Tucker WIRELINE SERVICES

COMPENSATED NEUTRON

PEL DENSITY

Company LAYNE ENERGY OPERATING, LL
Well FUQUA #9-36
Field
County ELK
State KANSAS
Country USA
API No. 15-049-22559

File No : TUL-57618
Company : LAYNE ENERGY OPERATING, LLC.
Well : FUQUA #9-36
Field :
County : ELK
State : KANSAS
Country : USA
API No : 15-049-22559

Location :
1852' FSL & 1320' FEL
N2 S2 N2 SE

LSD : **Sect :** 36 **Twp :** 28 **Rge :** 9E

Permanent Datum:	GL	**Elevations:**		**Services:**	
Drilling Measured From:	KB	**KB**	1212.00 Ft	SGT	MLT
Log Measured From:	GL	**DF**	1211.00 Ft	CNT	PIT
Above Permanent Datum:	0.00 Ft	**GL**	1201.00 Ft	LDT	

Date	02-24-2012			
Run Number	1			
Depth--Driller	2636.0 Ft			
Depth--Logger	2631.0 Ft			
First Reading	2618.0 Ft			
Last Reading	40.0 Ft			
Casing--Driller	40.0 Ft			
Casing--Logger	40.0 Ft			
Bit Size	7.875 In			
Casing Size	8.625 In			
Hole Fluid Type	WBM			
Density	9.0 LBS/GAL			
Fluid Loss	0.0 CC			
PH/Viscosity	0.0	60.0 SEC		
Sample Source	MEASURED			
RM@Measured Temp.	2.800 @ 60 F			
RMF@Measured Temp	2.380 @ 60 F			
RMC@Measured Temp.	3.220 @ 60 F			
Source RMF/RMC	CALCULATED	CALCULATED		
RM@BHT	1.470 @ 120 F			
Time Circulation Stopped				
Max Recorded Temp.	120 F			
Equipment/Base	123	TULSA		
Recorded By	S. DAVIS			
Witnessed By	M. MURPHY / J. MCLAIN / J.	BURRIS		

Bitsize Intervals

Size (In)	Bottom (Ft)
7.875	2642.00

Casing Strings

Size (In)	Weight (Lbs)	Bottom (Ft)
8.625	20.00	40.00

Run Number	1		
Date	02-24-2012		
Date/Time On Bottom	02-24-2012 12:00		
Depth to Fluid	0.0	Ft	
Salinity	0.000	PPM	
RMF@BHT	1.250 @ 120	F	
RMC@BHT	1.690 @ 120	F	

Run Number 1

Comments

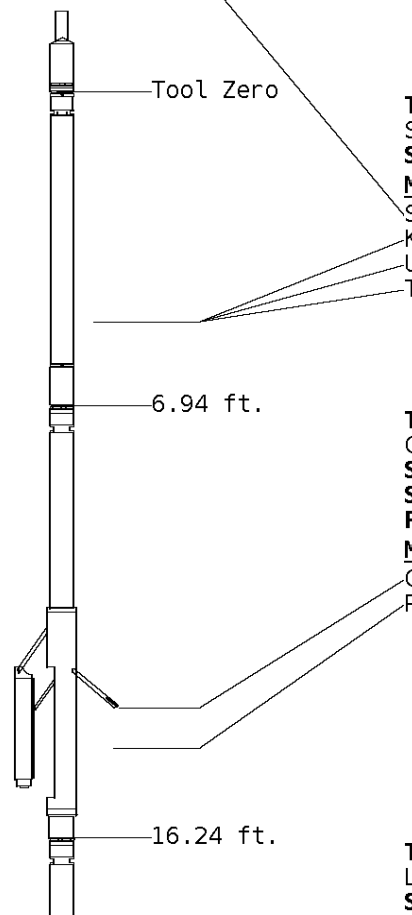
ALL PRESENTATIONS AS PER CUSTOMER REQUEST.
SGT, CNT, LDT, MLT, AND PIT RUN IN SPLIT RUNS
CALIPERS ORIENTED ON X-Y AXIS.
2.71 & 2.68 G/CC USED TO CALCULATED POROSITY.
ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING.
HIRES & SGT PRESENTED FROM TD TO 2200'
MISS. RW 0.12

SGT: GRP, UFGRP, S-KK, S-UK, S-TK,
CNT: PHIN, CLCNIN.
LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN.
MLT: NOR_RF, INV_RF, MSCLPIN.
PIT: ILD, ILM, SPU, SFLAEC.

OPERATORS:
A. WARREN
N. LOYD
B. STEVENS

Tool String Schematic

Total Tool Length - 35.62 **ft.**
Maximum Outside diameter - 6.00 **in.**
Net Weight in Air - 744.00 **lbs.**



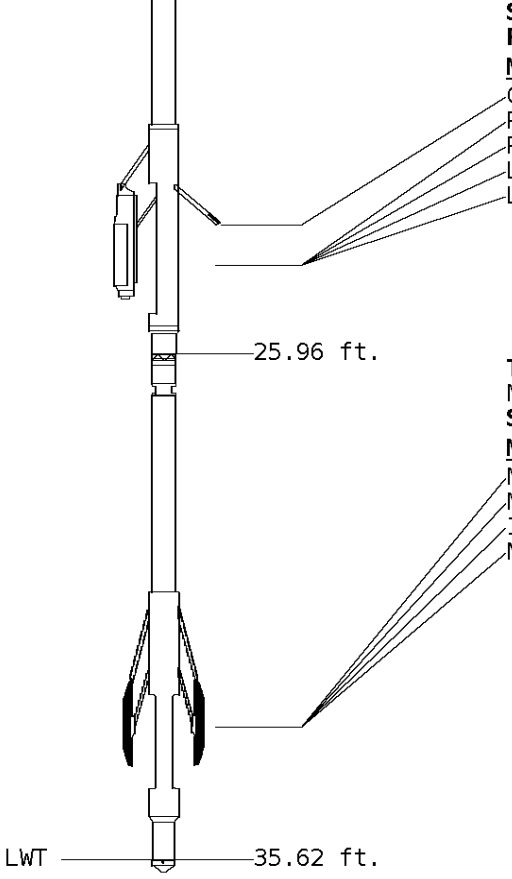
Tool: GRT-FA **Length:** 6.94 **ft.** **O.D.** 3.62 **in.**
Spectral Gamma Controller
Sonde ID :GRT-FA-074

Measure Point	Tool Offset	Stack Offset	Bottom Offset
SP	-4.42	-4.42	40.04
K	5.17	5.17	30.45
U	5.17	5.17	30.45
T	5.17	5.17	30.45

Tool: CNT-AA **Length:** 9.30 **ft.** **O.D.** 4.36 **in.**
Compensated Neutron A Pad on NDT-A
Sonde ID :NDT-BD-123
Source ID :N-1046
Pad ID :CNP-AA-024

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLCN	6.00	12.94	22.68
PHIN	6.80	13.74	21.88

Tool: LDT-DF **Length:** 9.72 **ft.** **O.D.** 4.80 **in.**
Litho Density D Pad on NDT-F
Sonde ID :PDT-GA-466



Source ID :2991GW
Pad ID :LDP-DA-067

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.42	22.66	12.96
PEL	7.42	23.66	11.96
PES	7.82	24.06	11.56
LDEN	7.62	23.86	11.76
LCOR	7.62	23.86	11.76

Tool: MST-DA **Length:** 9.66 **ft.** **O.D.** 6.00 **in.**
Micro Spherically Focused (IC)
Sonde ID :MLT-DA-21

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	33.56	2.06
MSCLP	7.60	33.56	2.06
INV	7.60	33.56	2.06
NOR	7.60	33.56	2.06

Well File: lan_fuq_9-36_feb_24_mstk **Scale:** 1:240
Segment: V1.D5.S1 MAIN **Acquired:** Not Available
Reference: 0 **Processed:** Not Available

