



# NABORS

**COMPLETION  
& PRODUCTION  
SERVICES CO.**

## DUAL INDUCTION LOG

Company		MULL DRILLING COMPANY, INC.	
Well	SAT UNIT #1-14		
Field	WILDCAT		
County	KIOWA	State	COLORADO
Location:	AP1 # : 05-061-06877		Other Services CDL/CNL/PE MEL/SONIC
Permanent Datum		GROUND LEVEL	Elevation 4101
Log Measured From		KELLY BUSHING 11' A.G.L.	
Drilling Measured From		KELLY BUSHING	Elevation K.B. 4112 D.F. 4110 G.L. 4101
SEC 14 TWP 17S RGE 45W			
Date	10/13/12		
Run Number	ONE		
Depth Driller	5300		
Depth Logger	5302		
Bottom Logged Interval	5300		
Top Log Interval	00		
Casing Driller	8 5/8"@352'		
Casing Logger	350		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICALMUD	CHLORIDES 3,000 PPM	
Density / Viscosity	9.2/60		
pH / Fluid Loss	9.5/9.6		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	.900@80F		
Rmt @ Meas. Temp	.675@80F		
Rmc @ Meas. Temp	1.08@80F		
Source of Rmt / Rmc	MEASUREMENT		
Rm @ BHT	.563@128F		
Time Circulation Stopped	3 HOURS		
Time Logger on Bottom	8:15 A.M.		
Maximum Recorded Temperature	128F		
Equipment Number	4010		
Location	HAYS, KANSAS		
Recorded By	JEFF LUEBBERS		
Witnessed By	PHIL ASKEY		

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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  
CHEYENNE WELLS, CO. 18S. ON HWY 385 TO "RD. Z", 6W. TO "RD. 59", 1/2S., E. INTO



**NABORS**  
COMPLETION  
& PRODUCTION

# MAIN SECTION

Database File:

409693pe.db

Dataset Pathname:

pass3.5

Presentation Format:

dil2

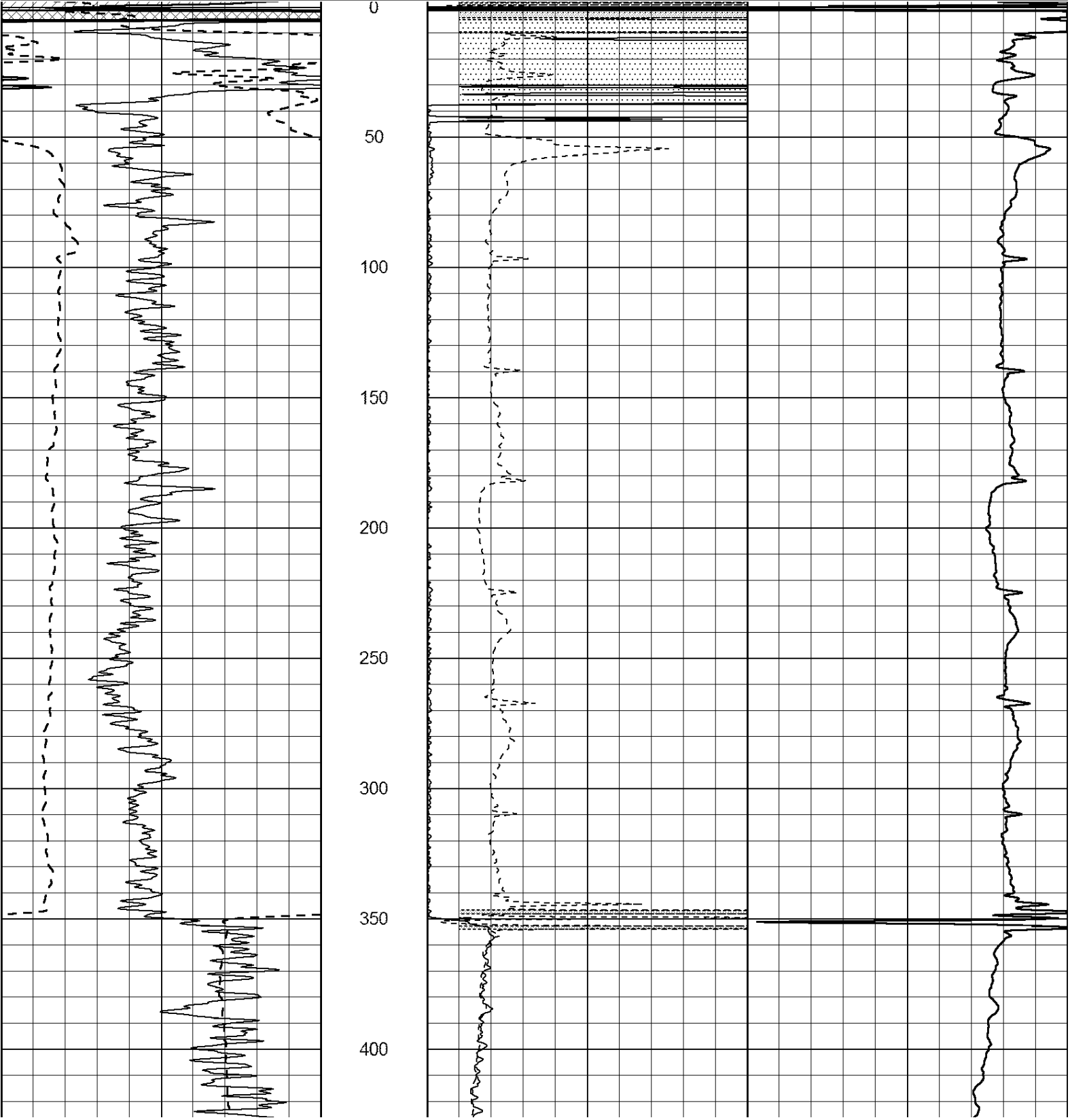
Dataset Creation:

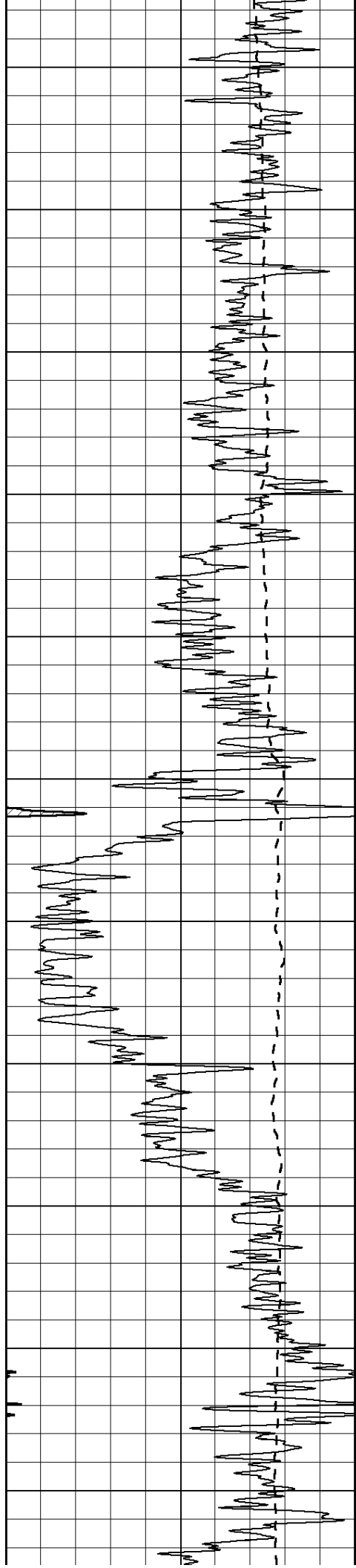
Sat Oct 13 10:22:42 2012 by Calc Open-Cased 110302

Charted by:

Depth in Feet scaled 1:600

0	Gamma Ray (GAPI)	150	0	RLL3 (Ohm-m)	50	
-100	SP (mV)	100	0	RILD (Ohm-m)	50	
-----			1000			CILD (mmho/m) 0
			50	RILD X10 (Ohm-m)	500	
			50	RLL3 X10 (Ohm-m)	500	





450

500

550

600

650

700

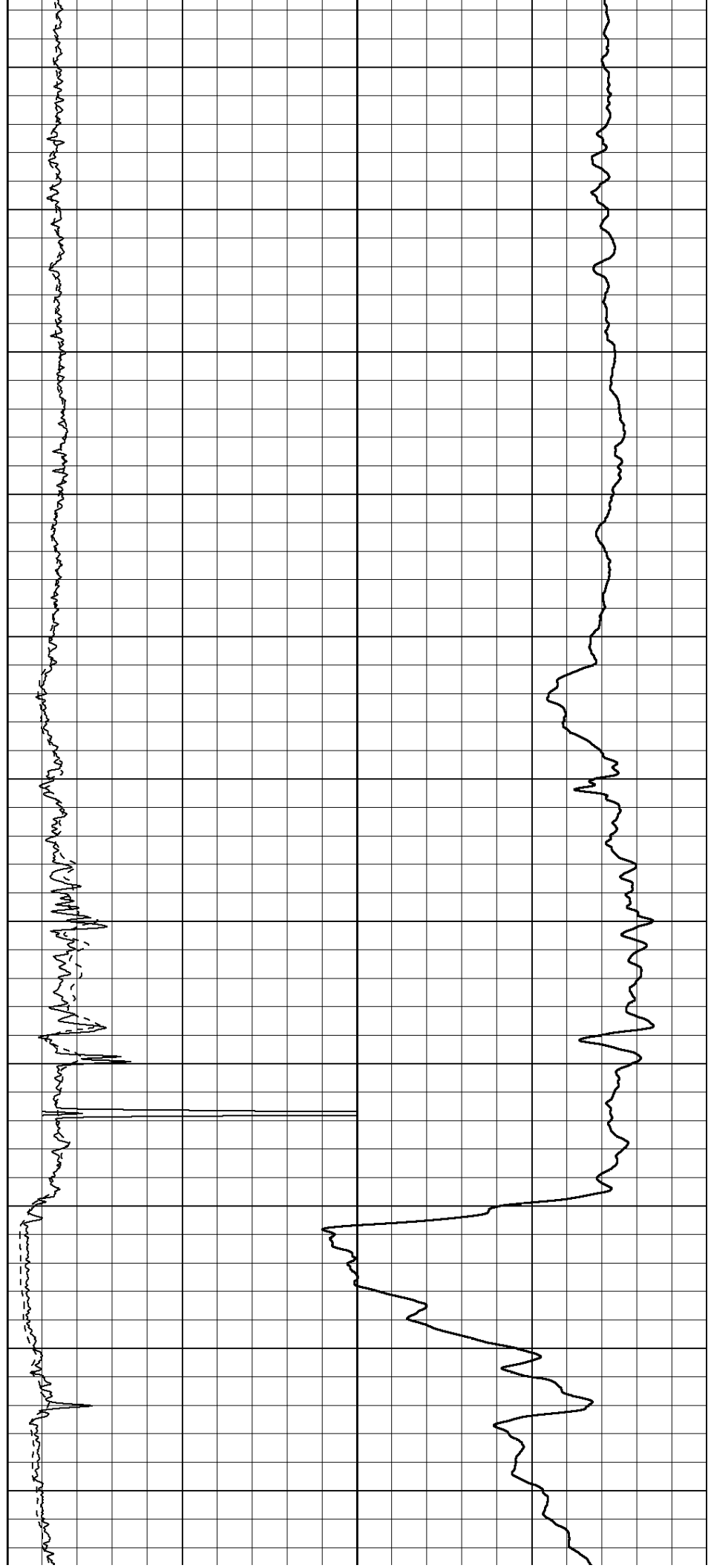
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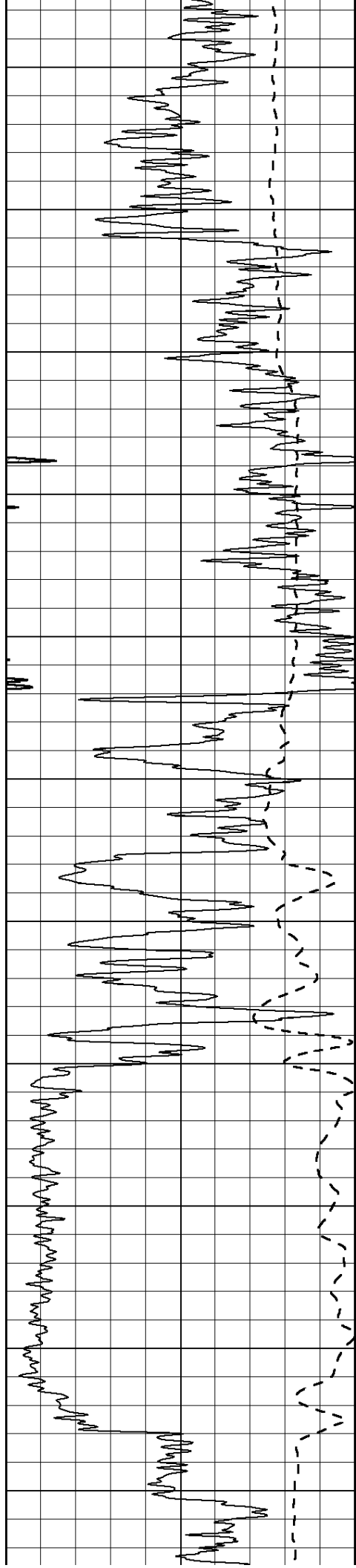
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850

