



NABORS

**COMPLETION
& PRODUCTION
SERVICES CO.**

DUAL INDUCTION LOG

Company	MAI OIL OPERATIONS, INC.		
Well	LUDWIG-MORGENSTERN UNIT #1		
Field	CAPITAL VIEW		
County	BARTON	State	KANSAS
Location:	API # : 15-009-25855-00-00		Other Services
	140' FSL & 2040' FWL SW - SE - SE - SW		DIL/MEL
	SEC 8 TWP 17S RGE 14W		Elevation
Permanent Datum	GROUND LEVEL	Elevation	1914
Log Measured From	KELLY BUSHING 8' A.G.L.	D.F.	1920
Drilling Measured From	KELLY BUSHING	G.L.	1914
Date	7/31/13		
Run Number	ONE		
Depth Driller	3491		
Depth Logger	3493		
Bottom Logged Interval	3491		
Top Log Interval	00		
Casing Driller	8 5/8" @ 901'		
Casing Logger	900		
Bit Size	7 7/8"		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 5,000 PPM	
Density / Viscosity	9.2/48		
pH / Fluid Loss	10.0/8.8		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.65 @ 79F		
Rmf @ Meas. Temp	0.49 @ 79F		
Rmc @ Meas. Temp	0.78 @ 79F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	0.46 @ 111F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom			
Maximum Recorded Temperature	111F		
Equipment Number	4010		
Location	HAYS, KANSAS		
Recorded By	IAN MABB		
Witnessed By	JIM MUSGROVE		

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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.

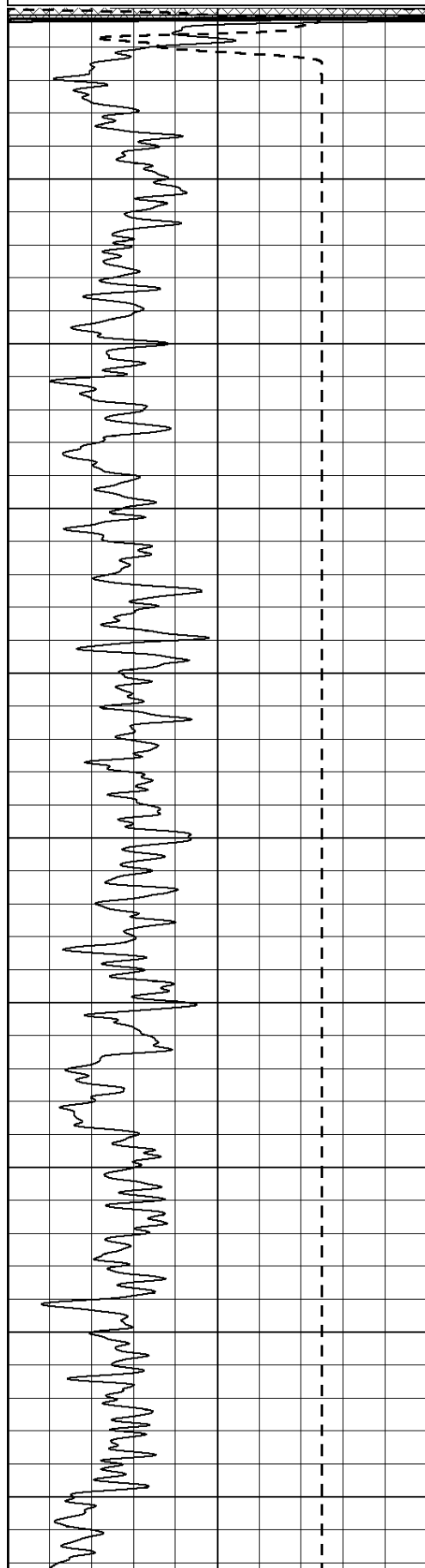
Comments

THANK YOU FOR USING NABORS, HAYS, KS. (785) 628-6395
DIRECTIONS: RUSSELL, KS. - SOUTH ON 281 TO NW 150 RD. - WEST 2 1/2 MILES NORTH INTO

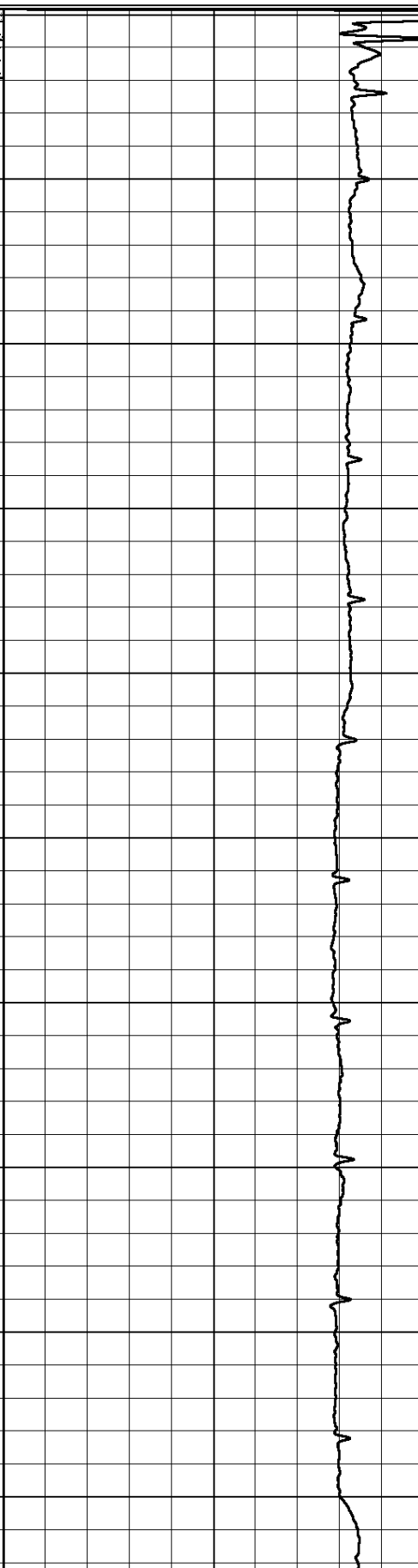
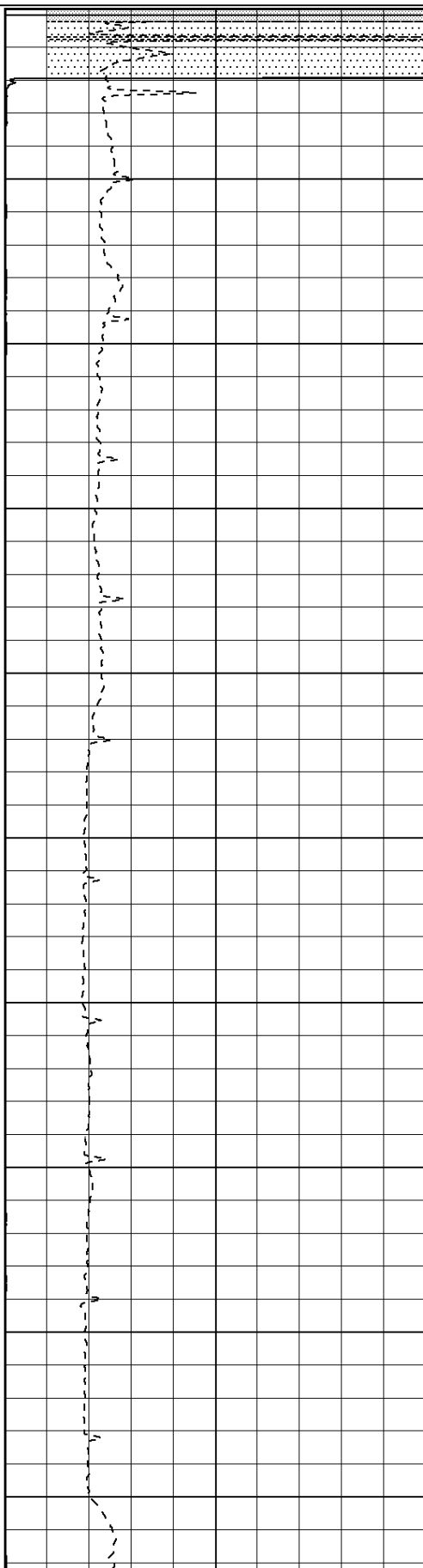
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-100	SP (mV)	100

