

**Cathedral Energy Services**

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

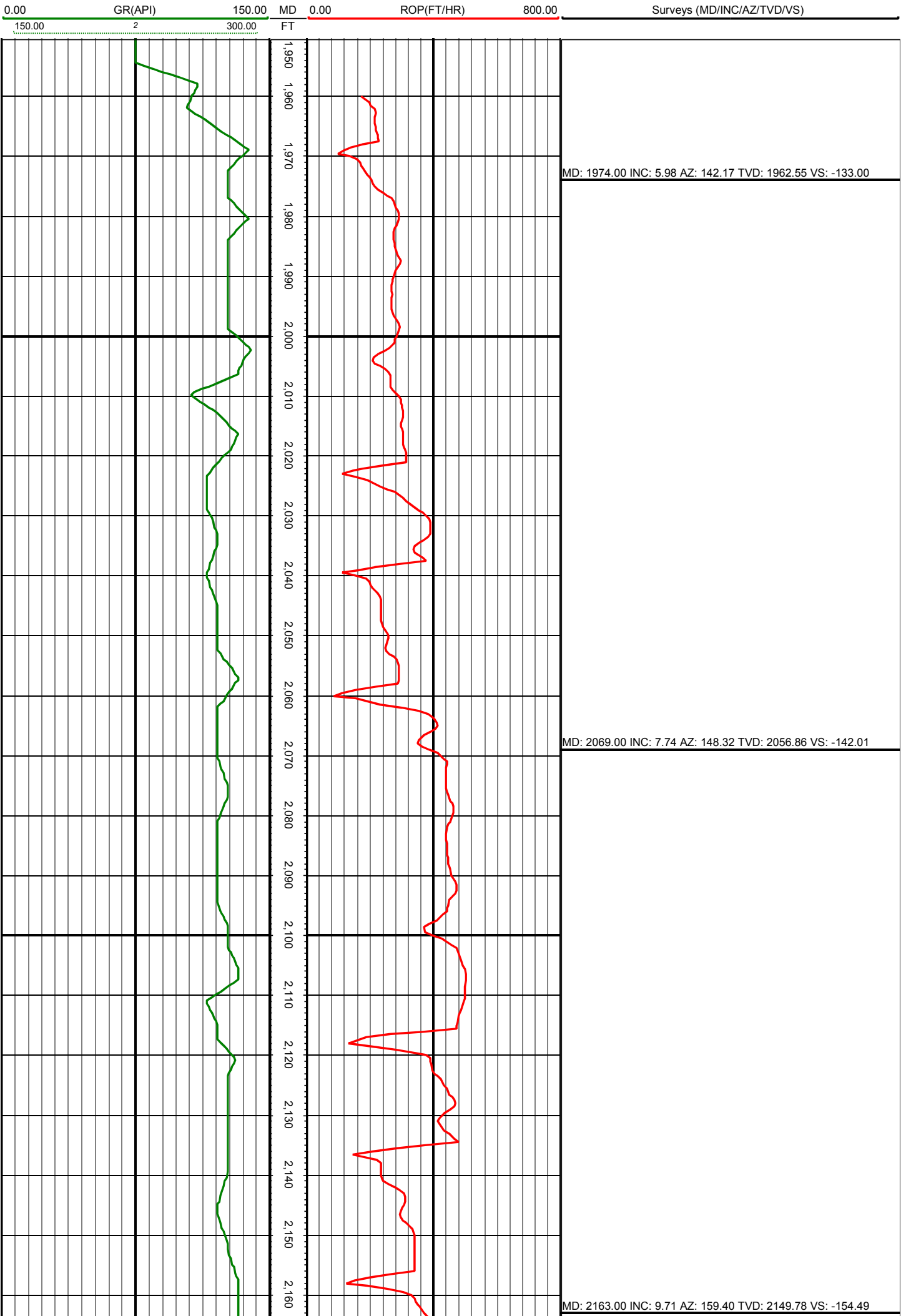
FILE 3S-32H-K268**Scale 5":100' - MD****12/12/2017 9:14 AM****Oper. Company:** Crestone Peak Resources**Well:** FILE 3S-32H-K268**Field:** DJ Basin**Rig:** Ensign 140**Well ID:** 05-123-45829-0000**Job Number:** 175174

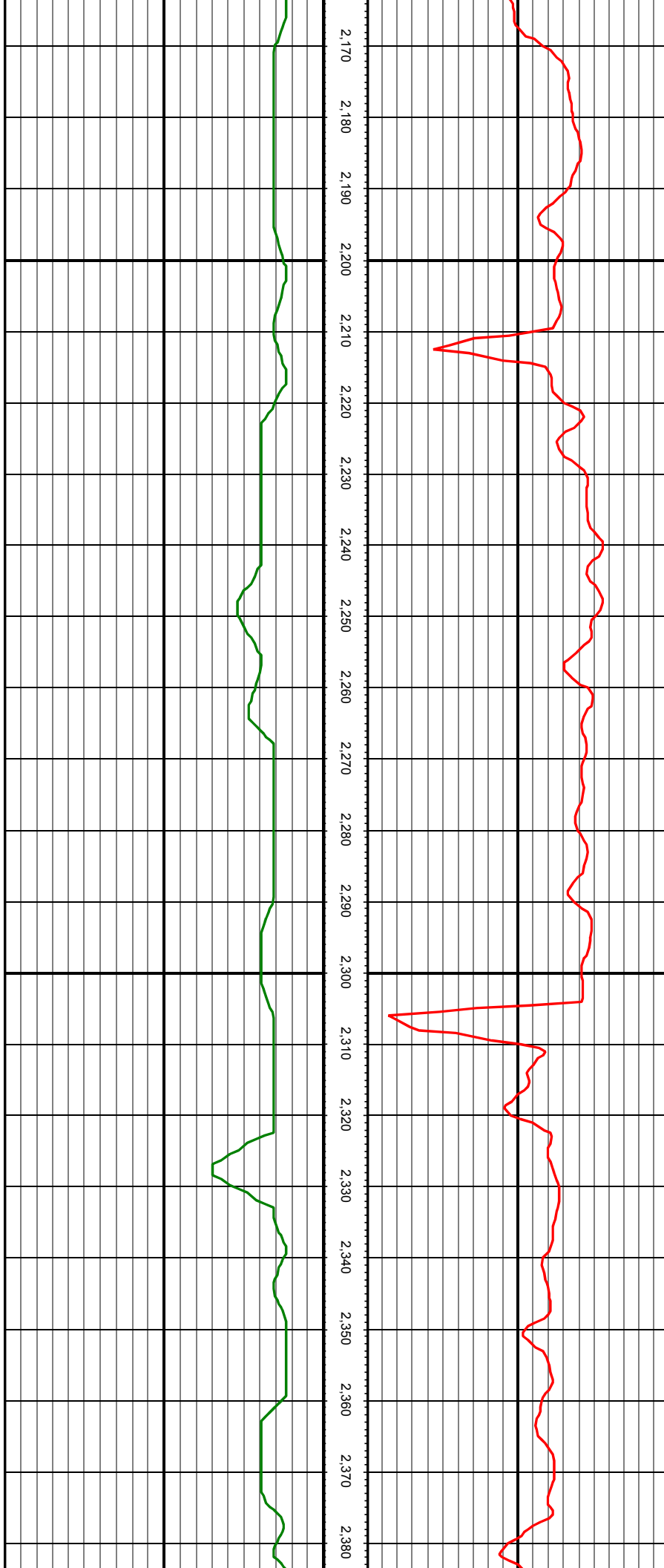
Notes: Gamma Ray Log
Section Plan: 2.96°
Datum: NAD 1983
Magnetic North: 8.49°
Grid Convergence: 0.31°
Gamma Averaging: 7% Smoothing

State: Colorado**County:** Weld**Country:** United States**Location:** S32-T2N-R68W**Start Date:** 12/06/2017 13:30:00**End Date:** 12/12/2017 07:30:00**Latitude:** 40.092573**Longitude:** -105.030574**Elev GL:** 4,970.00**Elev DF:** 4,993.00**Elev KB:** 4,993.00**Notes:** Log & Survey Depths Relative to Kelly Bushing (KB) Depth**Operator 1:** Jerry Shannahan**Operator 2:** Daniel Stevens**Notes:** Maximum Temperature: 259°F

Tool Run Data	Run #1	Run #2	Run #3	Run #4	Run #5
Tool S/N	1323	1638			
Bit Size	8.75	8.50			
Cal Factor	5.750	5.660			
Survey Offset	50.00	45.00			
Gamma Offset	38.64	34.39			
Resistivity Offset	0.00	0.00			
Start Depth	1957.00	8264.00			
StartDate	12/6/2017	12/8/2017			
StartTime	13:30	17:00			
EndDepth	8264.00	18633.00			
EndDate	12/8/2017	12/12/2017			
EndTime	14:00	07:30			
Mud Type	Oil Base	Oil Base			
Mud Weight	9.70 ppg	10.40 ppg			
Funnel Viscosity	52.00 sec/qt	53.00 sec/qt			
Plastic Viscosity	17.00 cp@120°	23.00 cp@120°			
Yield Point	12.00 lbf/100ft²	16.00 lbf/100ft²			
Gel Strength	6.00 10s/10m	9.00 10s/10m			
Solids Content	5.10 % by vol HGS	5.20 % by vol HGS			
Sand Content	0.00 % by vol	0.00 % by vol			
Filtrate Alkalinity	17.20 @ 250°F	16.40 @ 250°F			
Chlorides	166,537.00 ppm	248,364.00 ppm			
Temperature	222.00 °F	259.00 °F			
Hole Data			Casing Data		
Size	From	To	Size	From	To
12.25	0.00	1957.00	9.625	0.00	1915.00
8.75	1957.00	8264.00			
8.50	8264.00	18633.00			

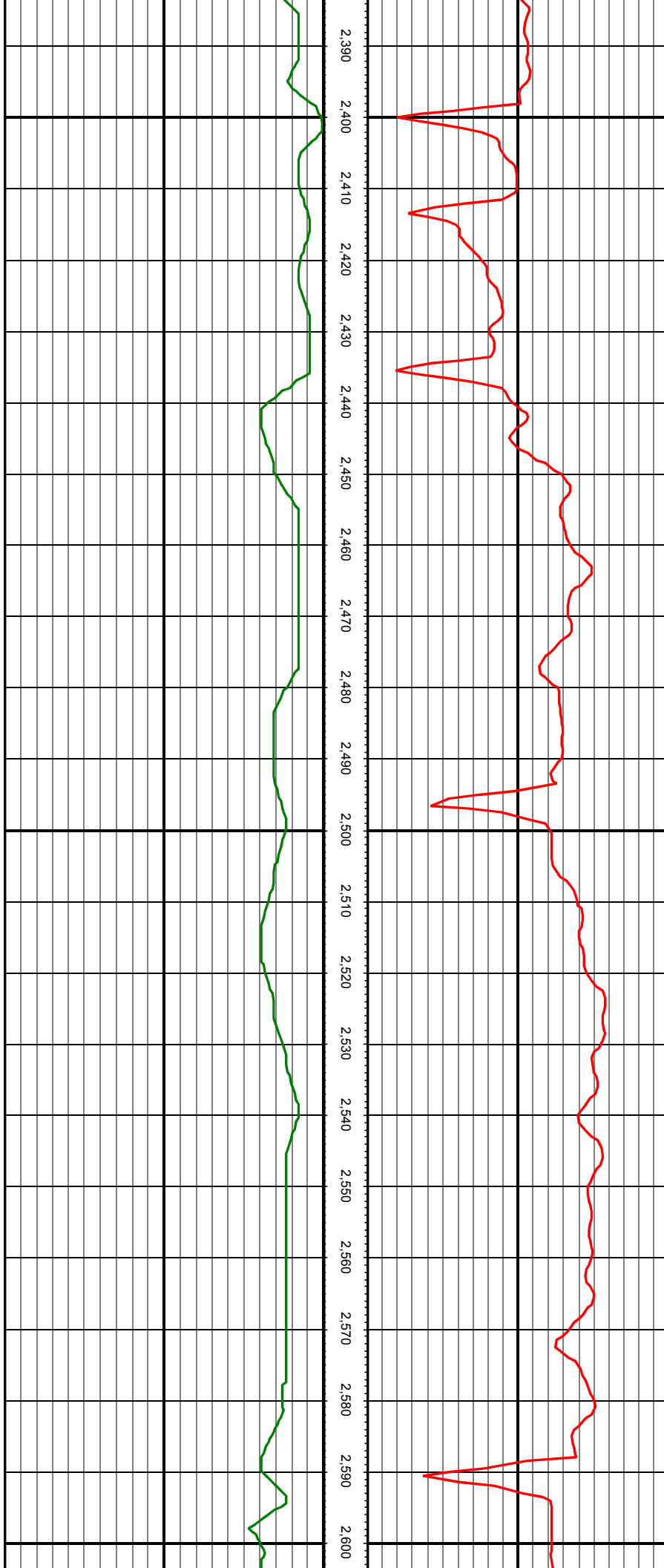
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not except in the case of gross or willful negligence on our part, be liable or responsible for any loss, cost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





MD: 2258.00 INC: 8.66 AZ: 161.42 TVD: 2243.56 VS: -168.48

MD: 2353.00 INC: 7.12 AZ: 161.60 TVD: 2337.66 VS: -180.62



MD: 2448.00 INC: 9.23 AZ: 162.39 TVD: 2431.69 VS: -193.24

MD: 2542.00 INC: 8.31 AZ: 164.41 TVD: 2524.59 VS: -206.73

MD: 2637.00 INC: 8.79 AZ: 156.59 TVD: 2618.53 VS: -219.75

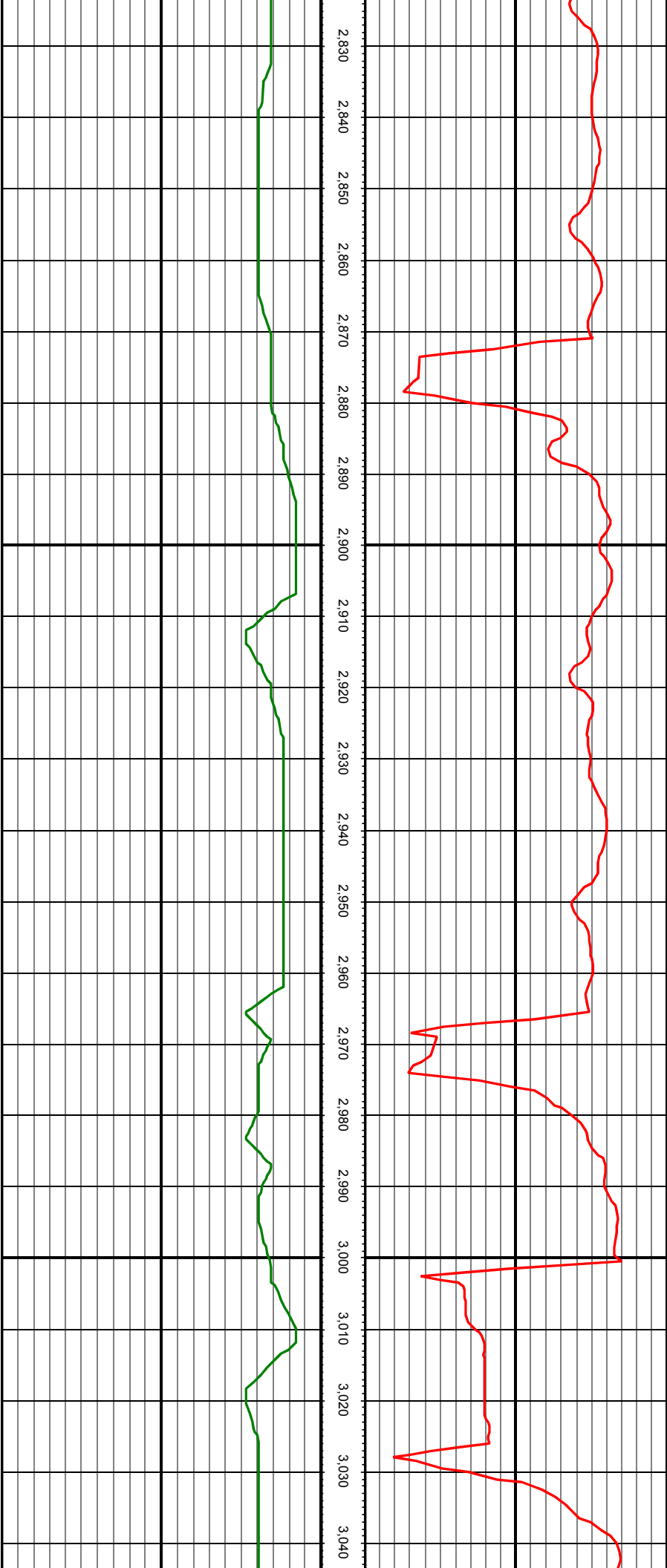
MD: 2732.00 INC: 9.67 AZ: 151.49 TVD: 2712.30 VS: -233.06

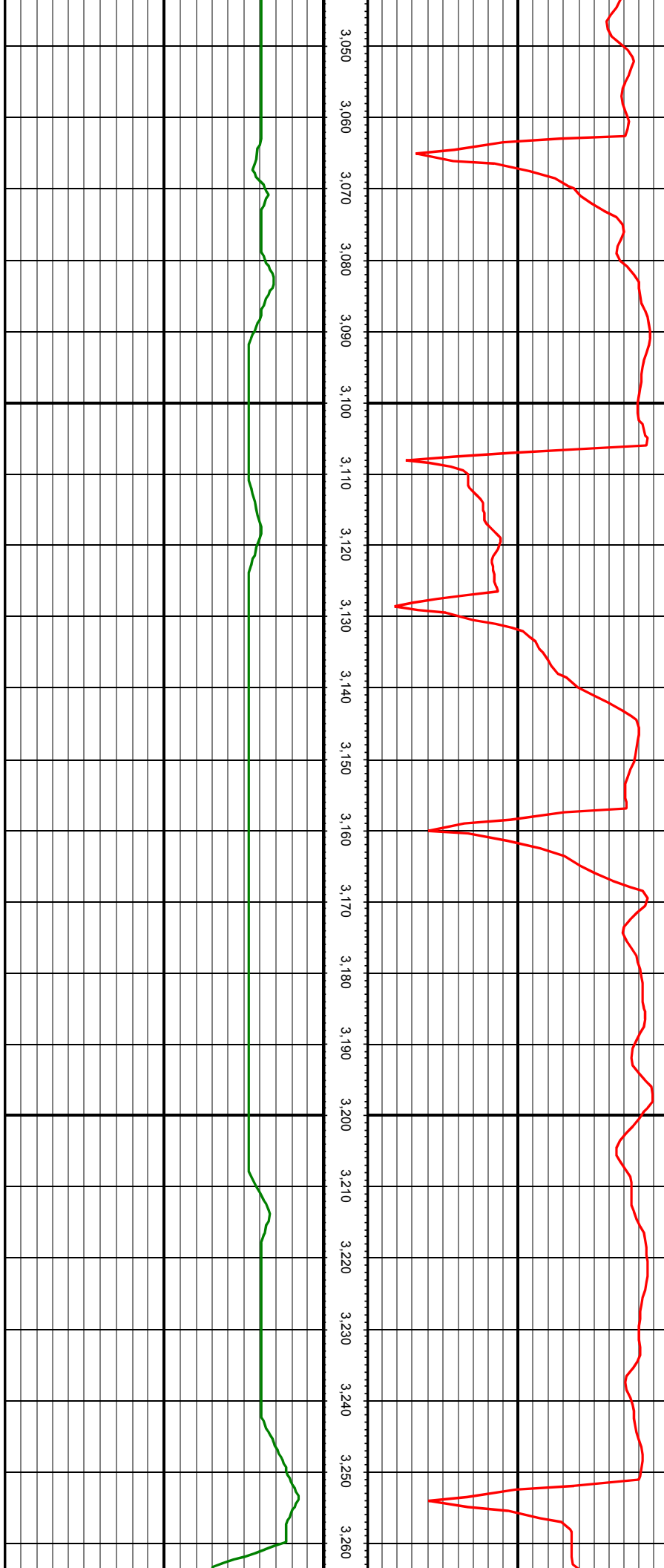


MD: 2826.00 INC: 8.97 AZ: 148.06 TVD: 2805.06 VS: -245.80

MD: 2921.00 INC: 7.74 AZ: 145.42 TVD: 2899.05 VS: -256.95

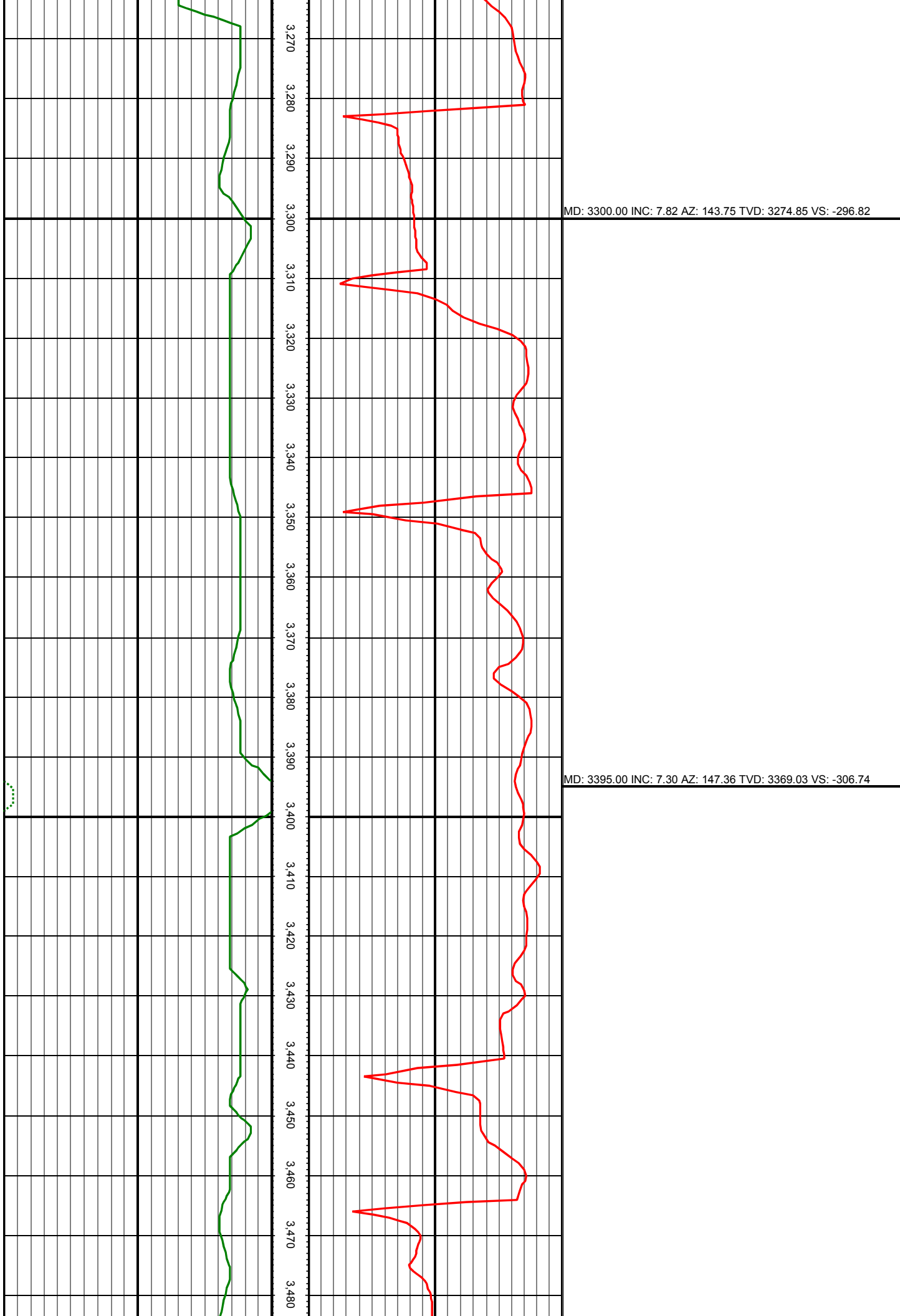
MD: 3016.00 INC: 7.43 AZ: 150.35 TVD: 2993.22 VS: -267.19





MD: 3110.00 INC: 7.30 AZ: 147.45 TVD: 3086.45 VS: -277.17

MD: 3205.00 INC: 7.30 AZ: 146.65 TVD: 3180.68 VS: -286.95

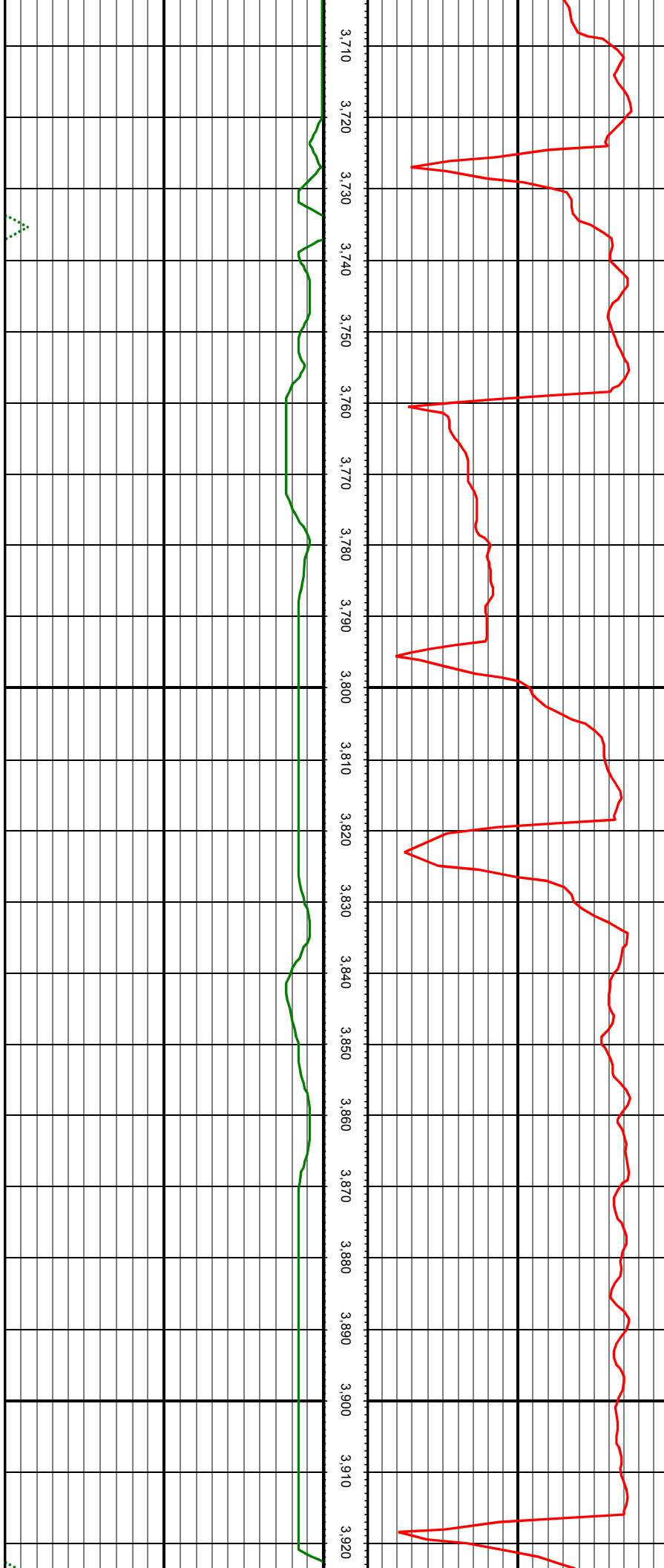


MD: 3490.00 INC: 7.03 AZ: 149.29 TVD: 3463.28 VS: -316.48

3.490 3.500 3.510 3.520 3.530 3.540 3.550 3.560 3.570 3.580 3.590 3.600 3.610 3.620 3.630 3.640 3.650 3.660 3.670 3.680 3.690 3.700

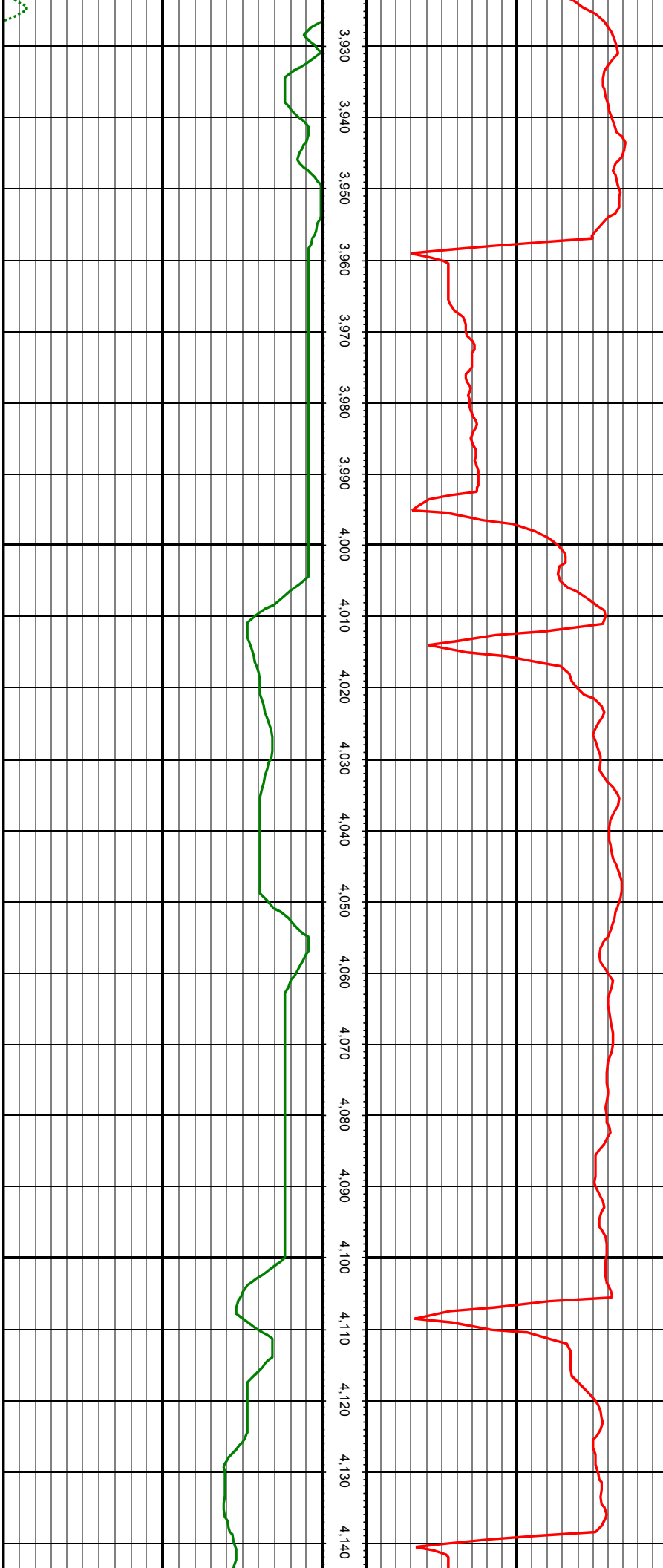
MD: 3585.00 INC: 6.29 AZ: 152.81 TVD: 3557.64 VS: -325.82