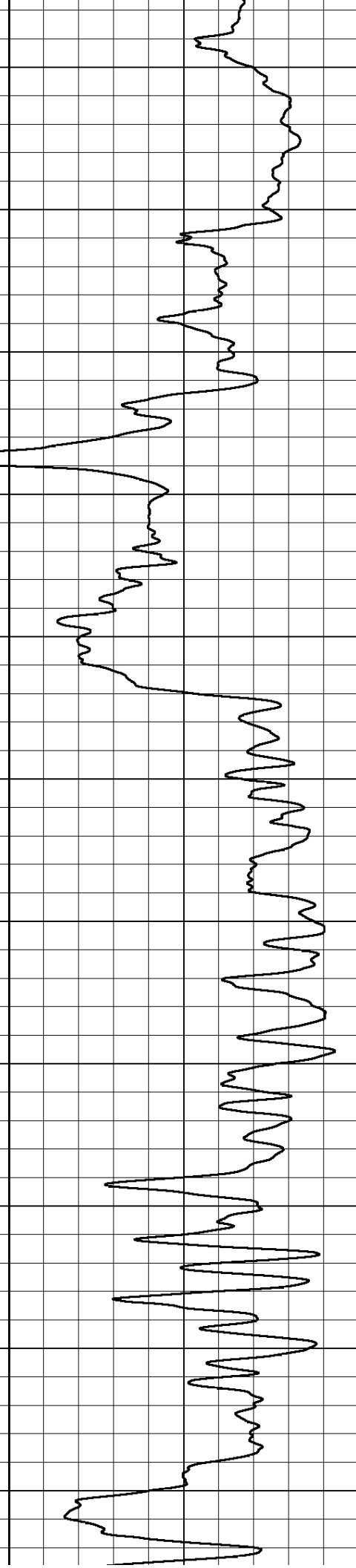
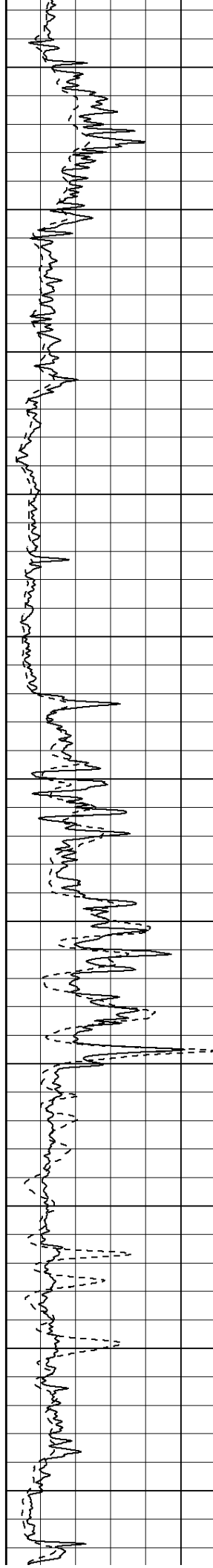
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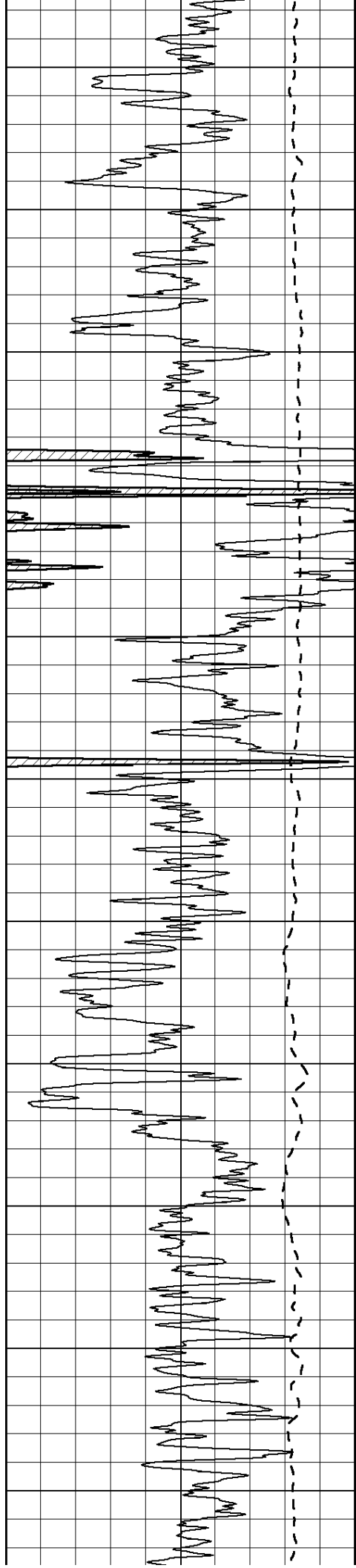
950





1000  
1050  
1100  
1150  
1200  
1250  
1300  
1350  
1400  
1450  
1500





1550

1600

1650

1700

1750

1800

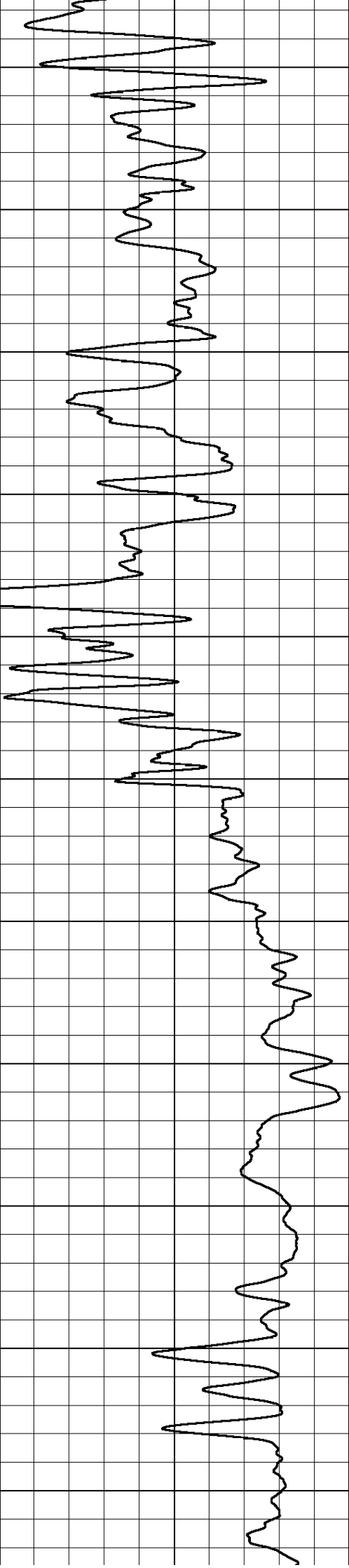
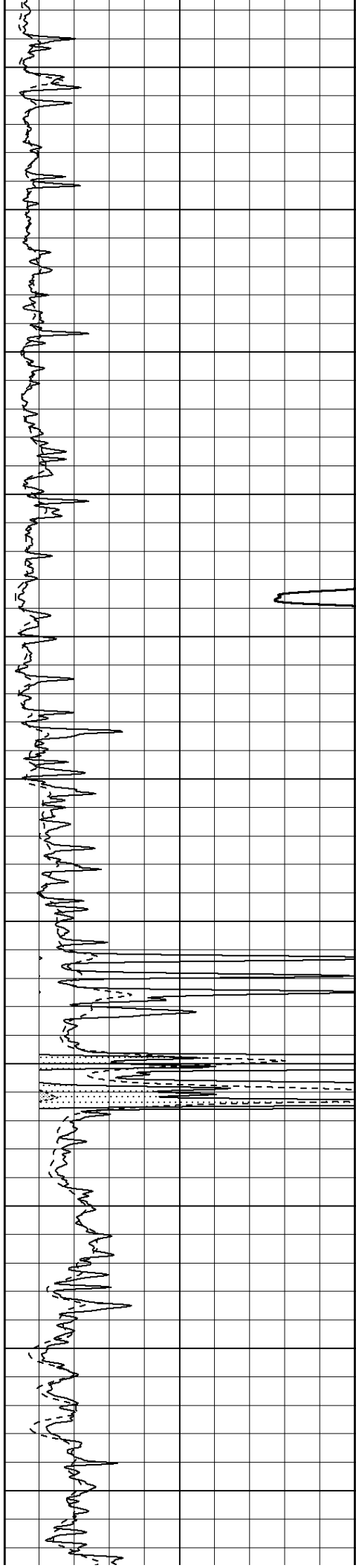
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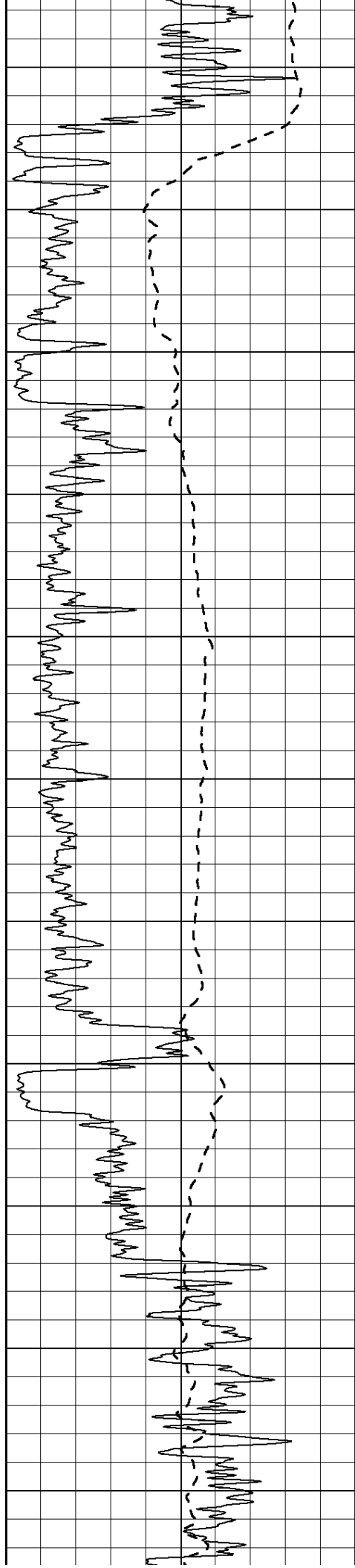
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1950

2000

2050





2100

2150

2200

2250

2300

2350

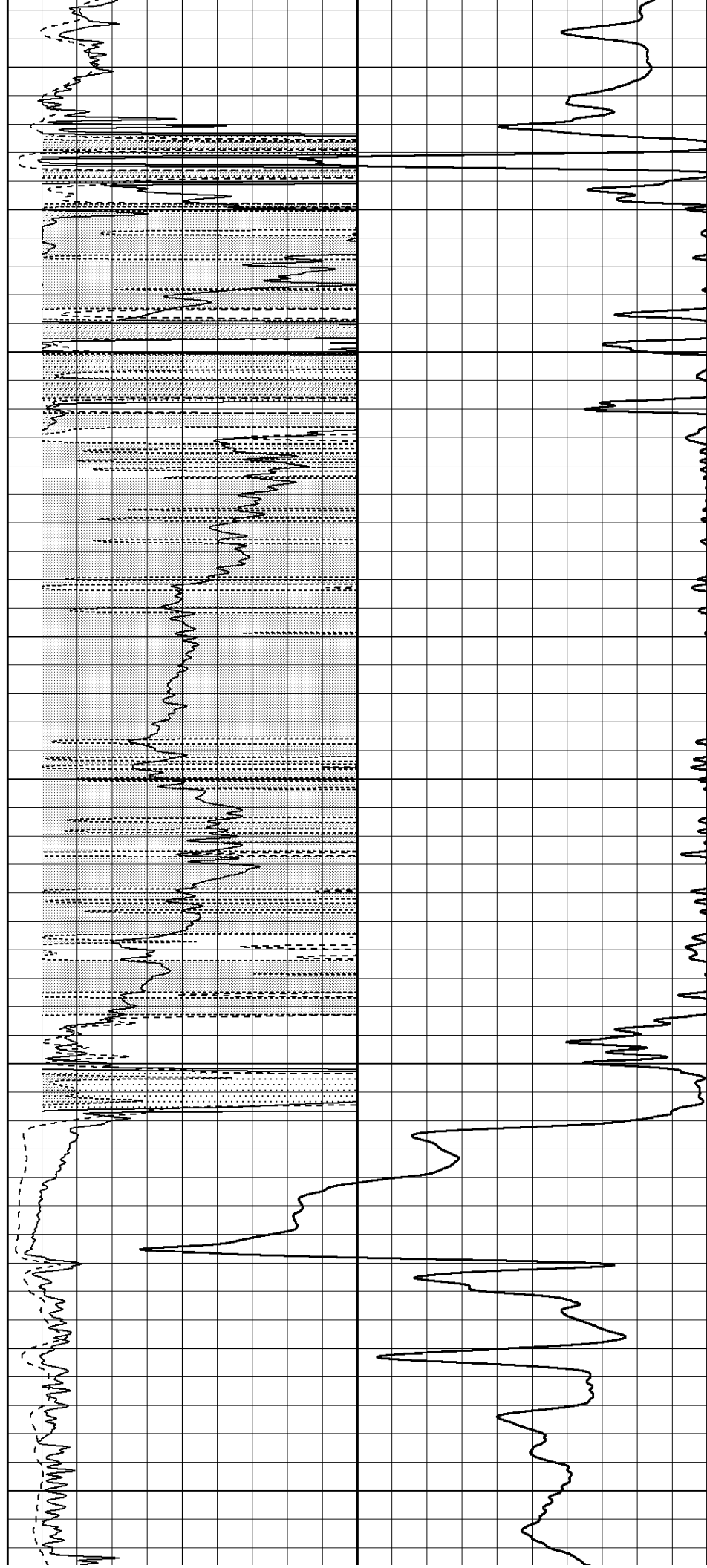
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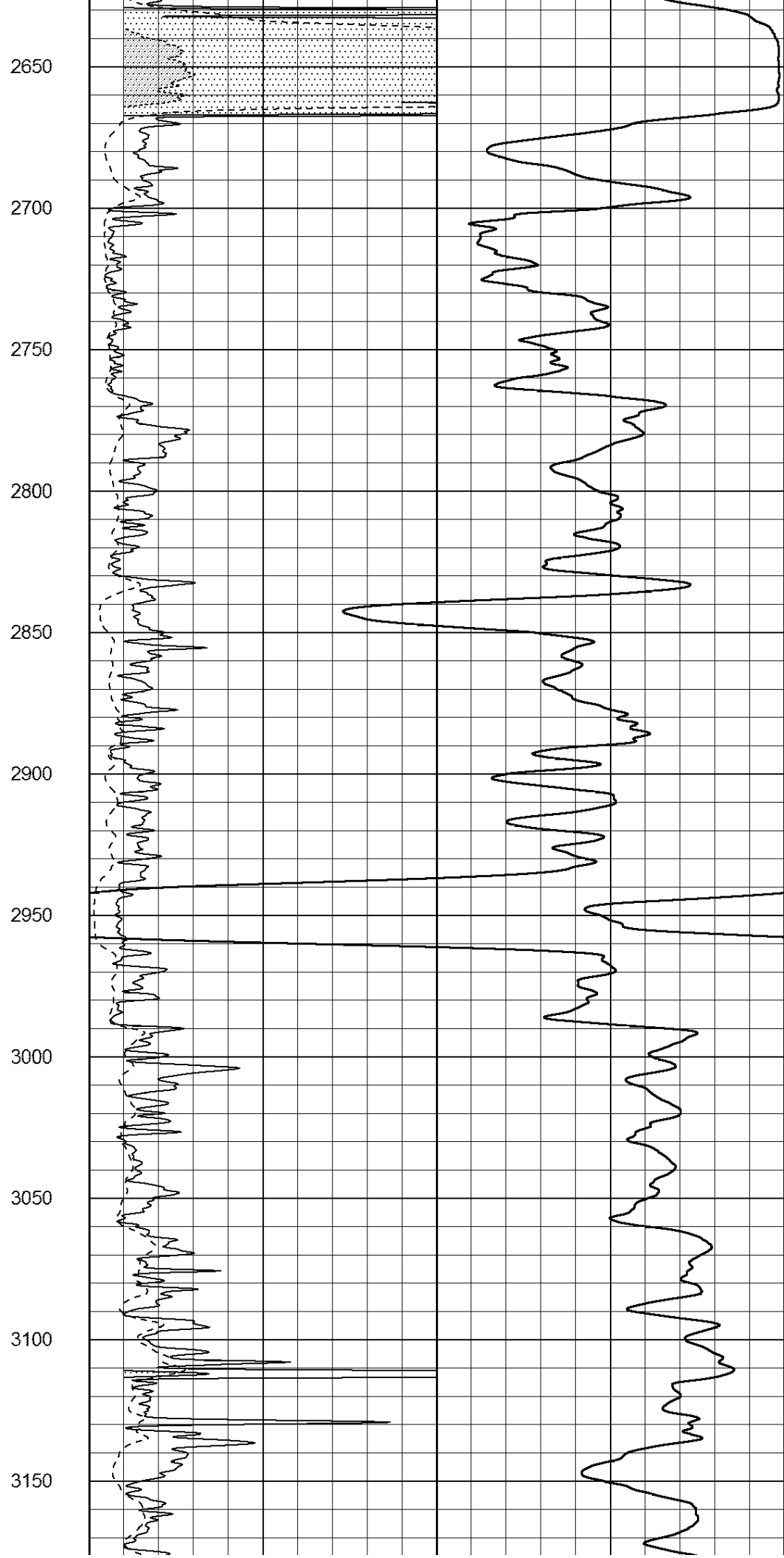
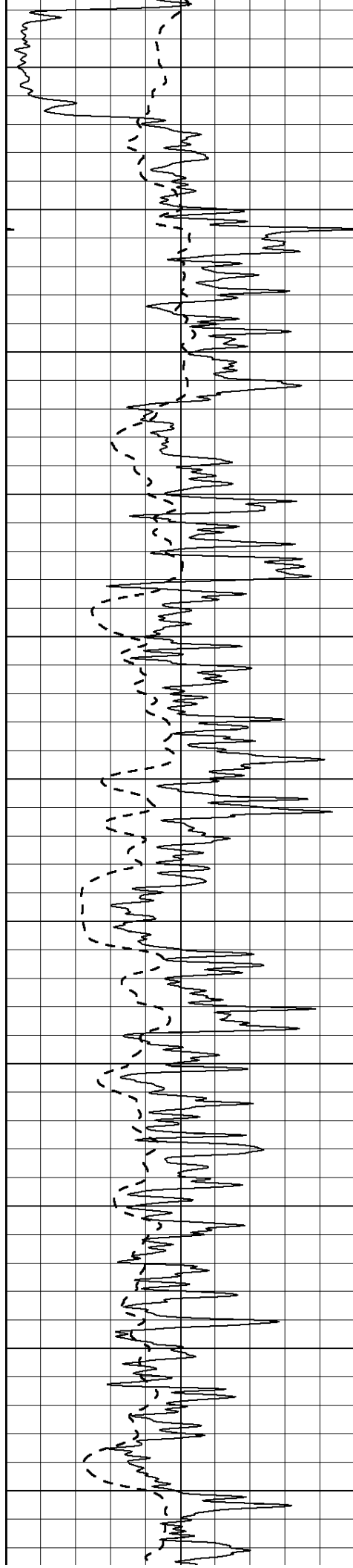
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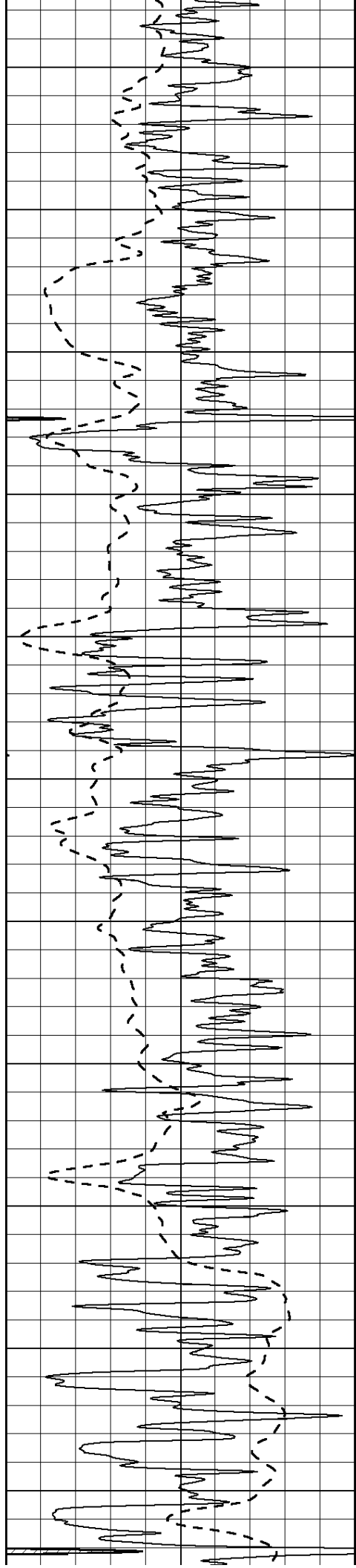
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2550

