PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company TDI, INC.
Well HART #1
Field WILDCAT
County ELLIS State KANSAS

Location: API # : 15-051-26953-00-00
2260' FNL & 550' FEL
SEC 26 TWP 13S RGE 19W

Other Services: CNL/CDL, MEL

Elevation: K.B. 2105', D.F. N/A, G.L. 2096'

Permanent Datum: GROUND LEVEL Elevation 2096'
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

Company TDI, INC.
Well HART #1
Field WILDCAT
County ELLIS
State KANSAS

Date	6/21/2019			
Run Number	ONE			
Depth Driller	3800'			
Depth Logger	3800'			
Bottom Logged Interval	3799'			
Top Log Interval	200'			
Casing Driller	8.625" @ 221'			
Casing Logger	220'			
Bit Size	7.875"			
Type Fluid in Hole	CHEMICAL			
Salinity,ppm CL	4000			
Density / Viscosity	9.4	64		
pH / Fluid Loss	10.0	6.0		
Source of Sample	FLOWLINE			
Rm @ Meas. Temp	.70 @ 68			
Rmf @ Meas. Temp	.53 @ 68			
Rmc @ Meas. Temp	.95 @ 68			
Source of Rmf / Rmc	CHARTS			
Rm @ BHT	.42 @ 114			
Operating Rig Time	2 HOURS			
Max Rec. Temp. F	114 DEG/F			
Equipment Number	P-108			
Location	HAYS			
Recorded By	J. HENRICKSON			
Witnessed By	HERB DEINES	TOM DENNING		

<<< Fold Here >>>

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

HAYS KANSAS
WEST ON OLD 40 TO 210 ROAD, 1/2 SOUTH,
WEST INTO

Log Measured From: KELLY BUSHING 9 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: J. HENRICKSON	Primary Witness: HERB DEINES
Operator:	Secondary Witness: TOM DENNING
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Log Variables

Database C:\ProgramData\Warrior\Data\tdi_hart_1.db
Dataset field/well/stackml/pass3.1/_vars_

Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	114	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	185	51	Off	3800

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			GR-M&W (89-M&W)	3.00	3.50	50.00
GR	44.50					
CNLSC	41.40		CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	40.65					
			CDL-M&W (144-84)	8.50	4.00	250.00
LSD	32.35					
DCAL	32.33					
SSD	31.85					
			ML-PSI UDM ML (UDM-01) Stackable Microlog Tools	11.50	4.00	215.00
MCAL	20.87					
MI	20.87					
MN	20.87					
RLL3	15.80					
RLL3F	15.79					
			DIL-M&W (PSI 988)	18.50	3.50	220.00
CILD	8.00					

CILM	4.70					
SP	0.20					

Dataset: tdi_hart_1.db: field/well/stackml/pass3.1
Total length: 47.00 ft
Total weight: 835.00 lb
O.D.: 4.00 in

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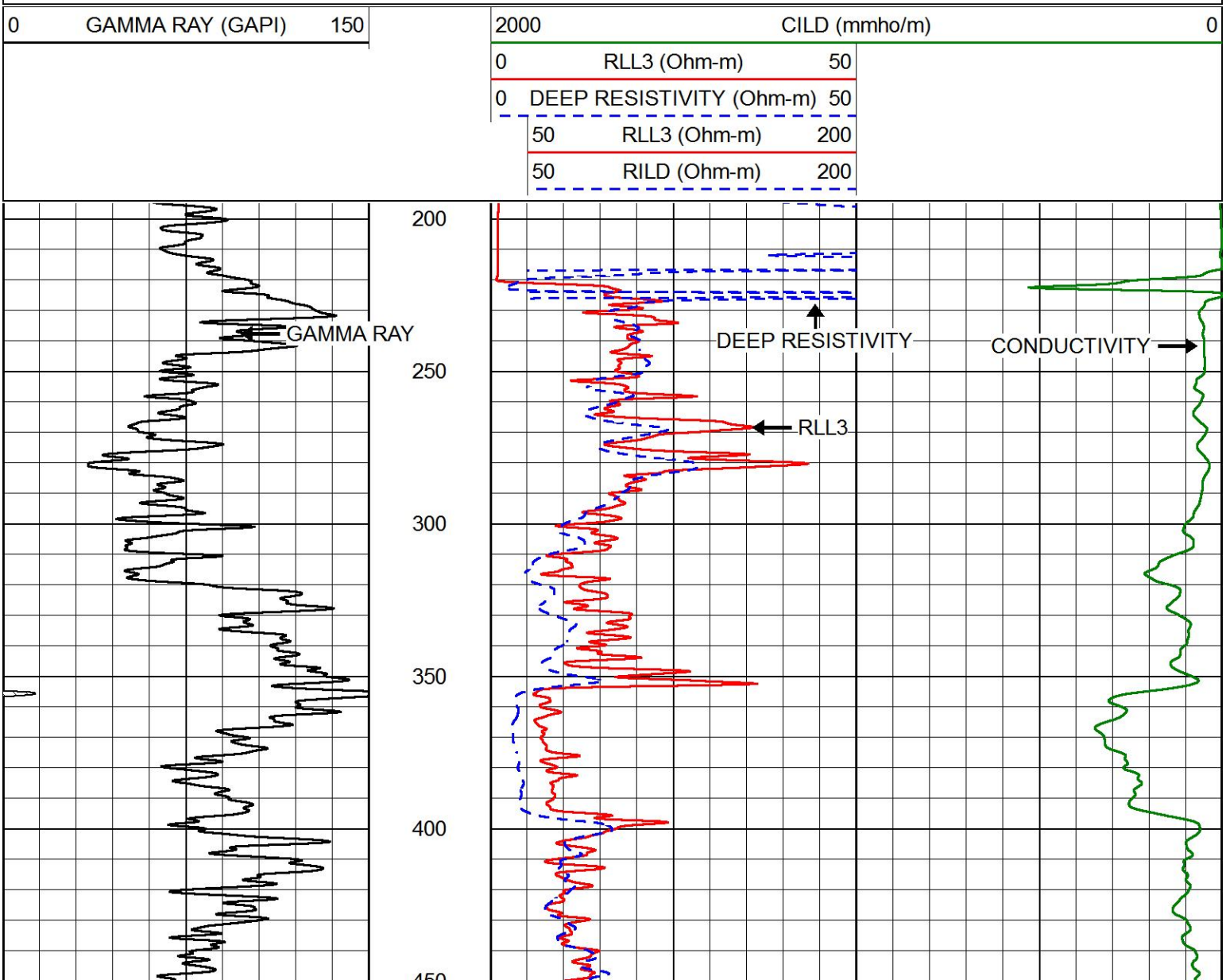
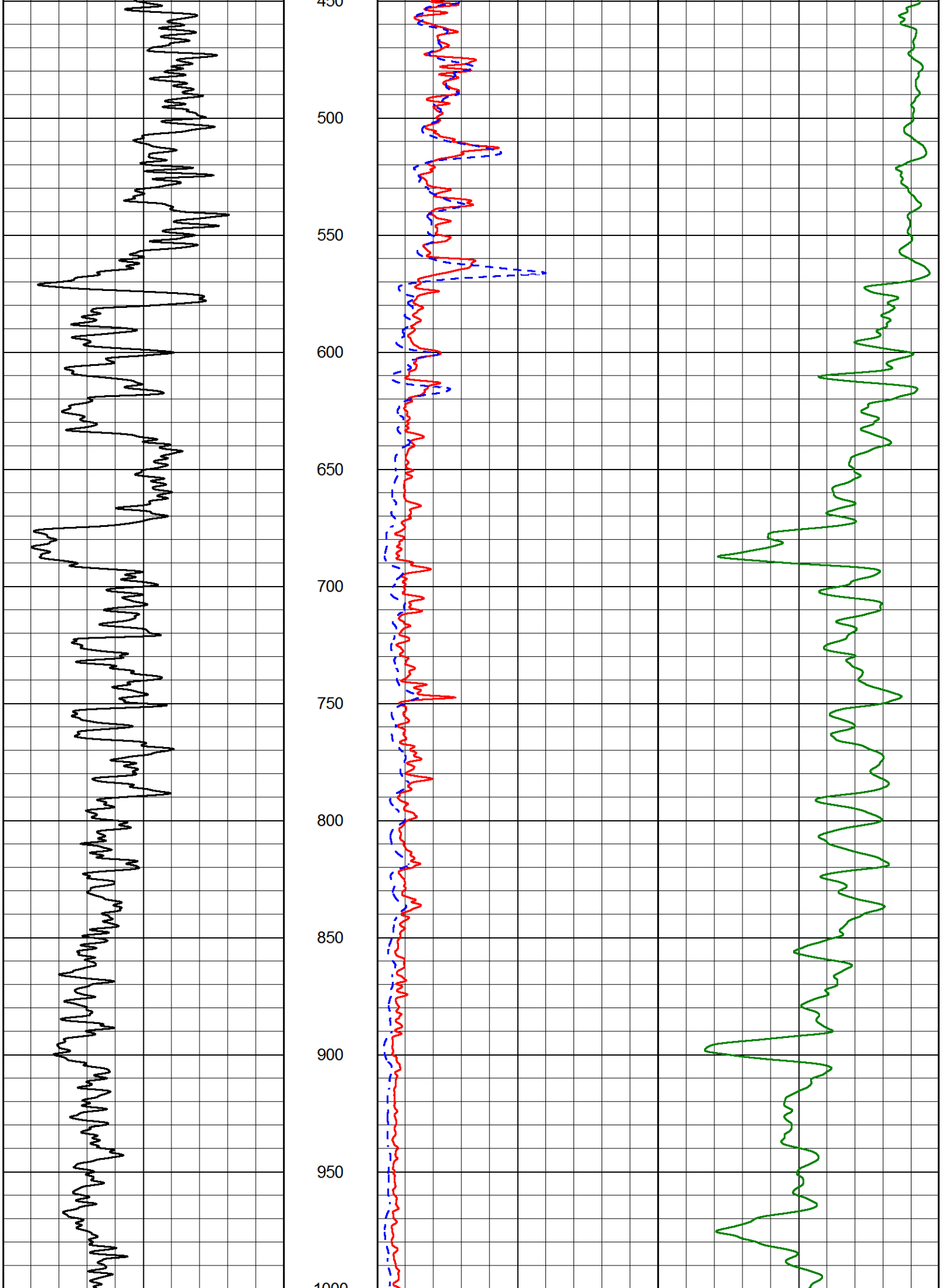
MAIN PASS

