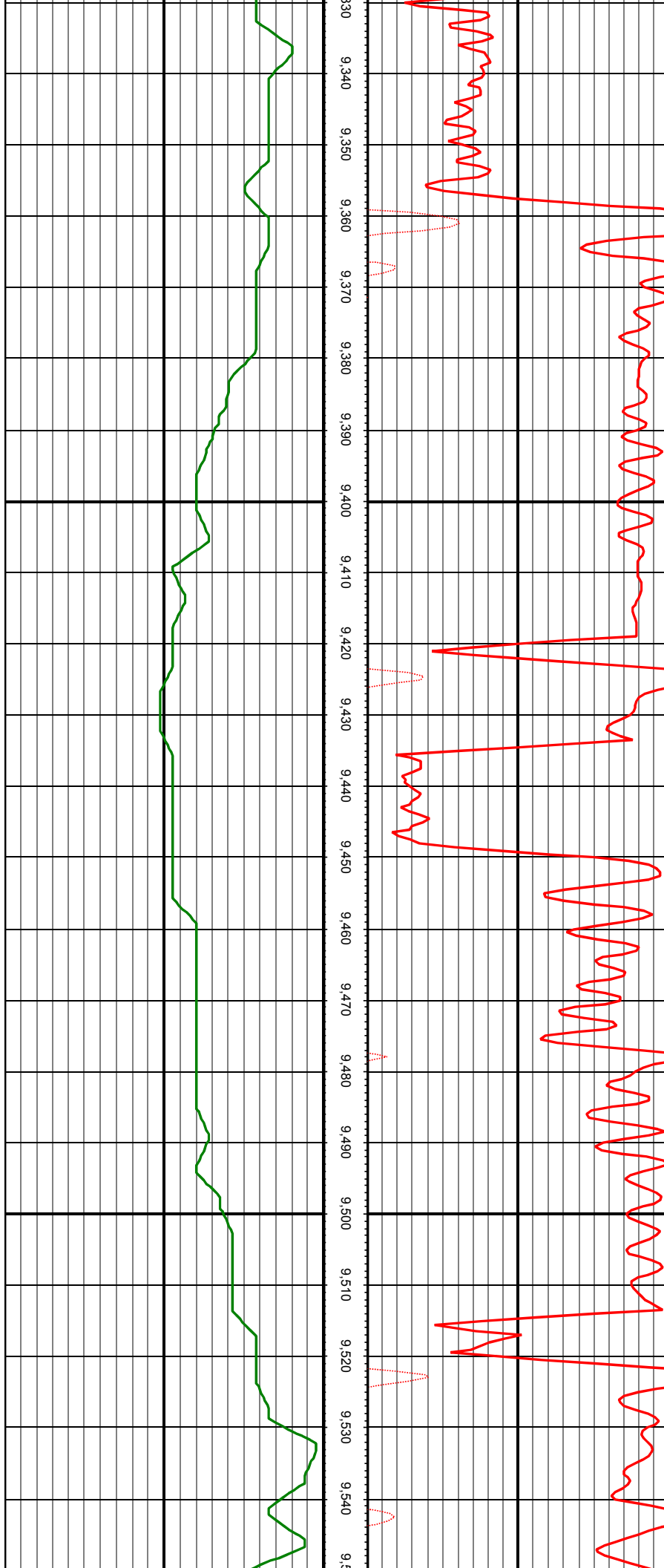
MD: 8972.00 INC: 88.44 AZ: 88.16 TVD: 7387.46 VS: 1574.20

