



NABORS

**COMPLETION
& PRODUCTION
SERVICES CO.**

DUAL INDUCTION LOG

Company		RICHLAN DRILLING	
Well		UMMEL BROTHERS TRUST #4	
Field		MINER	
County		NESS	
State		KANSAS	
Location:		API # : 15-135-25696-00-00 1177' FSL & 371' FEL NW - NE - SE - SE	
Other Services		CNL/CDL	
Permanent Datum		GROUND LEVEL Elevation 2165	
Log Measured From		KELLY BUSHING 9' A.G.L.	
Drilling Measured From		KELLY BUSHING	
SEC 24 TWP 18S RGE 24W			
Date	11/19/13		
Run Number	ONE		
Depth Driller	4385		
Depth Logger	4386		
Bottom Logged Interval	4384		
Top Log Interval	00		
Casing Driller	8 5/8" @ 220'		
Casing Logger	218		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD		
Density / Viscosity	9.2 / 56		
pH / Fluid Loss	9.5 / 9.6		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.50 @ 67F		
Rmt @ Meas. Temp	0.38 @ 67F		
Rmc @ Meas. Temp	0.60 @ 67F		
Source of Rmt / Rmc	MEASUREMENT		
Rm @ BHT	0.28 @ 119F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom	119F		
Maximum Recorded Temperature	4010		
Equipment Number	HAYS, KANSAS		
Location	IAN MABB		
Recorded By	BOB SCHREIBER		
Witnessed By			

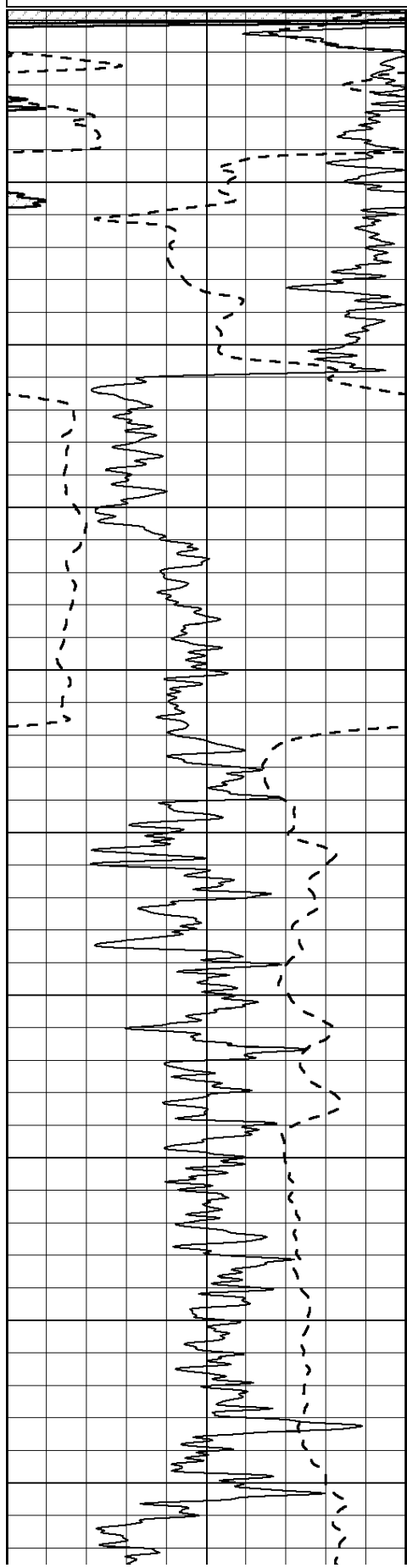
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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, 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. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

THANK YOU FOR USING NABORS, HAYS, KS. (785) 628-6395
 DIRECTIONS:
 NESS CITY, KS. - 1 MILE NORTH - WEST 1 MILE - NORTH 1/4 WEST INTO

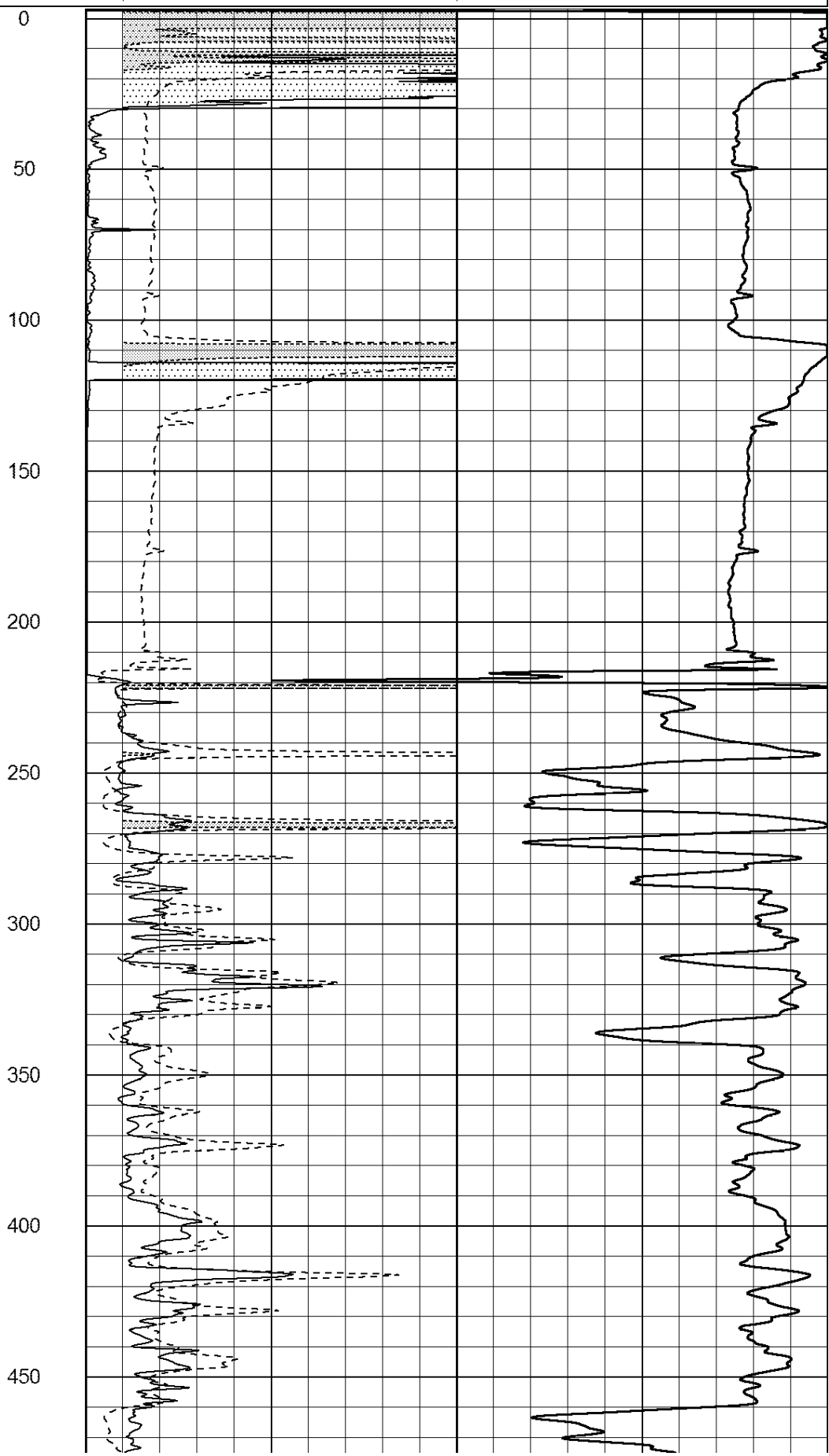
Charted by: Depth in feet scaled 1:600		
0	Gamma Ray (GAPI)	150
-100	SP (mV)	100

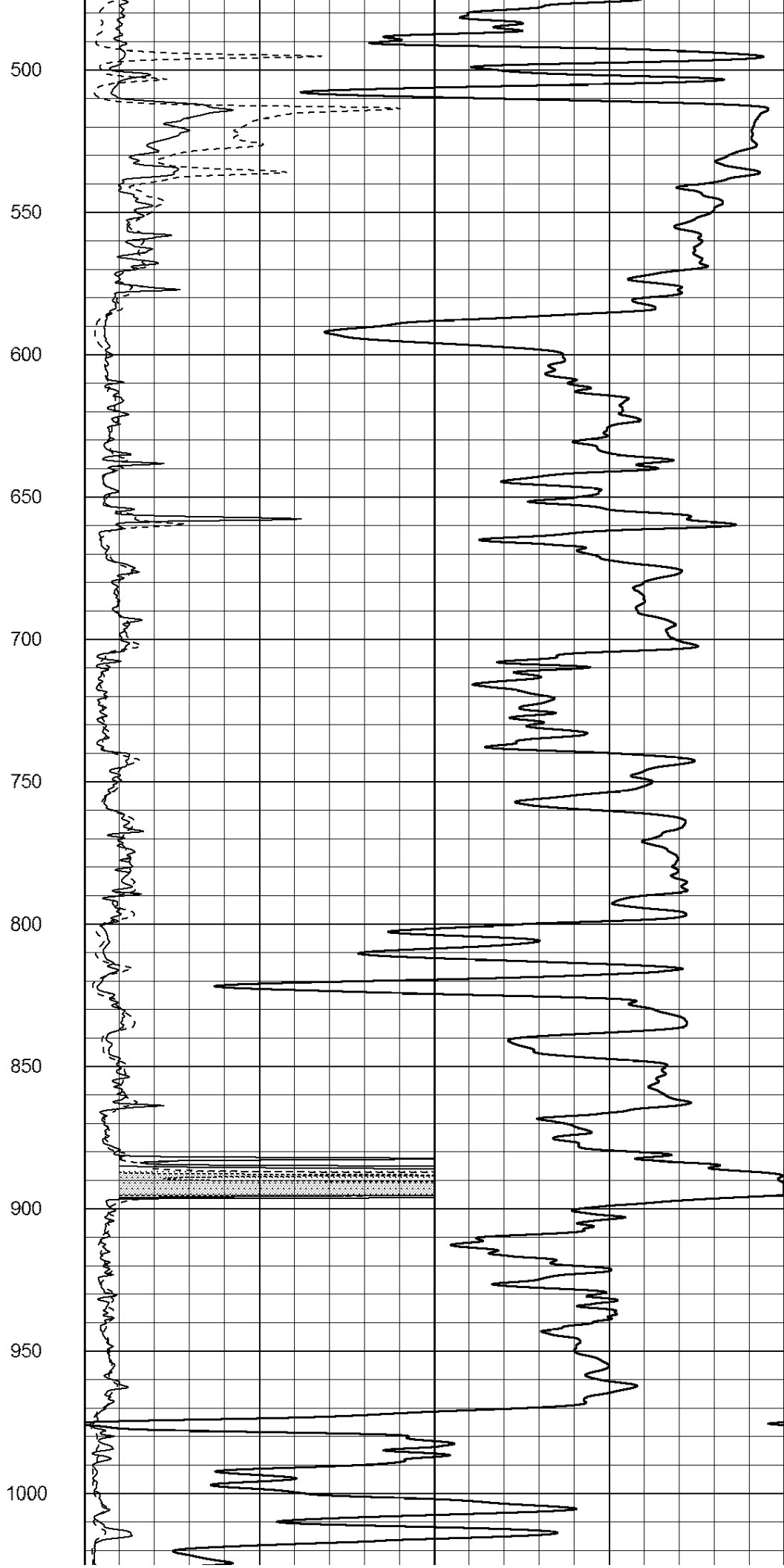
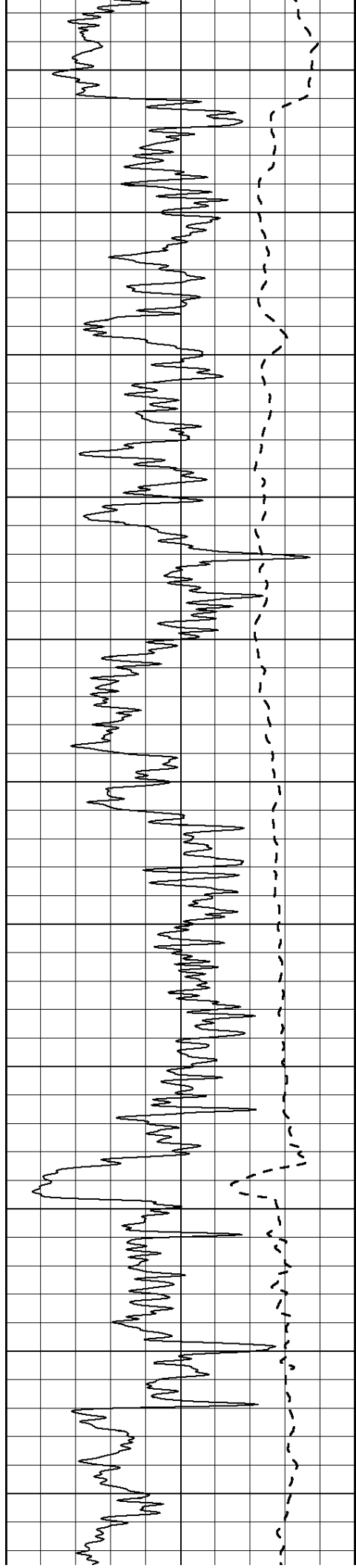