TENSION
LBS
10000 — 0

BIT SIZE
INCHES (IN)
6 — 16

DENSITY (X) CALIPER
INCHES (IN)
16 — 26
6 — 16

Volume
Quartz

PE CROSS-SECTION
BARNS/ELECTRON
0 — 10

DENSITY CORRECTION
G/CC
-0.25 — 0.25

NEUTRON (Y) CALIPER
INCHES (IN)
16 — 26
6 — 16

Volume
Calcite

NEUTRON POROSITY
PERCENT (LIMESTONE MATRIX)
70 — 30
30 — -10
-10 — -50

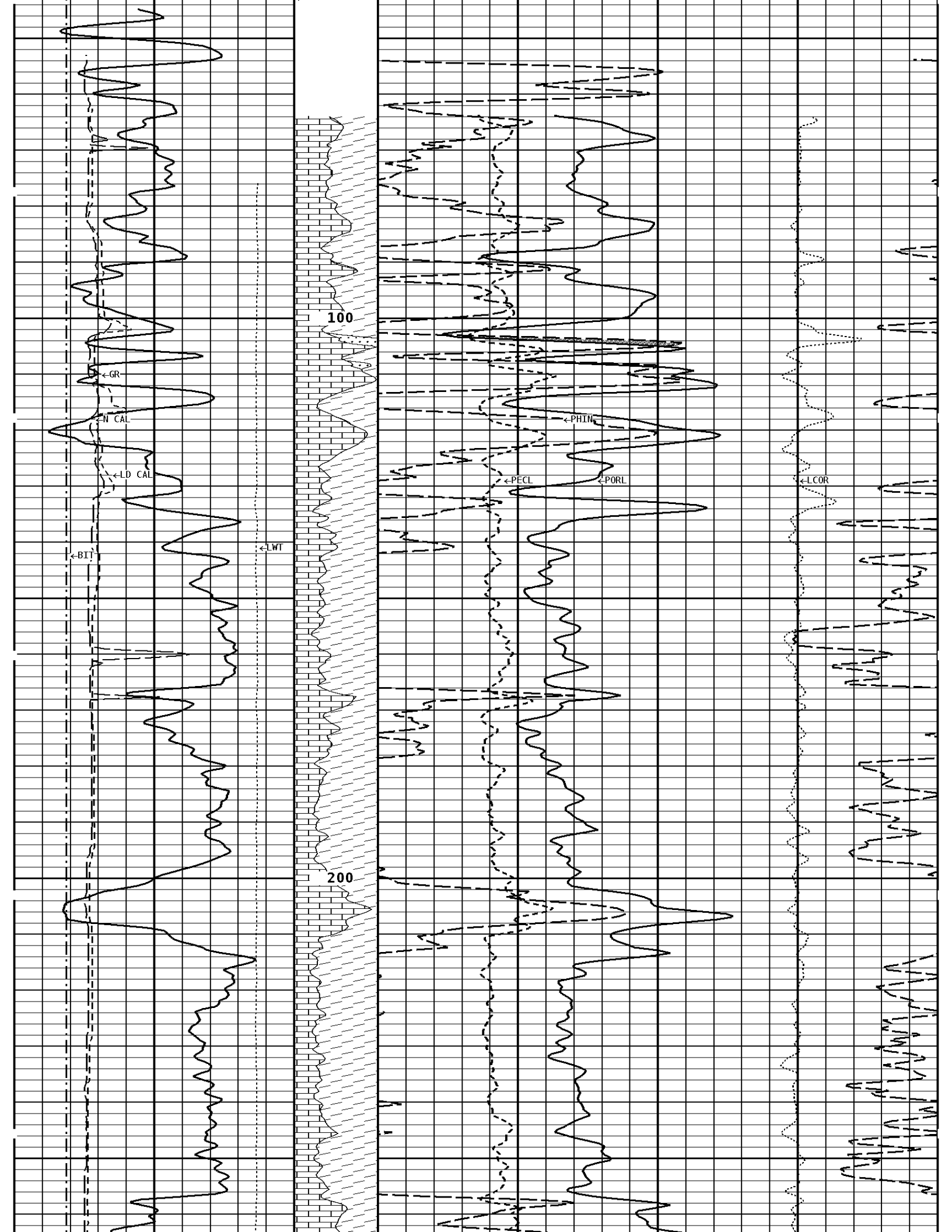
GAMMA RAY
API UNITS
150 — 300
0 — 150

Volume
Dolo/Shale

DENSITY POROSITY
PERCENT (2.71 g/cc)
70 — 30
30 — -10
-10 — -50

1:240 MAIN SECTION

File #1.5.1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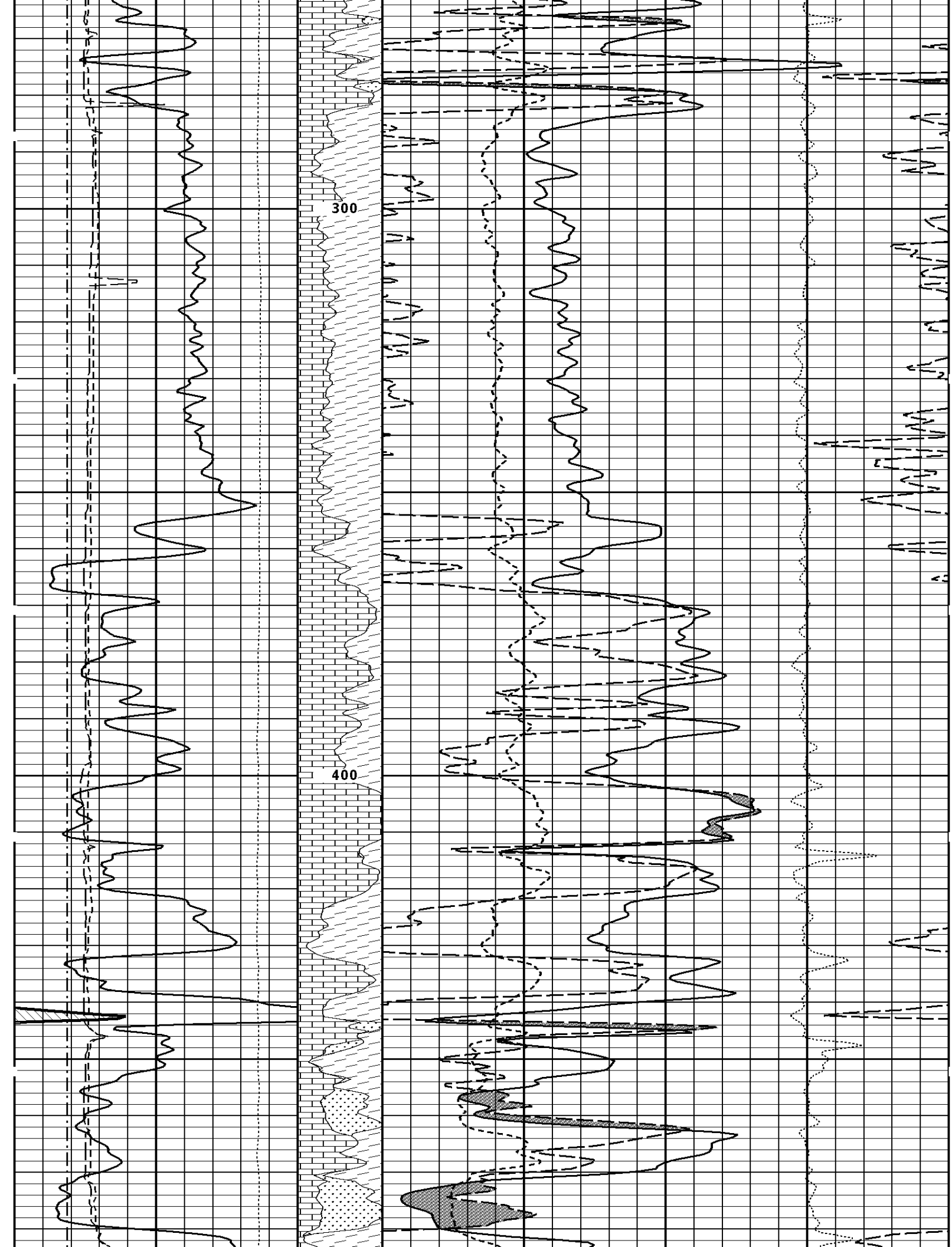
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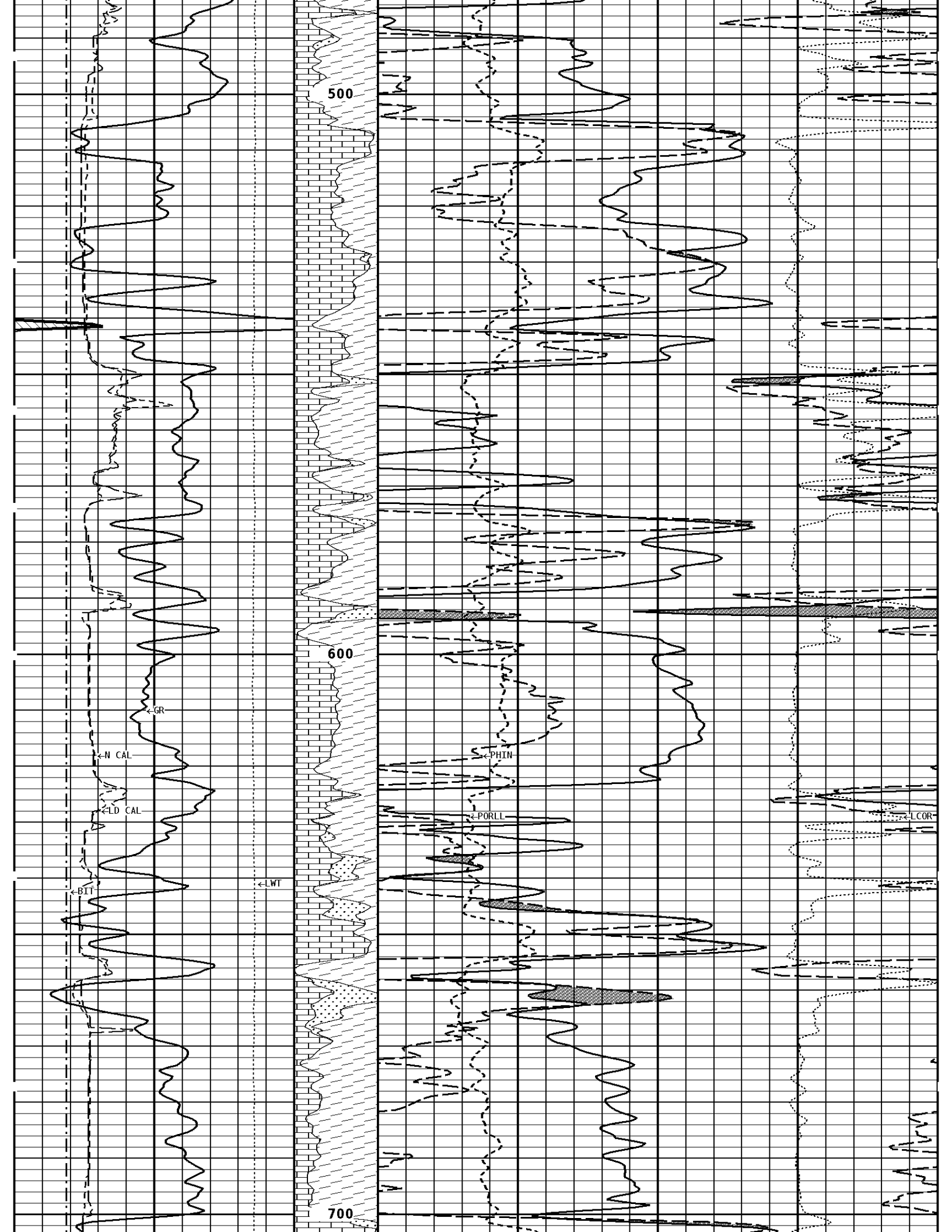
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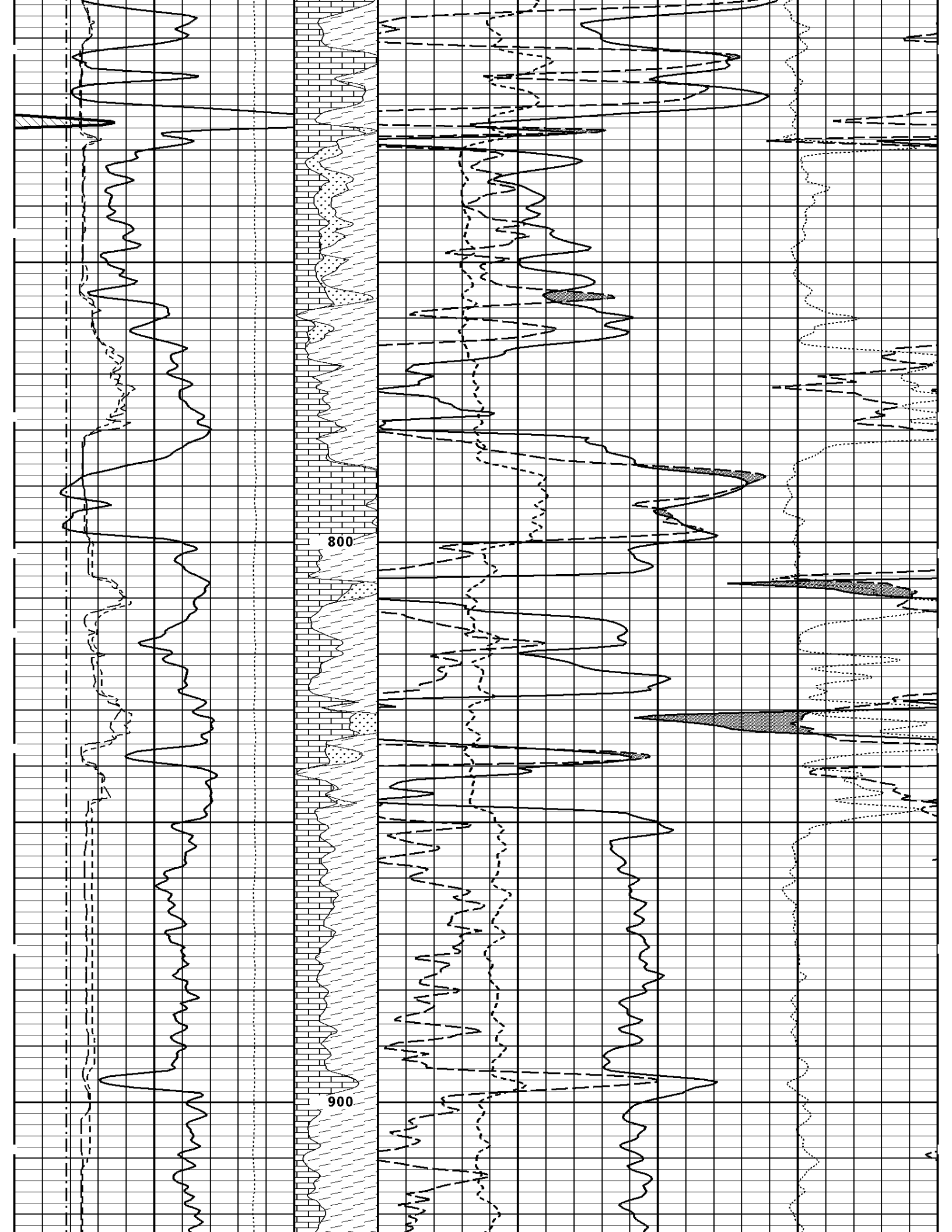
PORLL
LCOR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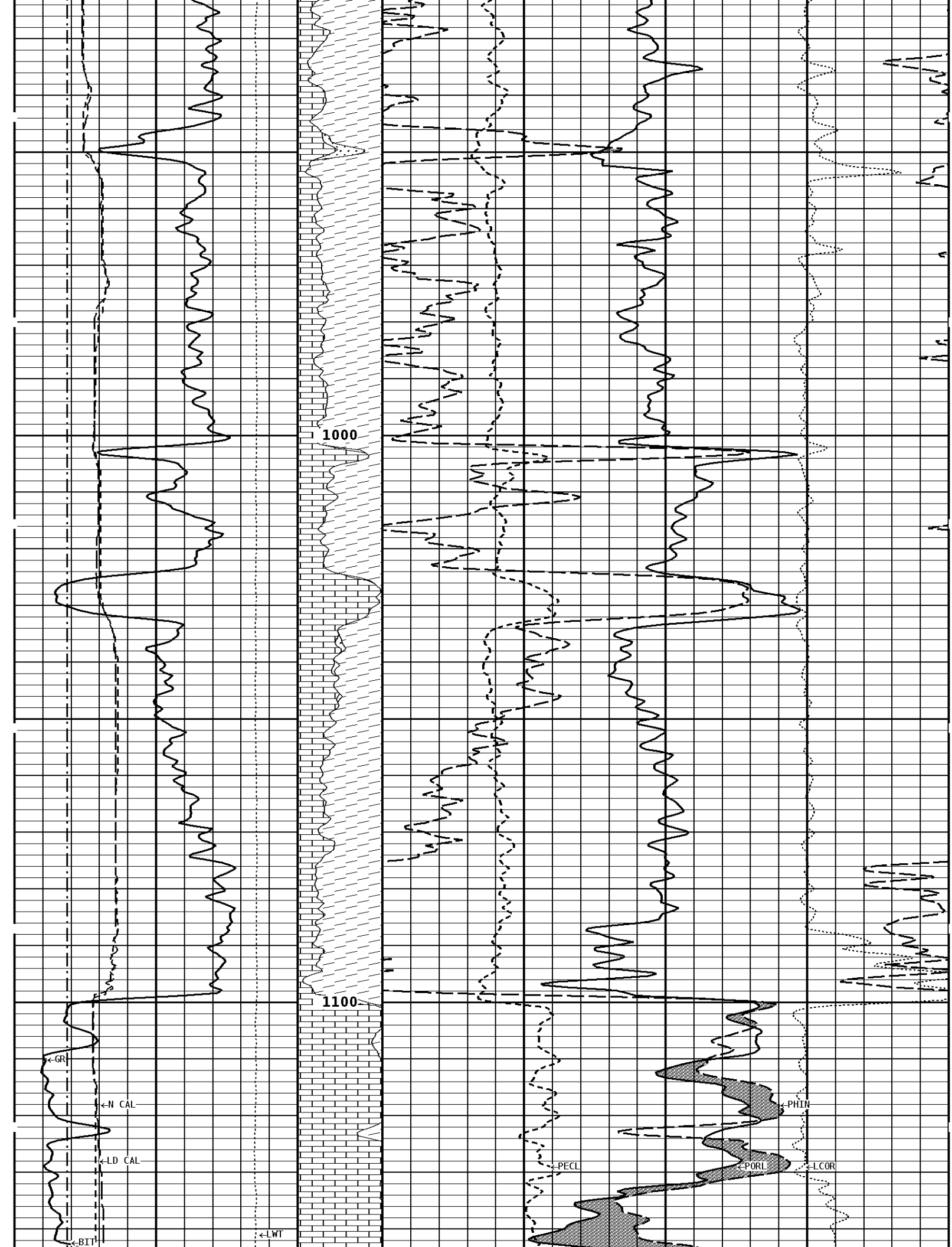
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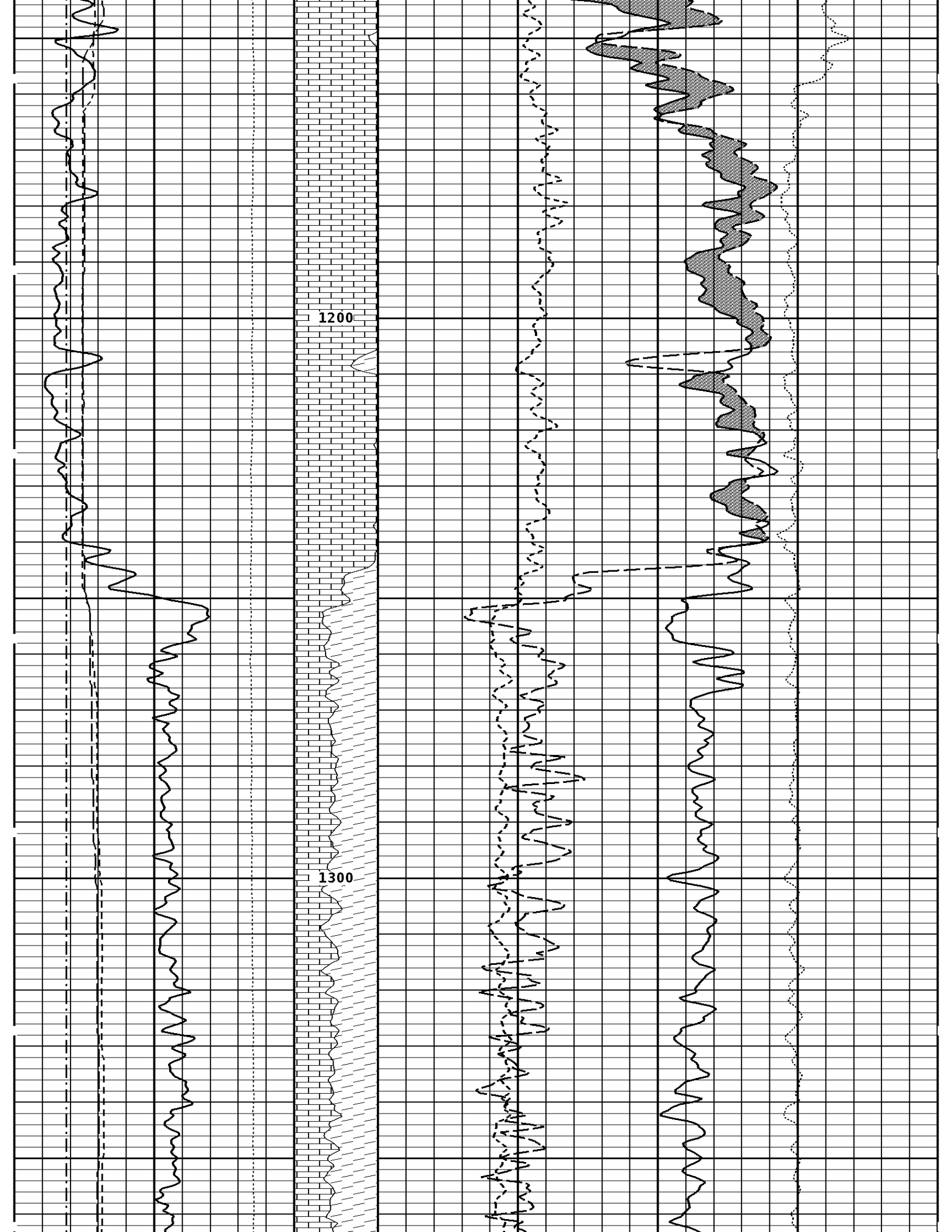
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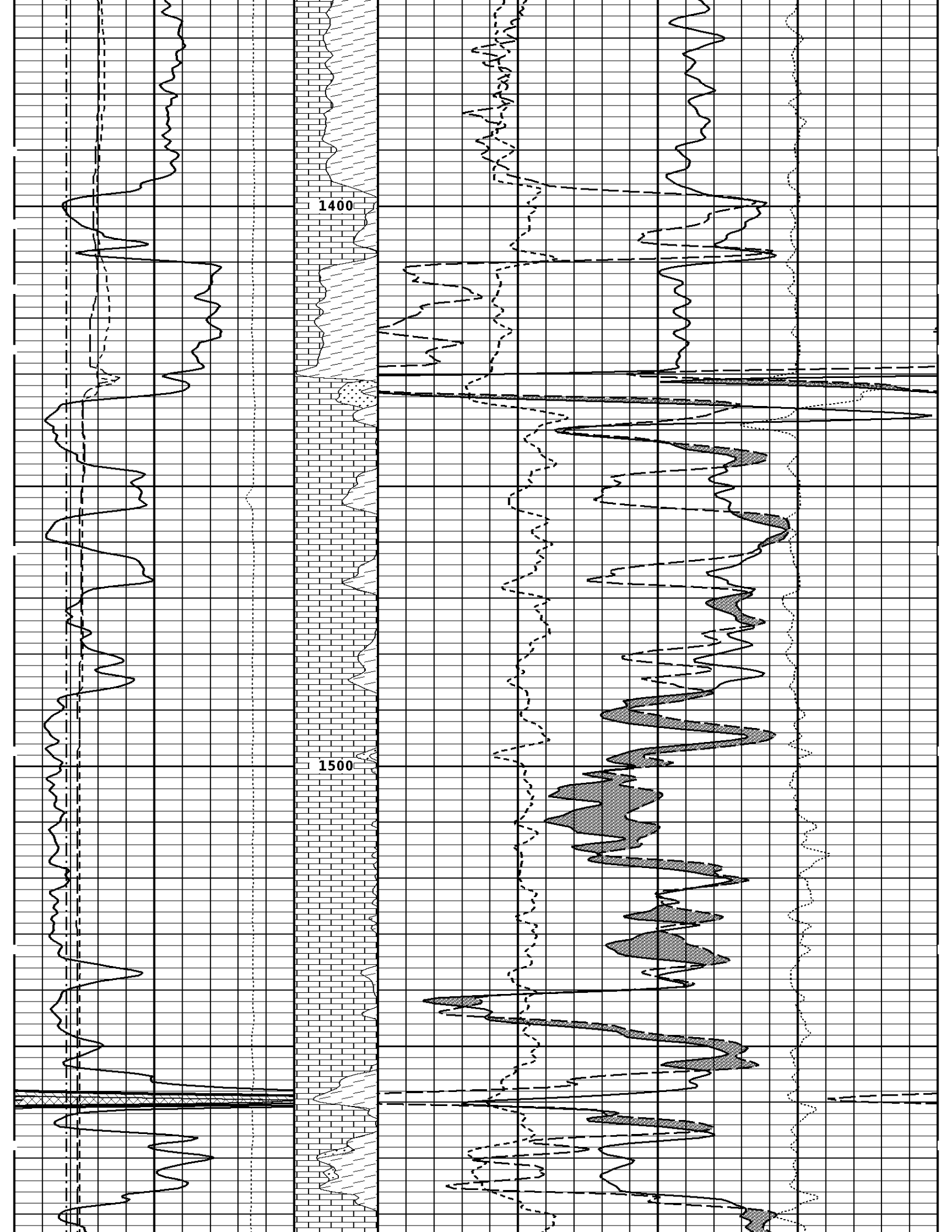
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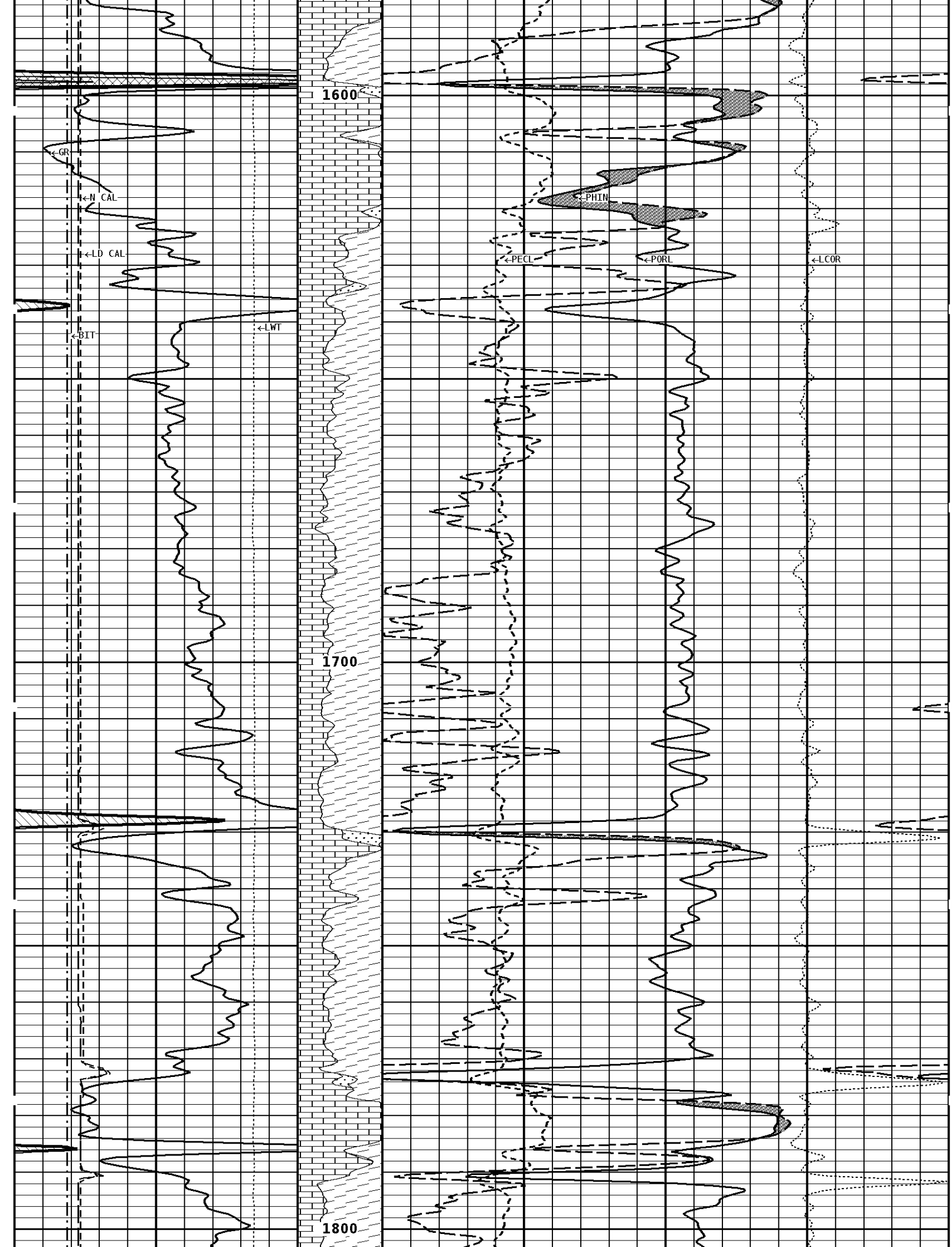
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BIT
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PHIN
PECL
PORL
LCOR
1700
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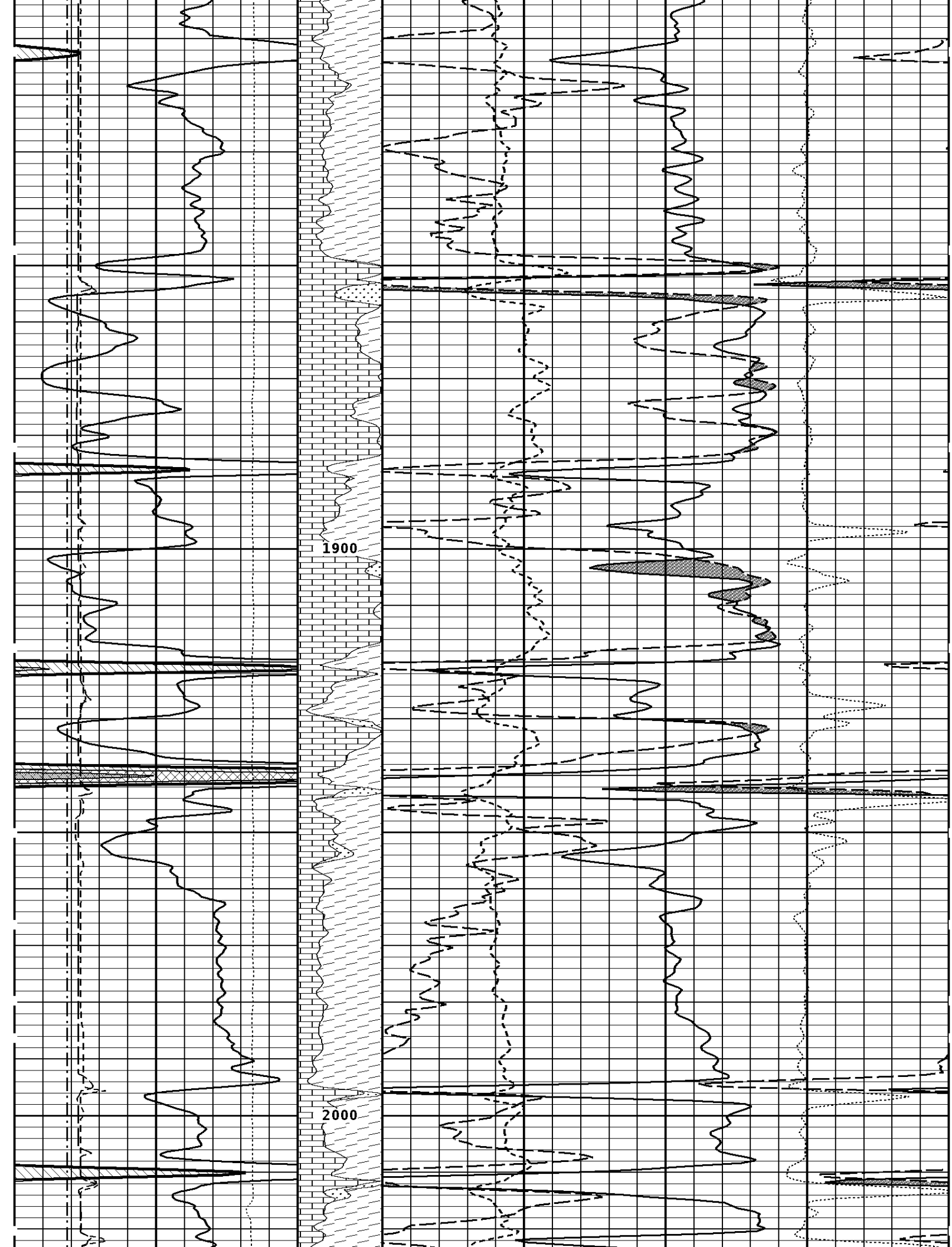
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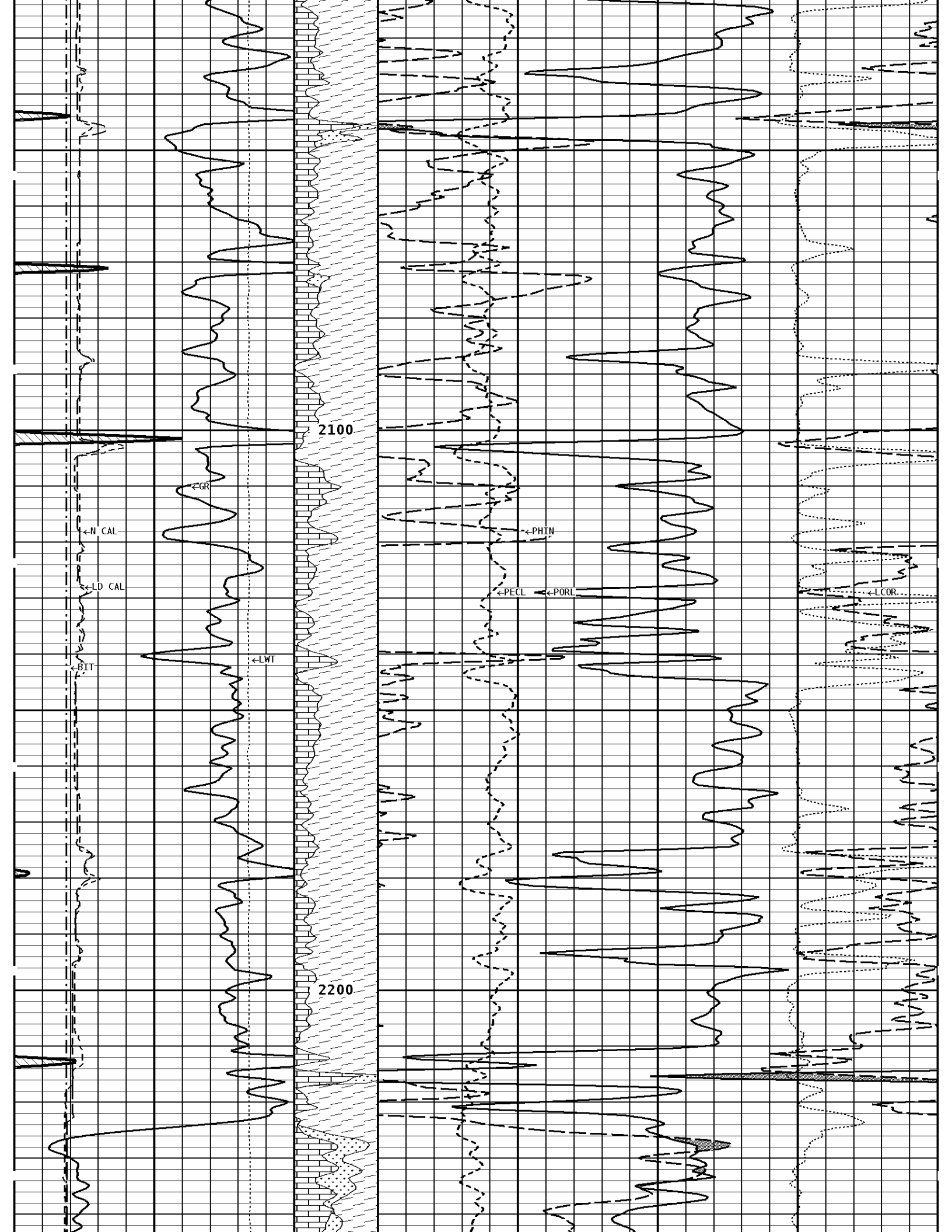
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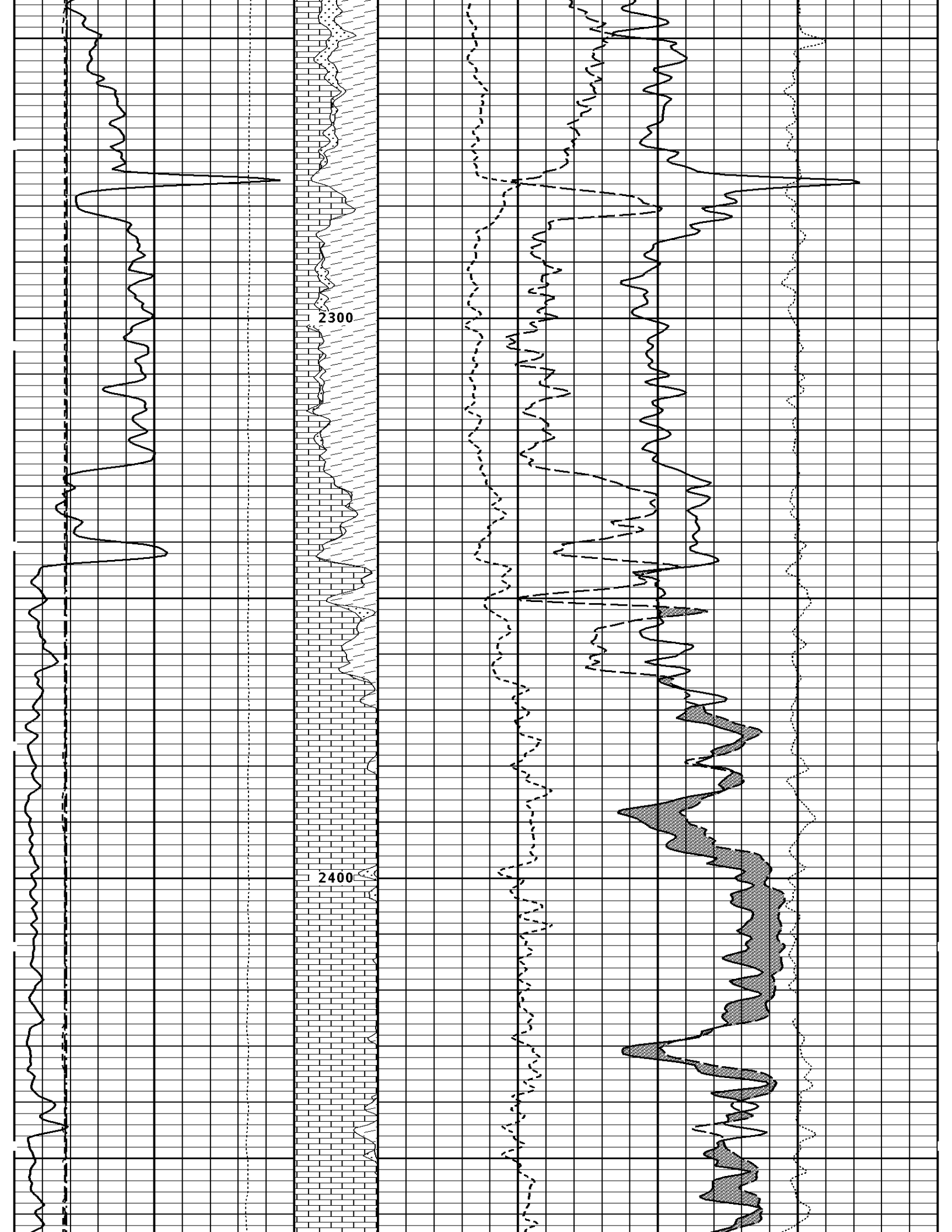
BIT
LWT
PHIN
PECL
PORL
LCOR
2200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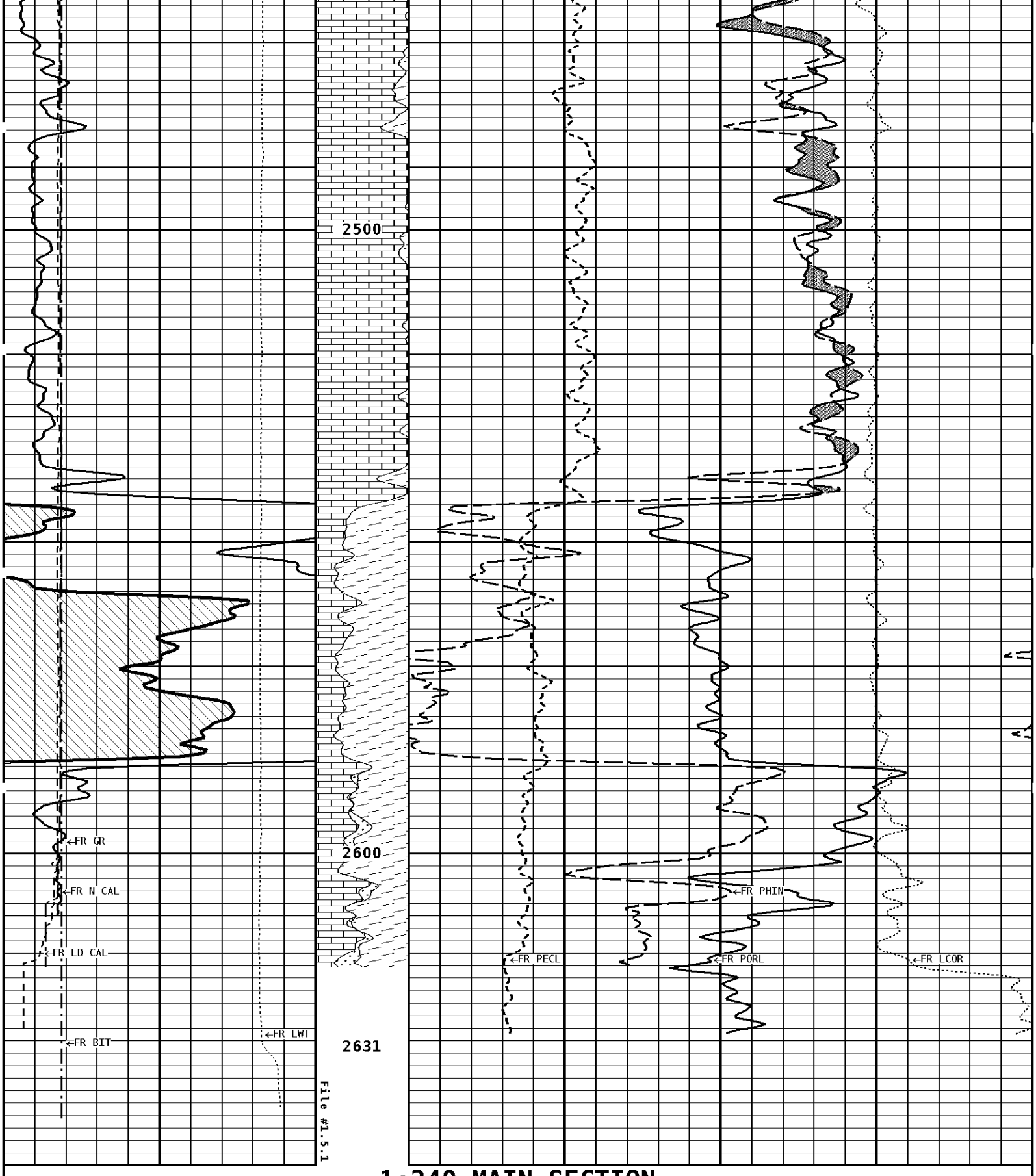


