Tucker
WIRELINE SERVICES

COMPENSATED NEUTRON
PEL DENSITY LOG

File No. : TUL-56589
Company : CHARLES N. GRIFFIN
Well : DENA #1
Field : HIBBORD NORTH EAST
County : HARPER
State : KANSAS
Country : U.S.A.

Location : API: #15-077-21692-00-00
2310' FSL & 505' FWL
NW NW SW

Sect : 31 Twp : 33S Rge : 08W

Recorded By : R. FRANKLIN
Witnessed By : J.R. GRIFFIN

Date : AUG 03 2010
Run No. : 1

Permanent Datum :	GL	
Drilling Measured From :	KB	
Log Measured From:	KB	
Above Permanent Datum :	8.00	FT
Depth--Driller :	4700.0	FT
Depth--Logger :	4691.0	FT
Bottom Log Interval :	4668.0	FT
Top Log Interval :	265.0	FT
Casing Depth--Driller:	265.0	FT
Casing Depth--Logger :	265.0	FT
Casing Diameter :	8.625	IN
Bit Size :	7.875	IN

Unit No. : TRK 123
Location : TULSA

Elevations :

KB :	1302.00	FT
DF :	1301.00	FT
GL :	1294.00	FT

Additional Services

PIT

The customer is hereby warned that by providing the log data herein, T. W. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. W. S. does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by T. W. S. personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by T. W. S. for its services. Any user of the log data is warned that said user is not entitled to rely on intepretations, conversions or recommendations as aforesaid.

Run Number 1

Depth To Fluid	0.0	FT
Fluid Type In Hole :	WBM	
Density :	9.600	LBS/GAL
Viscosity :	46.000	SEC/QT
pH :	10.000	
Fluid Loss :	12.000	CC
Salinity :	0.000	KPPM

RM Source :	MEASURED			
RM :	0.200	OHMM at	110	F
RM at BHT :	0.180	OHMM at	125	F

RMF Source :	CALCULATED			
RMF :	0.170	OHMM at	110	F
RMF at BHT :	0.150	OHMM at	125	F

RMC Source :	CALCULATED			
RMC :	0.220	OHMM at	110	F

RMC :	0.230	OHMM at	110	F
RMC at BHT :	0.200	OHMM at	125	F

Max Recorded Temp. :	125	F
Time Circulation Stopped :		
Operating Rig Time, Hrs. :	3.0	

- Source Serial Numbers -

Gamma	2991GW
Neutron	N-1046

- Sonde Serial Numbers -

GRTB	GRT-BC-41
CNT	CNP-AE-42
LDTNG	LDP-DA-067
PIT_B	PIT-BA-20

Casing Strings

Size (IN)	Weight (LB/FT)	Bottom (FT)
8.625	36.00	265.00

- Comments -

ALL PRESENTATIONS AS PER CLIENTS REQUEST.

GRT, CNT, LDT, AND PIT RUN IN COMBINATION.
CALIPERS ORIENTED ON THE X-Y AXIS.
2.71 G/CC USED TO CALCULATE PORSITY.
ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING.
DETAIL PRESENTED FROM TD TO 3400' AS PER CLIENTS REQUEST.

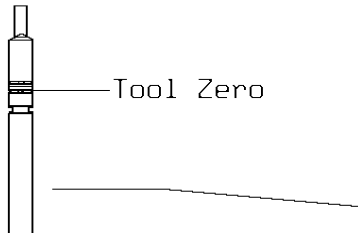
GRT: GRP.
CNT: PHIN, PHINLS, CLCNIN.
LDT: PORL, PORLLS, LCORN, PECLN, LDENN, CLLDIN.
PIT: ILD, ILM, CIRD, SFLAEC, SPU, RXRT.

OPERATORS:
M. GARNER
S. DAVIS

THANK YOU FOR USING TUCKER WIRELINE SERVICES!

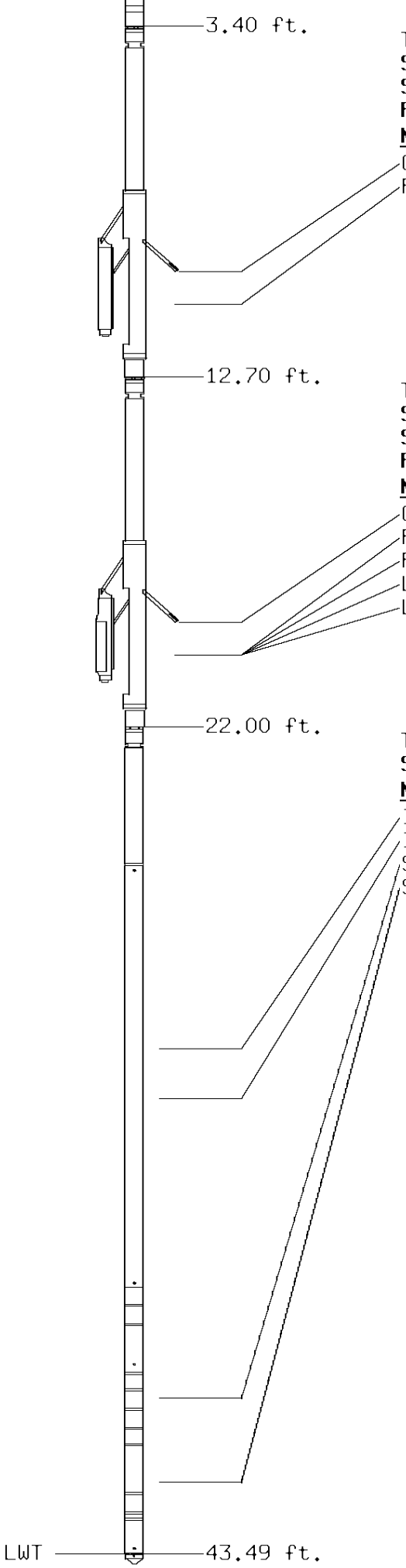
Tool String Schematic

Total Tool Length - 43.49 **ft.**
Maximum Outside diameter - 4.80 **in.**
Net Weight in Air - 743.00 **lbs.**



Tool: GRTB **Length:** 3.40 **ft. O.D.:** 3.60 **in.**
Sonde ID : GRT-BC-41

Measure Point	Stack Offset	Tool Offset	Bottom Offset
GRP	2.00	2.00	41.49



Tool: CNT **Length:** 9.30 **ft. O.D.:** 4.36 **in.**
Sonde ID : CNP-AE-42
Source ID : N-1046
Pad ID : CNP-AE-42

Measure Point	Stack Offset	Tool Offset	Bottom Offset
CLCN	9.40	6.00	34.09
PHIN	10.24	6.84	33.25

Tool: LDTNG **Length:** 9.30 **ft. O.D.:** 4.80 **in.**
Sonde ID : LDP-DA-067
Source ID : 2991GW
Pad ID : LDP-DA-067

Measure Point	Stack Offset	Tool Offset	Bottom Offset
CLLD	18.70	6.00	24.79
PEL	19.70	7.00	23.79
PES	20.10	7.40	23.39
LDEN	19.70	7.00	23.79
LCOR	19.70	7.00	23.79

Tool: PIT **Length:** 21.49 **ft. O.D.:** 3.62 **in.**
Sonde ID : PIT-BA-20

Measure Point	Stack Offset	Tool Offset	Bottom Offset
ILD	30.92	8.92	12.56
ILM	32.10	10.10	11.39
SFLU	39.49	17.49	4.00
SP	42.60	20.60	0.88

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)

