

Tucker
ENERGY SERVICES

COMPENSATED NEUTRON
PEL DENSITY MICRO LOG

File No : TUL-62046
Company : VAL ENERGY, INC
Well : BIRDZELL #1-23 OWWO
Field :
Country : COWLEY
State : KANSAS
Country : USA
API No : 15-035-22441-0001

Location :
660' FSL & 3630' FEL

LSD : Sect : 23 Twp : 33S Rge : 4E

Company VAL ENERGY, INC
Well BIRDZELL #1-23 OWWO
Field
Country COWLEY
State KANSAS
Country USA
API No. 15-035-22441-0001

Permanent Datum: GL Elevations: KB 0.00 Ft
Drilling Measured From: KB DF 0.00 Ft
Log Measured From: KB DF 0.00 Ft
Above Permanent Datum: 0.00 Ft GL 1117.00 Ft

Date	11-03-2018	Run Number	1
Depth--Driller	3480.0	Depth--Driller	Ft
Depth--Logger	3472.0	Depth--Logger	Ft
First Reading	3449.0	First Reading	Ft
Last Reading	234.0	Last Reading	Ft
Casing--Driller	234.0	Casing--Driller	Ft
Casing--Logger	234.0	Casing--Logger	Ft
Bit Size	7.875	Bit Size	In
Casing Size	8.625	Casing Size	In
Hole Fluid Type	WBM	Hole Fluid Type	
Density	9.0	Density	
Fluid Loss	16.0	Fluid Loss	
PH/Viscosity	9.0	PH/Viscosity	38.0
Sample Source	MEASURED	Sample Source	
RM@Measured Temp.	2.000 @ 70 F	RM@Measured Temp.	
RMF@Measured Temp	1.600 @ 70 F	RMF@Measured Temp	
RMC@Measured Temp.	2.400 @ 70 F	RMC@Measured Temp.	
Source RMF/RMC	CALCULATED/CALCULATED	Source RMF/RMC	
RM@BHT	0.000 @ 110 F	RM@BHT	
Time Circulation Stopped	11-03-2018 14:00	Time Circulation Stopped	
Max Recorded Temp.	110	Max Recorded Temp.	F
Equipment/Base	1022	Equipment/Base	TULSA, OK
Recorded By	SHELDON TYLER	Recorded By	
Witnessed By	JOE BAKER	Witnessed By	

The customer is hereby warned that by providing the log data herein, T. E. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. E. 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. E. 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. E. S. for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

Bitsize Intervals		Casing Strings			
Size (In)	Bottom (Ft)	Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
7.875	3480.00	8.625	32.00	234.00	0.00

Run Number	1
Date	11-03-2018
Date/Time On Bottom	11-03-2018 17:00
Depth to Fluid	0.0 Ft
Salinity	9000.000
RMF@BHT	0.000 @ 110 F
RMC@BHT	0.000 @ 110 F

