



**Weatherford®**

**COMPENSATED DENSITY  
COMPENSATED NEUTRON  
LOG**

COMPANY		KINDER MORGAN C02 Co. L.P	
WELL		DOE CANYON #14	
FIELD		DOE CANYON	
PROVINCE/COUNTY		DOLORES	
COUNTRY/STATE		U.S.A. / COLORADO	
LOCATION		987' FSL & 2384' FEL	
SEC 9	TWP 40N	RGE 18W	Other Services MDL/MMR MGS
API Number		05-033-06177-01	MIE
Permanent Datum GL, Elevation		7105 feet	Elevations: KB 7130.00 DF 7130.00 GL 7105.00
Log Measured From		KB	
Drilling Measured From		KB @ 25 FEET	
Date	17-AUG-2013		
Run Number	ONE		
Service Order	3529584		
Depth Driller	8502.00		feet
Depth Logger	8502.00		feet
First Reading	8498.00		feet
Last Reading	100.00		feet
Casing Driller	8368.00		feet
Casing Logger	8364.00		feet
Bit Size	6.000		inches
Hole Fluid Type	H2O		
Density / Viscosity	8.40 g/cc		
PH / Fluid Loss			
Sample Source			
Rm @ Measured Temp	0.92 @ 72.0		ohm-m
Rmf @ Measured Temp	0.74 @ 72.0		ohm-m
Rmc @ Measured Temp	1.10 @ 72.0		ohm-m
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.39 @ 177.0		ohm-m
Time Since Circulation	8 HOURS		
Max Recorded Temp	177.00		deg F
Equipment / Base	13173		GJ/CO
Recorded By	S. LACKEY		P. BATES
Witnessed By	C. SLAUGH		

BOREHOLE RECORD					Last Edited: 01-JAN-2002 00:15
Bit Size inches		Depth From feet		Depth To feet	
6.000		8368.00		8503.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
INTERMED	7.000	0.00	8368.00	29.00	

REMARKS
WLS VERSION 13.06.9802
TOOLS IN THREE SEPERATE RUNS: 1ST RUN: SHA, MBE, MBE, MCG, MUG, MLE AND MMR 2ND RUN: SHA, MCG, MISD, MDN AND MPD 3RD RUN: SHA, MCG, MIM AND MIE 4TH RUN: SHA, MCG, MDM, MRD AND MTD 5TH RUM: SHA, MGC, ANS SGS
HARDWARE: MUG: 0.5" STANDOFF MMR: 0.5" STANDOFF MISD: ECCENTRALIZER BOWSPRINGS MDN: DUAL BOWSPRINGS MPD: 8" PROFILE PLATE MIM: NONMAGNETIC BASKET MIE: NONMAGNETIC BASKET, 1.0" STANDOFF

2.71 GM/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT DATA QUALITY.

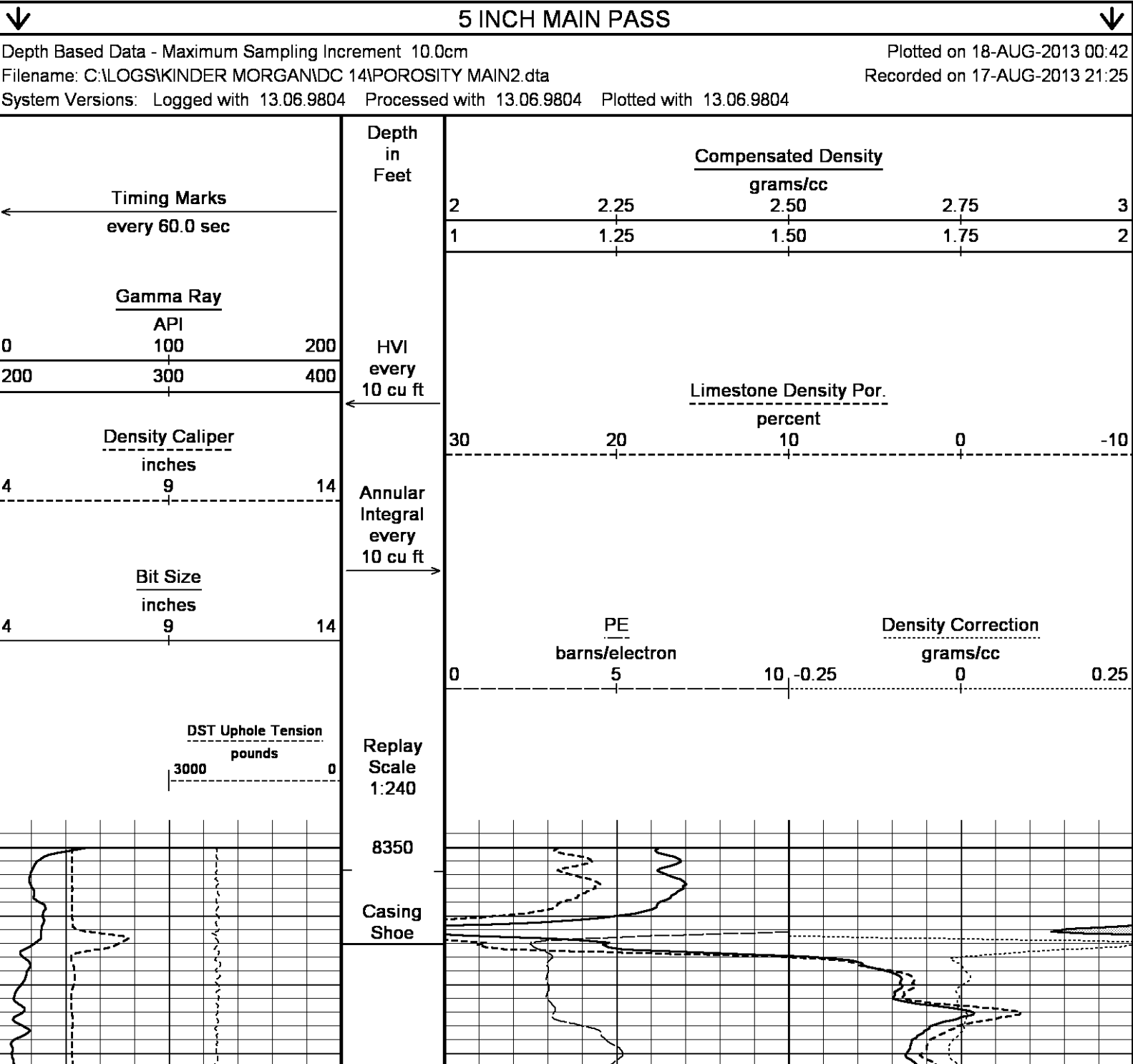
MIE CALIPERS CLOSED BEFORE CASING TO ALLOW FOR SAFE ENTRANCE.

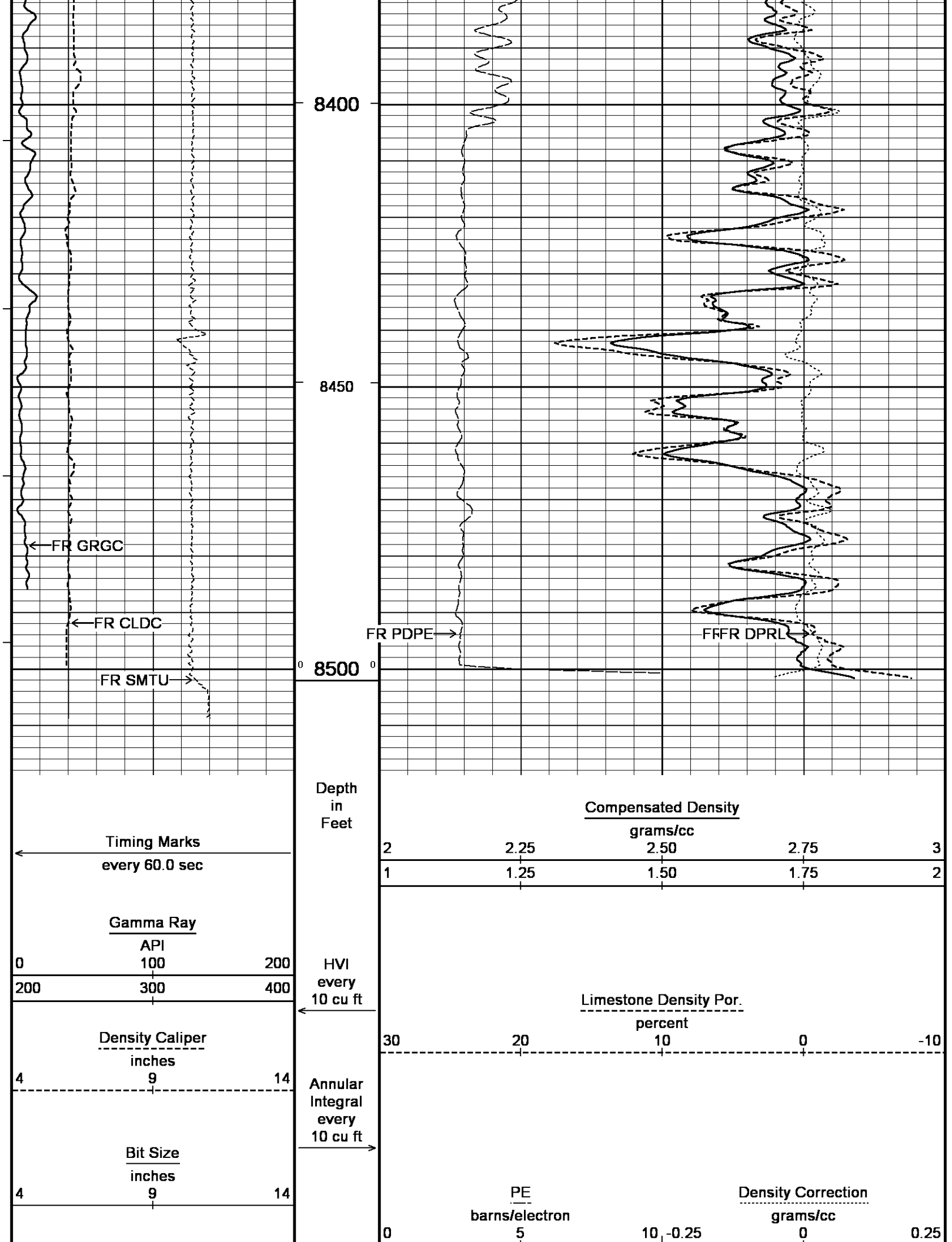
TOTAL HOLE VOLUME = 28 CUBIC FEET.

SERVICE ORDER: 3529584

RIG: NABORS 405

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 interpretations, and we shall not, except in the case of gross or wilful 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 in our price schedule.





DST Uphole Tension

pounds

30000

Replay

Scale

1:240

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 18-AUG-2013 00:42

Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta

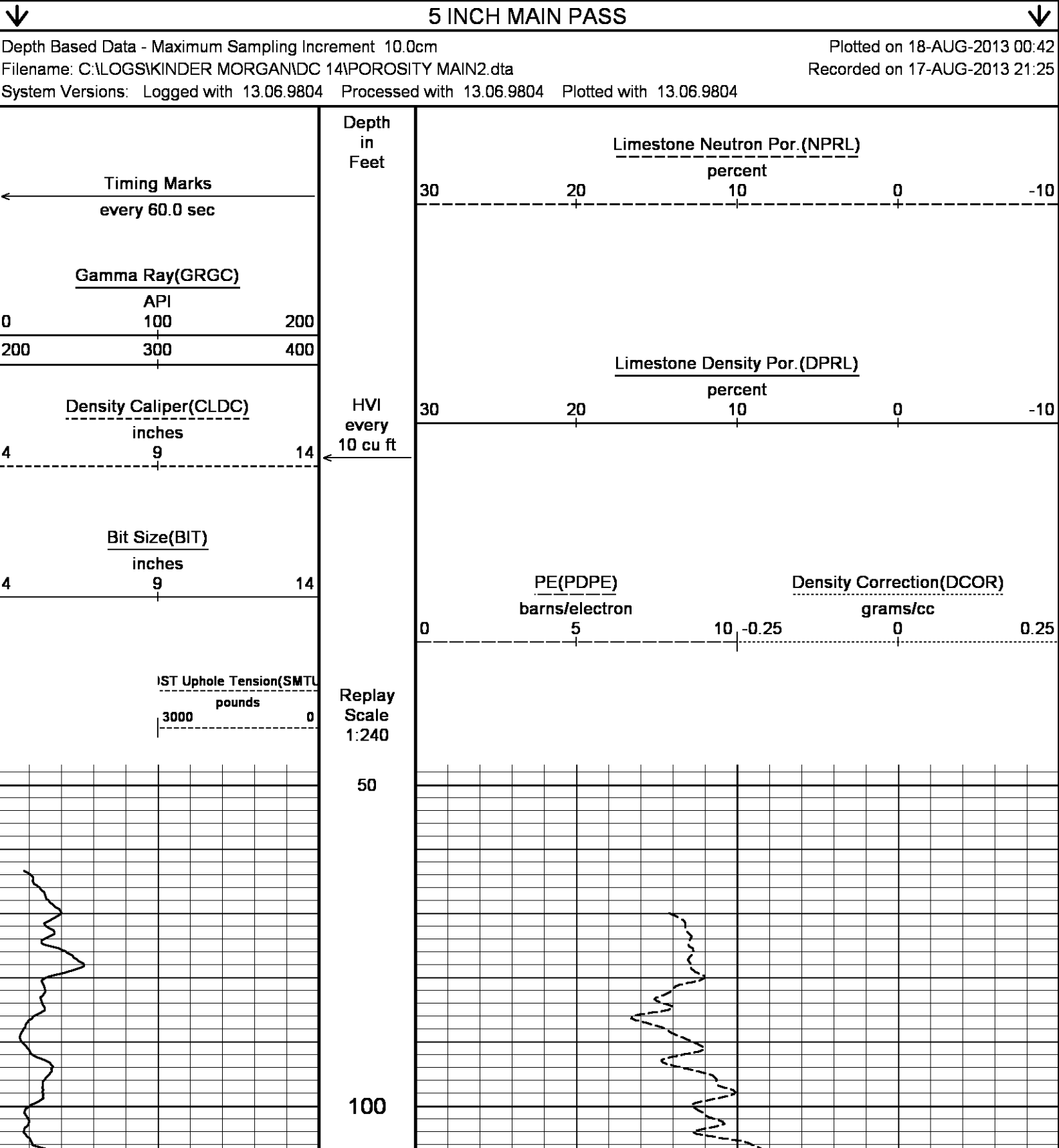
Recorded on 17-AUG-2013 21:25

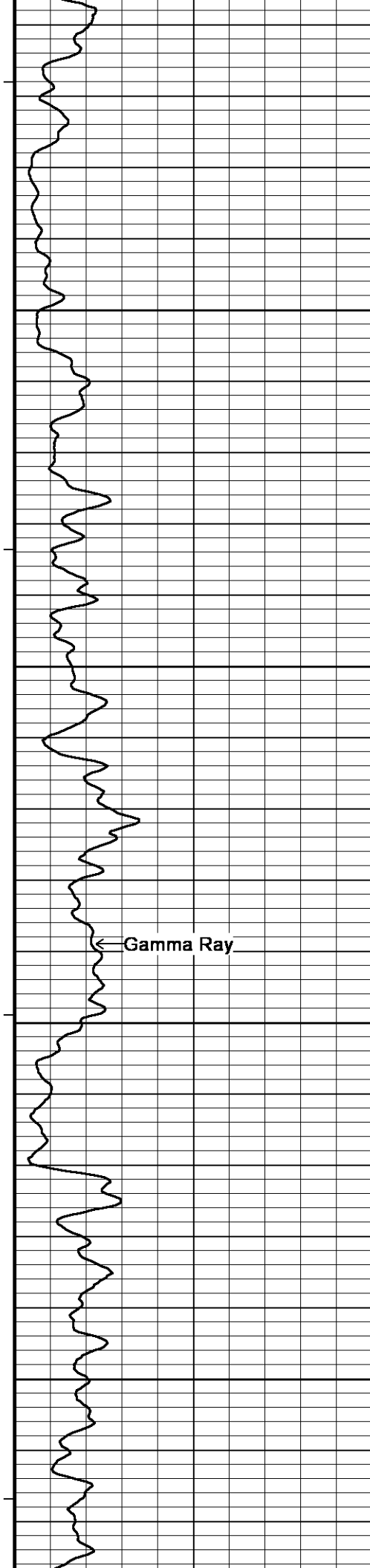
System Versions: Logged with 13.06.9804 Processed with 13.06.9804 Plotted with 13.06.9804

↑

5 INCH MAIN PASS

↑





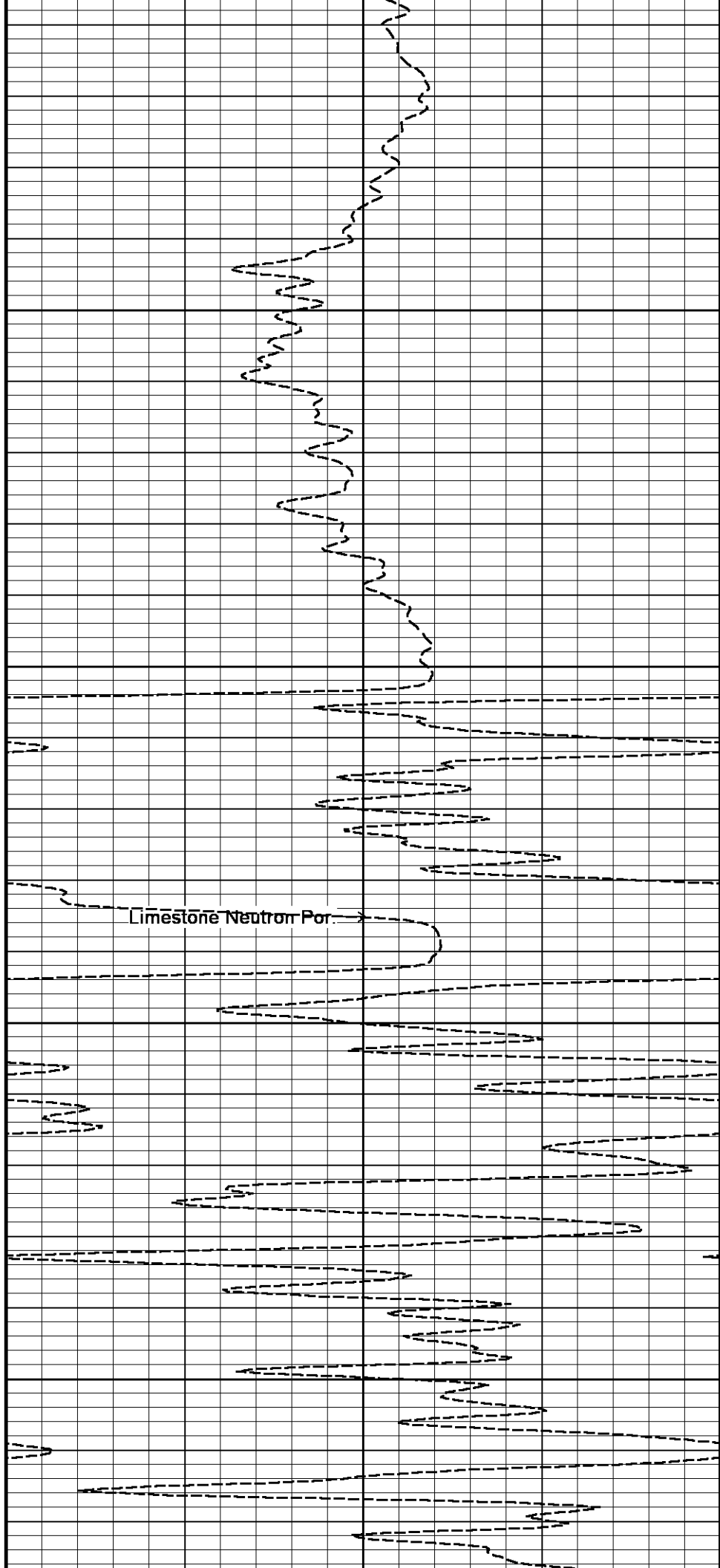
Gamma Ray

150

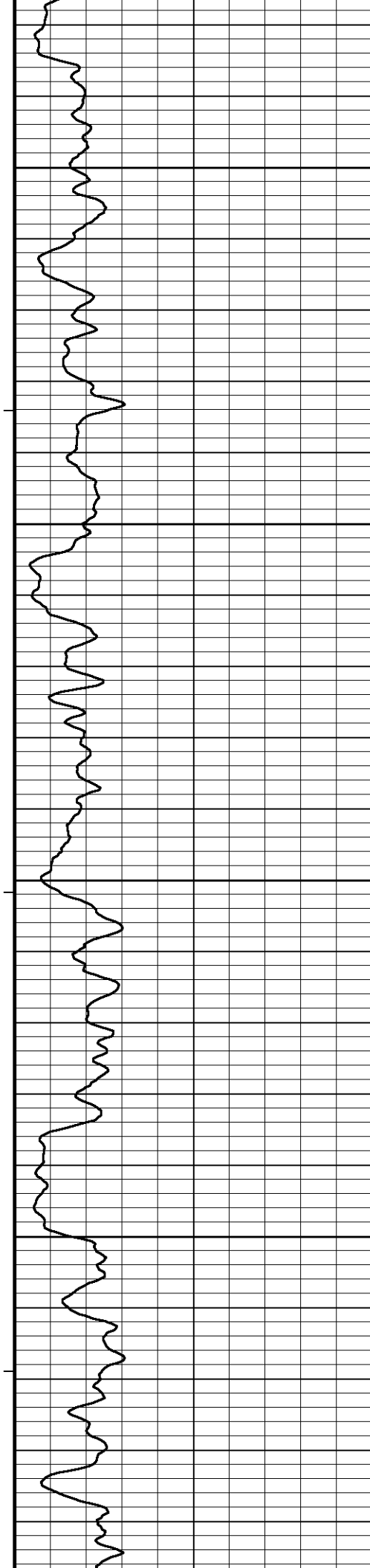
200

250

300



Limestone Neutron Por

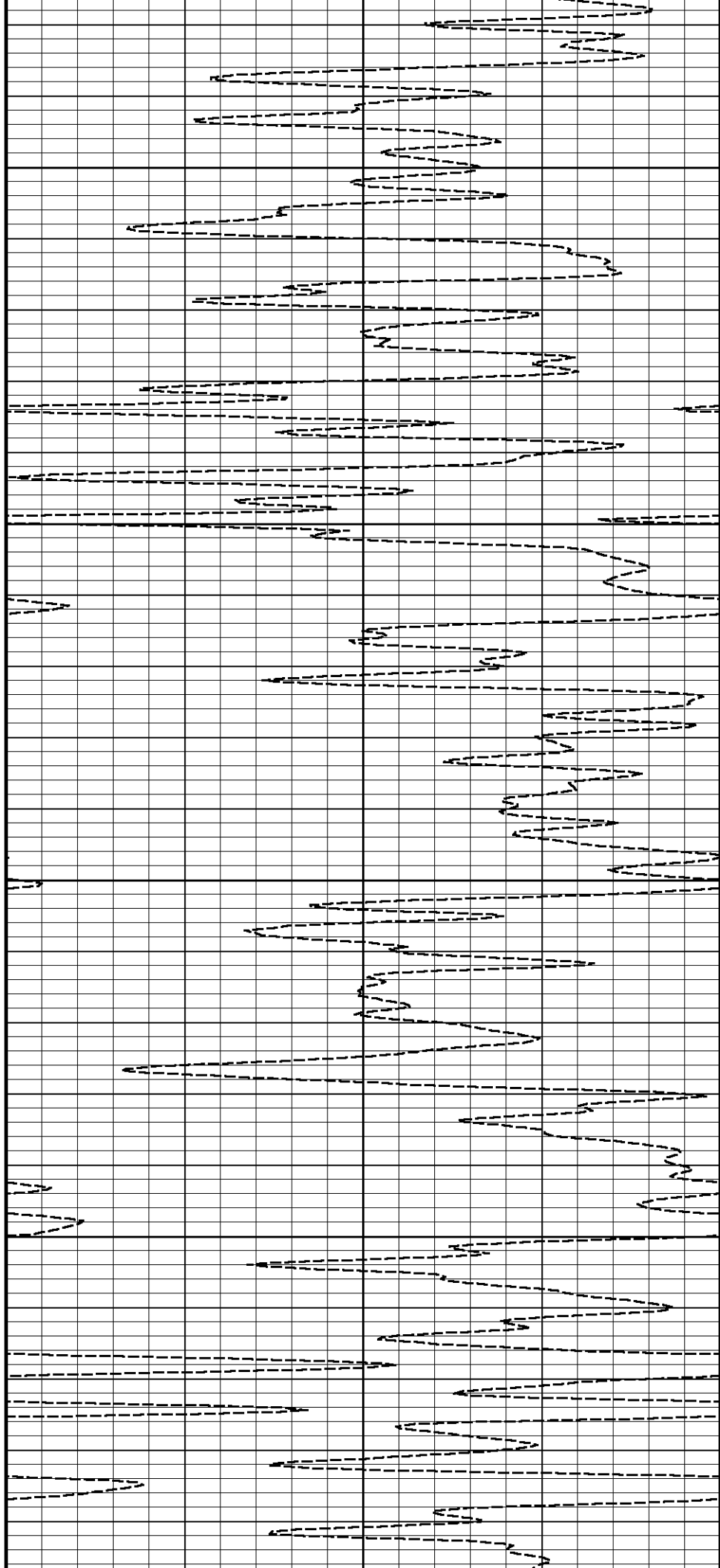


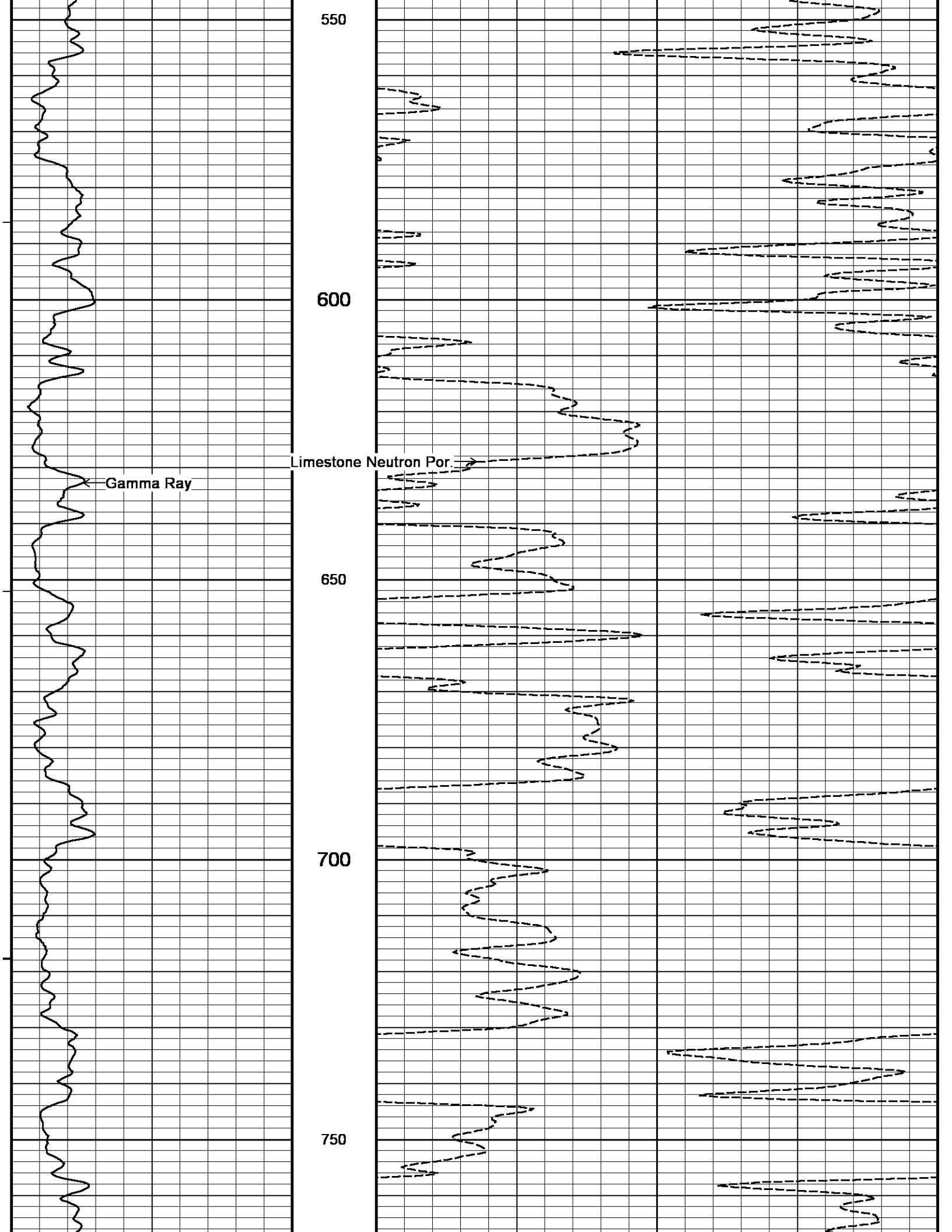
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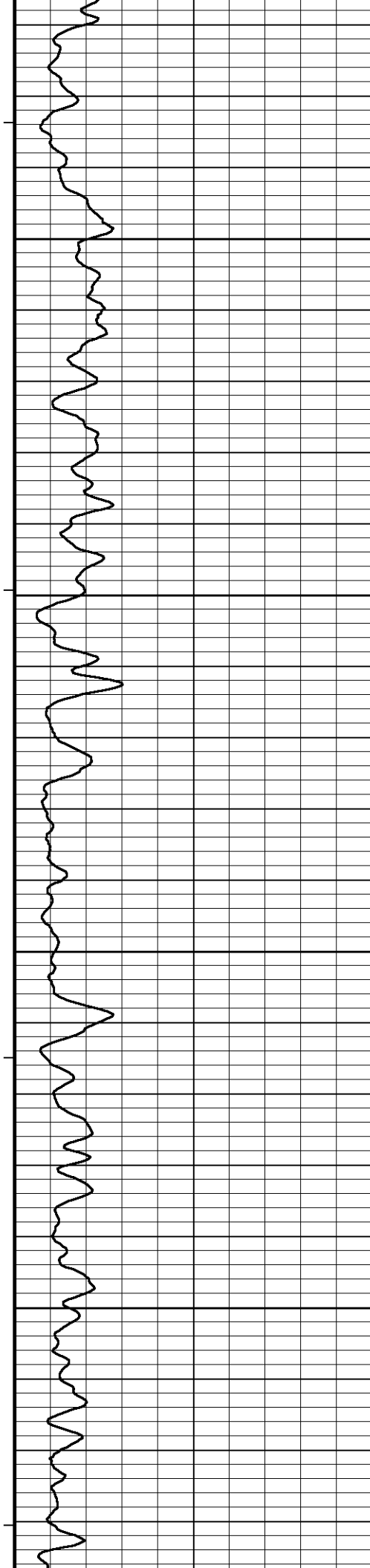
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450

