MUD	County: RIO BLANCO

Schlumberger

Company: **EXXONMOBIL PRODUCTION COMPANY**

Well: **PCU 297−11B1**

Field: **PICEANCE CREEK**

County: **RIO BLANCO** State: **COLORADO**

CORRELATION LOG
GAMMA RAY
USIT CASING COLLAR LOCATOR

Field: PICEANCE CREEK
Location: SESE 354' FSL 487' FEL
Well: PCU 297−11B1
Company: EXXONMOBIL PRODUCTION C

LOCATION

SESE 354' FSL 487' FEL

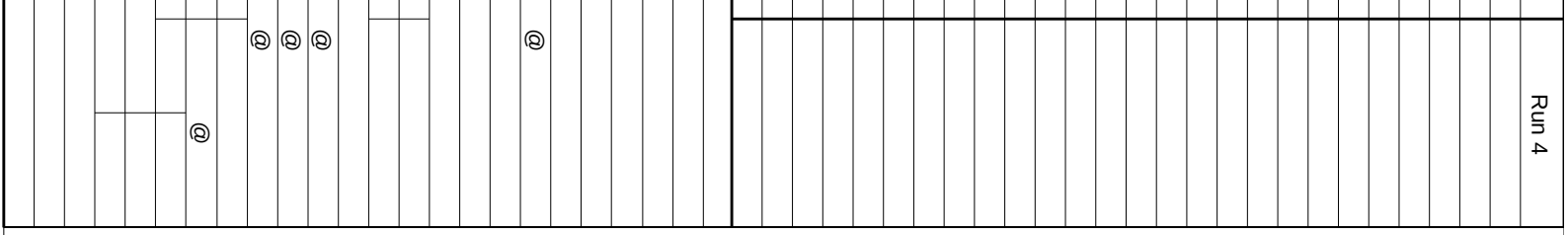
Elev.: K.B. 7157.10 ft
G.L. 7131.00 ft
D.F. 7156.10 ft

Permanent Datum: GROUND LEVEL Elev.: 7131.00 ft
Log Measured From: KELLY BUSHING 26.10 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05−103−11378−0(	11	2S	97W

	Run 1	Run 2	Run 3
Logging Date	10−Oct−2009		
Run Number	1		
Depth Driller	9006 ft		
Schlumberger Depth	8906 ft		
Bottom Log Interval	8906 ft		
Top Log Interval	200 ft		
Casing Driller Size @ Depth	7.000 in @	@	
Casing Schlumberger			
Bit Size	9.875 in		
Type Fluid In Hole	WBM		
MUD Density / Viscosity	10 lbm/gal		
MUD Fluid Loss / PH			
MUD Source Of Sample			
RM @ Measured Temperature	@	@	
RMF @ Measured Temperature	@	@	
RMC @ Measured Temperature	@	@	
Source RMF / RMC			
RM @ MRT / RMF @ MRT	@ 189 / @ 189	@ / @	
Maximum Recorded Temperatures	189 degF		
Circulation Stopped / Time			
Logger On Bottom / Time	10−Oct−2009 / 11:30		
Unit Number / Location	2276 / VERNAL		
Recorded By	RYAN STEWART		
Witnessed By	JONATHAN MAHLMANN		

	Run 1	Run 2	Run 3
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth	@		
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity			
MUD Fluid Loss / PH			
MUD Source Of Sample			
RM @ Measured Temperature	@		
RMF @ Measured Temperature	@		
RMC @ Measured Temperature	@		
Source RMF / RMC			
RM @ MRT / RMF @ MRT	@ / @	@	
Maximum Recorded Temperatures			
Circulation Stopped / Time			
Logger On Bottom / Time			
Unit Number / Location			
Recorded By			
Witnessed By			



DEPTH SUMMARY LISTING

Date Created: 11−OCT−2009 3:04:17

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46A XS
Serial Number:	6197	Serial Number:	2725	Serial Number:	2276
Calibration Date:	8/31/2009	Calibration Date:		Length:	24000 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100518		
Calibration Cable Type:	7−46P	Number of Calibration Points:	10	Conveyance Method:	Wireline
Wheel Correction 1:	−9	Calibration RMS:		Rig Type:	LAND
Wheel Correction 2:	−8	Calibration Peak Error:			

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	234.90 FT
Rig Up Length At Bottom:	234.50 FT
Rig Up Length Correction:	0.40 FT
Stretch Correction:	7.00 FT
Tool Zero Check At Surface:	0.40 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH POLICIES FOLLOWED
2. IDW USED AS PRIMARY METHOD OF DEPTH CONTROL; Z−CHART AS SECONDAR
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool ran as per tool sketch	
Tool centralized using 2 x in−line−centralizers and 1 x Gemco	
Neurton ran for gamma ray and temperature only	
Horizontal Resolution = 5 deg	
Verticle resolution = 6 inch	
Log correlated to down log at 8800 ft	
TD not tagged	
UFAO = −8	
Max recorded temperature: 189 degF	

Casing centralizers noted on logs

RUN 1		
SERVICE ORDER #:	ARVO−00080	
PROGRAM VERSION:	17C0−154	
FLUID LEVEL:	10 ft	
LOGGED INTERVAL	START	STOP

RUN 2		
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

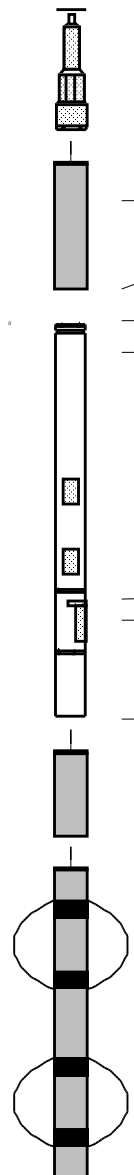
EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−QT 39.0
LEH−QT

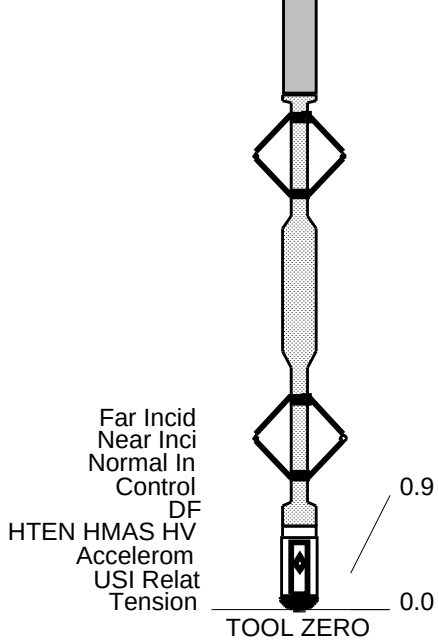
DTC−H 36.1
ECH−KC
DTCH0−A
DTCH1−A

HILTH−FTB 33.1
HGNSD−H
HMCA−H
HGNH
NLS−KL
NSR−F
HACCZ−H 3577
HCNT−H
HGR
NPV−N

AH−107 23.7
AH−107

USIT−D 21.7
ECH−MRA
USIC−D
USIS−A
USSC−B
IBCS_B−100158202
Top Transducer
Middle Top Transducer
Middle Bottom Transducer
Bottom Transducer

RUN 2



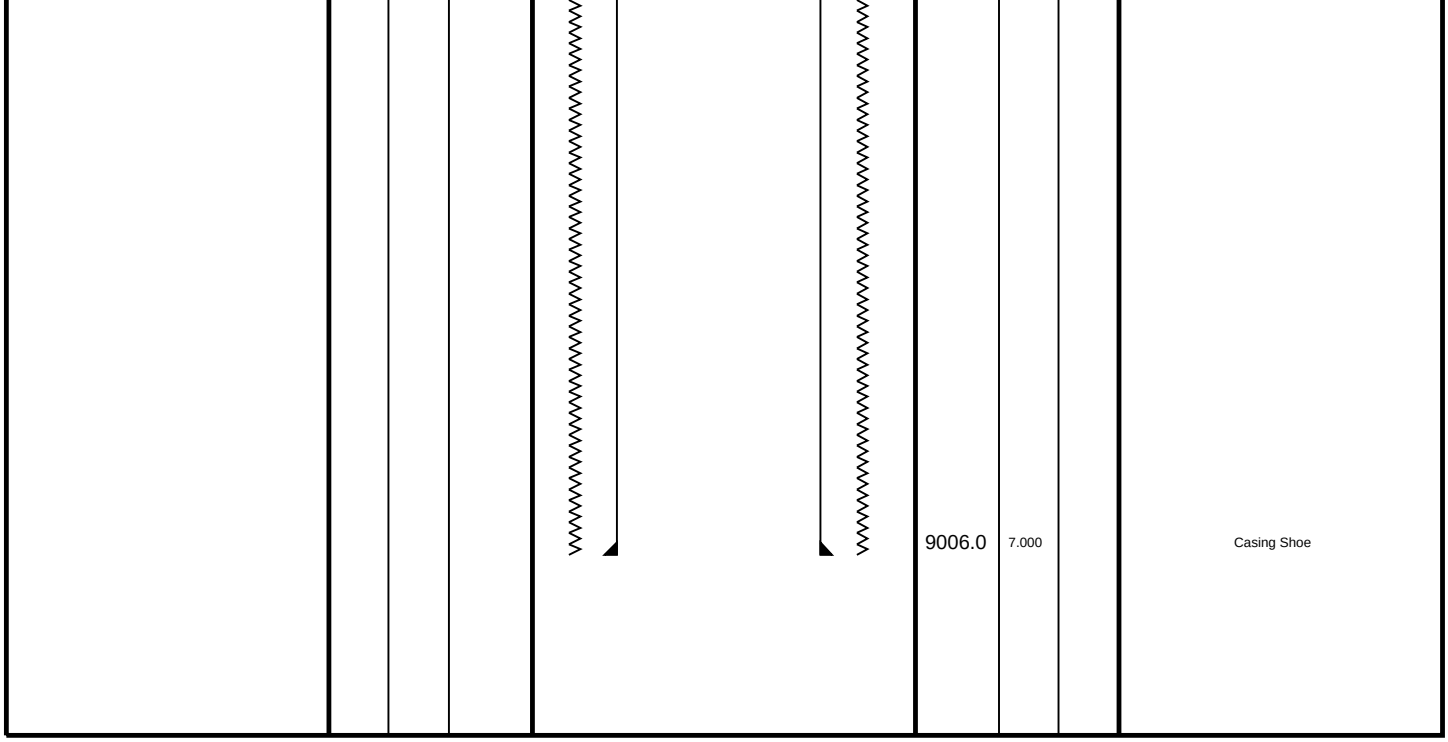
MAXIMUM STRING DIAMETER 7.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Client: EXXONMOBIL PRODUCTION COMPANY
Well: PCU 297−11B1
Field: PICEANCE CREEK
State: COLORADO
Country: USA

Drawing Date: 10/11/2009
API #: 05−103−11378−00

Rig Name: H&P 215
Reference Datum: Kelly Bushing
Elevation: 7131.0 ft

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					26.1	7.000		Casing String
					3966.0	9.875		Borehole Segment



Schlumberger

Correlation

MAXIS Field Log

Company: EXXONMOBIL PRODUCTION COMPANY **Well: PCU 297−11B1**

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_024LUP	FN:23	PRODUCER	10−Oct−2009 23:38	8907.0 FT	196.5 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_033PUP	FN:32	PRODUCER	11−Oct−2009 06:12	8914.0 FT	203.5 FT

OP System Version: 17C0−154

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

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time

ZMUD	1.9	MRAY	2.05	MRAY	7401.5 06:15:04
	2.05	MRAY	1.9	MRAY	5701.5 06:18:30
	1.95	MRAY	2.05	MRAY	4001.5 06:22:17

CCL (CCLU)

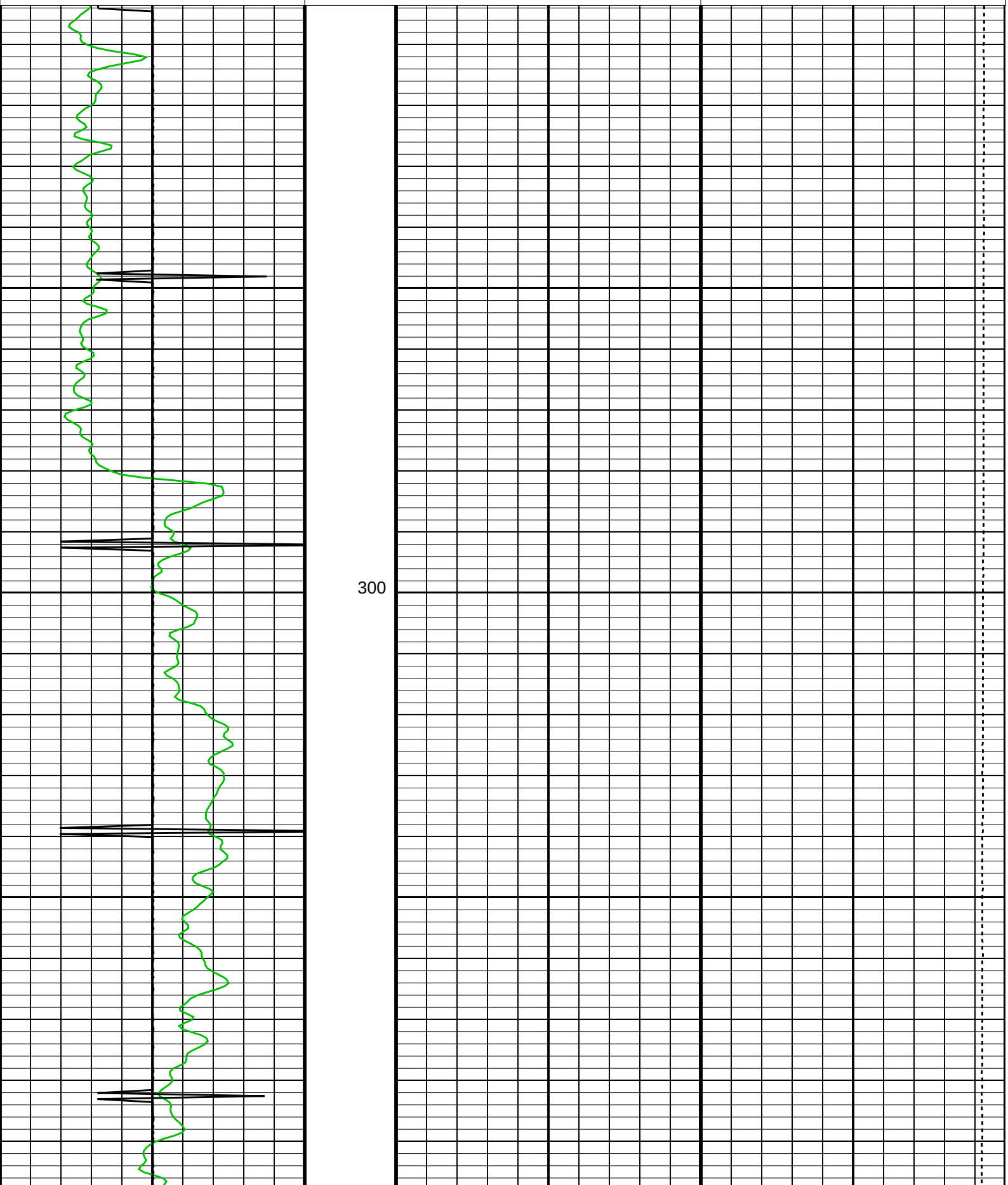
−20 (−−−− 20

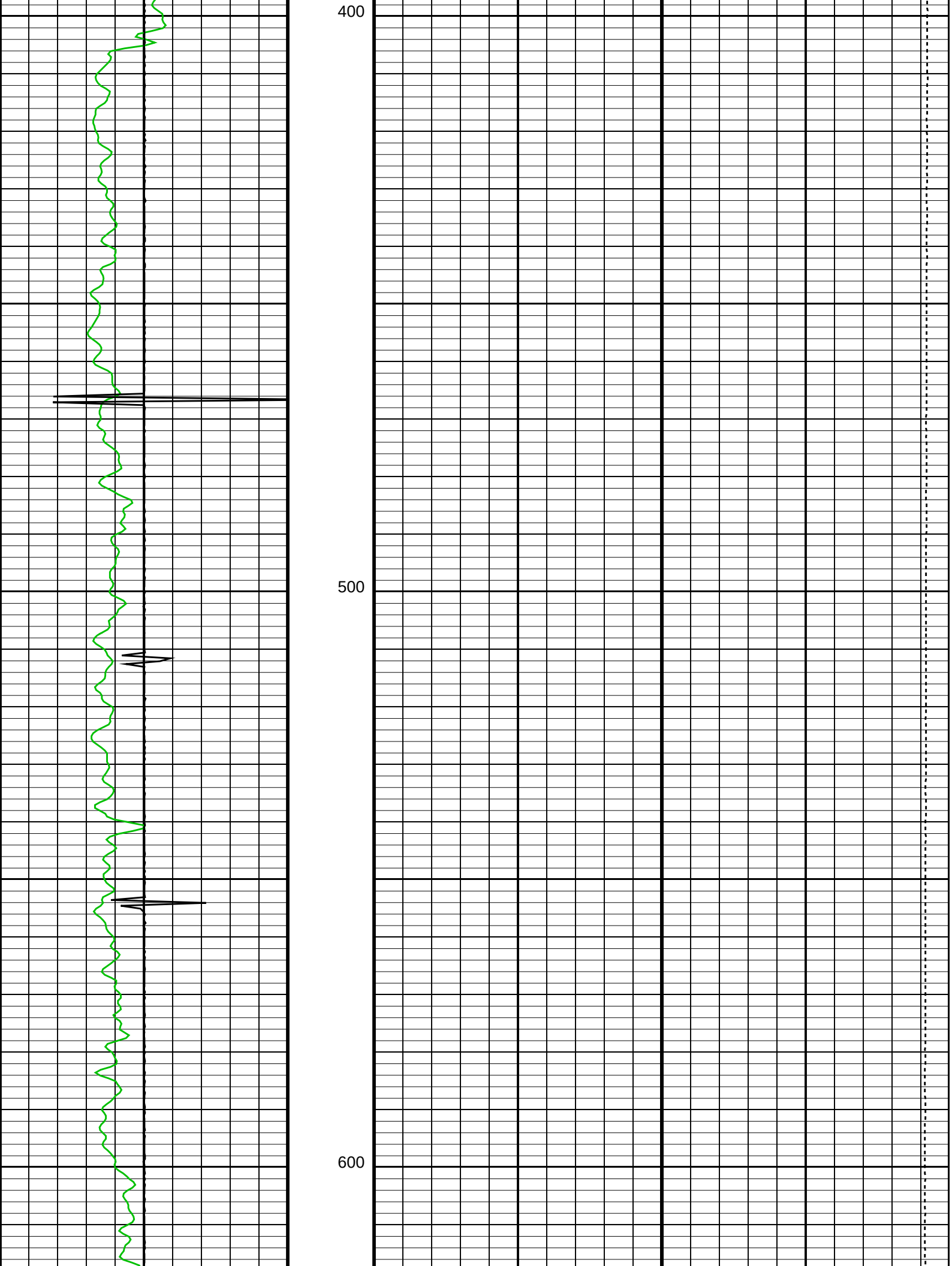
Gamma Ray (GR)

0 (GAPI) 150

Tension (TENS)

