

County: Rio Blanco

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Company: ExxonMobil Production Corp

Well: PCU 296-5A5

Field: Piceance Creek

County: Rio Blanco

State: Colorado

Location: 749' FNL & 551' FWL
Well: PCU 296-5A5
Company: ExxonMobil Production Corp

CORRELATION LOG

CCL-GAMMA RAY

LOCATION		Elev.: K.B. 7309.00 ft G.L. 7296.00 ft D.F. 7308.00 ft	
749' FNL & 551' FWL			
Permanent Datum:	GROUND LEVEL	Elev.: 7296.00 ft	
Log Measured From:	KELLY BUSHING	13.00 ft above Perm. Datum	
Drilling Measured From:	KELLY BUSHING		

API Serial No. 05-103-1124900	Section 5	Township 2S	Range 96W
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Logging Date 20-Nov-2010

Run Number	1			
Depth Driller	9967 ft			
Schlumberger Depth	9850 ft			
Bottom Log Interval	9850 ft			
Top Log Interval	200 ft			
Casing Fluid Type	WATER BASED MUD			
Fluid Viscosity	1300 ppm			
Fluid Density	9.4 lbm/gal			
Fluid Level	100 ft			

Size 9.875 in

From 0 ft

To 9967 ft

Casing/Tubing Size 7.000 in

Weight 26 lbm/ft

Grade

From 0 ft

To 9967 ft

Maximum Recorded Temperatures 198 degF

Logger On Bottom 20-Nov-2010

Unit Number 2276

Location VERNAL

Recorded By AMILCAR FUENTES

Witnessed By MARC HUDON

PVT DATA

Oil Density	Run 1	Run 2	Run 3
Water Salinity	1300 ppm		
Gas Gravity			
Bo			
Bw			
1/Bg			
Bubble Point Pressure			
Bubble Point Temperature			
Solution GOR			
Maximum Deviation			

CEMENTING DATA

Primary/Squeeze	Primary		
Casing String No			
Lead Cement Type			
Volume			
Density	11 lbm/gal		
Water Loss			
Additives			
Tail Cement Type			
Volume			
Density			
Water Loss			
Additives			

Expected Cement Top

Logging Date

Run Number

Depth Driller

Schlumberger Depth

Bottom Log Interval

Top Log Interval

Casing Fluid Type

Salinity

Density

Fluid Level

BIT/CASING/TUBING STRING

Bit Size

From

To

Casing/Tubing Size

Weight

Grade

From

To

Maximum Recorded Temperatures

Logger On Bottom

Unit Number

Location

Recorded By

Witnessed By

DEPTH SUMMARY LISTING

Date Created: 20-NOV-2010 19:52:24

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-46A XS
Serial Number:	6074	Serial Number:	7296	Serial Number:	100734
Calibration Date:	24-Sep-2010	Calibration Date:	12-Nov-2010	Length:	22608 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100443	Conveyance Method: Wireline Rig Type: LAND	
Calibration Cable Type:	7-46P	Number of Calibration Points:	10		
Wheel Correction 1:	-9	Calibration RMS:	21		
Wheel Correction 2:	-8	Calibration Peak Error:	43		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	186.40 FT
Rig Up Length At Bottom:	185.20 FT
Rig Up Length Correction:	1.20 FT
Stretch Correction:	6.00 FT
Tool Zero Check At Surface:	1.00 FT

Depth Control Remarks

1. All Schlumberger Depth Measurement & Control Standard dated 7-April-2010 followed
2. IDW used as primary depth control measurement device
3. Z-Chart used as secondary depth control measurement device
4.
5.
6.

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: IMAGING BEHIND CASIN	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
1. Tool ran as per tool sketch	
2. Tool ran centralized using 2 X In-Line centralizers and 2 X GEMCOs	
3. HGNS Neutron tool only ran for formation's GR purposes only	
4. Logging speed less than 1800 ft/hr	
5. Expected casing thickness = 0.362in Observed = 0.363in	
6. Expected internal radius = 3.13in Observed 3.14in	
7. Expected flexural attenuation in free pipe = 55dB Observed 57.2dB	
8. Log monitored real time by Netviewer SQC	
9. Main Pass correlated to Down Log	

SERVICE ORDER #:	BFJT-00021
PROGRAM VERSION:	17C0-154
FLUID LEVEL:	100 ft

LOGGED INTERVAL	START	STOP
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STOP

STOP

RUN 1

RUN 2

WITM (DTS)-A

GSR-U/Y
NCT-B
CNB-AB
NCS-VB

LEH-QT
LEH-QT

39.0

DTC-H
ECH-KC
DTCH0-A
DTCH1-A

CTEM

_____ 35.2

36.1

TelStatus
ToolStatu
HGNS HTEM
HMCA

33.1

_____ 33.1

32.4

33.1

HILTH-FTB
HGNSD-H
HMCA-H
HGNH
NLS-KL
NSR-F 2649
HACCZ-H 1614
HCNT-H
HGR
NPV-N

HGNS Neut
HGNS Neut

_____ 26.5

26.0

HGNS sens

_____ 23.7

AH-107
AH-107

23.7

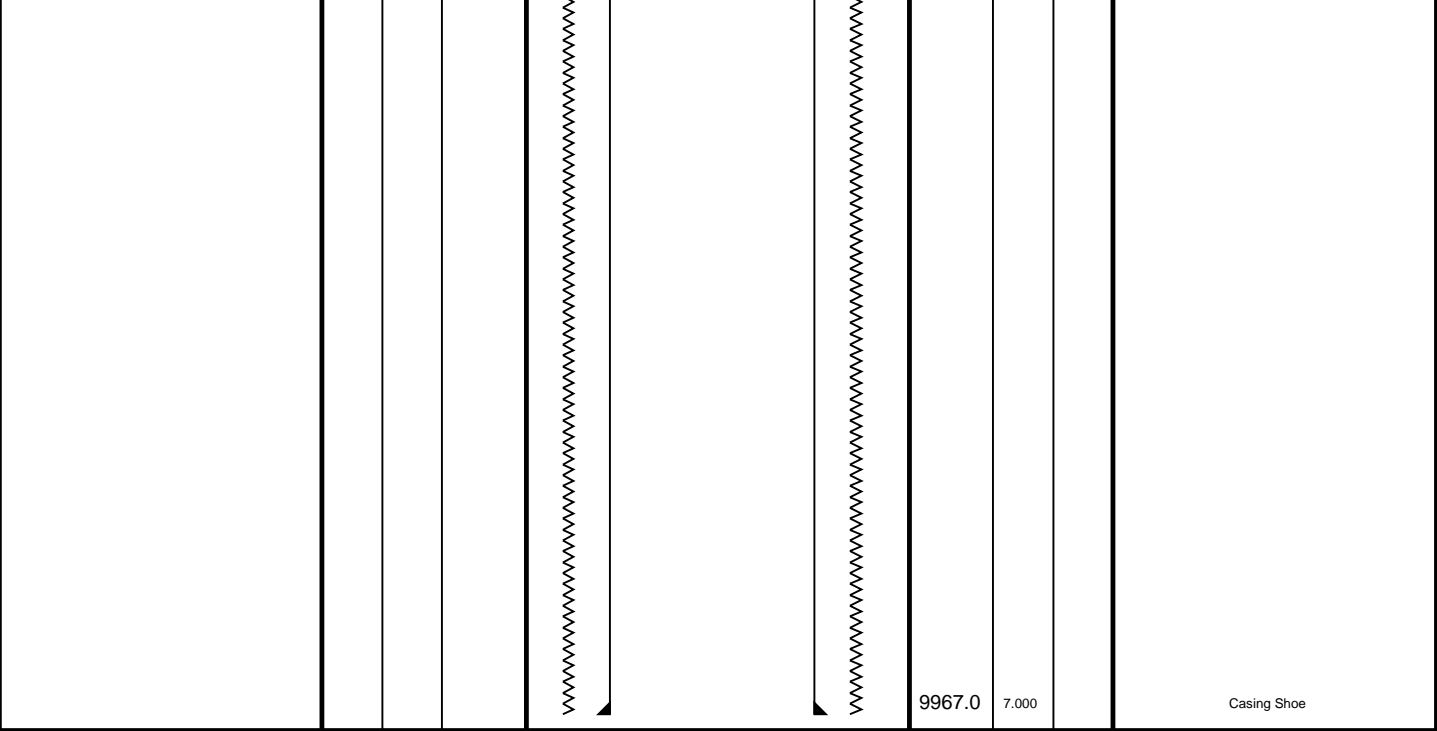
USIT-D
ECH-MRA
USIC-D
USIS-A
USSC-B
IBCS_B-100158202
Top Transducer
Middle Top Transducer
Middle Bottom Transducer
Bottom Transducer

21.7



Elevation: 7296.0 ft

Production String	(in) (ft)			Well Schematic			(ft) (in)			Casing String
	OD	ID	MD				MD	OD	ID	
							0.0	9.000		Borehole Segment



9967.0

7.000

Casing Shoe

Schlumberger

CORRELATION

MAXIS Field Log

Company: ExxonMobil Production Corp Well: PCU 296-5A5

Input DLIS Files

DEFAULT USI_TLD_MCFL_CNL_010LUP FN:9 PRODUCER 20-Nov-2010 16:25 9851.0 FT 167.7 FT

Output DLIS Files

DEFAULT USI_TLD_MCFL_CNL_004PUP FN:3 PRODUCER 20-Nov-2010 17:32 9850.0 FT 179.5 FT

OP System Version: 17C0-154

USIT-D 17C0-154 HILTH-FTB 17C0-154
DTC-H 17C0-154

CCL (CCLU)

-20 (----) 20

Gamma Ray (GR)

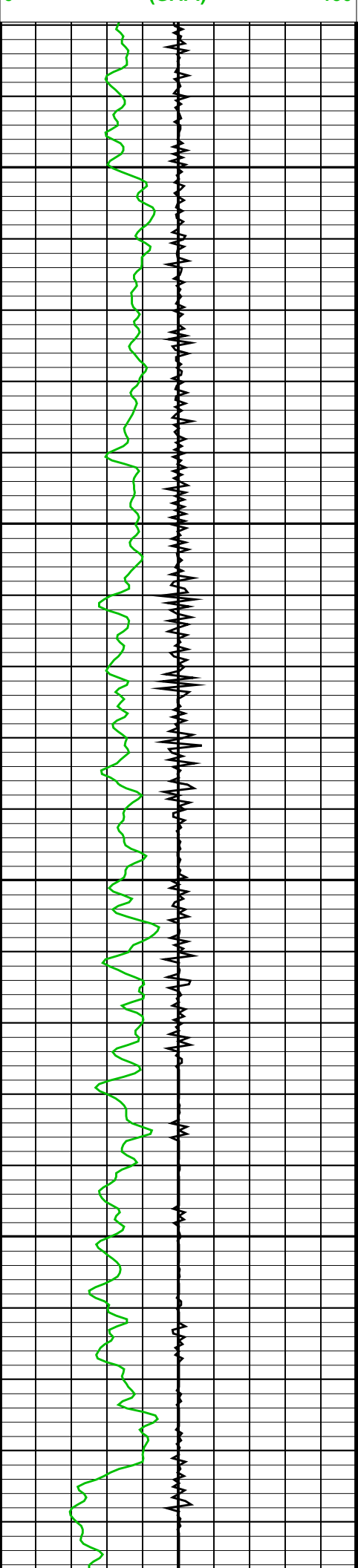
0 (GAPI) 150

HTC Cartridge Temperature (HTEM)

20 (DEGF) 220

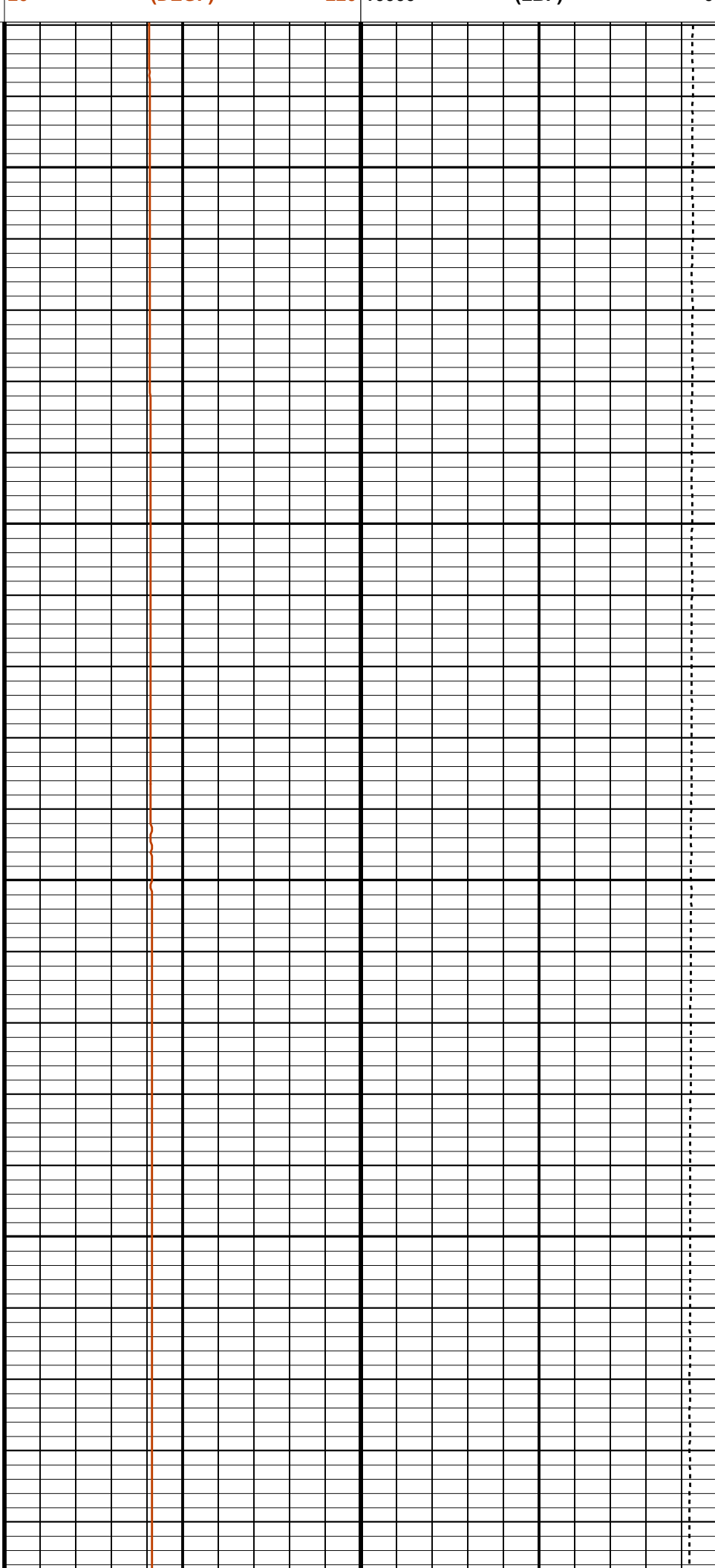
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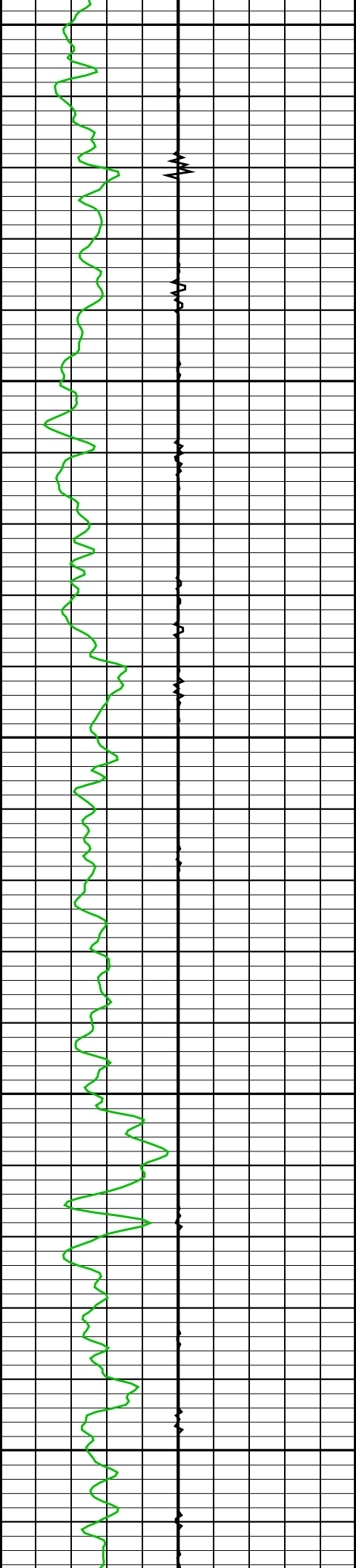
10000 (LBF) 0



200

300

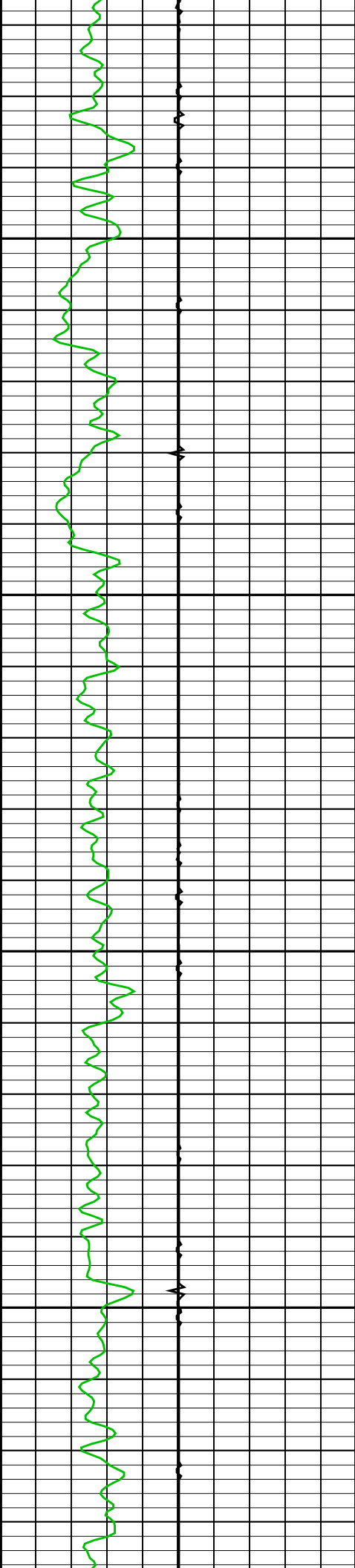




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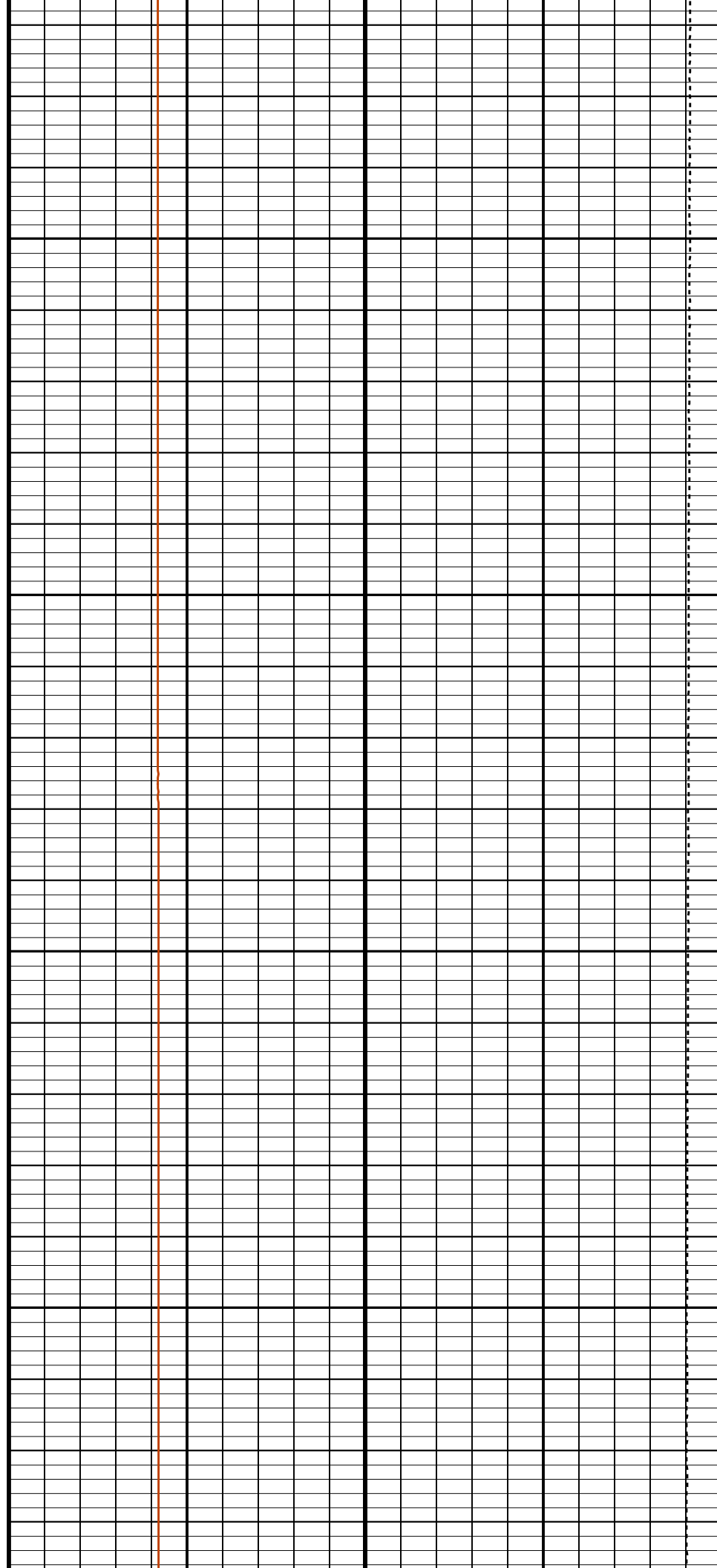
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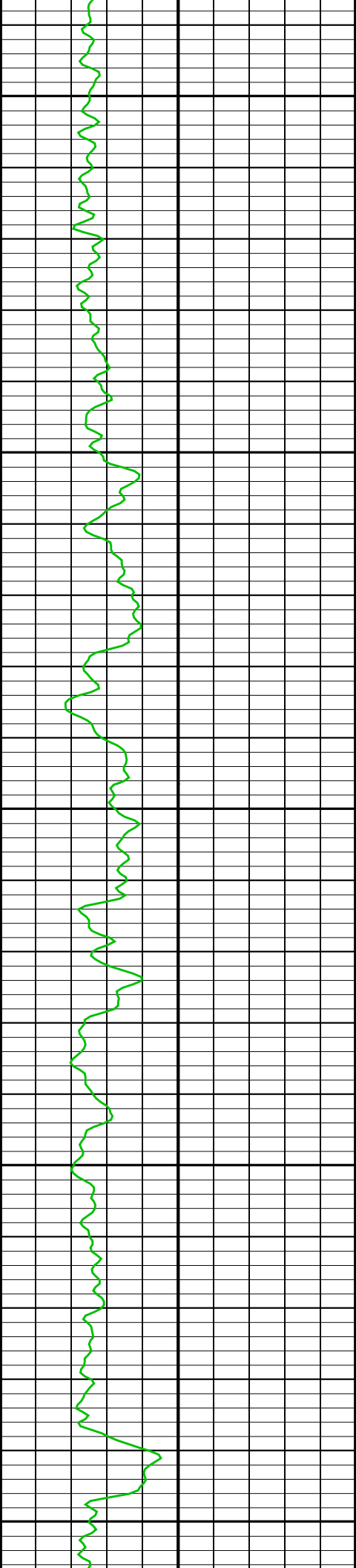
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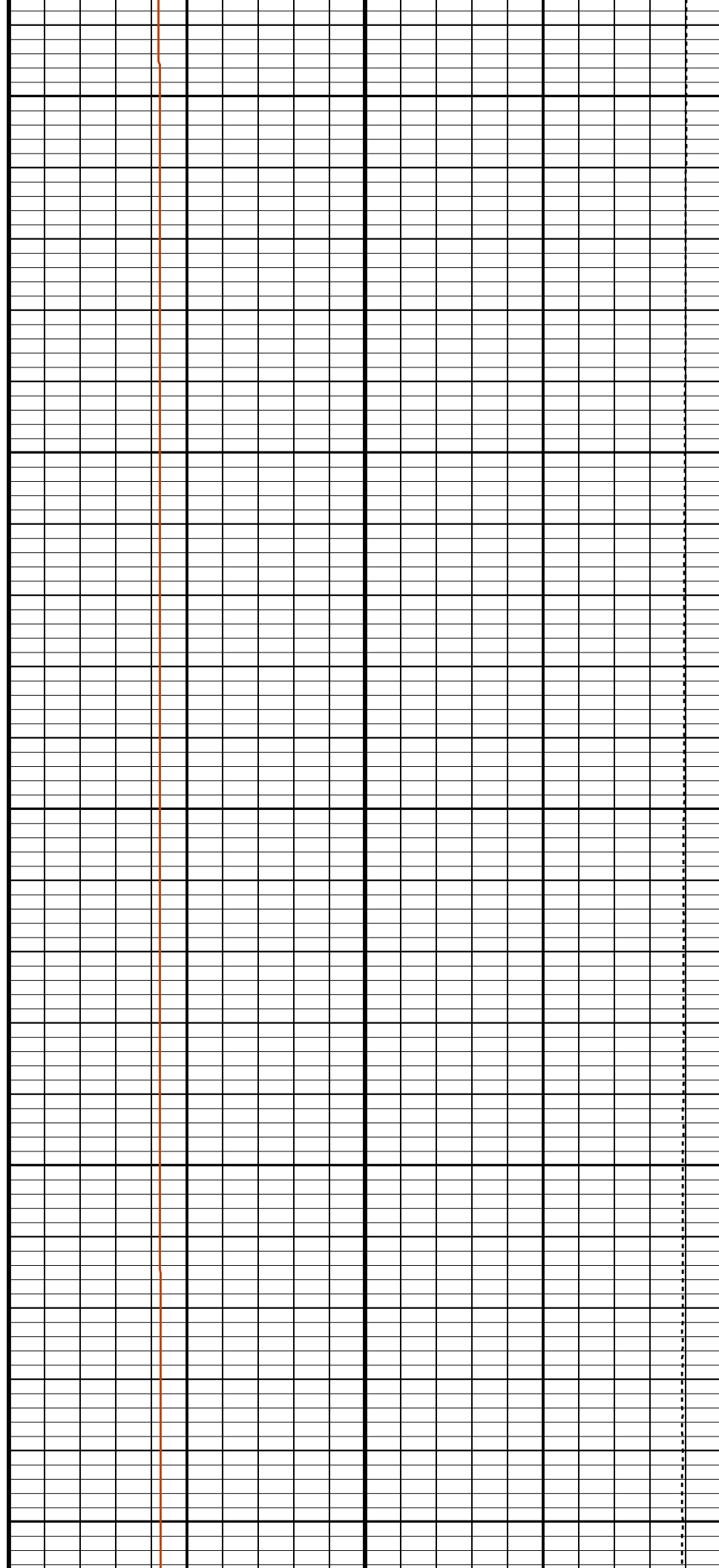
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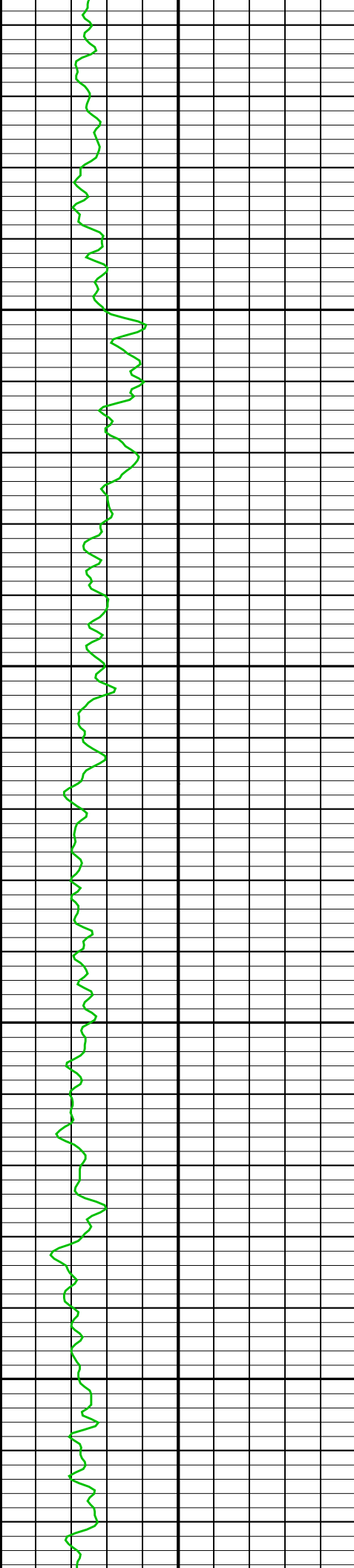