Database File	tdi_hart_1.db
Dataset Pathname	stackml/pass3.1
Presentation Format	dil2in
Dataset Creation	Fri Jun 21 07:38:50 2019
Charted by	Depth in Feet scaled 1:600

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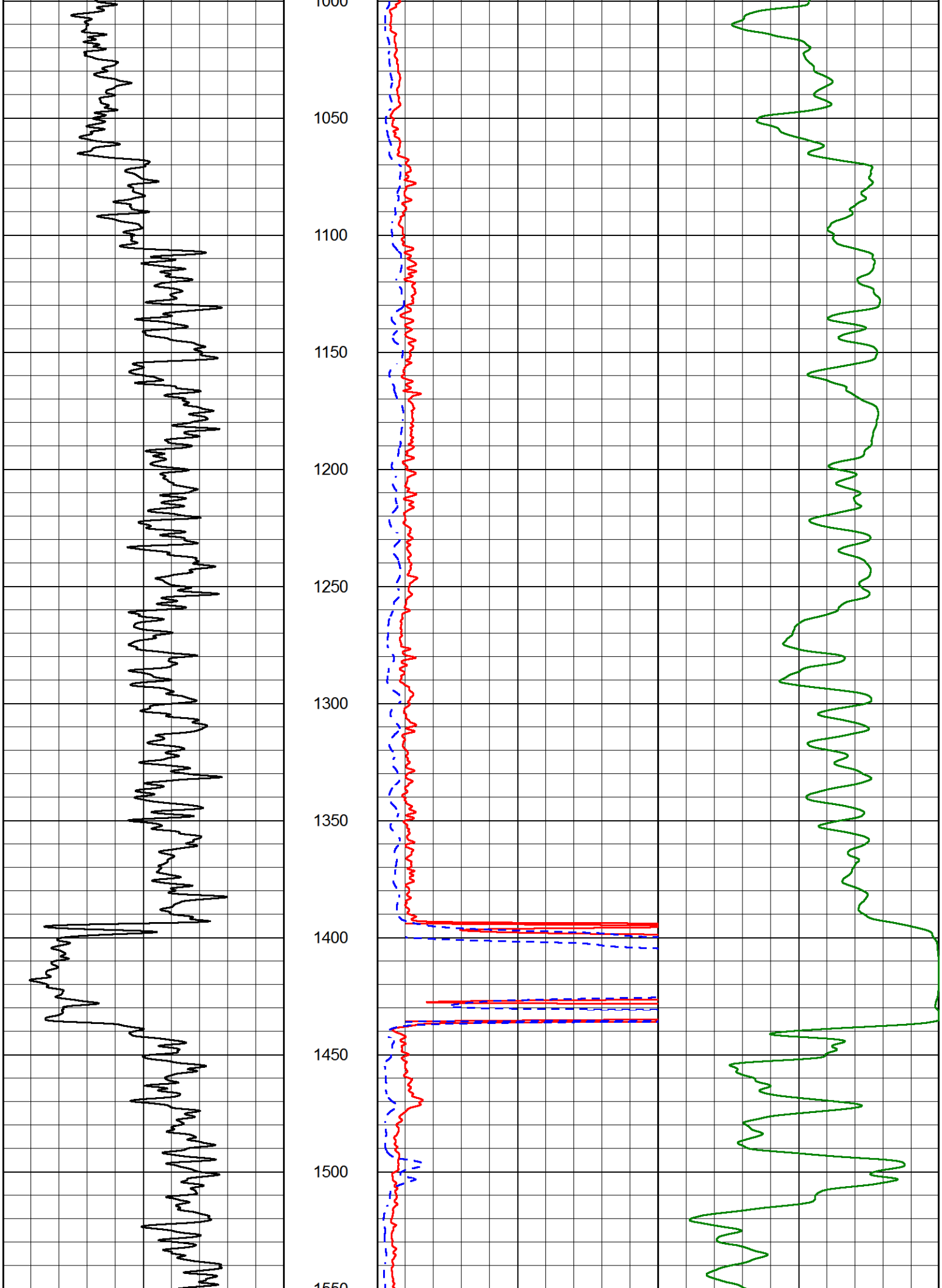
500
550
600
650
700
750
800
850
900
950