1:240 MAIN SECTION

GAMMA RAY API UNITS	Volume Dolo/Shale	DENSITY POROSITY PERCENT (2.71 g/cc)
150 — 300		70 — 30

0 150		30 -10
		-10 -50

NEUTRON (Y) CALIPER INCHES (IN)	Volume Calcite	NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)
16 26 6 16		70 30 30 -10 -10 -50

DENSITY (X) CALIPER INCHES (IN)	Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26 6 16		0 10	-0.25 0.25

BIT SIZE INCHES (IN)
6 16

TENSION LBS
10000 0

Well File: lan_fuq_9-36_feb_24_mstk	**Scale:** 1:240
Segment: V1.D5.S1 MAIN	**Acquired:** Not Available
Reference: 0	**Processed:** Not Available

TENSION LBS
10000 0

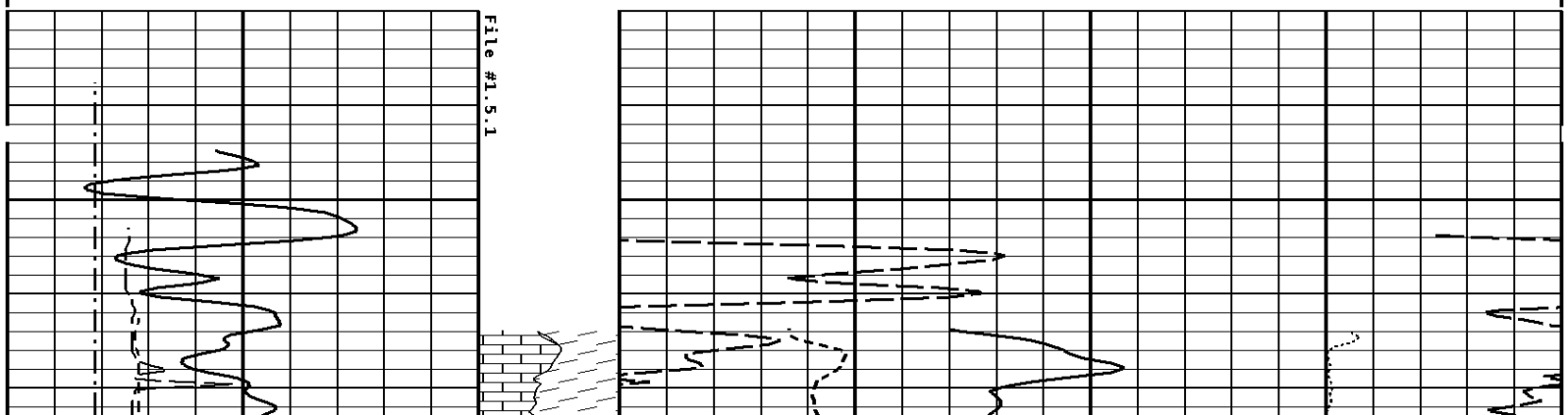
BIT SIZE INCHES (IN)
6 16

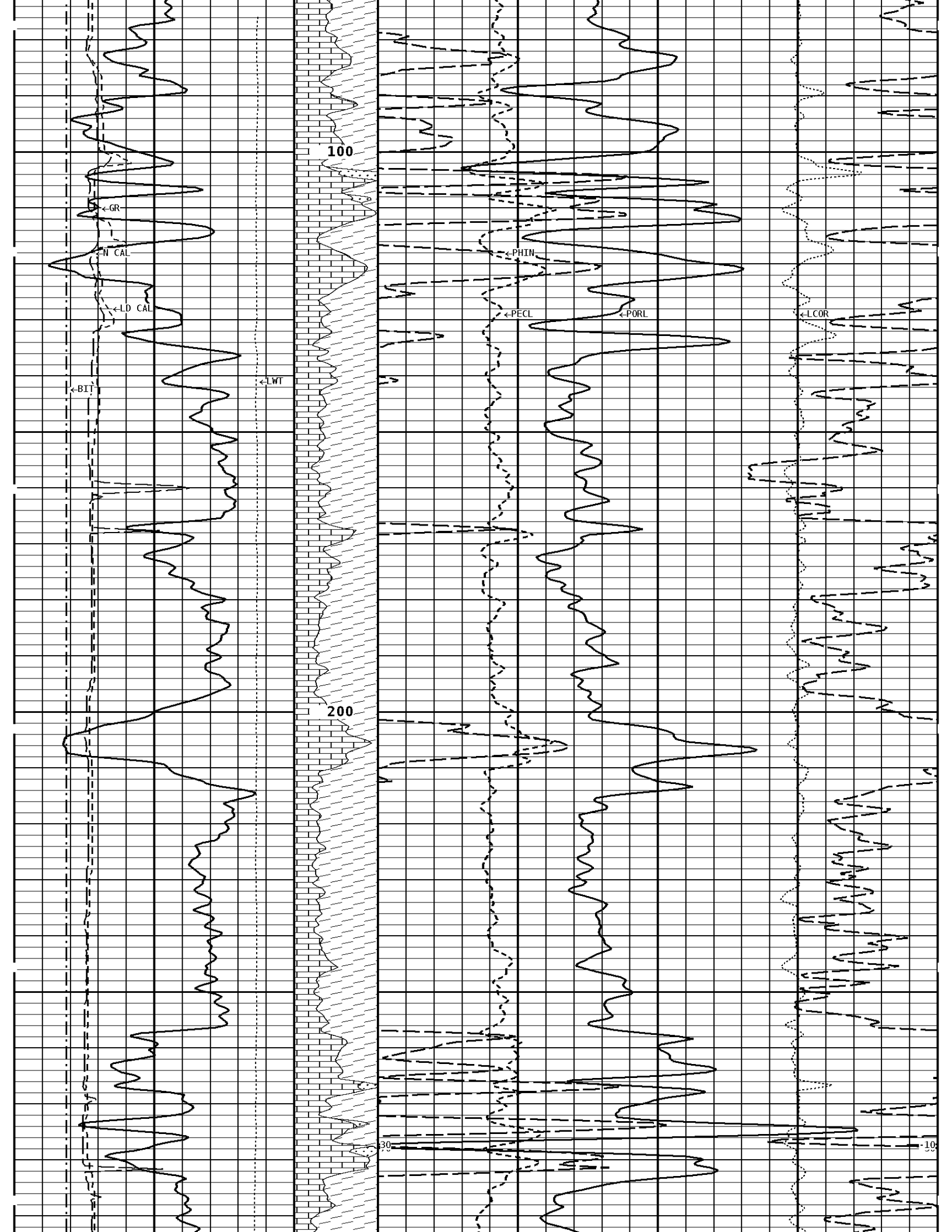
DENSITY (X) CALIPER INCHES (IN)	Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26 6 16		0 10	-0.25 0.25

NEUTRON (Y) CALIPER INCHES (IN)	Volume Calcite	NEUTRON POROSITY PERCENT (SANDSTONE MATRIX)
16 26 6 16		70 30 30 -10 -10 -50

GAMMA RAY API UNITS	Volume Dolo/Shale	DENSITY POROSITY PERCENT (2.68 g/cc)
150 300 0 150		70 30 30 -10 -10 -50