2600







3200

3250

3300

3350

3400

3450

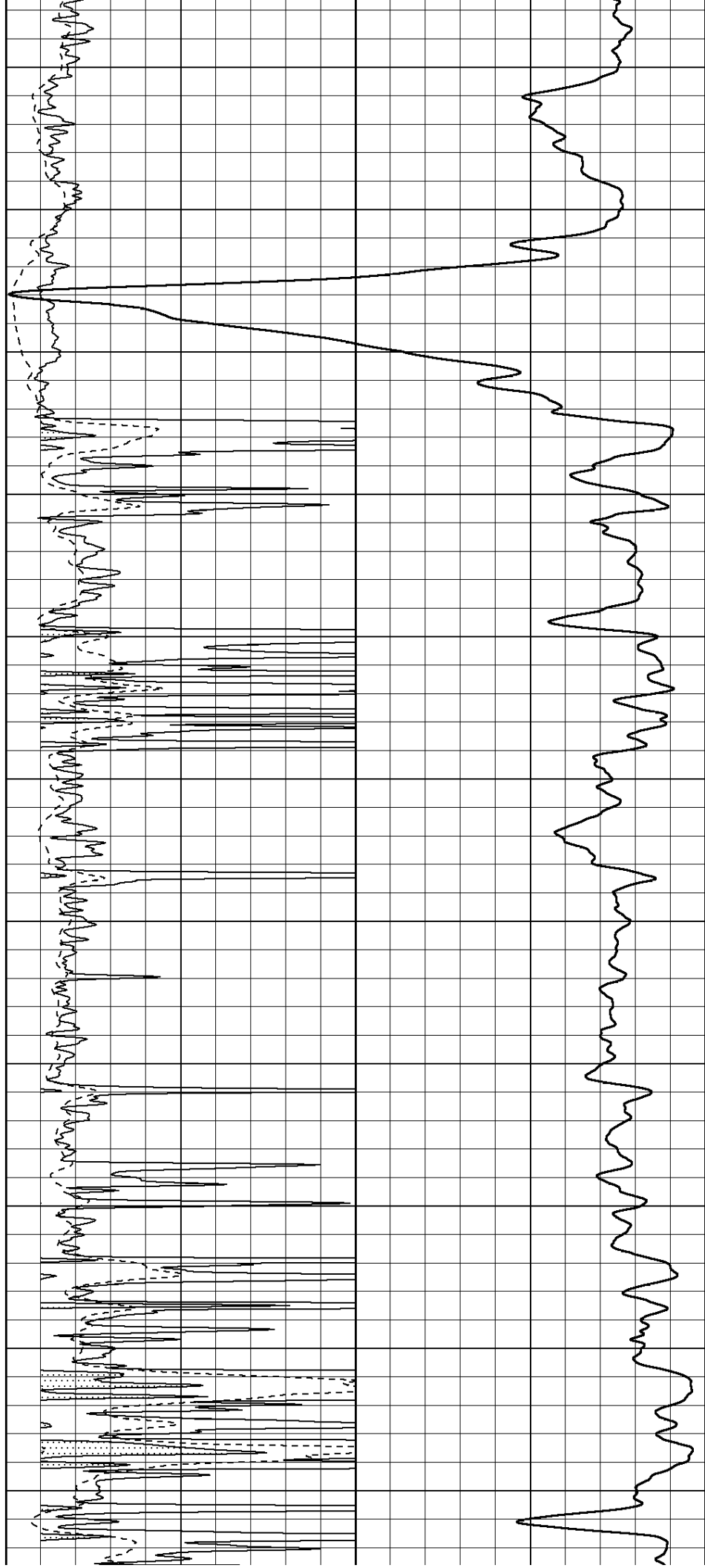
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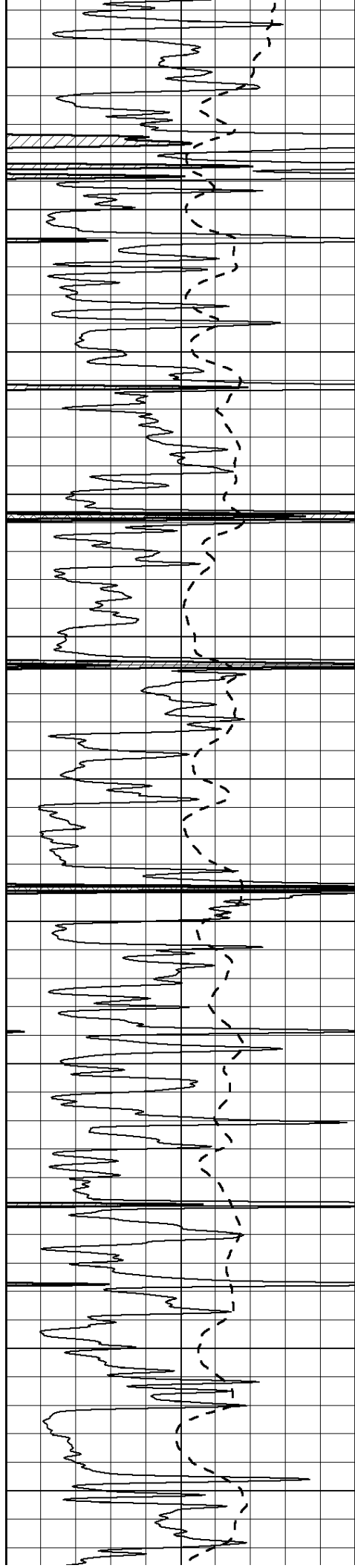
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3650

3700







3750

3800

3850

3900

3950

4000

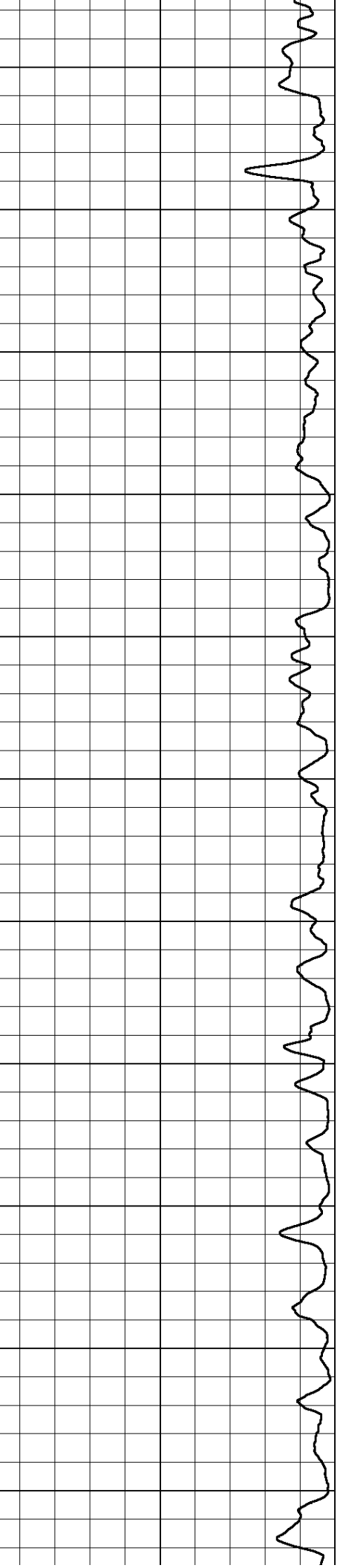
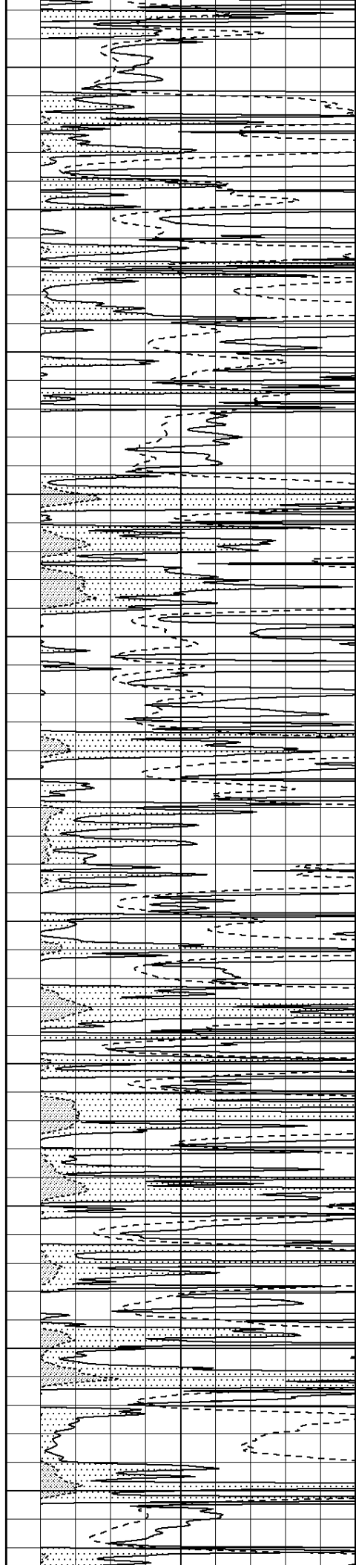
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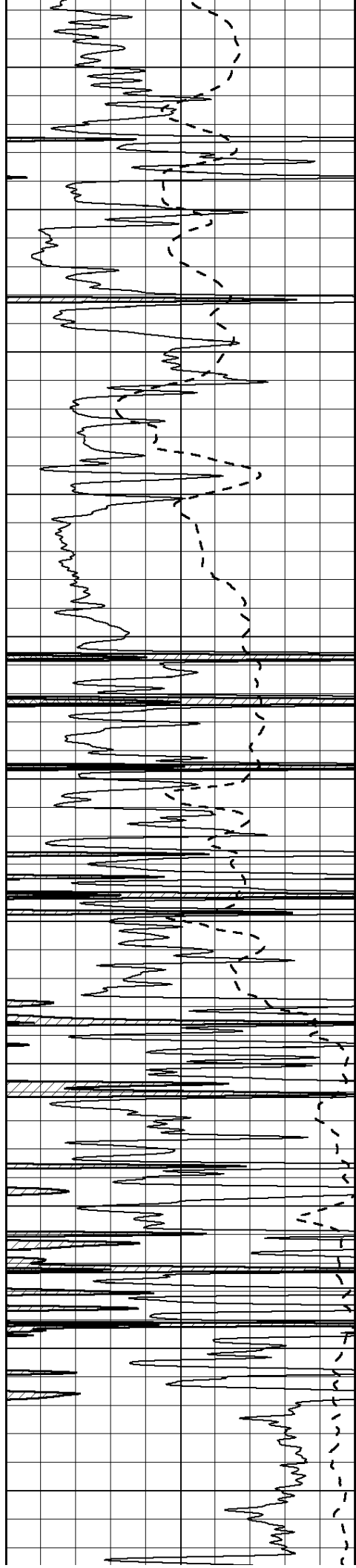
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4150

