



PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company MURFIN DRILLING CO, INC.
Well ABELL RANCH "B" #4-31
Field GAELAND WEST
County GOVE
State KANSAS

Company MURFIN DRILLING CO, INC.
Well ABELL RANCH "B" #4-31
Field GAELAND WEST
County GOVE State KANSAS

Location: API #: 15-063-22332-00-00

SEC 31 TWP 12S RGE 30W

Permanent Datum GROUND LEVEL Elevation 2877'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Other Services
CNL/CDL
MEL/BHCS
Elevation
K.B. 2877'
D.F. N/A
G.L. 2872'

Date	7/27/2018
Run Number	ONE
Depth Driller	4620'
Depth Logger	4618'
Bottom Logged Interval	4617'
Top Log Interval	0'
Casing Driller	8.625" @ 305'
Casing Logger	302'
Bit Size	7.875"
Type Fluid in Hole	CHEMICAL
Salinity, ppm CL	1800
Density / Viscosity	9.5 60
pH / Fluid Loss	10.5 7.2
Source of Sample	FLOWLINE
Rm @ Meas. Temp	0.50 @ 82
Rmt @ Meas. Temp	0.38 @ 82
Rmc @ Meas. Temp	0.68 @ 82
Source of Rmt / Rmc	CHARTS
Rm @ BHT	0.34 @ 122
Operating Rig Time	5 HOURS
Max Rec. Temp. F	122
Equipment Number	91
Location	HAYS
Recorded By	IAN MABB
Witnessed By	PAUL GUNZELMAN

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All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

GRINNEL, KS.

10 MILES SOUTH TO RD. S - WEST 4 MILES -
NORTH 1/4 MILE & EAST INTO

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES
www.pioneerenergy.com 785-625-3858

Your Pioneer Energy Services Crew

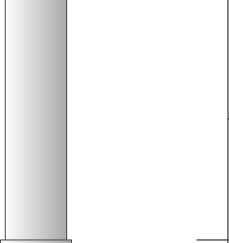
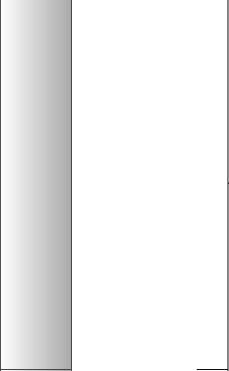
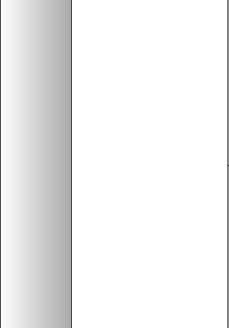
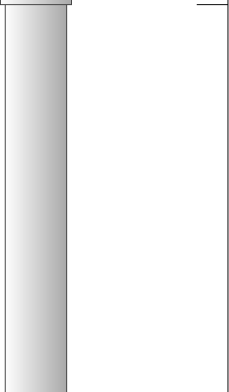
Engineer: IAN MABB
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

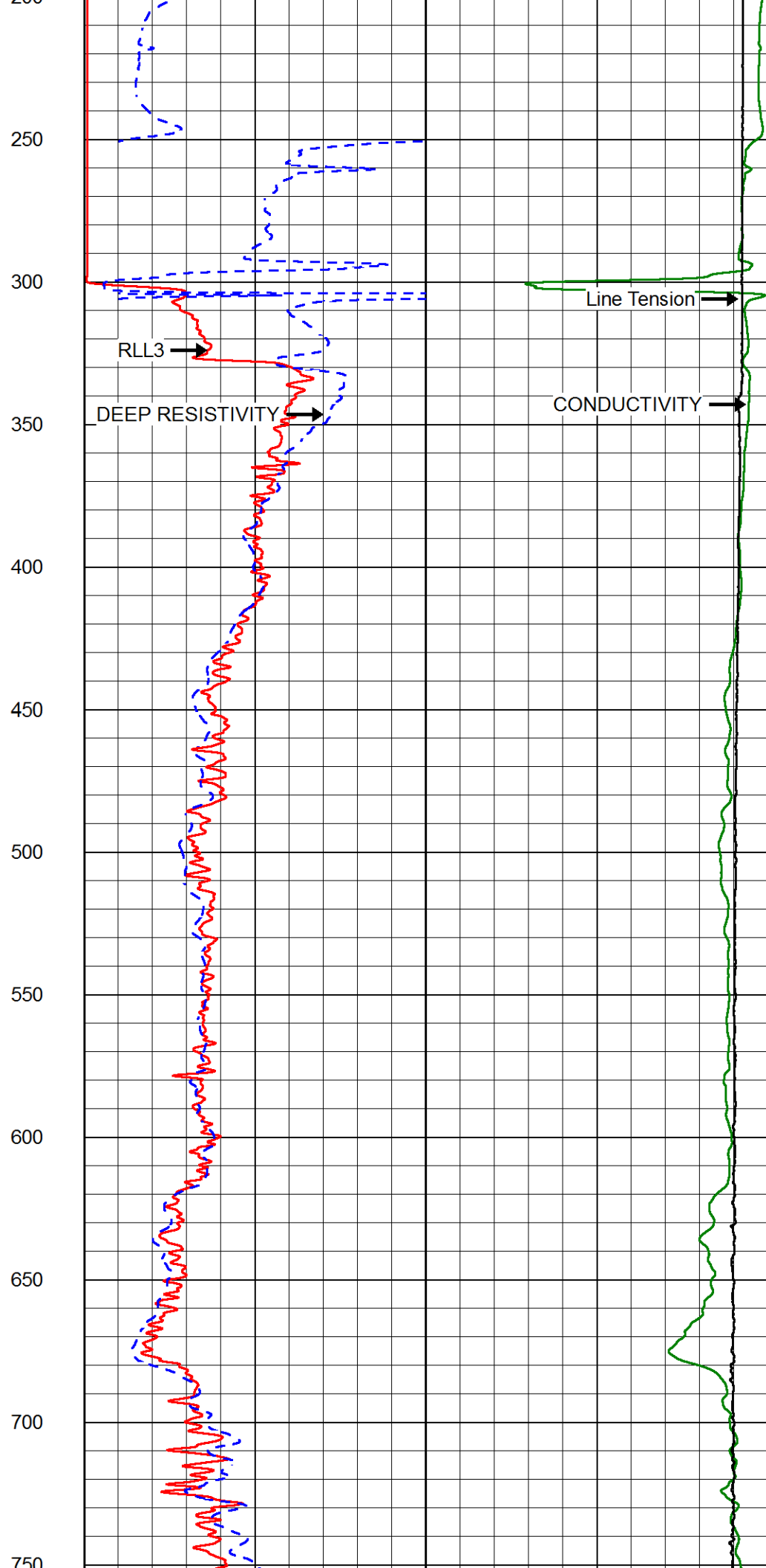
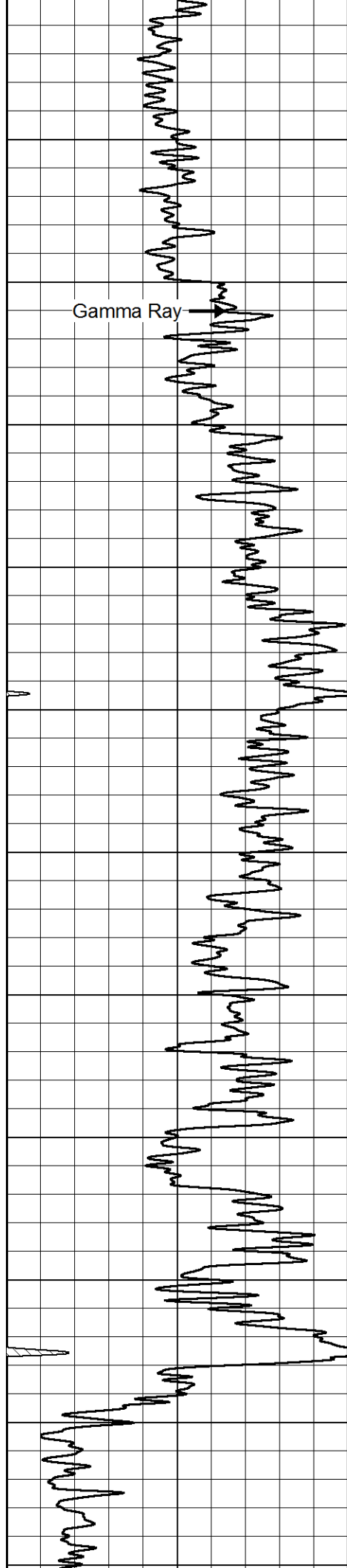
Primary Witness: PAUL GUNZELMAN
Secondary Witness:
Secondary Witness:
Secondary Witness:

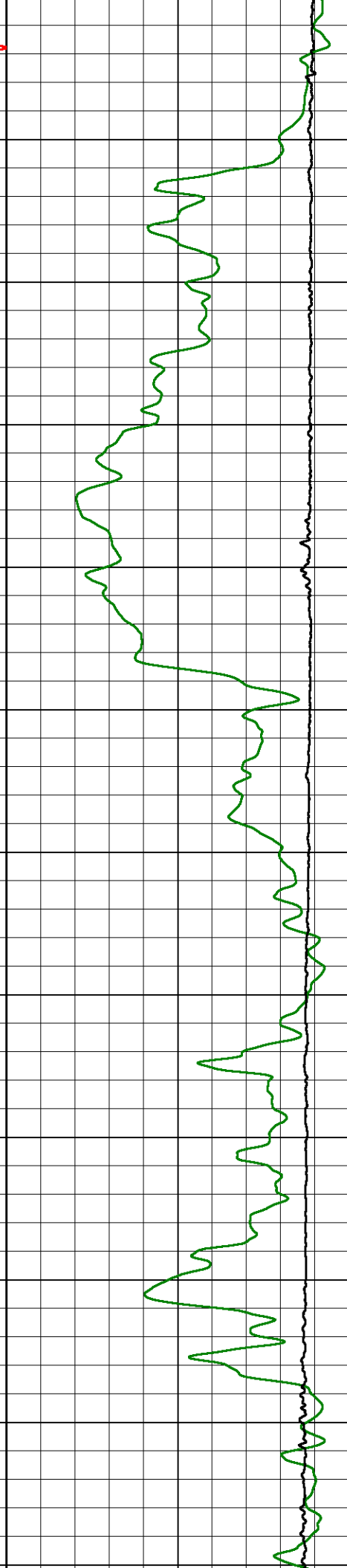
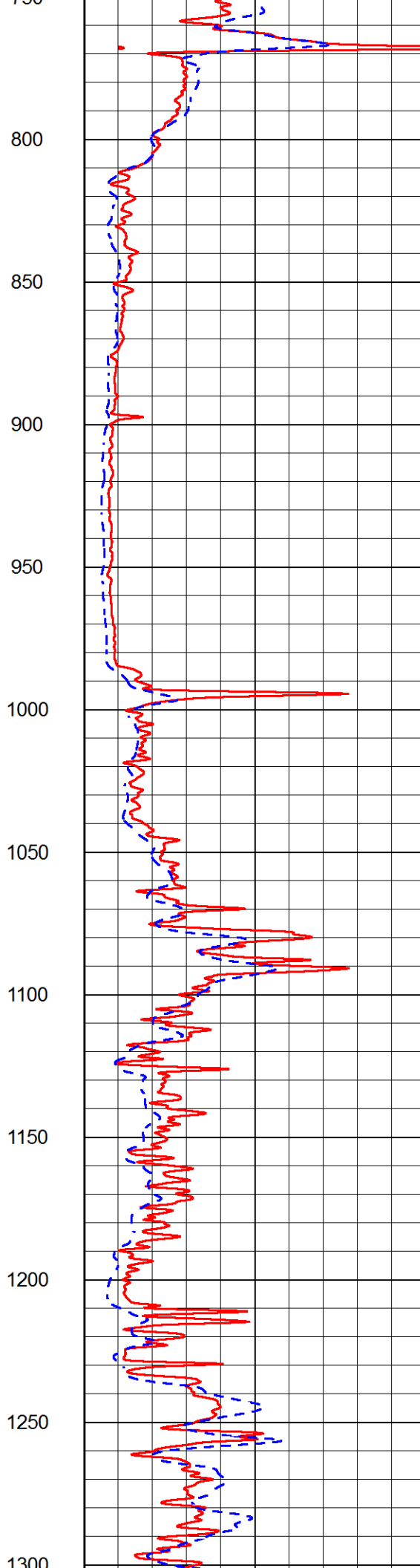
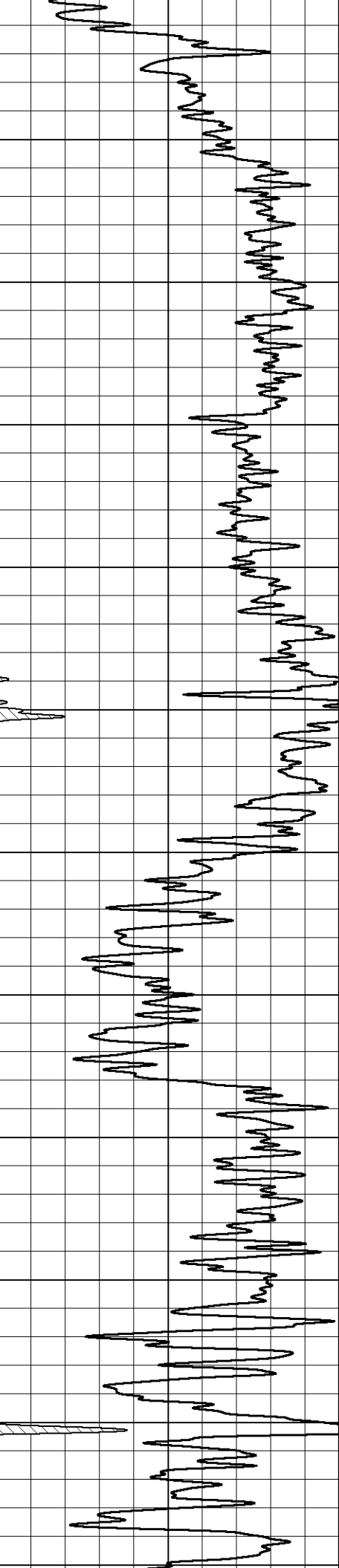
Top - Bottom

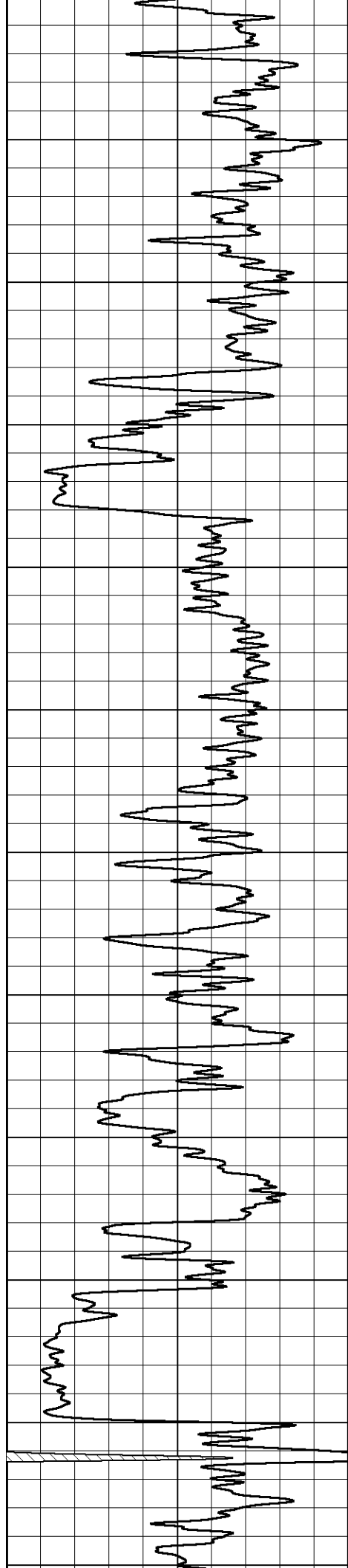
M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m
2	1	Off	Limestone	1	2.71	-40	3
SNDERR mmho/m	SRFTEMP degF	CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BOREID in
1	79	0	5.5	0	4618	122	7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (817-947)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

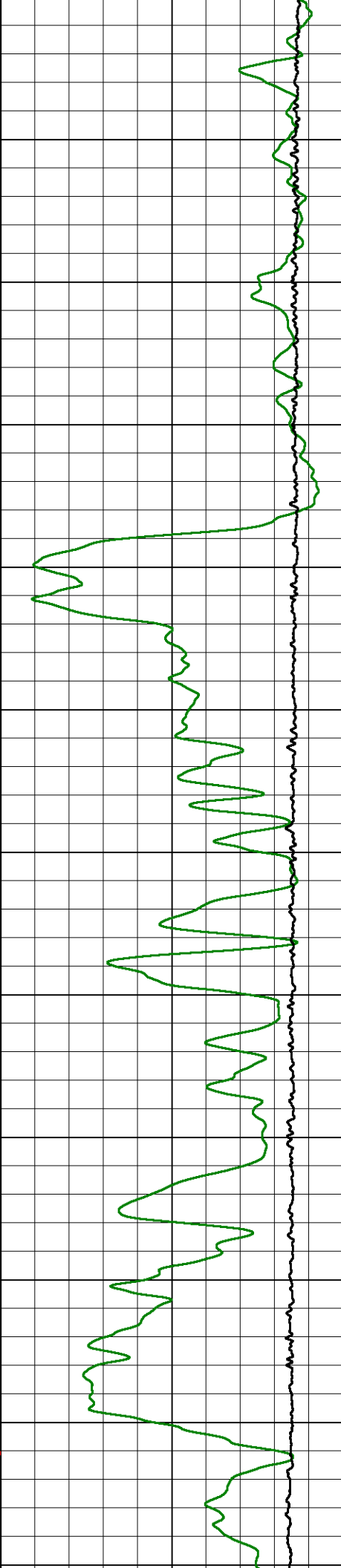
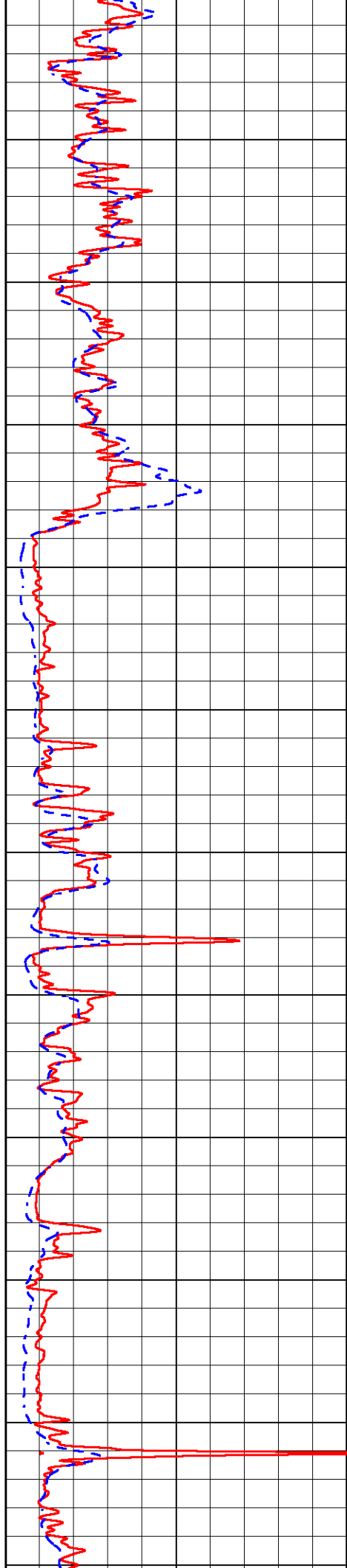
CILD	8.00		DIL-PSI HIGH TEMP (933 (HT))	18.50	3.50	220.00
CILM	4.70					
SP	0.20					
Dataset: murfin_abell_ranch_b_4_31.db: field/well/stackmel/pass3.1 Total length: 43.08 ft Total weight: 685.00 lb O.D.: 4.00 in						