10000 (LBF) 0

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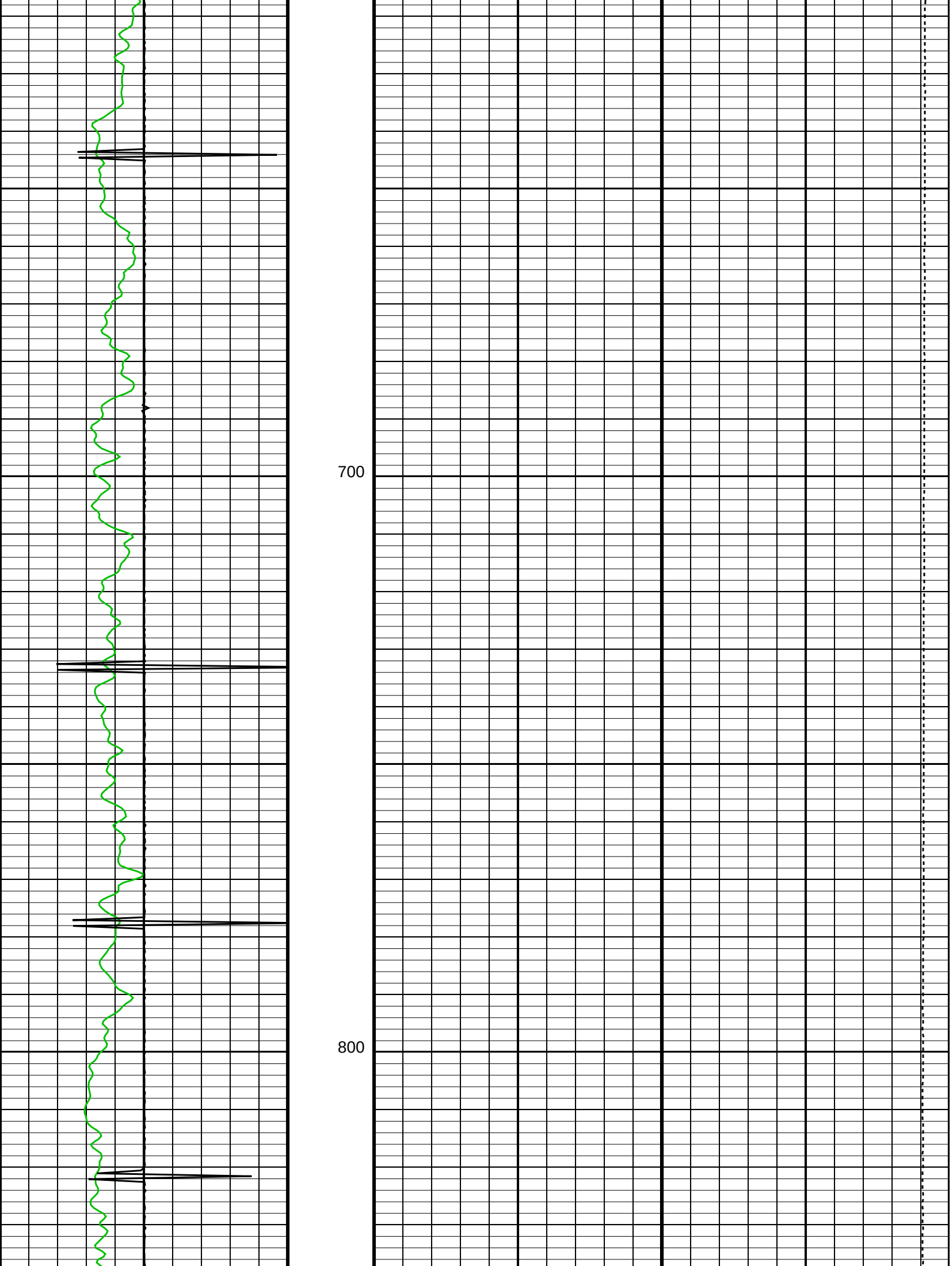
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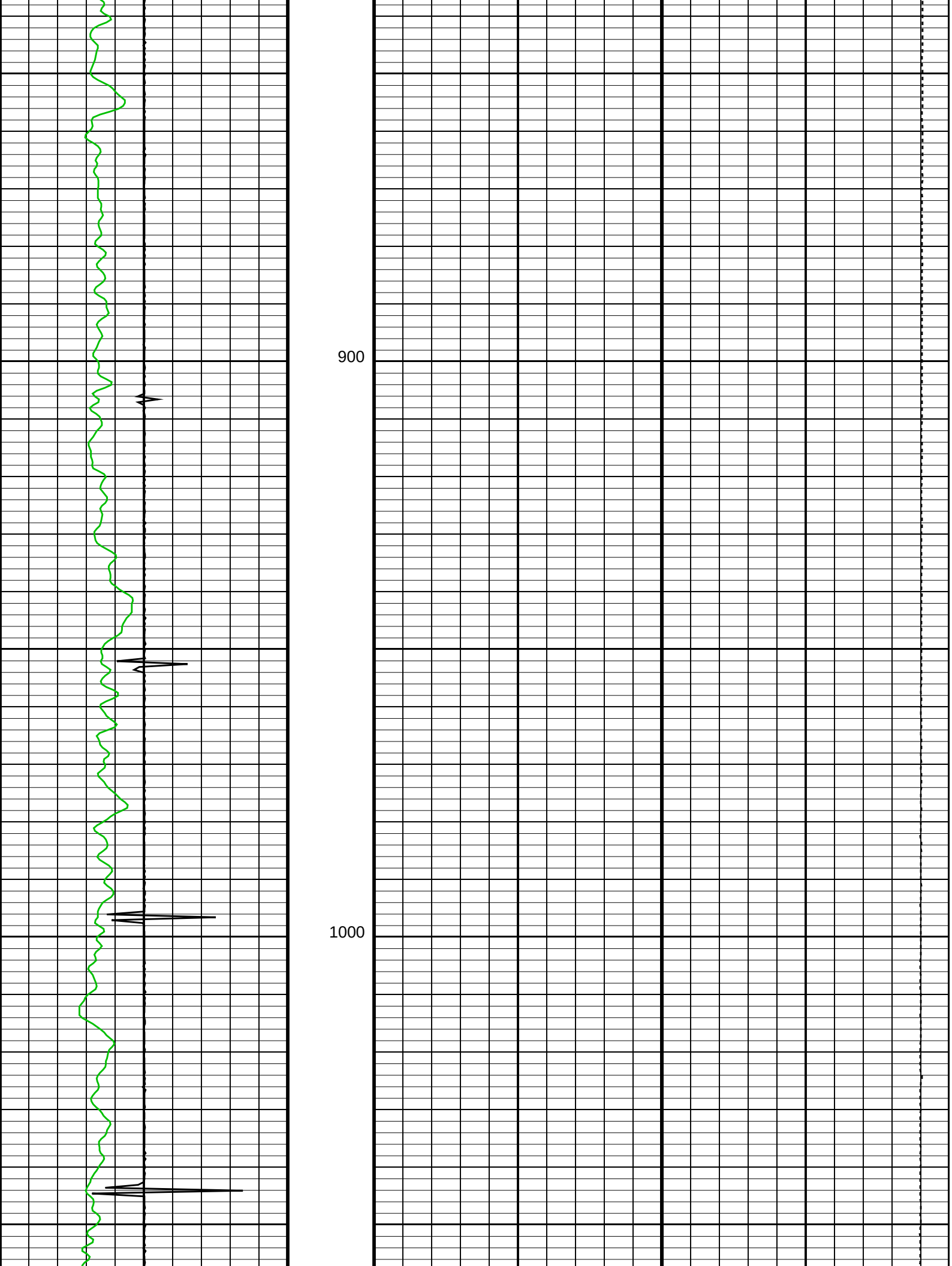
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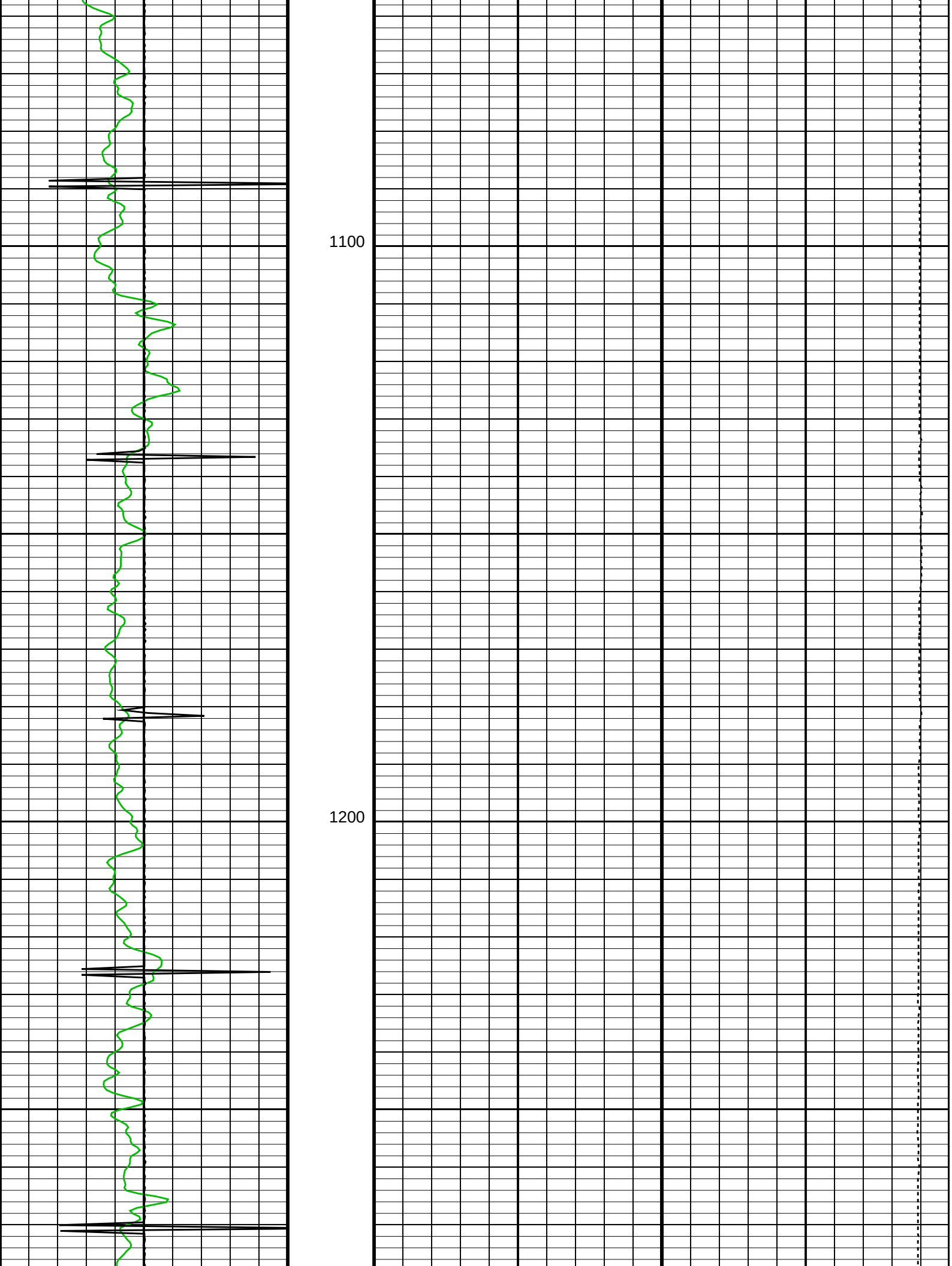
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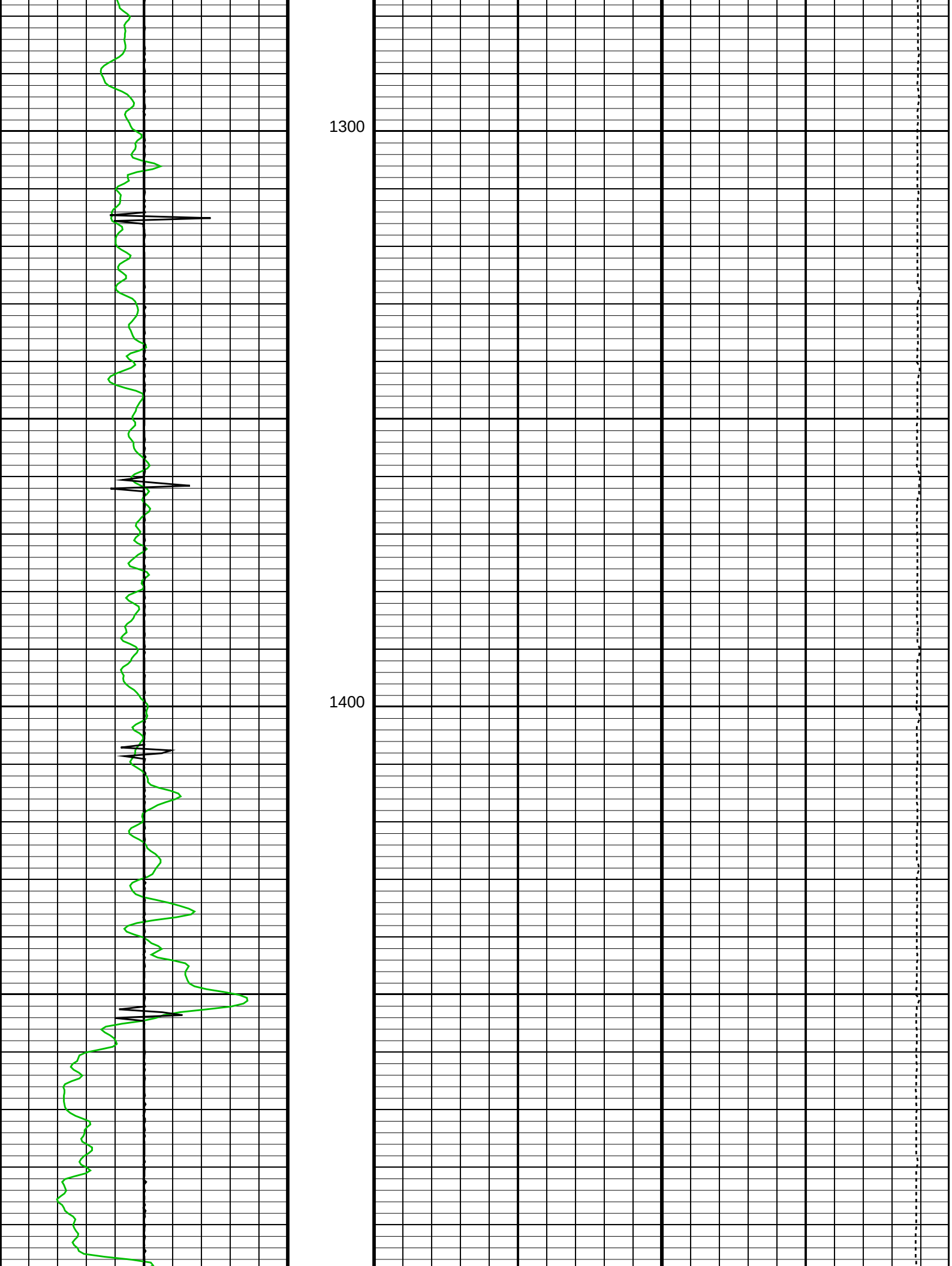
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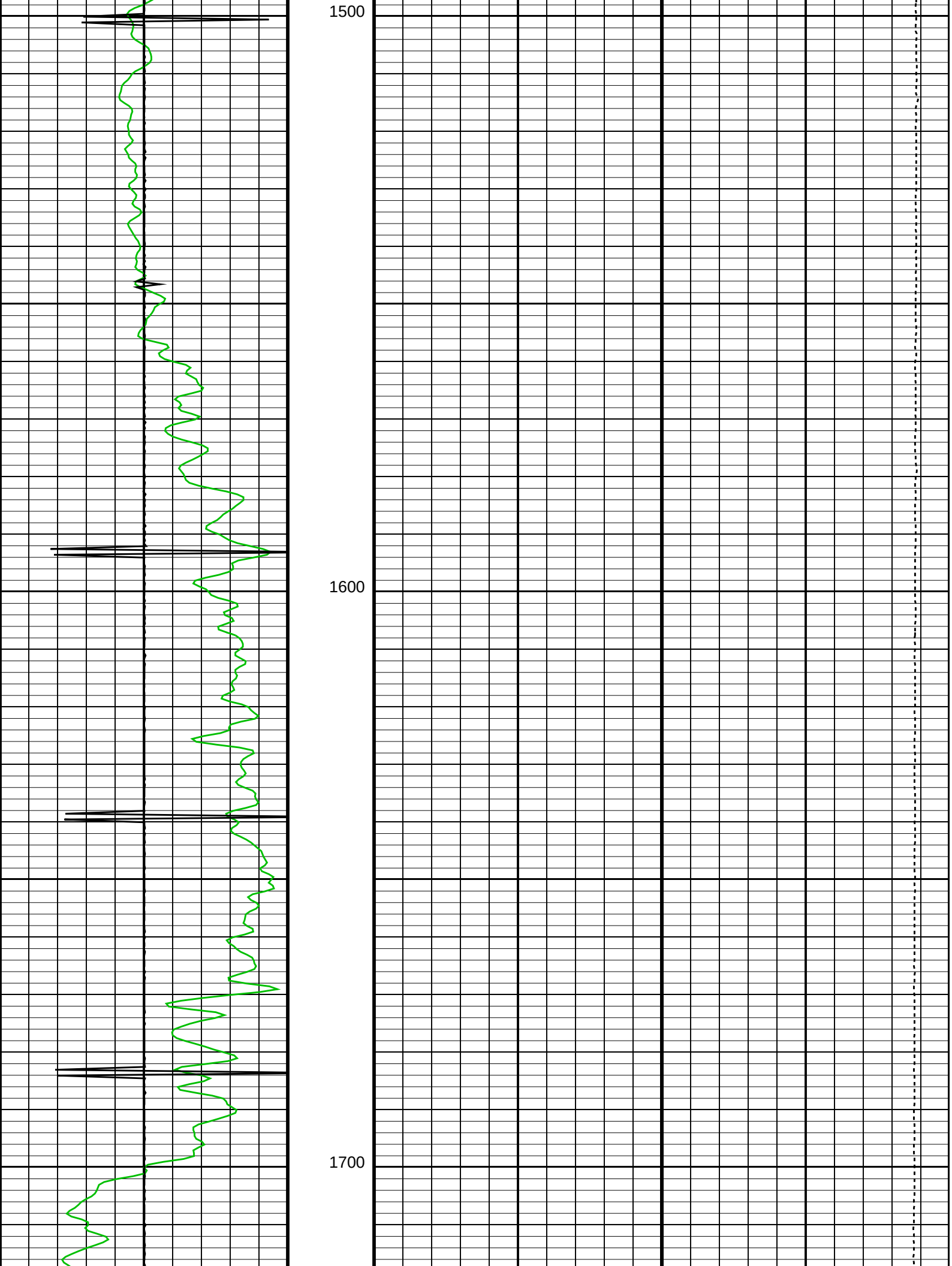
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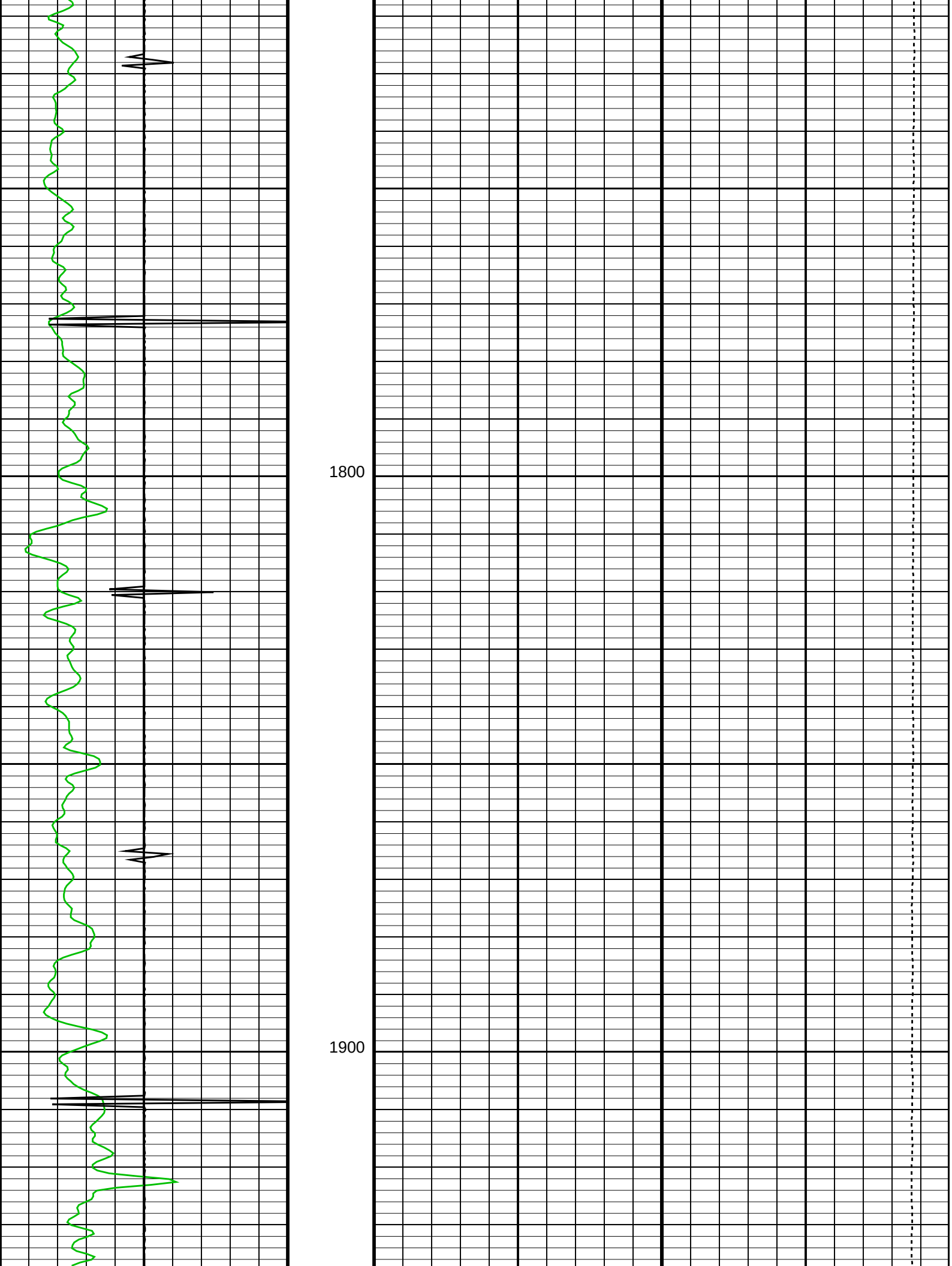