4200

4250





4300

4350

4400

4450

4500

4550

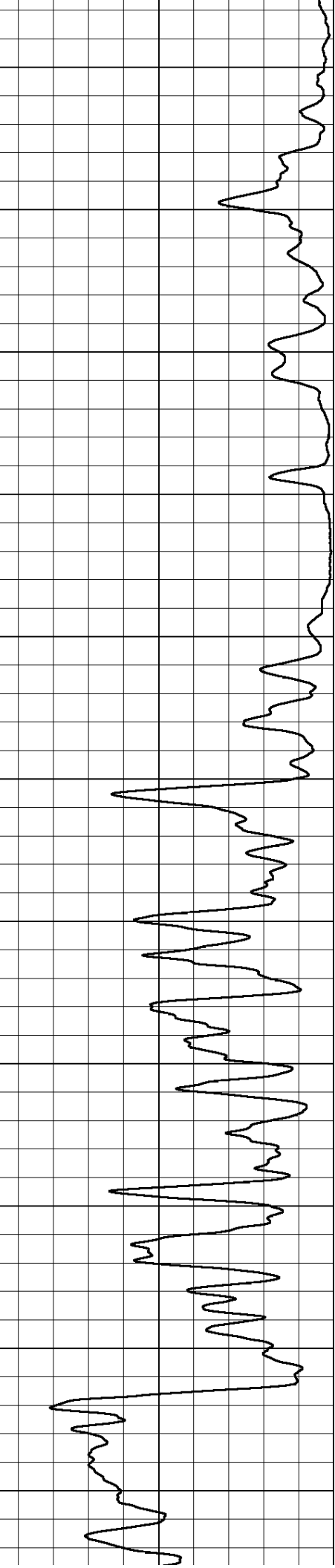
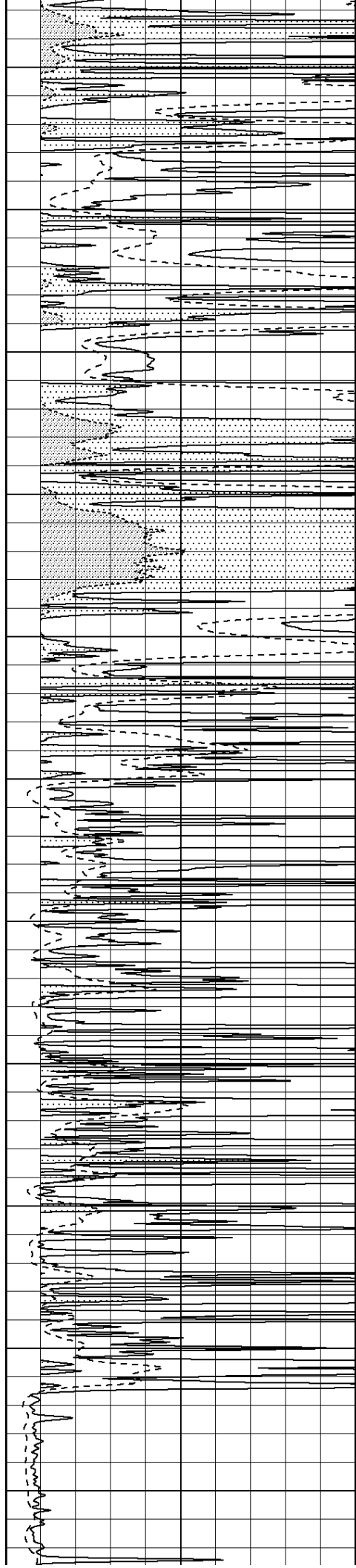
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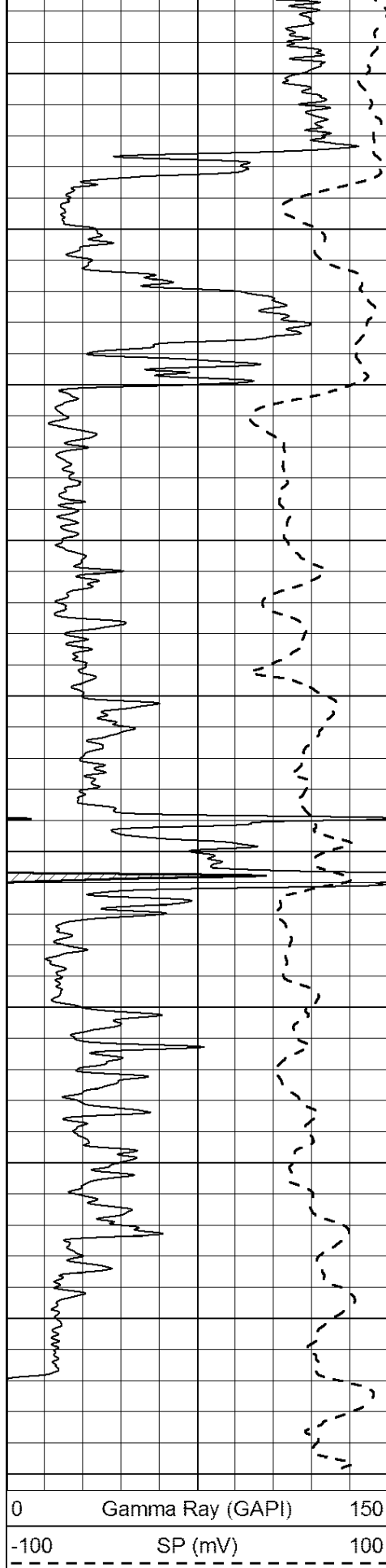
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4700

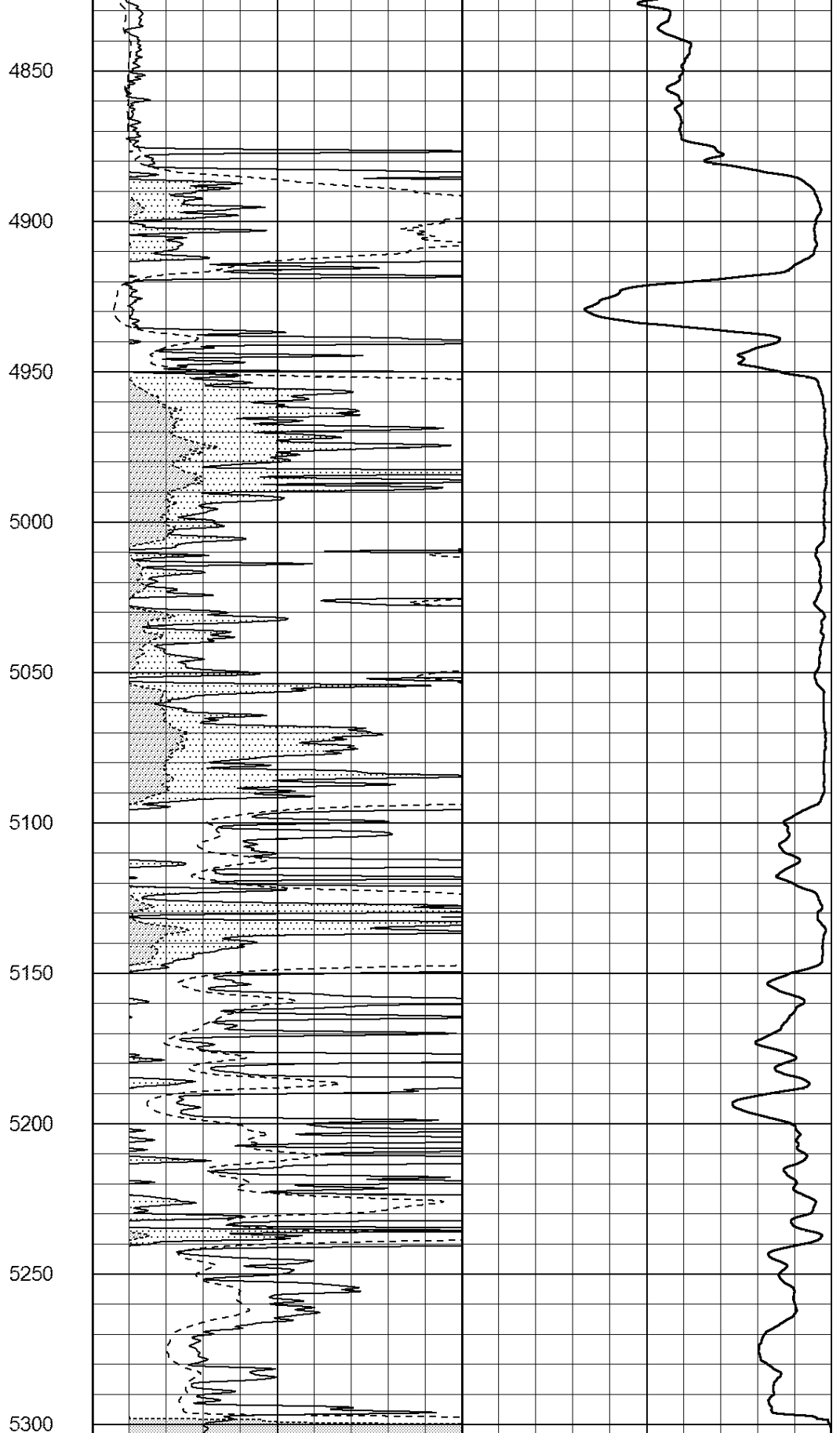
4750

4800





0      Gamma Ray (GAPI)      150  
-100      SP (mV)      100



0      RLL3 (Ohm-m)      50  
0      RILD (Ohm-m)      50  
1000      CILD (mmho/m)      0

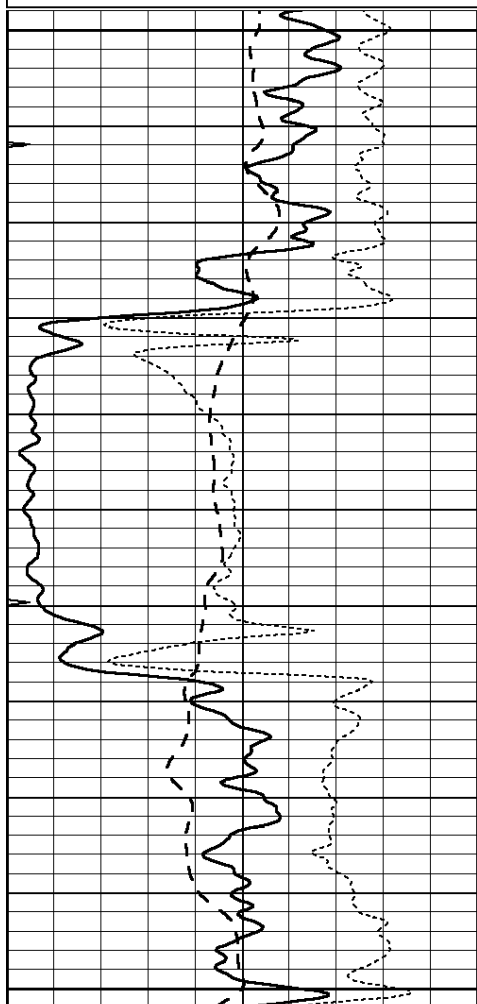
50      RILD X10 (Ohm-m)      500  
50      RLL3 X10 (Ohm-m)      500

# ANHYDRITE

Database File: 409693pe.db  
 Dataset Pathname: pass3.6  
 Presentation Format: \_dil  
 Dataset Creation: Sat Oct 13 10:26:33 2012 by Calc Open-Cased 110302  
 Charted by: Depth in Feet scaled 1:240

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

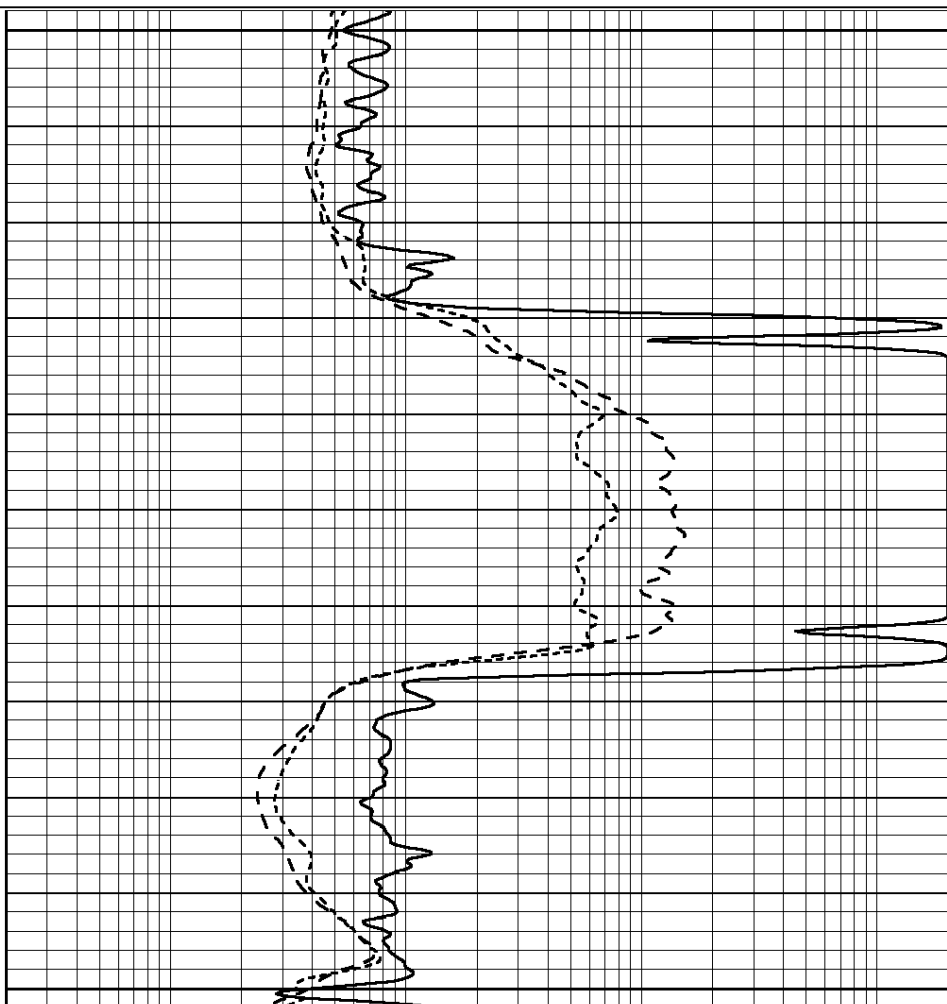
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