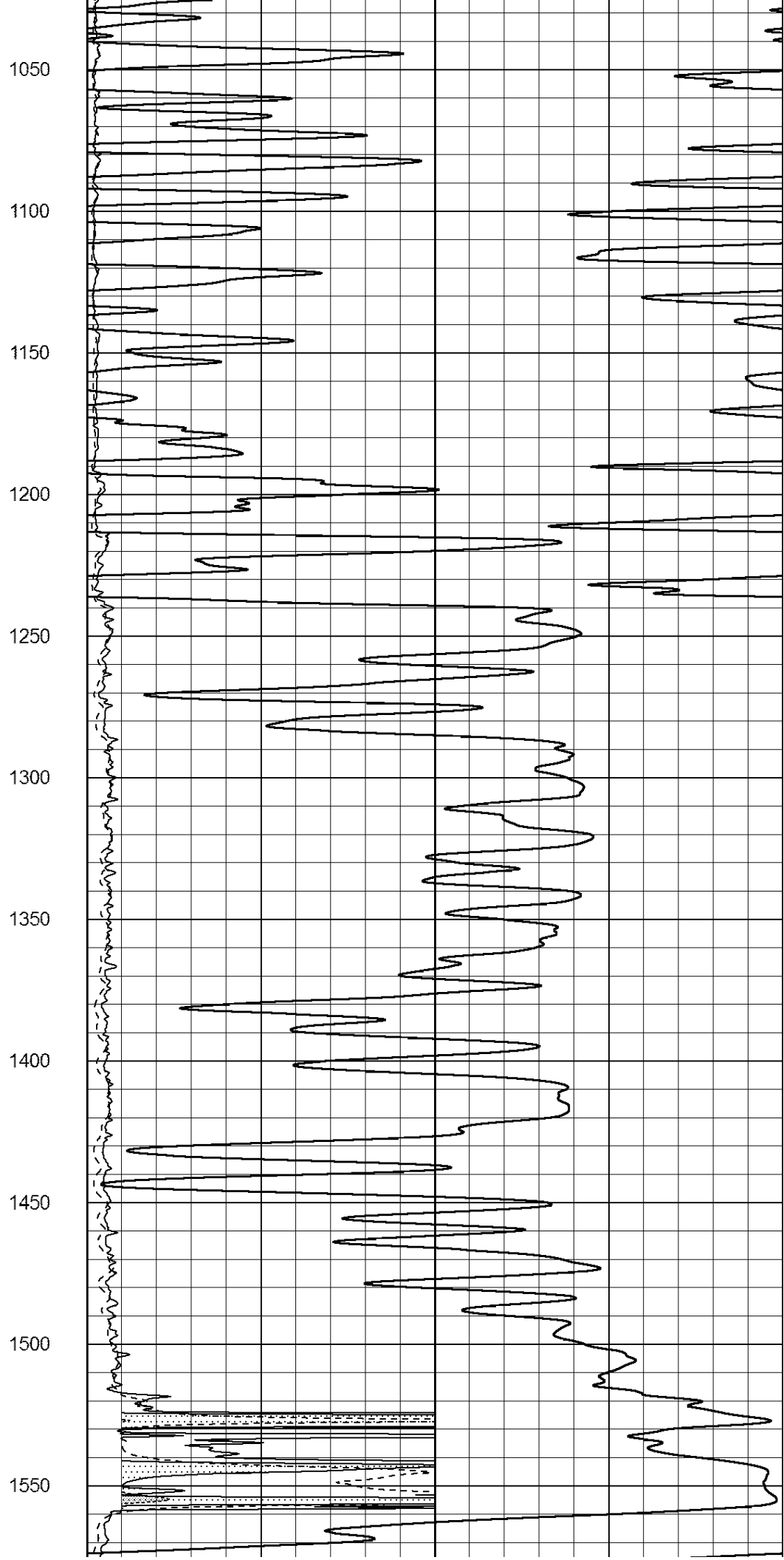
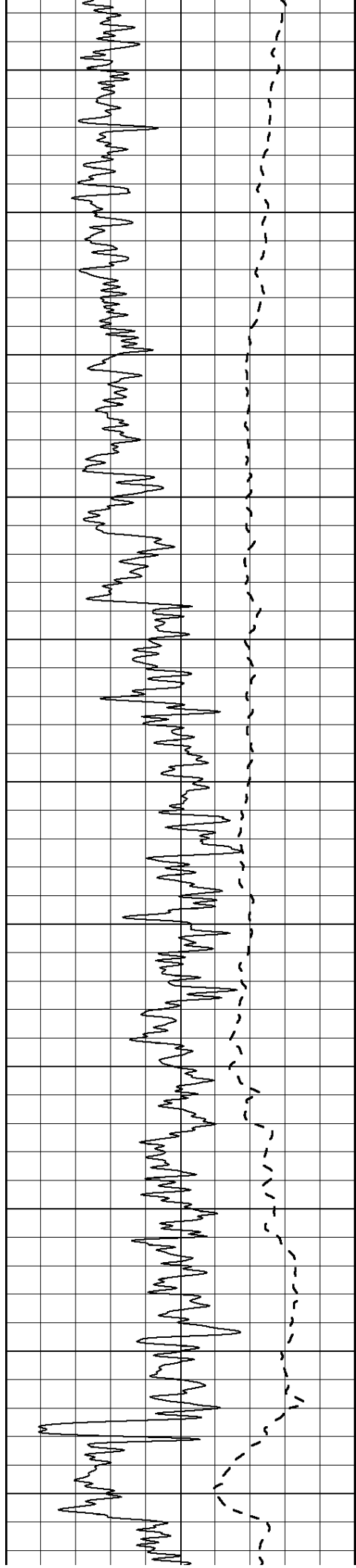
0	RLL3 (Ohm-m)	50	
0	RILD (Ohm-m)	50	

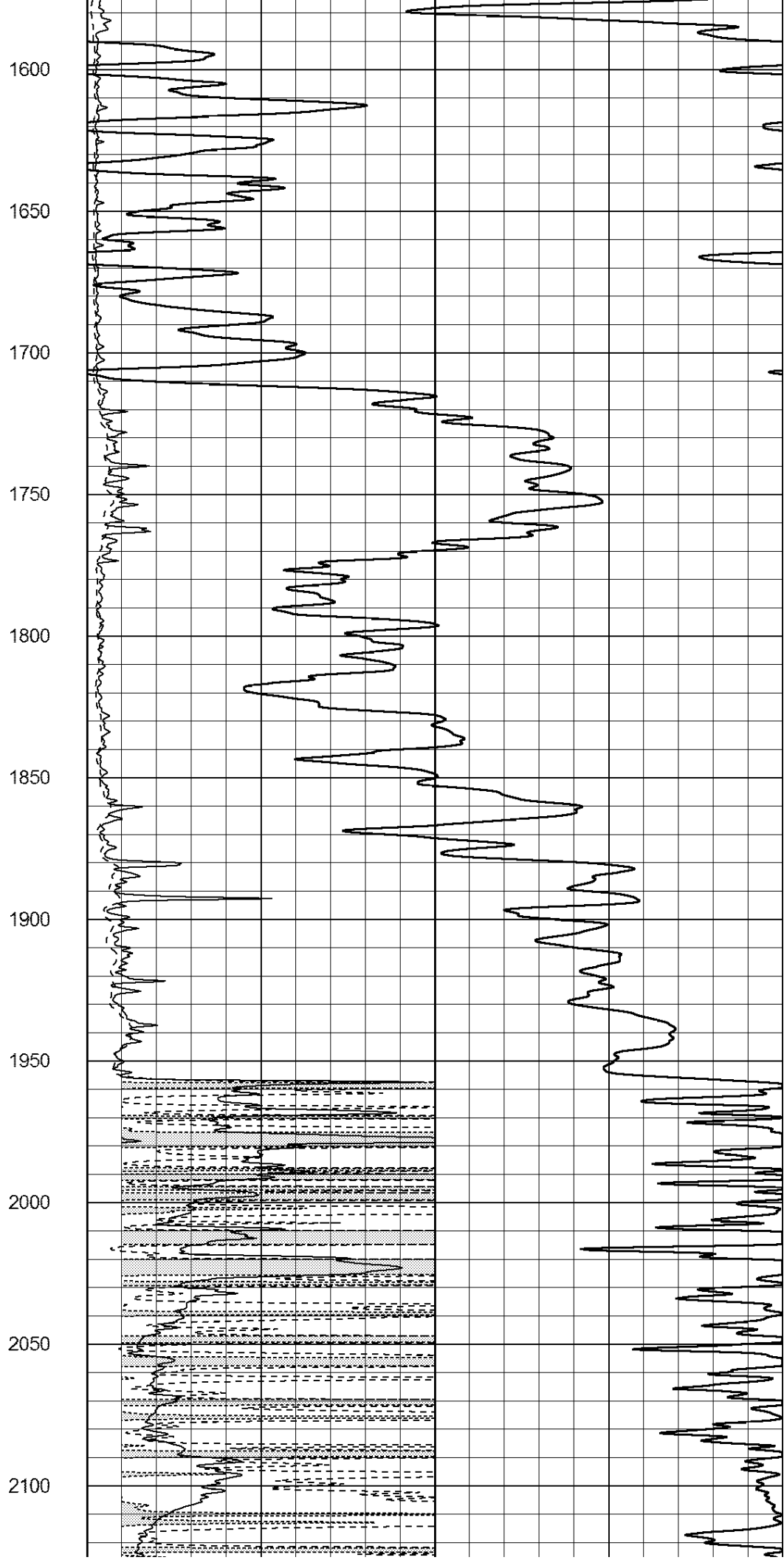
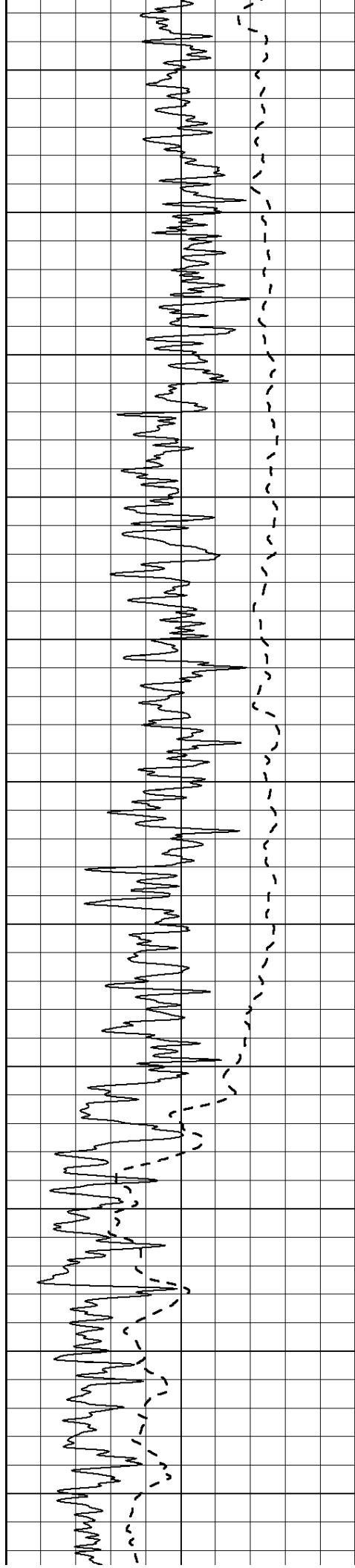
1000	CILD (mmho/m)		0
50	RILD X10 (Ohm-m)	500	