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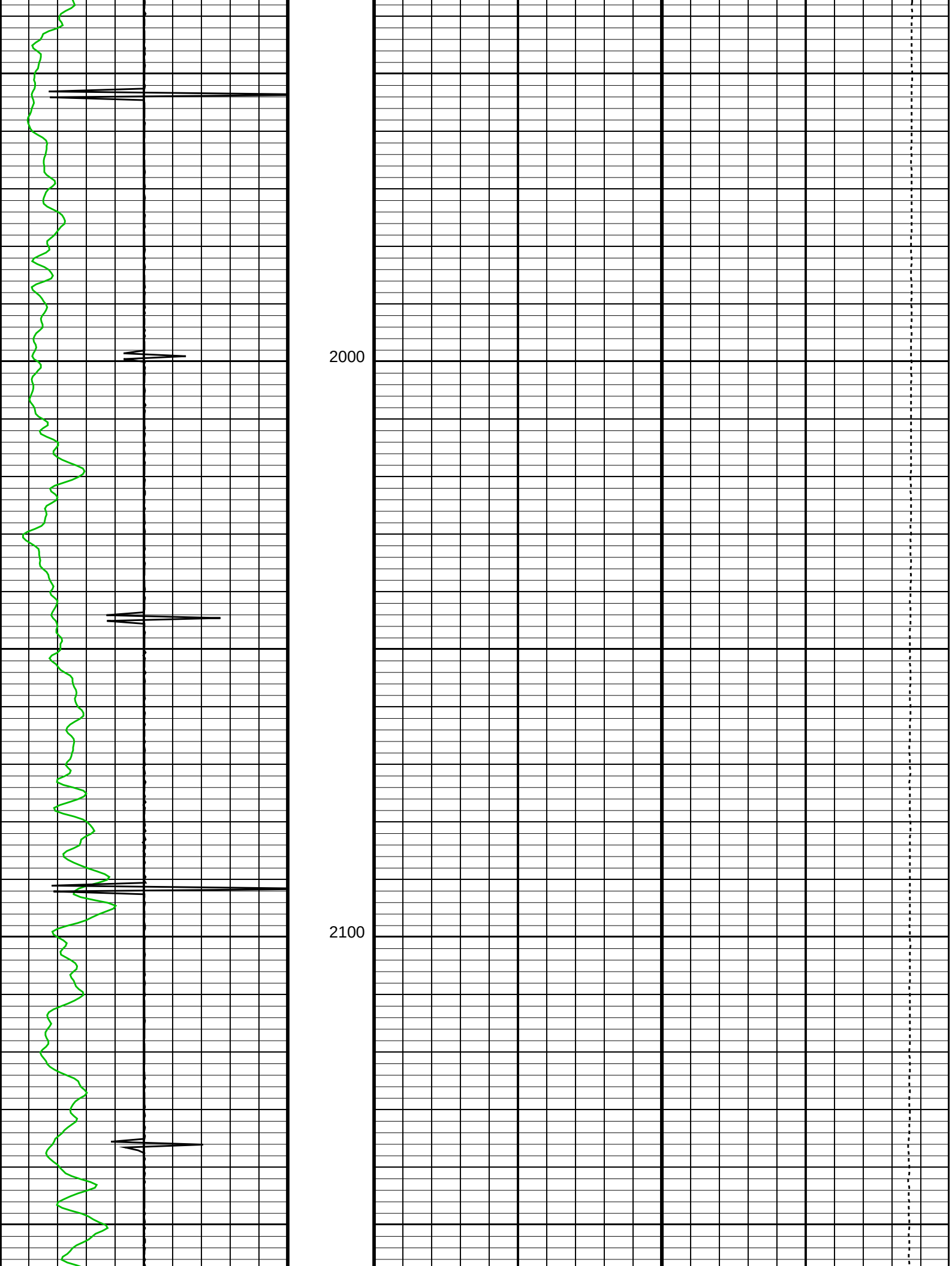
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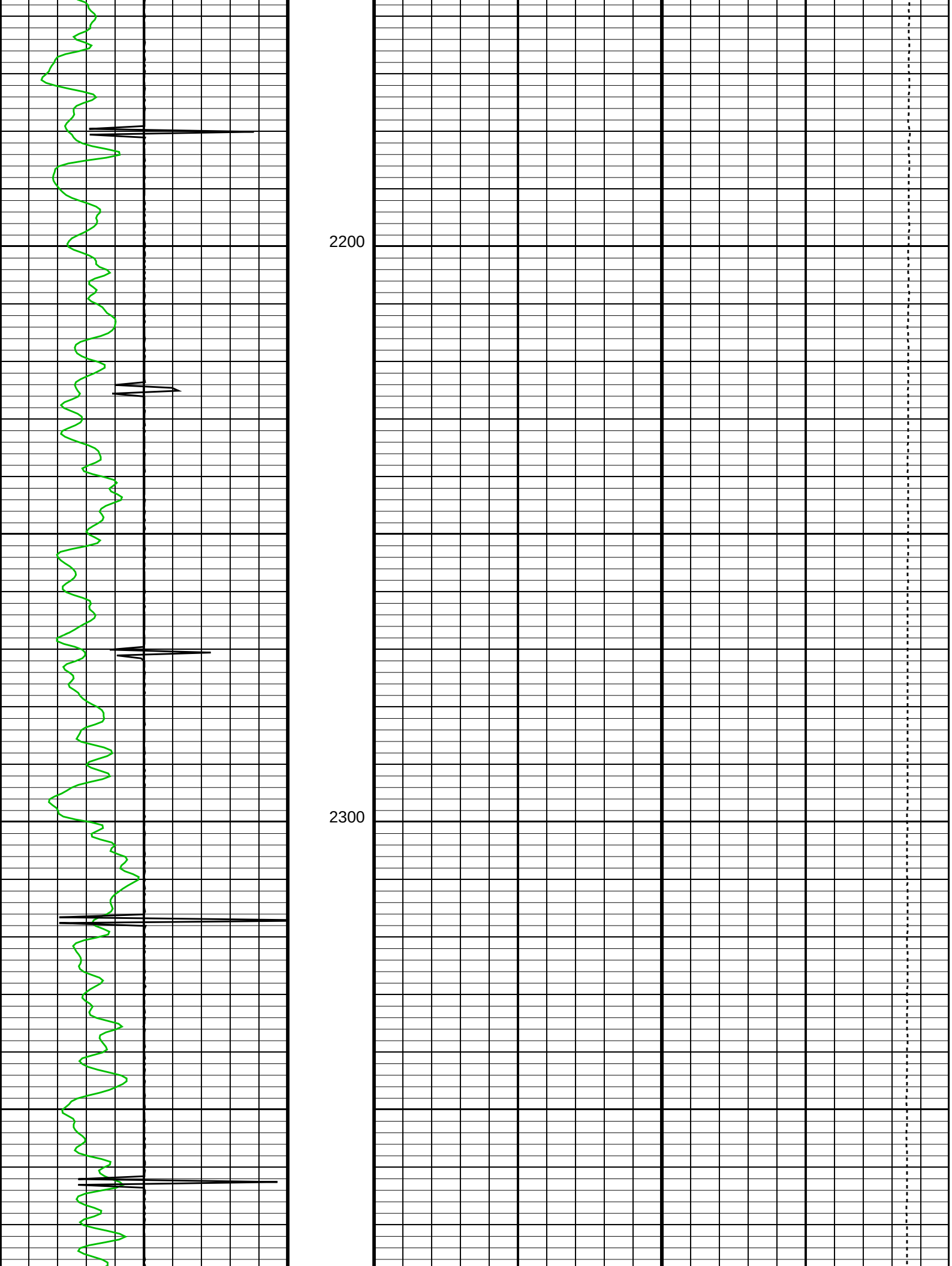
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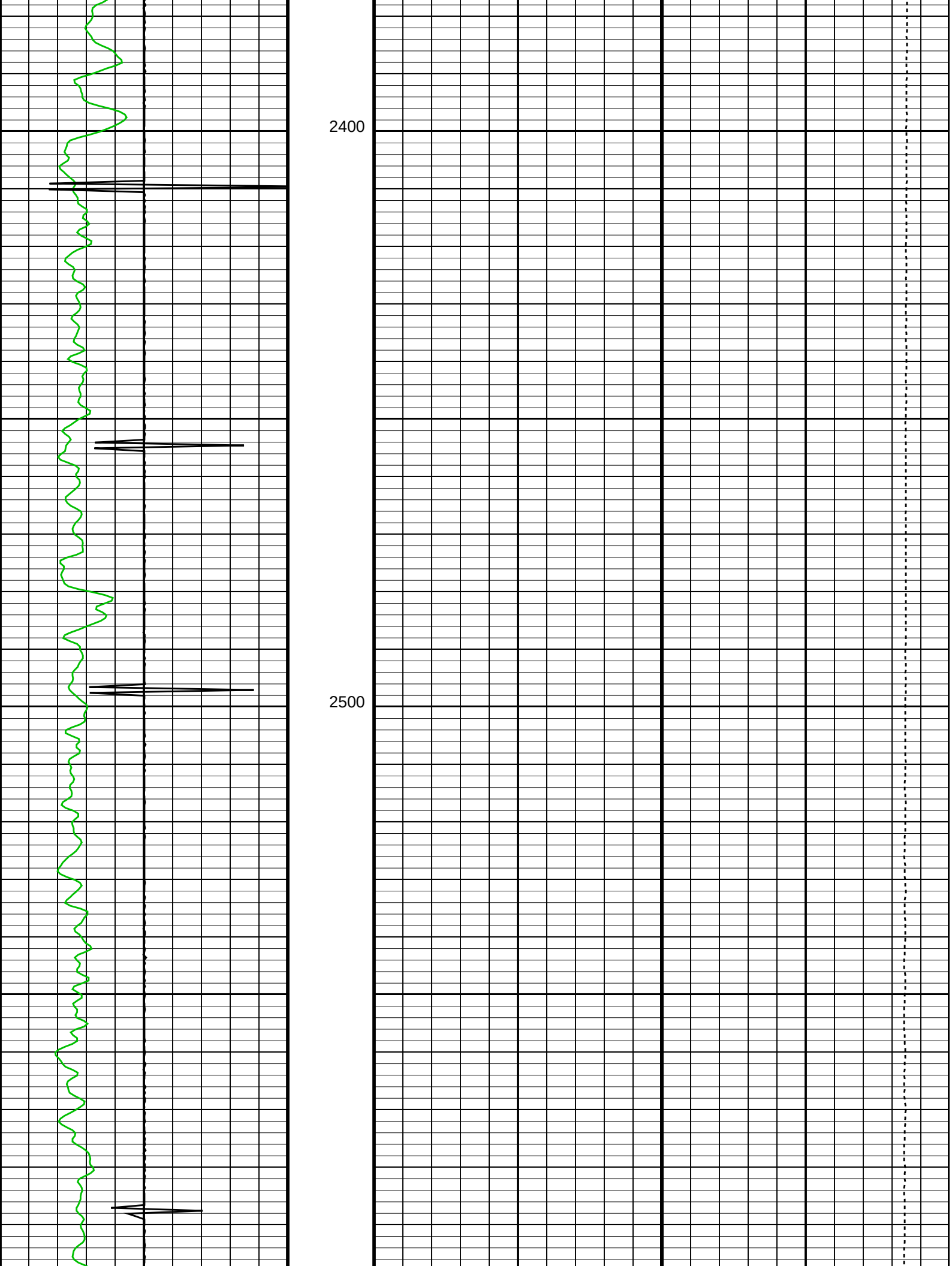
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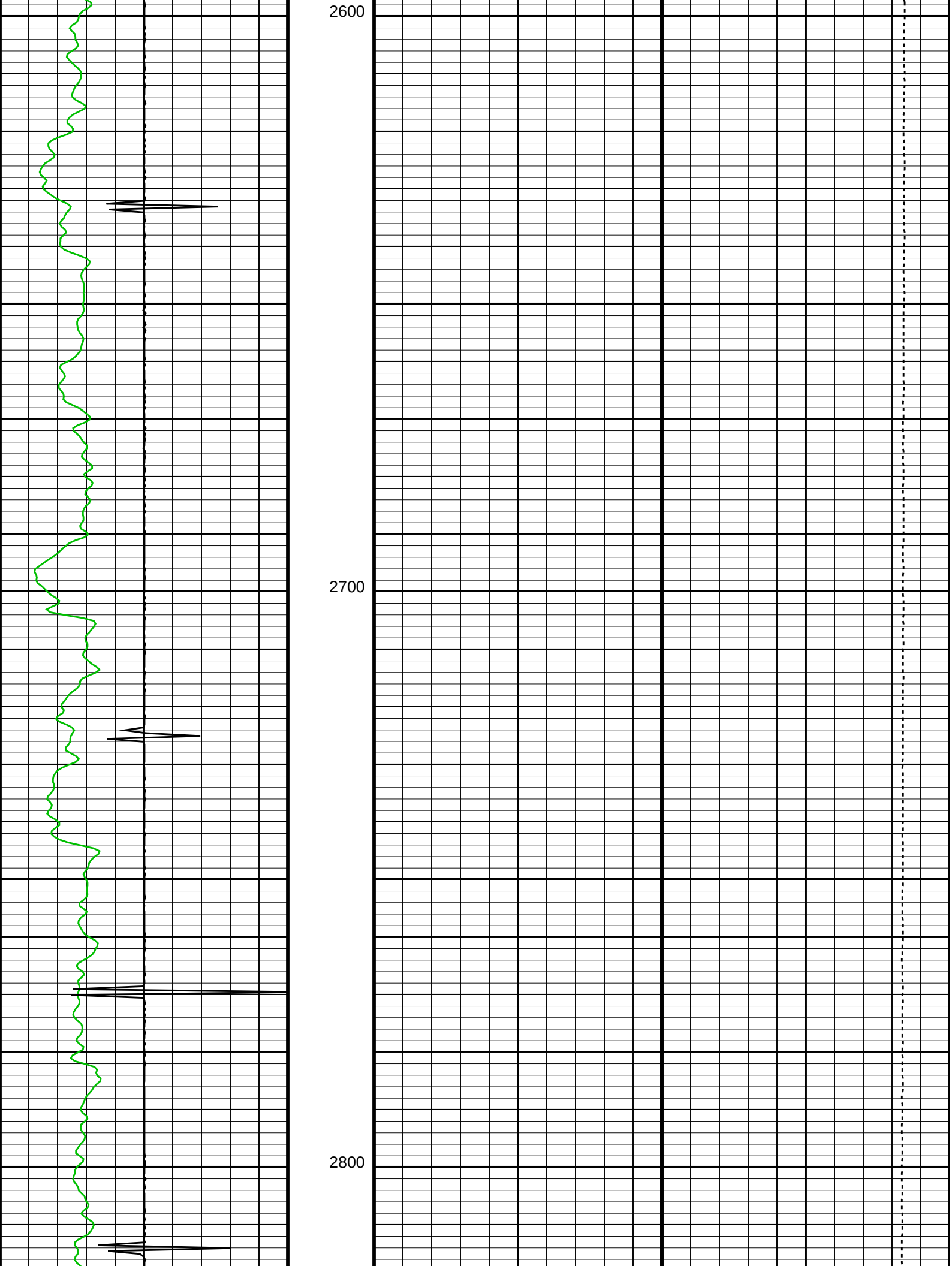
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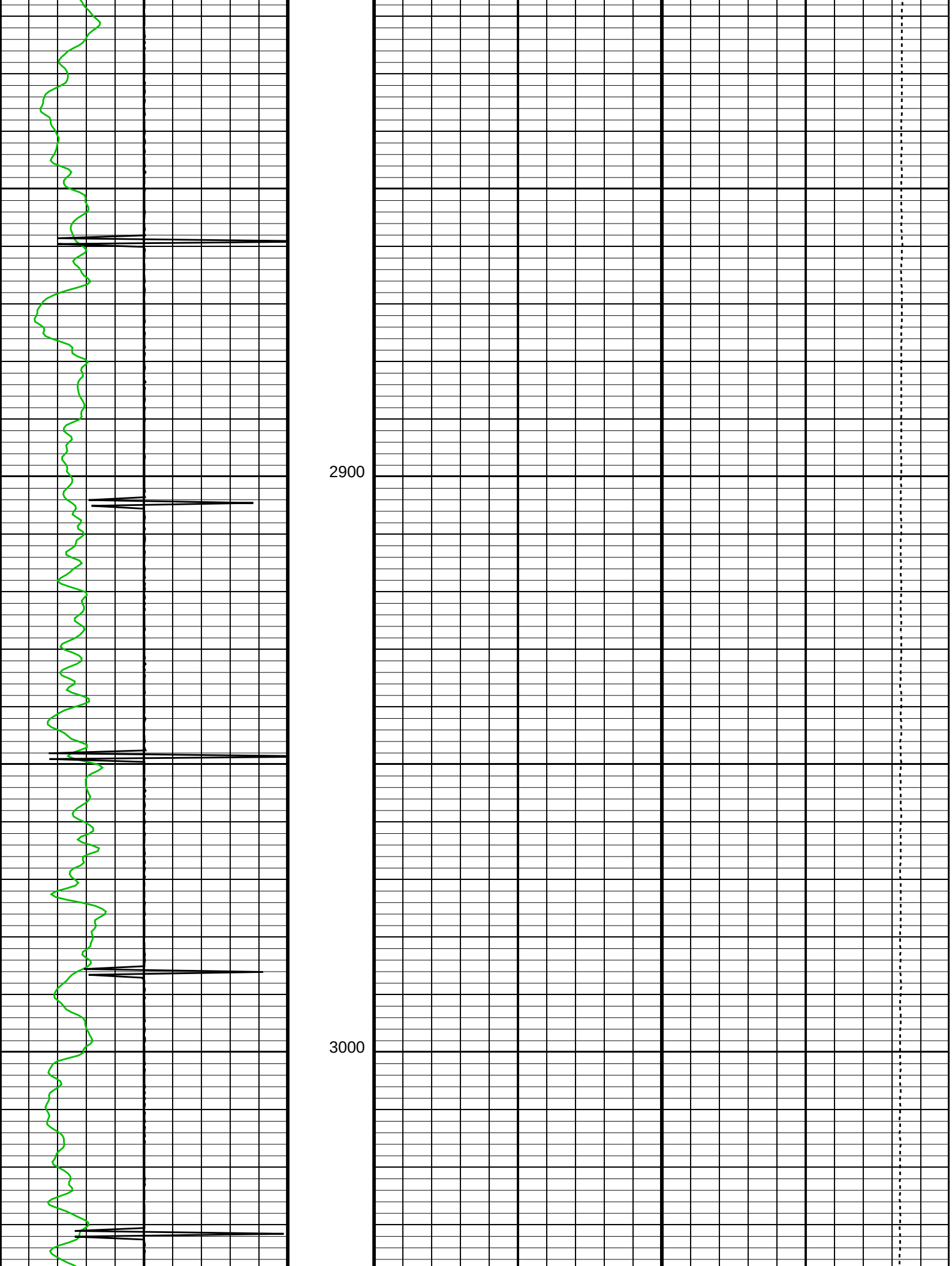
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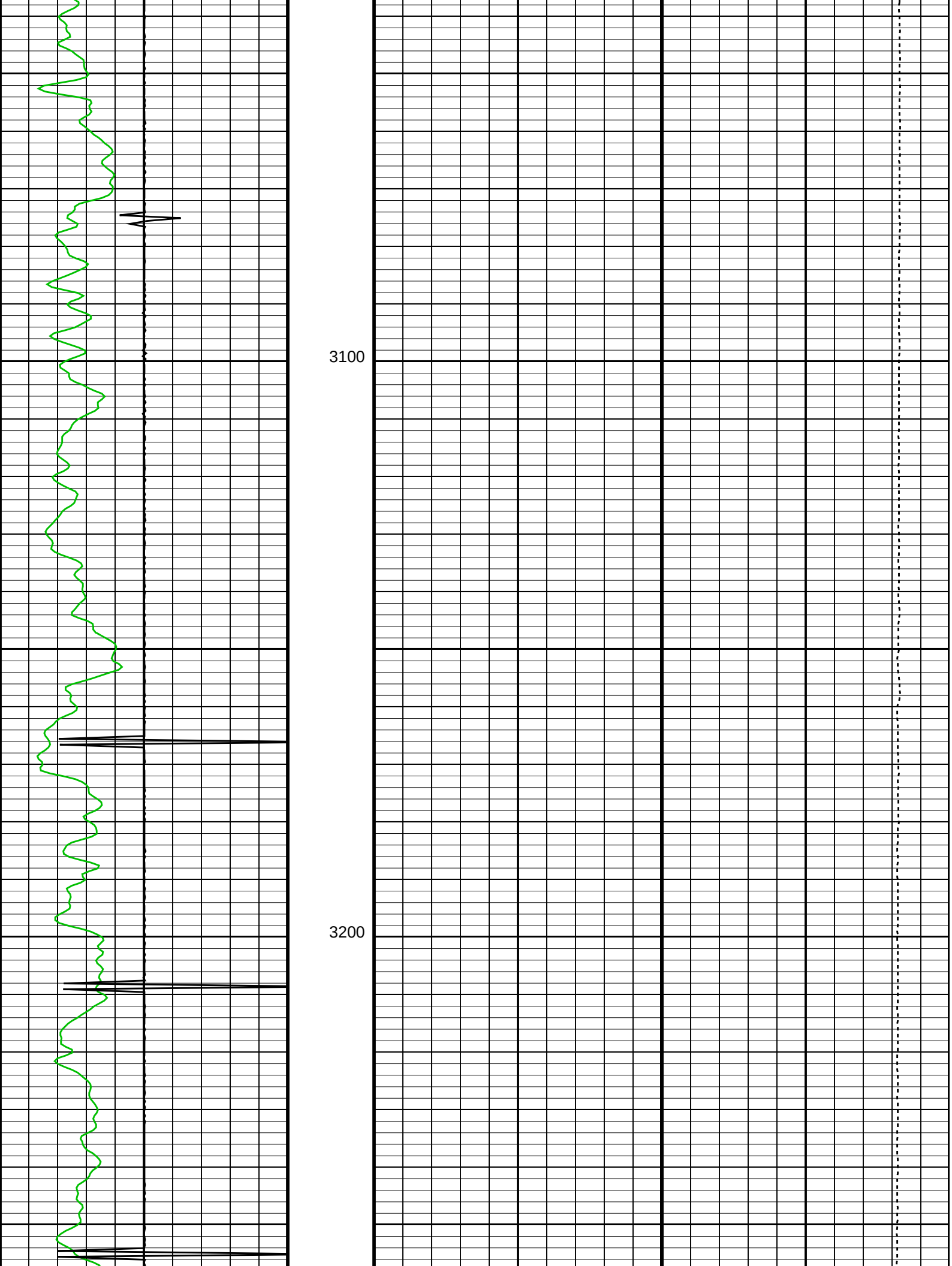
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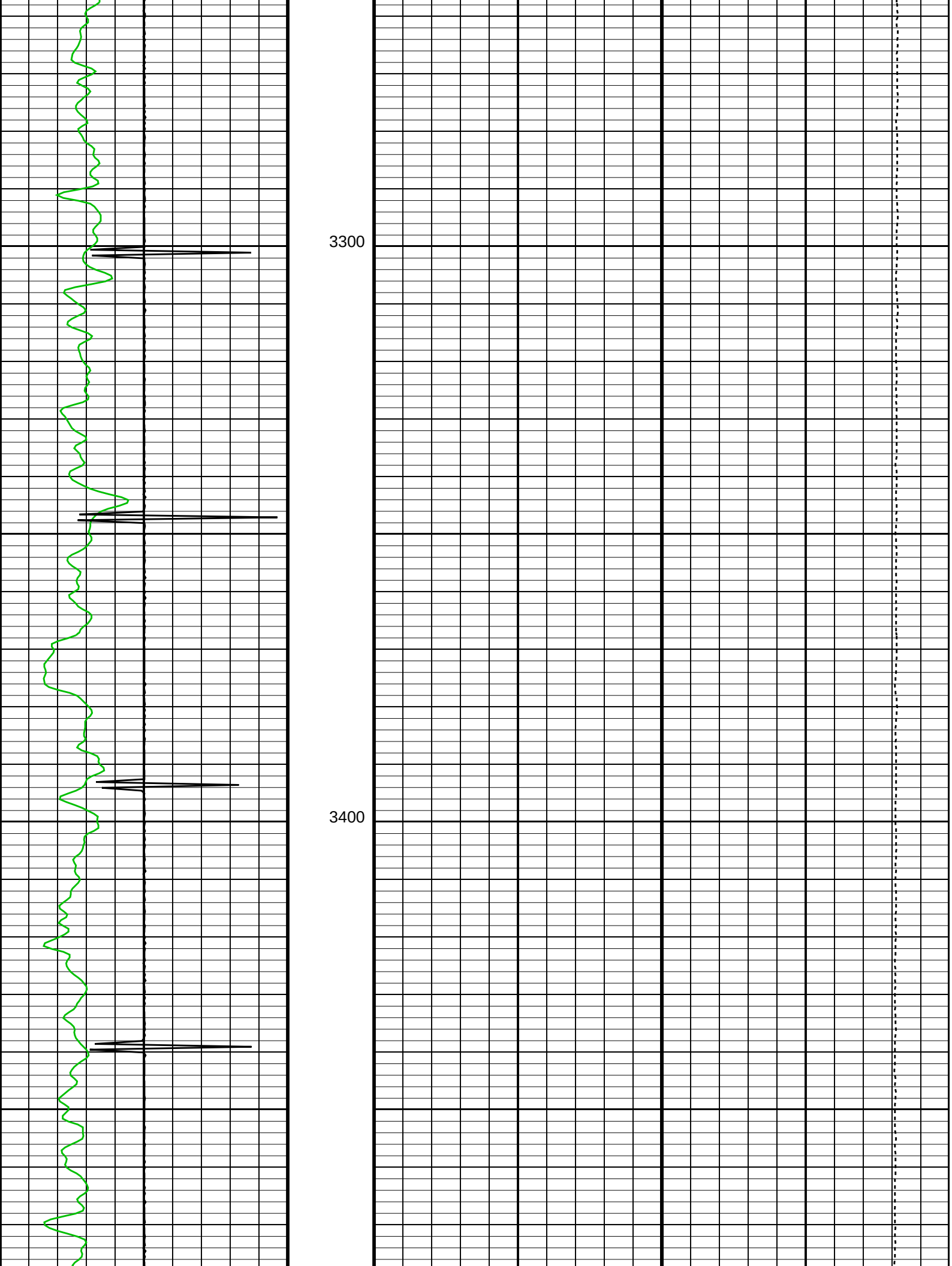