2600

2650

2700



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

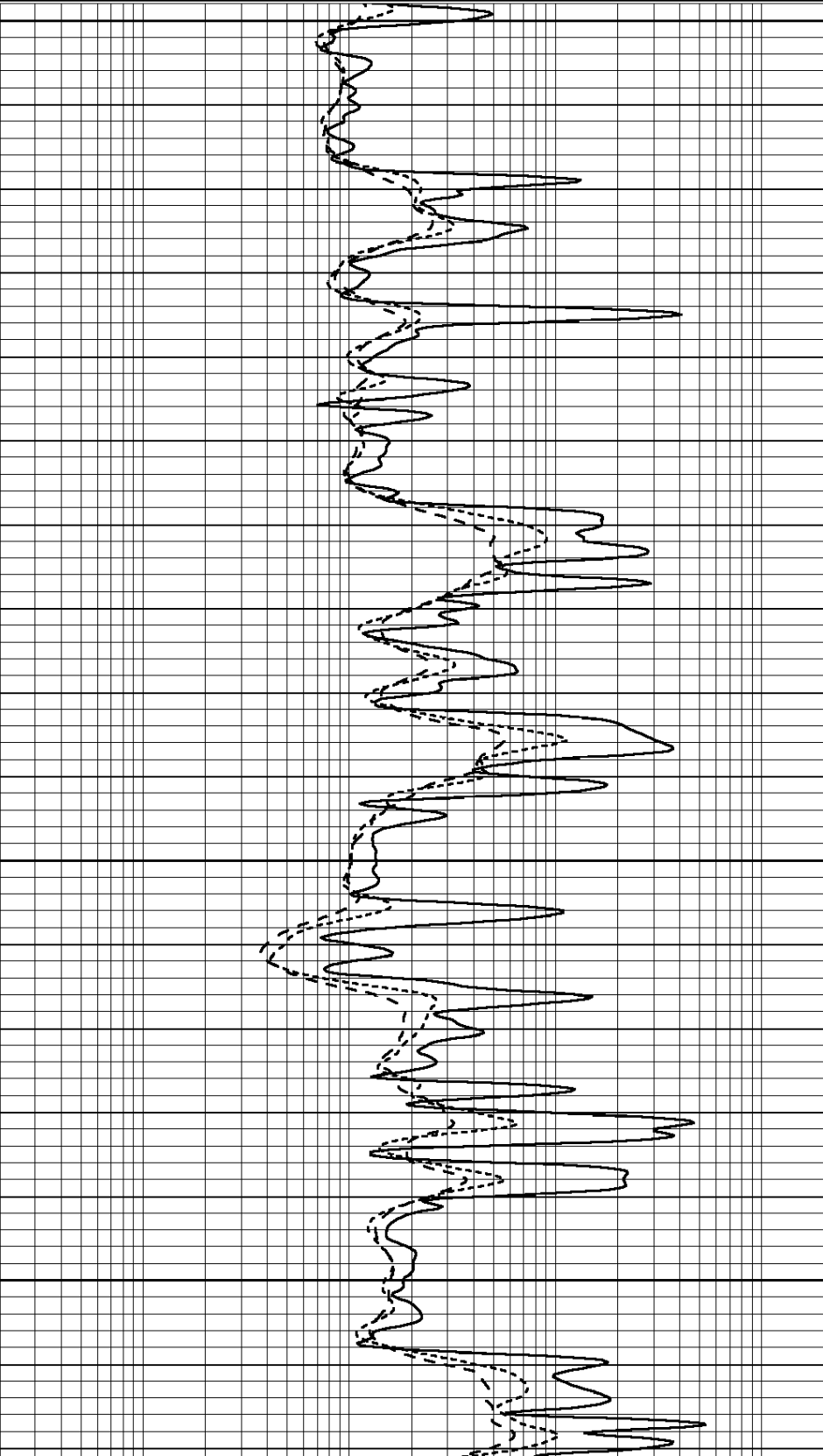
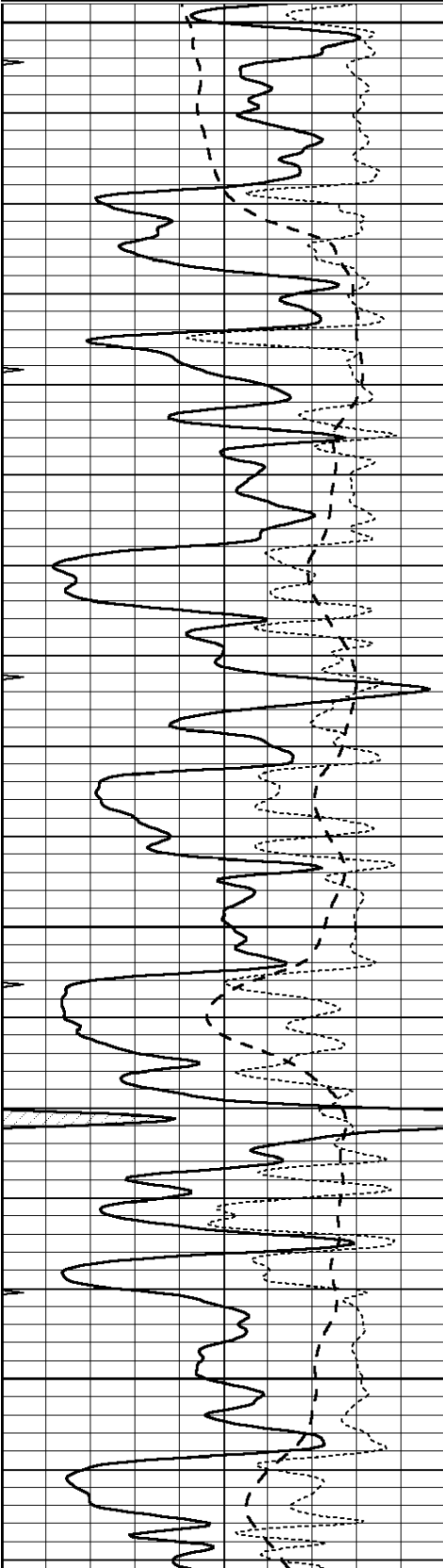
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

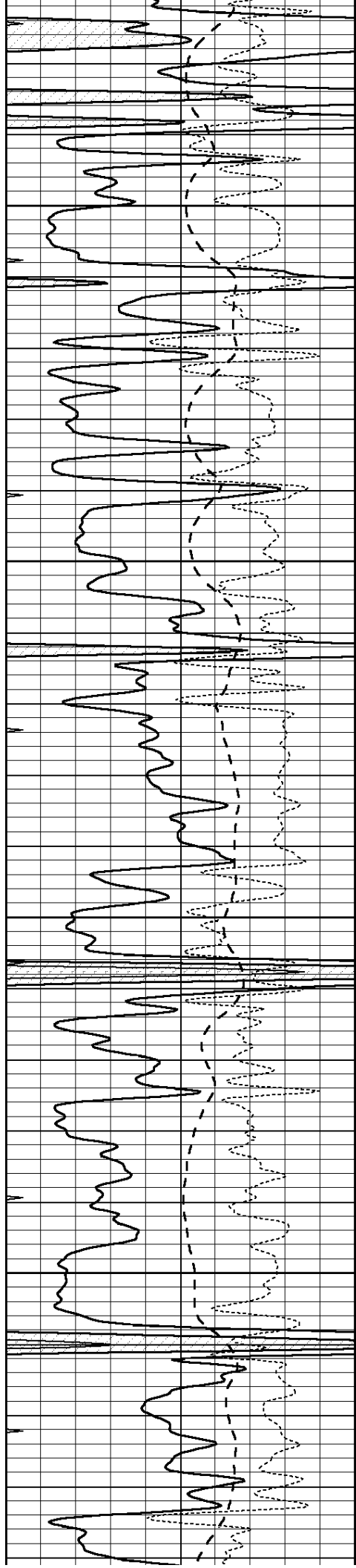
# MAIN SECTION

Database File: 409693pe.db  
Dataset Pathname: pass3.5  
Presentation Format: dil  
Dataset Creation: Sat Oct 13 10:22:42 2012 by Calc Open-Cased 110302  
Charted by: Depth in Feet scaled 1:240

0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
<hr style="border-top: 1px dashed black;"/>		
-250	Rxo/Rt	50
<hr style="border-top: 1px dotted black;"/>		
0	MINMK	20

0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
<hr style="border-top: 1px dashed black;"/>		
0.2	MEDIUM INDUCTION (Ohm-m)	2000
<hr style="border-top: 1px dotted black;"/>		