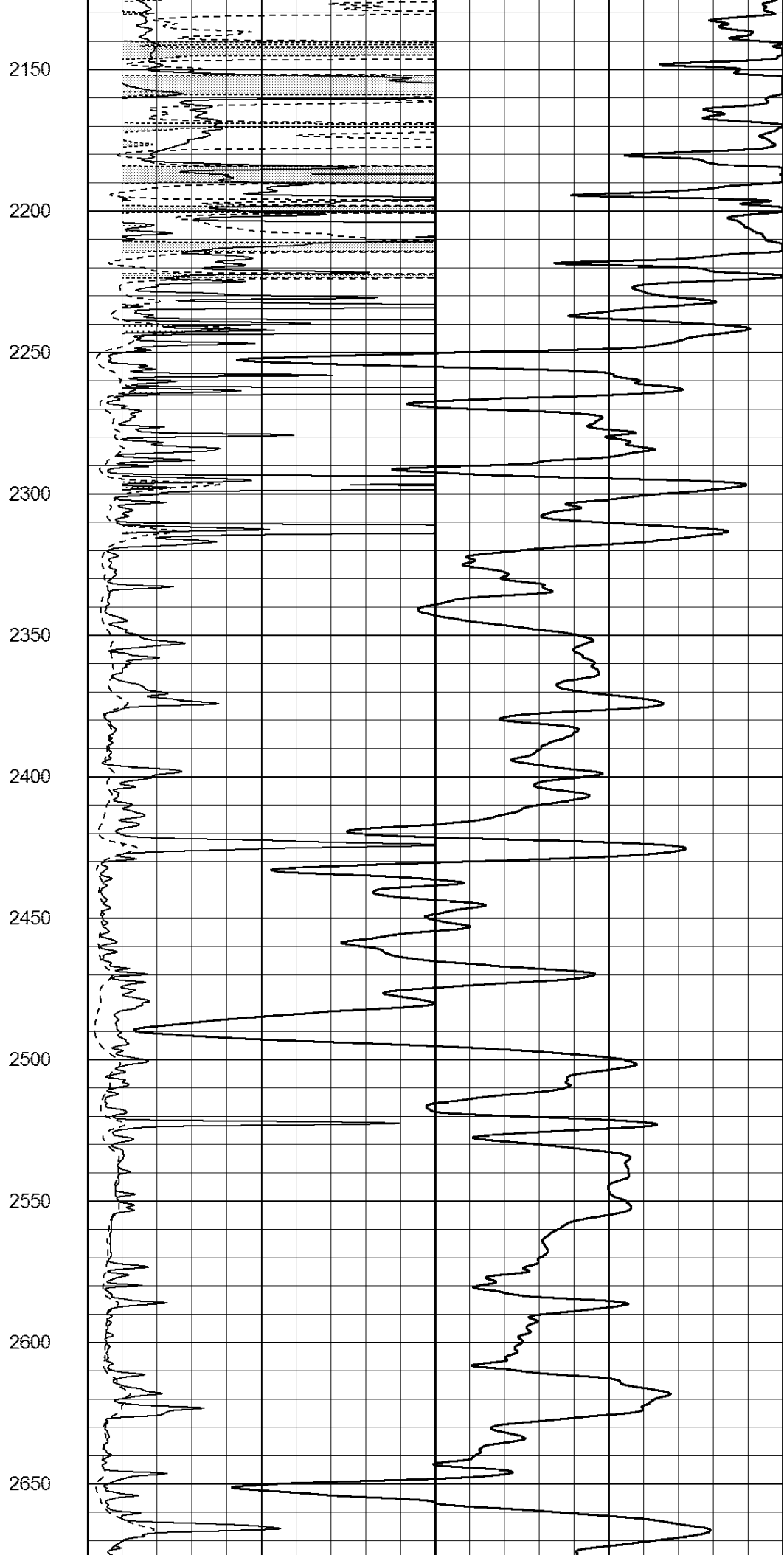
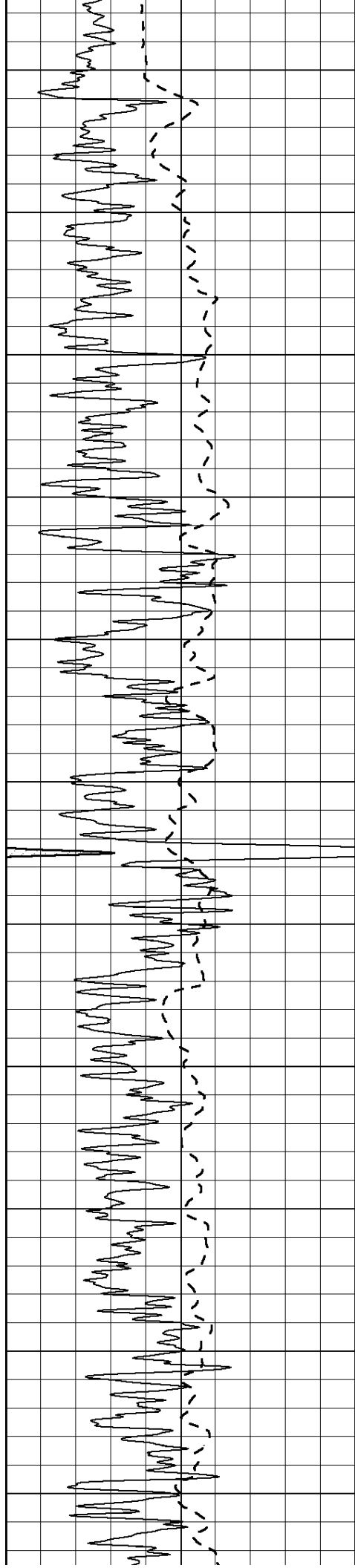
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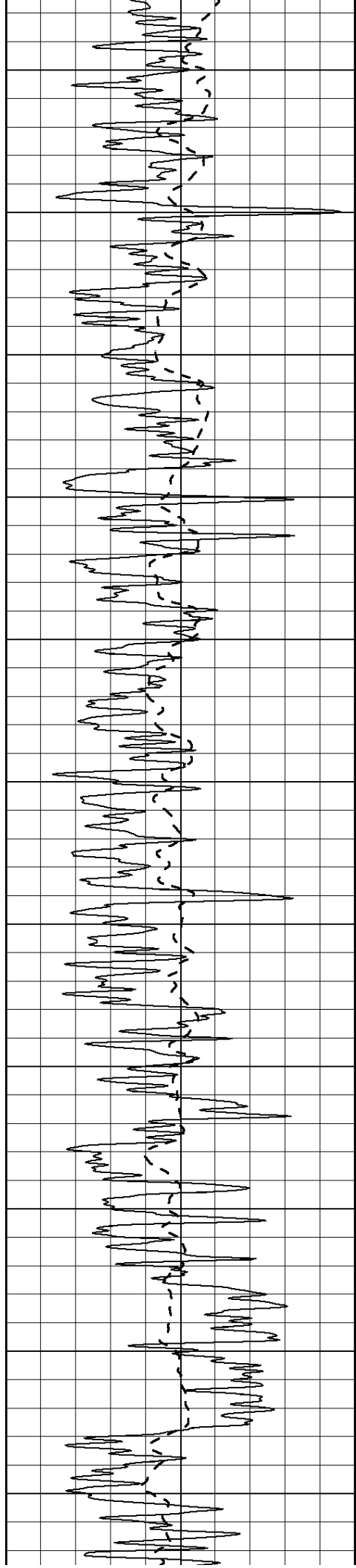












2700

2750

2800

2850

2900

2950

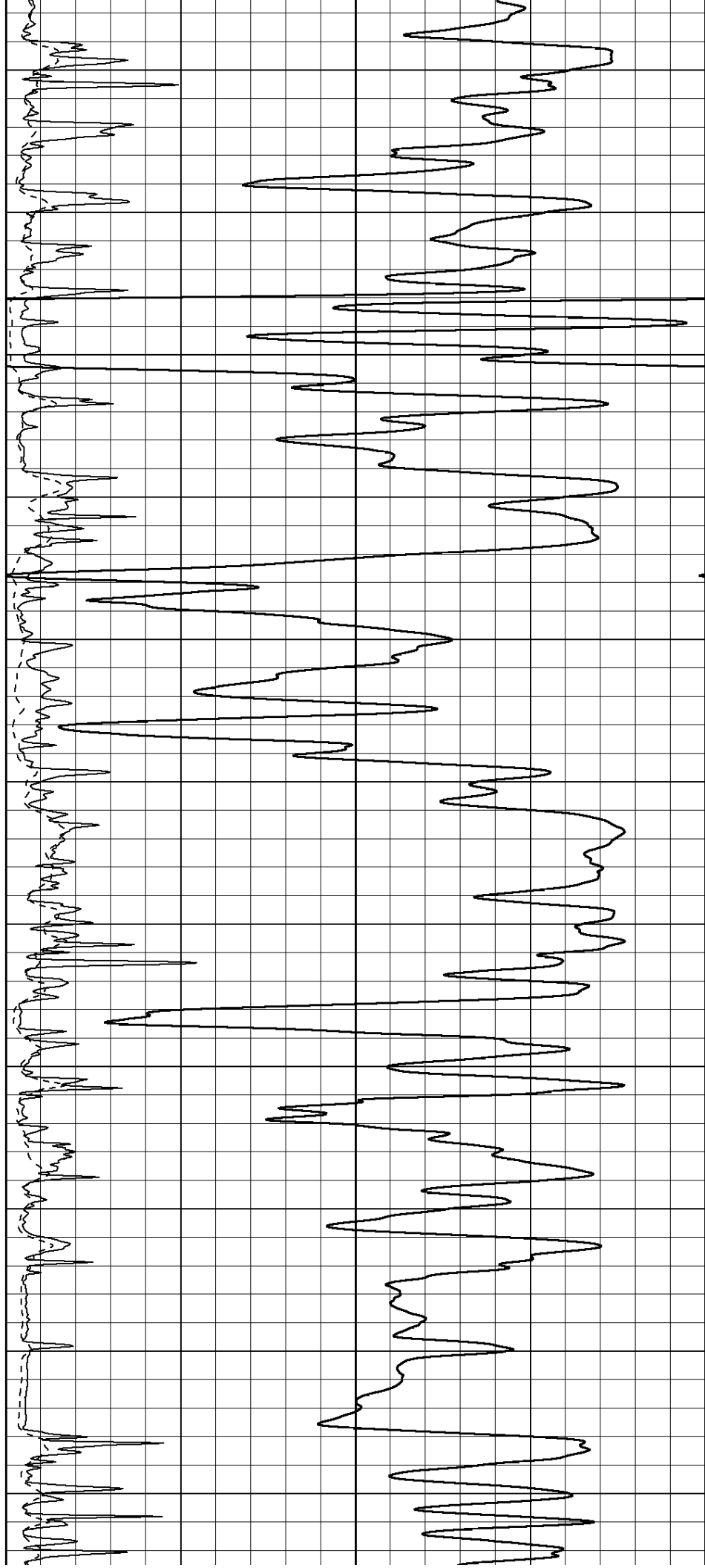
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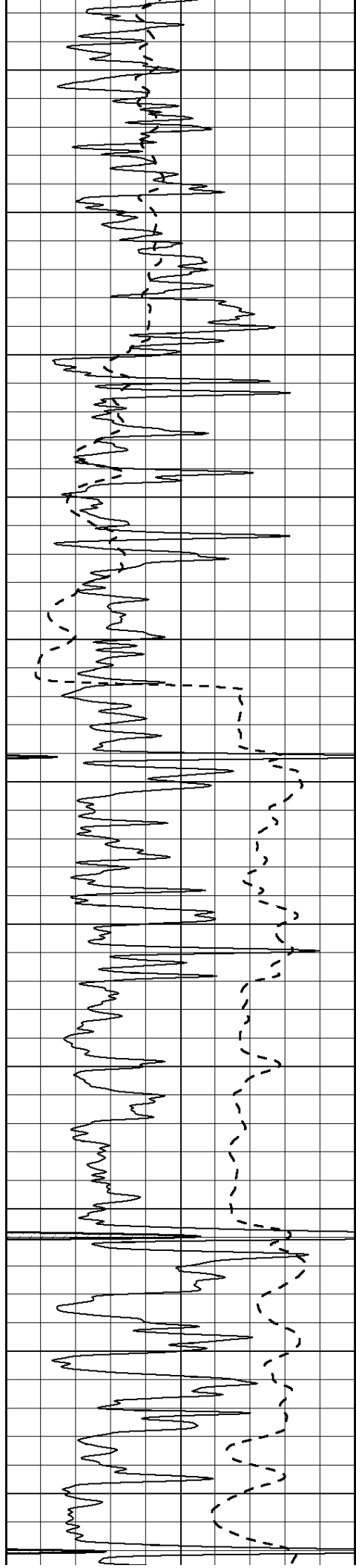
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3100

3150

3200





3250

3300

3350

3400

3450

3500

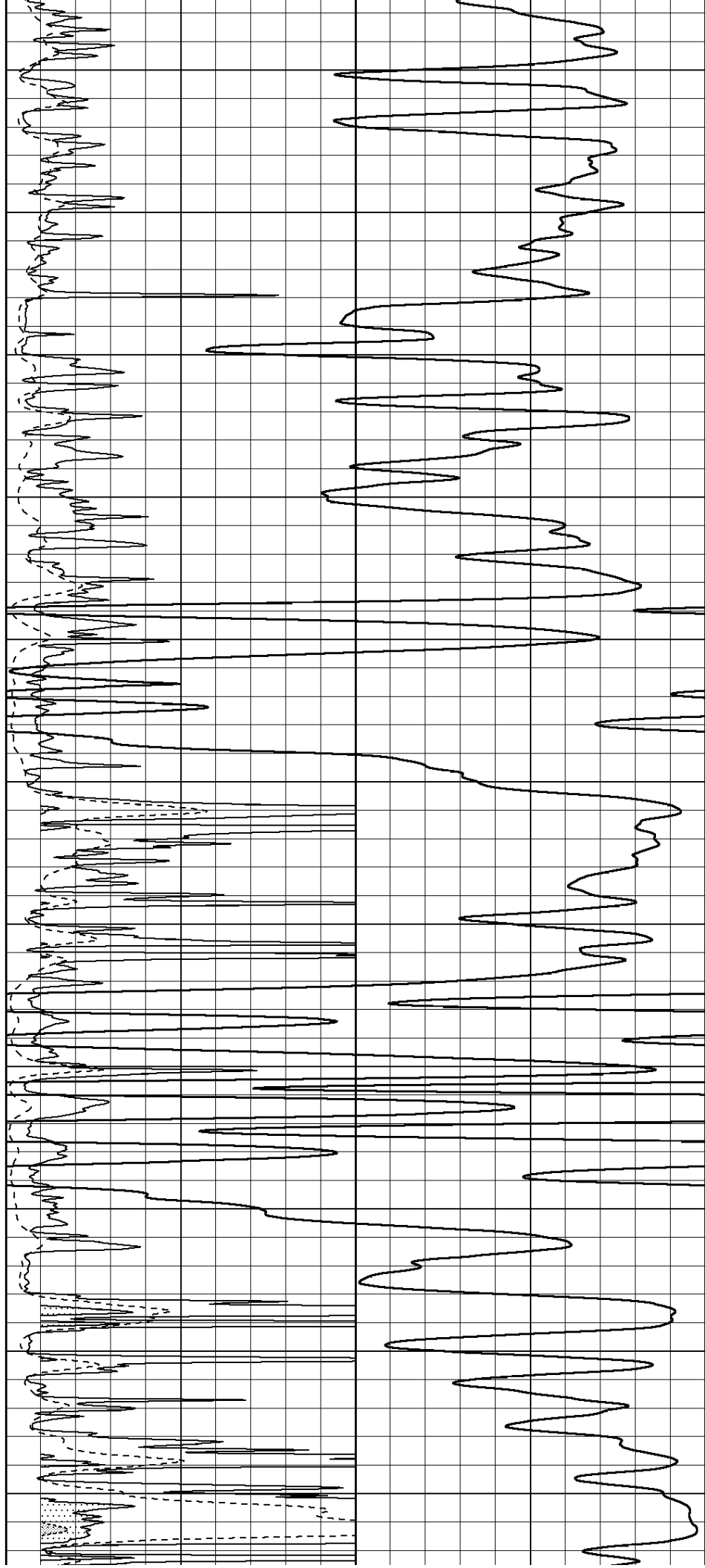
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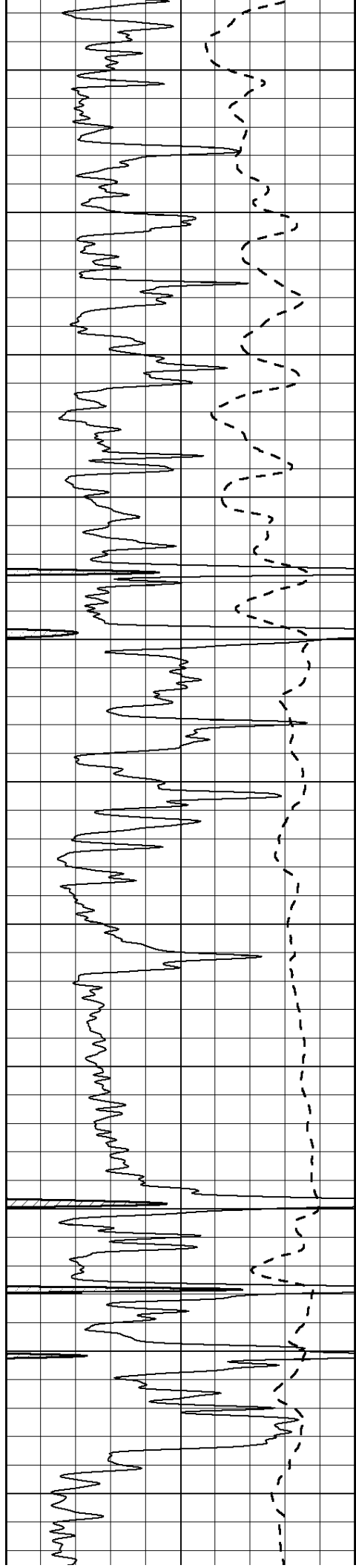
3600