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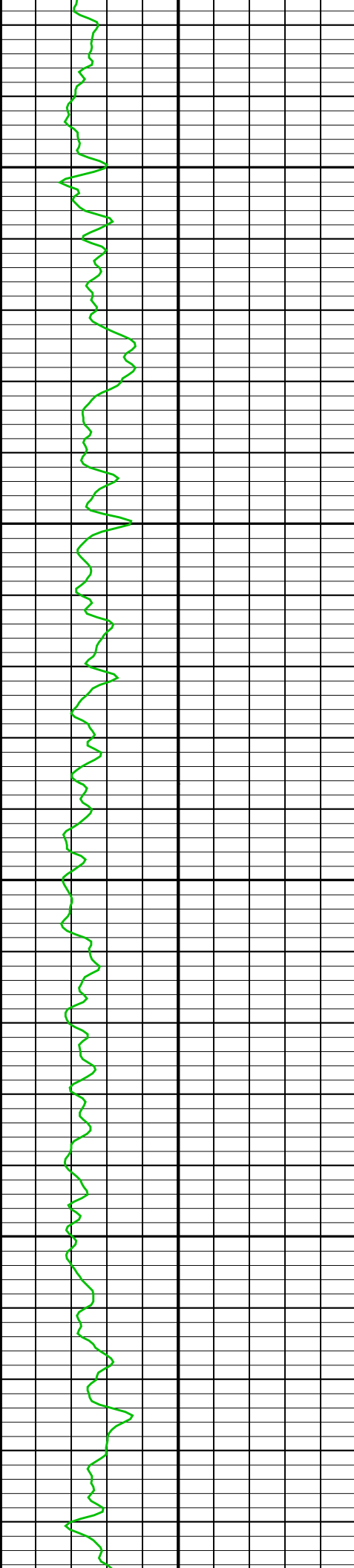
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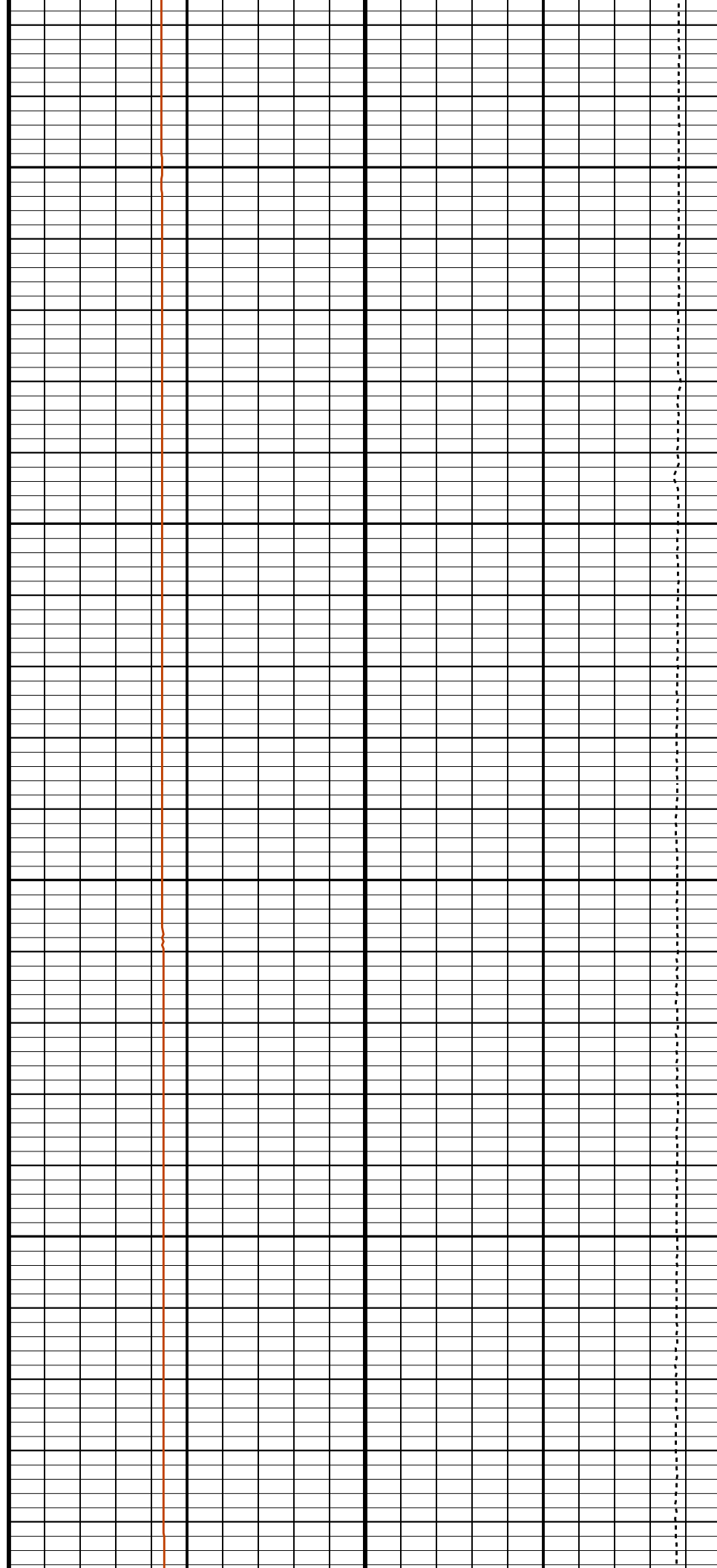
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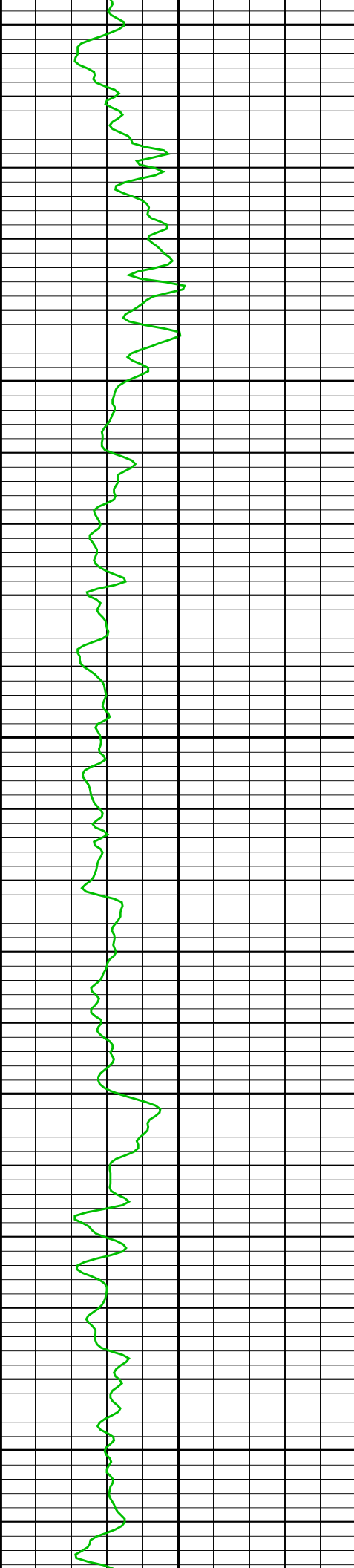
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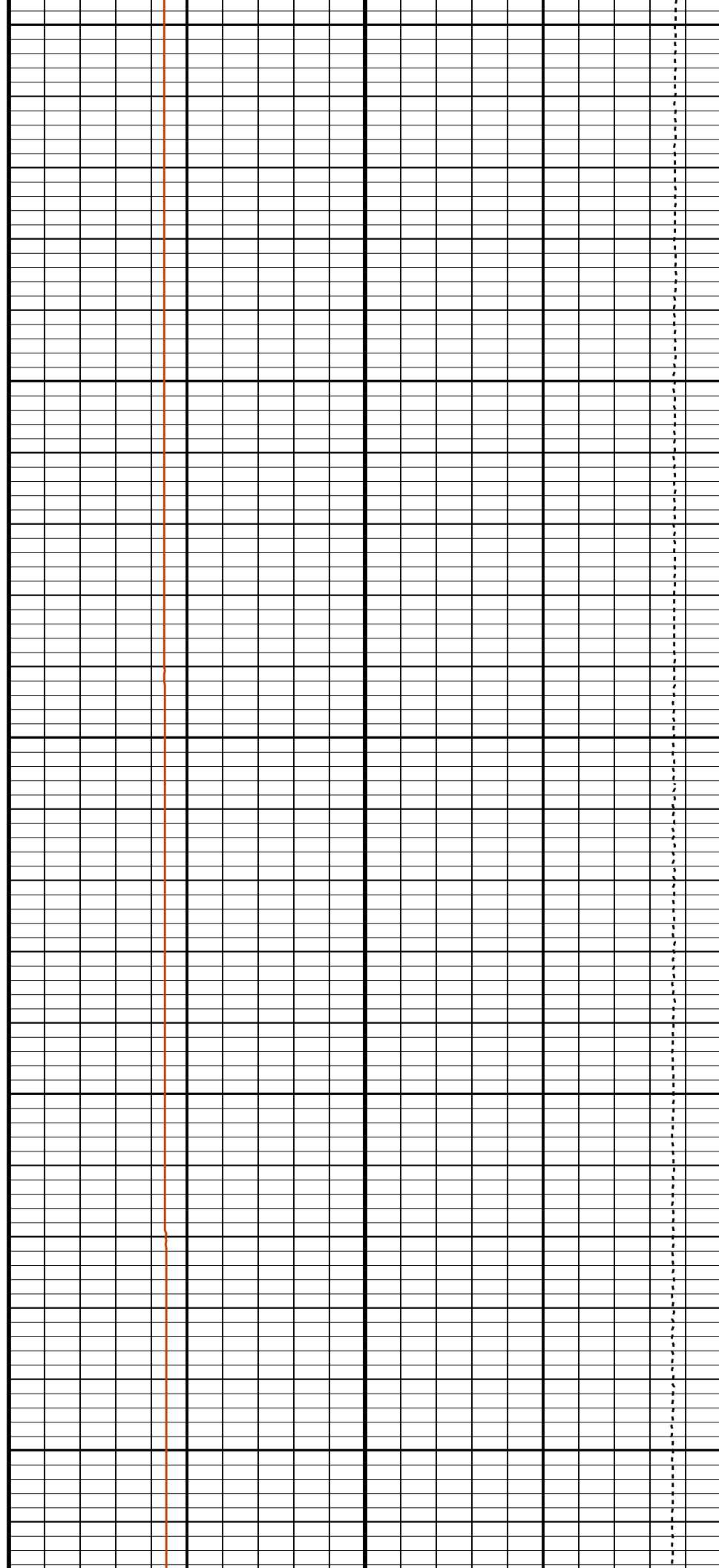


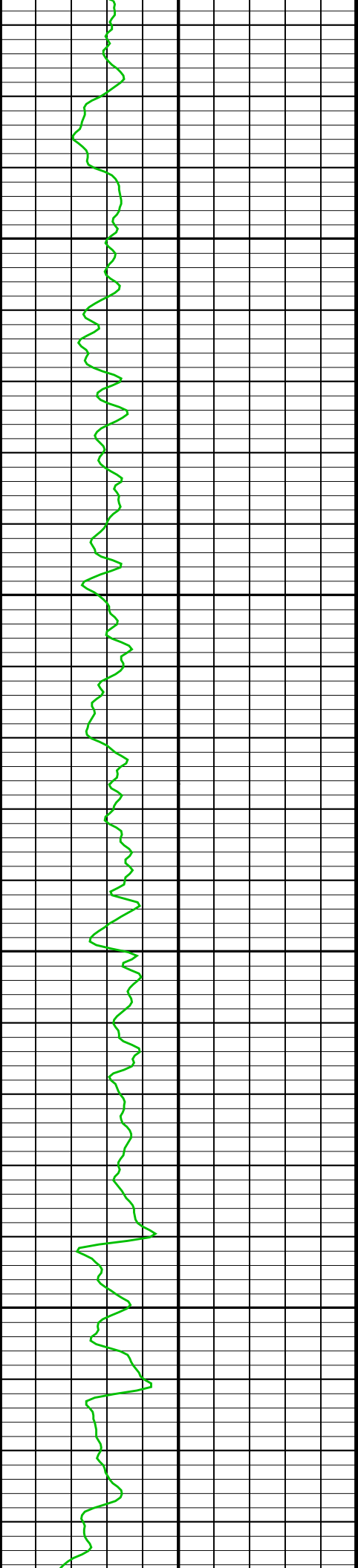


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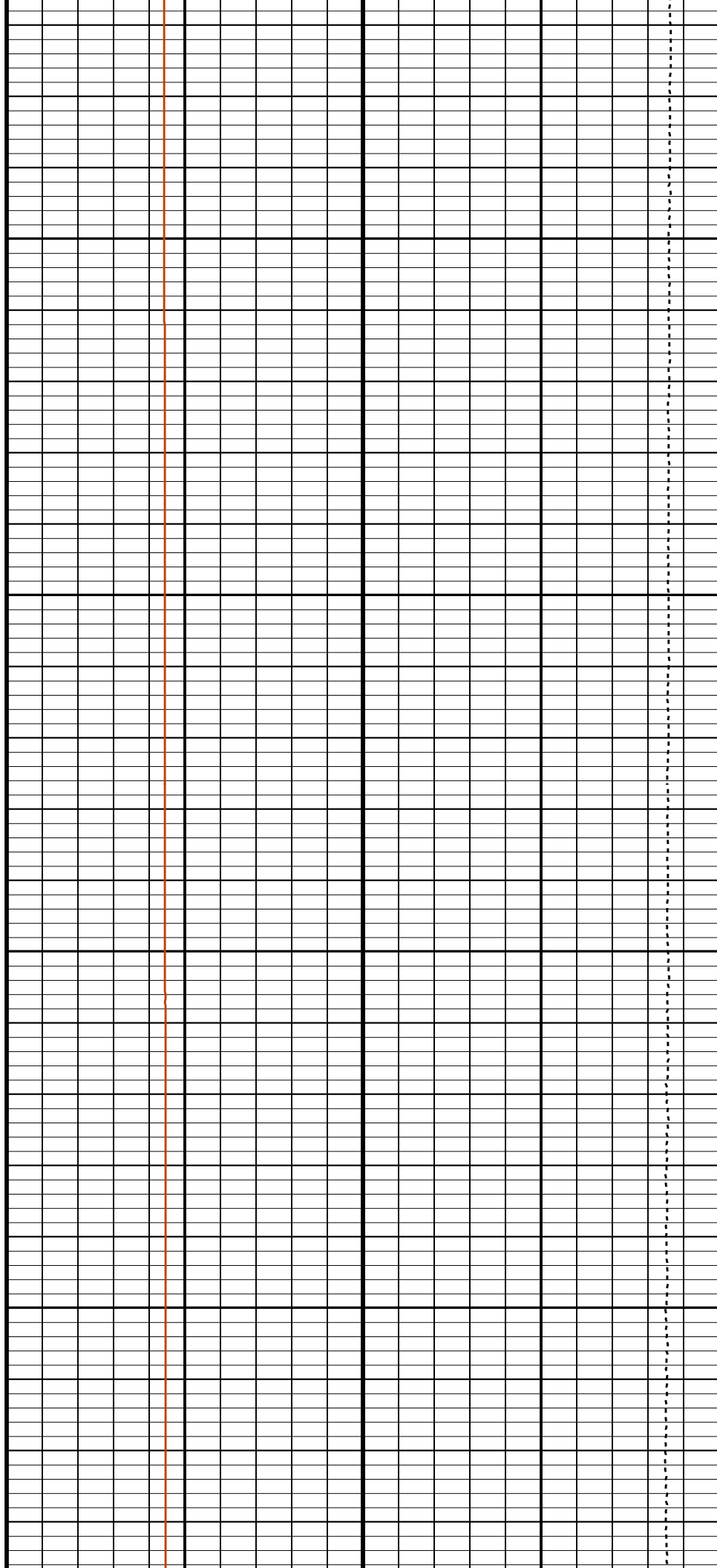
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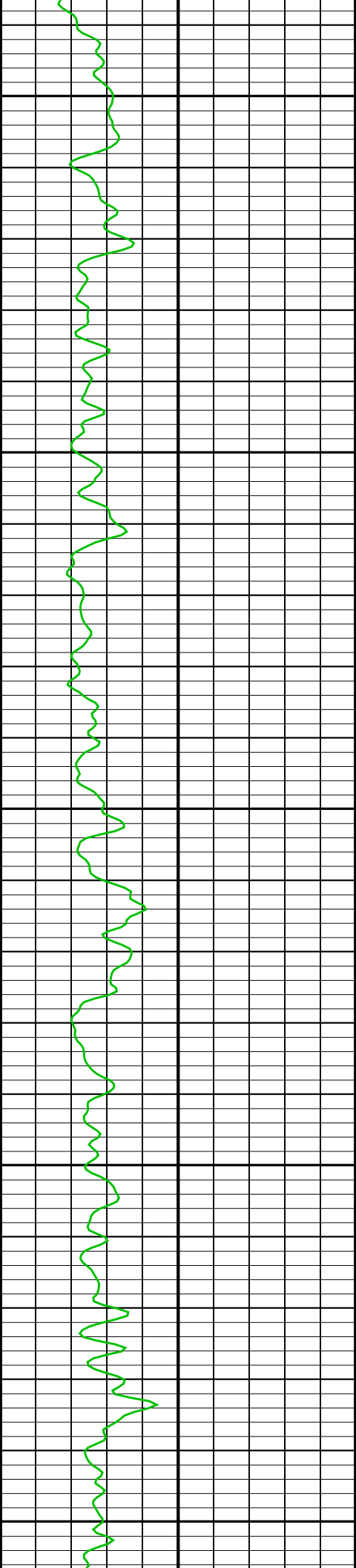




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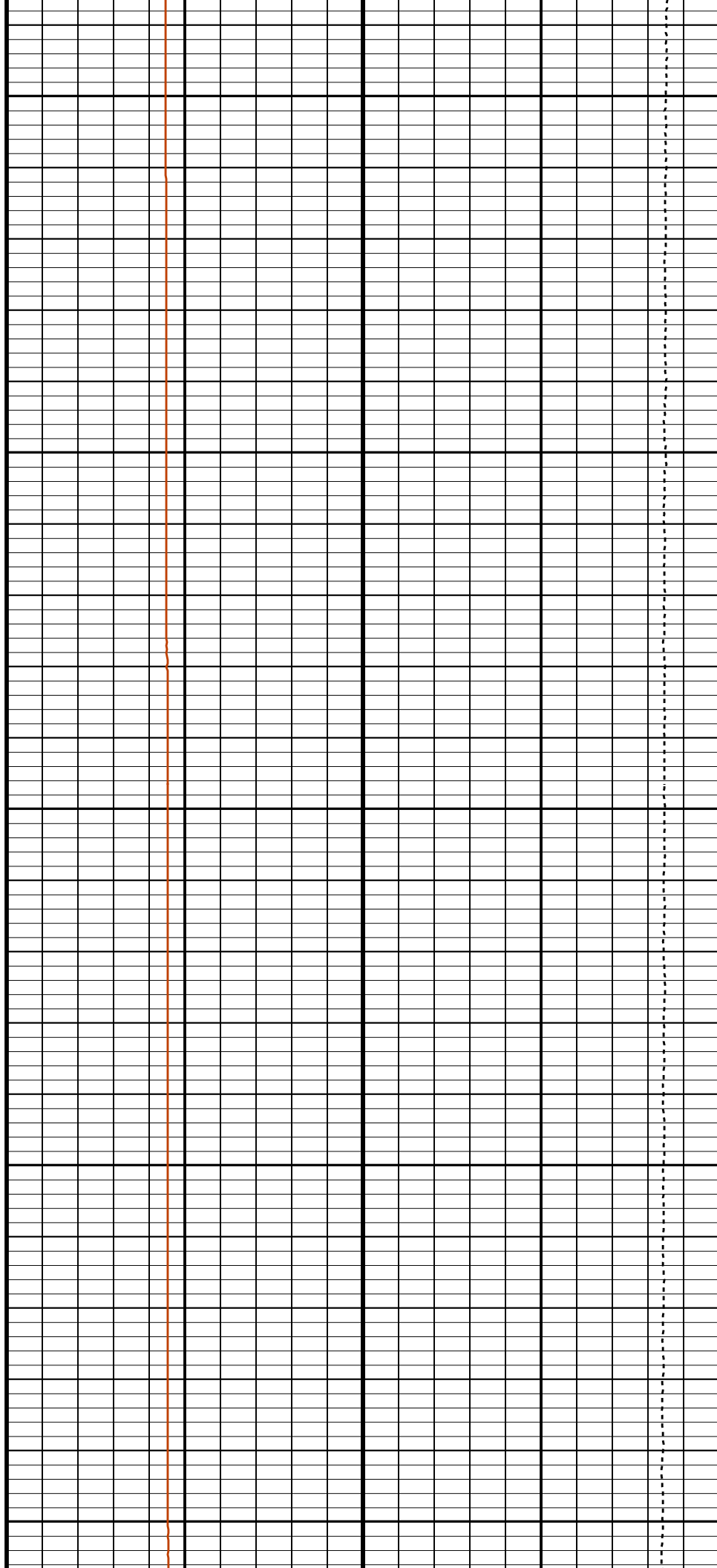
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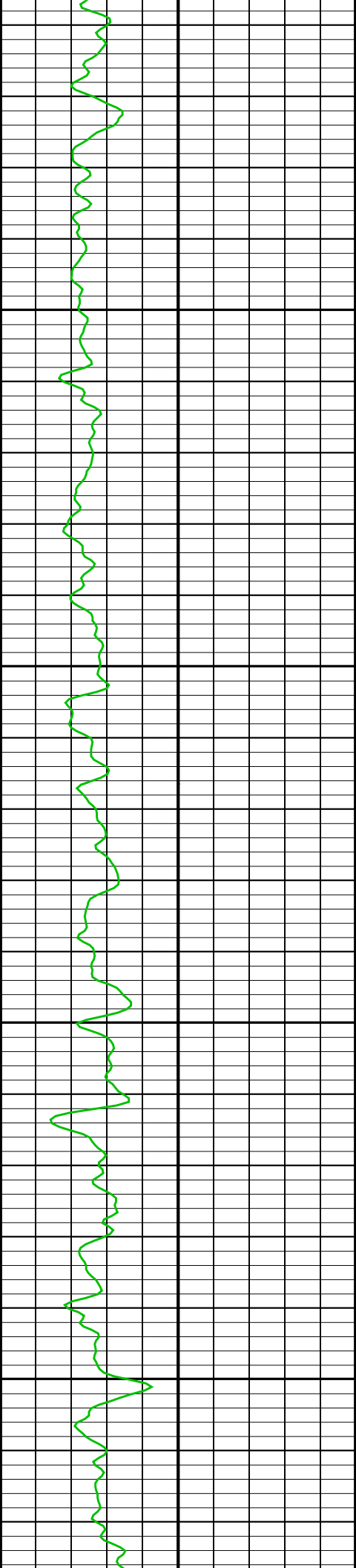




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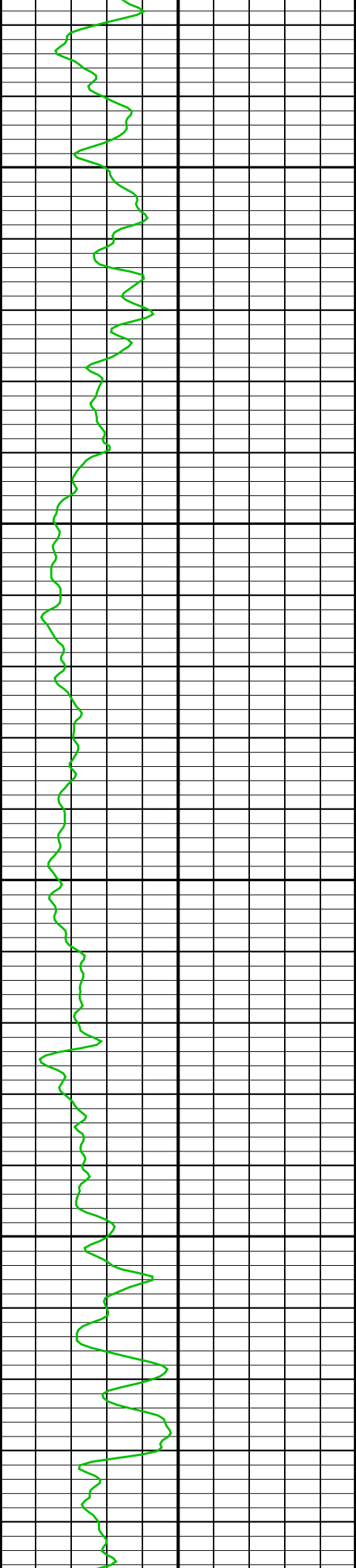
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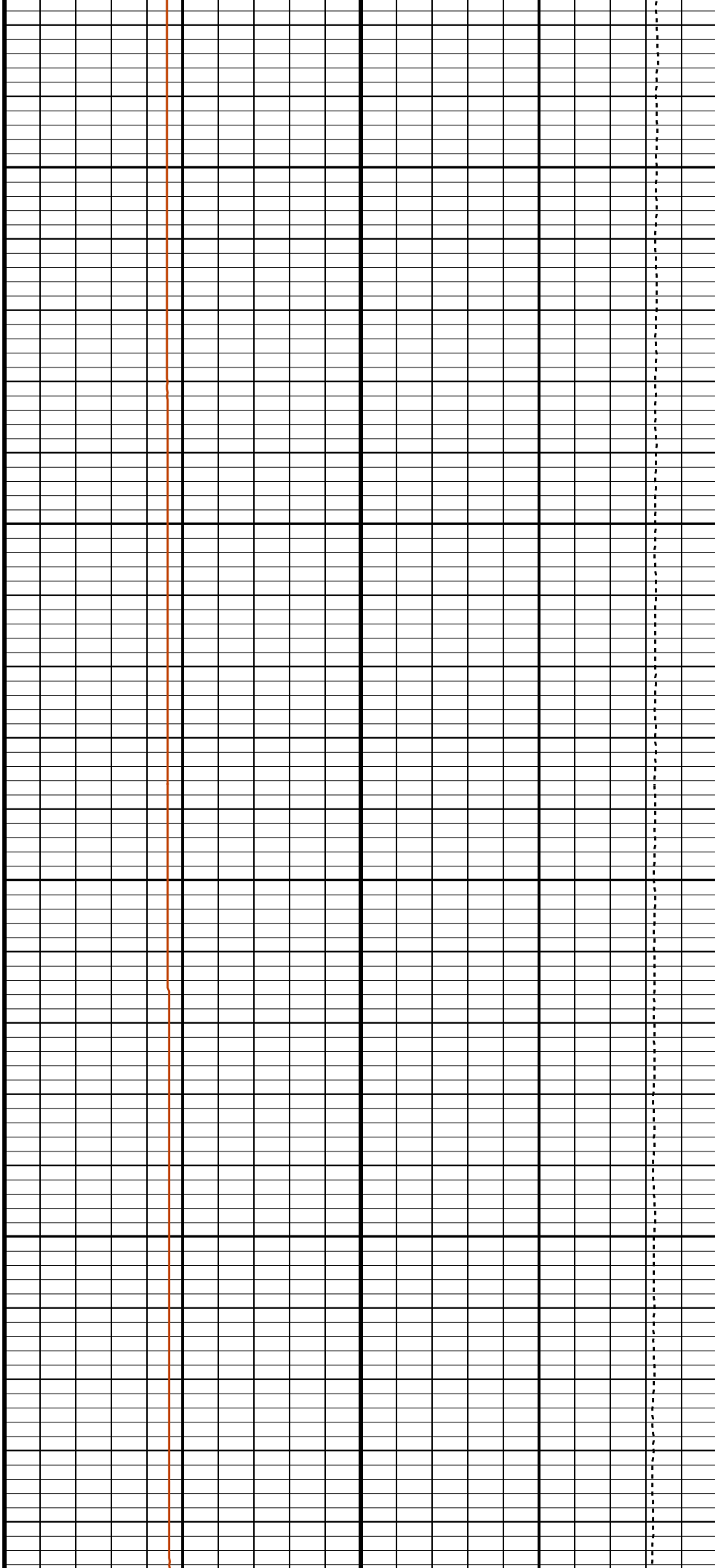
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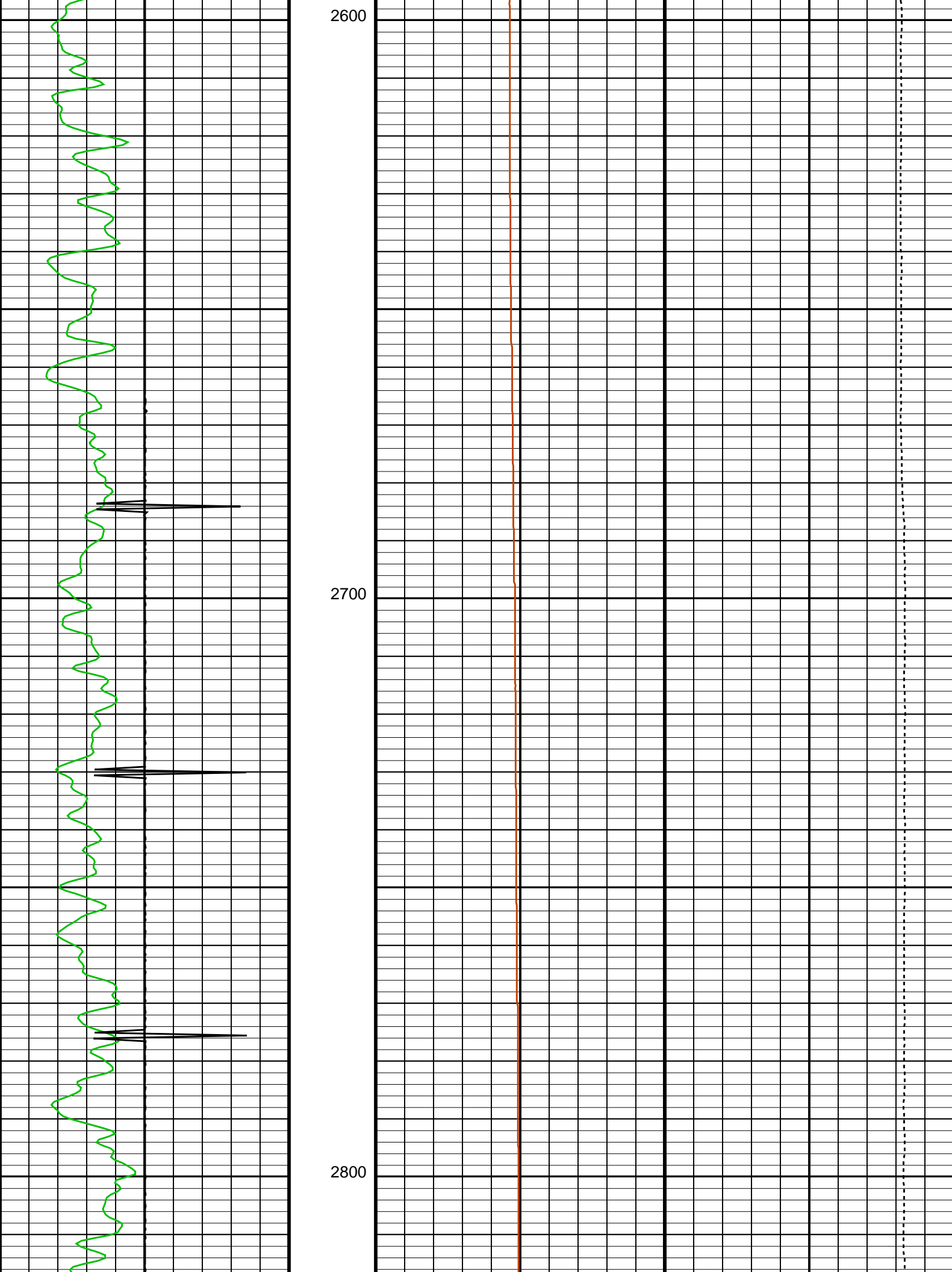
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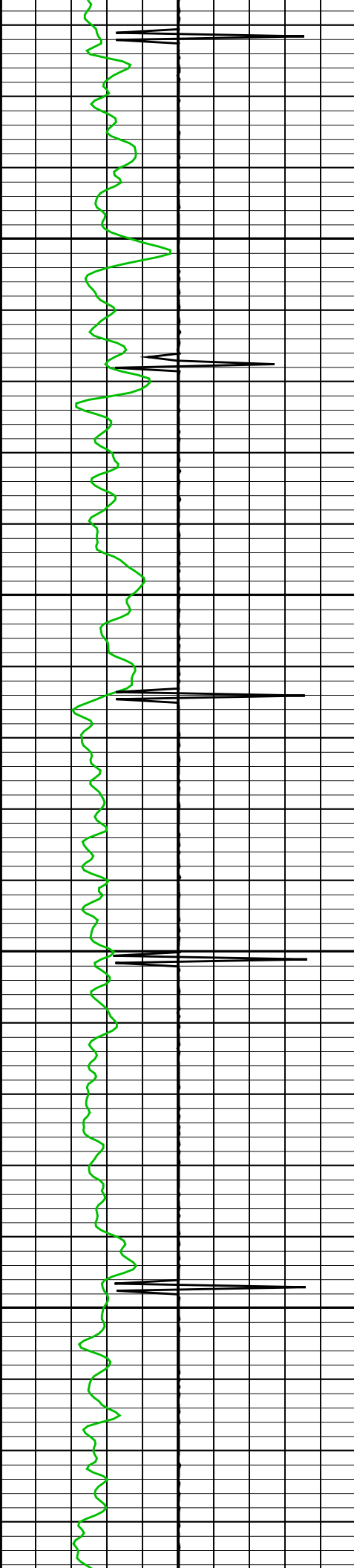


