PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company TDI, INC.
Well ROBBEN FAMILY #1
Field N/A
County ELLIS State KANSAS

Location: API # : 15-051-26847-00-00
NW NE SW NE
1360' FNL & 1720' FEL
SEC 3 TWP 15S RGE 16W

Other Services
CNL/CDL
MEL

Permanent Datum GROUND LEVEL Elevation 1893'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Elevation
K.B. 1903'
D.F. N/A
G.L. 1893'

Company TDI, INC.
Well ROBBEN FAMILY #1
Field N/A
County ELLIS
State KANSAS

Date	11/29/2016		
Run Number	ONE		
Depth Driller	3575'		
Depth Logger	3574'		
Bottom Logged Interval	3573'		
Top Log Interval	200'		
Casing Driller	8.625" @ 215'		
Casing Logger	212'		
Bit Size	7.875"		
Type Fluid in Hole	CHEMICAL		
Salinity,ppm CL	5300		
Density / Viscosity	9.3 / 60		
pH / Fluid Loss	10.5 / 7.2		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.7 @ 68		
Rmf @ Meas. Temp	0.53 @ 68		
Rmc @ Meas. Temp	0.95 @ 68		
Source of Rmf / Rmc	CHARTS		
Rm @ BHT	0.43 @ 112		
Operating Rig Time	2 1/2 HOURS		
Max Rec. Temp. F	112 DEG F		
Equipment Number	108		
Location	COLBY		
Recorded By	T. MARTIN		
Witnessed By	TOM DENNING	HERB DEINES	

<<< Fold Here >>>

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

WALKER, KS, 5.4 MILES S OF I-70
TO ANTONINO RD, 1/2 W, S INTO

Log Measured From: KELLY BUSHING 10 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: T. MARTIN	Primary Witness: TOM DENNING
Operator:	Secondary Witness: HERB DEINES
Operator:	Secondary Witness:
Operator:	Secondary Witness:

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb

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	40.58					
CNLSC	37.48		CNT-M&W (tk10-MW)	5.50	3.50	100.00
CNSSC	36.73					
			CDL-M&W (71-914)	8.50	4.00	250.00
LSD	28.43					
DCAL	28.42					
SSD	27.93					
			ML-PSI STKBL ML (PSI-01) Stackable Microlog Tools	7.58	4.00	65.00
MCAL	19.83					
MI	19.83					
MN	19.83					
RLL3	15.80					
RLL3F	15.79					
			DIL-M&W (1987)	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					

Dataset: tdi_robben family_#1.db: field/well/stkml/pass3.1
Total length: 43.08 ft
Total weight: 685.00 lb
O.D.: 4.00 in

Log Variables

DatabaseC:\ProgramData\Warrior\Data\tdi_robben family_#1.db
Dataset field/well/stkml/pass3.1/_vars_

Top - Bottom

A	BOREID in	BOTTEMP degF	CASEOD in	CASETHCK in	FLUIDDEN g/cc	M	MATRXDEN g/cc
1	7.875	112	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	-335	40	Off	3574