3650

3700

3750





3800

3850

3900

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4000

4050

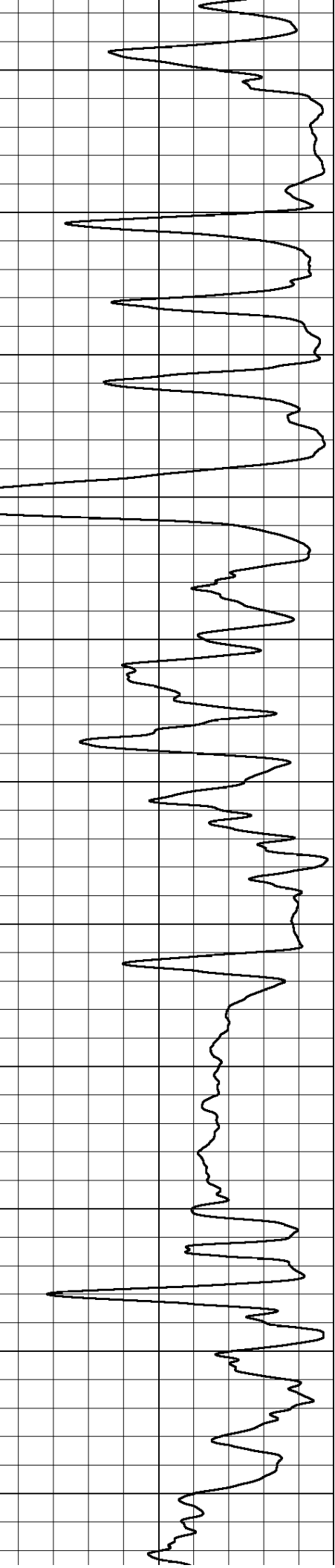
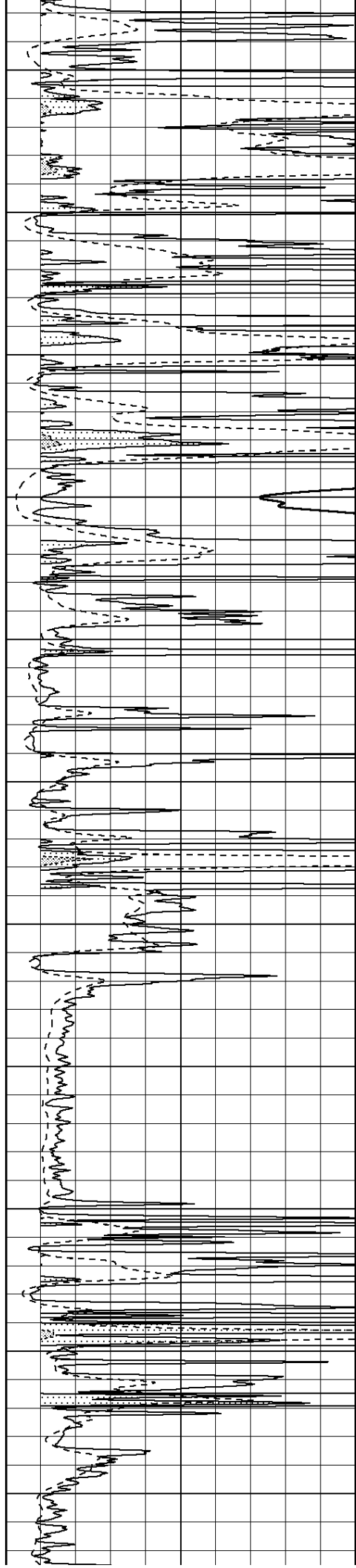
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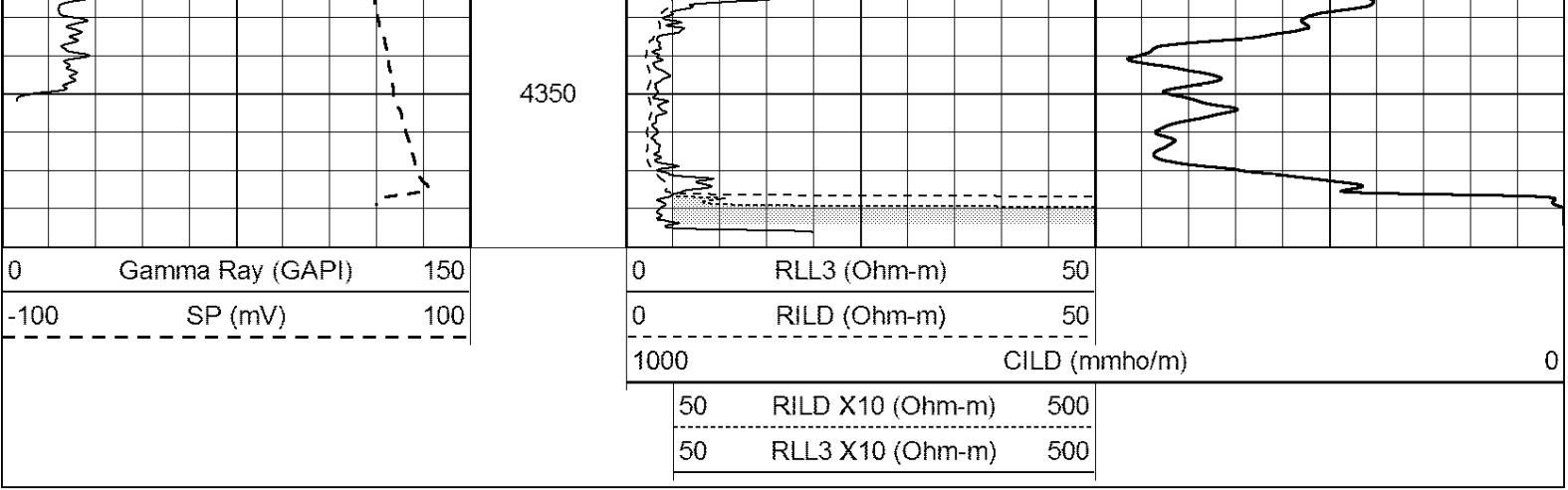
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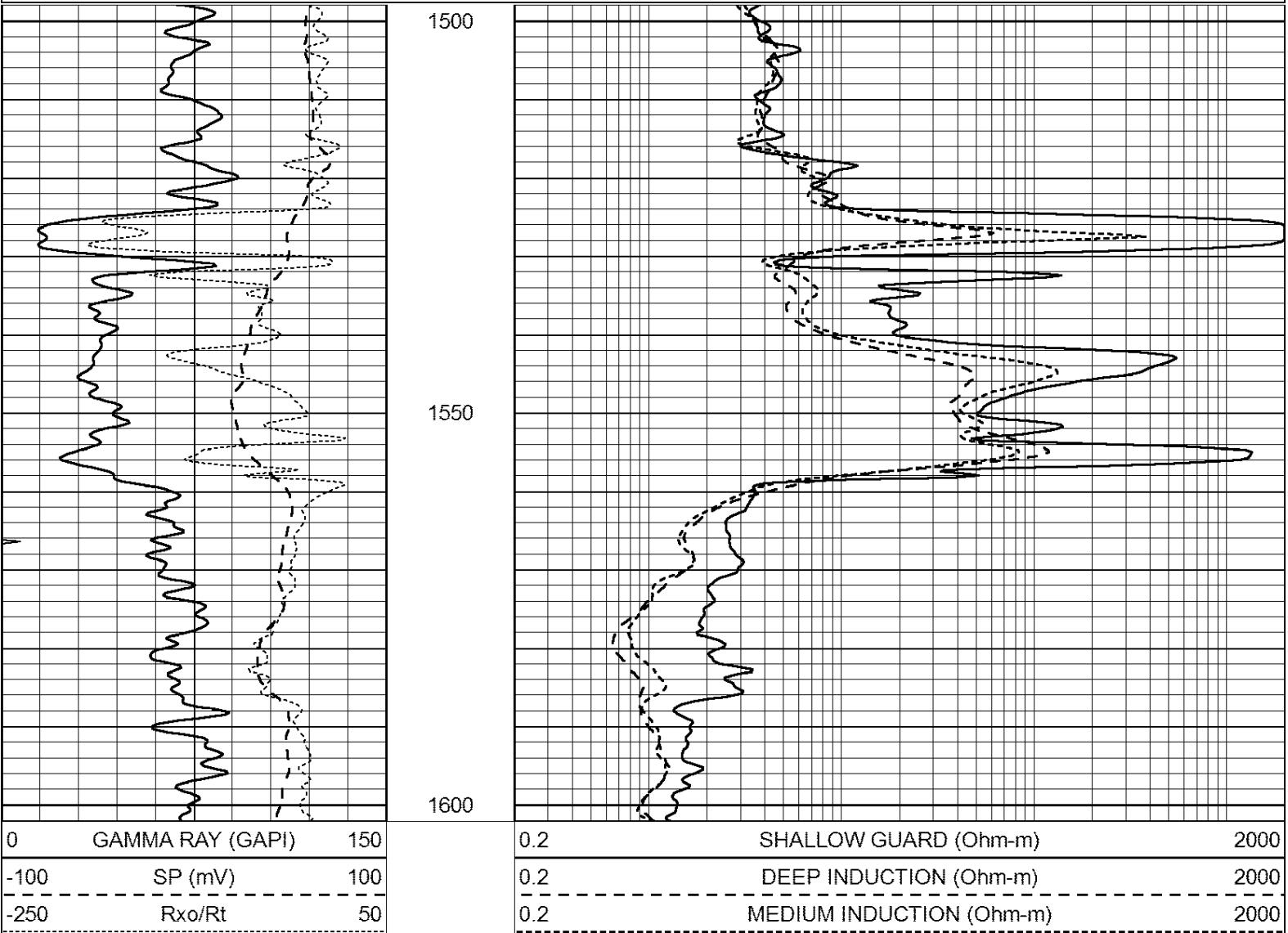
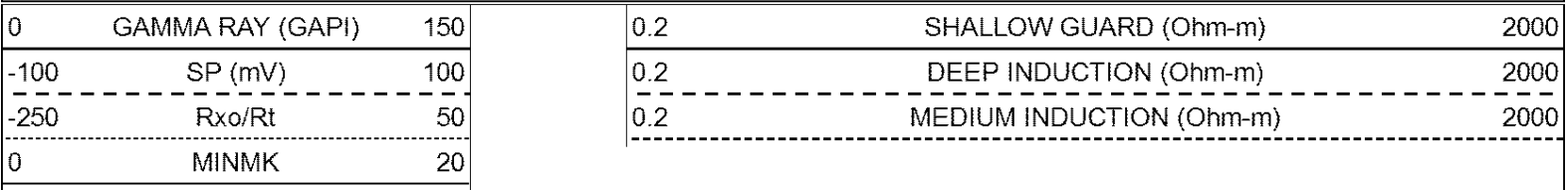
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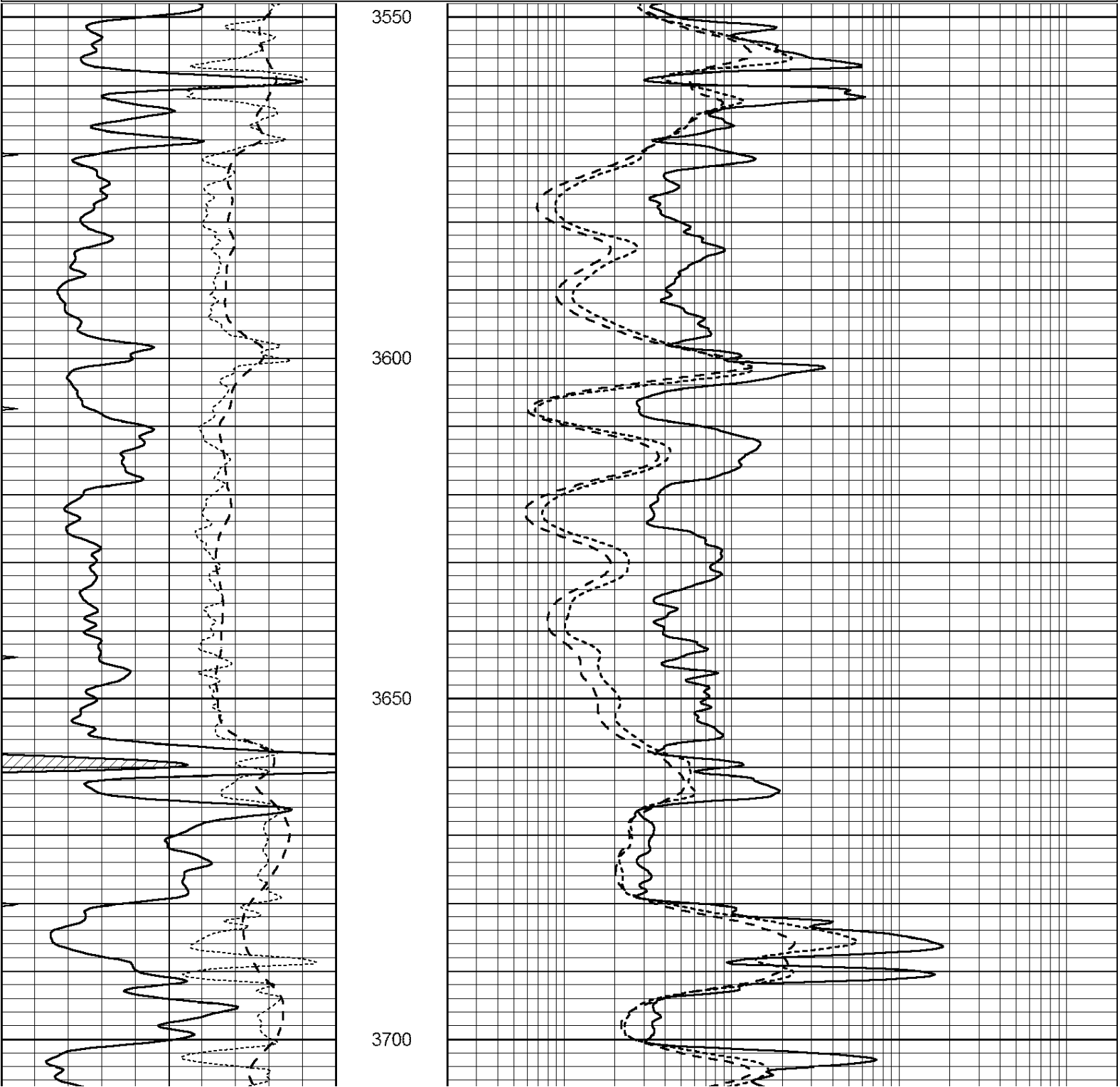


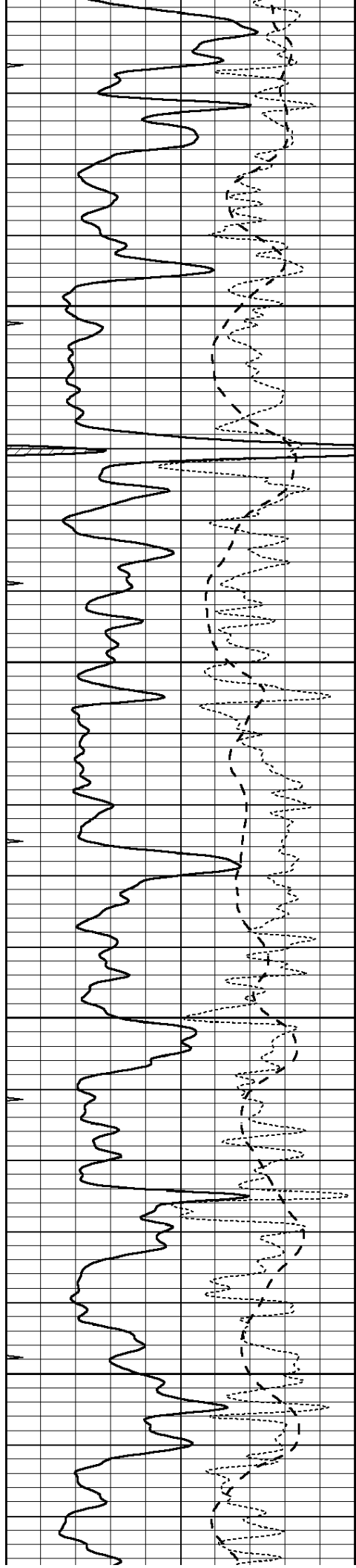
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Presentation Format: _dil
Dataset Creation: Tue Nov 19 09:31:23 2013 by Calc Open-Cased 090629
Charted by: Depth in Feet scaled 1:240



Database File:012095ddn.db
Dataset Pathname:pass4.4
Presentation Format:_dil
Dataset Creation:Tue Nov 19 09:31:23 2013 by Calc Open-Cased 090629
Charted by:Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			



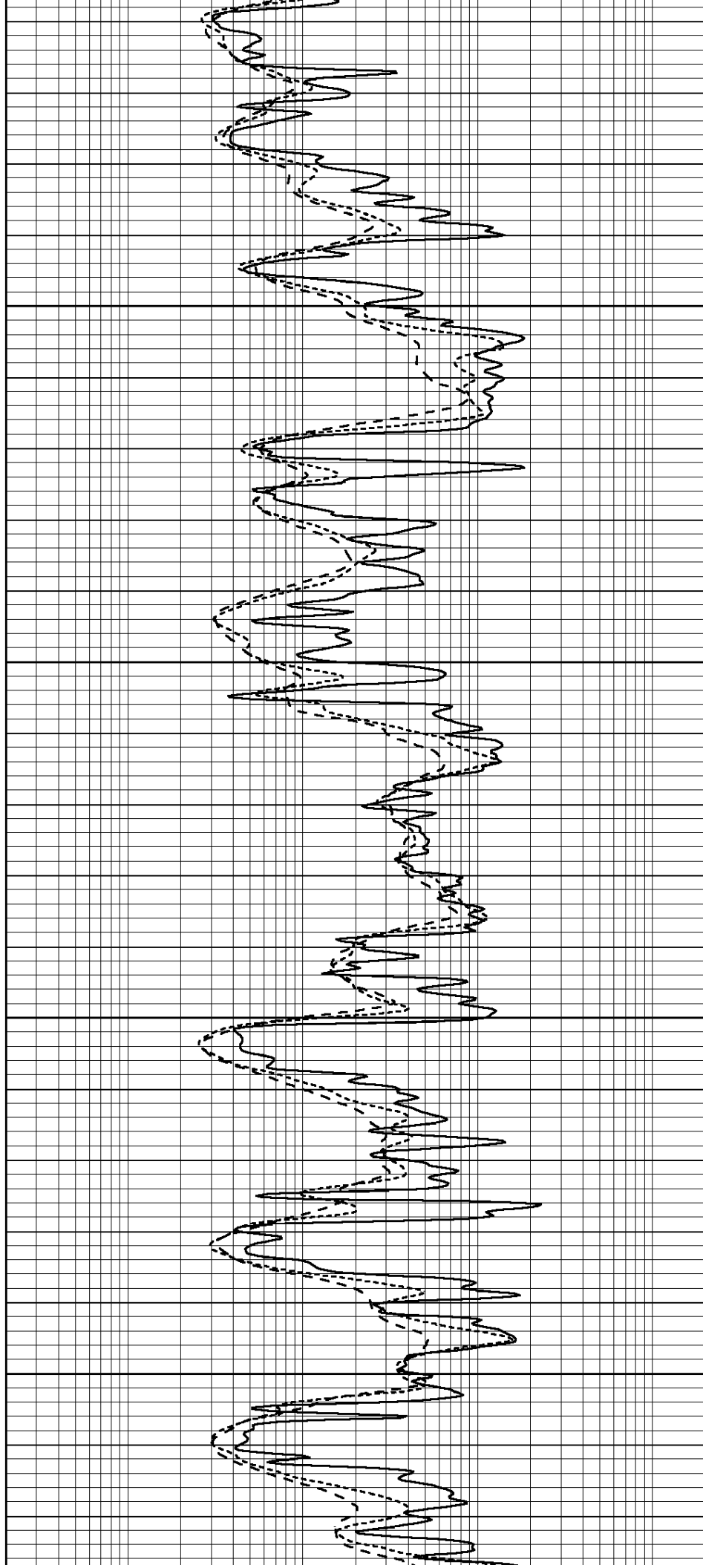


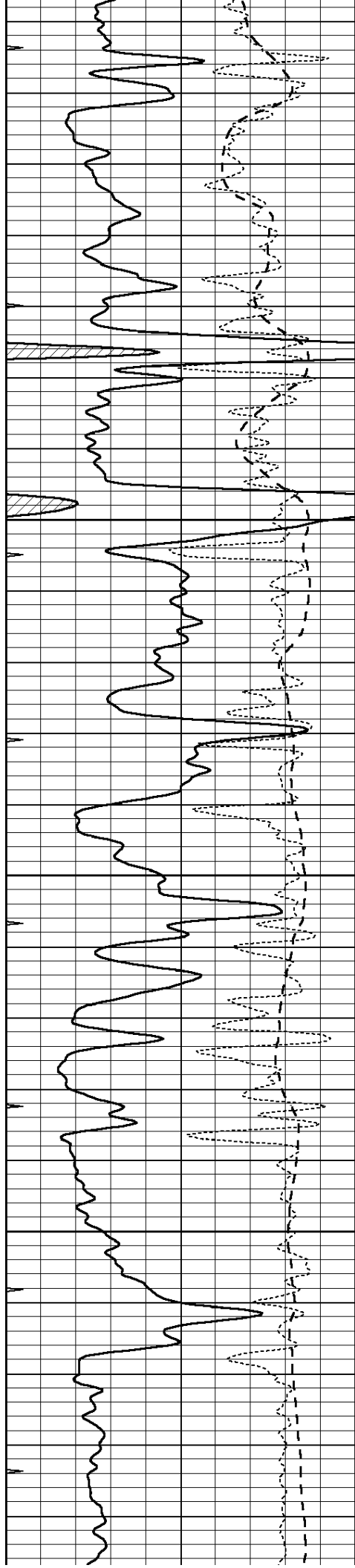
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3800