1:240 MAIN SECTION




100
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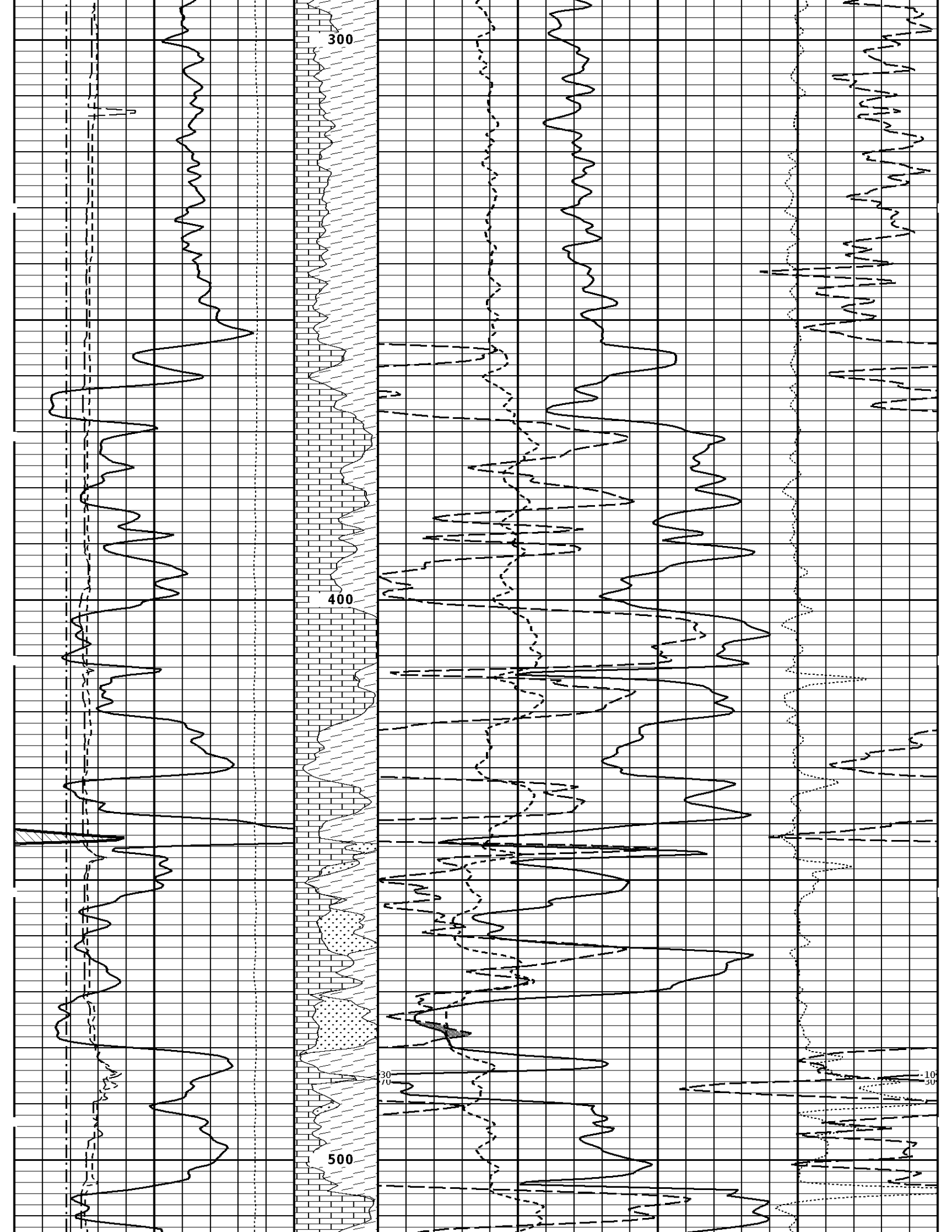
30
10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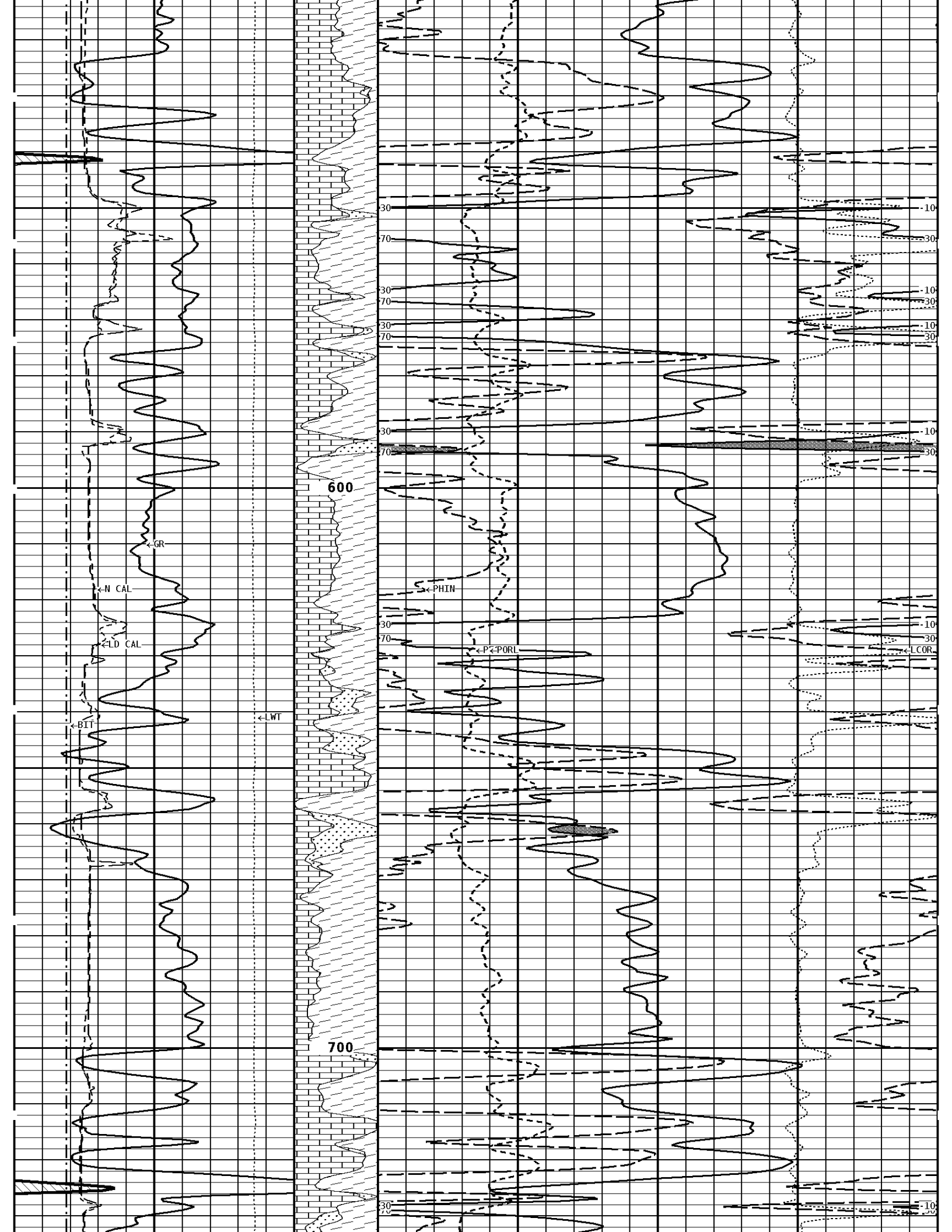
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70
10
30
30
70
10
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30
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10
30
30
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10
30
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10
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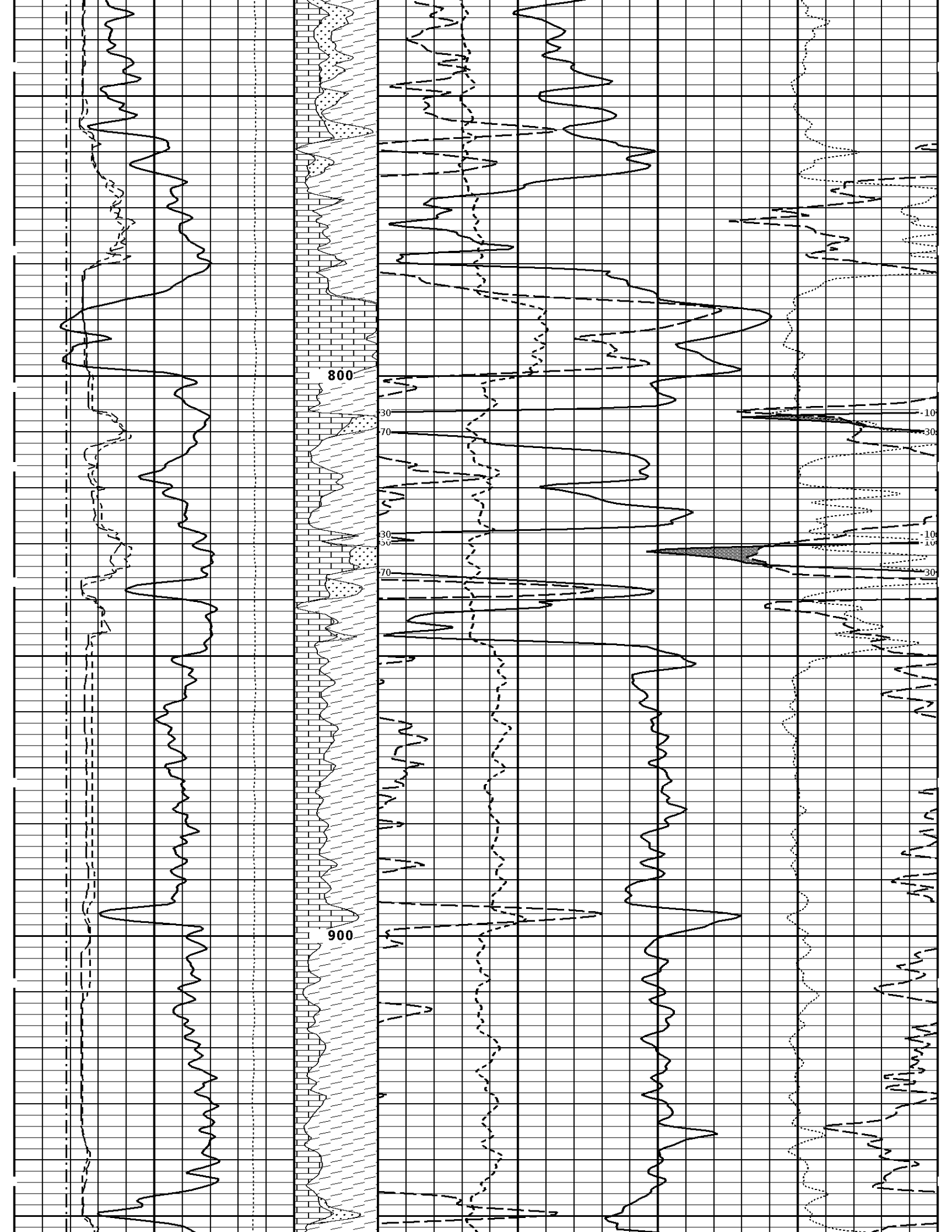
←BIT
←LWT
700
30
10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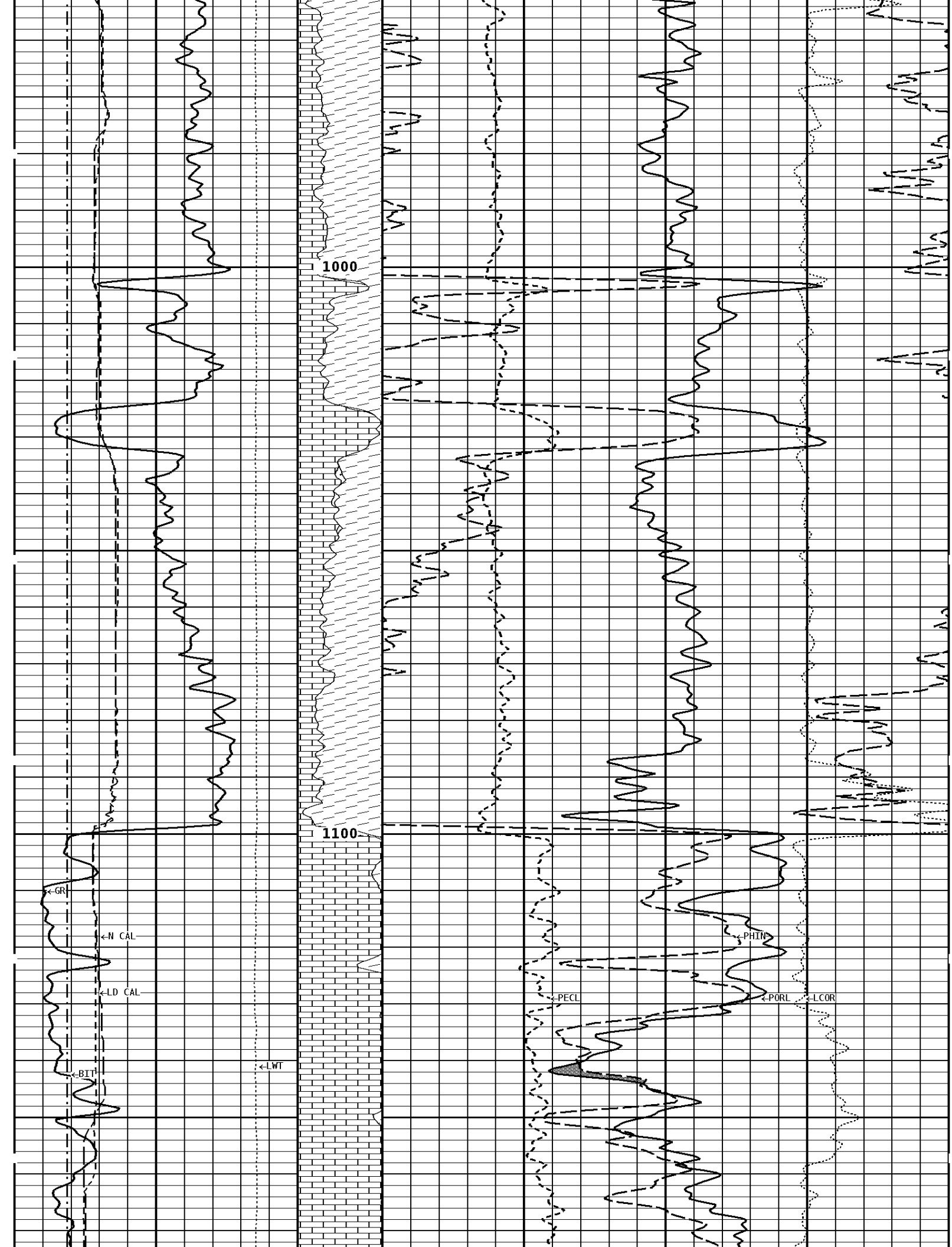
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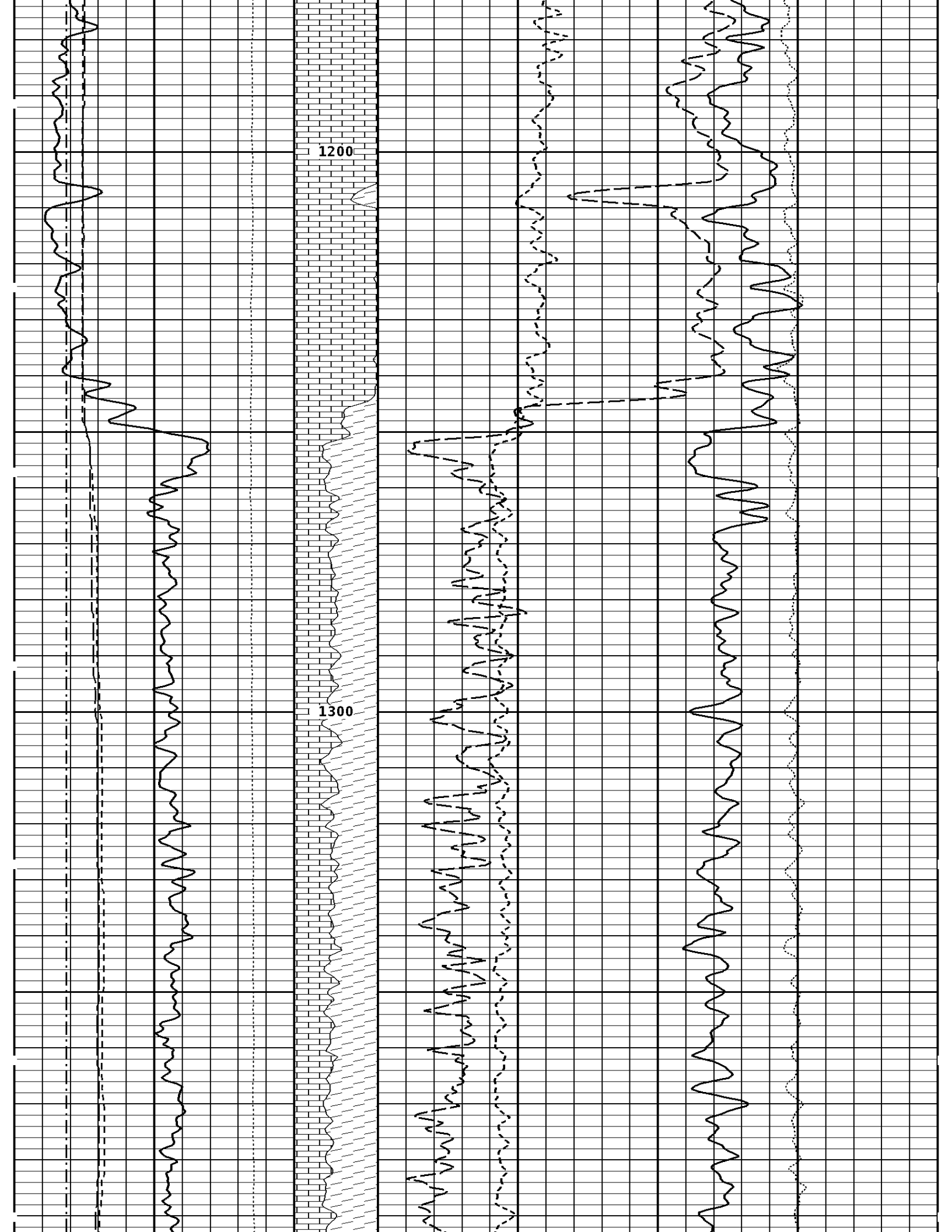
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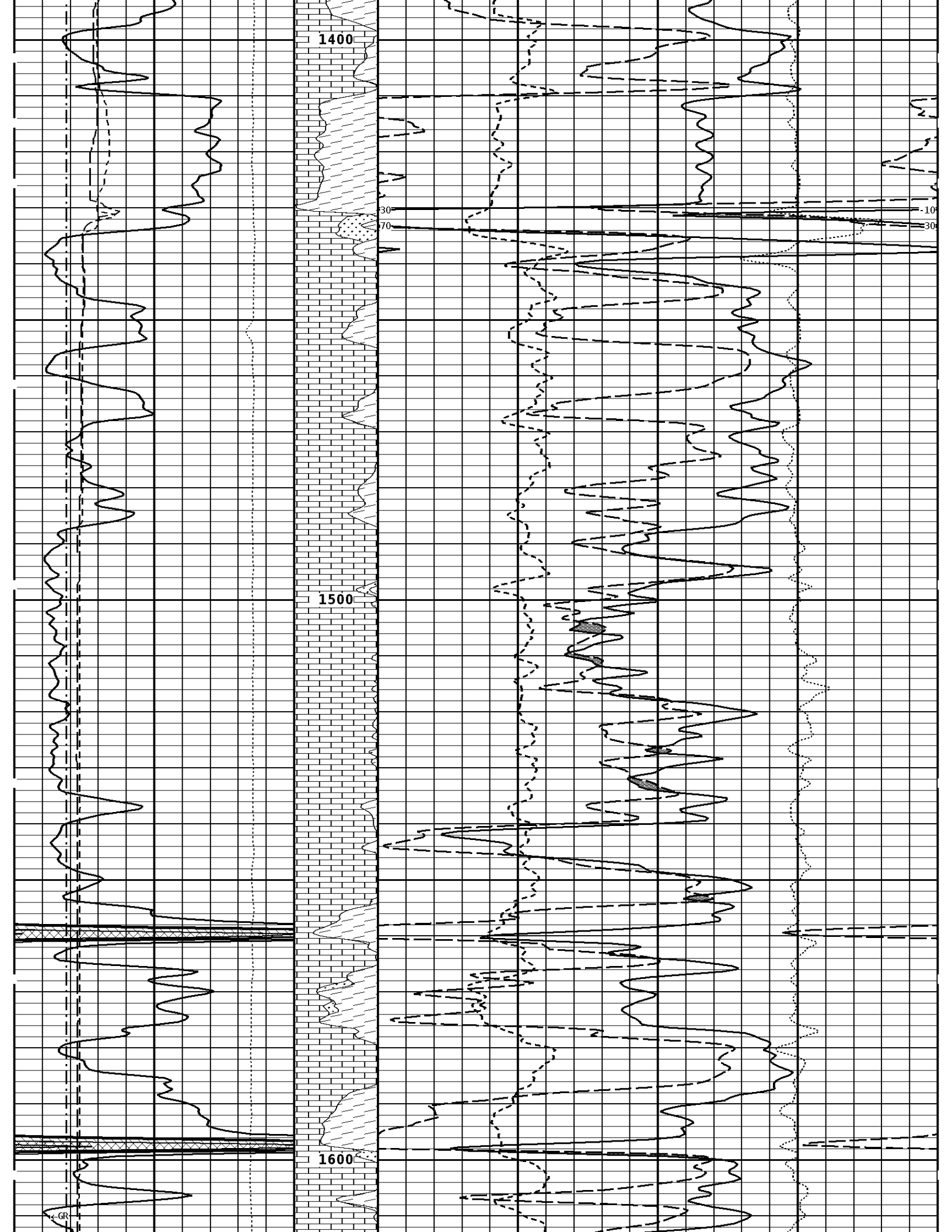
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30
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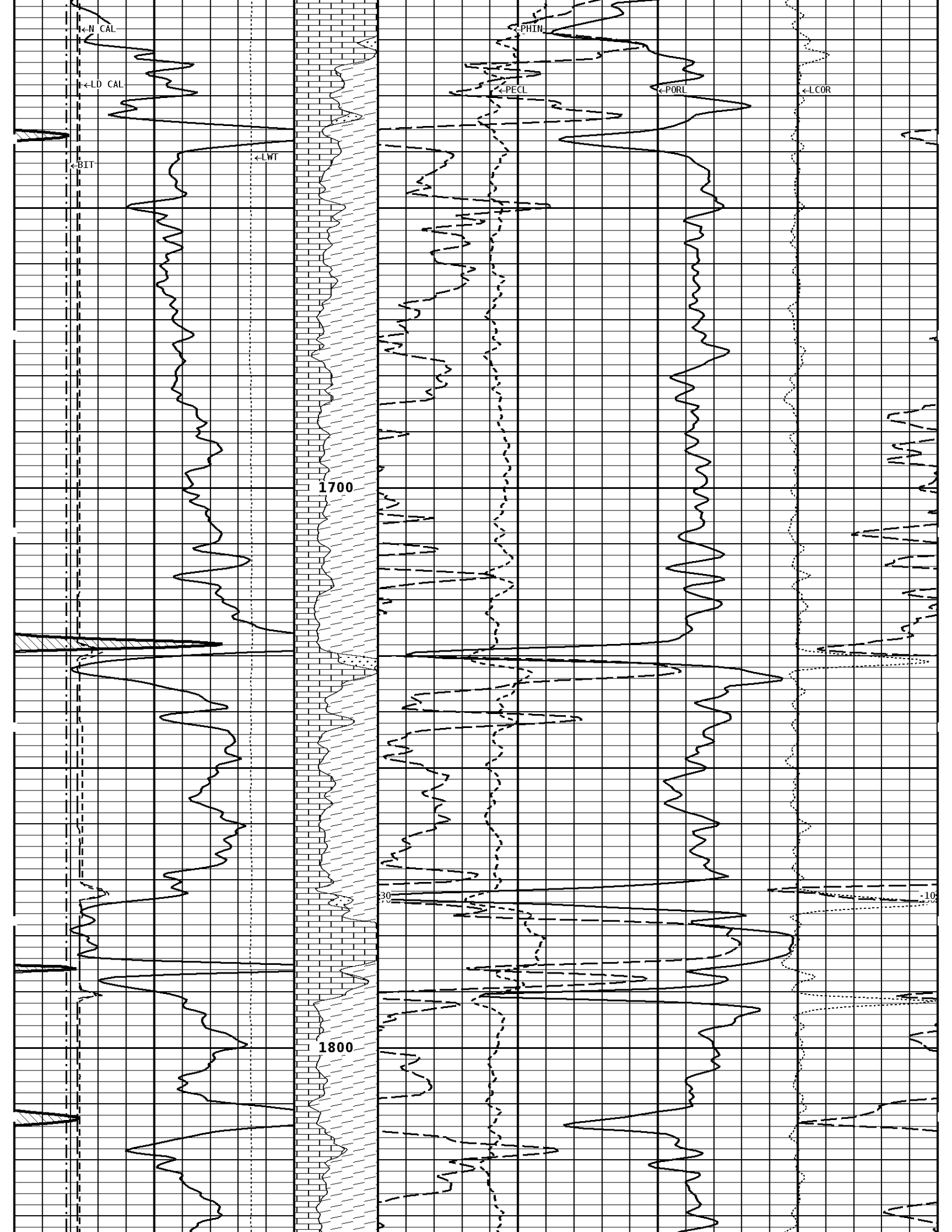
-10
30
1500
1600
GR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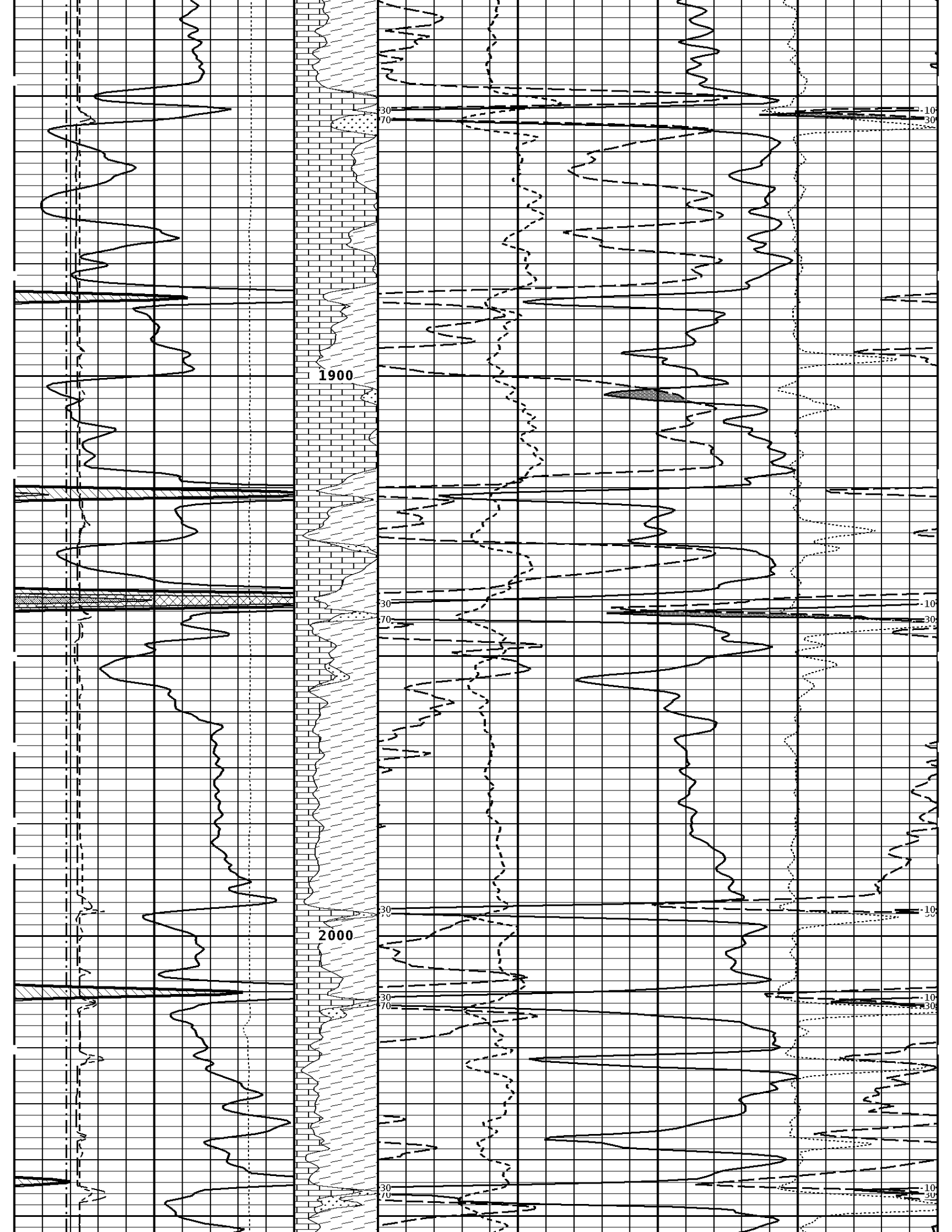
1800
30
-10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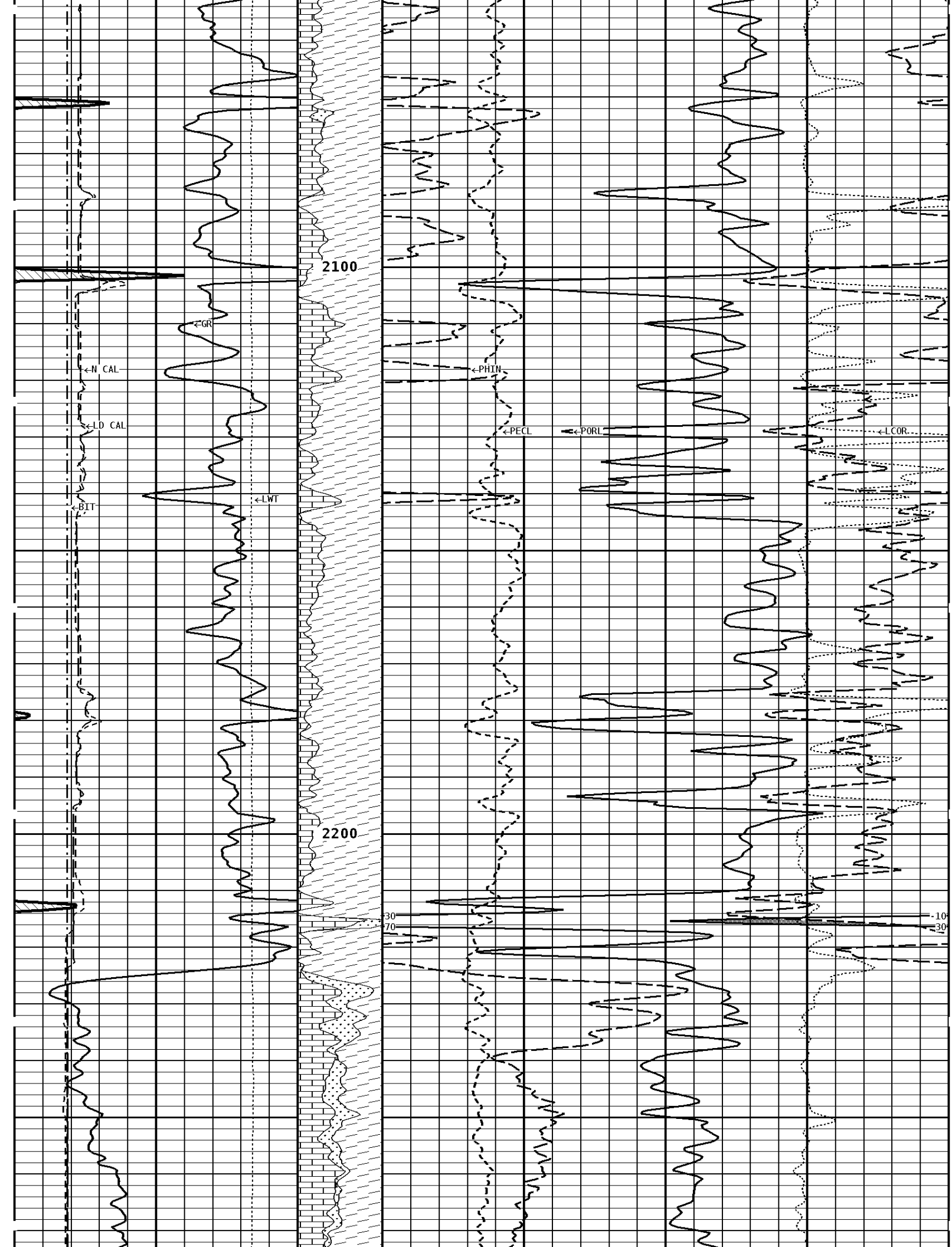
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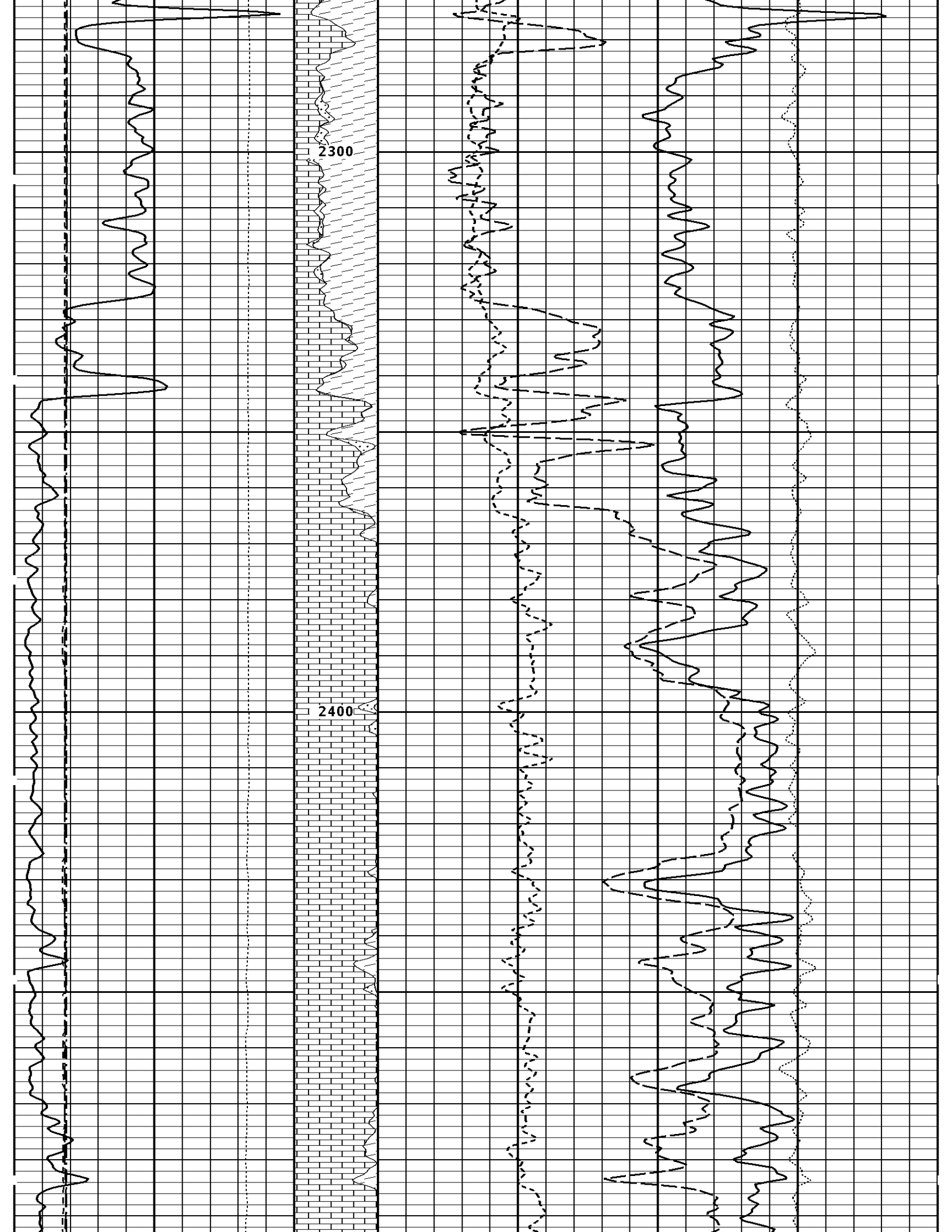
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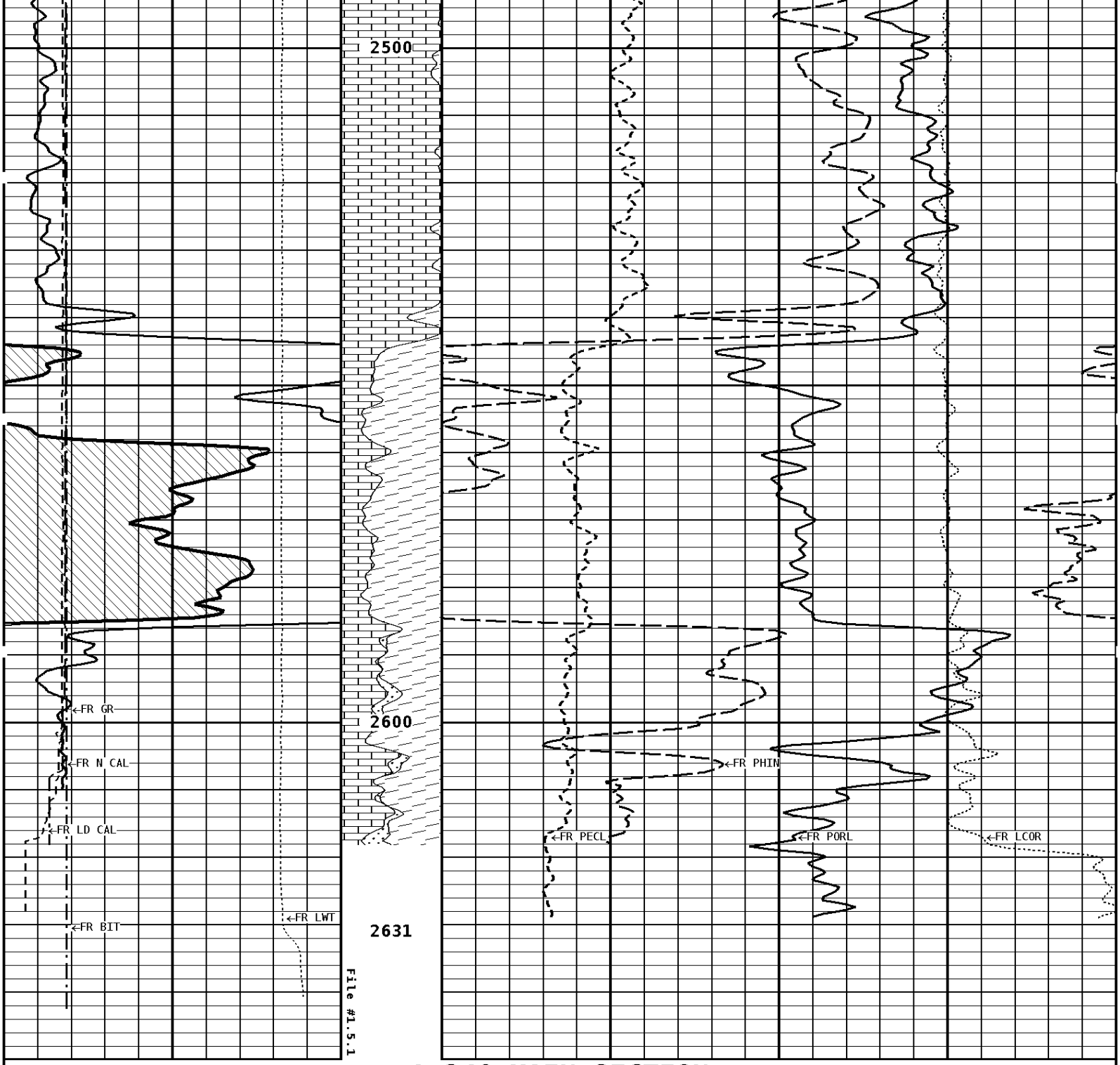


1:240 MAIN SECTION

GAMMA RAY API UNITS	Volume Dolo/Shale	DENSITY POROSITY PERCENT (2.68 g/cc)
150 300		70 30
0 150		30 -10
		-10 -50
NEUTRON (Y) CALIPER INCHES (IN)	Volume Calcite	**NEUTRON POROSITY PERCENT (SANDSTONE MATRIX)**
16 26		70 30
6 16		30 -10
		-10 -50
DENSITY (X) CALIPER INCHES (IN)	Volume Quartz	**PE CROSS-SECTION BARNS/ELECTRON** / **DENSITY CORRECTION G/CC**
16 26		0 10 / -0.25 0.25
6 16		

6 16		0 10	-0.25 0.25

BIT SIZE INCHES (IN)
6 16

TENSION LBS
10000 0

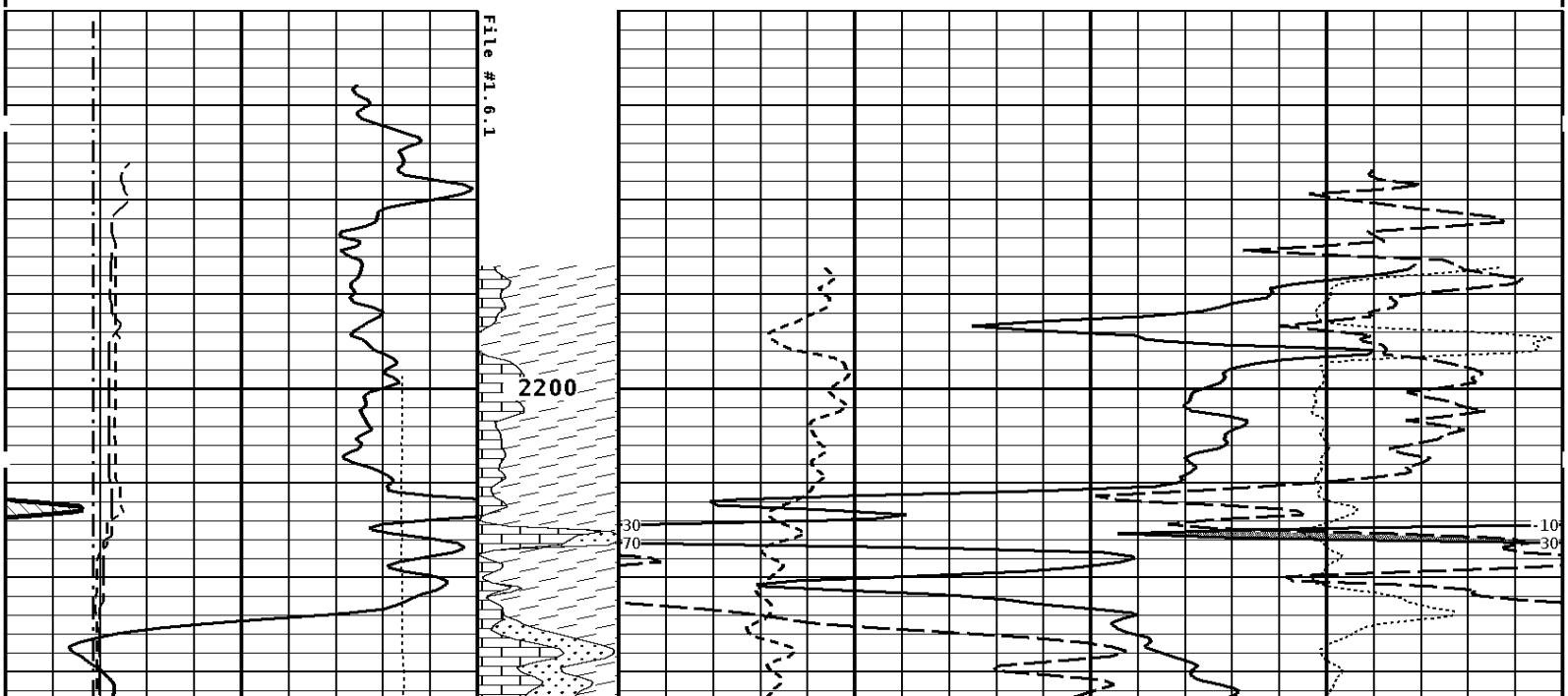
Well File: lan_fuq_9-36_feb_24_mstk		**Scale:** 1:240	
Segment: V1.D6.S1 REPEAT		**Acquired:** Not Available	
Reference: 0		**Processed:** Not Available	