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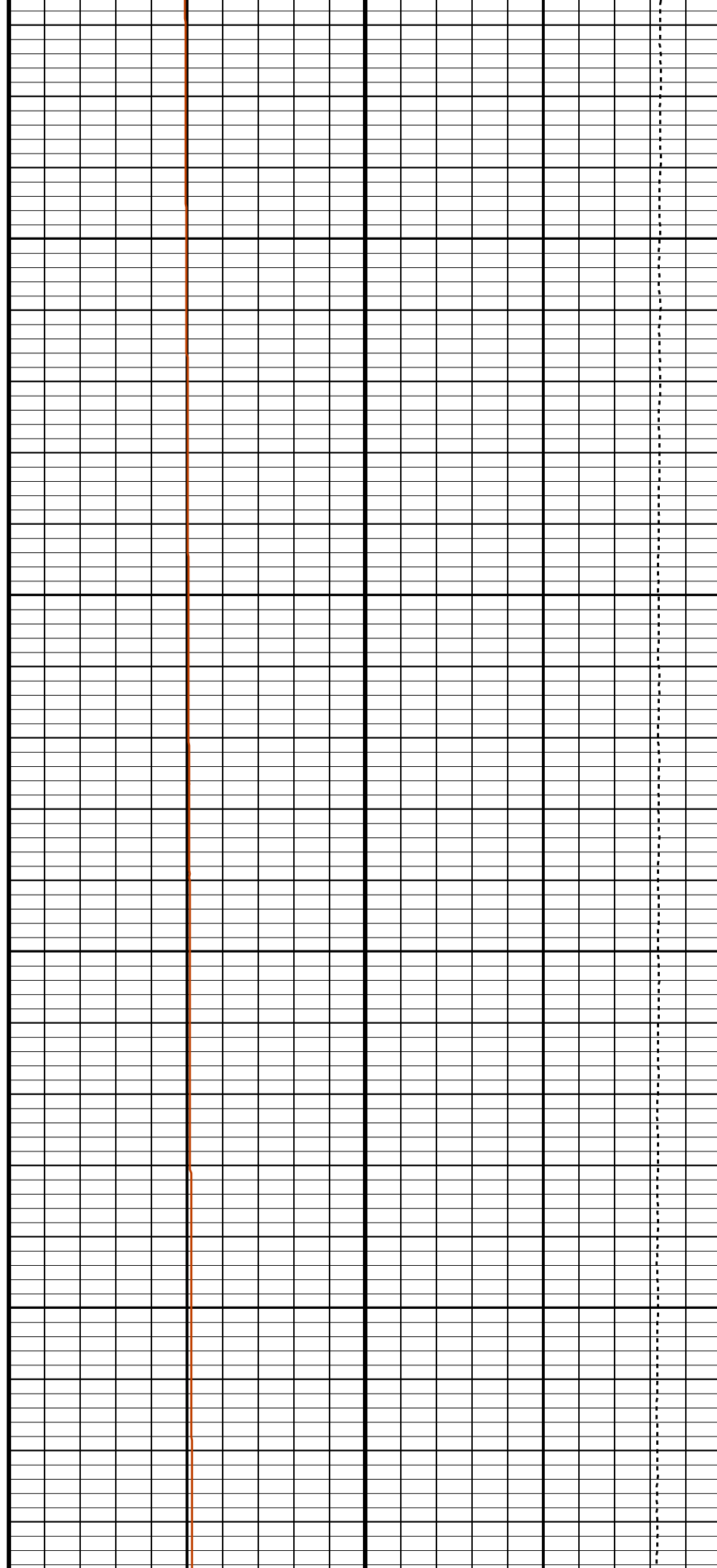


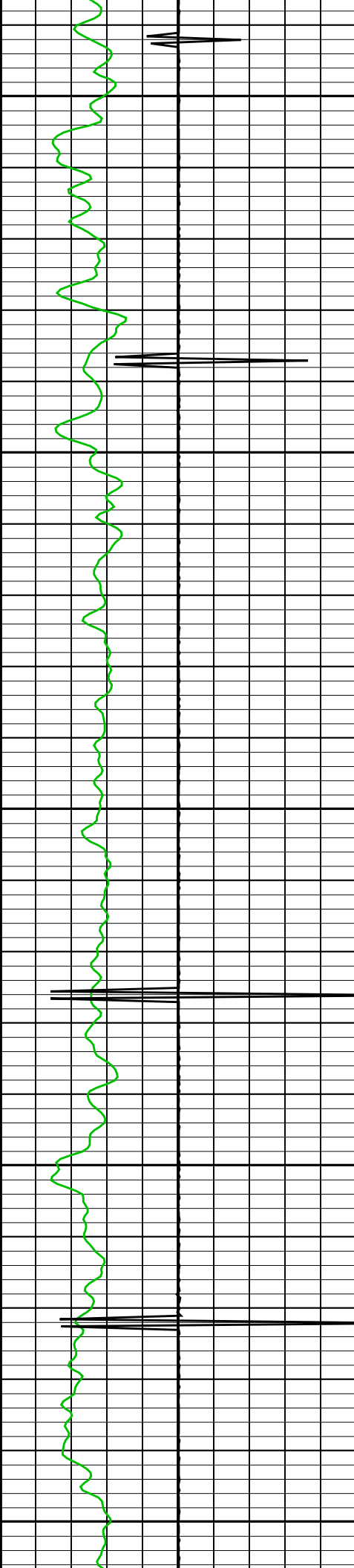




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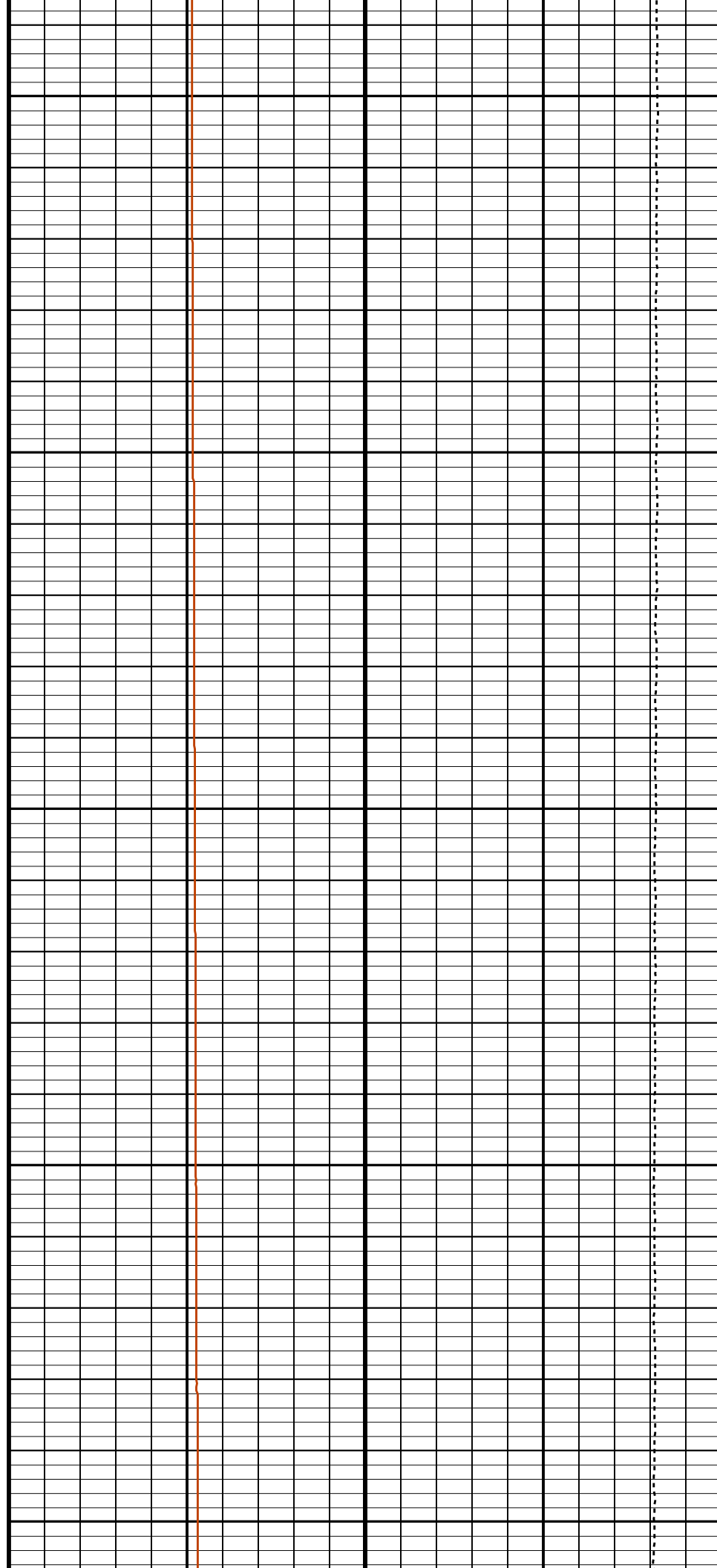
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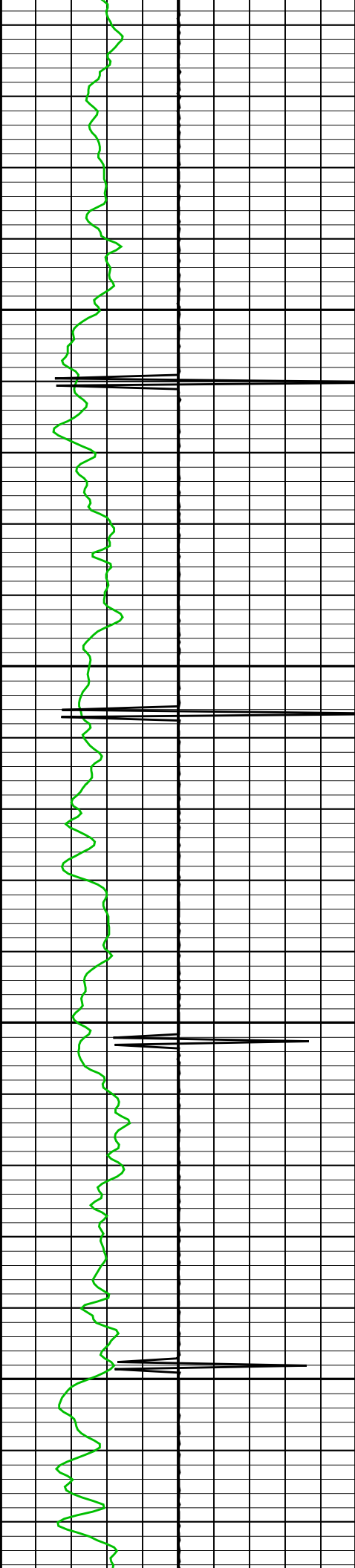




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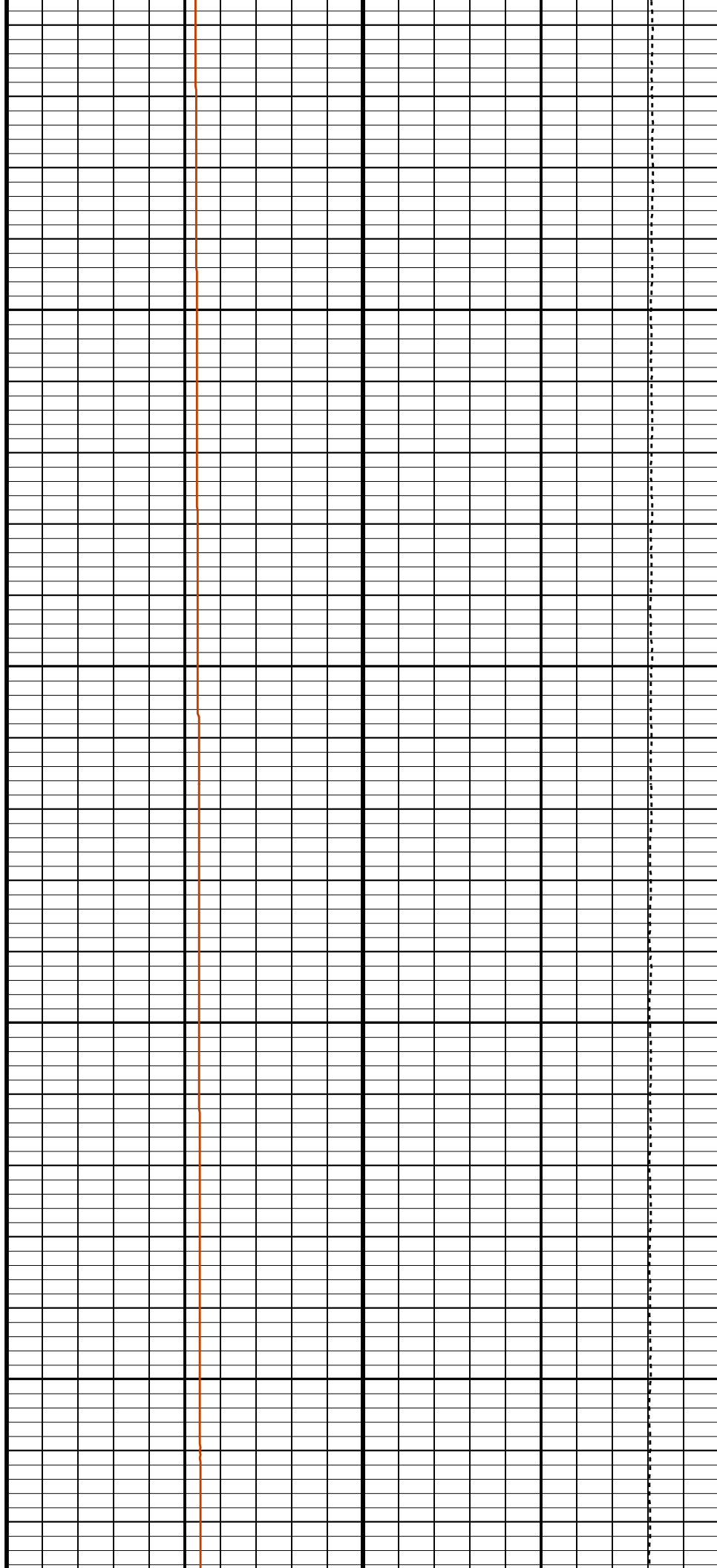
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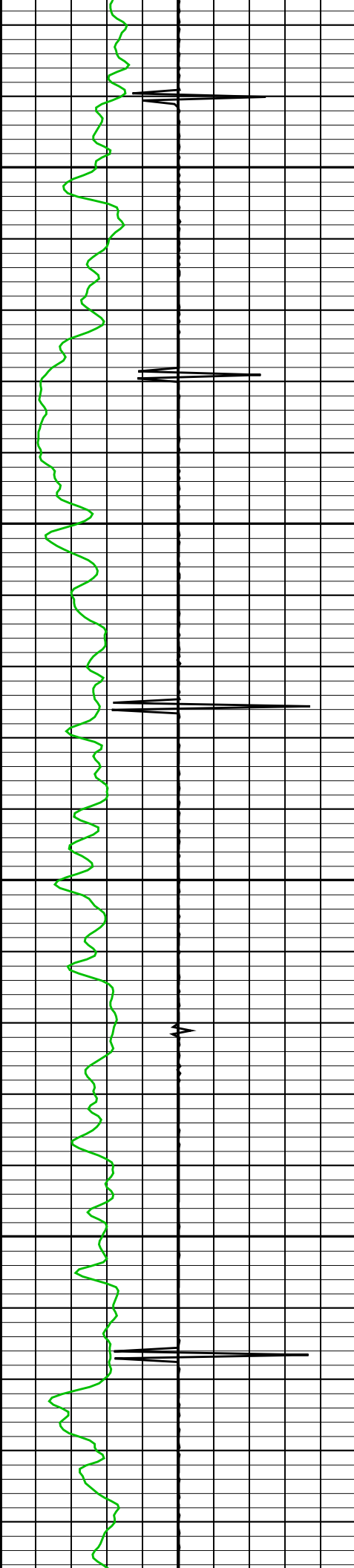




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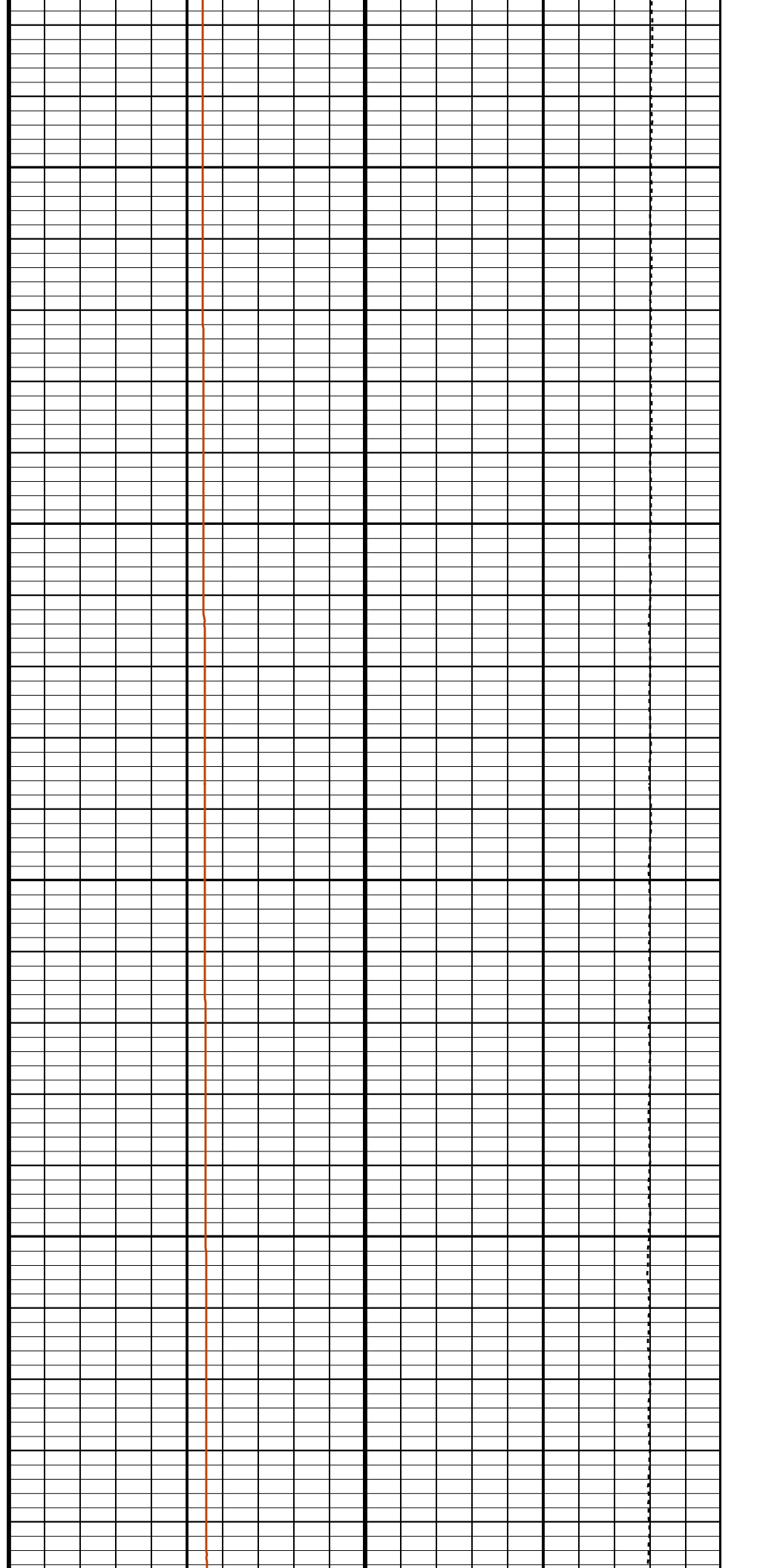
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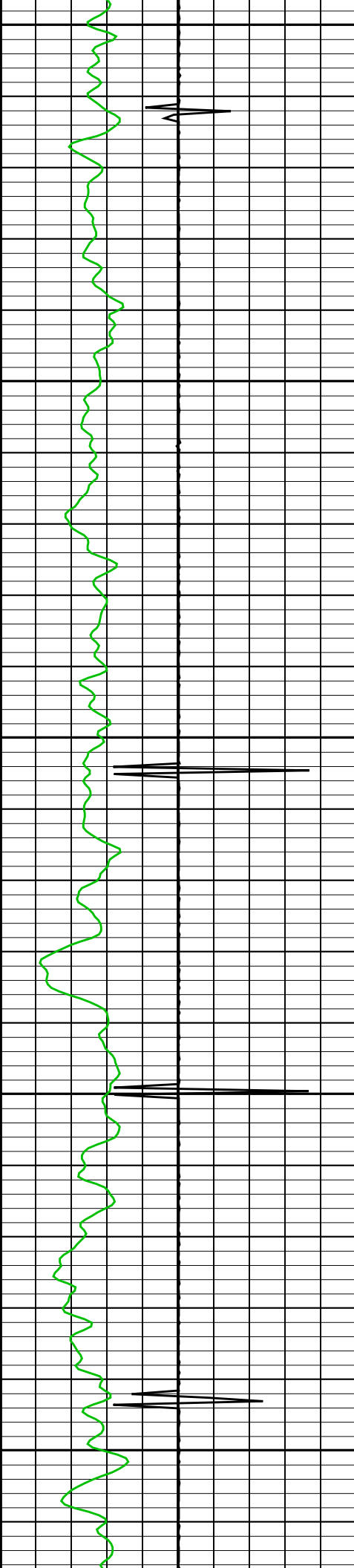




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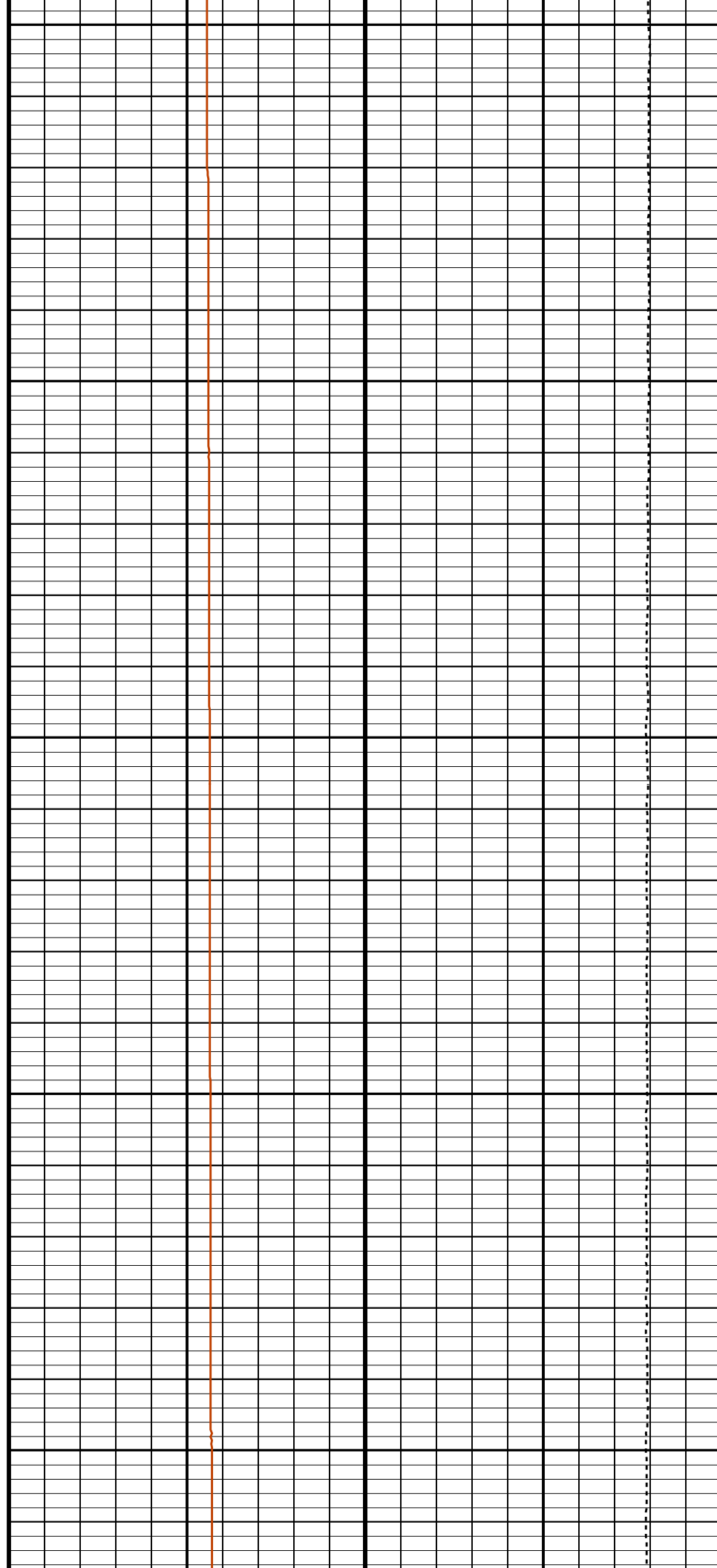


