



DUAL INDUCTION LOG

Company MULL DRILLING COMPANY, INC.
 Well MUCHMORE-THORNBURG UNIT #1-34
 Field CHAPMAN
 County GOVE State KANSAS

Location: API #: 15-063-22336-0000
 2445' FNL & 2130' FEL
 SE - SW - SW - NE
 Permanent Datum GROUND LEVEL Elevation 2558
 Log Measured From KELLY BUSHING 7' A.G.L.
 Drilling Measured From KELLY BUSHING
 SEC 34 TWP 15S RGE 26W
 Other Services
 CDL/CNL/PE
 MEL/SONIC
 Elevation
 K.B. 2565
 D.F. 2563
 G.L. 2558

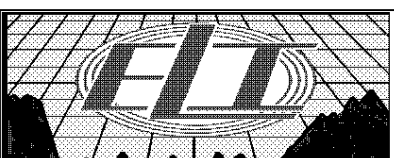
Date	10/17/19
Run Number	ONE
Depth Driller	4580
Depth Logger	4579
Bottom Logged Interval	4577
Top Log Interval	00
Casing Driller	8 5/8"@222'
Casing Logger	222
Bit Size	7 7/8"
Type Fluid in Hole	CHEMICAL MUD
Density / Viscosity	9.25/1
pH / Fluid Loss	10.0/7.6
Source of Sample	FLOWLINE
Rim @ Meas. Temp	.900@90F
Rmf @ Meas. Temp	.675@90F
Rmc @ Meas. Temp	1.08@90F
Source of Rmf / Rmc	MEASUREMENT
Rim @ BHT	.669@121F
Time Circulation Stopped	2 HOURS
Time Logger on Bottom	5:00 P.M.
Maximum Recorded Temperature	121F
Equipment Number	922339
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 ELI WIRELINE HAYS, KANSAS (785) 628-6395
 DIRECTIONS
 W. EDGE OF UTICA, KS. ON HWY 4, 4N., 1W., 1/2N., W. INTO



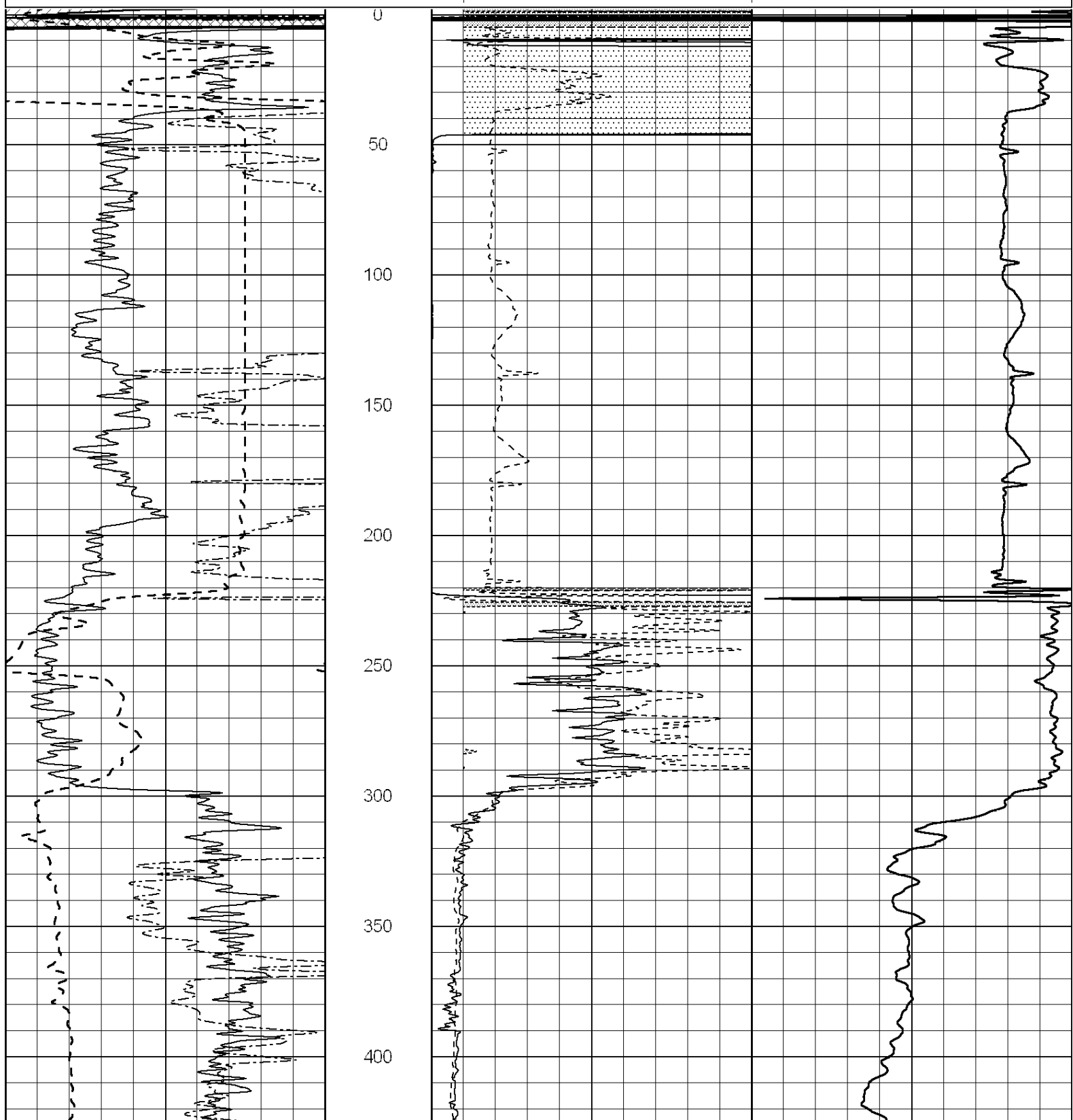
MAIN SECTION

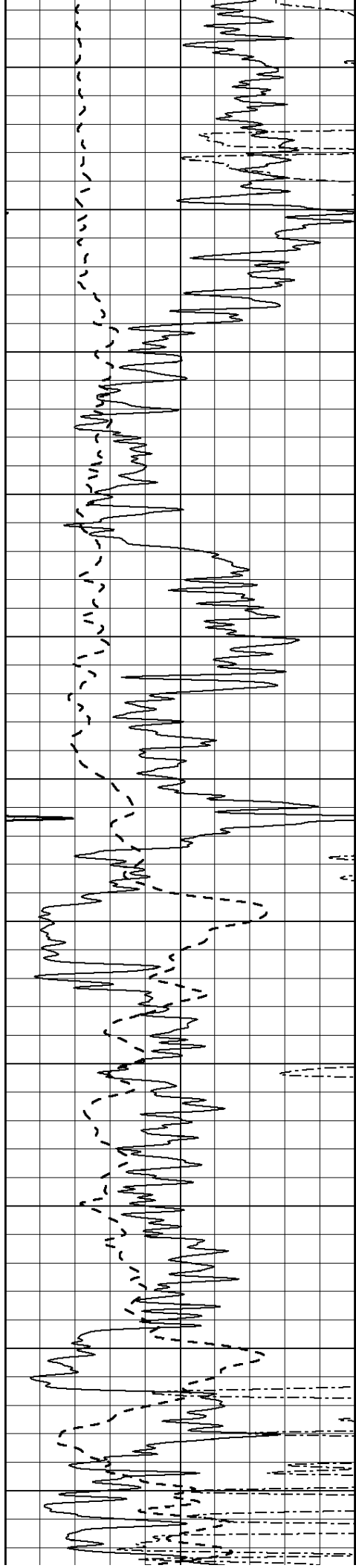
Database File: 3972pe.db
 Dataset Pathname: pass3.5
 Presentation Format: dil2
 Dataset Creation: Thu Oct 17 18:05:01 2019 by Calc SOC 120430
 Charted by: Depth in Feet scaled 1:600

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

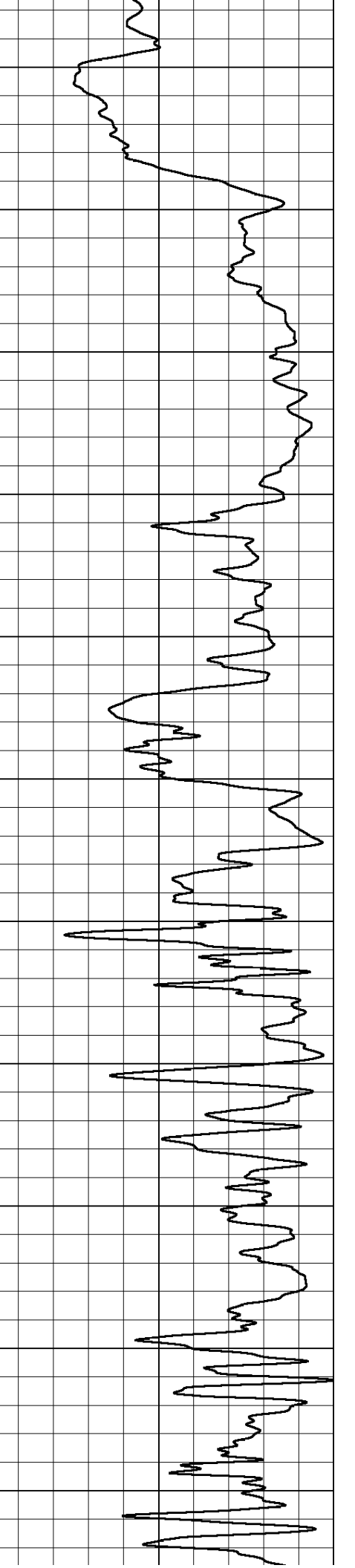
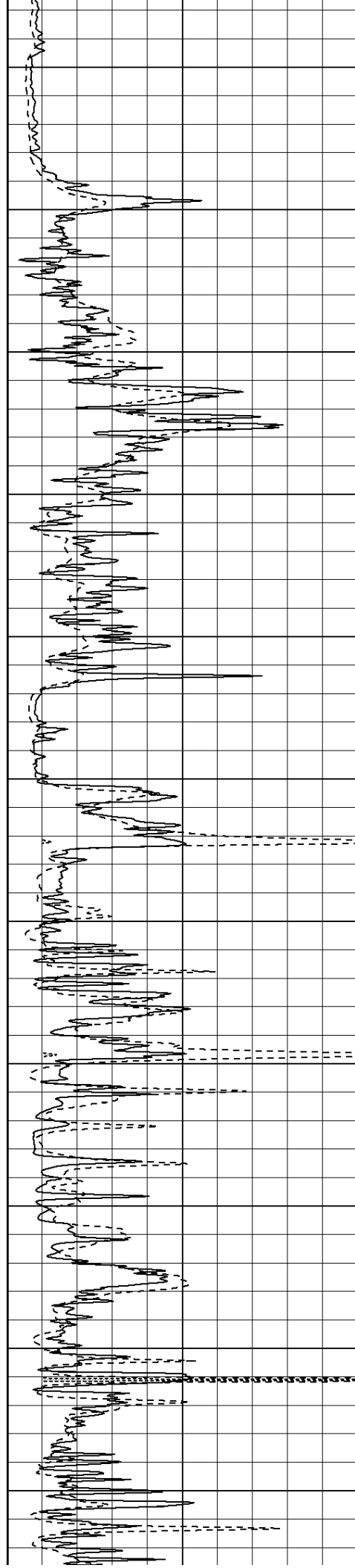
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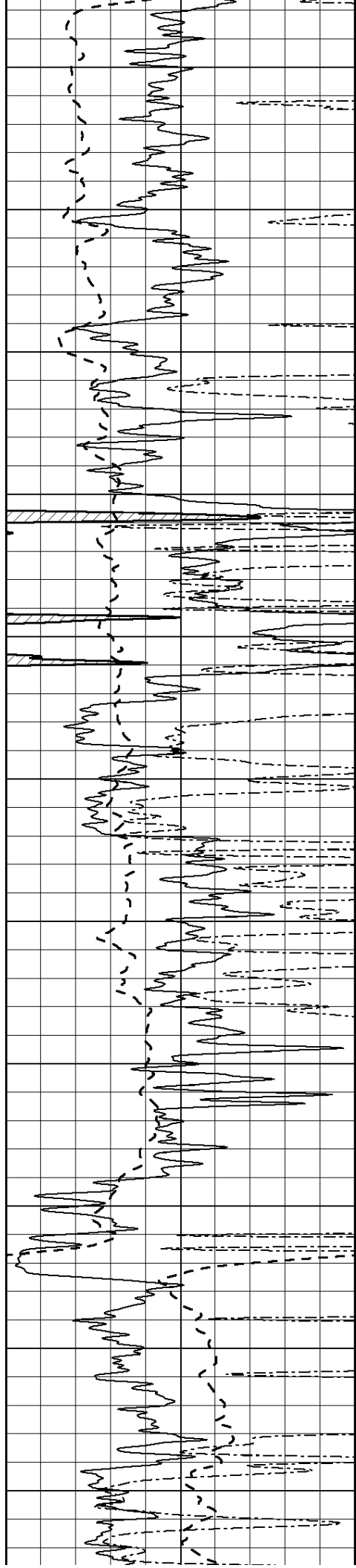
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850