1000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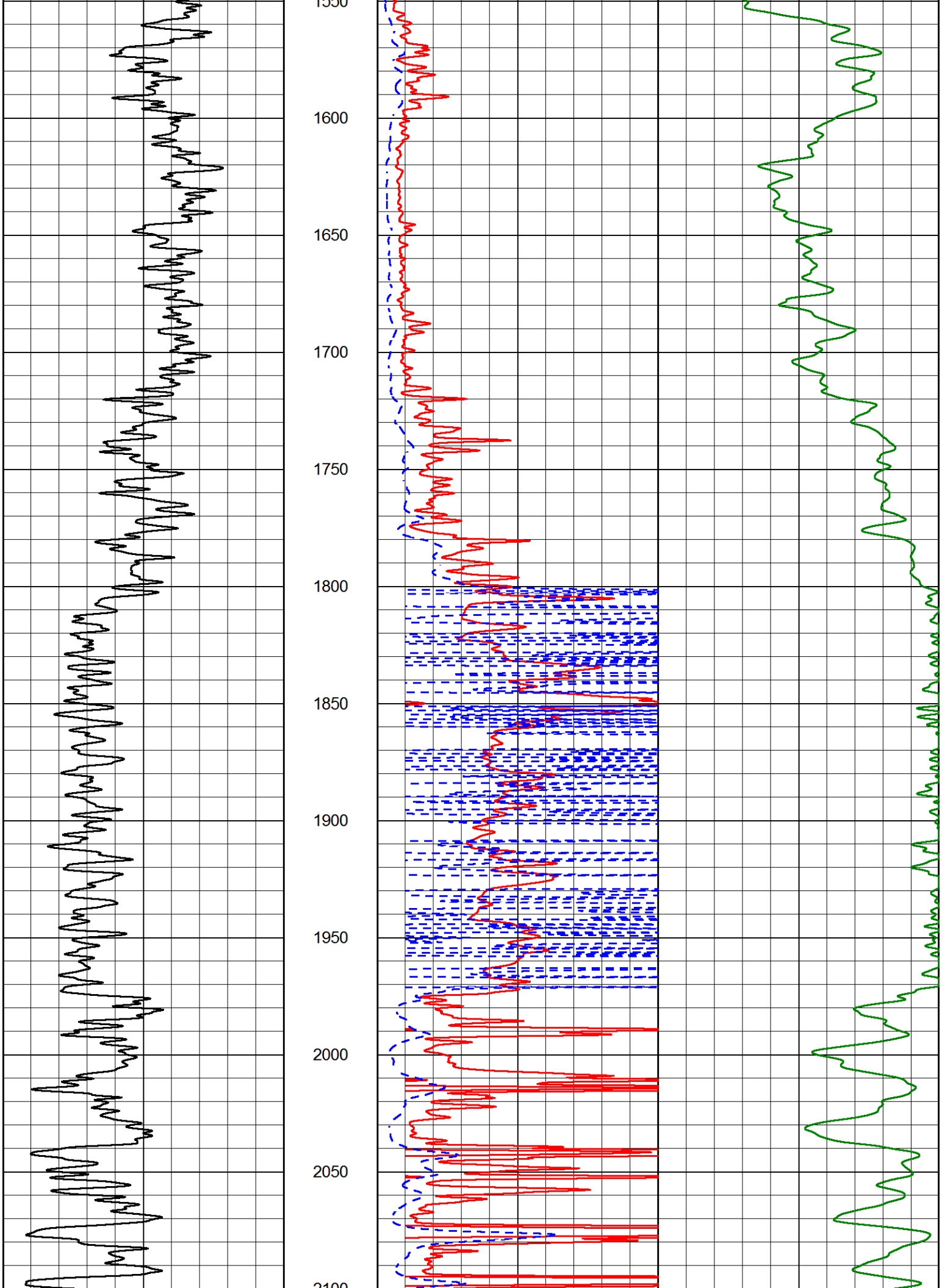
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550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1700
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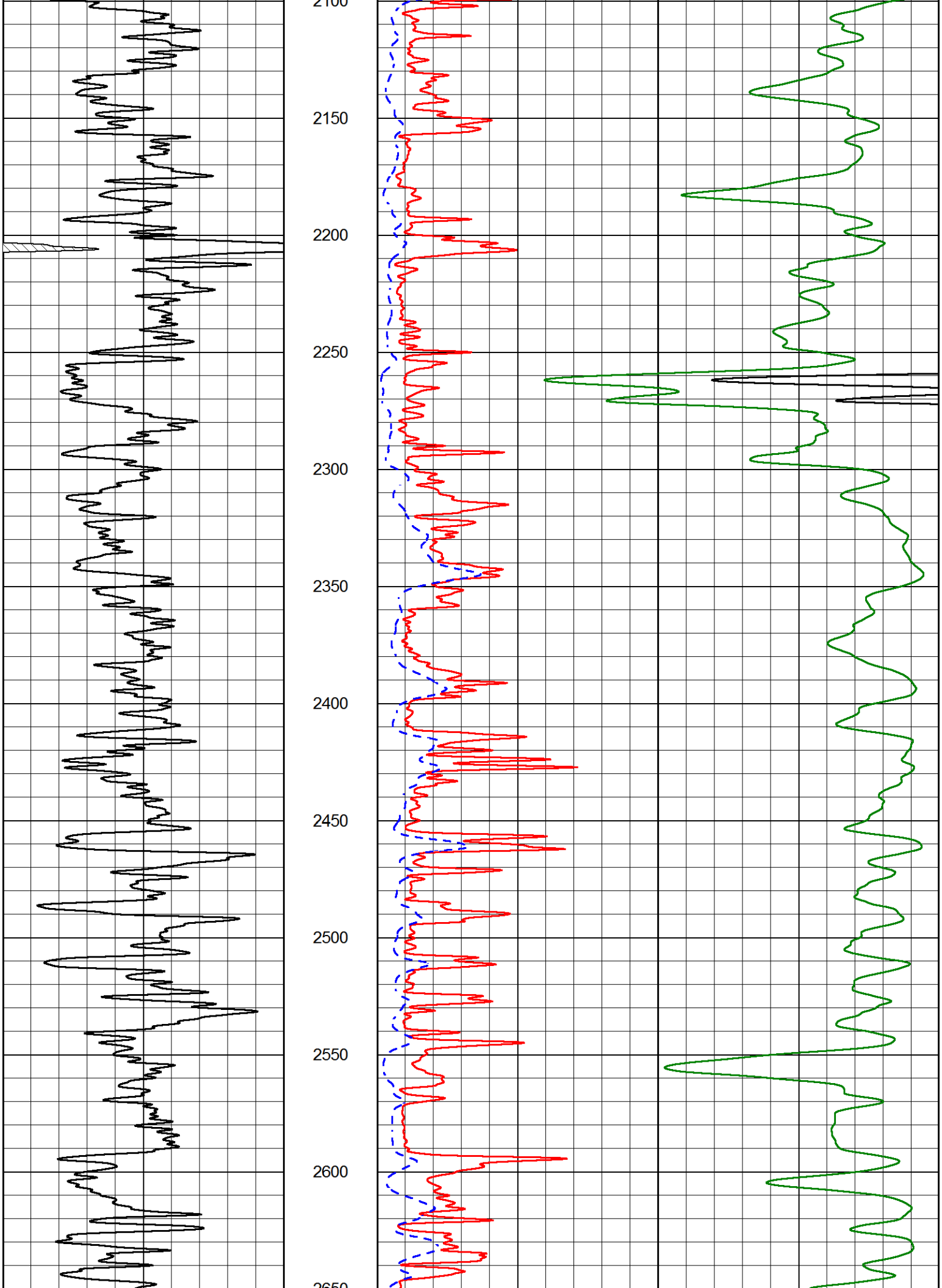