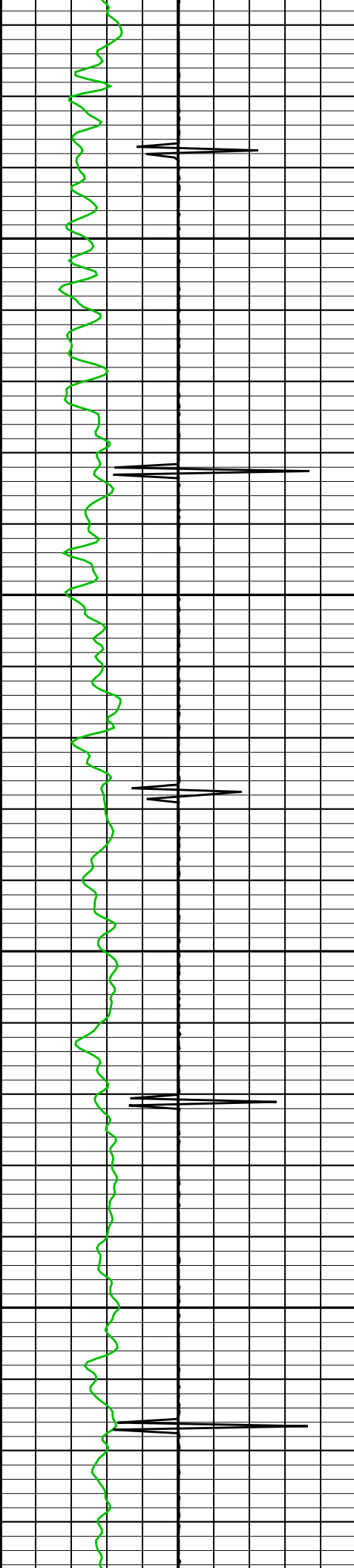


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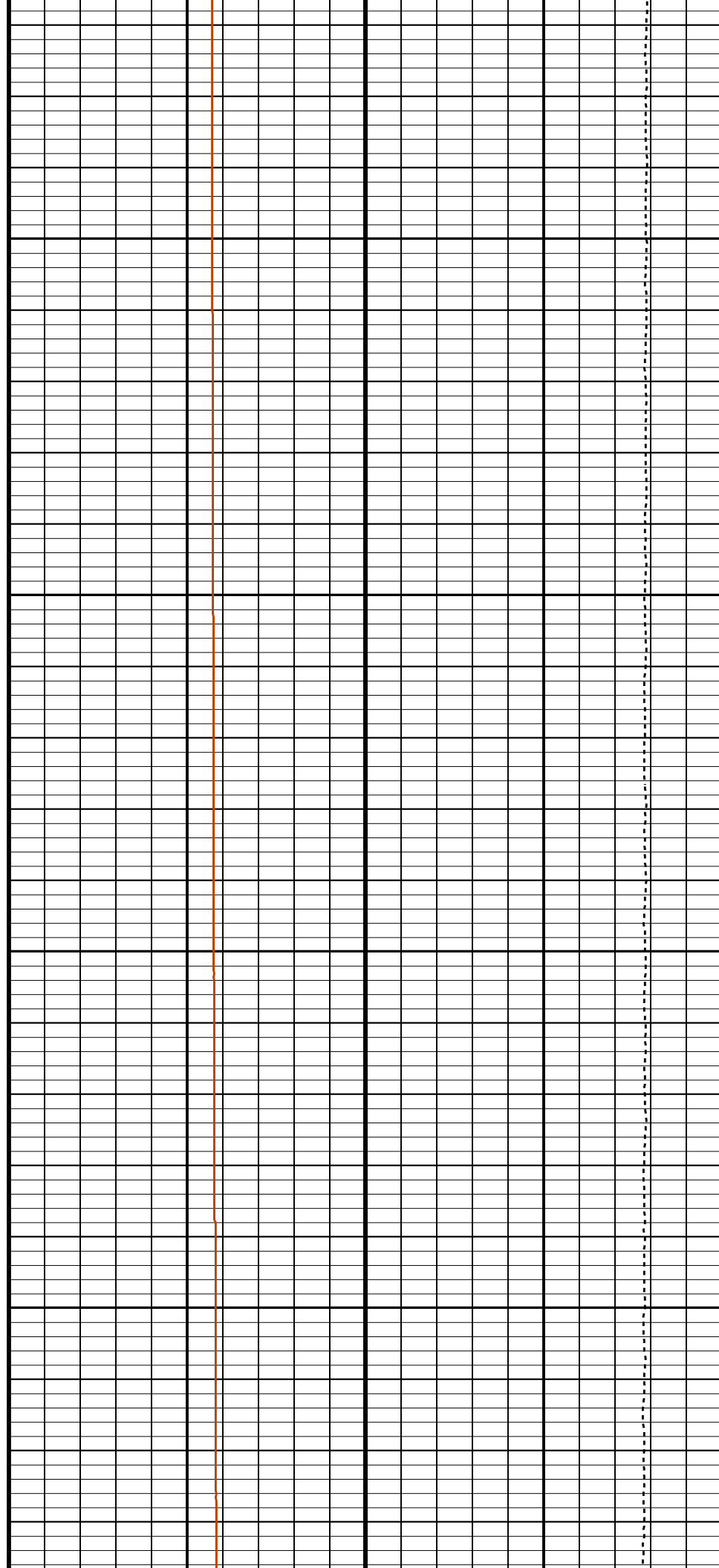
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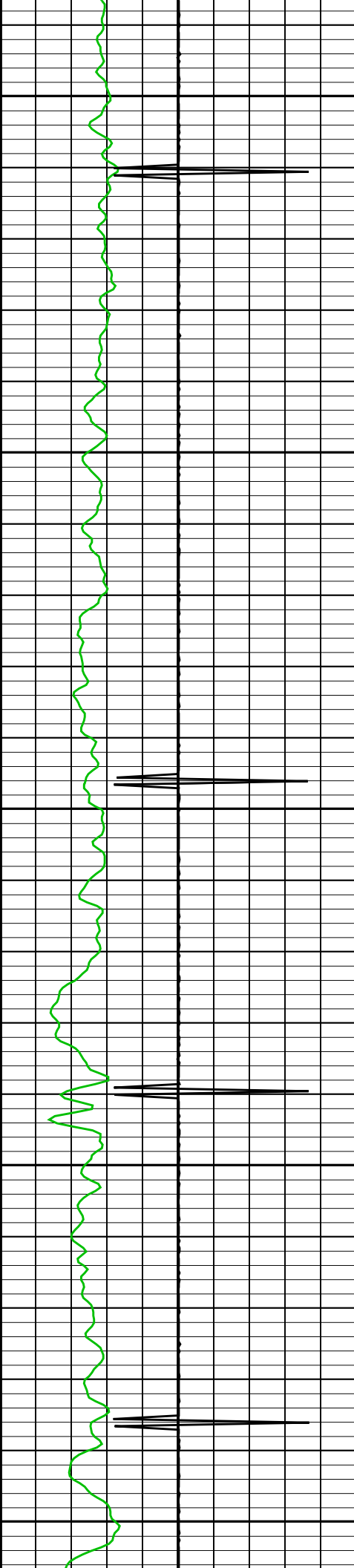




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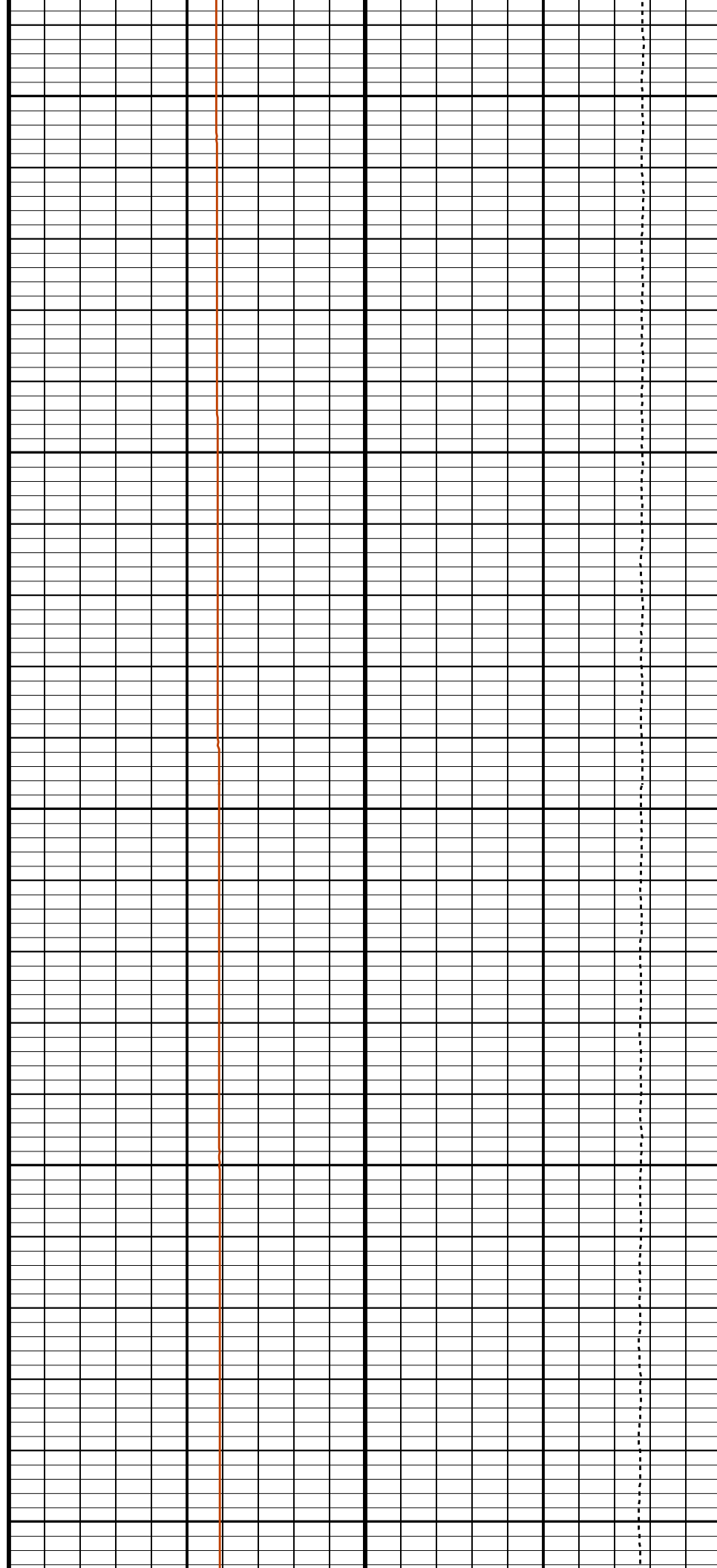
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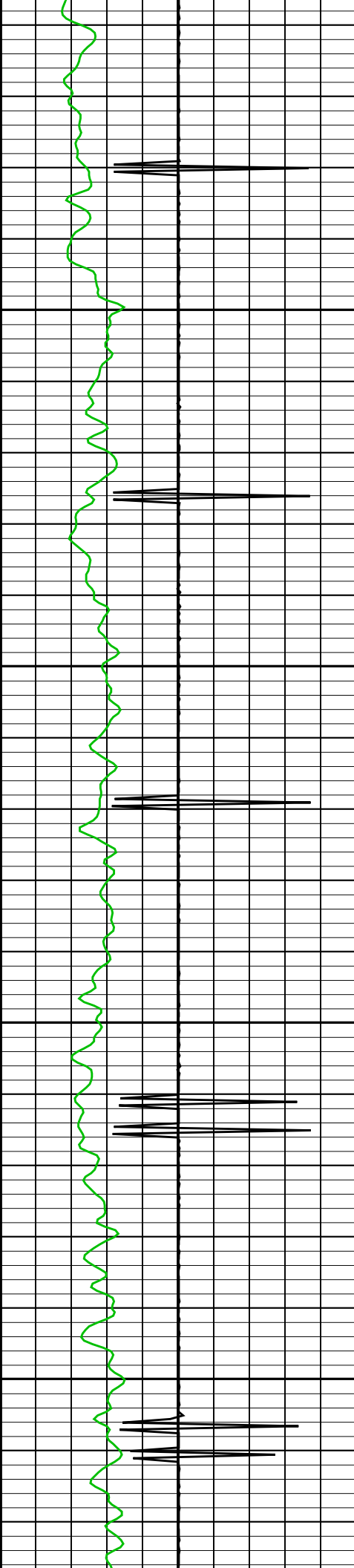




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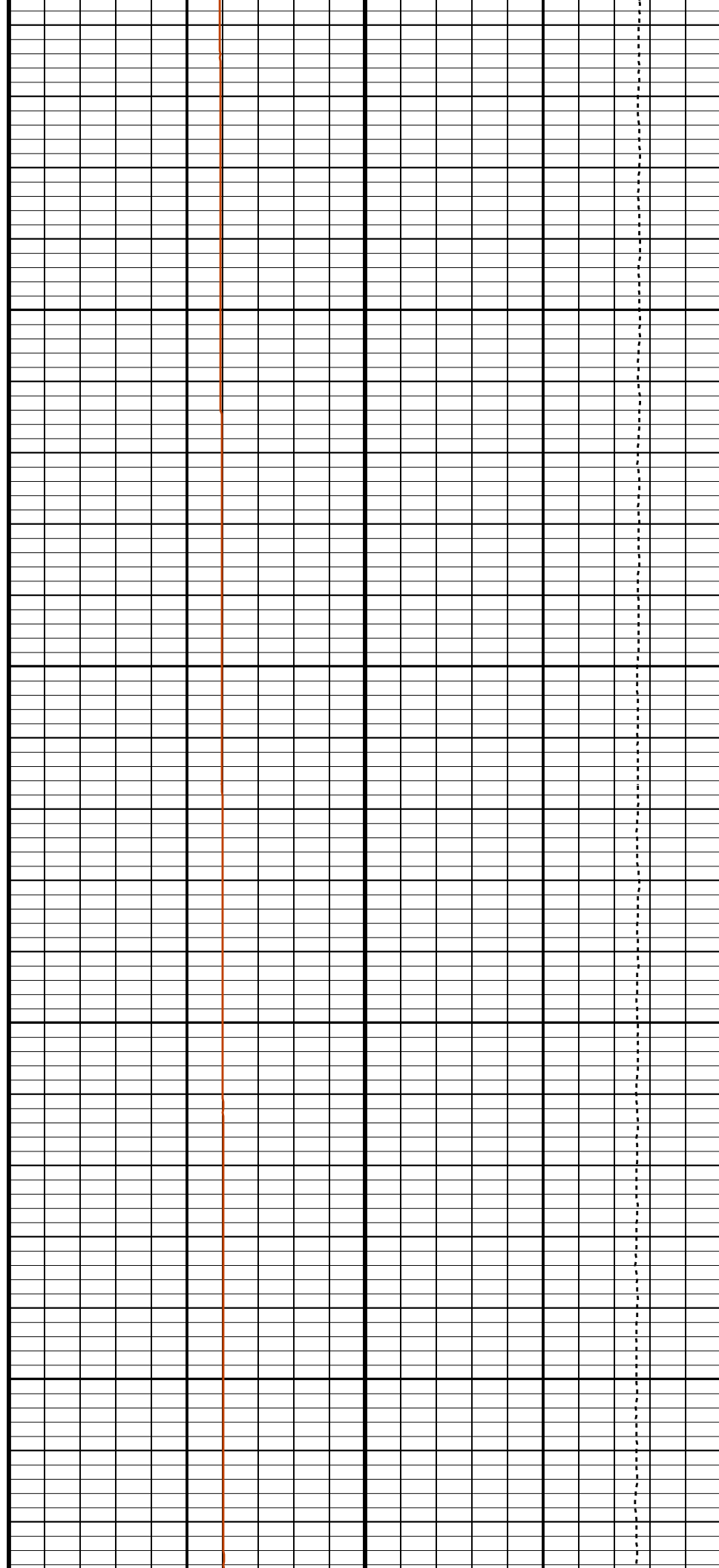
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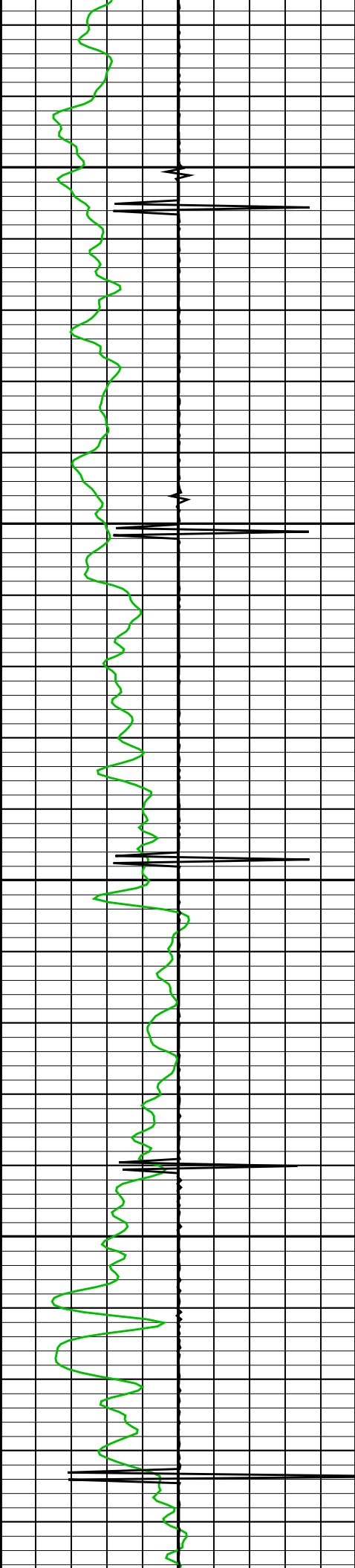




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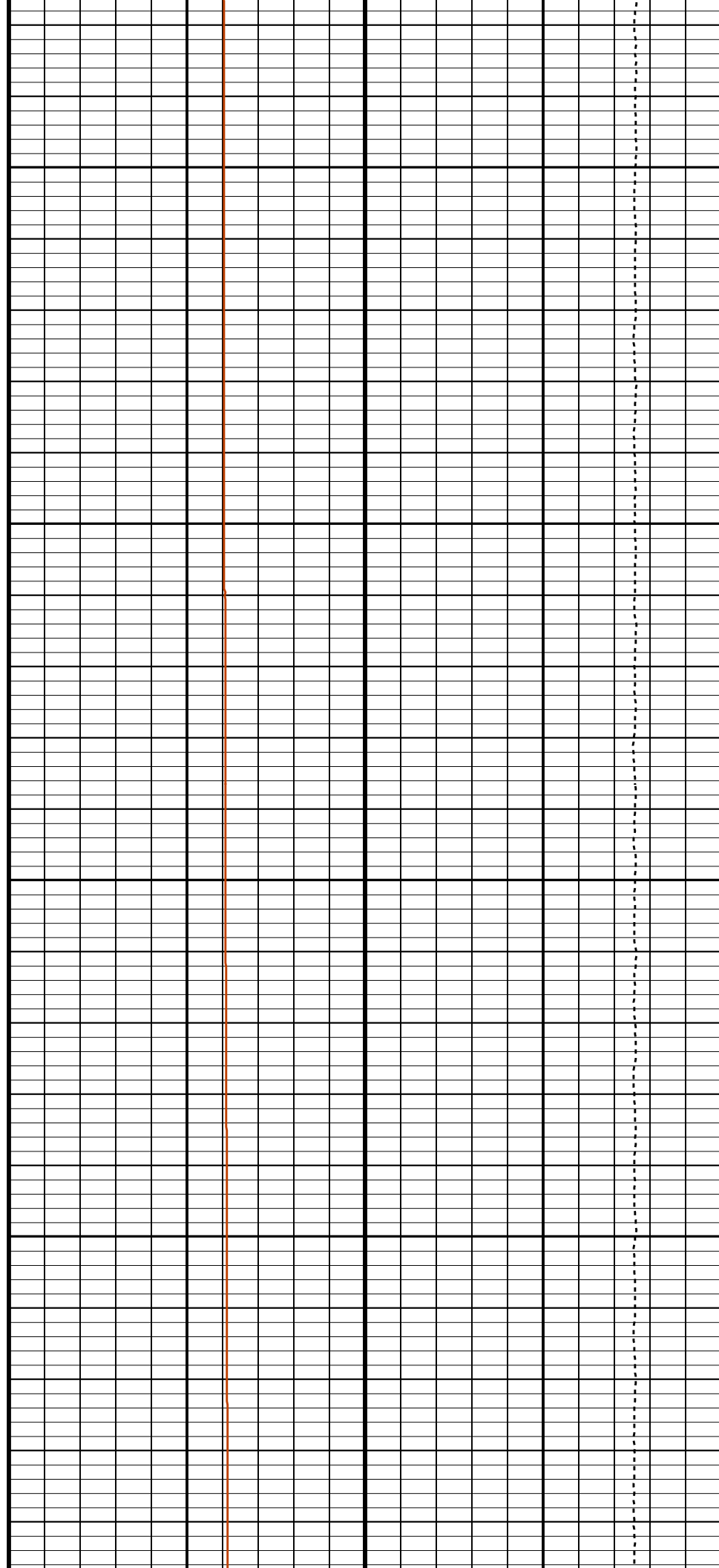
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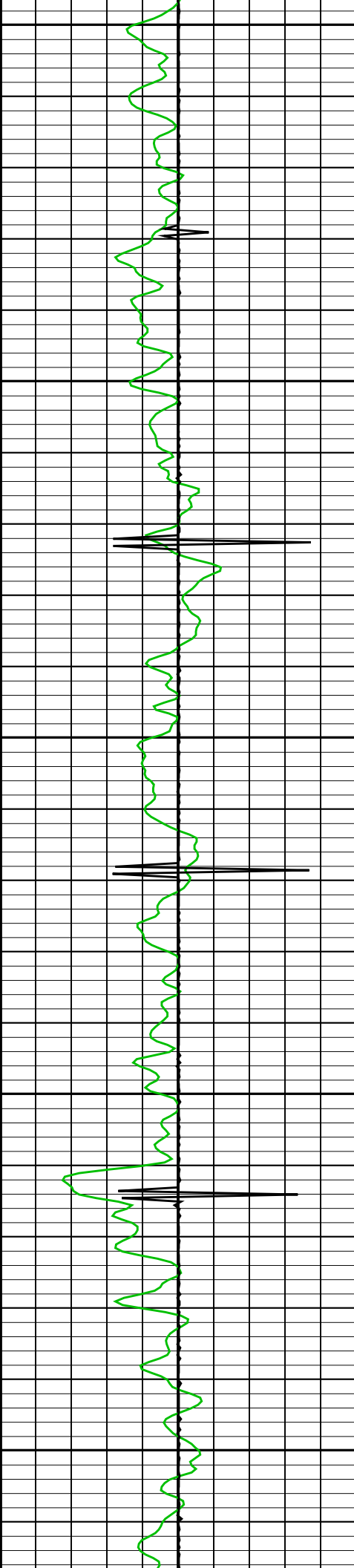




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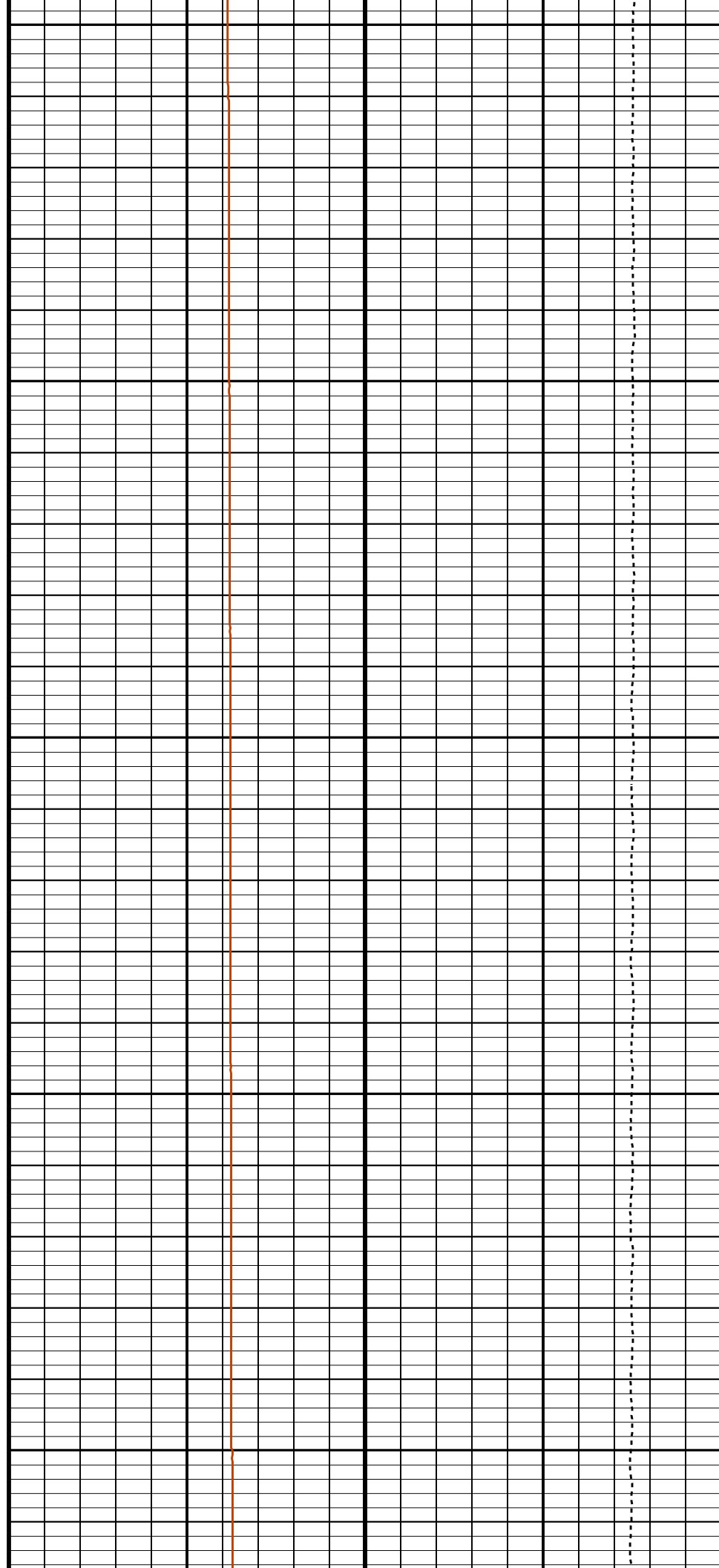