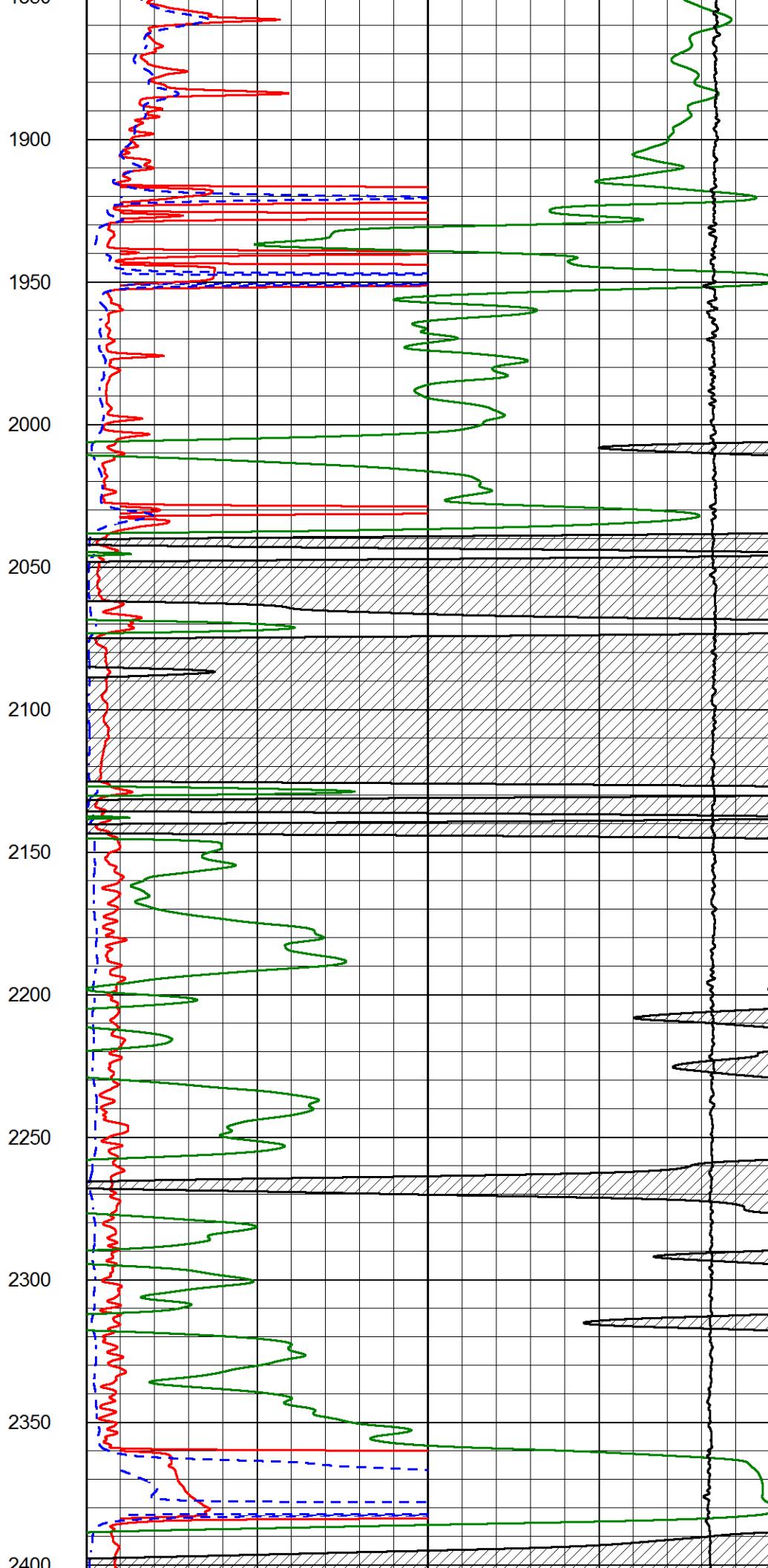
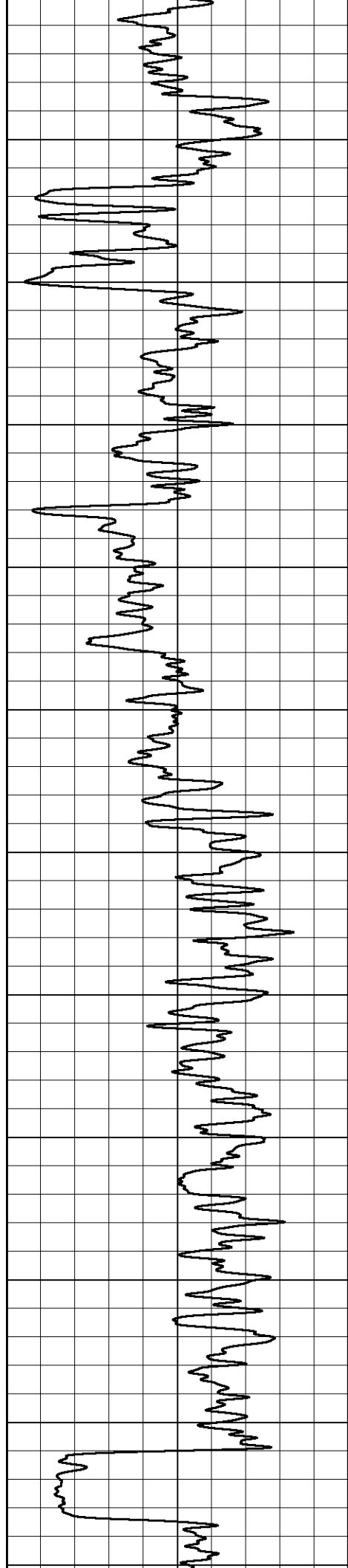


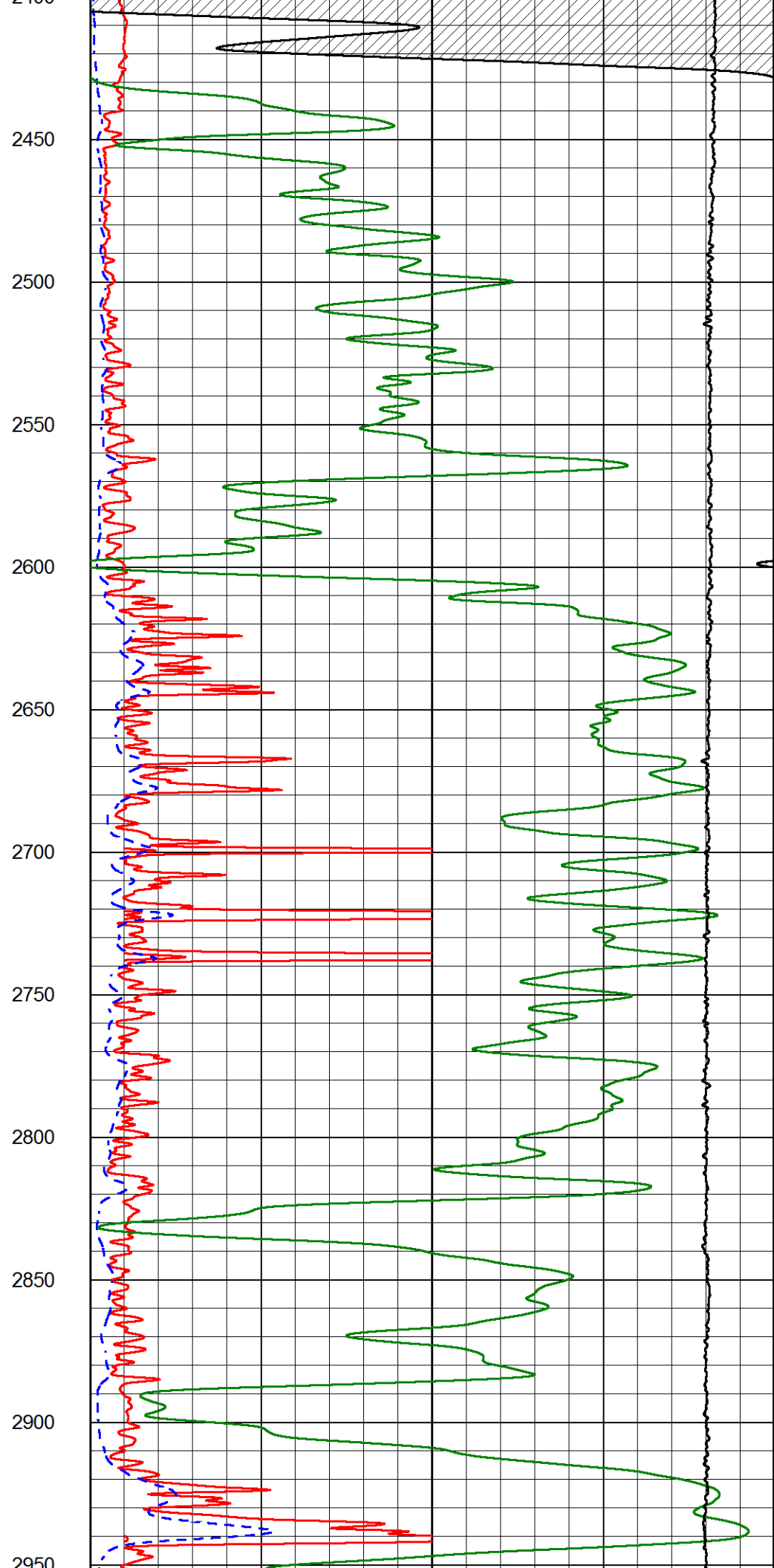
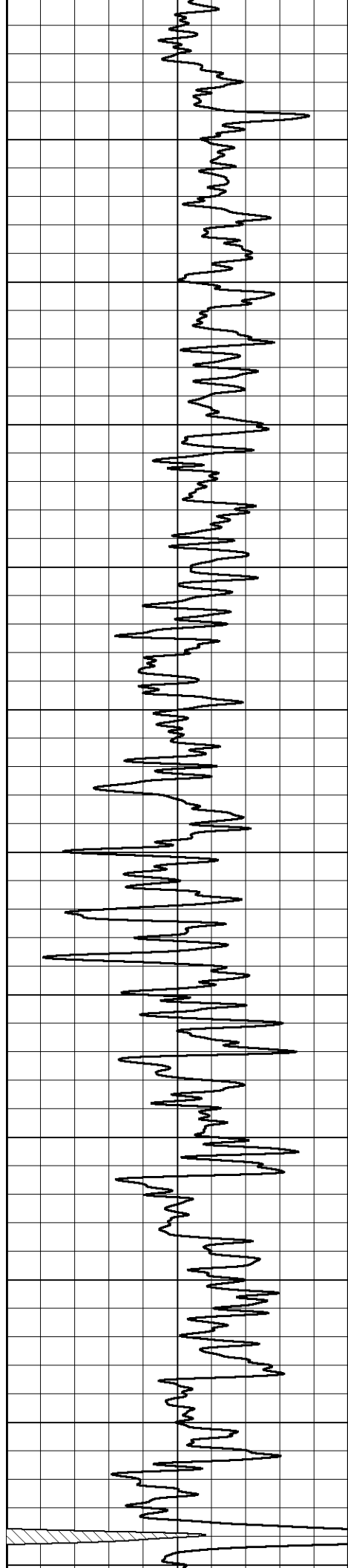


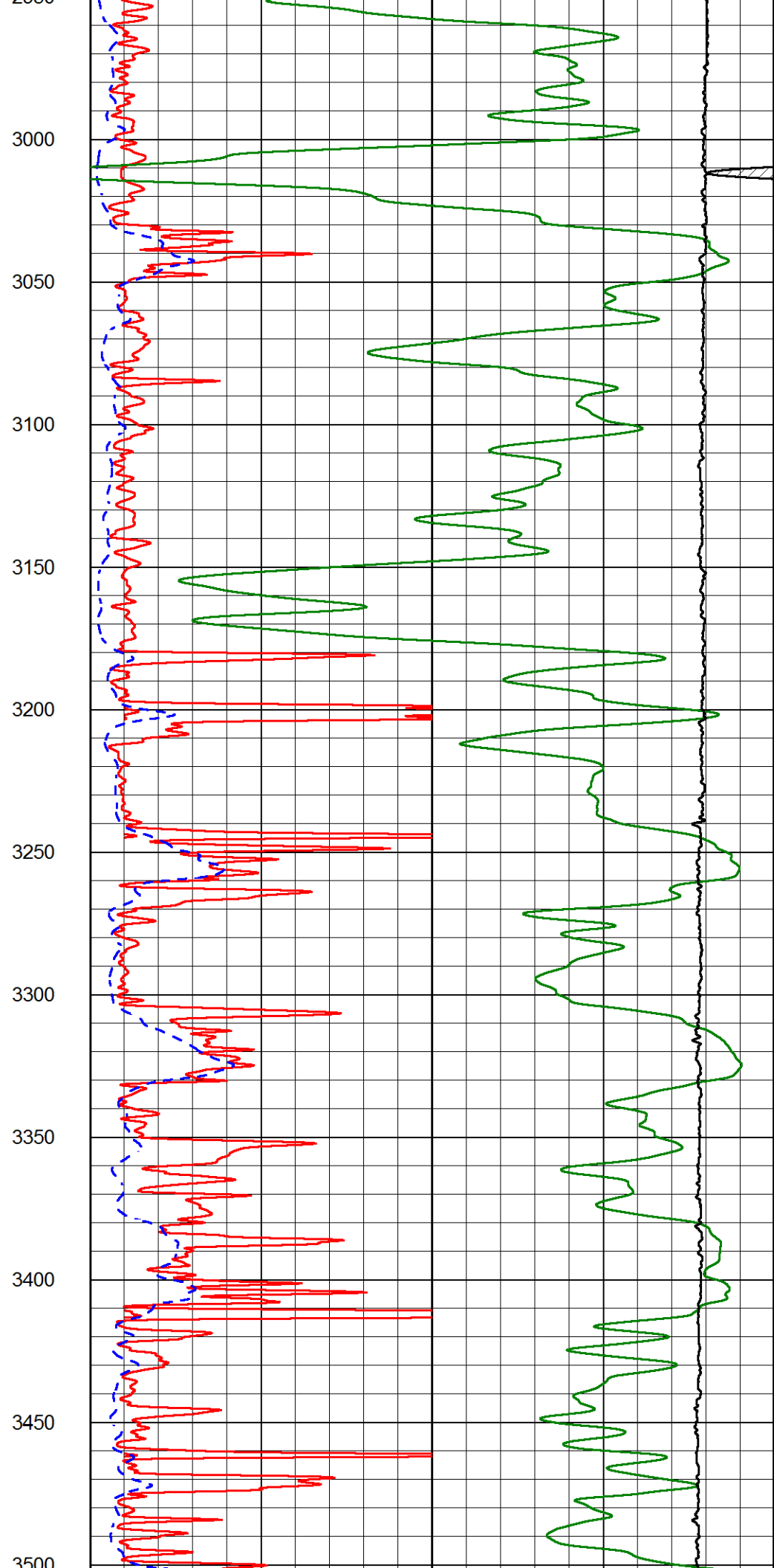
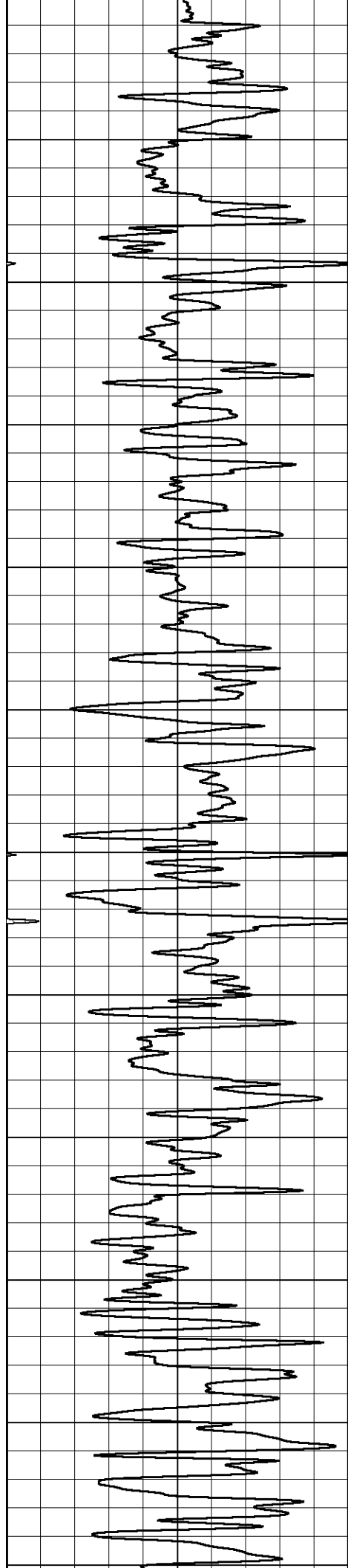


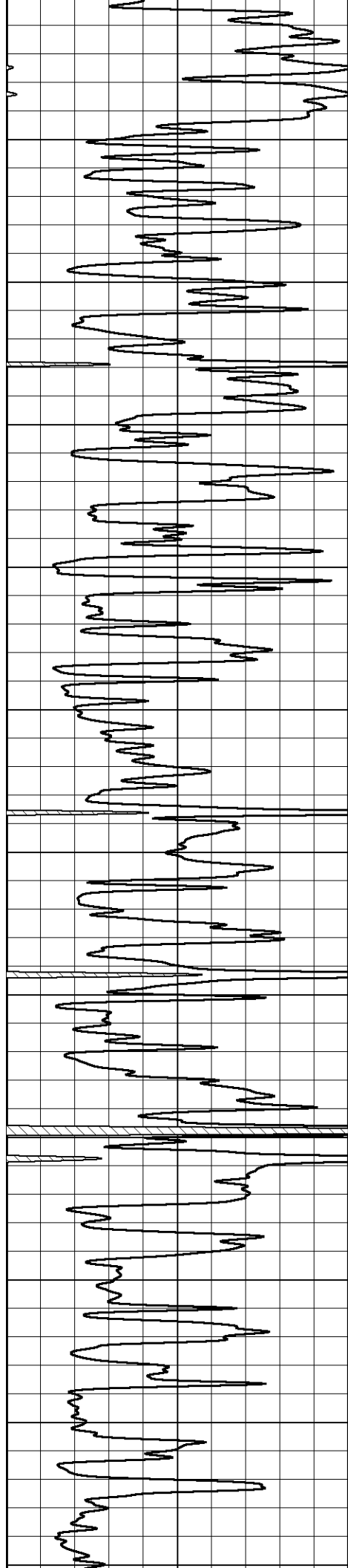
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1350
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850



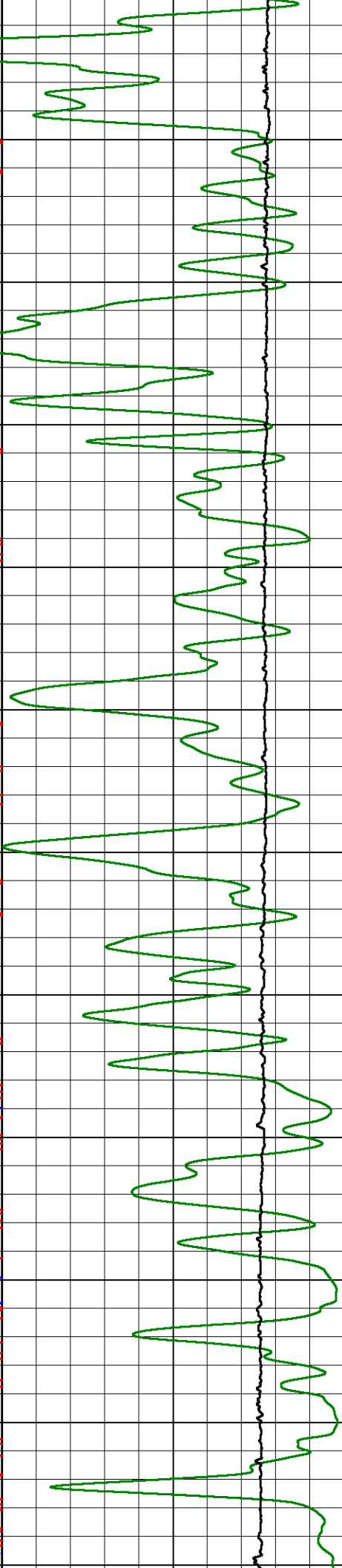
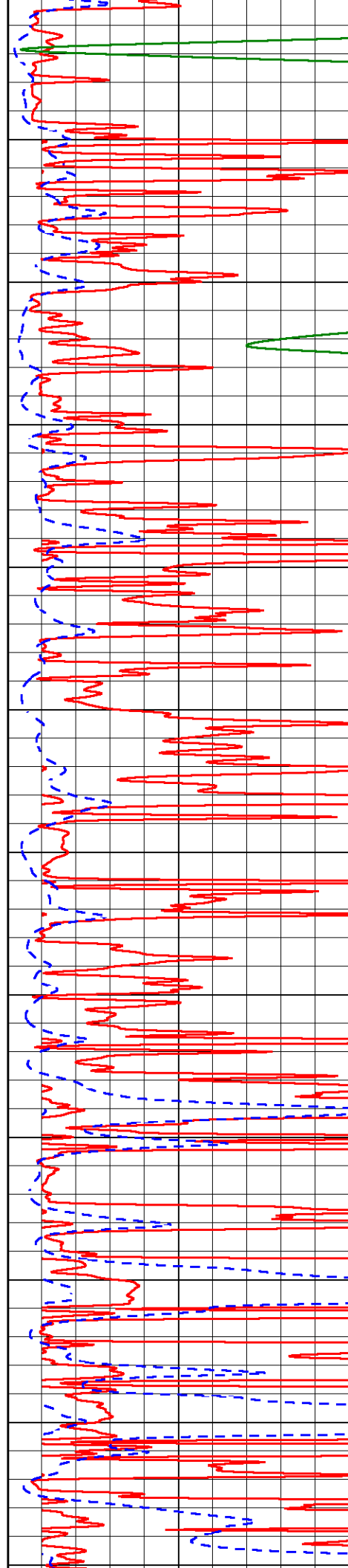


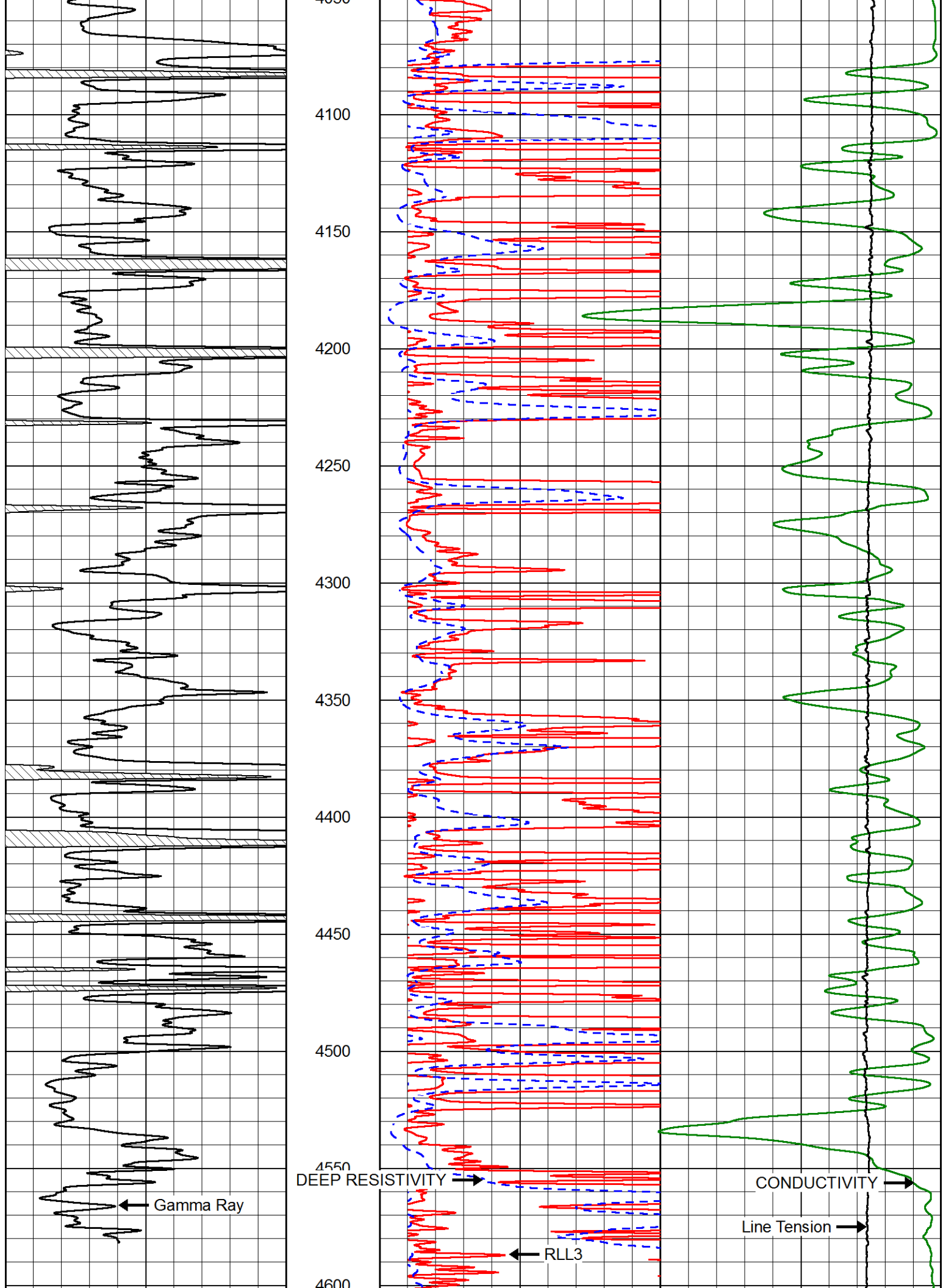


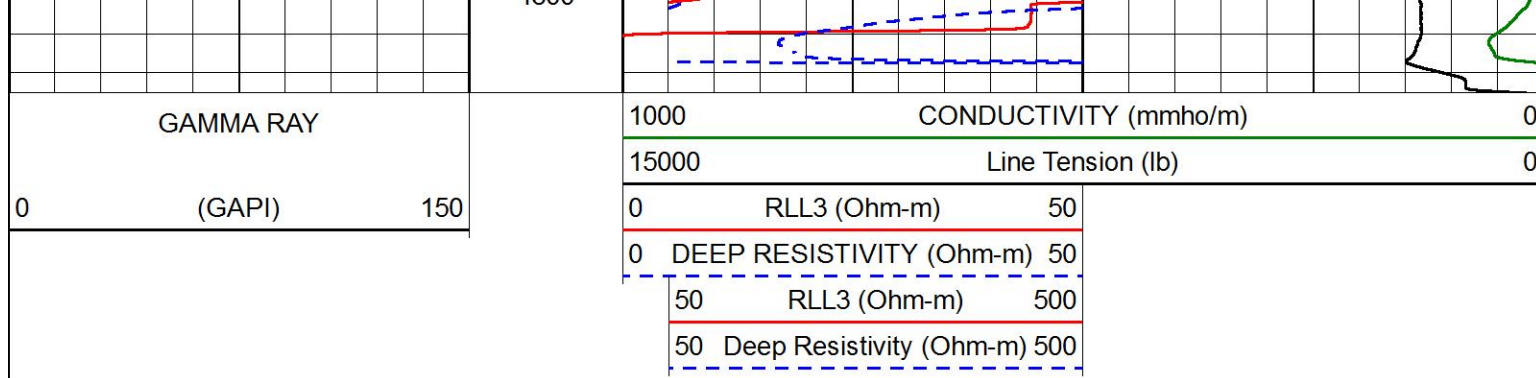




3500
3550
3600
3650
3700
3750
3800
3850
3900
3950
4000
4050





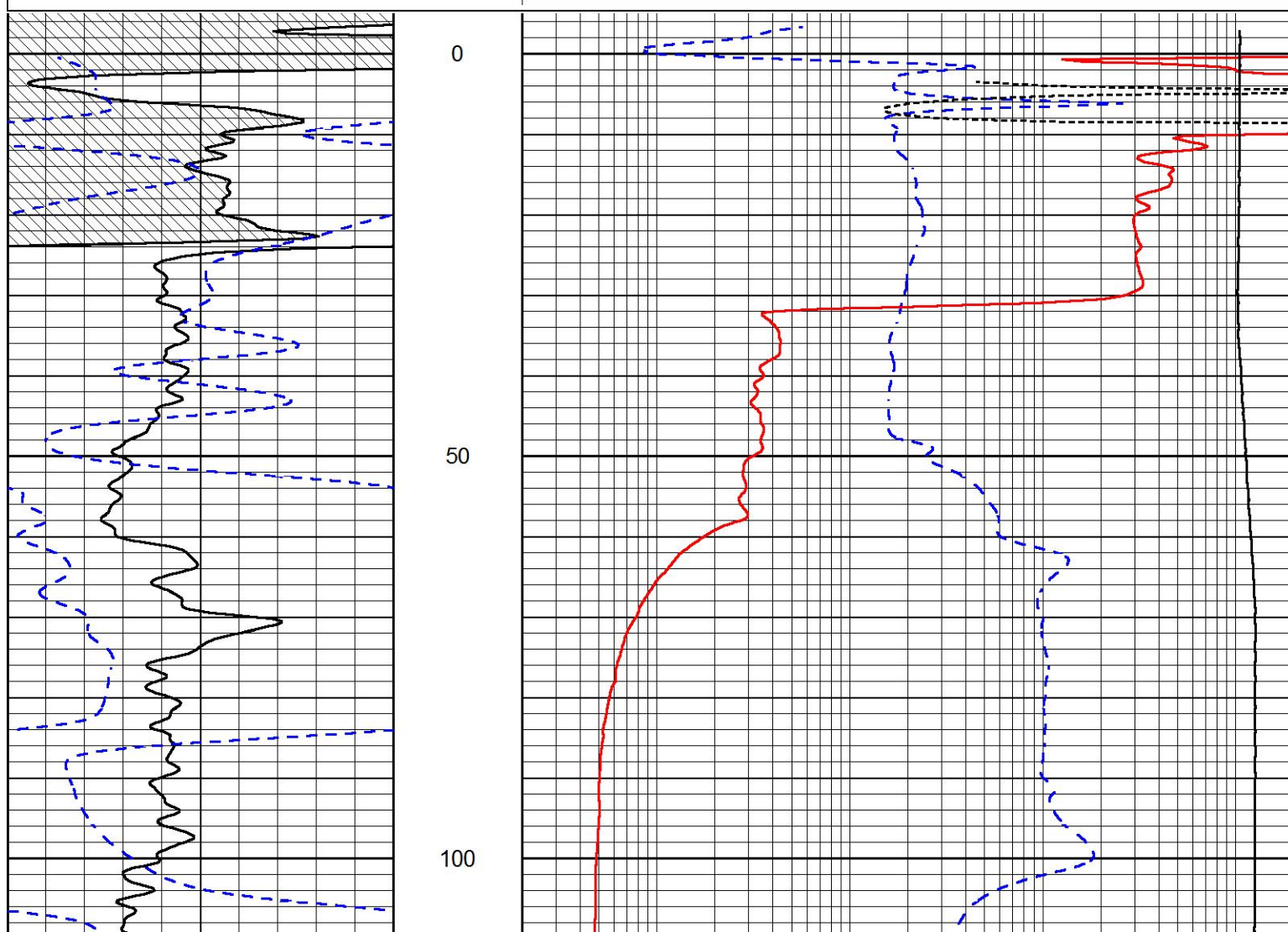


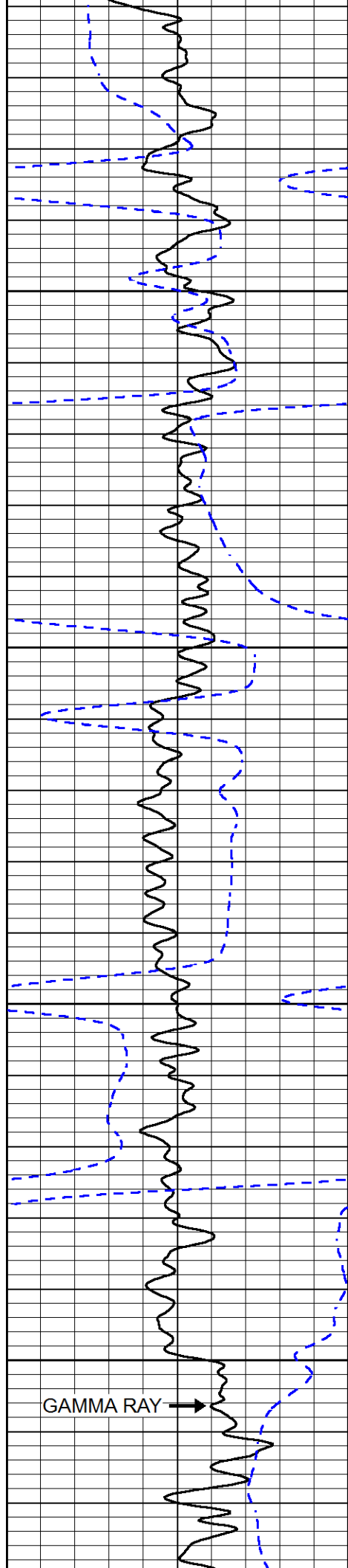


MAIN PASS

Database File	murfin_abell_ranch_b_4_31.db
Dataset Pathname	stackmel/pass4.1
Presentation Format	dil
Dataset Creation	Sat Jul 28 02:24:51 2018
Charted by	Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	LINE TENSION (lb)	0





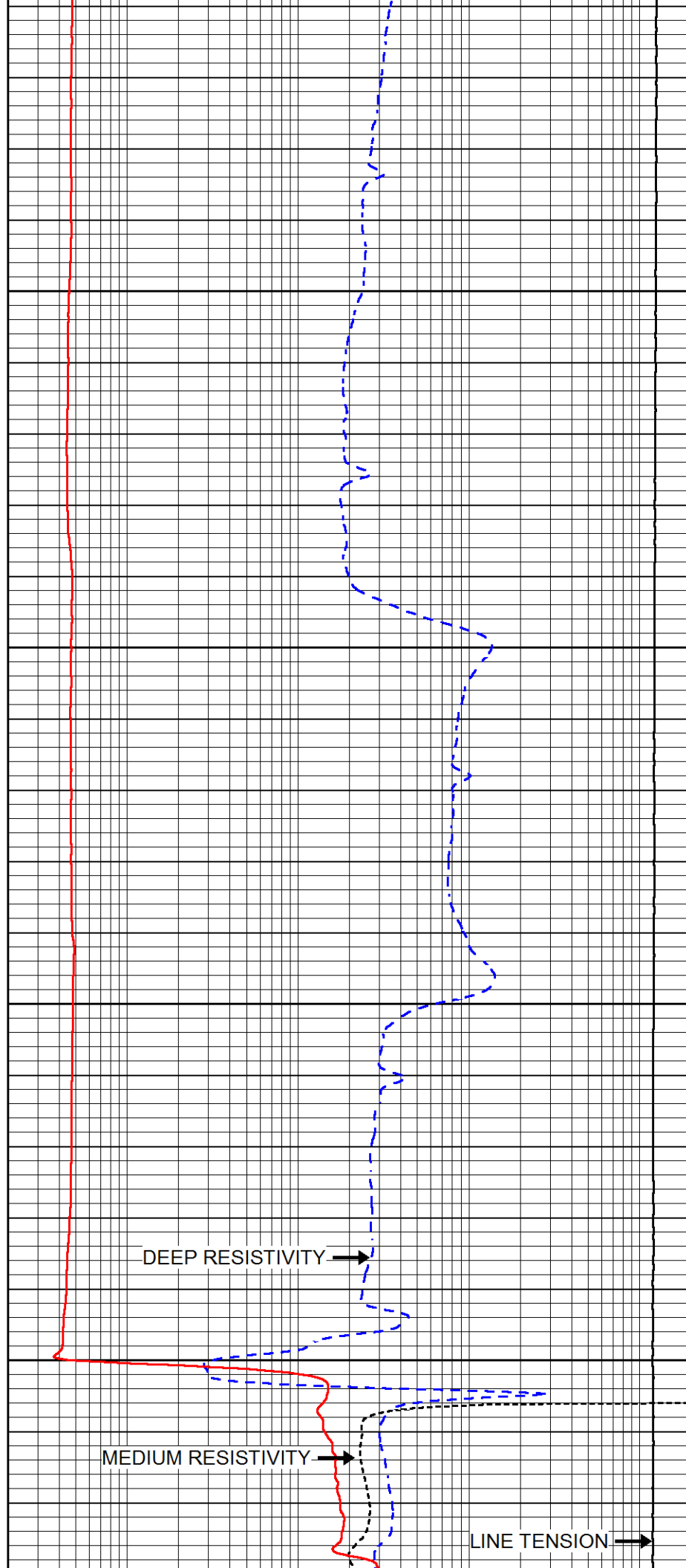
GAMMA RAY →

150

200

250

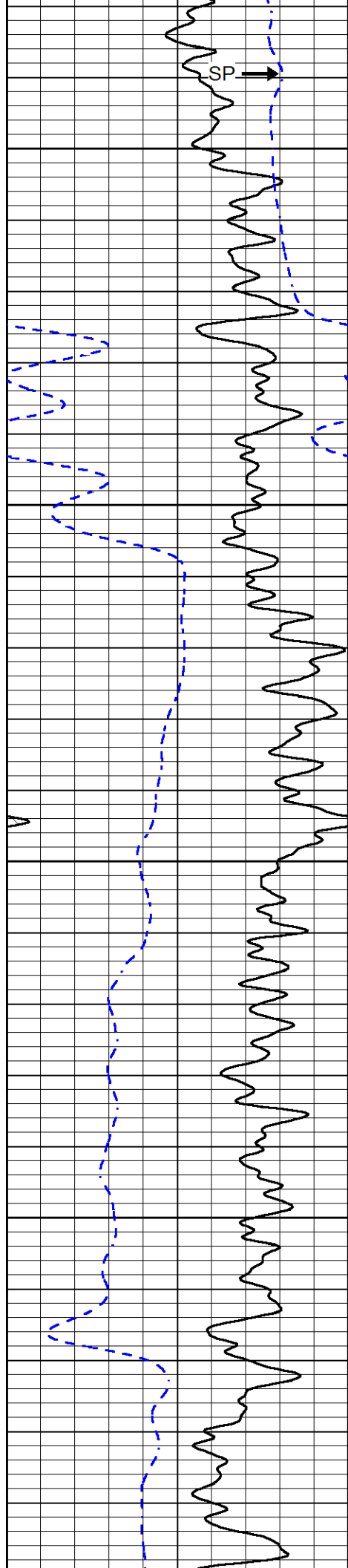
300



DEEP RESISTIVITY →

MEDIUM RESISTIVITY →

LINE TENSION →



350

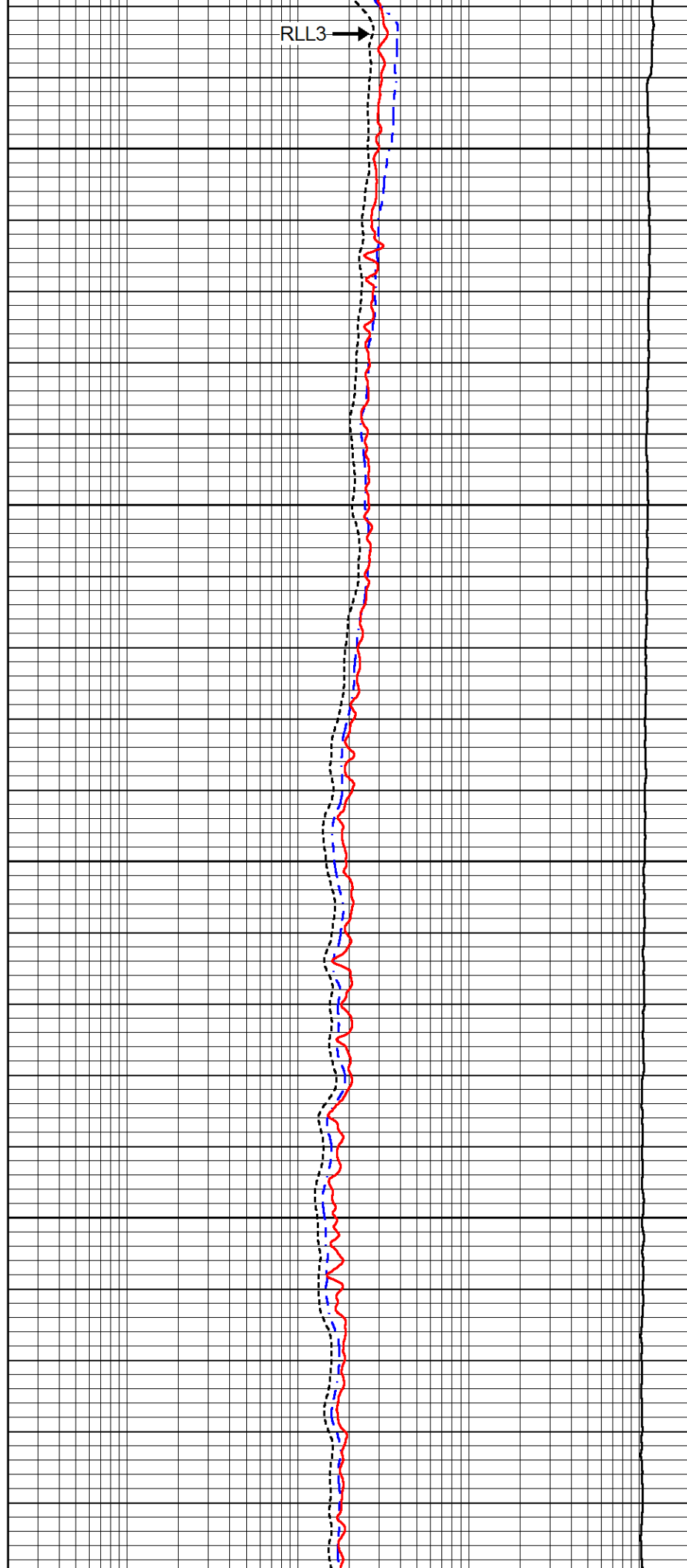
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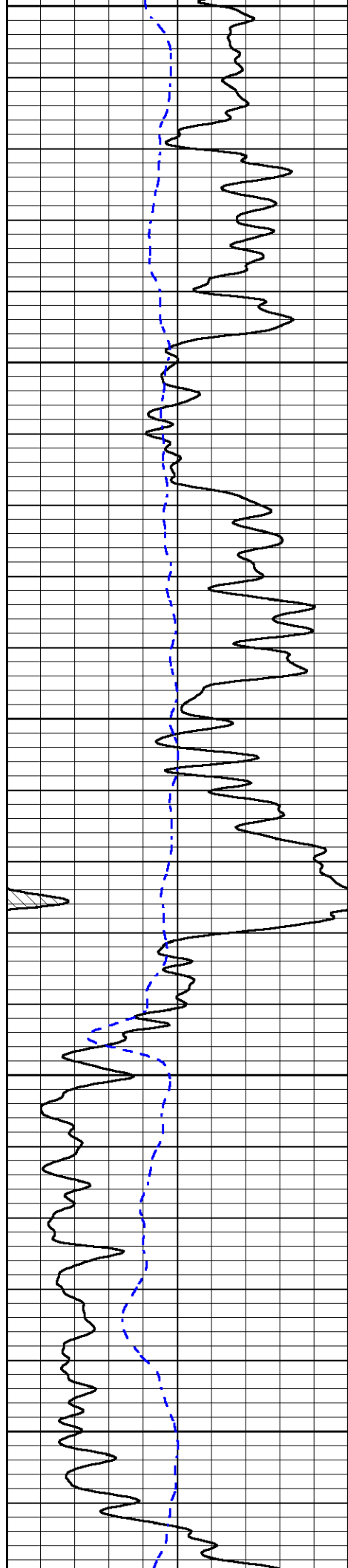
450