Run Number 1

Comments

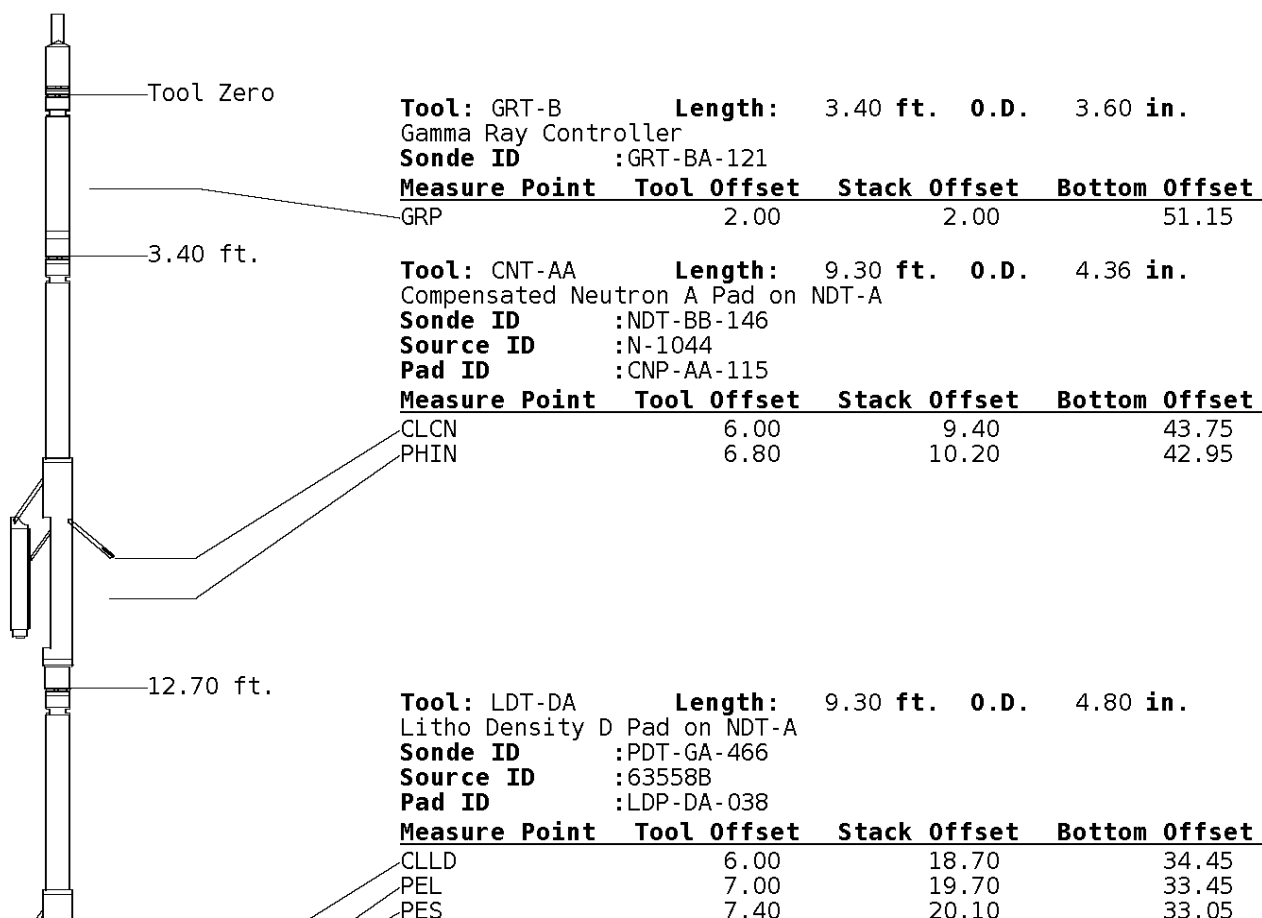
ALL PRESENTATIONS AS PER CUSTOMER REQUEST
 GRT, CNT, LDT, MLT AND PIT RUN IN COMBINATION
 CALIPERS ORIENTED ON X-Y AXIS
 2.71 G/CC USED TO CALCULATE POROSITY
 ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING
 PHIN IS CALIPER CORRECTED

GRT: GRP, GRX
 CNT: PHIN, CLCNIN, PHXN
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN, PRXL, PECLX, LDENNX, LCORX
 MLT: NOR_RF, INV_RF, MSCLPIN
 PIT: ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS:
 B.BAILEY
 K.WARREN

Tool String Schematic

Total Tool Length - 53.15 ft.
Maximum Outside diameter - 6.00 in.
Net Weight in Air - 943.00 lbs.





LDEN 7.20 19.90 33.25
 LCOR 7.20 19.90 33.25

Tool: MST-DA **Length:** 9.66 ft. **O.D.** 6.00 in.
 Micro Spherically Focused (IC)
Sonde ID :MST-DA-021

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	29.60	23.55
MSCLP	7.60	29.60	23.55
INV	7.60	29.60	23.55
NOR	7.60	29.60	23.55

Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-CA-069

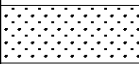
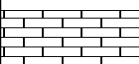
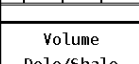

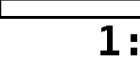
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	40.58	12.56
ILM	10.10	41.76	11.39
SFLU	17.49	49.15	4.00
SP	20.60	52.26	0.88