MD: 3679.00 INC: 6.77 AZ: 152.28 TVD: 3651.03 VS: -335.04



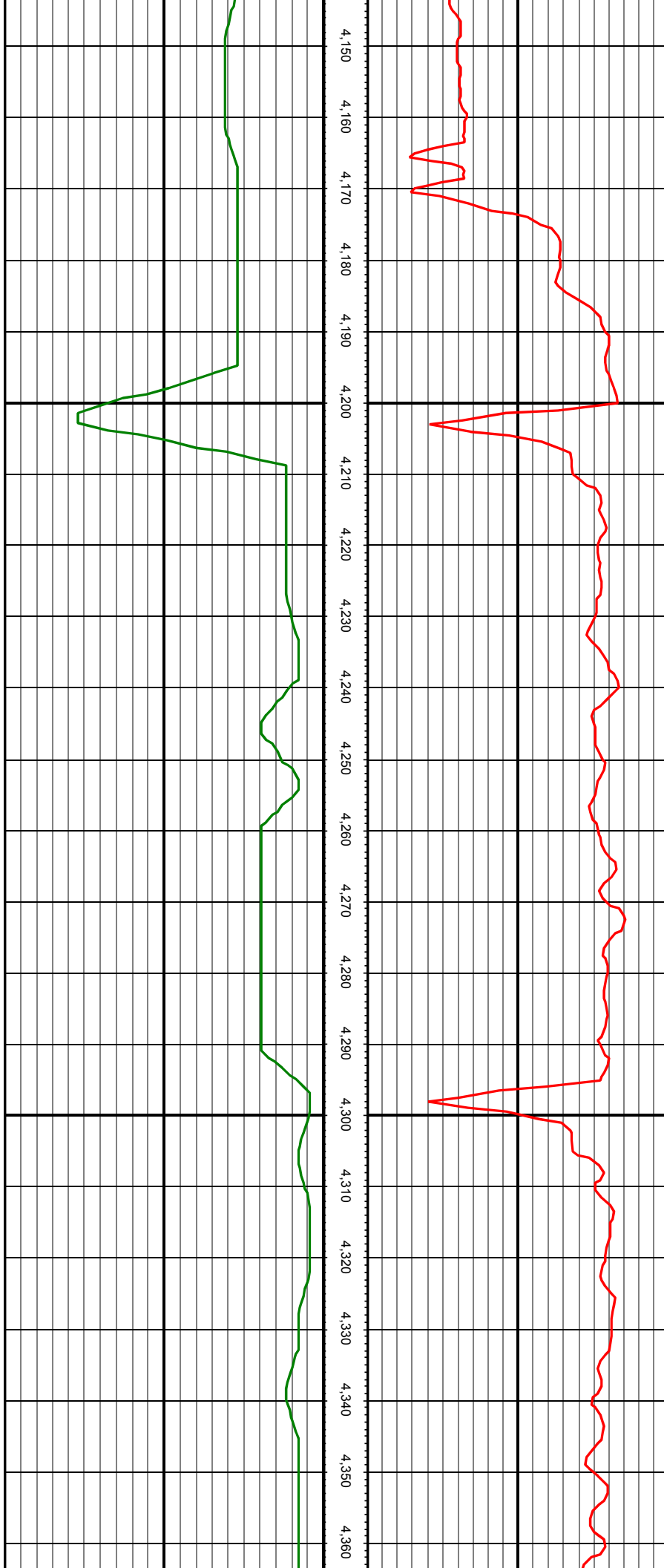
MD: 3774.00 INC: 8.31 AZ: 141.47 TVD: 3745.21 VS: -345.00

MD: 3869.00 INC: 9.10 AZ: 135.23 TVD: 3839.12 VS: -355.20



MD: 3963.00 INC: 8.04 AZ: 138.30 TVD: 3932.07 VS: -364.87

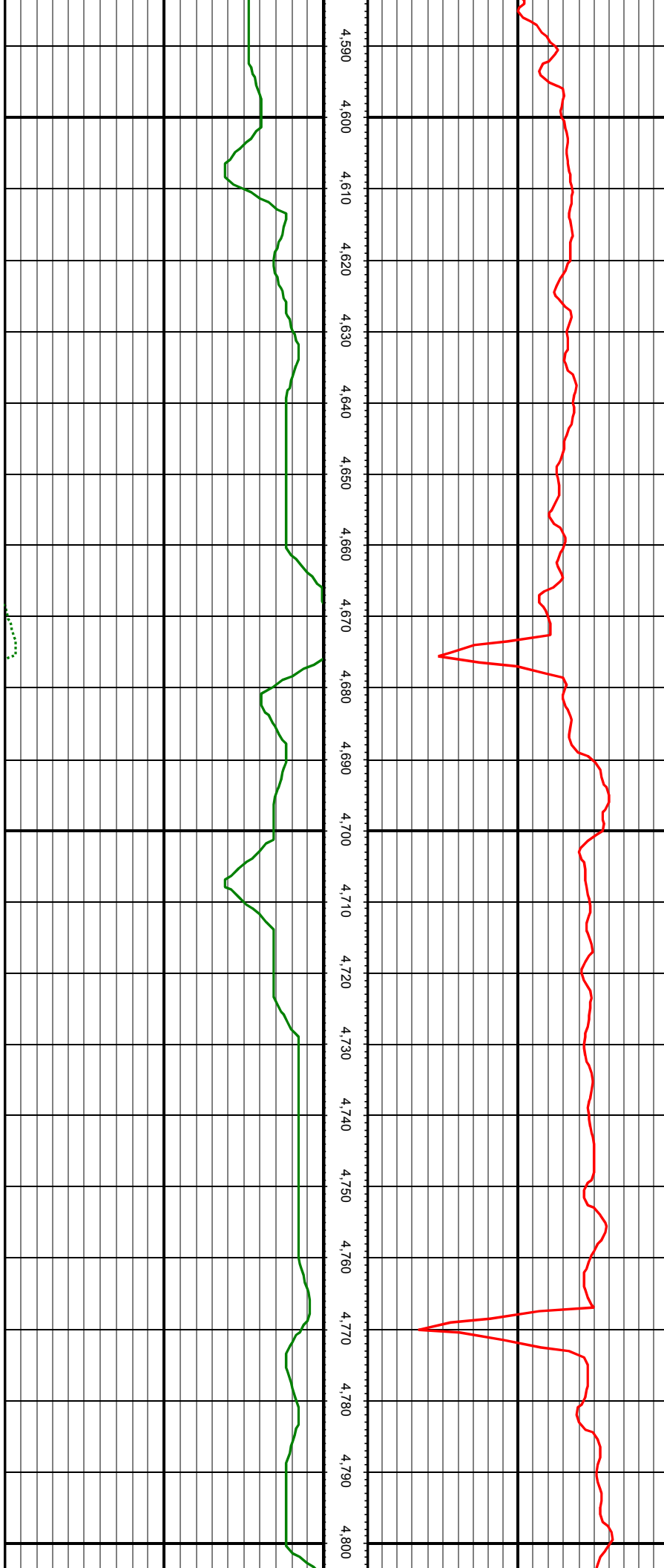
MD: 4058.00 INC: 10.07 AZ: 147.01 TVD: 4025.89 VS: -376.32



MD: 4153.00 INC: 11.25 AZ: 150.80 TVD: 4119.25 VS: -390.89

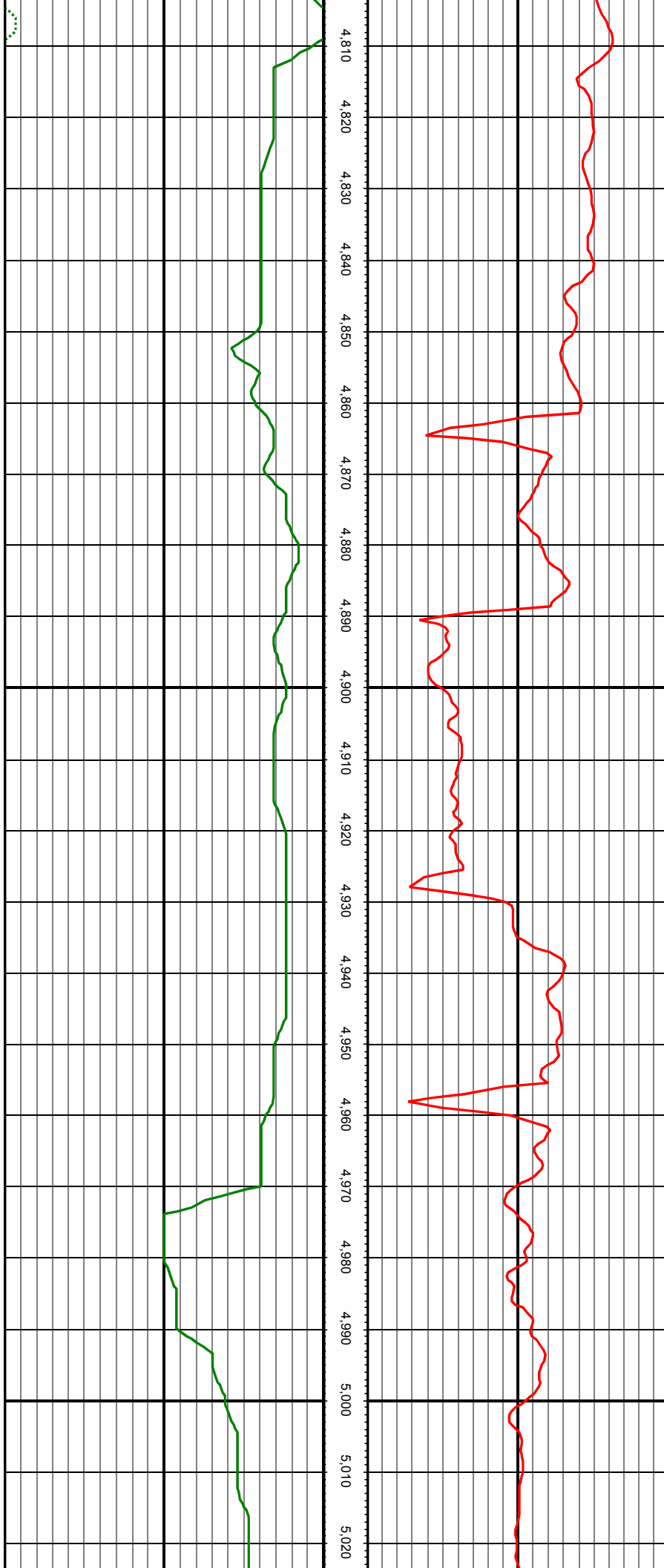
MD: 4247.00 INC: 11.16 AZ: 149.91 TVD: 4211.45 VS: -406.28

MD: 4341.00 INC: 9.05 AZ: 148.94 TVD: 4303.99 VS: -420.03



MD: 4625.00 INC: 9.89 AZ: 145.60 TVD: 4584.85 VS: -453.05

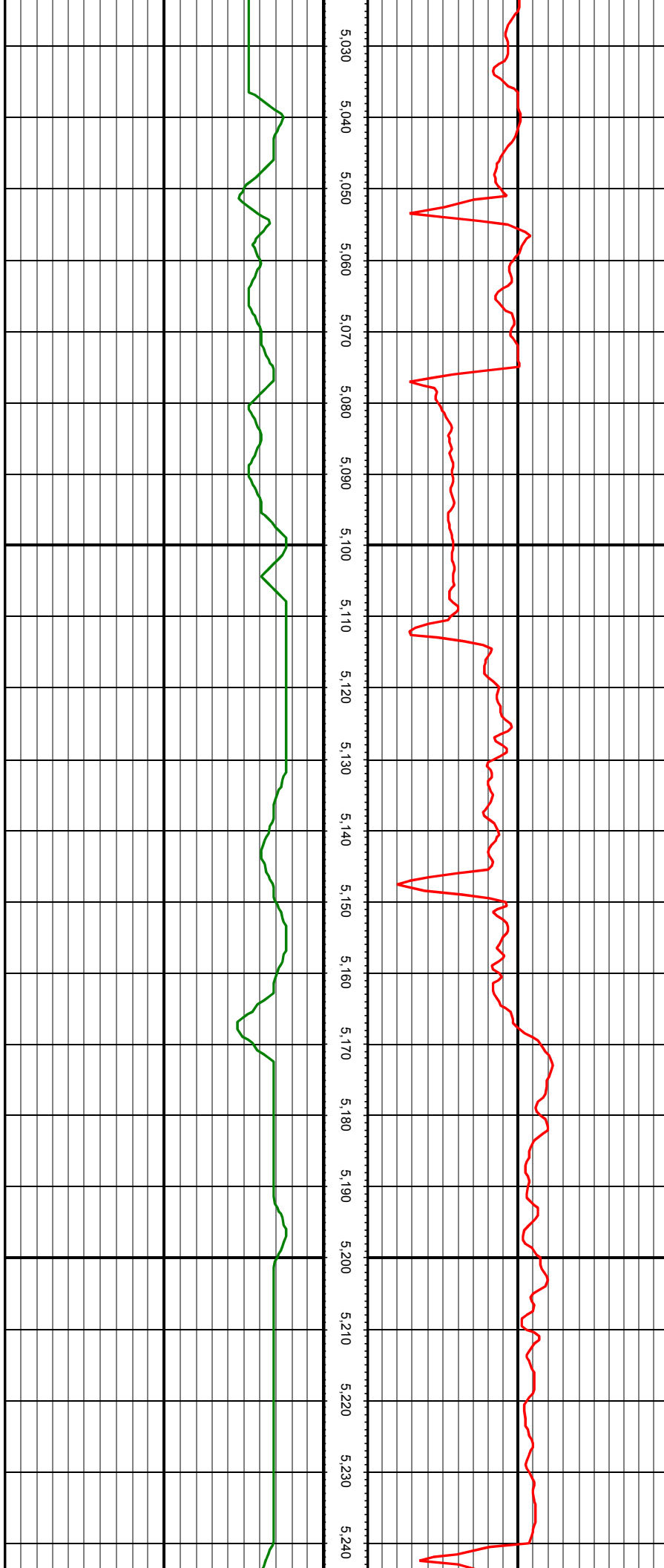
MD: 4720.00 INC: 7.87 AZ: 146.04 TVD: 4678.70 VS: -464.73



MD: 4815.00 INC: 5.85 AZ: 143.40 TVD: 4773.02 VS: -473.67

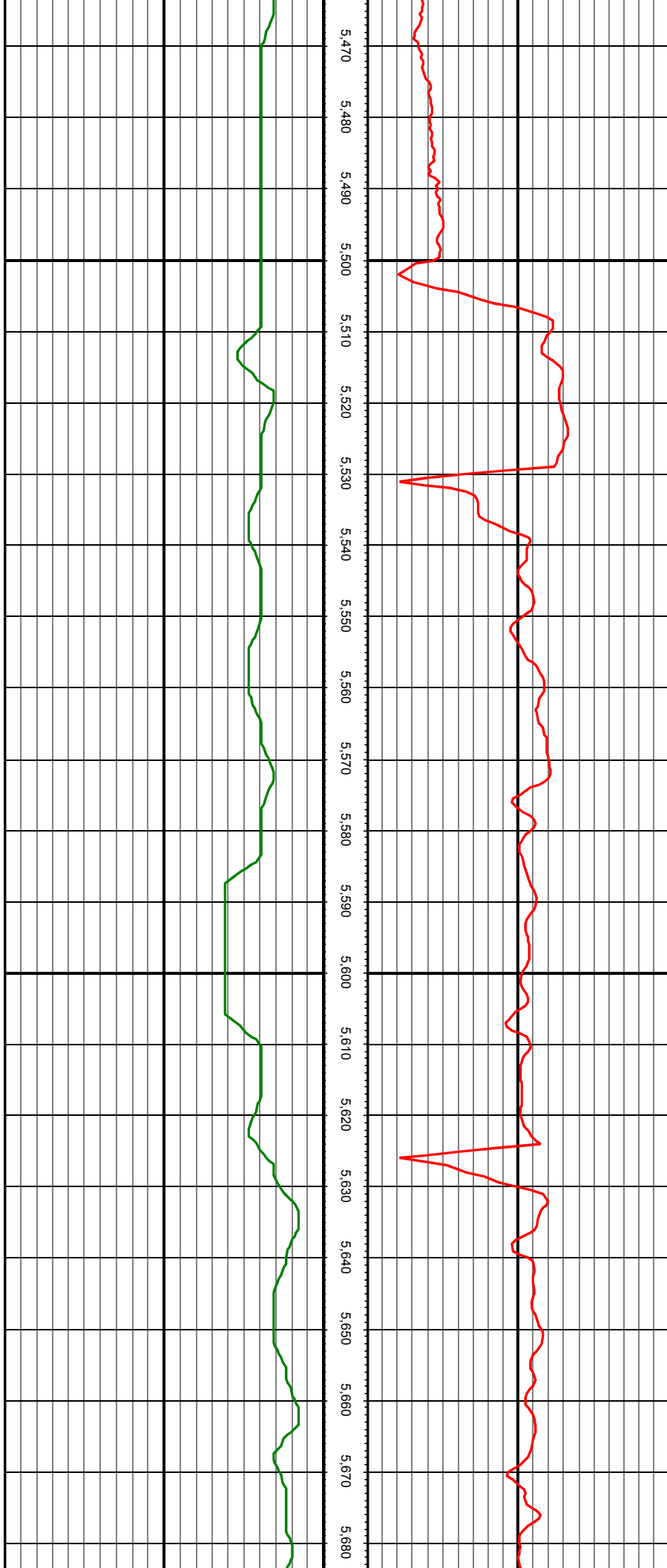
MD: 4910.00 INC: 5.89 AZ: 146.13 TVD: 4867.52 VS: -481.30

MD: 5005.00 INC: 7.47 AZ: 146.39 TVD: 4961.87 VS: -490.16



MD: 5100.00 INC: 9.14 AZ: 155.18 TVD: 5055.88 VS: -501.80

MD: 5195.00 INC: 9.10 AZ: 154.39 TVD: 5149.68 VS: -515.07



MD: 5479.00 INC: 8.40 AZ: 155.00 TVD: 5431.21 VS: -547.61

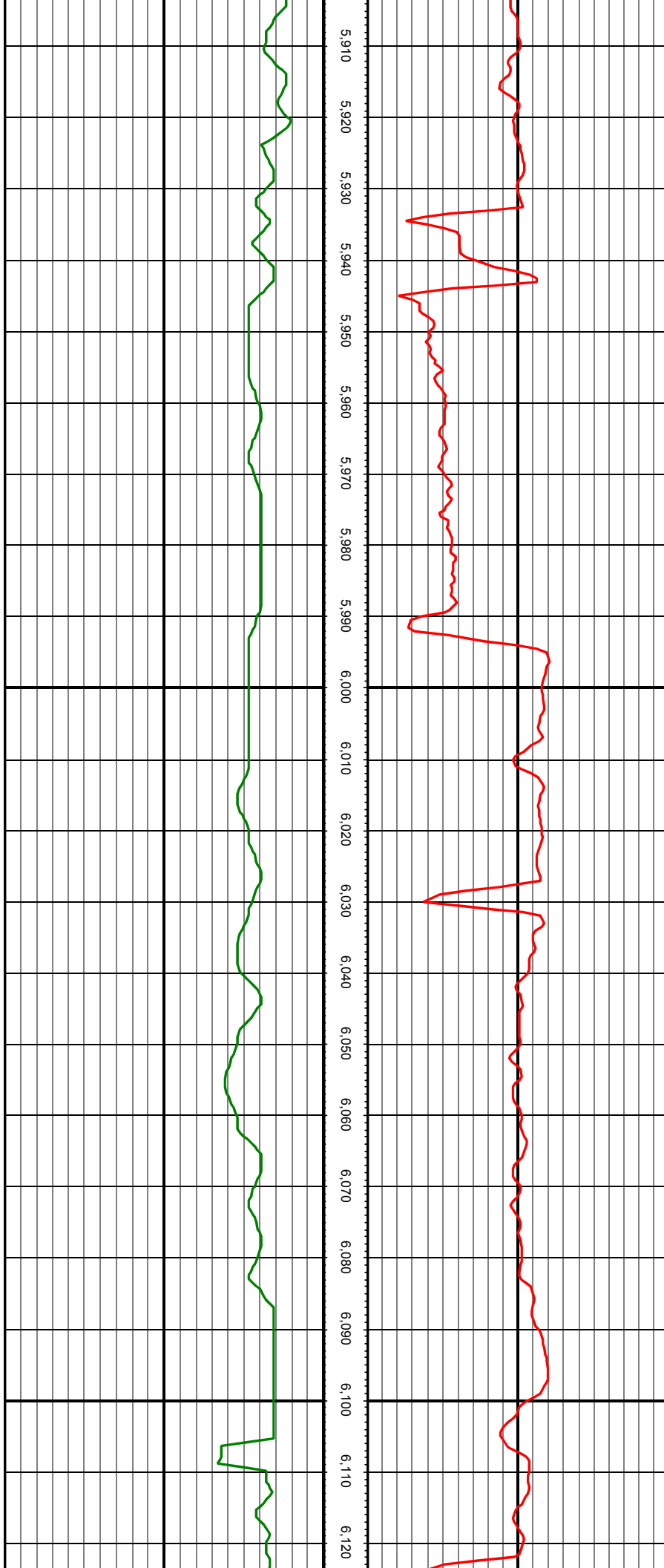
MD: 5573.00 INC: 8.53 AZ: 153.33 TVD: 5524.18 VS: -559.74

MD: 5669.00 INC: 6.24 AZ: 151.40 TVD: 5619.38 VS: -570.37



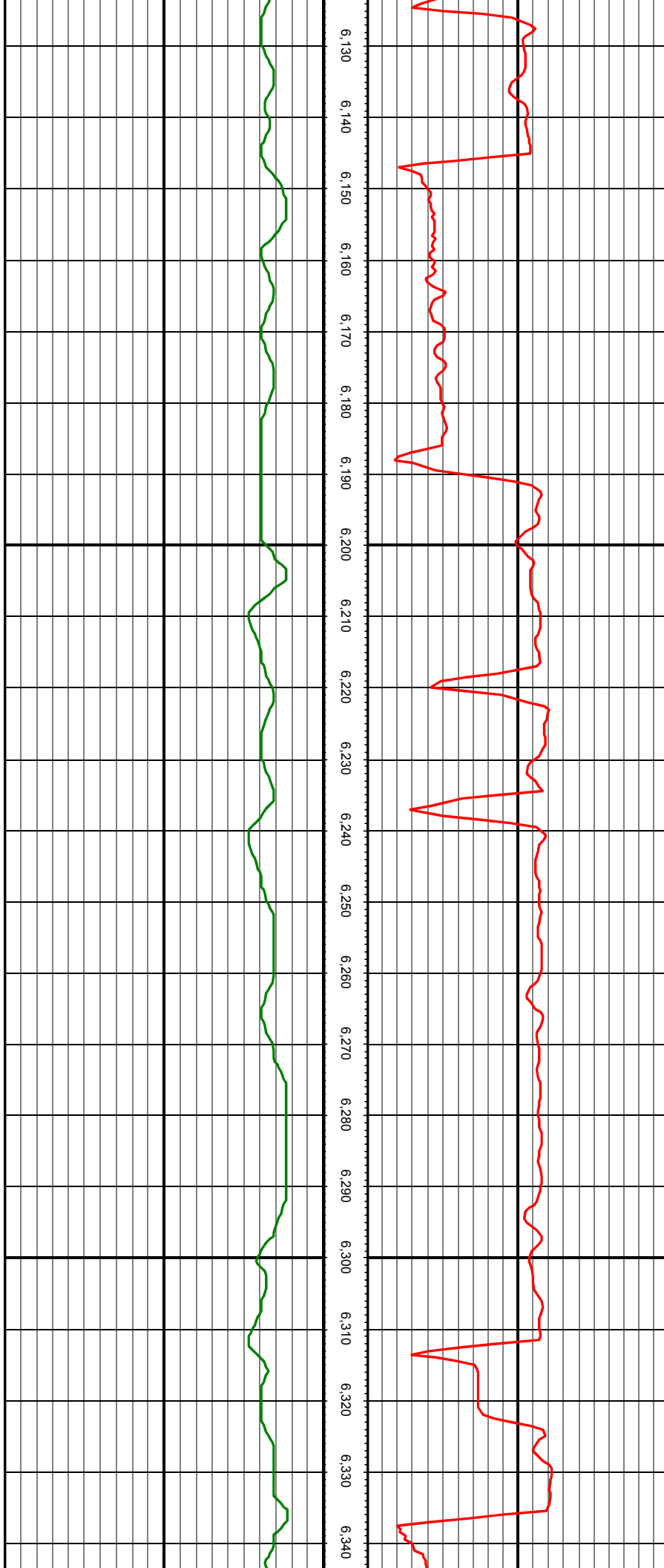
MD: 5787.00 INC: 8.75 AZ: 148.68 TVD: 5736.37 VS: -583.26

MD: 5882.00 INC: 6.59 AZ: 145.86 TVD: 5830.51 VS: -593.58



MD: 5976.00 INC: 7.74 AZ: 155.44 TVD: 5923.78 VS: -603.49

MD: 6071.00 INC: 7.16 AZ: 151.49 TVD: 6017.98 VS: -614.21



MD: 6166.00 INC: 8.13 AZ: 158.08 TVD: 6112.13 VS: -625.36

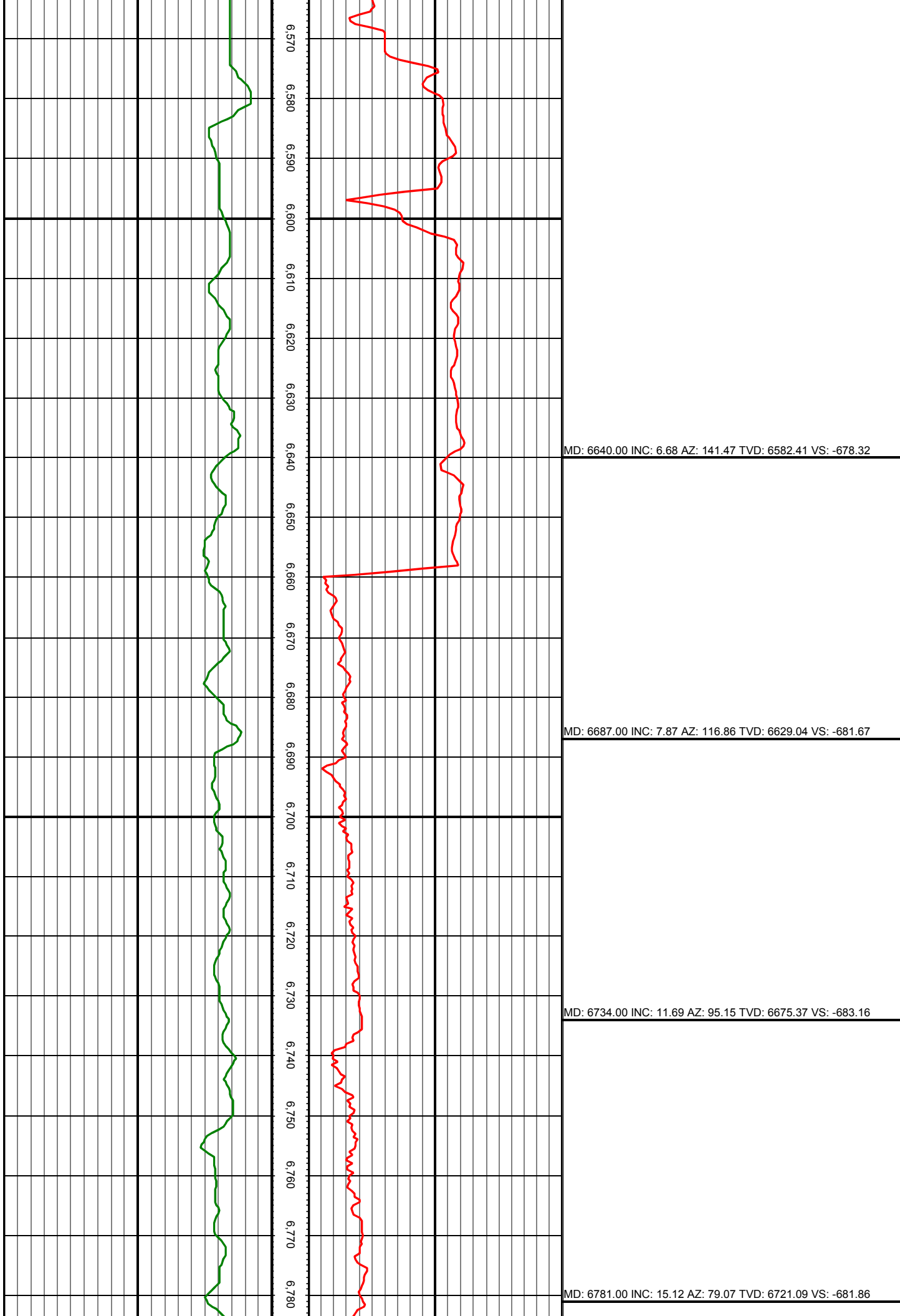
MD: 6261.00 INC: 7.74 AZ: 160.89 TVD: 6206.22 VS: -637.38

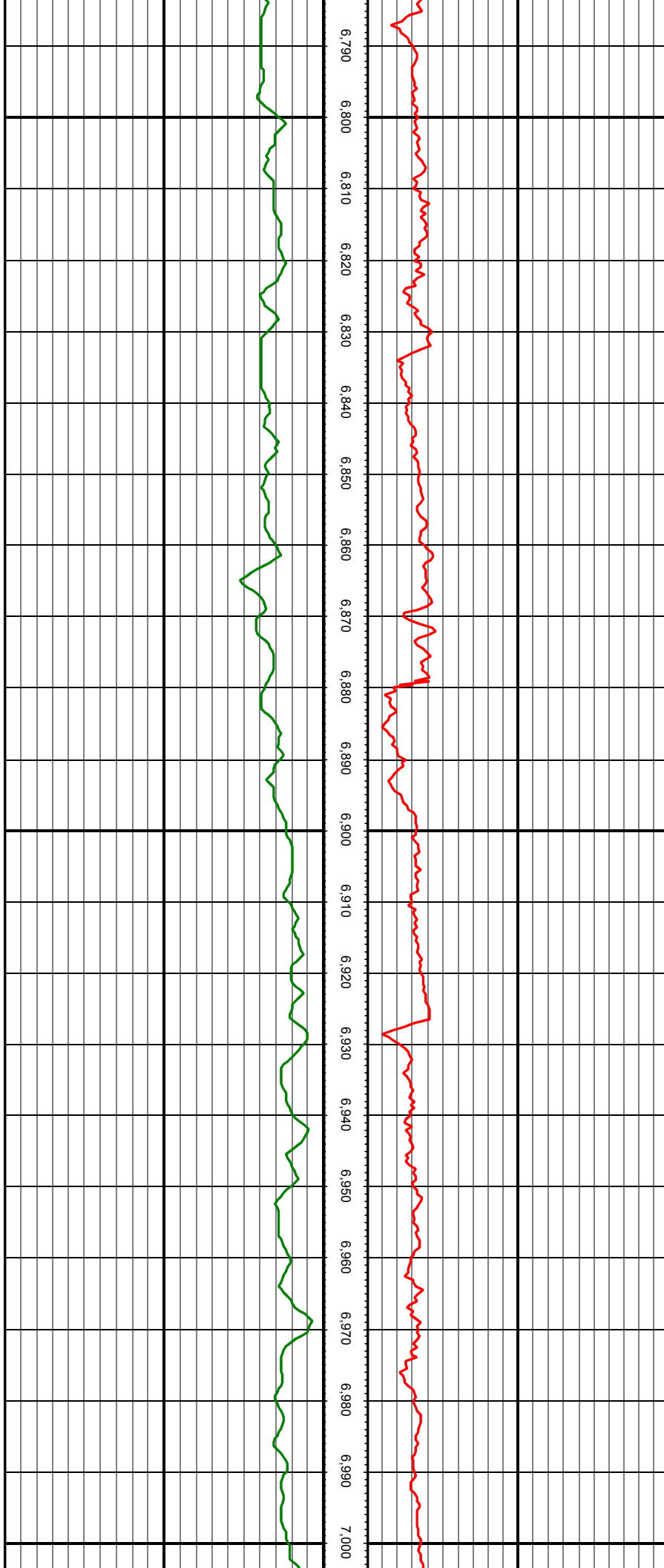


MD: 6355.00 INC: 6.86 AZ: 164.14 TVD: 6299.46 VS: -648.56

MD: 6450.00 INC: 6.81 AZ: 160.80 TVD: 6393.79 VS: -659.15

MD: 6544.00 INC: 7.08 AZ: 149.99 TVD: 6487.10 VS: -669.17



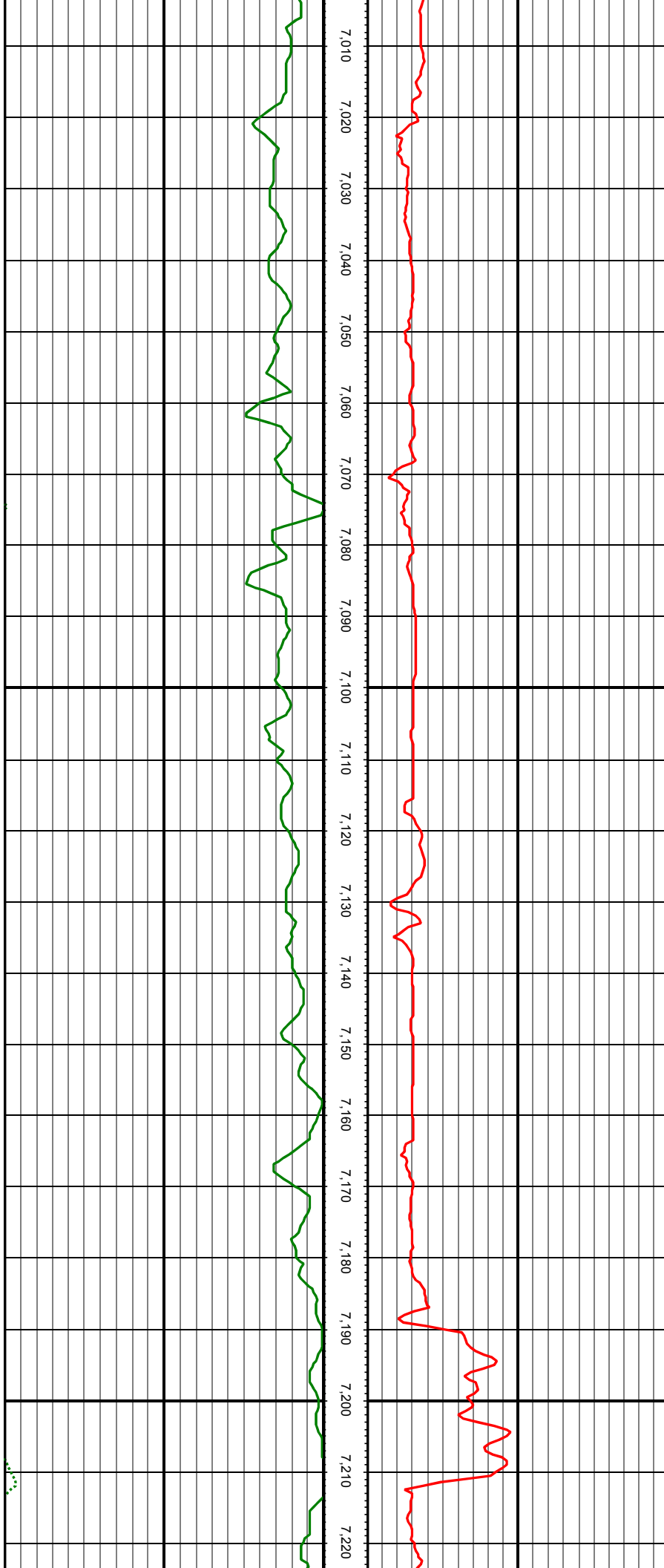


MD: 6829.00 INC: 17.41 AZ: 61.40 TVD: 6767.20 VS: -676.60

MD: 6876.00 INC: 17.80 AZ: 44.35 TVD: 6812.03 VS: -667.52

MD: 6923.00 INC: 21.01 AZ: 36.61 TVD: 6856.36 VS: -655.12

MD: 6970.00 INC: 25.32 AZ: 30.02 TVD: 6899.57 VS: -639.14



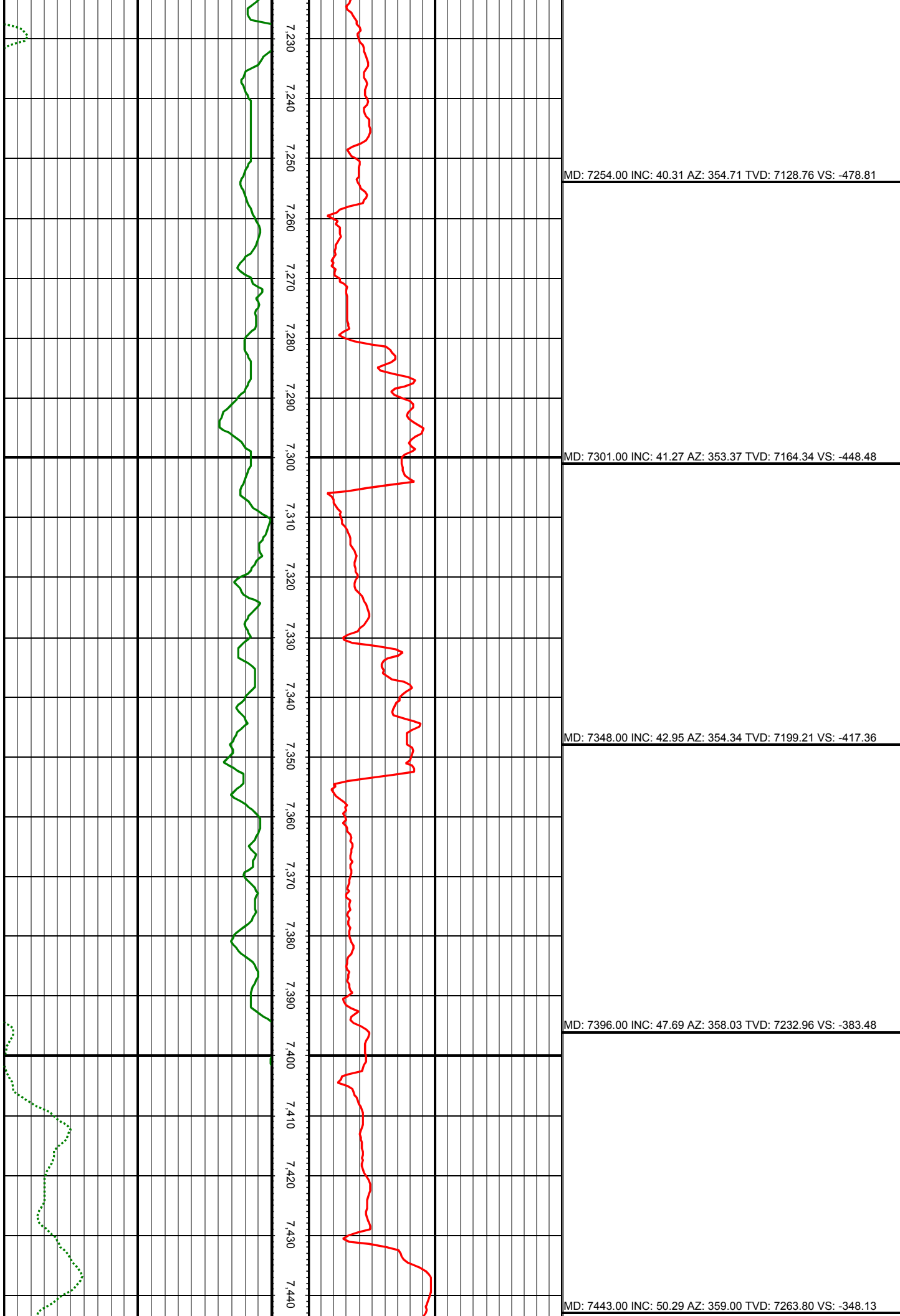
MD: 7018.00 INC: 29.67 AZ: 28.27 TVD: 6942.14 VS: -619.25

MD: 7065.00 INC: 33.98 AZ: 20.71 TVD: 6982.08 VS: -596.21

MD: 7113.00 INC: 37.89 AZ: 15.35 TVD: 7020.94 VS: -569.02

MD: 7160.00 INC: 40.26 AZ: 10.25 TVD: 7057.44 VS: -539.84

MD: 7207.00 INC: 41.10 AZ: 4.62 TVD: 7093.09 VS: -509.33



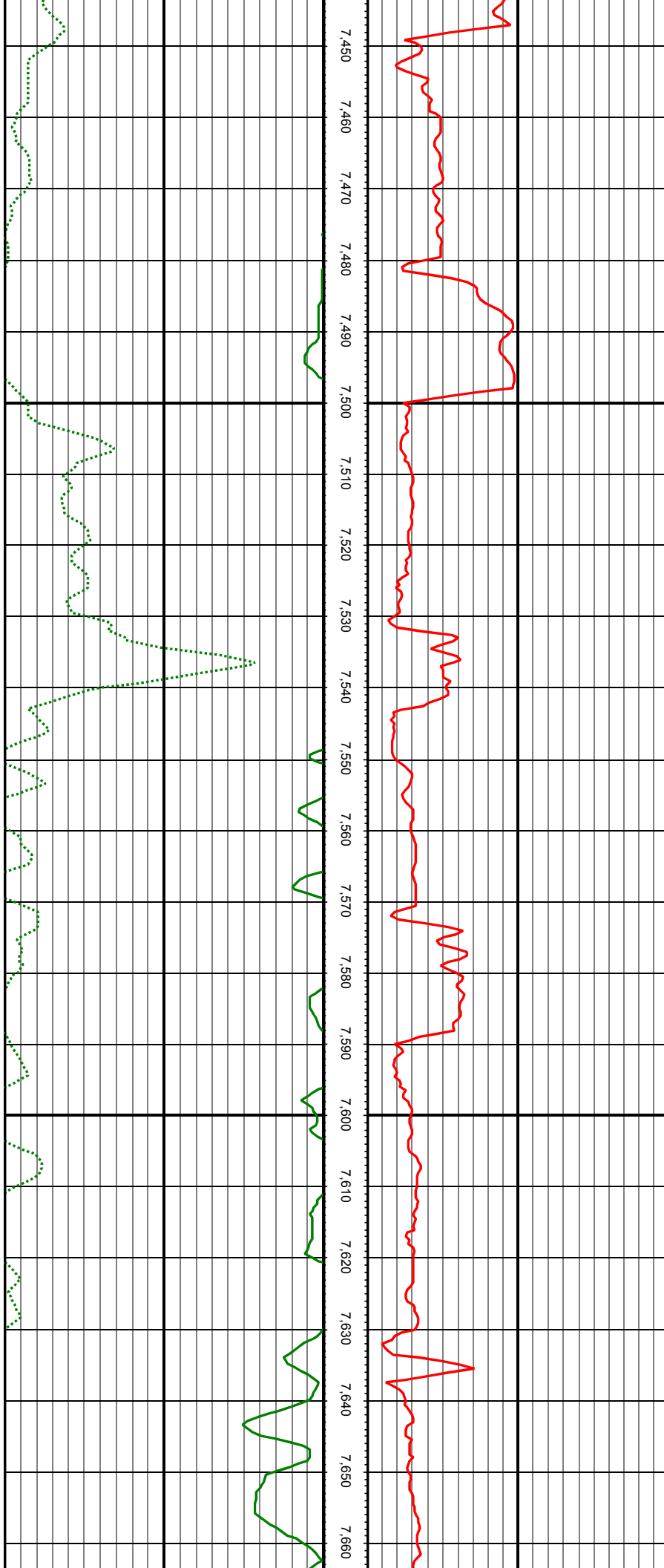
MD: 7254.00 INC: 40.31 AZ: 354.71 TVD: 7128.76 VS: -478.81

MD: 7301.00 INC: 41.27 AZ: 353.37 TVD: 7164.34 VS: -448.48

MD: 7348.00 INC: 42.95 AZ: 354.34 TVD: 7199.21 VS: -417.36

MD: 7396.00 INC: 47.69 AZ: 358.03 TVD: 7232.96 VS: -383.48

MD: 7443.00 INC: 50.29 AZ: 359.00 TVD: 7263.80 VS: -348.13

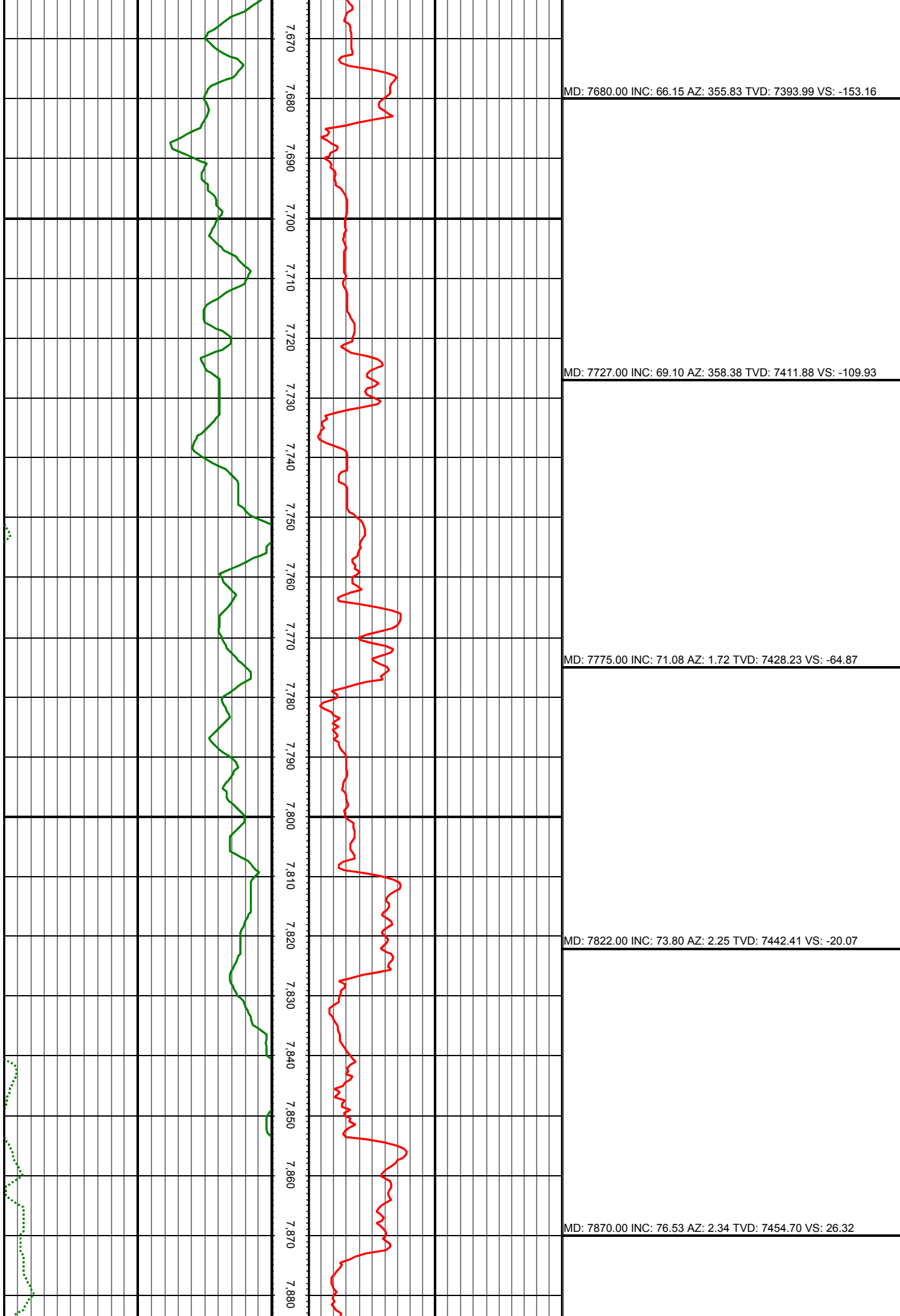


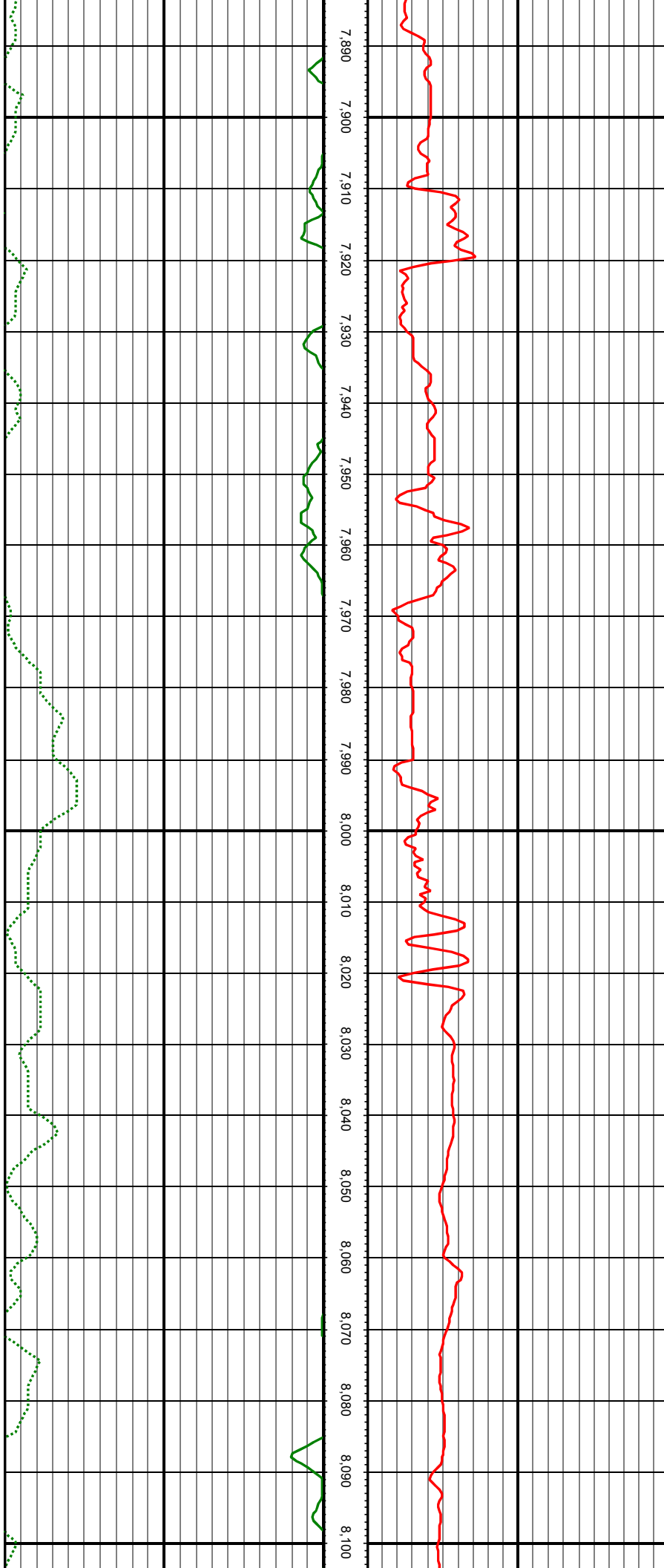
MD: 7491.00 INC: 50.55 AZ: 355.31 TVD: 7294.39 VS: -311.33

MD: 7538.00 INC: 54.51 AZ: 354.16 TVD: 7322.97 VS: -274.42

MD: 7586.00 INC: 57.67 AZ: 352.93 TVD: 7349.75 VS: -235.13

MD: 7633.00 INC: 61.89 AZ: 354.95 TVD: 7373.40 VS: -195.03

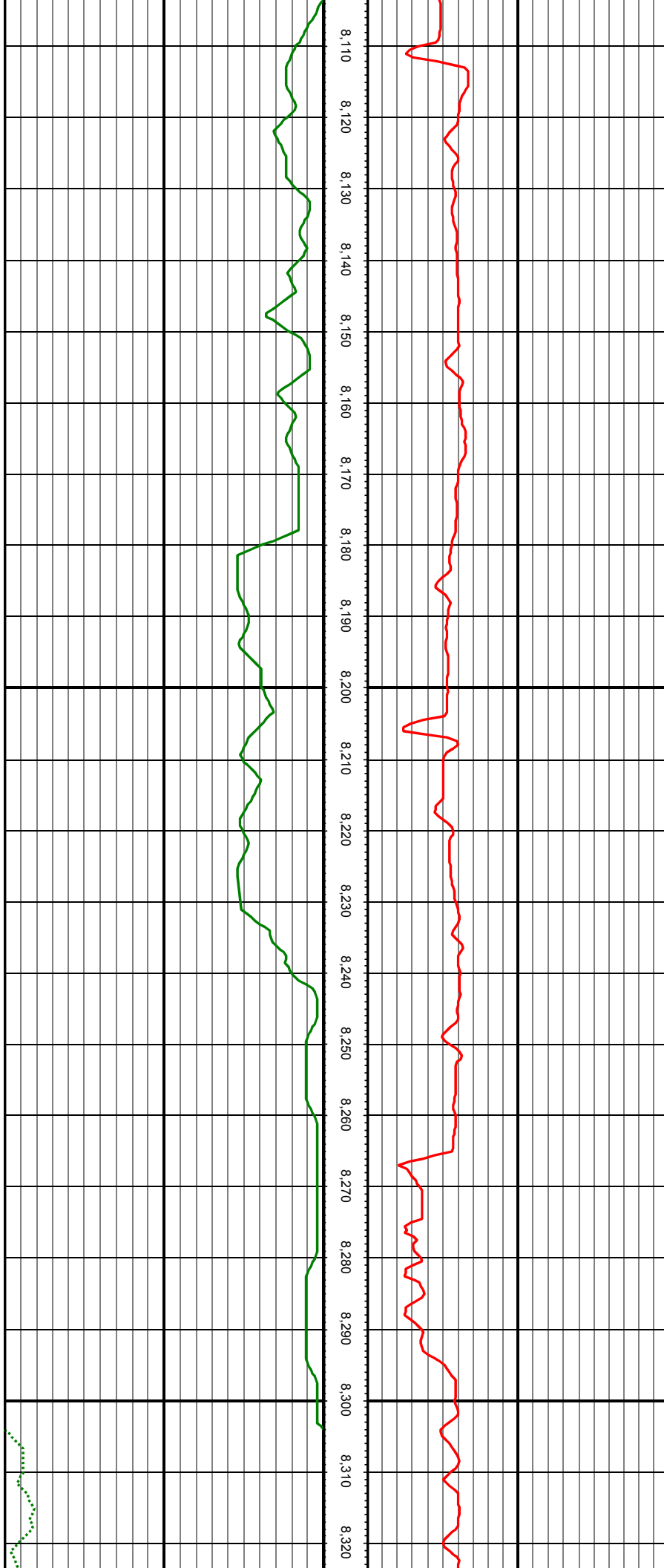




MD: 7917.00 INC: 80.79 AZ: 359.61 TVD: 7463.94 VS: 72.36

MD: 7964.00 INC: 85.93 AZ: 359.53 TVD: 7469.37 VS: 118.95

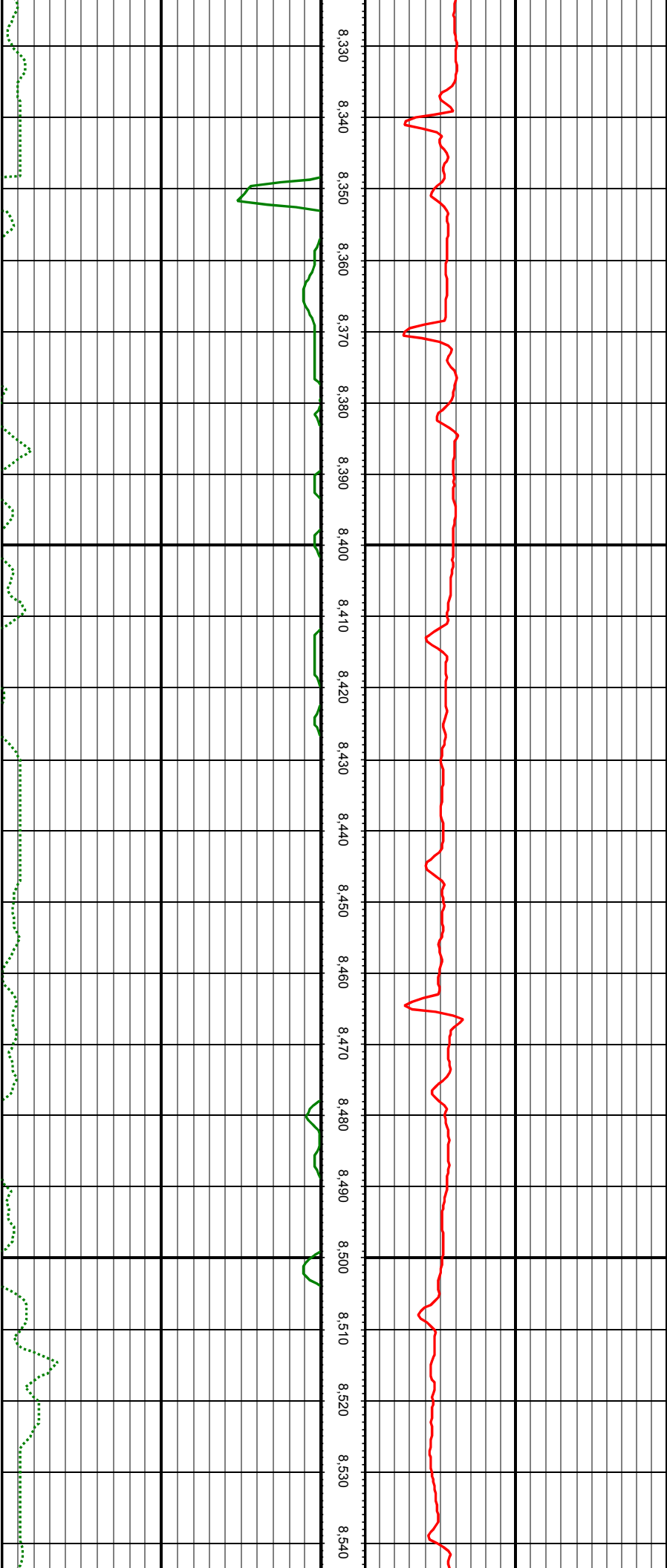
MD: 8059.00 INC: 88.92 AZ: 0.14 TVD: 7473.64 VS: 213.70