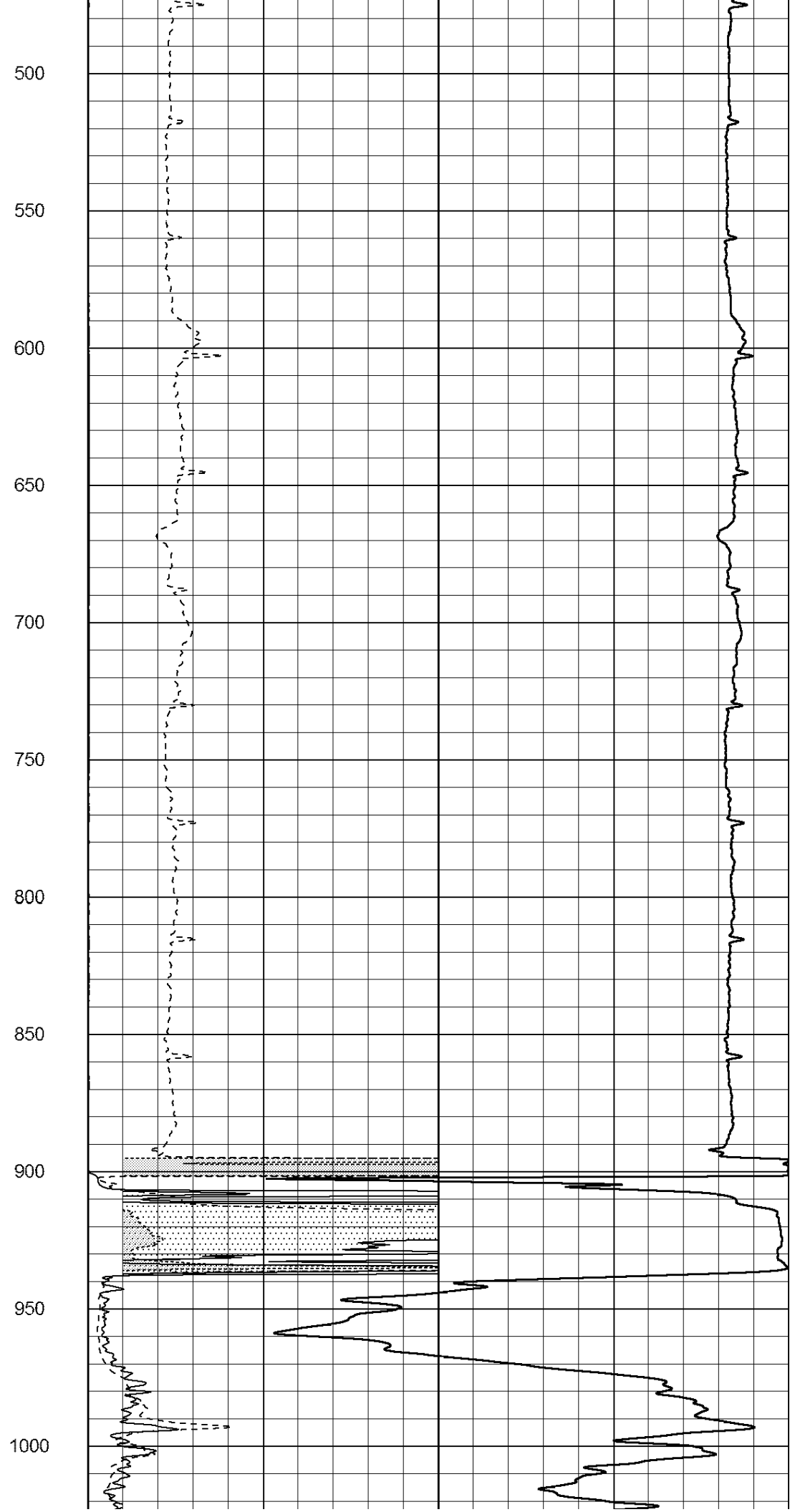
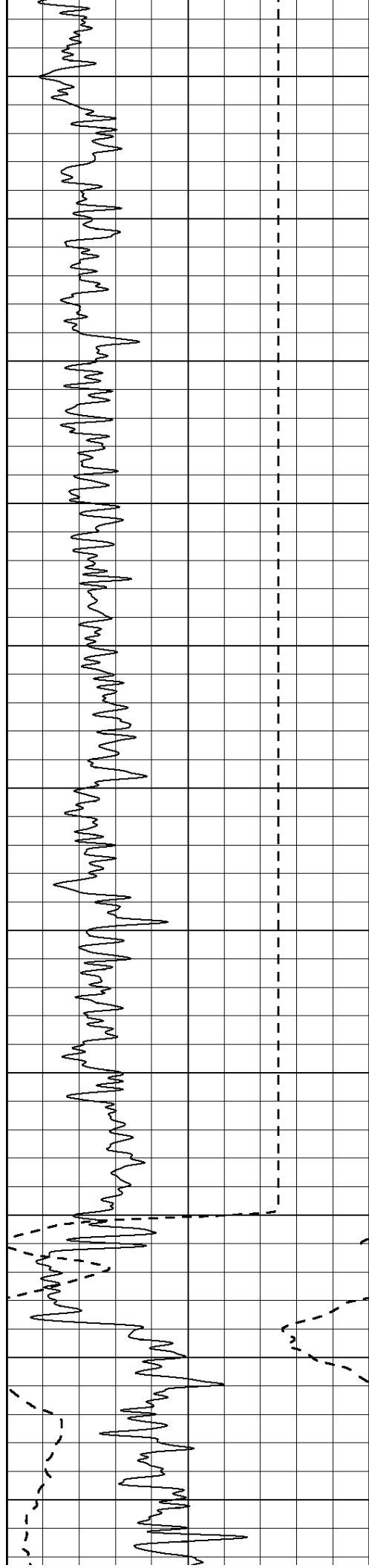
0	RLL3 (Ohm-m)	50
0	RILD (Ohm-m)	50

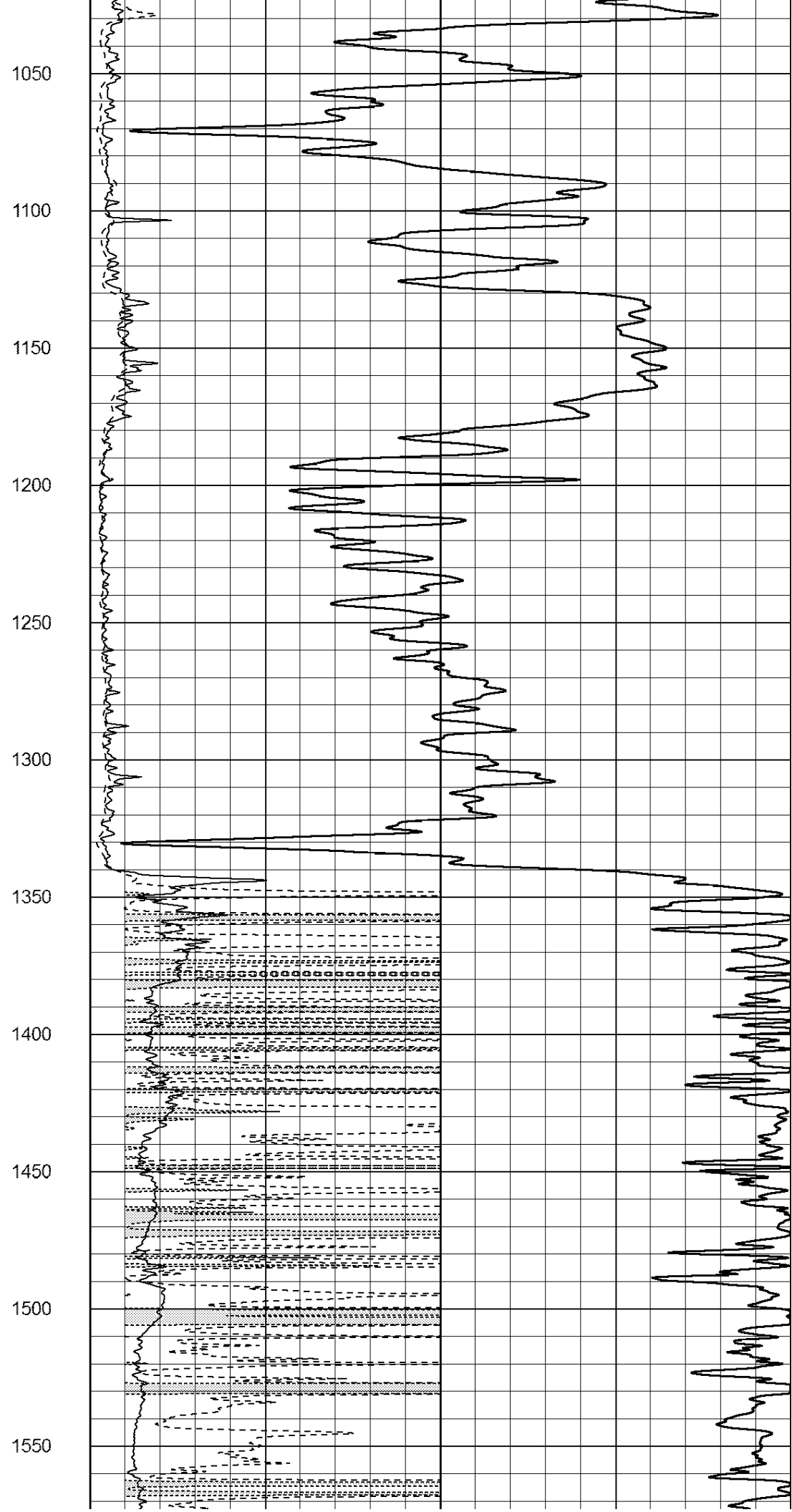
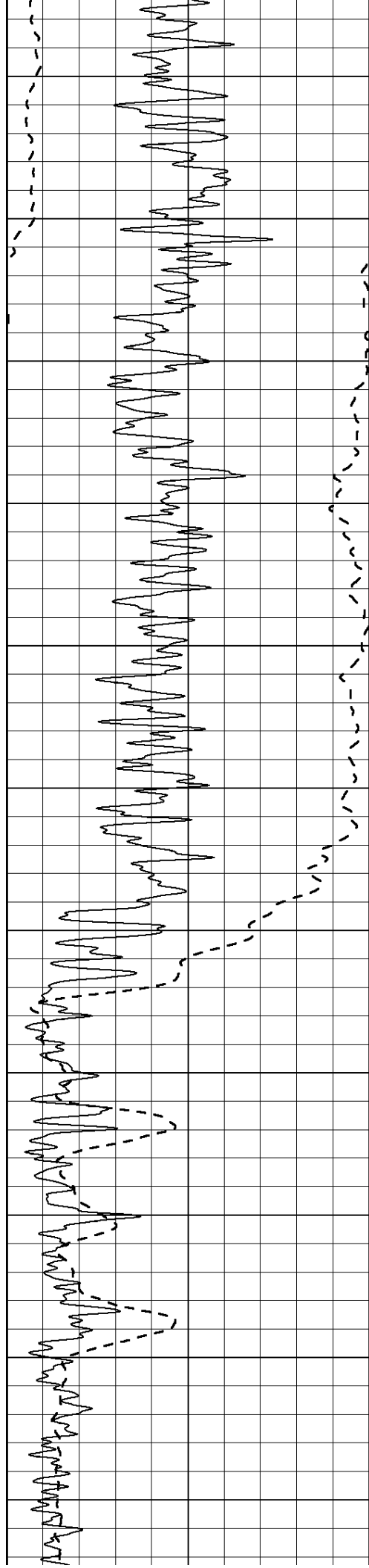
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50	RILD X10 (Ohm-m)	500
50	RLL3 X10 (Ohm-m)	500

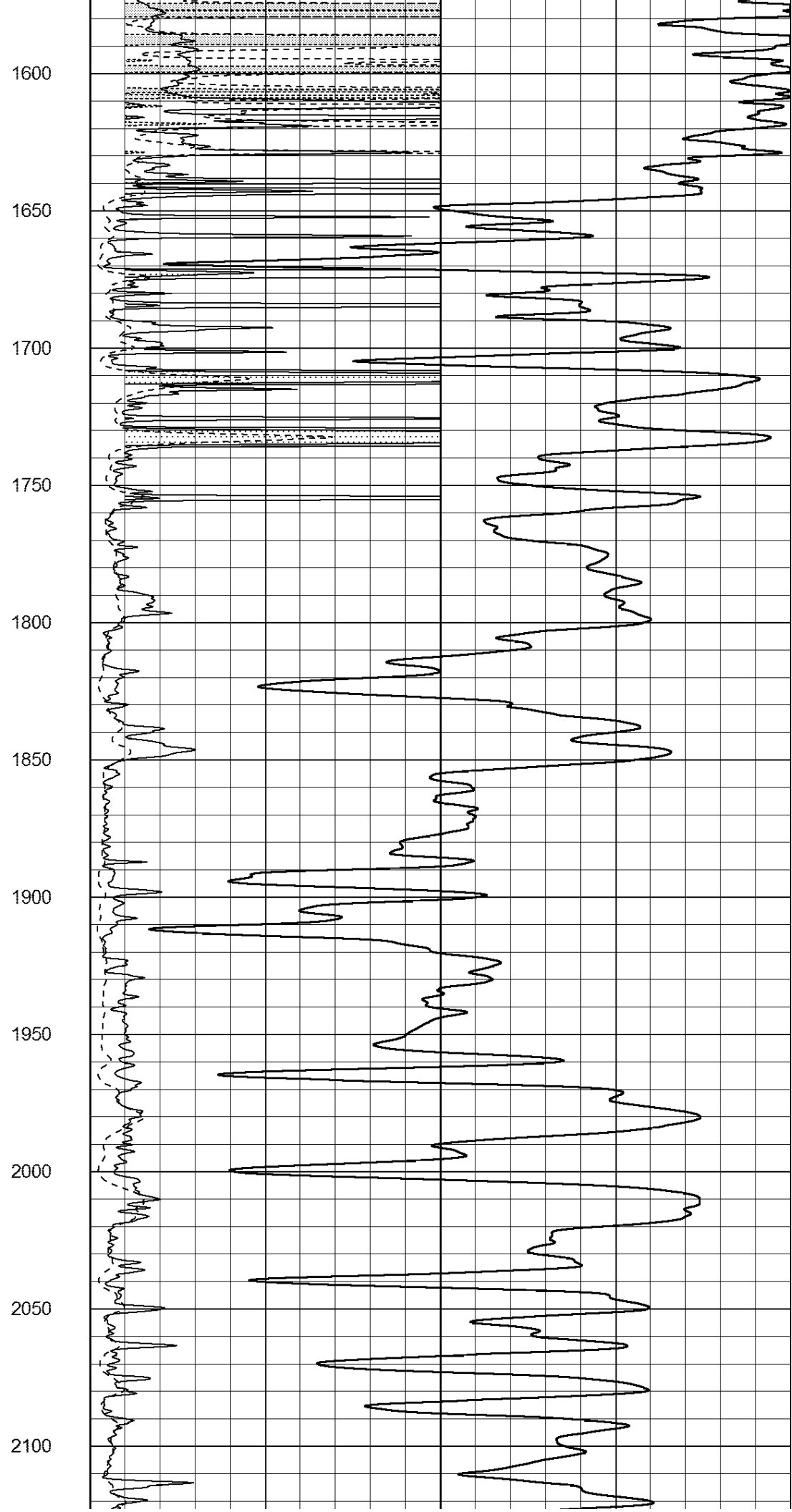
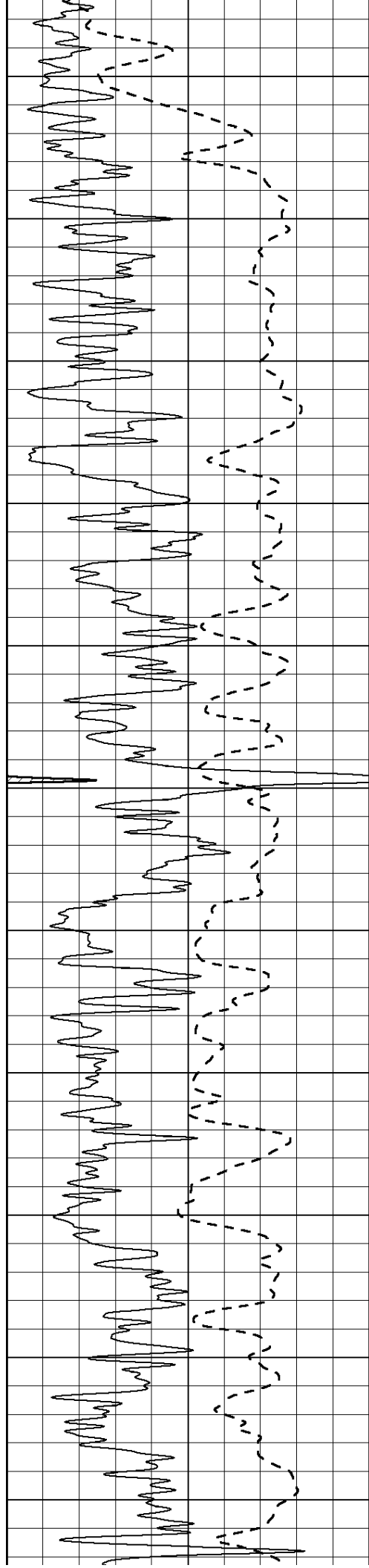


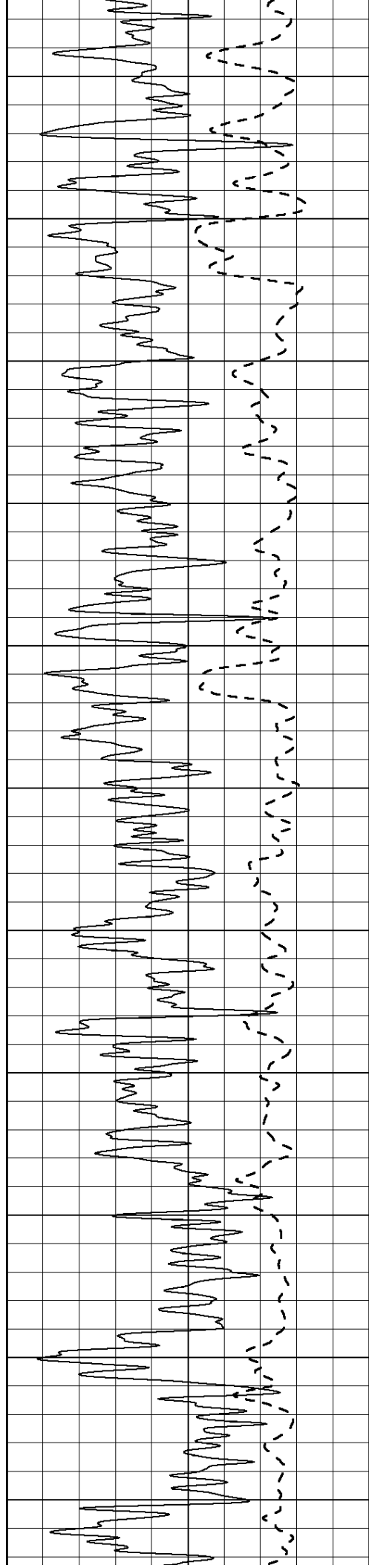
0
50
100
150
200
250
300
350
400
450











2150

2200

2250

2300

2350

2400

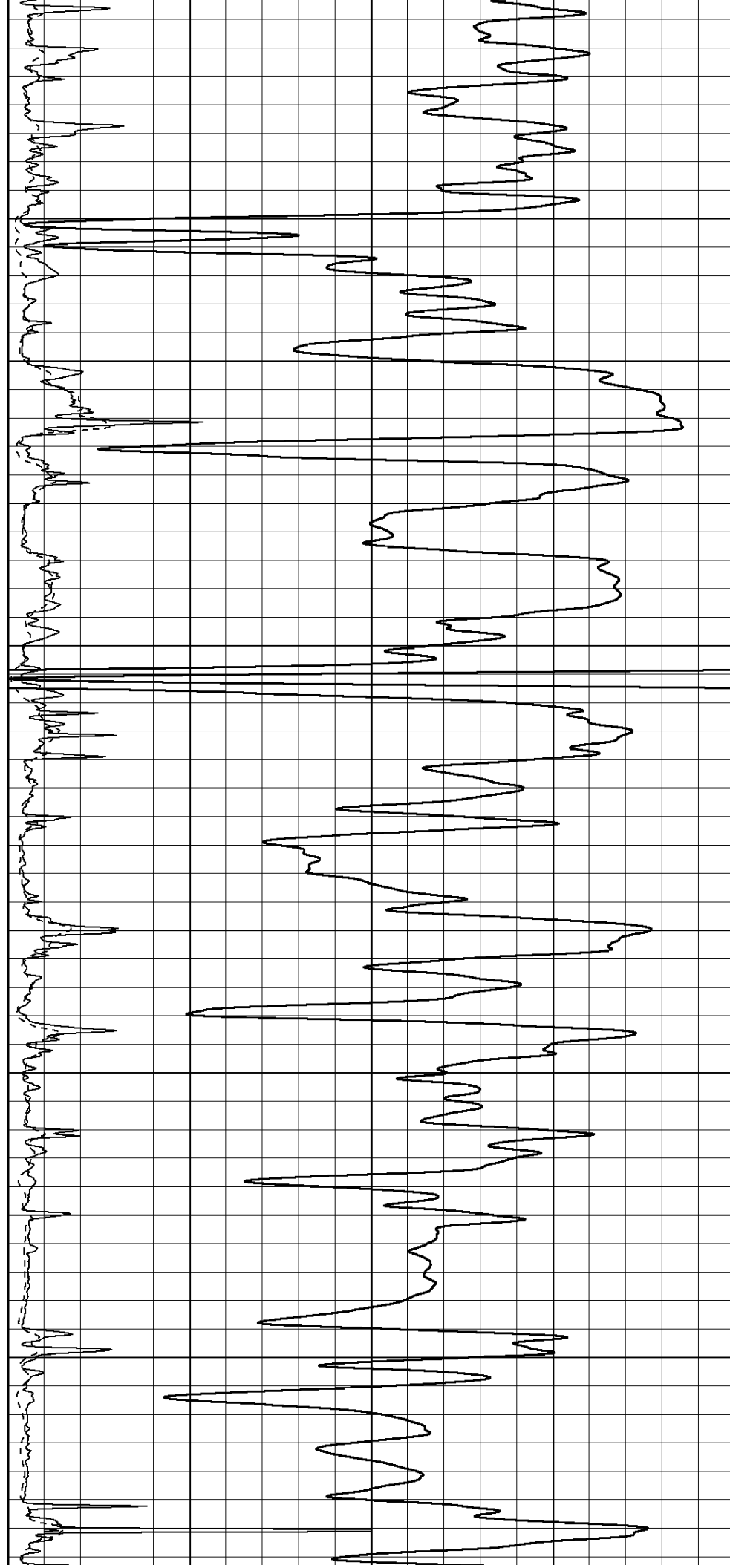
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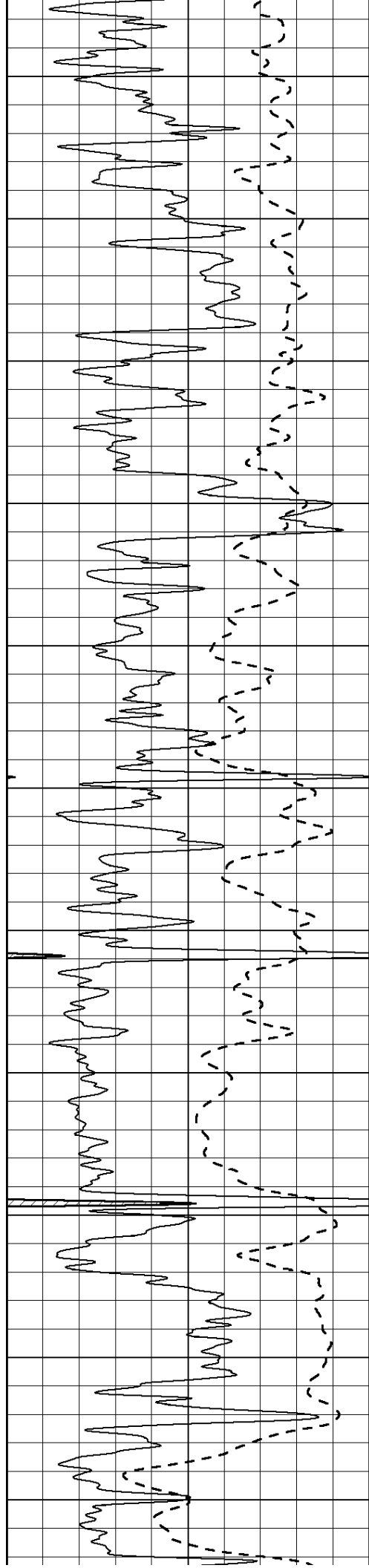
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2550

