



DUAL INDUCTION LOG

Company L.D. DRILLING, INC.
 Well #1-13 KNOTTTS
 Field PFAFF EAST
 County NESS
 State KANSAS

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 Well #1-13 KNOTTTS
 Field PFAFF EAST
 County NESS State KANSAS

Location: AP1 #: 15-135-25975-0000
 690' FSL & 1867' FEL
 SW - NE - SW - SE
 Permanent Datum GROUND LEVEL Elevation 2190
 Log Measured From KELLY BUSHING 5' A.G.L.
 Drilling Measured From KELLY BUSHING
 SEC 13 TWP 19S RGE 23W
 Other Services
 CDL/CNL/PE
 MEL/SONIC
 Elevation
 K.B. 2195
 D.F. 2193
 G.L. 2190

Date	9/30/17
Run Number	ONE
Depth Driller	4450
Depth Logger	4450
Bottom Logged Interval	4448
Top Log Interval	00
Casing Driller	8 5/8"@244'
Casing Logger	244
Bit Size	7 7/8"
Type Fluid in Hole	CHEMICAL MUD
Density / Viscosity	9.4/45
pH / Fluid Loss	9.0/11.2
Source of Sample	FLOWLINE
Rim @ Meas. Temp	.500@80F
Rmf @ Meas. Temp	.375@80F
Rmc @ Meas. Temp	.600@80F
Source of Rmf / Rmc	MEASUREMENT
Rim @ BHT	.333@120F
Time Circulation Stopped	2.5 HOURS
Time Logger on Bottom	7:30 P.M.
Maximum Recorded Temperature	120F
Equipment Number	922339
Location	HAYS, KANSAS
Recorded By	JEFF LUEBBERS
Witnessed By	KIM SHOEMAKER

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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 ELI WIRELINE HAYS, KANSAS (785) 628-6395
 DIRECTIONS
 NESS CITY, KS., 3E. ON HWY 96 TO "RD. W", 4S., 1/2E., N. INTO



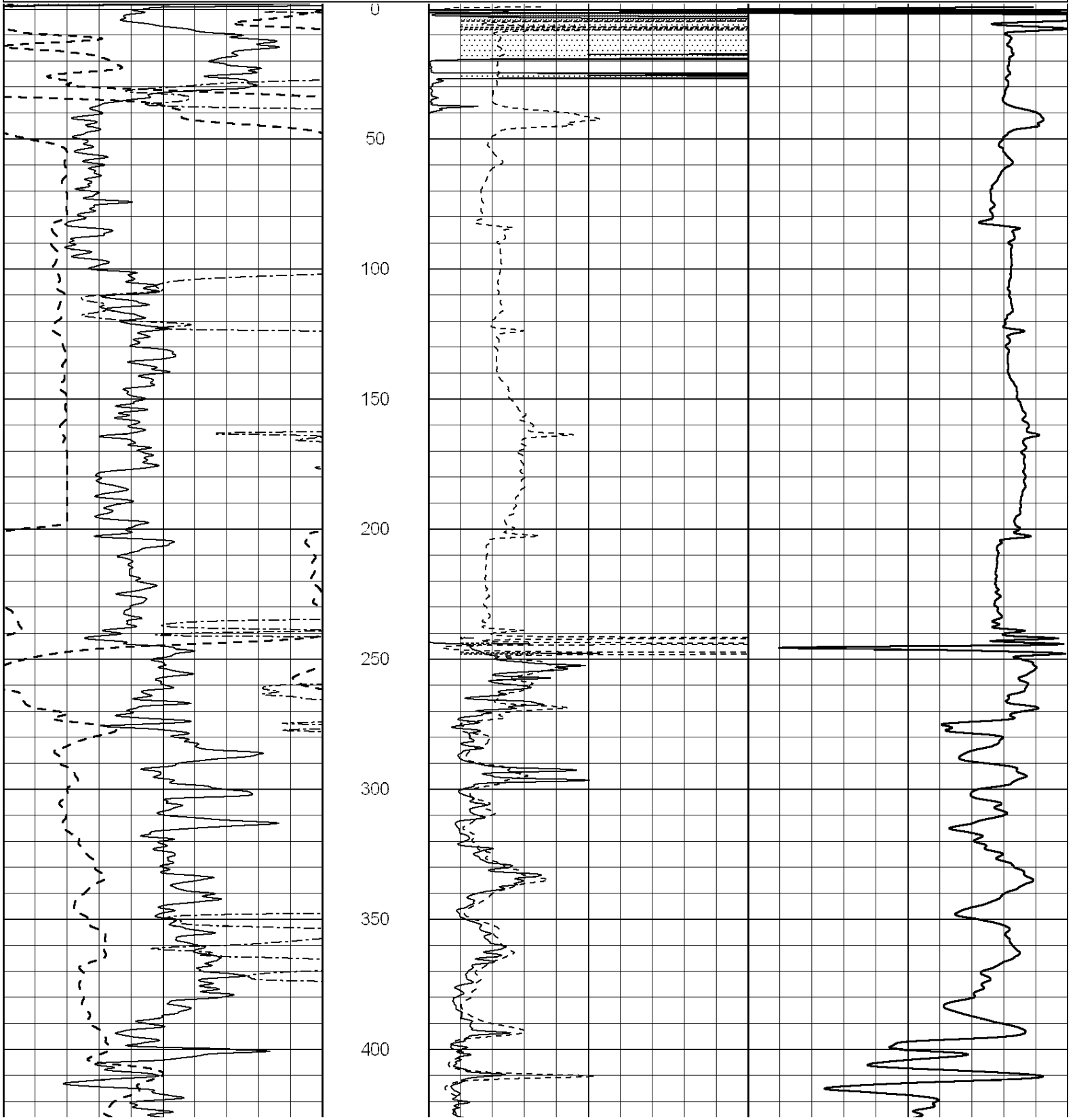
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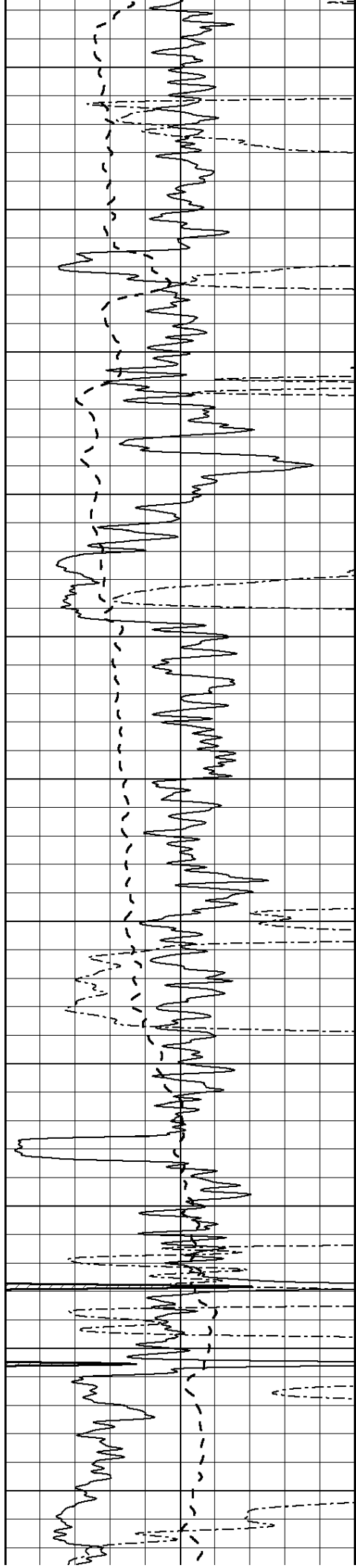
Database File: 1831pe.db
 Dataset Pathname: pass3.9M
 Presentation Format: dil2
 Dataset Creation: Sat Sep 30 21:02:15 2017
 Charted by: Depth in Feet scaled 1:600