30 -10

GAMMA RAY
API UNITS

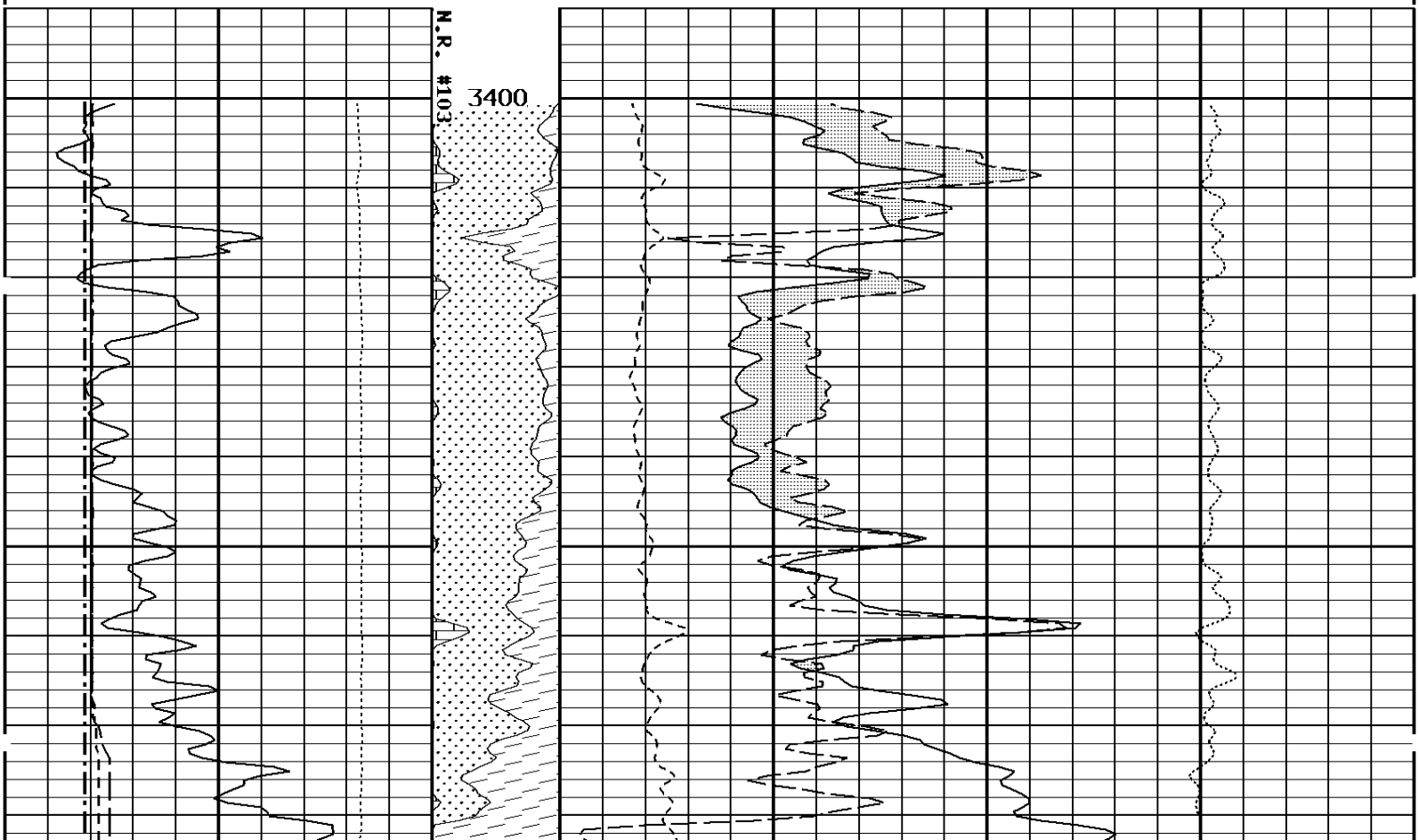
150 300
0 150

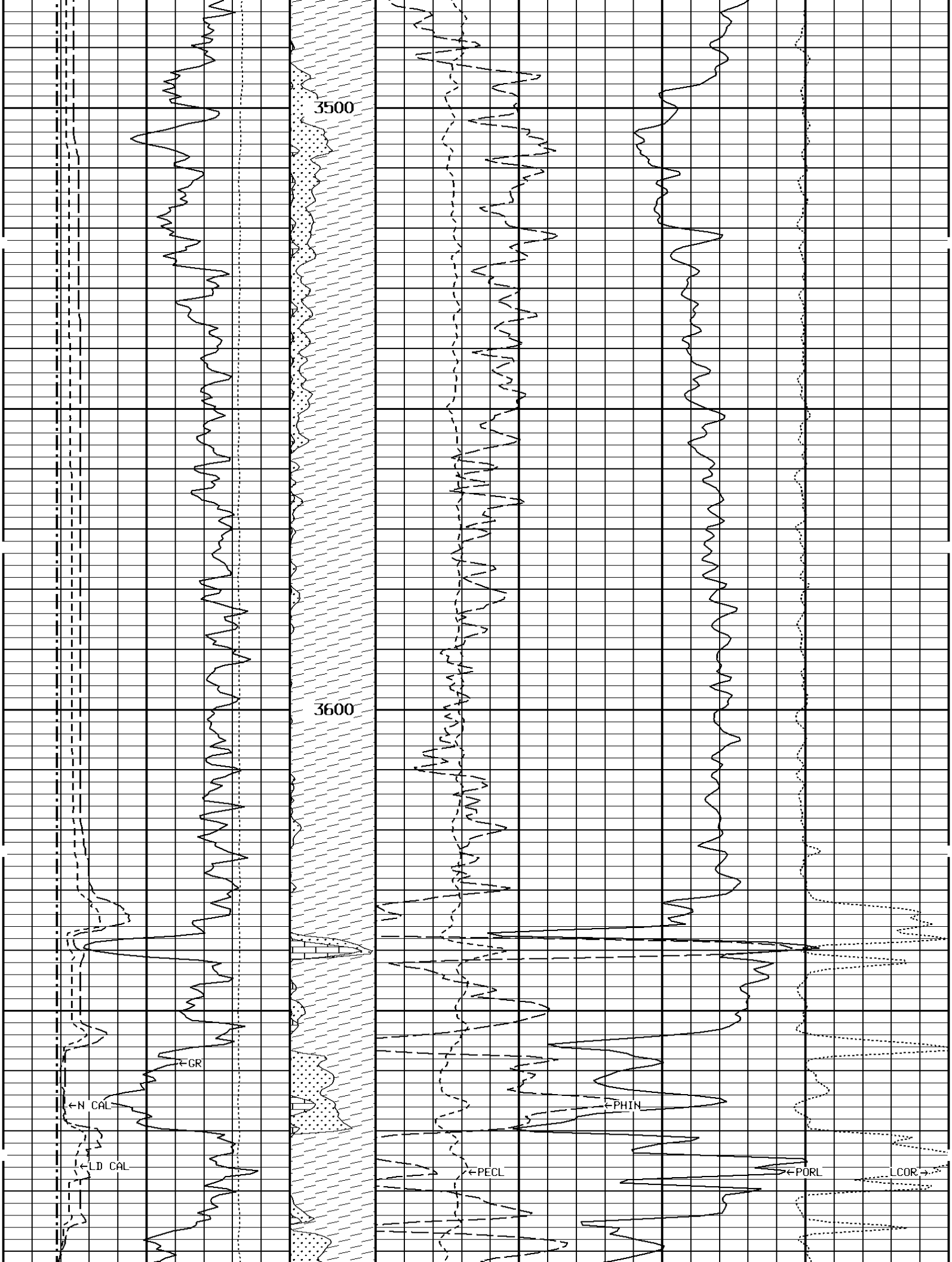
Volume
Dolo/Shale

DENSITY POROSITY
PERCENT (2.71 g/cc)

