



**NABORS**

**COMPLETION  
& PRODUCTION  
SERVICES CO.**

**DUAL INDUCTION  
LOG**

Company	MULL DRILLING COMPANY, INC.	Company	MULL DRILLING COMPANY, INC.
Well	APC - DOUG #1-25	Well	APC - DOUG #1-25
Field	LOMA	Field	LOMA
County	CHEYENNE	County	CHEYENNE
State	COLORADO	State	COLORADO
Location:	API # : 05-017-07732-0000 825' FSL & 1620' FEL SW/4 - SE/4	Permanent Datum Log Measured From Drilling Measured From	GROUND LEVEL KELLY BUSHING 11' A.G.L. KELLY BUSHING
	SEC 25 TWP 16S RGE 45W		Elevation K.B. 4306 D.F. 4304 G.L. 4295
Date	12/10/12	Run Number	ONE
Depth Driller	5560	Depth Logger	5565
Bottom Logged Interval	5563	Top Log Interval	00
Casing Driller	8 5/8"@323'	Casing Logger	326
Bit Size	7 7/8"	Type Fluid in Hole	CHEMICAL MUD
Density / Viscosity	9.2/57	pH / Fluid Loss	9.5/8.8
Source of Sample	FLOWLINE	Rim @ Meas. Temp	.950@84F
Rmf @ Meas. Temp	.713@84F	Rmc @ Meas. Temp	1.14@84F
Source of Rmf / Rmc	MEASUREMENT	Rim @ BHT	.614@130F
Time Circulation Stopped	3 HOURS	Time Logger on Bottom	12:30 P.M.
Maximum Recorded Temperature	130F	Equipment Number	4854
Location	HAYS, KANSAS	Recorded By	JEFF LUEBBERS
Witnessed By	PHIL ASKEY		

<<< Fold Here >>>

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, KANSAS (785) 628-6395  
DIRECTIONS

CHEYENNE WELLS, CO., 12 1/2S. ON HWY 385 TO "RD. C", 5 1/2W. TO RADIO TOWER, 1S., 1E. INTO



**COMPLETION  
& PRODUCTION**

**MAIN SECTION**

Database File:

010031pe.db

Dataset Pathname:

pass3.10

Presentation Format:

dil2

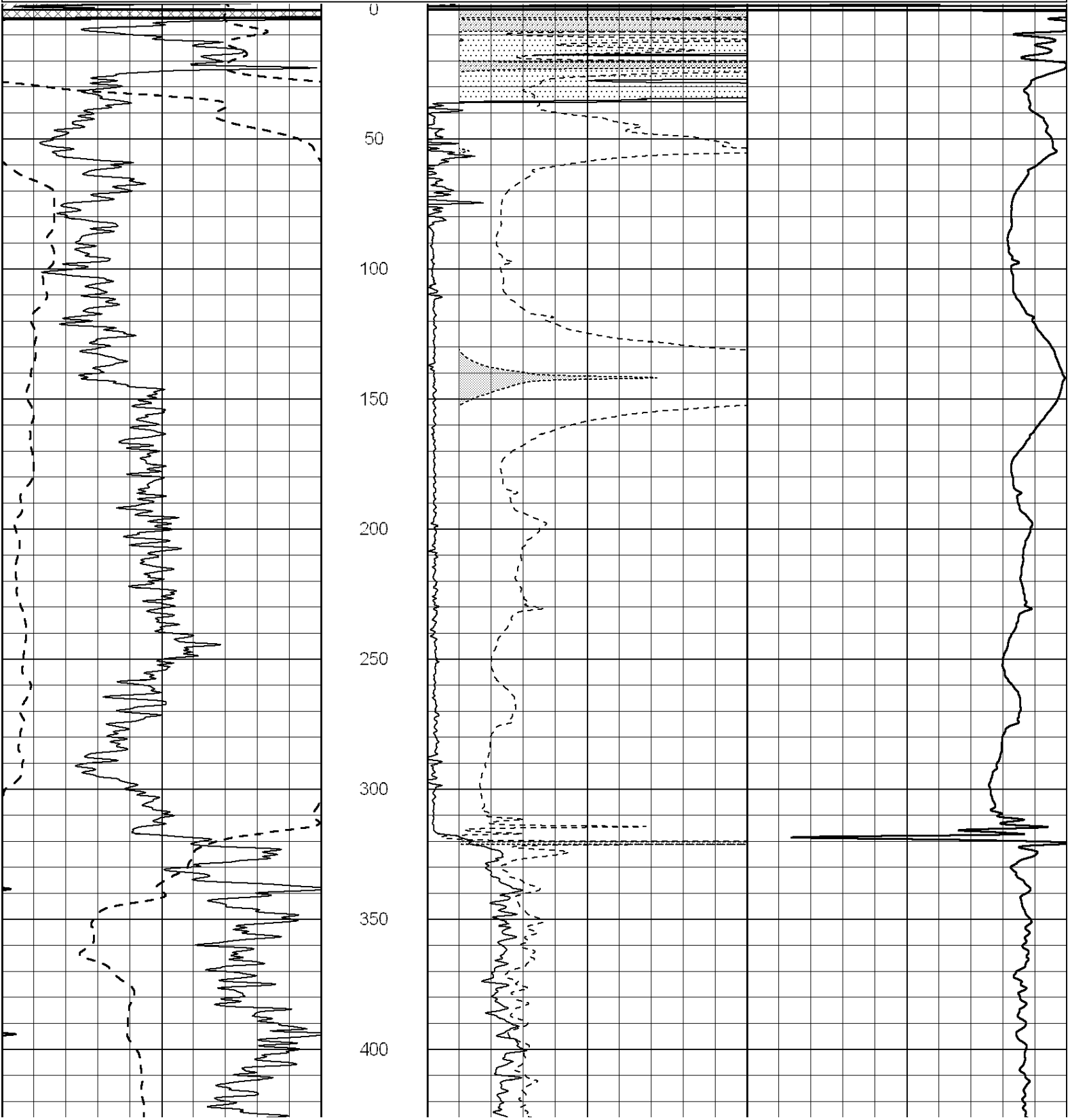
Dataset Creation:

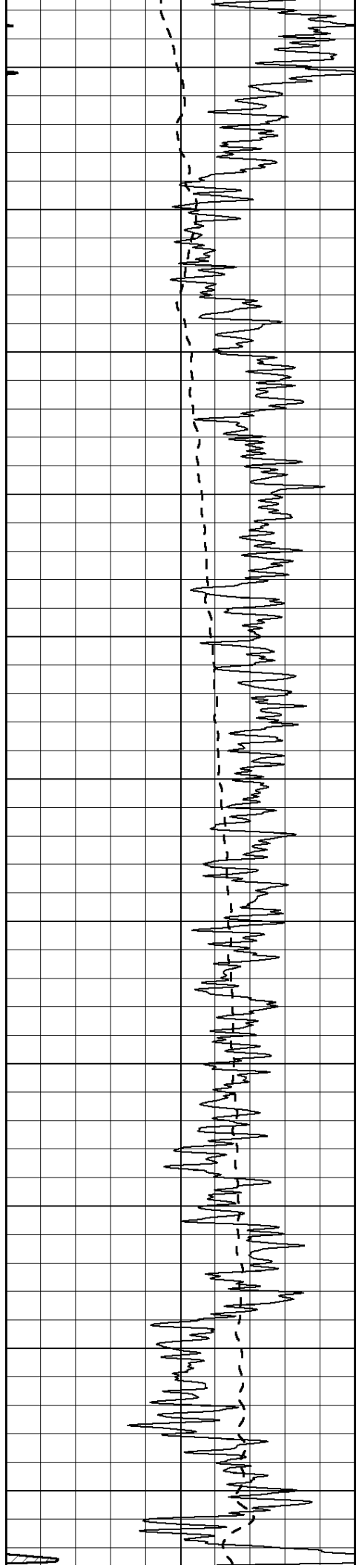
Mon Dec 10 14:20:06 2012

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

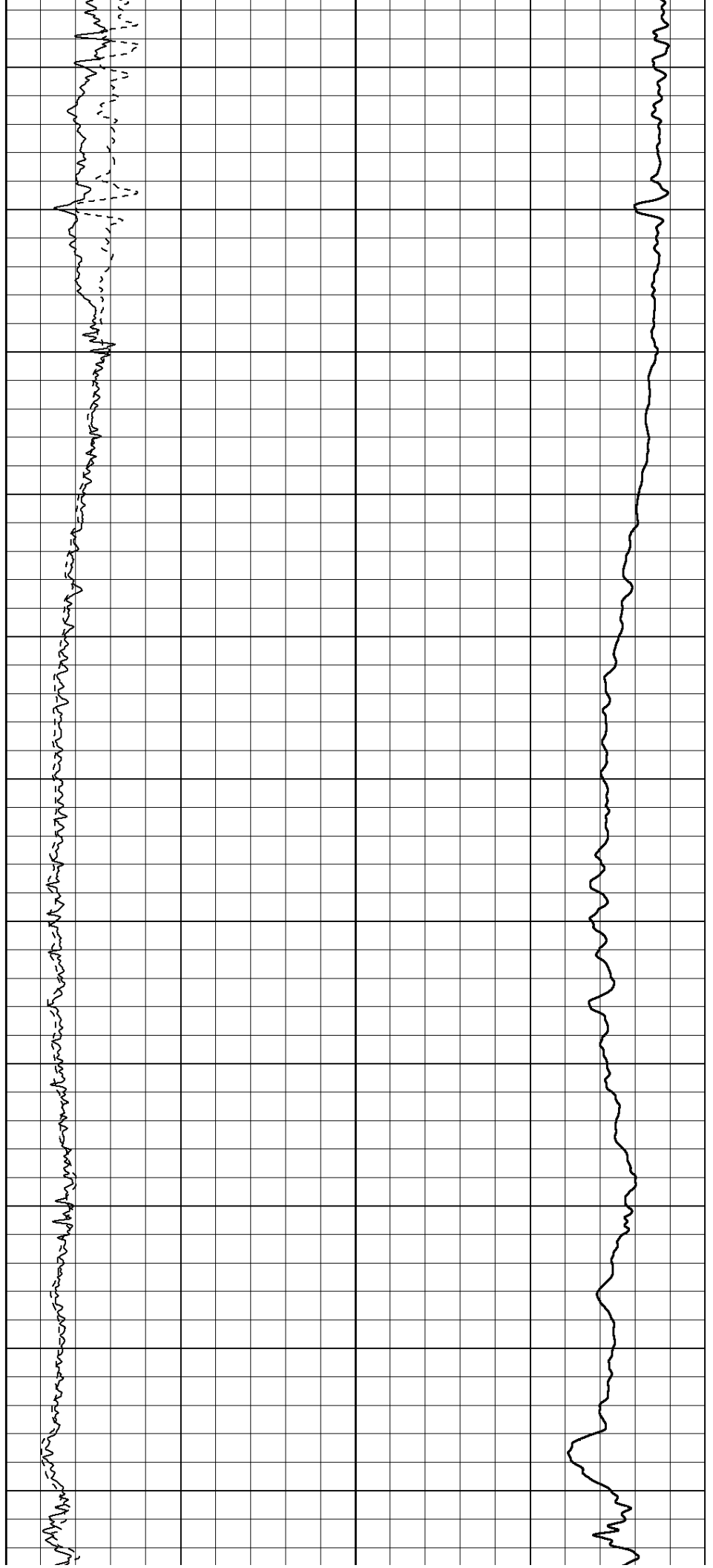
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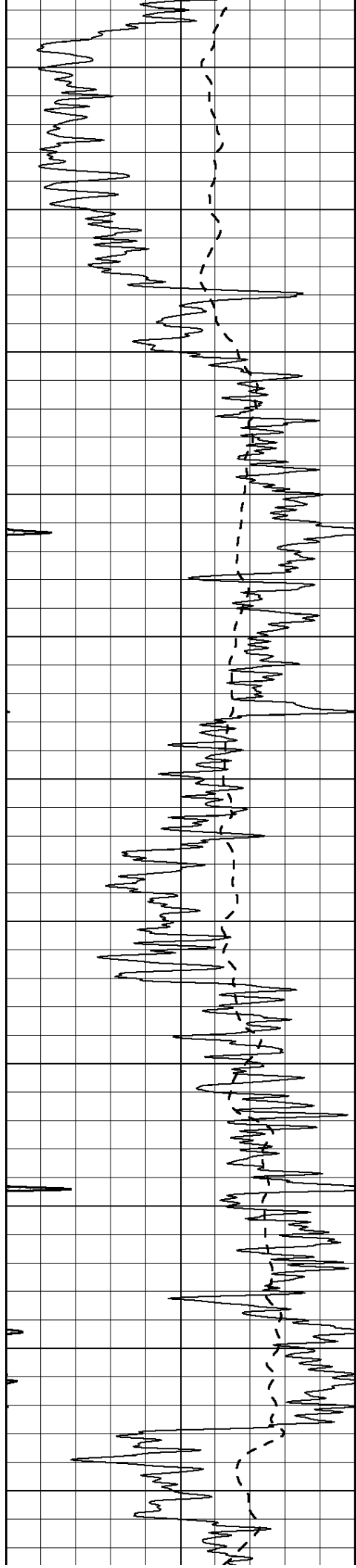
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850

