

Company: Noble Energy, Inc

Well: Timbro LD06–64HN

Field: Wildcat

County: Weld

State: Colorado

Isolation Scanner

Cement Evaluation (State Print)

County: Weld

Field: Wildcat

Location: SHL : 1980' FSL X 255' FWL

Well: Timbro LD06–64HN

Company: Noble Energy, Inc

LOCATION

SHL : 1980' FSL X 255' FWL

Lat/Long : 40.778367/-103.916297

Elev.: K.B. 4930.00 ft

G.L. 4900.00 ft

D.F. 4930.00 ft

Permanent Datum: \_\_\_\_\_

Ground Level \_\_\_\_\_

Elev.: 4900.00 ft \_\_\_\_\_

Log Measured From: \_\_\_\_\_

Kelly Bushing \_\_\_\_\_

30.00 ft above Perm. Datum

Drilling Measured From: \_\_\_\_\_

Kelly Bushing \_\_\_\_\_

API Serial No. 05–123–37517

Section 6

Township 9N

Range 58W

Logging Date	28-Jul–2013			
Run Number	One			
Depth Driller	5756 ft			
Schlumberger Depth	5756 ft			
Bottom Log Interval	5700 ft			
Top Log Interval	50 ft			
Casing Fluid Type	Water with KCL (Brine)			
Salinity				
Density	8.4 lbm/gal			
Fluid Level				
BIT/CASING/TUBING STRING				
Bit Size	8.750 in			
From				
To				
Casing/Tubing Size	7.000 in			
Weight	26 lbm/ft			
Grade				
From				
To				
Maximum Recorded Temperatures				
Logger On Bottom	28-Jul–2013		13:30	
Unit Number	3022	Fort Morgan		
Recorded By	Arvin Shi			
Witnessed By	Ryan Cook			

PVT DATA				Run 1	Run 2	Run 3
Oil Density						
Water Salinity						
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						
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						
Recorded By						
Witnessed By						

n 3	Run 4
-----	-------

Date Created: 28-JUL-2013 16:19:53

### Depth Measuring Device

Type:	IDW-B
Serial Number:	7249
Calibration Date:	12-Jun-2013
Calibrator Serial Number:	
Calibration Cable Type:	7-39P-LXS
Wheel Correction 1:	-4
Wheel Correction 2:	-4

Type:	CMTD-B/A
Serial Number:	1109
Calibration Date:	10-Jul-2013
Calibrator Serial Number:	
Number of Calibration Points:	10
Calibration RMS:	8
Calibration Peak Error:	15

Type:	7-39P-LXS
Serial Number:	
Length:	17100 FT
Conveyance Method:	Wireline
Rig Type:	LAND

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	
Tool Zero Check At Surface:	

1. All Schlumberger depth measurement policies followed
2. IDW used as primary depth measurement and Z-Chart as secondary depth measurement
- 3.
- 4.
- 5.
- 6.

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.

OS1: None  
OS2:  
OS3:  
OS4:  
OS5:

OS1:  
OS2:  
OS3:  
OS4:  
OS5:

1. Toolstring run as per tool sketch

3. Tail Cement : Expadacem Cement 13.8 lb/gal

5. Pressure casing up to 2934 psi and hold for 15 minutes in cementing job

6. Repeat pass done without pressure and main pass was done with 3000 psi pressure

---

---

---

---

pressure

8. at 3200 the SLG map has white spot because it is out of model (Flex Atte is high) near of Evansence point

Your Crew : Derrick Hunter & Gary Lapp

RUN 1

SERVICE ORDER #:  
PROGRAM VERSION: 19C2-270  
FLUID LEVEL:

RUN 2

SERVICE ORDER #:  
PROGRAM VERSION:  
FLUID LEVEL:

LOGGED INTERVAL

START

STOP

LOGGED INTERVAL

START

STOP

[illegible]

RUN 1

RUN 2

## SURFACE EQUIPMENT

GSR-U/Y  
WITM (DTS)-A

## DOWNHOLE EQUIPMENT

LEH-QT  
LEH-QT

33.9



DTC-H  
ECH-KC 9562  
DTCH0-A 8485  
DTCH1-A 8485

CTEM

\_\_\_\_\_ 30.1

31.0

TelStatus  
ToolStatu

\_\_\_\_\_ 28.0

SGT-N  
SGH-K 3039  
SGC-TB 10249  
SGD-TAB 21700

## Gamma Ray

\_\_\_\_\_ 27.1

28.0

AH-CEN  
AH-CEN

22.5

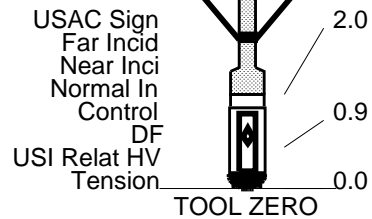
AH-107  
AH-107 757

18.7

USIT-E  
ECH-MFA 1964  
USAC-A 992  
USIS-A 2797  
LISSC-B 1730

16.7

IBCS\_B-100158202 808  
Top Transducer  
Middle Top Transducer  
Middle Bottom Transducer  
Bottom Transducer



MAXIMUM STRING DIAMETER 4.48 IN  
MEASUREMENTS RELATIVE TO TOOL ZERO  
ALL LENGTHS IN FEET

**Schlumberger**

**2 in State print**

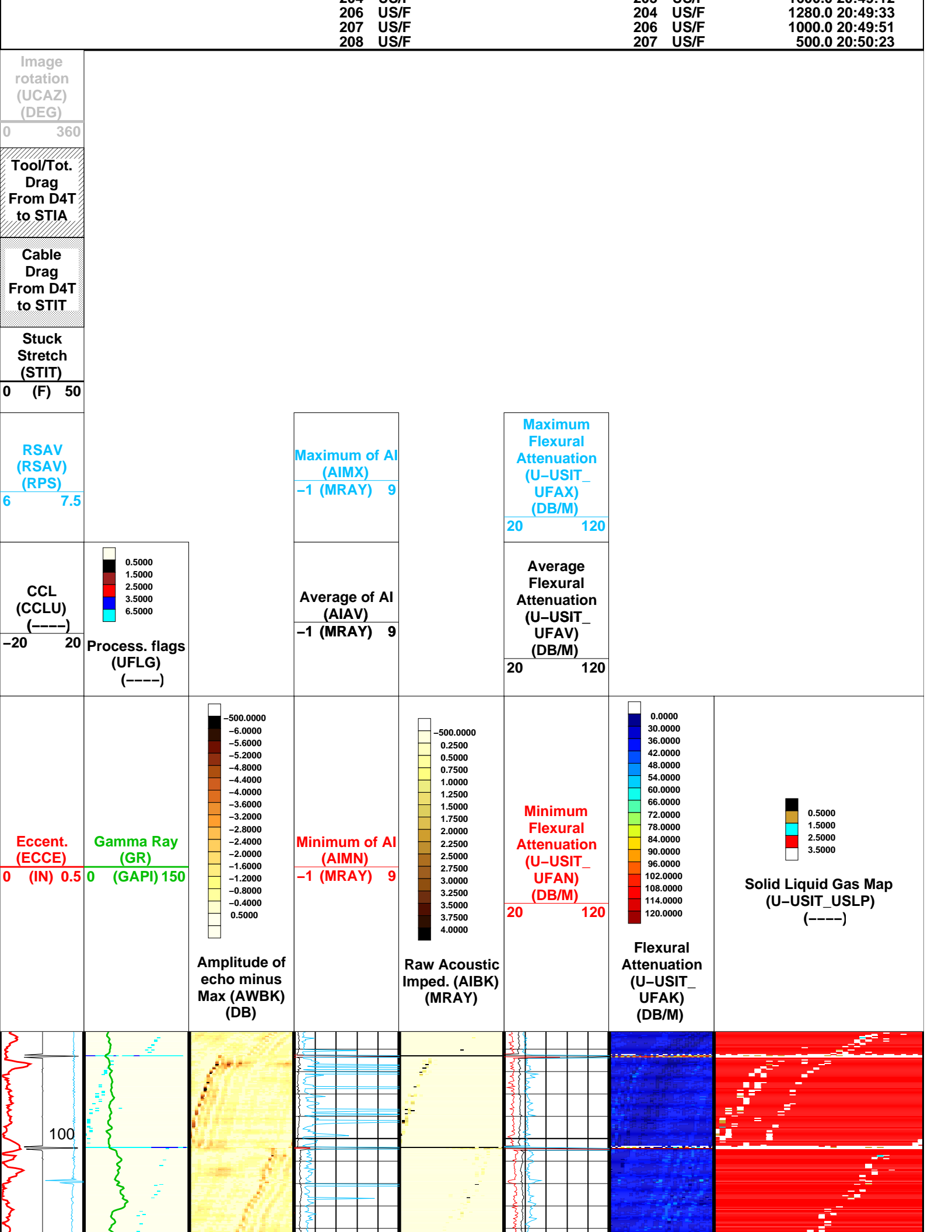
MAXIS Field Log

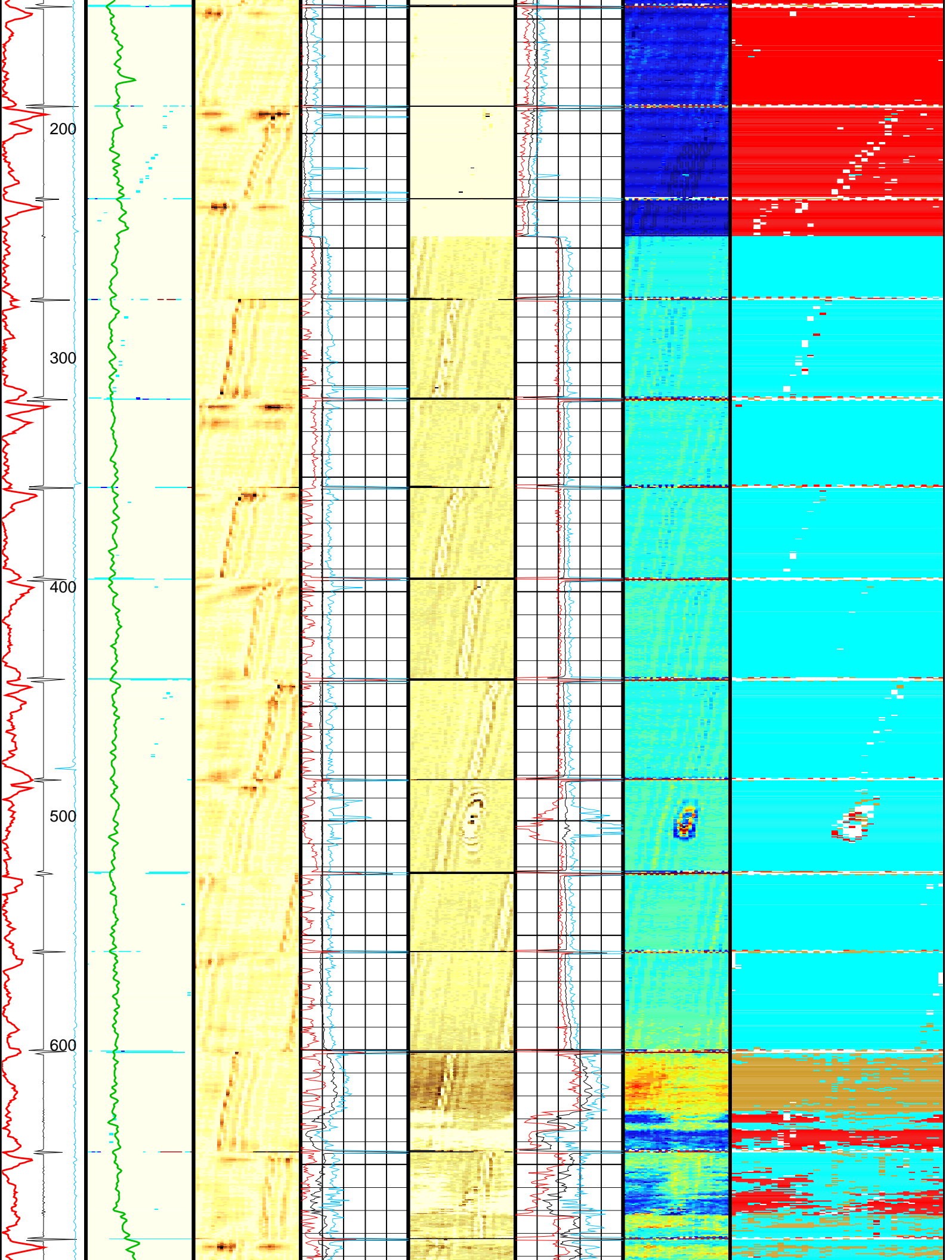
Company: Noble Energy, Inc Well: Timbro LD06-64HN

Input DLIS Files						
DEFAULT	USI_015LUP	FN:14	PRODUCER	28-Jul-2013 20:03	5694.5 FT	50.0 FT
Output DLIS Files						
DEFAULT	USI_005PUP	FN:4	PRODUCER	28-Jul-2013 20:44	5696.5 FT	52.0 FT

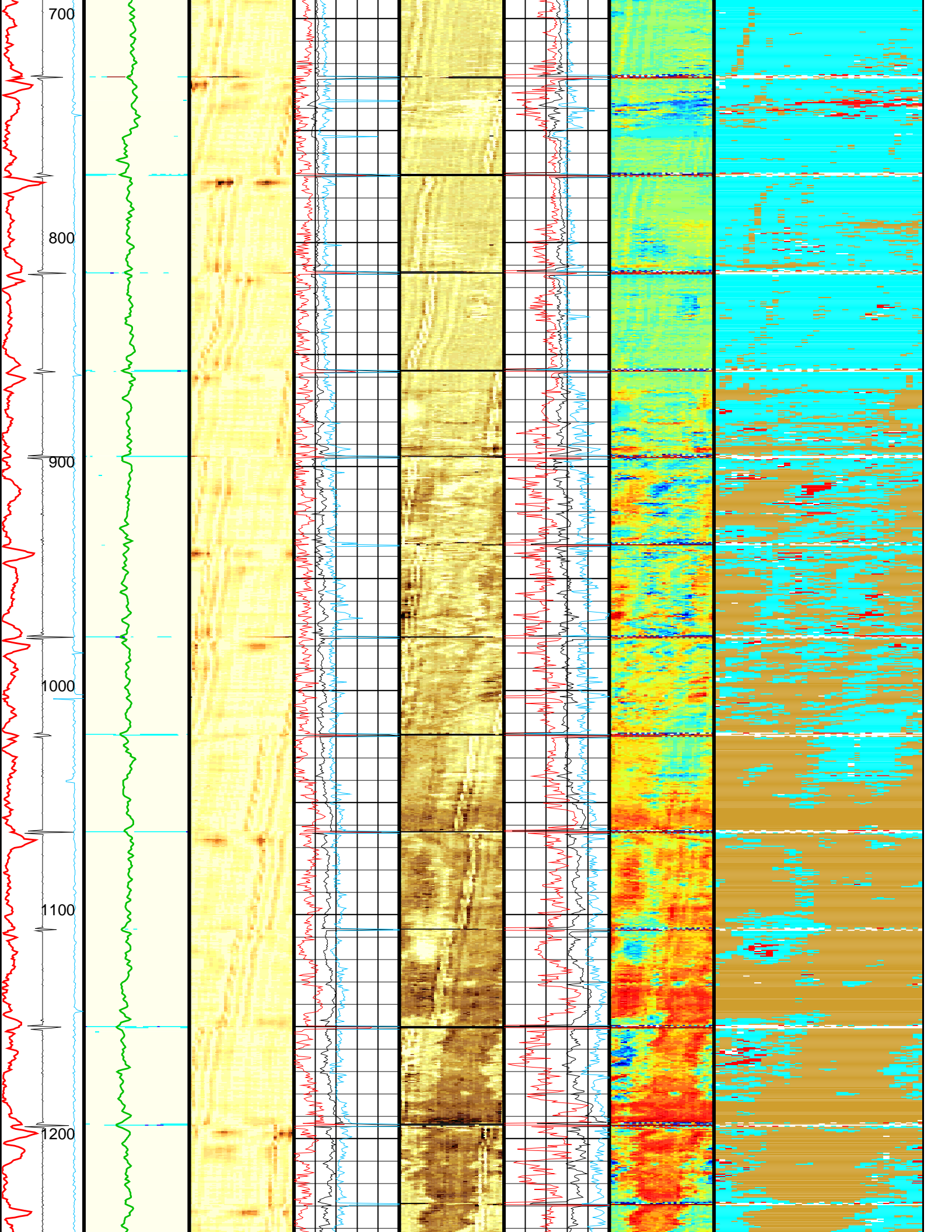
OP System Version: 19C0-187				
USIT-E	19C0-187	SGT-N	19C0-187	
DTC-H	19C0-187			

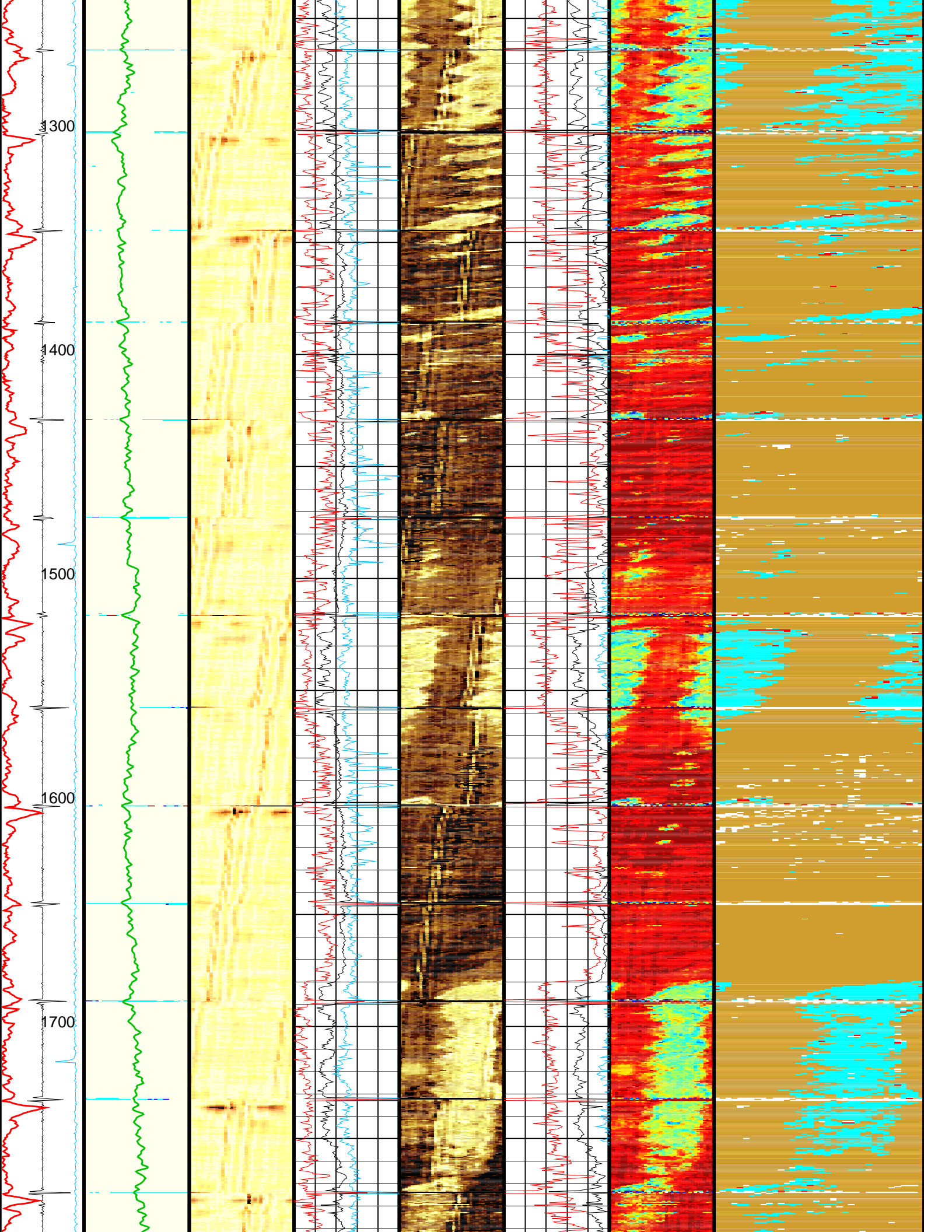
Changed Parameter Summary				
DLIS Name	New Value		Previous Value	Depth & Time
DFVL	216	US/F	208	US/F 5696.5 20:44:39
	209	US/F	216	US/F 5687.0 20:44:40
	202	US/F	209	US/F 5674.0 20:44:40
	199	US/F	202	US/F 5450.0 20:44:52
	200	US/F	199	US/F 5300.0 20:45:00
	202	US/F	200	US/F 5268.0 20:45:01
	201	US/F	202	US/F 5000.0 20:45:19
	203	US/F	201	US/F 2250.0 20:48:28
	204	US/F	203	US/F 1600.0 20:49:12



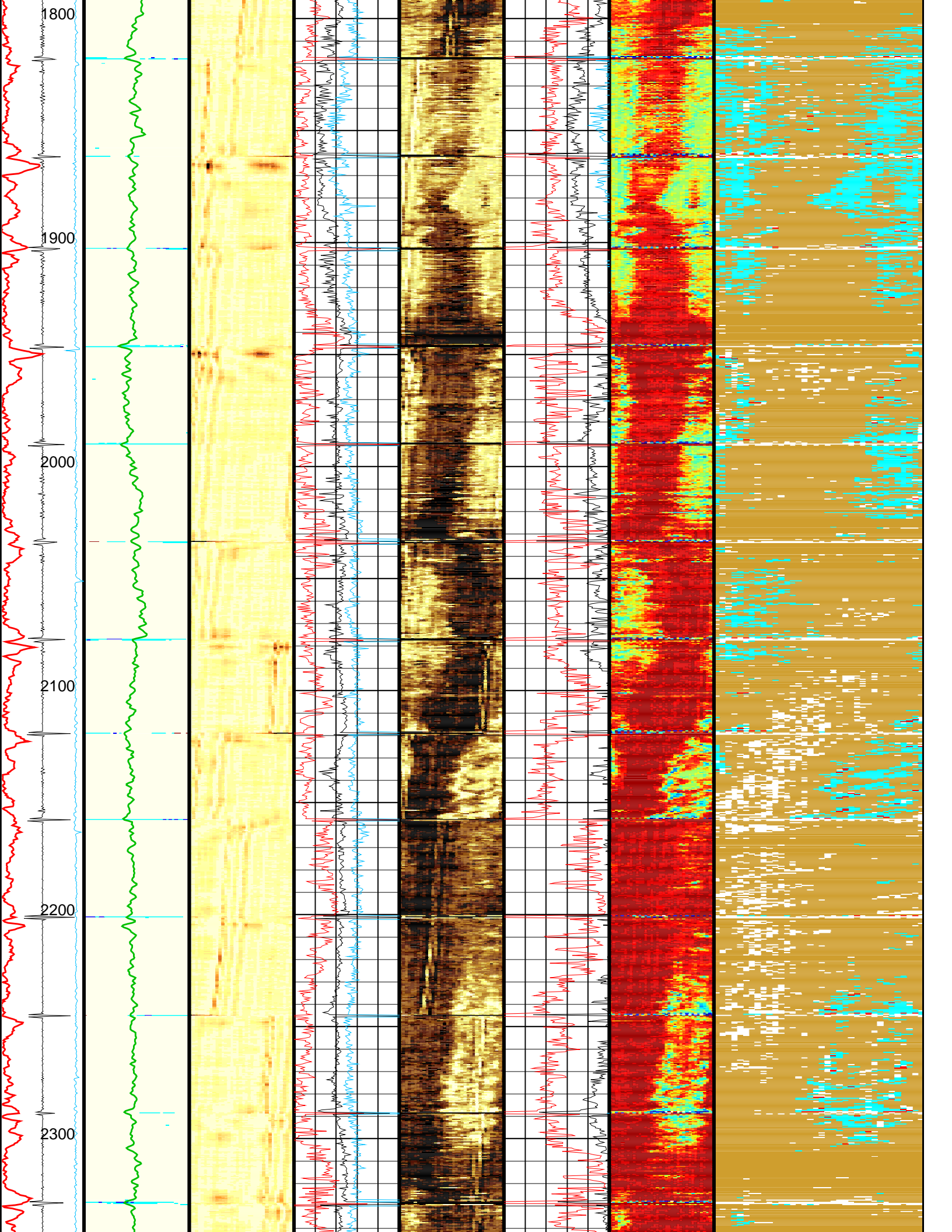


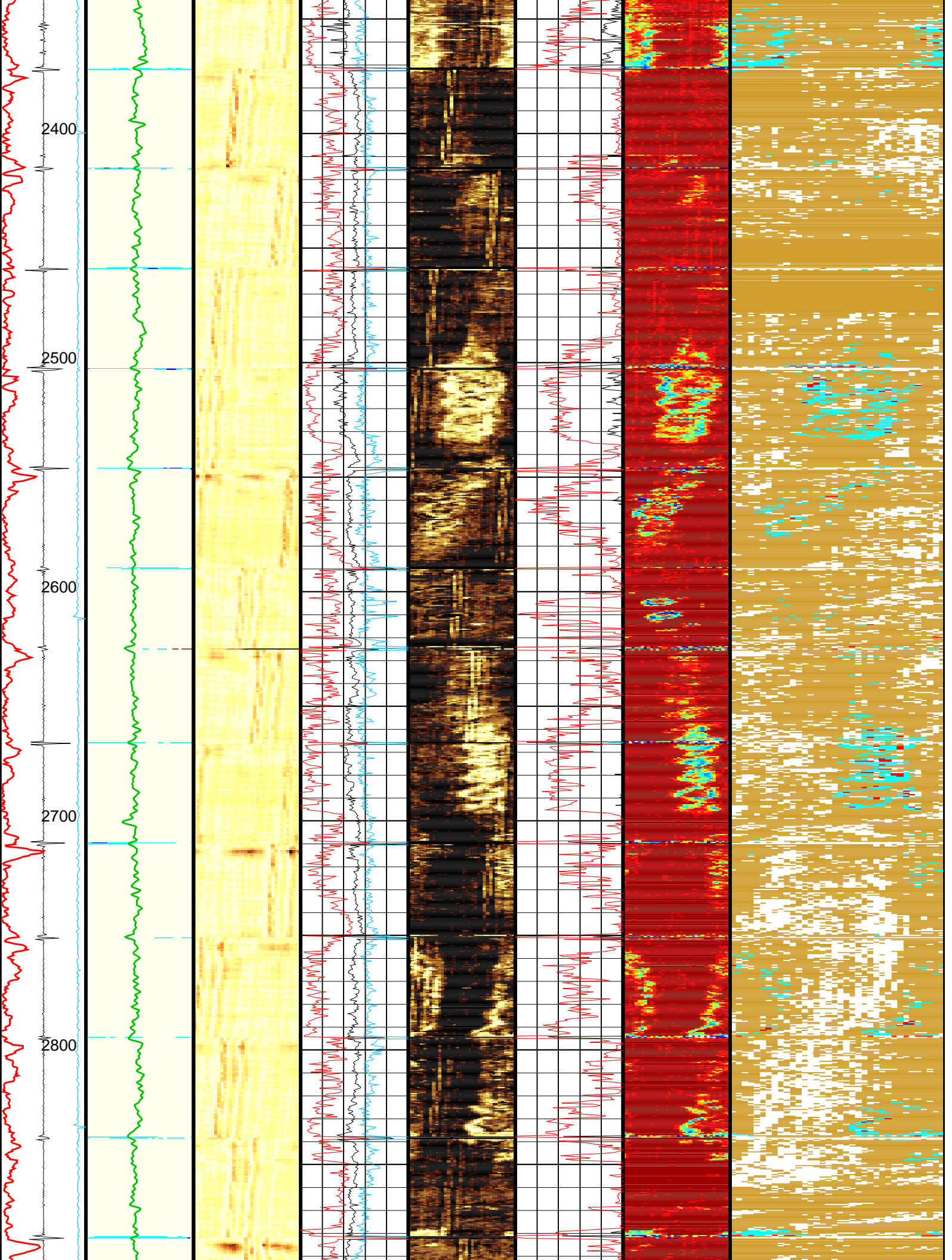




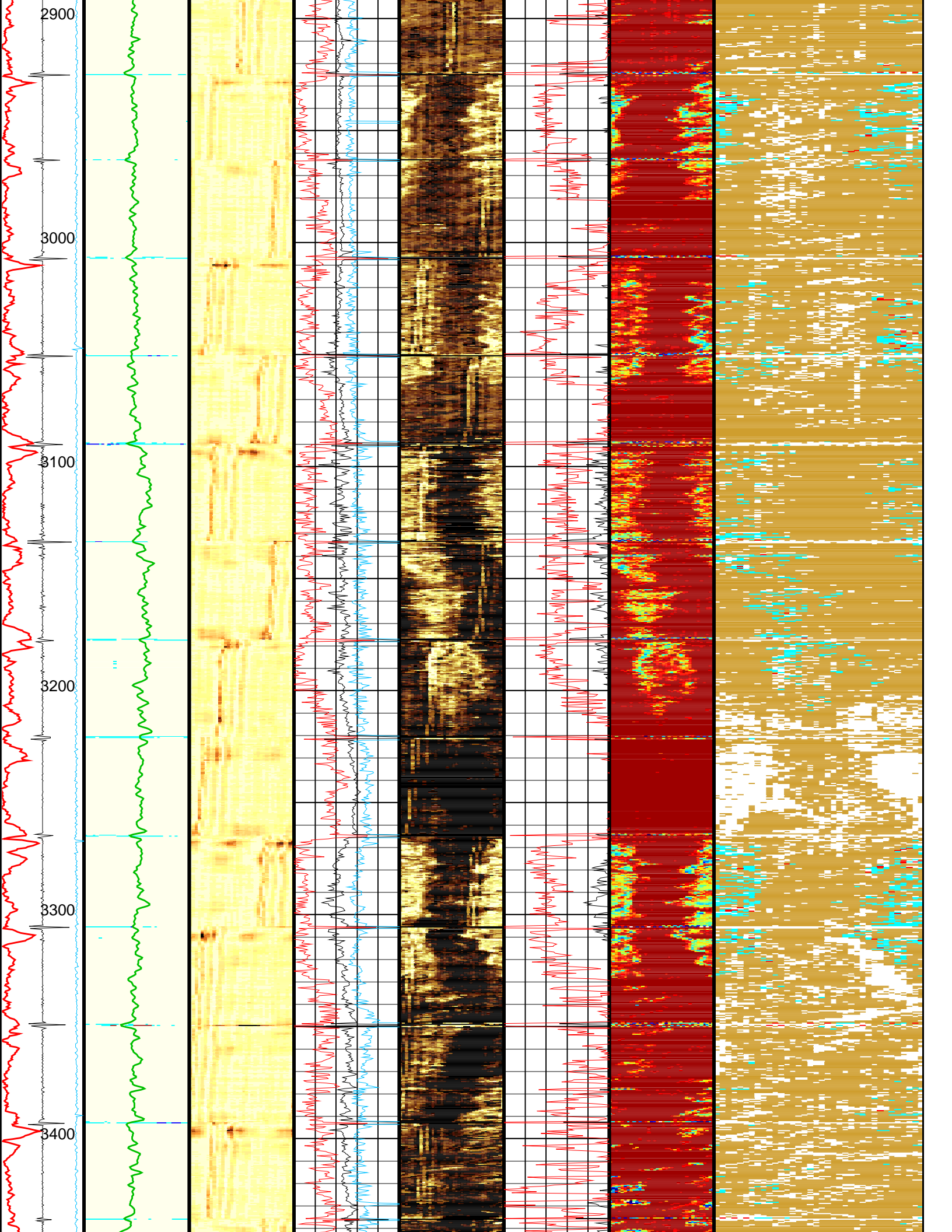


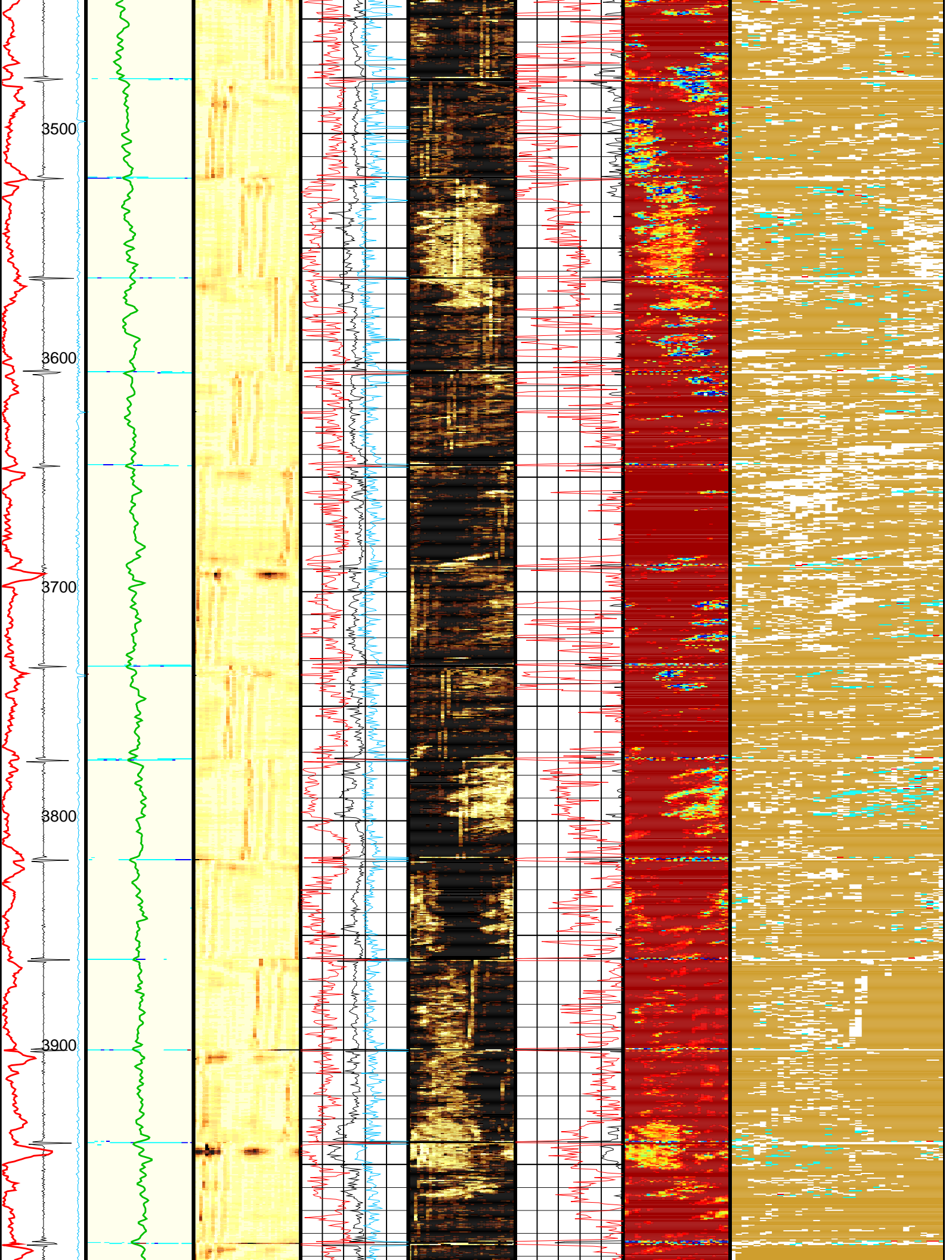




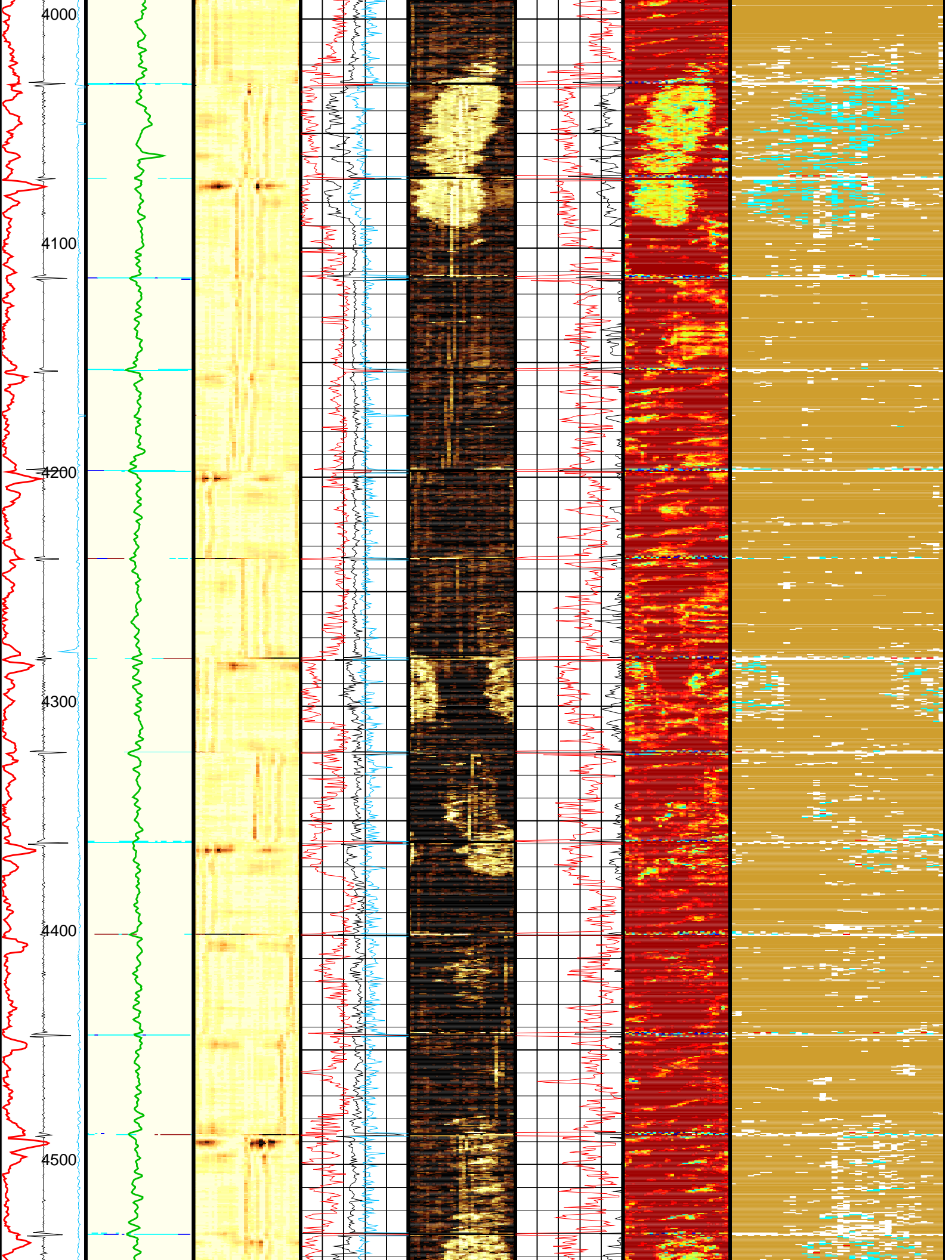




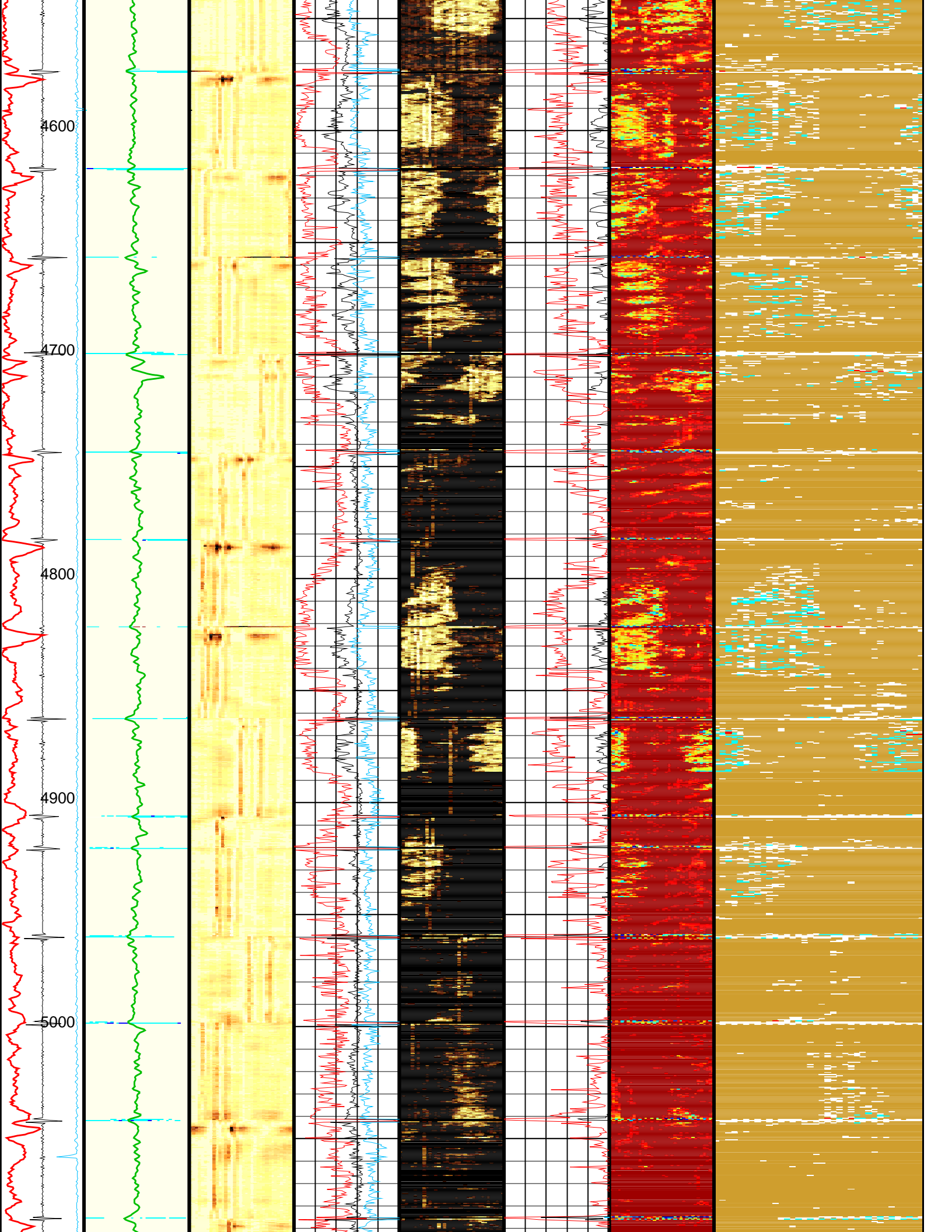


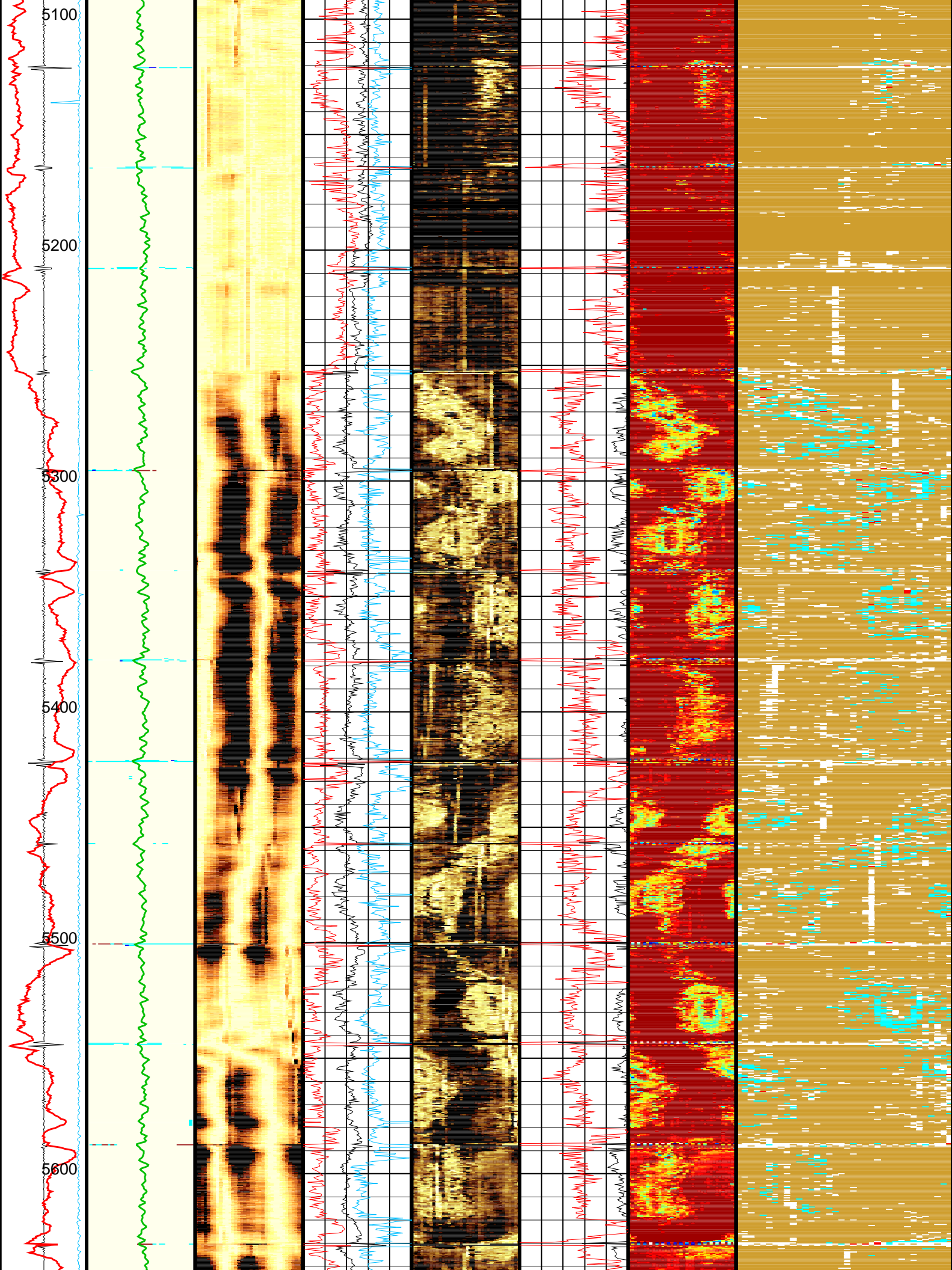


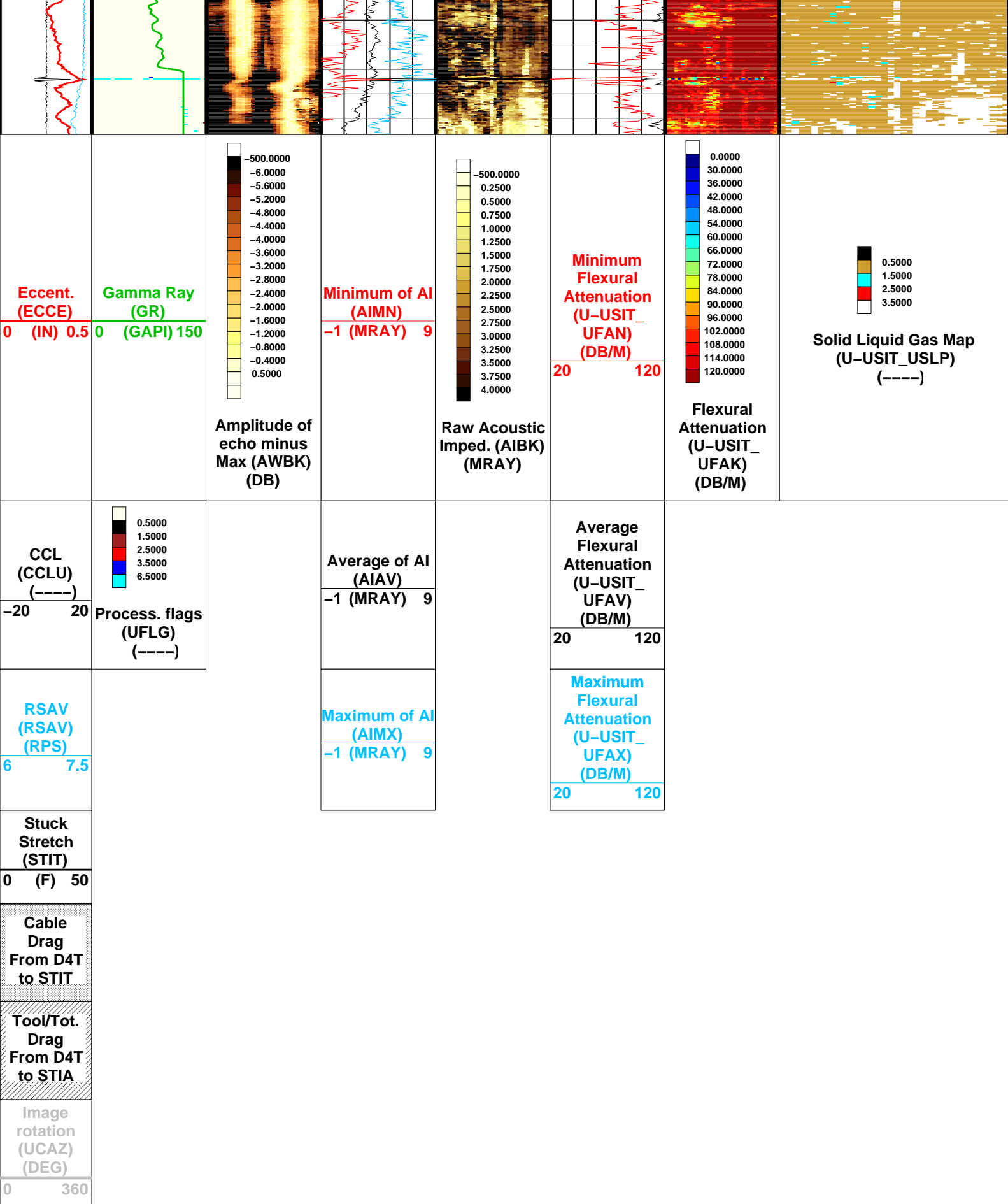












All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.

Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

## Parameters

DLIS Name	Description	Value	
USIT-E: Ultrasonic Imaging – E			
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	208	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	40	V
FDII	FPM Data Interpolation Interval	0	FT
IMAR	Image Rotation	OFF	
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
U-USIT_CEMT	USIT Cement Type	LIGHT	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	0	MRAY
U-USIT_IISR	USIT IBC Inverted Fluid Slowness Resolution	1.0_US_P_FT	
U-USIT_IIZR	USIT IBC Inverted ZMUD Resolution	0.050_MRAY	
U-USIT_OCDI	USIT Outer Casing Diameter	0	IN
U-USIT_OCSH	USIT Outer Casing Shoe	0	FT
U-USIT_OCWE	USIT Outer Casing Weight	0	LB/F
U-USIT_TIEB	IBC Third Interface Echo Bin Processing	YES	
U-USIT_TIEC	IBC Third Interface Echo Cleaning	NONE	
U-USIT_TIEM	IBC Third Interface Echo Multi Tracking	NO	
U-USIT_TIEP	IBC Third Interface Echo Policy	BFEP	
U-USIT_TIER	IBC Third Interface Echo Receivers	BOTH	
U-USIT_U3WE	Third Interface Echo Window End	110	US
U-USIT_UBTP	USIT Bottom Transducer Position	UNKNOWN	
U-USIT_UFAO	USIT Flexural Attenuation Offset	–1	DB/M
U-USIT_UIAP	USIT IBC Answer Product Enabled	SolidLiquidGasMap	
U-USIT_UIST	Ultrasonic IBC Sonde Type	Sub_ibcs_B	
U-USIT_UTAN	USIT Transducer Angles	33_DEG	
UMAO	USIT Measurement Angular Offset	18	DEG
USTO	Ultrasonic Time Offset	–2	US
USUB	Ultrasonic Subassembly Identifier	Sub_7_inch	
UWKM	Ultrasonic Working Mode	10DEG_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	1.65	MRAY
ZTCM	Acoustic Impedance Threshold for Cement	2.6	MRAY
ZTGS	Acoustic Impedance Threshold for Gas	0.3	MRAY
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth – Driller	5756.00	FT
TDL	Total Depth – Logger	5756.00	FT
System and Miscellaneous			
BS	Bit Size	8.750	IN
CWEI	Casing Weight	26.00	LB/F
DO	Depth Offset for Playback	2.0	FT
PP	Playback Processing	RECOMPUTE	

## Input DLIS Files

DEFAULT USI\_015LUP FN:14 PRODUCER 28-Jul-2013 20:03 5694.5 FT 50.0 FT

# Output DLIS Files

DEFAULT

USI\_005PUP

FN:4

PRODUCER

28-Jul-2013 20:44

Schlumberger

5 in Correlation

MAXIS Field Log

Company: Noble Energy, Inc

Well: Timbro LD06-64HN

## Input DLIS Files

DEFAULT

USI\_015LUP

FN:14

PRODUCER

28-Jul-2013 20:03

5694.5 FT

50.0 FT

## Output DLIS Files

DEFAULT

USI\_005PUP

FN:4

PRODUCER

28-Jul-2013 20:44

5696.5 FT

52.0 FT

## OP System Version: 19C0-187

USIT-E  
DTC-H

19C0-187  
19C0-187

SGT-N

19C0-187

## Changed Parameter Summary

DLIS Name

New Value

Previous Value

Depth & Time

DFVL

216 US/F  
209 US/F  
202 US/F  
199 US/F  
200 US/F  
202 US/F  
201 US/F  
203 US/F  
204 US/F  
206 US/F  
207 US/F  
208 US/F

208 US/F  
216 US/F  
209 US/F  
202 US/F  
199 US/F  
200 US/F  
202 US/F  
201 US/F  
203 US/F  
204 US/F  
206 US/F  
207 US/F

5696.5 20:44:39  
5687.0 20:44:40  
5674.0 20:44:40  
5450.0 20:44:52  
5300.0 20:45:00  
5268.0 20:45:01  
5000.0 20:45:19  
2250.0 20:48:28  
1600.0 20:49:12  
1280.0 20:49:33  
1000.0 20:49:51  
500.0 20:50:23

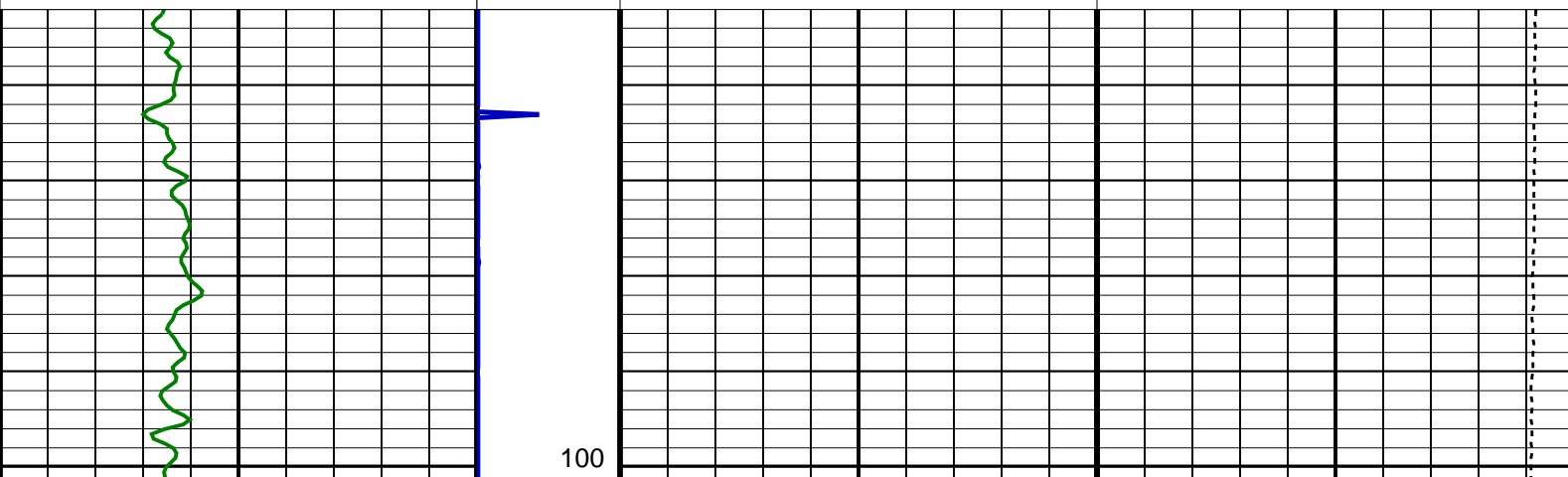
Gamma Ray (GR)  
(GAPI)

0 100

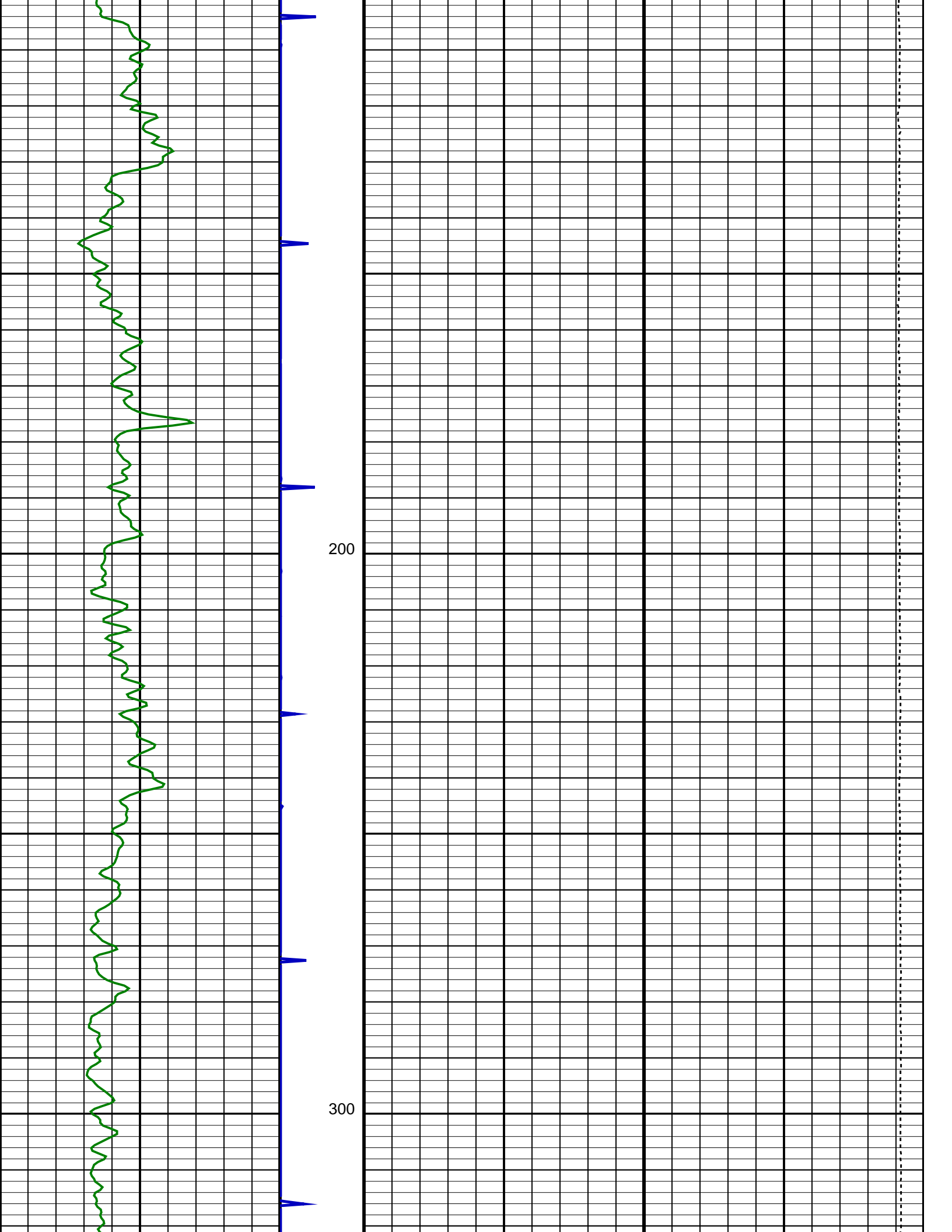
USIT  
COLLAR  
LOCATOR  
(CCLU)  
0 (----)10

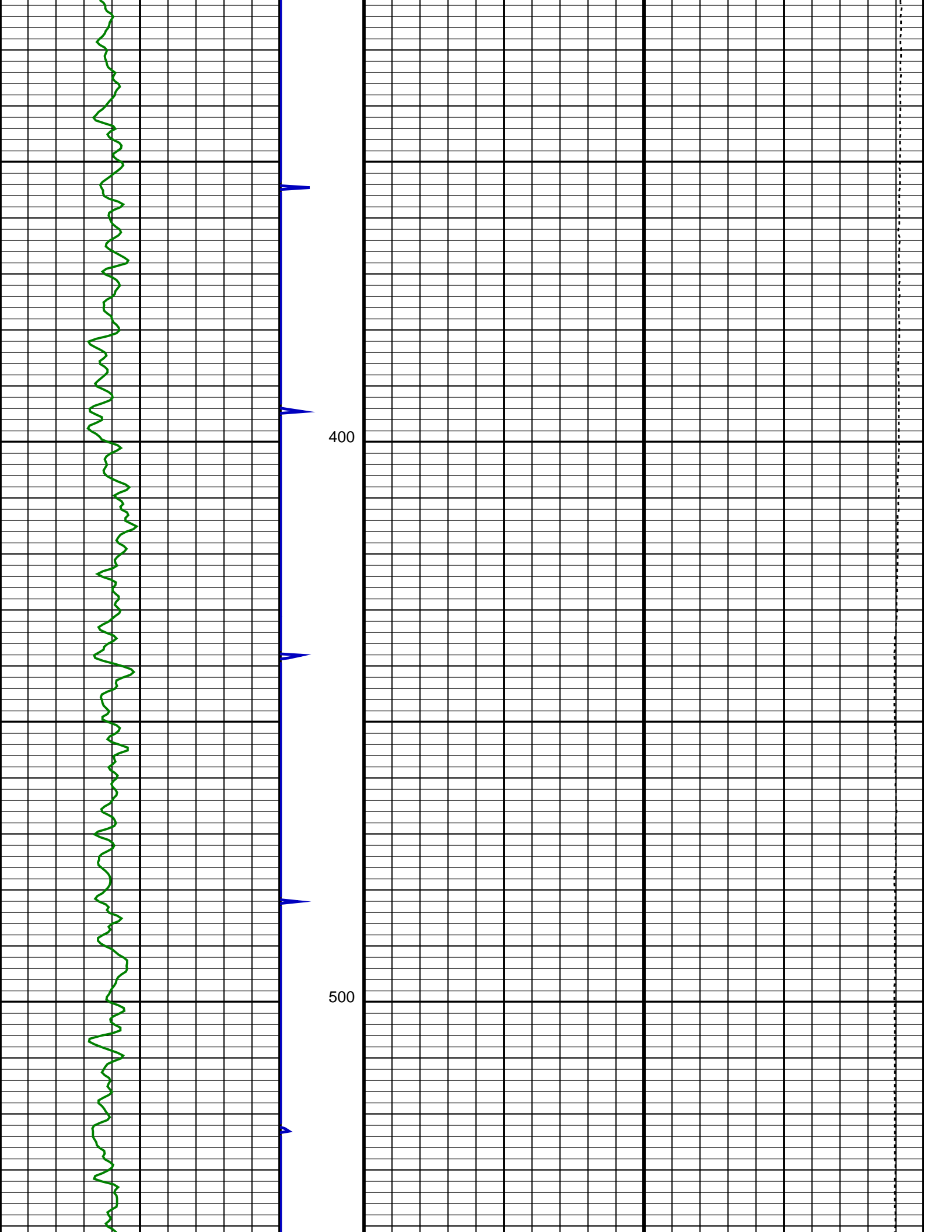
Tension (TENS)  
(LBF)

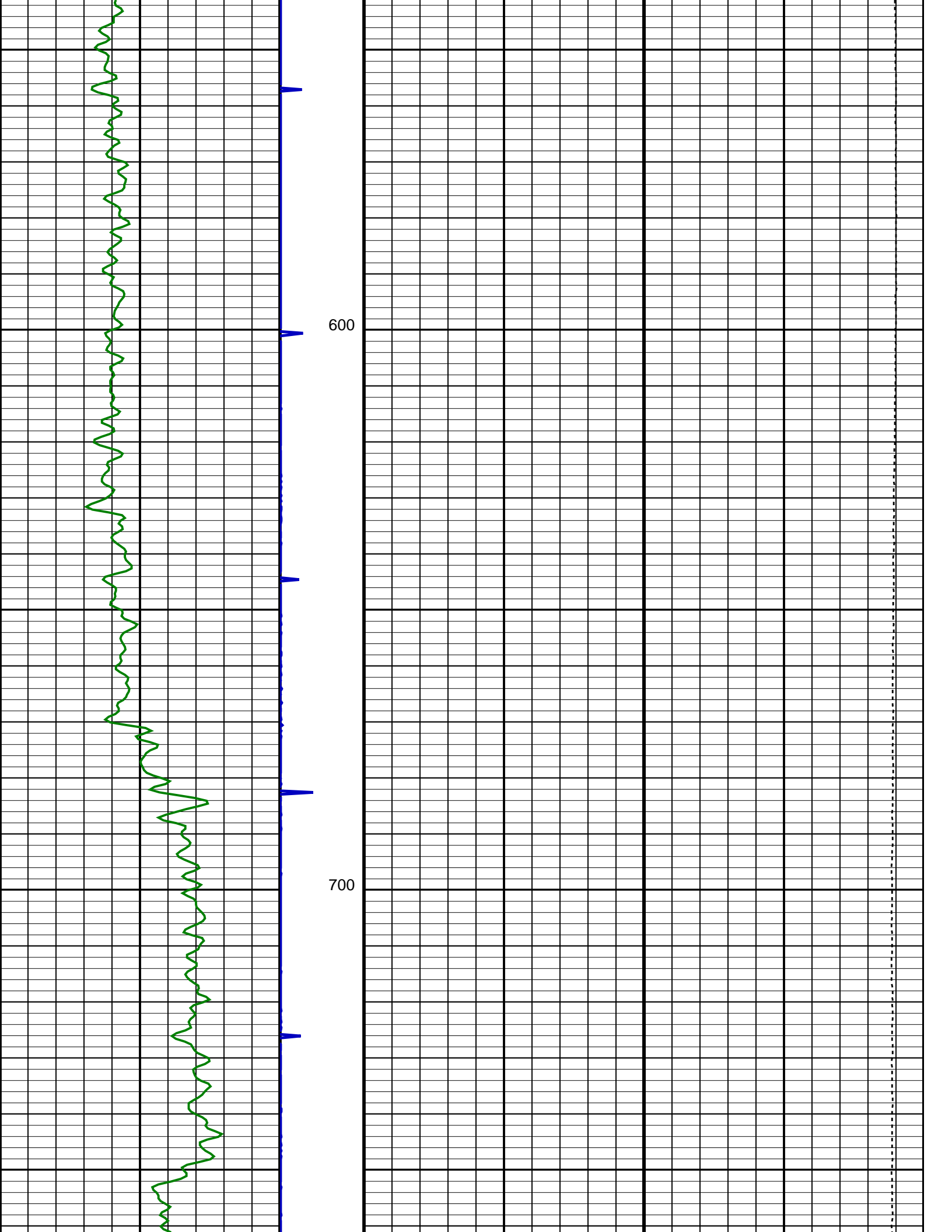
5000 0

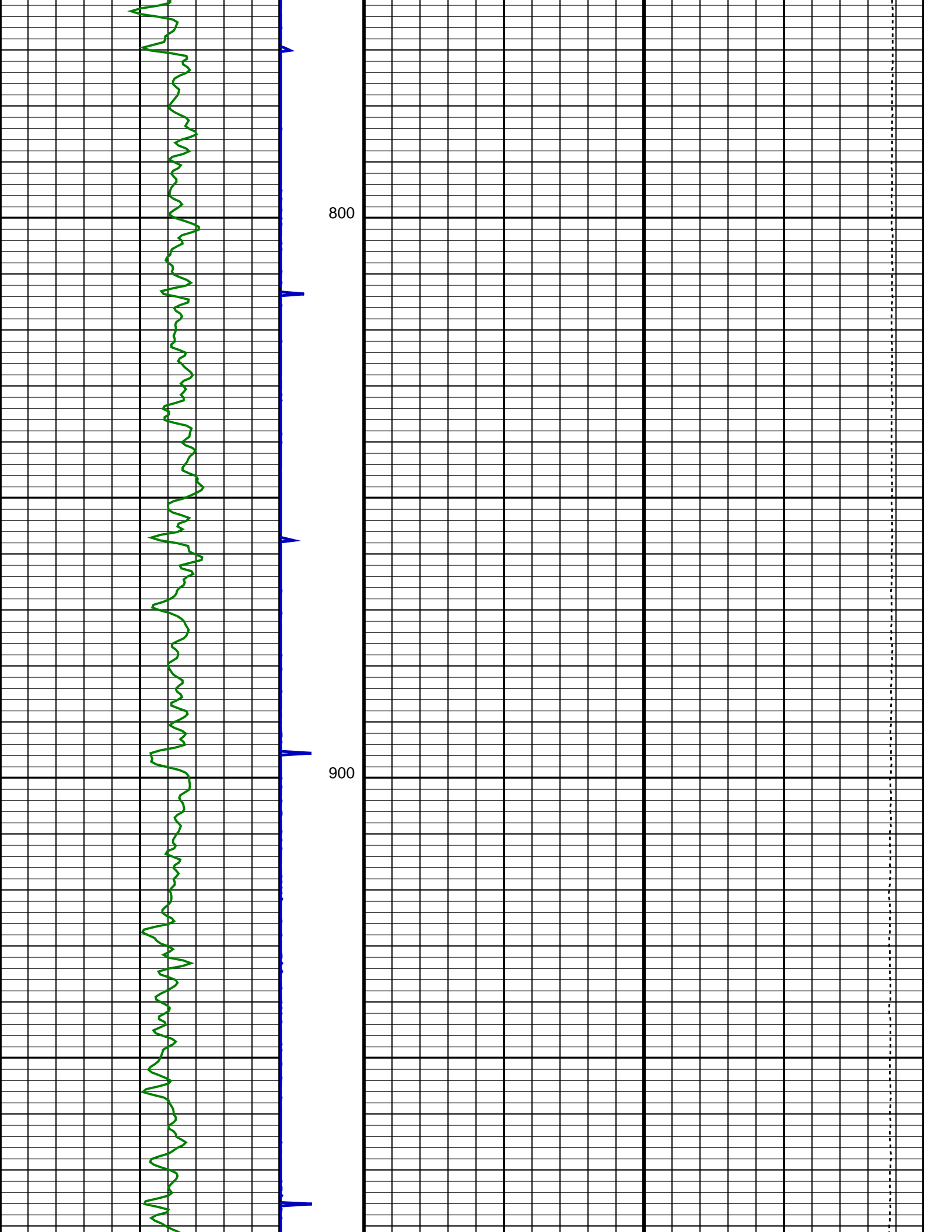


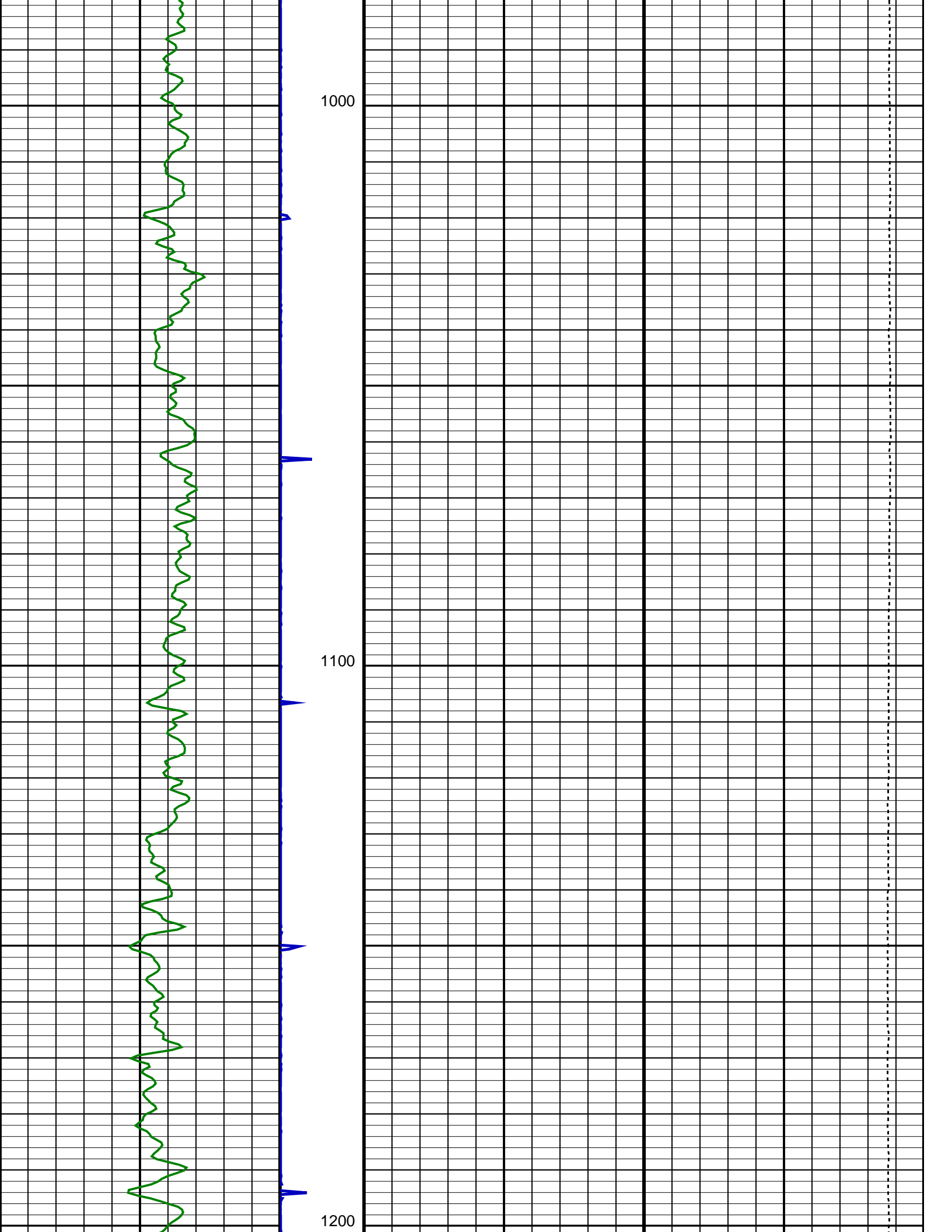




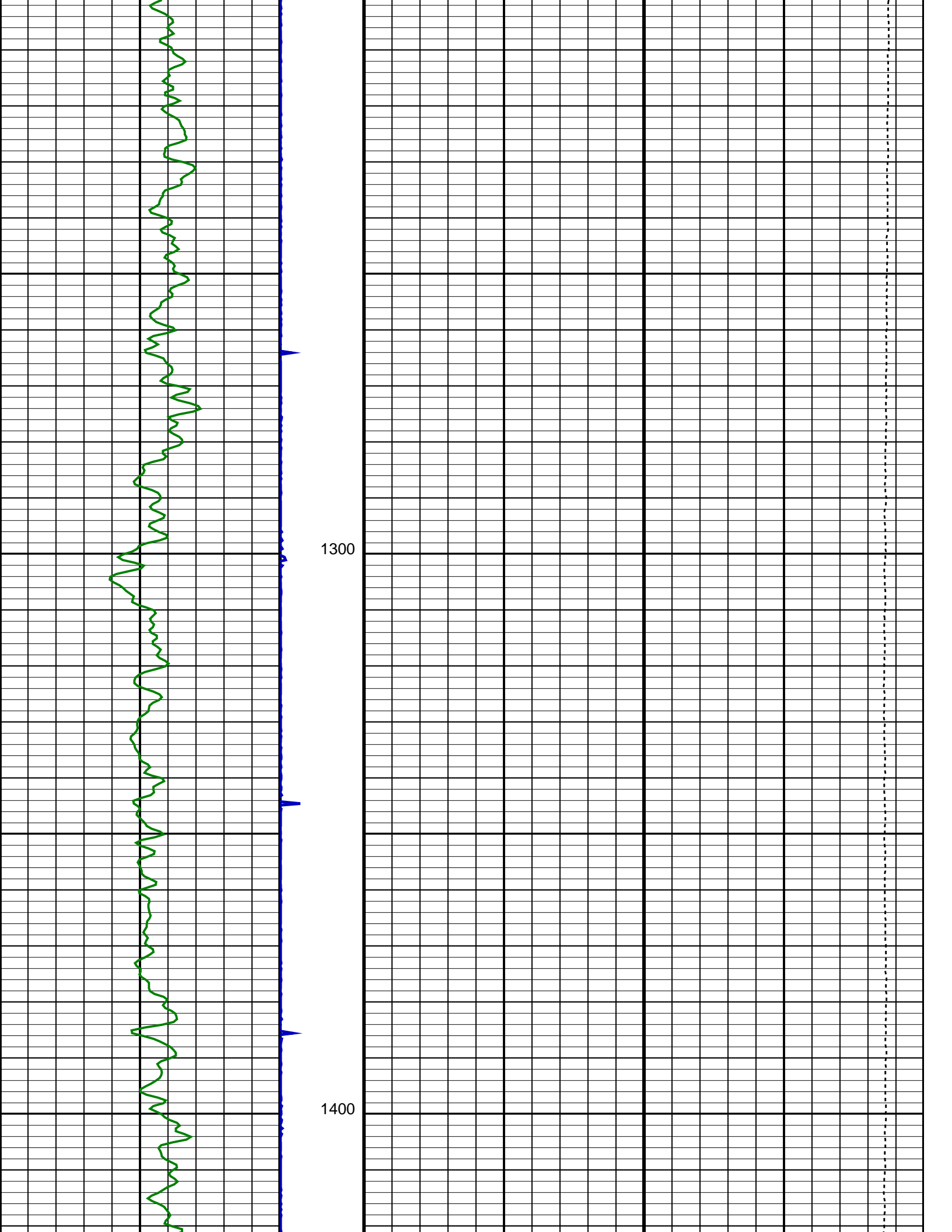


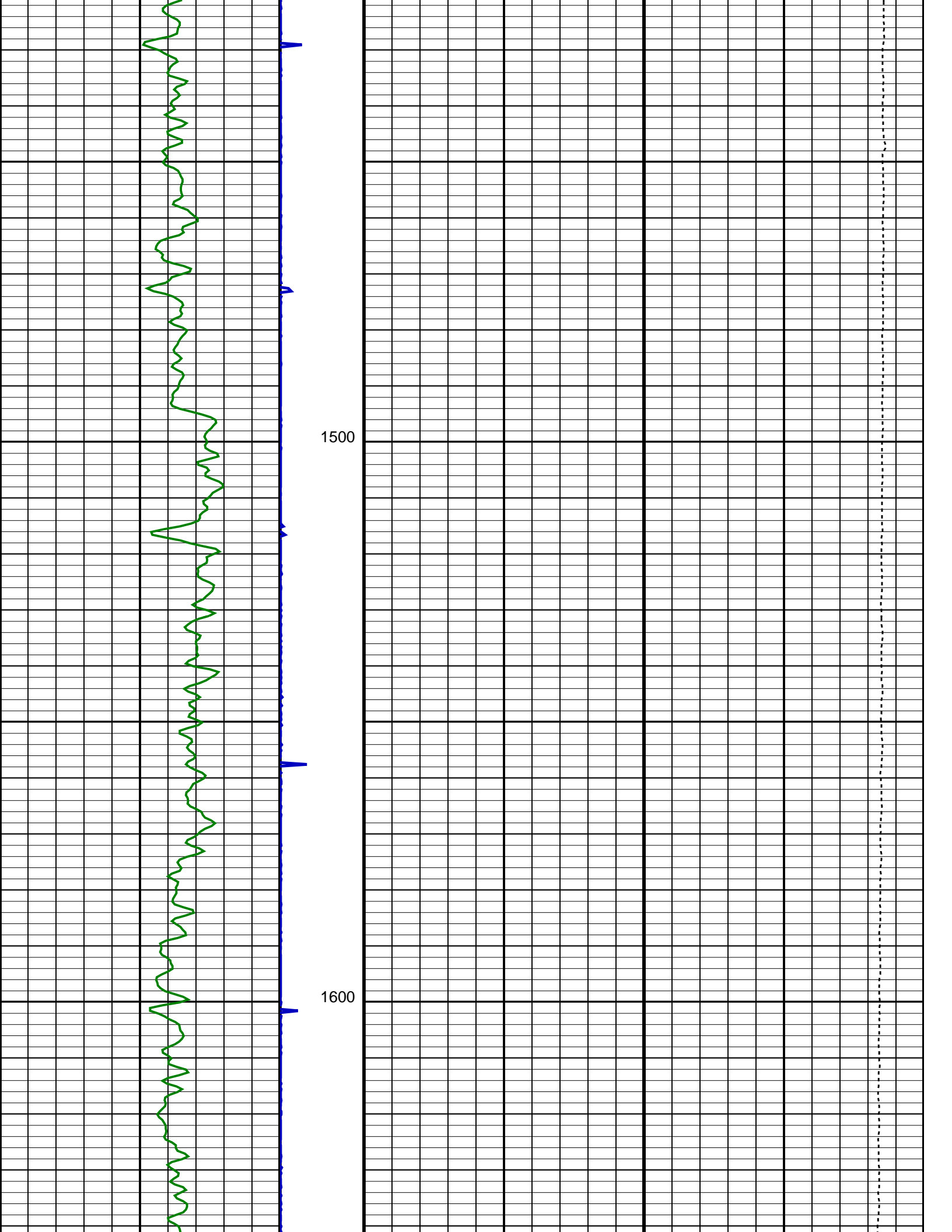


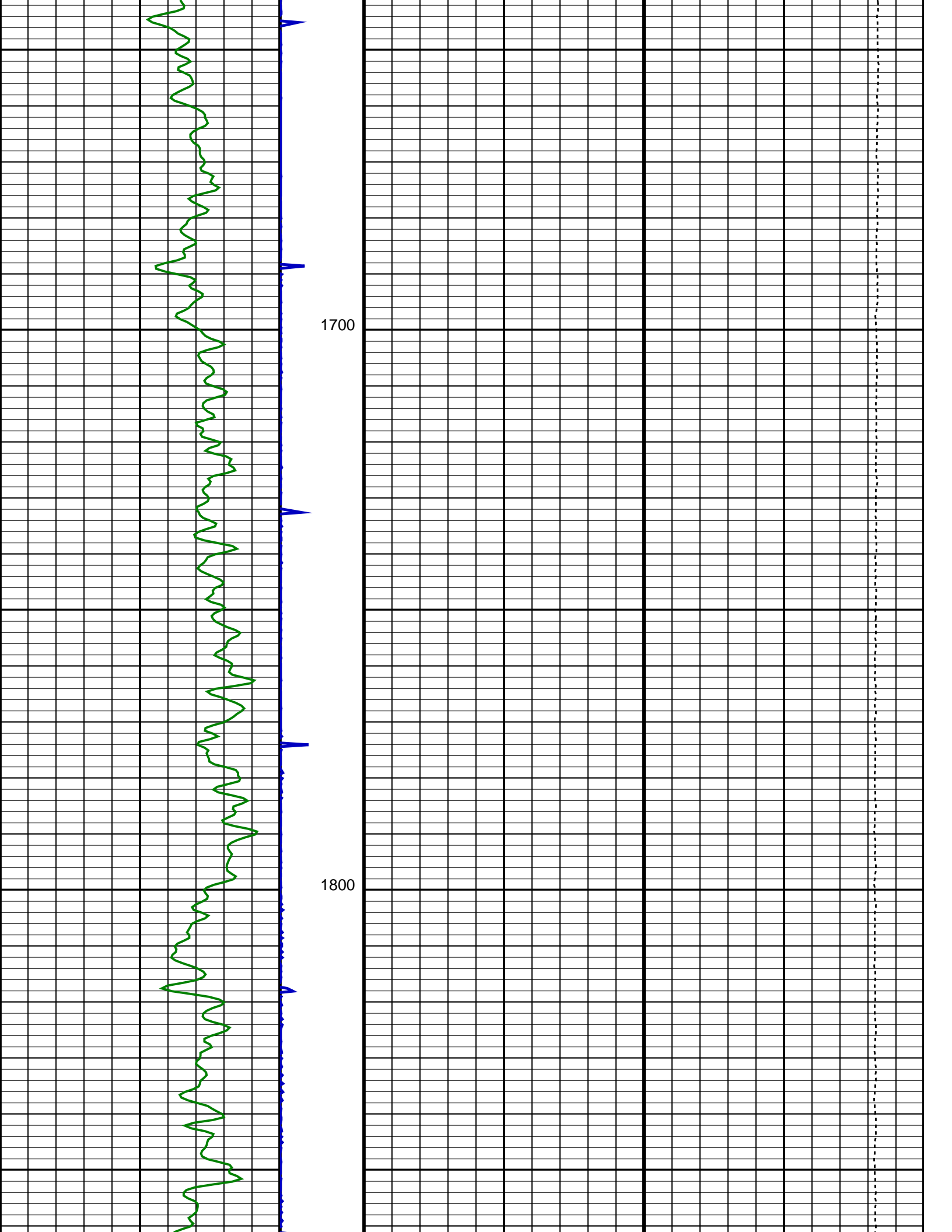


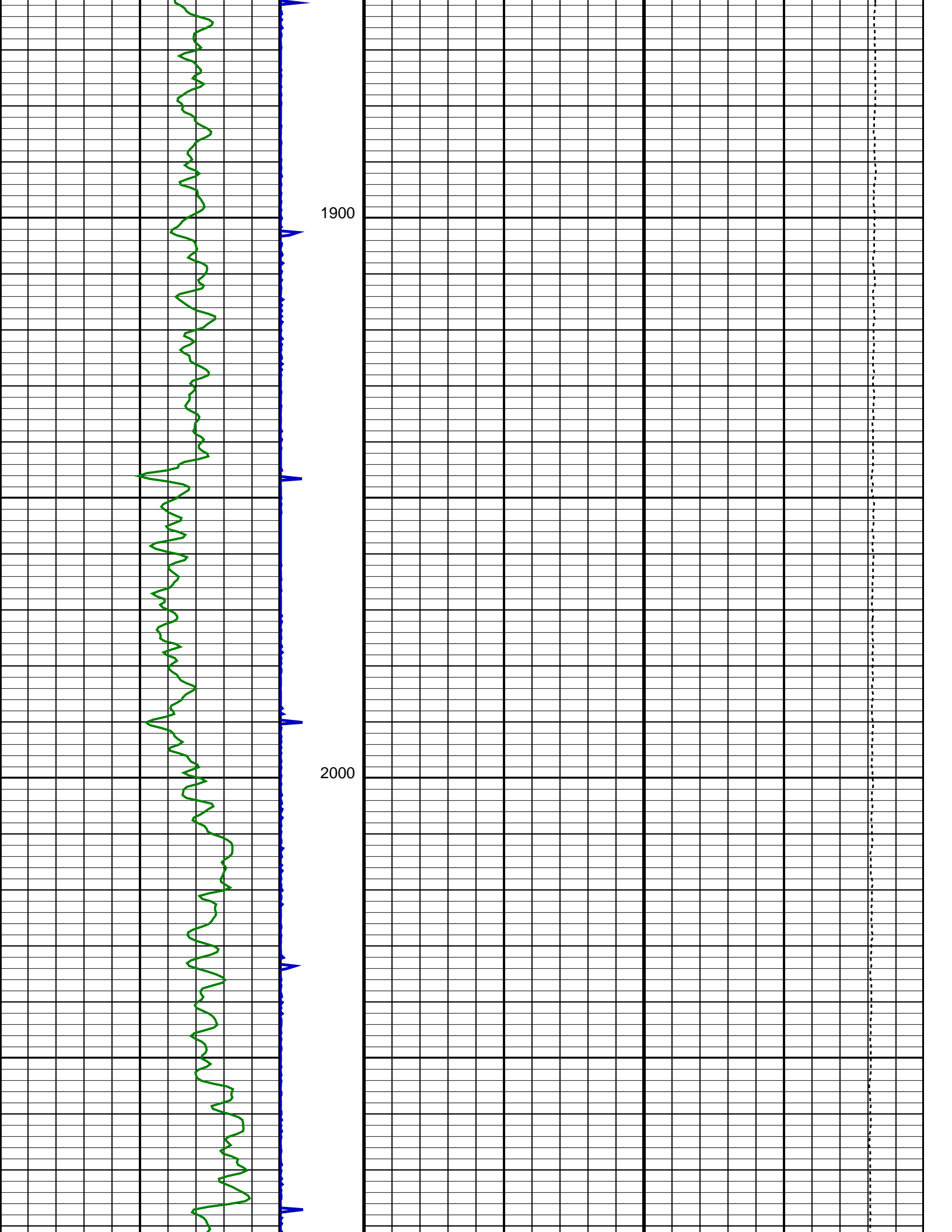