MD: 8154.00 INC: 89.10 AZ: 359.53 TVD: 7475.28 VS: 308.54

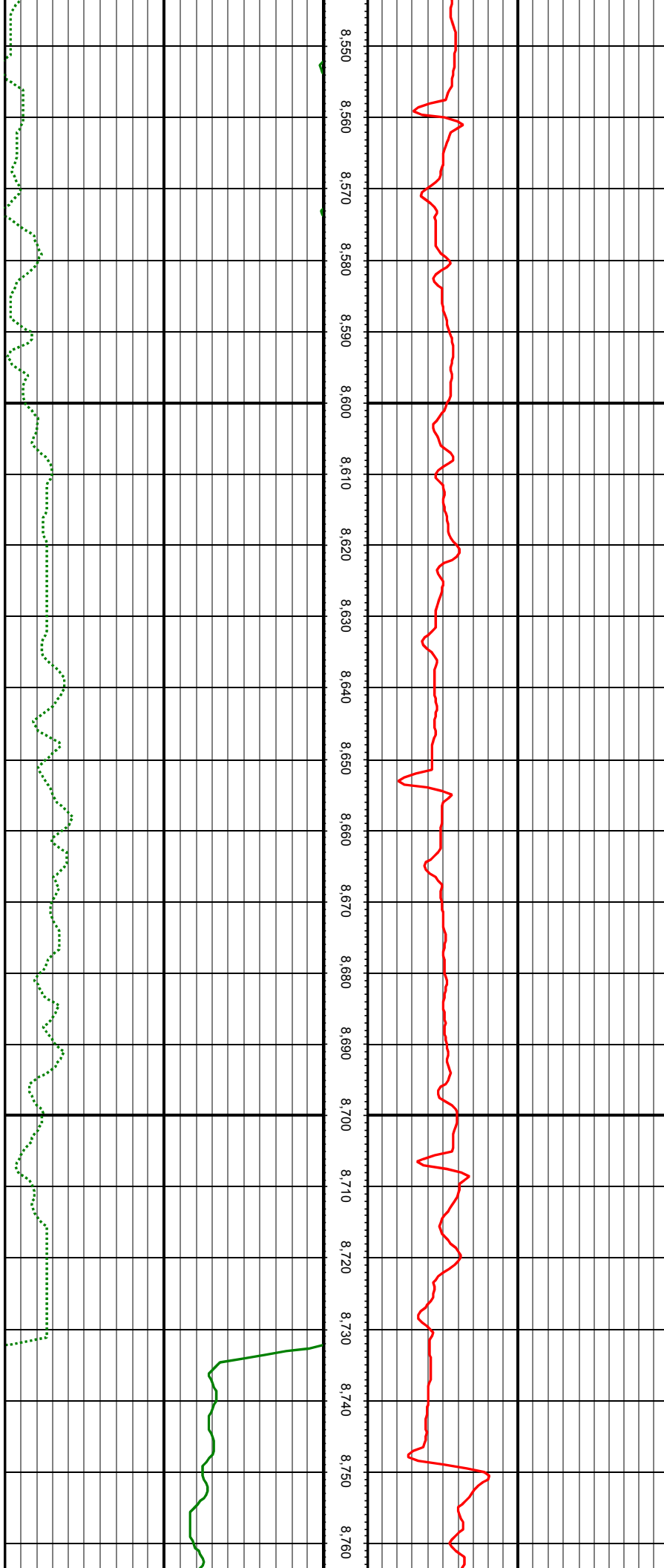
MD: 8234.00 INC: 91.91 AZ: 359.88 TVD: 7474.57 VS: 388.40

MD: 8328.00 INC: 91.08 AZ: 0.84 TVD: 7472.12 VS: 482.27



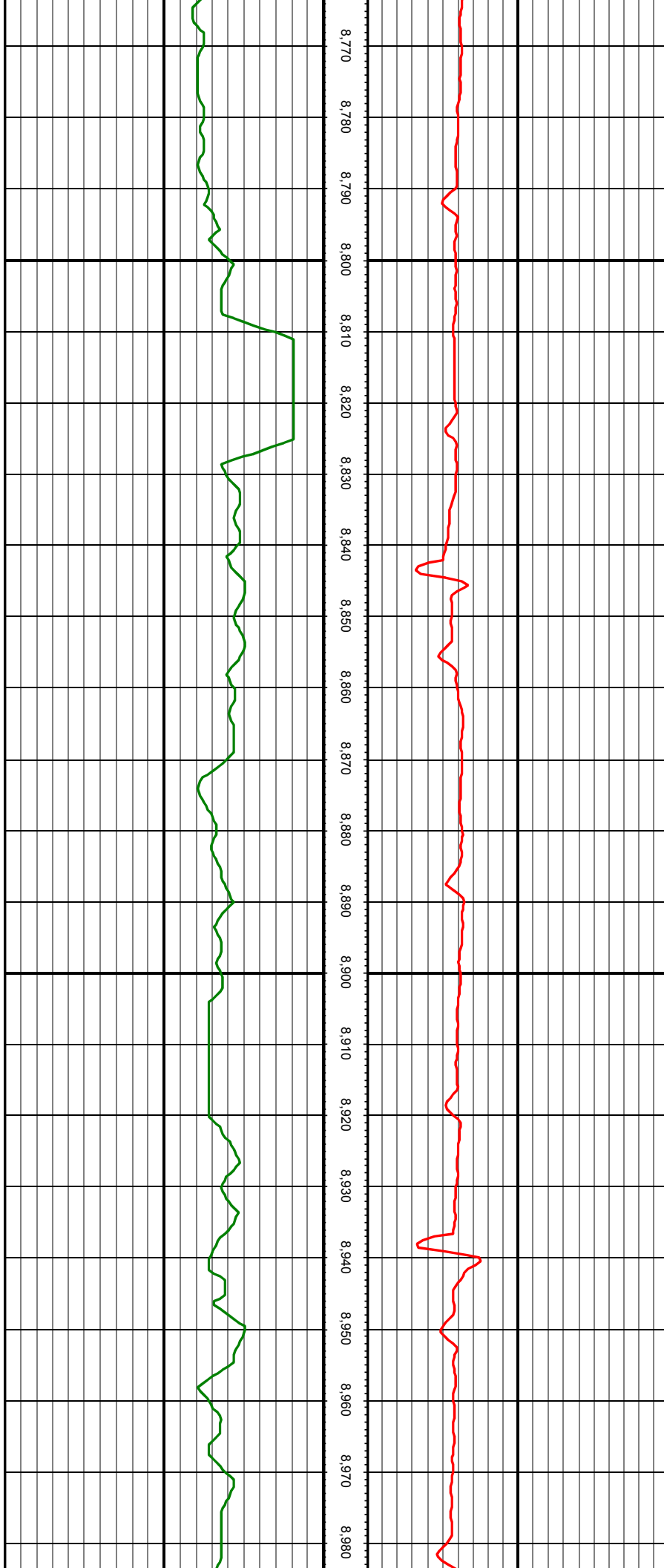
MD: 8422.00 INC: 90.33 AZ: 3.13 TVD: 7470.96 VS: 576.25

MD: 8516.00 INC: 90.15 AZ: 4.18 TVD: 7470.57 VS: 670.24



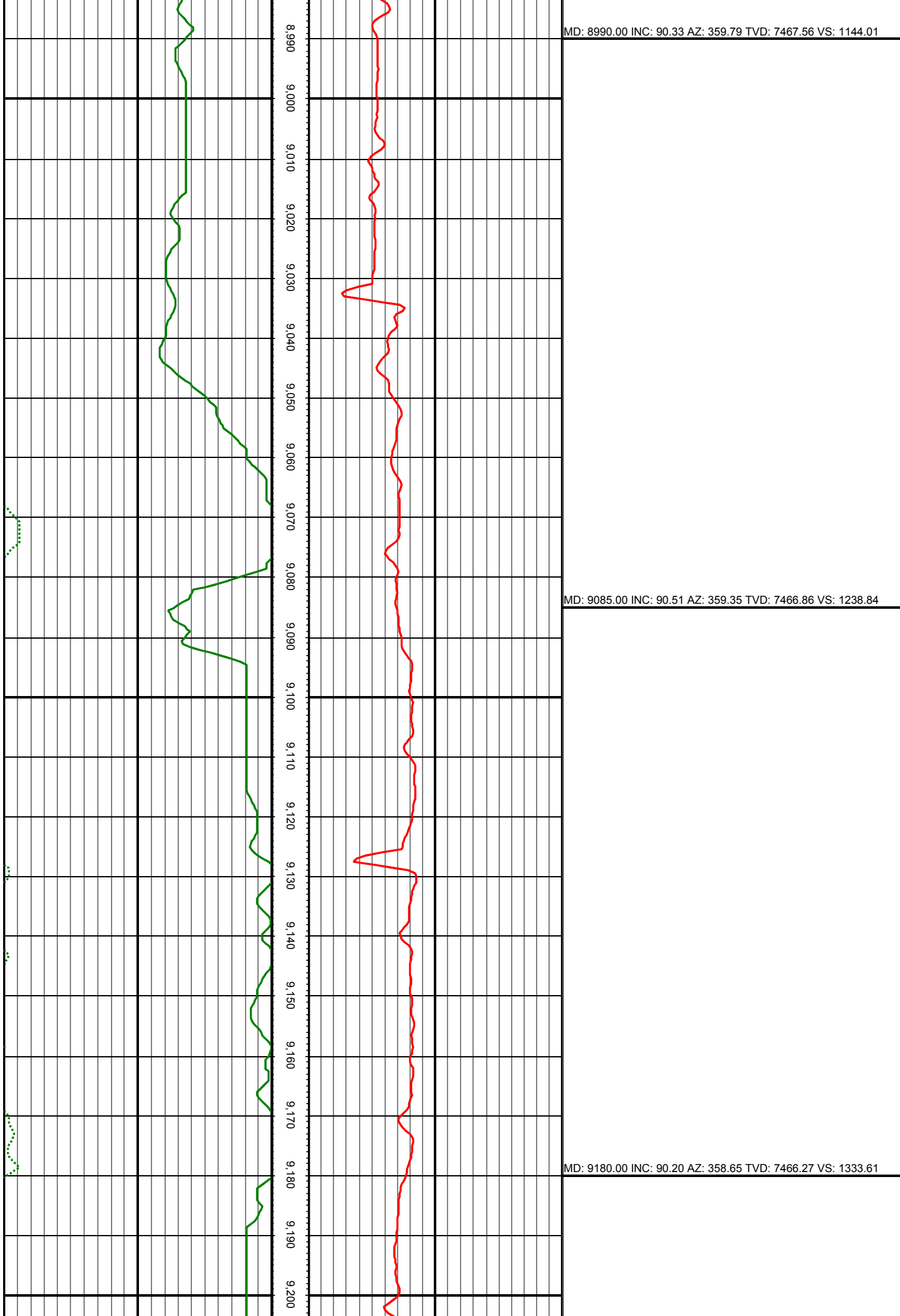
MD: 8611.00 INC: 90.37 AZ: 5.68 TVD: 7470.14 VS: 765.18

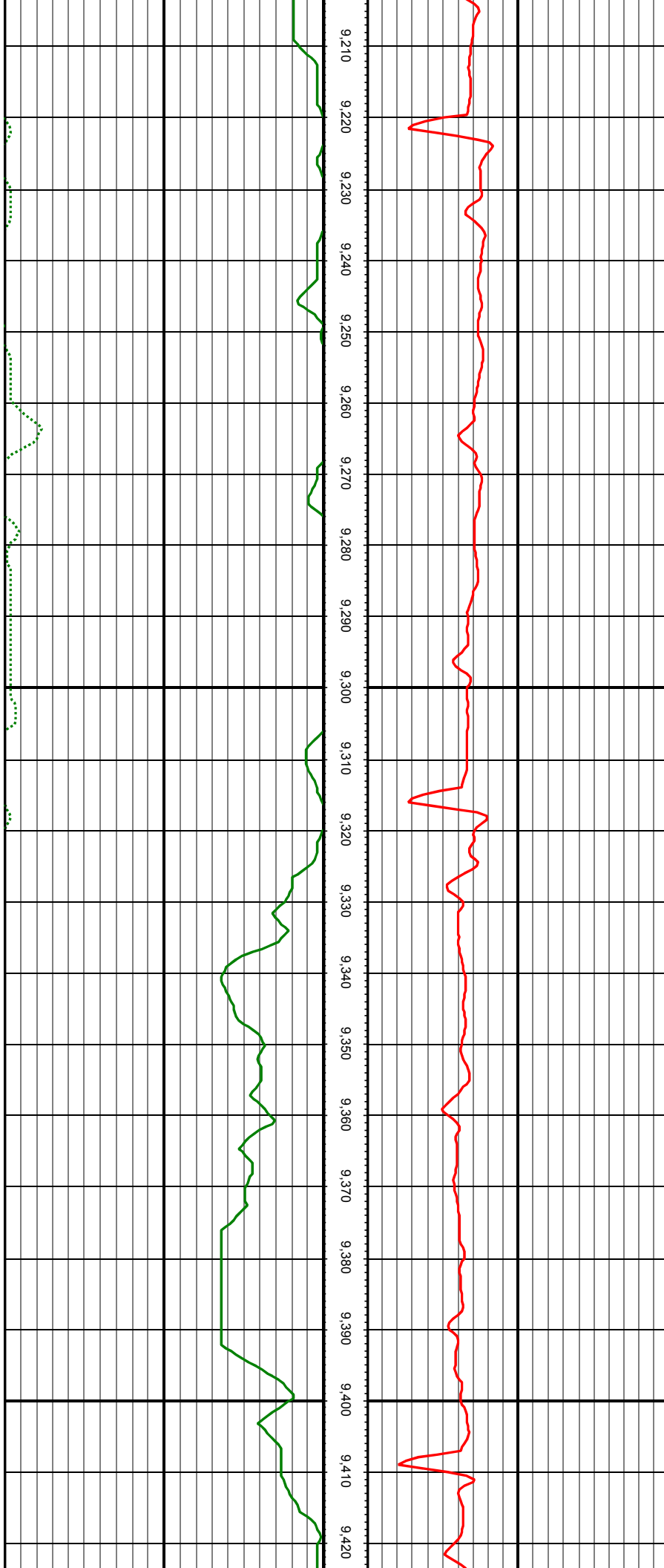
MD: 8706.00 INC: 90.29 AZ: 3.66 TVD: 7469.59 VS: 860.13



MD: 8800.00 INC: 90.37 AZ: 2.25 TVD: 7469.05 VS: 954.12

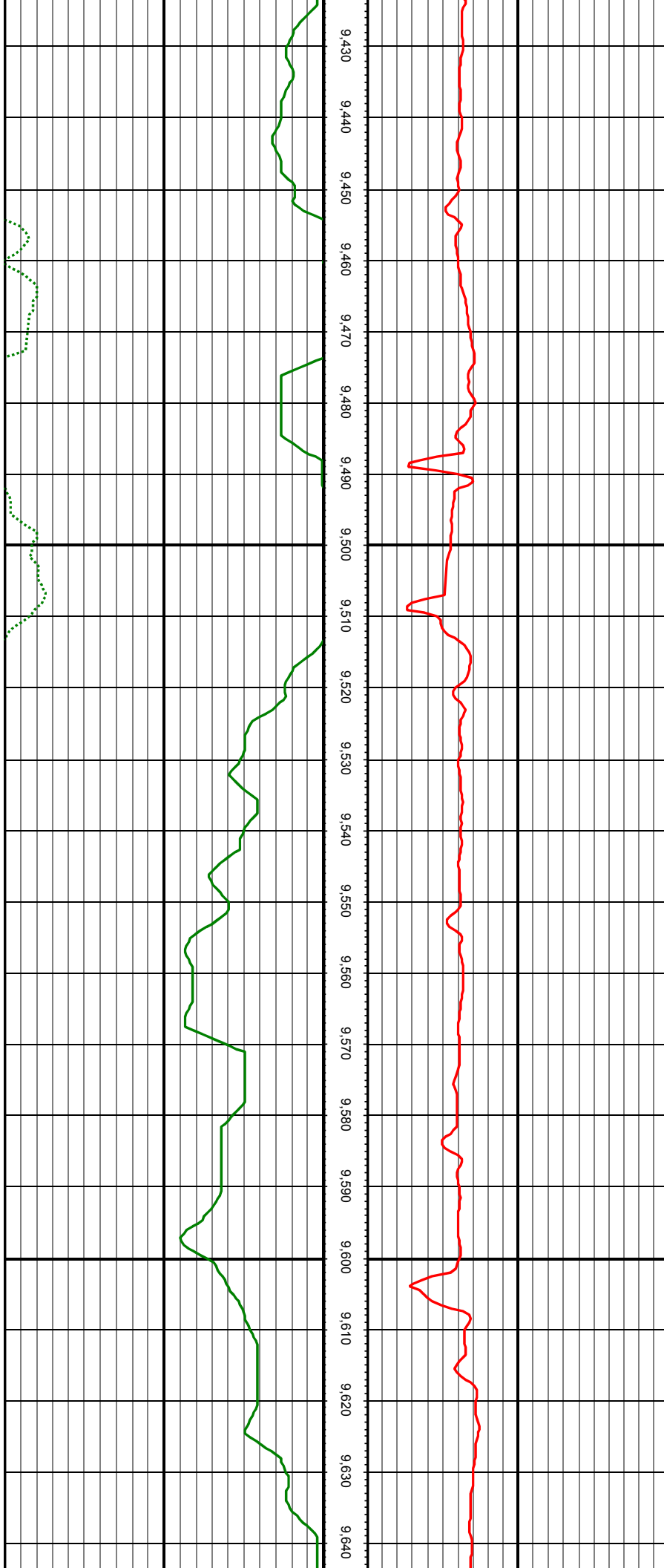
MD: 8896.00 INC: 90.55 AZ: 1.20 TVD: 7468.28 VS: 1050.10





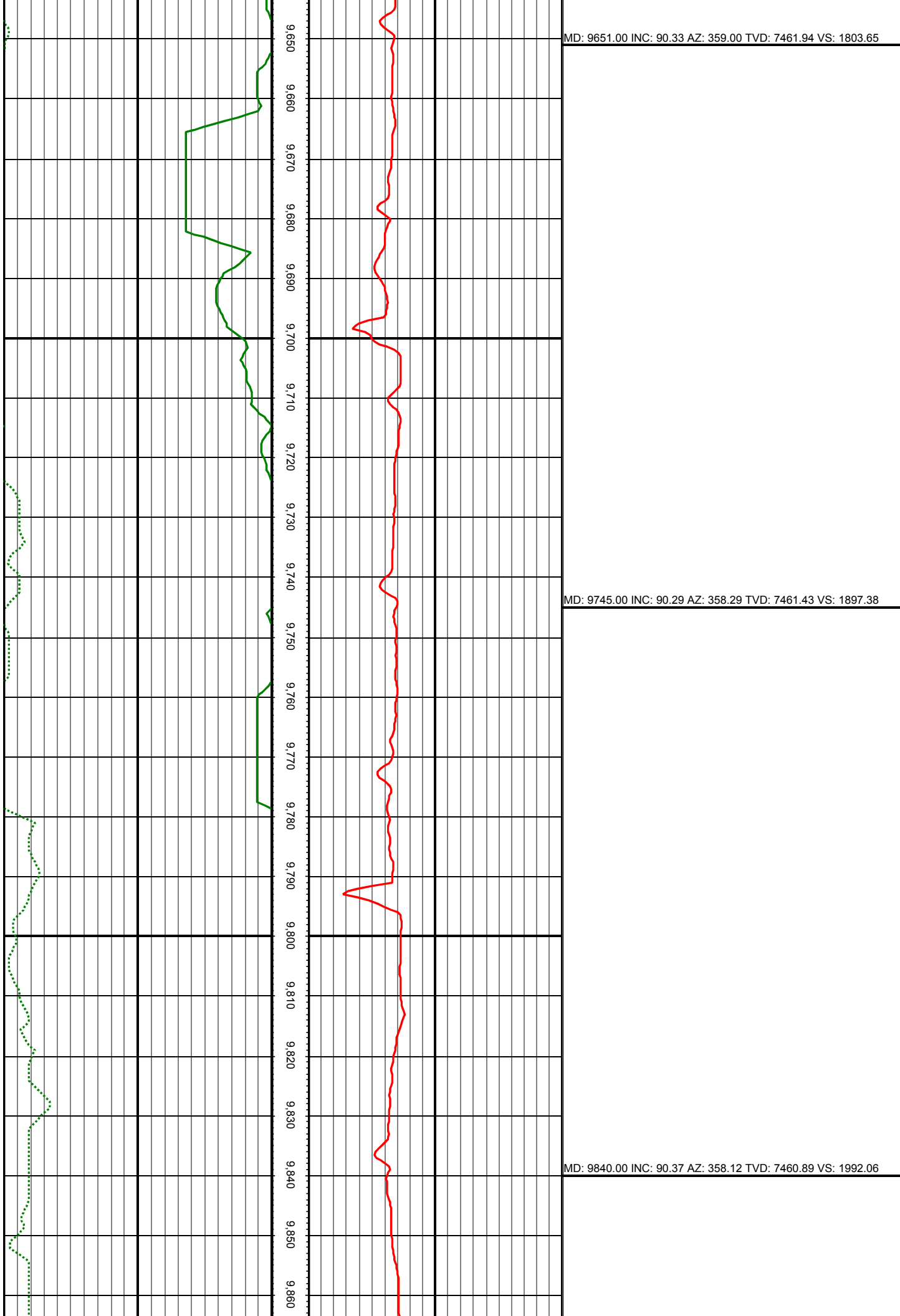
MD: 9274.00 INC: 90.37 AZ: 359.09 TVD: 7465.81 VS: 1427.37

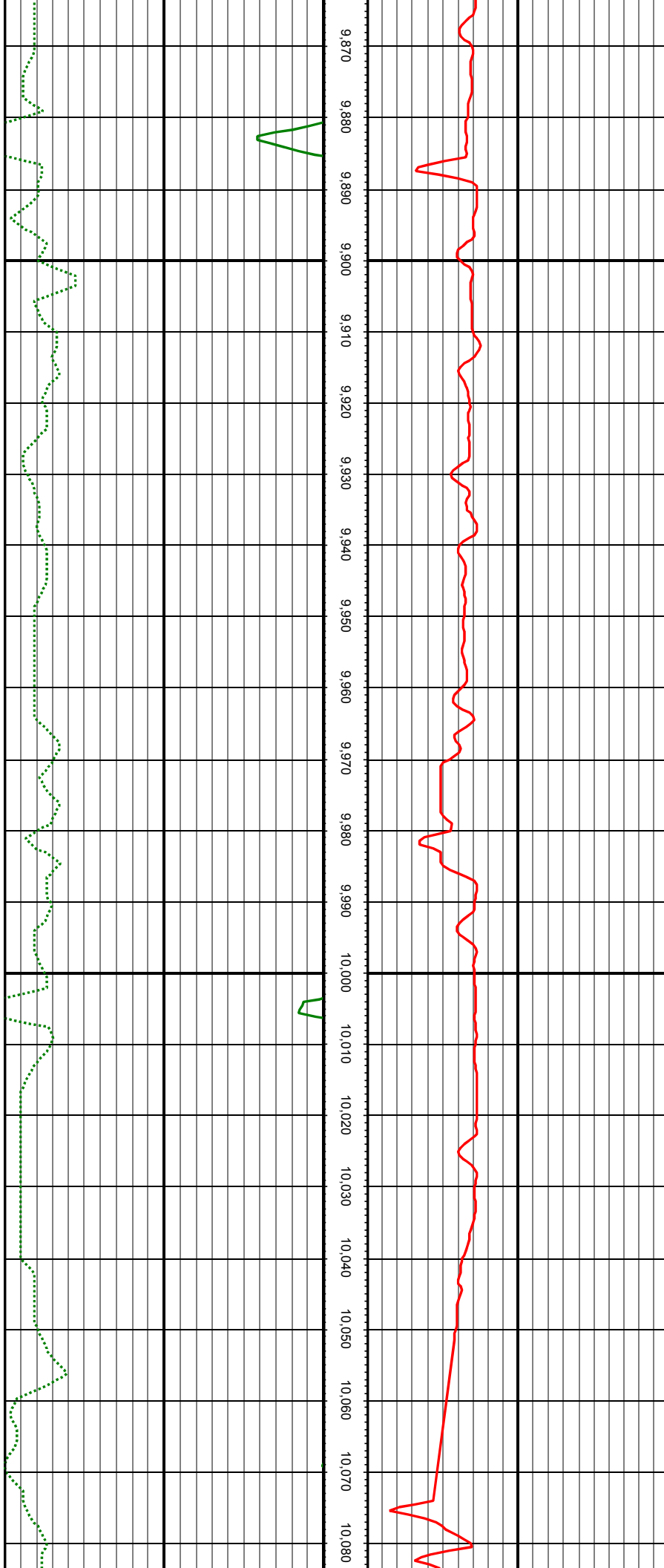
MD: 9368.00 INC: 90.77 AZ: 359.70 TVD: 7464.87 VS: 1521.18



MD: 9462.00 INC: 90.64 AZ: 359.70 TVD: 7463.71 VS: 1615.02

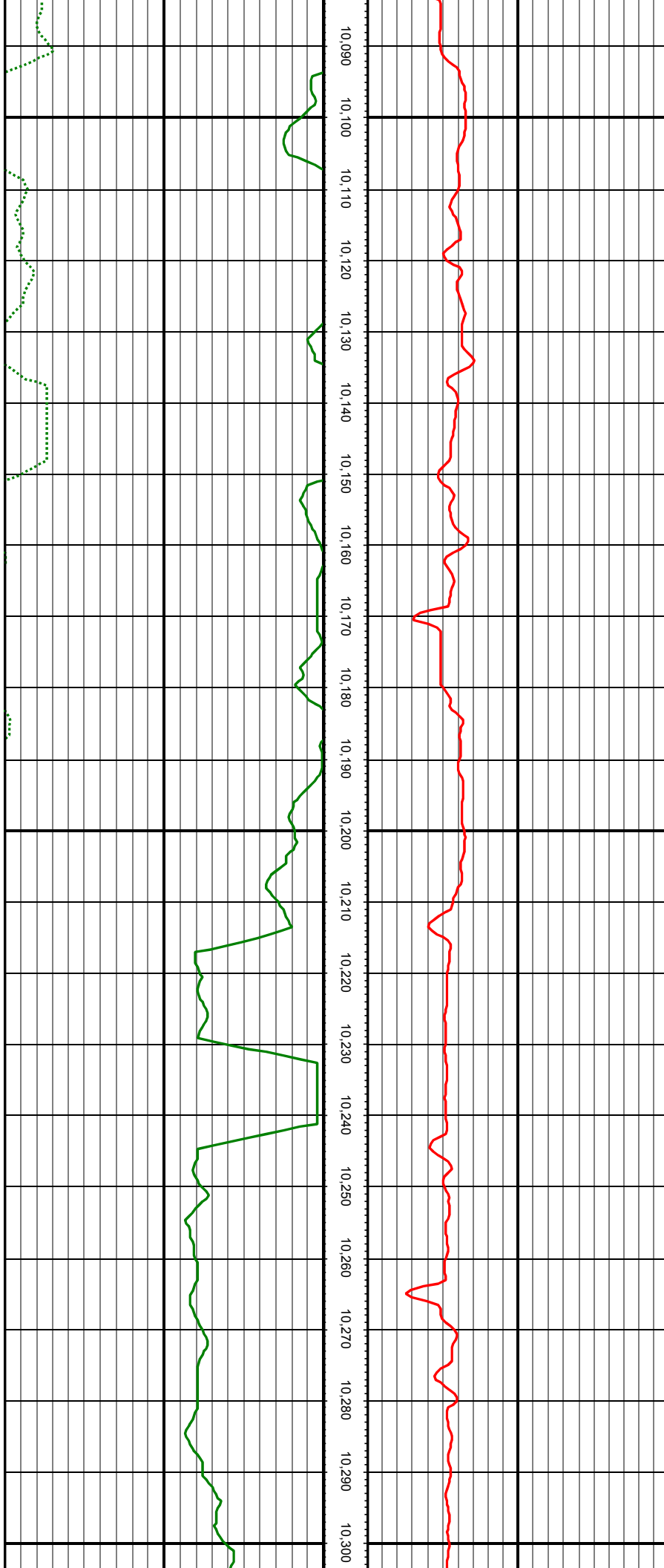
MD: 9556.00 INC: 90.59 AZ: 359.53 TVD: 7462.70 VS: 1708.85