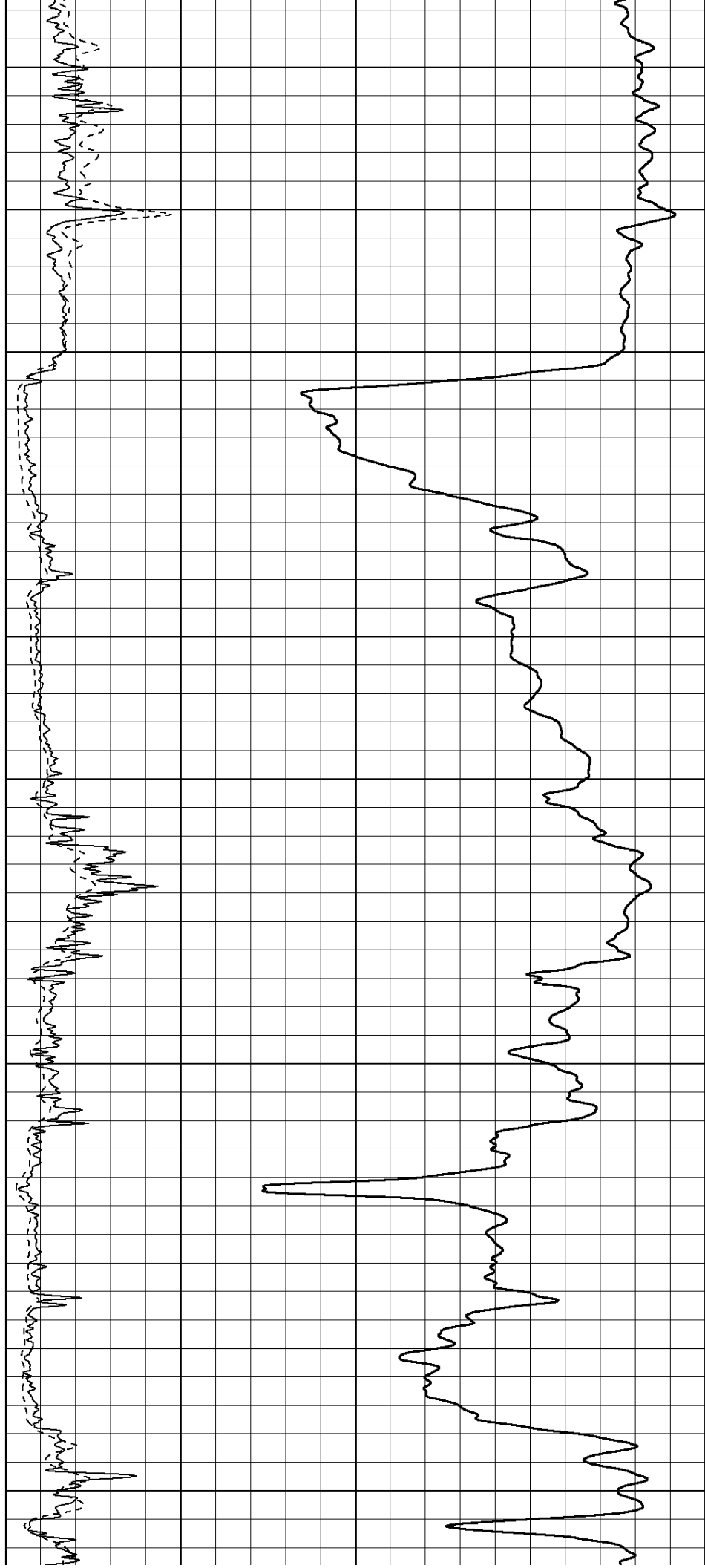
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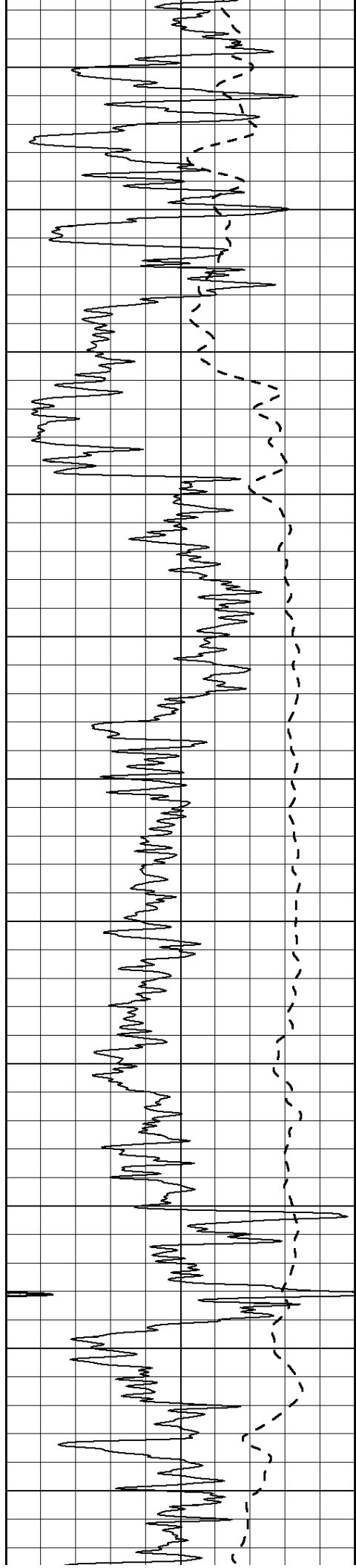
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1000  
1050  
1100  
1150  
1200  
1250  
1300  
1350  
1400  
1450  
1500





1550

1600

1650

1700

1750

1800

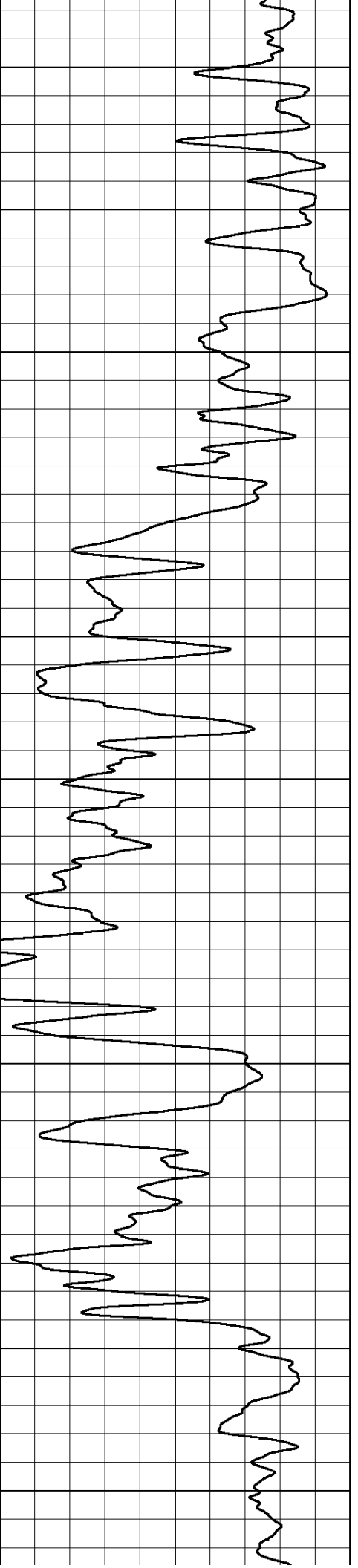
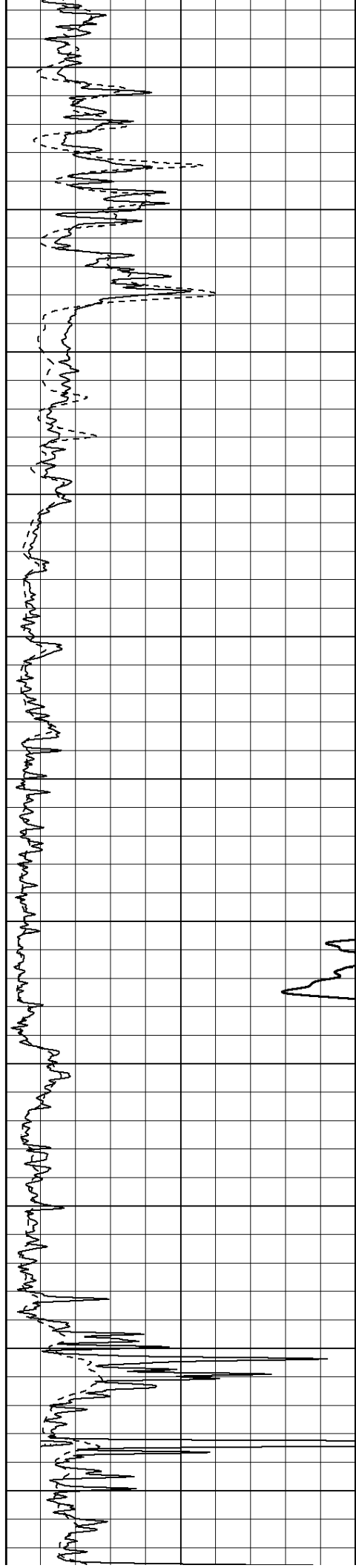
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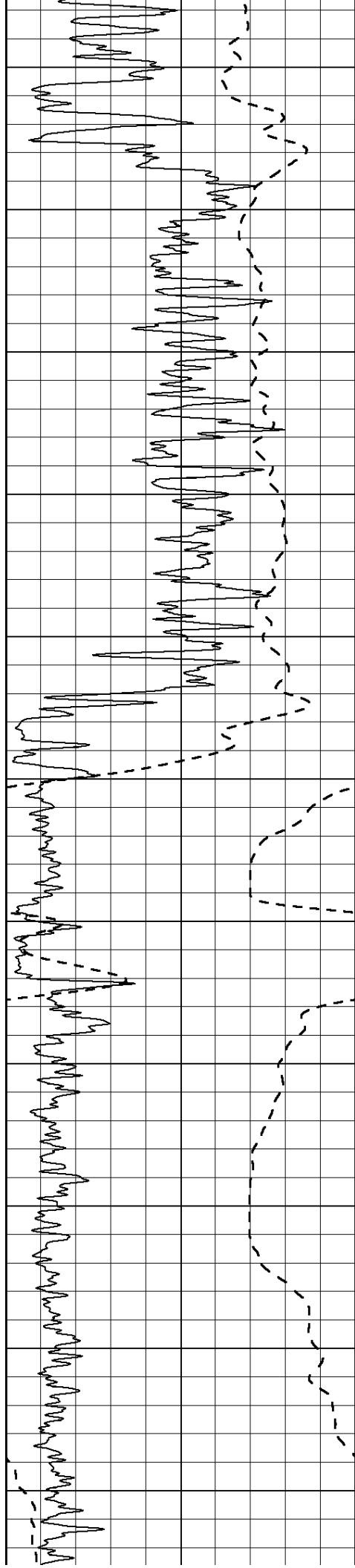
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1950