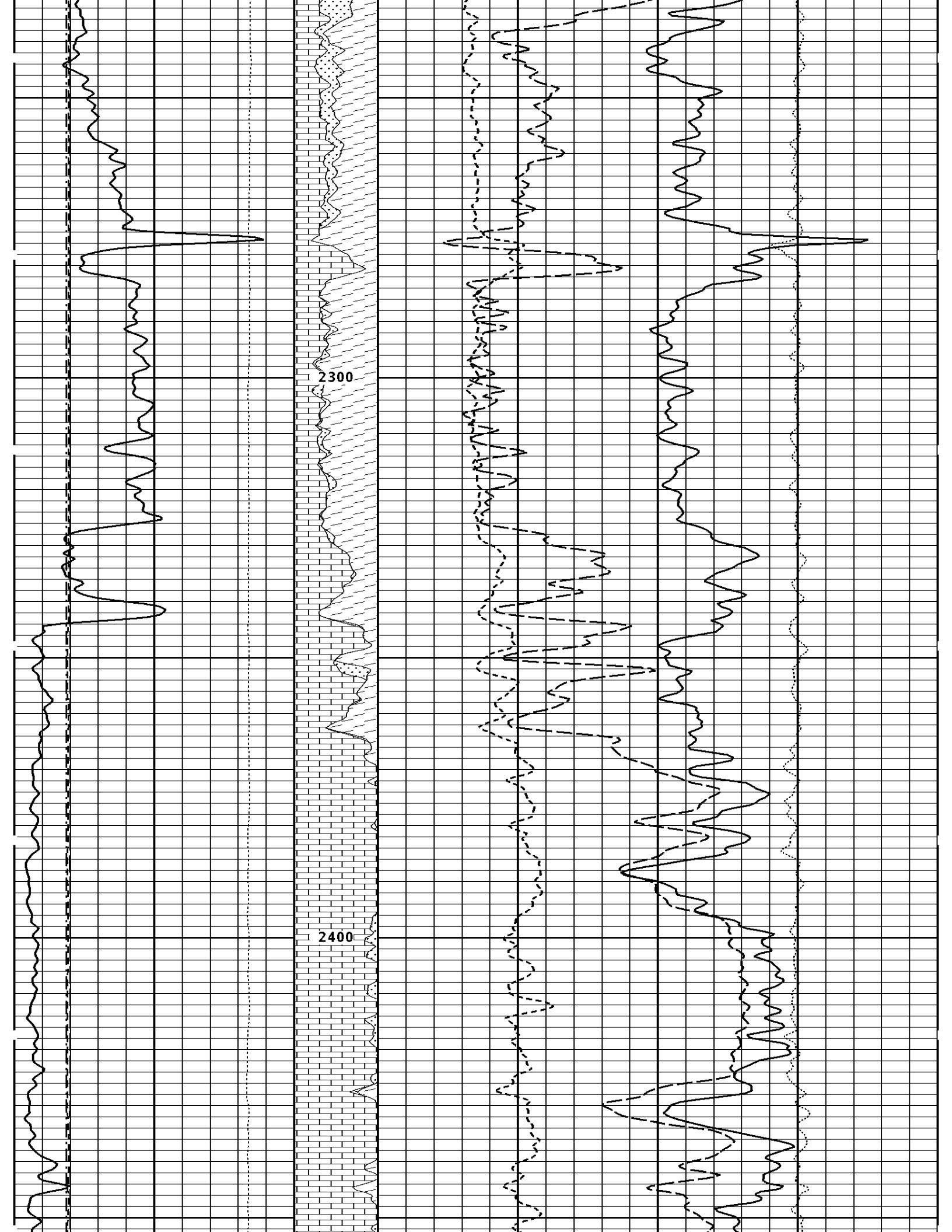
TENSION LBS
10000 0

BIT SIZE INCHES (IN)
6 16

DENSITY (X) CALIPER INCHES (IN)	Volume	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26 6 16	Quartz	0 10	-0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN)	Volume Calcite	**NEUTRON POROSITY PERCENT (SANDSTONE MATRIX)**	
16 26 6 16		70 30 -10 30 -10 -50	
GAMMA RAY API UNITS	Volume Dolo/Shale	**DENSITY POROSITY PERCENT (2.68 g/cc)**	
150 300 0 150		70 30 -10 30 -10 -50	

1:240 REPEAT SECTION

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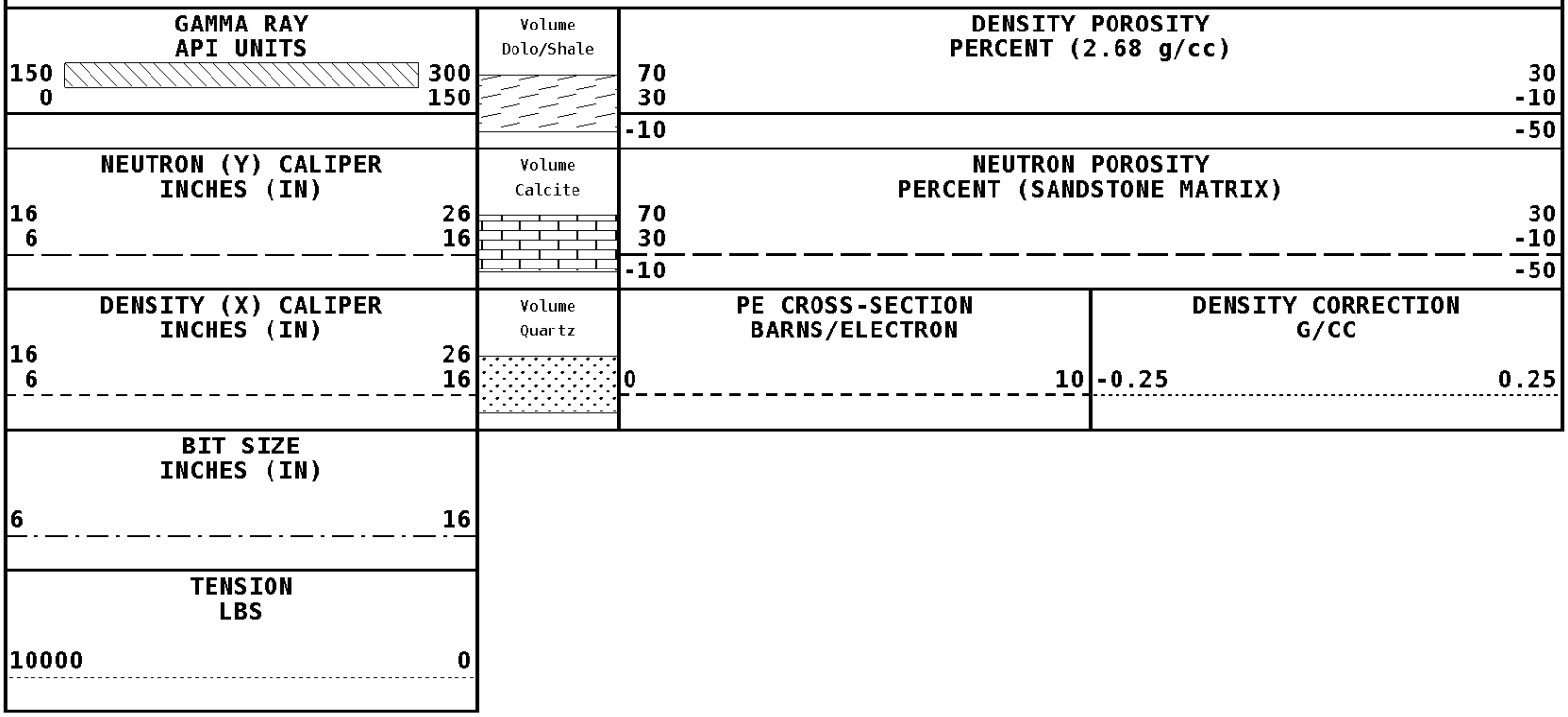

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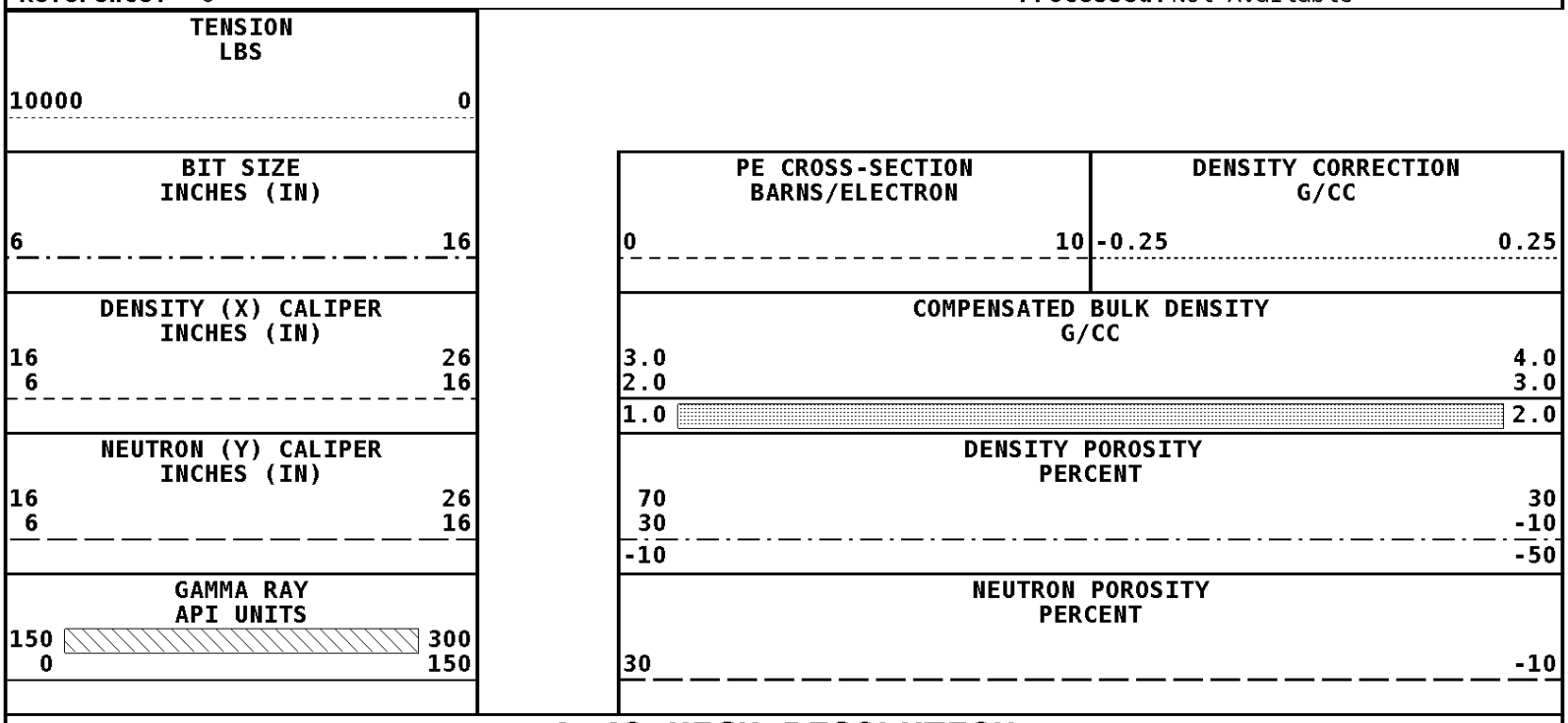

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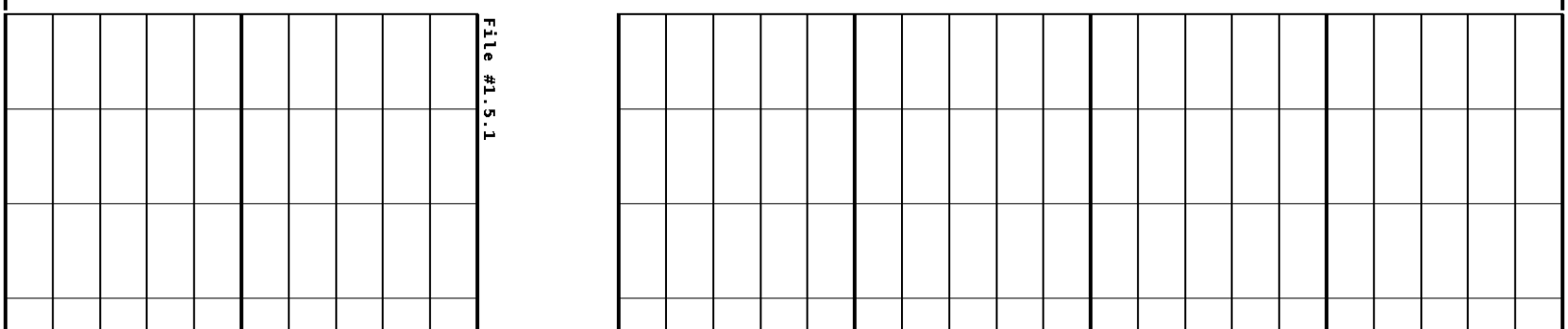

