County: Rio Blanco

Schlumberger

Company: **ExxonMobil Production Corp**

Well: **PCU 297−11C3**

Field: **Piceance Creek**

County: **Rio Blanco** State: **Colorado**

CORRELATION LOG

CCL / GAMMA RAY

Field: Piceance Creek
Location: 998' FNL & 900' FWL
Well: PCU 297−11C3
Company: ExxonMobil Production Corp

LOCATION

998' FNL & 900' FWL

Elev.: K.B. 6993.20 ft
G.L. 6960.00 ft
D.F. 6992.20 ft

Permanent Datum: GROUND LEVEL Elev.: 6960.00 ft
Log Measured From: KELLY BUSHING 33.20 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.	Section	Township	Range
05−103−11473−0C	11	2S	97W

Logging Date	29−Apr−2010							
Run Number	1							
Depth Driller	8719 ft							
Schlumberger Depth	8502 ft							
Bottom Log Interval	8501 ft							
Top Log Interval	4000 ft							
Casing Fluid Type	FRESH WATER							
Salinity	250 ppm							
Density	8.4 lbm/gal							
Fluid Level	15 ft							
BIT/CASING/TUBING STRING								
Bit Size	9.875 in							
From	0 ft							
To	8719 ft							
Casing/Tubing Size	7.000 in							
Weight	26 lbm/ft							
Grade								
From	0 ft							
To	8719 ft							
Maximum Recorded Temperatures	206 degF							
Logger On Bottom Time	29−Apr−2010	0:59						
Unit Number Location	2276	VERNAL						
Recorded By	KATIE WALSH							
Witnessed By	JOHN WOOD							

		Run 1	Run 2	Run 3
PVT DATA	Oil Density			
	Water Salinity	250 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 Time								
Unit Number Location								
Recorded By								
Witnessed By								

Run 4

DEPTH SUMMARY LISTING

Date Created: 28−APR−2010 14:35:56

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46A XS
Serial Number:	6195	Serial Number:	2527	Serial Number:	7232
Calibration Date:	12−APR−2010	Calibration Date:	11−APR−201	Length:	20090 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:	18	Rig Type:	LAND
Wheel Correction 2:	−8	Calibration Peak Error:	27		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	105.90 FT
Rig Up Length At Bottom:	105.60 FT
Rig Up Length Correction:	0.30 FT
Stretch Correction:	4.00 FT
Tool Zero Check At Surface:	0.30 FT

Depth Control Remarks

1. This is the first run in hole and therefore the reference for all subsequent logs
2. IDW used as primary depth control; Z−chart used as secondary
3. All Schlumberger depth control policies followed
4.
5.
6.

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

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Tool run as per tool sketch	
Tool run centralized using 2x GEMCO's and 2x in−line centralizers	
Neutron run for GR only	
UFAO = −1	
Logged at 1800'/hr max	
Expected casing thickness = 0.362" / Observed = 0.369"	
Expected internal radius = 3.13" / Observed = 3.18"	
Expected flexural attenuation in free pipe = 55dB / Observed = 55.5 dB	
Log monitored by real−time virtual SOC	

Log monitored by real−time virtual SQC

RUN 1		
SERVICE ORDER #:	B49A00054	
PROGRAM VERSION:	17C0−154	
FLUID LEVEL:	15 ft	
LOGGED INTERVAL	START	STOP

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

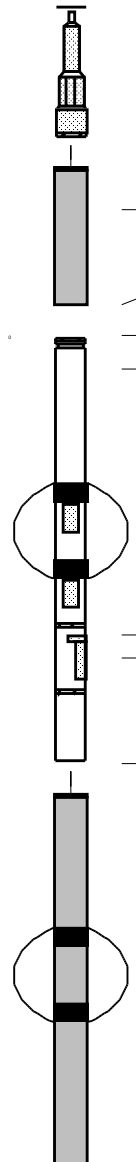
EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

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

DOWNHOLE EQUIPMENT



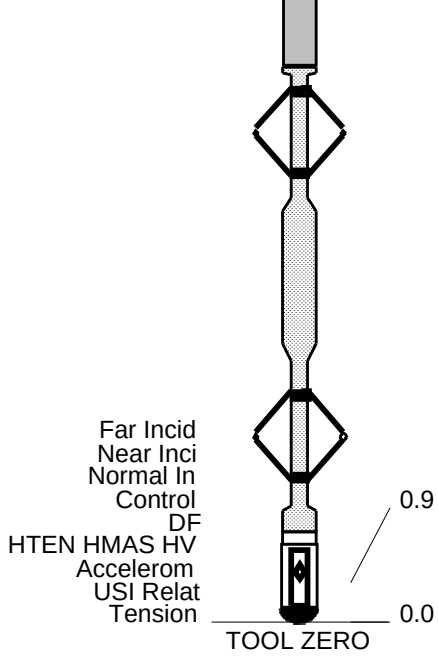
LEH−QT — 37.0
LEH−QT

DTC−H — 34.1
ECH−KC
DTCH0−A
DTCH1−A
CTEM — 33.2
TelStatus
ToolStatu — 31.1
HGNS HTEM
HMCA — 31.1

HILTH−FTB — 31.1
HGNSD−H
HMCA−H
HGNH
NLS−KL
NSR−F
HACCZ−H 3577
HCNT−H
HGR
NPV−N
HGNS Gamm — 30.4
HGNS Neut — 24.5
HGNS Neut — 24.0
HGNS sens — 21.7

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

Schlumberger

CORRELATION

MAXIS Field Log

Company: ExxonMobil Production Corp **Well: PCU 297−11C3**

Input DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_013LUP	FN:12	PRODUCER	29−Apr−2010 00:59	8505.5 FT	100.0 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Apr−2010 04:44	8505.5 FT	100.0 FT

OP System Version: 17C0−154

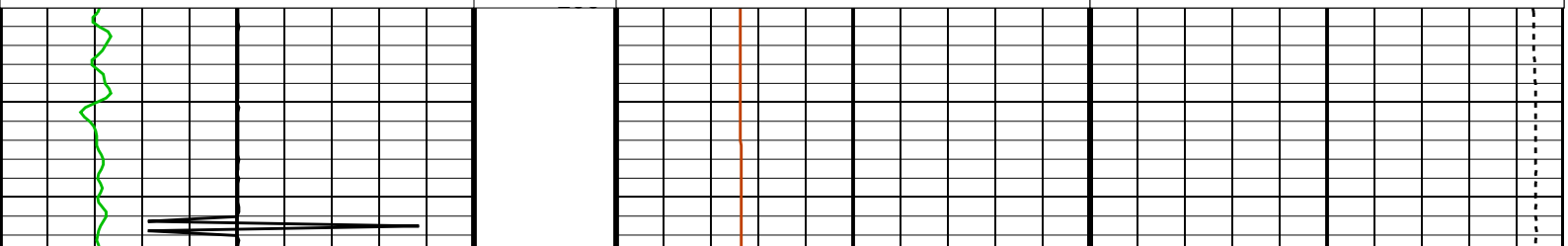
USIT−D	17C0−154	HILTH−FTB	17C0−154
DTC−H	17C0−154		

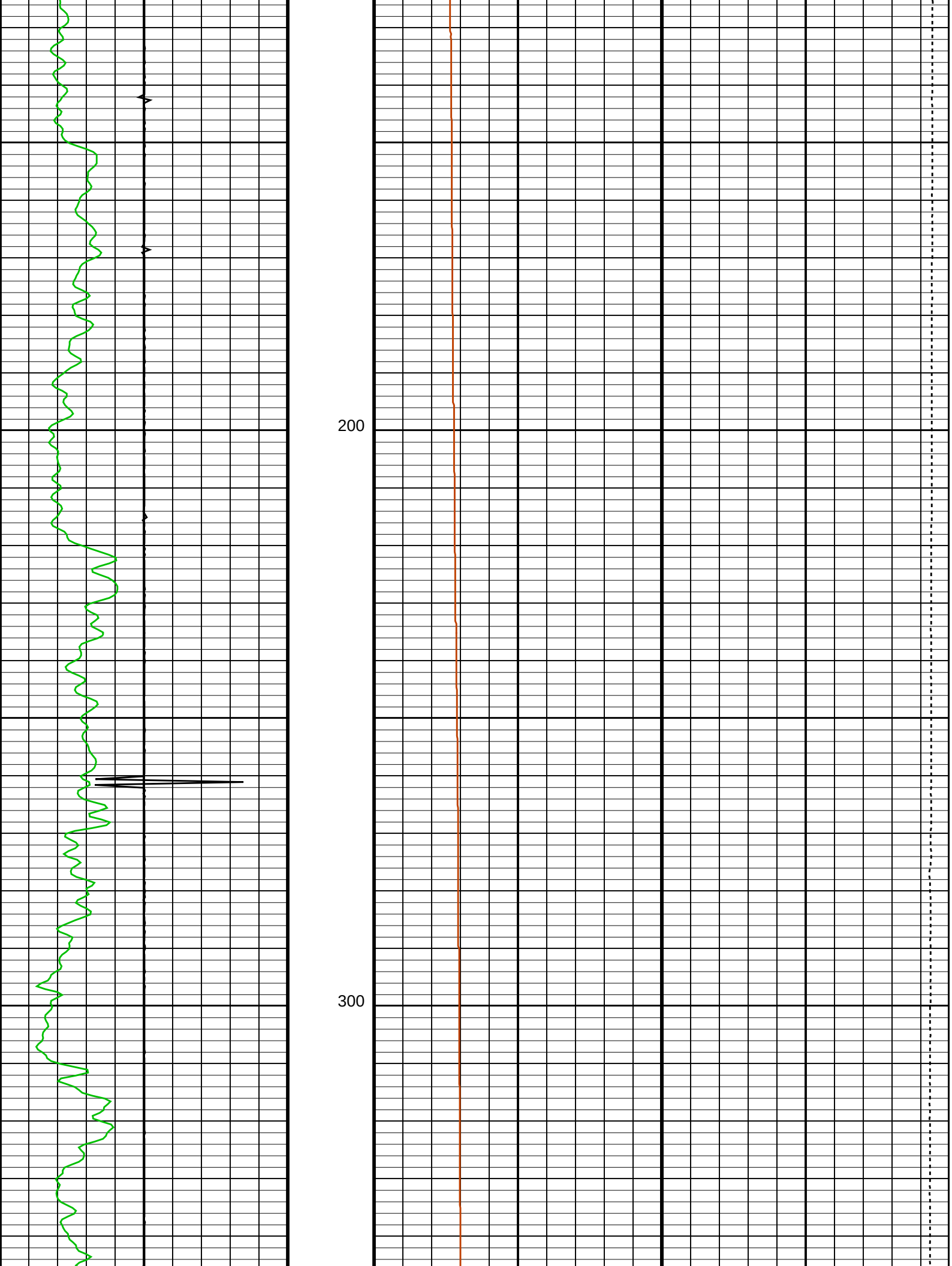
CCL (CCLU)		
−20	(−−−−	20

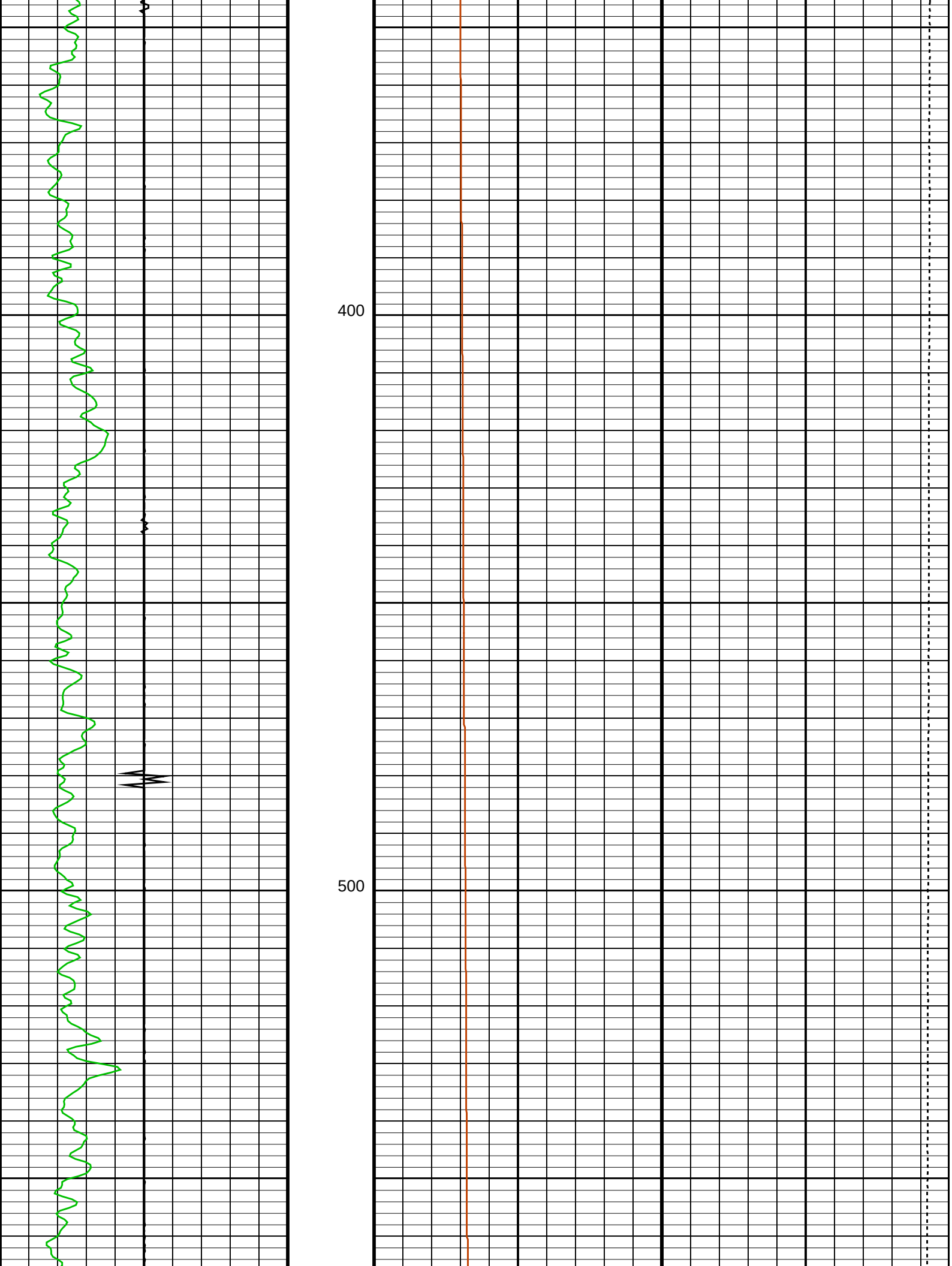
Gamma Ray (GR)		
0	(GAPI)	150

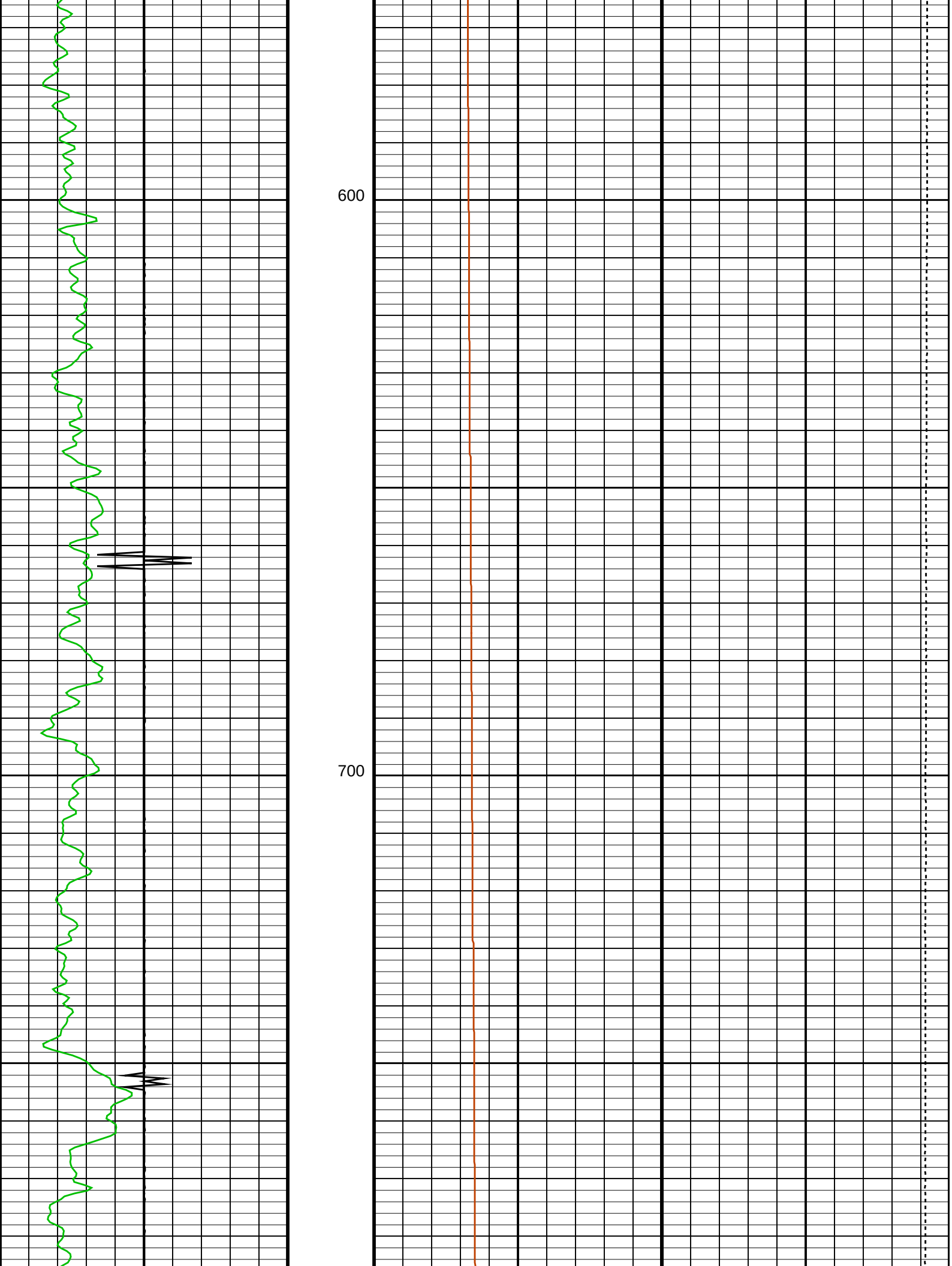
HTC Cartridge Temperature (HTEM)		
20	(DEGF)	220

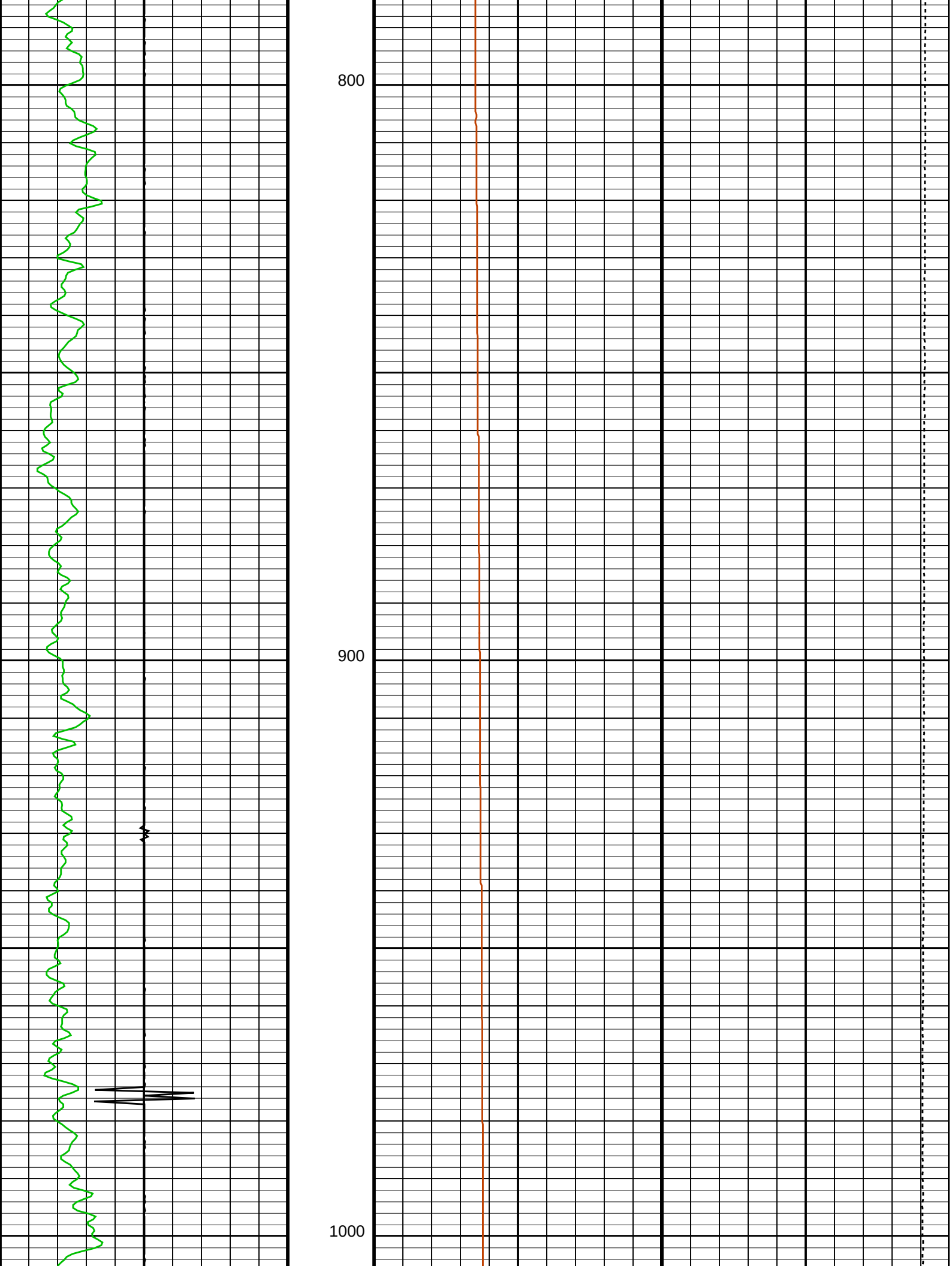
Tension (TENS)		
10000	(LBF)	0

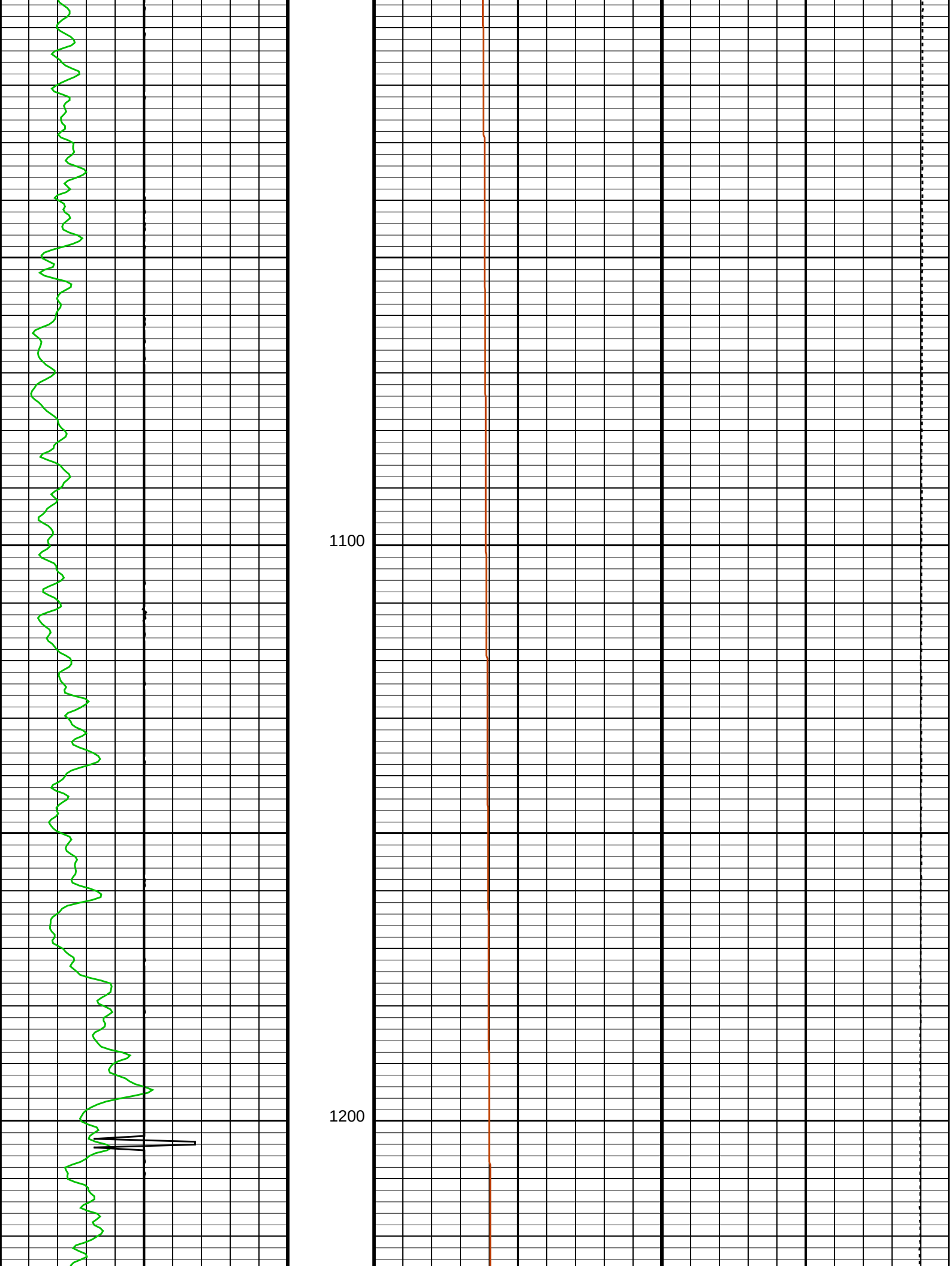


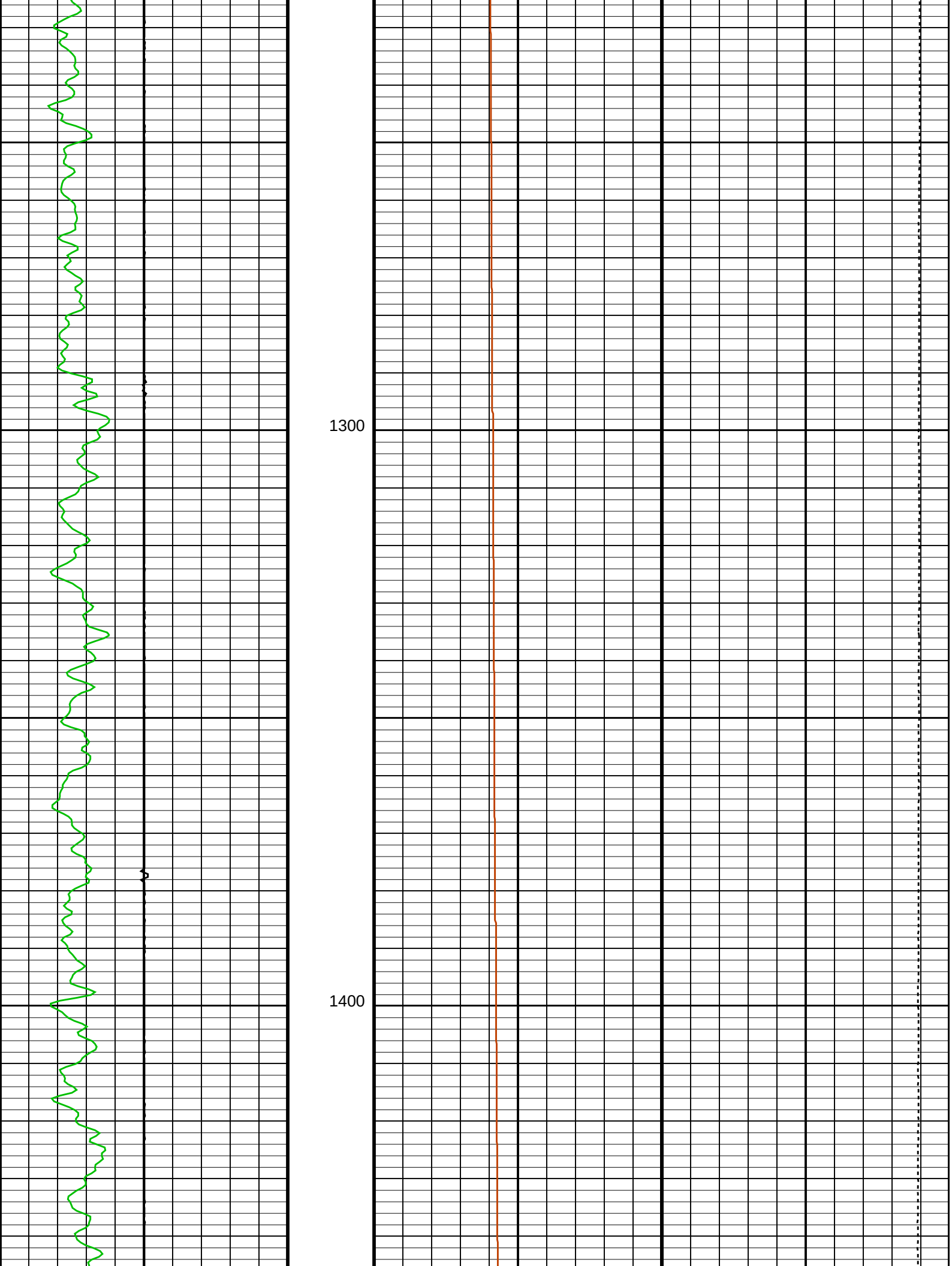

200
300

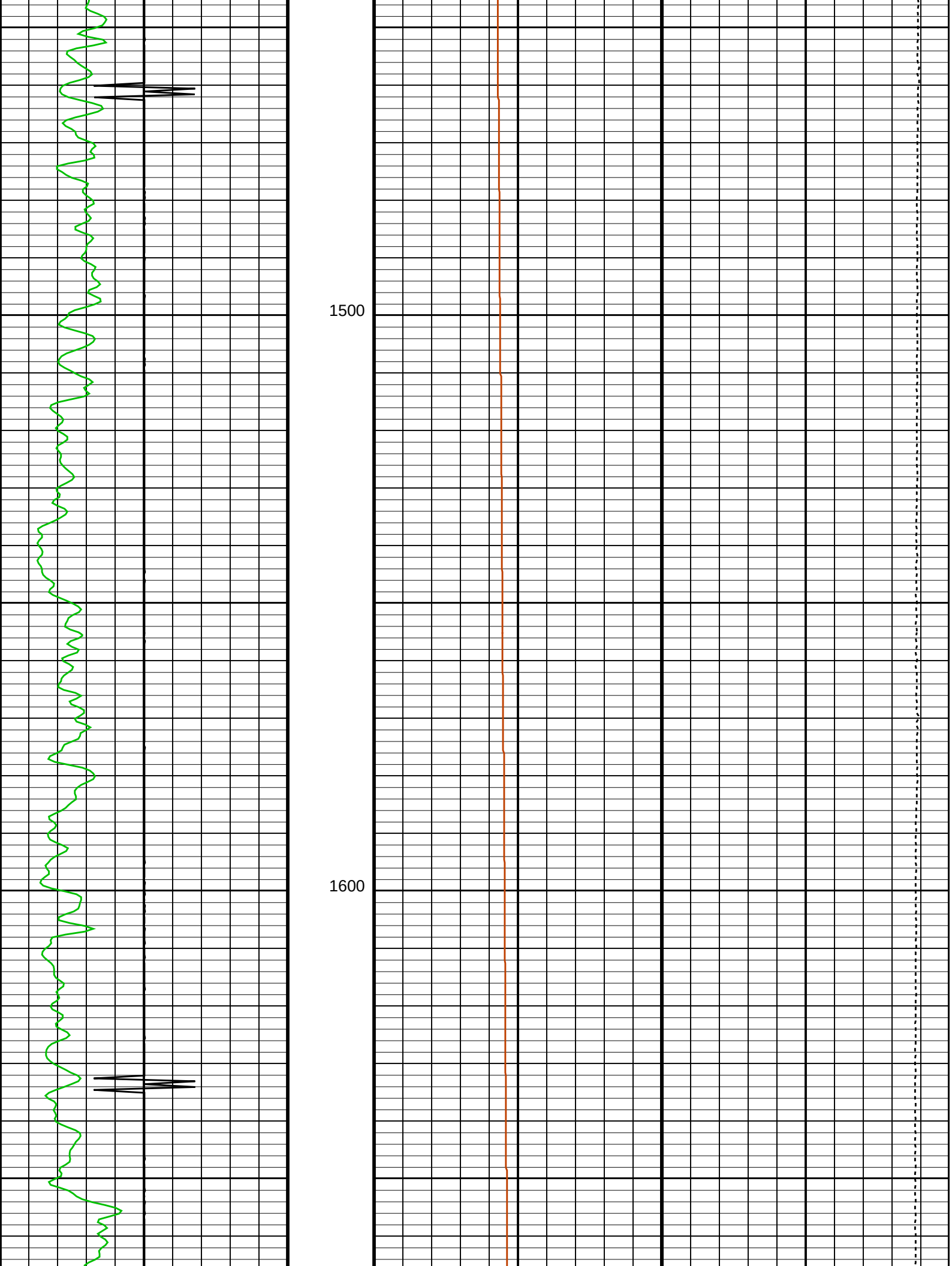

400
500

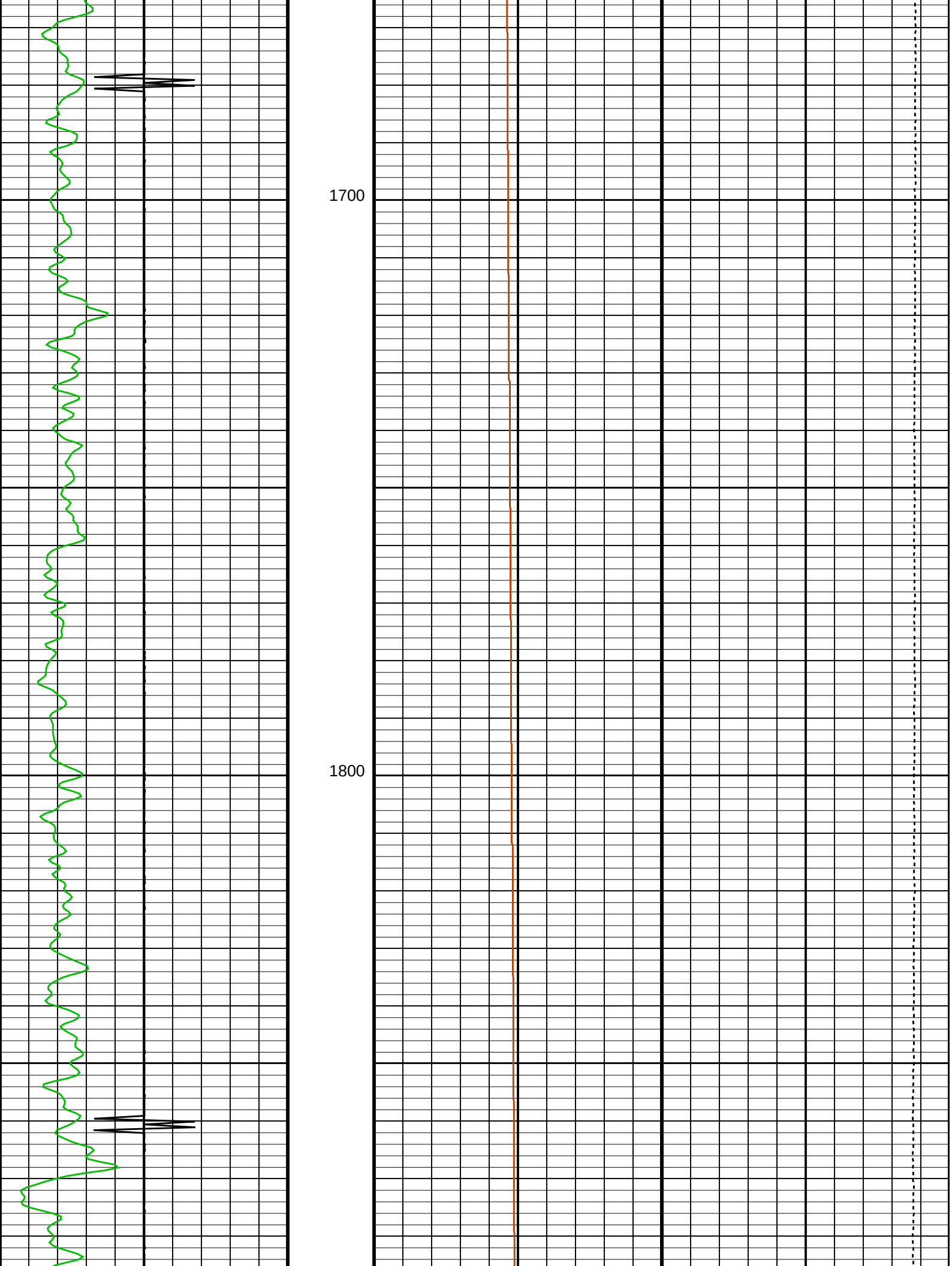

600
700

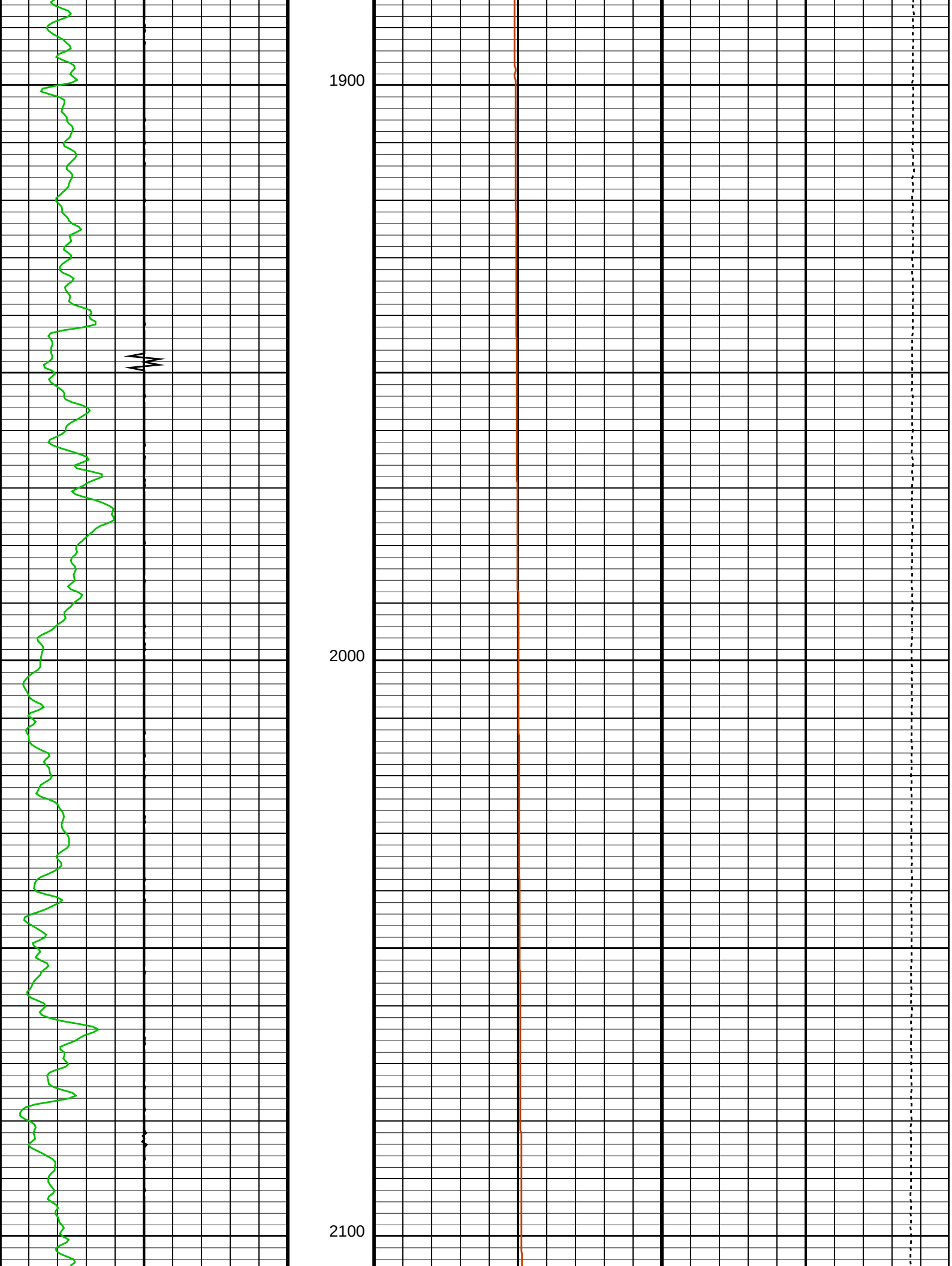

800
900
1000

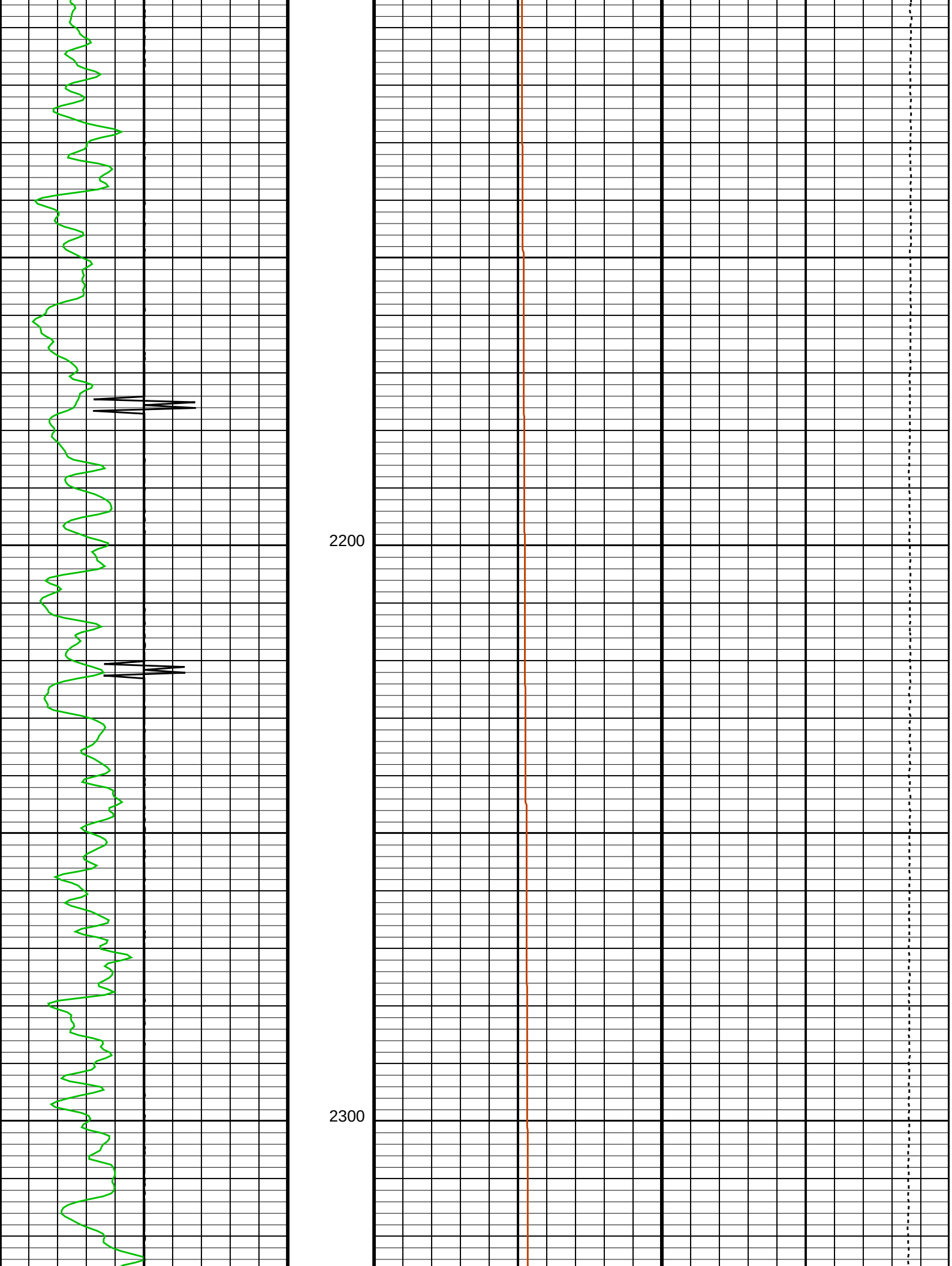

1100
1200

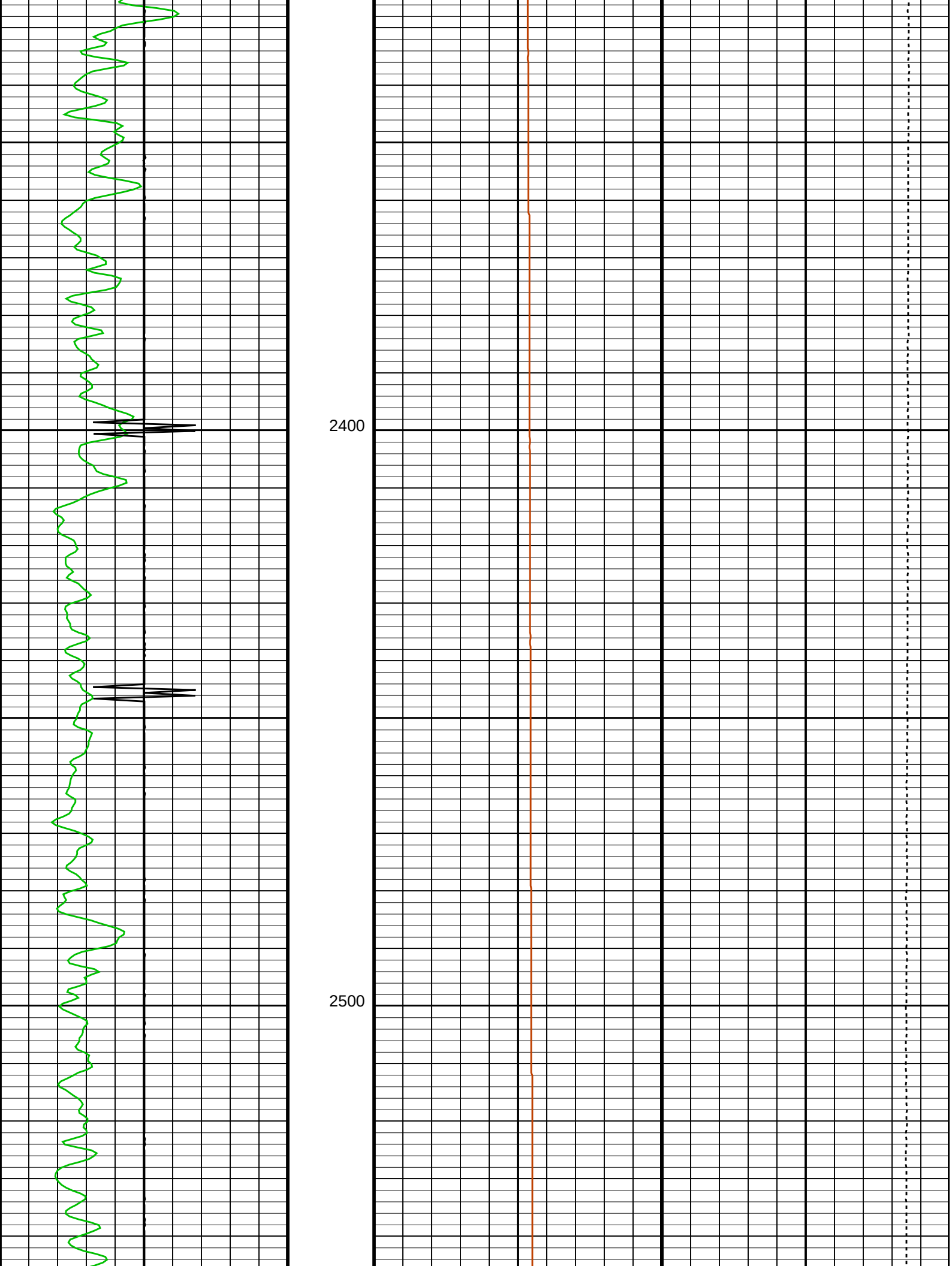

1300
1400

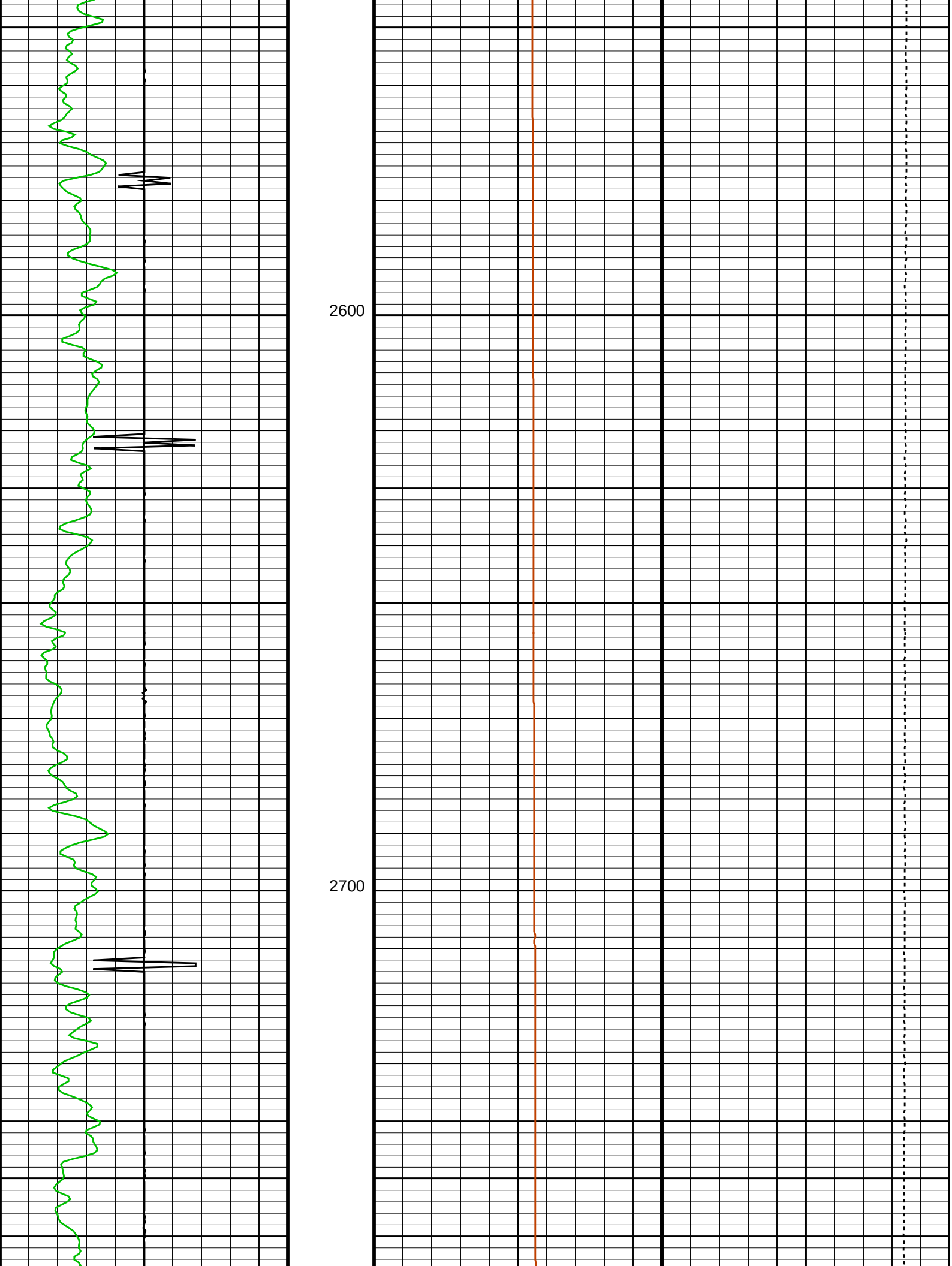

1500
1600

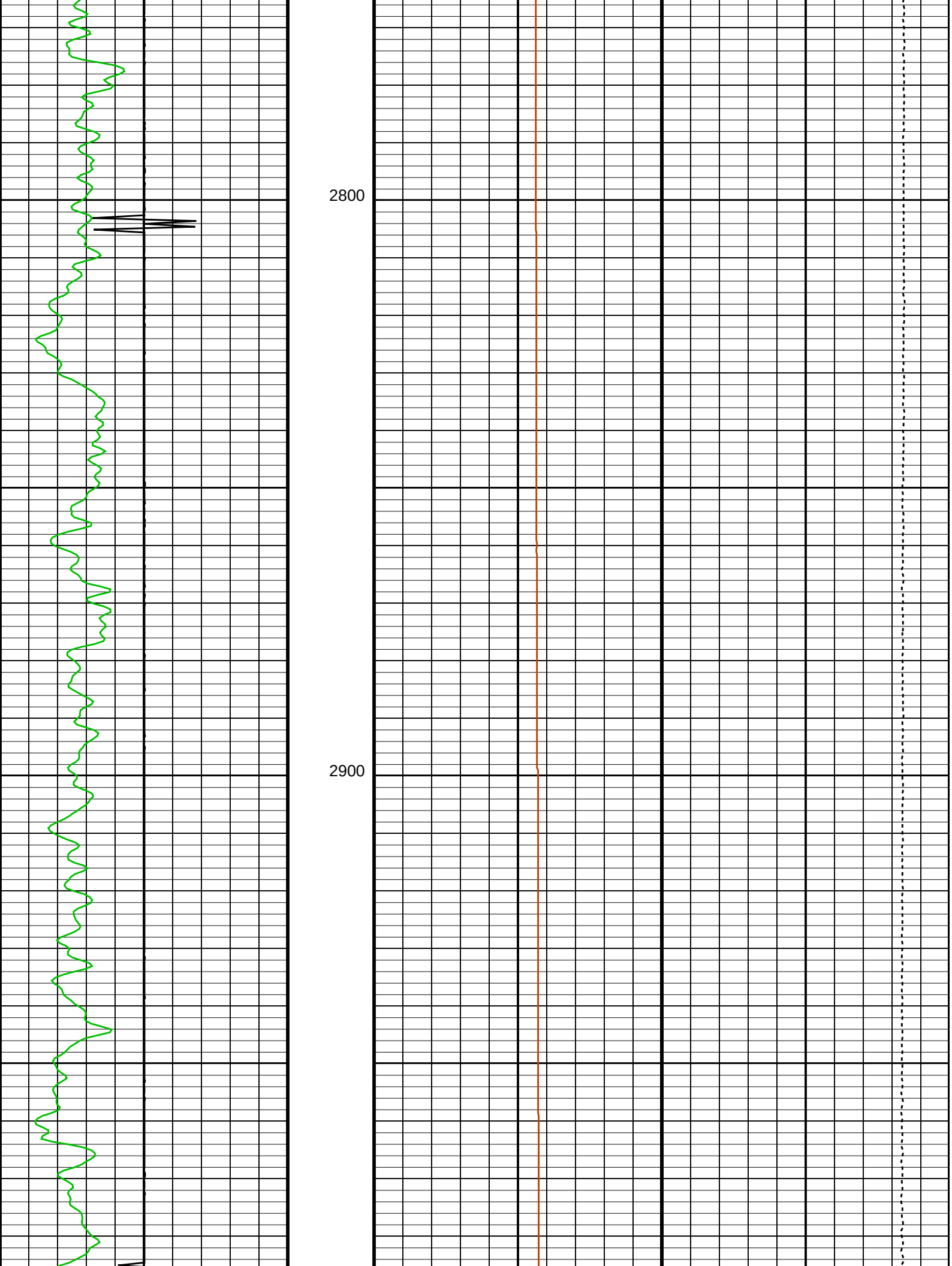

1700
1800

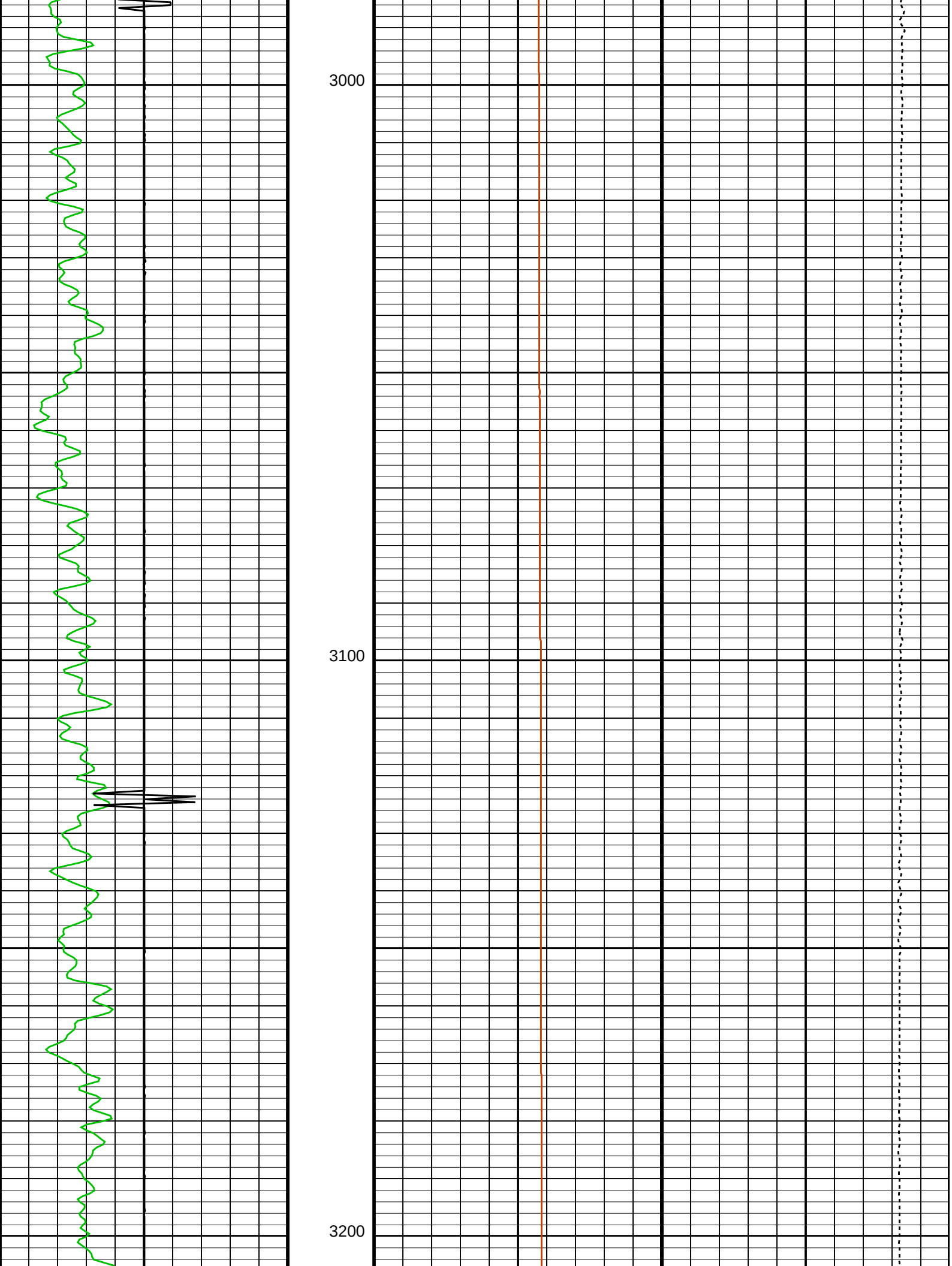

1900
2000
2100

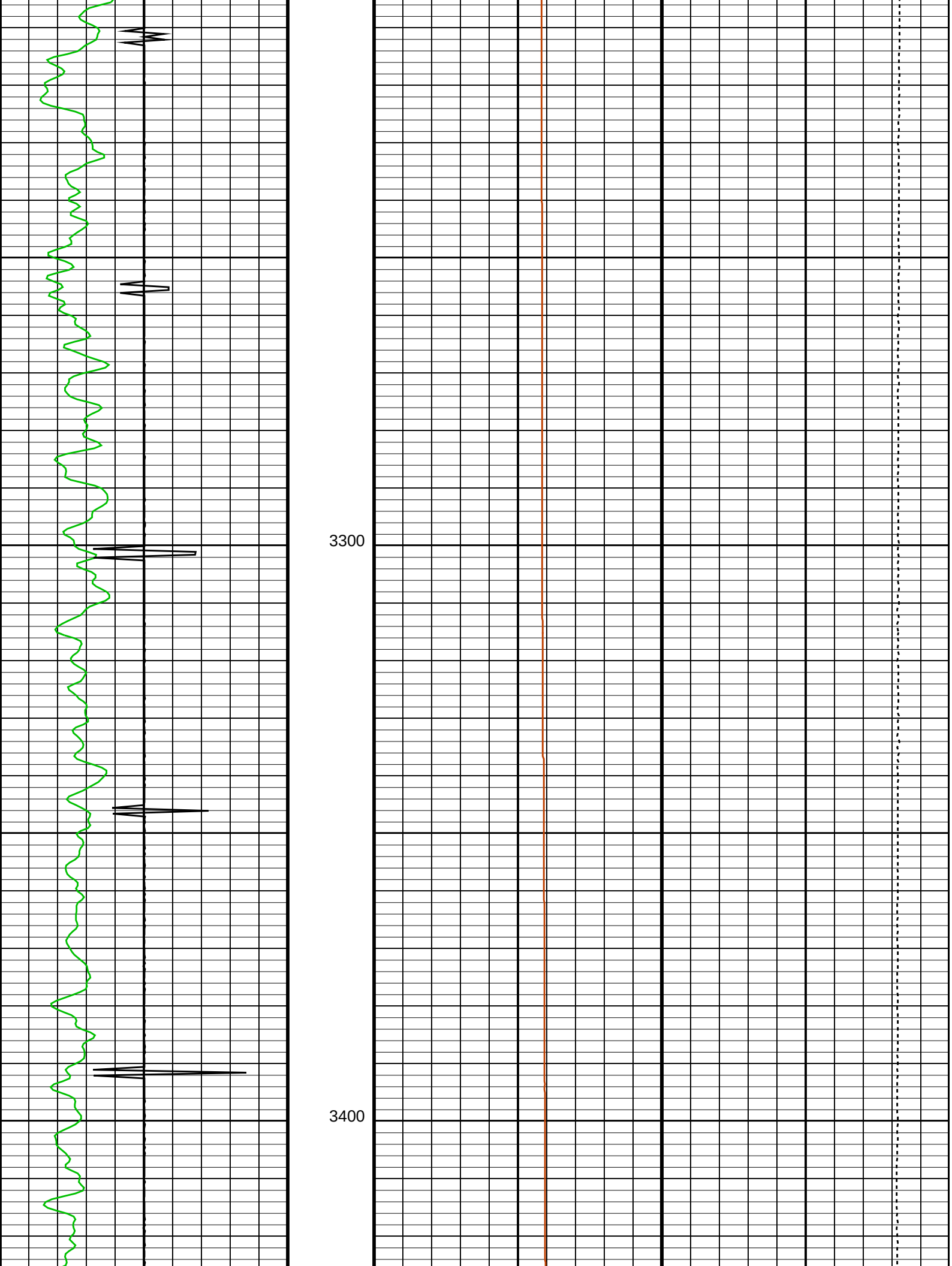

2200
2300

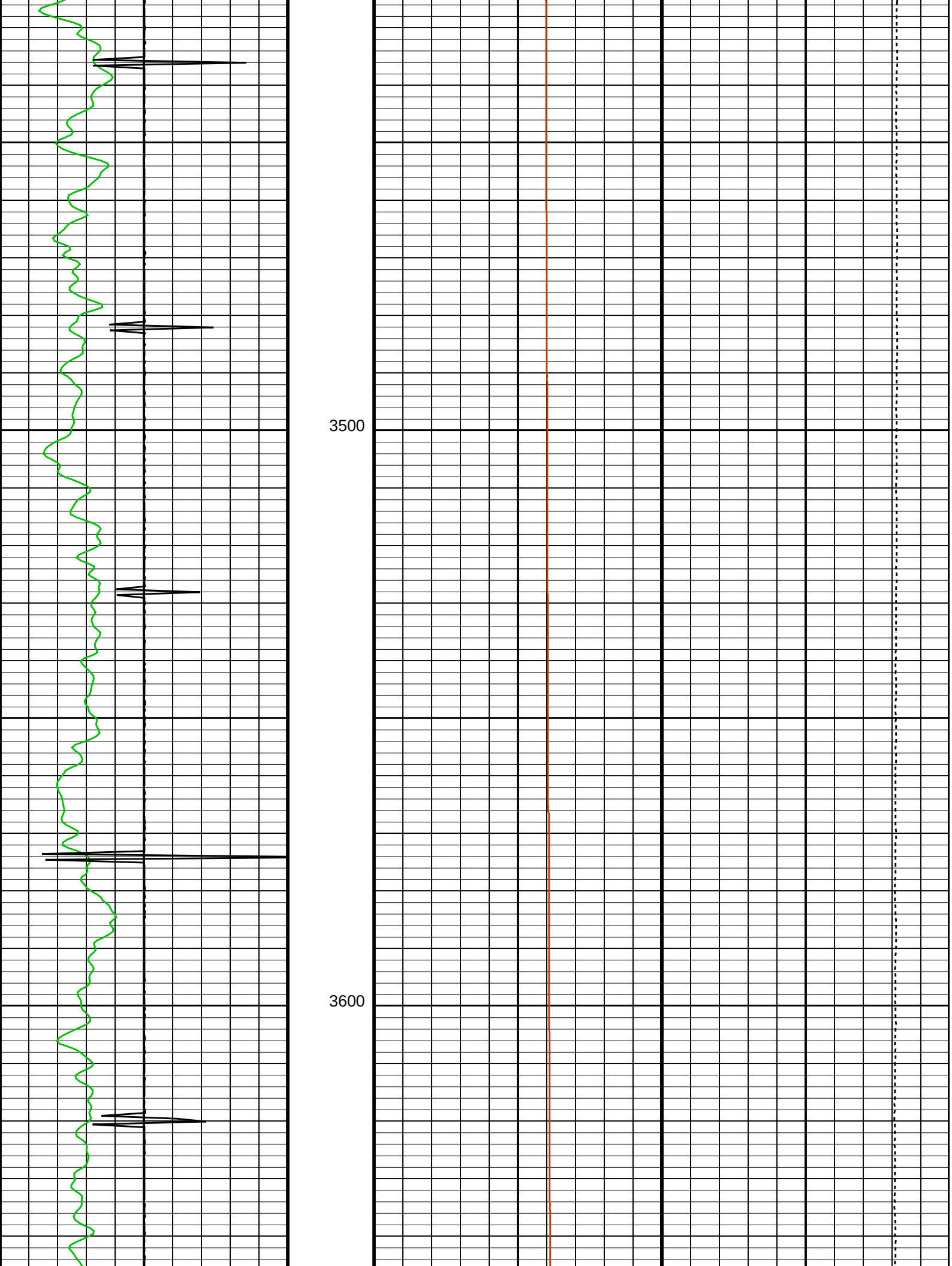

2400
2500

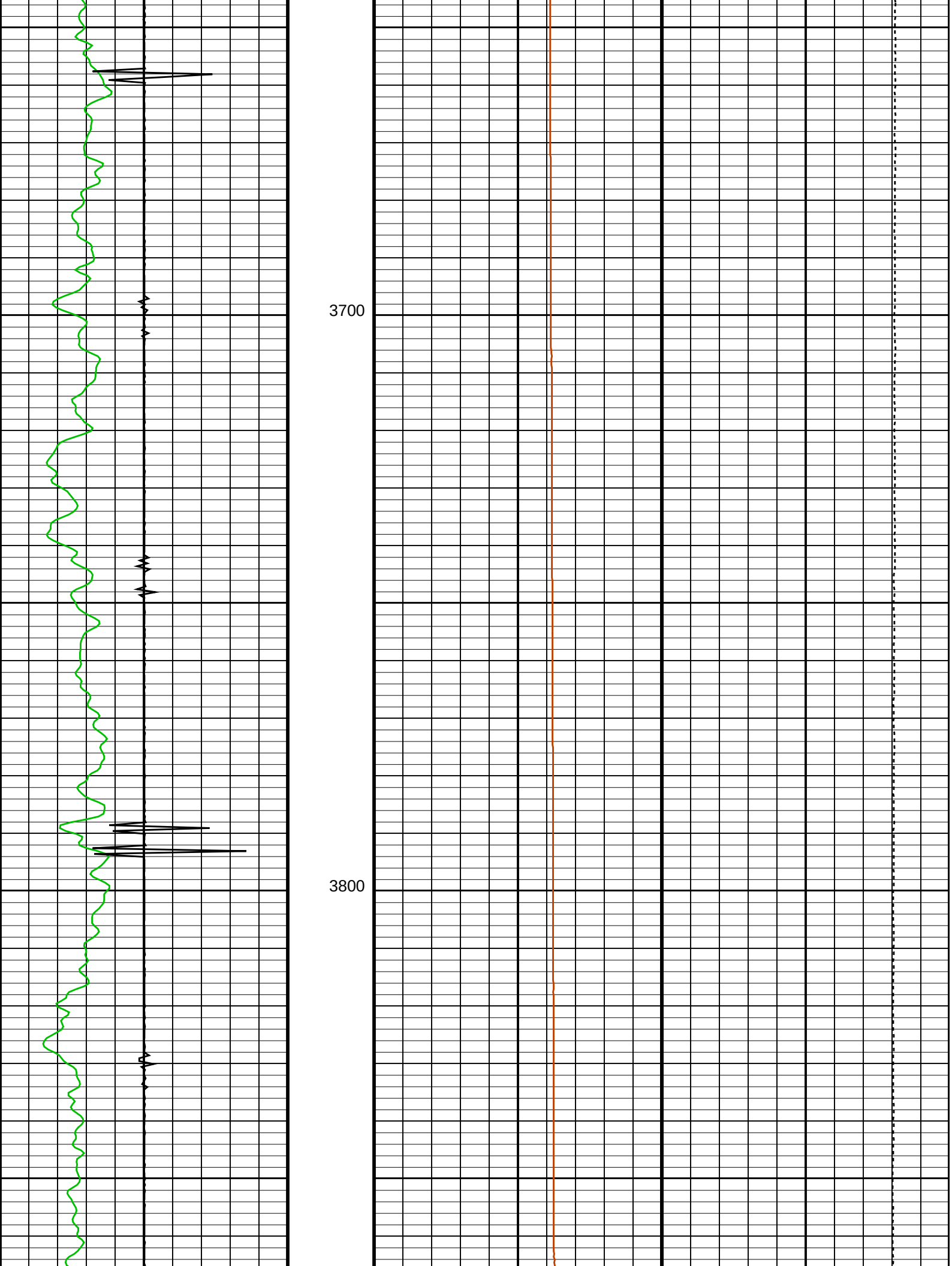

2600
2700

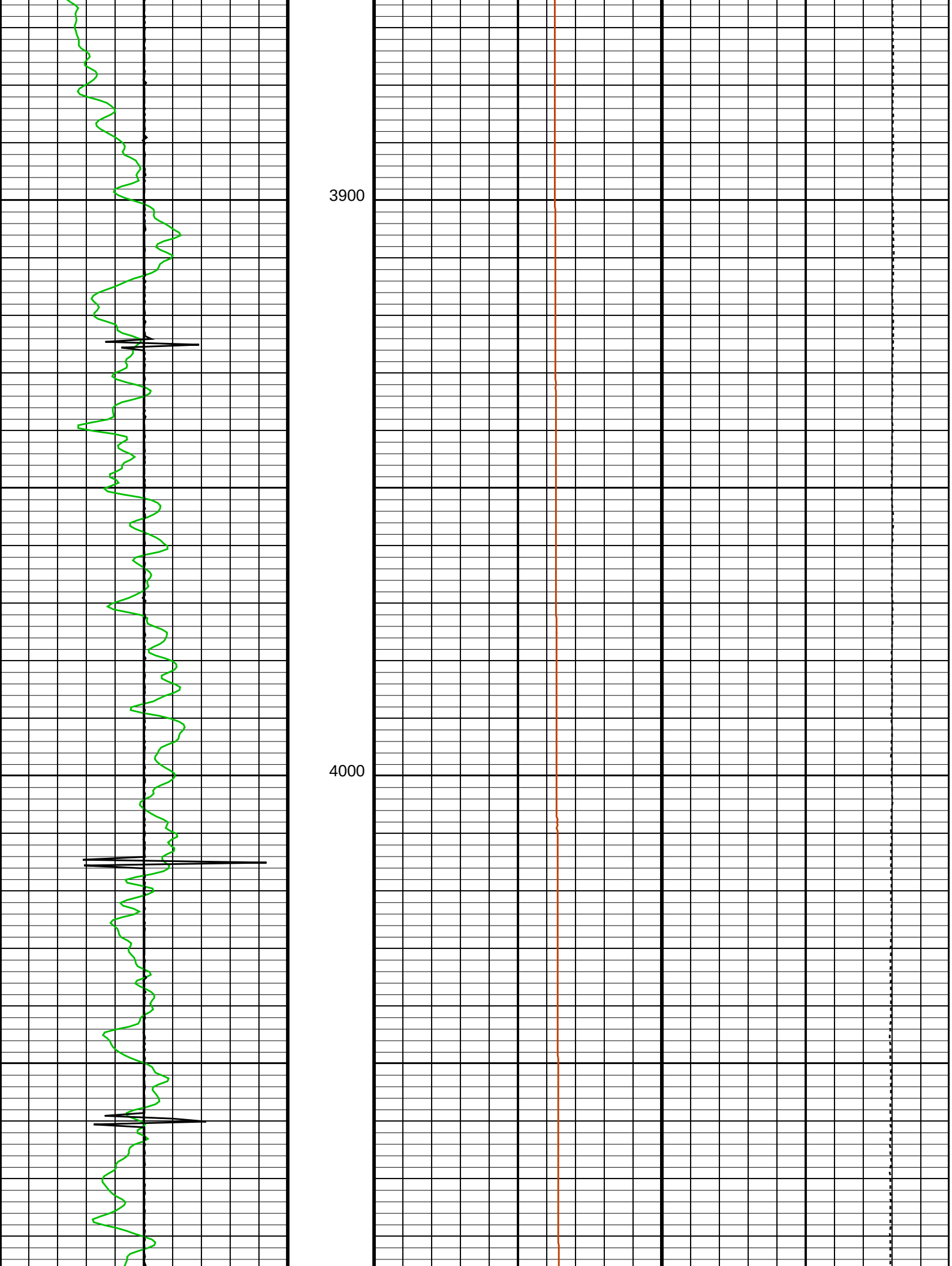

2800
2900

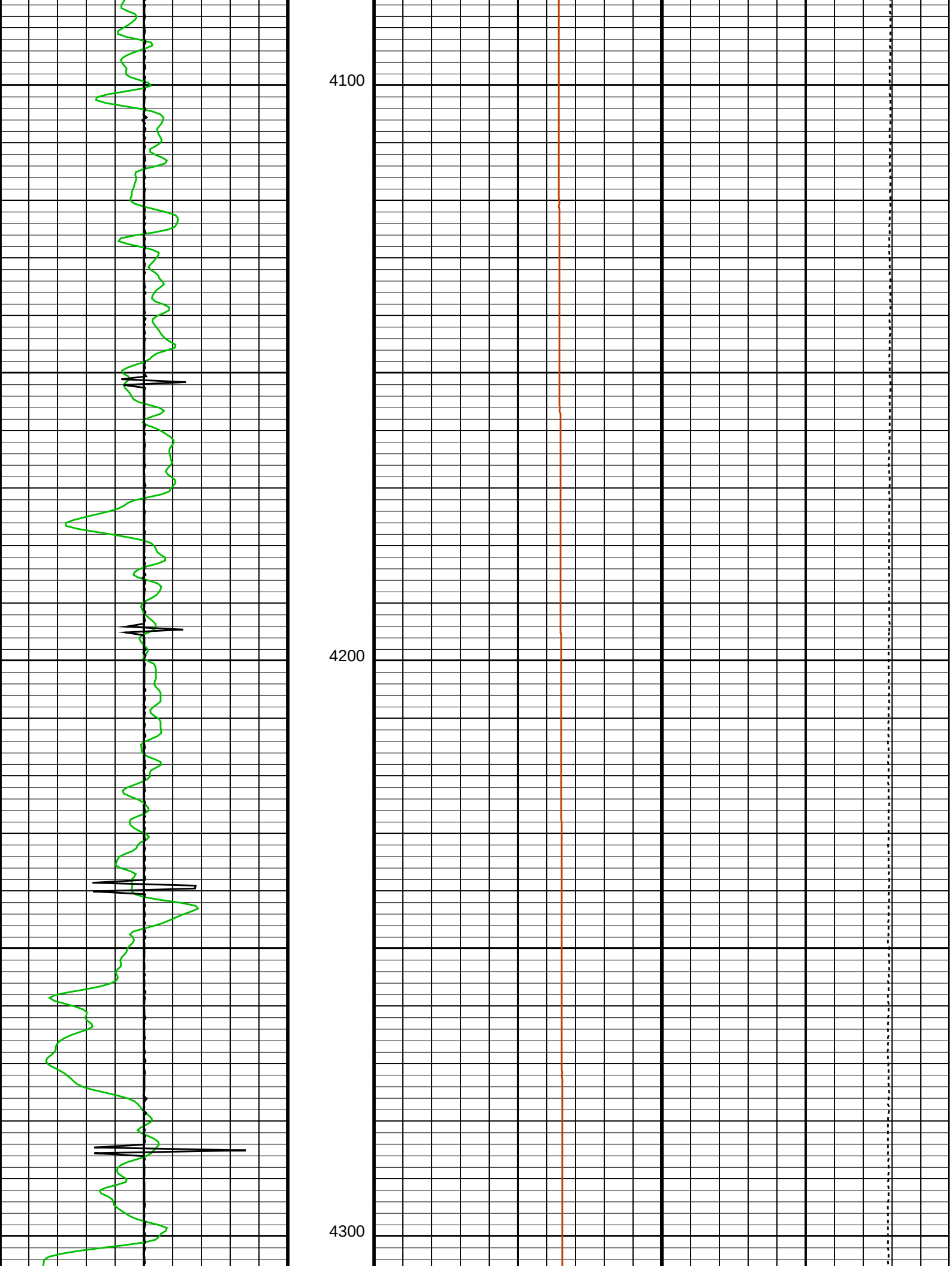

3000
3100
3200

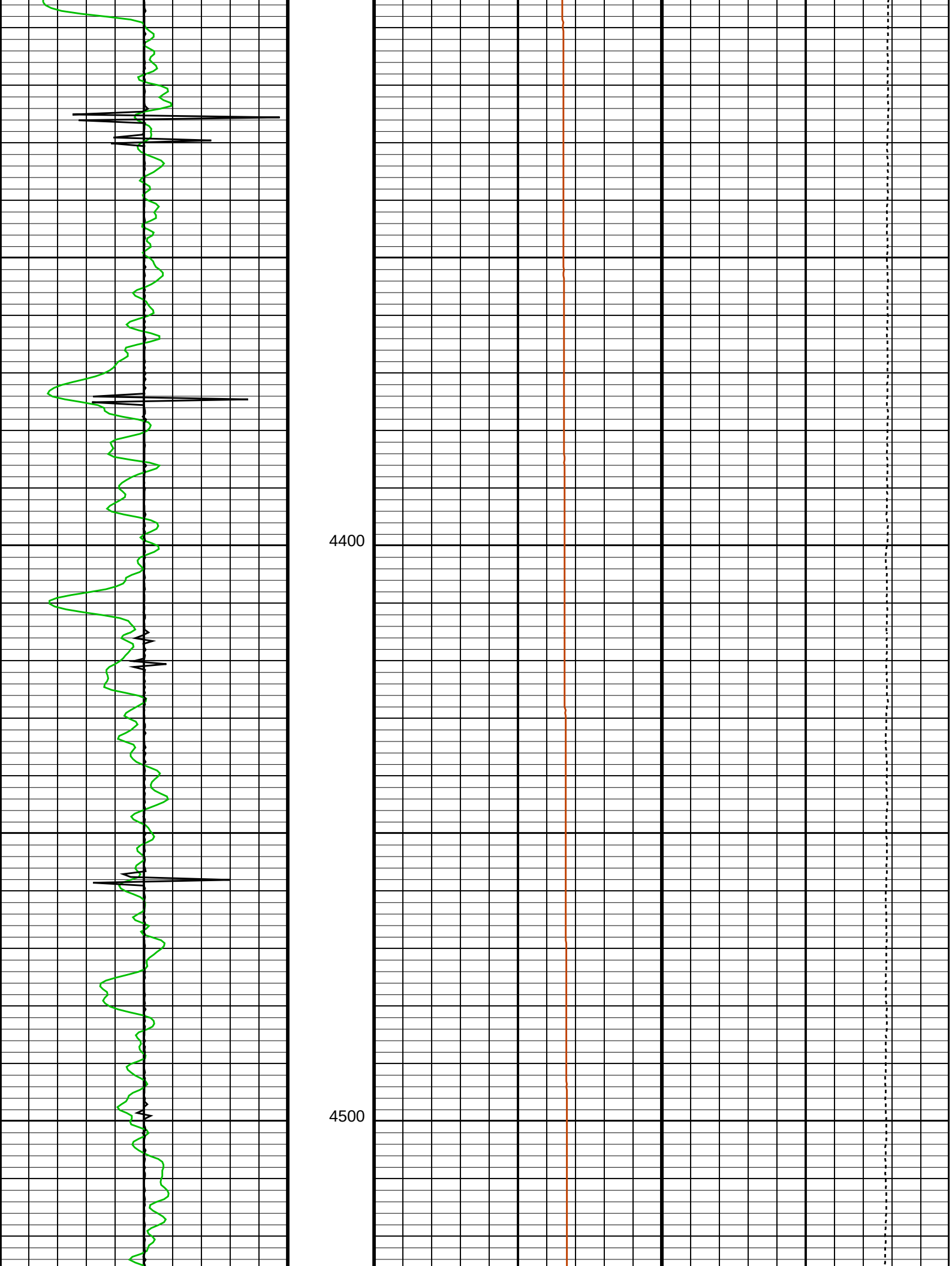

3300
3400

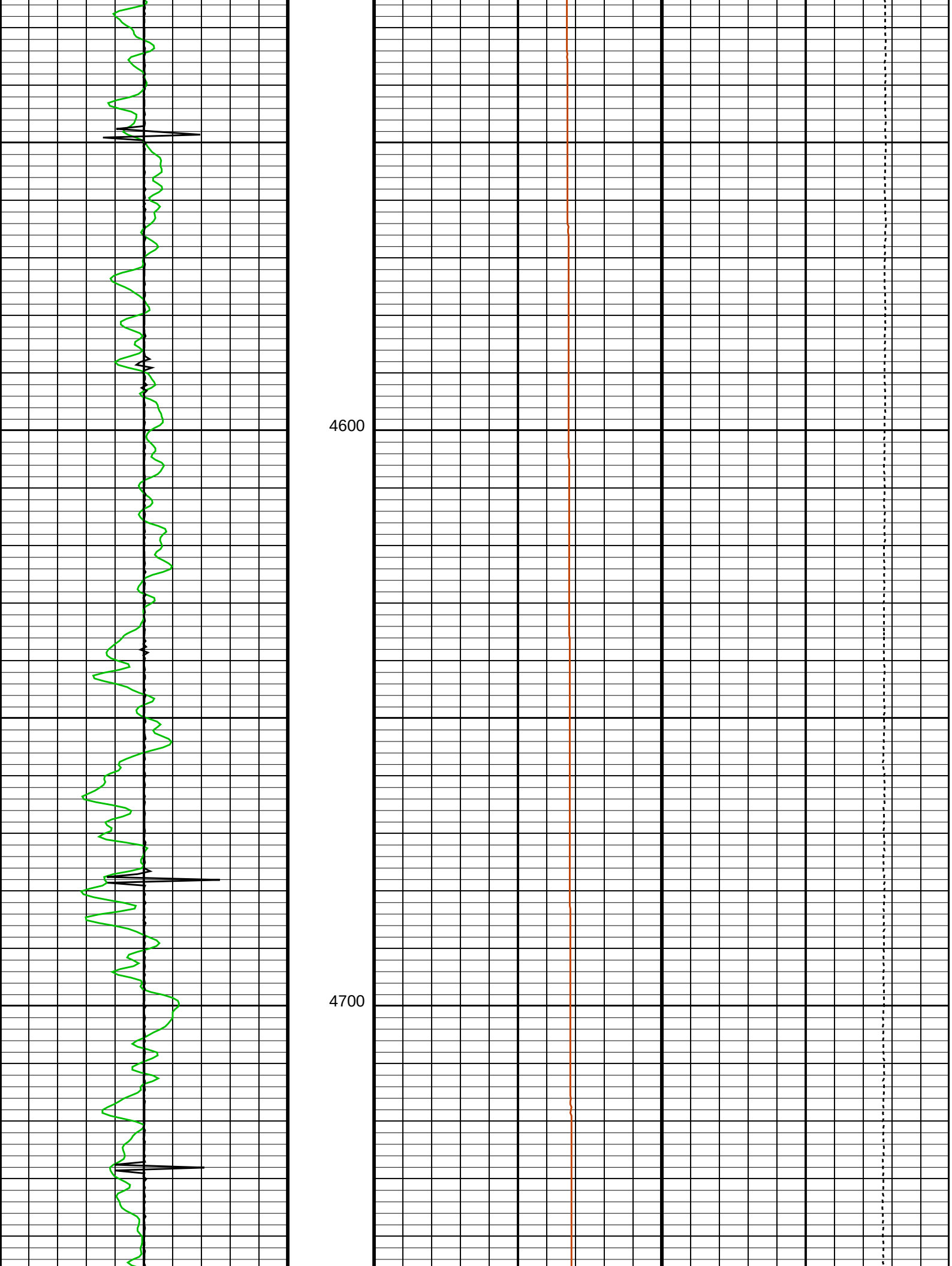

3500
3600

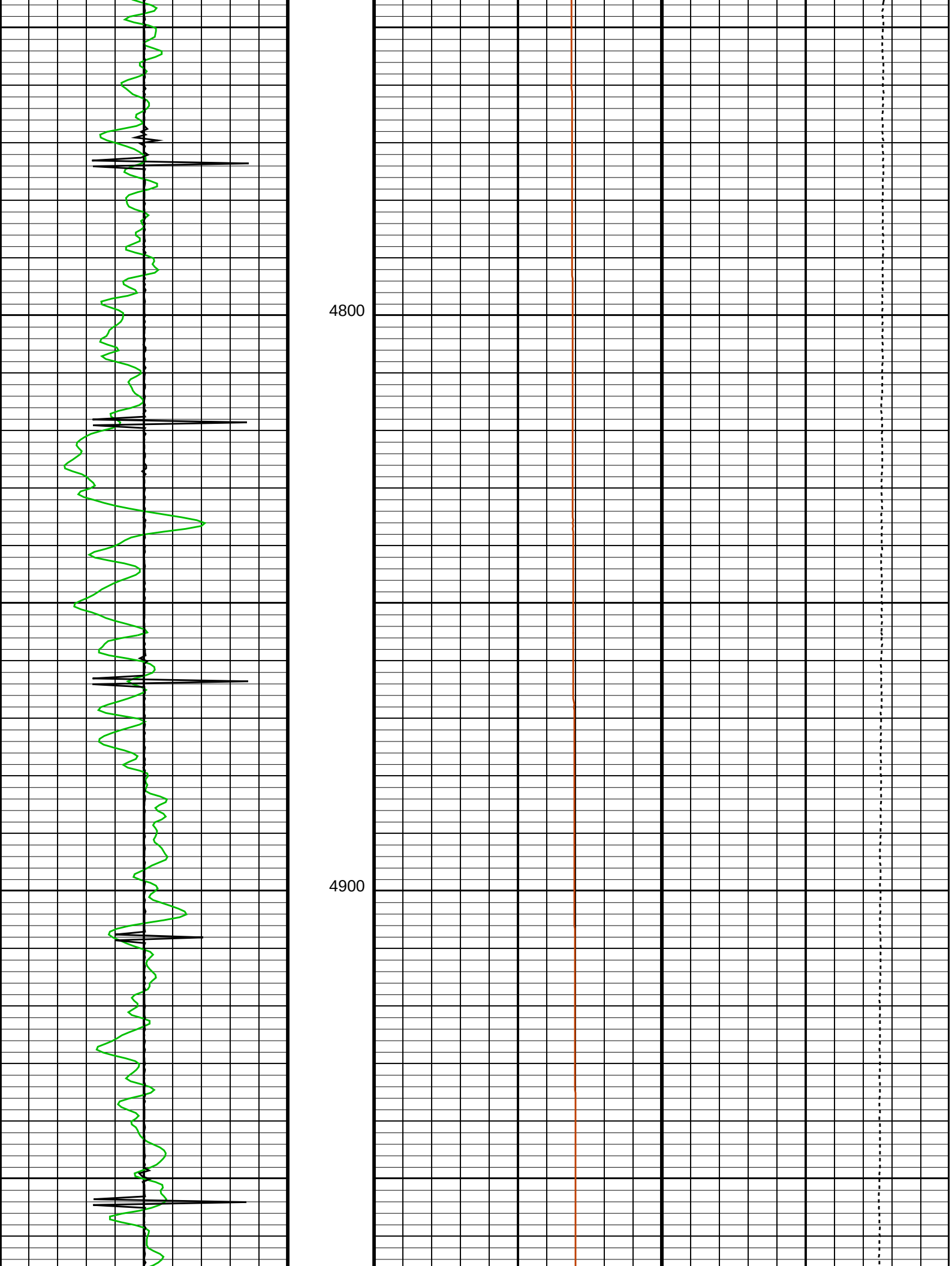

3700
3800

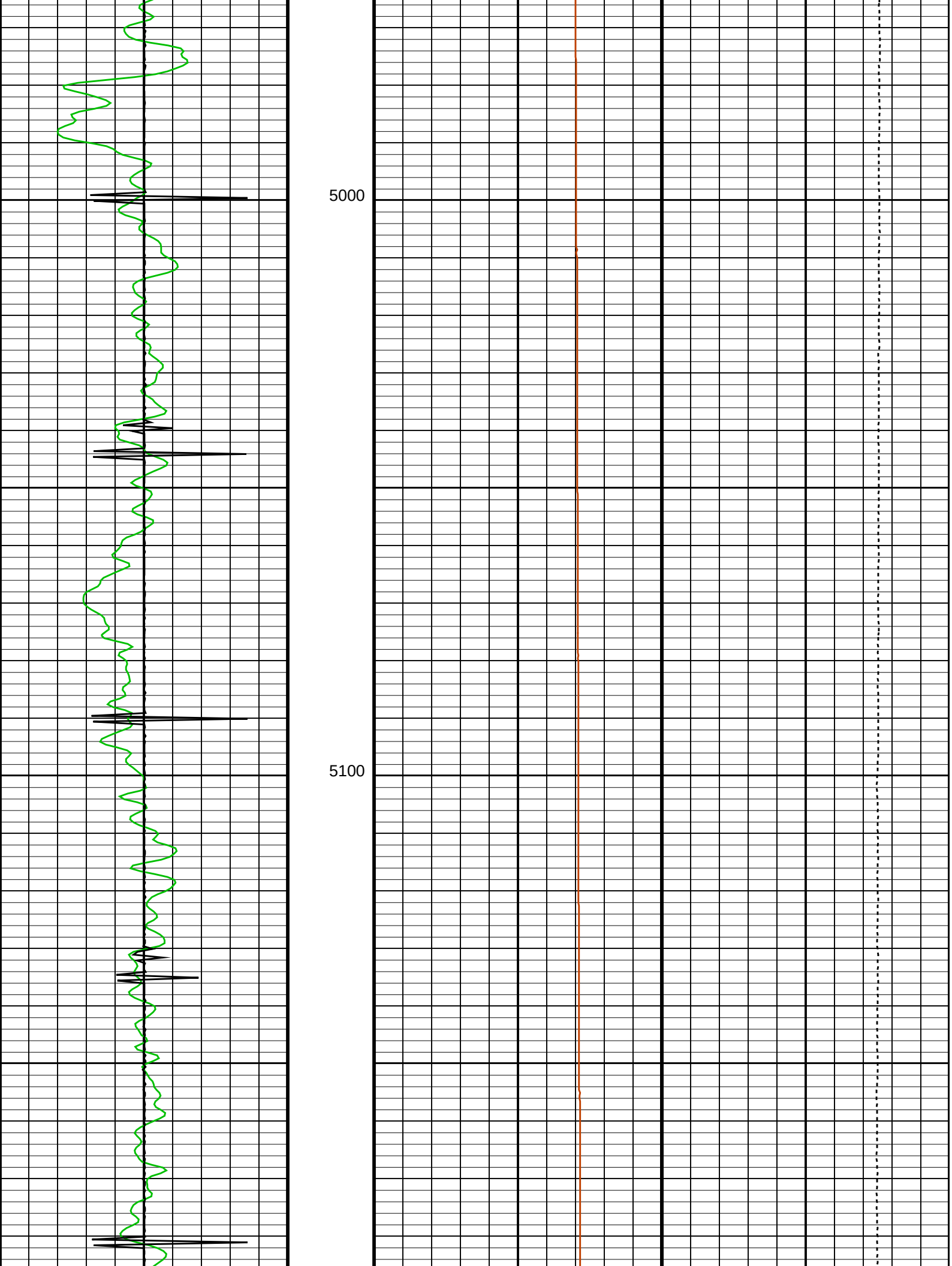

3900
4000

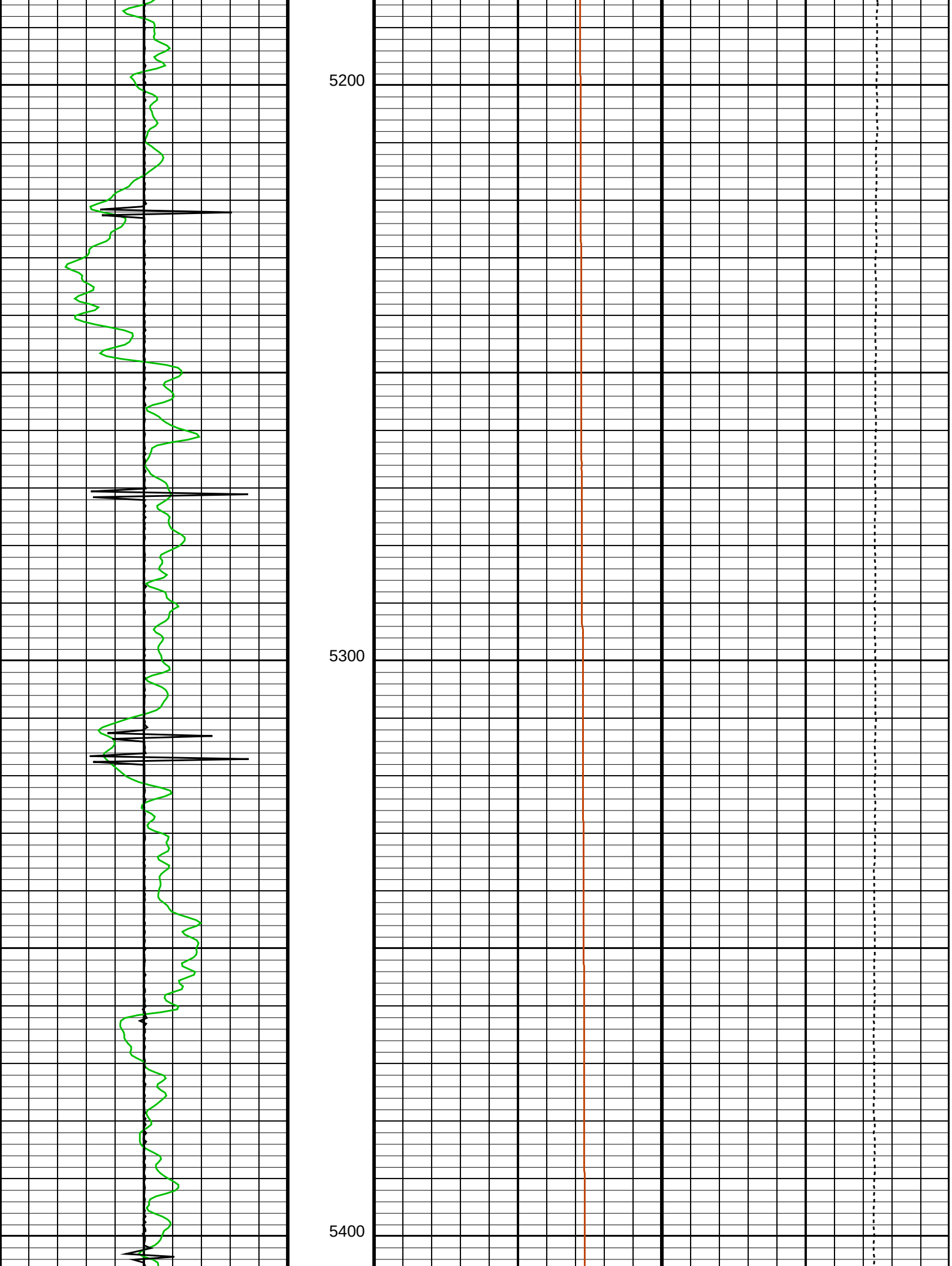

4100
4200
4300

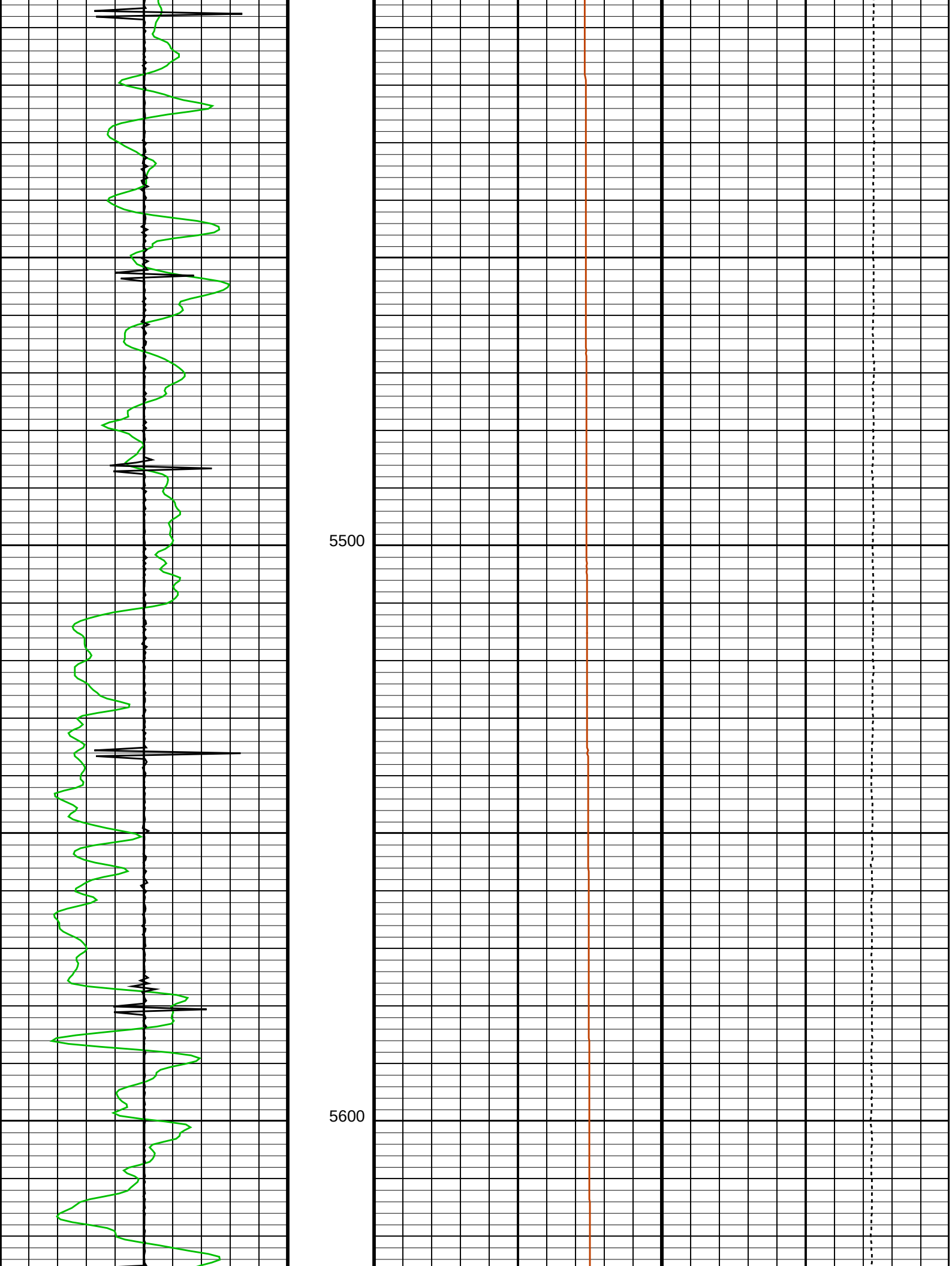

4400
4500

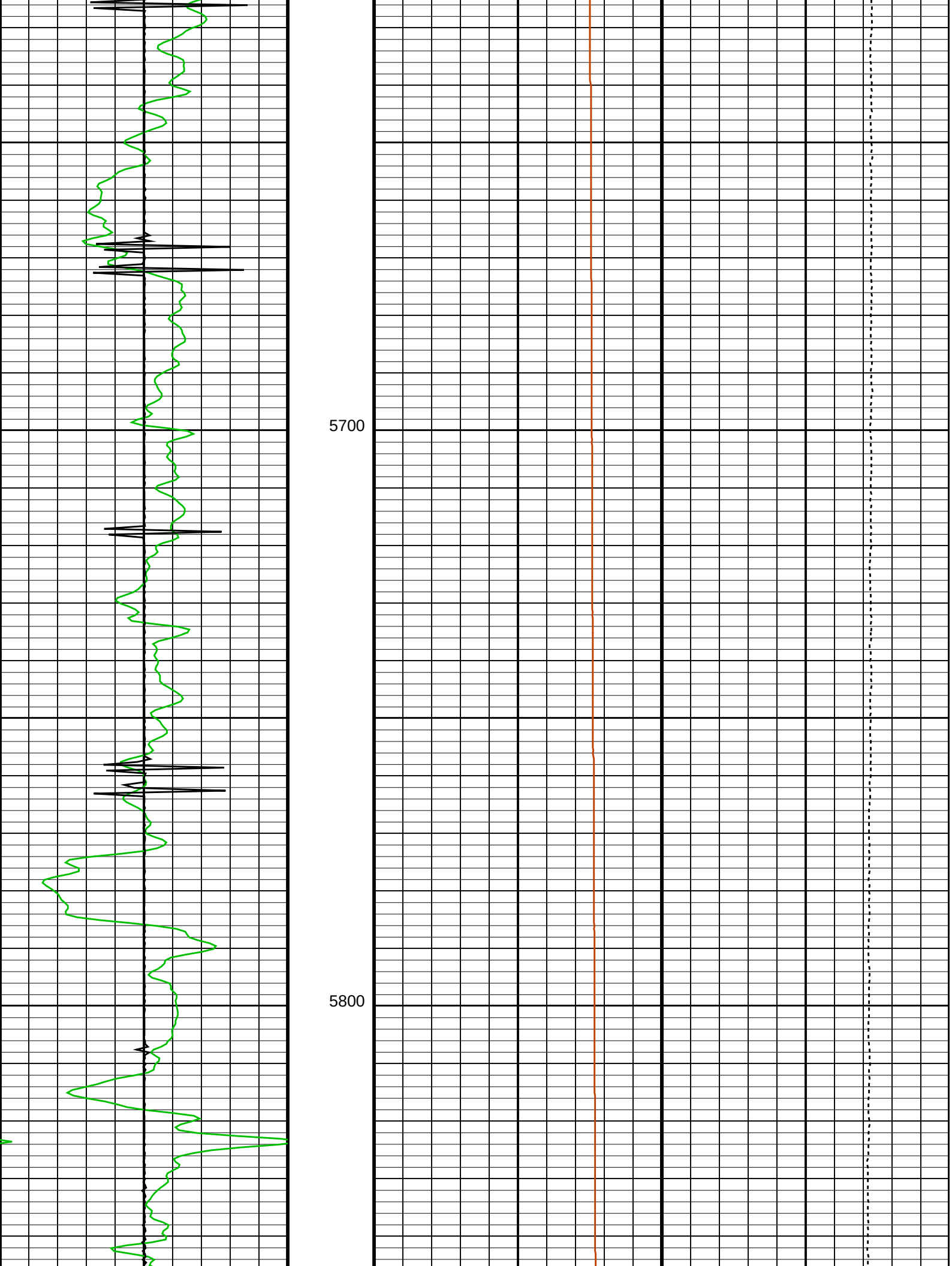

4600
4700

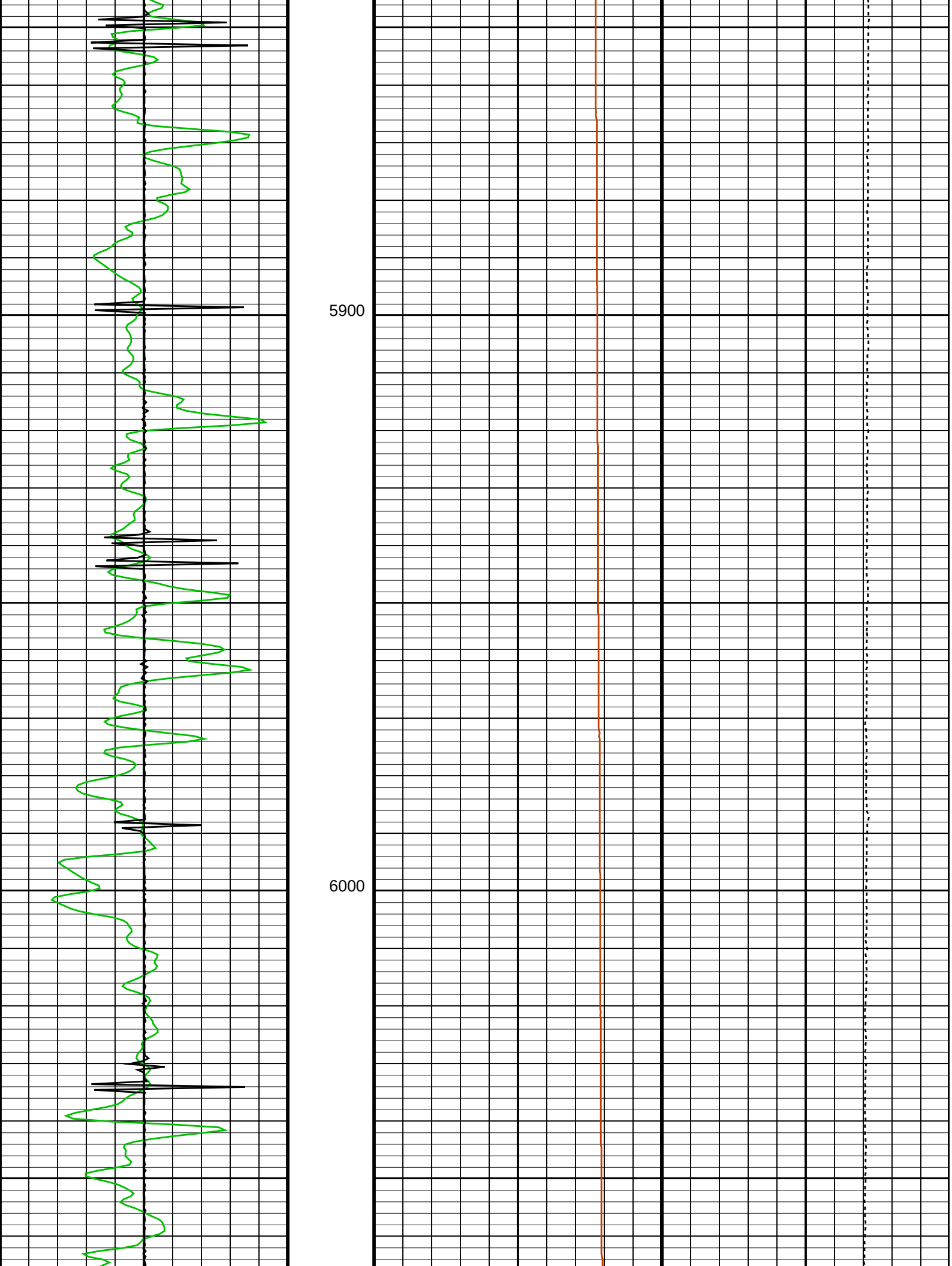

4800
4900

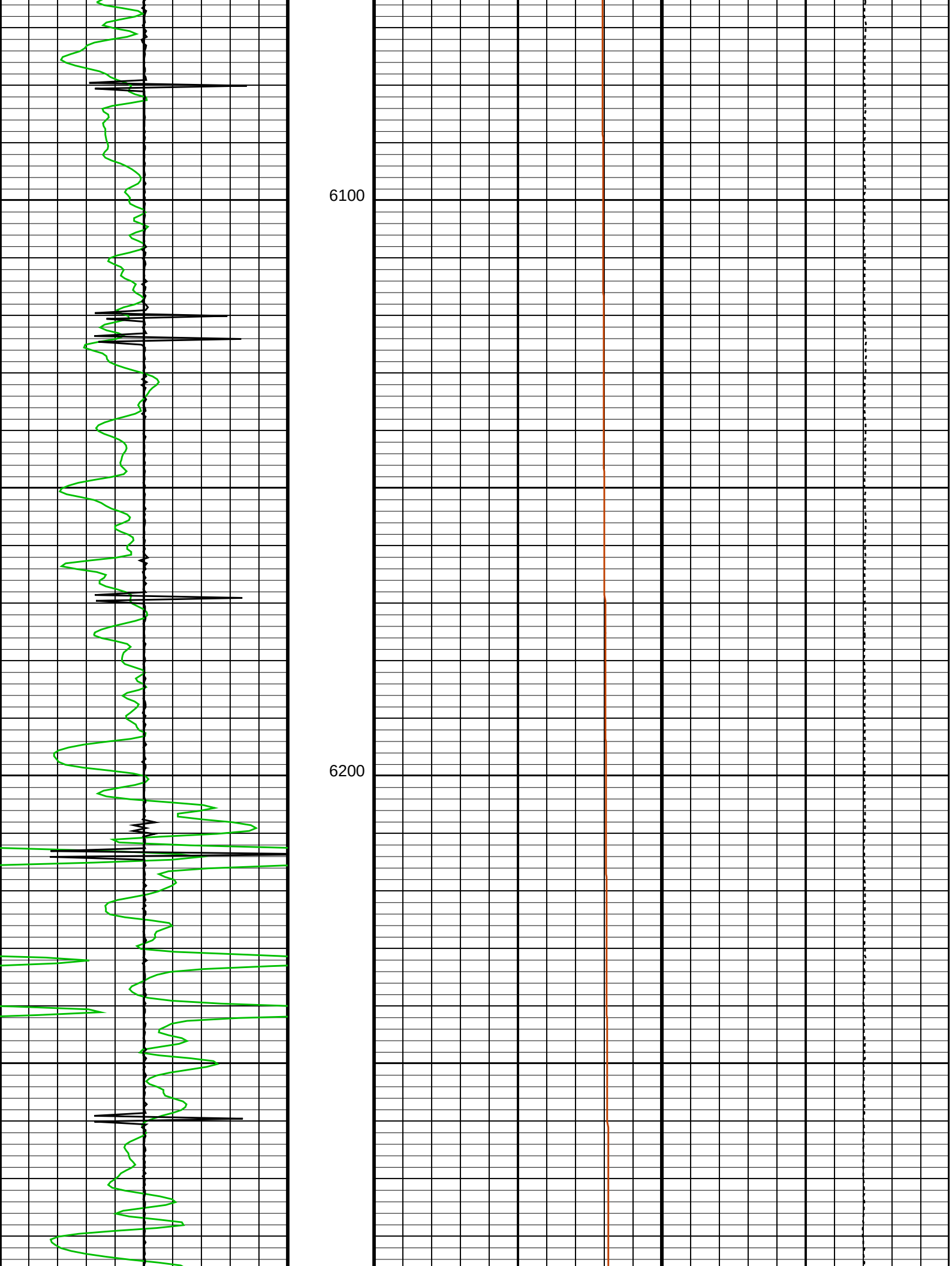

5000
5100

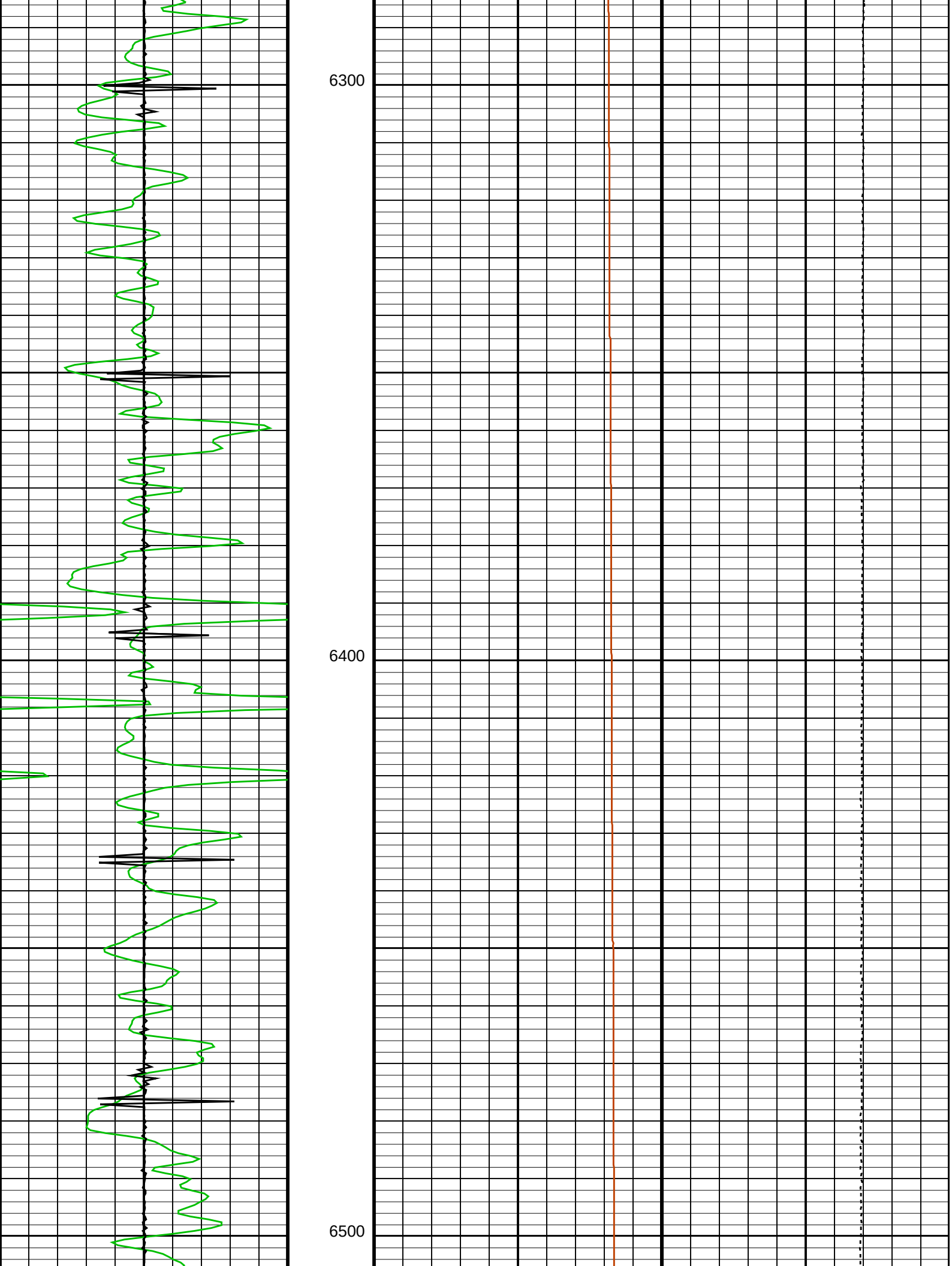

5200
5300
5400

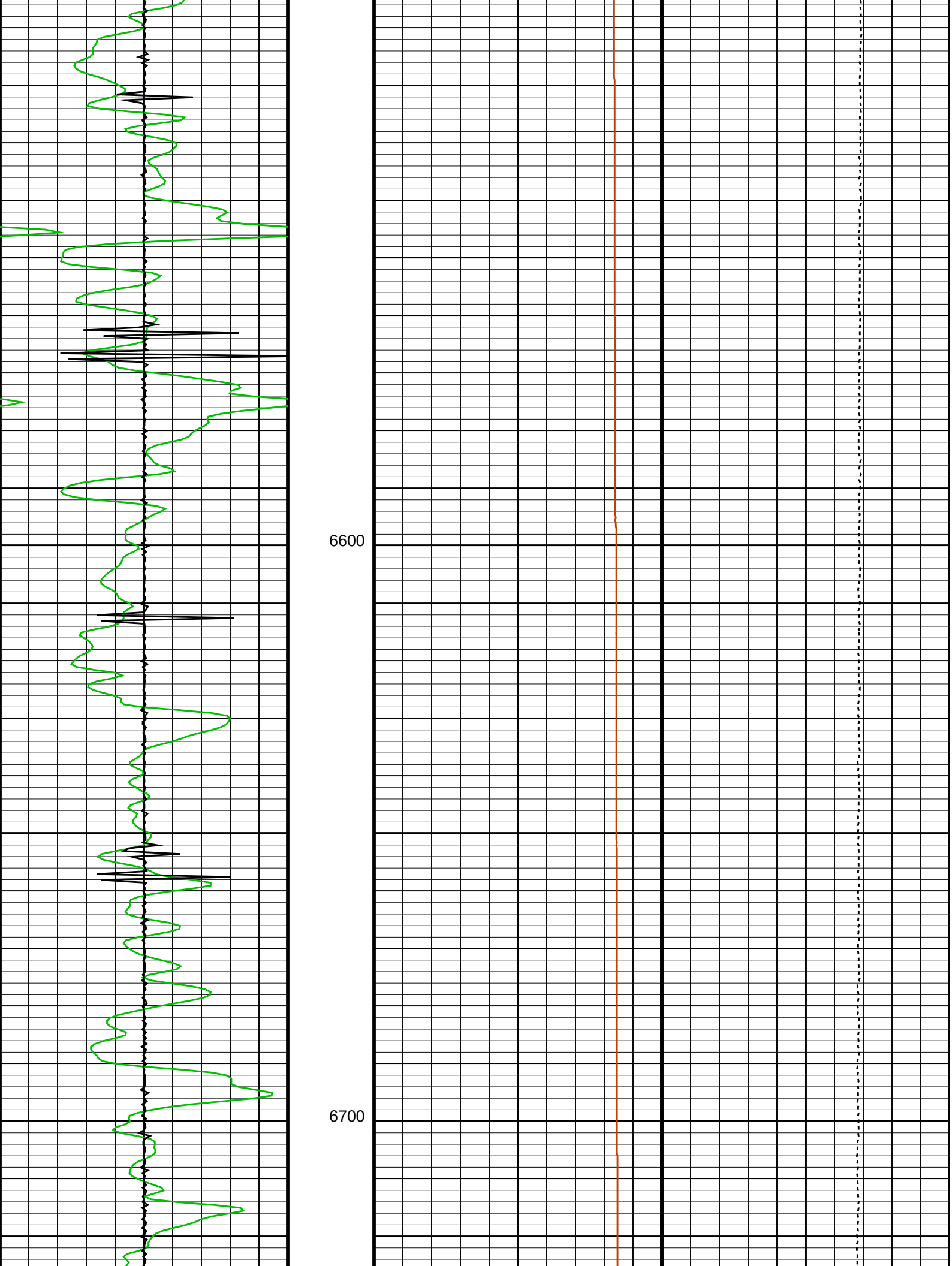

5500
5600

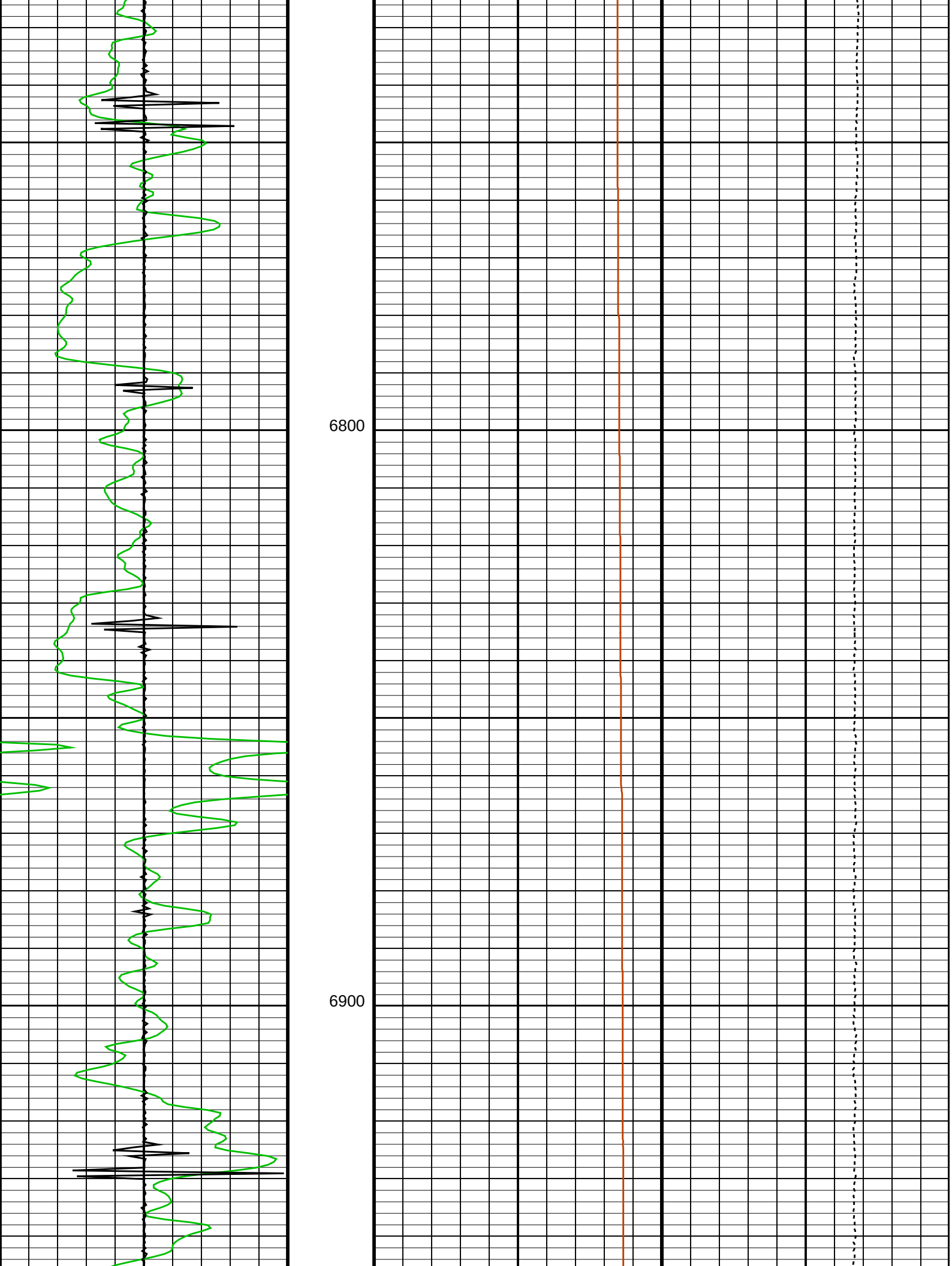

5700
5800

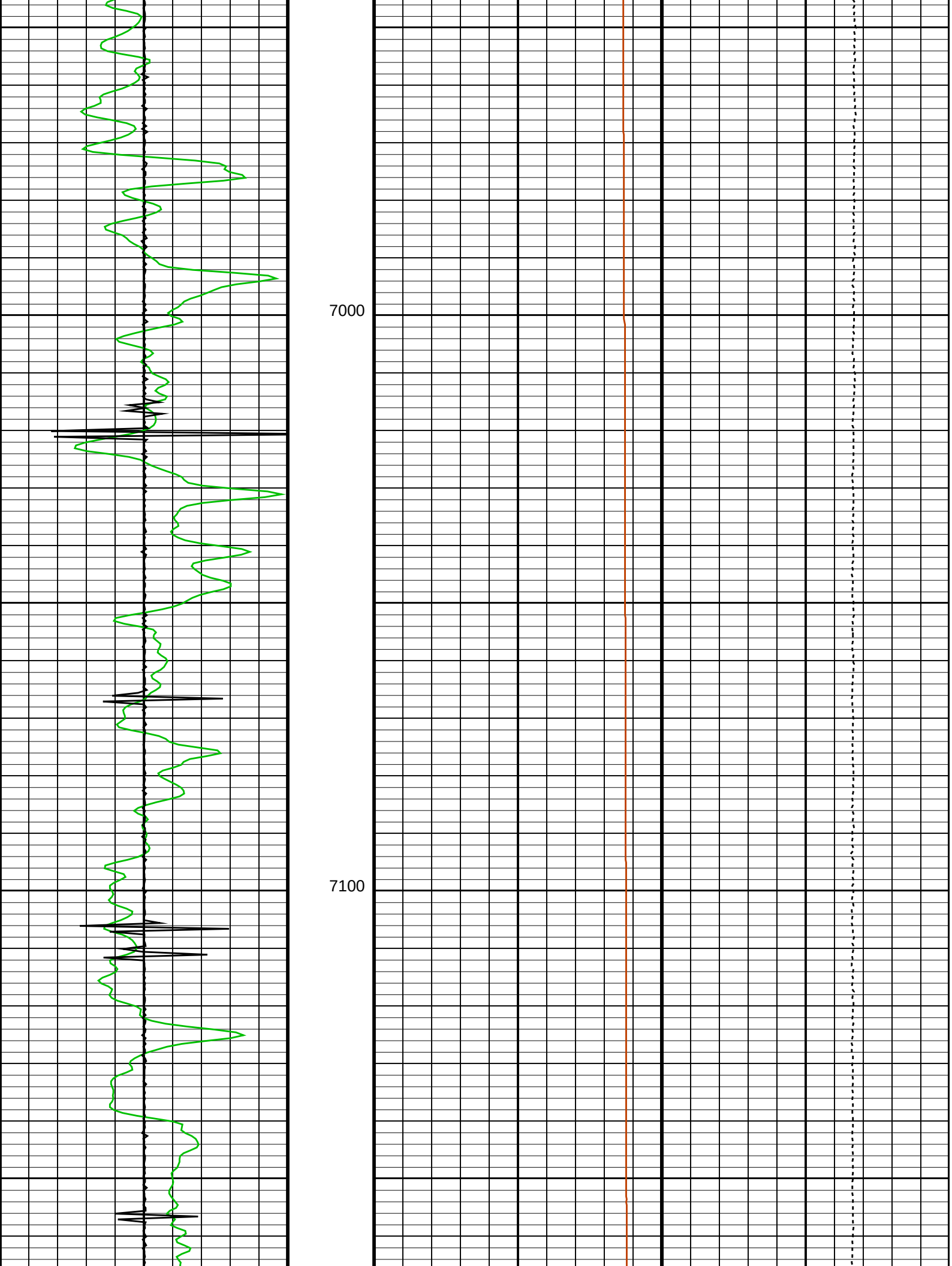

5900
6000

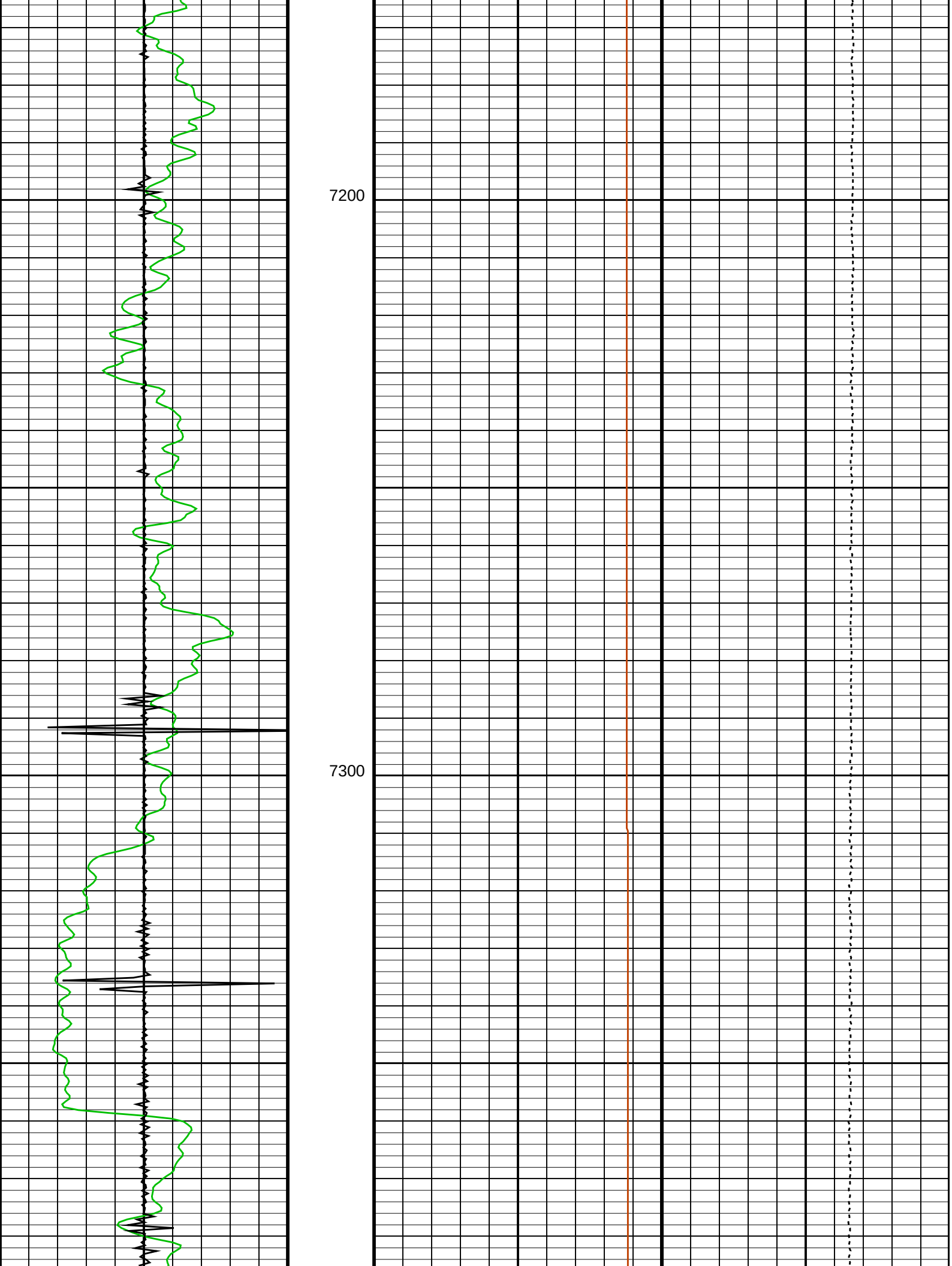

6100
6200

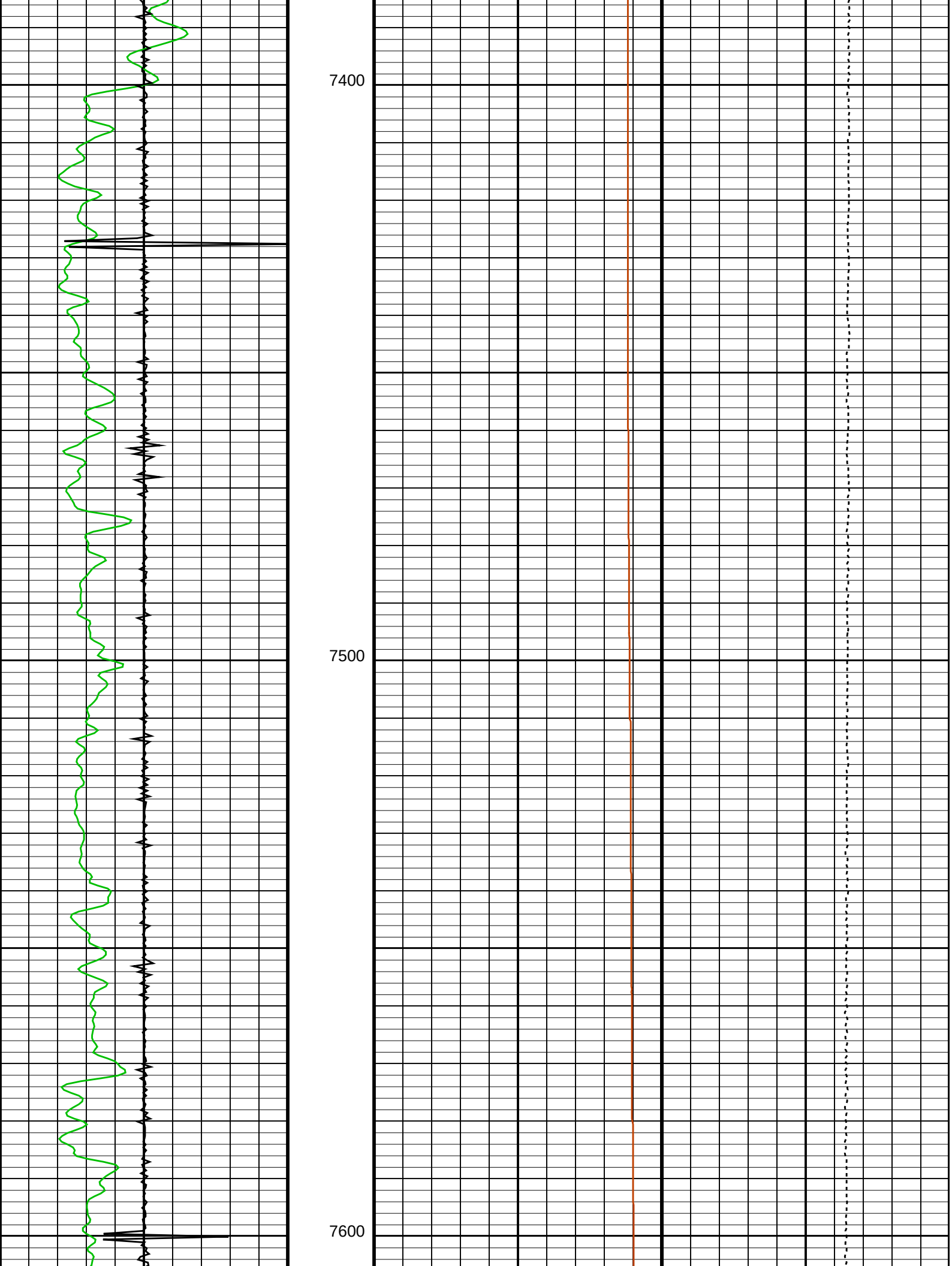

6300
6400
6500

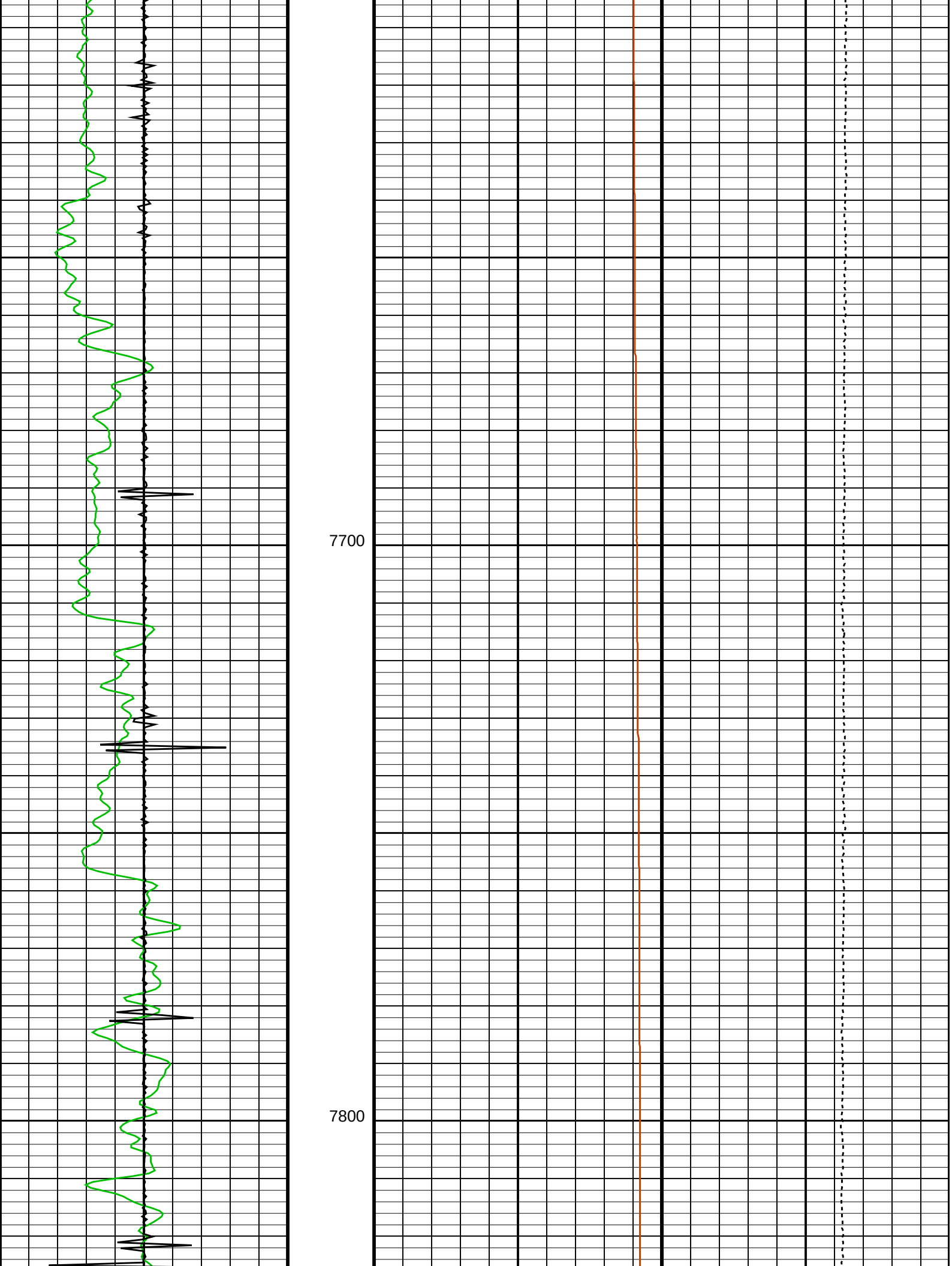

6600
6700

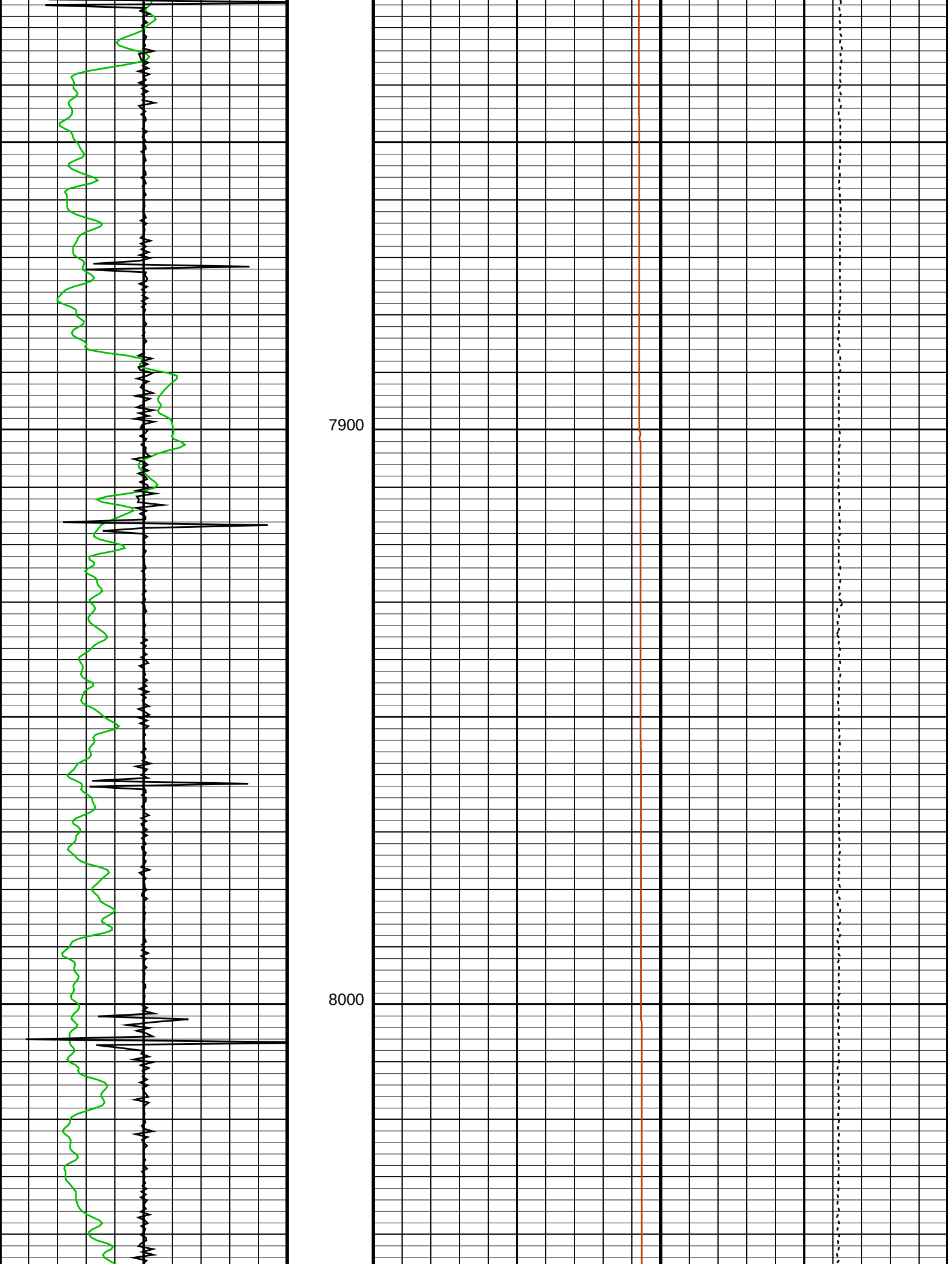

6800
6900

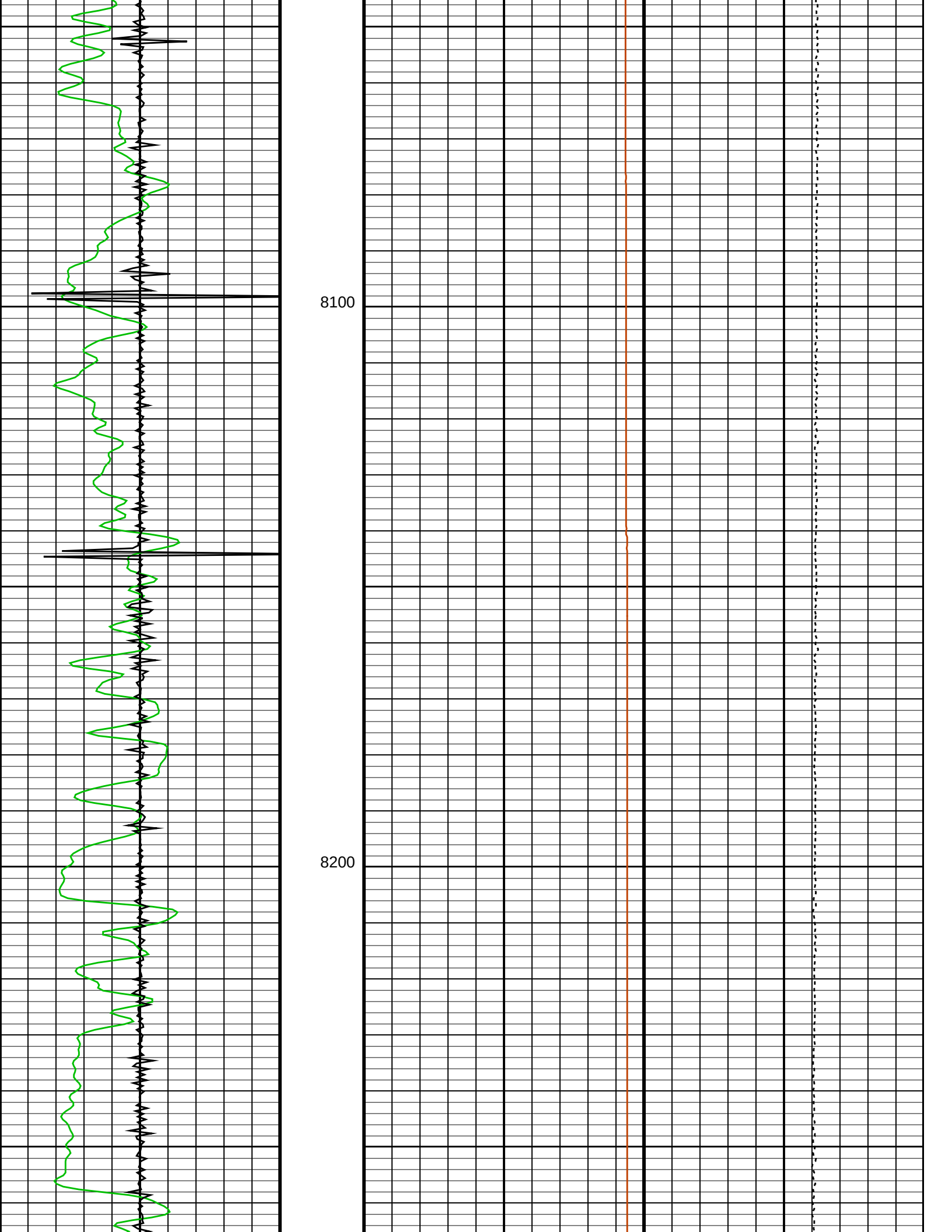

7000
7100

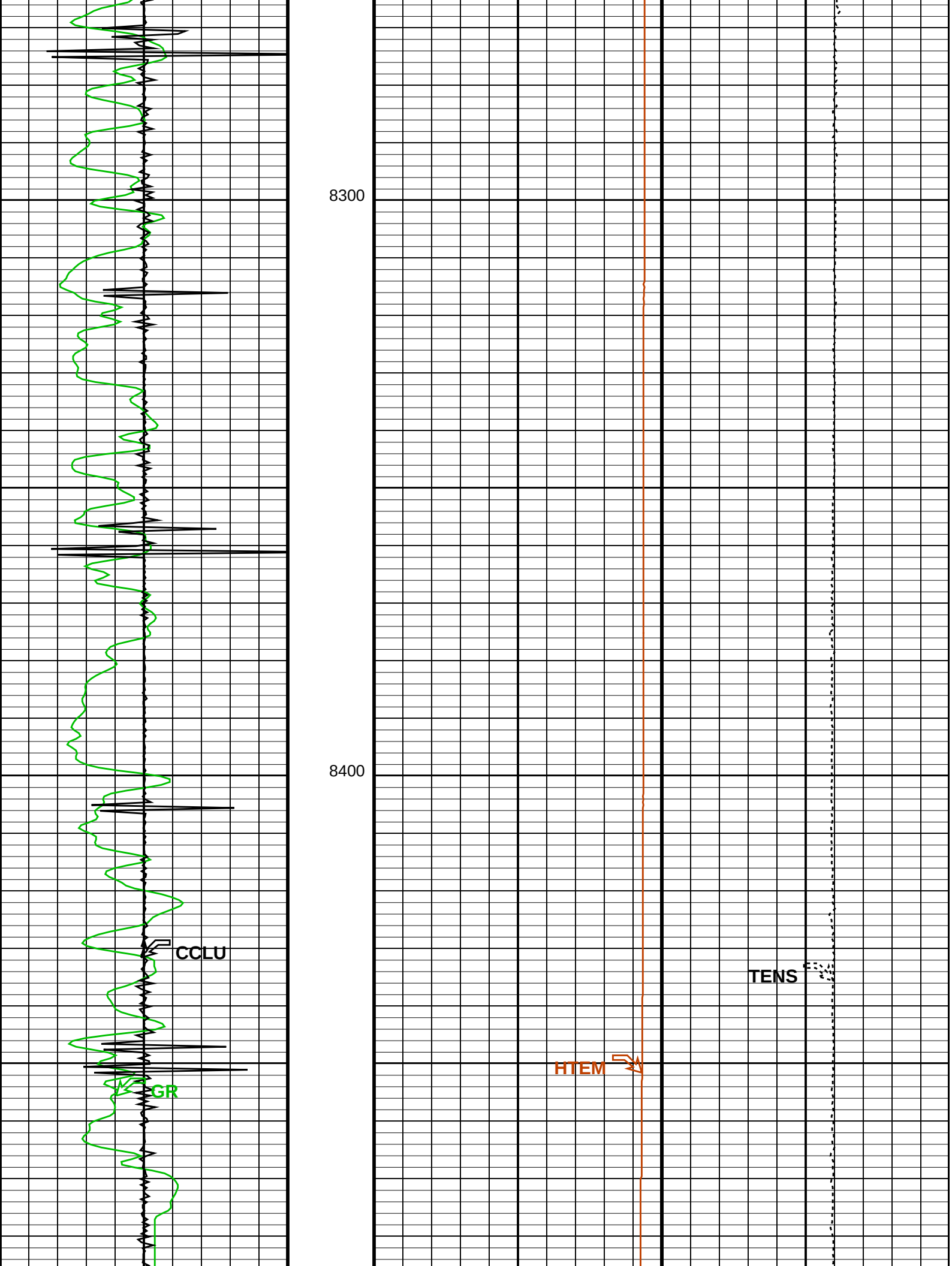

7200
7300

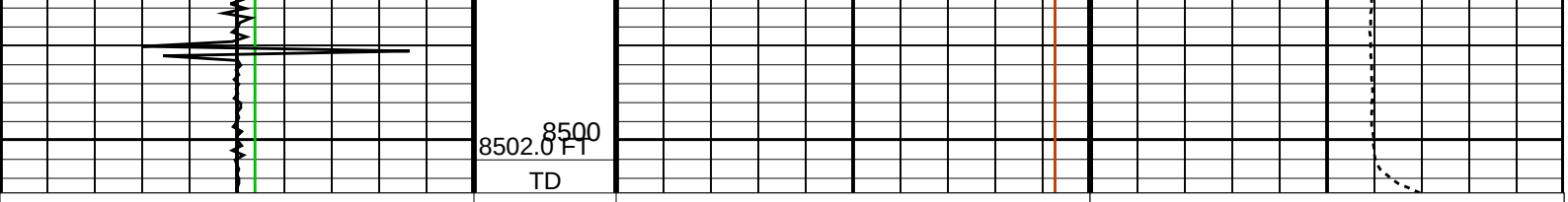

7400
7500
7600


7700
7800


7900
8000


8100
8200


8300
8400
CCLU
GR
HTEM
TENS



Gamma Ray (GR)		HTC Cartridge Temperature (HTEM)		Tension (TENS)	
0 (GAPI) 150		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	195	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
MW	Mud Weight	8.4	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	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.88	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.45	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
PP	Playback Processing	RECOMPUTE	

Format: CORRELATION Vertical Scale: 5" per 100’ Graphics File Created: 29−Apr−2010 04:44

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_013LUP	FN:12	PRODUCER	29−Apr−2010 00:59	8505.5 FT	100.0 FT

Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_022PUP	FN:21	PRODUCER	29−Apr−2010 04:44

Schlumberger

REPEAT PASS

Company: ExxonMobil Production Corp | Well: PCU 297−11C3

Input DLIS Files

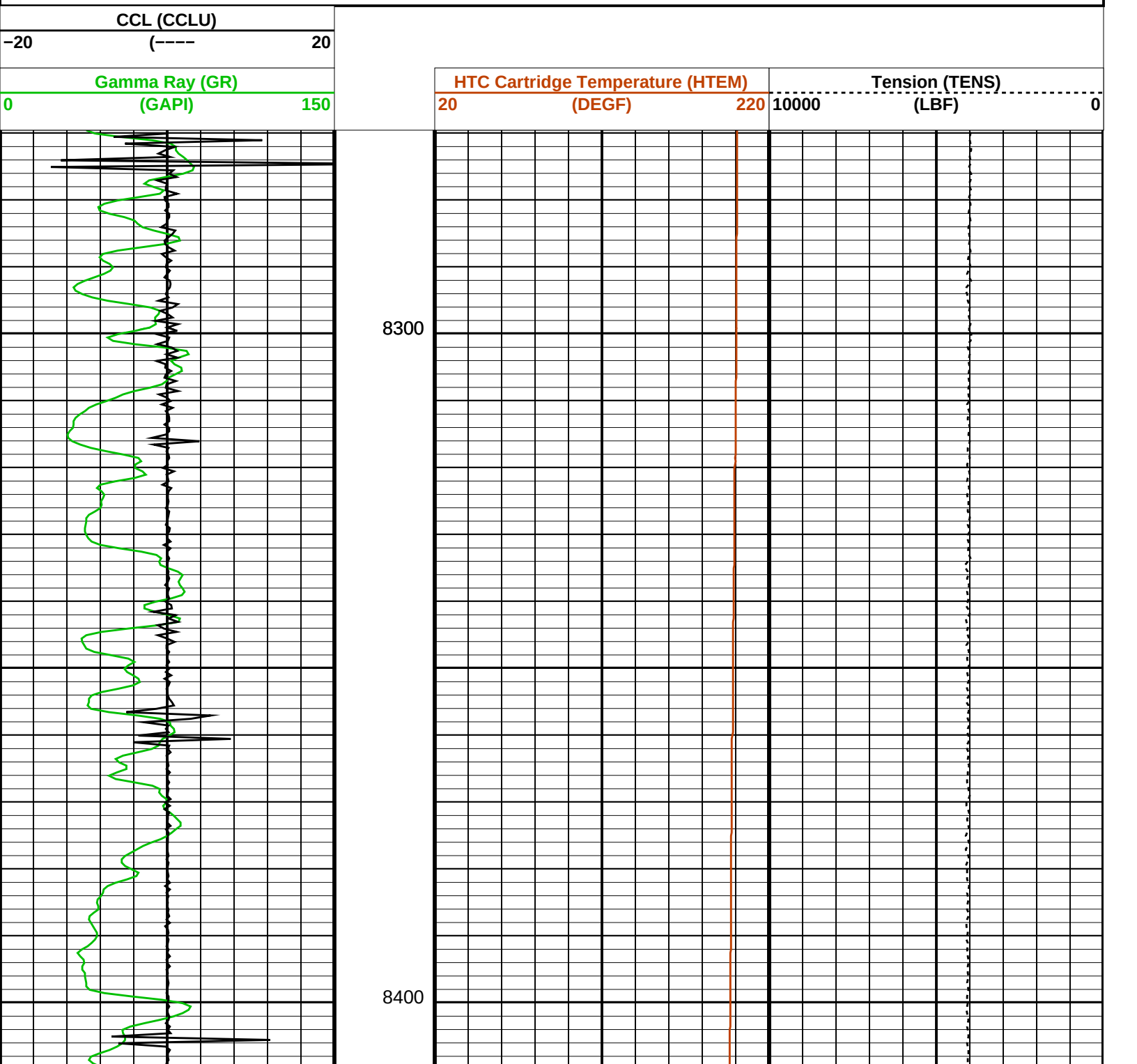
DEFAULT	USI_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	29−Apr−2010 00:46	8489.0 FT	8265.1 FT

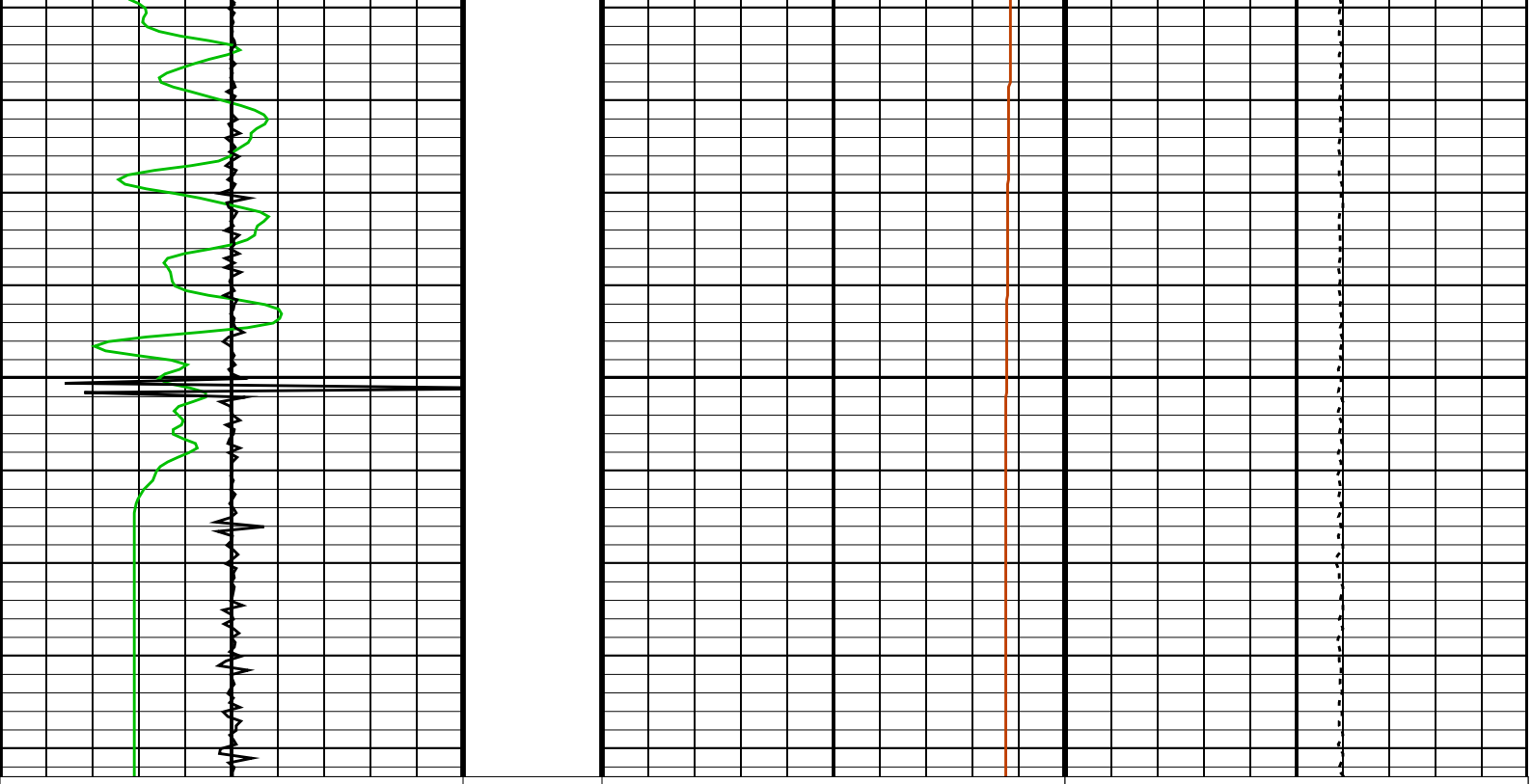
Output DLIS Files

DEFAULT	USI_TLD_MCFL_CNL_023PUP	FN:22	PRODUCER	29−Apr−2010 05:10	8493.0 FT	8269.5 FT

OP System Version: 17C0−154

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





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	195	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	50	V
MW	Mud Weight	8.4	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	46.25	MRAY
ZINI	Initial Estimate of Cement Impedance	−1	MRAY
ZMUD	Acoustic Impedance of Mud	1.88	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.45	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	4.0	FT
PP	Playback Processing	RECOMPUTE	

Format: CORRELATION **Vertical Scale: 5" per 100'** **Graphics File Created: 29−Apr−2010 05:10**

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**	**29−Apr−2010 00:46**	**8489.0 FT**	**8265.1 FT**

Output DLIS Files

DEFAULT	**USI_TLD_MCFL_CNL_023PUP**	**FN:22**	**PRODUCER**	**29−Apr−2010 05:10**

Schlumberger

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: 28−Apr−2010 5:57							
Gamma Ray Background	30.00	N/A	34.48	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	165.1	N/A	165.1	N/A	N/A	15.01	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−Feb−2010 14:58 Before: Calibration not done							
CNTC Background	26.67	26.67	N/A	N/A	N/A	4.001	CPS
CFTC Background	29.55	29.55	N/A	N/A	N/A	4.432	CPS
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement							
Master: 19−Feb−2010 14:58							
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: 28−Apr−2010 11:45							
Z−Axis Acceleration	32.19	N/A	32.15	N/A	N/A	N/A	F/S2

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

NCT−B Water Temperature 59.4 DEGF.
Thermal Housing Size 3.374 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 − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		34.48	Before		165.1	Before		165.0
0 (Minimum)	30.00 (Nominal) 120.0 (Maximum)		150.1 (Minimum)	165.1 (Nominal) 180.1 (Maximum)		150.0 (Minimum)	165.0 (Nominal) 180.0 (Maximum)	

Before: 28−Apr−2010 5:57

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		26.67	Master		29.55
Before	NOT DONE	N/A	Before	NOT DONE	N/A
5.000 (Minimum)	26.67 (Nominal) 40.00 (Maximum)		5.000 (Minimum)	29.55 (Nominal) 40.00 (Maximum)	

Master: 19−Feb−2010 14:58 Before: Calibration not done

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−Feb−2010 14:58

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.15
31.53 (Minimum)	32.19 (Nominal) 32.84 (Maximum)	

Before: 28−Apr−2010 11:45

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 Corp**

Schlumberger

Well: **PCU 297−11C3**
Field: **Piceance Creek**
County: **Rio Blanco**
State: **Colorado**

CORRELATION LOG

CCL / GAMMA RAY