2000

2050





2100

2150

2200

2250

2300

2350

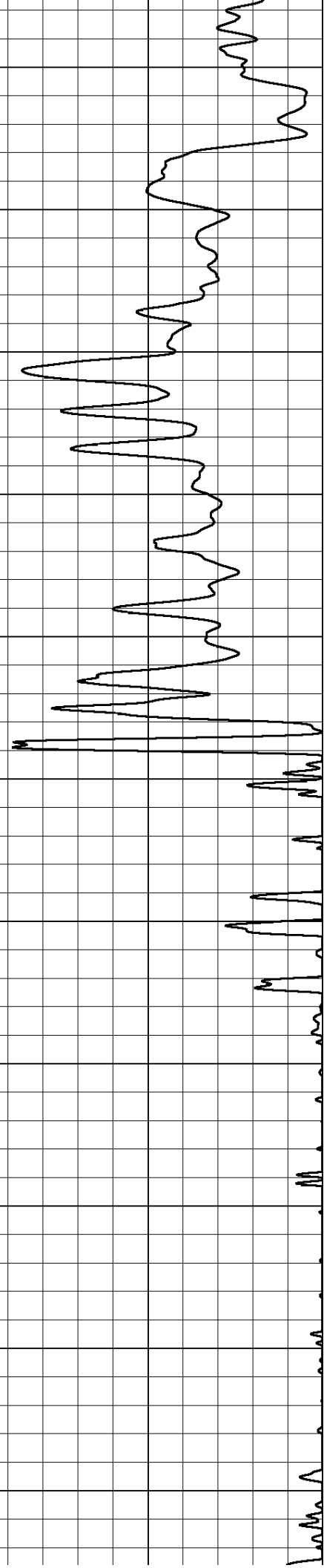
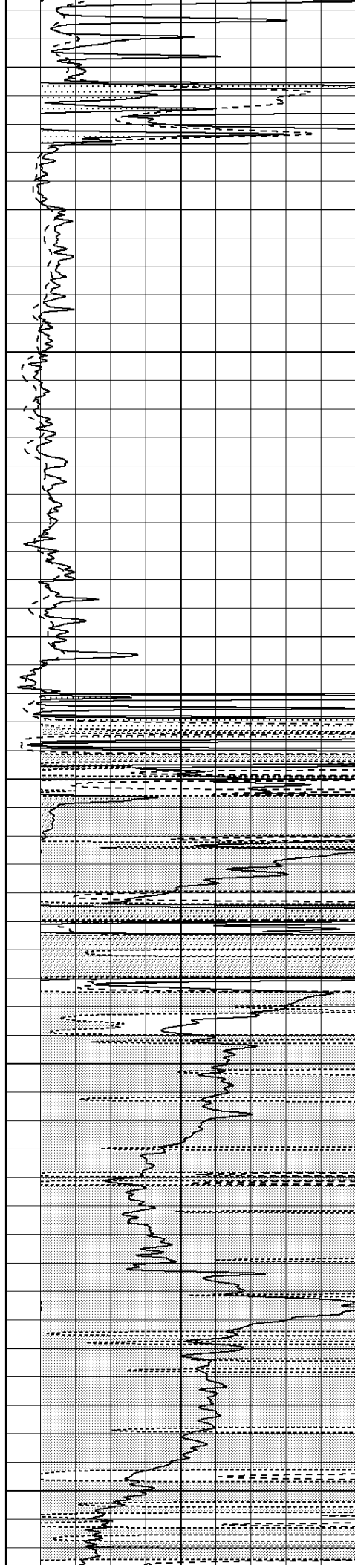
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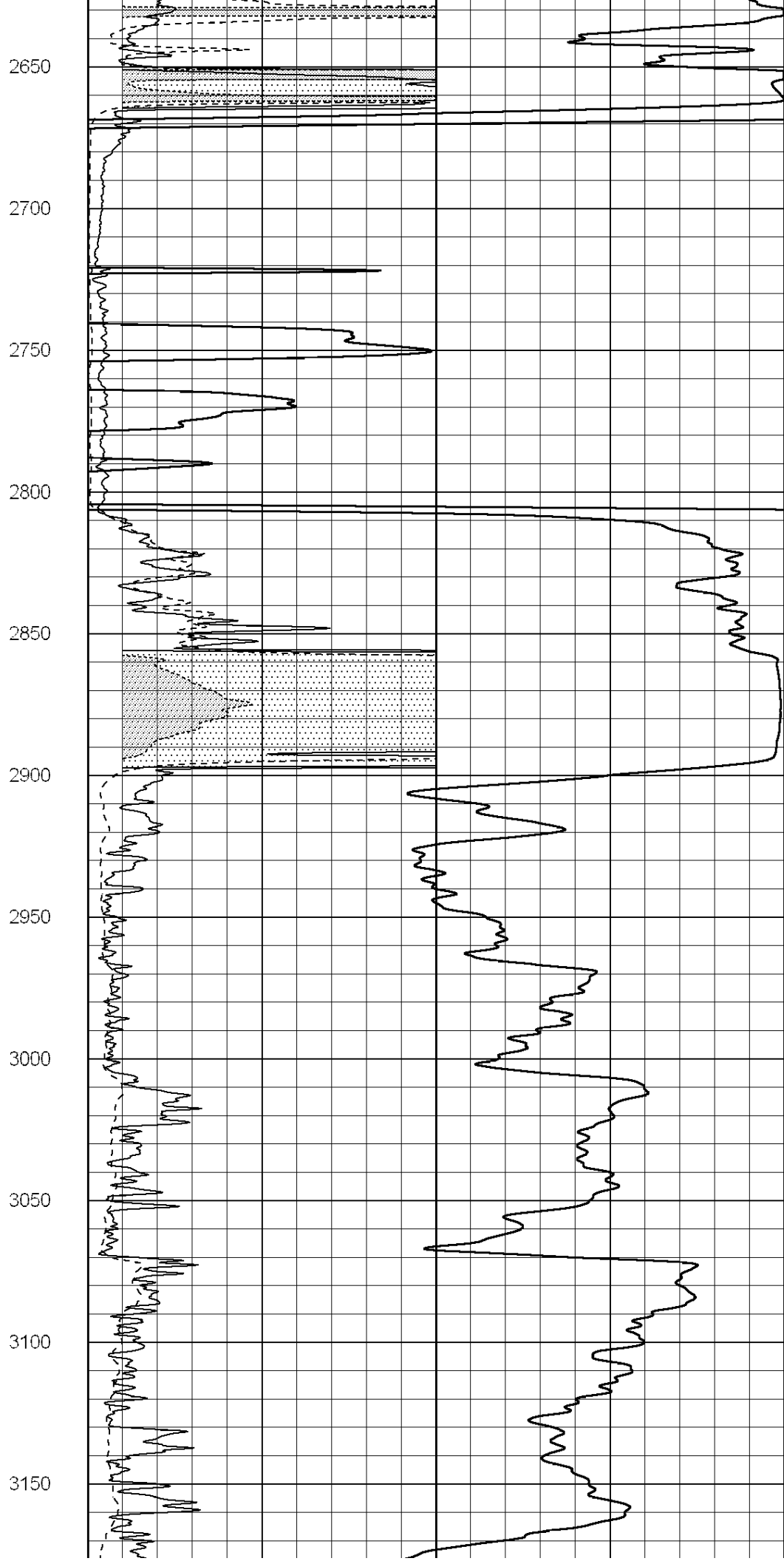
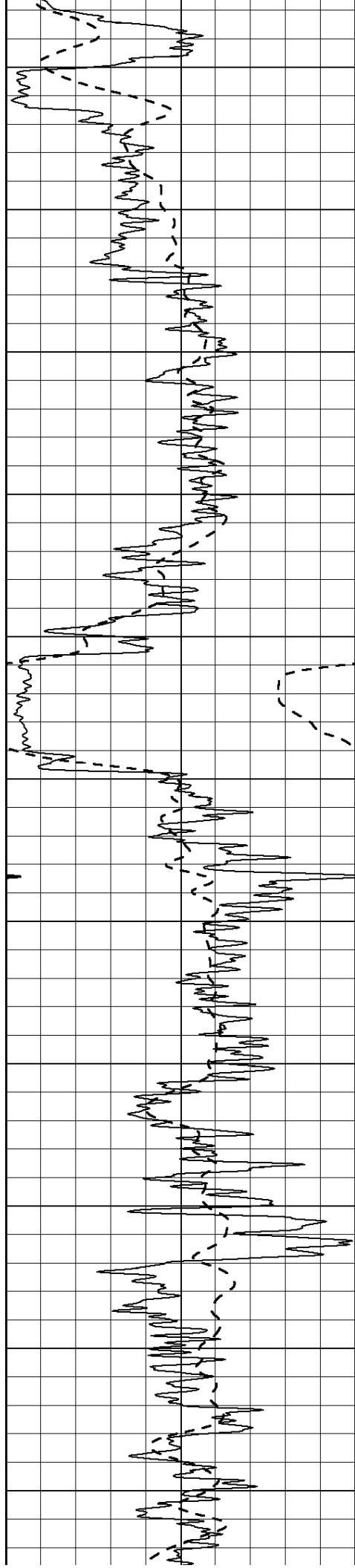
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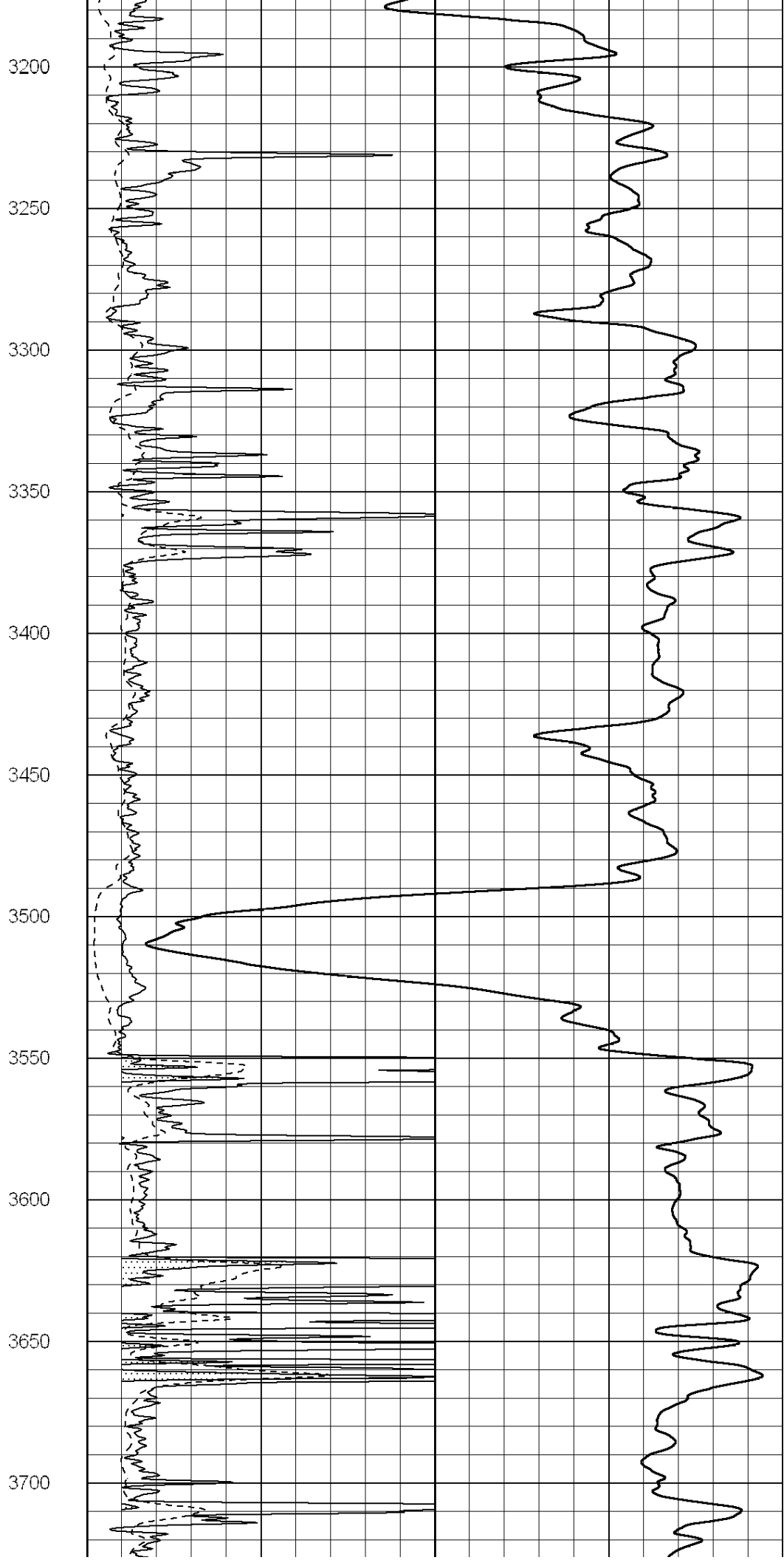
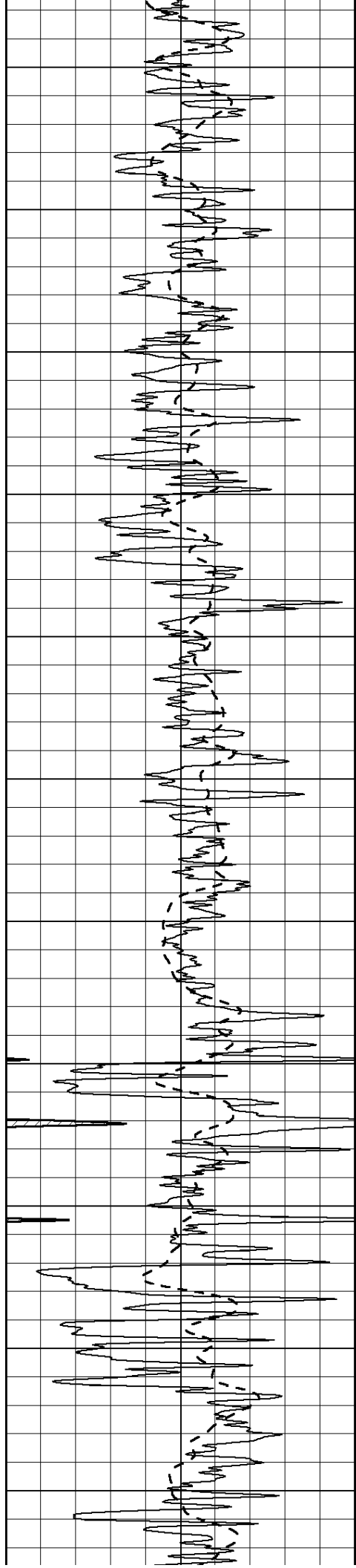
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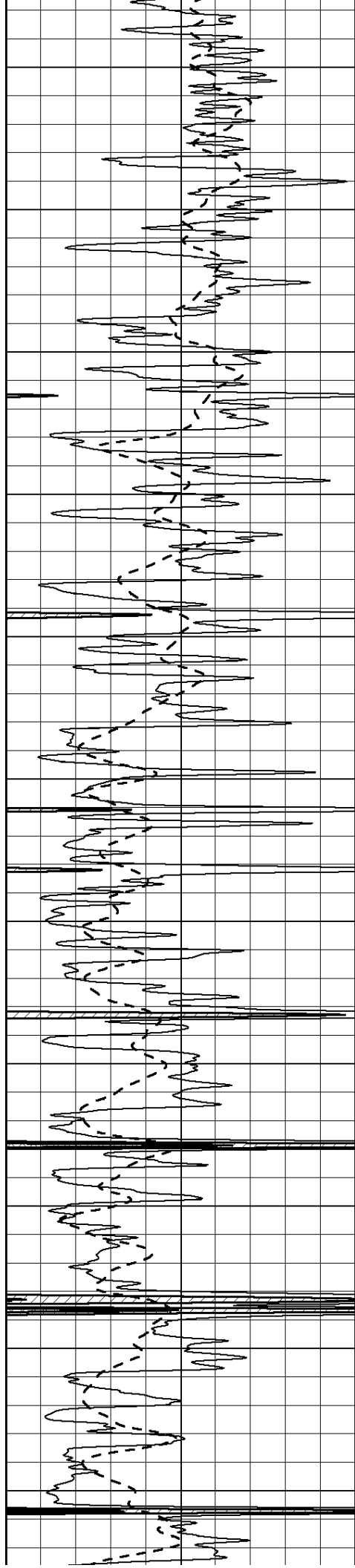
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3750

3800

3850

3900

3950

4000

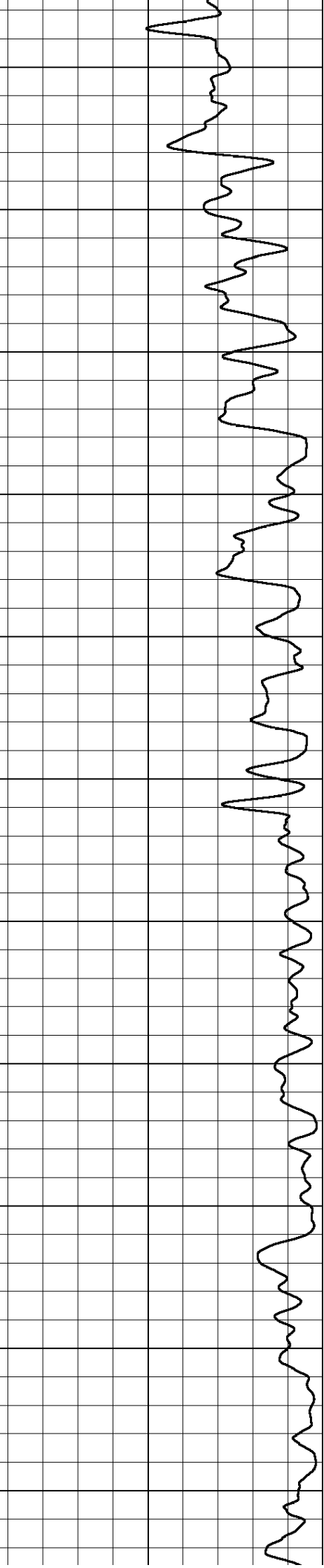
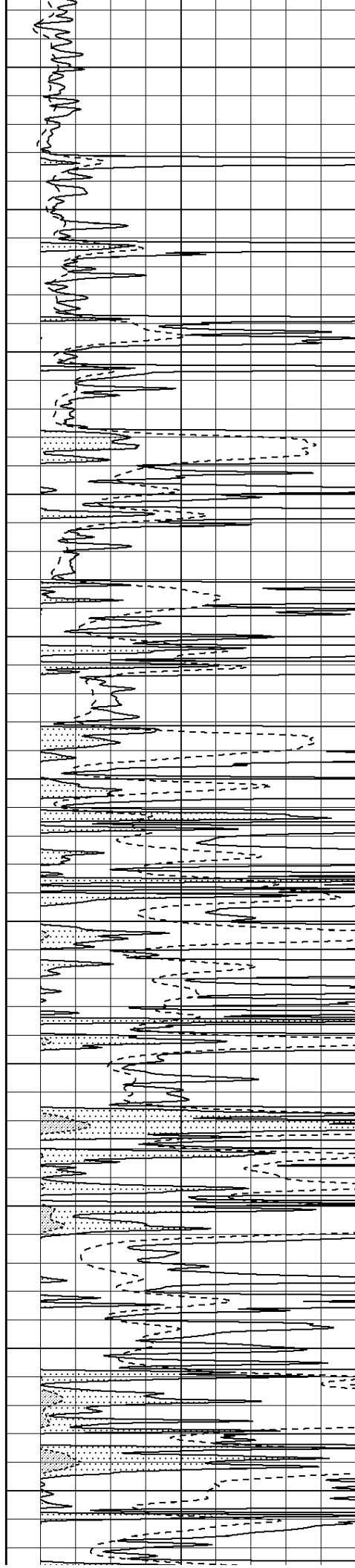
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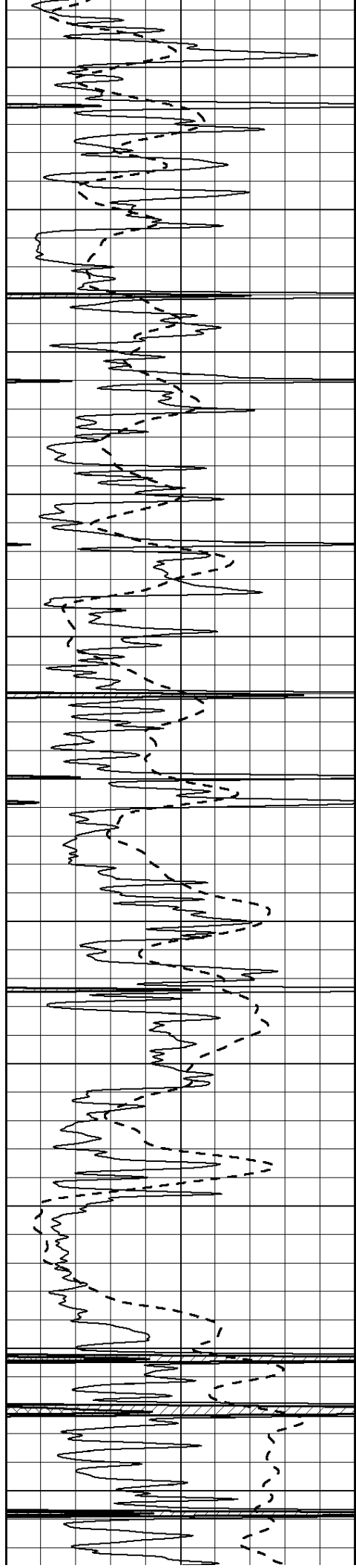
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4150