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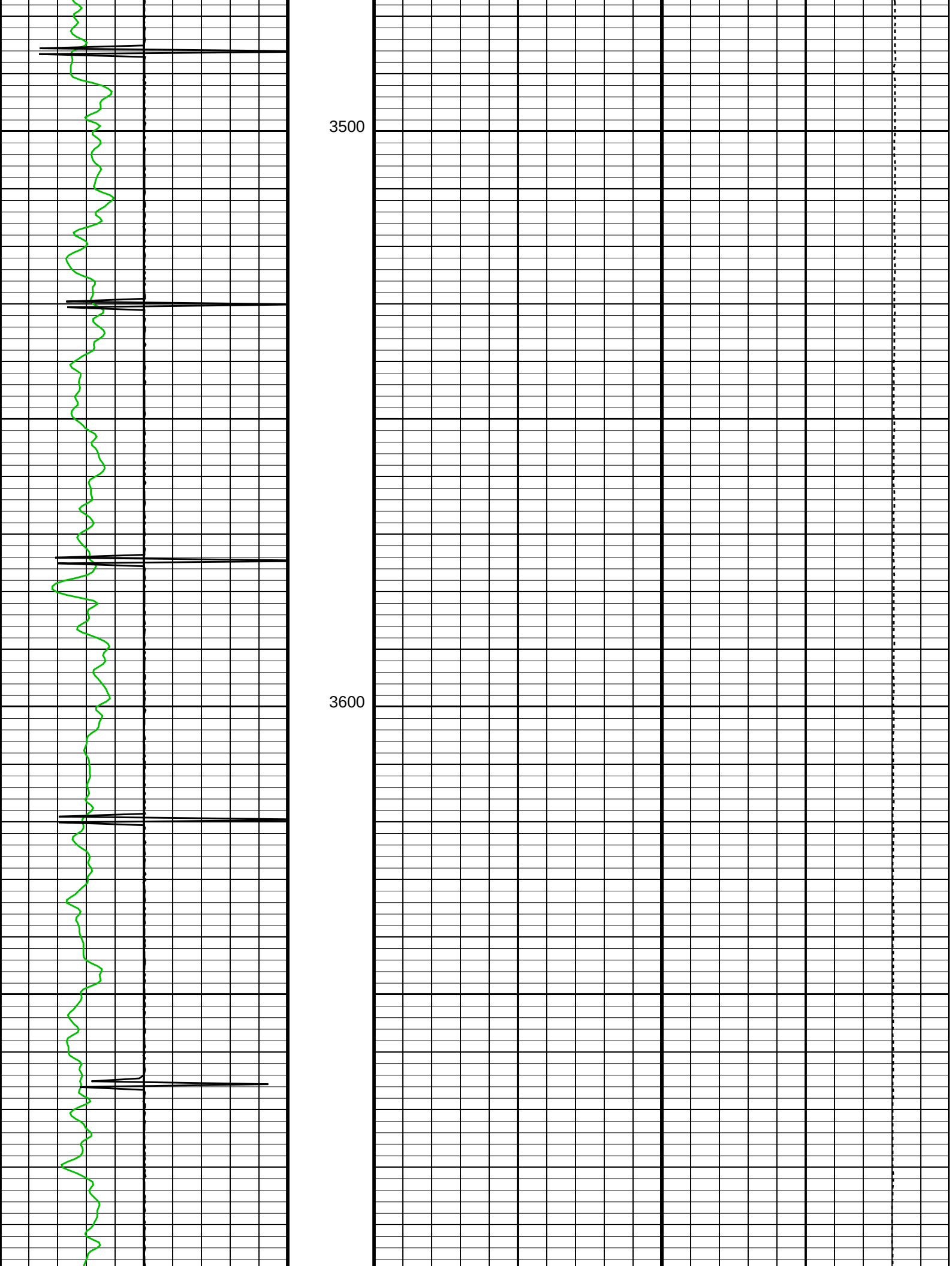
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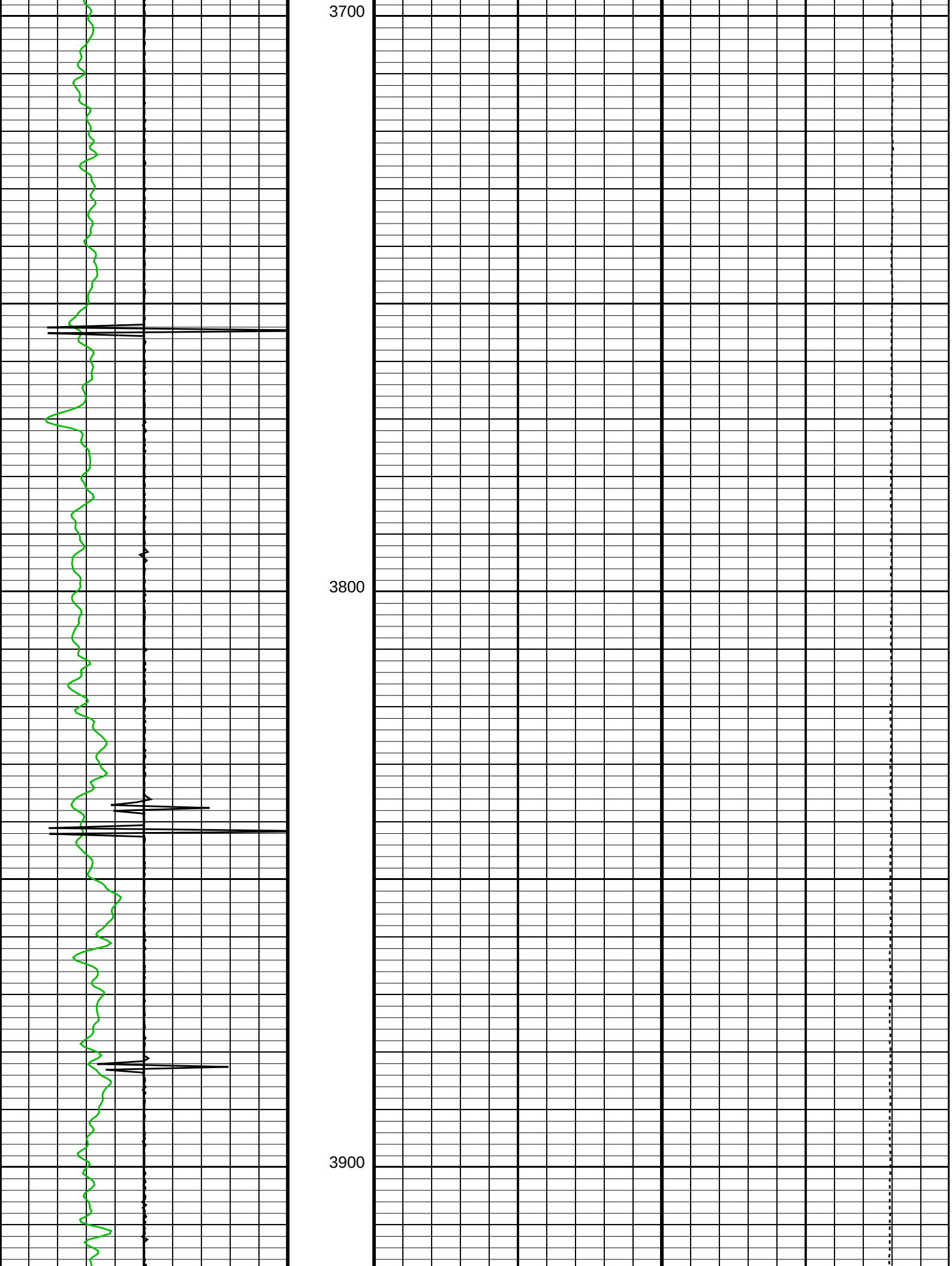
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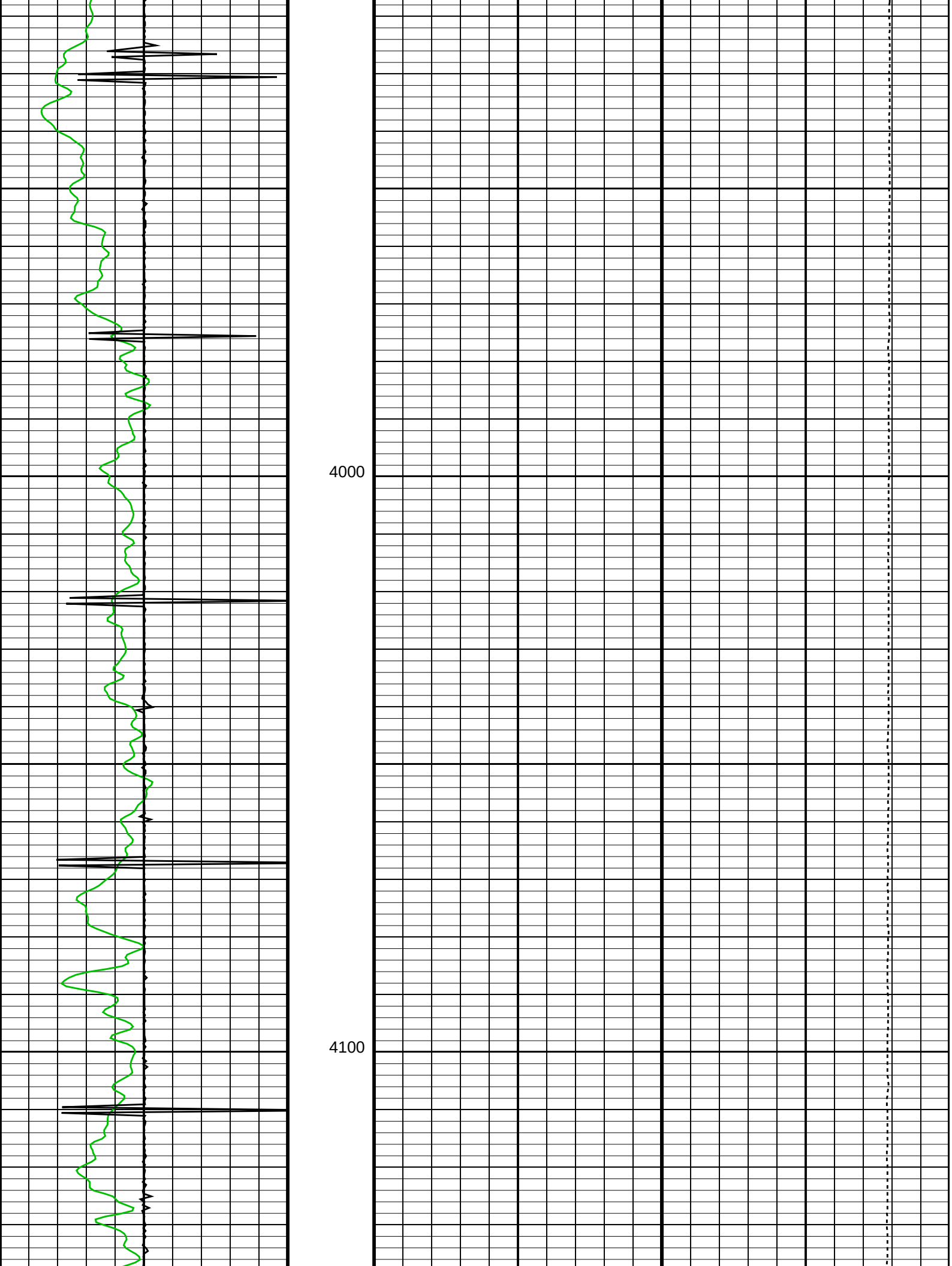
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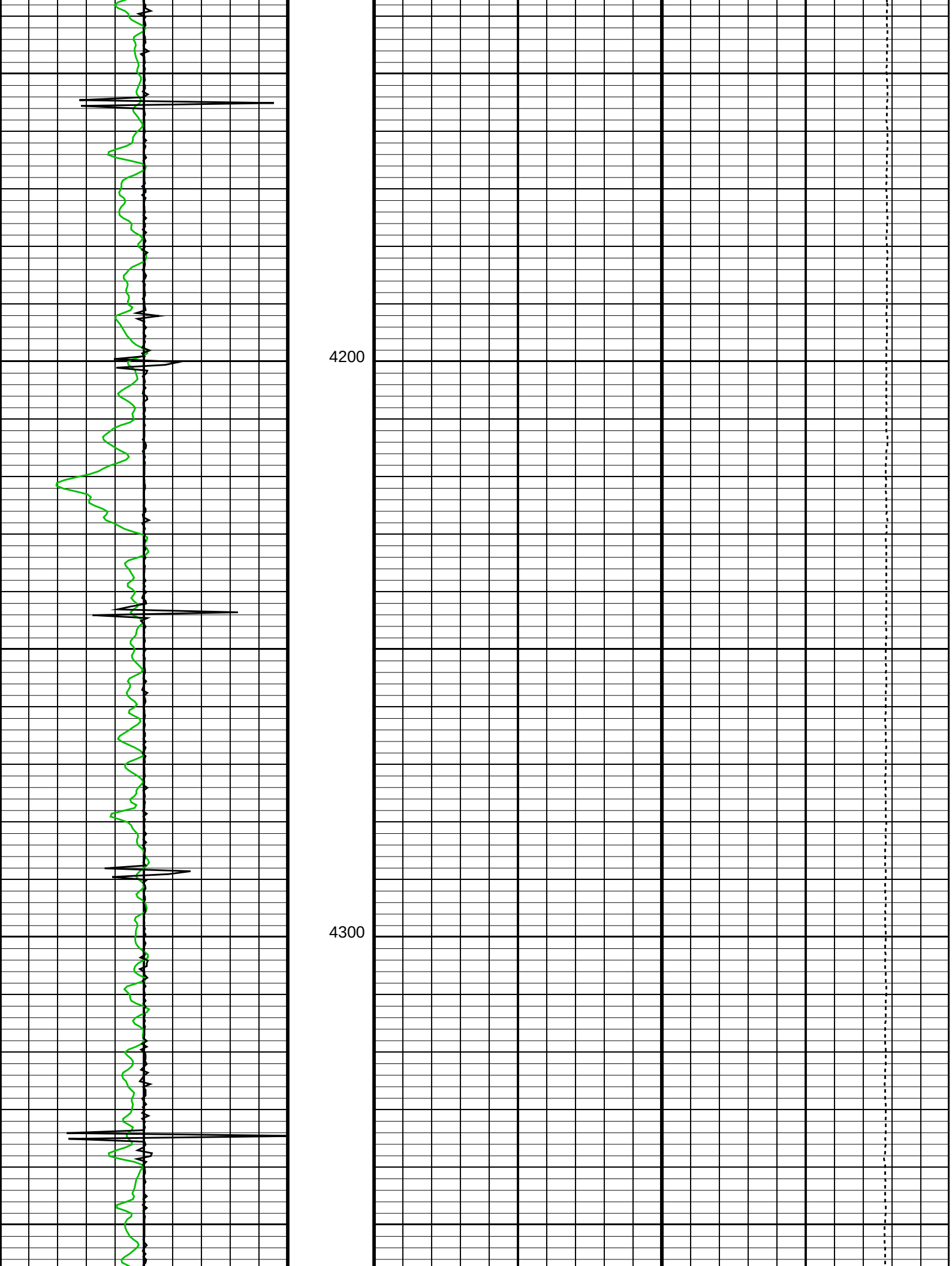
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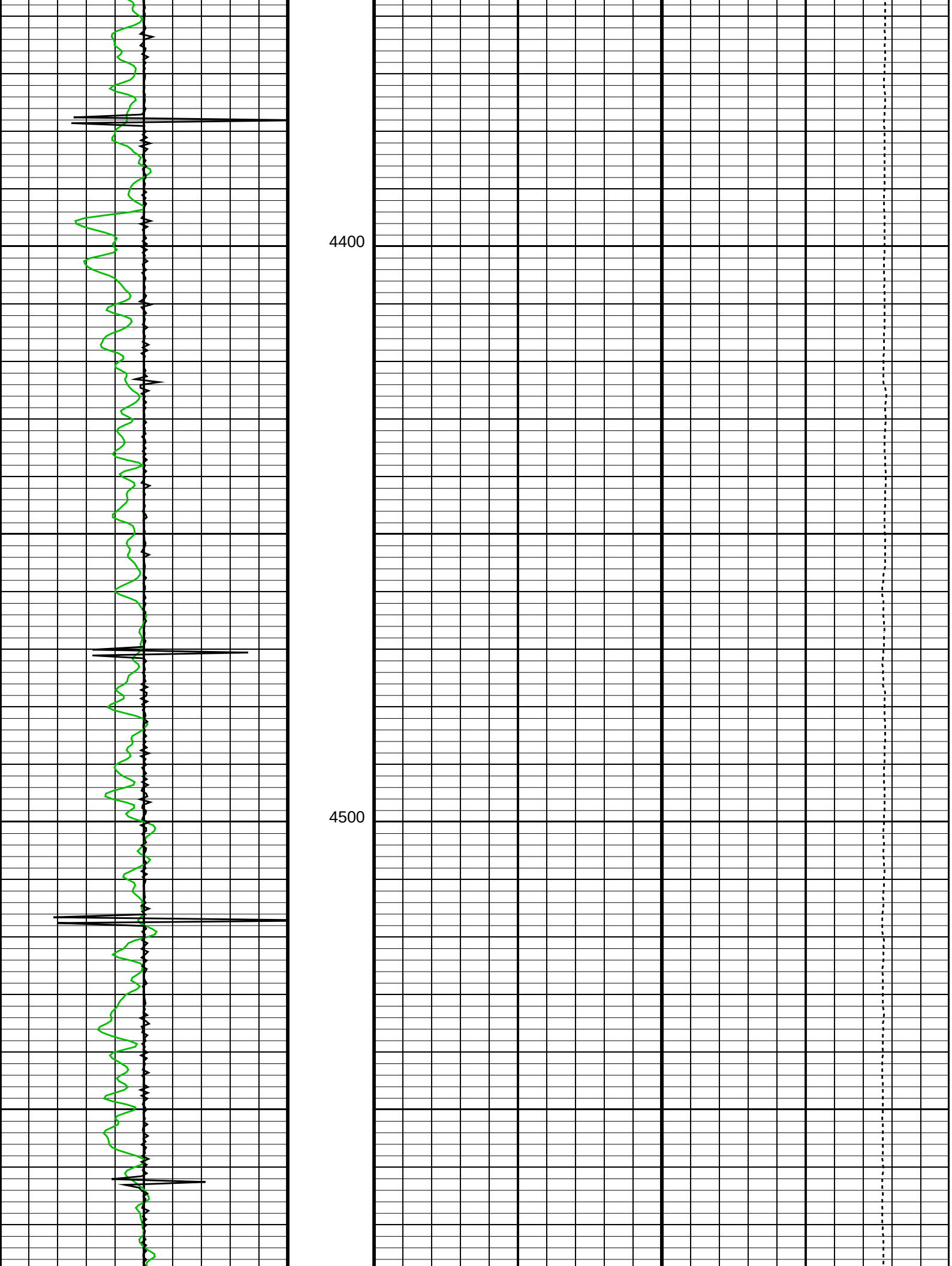
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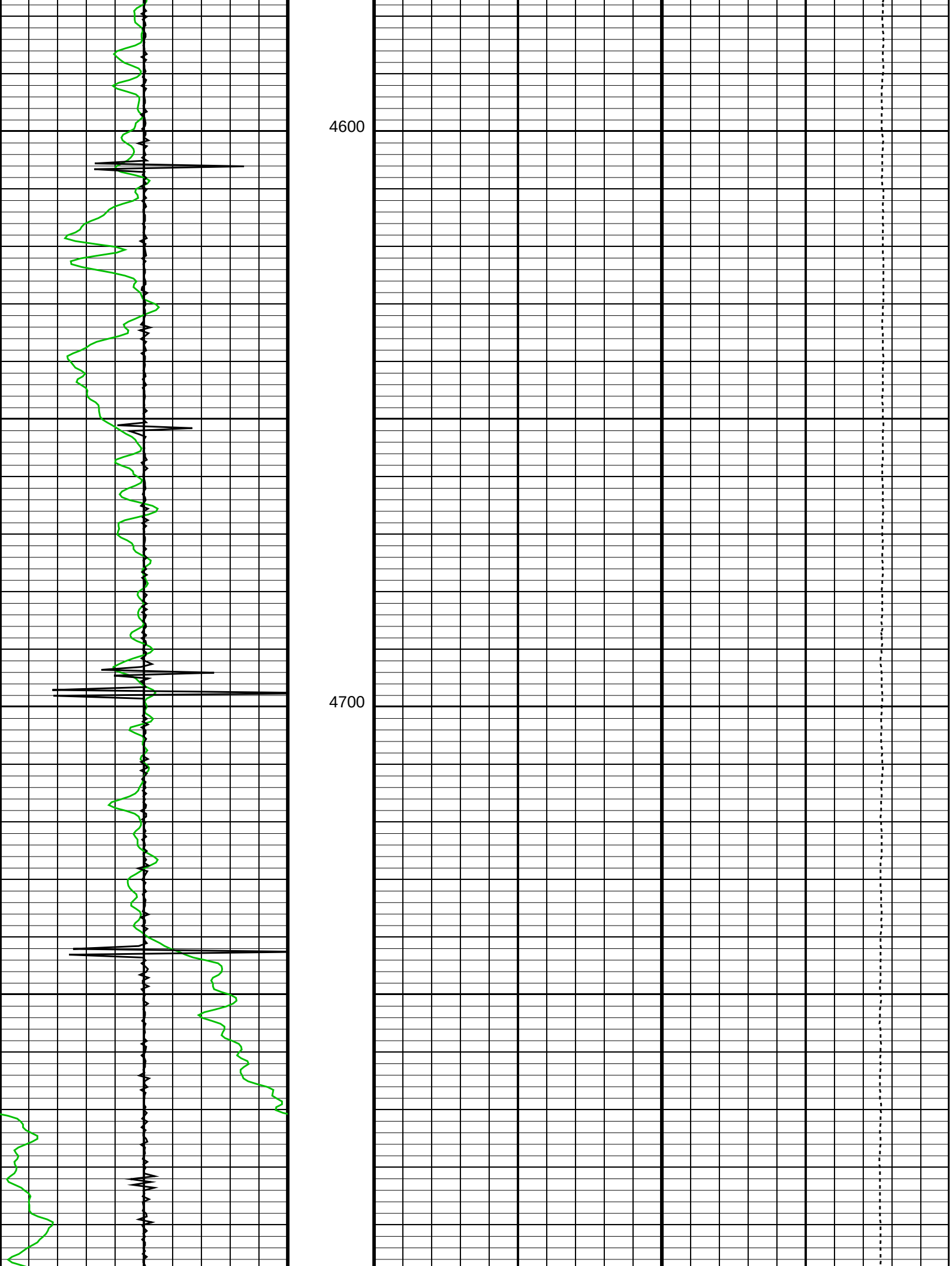