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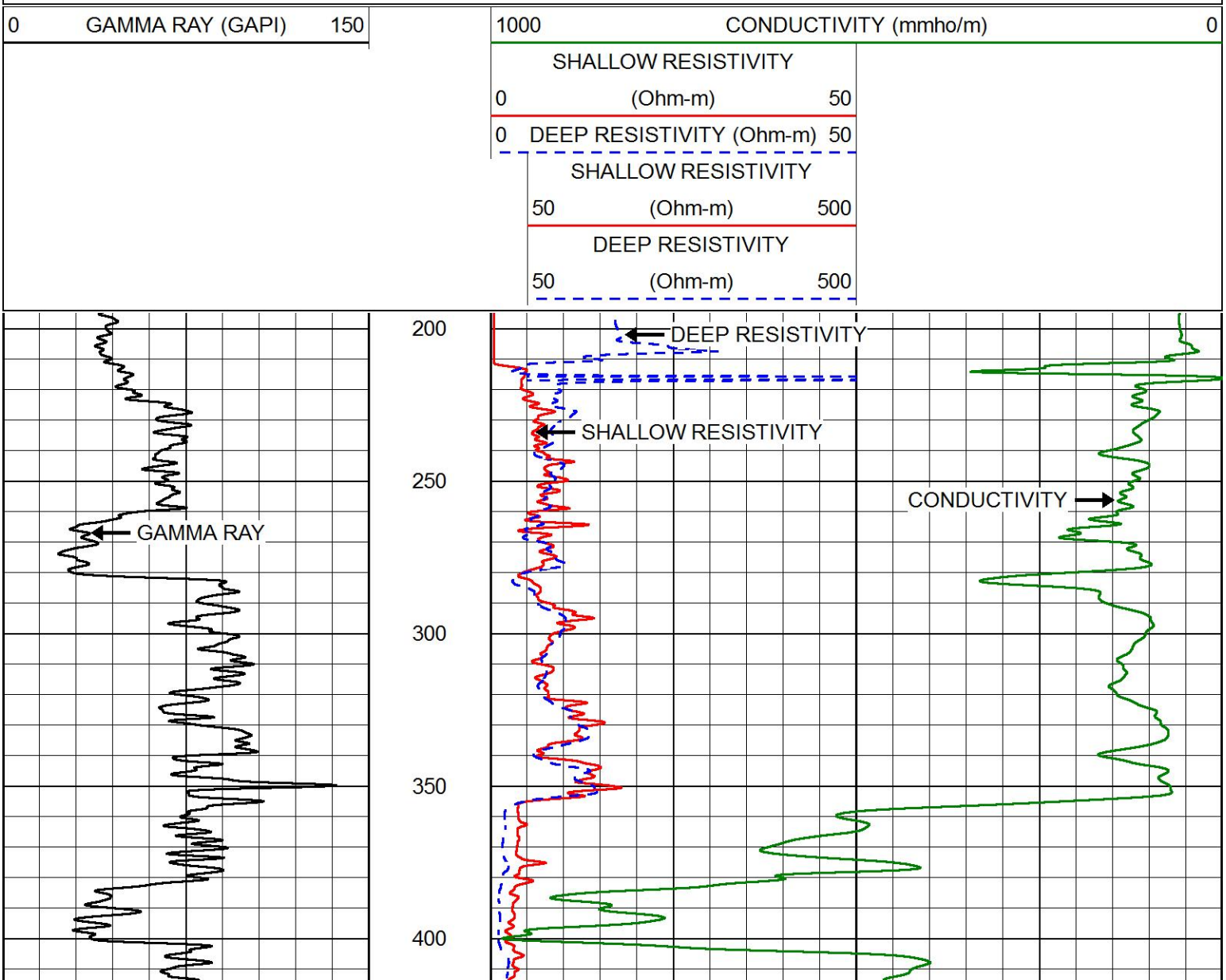
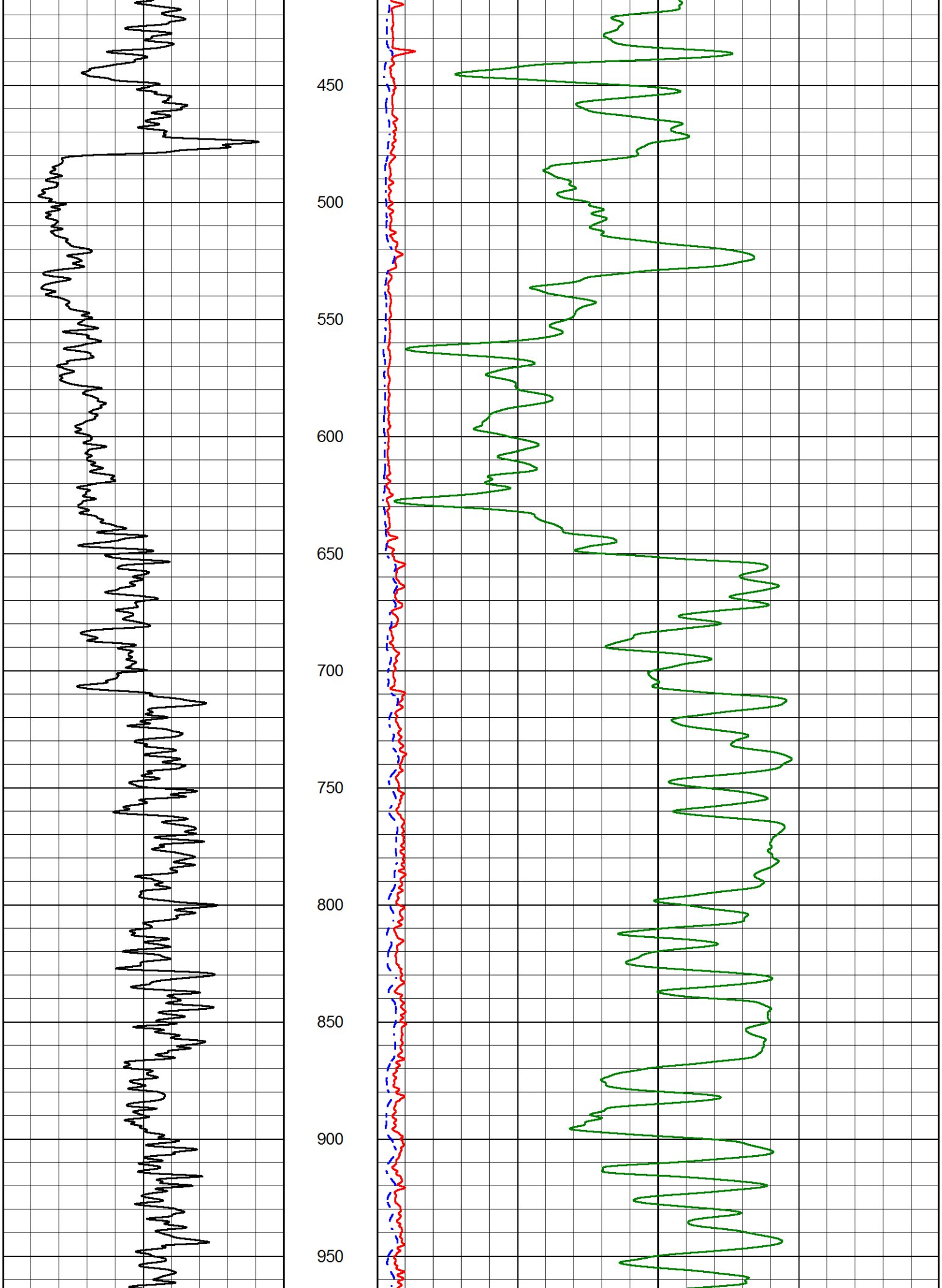
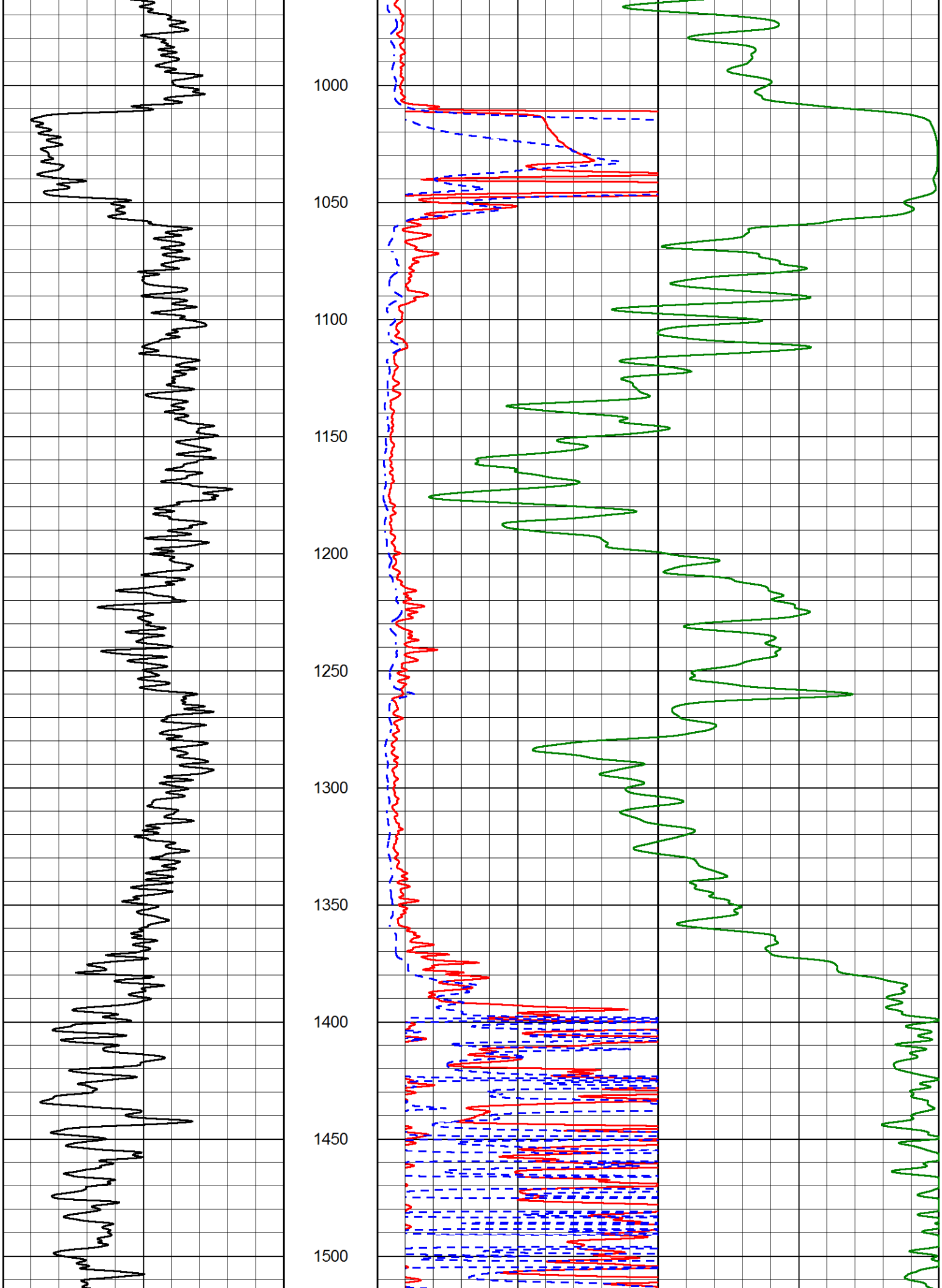
2" SCALE RESISTIVITY

MAIN PASS

Database File	tdi_robben family_#1.db
Dataset Pathname	stkml/pass3.2
Presentation Format	dil2in
Dataset Creation	Tue Nov 29 20:06:38 2016
Charted by	Depth in Feet scaled 1:600




450
500
550
600
650
700
750
800
850
900
950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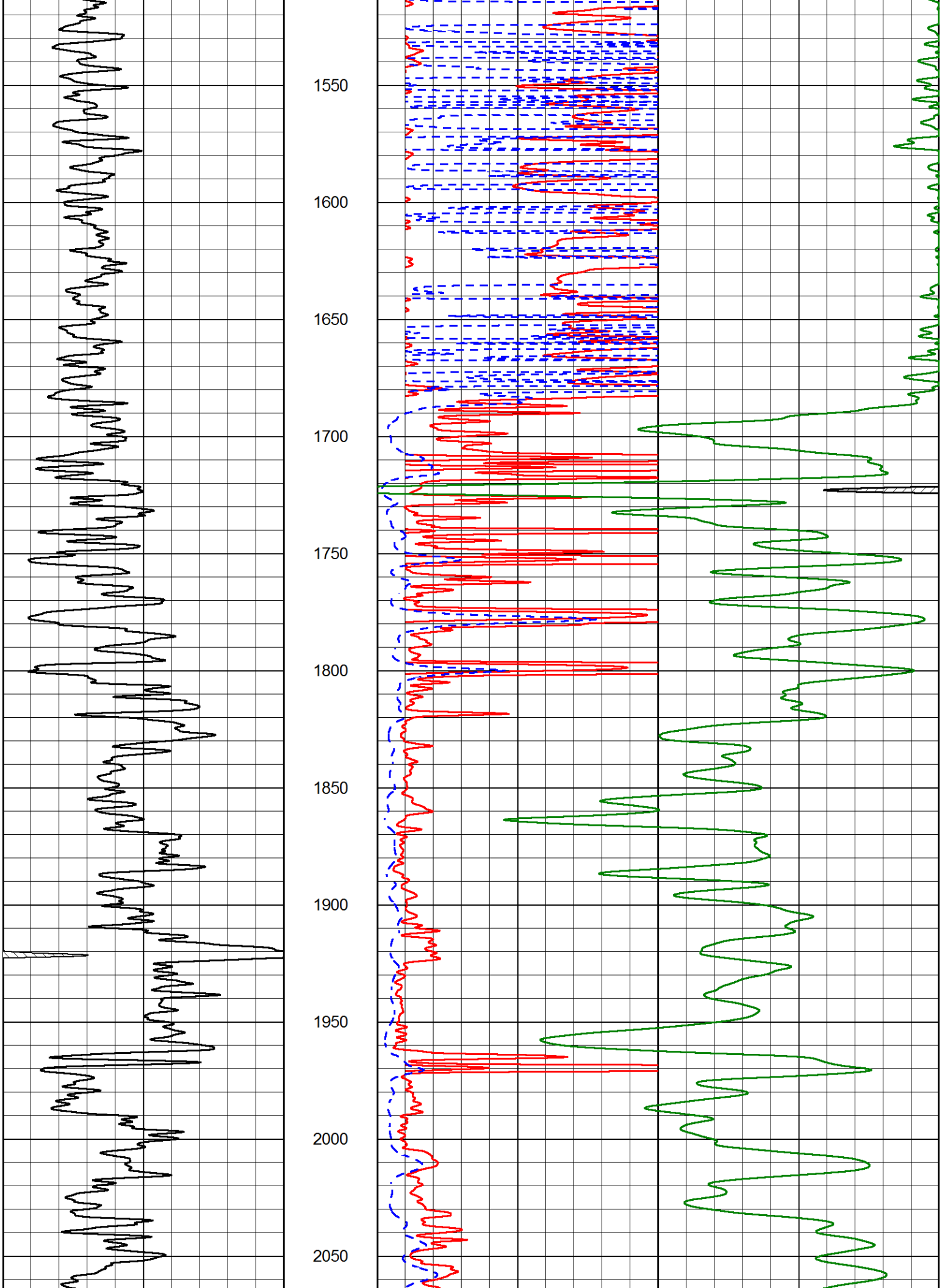
1100
1150
1200
1250
1300
1350
1400
1450