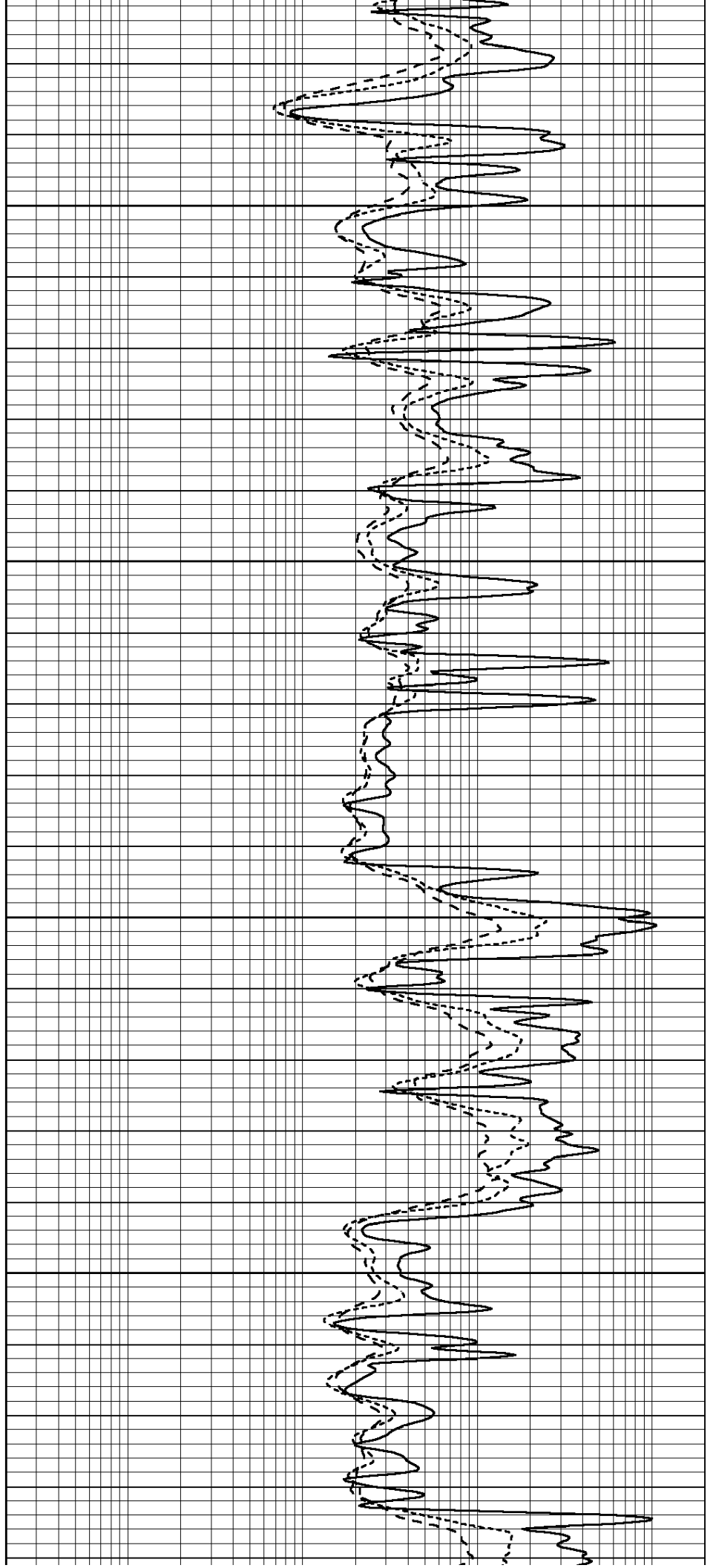


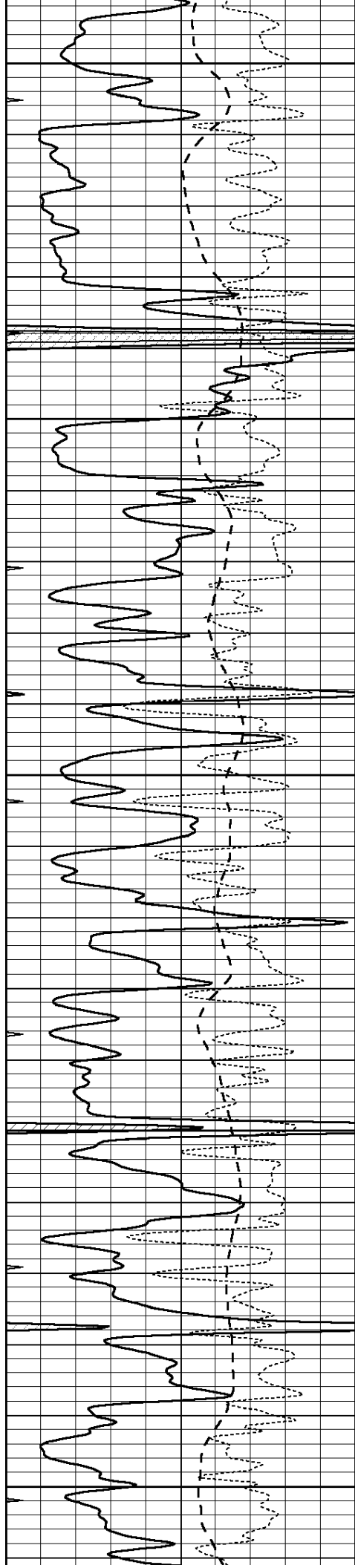
3800

3850

3900

3950





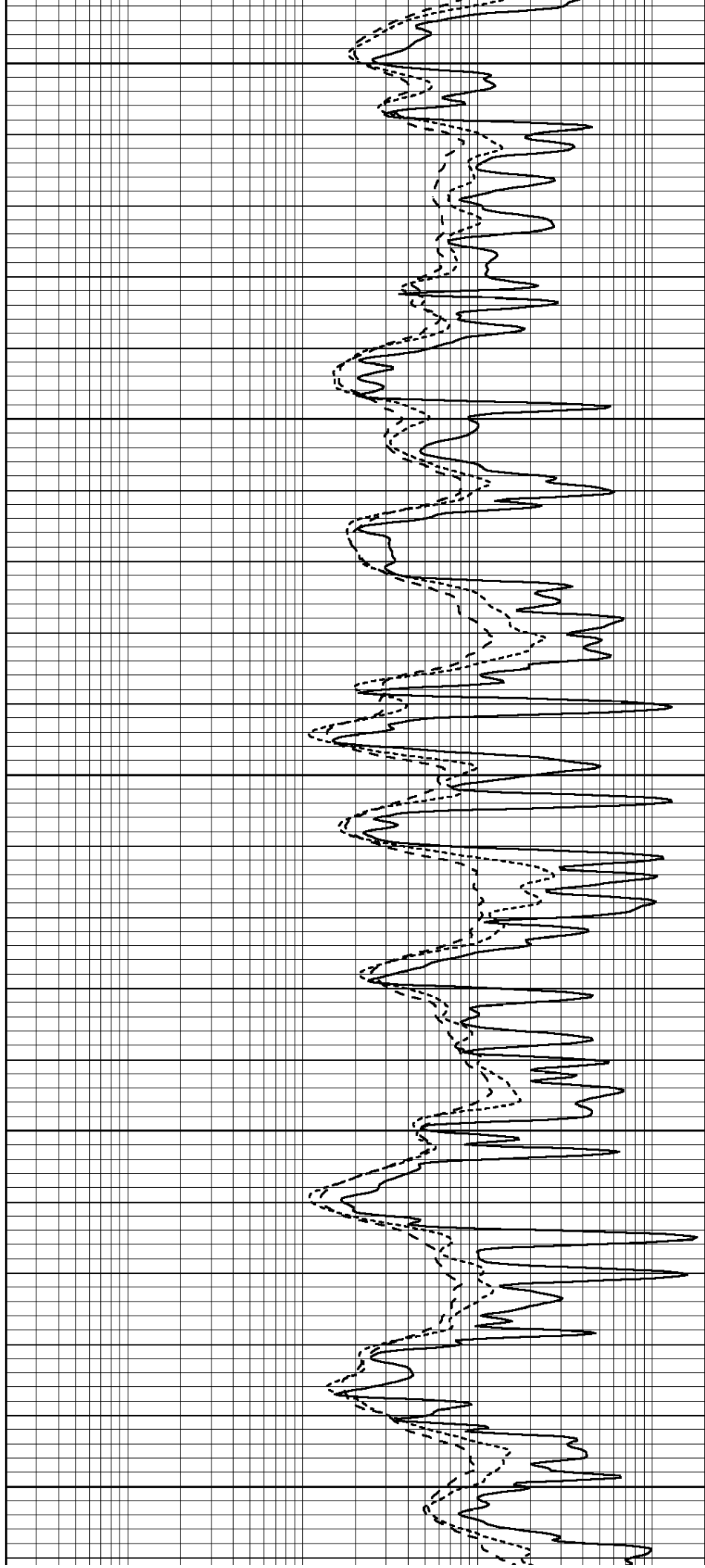
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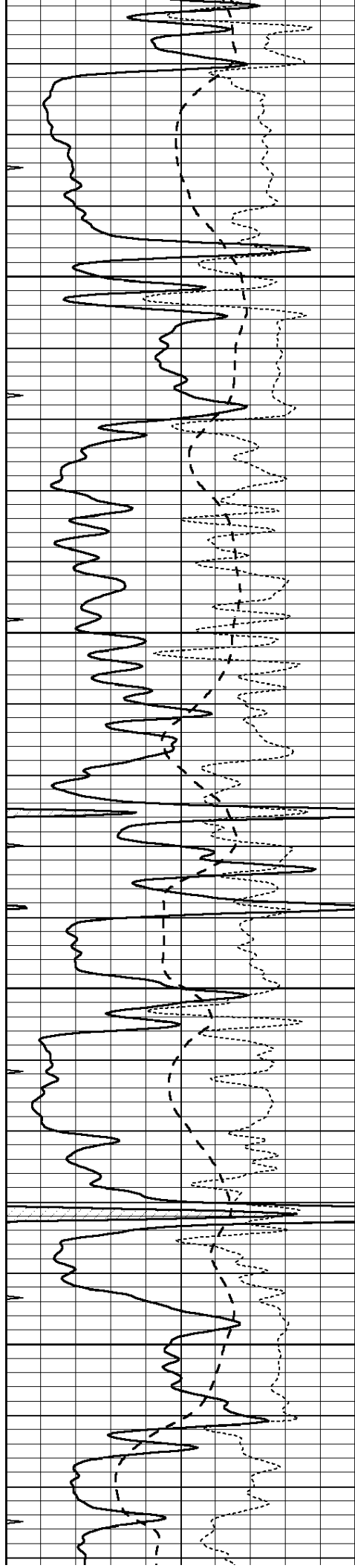
4050

4100

4150

4200



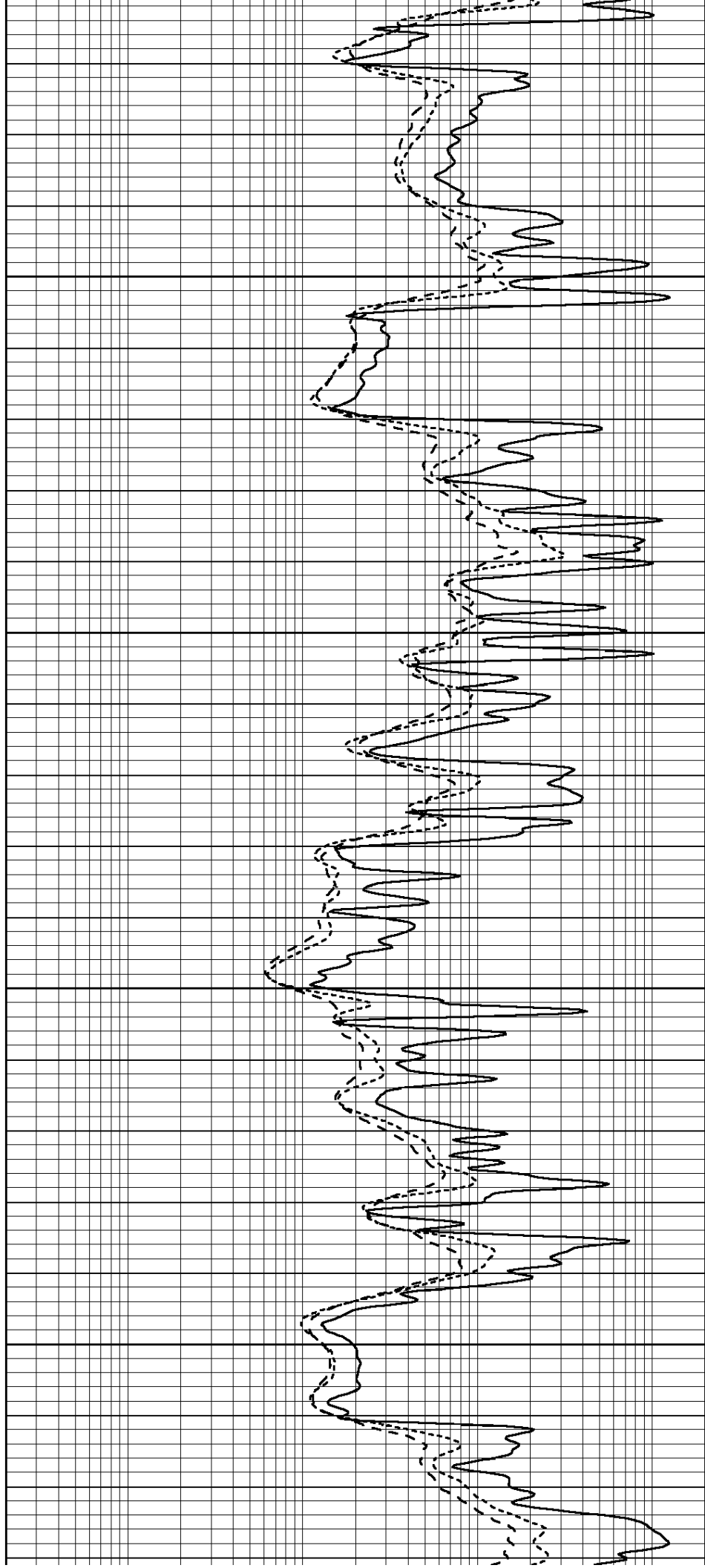


4250

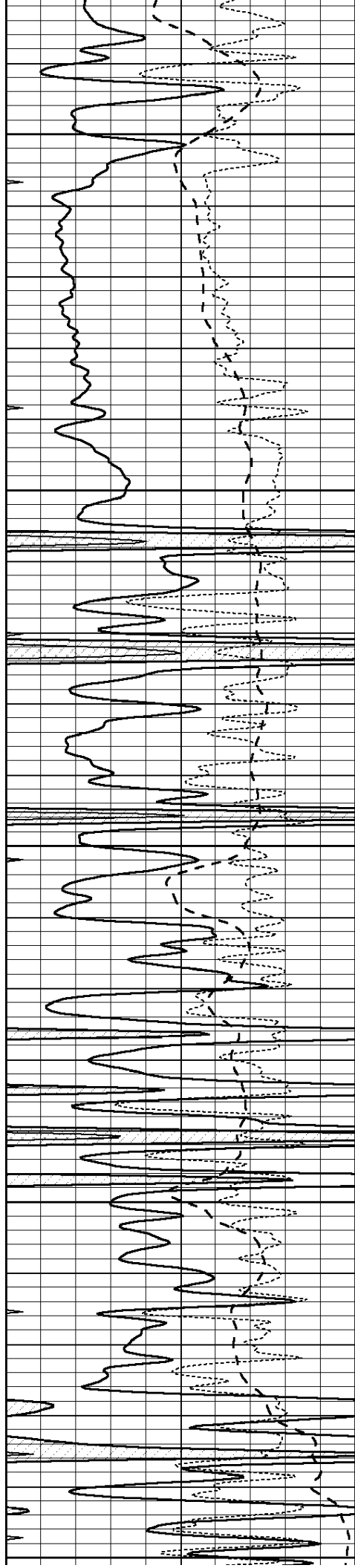
4300

4350

4400







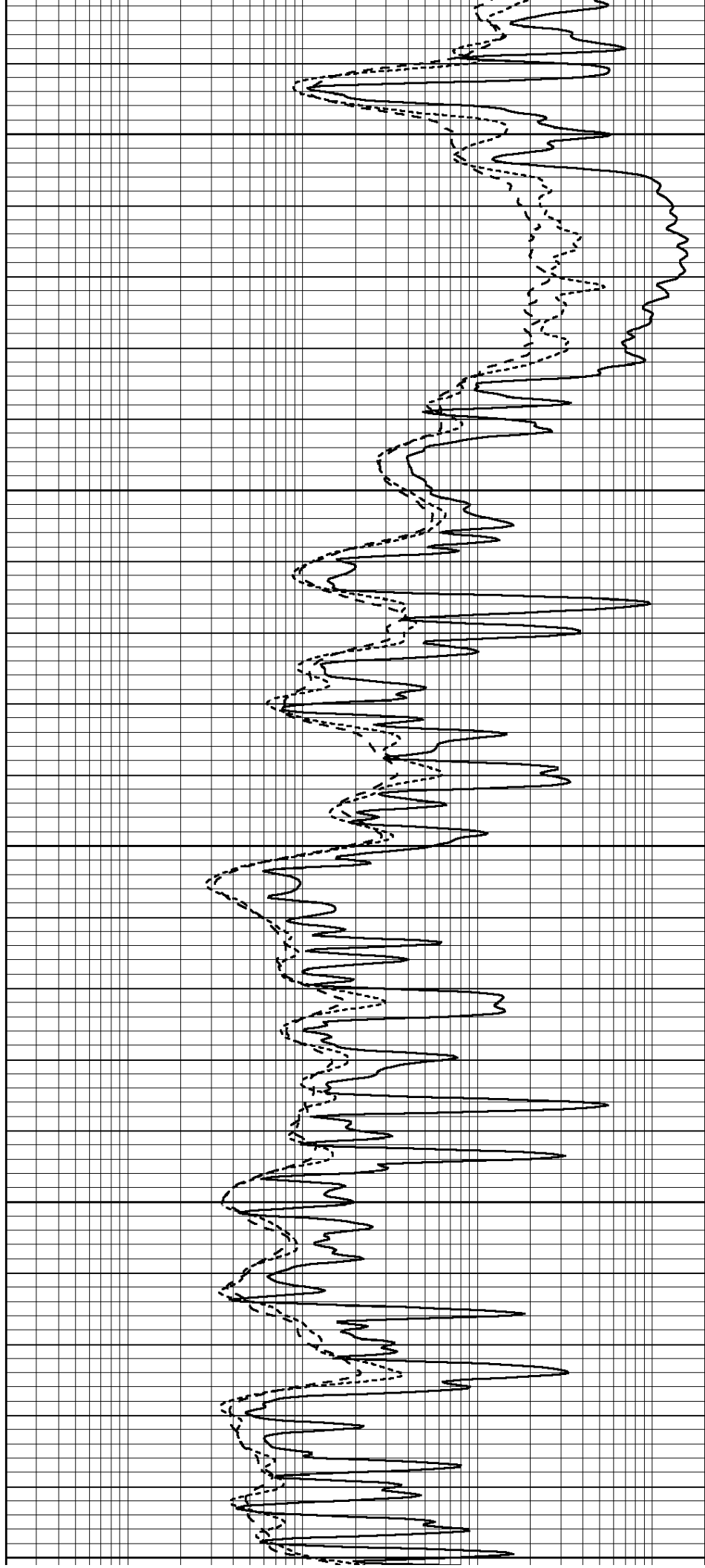
4450

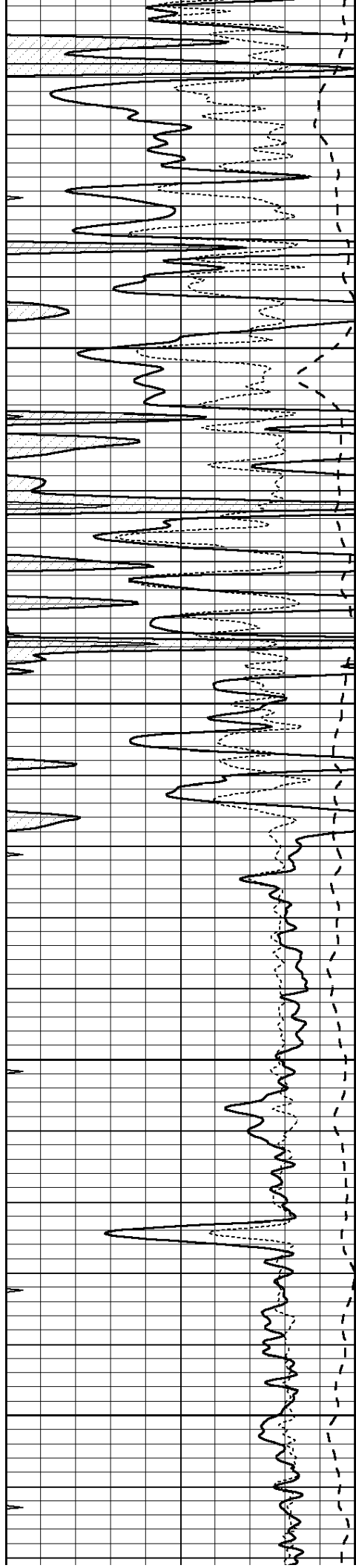
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4550