1800
1850
1900
1950
2000
2050
2100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2250
2300
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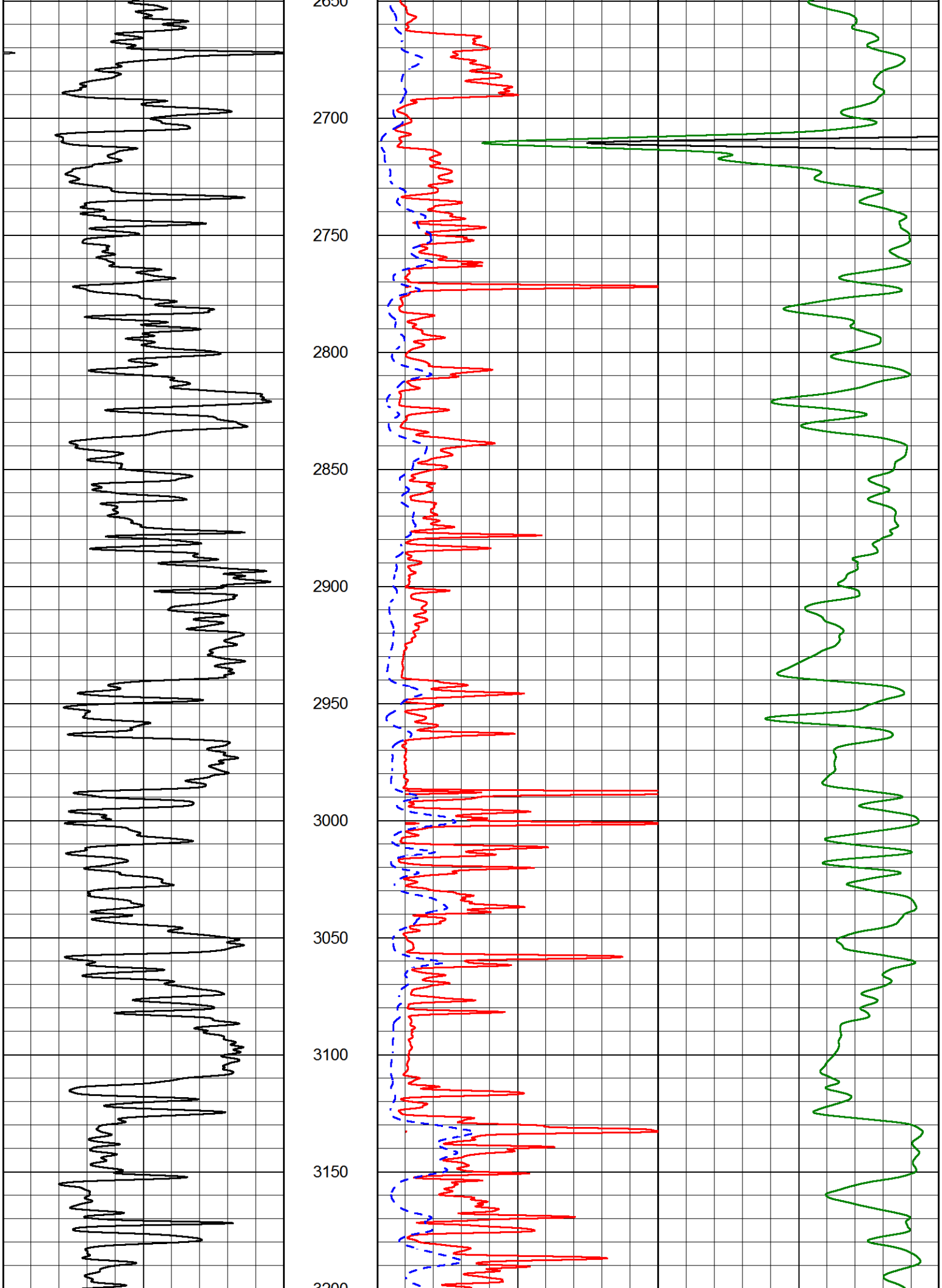
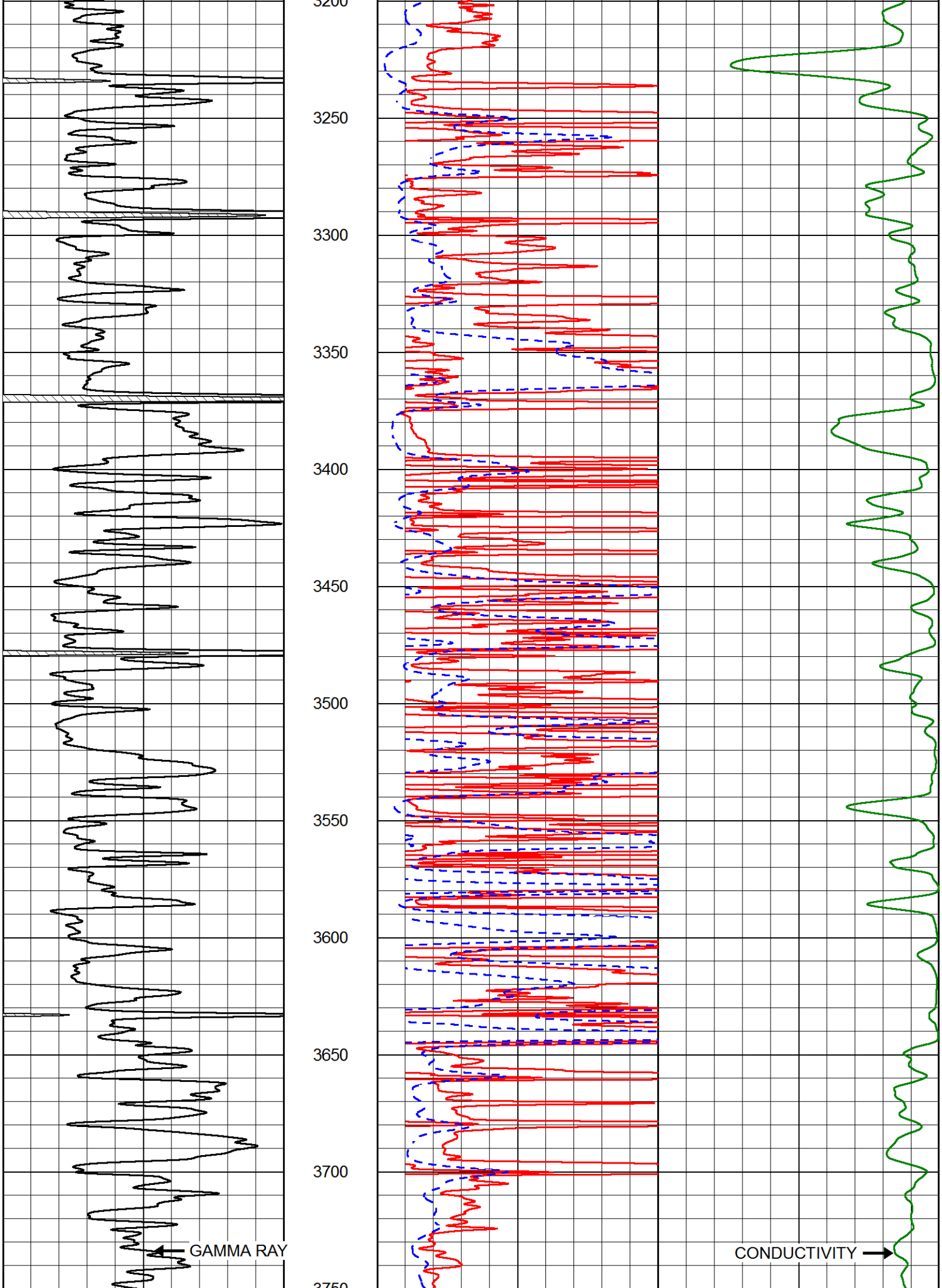
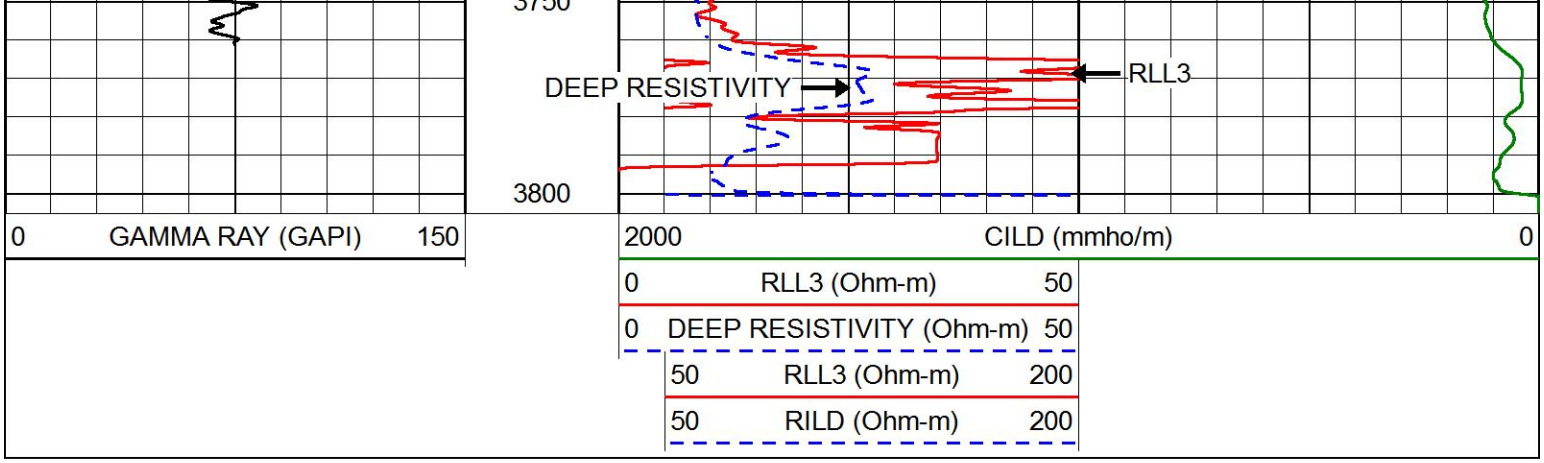
2400
2450
2500
2550
2600
2650


2650
2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200


3200
3250
3300
3350
3400
3450
3500
3550
3600
3650
3700
3750
GAMMA RAY
CONDUCTIVITY



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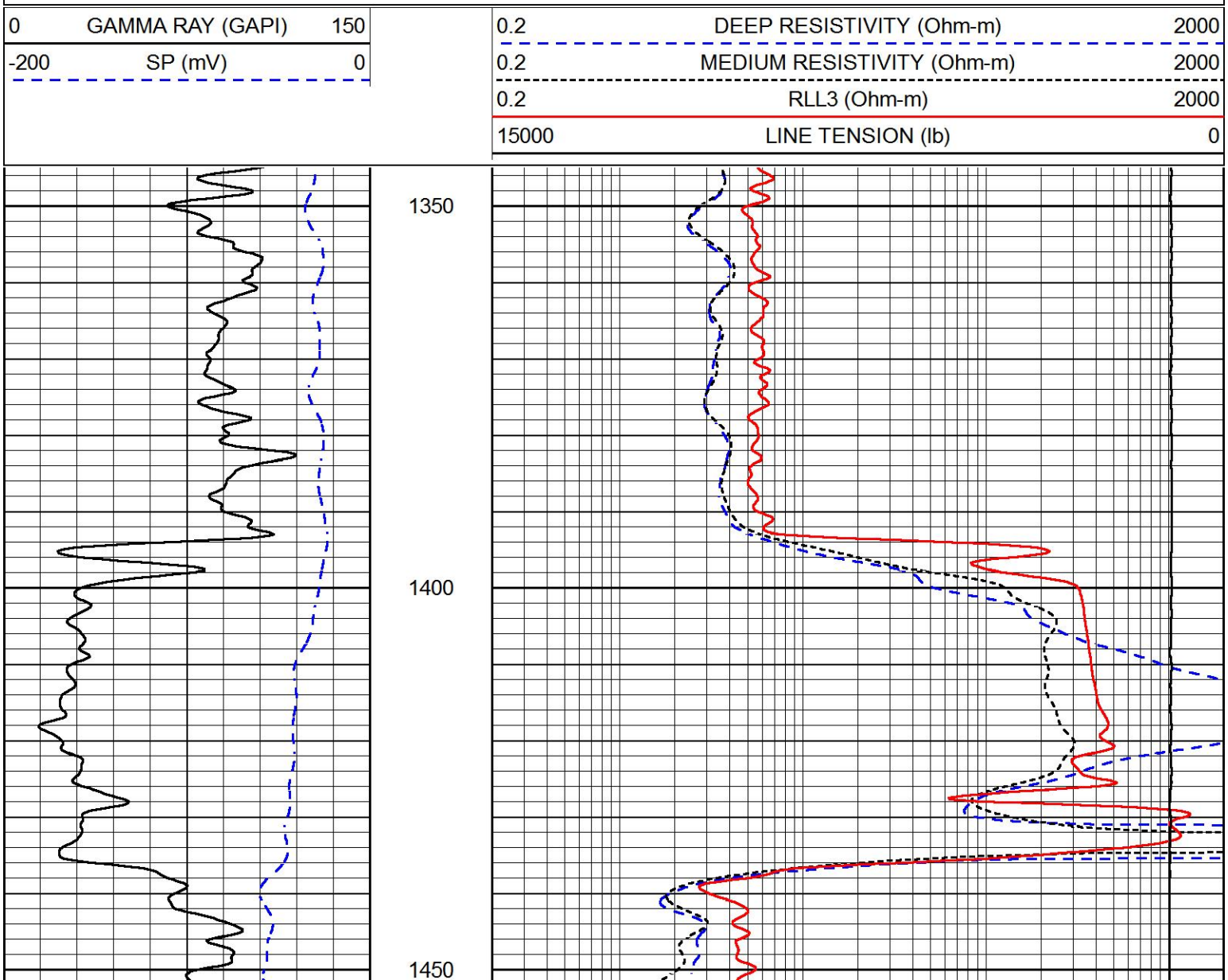
MAIN PASS

Database File	tdi_hart_1.db
Dataset Pathname	stackml/pass3.1
Presentation Format	dil
Dataset Creation	Fri Jun 21 07:38:50 2019
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

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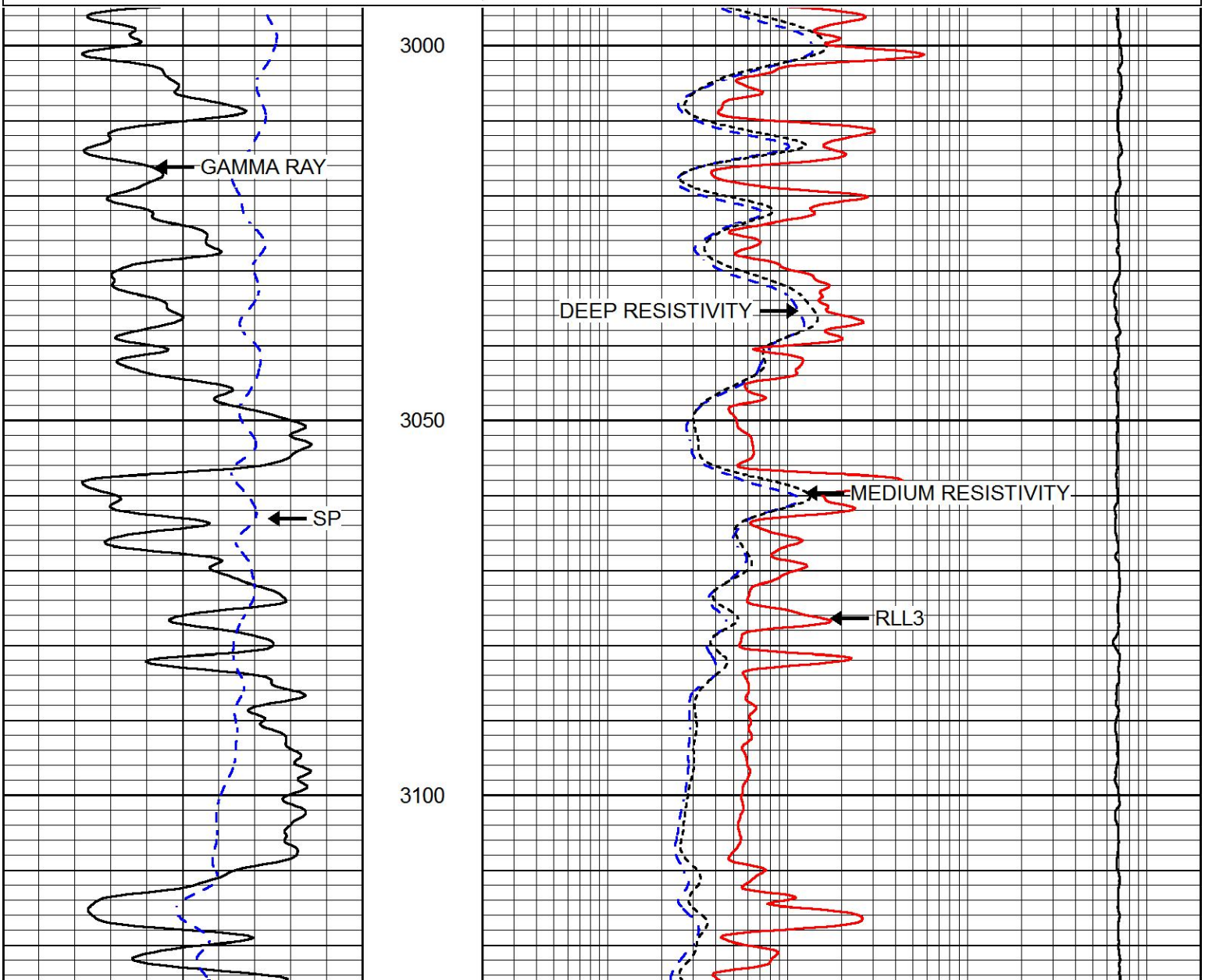
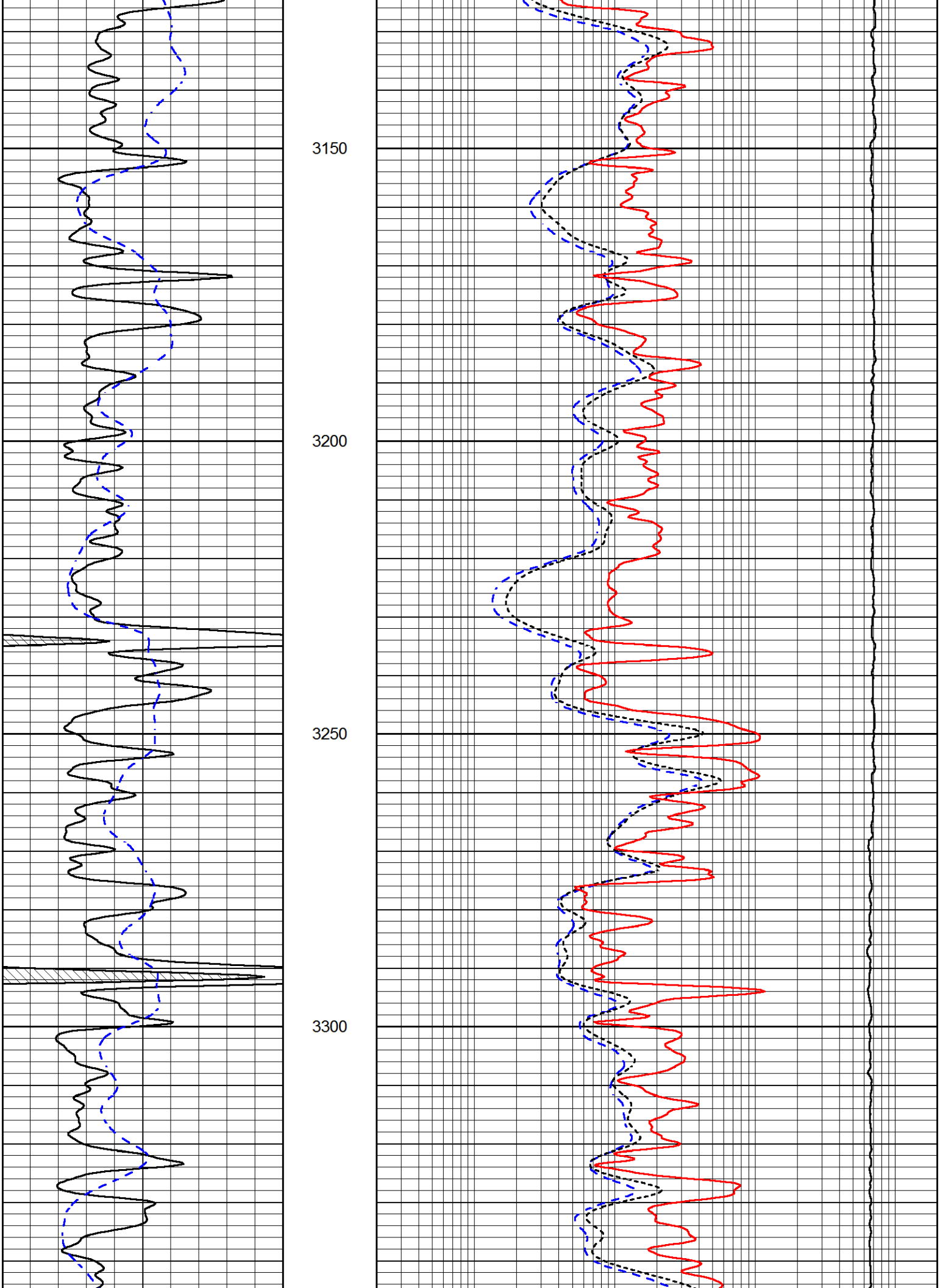
0.2	RLL3 (Ohm-m)	2000
15000	LINE TENSION (lb)	0

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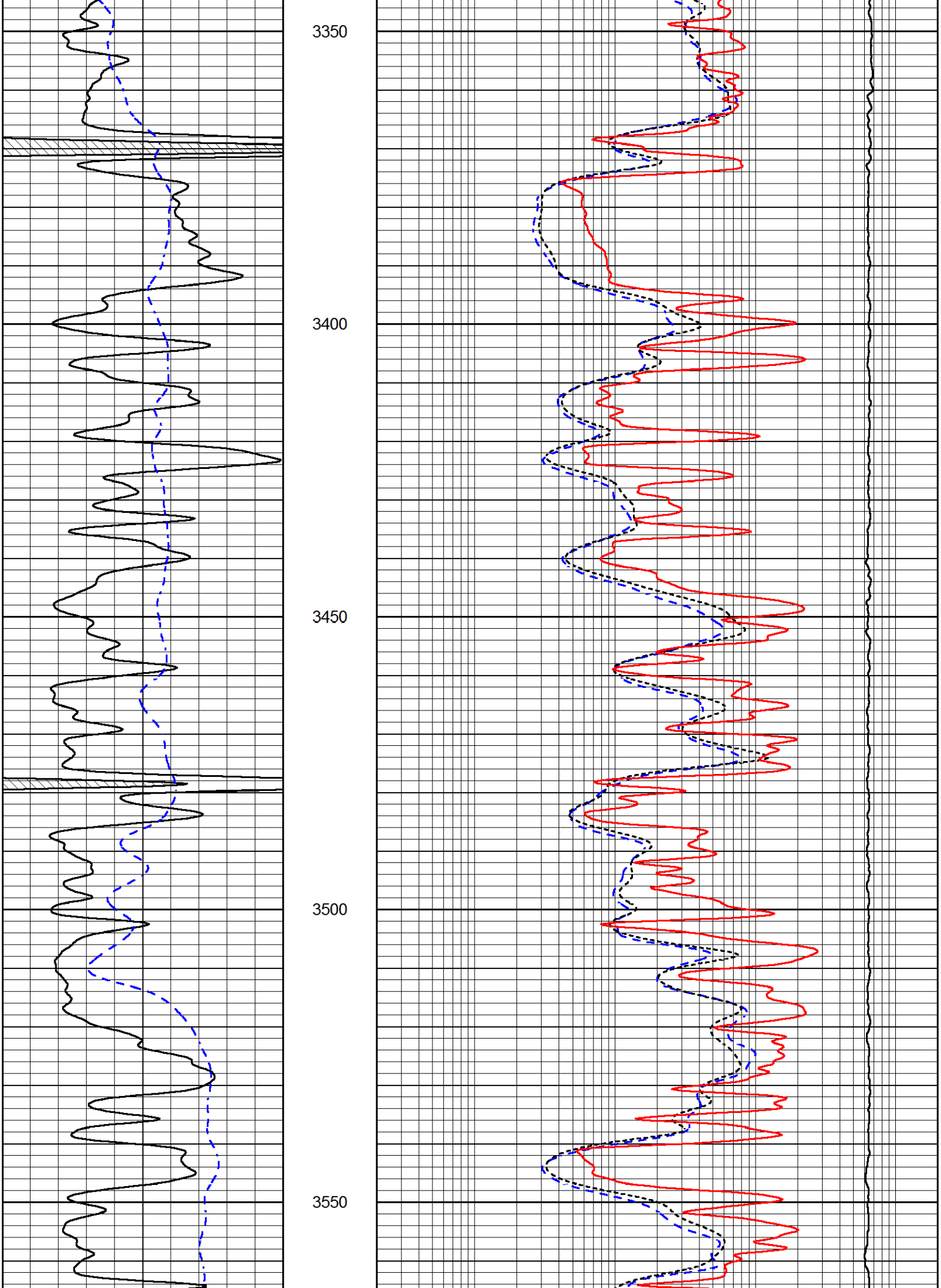
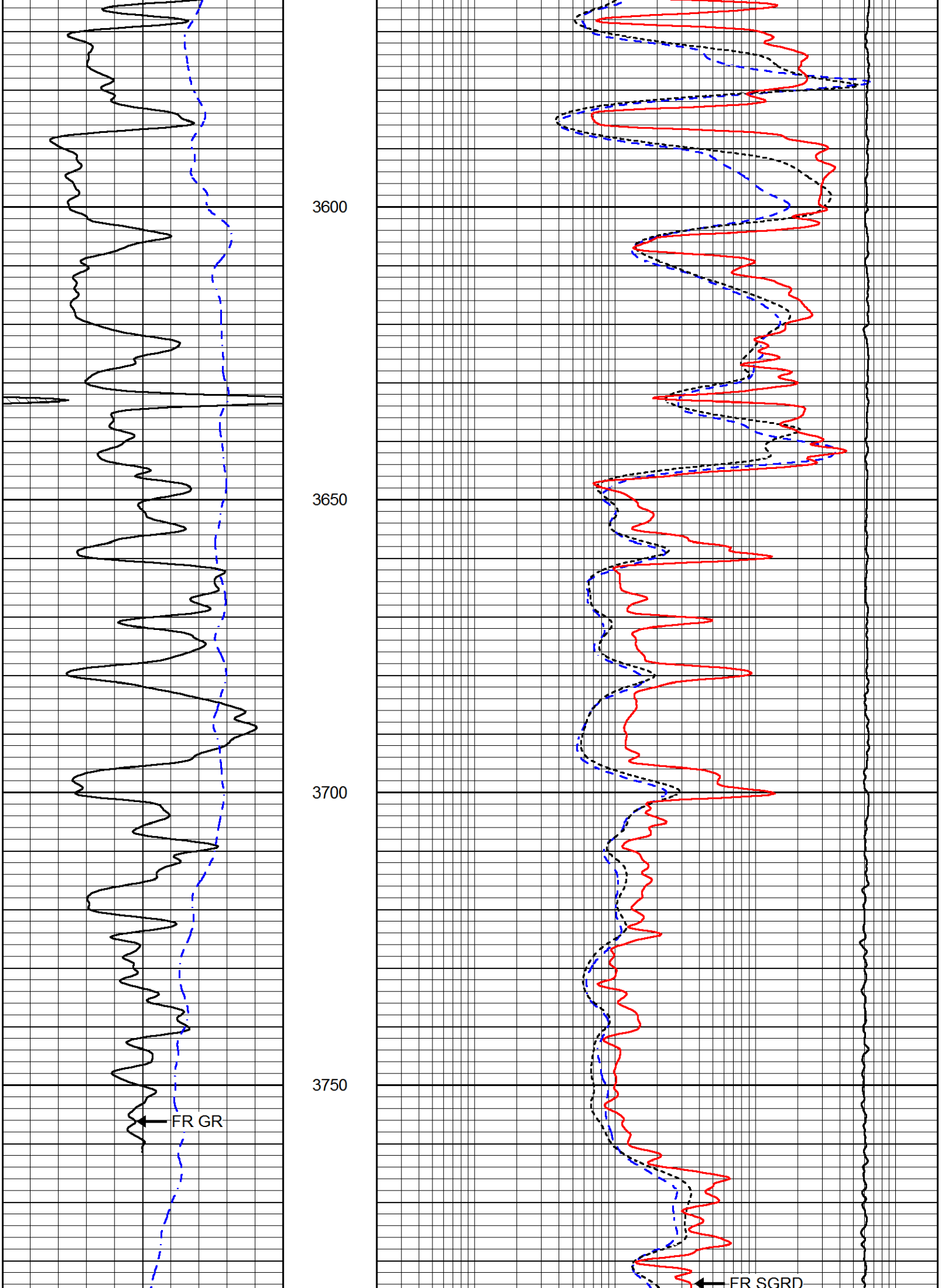
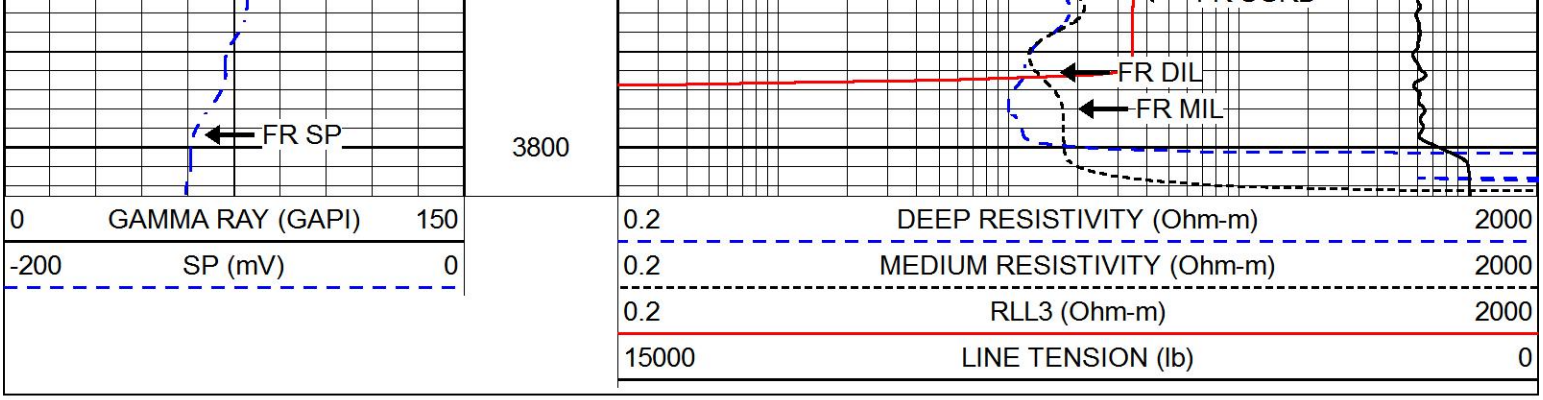
3200
3250
3300