0	Gamma Ray (GAPI)	150
-100	SP (mV)	100
0	RWA (Ohm-m)	1

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





450

500

550

600

650

700

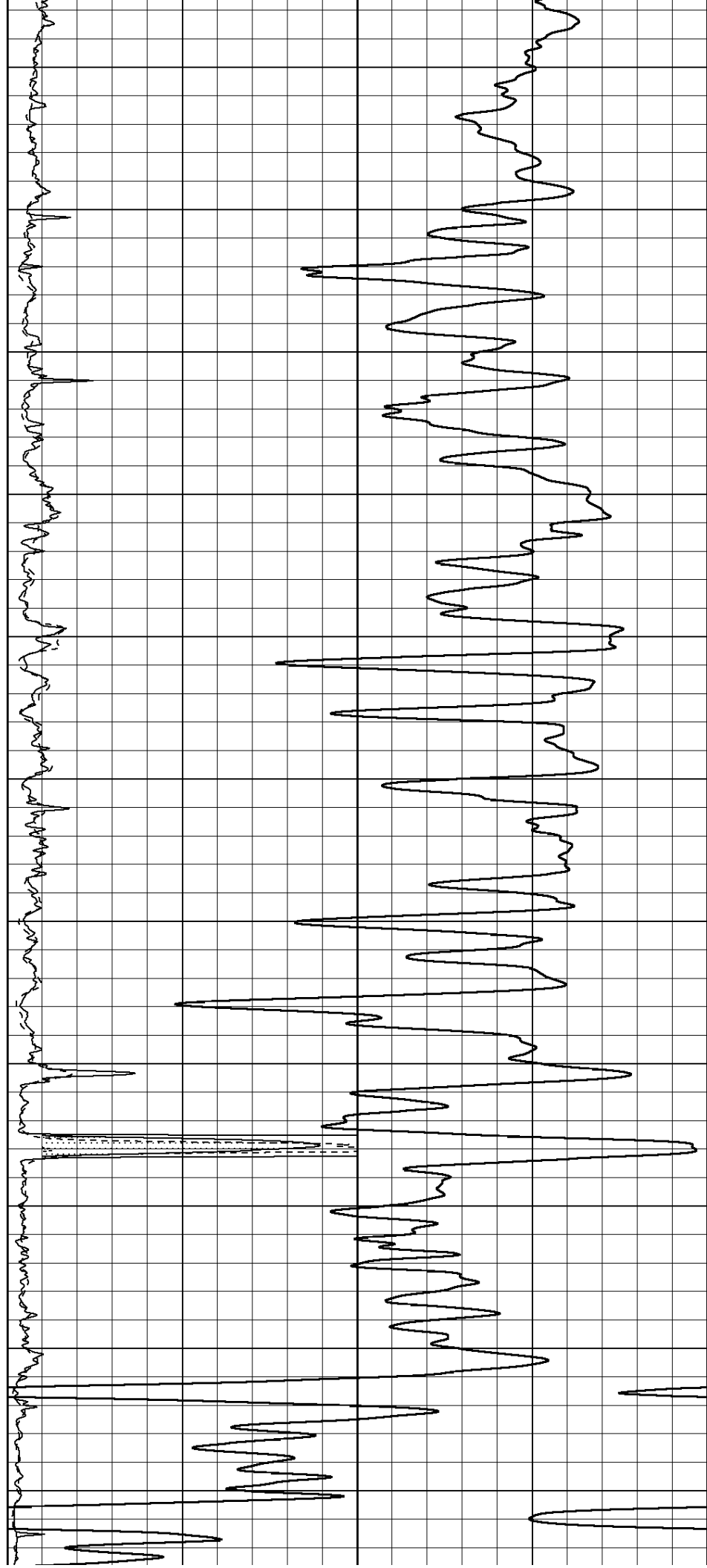
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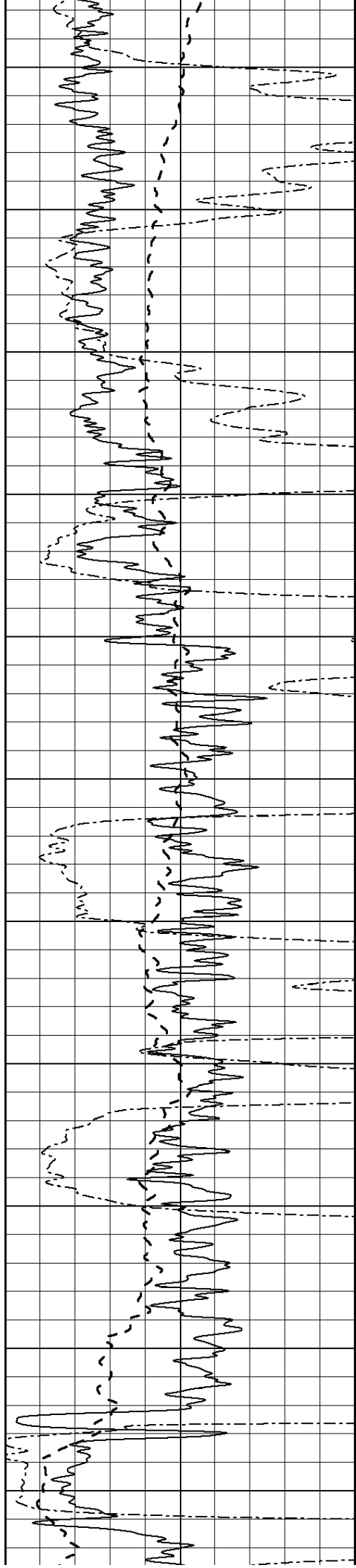
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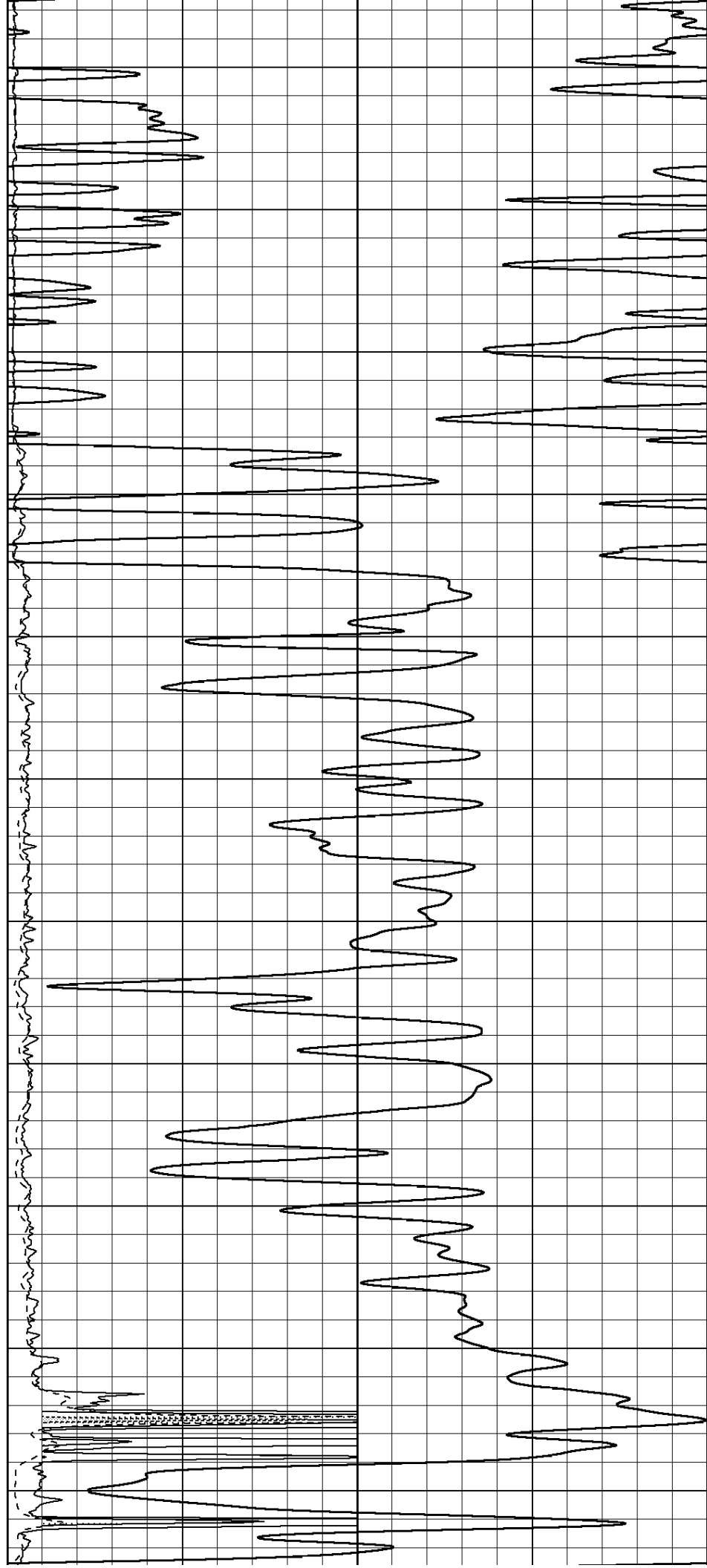
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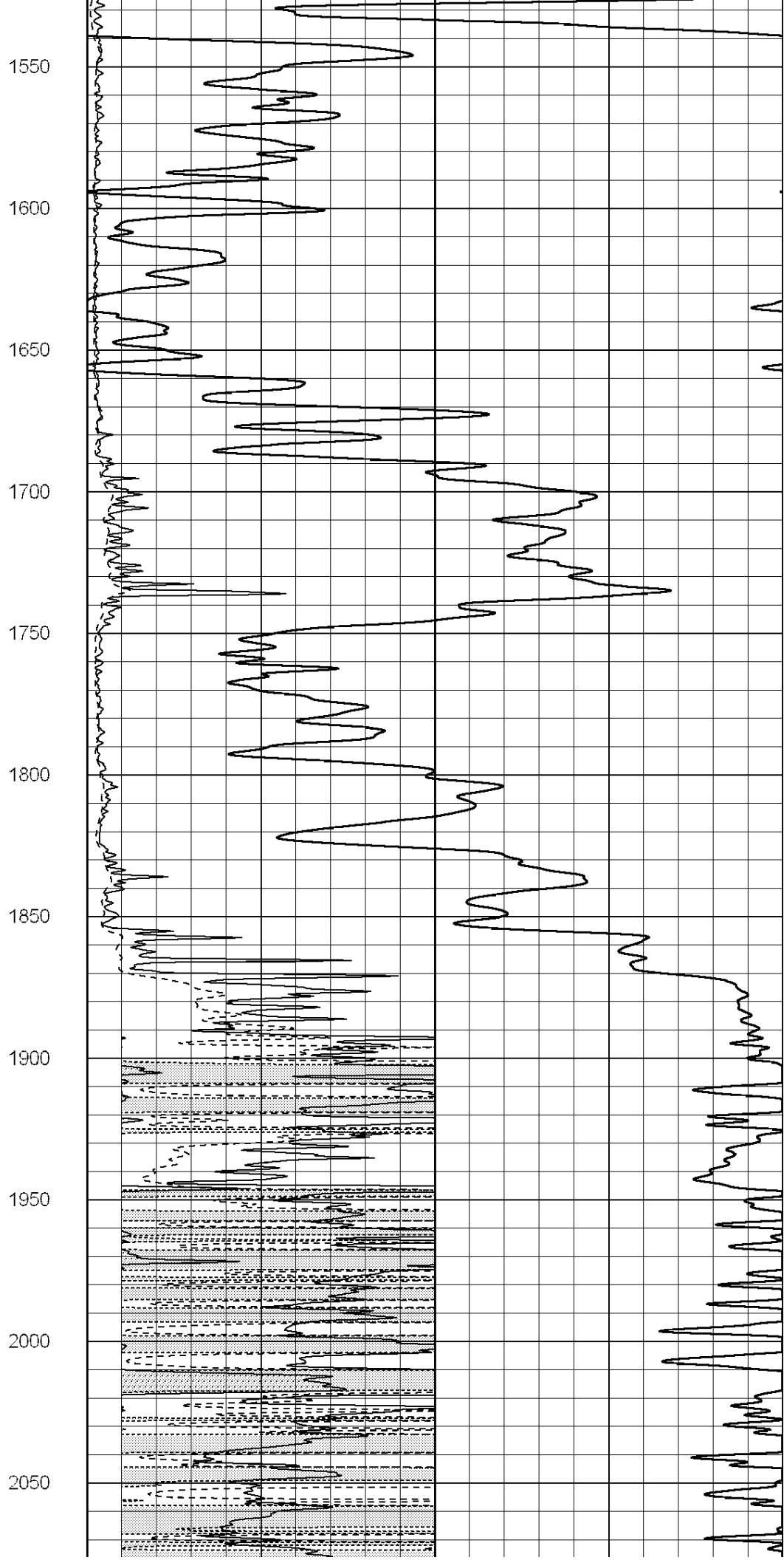
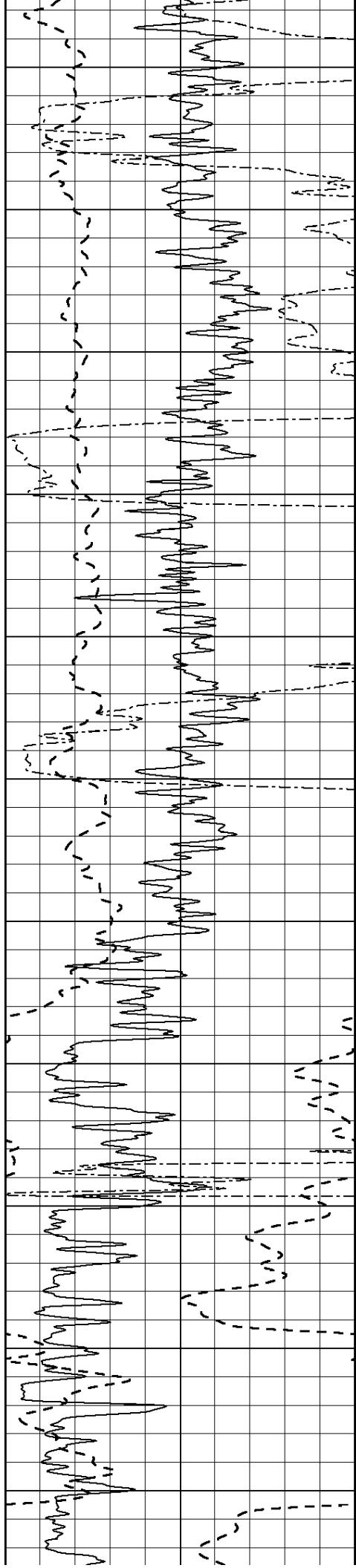
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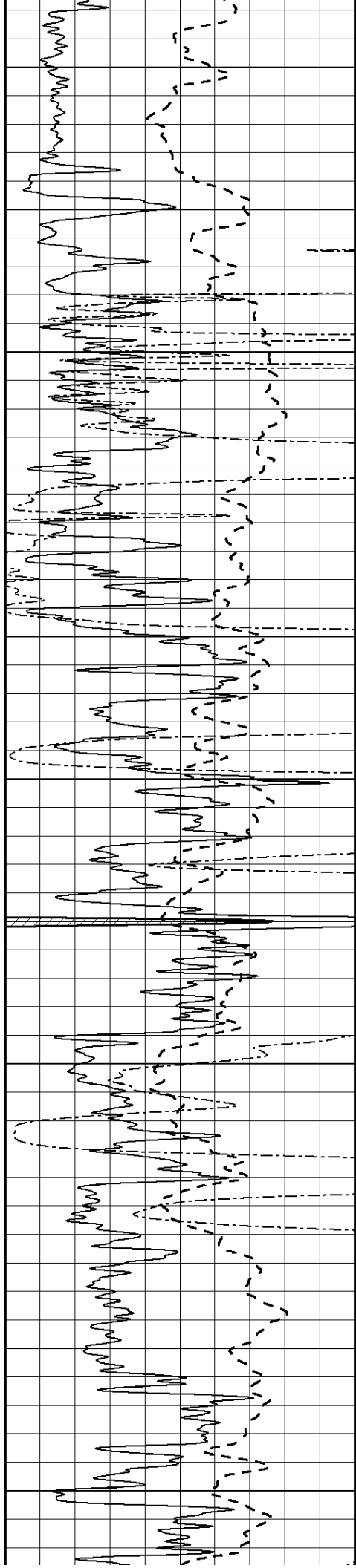