4600

4650



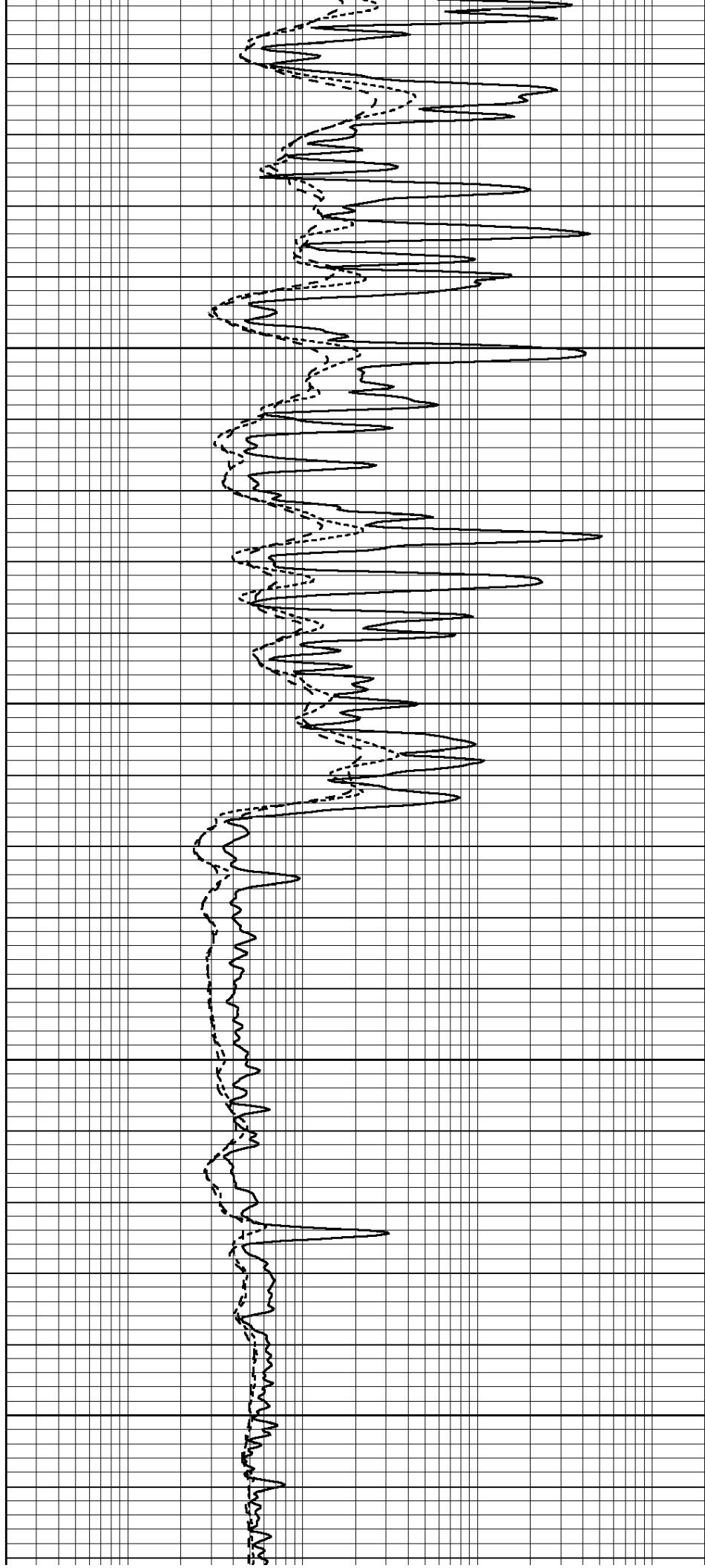


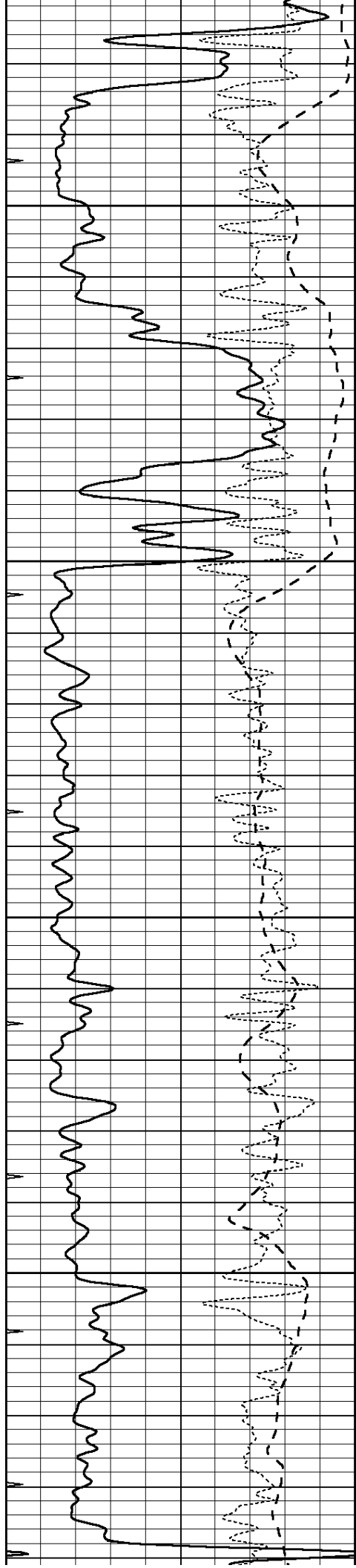
4700

4750

4800

4850



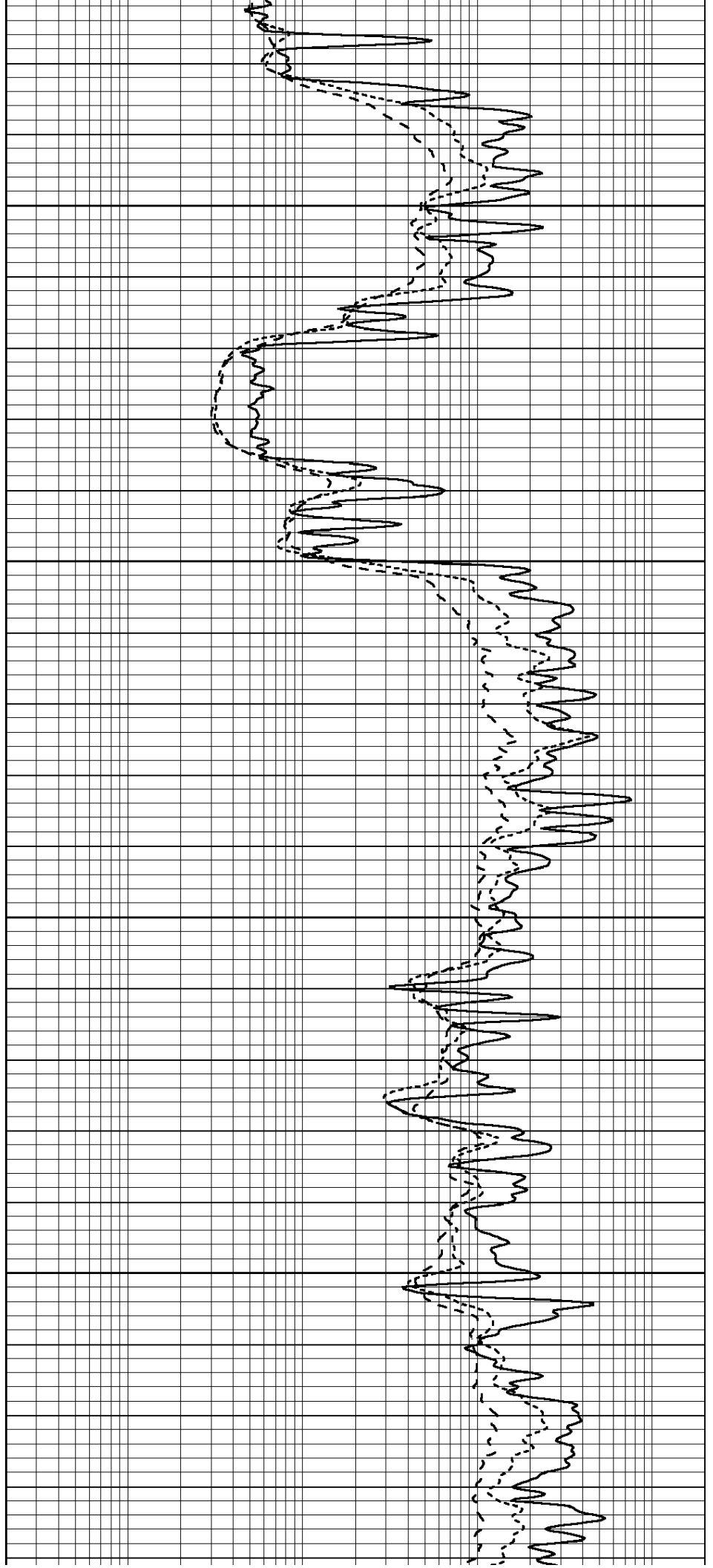


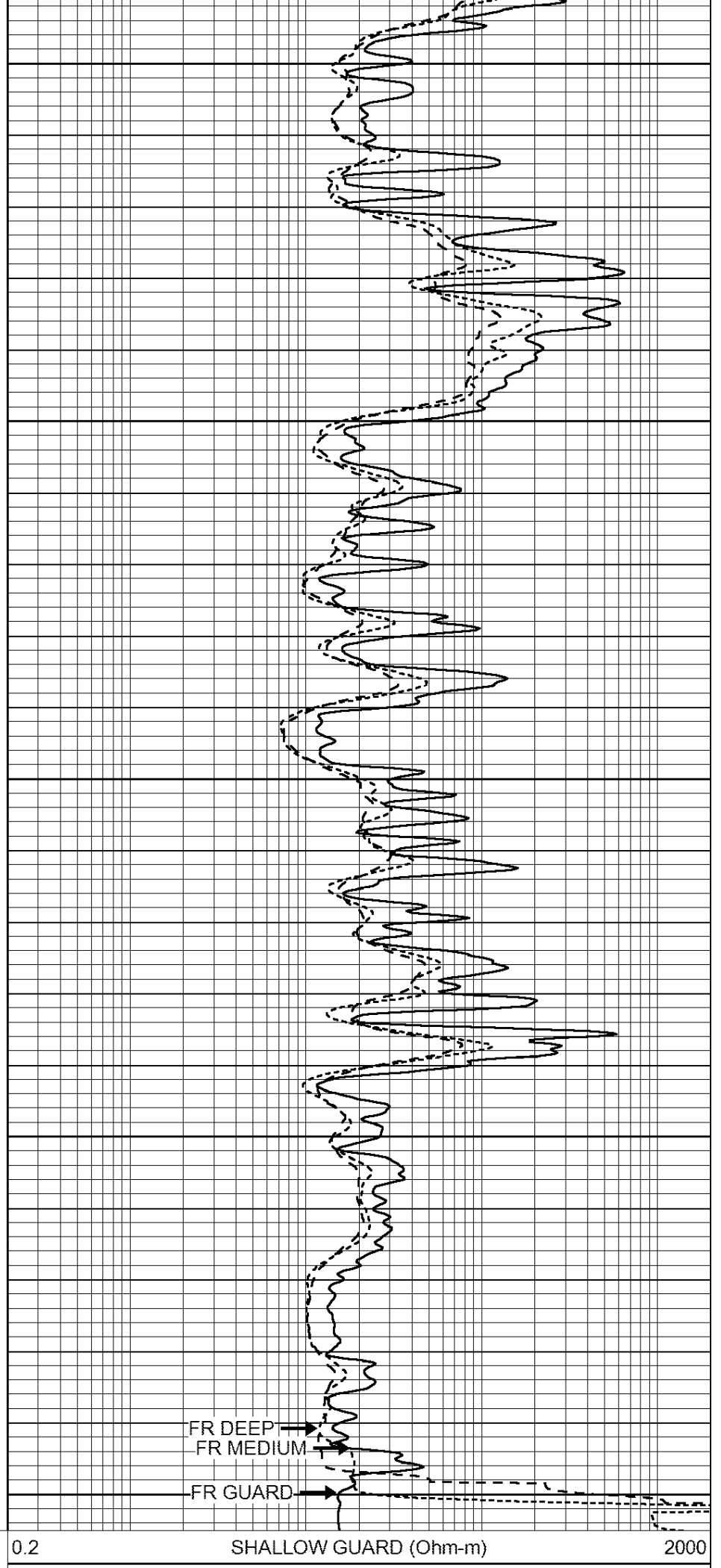
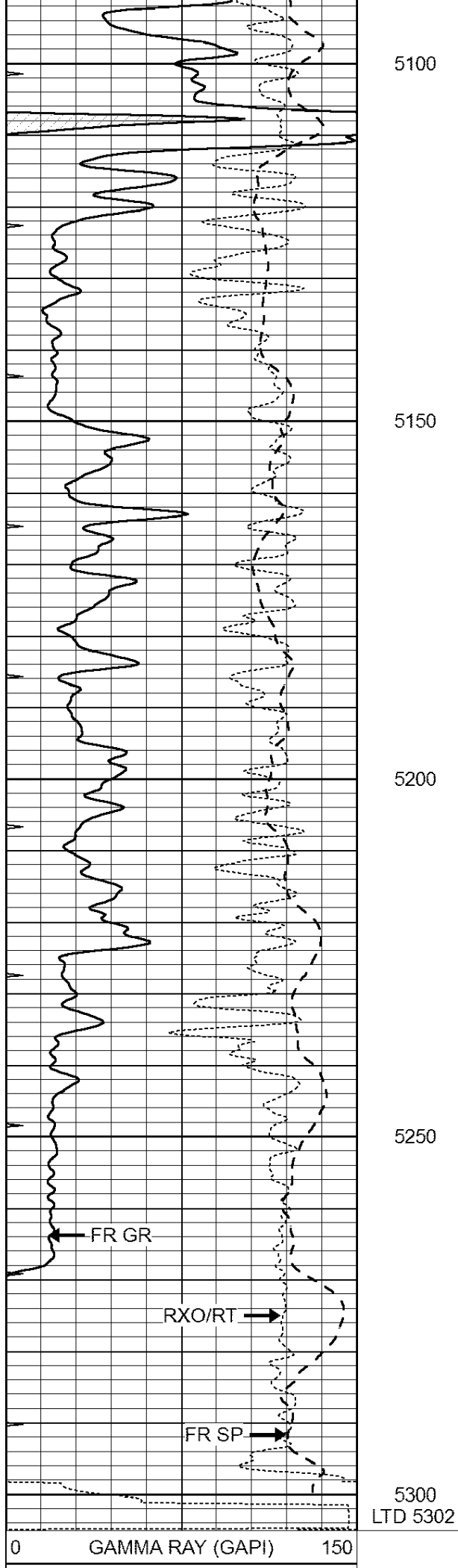
4900