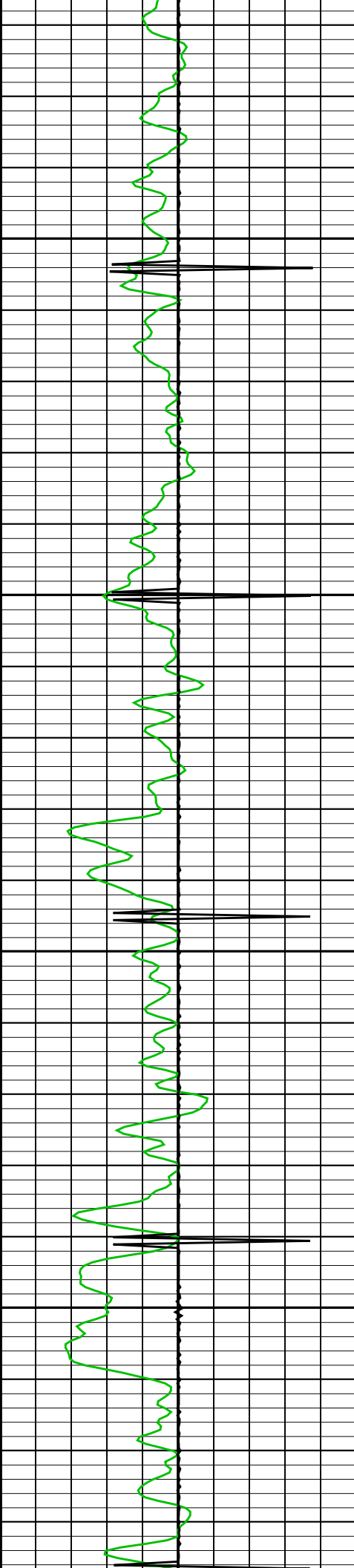


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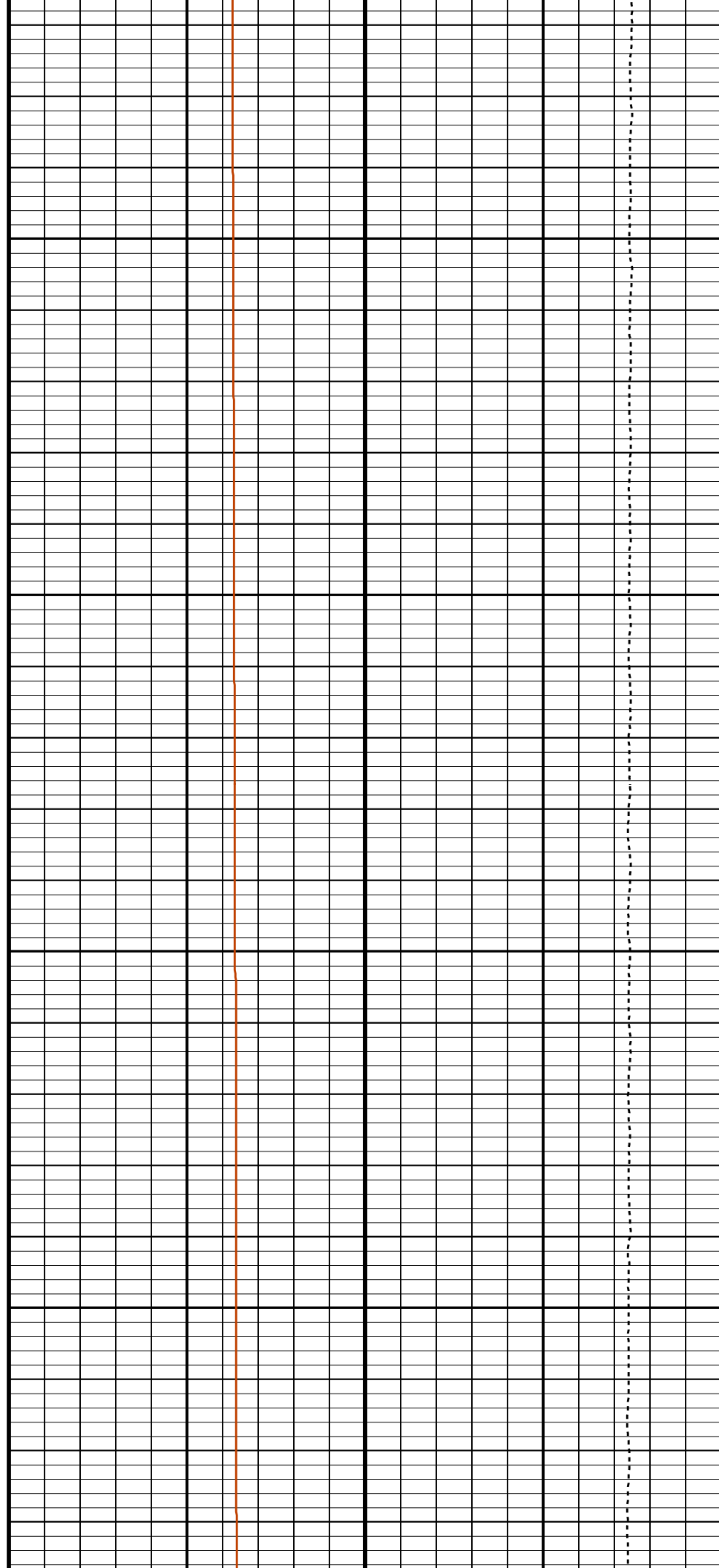
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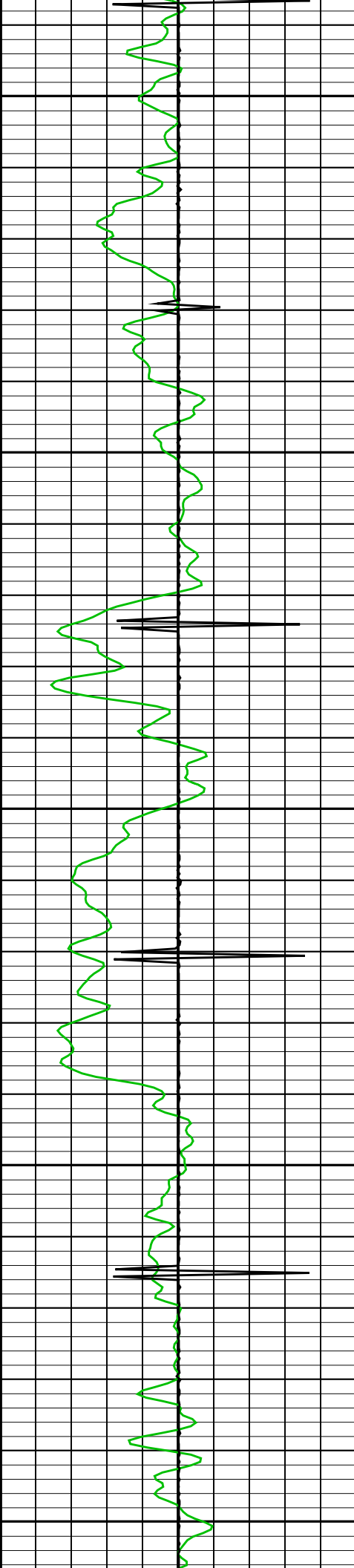




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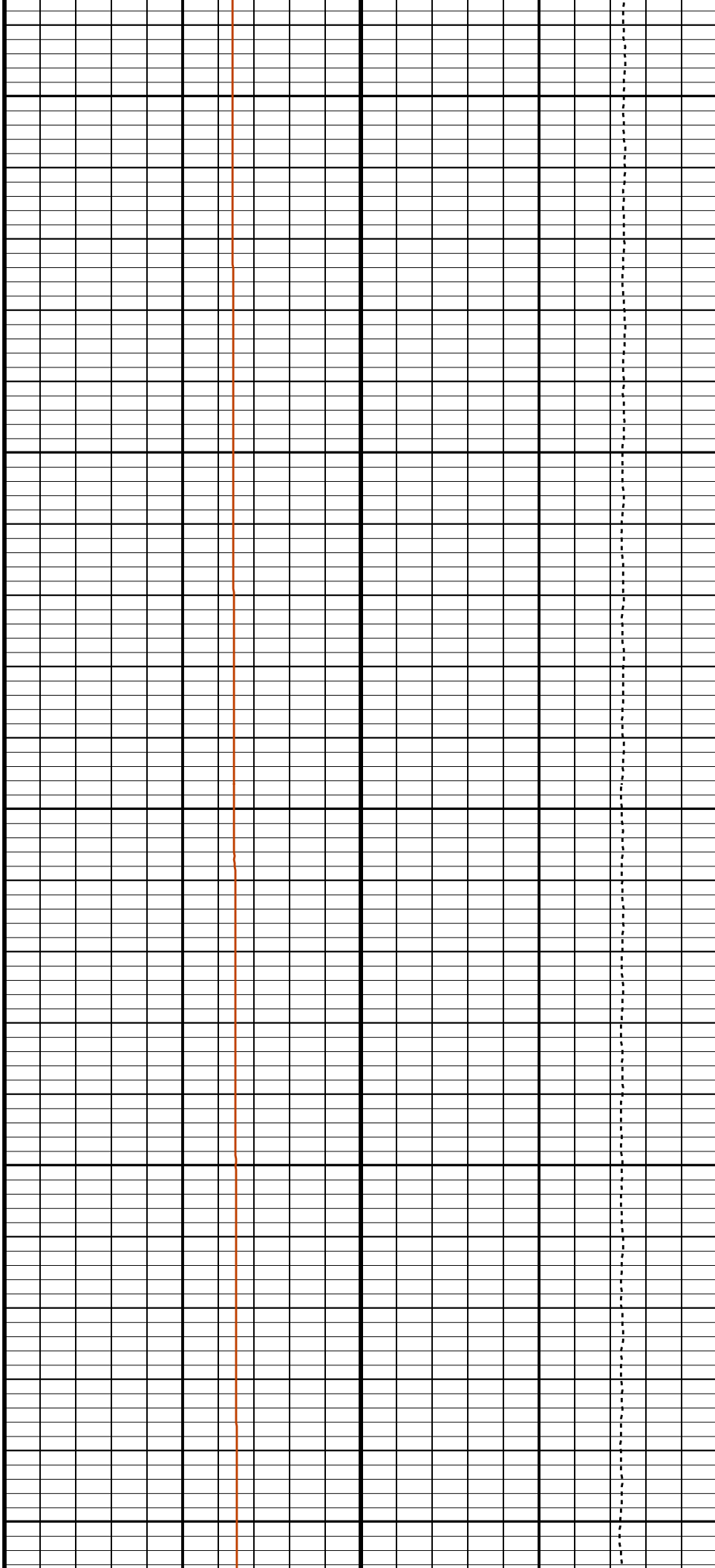
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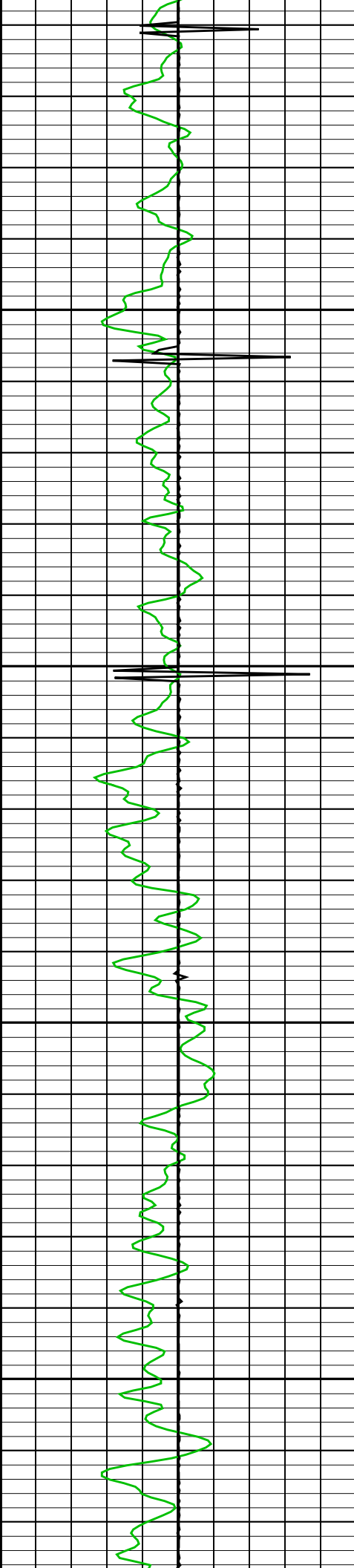




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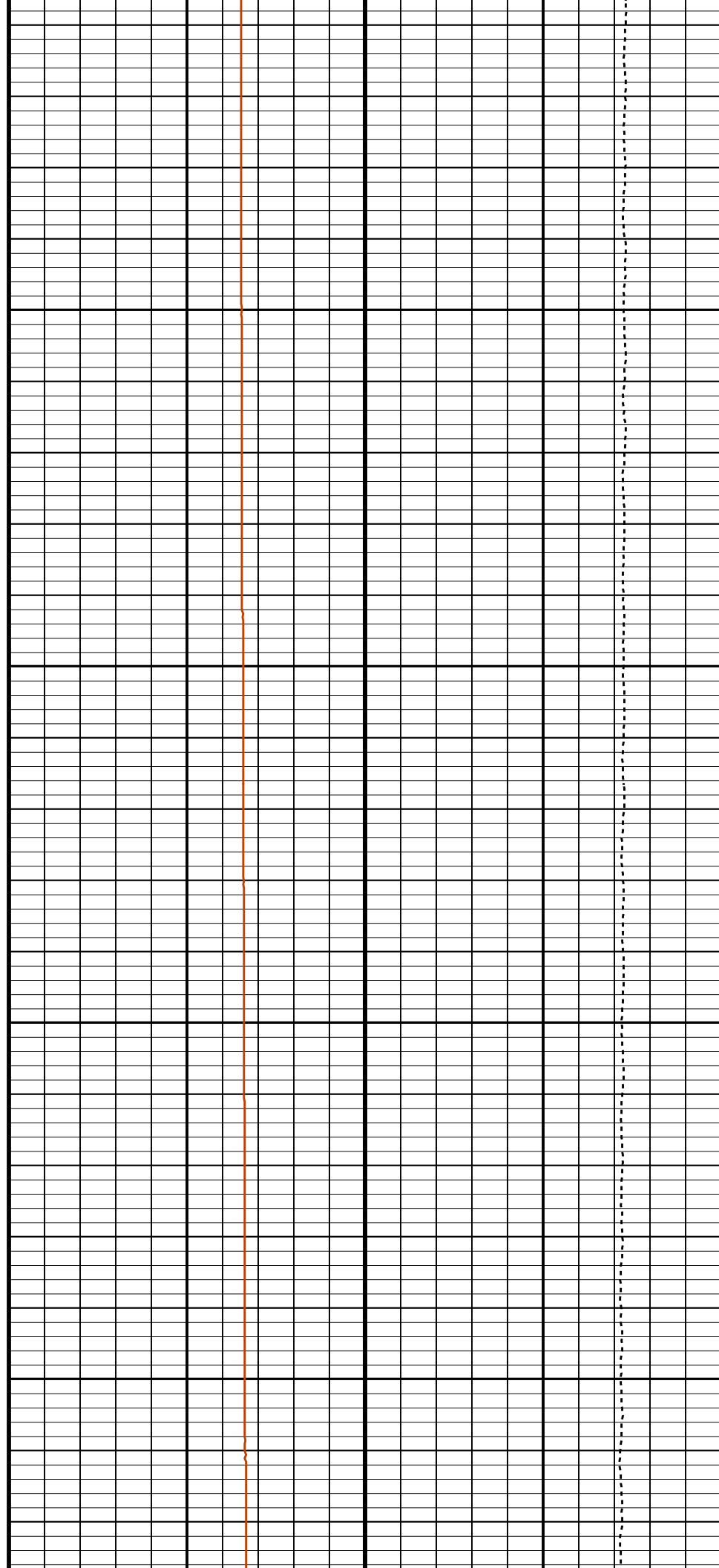
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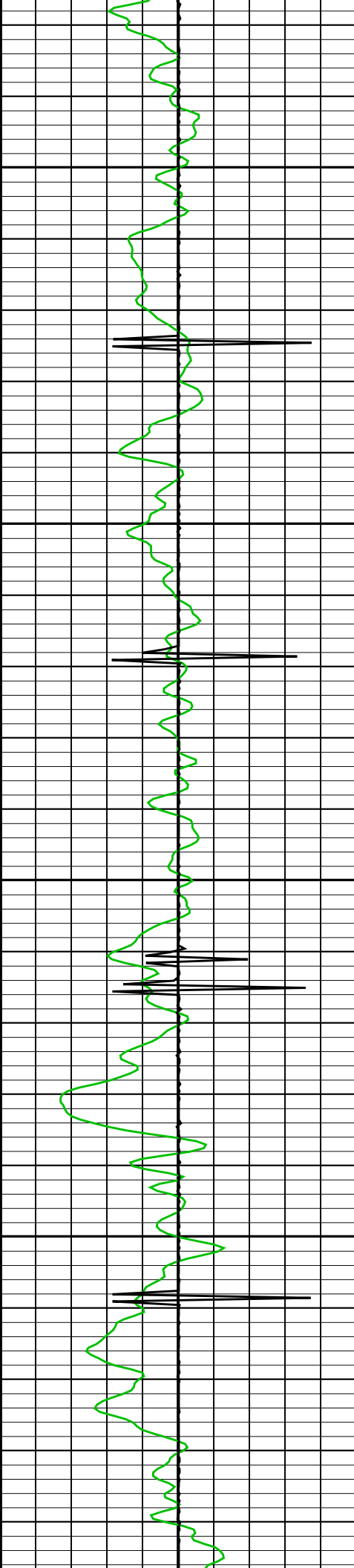




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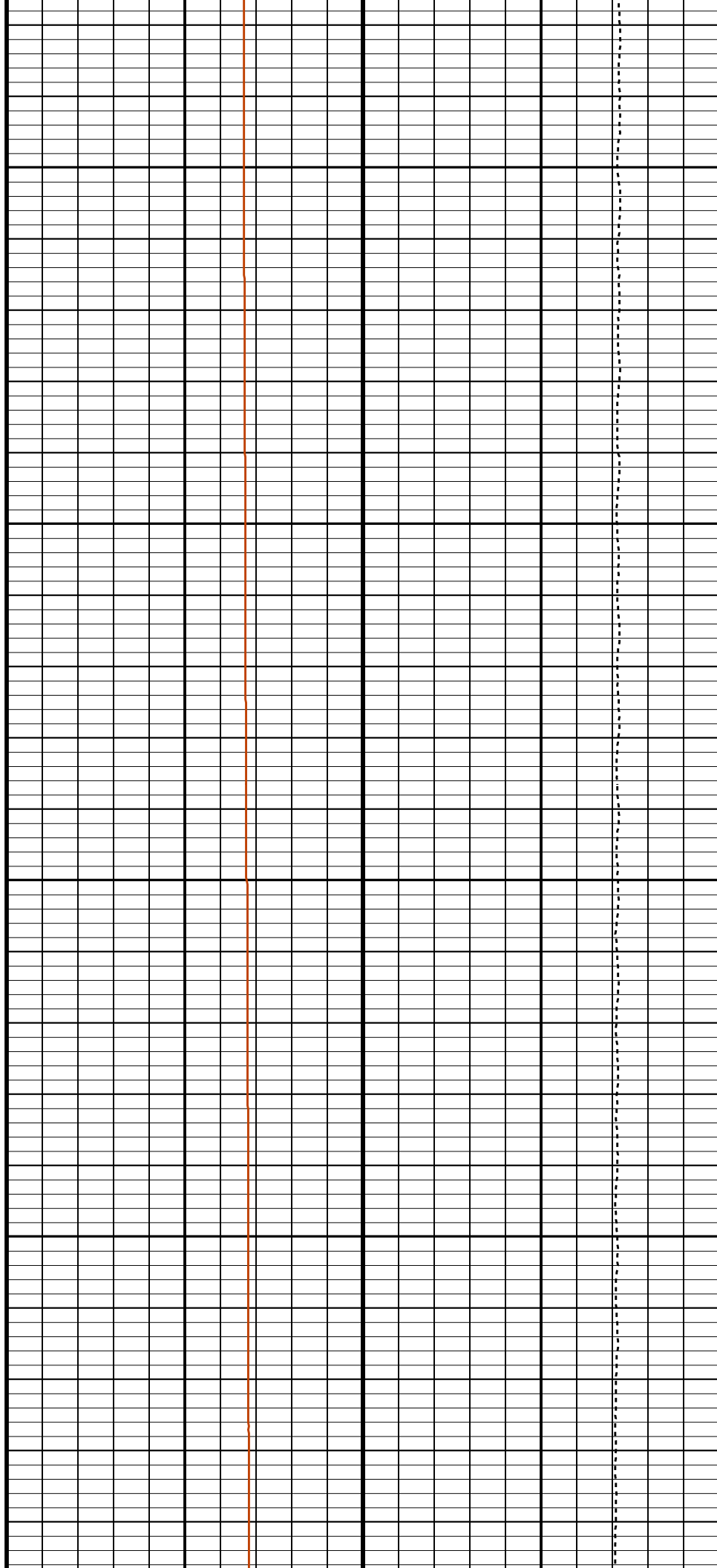
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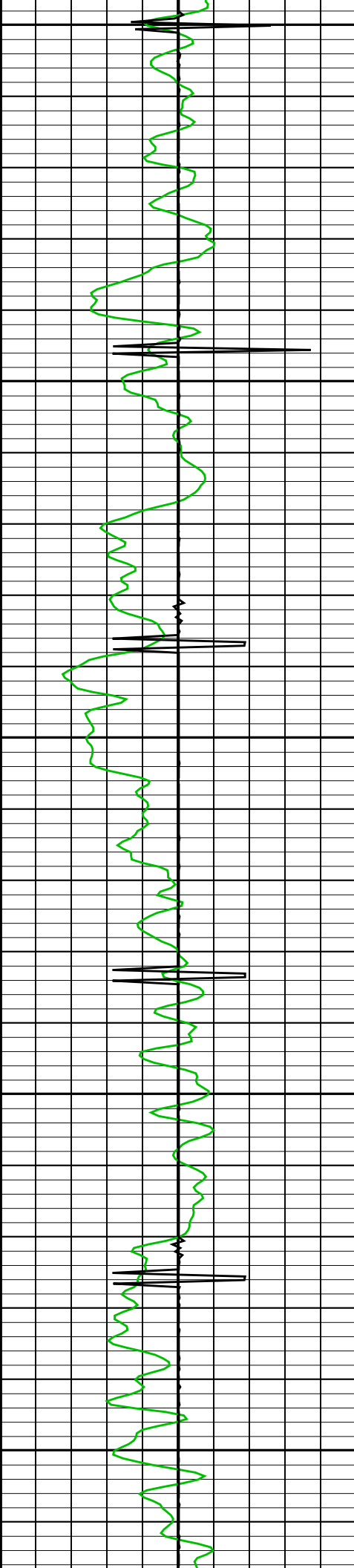




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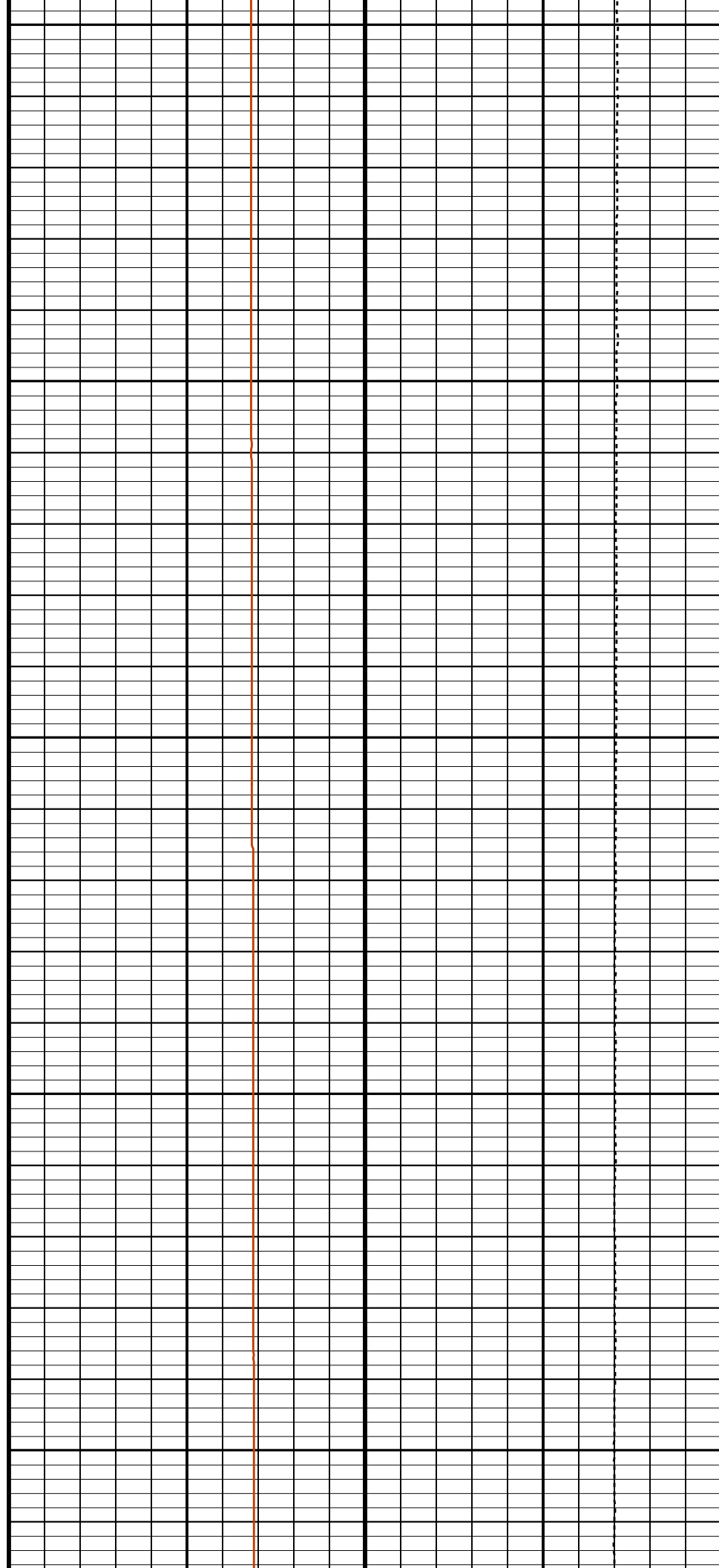


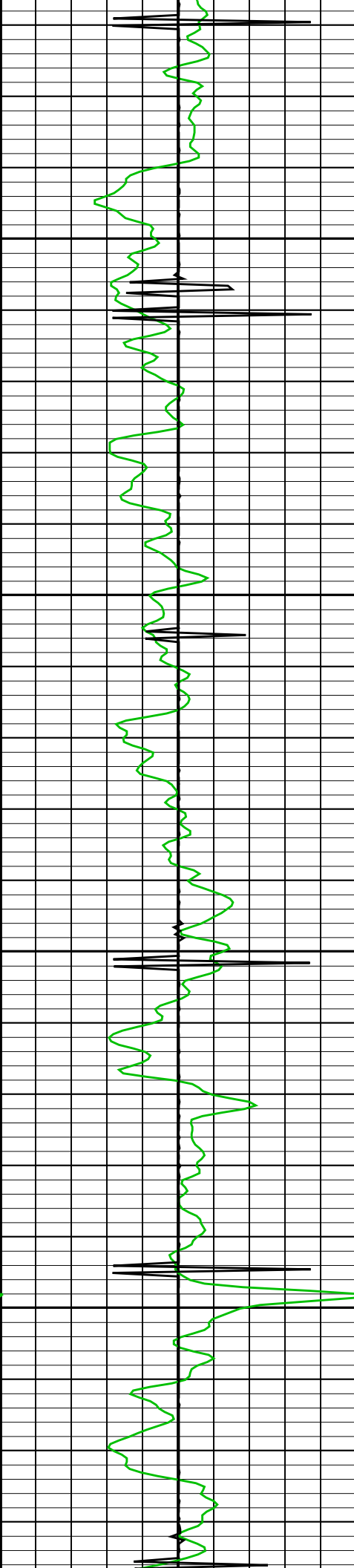


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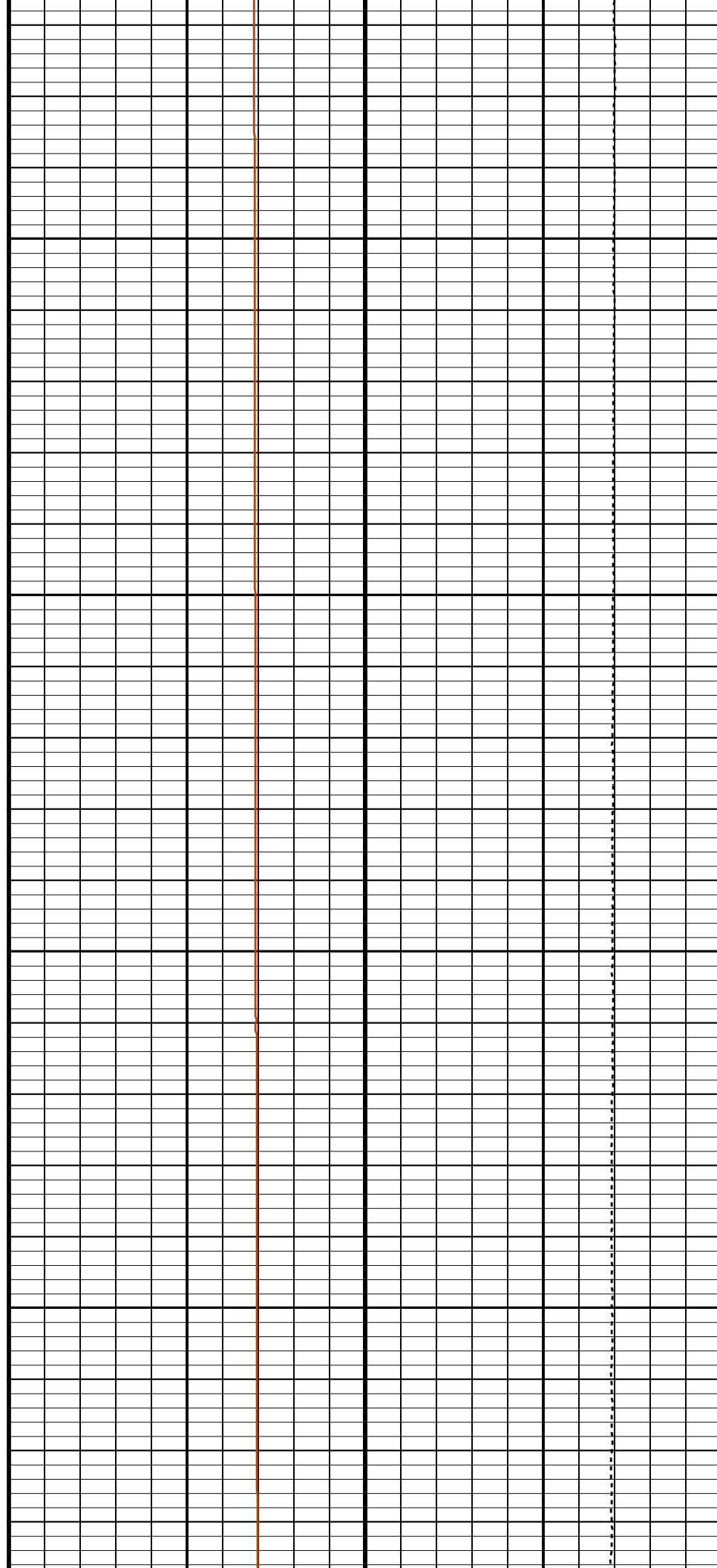
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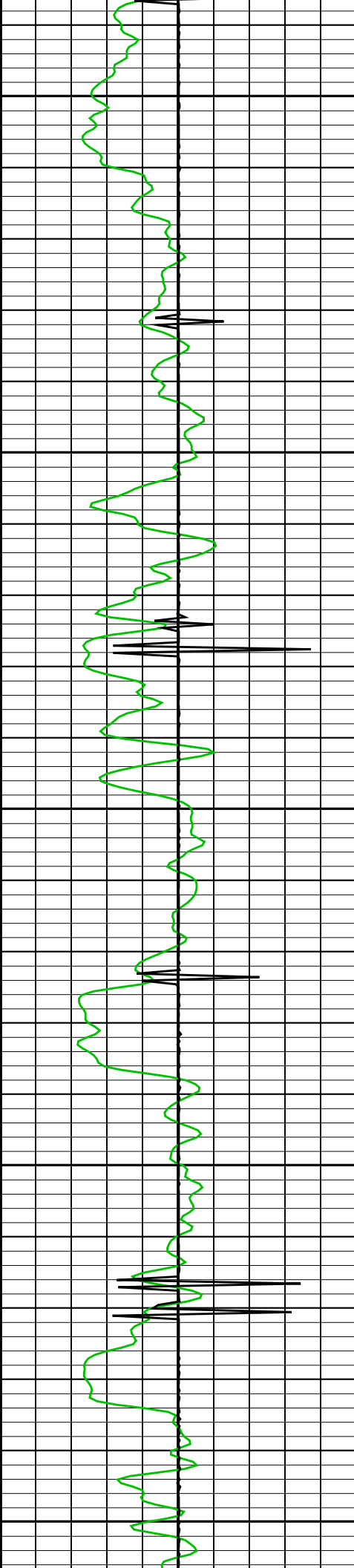




