



PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company **RICHLAN DRILLING**
Well **KUHLMAN FARMS INC. A NO.1**
Field **ELAINE WEST**
County **LOGAN** State **KANSAS**

Location: API #: 15-109-21514-00-00

Other Services

1180' FSL & 1770' FEL
SEC 4 TWP 12S RGE 34W

CNL/CDL
MEL

Permanent Datum GROUND LEVEL Elevation 3221'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Elevation
K.B. 3226'
D.F. N/A
G.L. 3221'

Date 8/7/2017

Run Number	ONE	
Depth Driller	4860'	
Depth Logger	4858'	
Bottom Logged Interval	4857'	
Top Log Interval	300'	
Casing Driller	8.625" @ 348'	
Casing Logger	347'	
Bit Size	7.875"	
Type Fluid in Hole	CHEMICAL	
Salinity, ppm CL	7,000	
Density / Viscosity	9.3 47	
pH / Fluid Loss	11.3 12.2	
Source of Sample	FLOWLINE	
Rm @ Meas. Temp	.55 @ 62	
Rmt @ Meas. Temp	.41 @ 62	
Rmc @ Meas. Temp	.74 @ 62	
Source of Rmt / Rmc	CHARTS	
Rm @ BHT	.27 @ 125	
Operating Rig Time	2 HOURS	
Max Rec. Temp. F	125 DEGF	
Equipment Number	108	
Location	HAYS	
Recorded By	J. HENRICKSON	
Witnessed By	WYATT URBAN	

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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.

MONUMENT KANSAS

4 SOUTH TO ZEST, WEST TO 310, 1 SOUTH, 1/2 WEST, NORTH 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: J. HENRICKSON
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

Primary Witness: WYATT URBAN
Secondary Witness:
Secondary Witness:
Secondary Witness:

Top - Bottom

A	BOREID	BOTTEMP	CASEOD	CASETHCK	FLUIDDEN	M	MATRXDEN
1	in 7.875	degF 125	in 5.5	in 0	g/cc 1	2	g/cc 2.71
NPORSEL	PERFS	SNDERR	SNDERRM	SPSHIFT	SRFTEMP	SZCOR	TDEPTH
Limestone	0	mmho/m 0	mmho/m 0	mV -270	degF 68	Off	ft 4858

Sensor	Offset (ft)	Schematic		Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58			GR-M&W (89-M&W)	3.00	3.50	50.00
CNLSC	37.48			CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	36.73						
LSD DCAL SSD	28.43 28.42 27.93			CDL-M&W (168-986)	8.50	4.00	250.00
ML-PSI STKBL ML (PSI-02) Stackable Microlog Tools	7.58				7.58	4.00	65.00
MCAL	19.83						
MI	19.83						
MN	19.83						
RLL3	15.80						
RLL3F	15.79						
CILD	8.00			DIL-M&W (1987)	18.50	3.50	220.00

CILM

4.70

SP

0.20

Dataset: richlan_kuhlman_farms_a_1.db: field/well/stackml/pass3.1
Total length: 43.08 ft
Total weight: 685.00 lb
O.D.: 4.00 in



MAIN PASS

Database File richlan_kuhlman_farms_a_1.db
Dataset Pathname stackml/pass3.1
Presentation Format dil2in
Dataset Creation Mon Aug 07 02:56:15 2017
Charted by Depth in Feet scaled 1:600

0 GAMMA RAY (GAPI) 150

2000 CONDUCTIVITY (mmho/m) 0

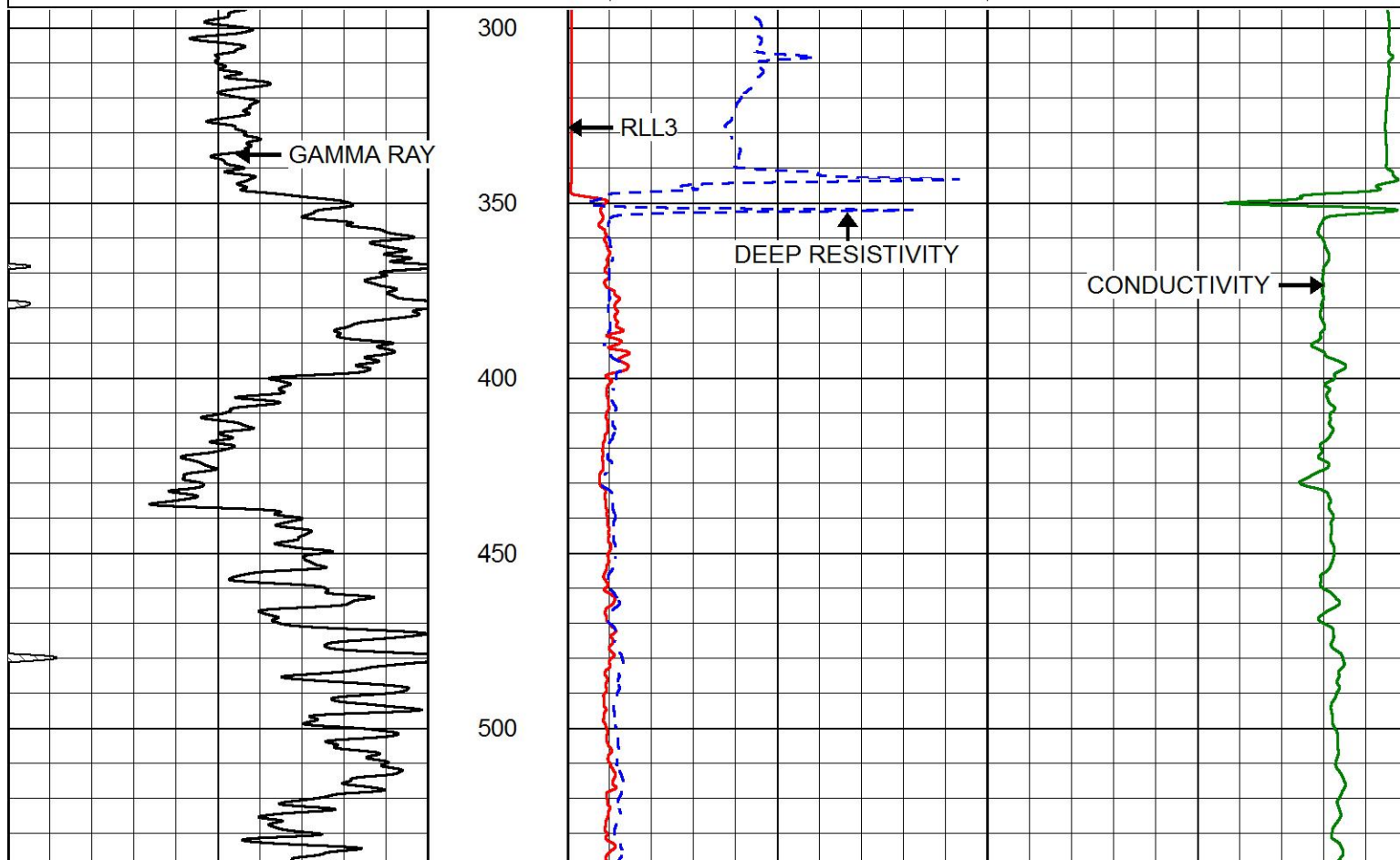
0 RLL3 (Ohm-m) 50

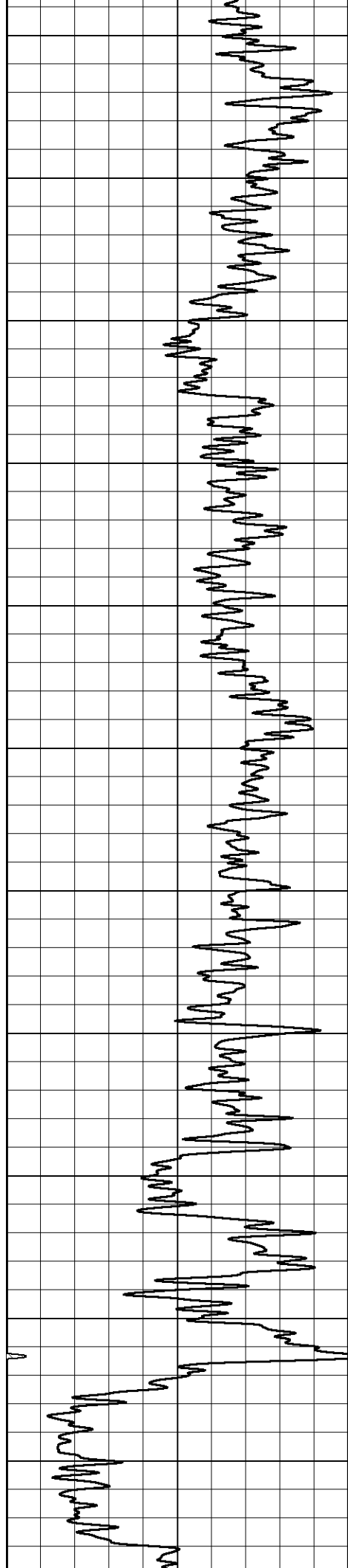
0 DEEP RESISTIVITY (Ohm-m) 50

50 RLL3 (Ohm-m) 500

DEEP RESISTIVITY

50 (Ohm-m) 500





550

600

650

700

750

800

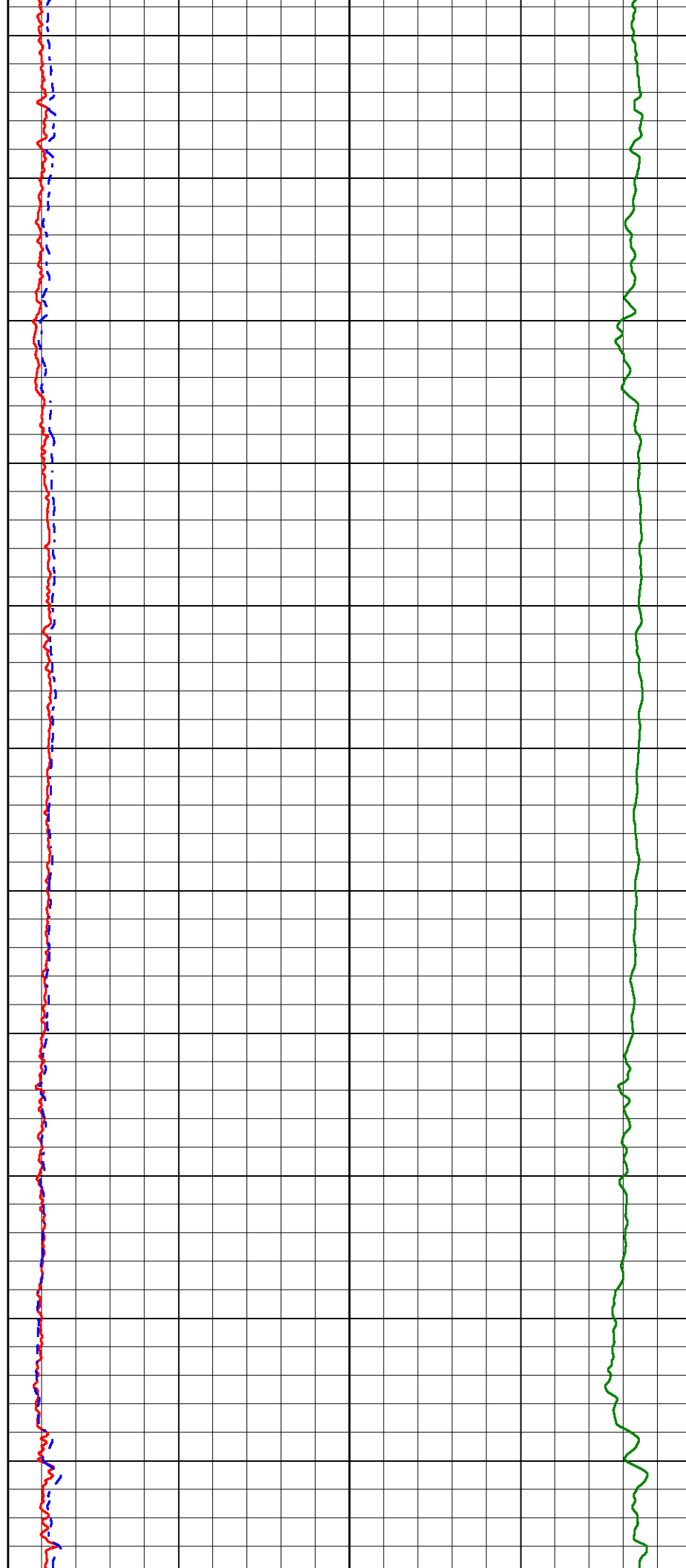
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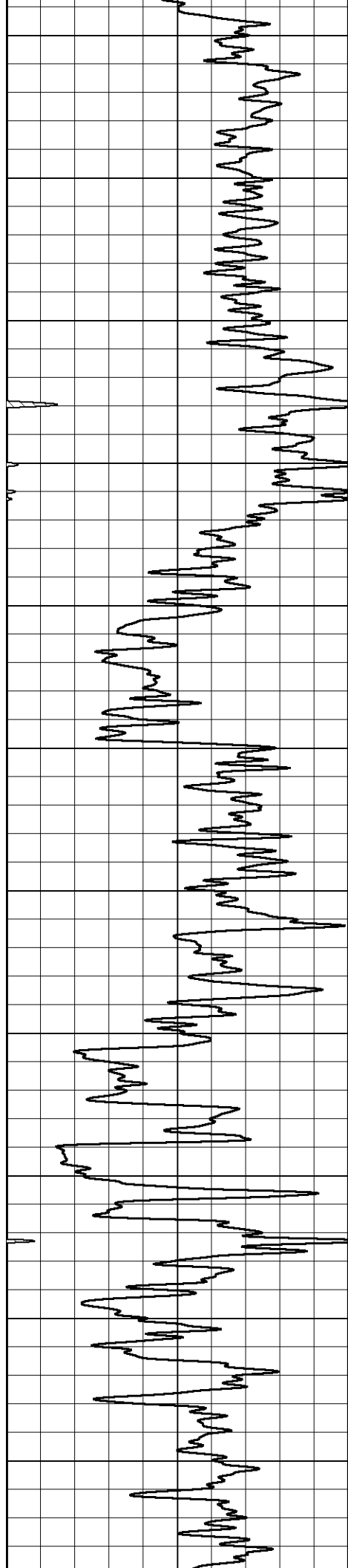
900

