



MIDWEST WIRELINE

# DUAL INDUCTION LOG

Company **Howell Oil Company, Inc.**  
 Well **Dole #6**  
 Field **Burton**  
 County **Reno** State **Kansas**

Location: **API #: 15-155-21779-00-00**  
**1600' FSL & 1065' FEL**  
 SEC 13 TWP 23S RGE 4W  
 Permanent Datum **Ground Level** Elevation **1468'**  
 Log Measured From **Kelly Bushing**  
 Drilling Measured From **Kelly Bushing**  
 Other Services **CNL/CDL**

Date	9/30/2020
Run Number	One
Depth Driller	3561'
Depth Logger	3558'
Bottom Logged Interval	3557'
Top Log Interval	300'
Casing Driller	13.375" @ 302'
Casing Logger	295'
Bit Size	7.875"
Type Fluid in Hole	Chemical
Salinity, ppm CL	2110
Density / Viscosity	9.55 53
pH / Fluid Loss	10.5 8.8
Source of Sample	FLOWLINE
Rm @ Meas. Temp	0.50 @ 60
Rmt @ Meas. Temp	0.38 @ 60
Rmc @ Meas. Temp	0.68 @ 60
Source of Rmf / Rmc	CHARTS
Rm @ BHT	0.27 @ 112
Operating Rig Time	2 Hours
Max Rec. Temp. F	112
Equipment Number	P-24
Location	HAYS
Recorded By	D. Schmidt
Witnessed By	Larry Ressler

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All interpretations are opinions based on inferences from electrical or other measurements and Midwest Wireline LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Midwest Wireline 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.

Burton,  
 West to Woodberry, 1 North, 1/2 West,  
 North into

Log Measured From: Kelly Bushing 12 Ft. Above Permanent Datum

THANK YOU FOR USING MIDWEST WIRELINE LLC  
 785-625-3858

### Your Midwest Wireline Crew

Engineer: D. Schmidt  
 Operator:  
 Operator:  
 Operator:

### This Log Record Was Witnessed By

Primary Witness: Larry Ressler  
 Secondary Witness: Roger Martin  
 Secondary Witness:  
 Secondary Witness:

Case No	Offset (ft)	Depth (ft)	Description	Length (ft)	O.D. (in)	Weight (lb)
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Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	33.00		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	29.90 29.15		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	20.85 20.83 20.35		CDL-M&W (126-4040)	8.50	4.00	250.00
RLL3F RLL3	15.80 15.80		DIL-PSI HIGH TEMP (952-828)	18.50	3.50	220.00
CILD	8.00		CILD	8.00		
CILM	4.70		CILM	4.70		
SP	0.20		SP	0.20		

Dataset: howell\_dole 6.db: field/well/STACK/pass4.1  
 Total length: 35.50 ft  
 Total weight: 620.00 lb  
 O.D.: 4.00 in

# Log Variables

DatabaseC:\ProgramData\Warrior\Data\howell\_dole 6.db  
 Dataset field/well/STACK/pass4.1/\_vars\_

## Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	100	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	220	0	Off	0

## Variable Description

A : Cement Factor (a)  
 BOREID : Borehole I.D.  
 BOTTEMP : Bottom Hole Temperature  
 CASEOD : Casing O.D.  
 CASETHCK : Casing Thickness  
 FLUIDDEN : Fluid Density  
 M : Cement Exp (m)  
 MATRXDEN : Matrix Density

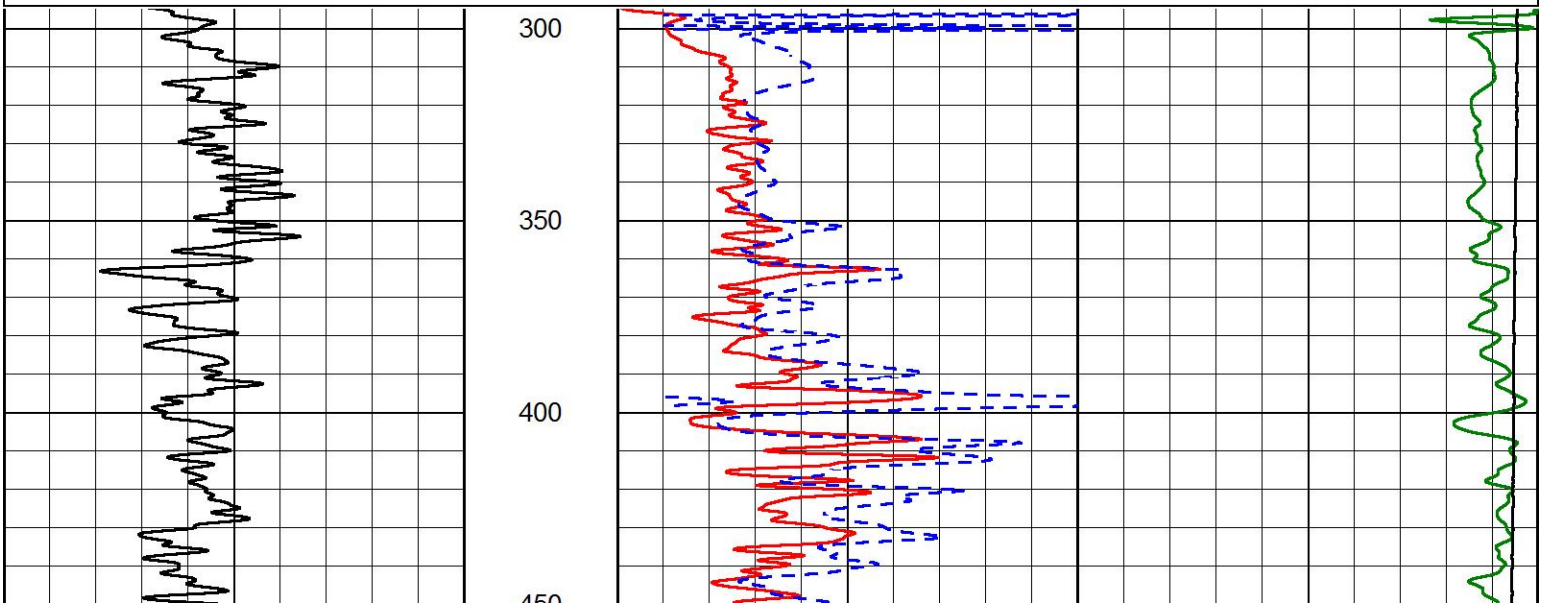
NPORSEL : Neutron Porosity Curve Select  
 PERFS : Perforation Flag  
 SNDERR : Deep Sonde Error Correction  
 SNDERRM : Medium Sonde Error Correction  
 SPSHIFT : S.P. Baseline Offset  
 SRFTEMP : Surface Temperature  
 SZCOR : CN Size Cor. ?  
 TDEPTH : Total Depth

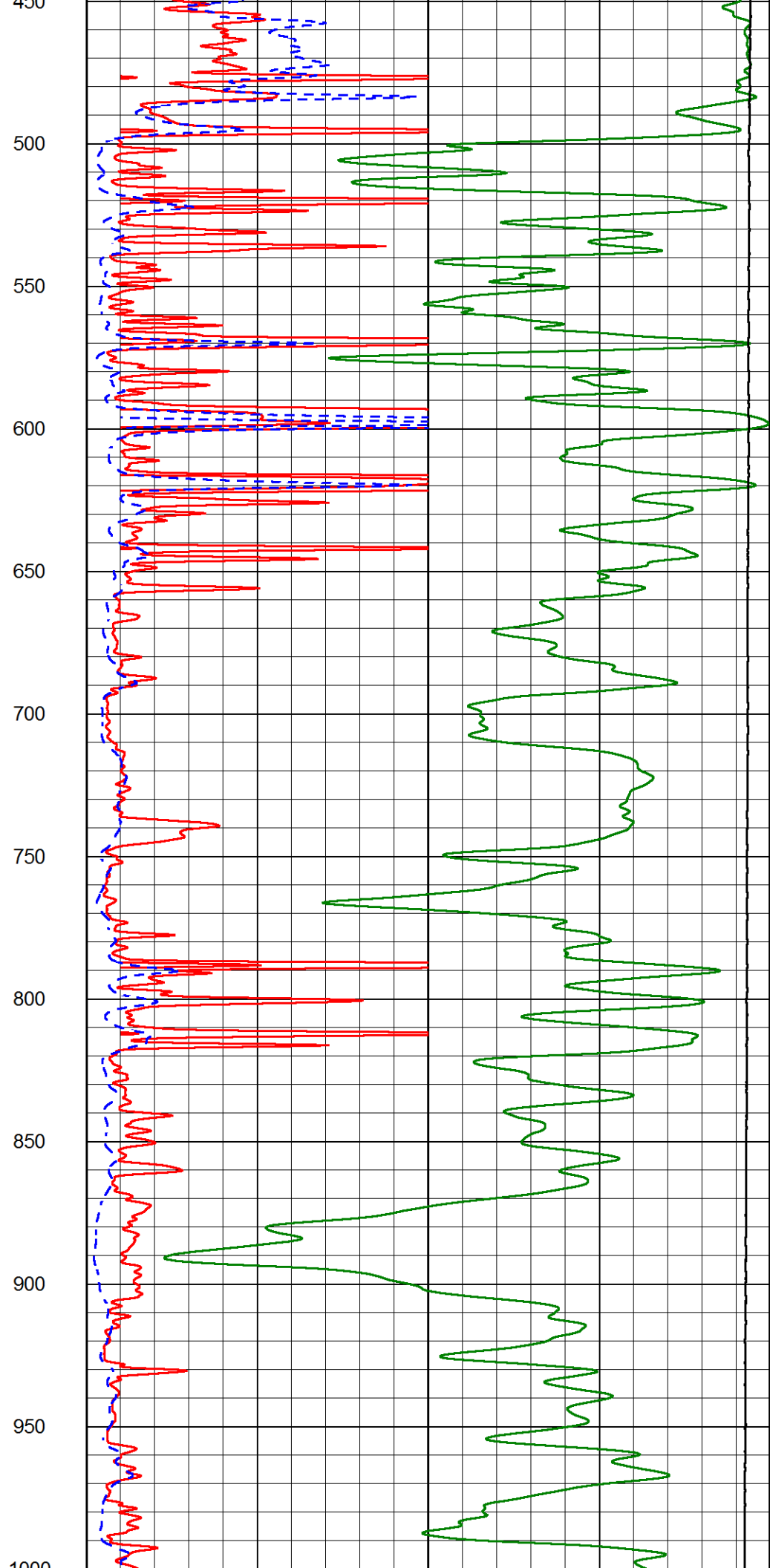
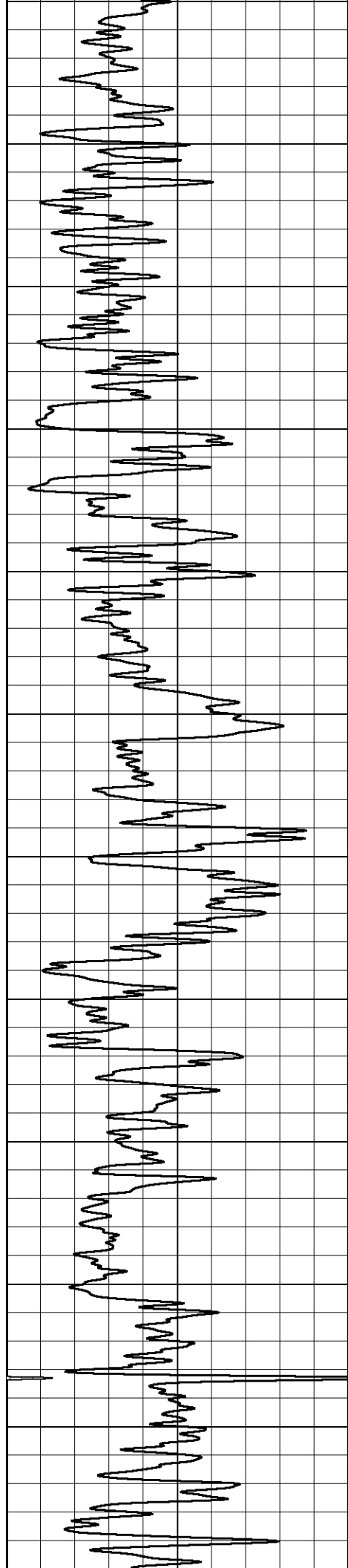