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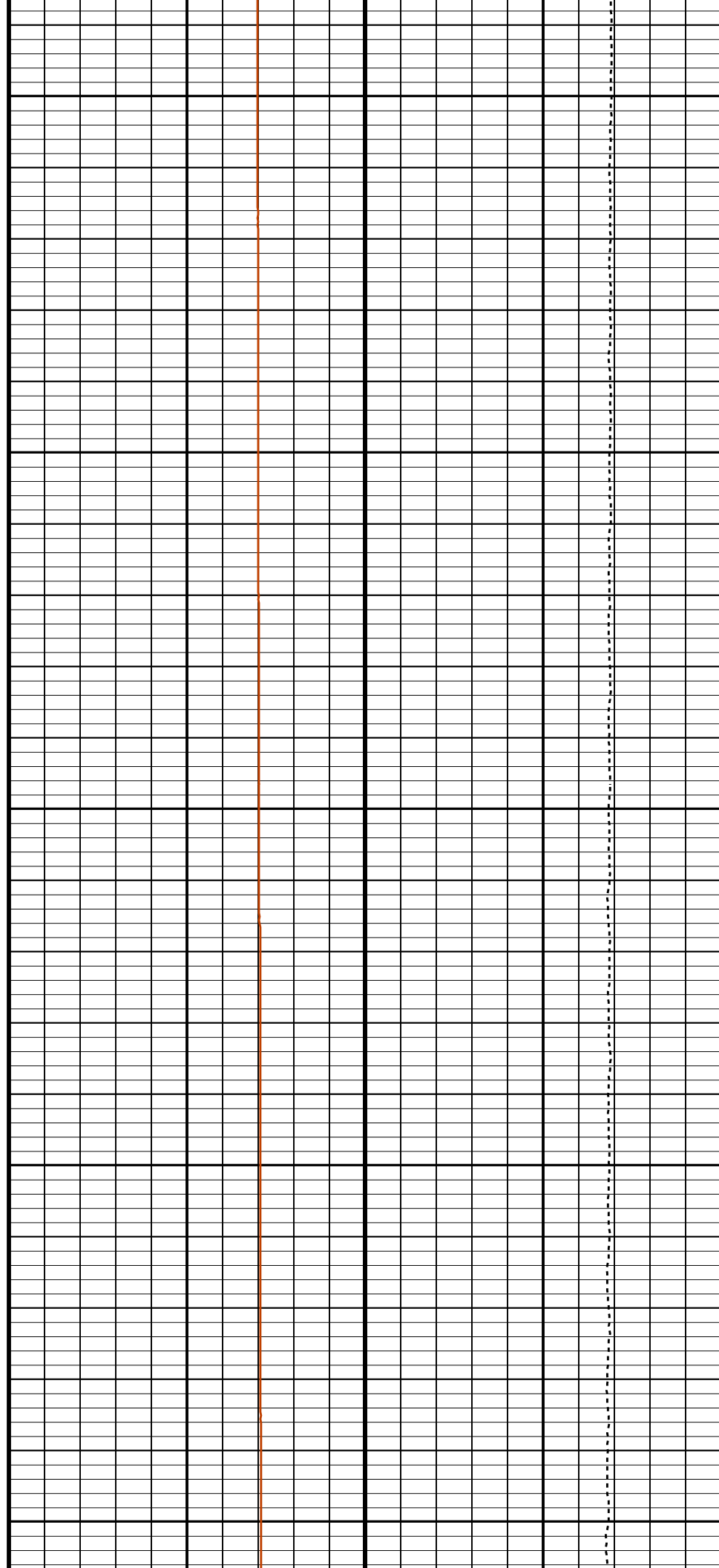
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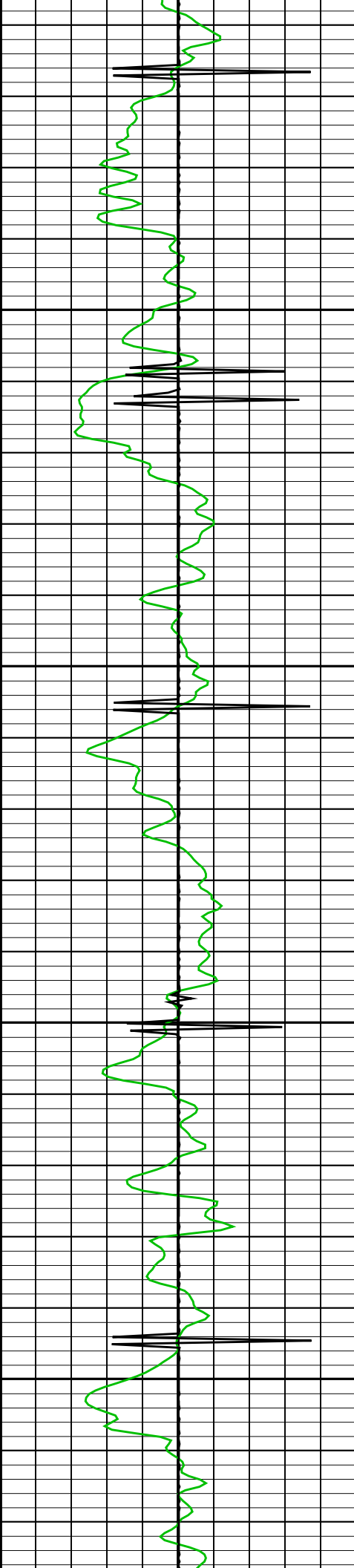




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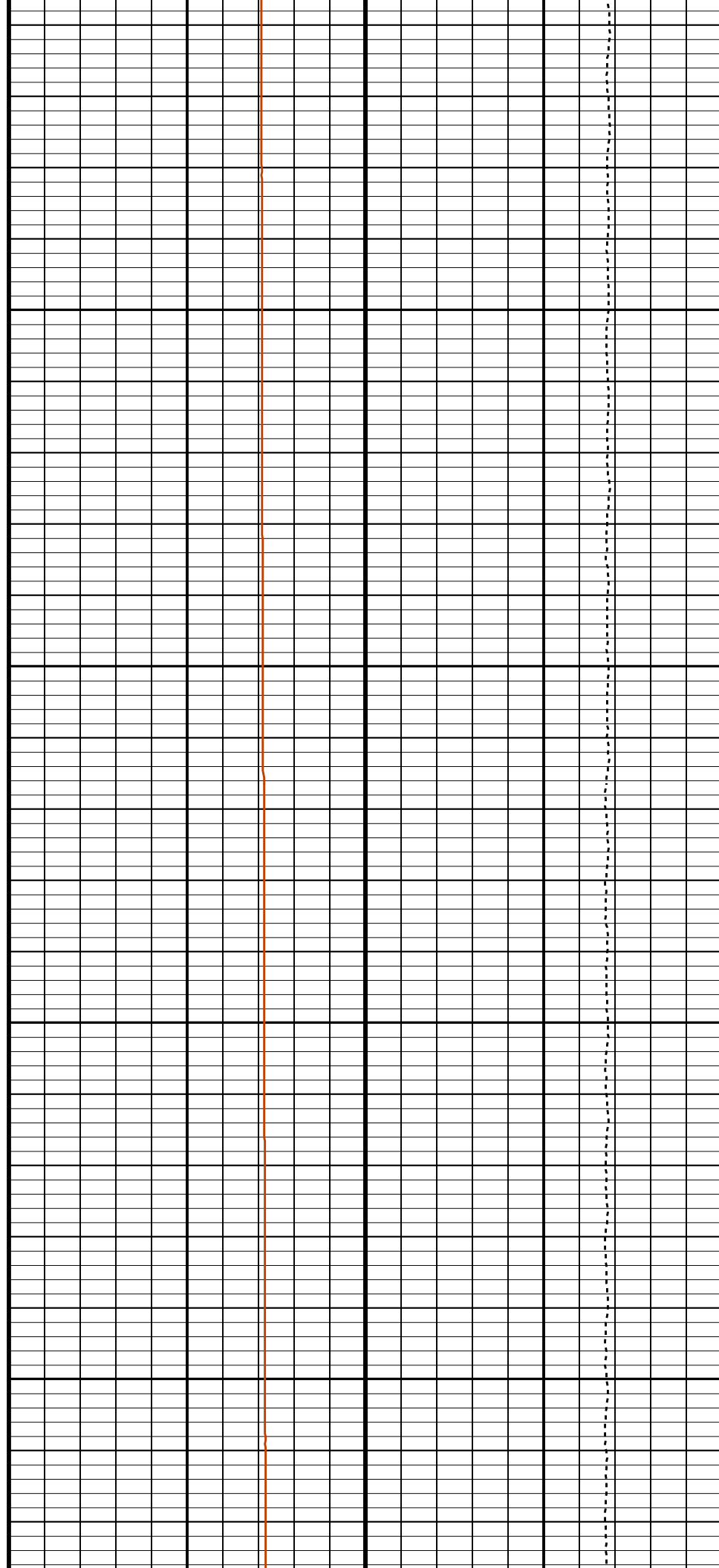
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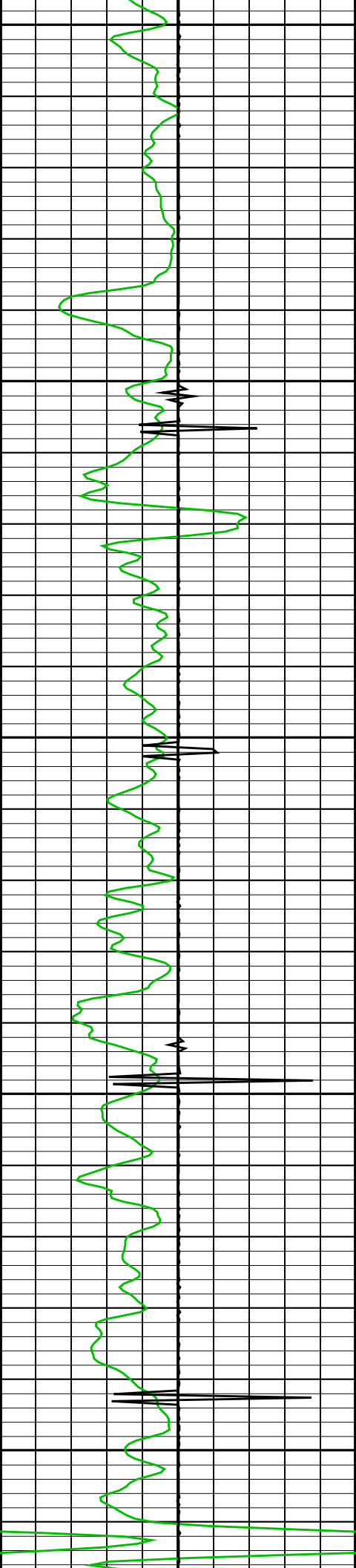
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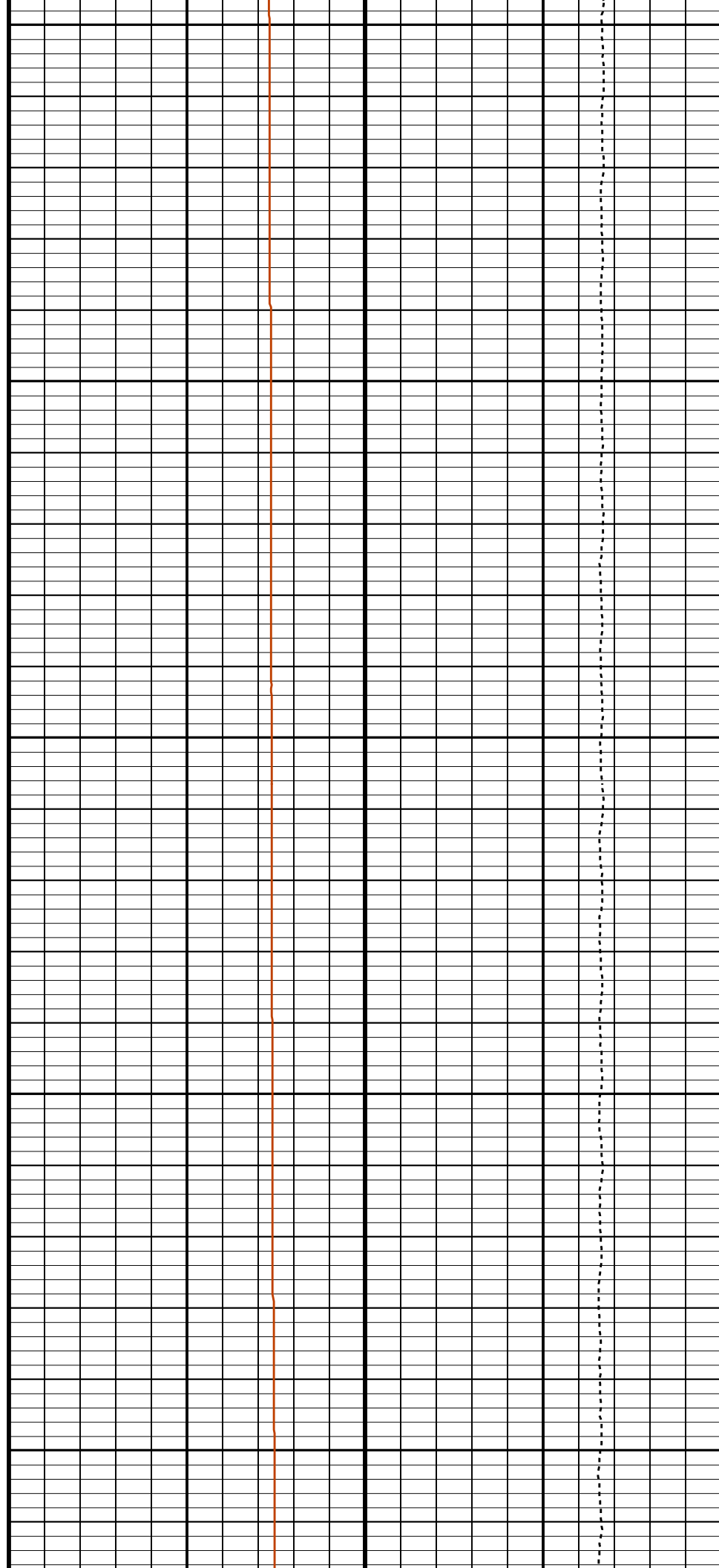
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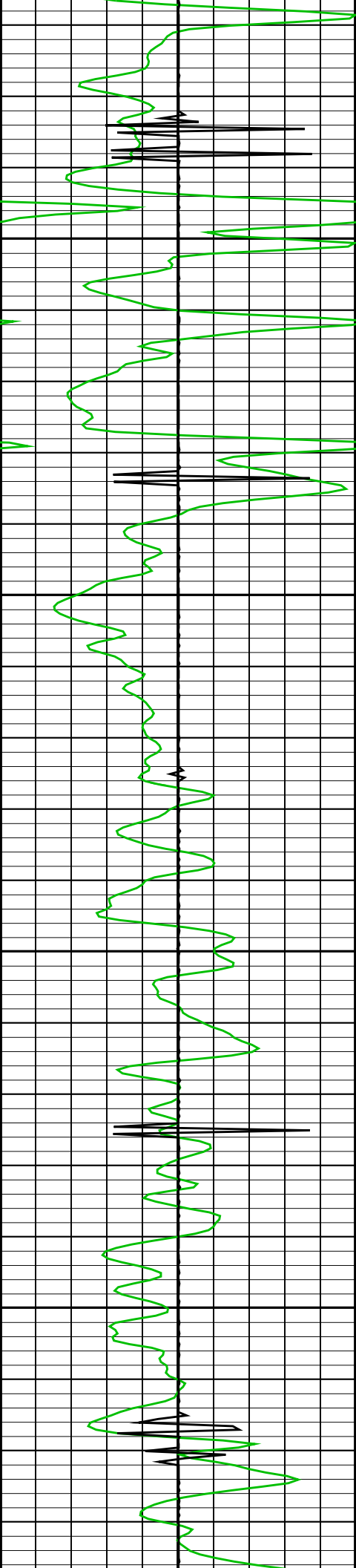


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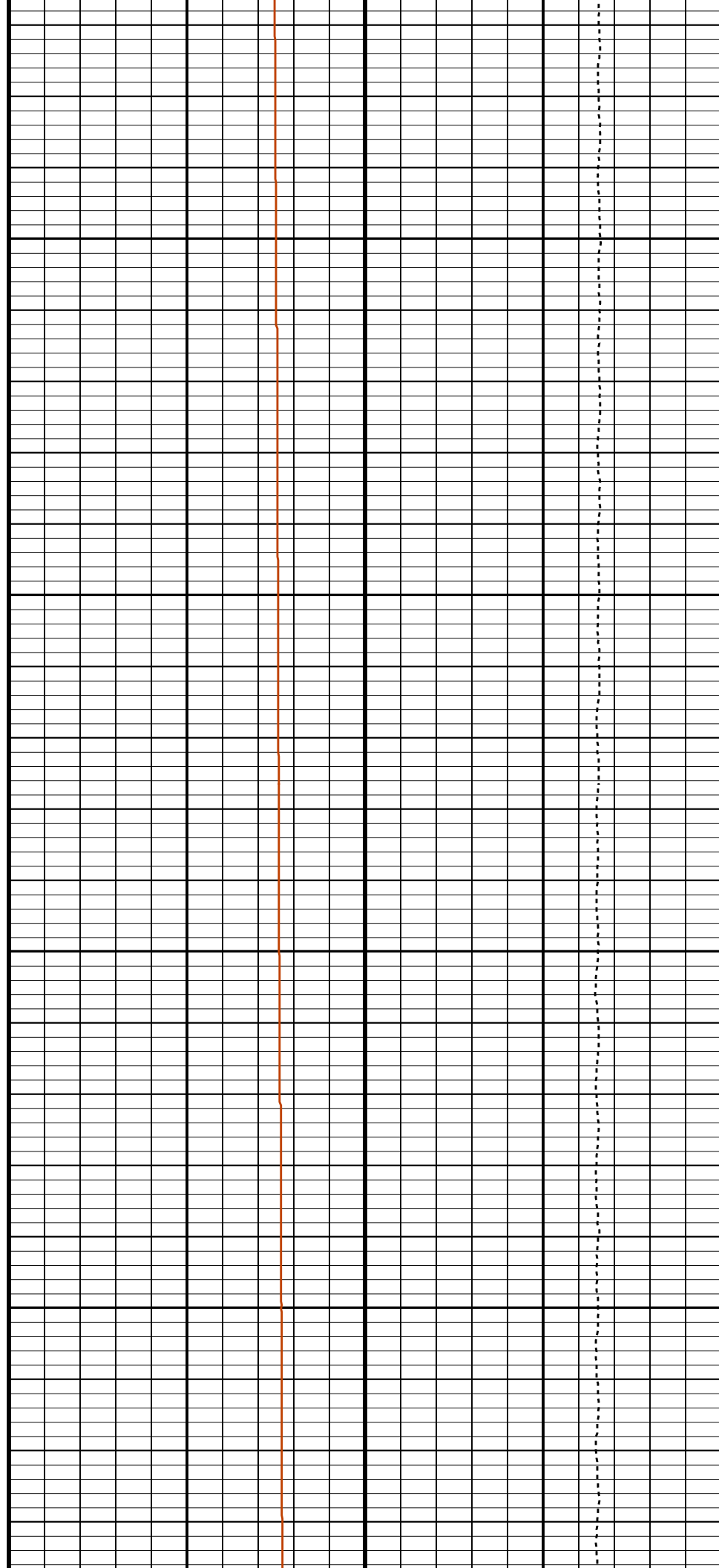
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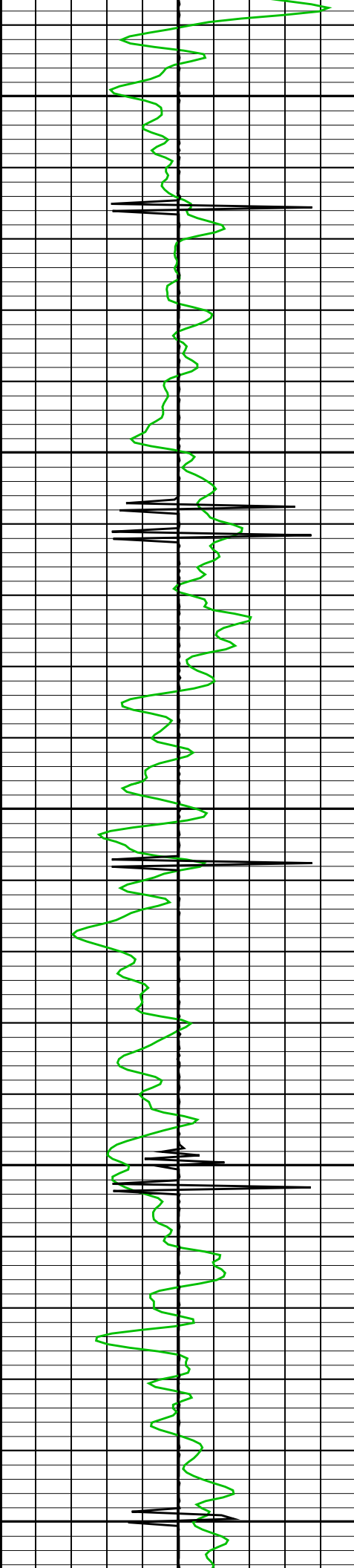




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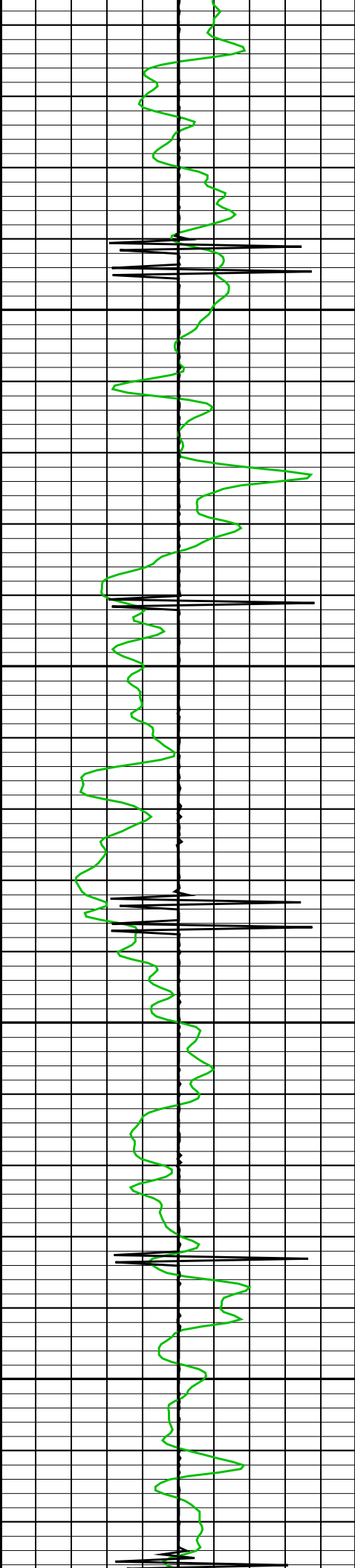
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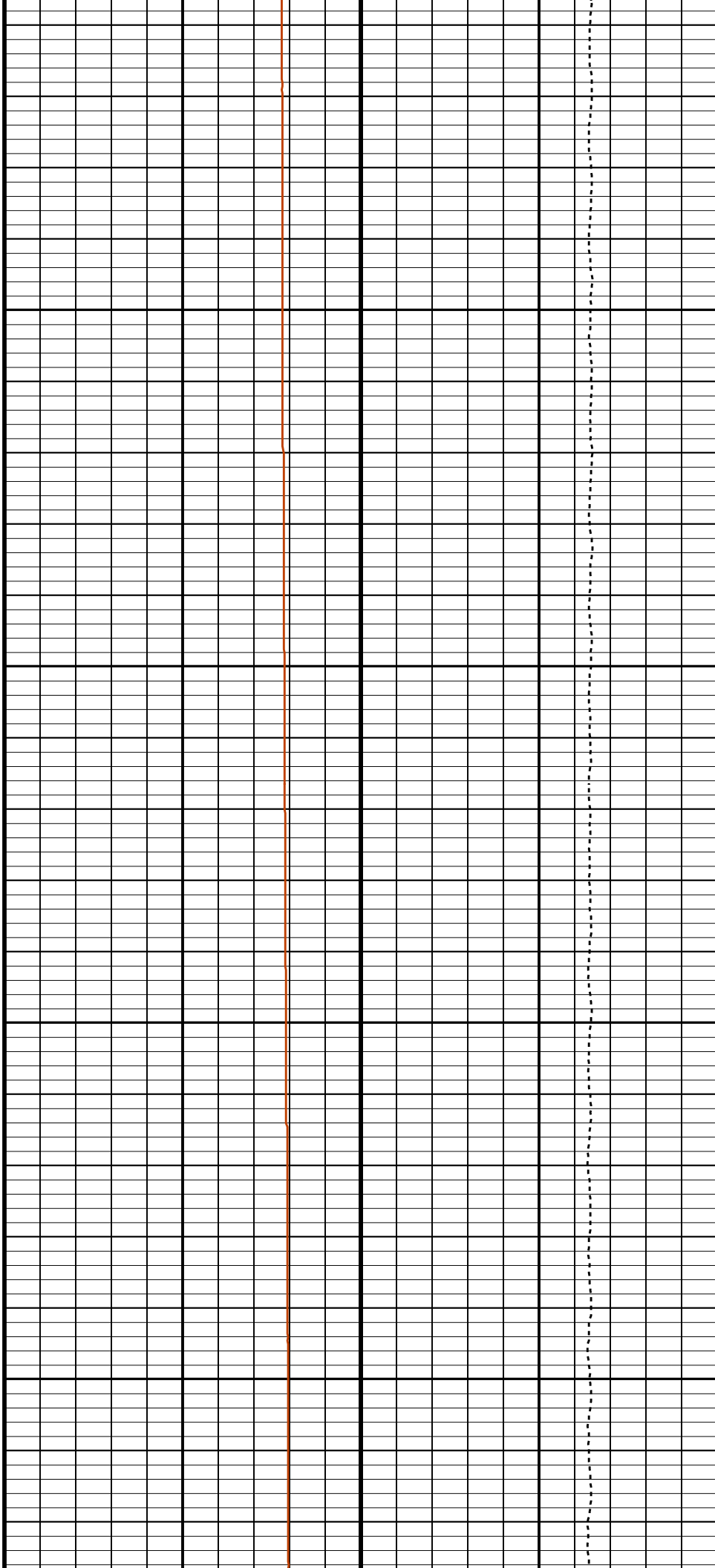
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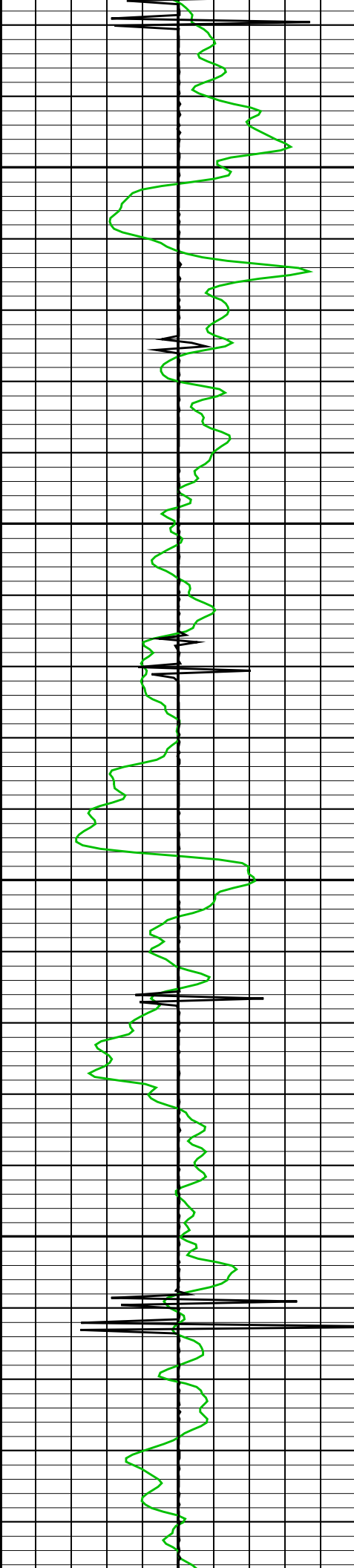
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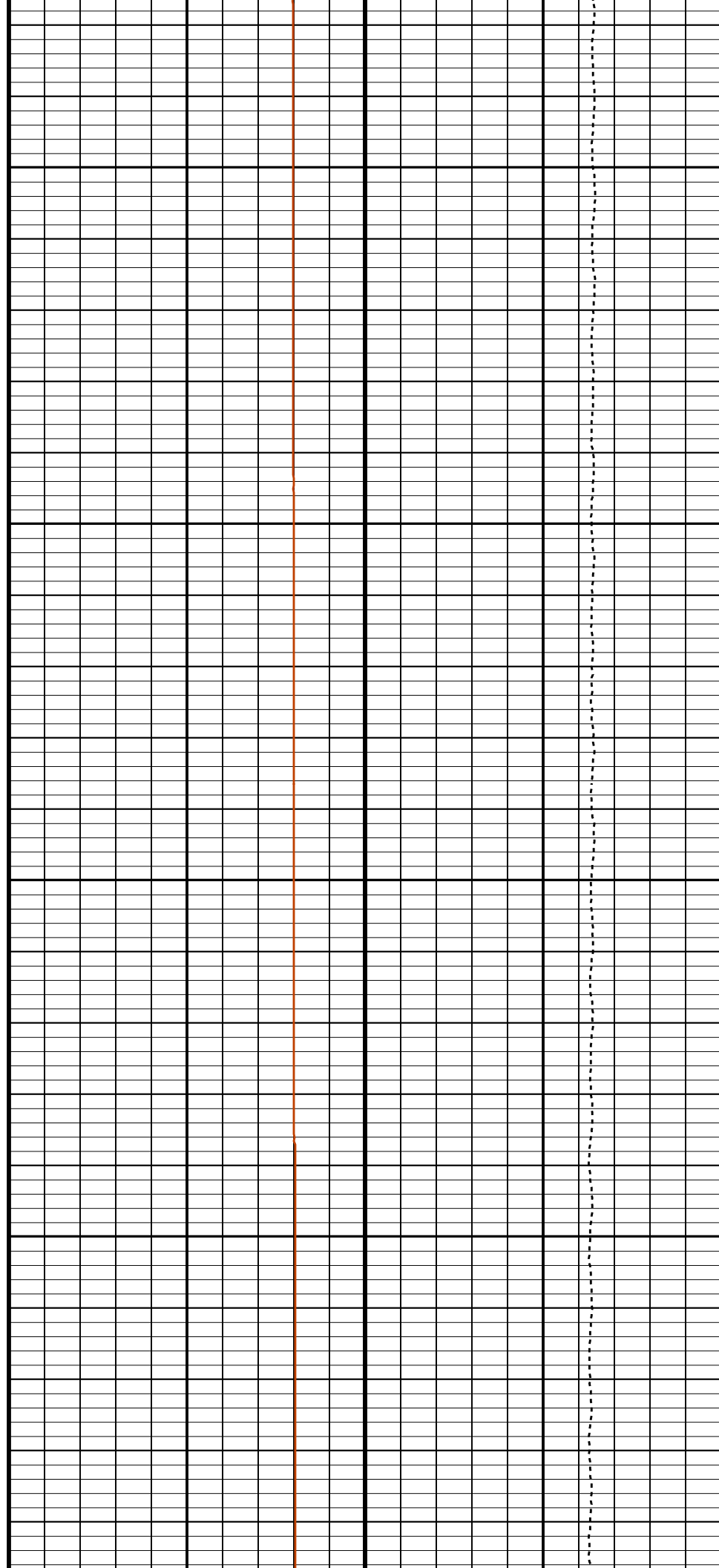
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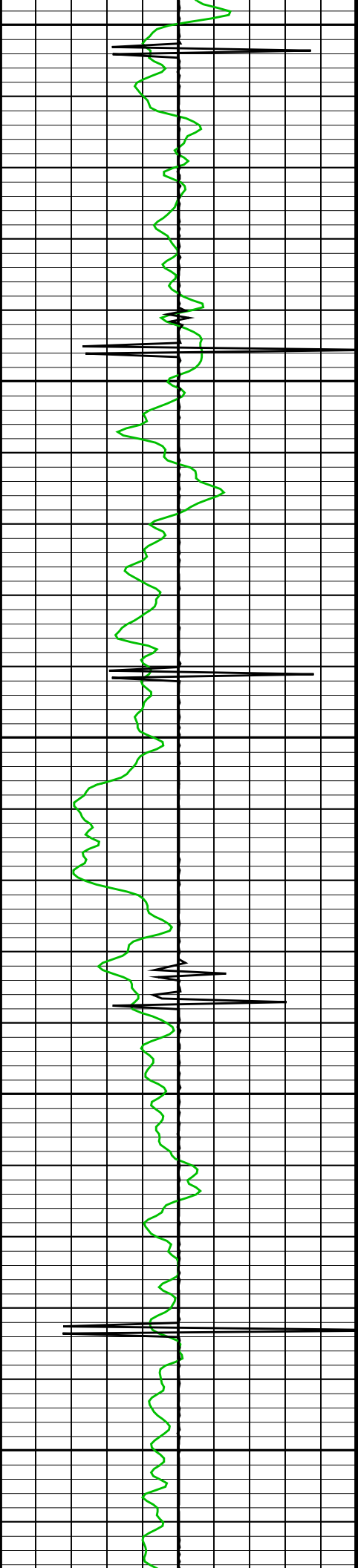