500





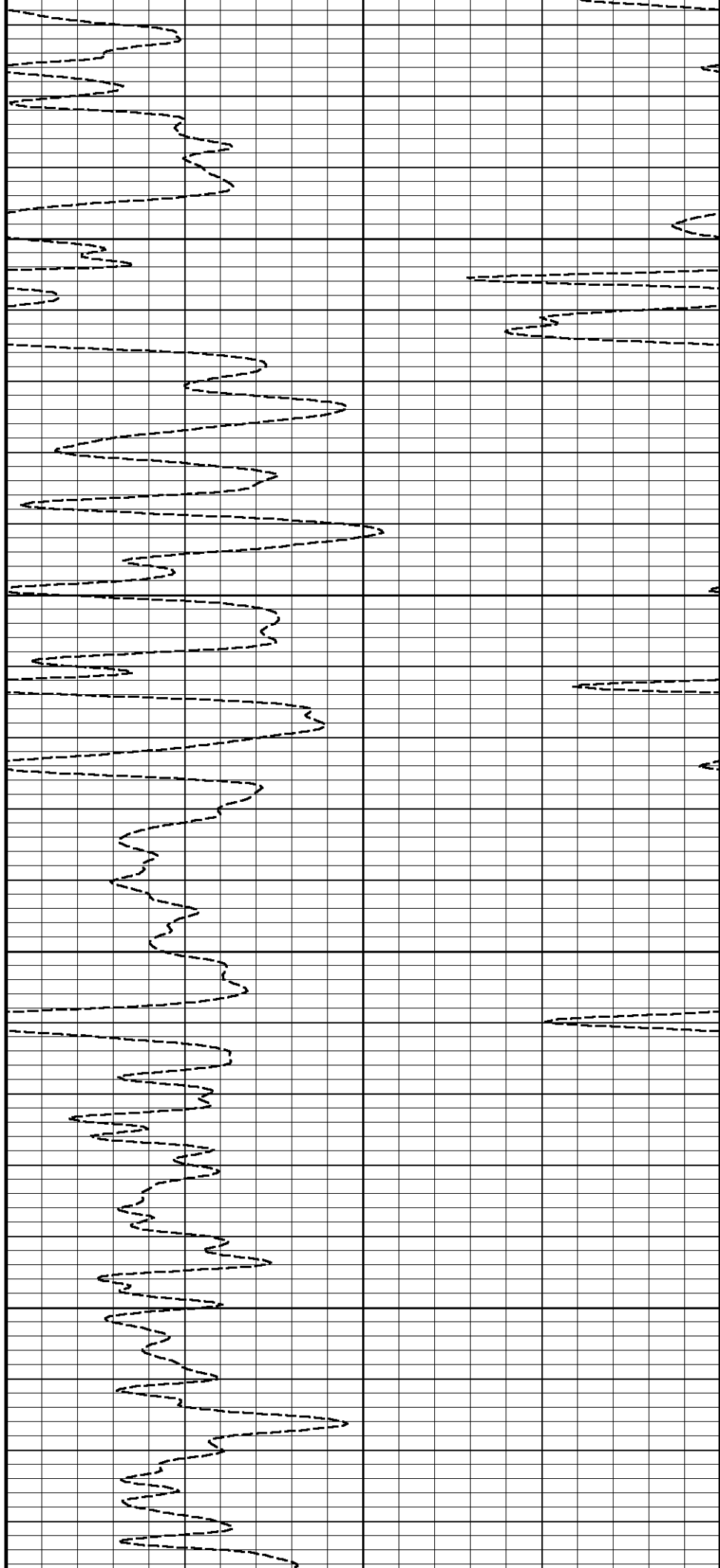


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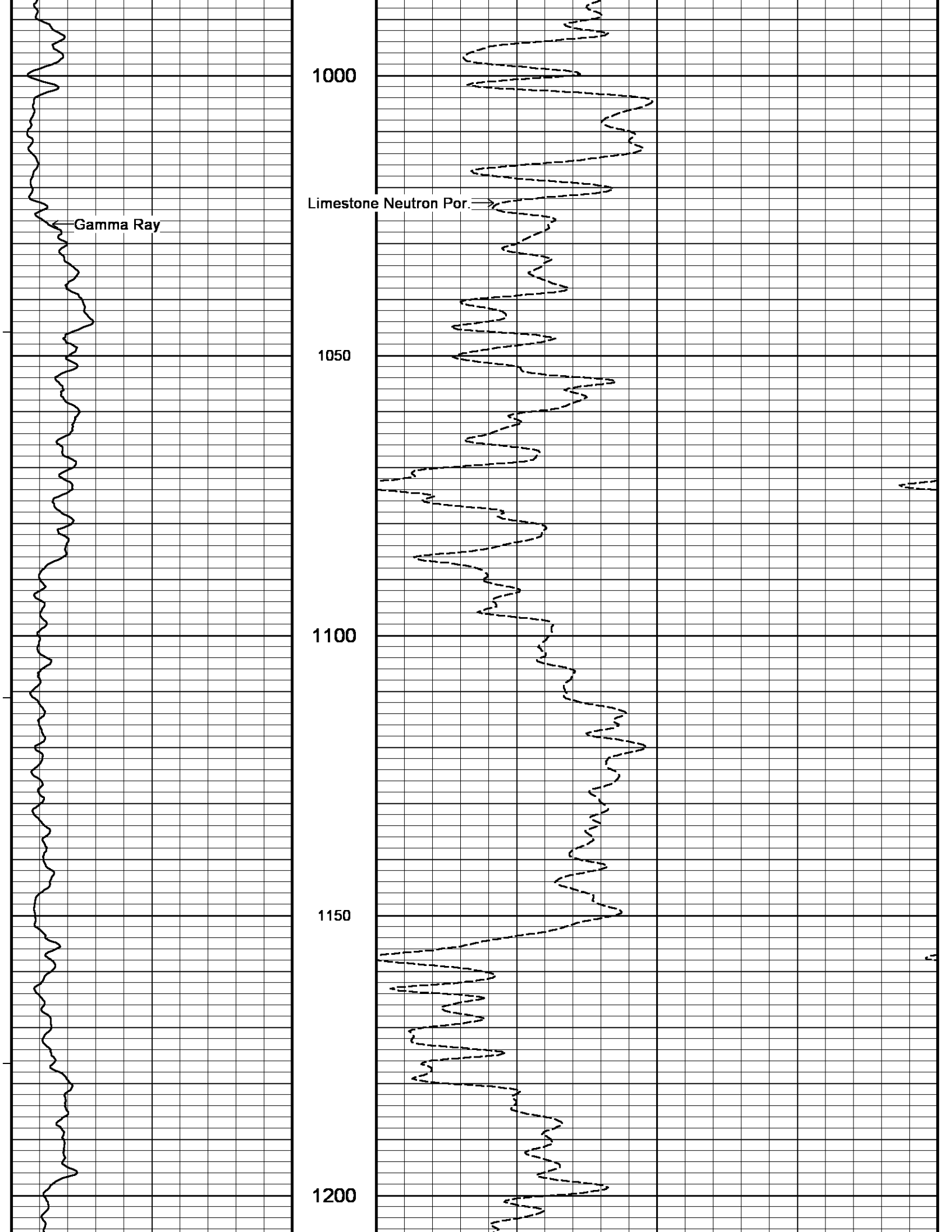
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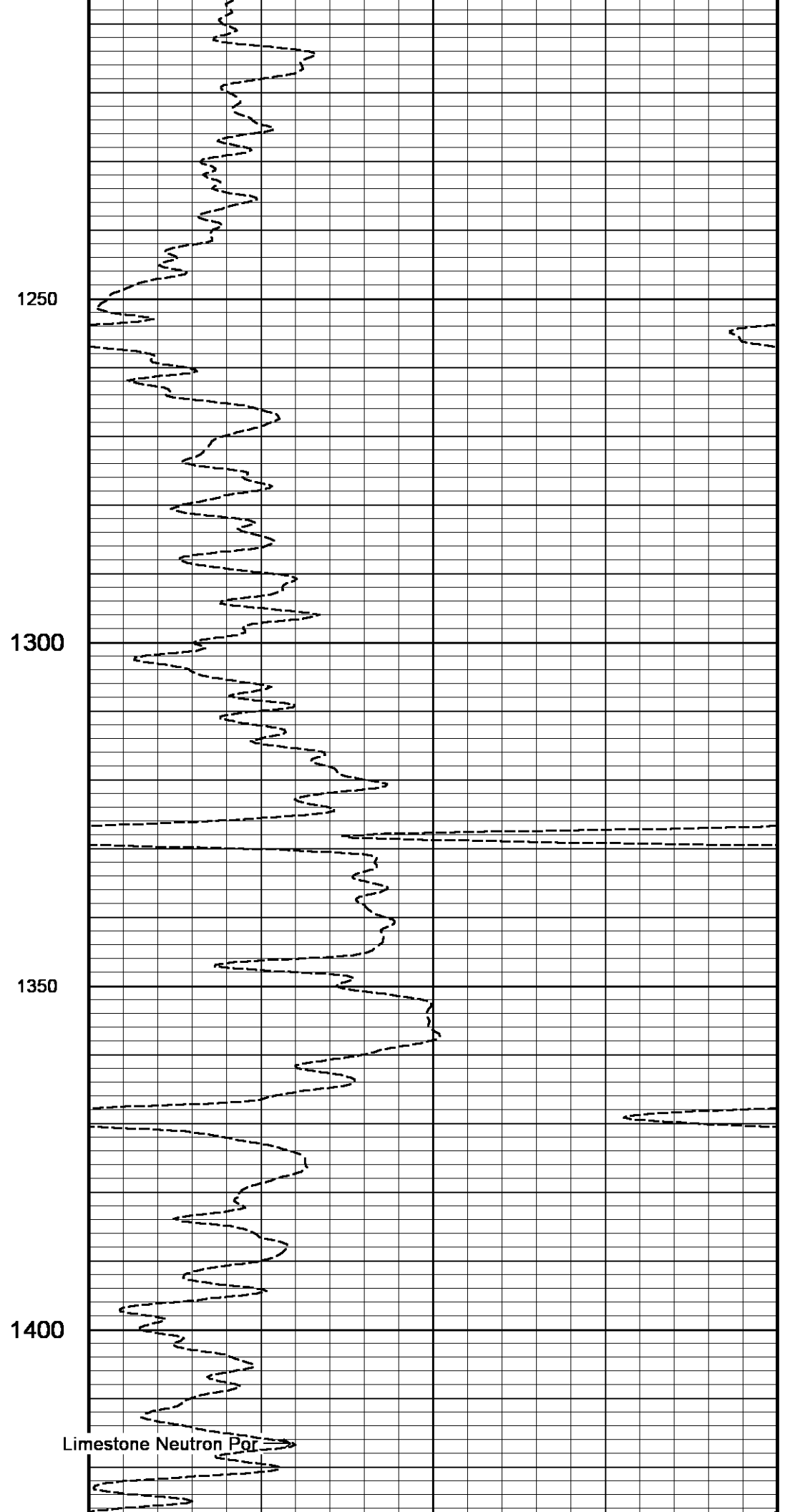
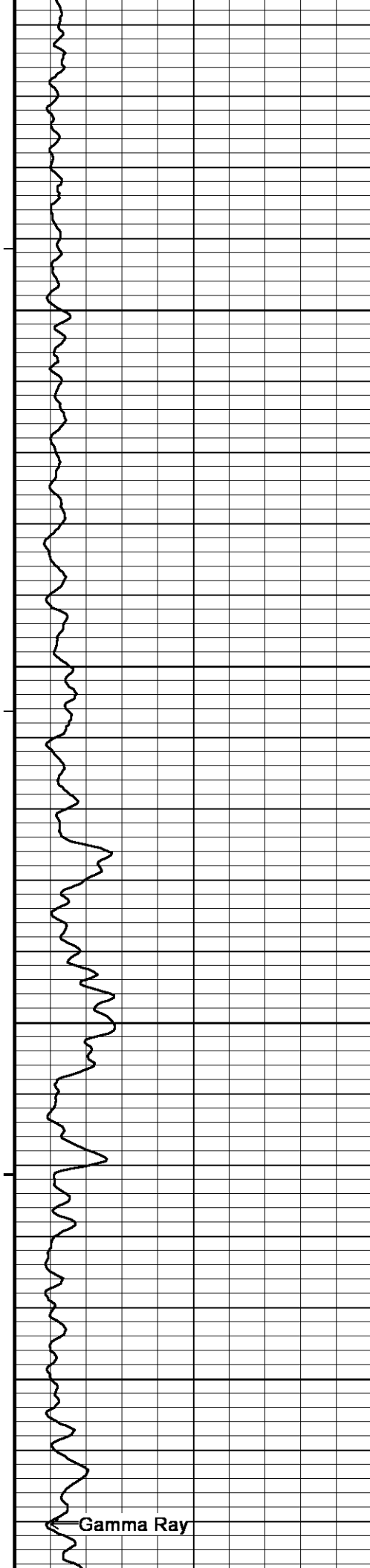
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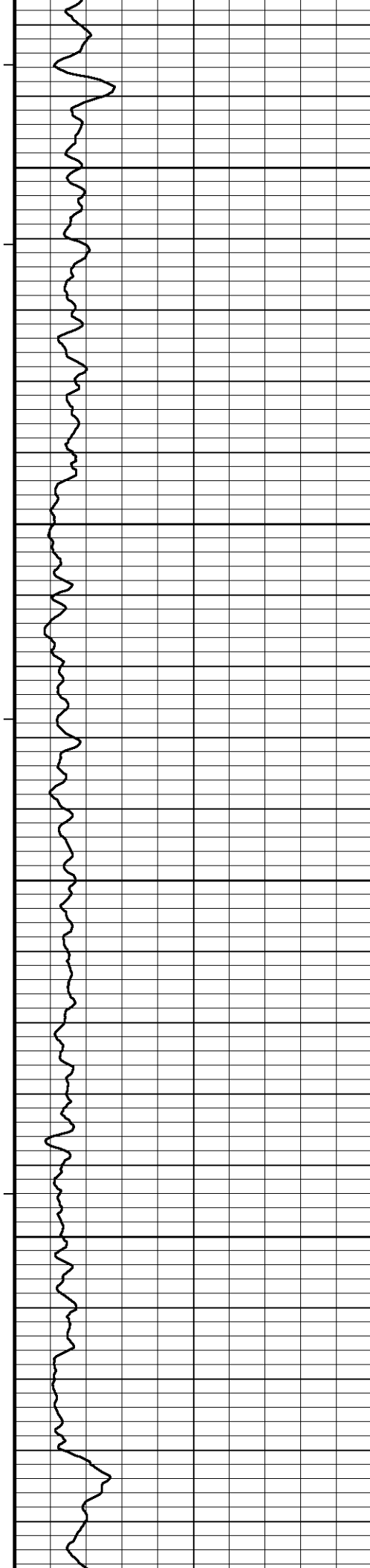
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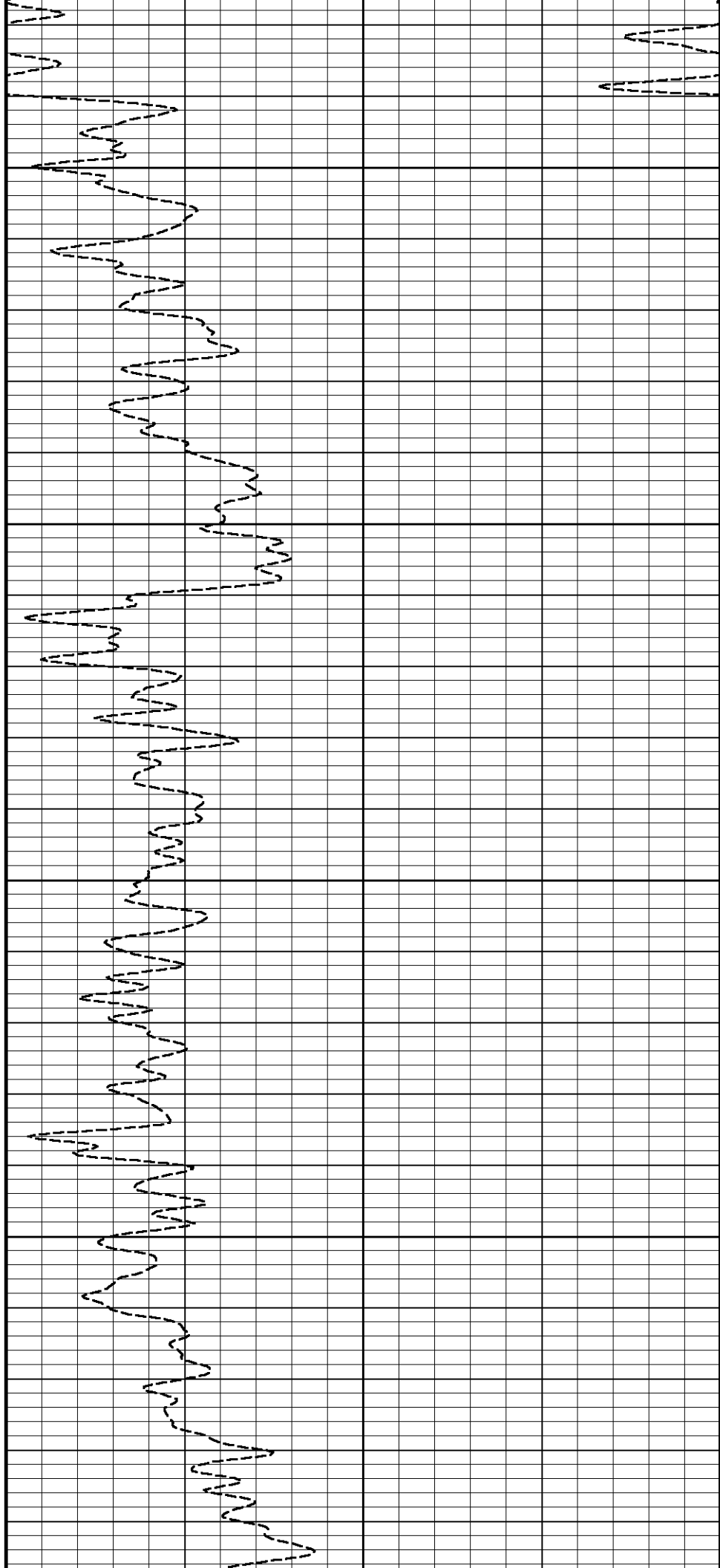


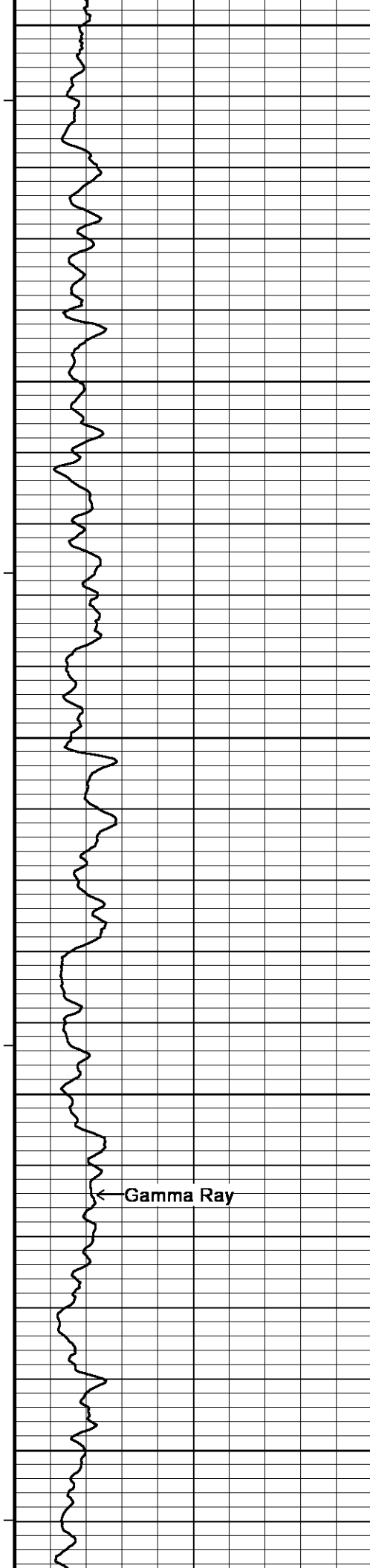
1450

1500

1550

1600





1650

1700

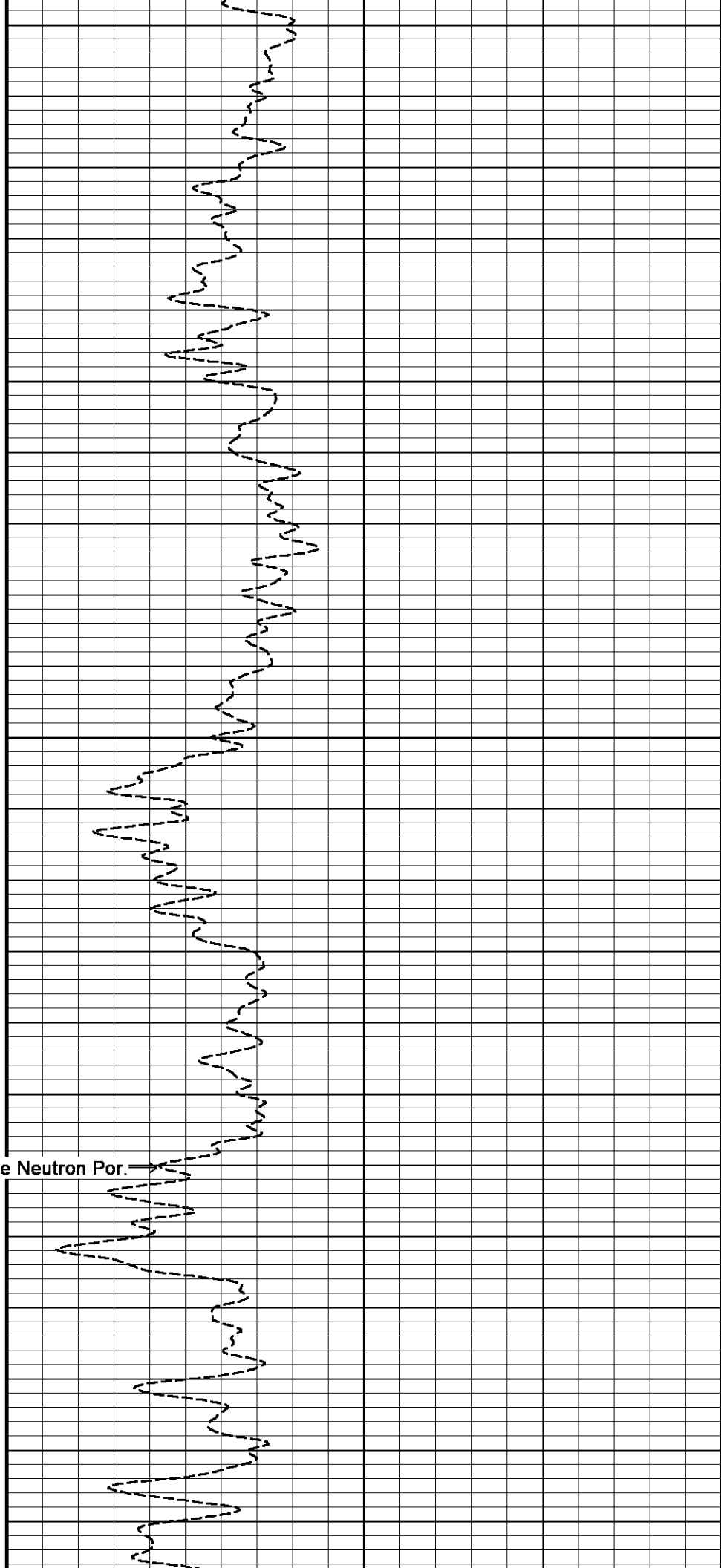
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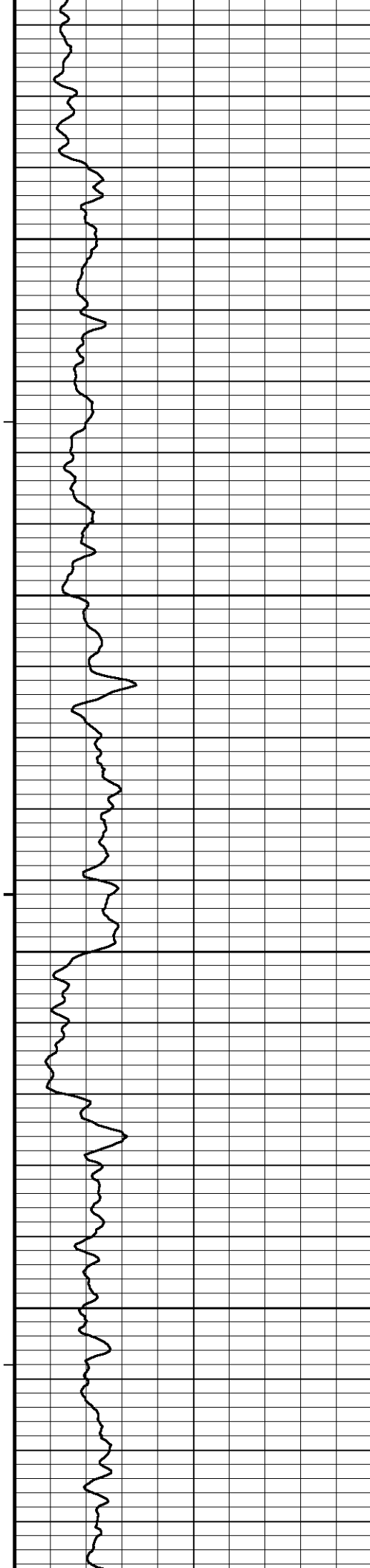
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1850

