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DUAL INDUCTION LOG

Company MURFIN DRILLING COMPANY, INC.
Well HAMIT UNIT #2-20
Field WILDCAT
County ROOKS State KANSAS
Location: API #: 15-163-24349-00-00
330' FSL & 1330' FWL
SEC 20 TWP 6S RGE 19W

Other Services
CNL/CDL
MEL/BHCS

Elevation
K.B. 2130'
D.F. N/A
G.L. 2125'

Permanent Datum GROUND LEVEL Elevation 2125'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Company MURFIN DRILLING COMPANY, INC.
Well HAMIT UNIT #2-20
Field WILDCAT
County ROOKS
State KANSAS

Date	11/14/2017			
Run Number	ONE			
Depth Driller	3686'			
Depth Logger	3687'			
Bottom Logged Interval	3686'			
Top Log Interval	0'			
Casing Driller	8.625" @ 218'			
Casing Logger	215'			
Bit Size	7.875"			
Type Fluid in Hole	CHEMICAL			
Salinity,ppm CL	1000			
Density / Viscosity	9.0	51		
pH / Fluid Loss	10.5	6.0		
Source of Sample	FLOWLINE			
Rm @ Meas. Temp	0.90 @ 55			
Rmf @ Meas. Temp	0.68 @ 55			
Rmc @ Meas. Temp	1.22 @ 55			
Source of Rmf / Rmc	CHARTS			
Rm @ BHT	0.44 @ 113			
Operating Rig Time	4 HOURS			
Max Rec. Temp. F	113			
Equipment Number	91			
Location	HAYS			
Recorded By	D. SCHMIDT			
Witnessed By	ROBERT HENDRIX			

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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.

STOCKTON,
NORTH TO E RD, 9 1/2 WEST,
NORTH INTO

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

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

Your Pioneer Energy Services Crew	This Log Record Was Witnessed By
Engineer: D. SCHMIDT	Primary Witness: ROBERT HENDRIX
Operator:	Secondary Witness:
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

Database C:\ProgramData\Warrior\Data\murfin_hamit_2-20.db
Dataset field/well/STACK/pass99/_vars_

Top - 1148.00 ft

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	113	5.5	0	1	2	2.71

NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	SPSHIFT mV	SRFTEMP degF	SZCOR	TDEPTH ft
Limestone	0	0	0	327	55	Off	3687

1148.00 ft - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	113	5.5	0	1	2	2.71

NPORSEL	PERFS	SNDERR mmho/m	SNDERRM mmho/m	**SPSHIFT mV**	**SRFTEMP degF**	SZCOR	TDEPTH ft
Limestone	0	0	0	**320**	**50**	Off	3687

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			GR-M&W (89)	3.00	3.50	50.00
GR	40.58					
CNLSC	37.48		CNT-M&W (207-MW)	5.50	3.50	100.00
CNSSC	36.73					
			CDL-M&W (90-1031)	8.50	4.00	250.00
LSD	28.43					
DCAL	28.42					
SSD	27.93					
			ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00

MCAL	19.83				
MI	19.83				
MN	19.83				
RLL3F	15.80				
RLL3	15.80				
		DIL-M&W (PSI 91)	18.50	3.50	220.00
CILD	8.00				
CILM	4.70				
SP	0.20				

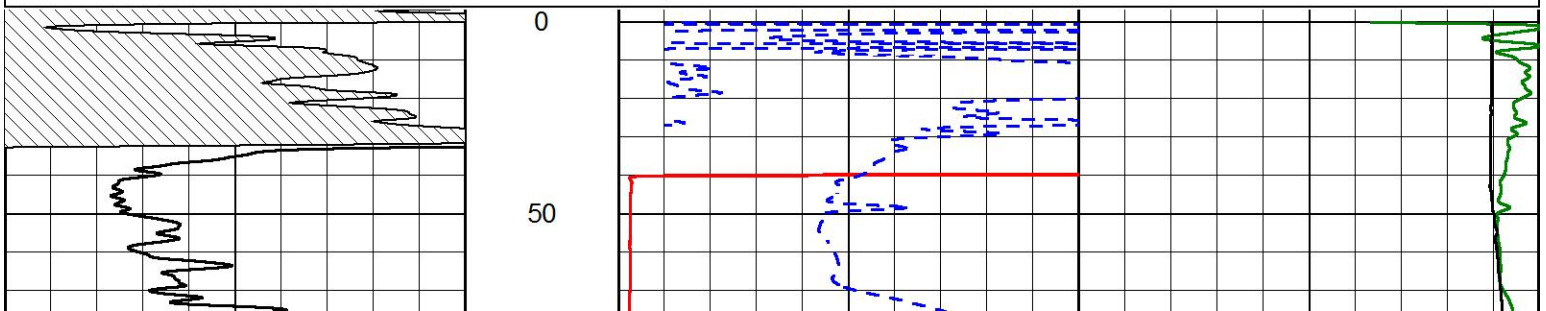
Dataset: murfin_hamit_2-20.db: field/well/STACK/pass99
Total length: 43.08 ft
Total weight: 685.00 lb
O.D.: 4.00 in

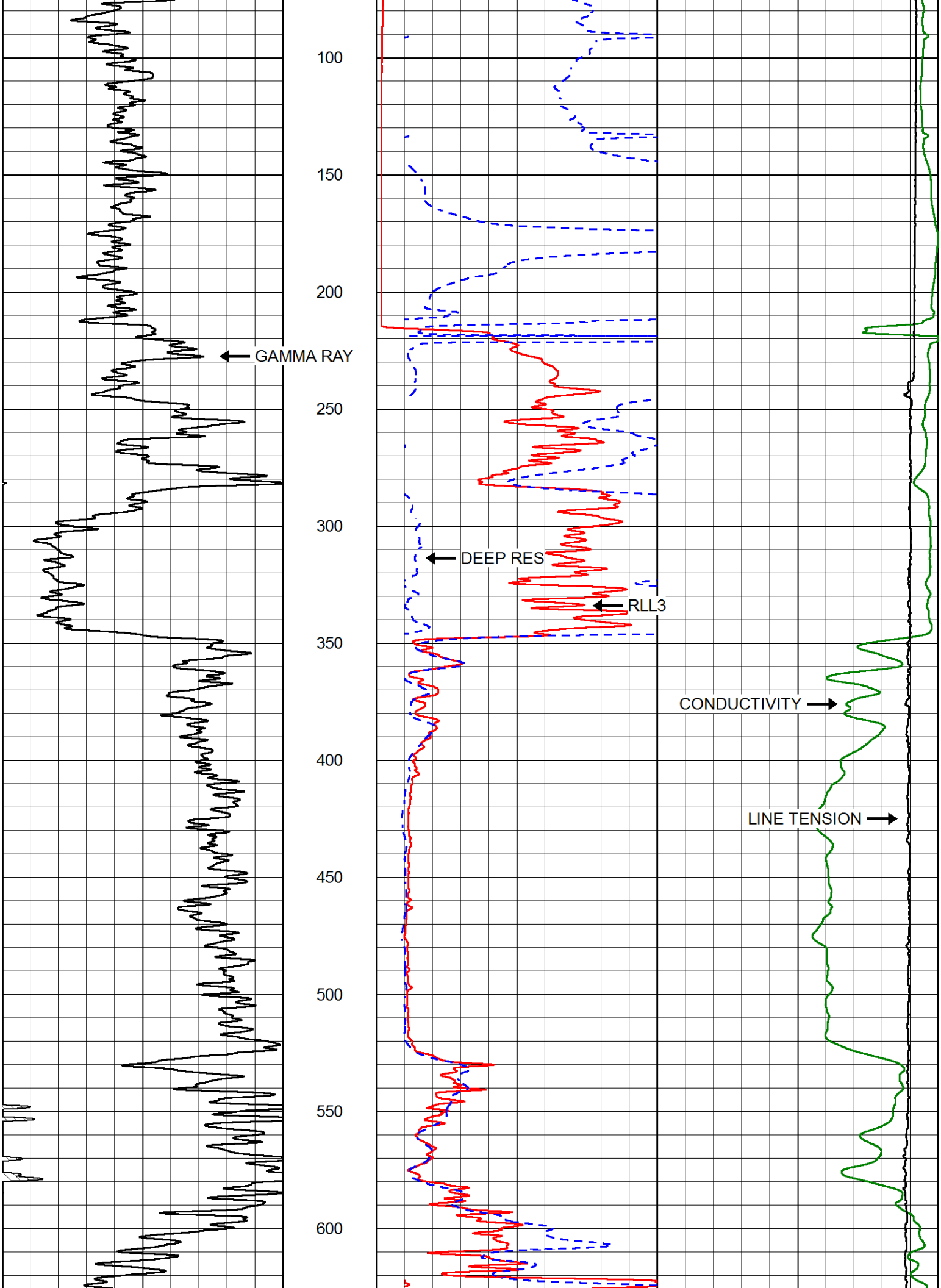
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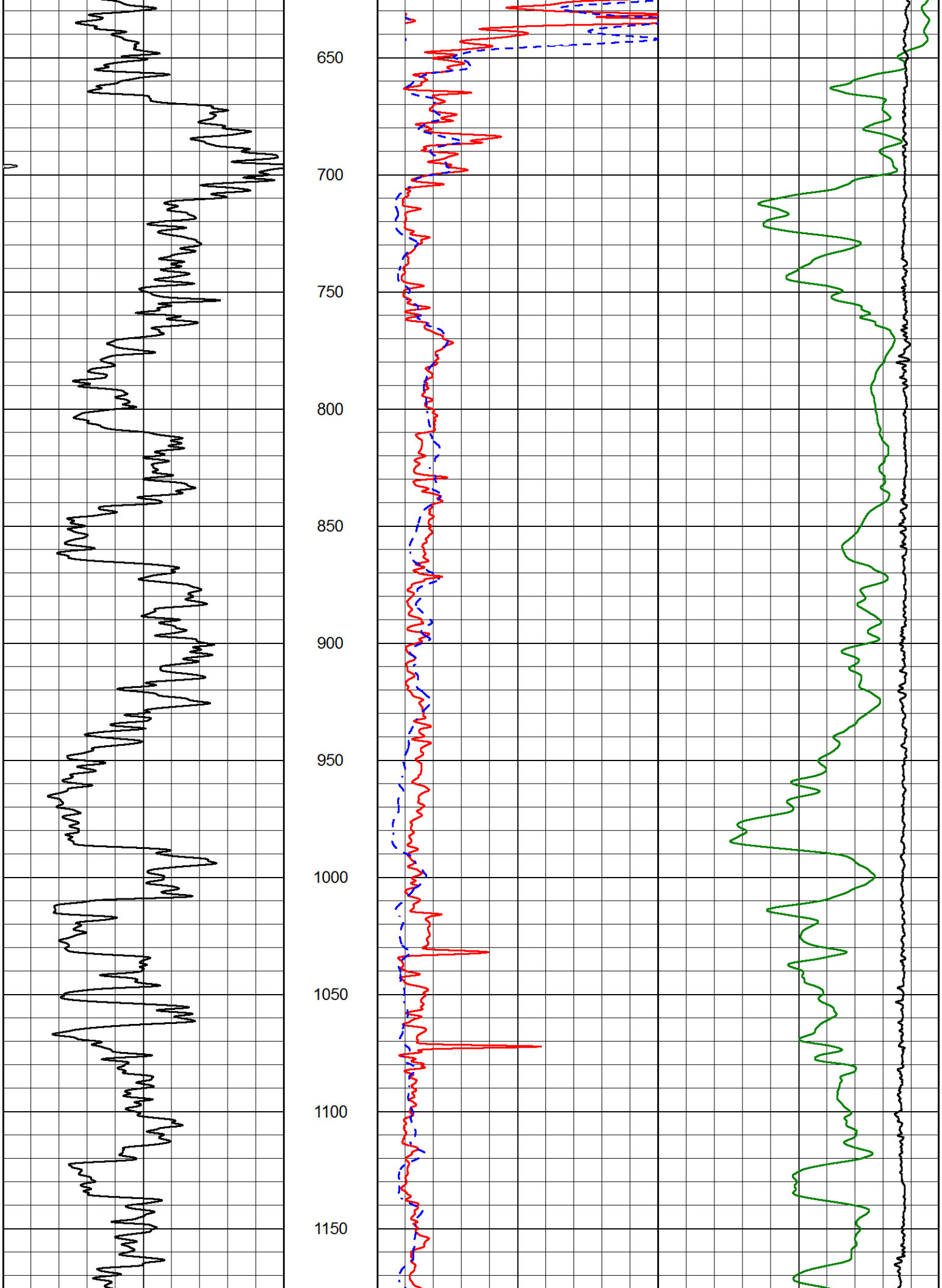
MAIN PASS

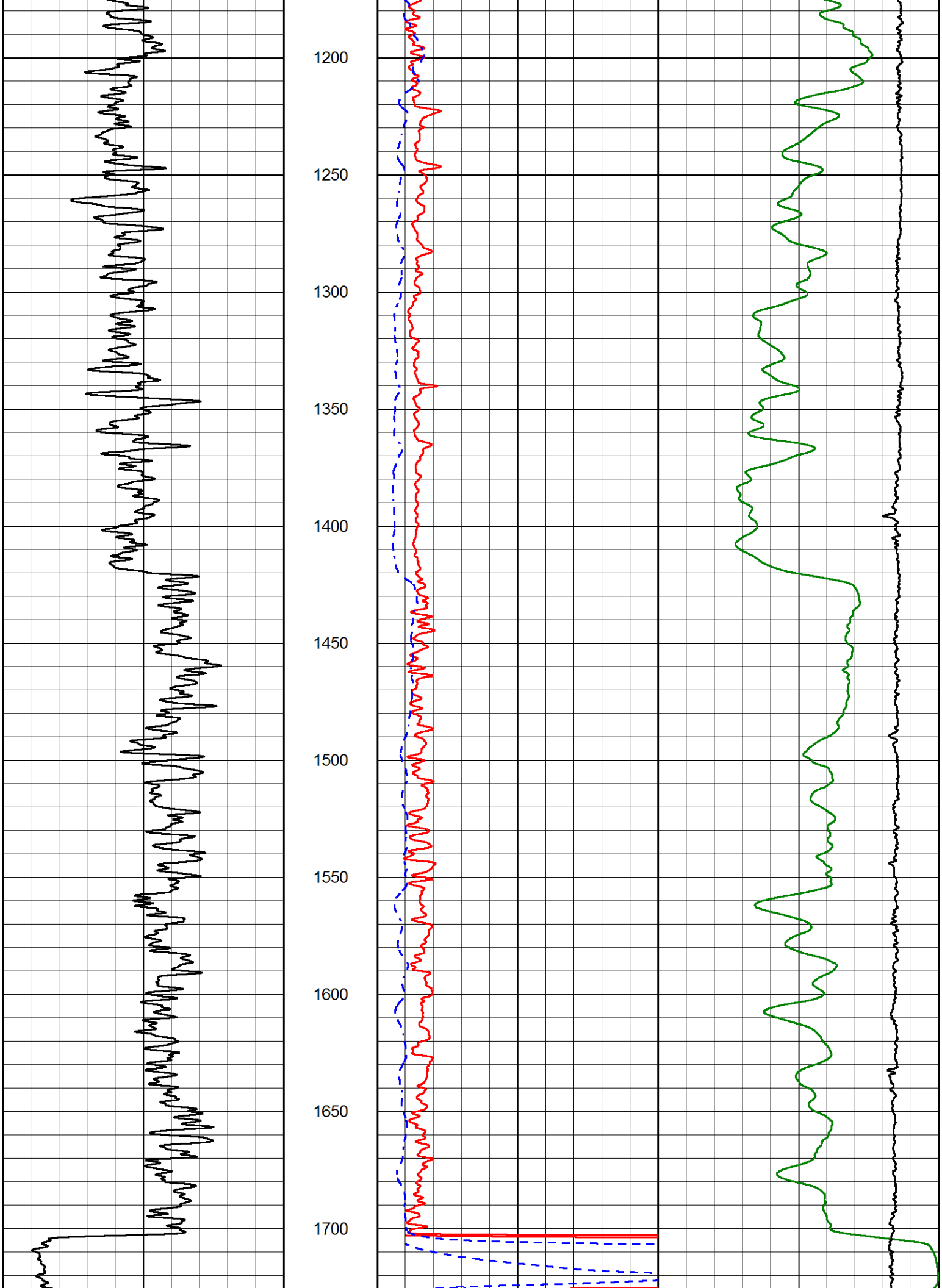
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Dataset Pathname	STACK/pass9.1
Presentation Format	dil2in
Dataset Creation	Tue Nov 14 07:27:01 2017
Charted by	Depth in Feet scaled 1:600

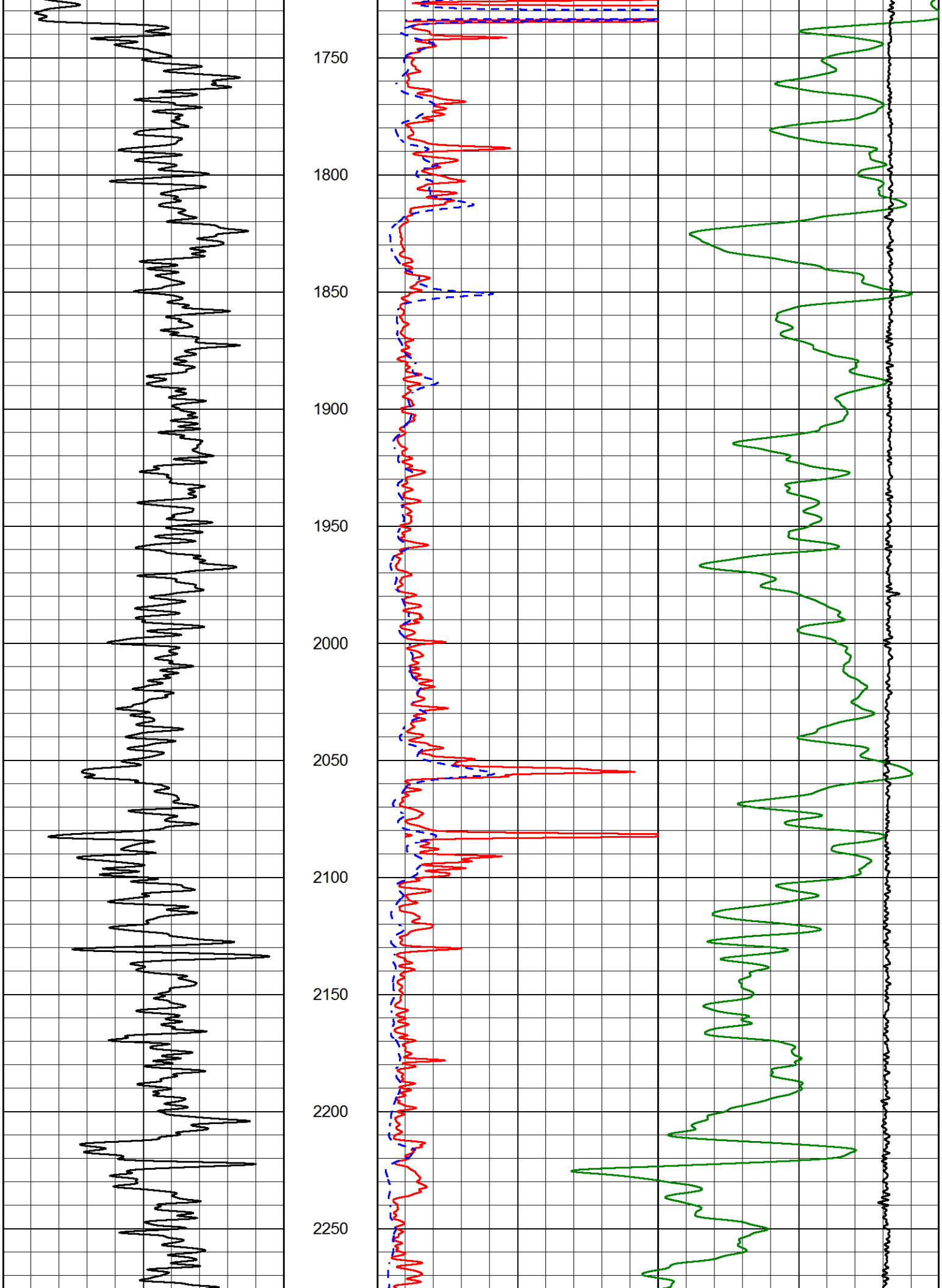
0	Gamma Ray (GAPI)	150
1000	Conductivity (mmho/m)	0
15000	Line Tension (lb)	0
0	RLL3 (Ohm-m)	50
0	Deep Resistivity (Ohm-m)	50
50	RLL3 (Ohm-m)	500
50	Deep Resistivity (Ohm-m)	500

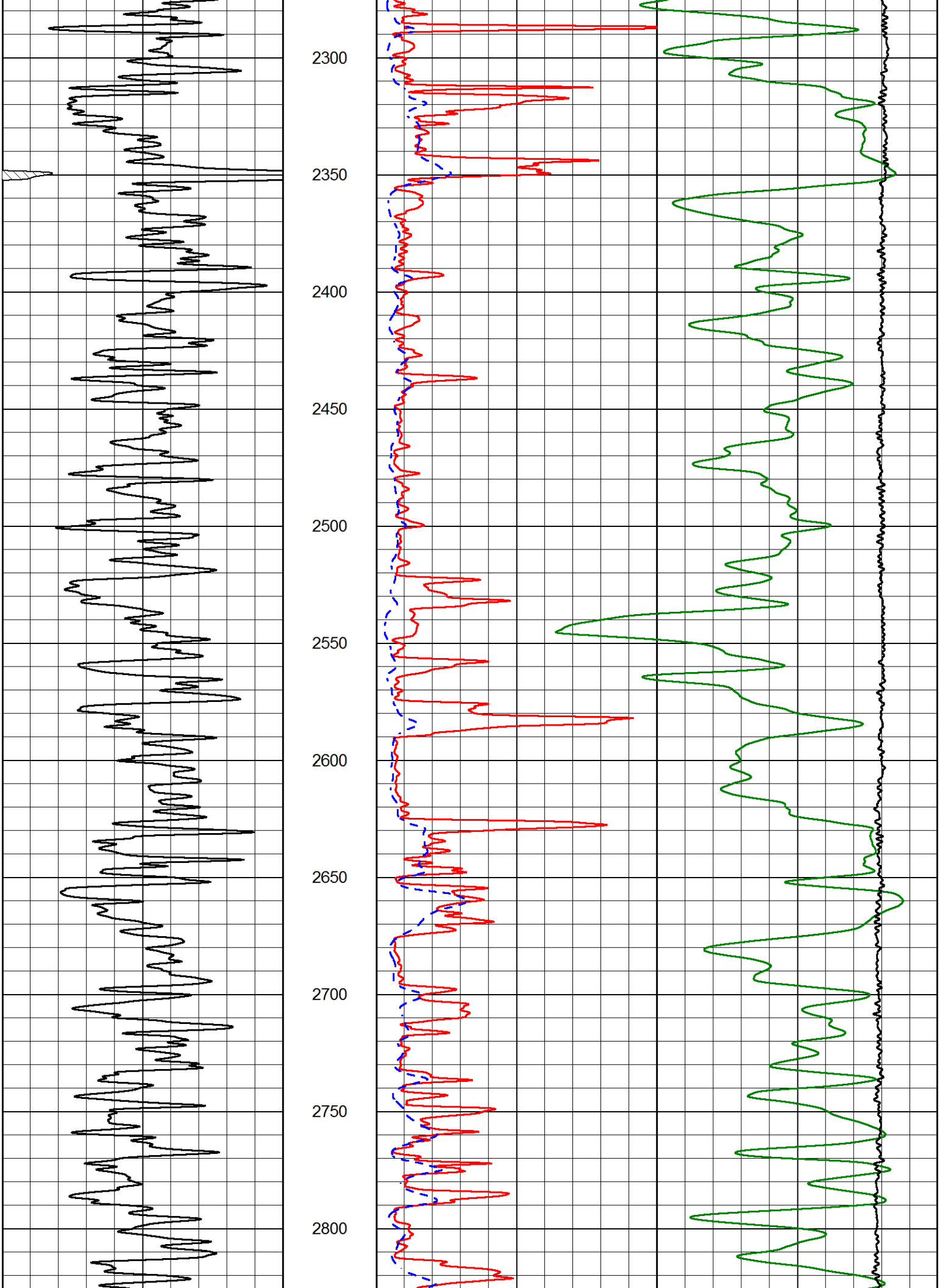


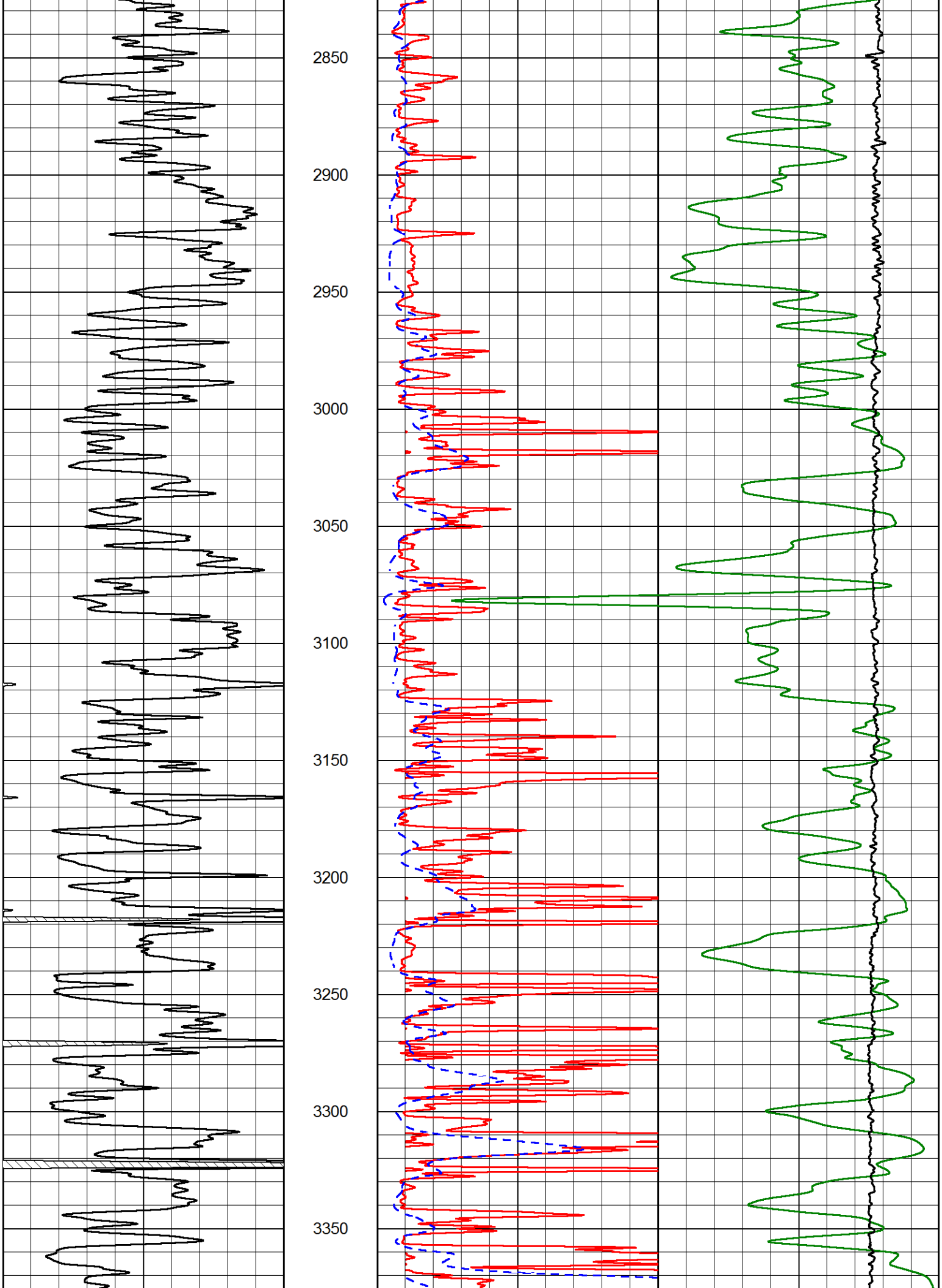

100
150
200
250
300
350
400
450
500
550
600
GAMMA RAY
DEEP RES
RLL3
CONDUCTIVITY
LINE TENSION

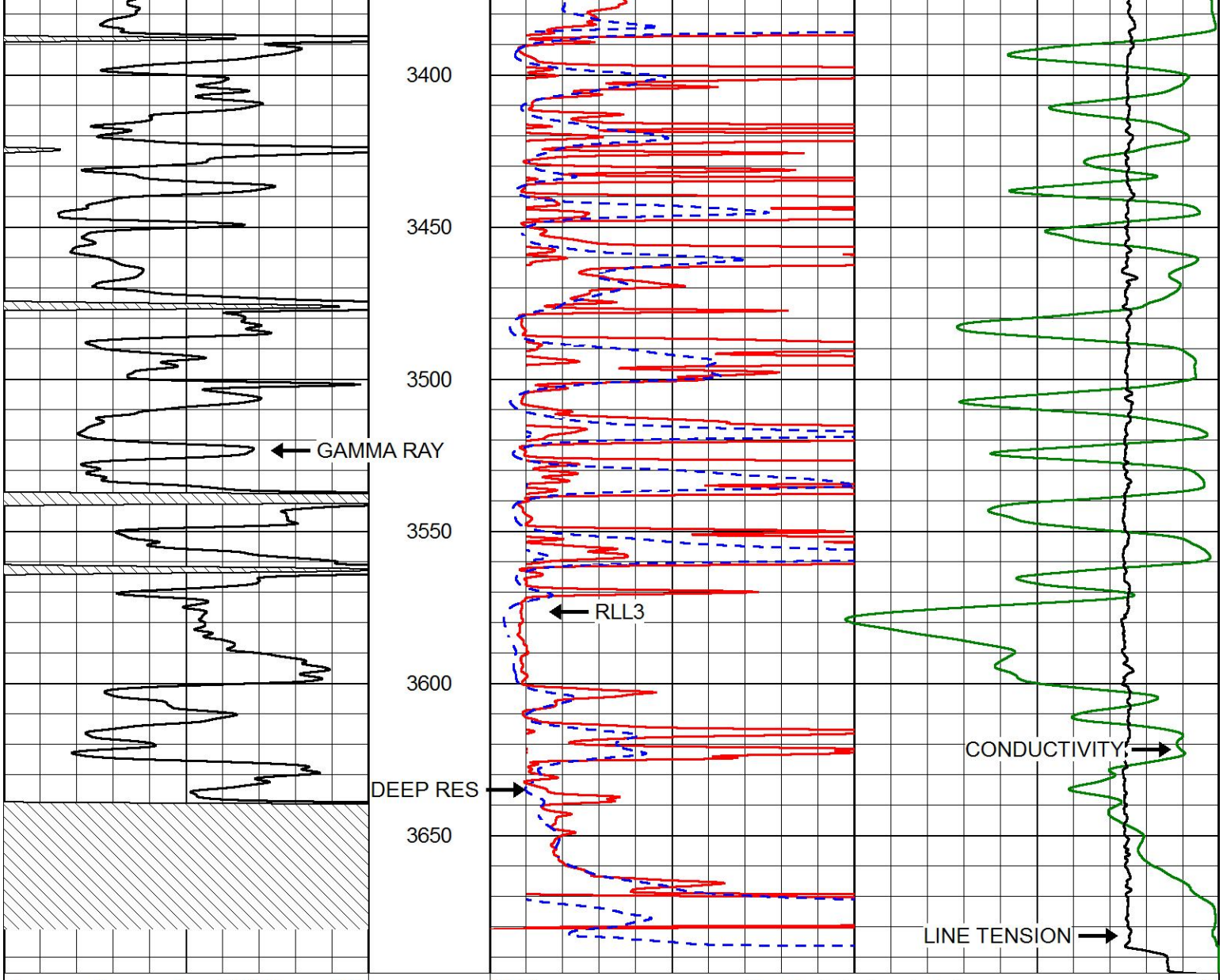

650
700
750
800
850
900
950
1000
1050
1100
1150


1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
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1750
1800
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1900
1950
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2150
2200
2250


2300
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2850
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3200
3250
3300
3350



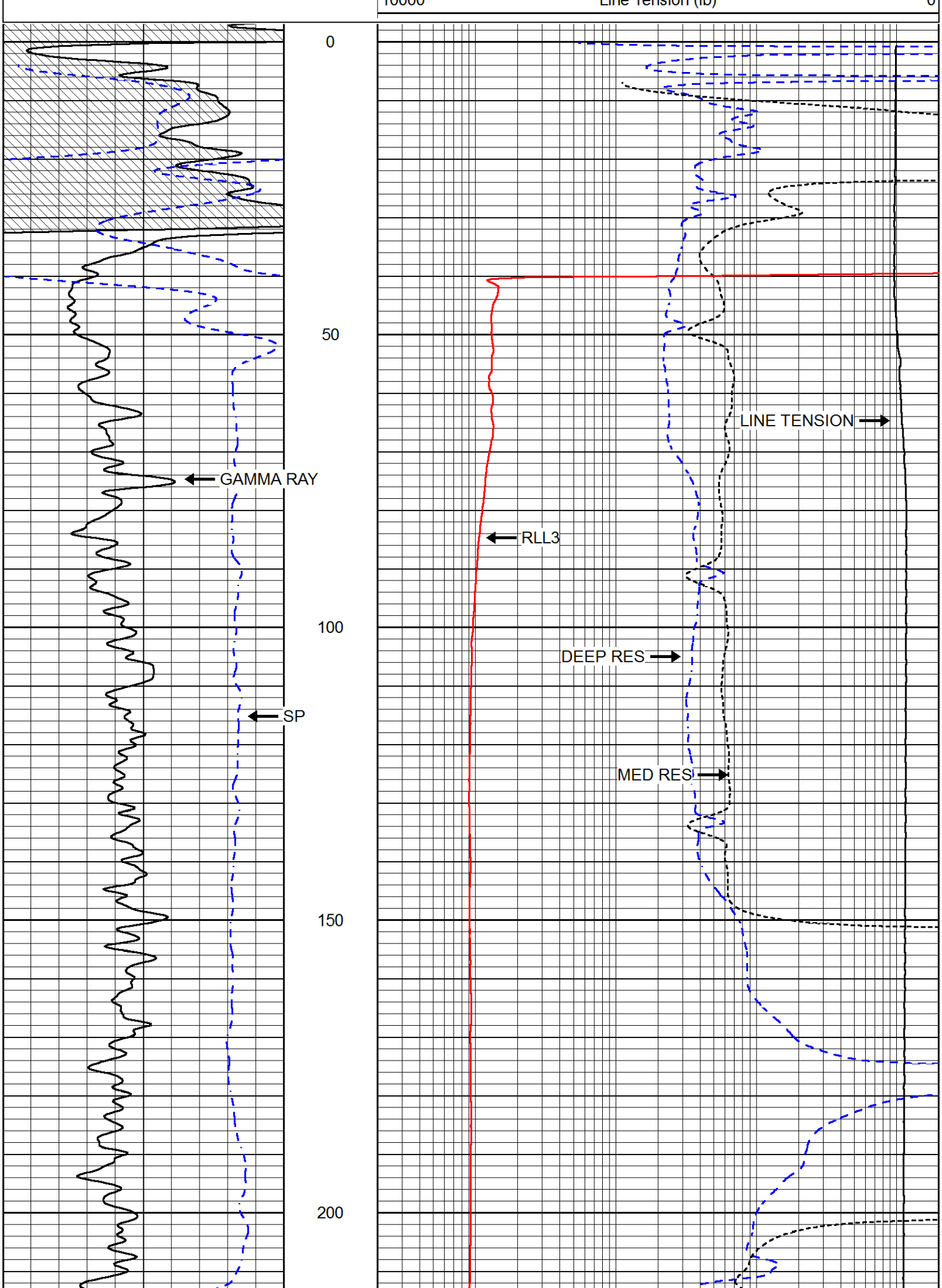
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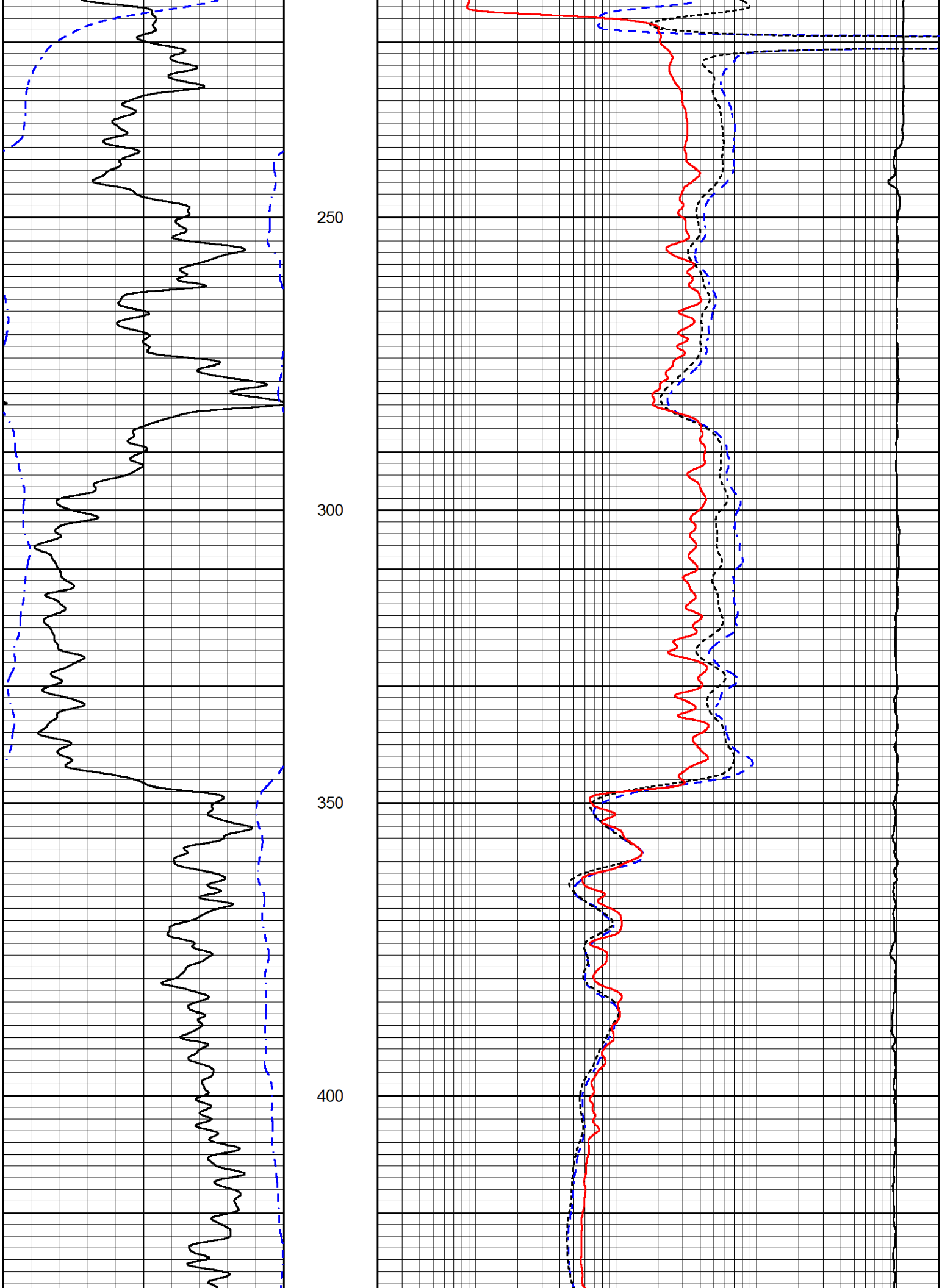
MAIN PASS

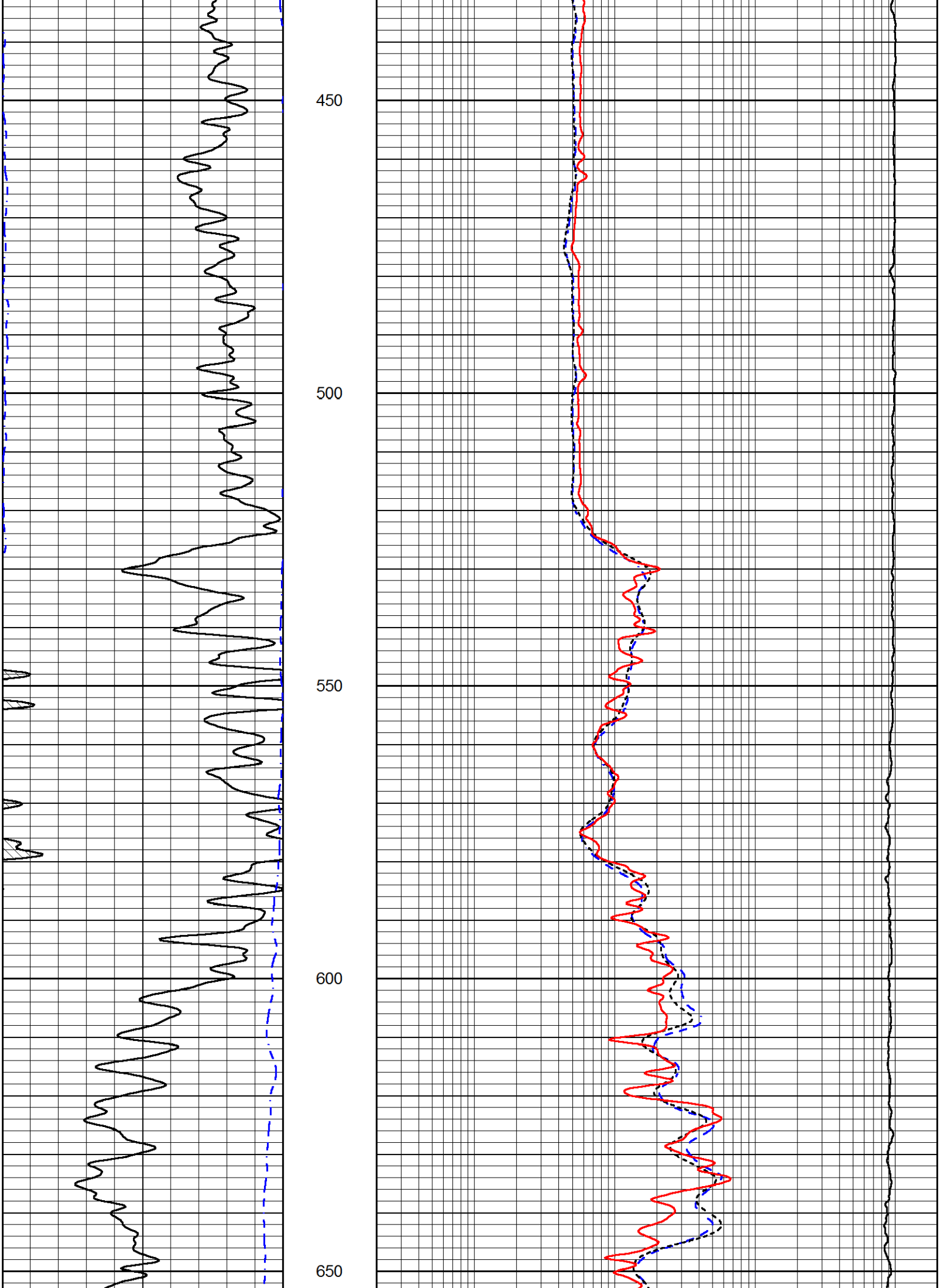
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Dataset Pathname	STACK/pass9.1
Presentation Format	dil
Dataset Creation	Tue Nov 14 07:27:01 2017
Charted by	Depth in Feet scaled 1:240

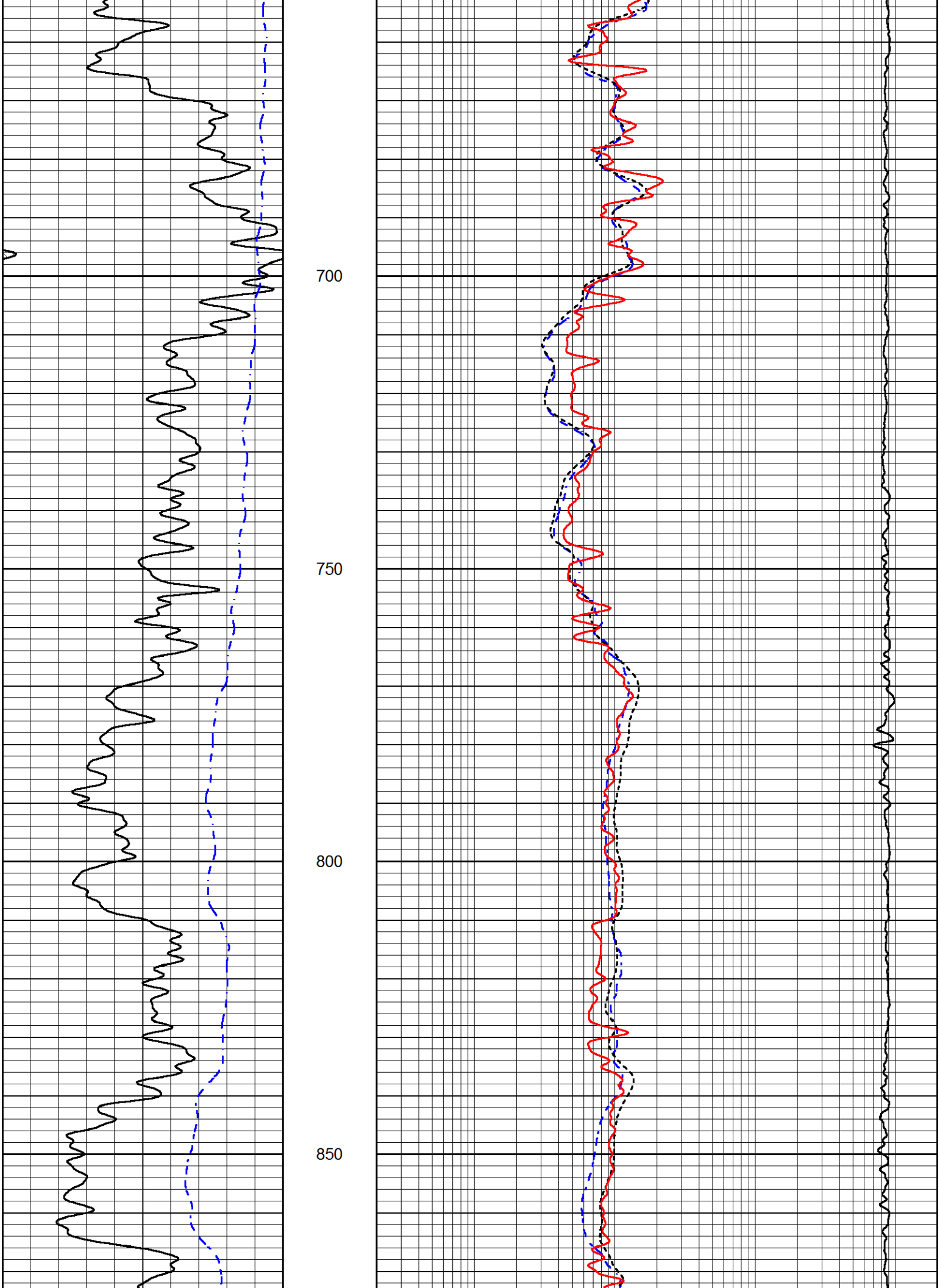
0	Gamma Ray (GAPI)	150
-200	SP (mV)	0

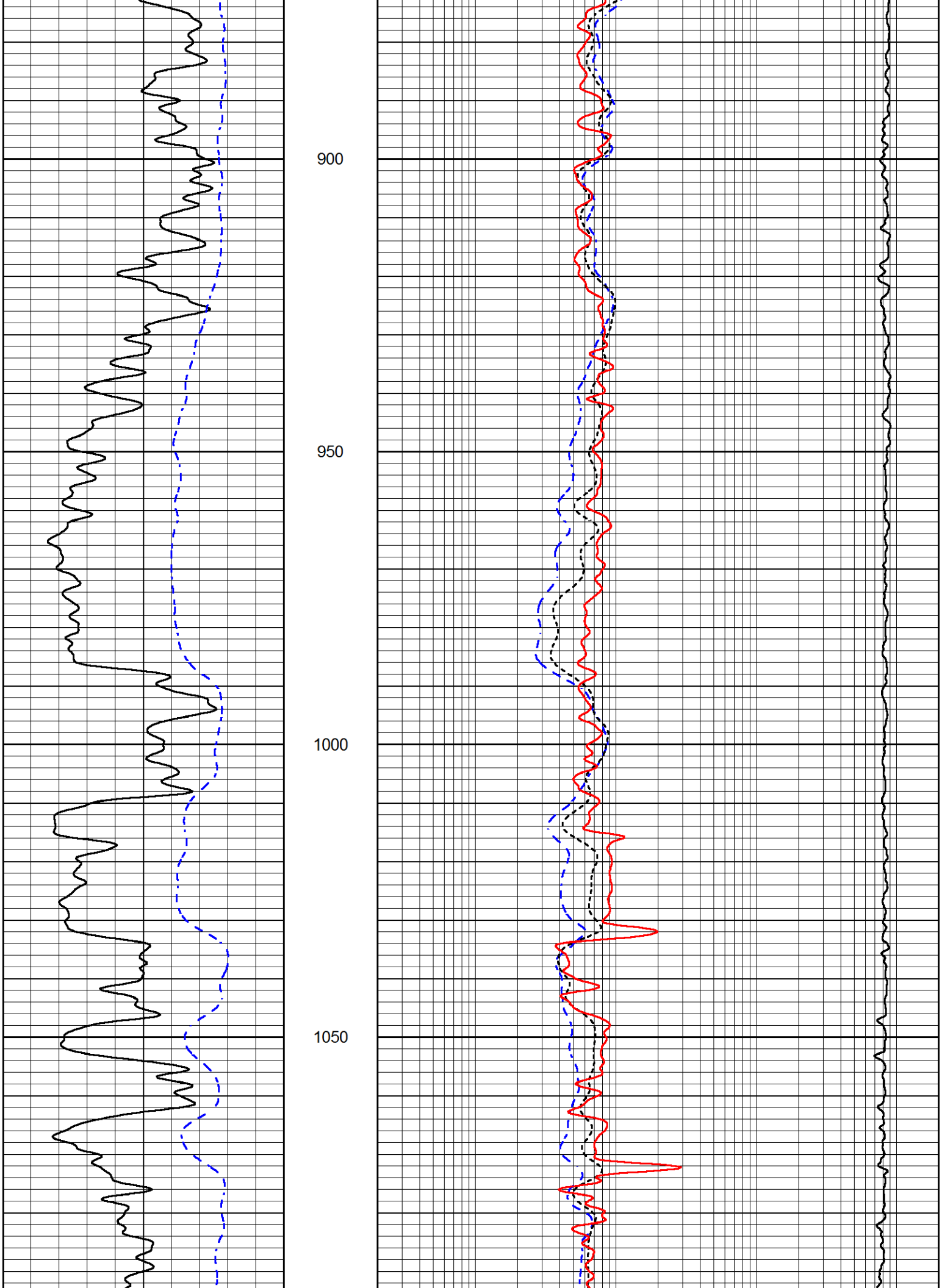
0.2	Deep Resistivity (Ohm-m)	2000
0.2	Medium Resistivity (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
10000	Line Tension (lb)	0

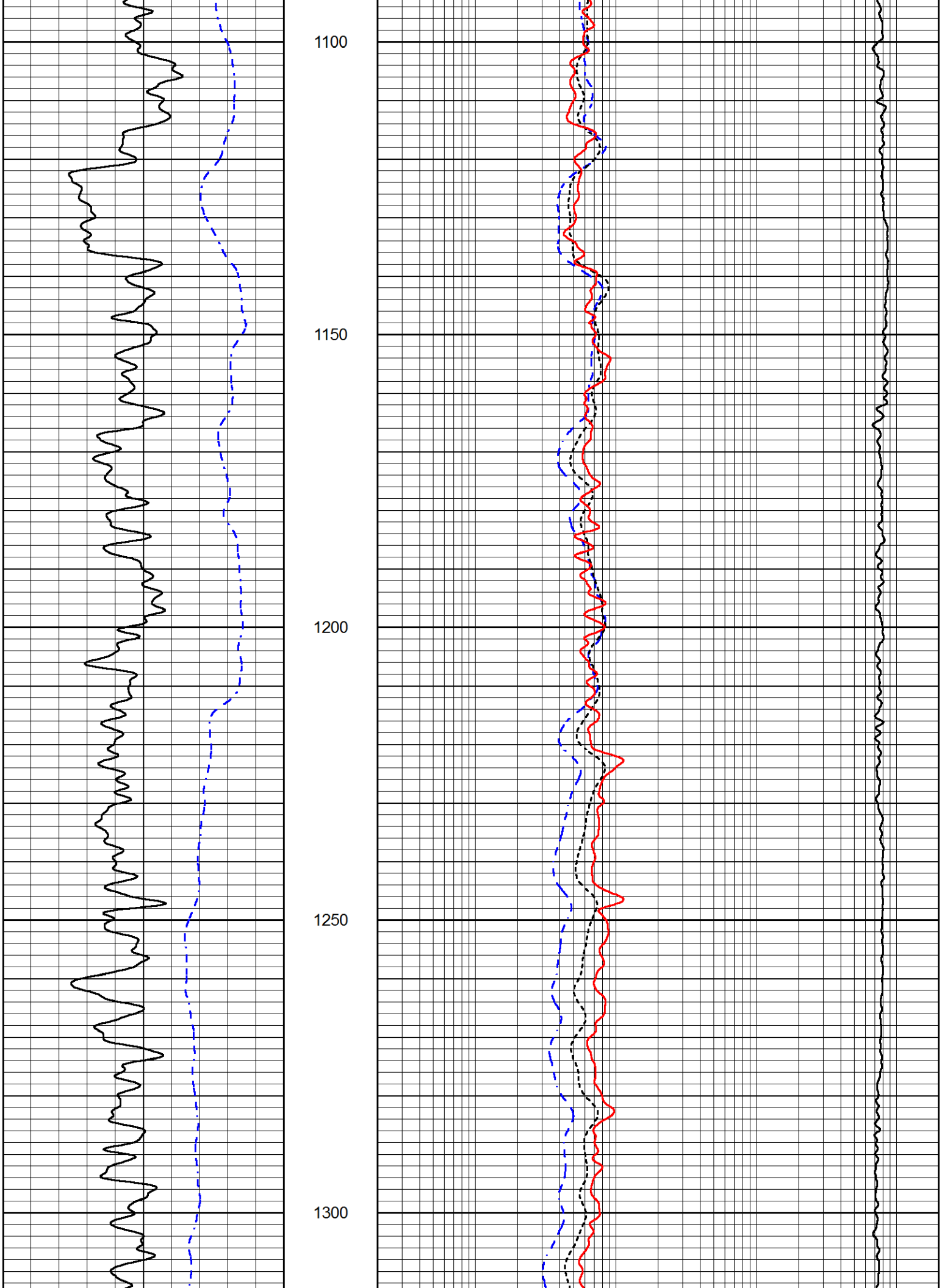

10000
Line Tension (lb)
0
0
50
100
150
200
GAMMA RAY
SP
RLL3
LINE TENSION
DEEP RES
MED RES

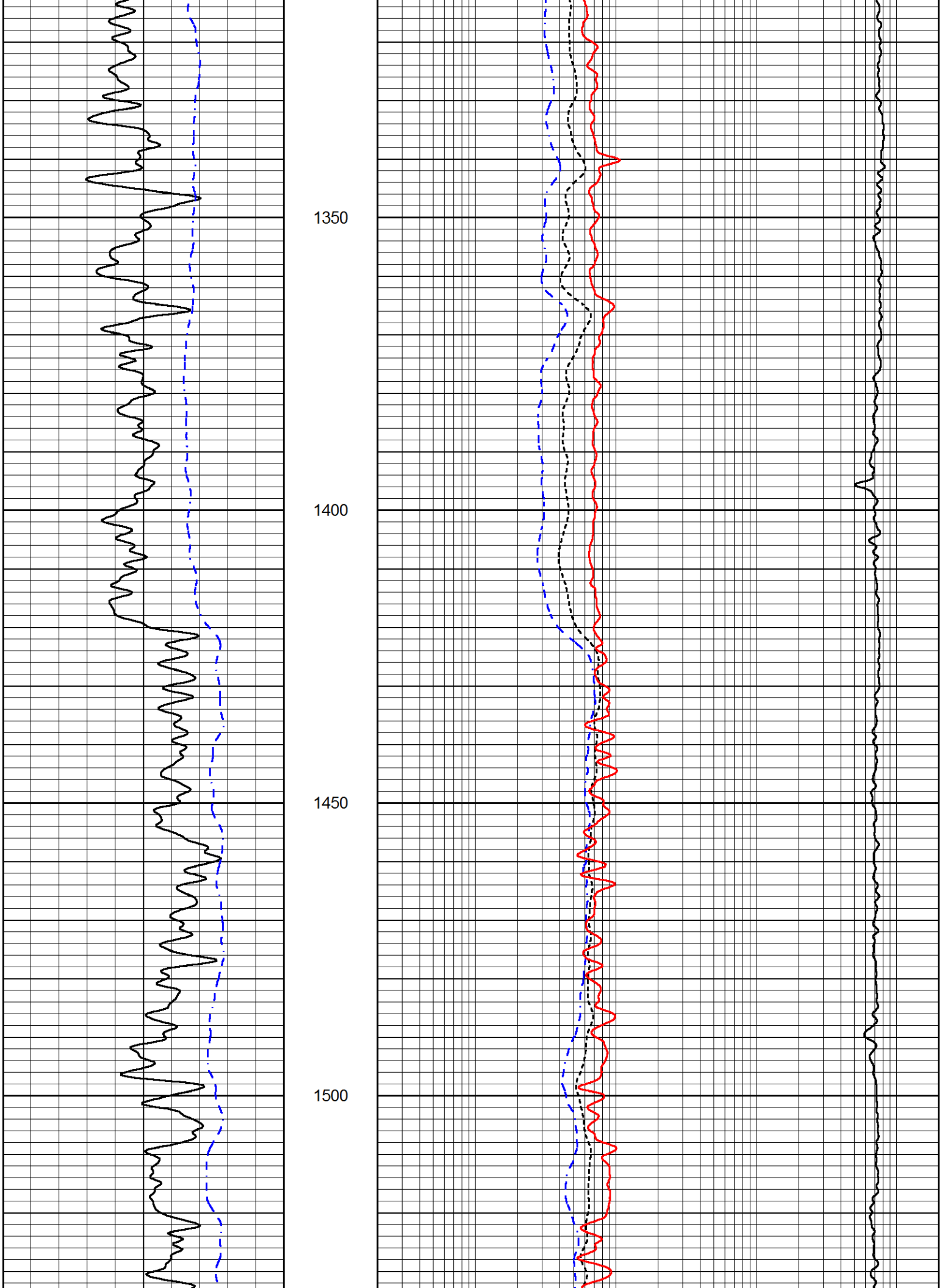

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300
350
400

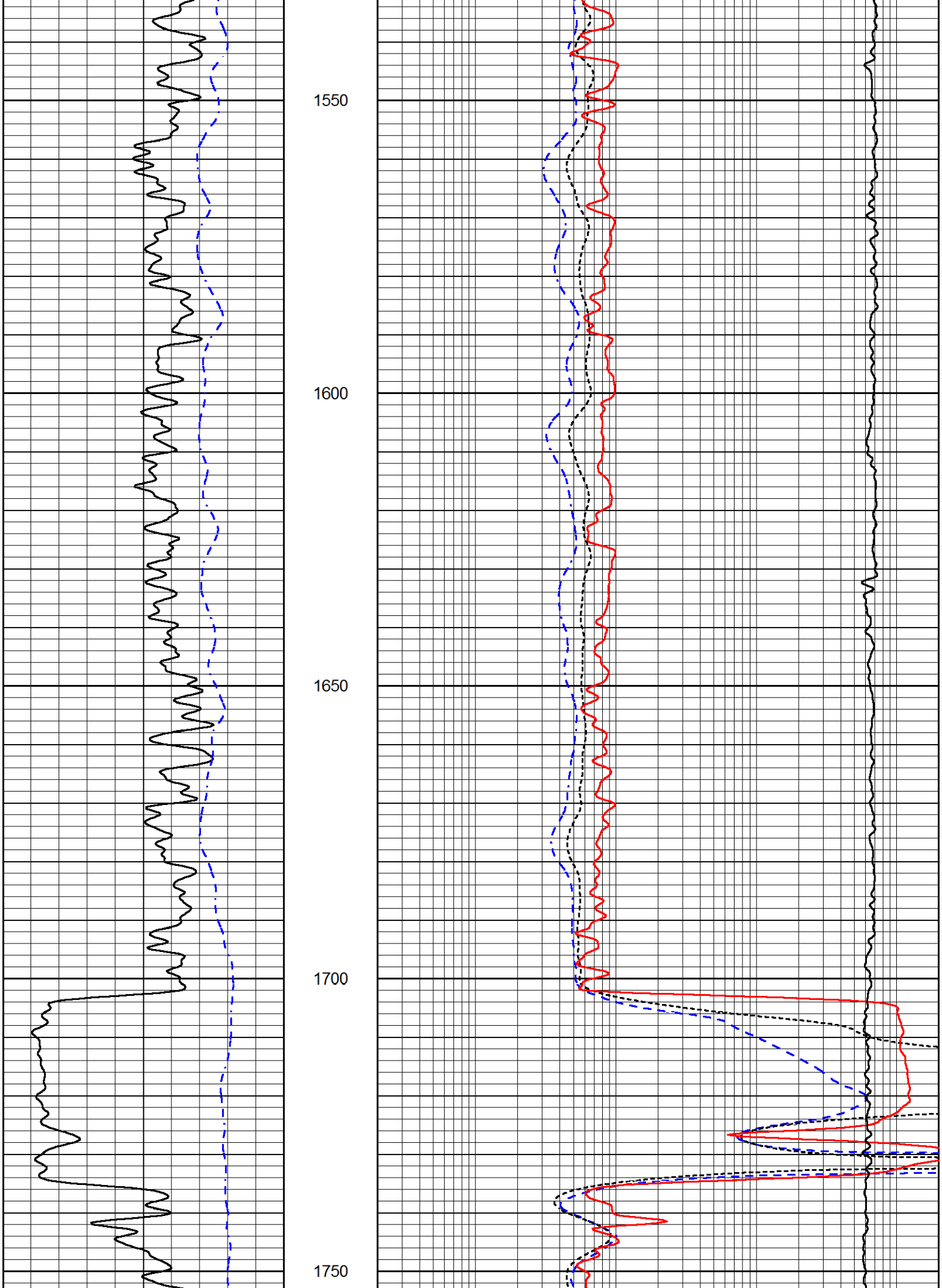

450
500
550
600
650

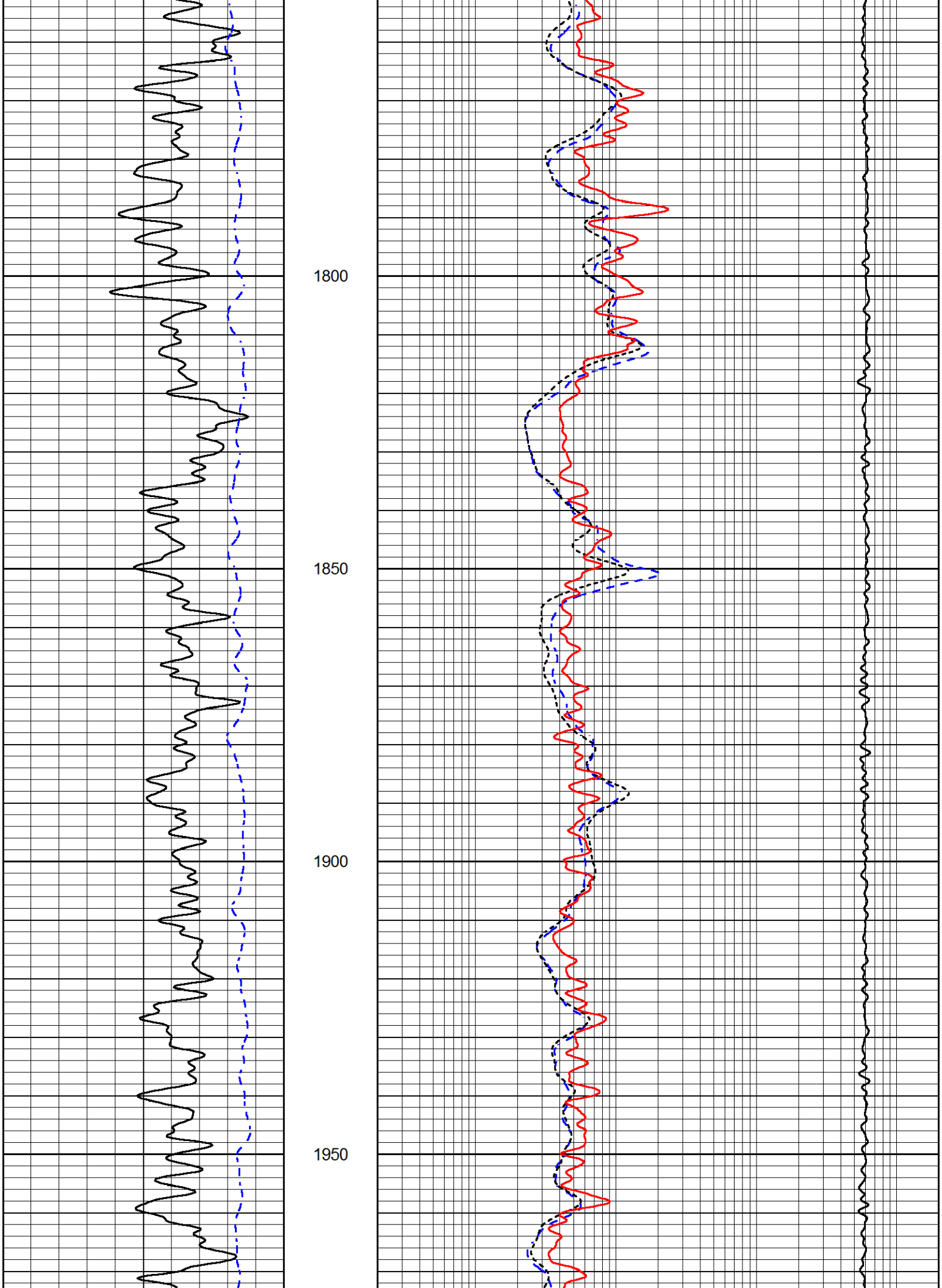

700
750
800
850

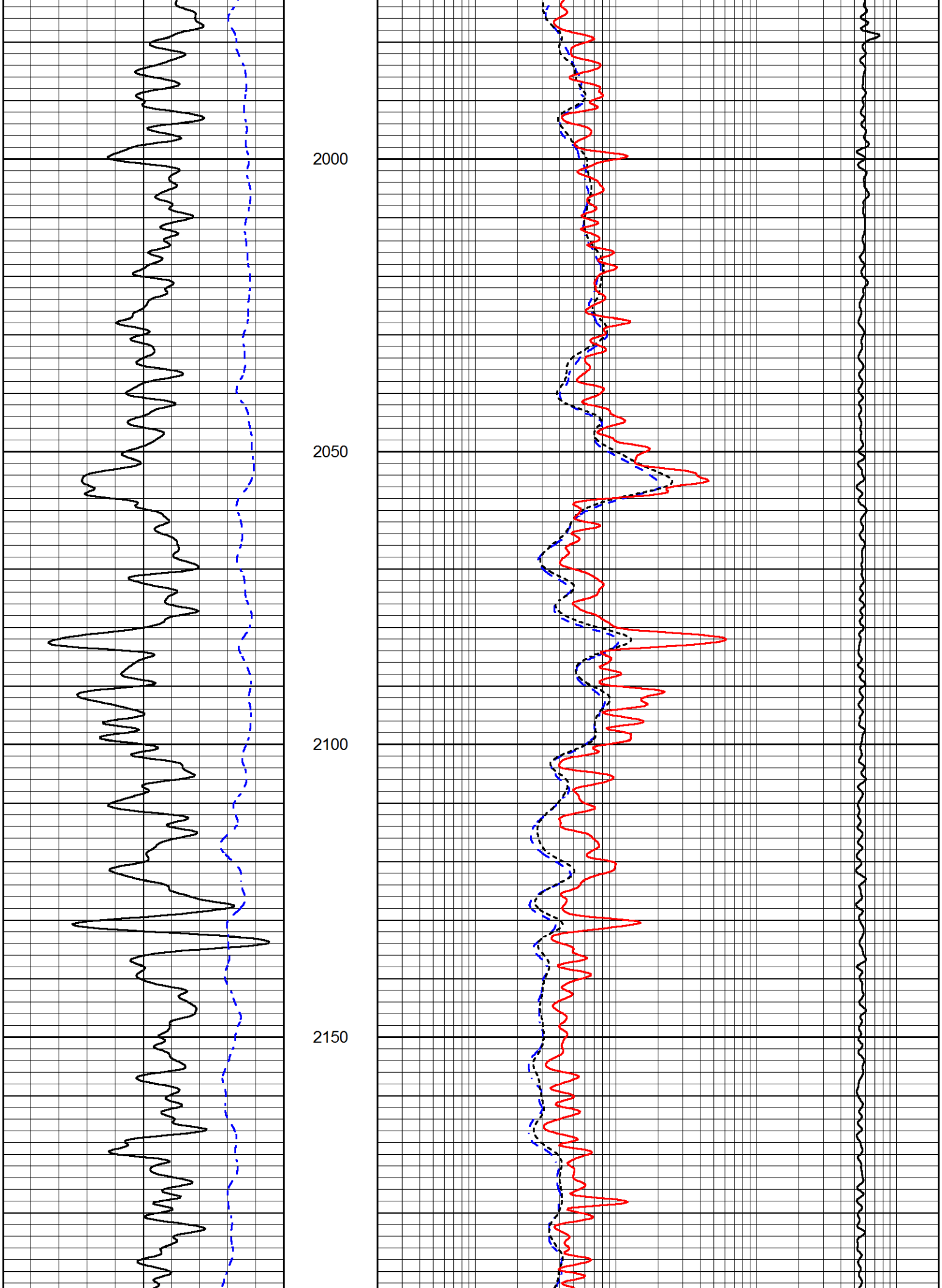

900
950
1000
1050

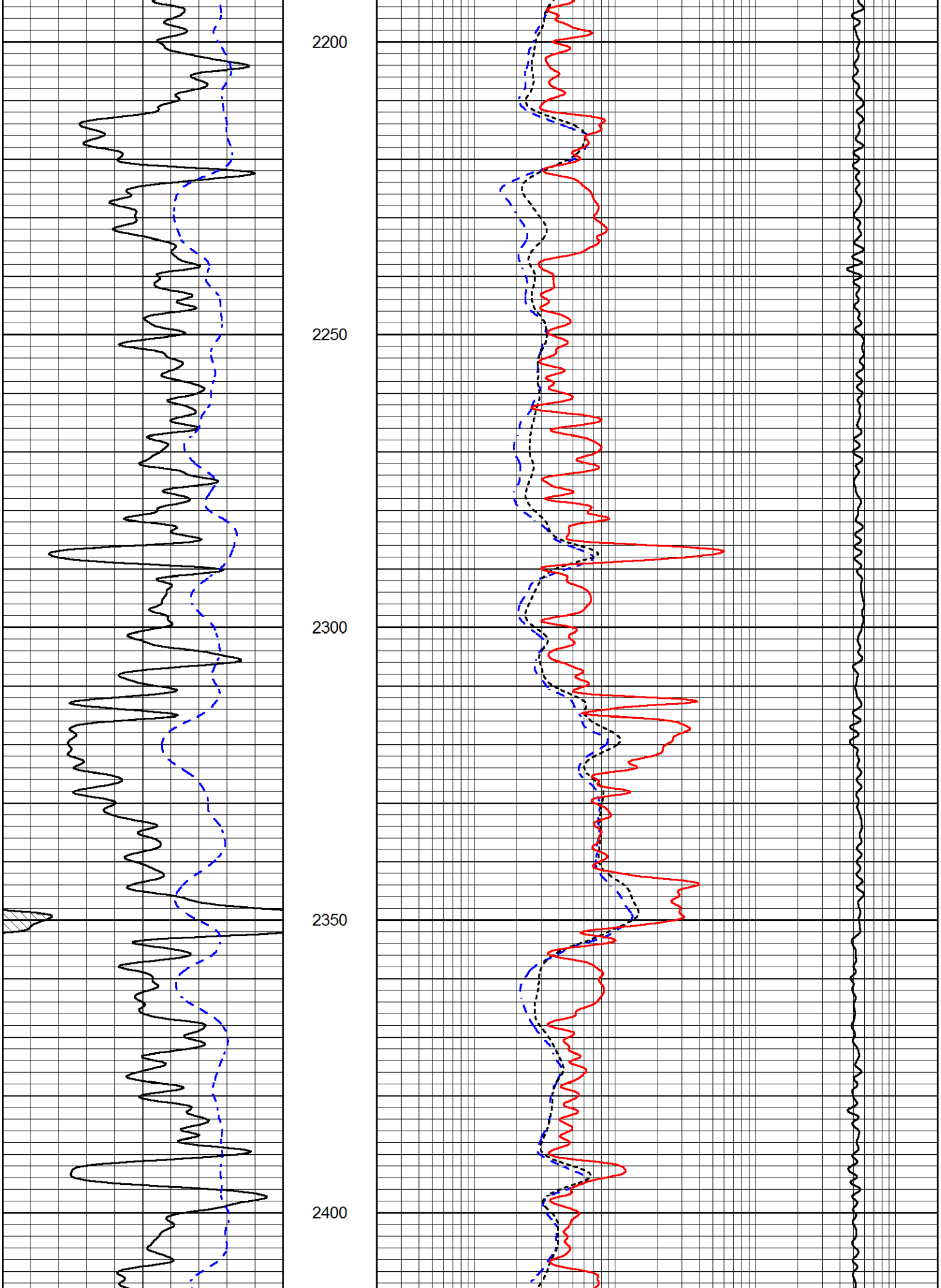

1100
1150
1200
1250
1300

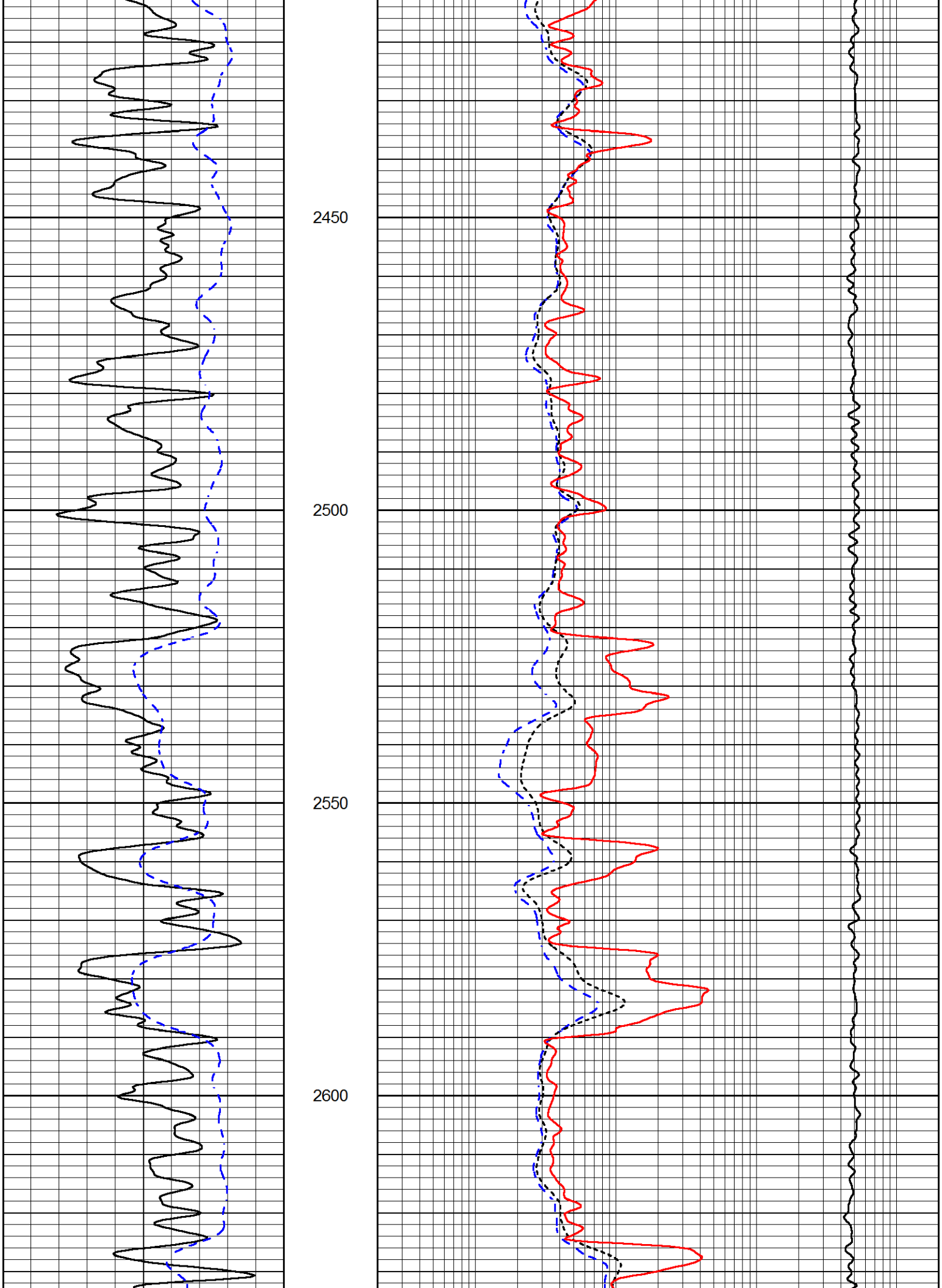

1350
1400
1450
1500

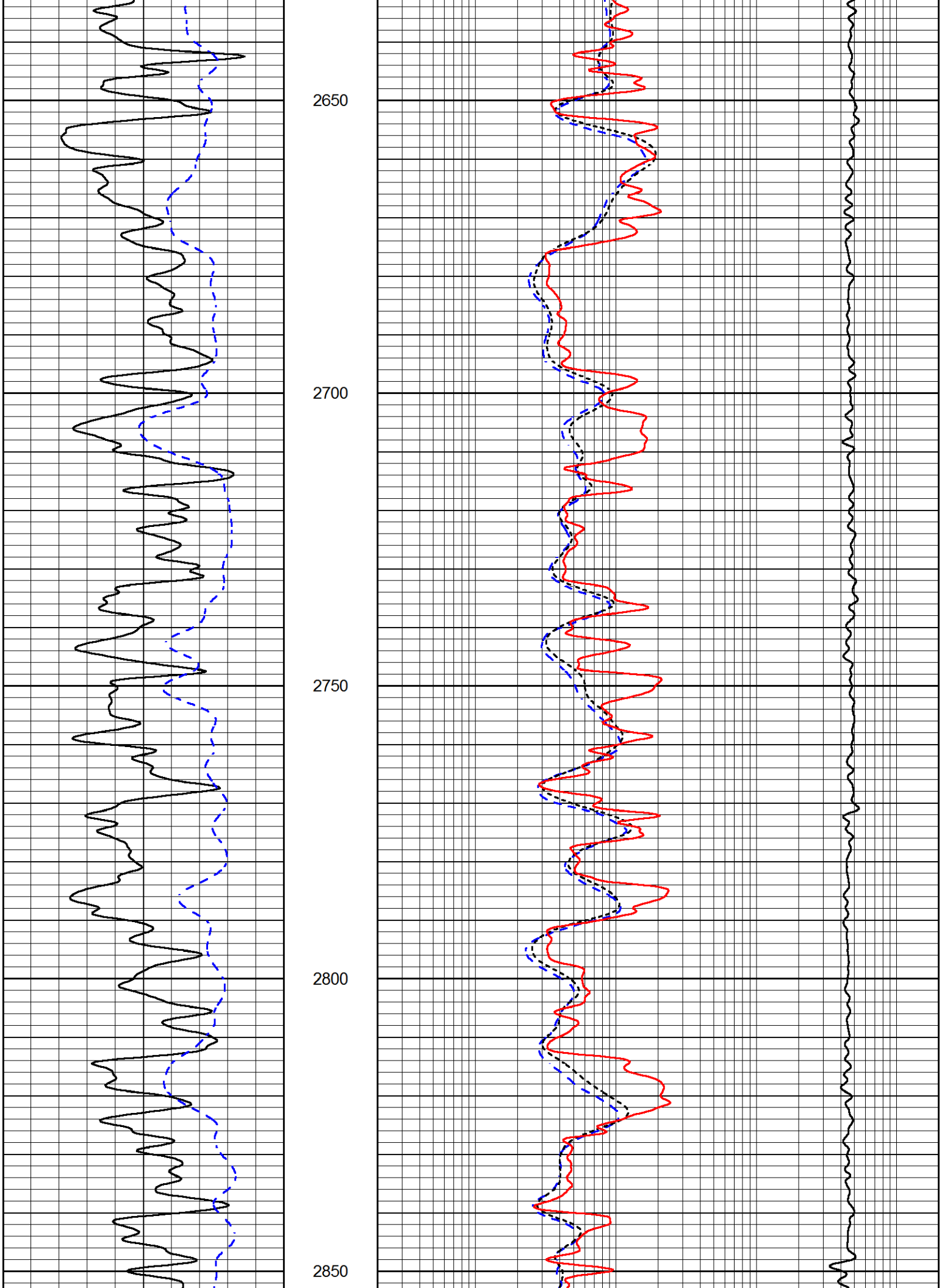

1550
1600
1650
1700
1750

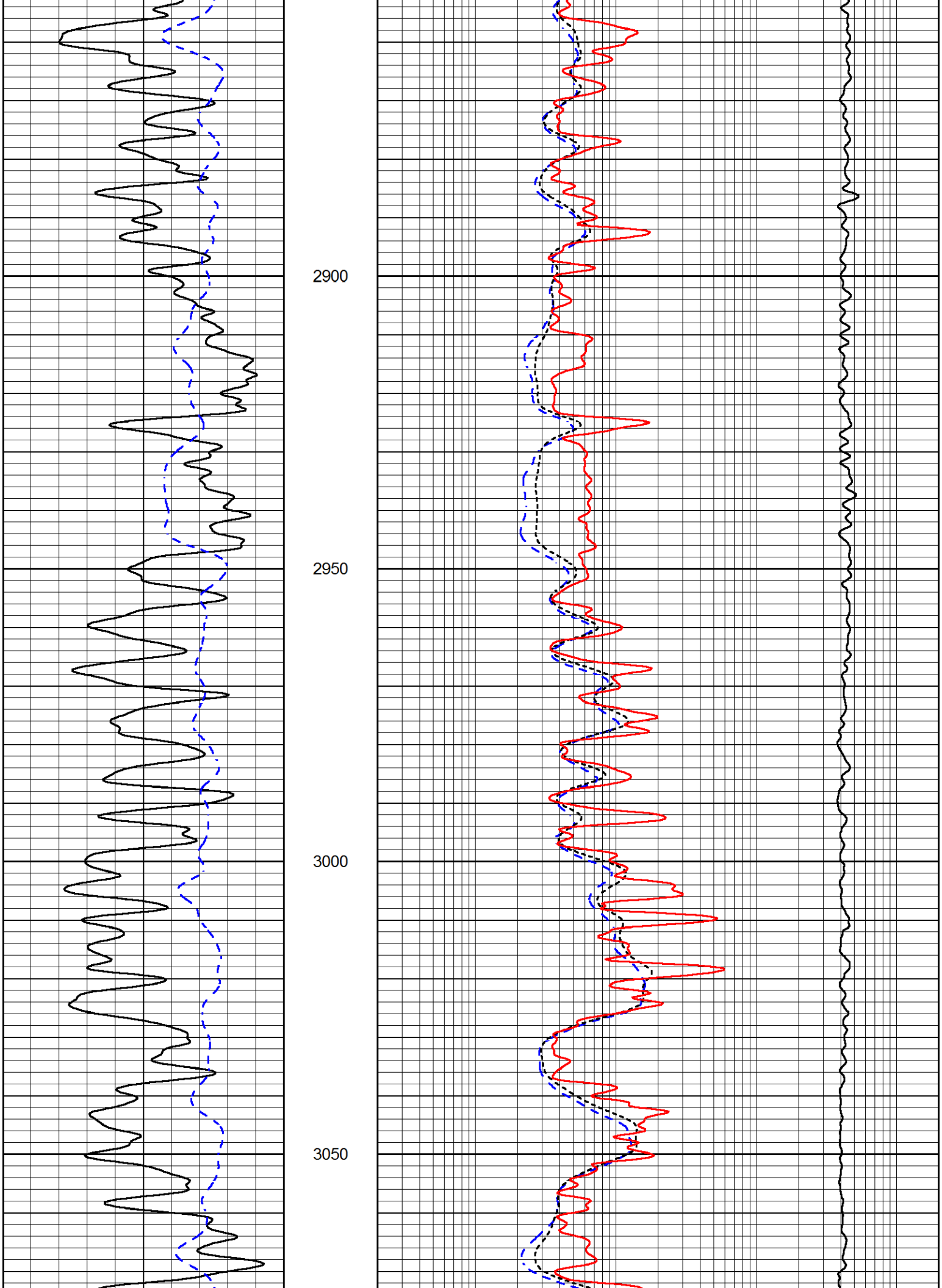

1800
1850
1900
1950

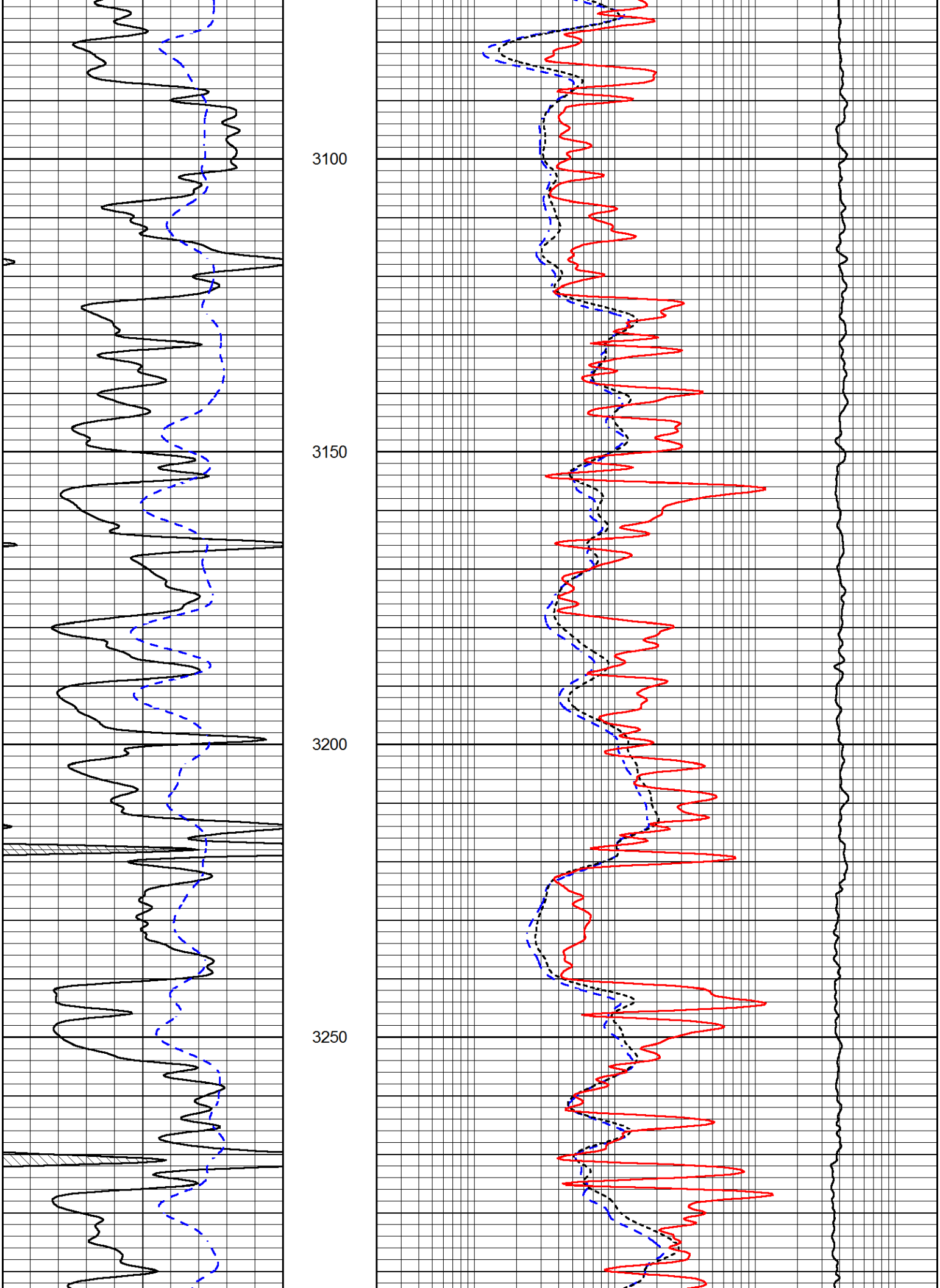

2000
2050
2100
2150

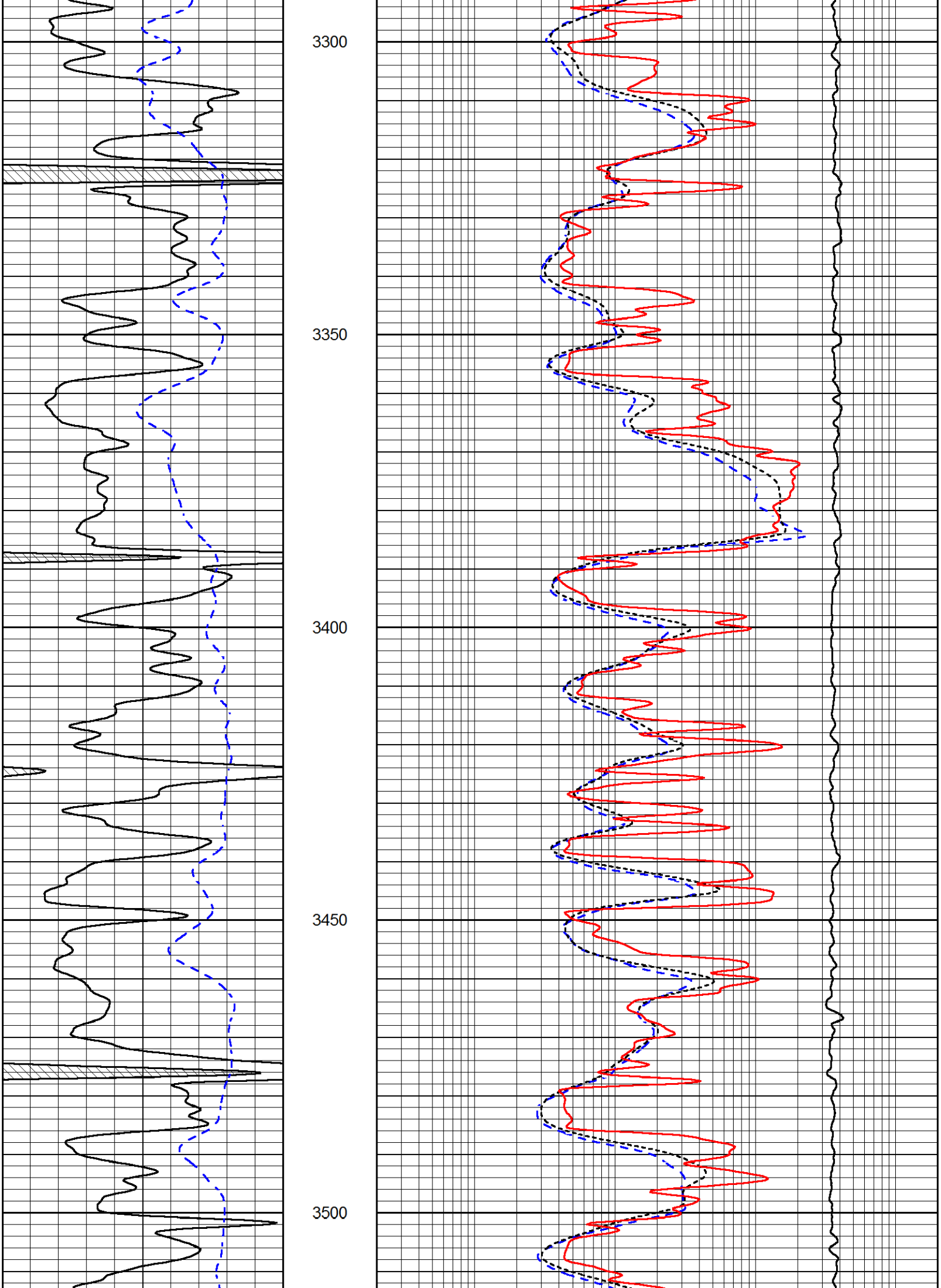

2200
2250
2300
2350
2400

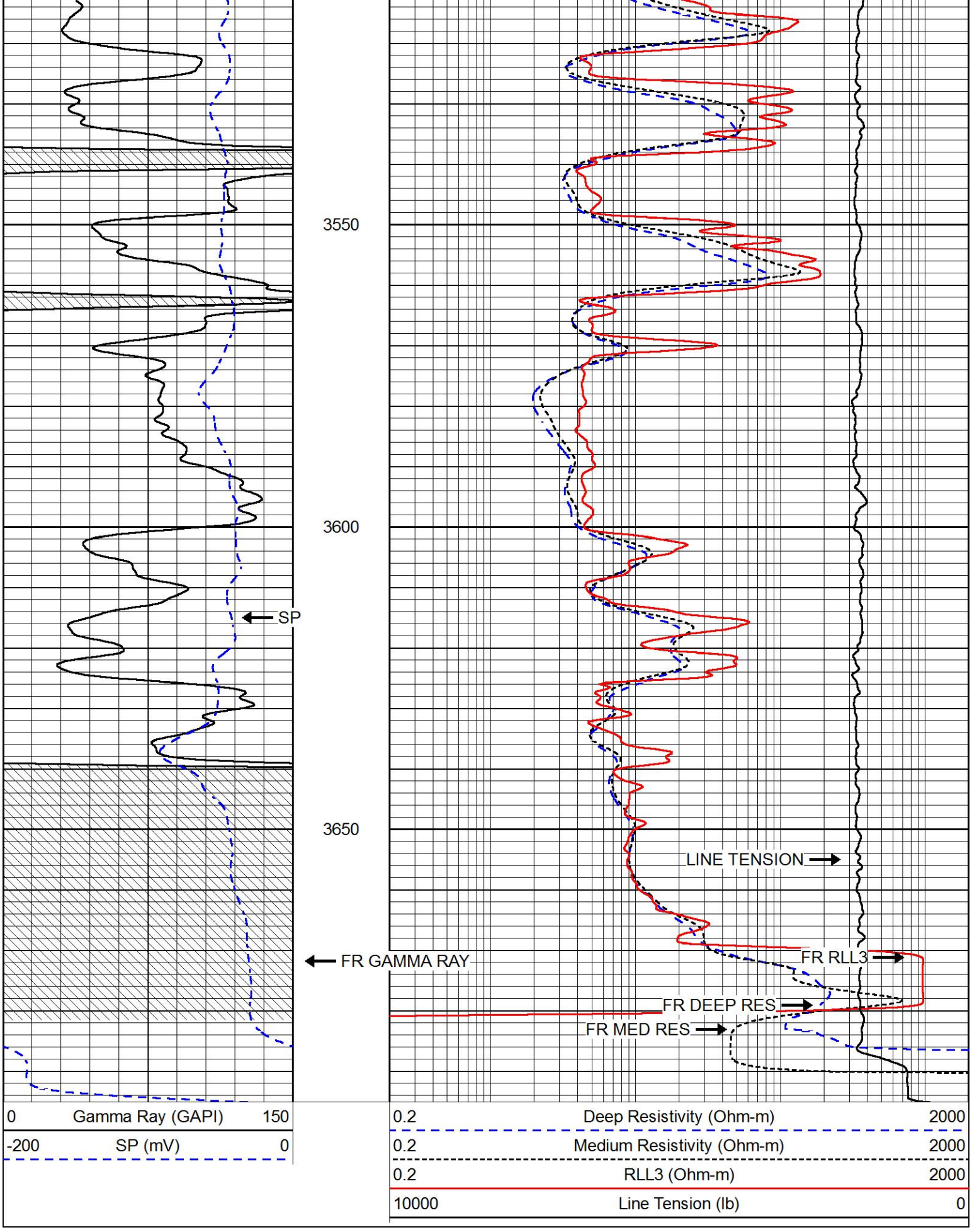

2450
2500
2550
2600


2650
2700
2750
2800
2850


2900
2950
3000
3050


3100
3150
3200
3250


3300
3350
3400
3450
3500



REPEAT SECTION

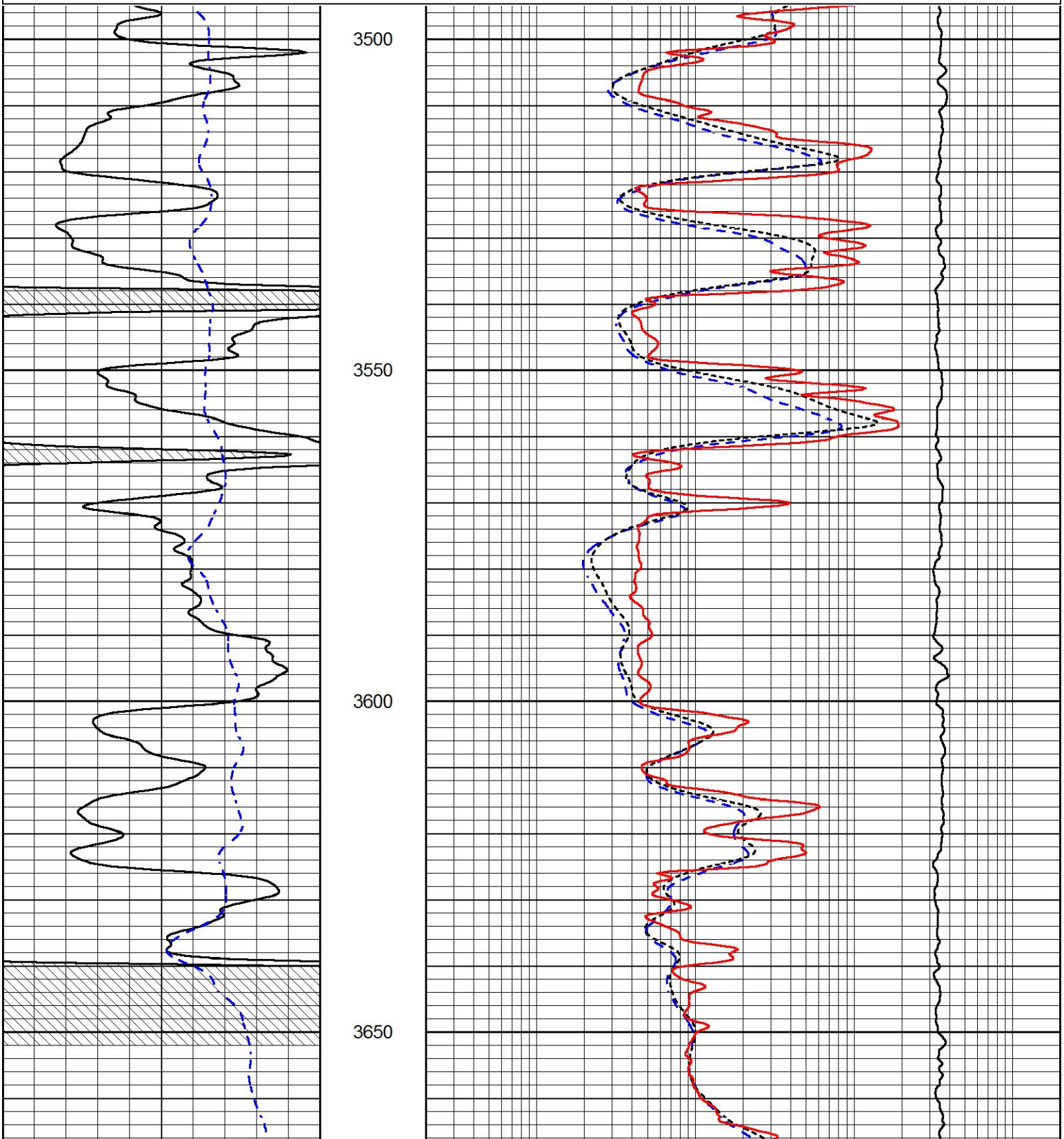
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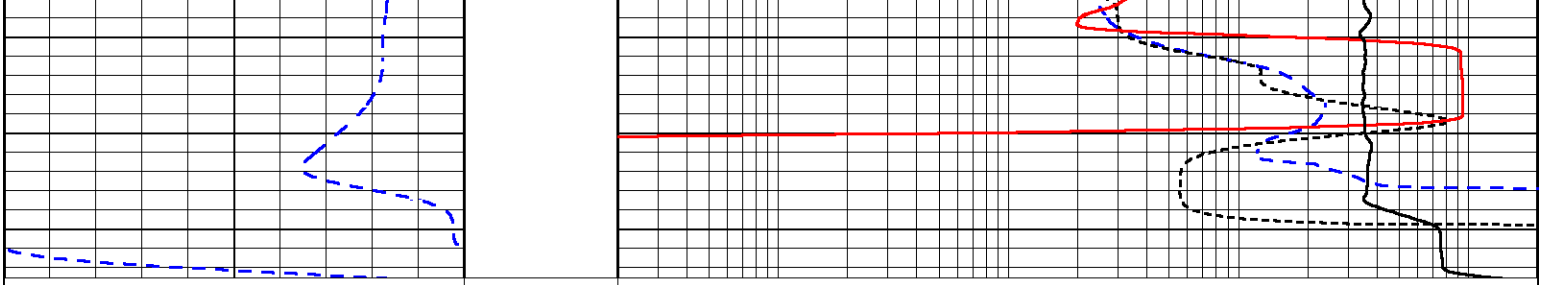
REPEAT SECTION

Database File	murfin_hamit_2-20.db
Dataset Pathname	STACK/pass3.1
Presentation Format	dil
Dataset Creation	Tue Nov 14 07:34:22 2017
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





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

Calibration Report

Database File	murfin_hamit_2-20.db
Dataset Pathname	STACK/pass9.1
Dataset Creation	Tue Nov 14 07:27:01 2017

Dual Induction Calibration Report

Serial-Model:	PSI 91-M&W
Calibration Performed:	Thu Nov 09 00:57:24 2017

	Readings		References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	166.796	835.089	0.000	255.800	mmho/m	0.430	-31.500
Medium	142.009	1348.560	0.000	255.800	mmho/m	0.360	-31.000

Microlog Calibration Report

Serial-Model:	PSI-01-PSIML
Performed:	Wed Nov 08 02:36:52 2017

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	-1.0000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	31000.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	100.0000	-97.3500

Compensated Density Calibration Report

Serial-Model:	90-1031-M&W
Source / Verifier:	16955B / 2ci
Master Calibration Performed:	Wed Nov 08 23:24:34 2017

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4903.44	6153.79	cps
Aluminum	2.640	g/cc	934.50	4021.31	cps

Spine Angle = 75.61

Density/Spine Ratio = 0.517

Size	Reading

Small Ring	8.00	in	1.84
Large Ring	22.00	in	1.46

Compensated Neutron Calibration Report

Serial Number: 207-MW
Tool Model: M&W
Calibration Performed: WED SEP 6 10:30:30 2017

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: Wed Sep 06 19:51:14 2017

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps

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Company	MURFIN DRILLING COMPANY, INC.
Well	HAMIT UNIT #2-20
Field	WILDCAT
County	ROOKS
State	KANSAS