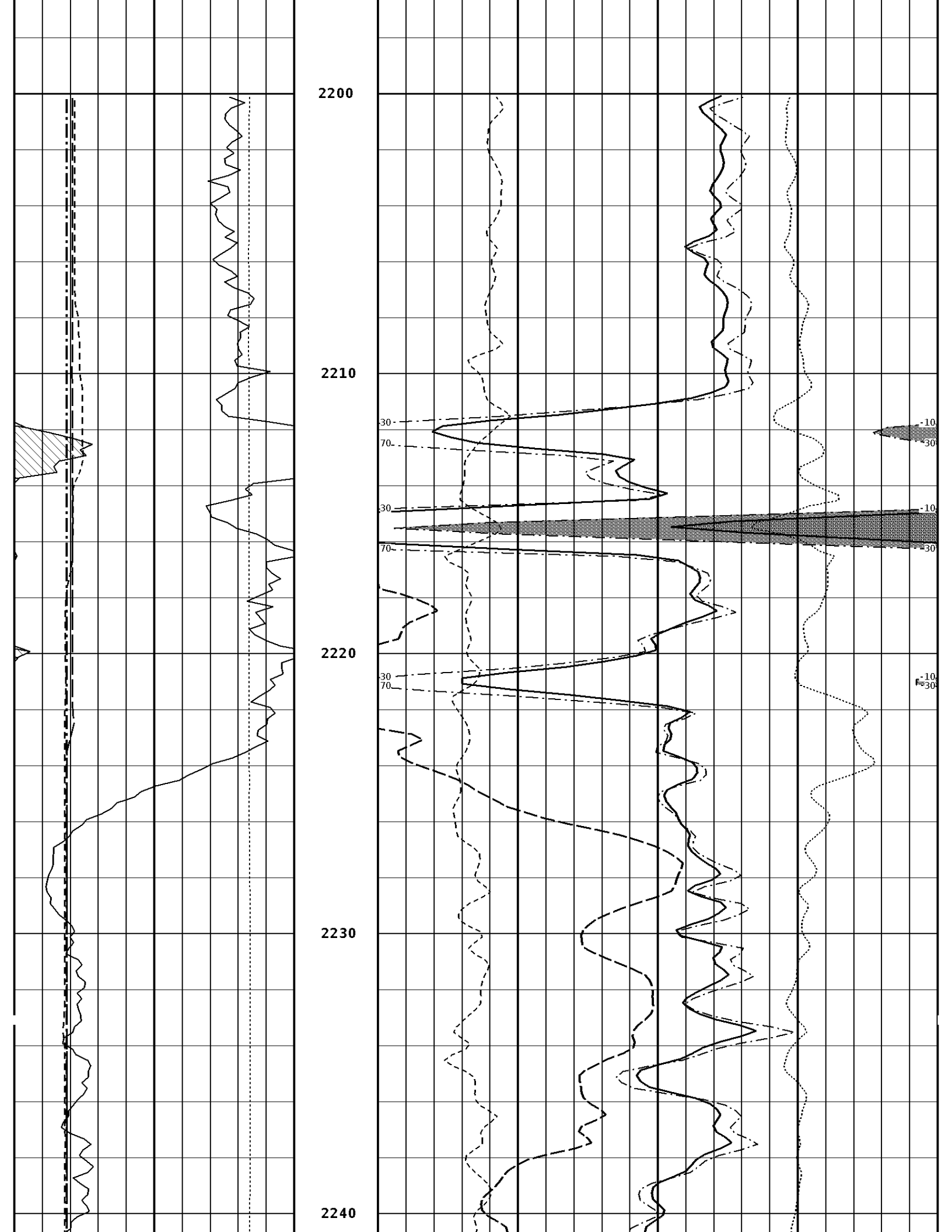
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70
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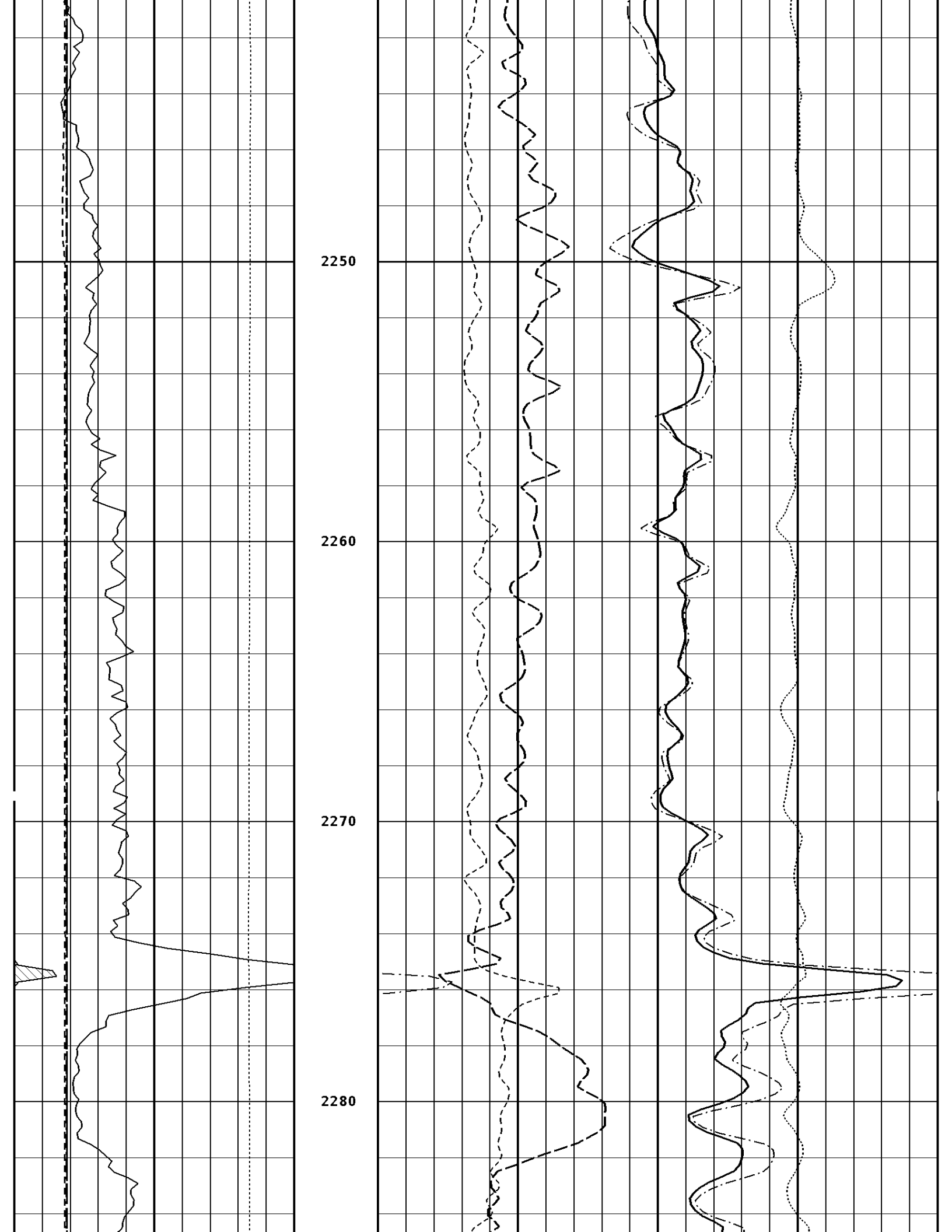
10
30
10
30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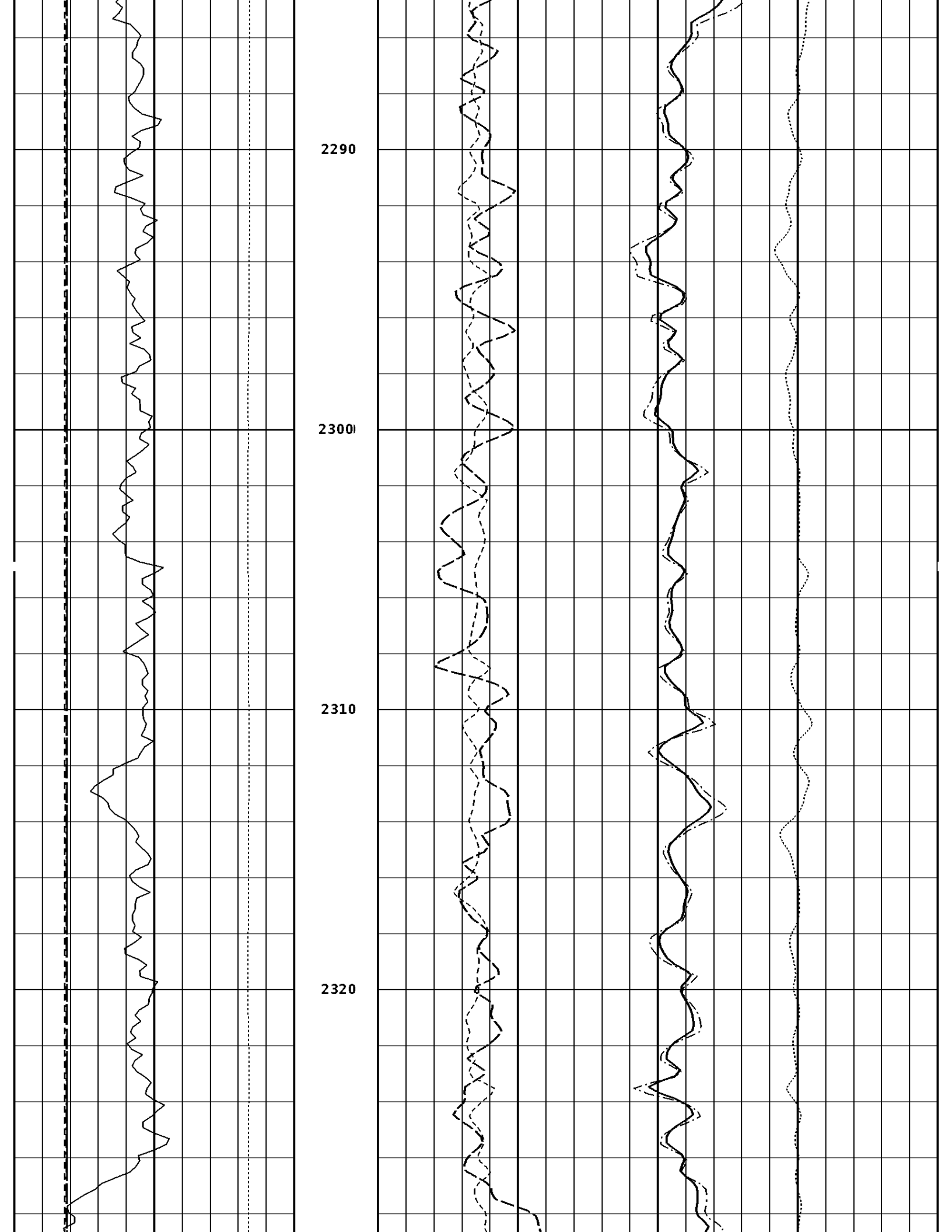
2270
2280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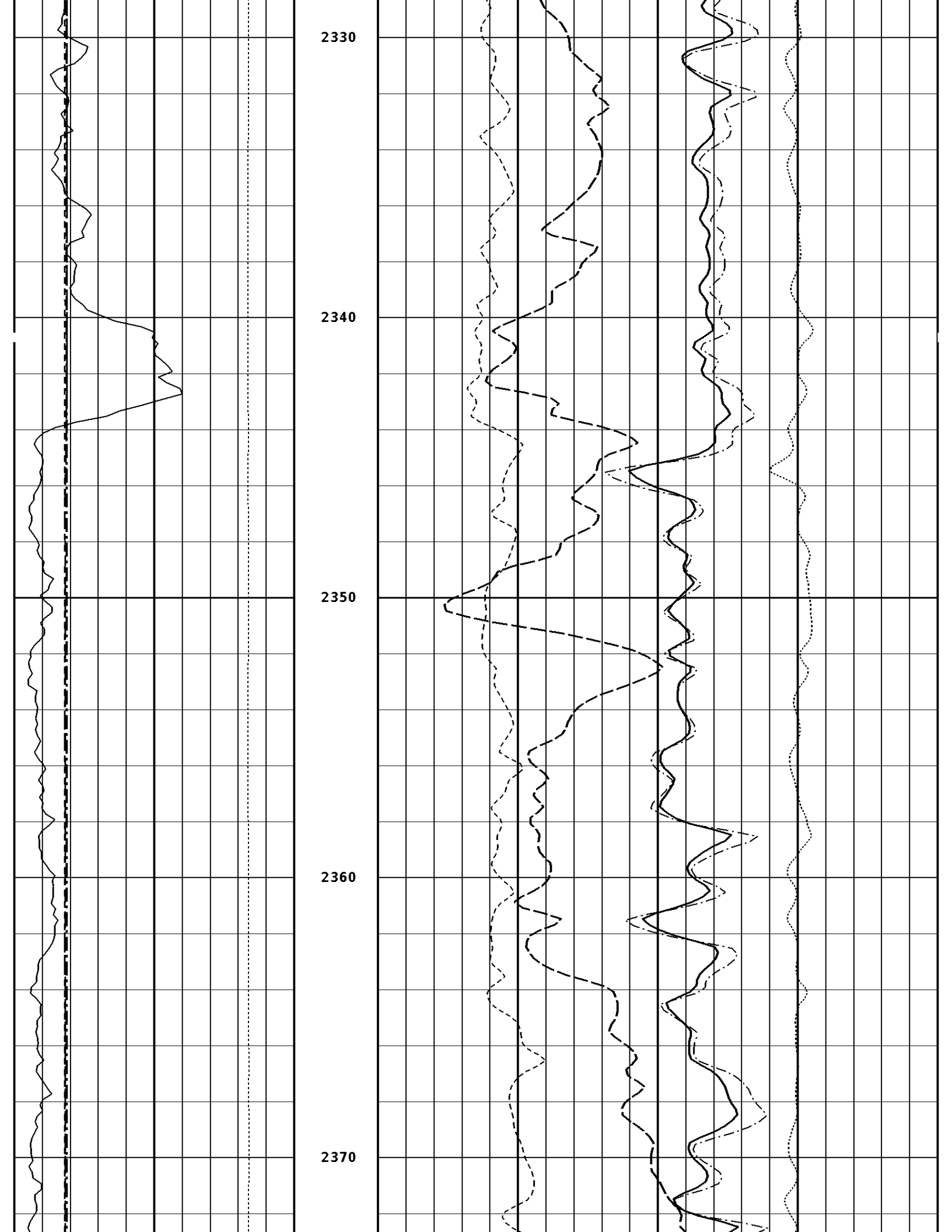
2300
2310
2320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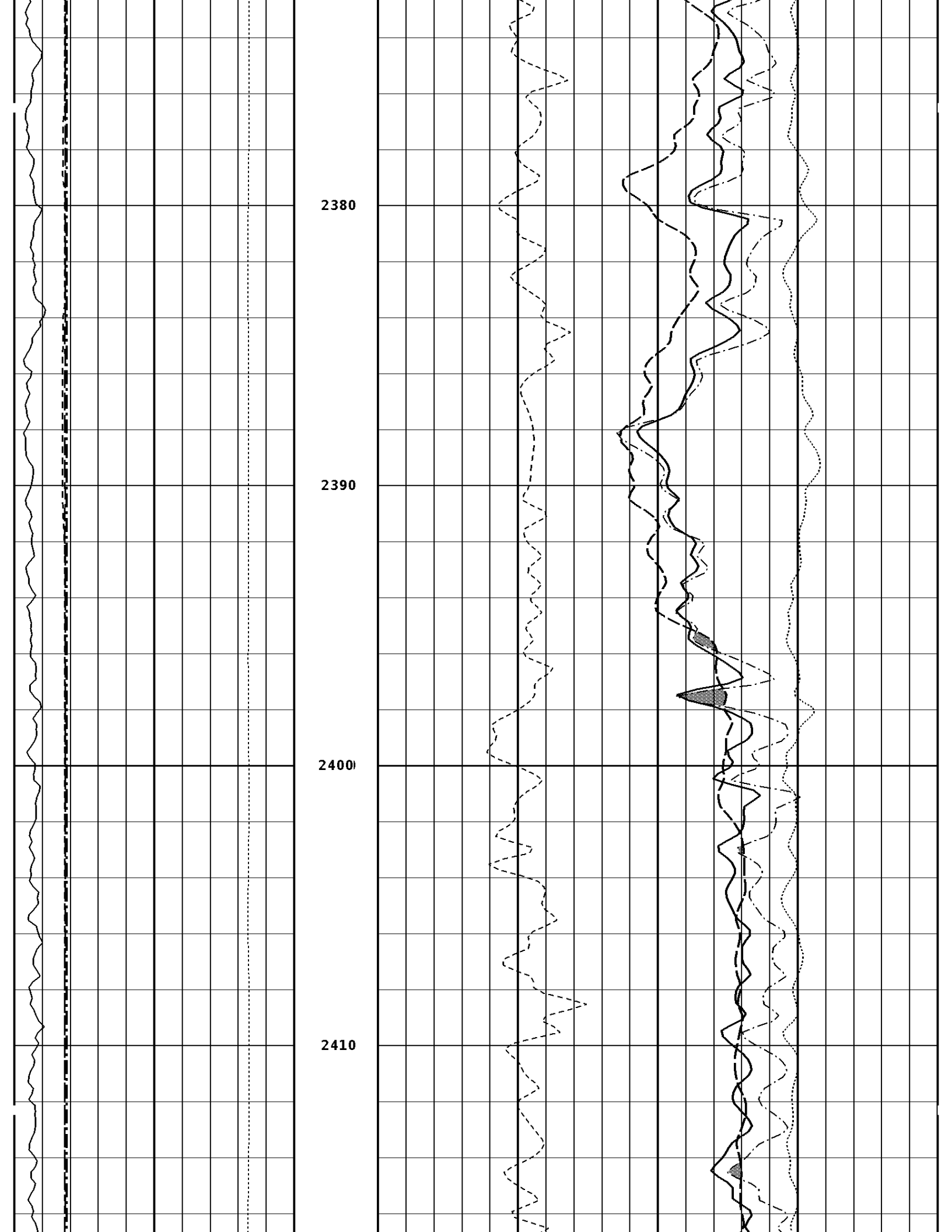
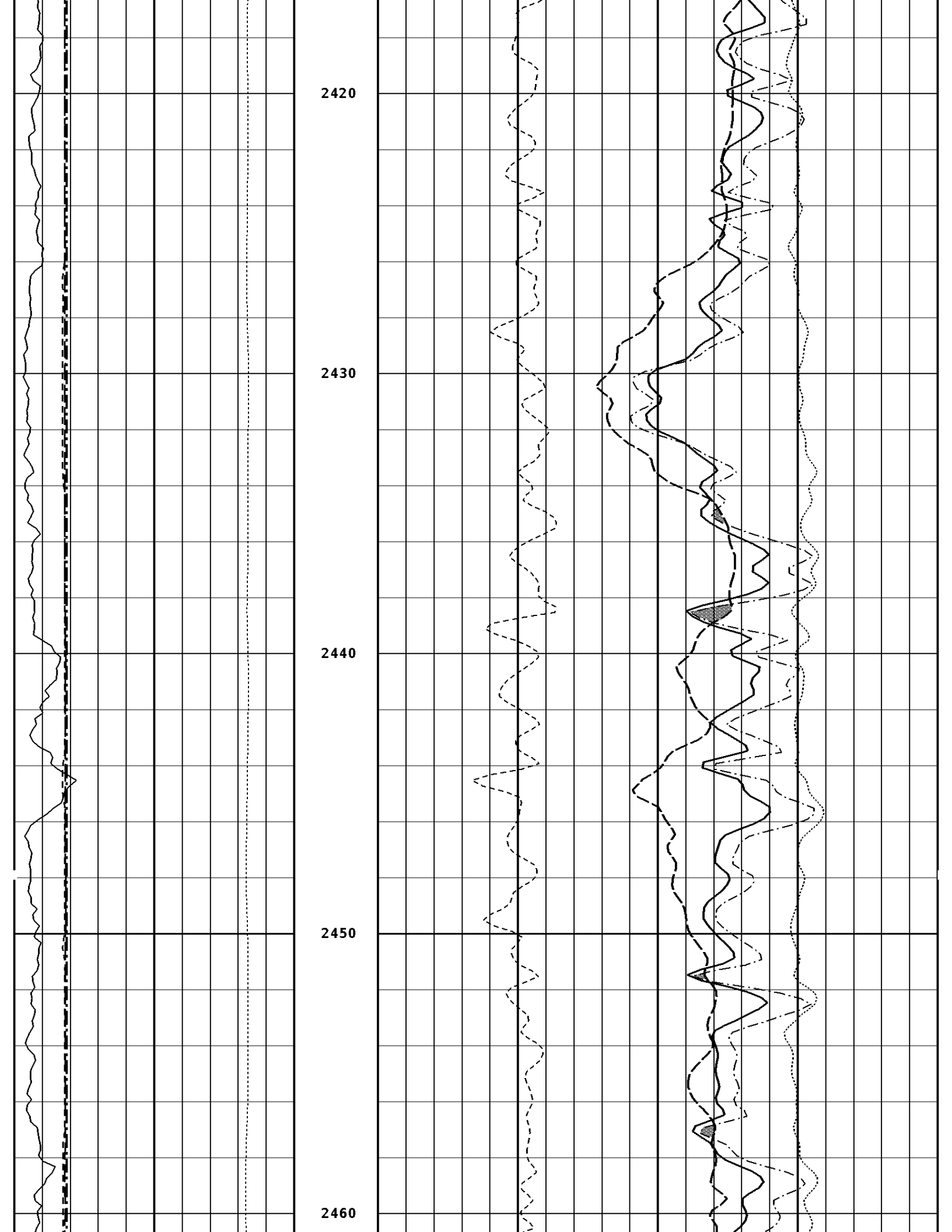
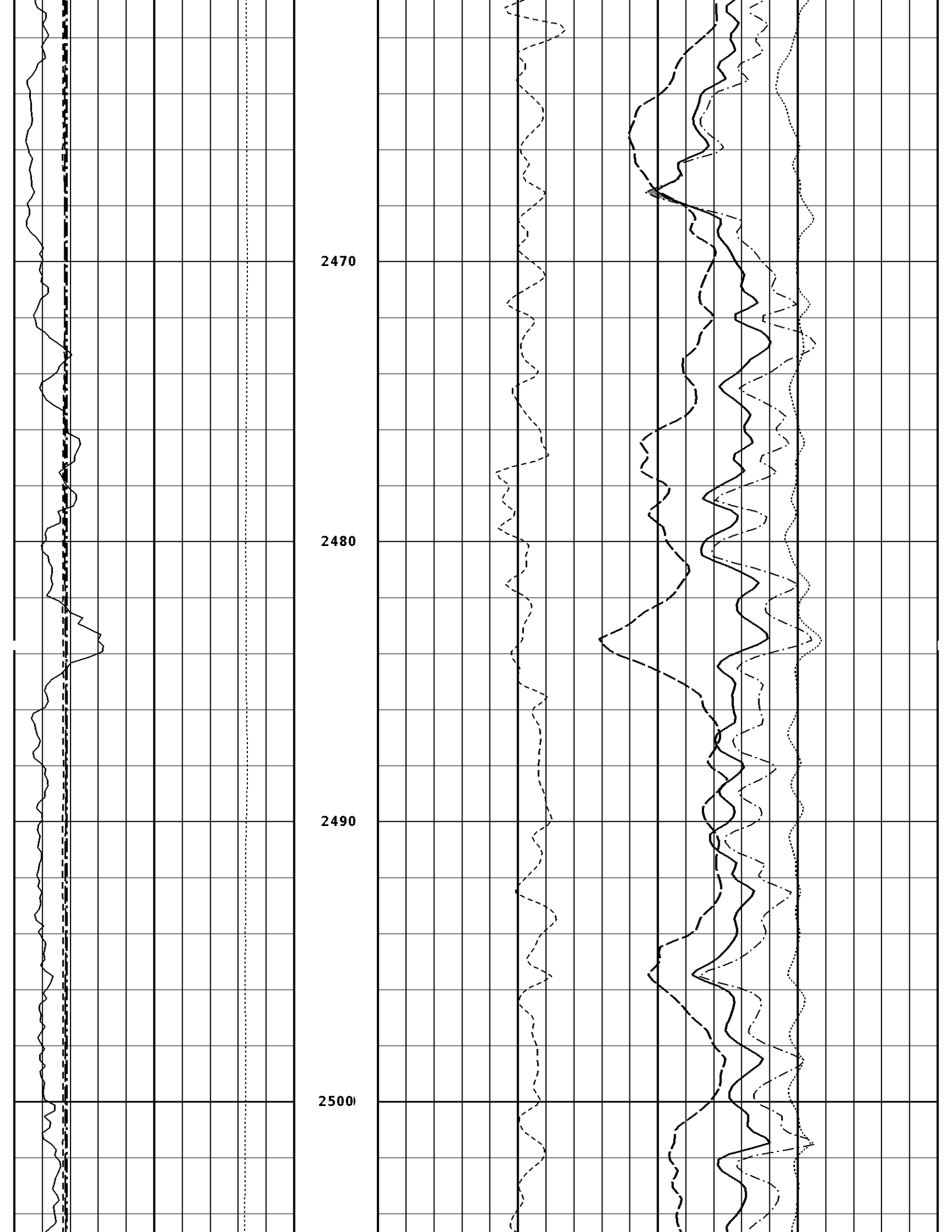
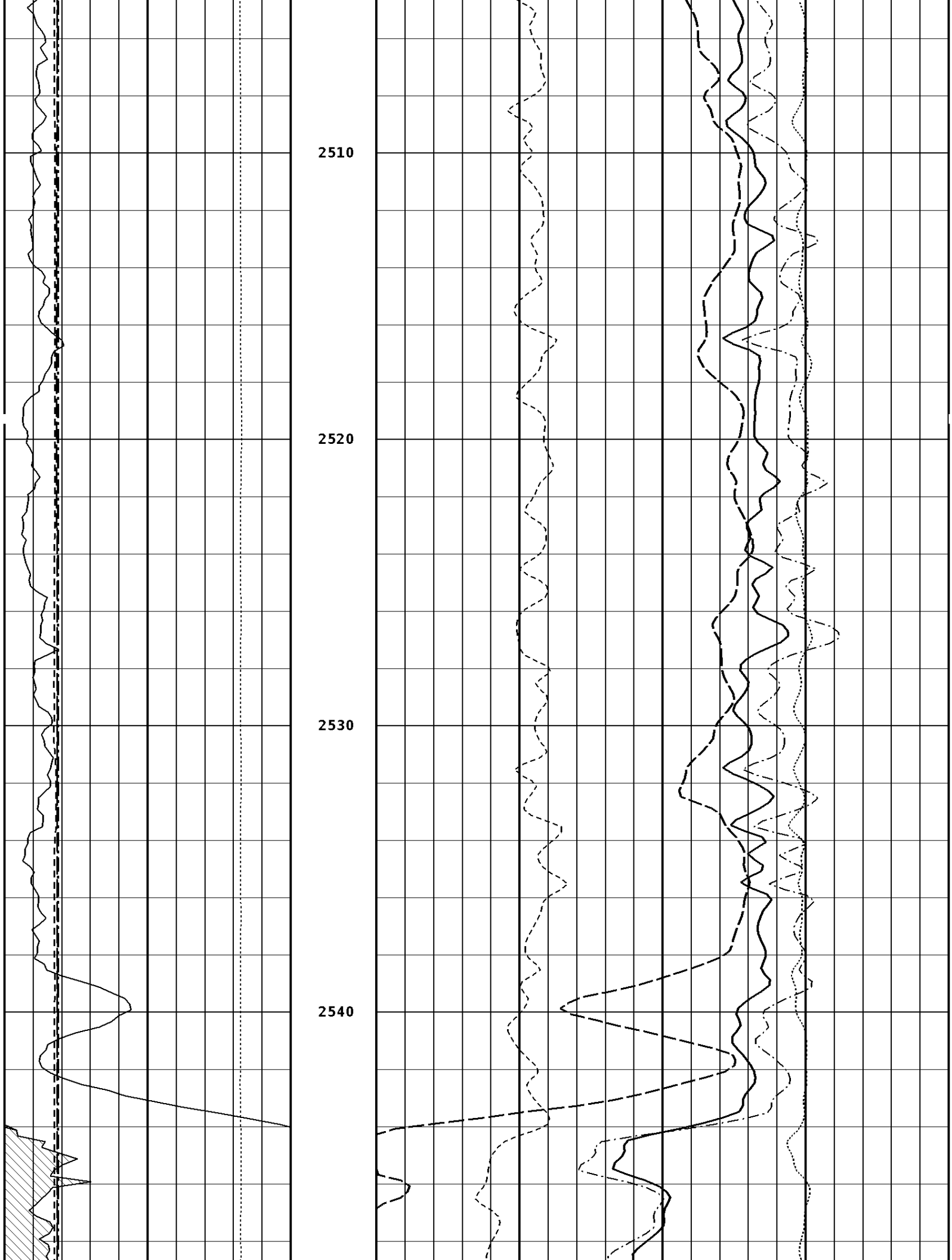
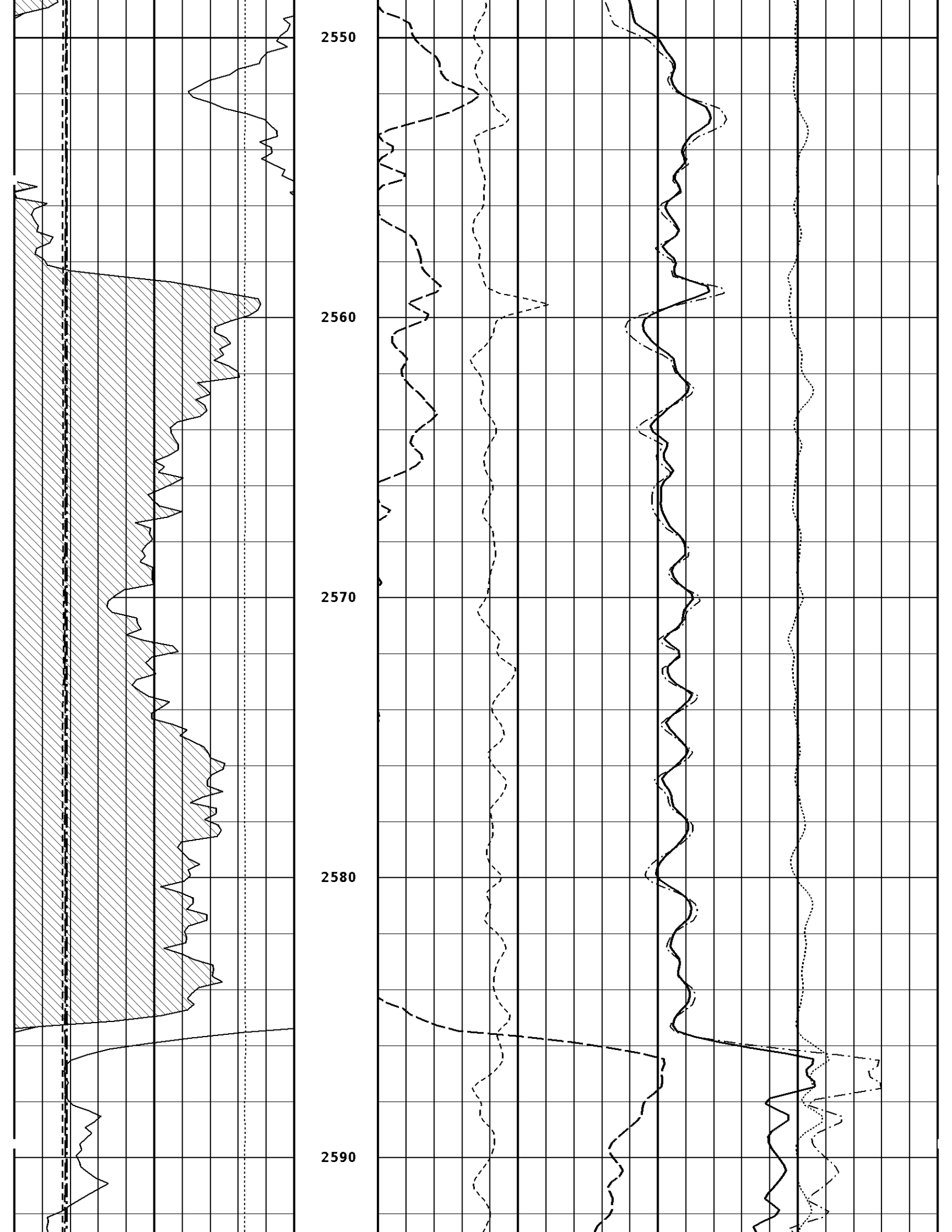
2340
2350
2360
2370

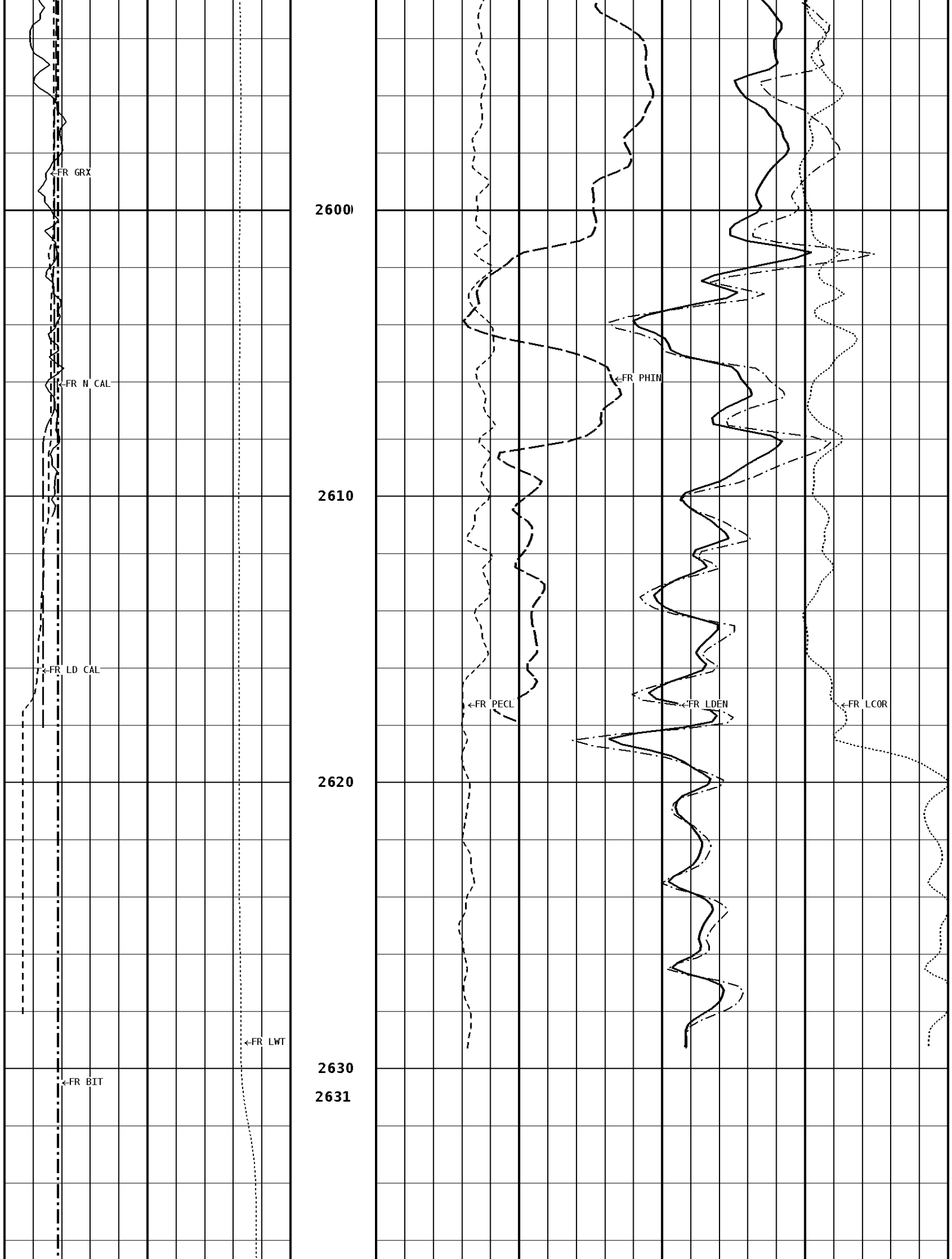

2380
2390
2400
2410

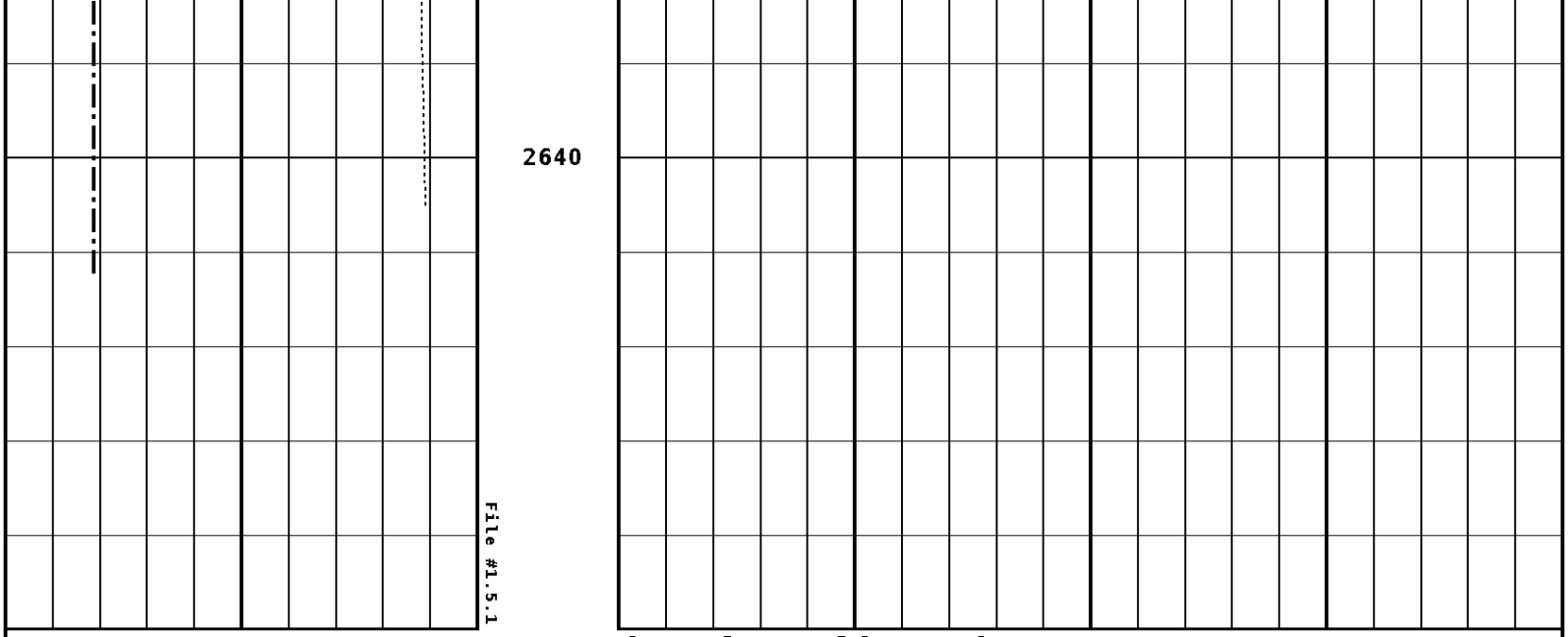

2420
2430
2440
2450
2460


2470
2480
2490
2500


2510
2520
2530
2540


2550
2560
2570
2580
2590


←FR GRX
2600
←FR N CAL
←FR PHIN
2610
←FR LD CAL
←FR PECL
←FR LDEN
←FR LCOR
2620
←FR LWT
2630
←FR BIT
2631



1:48 HIGH RESOLUTION

GAMMA RAY
API UNITS
150 300
0 150

NEUTRON (Y) CALIPER
INCHES (IN)
16 26
6 16

DENSITY (X) CALIPER
INCHES (IN)
16 26
6 16

BIT SIZE
INCHES (IN)
6 16

TENSION
LBS
10000 0

NEUTRON POROSITY
PERCENT
30 -10

DENSITY POROSITY
PERCENT
70 30
30 -10
-10 -50

COMPENSATED BULK DENSITY
G/CC
3.0 4.0
2.0 3.0
1.0 2.0

PE CROSS-SECTION
BARNS/ELECTRON
0 10

DENSITY CORRECTION
G/CC
-0.25 0.25

Well File: lan_fuq_9-36_feb_24_mstk
Segment: V1.D5.S1 MAIN
Reference: 0
Scale: 1:240
Acquired: Not Available
Processed: Not Available

