

**Schlumberger**

Company: Windy Hill Gas Storage, LLC

Well: Windy Hill 3-17D

Field: Wildcat

County: Morgan

State: Colorado

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Company: Windy Hill Gas Storage, LLC

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[illegible]

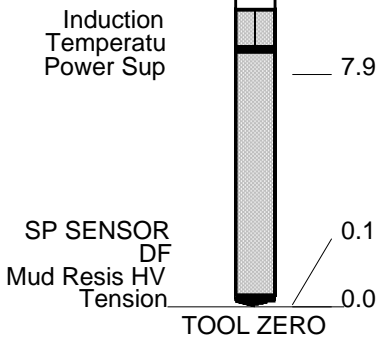
Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth		@		
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
Density	Viscosity			
Fluid Loss	PH			
Source Of Sample				
RM @ Measured Temperature		@		
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				

OTHER SERVICES1	OTHER SERVICES2
OS1: PEX	OS1:
OS2: Caliper	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Tool run as per tool sketch	
Matrix changes noted on logs.	

Rig: Unit 234					
Thank you for using Schlumberger Wireline					
Crew: Sam Hopper & David Marquez					
RUN 1			RUN 2		
SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:			SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:		
11634009			15C0-309		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP
EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		
SURFACE EQUIPMENT					
GSR-U WITM (DTS)-A					
DOWNHOLE EQUIPMENT					

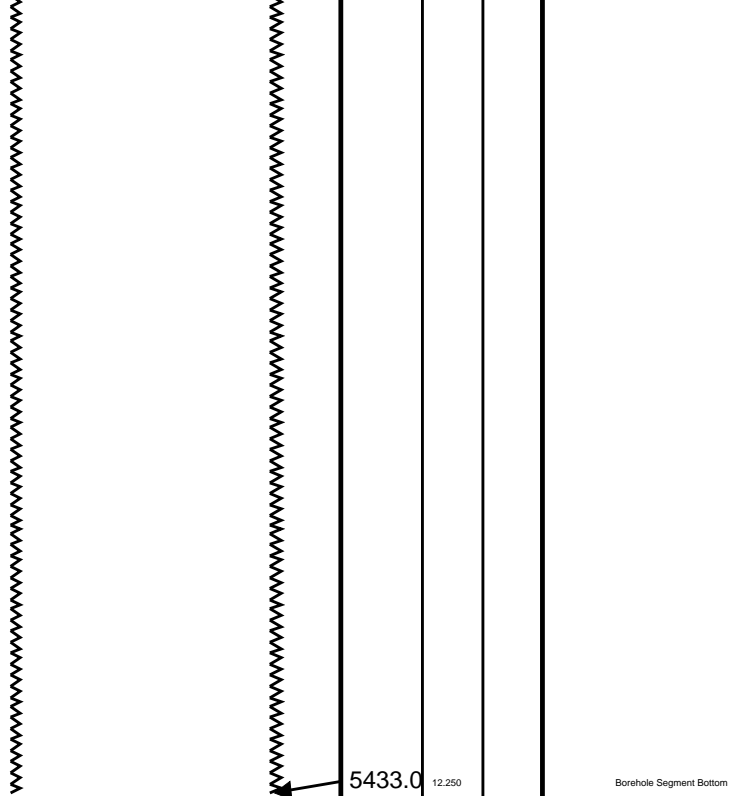
NGC-C  
NGCH-A

AIT-H  
AHIS-BA 372  
AHRM-A



MAXIMUM STRING DIAMETER 4.50 IN  
MEASUREMENTS RELATIVE TO TOOL ZERO  
ALL LENGTHS IN FEET

Production String	(in)		(ft) MD	Well Schematic	(ft) MD	(in)		Casing String
	OD	ID				OD	ID	
					0.0	13.375		Casing String, 52.5 lbm/ft
					476.0	13.375		Casing Shoe
					476.0	12.250		Borehole Segment



ALL DEPTHS AS PER DRILLER



**MAIN RESISTIVITY LOG 5" = 100'**

MAXIS Field Log

## Input DLIS Files

DEFAULT	AIT_NGS_SONIC_012LUP	FN:11	PRODUCER	12-Aug-2007 12:03	5430.0 FT	379.0 FT
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## Output DLIS Files

DEFAULT	AIT_NGS_SONIC_022PUP	FN:21	PRODUCER	12-Aug-2007 13:28	5430.0 FT	383.0 FT
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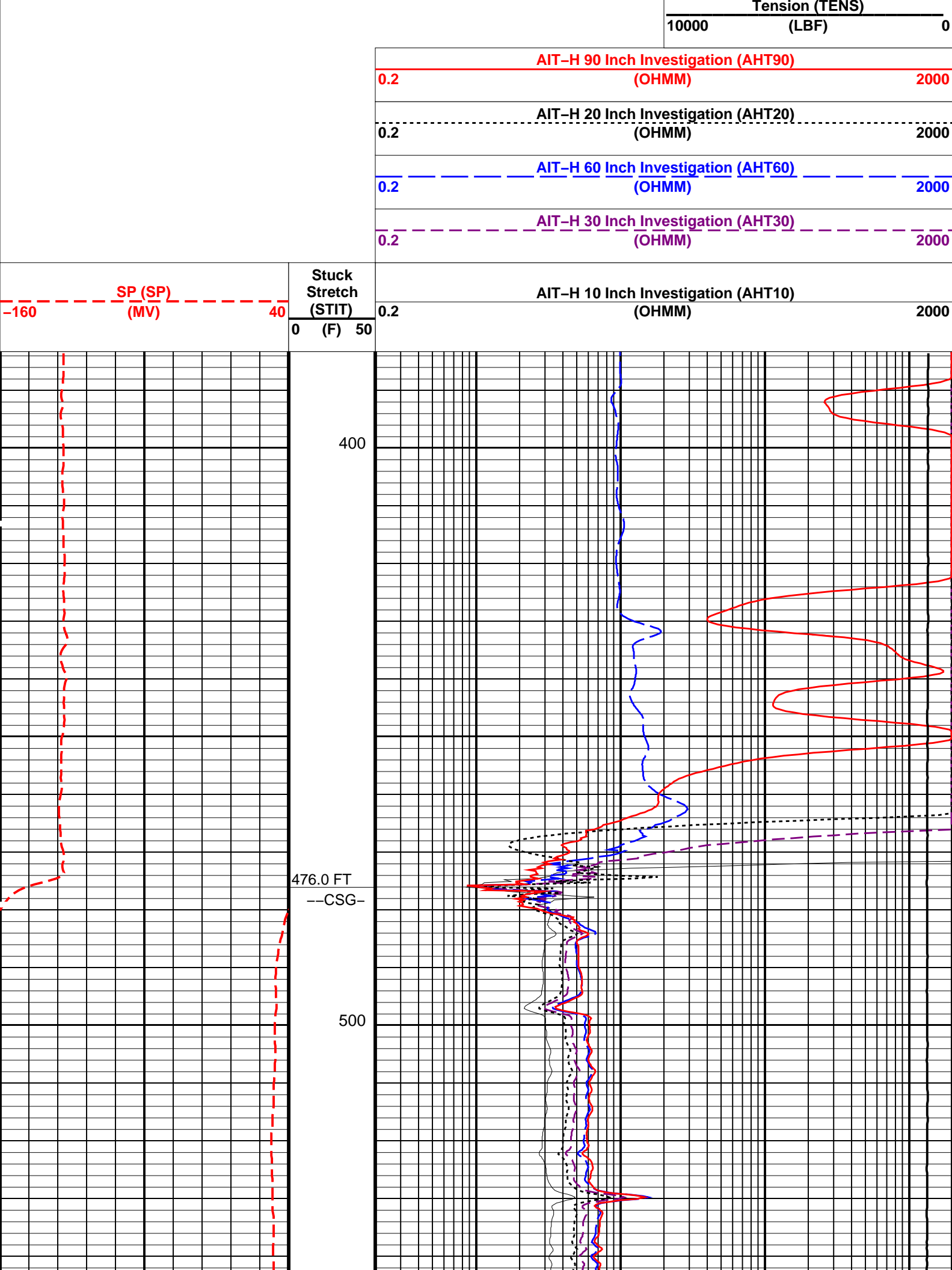
**OP System Version: 15C0-309**