4200

4250





4300

4350

4400

4450

4500

4550

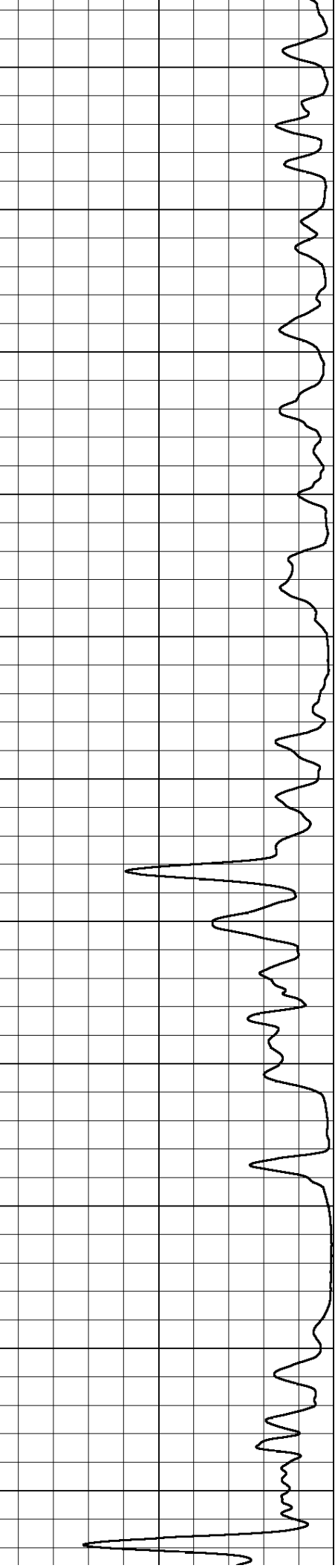
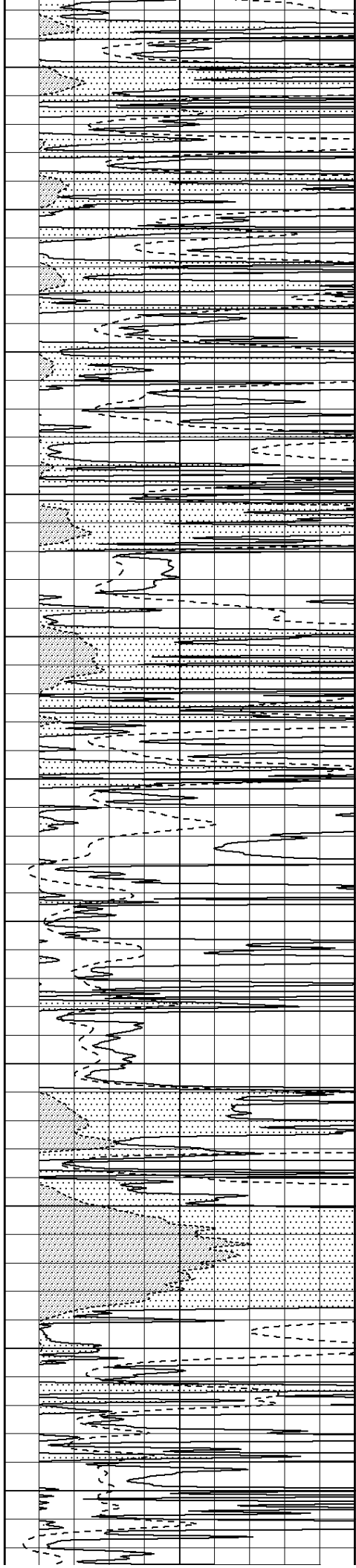
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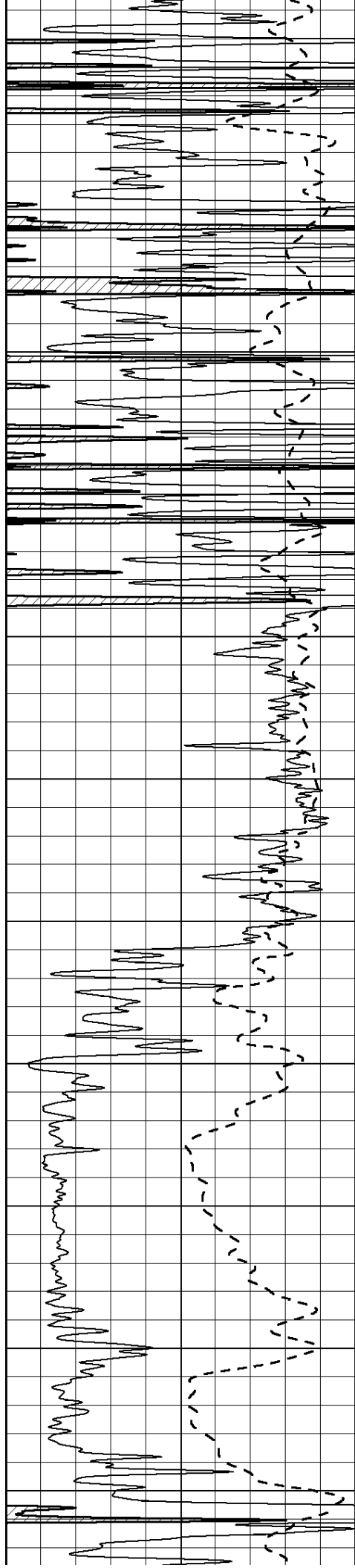
4650

4700

4750

4800





4850

4900

4950

5000

5050

5100

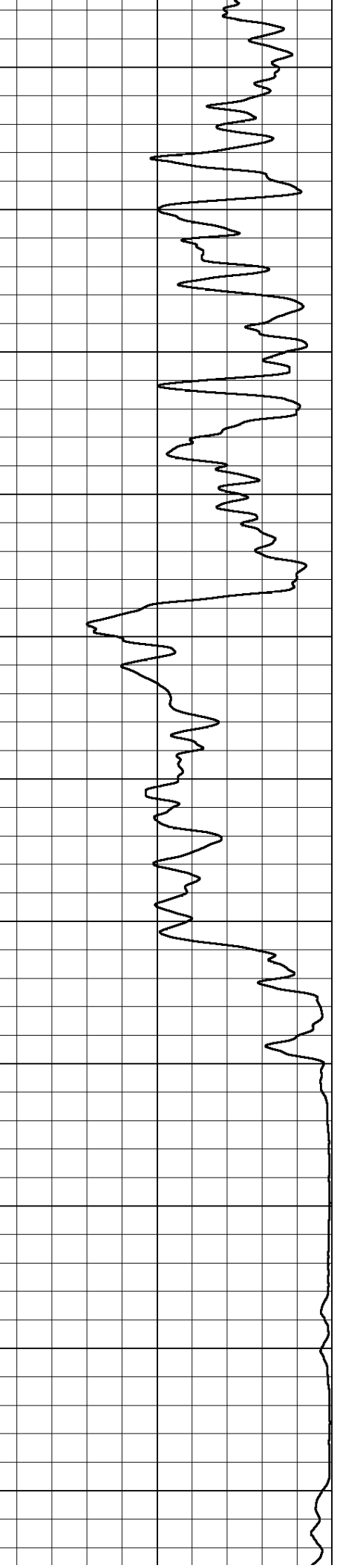
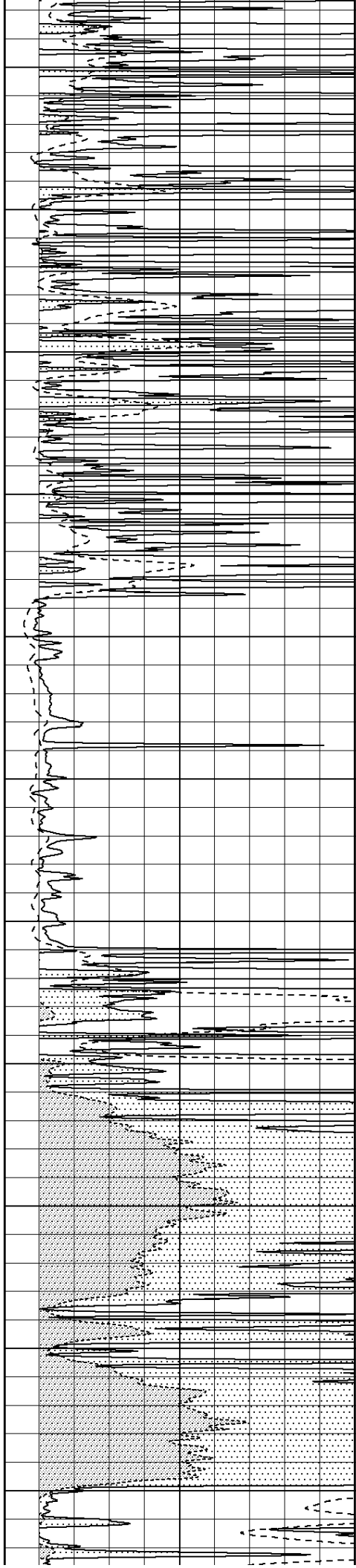
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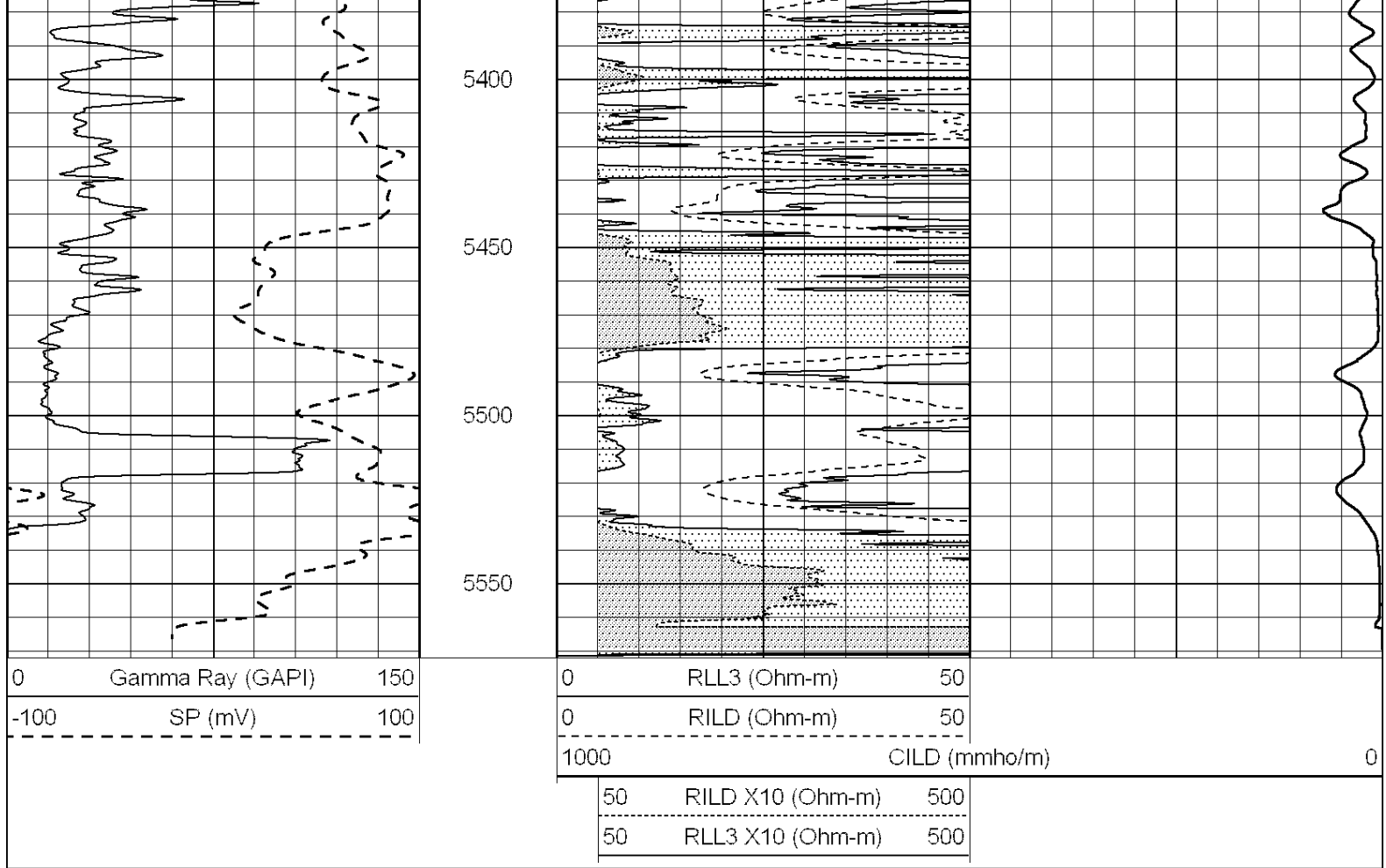
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5250