MD: 9068.00 INC: 89.10 AZ: 87.11 TVD: 7389.52 VS: 1670.09



MD: 9162.00 INC: 91.21 AZ: 89.48 TVD: 7389.27 VS: 1764.04

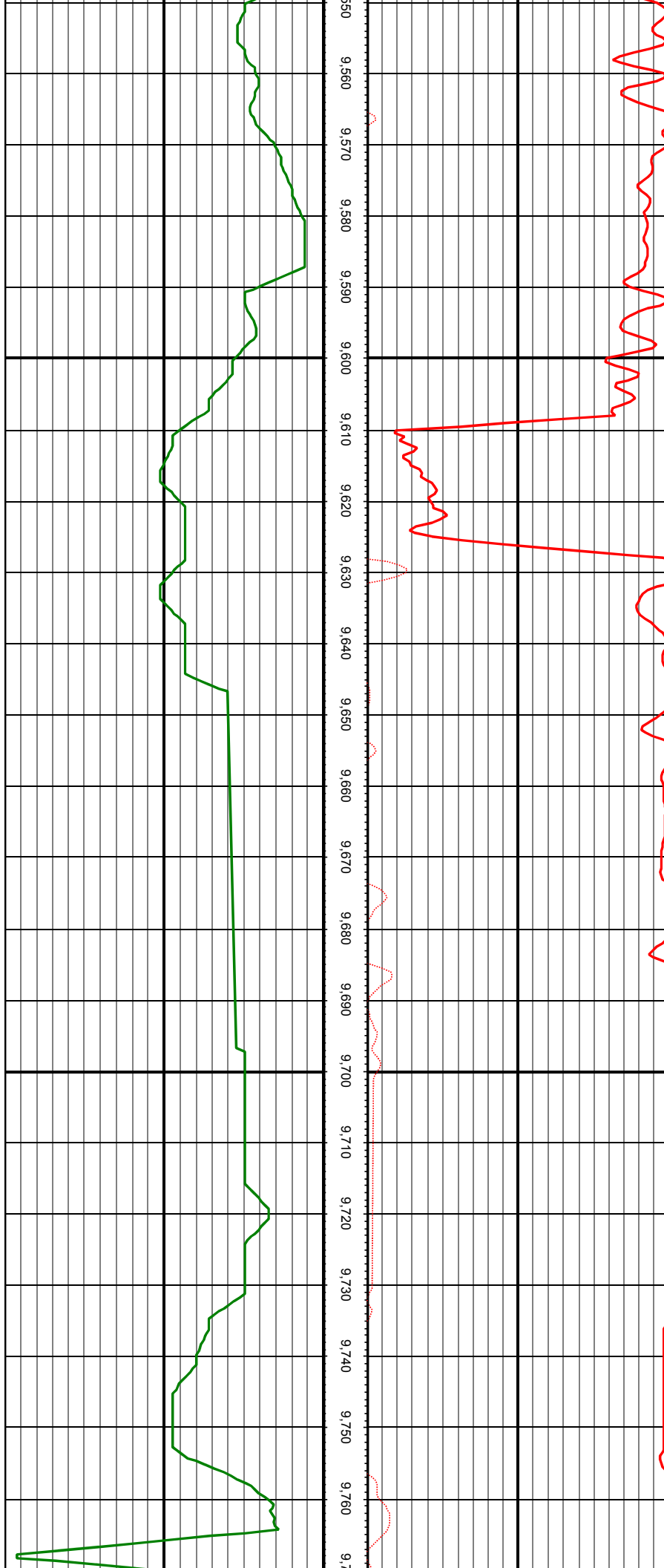
MD: 9257.00 INC: 91.56 AZ: 89.65 TVD: 7386.97 VS: 1859.01



MD: 9352.00 INC: 91.82 AZ: 89.83 TVD: 7384.17 VS: 1953.97

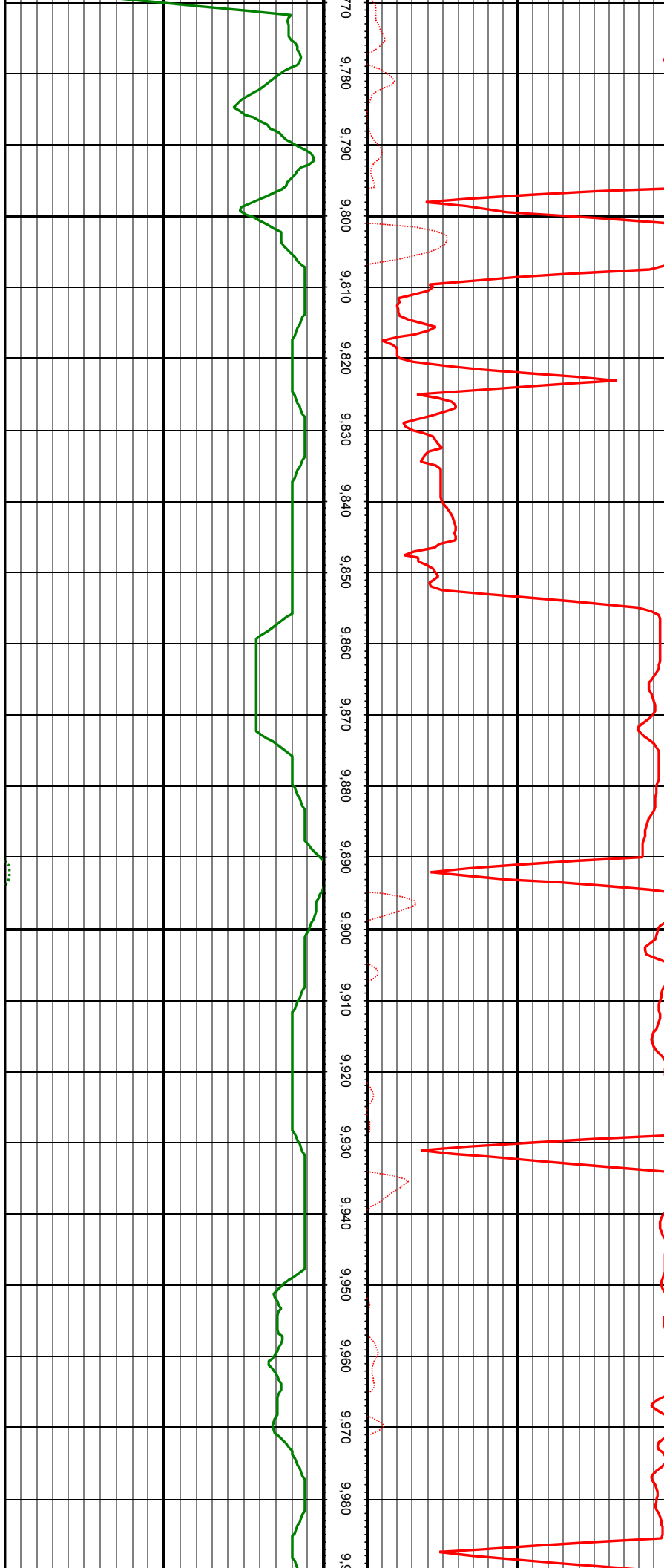
MD: 9447.00 INC: 90.11 AZ: 88.95 TVD: 7382.57 VS: 2048.95