950

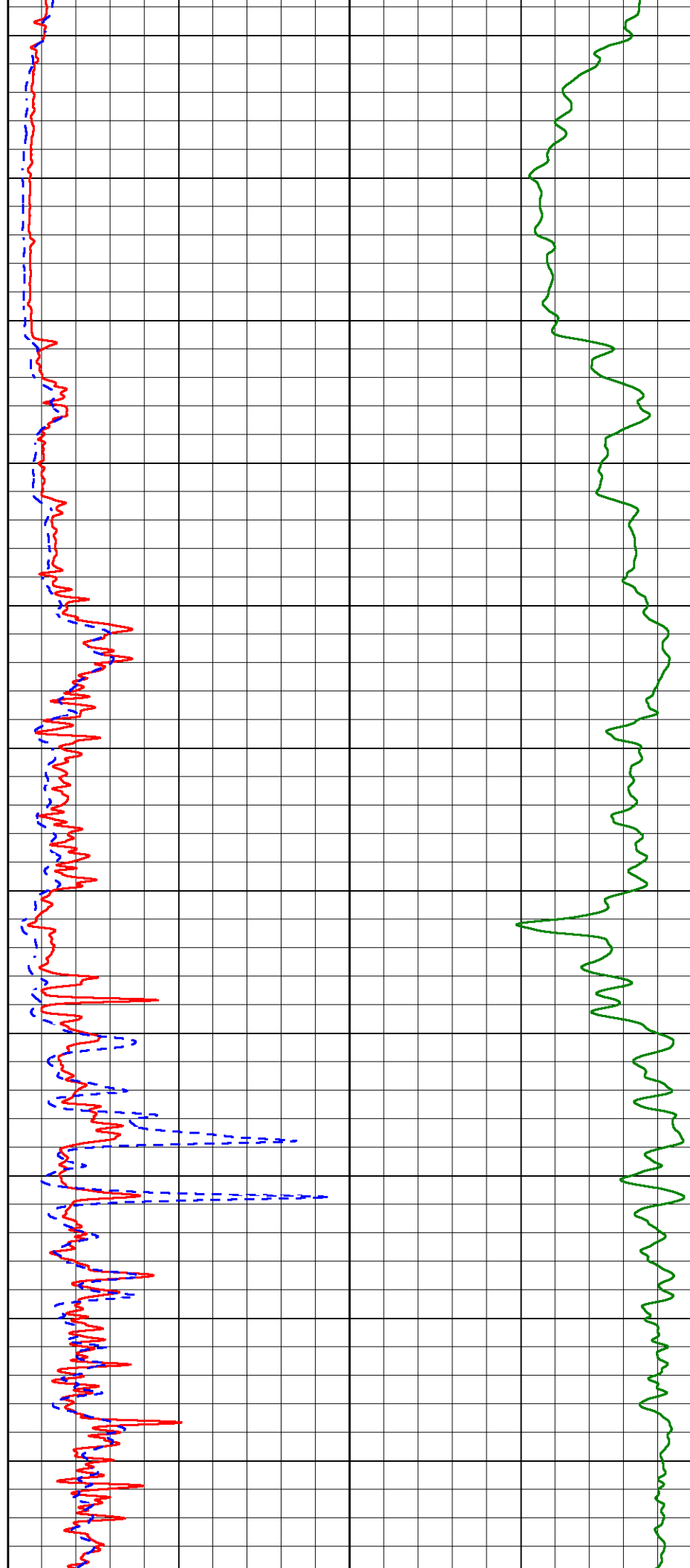
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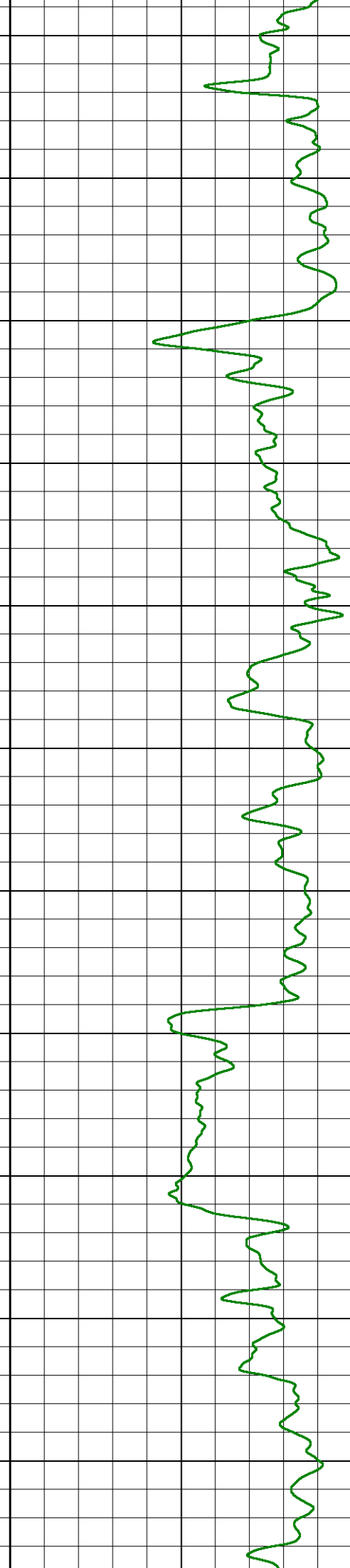
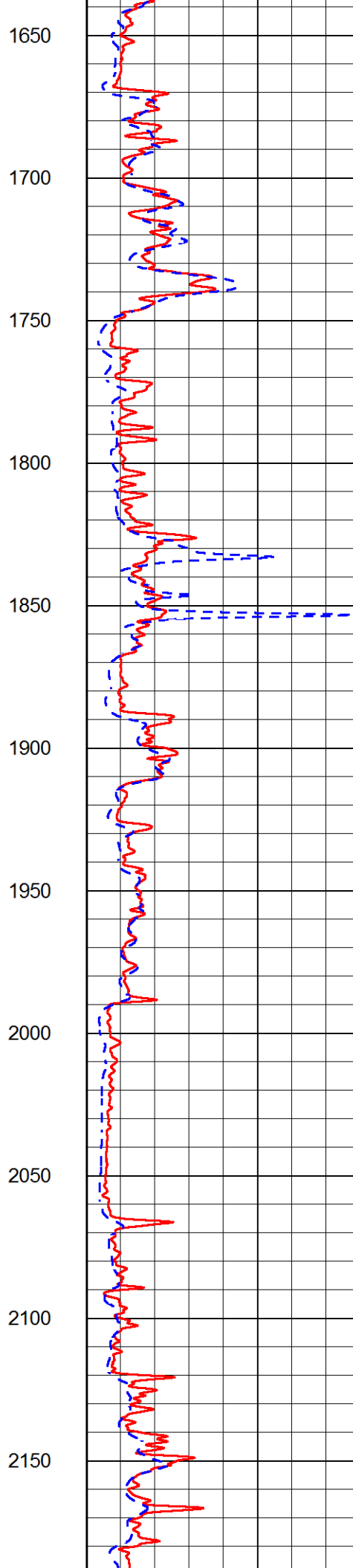
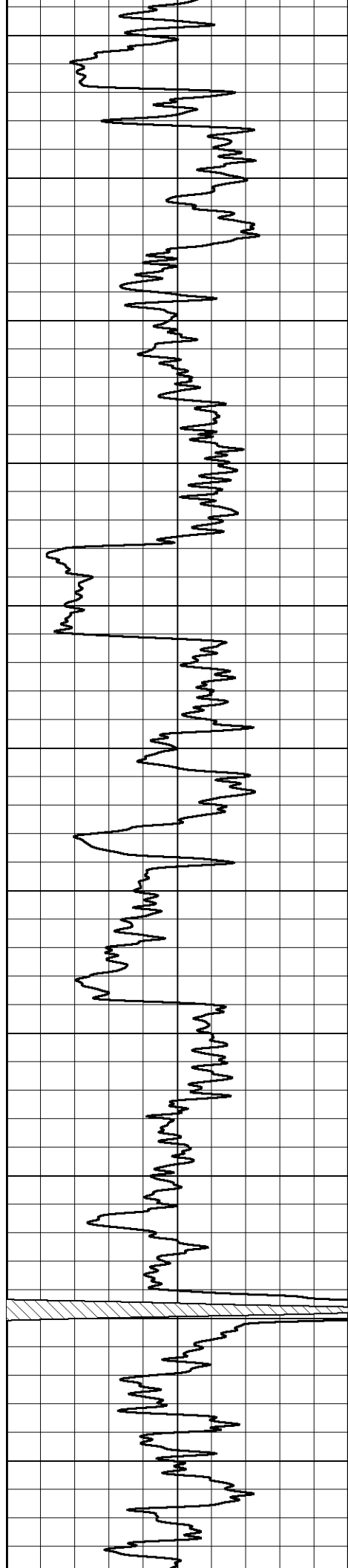
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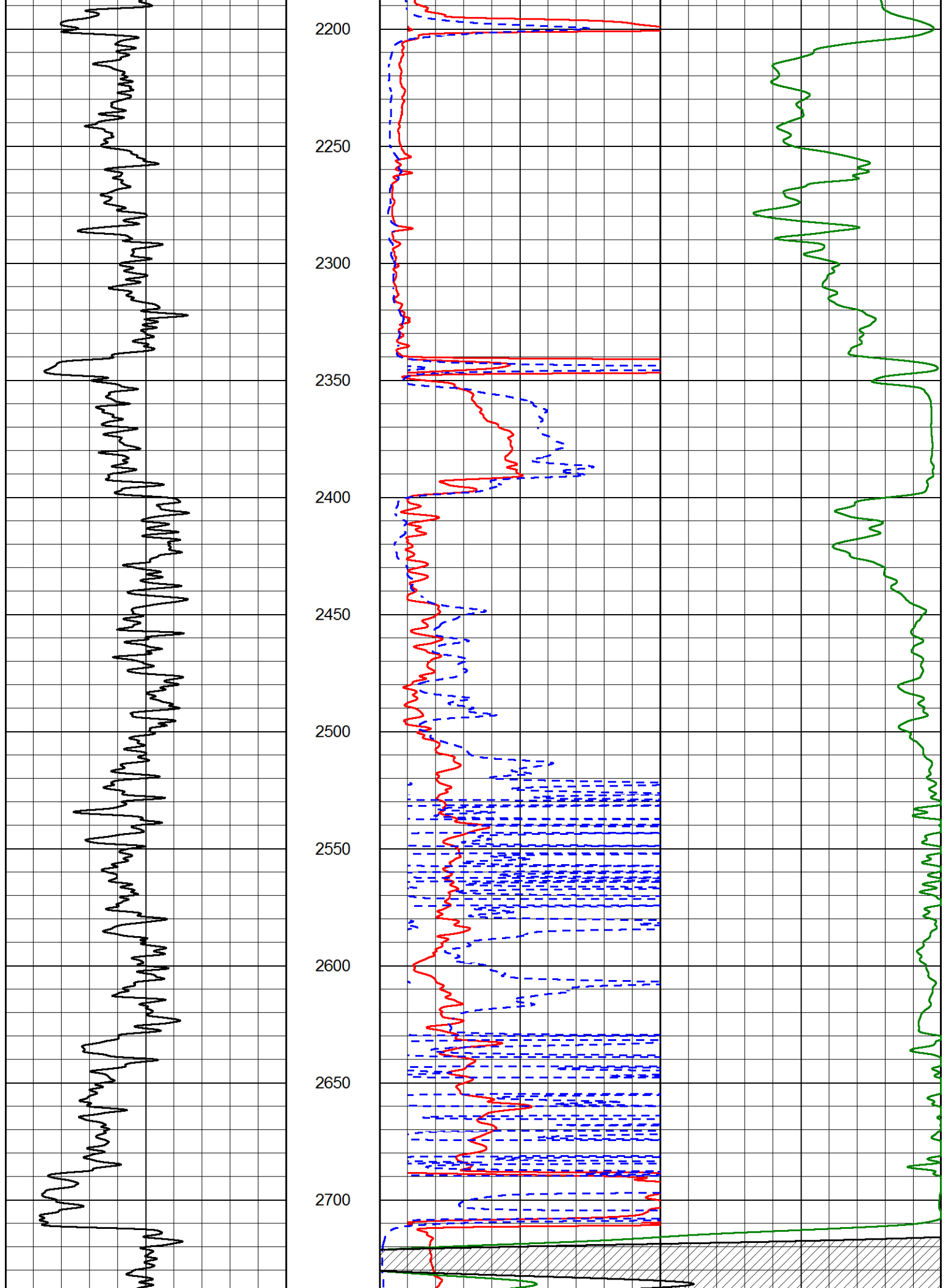


