

**Cathedral Energy Services**

6622 Willowbrook Park Drive  
Houston, Tx 77066  
281-440-1010 (Office)  
281-440-1025 (Fax)

**COSSLETT 1C-22H-B168****Scale 5":100' - MD****2/4/2019 7:49 AM****Oper. Company:** Crestone Peak Resources**Well:** COSSLETT 1C-22H-B168**Field:** DJ BASIN**Rig:** Ensign 140**Well ID:** 05-123-47671-00**Job Number:** 195003

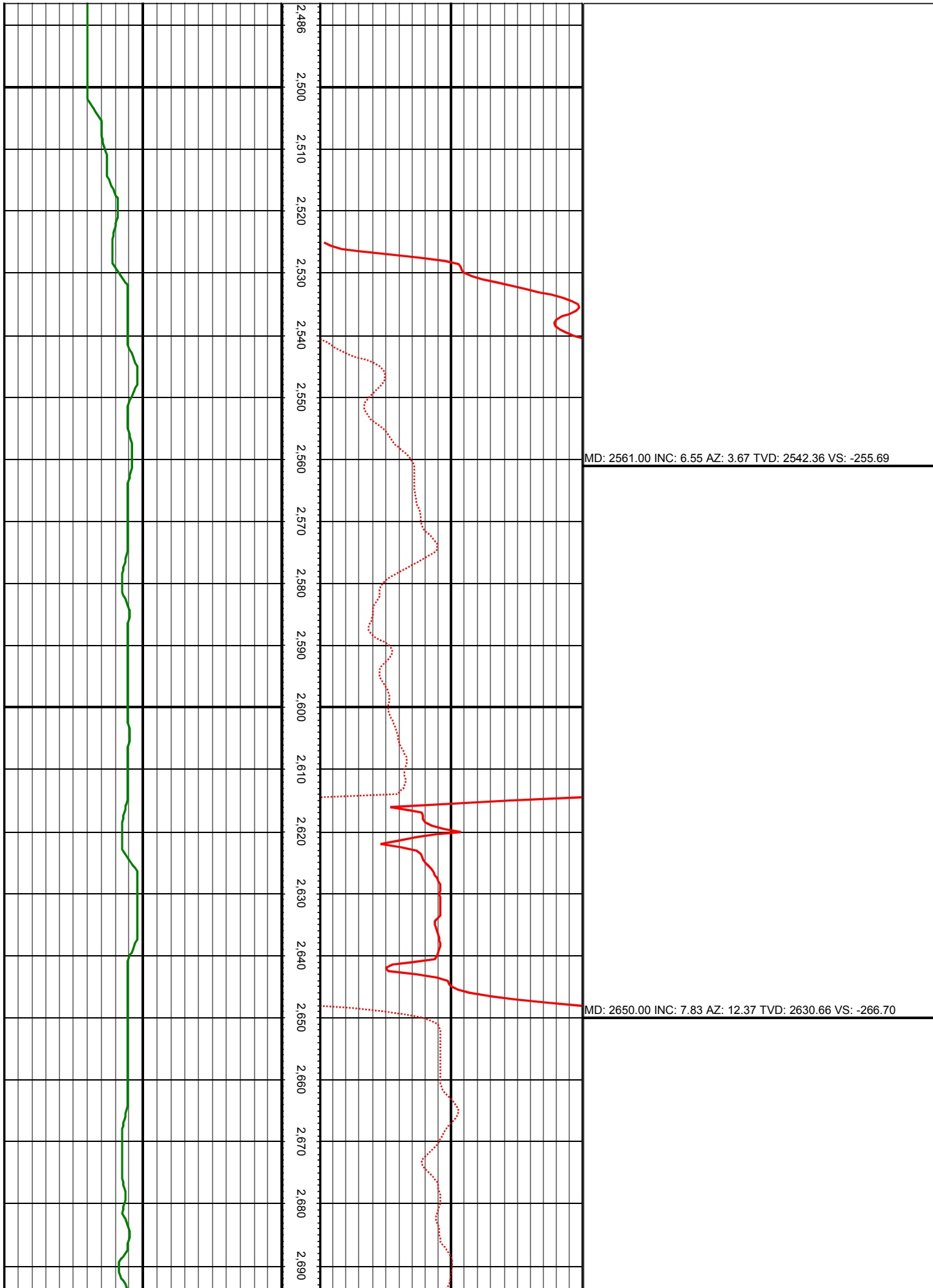
**Notes:** Gamma Ray Log  
Section Plan: 180.72°  
Datum: North American Datum 1983  
Magnetic North: 8.33°  
Grid Convergence: 0.33°  
Gamma Averaging: 7% Smoothing

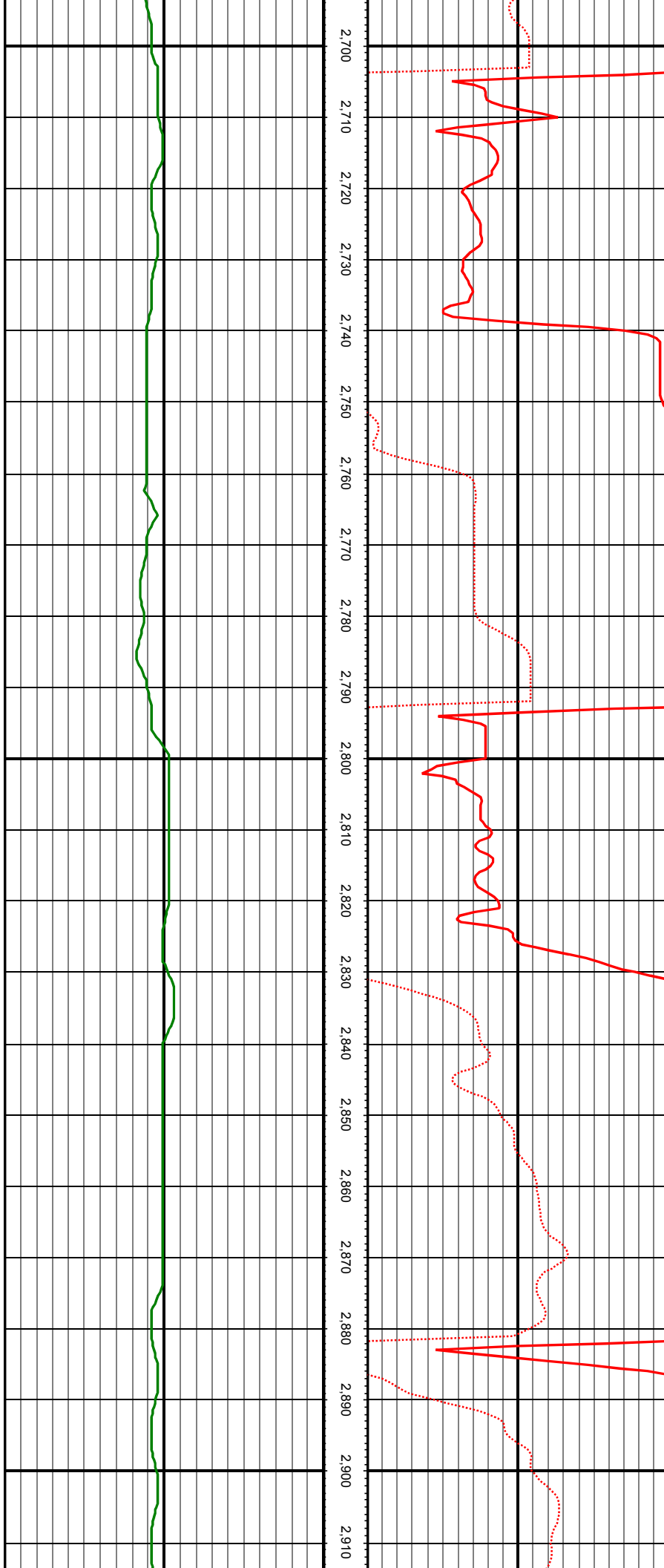
**State:** Colorado**County:** Weld**Country:** United States**Location:** S22-T1N-R68W**Start Date:** 01/30/2019 23:30:00**End Date:** 02/04/2019 07:00:00**Latitude:** 40.041391**Longitude:** -104.988012**Elev GL:** 5,174.00**Elev DF:** 5,197.00**Elev KB:** 5,197.00**Notes:** Log & Survey Depths Relative to Kelly Bushing (KB) Depth**Operator 1:** Bob Stahlecker**Operator 2:** Jerry Shannahan**Notes:** Maximum Temperature: 235.00°F

Tool Run Data	Run #1	Run #2	Run #3	Run #4	Run #5
Tool S/N	BTDM-1824				
Bit Size	8.75				
Cal Factor	5.32				
Survey Offset	55.00				
Gamma Offset	38.57				
Resistivity Offset	0.00				
Start Depth	2515.00				
StartDate	1/30/2019				
StartTime	23:30				
EndDepth	17471.00				
EndDate	2/4/2019				
EndTime	17:00				
Mud Type	INNOVERT				
Mud Weight	10.00 PPG				
Funnel Viscosity	64.00 SEC/QT				
Plastic Viscosity	26.00 CP				
Yield Point	22.00 LBS/100FT2				
Gel Strength	12.00/34.00/38.00 LBS/100FT2				
Solids Content	9.00 % BY VOL				
Sand Content	0.00 % BY VOL				
Mud Alkalinity	0.00 PPB				
Filtrate Alkalinity	0.00 % BY VOL				
Chlorides	45,000.00 MG/L				
Temperature	235.00 °F				

Hole Data			Casing Data		
Size	From	To	Size	From	To
12.25	516.00	2515.00	13.375	0.00	516.00
8.75	2515.00	17471.00	9.875	0.00	2502.00
			5.50	0.00	17471.00

*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.*

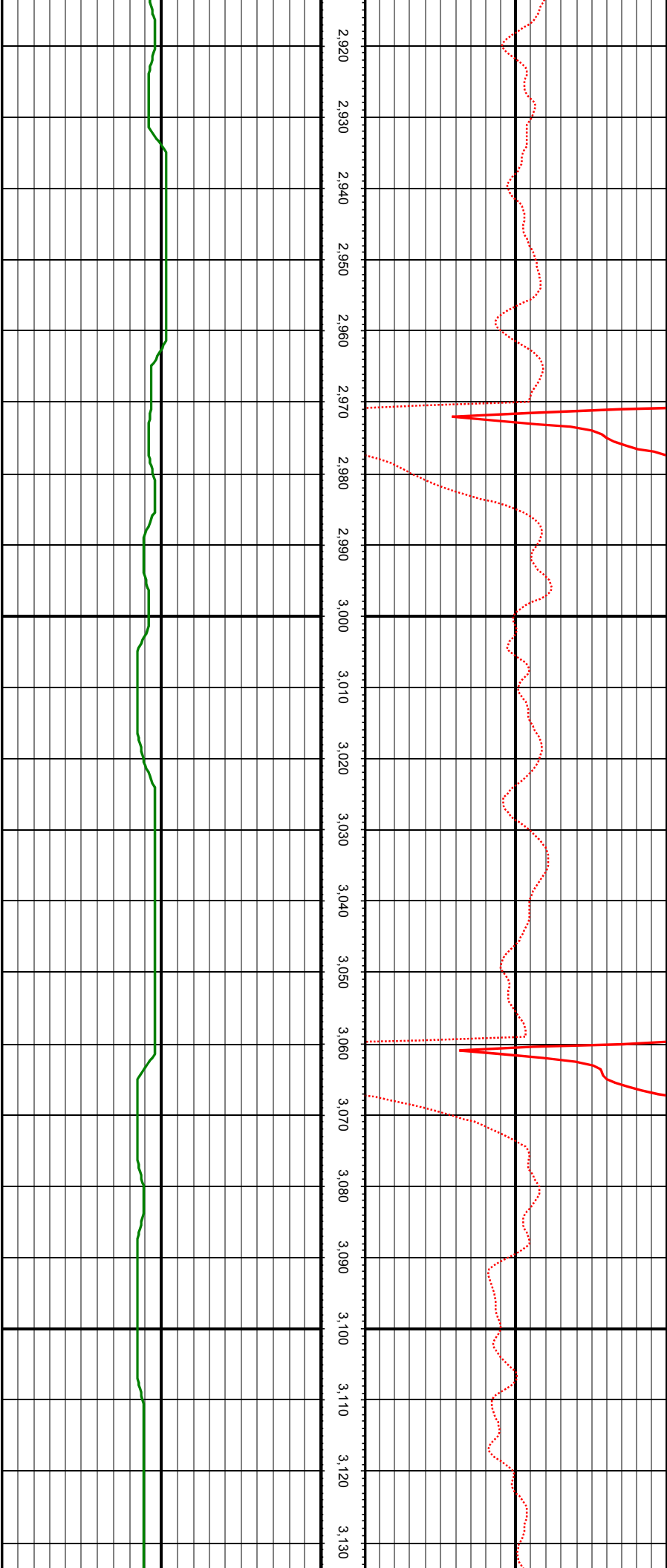




MD: 2740.00 INC: 8.48 AZ: 7.28 TVD: 2719.76 VS: -279.29

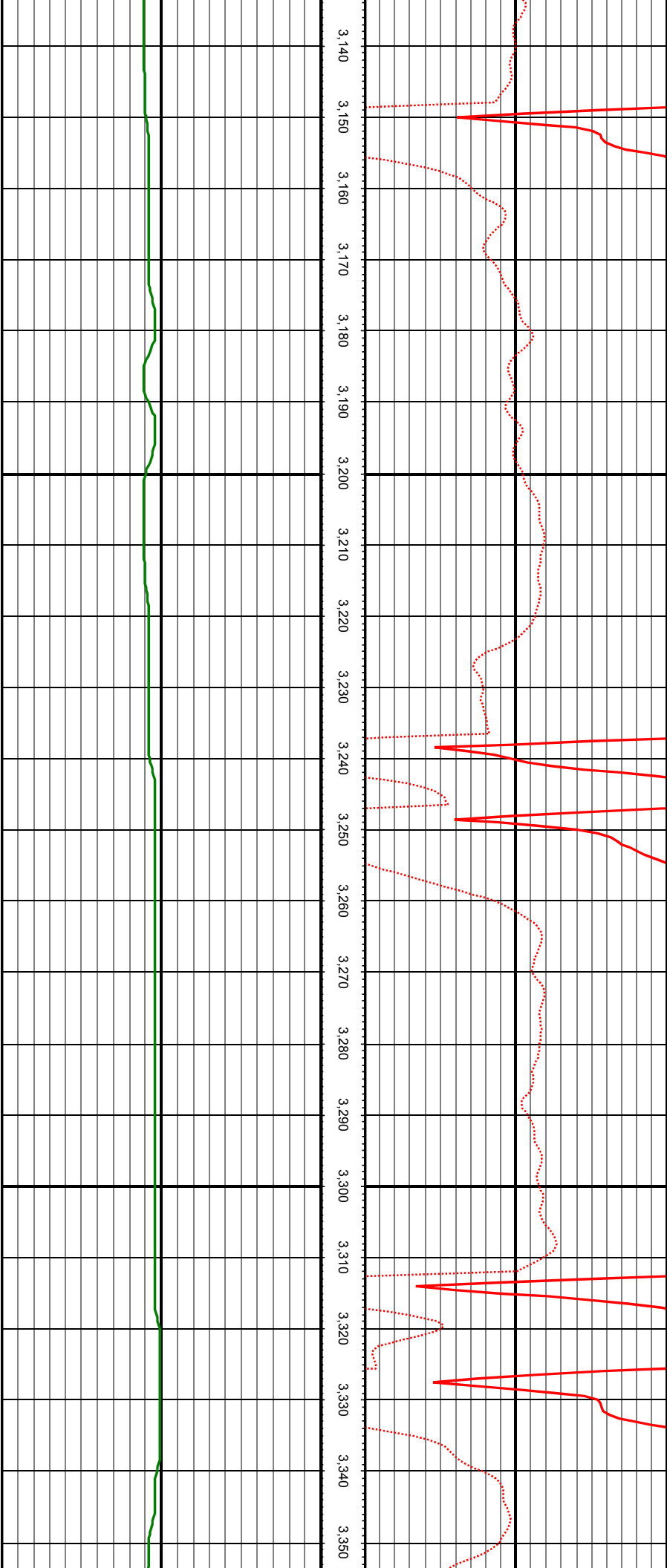
MD: 2829.00 INC: 9.71 AZ: 354.36 TVD: 2807.64 VS: -293.27

MD: 2918.00 INC: 9.54 AZ: 350.84 TVD: 2895.39 VS: -308.00



MD: 3007.00 INC: 9.14 AZ: 350.75 TVD: 2983.21 VS: -322.23

MD: 3096.00 INC: 8.57 AZ: 351.19 TVD: 3071.15 VS: -335.73



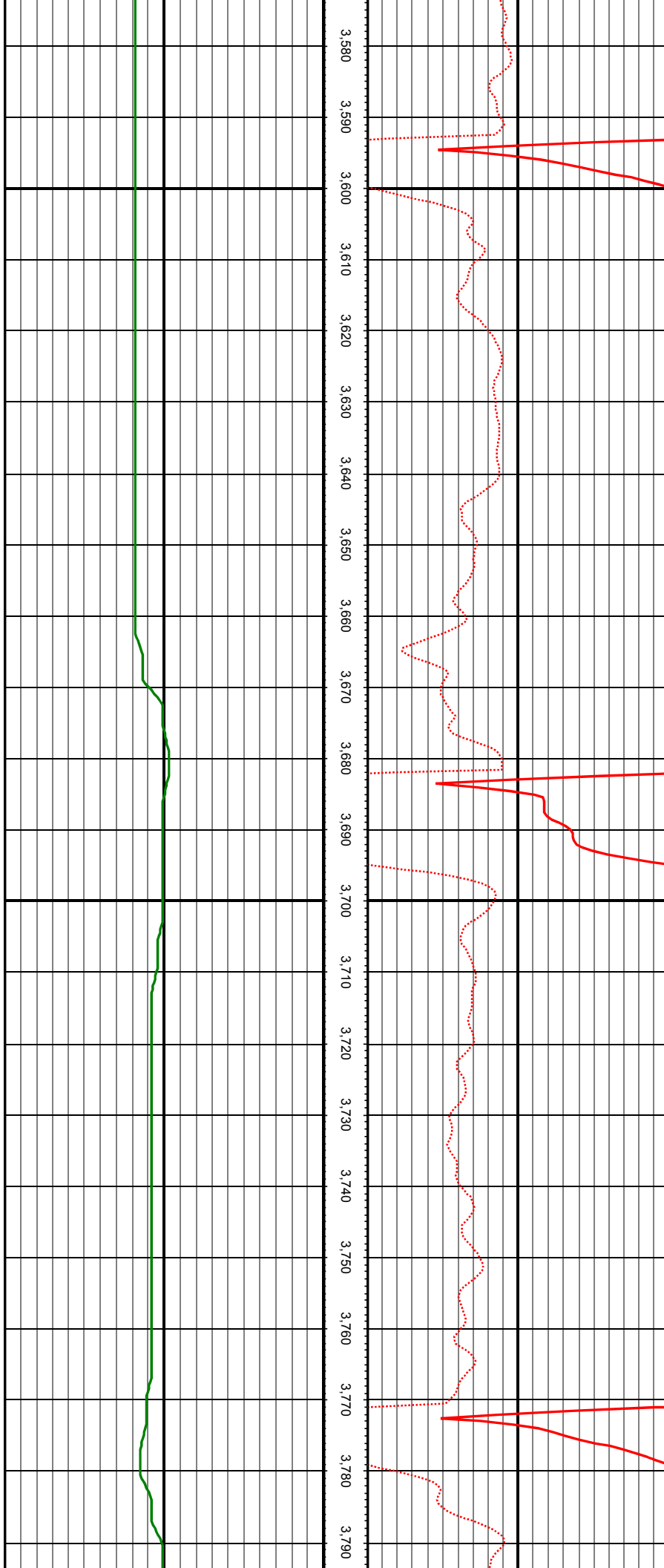
MD: 3185.00 INC: 7.78 AZ: 350.93 TVD: 3159.25 VS: -348.21