MD: 9541.00 INC: 90.86 AZ: 90.09 TVD: 7381.77 VS: 2142.94



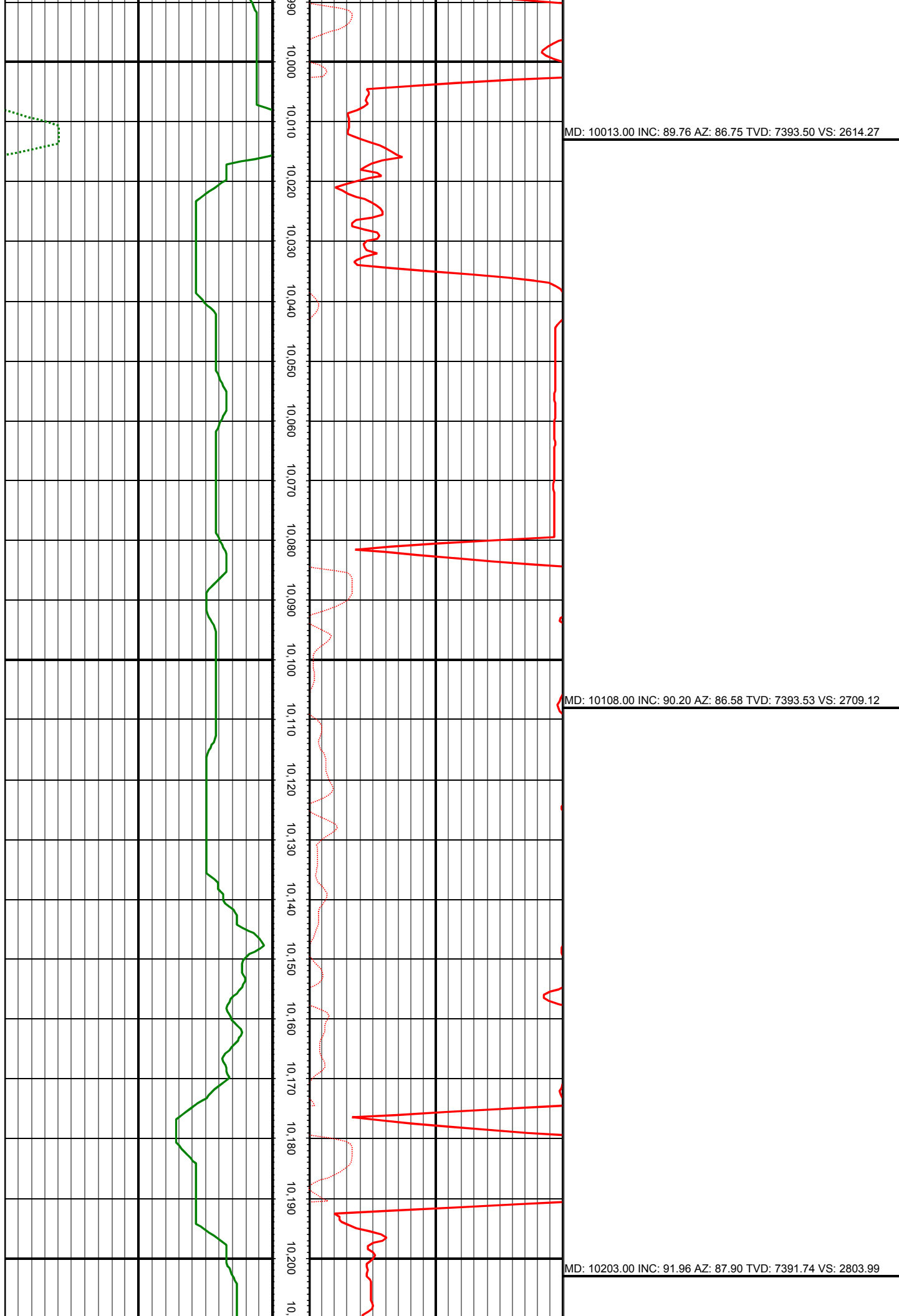
MD: 9635.00 INC: 87.96 AZ: 88.25 TVD: 7382.74 VS: 2236.92