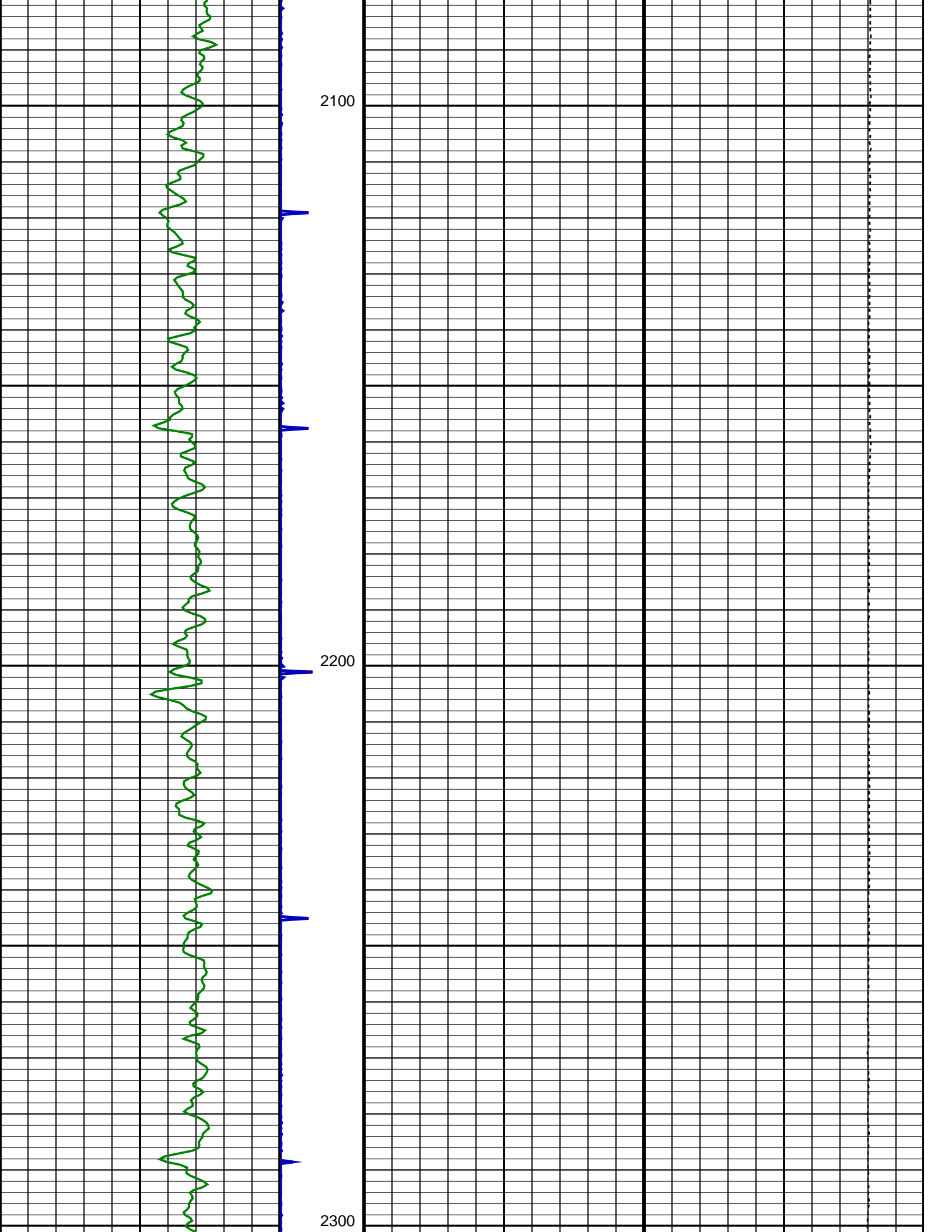




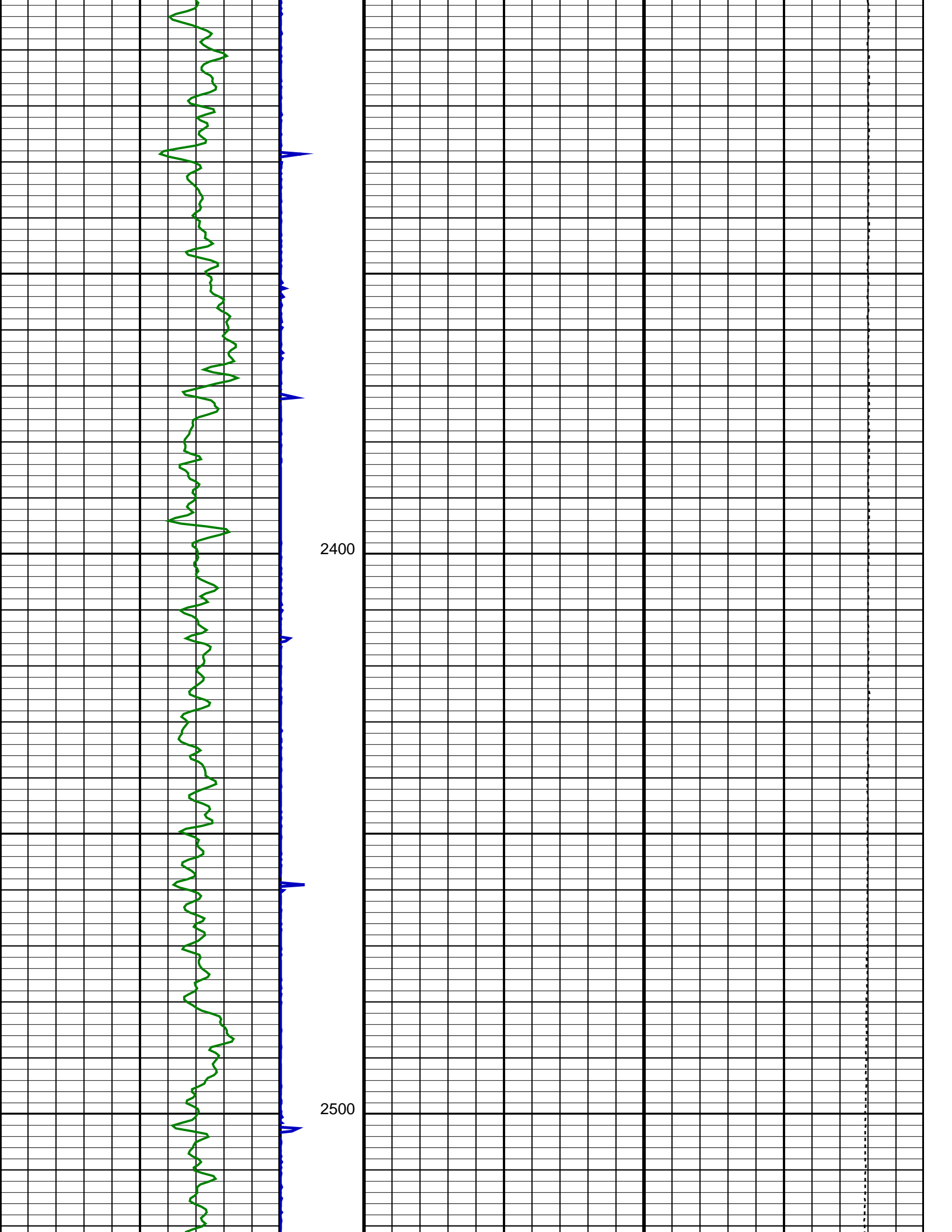


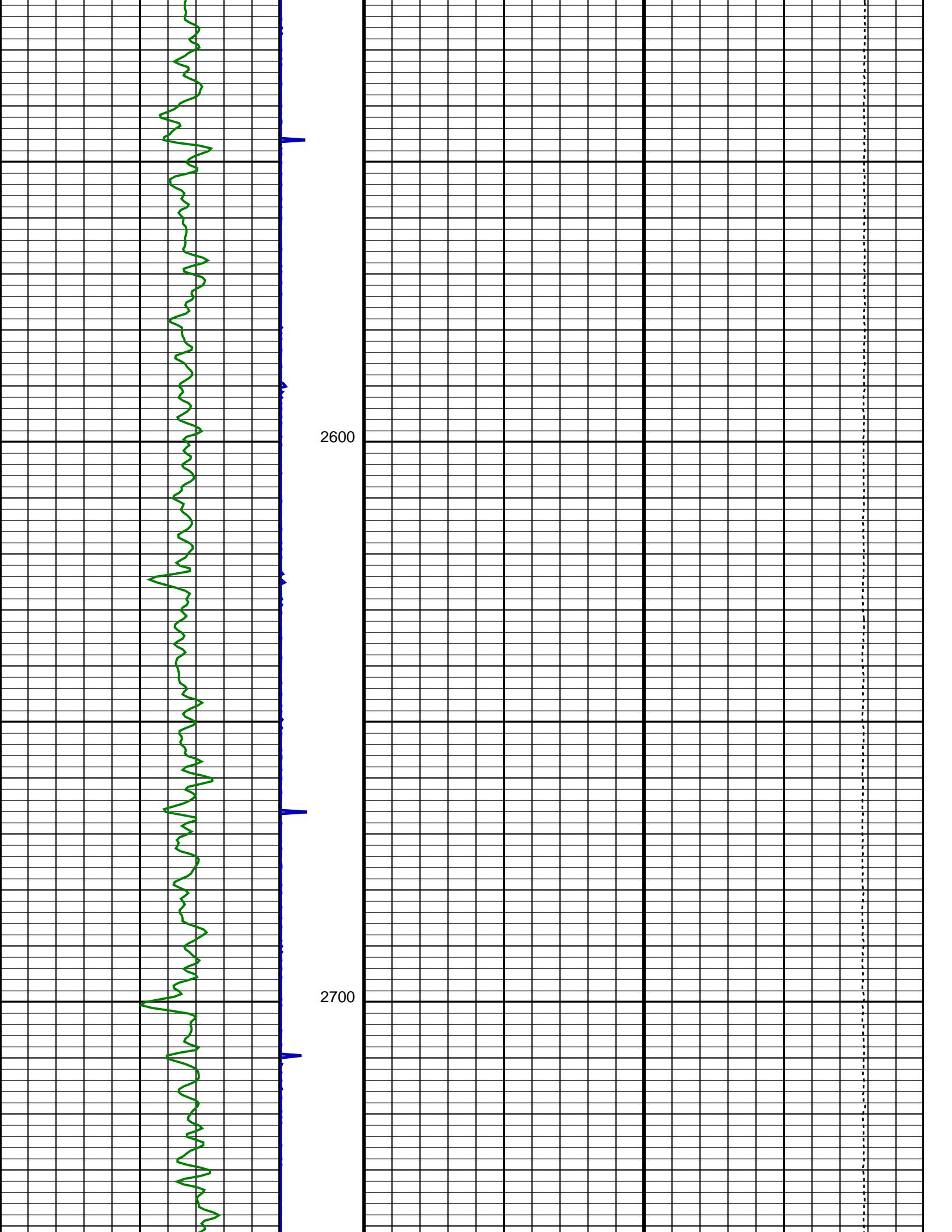


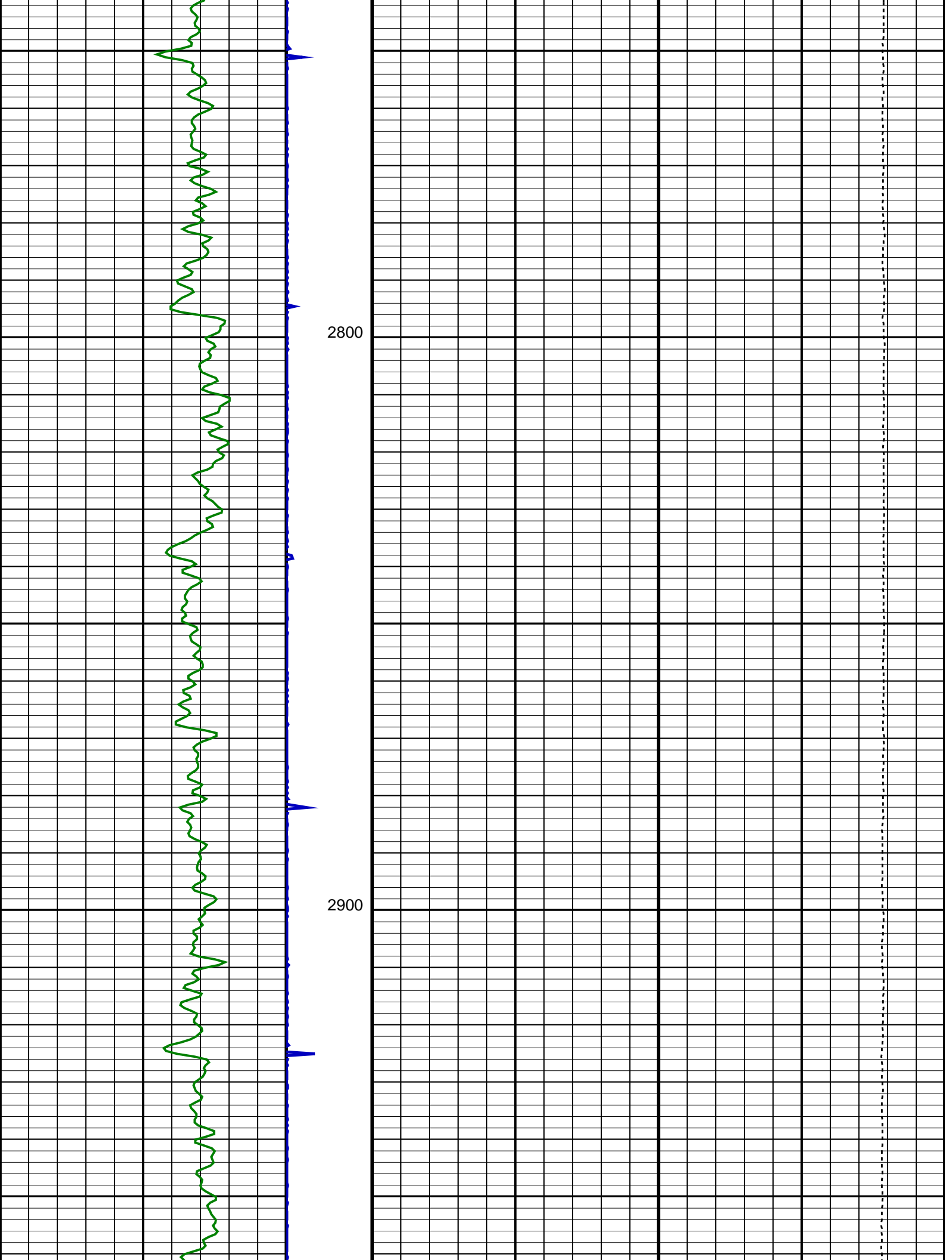


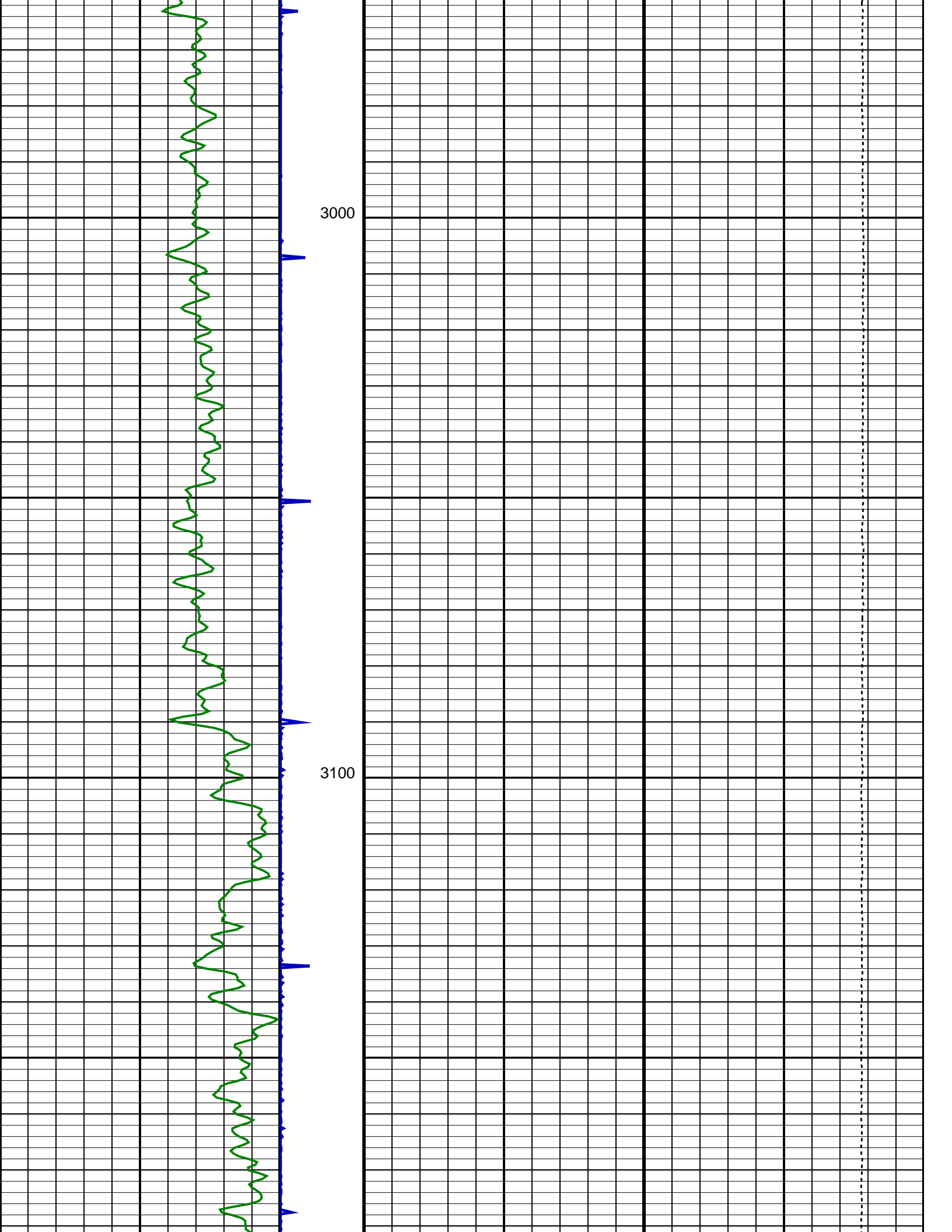


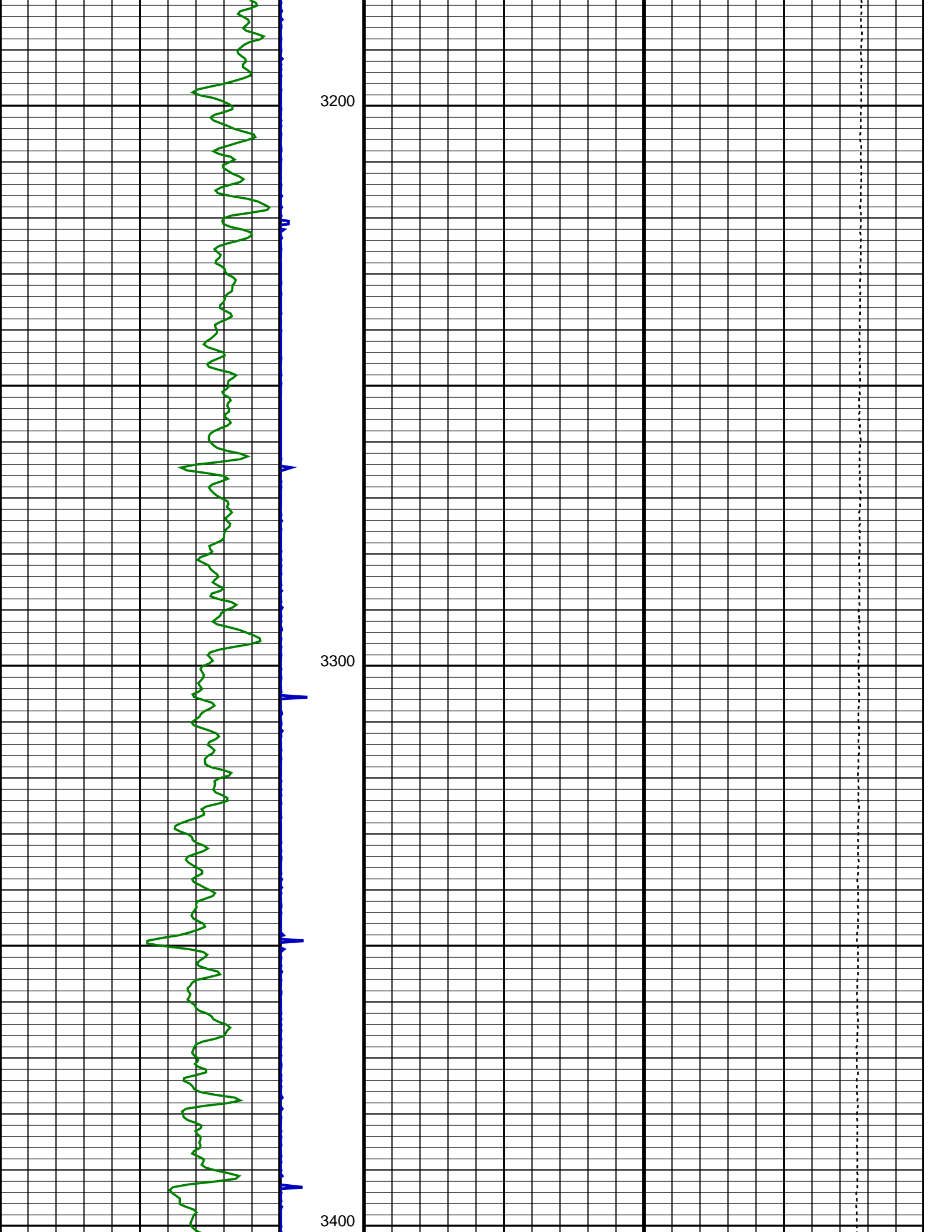


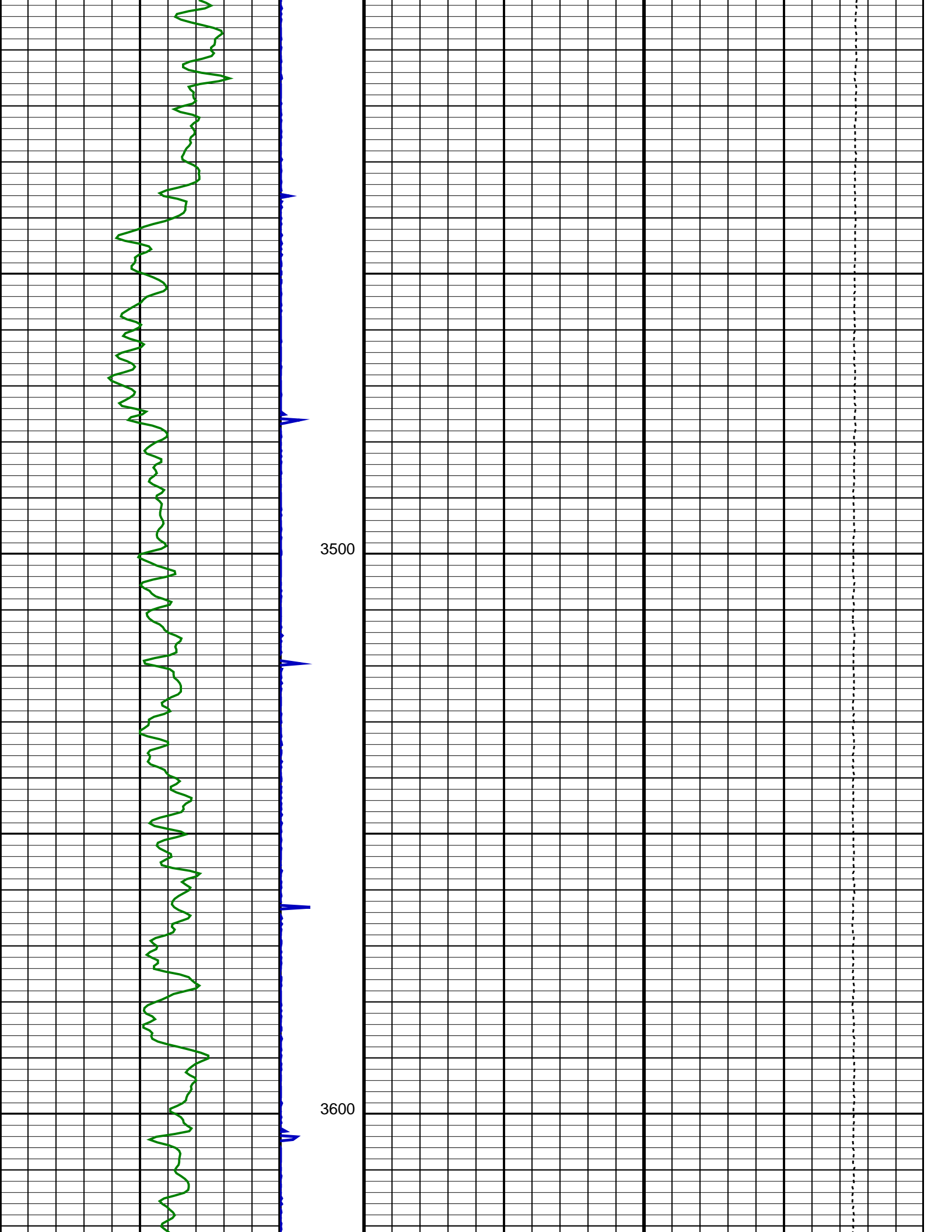


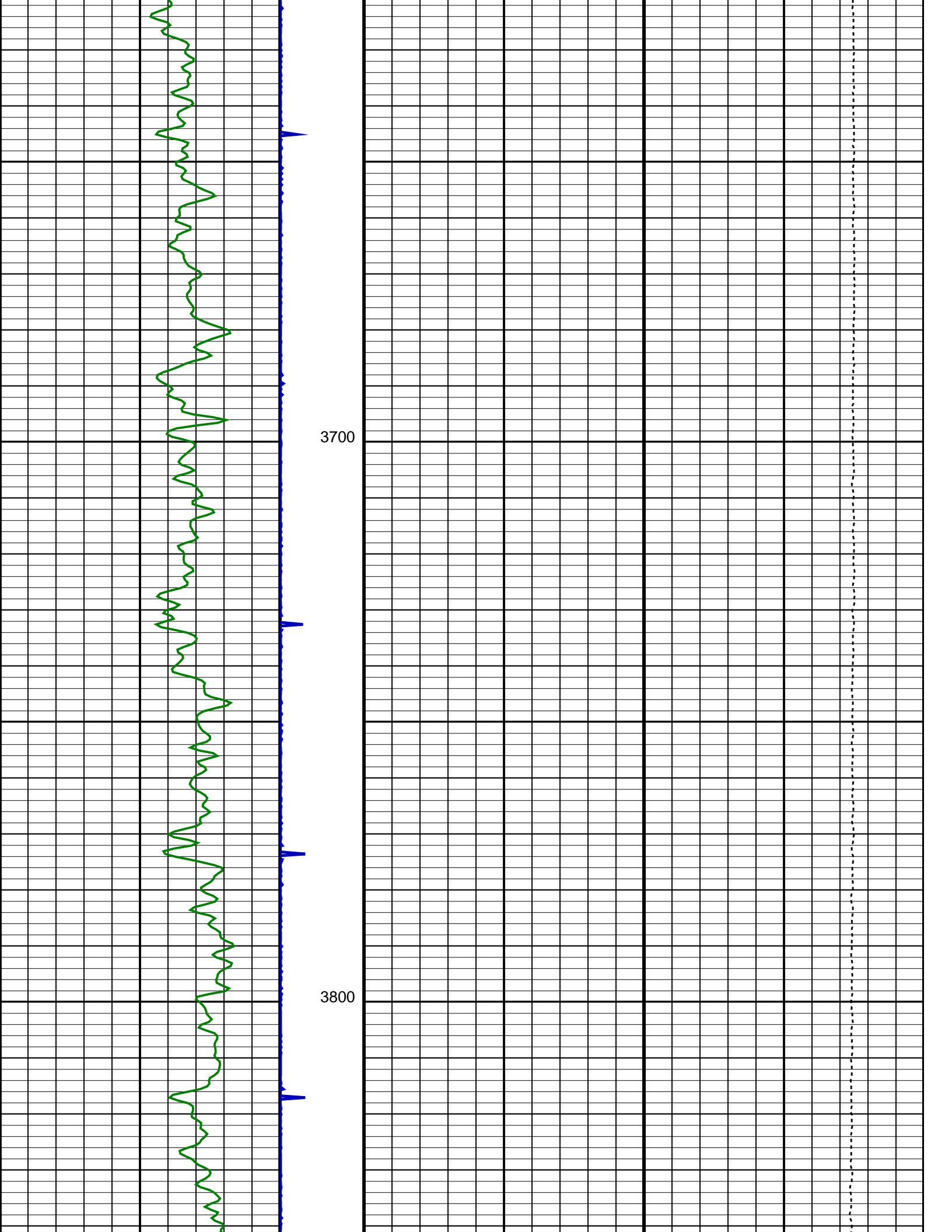


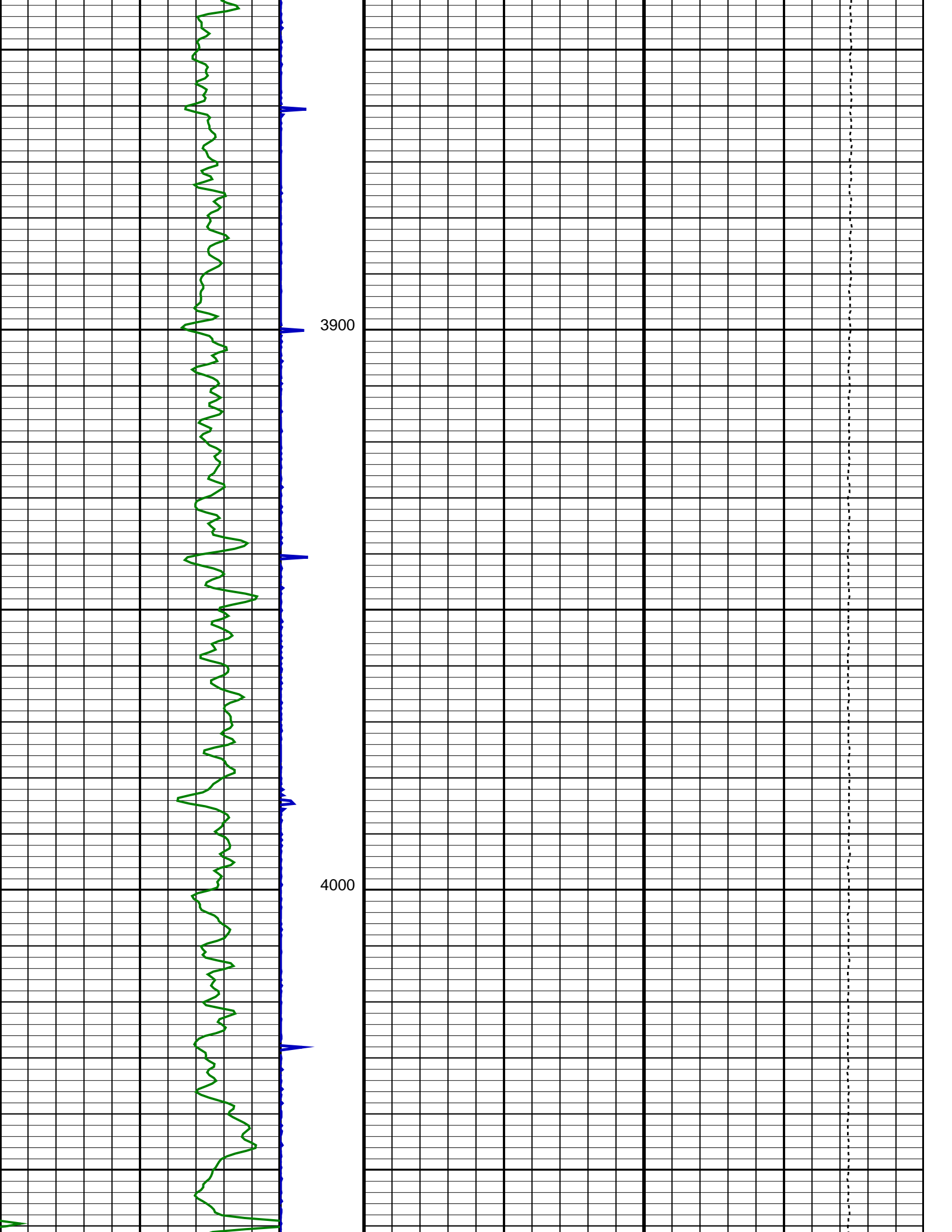




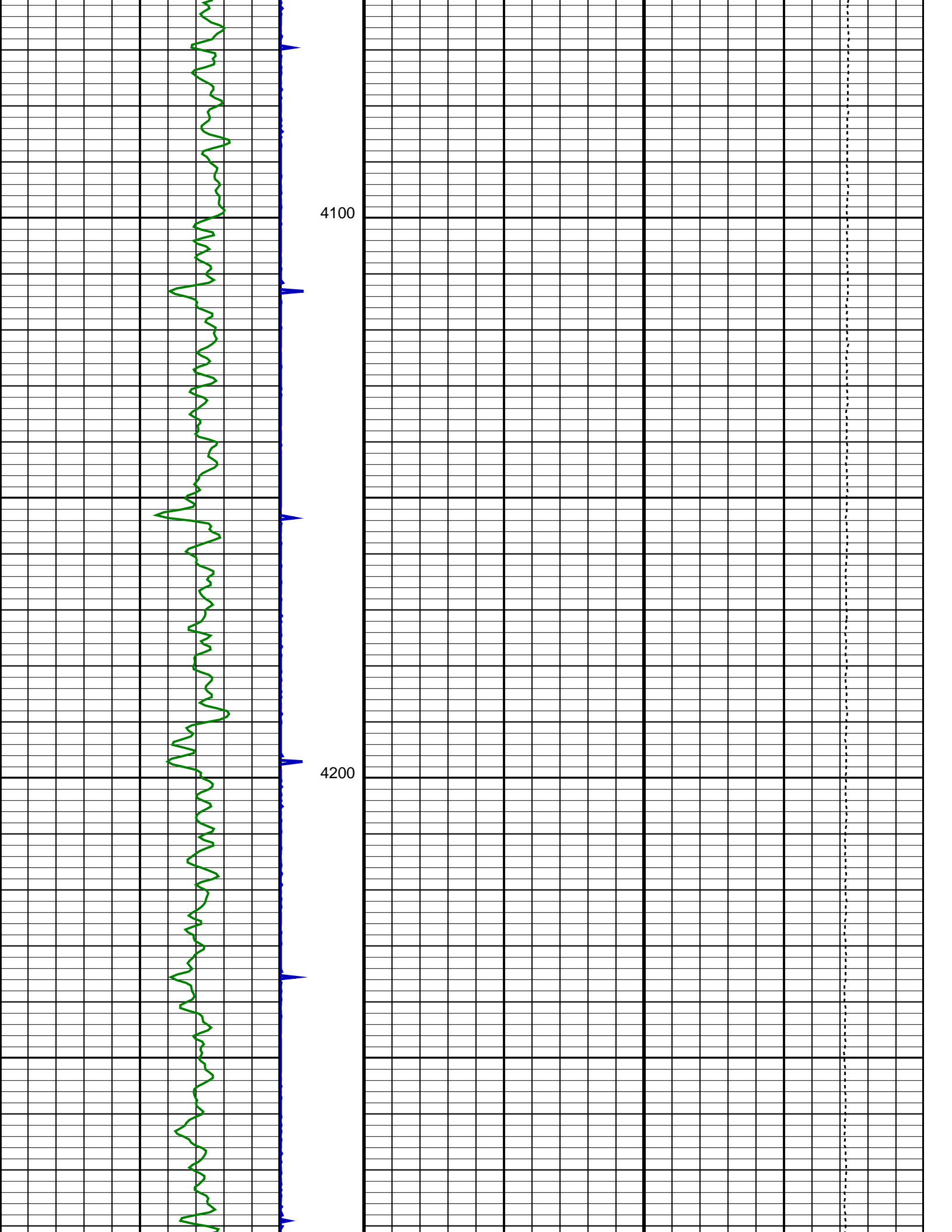


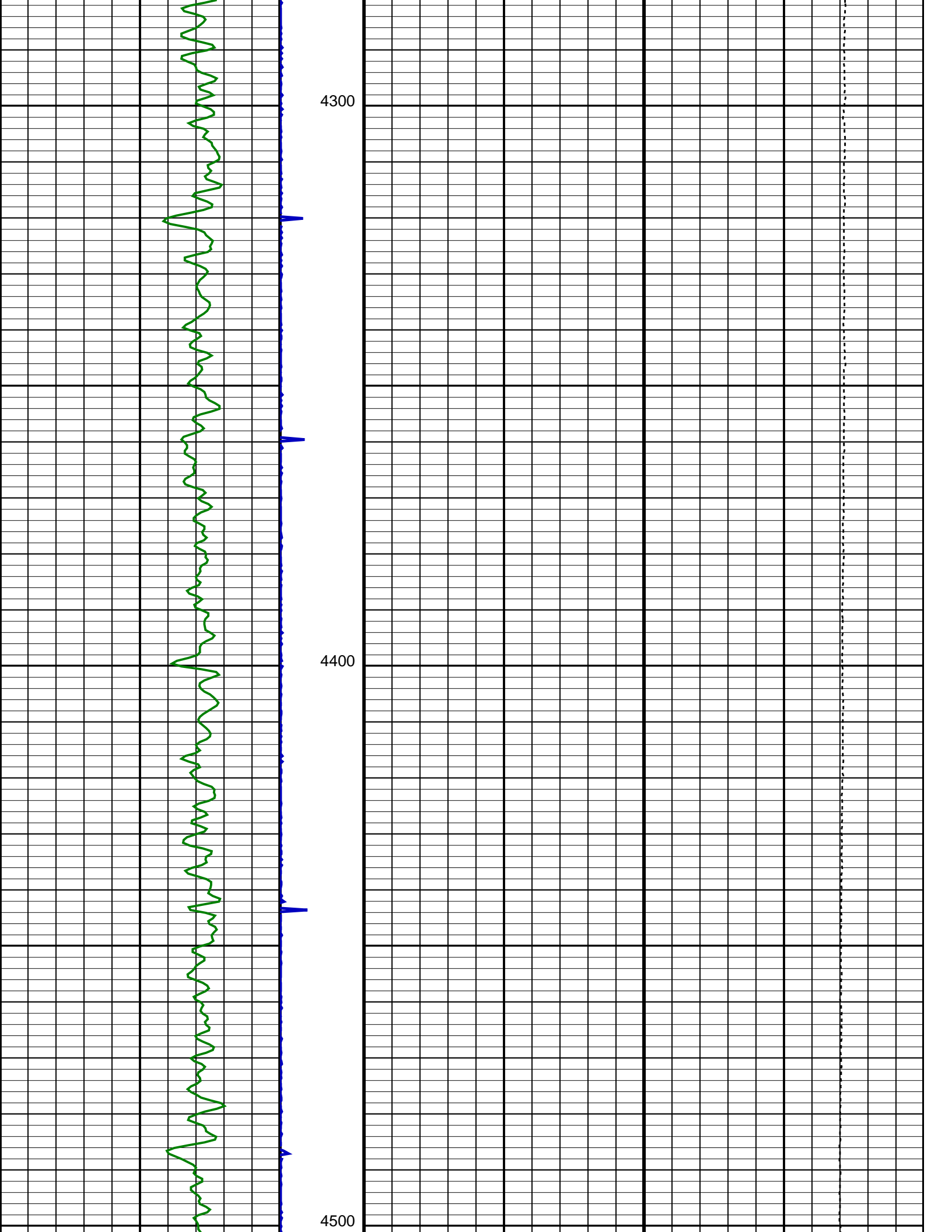


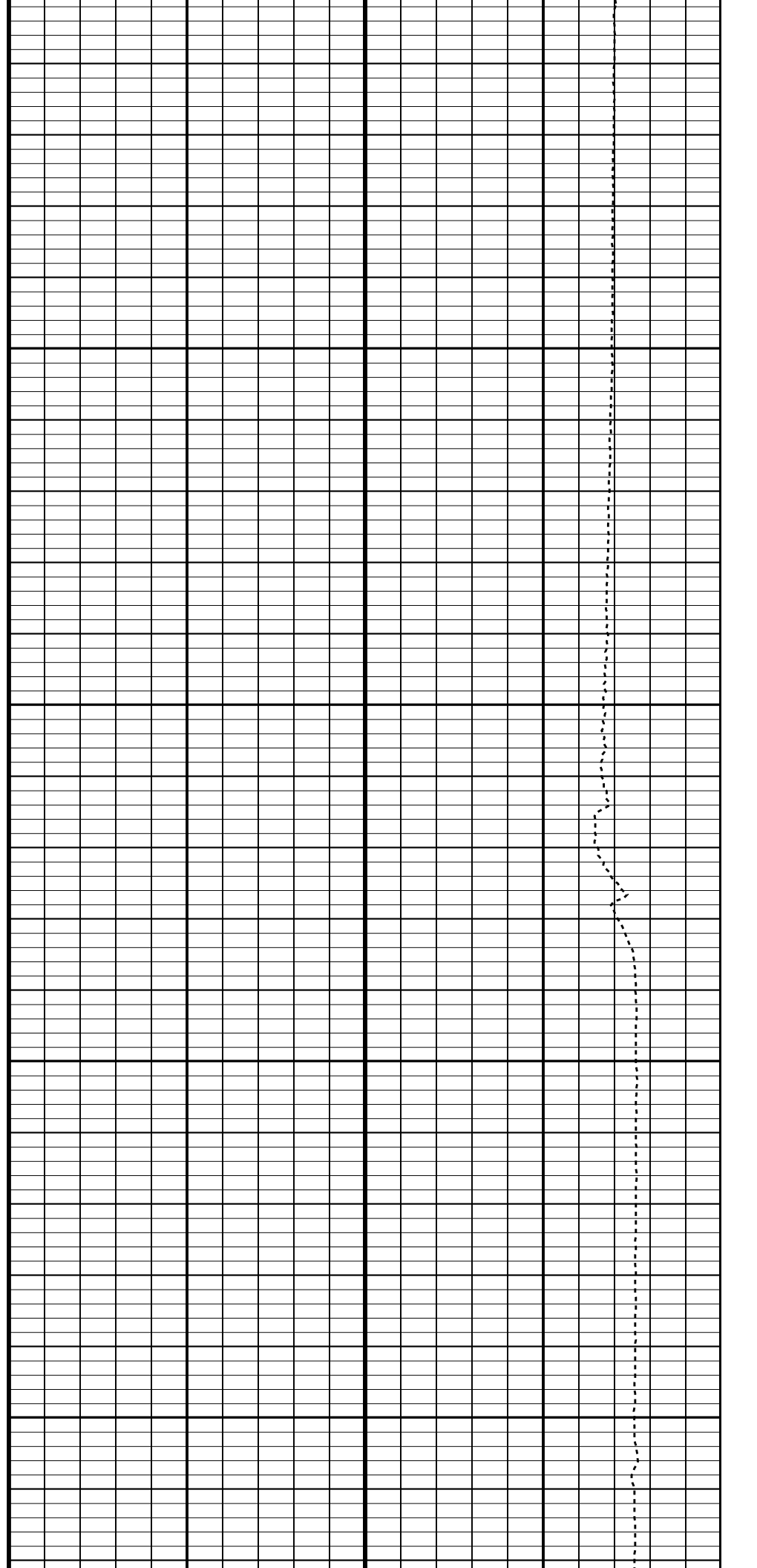
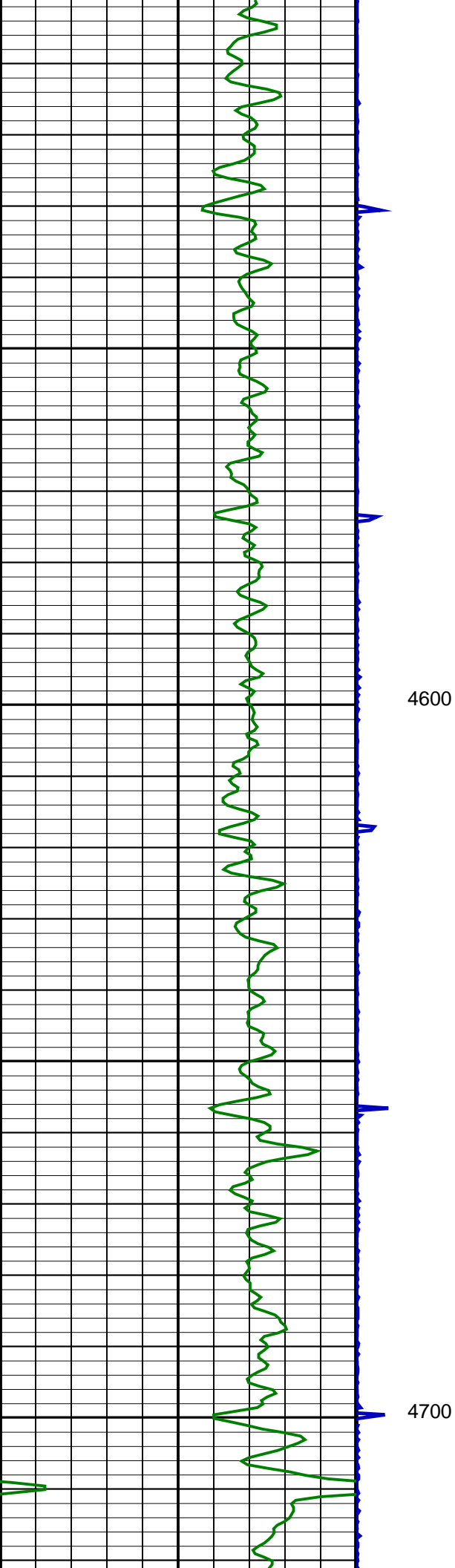


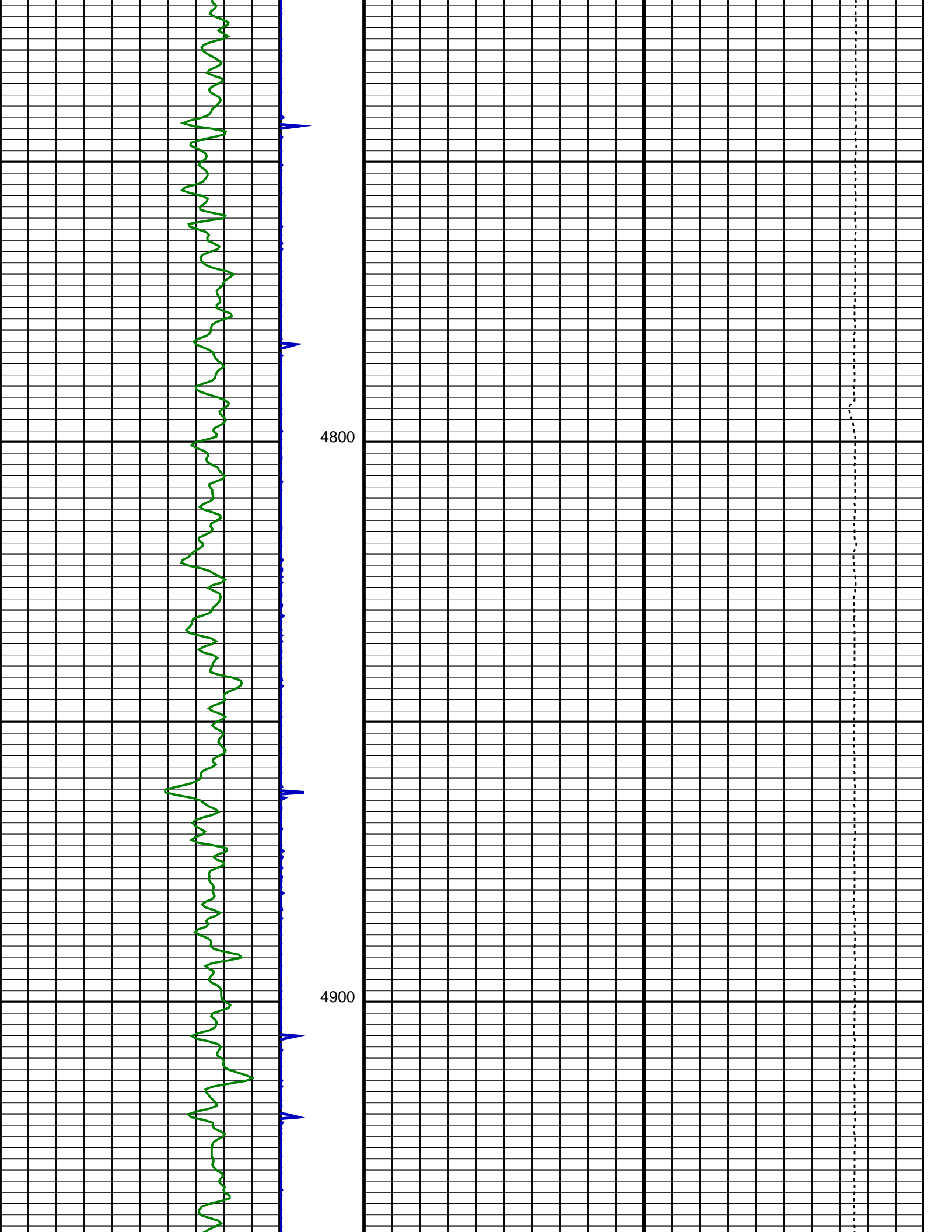


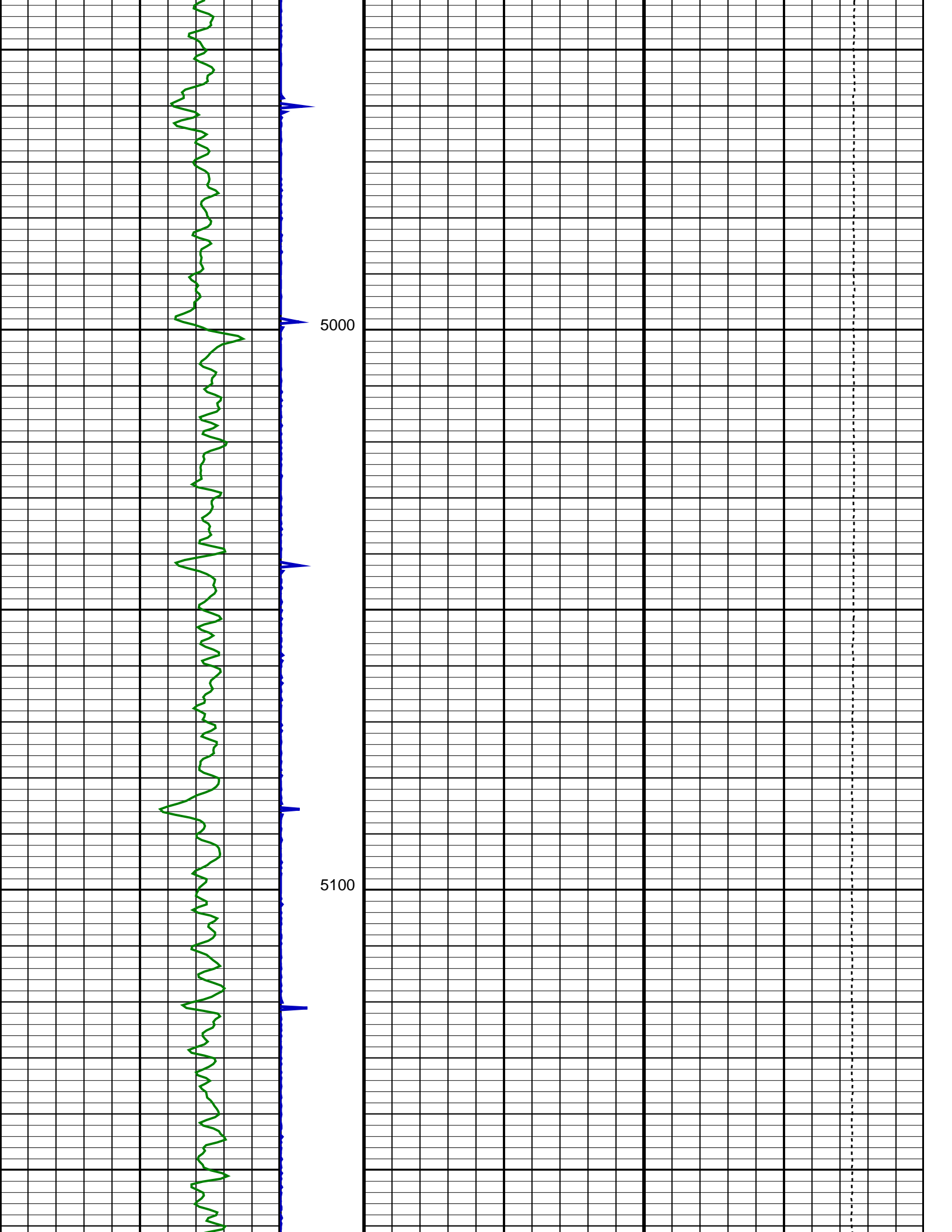


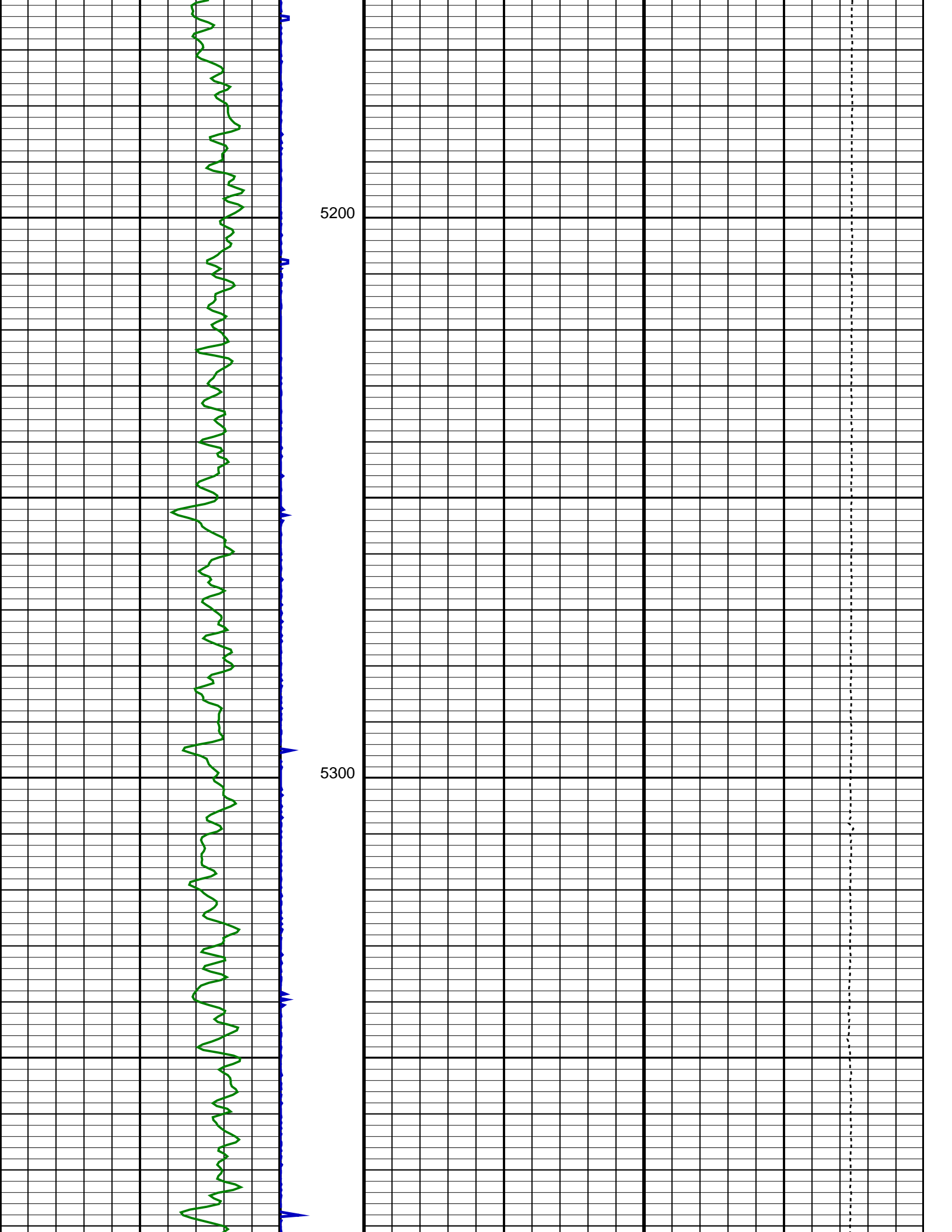


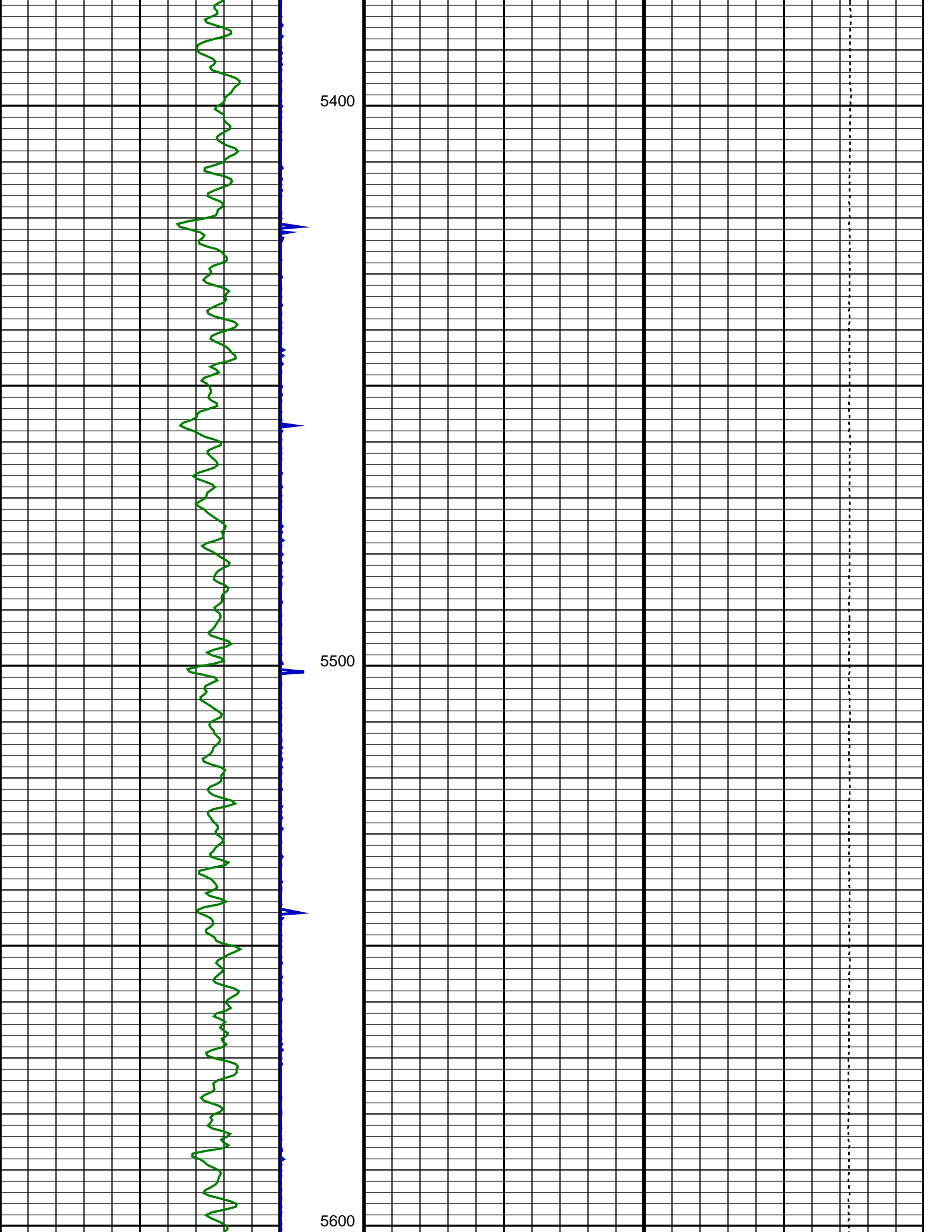


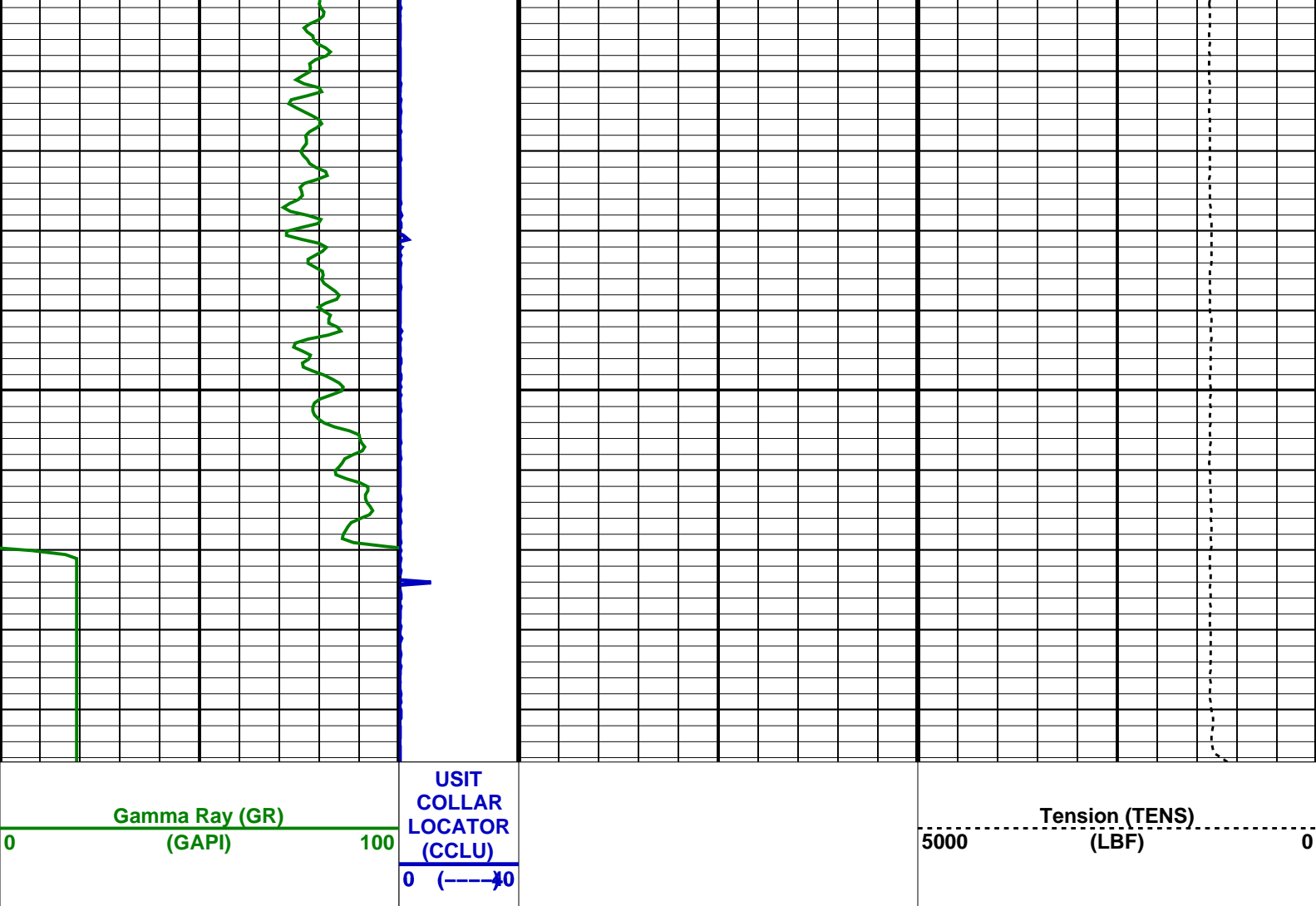












## Parameters

DLIS Name	Description	Value	
USIT-E: Ultrasonic Imaging – E			
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	208	US/F
DOT	Diameter of Transducer Sensor	2.874	IN
EMXV	EMEX Voltage	40	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	10DEG_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	1.65	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	2.0	FT
PP	Playback Processing	RECOMPUTE	



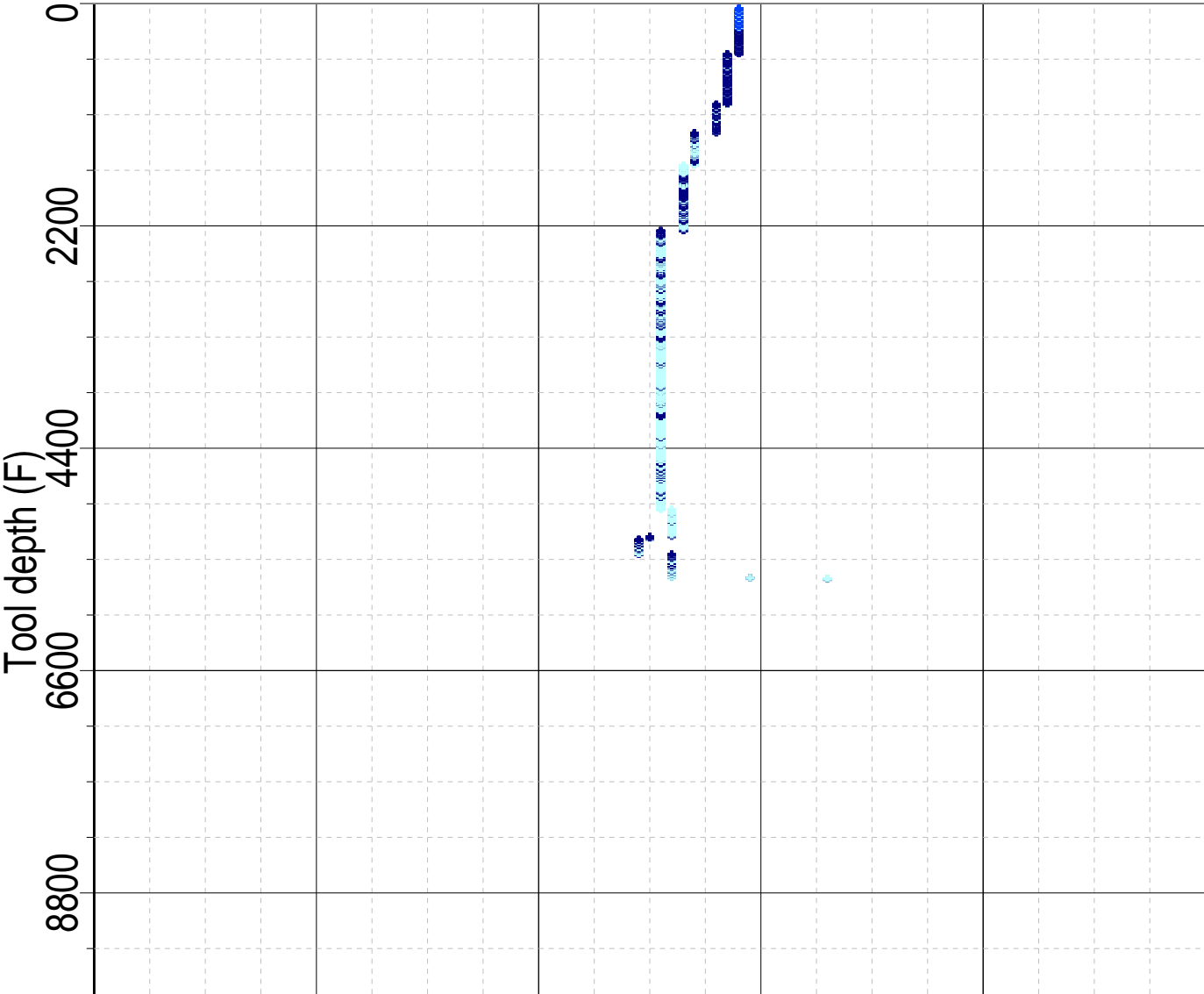
USIT-E	19C0-187	SGT-N	19C0-187
DTC-H	19C0-187		
Input DLIS Files			
DEFAULT	USI_015LUP	FN:14	PRODUCER 28-Jul-2013 20:03 5694.5 FT 50.0 FT
Output DLIS Files			
DEFAULT	USI_005PUP	FN:4	PRODUCER 28-Jul-2013 20:44

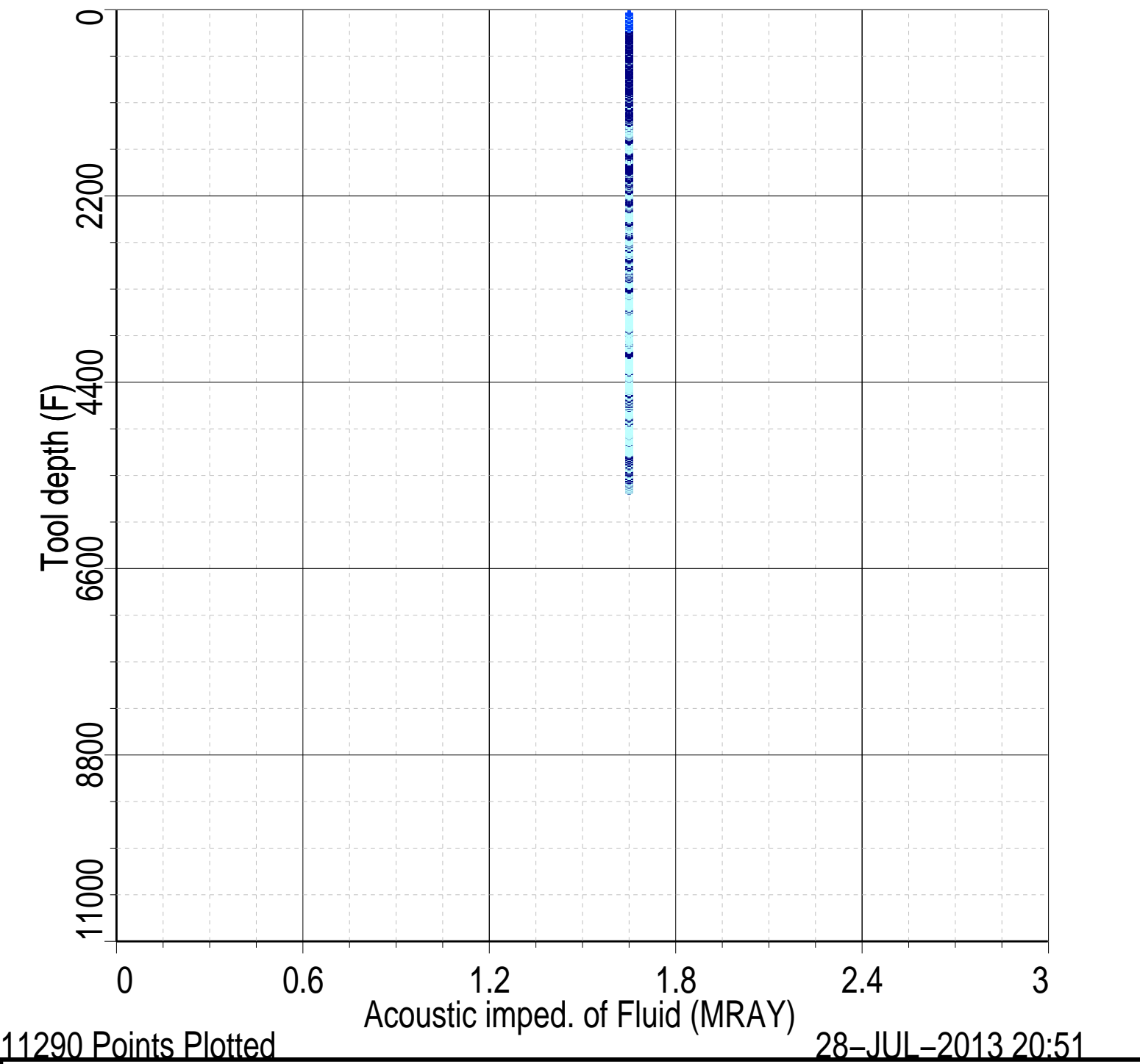
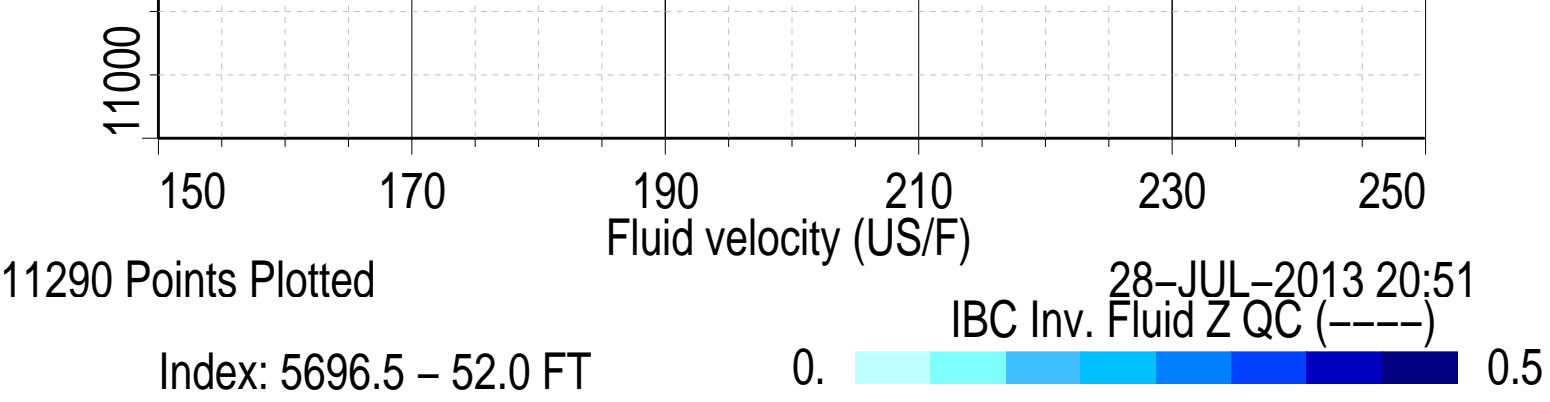


MAXIS Field Log

Index: 5696.5 – 52.0 FT

IBC Inv. Fluid Z QC (----) 0. 0.5





Company: Noble Energy, Inc

Well: Timbro LD06-64HN

## Input DLIS Files

DEFAULT      USI\_015LUP      FN:14    PRODUCER    28-Jul-2013 20:03    5694.5 FT    50.0 FT

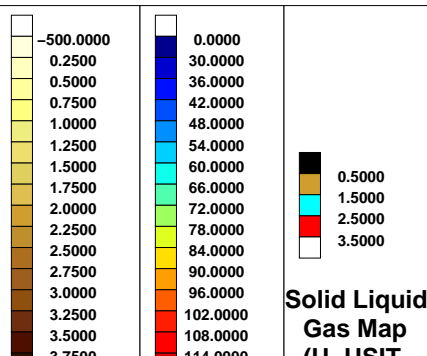
## Output DLIS Files

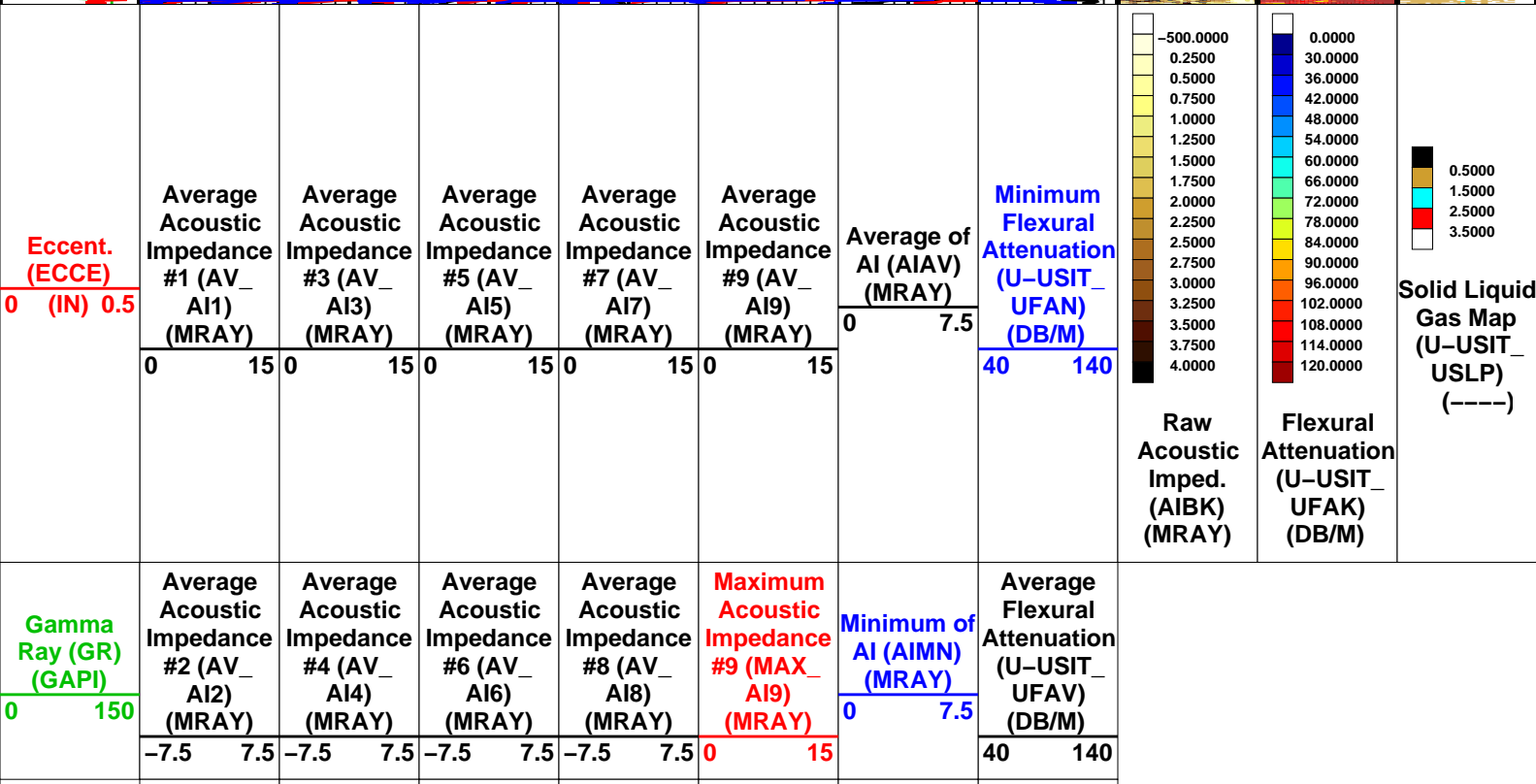
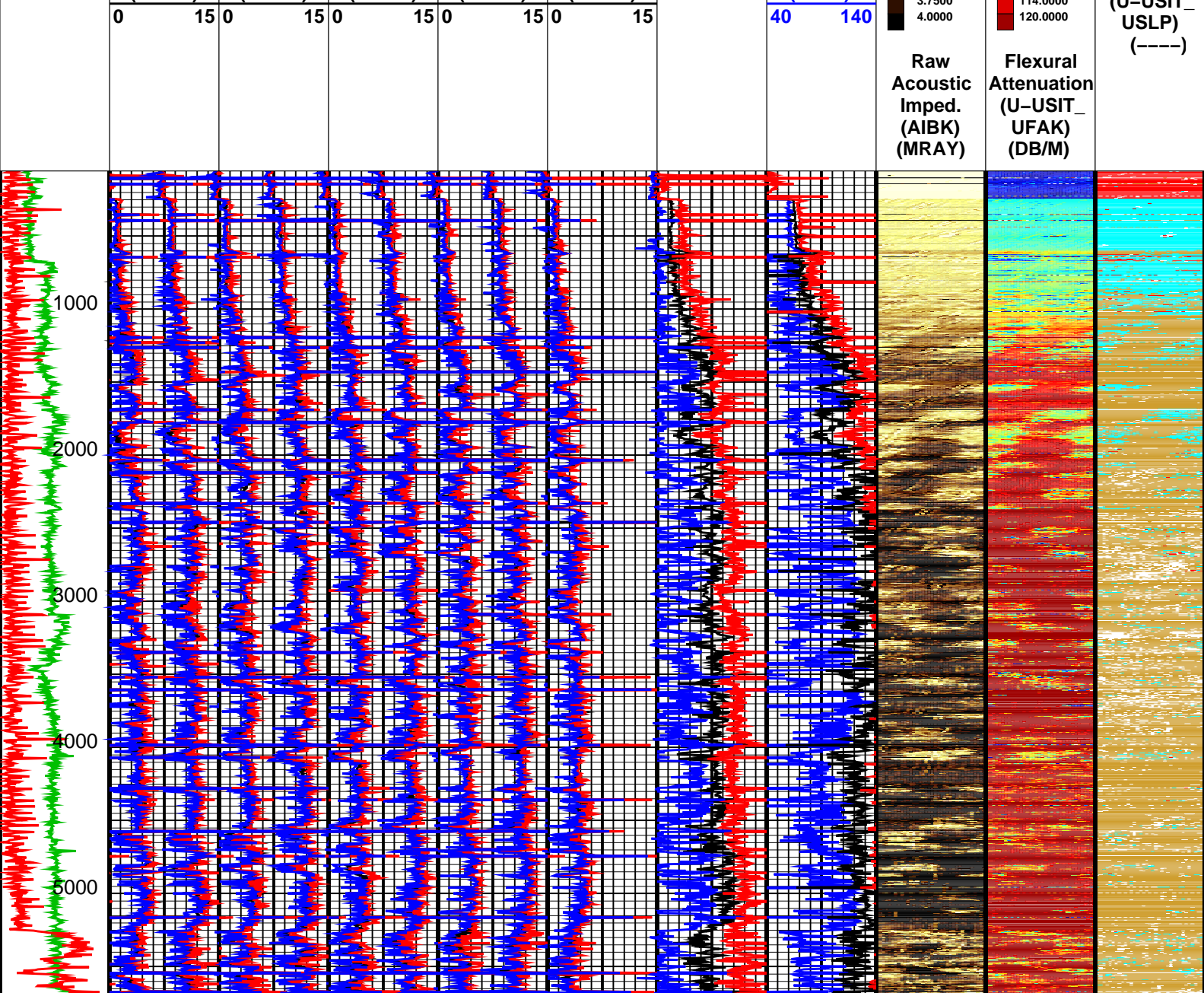
DEFAULT      USI\_005PUP      FN:4    PRODUCER    28-Jul-2013 20:44    5696.5 FT    52.0 FT

## OP System Version: 19C0-187

USIT-E      19C0-187      SGT-N      19C0-187  
DTC-H      19C0-187

	Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)			
	-7.5    7.5	-7.5    7.5	-7.5    7.5	-7.5    7.5			
	Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)			
	0      15	0      15	0      15	0      15			
	Maximum Acoustic Impedance #2 (MAX_ AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_ AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_ AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_ AI8) (MRAY)			
	-7.5    7.5	-7.5    7.5	-7.5    7.5	-7.5    7.5			
	Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)	Maximum Flexural Attenuation (U-USIT_ UFAX) (DB/M)
	0      15	0      15	0      15	0      15	0      15	0      7.5	40      140
Gamma Ray (GR) (GAPI)	Average Acoustic Impedance #2 (AV_ AI2) (MRAY)	Average Acoustic Impedance #4 (AV_ AI4) (MRAY)	Average Acoustic Impedance #6 (AV_ AI6) (MRAY)	Average Acoustic Impedance #8 (AV_ AI8) (MRAY)	Maximum Acoustic Impedance #9 (MAX_ AI9) (MRAY)	Minimum of AI (AIMN) (MRAY)	Average Flexural Attenuation (U-USIT_ UFAV) (DB/M)
0      150	-7.5    7.5	-7.5    7.5	-7.5    7.5	-7.5    7.5	0      15	0      7.5	40      140
	Average Acoustic Impedance #1 (AV_ AI1) (MRAY)	Average Acoustic Impedance #3 (AV_ AI3) (MRAY)	Average Acoustic Impedance #5 (AV_ AI5) (MRAY)	Average Acoustic Impedance #7 (AV_ AI7) (MRAY)	Average Acoustic Impedance #9 (AV_ AI9) (MRAY)	Average of AI (AIAV) (MRAY)	Minimum Flexural Attenuation (U-USIT_ UFAN) (DB/M)
Eccent. (ECCE)	0      0.5					0      7.5	





Maximum Acoustic Impedance #1 (MAX_ AI1) (MRAY)	Maximum Acoustic Impedance #3 (MAX_ AI3) (MRAY)	Maximum Acoustic Impedance #5 (MAX_ AI5) (MRAY)	Maximum Acoustic Impedance #7 (MAX_ AI7) (MRAY)	Minimum Acoustic Impedance #9 (MIN_ AI9) (MRAY)	Maximum of AI (AIMX) (MRAY)	Maximum Flexural Attenuation (U-USIT_ UFAX) (DB/M)
0 15	0 15	0 15	0 15	0 15	0 7.5	40 140
Maximum Acoustic Impedance #2 (MAX_ AI2) (MRAY)	Maximum Acoustic Impedance #4 (MAX_ AI4) (MRAY)	Maximum Acoustic Impedance #6 (MAX_ AI6) (MRAY)	Maximum Acoustic Impedance #8 (MAX_ AI8) (MRAY)			
-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			
Minimum Acoustic Impedance #1 (MIN_ AI1) (MRAY)	Minimum Acoustic Impedance #3 (MIN_ AI3) (MRAY)	Minimum Acoustic Impedance #5 (MIN_ AI5) (MRAY)	Minimum Acoustic Impedance #7 (MIN_ AI7) (MRAY)			
0 15	0 15	0 15	0 15			
Minimum Acoustic Impedance #2 (MIN_ AI2) (MRAY)	Minimum Acoustic Impedance #4 (MIN_ AI4) (MRAY)	Minimum Acoustic Impedance #6 (MIN_ AI6) (MRAY)	Minimum Acoustic Impedance #8 (MIN_ AI8) (MRAY)			
-7.5 7.5	-7.5 7.5	-7.5 7.5	-7.5 7.5			

Format: IBC Goodwin Compressed      Vertical Scale: 0.1" per 100'      Graphics File Created: 28-Jul-2013 20:44

## OP System Version: 19C0-187

USIT-E      19C0-187      SGT-N      19C0-187  
DTC-H      19C0-187

All USI Images are outside views

USI : LOW Frequency Compression Mode Used For Logging.  
Recommended casing thickness range for optimum cement impedance measurement : 0.27 to 0.6 IN.

### Input DLIS Files

DEFAULT      USI\_015LUP      FN:14      PRODUCER      28-Jul-2013 20:03      5694.5 FT      50.0 FT

### Output DLIS Files

DEFAULT      USI\_005PUP      FN:4      PRODUCER      28-Jul-2013 20:44

Company: Noble Energy, Inc

**Schlumberger**

Well: Timbro LD06-64HN  
Field: Wildcat  
County: Weld  
State: Colorado

Isolation Scanner  
Cement Evaluation (State Print)