Well File: VAL ENERGY BIRDZELL OWWO 1-23 NOV3 MSTK **Scale:** 1:240 **Format:** NLD-240
Segment: V1.D1.S5 FINAL MAIN **Acquired:** Not Available
Reference: 0 **Processed:** Not Available

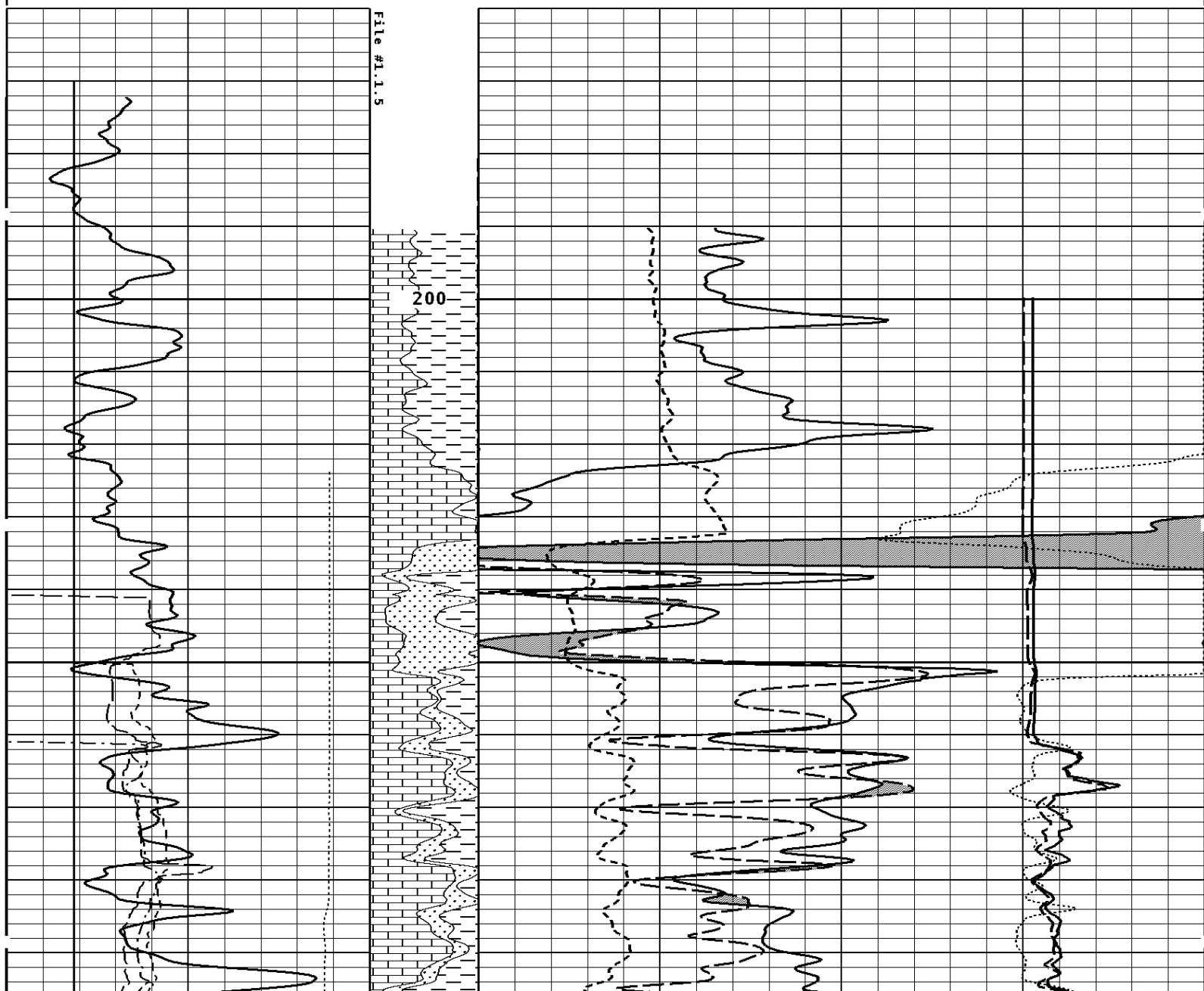
CALIPER MICRO INCHES (IN)	
16	26
6	16

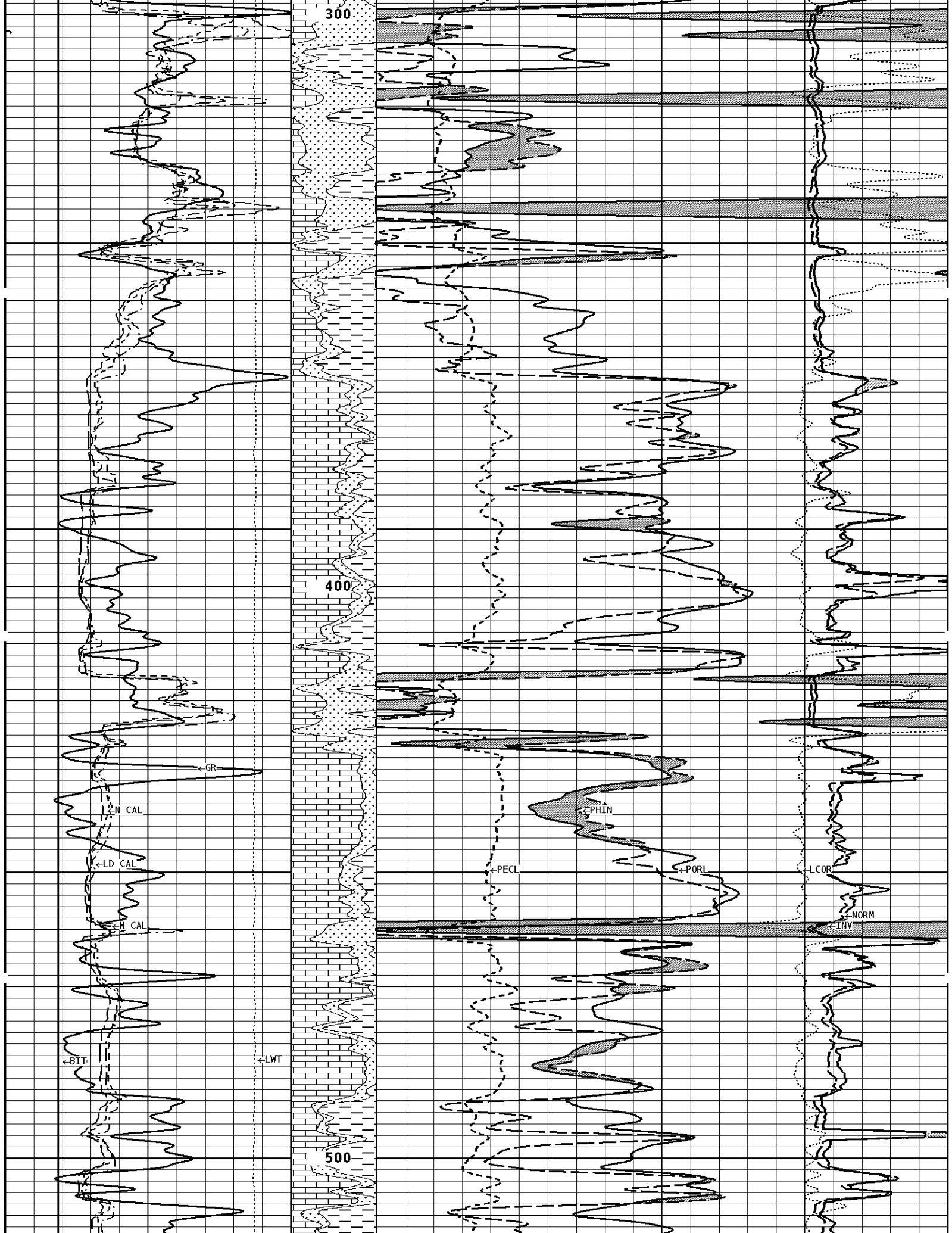
BIT SIZE INCHES (IN)