Gamma Ray

Limestone Neutron Por. →



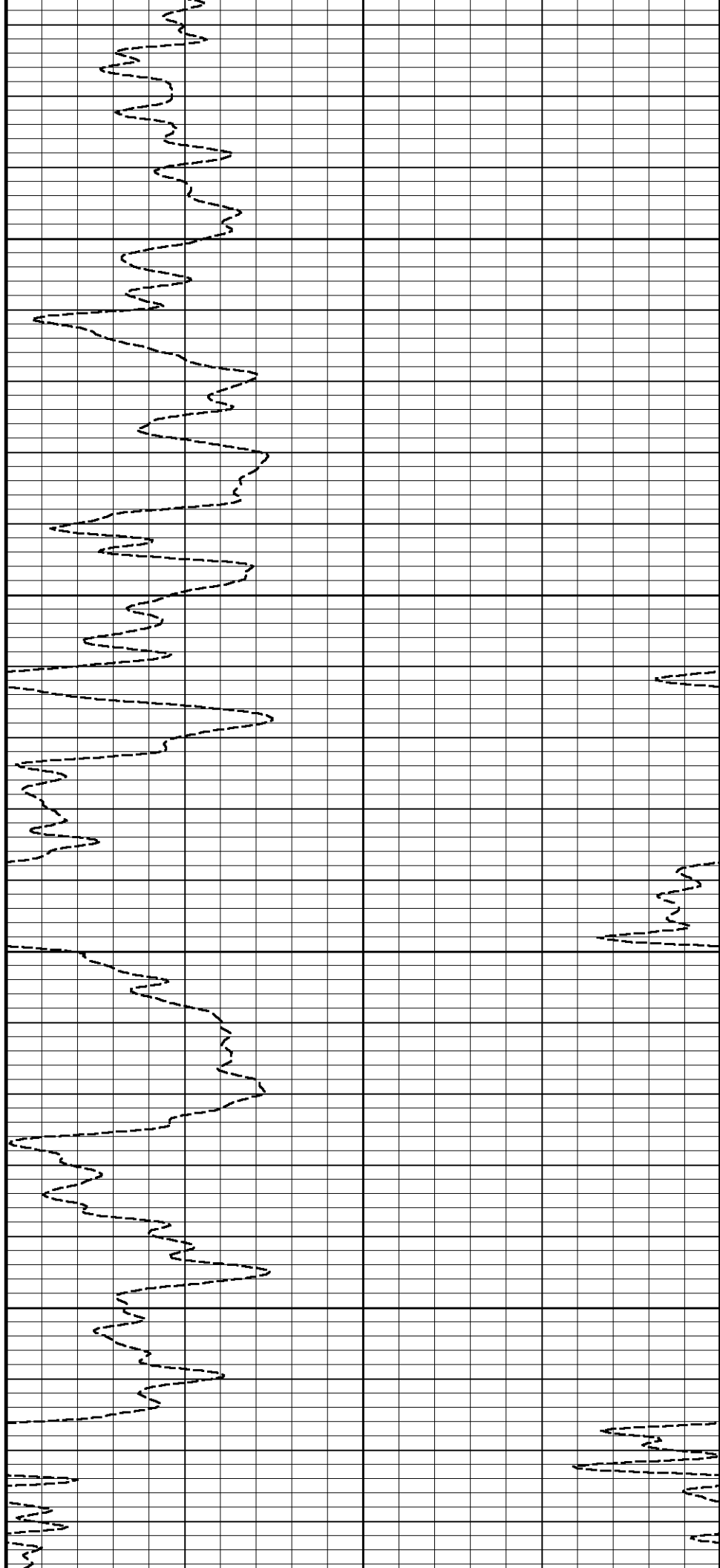


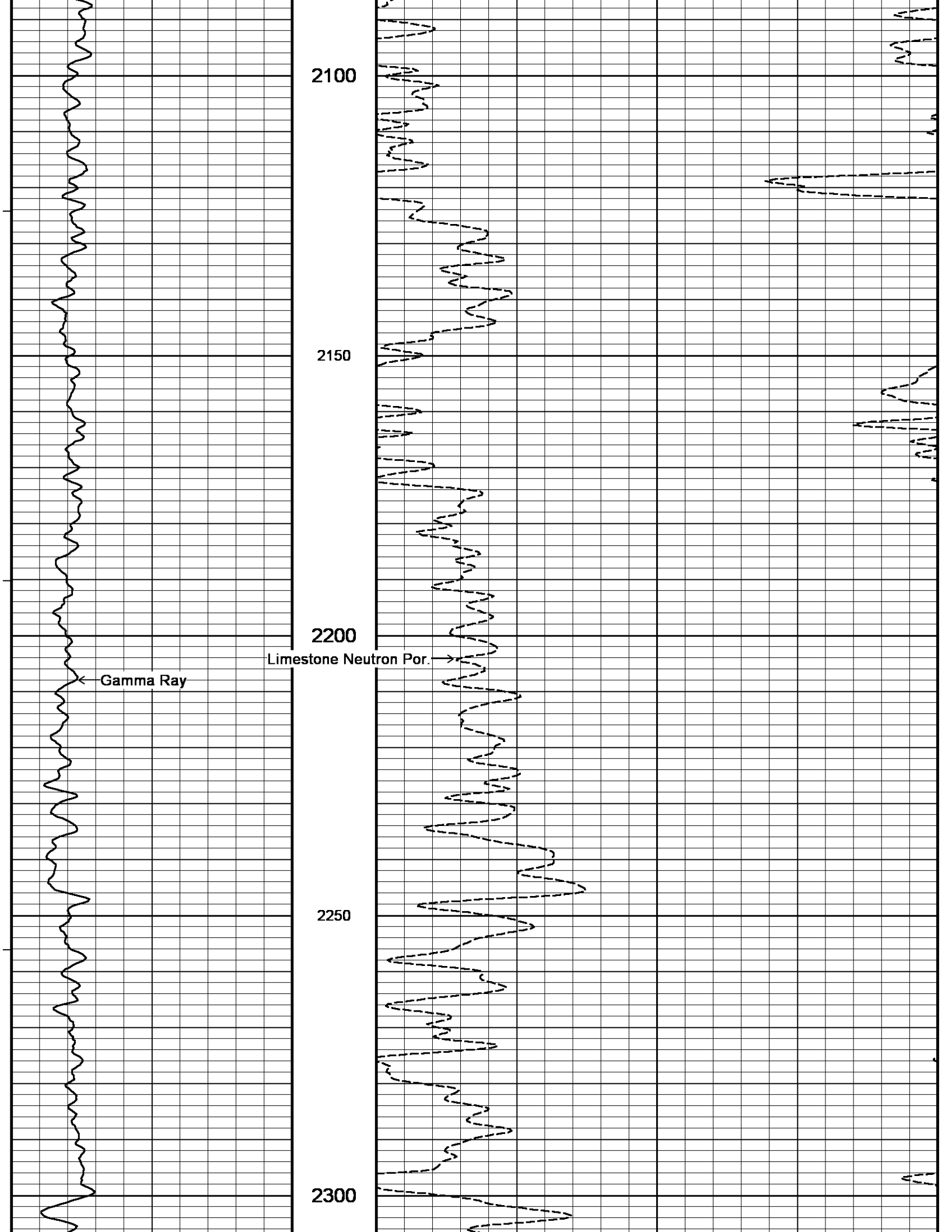
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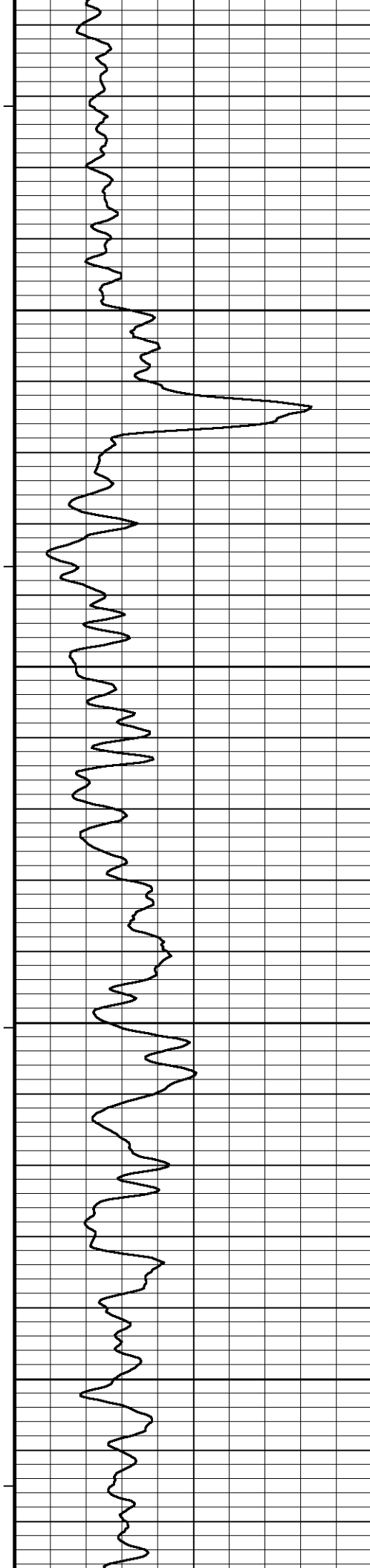
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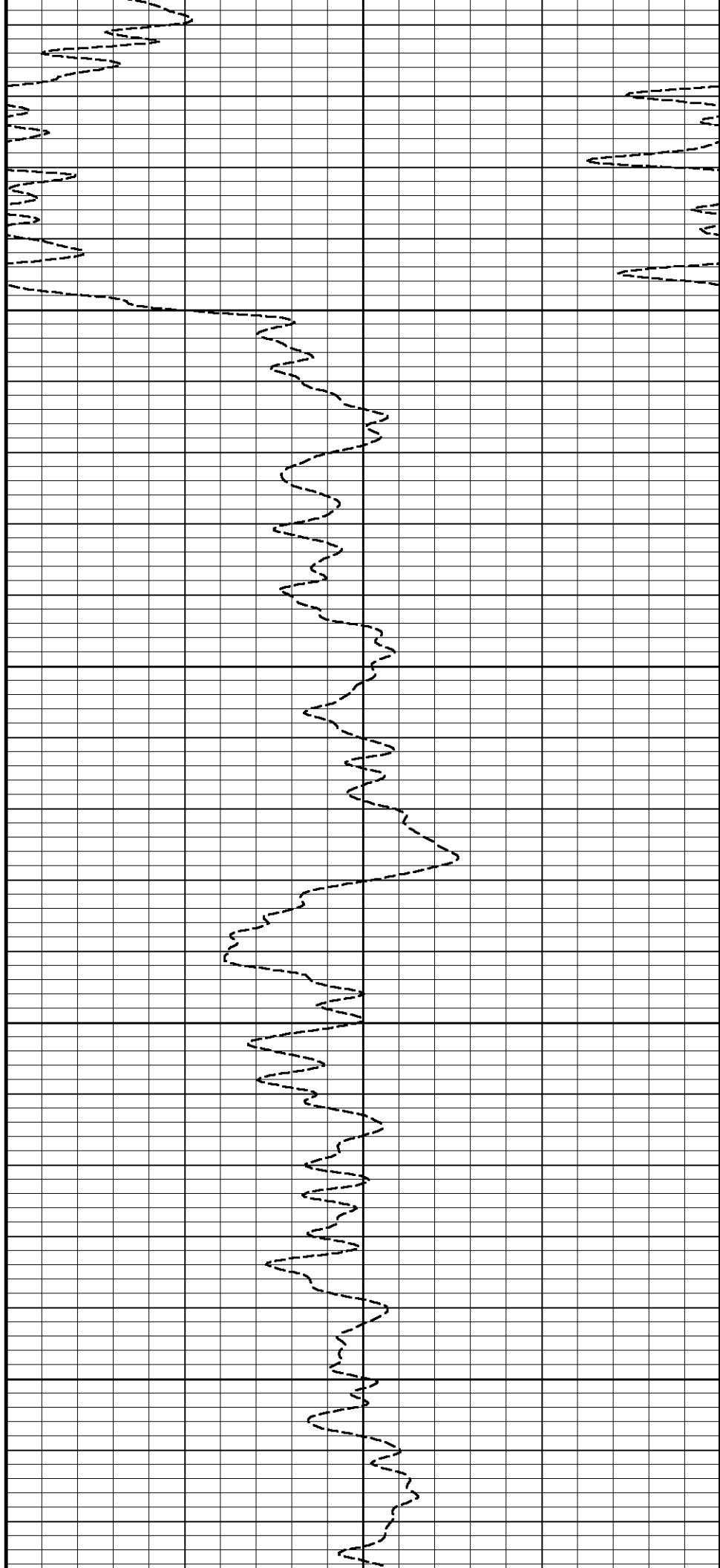


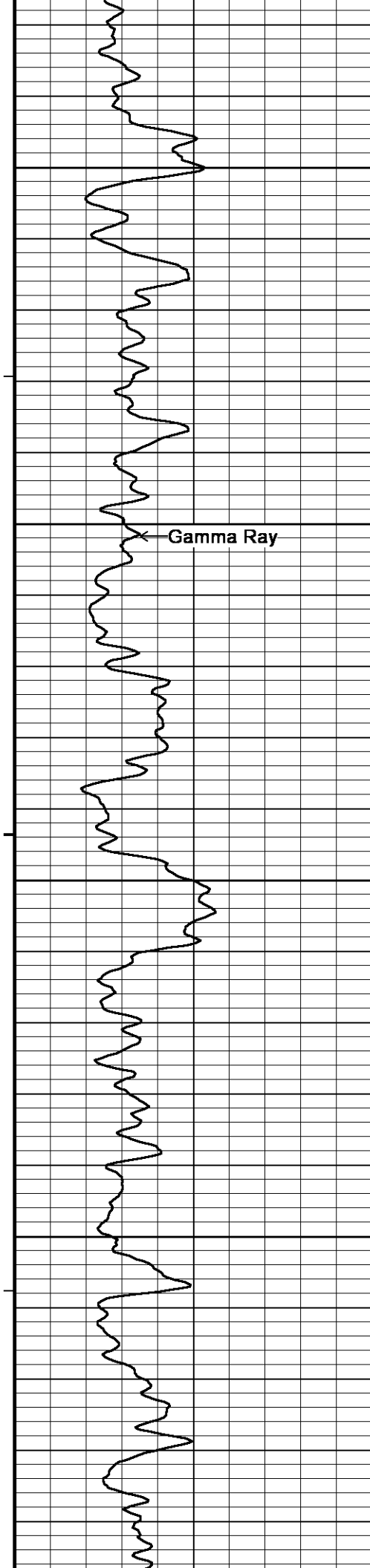
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2400

2450

2500





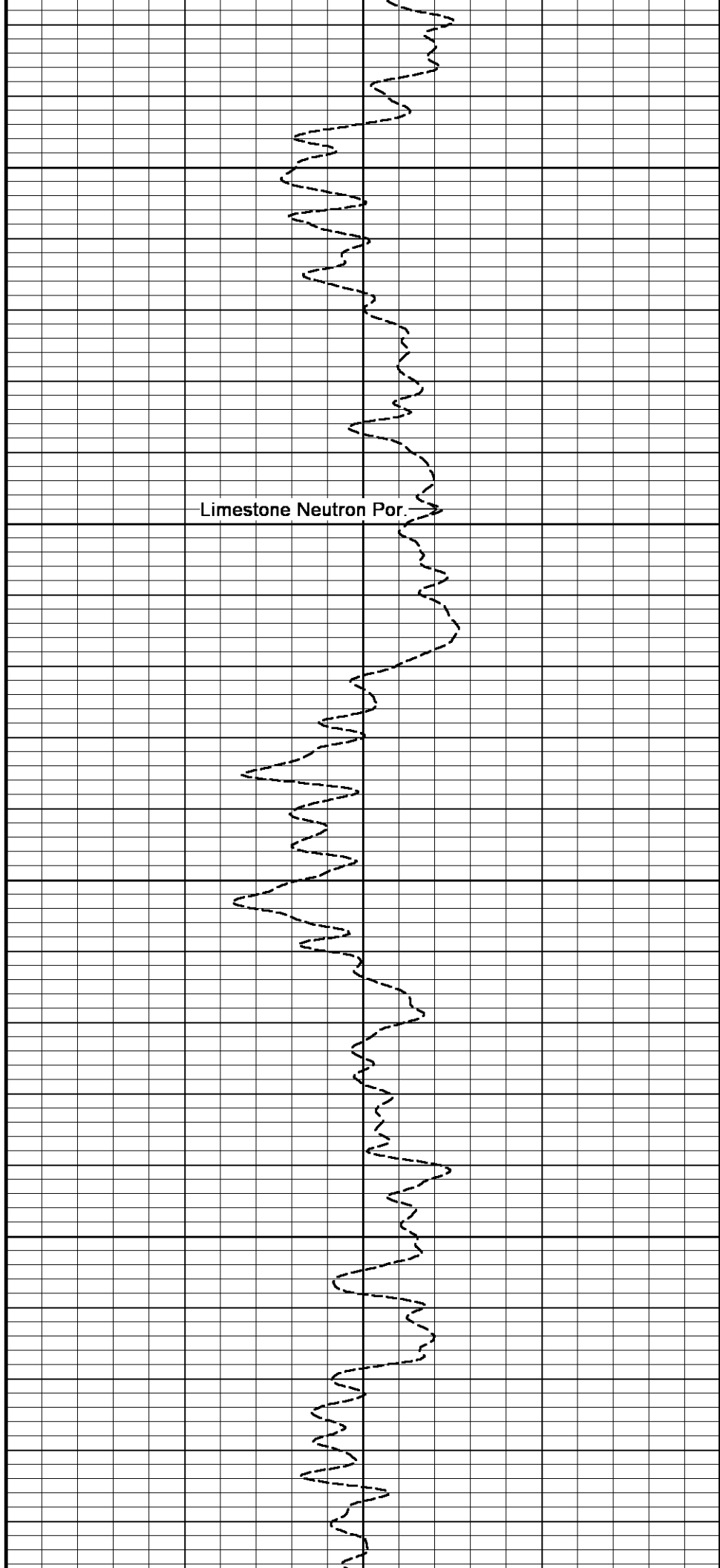
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2600

2650

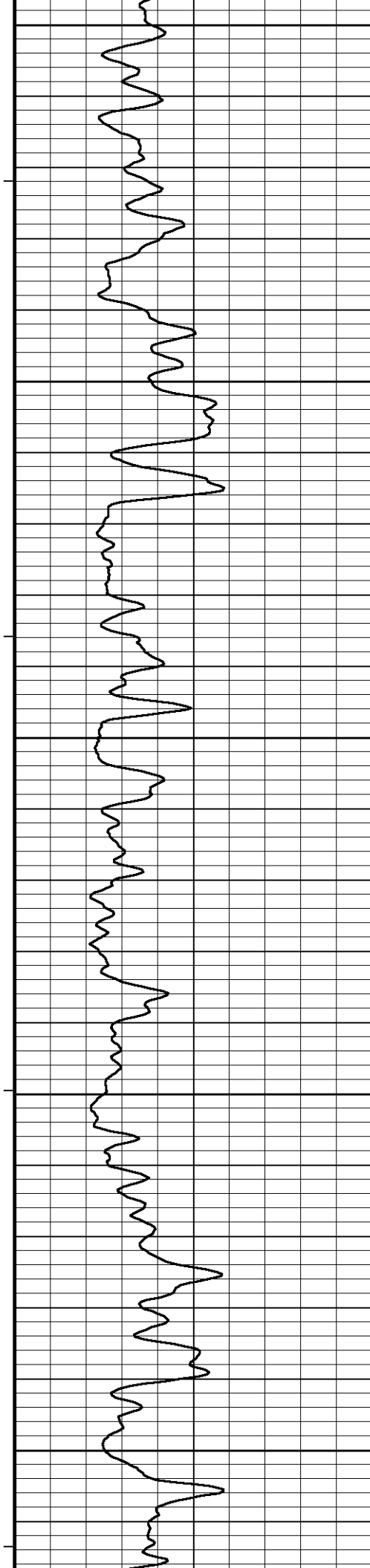
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Gamma Ray



Limestone Neutron Por.





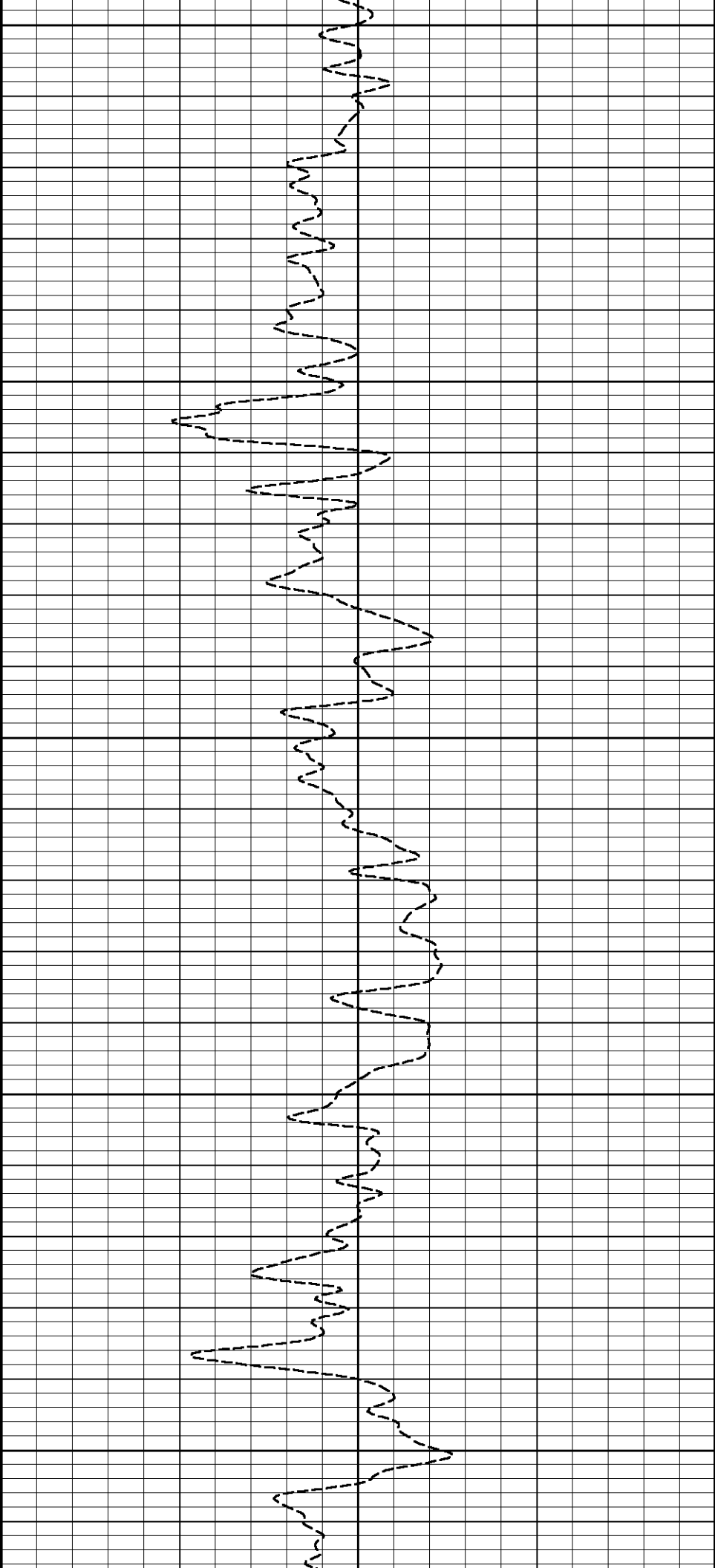
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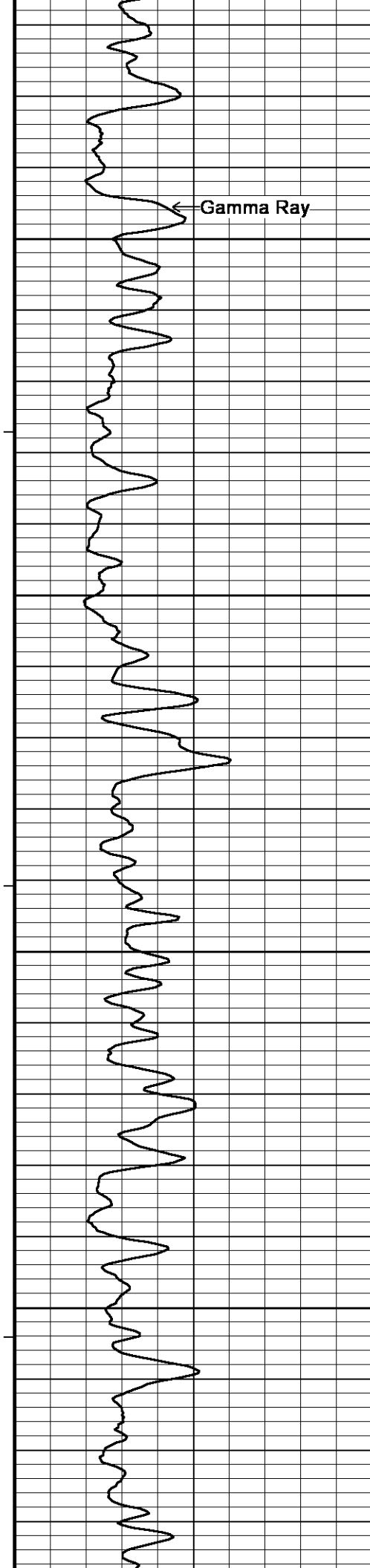
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2850

2900

2950





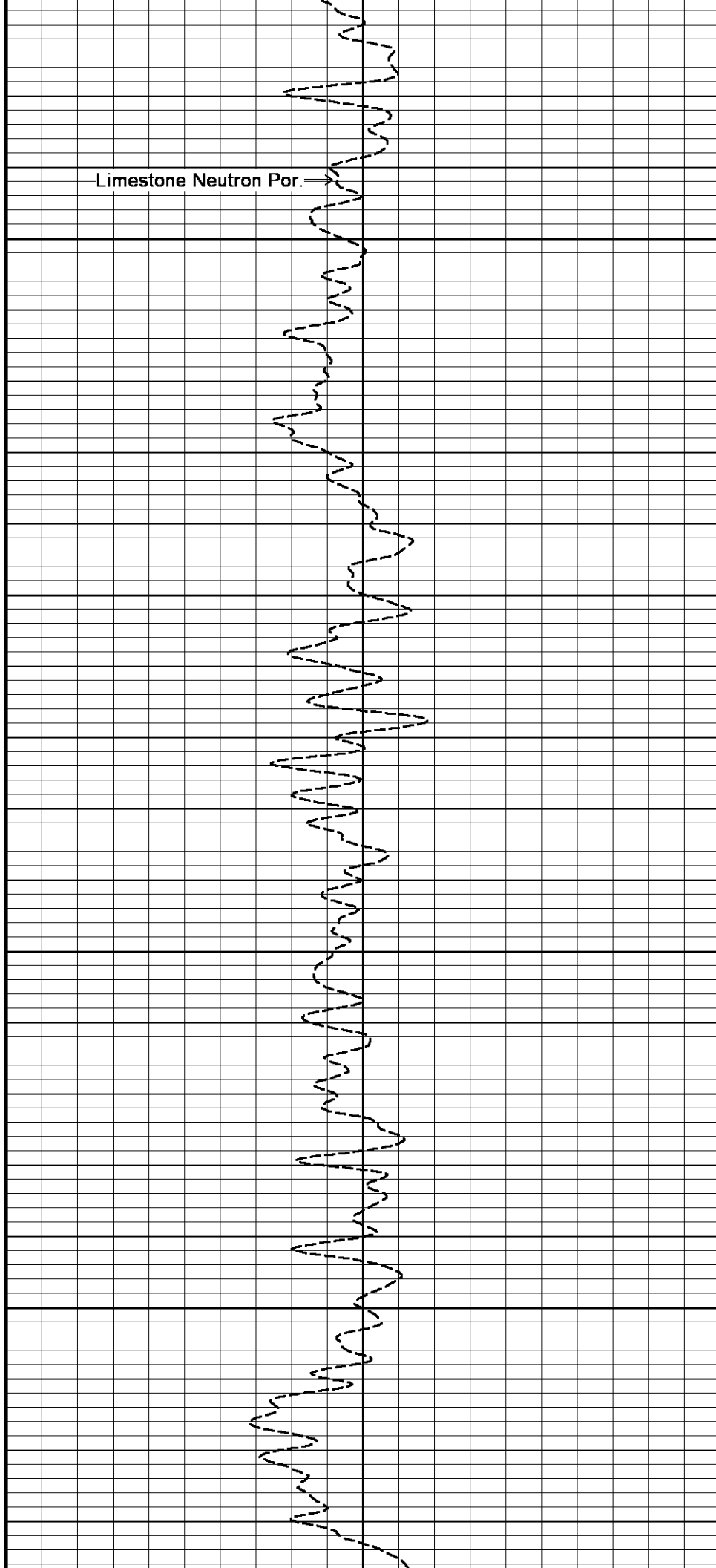
Gamma Ray

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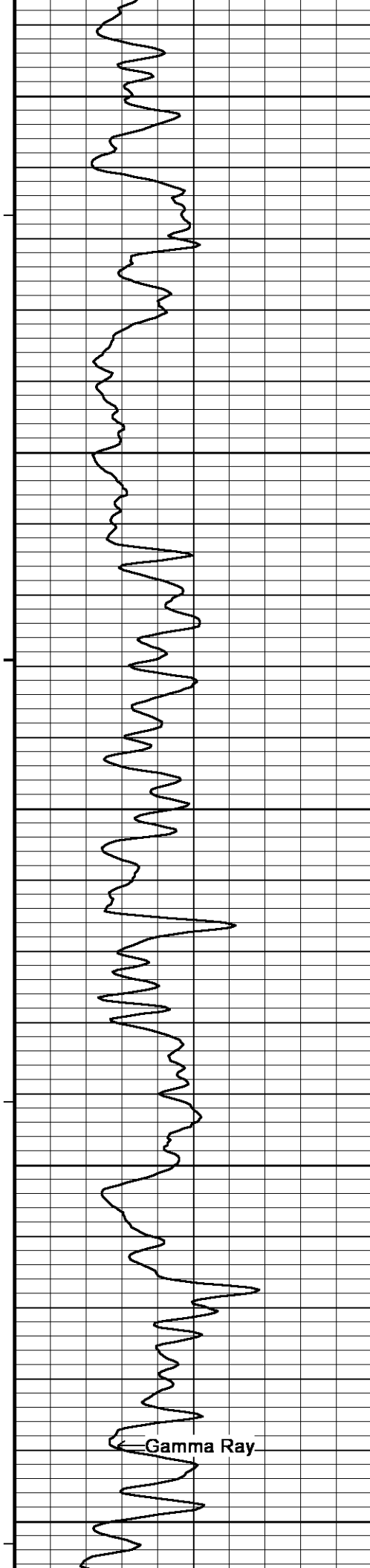
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3100

3150



Limestone Neutron Por.