2600

2650





2700

2750

2800

2850

2900

2950

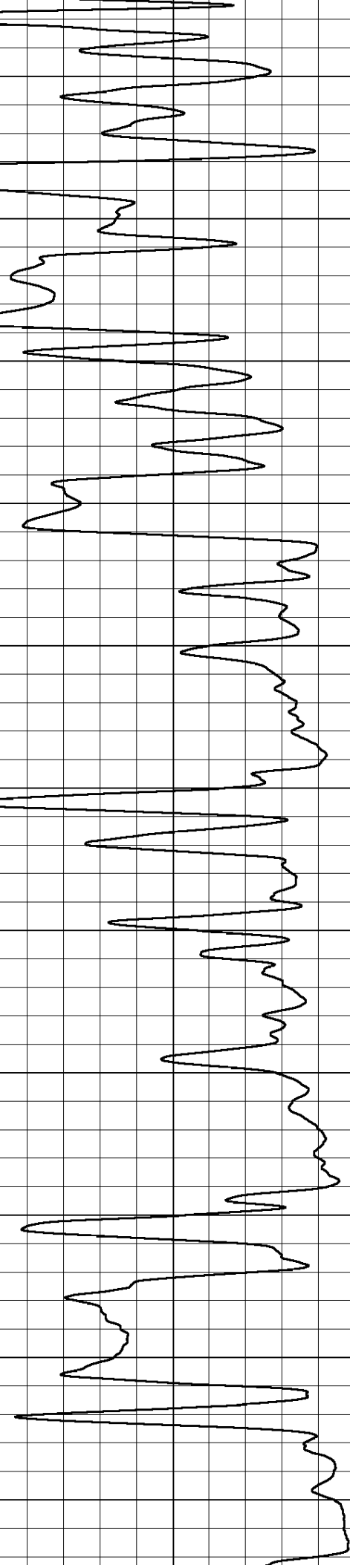
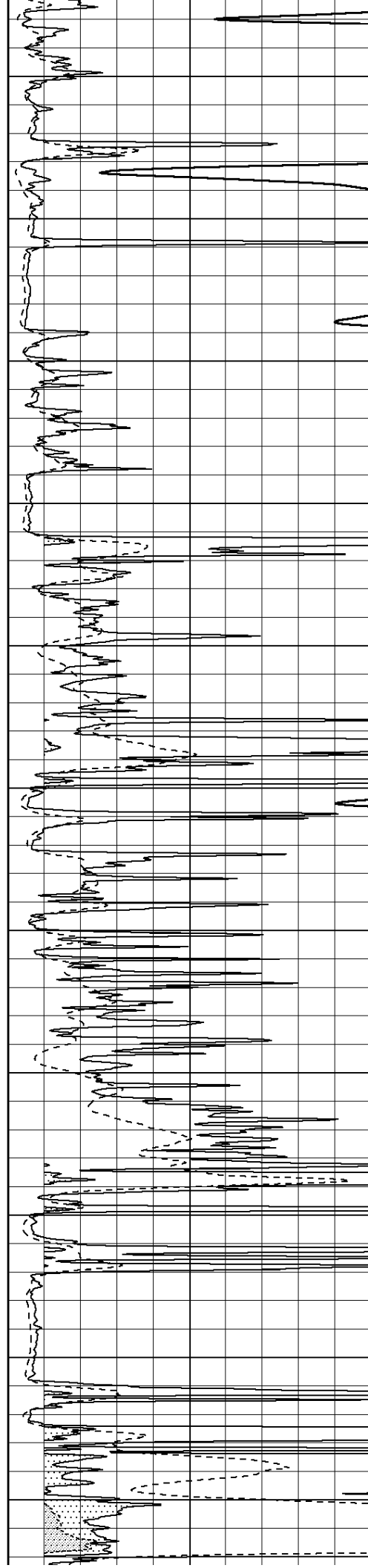
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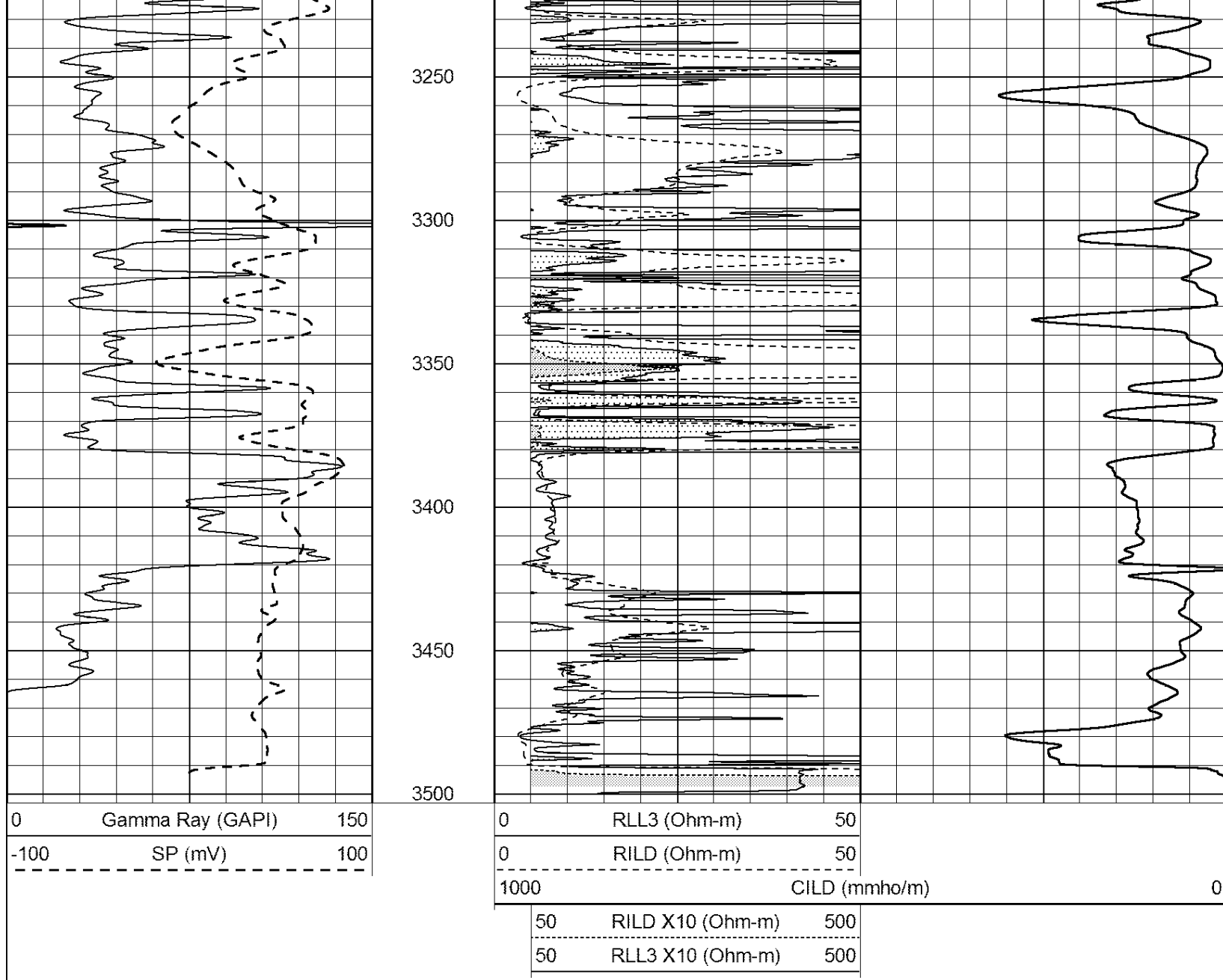
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3100

3150

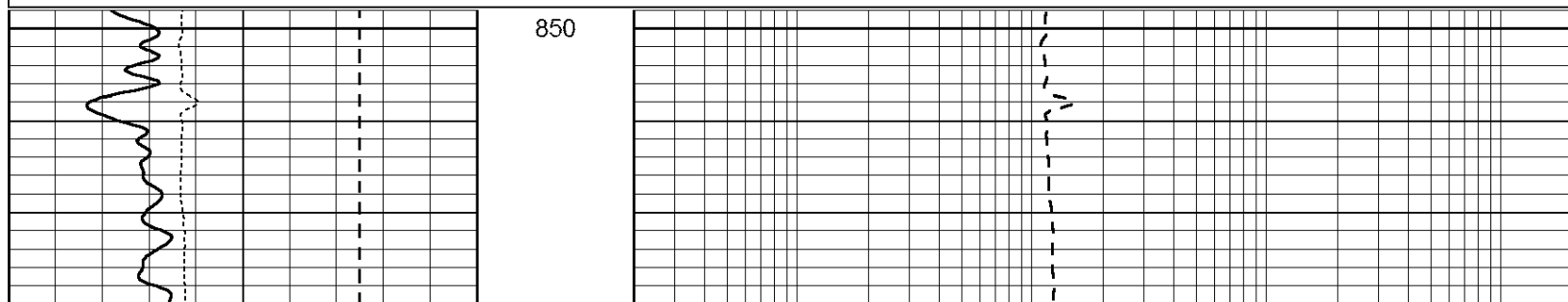
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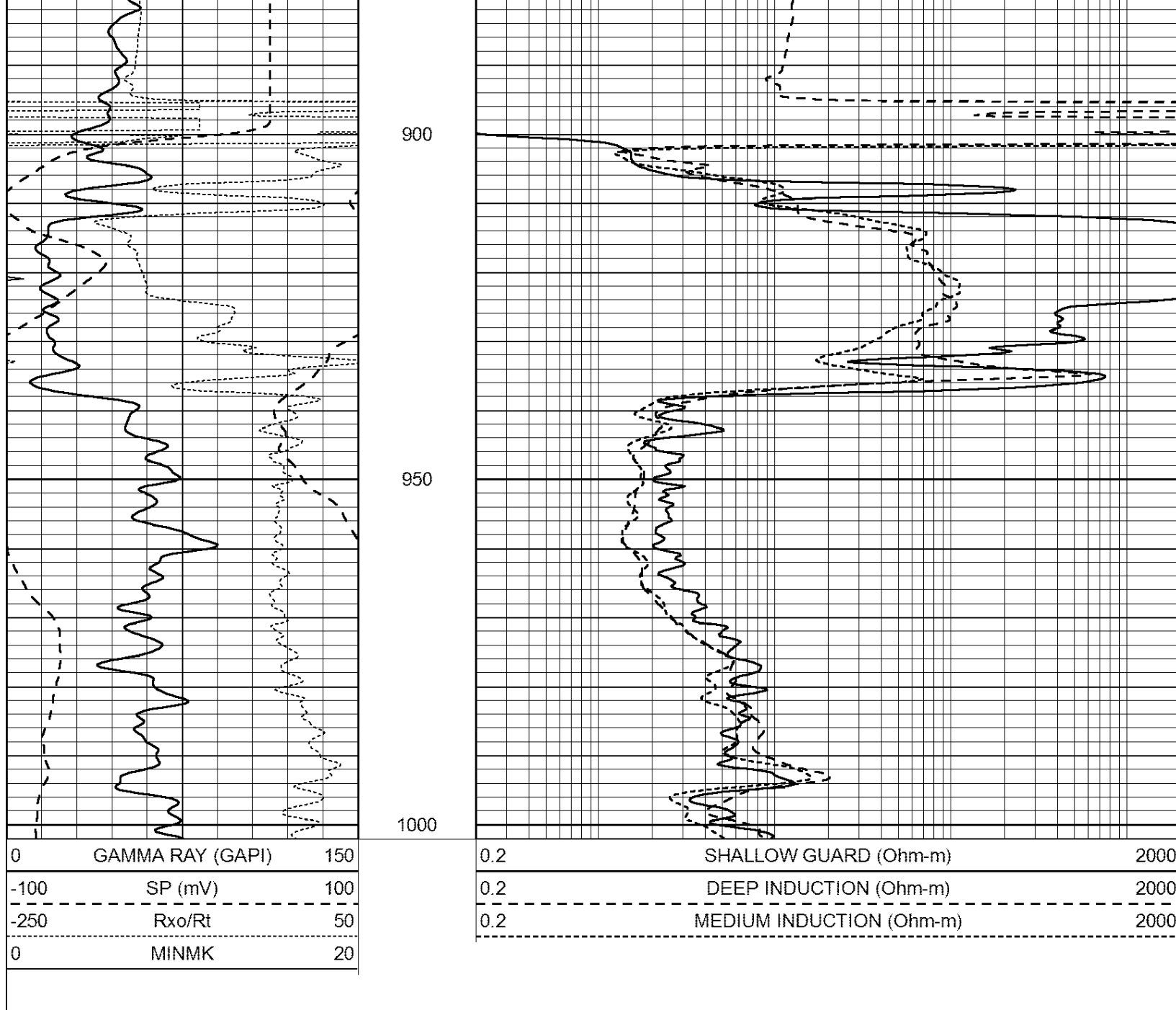




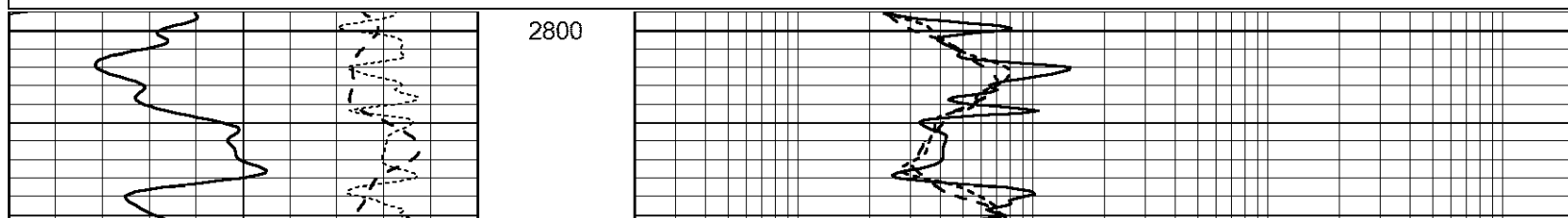
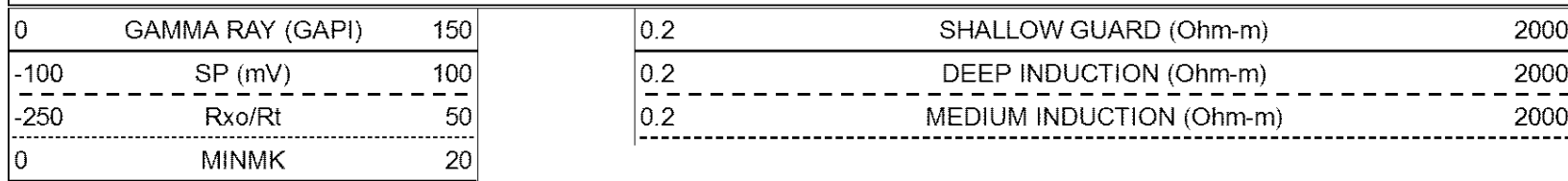
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Charted by: Depth in Feet scaled 1:240

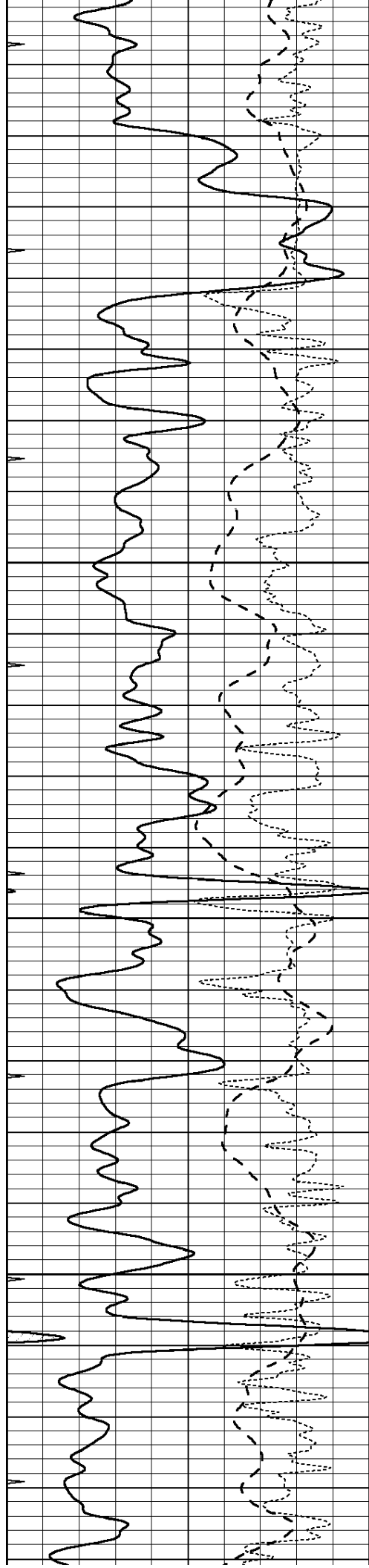
0	GAMMA RAY (GAPI)	150	0.2	SHALLOW GUARD (Ohm-m)	2000
-100	SP (mV)	100	0.2	DEEP INDUCTION (Ohm-m)	2000
-250	Rxo/Rt	50	0.2	MEDIUM INDUCTION (Ohm-m)	2000
0	MINMK	20			





Database File: 011370ddn.db
Dataset Pathname: pass3.4
Presentation Format: _dil
Dataset Creation: Wed Jul 31 02:23:34 2013
Charted by: Depth in Feet scaled 1:240



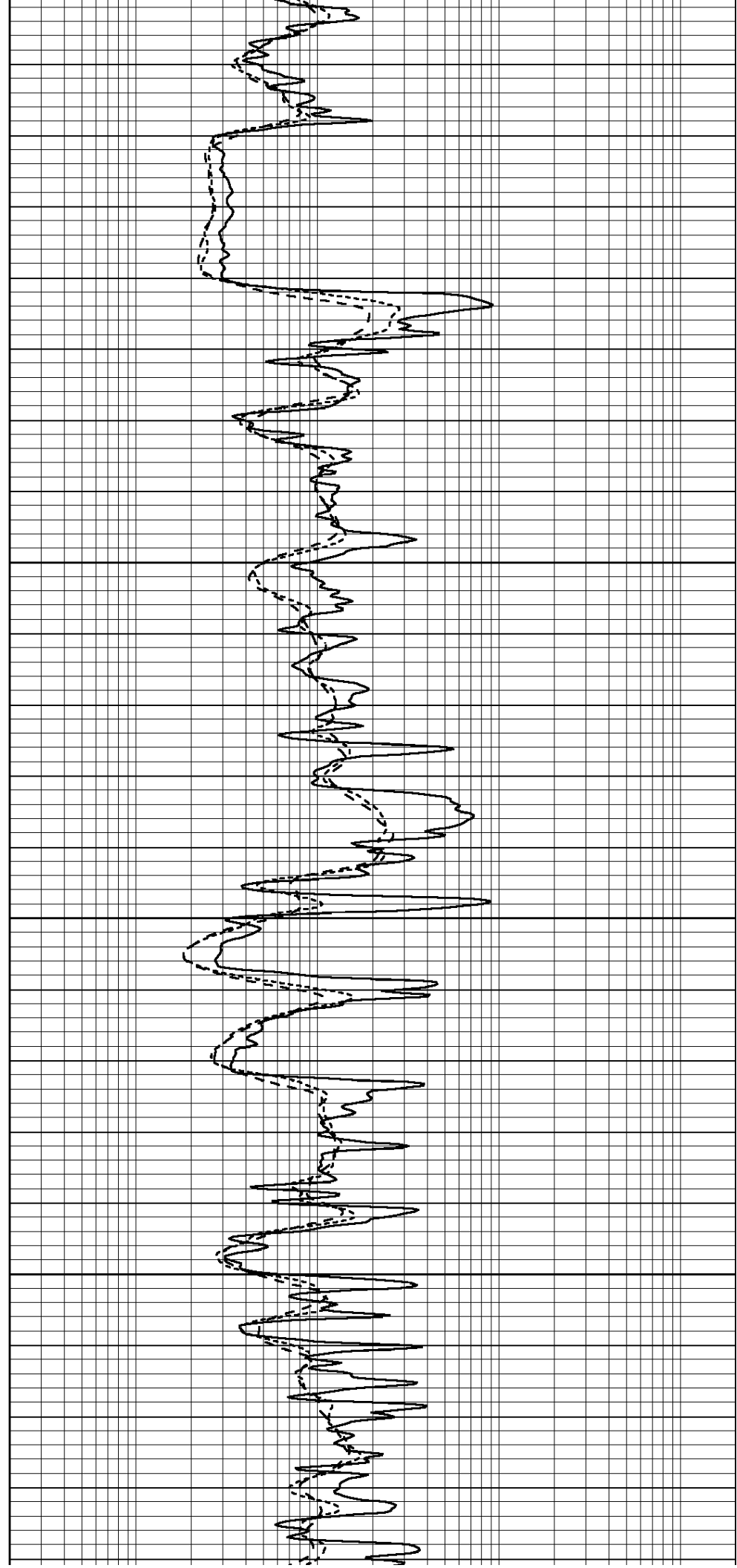


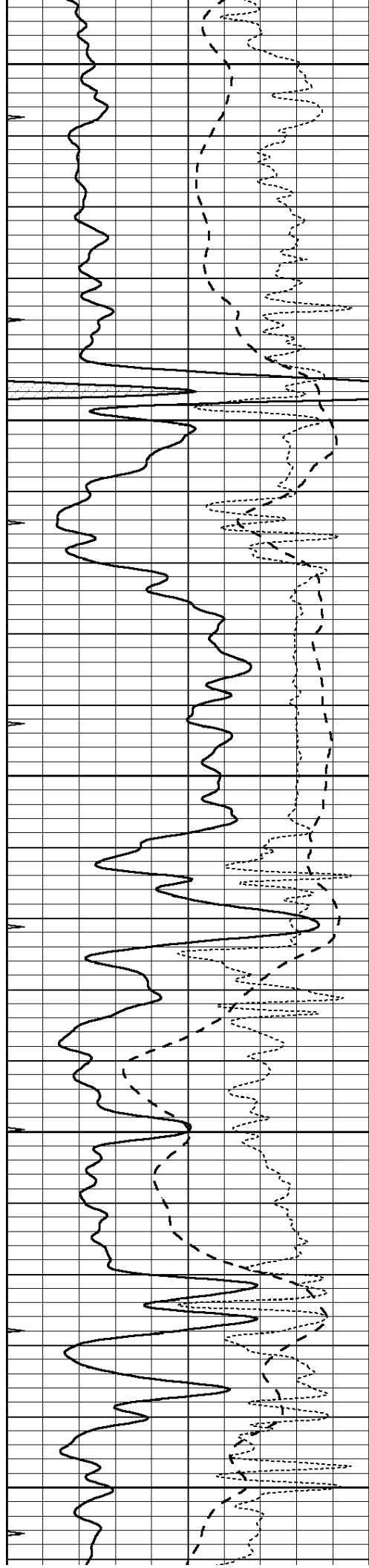
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2900

2950

3000





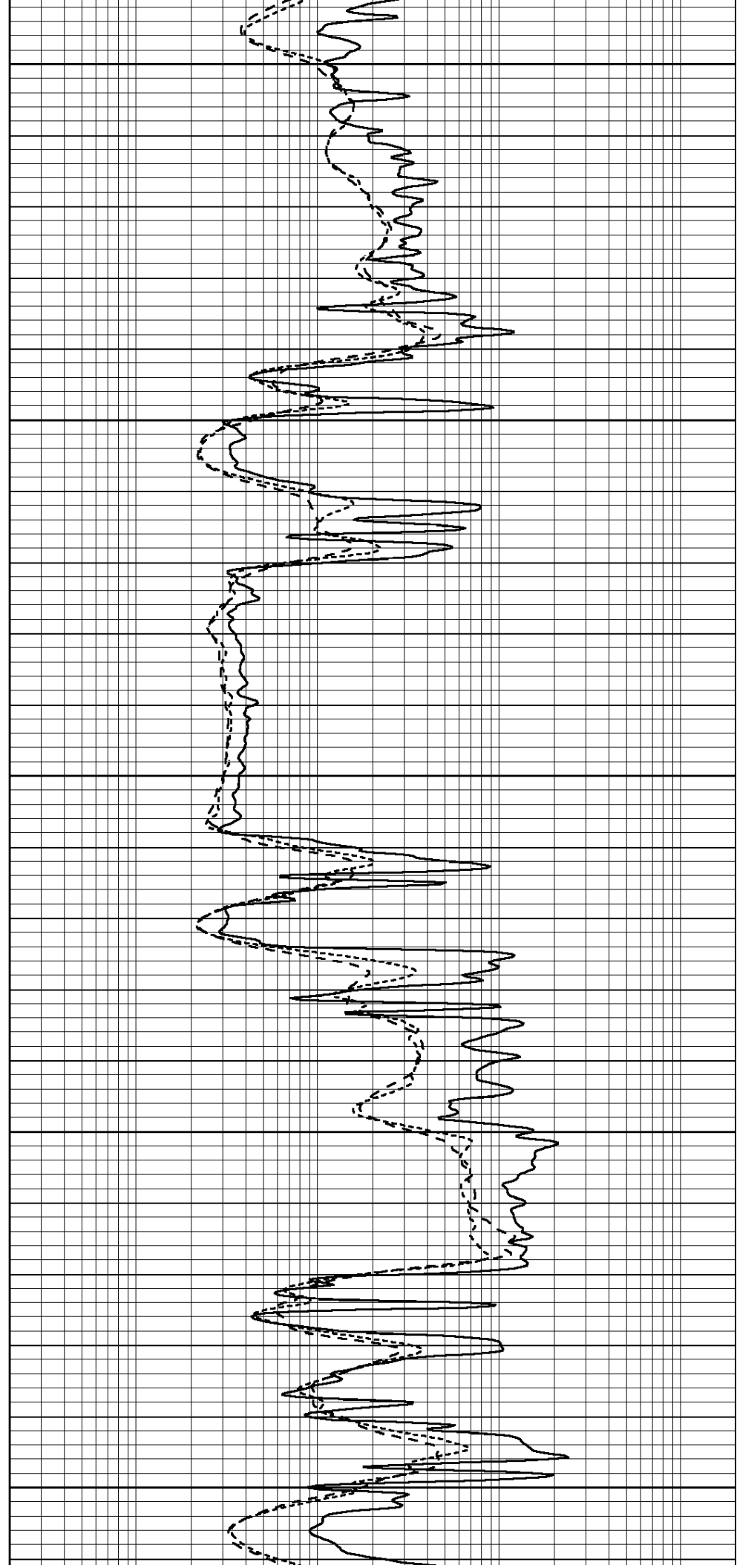
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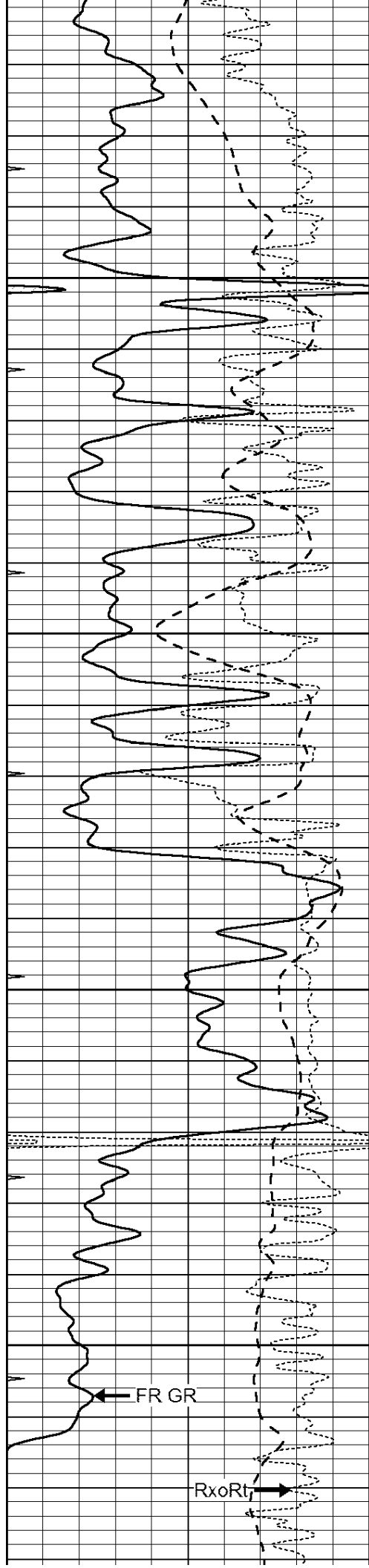
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3150

3200

3250



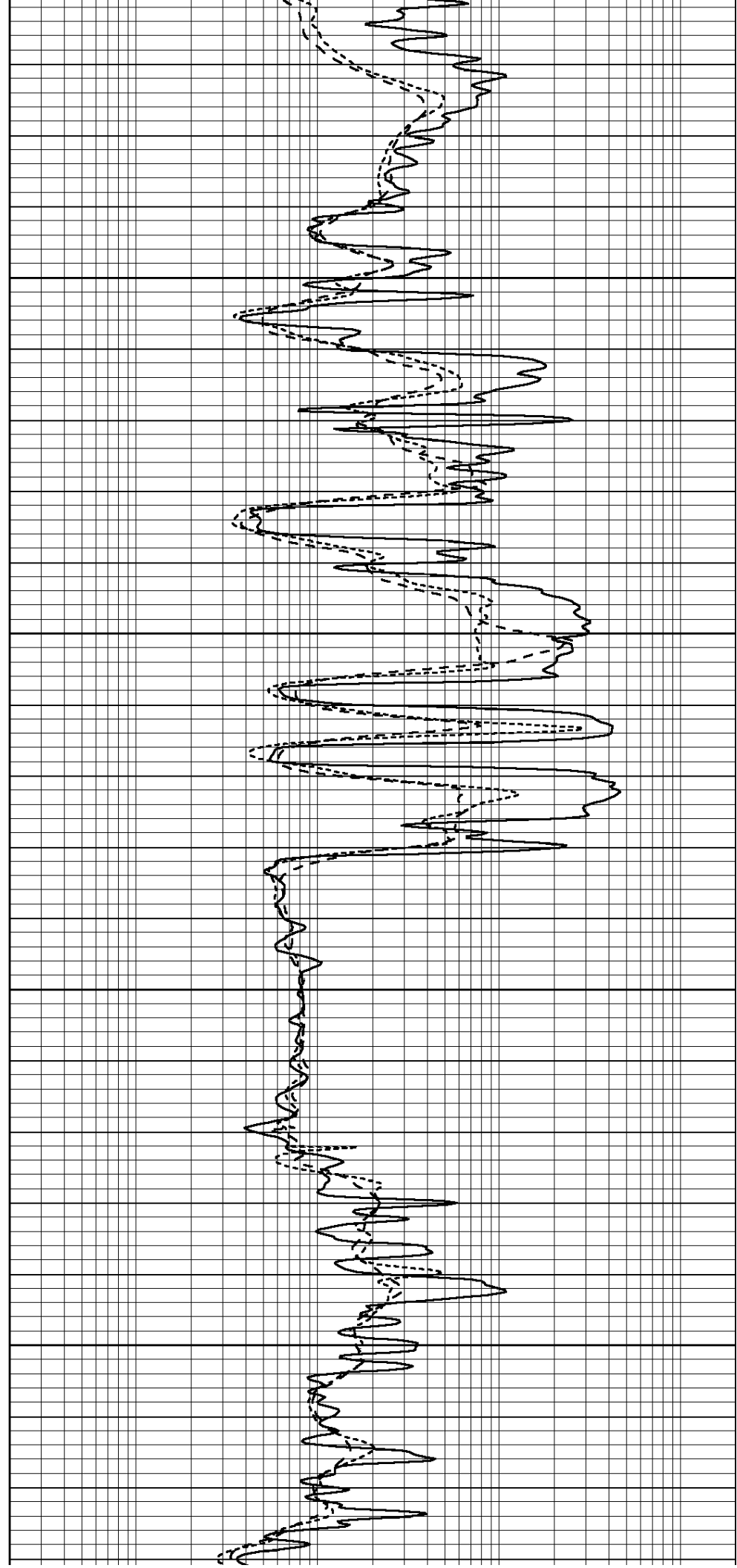


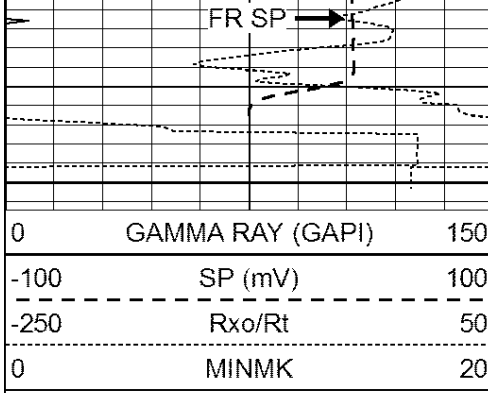
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3350

3400

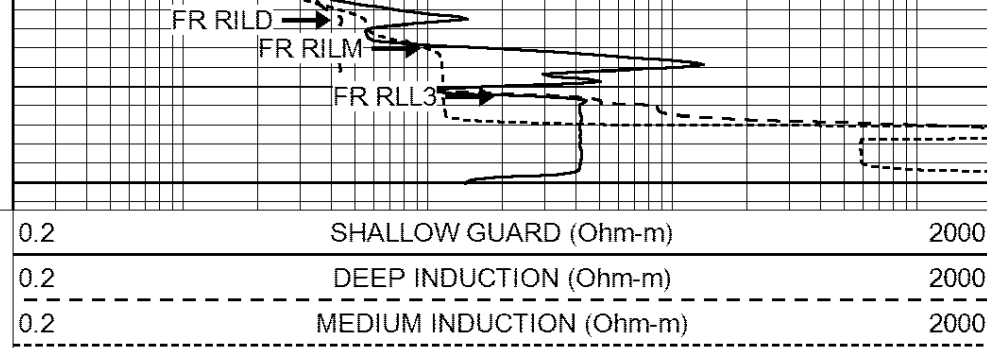
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LTD 3493

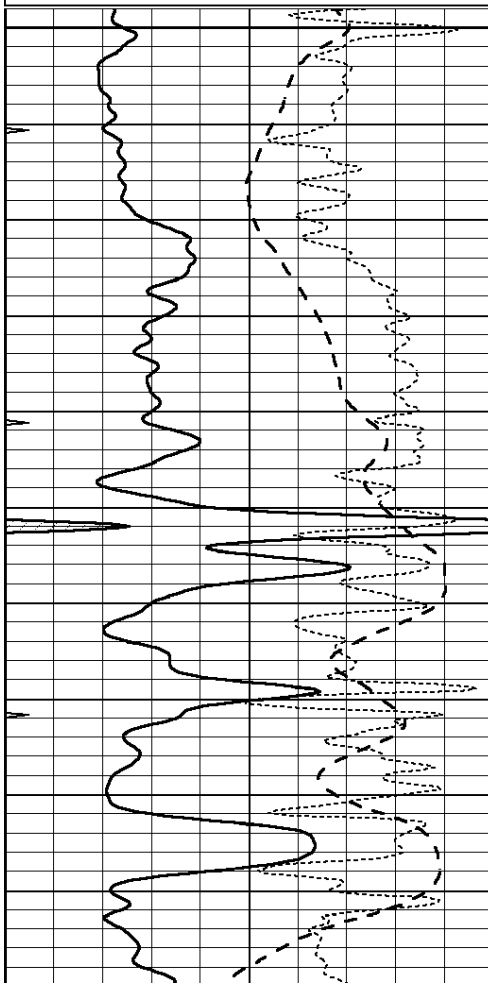
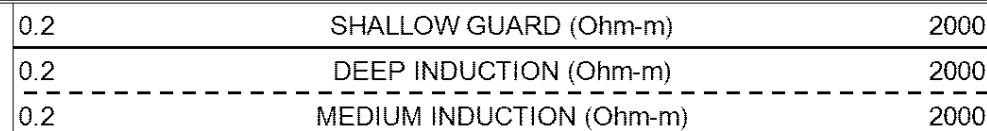
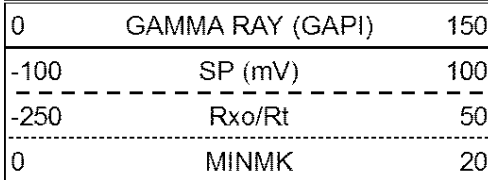
3500



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REPEAT SECTION

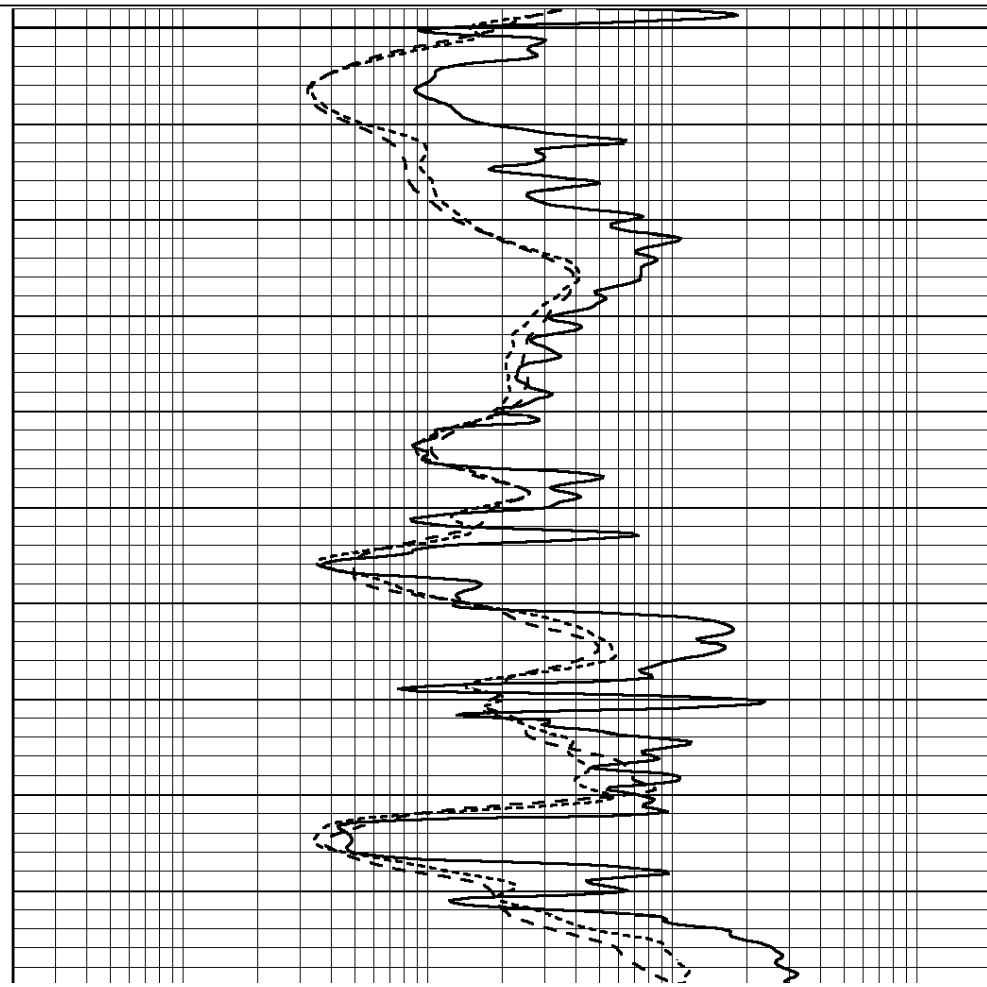
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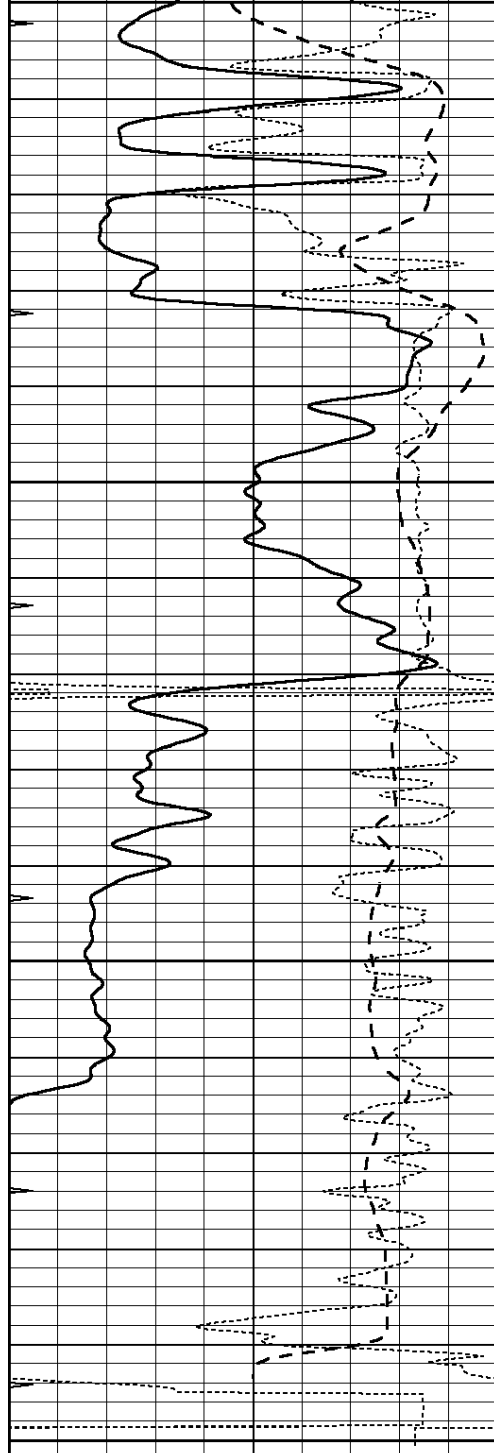


3250

3300

3350





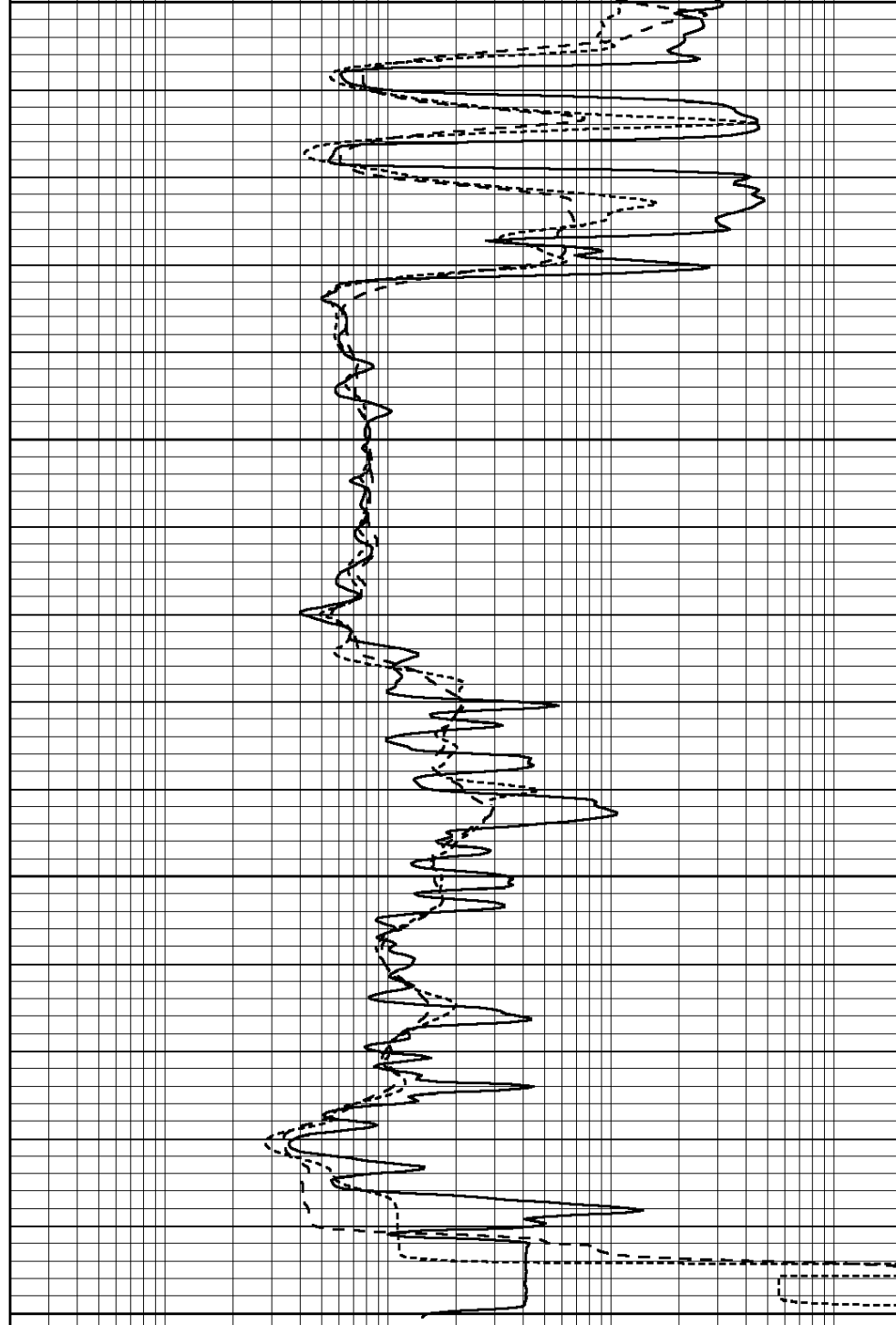
0	GAMMA RAY (GAPI)	150
-100	SP (mV)	100
-250	Rxo/Rt	50
0	MINMK	20

3350

3400

3450

3500



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: 011370ddn.db
 Dataset Pathname: pass3.4
 Dataset Creation: Wed Jul 31 02:23:34 2013

Dual Induction Calibration Report

Serial-Model:	PROBE7-DILG
Surface Cal Performed:	Mon Jul 01 07:10:41 2013
Downhole Cal Performed:	Sat Jan 19 19:51:38 2013
After Survey Verification Performed:	Sat Jan 19 19:51:38 2013

Surface Calibration								
Readings			References			Results		
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.793	0.790	V	0.000	400.000	mmho/m	620.000	22.000
Medium	0.992	1.002	V	0.000	464.000	mmho/m	660.000	-30.000
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.041	0.642	V	0.000	400.000	mmho/m	664.874	-27.011
Medium	0.035	0.802	V	0.000	464.000	mmho/m	604.936	-21.367

Downhole Calibration								
Readings			References			Results		
	Zero	Cal		Zero	Cal		m'	b'
Deep	135384.000	27094.500	mmho/m	135400.000	27082.400	mmho/m	1.000	-19.259
Medium	-47330.100	-9381.740	mmho/m	-47327.100	-9389.280	mmho/m	1.000	-10.154
LL3		7.322	V		1400.000	Ohm-m		
		0.038	V		20.000	Ohm-m		
		-7.273	V		4000.000	mmho-m		

After Survey Verification								
Readings			Targets			Results		
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	135384.000	27094.500	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	-47330.100	-9381.740	mmho/m	1.000	0.000
LL3		0.000	Ohm-m		1400.000	Ohm-m		
		0.000	Ohm-m		20.000	Ohm-m		
		0.000	mmho-m		4000.000	mmho-m		

Compensated Density Calibration Report

Serial-Model:	GEAR2-GEARHART
Source / Verifier:	147 / 147
Master Calibration Performed:	Wed Jul 31 01:43:38 2013
Before Survey Verification Performed:	
After Survey Verification Performed:	

Master Calibration						
Density			Far Detector		Near Detector	
Magnesium	1.710	g/cc	923.76		475.45	cps
Aluminum	2.580	g/cc	205.31		331.69	cps
Spine Angle = 76.54			Density/Spine Ratio = 0.563			
Size			Reading			
Small Ring	8.40	in	5.48	V		
Large Ring	14.00	in	7.58	V		

Before Survey Verification						
Target			Measured			

After Survey Verification						
Target			Measured			

g/cc
g/cc
g/cc

g/cc
g/cc
g/cc

Compensated Neutron Calibration Report

Serial Number: NEU_4I
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:	GR5
Tool Model:	OPEN
Performed:	Wed Jul 31 01:28:27 2013
Calibrator Value:	1.0 GAPI
Background Reading:	0.0 cps
Calibrator Reading:	1.0 cps
Sensitivity:	1.2000 GAPI/cps