5300

5350





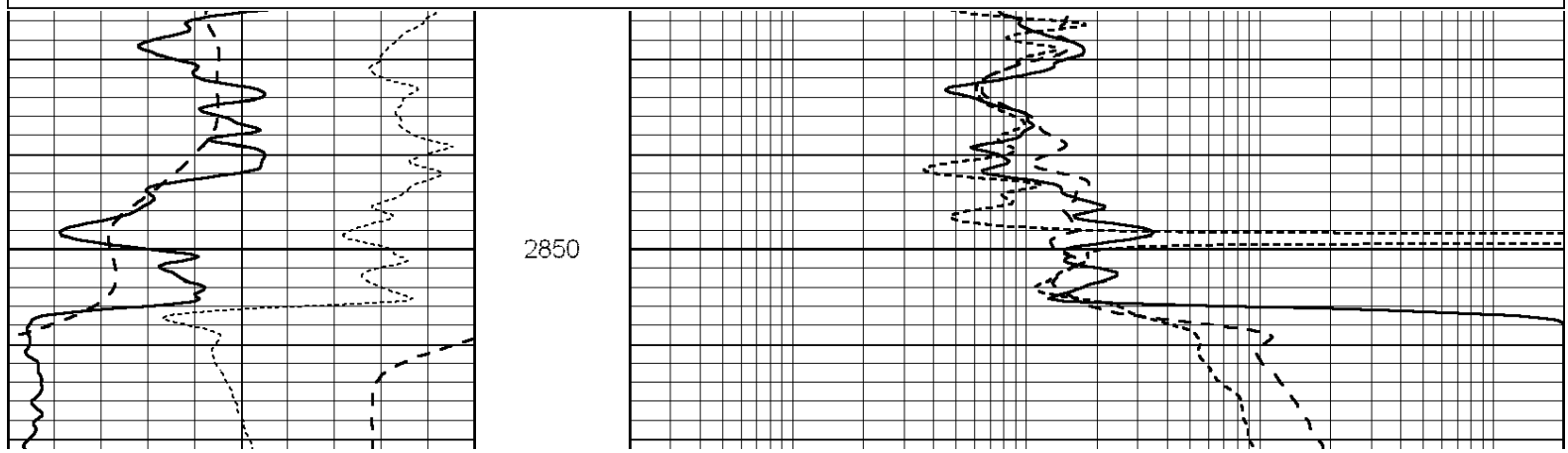


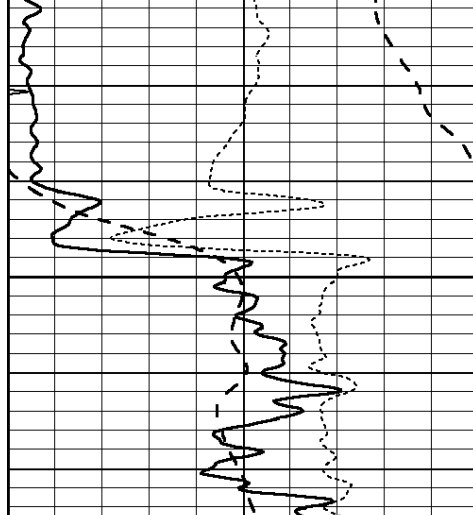
**NABORS**  
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SERVICES CO.

# ANHYDRITE

Database File: 010031pe.db  
 Dataset Pathname: pass3.11  
 Presentation Format: dil  
 Dataset Creation: Mon Dec 10 14:23:20 2012  
 Charted by: Depth in Feet scaled 1:240

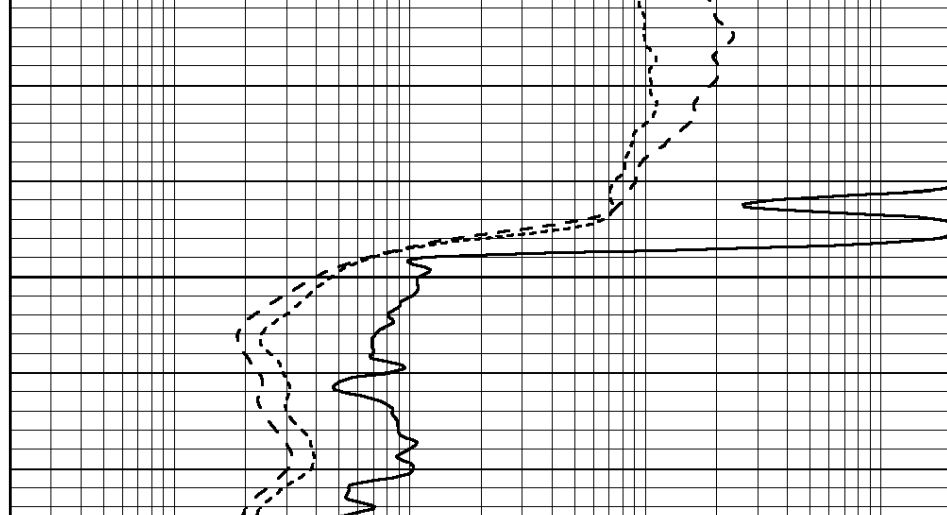
0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			





2900

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

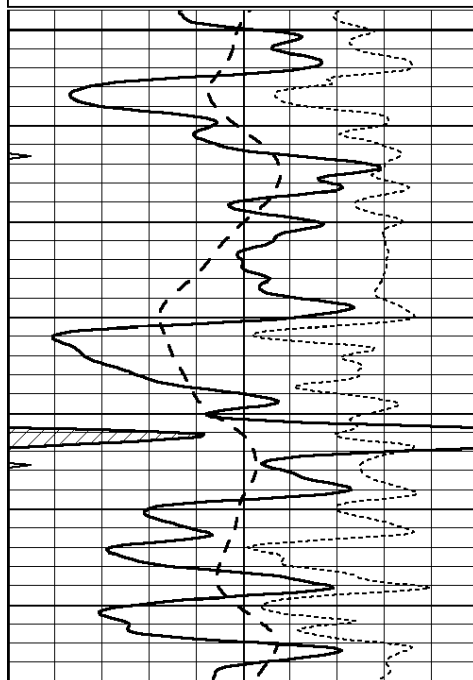


# MAIN SECTION

Database File: 010031pe.db  
 Dataset Pathname: pass3.10  
 Presentation Format: dil  
 Dataset Creation: Mon Dec 10 14:20:06 2012  
 Charted by: Depth in Feet scaled 1:240

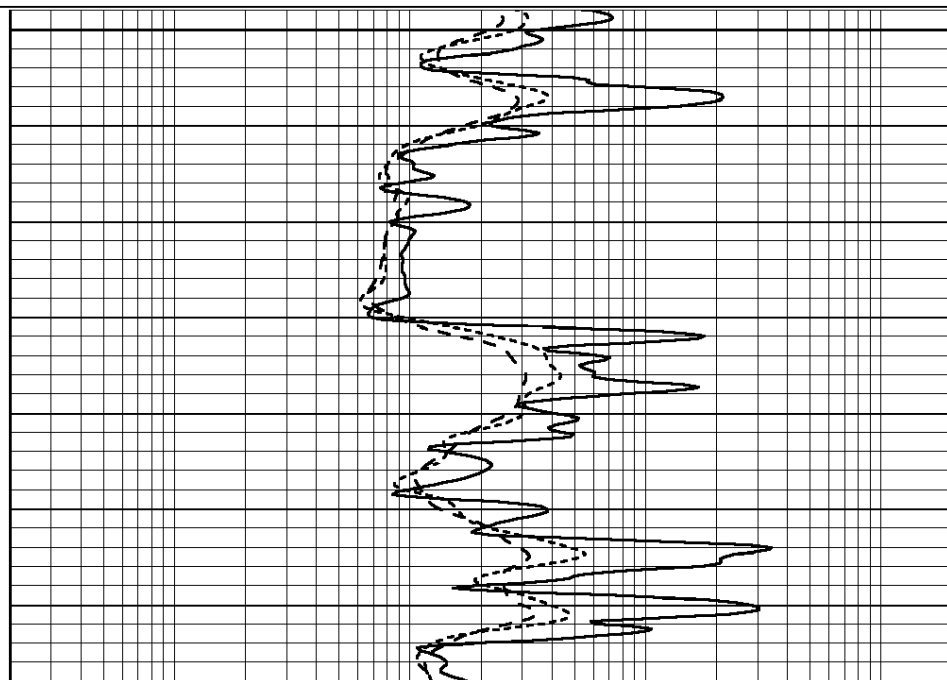
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

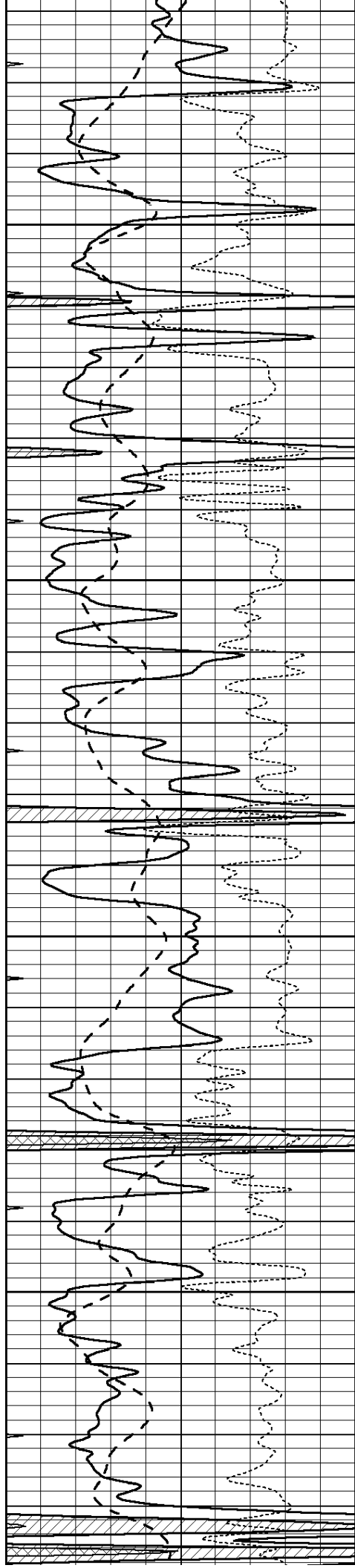
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