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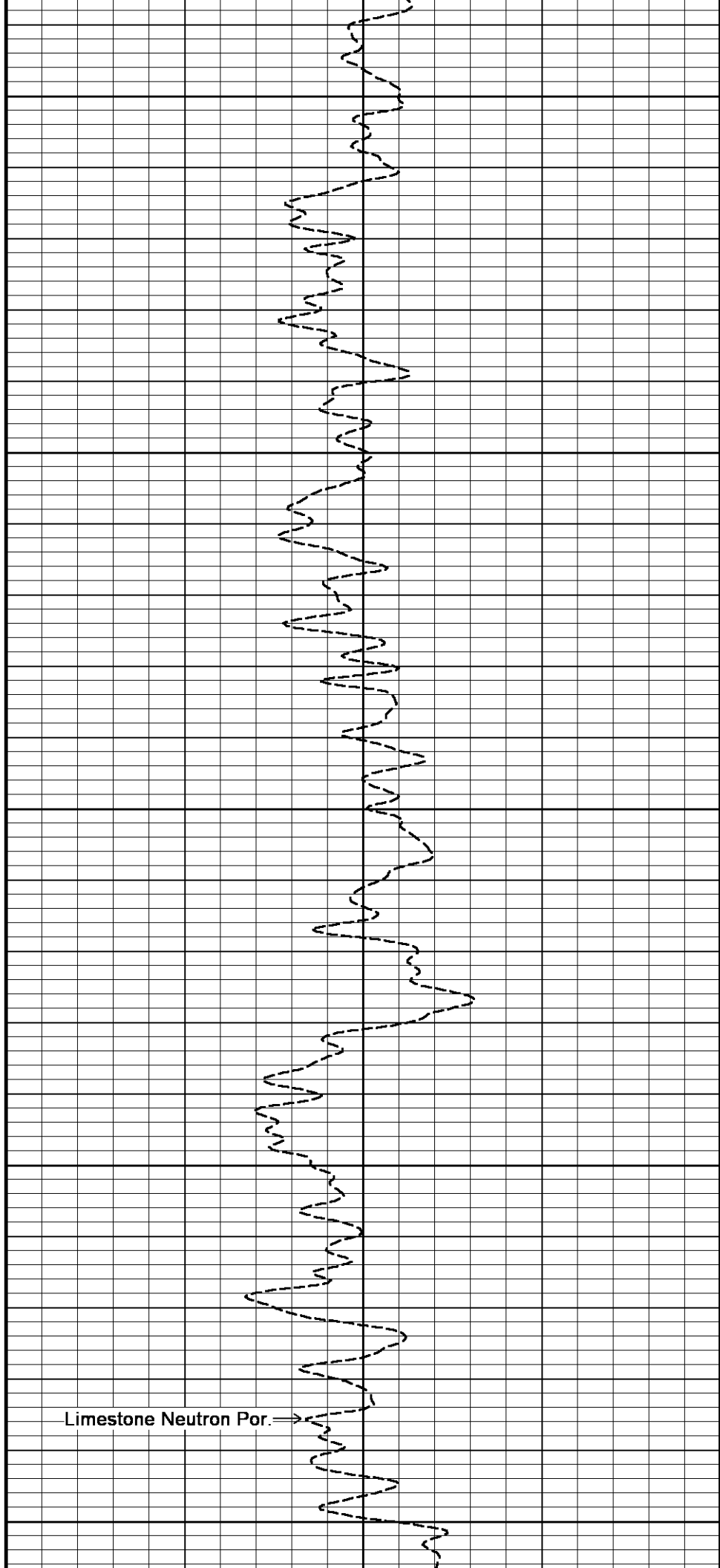
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3300

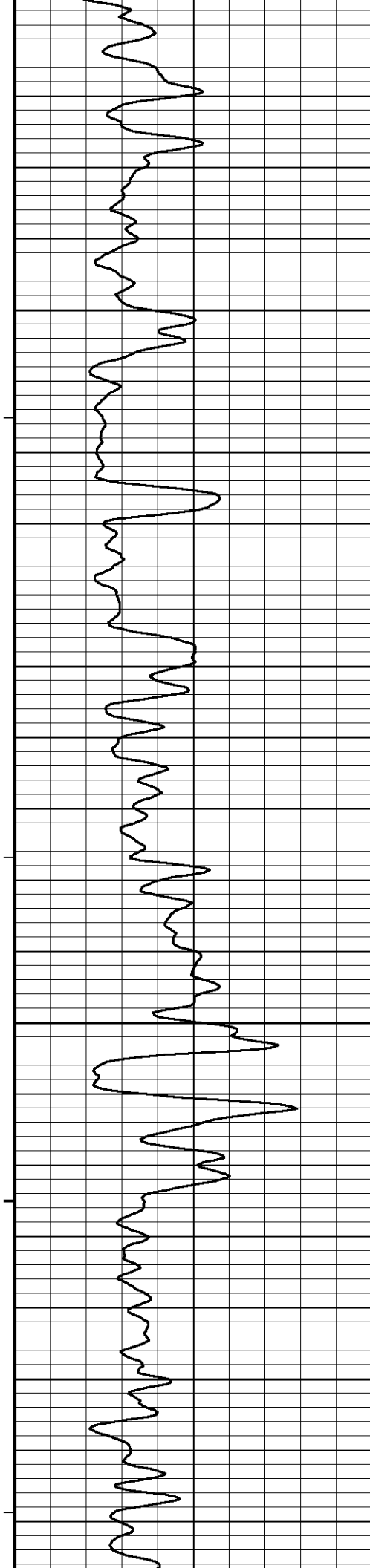
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3400

Gamma Ray



Limestone Neutron Por. →

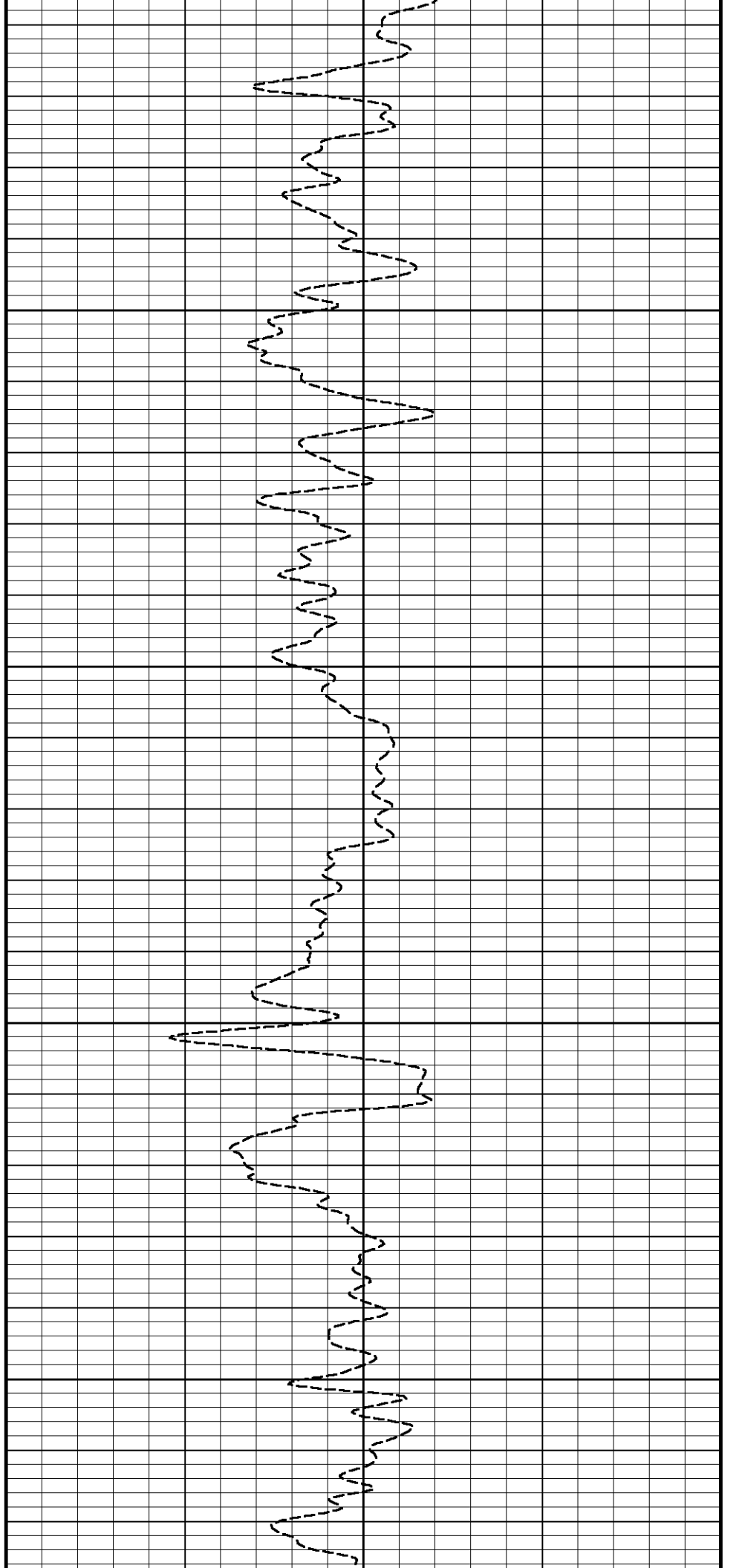


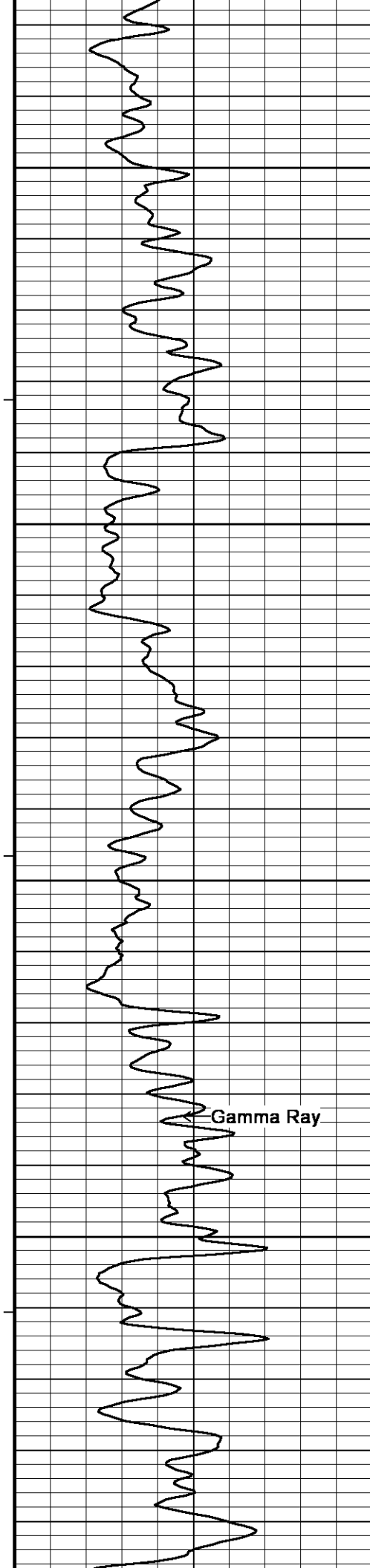
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3500

3550

3600





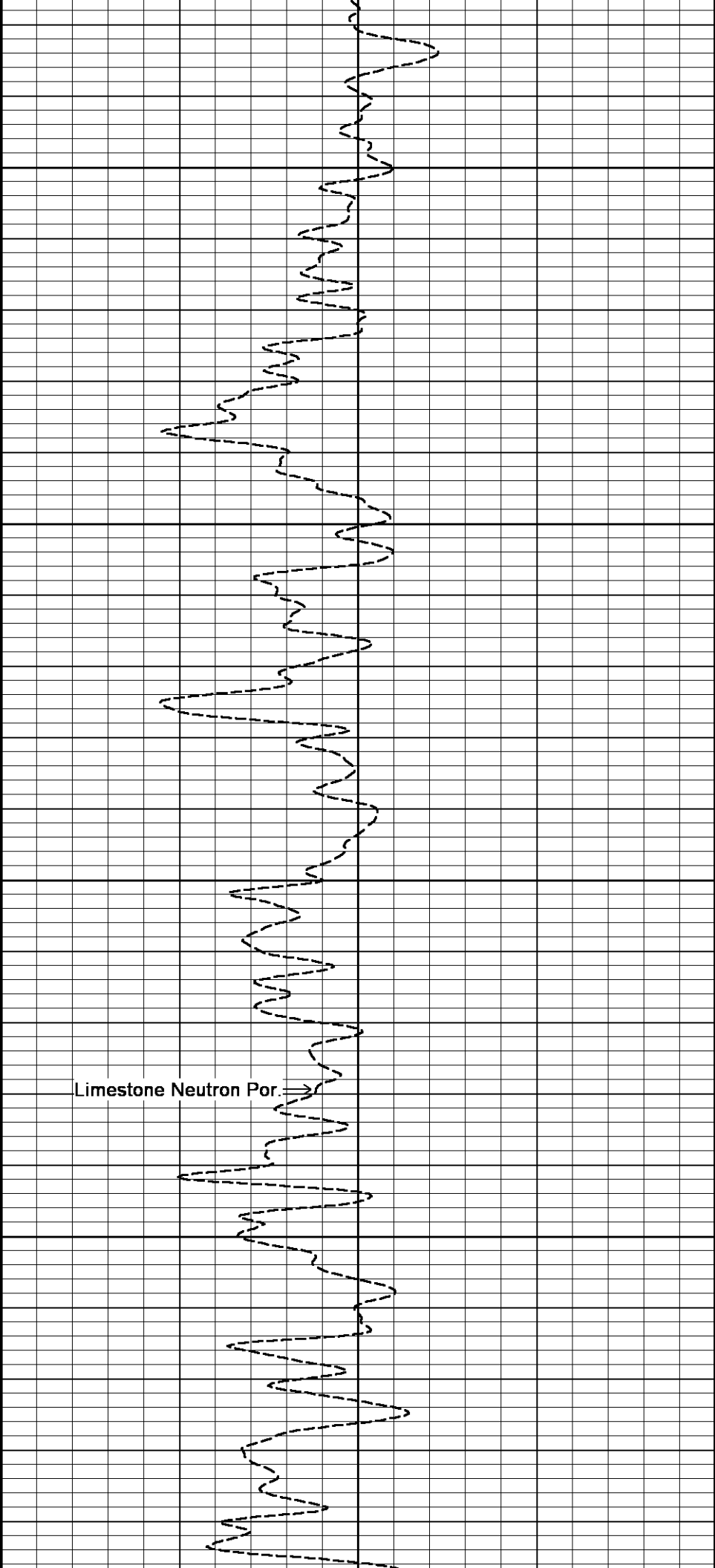
Gamma Ray

3650

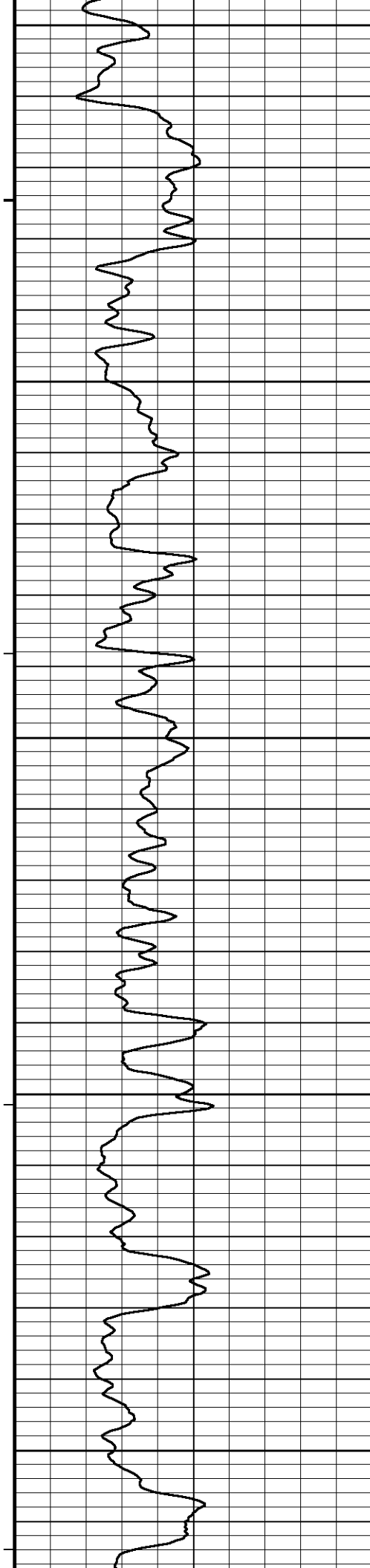
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3750

3800



Limestone Neutron Por. →



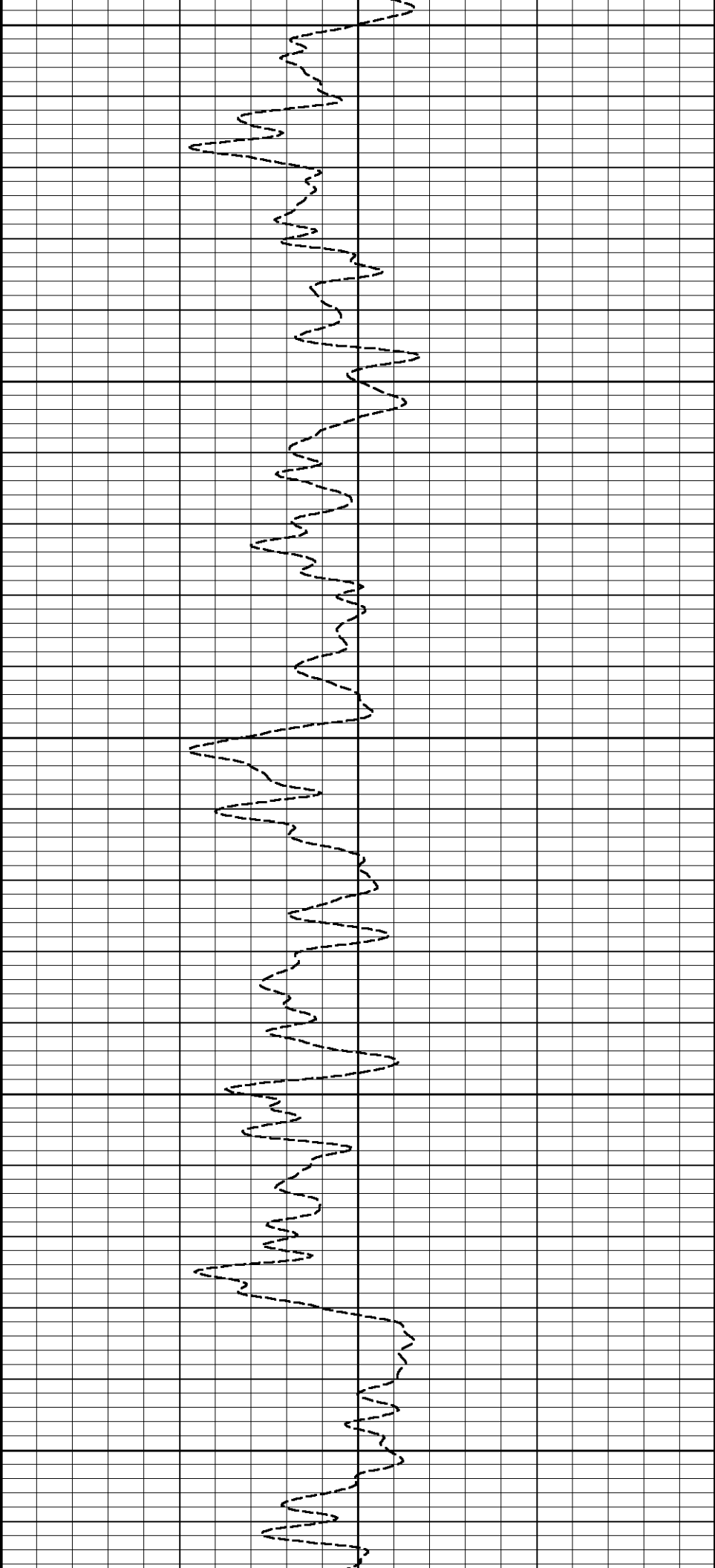
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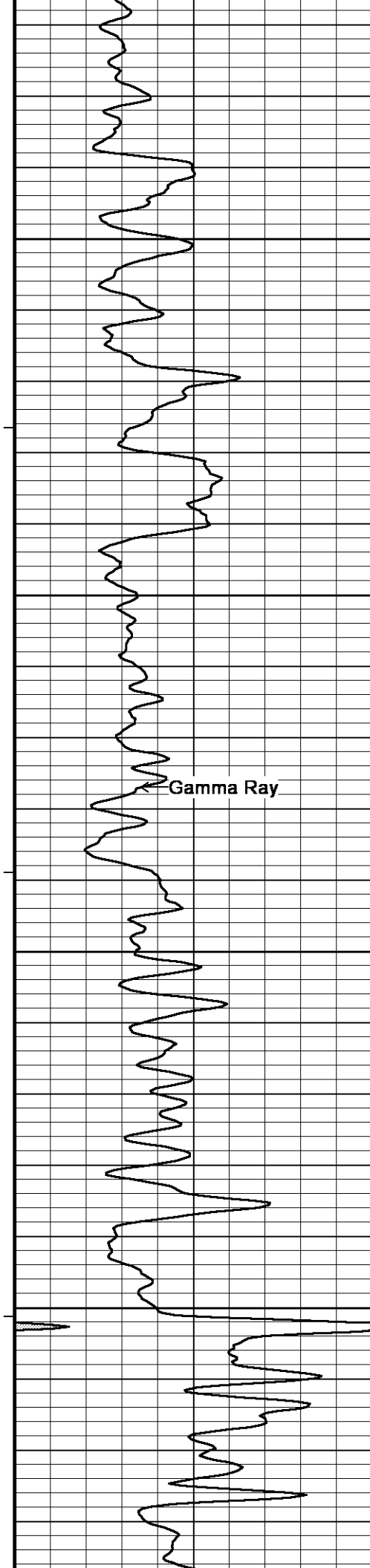
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3950

4000

4050





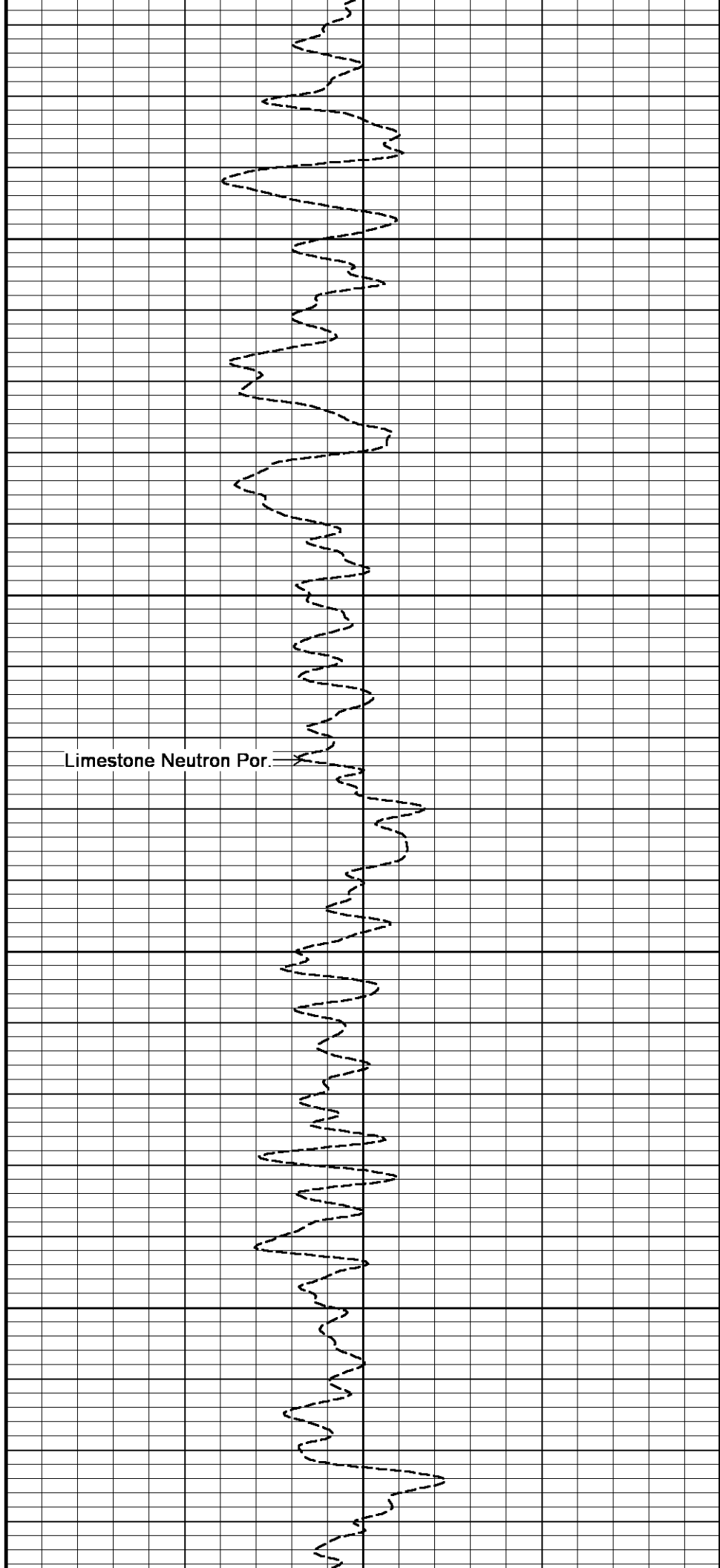
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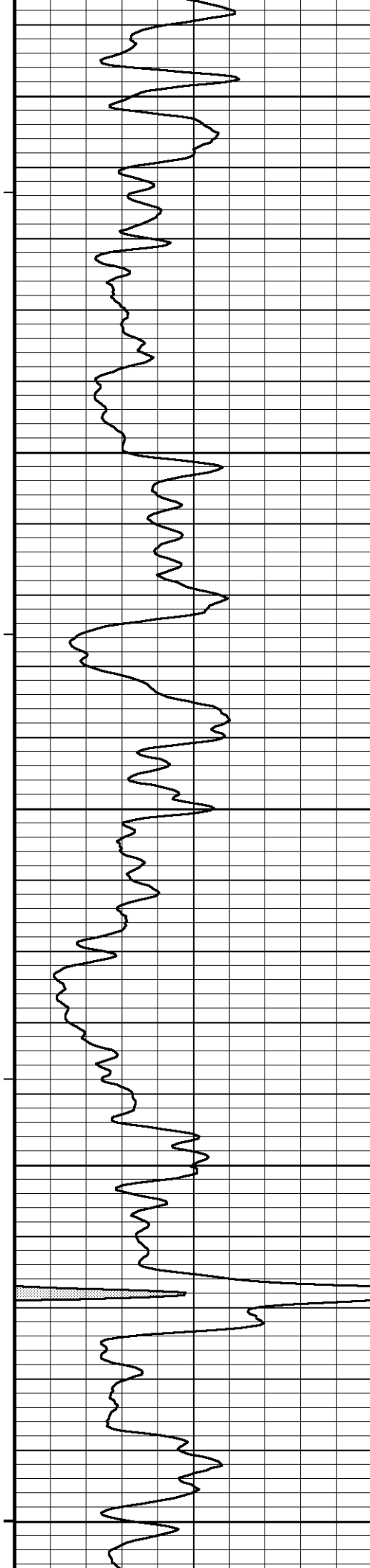
4200

4250

Gamma Ray



Limestone Neutron Por.