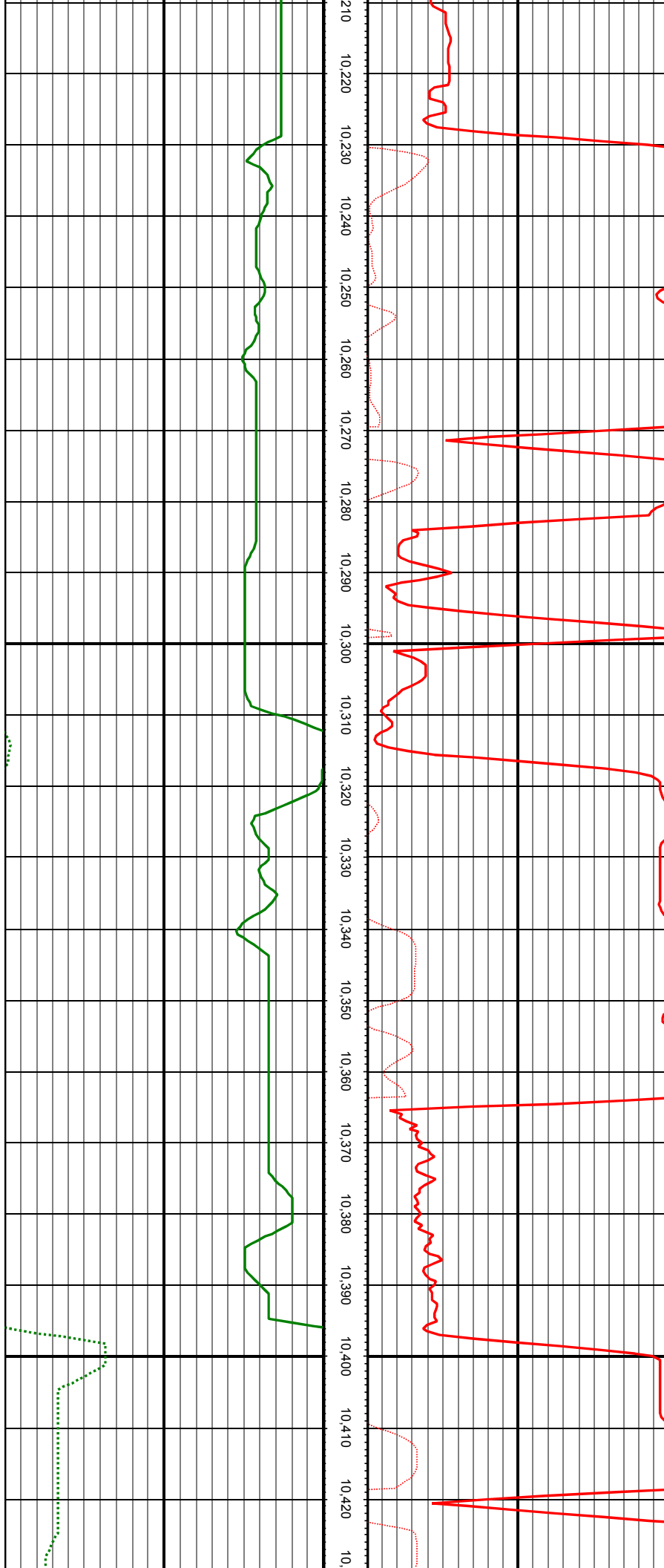
MD: 9729.00 INC: 87.08 AZ: 86.40 TVD: 7386.81 VS: 2330.73



MD: 9824.00 INC: 88.26 AZ: 86.40 TVD: 7390.67 VS: 2425.47

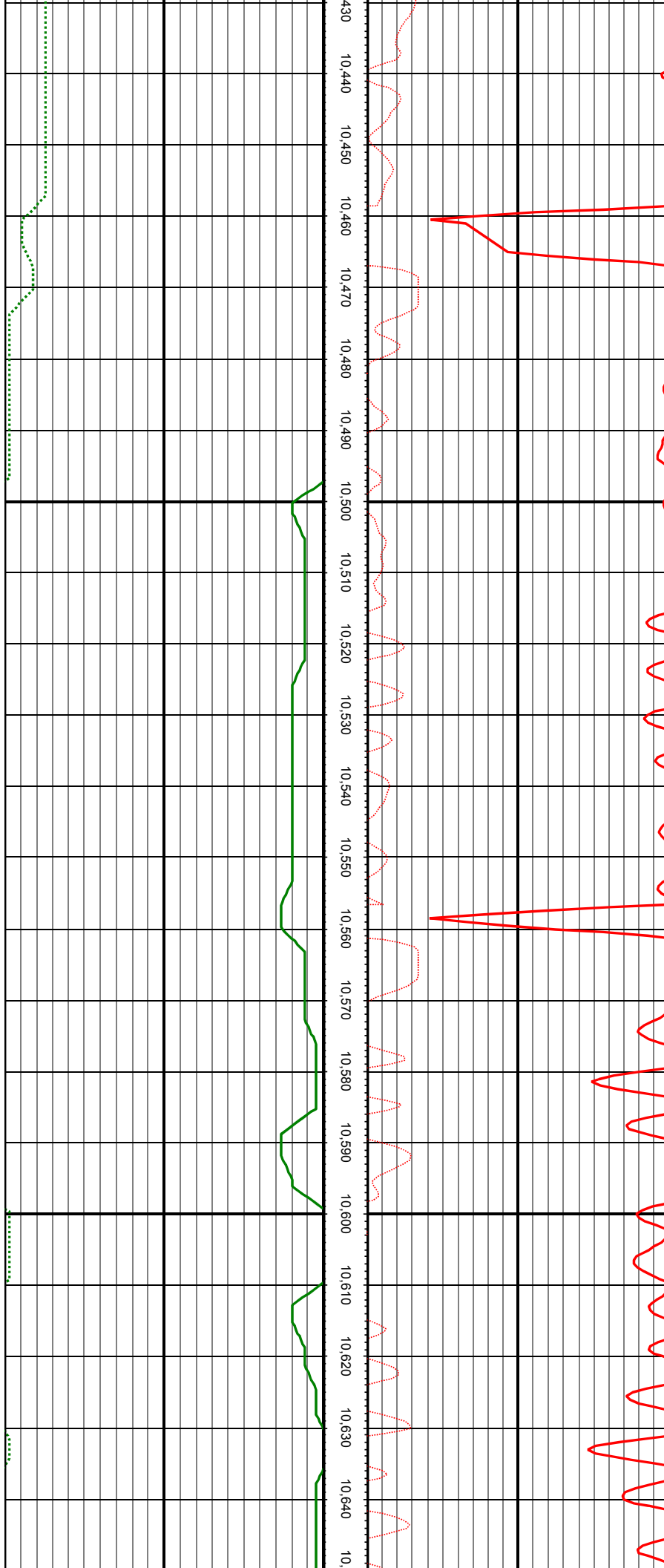
MD: 9918.00 INC: 89.27 AZ: 88.51 TVD: 7392.70 VS: 2519.35





