



Cathedral Energy Services
1949 North Pyrite Road
Casper, Wyoming 82604

145434

5":100' - MD

11/30/2014 11:48:24 AM

CATHEDRAL

Oper. Company: Encana Oil & Gas (USA) Inc.

Country: U.S.A.

State / Province: Colorado

County / Parish: Weld

Started: 11/22/2014 06:00 AM

API/UWI: 05-123-36889

Field: Wattenberg (Niobrara)

Well: Billings 3E-18H-L368

Rig: Patterson UTI Drilling 326

Ended: 11/28/2014 02:30 PM

Gamma Ray
Section Plane: 90.00
Magnetic North: 8.79
Gamma Attenuation Factor: 2.86
Gamma Averaging: 7%

Personnel

Day Hand: M. Andrew

Night Hand: T. Kapsch

Comp. Emp: Norman McCreary

Maximum Temperature: 221°F

Location

Latitude: 40.222622

Longitude: -105.061741

Elev. GL: 5155

Elev. DF:

Elev. KB: 5187

Log and Survey Depths Relative to Kelly Bushing (KB) Depth

Hole Data

Size	From	To
12-1/4	0	890
8-3/4	890	7538
6-1/8	7538	13990

Casing Data

Size	From	To
9-7/8	0	890
7	0	7538
4-1/2	0	13990

Bit Sizes

Size	From	To
12-1/4	0	890
8-3/4	890	7538
6-1/8	7538	13990

Mud Data

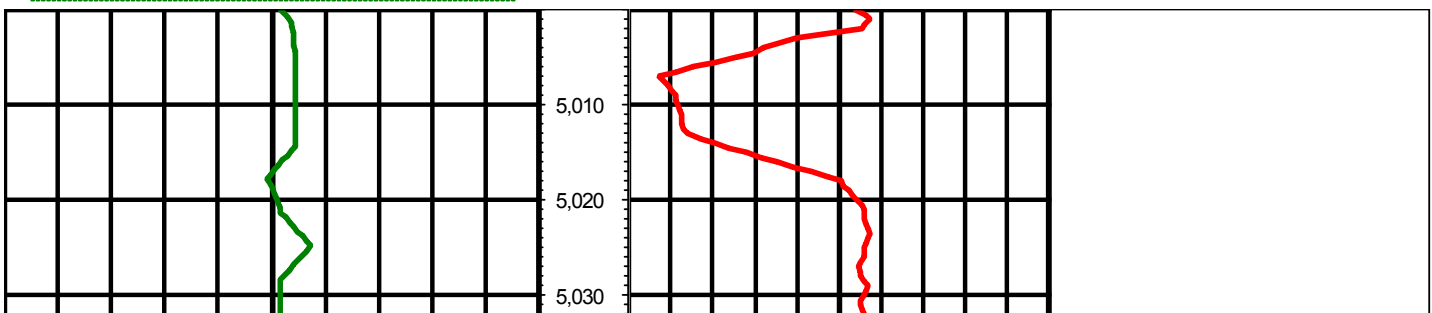
Type	Weight	Density	Viscosity	Rm	Rmf	Rmc	From	To
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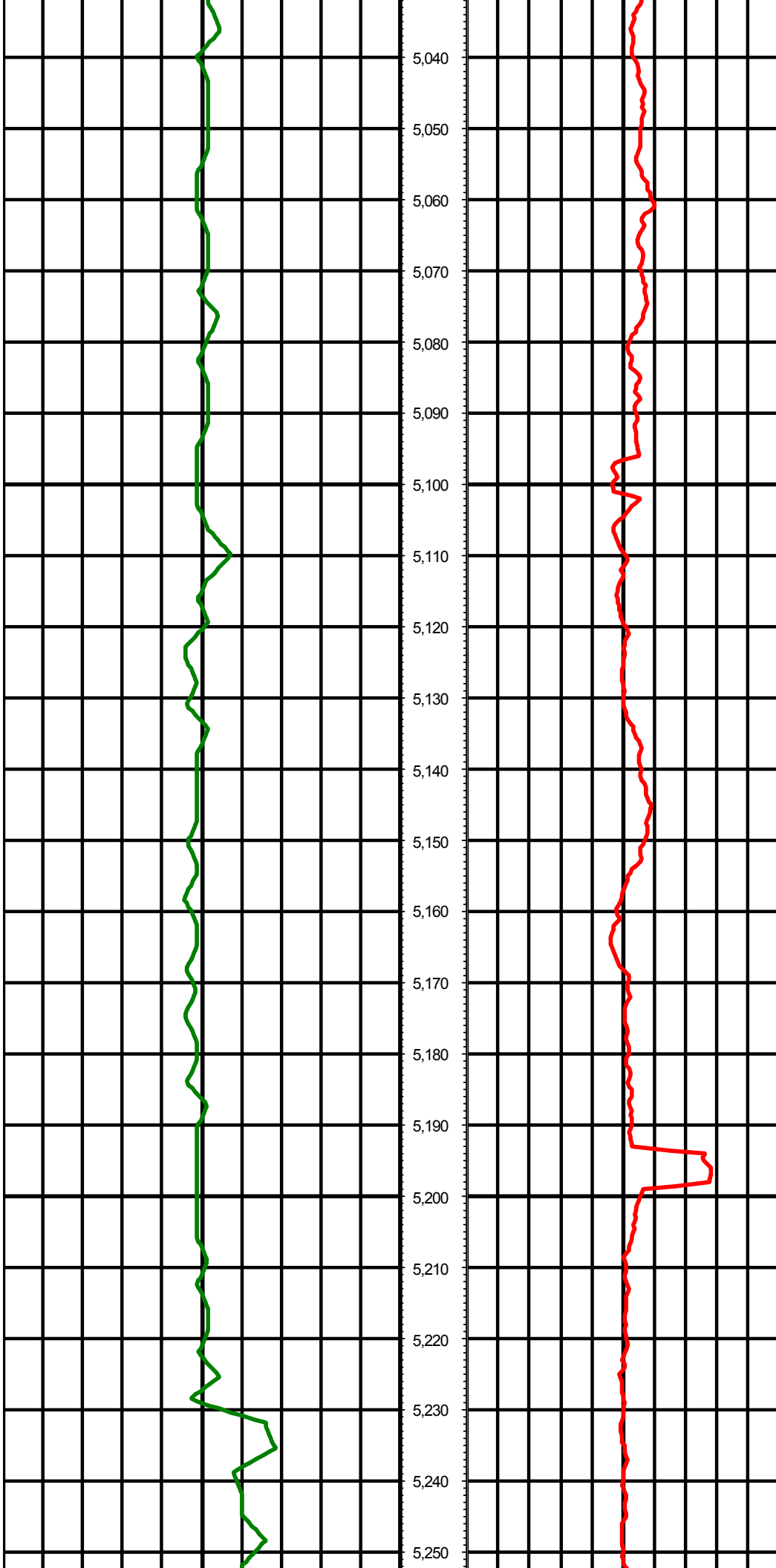
Tool Run Data

Serial Number	Gamma Offset	Resist. Offset	Start Time	Start Depth	End Time	End Depth
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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.

0.00 Gamma Ray(API) 150.00 MD 0.00 ROP (FT/HR) 600.00 Surveys (MD/INC/AZ)
150.00 2 300.00 FT

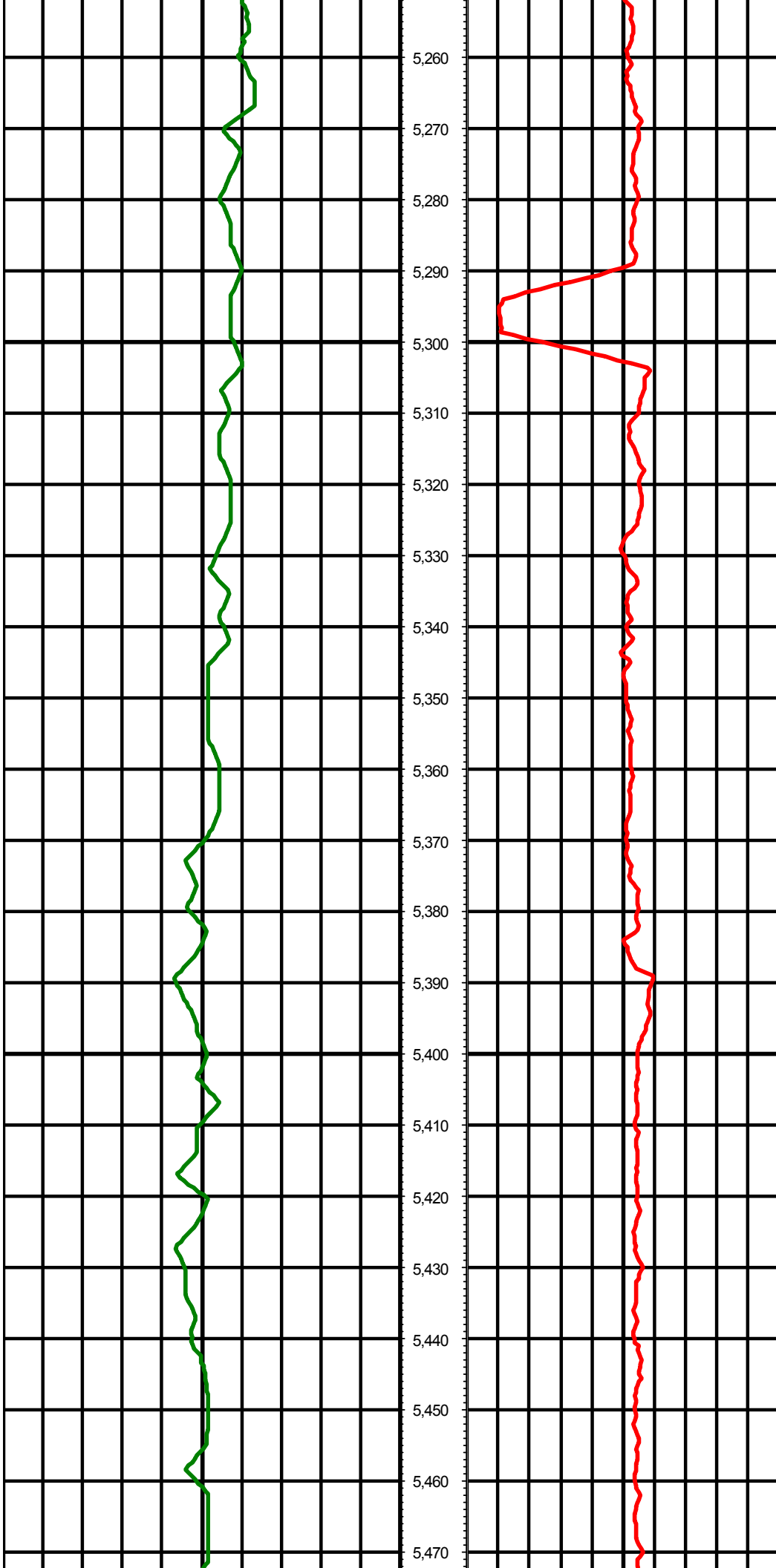




MD: 5048.00 INC: 10.60 AZ: 249.20

MD: 5143.00 INC: 10.00 AZ: 245.50

MD: 5238.00 INC: 9.00 AZ: 244.50



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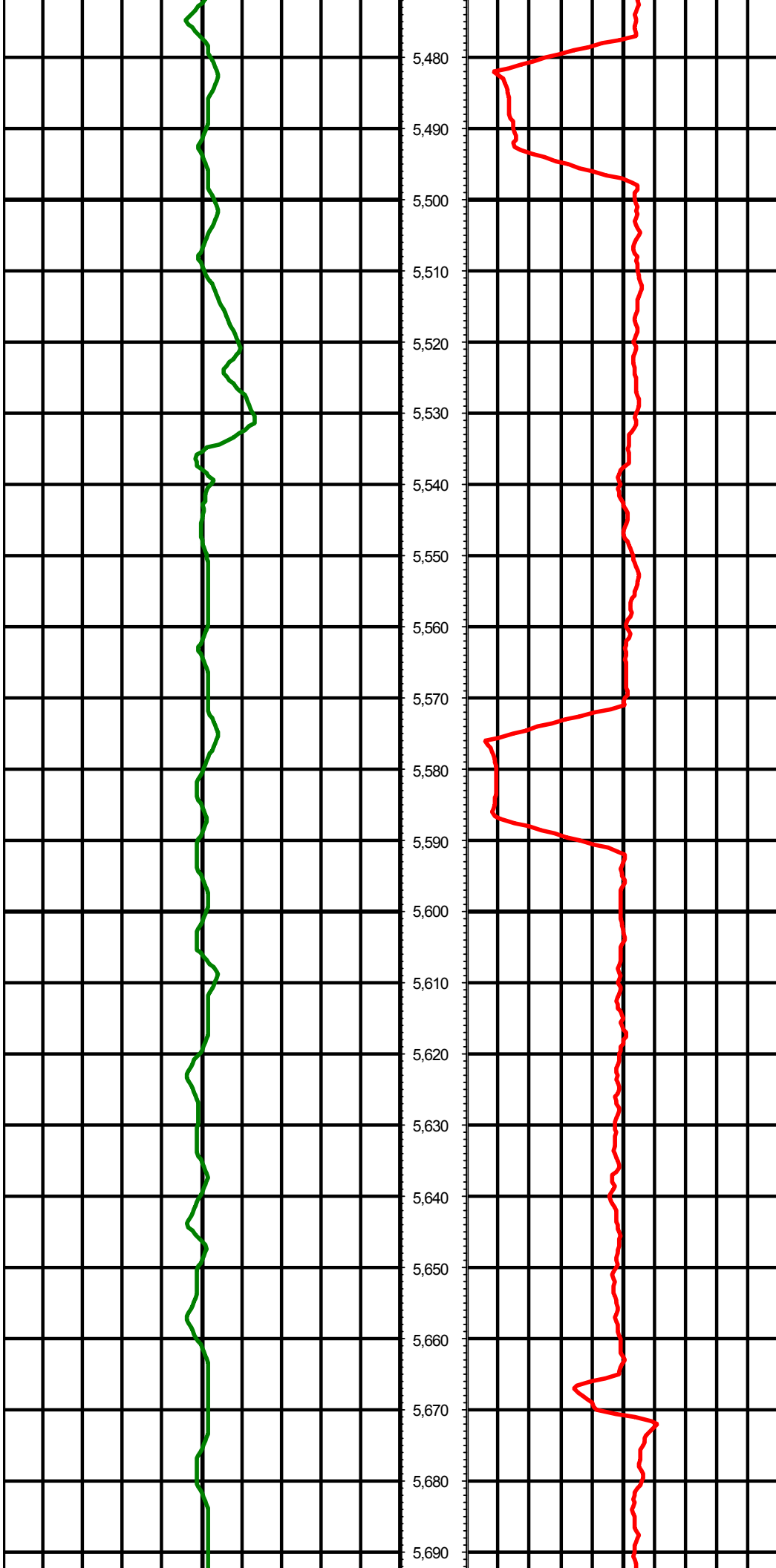
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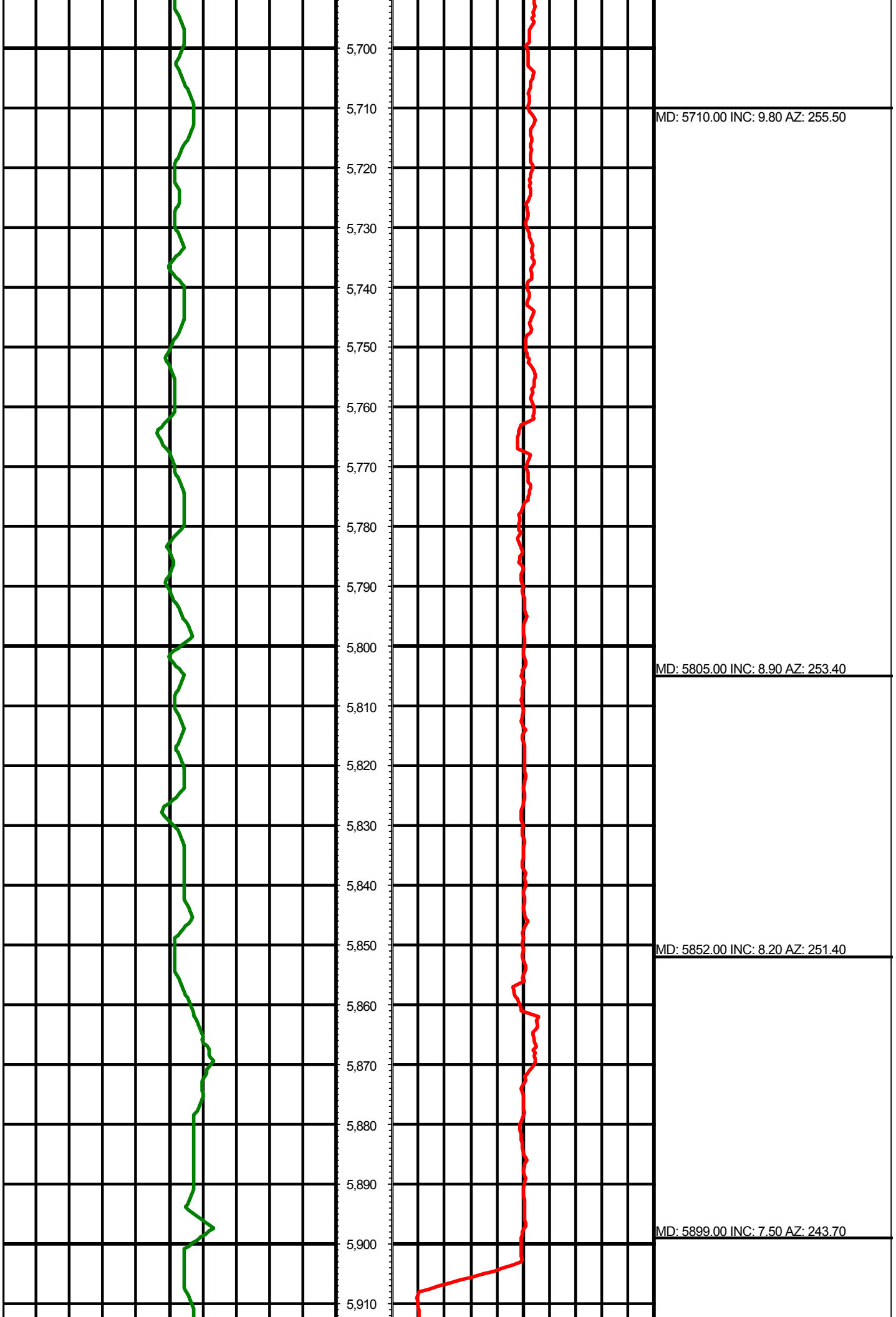
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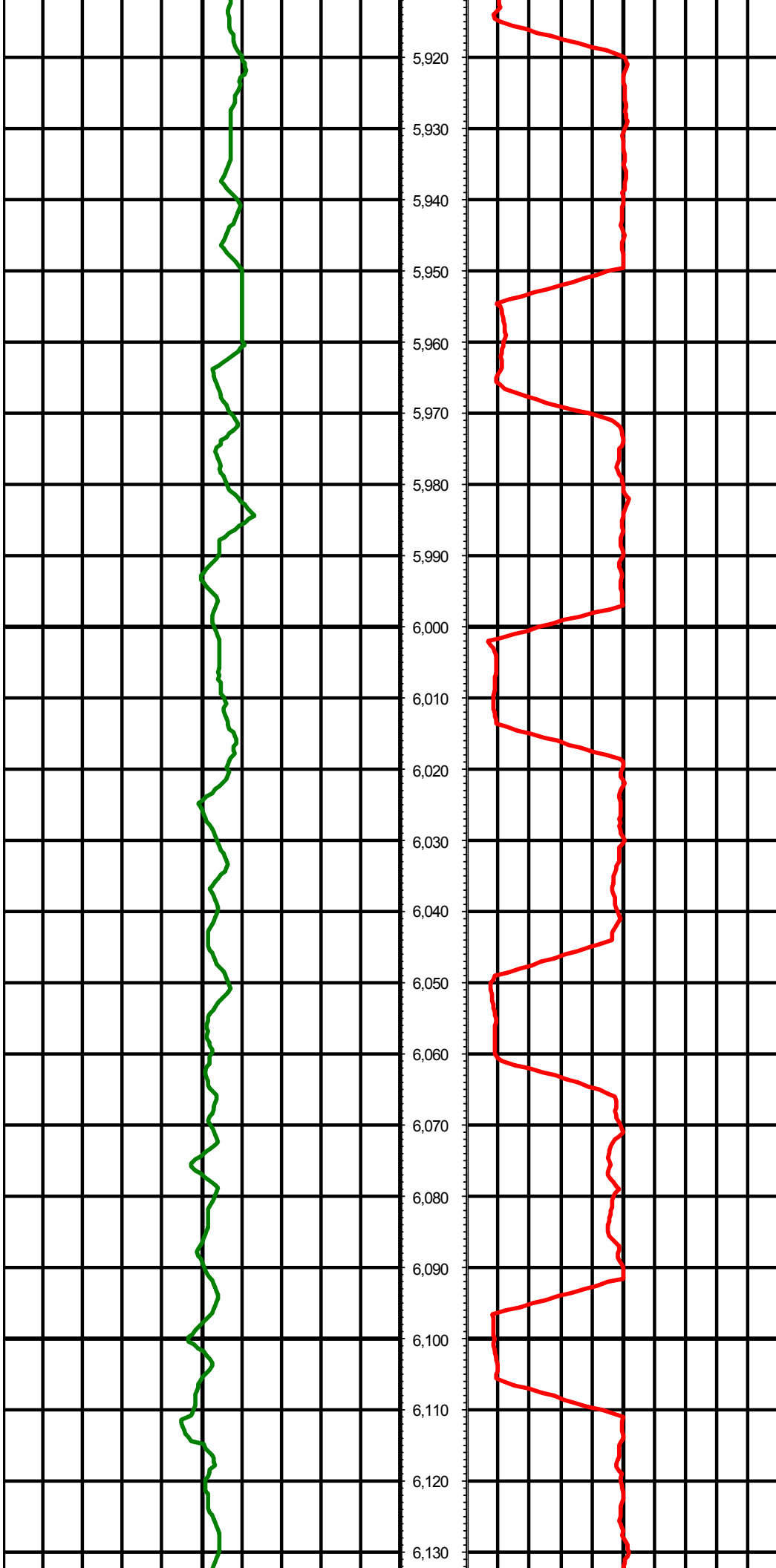