TENSION
LBS
10000 0

BIT SIZE
INCHES (IN)
6 16

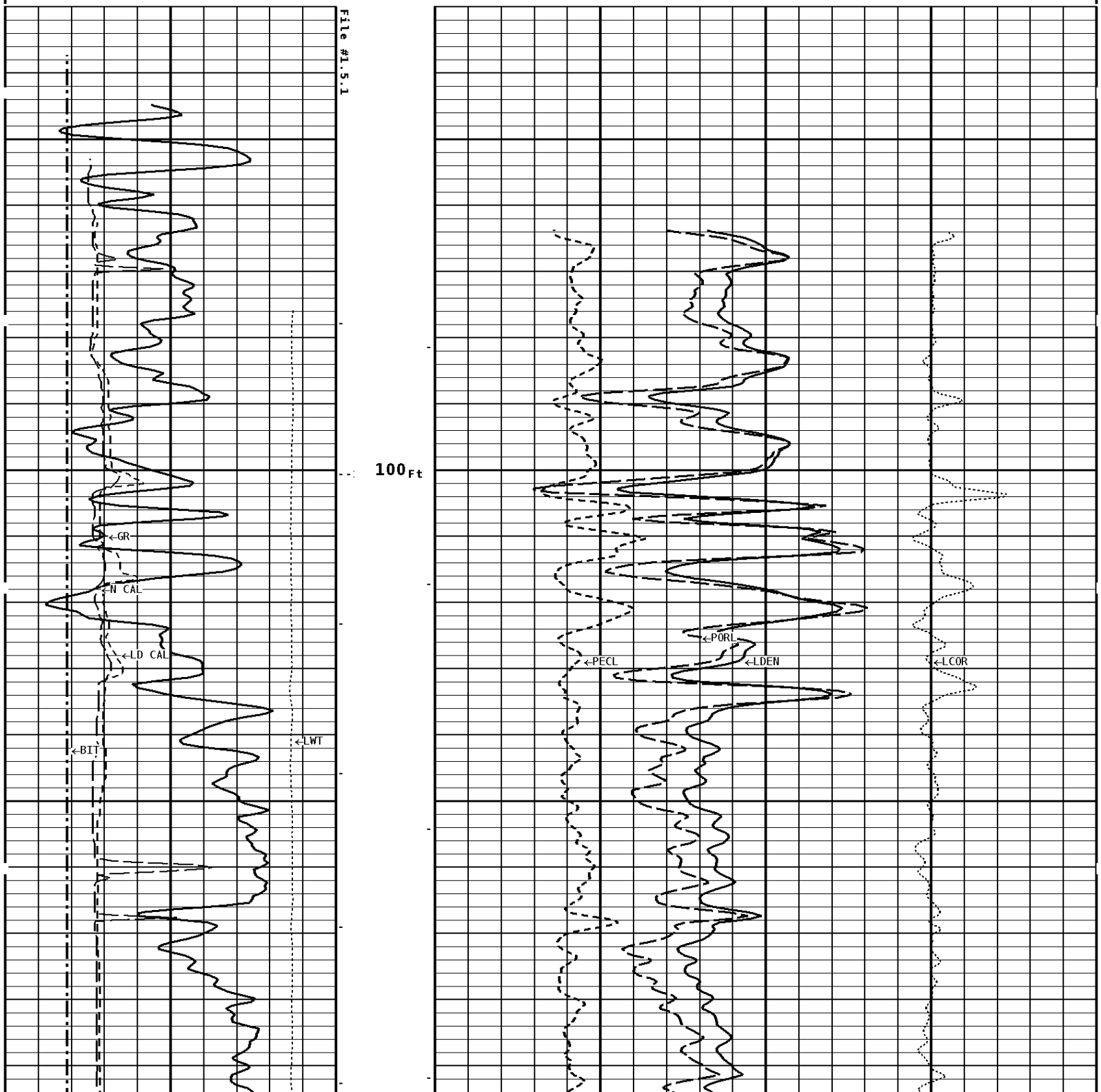
DENSITY (X) CALIPER
INCHES (IN)
16 26
6 16

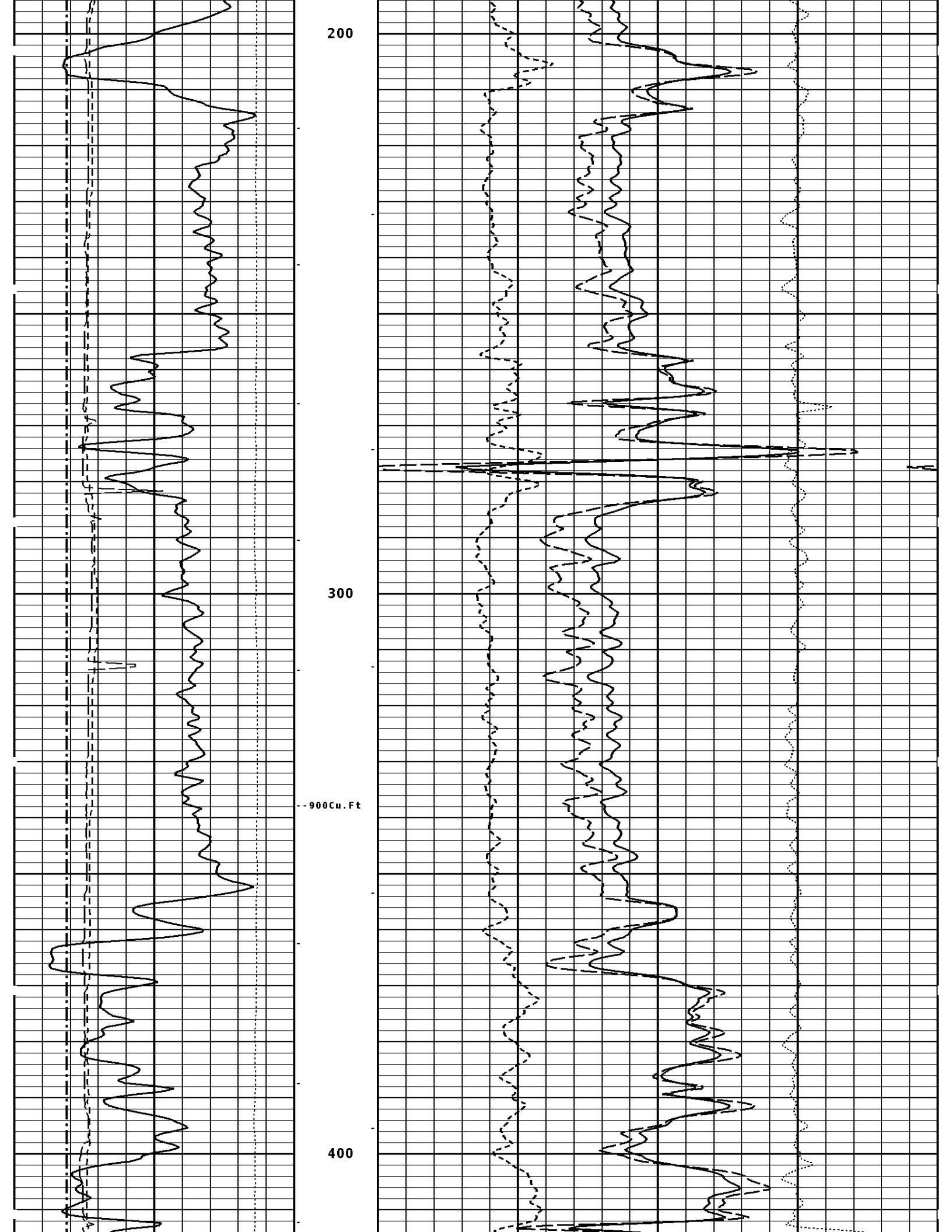
PE CROSS-SECTION
BARNS/ELECTRON
0 10

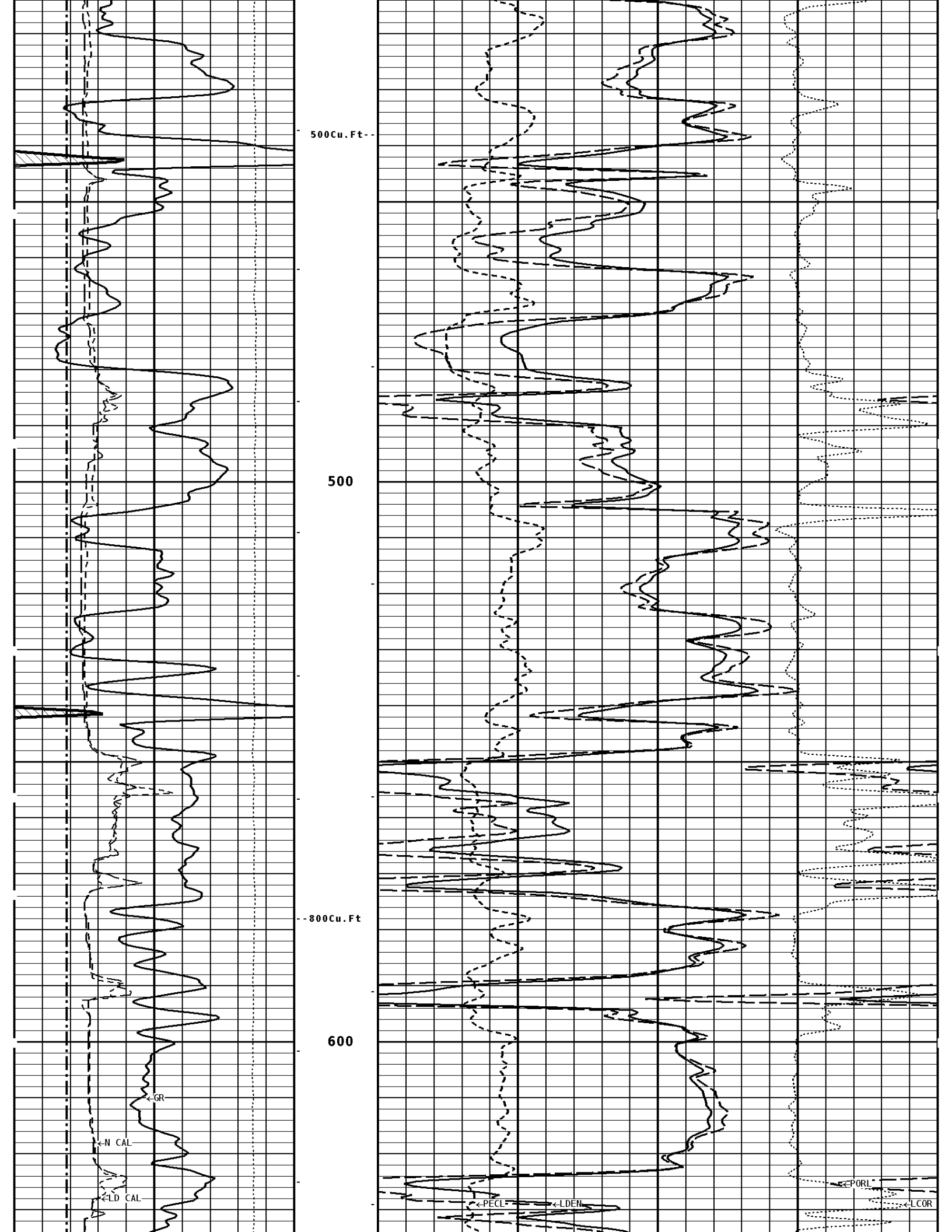
DENSITY CORRECTION
G/CC
-0.25 0.25

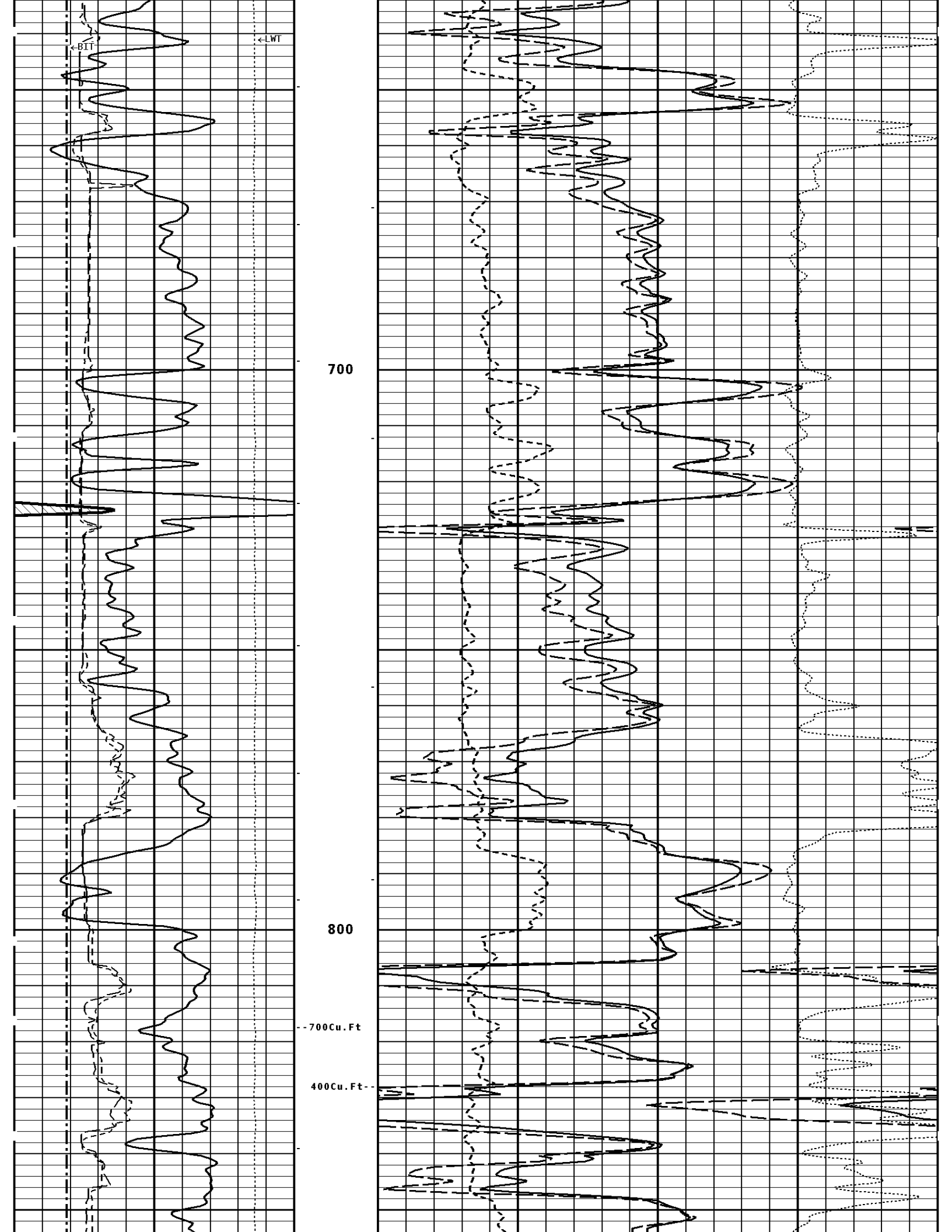
NEUTRON (Y) CALIPER INCHES (IN)		DENSITY POROSITY PERCENT (2.68 g/cc)
16 — 26		70 — 30
6 — 16		30 — -10
		-10 — -50
GAMMA RAY API UNITS	**-BHV AHV- CU.FT**	**COMPENSATED BULK DENSITY G/CC**
150 — 300		3.0 — 4.0
0 — 150		2.0 — 3.0
		1.0 — 2.0