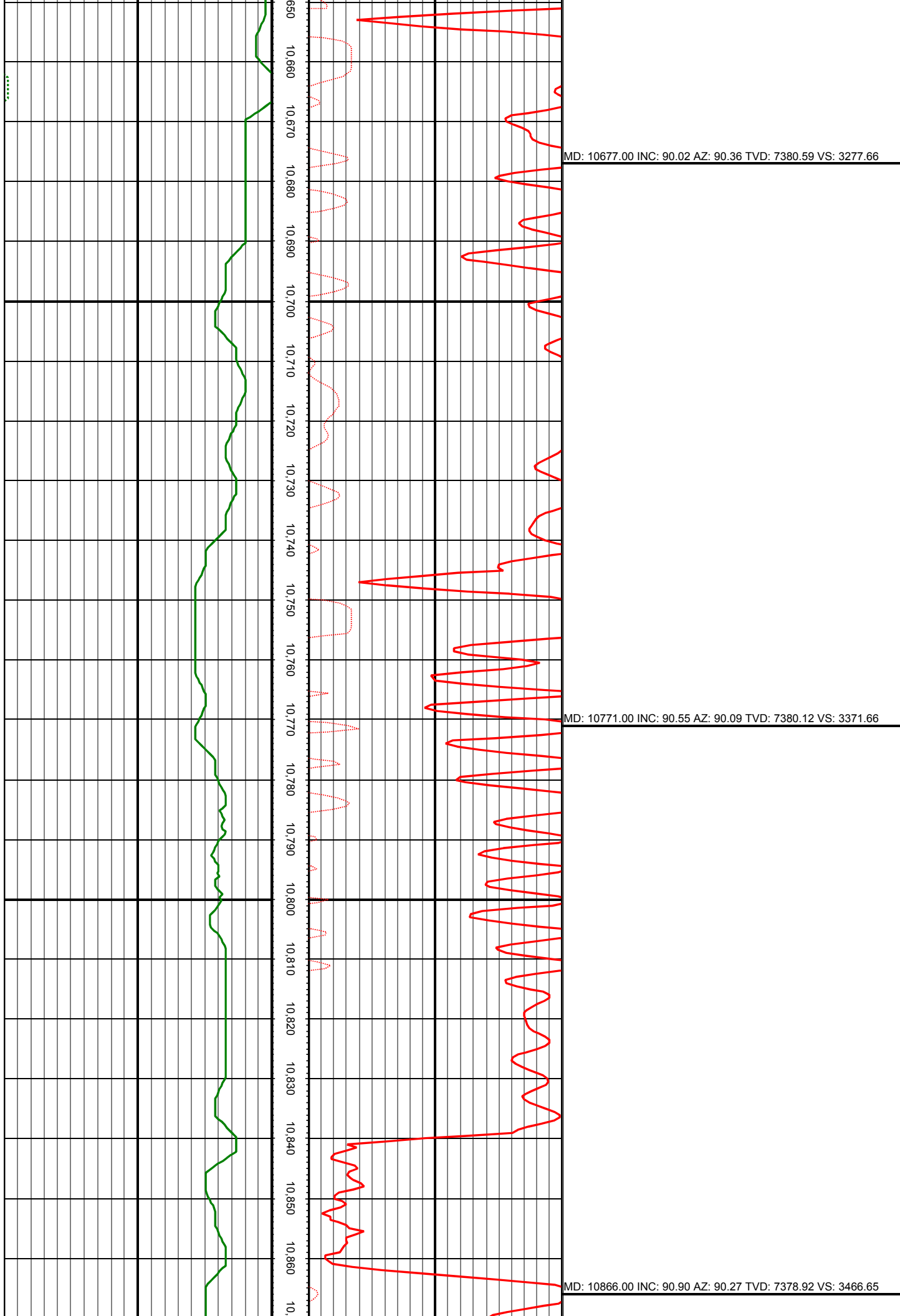
MD: 10297.00 INC: 94.20 AZ: 89.65 TVD: 7386.69 VS: 2897.82

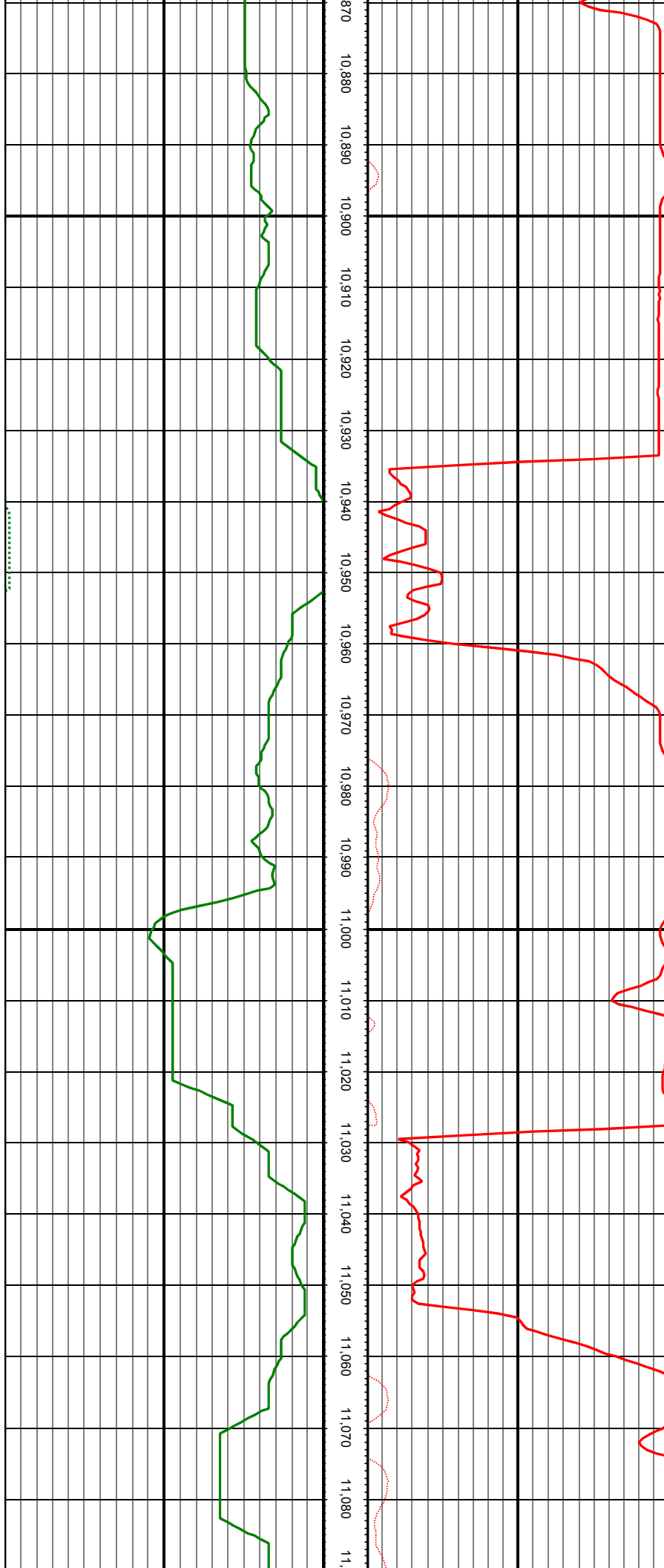
MD: 10392.00 INC: 91.08 AZ: 90.97 TVD: 7382.32 VS: 2992.71



MD: 10487.00 INC: 90.51 AZ: 91.06 TVD: 7381.00 VS: 3087.68

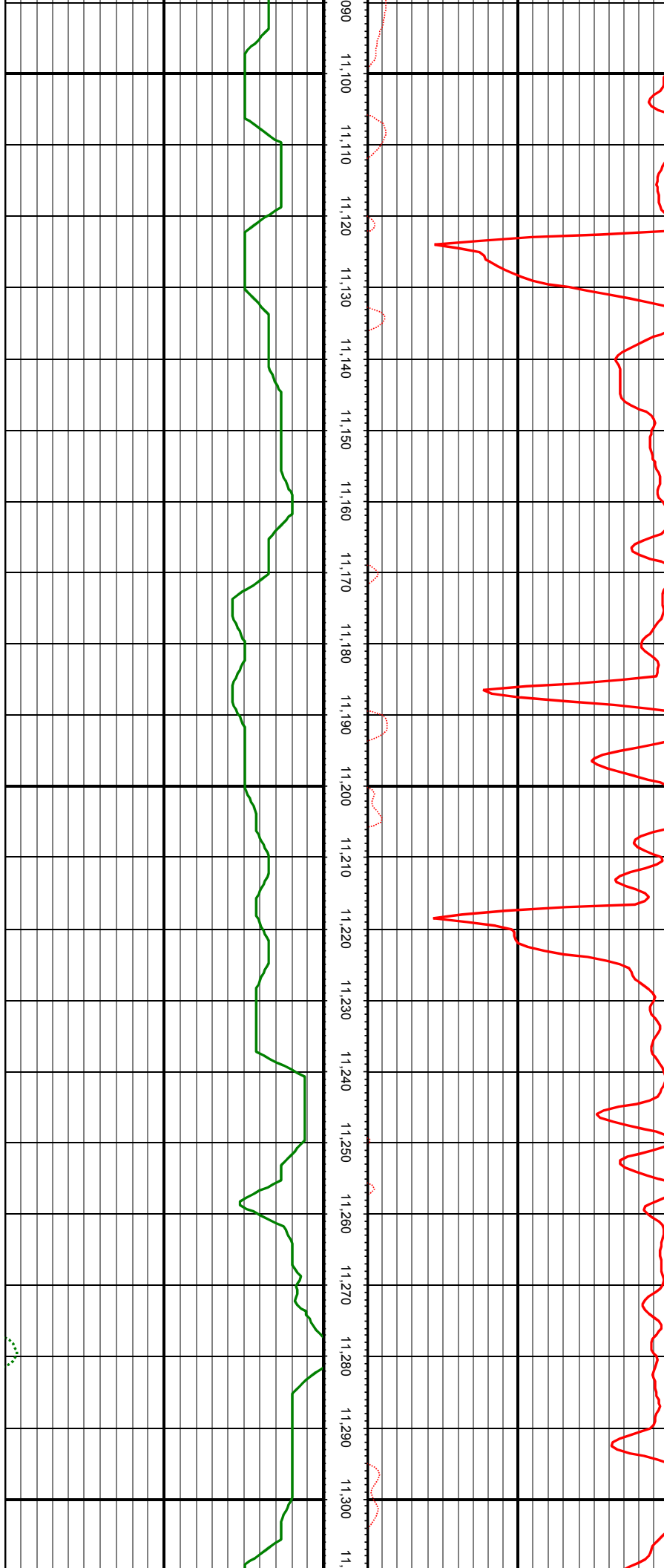
MD: 10582.00 INC: 89.98 AZ: 90.80 TVD: 7380.59 VS: 3182.66





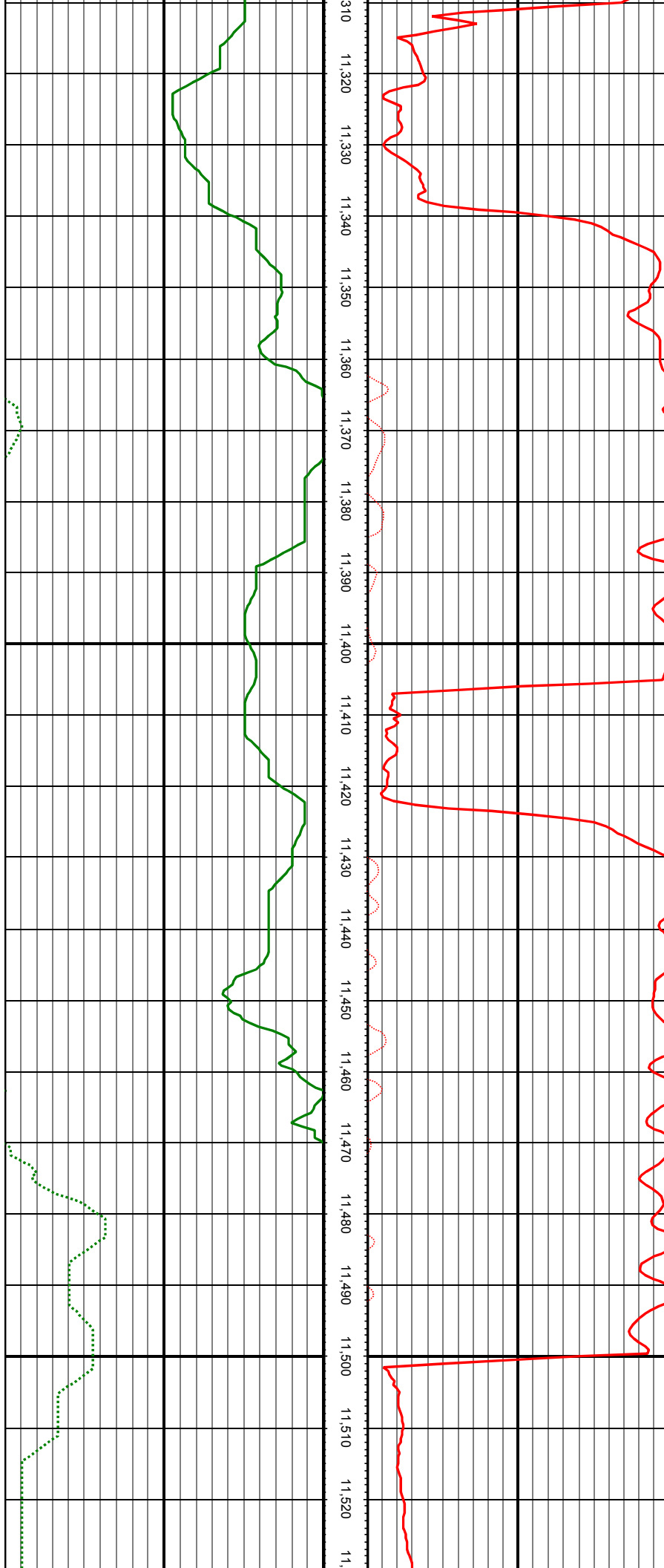
MD: 10960.00 INC: 90.59 AZ: 90.18 TVD: 7377.70 VS: 3560.64