3900

3950



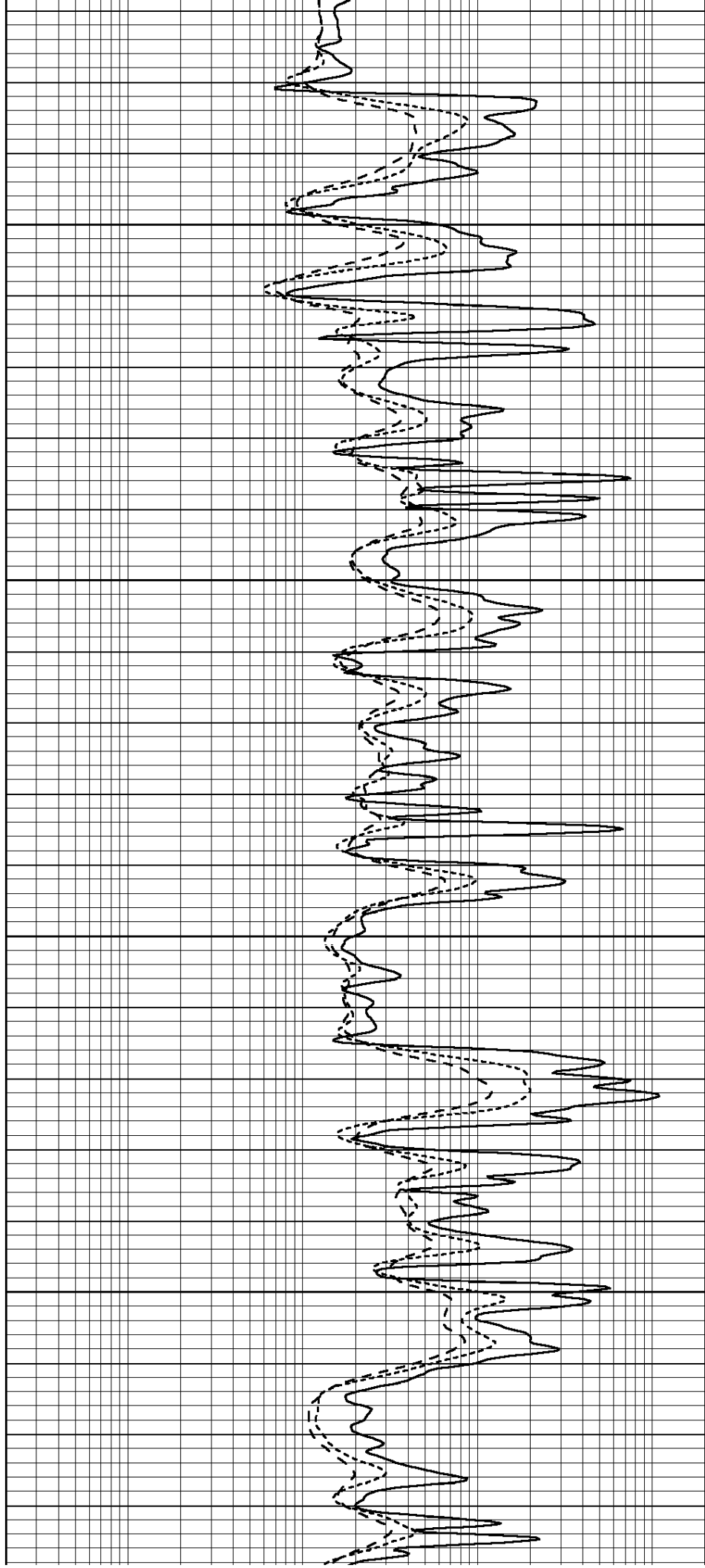


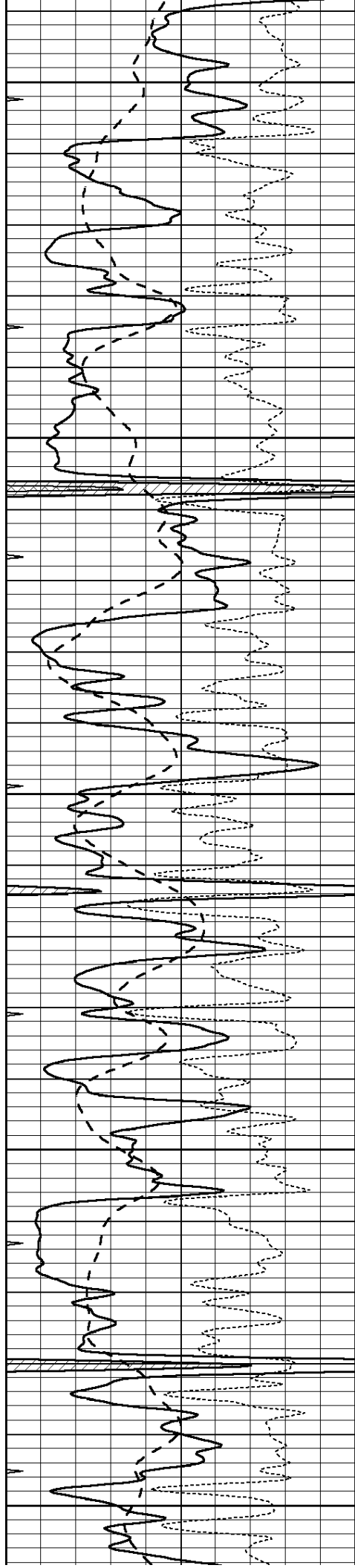
4000

4050

4100

4150





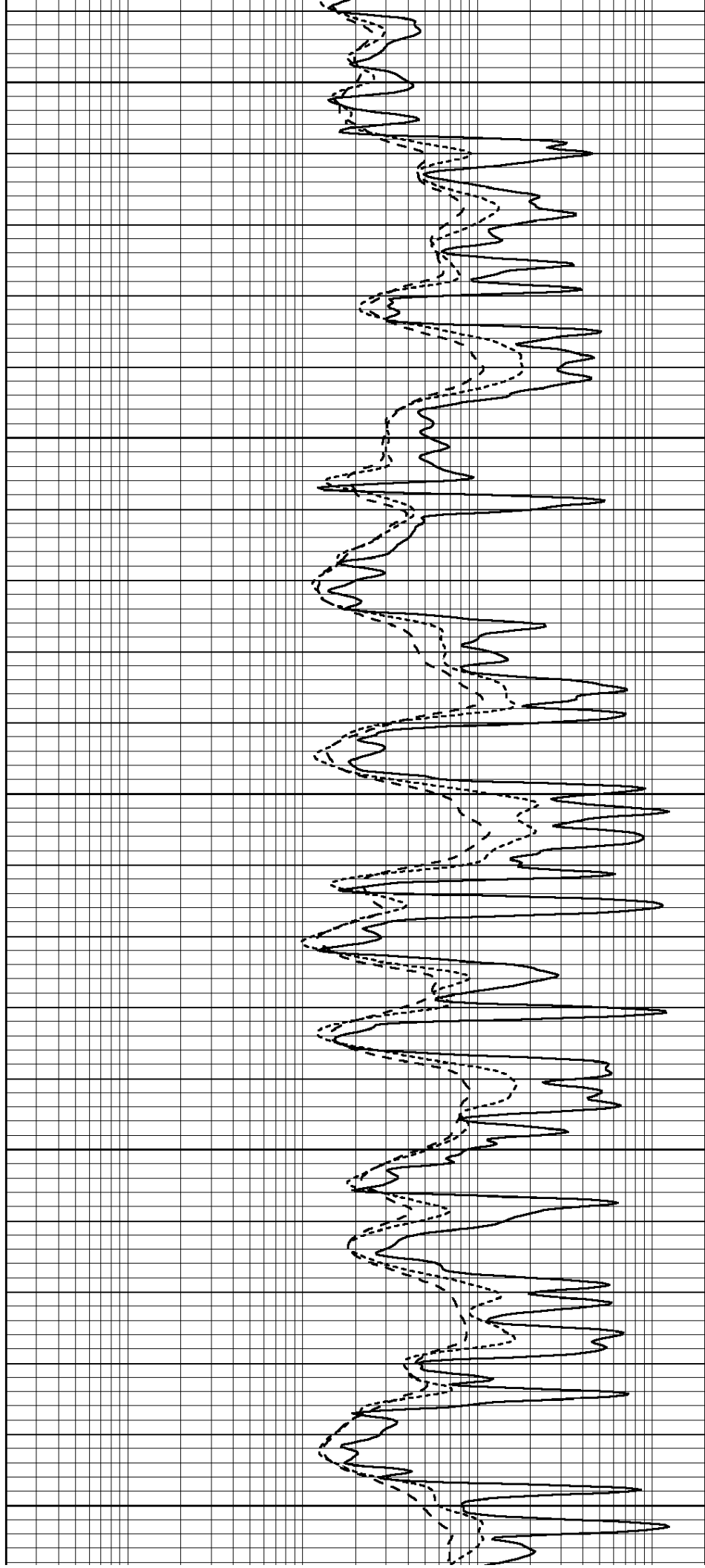
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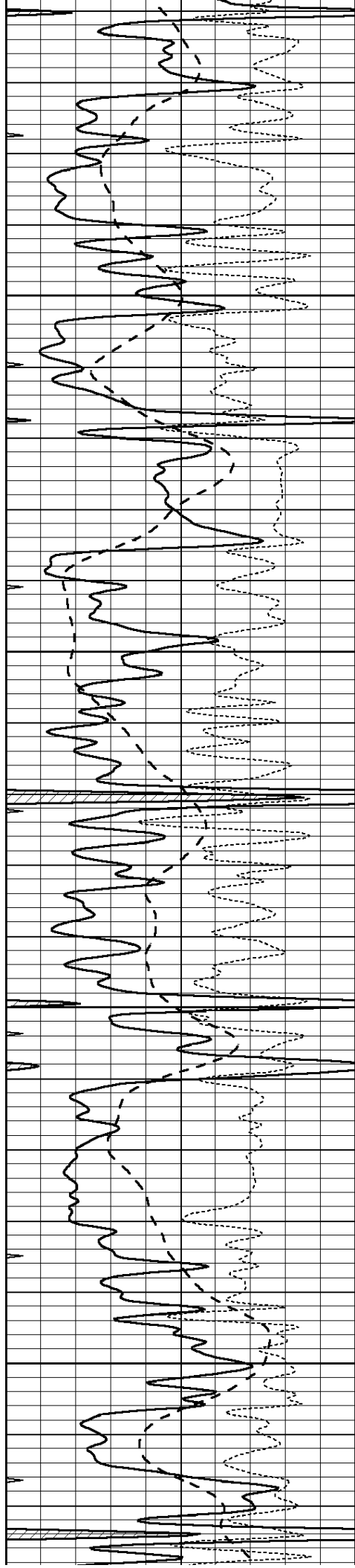
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4300