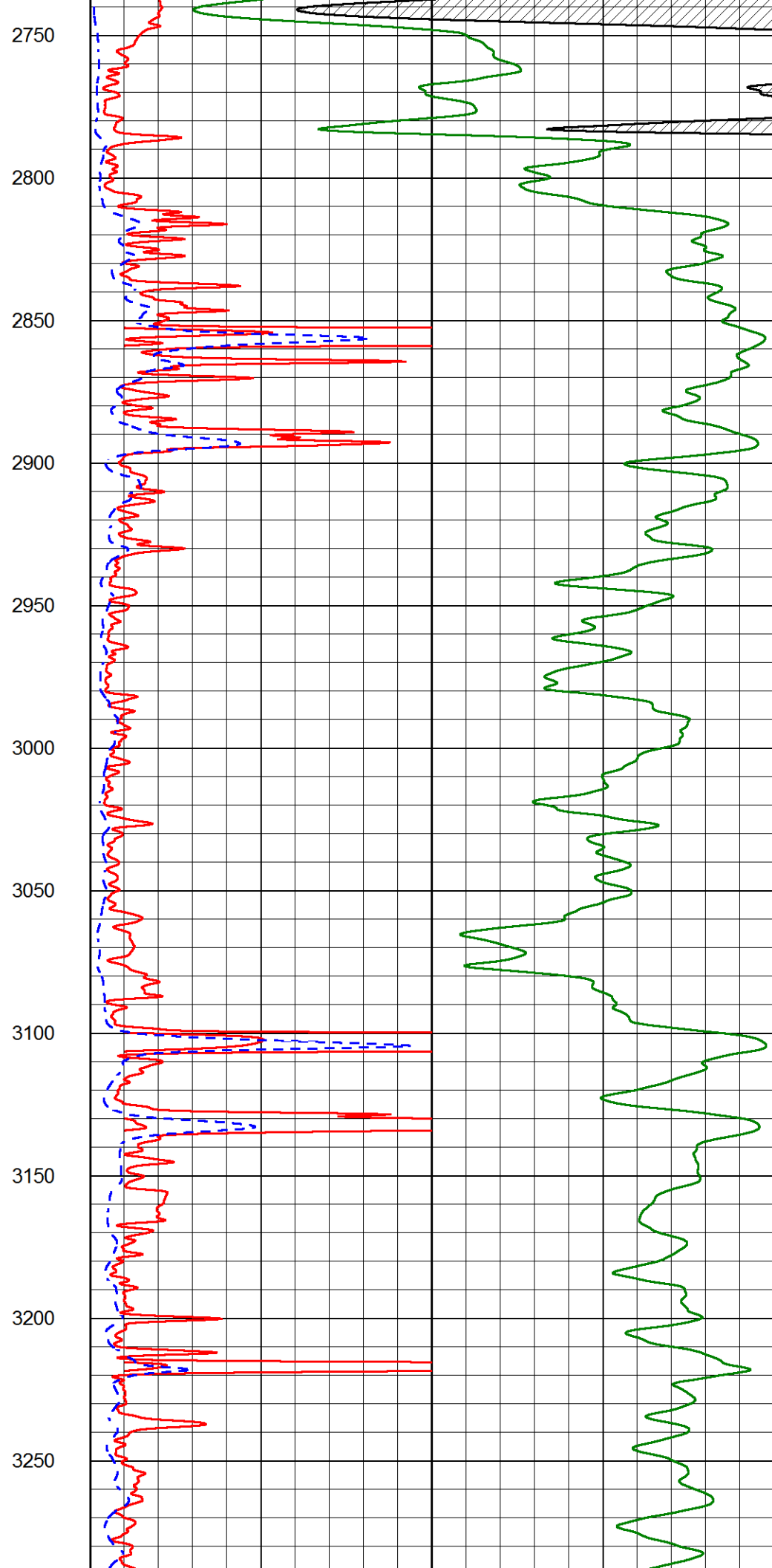
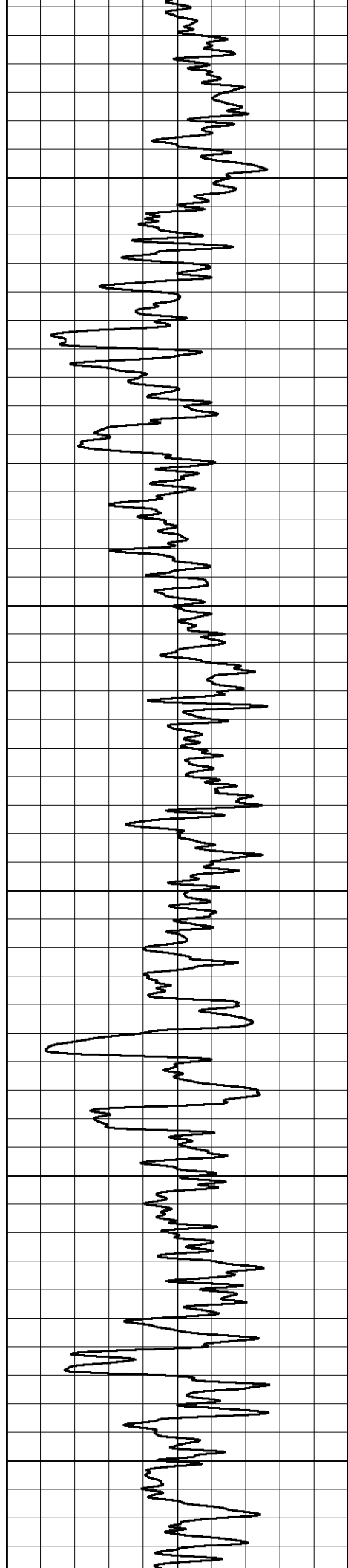


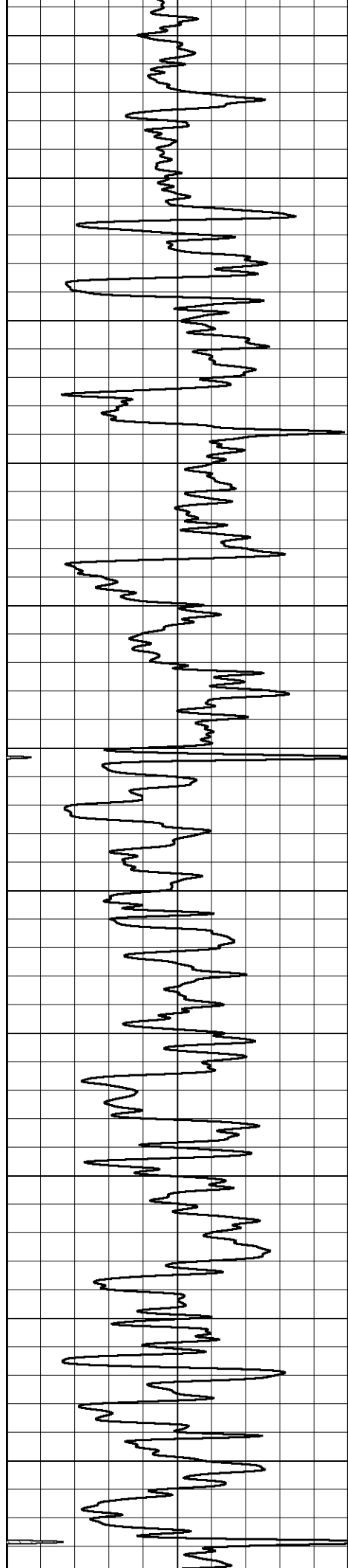
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600











3300

3350

3400

3450

3500

3550

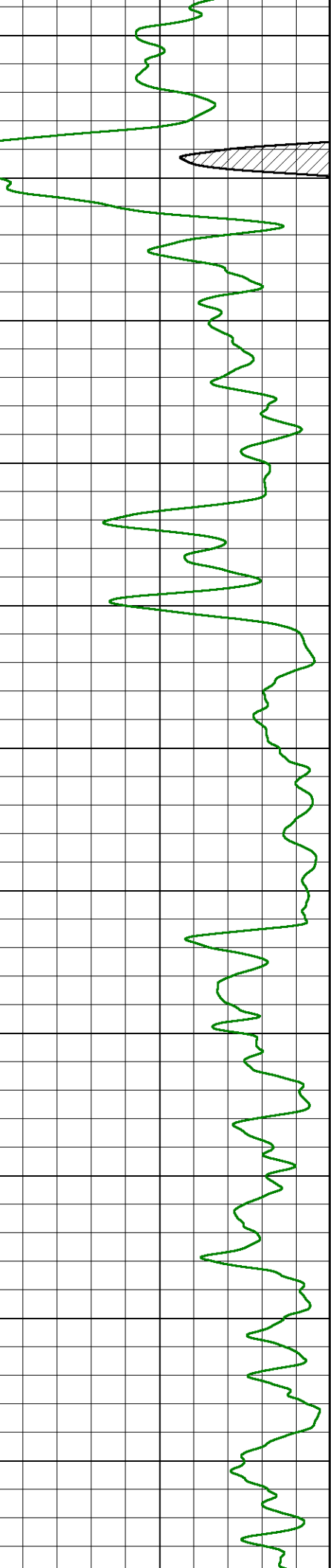
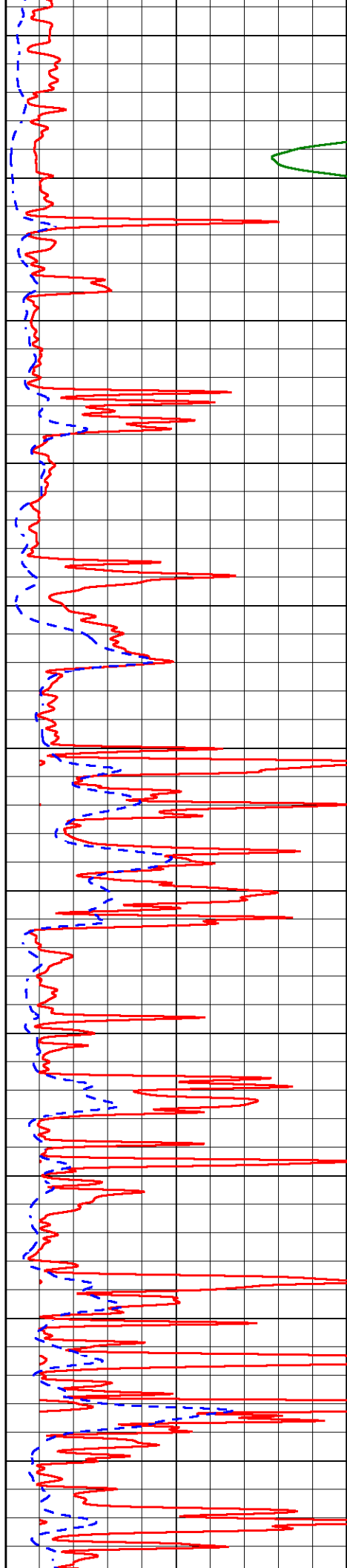
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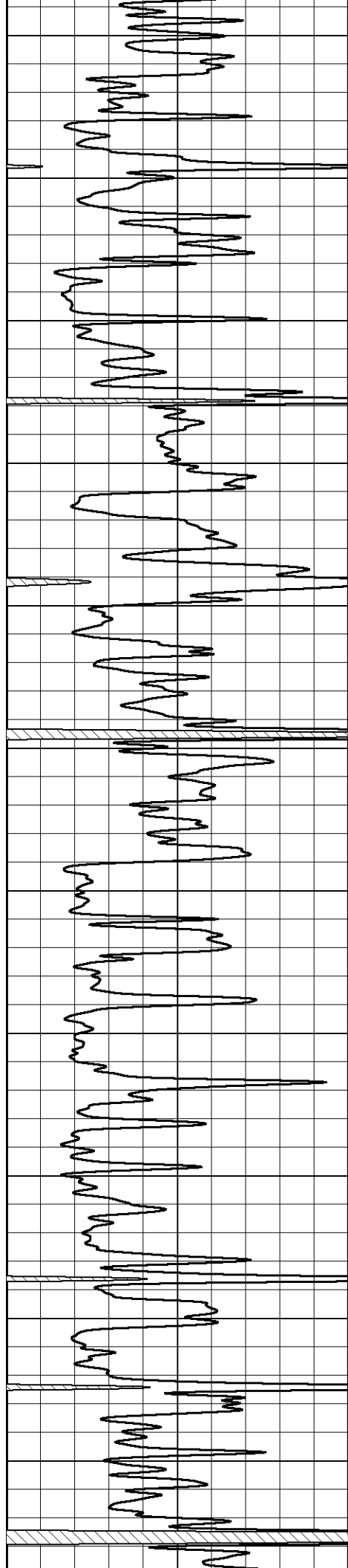
3650

3700

3750

3800





3850

3900

3950

4000

4050

4100

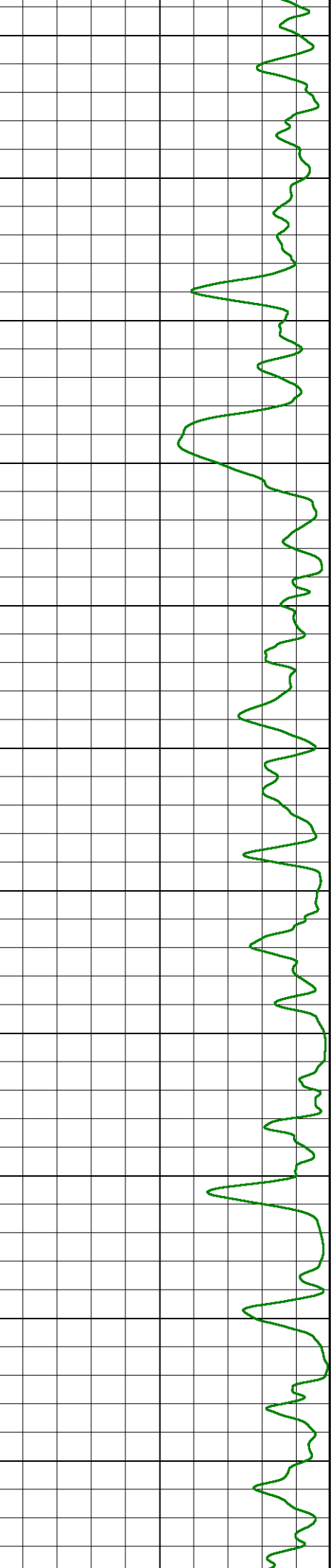
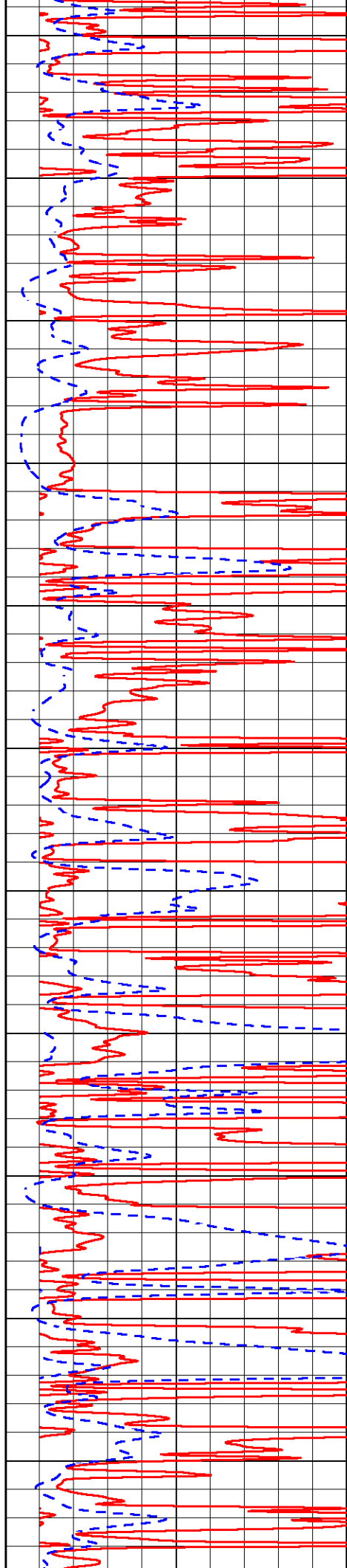
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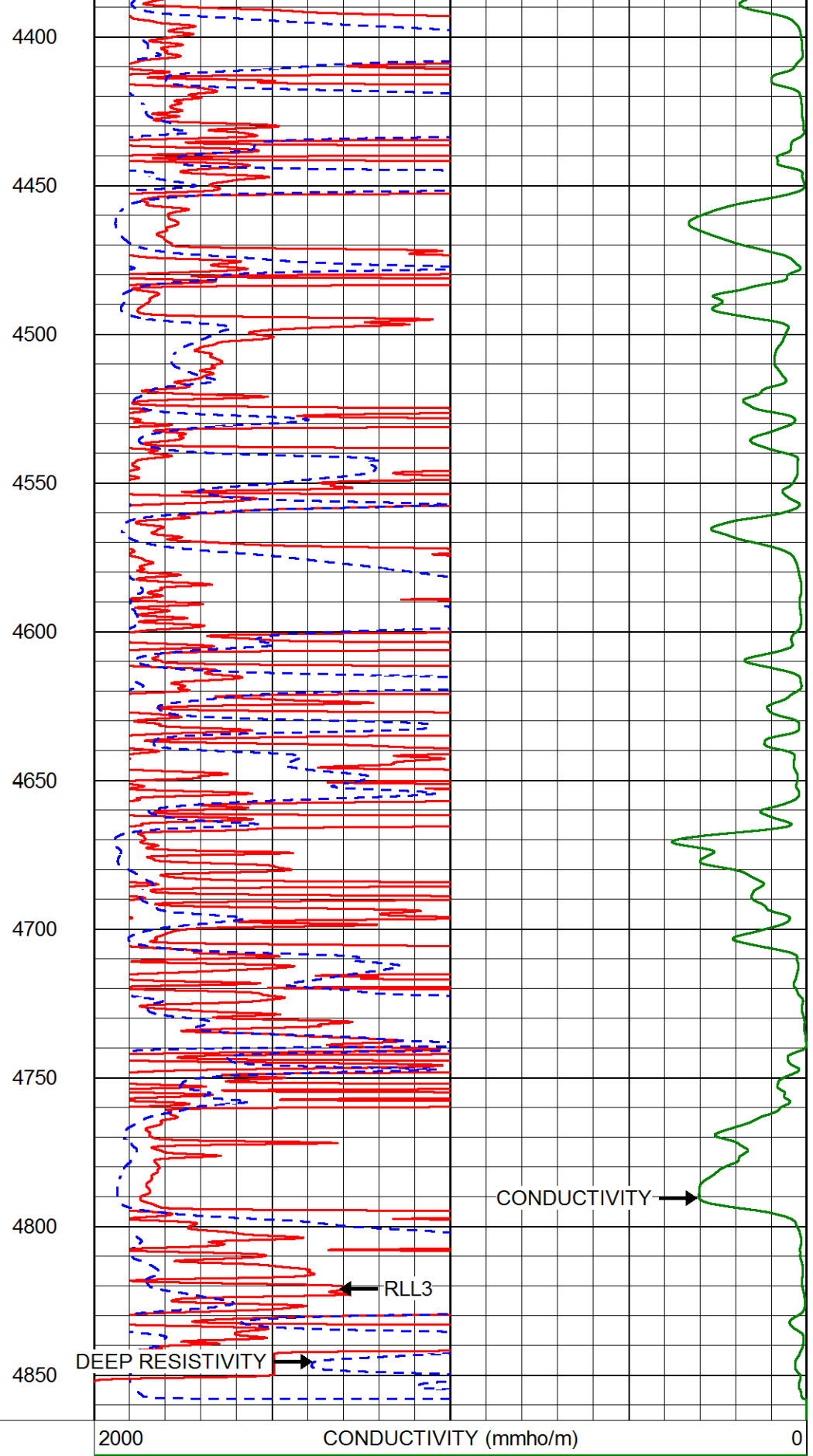
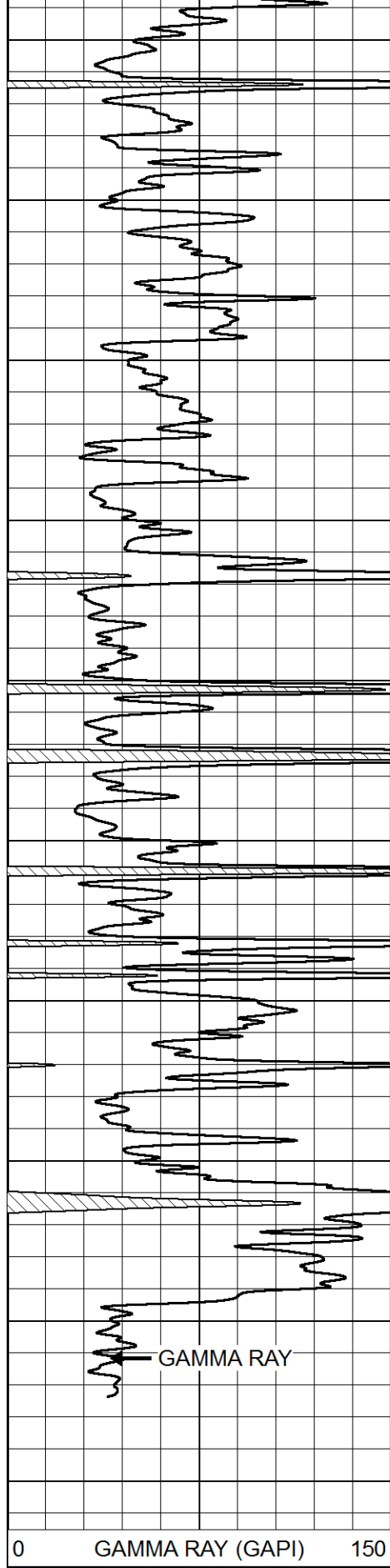
4200

4250

4300

4350





0 150

2000 0 CONDUCTIVITY (mmho/m)

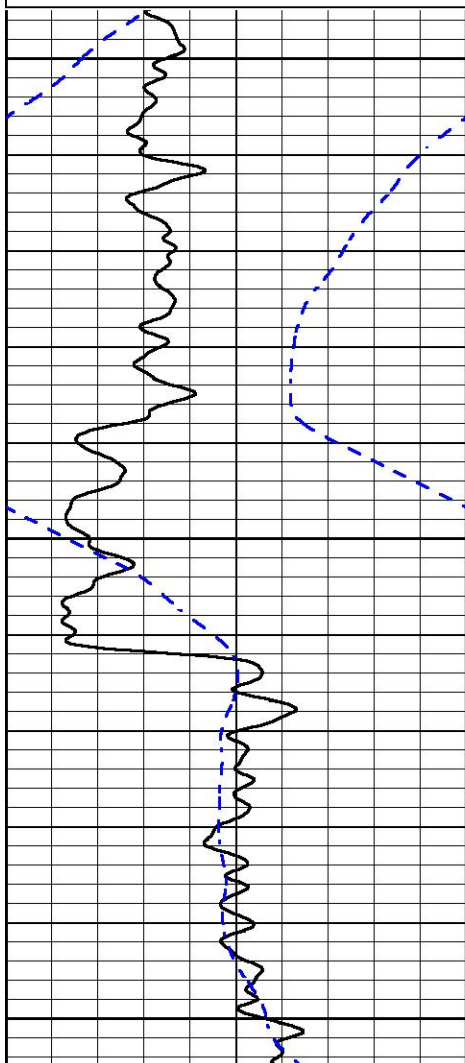
0	RLL3 (Ohm-m)	50
0	DEEP RESISTIVITY (Ohm-m)	50
50	RLL3 (Ohm-m)	500
DEEP RESISTIVITY		
50	(Ohm-m)	500

MAIN PASS

Database File richlan_kuhlman_farms_a_1.db
 Dataset Pathname stackml/pass3.1
 Presentation Format dil
 Dataset Creation Mon Aug 07 02:56:15 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
15000	LINE TENSION (lb)	0

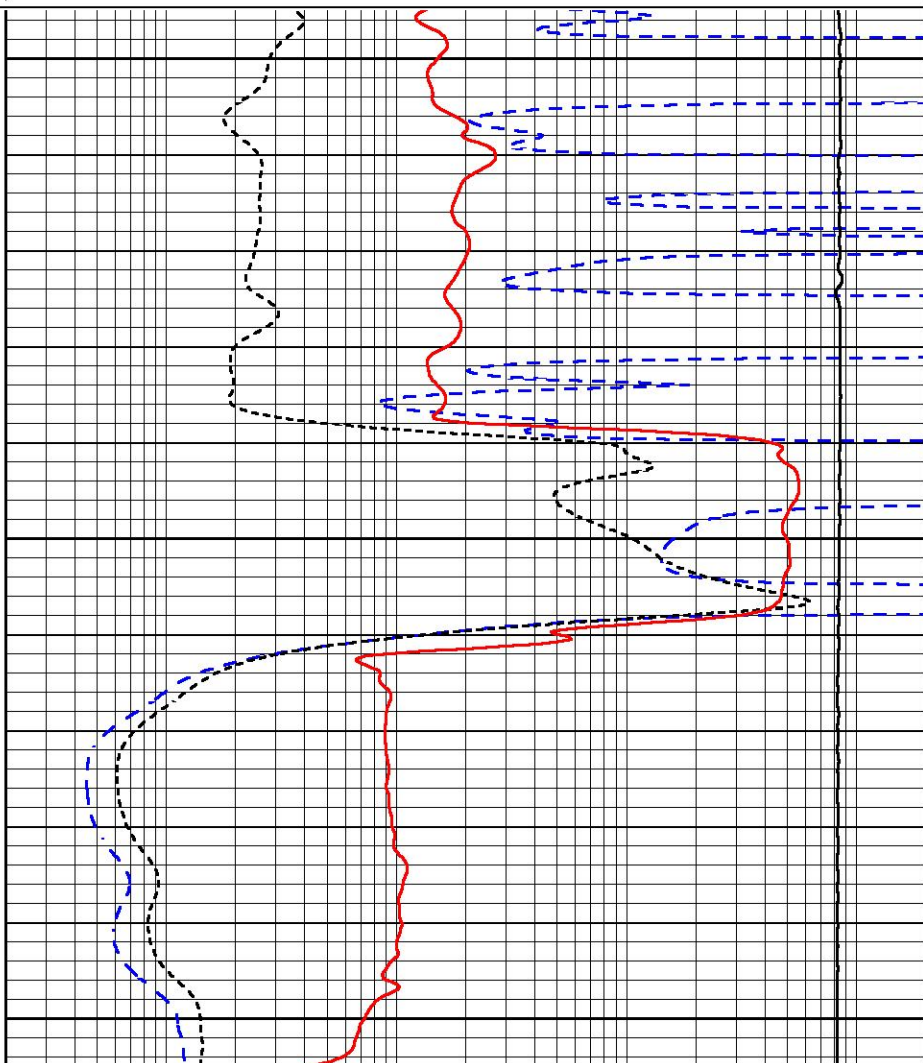


2650

2700

2750

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

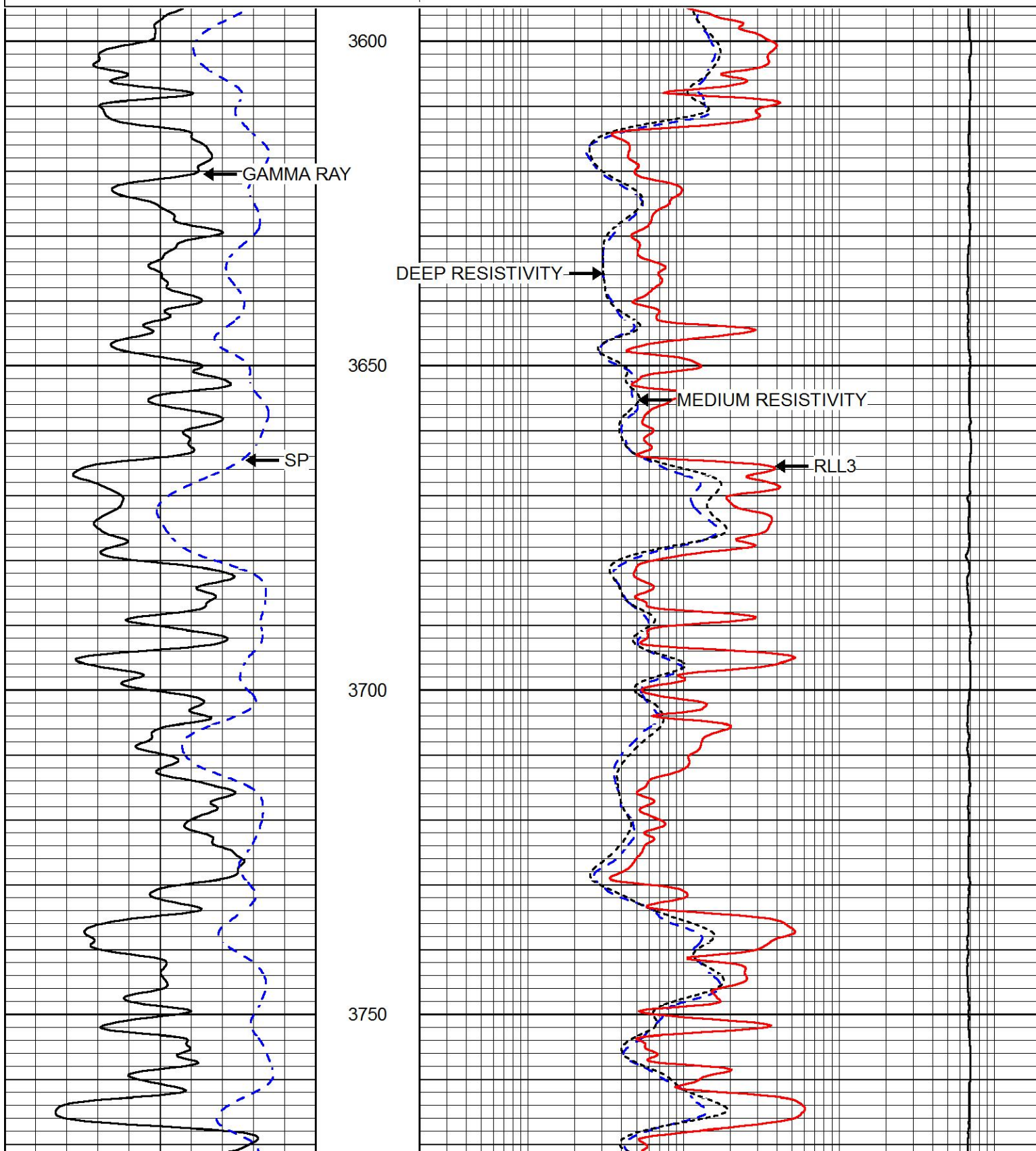


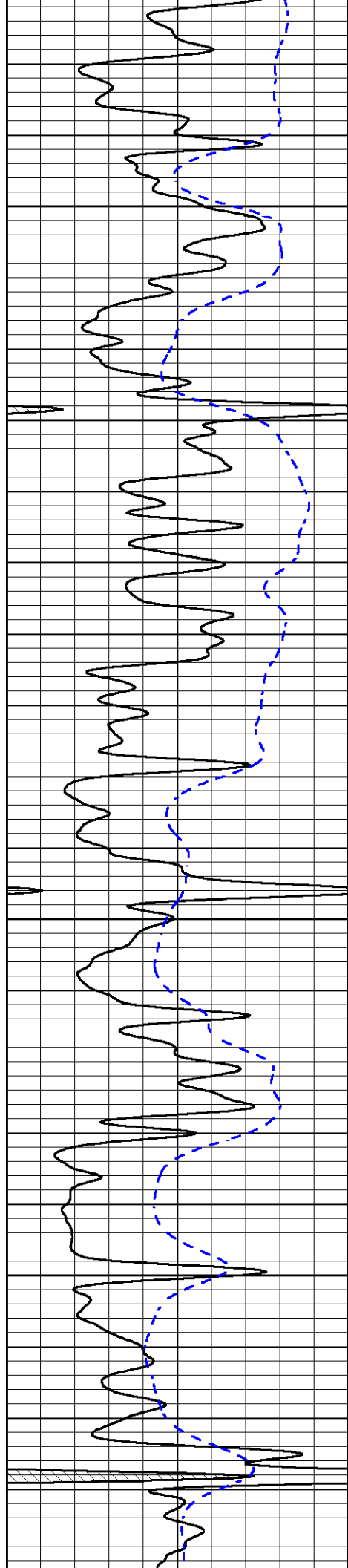
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

Database File richlan_kuhlman_farms_a_1.db
Dataset Pathname stackml/pass3.1
Presentation Format dil
Dataset Creation Mon Aug 07 02:56:15 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
15000	LINE TENSION (lb)	0



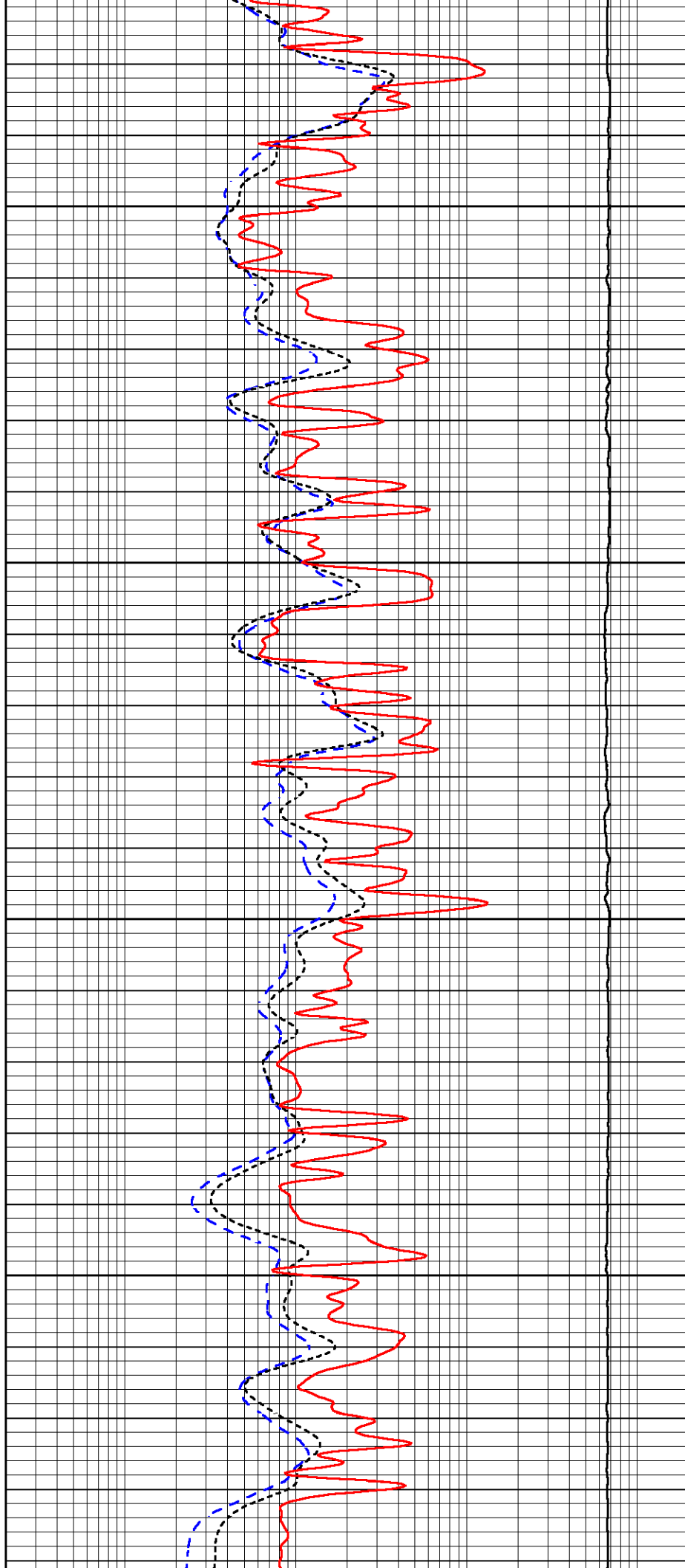


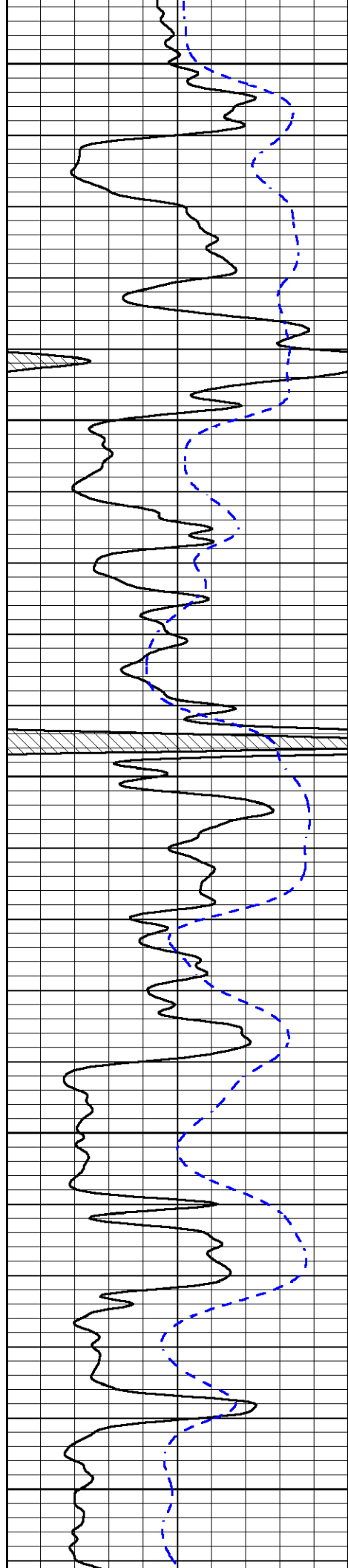
3800

3850

3900

3950





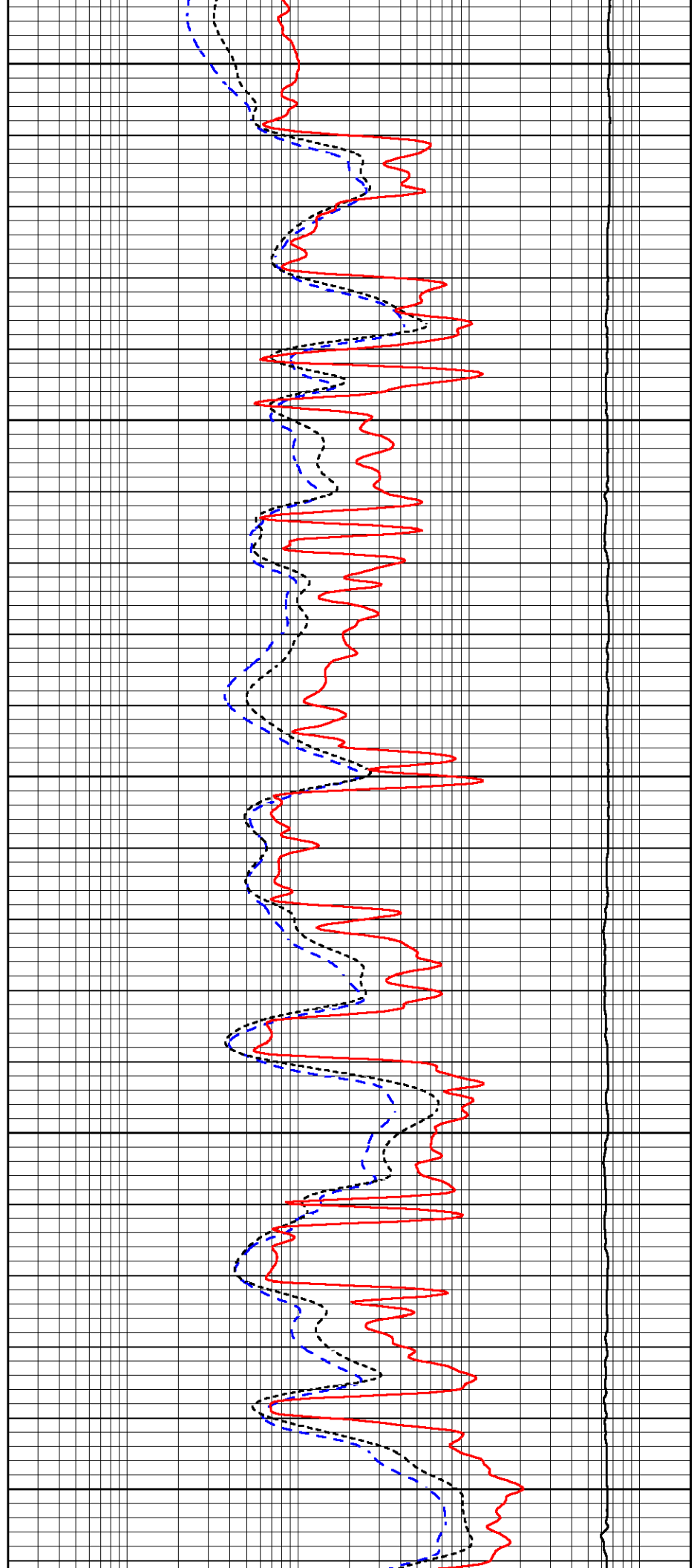
4000

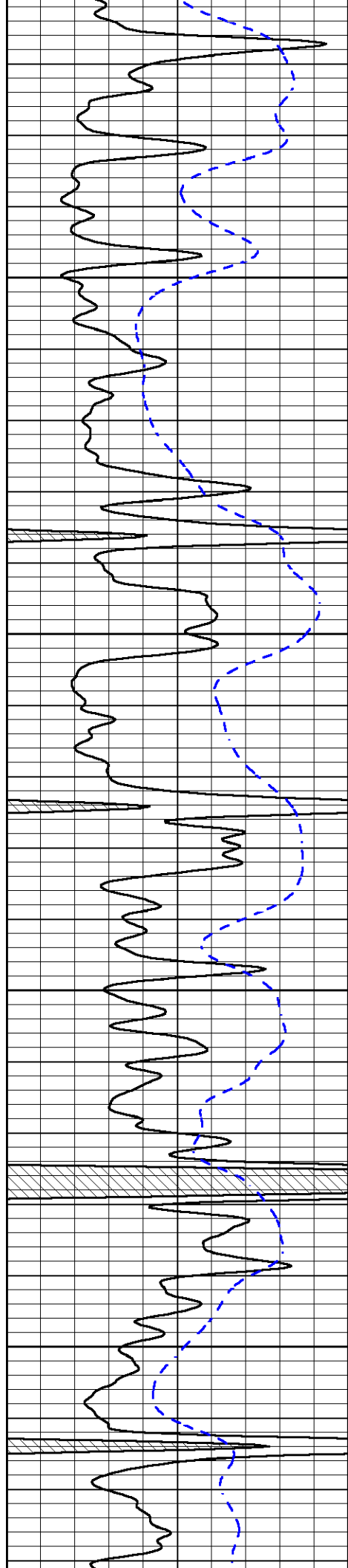
4050

4100

4150

4200



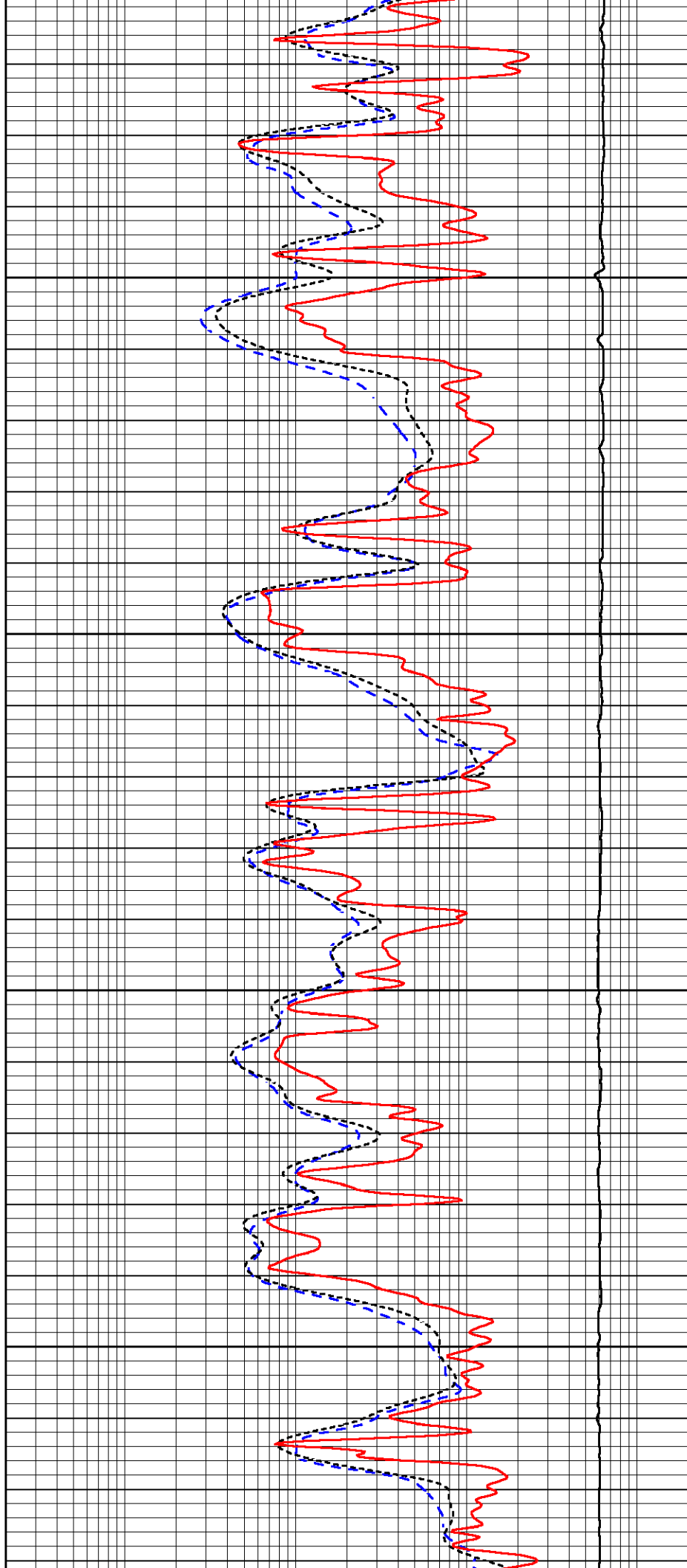


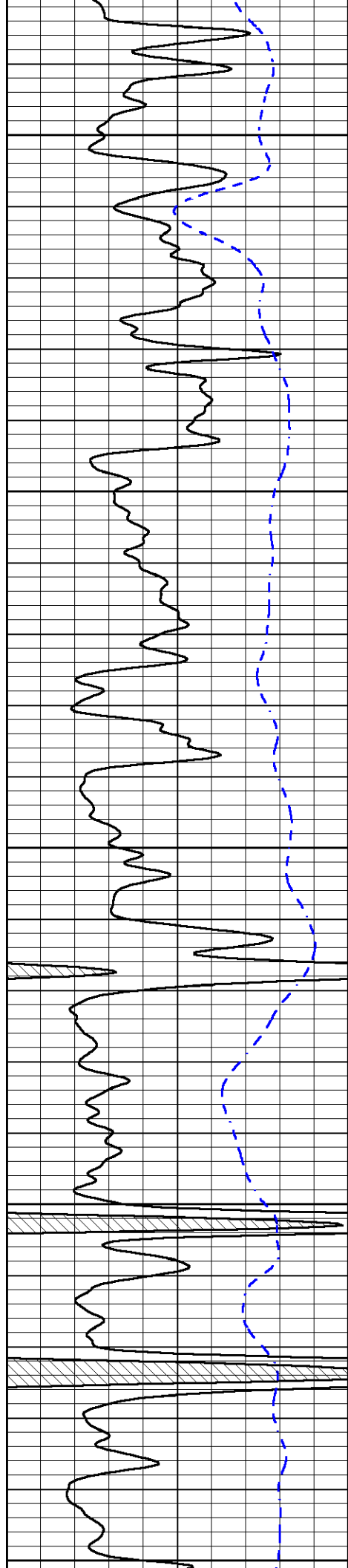
4250

4300

4350

4400





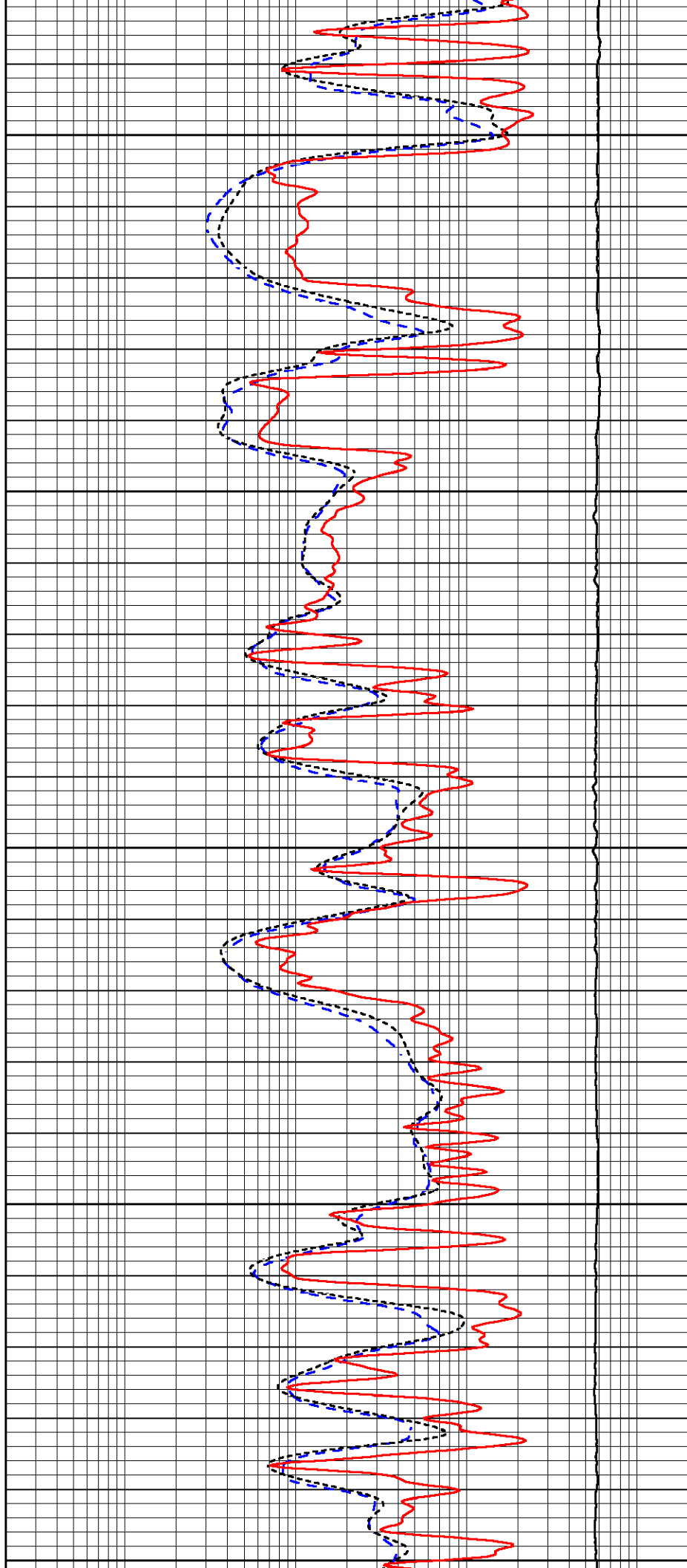
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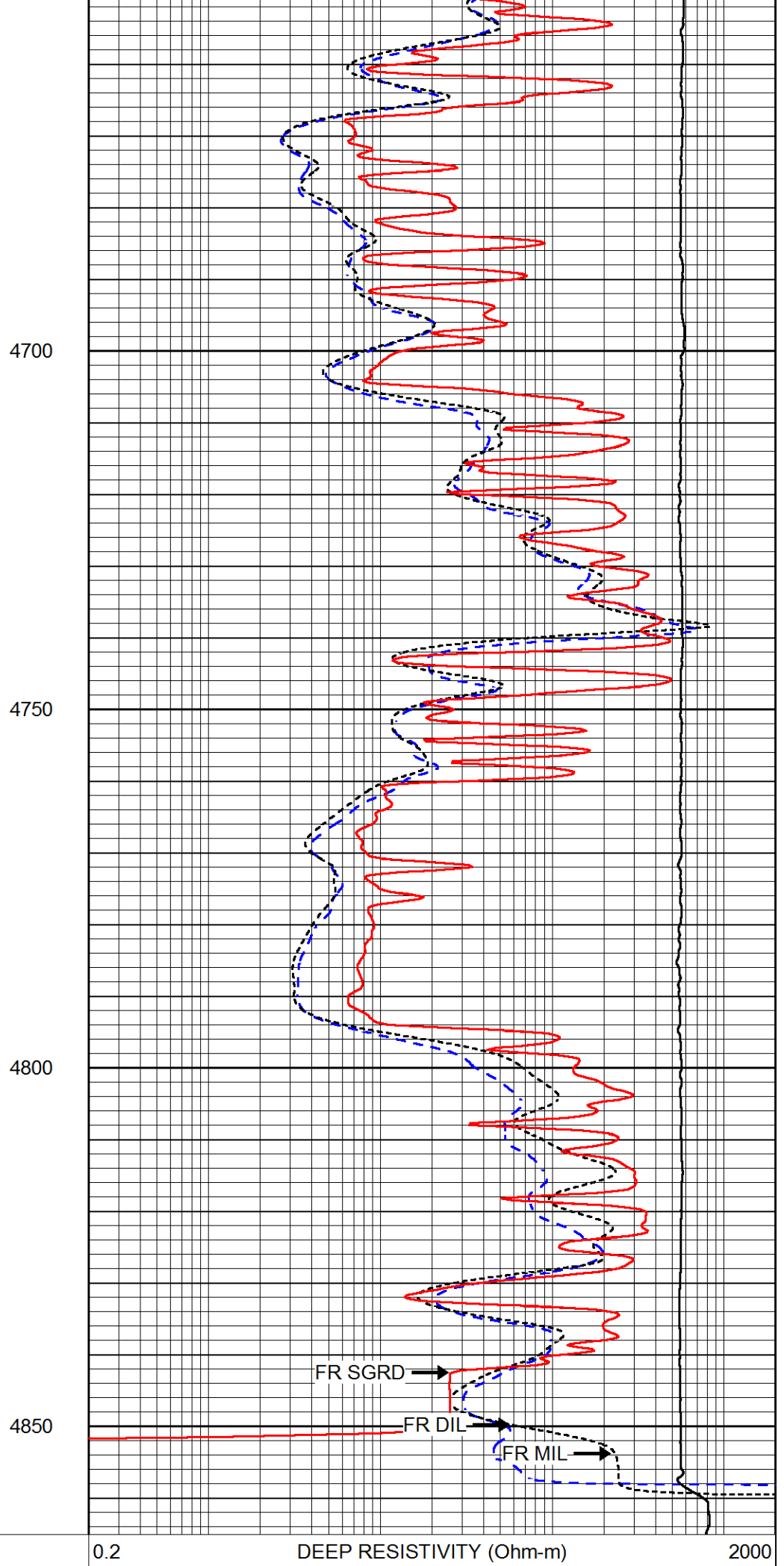
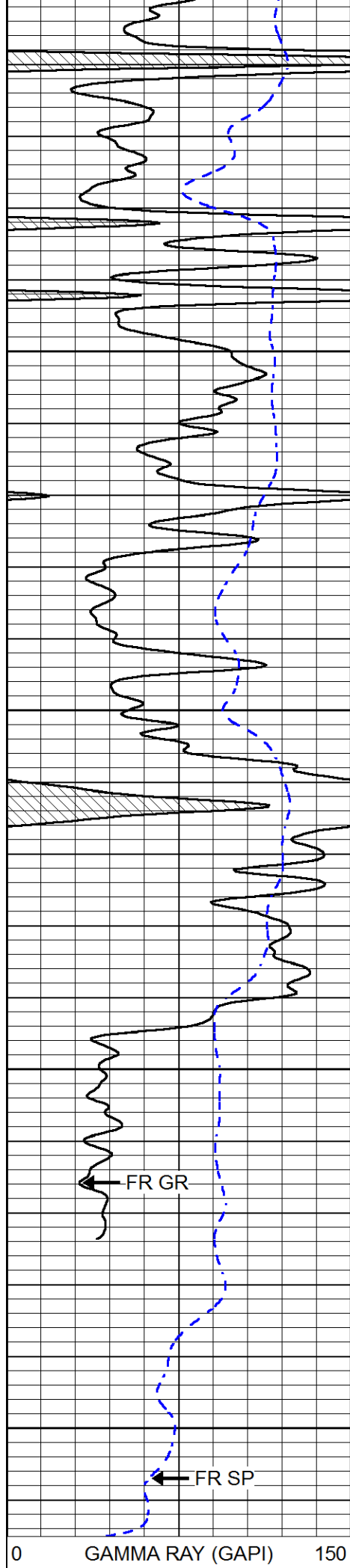
4500

4550

4600

4650





-200	SP (mV)	0
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0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

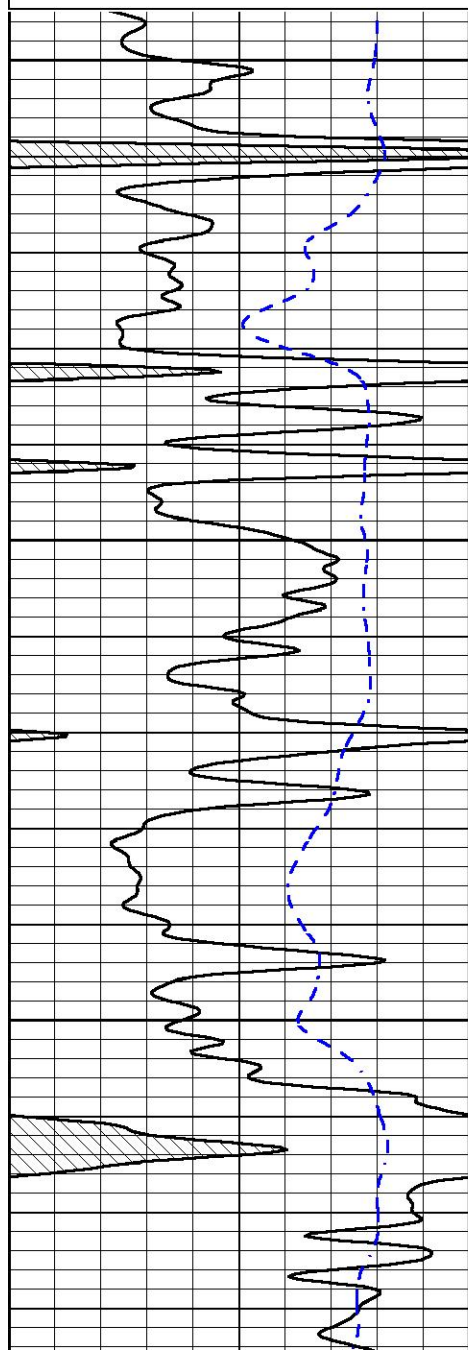


REPEAT SECTION

Database File richlan_kuhlman_farms_a_1.db
Dataset Pathname stackml/pass2.1
Presentation Format dil
Dataset Creation Mon Aug 07 02:36:37 2017
Charted by Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

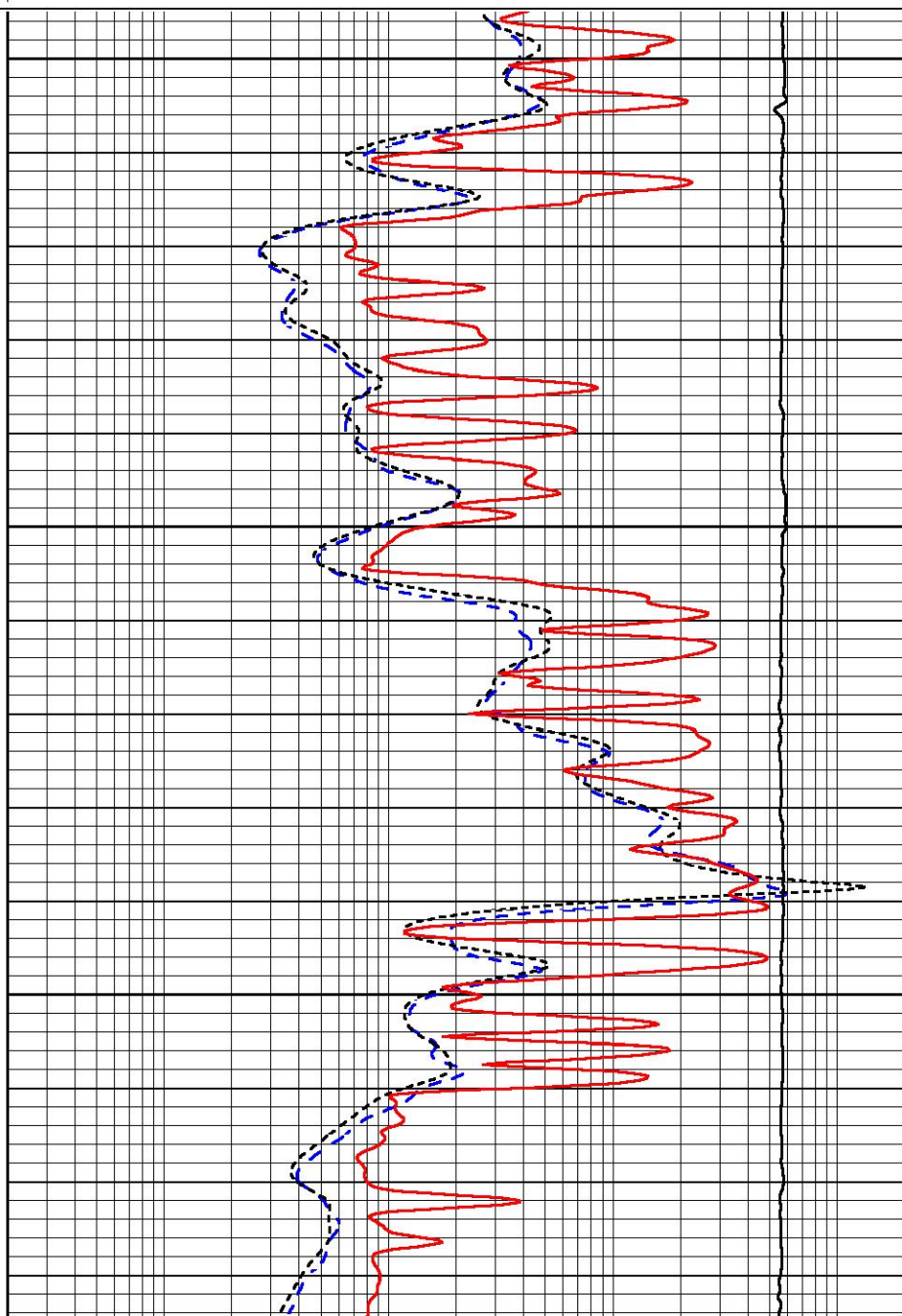
0.2	DEEP RESISTIVITY (Ohm-m)	2000
0.2	MEDIUM RESISTIVITY (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

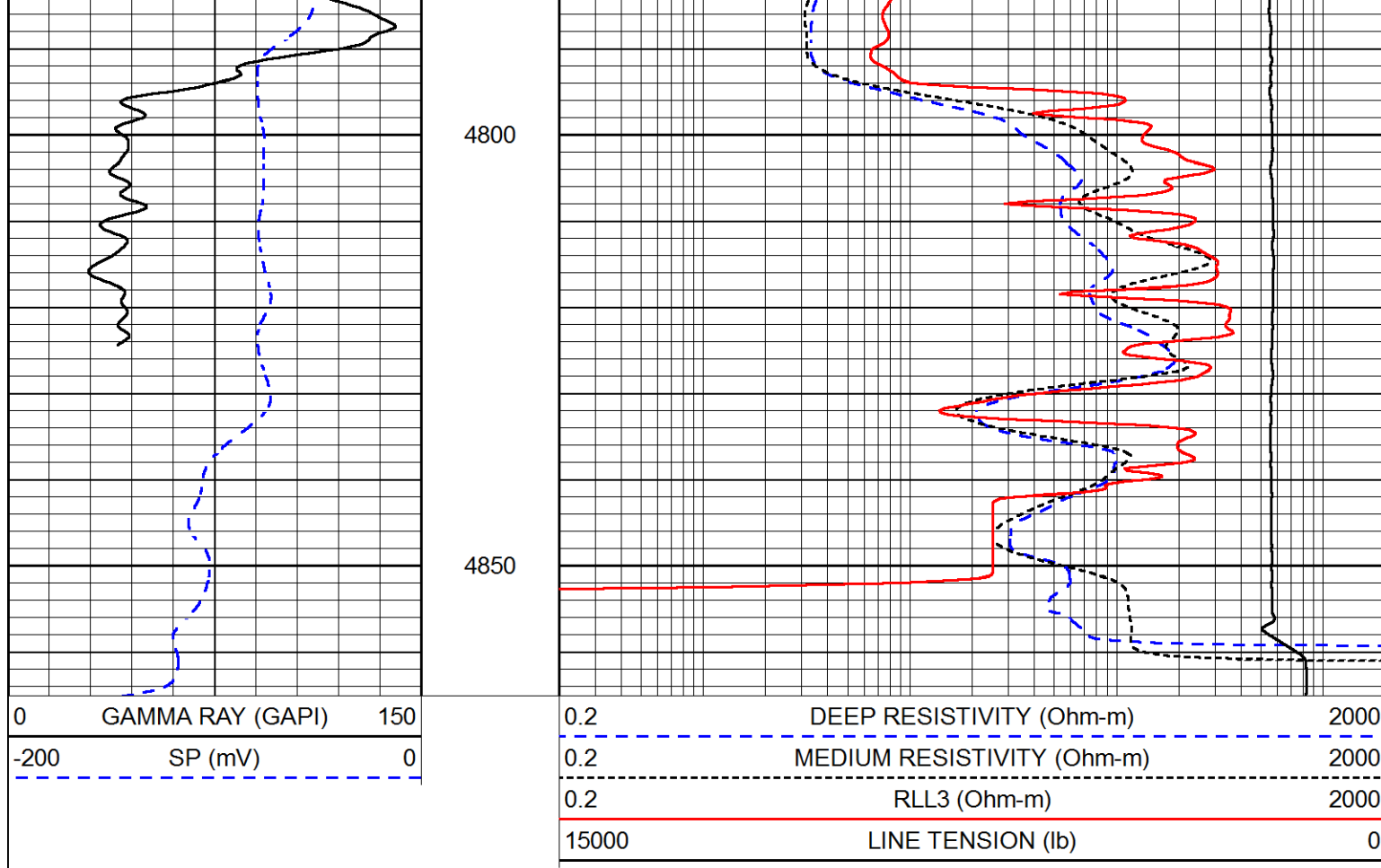


4650

4700

4750





Calibration Report

Database File richlan_kuhlman_farms_a_1.db
 Dataset Pathname stackml/pass3.1
 Dataset Creation Mon Aug 07 02:56:15 2017

Dual Induction Calibration Report

Serial-Model: 1987-M&W
 Calibration Performed: Tue Apr 11 16:07:38 2017

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.530	-36.500
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.440	-110.500

Microlog Calibration Report

Serial-Model: PSI-02-PSI STKBL ML
 Performed: Fri Jun 23 00:25:19 2017

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0031	0.0043	0.0000	10.0000	Ohm-m	16000.0000	-0.5000
Inverse	0.0000	0.0013	0.0000	10.0000	Ohm-m	17000.0000	0.0000
Caliper	1.0020	1.0834	5.5000	16.5000	in	135.1560	-131.6000

Compensated Density Calibration Report

Serial-Model:
Source / Verifier:
Master Calibration Performed:

168-986-M&W
/
Tue Apr 11 16:07:47 2017

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4691.86	4818.19	cps
Aluminum	2.675	g/cc	859.57	3020.22	cps
Spine Angle = 74.61			Density/Spine Ratio = 0.523		
	Size		Reading		
Small Ring	4.00	in	1.03		
Large Ring	14.00	in	1.23		

Compensated Neutron Calibration Report

Serial Number: tk10-MW
Tool Model: M&W
Calibration Performed: Wed Nov 16 11:21:36 2016

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-M&W
Tool Model: M&W
Calibration Performed: Tue Apr 11 16:08:01 2017

Calibrator Value: 1000.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 6.2 cps

Sensitivity: 0.5200 GAPI/cps



Company RICHLAN DRILLING
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