MD: 3274.00 INC: 7.16 AZ: 351.37 TVD: 3247.49 VS: -359.62

MD: 3363.00 INC: 6.42 AZ: 351.98 TVD: 3335.87 VS: -370.01

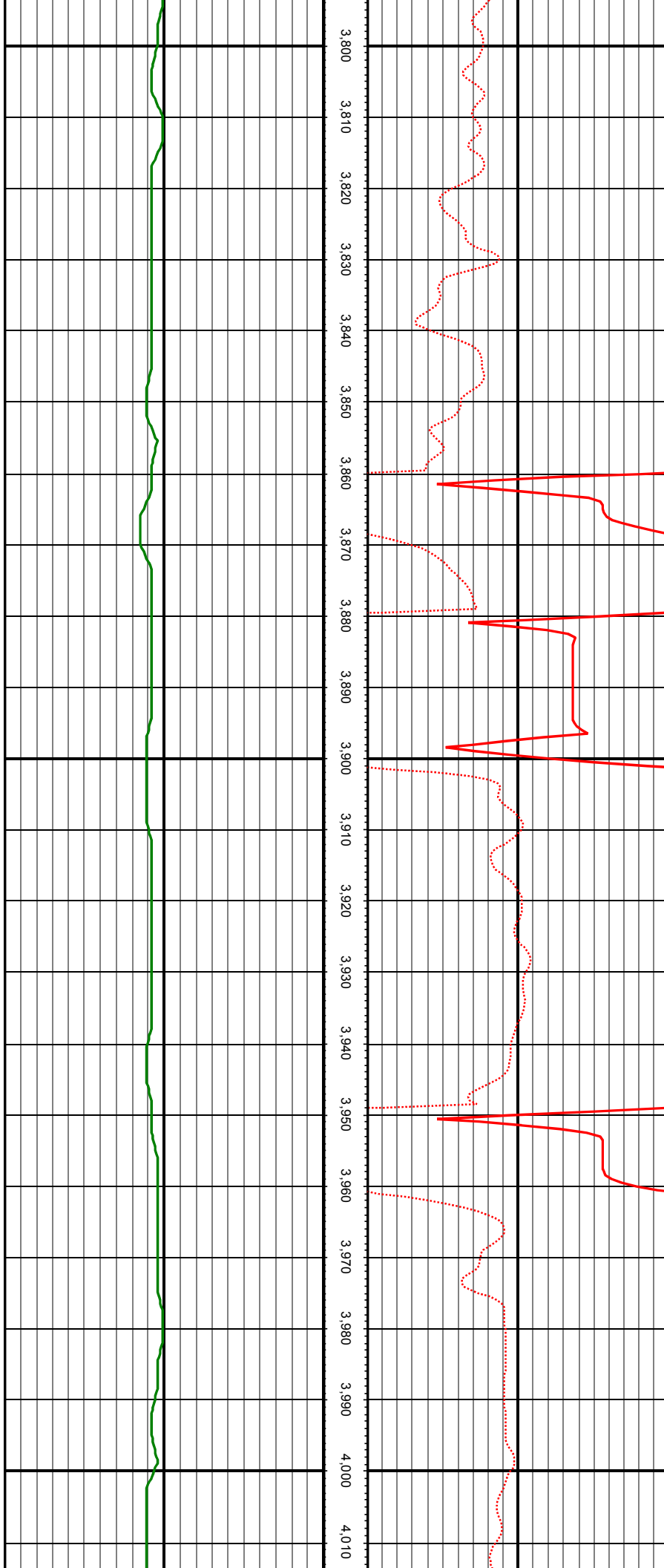


MD: 3541.00 INC: 8.66 AZ: 359.45 TVD: 3512.32 VS: -393.24



MD: 3630.00 INC: 7.60 AZ: 358.05 TVD: 3600.42 VS: -405.82

MD: 3720.00 INC: 6.55 AZ: 359.28 TVD: 3689.74 VS: -416.90

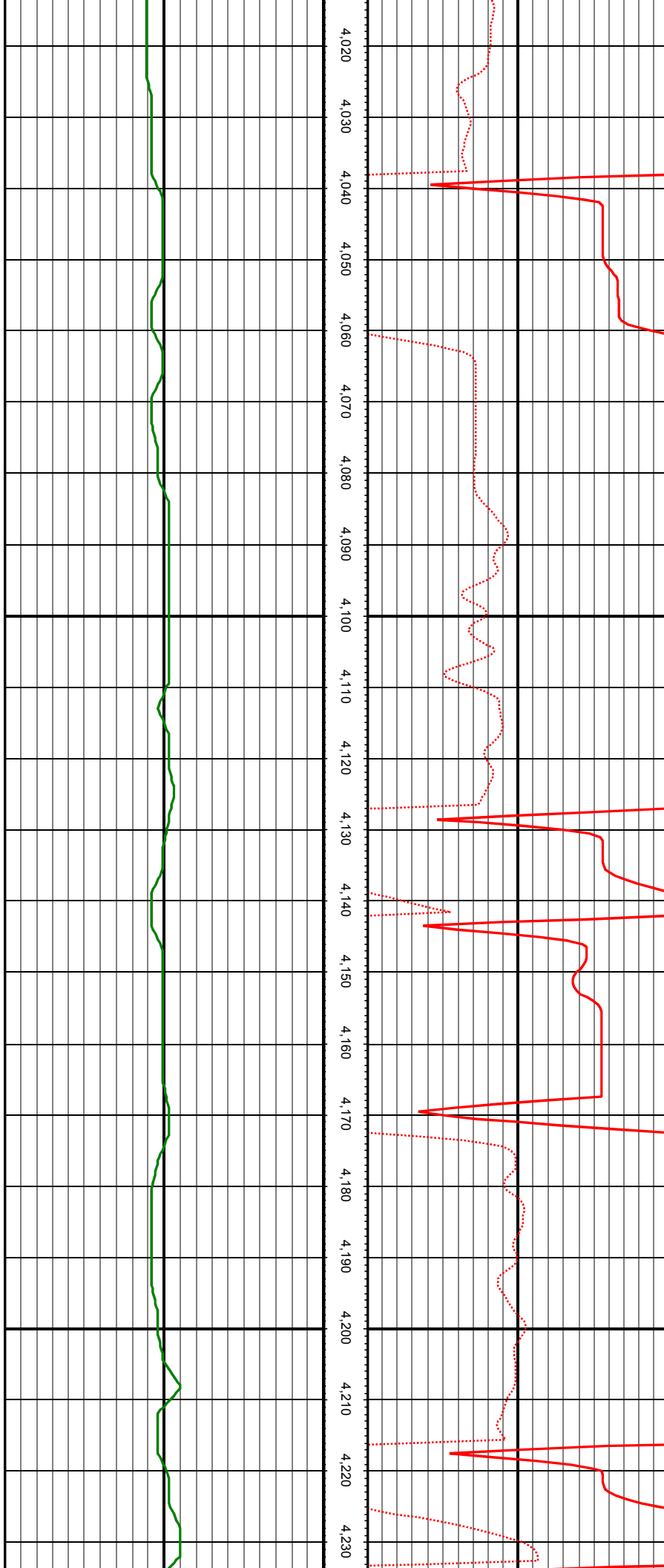


MD: 3809.00 INC: 5.67 AZ: 359.72 TVD: 3778.23 VS: -426.37

MD: 3898.00 INC: 5.41 AZ: 346.80 TVD: 3866.82 VS: -434.84

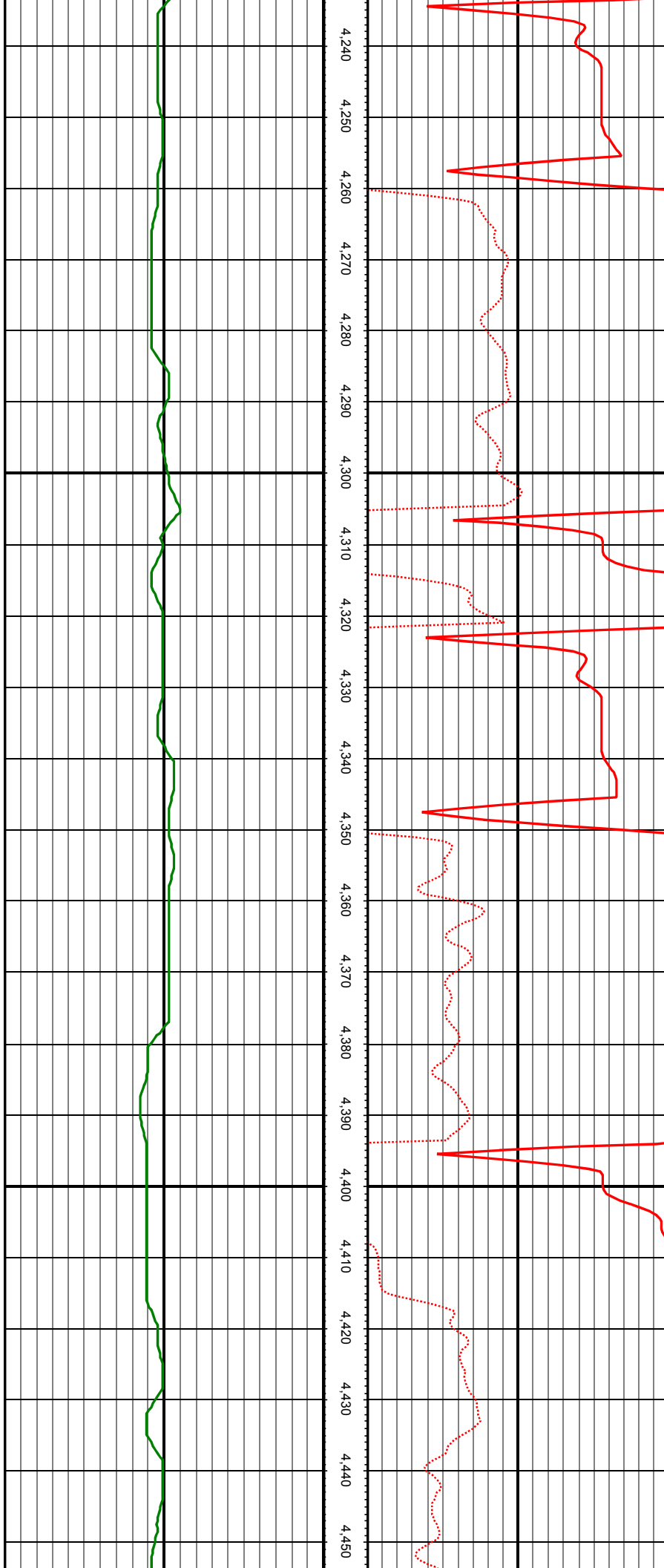
MD: 3987.00 INC: 5.45 AZ: 340.29 TVD: 3955.42 VS: -442.87





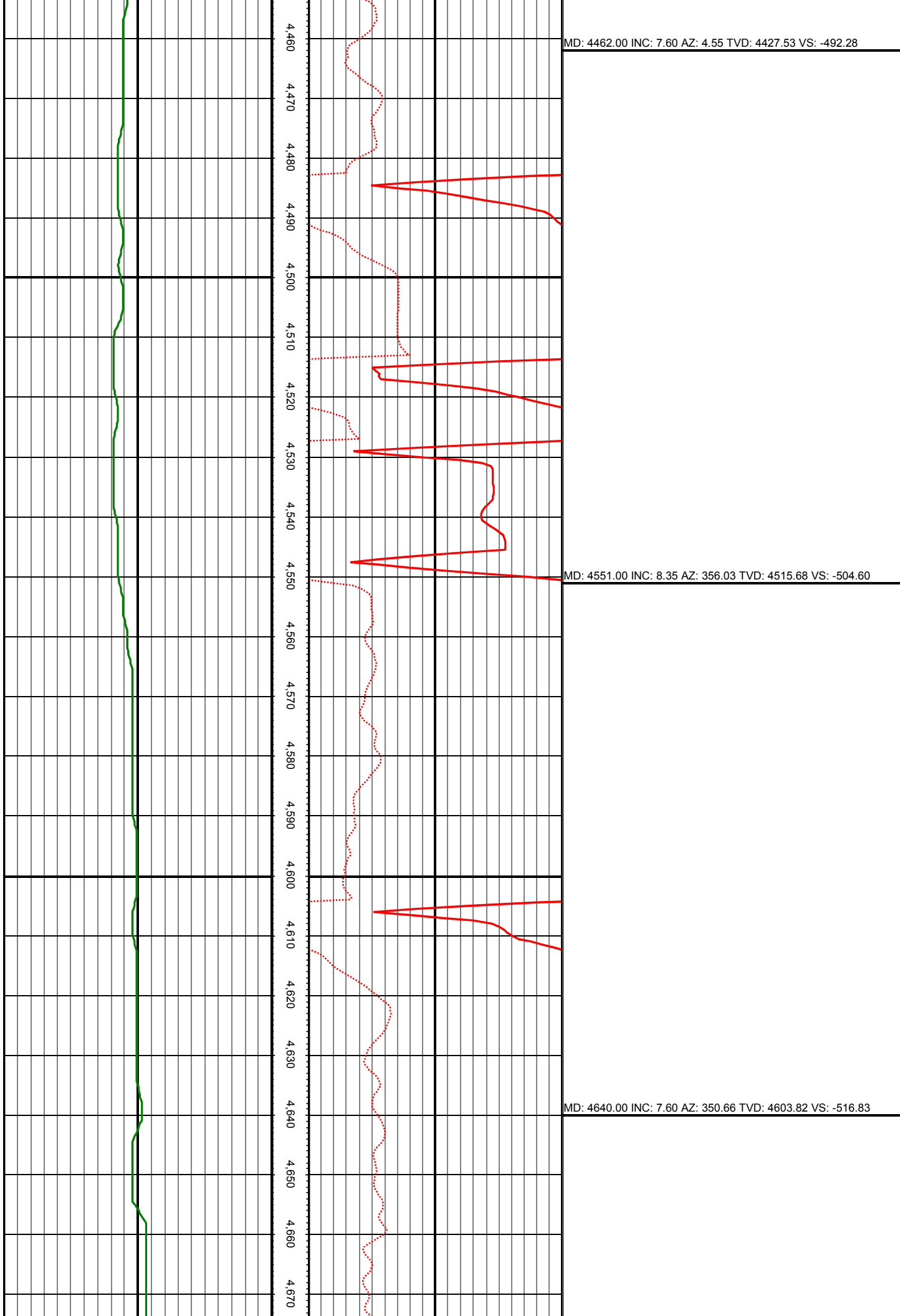
MD: 4076.00 INC: 4.13 AZ: 343.28 TVD: 4044.11 VS: -449.89

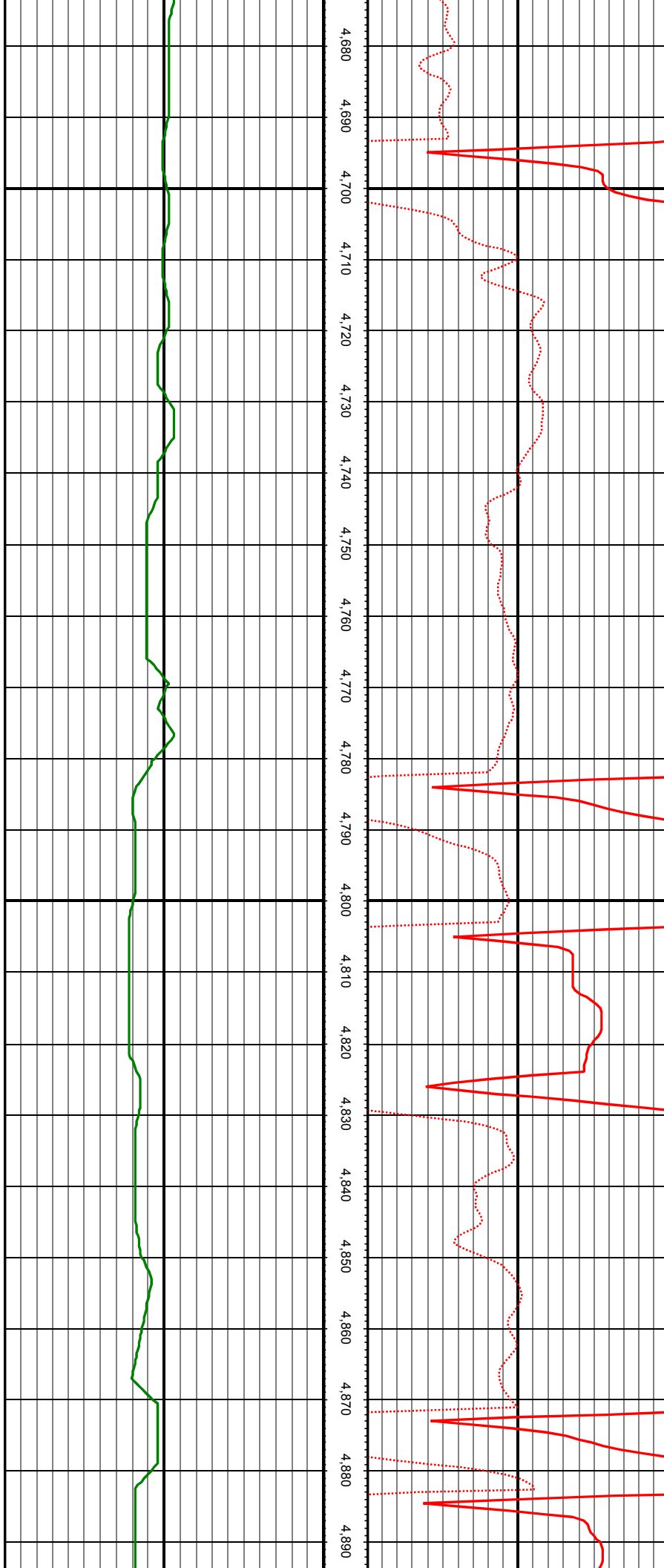
MD: 4165.00 INC: 4.70 AZ: 335.46 TVD: 4132.84 VS: -456.24



MD: 4254.00 INC: 6.64 AZ: 348.20 TVD: 4221.41 VS: -464.57

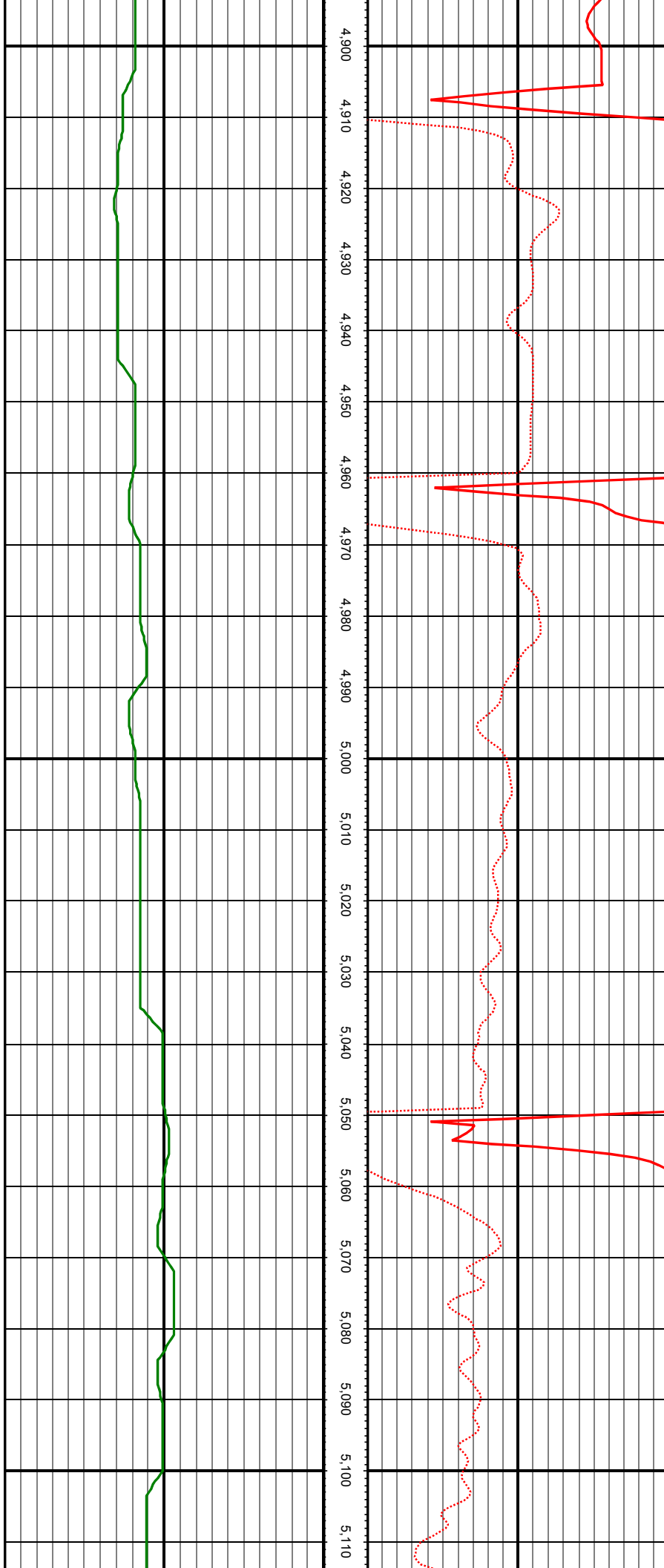
MD: 4343.00 INC: 8.22 AZ: 4.20 TVD: 4309.67 VS: -475.94





MD: 4729.00 INC: 6.24 AZ: 346.97 TVD: 4692.17 VS: -527.33

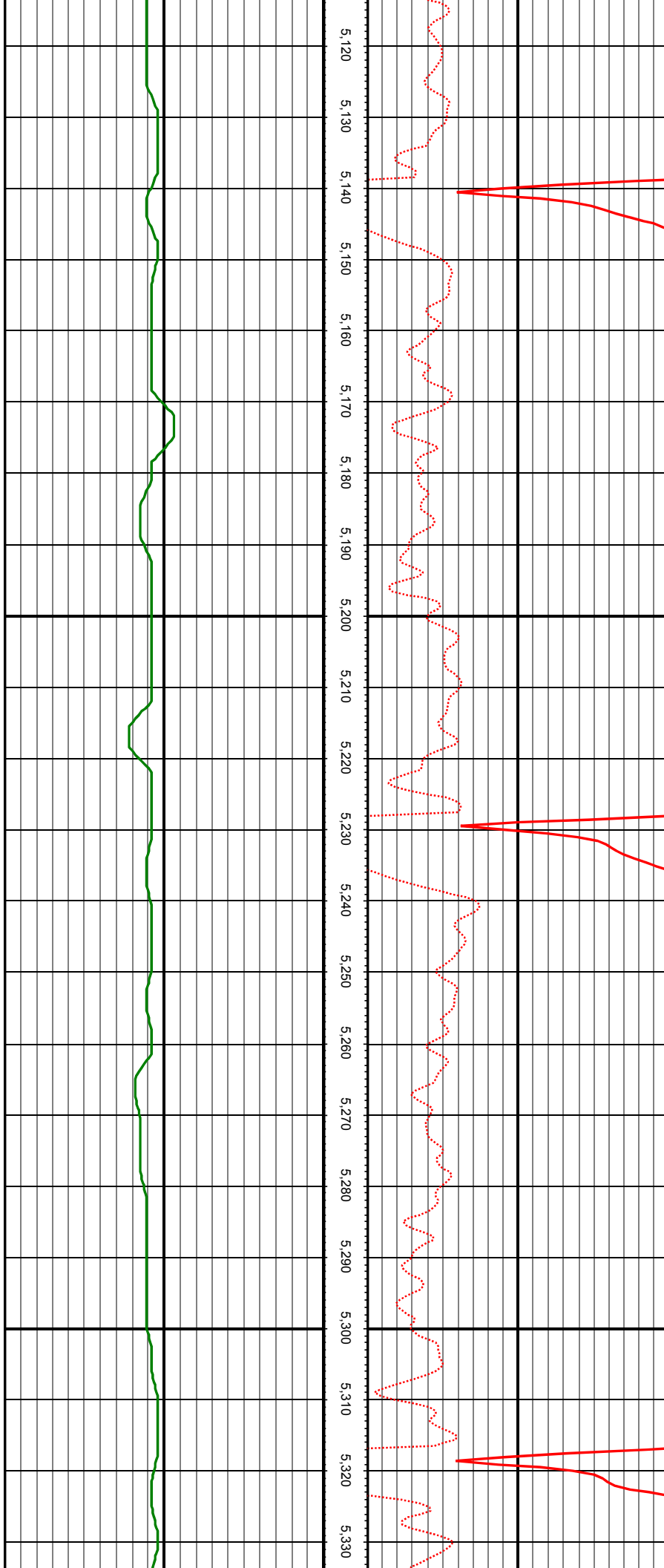
MD: 4818.00 INC: 7.08 AZ: 347.24 TVD: 4780.56 VS: -537.36



MD: 4907.00 INC: 10.02 AZ: 353.56 TVD: 4868.57 VS: -550.38

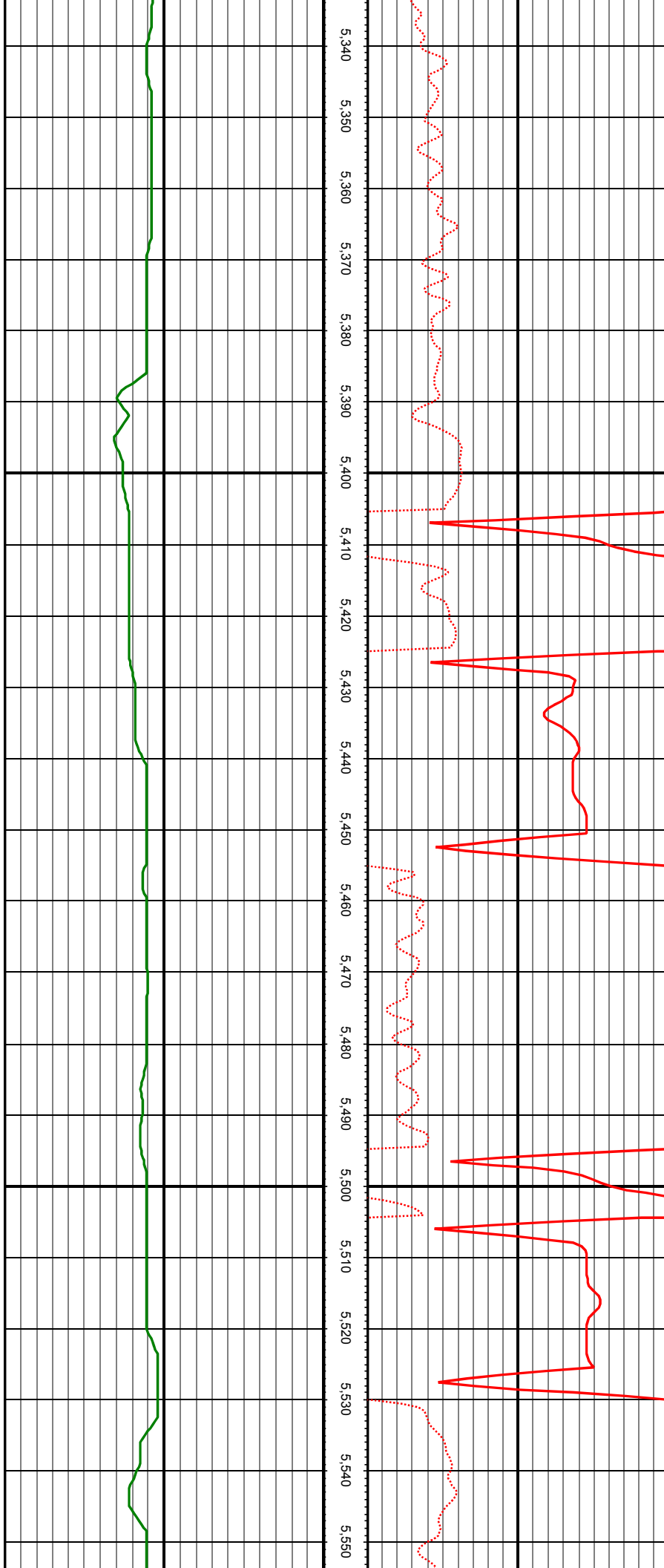
MD: 4996.00 INC: 11.08 AZ: 353.21 TVD: 4956.06 VS: -566.54

MD: 5085.00 INC: 10.11 AZ: 352.25 TVD: 5043.54 VS: -582.75



MD: 5174.00 INC: 8.44 AZ: 350.84 TVD: 5131.38 VS: -596.91

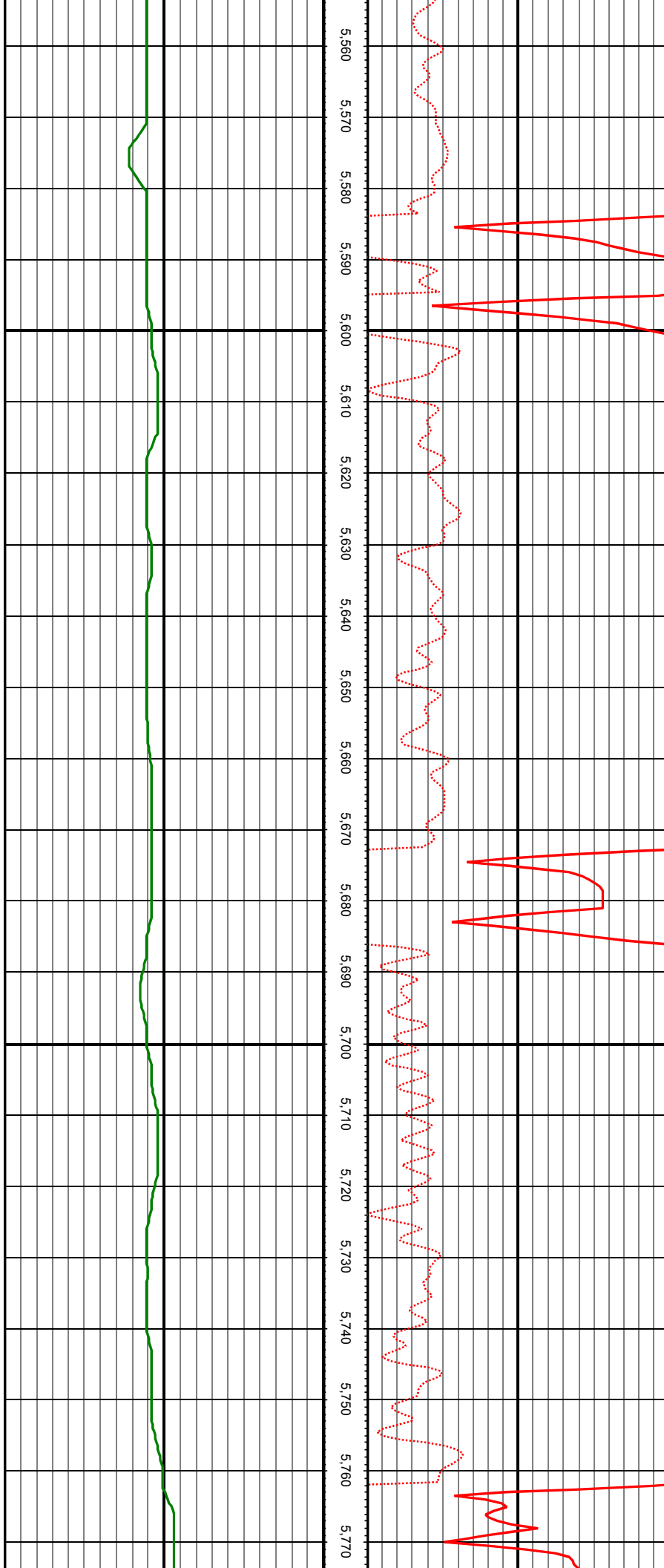
MD: 5263.00 INC: 6.68 AZ: 349.43 TVD: 5219.60 VS: -608.42



MD: 5352.00 INC: 5.14 AZ: 346.36 TVD: 5308.12 VS: -617.36

MD: 5441.00 INC: 6.02 AZ: 347.76 TVD: 5396.70 VS: -625.77

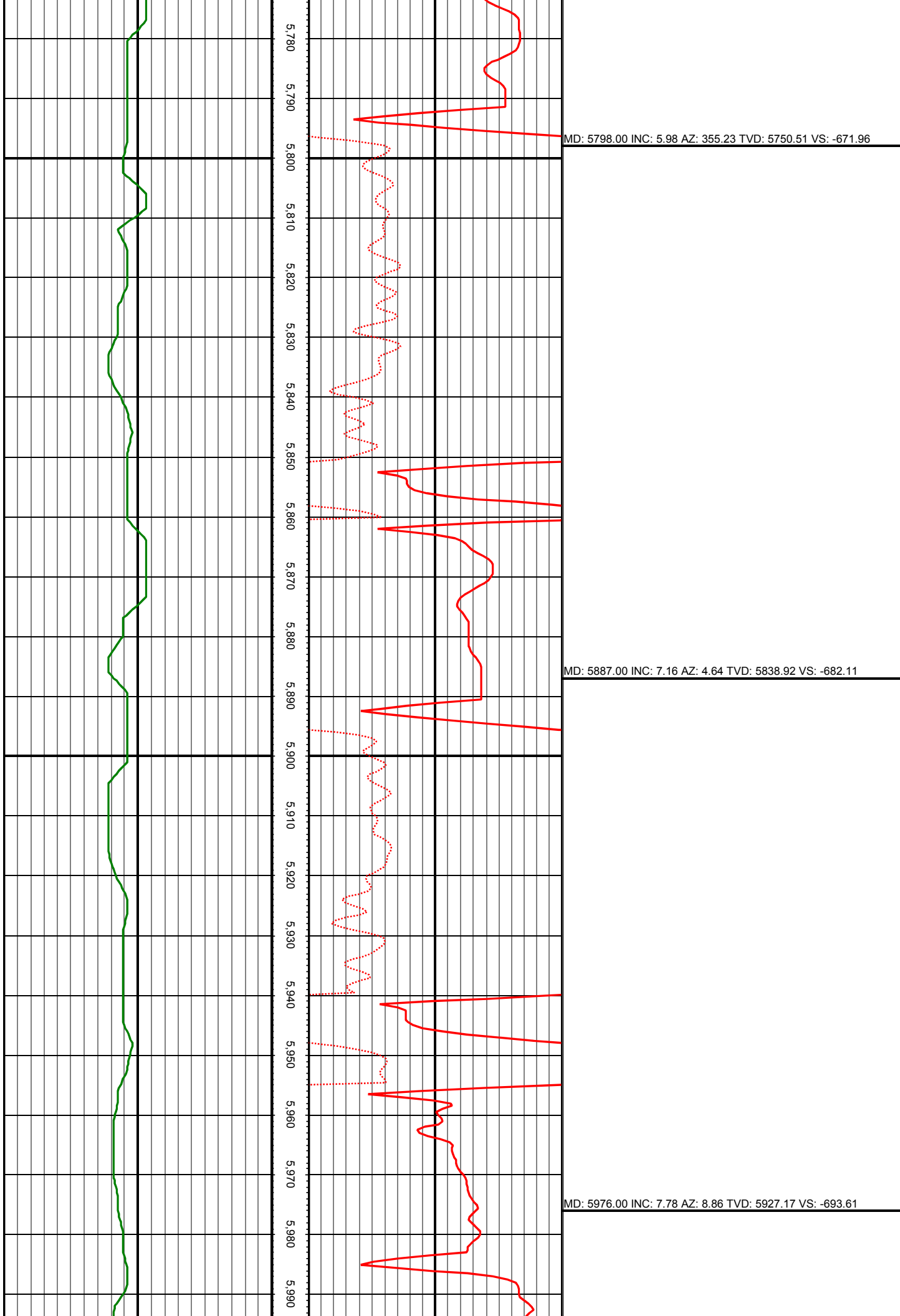
MD: 5531.00 INC: 9.36 AZ: 351.02 TVD: 5485.88 VS: -637.59

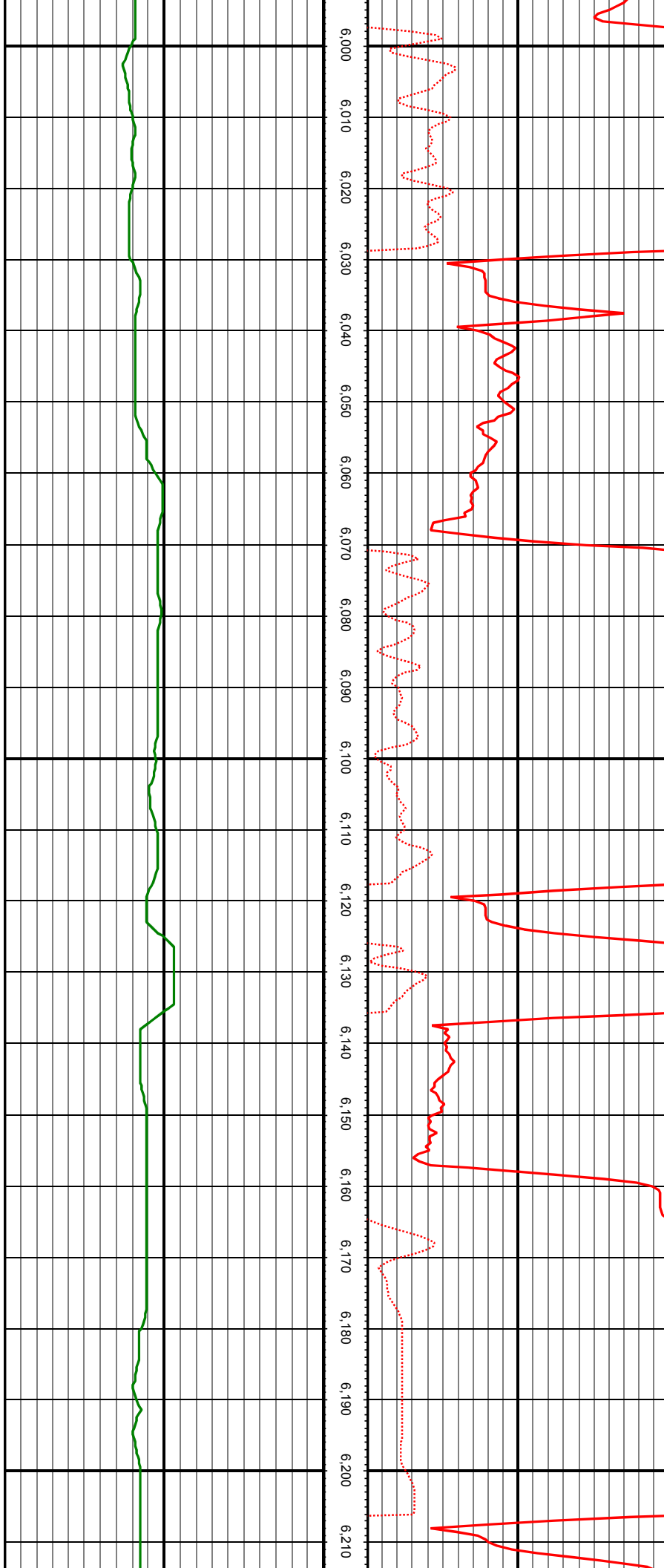


MD: 5620.00 INC: 8.44 AZ: 348.82 TVD: 5573.81 VS: -651.11

MD: 5709.00 INC: 6.59 AZ: 345.30 TVD: 5662.04 VS: -662.43

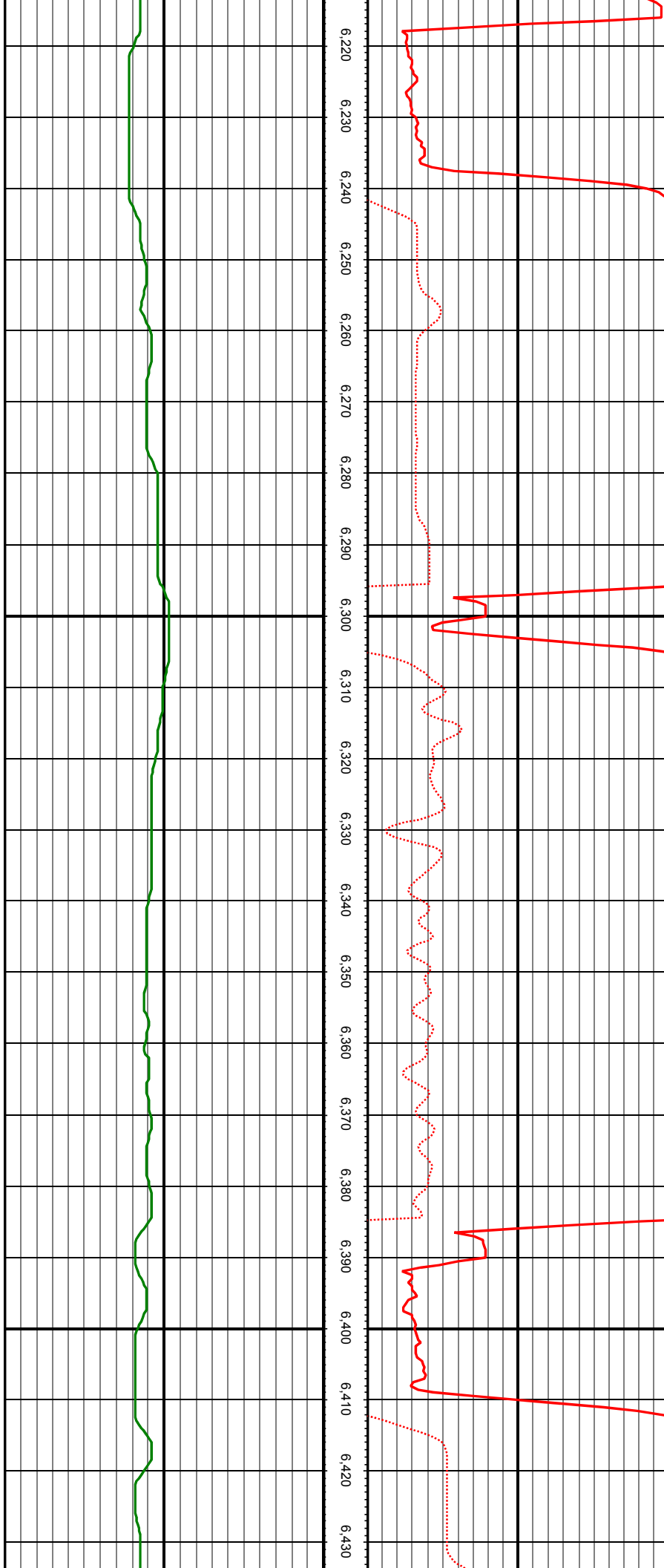






MD: 6065.00 INC: 7.82 AZ: 3.50 TVD: 6015.35 VS: -705.62

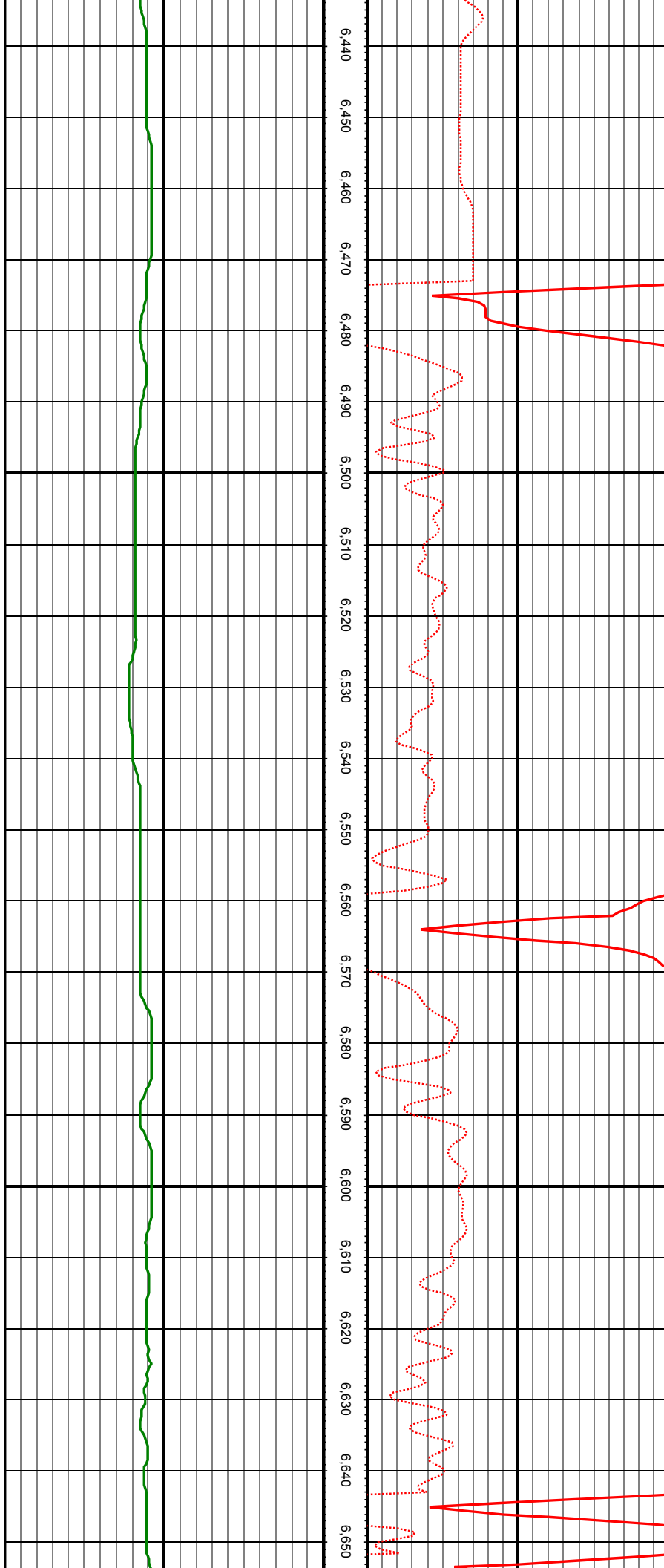
MD: 6154.00 INC: 6.81 AZ: 354.18 TVD: 6103.62 VS: -716.91



MD: 6243.00 INC: 7.47 AZ: 350.93 TVD: 6191.93 VS: -727.86

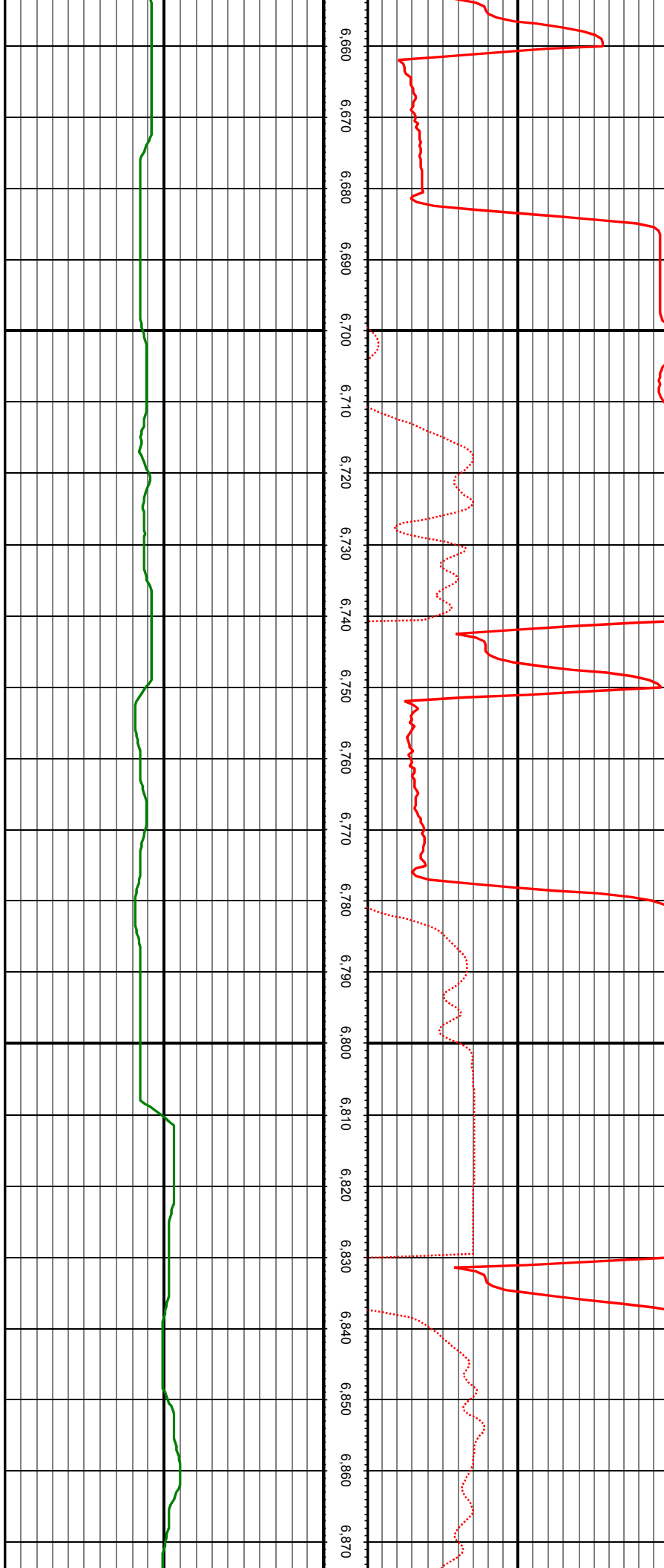
MD: 6332.00 INC: 6.64 AZ: 348.47 TVD: 6280.26 VS: -738.59

MD: 6421.00 INC: 6.95 AZ: 355.06 TVD: 6368.64 VS: -748.97



MD: 6511.00 INC: 6.15 AZ: 345.83 TVD: 6458.05 VS: -759.05

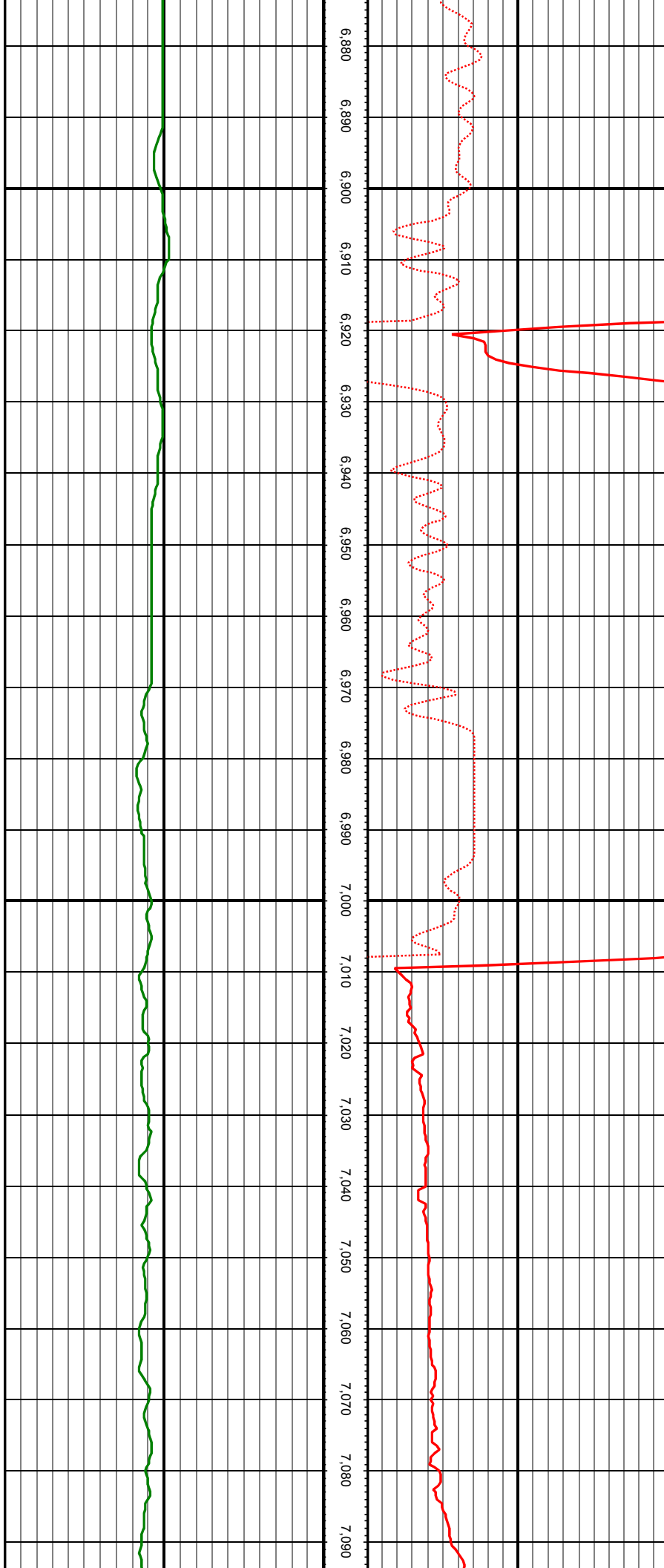
MD: 6600.00 INC: 4.97 AZ: 336.43 TVD: 6546.63 VS: -767.17



MD: 6689.00 INC: 4.97 AZ: 334.40 TVD: 6635.30 VS: -774.14

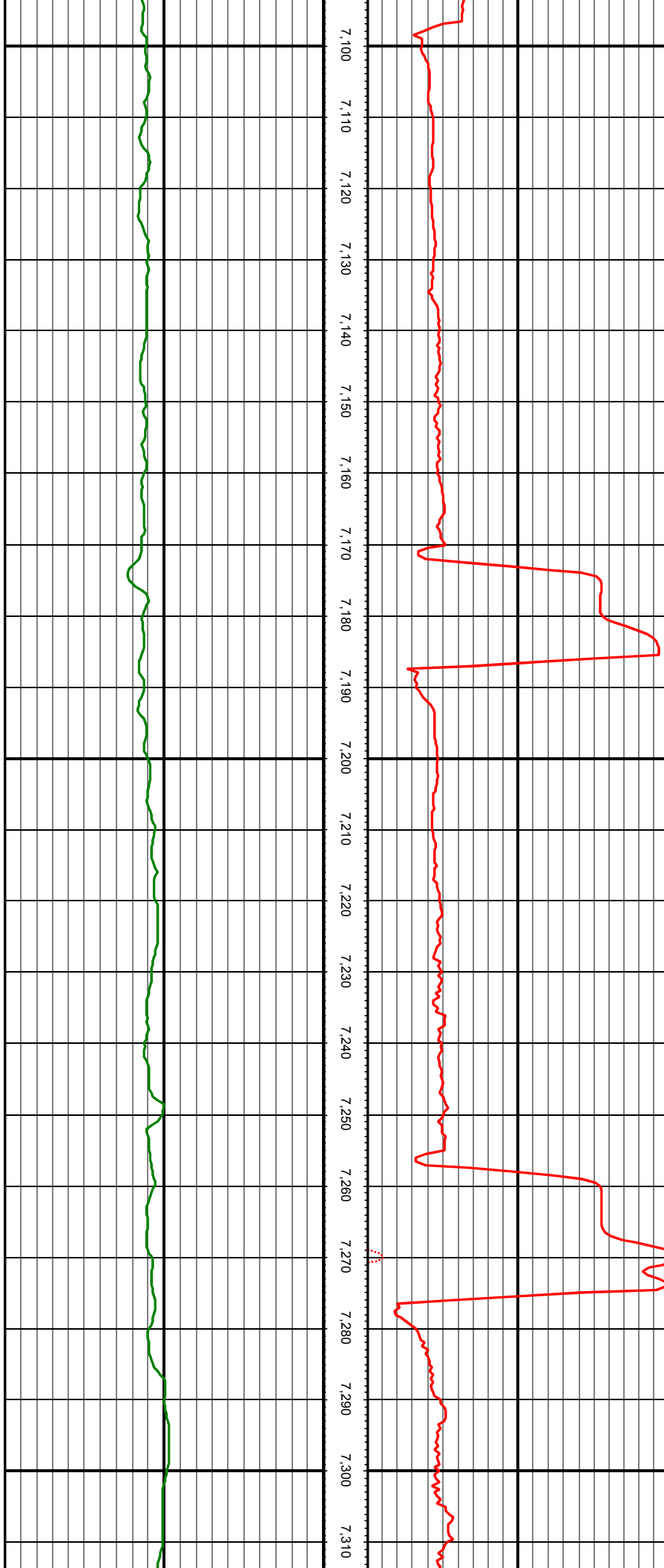
MD: 6778.00 INC: 5.45 AZ: 1.47 TVD: 6723.94 VS: -781.82

MD: 6867.00 INC: 4.66 AZ: 3.14 TVD: 6812.60 VS: -789.66



MD: 6956.00 INC: 3.34 AZ: 351.02 TVD: 6901.38 VS: -795.83

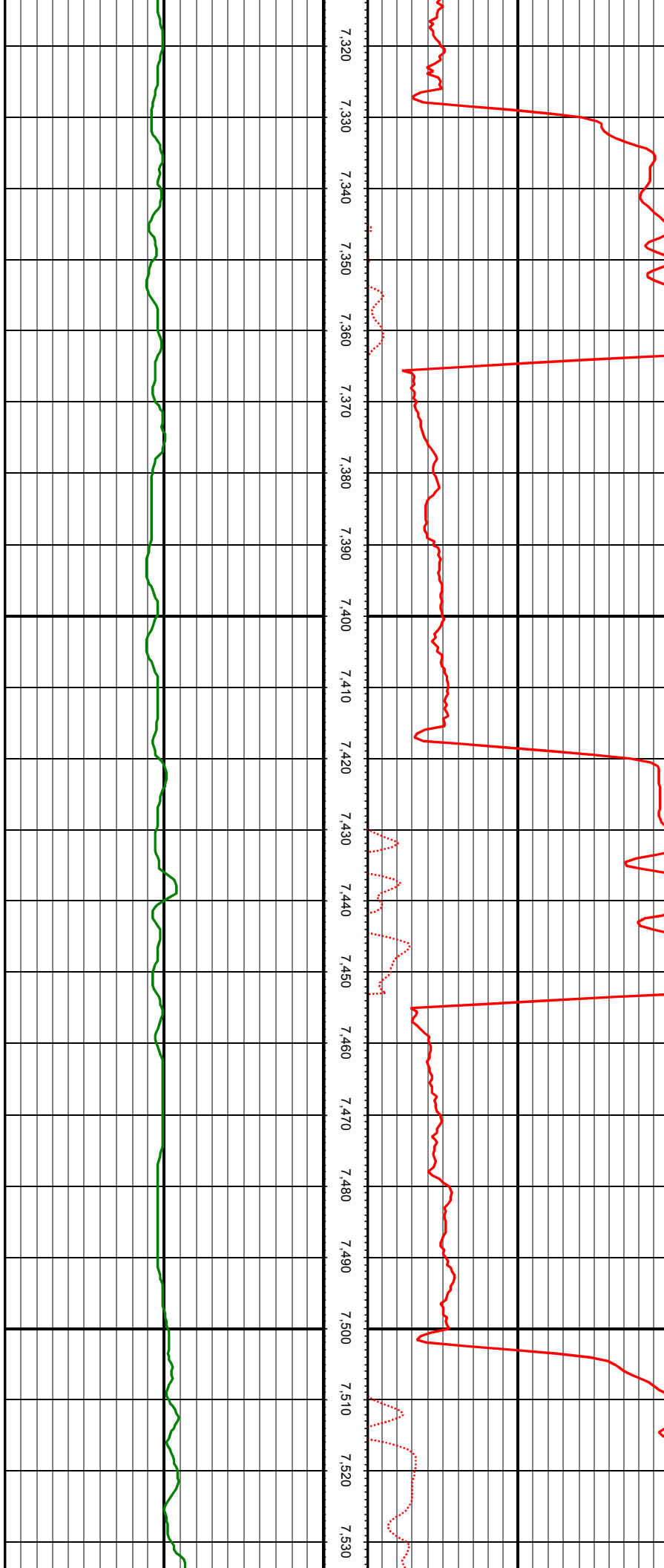
MD: 7046.00 INC: 1.67 AZ: 202.30 TVD: 6991.34 VS: -797.20



MD: 7135.00 INC: 9.67 AZ: 171.19 TVD: 7079.84 VS: -788.60

MD: 7224.00 INC: 17.41 AZ: 184.55 TVD: 7166.32 VS: -767.91

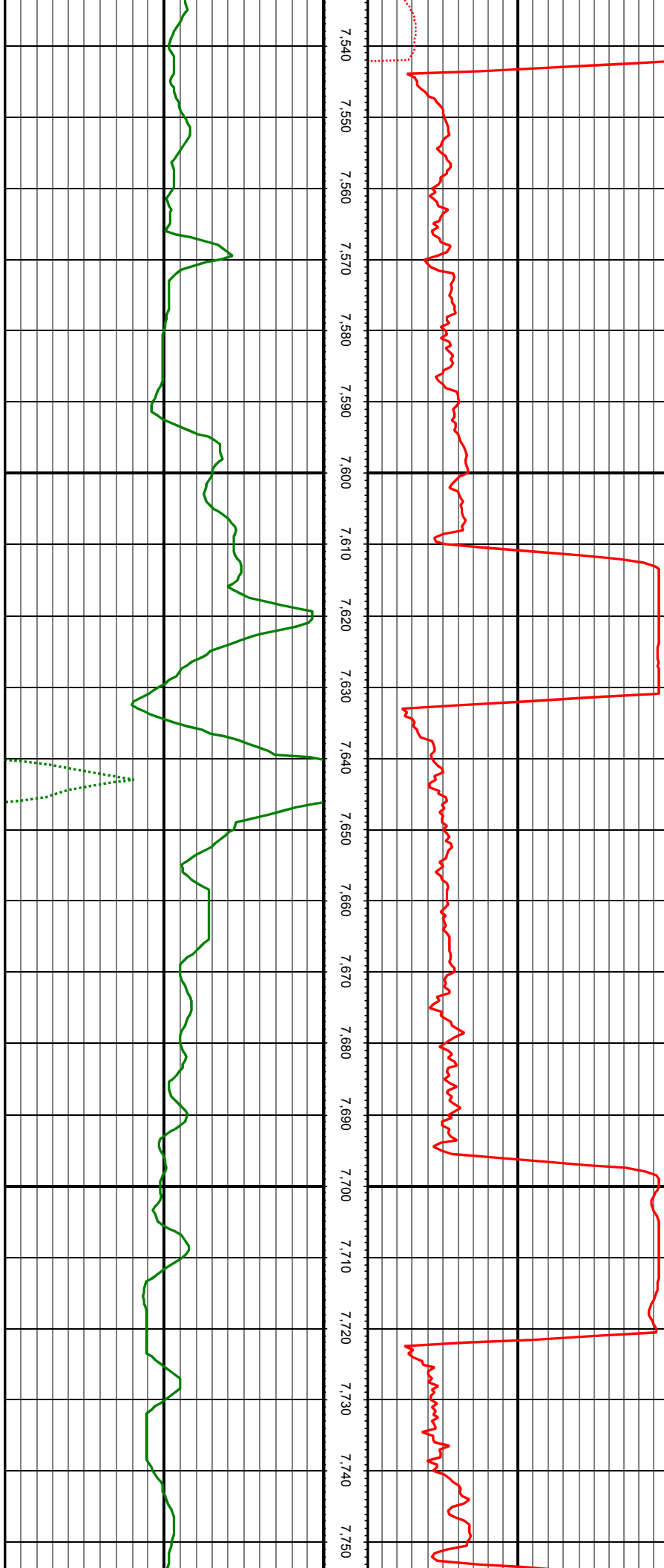
MD: 7313.00 INC: 24.13 AZ: 191.93 TVD: 7249.50 VS: -736.74



MD: 7402.00 INC: 28.13 AZ: 194.39 TVD: 7329.39 VS: -698.49

MD: 7492.00 INC: 32.04 AZ: 191.32 TVD: 7407.26 VS: -654.39





MD: 7581.00 INC: 36.66 AZ: 186.57 TVD: 7480.73 VS: -604.72

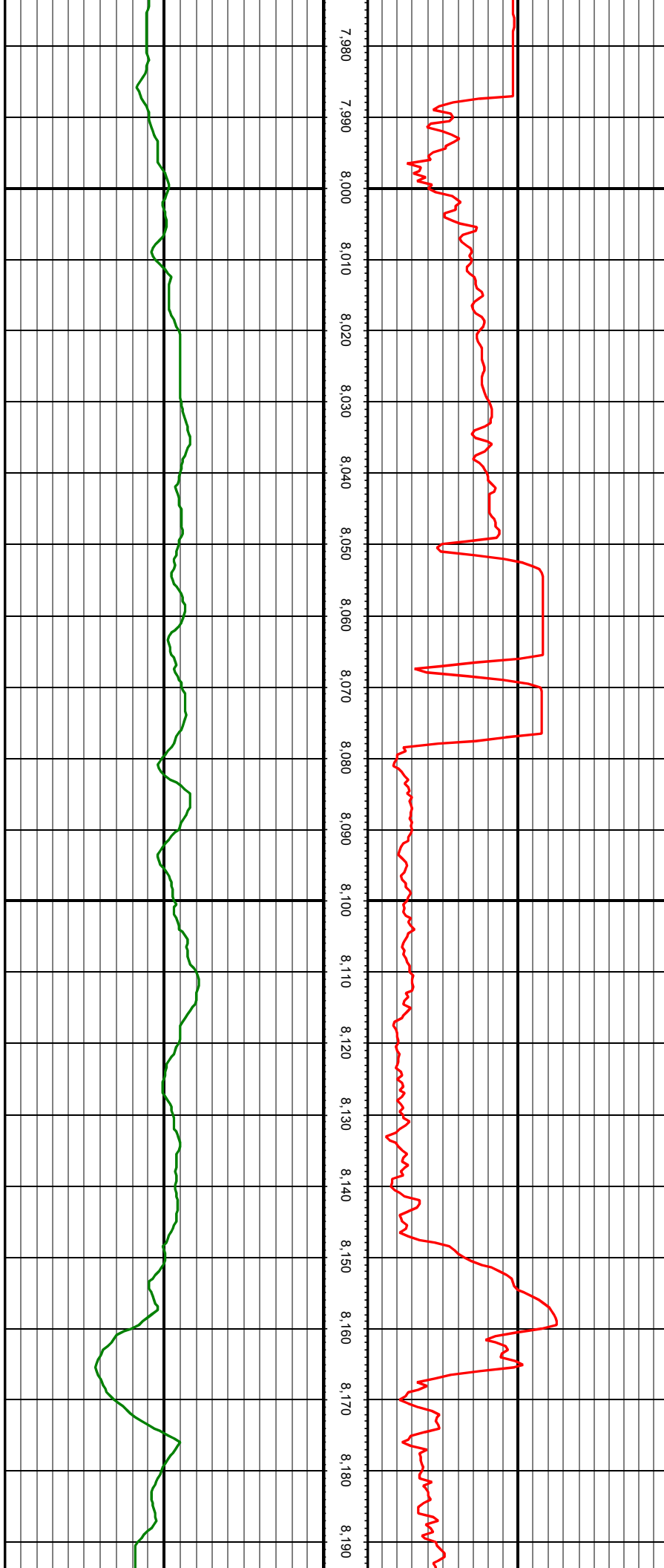
MD: 7670.00 INC: 46.20 AZ: 181.12 TVD: 7547.40 VS: -546.02

MD: 7759.00 INC: 55.21 AZ: 180.42 TVD: 7603.71 VS: -477.21

7.760 7.770 7.780 7.790 7.800 7.810 7.820 7.830 7.840 7.850 7.860 7.870 7.880 7.890 7.900 7.910 7.920 7.930 7.940 7.950 7.960 7.970

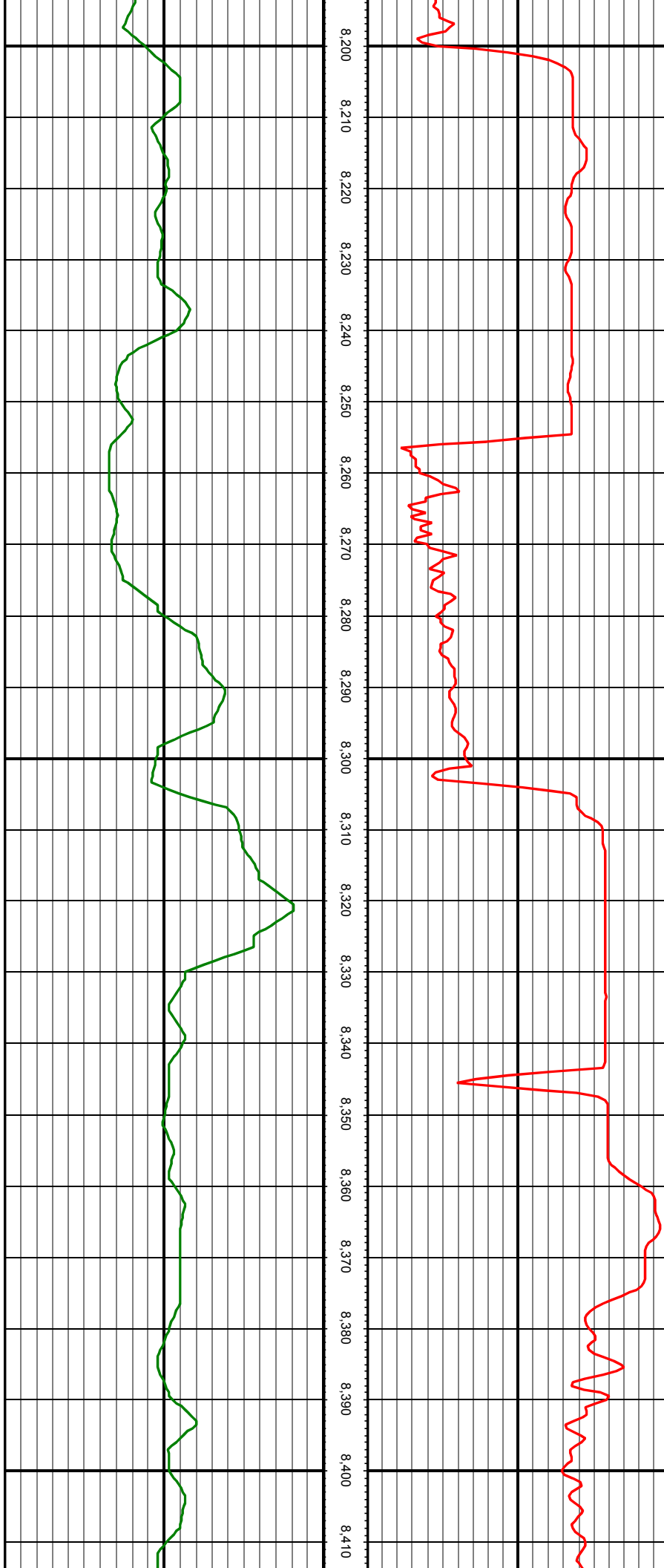
MD: 7848.00 INC: 60.00 AZ: 178.84 TVD: 7651.38 VS: -402.10

MD: 7937.00 INC: 62.37 AZ: 178.49 TVD: 7694.27 VS: -324.18



MD: 8026.00 INC: 66.37 AZ: 179.72 TVD: 7732.77 VS: -243.98

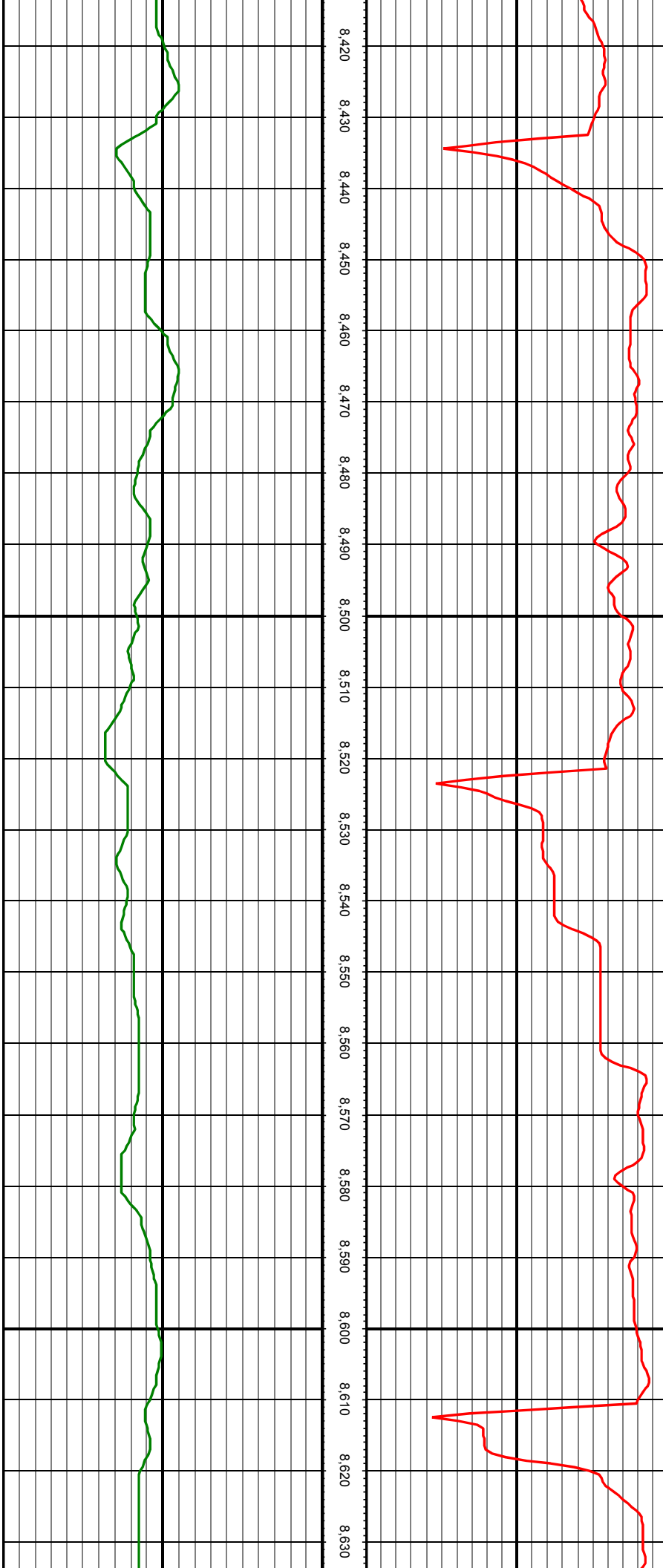
MD: 8115.00 INC: 74.42 AZ: 175.85 TVD: 7762.61 VS: -160.35



MD: 8204.00 INC: 81.71 AZ: 173.12 TVD: 7781.01 VS: -73.86

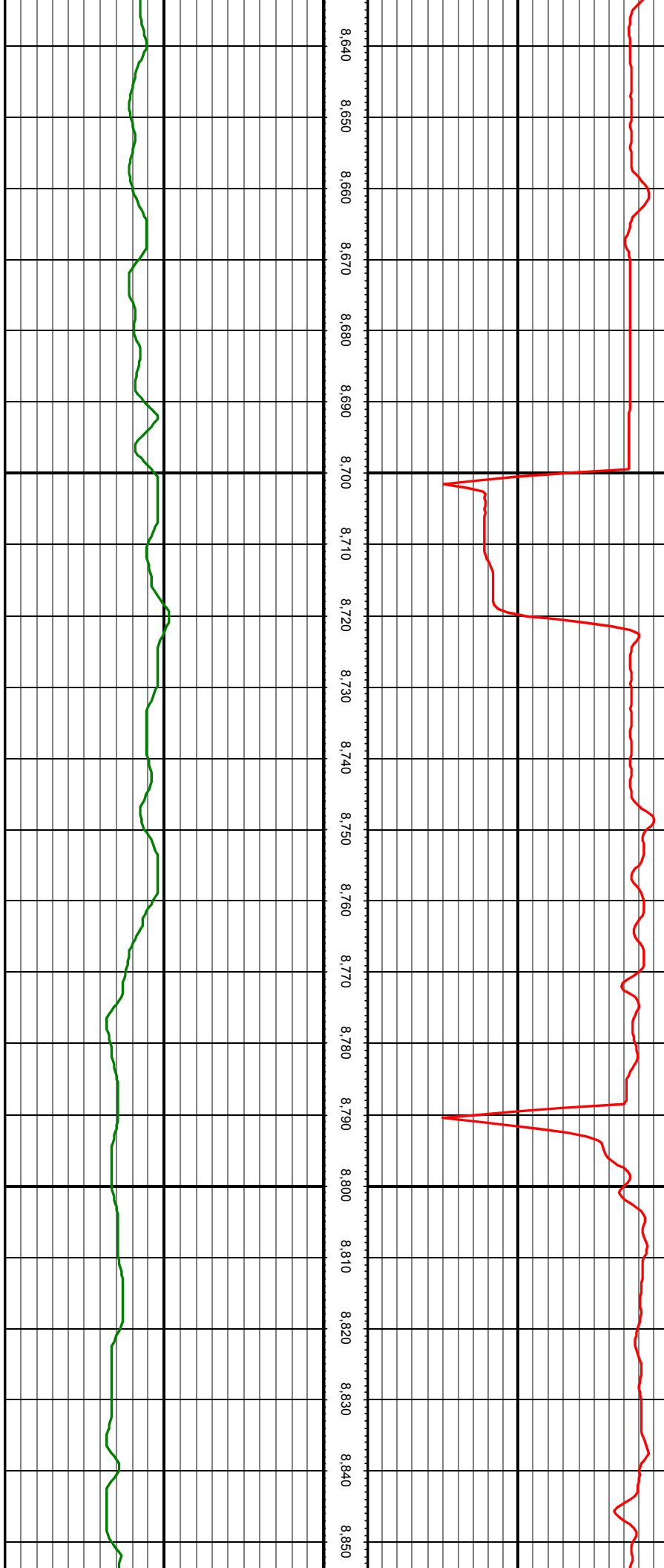
MD: 8293.00 INC: 87.08 AZ: 177.26 TVD: 7789.70 VS: 14.26

MD: 8382.00 INC: 89.85 AZ: 177.52 TVD: 7792.09 VS: 103.07



MD: 8471.00 INC: 90.11 AZ: 177.87 TVD: 7792.12 VS: 191.94

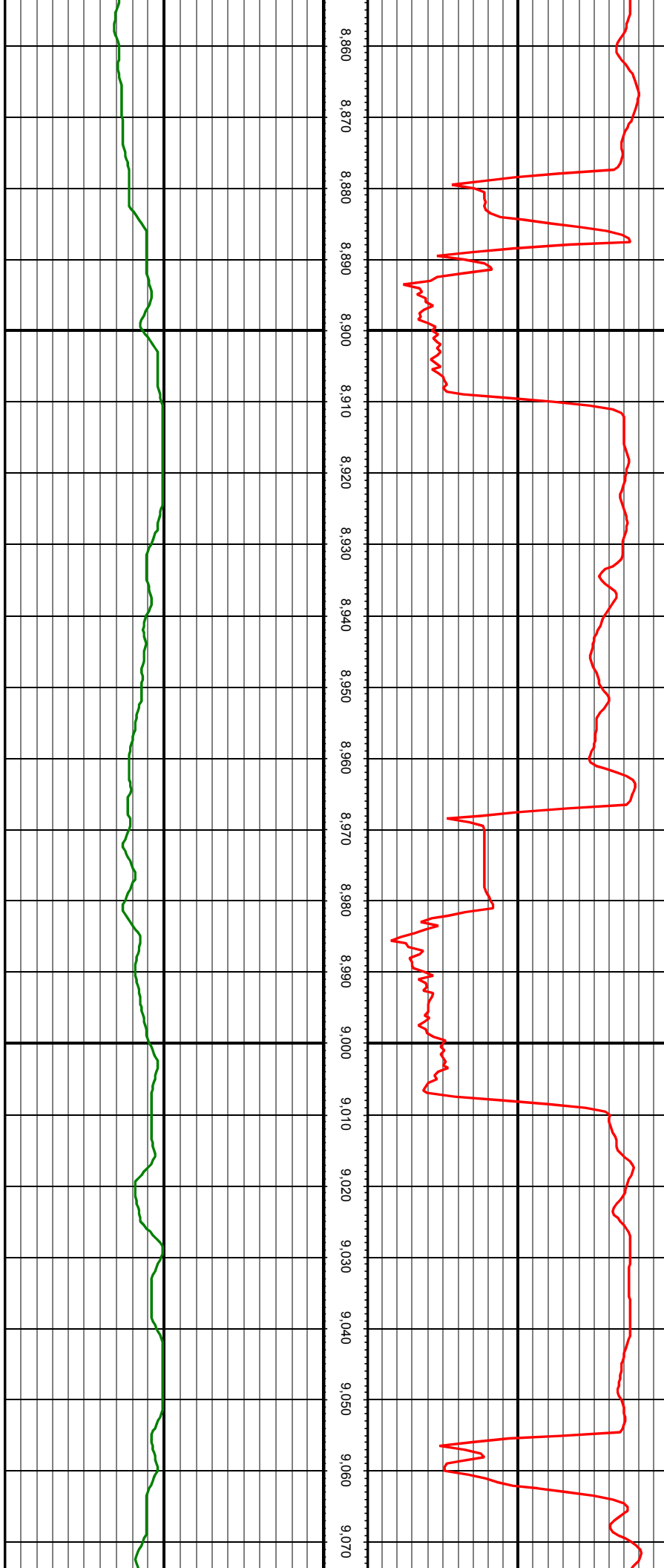
MD: 8560.00 INC: 89.32 AZ: 178.66 TVD: 7792.56 VS: 280.86



MD: 8649.00 INC: 89.89 AZ: 179.45 TVD: 7793.17 VS: 369.82

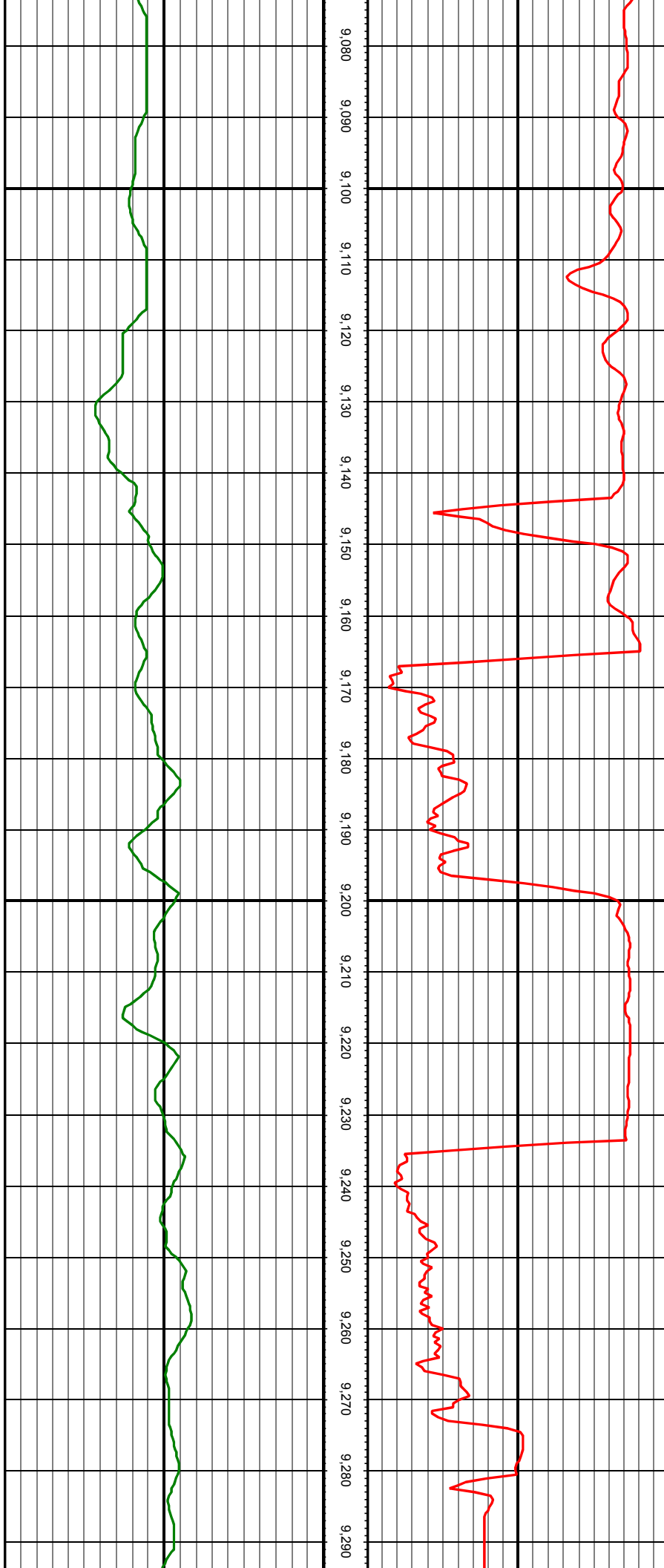
MD: 8739.00 INC: 91.16 AZ: 179.89 TVD: 7792.35 VS: 459.80

MD: 8828.00 INC: 92.57 AZ: 179.89 TVD: 7789.45 VS: 548.74



MD: 8917.00 INC: 92.57 AZ: 179.98 TVD: 7785.46 VS: 637.64

MD: 9006.00 INC: 90.86 AZ: 180.77 TVD: 7782.80 VS: 726.59

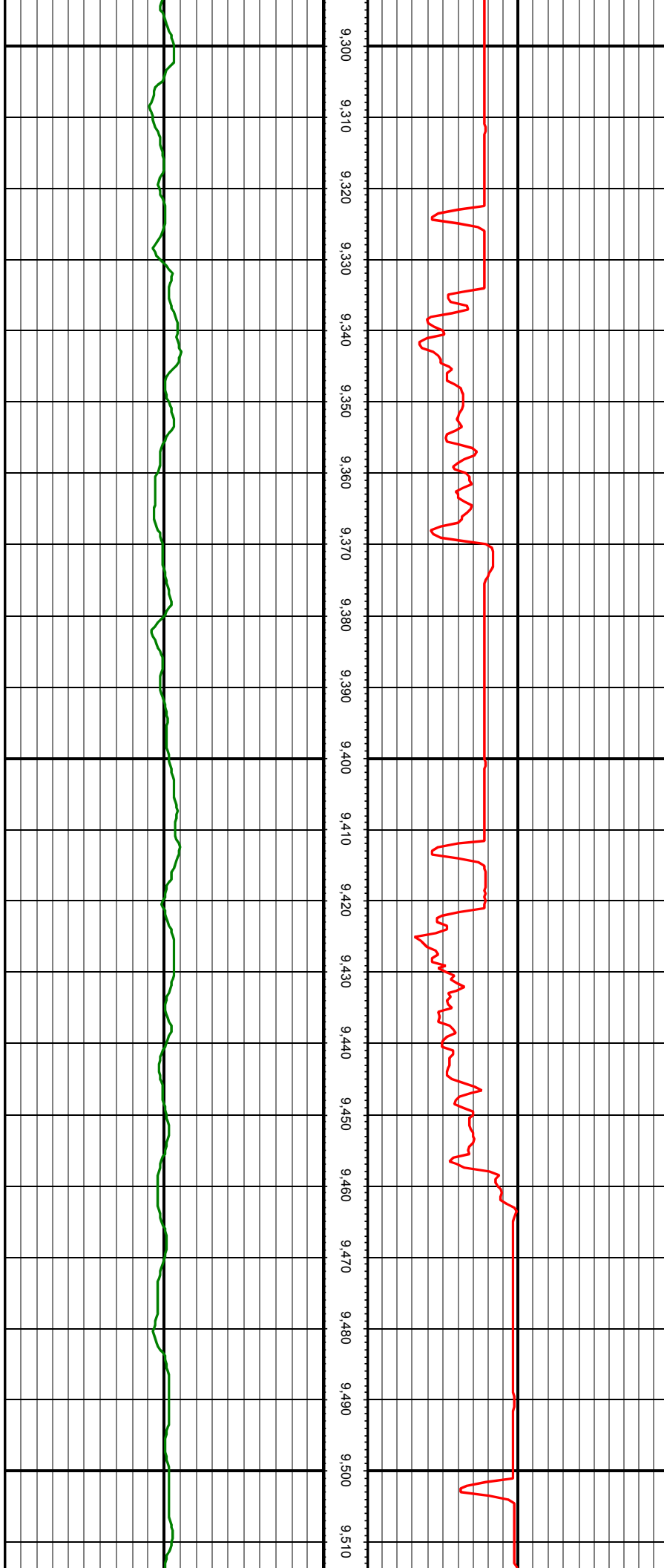


MD: 9095.00 INC: 92.44 AZ: 181.47 TVD: 7780.24 VS: 815.55

MD: 9184.00 INC: 96.70 AZ: 180.68 TVD: 7773.15 VS: 904.25

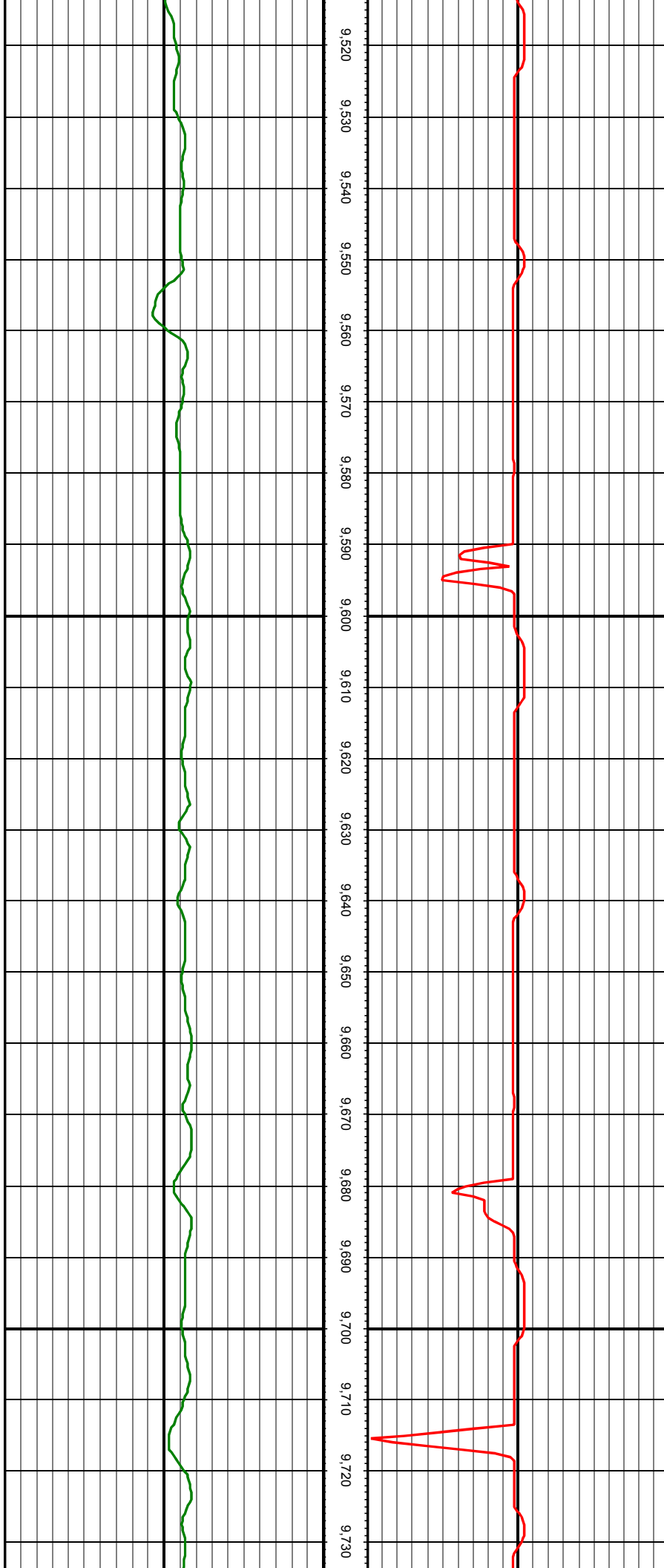
MD: 9273.00 INC: 93.71 AZ: 178.22 TVD: 7765.07 VS: 992.84





MD: 9362.00 INC: 91.25 AZ: 178.57 TVD: 7761.22 VS: 1081.68

MD: 9451.00 INC: 87.47 AZ: 180.95 TVD: 7762.22 VS: 1170.64

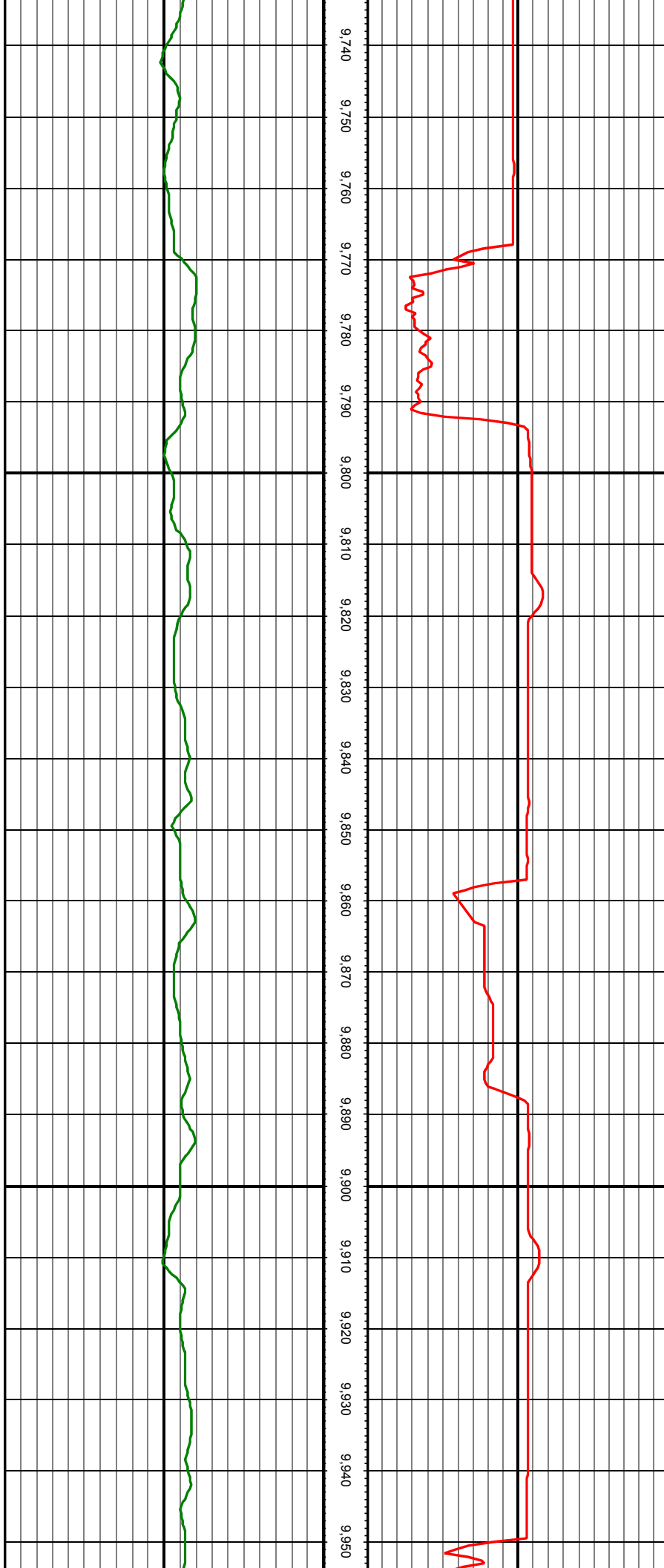


9,520 9,530 9,540 9,550 9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630 9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730

MD: 9540.00 INC: 87.12 AZ: 181.39 TVD: 7766.42 VS: 1259.53

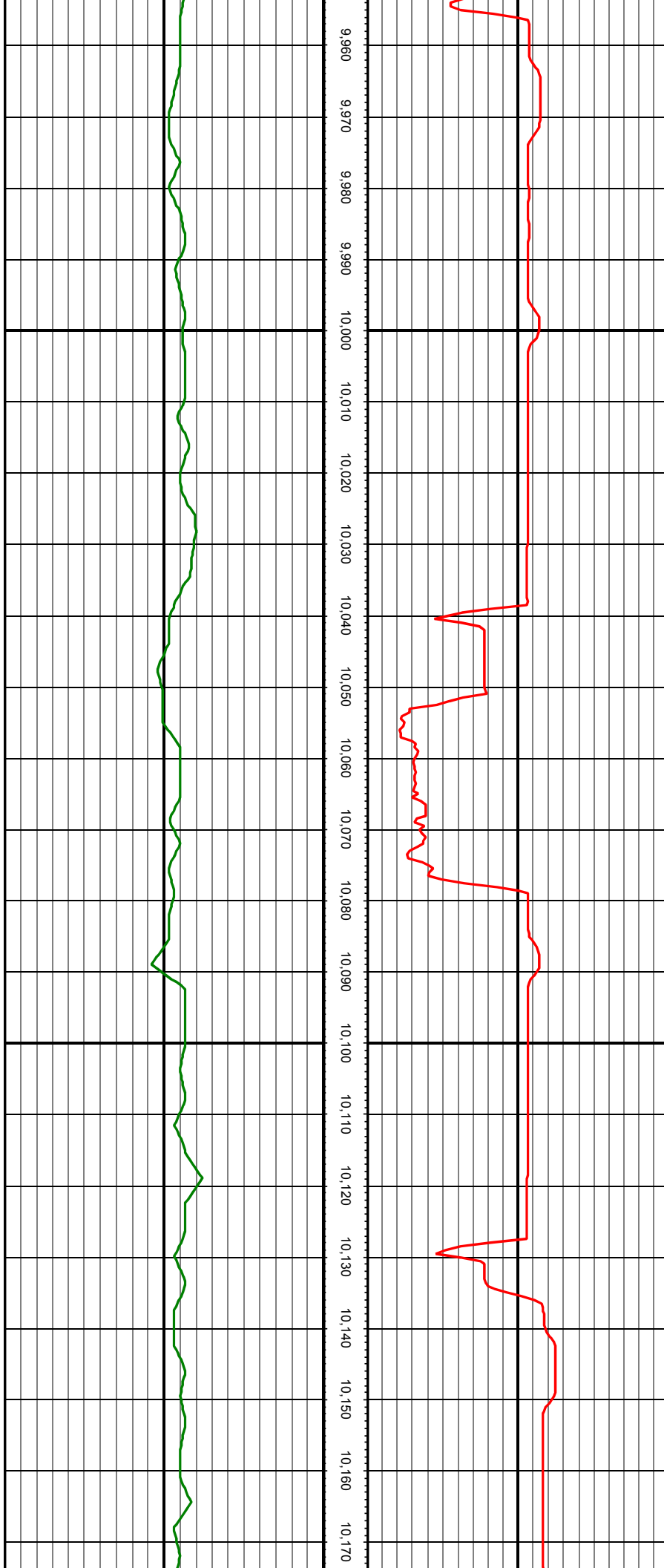
MD: 9629.00 INC: 88.26 AZ: 181.47 TVD: 7770.00 VS: 1348.45

MD: 9718.00 INC: 89.80 AZ: 181.39 TVD: 7771.51 VS: 1437.43



MD: 9807.00 INC: 88.18 AZ: 180.42 TVD: 7773.08 VS: 1526.41

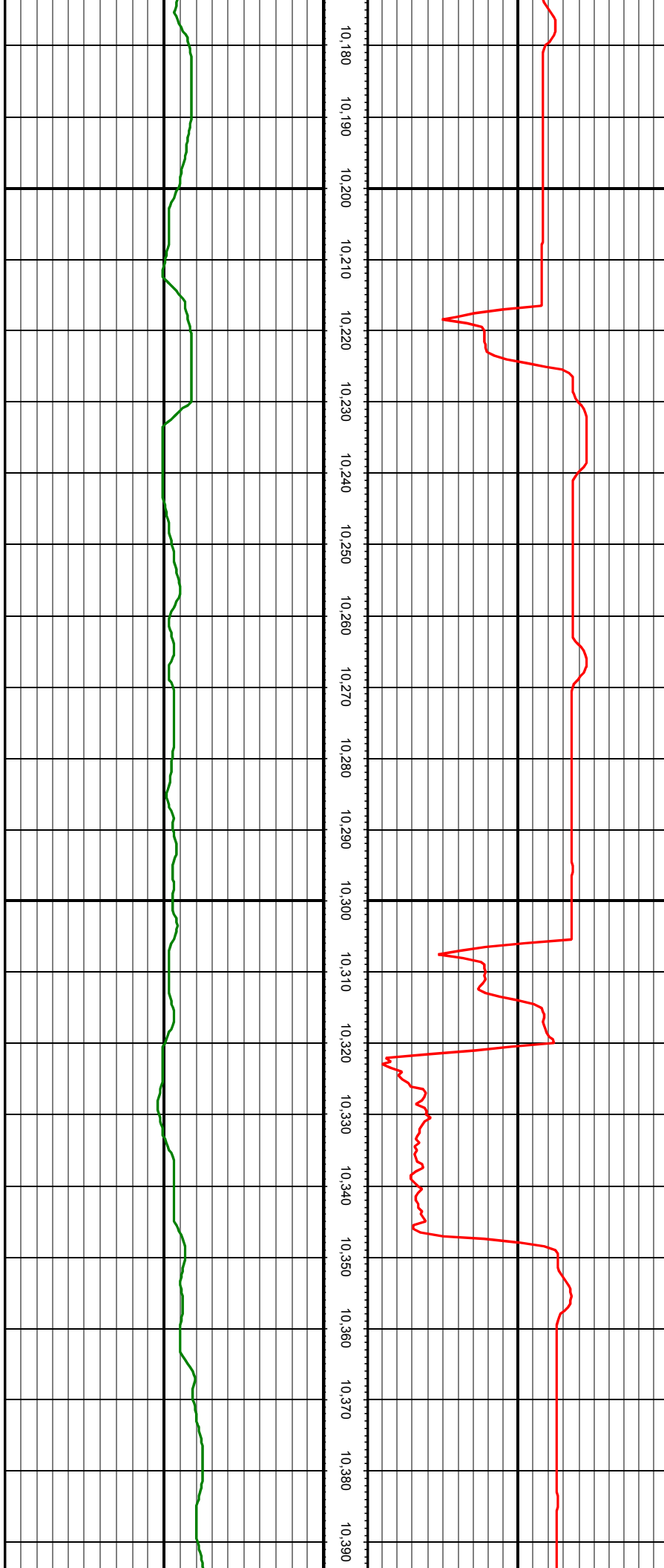
MD: 9896.00 INC: 88.92 AZ: 180.07 TVD: 7775.33 VS: 1615.38



MD: 9985.00 INC: 90.20 AZ: 180.07 TVD: 7776.01 VS: 1704.37

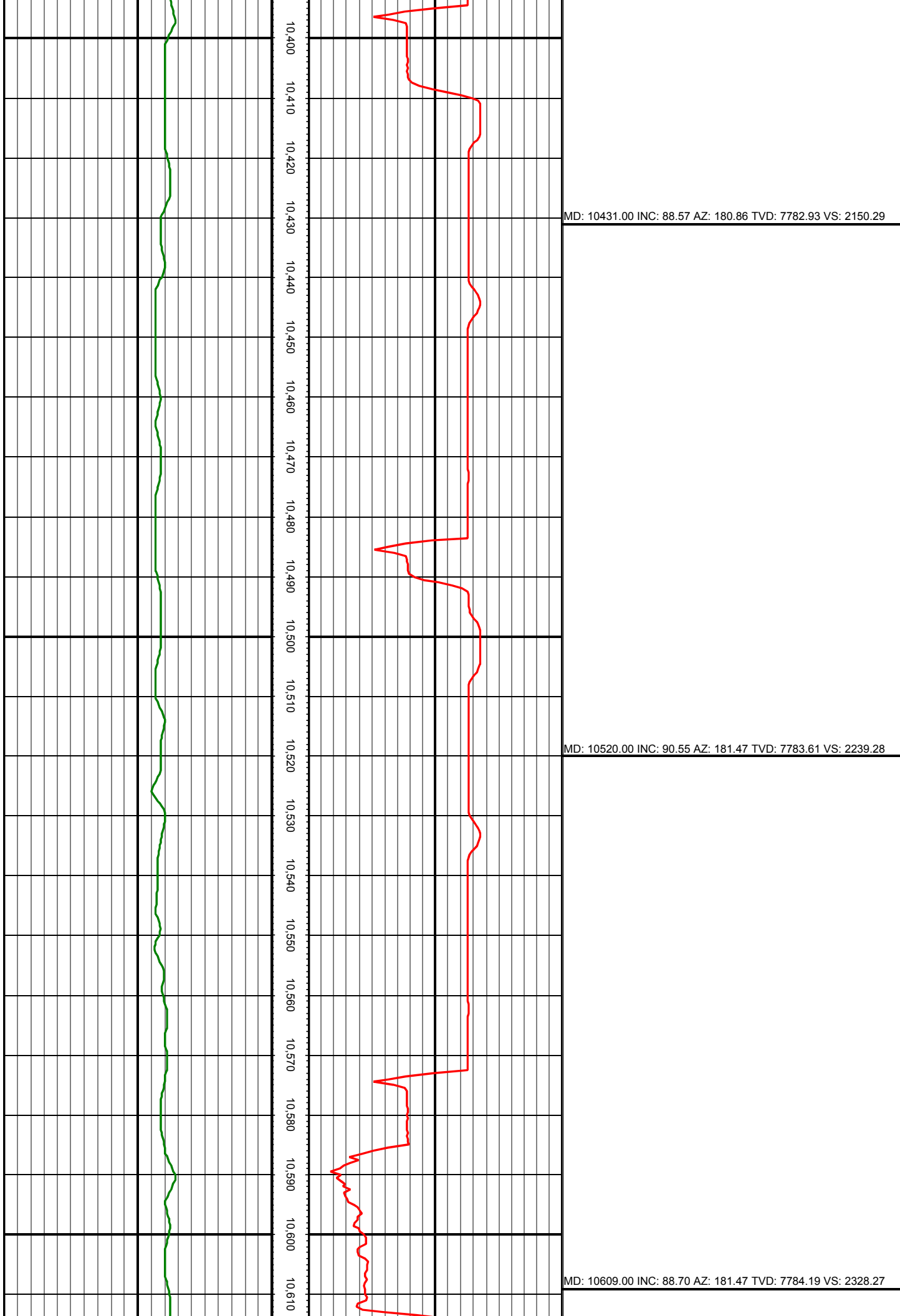
MD: 10075.00 INC: 88.75 AZ: 180.33 TVD: 7776.84 VS: 1794.36

MD: 10164.00 INC: 88.70 AZ: 180.51 TVD: 7778.82 VS: 1883.34



MD: 10253.00 INC: 90.15 AZ: 180.33 TVD: 7779.71 VS: 1972.33

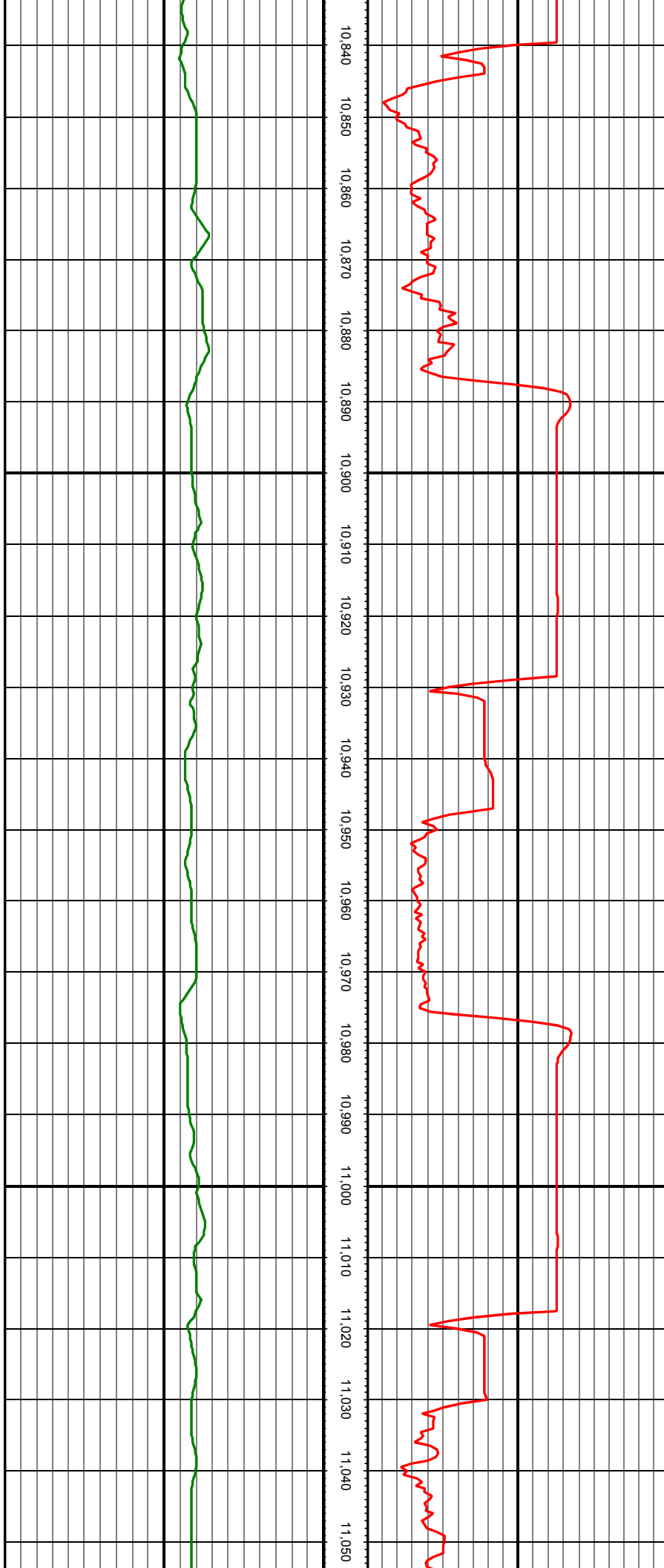
MD: 10342.00 INC: 88.57 AZ: 180.60 TVD: 7780.71 VS: 2061.32





MD: 10699.00 INC: 88.92 AZ: 181.91 TVD: 7786.06 VS: 2418.23

MD: 10788.00 INC: 91.38 AZ: 183.67 TVD: 7785.83 VS: 2507.17



MD: 10877.00 INC: 90.86 AZ: 181.47 TVD: 7784.09 VS: 2596.10

MD: 10966.00 INC: 90.64 AZ: 178.57 TVD: 7782.92 VS: 2685.07

MD: 11055.00 INC: 89.62 AZ: 176.00 TVD: 7783.50 VS: 2773.04

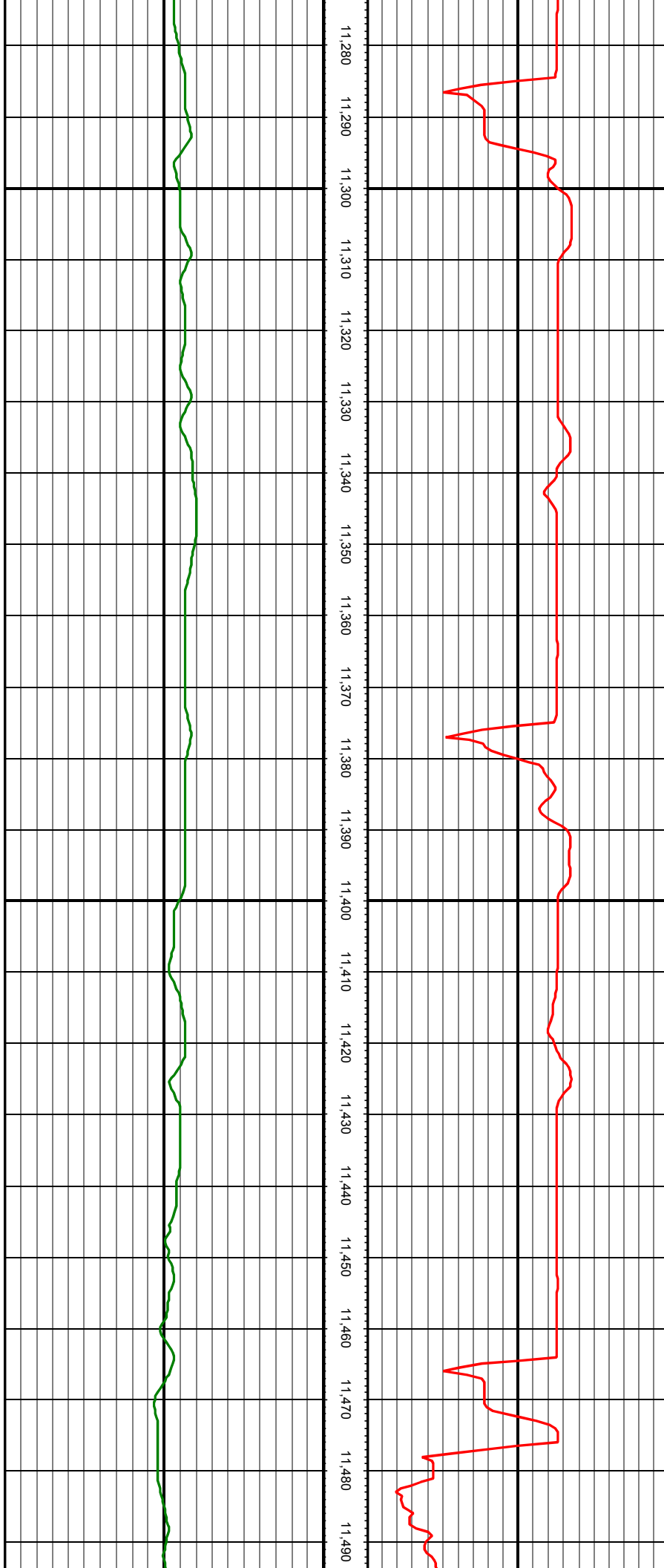


MD: 11059.00 INC: 88.62 AZ: 176.90 TVD: 7783.50 VS: 2773.94

MD: 11144.00 INC: 89.10 AZ: 176.99 TVD: 7785.27 VS: 2862.73

MD: 11233.00 INC: 88.66 AZ: 178.75 TVD: 7787.01 VS: 2951.60





MD: 11322.00 INC: 88.40 AZ: 178.84 TVD: 7789.29 VS: 3040.52

MD: 11411.00 INC: 90.90 AZ: 179.37 TVD: 7789.84 VS: 3129.48

MD: 11500.00 INC: 89.45 AZ: 178.75 TVD: 7789.56 VS: 3218.44

MD: 11590.00 INC: 86.55 AZ: 178.84 TVD: 7792.70 VS: 3308.32

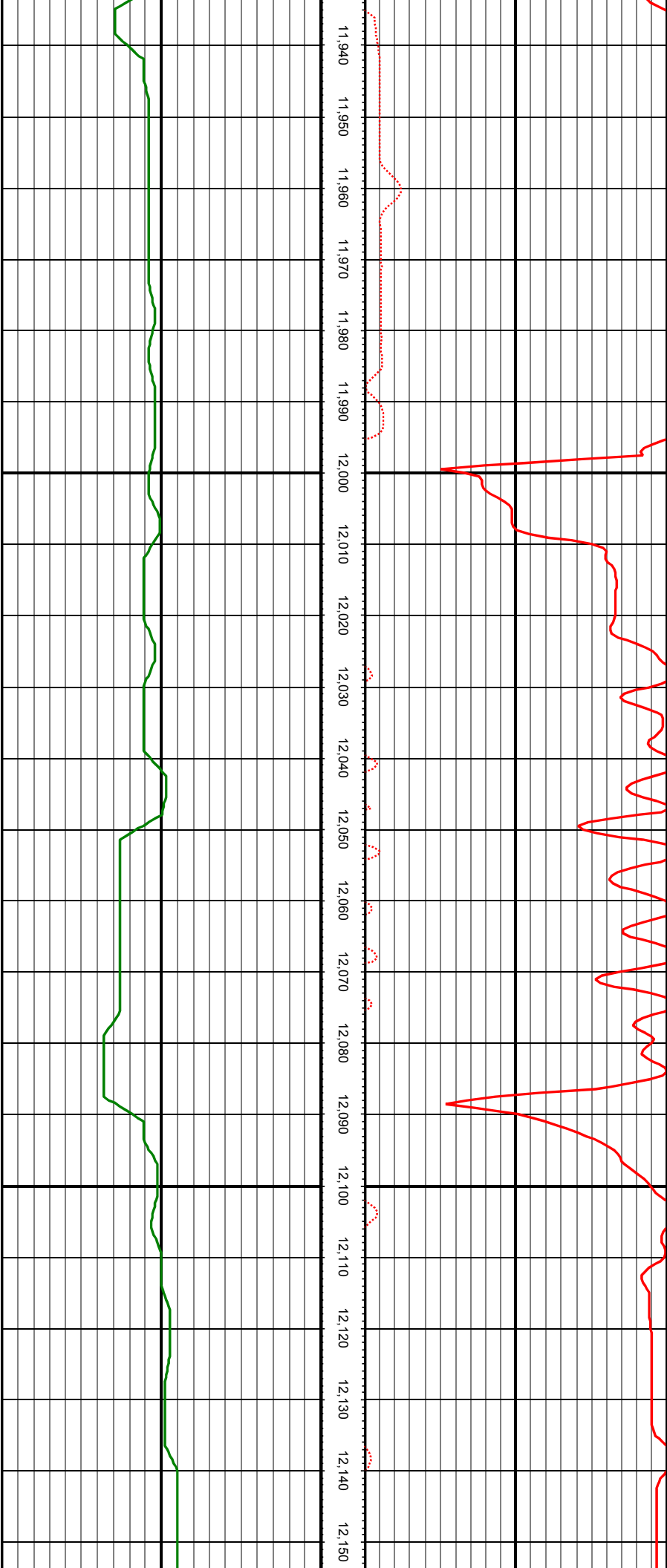
MD: 11679.00 INC: 85.58 AZ: 179.10 TVD: 7798.81 VS: 3397.07

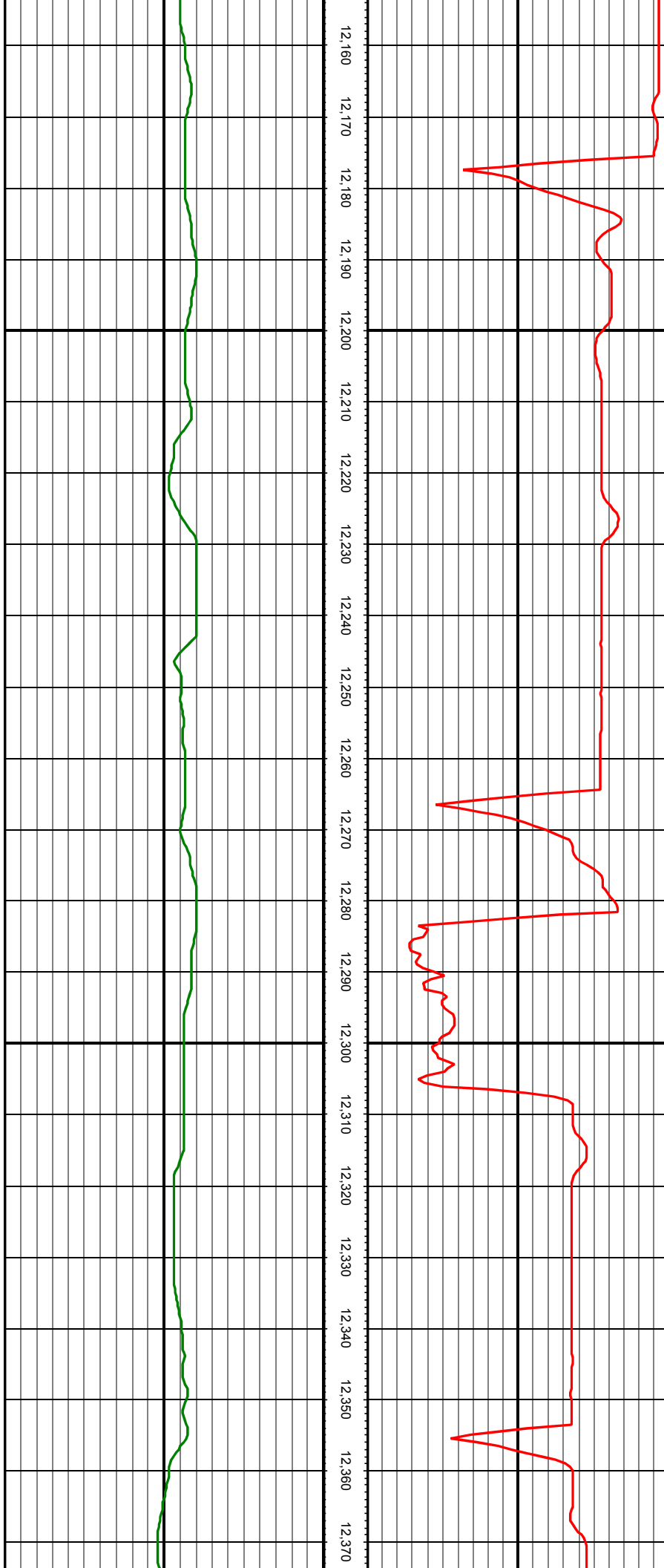


MD: 11946.00 INC: 87.87 AZ: 179.63 TVD: 7816.85 VS: 3663.36

MD: 12035.00 INC: 89.23 AZ: 179.19 TVD: 7819.11 VS: 3752.31

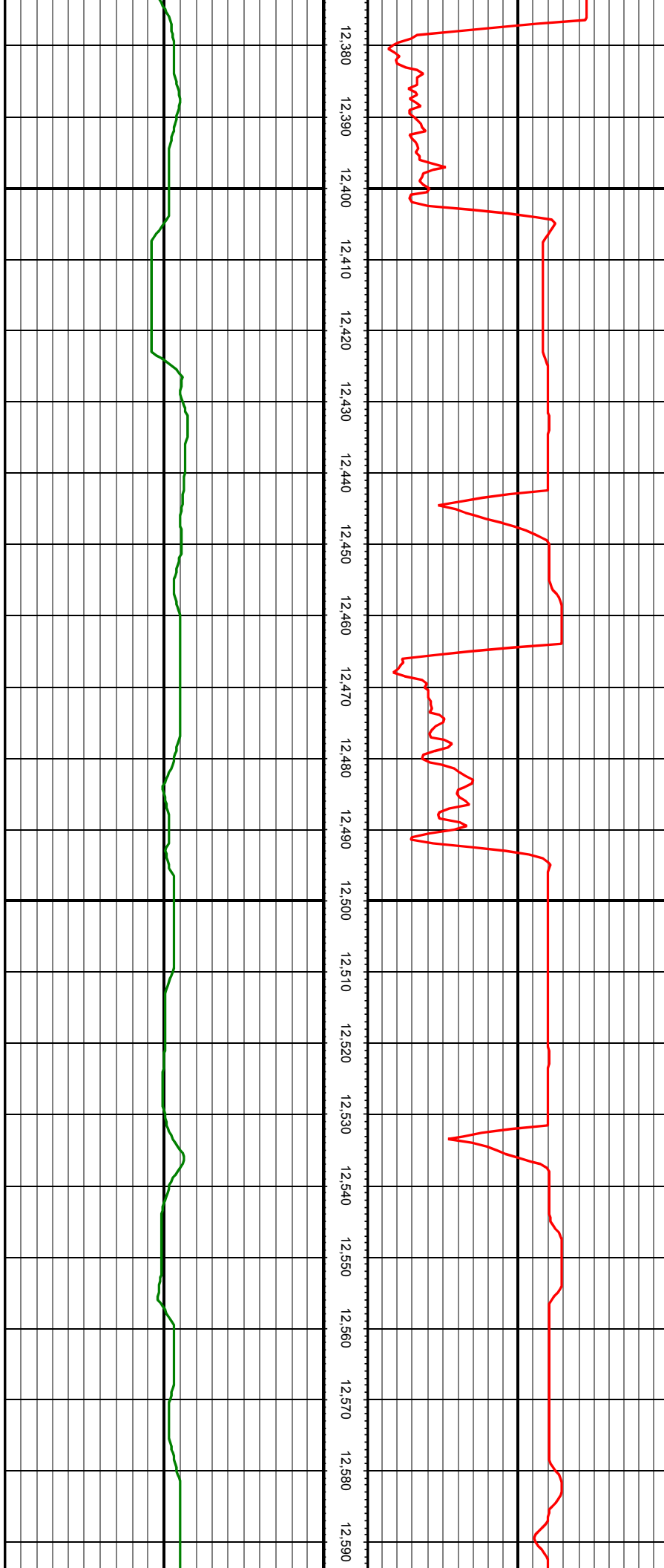
MD: 12124.00 INC: 90.46 AZ: 179.01 TVD: 7819.35 VS: 3841.27





MD: 12213.00 INC: 92.31 AZ: 178.84 TVD: 7817.20 VS: 3930.20

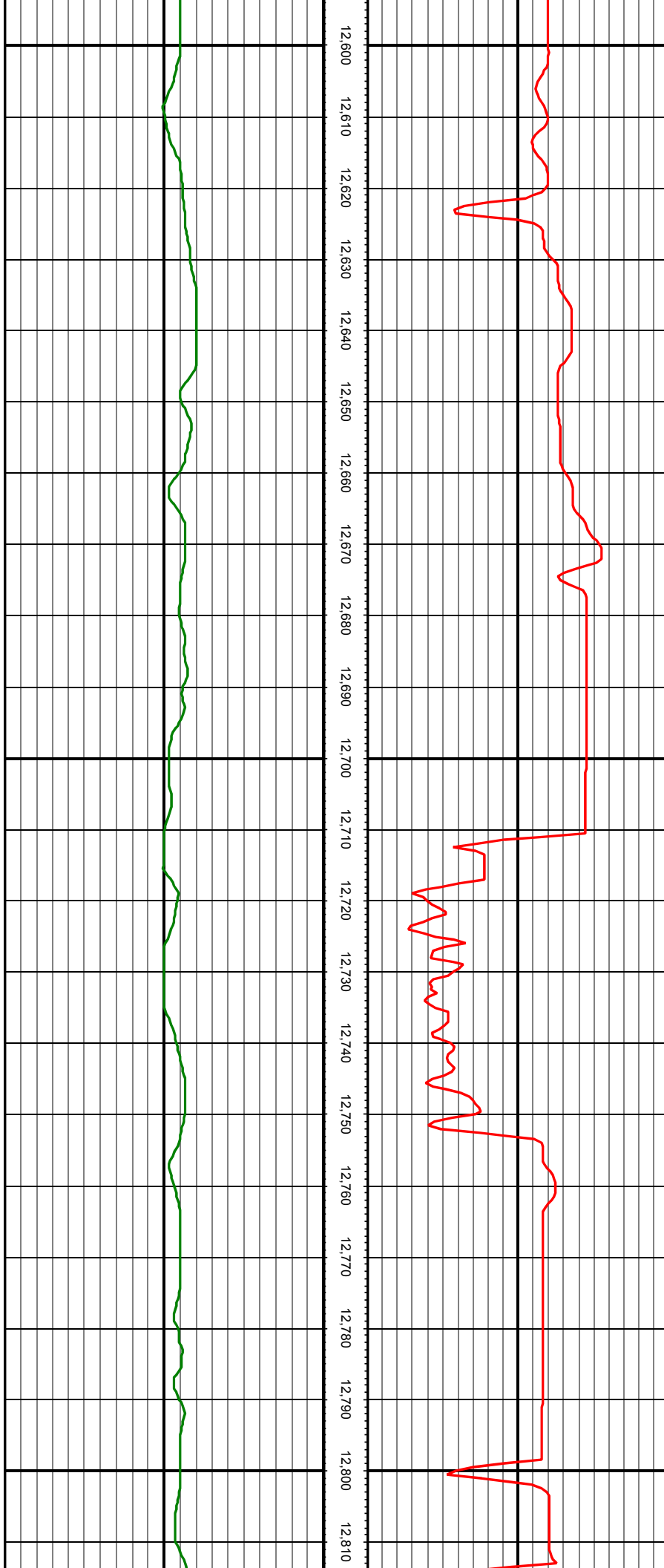
MD: 12302.00 INC: 92.88 AZ: 180.95 TVD: 7813.17 VS: 4019.09



MD: 12391.00 INC: 92.00 AZ: 180.33 TVD: 7809.38 VS: 4108.01

MD: 12480.00 INC: 90.11 AZ: 180.86 TVD: 7807.74 VS: 4196.99

MD: 12570.00 INC: 89.71 AZ: 179.98 TVD: 7807.88 VS: 4286.99



MD: 12659.00 INC: 92.00 AZ: 179.54 TVD: 7806.55 VS: 4375.96

MD: 12748.00 INC: 90.11 AZ: 179.80 TVD: 7804.91 VS: 4464.92

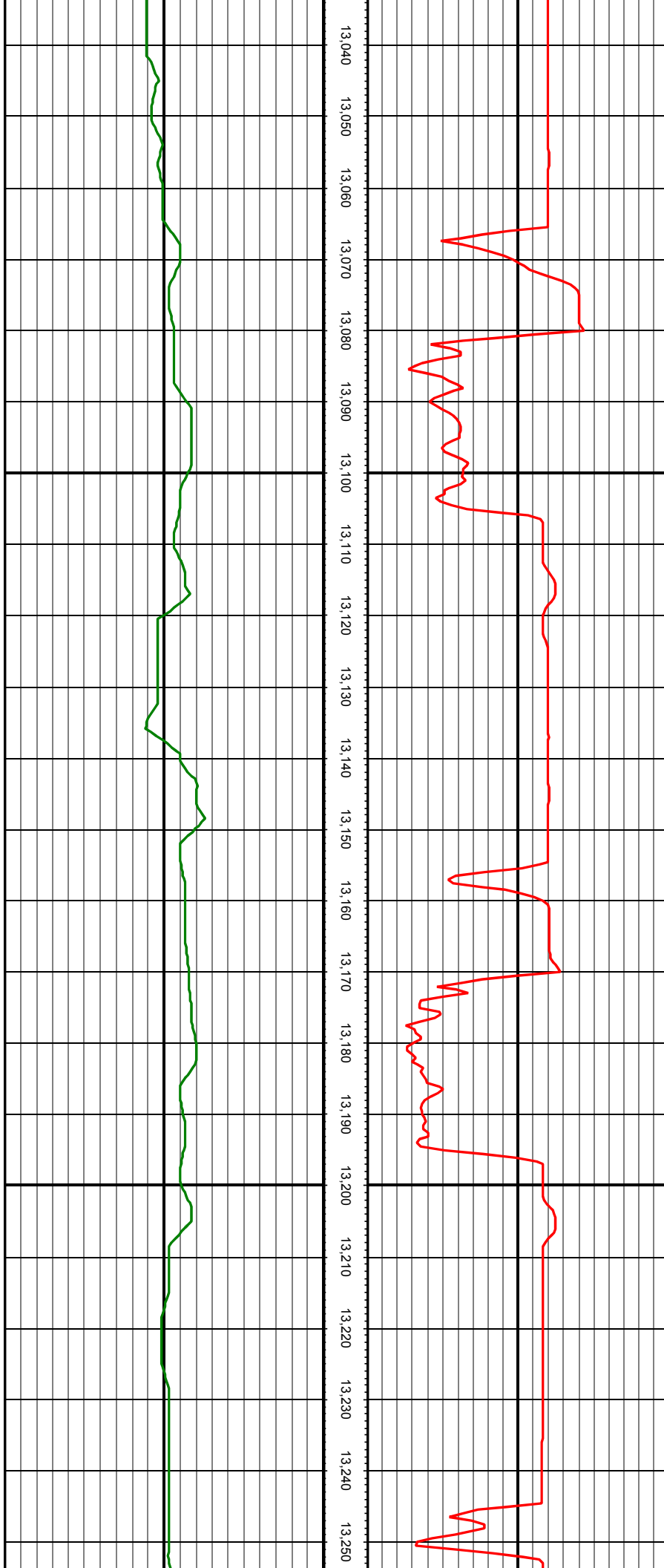




MD: 12837.00 INC: 88.44 AZ: 182.18 TVD: 7806.04 VS: 4553.90

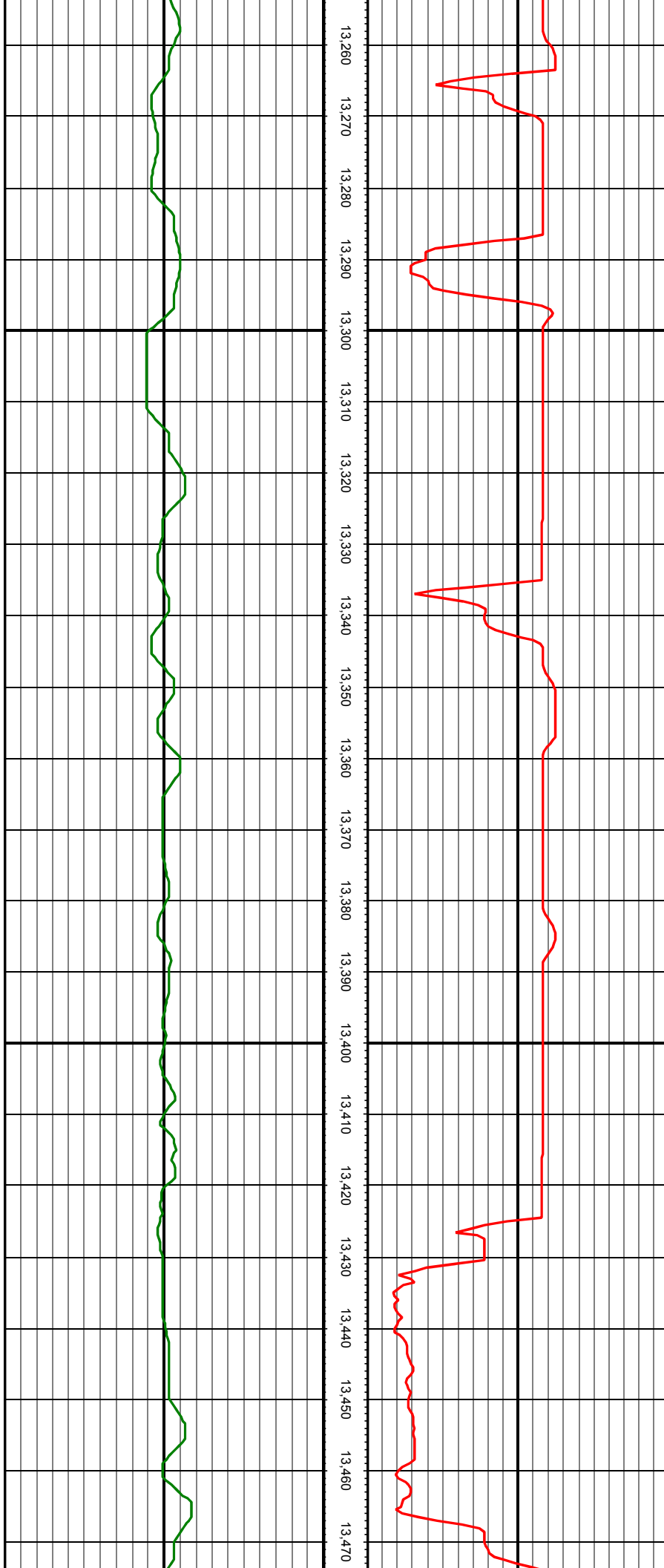
MD: 12926.00 INC: 88.57 AZ: 182.44 TVD: 7808.36 VS: 4642.84

MD: 13015.00 INC: 89.76 AZ: 183.14 TVD: 7809.66 VS: 4731.77



MD: 13104.00 INC: 89.49 AZ: 180.95 TVD: 7810.24 VS: 4820.74

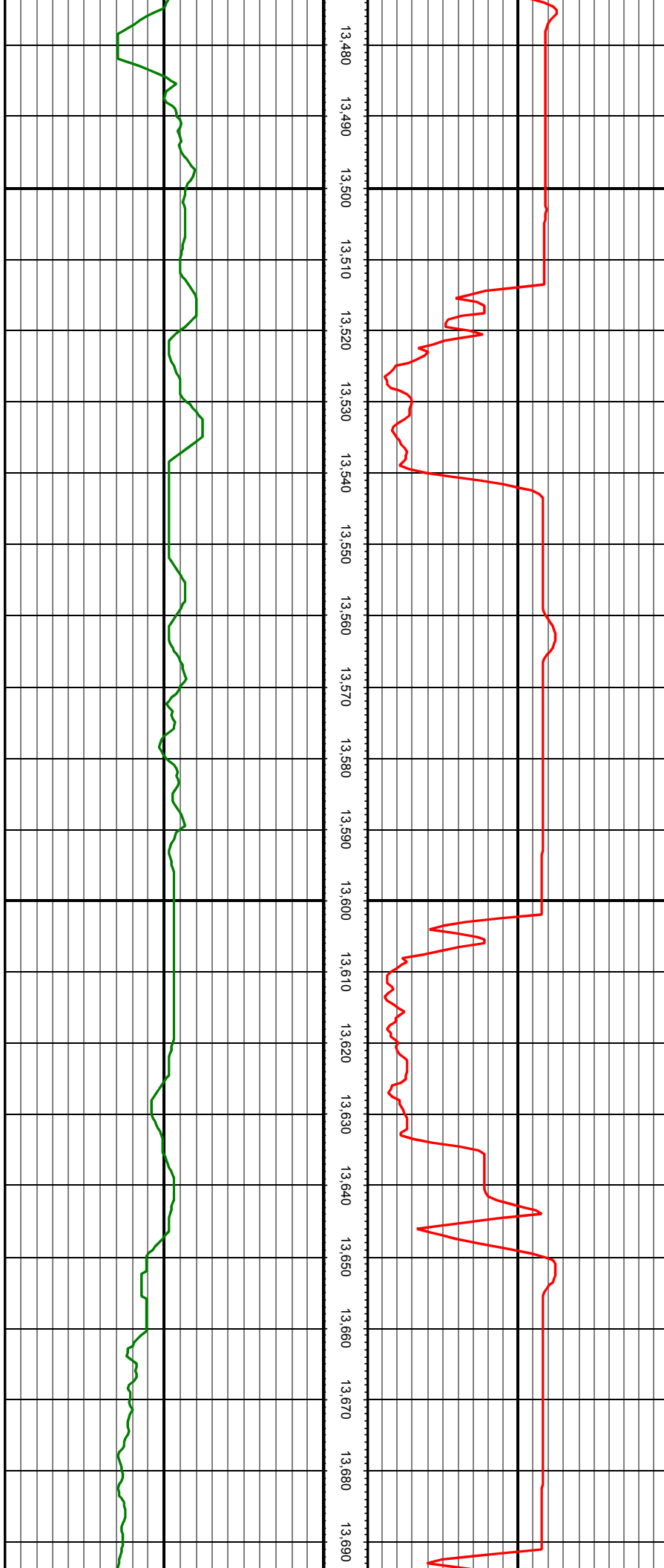
MD: 13193.00 INC: 89.01 AZ: 180.60 TVD: 7811.41 VS: 4909.73



MD: 13283.00 INC: 89.49 AZ: 180.77 TVD: 7812.58 VS: 4999.72

MD: 13372.00 INC: 90.29 AZ: 180.33 TVD: 7812.75 VS: 5088.72

MD: 13461.00 INC: 86.86 AZ: 175.76 TVD: 7814.97 VS: 5177.56



MD: 13550.00 INC: 87.03 AZ: 176.46 TVD: 7819.71 VS: 5266.15

MD: 13639.00 INC: 87.82 AZ: 178.22 TVD: 7823.71 VS: 5354.90



MD: 13728.00 INC: 89.41 AZ: 180.33 TVD: 7825.86 VS: 5443.83

MD: 13817.00 INC: 90.37 AZ: 180.60 TVD: 7826.03 VS: 5532.83

MD: 13906.00 INC: 90.46 AZ: 178.66 TVD: 7825.39 VS: 5621.81



MD: 13995.00 INC: 89.41 AZ: 180.33 TVD: 7825.49 VS: 5710.79

MD: 14084.00 INC: 90.11 AZ: 179.63 TVD: 7825.86 VS: 5799.78

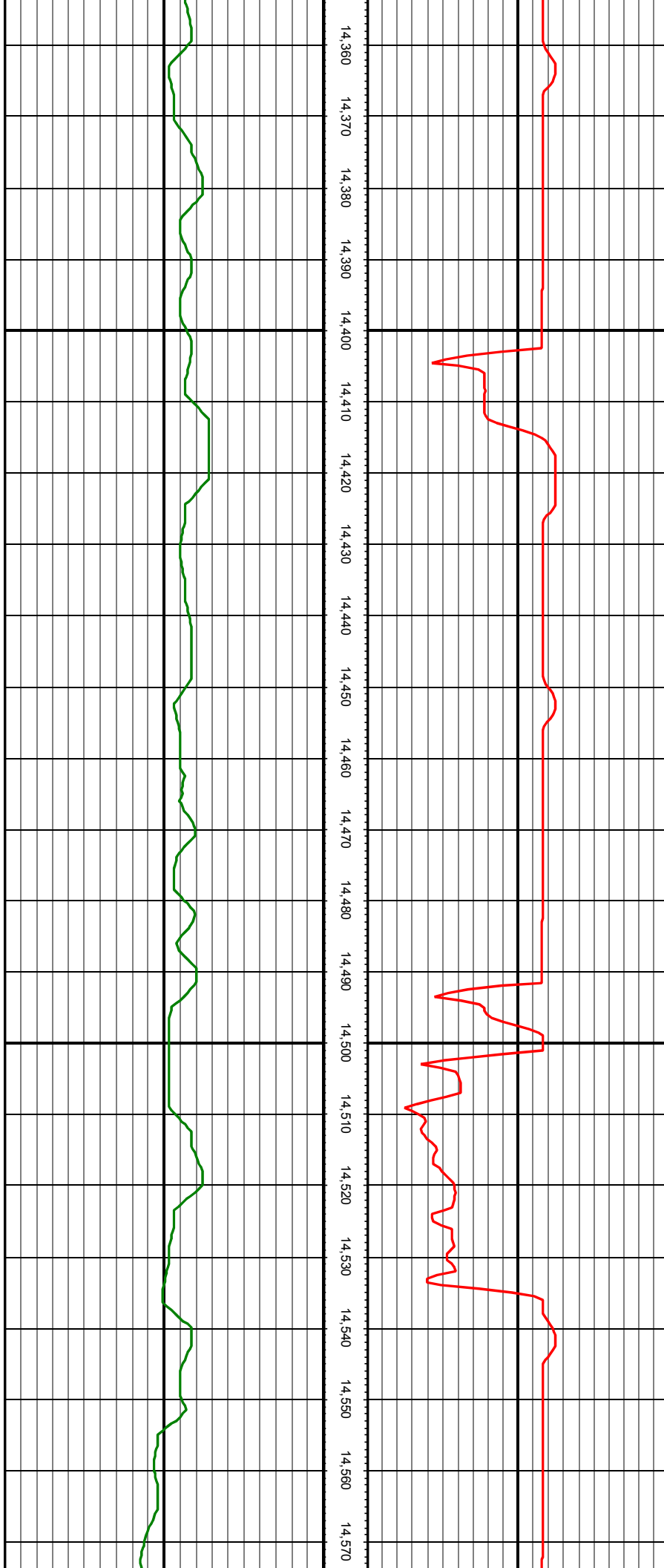


14,140 14,150 14,160 14,170 14,180 14,190 14,200 14,210 14,220 14,230 14,240 14,250 14,260 14,270 14,280 14,290 14,300 14,310 14,320 14,330 14,340 14,350

MD: 14173.00 INC: 88.04 AZ: 179.98 TVD: 7827.30 VS: 5888.75

MD: 14263.00 INC: 90.02 AZ: 181.91 TVD: 7828.82 VS: 5978.73

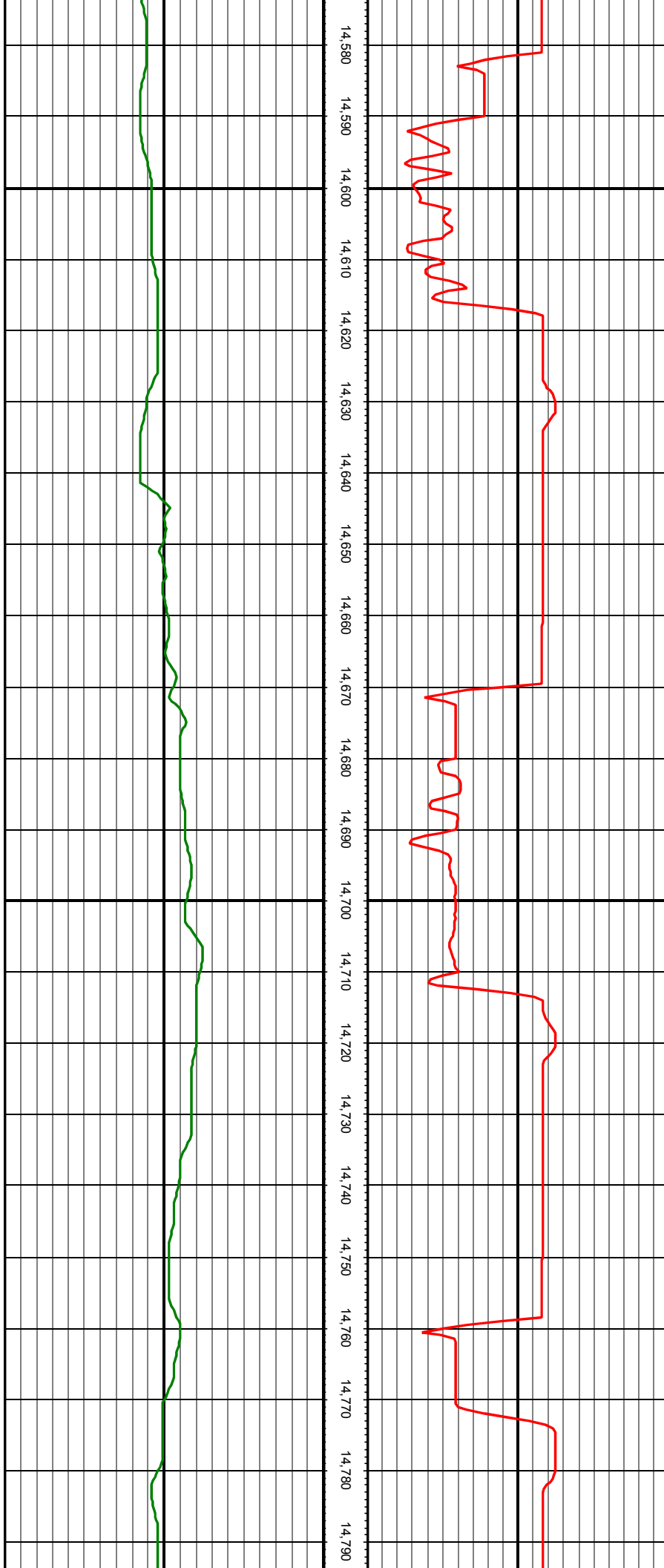
MD: 14352.00 INC: 90.55 AZ: 179.89 TVD: 7828.38 VS: 6067.72



MD: 14441.00 INC: 91.91 AZ: 179.10 TVD: 7826.47 VS: 6156.68

MD: 14530.00 INC: 90.37 AZ: 180.07 TVD: 7824.70 VS: 6245.64





MD: 14619.00 INC: 89.05 AZ: 179.01 TVD: 7825.15 VS: 6334.61

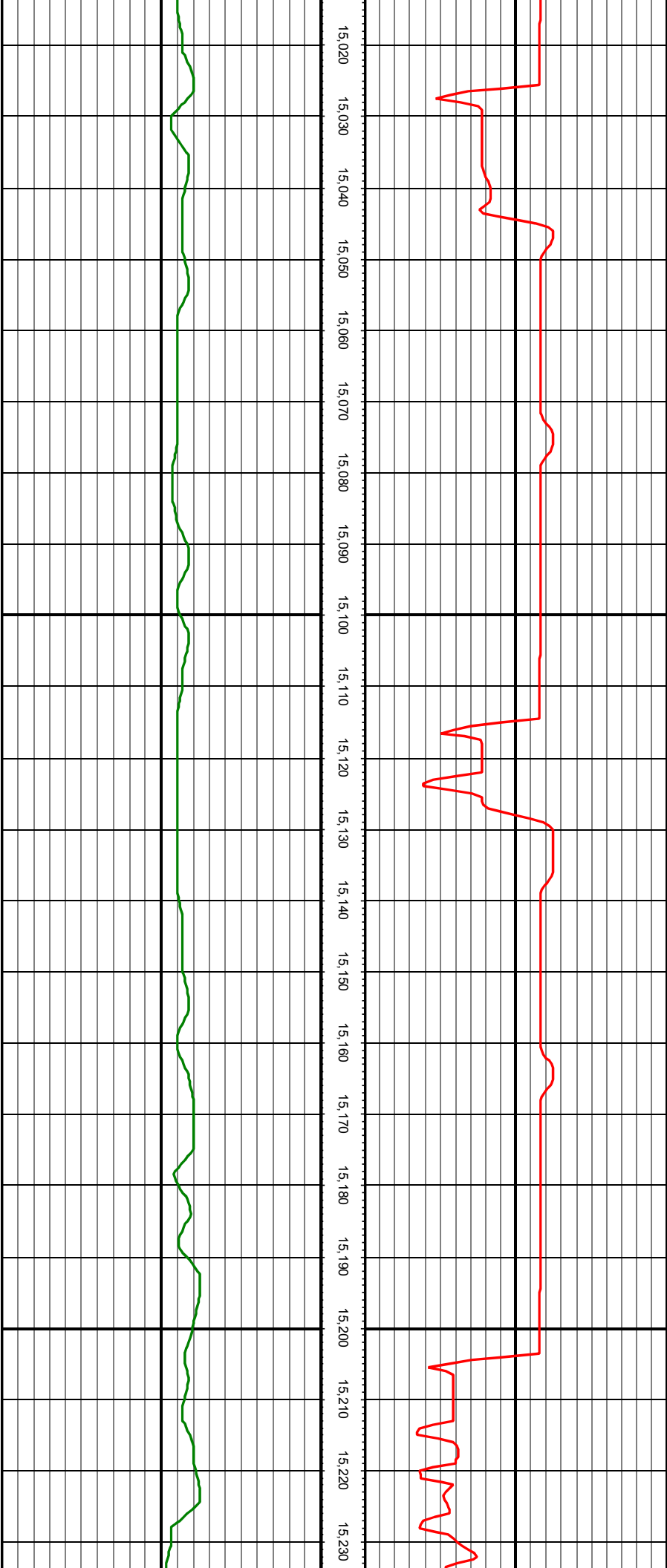
MD: 14708.00 INC: 88.48 AZ: 180.24 TVD: 7827.07 VS: 6423.57

MD: 14886.00 INC: 90.77 AZ: 180.68 TVD: 7829.05 VS: 6601.55

MD: 14976.00 INC: 89.49 AZ: 181.74 TVD: 7828.84 VS: 6691.54

MD: 15065.00 INC: 89.45 AZ: 181.74 TVD: 7829.67 VS: 6780.53

MD: 15154.00 INC: 90.68 AZ: 181.30 TVD: 7829.57 VS: 6869.51





MD: 15243.00 INC: 89.49 AZ: 180.33 TVD: 7829.43 VS: 6958.51

MD: 15332.00 INC: 90.37 AZ: 179.80 TVD: 7829.54 VS: 7047.51

MD: 15421.00 INC: 87.96 AZ: 181.39 TVD: 7830.84 VS: 7136.49



MD: 15510.00 INC: 88.13 AZ: 181.21 TVD: 7833.88 VS: 7225.43

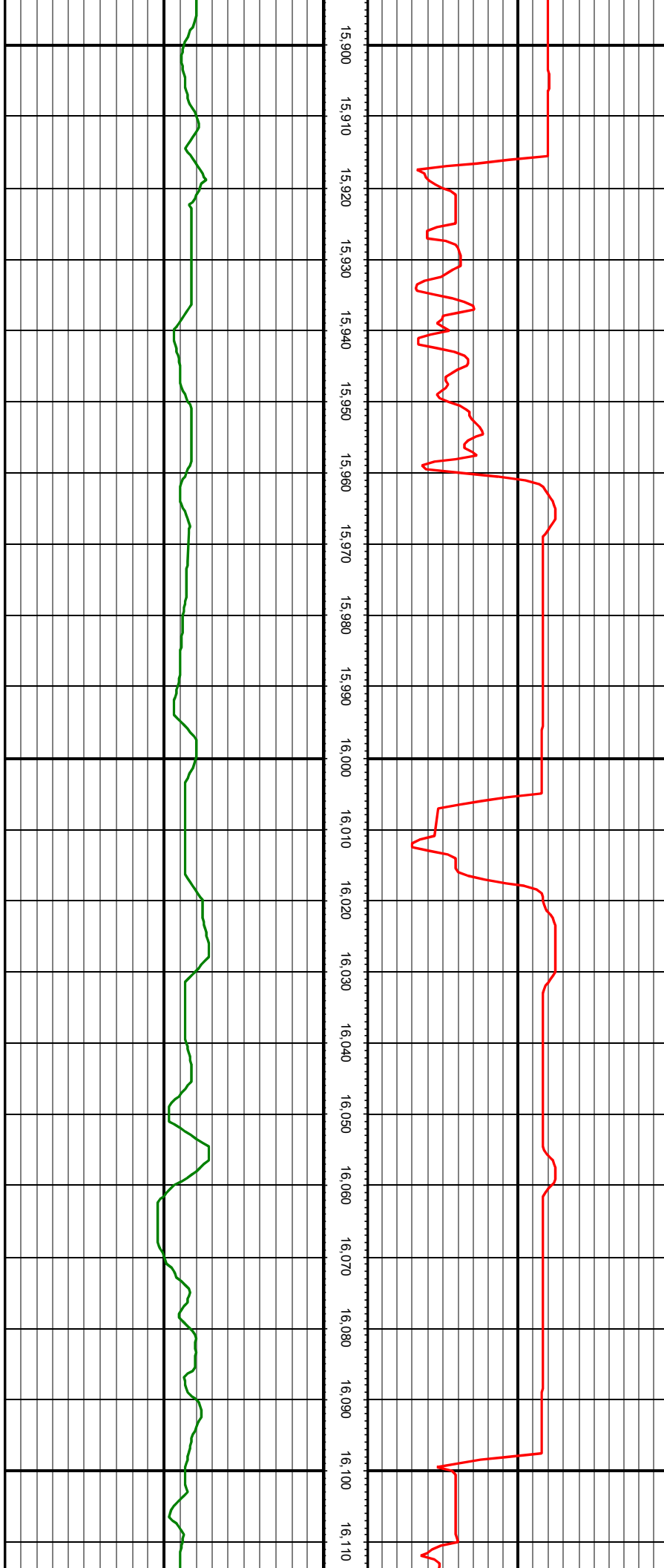
MD: 15599.00 INC: 89.76 AZ: 181.56 TVD: 7835.51 VS: 7314.41



MD: 15688.00 INC: 88.22 AZ: 180.77 TVD: 7837.08 VS: 7403.39

MD: 15777.00 INC: 88.70 AZ: 180.95 TVD: 7839.47 VS: 7492.35

MD: 15866.00 INC: 90.73 AZ: 181.83 TVD: 7839.92 VS: 7581.34



MD: 15955.00 INC: 89.01 AZ: 179.89 TVD: 7840.12 VS: 7670.33

MD: 16045.00 INC: 89.36 AZ: 178.66 TVD: 7841.40 VS: 7760.29

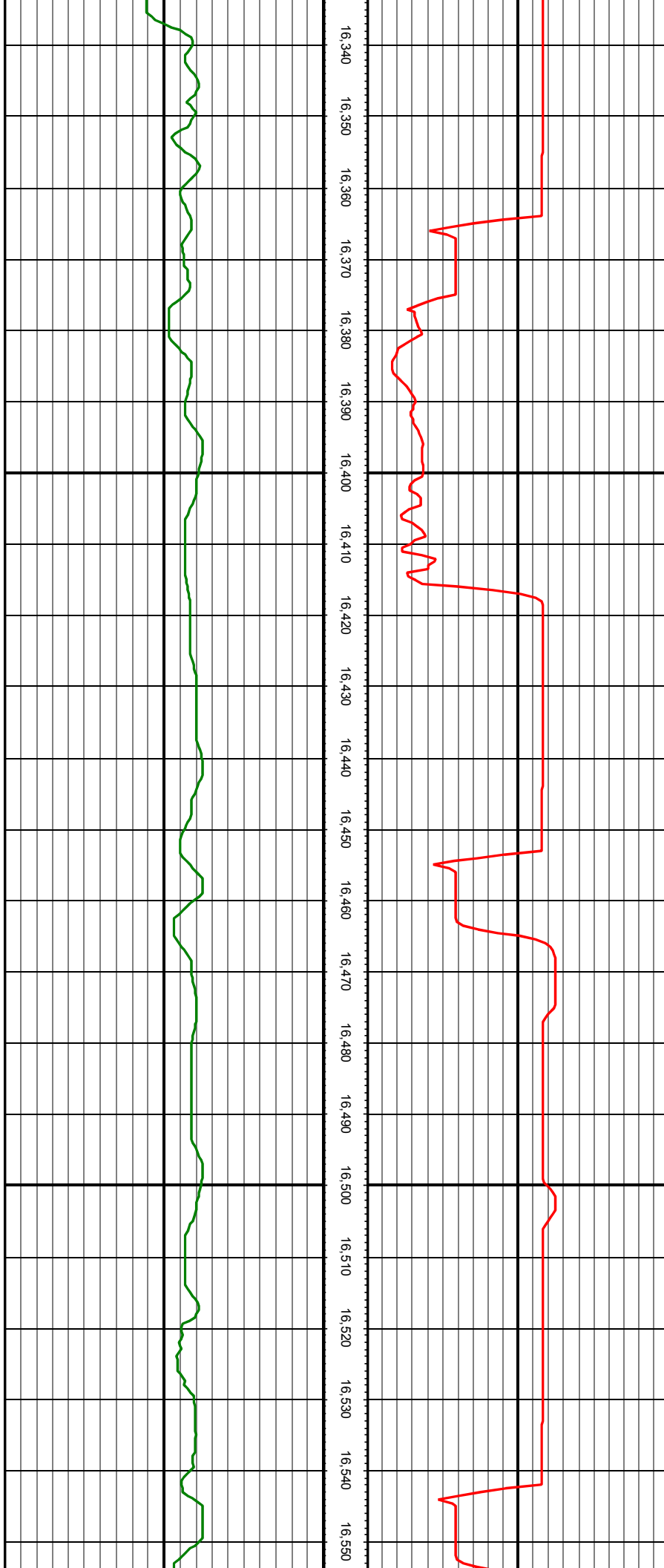


MD: 16134.00 INC: 88.09 AZ: 179.63 TVD: 7843.38 VS: 7849.23

MD: 16223.00 INC: 88.35 AZ: 180.33 TVD: 7846.14 VS: 7938.18

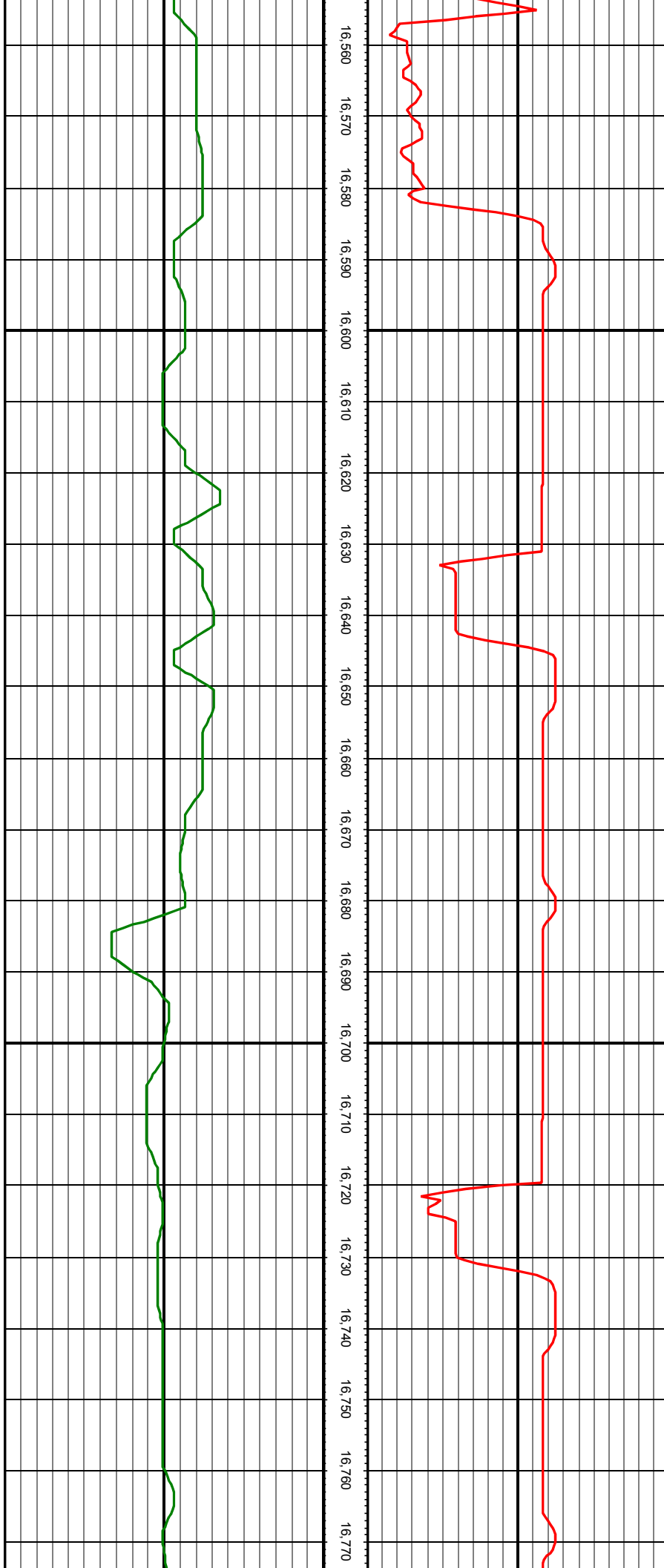
MD: 16312.00 INC: 90.29 AZ: 180.95 TVD: 7847.20 VS: 8027.17





MD: 16401.00 INC: 89.36 AZ: 181.12 TVD: 7847.47 VS: 8116.17

MD: 16490.00 INC: 88.92 AZ: 180.33 TVD: 7848.81 VS: 8205.16



16,560  
16,570  
16,580  
16,590  
16,600  
16,610  
16,620  
16,630  
16,640  
16,650  
16,660  
16,670  
16,680  
16,690  
16,700  
16,710  
16,720  
16,730  
16,740  
16,750  
16,760  
16,770

MD: 16579.00 INC: 87.30 AZ: 180.24 TVD: 7851.74 VS: 8294.10

MD: 16668.00 INC: 87.69 AZ: 179.80 TVD: 7855.63 VS: 8383.01

MD: 16758.00 INC: 89.14 AZ: 180.24 TVD: 7858.12 VS: 8472.97



MD: 16847.00 INC: 88.62 AZ: 179.63 TVD: 7859.86 VS: 8561.94

MD: 16936.00 INC: 88.31 AZ: 179.72 TVD: 7862.25 VS: 8650.90



MD: 17025.00 INC: 90.37 AZ: 180.68 TVD: 7863.27 VS: 8739.88

MD: 17114.00 INC: 88.40 AZ: 179.98 TVD: 7864.23 VS: 8828.87

MD: 17203.00 INC: 87.65 AZ: 179.10 TVD: 7867.29 VS: 8917.79



MD: 17292.00 INC: 89.36 AZ: 179.28 TVD: 7869.62 VS: 9006.73

MD: 17381.00 INC: 90.99 AZ: 179.45 TVD: 7869.34 VS: 9095.70

MD: 17416.00 INC: 91.43 AZ: 179.10 TVD: 7868.60 VS: 9130.68