70 30
30 -10
-10 -50

1:240 MAIN SECTION

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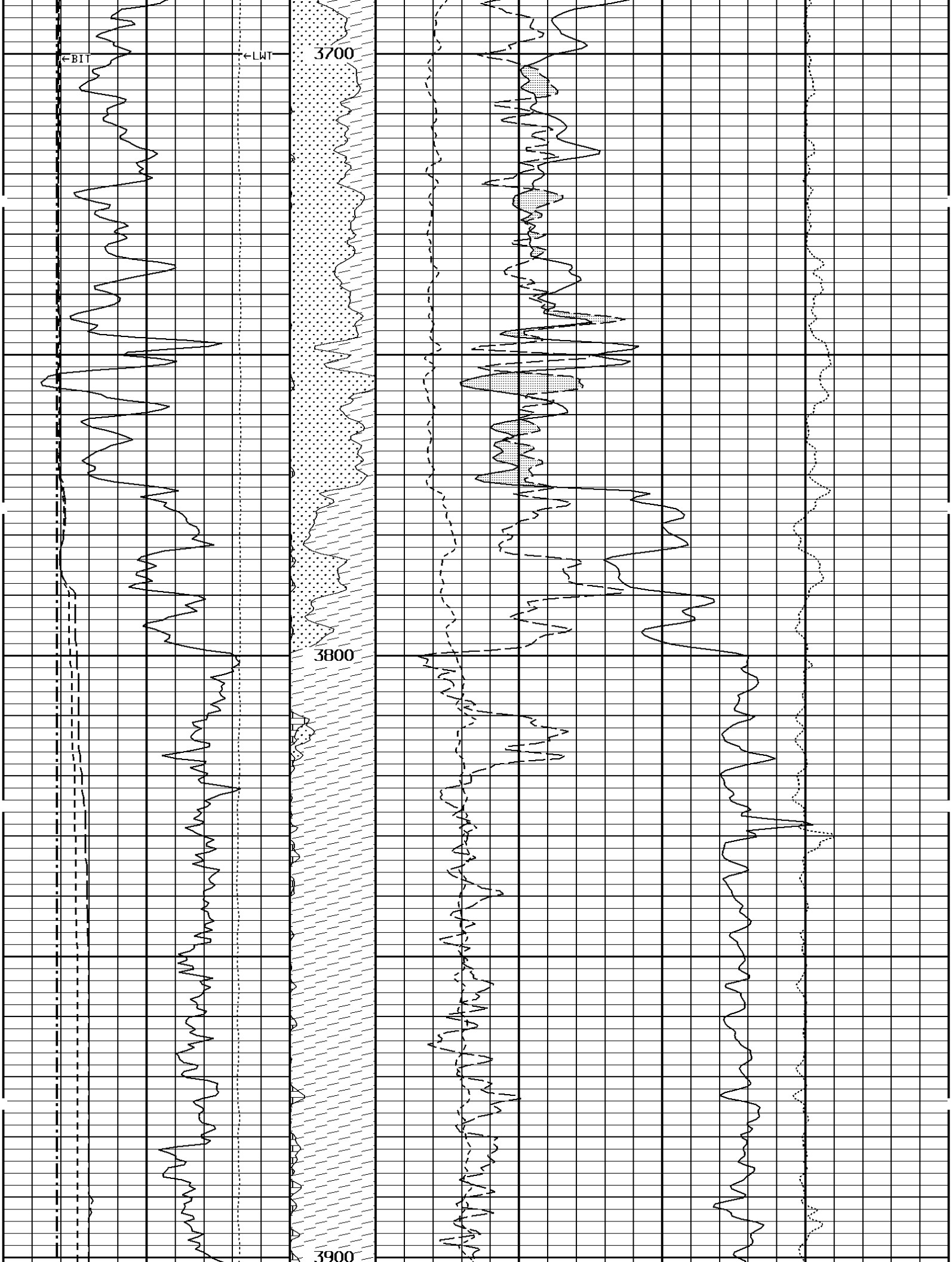
LCOR→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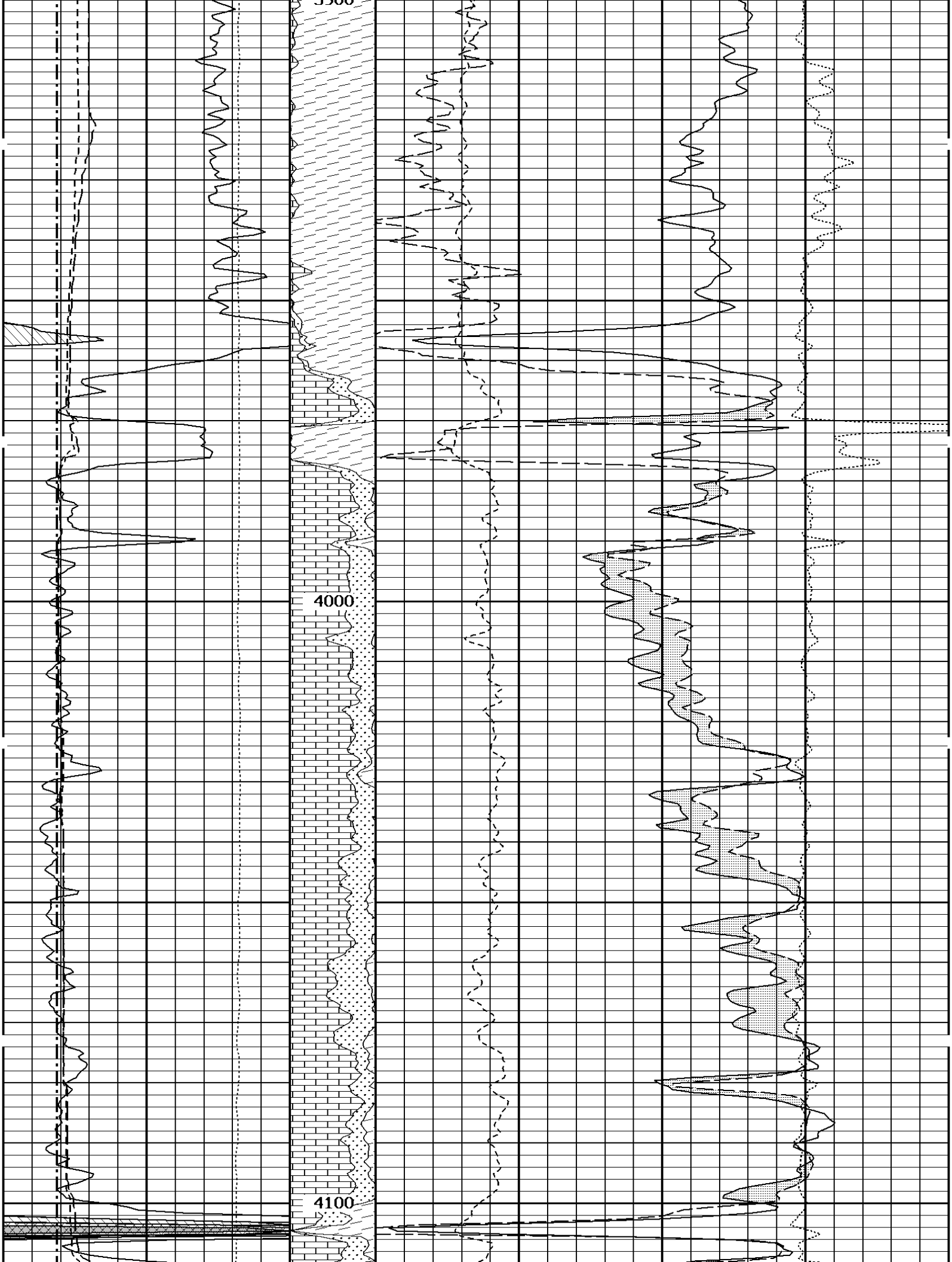
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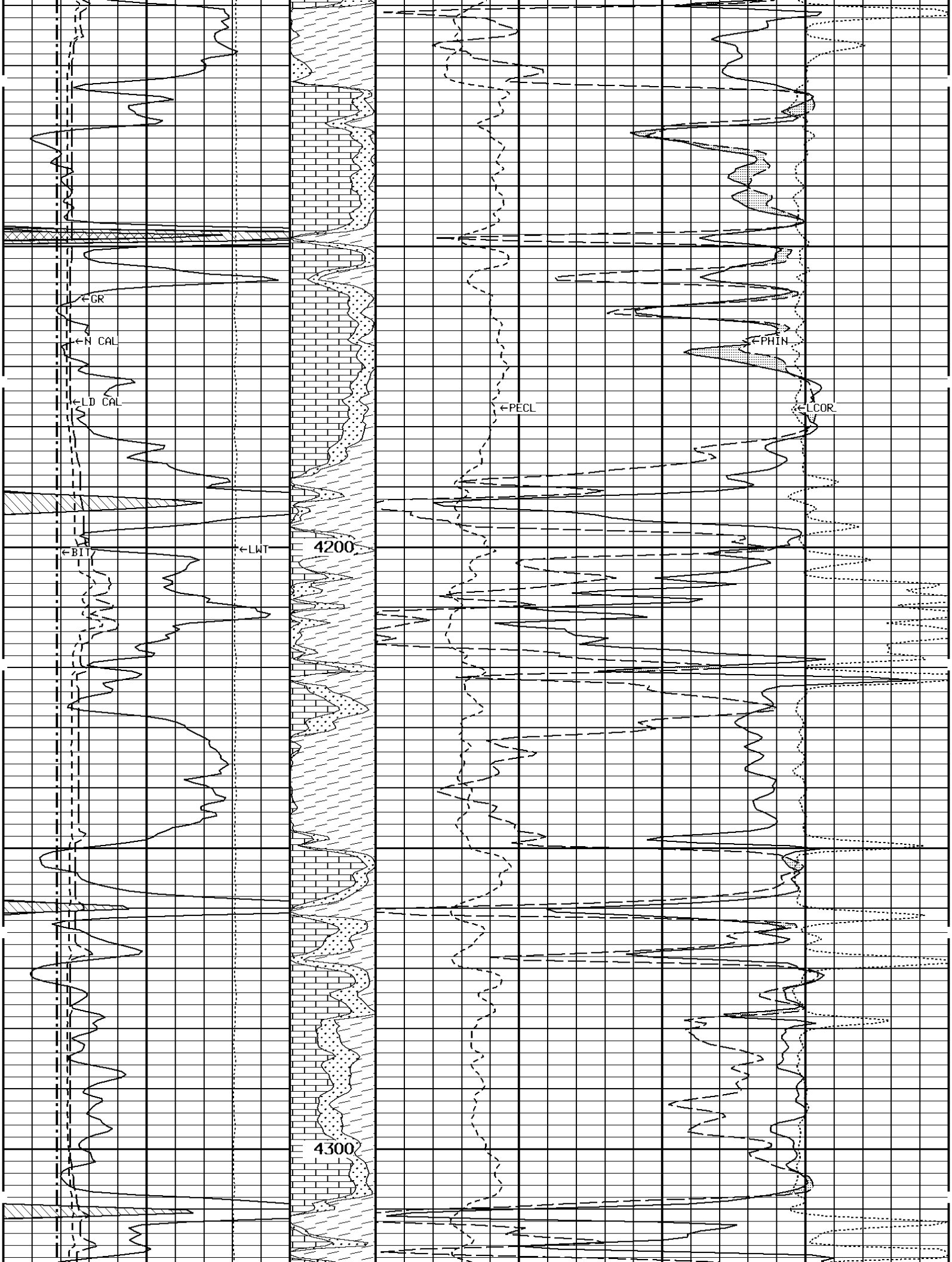