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MD: 5521.00 INC: 8.90 AZ: 255.20

MD: 5616.00 INC: 10.90 AZ: 257.40



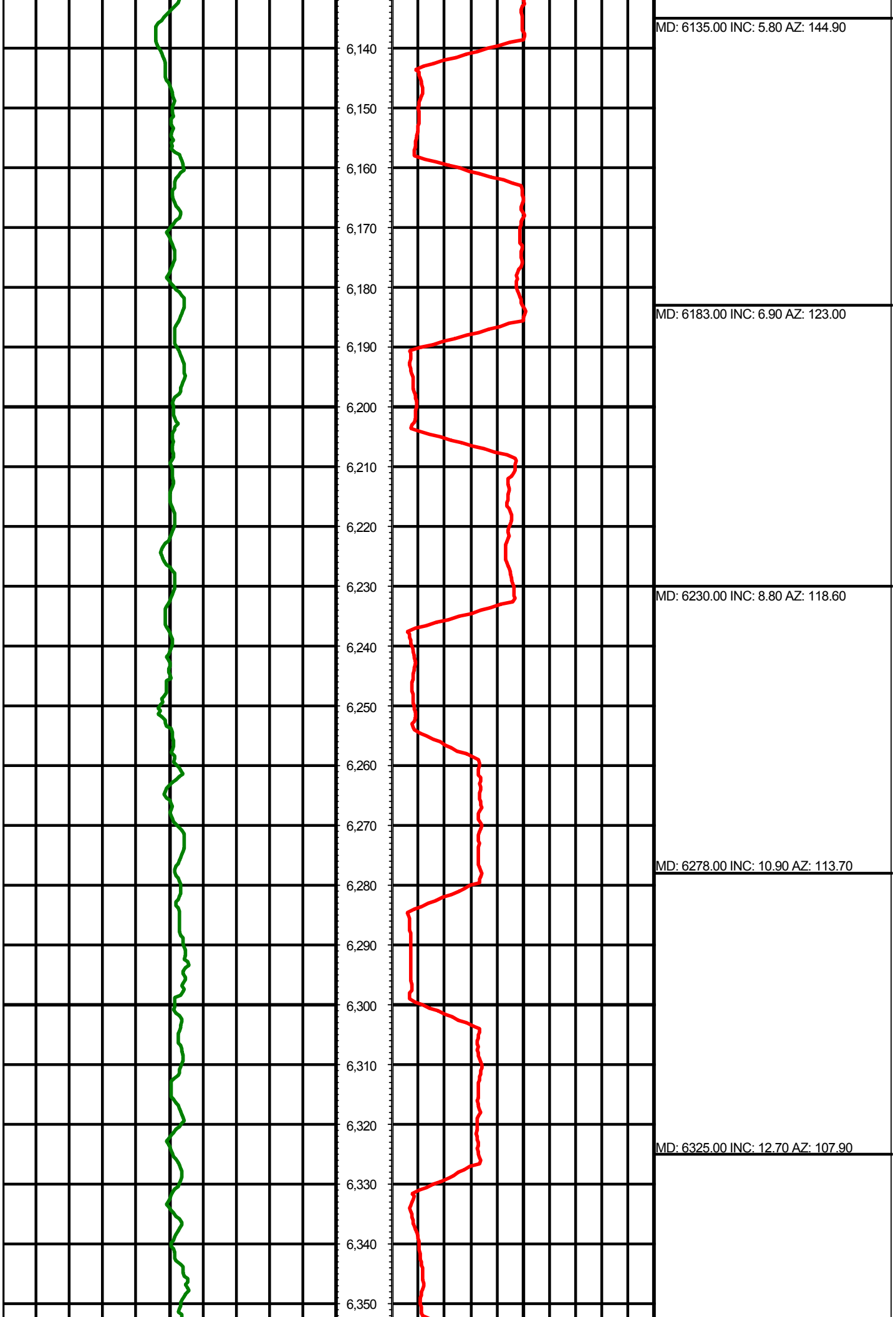


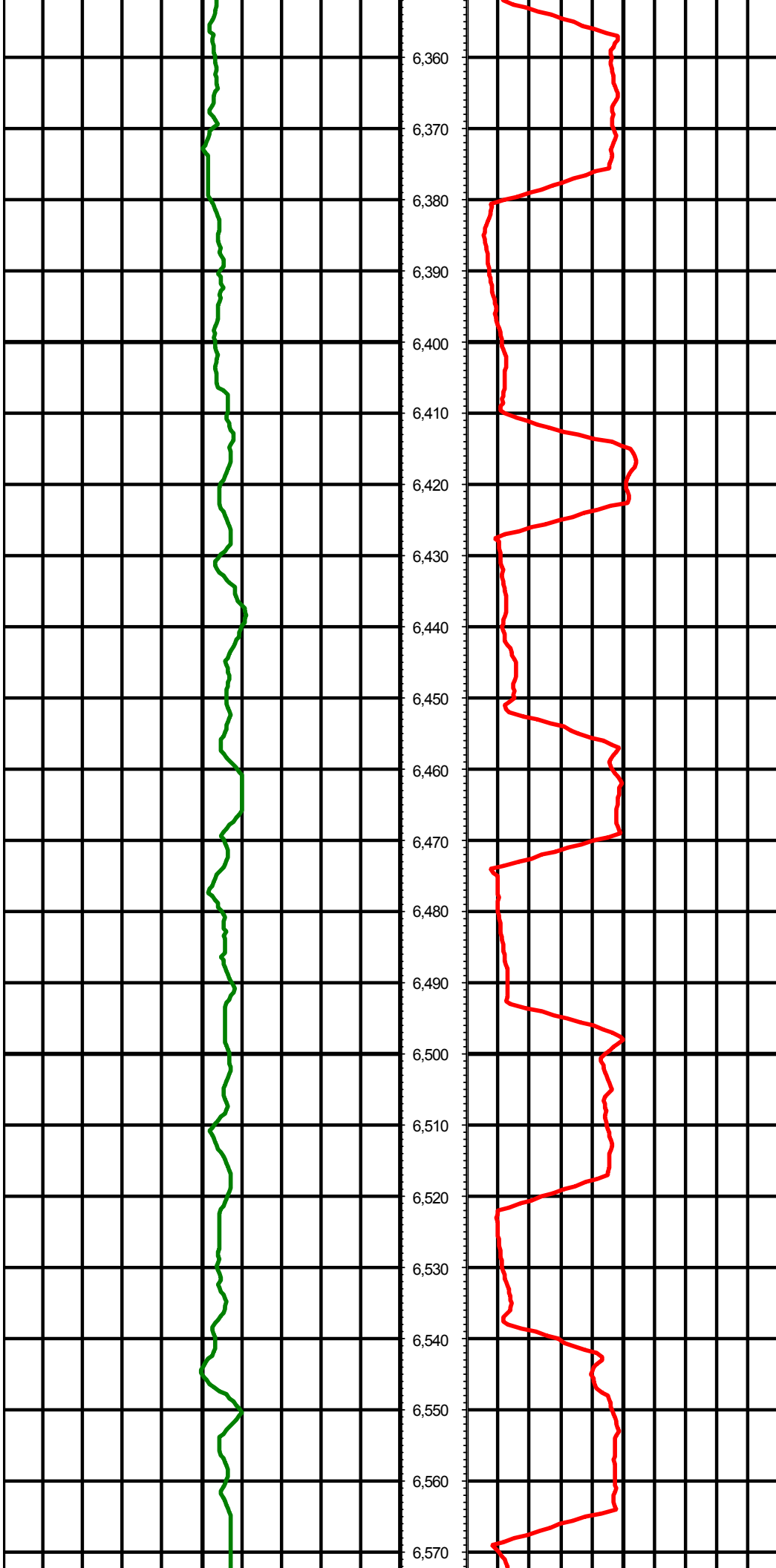
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MD: 5994.00 INC: 5.10 AZ: 209.70

MD: 6041.00 INC: 5.10 AZ: 184.40

MD: 6088.00 INC: 5.50 AZ: 165.50





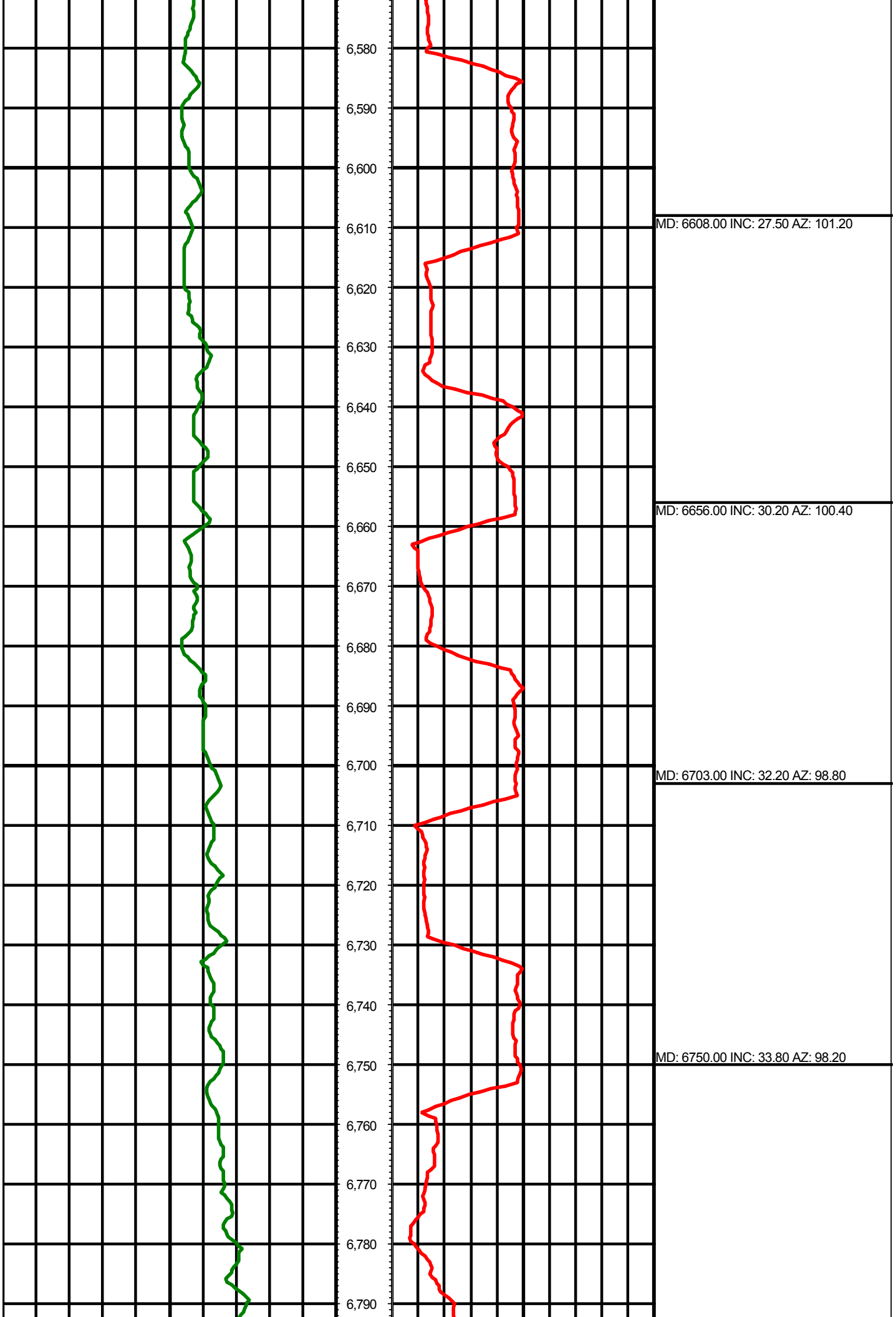
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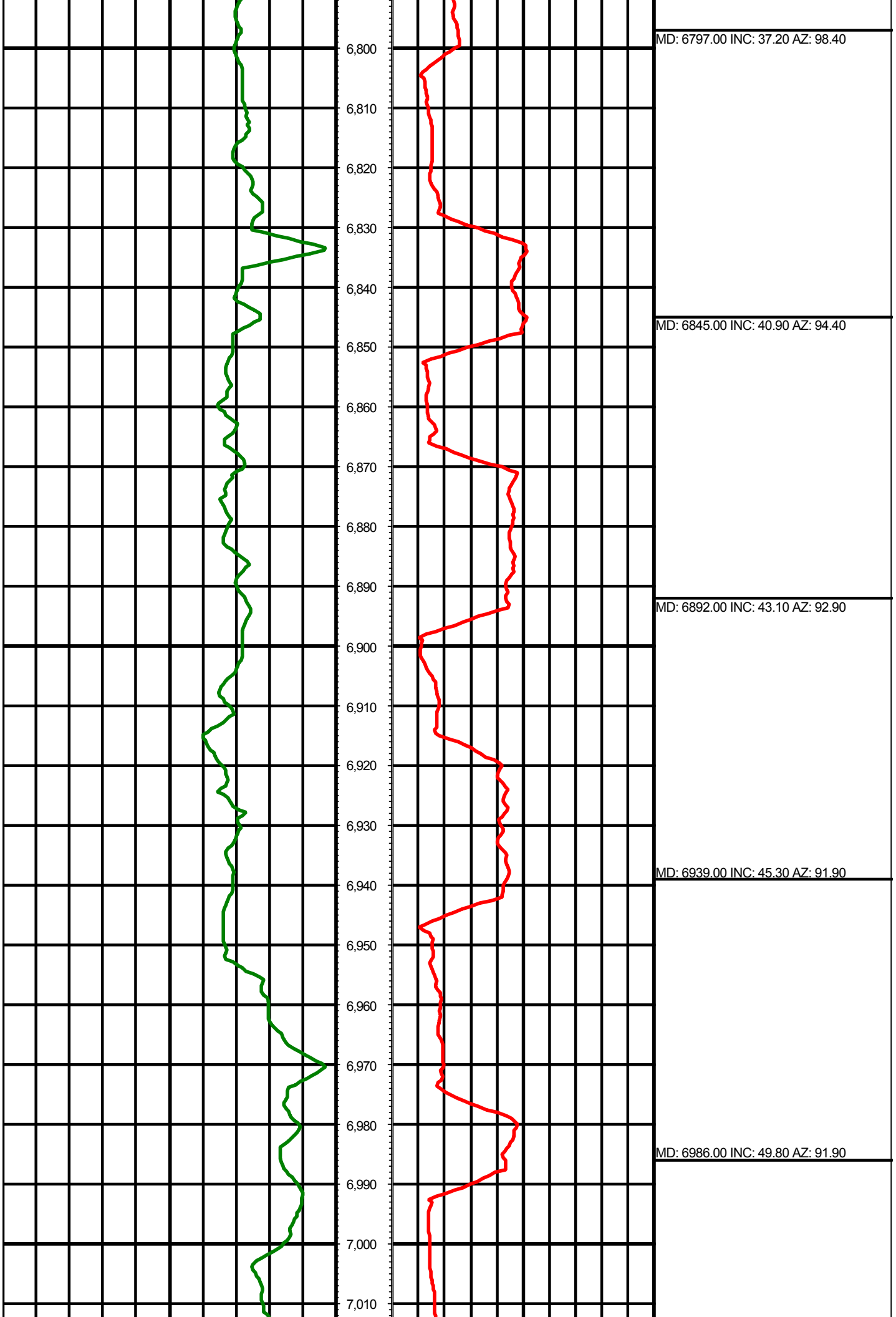
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MD: 6467.00 INC: 20.70 AZ: 101.10