1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500







2100

2150

2200

2250

2300

2350

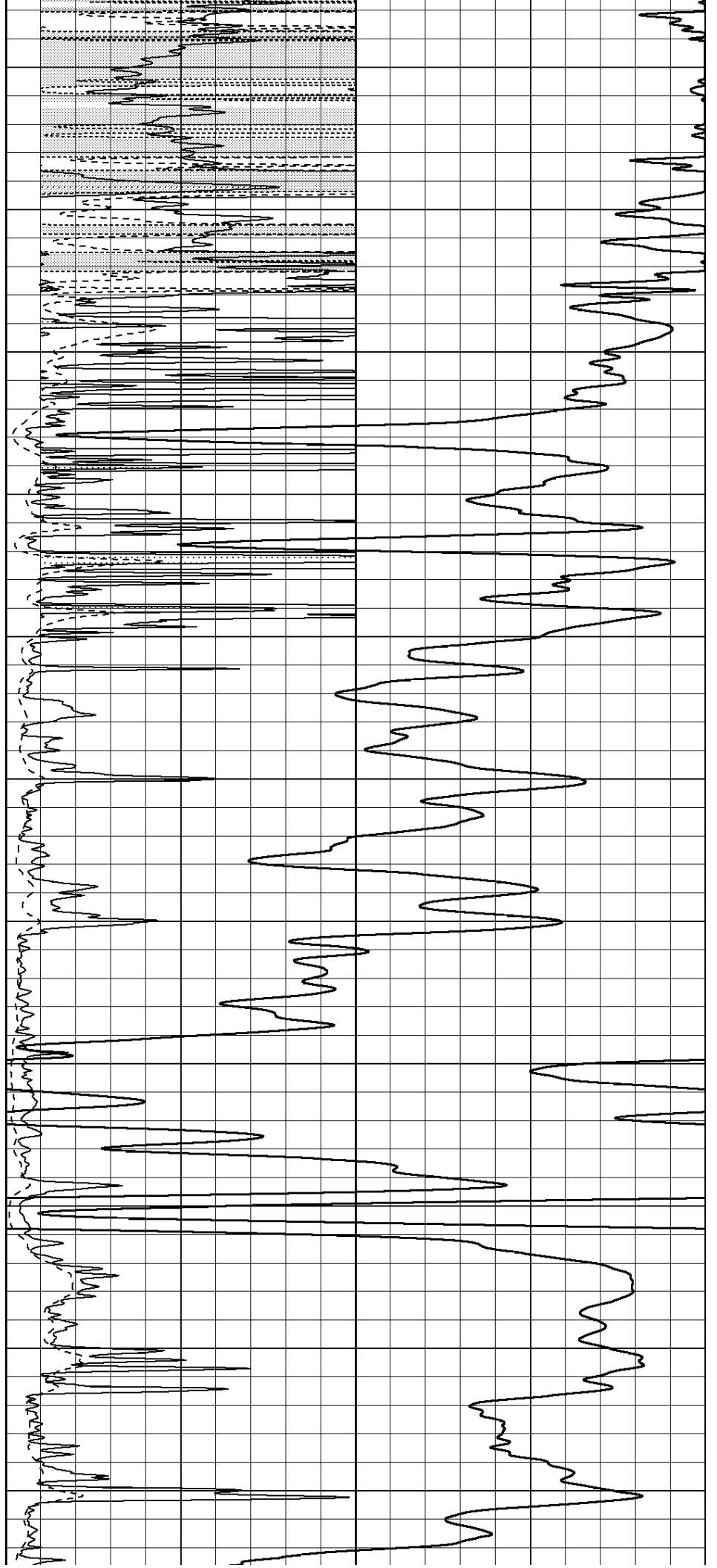
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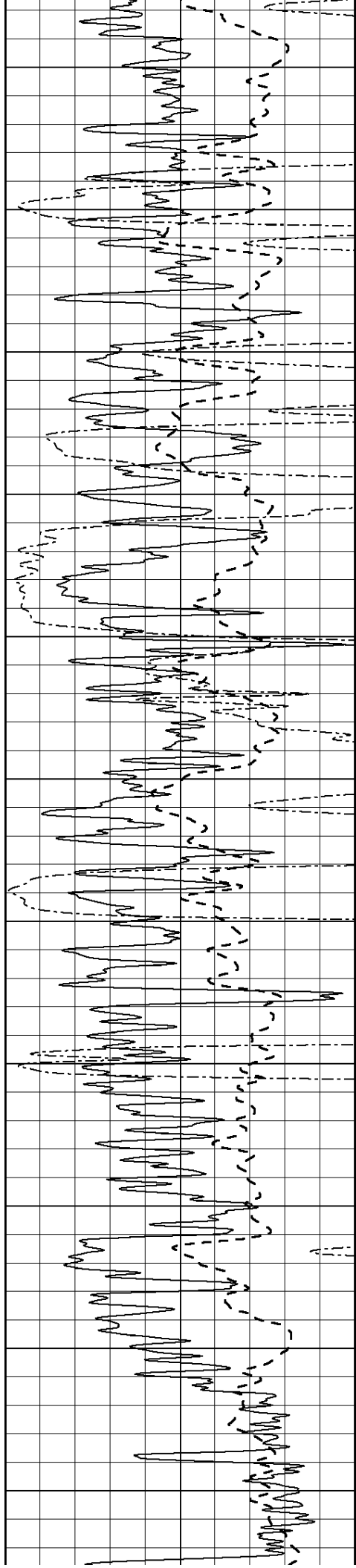
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2500

2550

2600





2650

2700

2750

2800

2850

2900

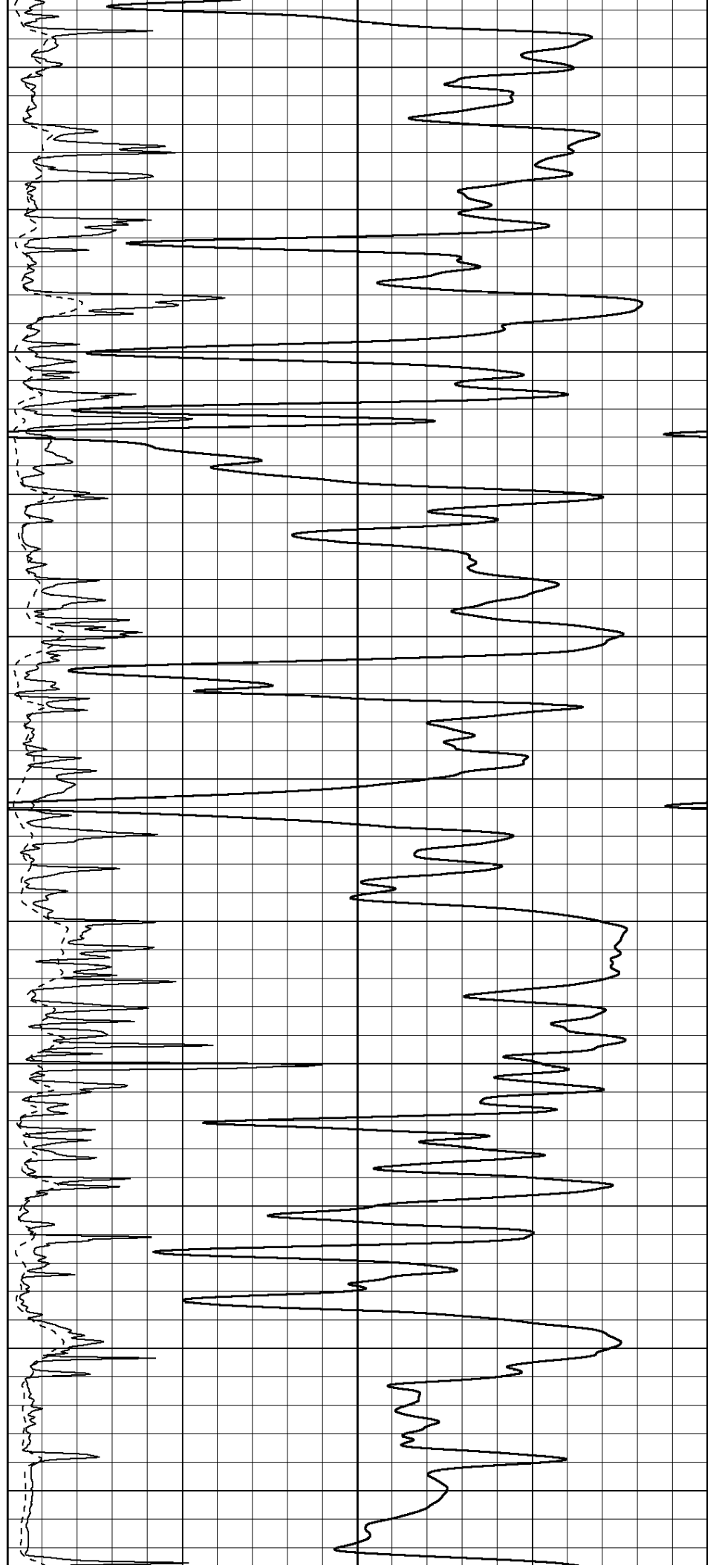
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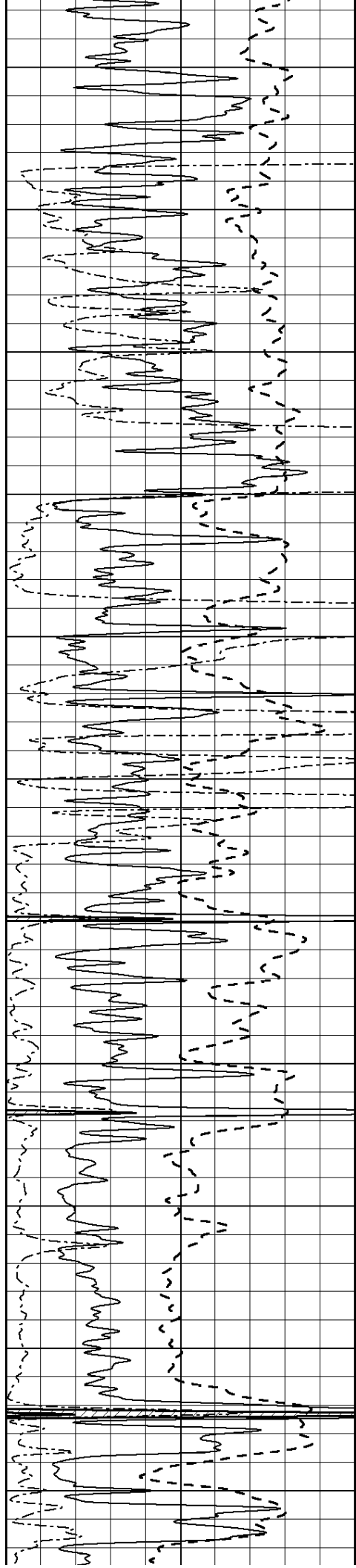
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3050