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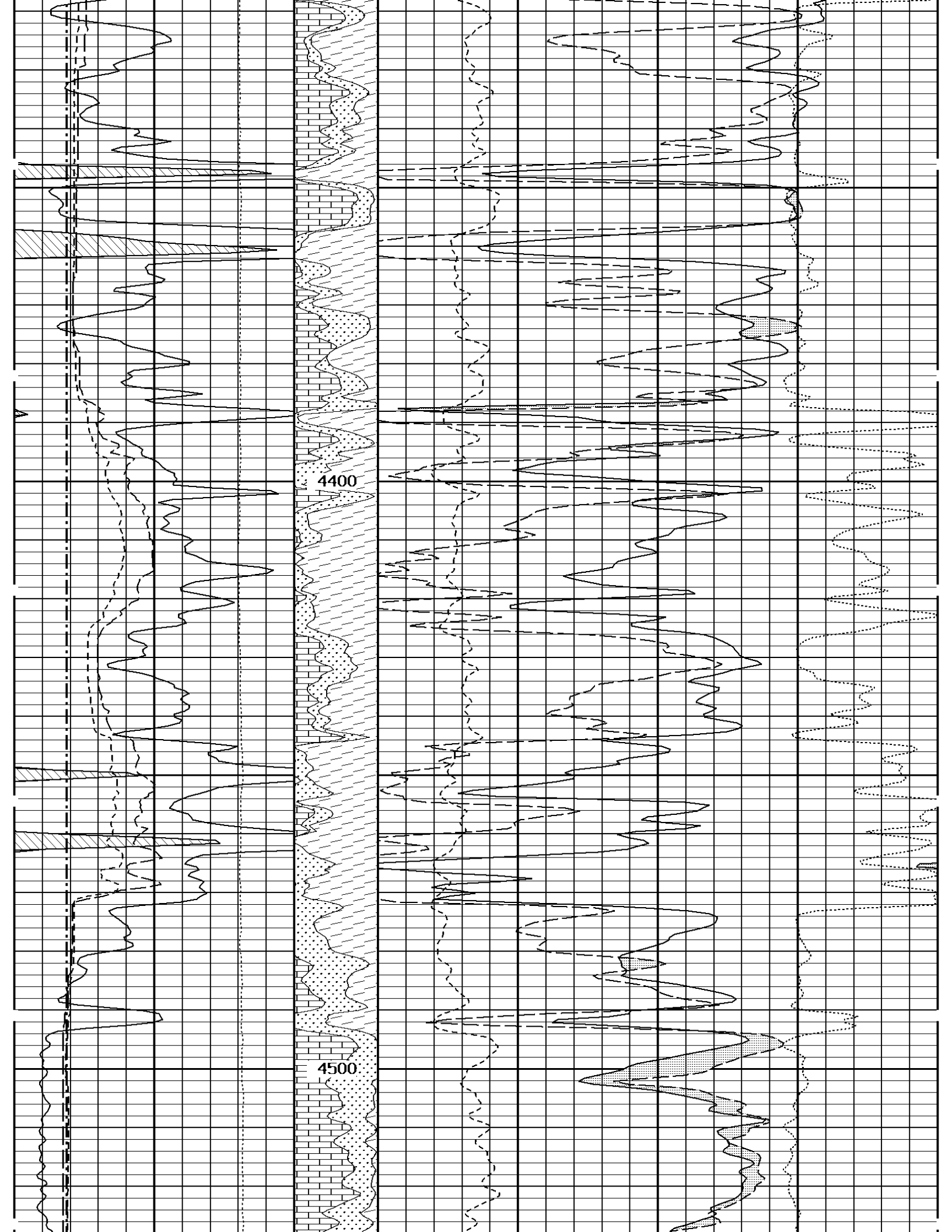
←LCOR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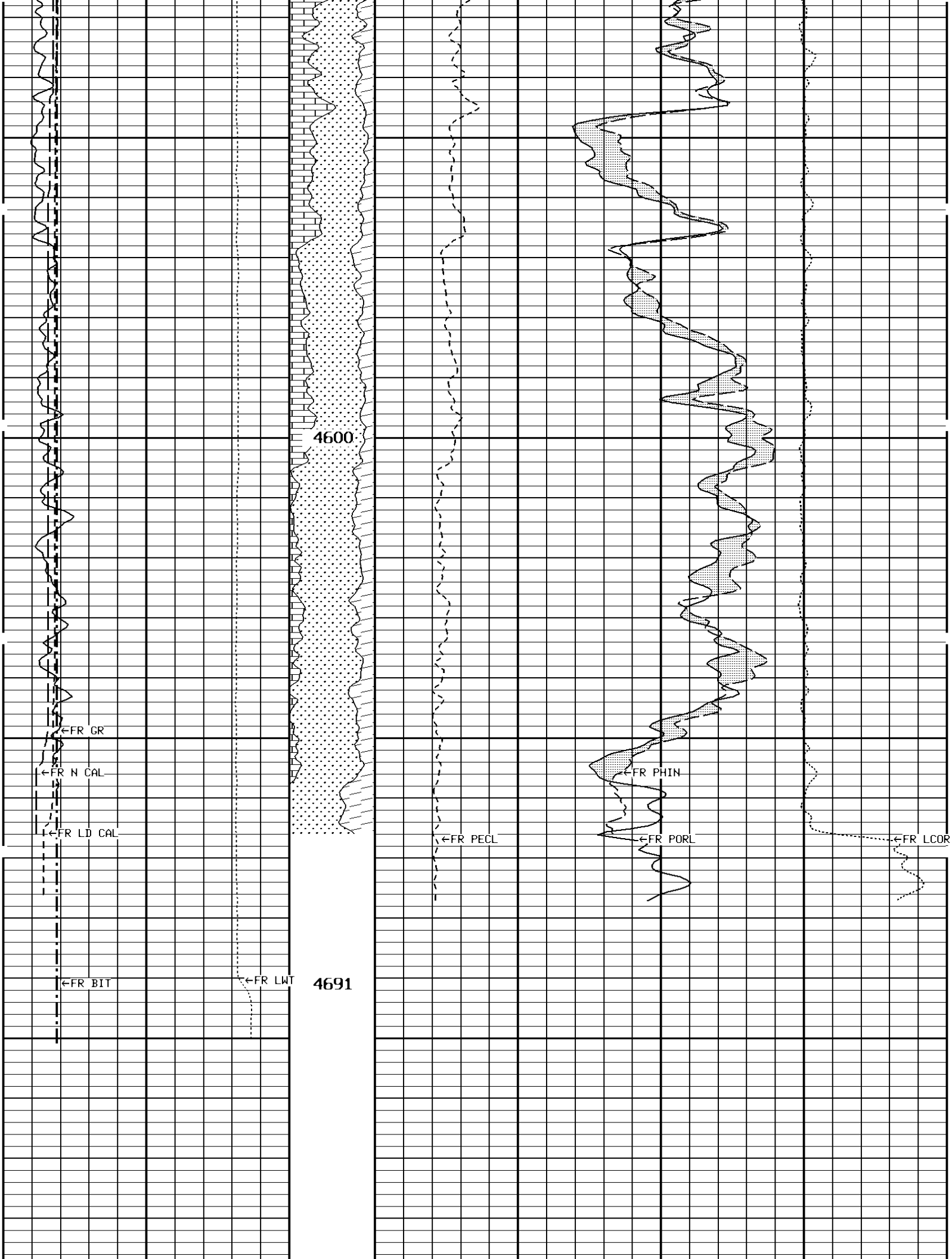
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←FR PORL
←FR LCOR