MD: 6514.00 INC: 23.50 AZ: 98.30

MD: 6561.00 INC: 25.50 AZ: 100.40





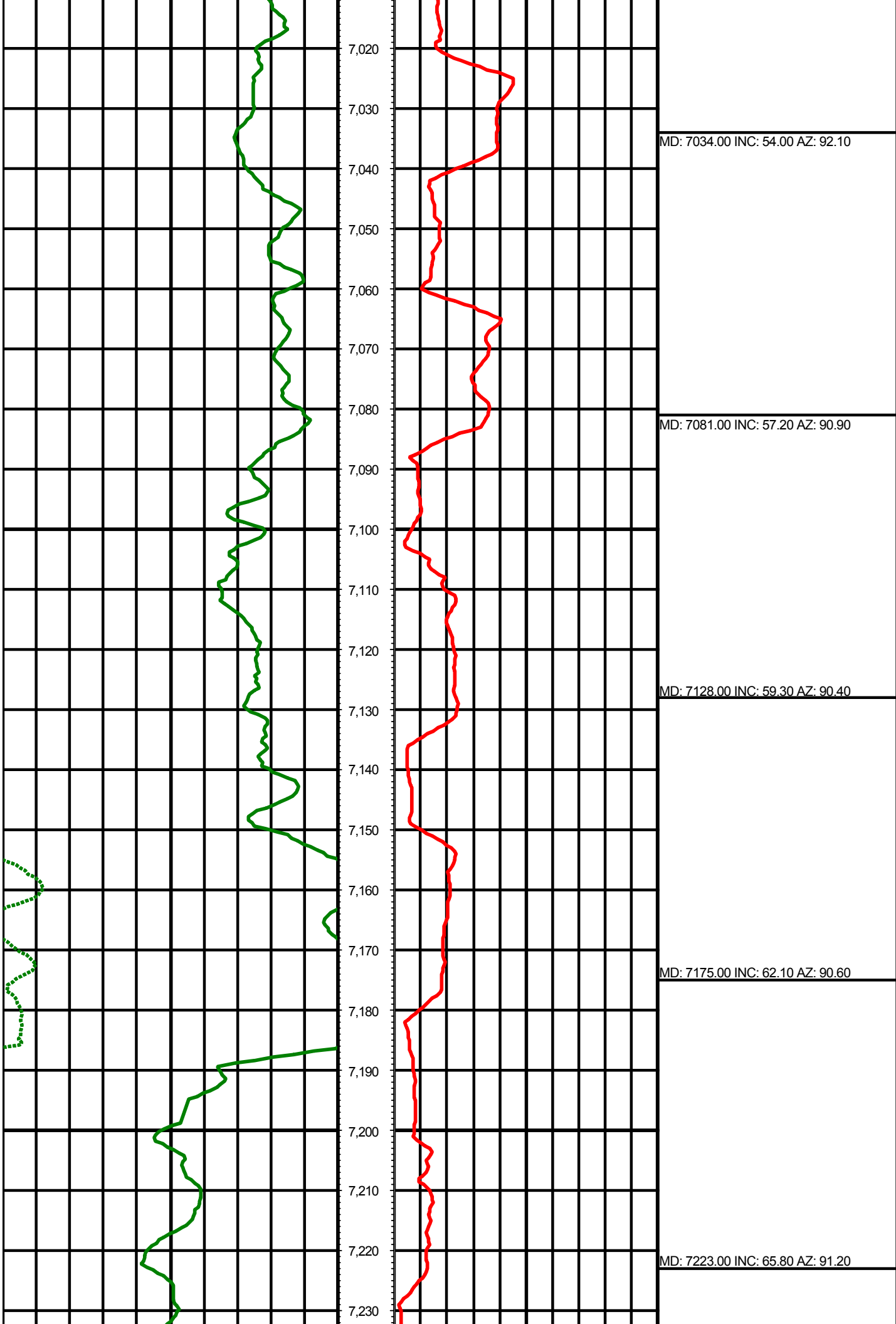
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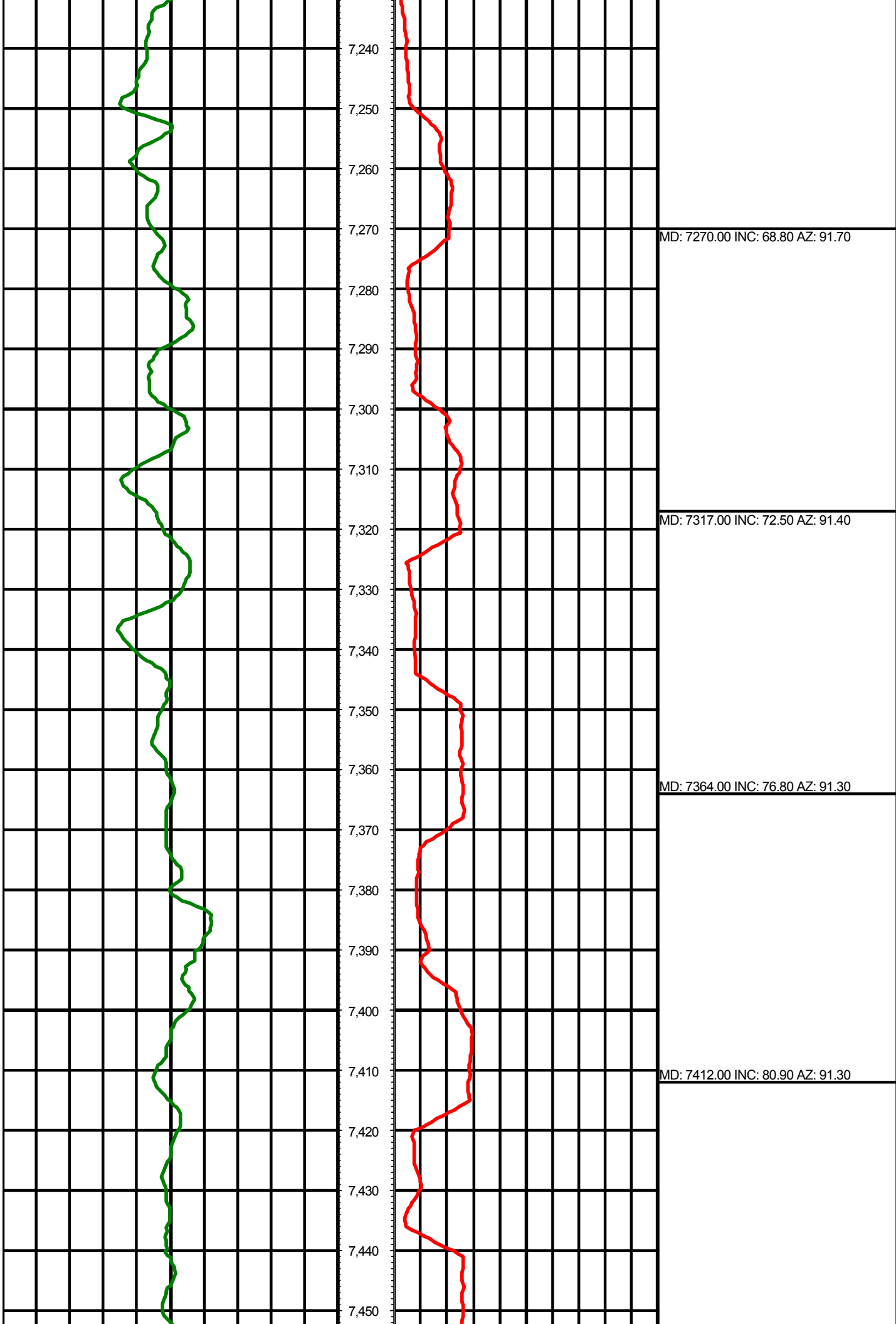
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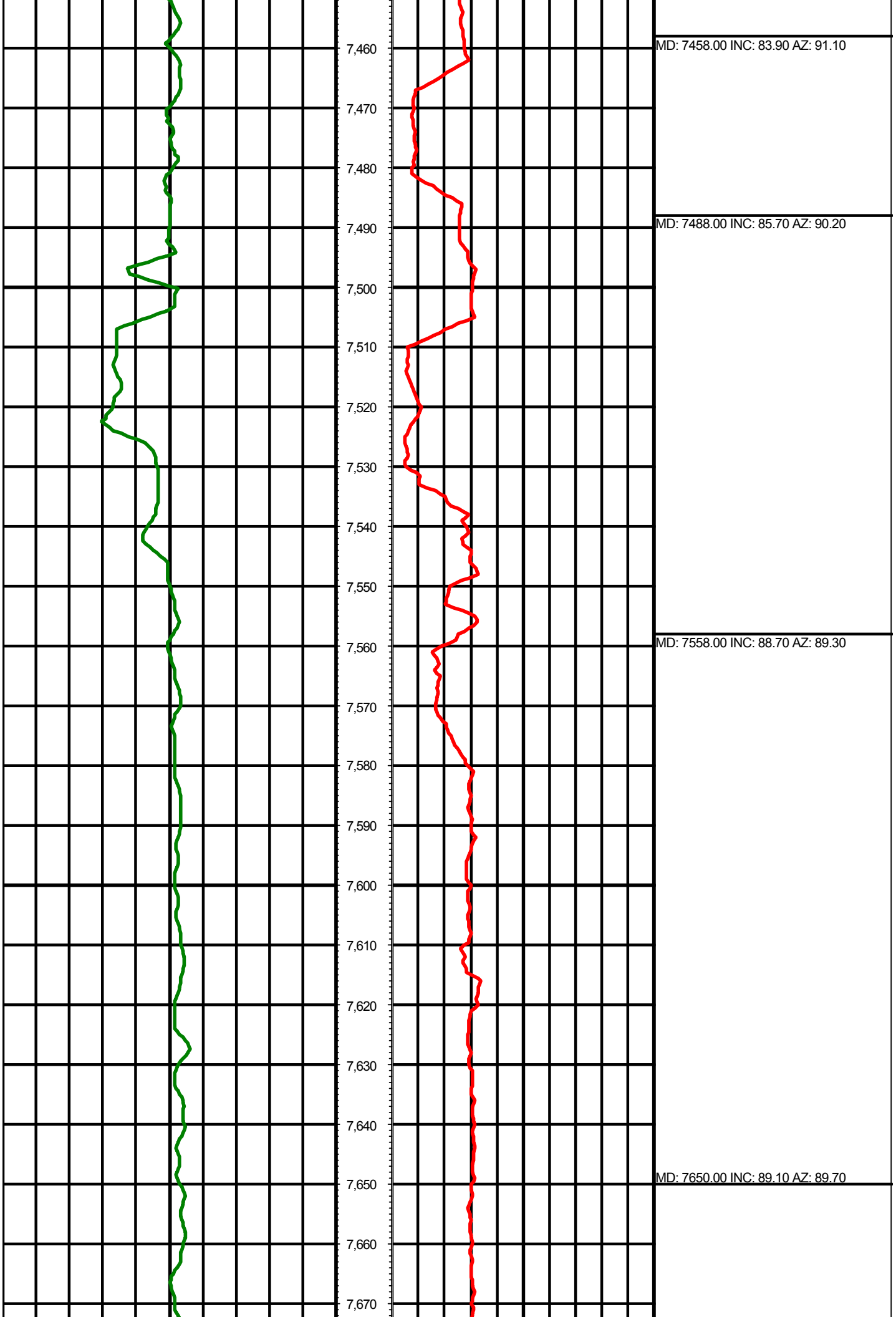
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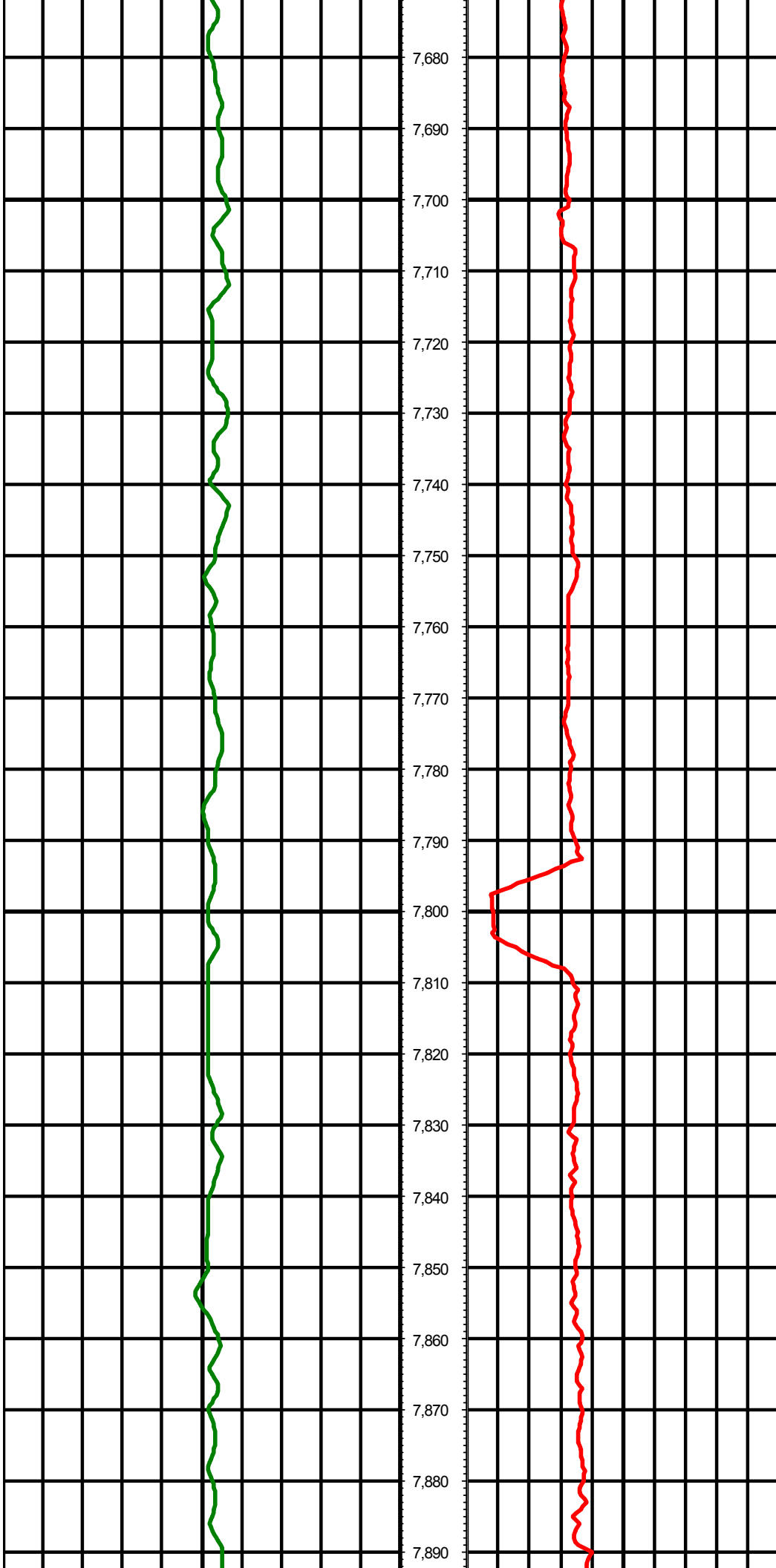
MD: 6939.00 INC: 45.30 AZ: 91.90

MD: 6986.00 INC: 49.80 AZ: 91.90









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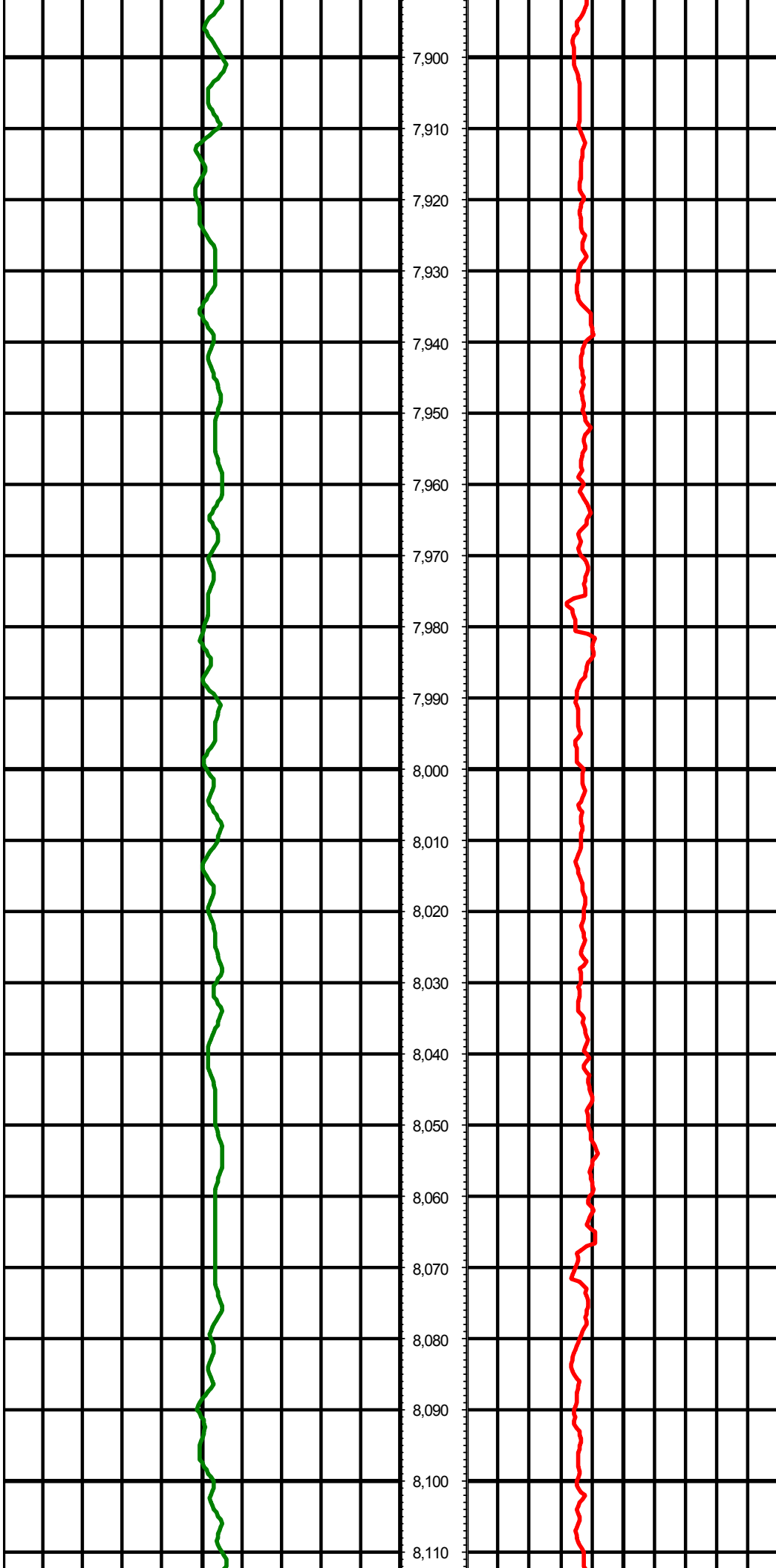
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MD: 7742.00 INC: 88.70 AZ: 89.30

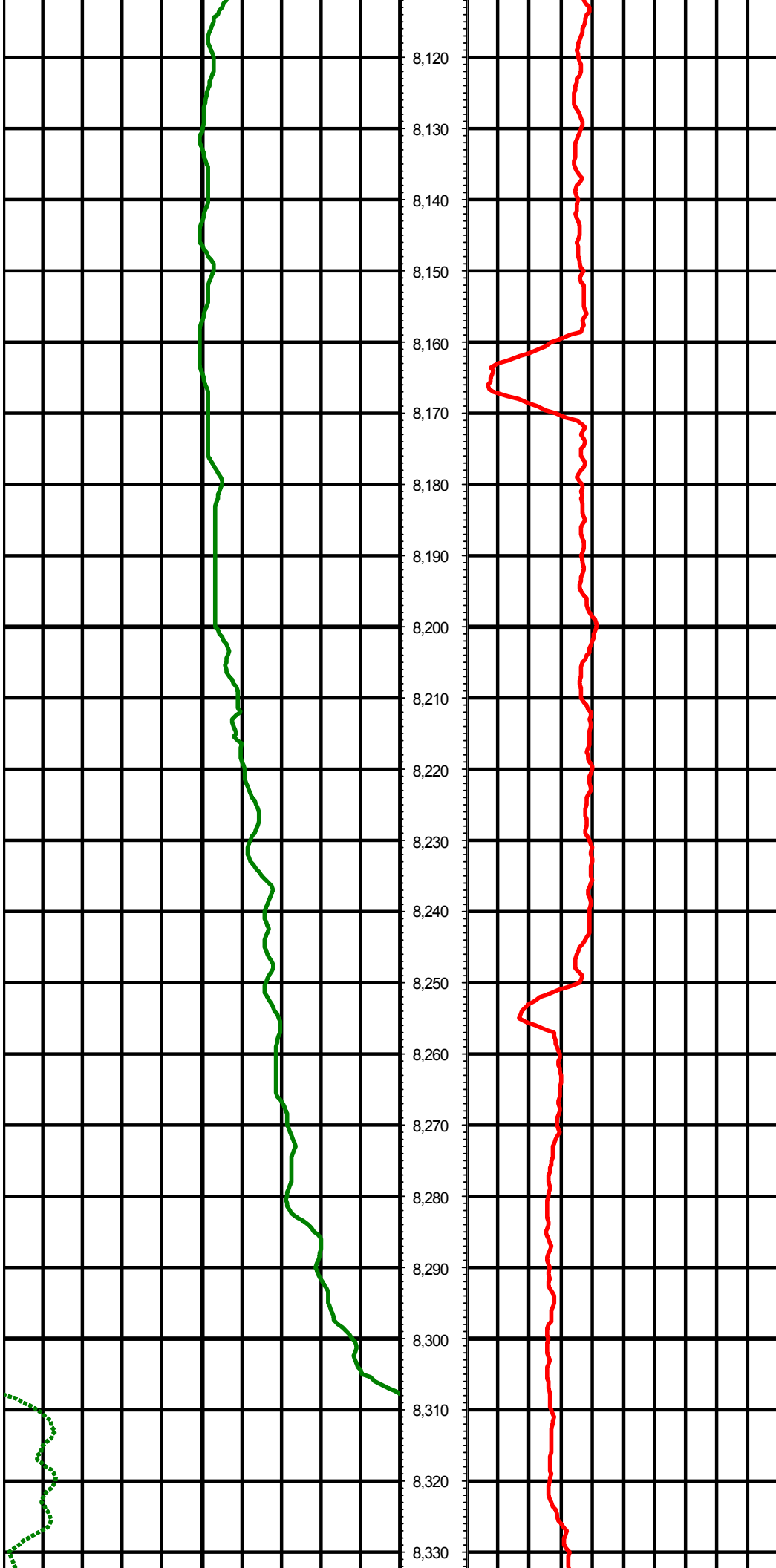
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MD: 7926.00 INC: 90.10 AZ: 91.20

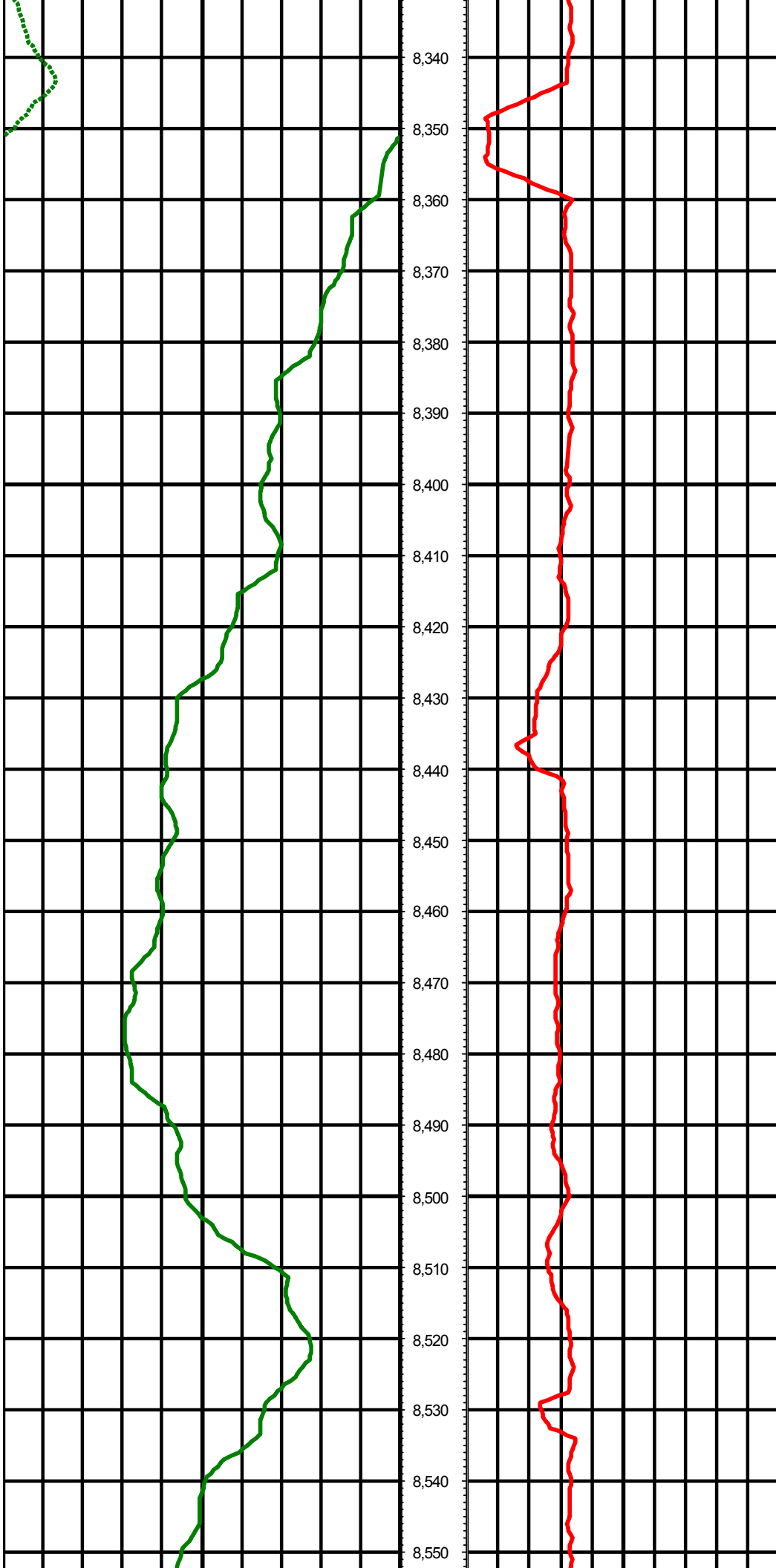
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MD: 8110.00 INC: 89.50 AZ: 90.60



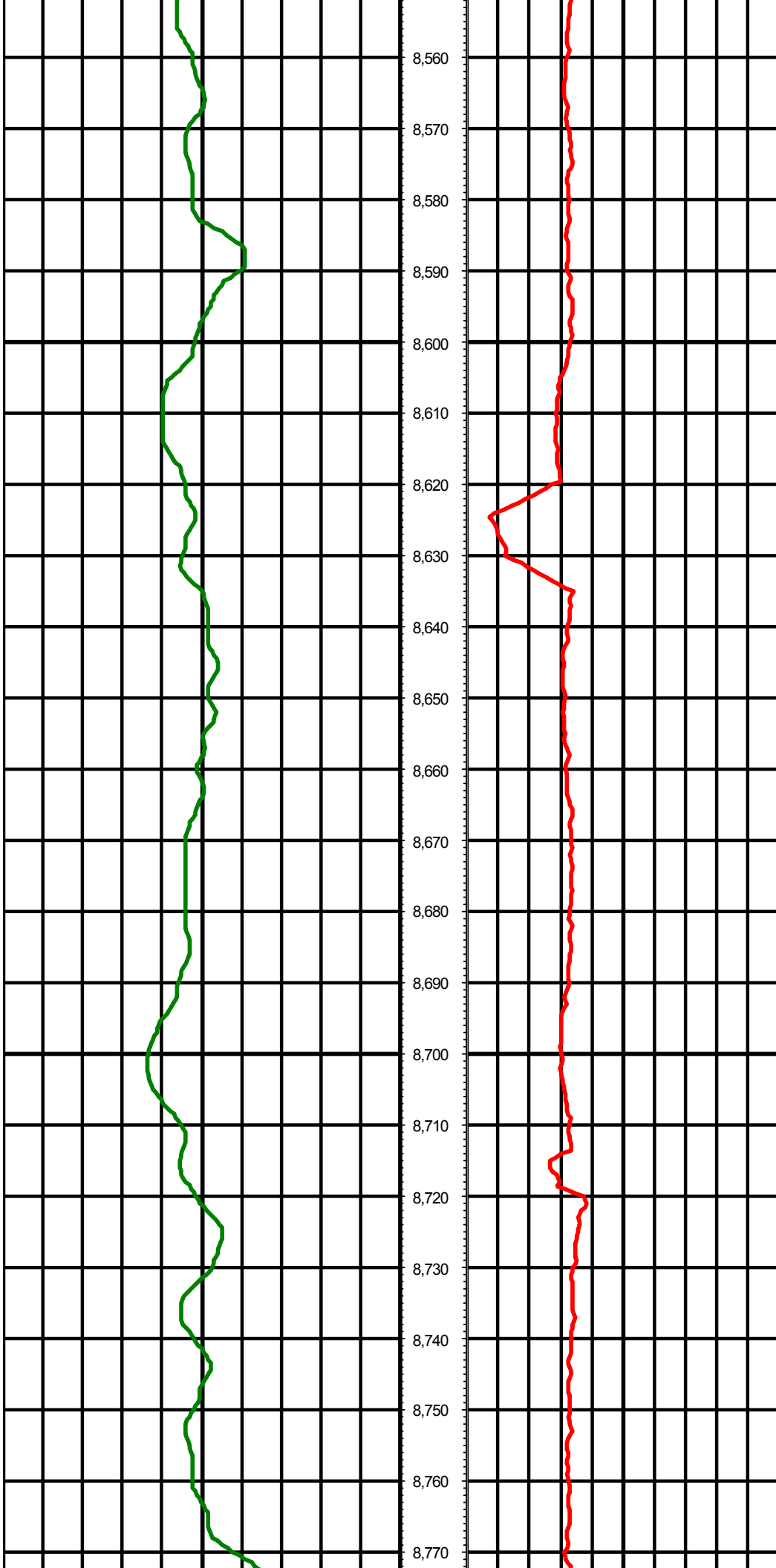
MD: 8202.00 INC: 88.90 AZ: 90.90

MD: 8294.00 INC: 89.40 AZ: 91.10



MD: 8386.00 INC: 87.60 AZ: 90.50

MD: 8479.00 INC: 88.00 AZ: 90.30



MD: 8571.00 INC: 88.00 AZ: 89.80

MD: 8665.00 INC: 90.70 AZ: 90.50

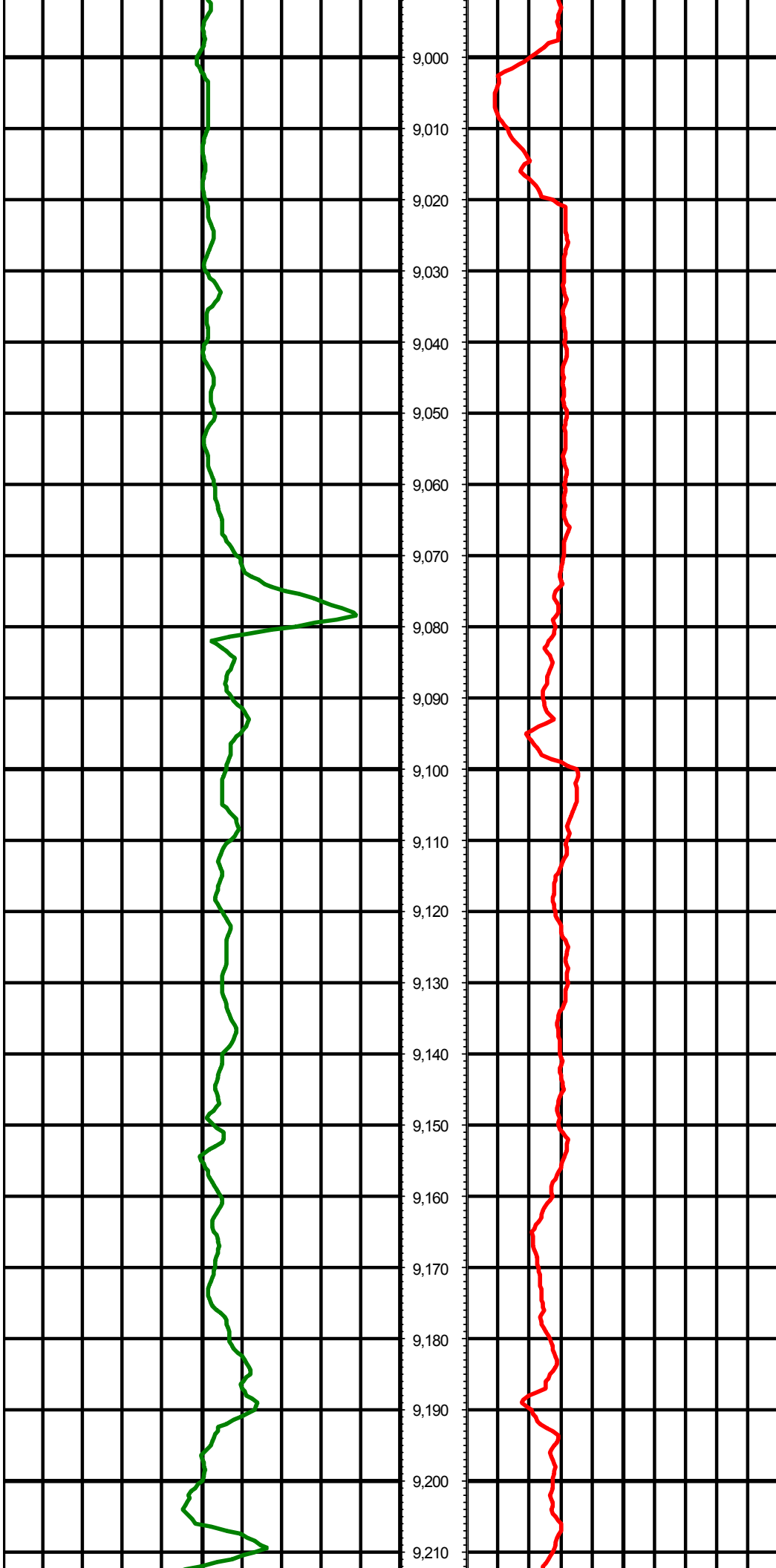
MD: 8760.00 INC: 92.10 AZ: 90.00



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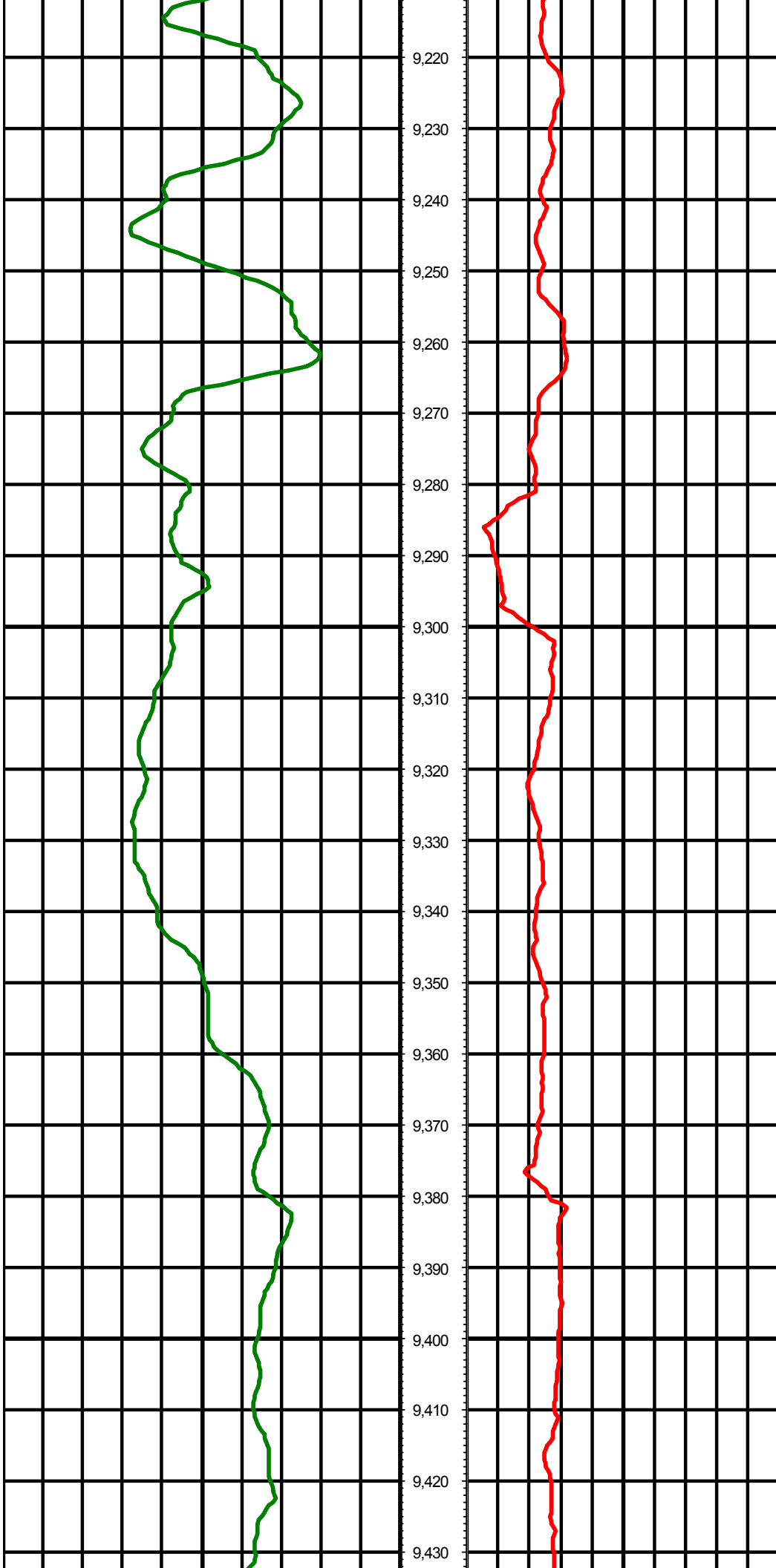
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MD: 8949.00 INC: 90.30 AZ: 89.00



MD: 9043.00 INC: 88.60 AZ: 89.00

MD: 9138.00 INC: 88.60 AZ: 88.90



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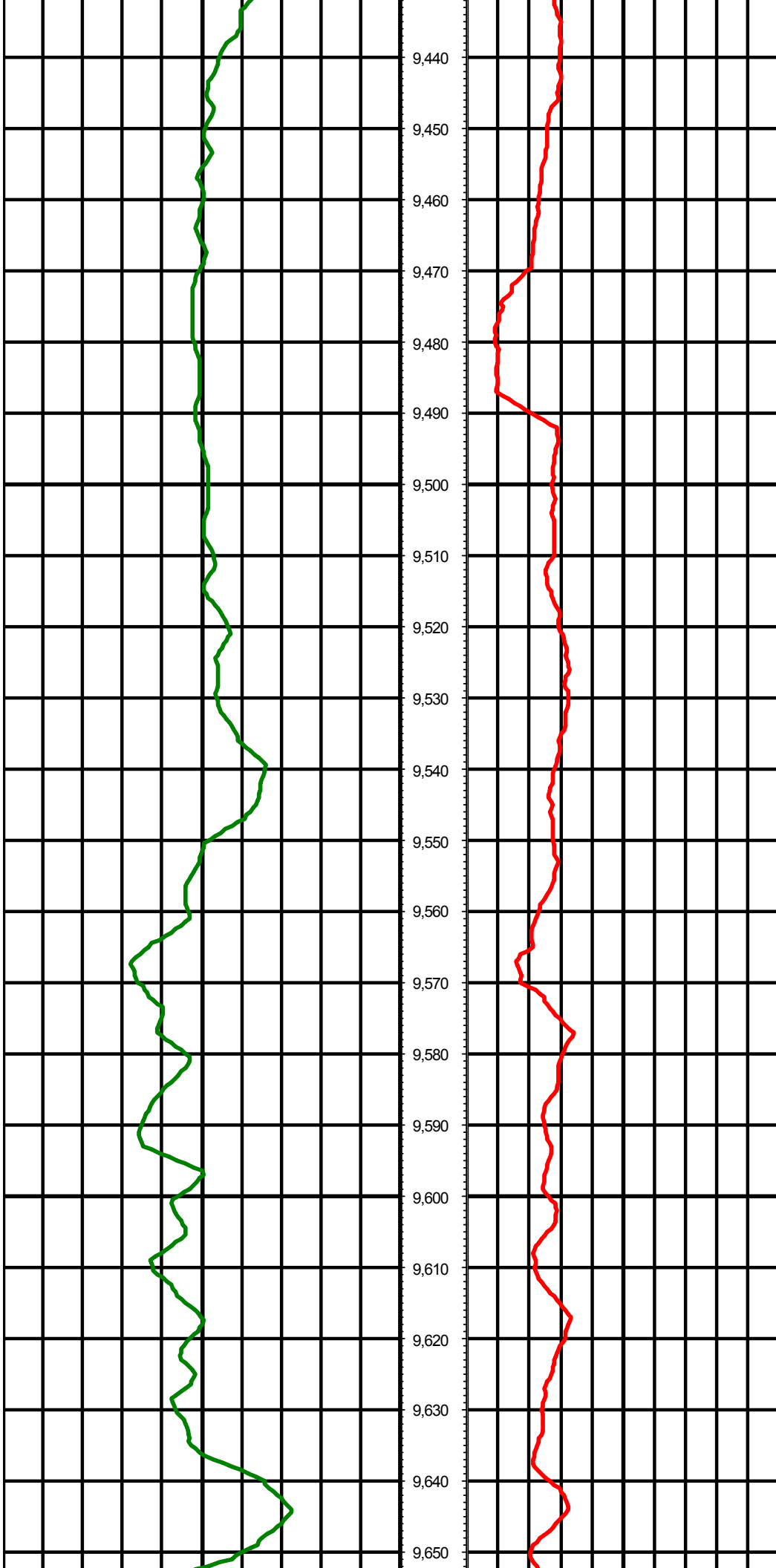
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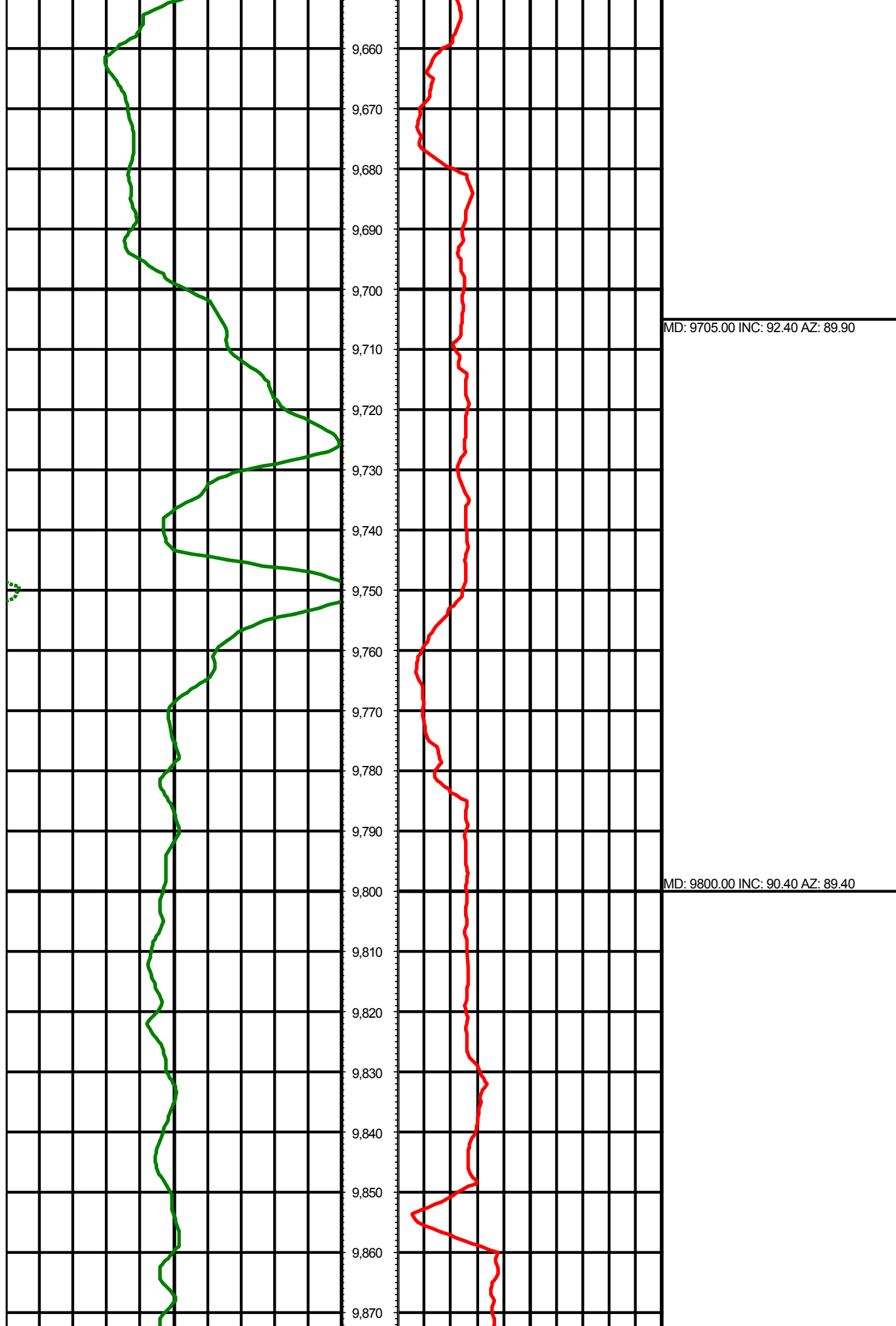
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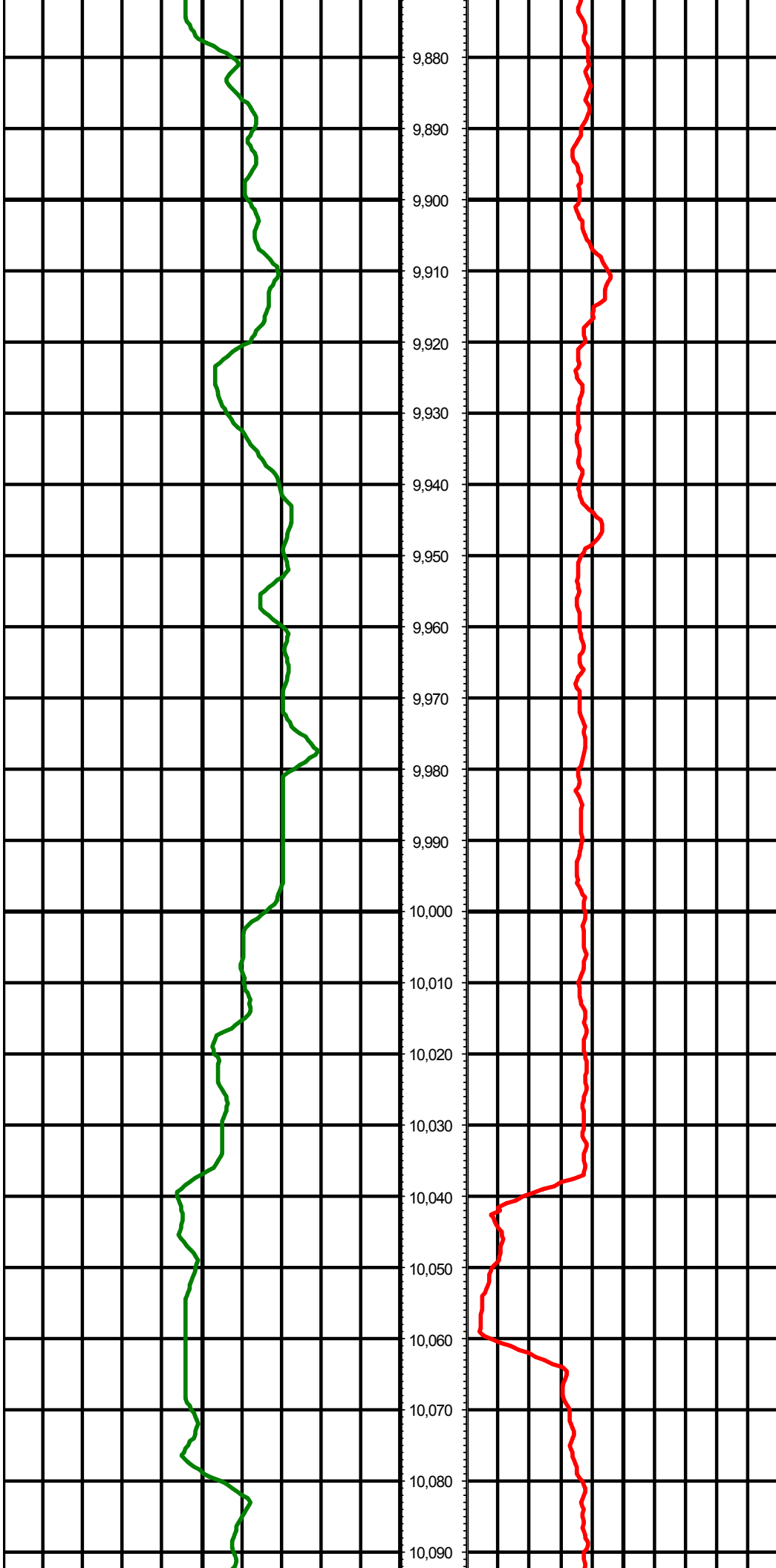
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MD: 9516.00 INC: 90.10 AZ: 89.70

MD: 9611.00 INC: 91.50 AZ: 89.80





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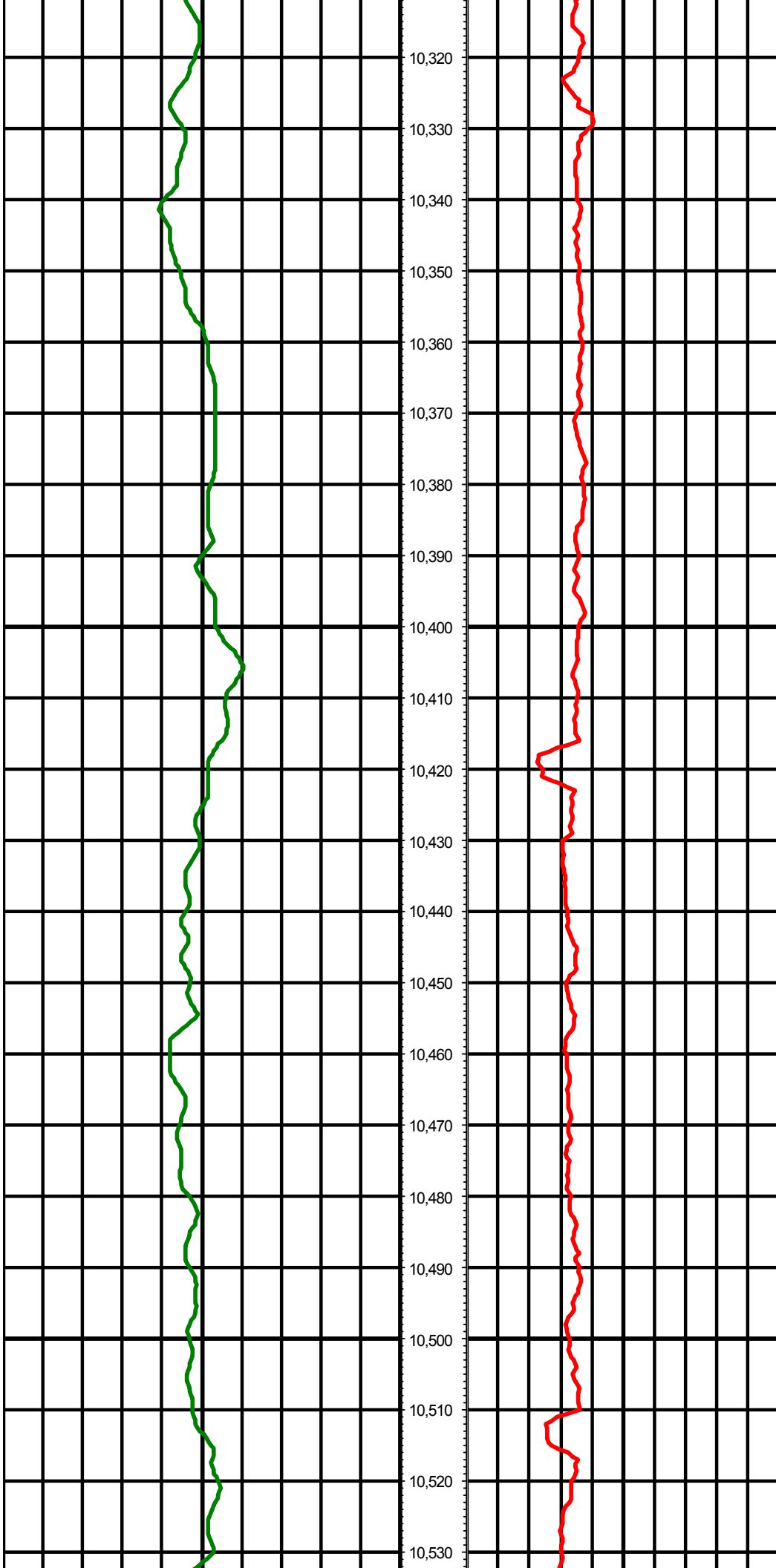
MD: 10082.00 INC: 88.60 AZ: 89.20



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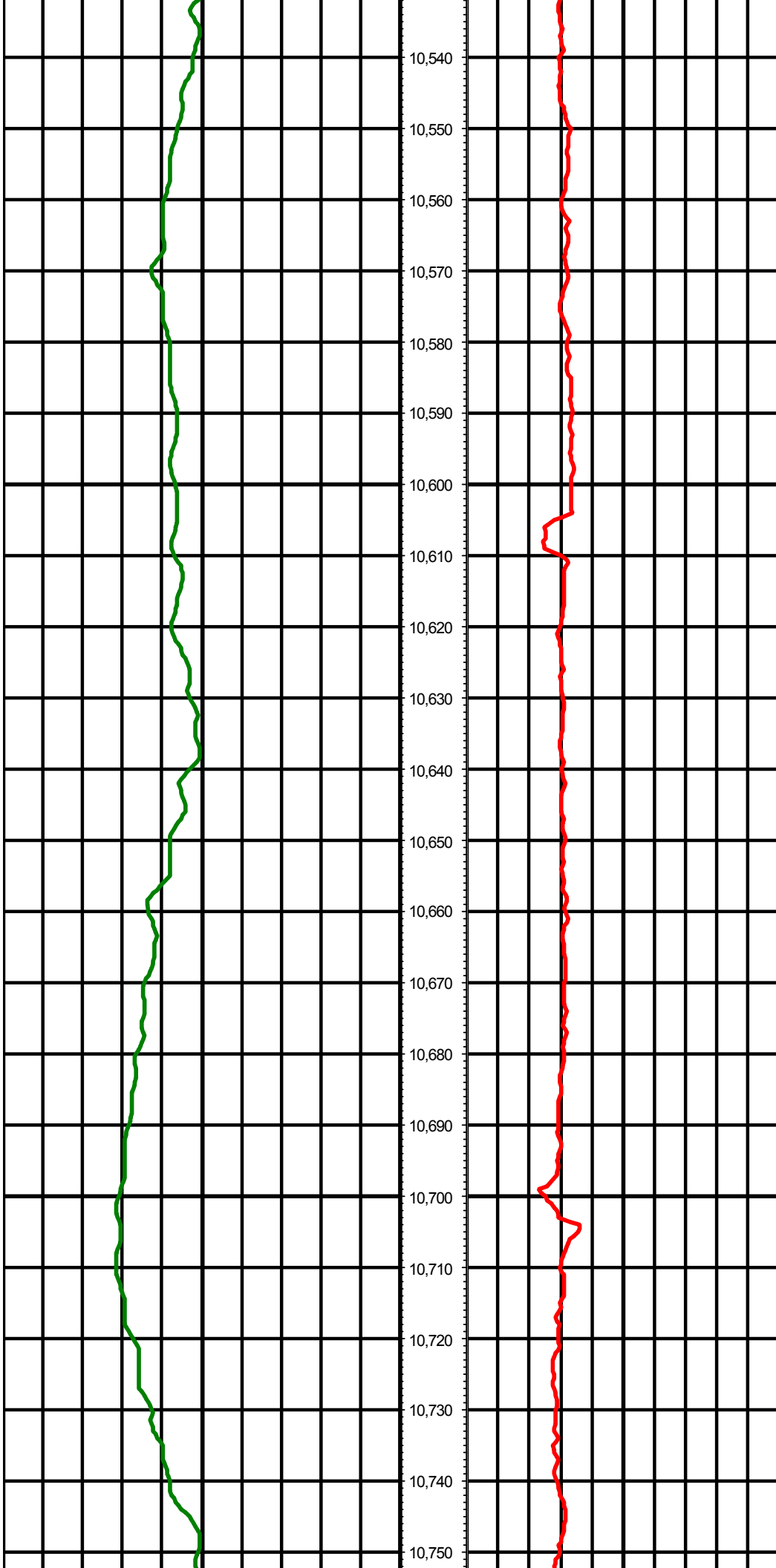
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MD: 10461.00 INC: 90.20 AZ: 90.50



MD: 10555.00 INC: 90.20 AZ: 90.10

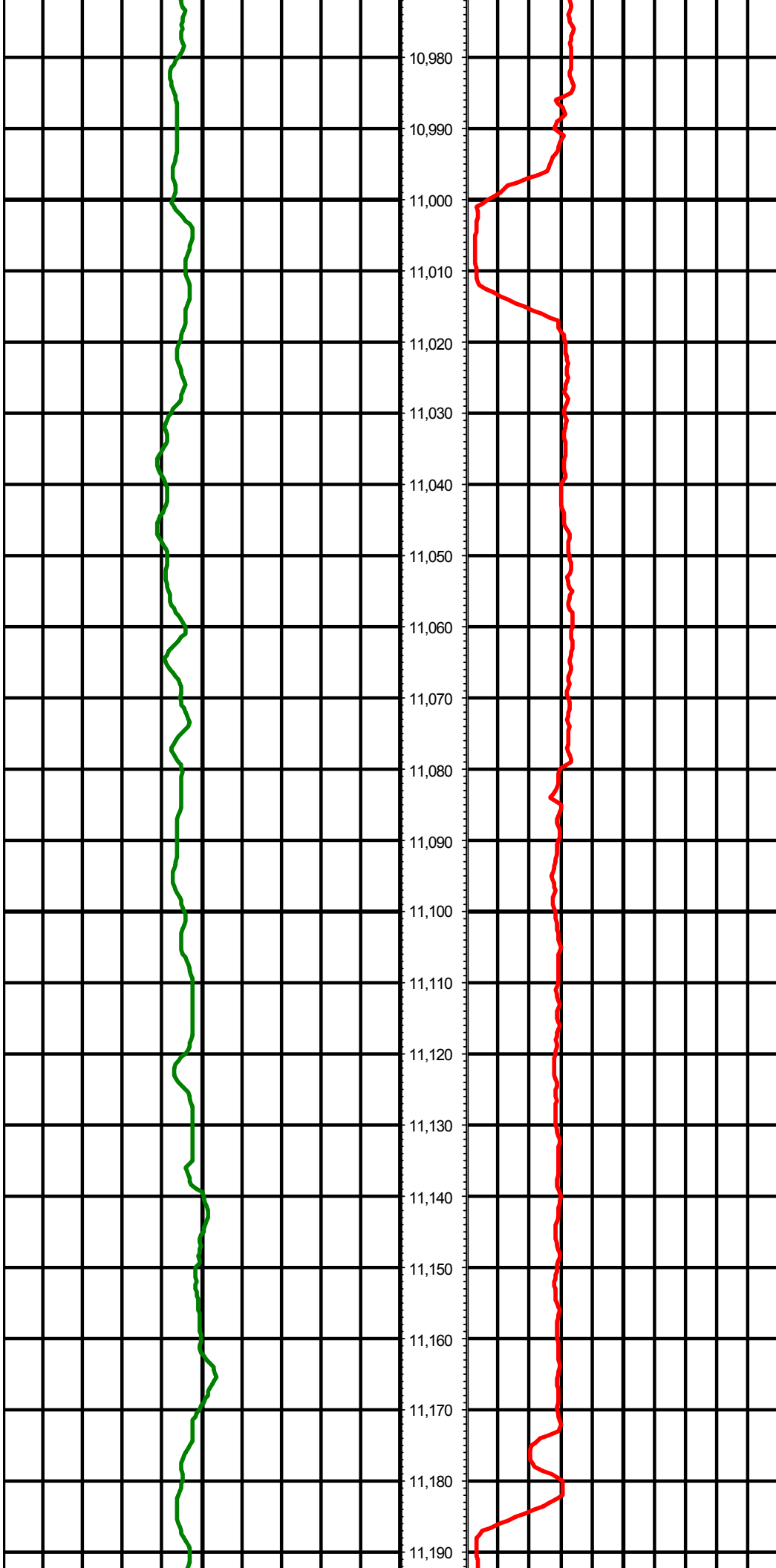
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MD: 10744.00 INC: 90.60 AZ: 89.60



MD: 10839.00 INC: 89.30 AZ: 89.90

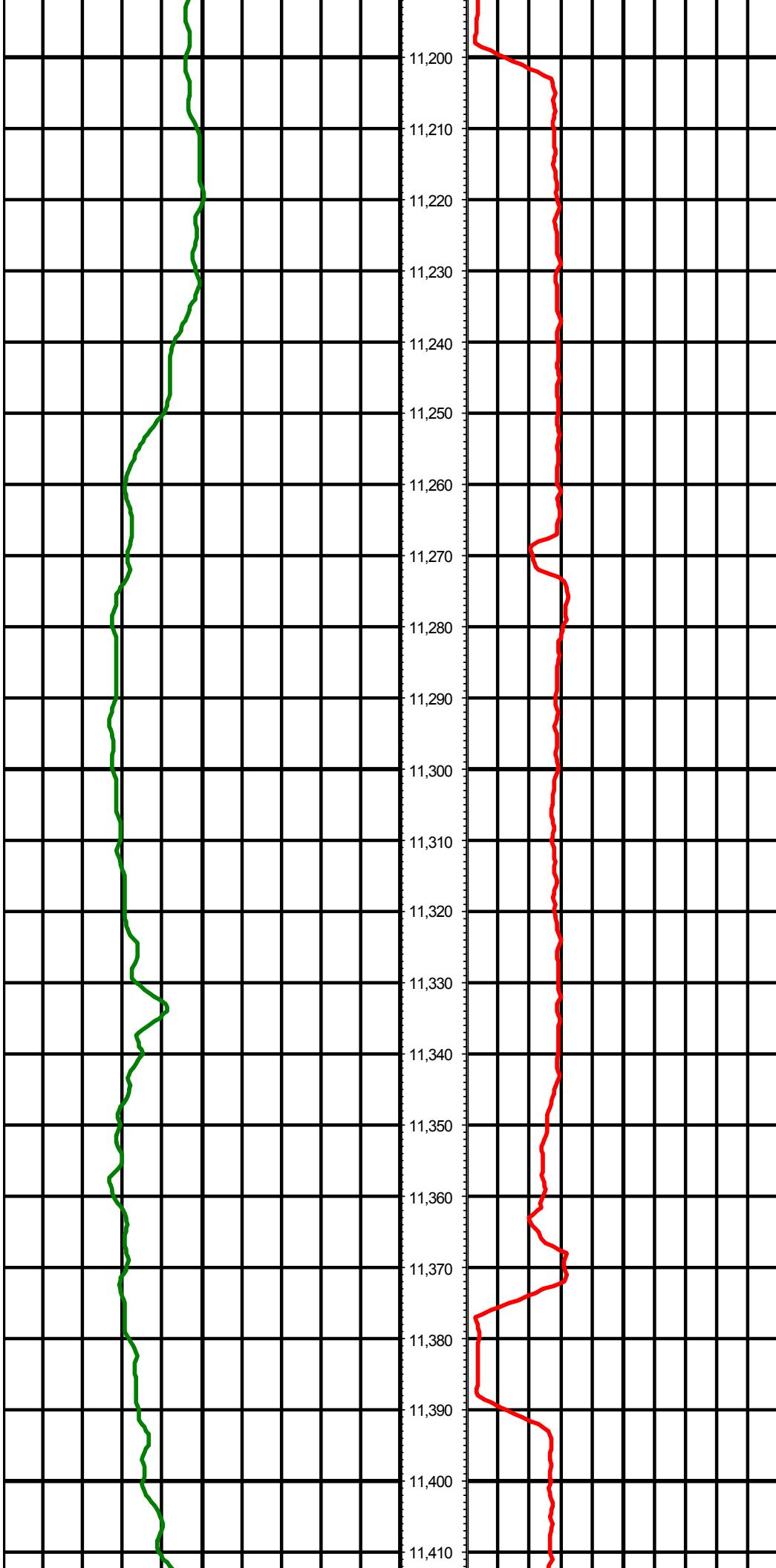
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MD: 11028.00 INC: 87.10 AZ: 89.50

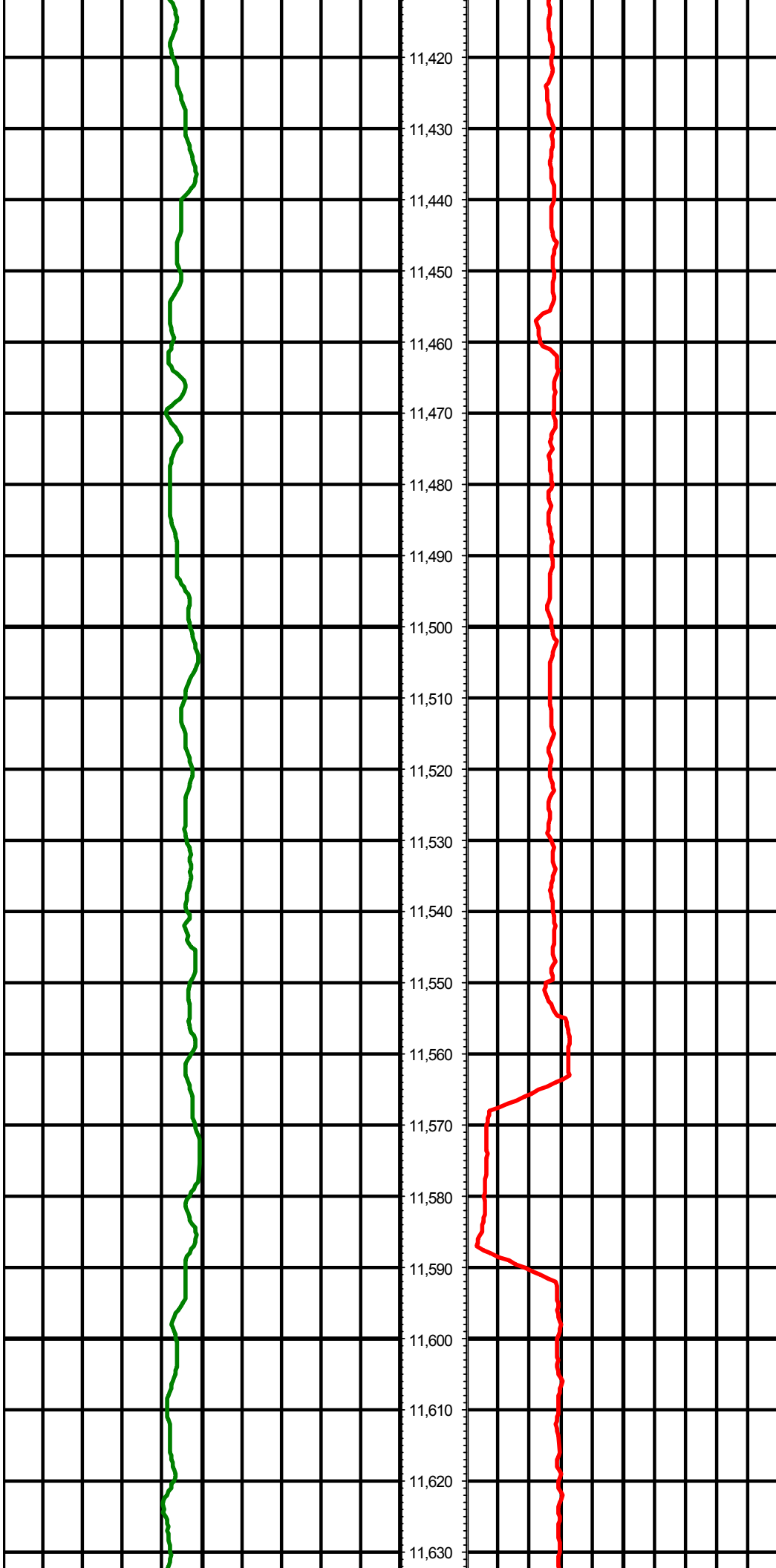
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MD: 11217.00 INC: 87.40 AZ: 91.30

MD: 11311.00 INC: 88.00 AZ: 91.70

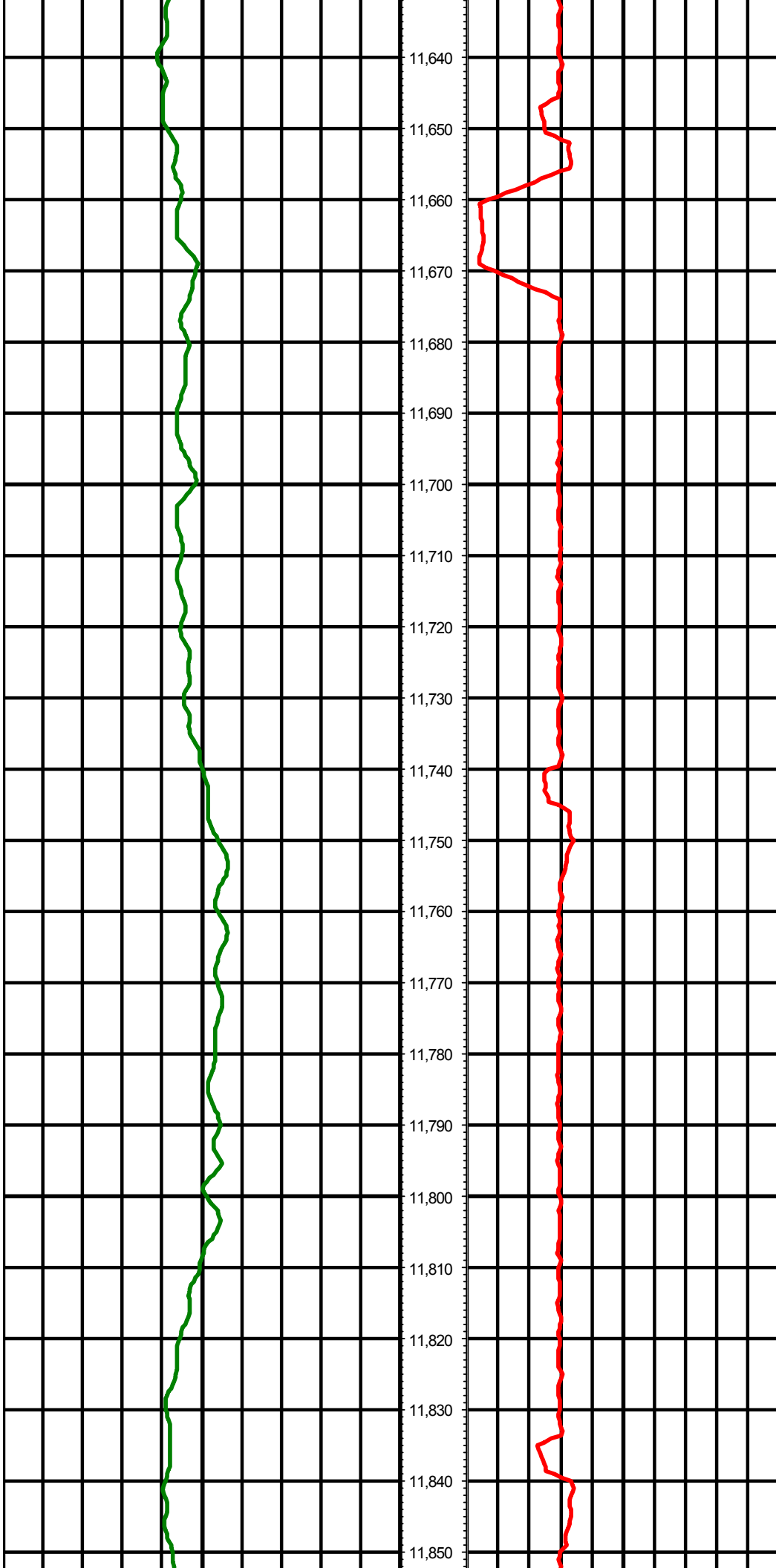
MD: 11406.00 INC: 86.80 AZ: 91.20



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MD: 11501.00 INC: 88.00 AZ: 91.80

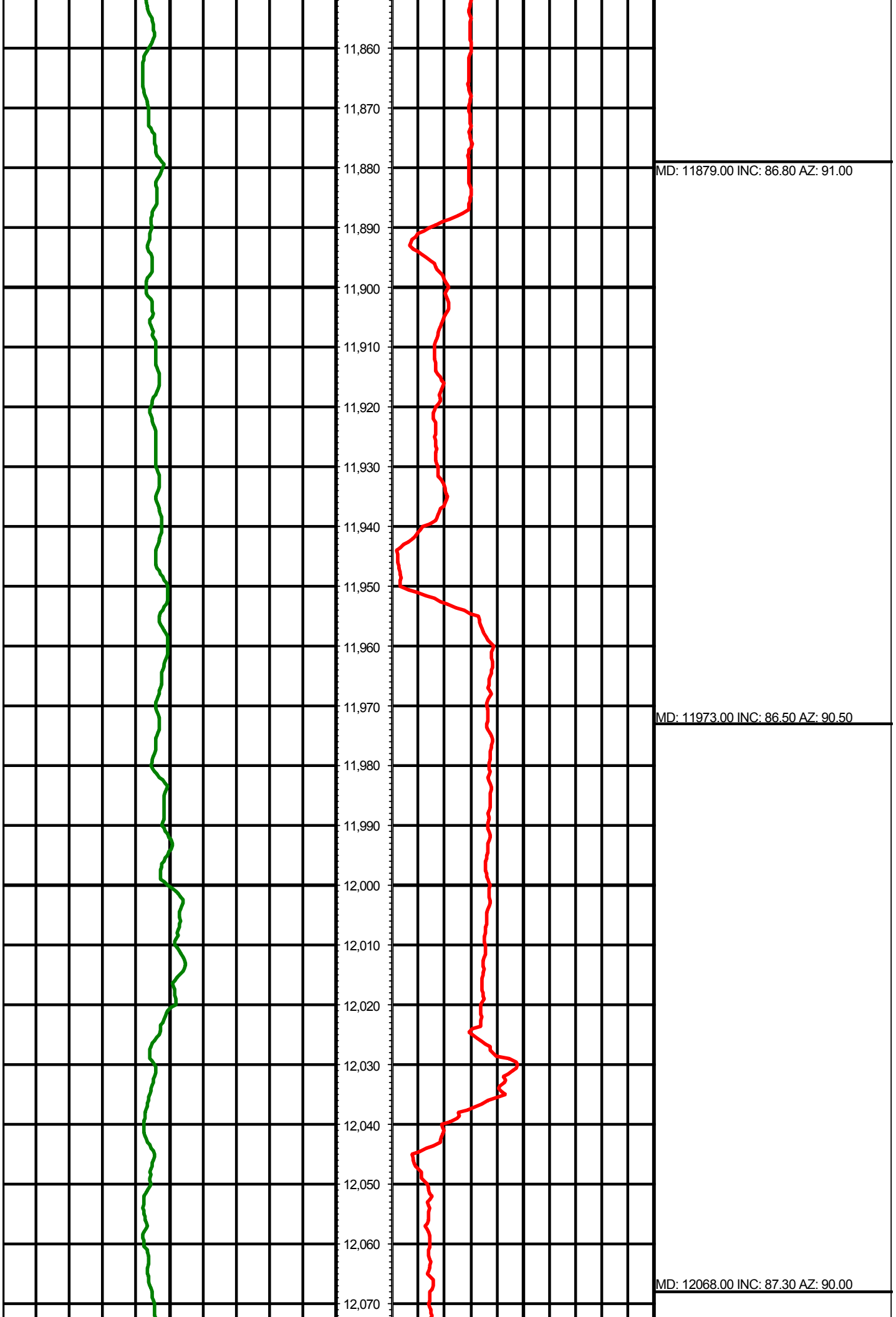
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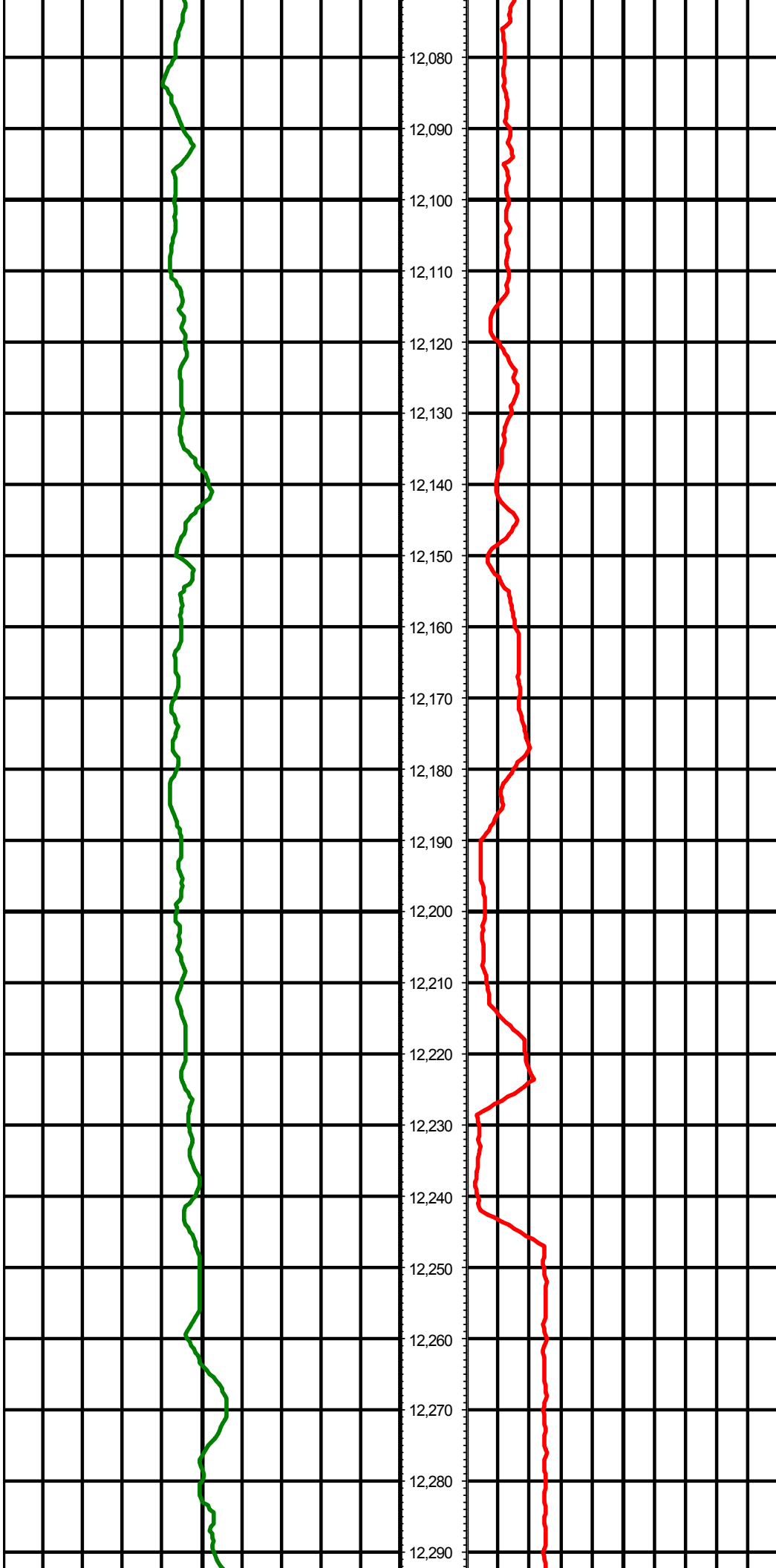


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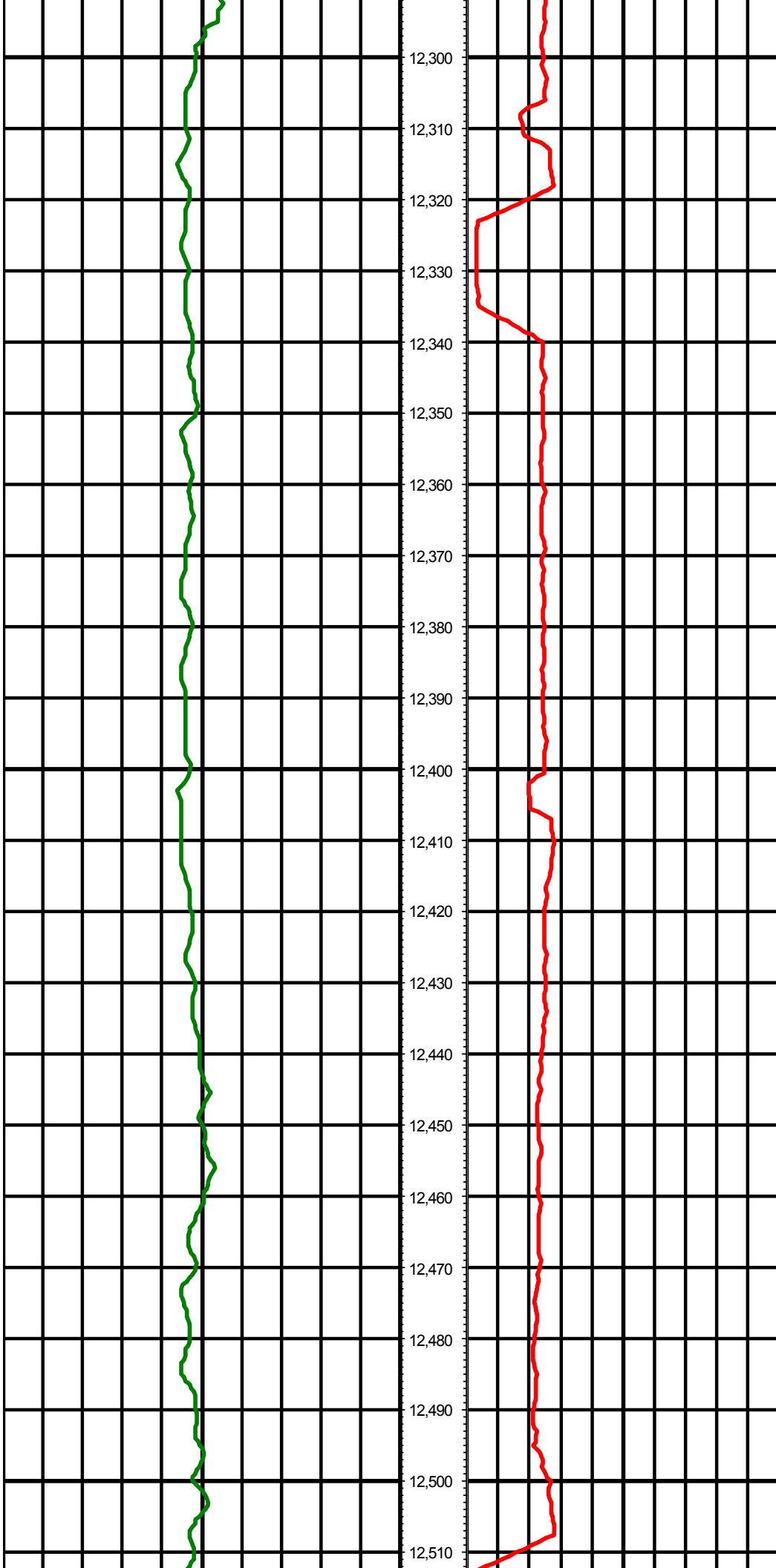
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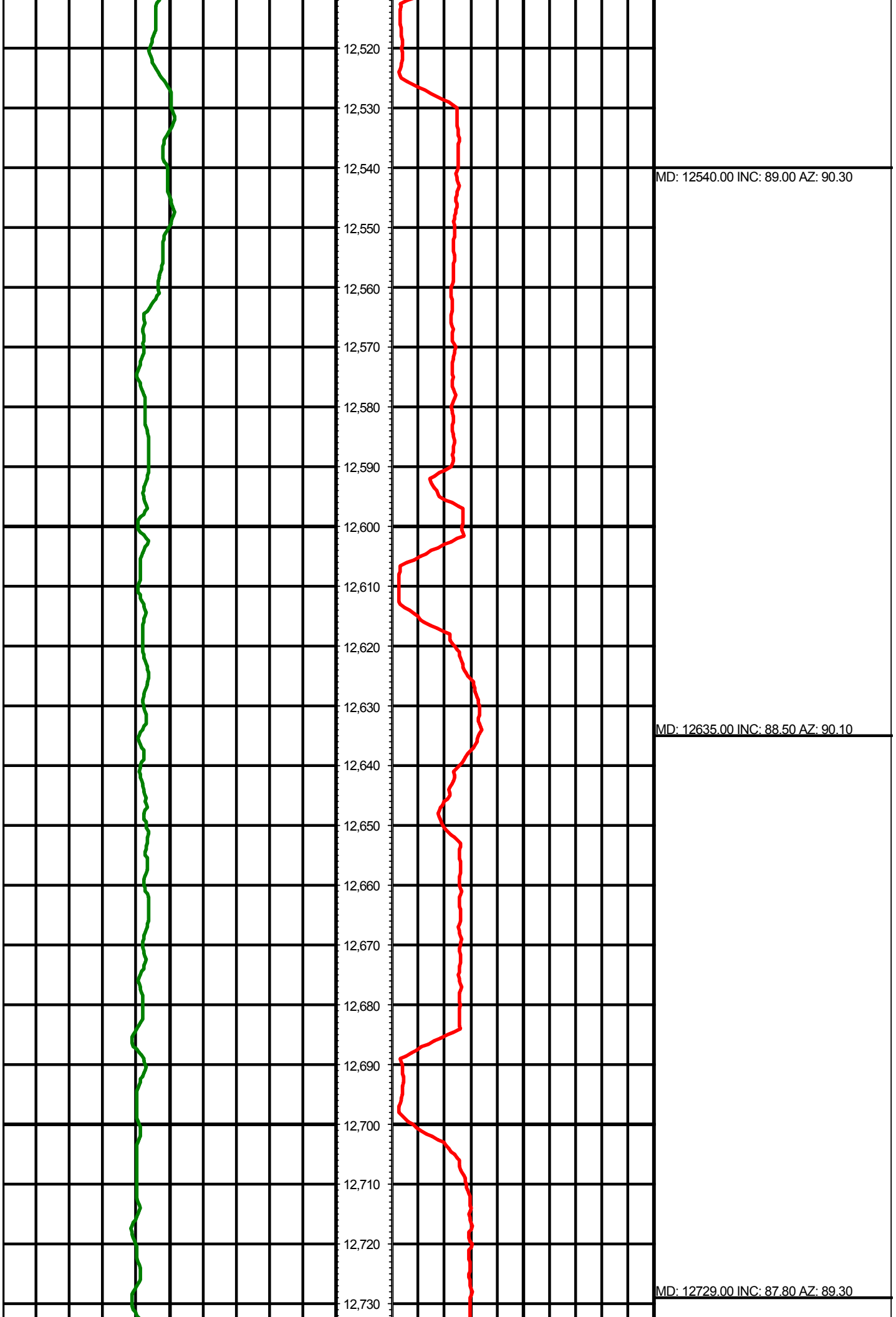
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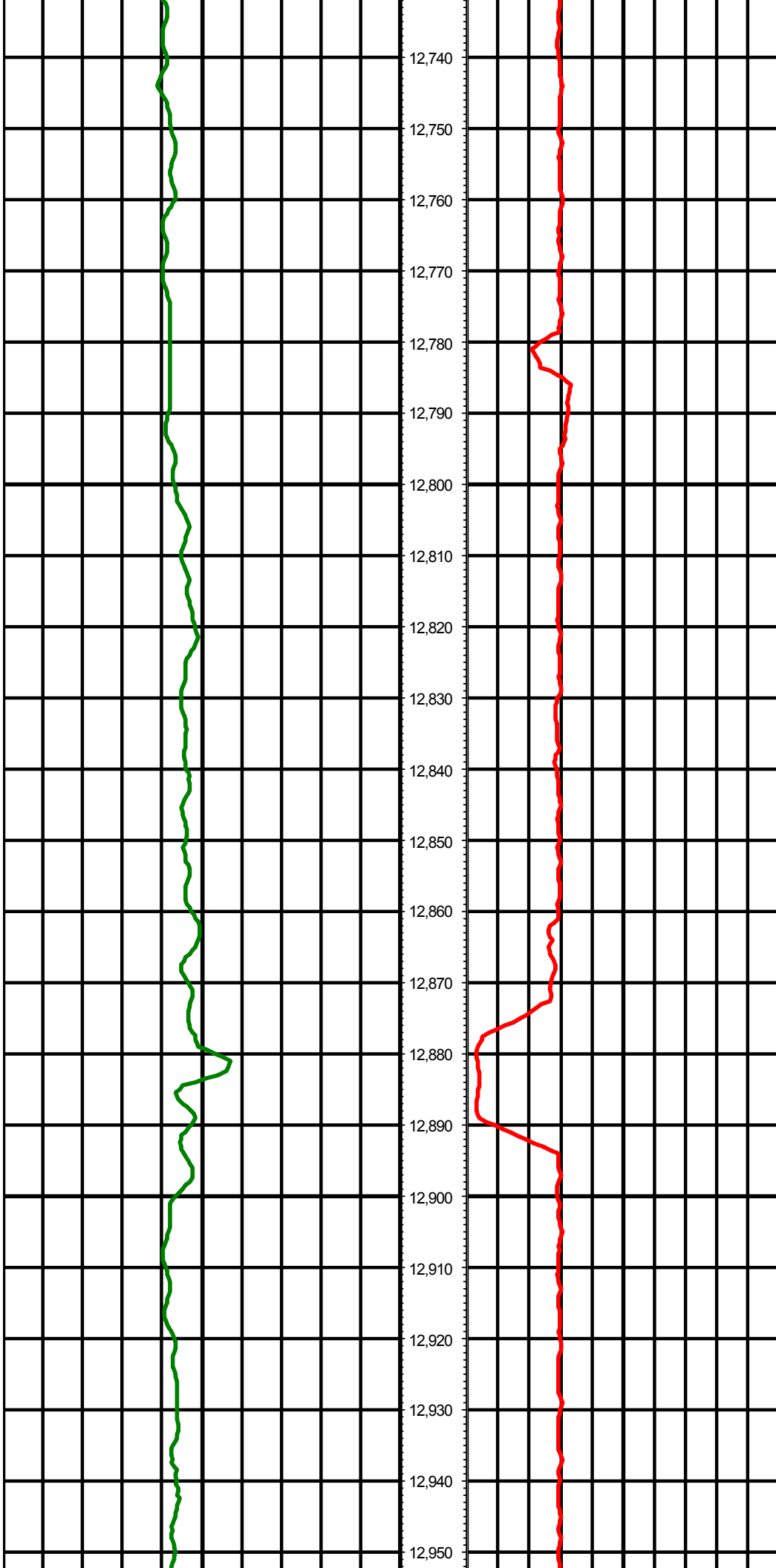


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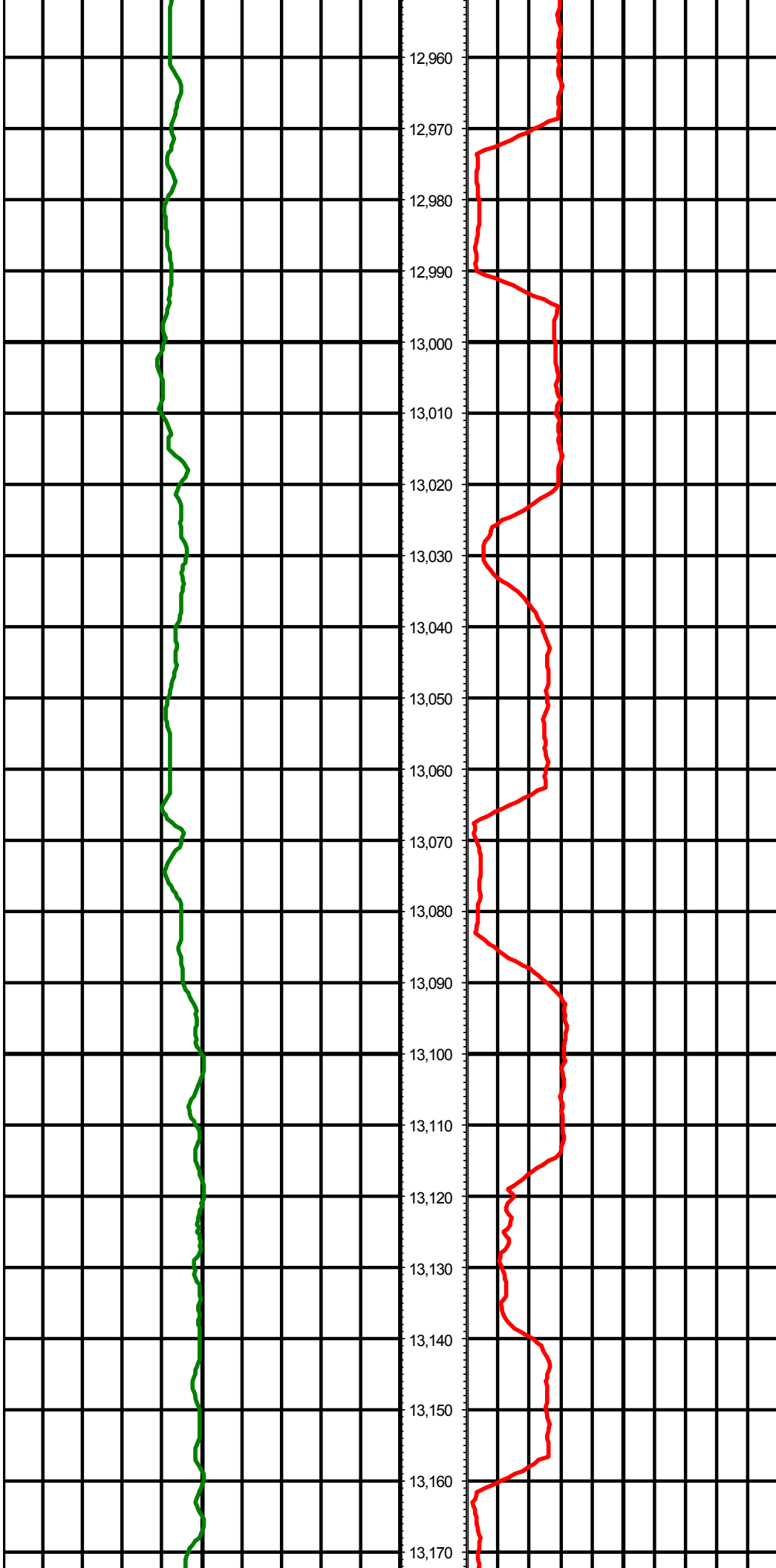
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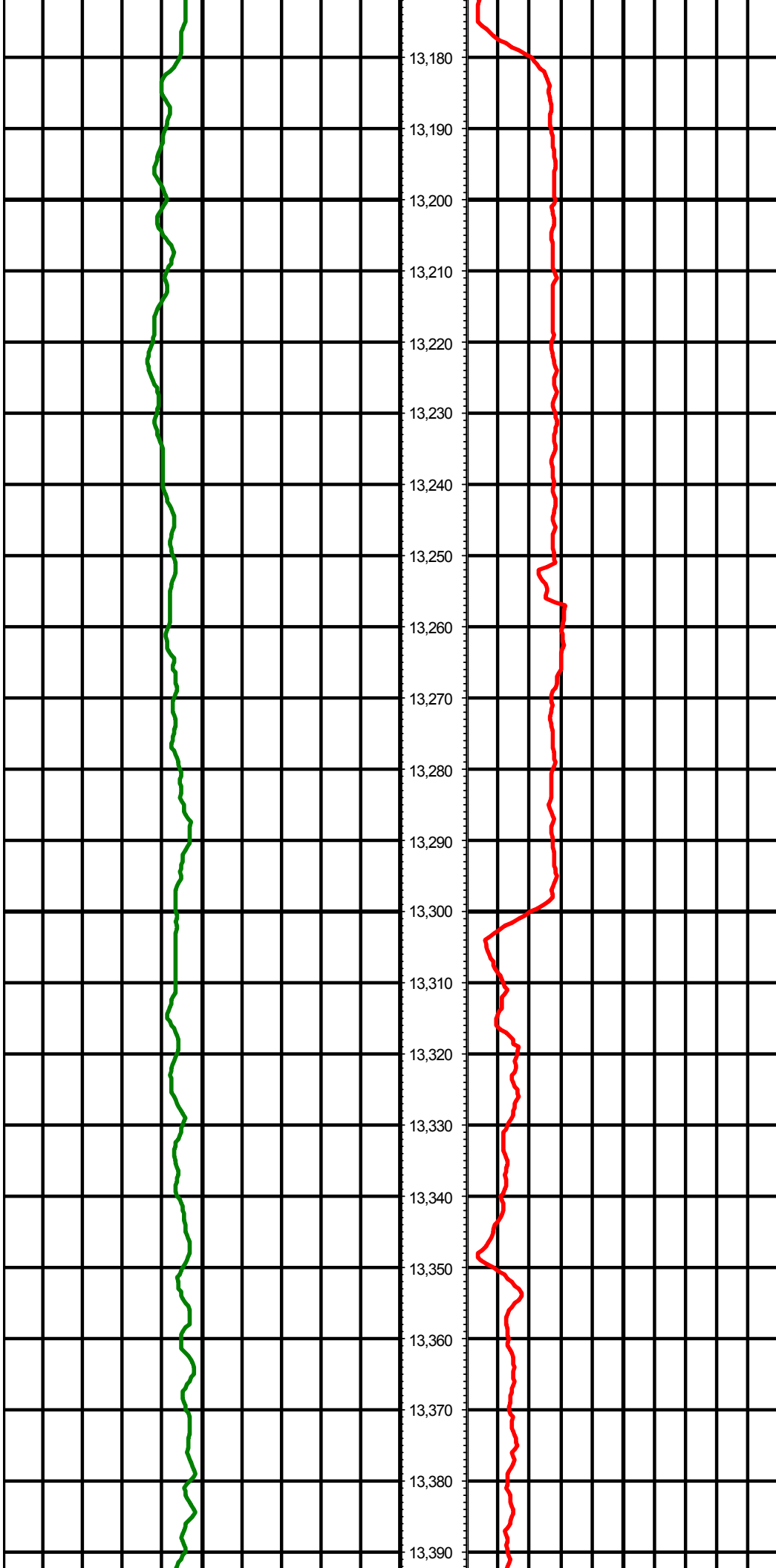
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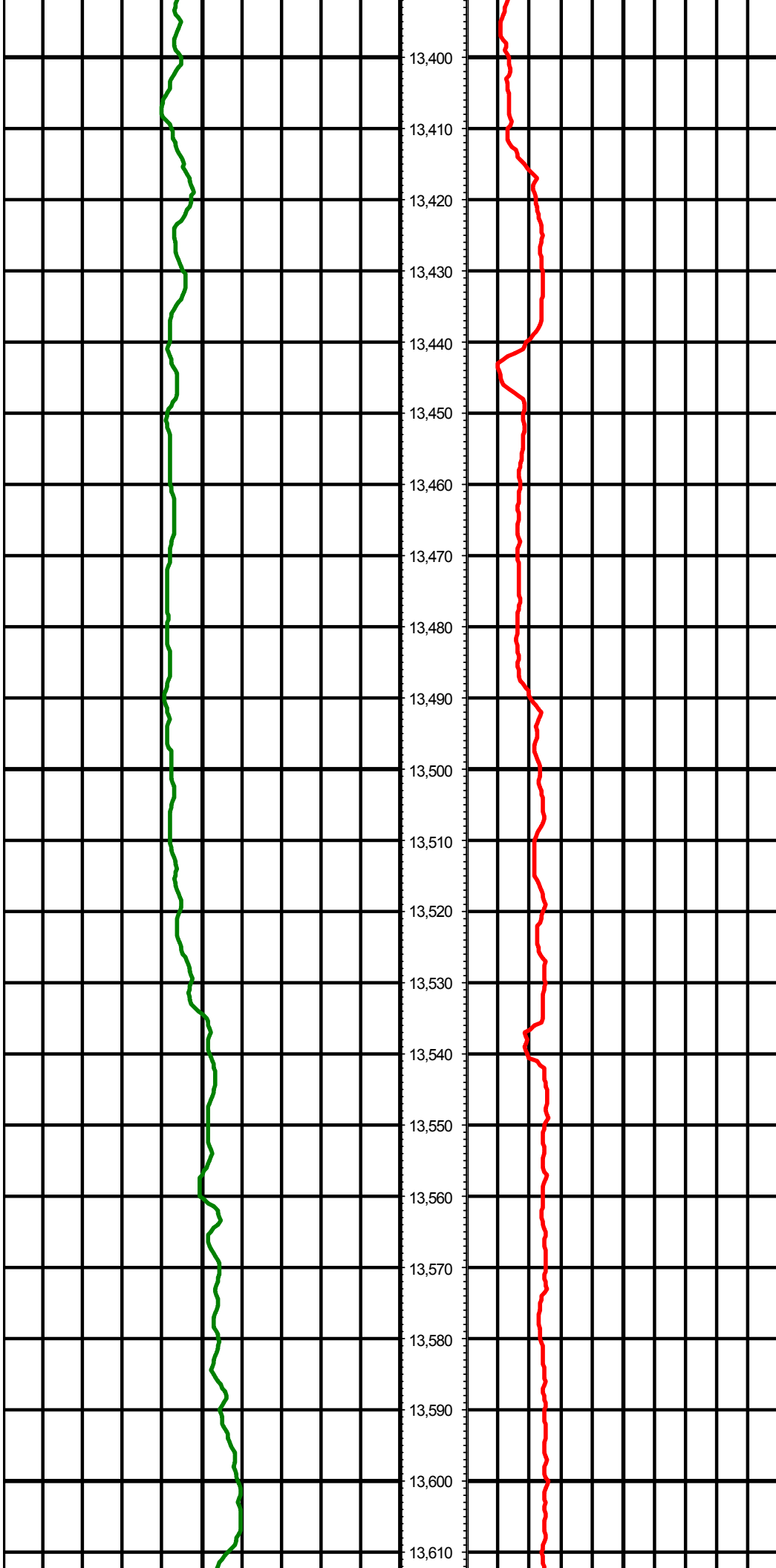
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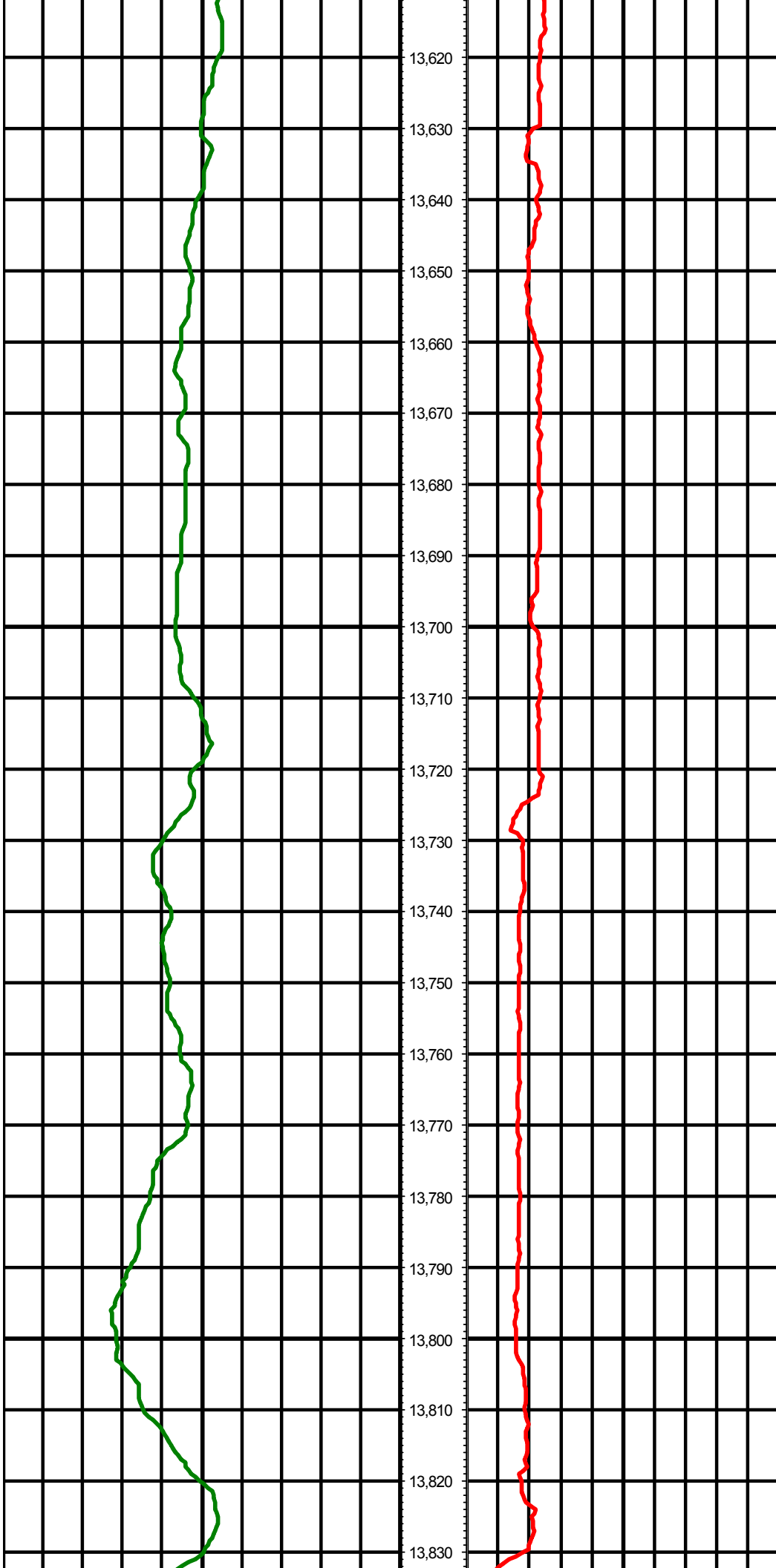
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MD: 13486.00 INC: 88.80 AZ: 89.00

MD: 13580.00 INC: 89.40 AZ: 89.00



MD: 13675.00 INC: 89.70 AZ: 88.60

MD: 13769.00 INC: 90.30 AZ: 88.70