3100

3150





3200

3250

3300

3350

3400

3450

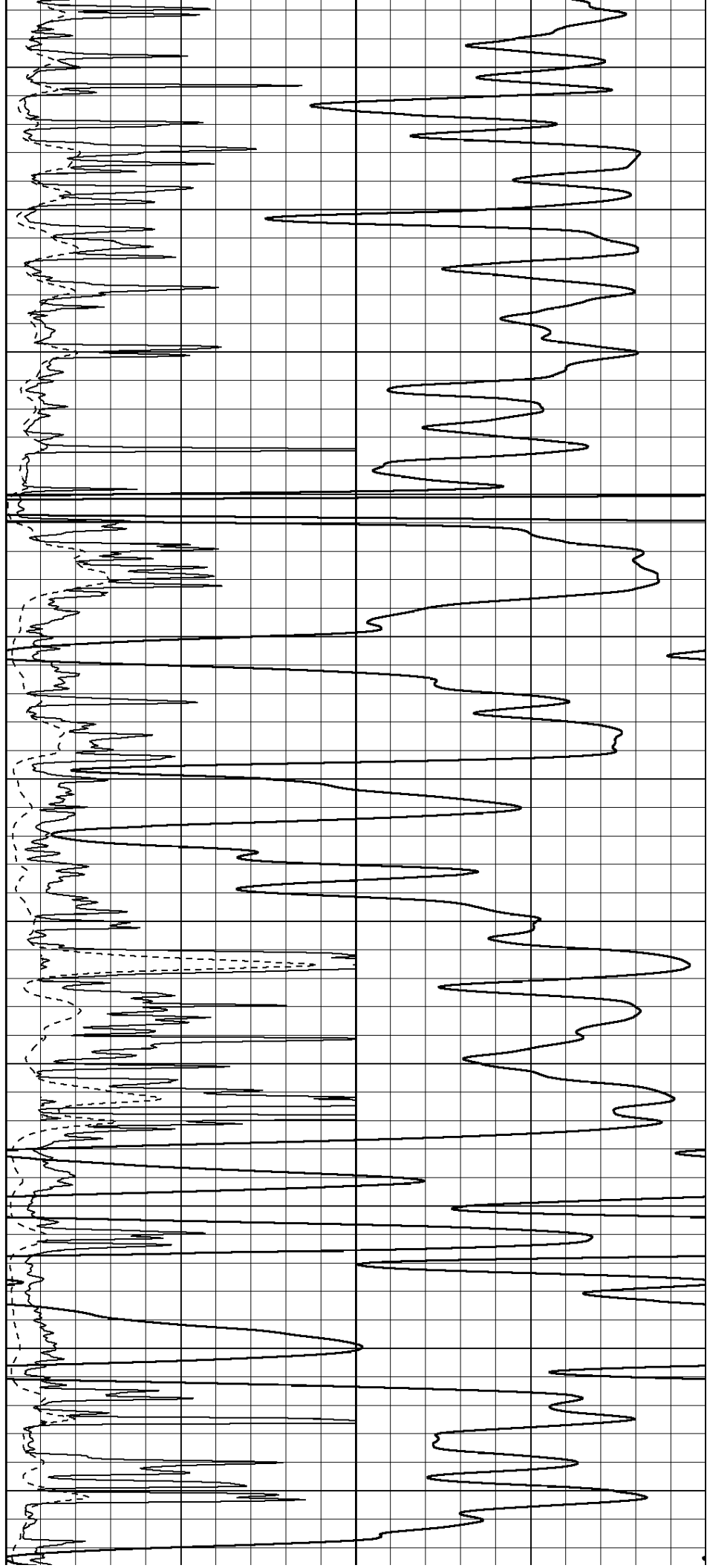
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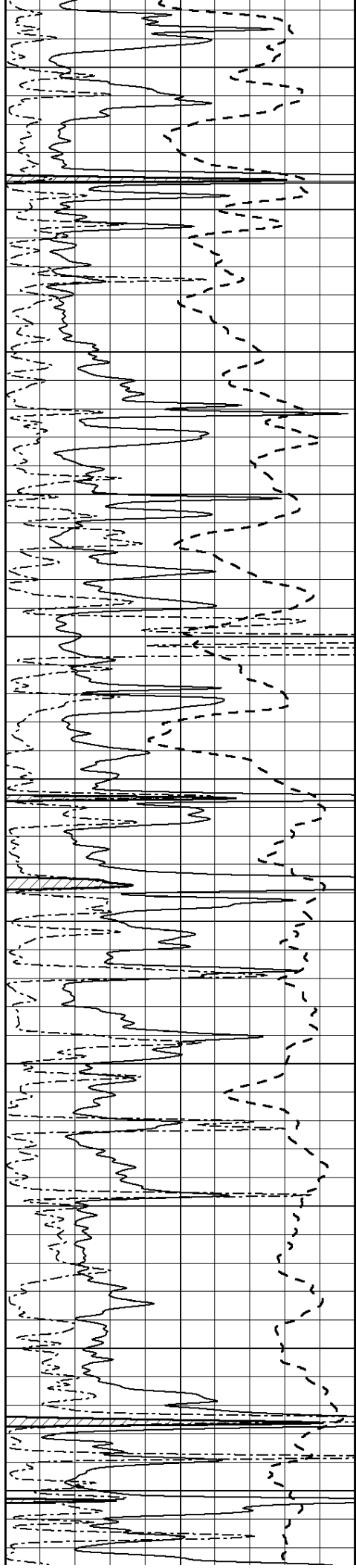
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3600

3650

3700





3750

3800

3850

3900

3950

4000

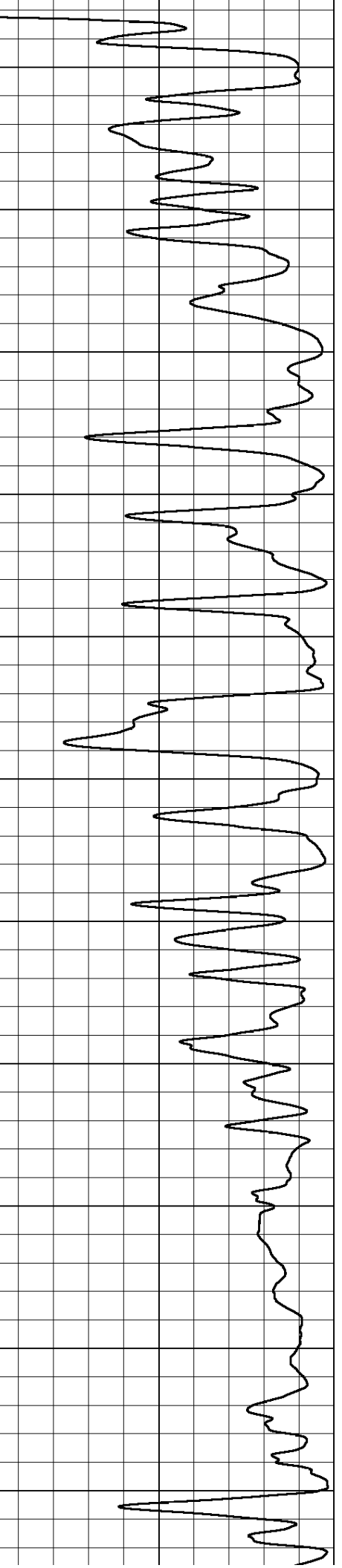
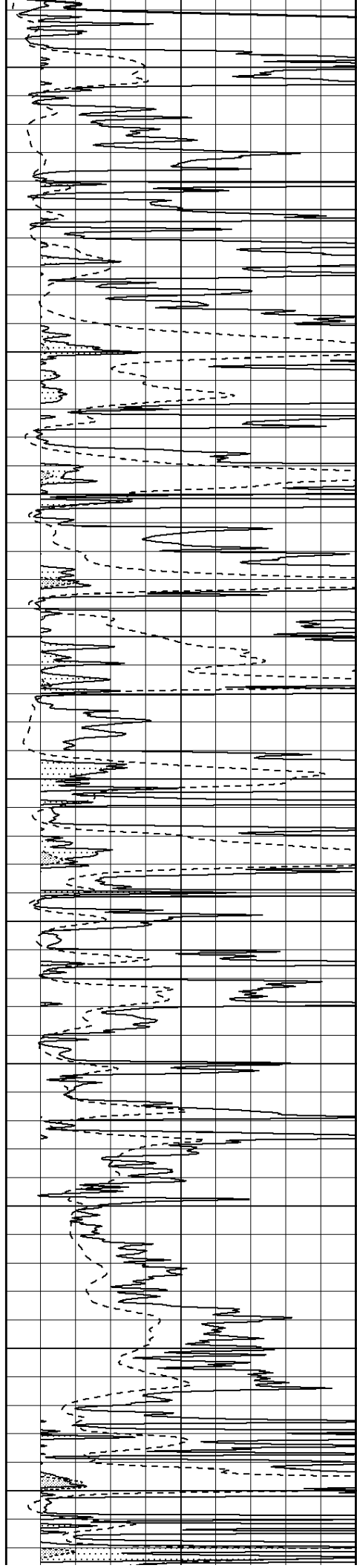
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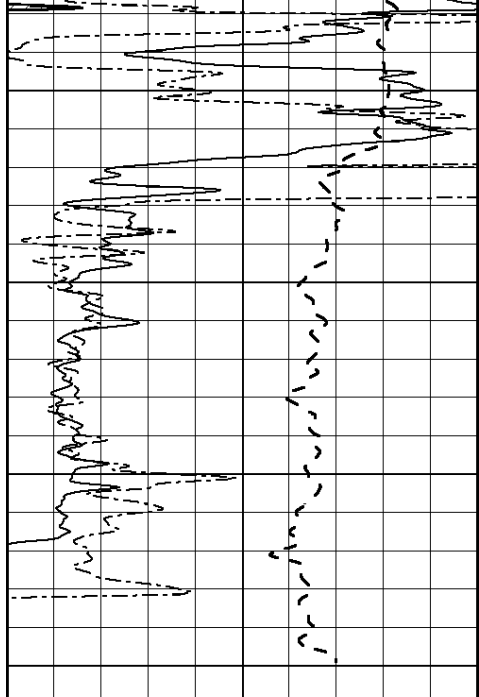
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4150

4200

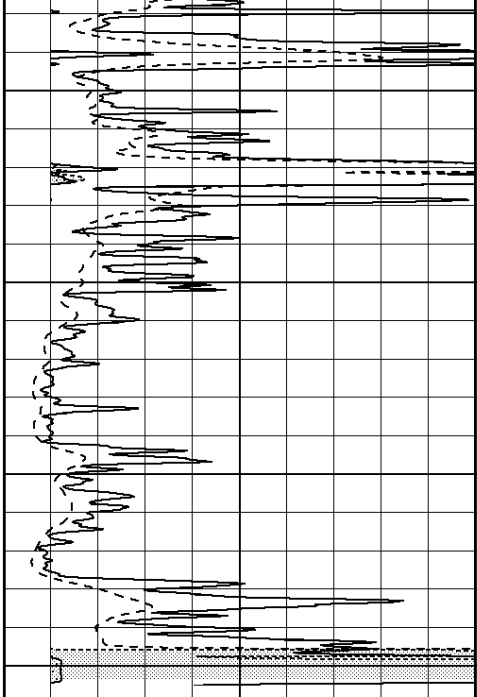
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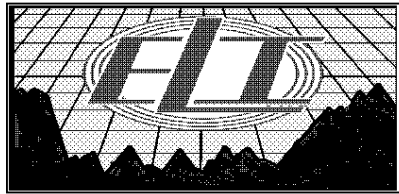
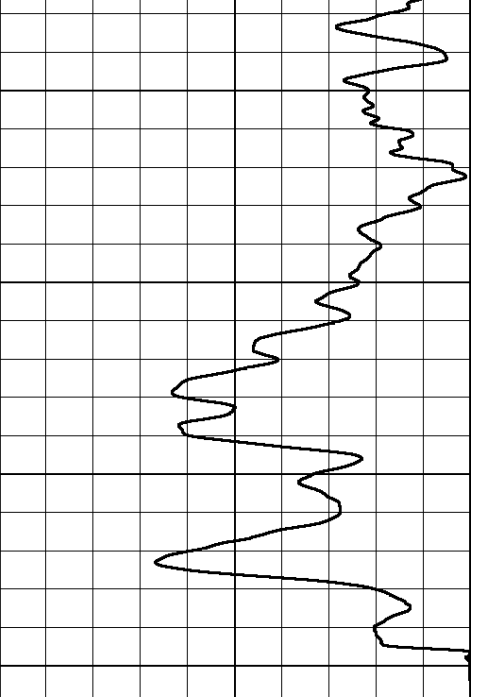


0	Gamma Ray (GAPI)	150
-100	SP (mV)	100
0	RWA (Ohm-m)	1

4300
4350
4400
4450



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

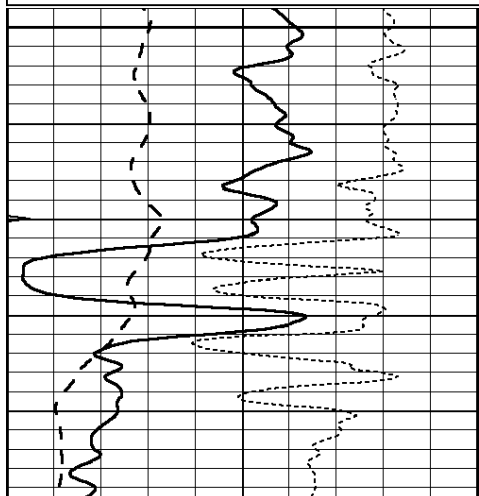


ANHYDRITE

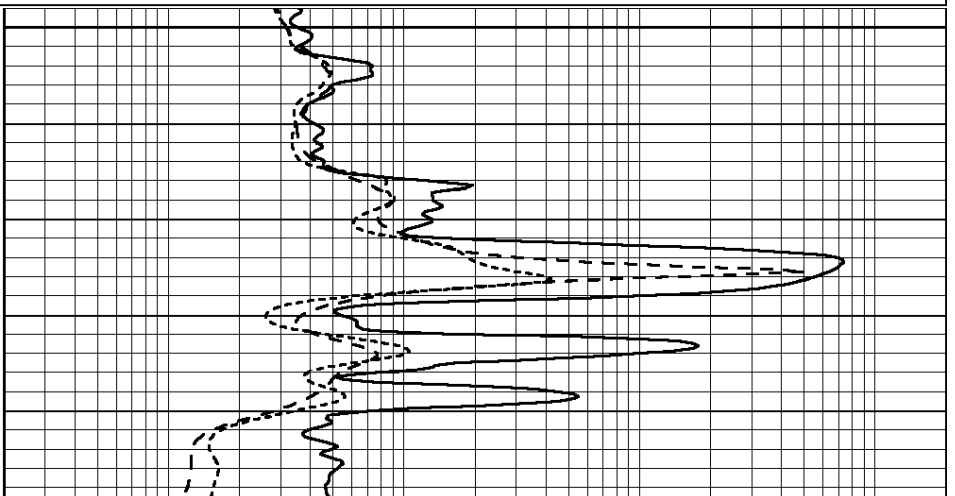
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 Presentation Format: _dil
 Dataset Creation: Sat Sep 30 21:02:32 2017
 Charted by: Depth in Feet scaled 1:240

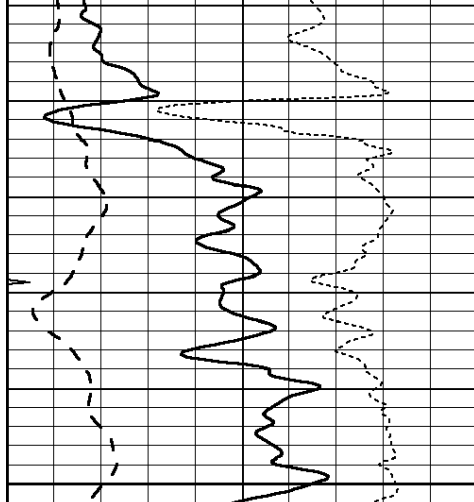
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

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



1450

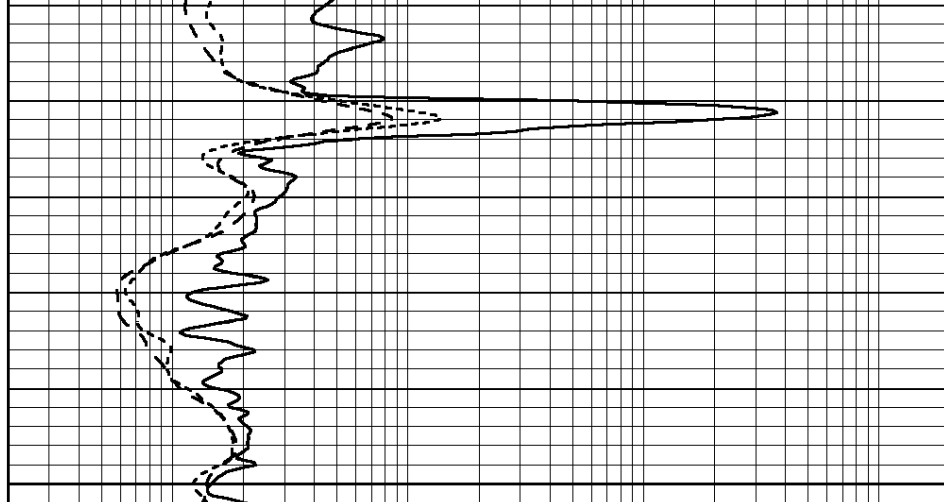




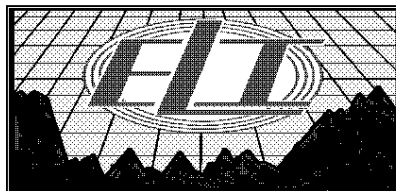
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

1500

1550



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

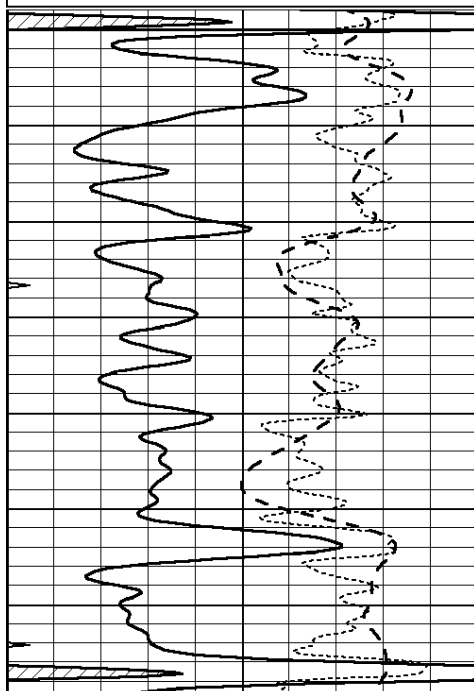


MAIN SECTION

Database File: 1831pe.db
 Dataset Pathname: pass3.9M
 Presentation Format: _dil
 Dataset Creation: Sat Sep 30 21:02:15 2017
 Charted by: Depth in Feet scaled 1:240

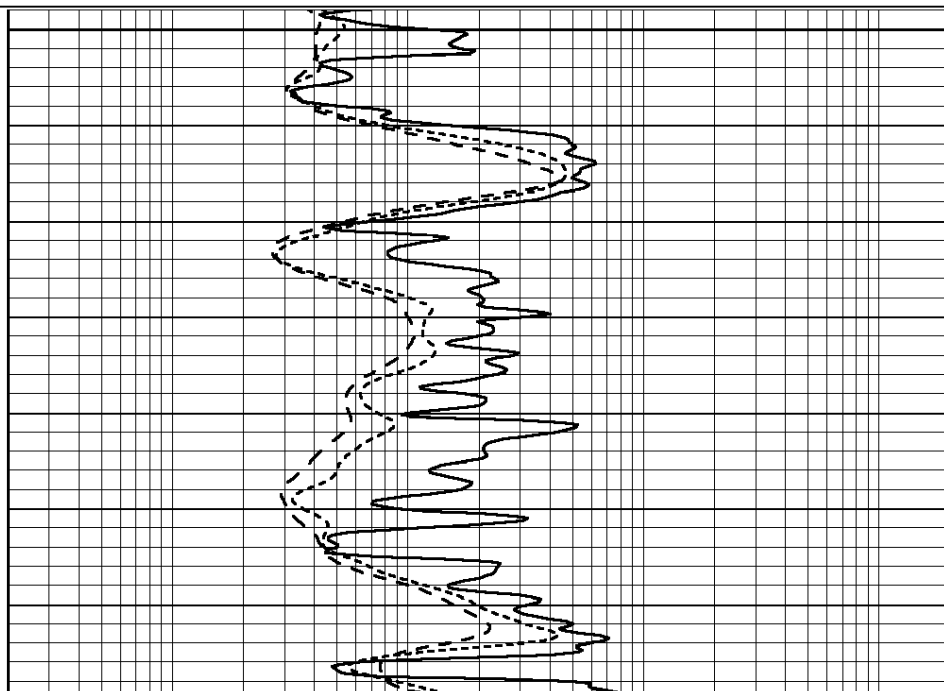
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

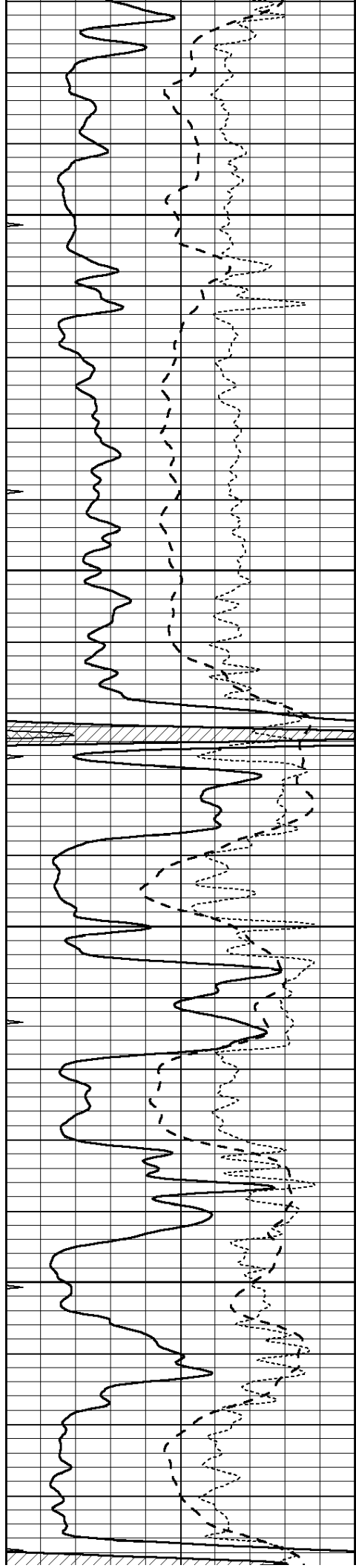
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000



3500

3550



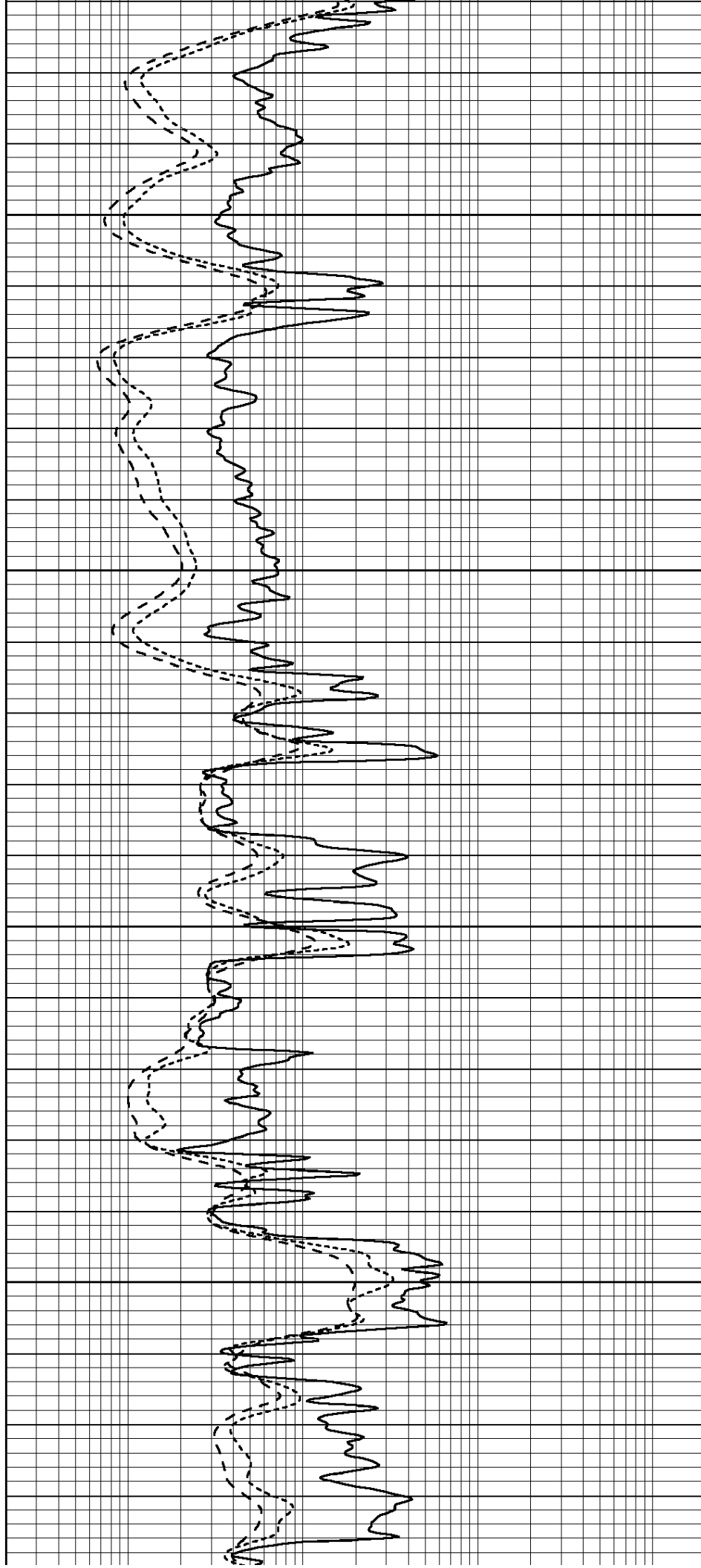


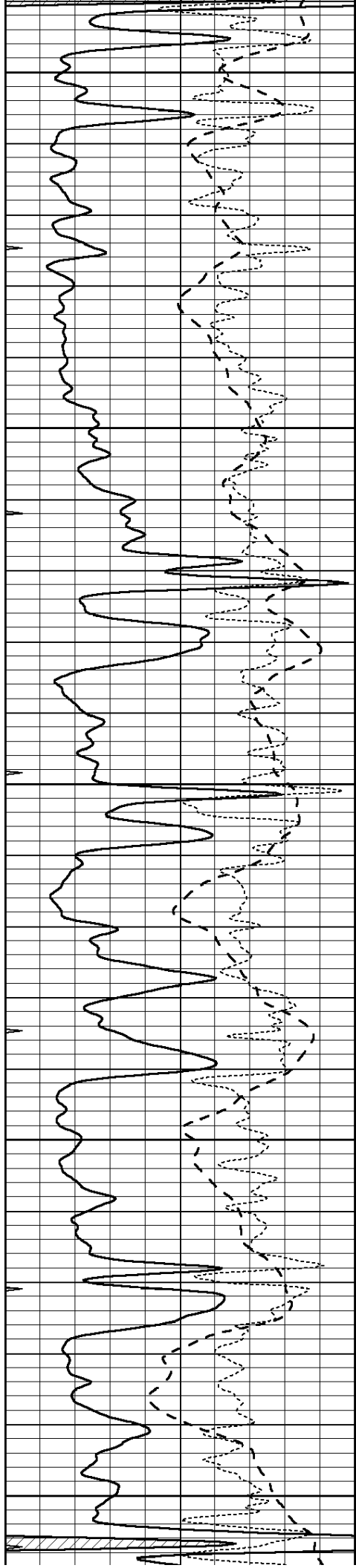
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3650

3700

3750





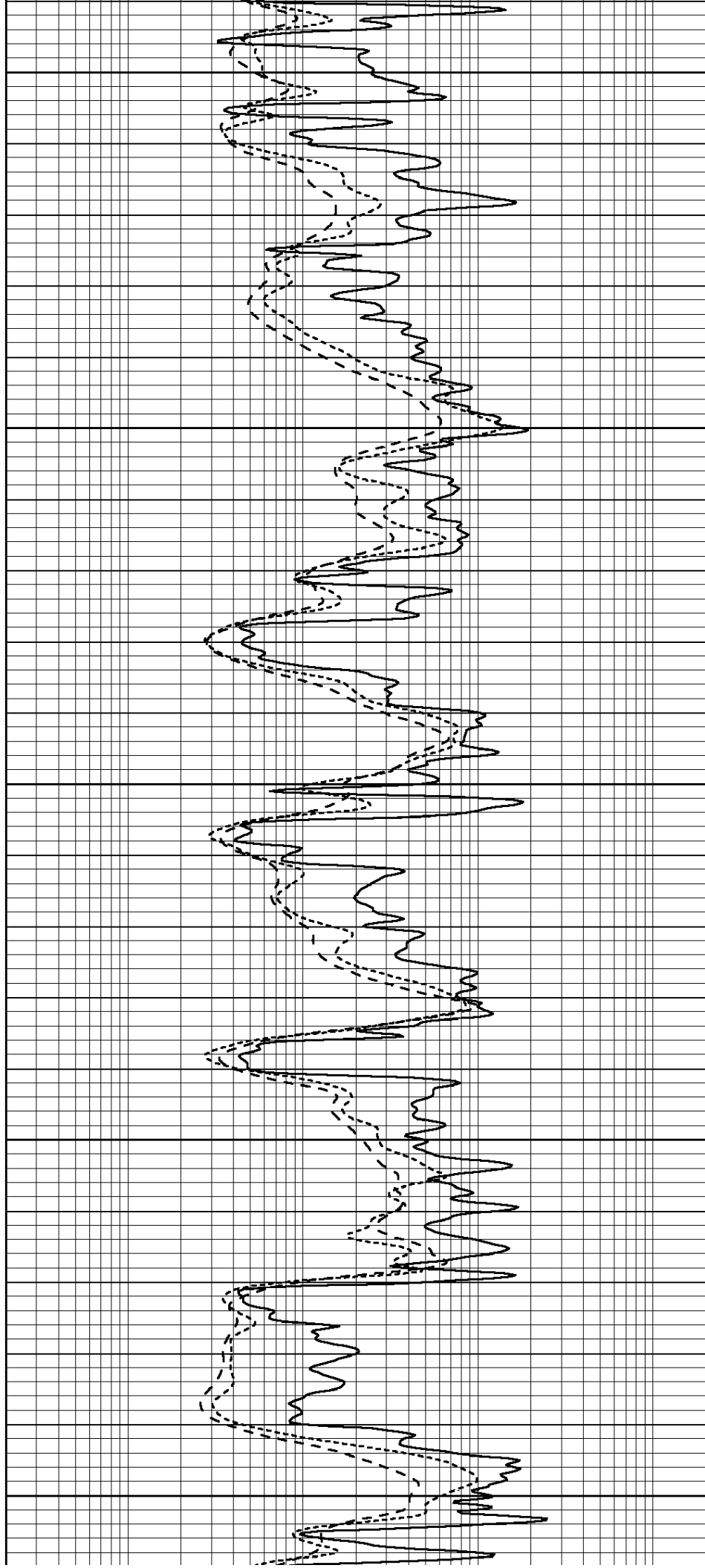
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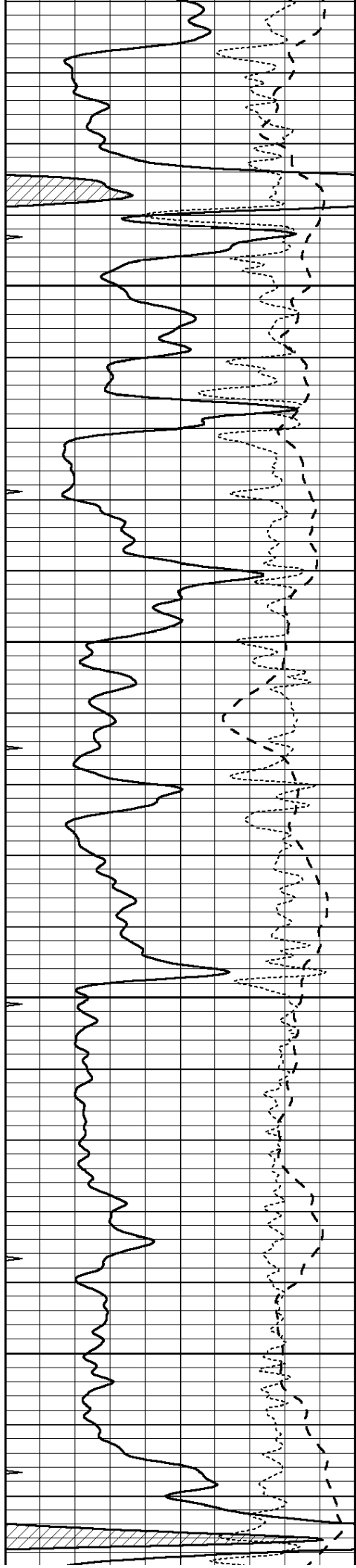
3850

3900

3950

4000



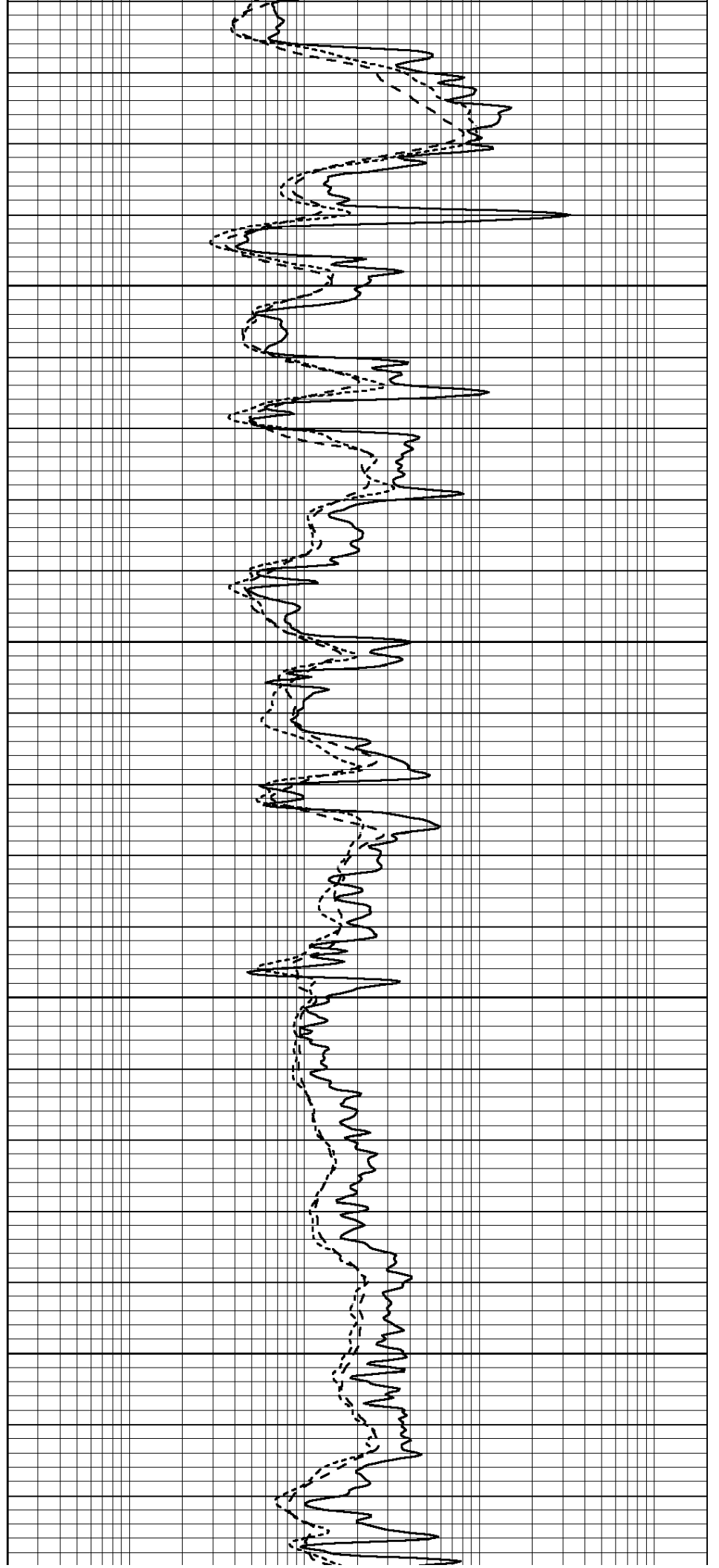


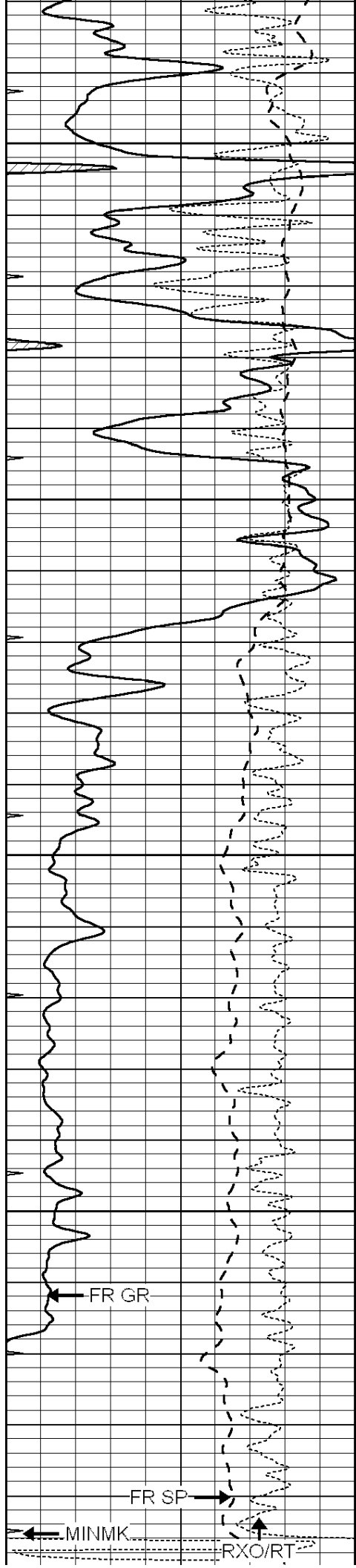
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4100

4150

4200





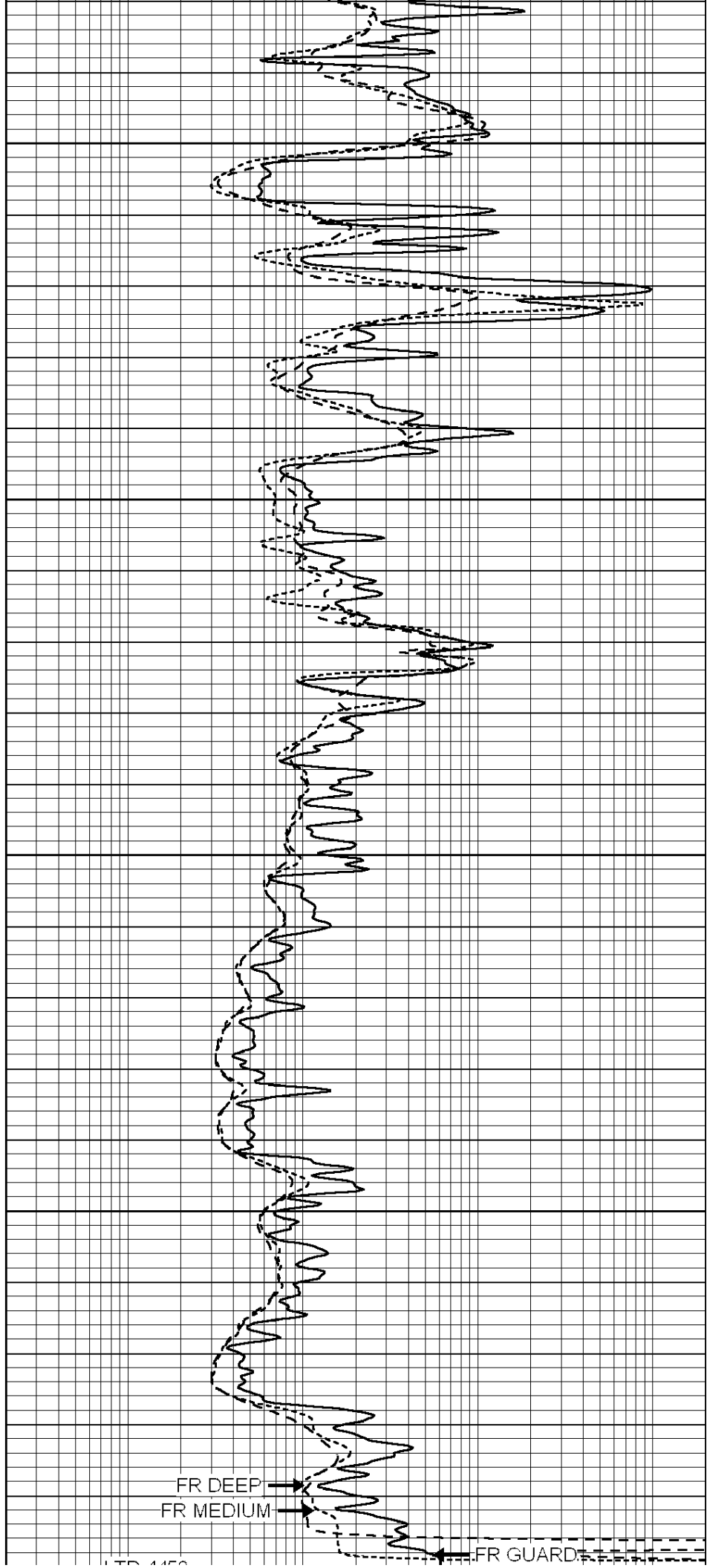
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4300

4350

4400

4450

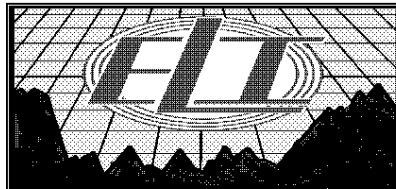


UTD 1150

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

4450

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

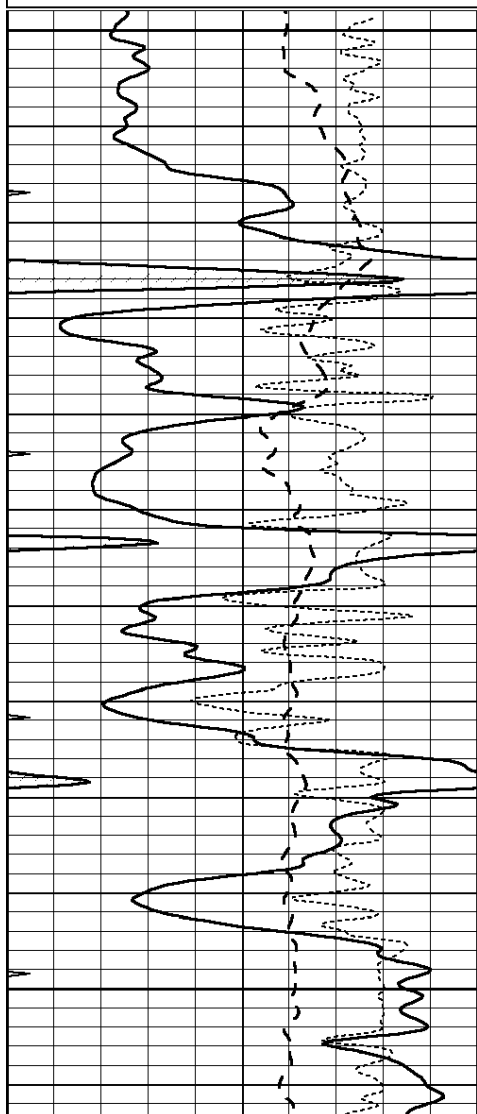


REPEAT SECTION

Database File: 1831pe.db
 Dataset Pathname: pass2.4
 Presentation Format: _dil
 Dataset Creation: Sat Sep 30 20:00:55 2017
 Charted by: Depth in Feet scaled 1:240

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

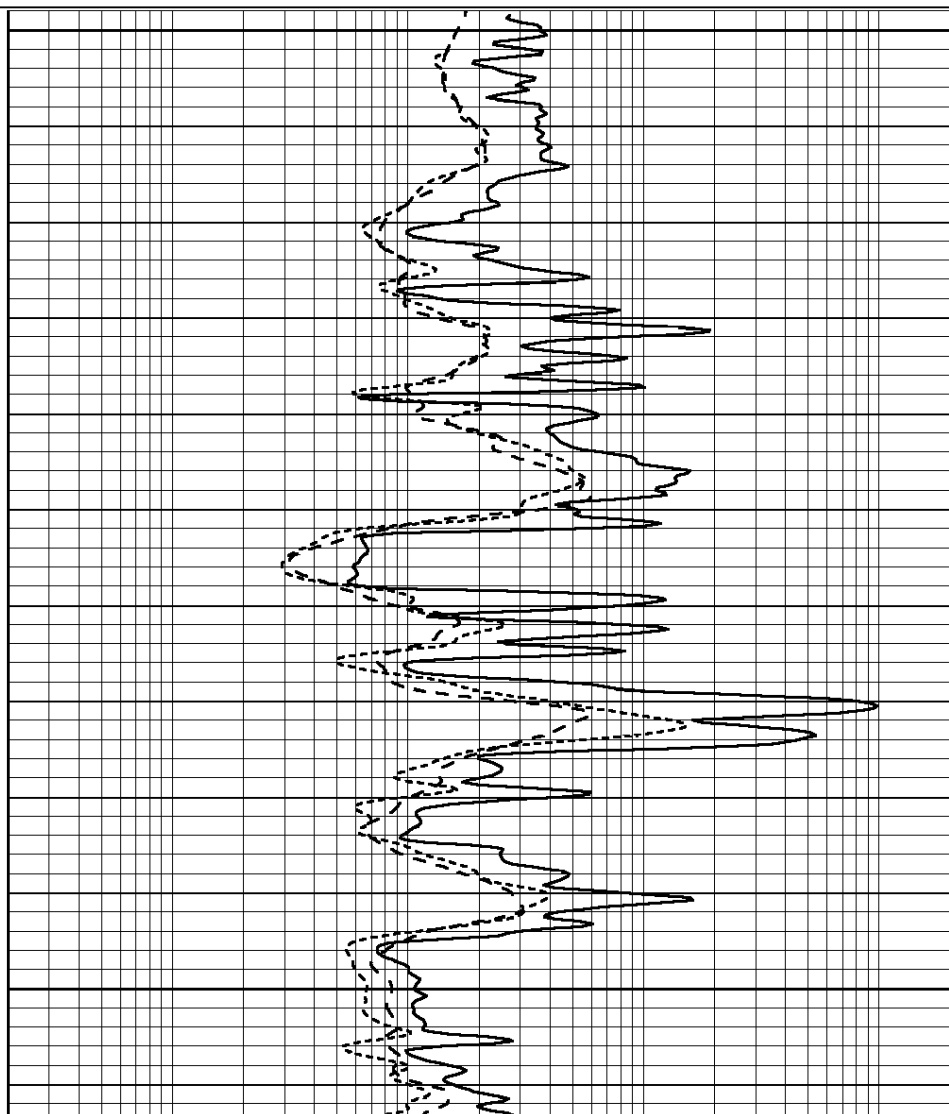
0.2	SHALLOW GUARD (Ohm-m)	2000
0.2	DEEP INDUCTION (Ohm-m)	2000
0.2	MEDIUM INDUCTION (Ohm-m)	2000

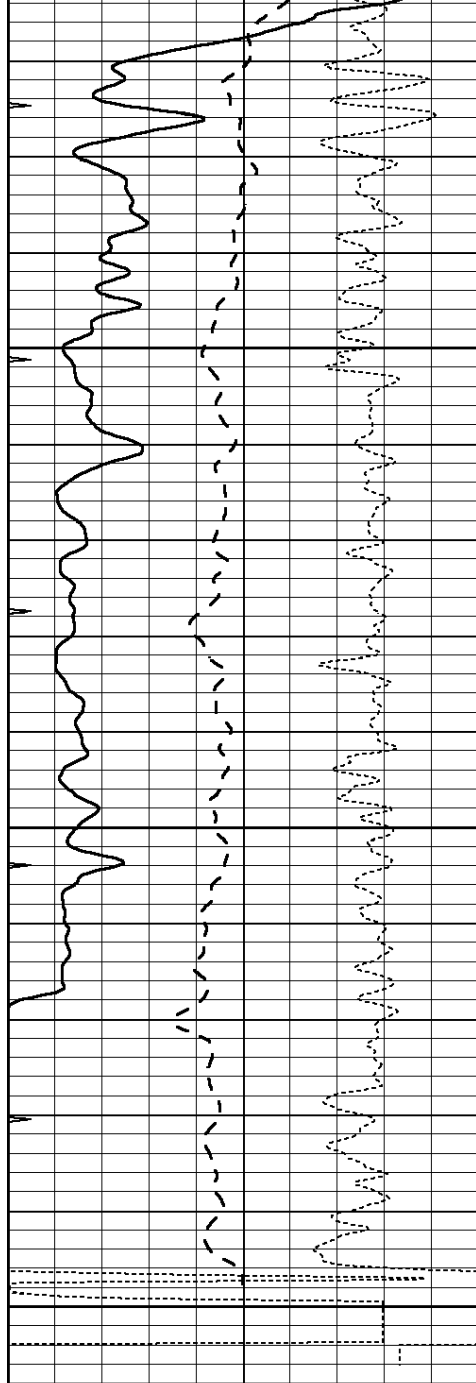


4200

4250

4300



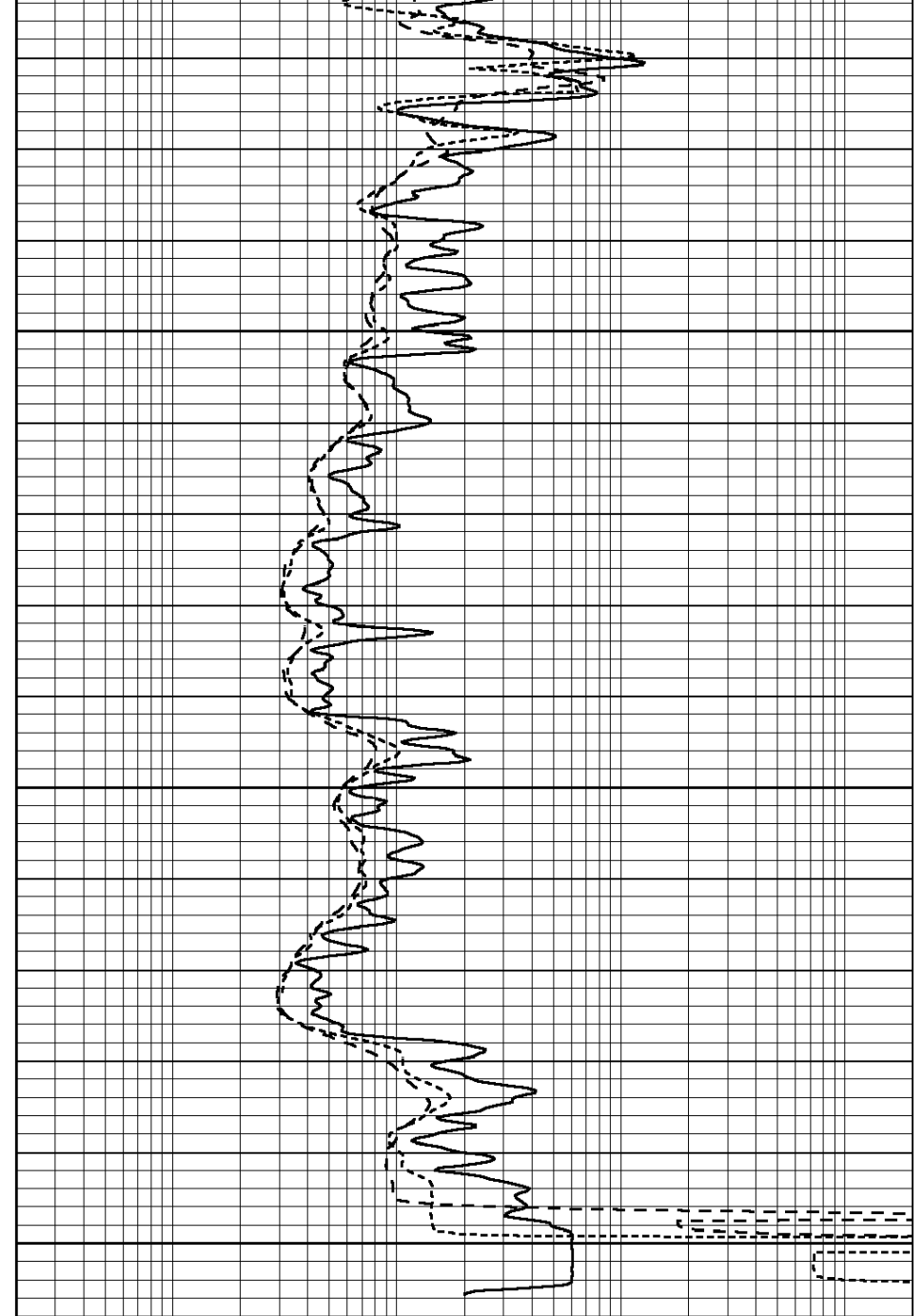


4350

4400

4450

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: 1598ddn.db
 Dataset Pathname: pass4
 Dataset Creation: Wed Aug 30 02:13:00 2017 by Log SOC 120430

Dual Induction Calibration Report

Serial-Model: PROBE7-DILG
 Surface Cal Performed: Wed Aug 30 00:06:33 2017
 Downhole Cal Performed: Mon Jul 28 12:02:56 2008
 After Survey Verification Performed: Mon Jul 28 12:02:56 2008

Surface Calibration

Readings

References

Results

Readings			References			Results		
Loop:	Air	Loop		Air	Loop		m	b
Deep	-0.014	0.629	V	0.000	400.000	mmho/m	620.000	0.000
Medium	0.039	0.728	V	0.000	464.000	mmho/m	675.000	-44.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.610	V	0.000	400.000	mmho/m	667.135	-7.256
Medium	0.005	0.712	V	0.000	464.000	mmho/m	655.677	-3.102

Downhole Calibration								
Readings			References			Results		
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	14.508	388.384	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	166.367	504.400	mmho/m	1.000	0.000
LL3		7.500	V		1400.000	Ohm-m		
		0.000	V		20.000	Ohm-m		
		-7.200	V		4000.000	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		

Litho Density Calibration Report
Serial: 002 Model: PRB

Master Calibration					Performed Mon Aug 21 11:27:42 2017				
	Background		Magnesium		Aluminum		Sandstone		
Window 1	837.1		10632.5		2945.1		12110.1		cps
Window 2	772.0		9117.4		2570.1		10197.3		cps
Window 3	631.7		4669.0		1481.9		5042.9		cps
Window 4	187.0		187.5		185.9		189.9		cps
Long Space	0.0		8345.4		1798.1		9425.3		cps
Short Space	1.1		1927.9		1285.9		2050.2		cps
Rho			1.7100		2.5960		1.3800		g/cc
Pe			0.0000		2.5700		1.5500		
Rib Angle	: 45.2		Rib Slope	: 1.008	Density/Spine Ratio		: 0.558		
Spine Angle	: 75.2		Spine Slope	: 3.790	Spine Intercept		: -19.6		

Before Survey Verification					Performed Wed Dec 31 18:00:00 1969				
	Background		Magnesium		Aluminum		Sandstone		
Window 1	0.0		0.0		0.0		0.0		cps
Window 2	0.0		0.0		0.0		0.0		cps
Window 3	0.0		0.0		0.0		0.0		cps
Window 4	0.0		0.0		0.0		0.0		cps
Long Space	0.0		0.0		0.0		0.0		cps
Short Space	0.0		0.0		0.0		0.0		cps
Measured Rho			0.0000		0.0000		0.0000		g/cc
Measured Correction			0.0000		0.0000		0.0000		g/cc
Measured Pe					0.0000		0.0000		

After Survey Verification Performed Wed Dec 31 18:00:00 1969

Window 1	0.0	0.0	0.0	0.0	cps
Window 2	0.0	0.0	0.0	0.0	cps
Window 3	0.0	0.0	0.0	0.0	cps
Window 4	0.0	0.0	0.0	0.0	cps
Long Space	0.0	0.0	0.0	0.0	cps
Short Space	0.0	0.0	0.0	0.0	cps
Measured Rho		0.0000	0.0000	0.0000	g/cc
Measured Correction		0.0000	0.0000	0.0000	g/cc
Measured Pe			0.0000	0.0000	

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: 070558
Tool Model: OPEN_GR
Performed: Wed May 31 00:09:32 2017

Calibrator Value: 1.0 GAPI
Background Reading: 0.0 cps
Calibrator Reading: 1.0 cps
Sensitivity: 0.2800 GAPI/cps