N.R. #103

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		30 — -10

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

* Borehole Zone Factors *

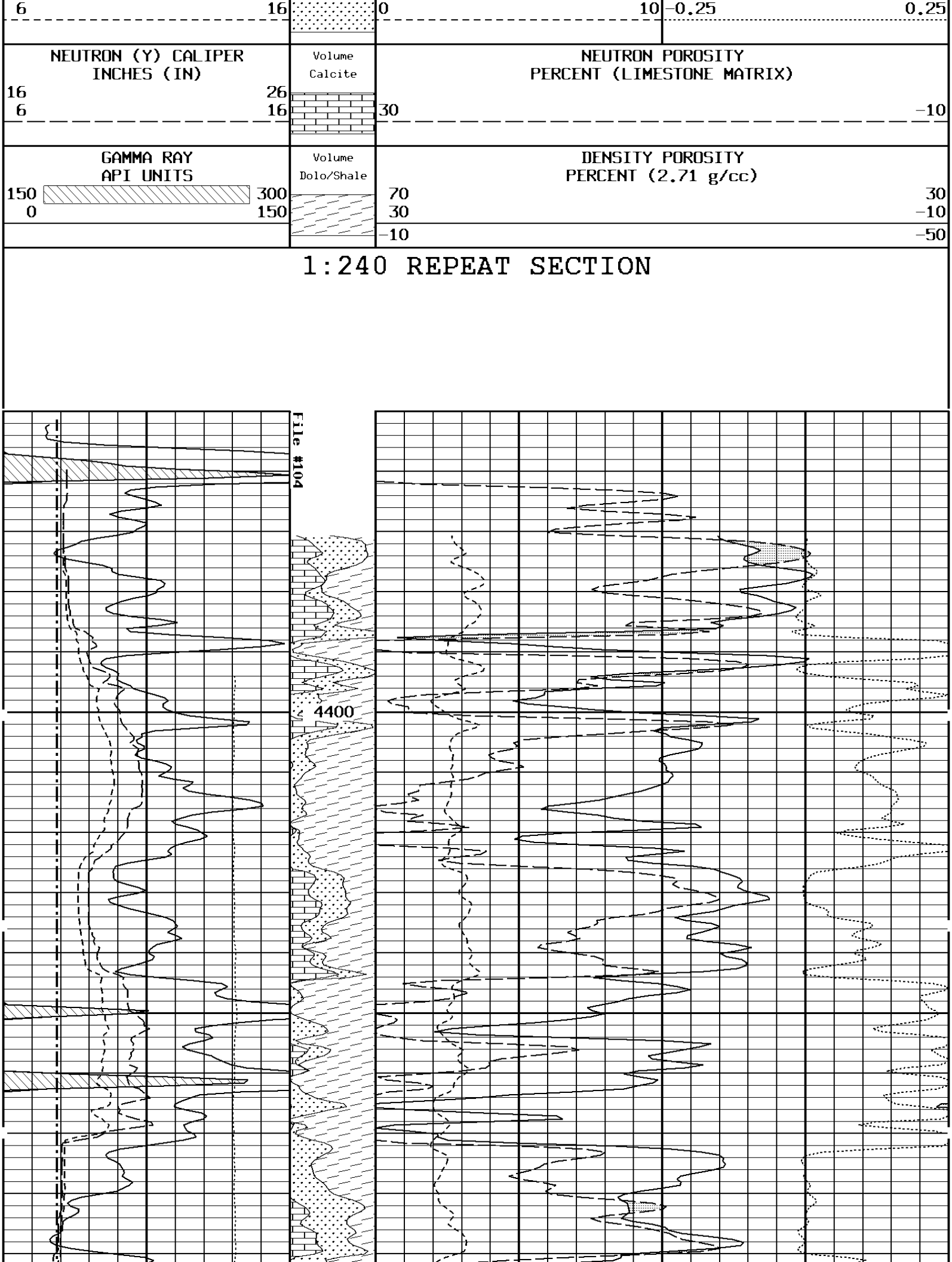
Zone 1 99999.0 to 0.0 F

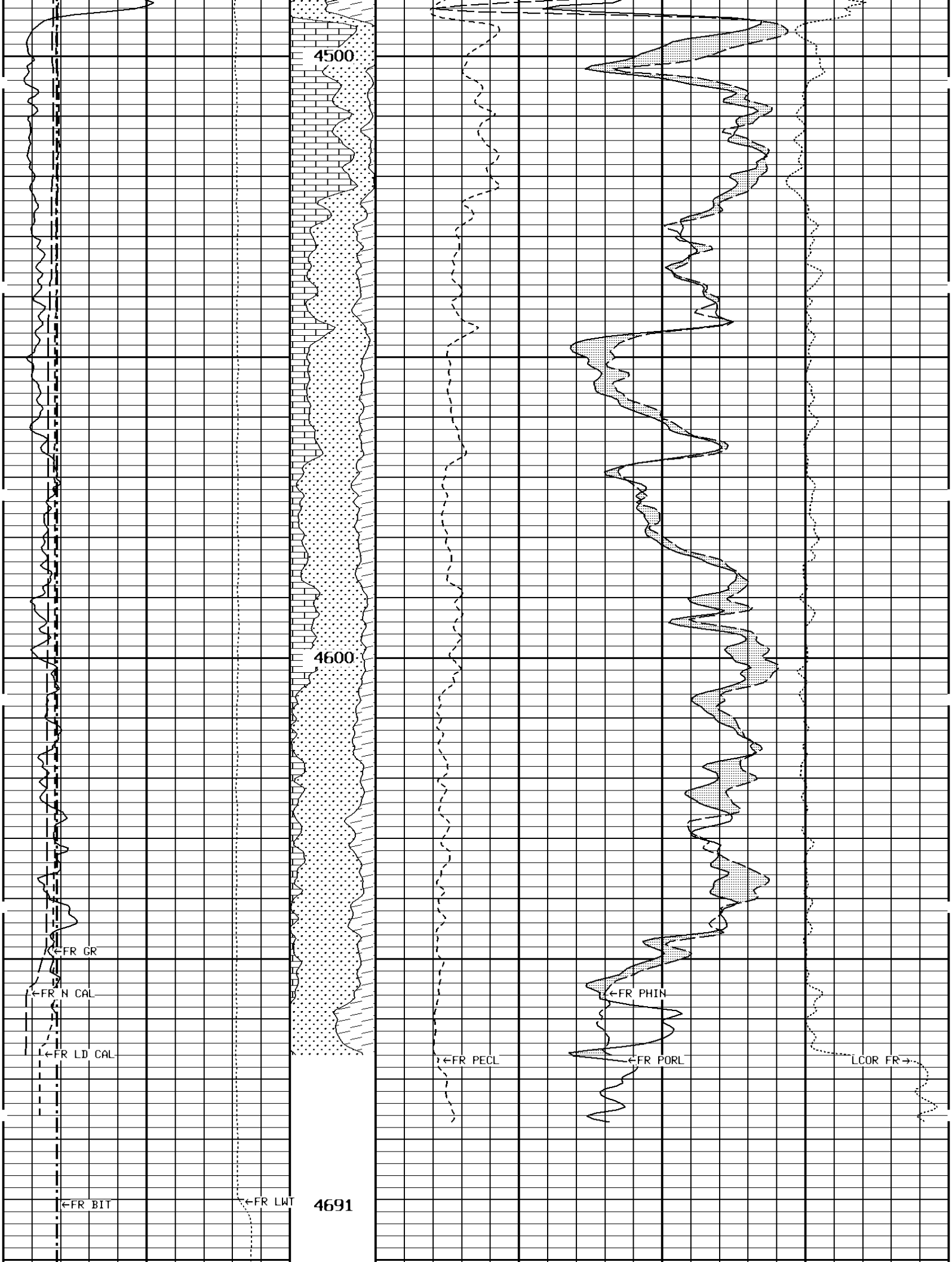
Matrix Density	2.71	G/C3
Fluid Density	1.00	G/C3
Formation Matrix	Limestone	
Drill Bit Size	7.875	IN
Production Casing Diameter	5.500	IN
Casing Correction (PHI N)	Disable	

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)
16
26
6
16
Volume
Calcite
NEUTRON POROSITY
PERCENT (LIMESTONE MATRIX)
30
-10
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 REPEAT SECTION
File #104
4400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←FR PHIN
←FR PORL
LCOR FR→

File #104

1:240 REPEAT 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	30	-10
6 — 16		

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			

BIT SIZE INCHES (IN)
6 — 16

TENSION LBS
10000 — 0

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 F

Matrix Density	2.71	G/C3
Fluid Density	1.00	G/C3
Formation Matrix	Limestone	
Drill Bit Size	7.875	IN
Production Casing Diameter	5.500	IN
Casing Correction (PHI N)	Disable	

TENSION LBS

10000 0

BIT SIZE
INCHES (IN)

6 16

DENSITY (X) CALIPER
INCHES (IN)

16 26
6 16

NEUTRON (Y) CALIPER
INCHES (IN)

16 26
6 16

GAMMA RAY
API UNITS

150 300
0 150

-BHV AHV-
CU.FT

PE CROSS-SECTION
BARNS/ELECTRON

0 10

DENSITY CORRECTION
G/CC

-0.25 0.25

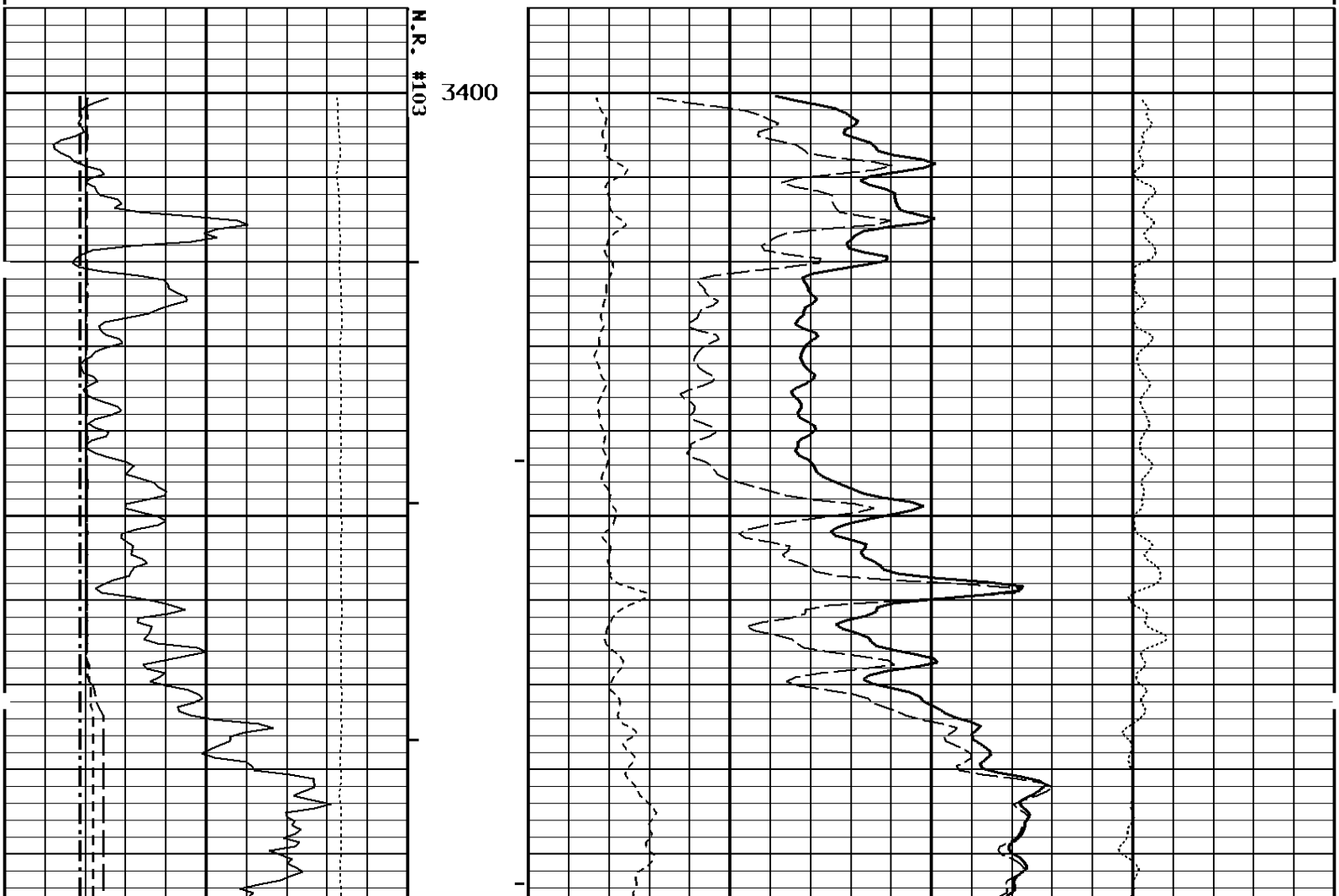
DENSITY POROSITY
PERCENT (2.71 g/cc)