3850

3900



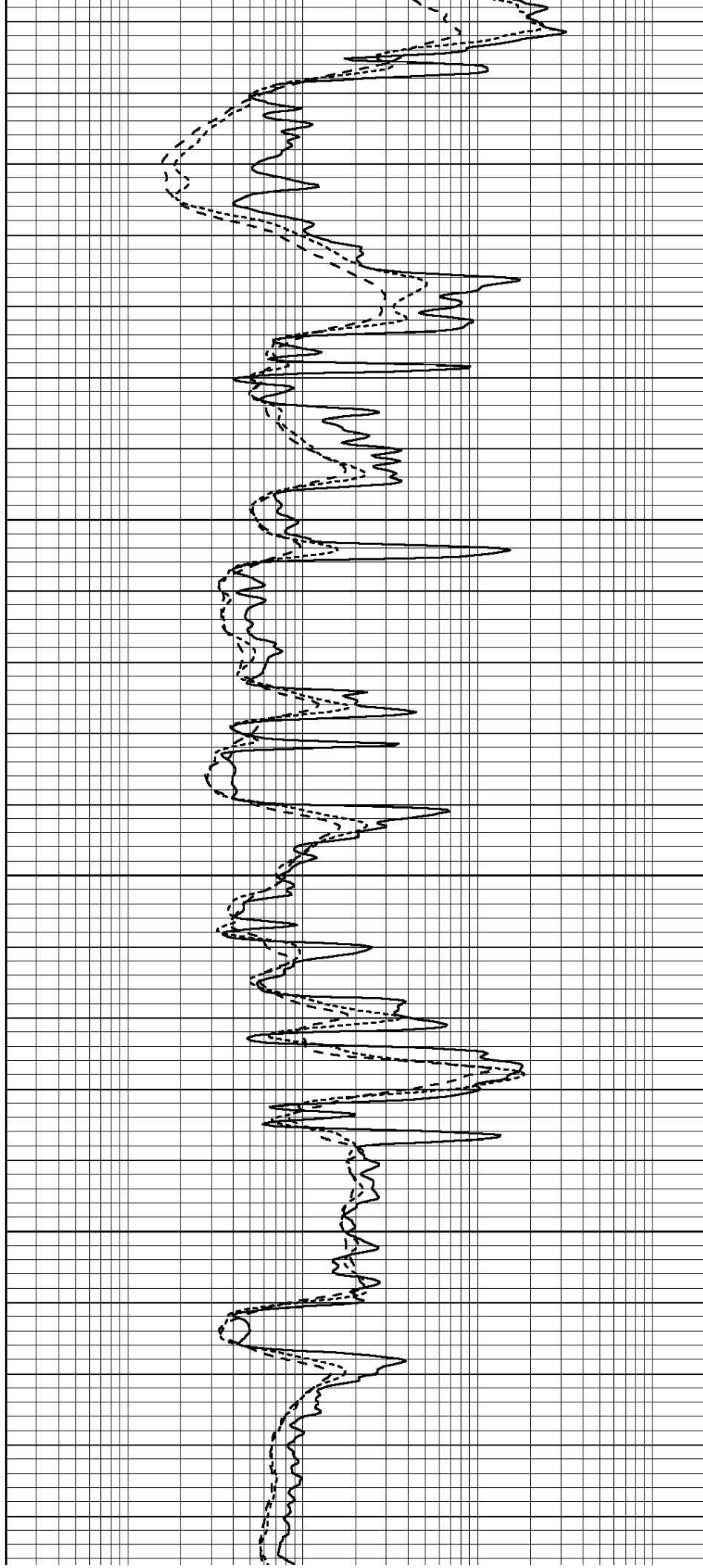


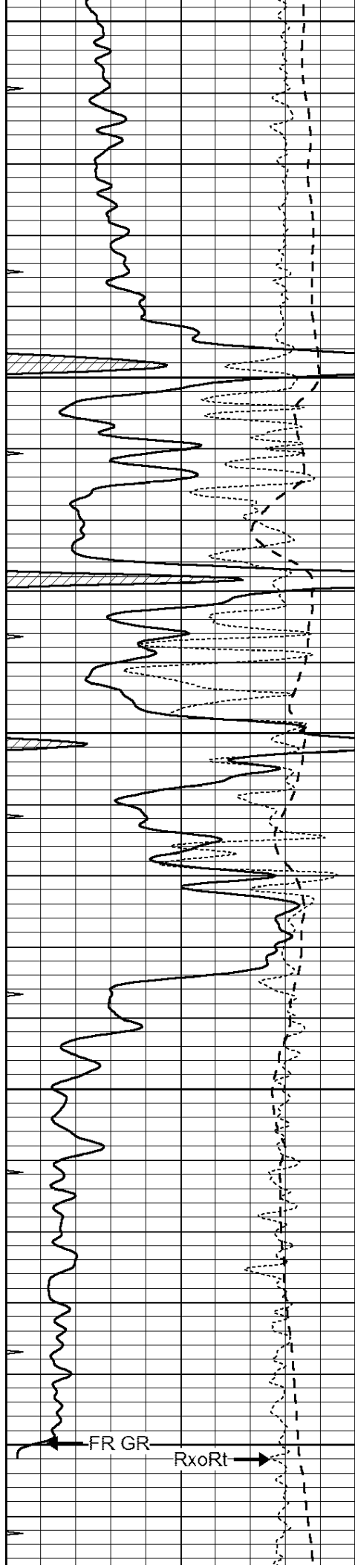
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4000

4050

4100





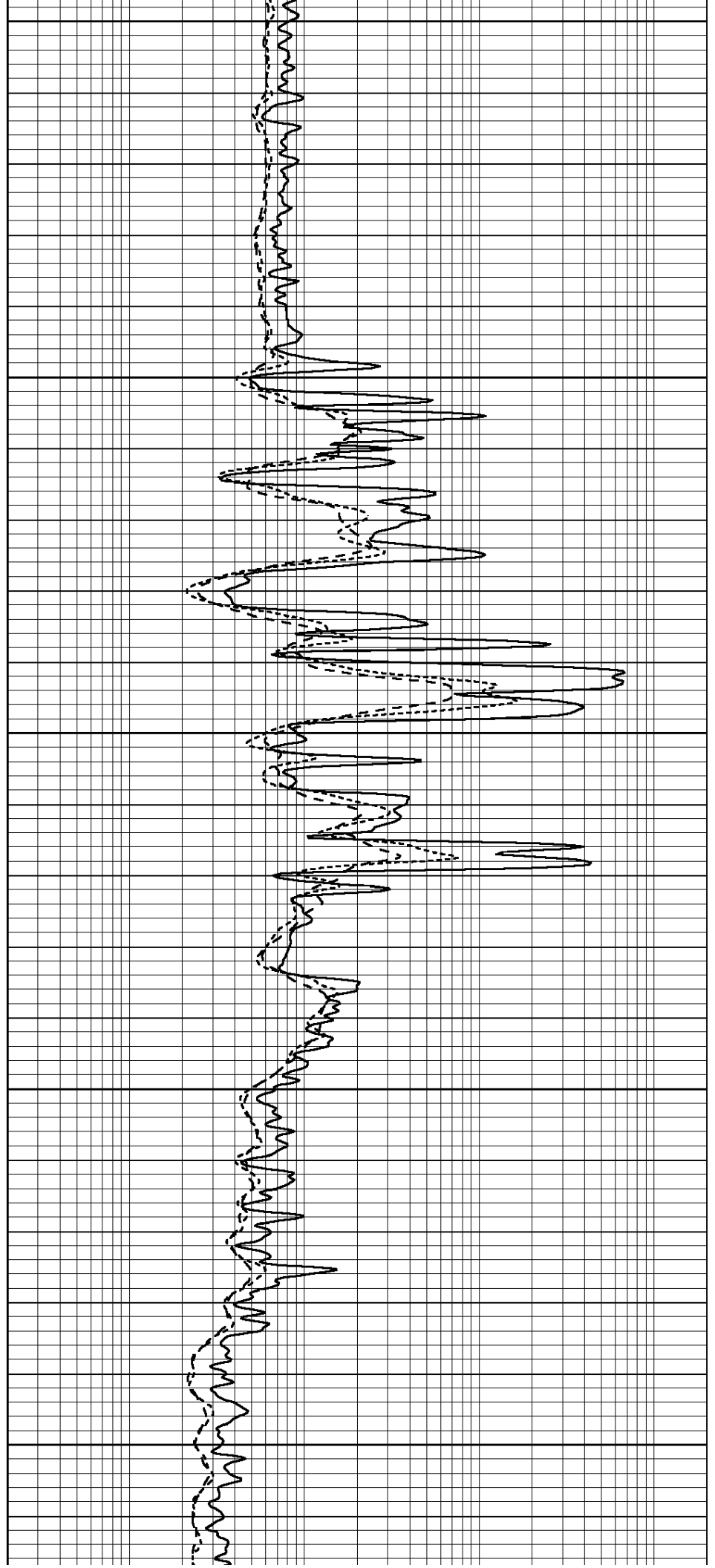
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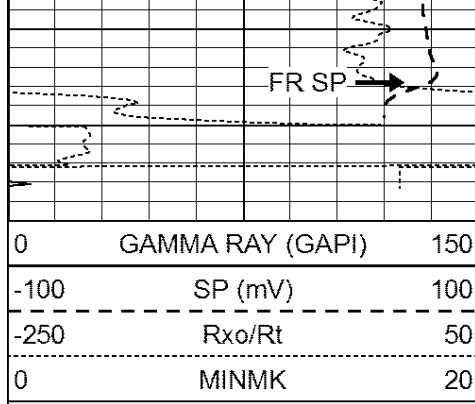
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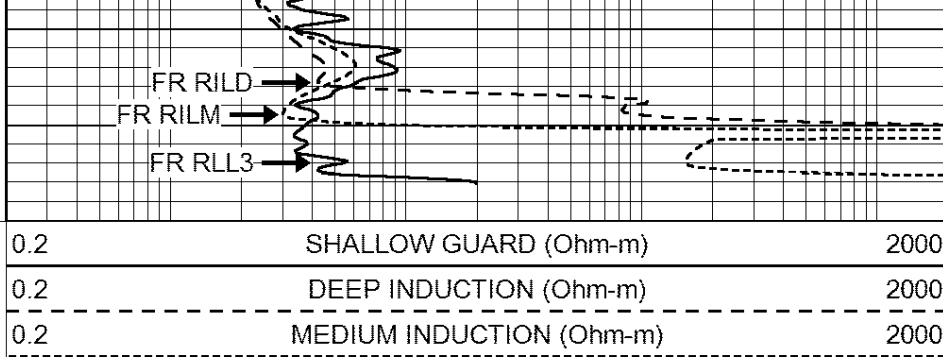
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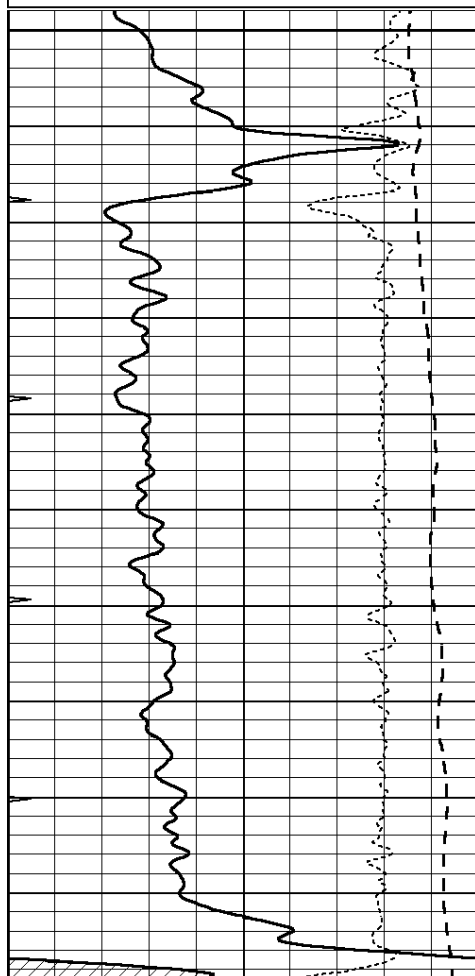
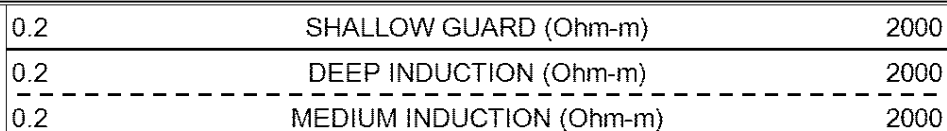
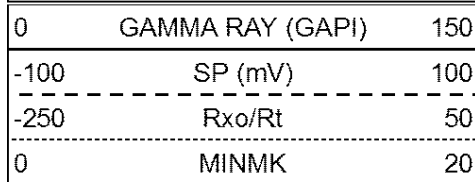