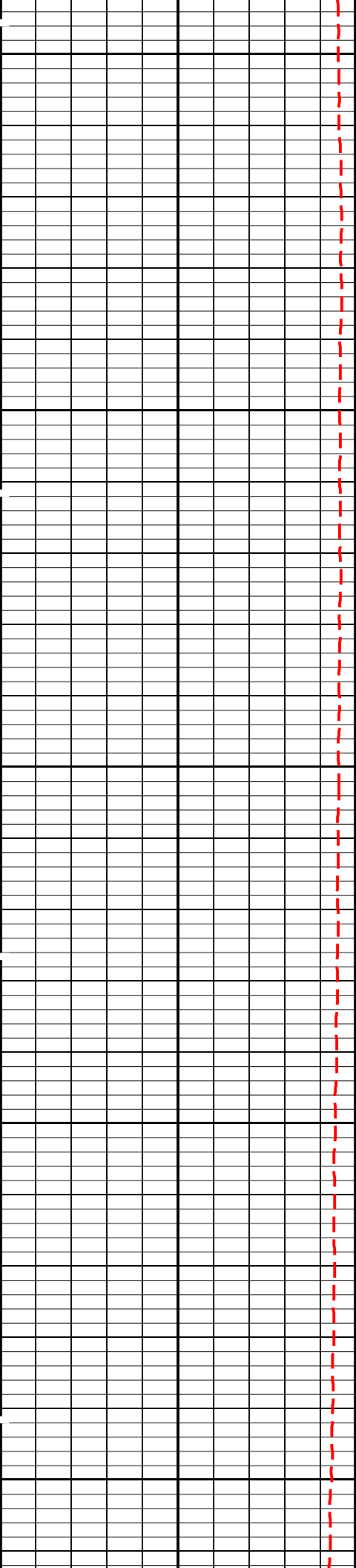
## MCM

AIT-H	SRPC-3357-Q2_2007	NGT-C	15C0-309
DTA-A	SRPC-3357-Q2_2007	DSLT-FTB	15C0-309
DTC-H	15C0-309		

## PIP SUMMARY

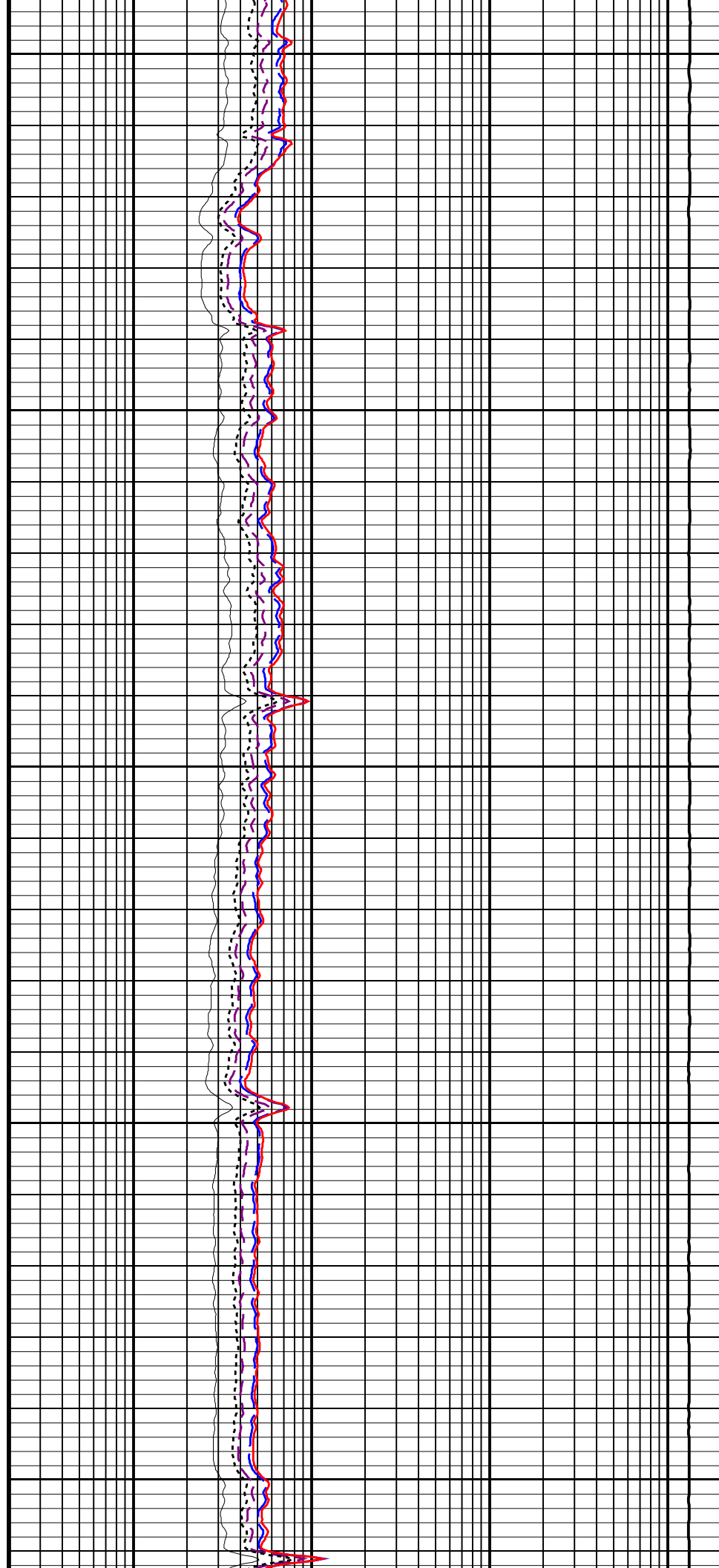
**Time Mark Every 60 S**

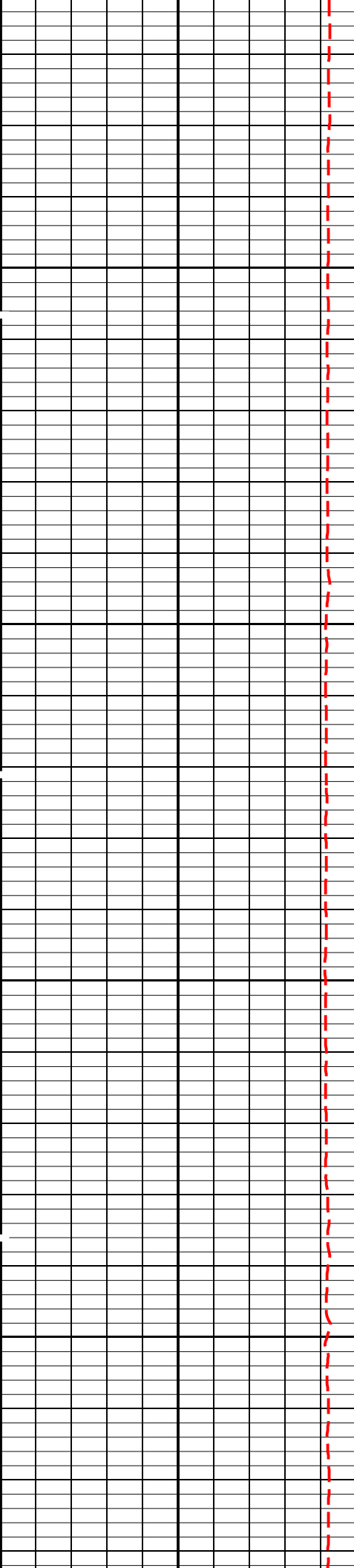




600

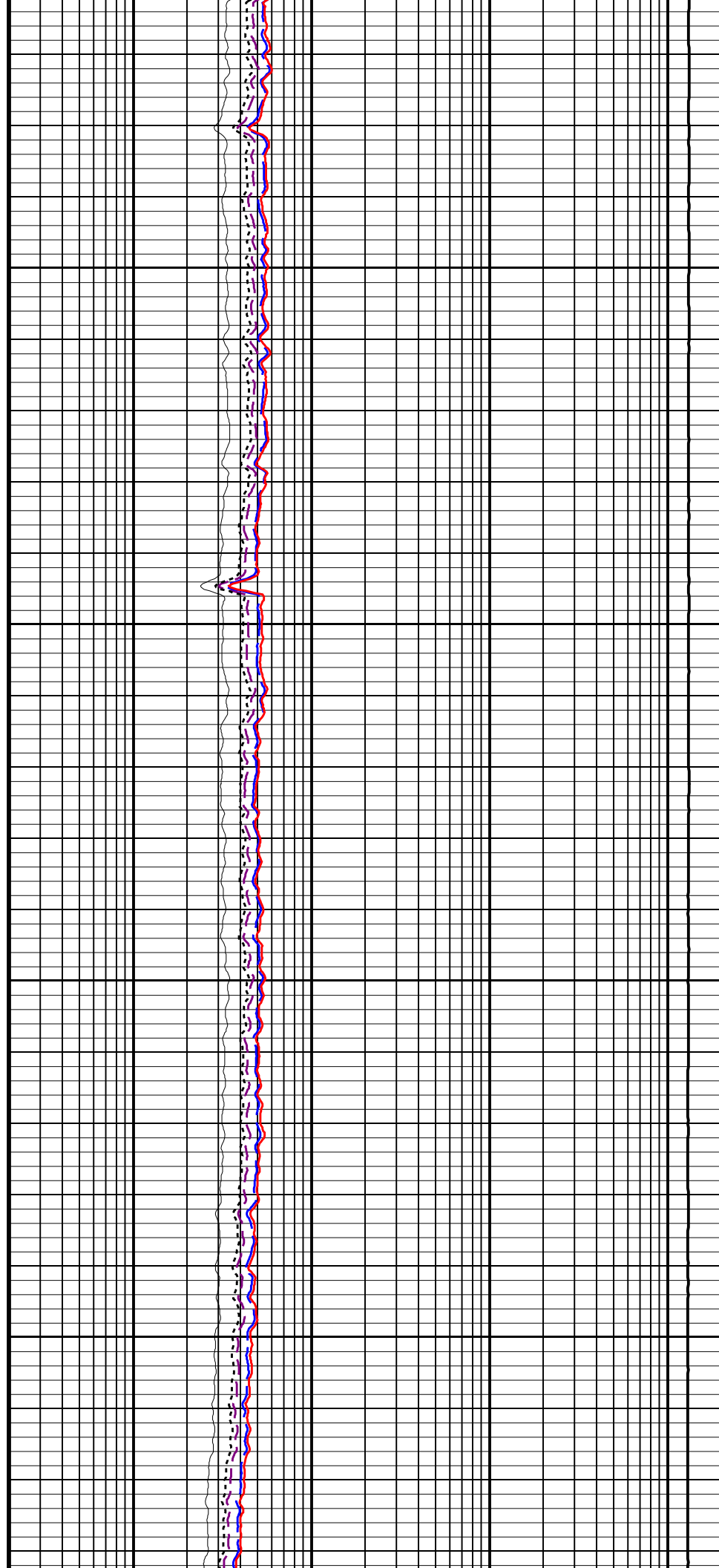
700



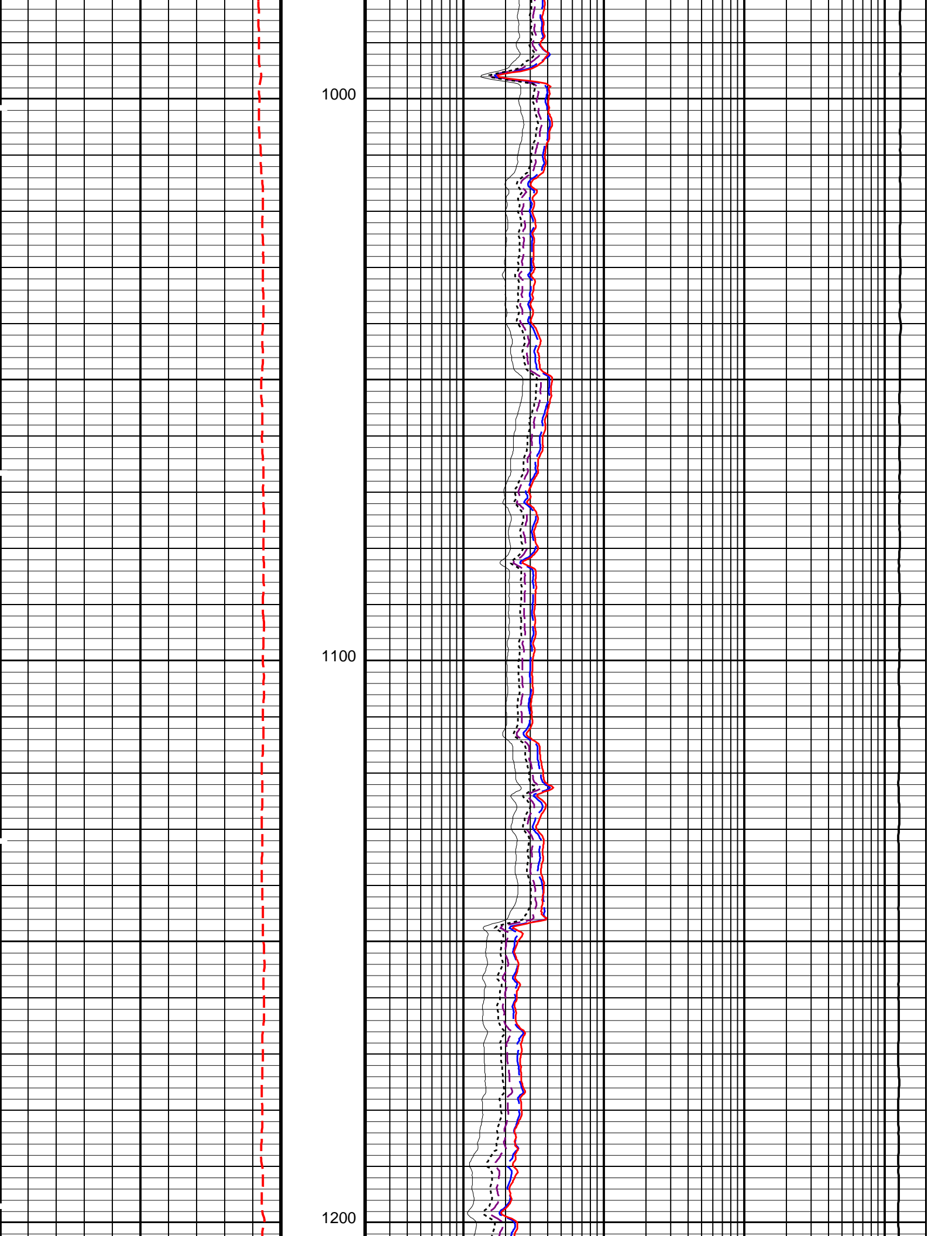


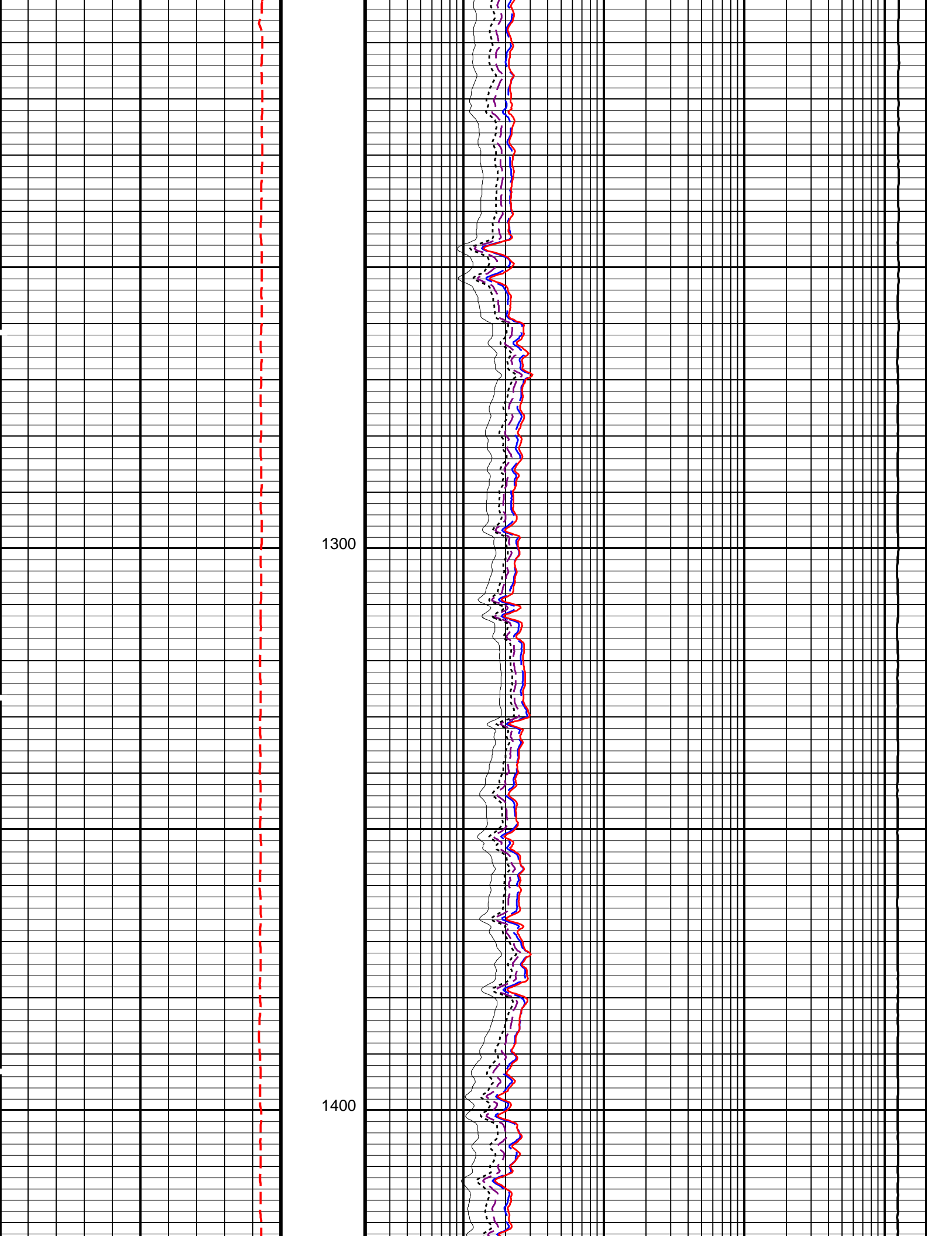
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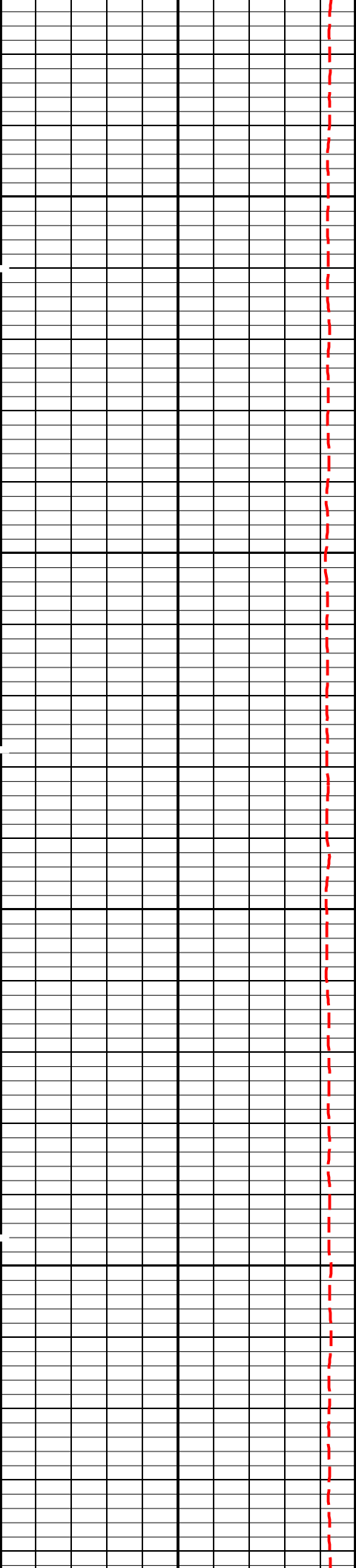
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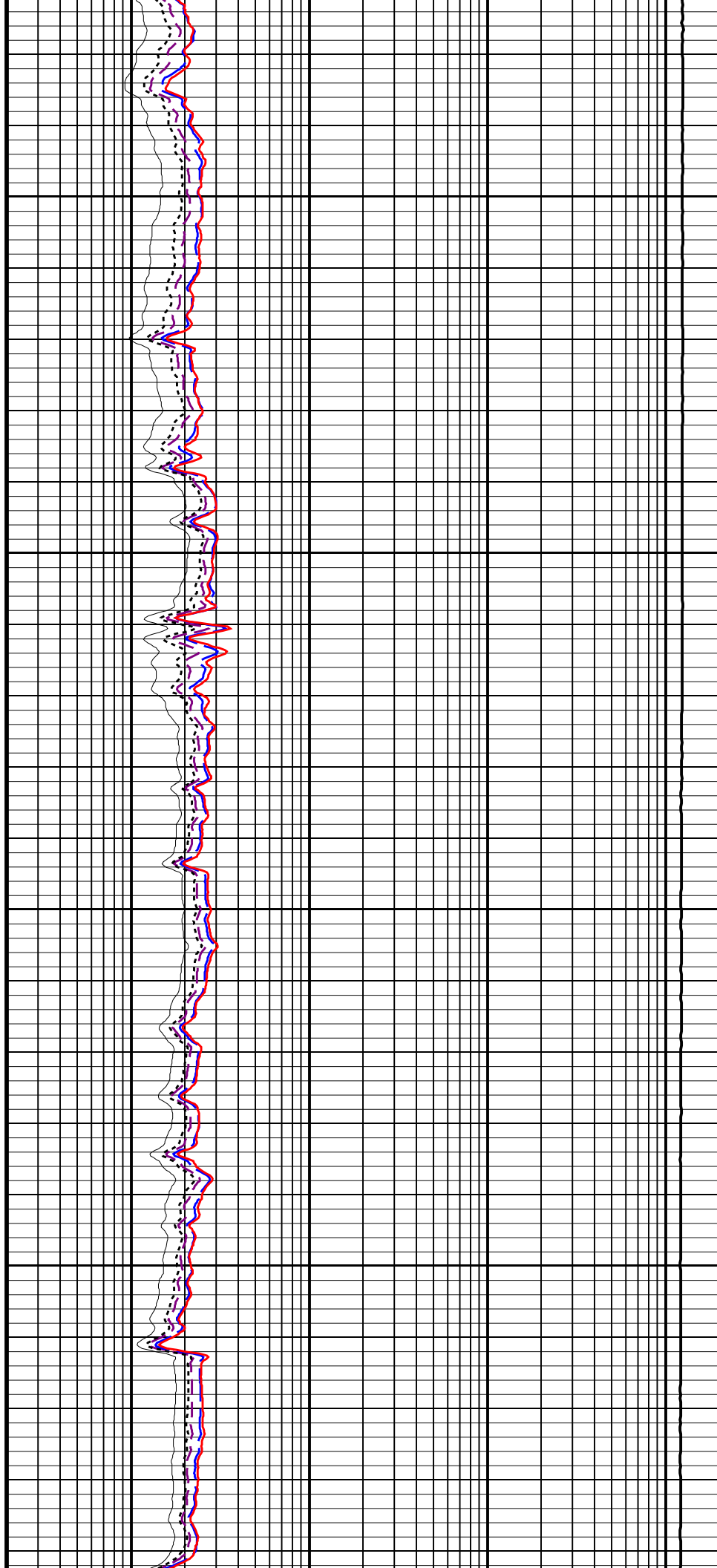


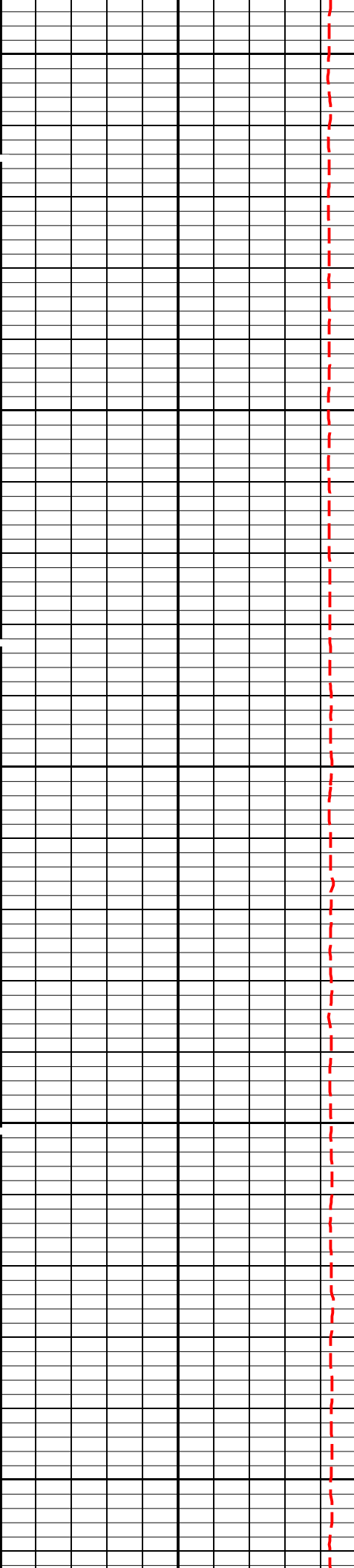




1500

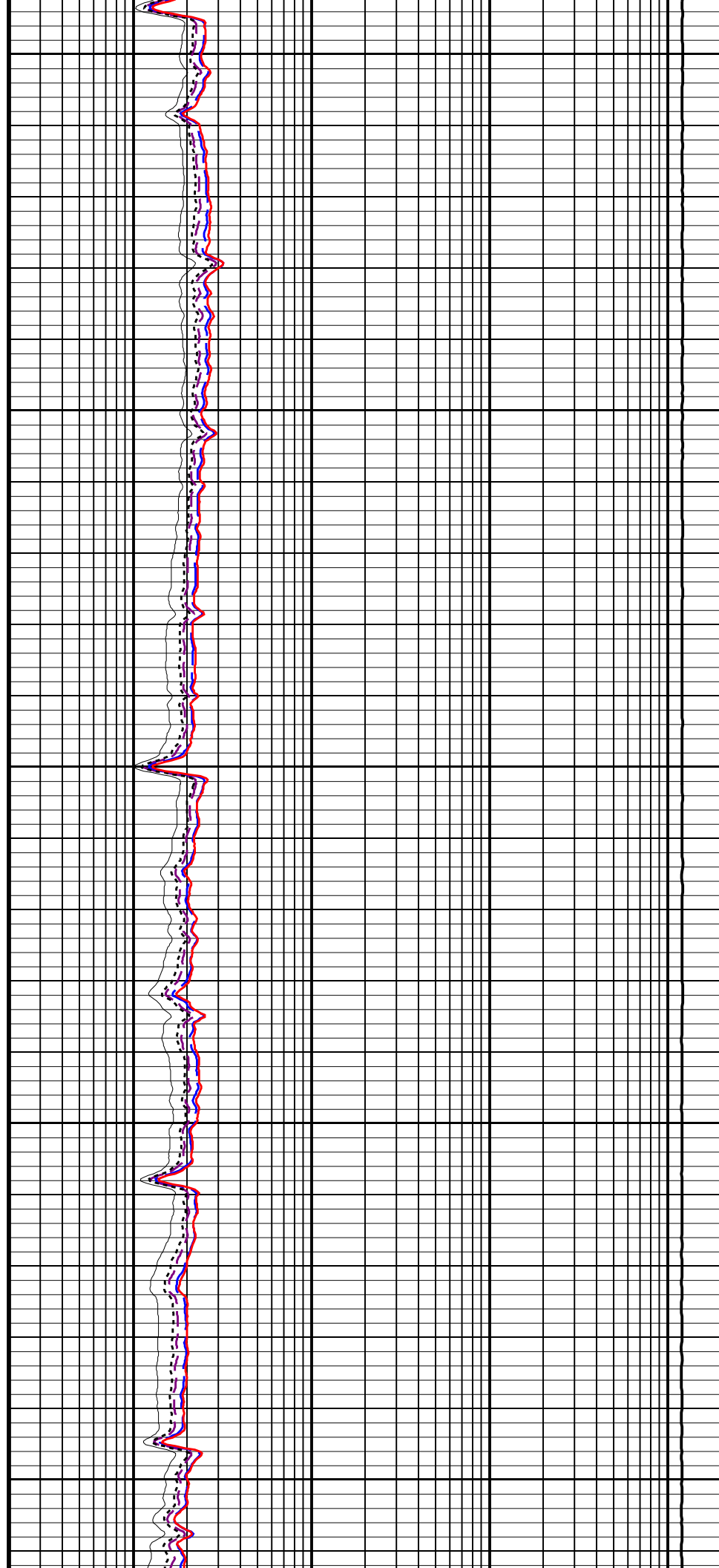
1600

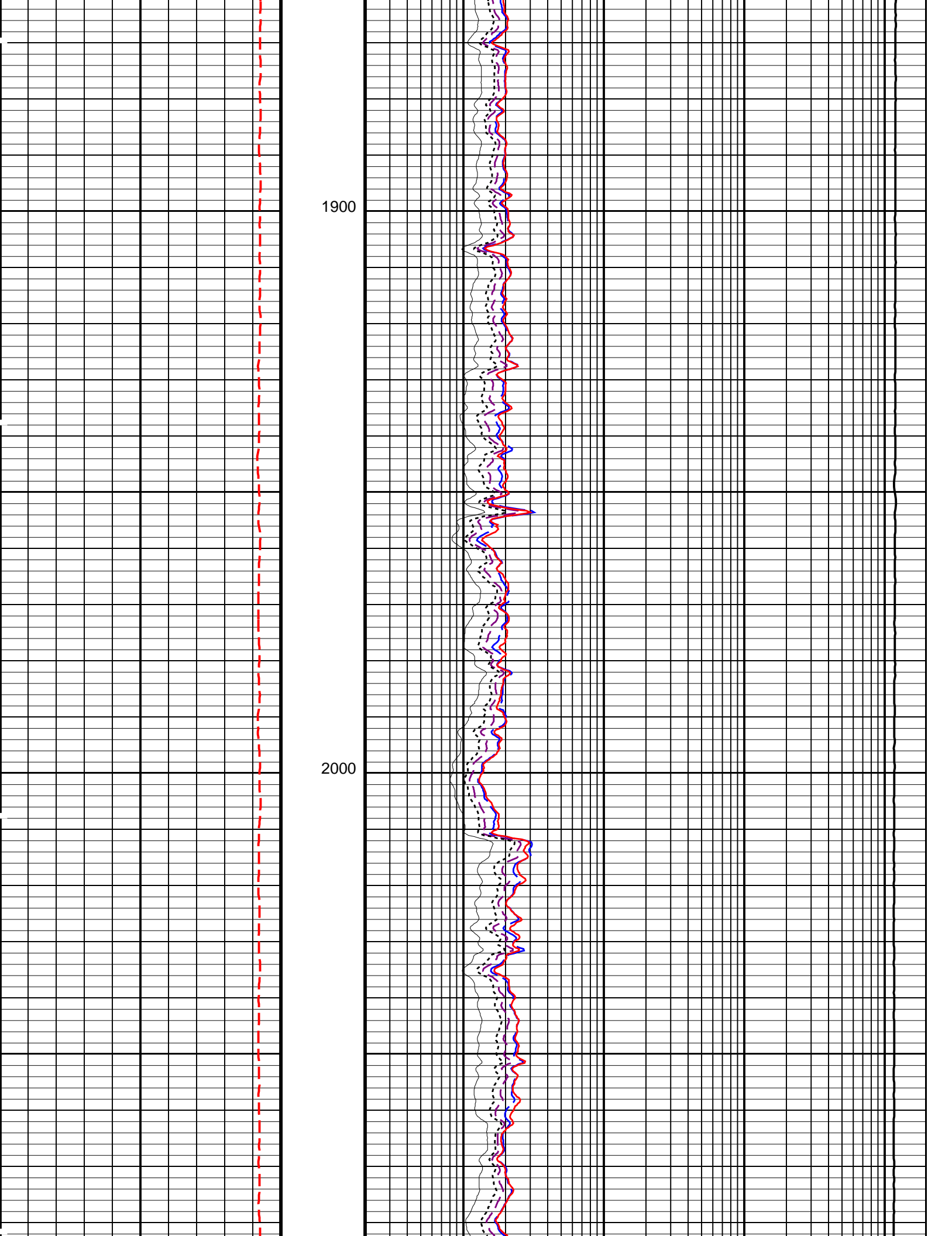


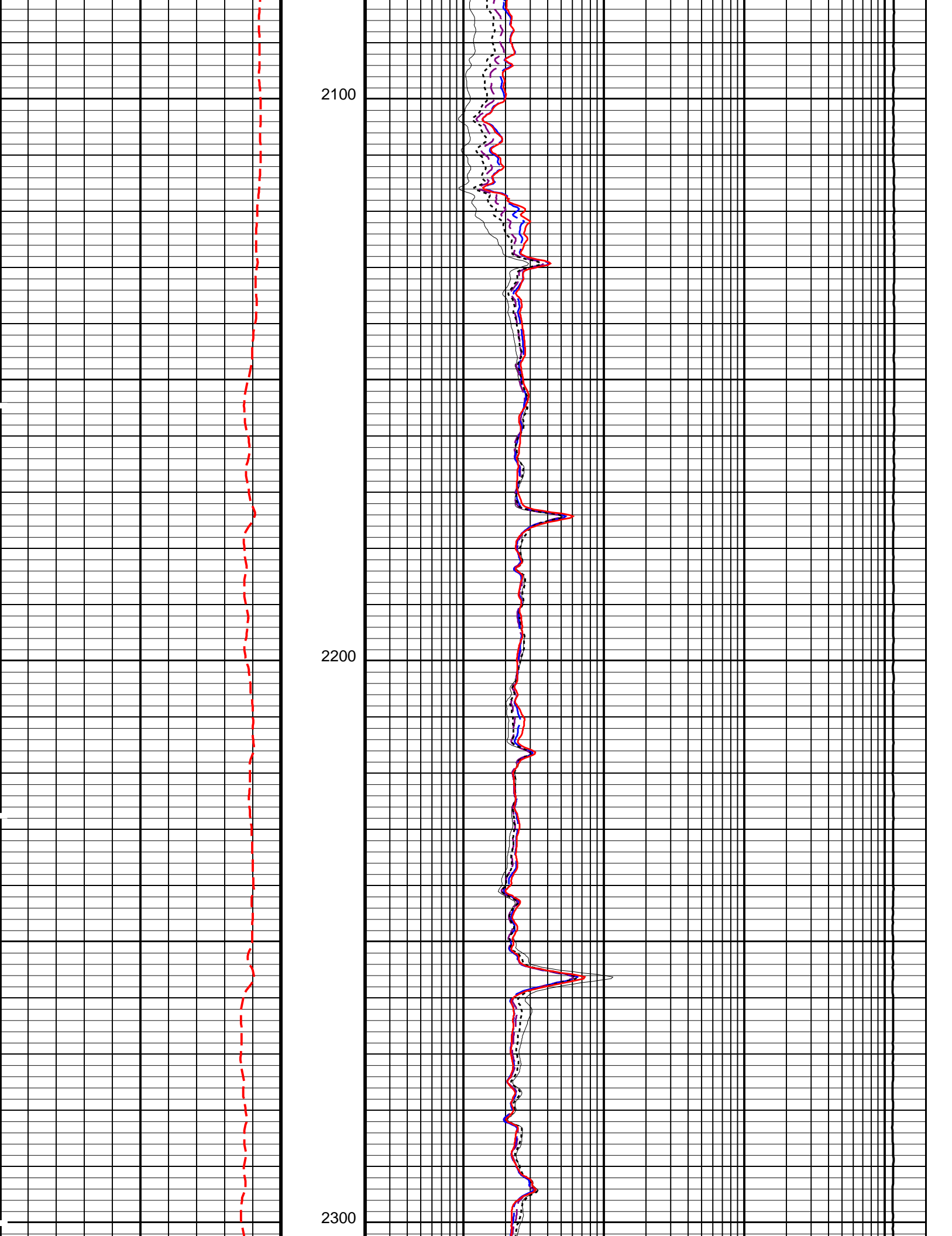


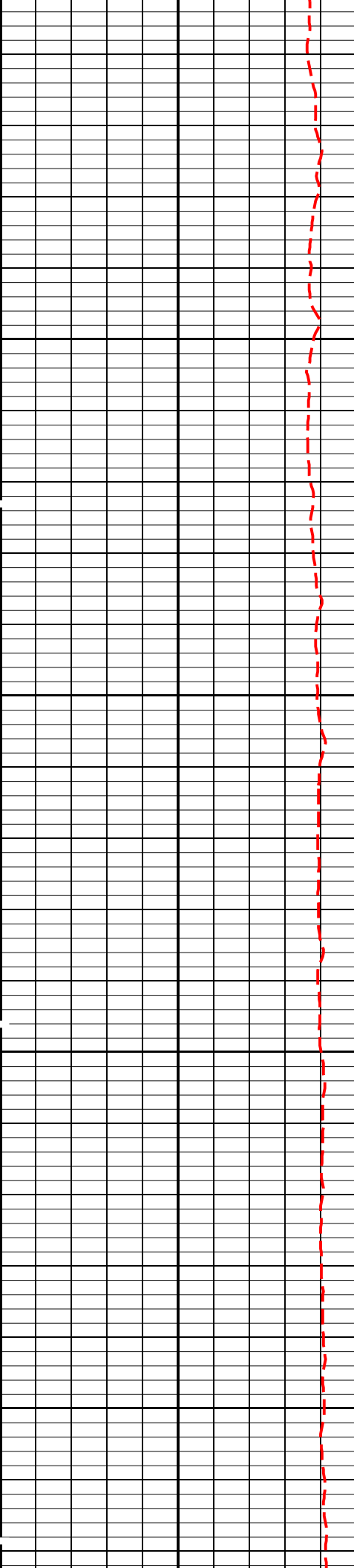
1700

1800



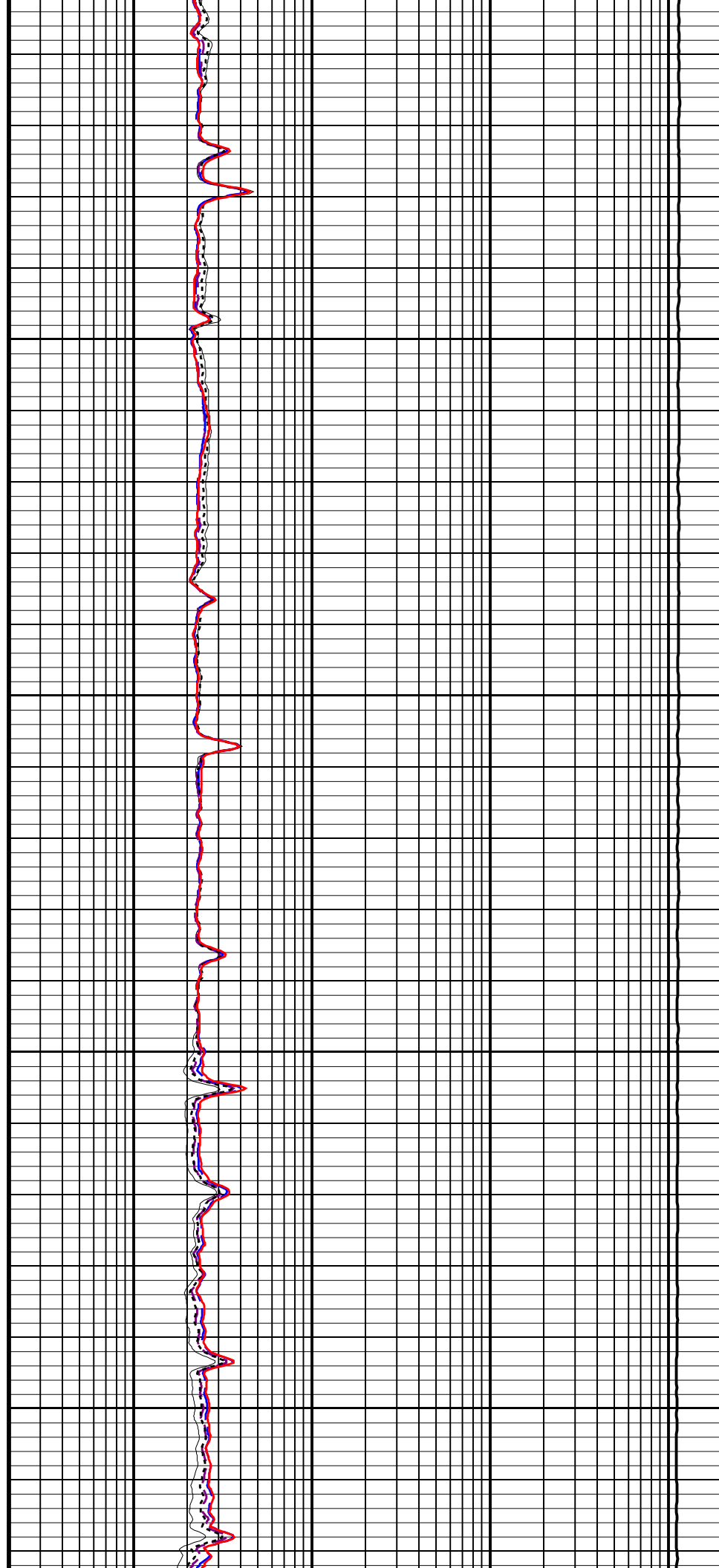


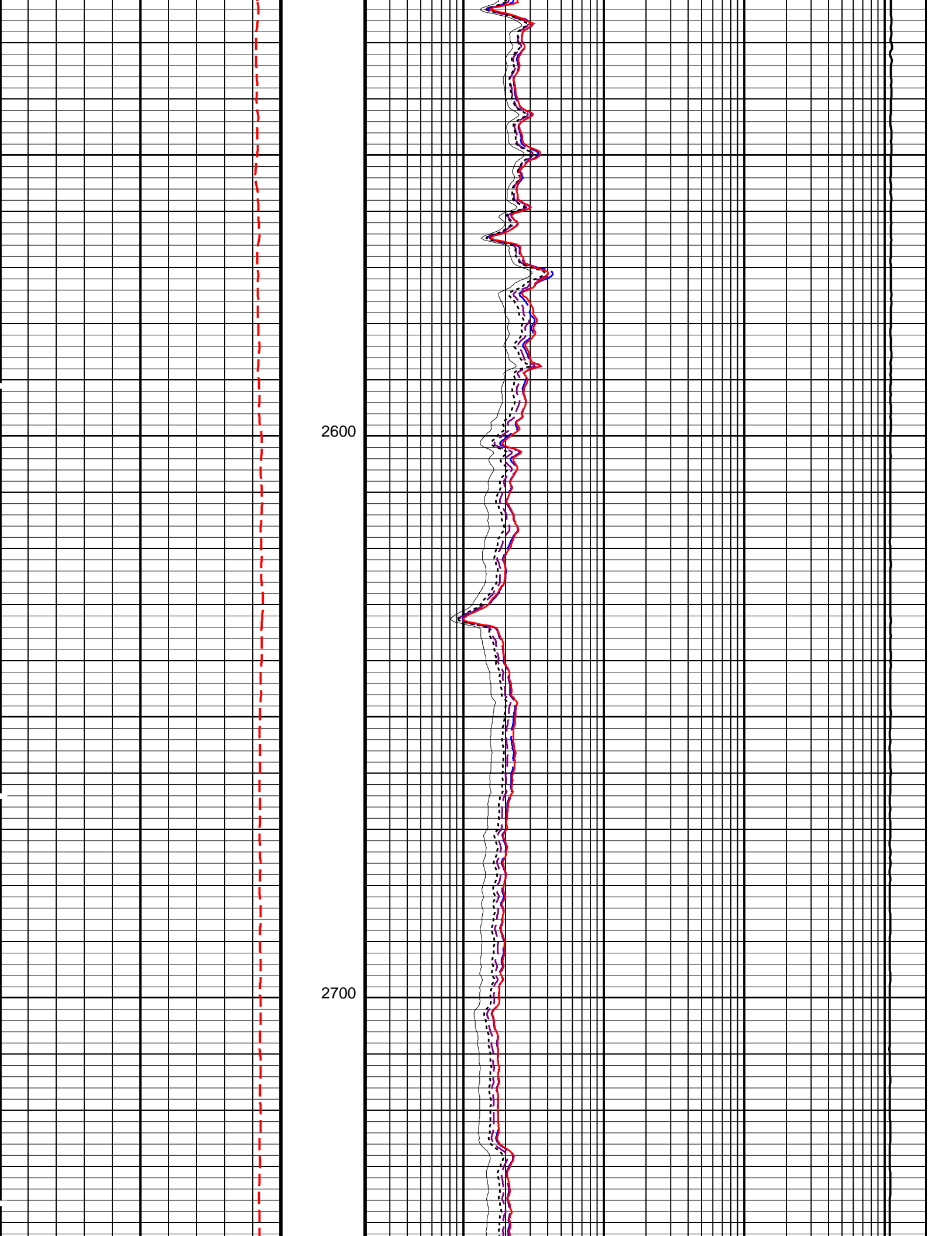




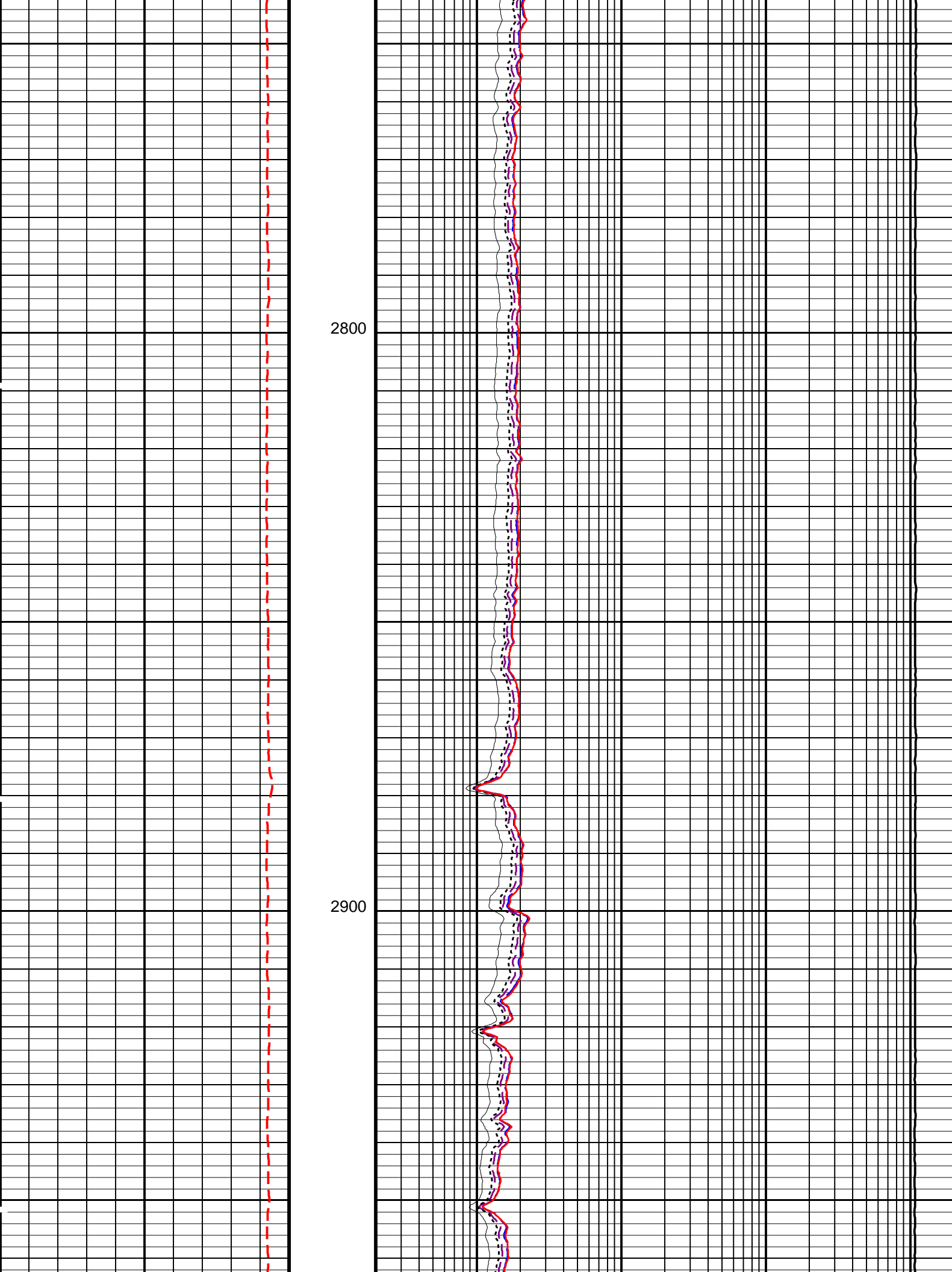
2400

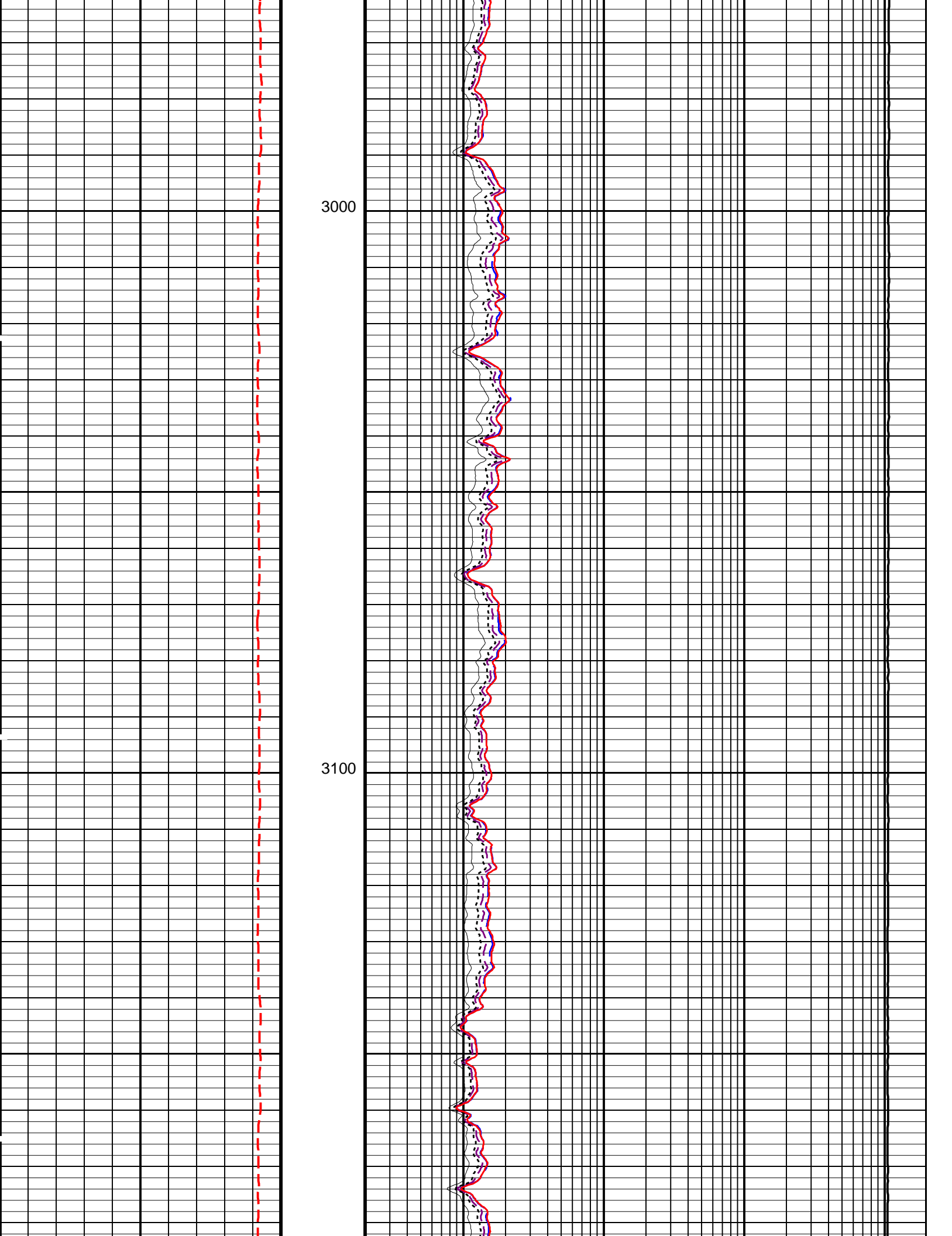
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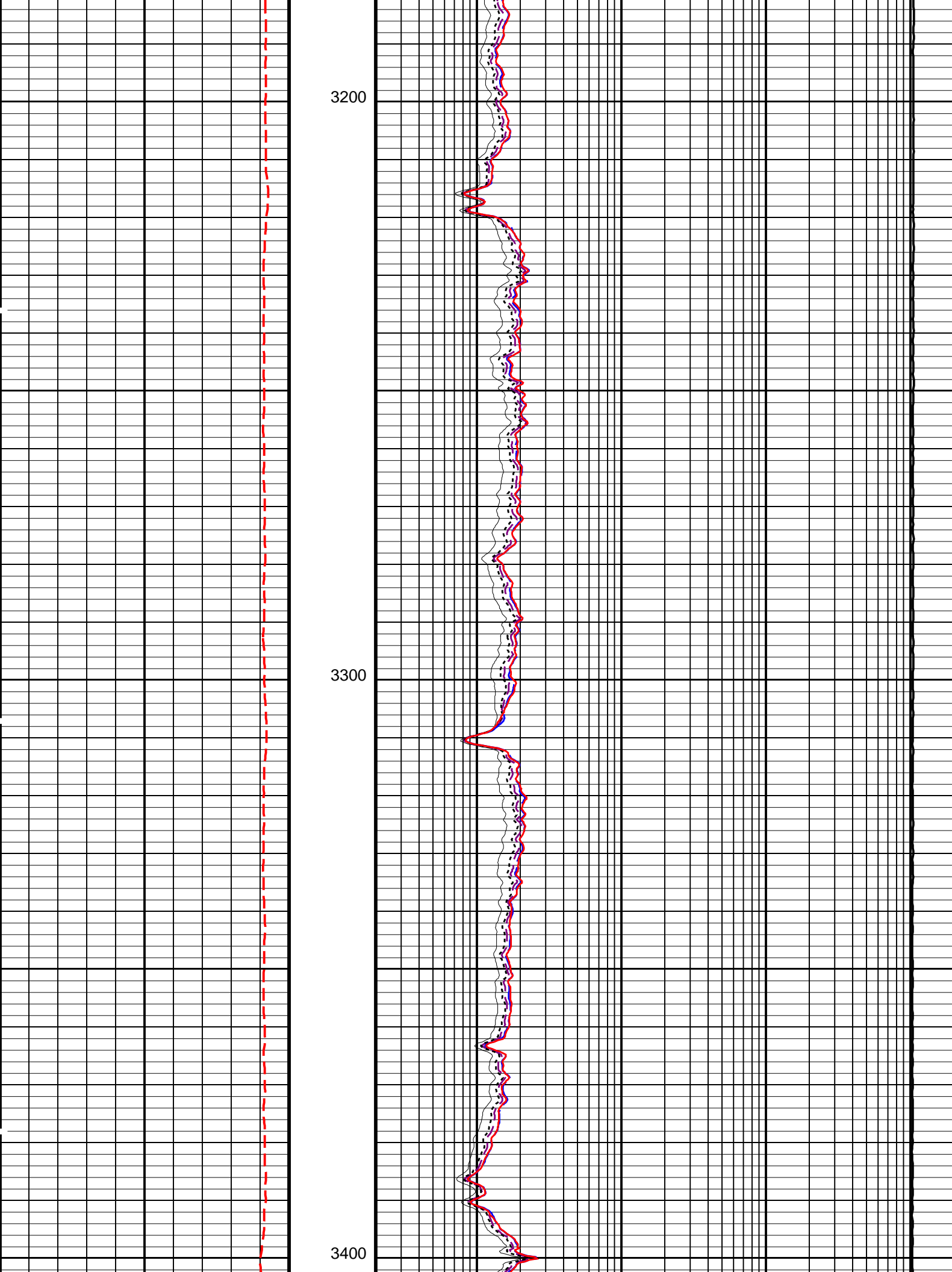








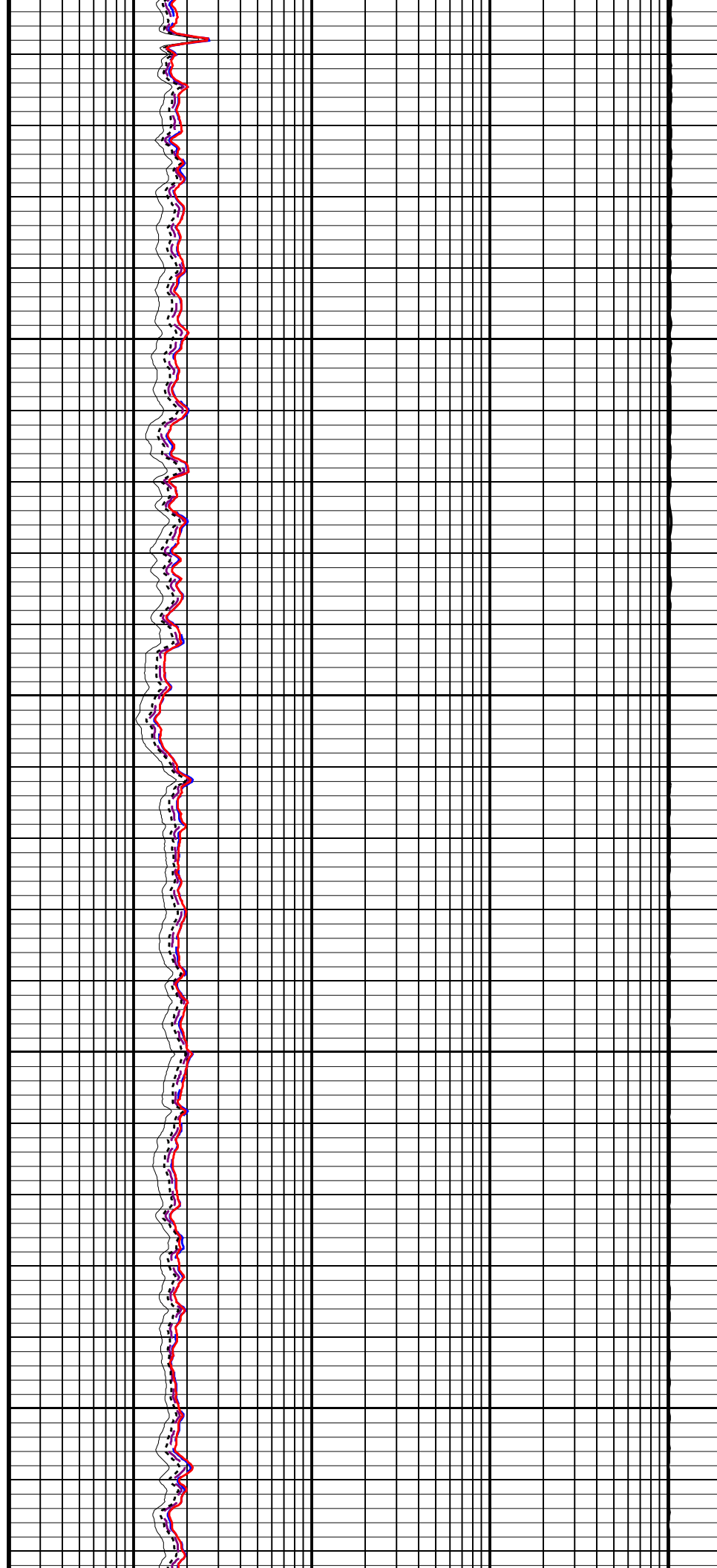


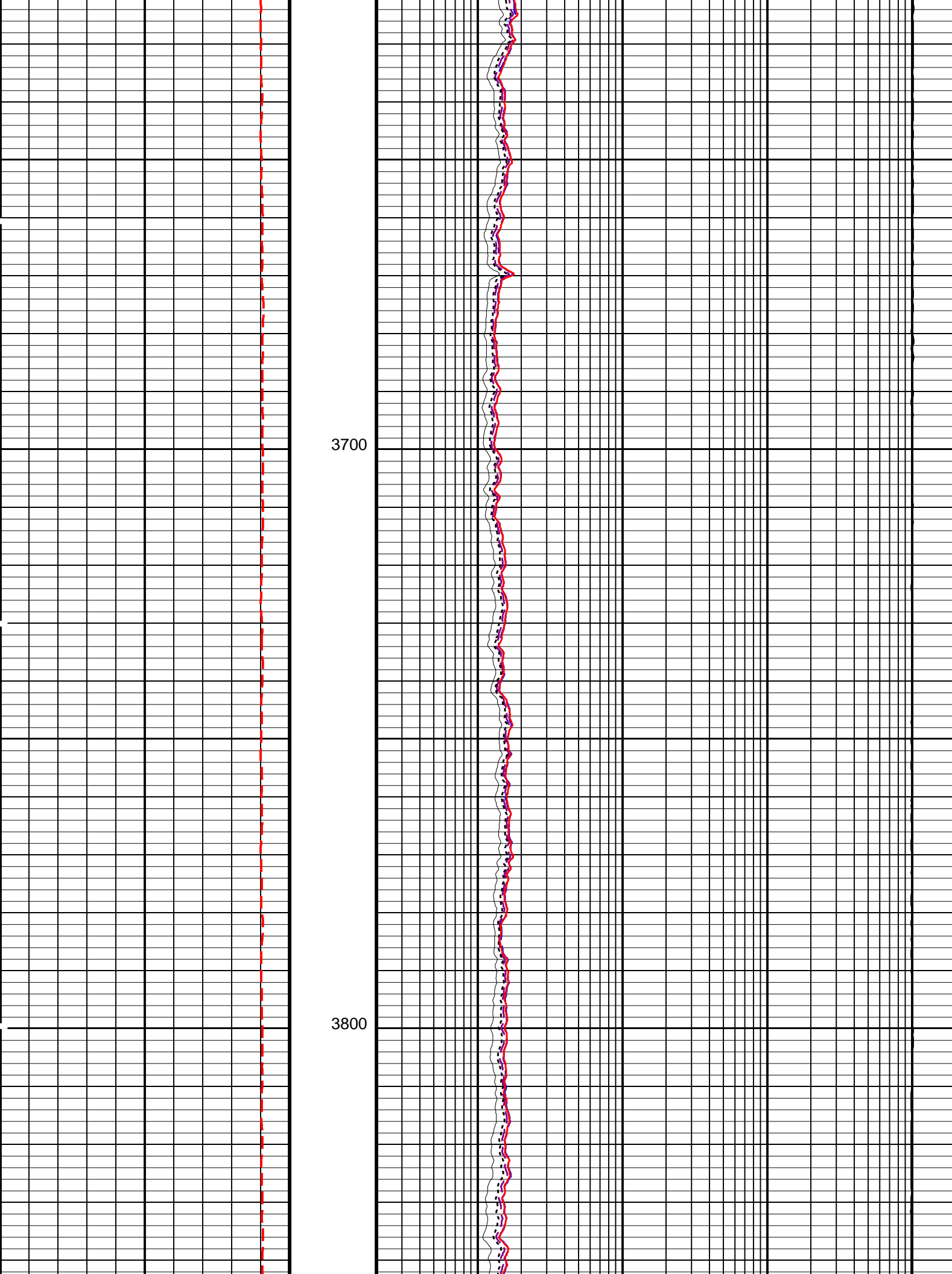


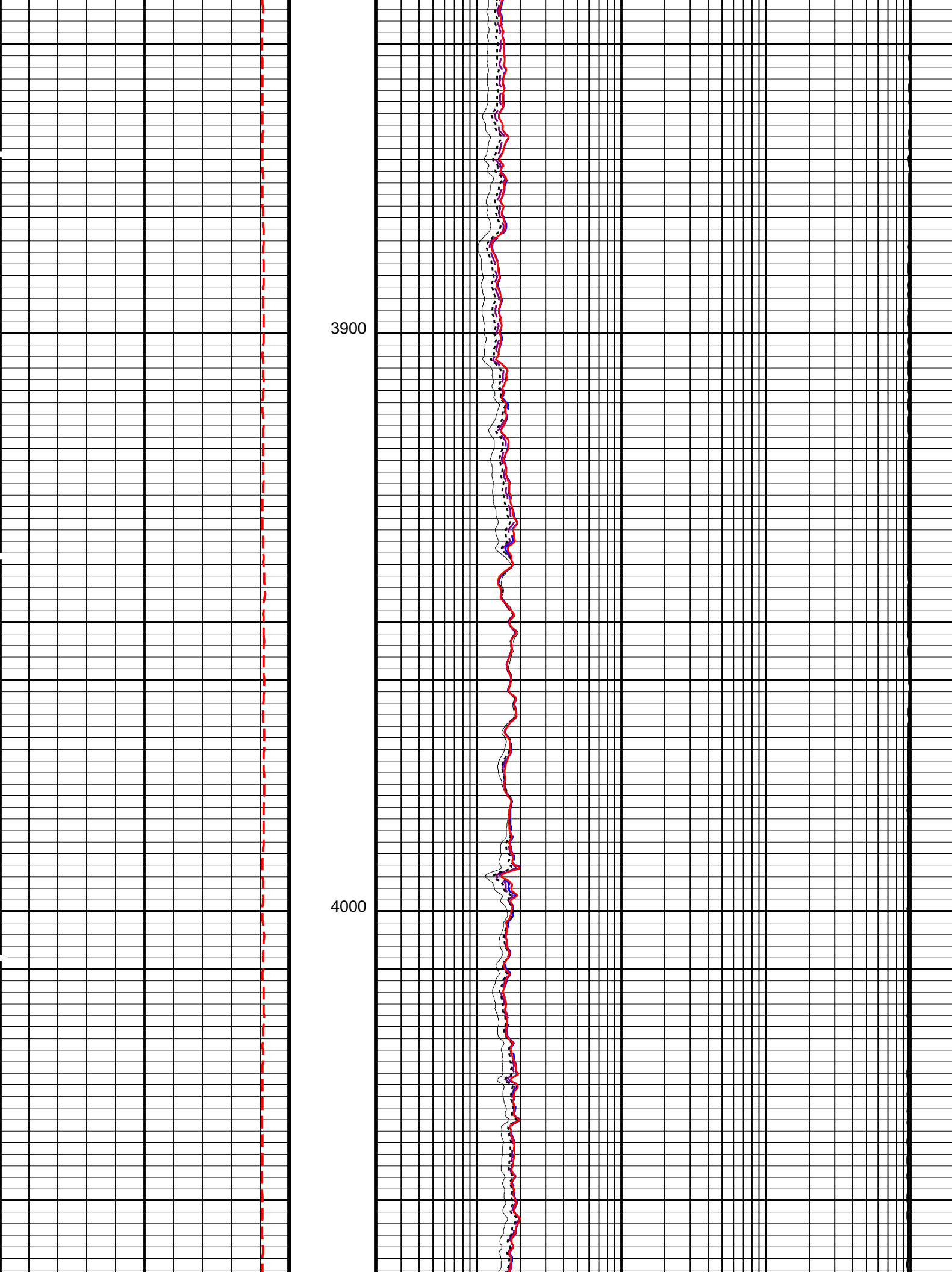


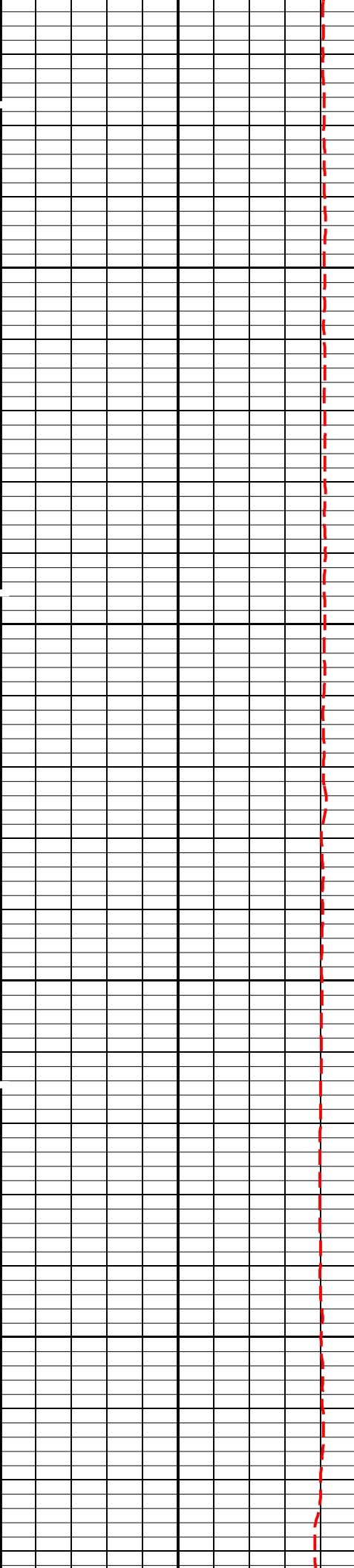
3500

3600



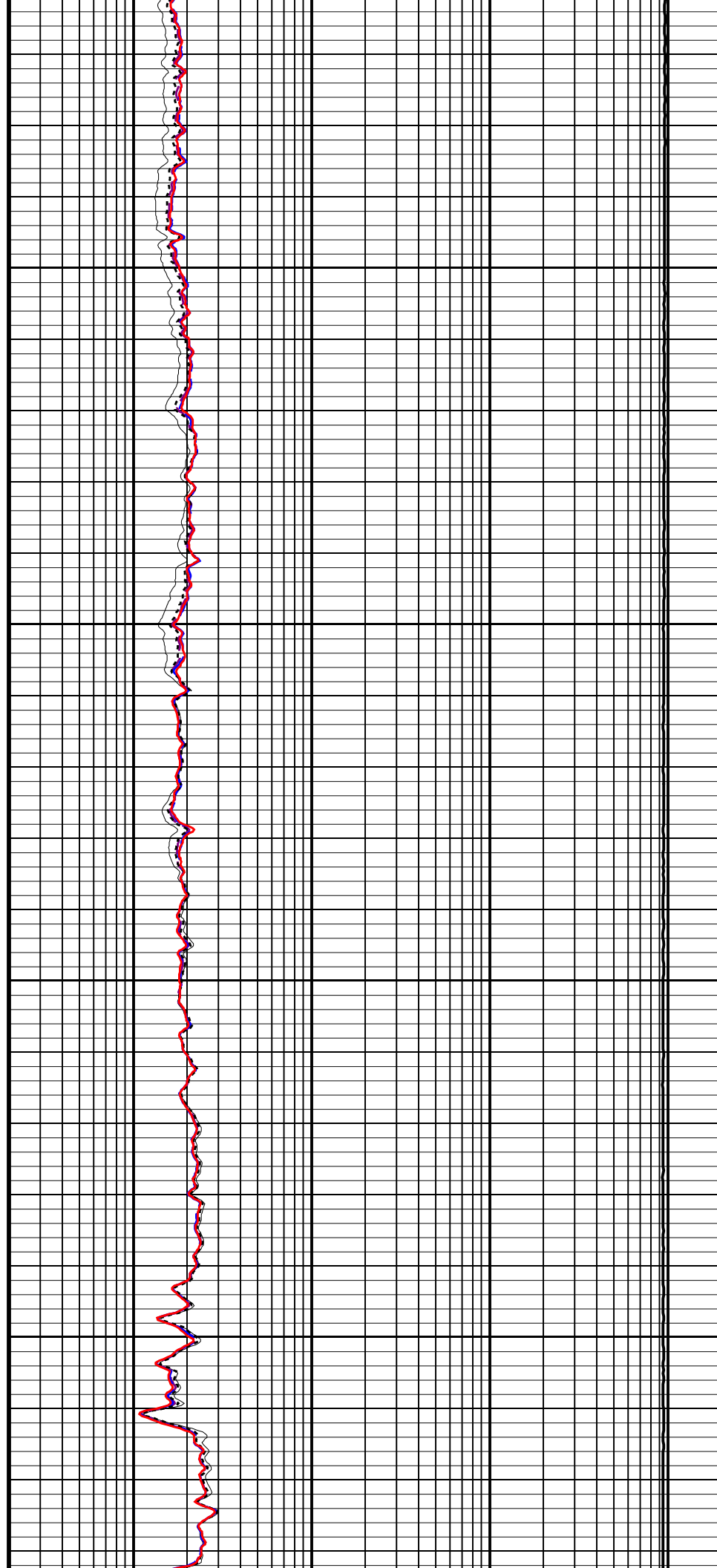


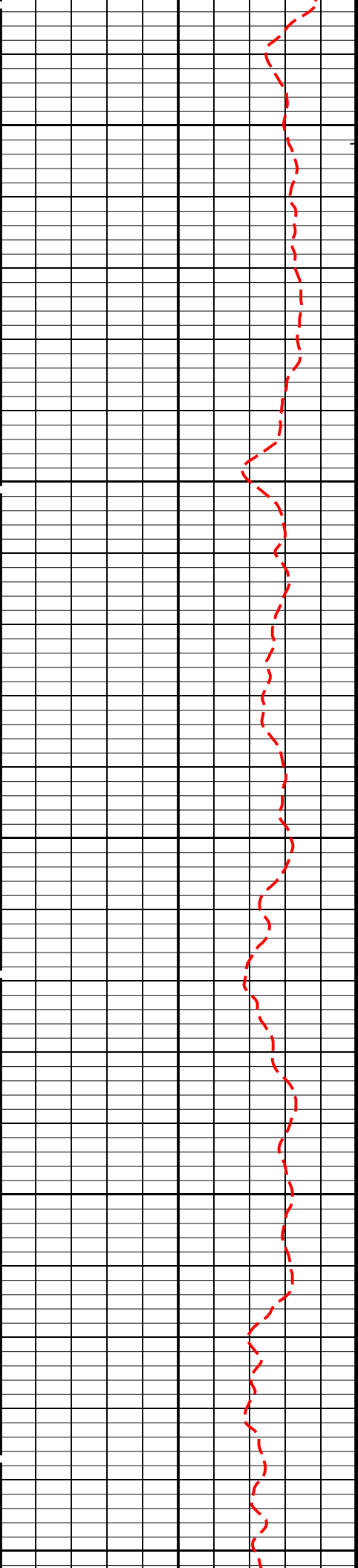




4100

4200



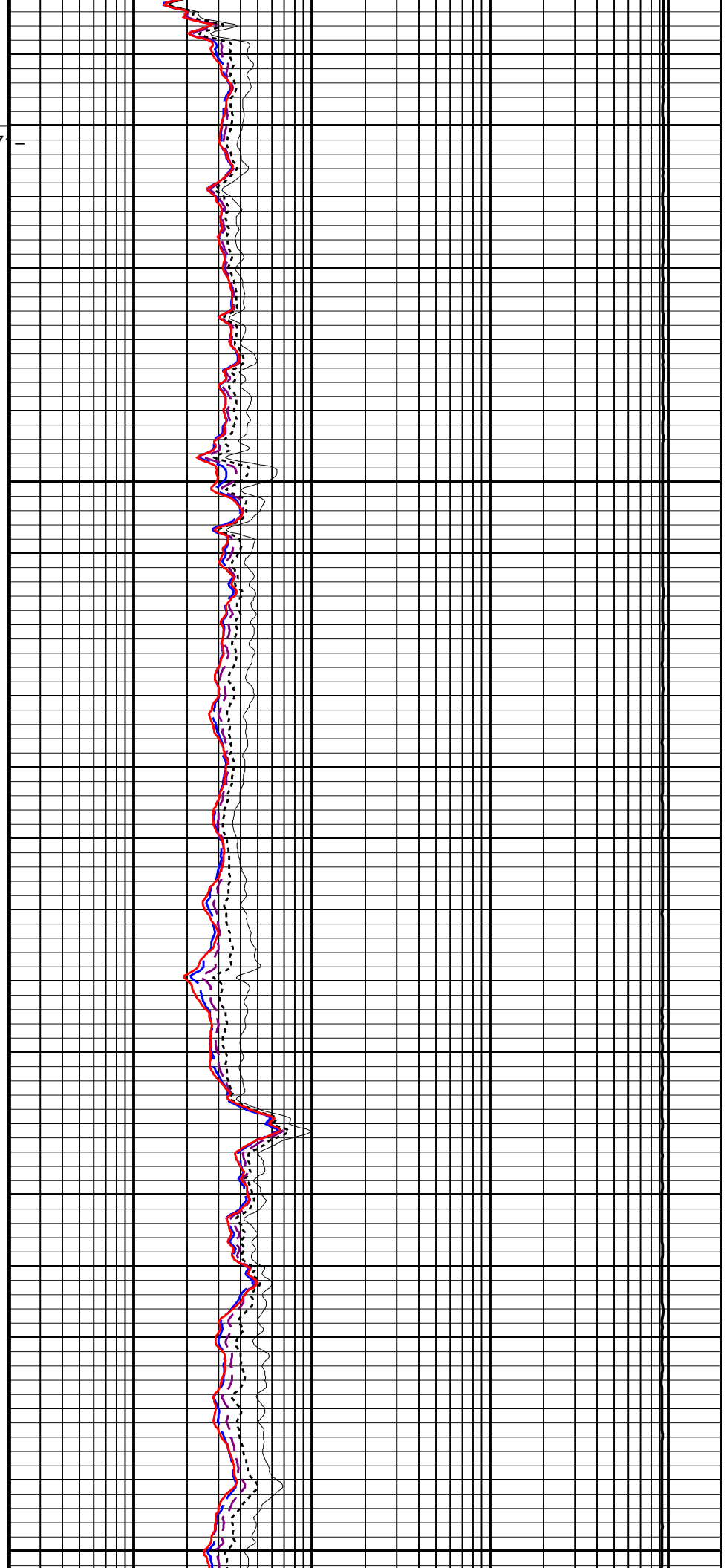


4300.0 FT

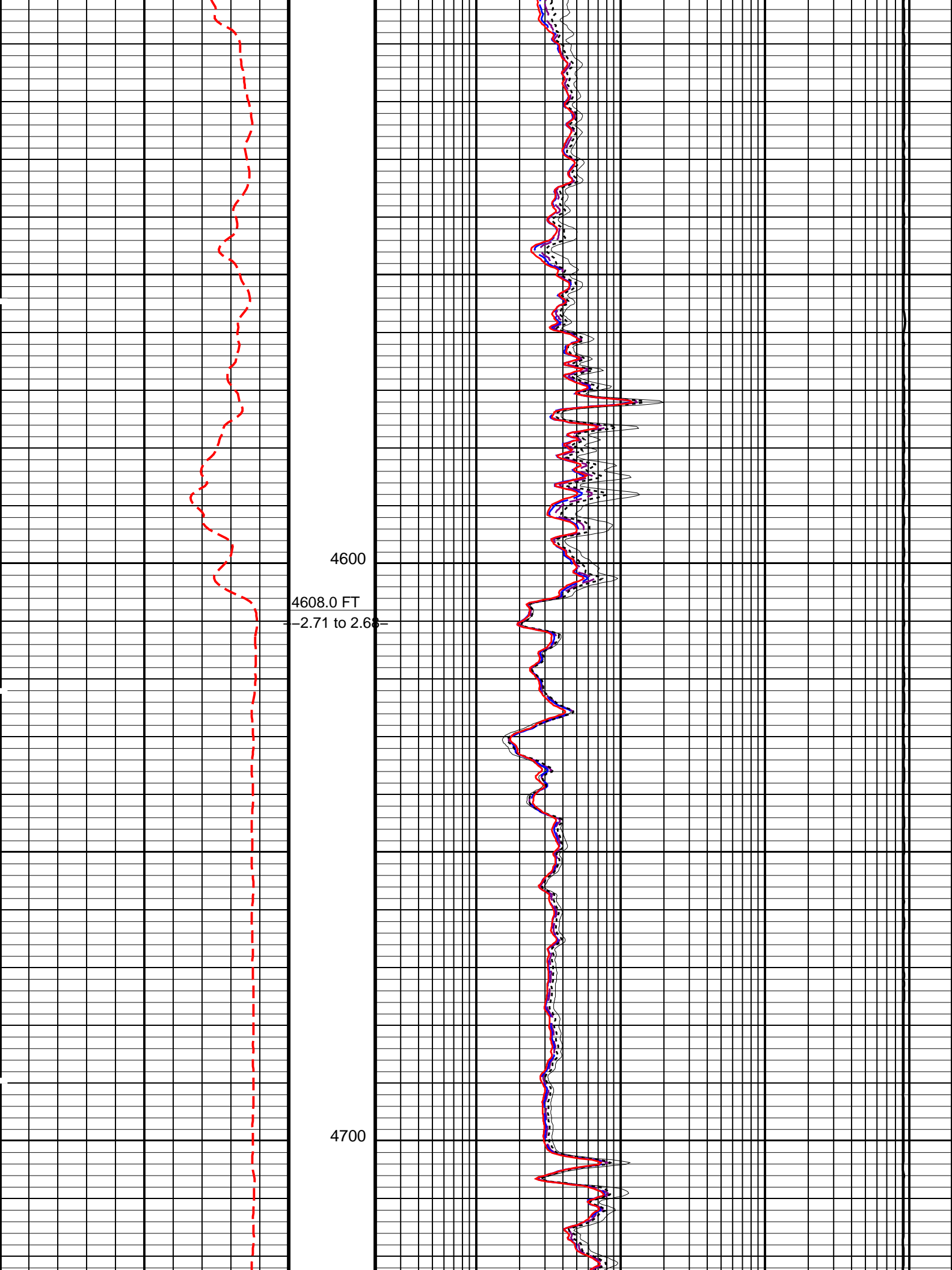
-2.68 to 2.7 -

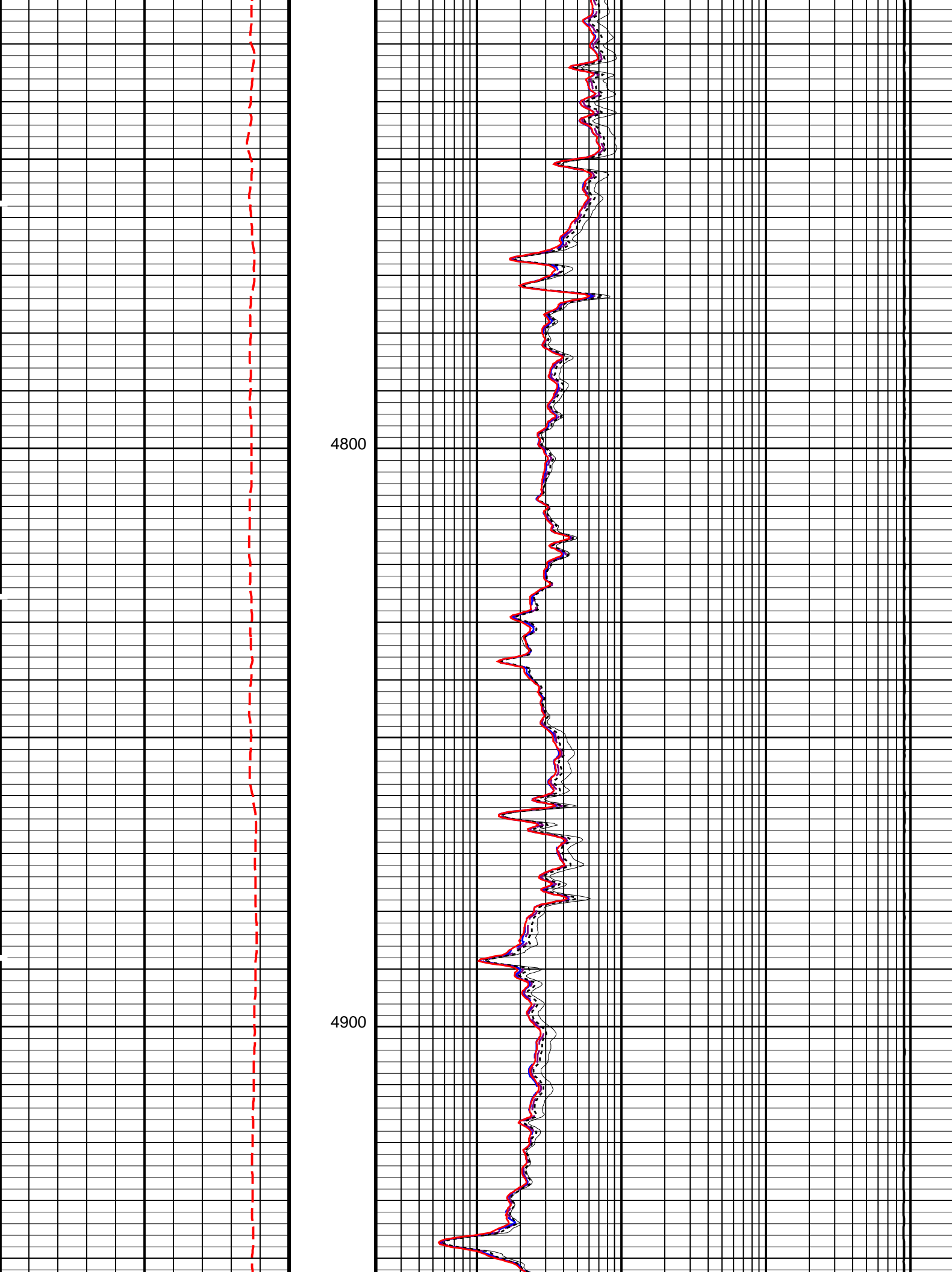
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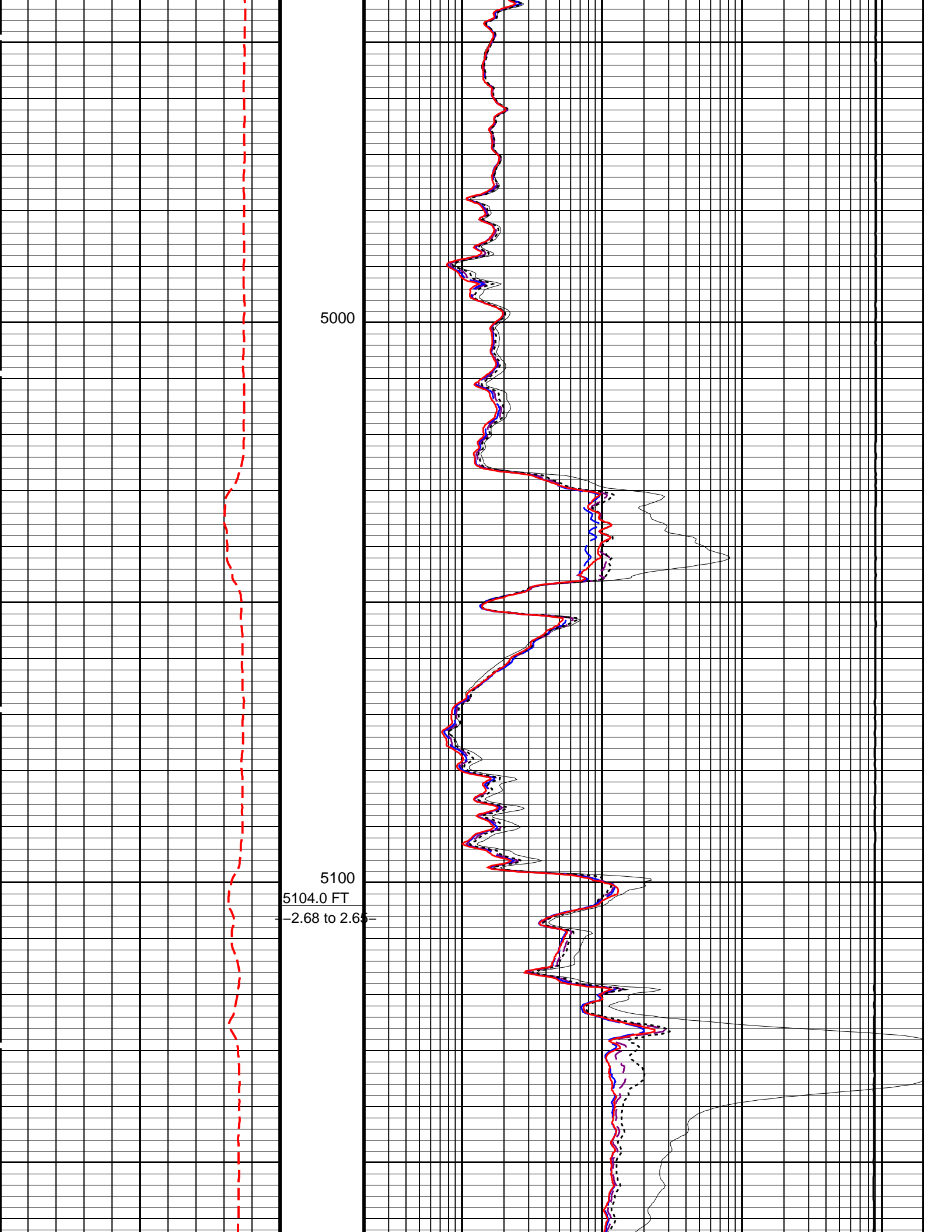
4500

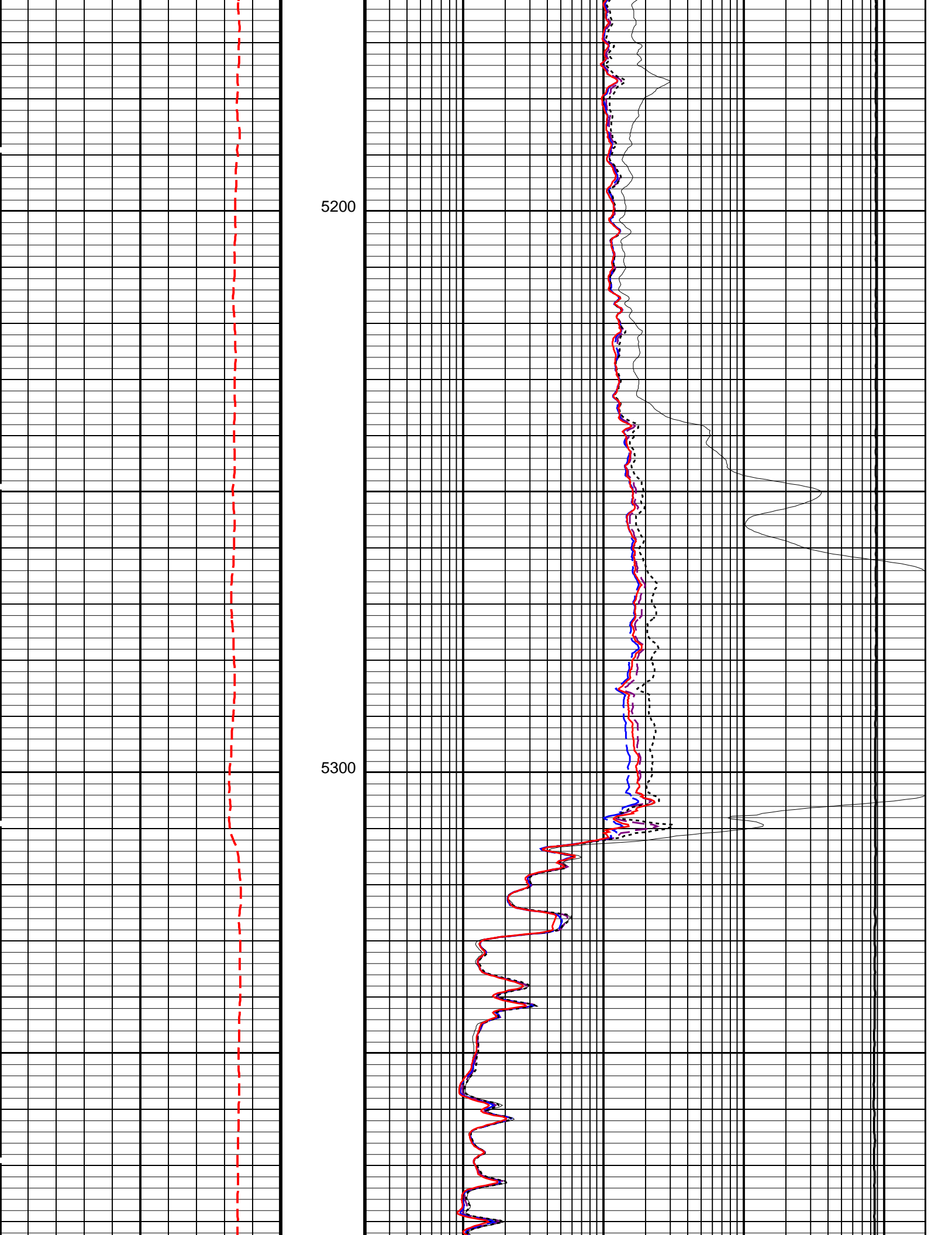


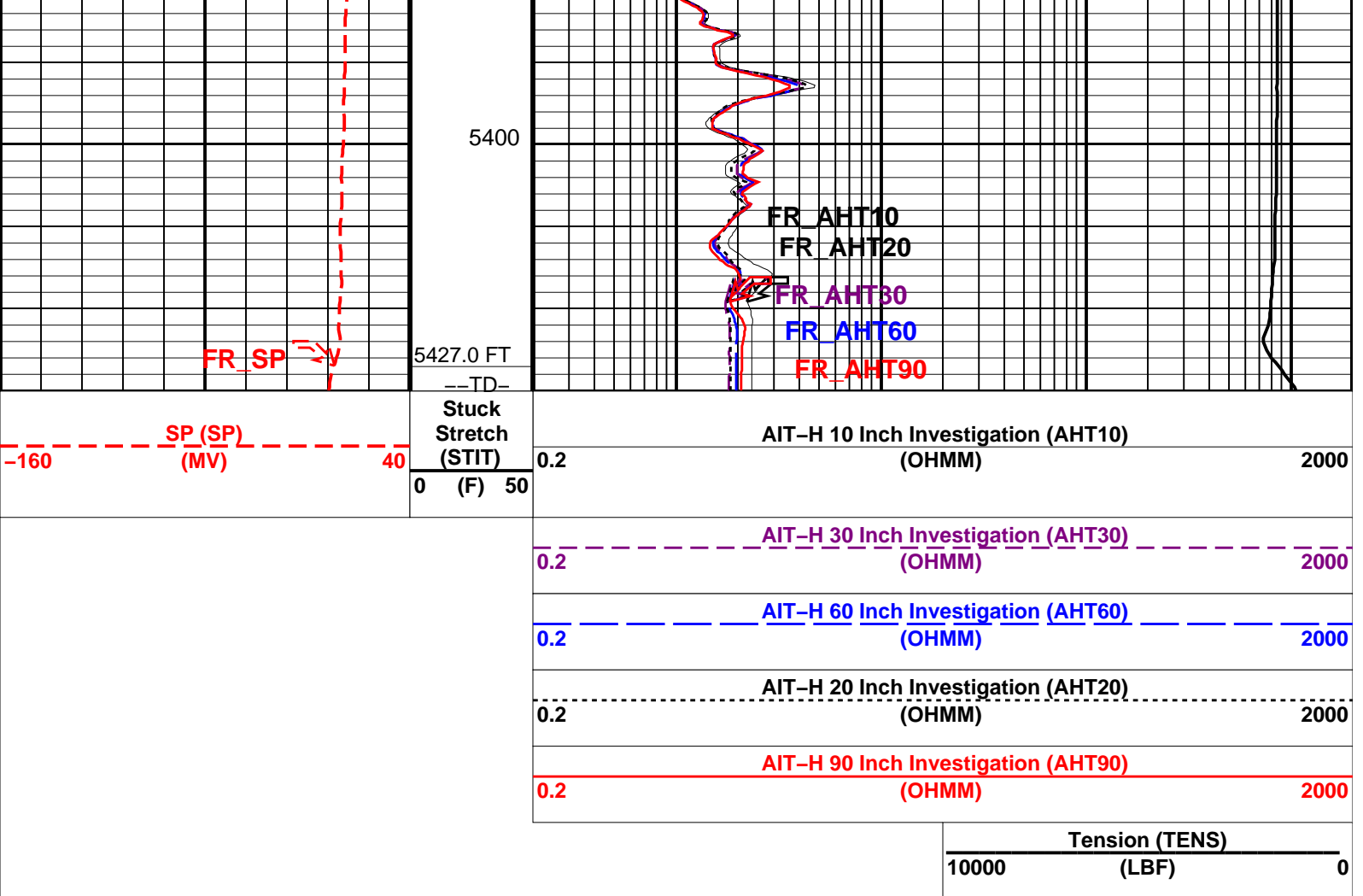












### PIP SUMMARY

Time Mark Every 60 S

## Parameters

DLIS Name	Description	Value
AIT-H: Array Induction Tool - H		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff
AHBHV	Array Induction Borehole Correction Code Version Number	900
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four
AHBLV	Array Induction Basic Logs Code Version Number	223
AHCDE	Array Induction Casing Detection Enable	No
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Centered
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20
AHMRF	Array Induction Mud Resistivity Factor	1
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20
AHRFV	Array Induction Radial Profiling Code Version Number	701
AHRPV	Array Induction Radial Parametrization Code Version Number	232
AHSTA	Array Induction Tool Standoff	0.125 IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
SHT	Surface Hole Temperature	68 DEGF
SPNV	SP Next Value	0 MV
FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
PERT: Preliminary Evaluation - Real Time		
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F

CHART_GEN 9	0.01	DEGF
GRSE	Generalized Mud Resistivity Selection	LINEAR_ESTIMATE
GTSE	Generalized Temperature Selection	68
SHT	Surface Hole Temperature	DEGF
STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	TDL
STKT	STI Stuck Threshold	2.5
TDD	Total Depth - Driller	5433.00
TDL	Total Depth - Logger	5427.00
System and Miscellaneous		
BS	Bit Size	12.250
DFD	Drilling Fluid Density	9.80
DO	Depth Offset for Playback	0.0
DORL	Depth Offset for Repeat Analysis	2.0
MST	Mud Sample Temperature	130.00
PP	Playback Processing	RECOMPUTE
TD	Total Depth	5427

Format: GRES\_S5\_LOG

Vertical Scale: 5" per 100'

Graphics File Created: 12-Aug-2007 13:28

OP System Version: 15C0-309			
MCM			
AIT-H	SRPC-3357-Q2_2007	NGT-C	15C0-309
DTA-A	SRPC-3357-Q2_2007	DSLT-FTB	15C0-309
DTC-H	15C0-309		

Input DLIS Files						
DEFAULT	AIT_NGS_SONIC_012LUP	FN:11	PRODUCER	12-Aug-2007 12:03	5430.0 FT	379.0 FT
Output DLIS Files						
DEFAULT	AIT_NGS_SONIC_022PUP	FN:21	PRODUCER	12-Aug-2007 13:28		

Schlumberger

REPEAT ANALYSIS

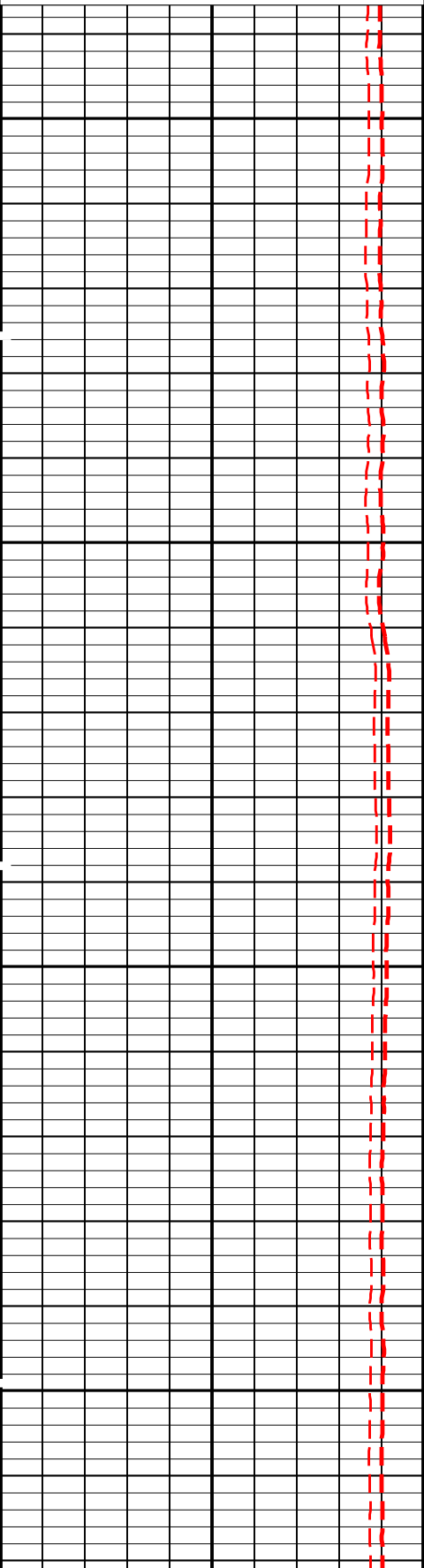
MAXIS Field Log

Input DLIS Files						
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DEFAULT	AIT_NGS_SONIC_012LUP	FN:11	PRODUCER	12-Aug-2007 12:03	5430.0 FT	379.0 FT
Output DLIS Files						
DEFAULT	AIT_NGS_SONIC_022PUP	FN:21	PRODUCER	12-Aug-2007 13:28		

OP System Version: 15C0-309			
MCM			
AIT-H	SRPC-3357-Q2_2007	NGT-C	15C0-309
DTA-A	SRPC-3357-Q2_2007	DSLT-FTB	15C0-309
DTC-H	15C0-309		

PIP SUMMARY		
Time Mark Every 60 S		
		TENS_REP Curve (TENS_REP)
		10000 (LBF) 0
AHT90_REP Curve (AHT90_REP)		
0.2	(OHMM)	2000
AHT20_REP Curve (AHT20_REP)		

SP\_REP Curve (SP\_REP)  
(MV)

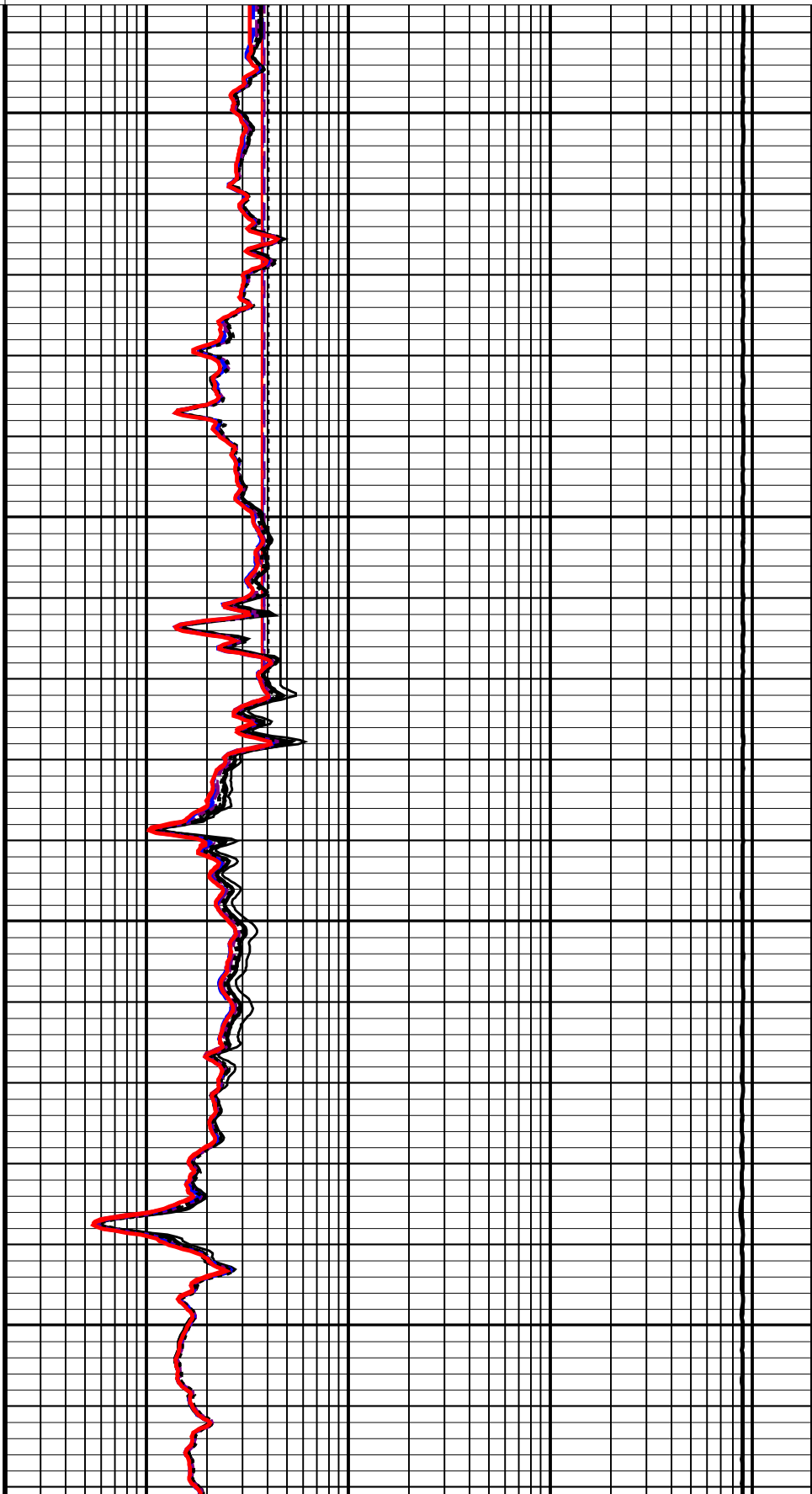


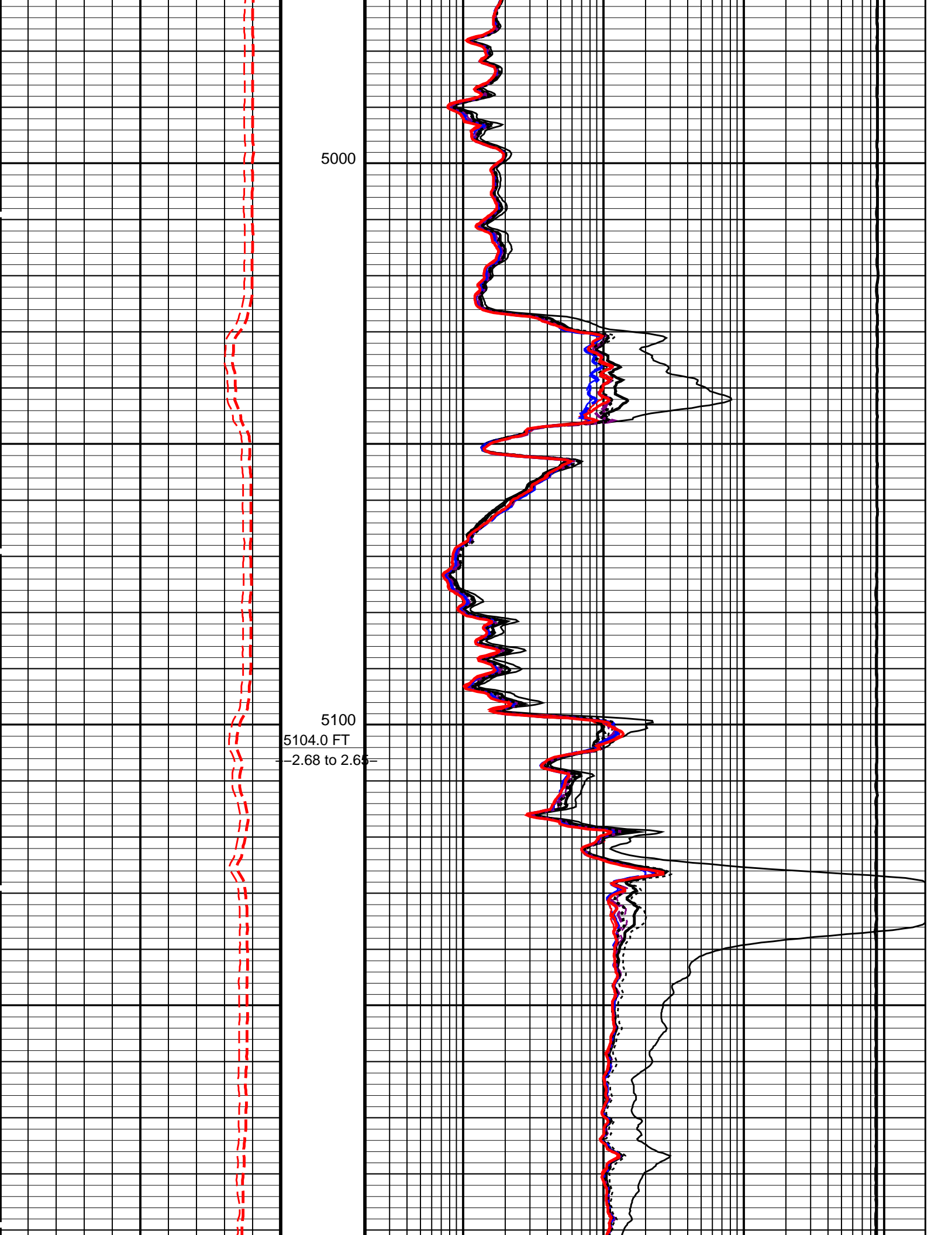
AHT20\_REP Curve (AHT20\_REP)  
(OHMM)

AHT60\_REP Curve (AHT60\_REP)  
(OHMM)

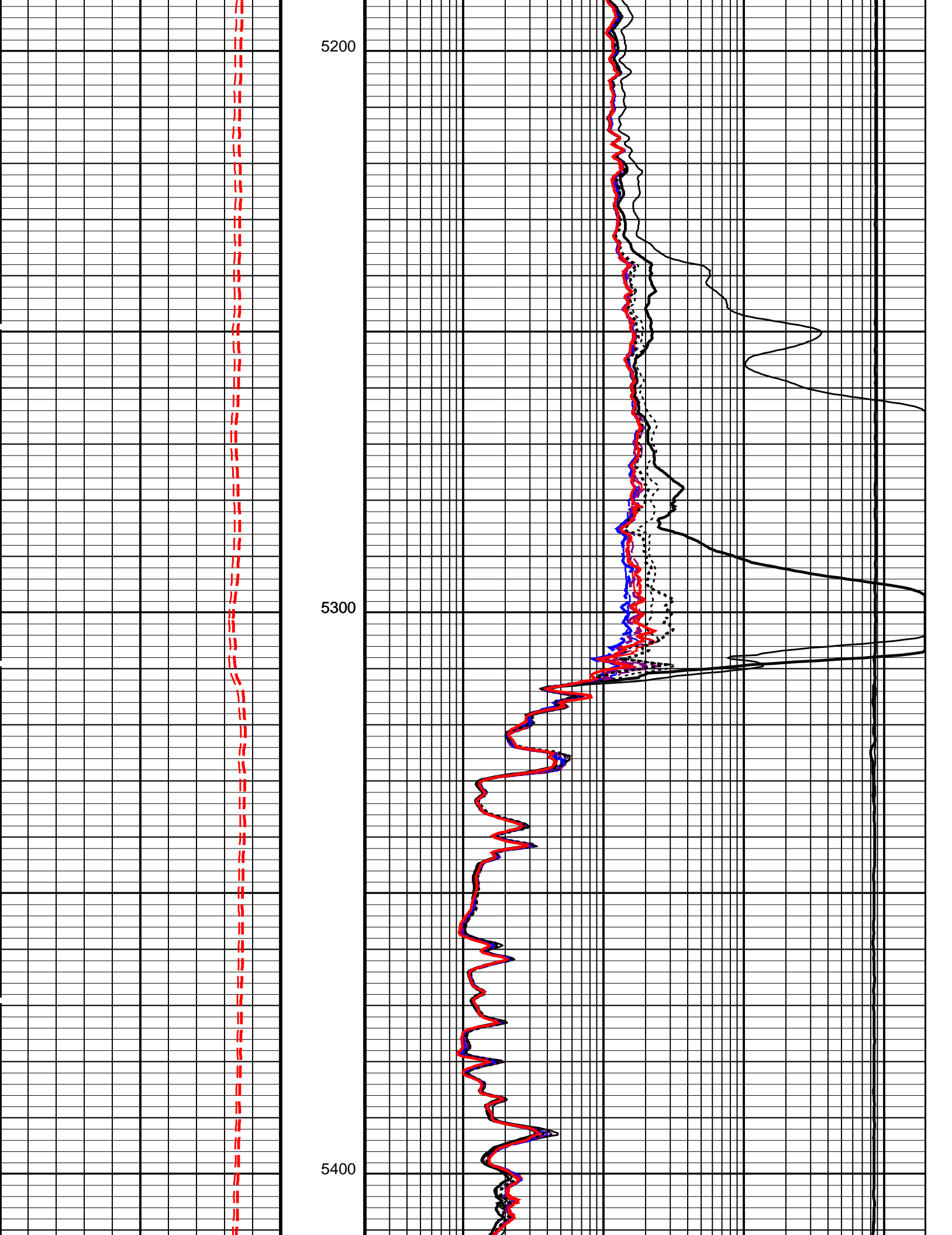
AHT30\_REP Curve (AHT30\_REP)  
(OHMM)

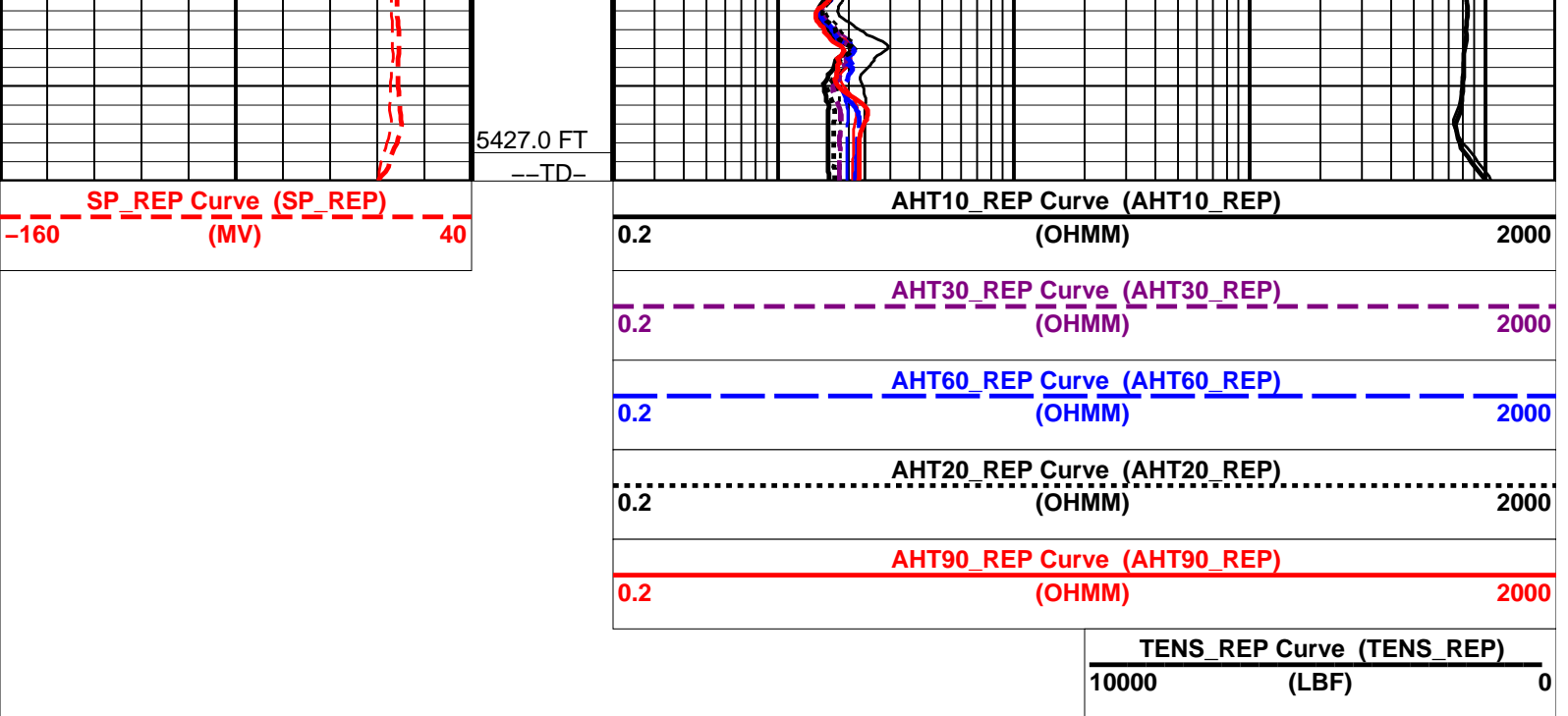
AHT10\_REP Curve (AHT10\_REP)  
(OHMM)











### PIP SUMMARY

Time Mark Every 60 S

## Parameters

DLIS Name	Description	Value
AIT-H: Array Induction Tool - H		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff
AHBHV	Array Induction Borehole Correction Code Version Number	900
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four
AHBLV	Array Induction Basic Logs Code Version Number	223
AHCDE	Array Induction Casing Detection Enable	No
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Centered
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20
AHMRF	Array Induction Mud Resistivity Factor	1
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20
AHRFV	Array Induction Radial Profiling Code Version Number	701
AHRPV	Array Induction Radial Parametrization Code Version Number	232
AHSTA	Array Induction Tool Standoff	0.125 IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
SHT	Surface Hole Temperature	68 DEGF
SPNV	SP Next Value	0 MV
FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
PERT: Preliminary Evaluation - Real Time		
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
GCSE	Generalized Caliper Selection	BS
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.01 DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN 9
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
SHT	Surface Hole Temperature	68 DEGF
System and Miscellaneous		
BS	Bit Size	12.250 IN
DFD	Drilling Fluid Density	9.80 LB/G
DO	Depth Offset for Playback	0.0 FT
DORL	Depth Offset for Repeat Analysis	2.0 FT
MST	Mud Sample Temperature	130.00 DEGF
PP	Playback Processing	RECOMPUTE
TD	Total Depth	5427 FT

# OP System Version: 15C0-309

MCM

AIT-H	SRPC-3357-Q2_2007	NGT-C	15C0-309
DTA-A	SRPC-3357-Q2_2007	DSLT-FTB	15C0-309
DTC-H	15C0-309		

## Input DLIS Files

DEFAULT	AIT_NGS_SONIC_010LUP	FN:9	PRODUCER	12-Aug-2007 11:46	5442.0 FT	4784.5 FT
DEFAULT	AIT_NGS_SONIC_012LUP	FN:11	PRODUCER	12-Aug-2007 12:03	5430.0 FT	379.0 FT

## Output DLIS Files

DEFAULT	AIT_NGS_SONIC_022PUP	FN:21	PRODUCER	12-Aug-2007 13:28
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**Schlumberger**

**BEFORE CALIBRATIONS**

MAXIS Field Log

### Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool – H Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase							
Master: 20-Jul-2007 10:53 Before: 11-Aug-2007 4:09							
Thru Cal Magnitude – 0	0	0.6146	0.6172	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.260	1.266	N/A	N/A	N/A	V
Thru Cal Magnitude – 2	0	0.6267	0.6297	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7053	0.7083	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.327	1.332	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.923	1.931	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.923	1.931	N/A	N/A	N/A	V
Thru Cal Magnitude – 7	0	1.379	1.382	N/A	N/A	N/A	V
Phase – 0	0	59.30	58.78	N/A	N/A	N/A	DEG
Phase – 1	0	58.27	57.74	N/A	N/A	N/A	DEG
Phase – 2	0	54.43	53.89	N/A	N/A	N/A	DEG
Phase – 3	0	53.64	53.10	N/A	N/A	N/A	DEG
Phase – 4	0	47.09	46.52	N/A	N/A	N/A	DEG
Phase – 5	0	45.23	44.64	N/A	N/A	N/A	DEG
Phase – 6	0	45.24	44.65	N/A	N/A	N/A	DEG
Phase – 7	0	42.16	41.37	N/A	N/A	N/A	DEG
Array Induction Tool – H Wellsite Calibration – Electronics Calibration Check – Auxilliary							
Master: 20-Jul-2007 10:53 Before: 11-Aug-2007 4:09							
Array Induction SPA Plus	990.5	990.5	990.3	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.03630	0.03388	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9174	0.9171	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.00003146	0.00003267	N/A	N/A	N/A	V
Array Induction Tool – H Wellsite Calibration – Test Loop Gain Correction							
Master: 20-Jul-2007 10:53							
Test Loop Gain Magnitude – 0	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 1	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 2	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 3	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 4	0	0.9965	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 5	0	1.008	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 6	0	1.005	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude – 7	0	1.009	N/A	N/A	N/A	N/A	V
Phase – 0	0	0.3788	N/A	N/A	N/A	N/A	DEG
Phase – 1	0	0.4778	N/A	N/A	N/A	N/A	DEG

Phase – 2	0	–0.1272	N/A	N/A	N/A	N/A	DEG
Phase – 3	0	–0.03952	N/A	N/A	N/A	N/A	DEG
Phase – 4	0	–0.1155	N/A	N/A	N/A	N/A	DEG
Phase – 5	0	–0.1104	N/A	N/A	N/A	N/A	DEG
Phase – 6	0	0.2446	N/A	N/A	N/A	N/A	DEG
Phase – 7	0	–0.3556	N/A	N/A	N/A	N/A	DEG

#### Array Induction Tool – H Wellsite Calibration – Sonde Error Correction

Master: 20–Jul–2007 10:53

R Sonde Error Correction – 0	0	–153.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	137.2	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 2	0	124.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 3	0	54.29	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	25.17	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	7.628	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	8.197	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	–2.134	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	639.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	211.5	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	29.16	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	–5.433	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	26.43	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	–16.14	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	0.5340	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	1.764	N/A	N/A	N/A	N/A	MM/M

#### Array Induction Tool – H Wellsite Calibration – Mud Gain Correction

Master: 20–Jul–2007 10:53

Coarse – Mag, Real, Imag – 0	0	1.015	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 1	0	1.015	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 2	0	1.015	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 0	0	1.016	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 1	0	1.017	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 2	0	1.017	N/A	N/A	N/A	N/A

#### Natural Gamma Spectroscopy – C Wellsite Calibration – Background Measurement

Master: 8–Aug–2007 12:46 Before: 8–Aug–2007 13:13

WINDOW 1 Background	100.0	150.0	146.4	N/A	N/A	100.0	CPS
WINDOW 2 Background	50.00	52.18	52.22	N/A	N/A	50.00	CPS
WINDOW 3 Background	10.00	17.13	17.31	N/A	N/A	10.00	CPS
WINDOW 4 Background	6.000	2.700	2.445	N/A	N/A	6.000	CPS
WINDOW 5 Background	10.00	2.600	2.405	N/A	N/A	10.00	CPS
SGR Background	30.00	58.76	57.76	N/A	N/A	N/A	GAPI

#### Natural Gamma Spectroscopy – C Wellsite Calibration – Normalized Jig Measurement

Master: 8–Aug–2007 12:04 Before: 8–Aug–2007 13:19

WINDOW 1 Jig	376.0	357.6	361.7	N/A	N/A	22.56	CPS
WINDOW 2 Jig	167.0	158.8	159.2	N/A	N/A	10.02	CPS
WINDOW 3 Jig	24.00	22.28	22.00	N/A	N/A	1.440	CPS
WINDOW 4 Jig	14.00	13.26	13.33	N/A	N/A	2.800	CPS
WINDOW 5 Jig	22.50	21.17	21.57	N/A	N/A	4.500	CPS
SGR Jig	165.0	163.7	165.0	N/A	N/A	7.000	GAPI

#### Natural Gamma Spectroscopy – C Master Calibration – Master Quality Control Values

Master: 8–Aug–2007 11:59

Photomultiplier Res. CARC3	8.000	7.686	--	--	--	--	
APU WINDOW Jig	1350	831.4	--	--	--	--	CPS
APL WINDOW Jig	1350	831.3	--	--	--	--	CPS

#### Digitizing Sonic Logging Tool Master Calibration – DSLT CBL/CBLB Amplitude Normalization in SFT–255

Master: Calibration not done

CBL Raw Amplitude	33.00	N/A	--	--	--	--	MV
CBLB Raw Amplitude	46.00	N/A	--	--	--	--	MV

The NGT PCSL Value is set to 134.651 KEV

#### Array Induction Tool – H / Equipment Identification

##### Primary Equipment:

Rm/SP Bottom Nose  
Array Induction Sonde

AHRM – A  
AHIS – BA

372

##### Auxiliary Equipment:

Array Induction Tool – H Wellsite Calibration

Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6146		0.6050	59.30		71.00
	Before	0.6172			58.78		
1	Master	1.260		1.270	58.27		70.00
	Before	1.266			57.74		
2	Master	0.6267		0.6230	54.43		66.00
	Before	0.6297			53.89		
3	Master	0.7053		0.7040	53.64		65.00
	Before	0.7083			53.10		
4	Master	1.327		1.337	47.09		59.00
	Before	1.332			46.52		
5	Master	1.923		1.955	45.23		57.00
	Before	1.931			44.64		
6	Master	1.923		1.955	45.24		57.00
	Before	1.931			44.65		
7	Master	1.379		1.415	42.16		53.00
	Before	1.382			41.37		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 20-Jul-2007 10:53				Before: 11-Aug-2007 4:09			

Array Induction Tool – H Wellsite Calibration													
Electronics Calibration Check – Auxiliary													
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value						
Master			990.5	Master			0.03630						
Before			990.3	Before			0.03388						
941.0 (Minimum)			990.5 (Nominal)	1040 (Maximum)			-50.00 (Minimum)		0 (Nominal)	50.00 (Maximum)			
Phase	Array Induction Temperature Plus V			Value	Phase	Array Induction Temperature Zero V			Value				
Master				0.9174	Master				3.146E-00				
Before				0.9171	Before				3.267E-00				
0.8700 (Minimum)			0.9150 (Nominal)	0.9600 (Maximum)			-0.05000 (Minimum)			0 (Nominal)	0.05000 (Maximum)		
Master: 20-Jul-2007 10:53						Before: 11-Aug-2007 4:09							

Array Induction Tool – H Wellsite Calibration							
Test Loop Gain Correction							
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG	
0	1.017				0.3788		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.019				0.4778		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.016				-0.1272		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.017				-0.03952		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9965				-0.1155		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	1.008				-0.1104		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

		(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)
6	1.005				0.2446				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)			-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.009				-0.3556				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)			-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 20-Jul-2007 10:53

Array Induction Tool – H Wellsite Calibration									
Sonde Error Correction									
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M			
0	-153.6				639.1				
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)			-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	137.2				211.5				
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)			-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	124.6				29.16				
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)			-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	54.29				-5.433				
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)			-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.17				26.43				
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)			-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	7.628				-16.14				
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)			-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	8.197				0.5340				
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)			-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-2.134				1.764				
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)			-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)





Master: 20-Jul-2007 10:53

















Array Induction Tool – H Wellsite Calibration									
Mud Gain Correction									
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag			
0	1.015				1.016				
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)			0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.015				1.017				
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)			0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.015				1.017				
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)			0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)







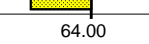



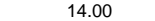

Master: 20-Jul-2007 10:53

Array Induction Tool – H Master Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6146		0.6050	59.30		71.00
1	Master	1.260		1.270	58.27		70.00
2	Master	0.6267		0.6230	54.43		66.00
3	Master	0.7053		0.7040	53.64		65.00
4	Master	1.327		1.337	47.09		59.00
5	Master	1.923		1.955	45.23		57.00
6	Master	1.923		1.955	45.24		57.00
7	Master	1.670		1.665	49.10		59.00

Master	1.379	60.00 % (Minimum)	140.0 % (Maximum)	1.415	42.16	53.00
		(Nominal)			Nom -60.00 (Minimum)	Nom + 60.00 (Maximum)
Master: 20-Jul-2007 10:53						

Array Induction Tool – H Master Calibration							
Electronics Calibration Check – Auxilliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			990.5	Master			0.03630
	941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V		Value	Phase	Array Induction Temperature Zero V		Value
Master			0.9174	Master			3.146E-00
	0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 20-Jul-2007 10:53							

Array Induction Tool – H Master Calibration						
Test Loop Gain Correction						
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG
0	1.017				0.3788	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
1	1.019				0.4778	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
2	1.016				-0.1272	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
3	1.017				-0.03952	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
4	0.9965				-0.1155	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
5	1.008				-0.1104	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
6	1.005				0.2446	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
7	1.009				-0.3556	
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
Master: 20-Jul-2007 10:53						

Array Induction Tool – H Master Calibration						
Sonde Error Correction						
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M
0	-153.6				639.1	
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	137.2				211.5	
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	124.6				29.16	
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)
3	54.29				-5.433	
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal) 250.0 (Maximum)
4	25.17				26.43	
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal) 63.00 (Maximum)
5	7.628				-16.14	
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal) 50.00 (Maximum)

	(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
6	8.197			0.5340			
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-2.134			1.764			
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
Master: 20-Jul-2007 10:53							

Array Induction Tool – H Master Calibration								
Mud Gain Correction								
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag		
0	1.015				1.016			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.015				1.017			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.015				1.017			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
Master: 20-Jul-2007 10:53								

Natural Gamma Spectroscopy – C / Equipment Identification			
Primary Equipment:			
NGT Cartridge		NGC – C	
NGT Sonde		NGD – A      1745	
Auxiliary Equipment:			
NGT Cartridge Housing		NGCH – A	
NGT Sonde Housing		NGH – B	
Gamma Source Radioactive		GSR – U	


Natural Gamma Spectroscopy – C Wellsite Calibration												
Background Measurement												
Phase	WINDOW 1 Background CPS		Value	Phase	WINDOW 2 Background CPS		Value	Phase	WINDOW 3 Background CPS		Value	
Master			150.0	Master			52.18	Master			17.13	
Before			146.4	Before			52.22	Before			17.31	
0 (Minimum)			100.0 (Nominal)	0 (Minimum)			50.00 (Nominal)	0 (Minimum)			10.00 (Nominal)	40.00 (Maximum)
Phase	WINDOW 4 Background CPS		Value	Phase	WINDOW 5 Background CPS		Value	Phase	SGR Background GAPI		Value	
Master			2.700	Master			2.600	Master			58.76	
Before			2.445	Before			2.405	Before			57.76	
0 (Minimum)			6.000 (Nominal)	0 (Minimum)			10.00 (Nominal)	0 (Minimum)			30.00 (Nominal)	120.0 (Maximum)
Master: 8-Aug-2007 12:46						Before: 8-Aug-2007 13:13						


Natural Gamma Spectroscopy – C Wellsite Calibration														
Normalized Jig Measurement														
Phase	WINDOW 1 Jig CPS			Value	Phase	WINDOW 2 Jig CPS			Value	Phase	WINDOW 3 Jig CPS			Value
Master				357.6	Master				158.8	Master				22.28
Before				361.7	Before				159.2	Before				22.00
354.0 (Minimum)376.0 (Nominal)398.0 (Maximum)					155.0 (Minimum)167.0 (Nominal)179.0 (Maximum)					21.50 (Minimum)24.00 (Nominal)26.50 (Maximum)				
Phase	WINDOW 4 Jig CPS			Value	Phase	WINDOW 5 Jig CPS			Value	Phase	SGR Jig GAPI			Value
Master				13.26	Master				21.17	Master				163.7
Before				13.33	Before				21.57	Before				165.0
12.50 (Minimum)14.00 (Nominal)15.50 (Maximum)					20.00 (Minimum)22.50 (Nominal)25.00 (Maximum)					153.0 (Minimum)165.0 (Nominal)177.0 (Maximum)				
Master: 8-Aug-2007 12:04					Before: 8-Aug-2007 13:19									

Natural Gamma Spectroscopy – C Wellsite Calibration			



### Quality Control Values

Quality Control Values								
Phase	DHVF Jig V		Value	Phase	Quality Windows Ratio Jig		Value	
Master			1369	Master			2.251	
Before			1368	Before			2.271	
1088 (Minimum)			1450 (Nominal)	1813 (Maximum)				
				2.150 (Minimum)			2.240 (Nominal)	2.330 (Maximum)
Master: 8-Aug-2007 12:04				Before: 8-Aug-2007 13:19				

Natural Gamma Spectroscopy – C Wellsite Calibration		
Quality Control Values Check		
Phase	Thorium peak Form Factor Jig	Value
Before		-0.01207
-0.2000 (Minimum)		0 (Nominal)
		0.2000 (Maximum)
Before: 8-Aug-2007 13:19		

Natural Gamma Spectroscopy – C Master Calibration												
Master Quality Control Values												
Phase	Photomultiplier Res. CARC3		Value	Phase	APU WINDOW Jig CPS		Value	Phase	APL WINDOW Jig CPS		Value	
Master	<div><div></div></div>		7.686	Master	<div><div></div></div>		831.4	Master	<div><div></div></div>		831.3	
4.500 (Minimum)			8.000 (Nominal)	700.0 (Minimum)			1350 (Nominal)	700.0 (Minimum)			1350 (Nominal)	1600 (Maximum)
Phase	Thorium peak Form Factor Jig		Value									
Master	<div><div></div></div>		−0.01887									
−0.1000 (Minimum)			0 (Nominal)									0.1000 (Maximum)
Master: 8–Aug–2007 11:59												

### Digitizing Sonic Logging Tool / Equipment Identification

#### Primary Equipment:

BHC Sonde

Digitizing Sonic Logging Cartridge

SLS – W

DSLCL – B

#### Auxiliary Equipment:

Electronics Cartridge Housing

ECH – KH

Digitizing Sonic Logging Tool Master Calibration									
DSLTL CBL/CBLB Amplitude Normalization in SFT-255									
Phase	CBL Raw Amplitude MV			Value	Phase	CBLB Raw Amplitude MV			Value
Master	<div>NOT DONE</div>			N/A	Master	<div>NOT DONE</div>			N/A
27.00 (Minimum)		33.00 (Nominal)		43.00 (Maximum)	27.00 (Minimum)		46.00 (Nominal)		68.00 (Maximum)
Master: Calibration not done									

### DTS Telemetry Tool / Equipment Identification

#### Primary Equipment:

DTC-H Auxiliary Cartridge

DTC-H Telemetry Cartridge

DTCH – A

DTCH – A

#### Auxiliary Equipment:

DTCH Telemetry Cartridge Housing

ECH – KC

Well: **Windy Hill 3–17D**  
Field: **Wildcat**  
County: **Morgan**  
State: **Colorado**

Array Induction  
Linear Correlation