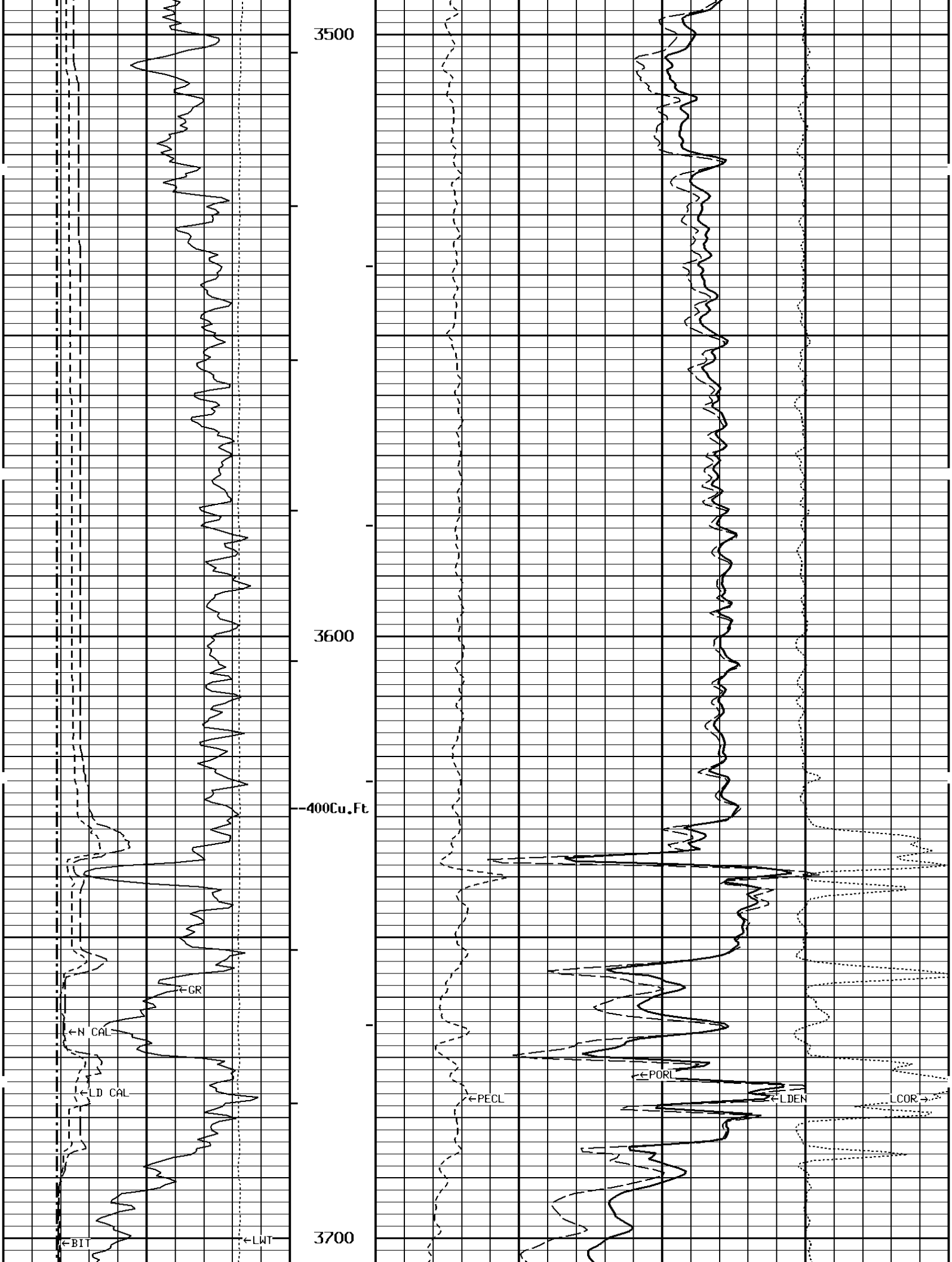
70 30
30 -10
-10 -50

COMPENSATED BULK DENSITY
G/CC

3.0 4.0
2.0 3.0
1.0 2.0

1:240 MAIN SECTION
BULK DENSITY

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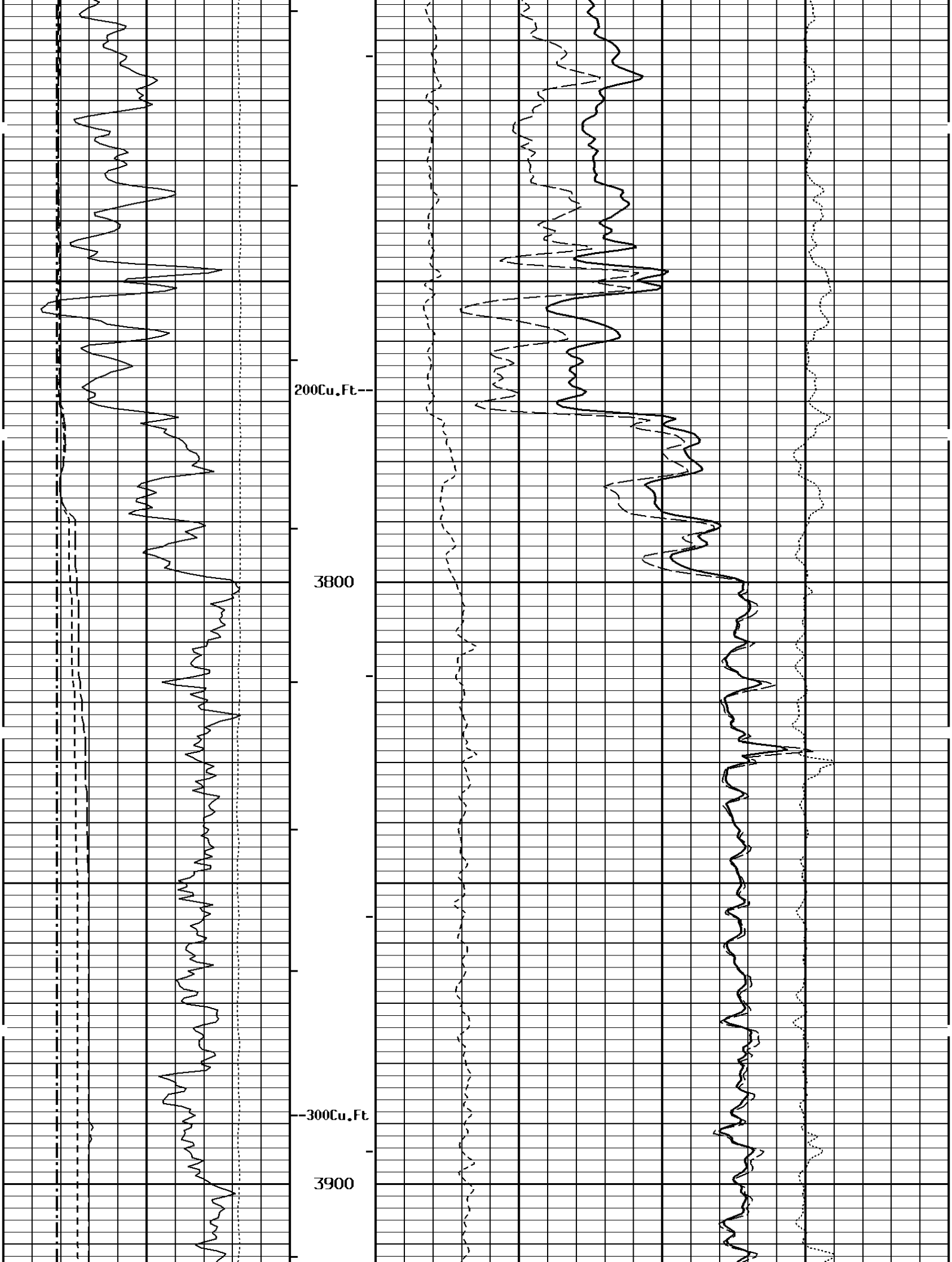
LD CAL
BIT
LWT
PECL
PORL
LDEN
LCOR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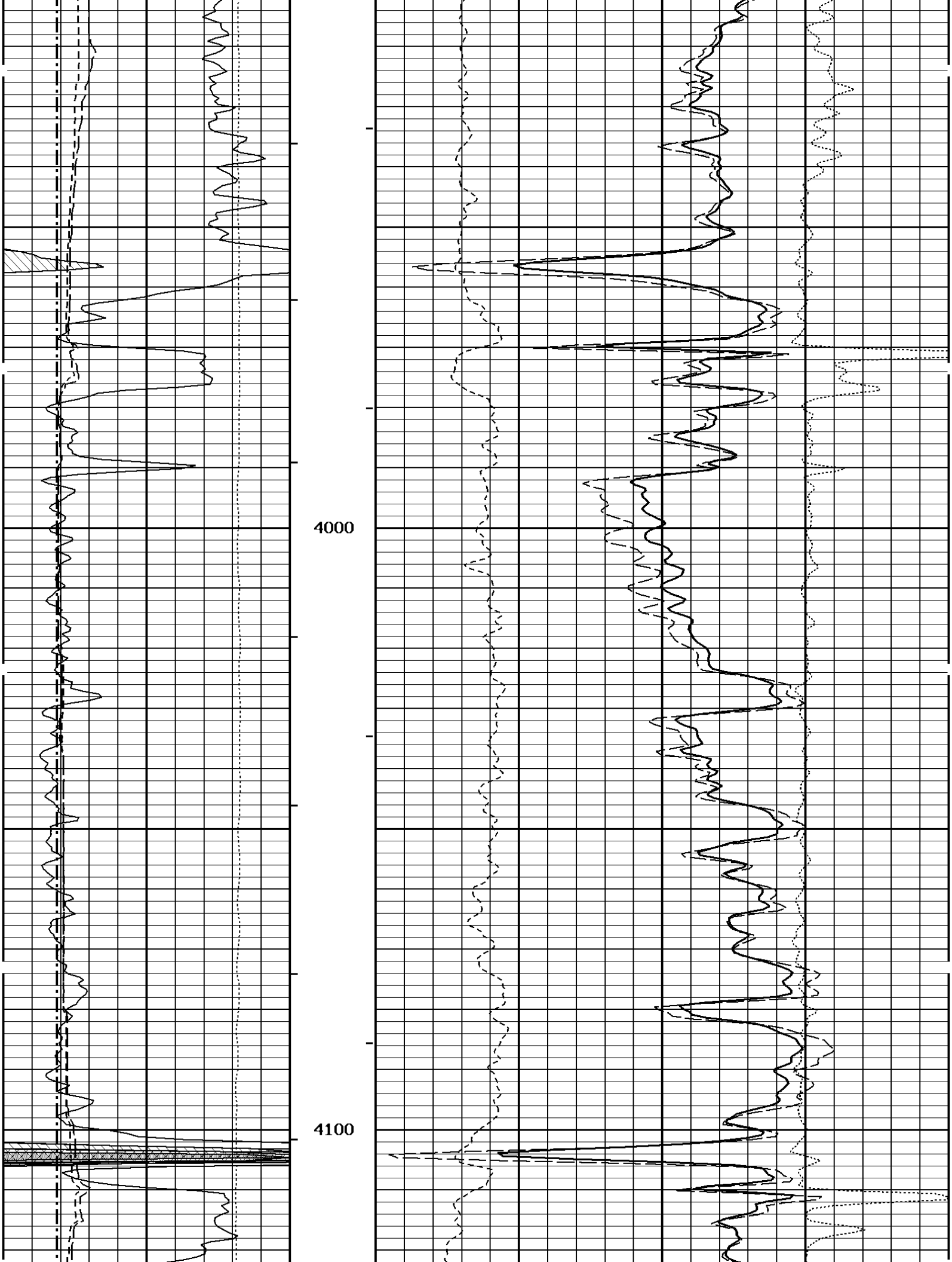