7900

8000

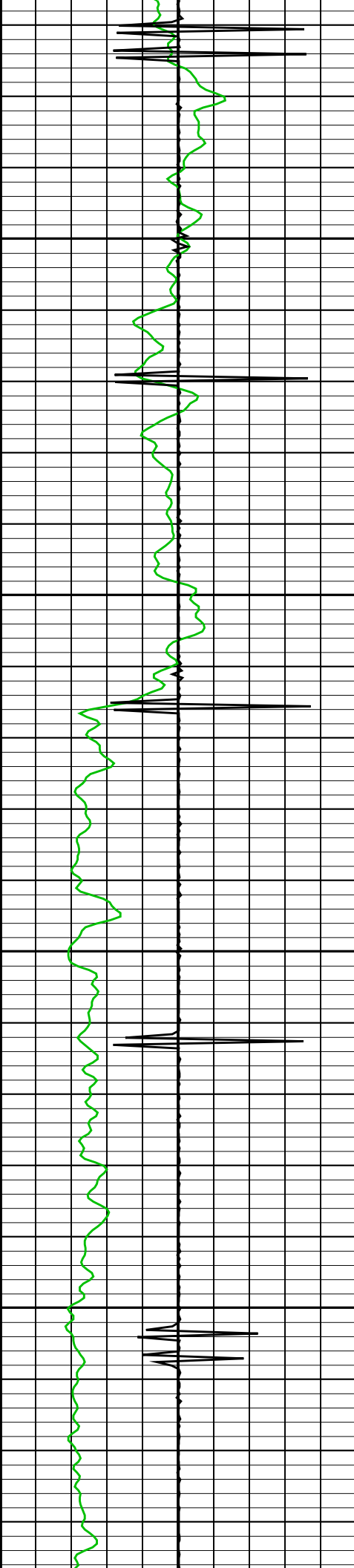




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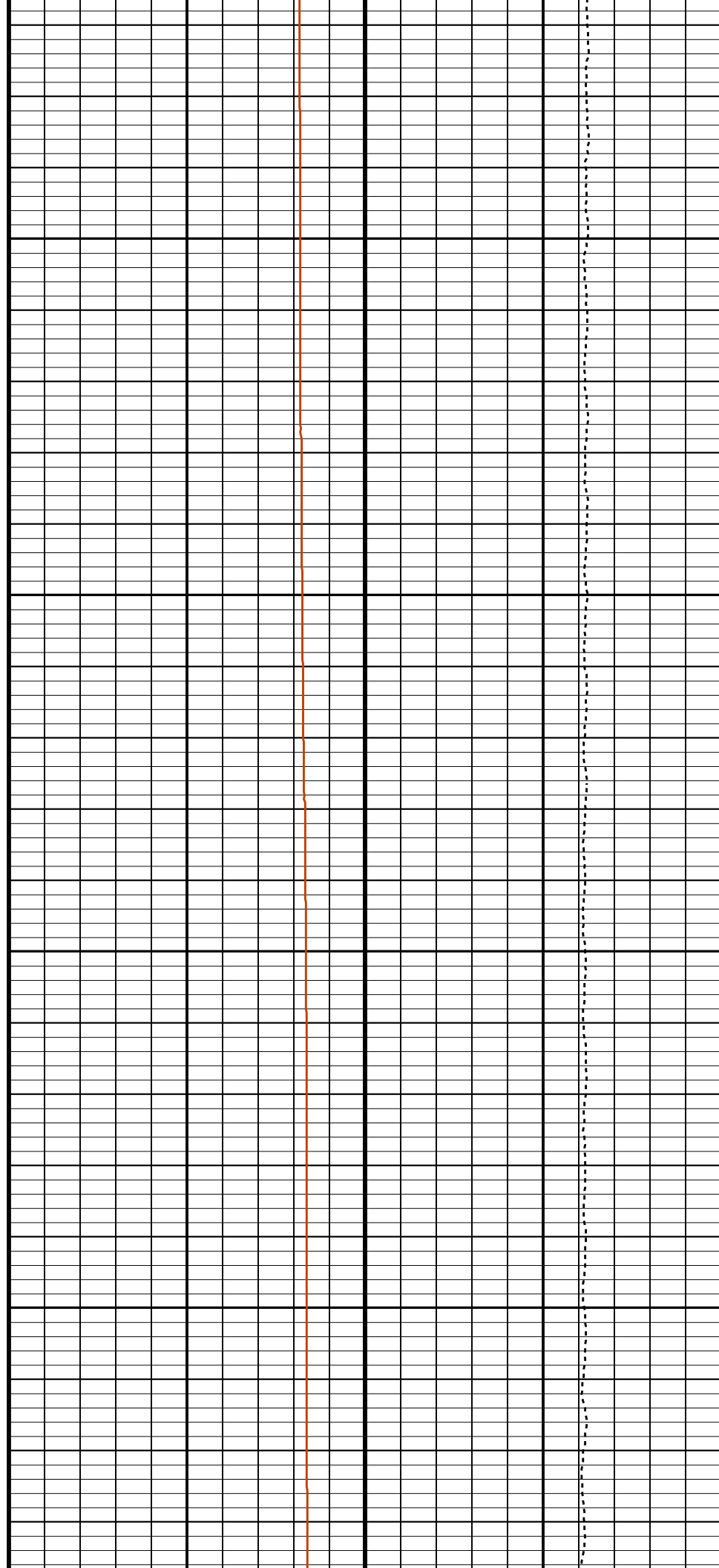
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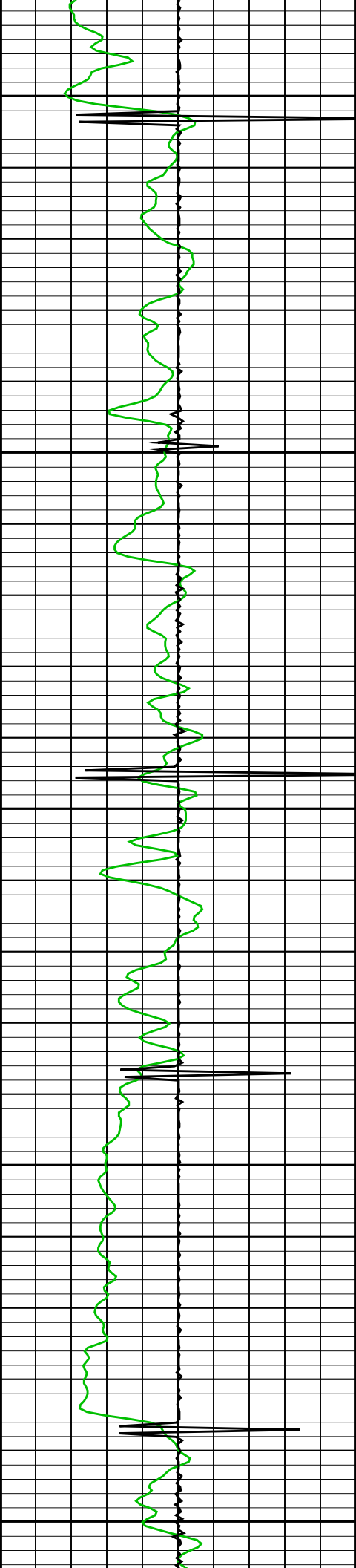
8300