3350
3400
3450
3500
3550


3600
3650
3700
3750
FR GR
FR SGRD



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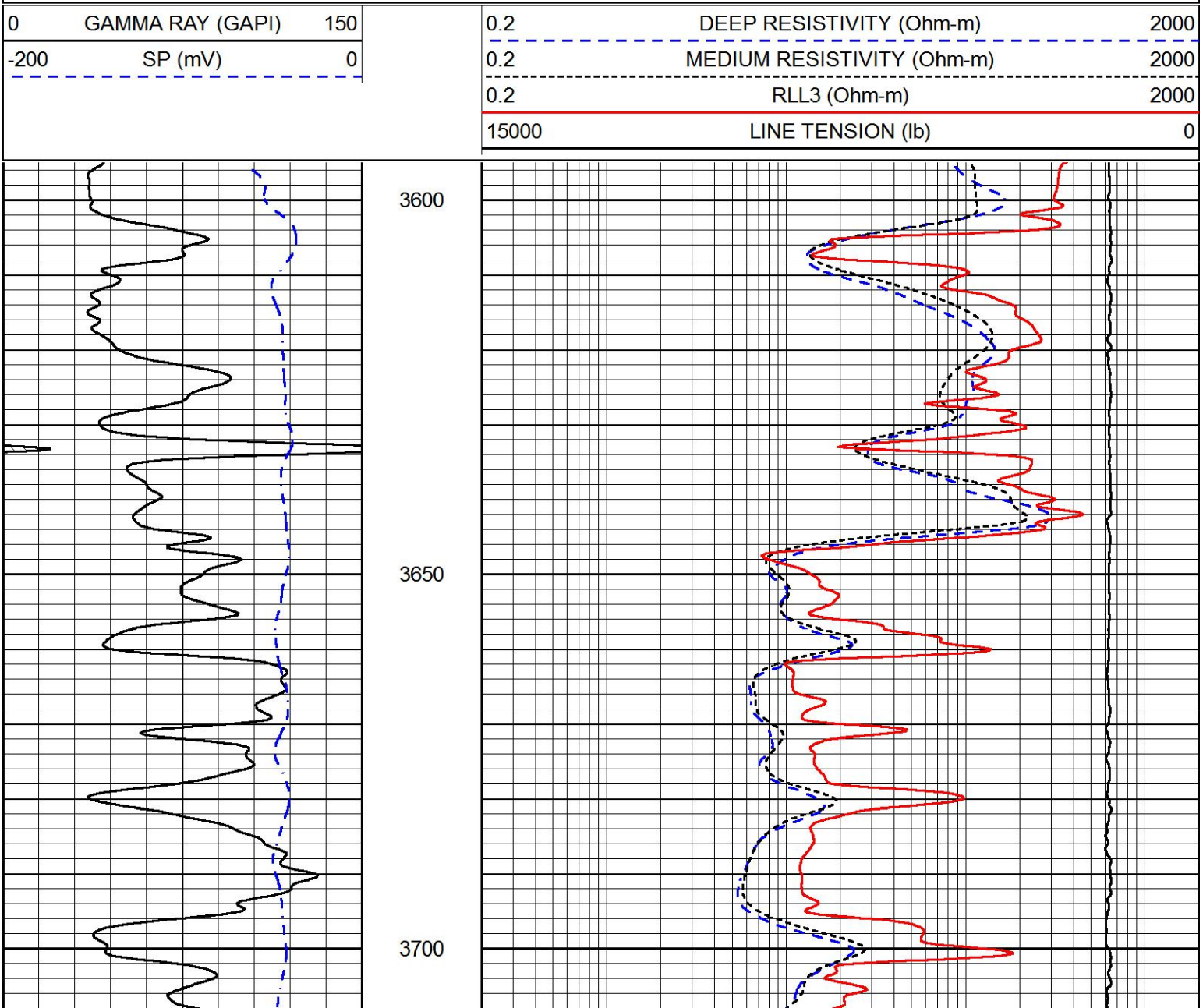
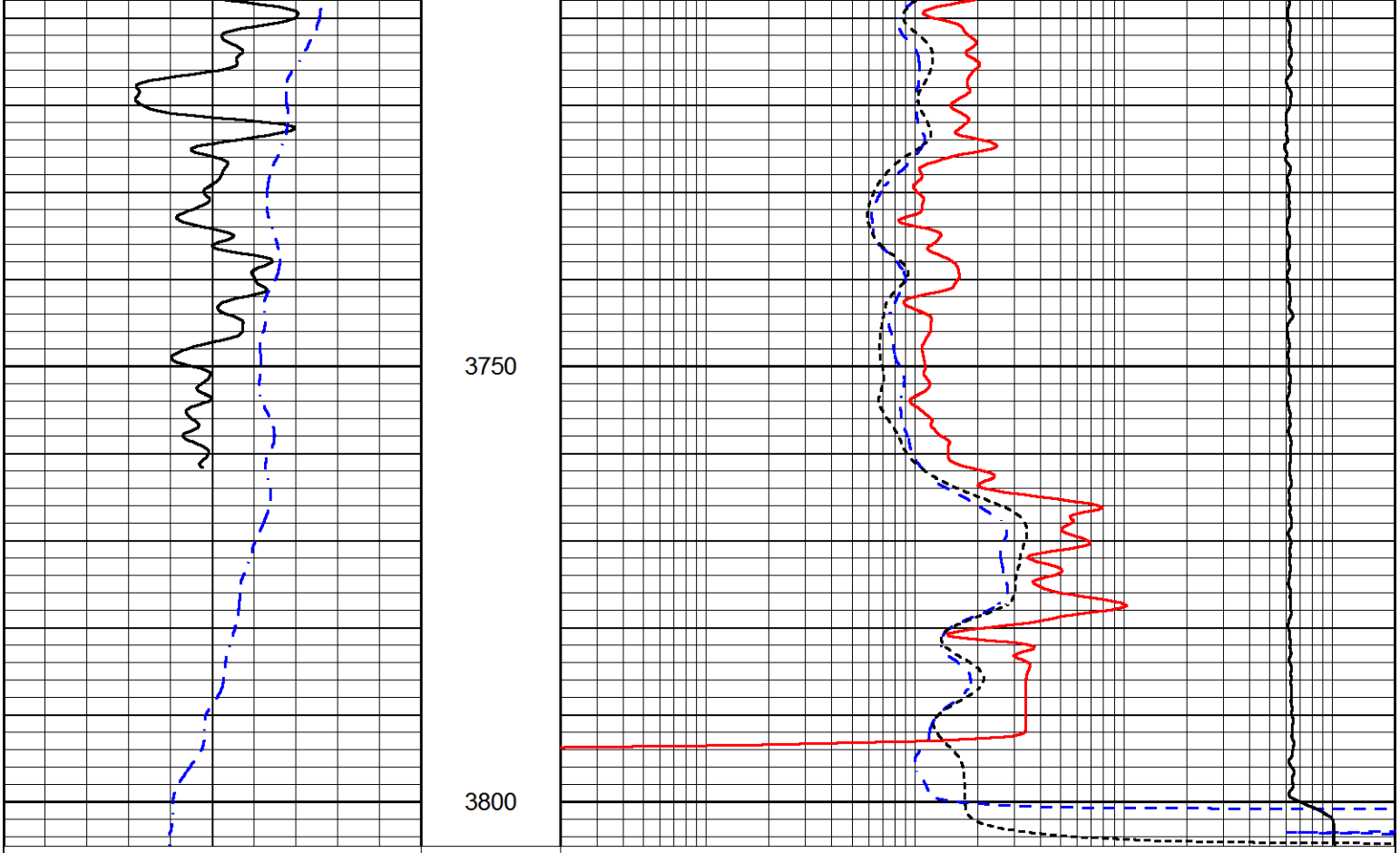
REPEAT SECTION

Database File	tdi_hart_1.db
Dataset Pathname	stackml/pass2.1
Presentation Format	dil
Dataset Creation	Fri Jun 21 07:10:05 2019
Charted by	Depth in Feet scaled 1:240





Calibration Report

Database File	tdi_hart_1.db
Dataset Pathname	stackml/pass3.1
Dataset Creation	Fri Jun 21 07:38:50 2019

Dual Induction Calibration Report

Serial-Model:	PSI 988-M&W
Calibration Performed:	Tue Nov 20 10:50:19 2018

	Readings		References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.525	-44.000
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.380	-17.000

Microlog Calibration Report

Serial-Model:	UDM-01-PSI UDM ML
Performed:	Fri May 31 06:10:42 2019

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	30000.0000	-0.3000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	25000.0000	0.0000

Inverse	0.0000	1.0000		0.0000	1.0000	Ohm-m	25000.0000	0.0000
Caliper	1.3170	1.1585		8.0000	22.0000	in	-88.3214	123.7000

Compensated Density Calibration Report

Serial-Model:	144-84-M&W
Source / Verifier:	/
Master Calibration Performed:	Mon Jan 07 15:00:31 2019

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4315.49	5309.89	cps
Aluminum	2.665	g/cc	825.26	3443.46	cps

Spine Angle = 75.33 Density/Spine Ratio = 0.532

	Size		Reading
Small Ring	4.00	in	0.69
Large Ring	14.00	in	0.04

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 17:08:01 2017	
Calibrator Value:	1000.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	6.2	cps
Sensitivity:	0.5200	GAPI/cps

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Company	TDI, INC.
Well	HART #1
Field	WILDCAT
County	ELLIS
State	KANSAS