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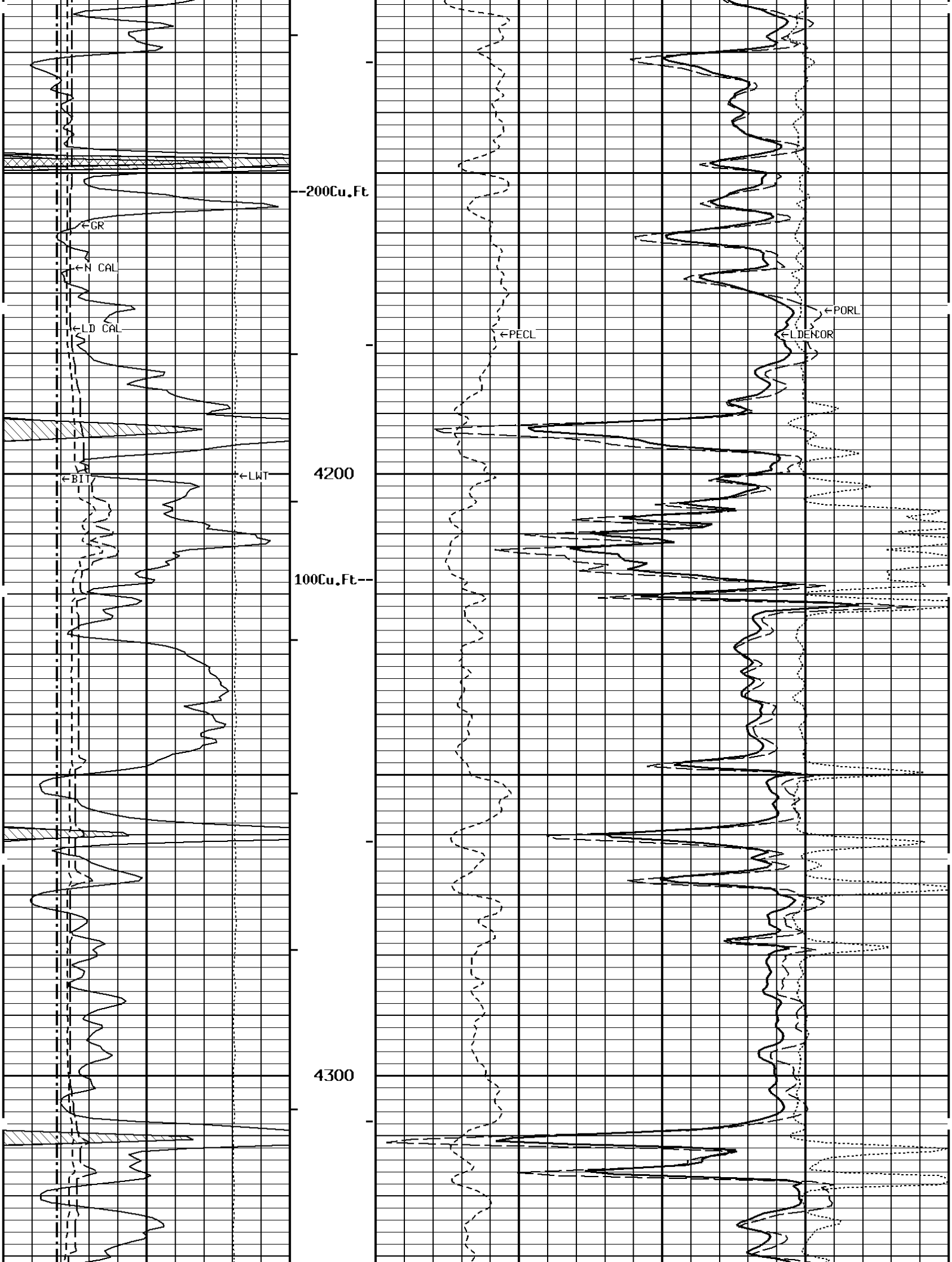
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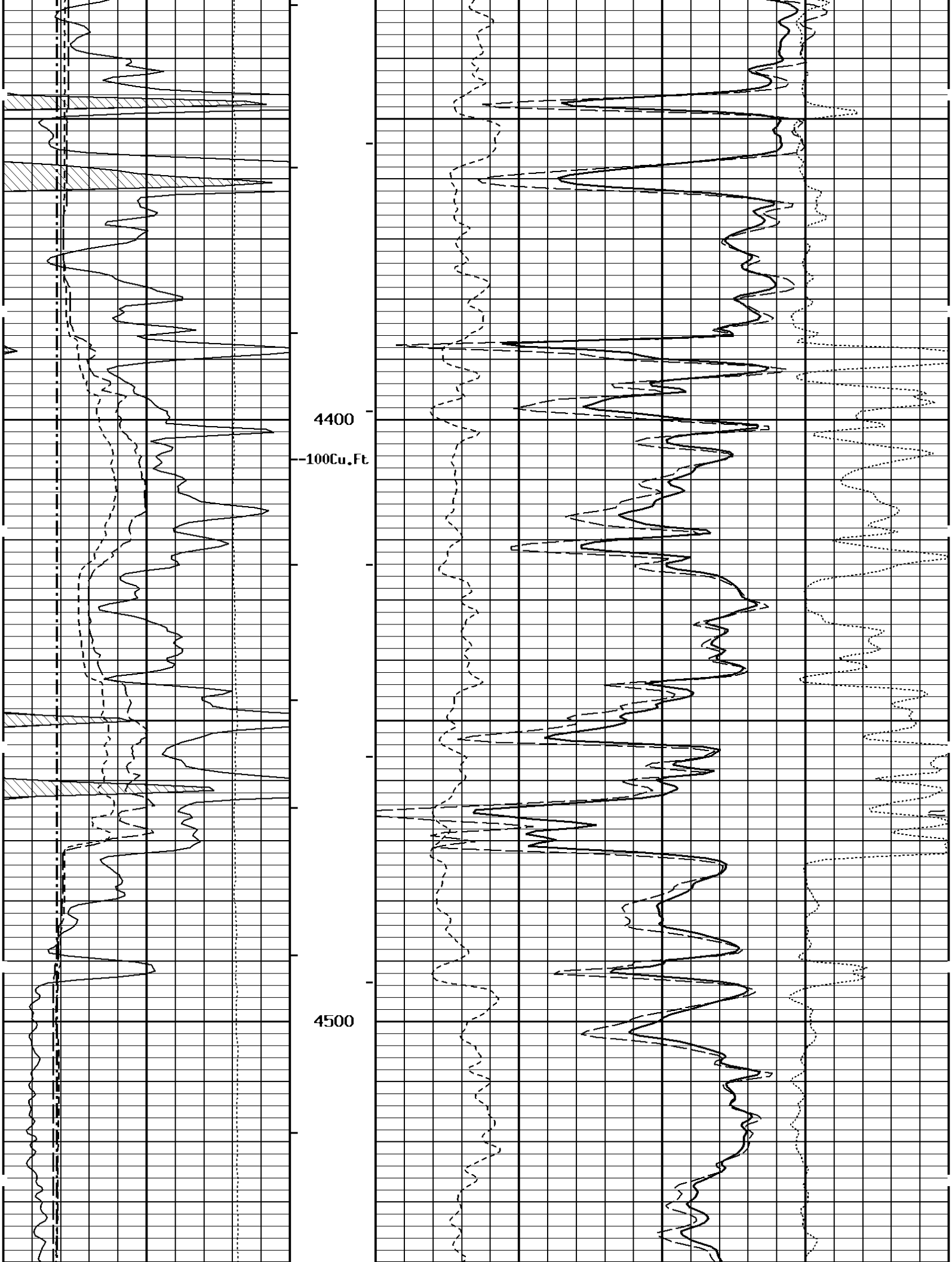
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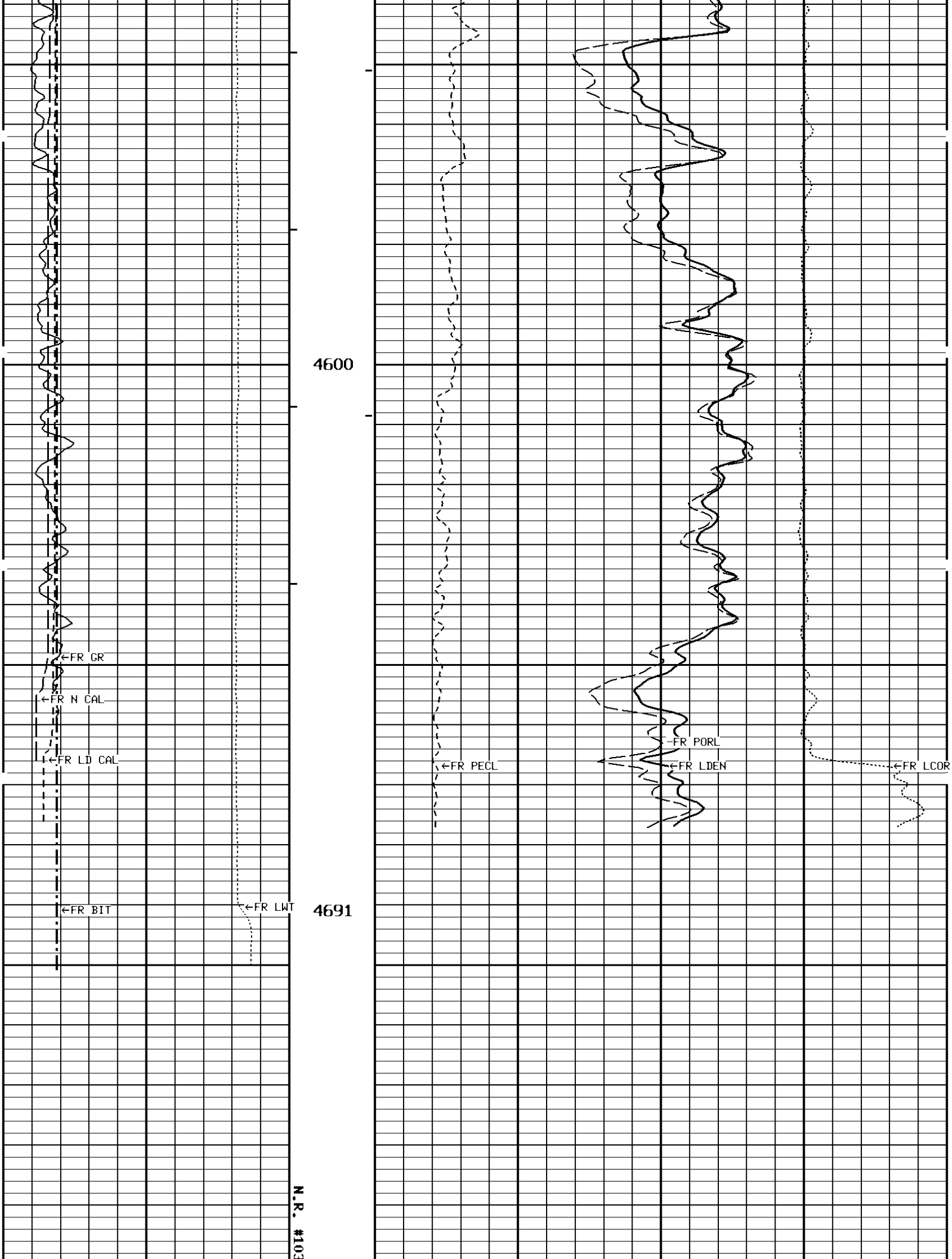
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←FR LDEN
←FR LCOR
N.R. #103