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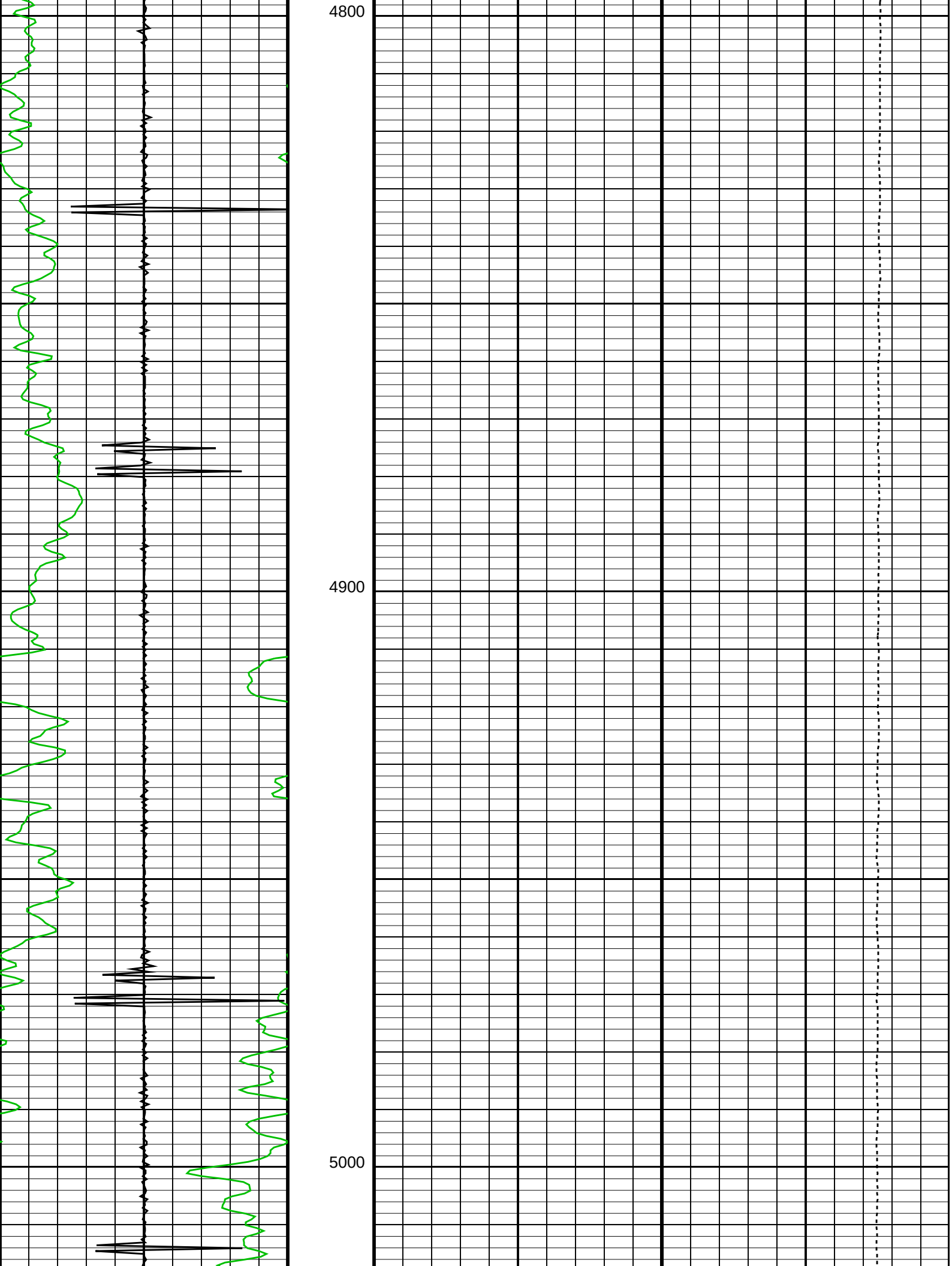
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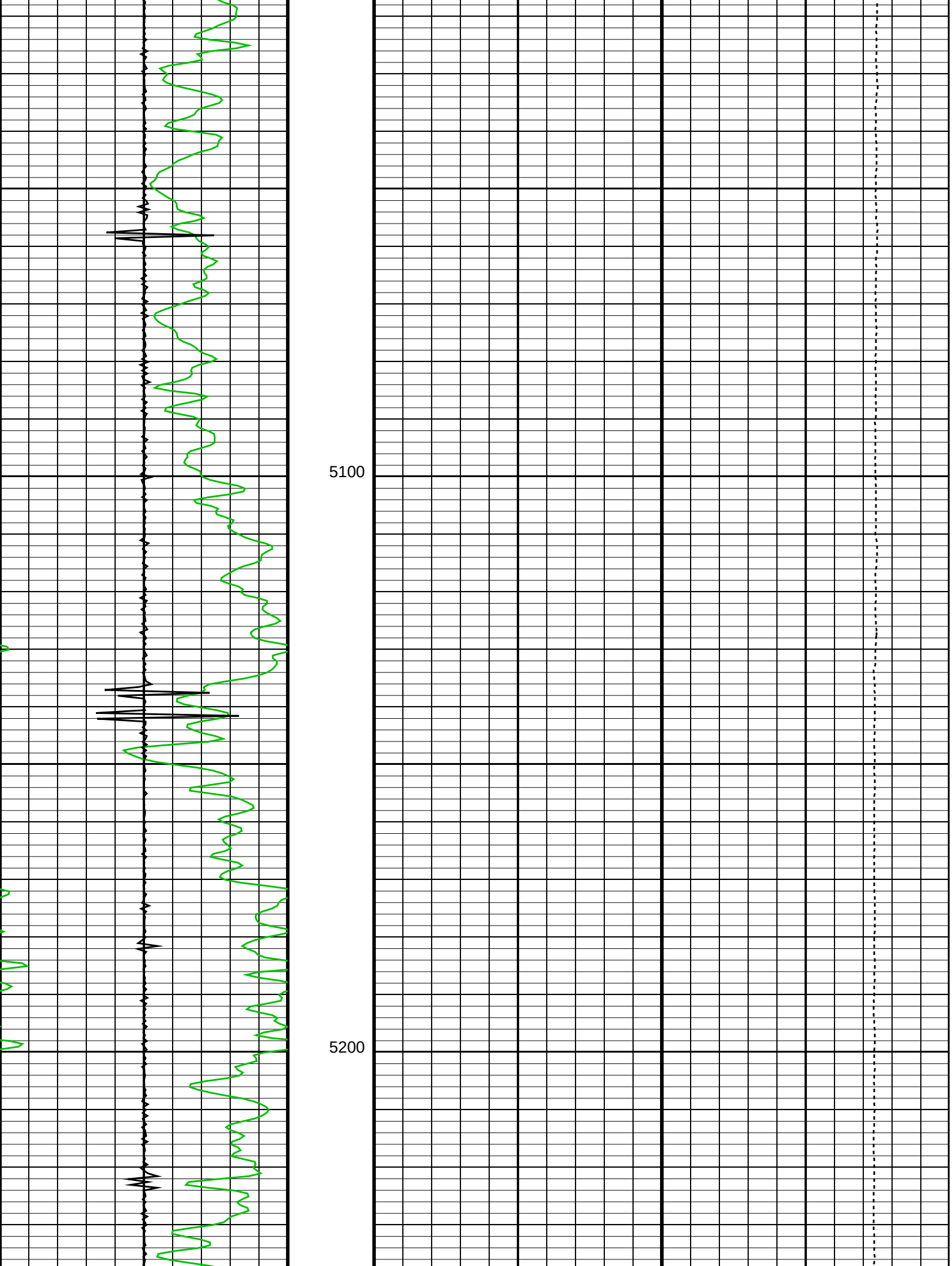
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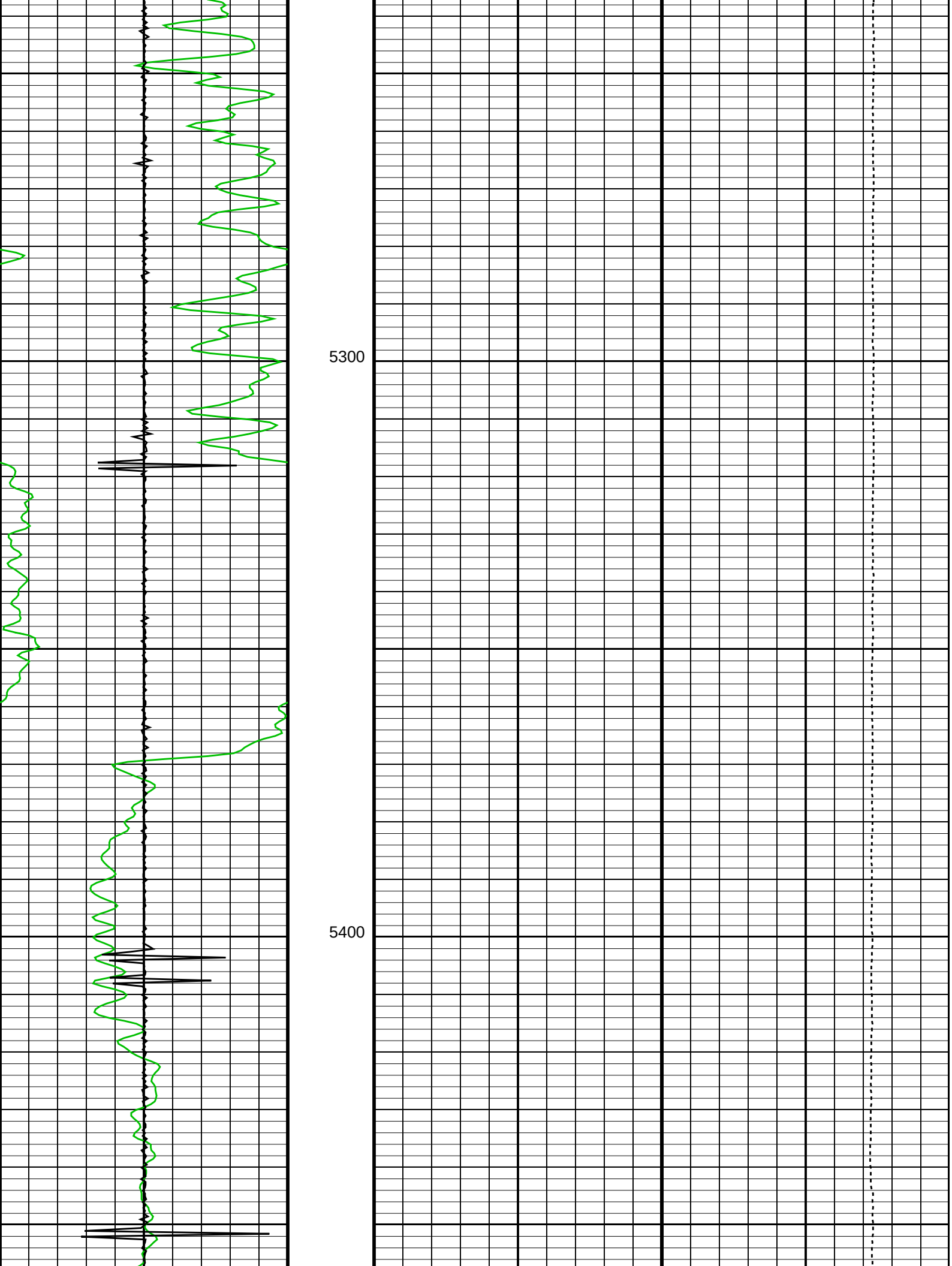
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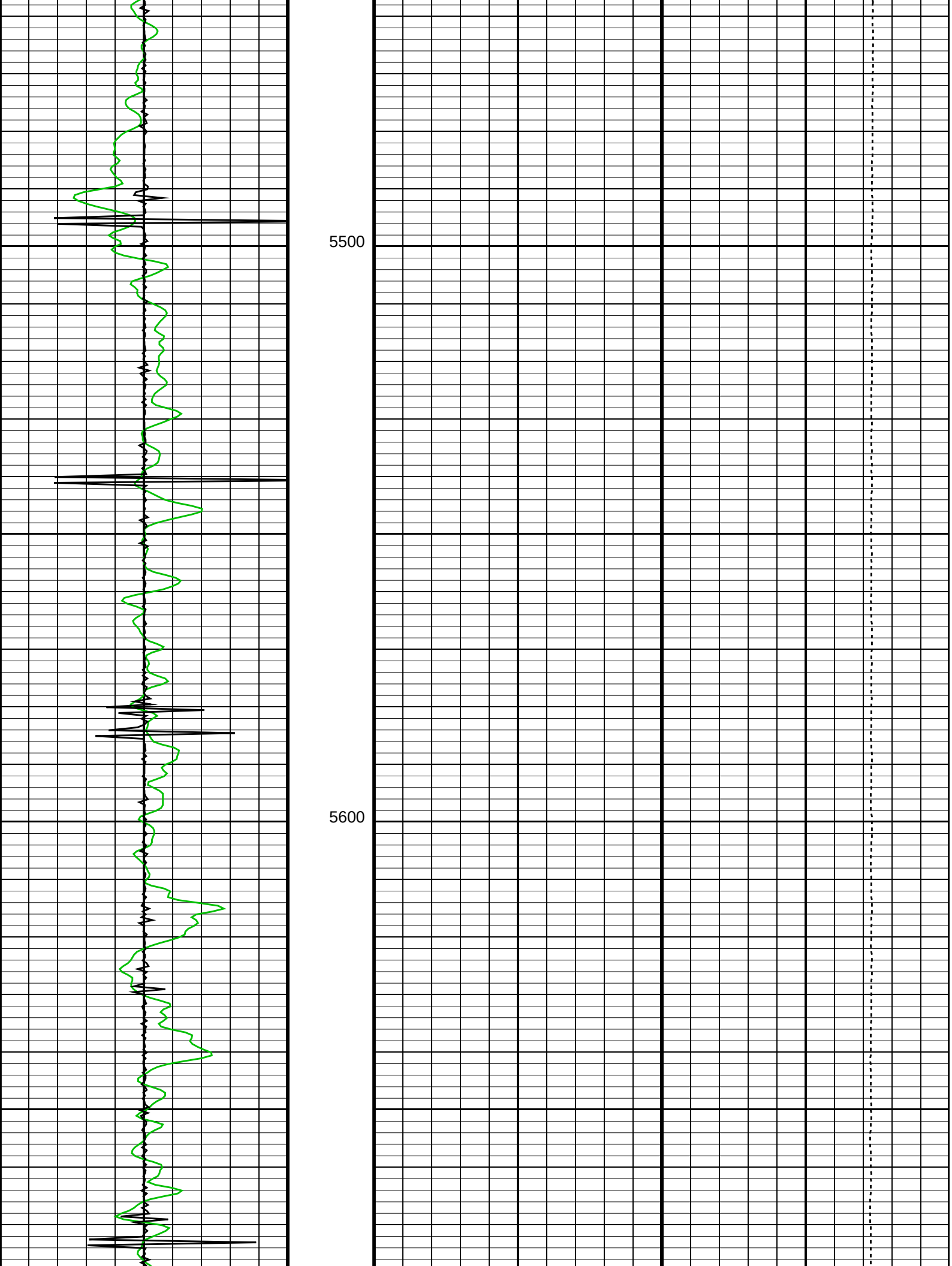
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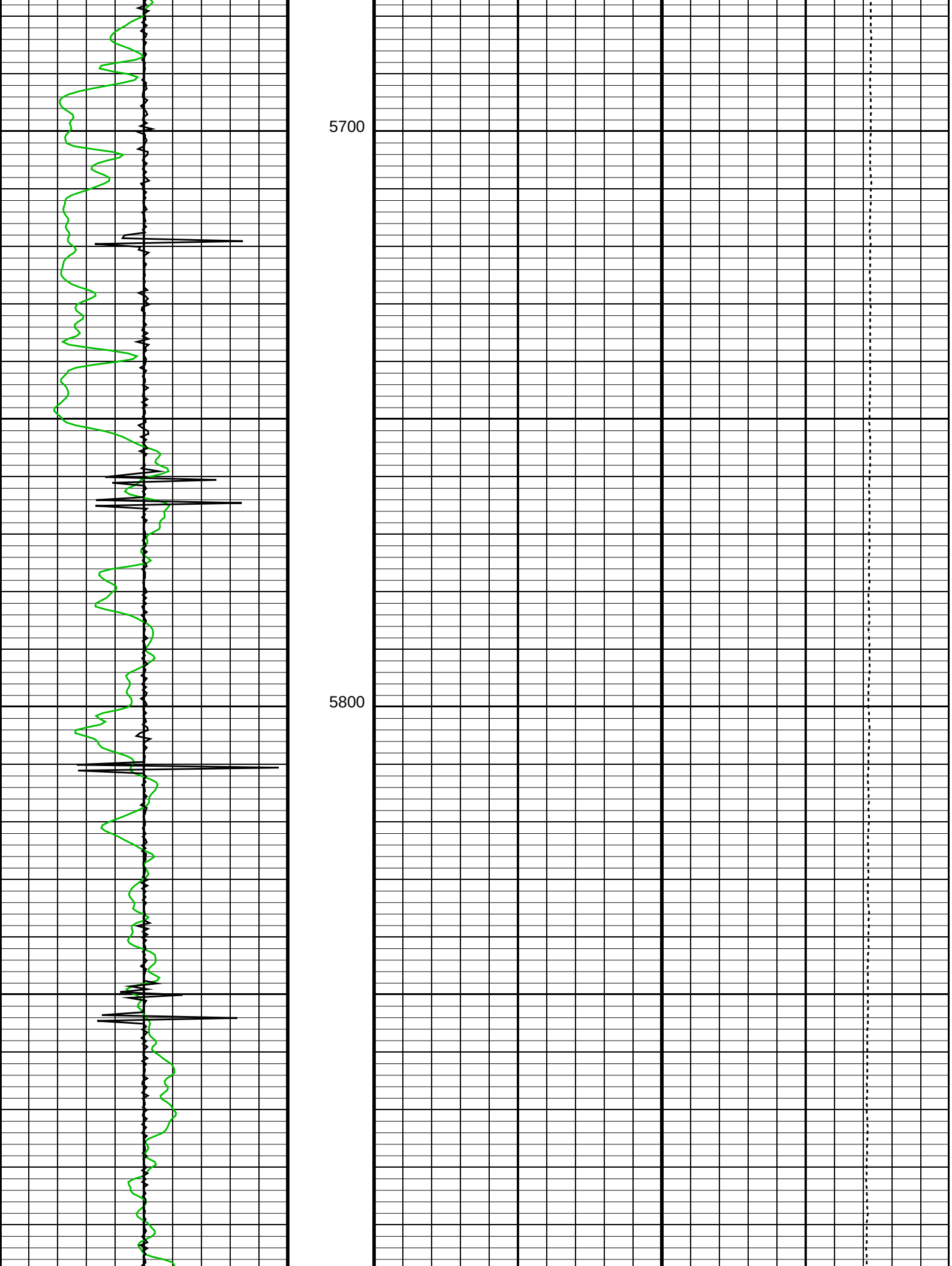
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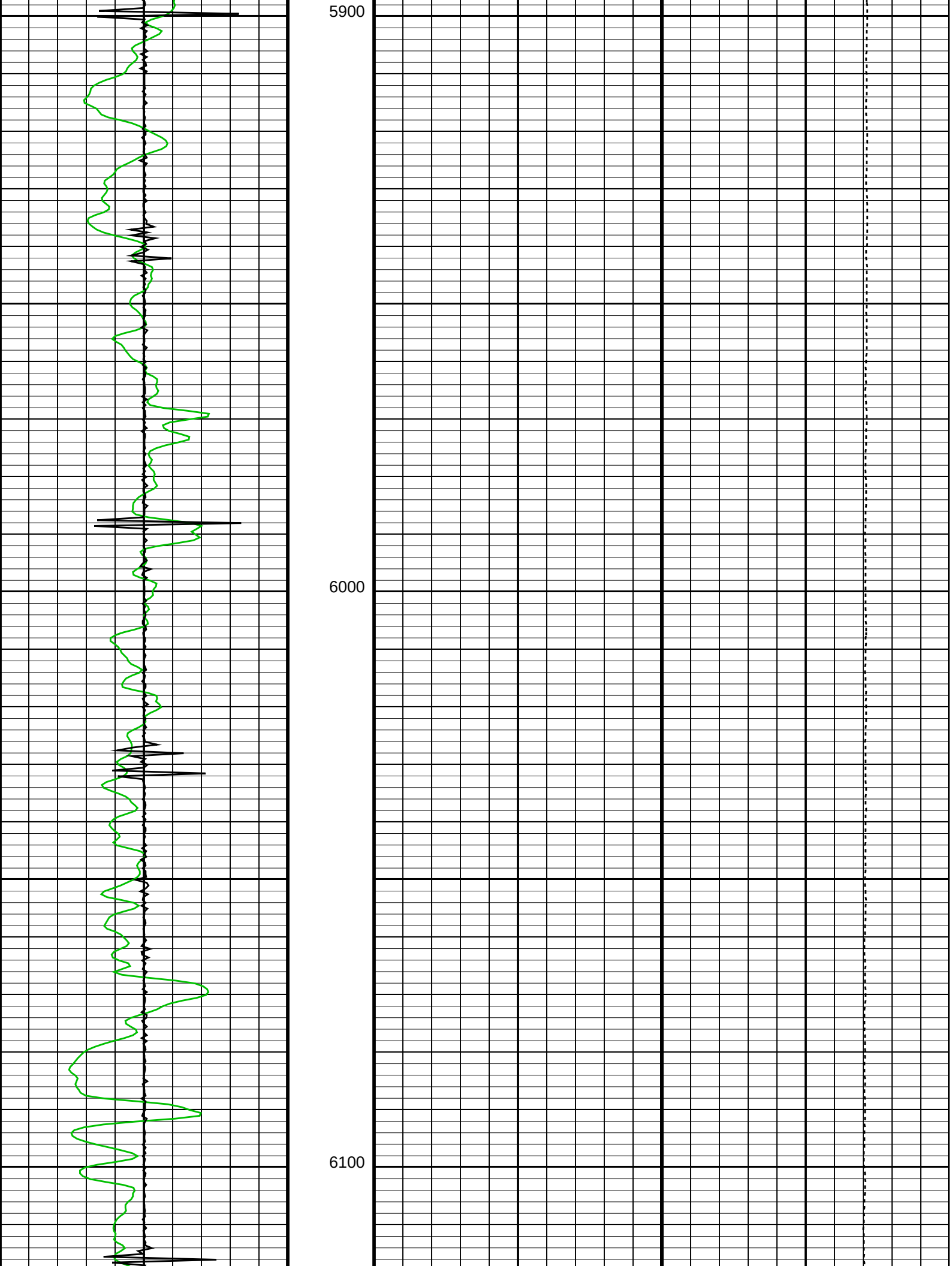
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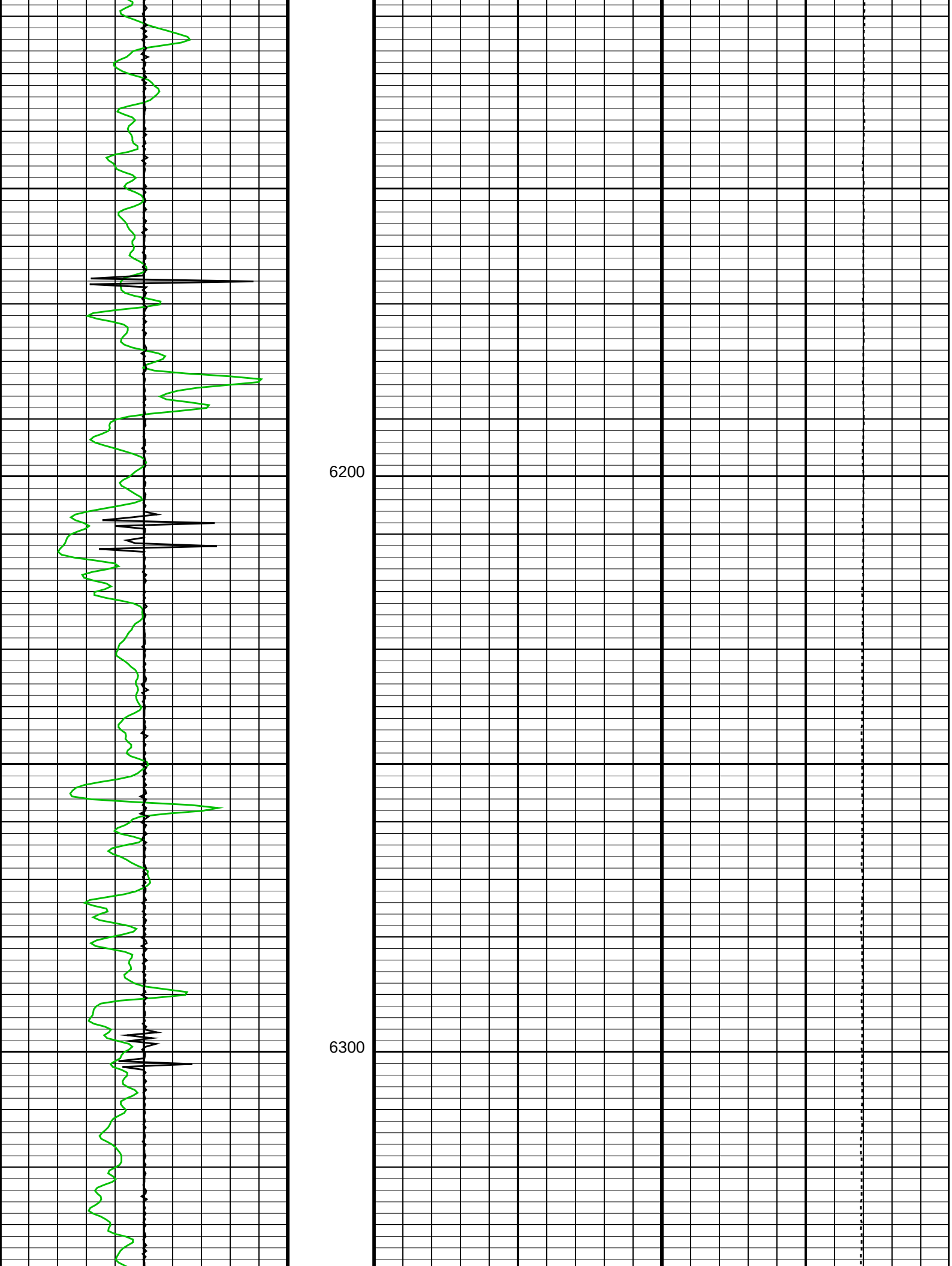
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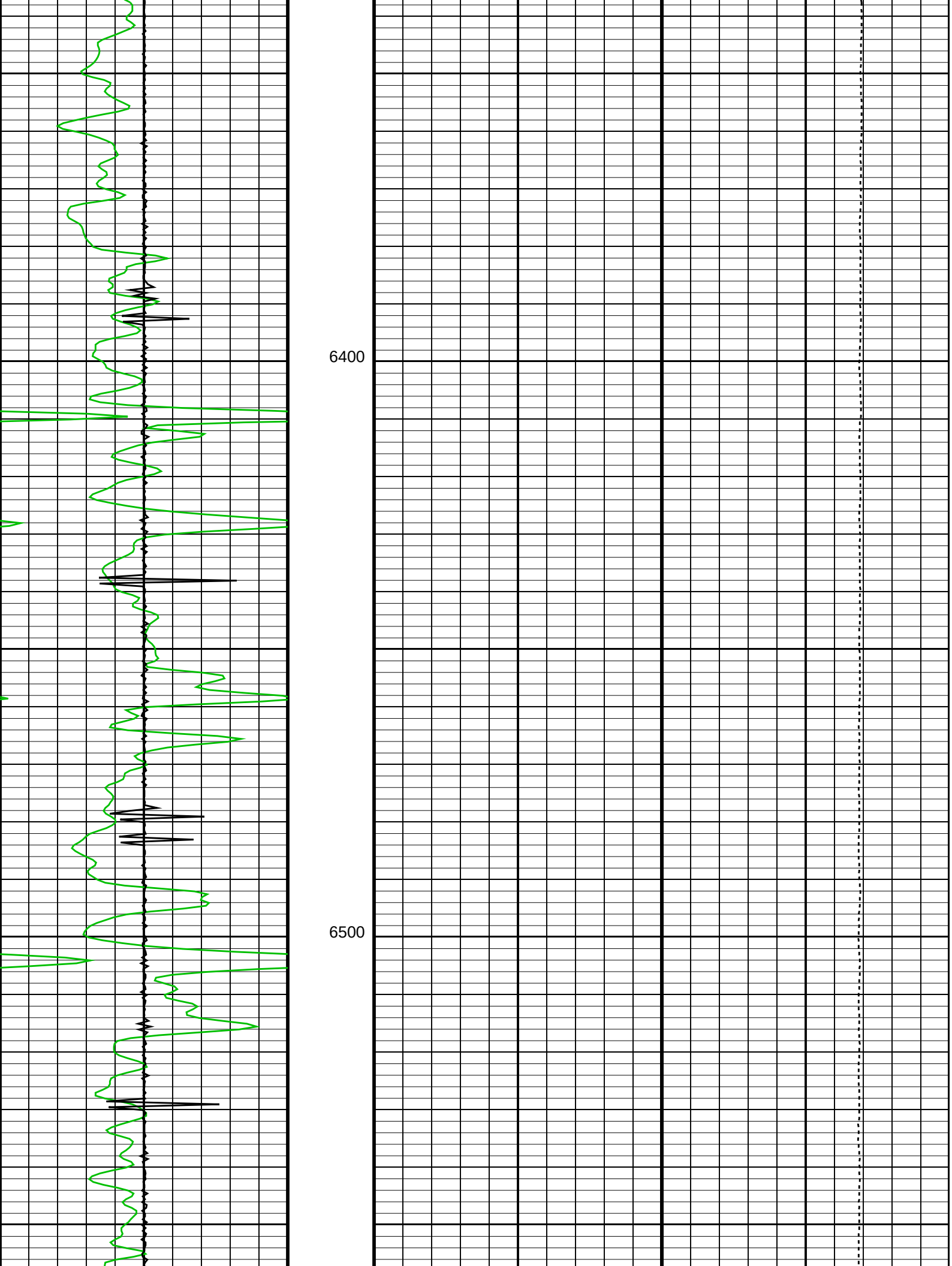
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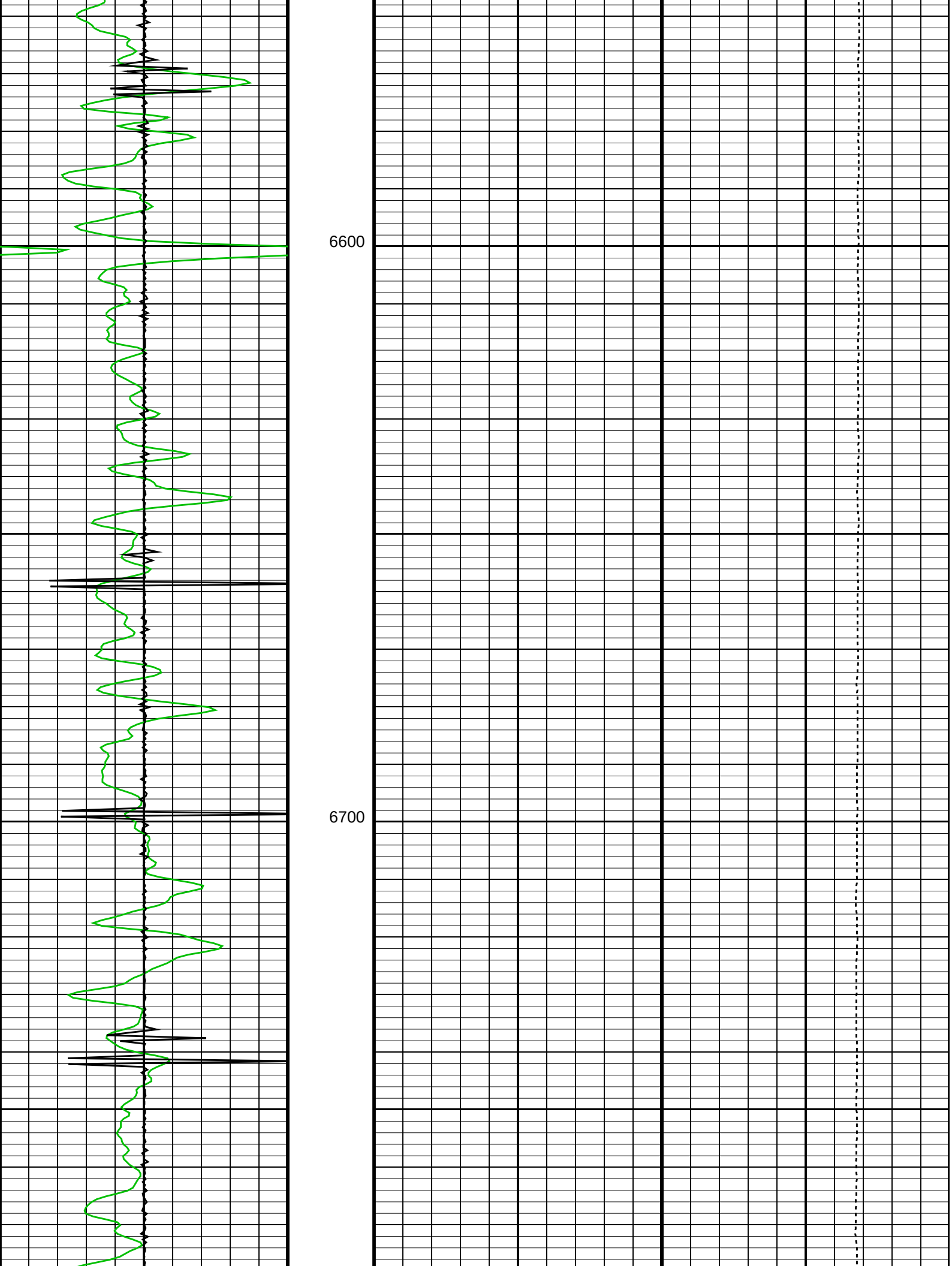
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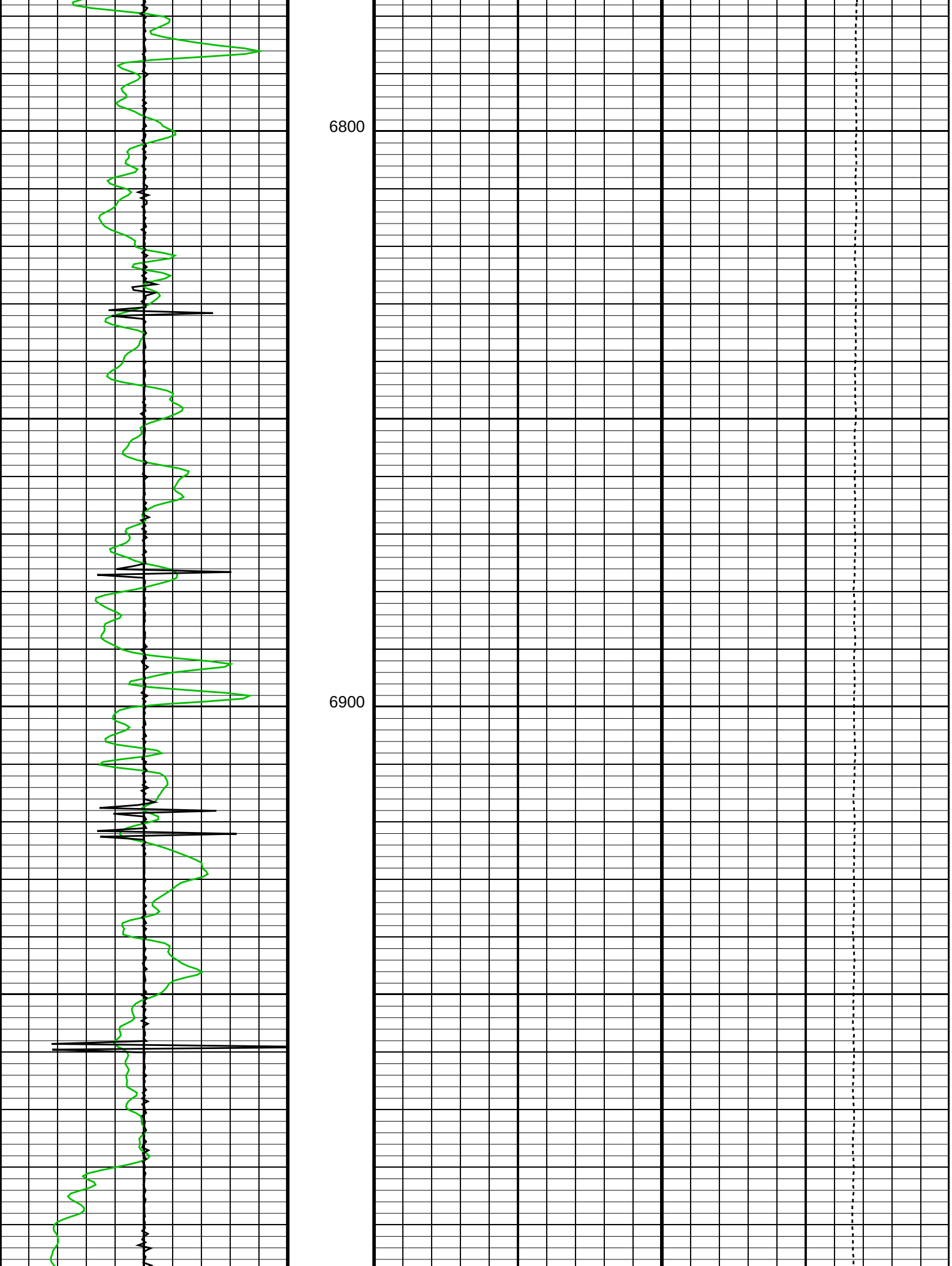
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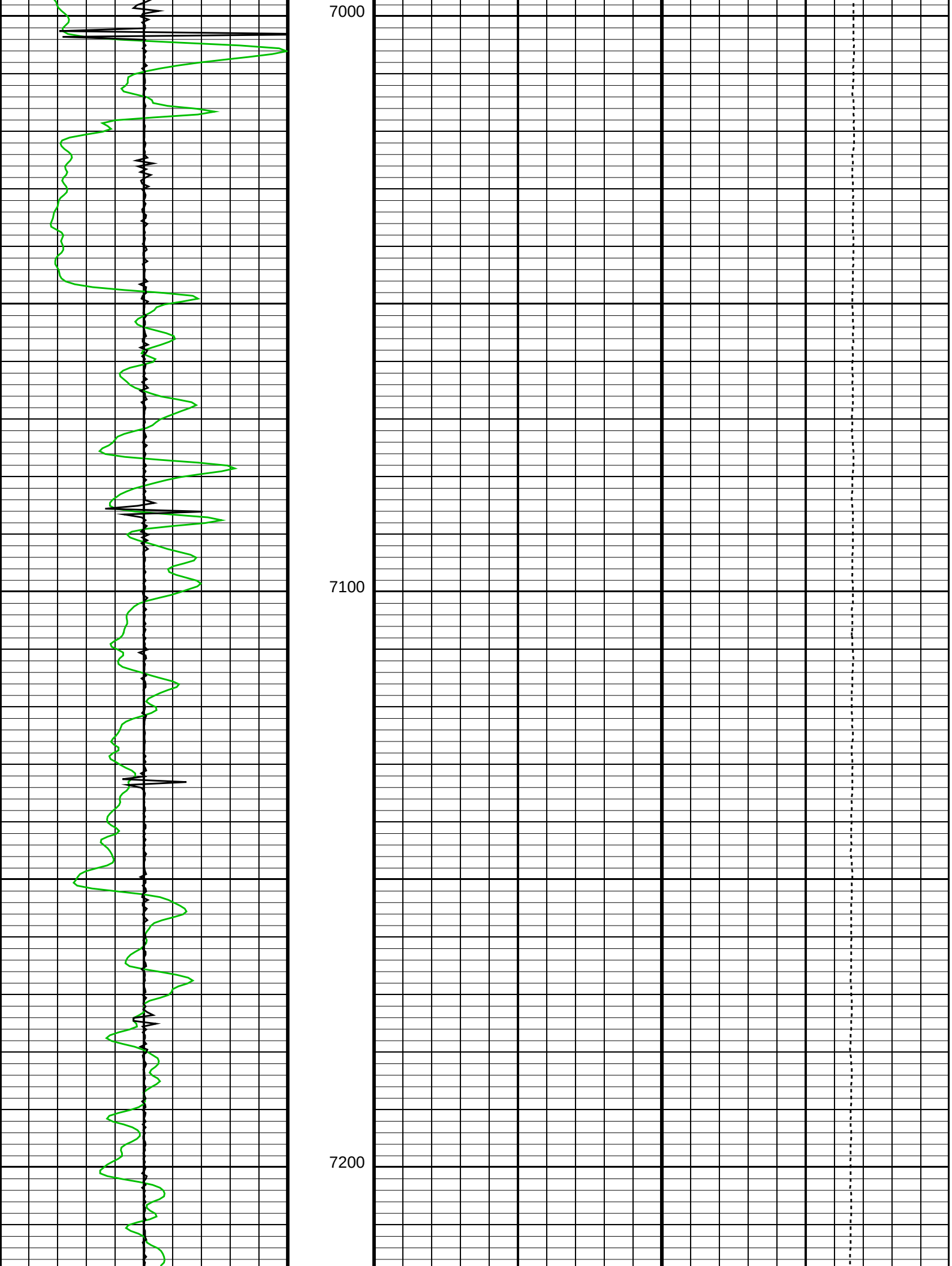
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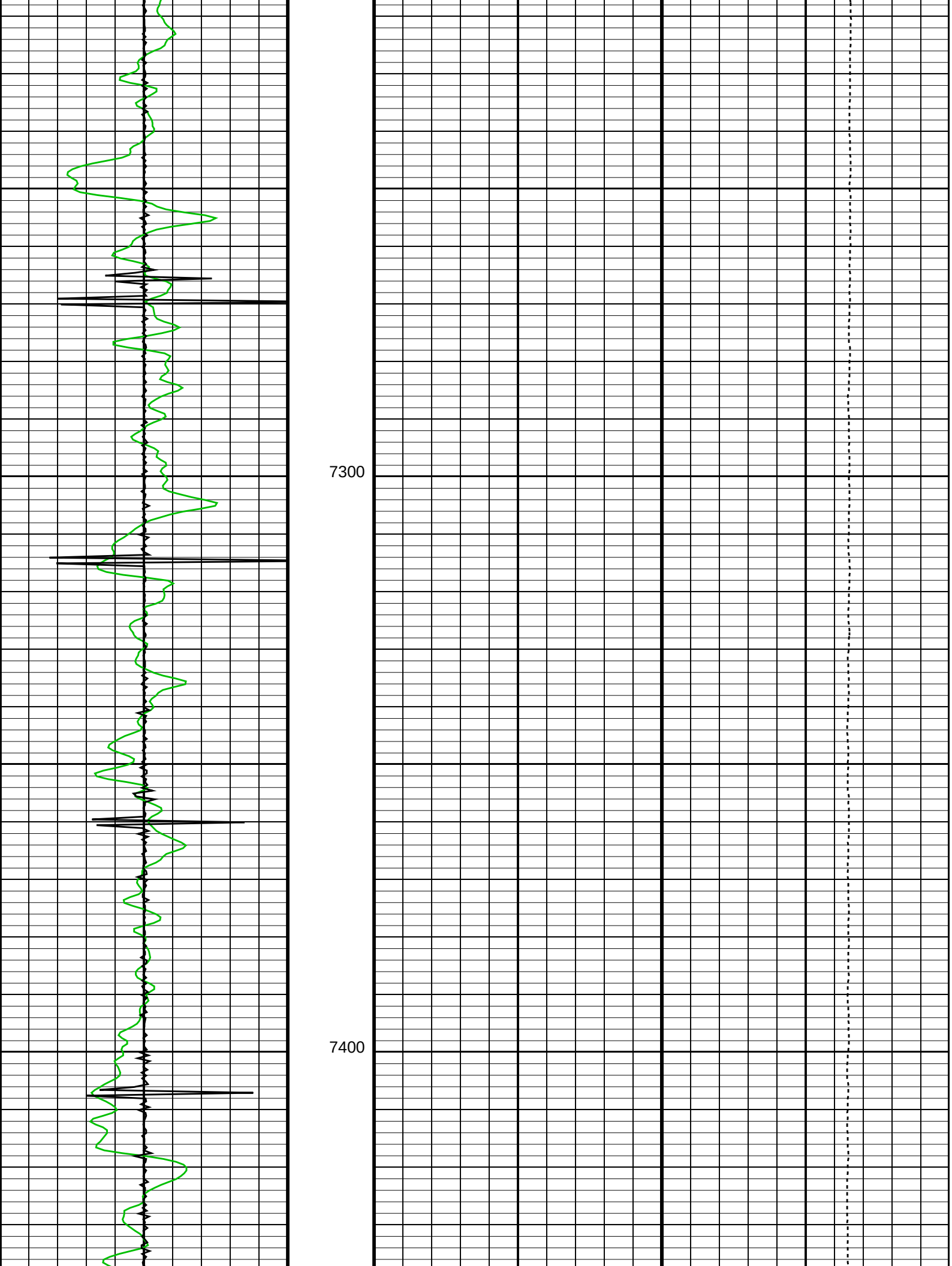
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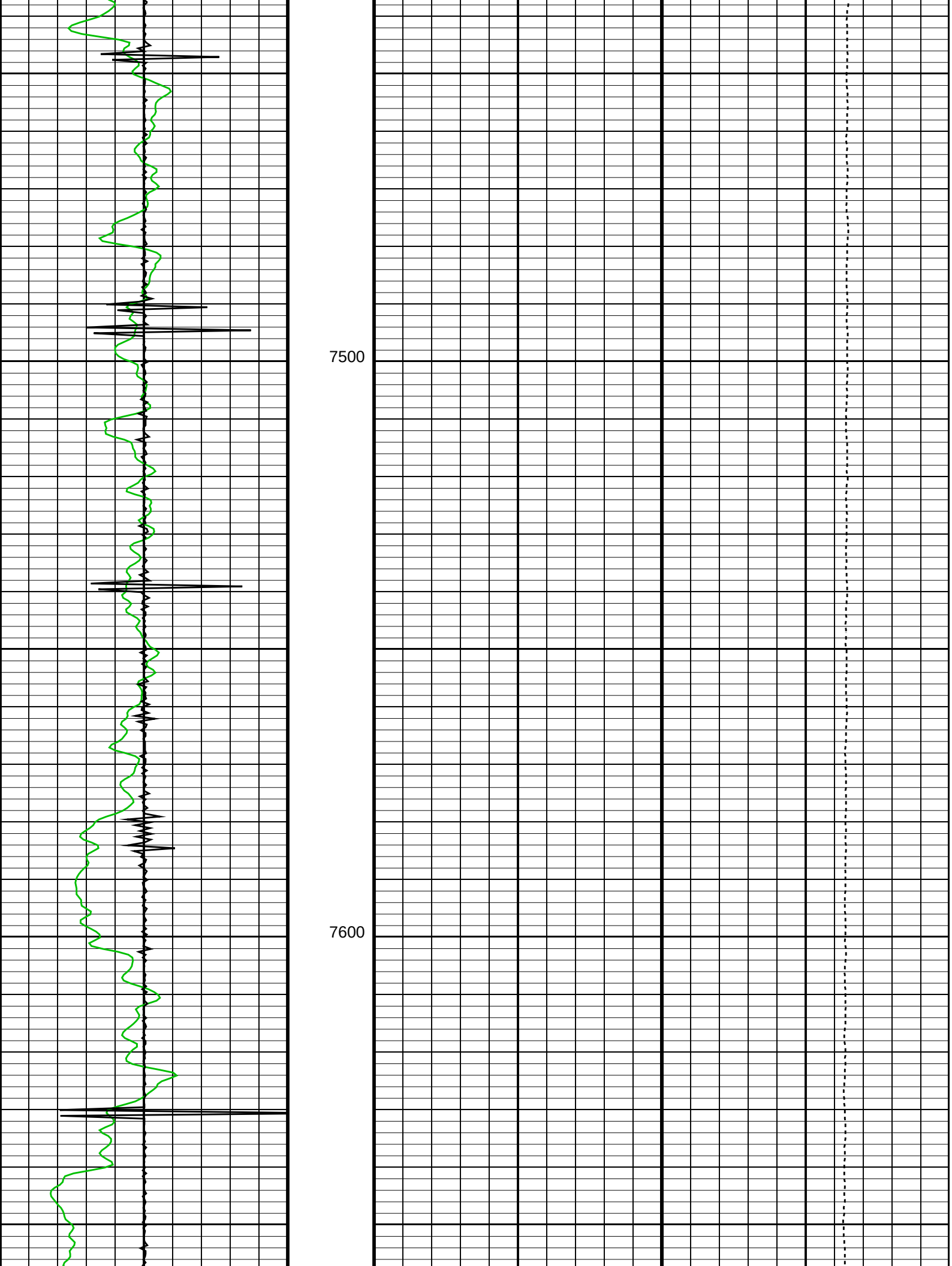
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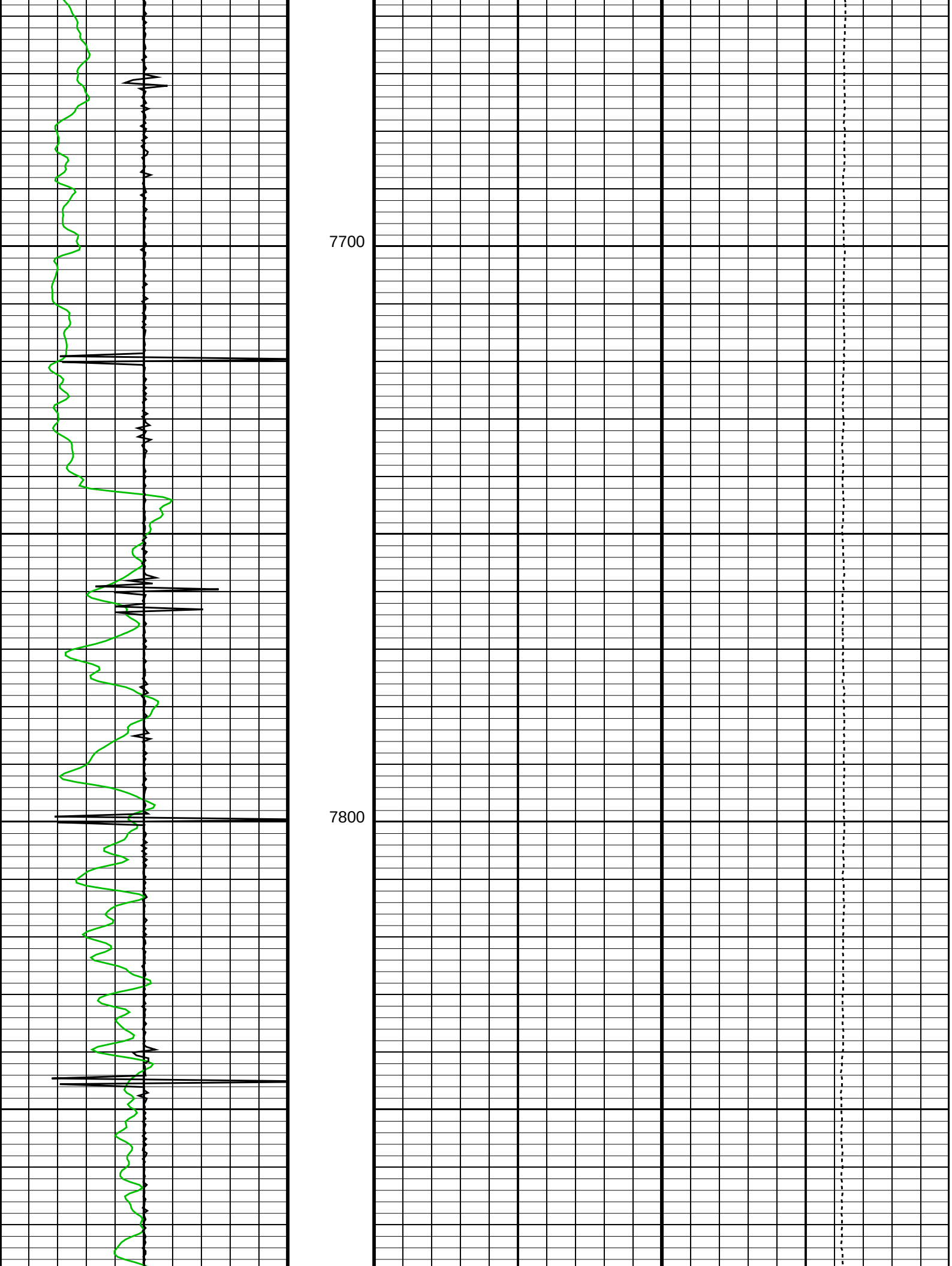
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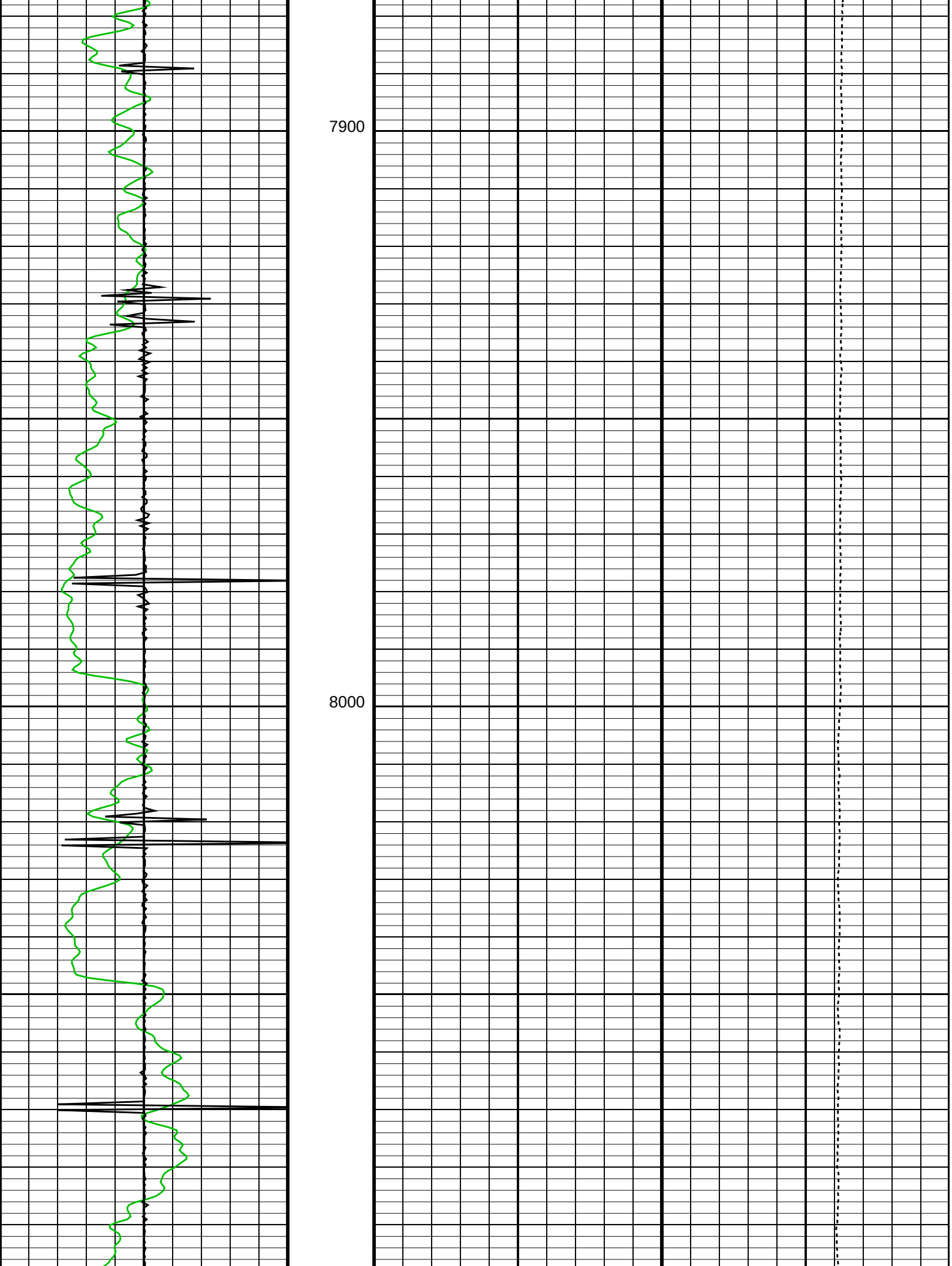
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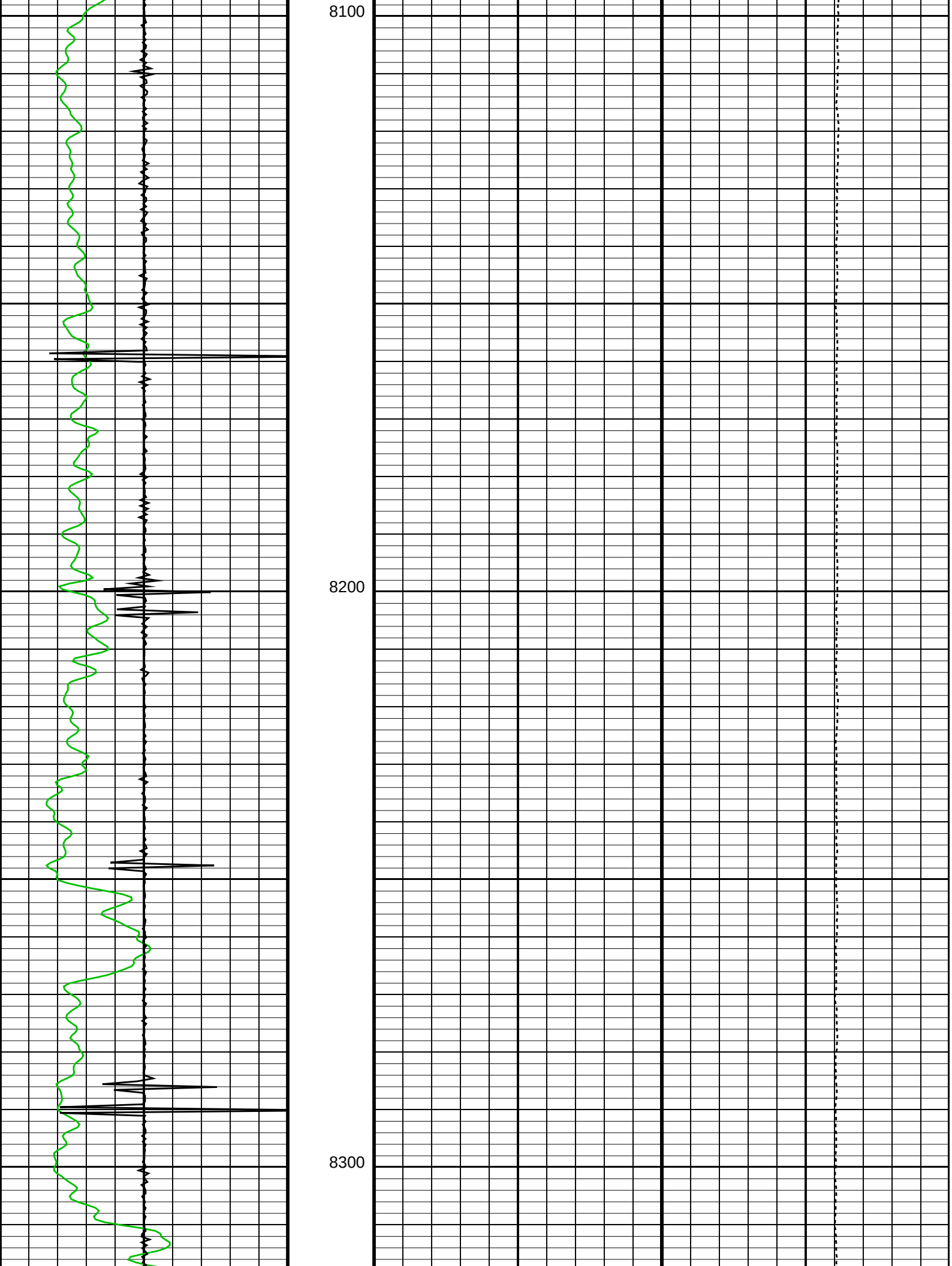
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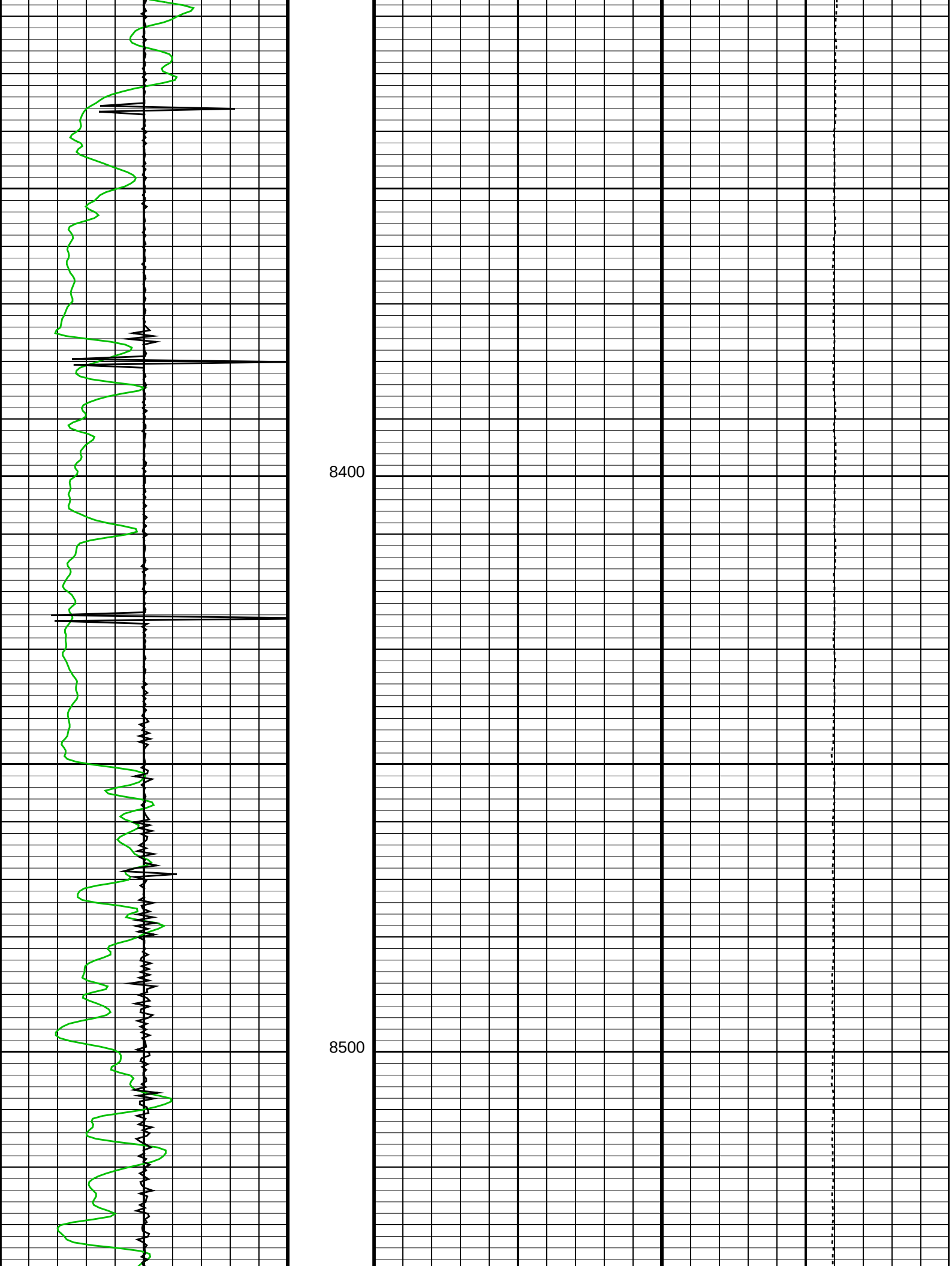
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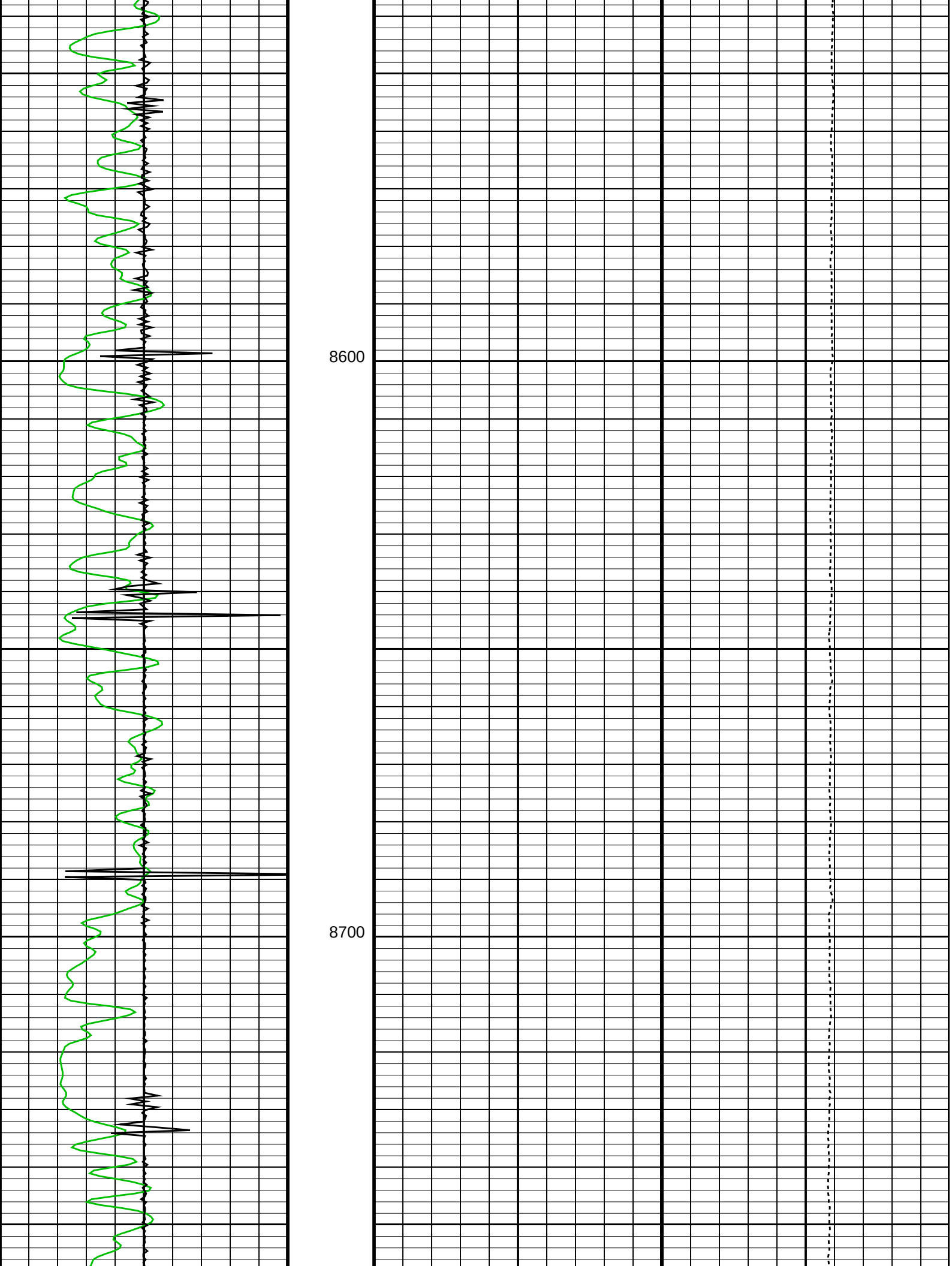
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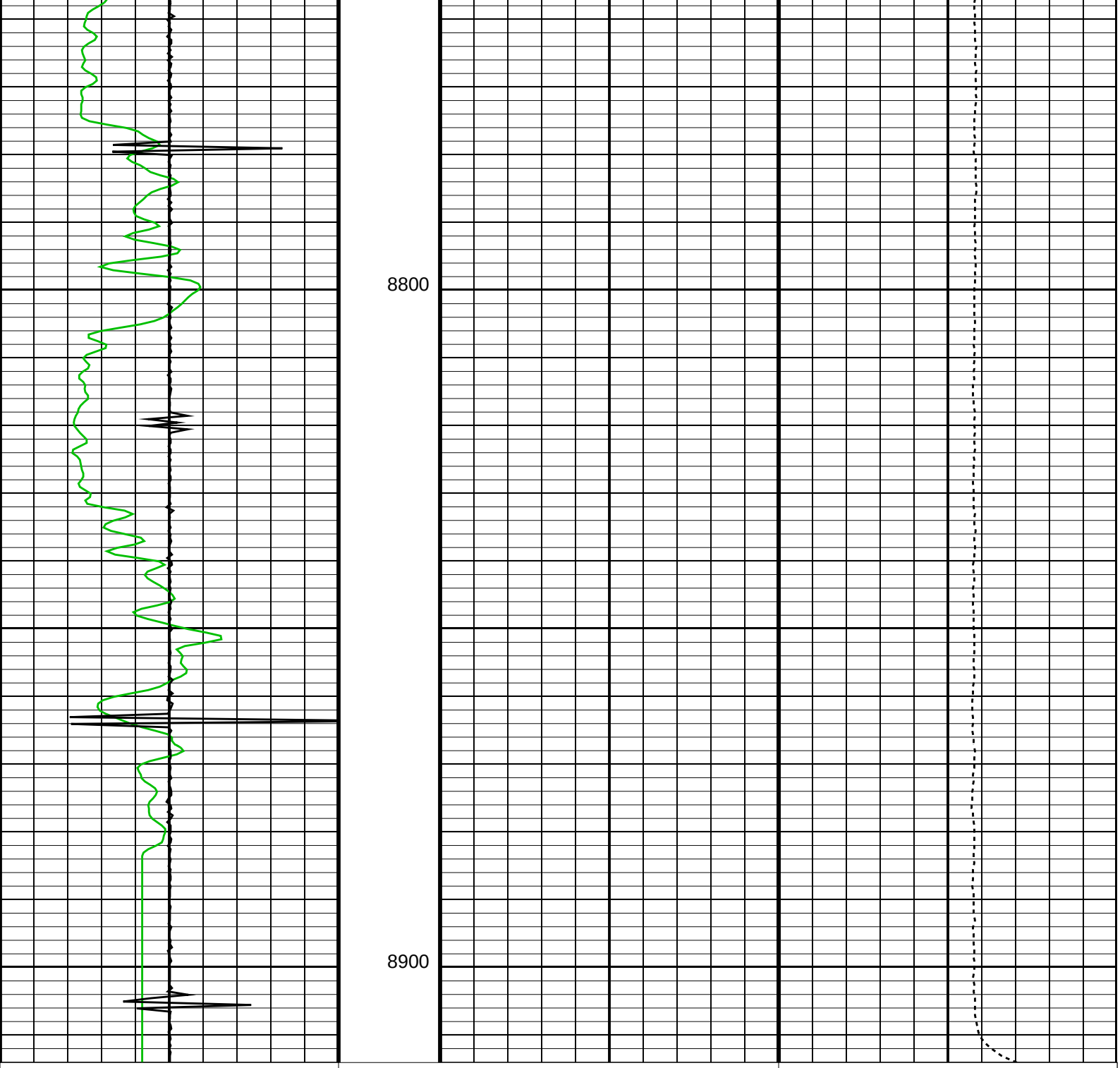

Parameters

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	205	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	120	V
MW	Mud Weight	10	LB/G
RCOD	Reference Calibrator Outer Diameter	7	IN

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	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	2.05	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	7.0	FT
DORL	Depth Offset for Repeat Analysis	0.0	FT
PP	Playback Processing	RECOMPUTE	

Format: CORRELATION **Vertical Scale: 5" per 100'** **Graphics File Created: 11−Oct−2009 06:12**

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_024LUP	FN:23	PRODUCER	10−Oct−2009 23:38	8907.0 FT	196.5 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_033PUP	FN:32	PRODUCER	11−Oct−2009 06:12

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Correlation Repeat

MAXIS Field Log

Company: EXXONMOBIL PRODUCTION COMPANY **Well: PCU 297−11B1**

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_024LUP	FN:23	PRODUCER	10−Oct−2009 23:38	8907.0 FT	196.5 FT
DEFAULT	USI_TLD_MCFL_CNL_031PUP	FN:30	PRODUCER	11−Oct−2009 05:50	8919.5 FT	8501.0 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_033PUP	FN:32	PRODUCER	11−Oct−2009 06:12

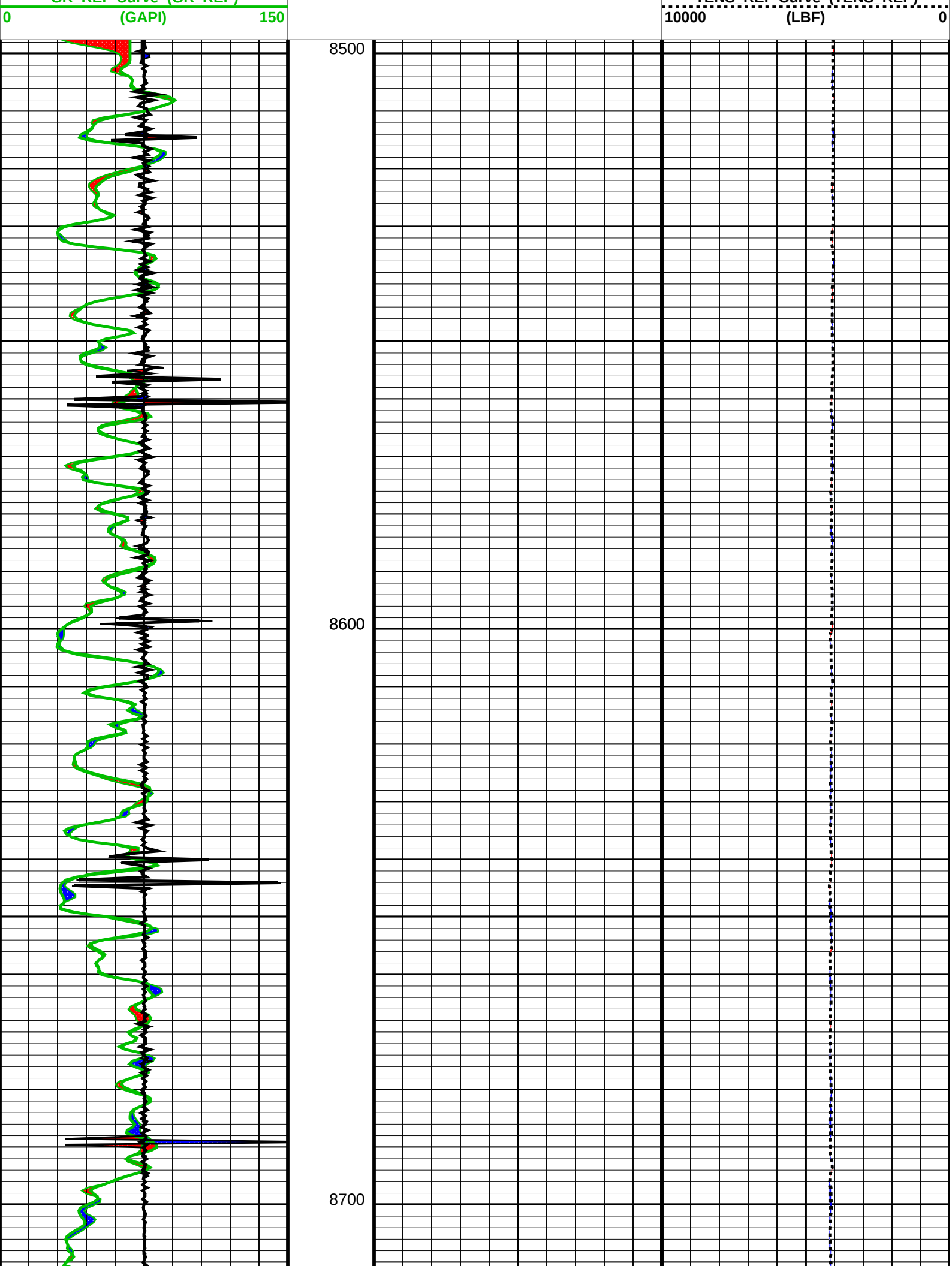
OP System Version: 17C0−154

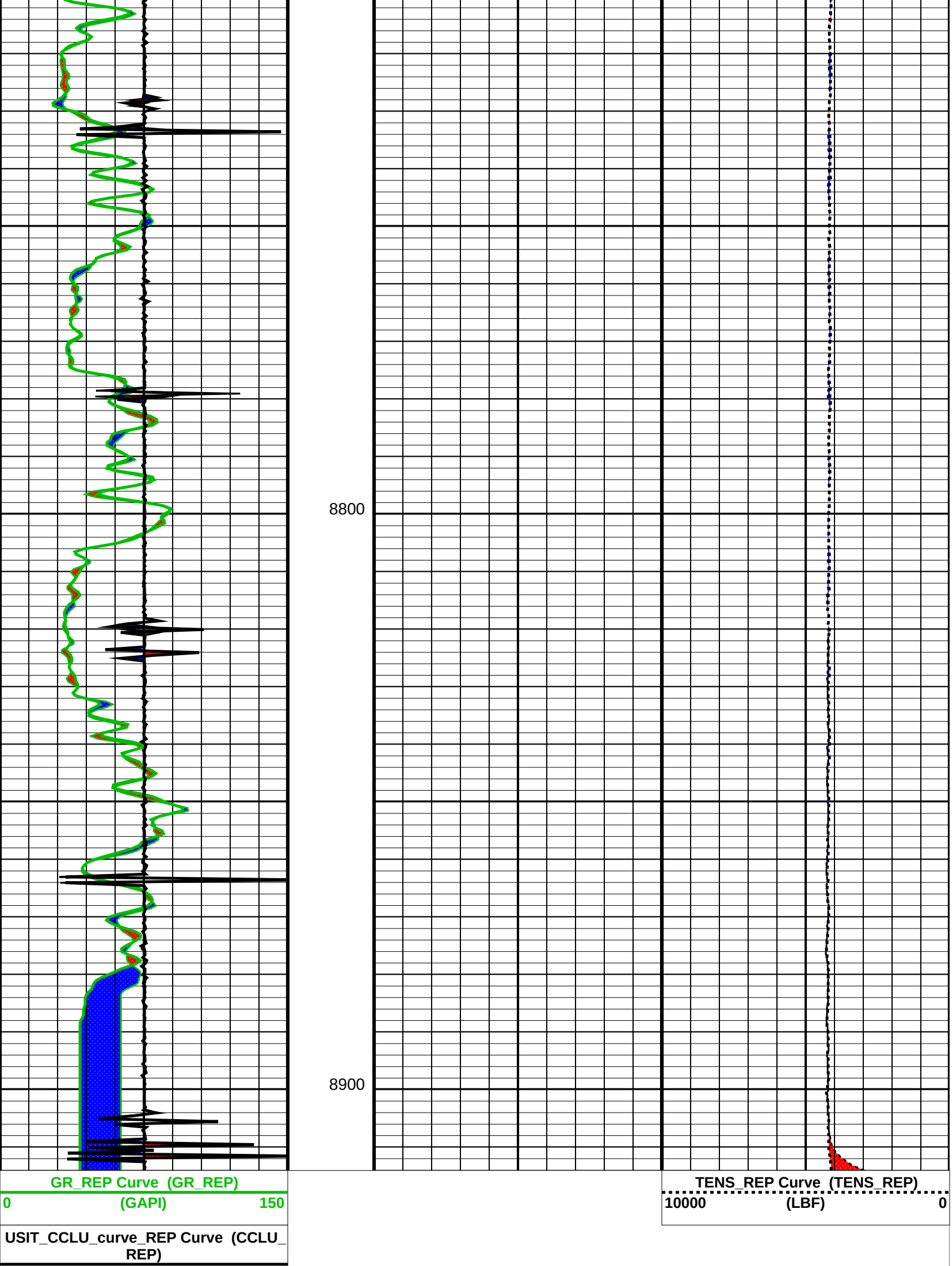
USIT−D	17C0−154	HILTH−FTB	17C0−154
DTC−H	17C0−154		

USIT_CCLU_curve_REP Curve (CCLU_REP)		
−20	(−−−−	20

GR_REP Curve (GR_REP)

TENS_REP Curve (TENS_REP)


0
(GAPI)
150
10000
(LBF)
0
8500
8600
8700


8800
8900
GR_REP Curve (GR_REP)
0
(GAPI)
150
USIT_CCLU_curve_REP Curve (CCLU_REP)
TENS_REP Curve (TENS_REP)
10000
(LBF)
0

−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
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DFVL	Default Fluid Velocity	205	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	120	V
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TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
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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	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	2.05	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	7.0	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: 11−Oct−2009 06:12**

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_024LUP	FN:23	PRODUCER	10−Oct−2009 23:38	8907.0 FT	196.5 FT
DEFAULT	USI_TLD_MCFL_CNL_031PUP	FN:30	PRODUCER	11−Oct−2009 05:50	8919.5 FT	8501.0 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_033PUP	FN:32	PRODUCER	11−Oct−2009 06:12

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CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration							
Before: 30−Sep−2009 16:45							
Gamma Ray Background	30.00	N/A	32.18	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkgd)	165.0	N/A	170.9	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement							
Master: 31−Aug−2009 11:18 Before: 30−Sep−2009 16:53							
CNTC Background	26.93	26.93	27.41	N/A	N/A	4.040	CPS
CFTC Background	29.90	29.90	30.39	N/A	N/A	4.485	CPS
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement							
Master: 31−Aug−2009 11:18							
Thermal Near Corr. (Tank)	5800	5398	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2144	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.518	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration							
Before: 10−Oct−2009 21:06							
Z−Axis Acceleration	32.19	N/A	32.14	N/A	N/A	N/A	F/S2

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature 65.0 DEGF.
Thermal Housing Size 3.381 IN.
NSR−F serial number 0

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − H	
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT − H	
Z−Axis Accelerometer	HACC − H	3577
Neutron Logging Source	NLS − KL	
Neutron Source Radioactive	NSR − F	
Compensated Neutron Box	CNB − AB	
HTBC Communication Assembly DTS Mode	HMCA − H	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkgd) GAPI	Value
Before		32.18	Before		170.9
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			157.1 (Minimum) 165.0 (Nominal) 206.3 (Maximum)	

Before: 30−Sep−2009 16:45

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		26.93	Master		29.90
Before		27.41	Before		30.39
	5.000 (Minimum) 26.93 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 29.90 (Nominal) 40.00 (Maximum)	

Master: 31−Aug−2009 11:18 Before: 30−Sep−2009 16:53

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		5398	Master		2144	Master		2.518
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)	(Minimum)	(Nominal)	(Maximum)

Master: 31−Aug−2009 11:18

High resolution Integrated Logging Tool−DTS
Wellsite Calibration
Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2			Value
Before				32.14
	31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)	

Before: 10−Oct−2009 21:06

High resolution Integrated Logging Tool−DTS Master Calibration
Zero Measurement

Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				26.93	Master				29.90
	5.000 (Minimum)	26.93 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	29.90 (Nominal)	40.00 (Maximum)	

Master: 31−Aug−2009 11:18

High resolution Integrated Logging Tool−DTS Master Calibration
Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master				5398	Master				2144	Master				2.518
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	

Master: 31−Aug−2009 11:18

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH − KC

Company: **EXXONMOBIL PRODUCTION COMPANY**

Schlumberger

Well: **PCU 297−11B1**
Field: **PICEANCE CREEK**
County: **RIO BLANCO**
State: **COLORADO**

CORRELATION LOG
GAMMA RAY
USIT CASING COLLAR LOCATOR