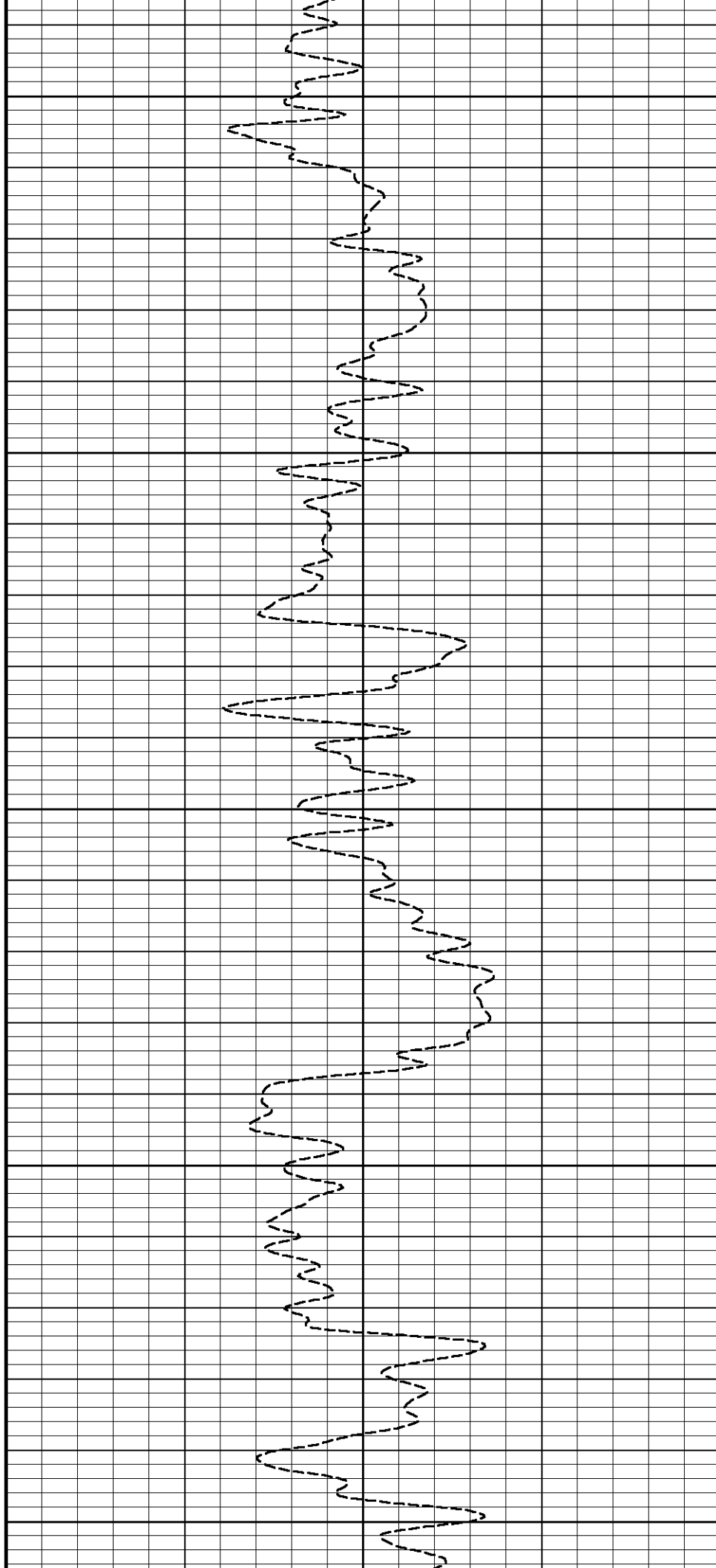
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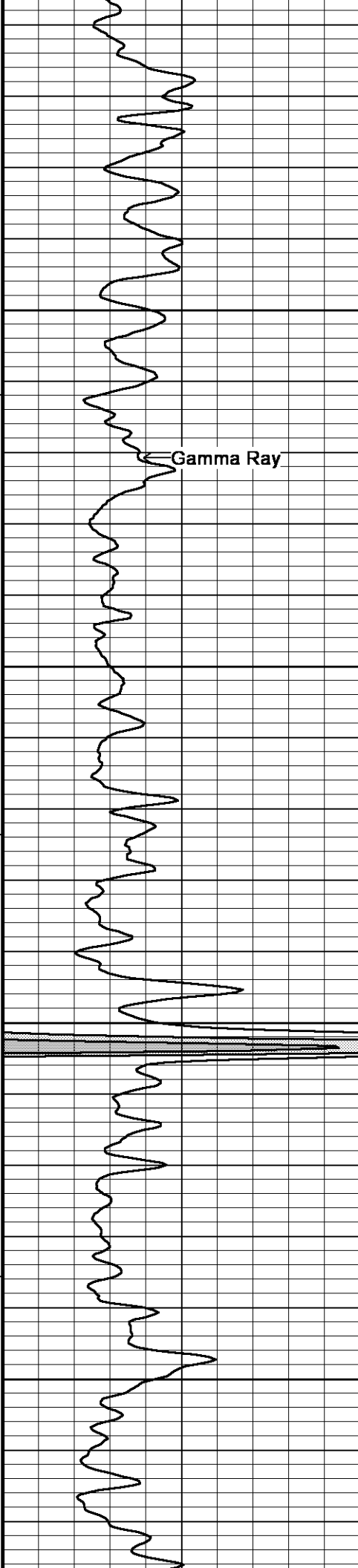
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4500







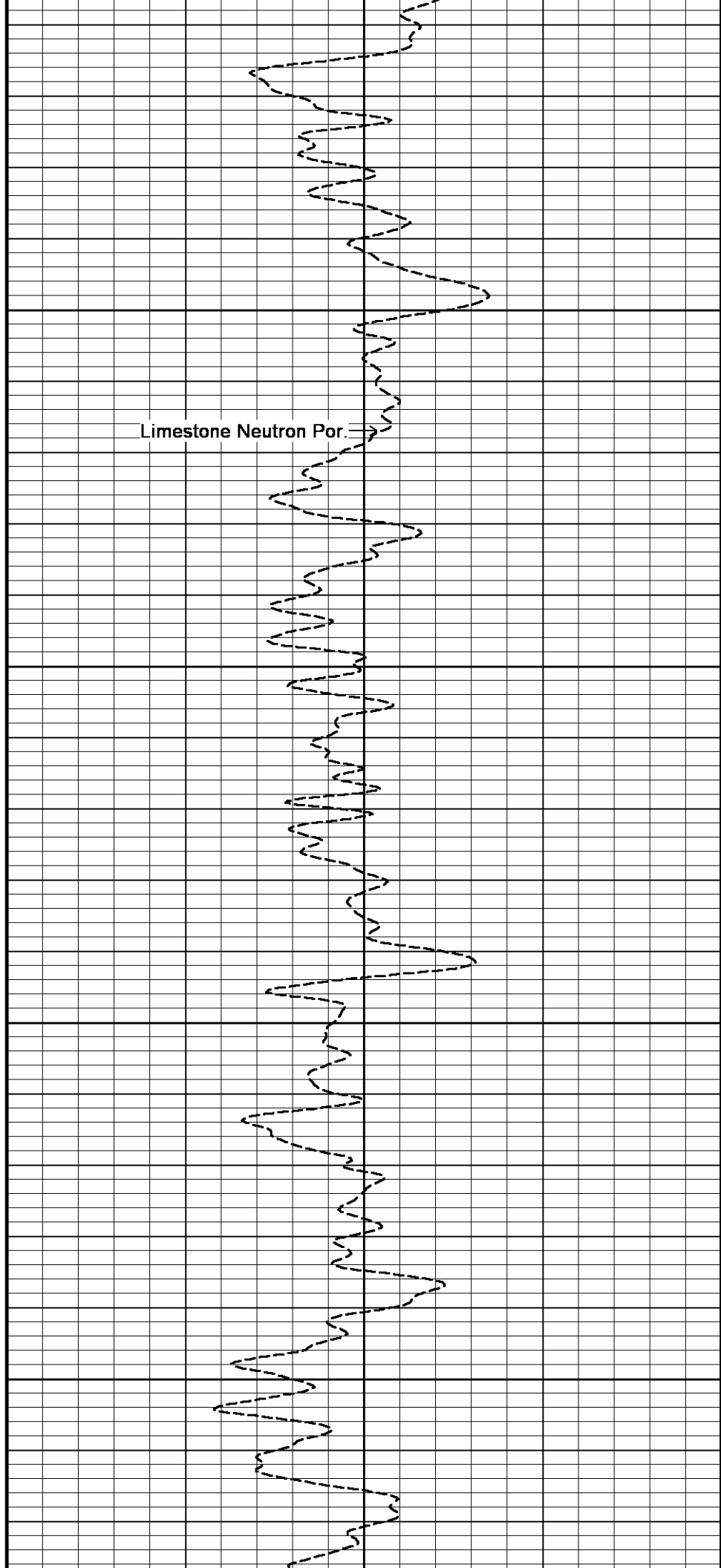
Gamma Ray

4550

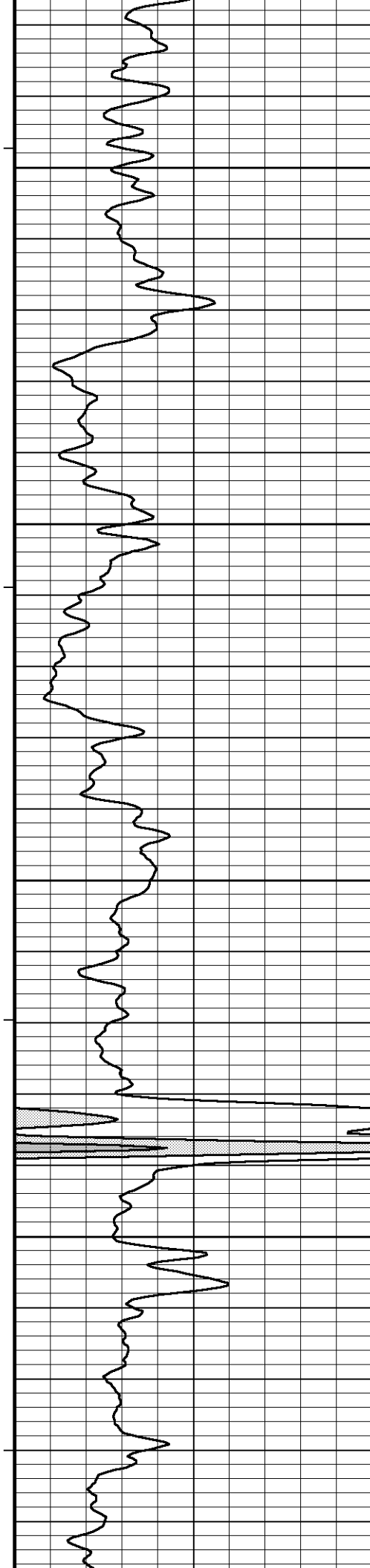
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4700



Limestone Neutron Por.

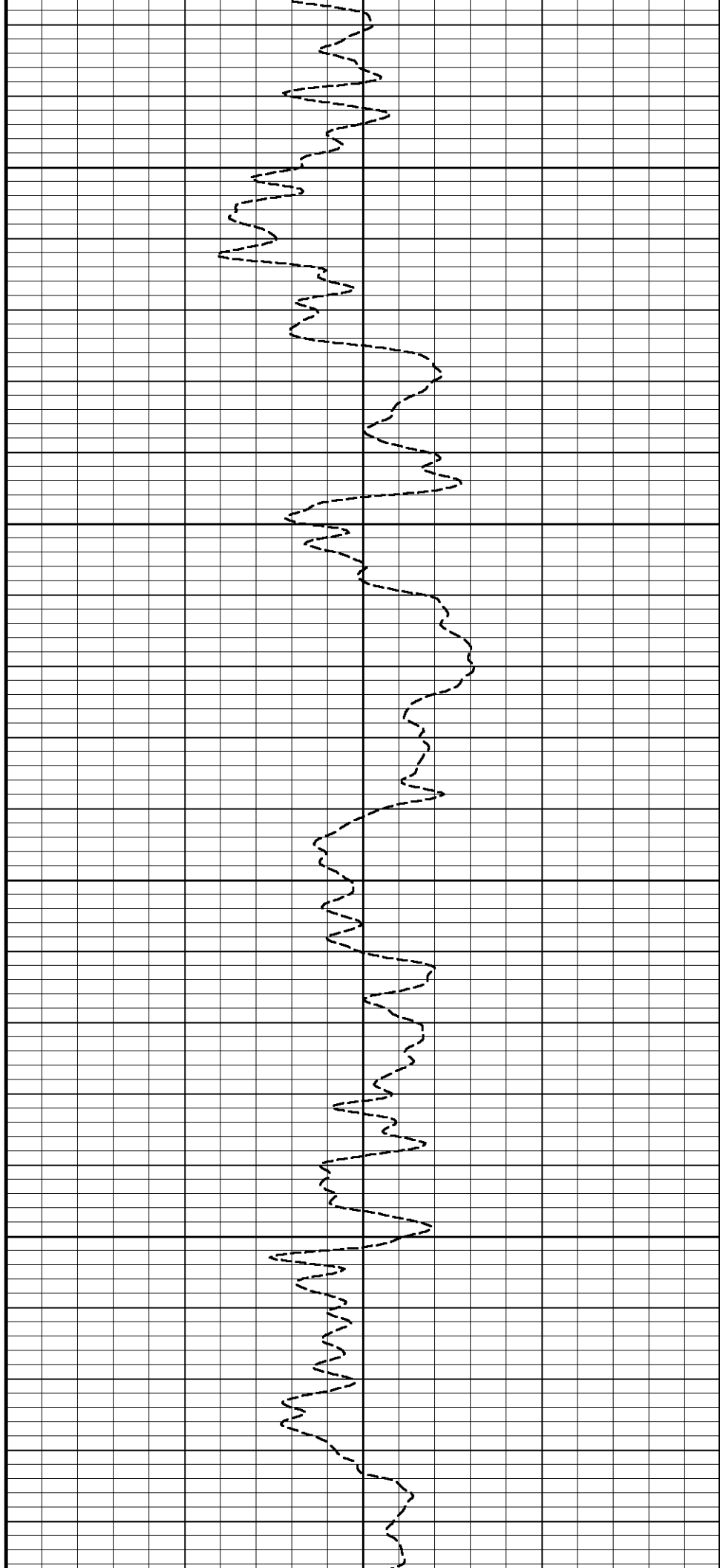


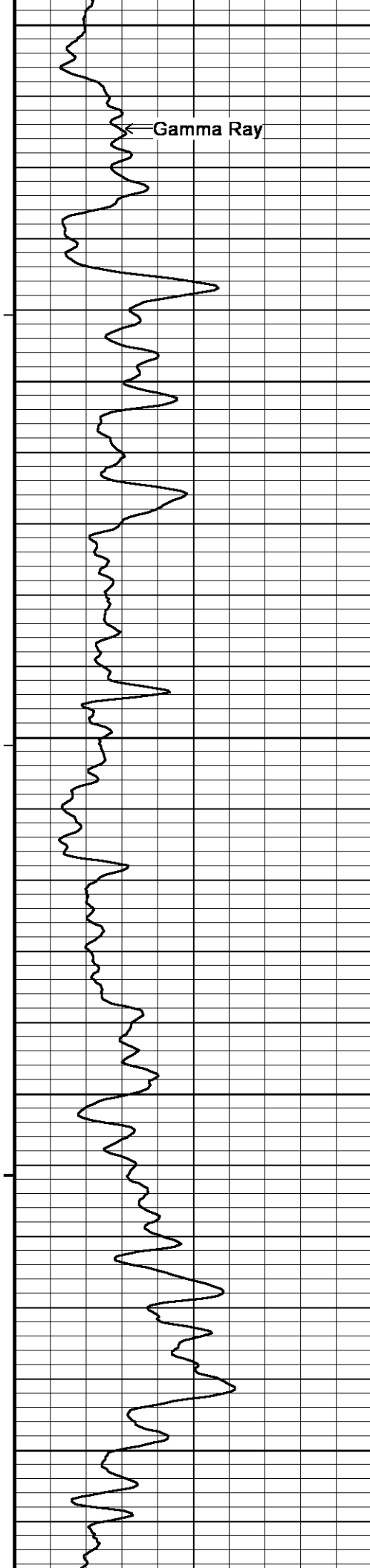
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4800

4850

4900





← Gamma Ray

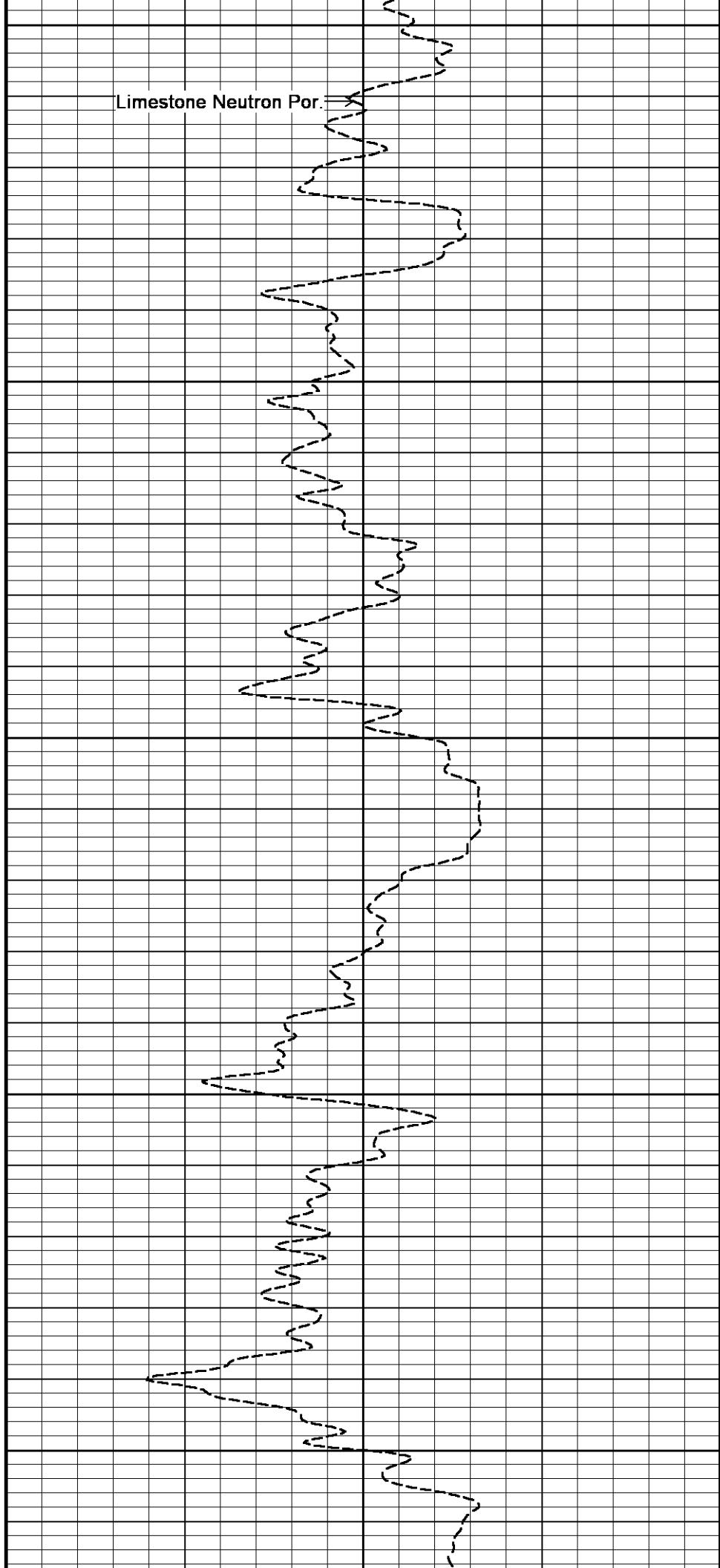
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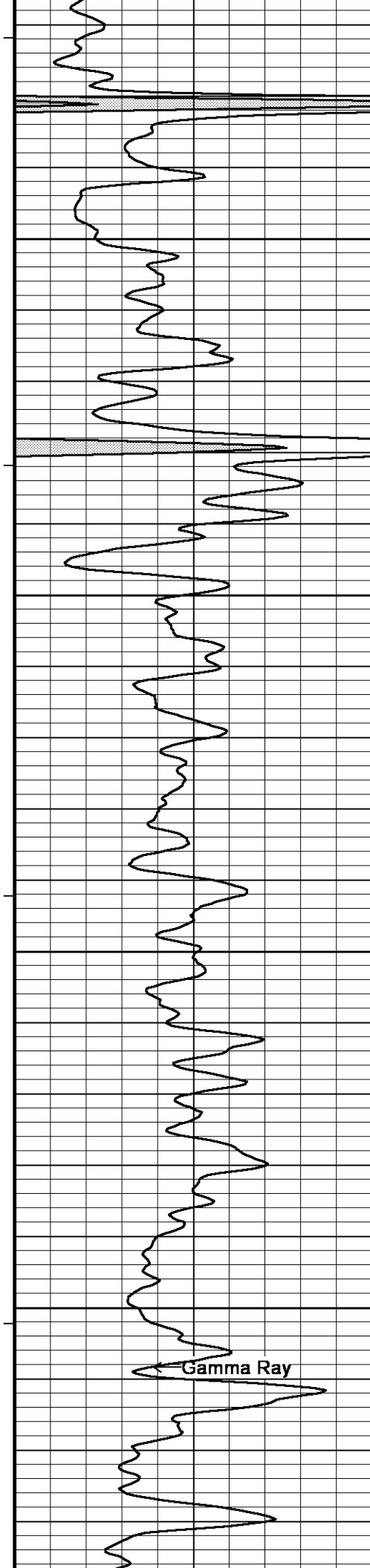
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5100

5150



Limestone Neutron Por.



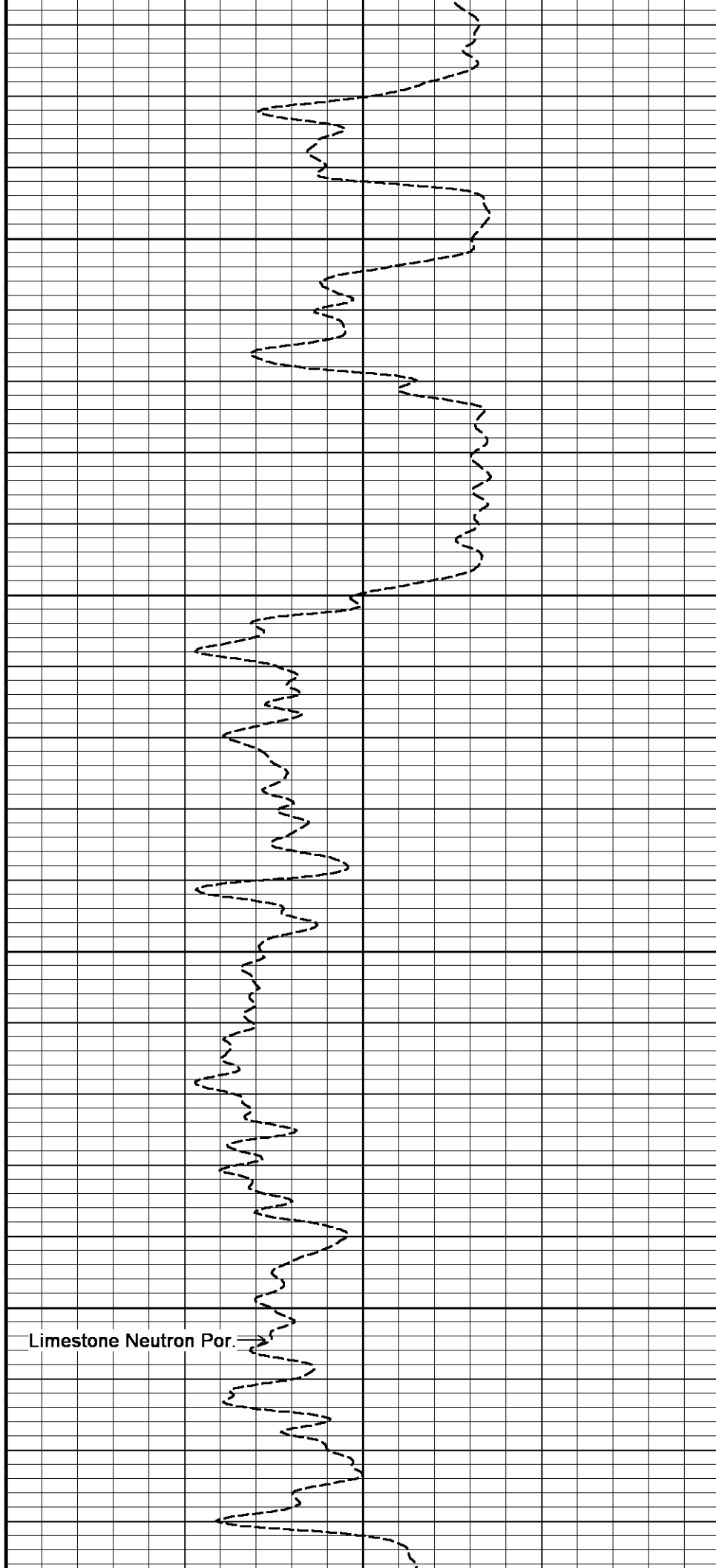
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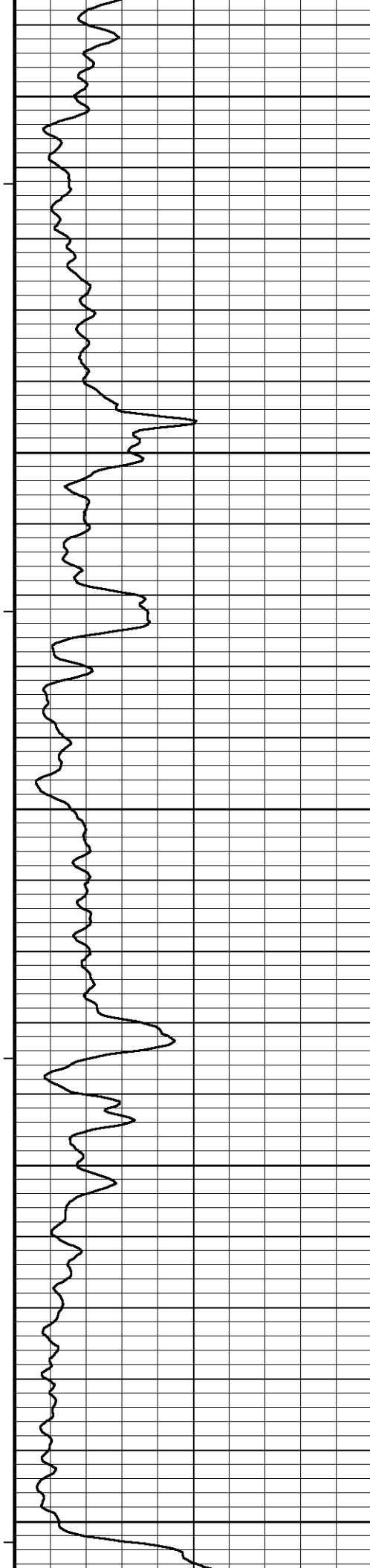
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5350

Gamma Ray



Limestone Neutron Por.



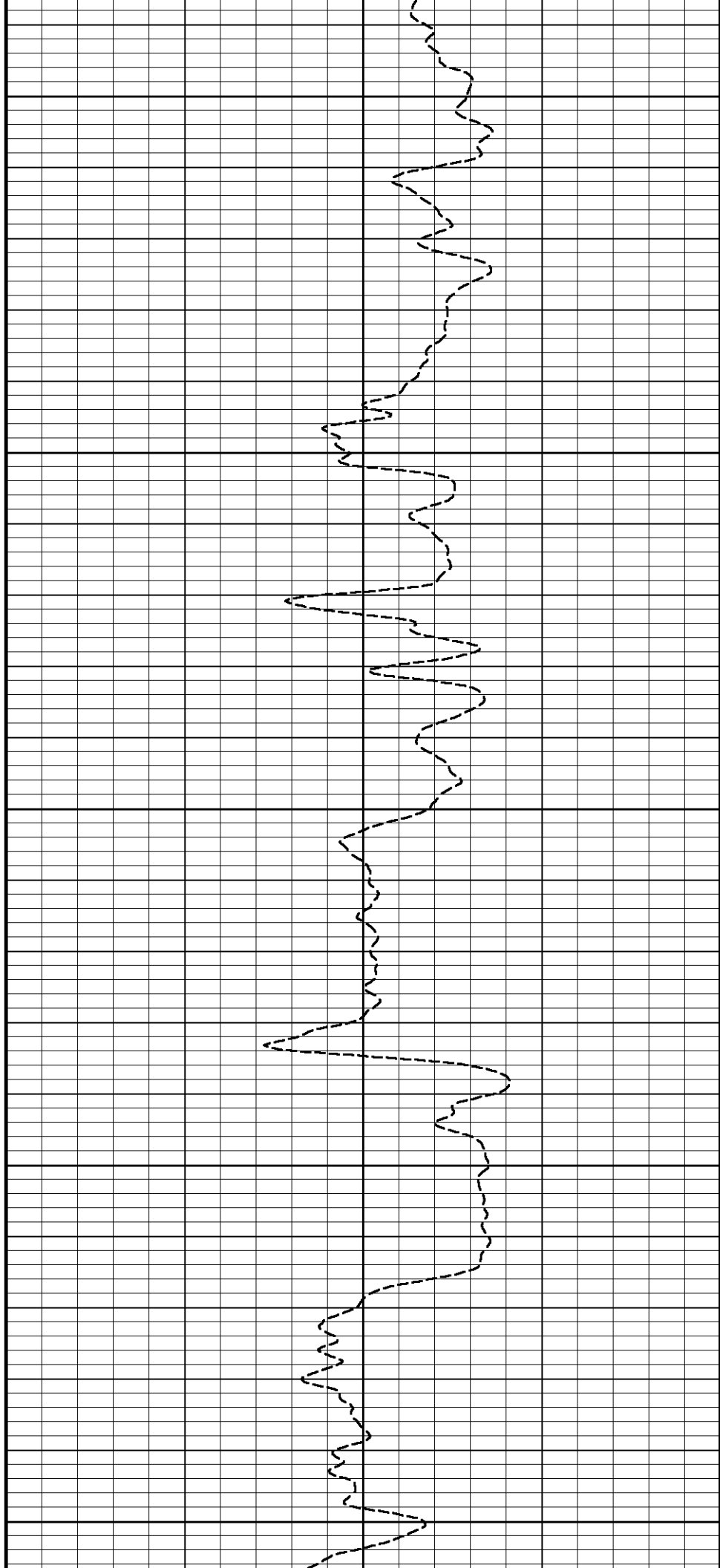
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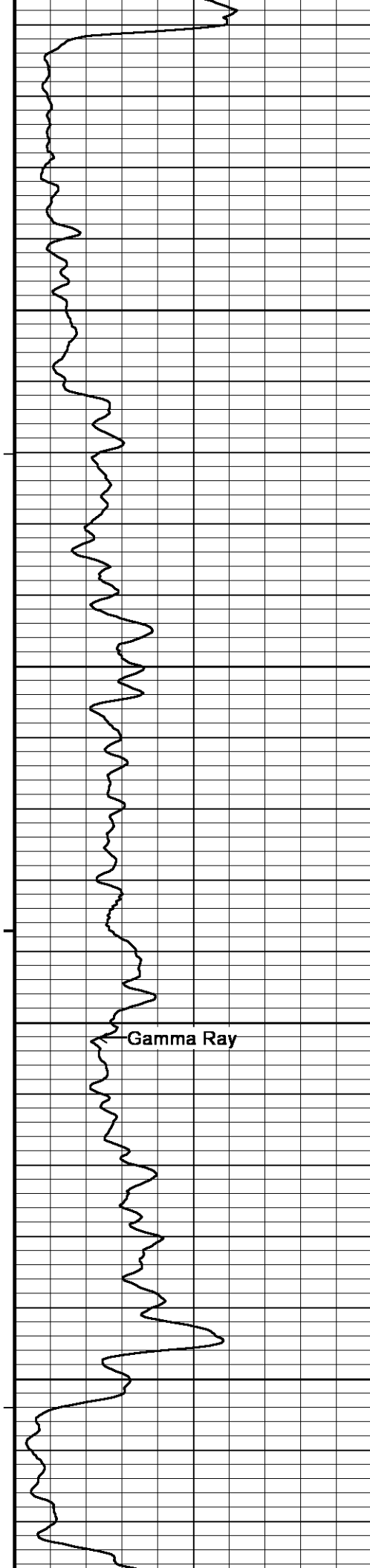
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5600