4350

4400



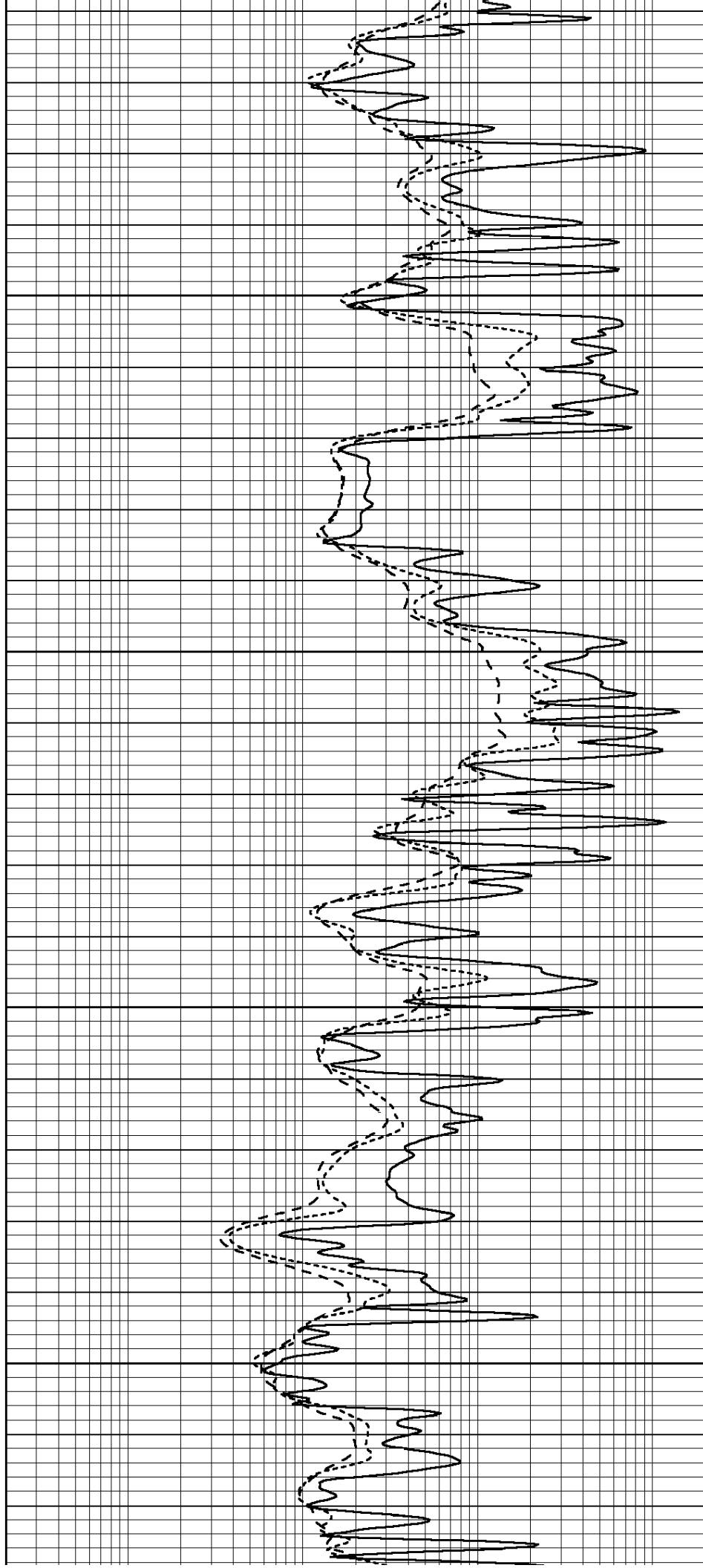


4450

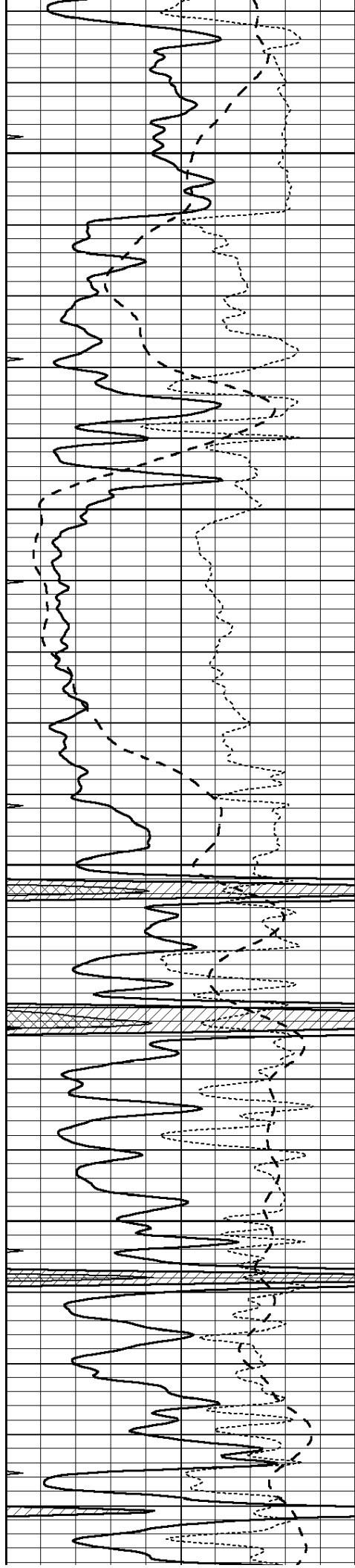
4500

4550

4600





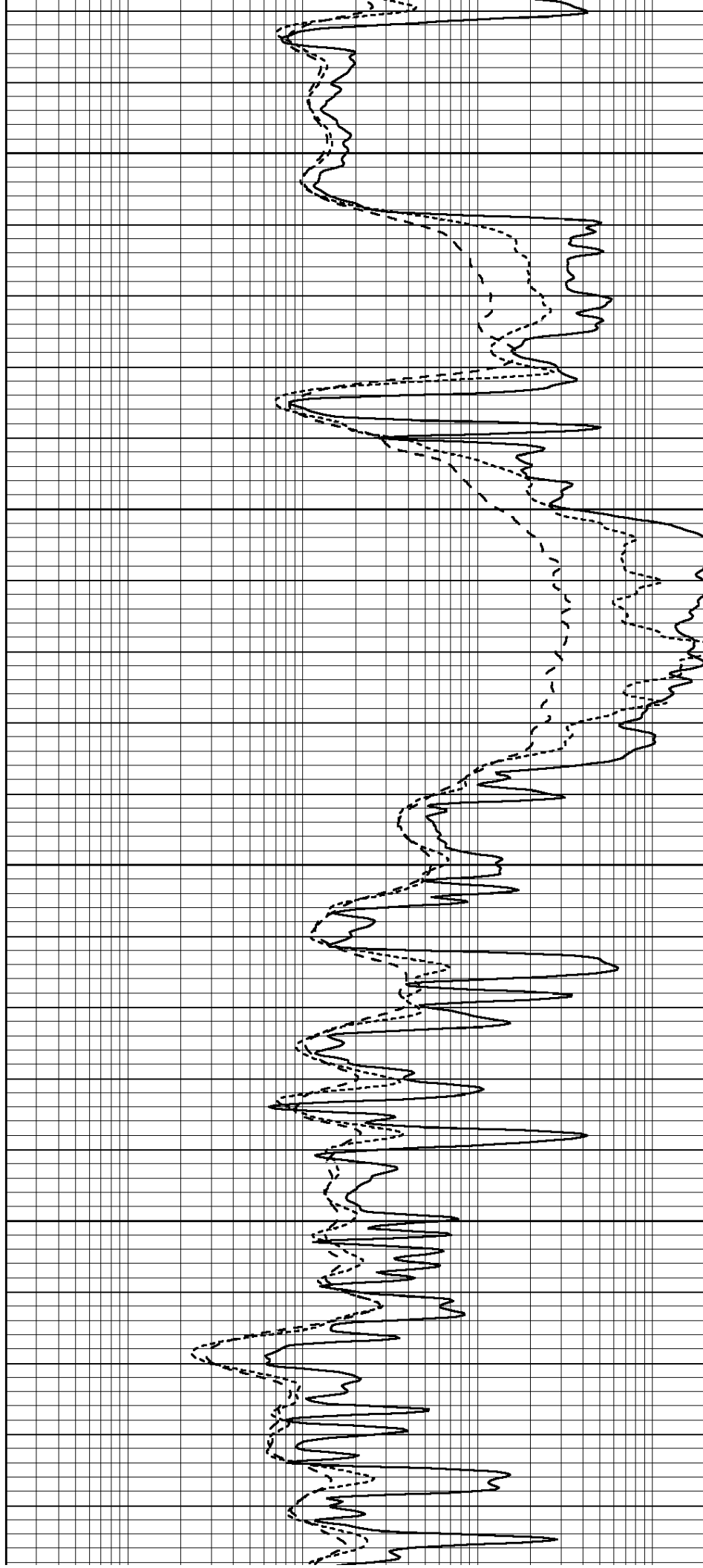


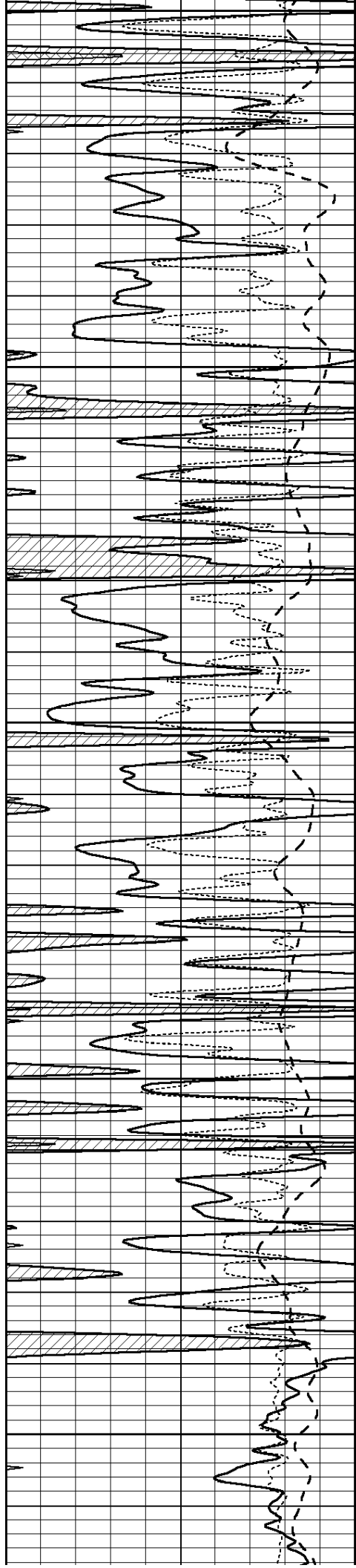
4650

4700

4750

4800





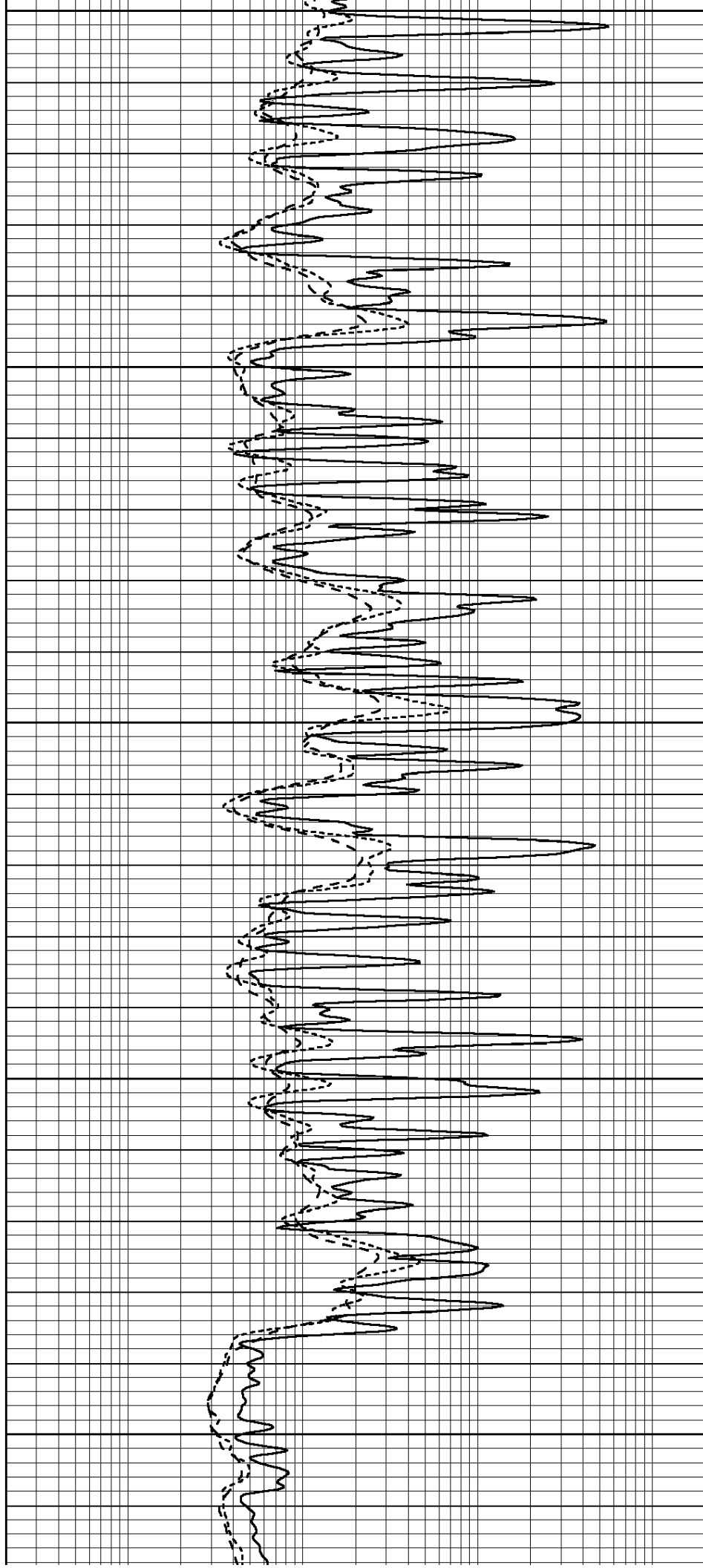
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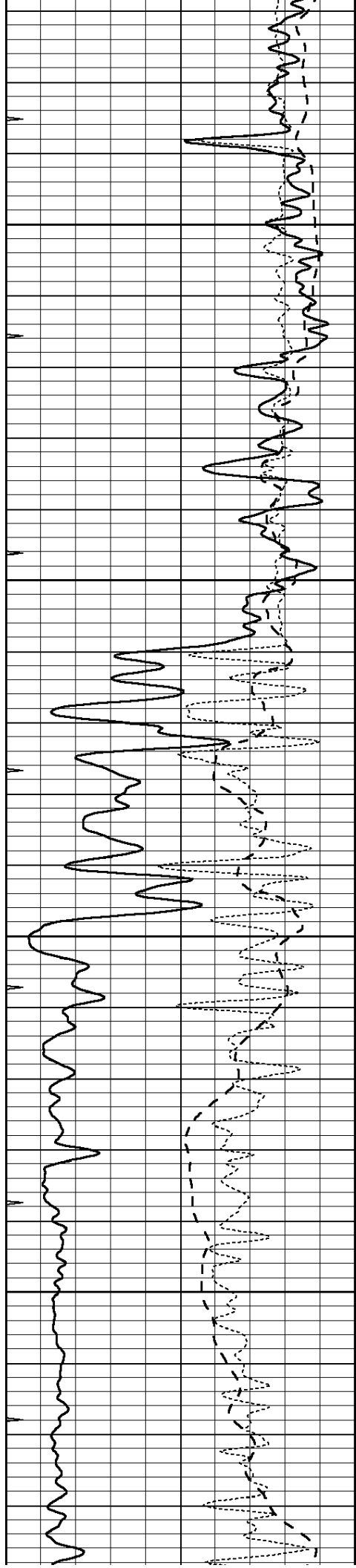
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4950