500

550

RLL3





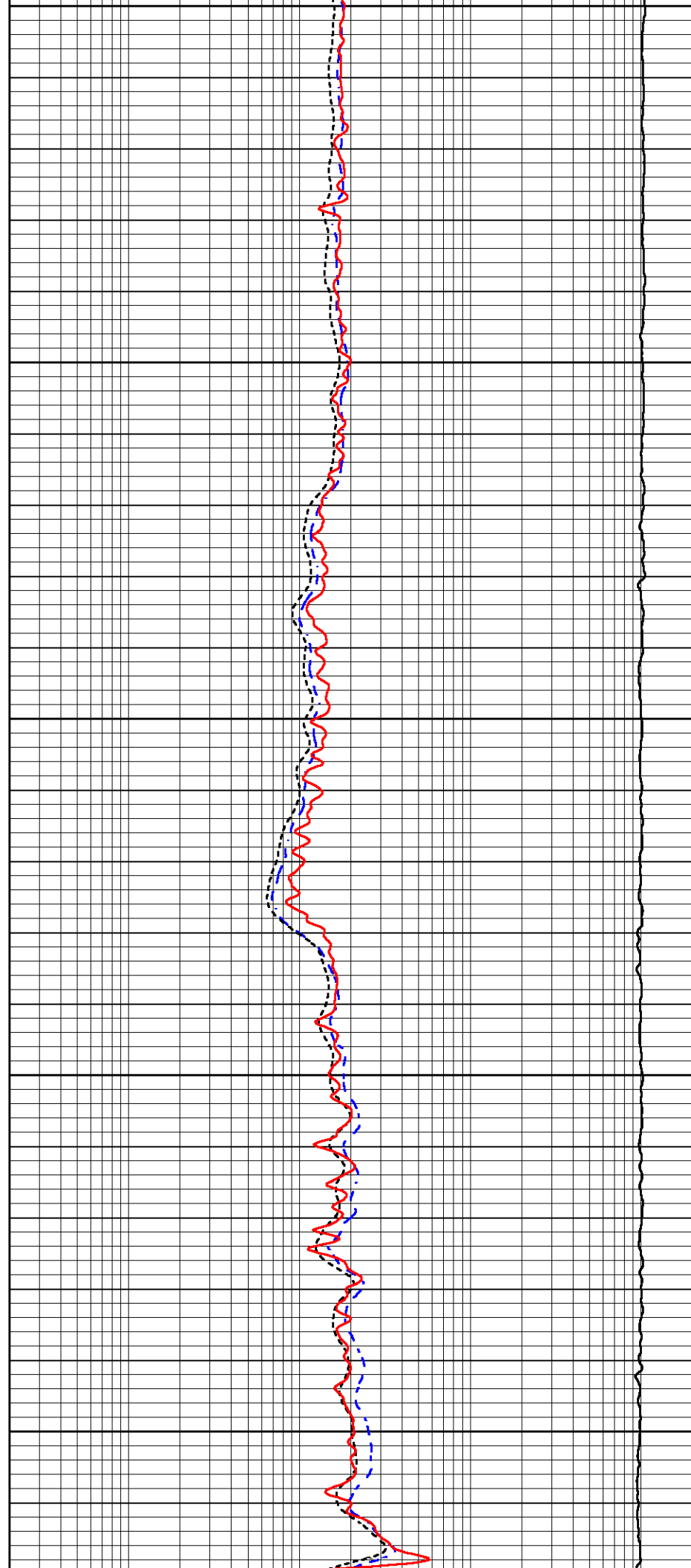
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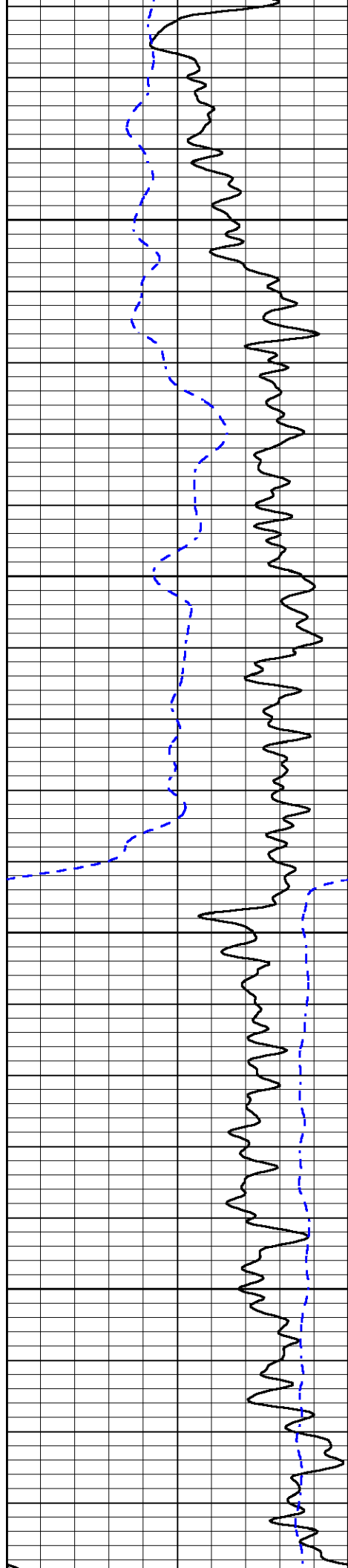
600

650

700

750



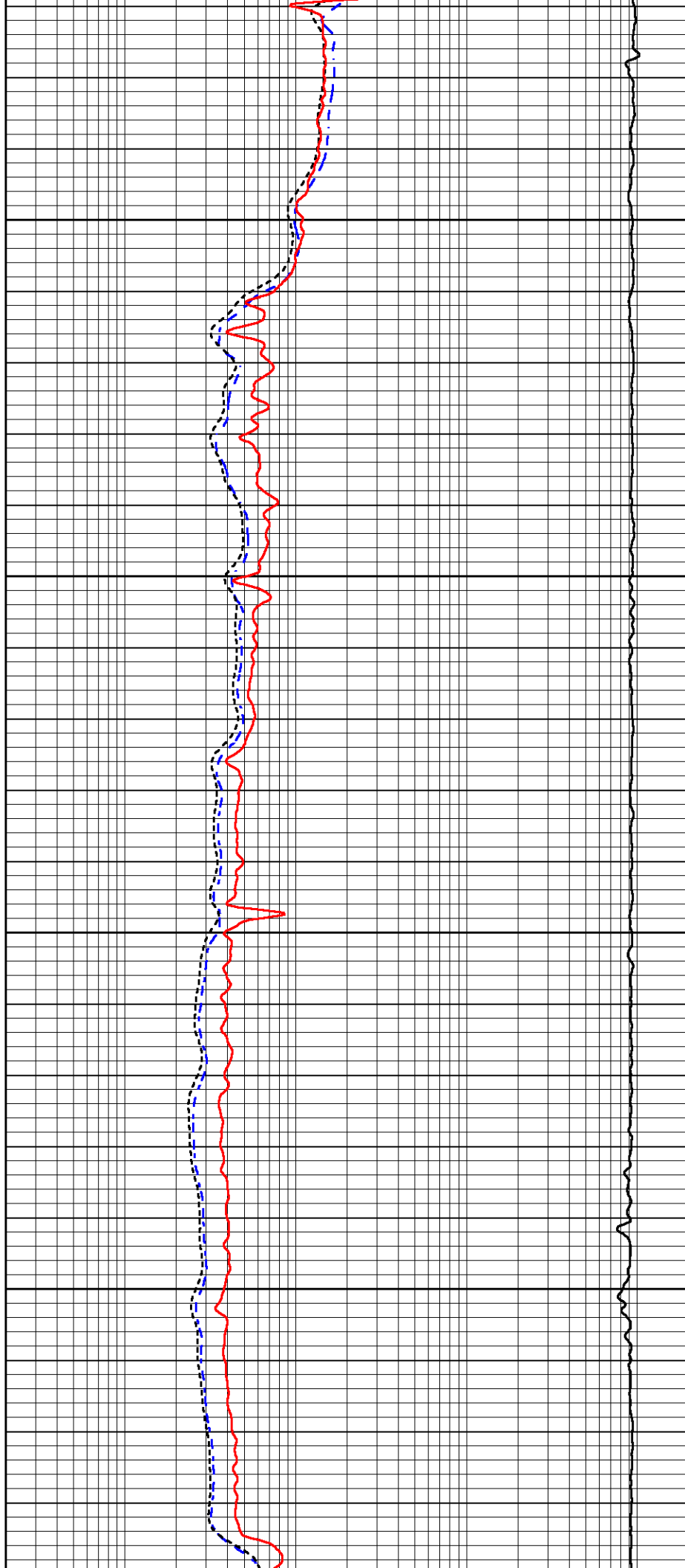


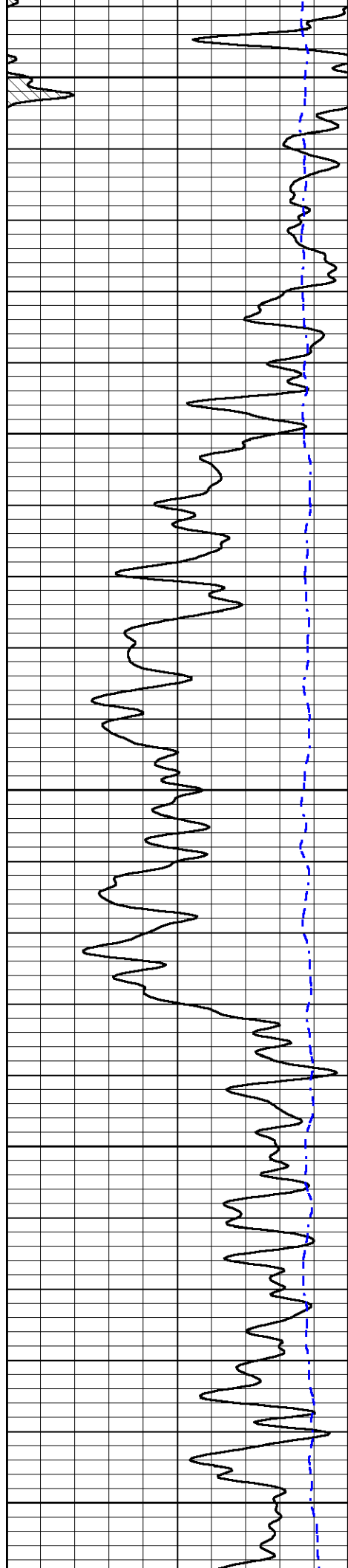
800

850

900

950





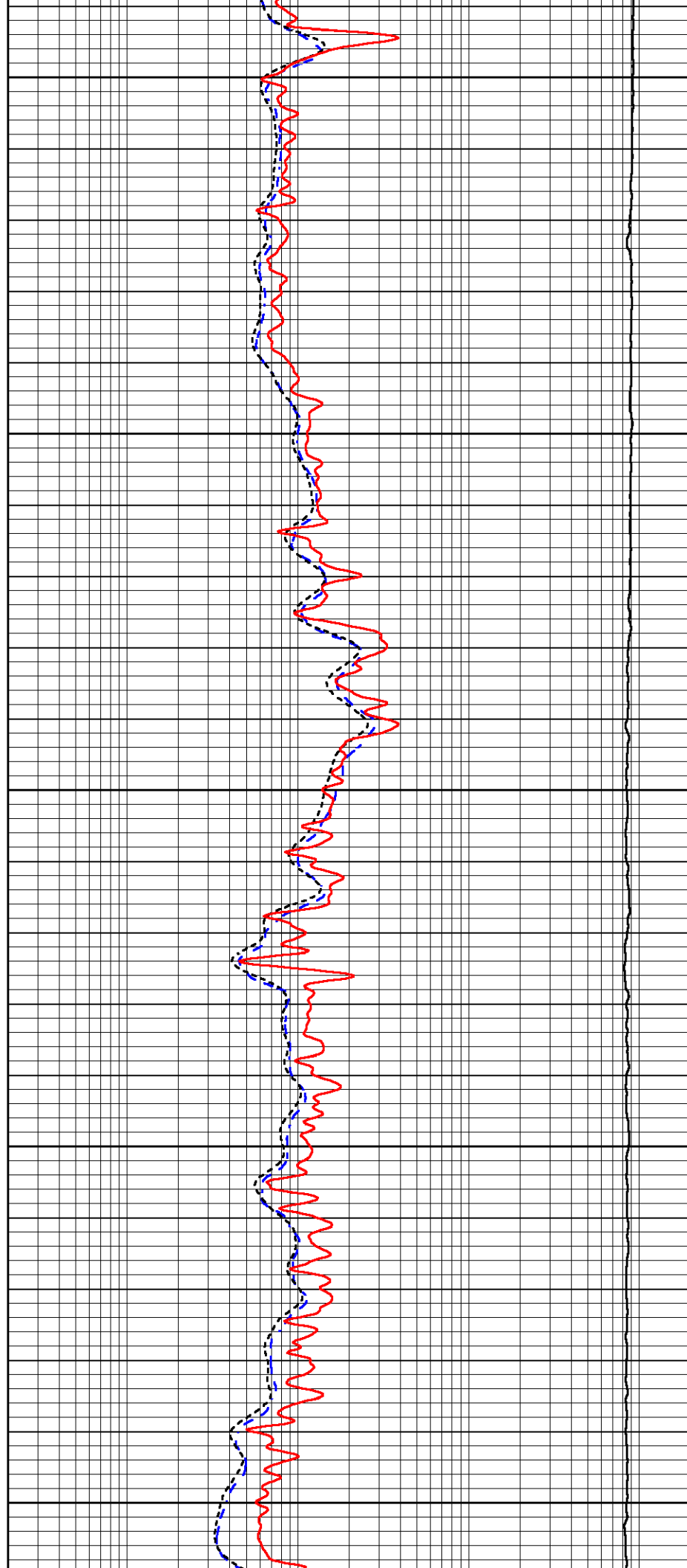
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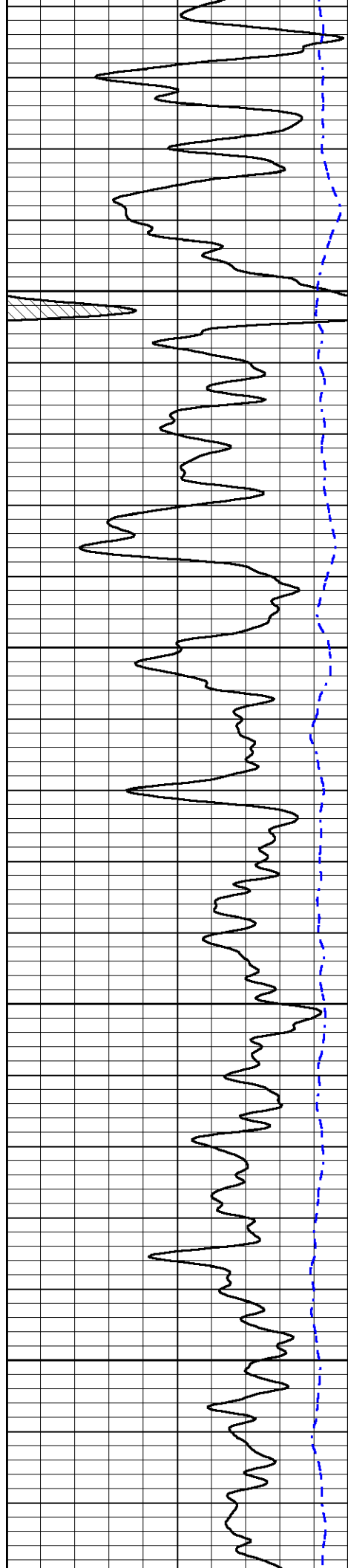
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1100

1150

1200



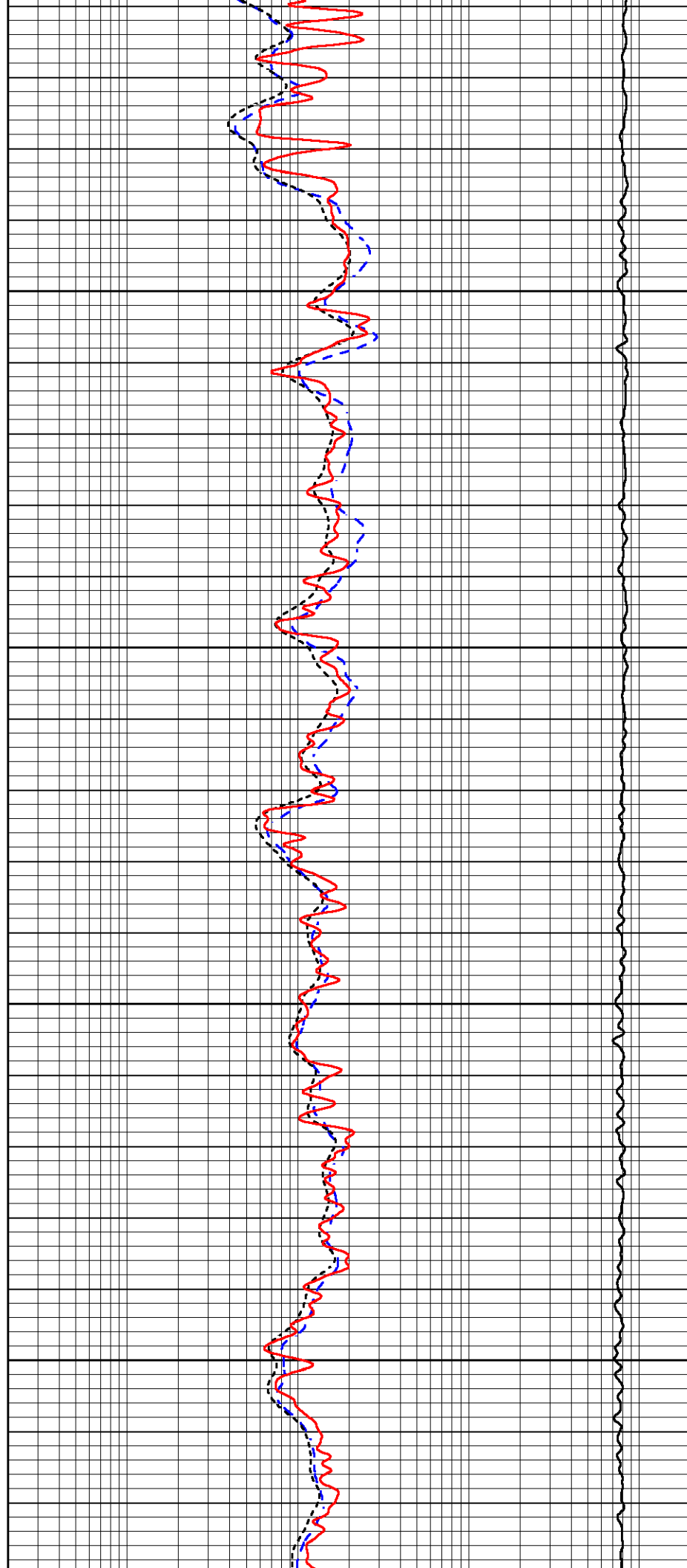


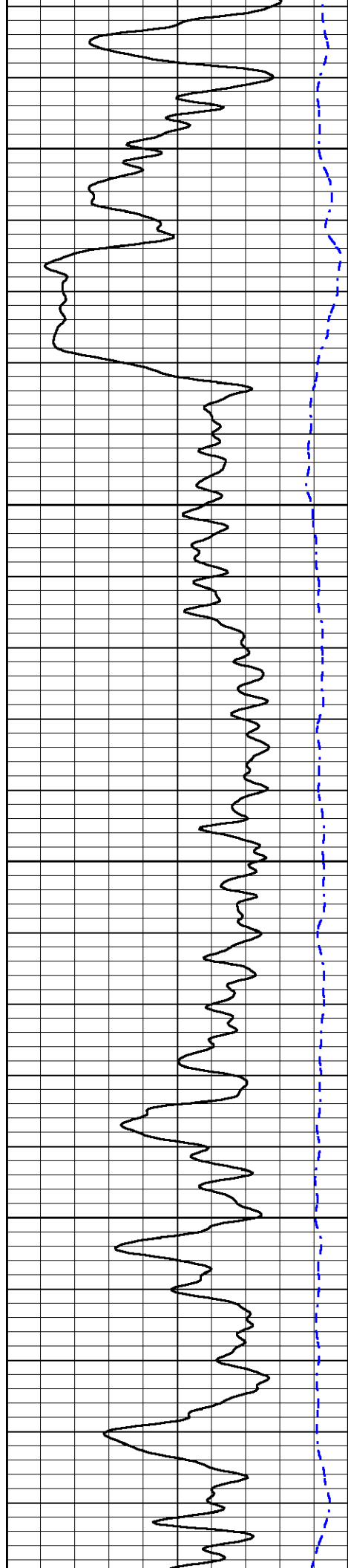
1250

1300

1350

1400





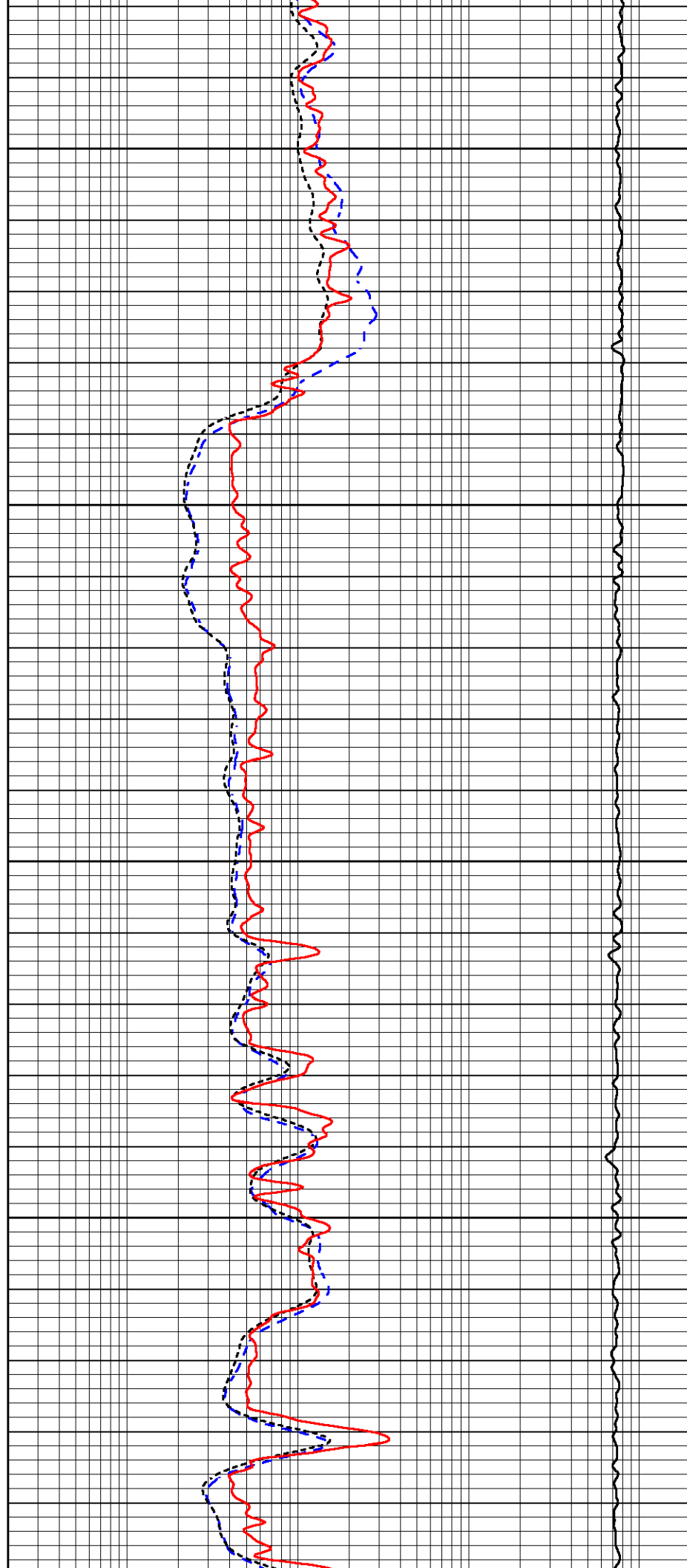
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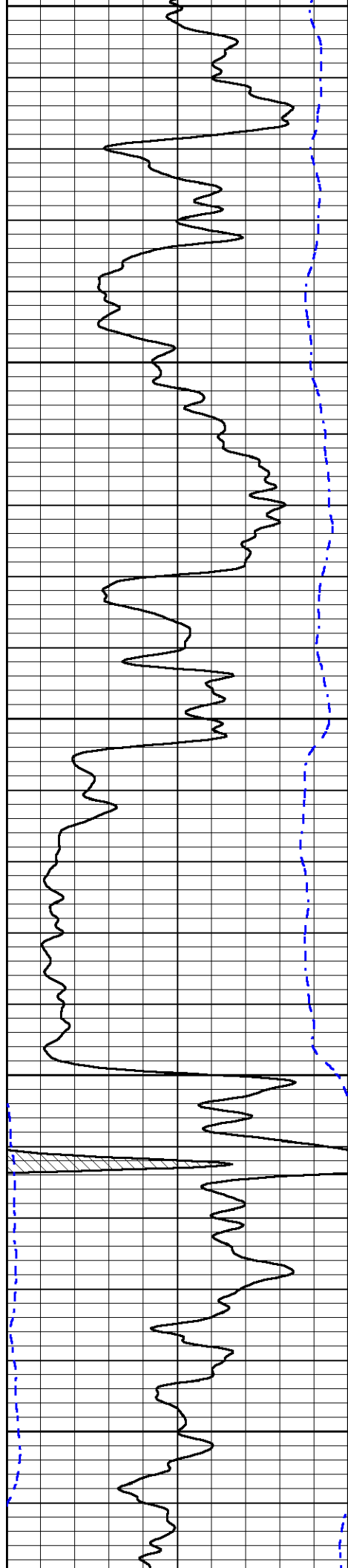
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1550

1600

1650





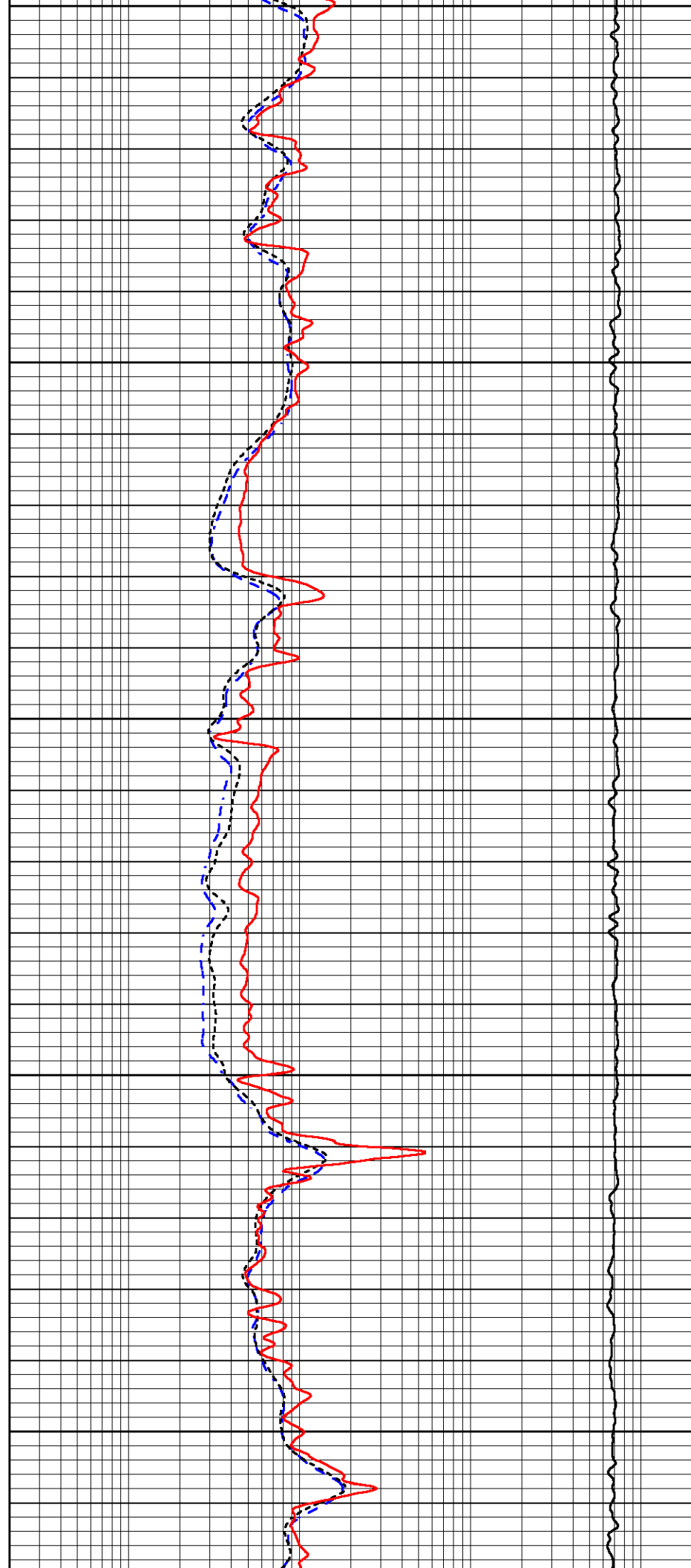
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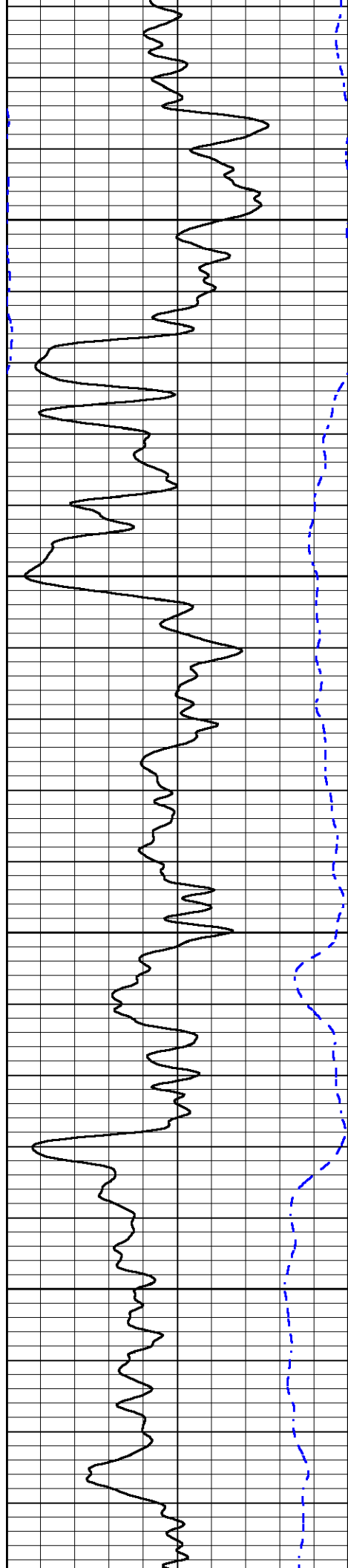
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1750

1800

1850



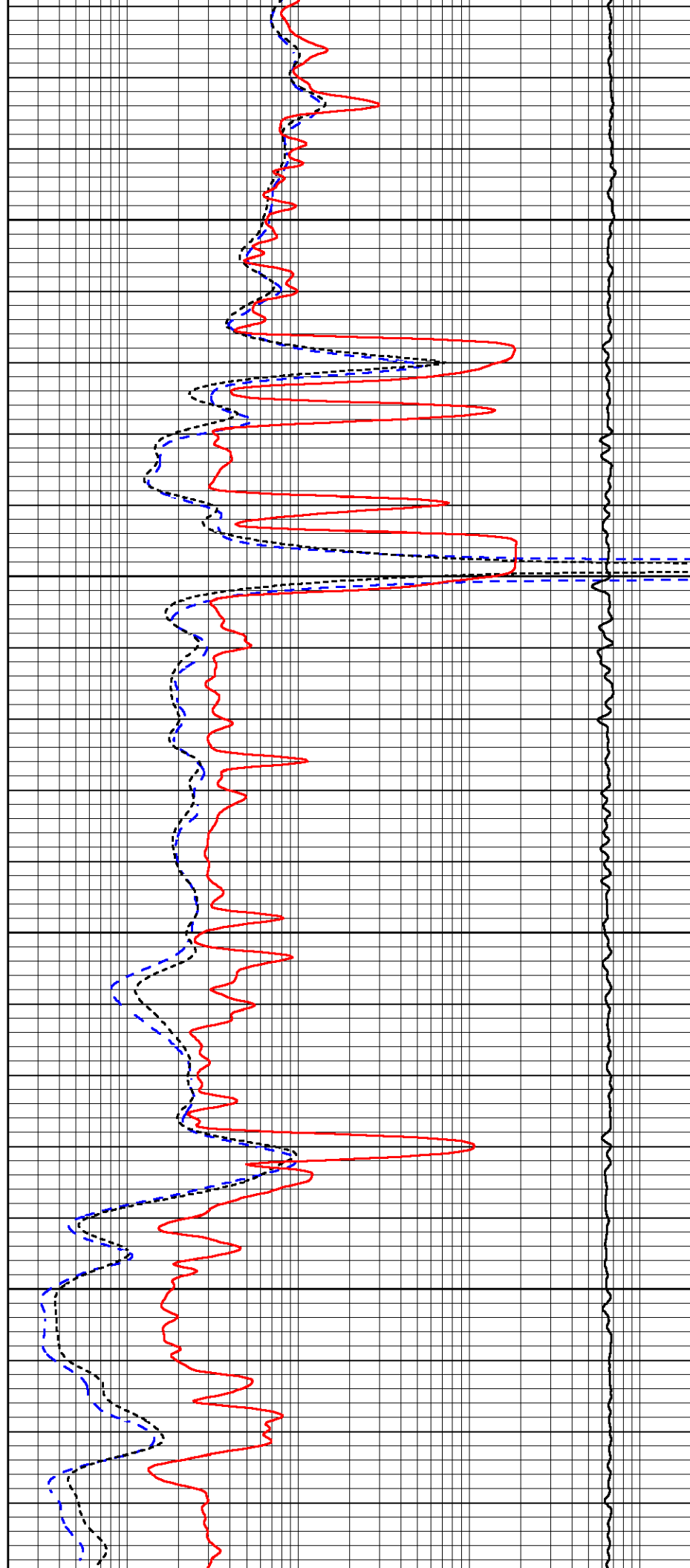


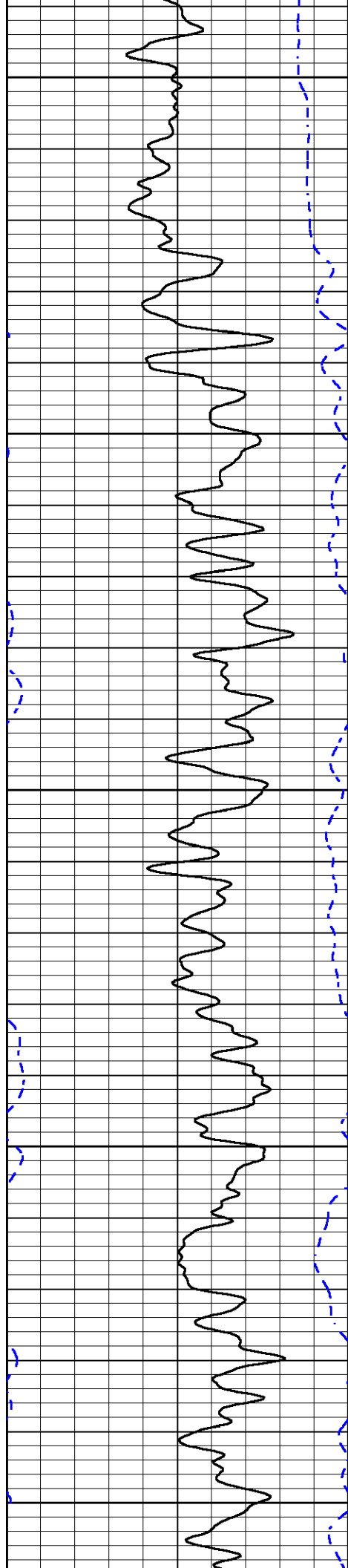
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1950

2000

2050





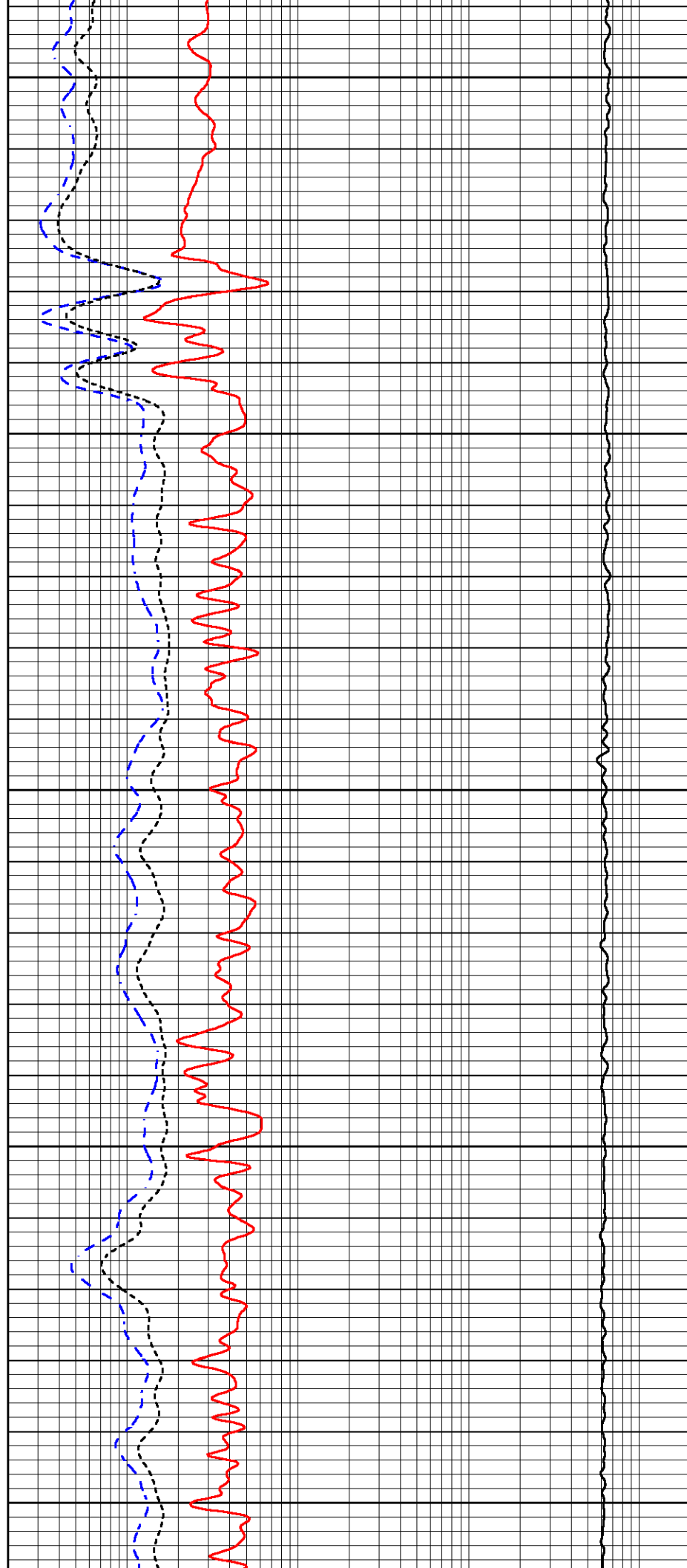
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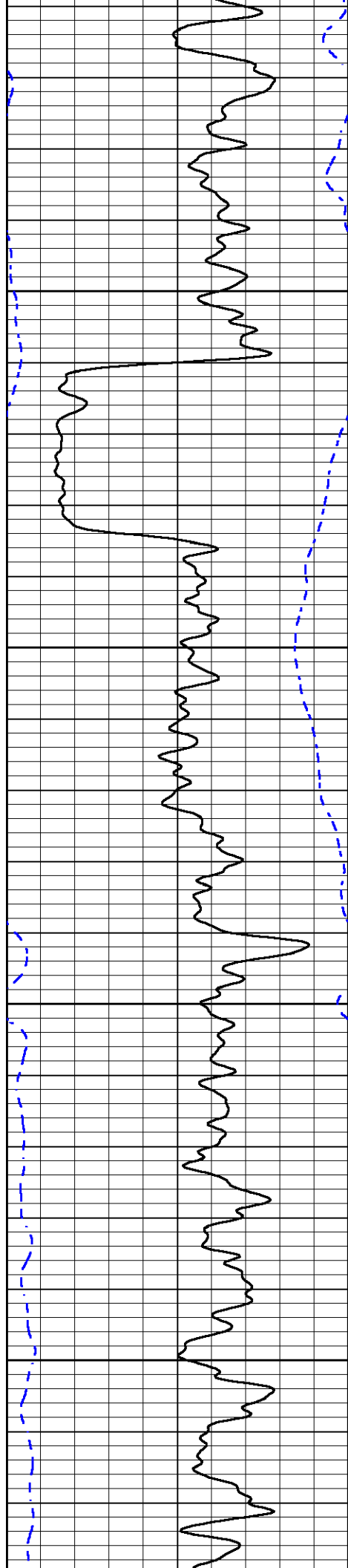
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2200

2250

2300



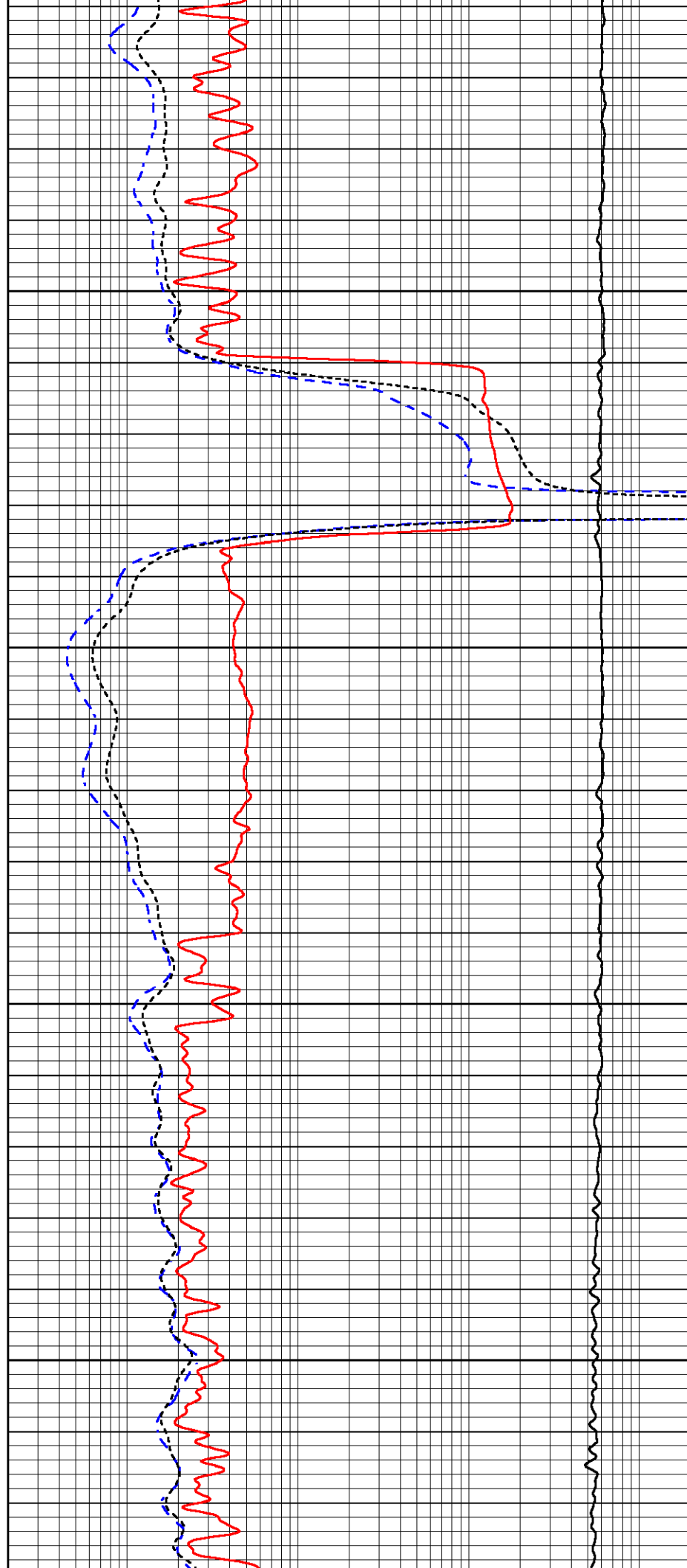


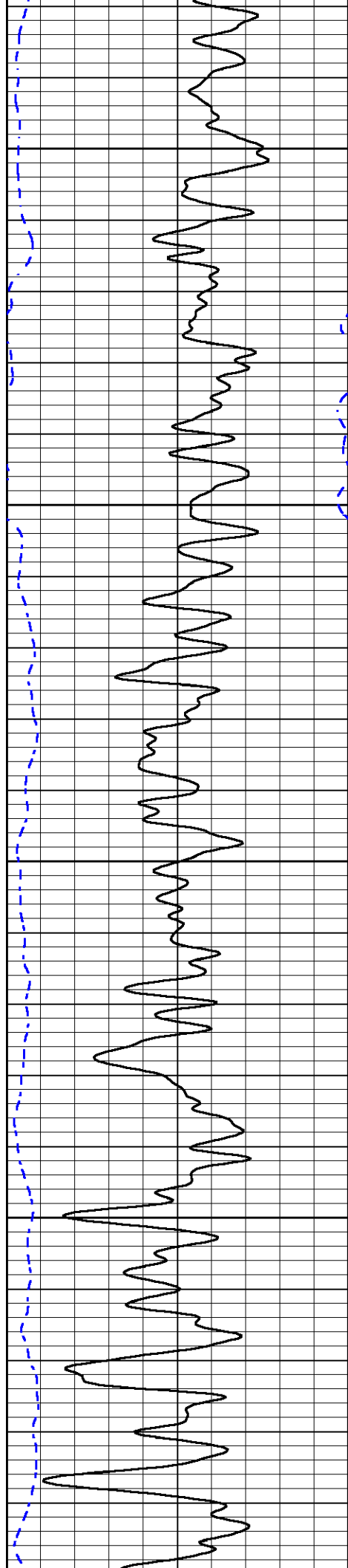
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2400

2450

2500





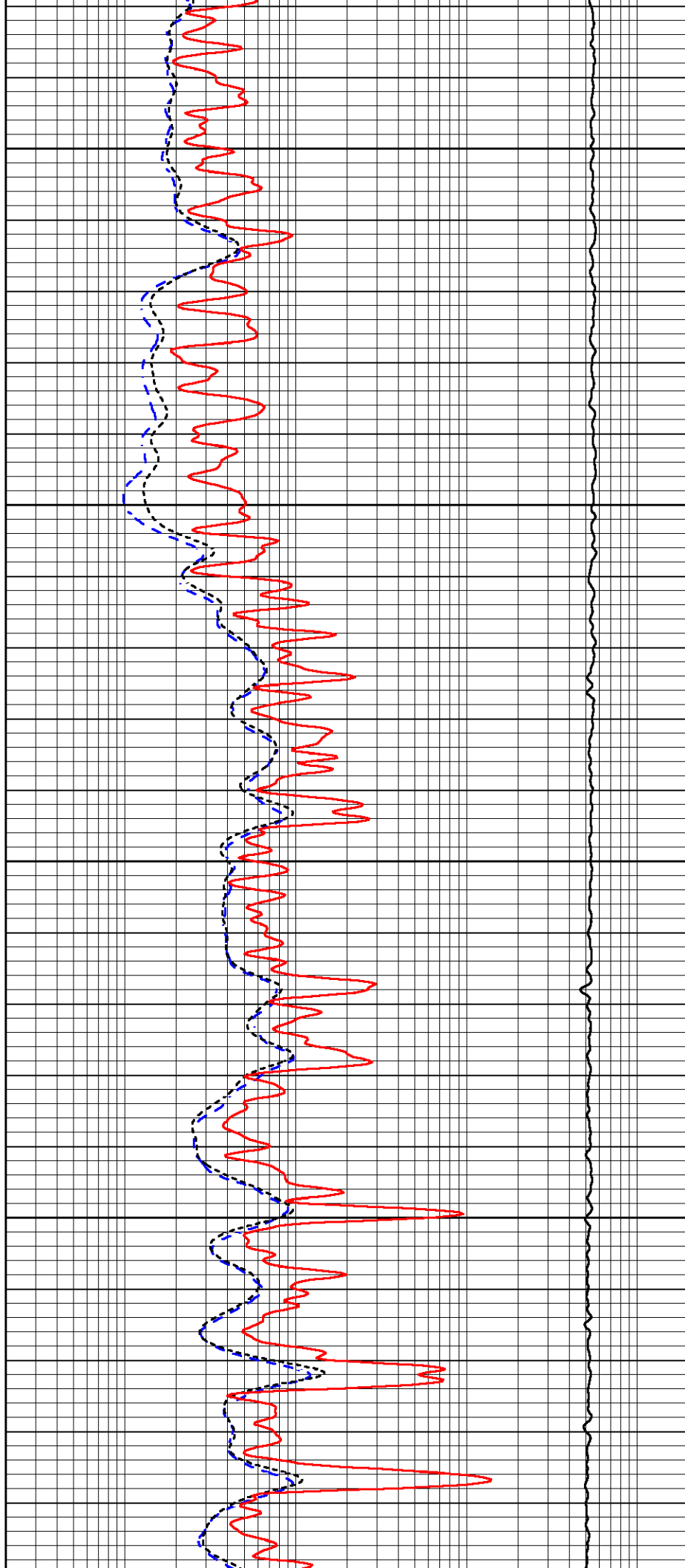
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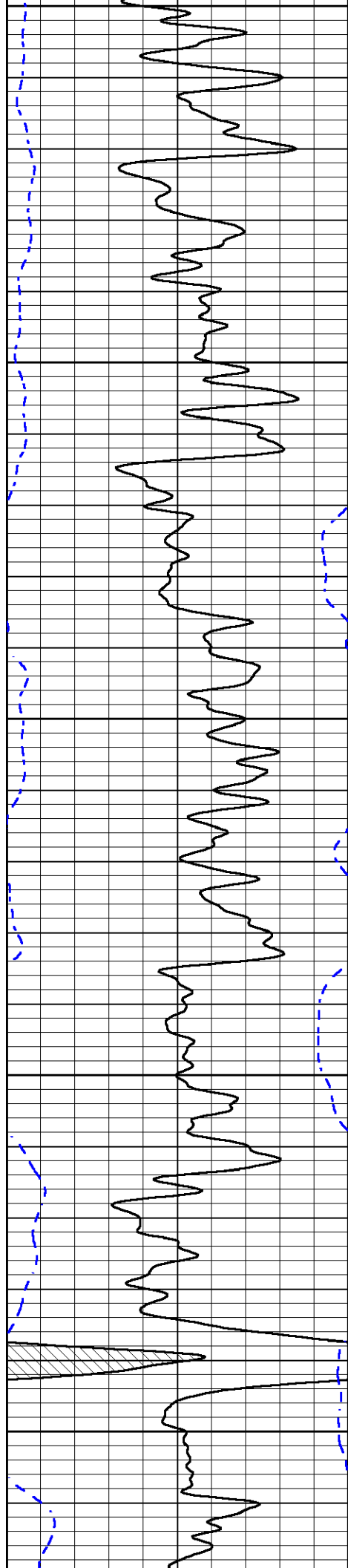
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2650

2700

2750





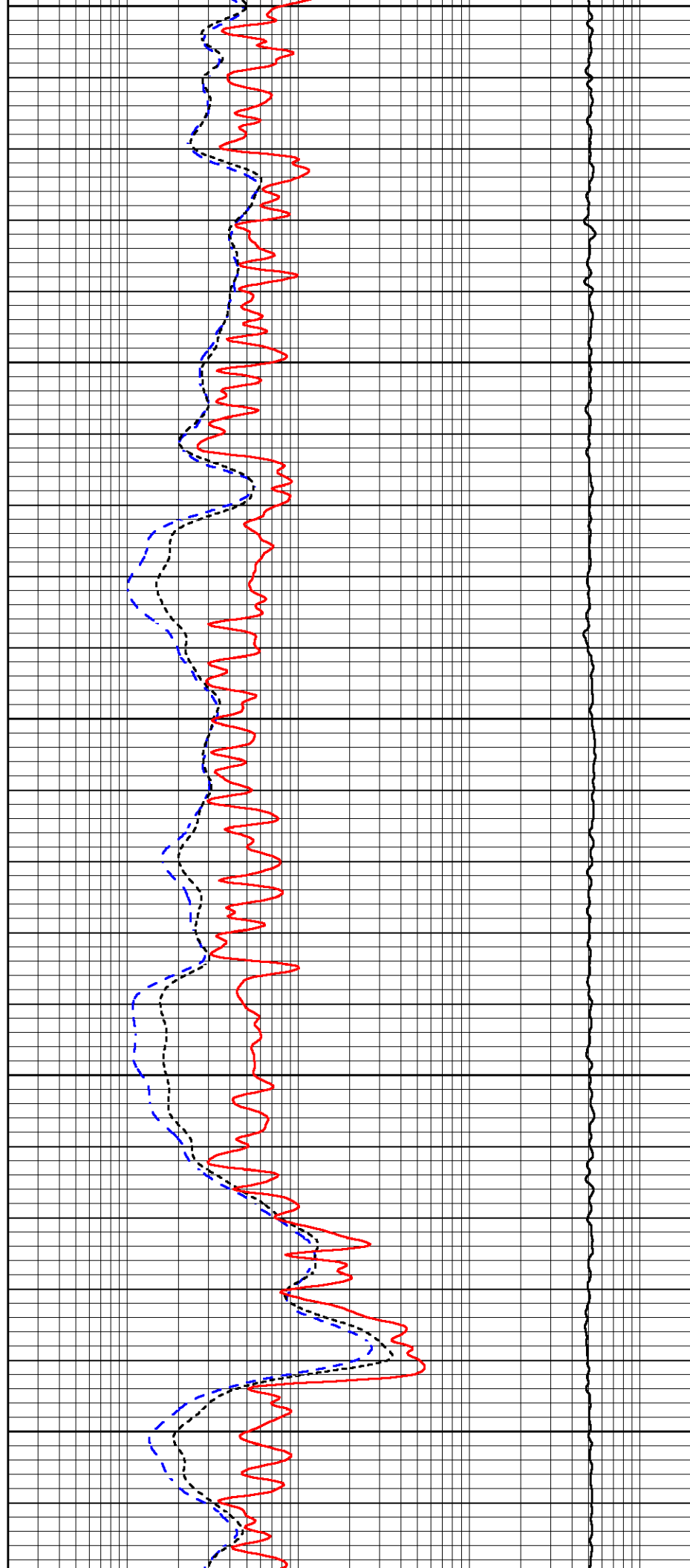
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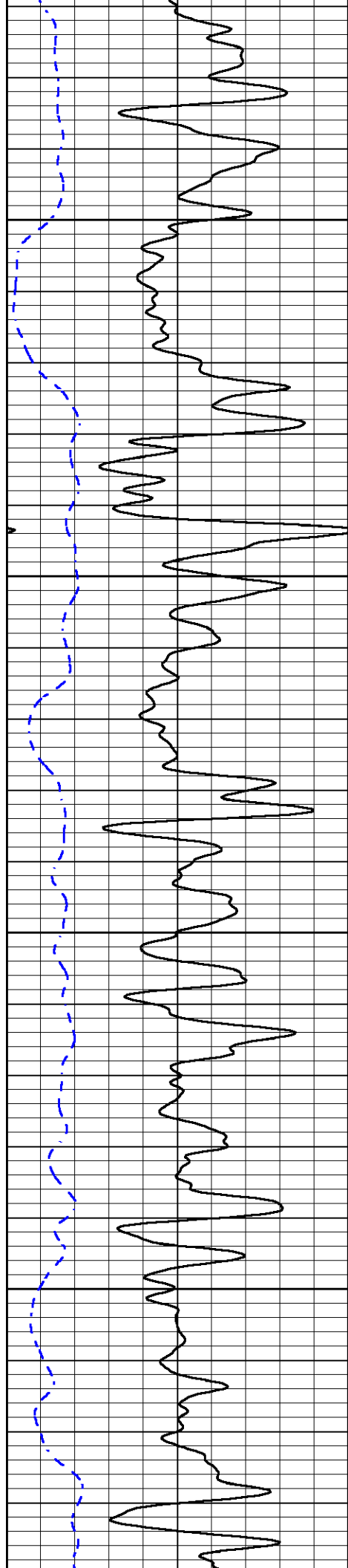
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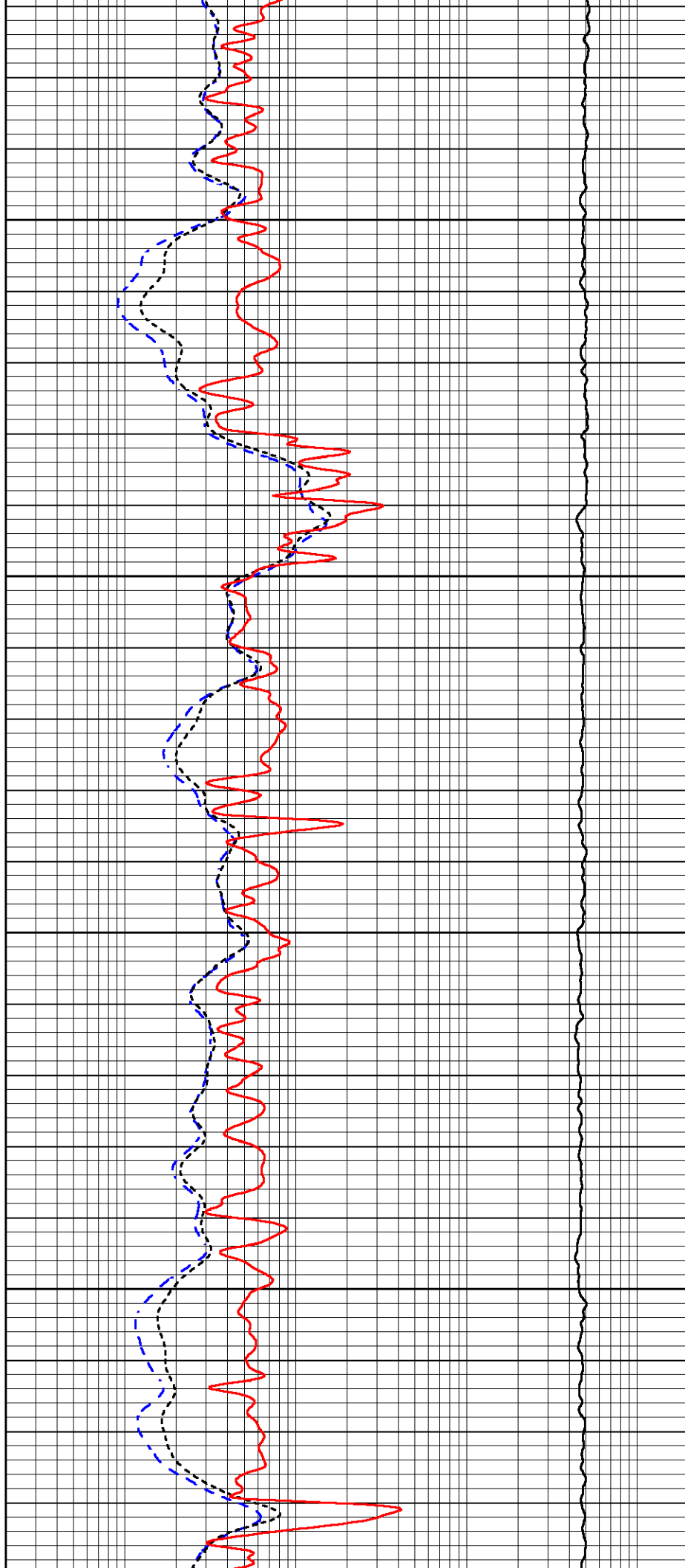


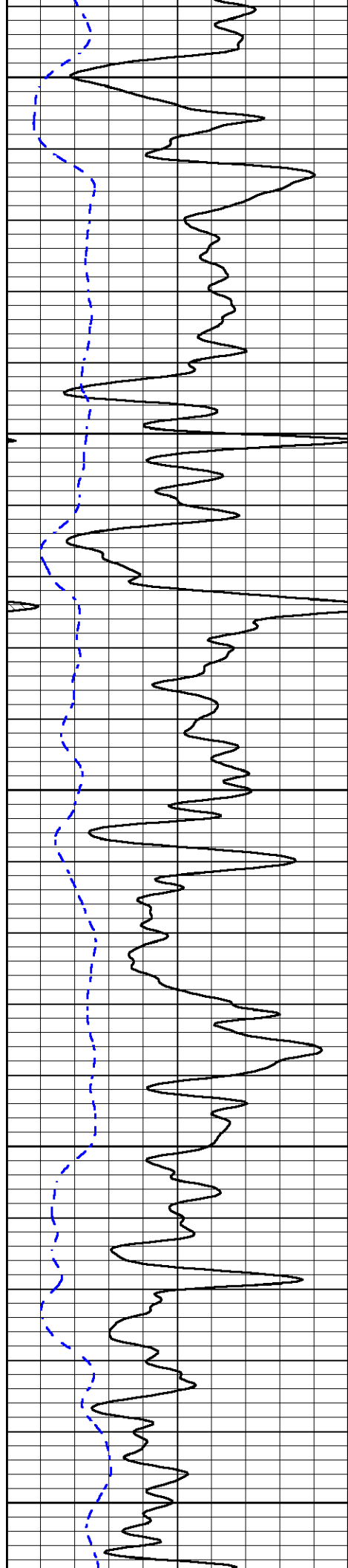
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3050

3100

3150





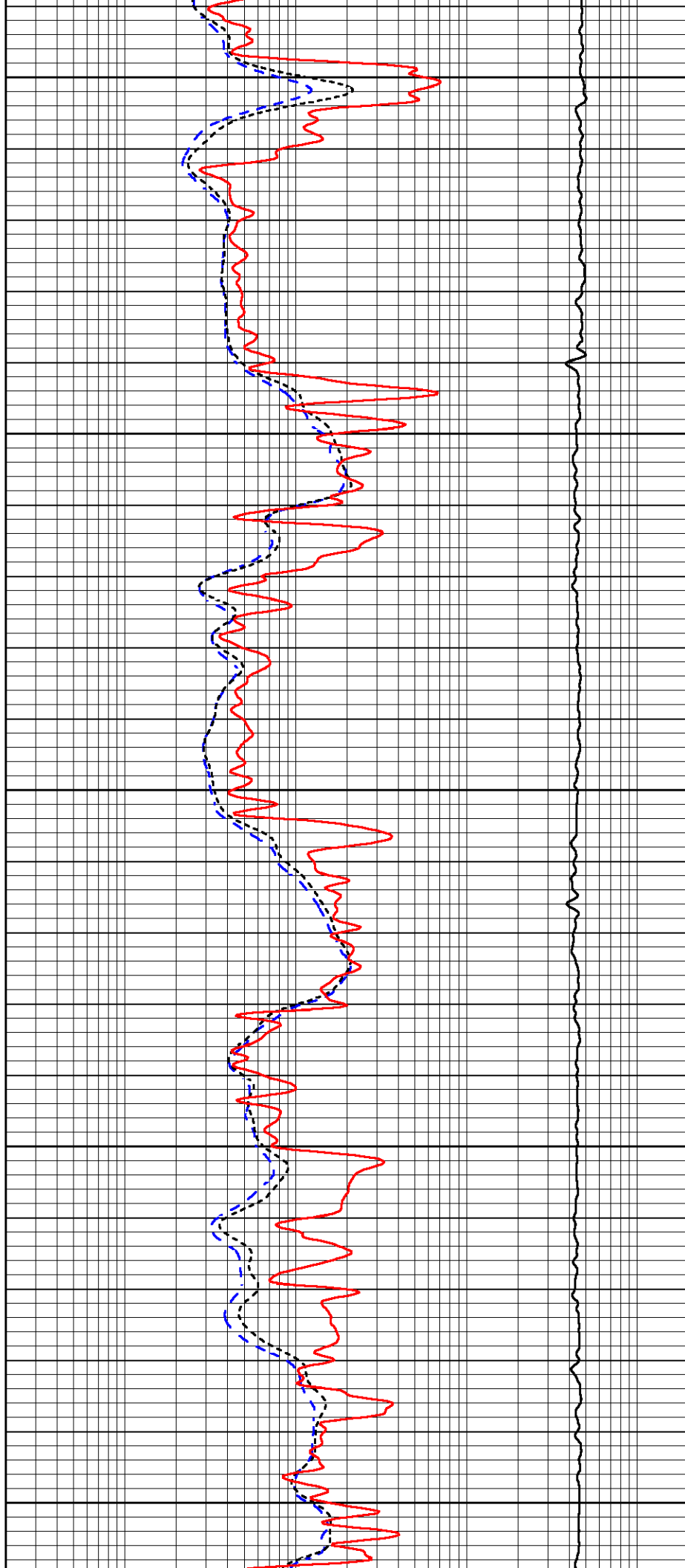
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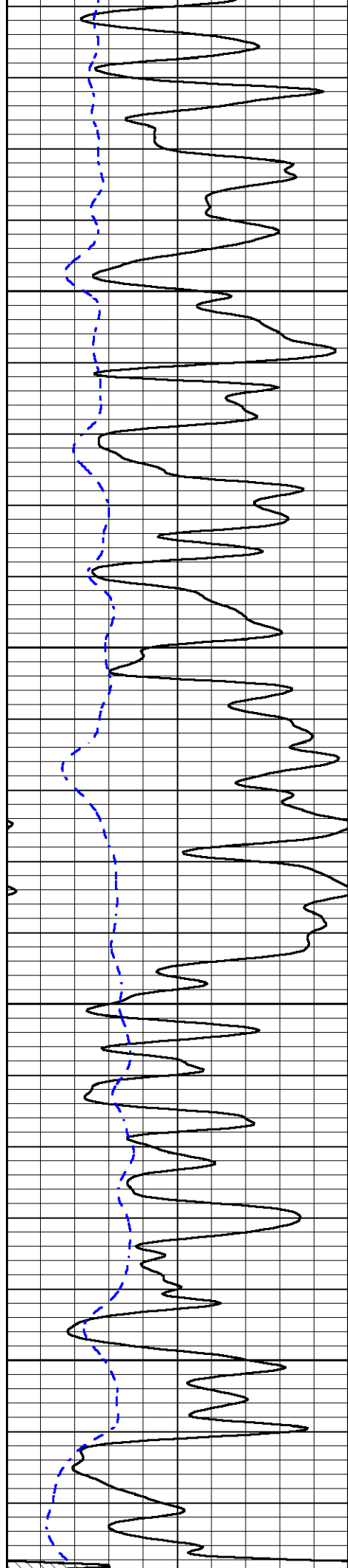
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3350

3400



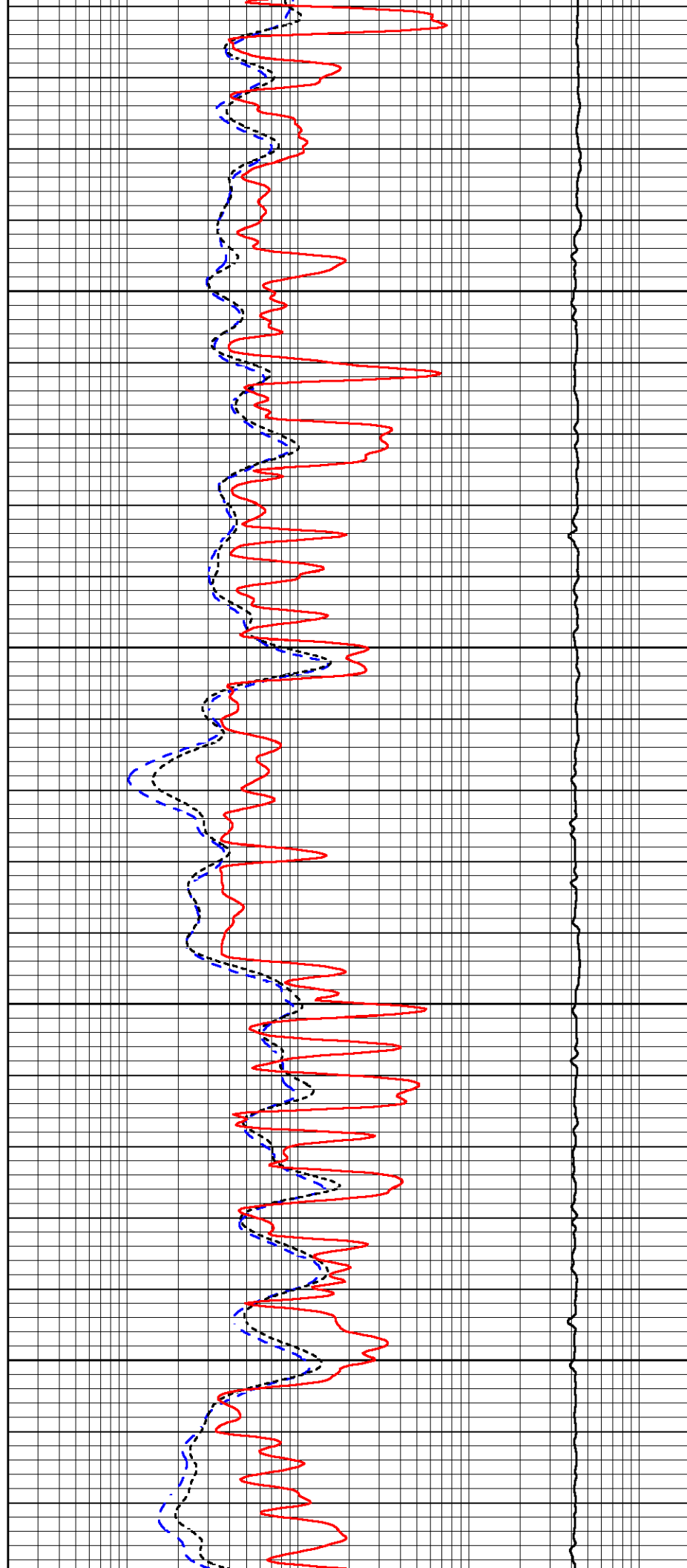


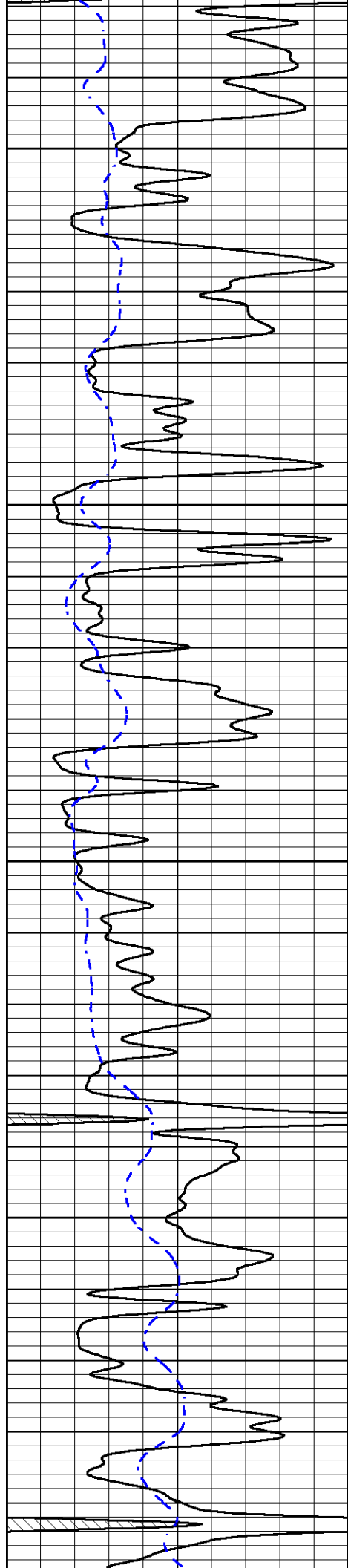
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3550

3600





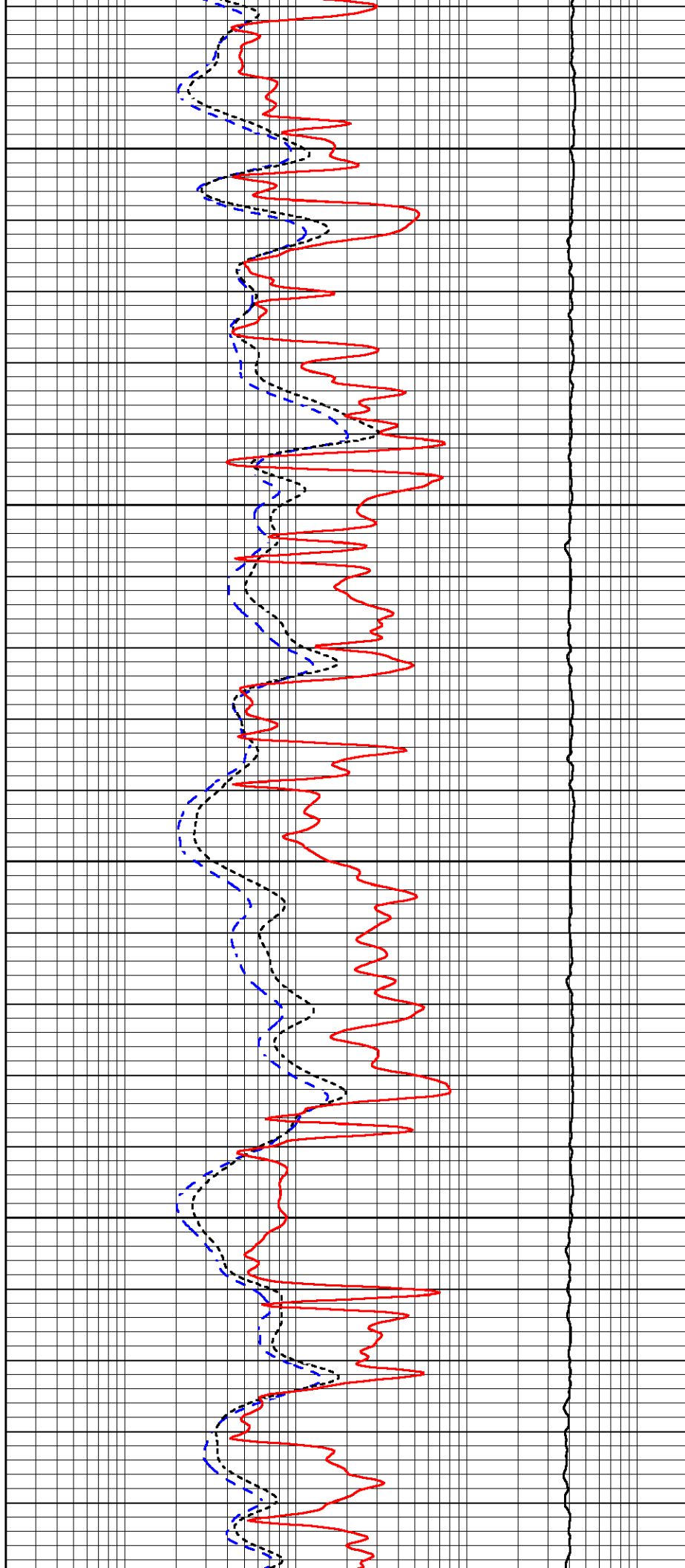
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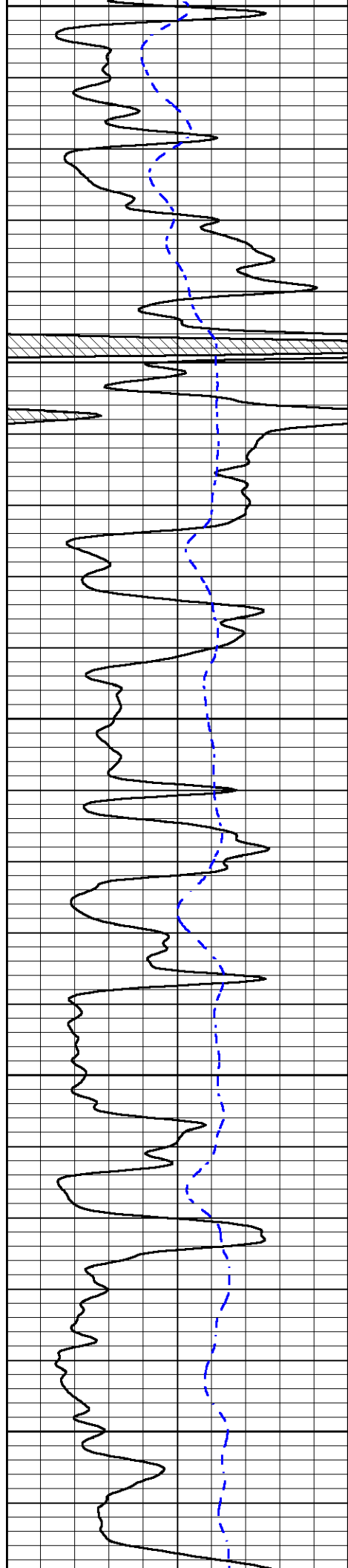
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3800

3850





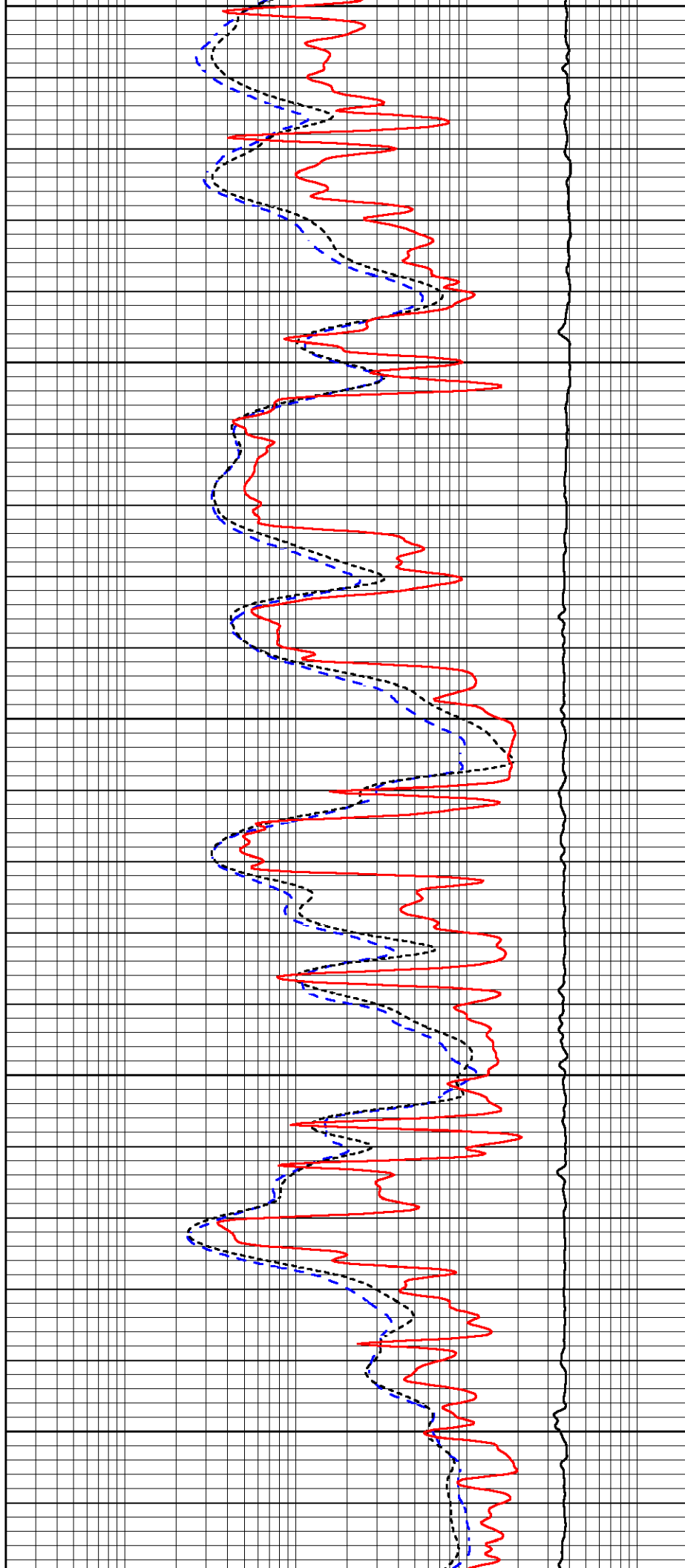
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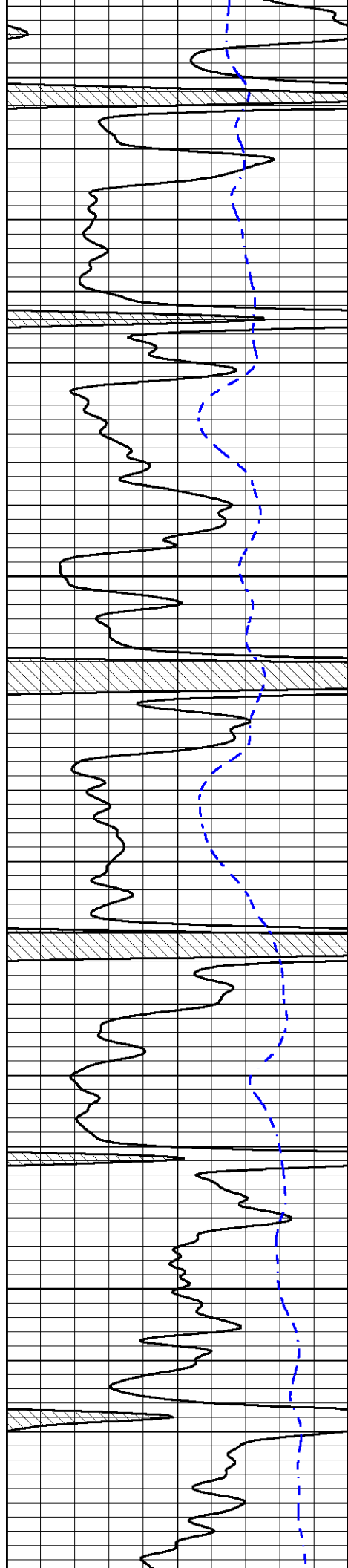
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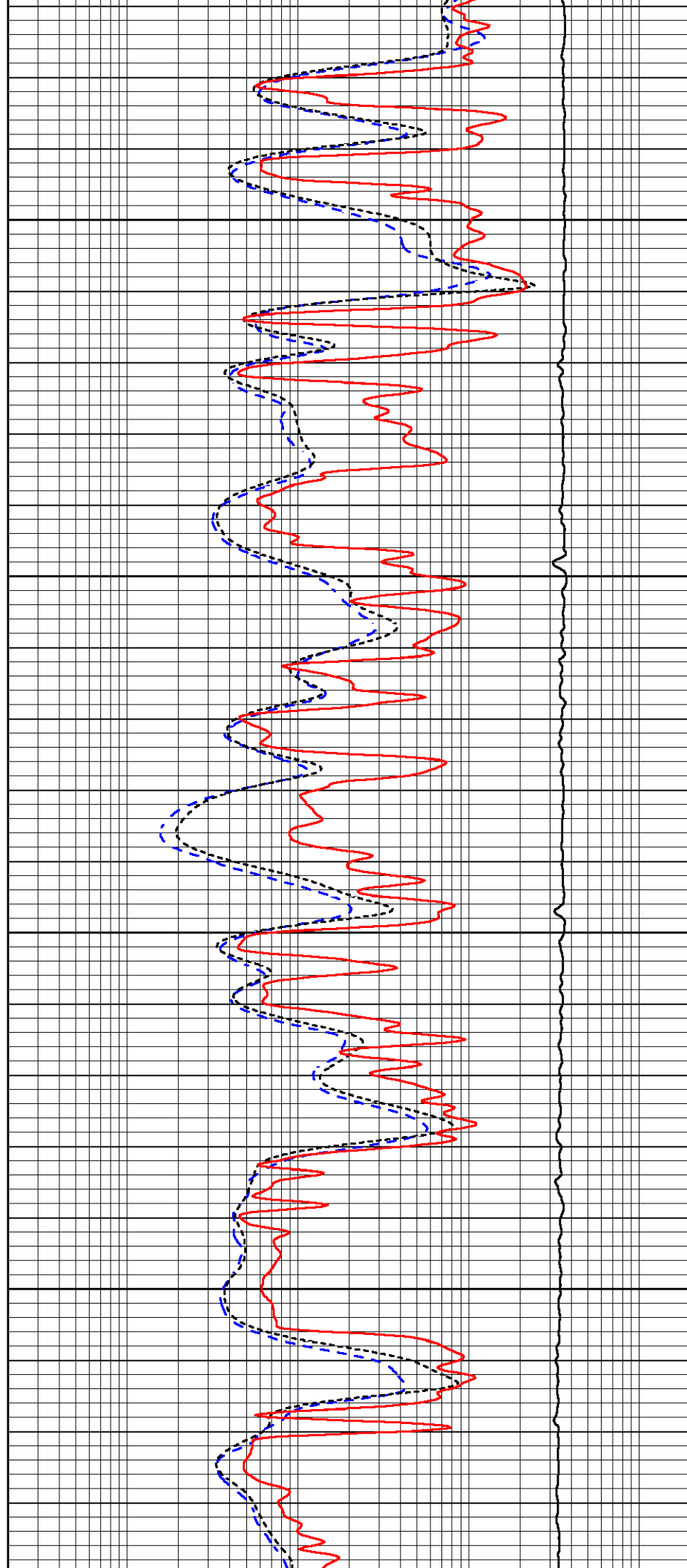


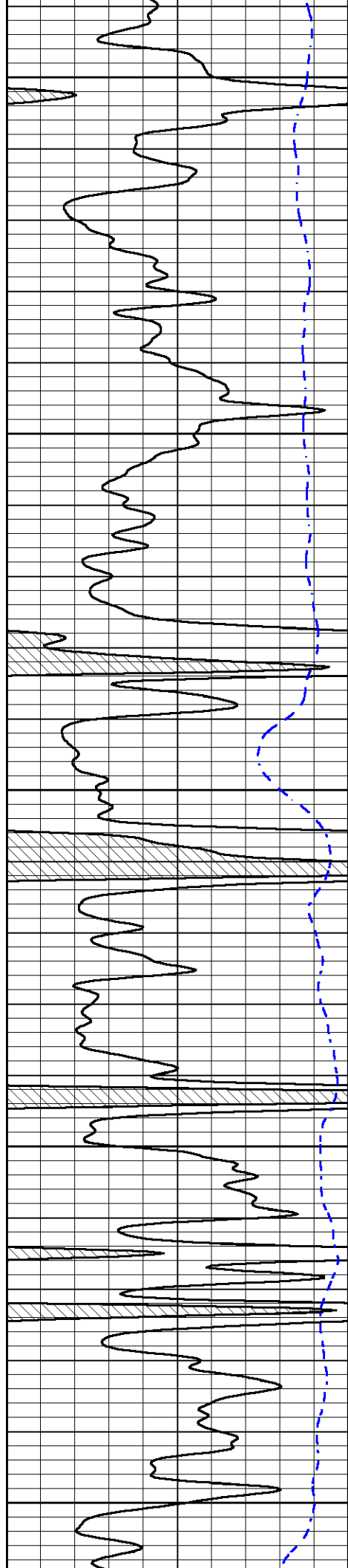
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4200

4250





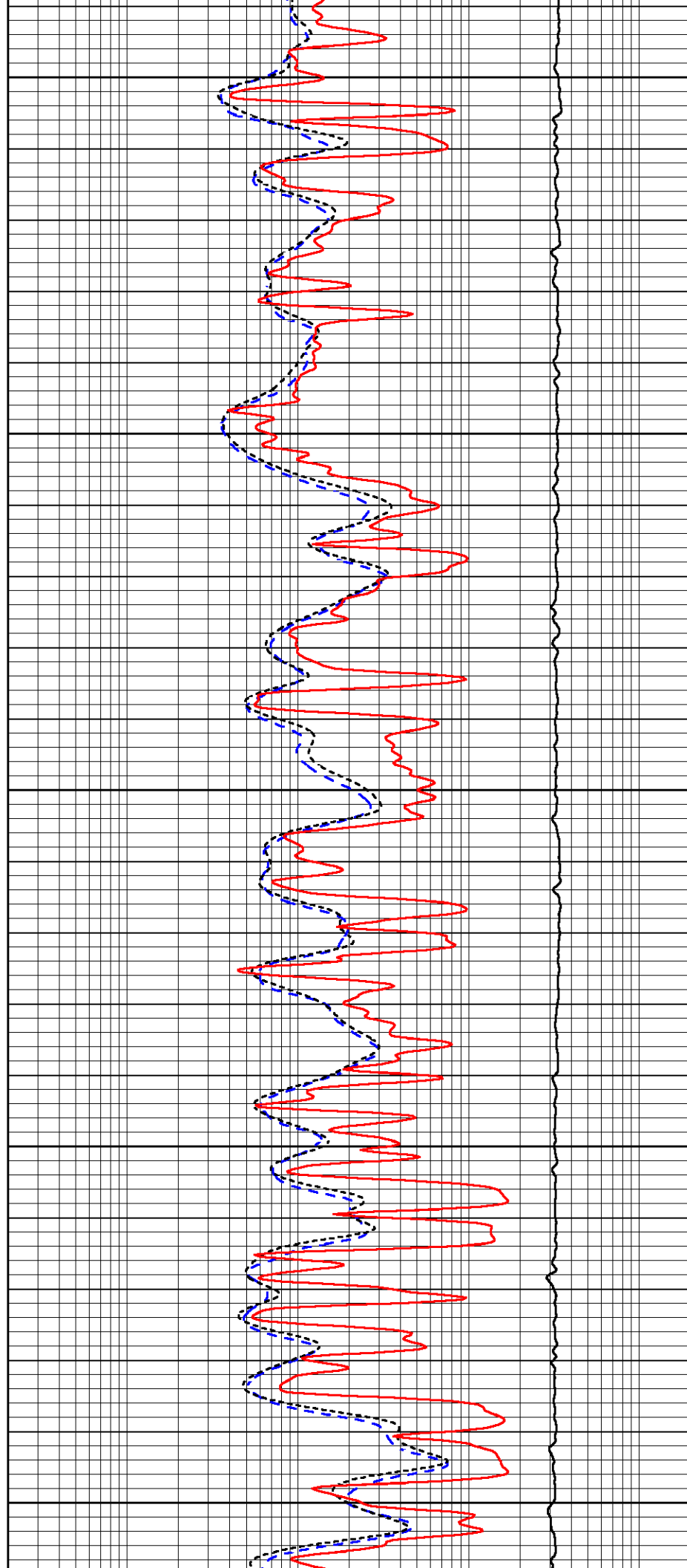
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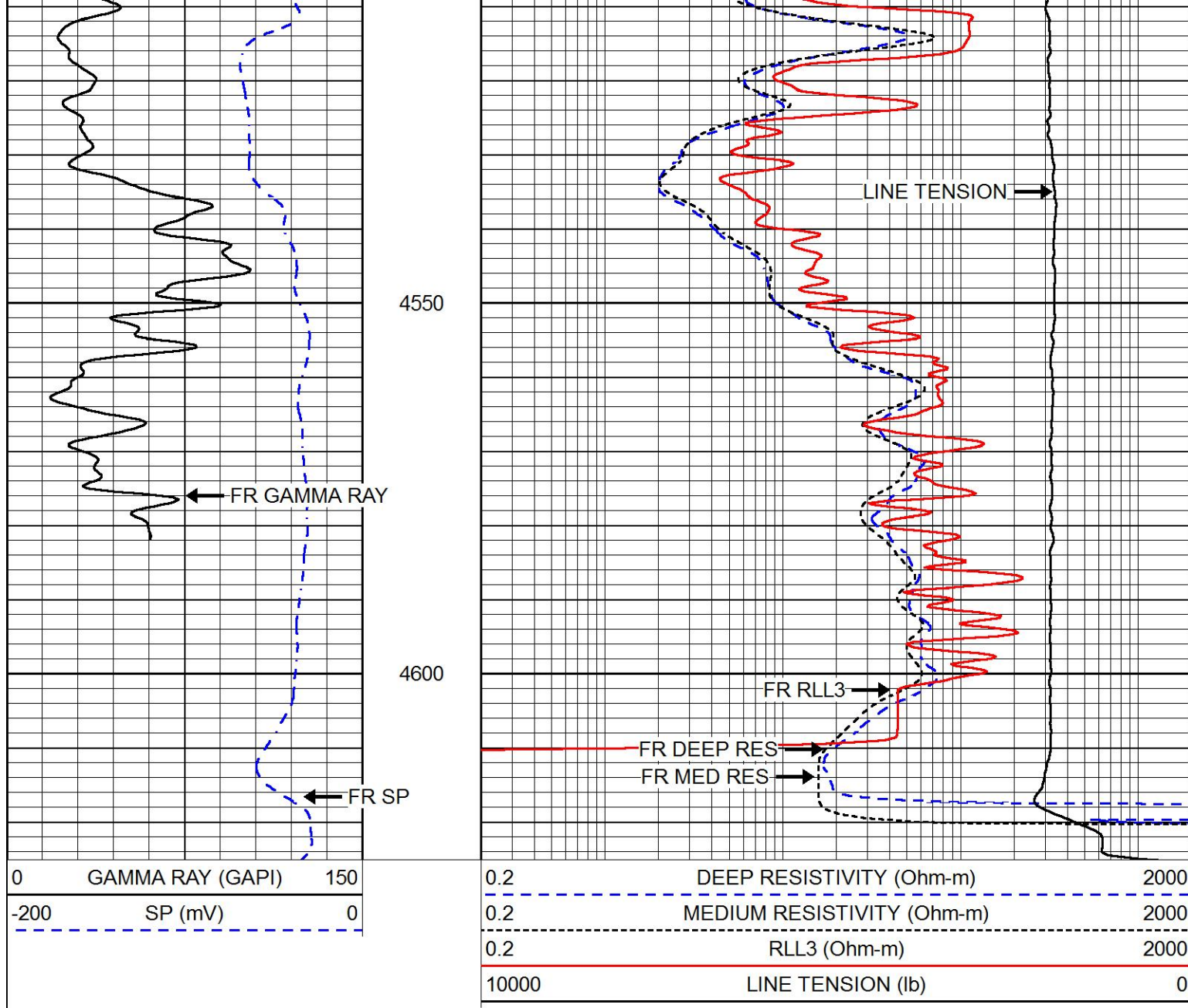
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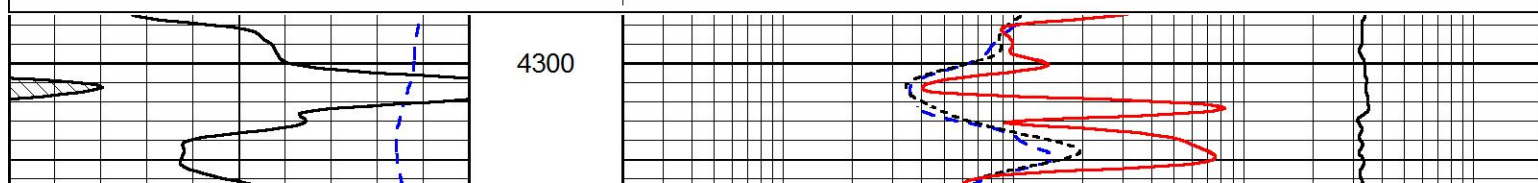
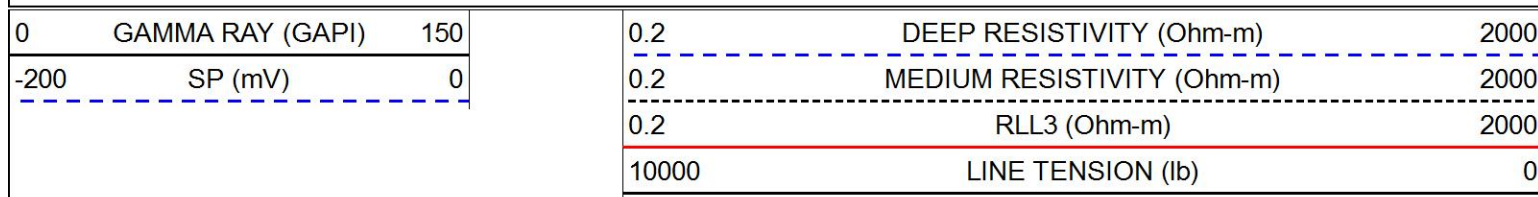
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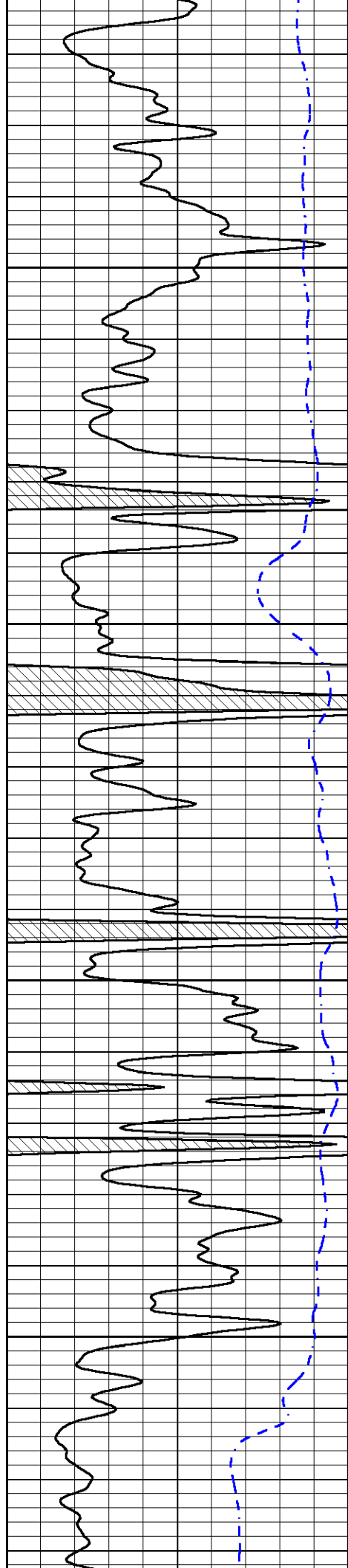




REPEAT SECTION

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Dataset Pathname	stackmel/pass2.1
Presentation Format	dil
Dataset Creation	Sat Jul 28 01:28:43 2018
Charted by	Depth in Feet scaled 1:240



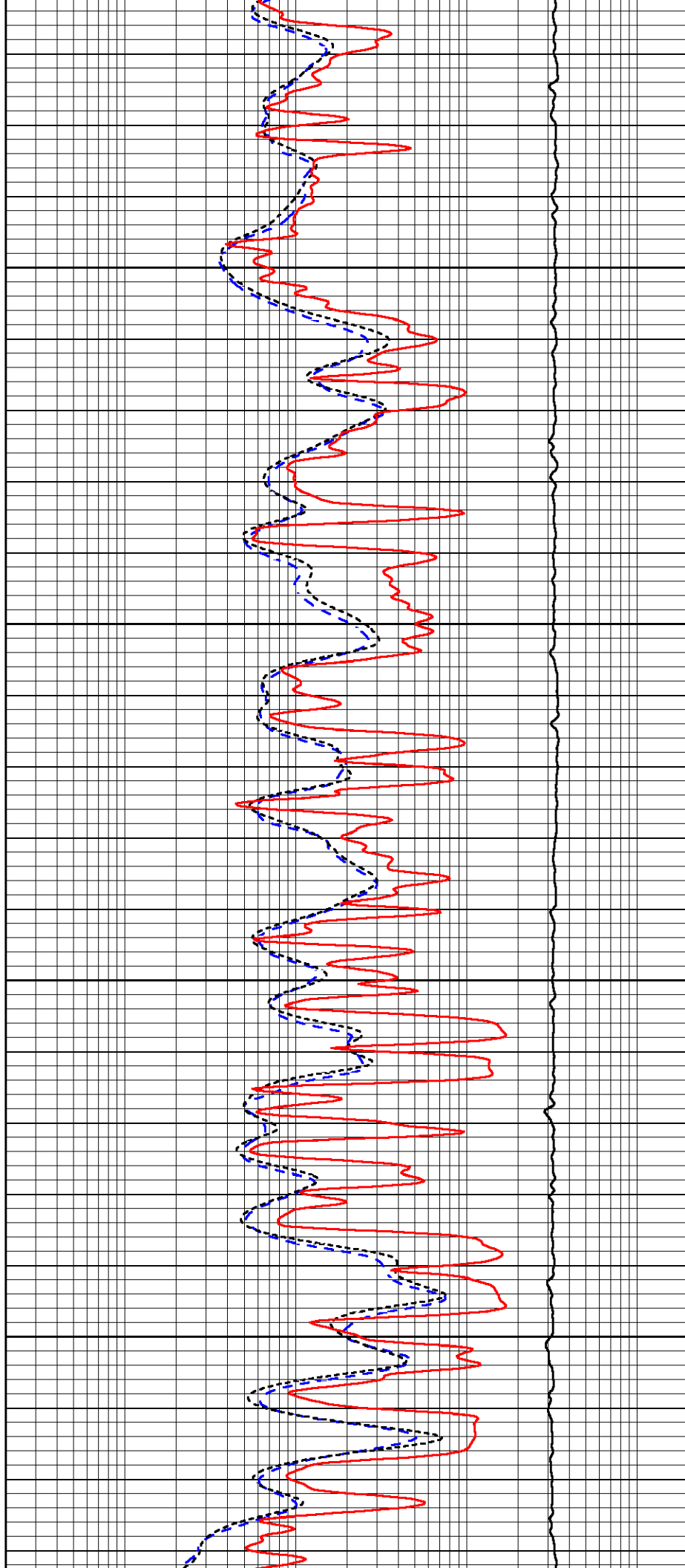


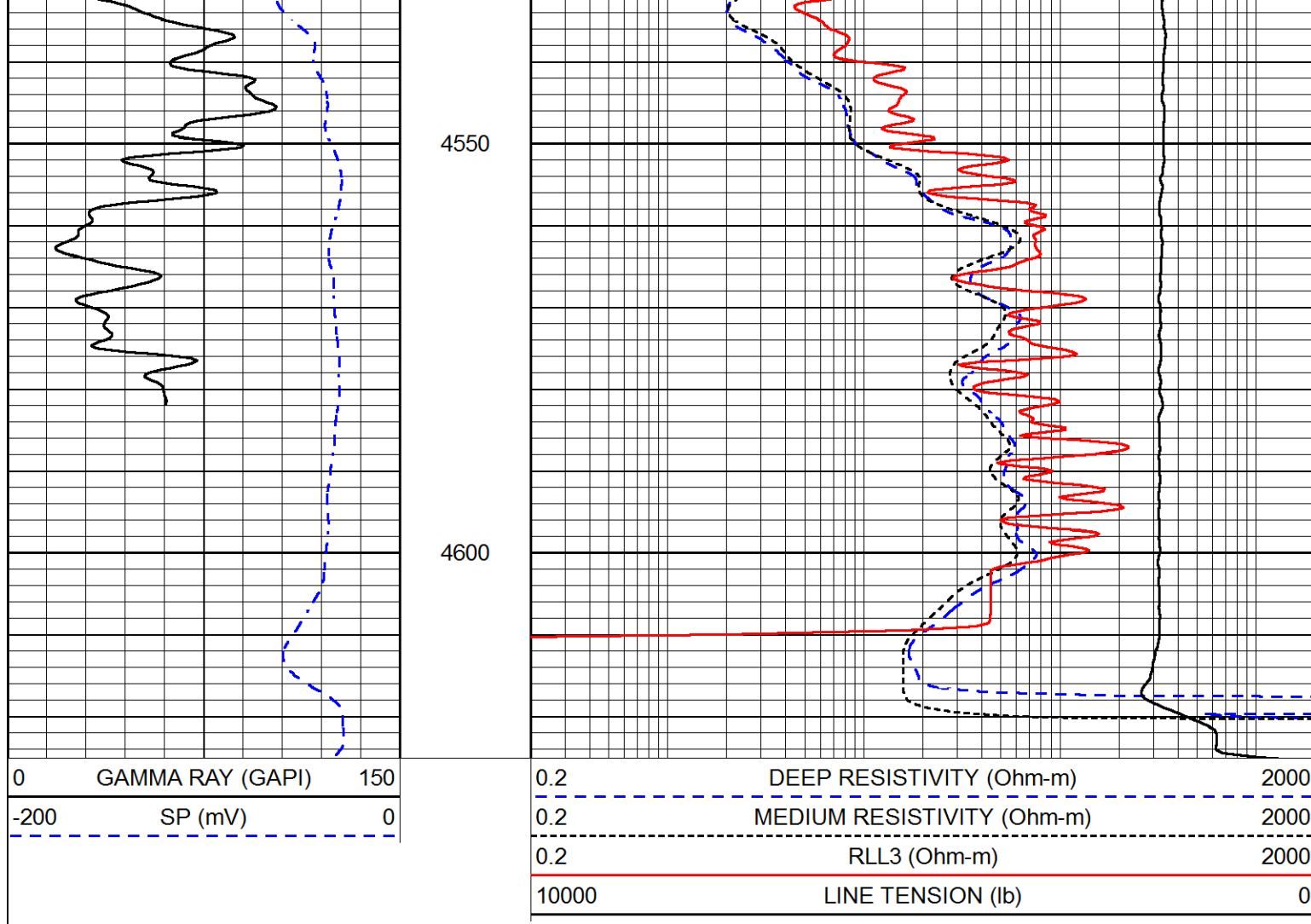
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4400

4450

4500





Calibration Report							
Database File	murfin_abell_ranch_b_4_31.db						
Dataset Pathname	stackmel/pass4.1						
Dataset Creation	Sat Jul 28 02:24:51 2018						
Dual Induction Calibration Report							
Serial-Model:				933 (HT)-PSI HIGH TEMP			
Calibration Performed:				Sun Jul 15 05:36:29 2018			
Readings		References			Results		
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.700	-17.000
Medium	142.000	1349.000	0.000	255.000	mmho/m	0.565	-60.500
Microlog Calibration Report							
Serial-Model:				PSI-01-PSIML			
Performed:				Sun Jul 15 07:40:28 2018			
Readings		References			Results		
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	24000.0000	-0.8000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	30000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	70.0000	-65.8100

Compensated Density Calibration Report

Serial-Model:	817-947-M&W
Source / Verifier:	16955B / 2ci
Master Calibration Performed:	Sun Jul 15 05:36:52 2018

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	6127.15	5922.31	cps
Aluminum	2.670	g/cc	1141.85	3762.09	cps
Spine Angle = 74.89			Density/Spine Ratio = 0.526		
	Size		Reading		
Small Ring	4.50	in	1.02		
Large Ring	15.00	in	1.15		

Compensated Neutron Calibration Report

Serial Number:	207-MW
Tool Model:	M&W
Calibration Performed:	SUN JUL 15 10:30:30 2018

Detector	Readings	Target	Normalization
Short Space	6240.00 cps	1000.00 cps	1.6025
Long Space	460.00 cps	1000.00 cps	1.9500

Gamma Ray Calibration Report

Serial Number:	89	
Tool Model:	M&W	
Calibration Performed:	Sun Jul 15 05:37:08 2018	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.6000	GAPI/cps



Company	MURFIN DRILLING CO, INC.
Well	ABELL RANCH "B" #4-31
Field	GAELAND WEST
County	GOVE
State	KANSAS