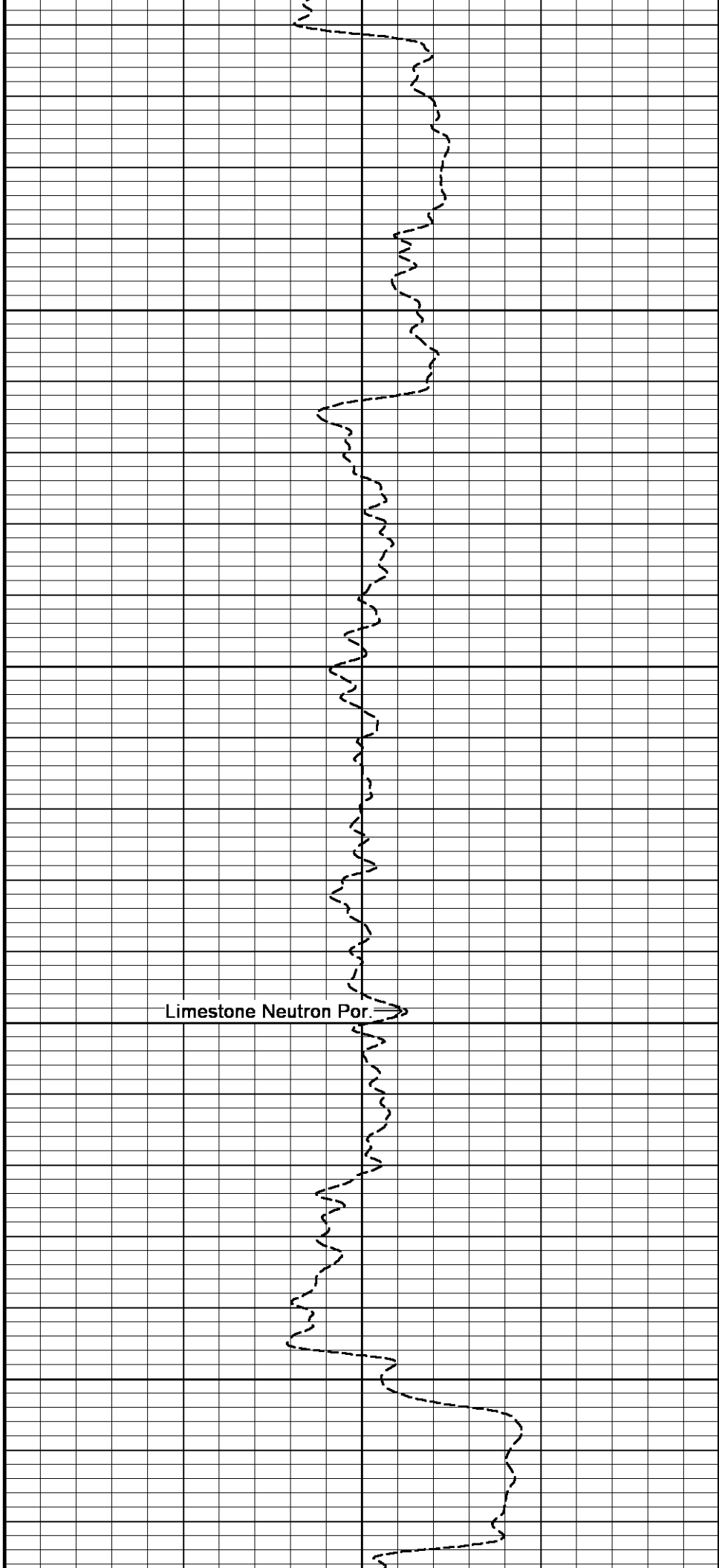
Gamma Ray

5650

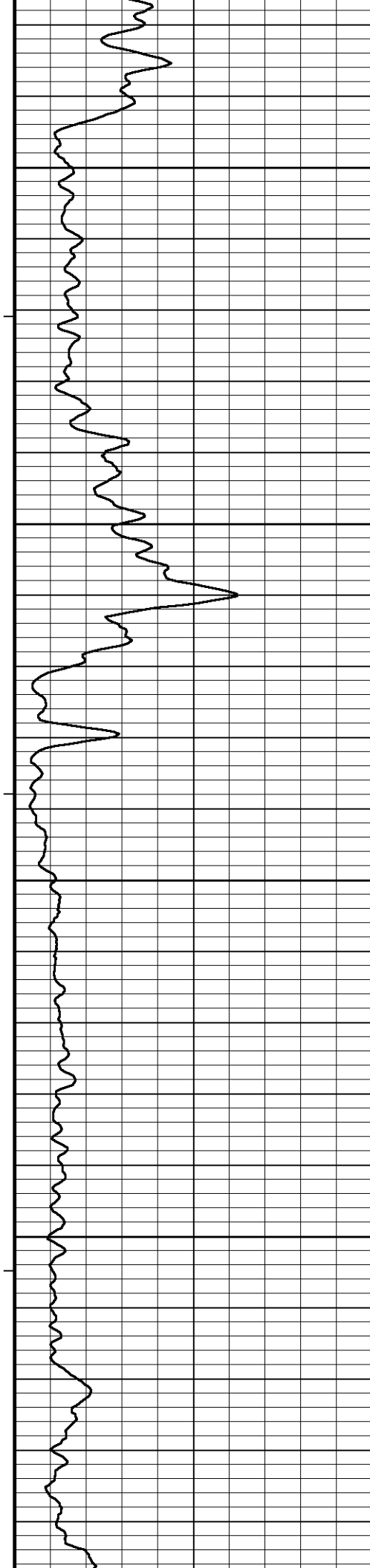
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5750

5800



Limestone Neutron Por.

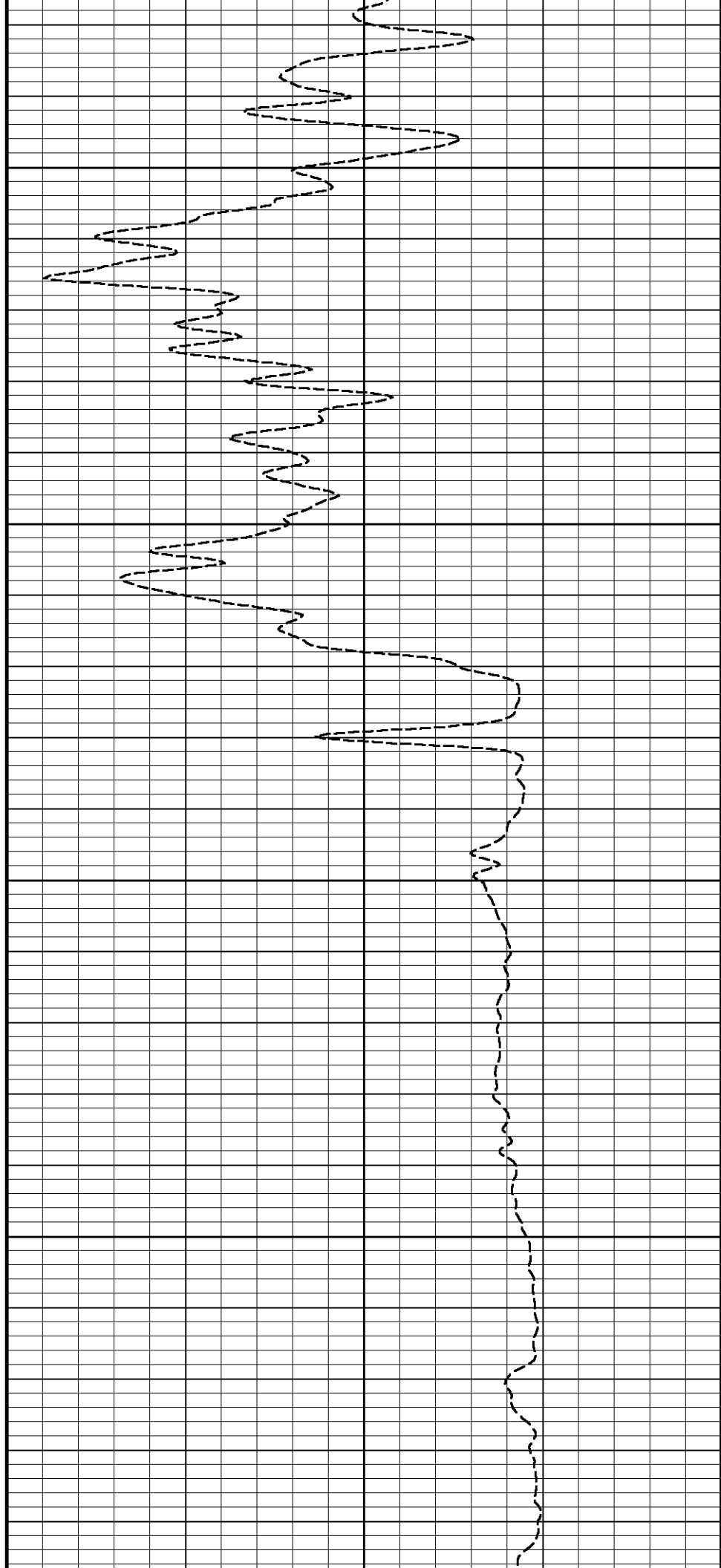


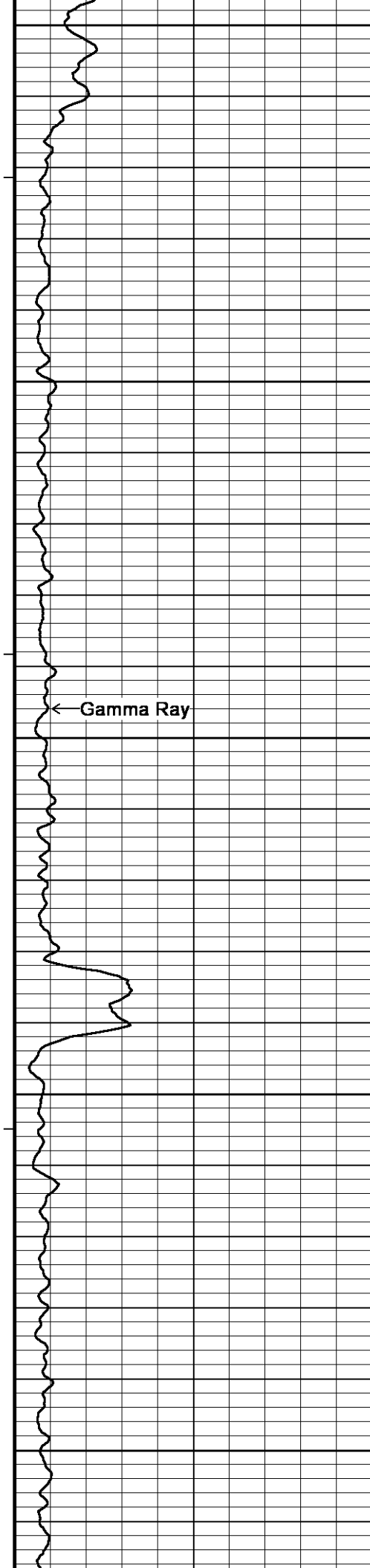
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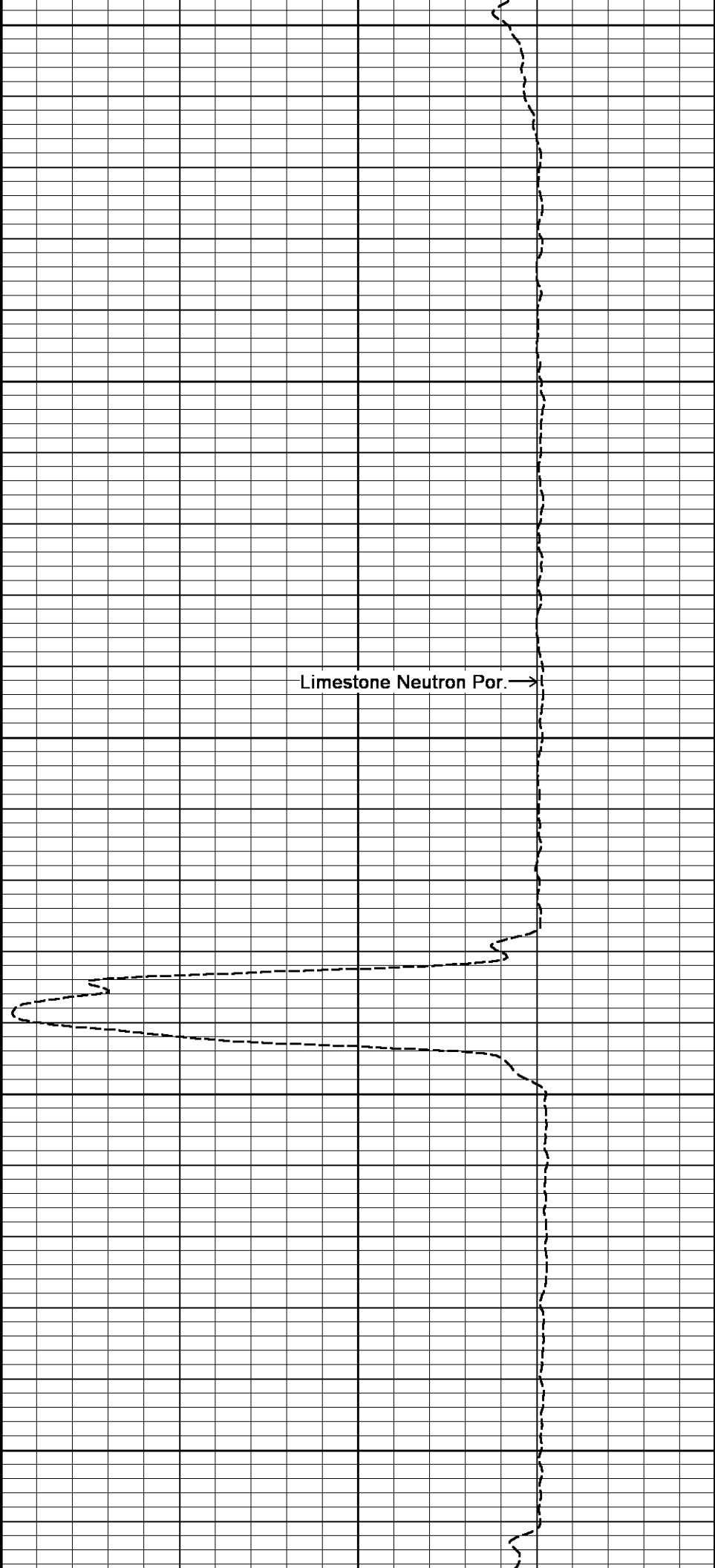
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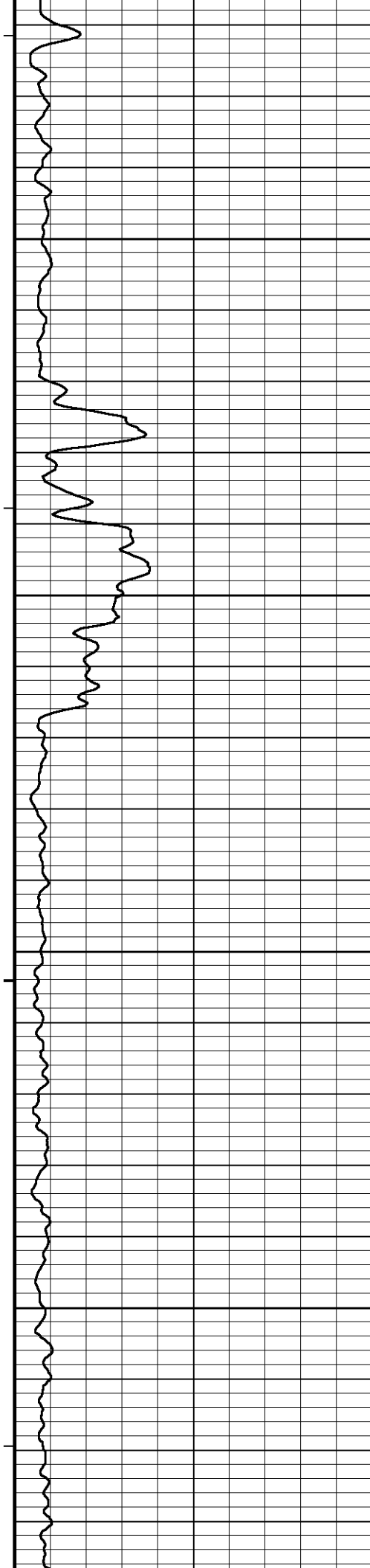
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Gamma Ray



Limestone Neutron Por. —>



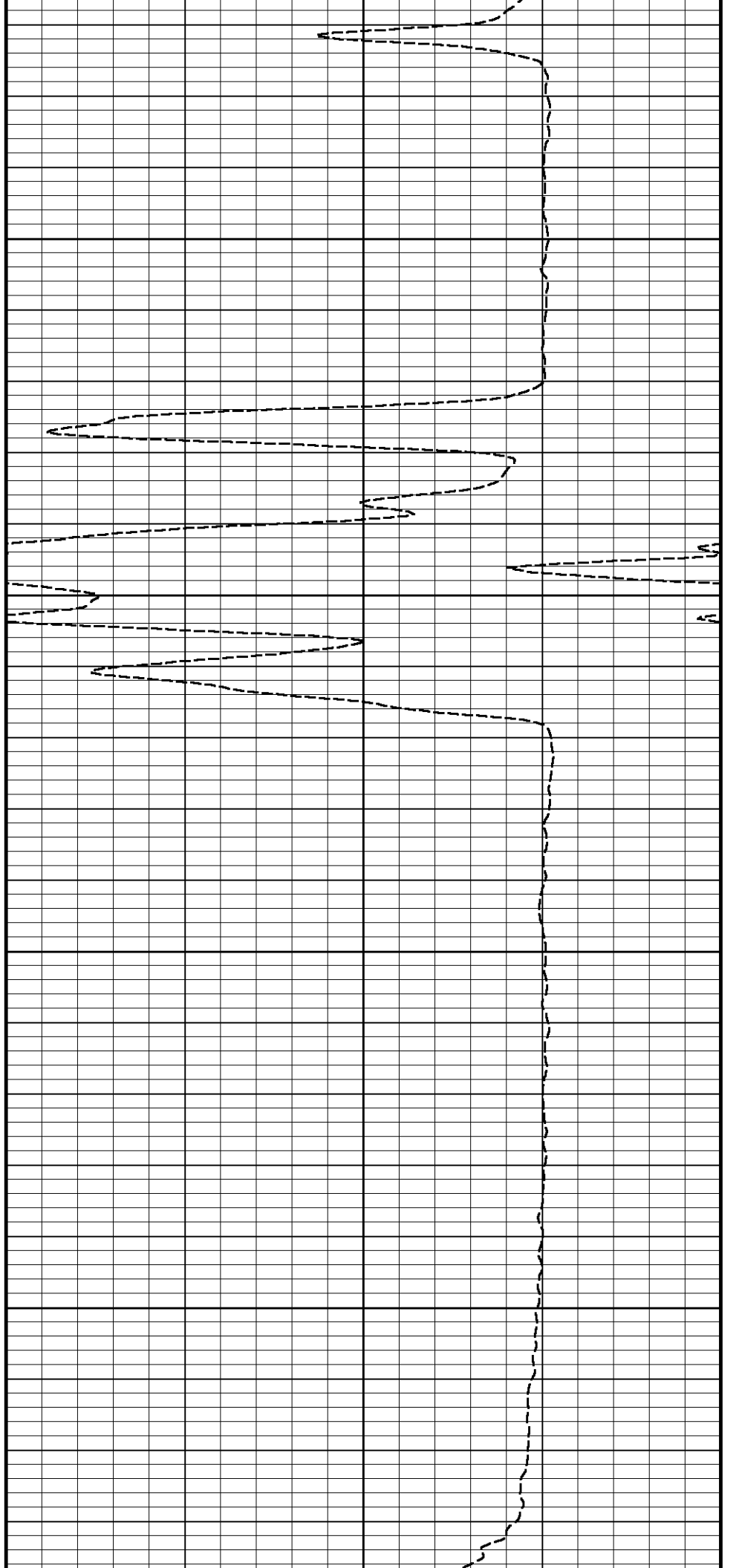


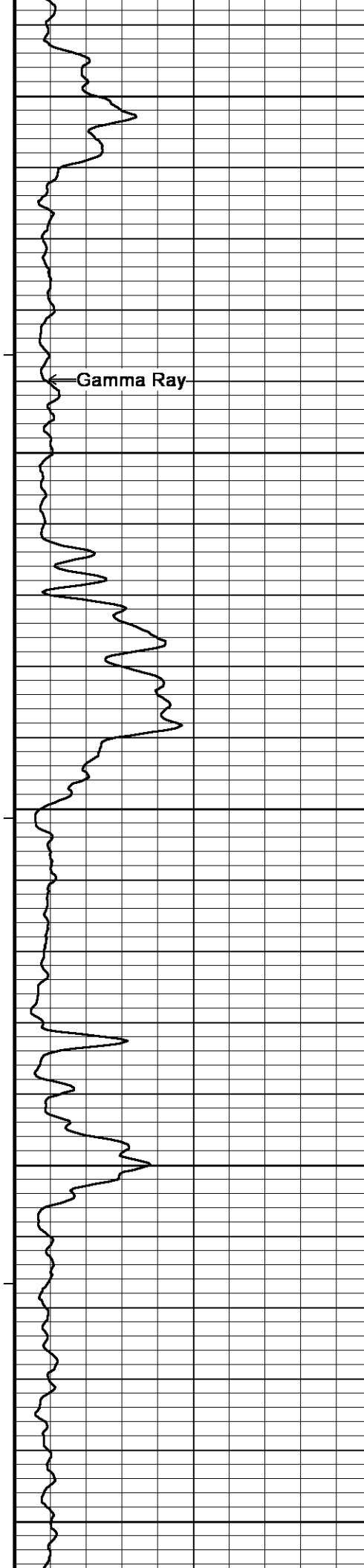
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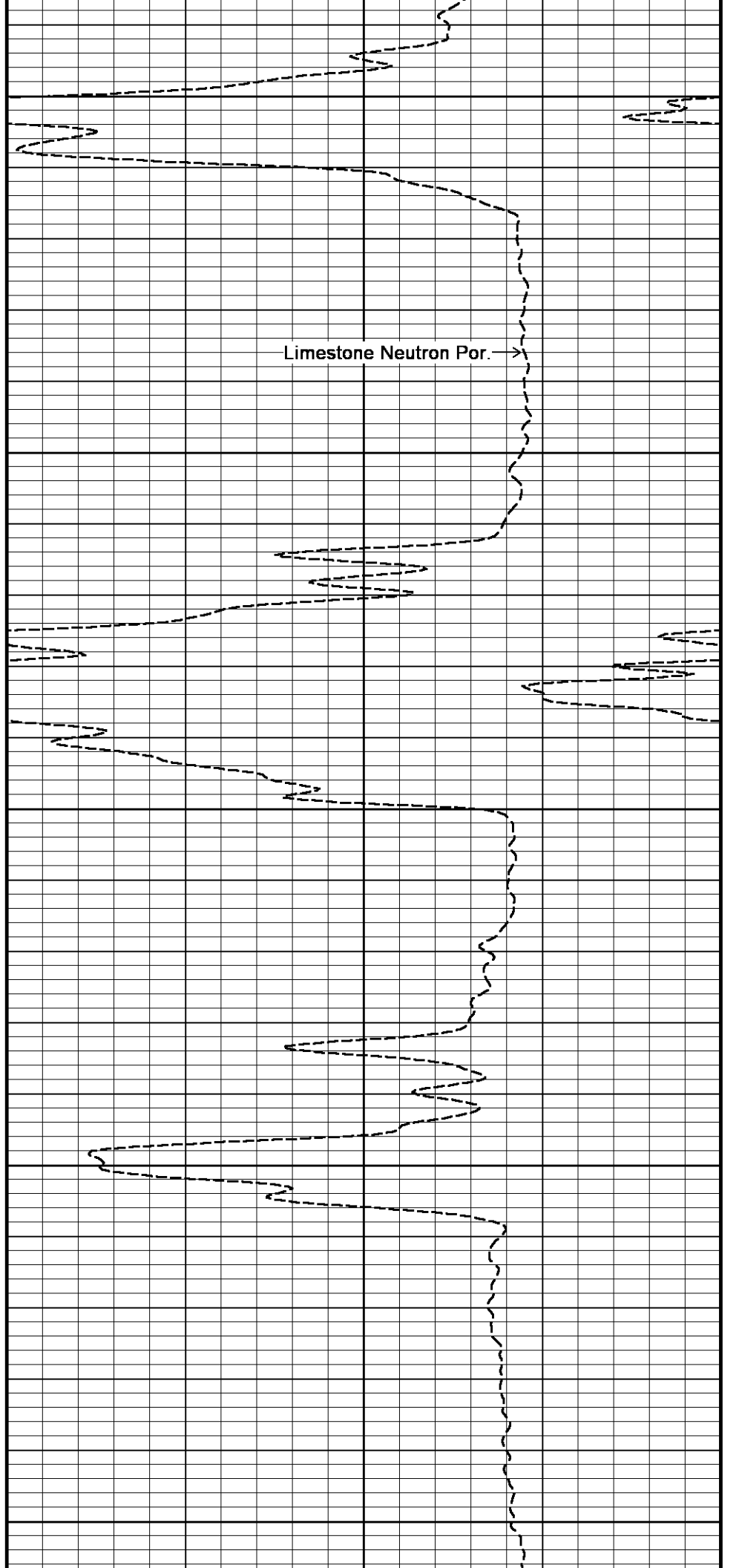
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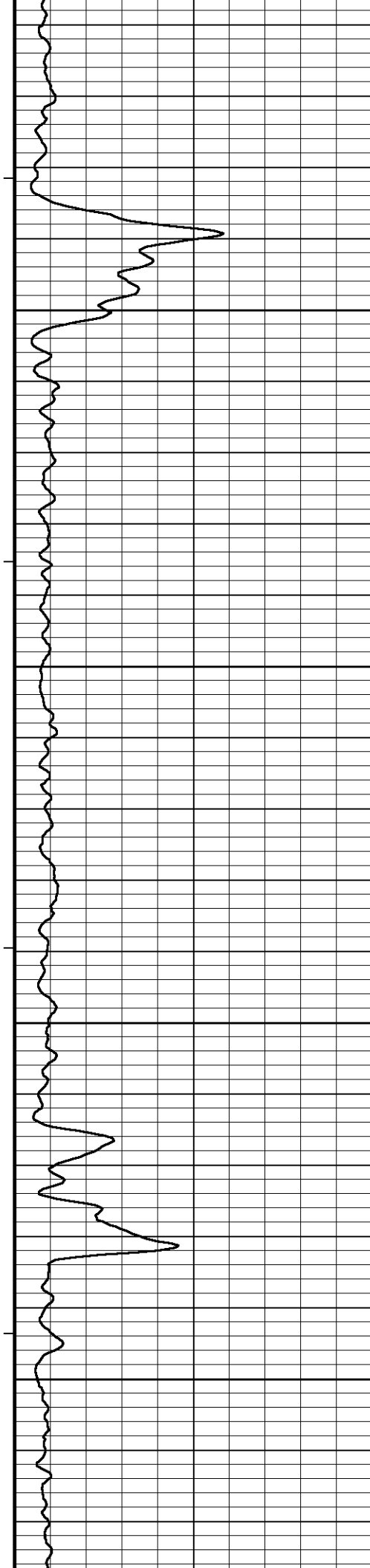
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Limestone Neutron Por. →



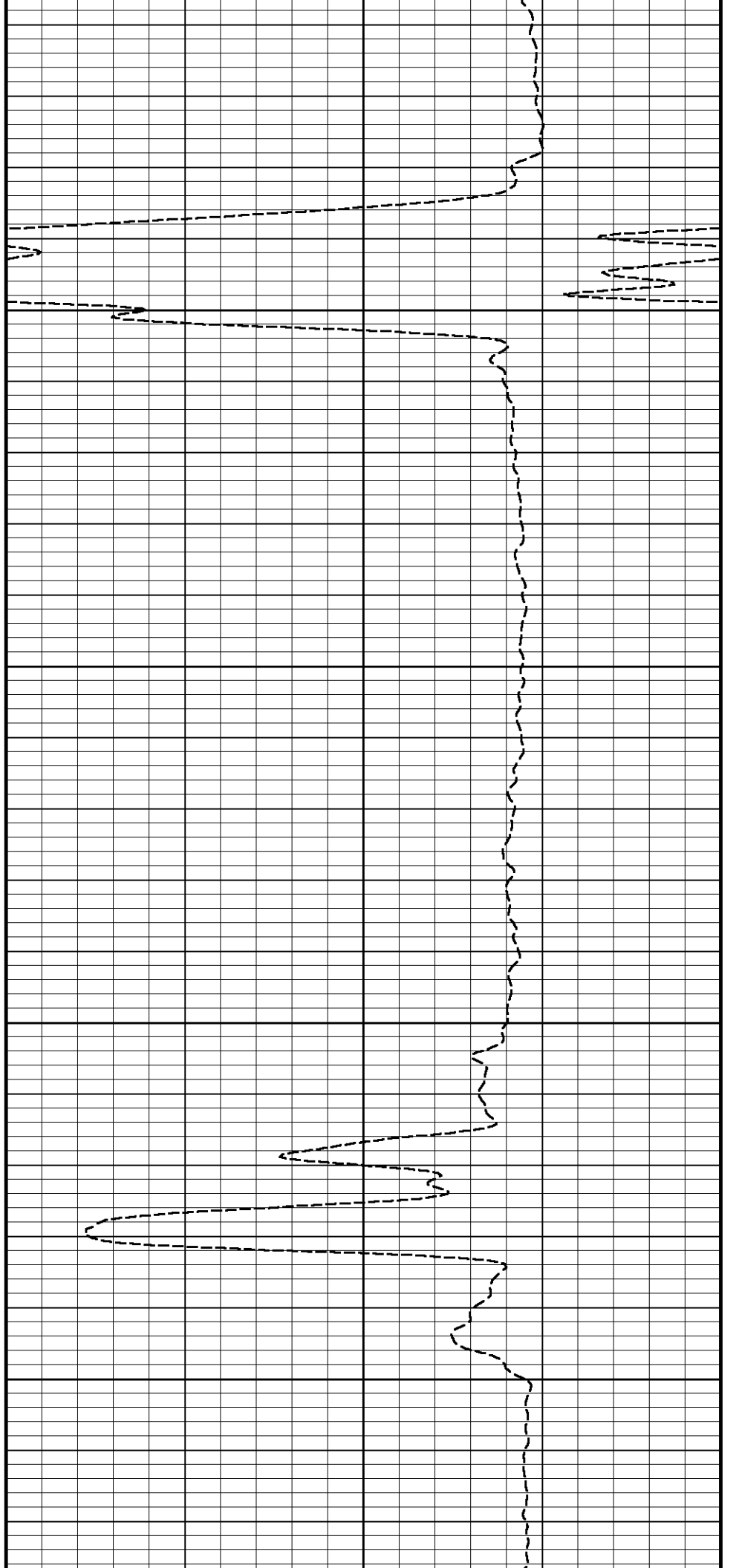


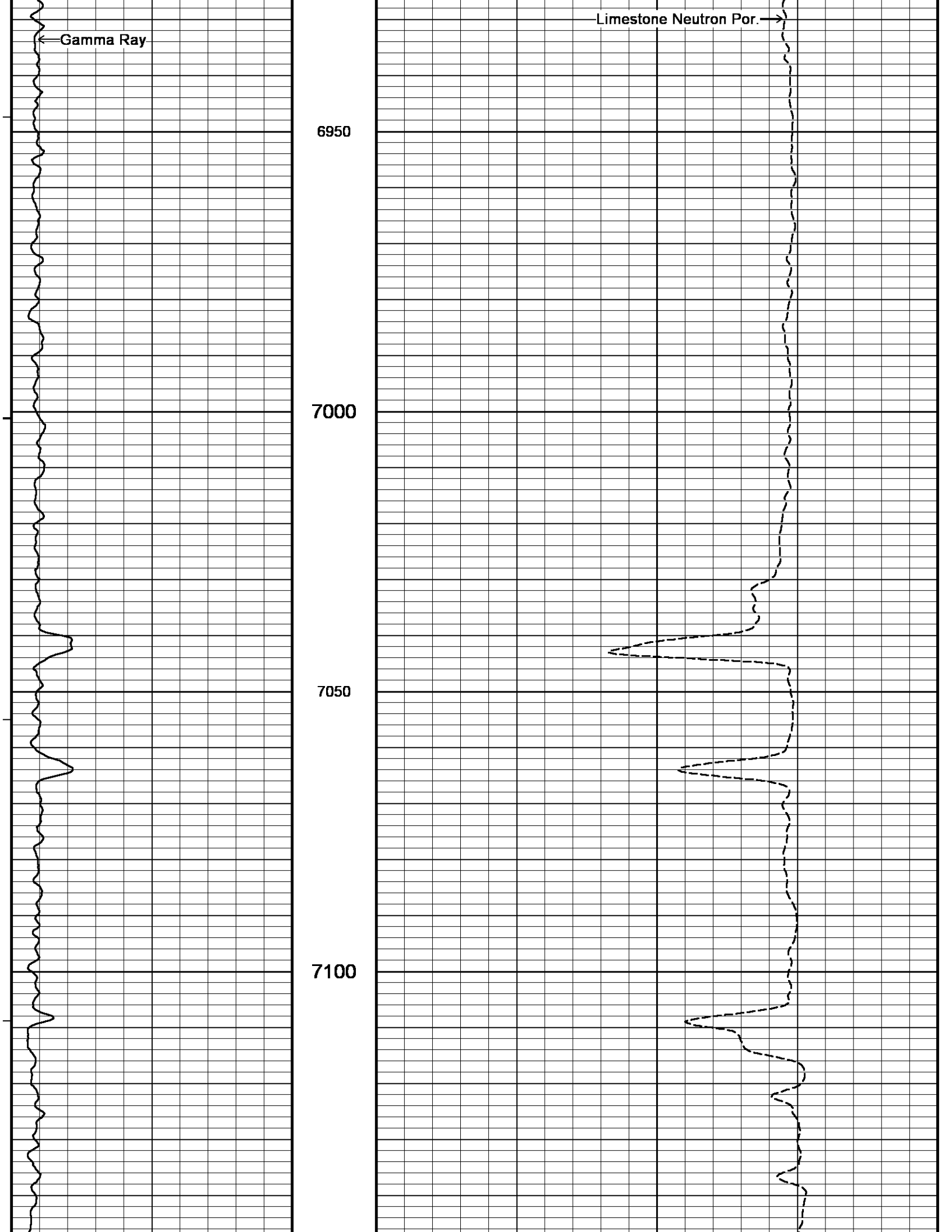
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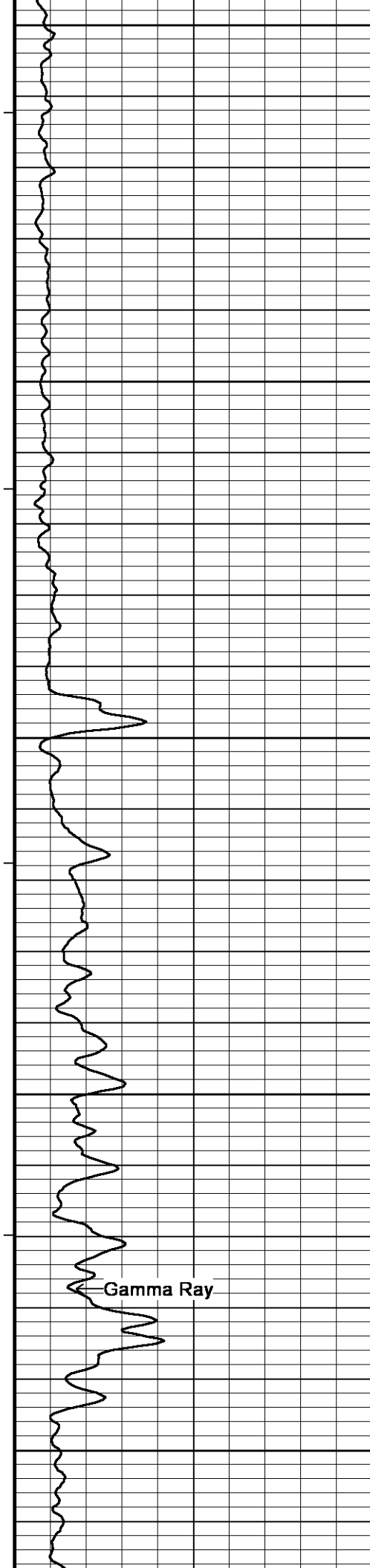
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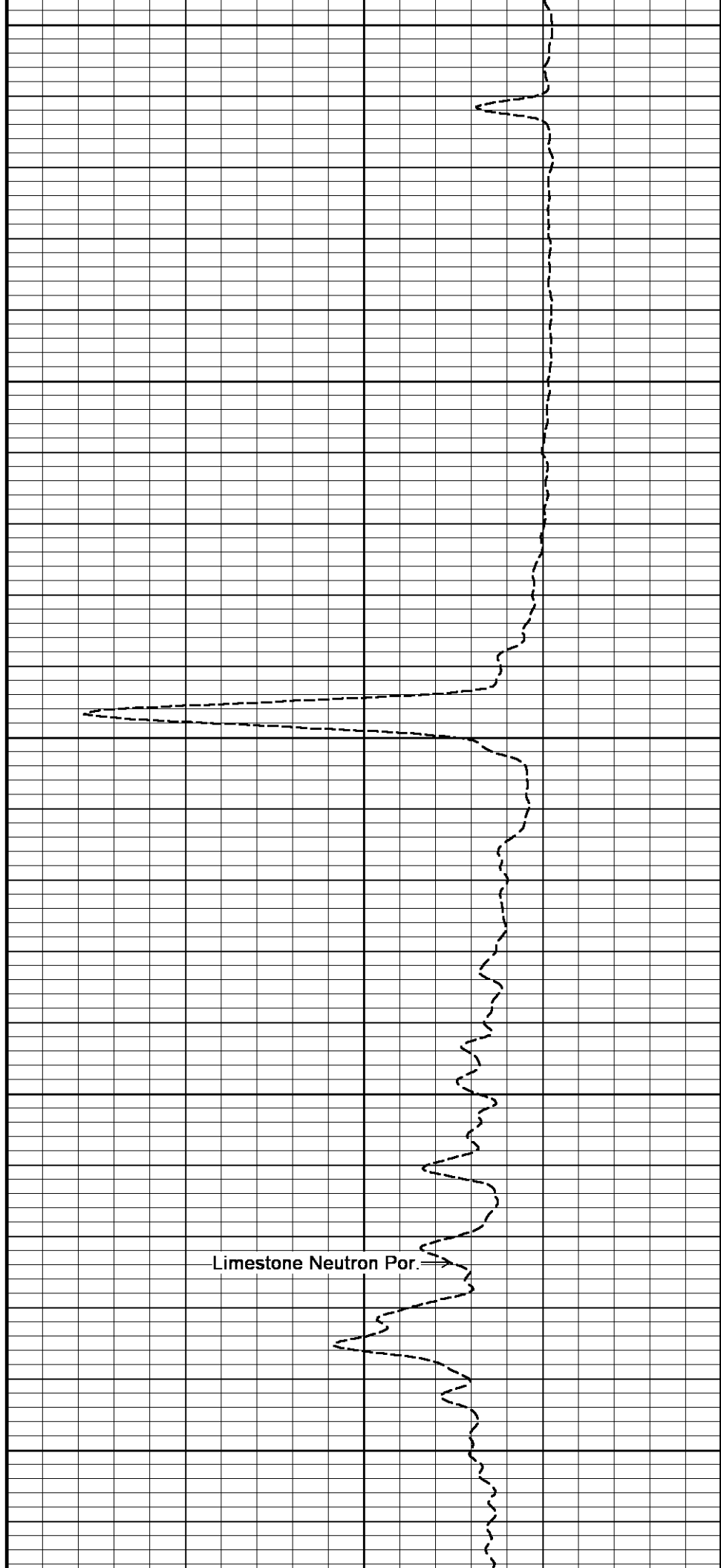
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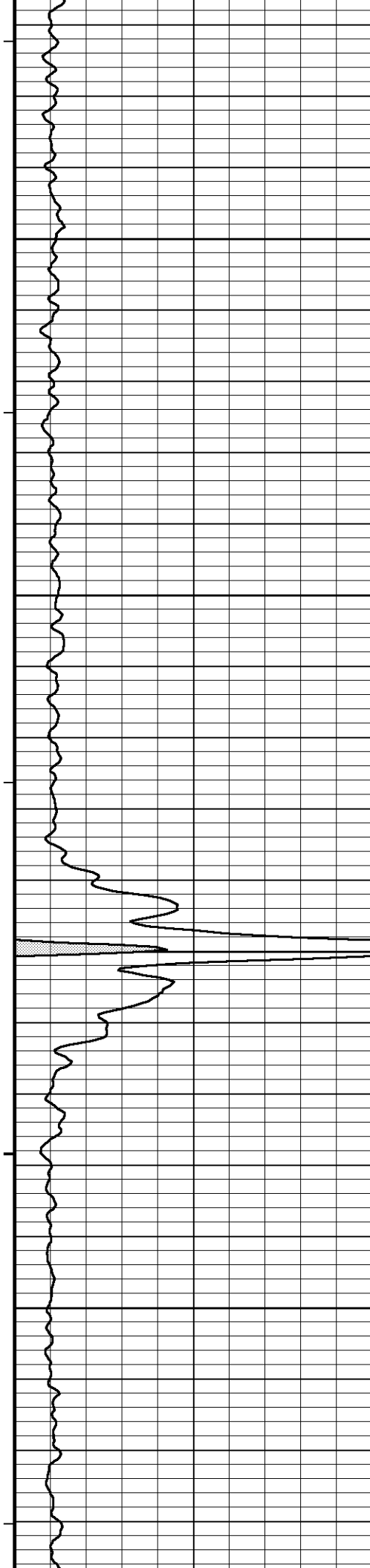
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Gamma Ray



Limestone Neutron Por.

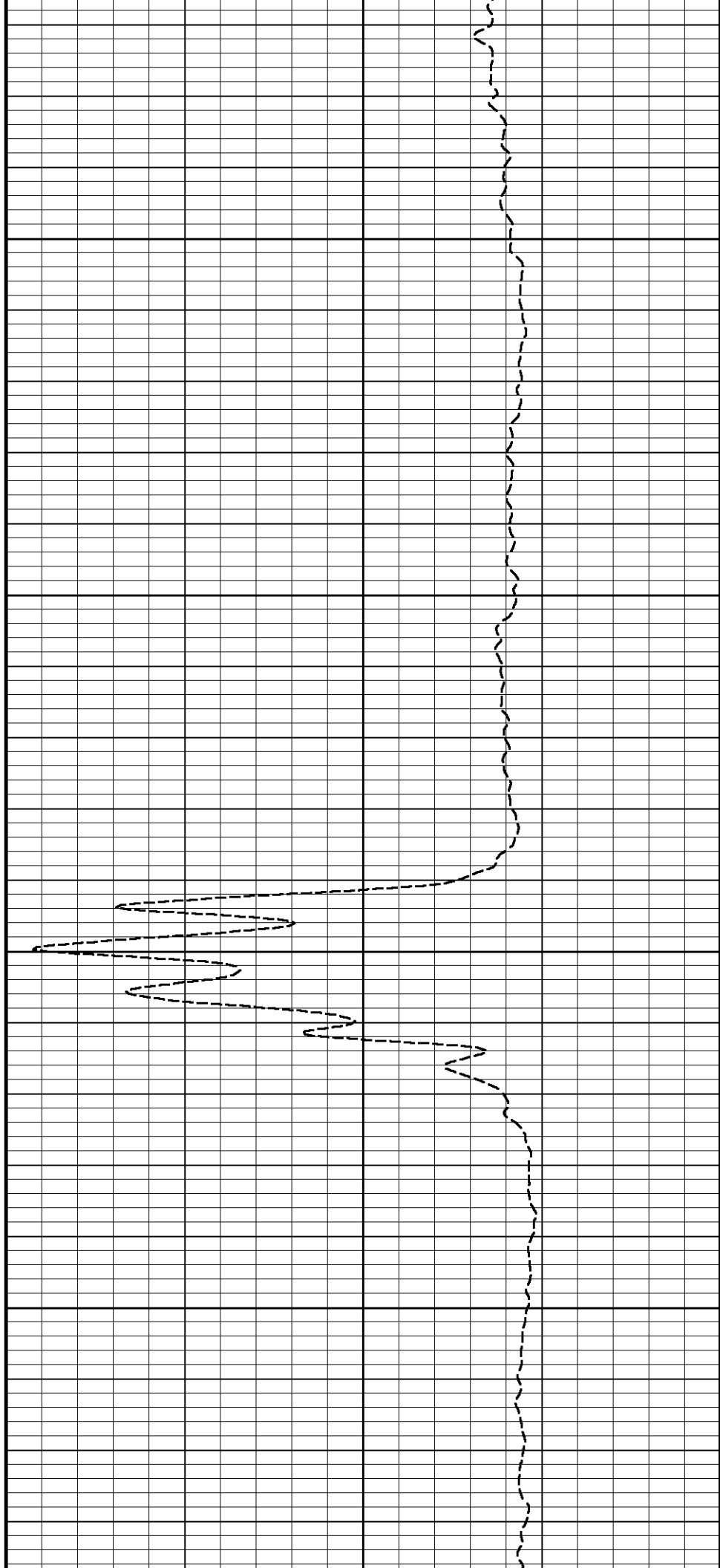


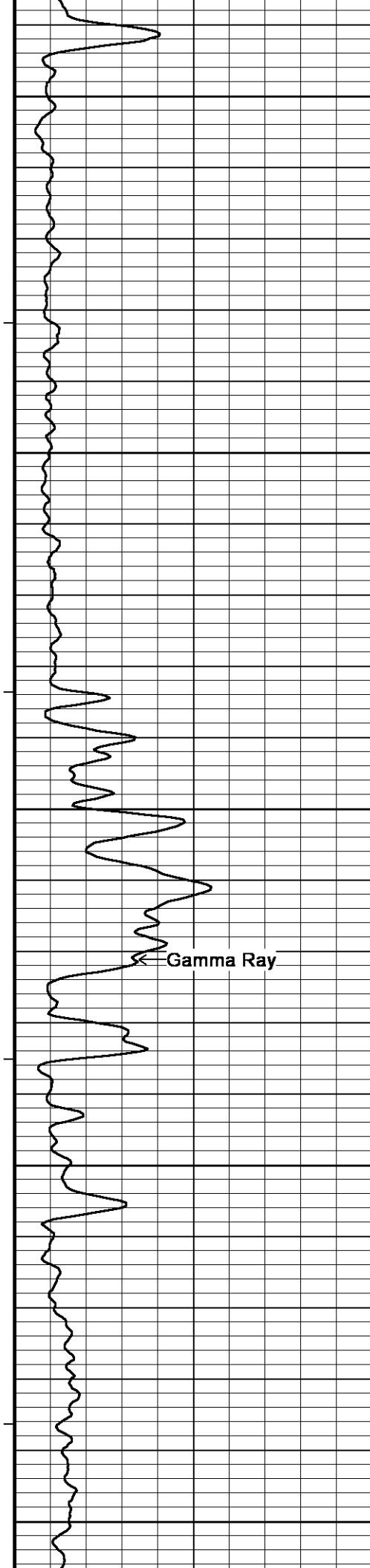
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7500

7550





7600

7650

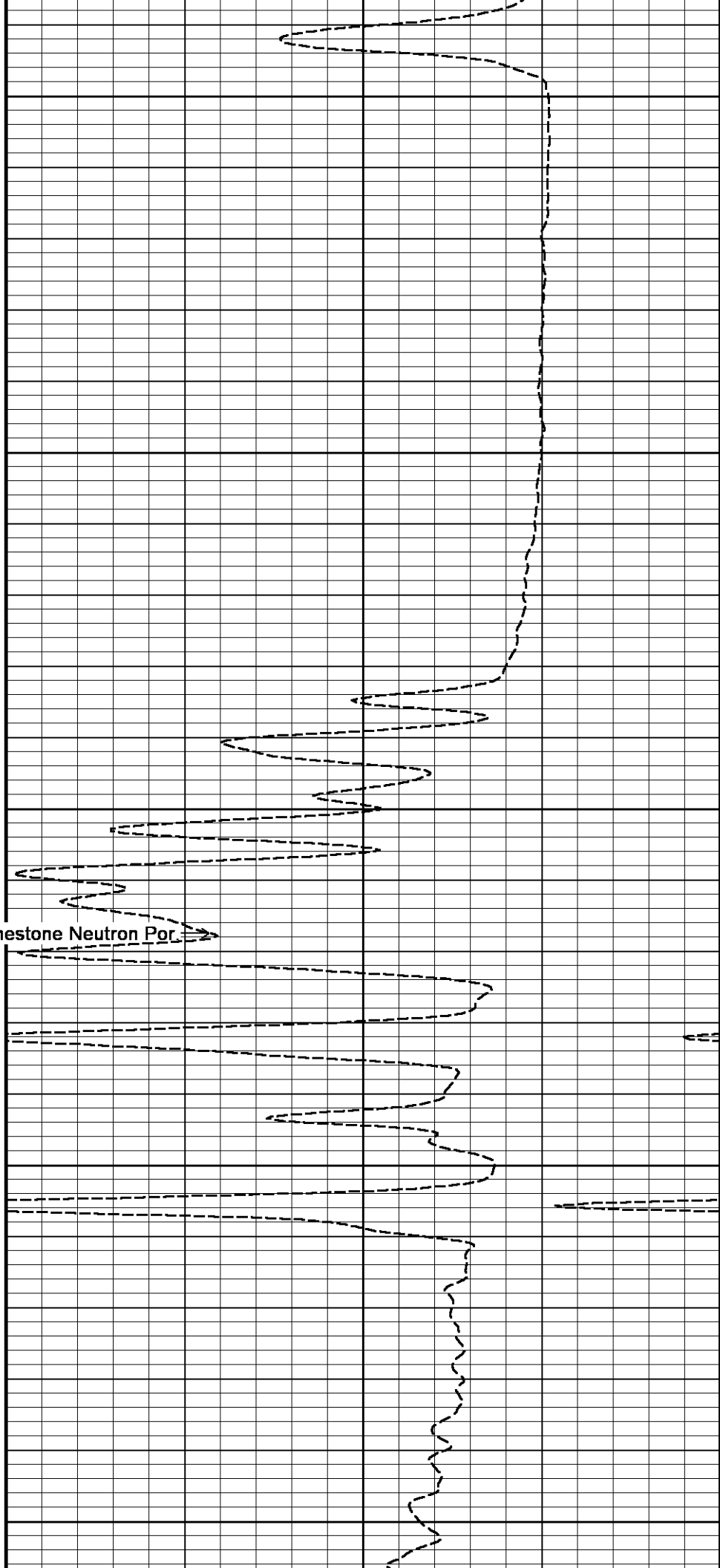
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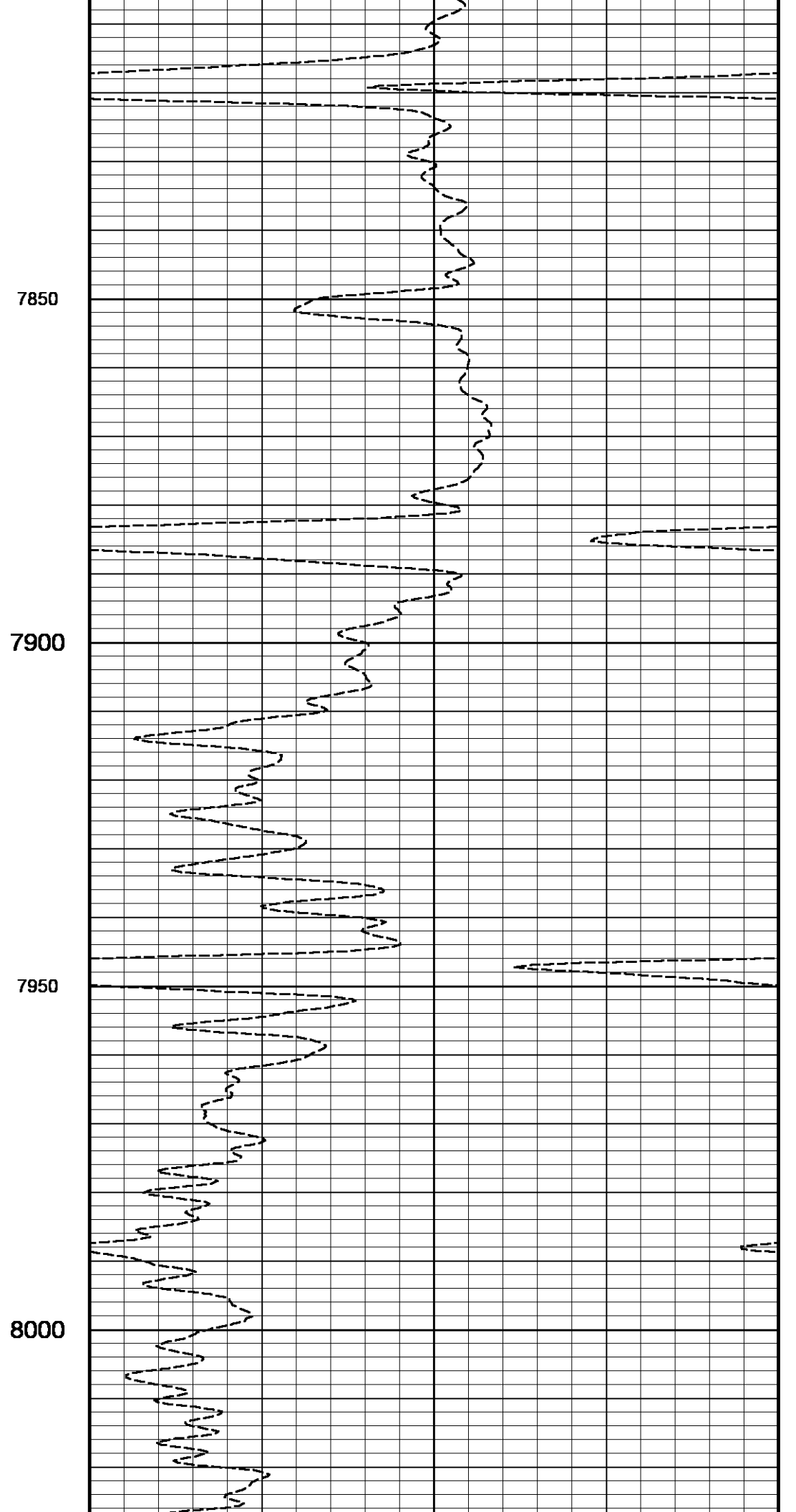
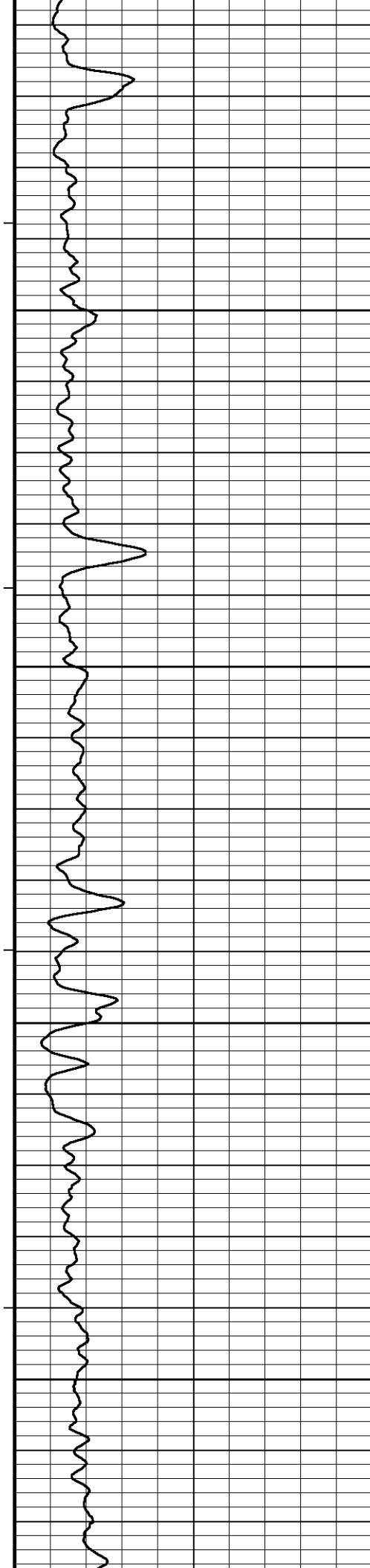
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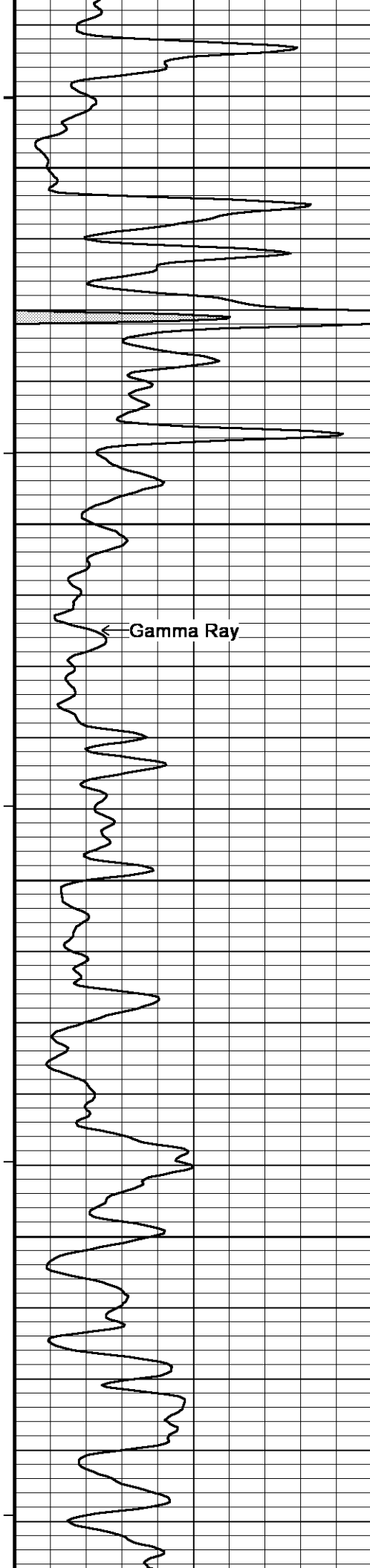
Gamma Ray

Limestone Neutron Por. →









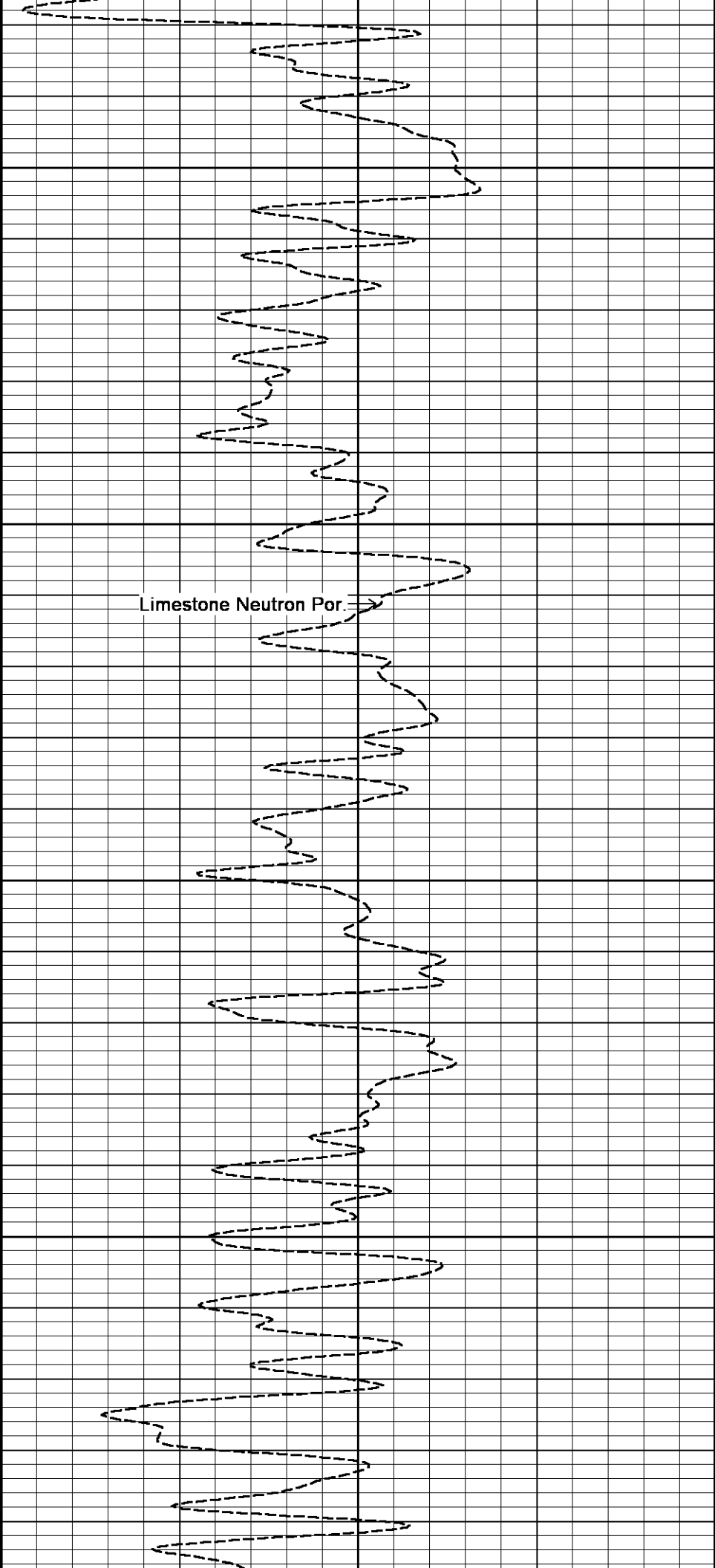
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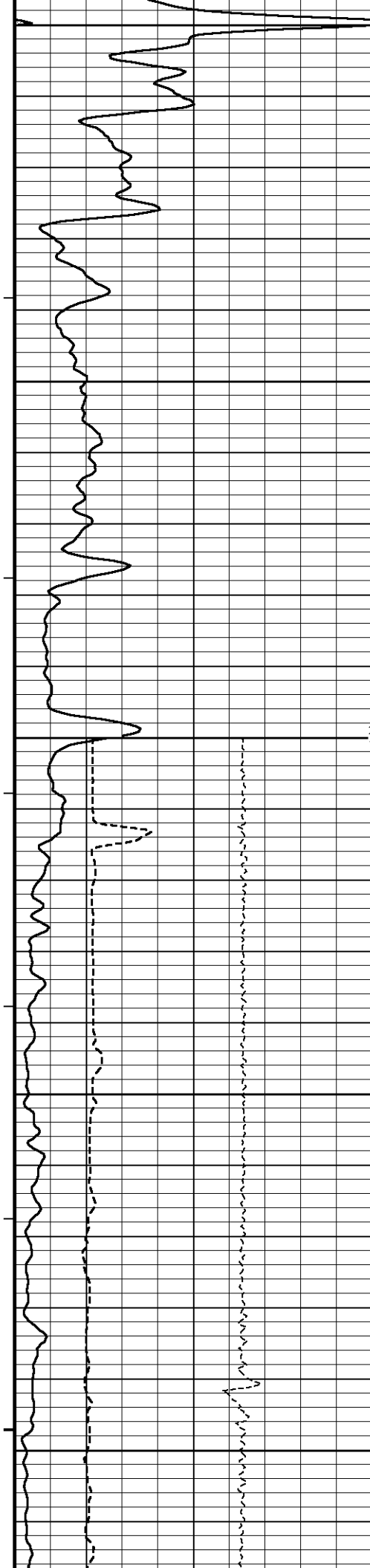
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8200

Gamma Ray



Limestone Neutron Por.



8250

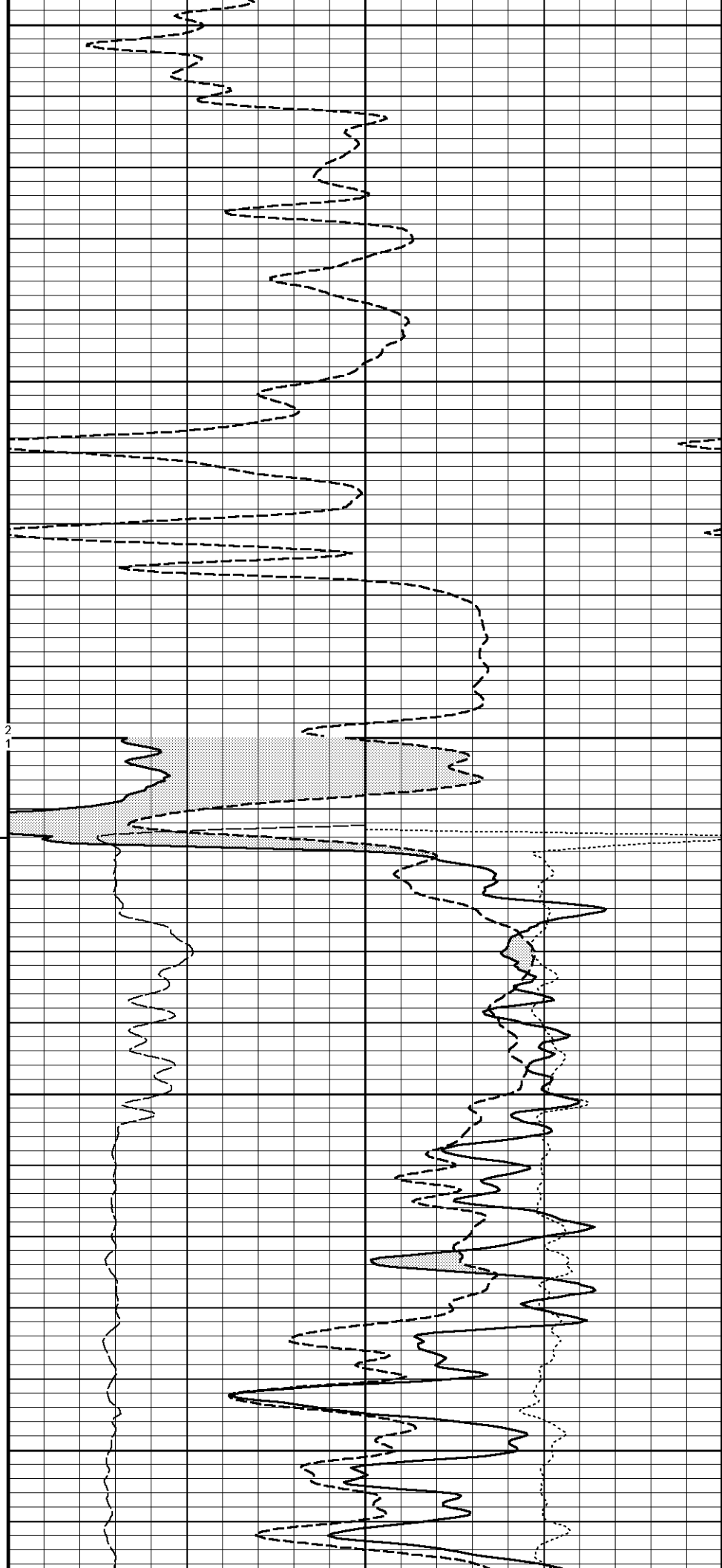
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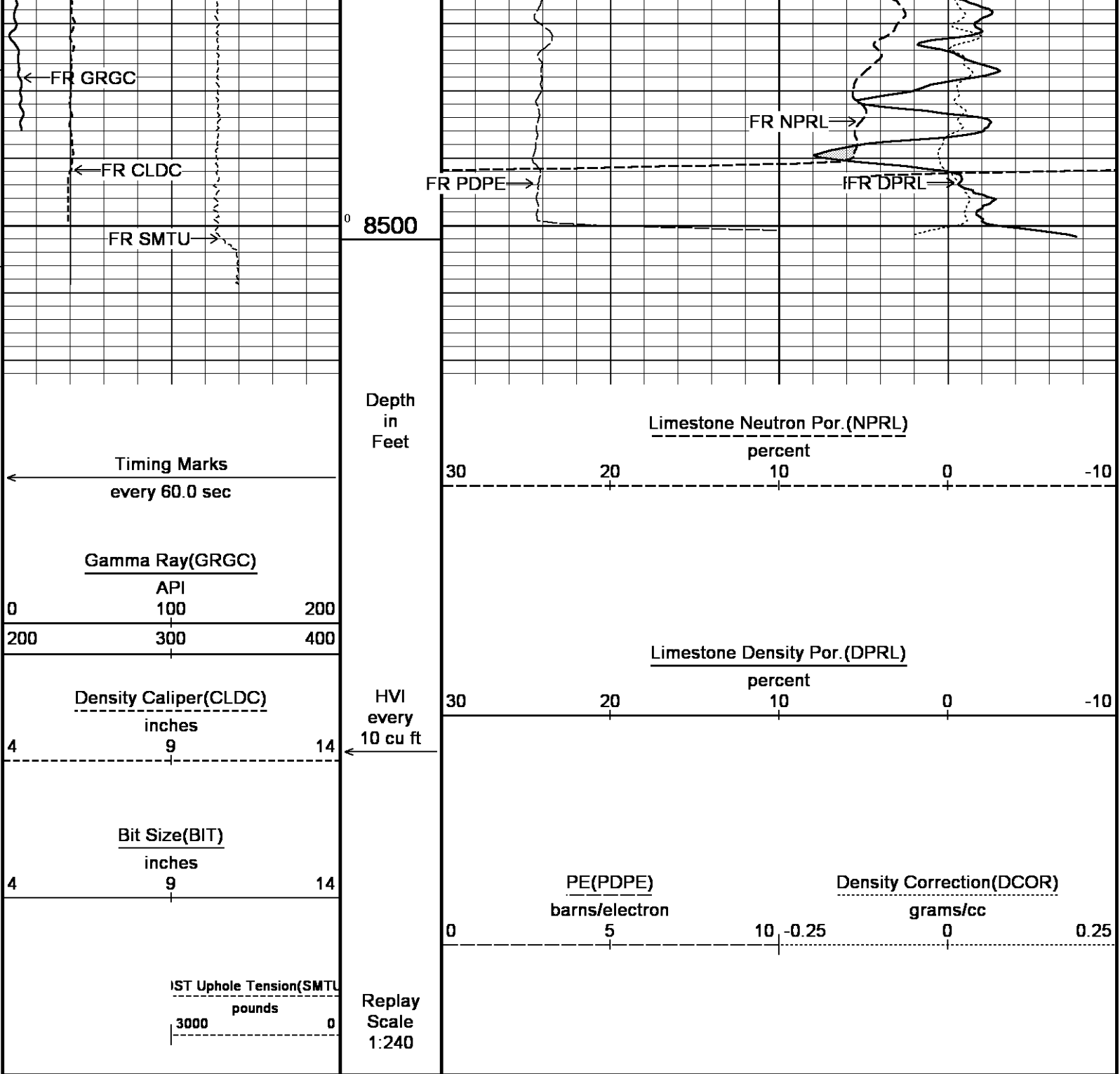
8350

Casing  
Shoe

8400

8450



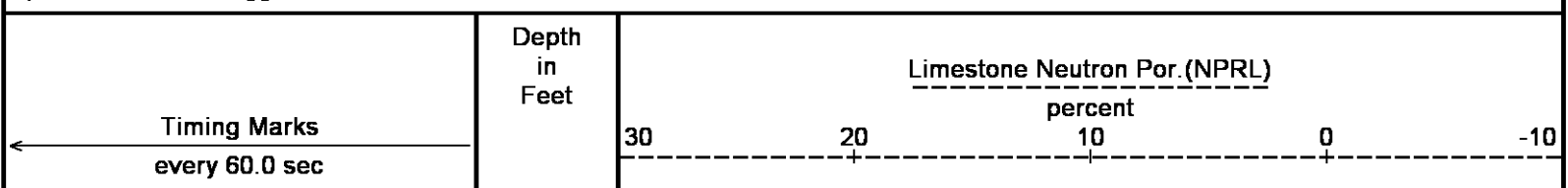


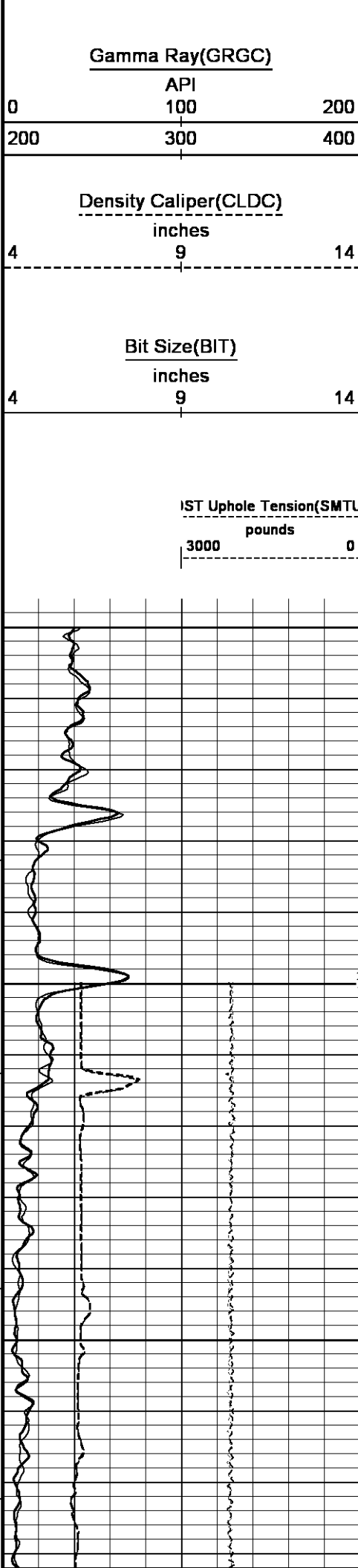
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 18-AUG-2013 00:42  
Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta Recorded on 17-AUG-2013 21:25  
System Versions: Logged with 13.06.9804 Processed with 13.06.9804 Plotted with 13.06.9804

5 INCH MAIN PASS

REPEAT OVERLAY

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 18-AUG-2013 00:42  
Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta Recorded on 17-AUG-2013 21:25  
Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY REPEAT.dta Recorded on 17-AUG-2013 20:42  
System Versions: Logged with 13.06.9804 Processed with 13.06.9804 Plotted with 13.06.9804





HVI  
every  
10 cu ft

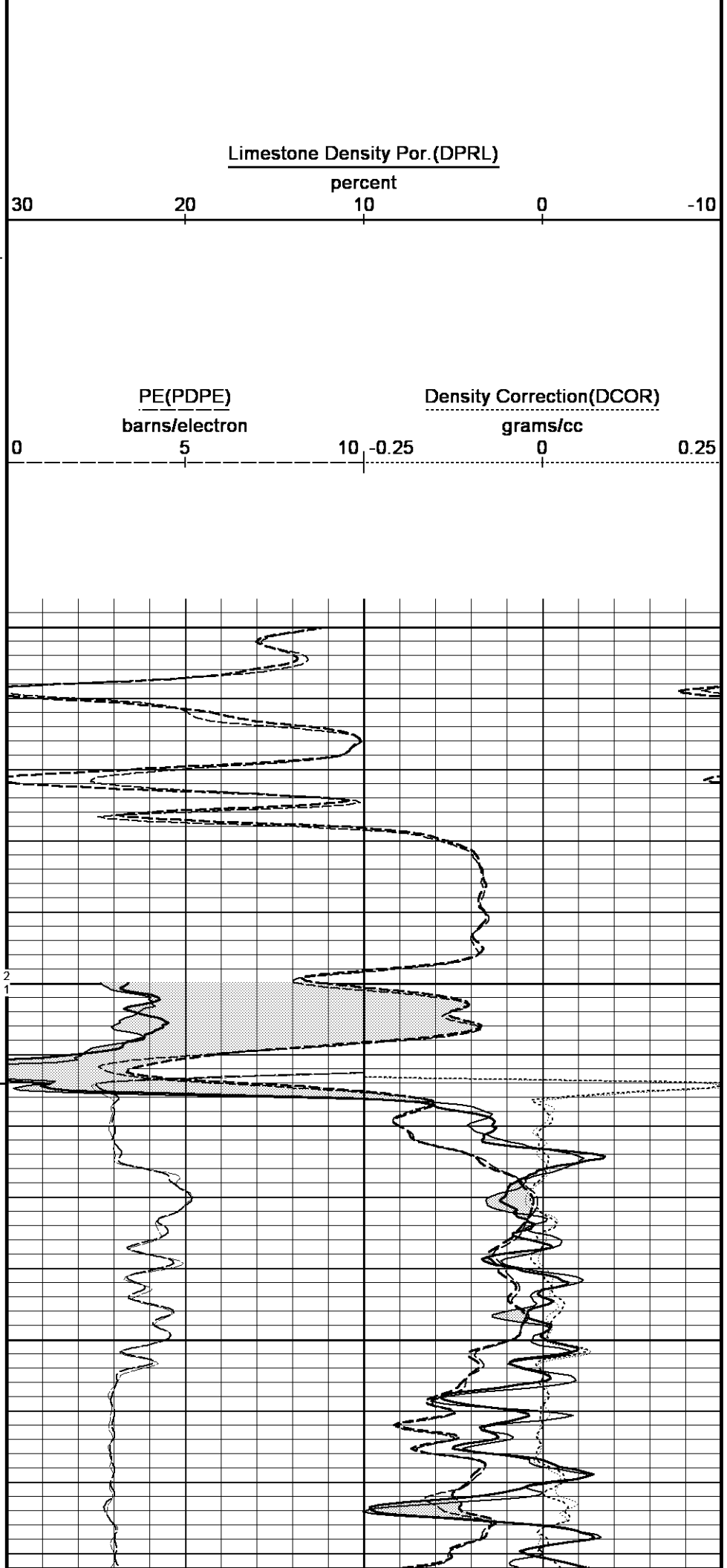
Replay  
Scale  
1:240

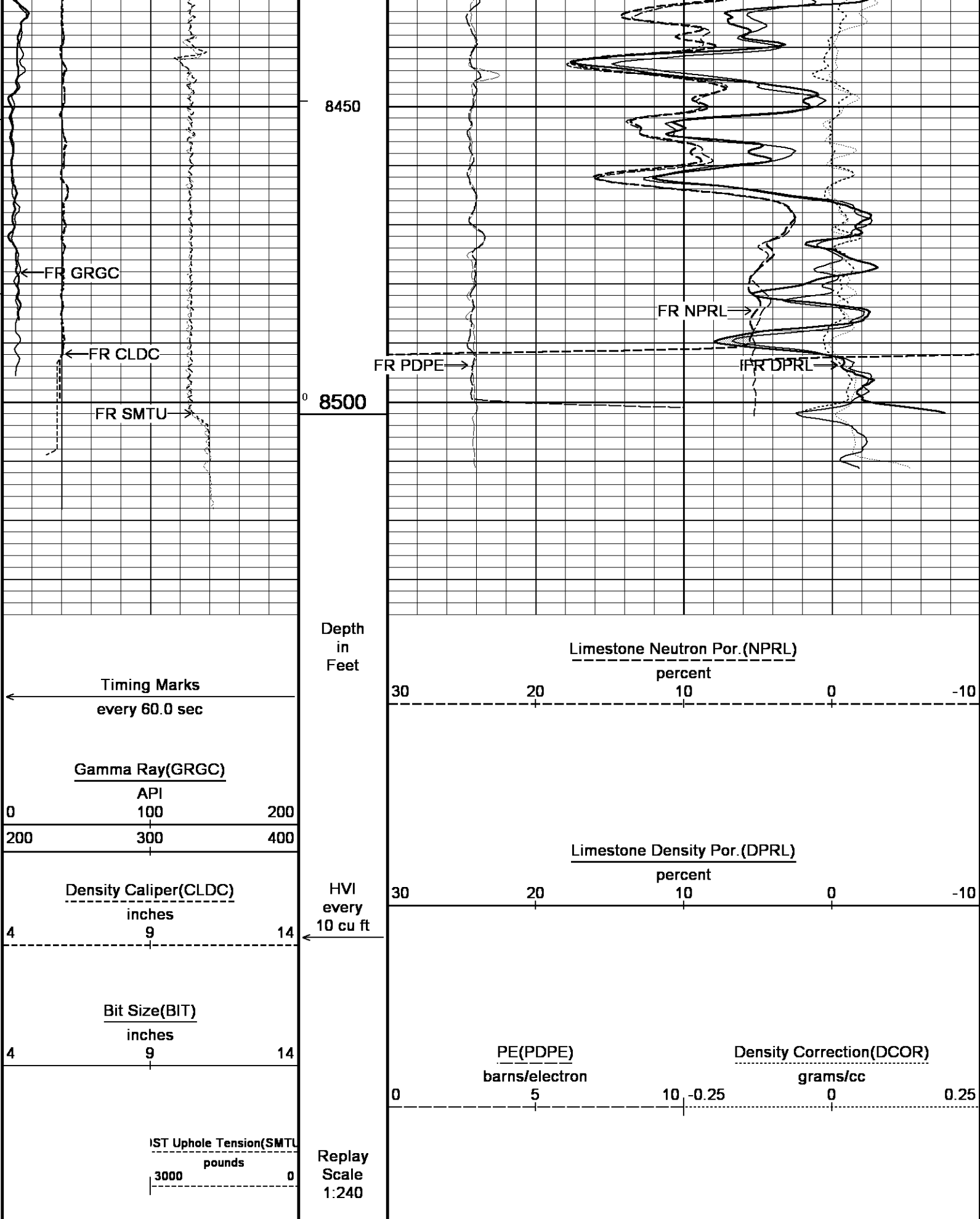
8300

8350

Casing  
Shoe

8400





Depth Based Data - Maximum Sampling Increment 10.0cm

Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta

Filename: C:\LOGS\KINDER MORGAN\DC 14\POROSITY REPEAT.dta

System Versions: Logged with 13.06.9804 Processed with 13.06.9804 Plotted with 13.06.9804

Plotted on 18-AUG-2013 00:42

Recorded on 17-AUG-2013 21:25

Recorded on 17-AUG-2013 20:42



## BEFORE SURVEY CALIBRATION

C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta

## General Constants All 000

Last Edited on 17-AUG-2013,19:17

## General Parameters

Mud Resistivity	0.920	ohm-metres
Mud Resistivity Temperature	72.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

## Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	0.000	inches
Caliper for Differential Caliper	None	

## Rwa Parameters

Porosity used	N/A
Resistivity used	N/A
RWA Constant A	N/A
RWA Constant M	N/A
SW/APOR Tool Source	

## Gamma Calibration MCG-E.A 479

Field Calibration on 17-AUG-2013,17:25

	Measured	Calibrated (API)
Background	43	28
Calibrator (Gross)	1424	940
Calibrator (Net)	1381	912

## Gamma Constants MCG-E.A 479

Last Edited on 17-AUG-2013,17:28

Gamma Calibrator Number	GRC 072	
Mud Density	1.00	gm/cc
Caliper Source for Processing	MMR Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

## Neutron Calibration MDN-B.A 296

Base Calibration on 17-JUL-2013 11:06

Field Check on 17-AUG-2013,20:36

## Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3240	100	3714	110
		32.504		33.764

## Field Calibrator at Base

	Calibrated (cps)	
	1331	1941
Ratio		0.686

## Field Check

	Calibrated (cps)	
	1329	1940
Ratio		0.685

## Neutron Constants MDN-B.A 296

Last Edited on 18-AUG-2013,00:35

Neutron Source Id	N1056	
Neutron Jig Number	5922NE	
Epithermal Neutron	No	
Caliper Source for Processing	Bit Size	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	cu

Sandstone Sigma	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

#### Caliper Calibration MPD-C.A 253

Base Calibration on 17-JUL-2013 10:53  
Field Calibration on 17-AUG-2013 20:52

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	17136	3.98
2	25568	5.96
3	33408	7.97
4	41675	9.84
5	51070	11.91
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	5.99	6.20

#### Photo Density Calibration MPD-C.A 253

Base Calibration on 17-JUL-2013 10:48  
Field Check on 13-AUG-2013 20:12

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57246	26492	59814	31141
Reference 2	22766	2373	24943	2546
Field Check at Base				
	1082.7	1226.1		
Field Check				
	1061.9	1176.0		

PE Calibration				
Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	196	967		
Reference 1	22432	57056	0.396	0.368
Reference 2	6369	22639	0.285	0.272
Field Check at Base				
	195.7	967.3		
Field Check				
	191.3	955.3		

#### Density Constants MPD-C.A 253

Last Edited on 17-AUG-2013,19:16

Density Source Id	P50561B	
Nylon Calibrator Number	687	
Aluminium Calibrator Number	696	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.68	0.00	
2.22		

0.00  
0.00  
0.00  
0.00  
0.00  
0.00  
0.00

0.00  
0.00  
0.00  
0.00  
0.00  
0.00  
0.00

## DOWNHOLE EQUIPMENT

C:\LOGS\KINDER MORGAN\DC 14\POROSITY MAIN2.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor

SHA-J.A 214 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact Comms Gamma

MCG-E.A 479 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron

MDN-B.A 296 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

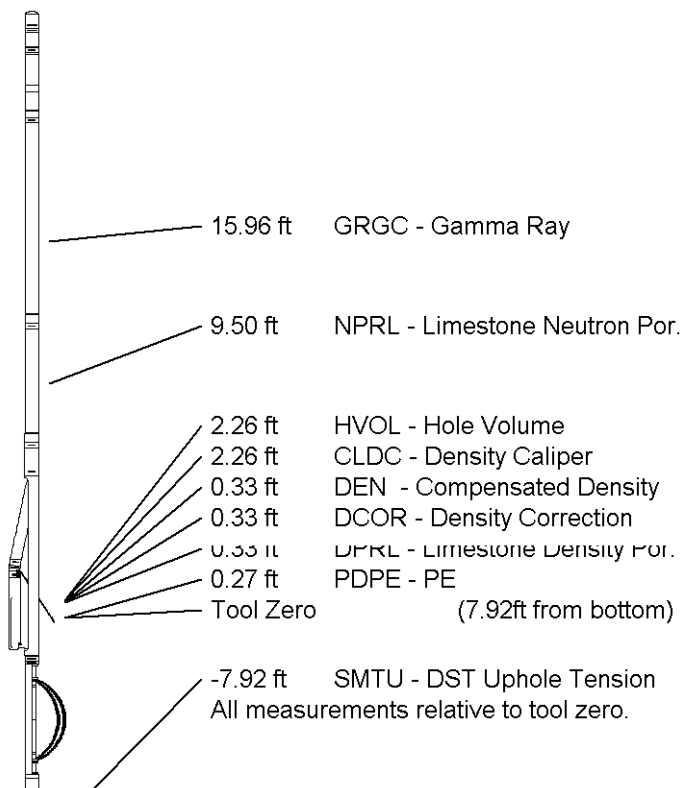
Compact Density/Caliper

MPD-C.A 253 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

MIS-A.A Compact Inline Bowspring sub

MIS-A.A 70 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Total Length: 32.91 ft Weight: 275.6 lb



COMPANY

KINDER MORGAN C02 Co. L.P

WELL

DOE CANYON #14

FIELD

DOE CANYON

PROVINCE/COUNTY

DOLORES

COUNTRY/STATE

U.S.A. / COLORADO

Elevation Kelly Bushing 7130.00 feet

Elevation Drill Floor 7130.00 feet

Elevation Ground Level 7105.00 feet

First Reading 8498.00 feet

Depth Driller 8502.00 feet

Depth Logger 8502.00 feet



**Weatherford®**

COMPENSATED DENSITY

COMPENSATED NEUTRON

LOG