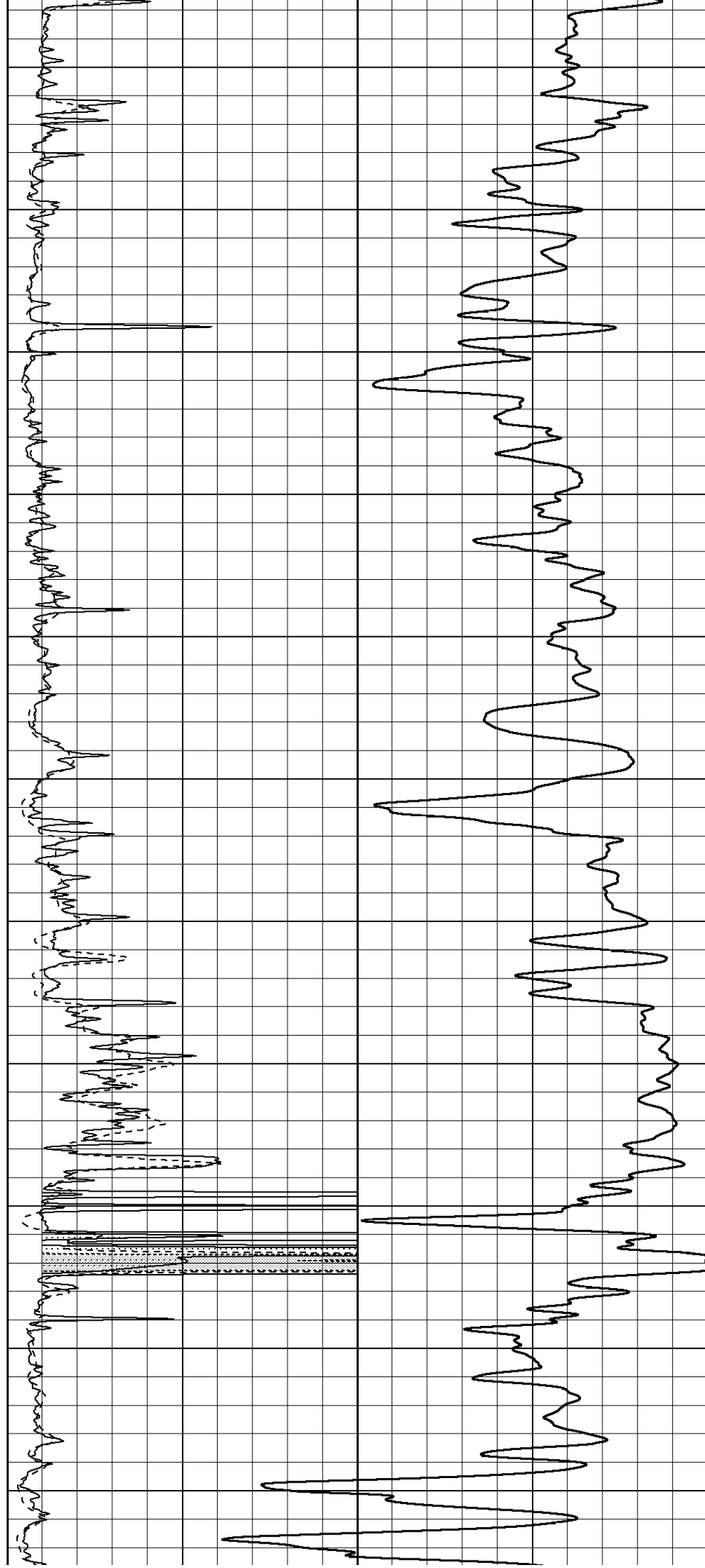
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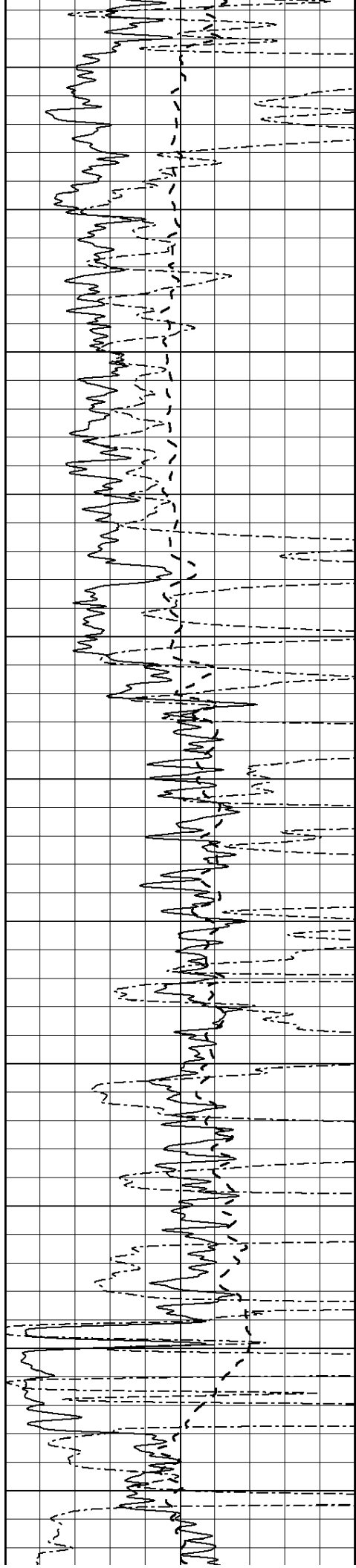
950





1000
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500





1550

1600

1650

1700

1750

1800

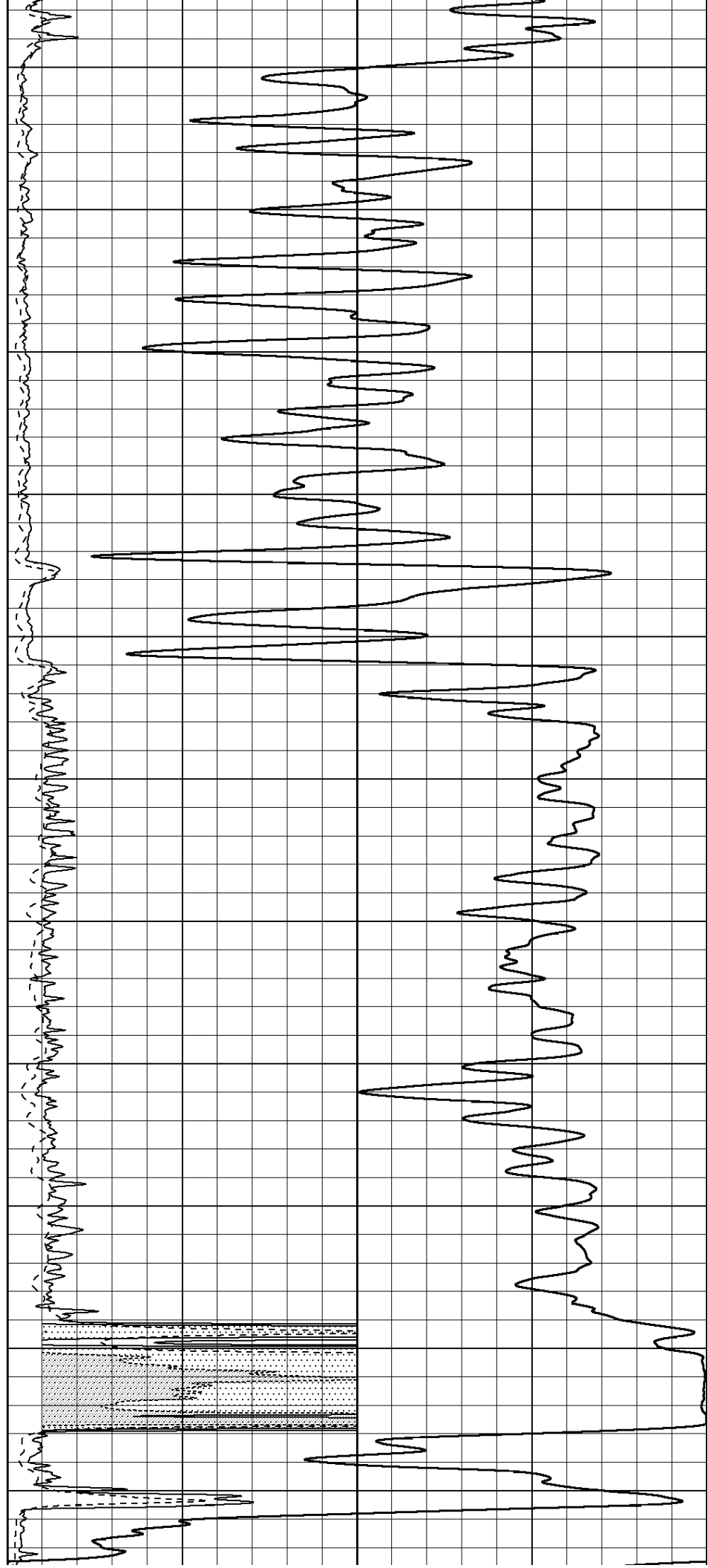
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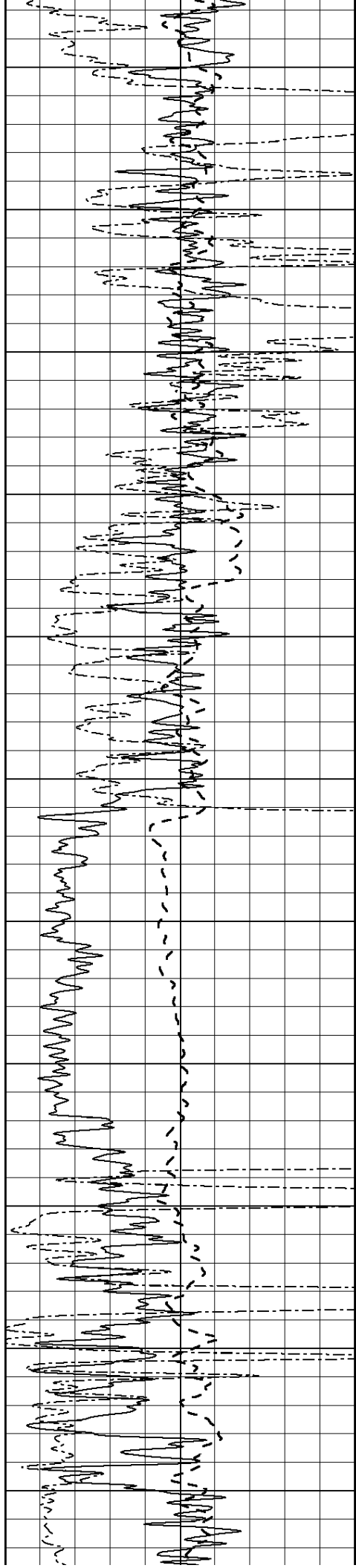
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1950

2000

2050





2100

2150

2200

2250

2300

2350

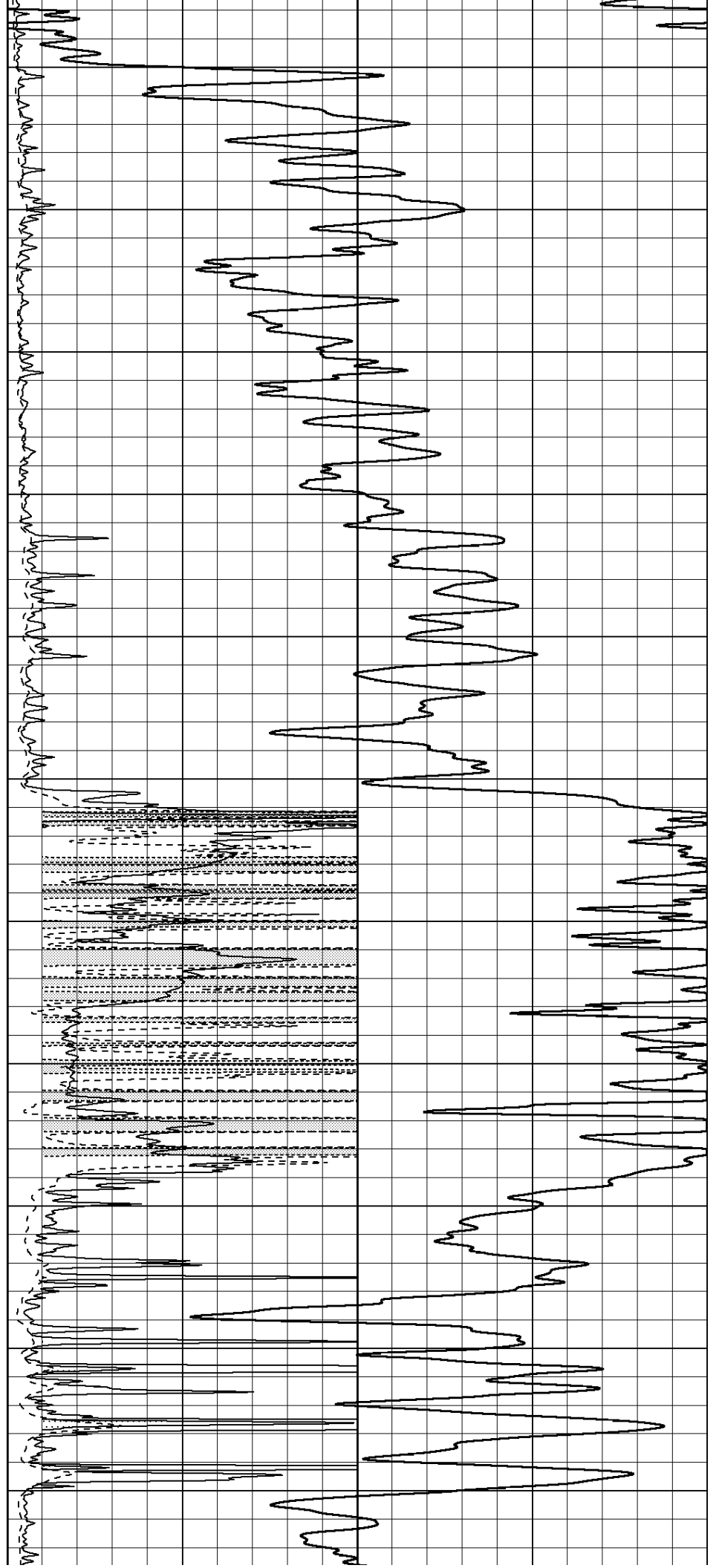
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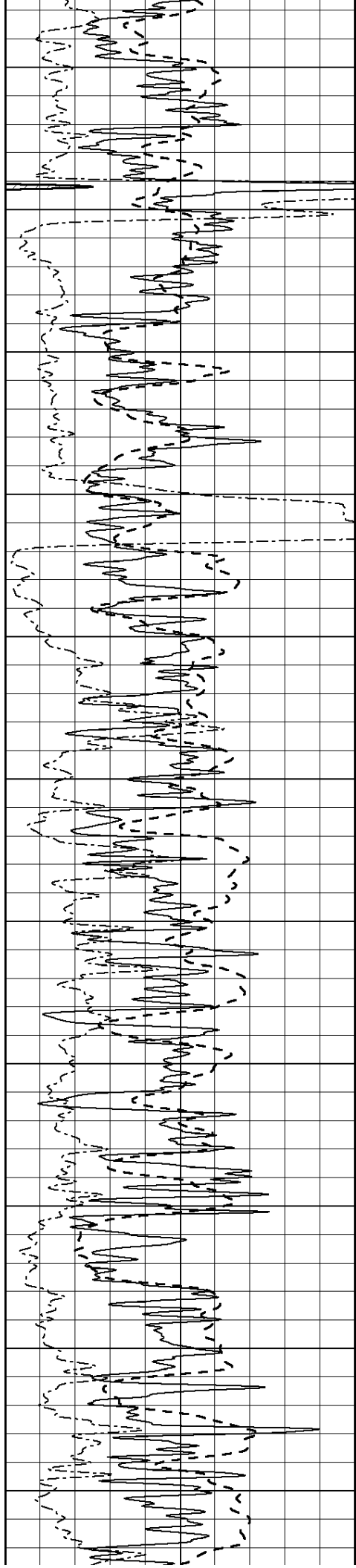
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2500

2550

2600





2650

2700

2750

2800

2850

2900

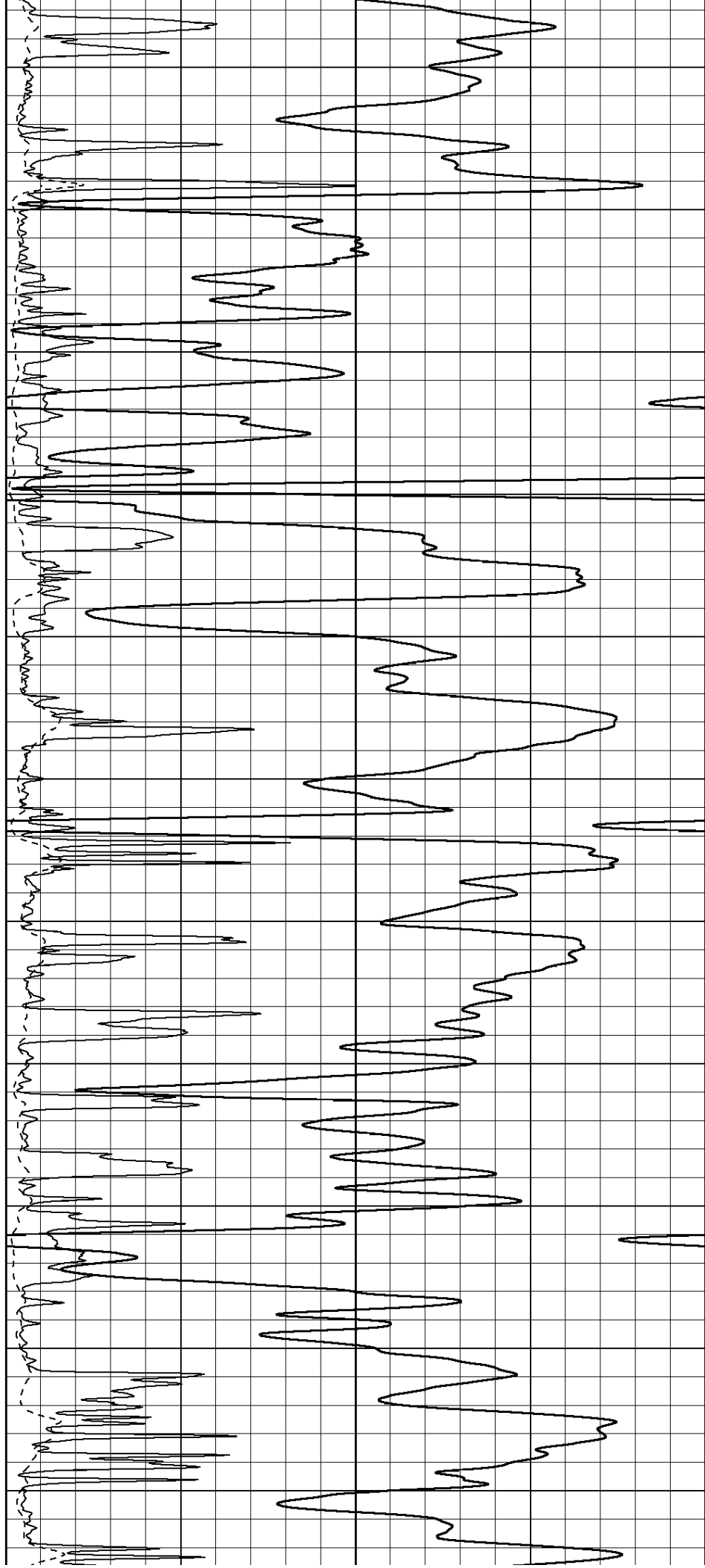
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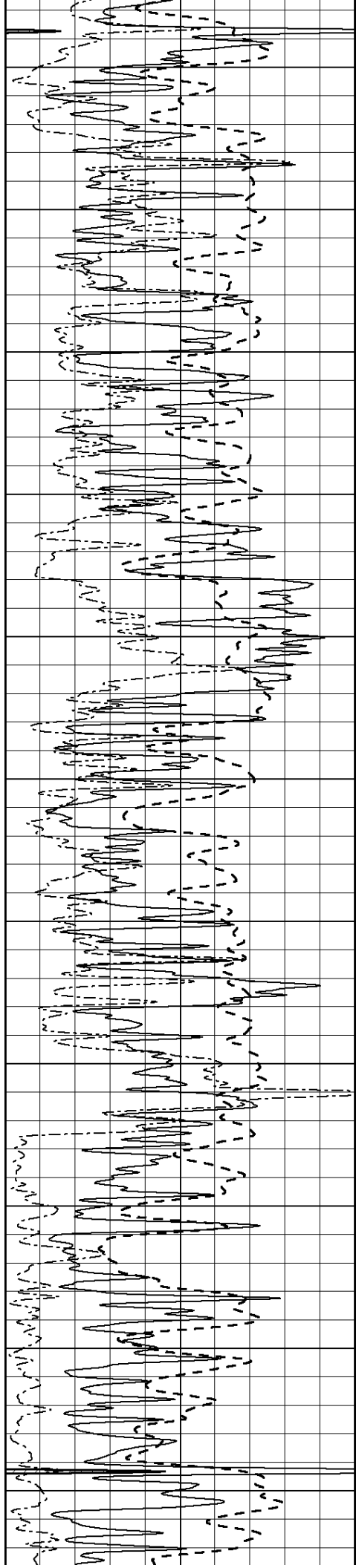
3000