5000

5050



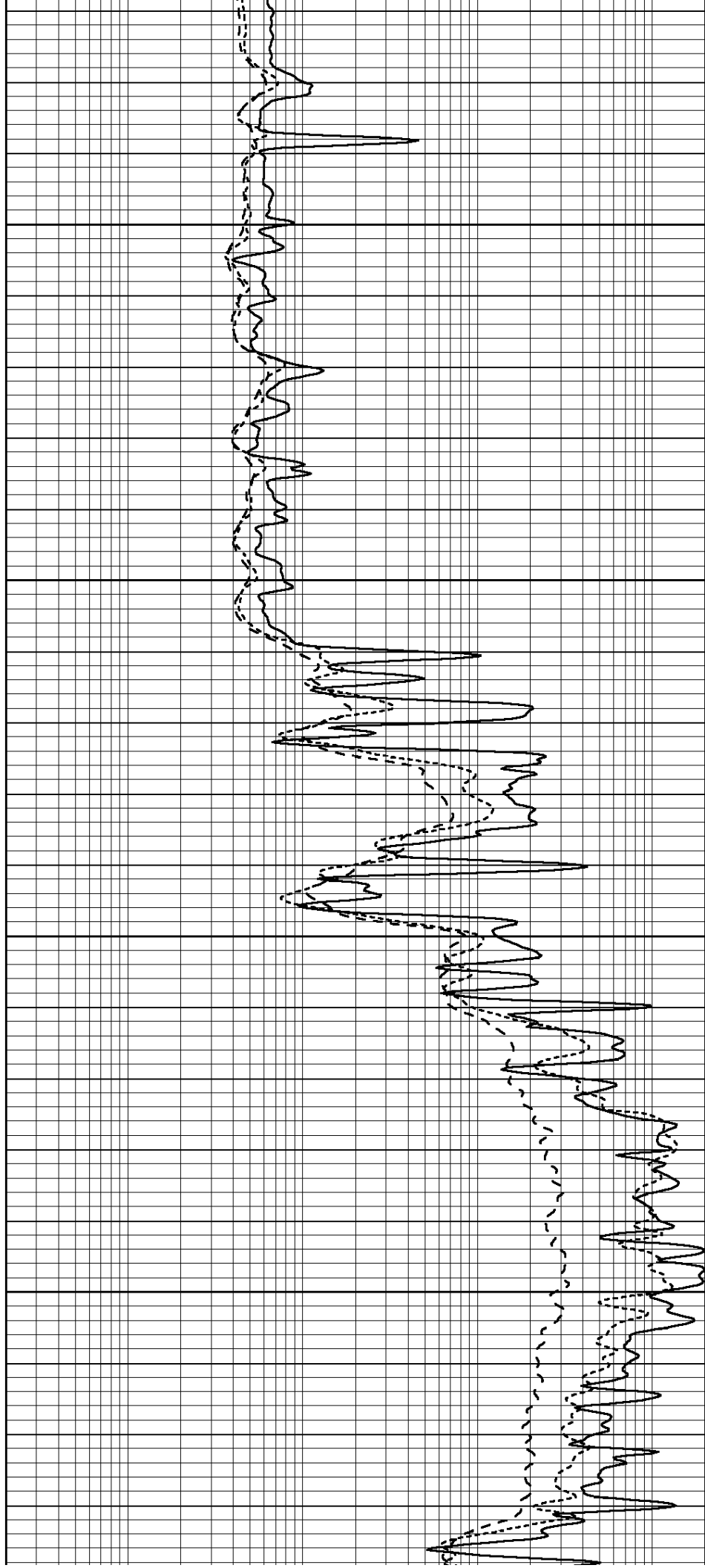


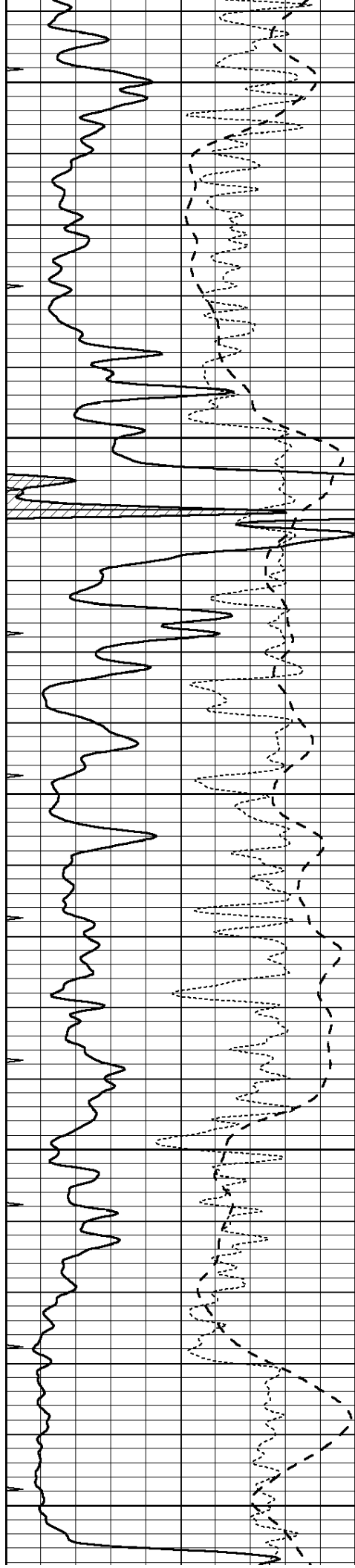
5100

5150

5200

5250





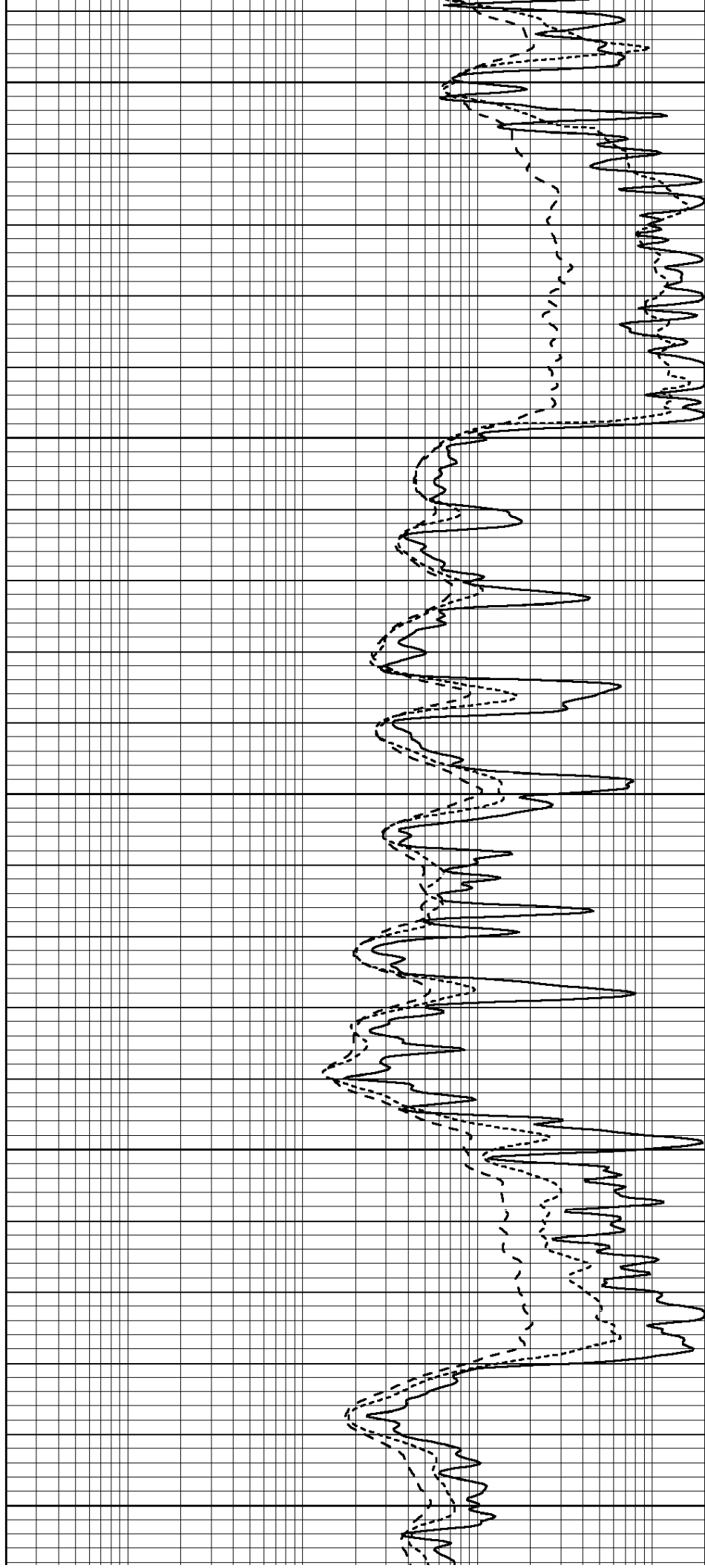
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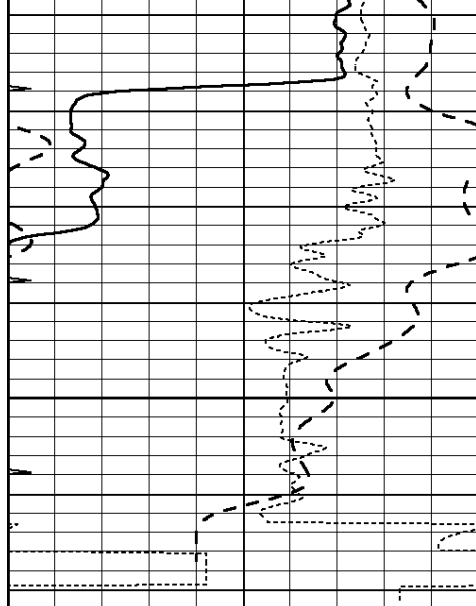
5350

5400

5450

5500





5550

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

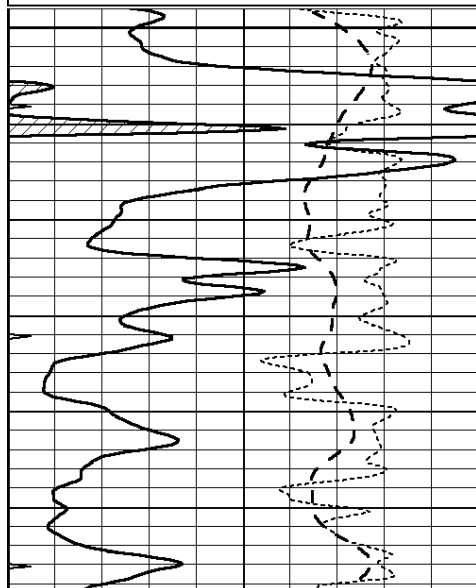


# REPEAT SECTION

Database File: 010031pe.db  
 Dataset Pathname: pass2.9  
 Presentation Format: dil  
 Dataset Creation: Mon Dec 10 14:44:53 2012 by Calc SOC 120430  
 Charted by: Depth in Feet scaled 1:240

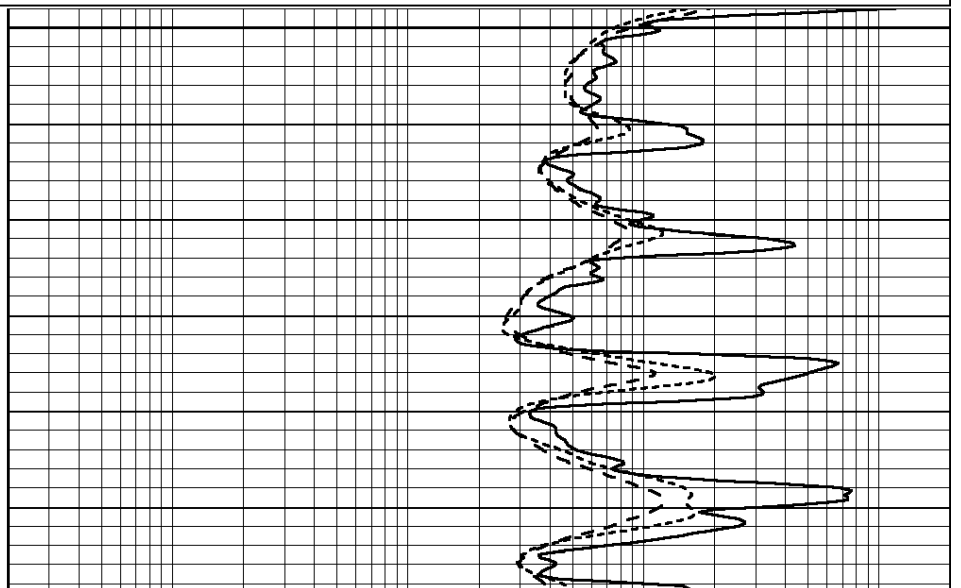
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

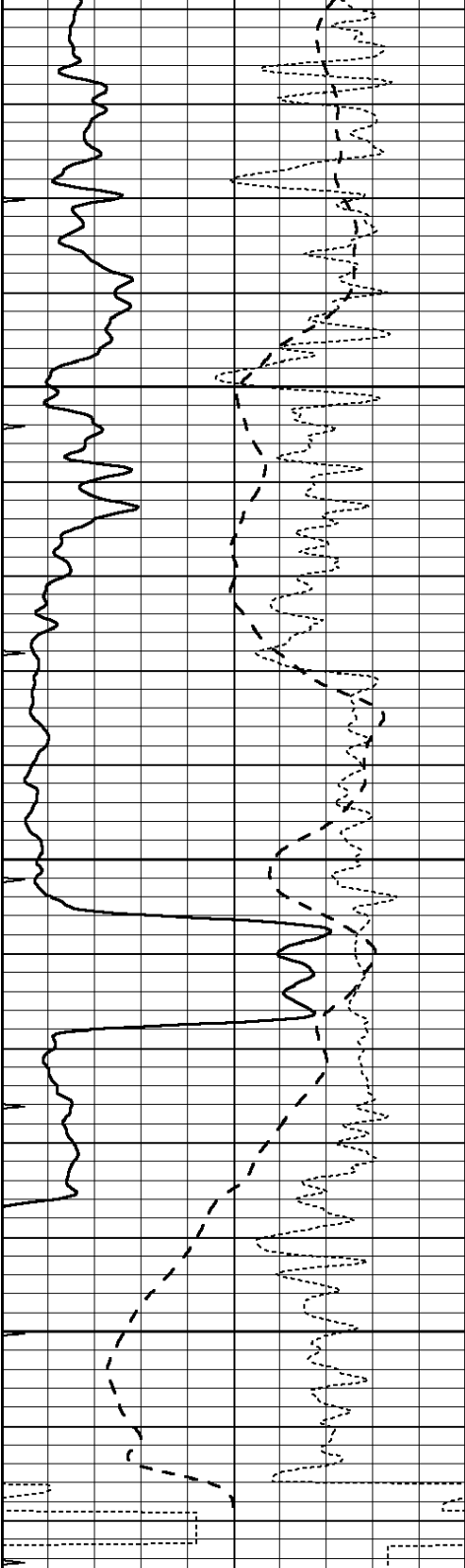
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



5350

5400



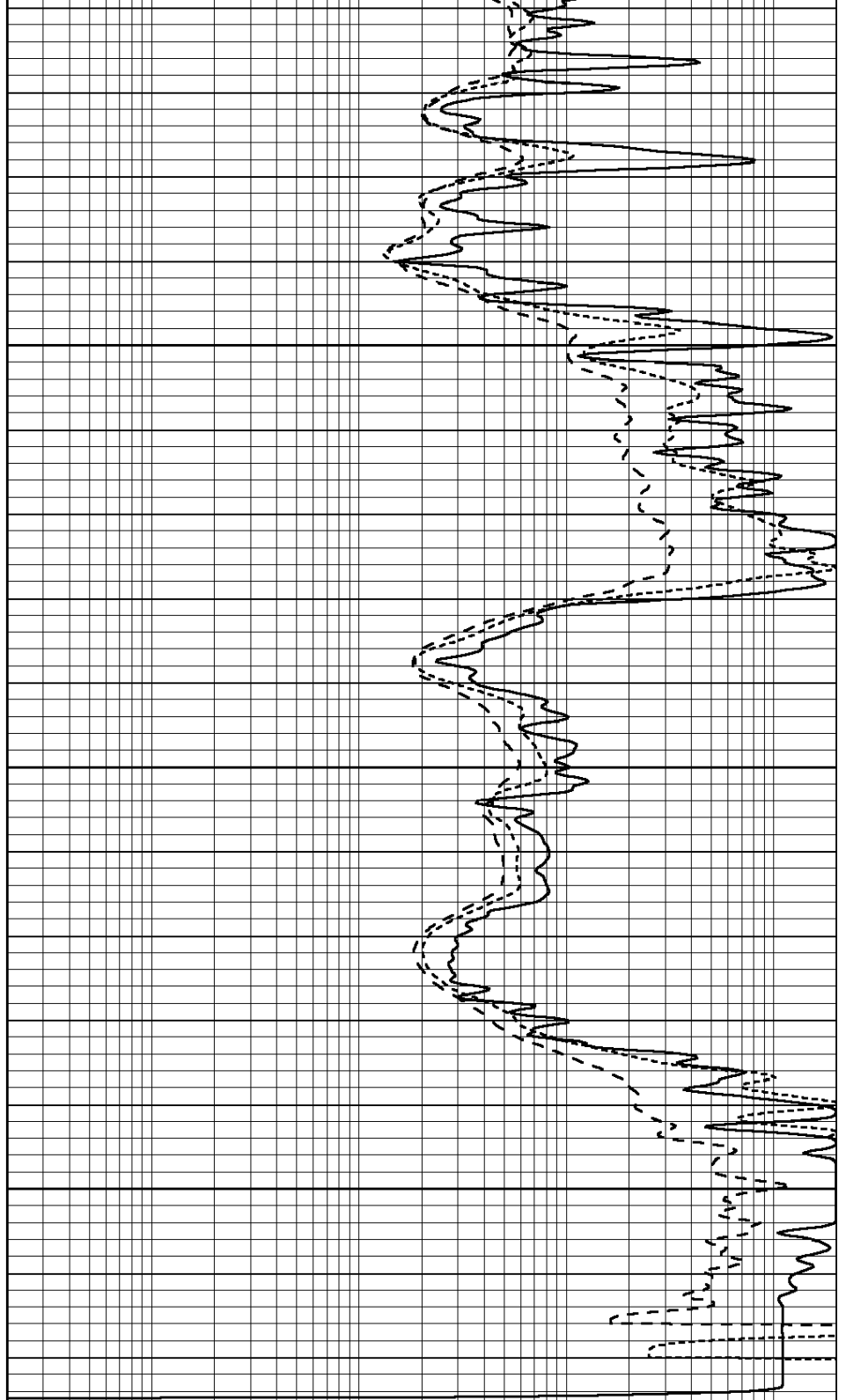


0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

5450

5500

5550



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: 010031pe.db  
Dataset Pathname: pass3.10  
Dataset Creation: Mon Dec 10 14:20:06 2012

Dual Induction Calibration Report

Readings				References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.011	0.656	V	0.000	400.000	mmho/m	640.000	8.000
Medium	0.013	0.740	V	0.000	462.500	mmho/m	700.000	-10.000
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								
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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	1198.3	4733.6		1952.5		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	6.7
High Ref	5.5	15.0
	Gain: 4.3	Offset: -8.5

Compensated Neutron Calibration Report								
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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								
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Serial Number:			070559					
Tool Model:			OPEN_GR					
Performed:			Wed Nov 28 18:32:17 2012					
Calibrator Value:			1.0	GAPI				
Detector ID:			2.0					

Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.3000	GAPI/cps