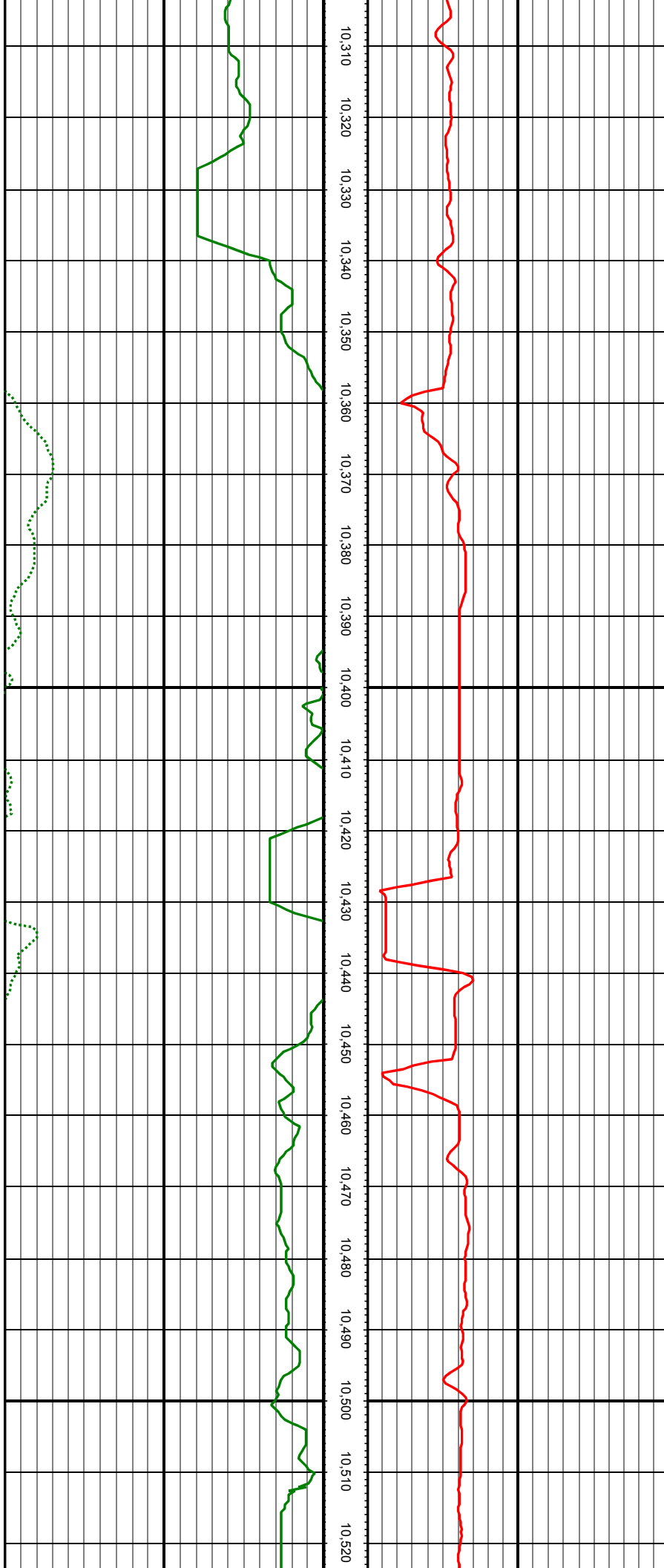
MD: 9934.00 INC: 90.11 AZ: 357.77 TVD: 7460.49 VS: 2085.69

MD: 10029.00 INC: 89.63 AZ: 358.03 TVD: 7460.71 VS: 2180.32



MD: 10123.00 INC: 89.19 AZ: 359.35 TVD: 7461.68 VS: 2274.06

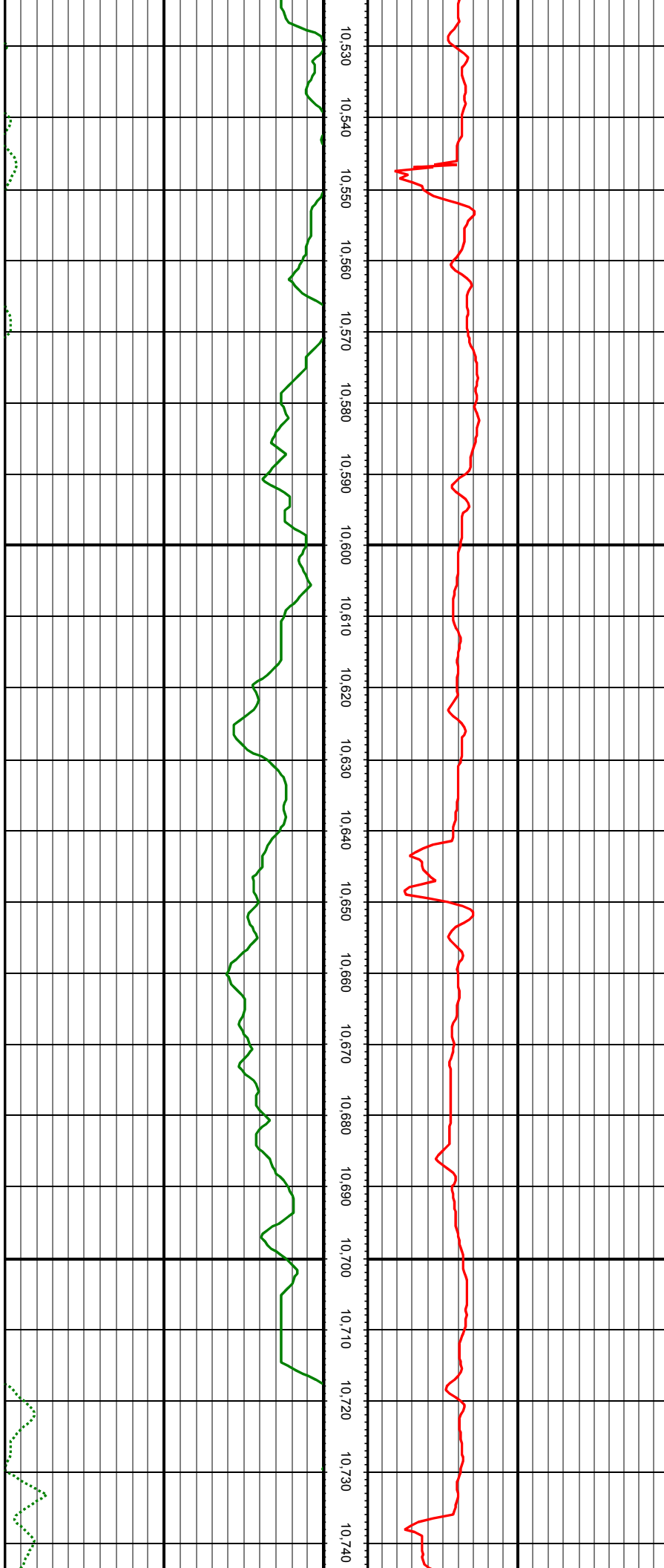
MD: 10218.00 INC: 89.19 AZ: 358.29 TVD: 7463.02 VS: 2368.80



MD: 10312.00 INC: 89.27 AZ: 358.82 TVD: 7464.28 VS: 2462.51

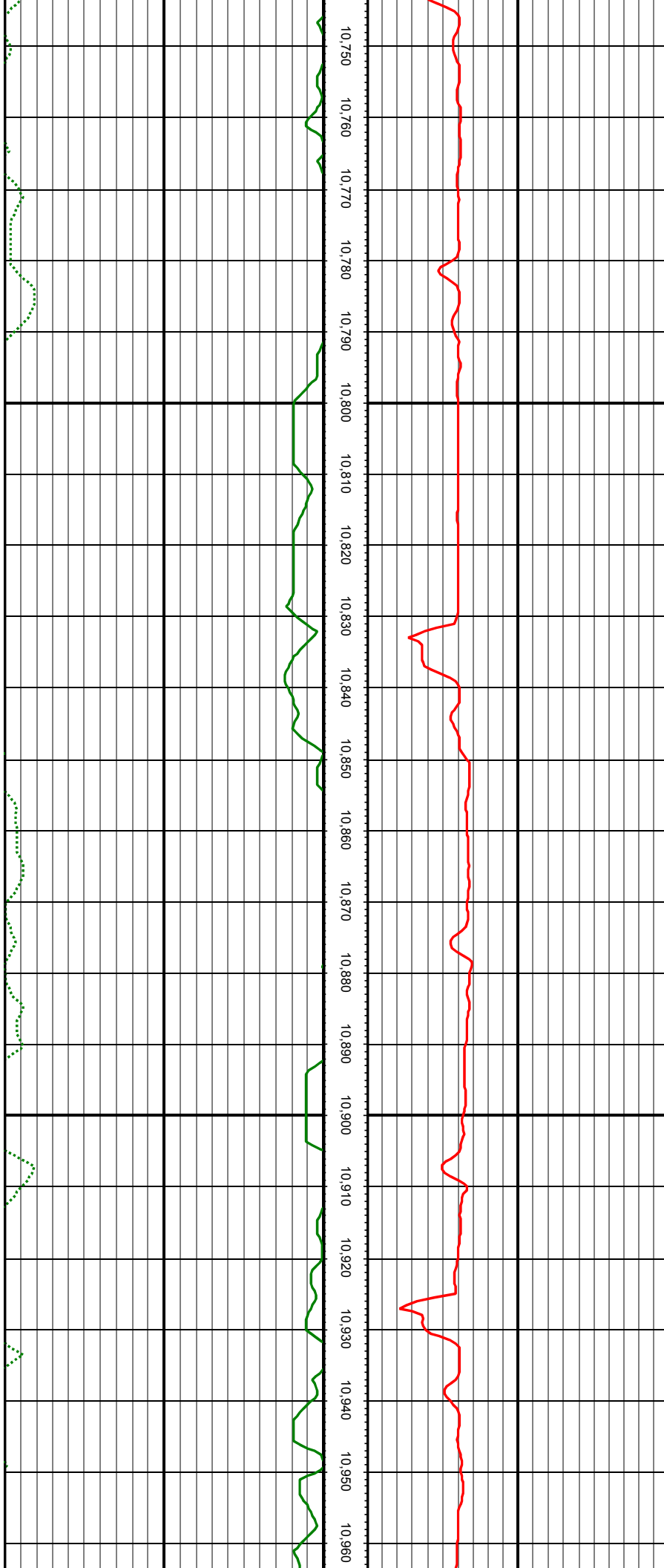
MD: 10407.00 INC: 89.45 AZ: 358.56 TVD: 7465.34 VS: 2557.24

MD: 10501.00 INC: 90.59 AZ: 358.91 TVD: 7465.31 VS: 2650.98



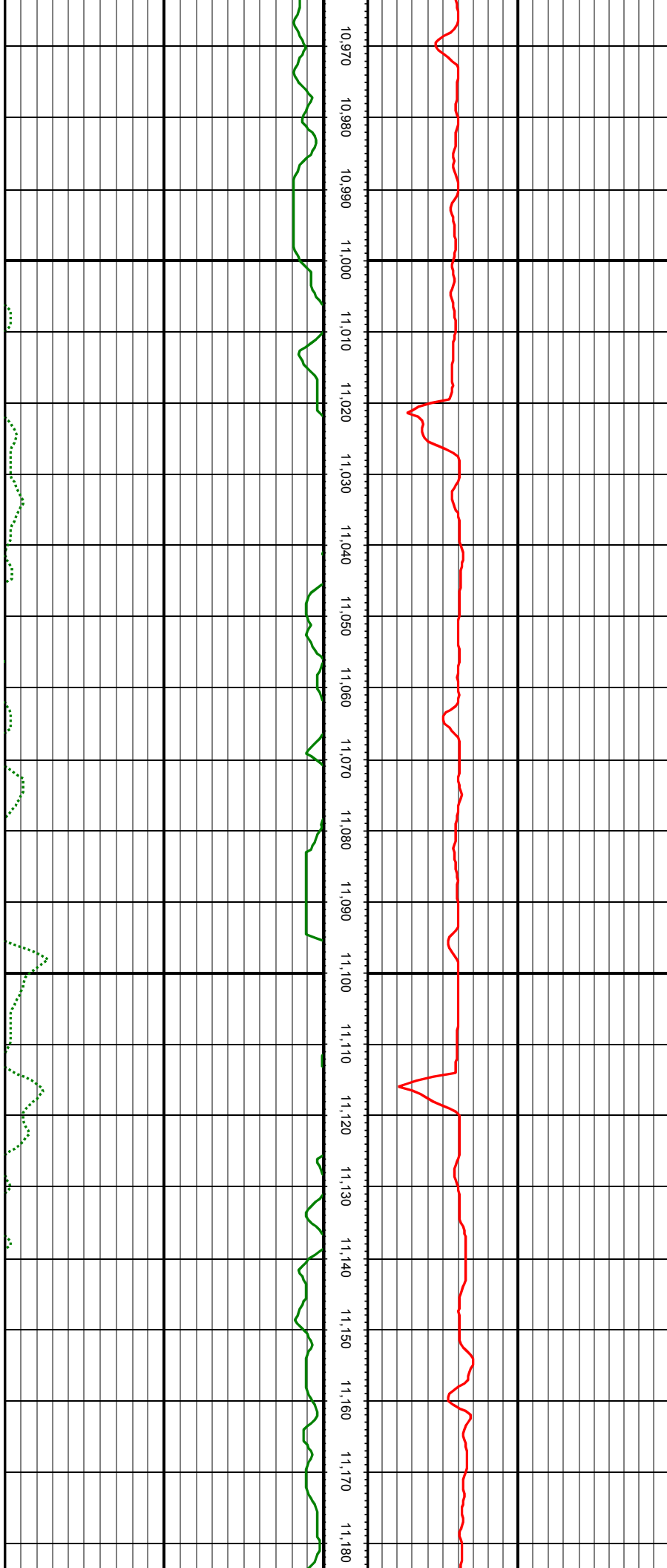
MD: 10596.00 INC: 90.46 AZ: 359.61 TVD: 7464.44 VS: 2745.78

MD: 10691.00 INC: 90.55 AZ: 0.58 TVD: 7463.60 VS: 2840.66



MD: 10785.00 INC: 90.33 AZ: 1.55 TVD: 7462.88 VS: 2934.60

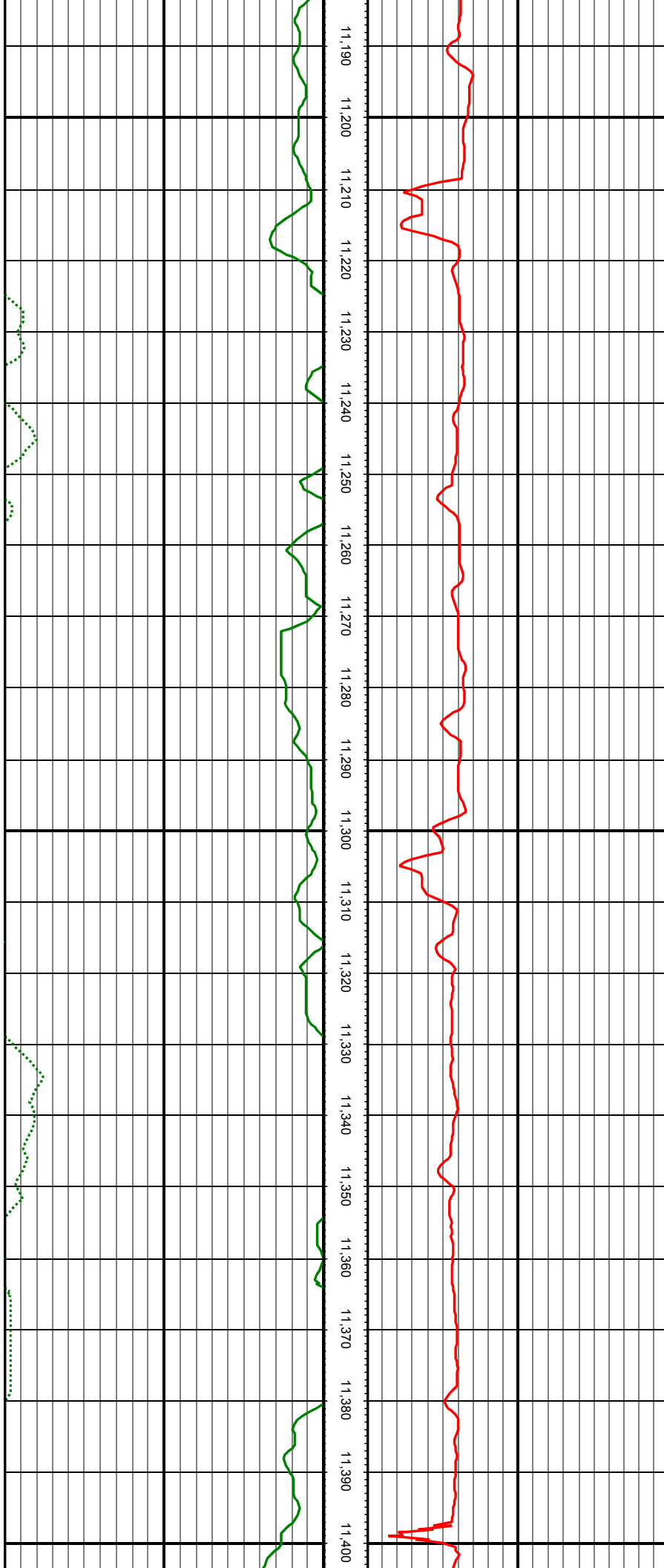
MD: 10880.00 INC: 90.59 AZ: 359.79 TVD: 7462.12 VS: 3029.52



MD: 10974.00 INC: 90.07 AZ: 359.26 TVD: 7461.58 VS: 3123.35

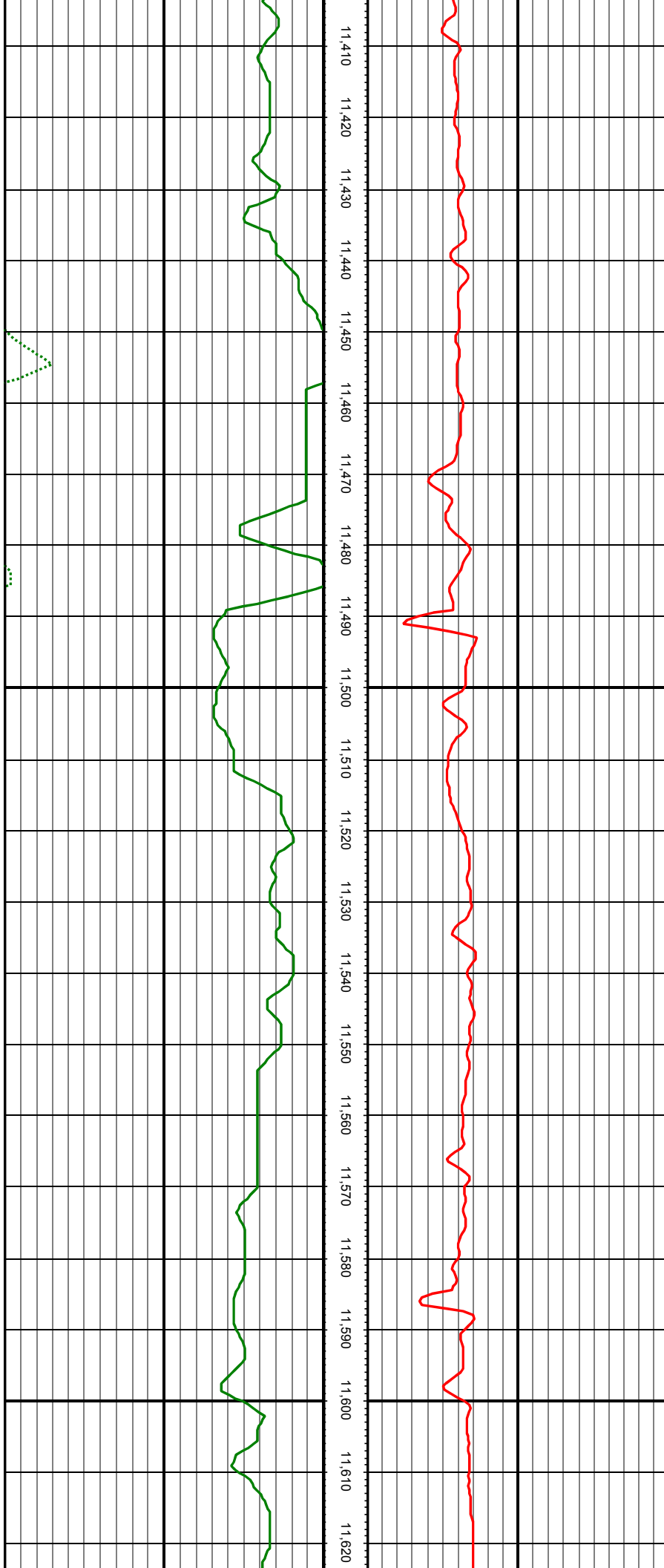
MD: 11069.00 INC: 89.32 AZ: 0.40 TVD: 7462.08 VS: 3218.20

MD: 11163.00 INC: 89.32 AZ: 1.55 TVD: 7463.20 VS: 3312.14



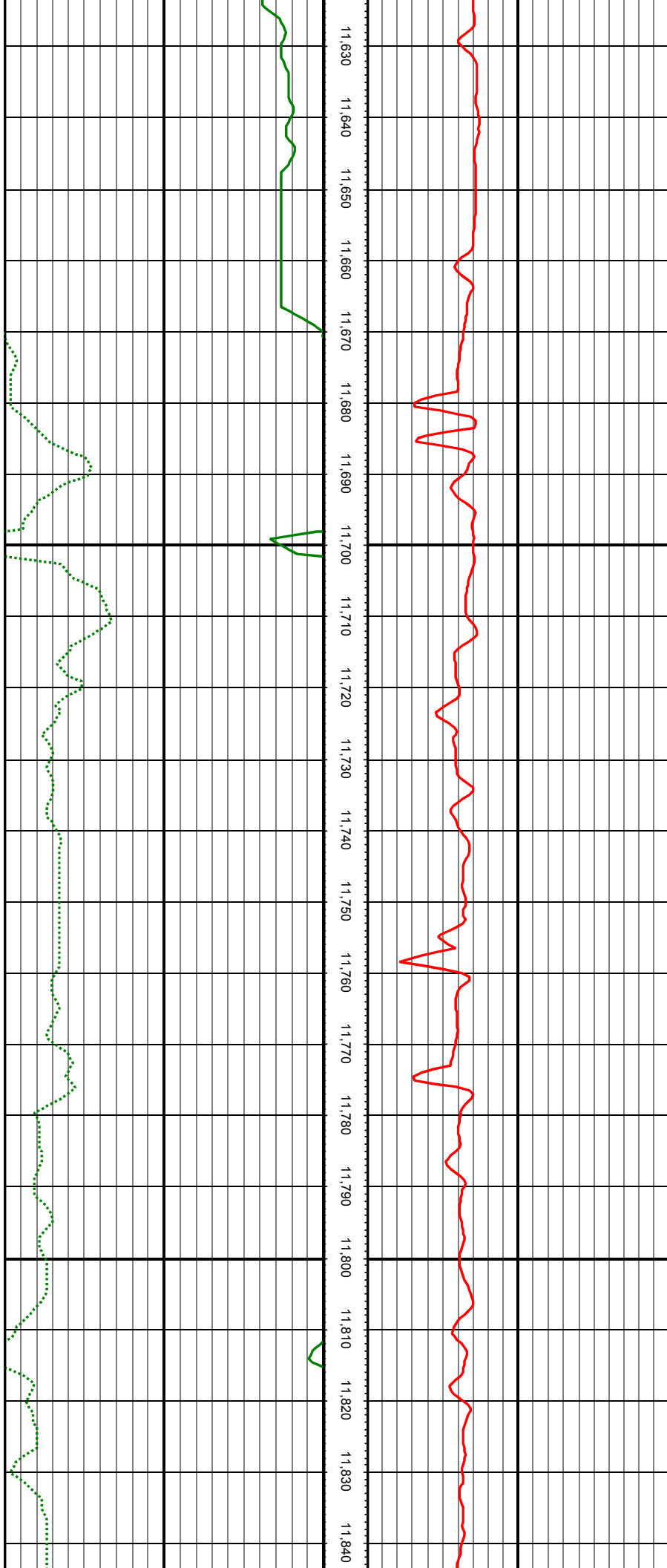
MD: 11258.00 INC: 89.27 AZ: 2.43 TVD: 7464.37 VS: 3407.12

MD: 11352.00 INC: 89.89 AZ: 0.84 TVD: 7465.06 VS: 3501.09



MD: 11447.00 INC: 90.51 AZ: 0.76 TVD: 7464.72 VS: 3596.02

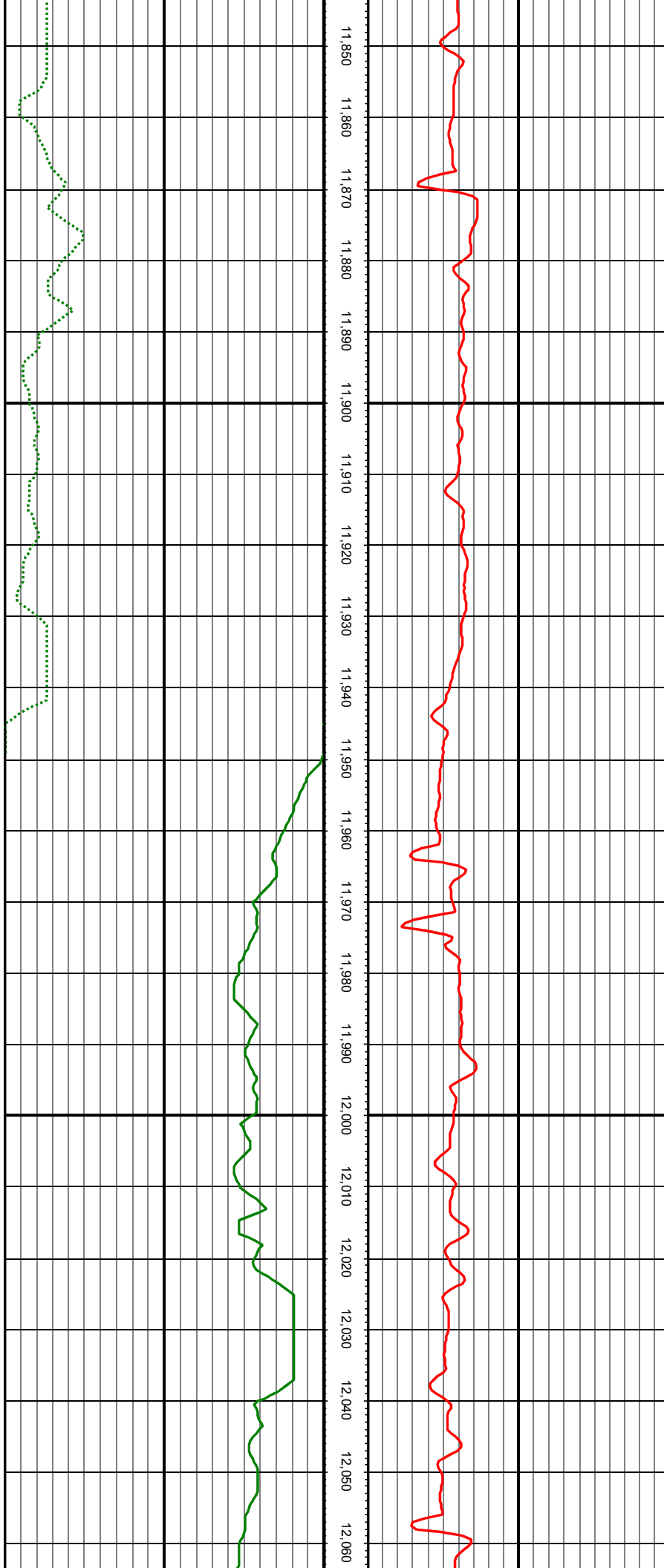
MD: 11542.00 INC: 90.33 AZ: 0.05 TVD: 7464.03 VS: 3690.92



MD: 11637.00 INC: 90.29 AZ: 359.35 TVD: 7463.51 VS: 3785.76

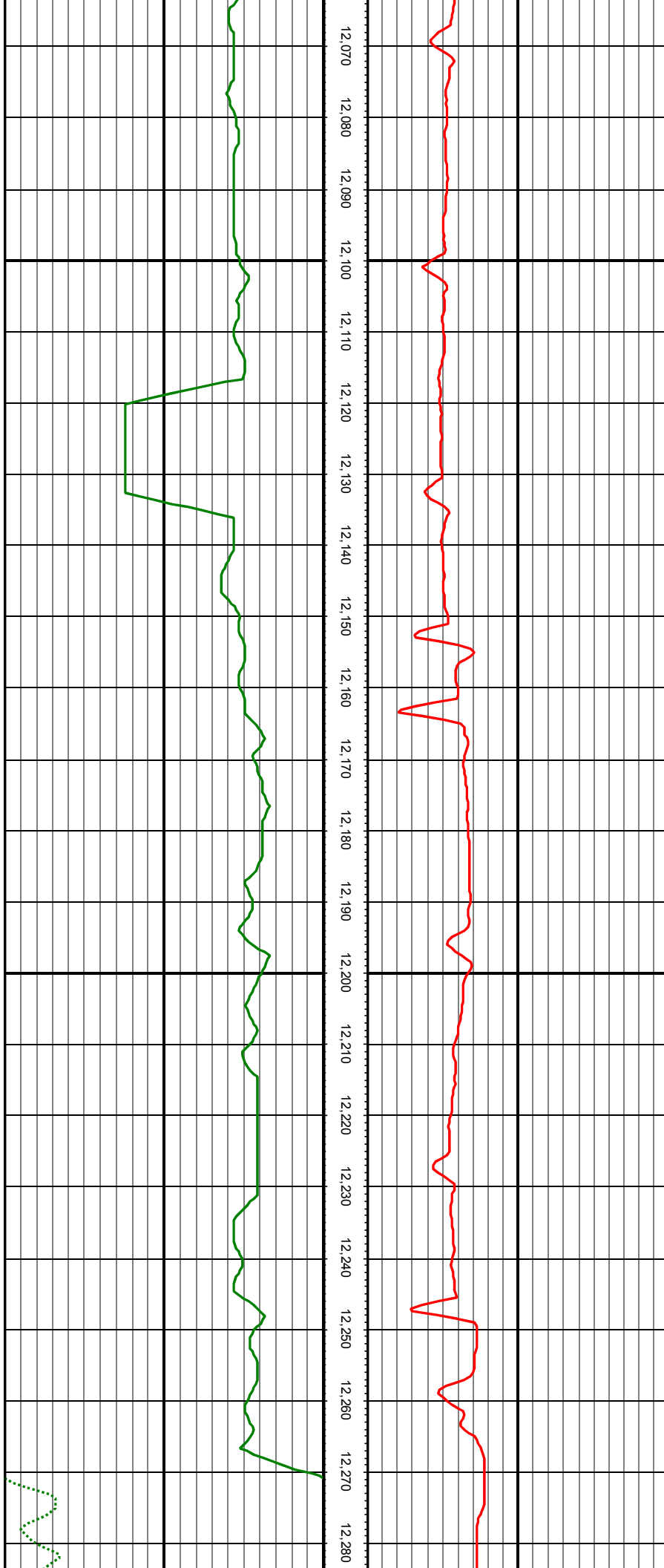
MD: 11732.00 INC: 90.37 AZ: 359.53 TVD: 7462.97 VS: 3880.58

MD: 11827.00 INC: 89.36 AZ: 0.40 TVD: 7463.19 VS: 3975.45



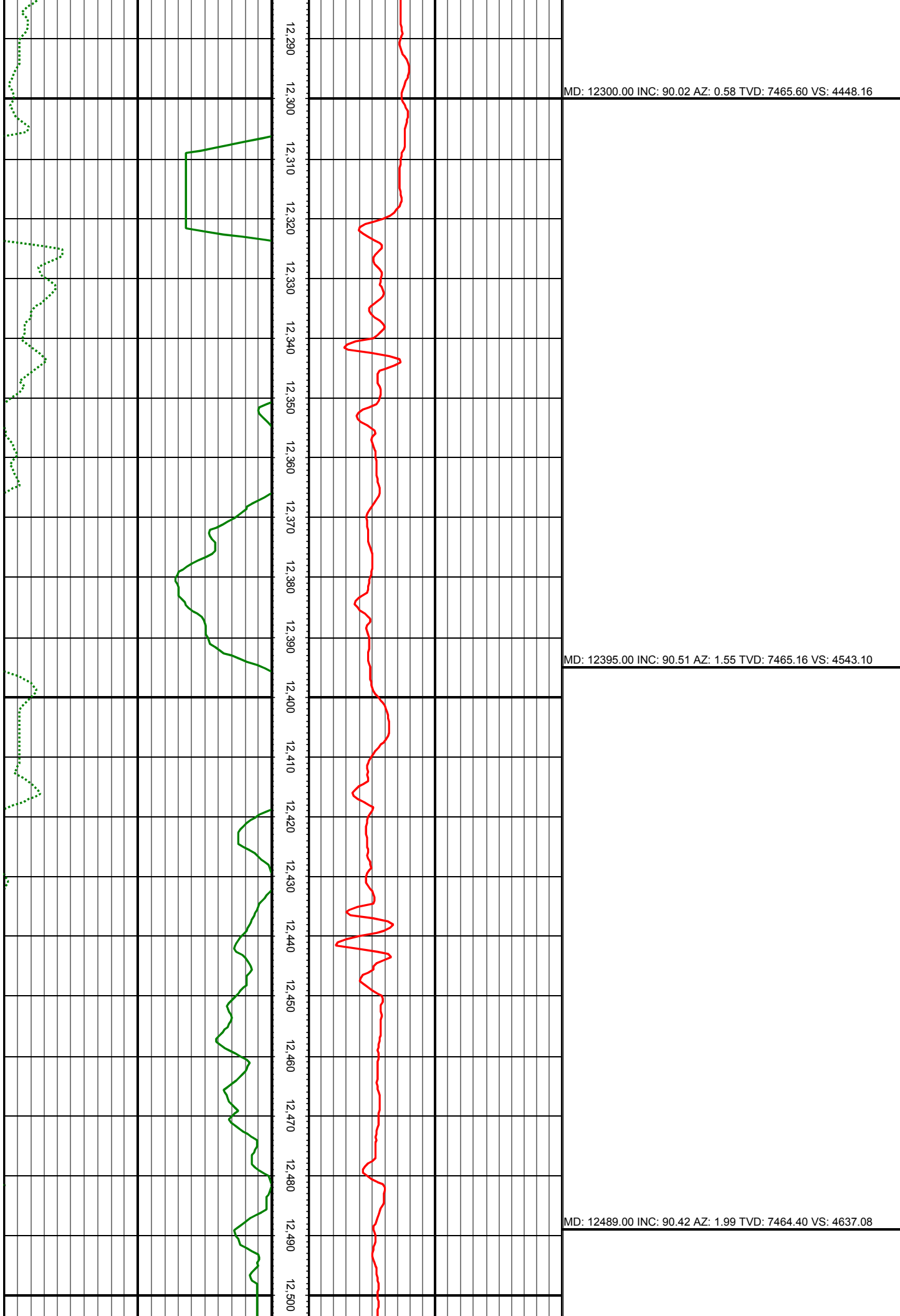
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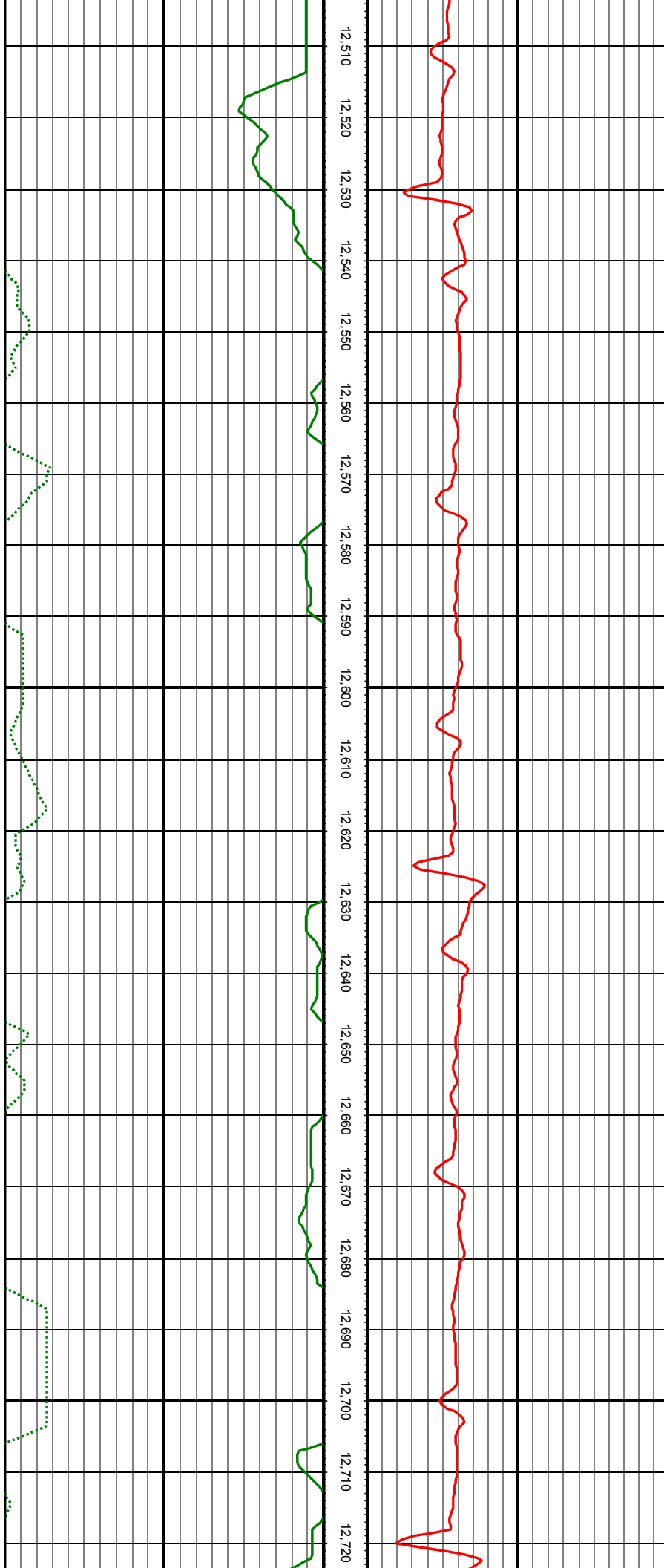
MD: 12016.00 INC: 89.23 AZ: 2.16 TVD: 7465.62 VS: 4164.34



MD: 12111.00 INC: 90.15 AZ: 1.02 TVD: 7466.14 VS: 4259.31

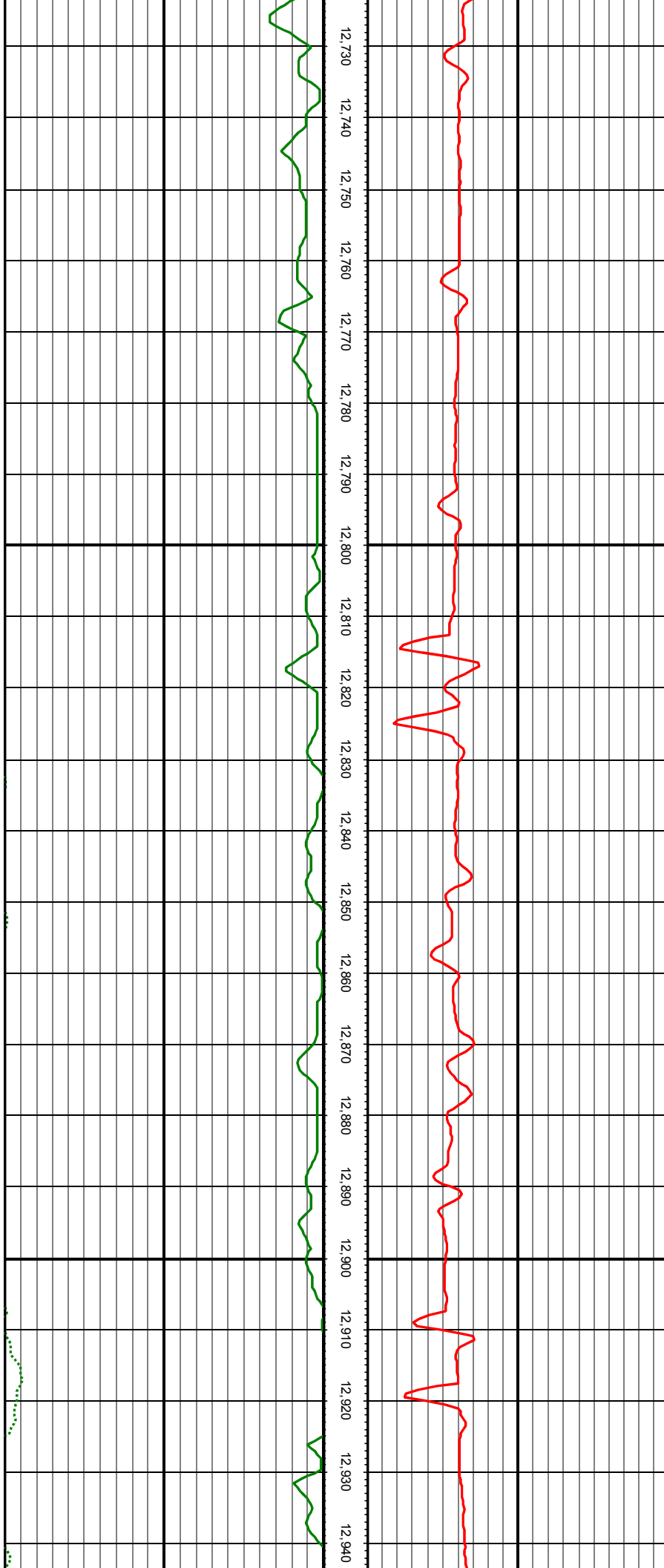
MD: 12206.00 INC: 90.24 AZ: 0.49 TVD: 7465.81 VS: 4354.24





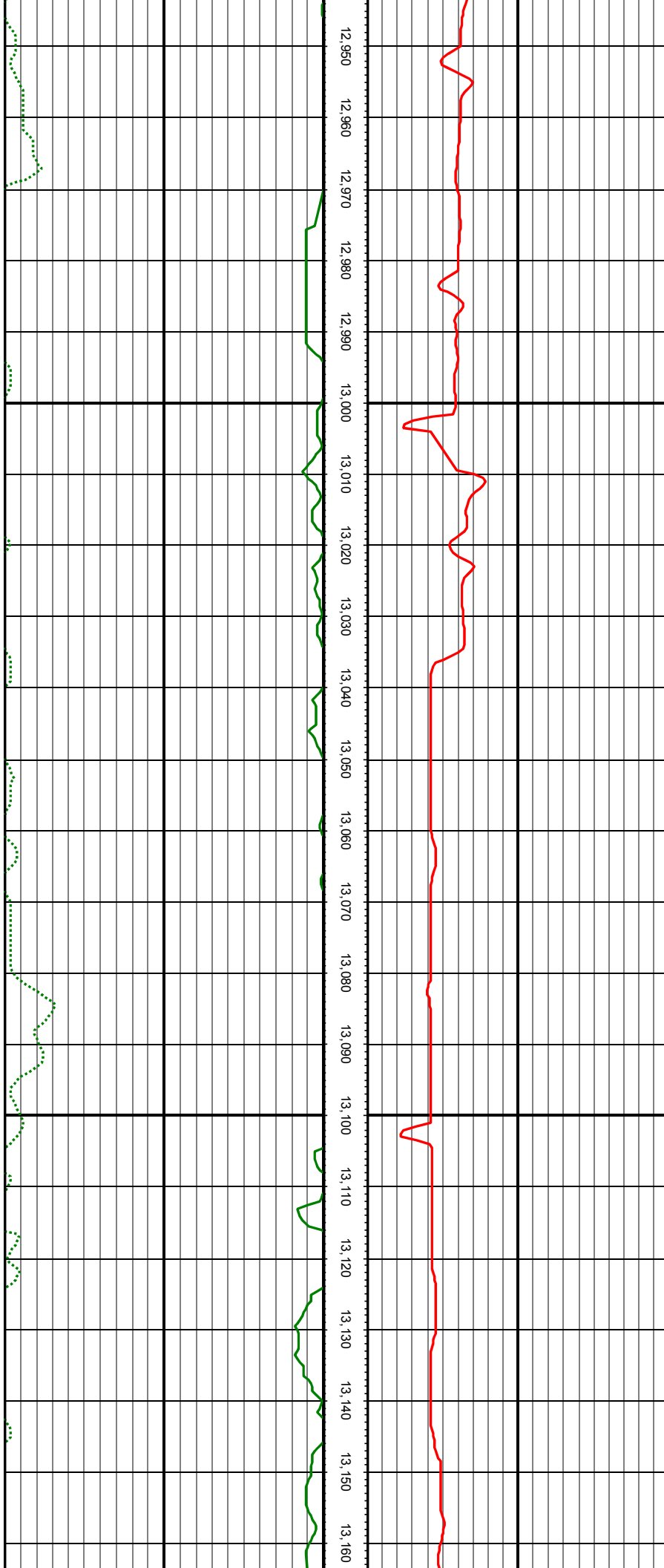
MD: 12584.00 INC: 90.42 AZ: 2.07 TVD: 7463.70 VS: 4732.06

MD: 12679.00 INC: 90.37 AZ: 1.81 TVD: 7463.05 VS: 4827.05



MD: 12774.00 INC: 90.86 AZ: 2.78 TVD: 7462.03 VS: 4922.03

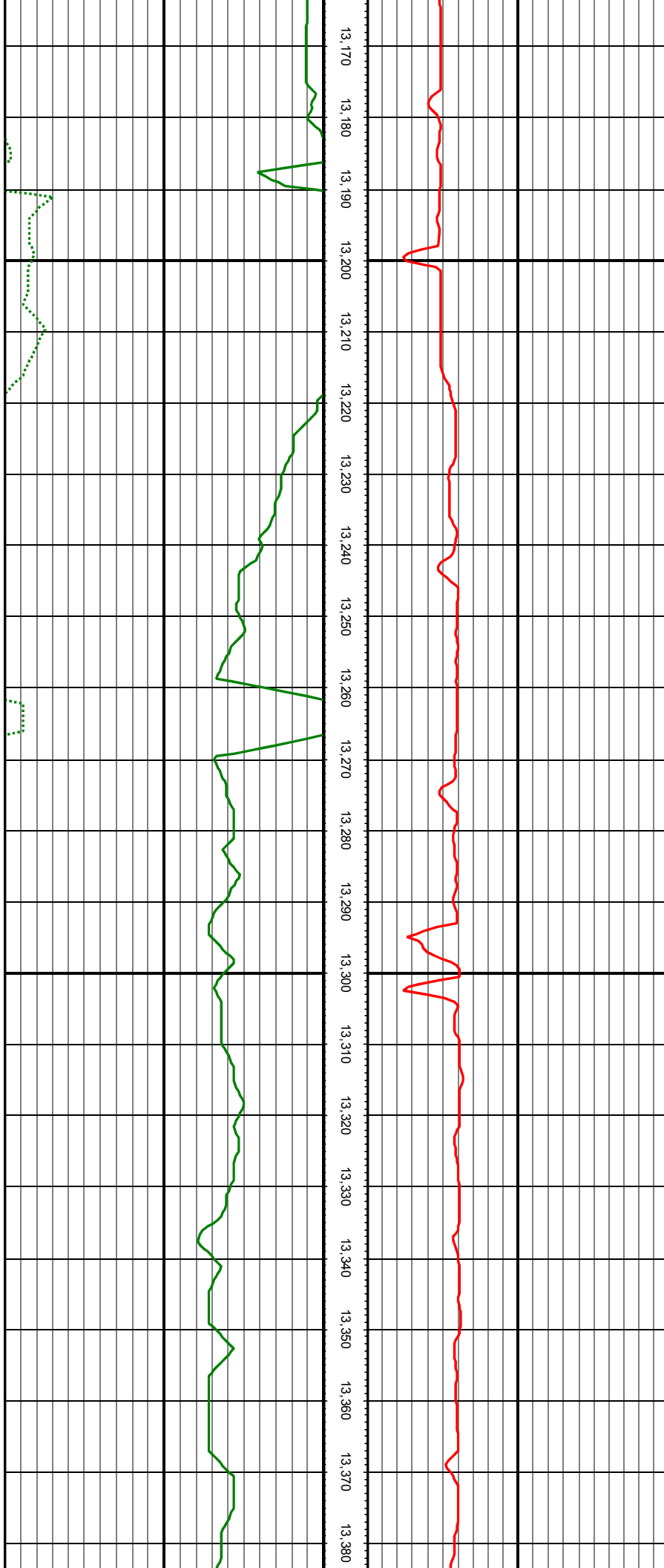
MD: 12868.00 INC: 90.29 AZ: 2.34 TVD: 7461.09 VS: 5016.02



MD: 12964.00 INC: 90.33 AZ: 1.11 TVD: 7460.57 VS: 5112.00

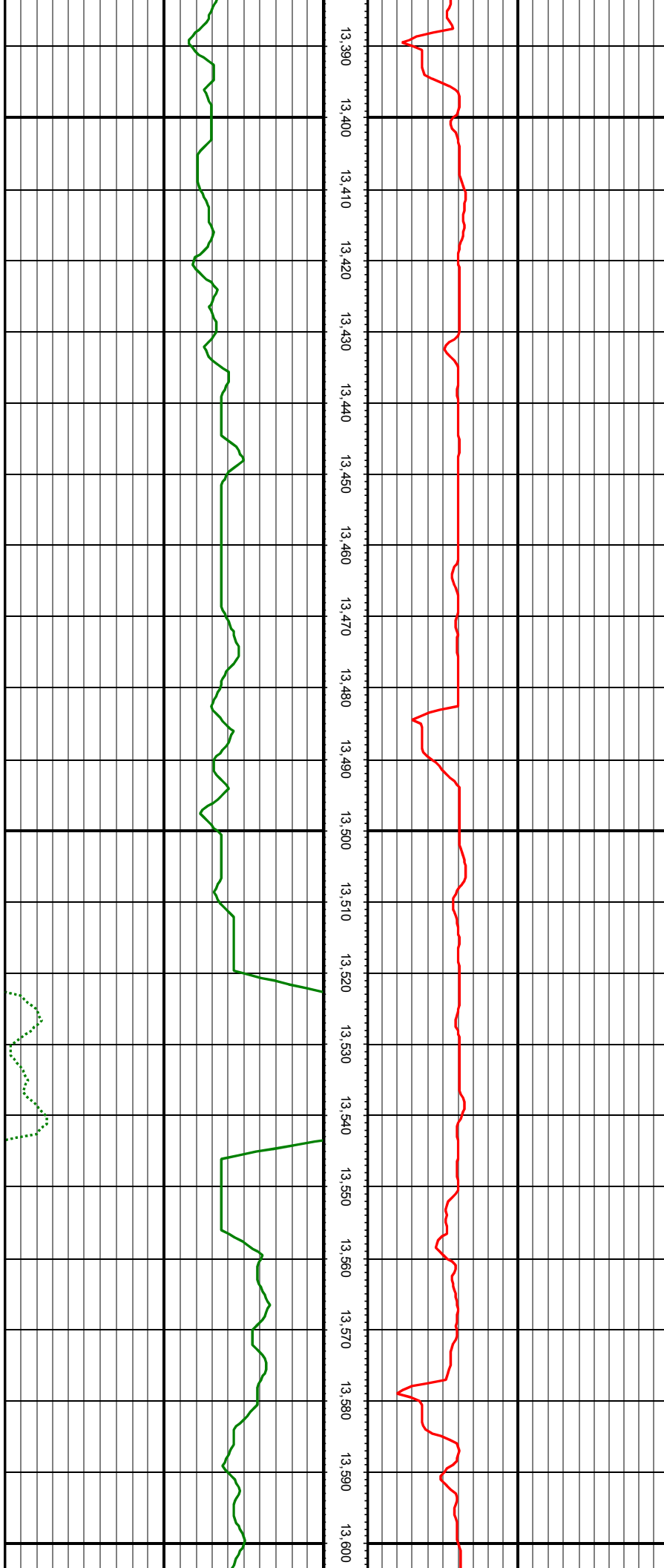
MD: 13058.00 INC: 90.20 AZ: 1.11 TVD: 7460.13 VS: 5205.95

MD: 13153.00 INC: 89.36 AZ: 0.49 TVD: 7460.50 VS: 5300.88



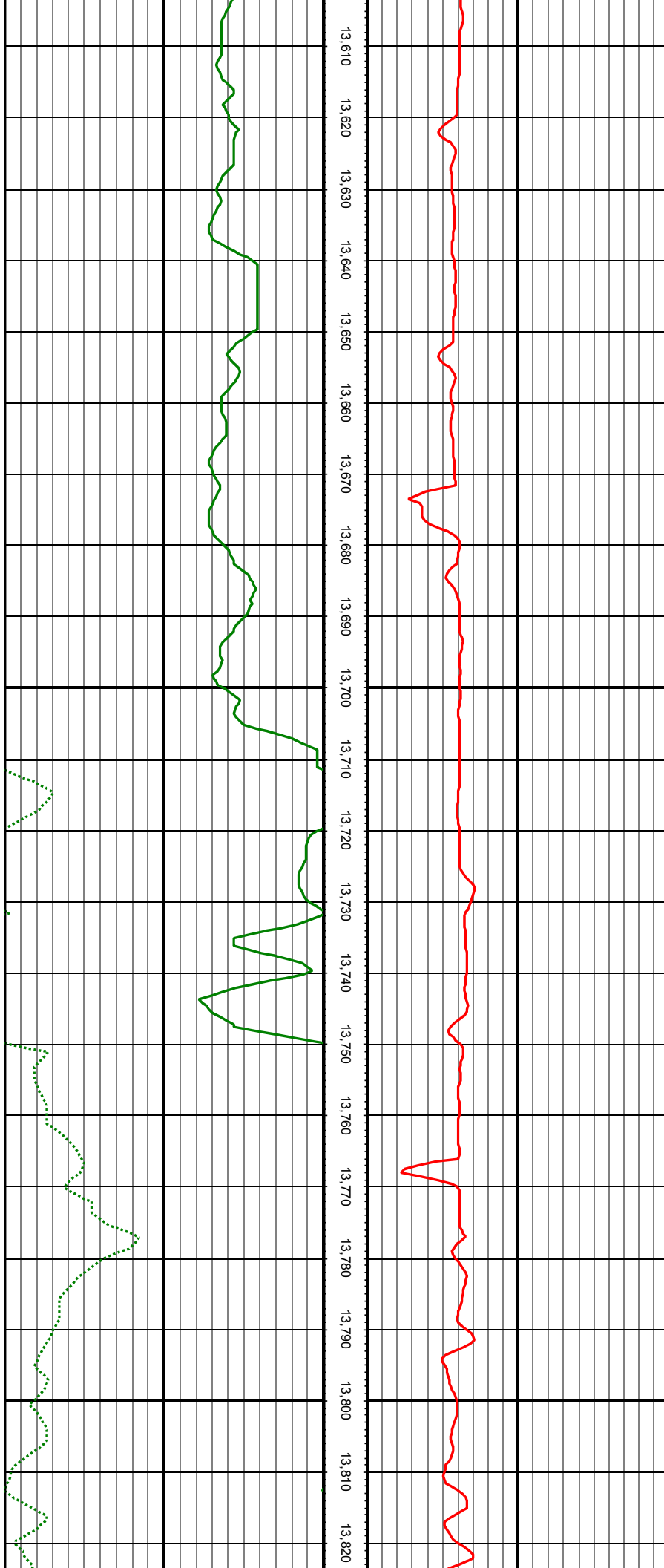
MD: 13247.00 INC: 89.58 AZ: 1.28 TVD: 7461.37 VS: 5394.81

MD: 13342.00 INC: 89.41 AZ: 0.58 TVD: 7462.20 VS: 5489.75



MD: 13437.00 INC: 89.41 AZ: 0.58 TVD: 7463.18 VS: 5584.66

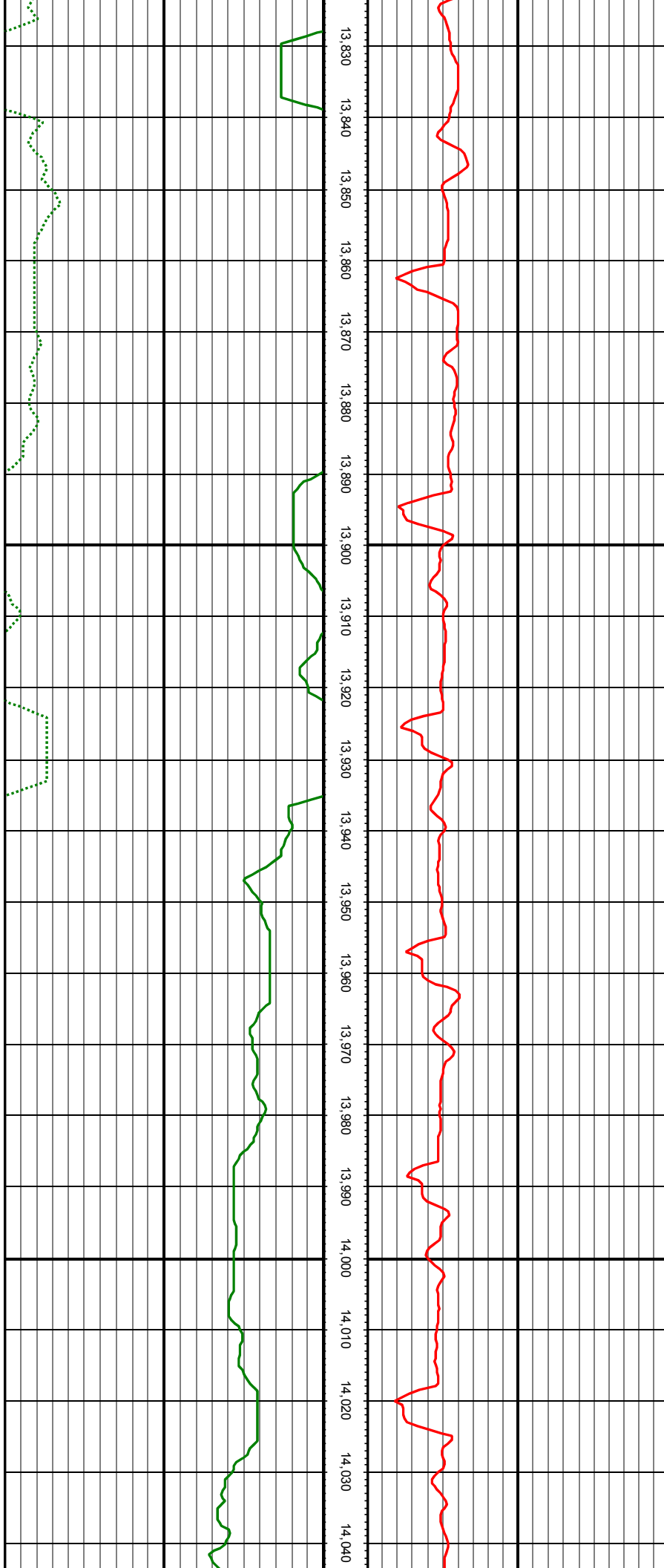
MD: 13532.00 INC: 89.32 AZ: 359.79 TVD: 7464.23 VS: 5679.54



MD: 13626.00 INC: 90.24 AZ: 0.40 TVD: 7464.59 VS: 5773.42

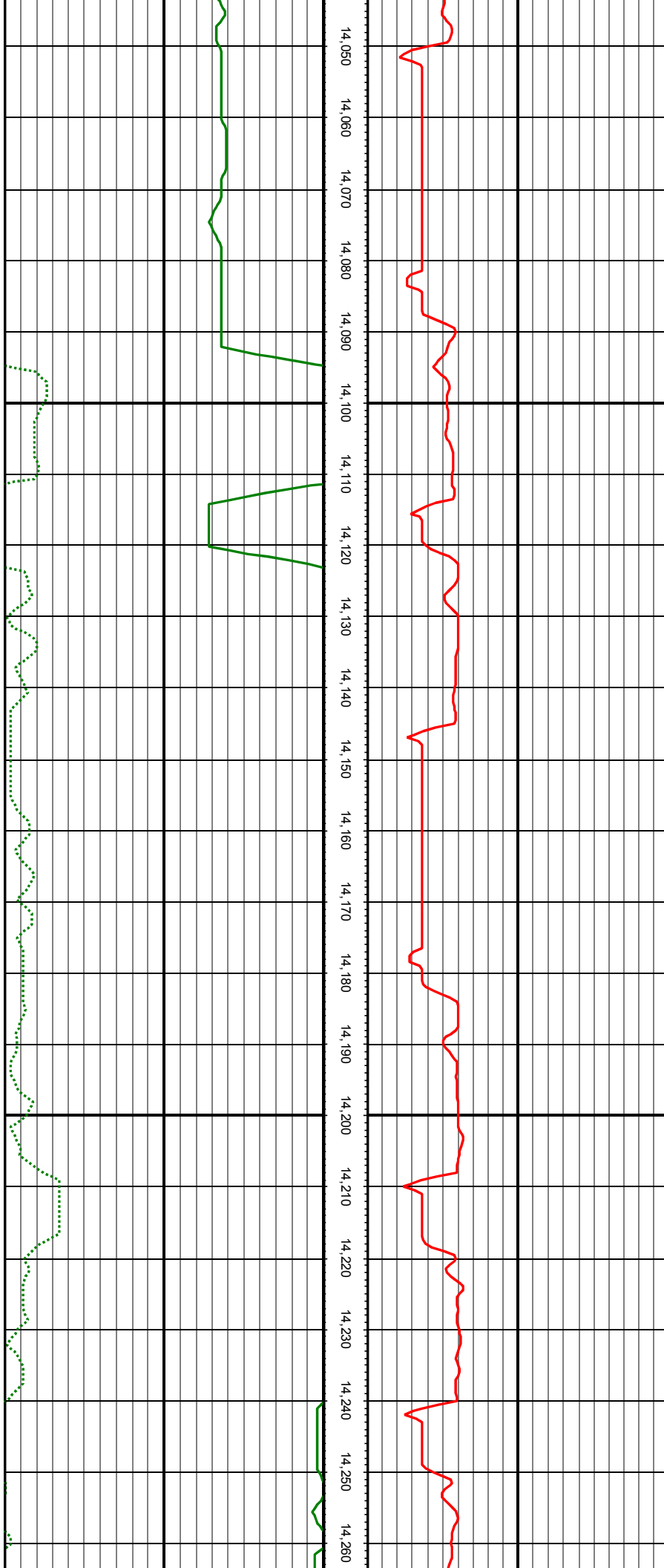
MD: 13720.00 INC: 90.15 AZ: 1.55 TVD: 7464.27 VS: 5867.37

MD: 13815.00 INC: 90.15 AZ: 2.34 TVD: 7464.03 VS: 5962.35



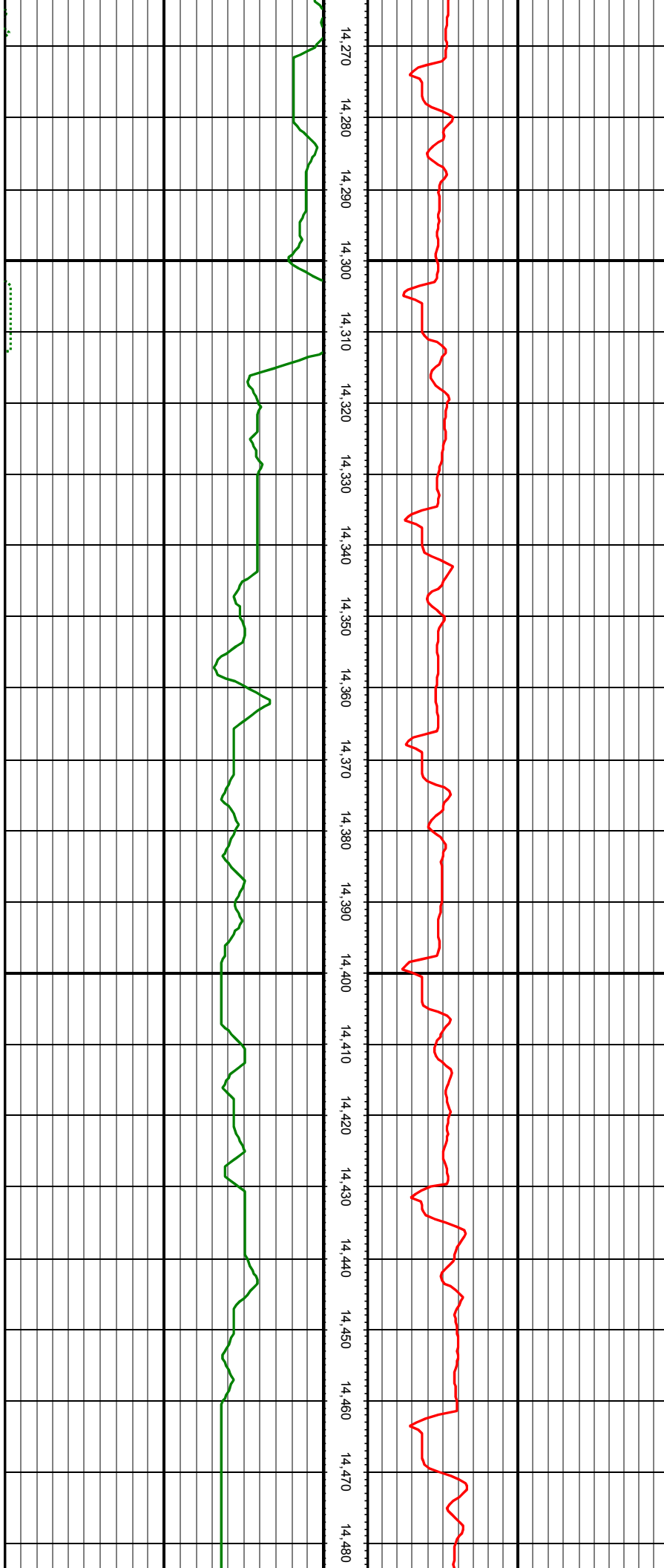
MD: 13909.00 INC: 90.33 AZ: 1.81 TVD: 7463.63 VS: 6056.34

MD: 14004.00 INC: 90.33 AZ: 2.69 TVD: 7463.08 VS: 6151.33



MD: 14099.00 INC: 90.15 AZ: 1.72 TVD: 7462.69 VS: 6246.32

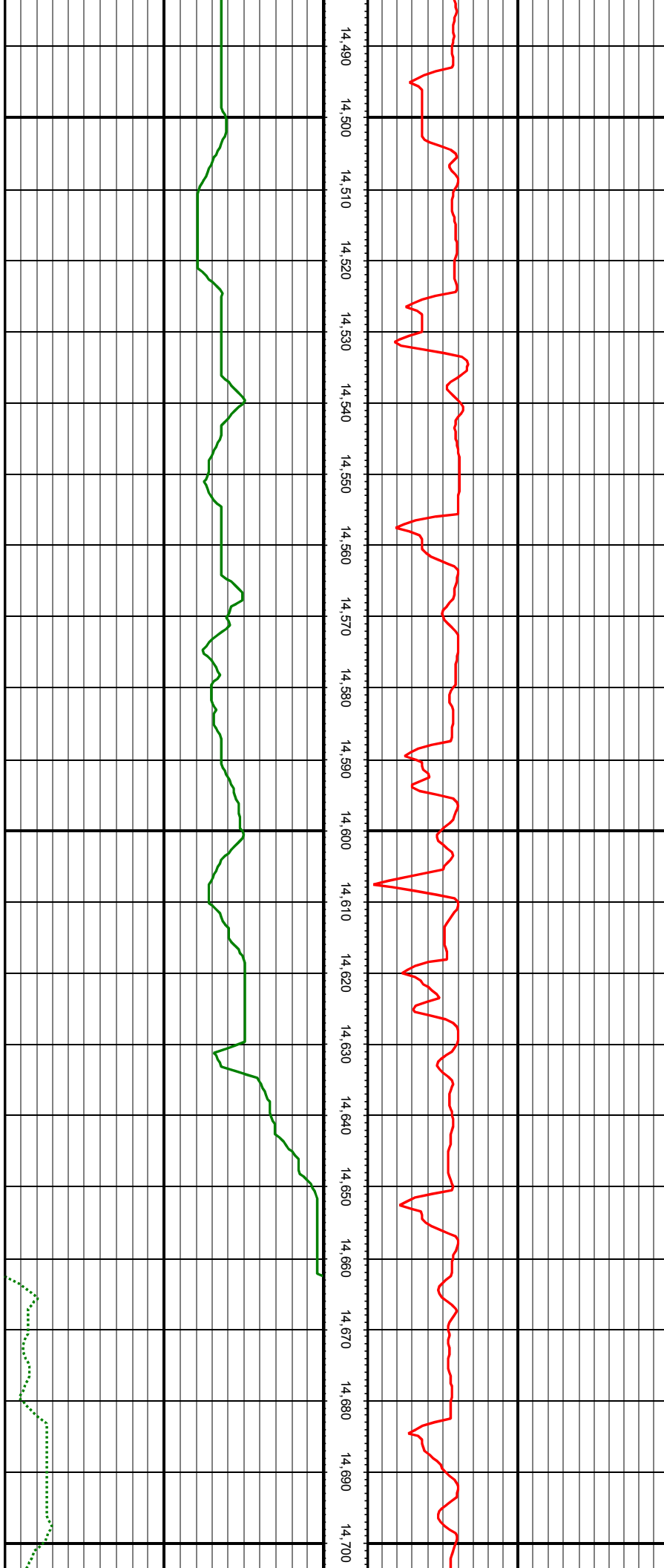
MD: 14194.00 INC: 90.29 AZ: 1.37 TVD: 7462.32 VS: 6341.29



MD: 14289.00 INC: 90.55 AZ: 1.99 TVD: 7461.63 VS: 6436.26

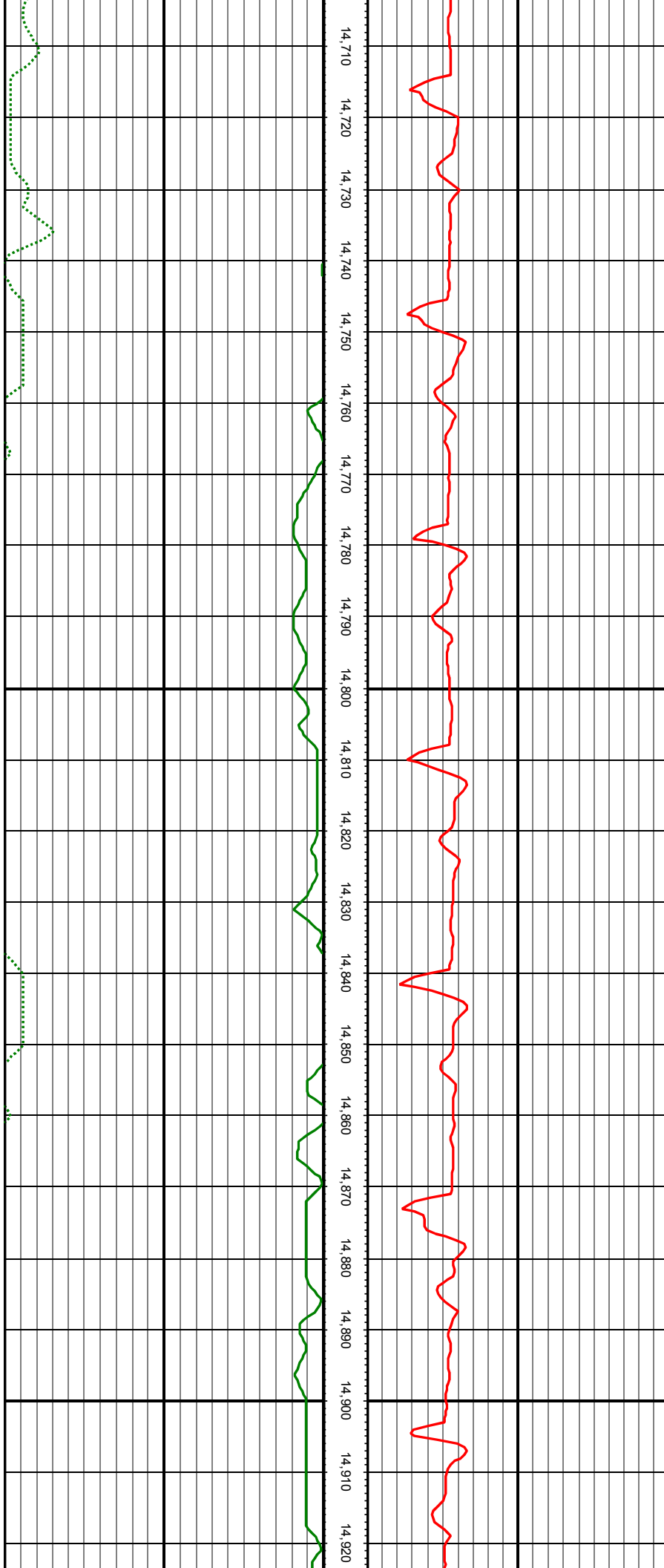
MD: 14384.00 INC: 90.42 AZ: 2.51 TVD: 7460.82 VS: 6531.25

MD: 14479.00 INC: 90.11 AZ: 2.78 TVD: 7460.38 VS: 6626.25



MD: 14574.00 INC: 90.33 AZ: 2.51 TVD: 7460.02 VS: 6721.24

MD: 14668.00 INC: 90.37 AZ: 2.95 TVD: 7459.44 VS: 6815.24



MD: 14763.00 INC: 90.46 AZ: 3.04 TVD: 7458.76 VS: 6910.24

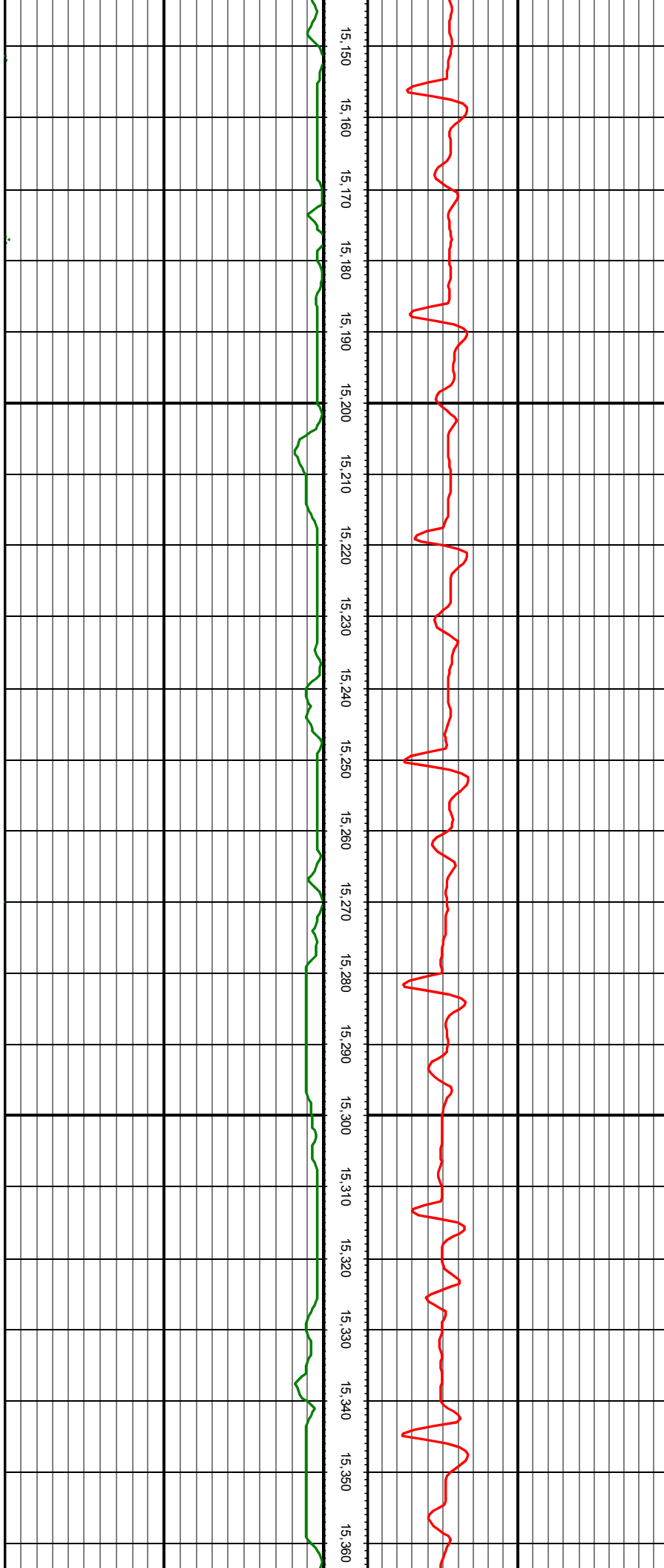
MD: 14857.00 INC: 90.07 AZ: 2.60 TVD: 7458.32 VS: 7004.24



MD: 14952.00 INC: 90.42 AZ: 3.22 TVD: 7457.91 VS: 7099.24

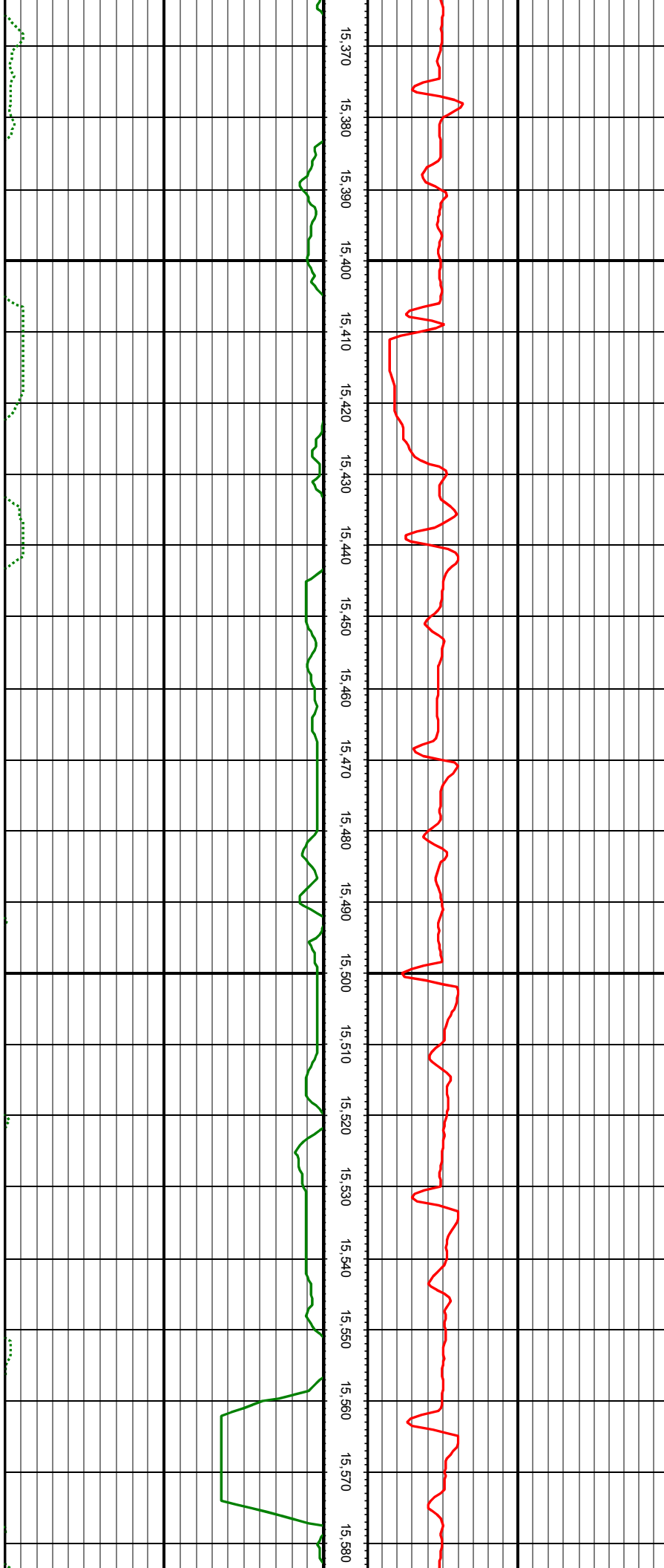
MD: 15047.00 INC: 90.29 AZ: 2.69 TVD: 7457.33 VS: 7194.23

MD: 15141.00 INC: 90.15 AZ: 2.69 TVD: 7456.96 VS: 7288.23



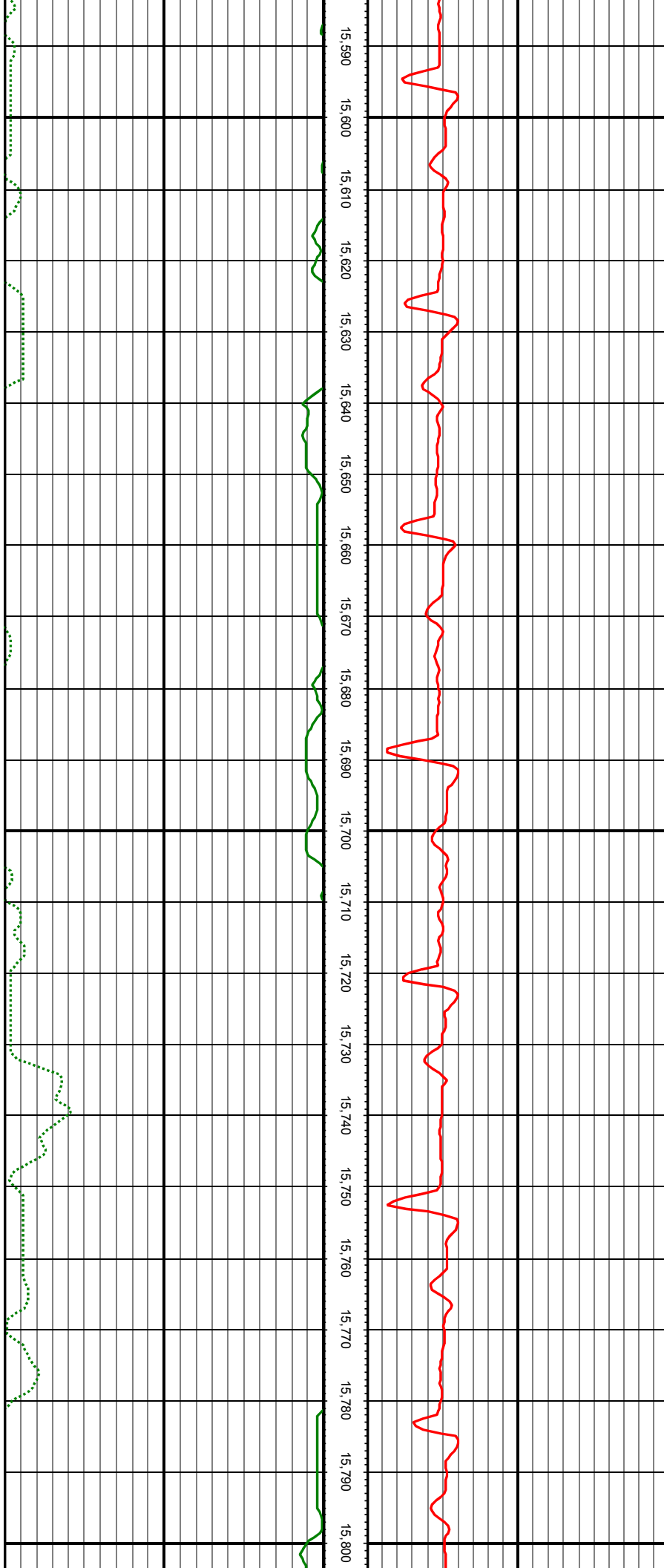
MD: 15235.00 INC: 90.33 AZ: 2.60 TVD: 7456.57 VS: 7382.23

MD: 15330.00 INC: 90.33 AZ: 2.78 TVD: 7456.02 VS: 7477.23



MD: 15422.00 INC: 89.19 AZ: 2.25 TVD: 7456.41 VS: 7569.22

MD: 15517.00 INC: 90.33 AZ: 2.07 TVD: 7456.81 VS: 7664.21

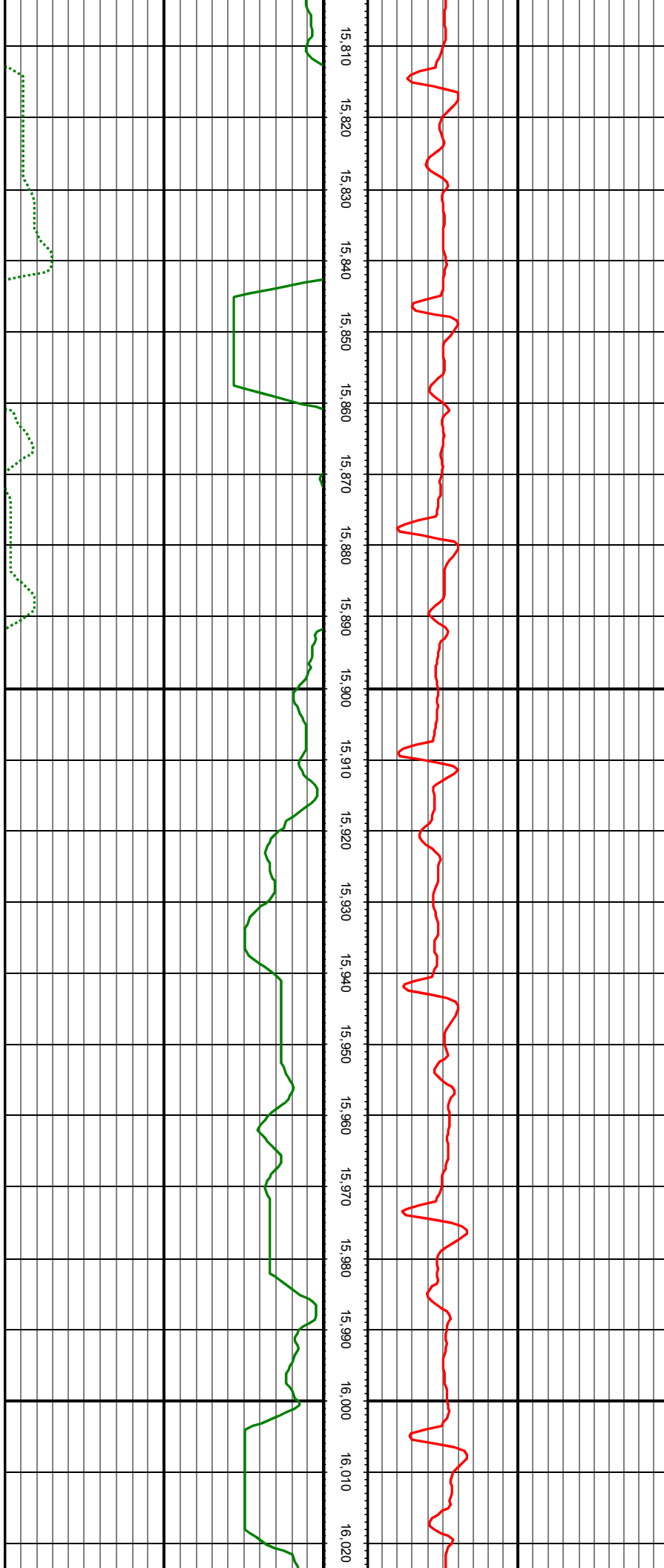


15,590 15,600 15,610 15,620 15,630 15,640 15,650 15,660 15,670 15,680 15,690 15,700 15,710 15,720 15,730 15,740 15,750 15,760 15,770 15,780 15,790 15,800

MD: 15611.00 INC: 90.11 AZ: 1.28 TVD: 7456.45 VS: 7758.19

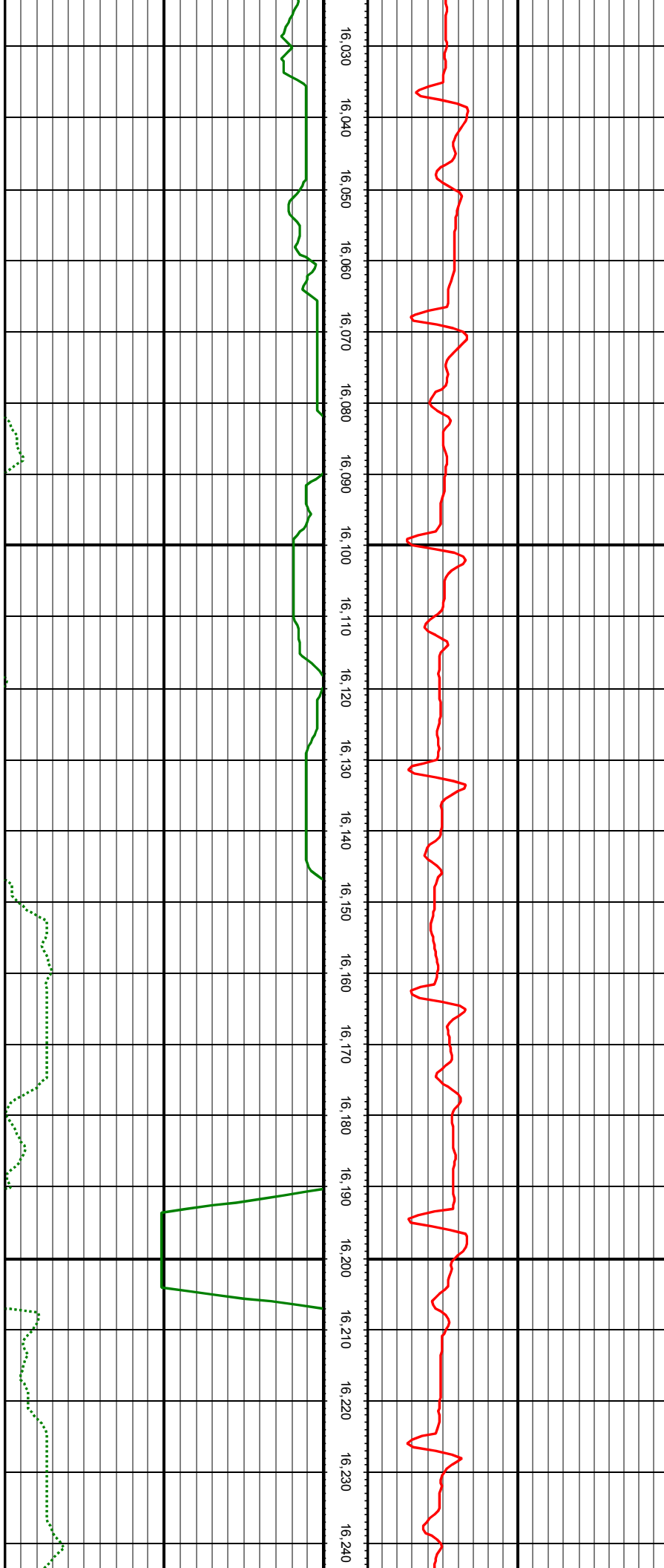
MD: 15706.00 INC: 90.24 AZ: 1.90 TVD: 7456.16 VS: 7853.16

MD: 15801.00 INC: 90.20 AZ: 1.63 TVD: 7455.79 VS: 7948.14



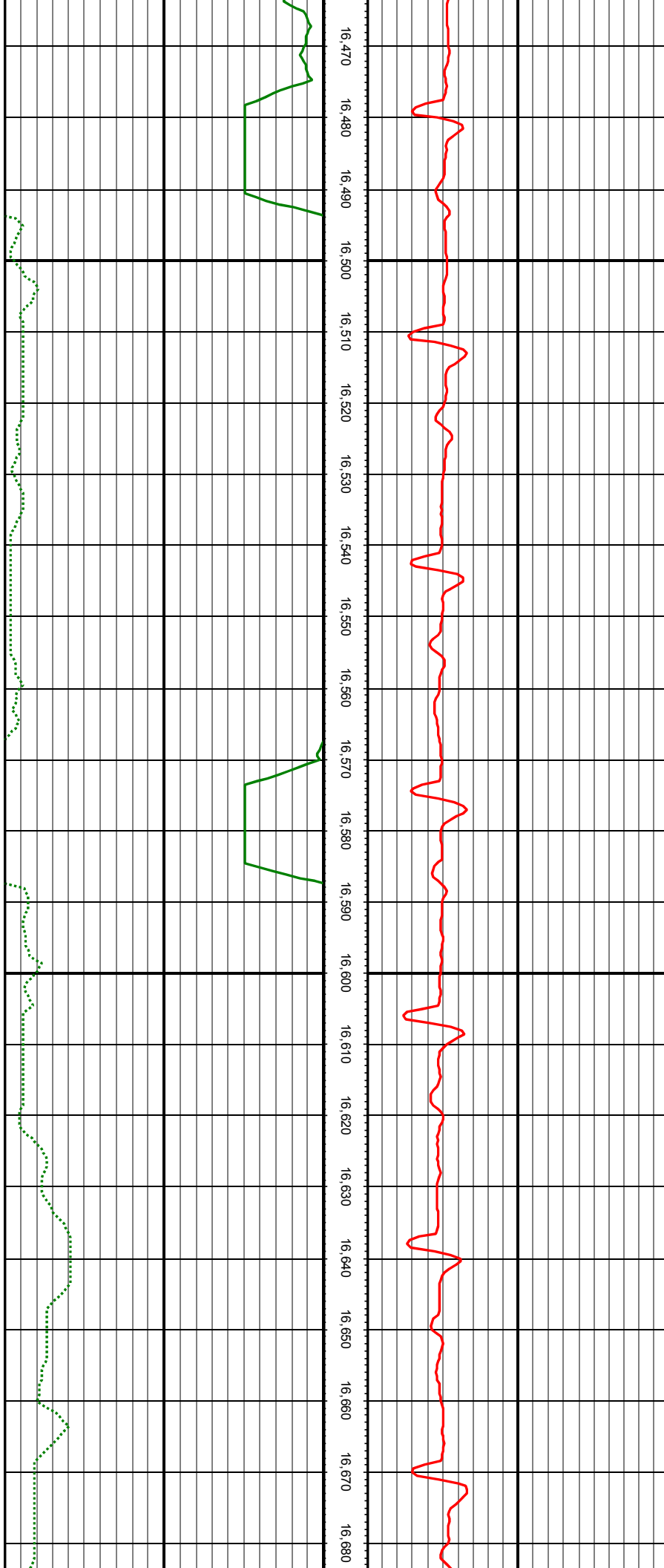
MD: 15895.00 INC: 90.33 AZ: 1.63 TVD: 7455.36 VS: 8042.11

MD: 15989.00 INC: 90.46 AZ: 2.43 TVD: 7454.71 VS: 8136.09



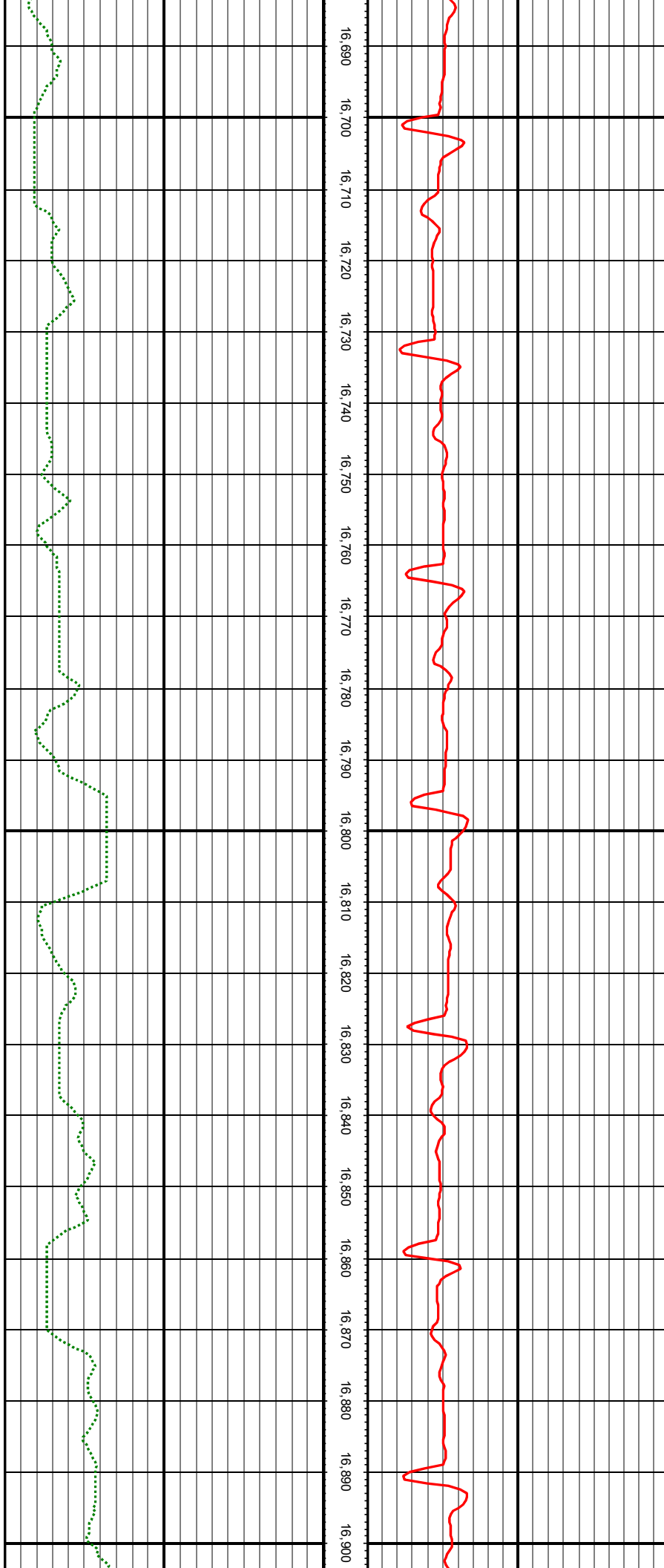
MD: 16084.00 INC: 90.24 AZ: 1.55 TVD: 7454.13 VS: 8231.08

MD: 16179.00 INC: 90.29 AZ: 2.60 TVD: 7453.69 VS: 8326.06



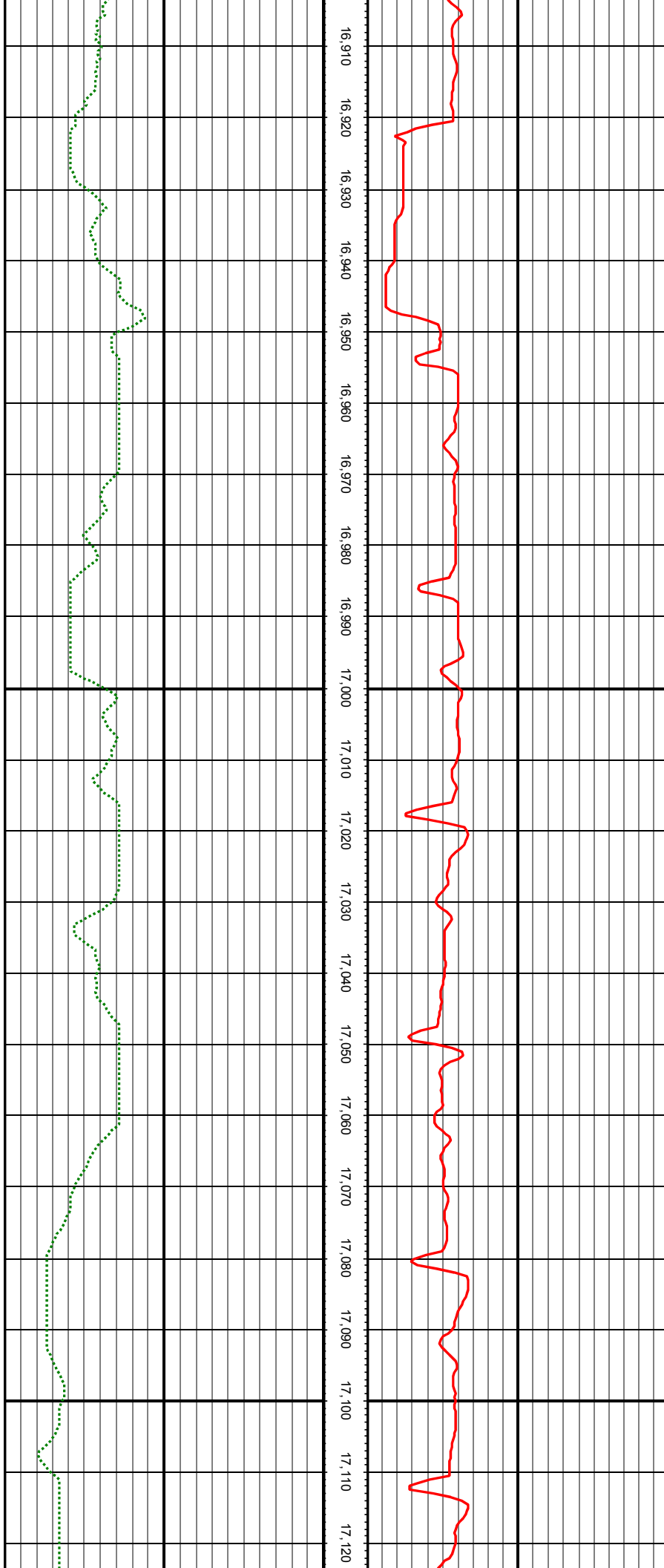
MD: 16559.00 INC: 90.33 AZ: 1.46 TVD: 7451.25 VS: 8706.01

MD: 16654.00 INC: 90.42 AZ: 1.02 TVD: 7450.63 VS: 8800.97



MD: 16749.00 INC: 90.37 AZ: 1.20 TVD: 7449.97 VS: 8895.92

MD: 16844.00 INC: 90.15 AZ: 0.67 TVD: 7449.54 VS: 8990.86



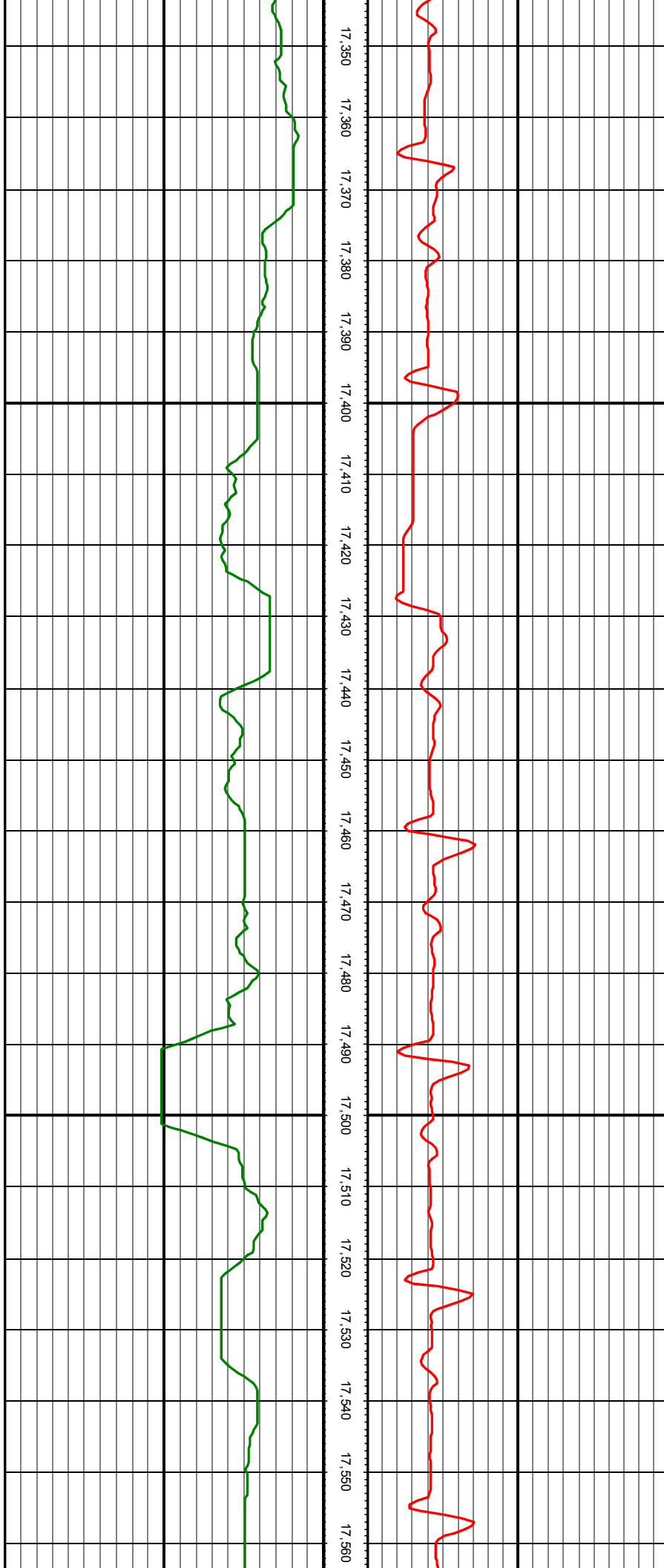
MD: 16939.00 INC: 89.93 AZ: 0.58 TVD: 7449.48 VS: 9085.78

MD: 17033.00 INC: 89.19 AZ: 0.93 TVD: 7450.20 VS: 9179.70

MD: 17128.00 INC: 89.41 AZ: 1.50 TVD: 7451.36 VS: 9274.65

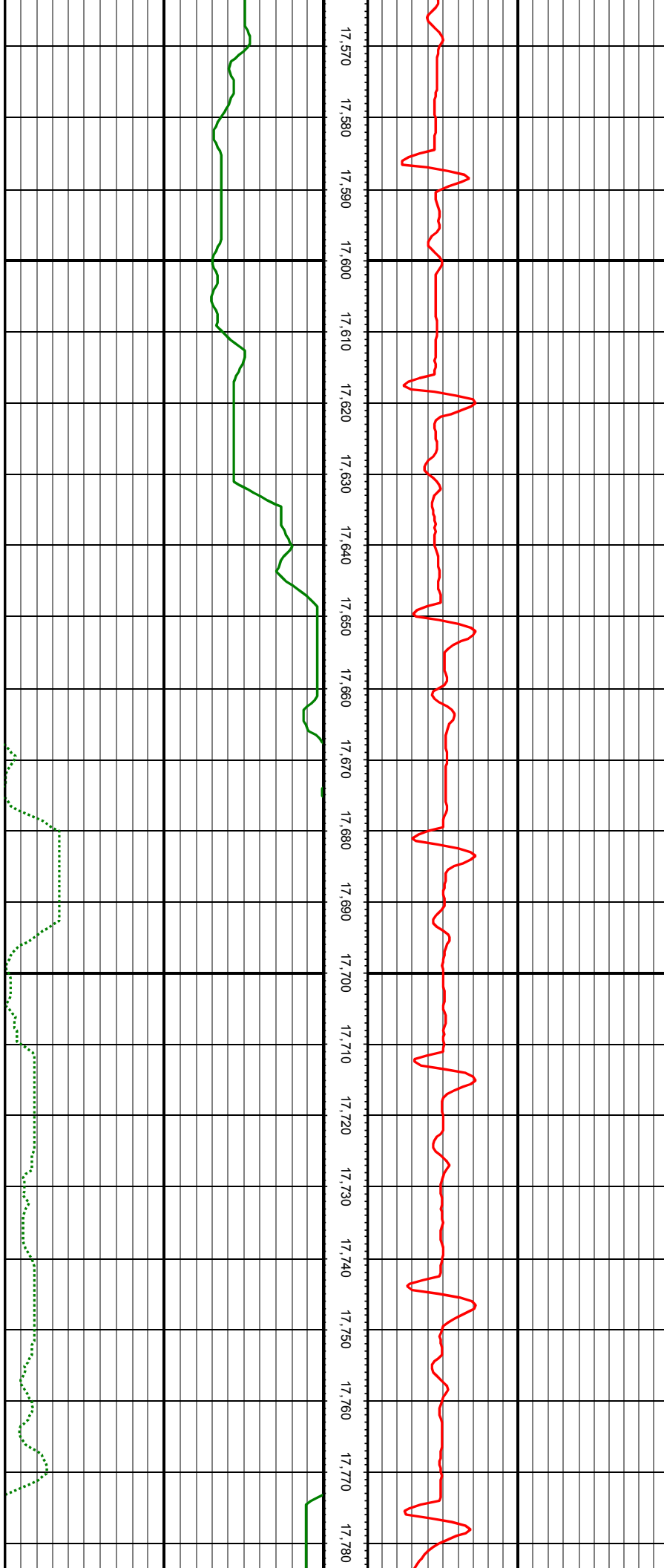
MD: 17223.00 INC: 89.10 AZ: 0.76 TVD: 7452.59 VS: 9369.60

MD: 17318.00 INC: 89.41 AZ: 1.55 TVD: 7453.83 VS: 9464.54



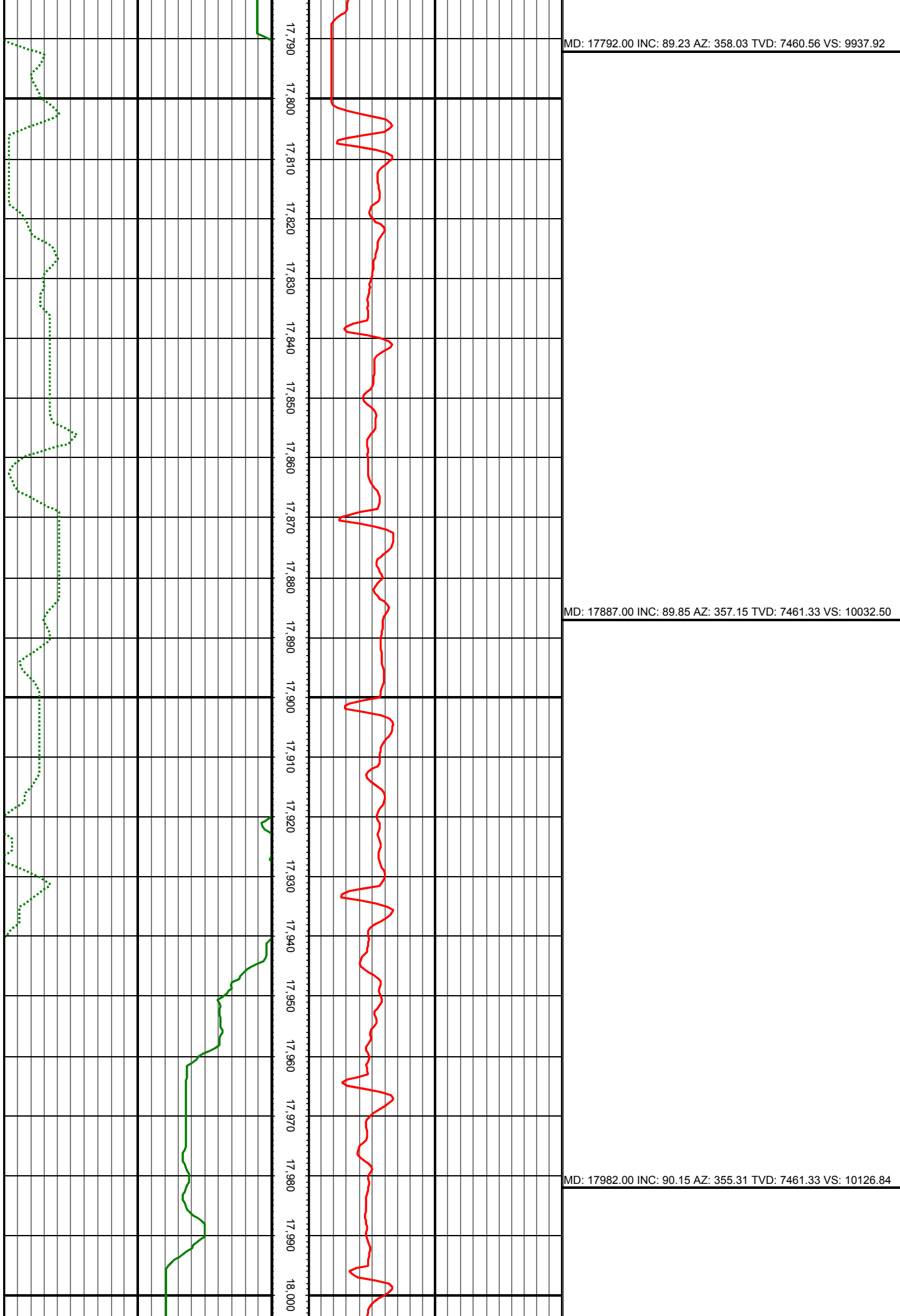
MD: 17413.00 INC: 89.14 AZ: 1.81 TVD: 7455.03 VS: 9559.51

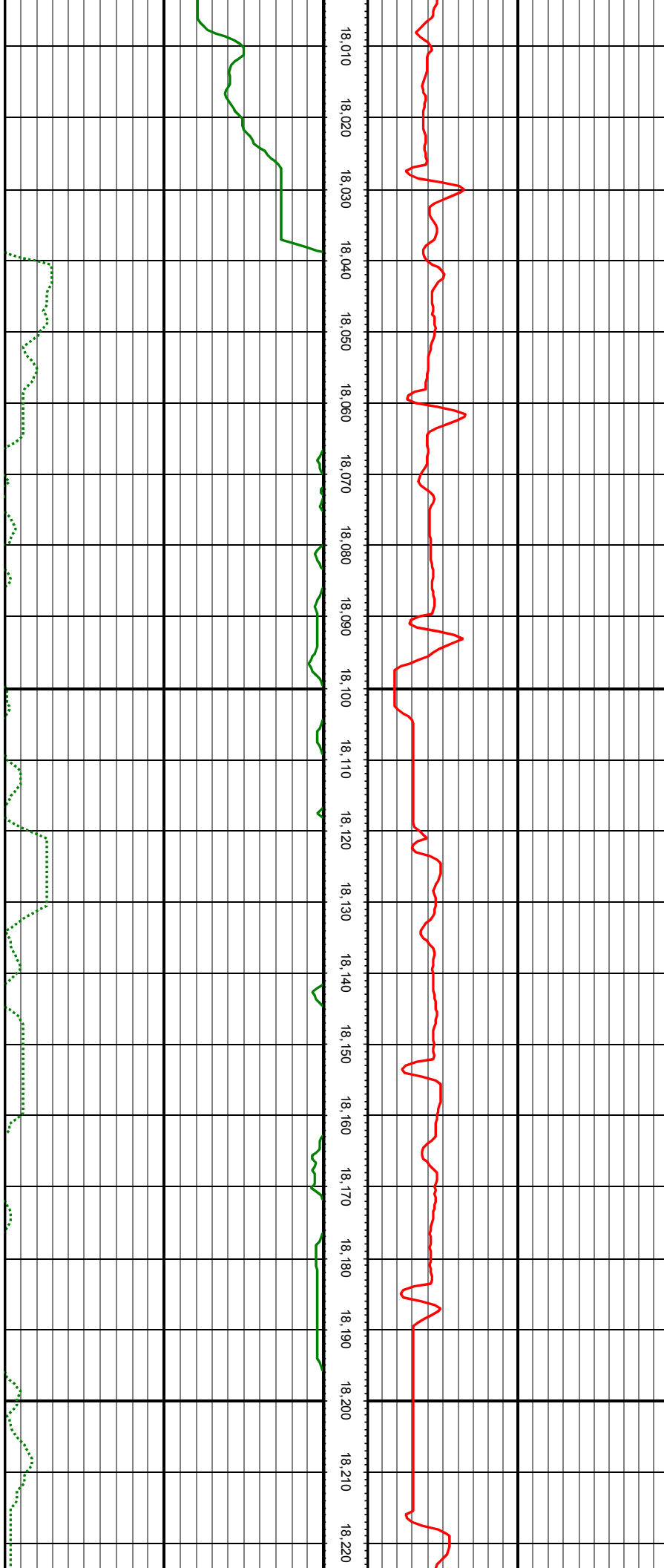
MD: 17508.00 INC: 89.14 AZ: 1.11 TVD: 7456.46 VS: 9654.46



MD: 17603.00 INC: 89.23 AZ: 0.05 TVD: 7457.81 VS: 9749.37

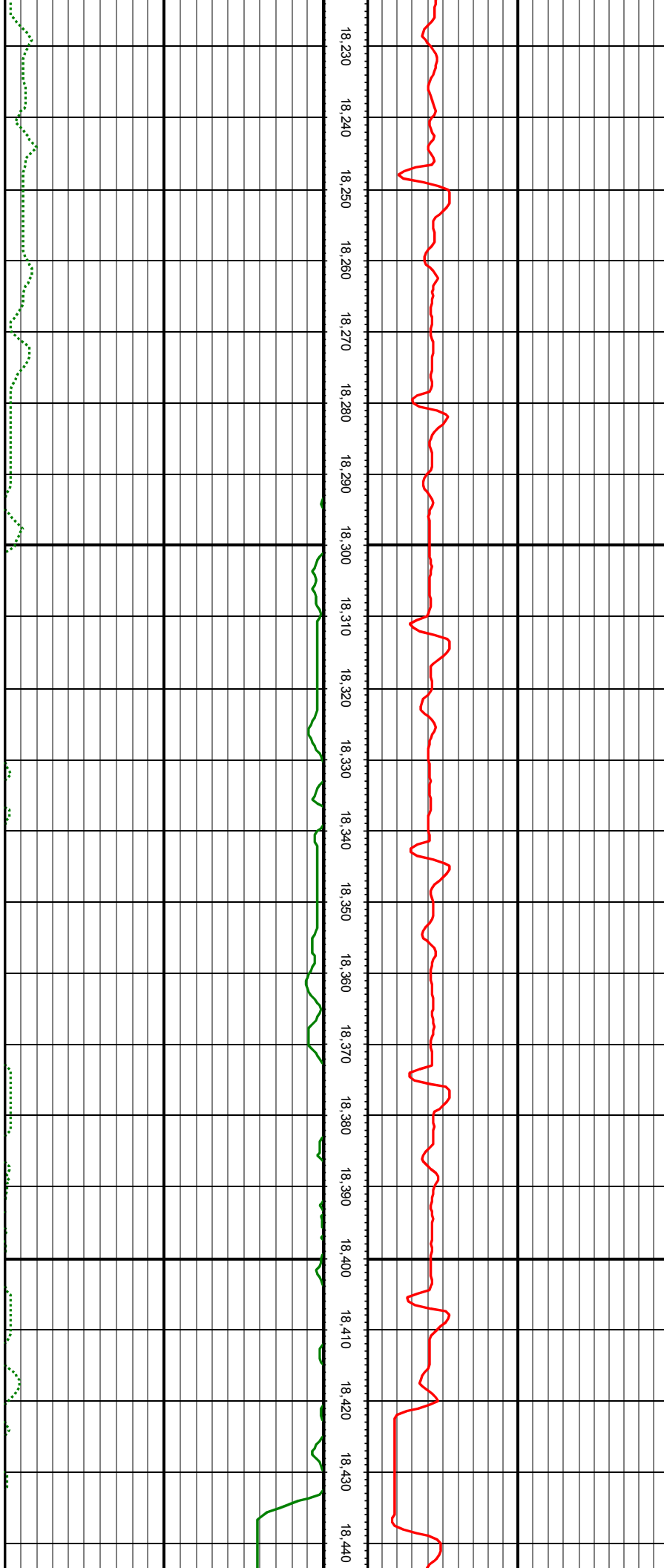
MD: 17697.00 INC: 89.10 AZ: 359.26 TVD: 7459.18 VS: 9843.20





MD: 18076.00 INC: 90.15 AZ: 353.46 TVD: 7461.08 VS: 10219.79

MD: 18171.00 INC: 91.08 AZ: 351.61 TVD: 7460.06 VS: 10313.21



MD: 18265.00 INC: 91.21 AZ: 350.38 TVD: 7458.18 VS: 10405.15

MD: 18360.00 INC: 91.16 AZ: 347.66 TVD: 7456.22 VS: 10497.32