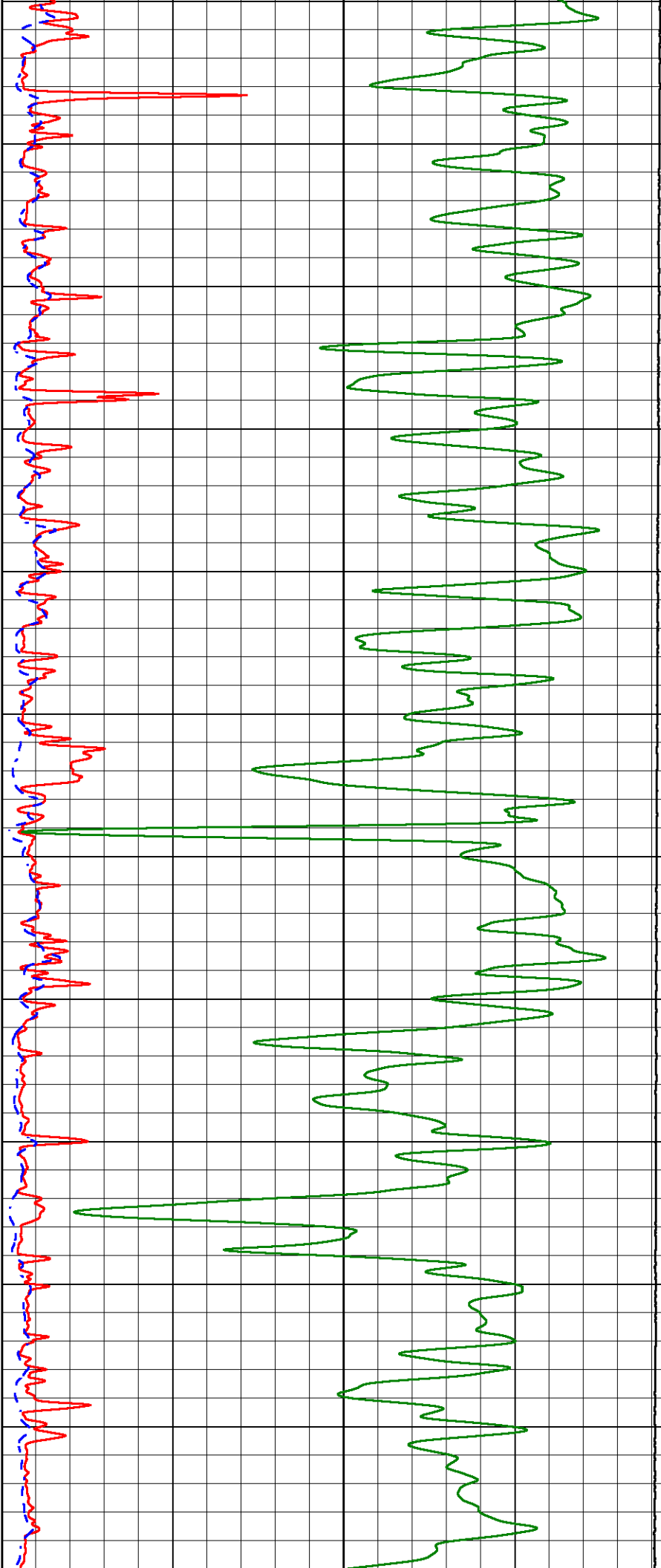
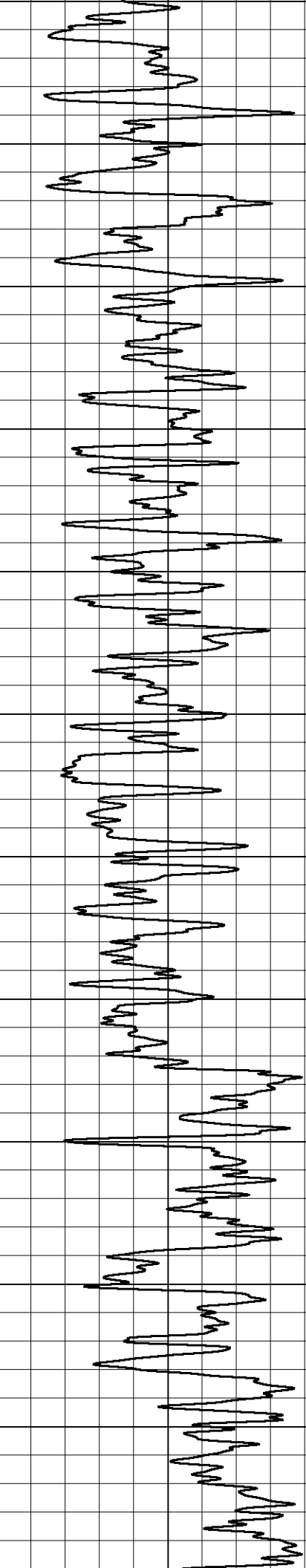
# MAIN PASS

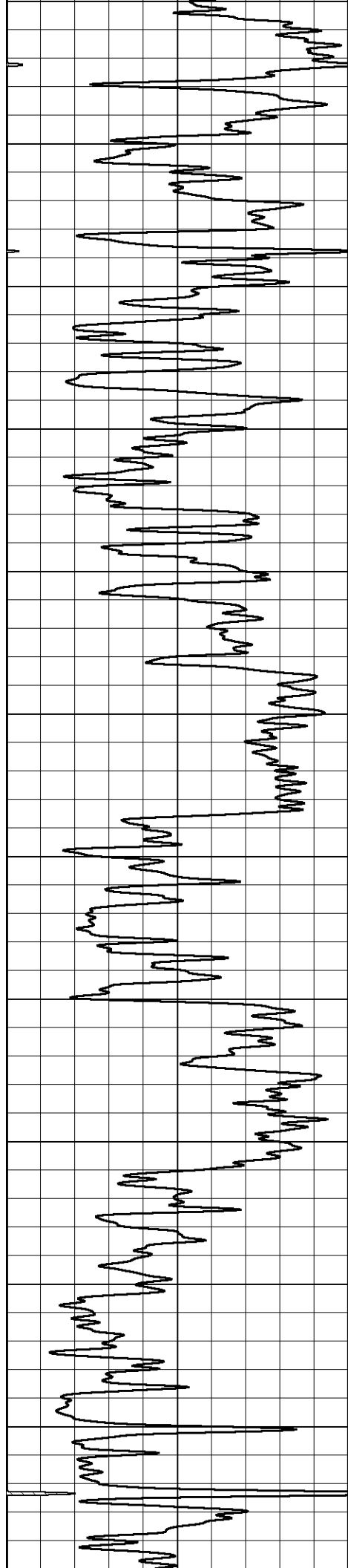
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 Dataset Pathname    STACK/pass5.1  
 Presentation Format    \_dil2in  
 Dataset Creation      Wed Sep 30 10:21:18 2020  
 Charted by            Depth in Feet scaled 1:600

GAMMA RAY (GAPI)                      150	1000	CONDUCTIVITY (mmho/m)	0
	15000	Line Tension (lb)	0
	0	RLL3 (Ohm-m)	50
	0	RILD (Ohm-m)	50
	50	RLL3 (Ohm-m)	200
	50	Deep Resistivity (Ohm-m)	200

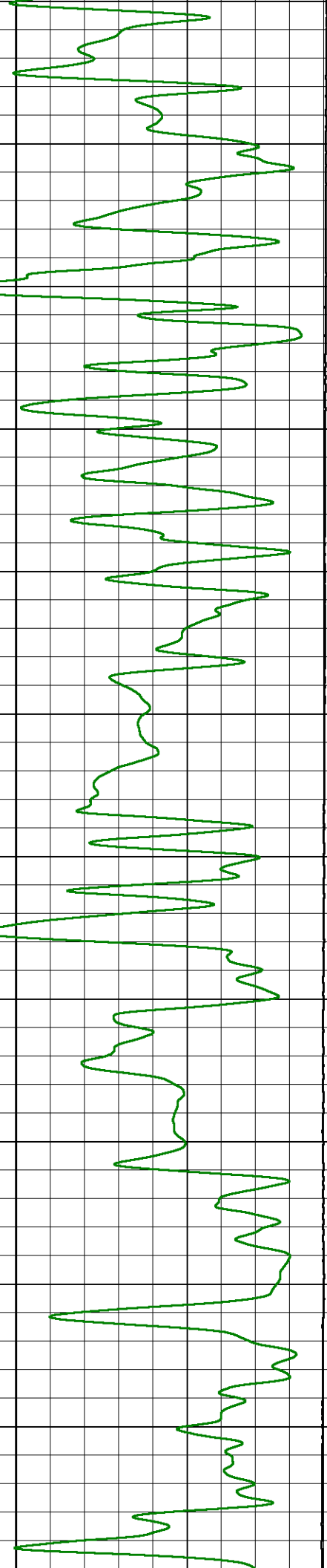
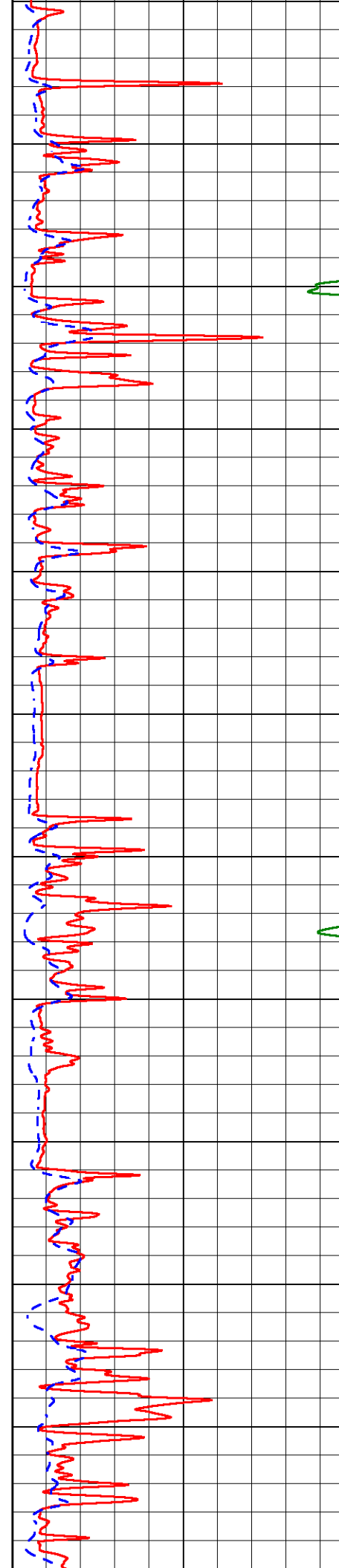


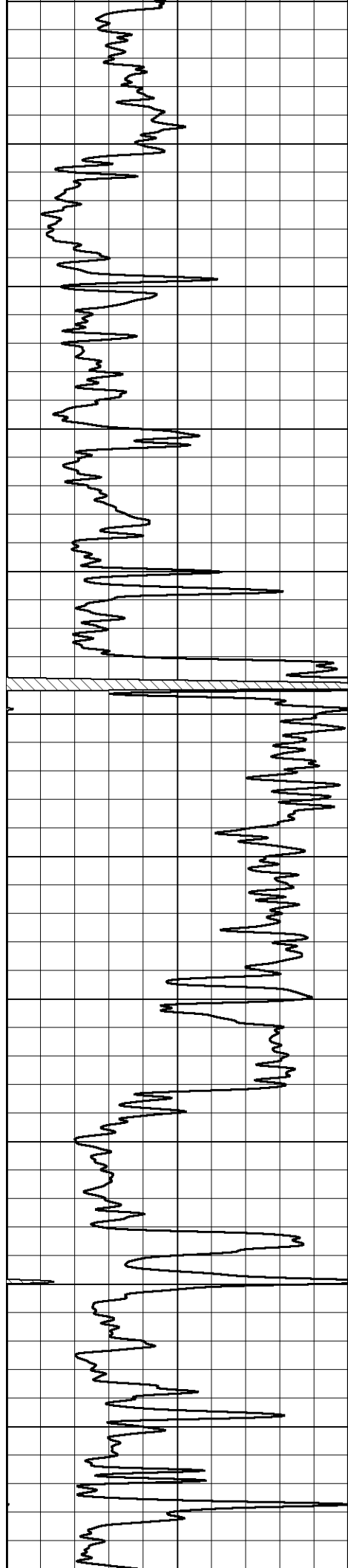




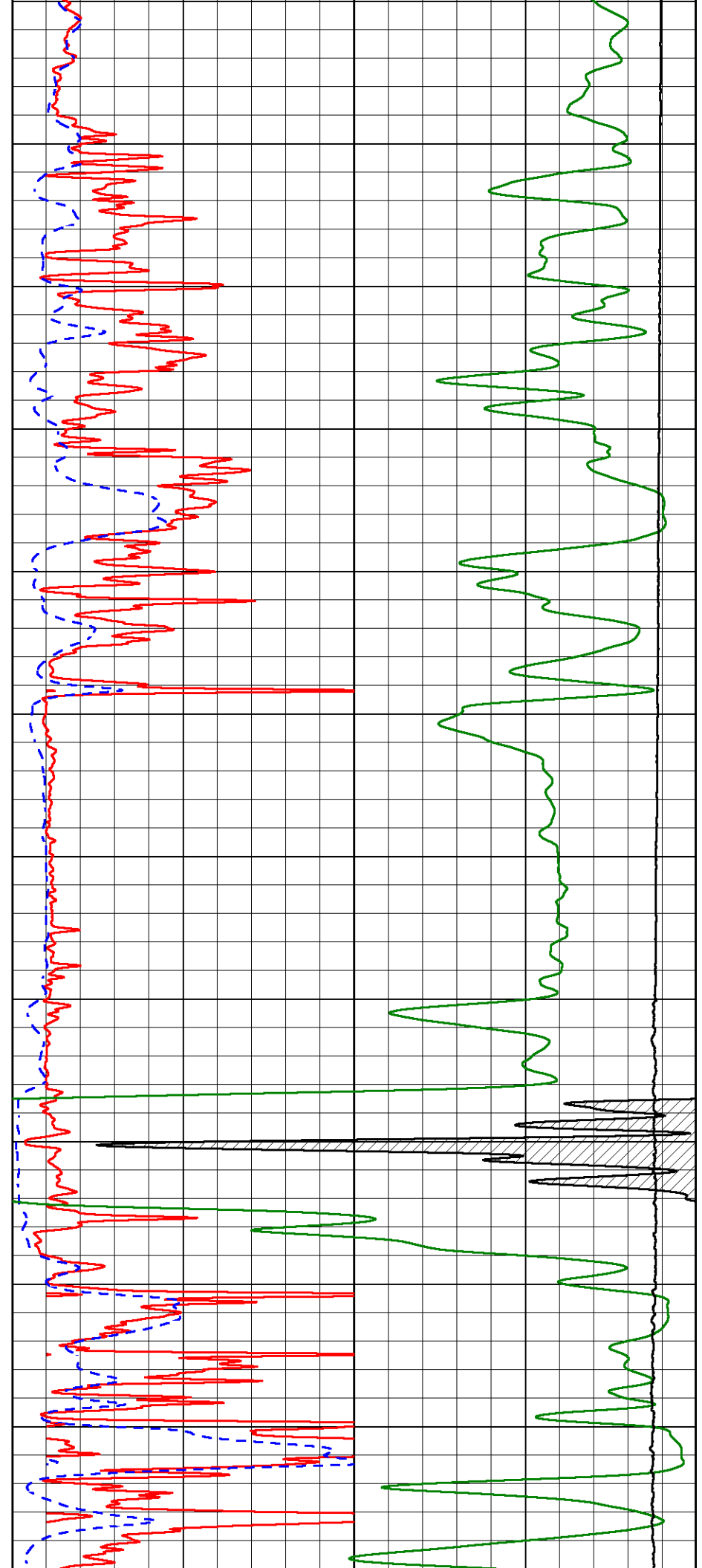


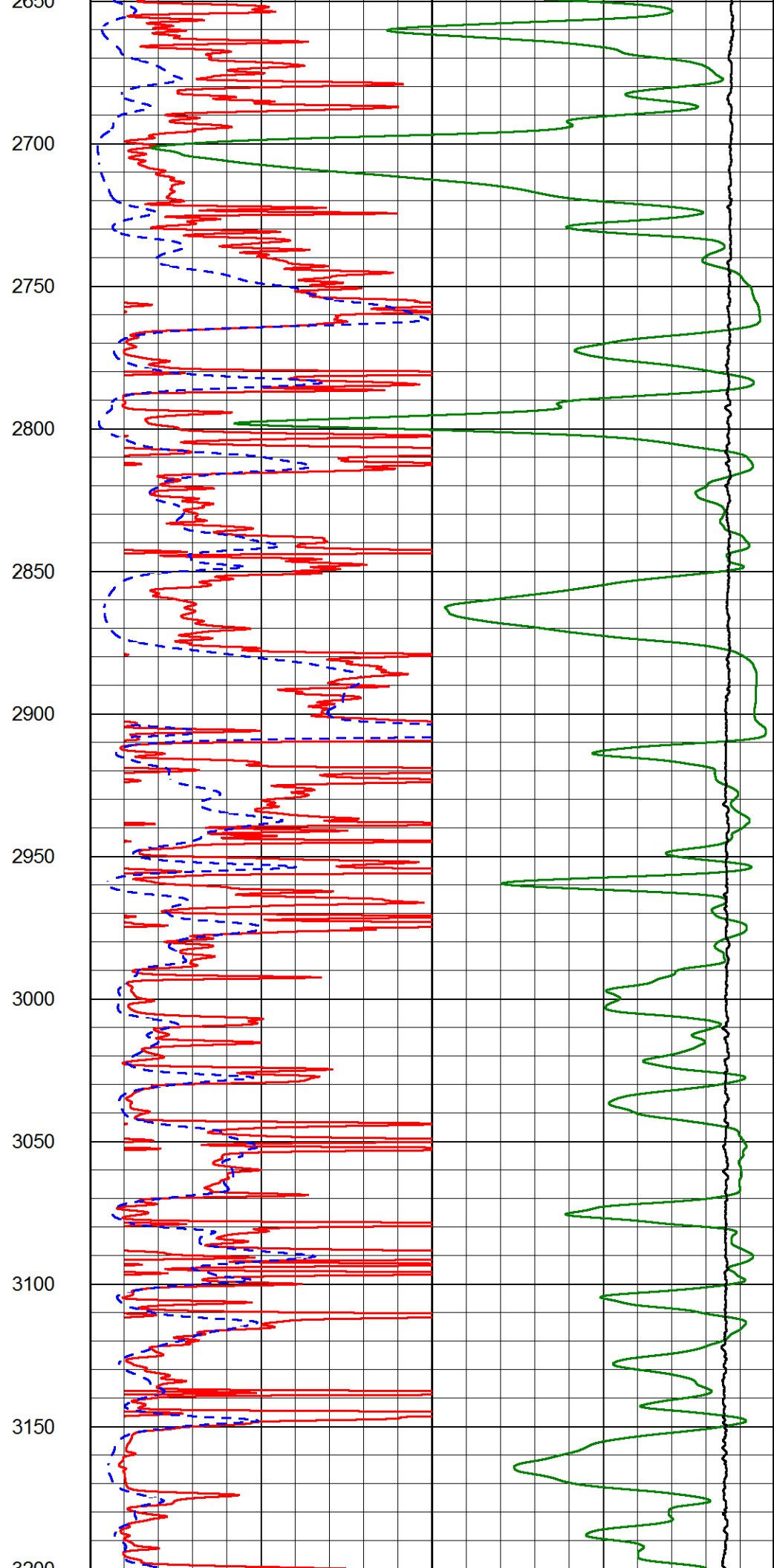
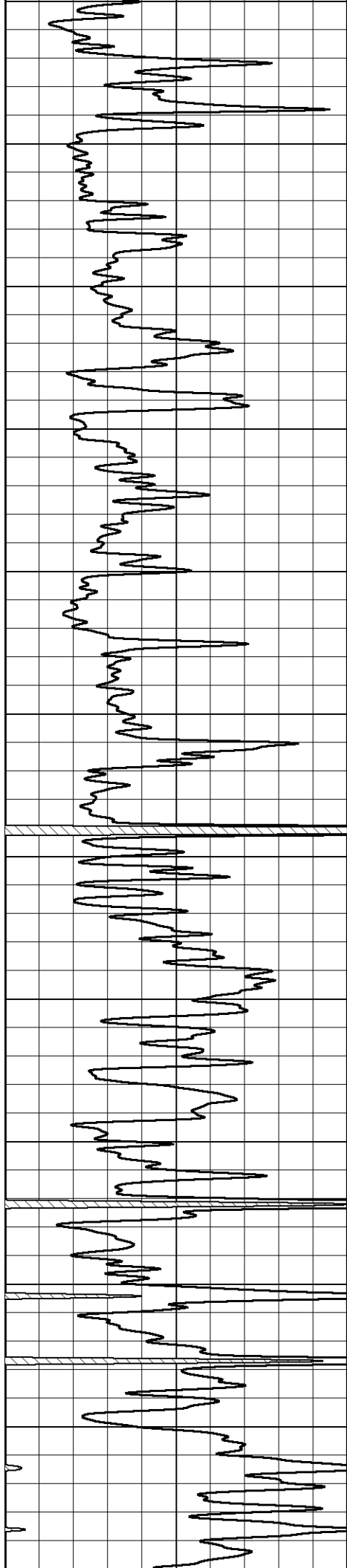
1550  
1600  
1650  
1700  
1750  
1800  
1850  
1900  
1950  
2000  
2050  
2100

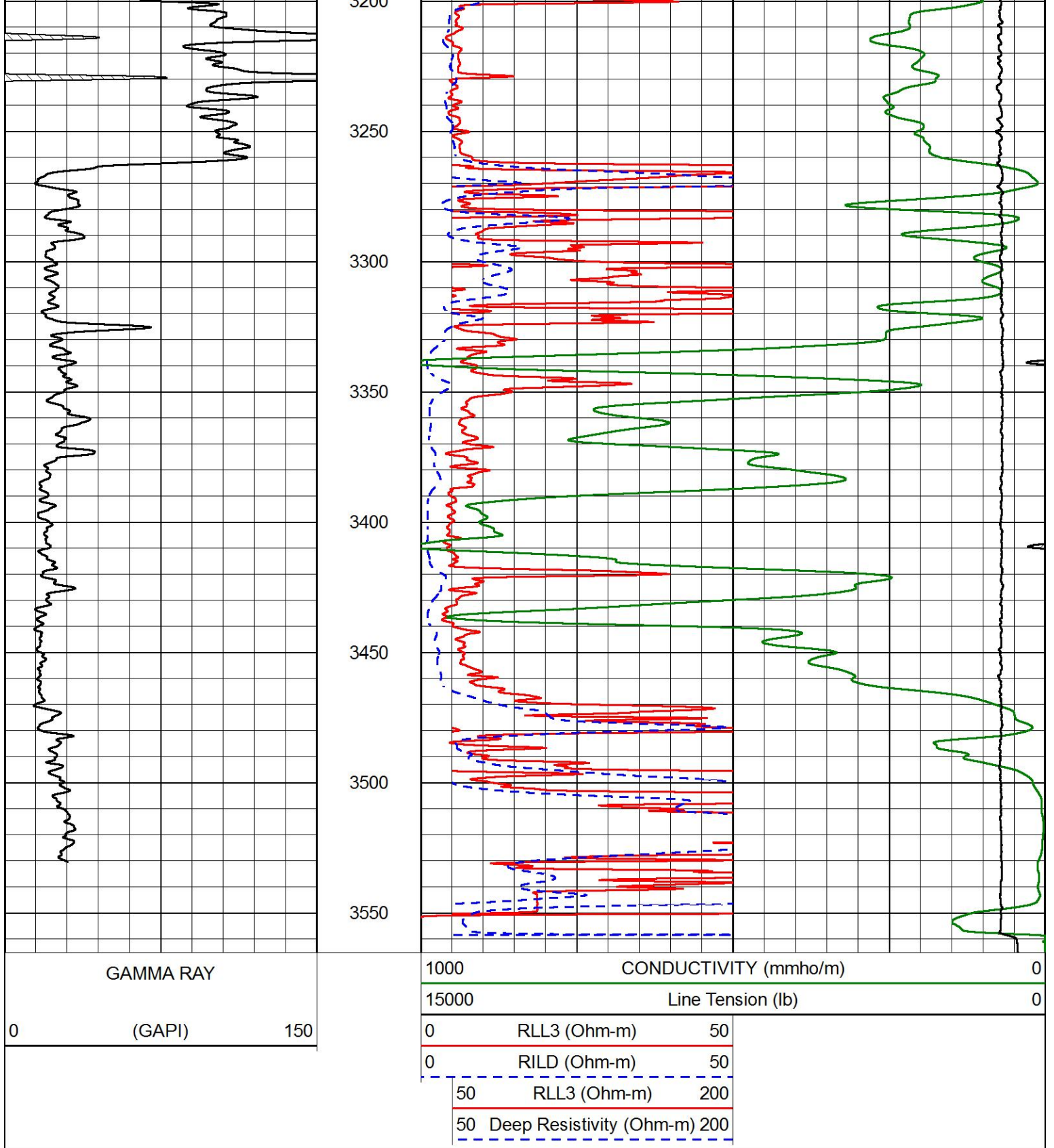




2100  
2150  
2200  
2250  
2300  
2350  
2400  
2450  
2500  
2550  
2600  
2650





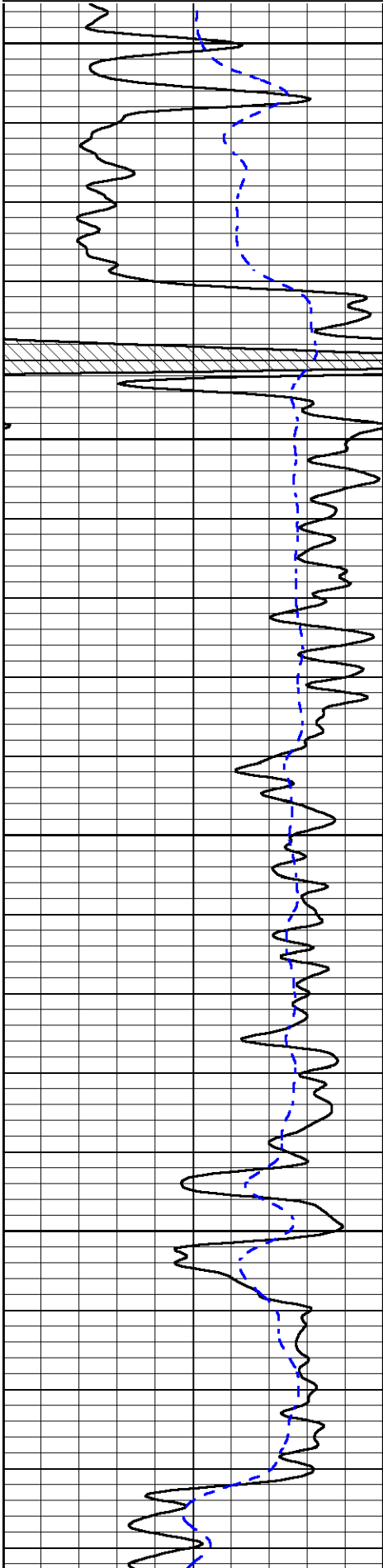


# MAIN PASS

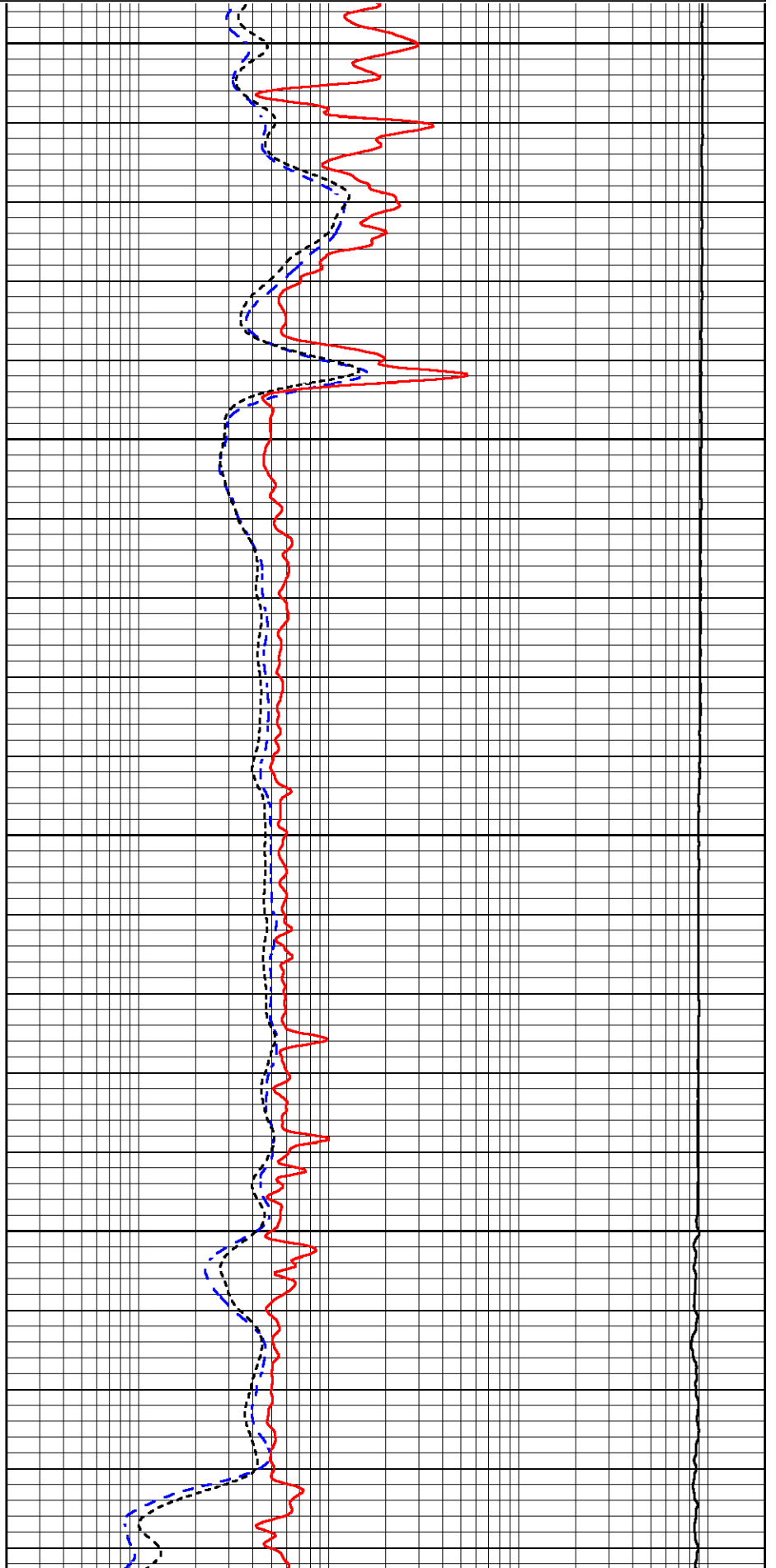
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 Dataset Creation Wed Sep 30 09:56:53 2020  
 Charted by Depth in Feet scaled 1:240

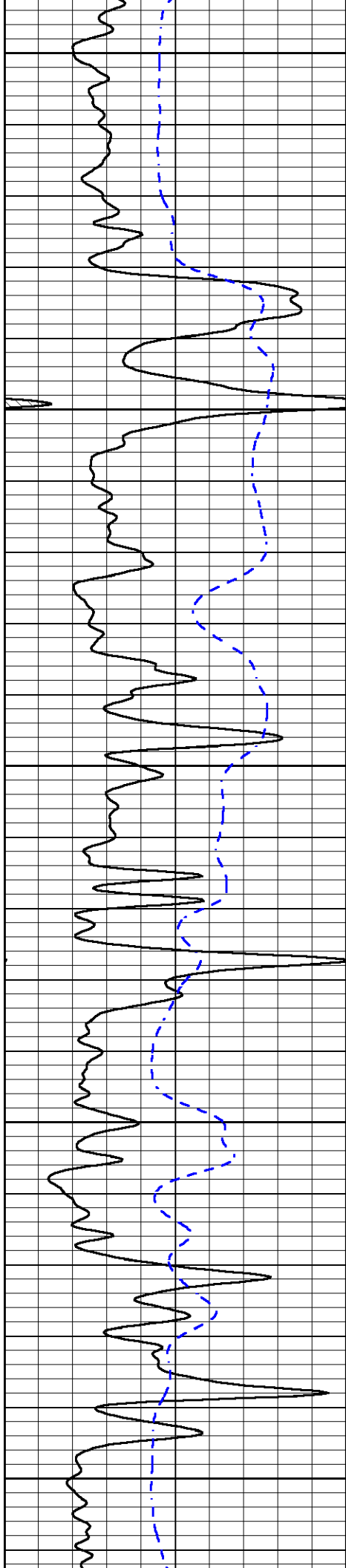
0	GAMMA RAY (GAPI)	150
-200	SP (mV)	0

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



2300  
2350  
2400  
2450





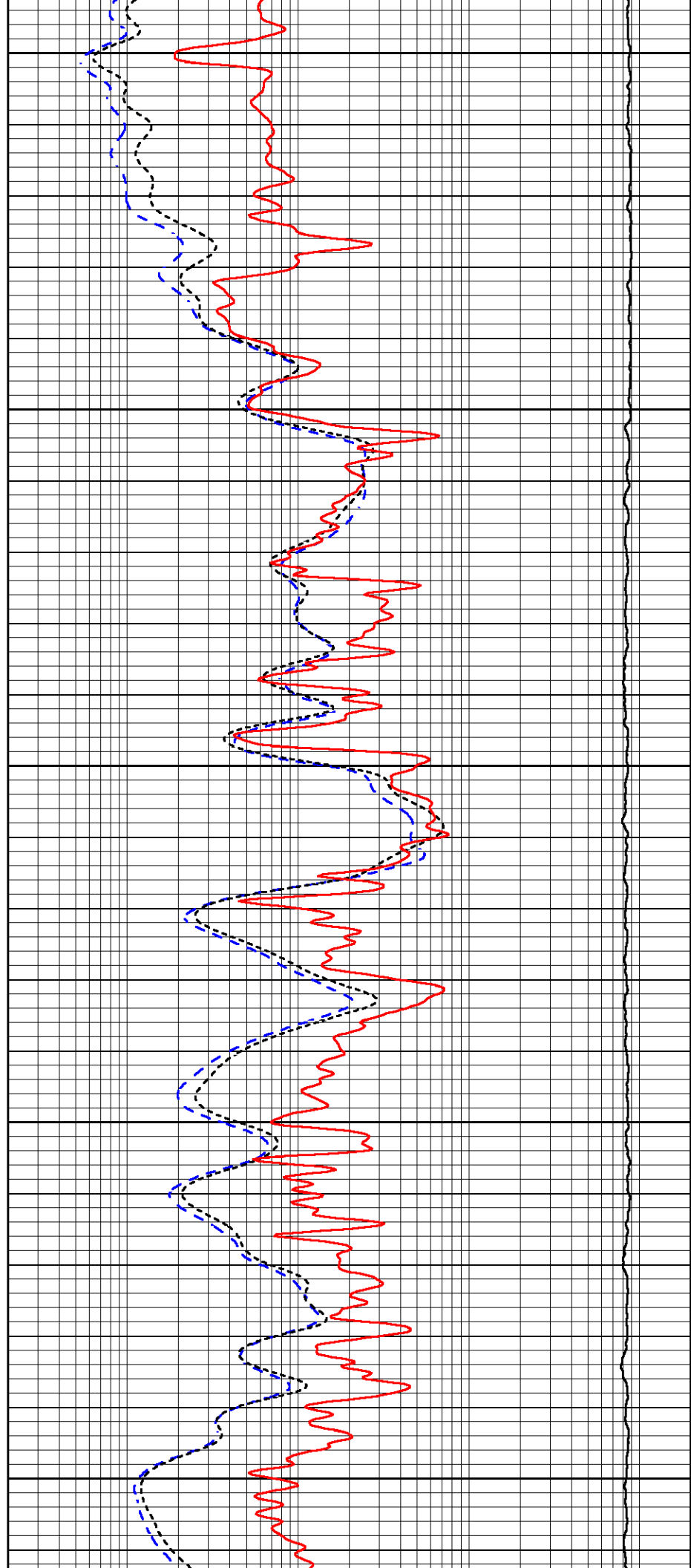
2500

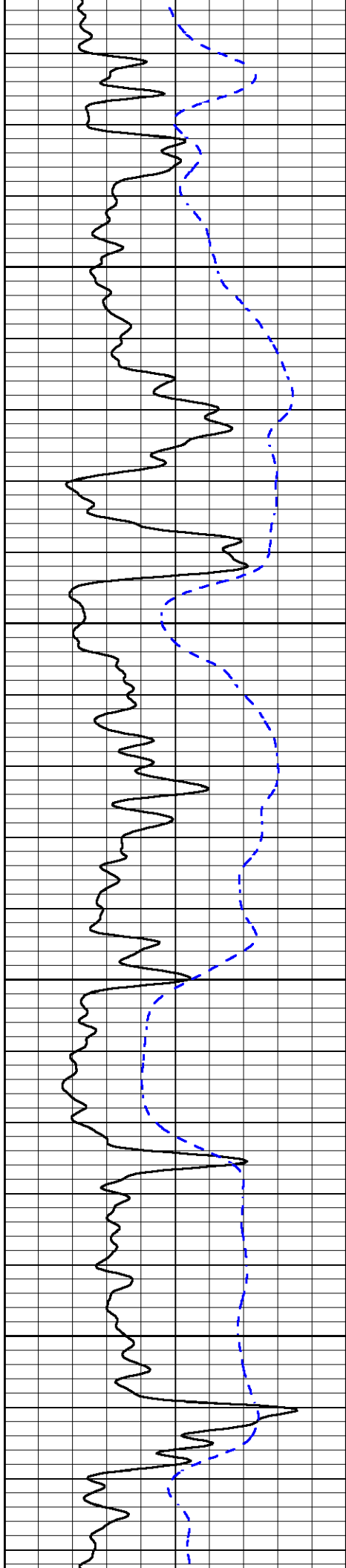
2550

2600

2650

2700



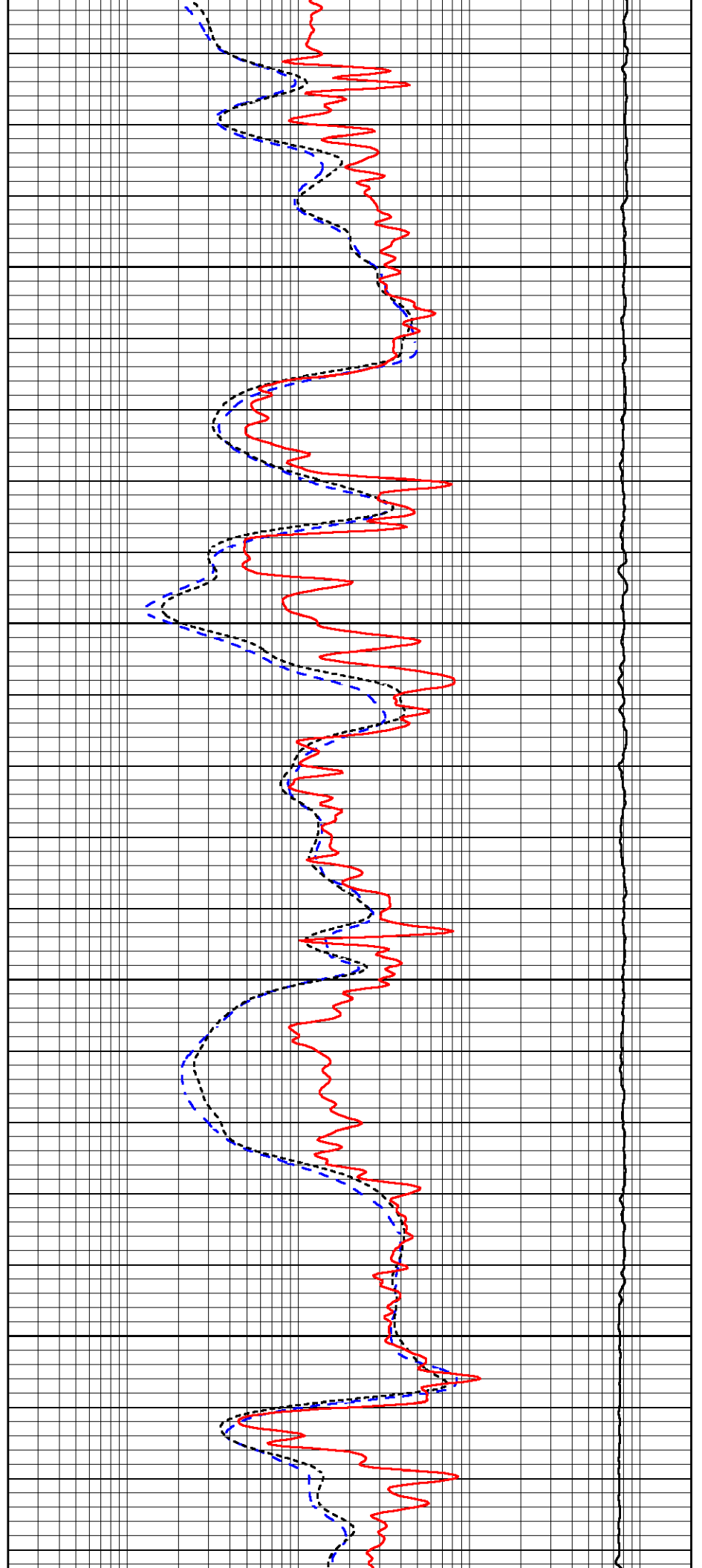


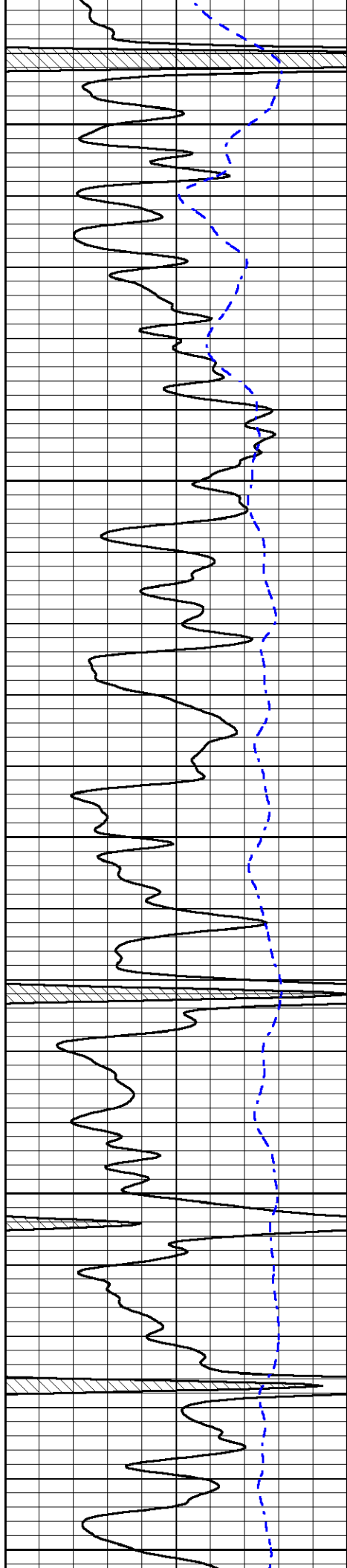
2750

2800

2850

2900





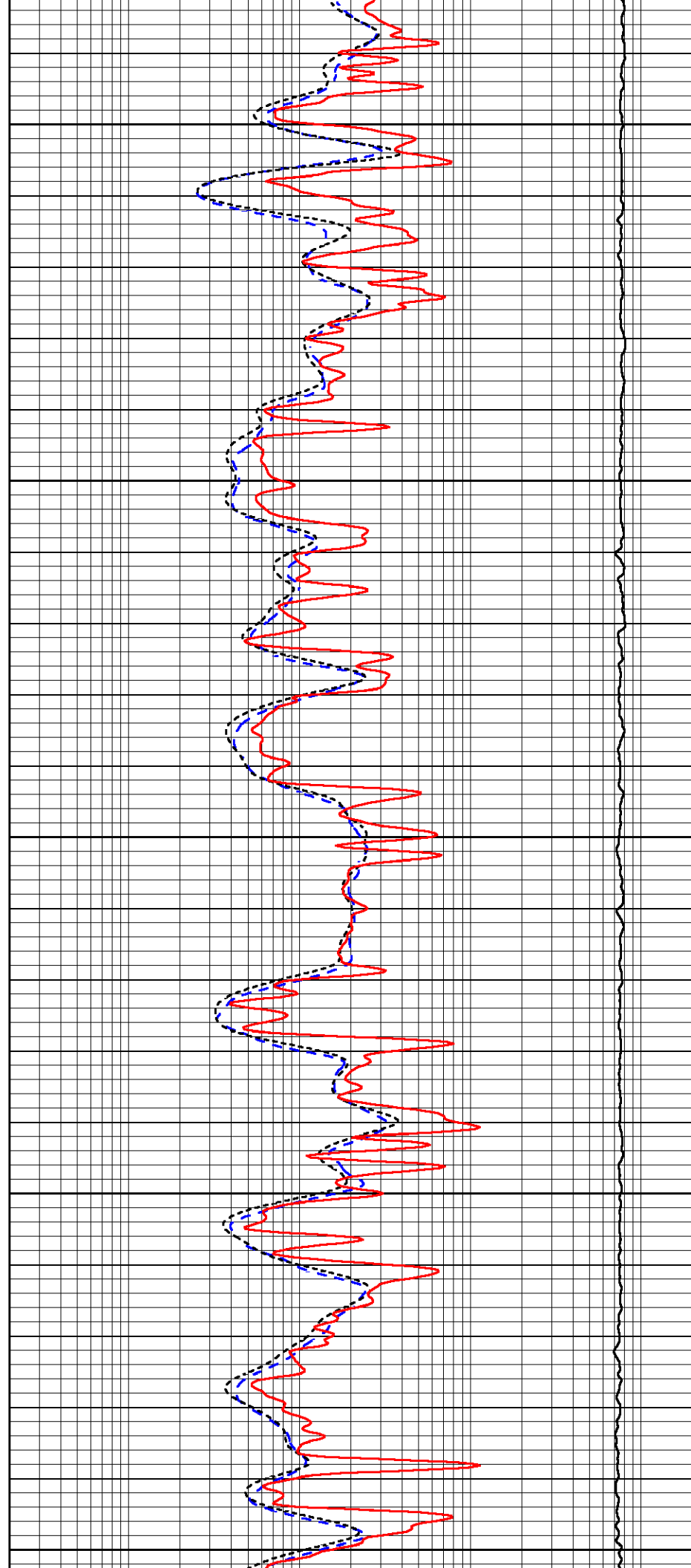
2950

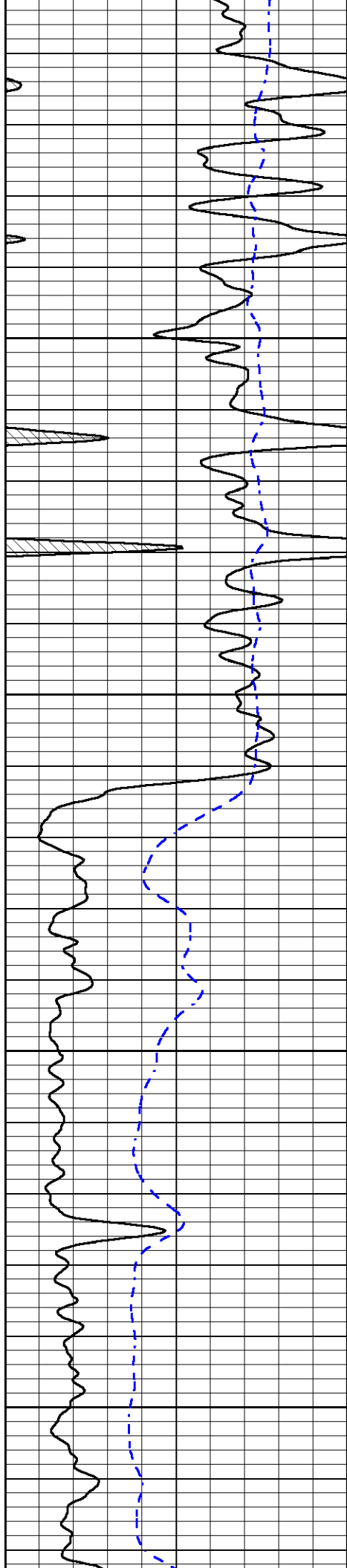
3000

3050

3100

3150



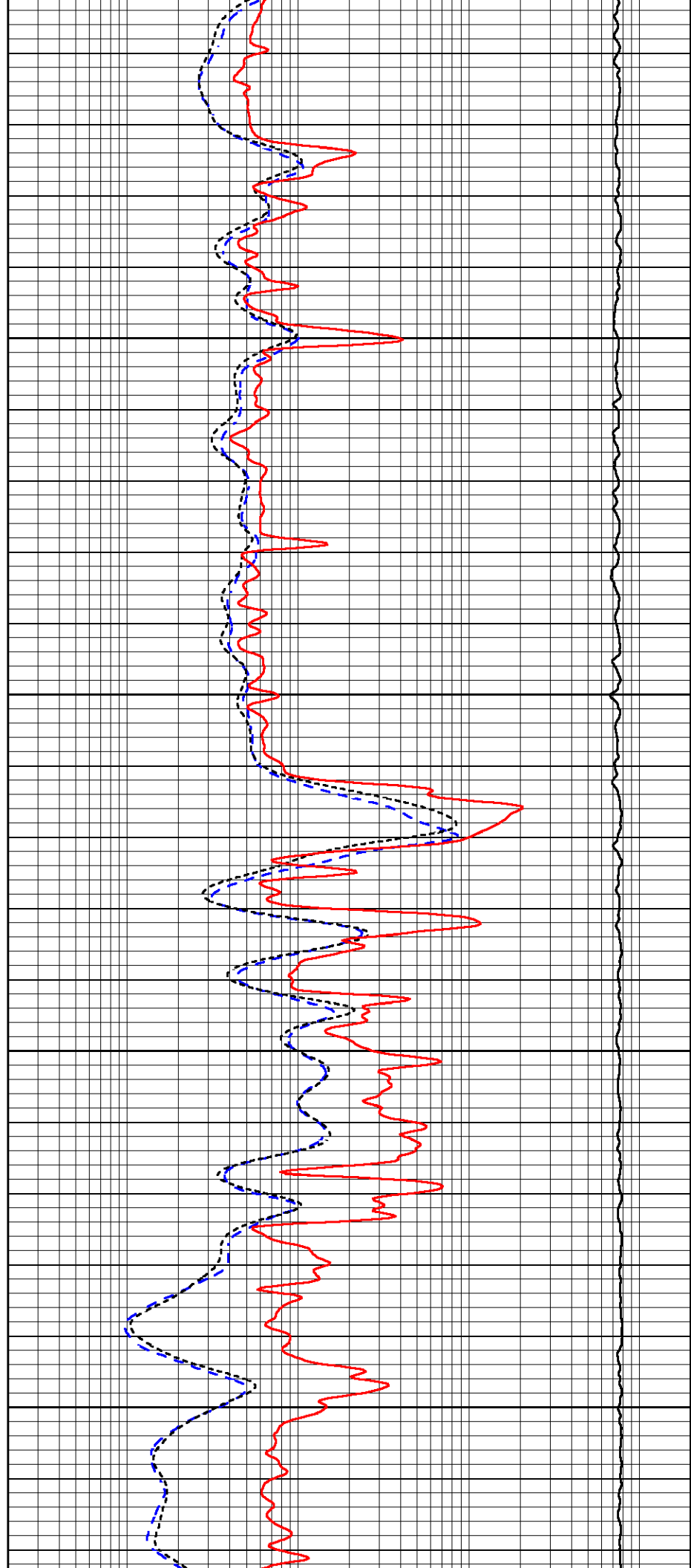


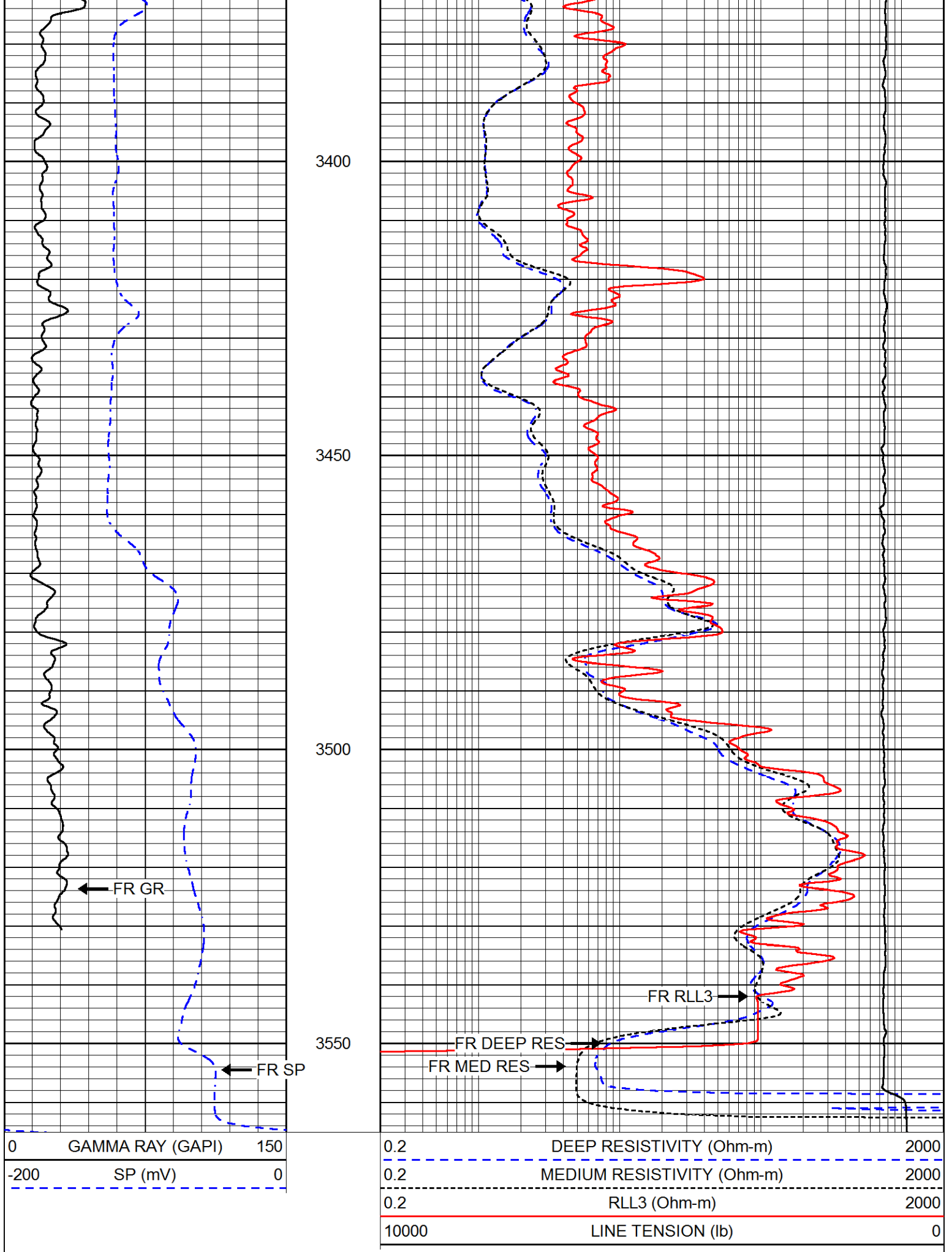
3200

3250

3300

3350







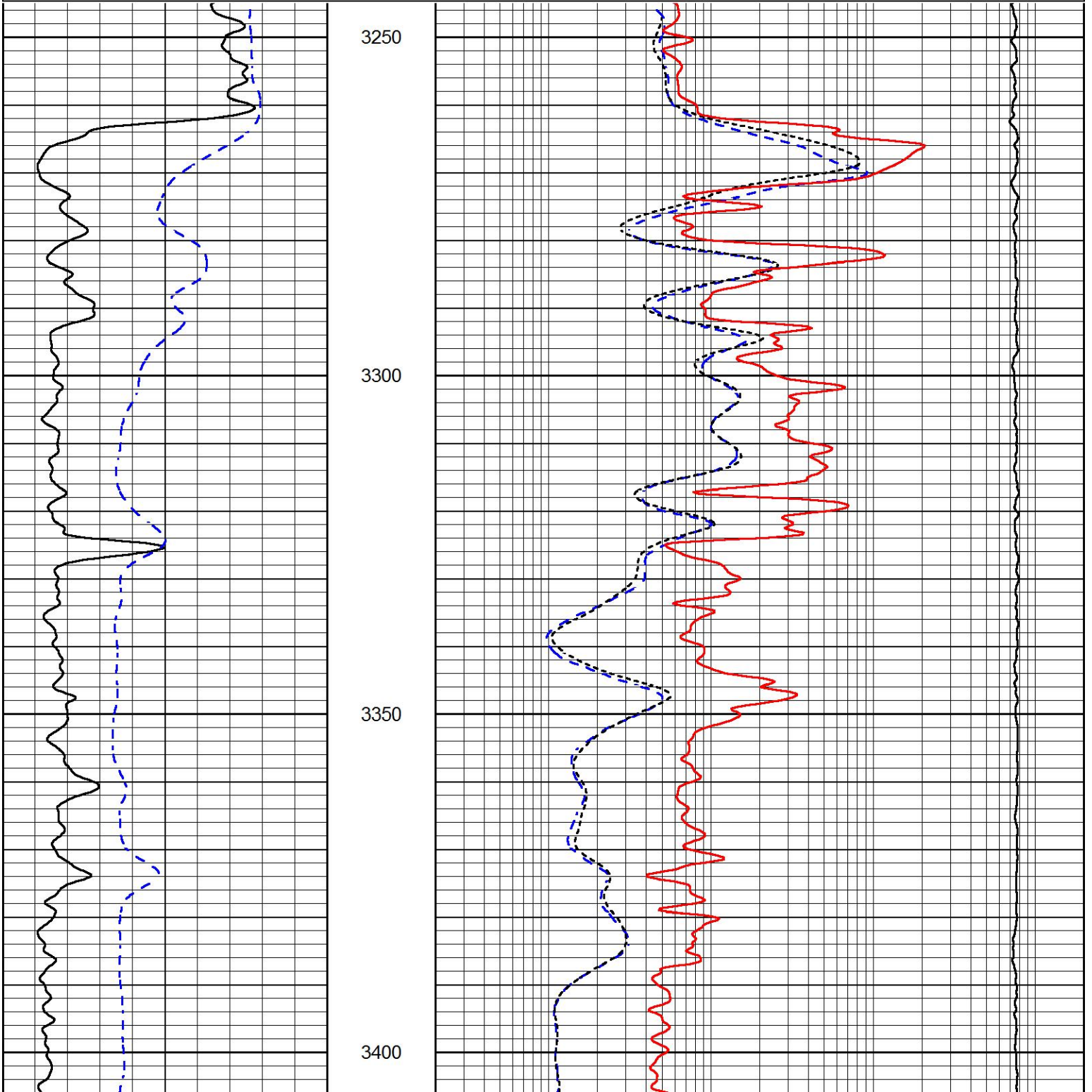
MIDWEST WIRELINE

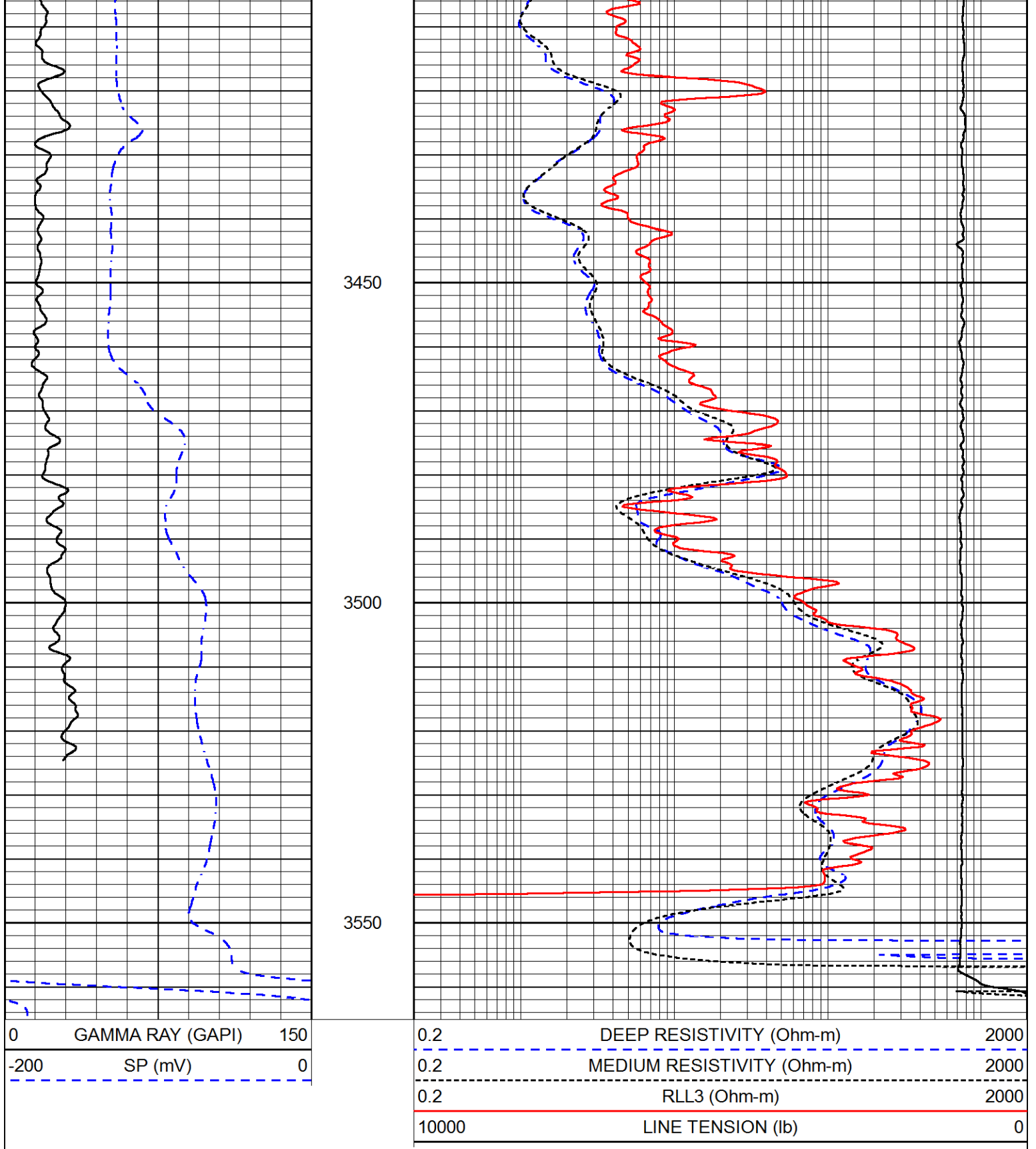
# REPEAT SECTION

Database File      howell\_dole 6.db  
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 Presentation Format    \_dil  
 Dataset Creation     Wed Sep 30 09:53:01 2020  
 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





Calibration Report

Database File      howell\_dole 6.db  
 Dataset Pathname    STACK/pass4.1  
 Dataset Creation    Wed Sep 30 09:56:53 2020

Dual Induction Calibration Report

Serial-Model:                      952-828-PSI HIGH TEMP  
 Calibration Performed:            Sun Jun 28 08:39:24 2020

Loop:	Readings		References			Results	
	Air	Loop	Air	Loop		Gain	Offset
Deep	167.000	835.000	0.000	255.000	mmho/m	0.465	-35.000
Medium	0.000	1348.000	142.000	255.000	mmho/m	0.335	-35.500

Compensated Density Calibration Report

Serial-Model: 126-4040-M&W  
Source / Verifier: 16955B / 2ci  
Master Calibration Performed: Mon May 04 13:53:02 2020

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4596.93	6658.73	cps
Aluminum	2.688	g/cc	866.71	4213.06	cps
Spine Angle = 74.66			Density/Spine Ratio = 0.539		
	Size		Reading		
Small Ring	6.00	in	0.53		
Large Ring	14.00	in	0.60		

Compensated Neutron Calibration Report

Serial Number: 207-MW  
Tool Model: M&W  
Calibration Performed: WED FEB 13 10:30:30 2019

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: Fri Aug 24 11:16:10 2018

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.6000 GAPI/cps