MD: 11055.00 INC: 88.66 AZ: 90.80 TVD: 7378.32 VS: 3655.63



MD: 11149.00 INC: 87.87 AZ: 89.74 TVD: 7381.17 VS: 3749.58

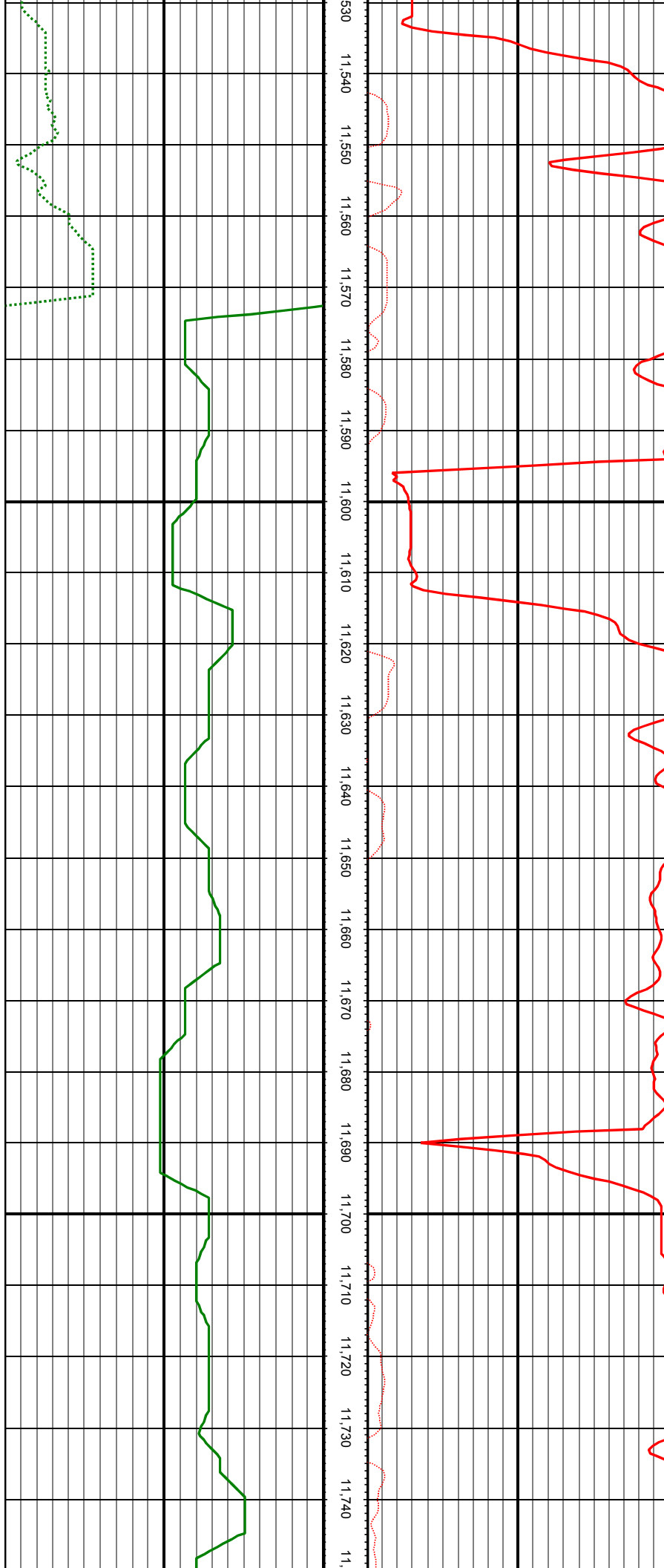
MD: 11244.00 INC: 86.73 AZ: 88.95 TVD: 7385.64 VS: 3844.47



MD: 11339.00 INC: 86.20 AZ: 90.53 TVD: 7391.50 VS: 3939.28

MD: 11433.00 INC: 85.32 AZ: 91.32 TVD: 7398.45 VS: 4033.01

MD: 11528.00 INC: 87.87 AZ: 93.08 TVD: 7404.09 VS: 4127.75



MD: 11623.00 INC: 90.95 AZ: 93.79 TVD: 7405.07 VS: 4222.56

MD: 11717.00 INC: 90.42 AZ: 93.35 TVD: 7403.95 VS: 4316.36