3050

3100

3150





3200

3250

3300

3350

3400

3450

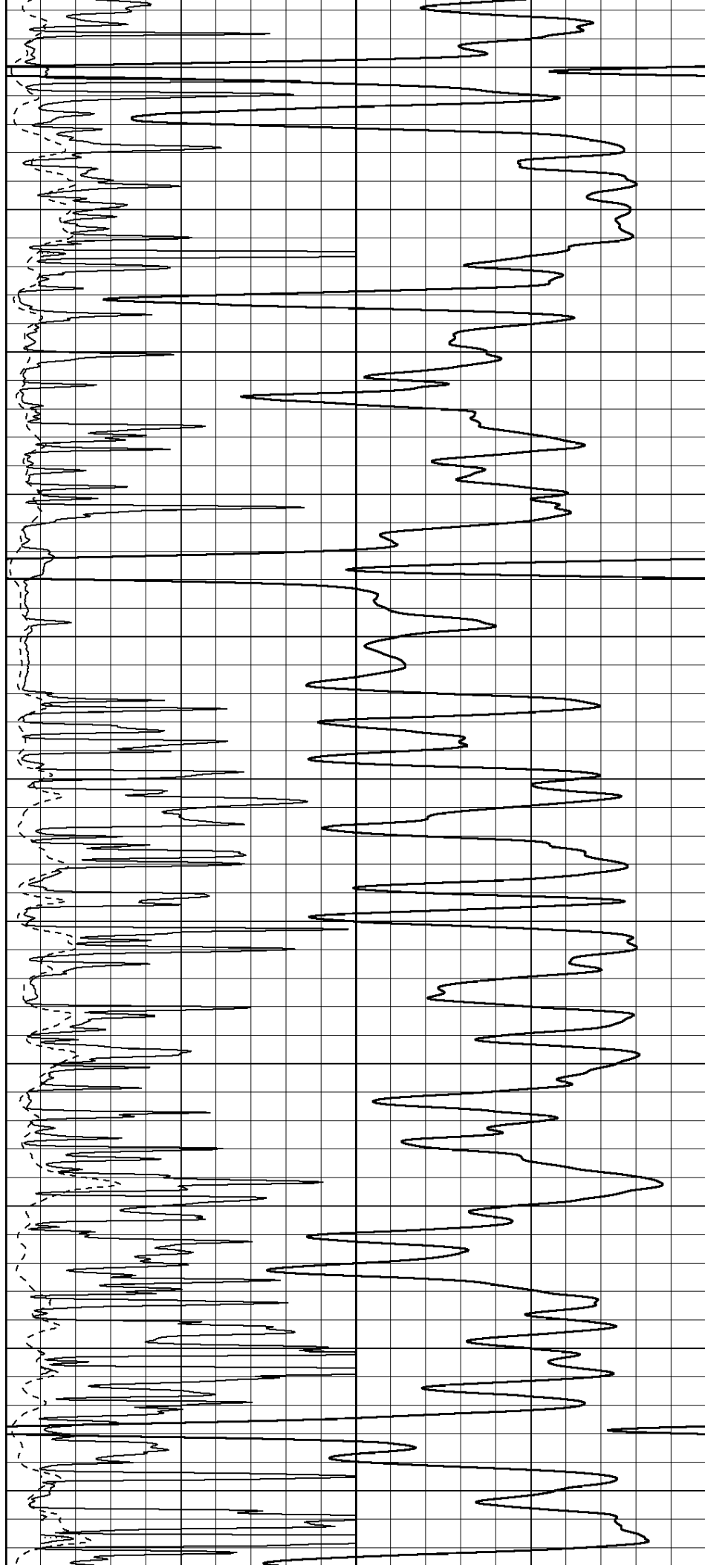
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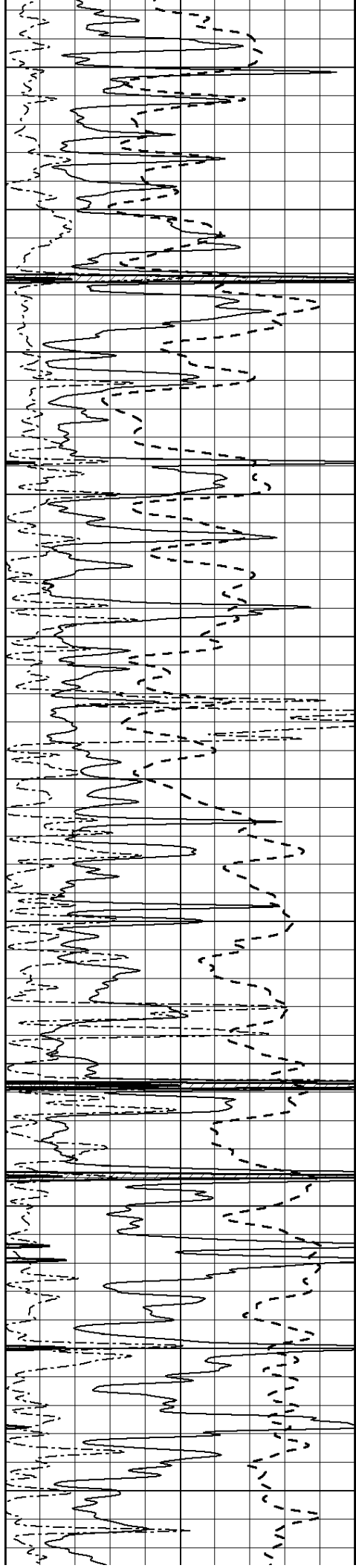
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3600

3650

3700





3750

3800

3850

3900

3950

4000

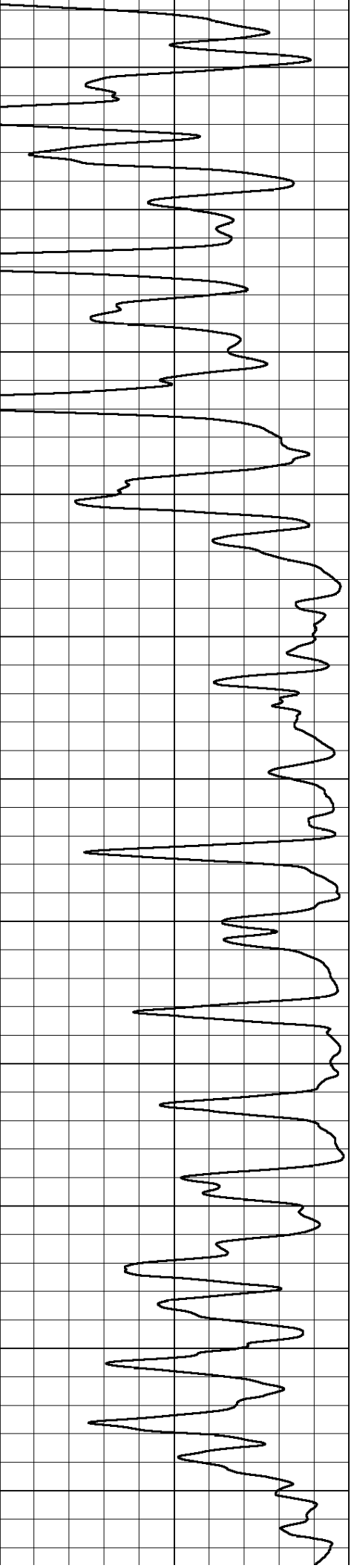
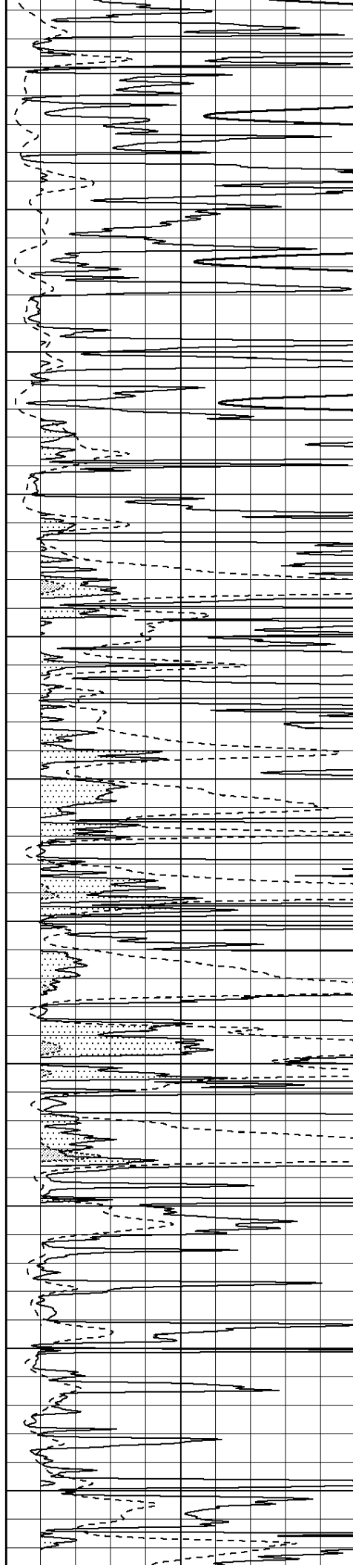
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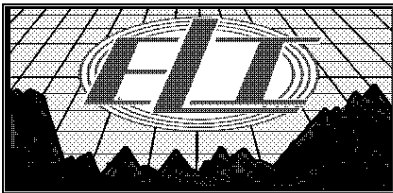
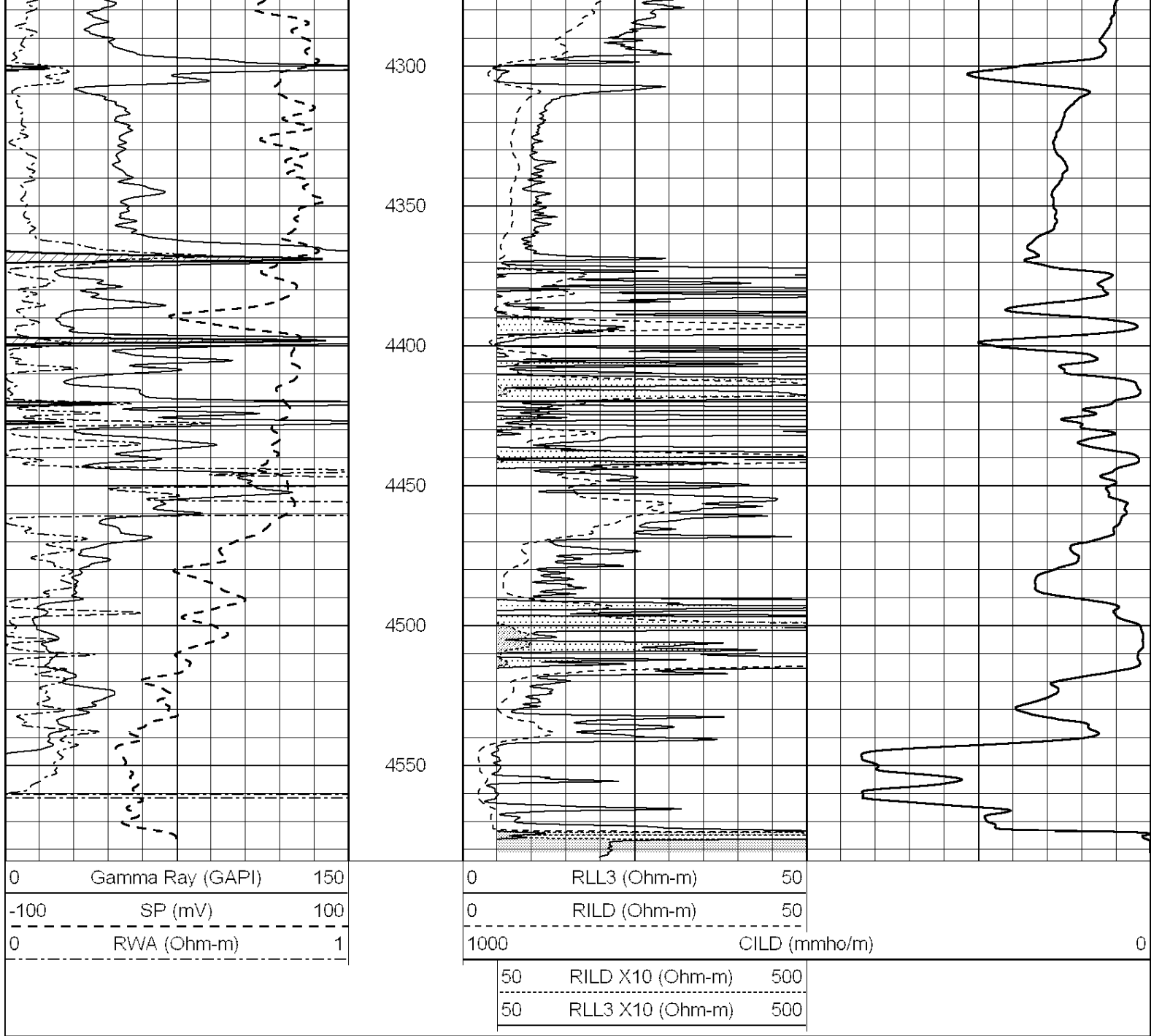
4100

4150

4200

4250

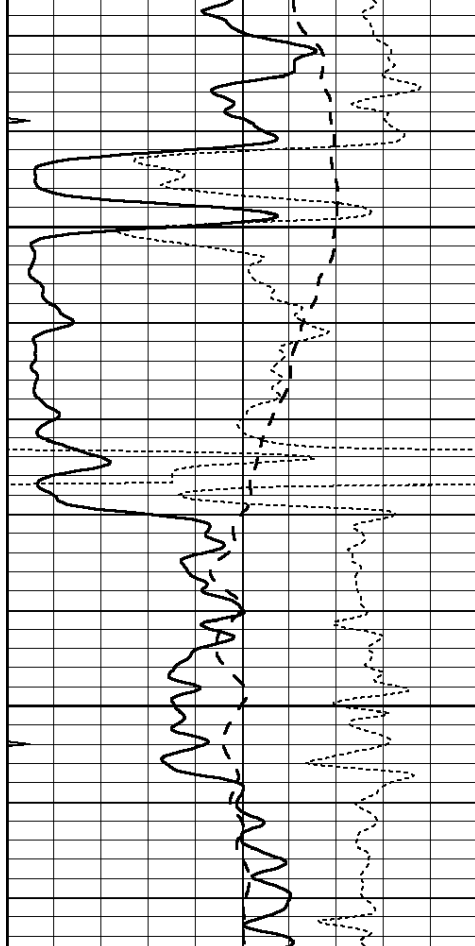




ANHYDRITE

Database File: 3972pe.db
 Dataset Pathname: pass3.6
 Presentation Format: _dil
 Dataset Creation: Thu Oct 17 18:06:55 2019 by Calc SOC 120430
 Charted by: Depth in Feet scaled 1:240

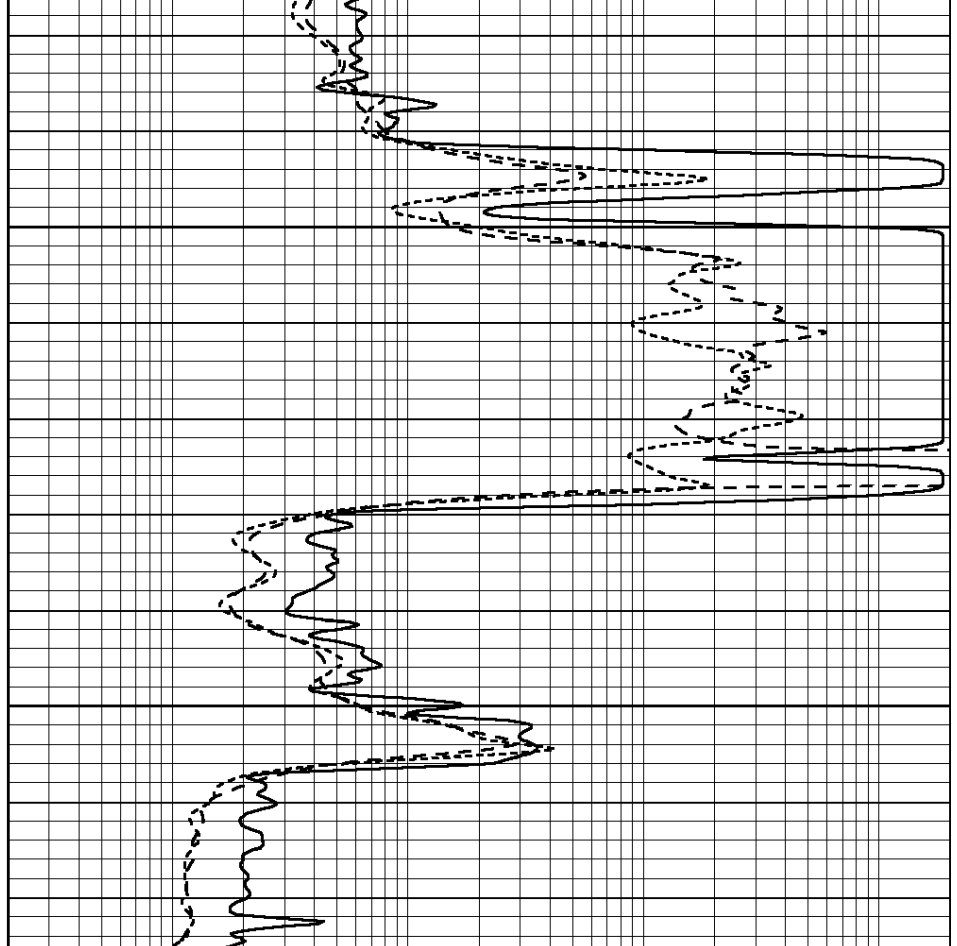
0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			



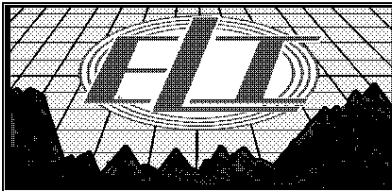
2000

2050

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

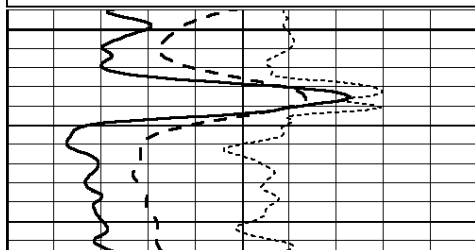


MAIN SECTION

Database File: 3972pe.db
 Dataset Pathname: pass3.5
 Presentation Format: _dil
 Dataset Creation: Thu Oct 17 18:05:01 2019 by Calc SOC 120430
 Charted by: Depth in Feet scaled 1:240

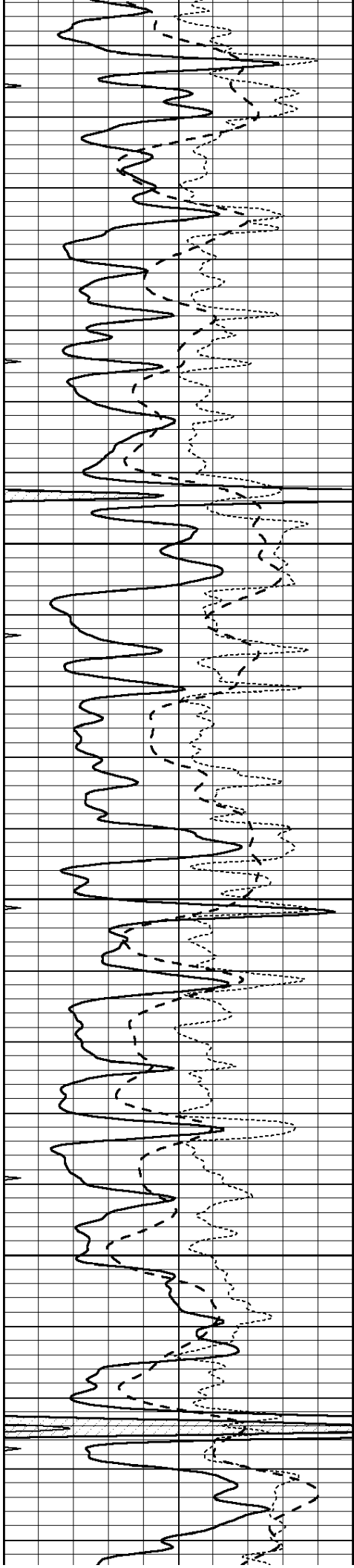
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

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



3600



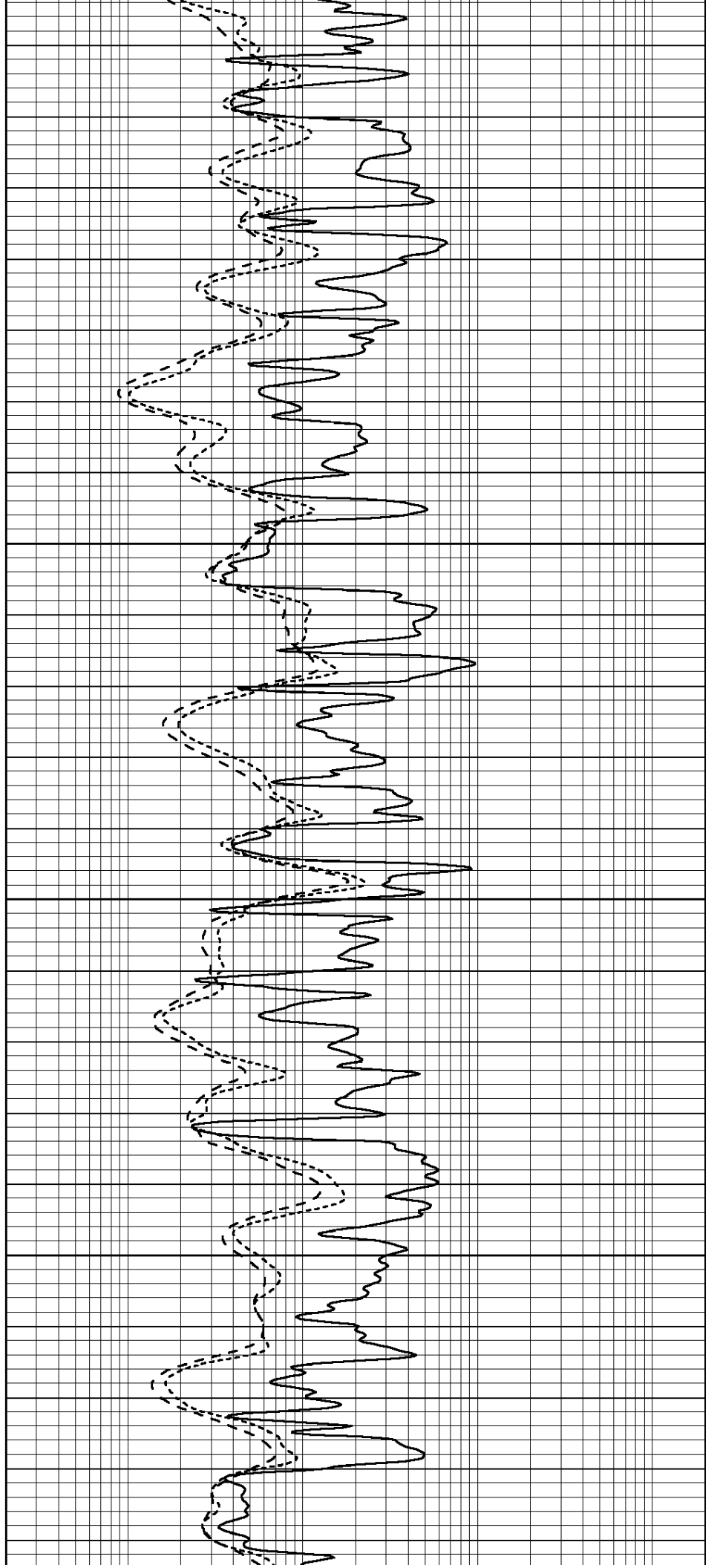


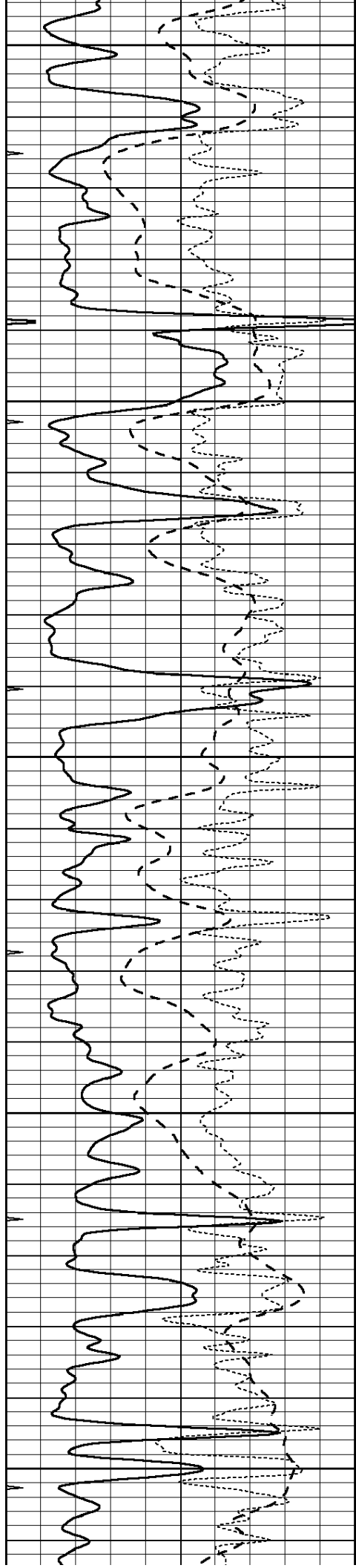
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3700

3750

3800





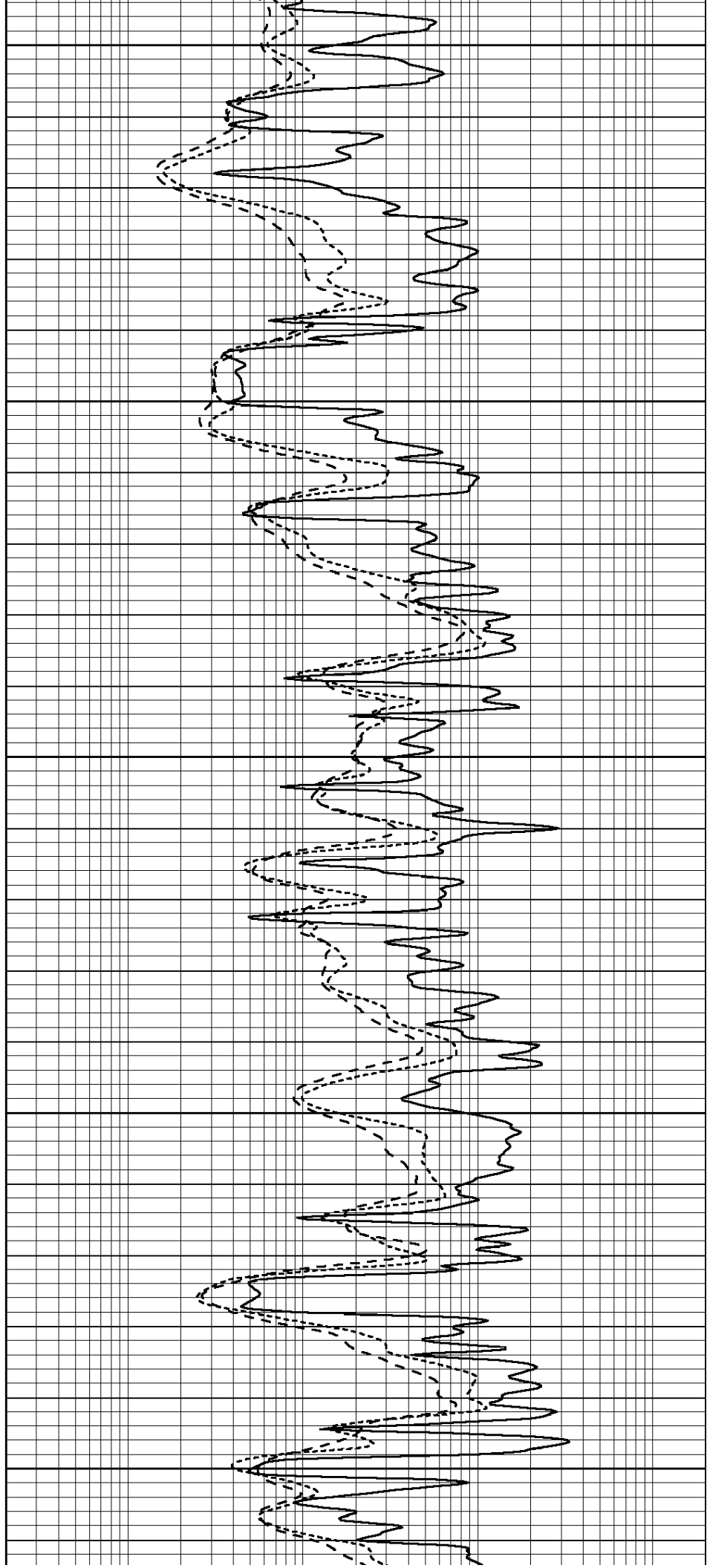
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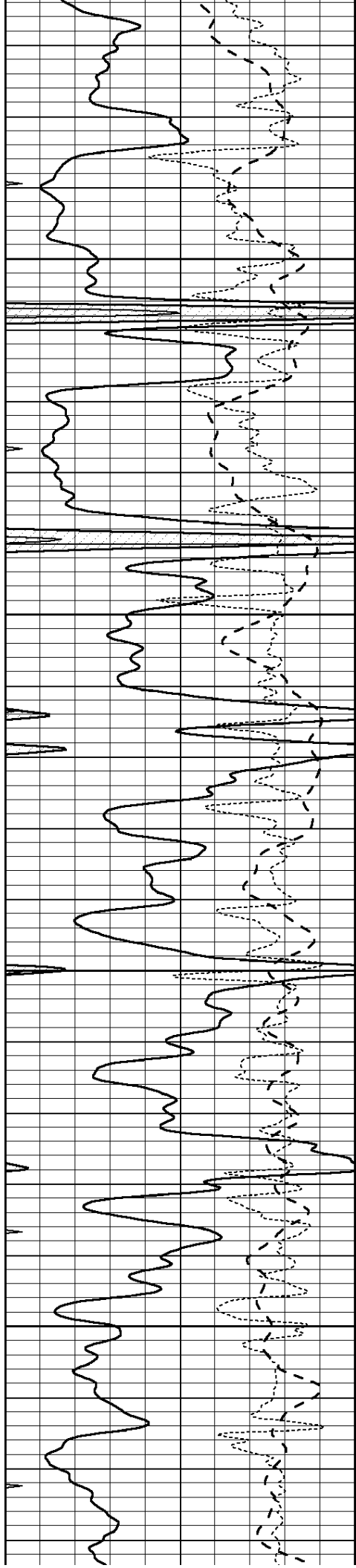
3900

3950

4000

4050



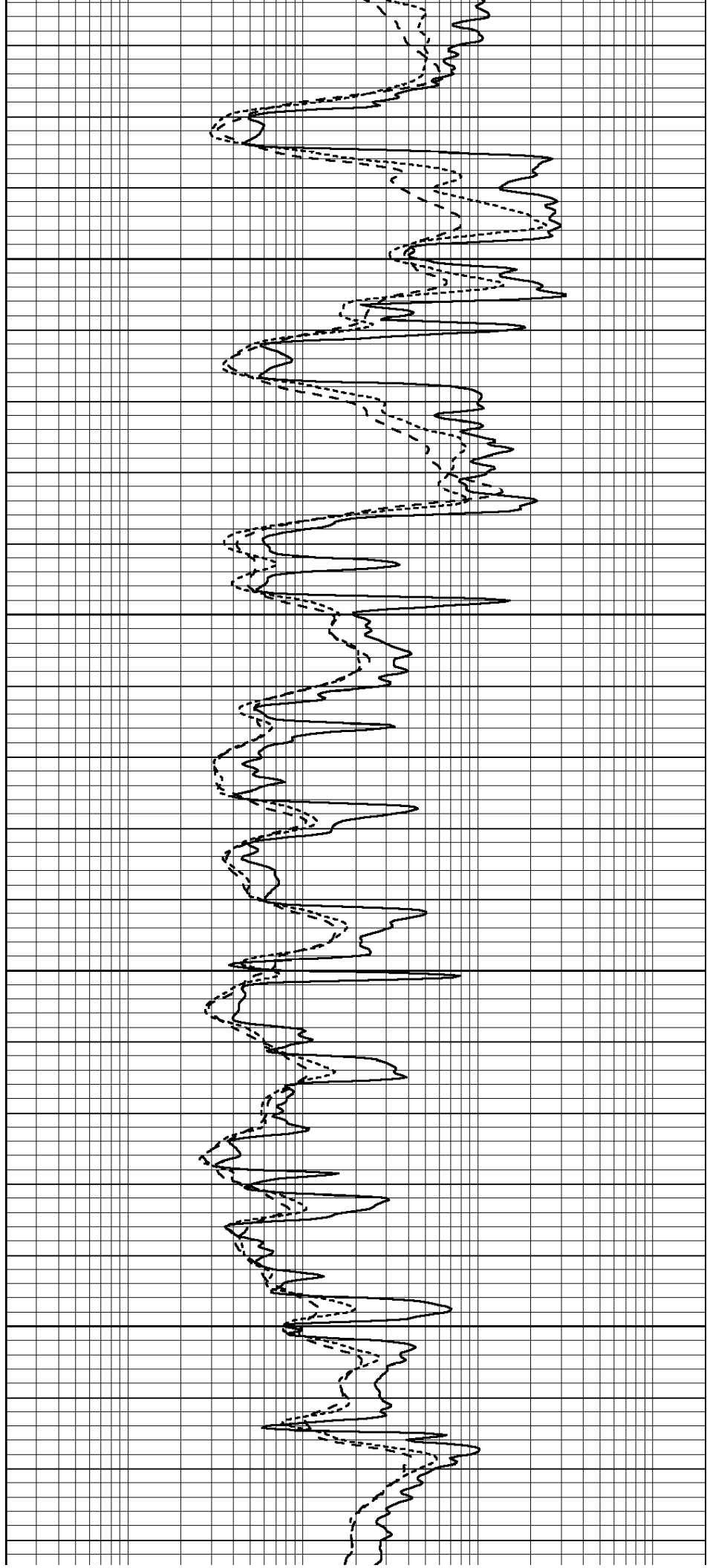


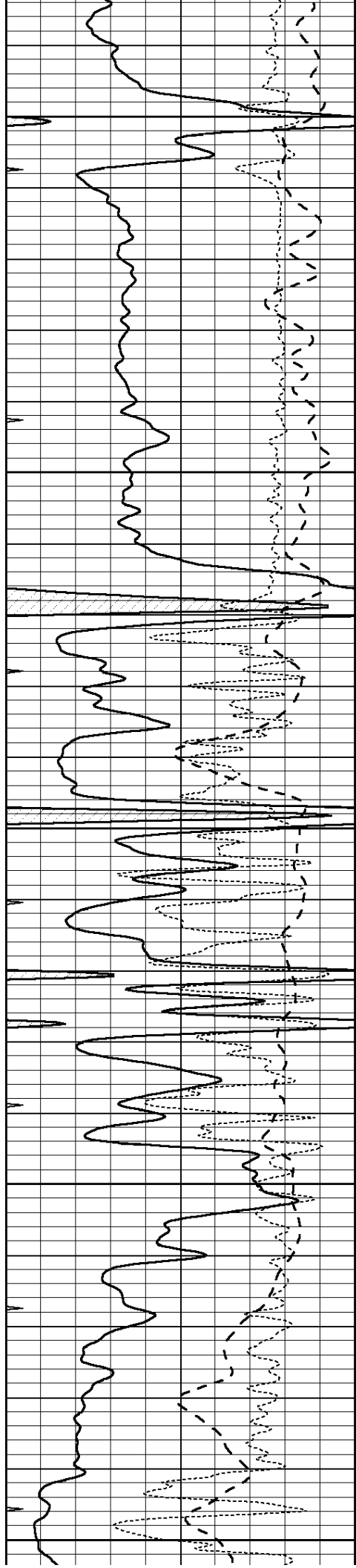
4100

4150

4200

4250





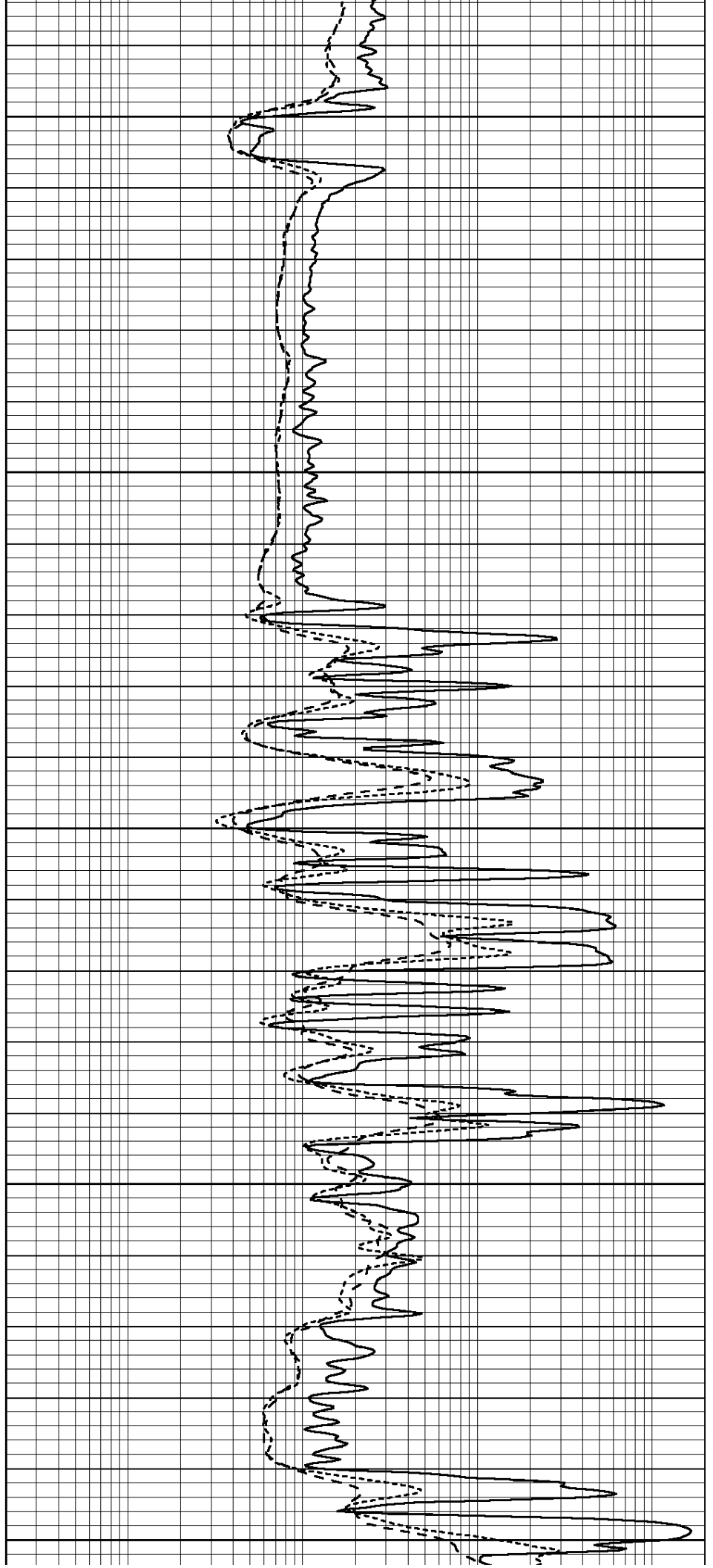
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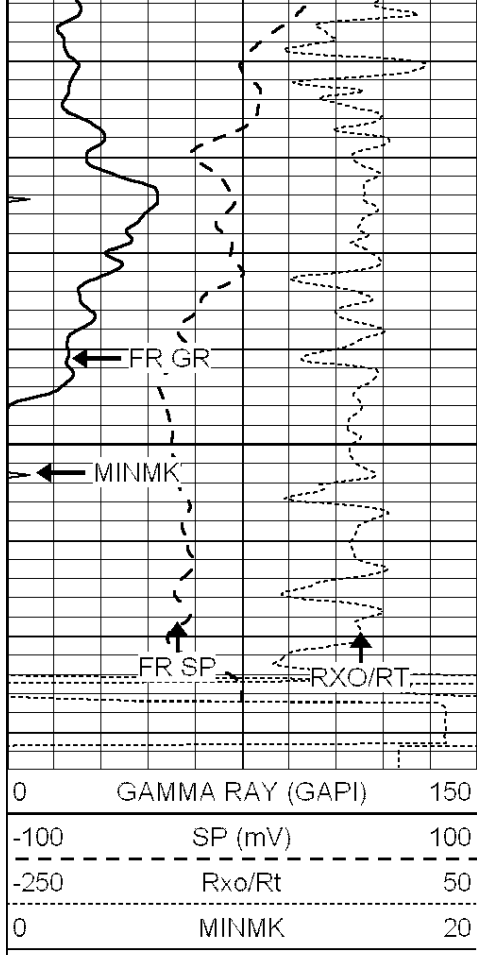
4350

4400

4450

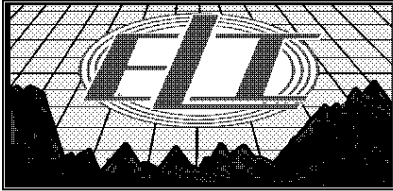
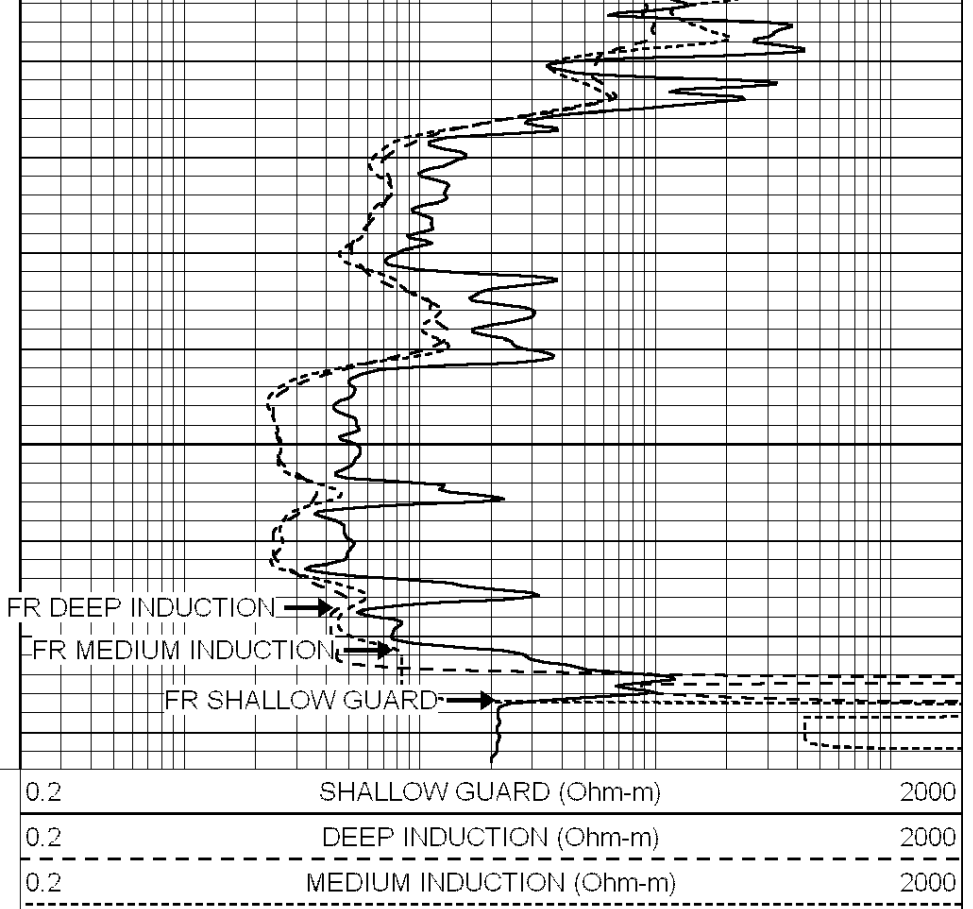
4500





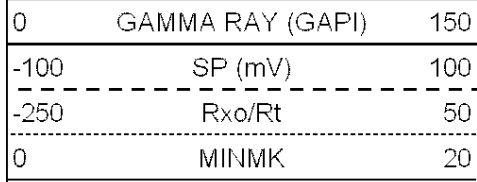
4550

LTD 4579

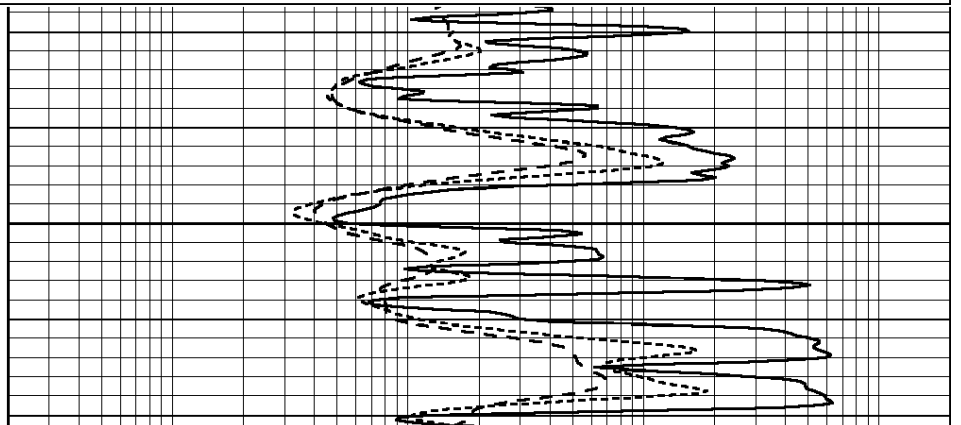
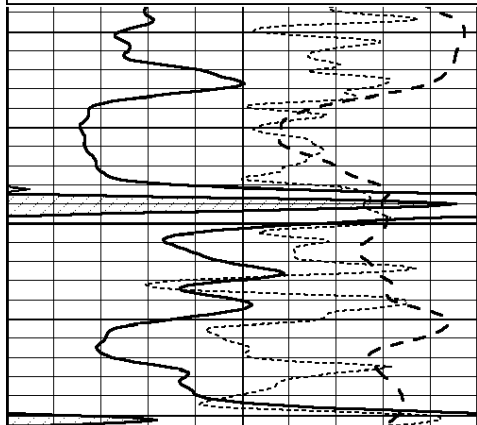
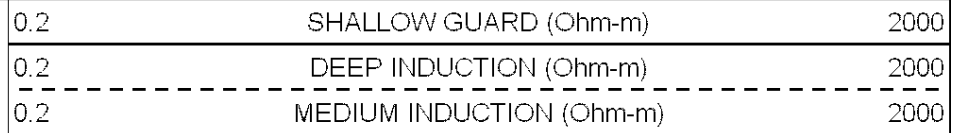


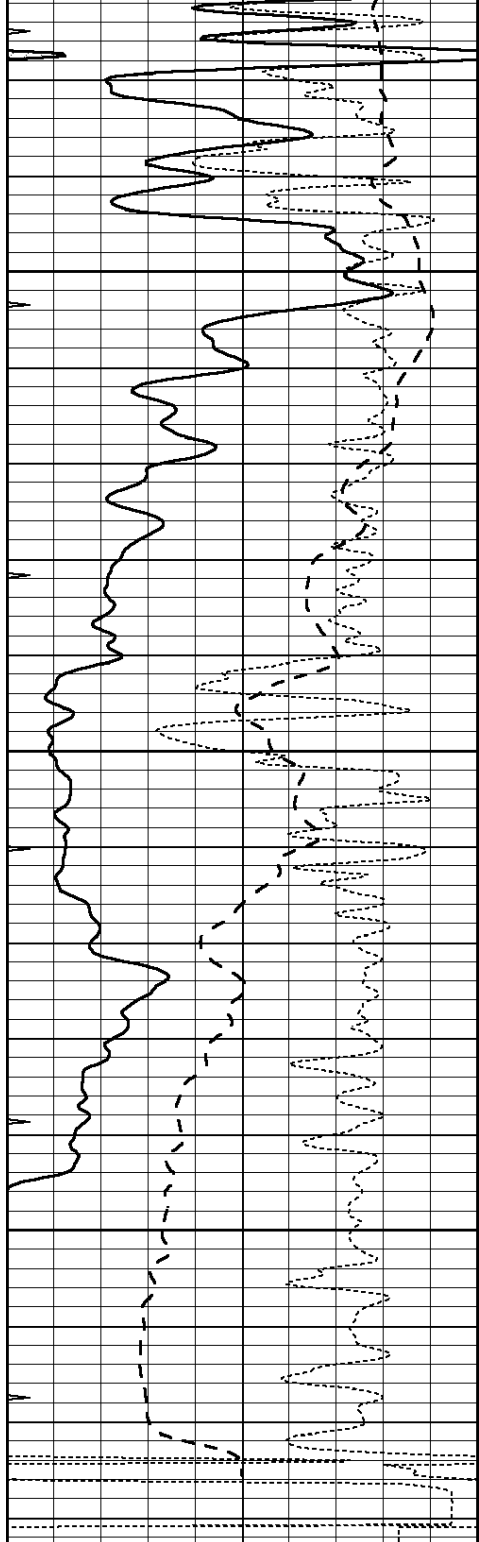
REPEAT SECTION

Database File: 3972pe.db
 Dataset Pathname: pass2.3
 Presentation Format: _dil
 Dataset Creation: Thu Oct 17 18:14:26 2019 by Calc SOC 120430
 Charted by: Depth in Feet scaled 1:240



4400



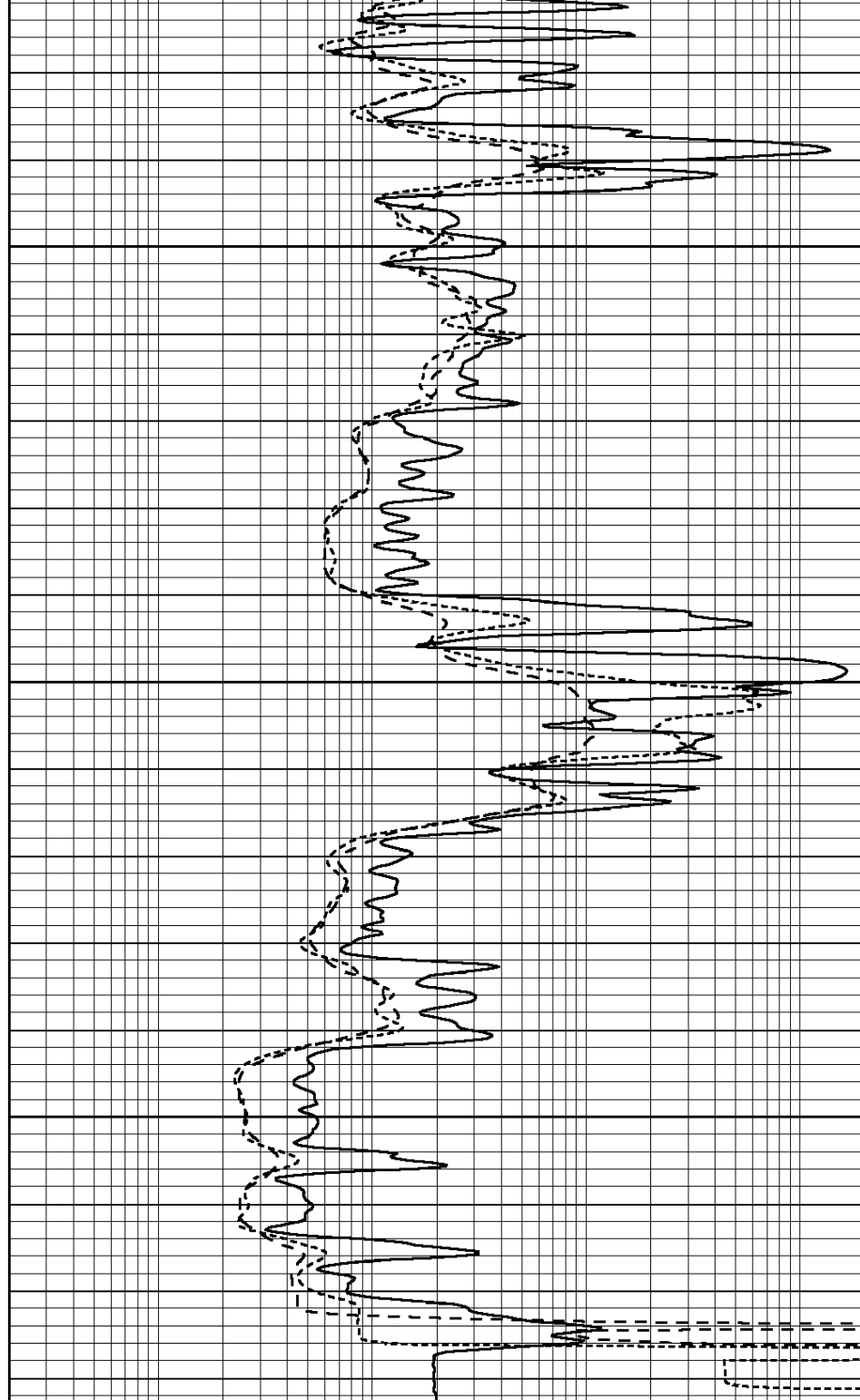


4450

4500

4550

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:
 Downhole Cal Performed:
 After Survey Verification Performed:

Wed Aug 30 00:06:33 2017
 Mon Jul 28 12:02:56 2008
 Mon Jul 28 12:02:56 2008

Surface Calibration								
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			
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