1500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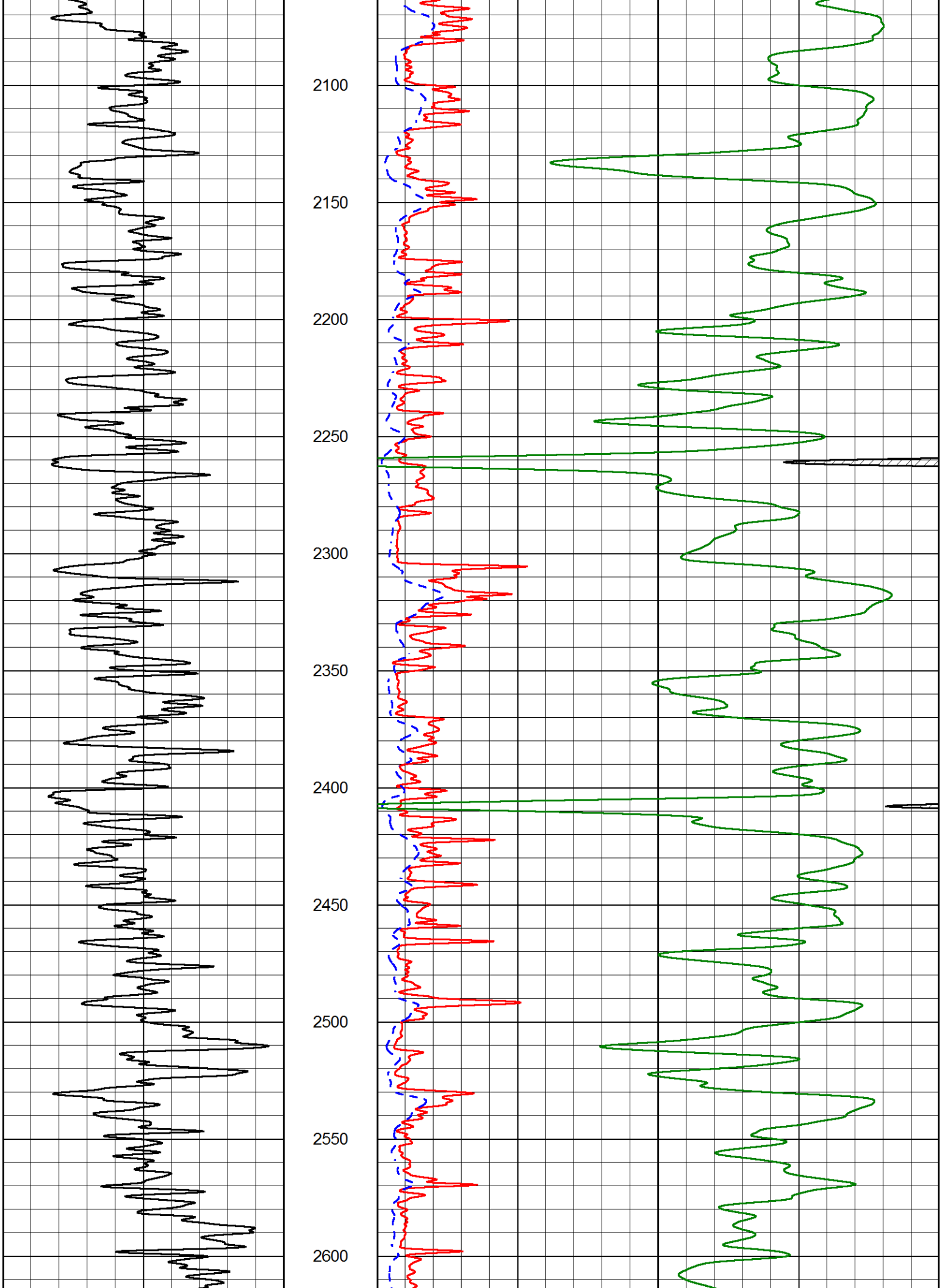
1600
1650
1700
1750
1800
1850
1900
1950
2000
2050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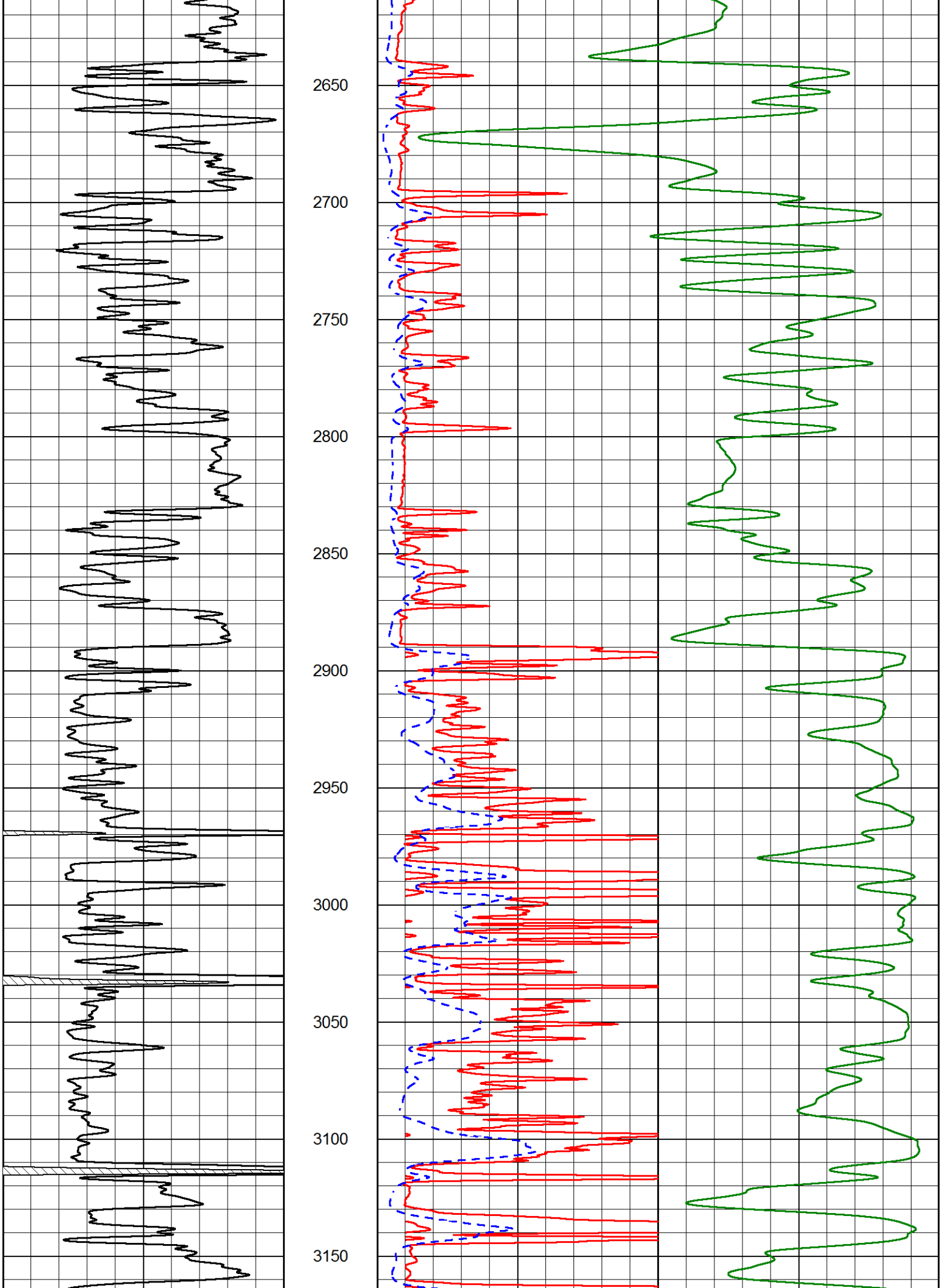
2150
2200
2250
2300
2350
2400
2450
2500
2550
2600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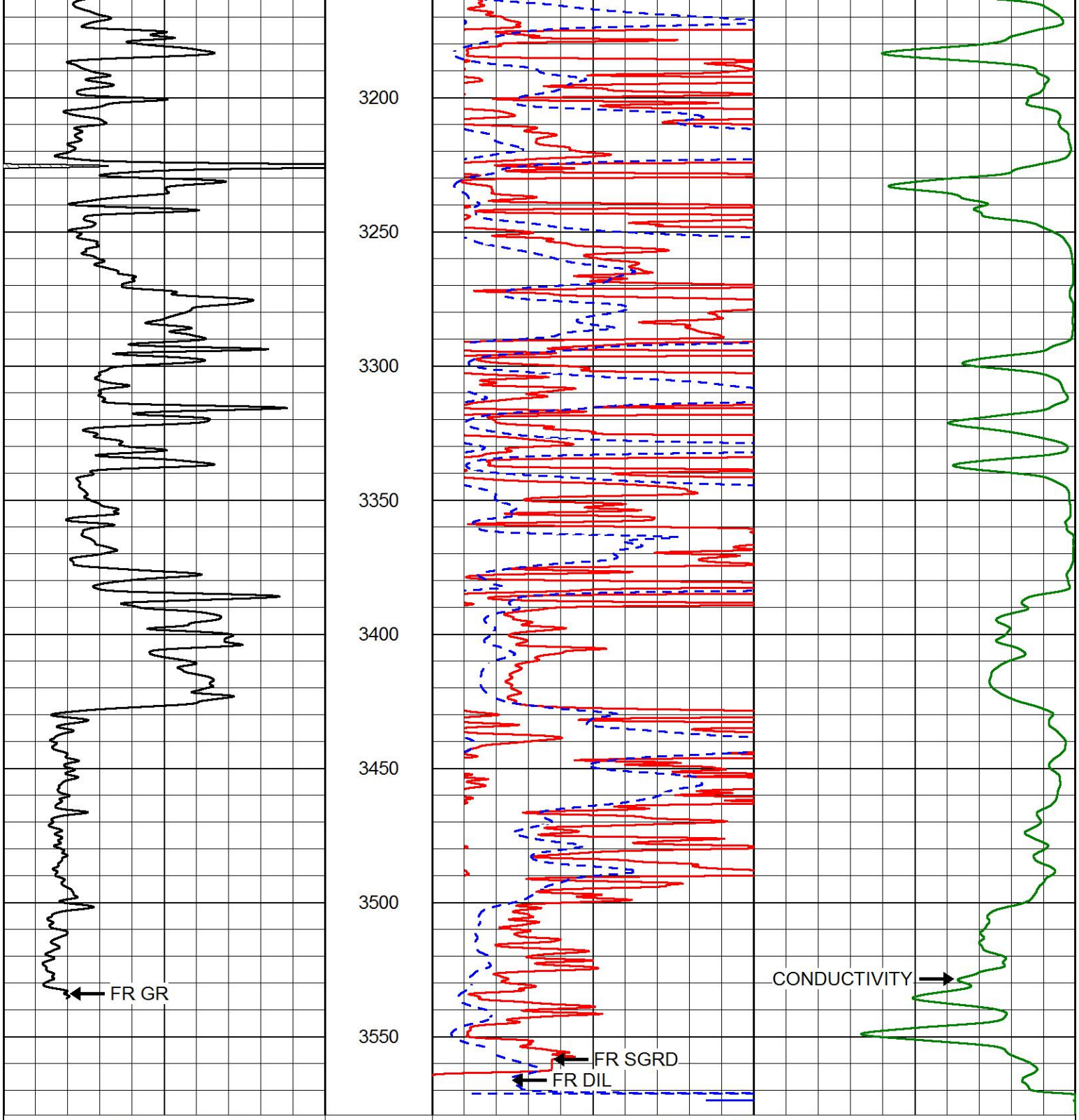
2700
2750
2800
2850
2900
2950
3000
3050
3100
3150



ANHYDRITE SECTION

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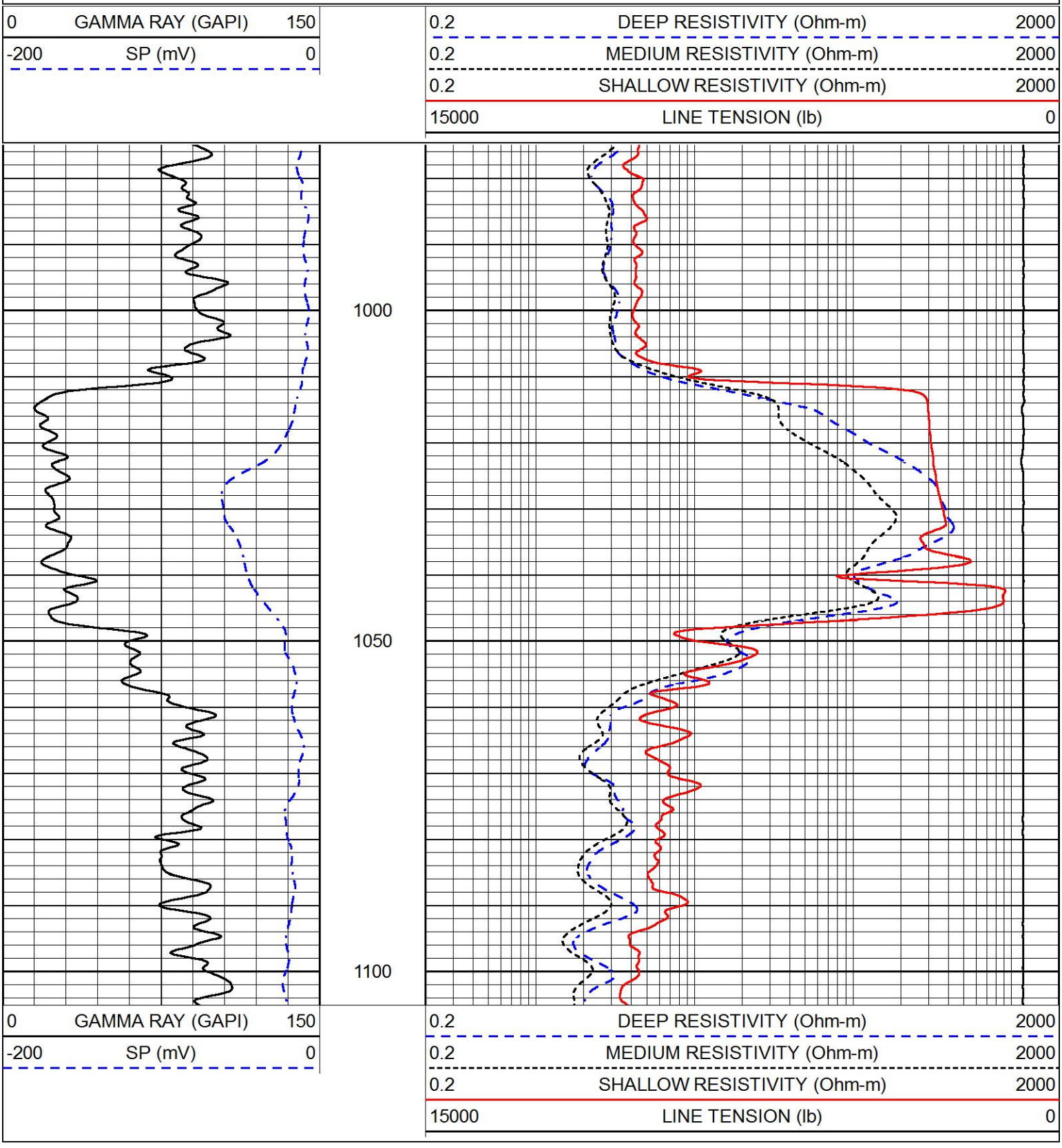
MAIN PASS

Database File	tdi_robben family_#1.db
Dataset Pathname	stkml/pass3.4
Presentation Format	dil
Dataset Creation	Tue Nov 29 19:57:10 2016
Charted by	Depth in Feet scaled 1:240



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MAIN PASS

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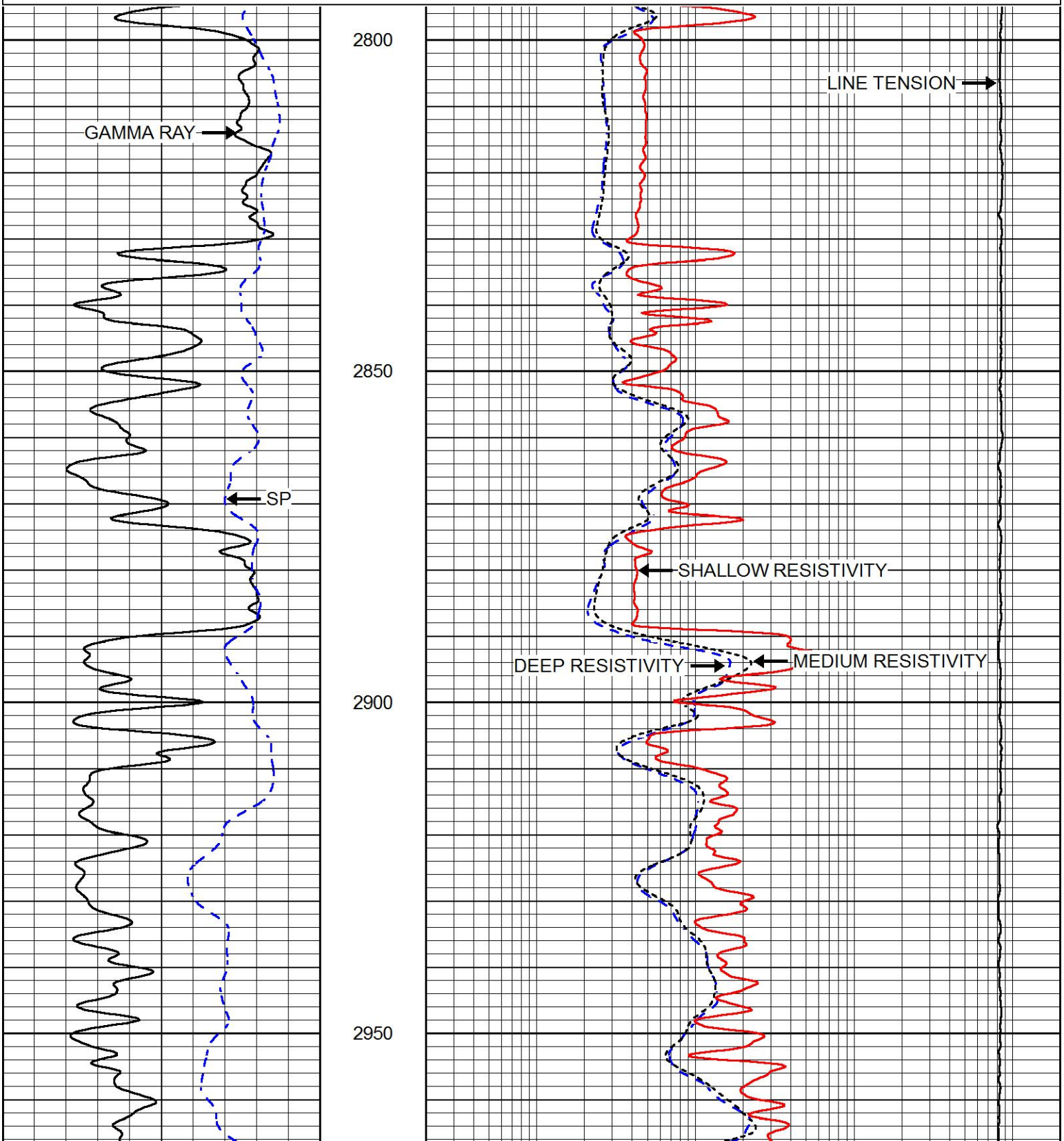
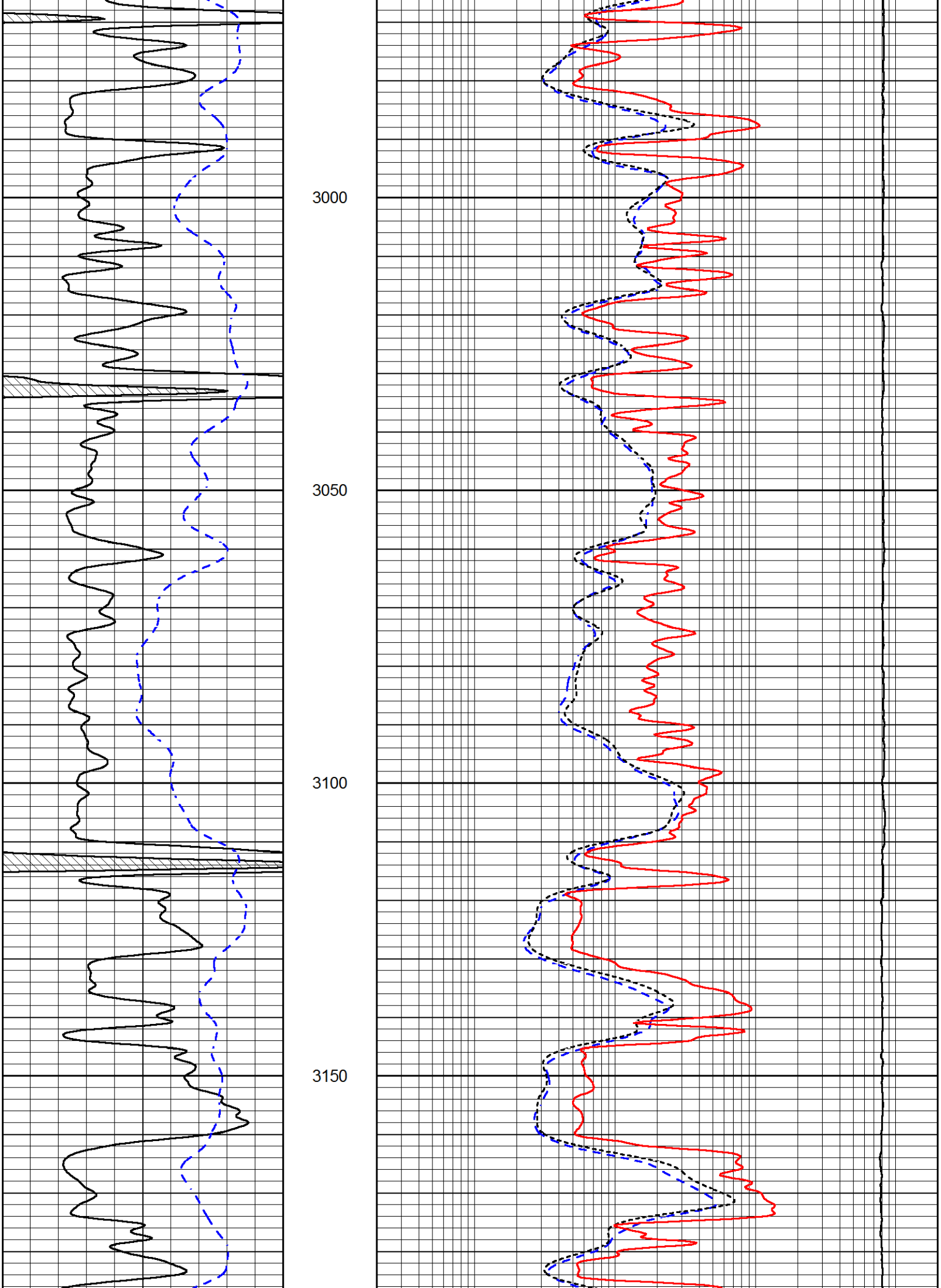
MAIN PASS

Database File	tdi_robben family_#1.db
Dataset Pathname	stkml/pass3.1
Presentation Format	dil
Dataset Creation	Tue Nov 29 20:06:47 2016
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	SHALLOW RESISTIVITY (Ohm-m)	2000
15000	LINE TENSION (lb)	0

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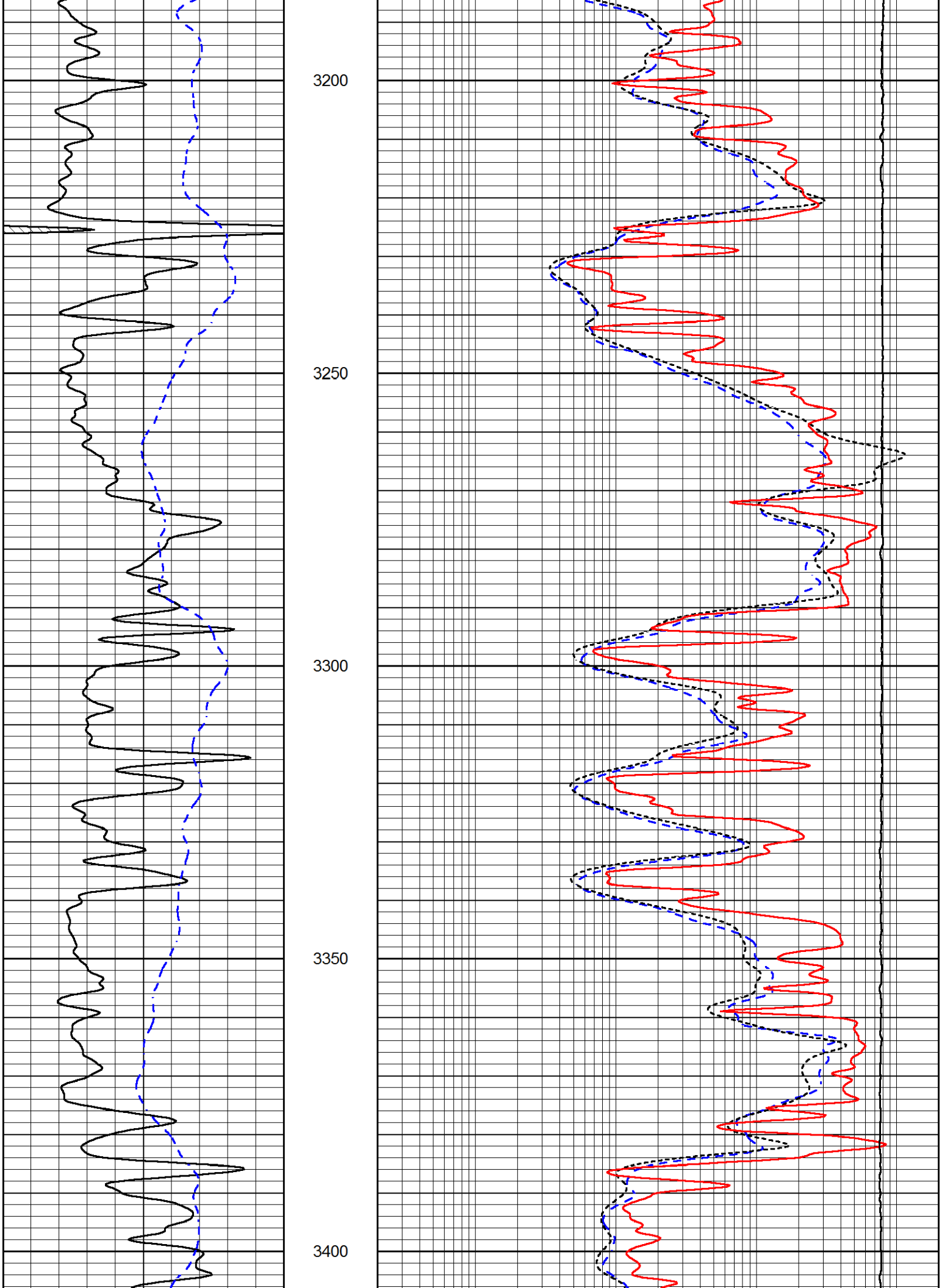
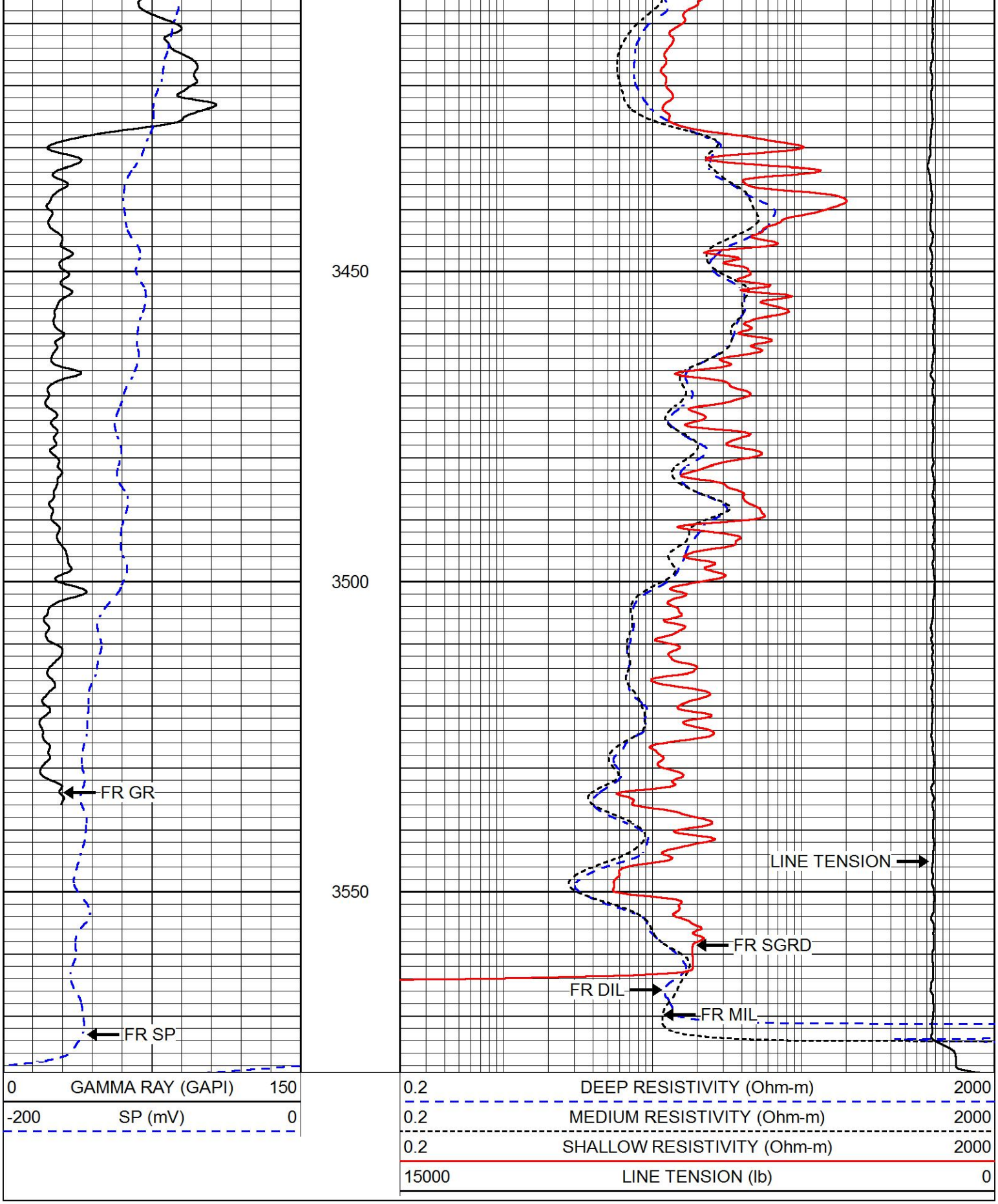
3050
3100
3150


3200
3250
3300
3350
3400



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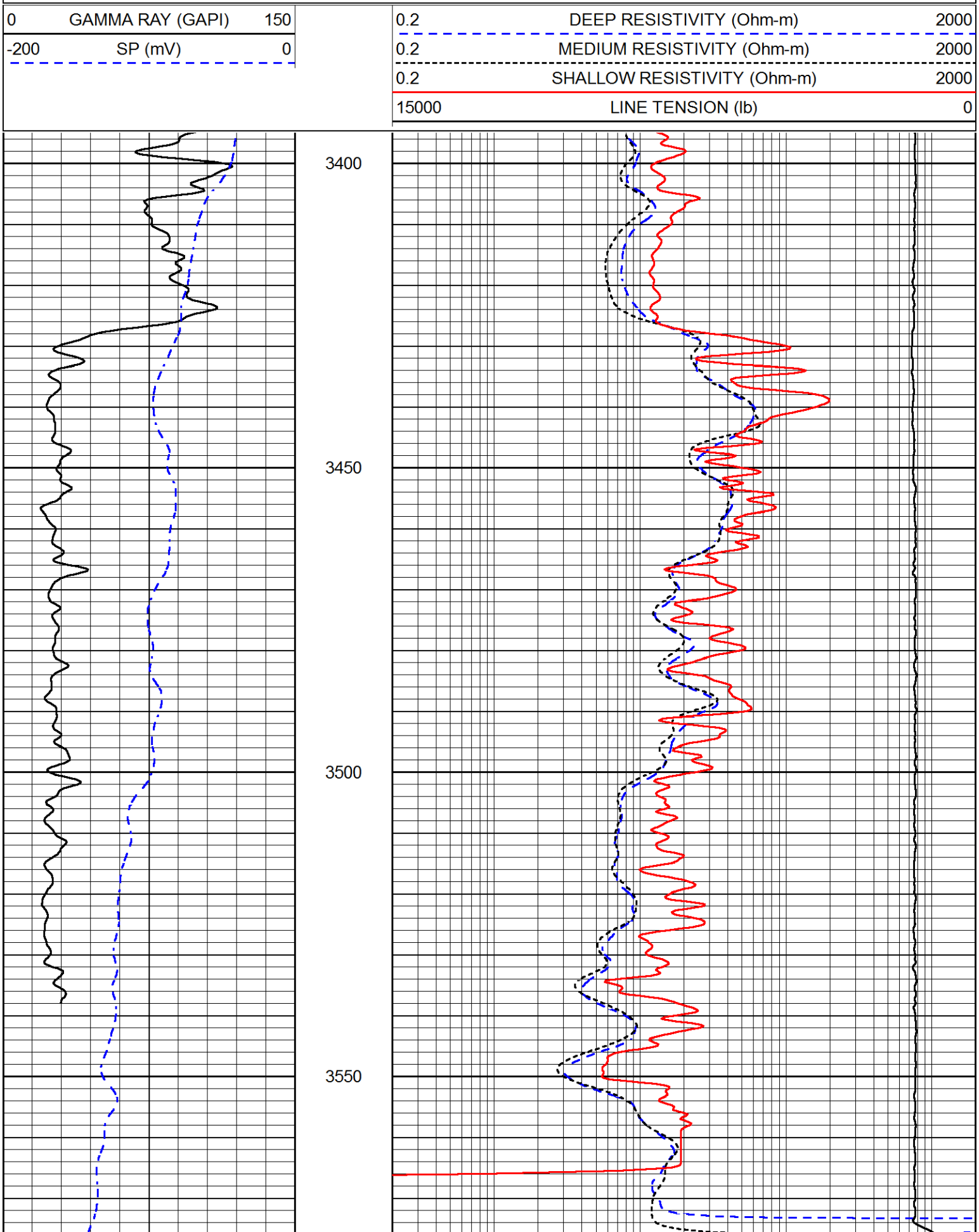
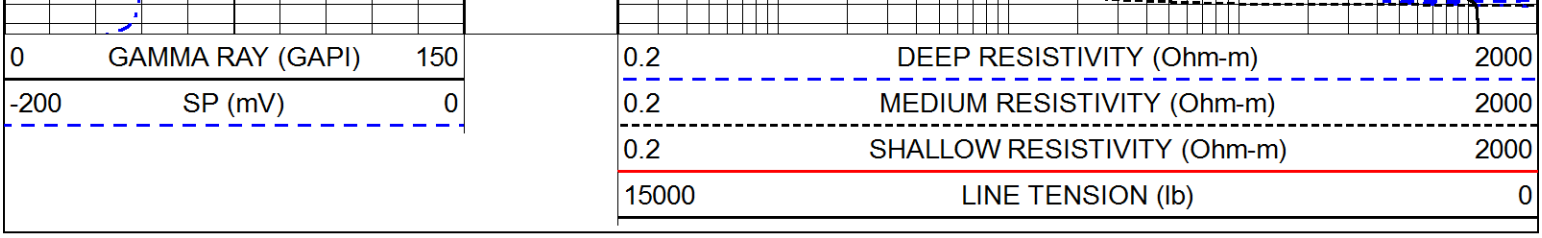
REPEAT SECTION

Database File	tdi_robben family_#1.db
Dataset Pathname	stkml/pass2.1
Presentation Format	dil
Dataset Creation	Tue Nov 29 19:34:21 2016
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	SHALLOW RESISTIVITY (Ohm-m)	2000
15000	LINE TENSION (lb)	0

Calibration Report

Database File	tdi_robben family_#1.db
Dataset Pathname	stkml/pass3.1
Dataset Creation	Tue Nov 29 20:06:47 2016

Dual Induction Calibration Report

Serial-Model:	1987-M&W
Calibration Performed:	Thu Nov 17 20:52:56 2016

	Readings		References			Results	
Loop:	Air	Loop	Air	Loop		Gain	Offset
Deep	178.615	710.235	0.000	255.800	mmho/m	0.530	-35.500
Medium	161.982	1441.110	0.000	255.800	mmho/m	0.440	-112.000

Microlog Calibration Report

Serial-Model:	PSI-01-PSI STKBL ML
Performed:	Thu Mar 31 17:14:32 2016

	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	24500.0000	-1.0000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	29500.0000	-1.0000
Caliper	1.0001	1.1397	6.5000	18.5000	in	86.0000	-82.5500

Compensated Density Calibration Report

Serial-Model:	71-914-M&W
Source / Verifier:	/
Master Calibration Performed:	Thu Nov 17 21:42:33 2016

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.755	g/cc	4314.49	5307.52	cps
Aluminum	2.675	g/cc	822.19	3456.36	cps

Spine Angle = 75.49

Density/Spine Ratio = 0.537

	Size		Reading
Small Ring	4.00	in	1.16
Large Ring	14.00	in	1.57

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:	Thu Nov 17 21:13:32 2016	
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	ROBBEN FAMILY #1
Field	N/A
County	ELLIS
State	KANSAS