LTD 4386



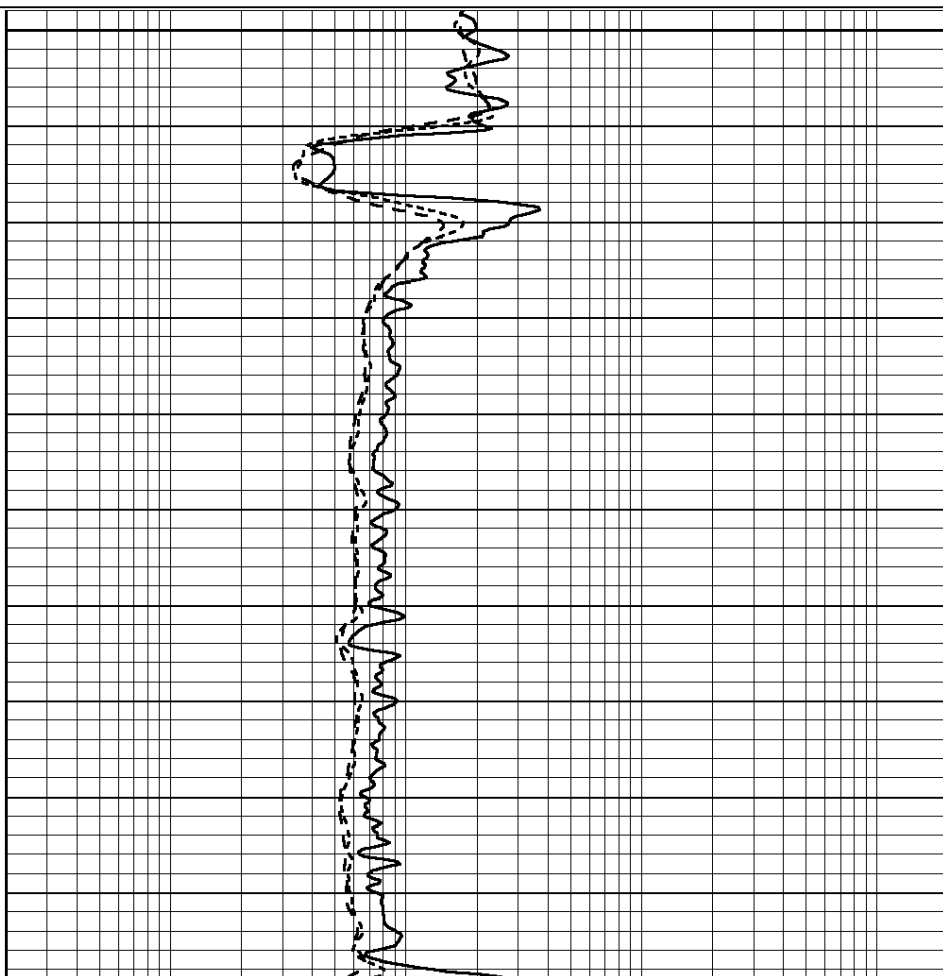
REPEAT SECTION

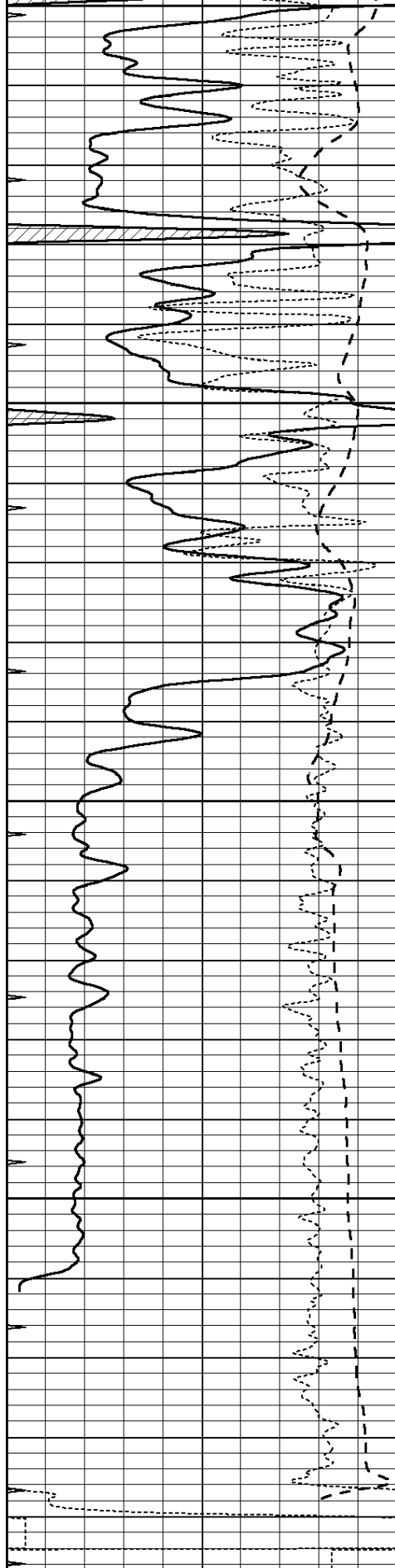
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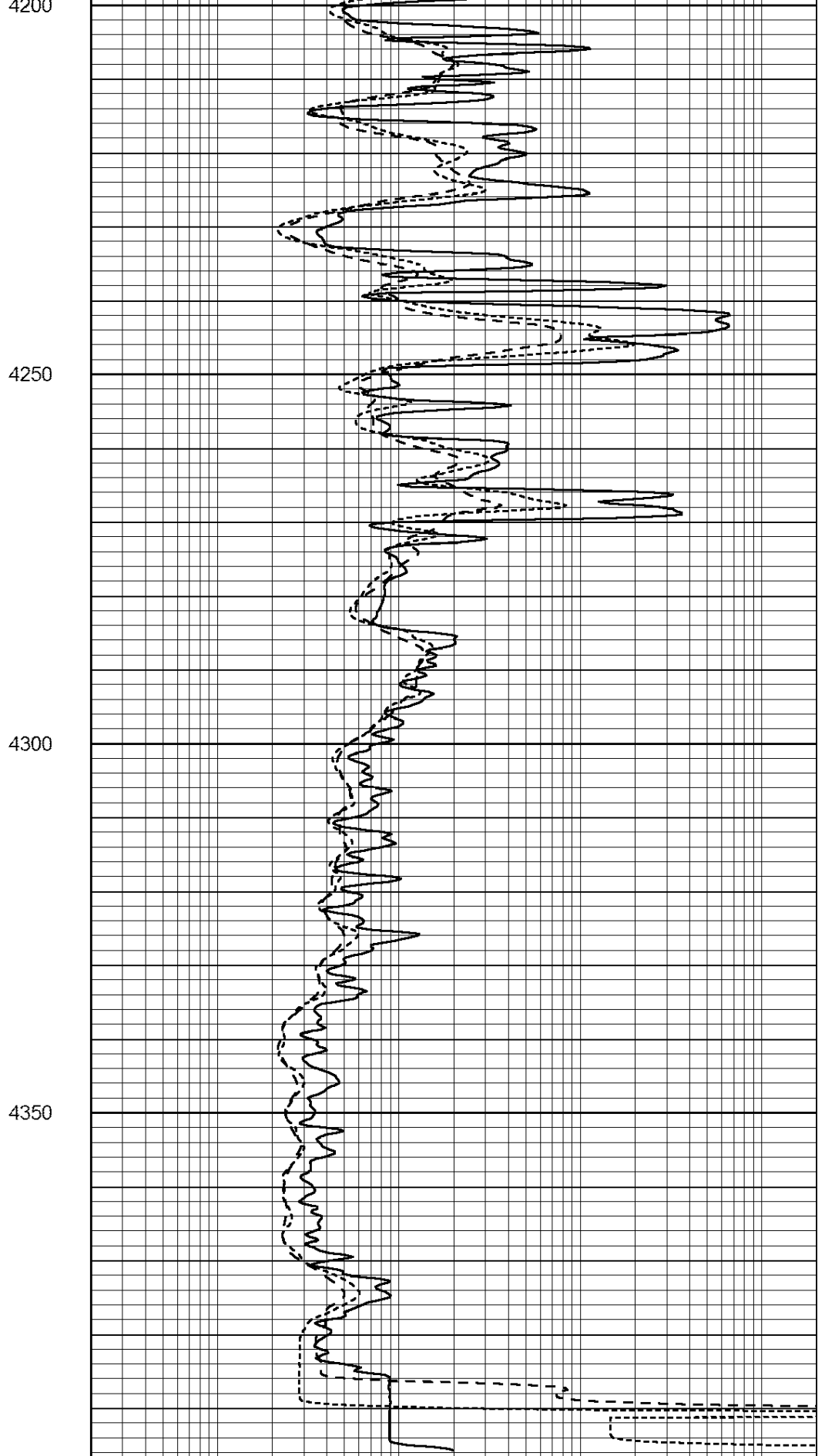
4100

4150





0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20



0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

Calibration Report

Database File: 012095ddn.db
 Dataset Pathname: pass4.4
 Dataset Creation: Tue Nov 19 09:31:23 2013 by Calc Open-Cased 090629

Dual Induction Calibration Report

Serial-Model: PROBE8-DILG
 Surface Cal Performed: Fri Aug 01 06:33:19 2008
 Downhole Cal Performed: Mon Jul 28 11:08:27 2008
 After Survey Verification Performed: Mon Jul 28 11:08:27 2008

Surface Calibration

Readings				References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.015	0.648	V	0.000	400.000	mmho/m	632.616	-9.730
Medium	0.029	0.796	V	0.000	464.000	mmho/m	605.049	-17.680
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.017	0.657	V	0.000	400.000	mmho/m	625.153	-10.619
Medium	0.016	0.757	V	0.000	464.000	mmho/m	625.992	-9.739

Downhole Calibration

Readings				References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	2.011	405.777	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	7.590	503.393	mmho/m	1.000	0.000
LL3		7.500	V		1500.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		3800.000	mmho-m		

After Survey Verification

Readings				Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
Medium	0.000	0.000	mmho/m	0.000	0.000	mmho/m	0.000	0.000
LL3		1.000	Ohm-m		1.000	Ohm-m		
		0.000	Ohm-m		0.000	Ohm-m		
		1.000	mmho-m		1.000	mmho-m		

Compensated Density Calibration Report

Serial-Model: GEAR4-GEARHART
 Source / Verifier: 143 / 143
 Master Calibration Performed: Wed Sep 18 03:03:09 2013
 Before Survey Verification Performed:
 After Survey Verification Performed:

Master Calibration

	Density		Far Detector	Near Detector	
Magnesium	1.710	g/cc	1075.98	532.39	cps
Aluminum	2.560	g/cc	286.51	422.88	cps

Spine Angle = 80.13

Density/Spine Ratio = 0.633

	Size		Reading	
Small Ring	8.00	in	3.21	V

Small Ring	0.00	in	0.21	V		
Large Ring	14.00		5.46			
Before Survey Verification						
	Target		Measured			
		g/cc		g/cc		
		g/cc		g/cc		
		g/cc		g/cc		
After Survey Verification						
	Target		Measured			
		g/cc		g/cc		
		g/cc		g/cc		
		g/cc		g/cc		
Compensated Neutron Calibration Report						
	Serial Number:		6I			
	Tool Model:		G			
CALIBRATION						
	Detector	Readings		Target	Normalization	
	Short Space	1.00	cps	1.00	cps	1.0000
	Long Space	1.00	cps	1.00	cps	1.0000
PRE-SURVEY VERIFICATION						
	Detector	Readings		Measured	Target	
1)	Short Space		cps			
	Long Space		cps	pu	pu	
2)	Short Space		cps			
	Long Space		cps	pu		
3)	Short Space		cps			
	Long Space		cps	pu		
POST-SURVEY VERIFICATION						
	Detector	Readings		Measured	Target	
1)	Short Space		cps			
	Long Space		cps	pu	pu	
2)	Short Space		cps			
	Long Space		cps	pu	pu	
3)	Short Space		cps			
	Long Space		cps	pu	pu	
Gamma Ray Calibration Report						
	Serial Number:		#8			
	Tool Model:		OPEN			
	Performed:		Tue Nov 19 07:23:02 2013			
	Calibrator Value:		150.0			
			GAPI			
	Background Reading:		0.0			
	Calibrator Reading:		175.0			
			cps			
	Sensitivity:		0.8371			
			GAPI/cps			