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 (2.71 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		
6 — 16	0 — 10	-0.25 — 0.25

BIT SIZE INCHES (IN)
6 — 16

TENSION LBS
10000 — 0

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 F

Matrix Density	2.71	G/C3
Fluid Density	1.00	G/C3
Formation Matrix	Limestone	
Drill Bit Size	7.875	IN
Production Casing Diameter	5.500	IN
Casing Correction (PHI N)	Disable	

* Calibration Summary *

Shop Calibration
GRTB

Performed : 29-Apr-2010 Time : 11:02
Sensor Suite : GR-GR5 ID : GRT-BC-41

	Measured Background	Measured Jig	Units	Calibrated Jig	Units
GR	46	346	CPS	175	GRAPI

Shop Calibration
CNT

Performed : 02-Aug-2010 Time : 10:31
Sensor Suite : BHC NEUT ID : CNP-AE-42
Source ID : N-1046

	Tank	Verification	Units

	Tank Measured	Tank Calibrated	Verification Jig	Units
N/F	3.6680	3.6894	3.6874	
Porosity	20.2	20.5	20.5	%

Performed : 02-AUG-2010 Time : 11:25
Sensor Suite : CALI-BCN ID : CNP-AE-42

	Jig - Measured Ring#1	Jig - Measured Ring#2	Jig - Calibrated Ring#1	Jig - Calibrated Ring#2	Units
CL # 1	6.1	11.6	6.0	12.0	IN.

Shop Calibration
LDTNG

Performed : 15-JUL-2010 Time : 17:11
Sensor Suite : CALIPEL ID : LDP-DA-067

	Jig - Measured Ring#1	Jig - Measured Ring#2	Jig - Calibrated Ring#1	Jig - Calibrated Ring#2	Units
CL # 1	6.1	12.1	6.0	12.0	IN.

Performed : 15-Jul-2010 Time : 12:04
Sensor Suite : BHCPELNG ID : LDP-DA-067
Source ID : 2991GW

Short Space

	BKGD	Al	Mg	Al+Fe	Units
LSW1	67	1169	1884	759	CPS
LSW2	74	1364	2159	977	CPS
LSW3	268	3140	5045	2657	CPS
LSW4	331	2836	4124	2495	CPS
LSW5	38	66	73	63	CPS
LSW6	81	84	88	86	CPS
LSW7	56	59	61	61	CPS
LSW8	5	7	9	8	CPS
QS	0.182	0.175	0.181	0.170	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	98	1269	5094	766	CPS
LLW2	109	2314	9012	1674	CPS
LLW3	412	4301	16266	3684	CPS
LLW4	534	2025	6529	1831	CPS
LLW5	56	70	129	67	CPS
LLW6	179	174	162	174	CPS
LLW7	108	108	102	109	CPS
LLW8	3	6	19	6	CPS
QL	0.247	0.234	0.227	0.230	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC