



PIONEER
Pioneer Energy Services

DUAL INDUCTION LOG

Company **COBALT ENERGY, LLC**
Well **BILLY GENE 'A' #1-3**
Field **FRANK NORTH**
County **BARTON** State **KANSAS**

Location: API #: 15-009-26195-00-00

2223' FSL & 1883' FWL

Other Services
CNL/CDL
MEL

SEC 3 TWP 19S RGE 12W

Permanent Datum GROUND LEVEL Elevation 1804'
Log Measured From KELLY BUSHING
Drilling Measured From KELLY BUSHING

Elevation
K.B. 1809'
D.F. N/A
G.L. 1804'

Date 2/15/2018

Run Number ONE

Depth Driller 3420'

Depth Logger 3419'

Bottom Logged Interval 3418'

Top Log Interval 300'

Casing Driller 8.625" @ 320'

Casing Logger 318'

Bit Size 7.875"

Type Fluid in Hole CHEMICAL

Salinity, ppm CL 15200

Density / Viscosity 9.1 48

pH / Fluid Loss 9.5 10.4

Source of Sample FLOWLINE

Rm @ Meas. Temp 0.30 @ 60

Rmf @ Meas. Temp 0.23 @ 60

Rmc @ Meas. Temp 0.41 @ 60

Source of Rmf / Rmc CHARTS

Rm @ BHT 0.16 @ 110

Operating Rig Time 3 HOURS

Max Rec. Temp. F 110

Equipment Number 91

Location HAYS

Recorded By D. SCHMIDT

Witnessed By BOB O'DELL

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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.

GREAT BEND,
EAST TO HWY 156, NORTH TO 40 RD, 1 EAST,
NORTH AND WEST 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

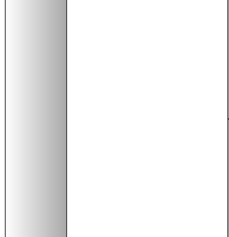
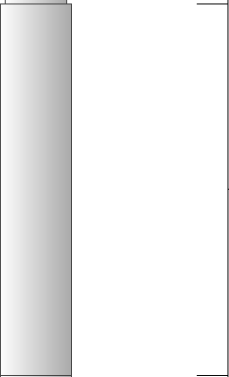
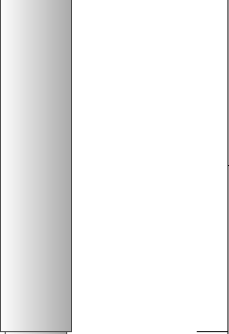
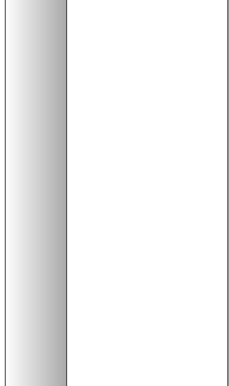
Engineer: D. SCHMIDT
Operator:
Operator:
Operator:

This Log Record Was Witnessed By

Primary Witness: BOB O'DELL
Secondary Witness:
Secondary Witness:
Secondary Witness:

Top - Bottom

M	A	SZCOR	NPORSEL	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	SNDERRM mmho/m
2	1	Off	Limestone	1	2.71	-85	0
SNDERR mmho/m 0	SRFTEMP degF 50	CASETHCK in 0	CASEOD in 5.5	PERFS 0	TDEPTH ft 3419	BOTTEMP degF 110	BOREID in 7.875

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR	40.58		GR-M&W (89)	3.00	3.50	50.00
CNLSC CNSSC	37.48 36.73		CNT-M&W (207-MW)	5.50	3.50	100.00
LSD DCAL SSD	28.43 28.42 27.93		CDL-M&W (182-152)	8.50	4.00	250.00
MCAL MI MN	19.83 19.83 19.83		ML-PSIML (PSI-01) GO Micro log tools converted to Simplec electronics	7.58	4.00	65.00
RLL3F RLL3	15.80 15.80					

			DIL-PSI HIGH TEMP (933 (HT))	18.50	3.50	220.00
CILD	8.00					
CILM	4.70					
SP	0.20					
Dataset: cobalt_billy gene a 1-3.db: field/well/STKML/pass3.3 Total length: 43.08 ft Total weight: 685.00 lb O.D.: 4.00 in						



Database File

cobalt_billy gene a 1-3.db

Dataset Pathname

STKML/pass4.1

Presentation Format

dil2in

Dataset Creation

Thu Feb 15 20:39:11 2018

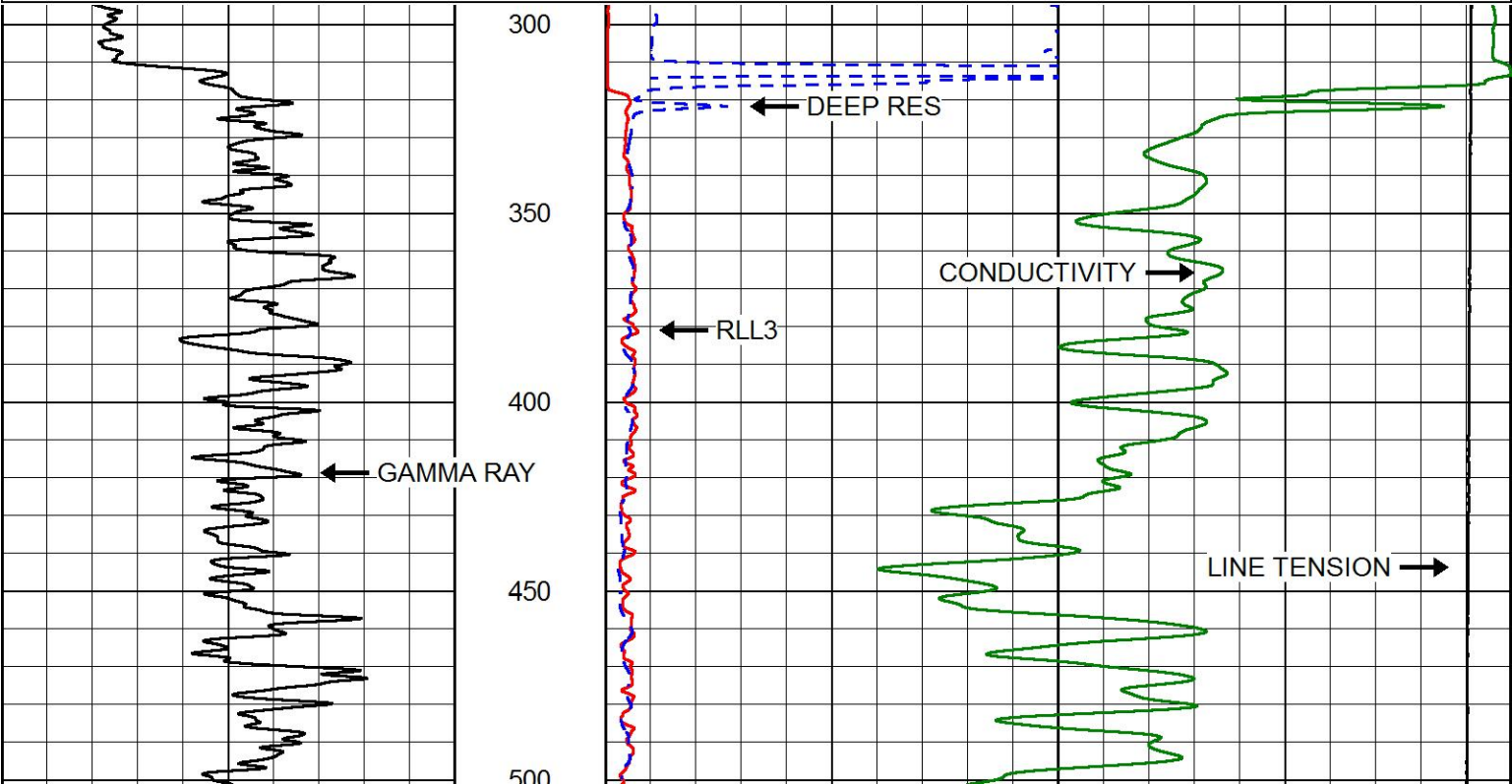
Charted by

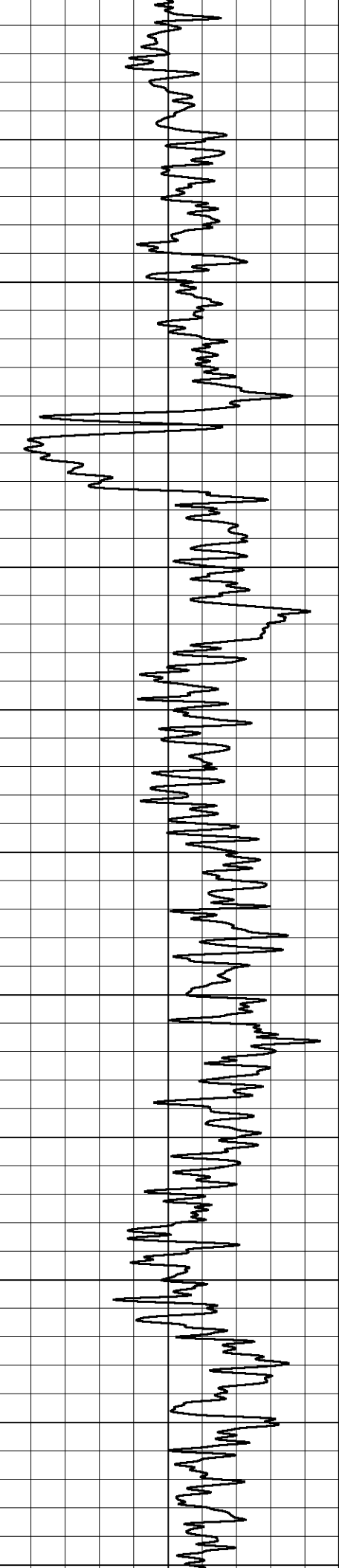
Depth in Feet scaled 1:600

MAIN PASS

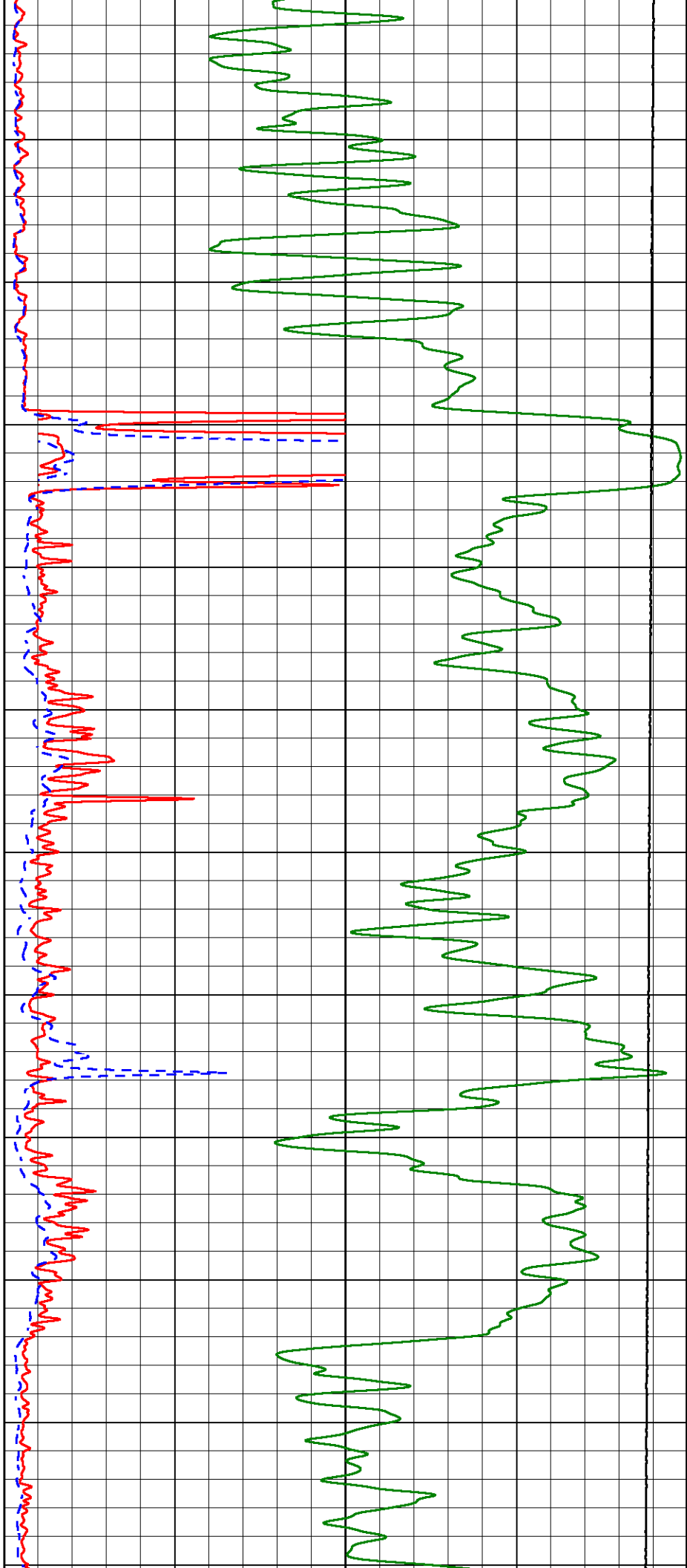
0	Gamma Ray (GAPI)	150
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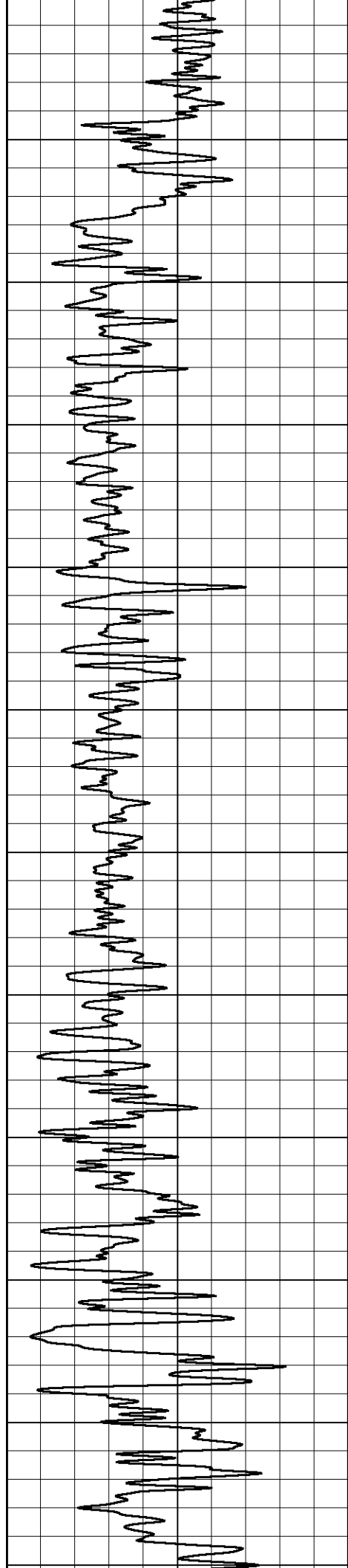
1000	Conductivity (mmho/m)	0
15000	Line Tension (lb)	0
0	RLL3 (Ohm-m)	50
0	Deep Resistivity (Ohm-m)	50
50	RLL3 (Ohm-m)	500
50	Deep Resistivity (Ohm-m)	500



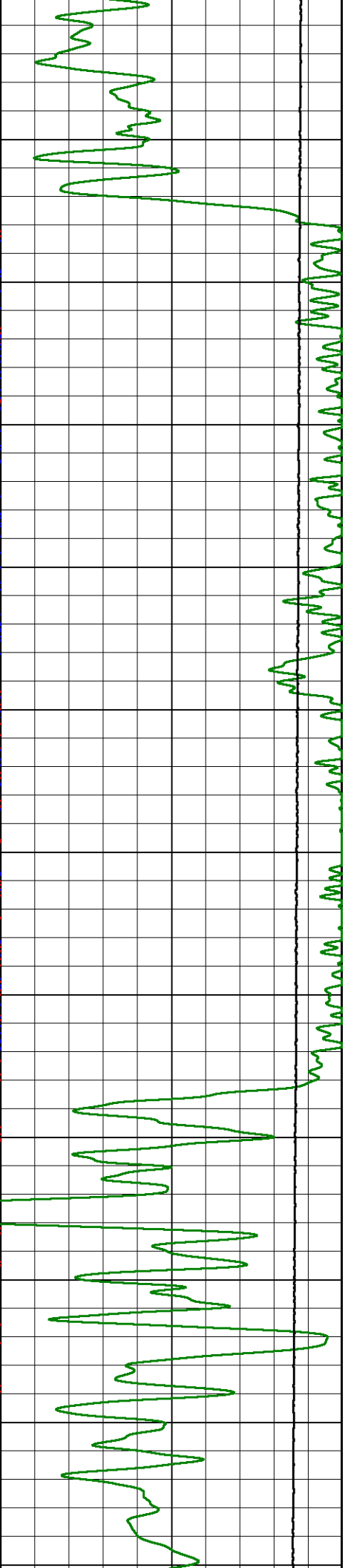
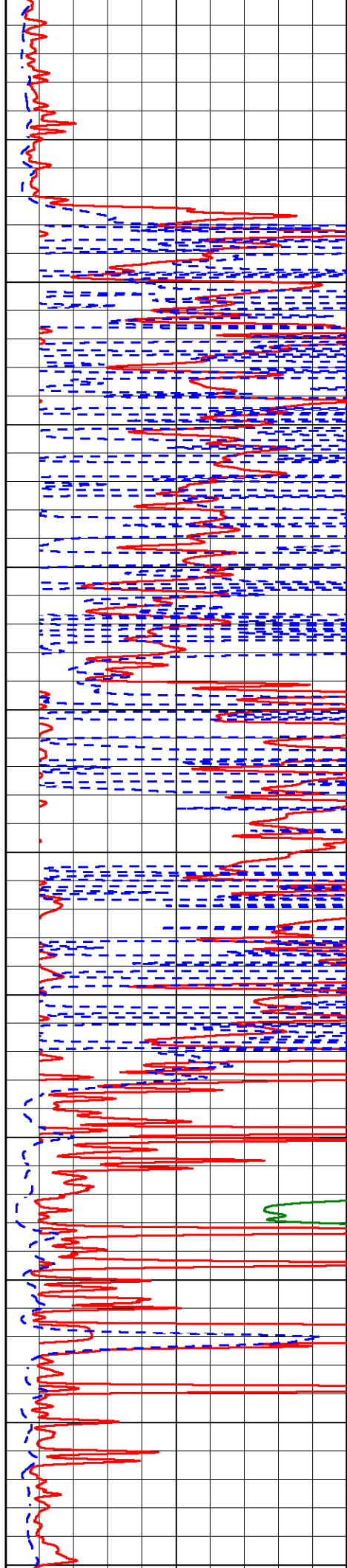


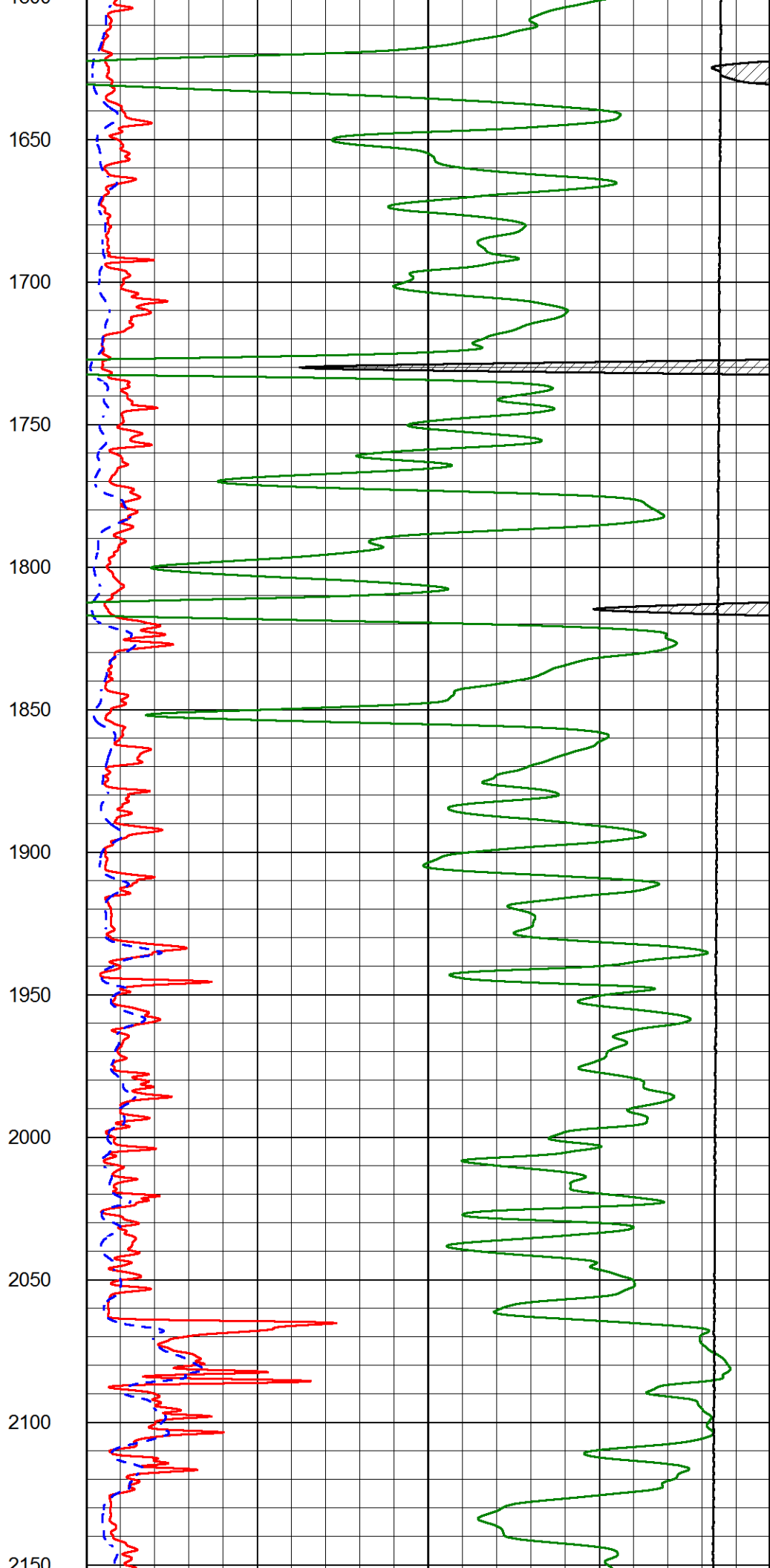
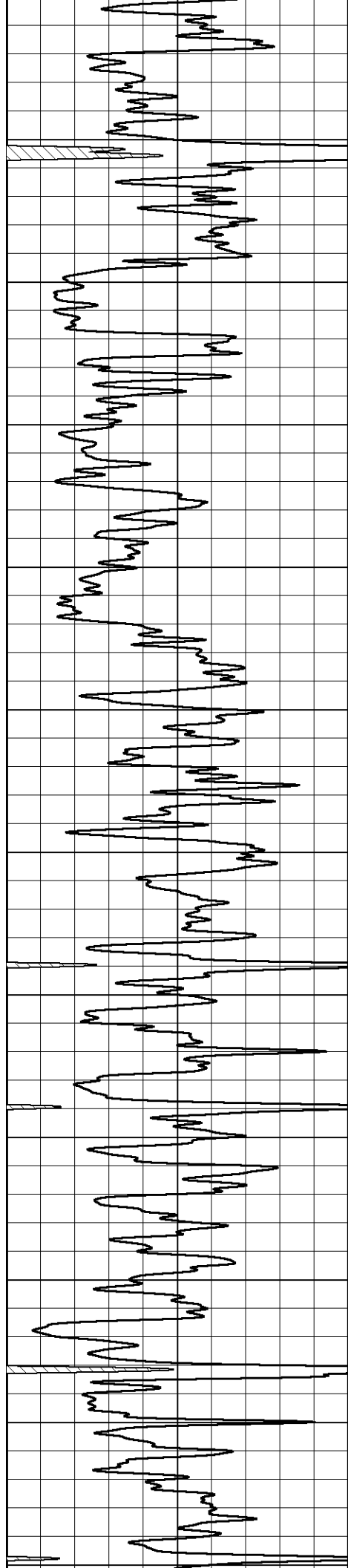
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550
600
650
700
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800
850
900
950
1000
1050

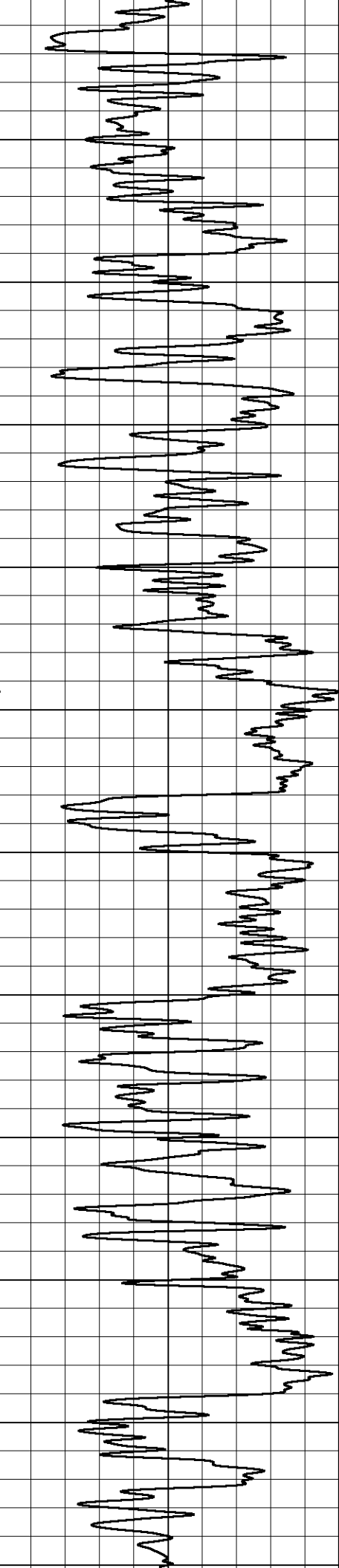




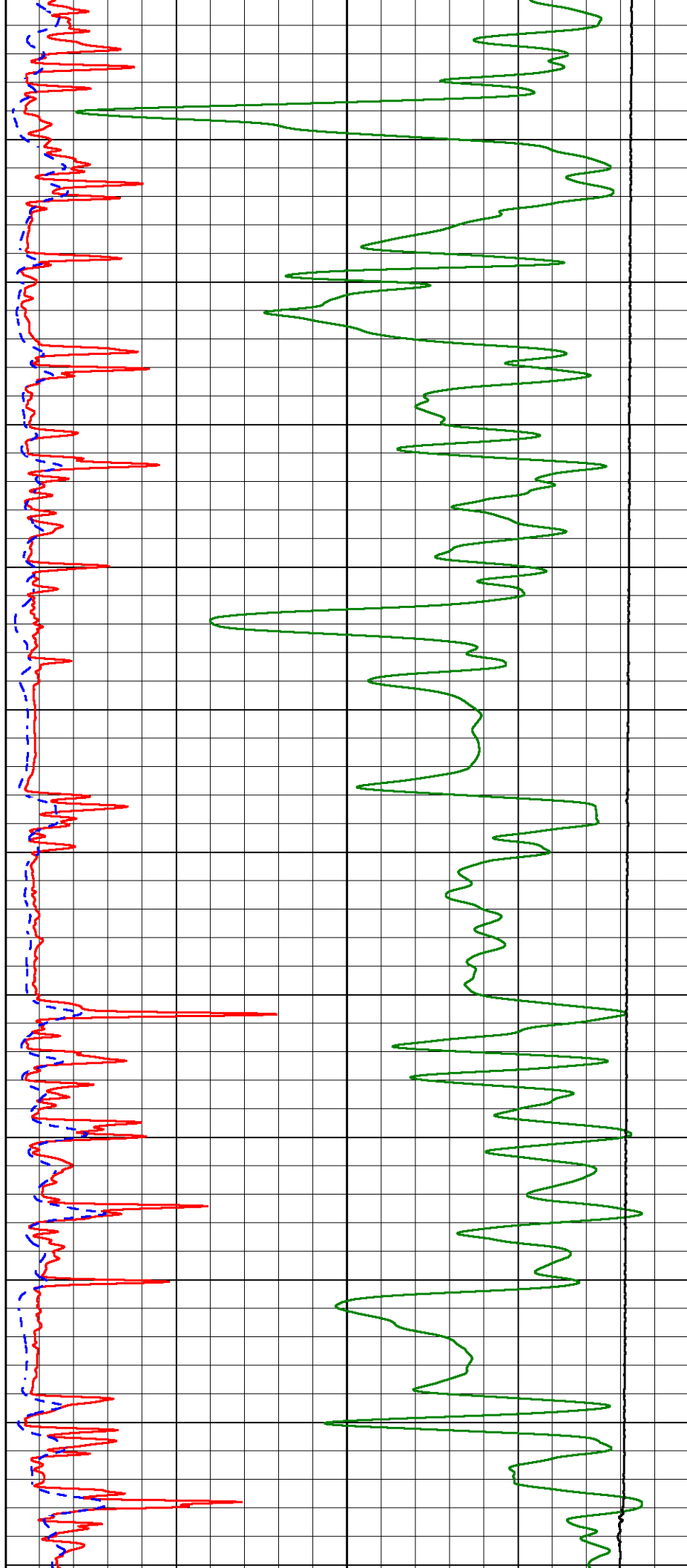
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1100
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1200
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1300
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1400
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1500
1550
1600

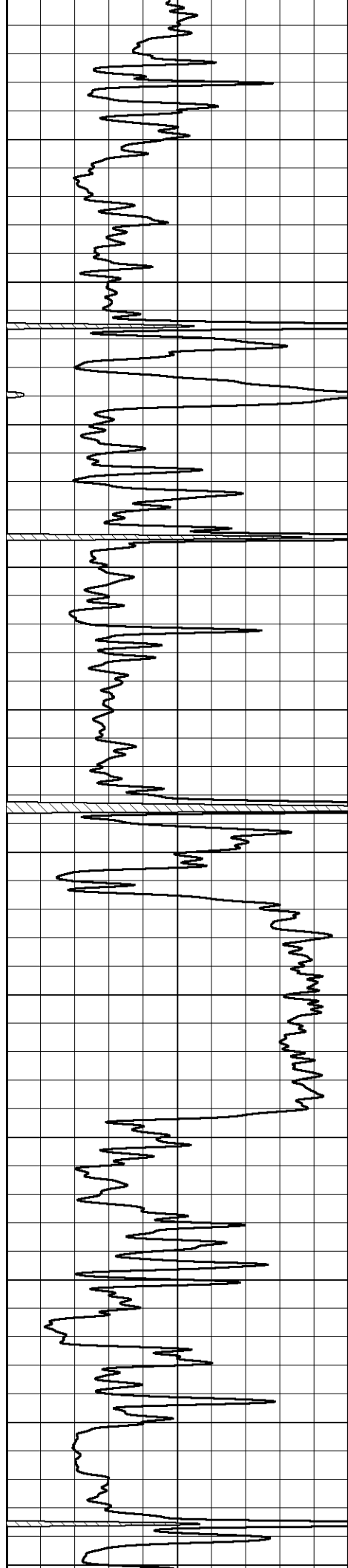




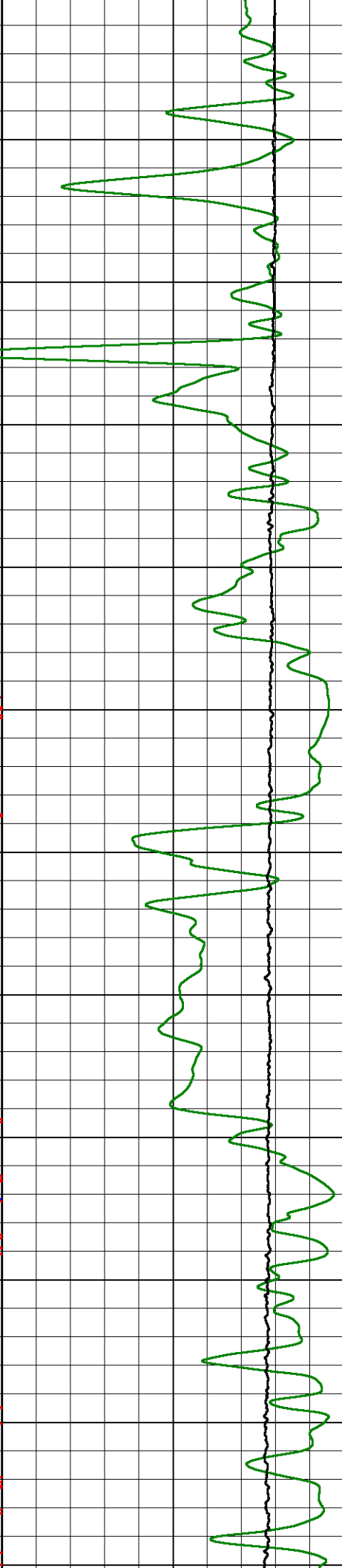
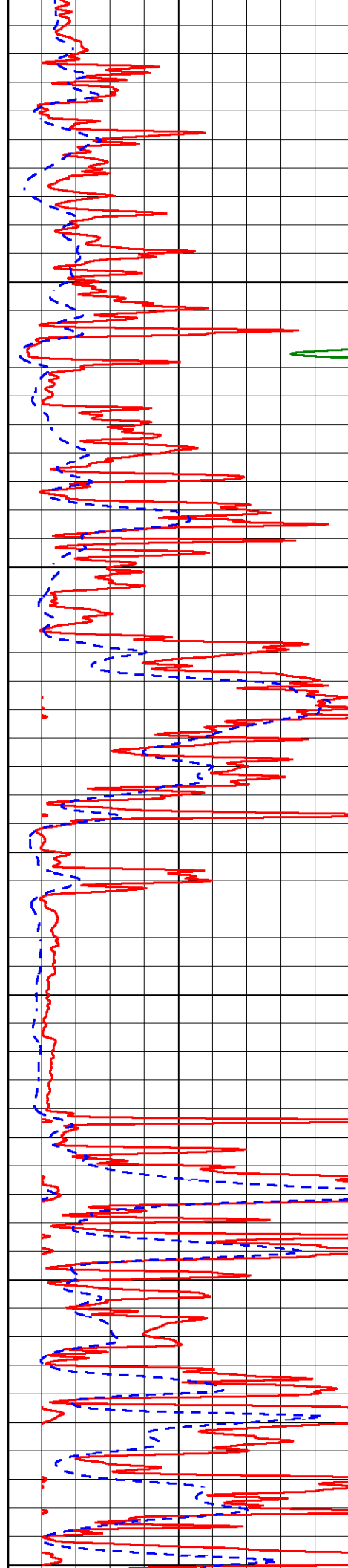


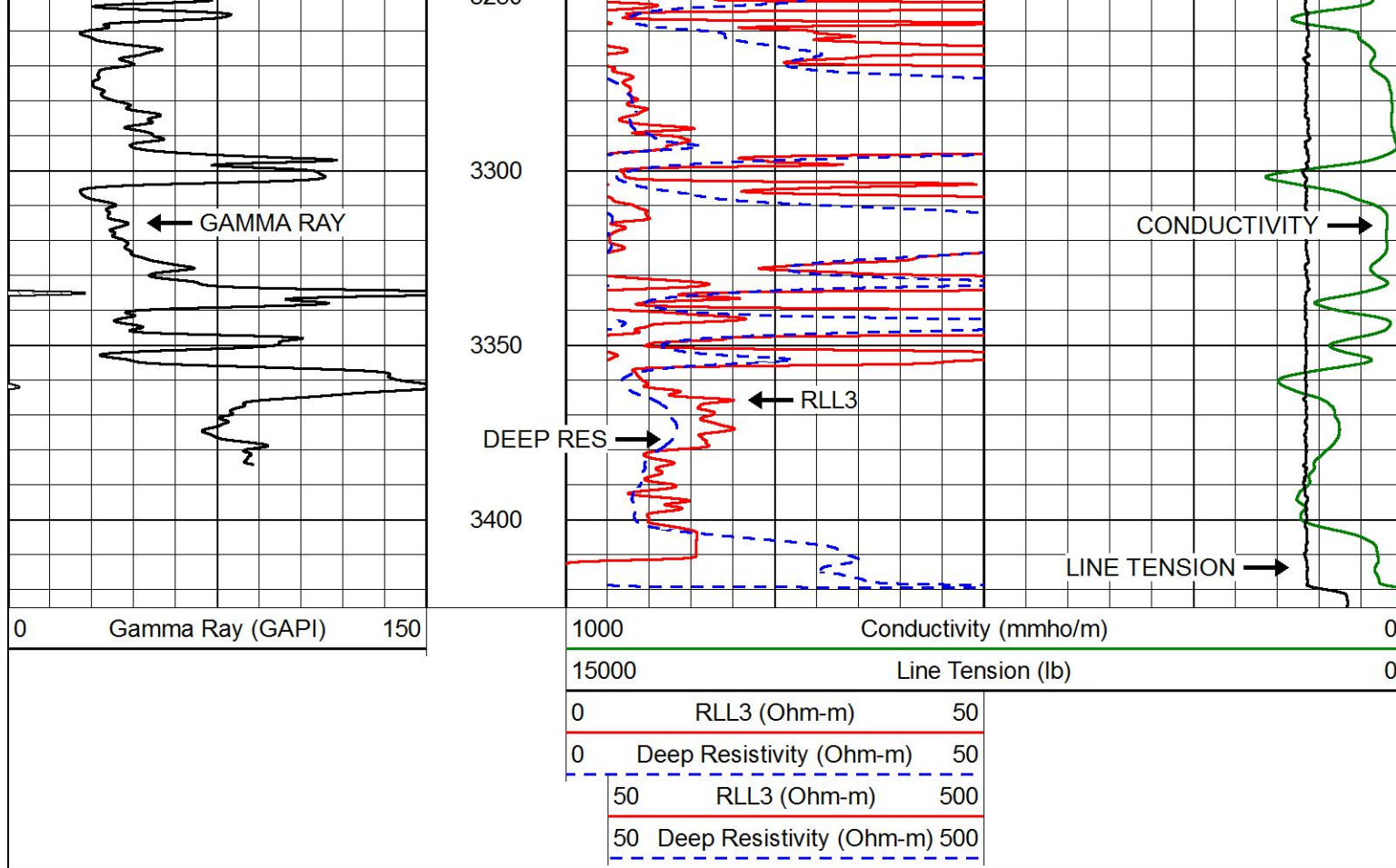
2100
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
2700





2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200
3250



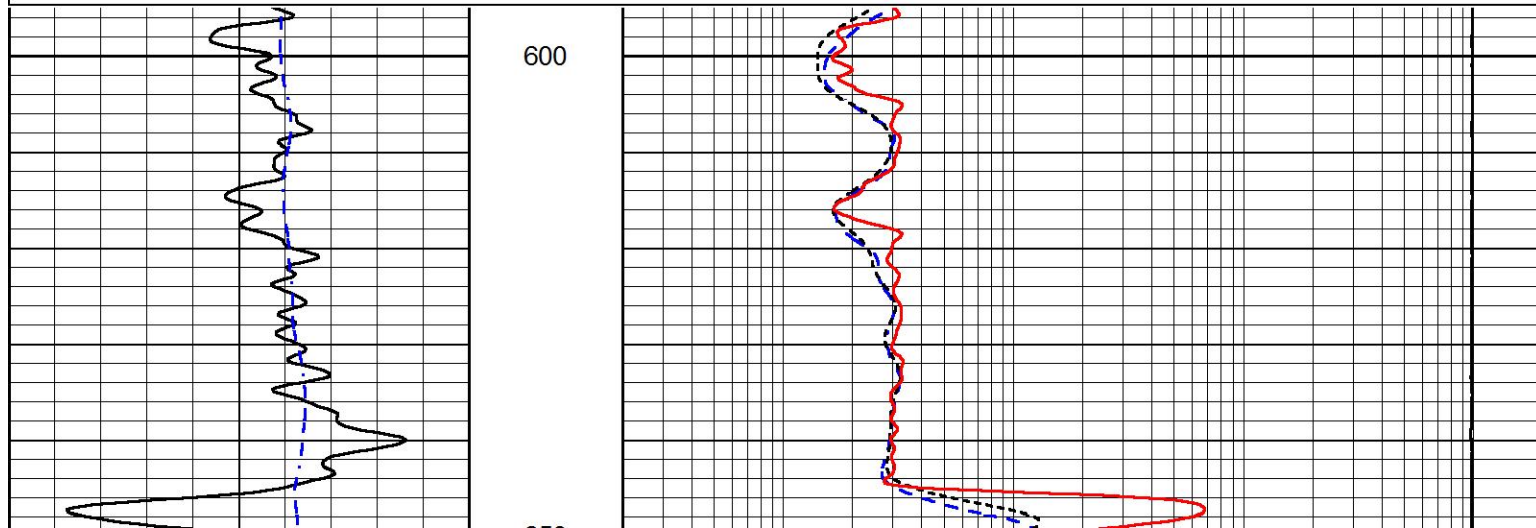


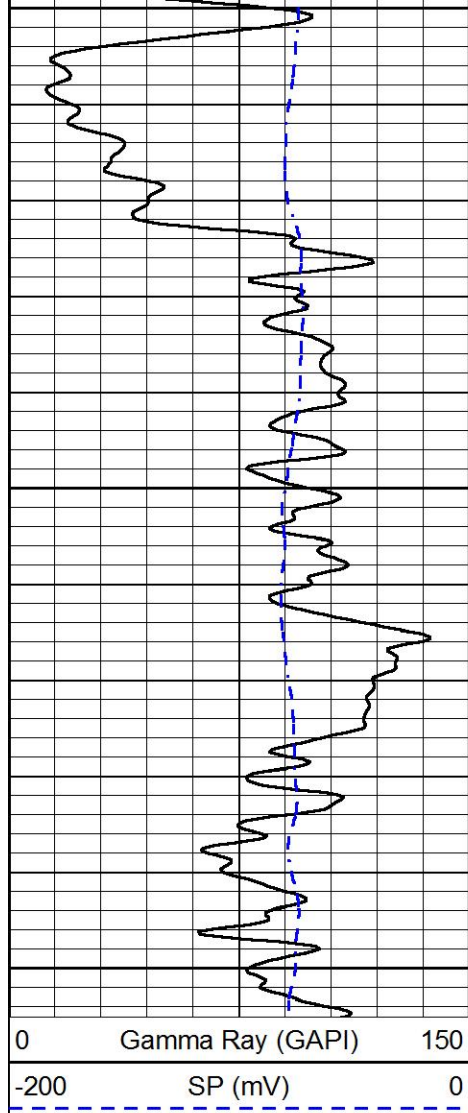


MAIN PASS

Database File cobalt_billy gene a 1-3.db
 Dataset Pathname STKML/pass4.1
 Presentation Format dil
 Dataset Creation Thu Feb 15 20:39:11 2018
 Charted by Depth in Feet scaled 1:240

0	Gamma Ray (GAPI)	150	0.2	Deep Resistivity (Ohm-m)	2000
-200	SP (mV)	0	0.2	Medium Resistivity (Ohm-m)	2000
			0.2	RLL3 (Ohm-m)	2000
			10000	Line Tension (lb)	0

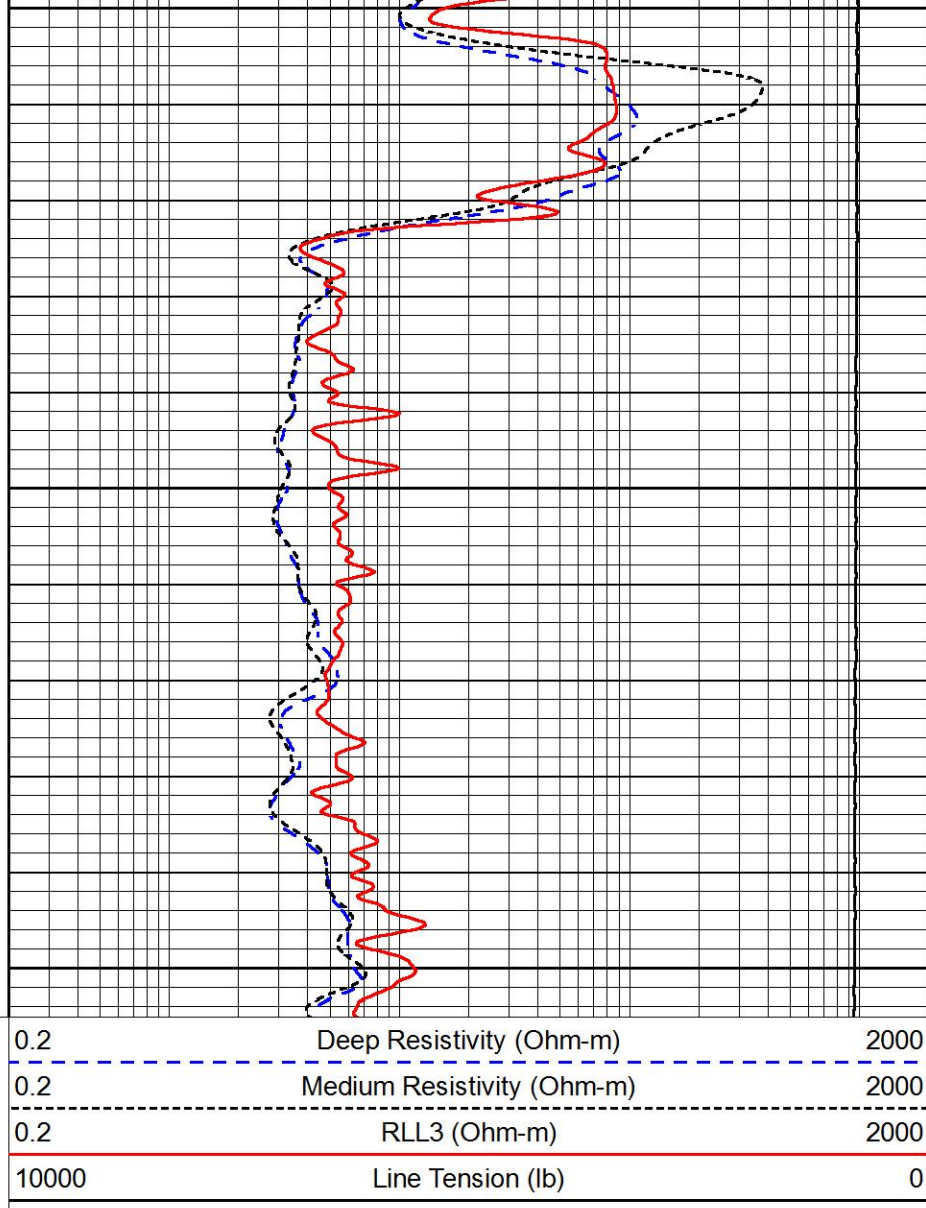




650

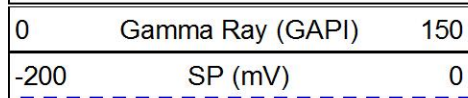
700

750

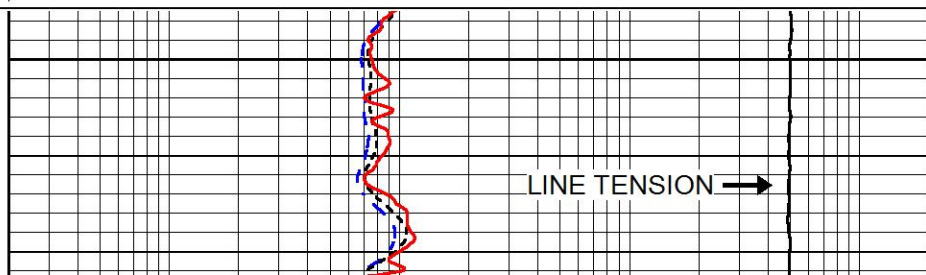
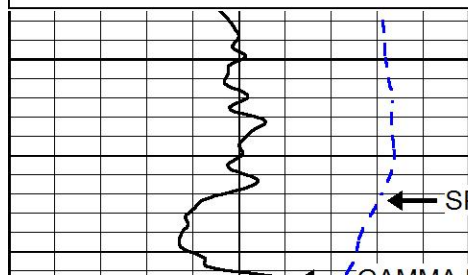
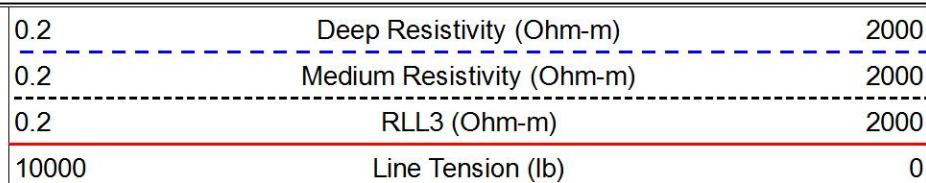


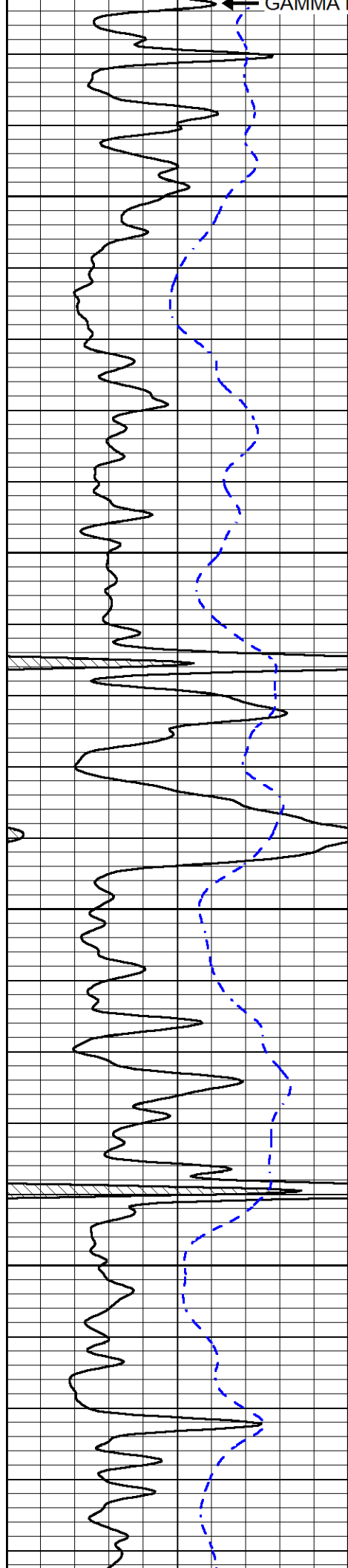
MAIN PASS

Database File cobalt_billy gene a 1-3.db
Dataset Pathname STKML/pass3.1
Presentation Format dil
Dataset Creation Thu Feb 15 20:11:43 2018
Charted by Depth in Feet scaled 1:240