4950

5000

5050





-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

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



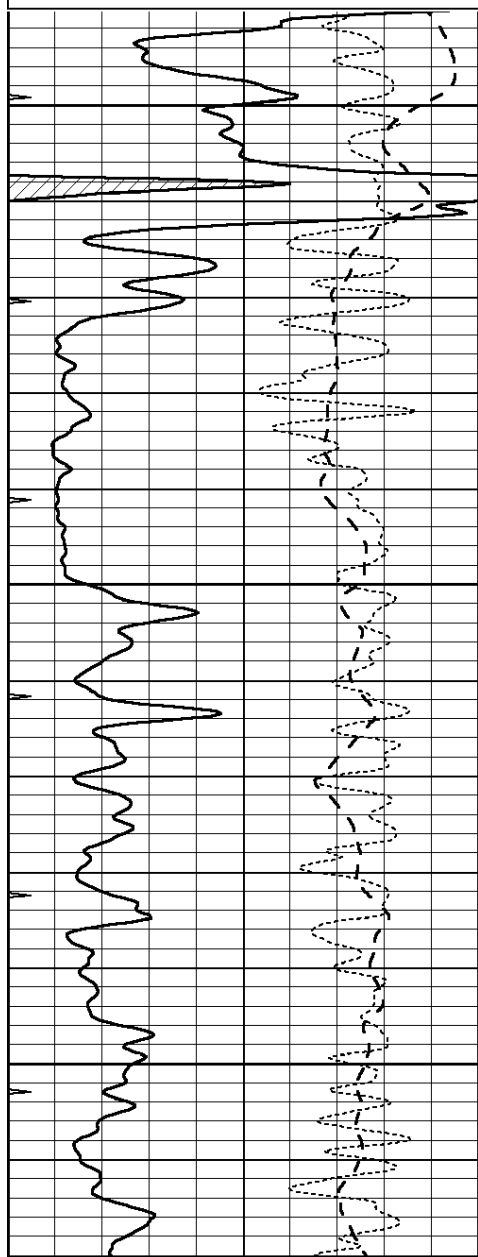
**COMPLETION  
& PRODUCTION  
SERVICES CO.**

# REPEAT SECTION

Database File: 409693pe.db  
Dataset Pathname: pass2.4  
Presentation Format: dil  
Dataset Creation: Sat Oct 13 10:29:38 2012 by Calc Open-Cased 110302  
Charted by: Depth in Feet scaled 1:240

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

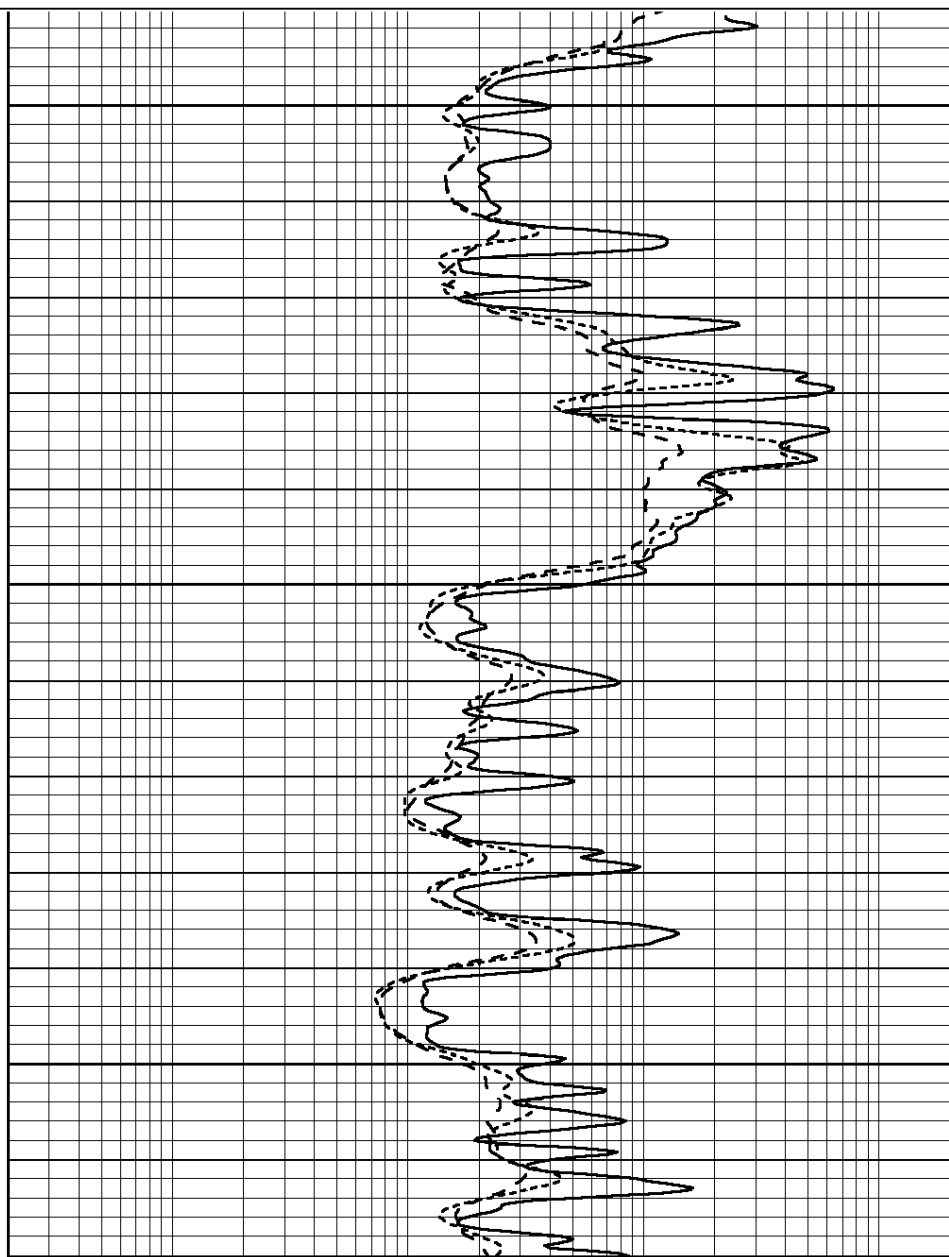
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

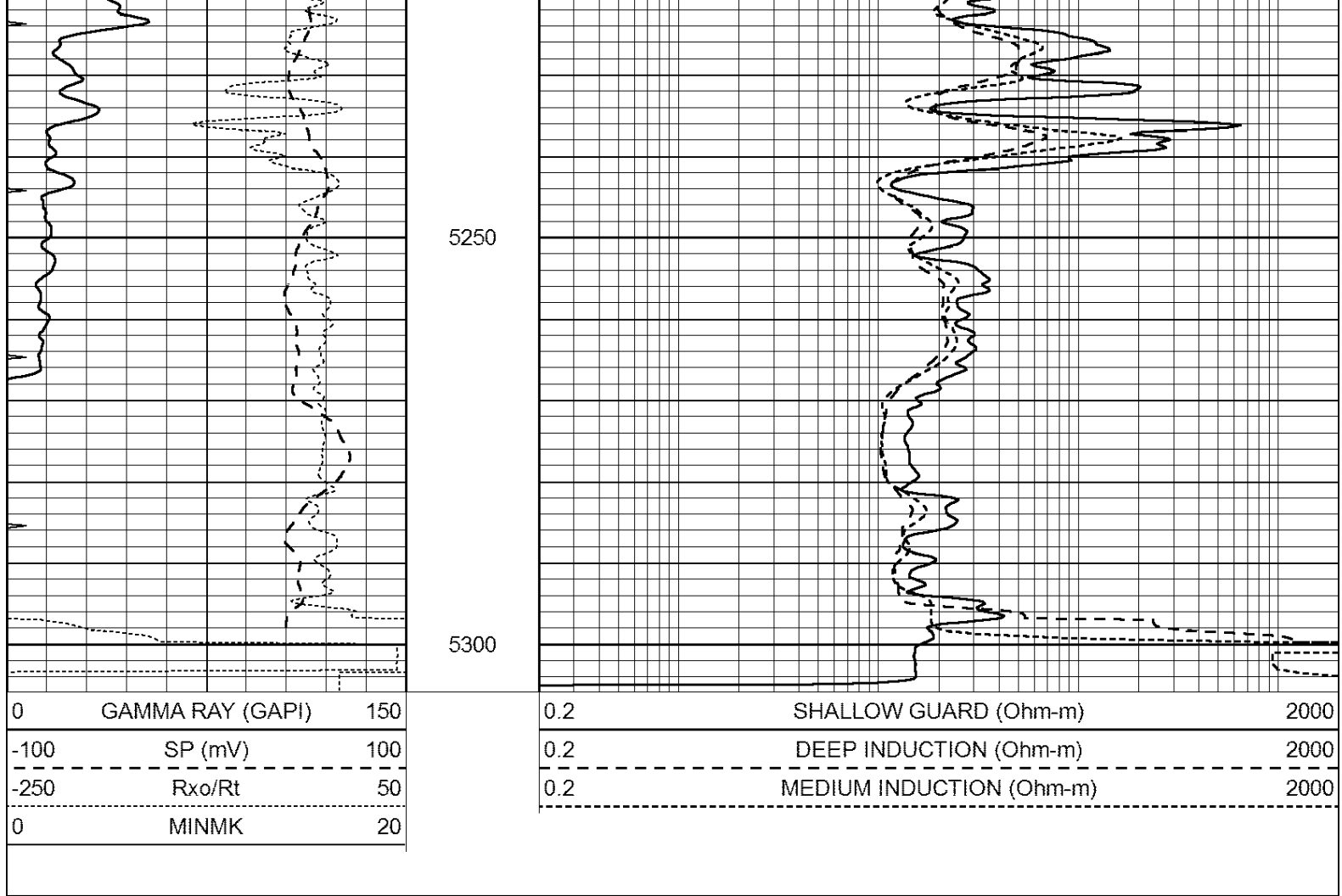


5100

5150

5200





Calibration Report								
Database File:		409693pe.db						
Dataset Pathname:		pass3.5						
Dataset Creation:		Sat Oct 13 10:22:42 2012 by Calc Open-Cased 110302						
Dual Induction Calibration Report								
Serial-Model:		DIL3-GEAR						
Performed:		Mon Oct 01 18:43:03 2012						
Readings				References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.011	0.656	V	0.000	400.000	mmho/m	640.000	15.000
Medium	0.013	0.740	V	0.000	462.500	mmho/m	700.000	-1.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.002	0.645	V	0.000	400.000	mmho/m	622.059	-1.071
Medium	0.007	0.740	V	0.000	462.500	mmho/m	631.393	-4.555

Litho Density Calibration Report					
Serial: 006		Model: PRB			
Performed Sun Aug 15 09:48:41 2010					
Litho Density Calibration					
	Background	Magnesium	Aluminum	Sandstone	
Window 1	1686.6	11612.8	3932.0	12718.8	cps
Window 2	1531.4	9204.7	3267.8	9851.9	cps
Window 3	1408.2	4722.6	1052.5	4020.6	cps

Window 3	1196.3	4733.6	1932.3	4920.6	cps
Window 4	317.3	321.2	325.9	303.6	cps
Long Space	0.0	7673.3	1736.4	8320.4	cps
Short Space	1.7	2548.5	1657.2	2628.8	cps
Rho		1.7100	2.5900	1.3800	g/cc
Pe			2.5700	1.5500	
Rib Angle	: 43.8	Rib Slope	: 0.961	Density/Spine Ratio	: 0.569
Spine Angle	: 73.8	Spine Slope	: 3.453	Spine Intercept	: -18.1
Caliper					
	Readings	Reference			
Low Ref	3.5	6.6			
High Ref	5.5	15.0			
	Gain: 4.4		Offset: -8.8		
Compensated Neutron Calibration Report					
		Serial Number:	070808		
		Tool Model:	Probe		
PRE-SURVEY VERIFICATION					
Detector	Readings	Measured	Target		
Short Space	cps				
Long Space	cps	pu	pu		
POST-SURVEY VERIFICATION					
Detector	Readings	Measured	Target		
Short Space	cps				
Long Space	cps	pu	pu		
Gamma Ray Calibration Report					
Serial Number:	070559				
Tool Model:	OPEN_GR				
Performed:	Wed Sep 19 15:58:00 2012				
Calibrator Value:	1.0	GAPI			
Background Reading:	0.0	cps			
Calibrator Reading:	1.0	cps			
Sensitivity:	0.3000	GAPI/cps			