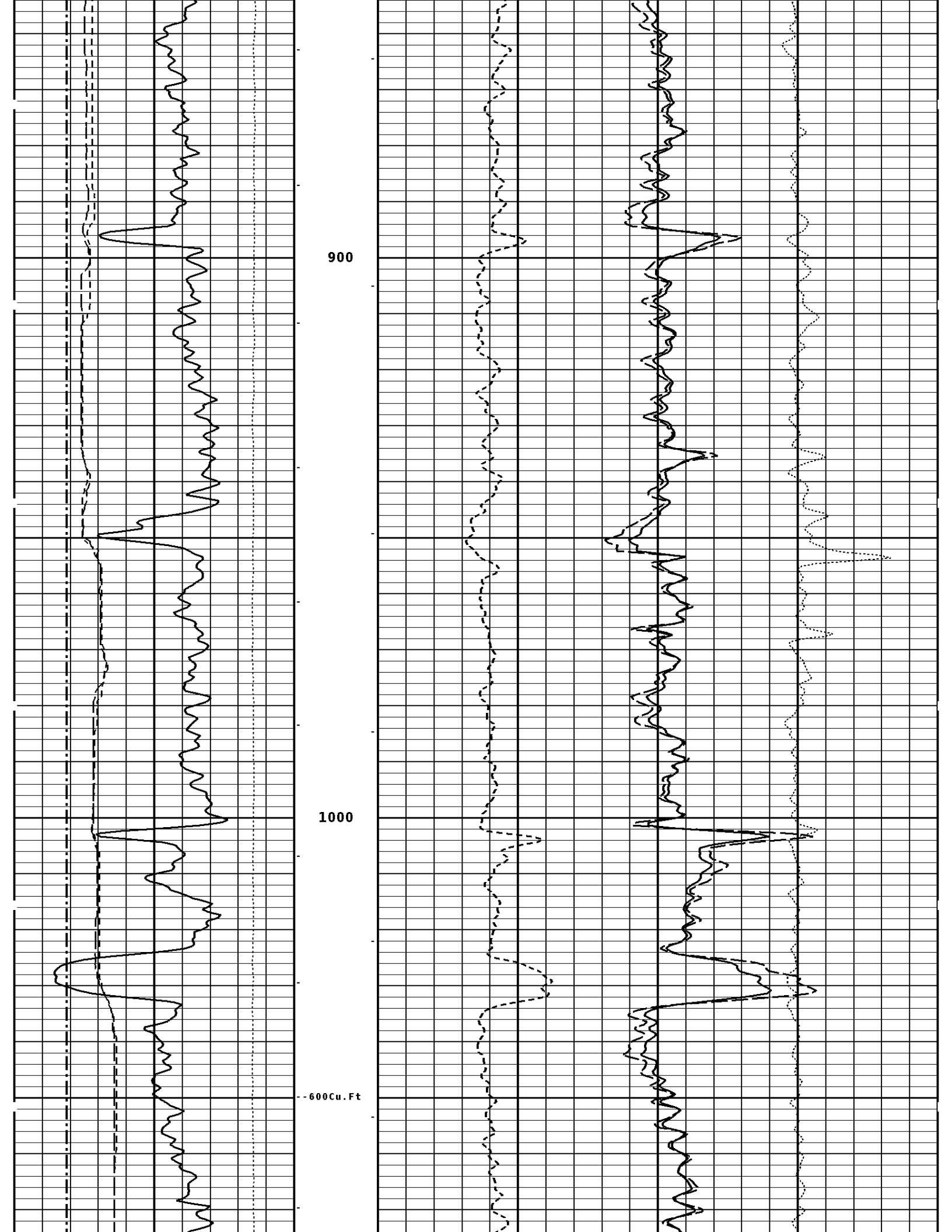
1:240 MAIN SECTION
BULK DENSITY

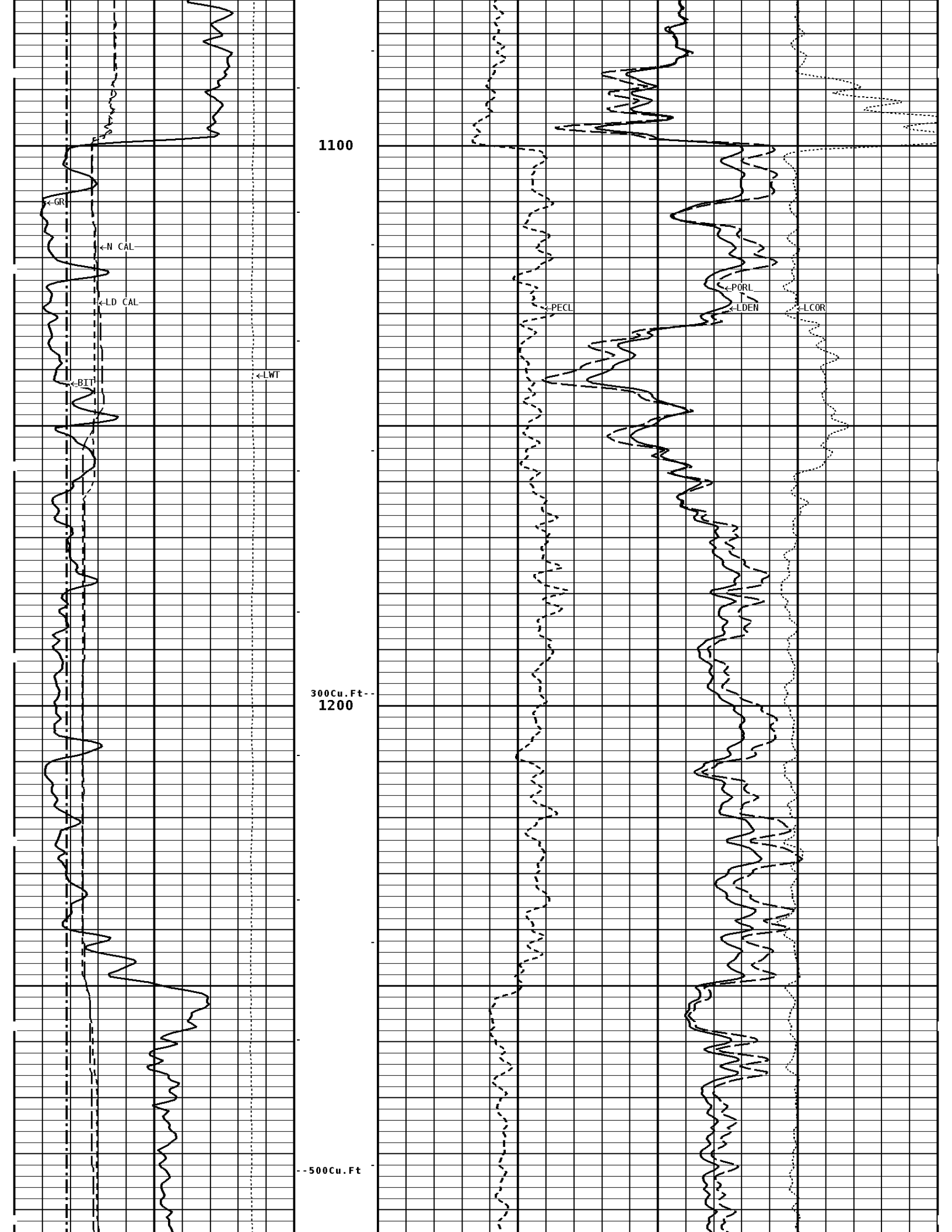


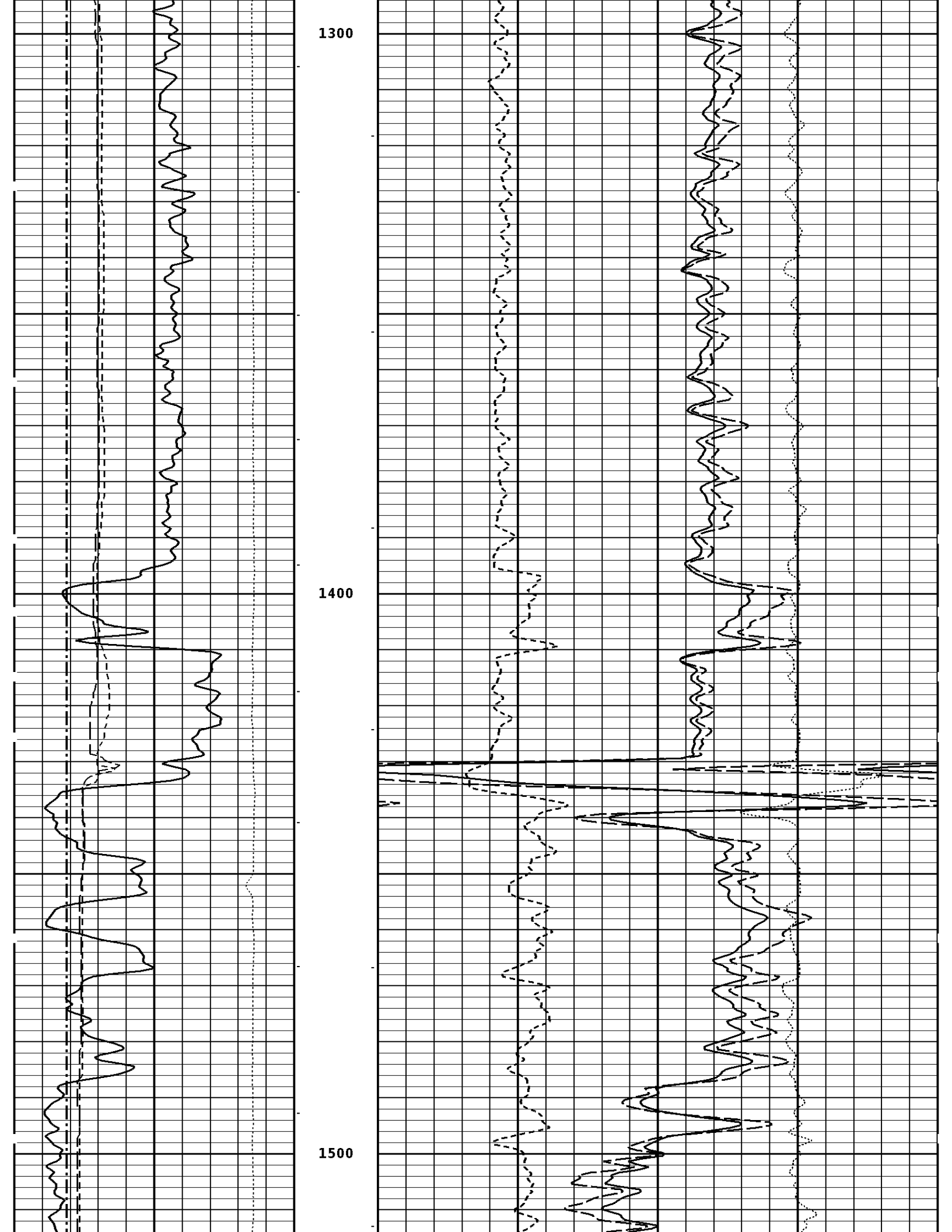

200
300
--900Cu.Ft
400

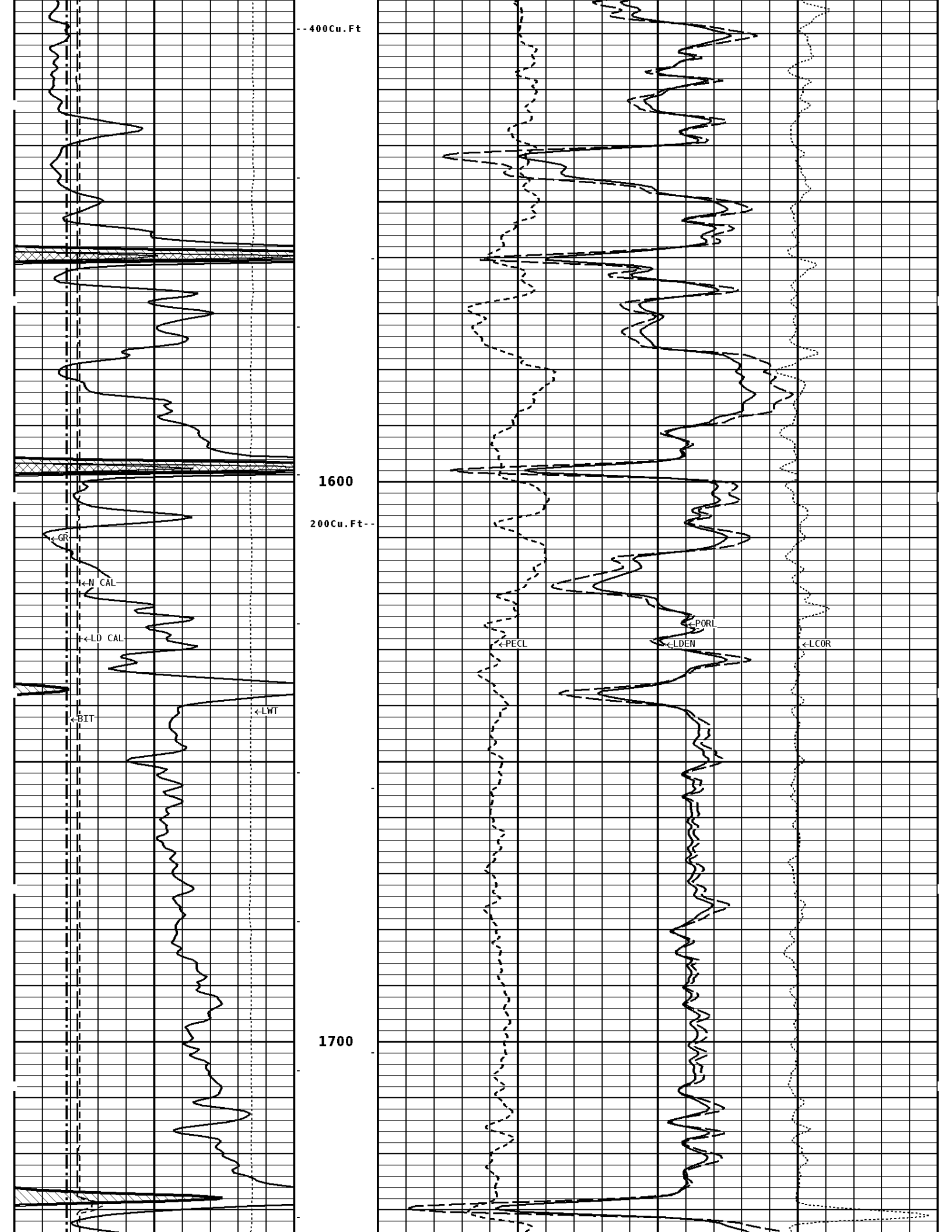

500Cu.Ft
500
800Cu.Ft
600
GR
N CAL
LD CAL
PECL
LDEN
PORL
LCOR

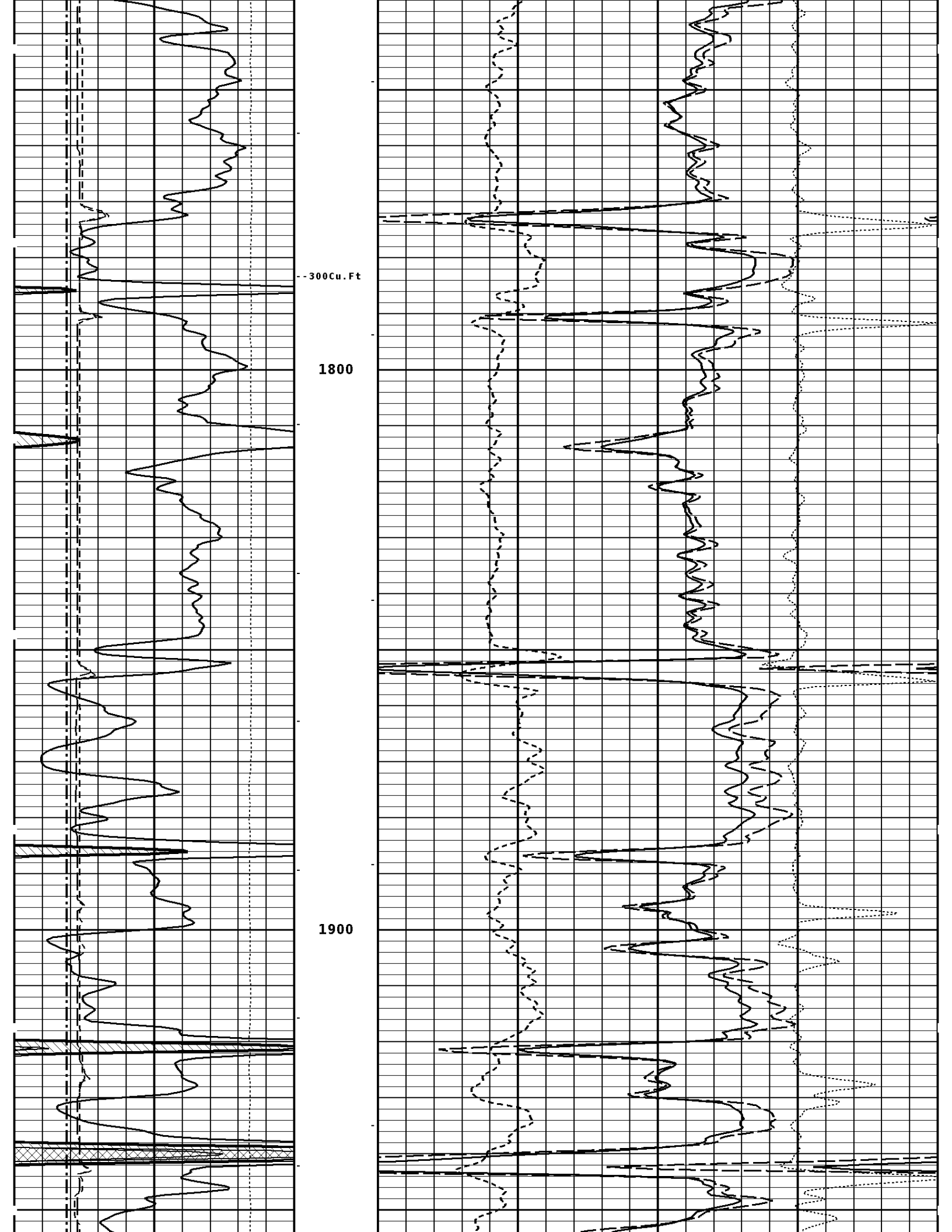

<BIT
<LWT
700
800
--700Cu.Ft
400Cu.Ft--

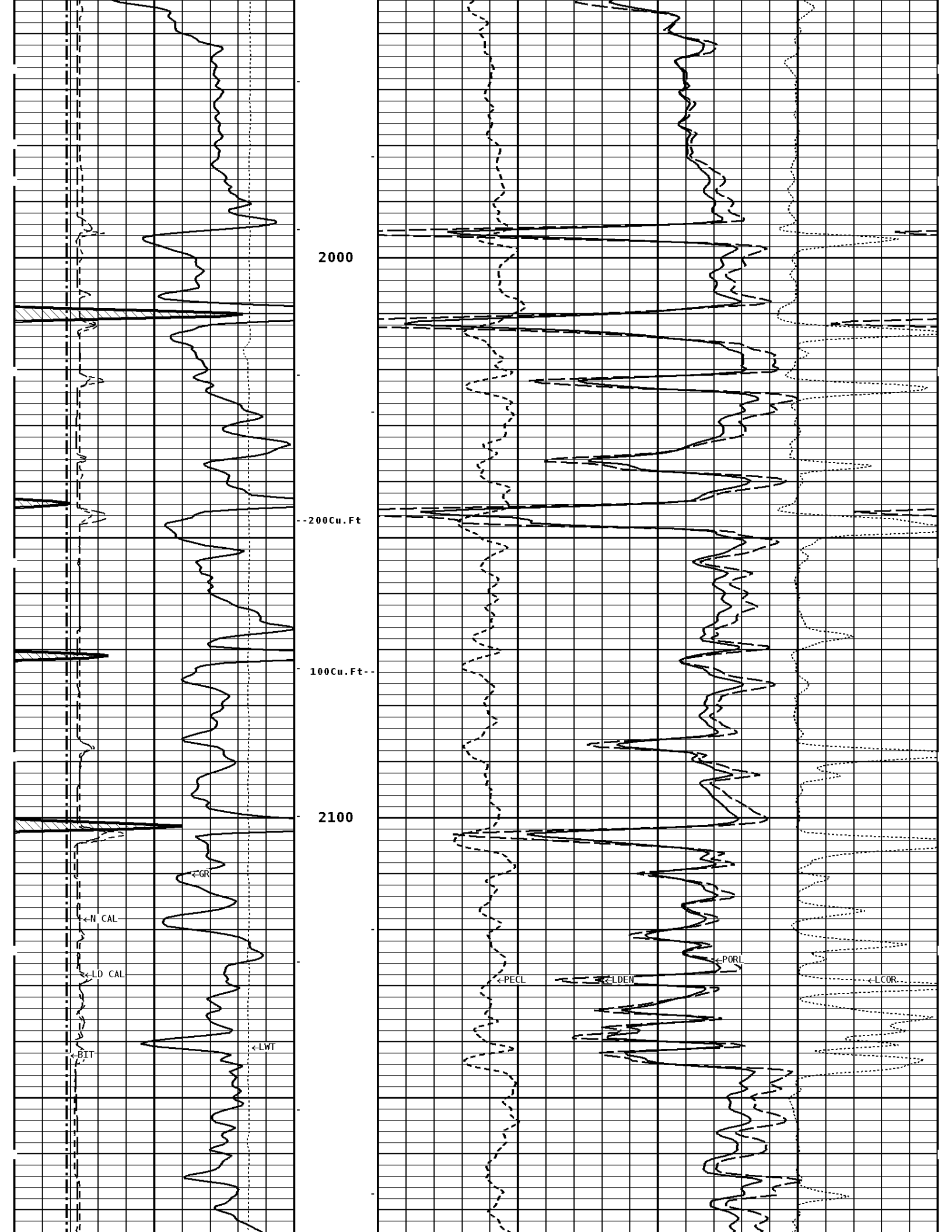

900
1000
--600Cu.Ft

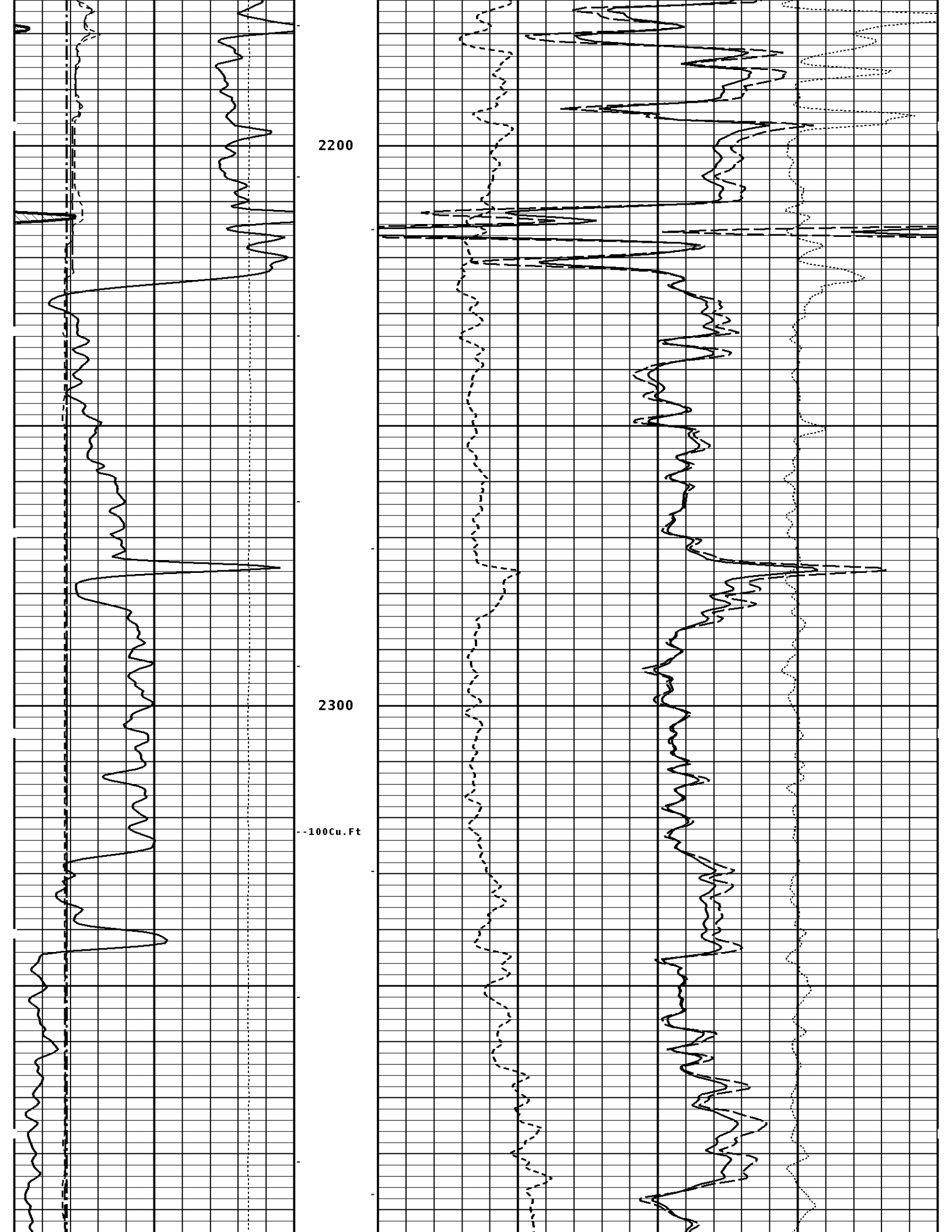

1100
←GR
←N CAL
←LD CAL
←BIT
←LWT
←PECL
←PORL
←LDEN
←LCOR
300Cu.Ft--
1200
--500Cu.Ft

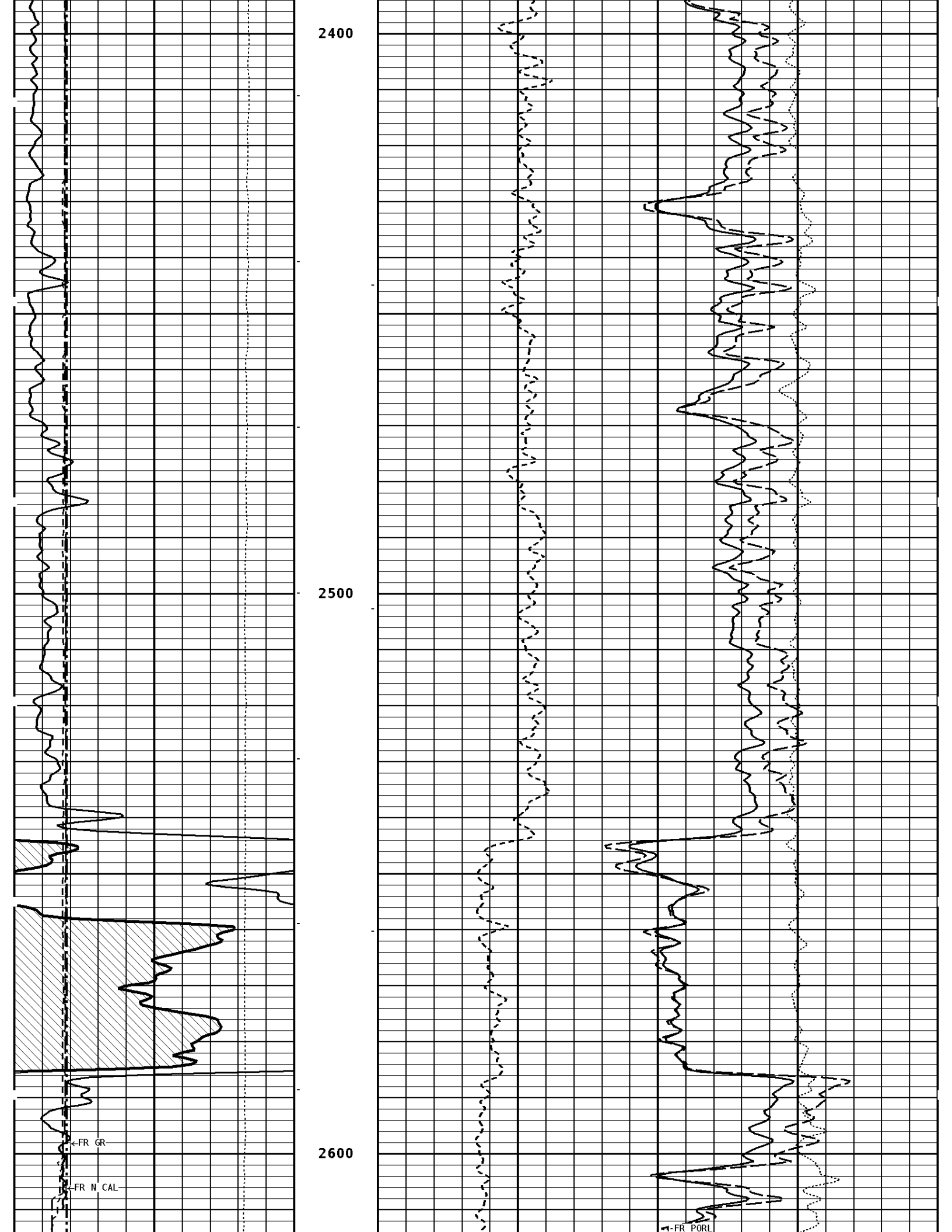

1300
1400
1500

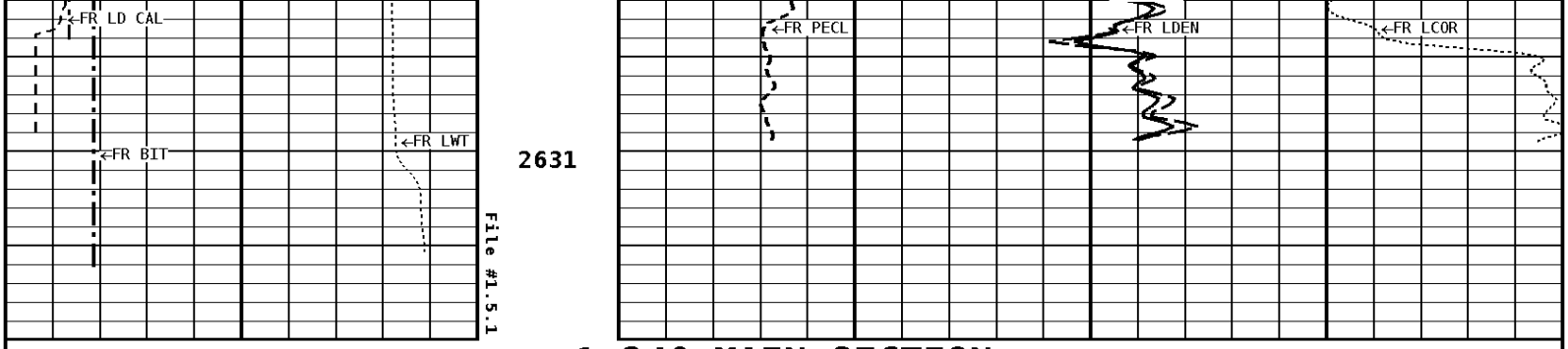

--400Cu.Ft
1600
200Cu.Ft--
←GR
←N CAL
←LD CAL
←BIT
←LWT
←PECL
←PORL
←LDEN
←LCOR
1700


--300Cu.Ft
1800
1900


2000
--200Cu.Ft
100Cu.Ft--
2100
←GR
←N CAL
←LD CAL
←BIT
←LWT
←PECL
←LDEN
←PORL
←LCOR


2200
2300
--100Cu.Ft


2400
2500
2600
←FR GR
←FR N CAL
FR PORL



1:240 MAIN SECTION
BULK DENSITY

GAMMA RAY API UNITS	-BHV AHV- CU.FT	COMPENSATED BULK DENSITY G/CC
150 300		3.0 4.0
0 150		2.0 3.0
		1.0 2.0

NEUTRON (Y) CALIPER INCHES (IN)	DENSITY POROSITY PERCENT (2.68 g/cc)
16 26	70 30
6 16	30 -10
	-10 -50

DENSITY (X) CALIPER INCHES (IN)	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26	0 10	-0.25 0.25
6 16		

BIT SIZE INCHES (IN)
6 16

TENSION LBS
10000 0

* Calibration Summary *

Shop Calibration
CNT-AA

Performed : 26-JAN-2012 Time : 10:38
Sensor Suite : CALI-BCN ID : NDT-BD-123

	Jig - Measured Ring#1	Ring#2	Jig - Calibrated Ring#1	Ring#2	Units
CL # 1	6.2	11.2	6.0	12.0	IN.

Performed : 25-Jan-2012 Time : 10:27
Sensor Suite : BHC NEUT ID : CNP-AA-024
Source ID : N-1046

	Tank Measured	Calibrated	Verification Jig	Units
N/F	3.8832	3.6893	3.7187	
Porosity	23.6	20.5	20.9	%

Shop Calibration
LDT-DF

Performed : 26-OCT-2011 Time : 09:52
Sensor Suite : CALI-LTH ID : PDT-GA-466

	Jig - Measured Ring#1	Ring#2	Jig - Calibrated Ring#1	Ring#2	Units
CL # 1	7.2	10.5	6.0	12.0	IN.

Performed : 25-Jan-2012 Time : 11:26

Sensor Suite : BHCPELNG ID : LDP-DA-067
Source ID : 2991GW

Short Space

	BKGD	Al	Mg	Al+Fe	Units
LSW1	65	1156	1881	748	CPS
LSW2	71	1352	2166	967	CPS
LSW3	259	3083	4989	2607	CPS
LSW4	316	2838	4180	2501	CPS
LSW5	39	70	79	66	CPS
LSW6	73	80	78	79	CPS
LSW7	54	57	58	56	CPS
LSW8	7	9	11	9	CPS
QS	0.148	0.172	0.149	0.168	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	93	1346	5490	813	CPS
LLW2	104	2407	9385	1742	CPS
LLW3	401	4286	16345	3711	CPS
LLW4	515	2008	6544	1816	CPS
LLW5	57	68	133	67	CPS
LLW6	171	164	159	169	CPS
LLW7	108	104	99	103	CPS
LLW8	3	6	18	6	CPS
QL	0.227	0.223	0.231	0.240	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC