County: RIO BLANCO

Schlumberger

Company: **EXXONMOBIL PRODUCTION CO.**

Well: **PCU 197−34A3**

Field: **PICEANCE CREEK**

County: **RIO BLANCO** State: **CO**

CORRELATION LOG

GAMMA RAY

CCLU

Field: PICEANCE CREEK
Location: NWSW 1716' FSL & 132' FWL
Well: PCU 197−34A3
Company: EXXONMOBIL PRODUCTION C

LOCATION

NWSW 1716' FSL & 132' FWL

Elev.: K.B. 6521.20 ft
G.L. 6491.00 ft
D.F. 6520.20 ft

Permanent Datum: GROUND LEVEL Elev.: 6491.00 ft
Log Measured From: KELLY BUSHING 30.20 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05−103−11542	34	1S	97W

	Run 1	Run 2	Run 3
PVT DATA			
Oil Density			
Water Salinity			
Gas Gravity			
Bo			
Bw			
1/Bg			
Bubble Point Pressure			
Bubble Point Temperature			
Solution GOR			
Maximum Deviation	20 deg		
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			

ogging Date		27−Jun−2010			Logging Date		
un Number		1			Run Number		
epth Driller		8646 ft			Depth Driller		
chlumberger Depth		8546 ft			Schlumberger Depth		
ottom Log Interval		8546 ft			Bottom Log Interval		
op Log Interval		3150 ft			Top Log Interval		
asing Fluid Type		WBM			Casing Fluid Type		
alinity					Salinity		
ensity		8.4 lbm/gal			Density		
uid Level		10 ft			Fluid Level		
BIT/CASING/TUBING STRING					BIT/CASING/TUBING STRING		
t Size		9.875 in			Bit Size		
om		3353 ft			From		
o		8646 ft			To		
asing/Tubing Size		7.000 in			Casing/Tubing Size		
eight		26 lbm/ft			Weight		
rade					Grade		
om		0 ft			From		
o		8646 ft			To		
aximum Recorded Temperatures		206 degF			Maximum Recorded Temperatures		
ogger On Bottom	Time	27−Jun−2010	12:05		Logger On Bottom	Time	
nit Number	Location	2379	VERNAL		Unit Number	Location	
ecorded By		RYAN STEWART			Recorded By		
itnessed By		JOSH LOVE			Witnessed By		

Run 4

DEPTH SUMMARY LISTING

Date Created: 27−JUN−2010 16:53:04

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46P
Serial Number:	6214	Serial Number:	8093	Serial Number:	709025
Calibration Date:	1−JAN−10	Calibration Date:	03−JUN−10	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:	−8	Calibration RMS:	34	Rig Type:	LAND
Wheel Correction 2:	−9	Calibration Peak Error:	62		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	230.90 FT
Rig Up Length At Bottom:	230.60 FT
Rig Up Length Correction:	0.30 FT
Stretch Correction:	7.00 FT
Tool Zero Check At Surface:	0.20 FT

Depth Control Remarks

1. ALL SCHLUMBERGER DEPTH POLICIES FOLLOWED
2. IDW USED AS PRIMARY METHOD OF DEPTH CONTROL
3. Z−CHART USED AS SECONDARY METHOD OF DEPTH CONTROI
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 CENTERED USING 2 X ILC AND 2 X GEMCO	
UFAO = −12 DB/M	
EXPECTED CASING THICKNESS 0.362 INCH	
EXPECTED CASING ID 6.276 INCH	
CEMENT: SINGLE SLURRY 11LB/G	
LOG CORRELATED TO DOWNLOG AT 8300 FT	
HORIZONTAL RESOLUTION: 5 DEG	
VERTICLE RESOLUTION : 6 INCH	

RUN 1		RUN 2	
SERVICE ORDER #:	BADQ−00024	SERVICE ORDER #:	
PROGRAM VERSION:	17C0−154	PROGRAM VERSION:	
FLUID LEVEL:	10 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

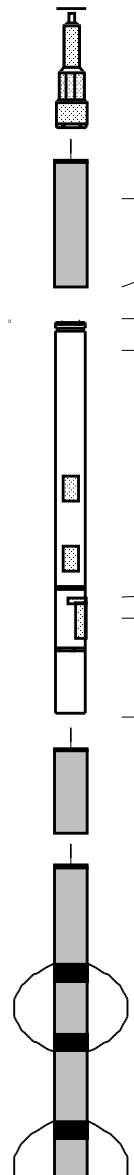
RUN 1

SURFACE EQUIPMENT

GSR−U/Y
NCT−B
CNB−AB
NCS−VB

WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−QT 39.1
LEH−QT

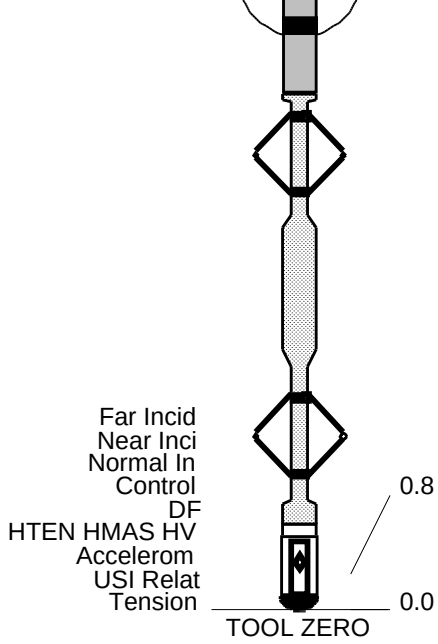
DTC−H 36.1
ECH−KC
DTCH0−A
DTCH1−A

HILTH−FTB 33.1
HGNSD−H
HMCA−H
HGNH
NLS−KL
NSR−F 5138
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_A−100158201
Top Transducer
Middle Top Transducer
Middle Bottom Transducer
Bottom Transducer

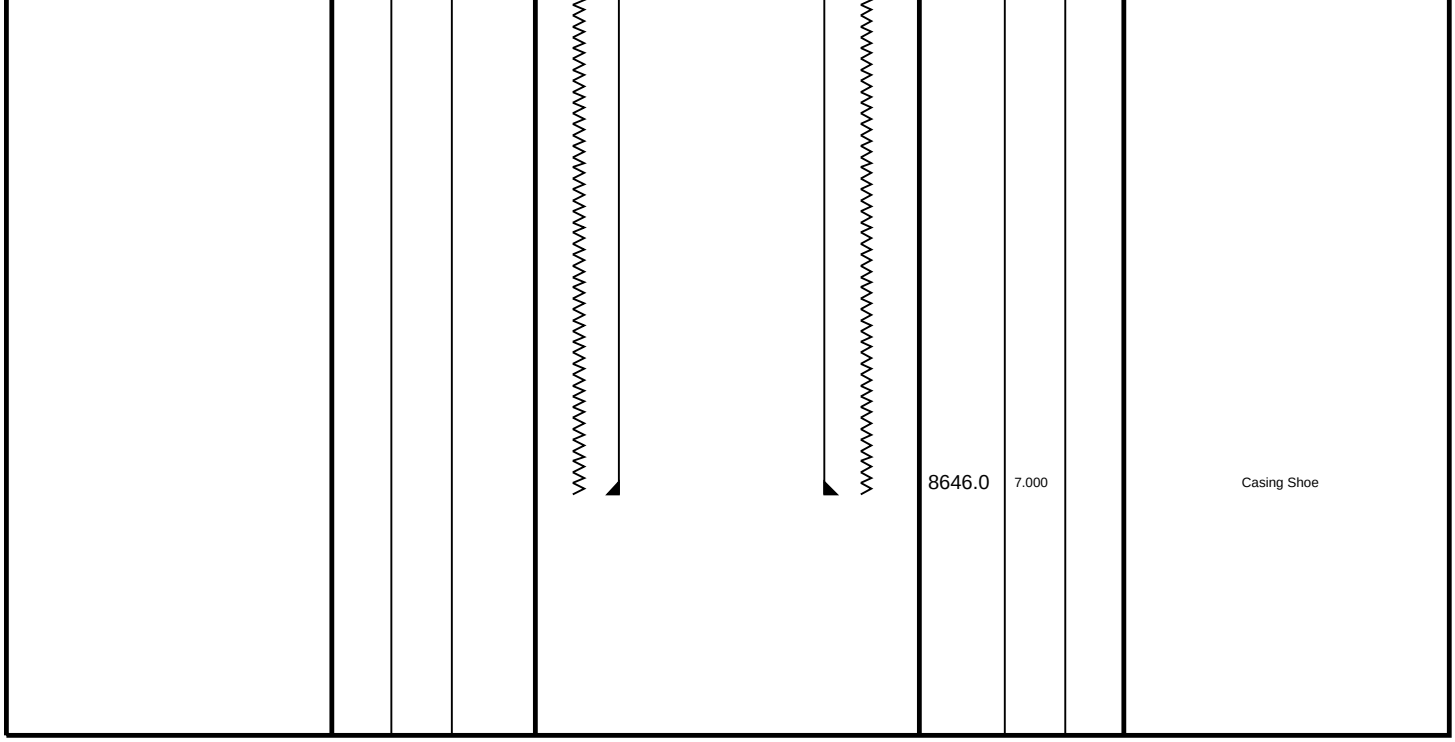
RUN 2



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

Client: EXXONMOBIL PRODUCTION CO.
Drawing Date: 6/27/2010
Well: PCU 197−34A3
API #: 05−103−11542
Field: PICEANCE CREEK
Rig Name: MAST
State: CO
Reference Datum: GROUND LEVEL
Country: USA
Elevation: 6491.0 ft

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					0.0	7.000		Casing String
					3353.0	9.875		Borehole Segment



Schlumberger

Correlation

MAXIS Field Log

Company: EXXONMOBIL PRODUCTION CO. **Well: PCU 197−34A3**

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_004LUP	FN:3	PRODUCER	27−Jun−2010 12:38	8504.0 FT	57.5 FT

Output DLIS Files

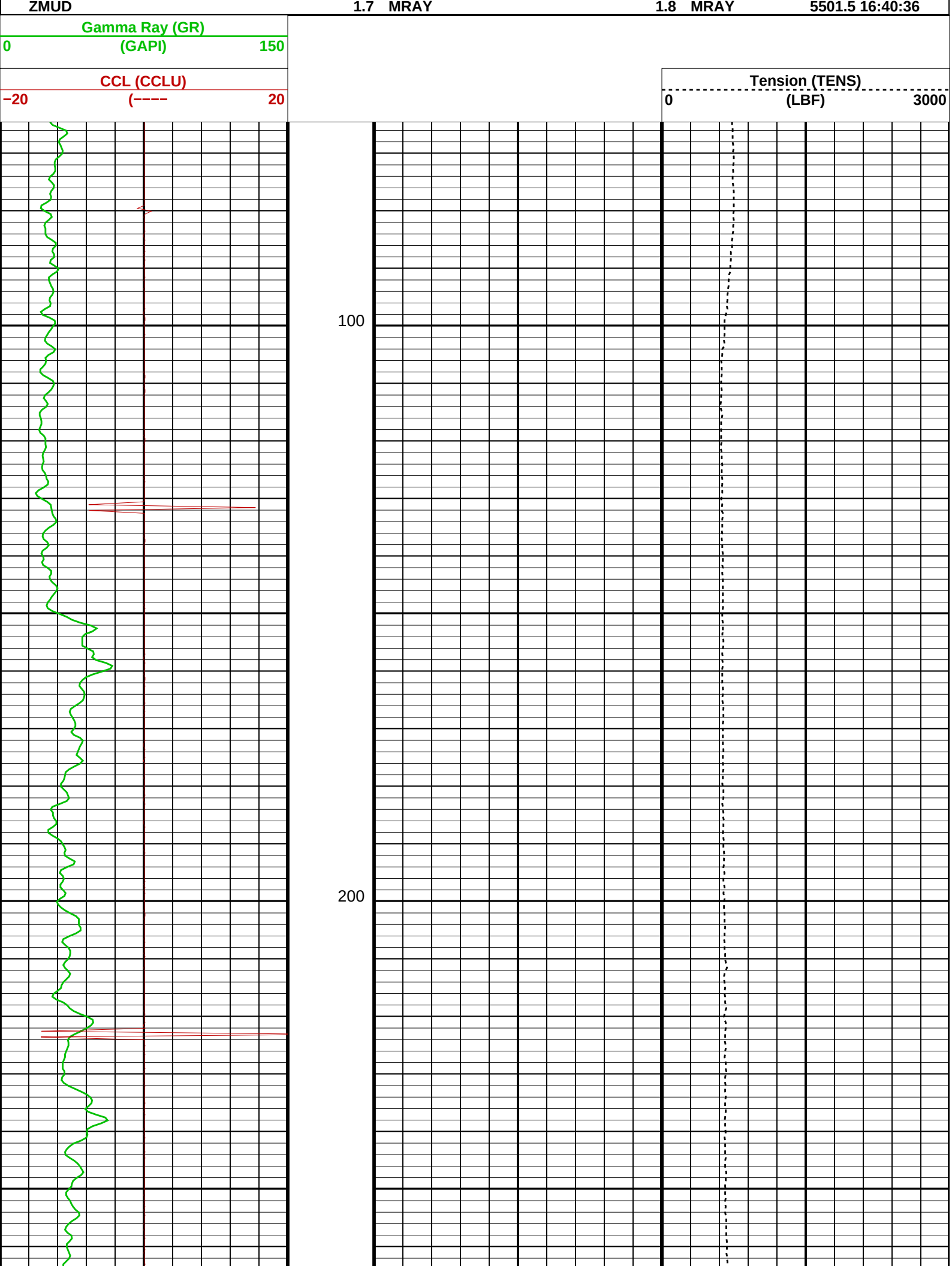
DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	27−Jun−2010 16:35	8511.0 FT	64.5 FT

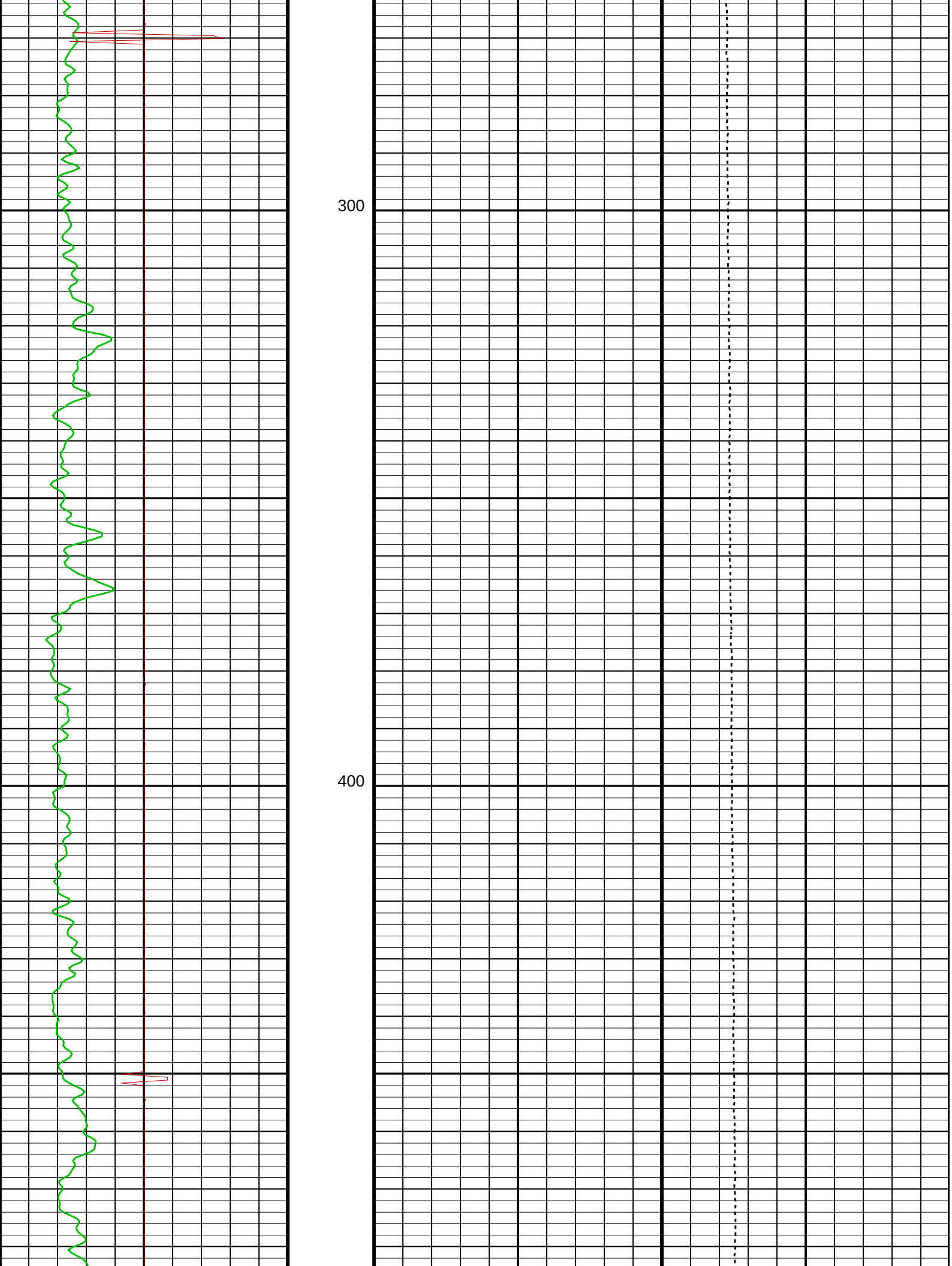
OP System Version: 17C0−154

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

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time


ZMUD
1.7 MRAY
1.8 MRAY
5501.5 16:40:36
Gamma Ray (GR)
0
(GAPI)
150
CCL (CCLU)
−20
(−−−−
20
Tension (TENS)
0
(LBF)
3000
100
200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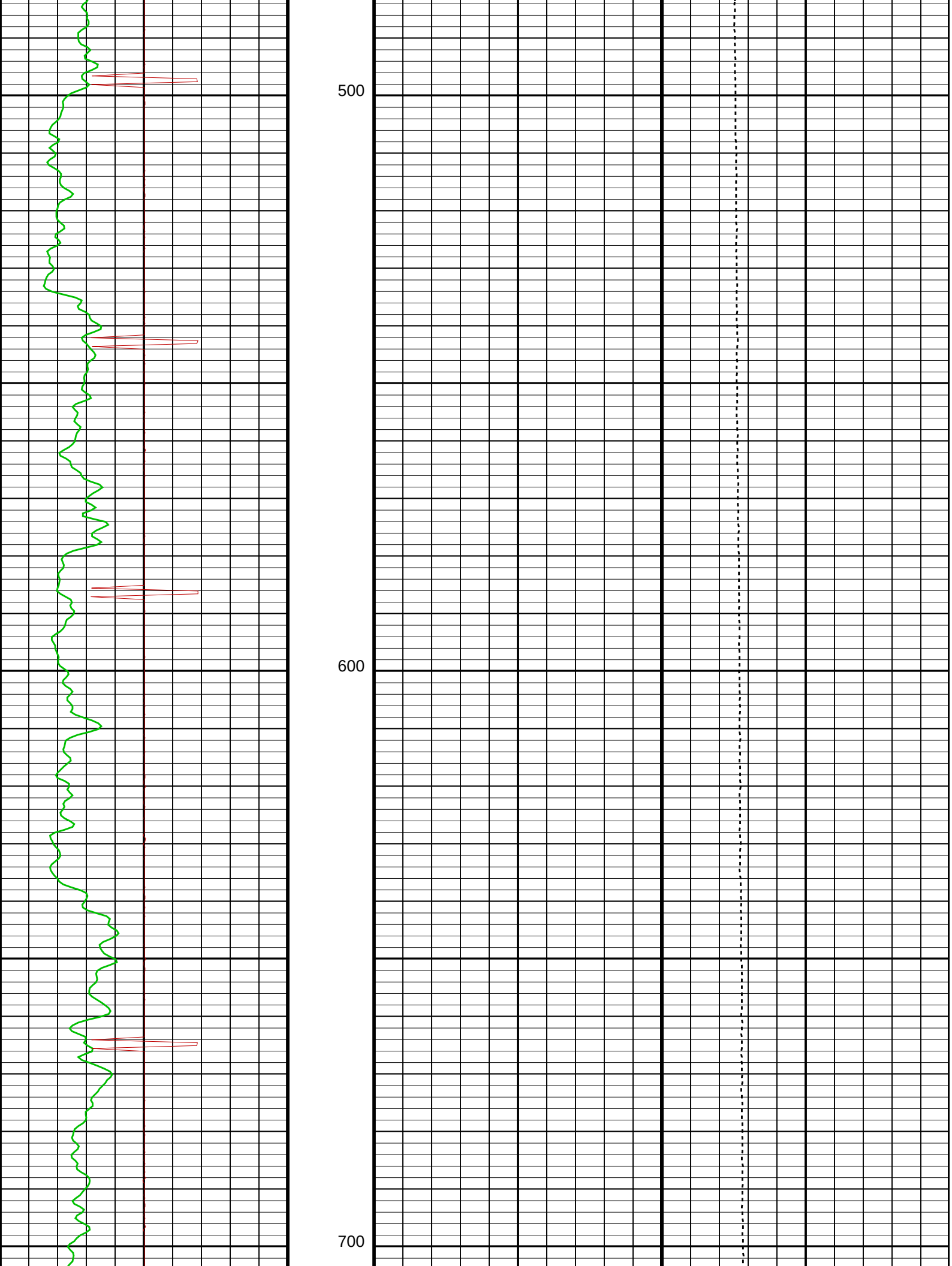
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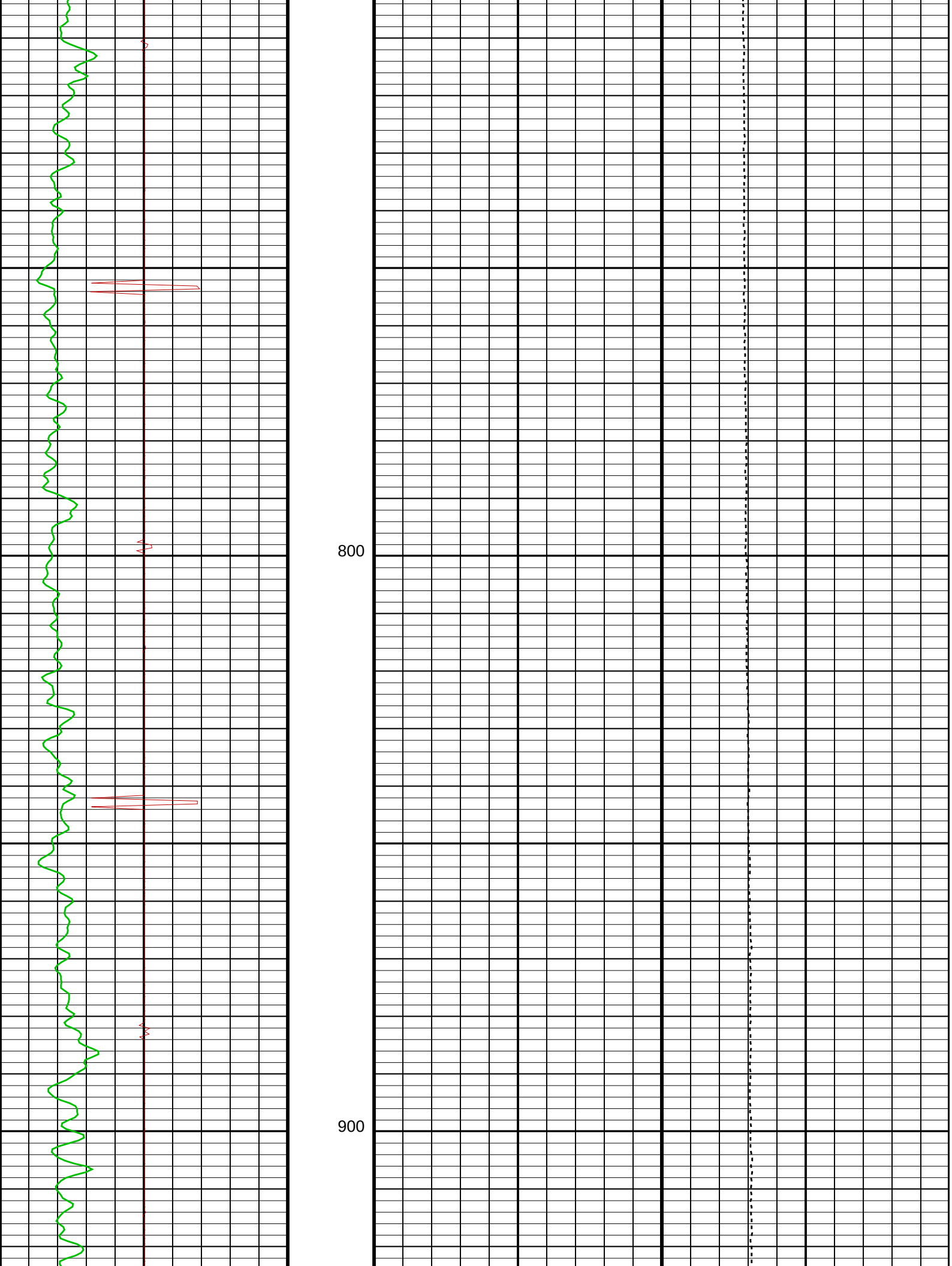
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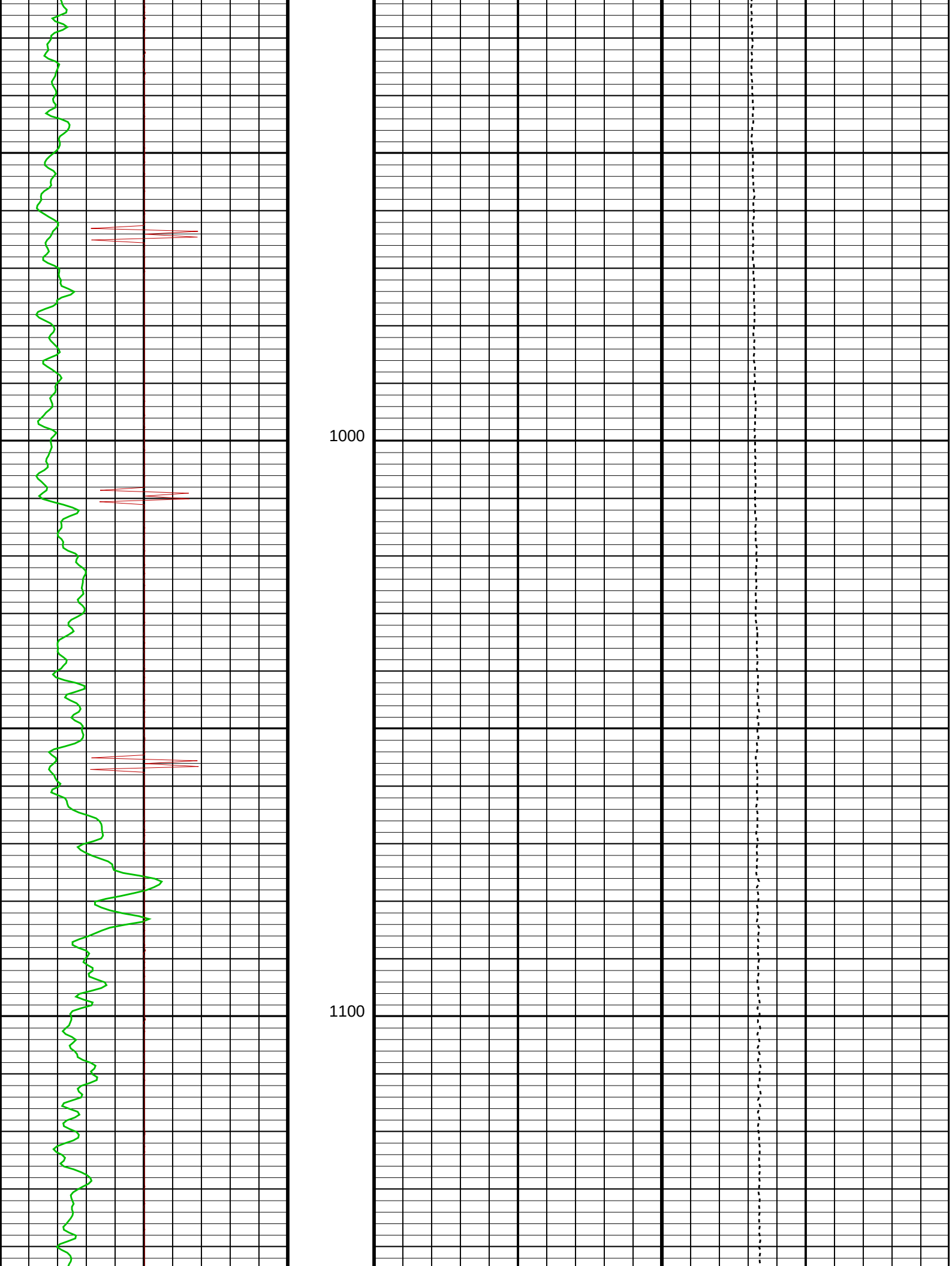
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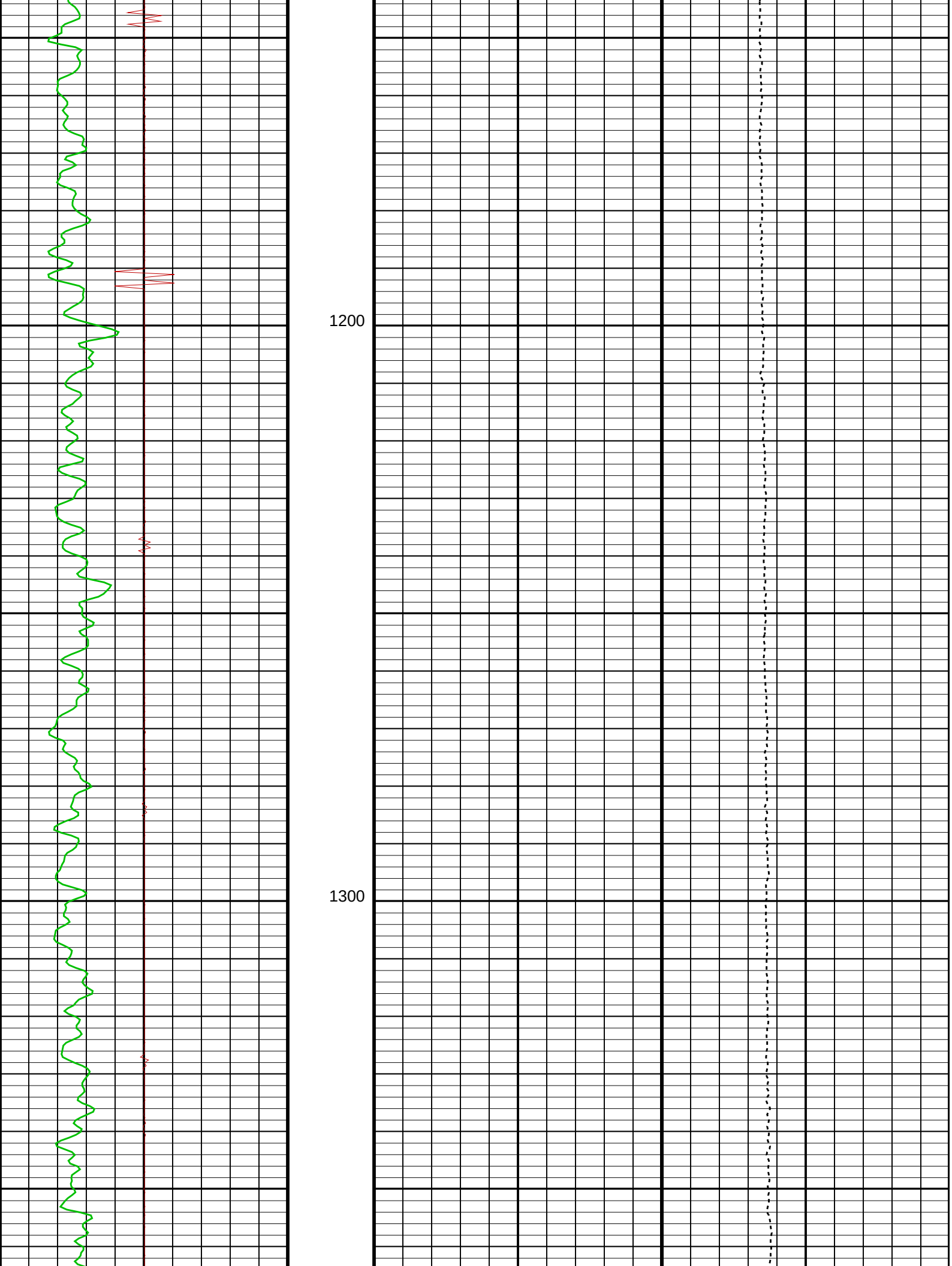
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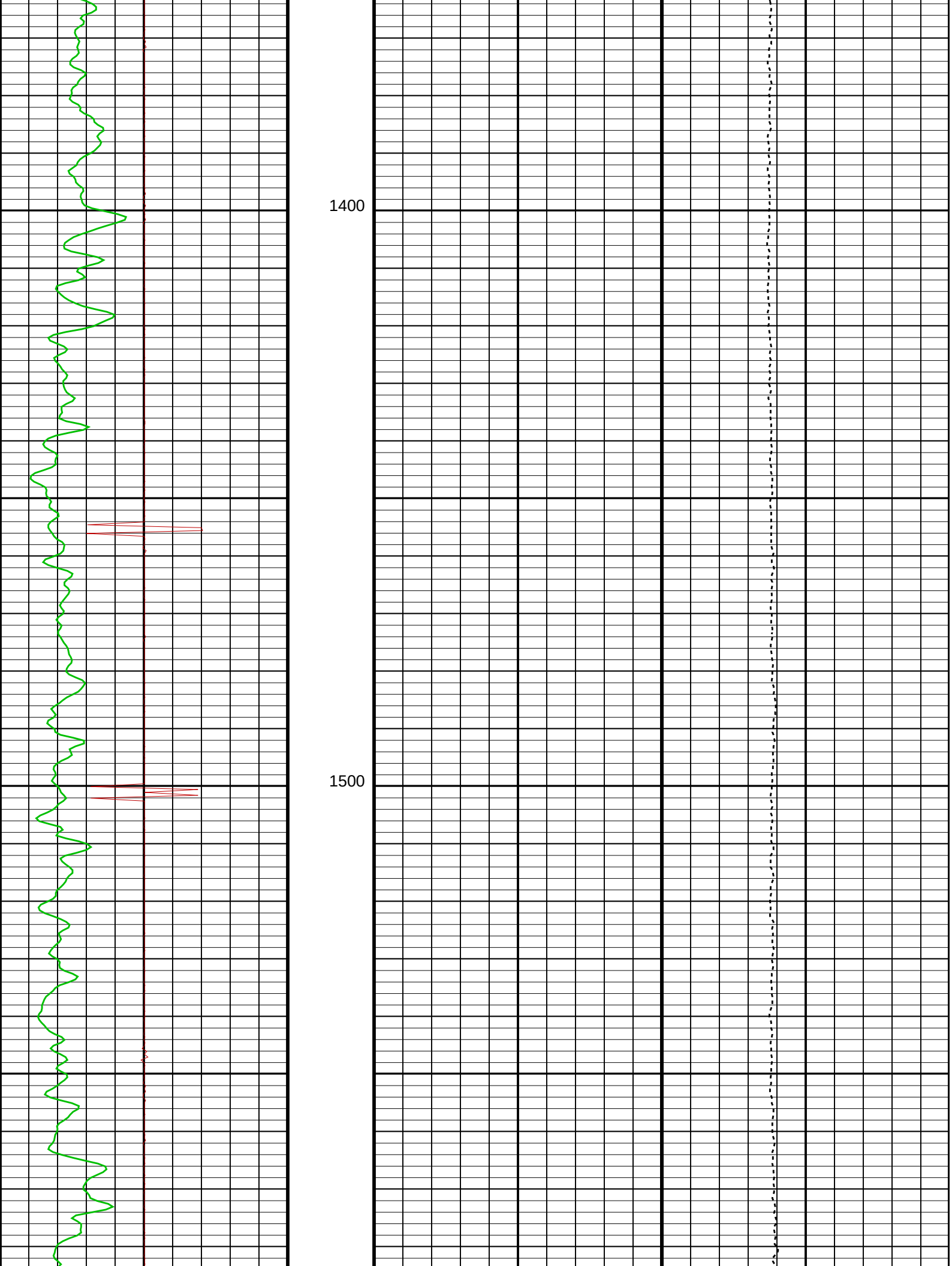
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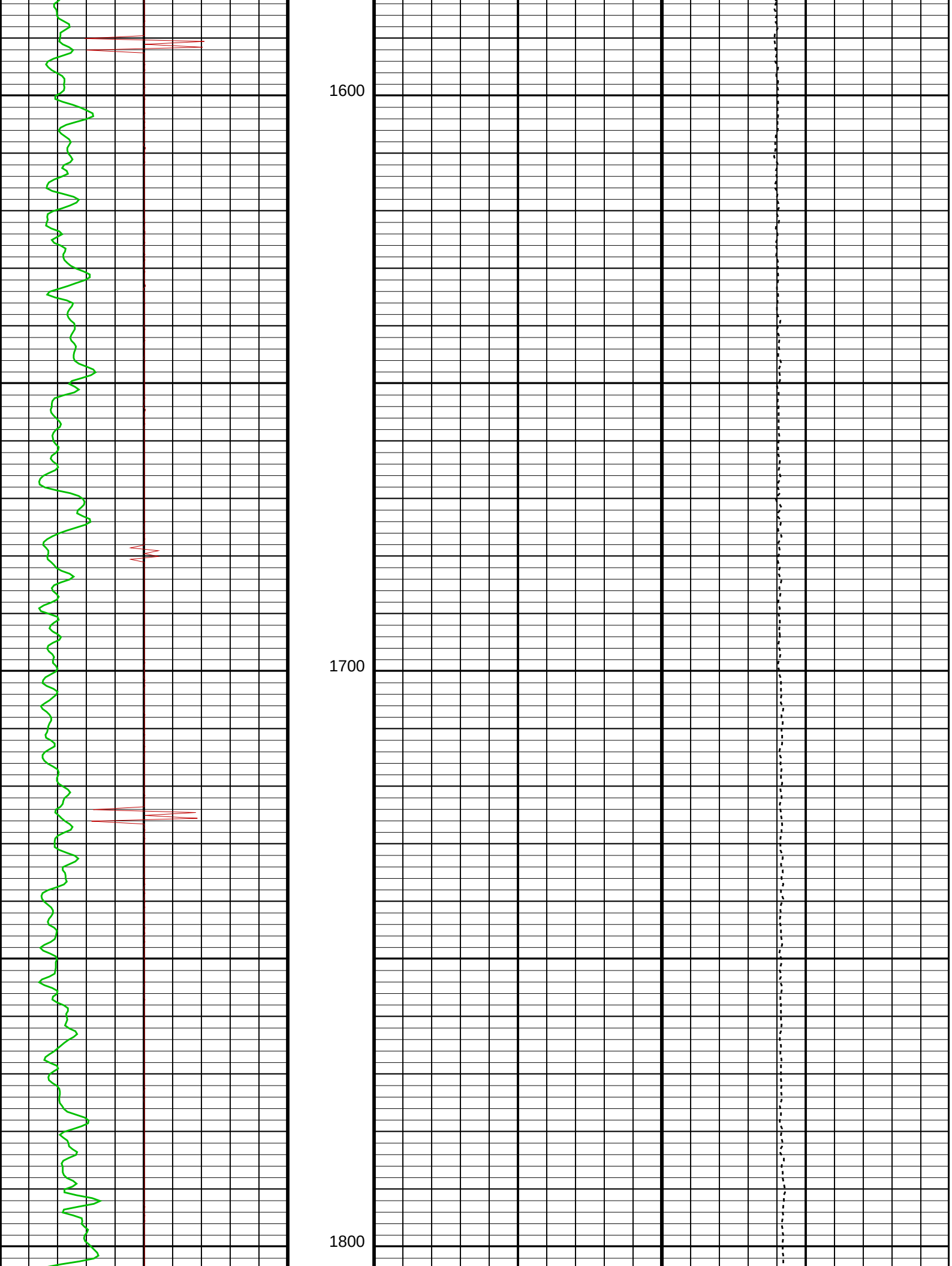
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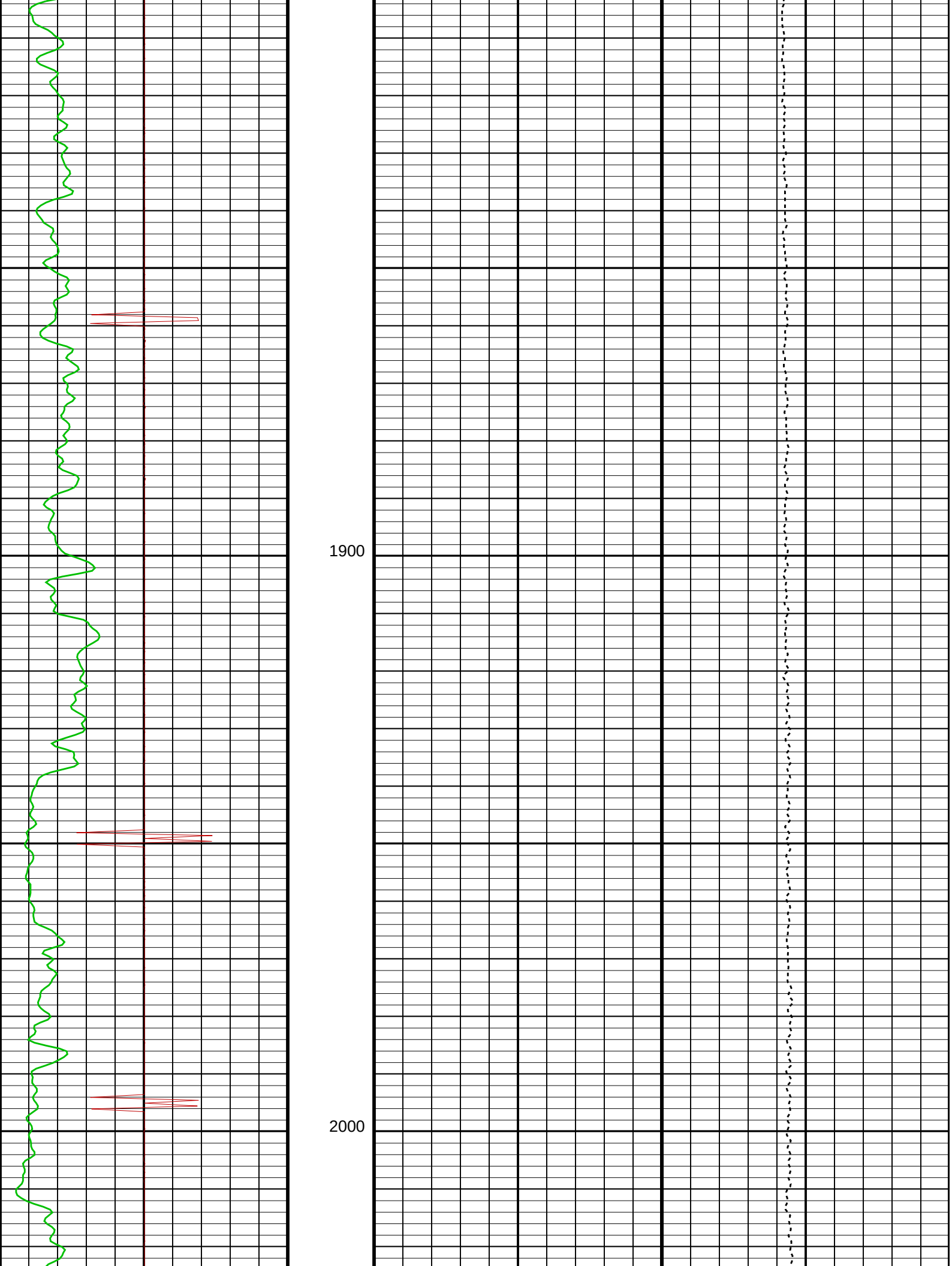
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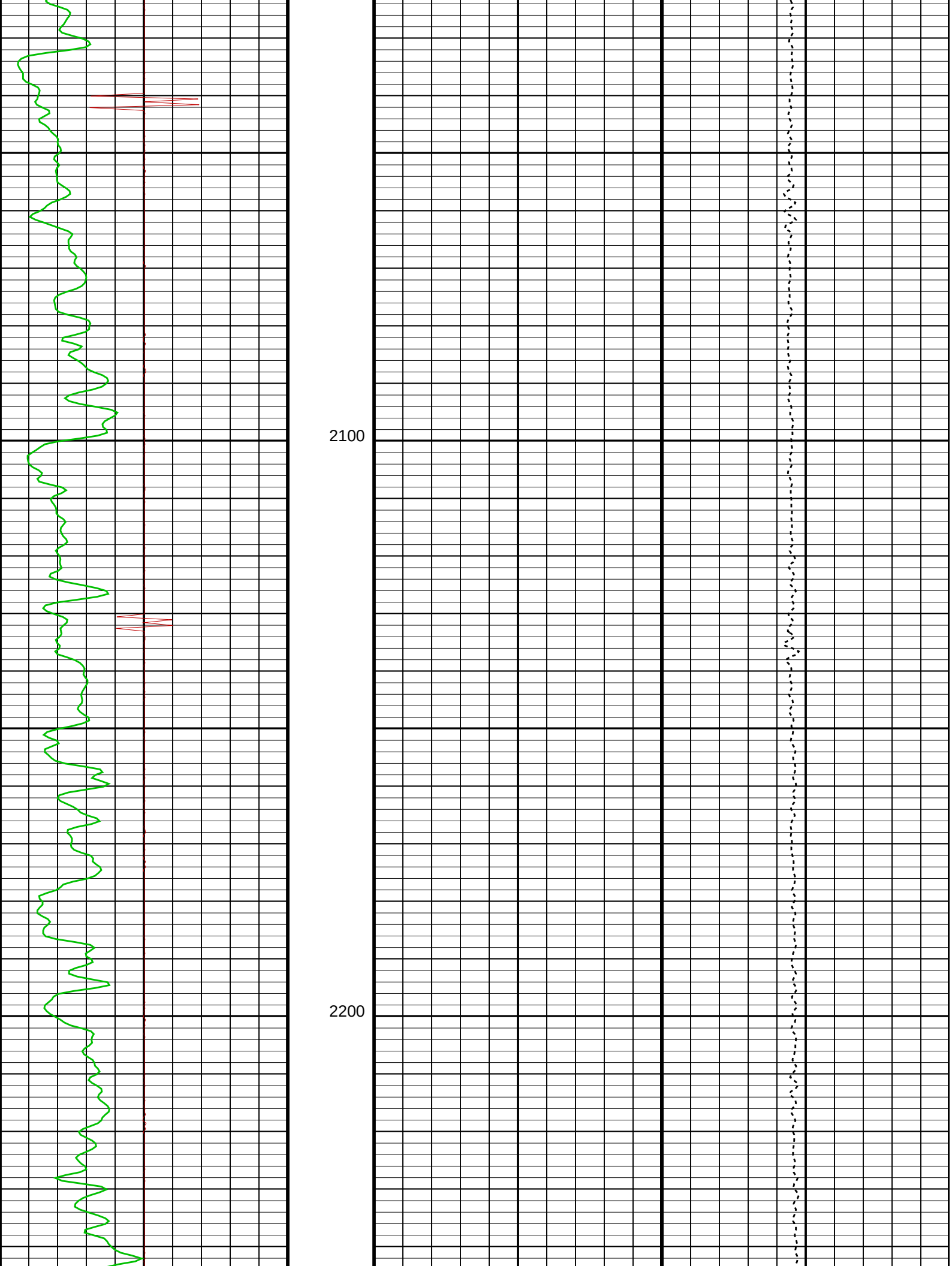
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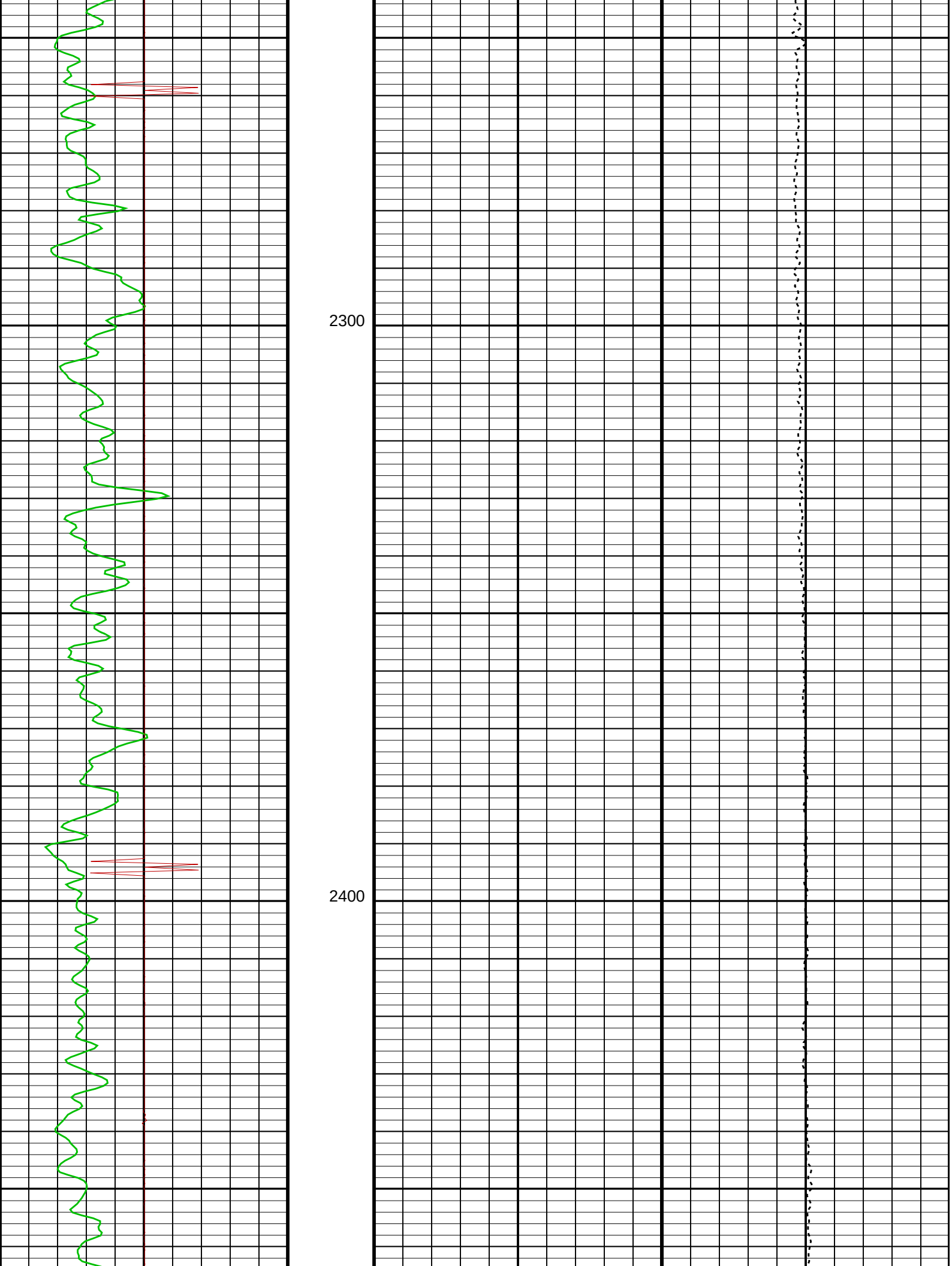
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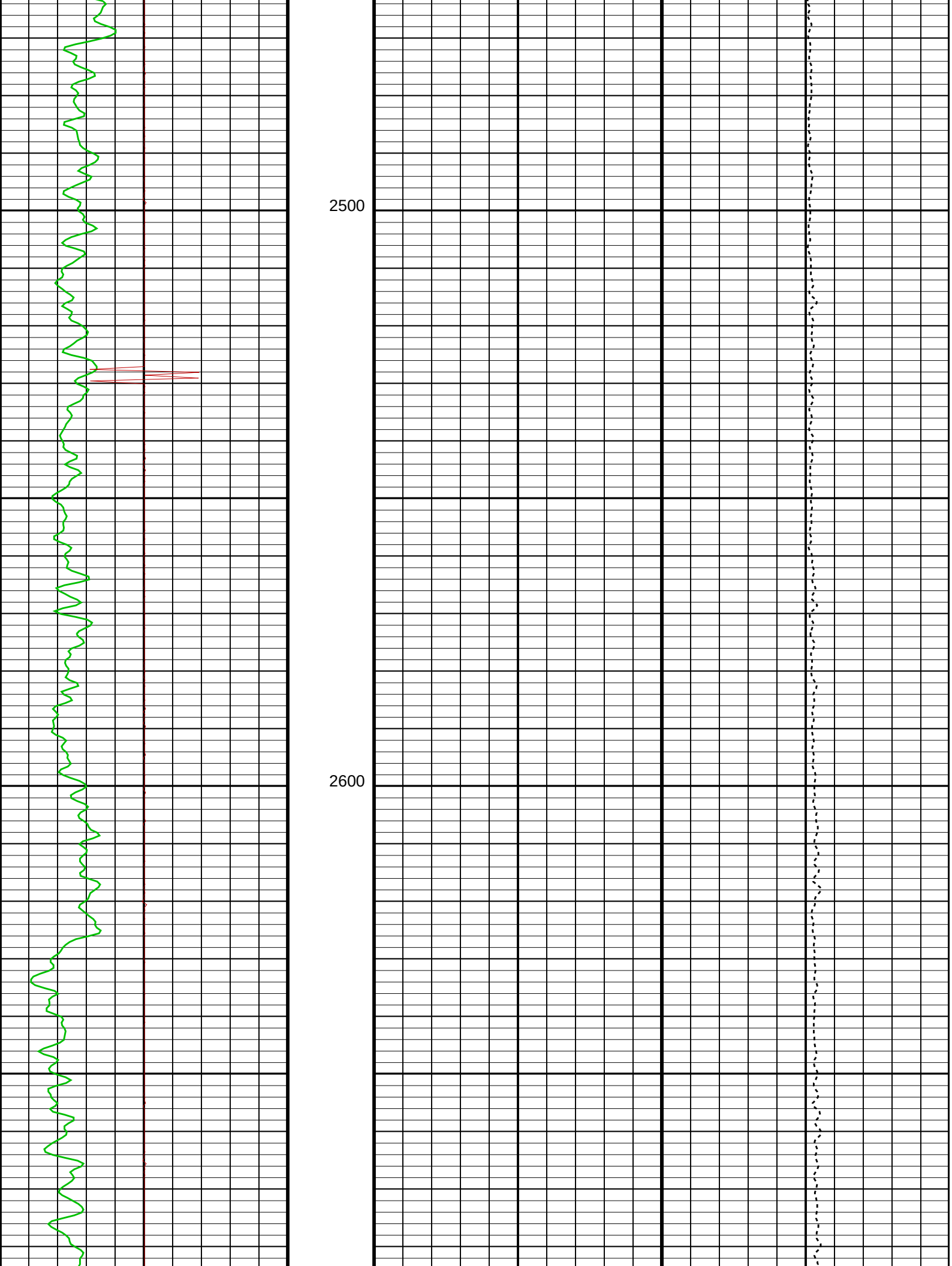
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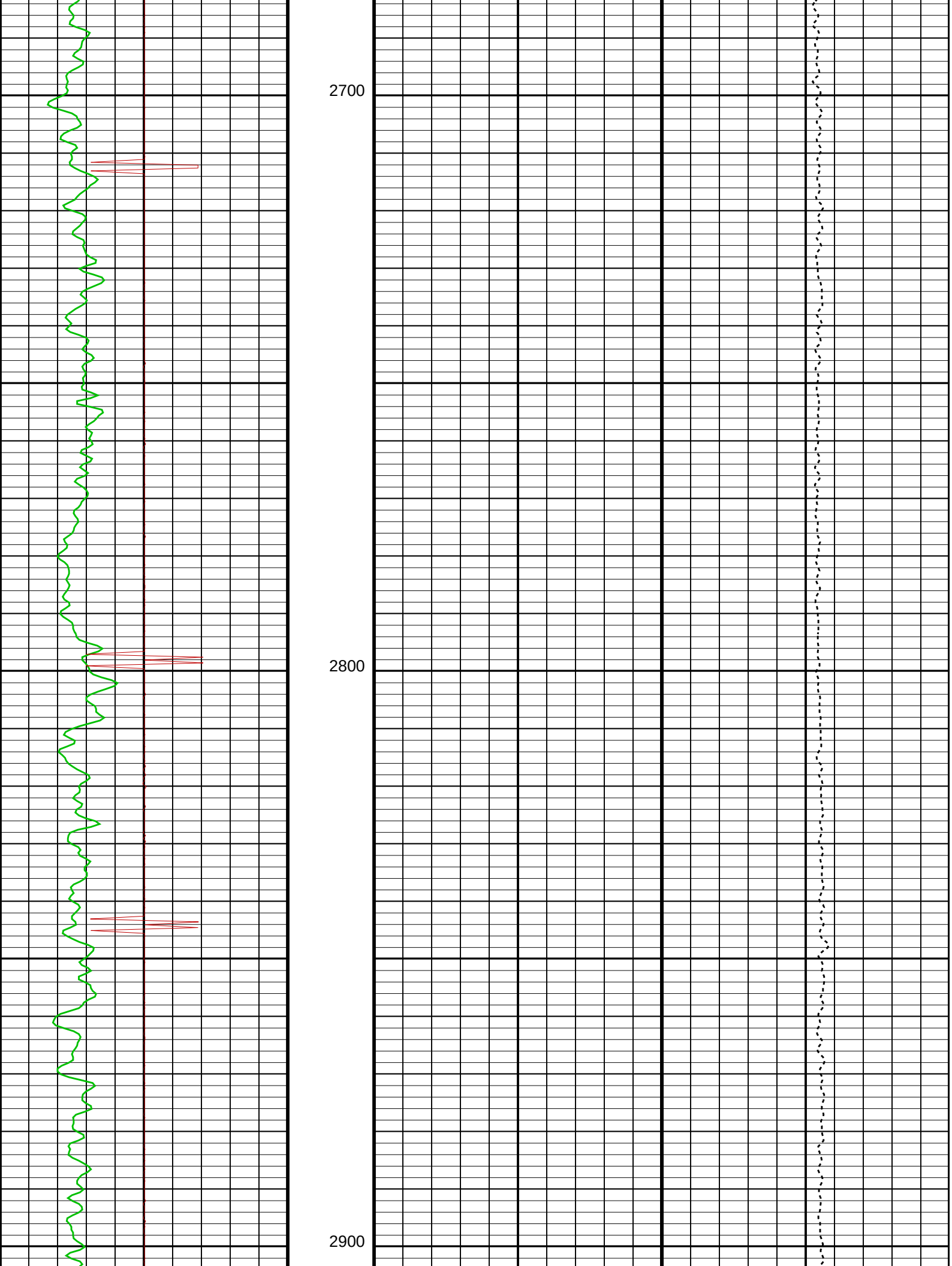
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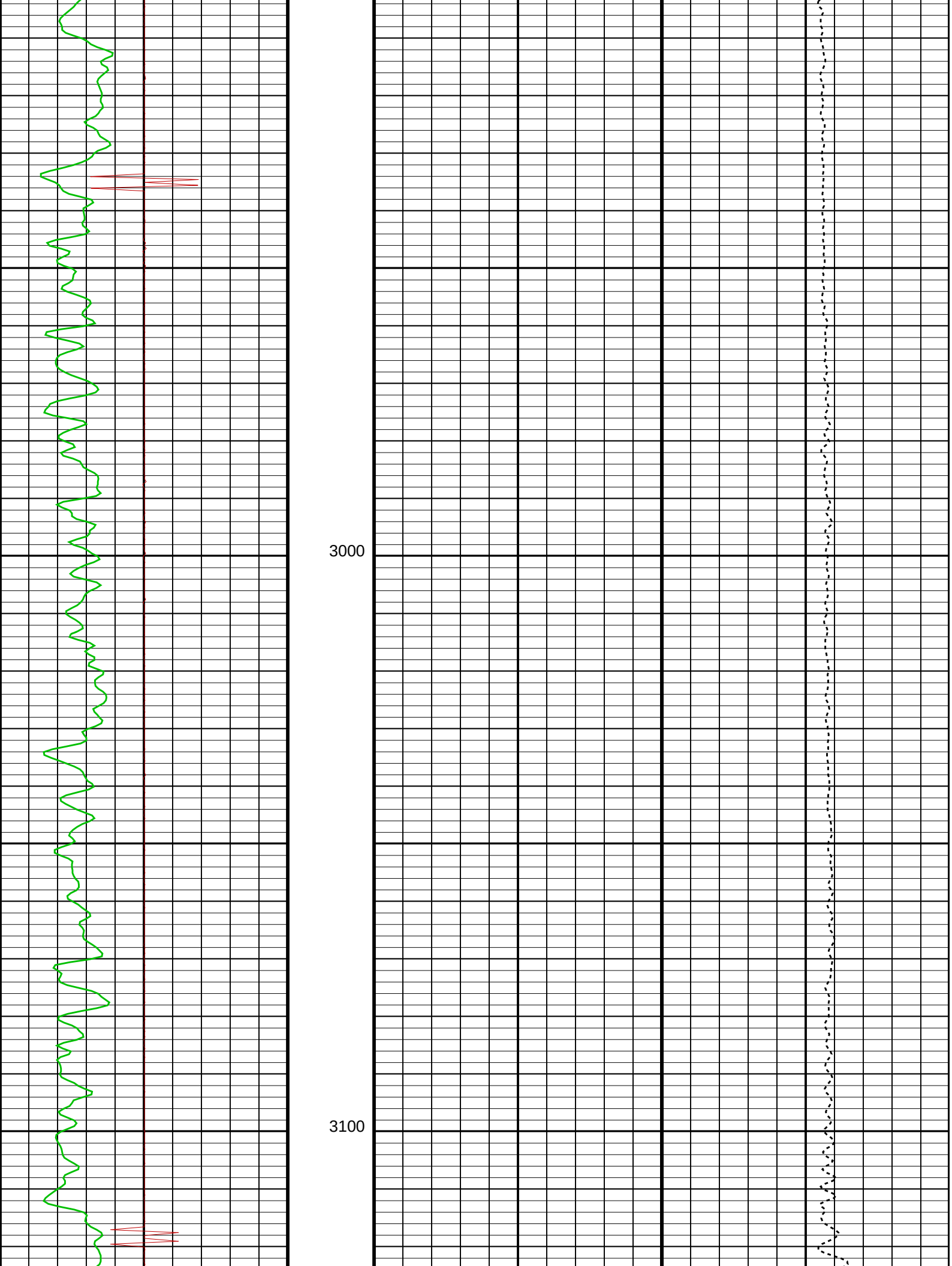
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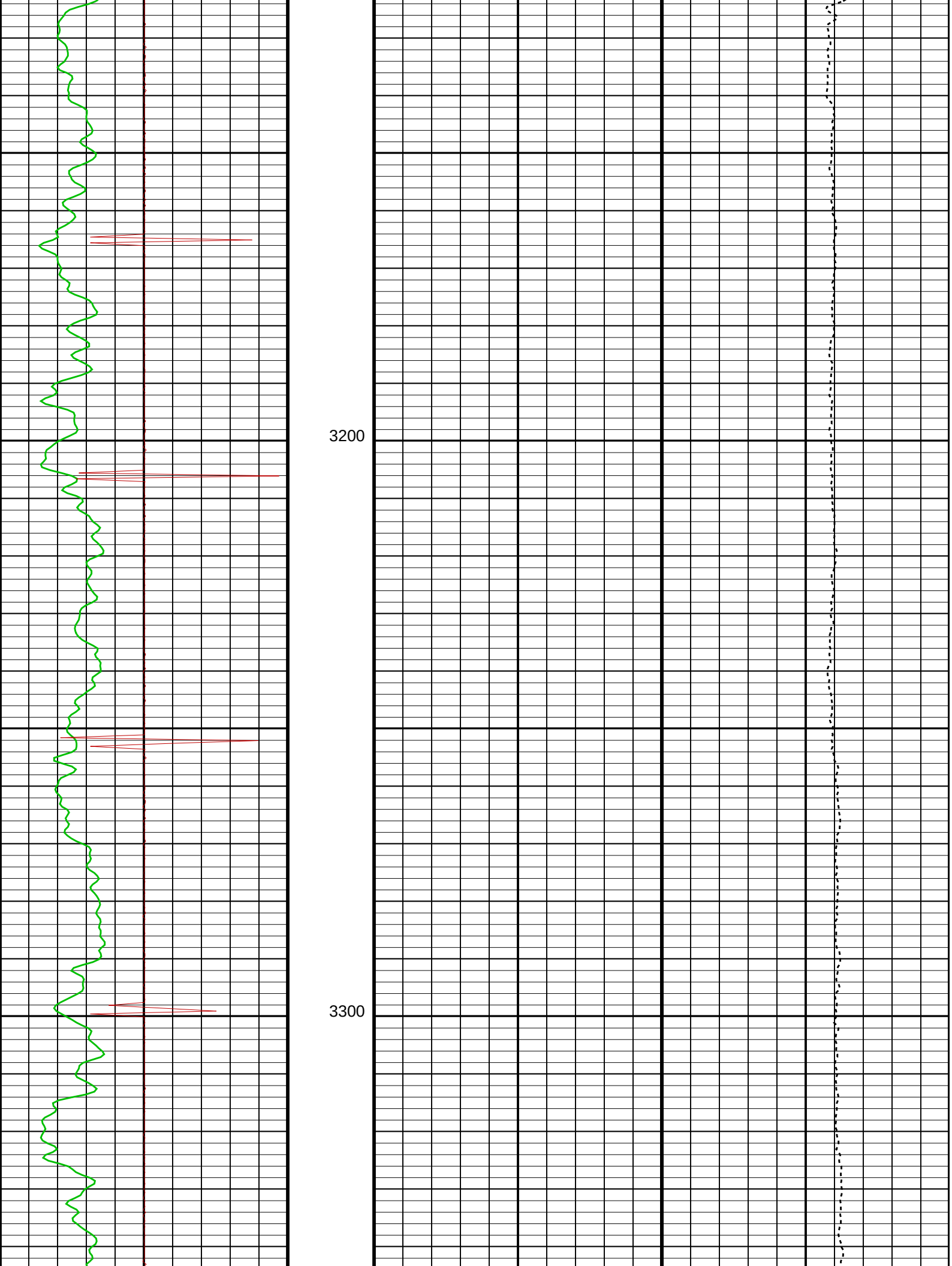
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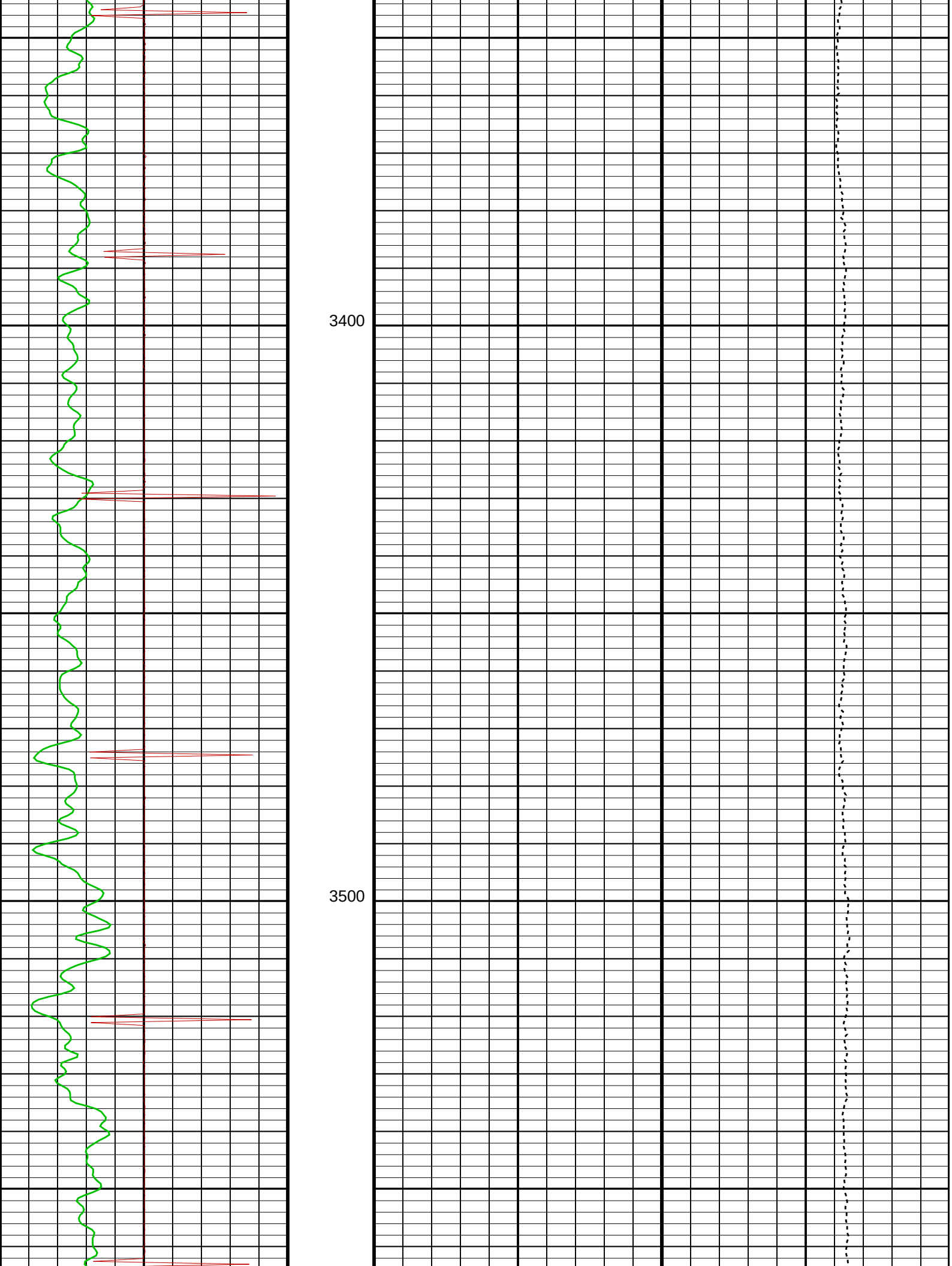
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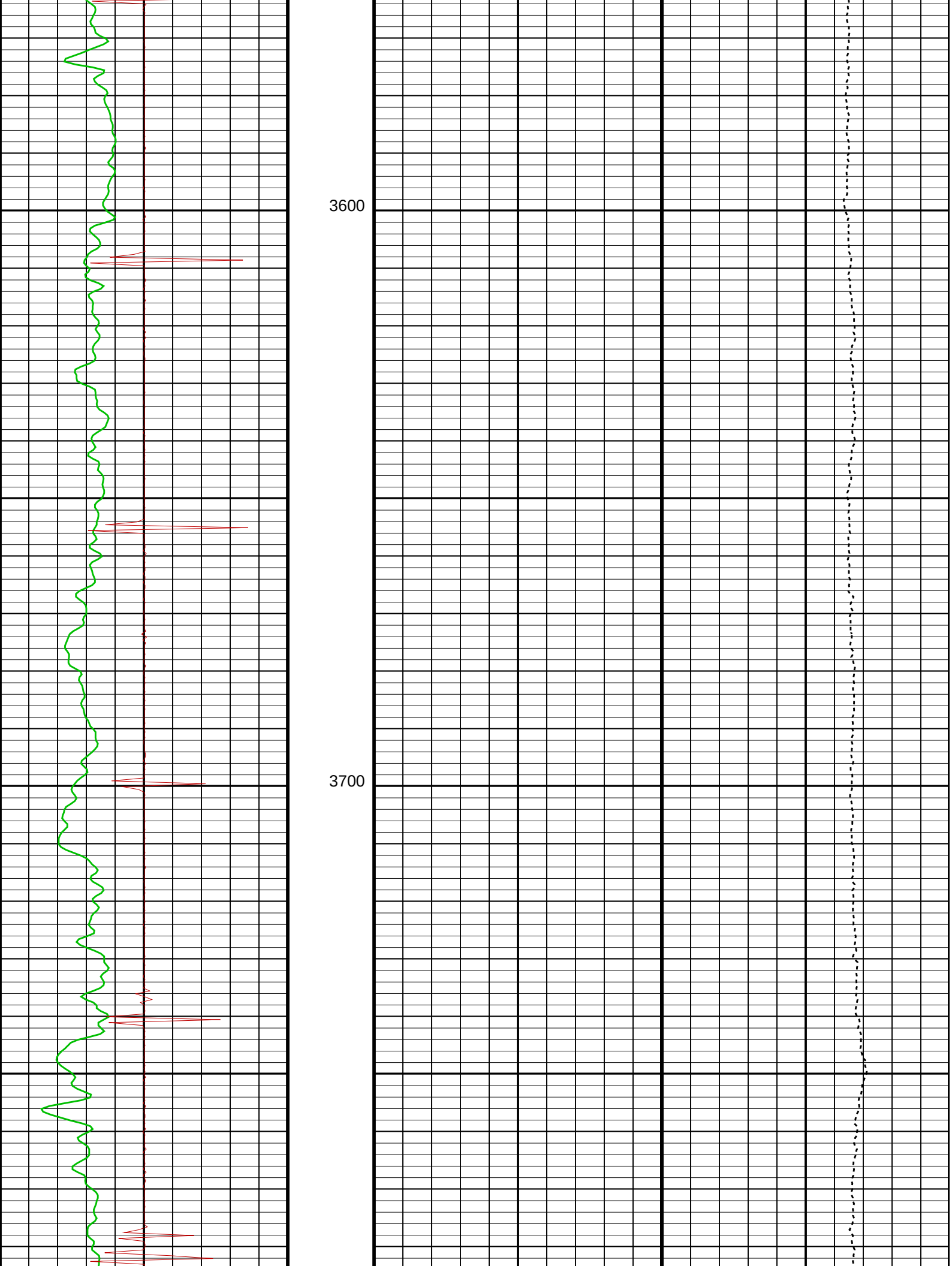
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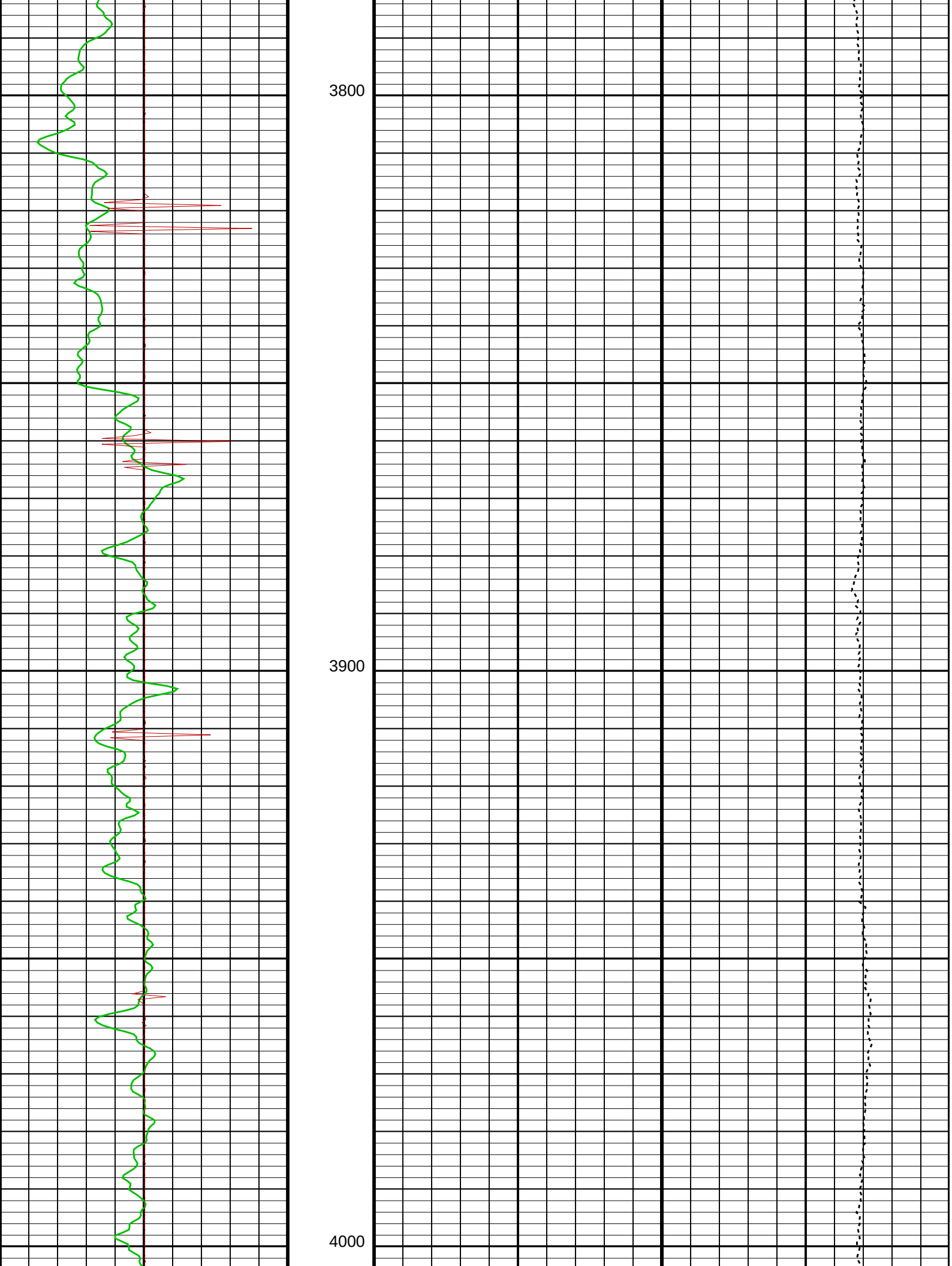
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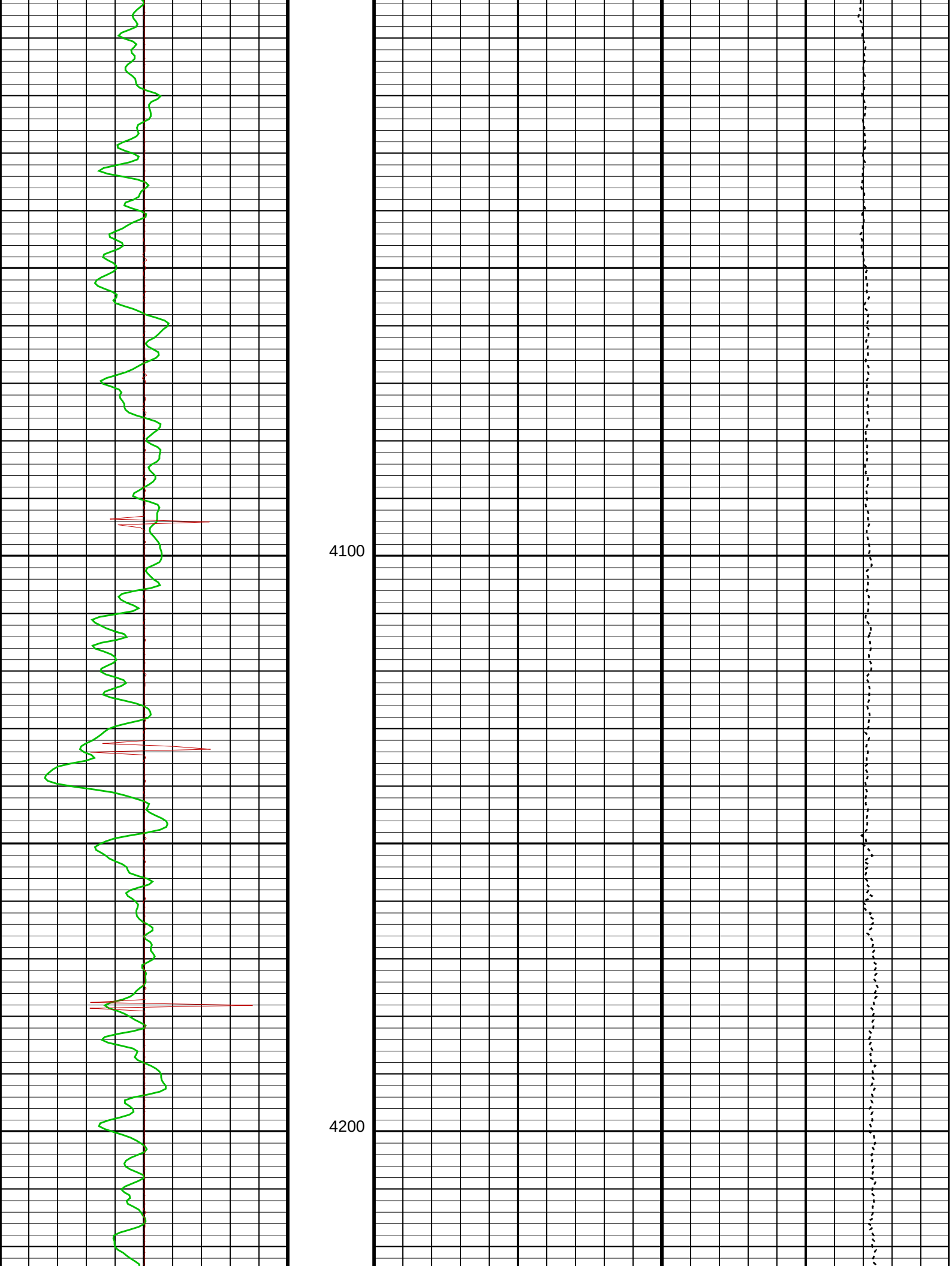
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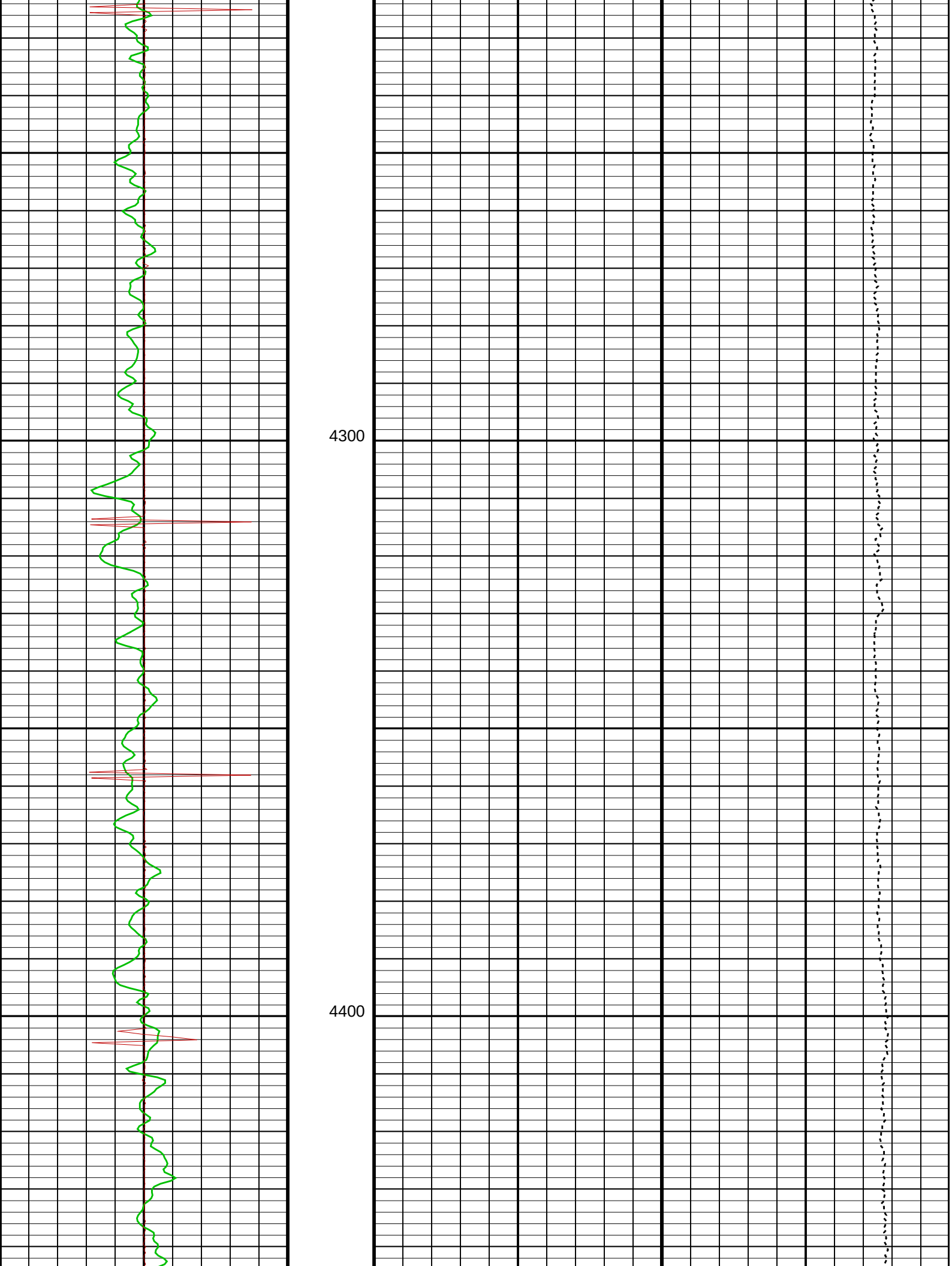
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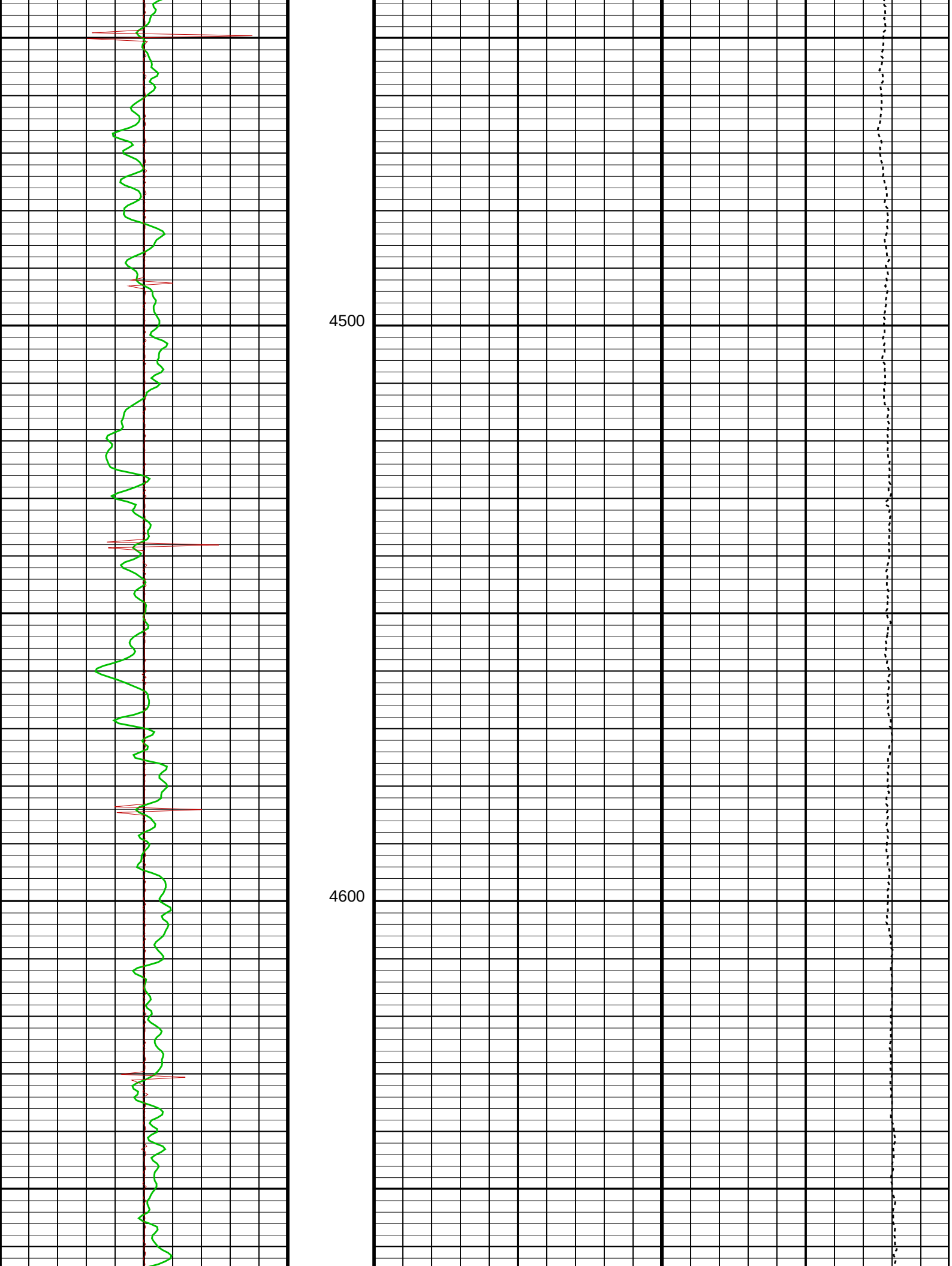
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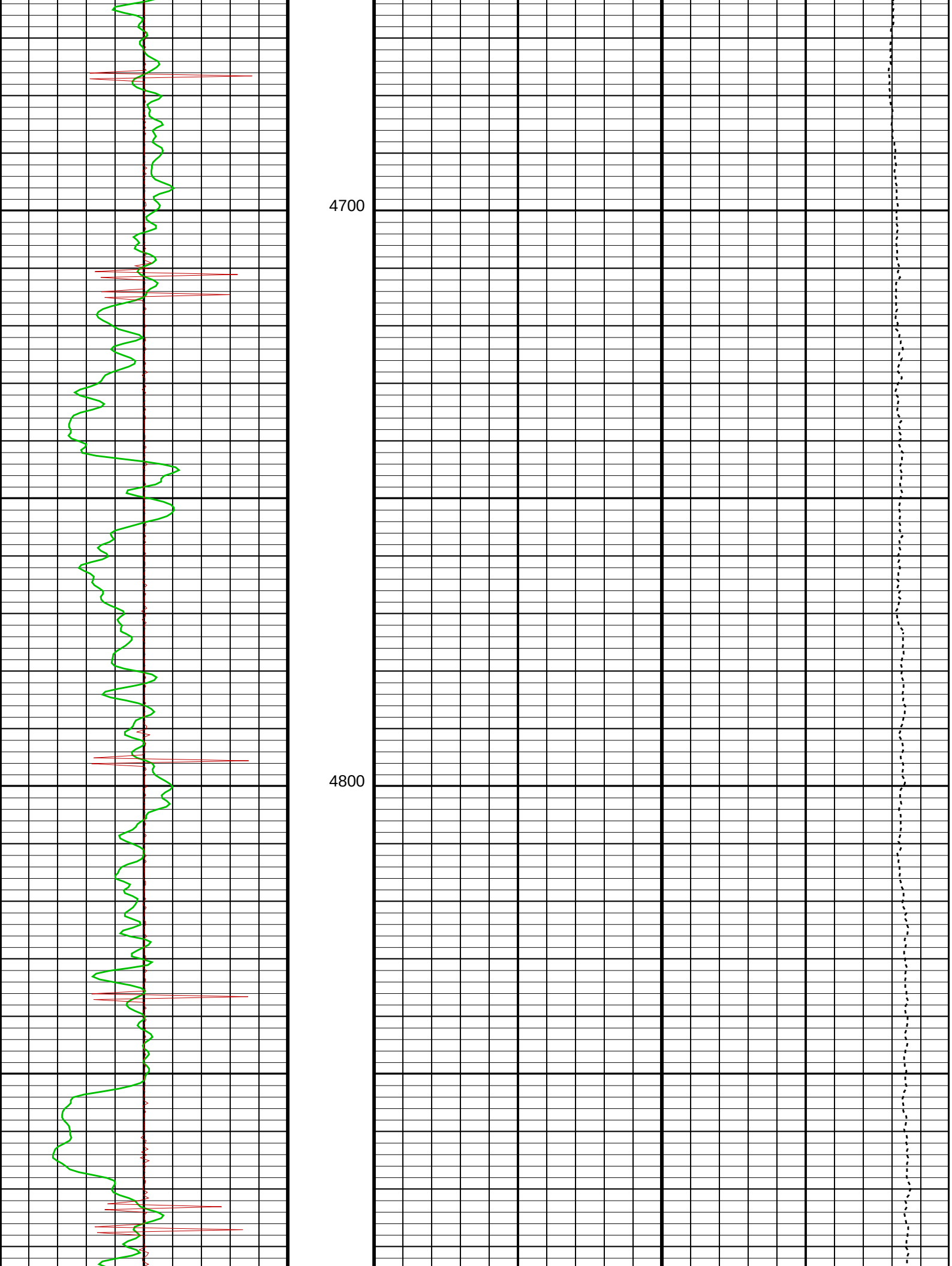
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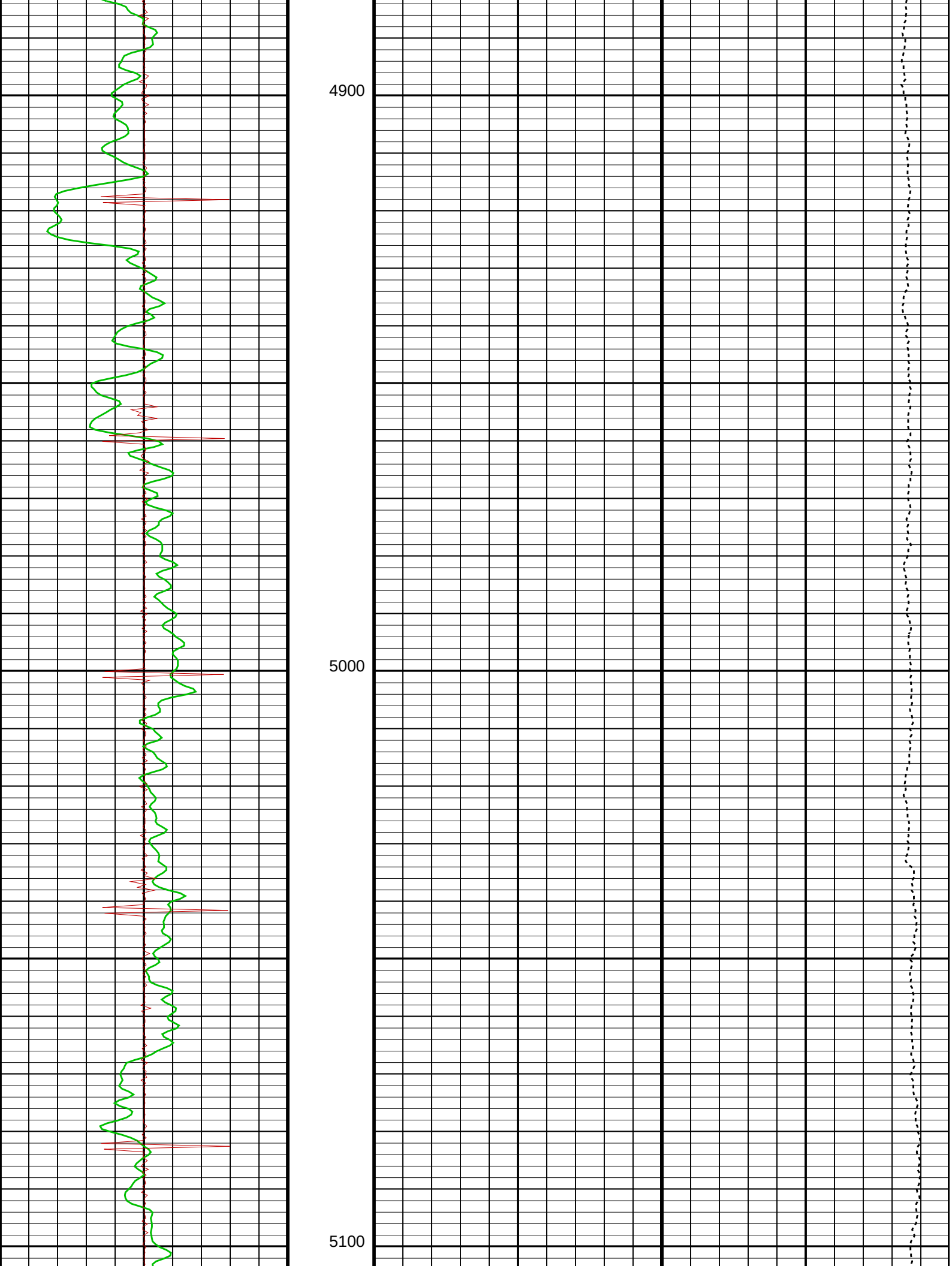
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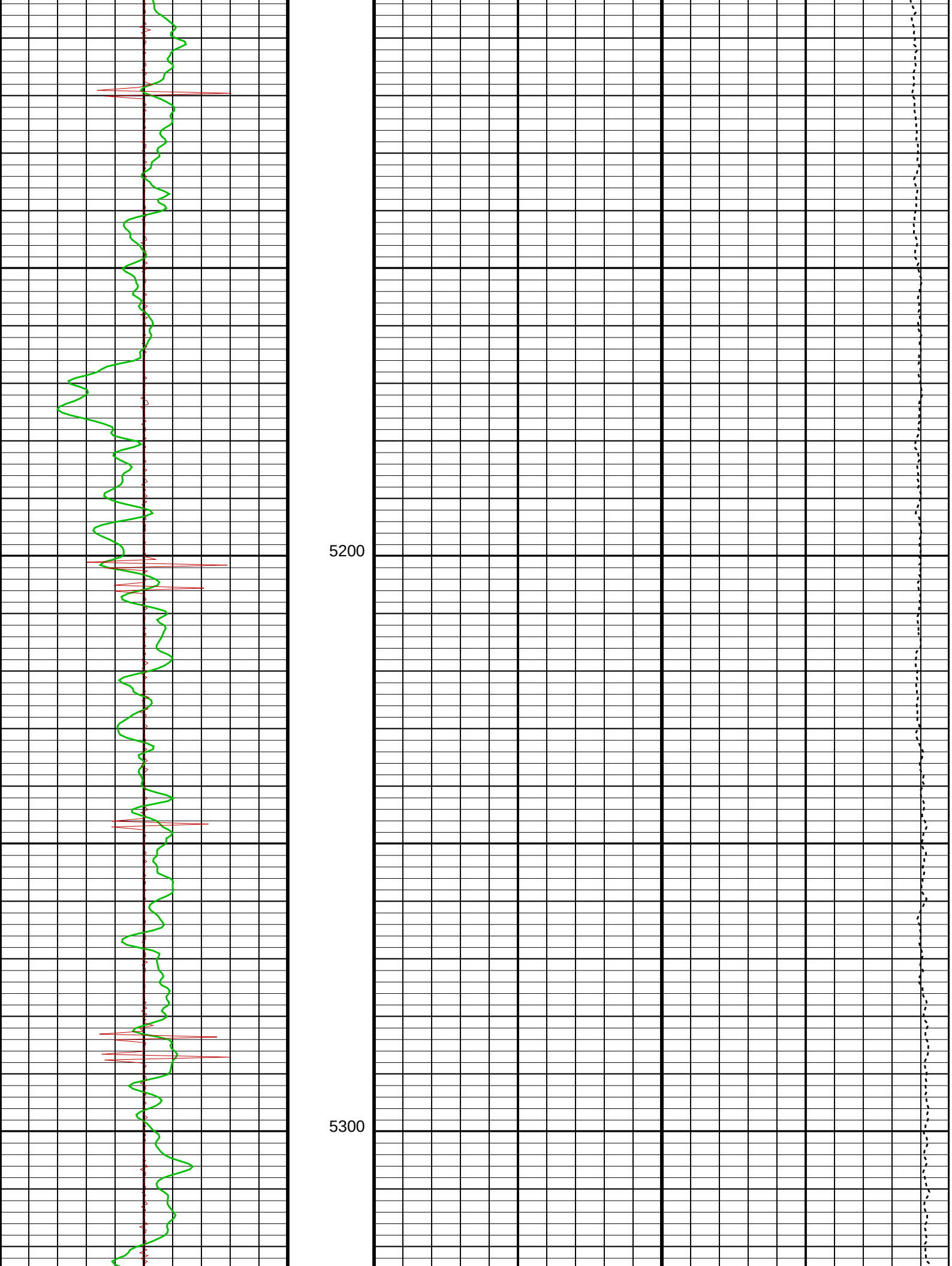
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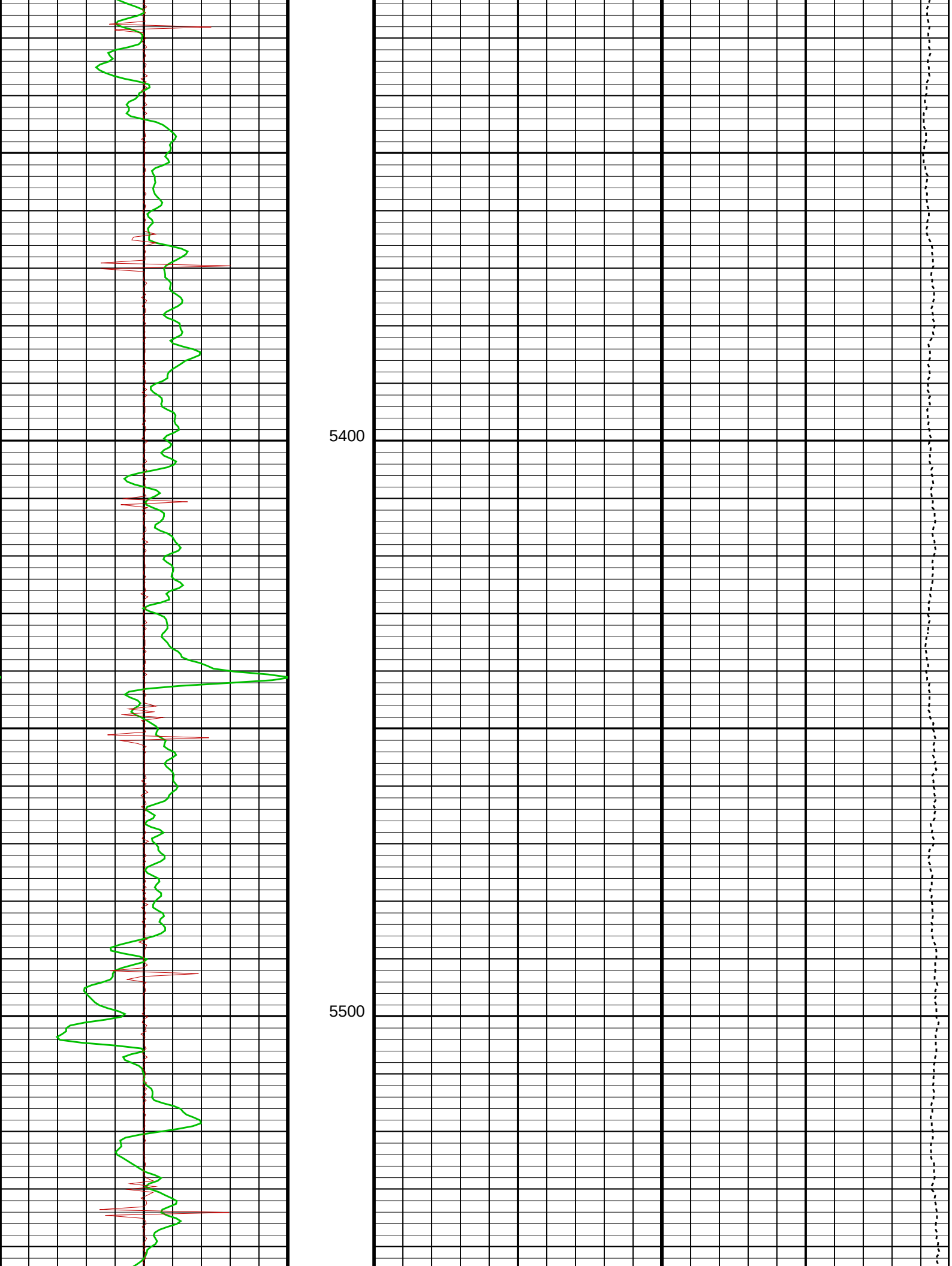
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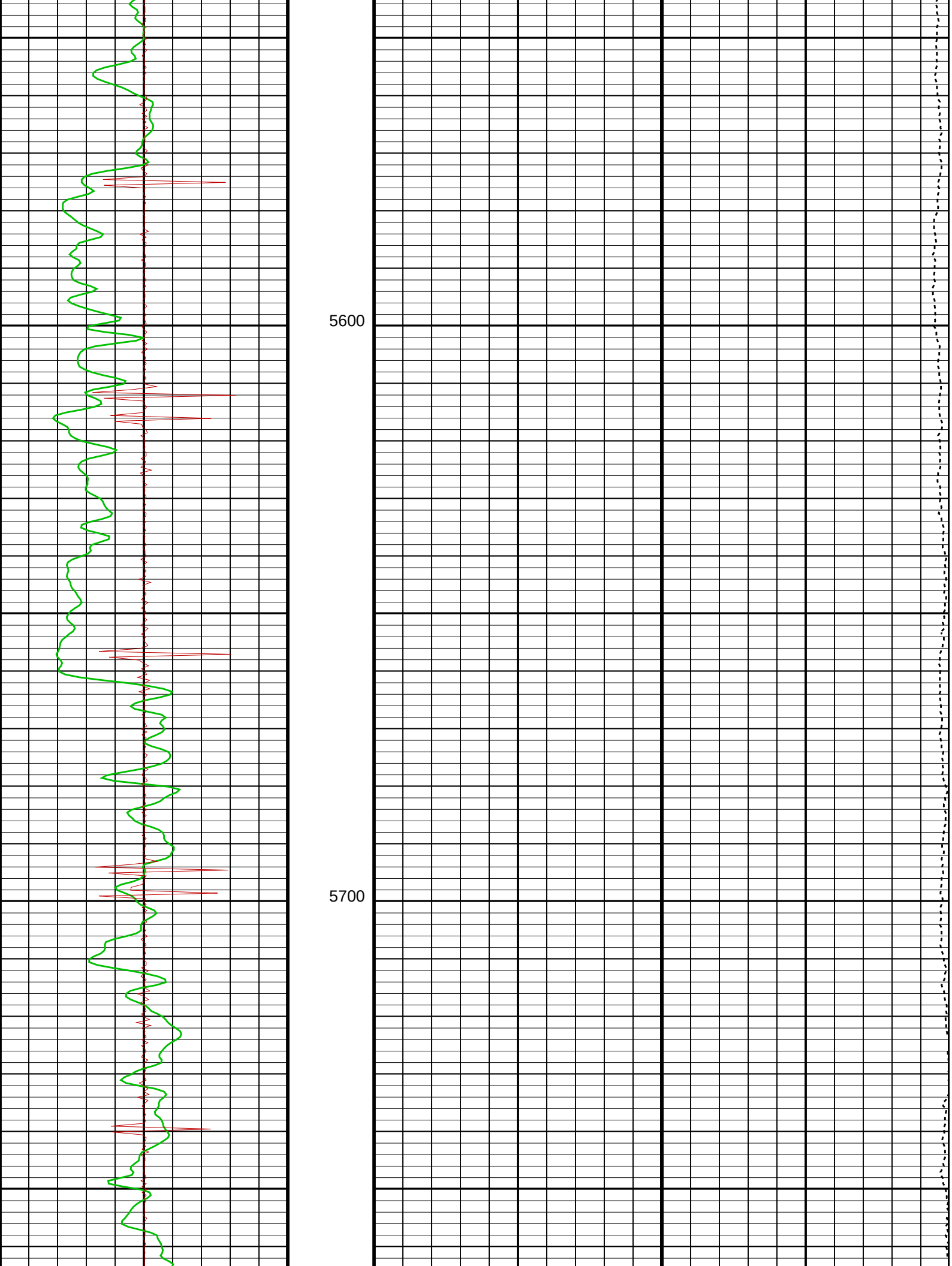
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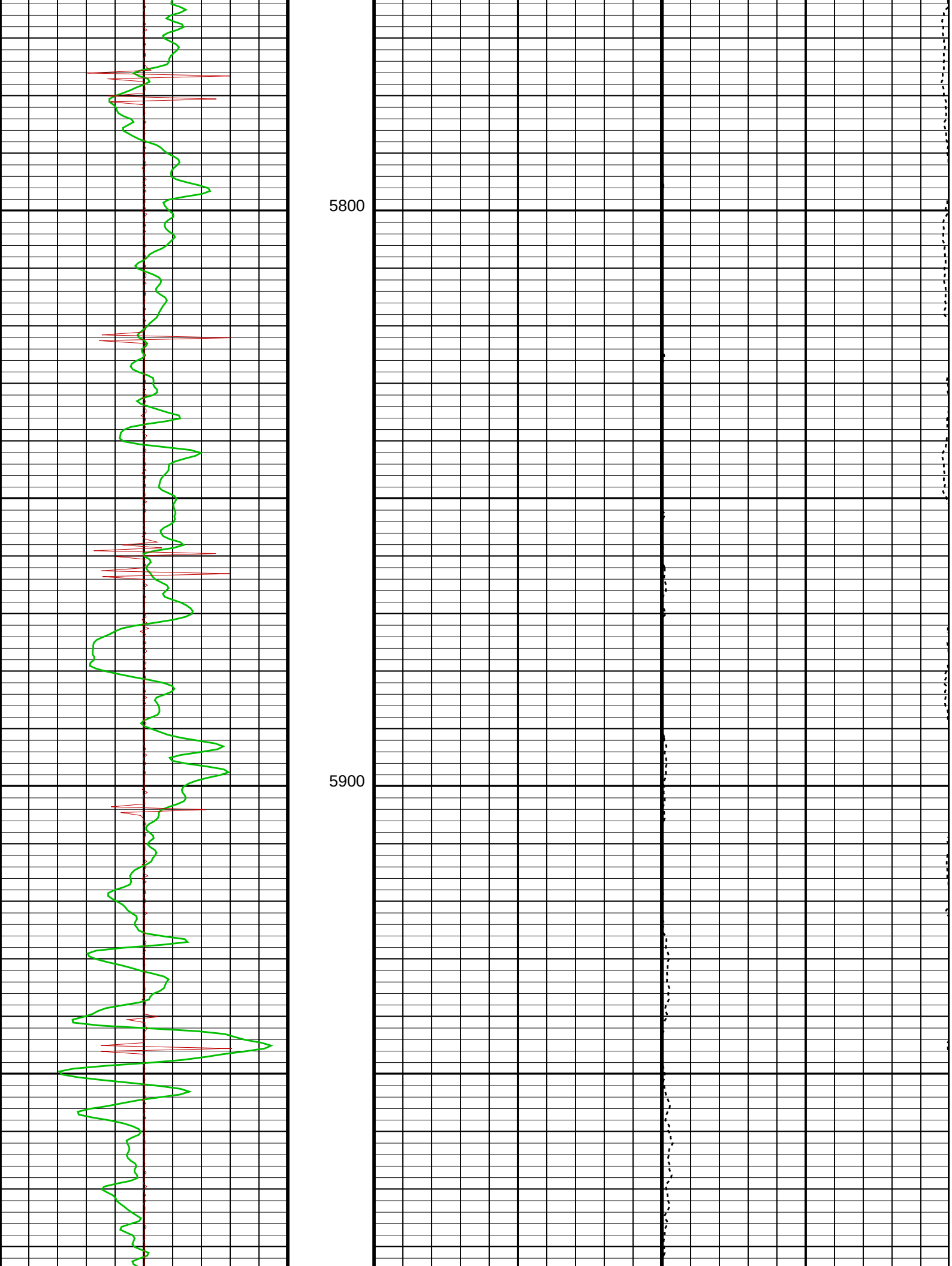
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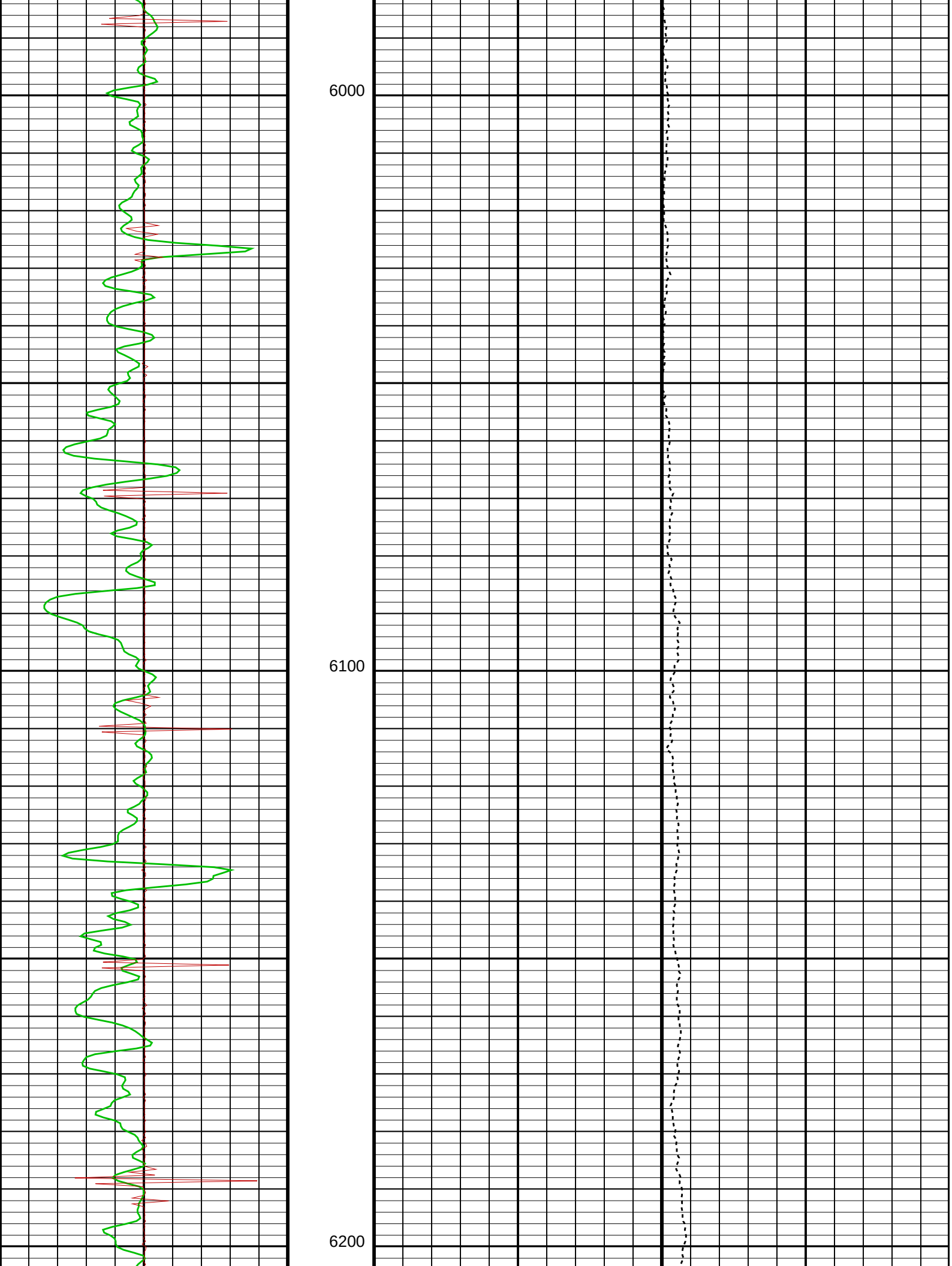
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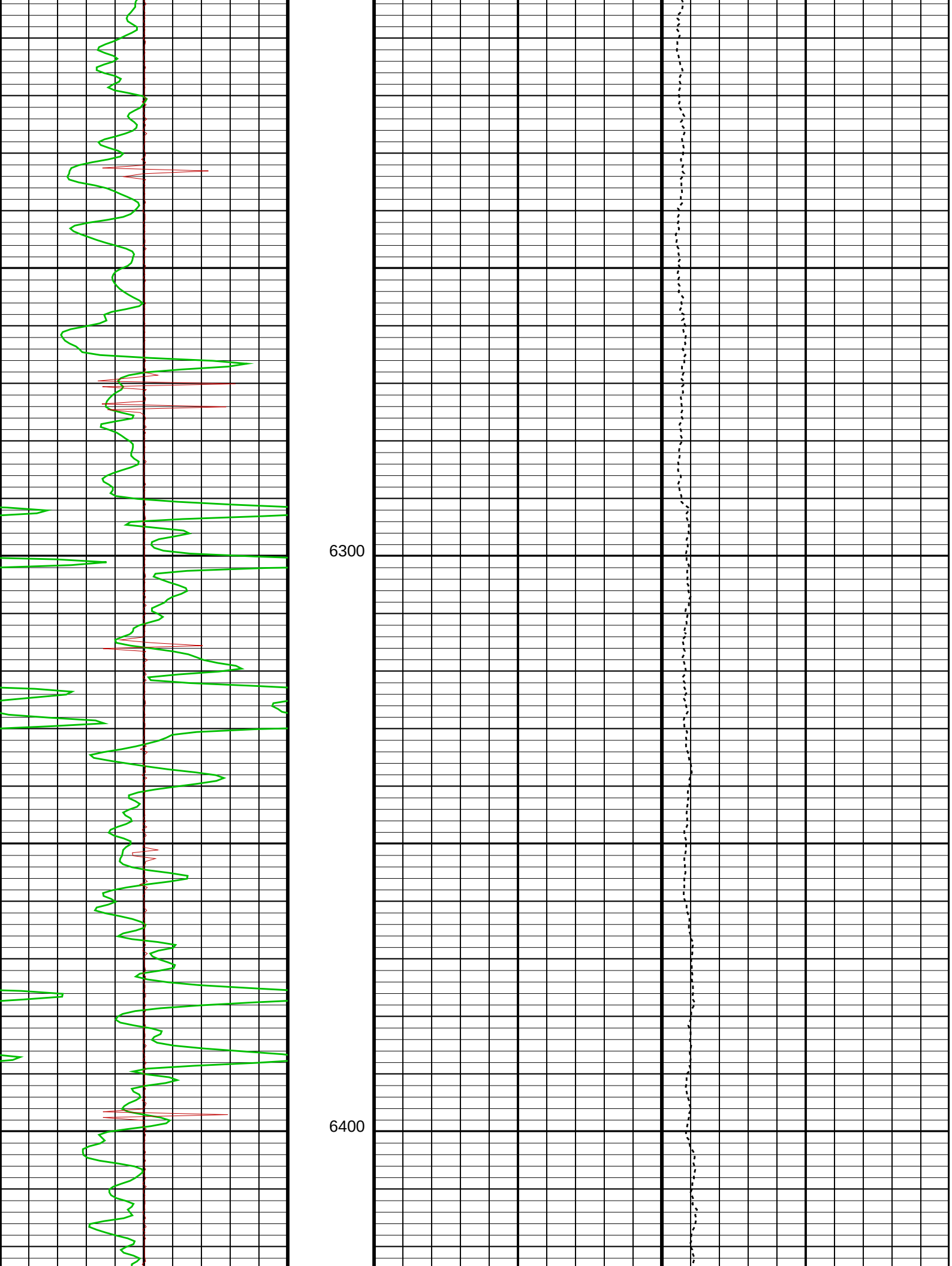
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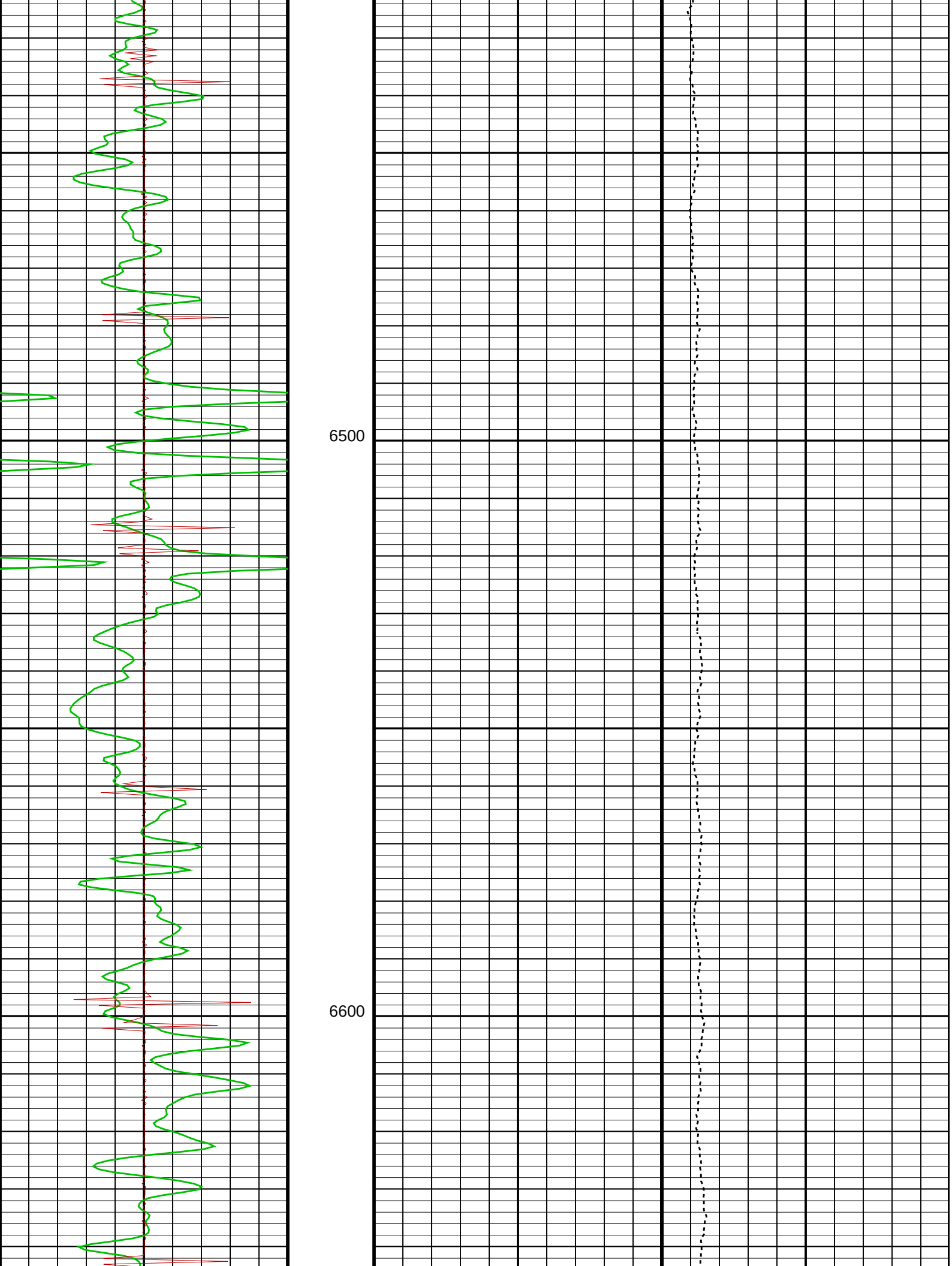
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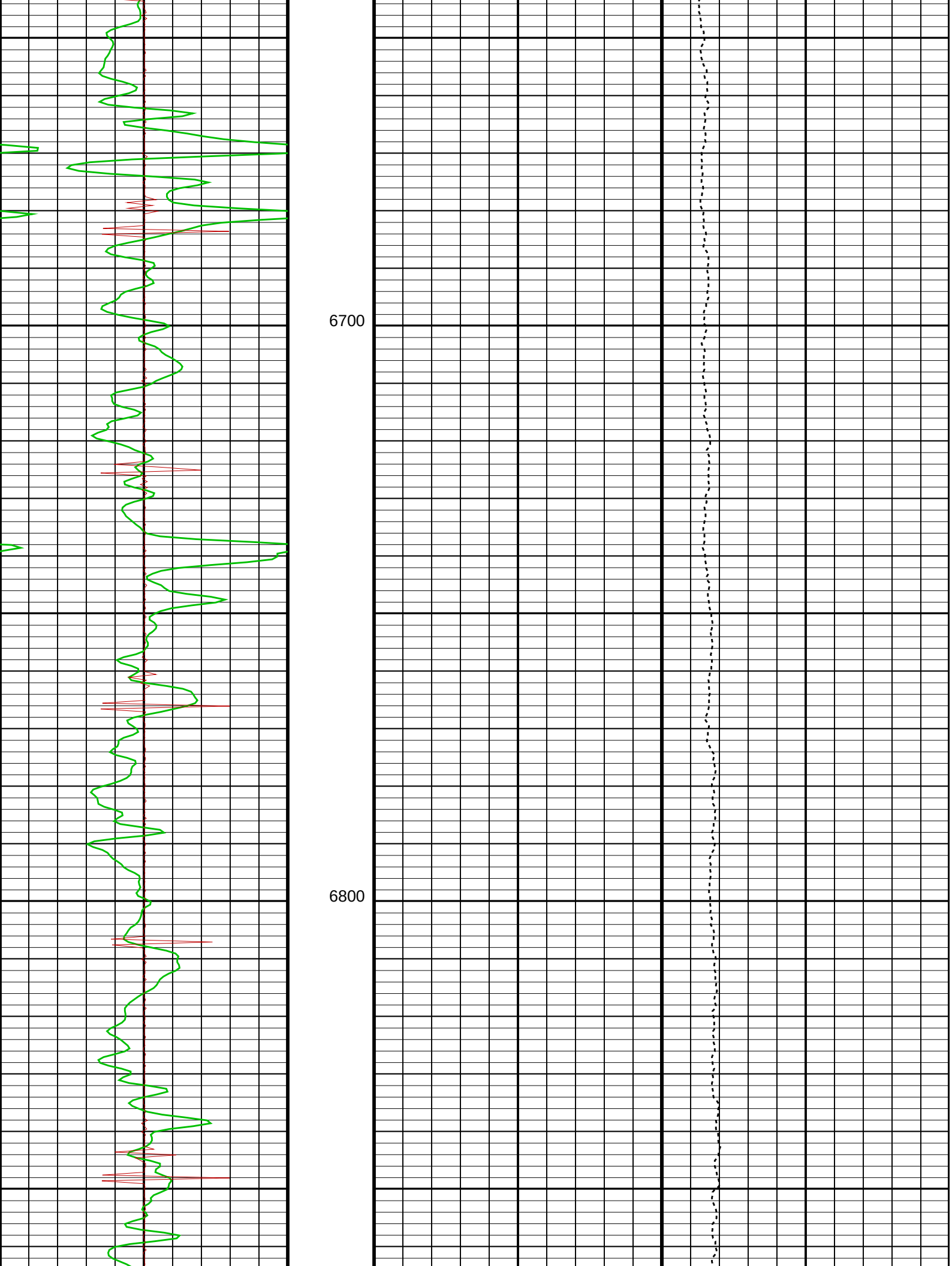
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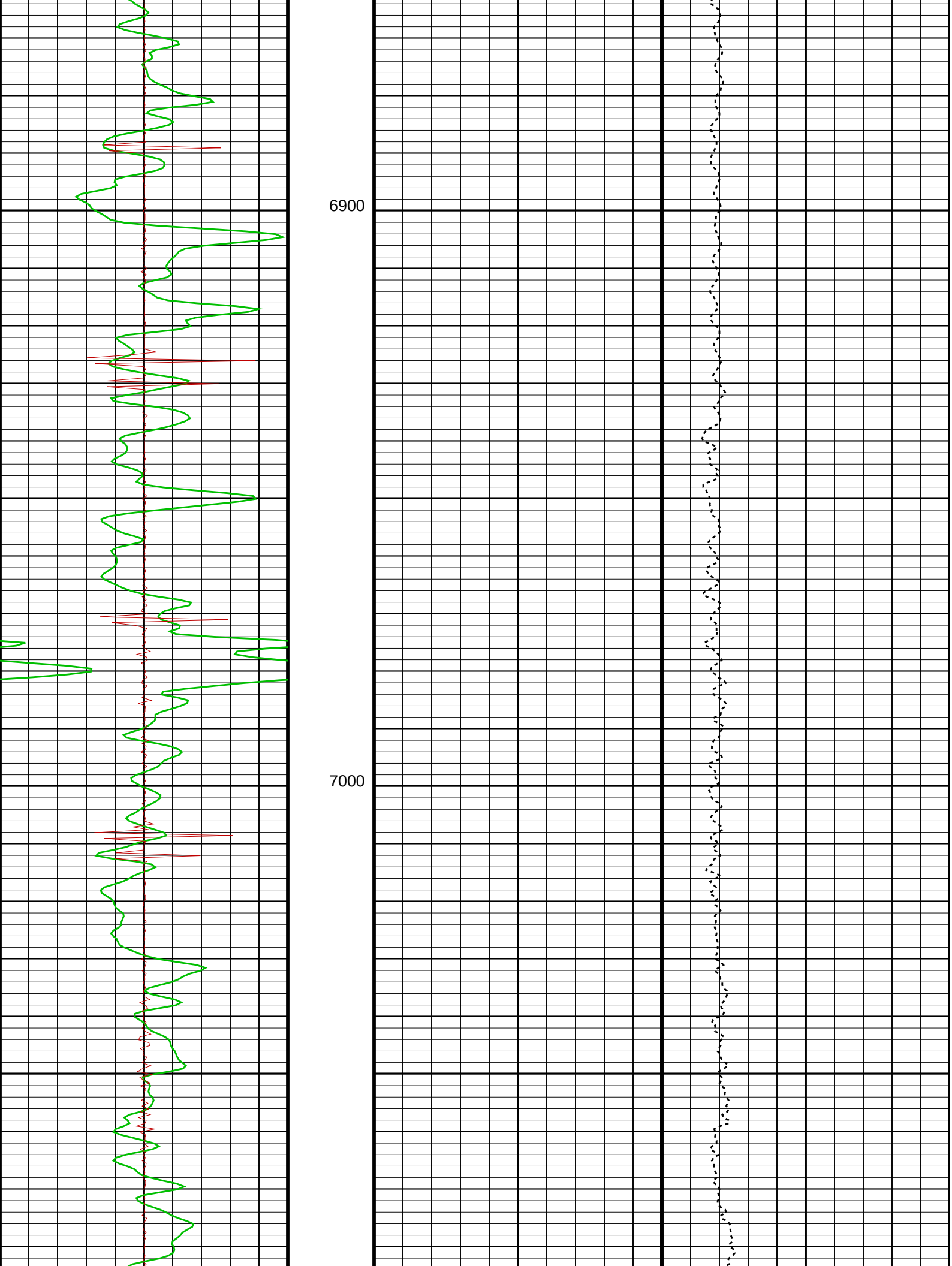
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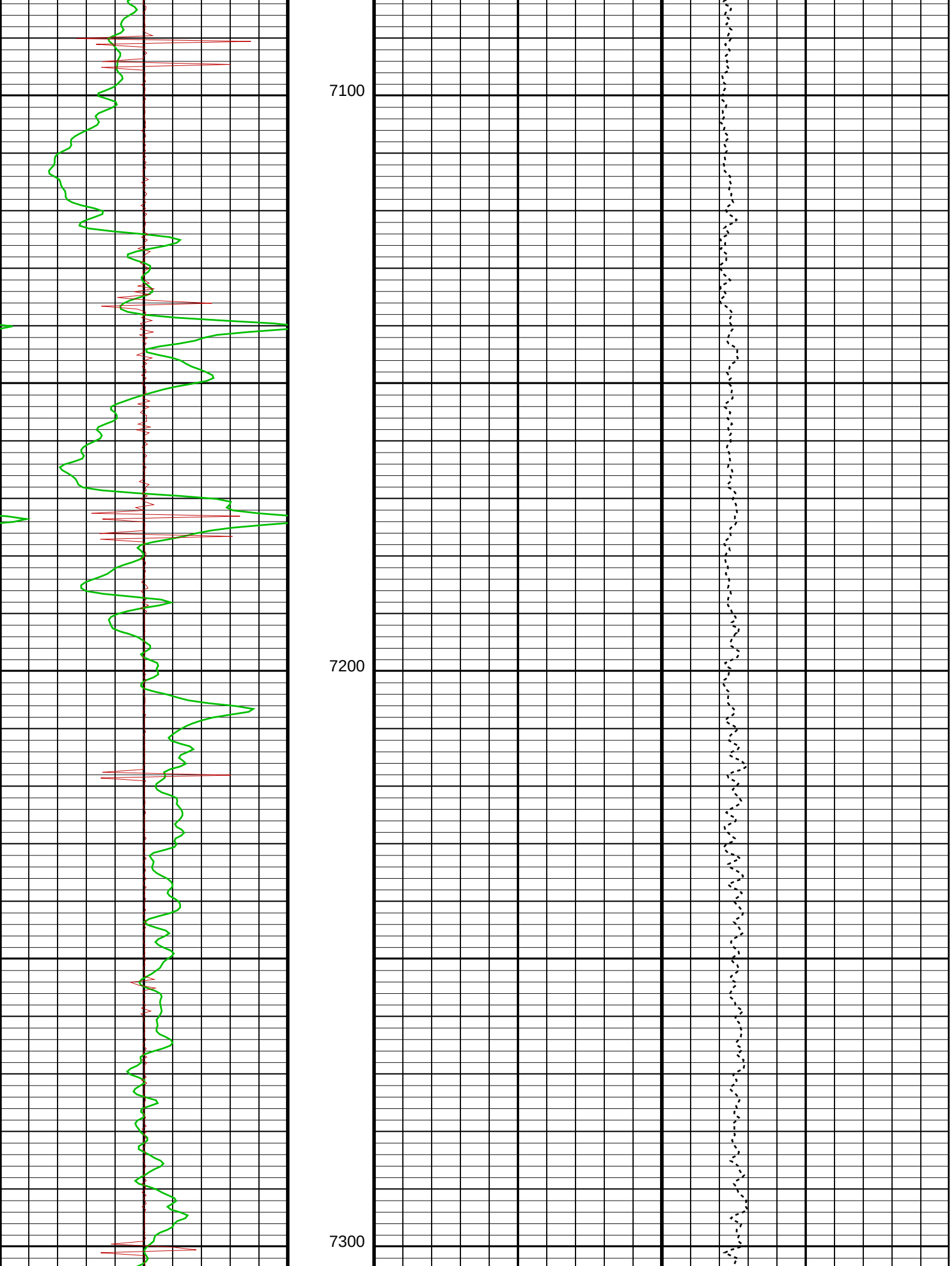
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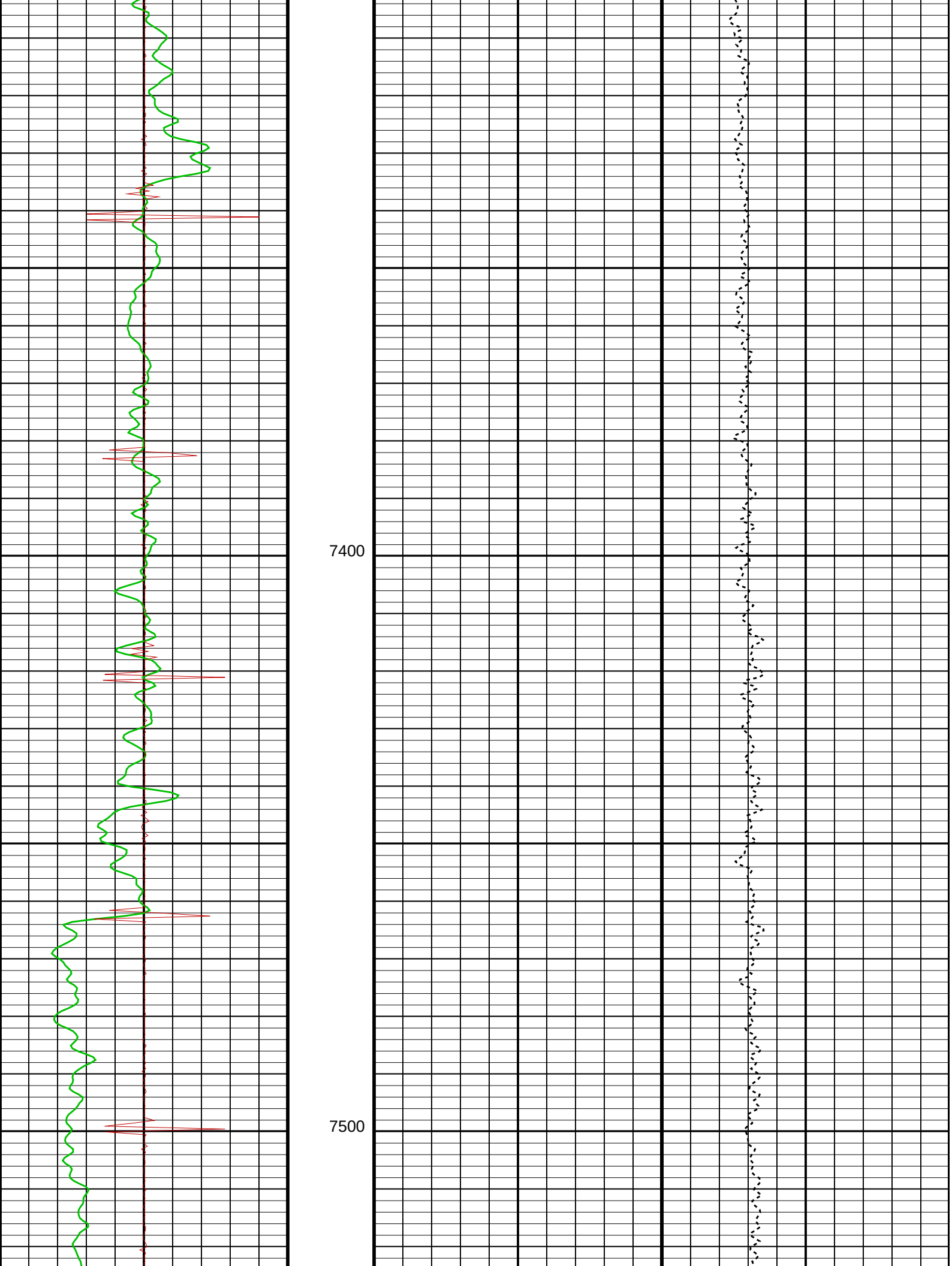
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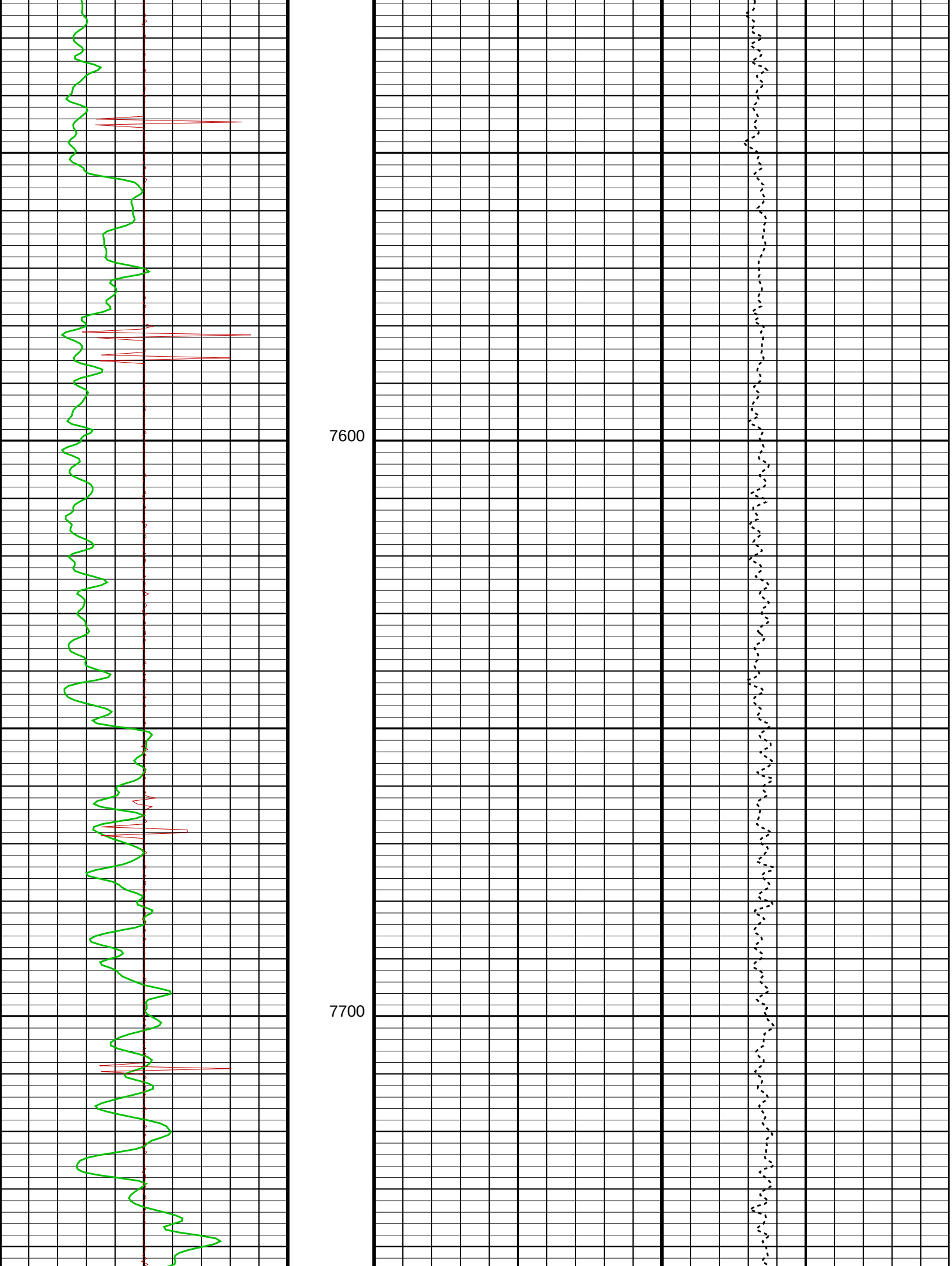
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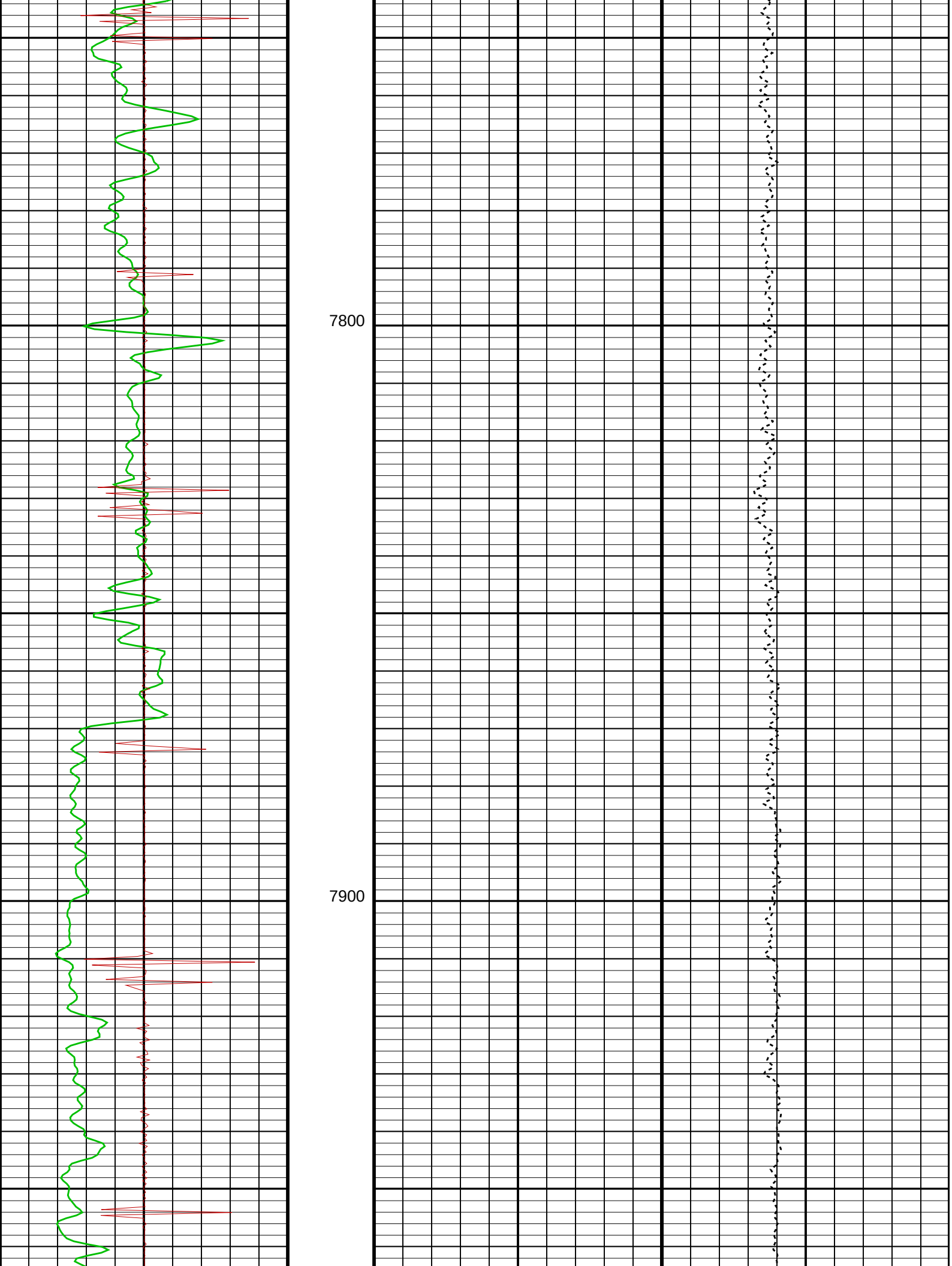
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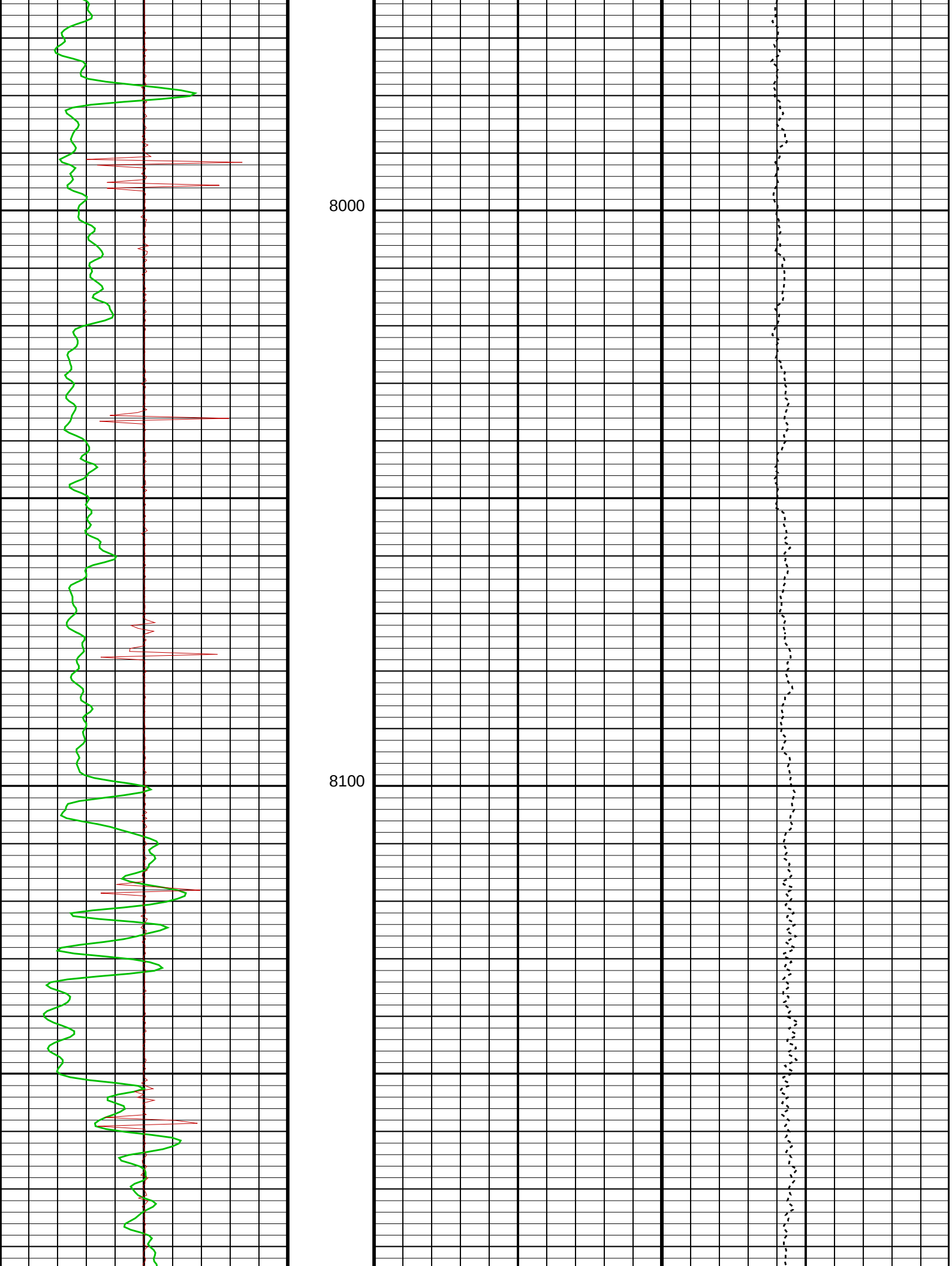
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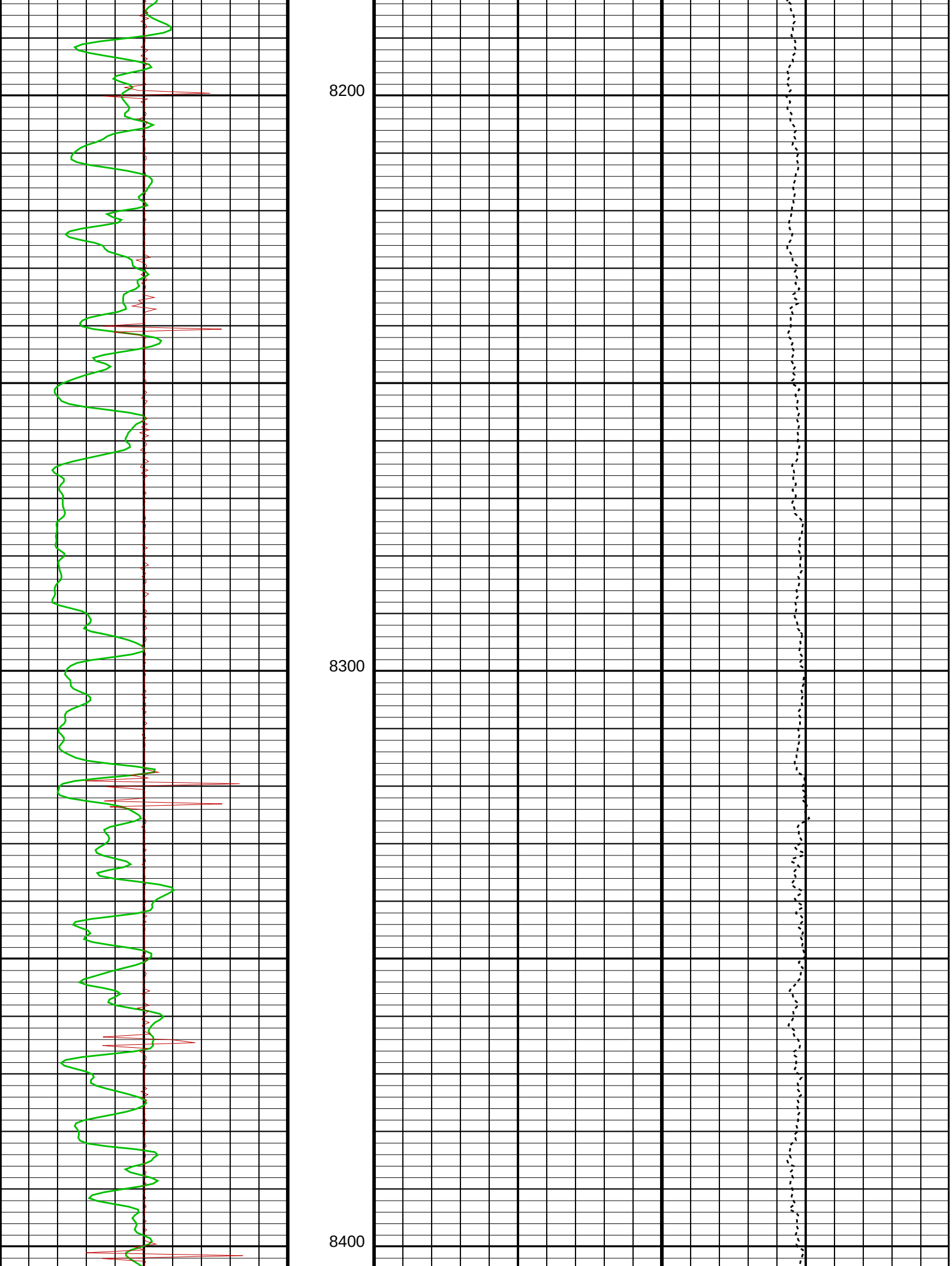
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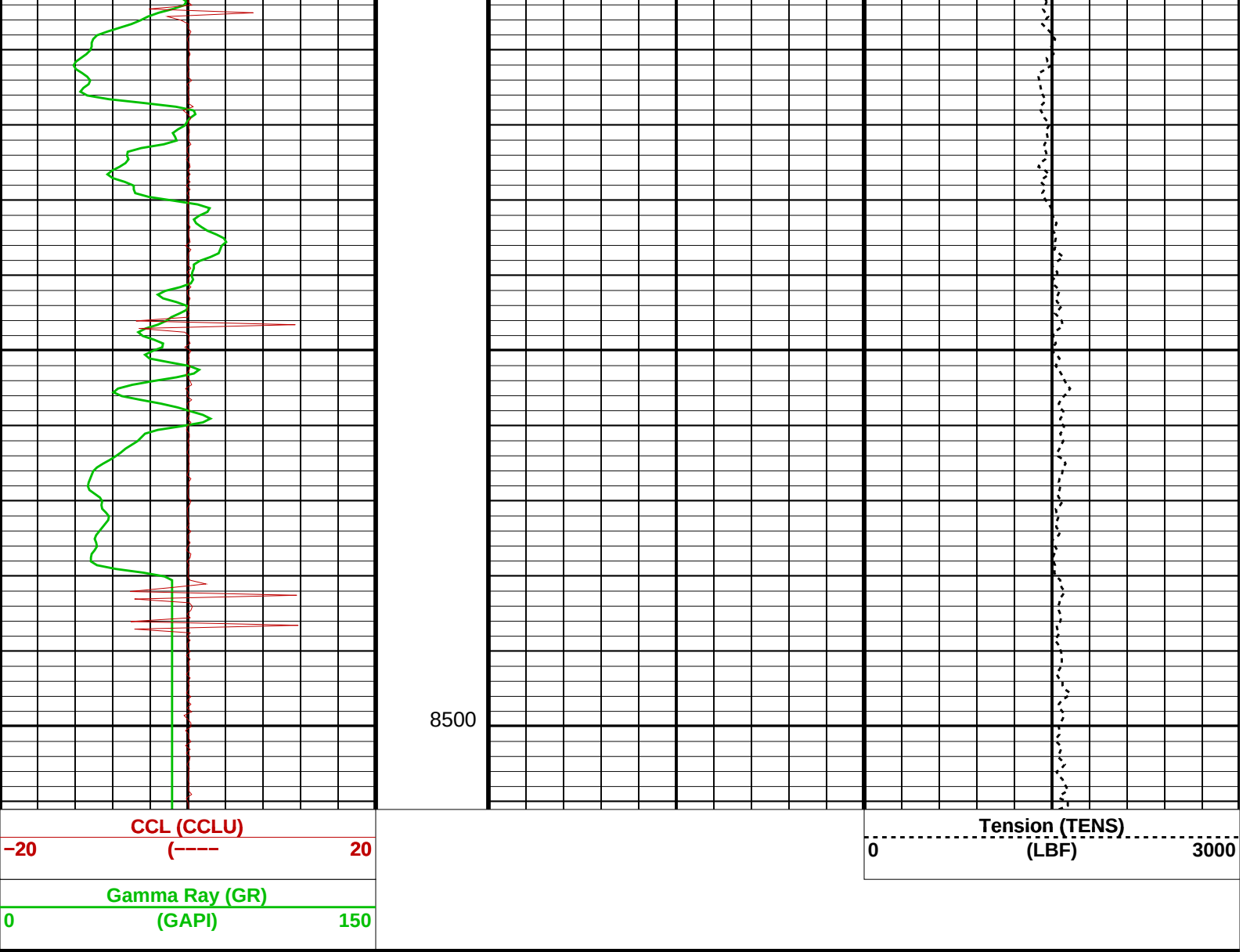

Parameters

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	206	US/F
DOT	Diameter of Transducer Sensor	1.756	IN
EMXV	EMEX Voltage	65	V
MW	Mud Weight	8.4	LB/G
RCOD	Reference Calibrator Outer Diameter	4.5	IN
RCSO	Reference Calibrator Standoff	0.8425	IN
RCTH	Reference Calibrator Thickness	0.2165	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_5_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	1.8	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

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	NORMAL	

Format: CORRELATION Vertical Scale: 5" per 100' Graphics File Created: 27−Jun−2010 16:35

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_004LUP	FN:3	PRODUCER	27−Jun−2010 12:38	8504.0 FT	57.5 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	27−Jun−2010 16:35		

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Repeat Analysis

MAXIS Field Log

Company: EXXONMOBIL PRODUCTION CO. Well: PCU 197−34A3

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_004LUP	FN:3	PRODUCER	27−Jun−2010 12:38	8504.0 FT	57.5 FT
DEFAULT	USI_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	27−Jun−2010 16:28	8497.5 FT	8181.5 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_006PUP	FN:5	PRODUCER	27−Jun−2010 16:35		

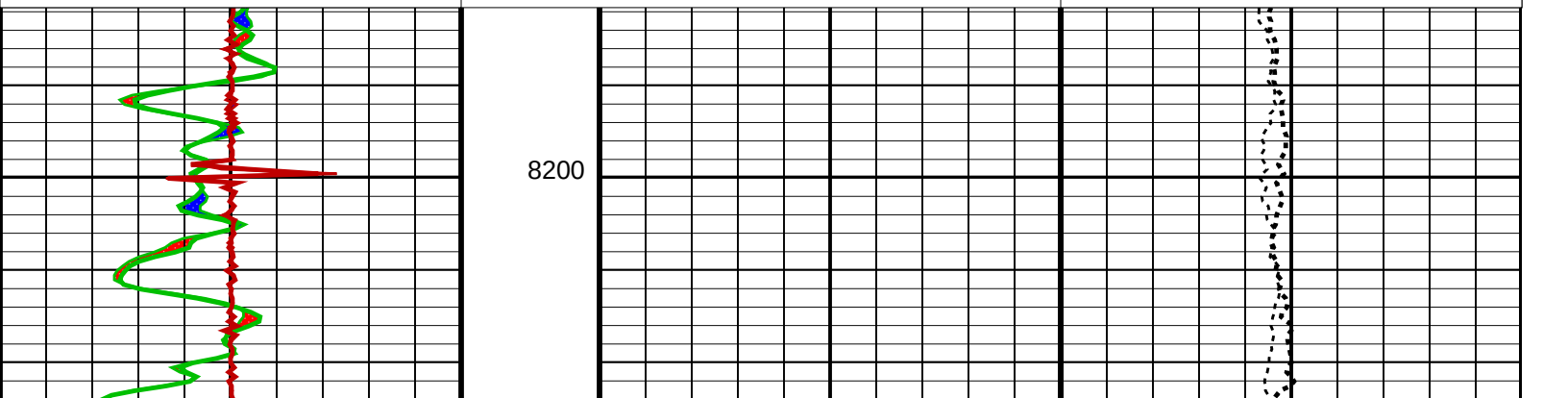
OP System Version: 17C0−154

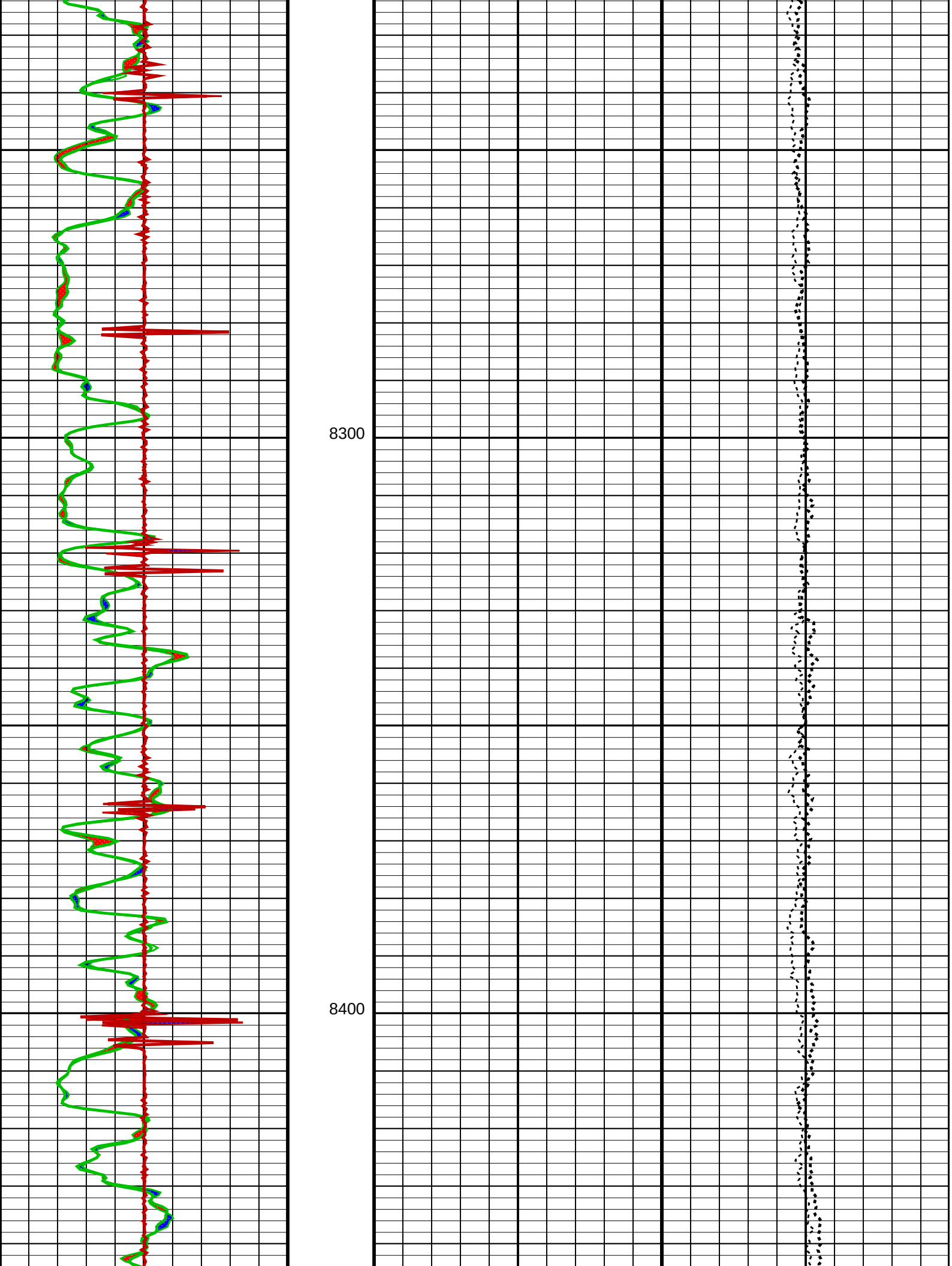
USIT−D	17C0−154	HILTH−FTB	17C0−154
DTC−H	17C0−154		

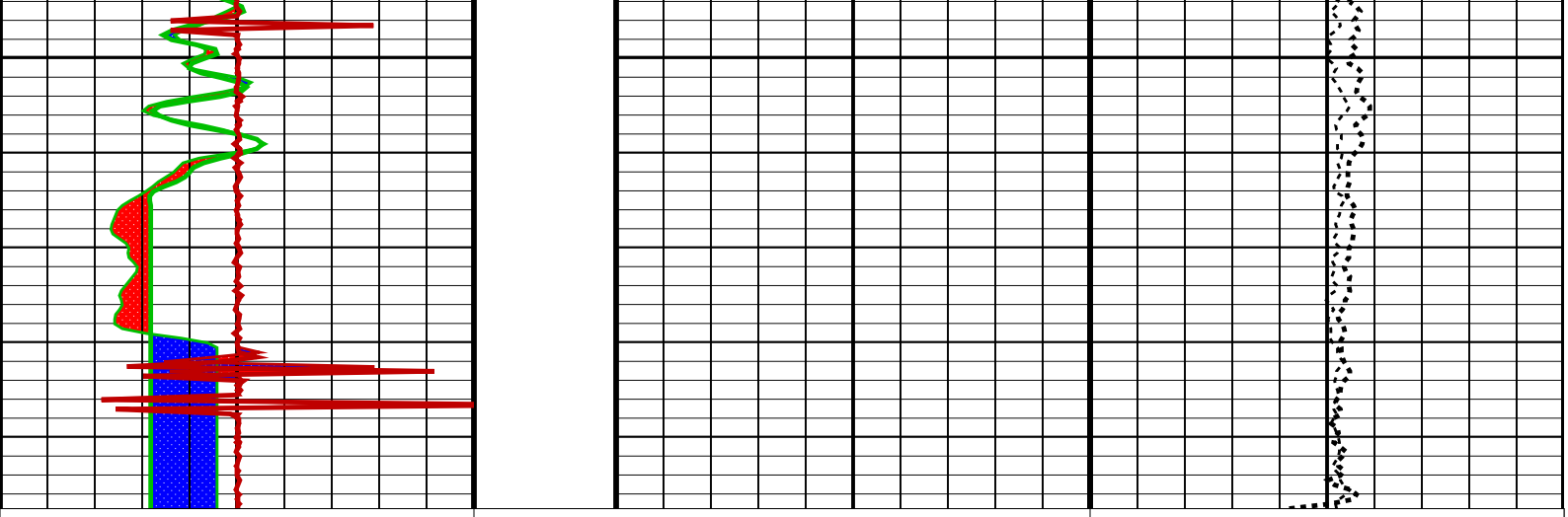
USIT_CCLU_curve_REP Curve (CCLU_REP)
−20 (−−−− 20

GR_REP Curve (GR_REP)
0 (GAPI) 150

TENS_REP Curve (TENS_REP)
0 (LBF) 3000




8300
8400



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	1.756	IN
EMXV	EMEX Voltage	65	V
MW	Mud Weight	8.4	LB/G
RCOD	Reference Calibrator Outer Diameter	4.5	IN
RCSO	Reference Calibrator Standoff	0.8425	IN
RCTH	Reference Calibrator Thickness	0.2165	IN
TCUB	T^3 Processing Level	Vax_Loop	
THDH	Maximum Search Thickness (percentage of nominal)	130	
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THNO	Nominal Thickness of Casing	0.362	IN
USTO	Ultrasonic Time Offset	−2	US
USUB	Ultrasonic Subassembly Identifier	Sub_5_inch	
UWKM	Ultrasonic Working Mode	5DEG_6IN_136UNF_LF	
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WLEN	T^3 Processing Length	21.7078	US
ZCAS	Acoustic Impedance of Casing	46.25	MRAY
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ZMUD	Acoustic Impedance of Mud	1.8	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	NORMAL	

Format: CORRELATION_REP Vertical Scale: 5" per 100’ Graphics File Created: 27−Jun−2010 16:35

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_004LUP	FN:3	PRODUCER	27−Jun−2010 12:38	8504.0 FT	57.5 FT
DEFAULT	USI_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	27−Jun−2010 16:28	8497.5 FT	8181.5 FT

Output DLIS Files

DEFAULT **USI_TLD_MCFL_CNL_006PUP** **FN:5** **PRODUCER** **27−Jun−2010 16:35**

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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: 23−Jun−2010 14:06							
Gamma Ray Background	30.00	N/A	29.00	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	168.1	N/A	168.1	N/A	N/A	15.28	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement							
Master: 19−May−2010 12:23 Before: 23−Jun−2010 14:07							
CNTC Background	27.64	27.64	27.27	N/A	N/A	4.146	CPS
CFTC Background	28.93	28.93	27.90	N/A	N/A	4.340	CPS
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement							
Master: 19−May−2010 12:23							
Thermal Near Corr. (Tank)	5800	5258	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2175	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.417	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration							
Before: 26−Jun−2010 11:48							
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	61.8	DEGF.
Thermal Housing Size	3.374	IN.
NSR−F serial number	5138	

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	5138
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

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		29.00	Before		168.1	Before		165.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			152.8 (Minimum) 168.1 (Nominal) 183.4 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 23−Jun−2010 14:06

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.64	Master		28.93
Before		27.27	Before		27.90
	5.000 (Minimum) 27.64 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 28.93 (Nominal) 40.00 (Maximum)	

Master: 19−May−2010 12:23 Before: 23−Jun−2010 14:07

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		5258	Master		2175	Master		2.417
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 19−May−2010 12:23

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: 26−Jun−2010 11:48

High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.64	Master		28.93
	5.000 (Minimum) 27.64 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 28.93 (Nominal) 40.00 (Maximum)	

Master: 19−May−2010 12:23

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		5258	Master		2175	Master		2.417
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 19−May−2010 12:23

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 CO.**
Well:	**PCU 197−34A3**
Field:	**PICEANCE CREEK**
County:	**RIO BLANCO**
State:	**CO**

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CORRELATION LOG
GAMMA RAY
CCLU