2700





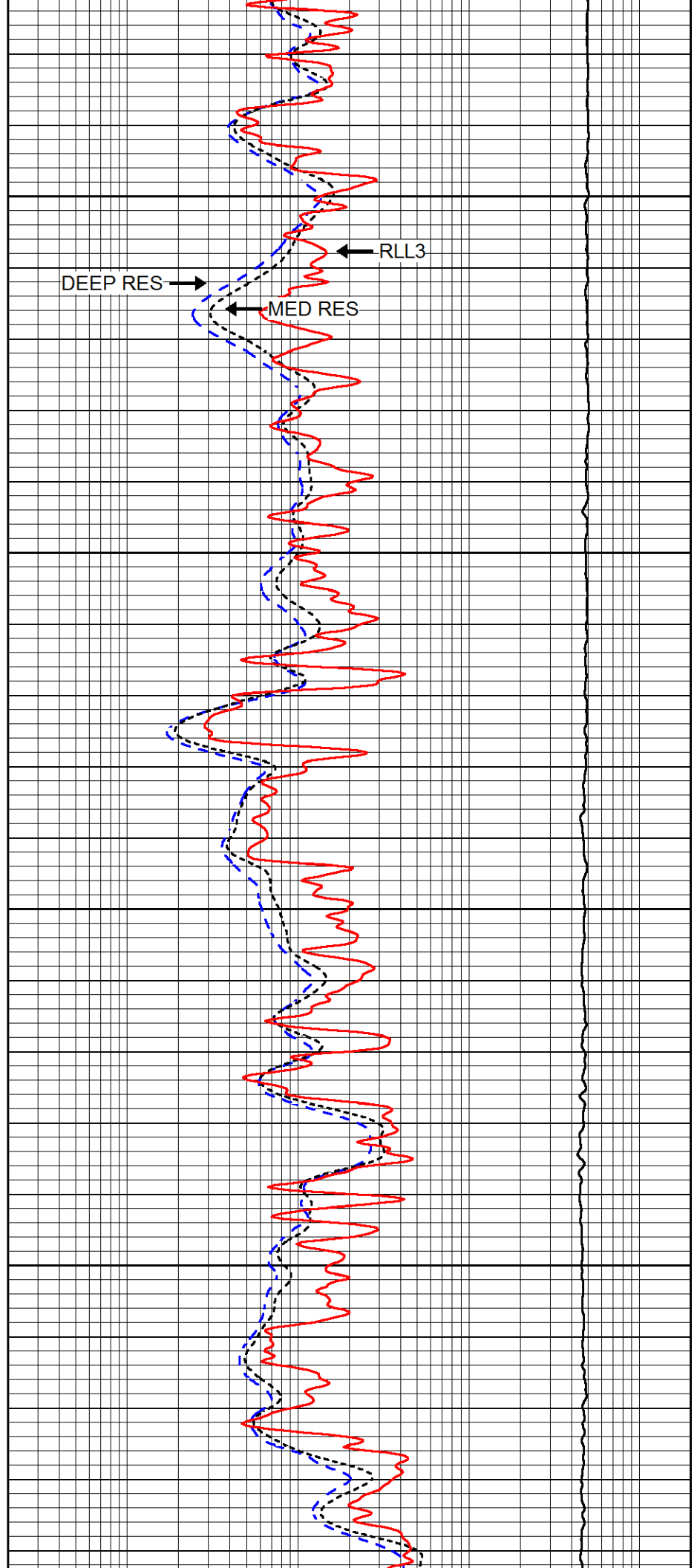
← GAMMA RAY

2750

2800

2850

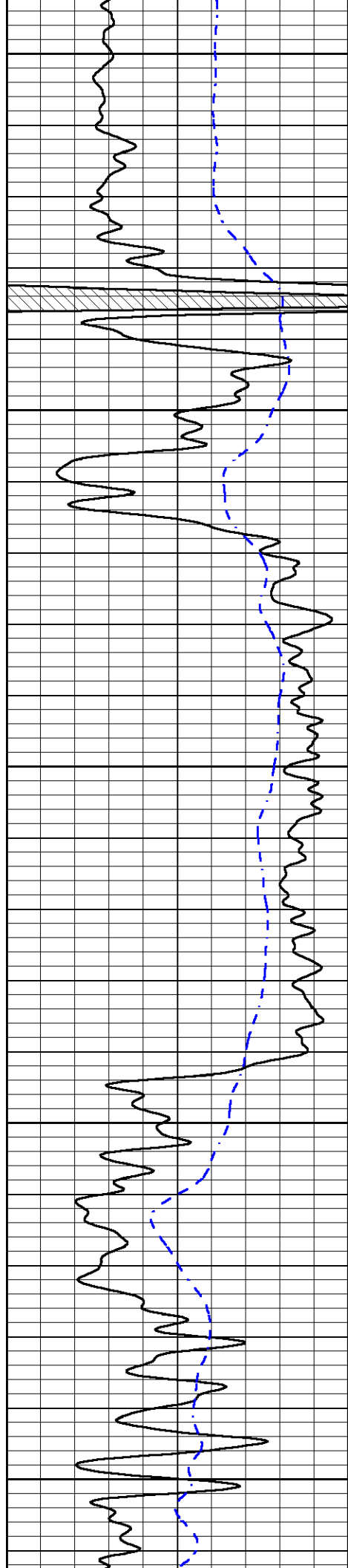
2900



DEEP RES →

← MED RES

← RLL3



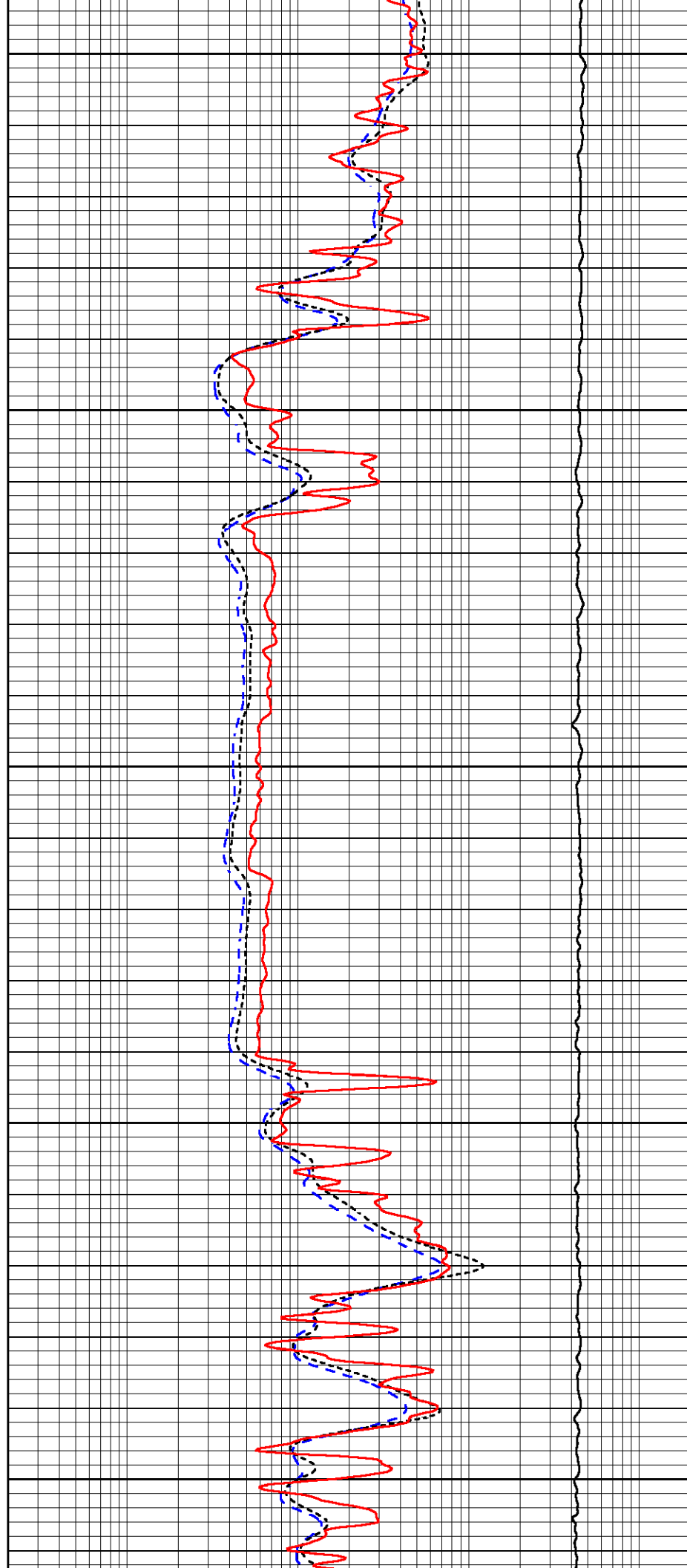
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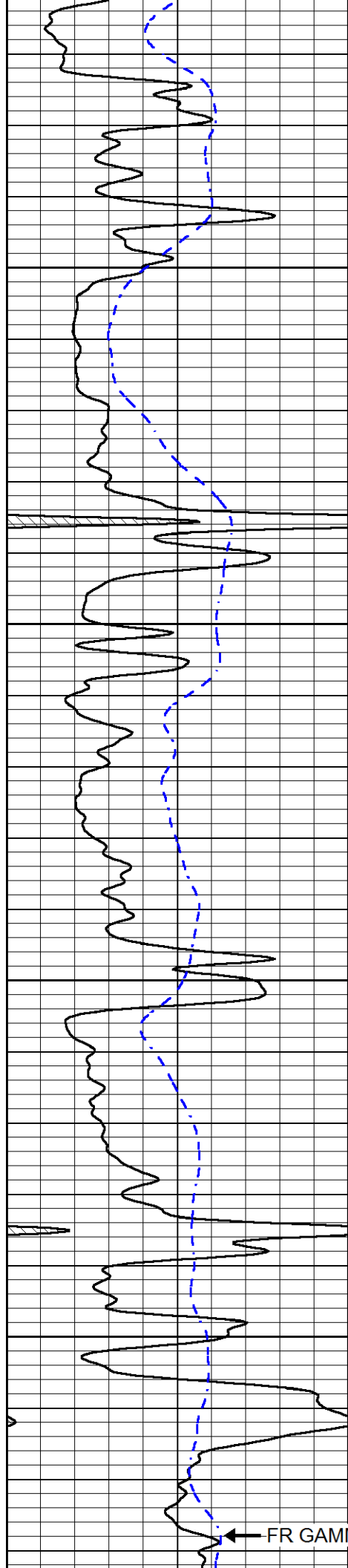
3000

3050

3100

3150





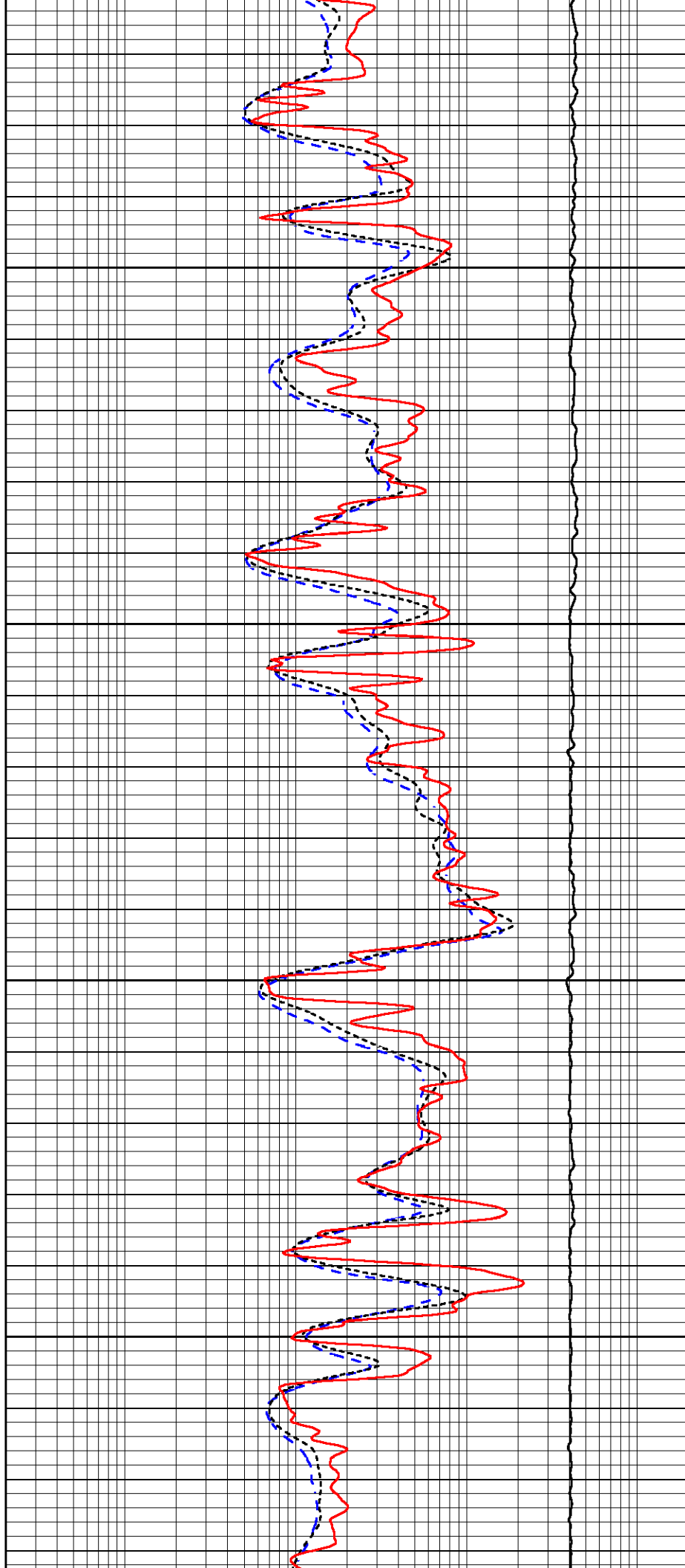
3200

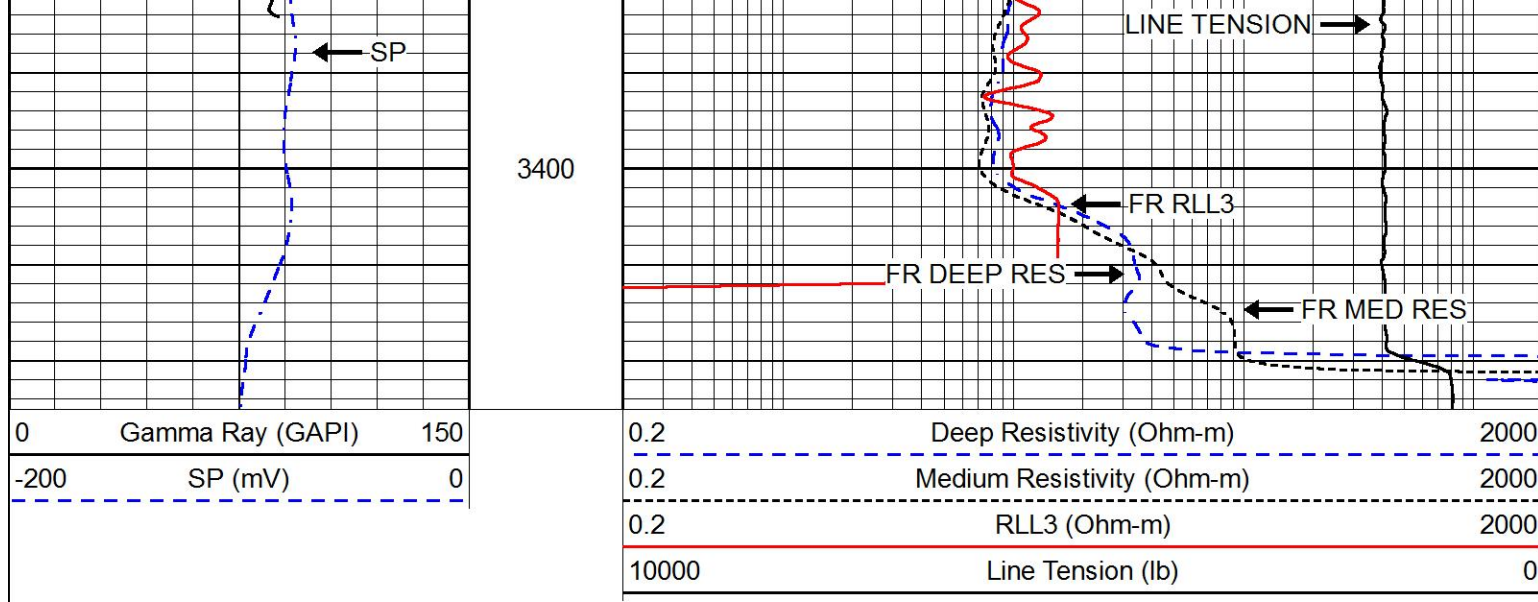
3250

3300

3350

← FR GAMMA RAY







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REPEAT SECTION

Database File cobalt_billy gene a 1-3.db

Dataset Pathname STKML/pass2.1

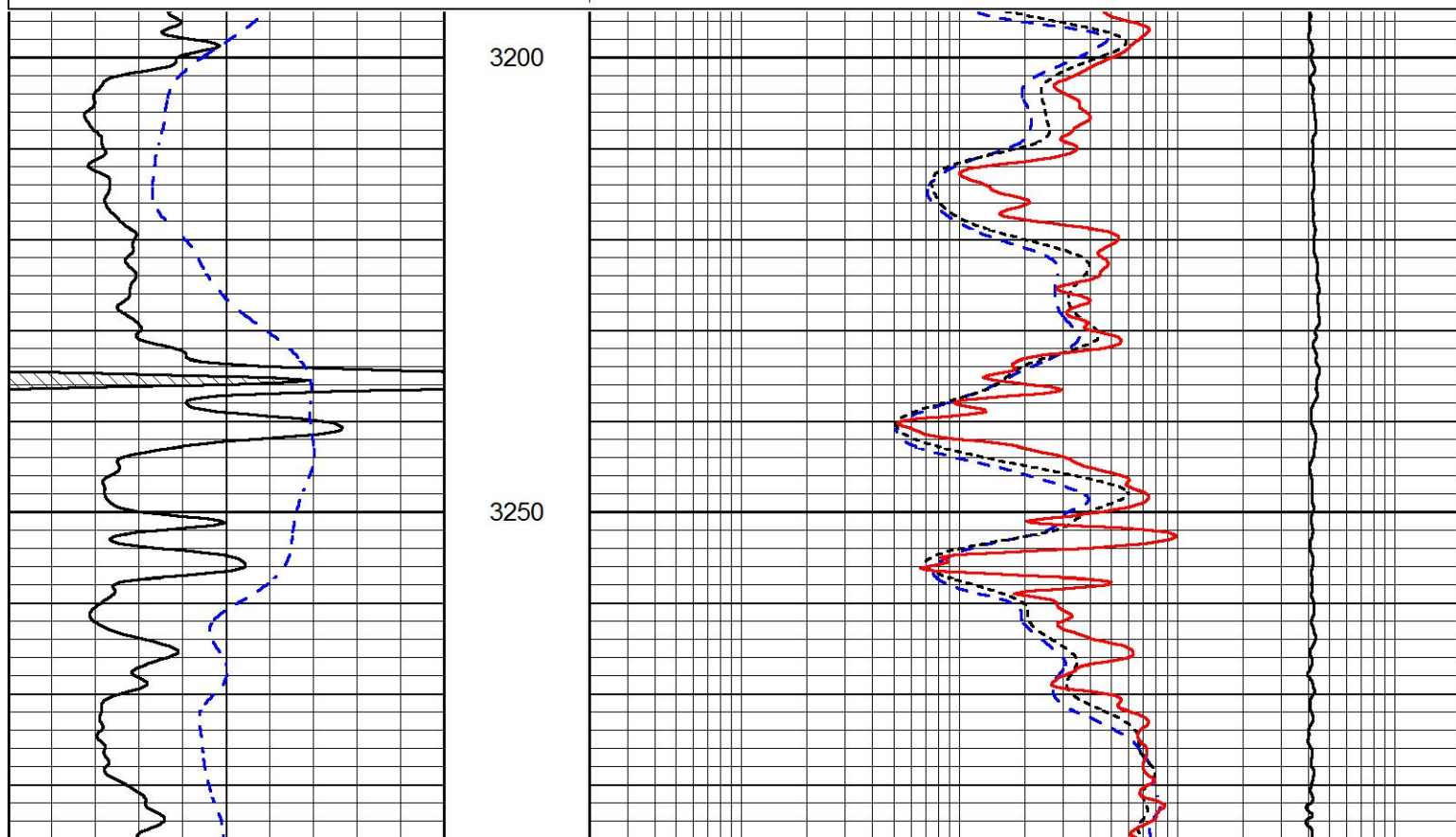
Presentation Format dil

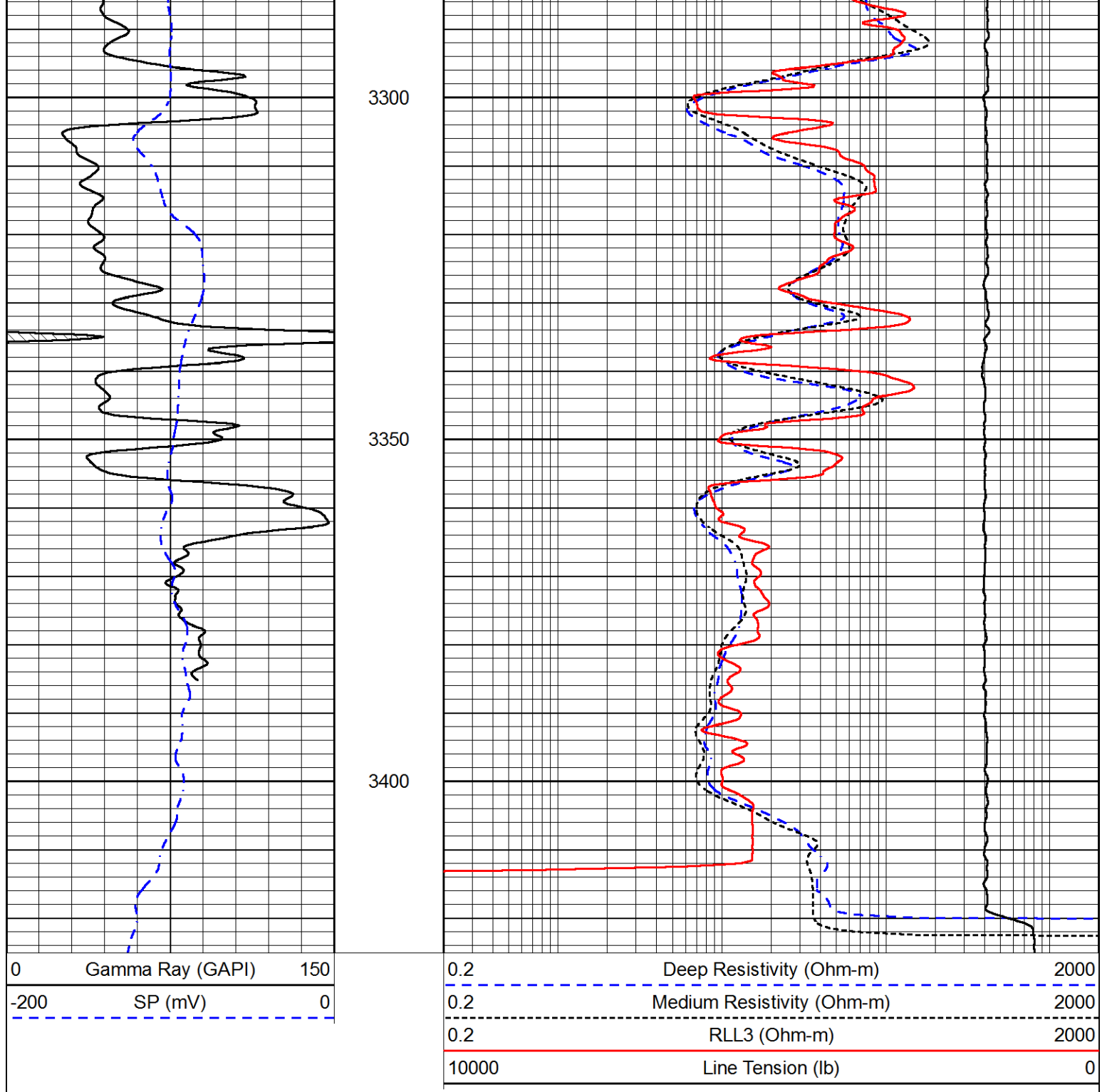
Dataset Creation Thu Feb 15 20:00:03 2018

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 cobalt_billy gene a 1-3.db
 Dataset Pathname STKML/pass3.3
 Dataset Creation Thu Feb 15 19:51:26 2018

Dual Induction Calibration Report

Serial-Model: 933 (HT)-PSI HIGH TEMP
 Calibration Performed: Mon Feb 12 17:16:25 2018

Readings

References

Results

Loop:	Air	Loop	Air	Loop	Gain	Offset
Deep	167.000	835.000	0.000	255.000	0.720	-18.350
Medium	142.000	1340.000	0.000	255.000	0.560	62.000

Microlog Calibration Report							
Serial-Model: Performed:			PSI-01-PSIML Mon Jan 15 11:19:55 2018				
	Readings		References			Results	
	Zero	Cal	Zero	Cal		m	b
Normal	0.0000	1.0000	0.0000	1.0000	Ohm-m	32000.0000	-1.2000
Inverse	0.0000	1.0000	0.0000	1.0000	Ohm-m	36500.0000	-0.6000
Caliper	1.0001	1.1397	6.5000	18.5000	in	100.0000	-97.3800
Compensated Density Calibration Report							
Serial-Model: Source / Verifier: Master Calibration Performed:			182-152-M&W 16955B / 2ci Mon Feb 12 16:20:26 2018				
Master Calibration							
	Density		Far Detector		Near Detector		
Magnesium	1.755	g/cc	4992.81		6098.44	cps	
Aluminum	2.675	g/cc	945.67		3945.60	cps	
Spine Angle = 75.33			Density/Spine Ratio = 0.535				
	Size		Reading				
Small Ring	4.50	in	1.09				
Large Ring	15.00	in	1.03				
Compensated Neutron Calibration Report							
Serial Number: Tool Model: Calibration Performed:			207-MW M&W MON JAN 15 10:30:30 2018				
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:		Mon Jan 15 11:20:44 2018					
Calibrator Value:		1.0		GAPI			
Background Reading:		0.0		cps			
Calibrator Reading:		1.0		cps			
Sensitivity:		0.6000		GAPI/cps			



PIONEER

Pioneer Energy Services

Well	BILLY GENE 'A' #1-3
Field	FRANK NORTH
County	BARTON
State	KANSAS