8400

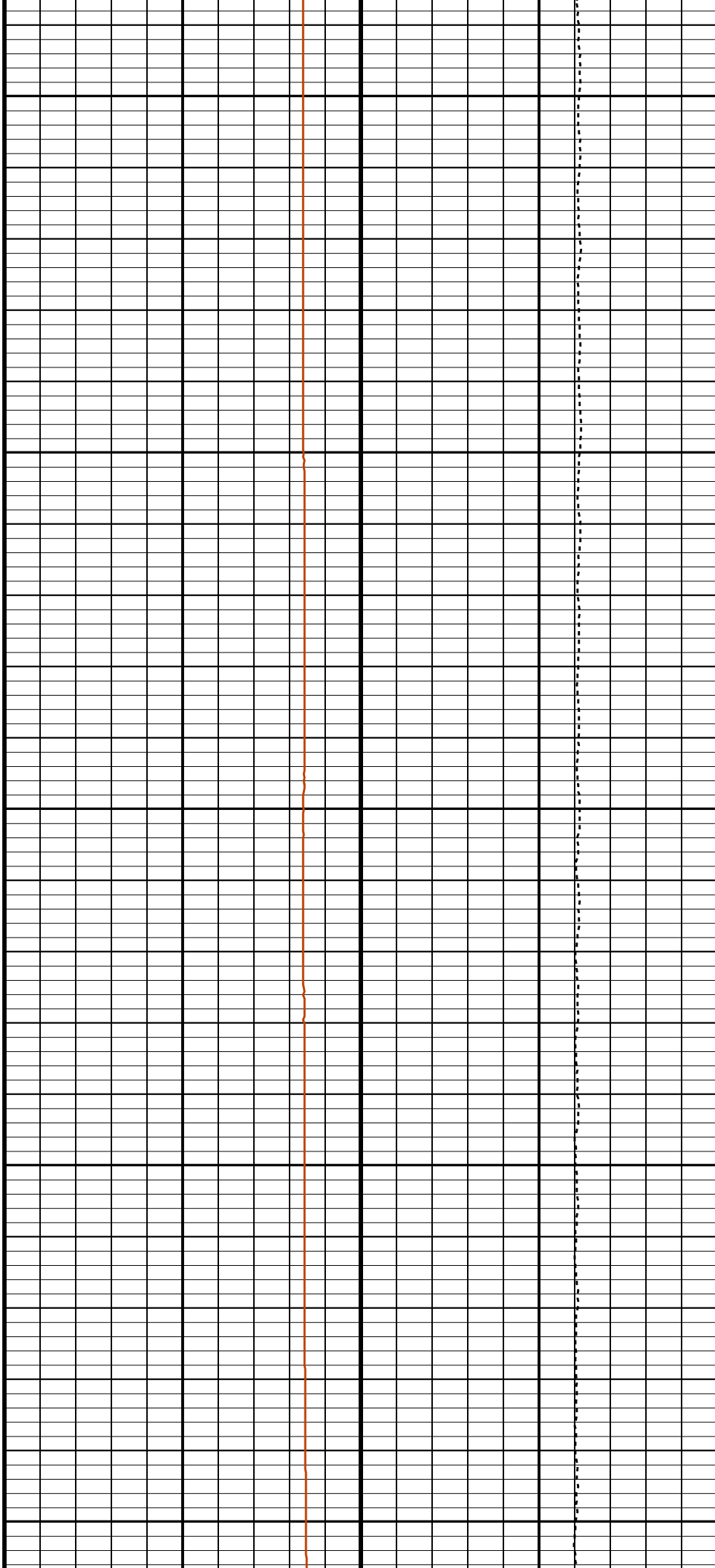
8500

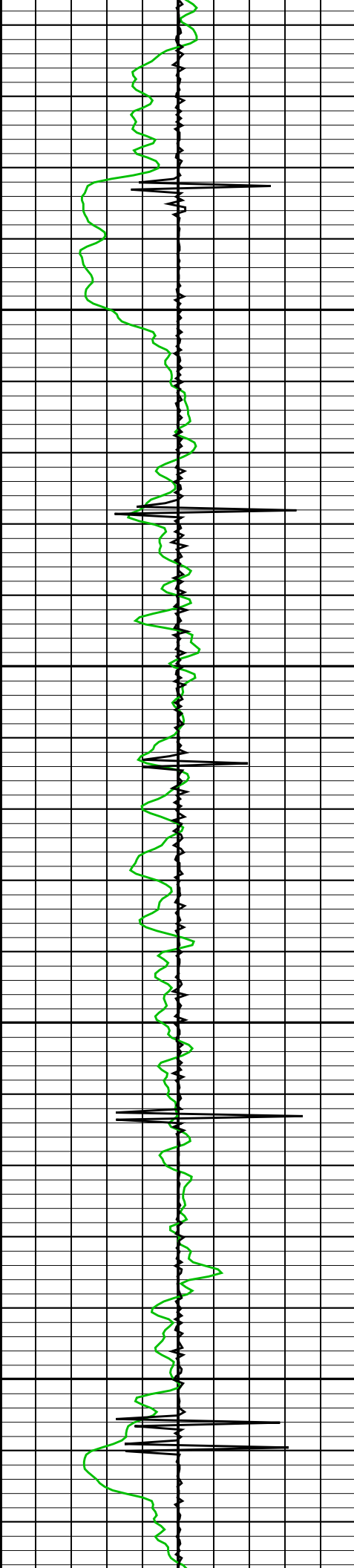




8600

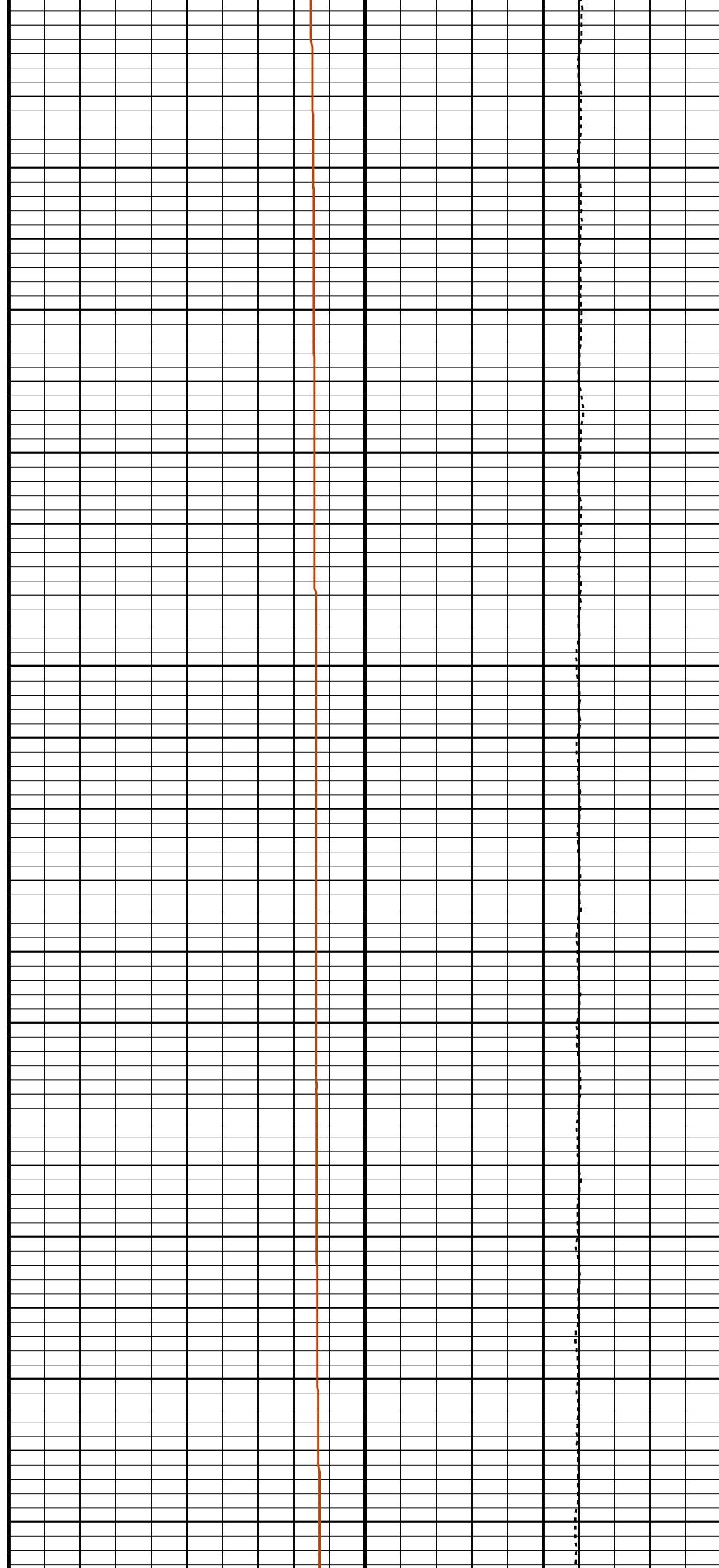
8700

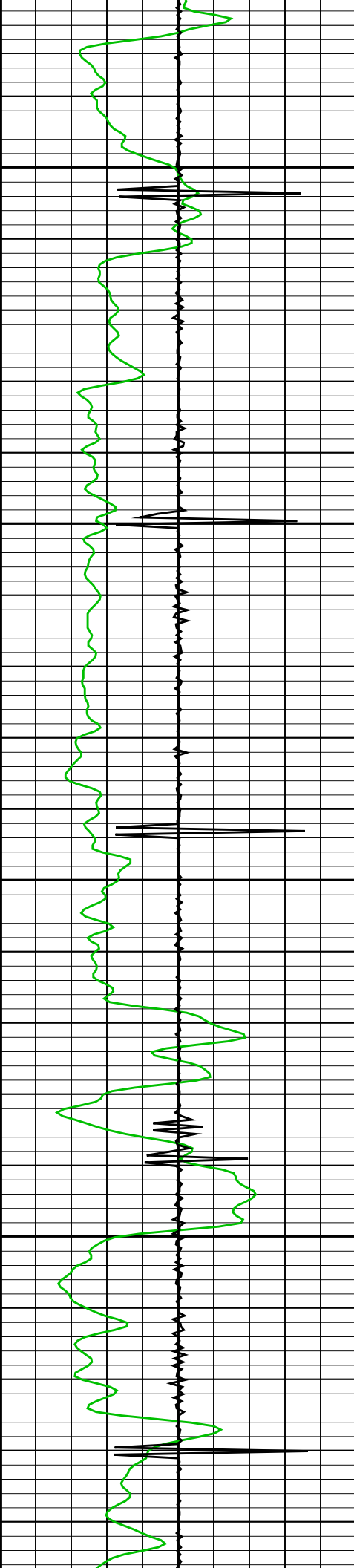




8800

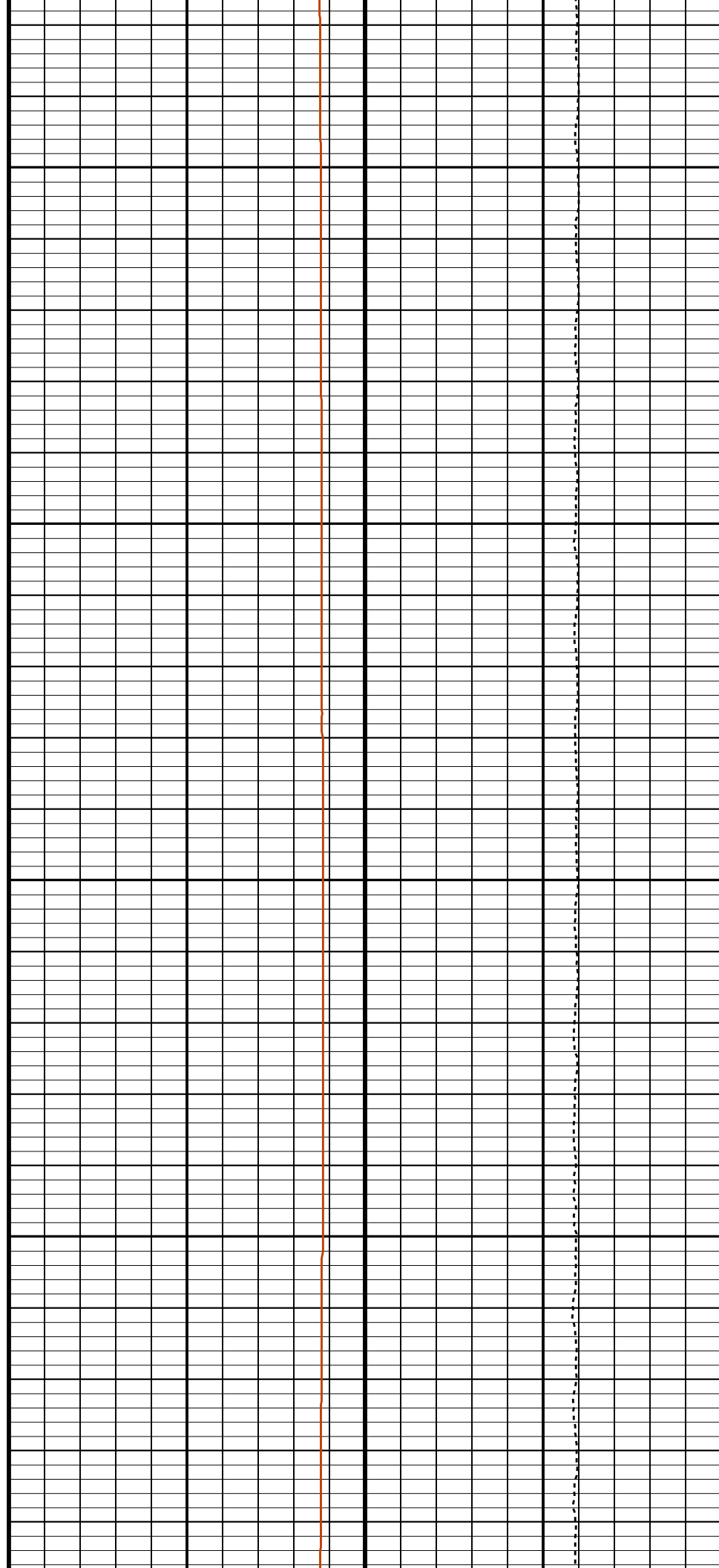
8900

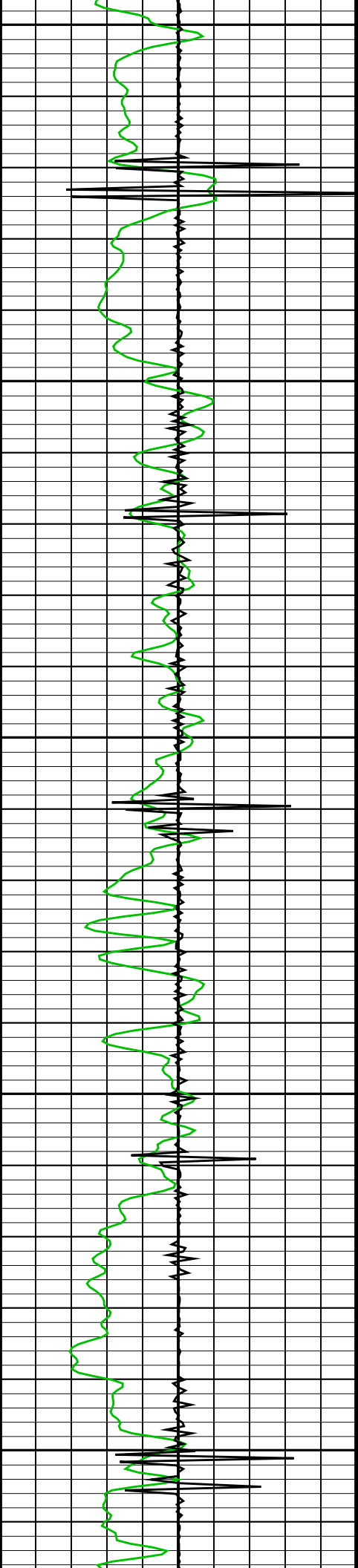




9000

9100

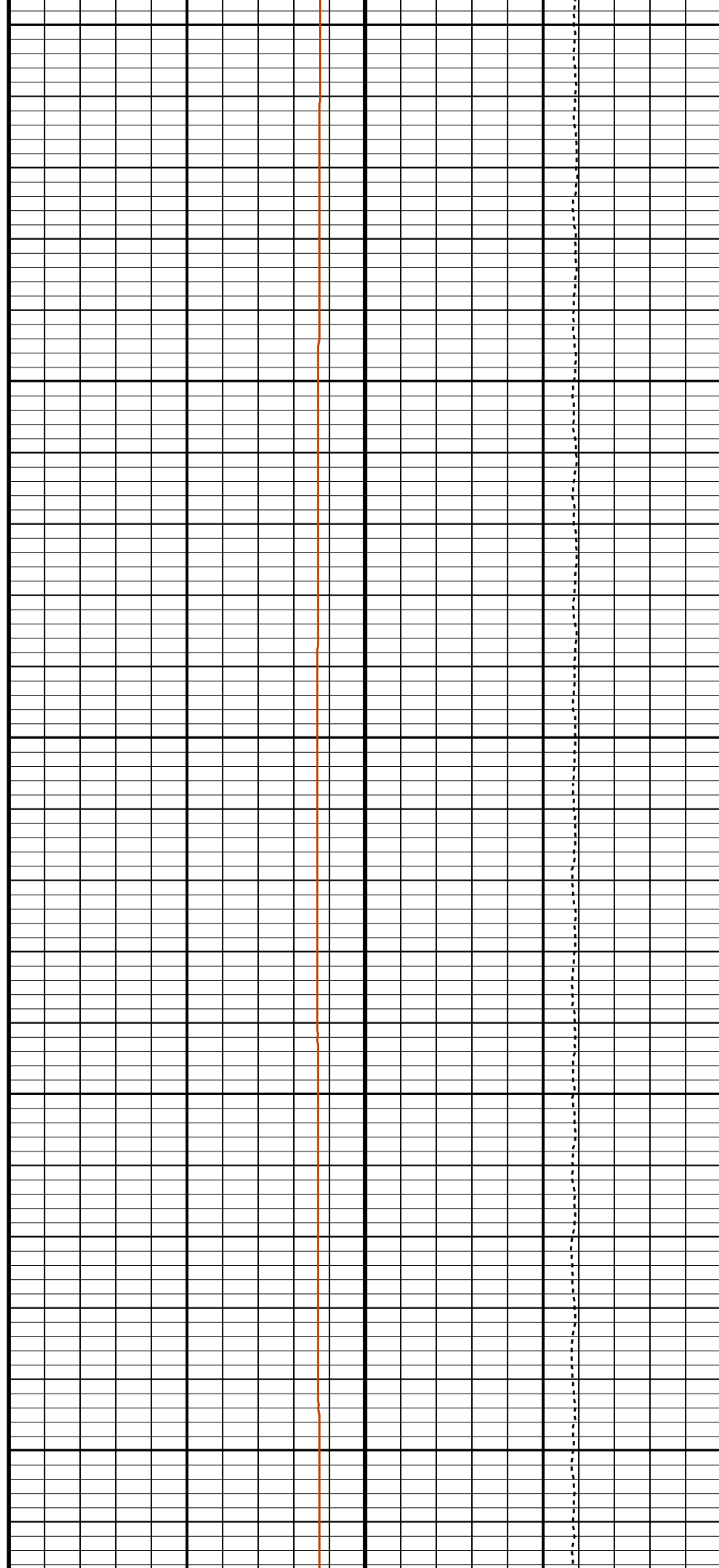


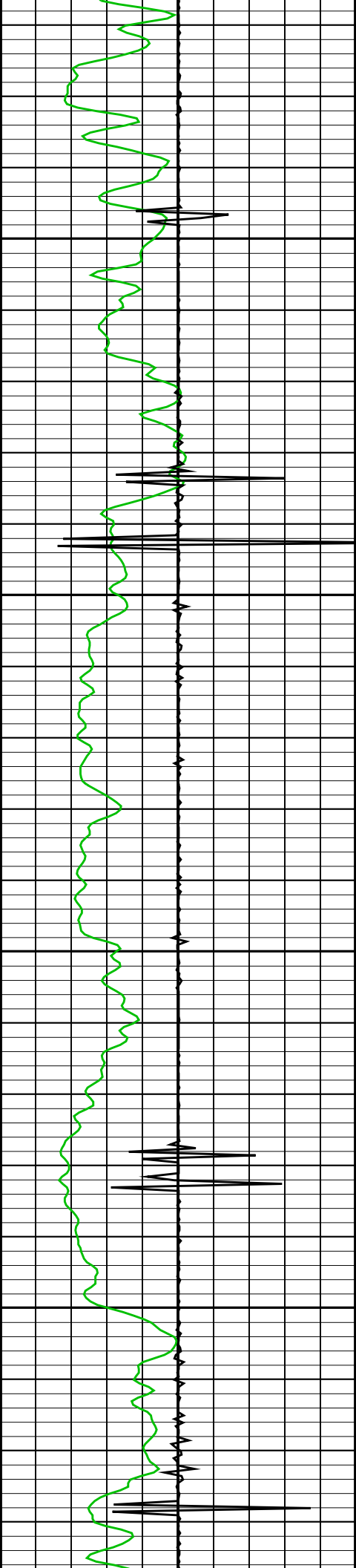


9200

9300

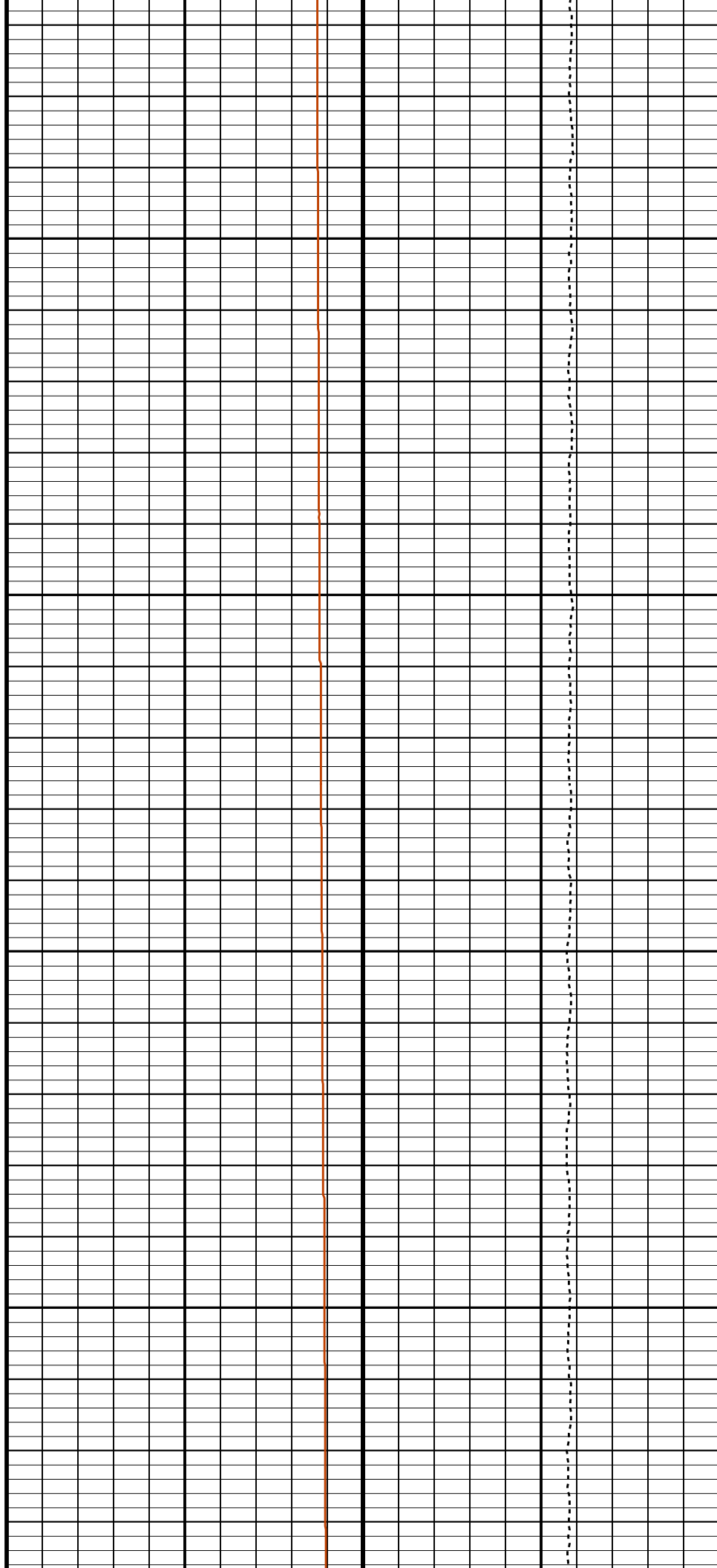
9400

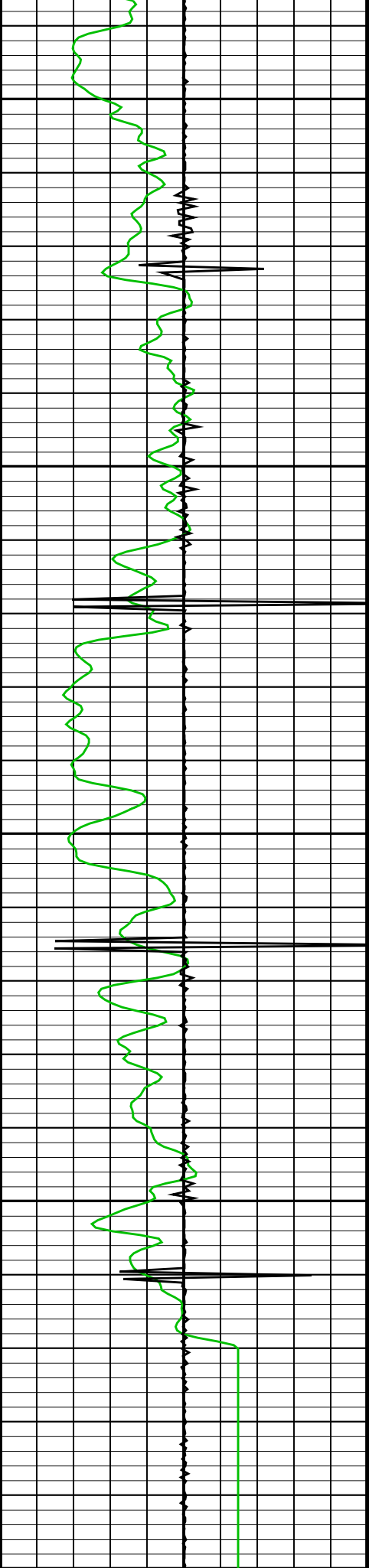




9500

9600

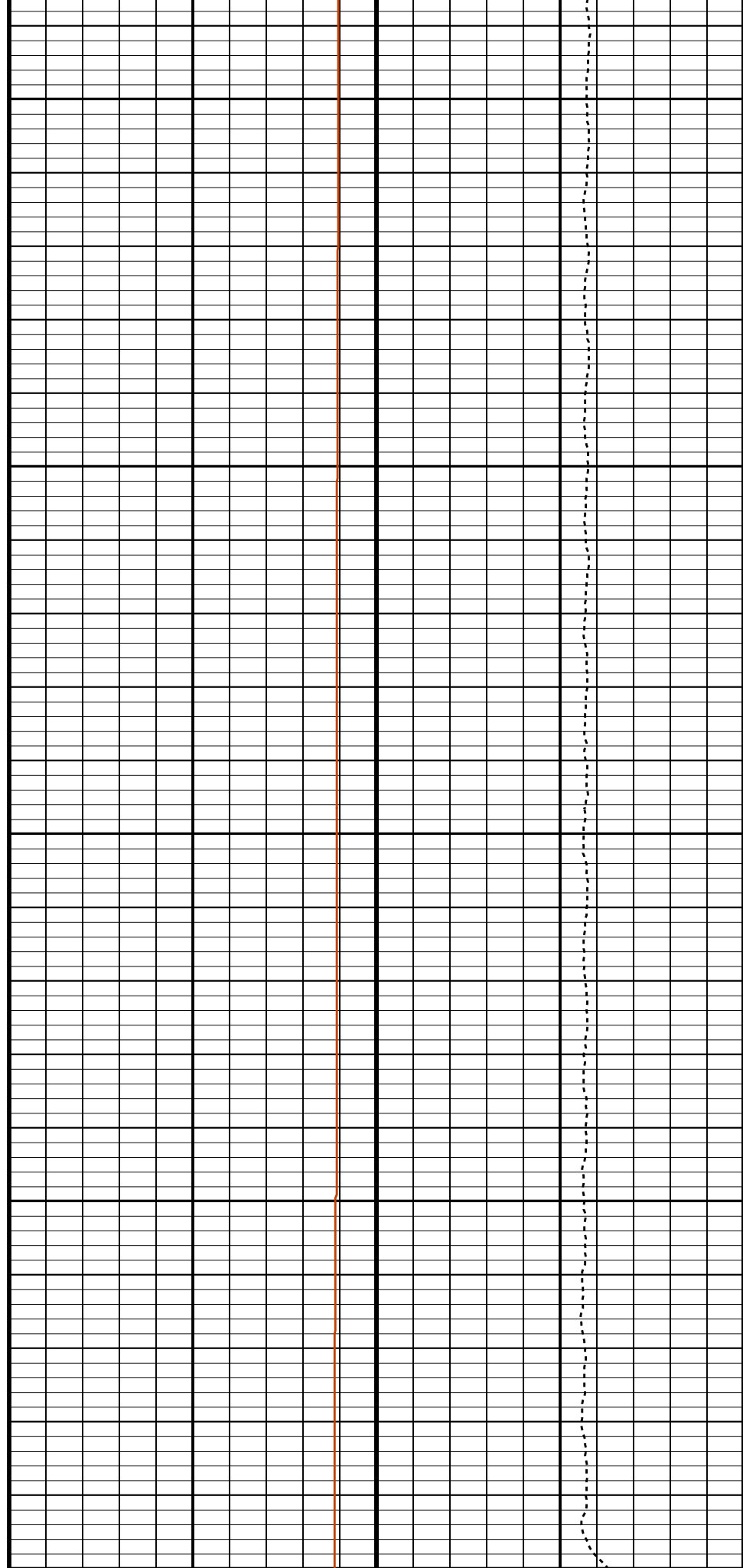




0 (GAPI) 150

9700

9800



20 (DEGF) 220 10000 (LBF) 0

	CCL (CCLU)	
-20	(----	20

Parameters

DLIS Name	Description	Value	
USIT-D: Ultrasonic Imaging - D			
AGMN	Minimum Gain of Cartridge	-4	DB
AGMX	Maximum Gain of Cartridge	20	DB
BERJ	Bad Echo Rejection	ON	
CDIA	Casing Outer Diameter	7	IN
CSDE	Casing Density	486.94	LBCF
CSID	Casing Inner Diameter	6.276	IN
DFVL	Default Fluid Velocity	206	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	20	V
MW	Mud Weight	9.4	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN
RCSO	Reference Calibrator Standoff	1.1811	IN
RCTH	Reference Calibrator Thickness	0.2952	IN
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
THDL	Minimum Search Thickness (percentage of nominal)	70	
THDP	Thickness Detection Policy	Fundamental	
THNO	Nominal Thickness of Casing	0.362	IN
USTO	Ultrasonic Time Offset	-2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF	
VCAS	Ultrasonic Transversal Velocity in Casing	51.4	US/F
WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.2537	MRAY
ZINI	Initial Estimate of Cement Impedance	-1	MRAY
ZMUD	Acoustic Impedance of Mud	1.9	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
System and Miscellaneous			
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	0.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
PP	Playback Processing	RECOMPUTE	

Format: CORRELATION Vertical Scale: 5" per 100' Graphics File Created: 20-Nov-2010 17:32

OP System Version: 17C0-154

USIT-D	17C0-154	HILTH-FTB	17C0-154
DTC-H	17C0-154		

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	20-Nov-2010 16:25
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Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_004PUP	FN:3	PRODUCER	20-Nov-2010 17:32
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Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Company: ExxonMobil Production Corp Well: PCU 296-5A5

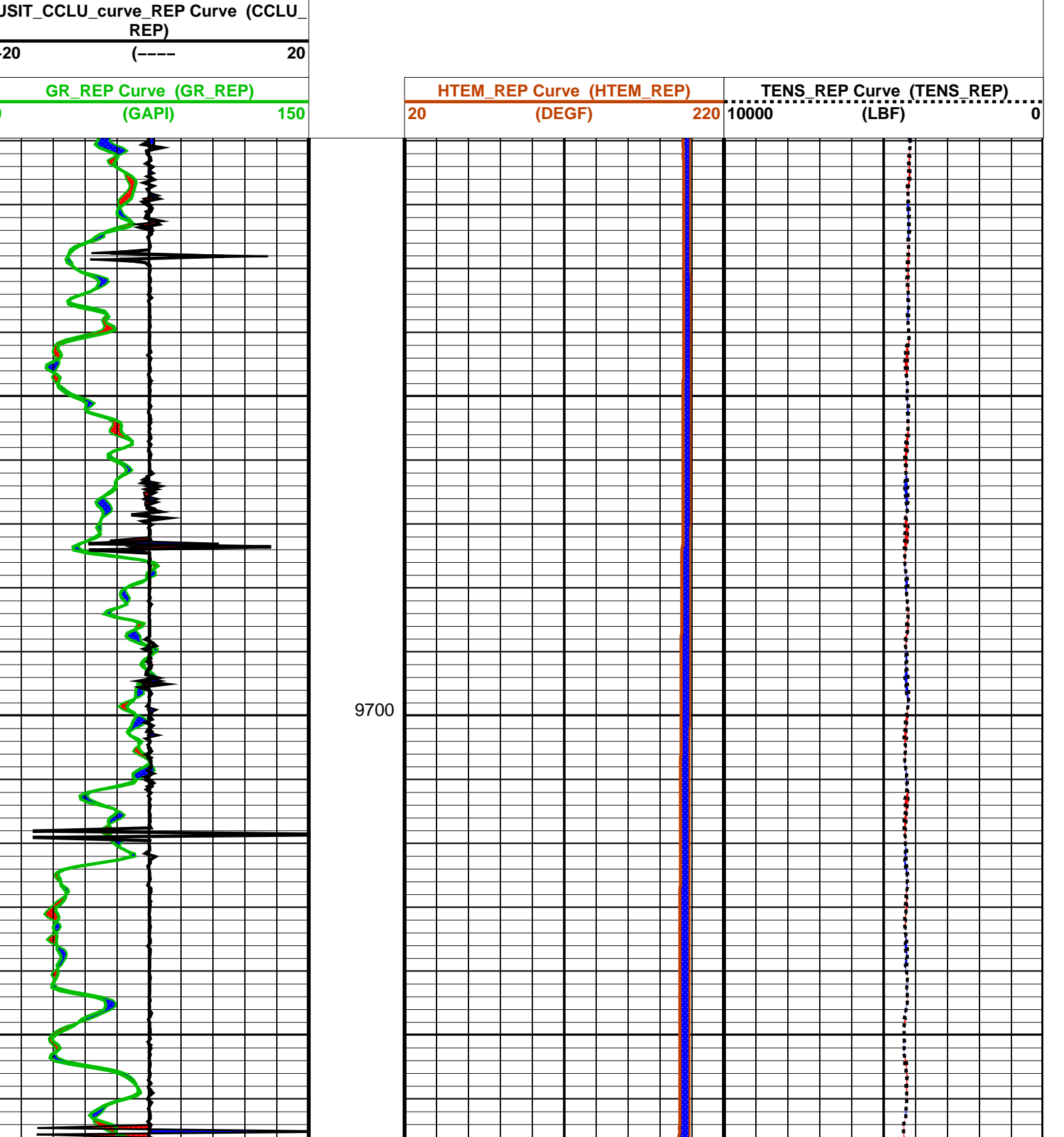
Input DLIS Files

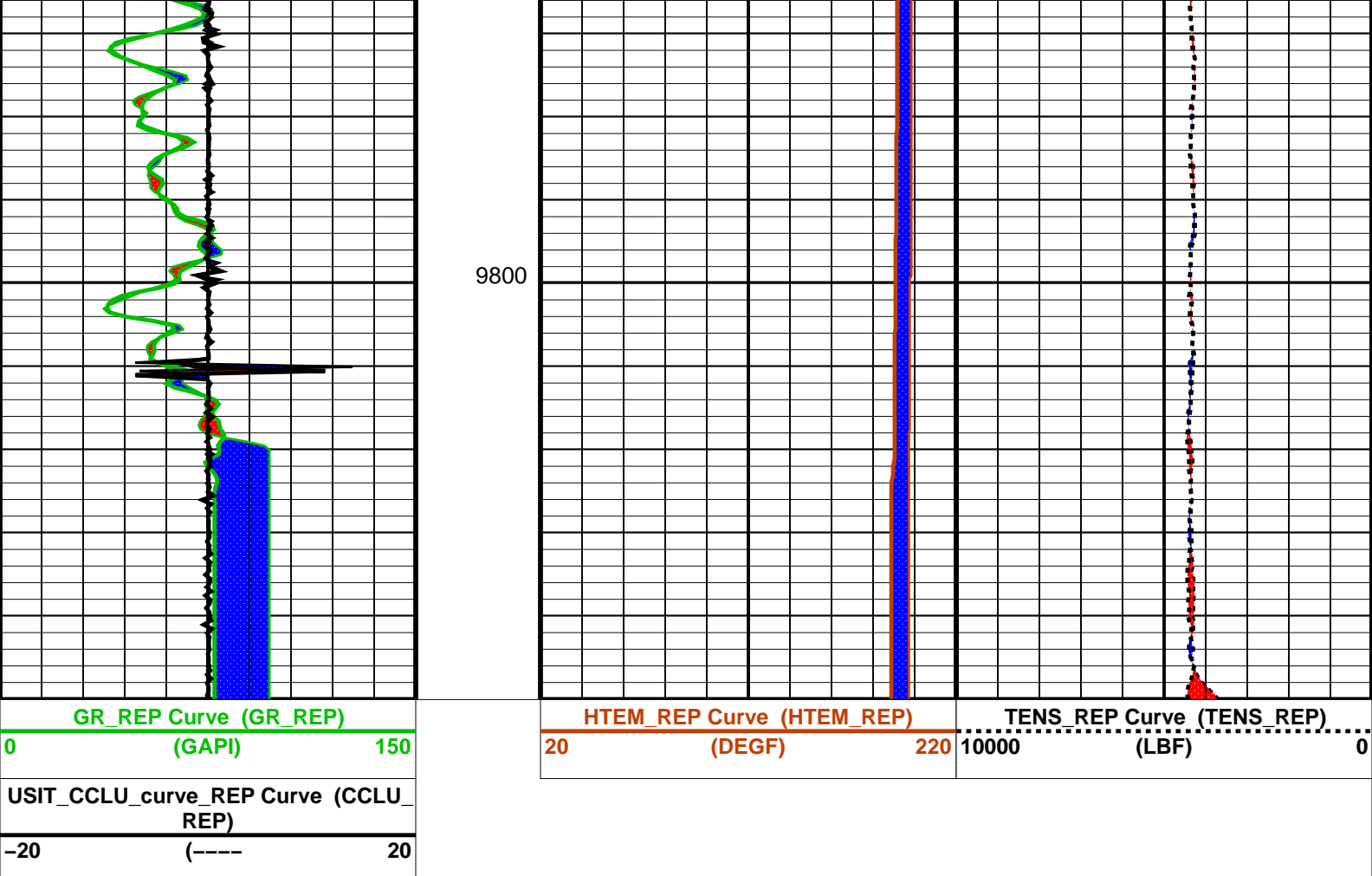
Output DLIS Files

OP System Version: 17C0-154

USIT-D17C0-154HILTH-FTB17C0-154

DTC-H17C0-154





Parameters

DLIS Name	Description	Value
USIT-D: Ultrasonic Imaging - D		
AGMN	Minimum Gain of Cartridge	-4 DB
AGMX	Maximum Gain of Cartridge	20 DB
BERJ	Bad Echo Rejection	ON
CDIA	Casing Outer Diameter	7 IN
CSDE	Casing Density	486.94 LBCF
CSID	Casing Inner Diameter	6.276 IN
DFVL	Default Fluid Velocity	206 US/F
DOT	Diameter of Transducer Sensor	2.874 IN
EMXV	EMEX Voltage	20 V
MW	Mud Weight	9.4 LB/G
RCOD	Reference Calibrator Outer Diameter	7 IN
RCSO	Reference Calibrator Standoff	1.1811 IN
RCTH	Reference Calibrator Thickness	0.2952 IN
TCUB	T^3 Processing Level	Vax_Loop
THDH	Maximum Search Thickness (percentage of nominal)	130
THDL	Minimum Search Thickness (percentage of nominal)	70
THDP	Thickness Detection Policy	Fundamental
THNO	Nominal Thickness of Casing	0.362 IN
USTO	Ultrasonic Time Offset	-2 US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF
VCAS	Ultrasonic Transversal Velocity in Casing	51.4 US/F
WLEN	T^3 Processing Length	21.7078 US
ZCAS	Acoustic Impedance of Casing	46.2537 MRAY
ZINI	Initial Estimate of Cement Impedance	-1 MRAY
ZMUD	Acoustic Impedance of Mud	1.9 MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6 MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3 MRAY
System and Miscellaneous		
CWEI	Casing Weight	26.00 LB/F
DO	Depth Offset for Playback	0.0 FT
DORL	Depth Offset for Repeat Analysis	0.0 FT
PP	Playback Processing	RECOMPUTE

Format: CORRELATION_REP

Vertical Scale: 5" per 100'

Graphics File Created: 20-Nov-2010 17:32

Input DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_002PUP	FN:1	PRODUCER	20-Nov-2010 16:40	9850.0 FT	9609.5 FT
DEFAULT	USI_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	20-Nov-2010 16:25		
Output DLIS Files						
DEFAULT	USI_TLD_MCFL_CNL_004PUP	FN:3	PRODUCER	20-Nov-2010 17:32		



CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary							
Measurement	Nominal	Master	Before	After	Change	Limit	Units
Ultrasonic Imaging – D Wellsite Calibration – IBC CSL: Far versus Near Gain Offset							
Before: Calibration not done							
Near Waveform for azimuth 001	0	N/A	0	N/A	N/A	N/A	DB/M
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Detector Calibration							
Before: 19–Nov–2010 22:35							
Gamma Ray Background	30.00	N/A	42.23	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkgd)	165.0	N/A	173.7	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Zero Measurement							
Master: Calibration out of date 2–Aug–2010 18:14 Before: 19–Nov–2010 22:51							
CNTC Background	26.68	26.68	27.47	N/A	N/A	4.002	CPS
CFTC Background	28.42	28.42	31.85	N/A	N/A	4.263	CPS
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement							
Master: Calibration out of date 2–Aug–2010 18:14							
Thermal Near Corr. (Tank)	5800	5387	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2189	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.461	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration							
Before: 20–Nov–2010 12:25							
Z–Axis Acceleration	32.19	N/A	32.26	N/A	N/A	N/A	F/S2
The HGNS Neutron Master Calibration was done with the following parameters :							
NCT–B Water Temperature	80.0	DEGF.					
Thermal Housing Size	3.373	IN.					
NSR–F serial number	2649						

Ultrasonic Imaging – D / Equipment Identification


Primary Equipment:	
IBC 7 Inch Sub	IBCS – 100
Ultrasonic Transducer	Bott –
Ultrasonic Transducer	Midd –

Ultrasonic Transducer
 Ultrasonic Transducer
 USIT sonde
 USIT Sonde Cartridge For 4 Transducers
 USIT Acquisition Cartridge DTS/FTB

Midd –
 Top –
 USIS – A
 USSC – B
 USIC – D

Auxiliary Equipment:
 USIT Housing/cartridge

ECH – MRA

Ultrasonic Imaging – D Wellsite Calibration		
IBC CSL: Far versus Near Gain Offset		
Phase	Near Waveform for azimuth 001 DB/M	Value
Before		0
	-200.0 (Minimum) 0 (Nominal) 200.0 (Maximum)	
Before: Calibration not done		

High resolution Integrated Logging Tool–DTS / Equipment Identification

Primary Equipment:



HILT Gamma-Ray Neutron Sonde–DTS
 HGNS Gamma-Ray Device
 HGNS Neutron Detector with Alpha Source
 Z–Axis Accelerometer
 Neutron Logging Source
 Neutron Source Radioactive
 Compensated Neutron Box
 HTBC Communication Assembly DTS Mode



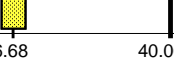
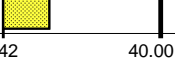
HGNS – H
 HGR –
 HCNT – H
 HACC – H 1614
 NLS – KL
 NSR – F 2649
 CNB – AB
 HMCA – H




Auxiliary Equipment:

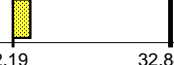
Neutron Calibration Tank
 Gamma Source Radioactive
 HGNS Housing

NCT – B
 GSR – U/Y
 HGNSH –

High resolution Integrated Logging Tool–DTS Wellsite Calibration							
Detector Calibration							
Phase	Gamma Ray Background	GAPI	Value	Phase	Gamma Ray (Jig – Bkgd)	GAPI	Value
Before			42.23	Before			173.7
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)				157.1 (Minimum) 165.0 (Nominal) 206.3 (Maximum)		
Before: 19–Nov–2010 22:35							

High resolution Integrated Logging Tool–DTS Wellsite Calibration							
Zero Measurement							
Phase	CNTC Background	CPS	Value	Phase	CFTC Background	CPS	Value
Master			26.68	Master			28.42
Before			27.47	Before			31.85
	5.000 (Minimum) 26.68 (Nominal) 40.00 (Maximum)				5.000 (Minimum) 28.42 (Nominal) 40.00 (Maximum)		
Master: Calibration out of date 2–Aug–2010 18:14				Before: 19–Nov–2010 22:51			

High resolution Integrated Logging Tool–DTS Wellsite Calibration											
Ratio Measurement											
Phase	Thermal Near Corr. (Tank)	CPS	Value	Phase	Thermal Far Corr. (Tank)	CPS	Value	Phase	CNTC/CFTC (Tank)		Value
Master			5387	Master			2189	Master			2.461
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)				1900 (Minimum) 2400 (Nominal) 2900 (Maximum)				2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)		
Master: Calibration out of date 2–Aug–2010 18:14											

High resolution Integrated Logging Tool–DTS Wellsite Calibration		
Accelerometer Calibration		
Phase	Z–Axis Acceleration F/S2	Value
Before		32.26
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC-H Auxiliary Cartridge
DTC-H Telemetry Cartridge

DTCH - A
DTCH - A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing

ECH - KC

Company: **ExxonMobil Production Corp**

Schlumberger

Well: **PCU 296-5A5**

Field: **Piceance Creek**

County: **Rio Blanco**

State: **Colorado**

CORRELATION LOG

CCL-GAMMA RAY