NORMAL
OHMH

6	16			0	40
NEUTRON (Y) CALIPER INCHES (IN)				INVERSE OHMM	
16	26			0	40
6	16				
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARN/ELECTRON	DENSITY CORRECTION G/CC	
16	26				
6	16		0	10 -0.25	0.25
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT		
10000	0		70		30
			30		-10
			-10		-50
GAMMA RAY API UNITS		Volume DoLo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT		
150	300				
0	150		30		-10

1:240 MAIN SECTION





300

400

500

← GR

← N CAL

← LD CAL

← M CAL

← BIT

← LWT

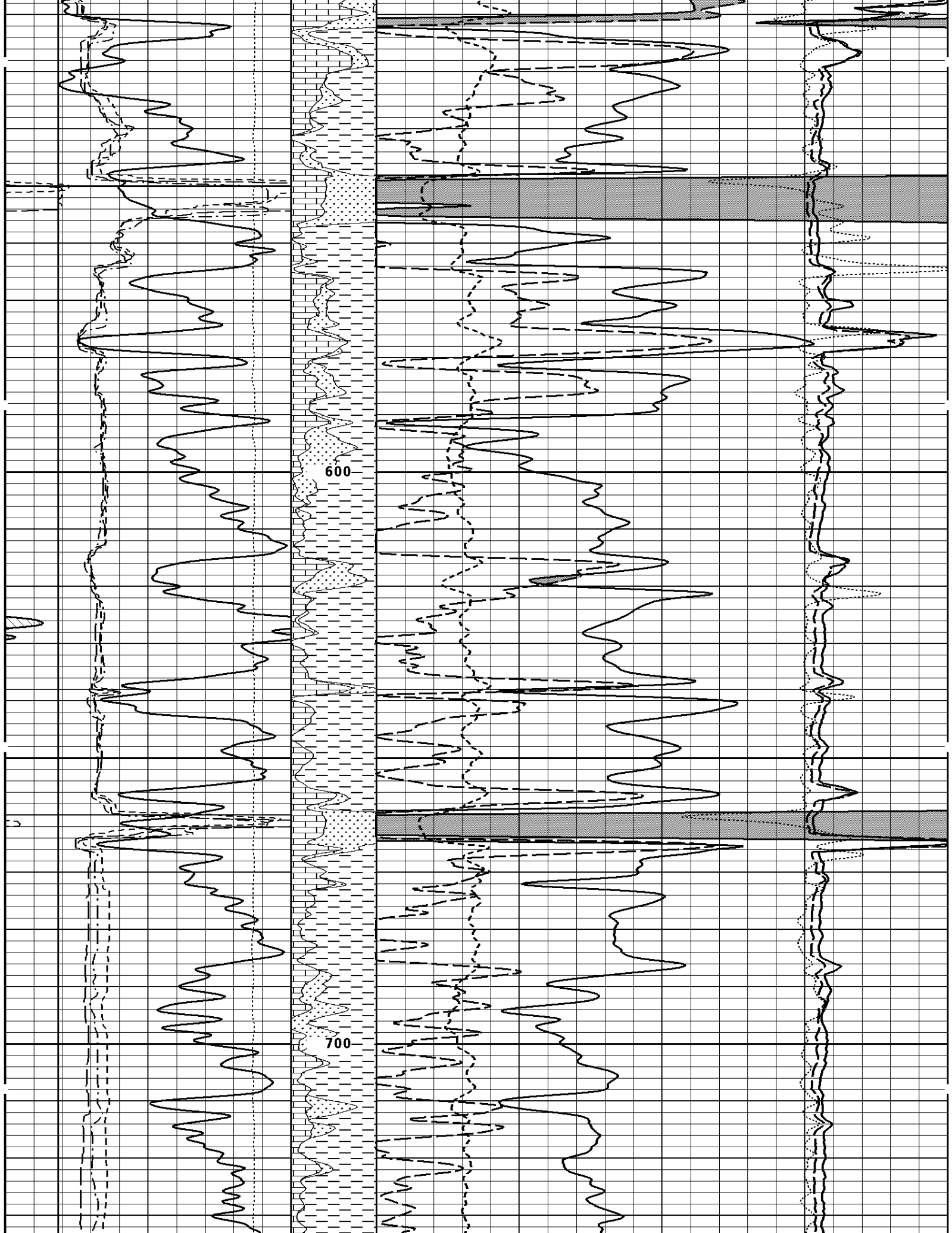
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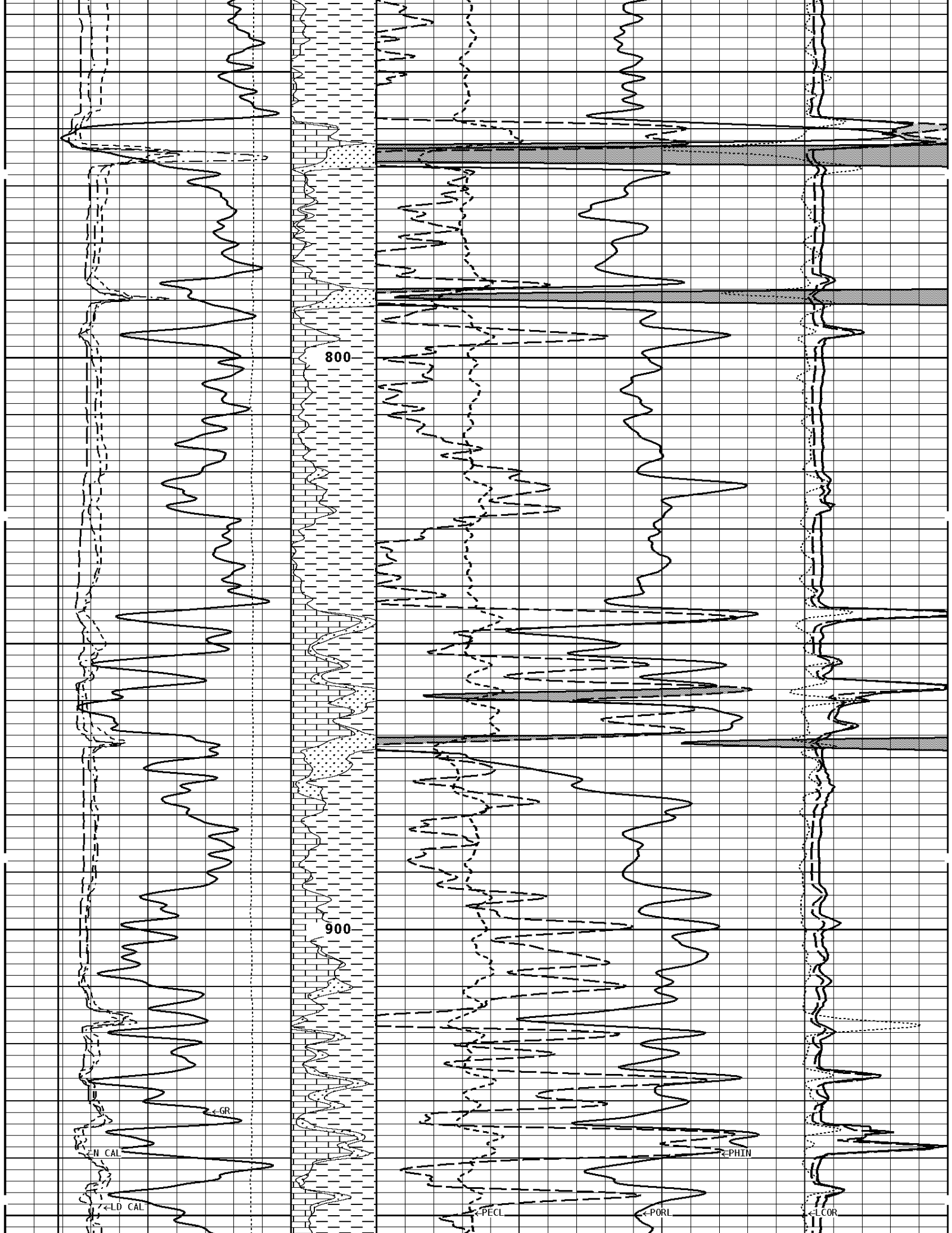
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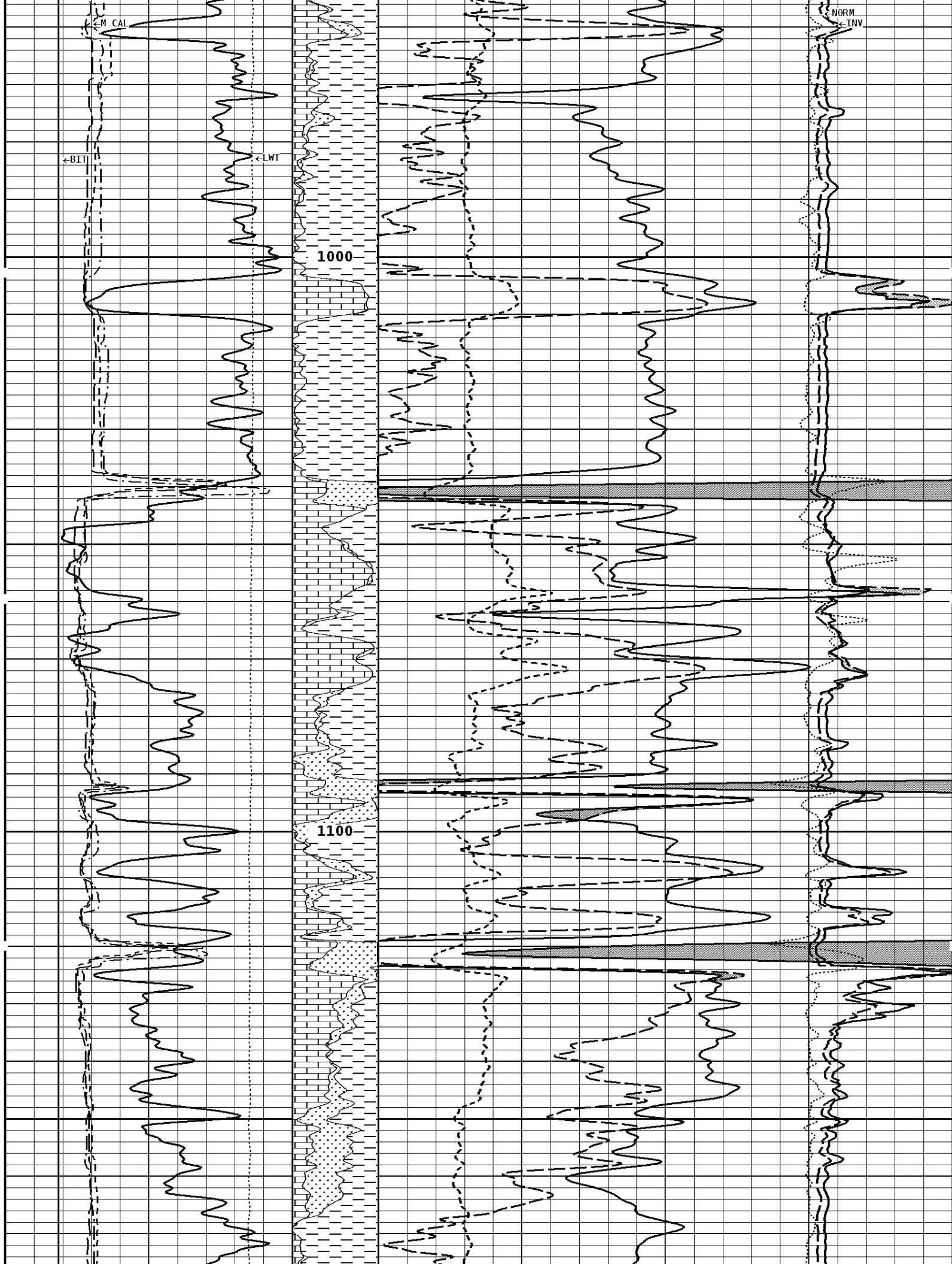
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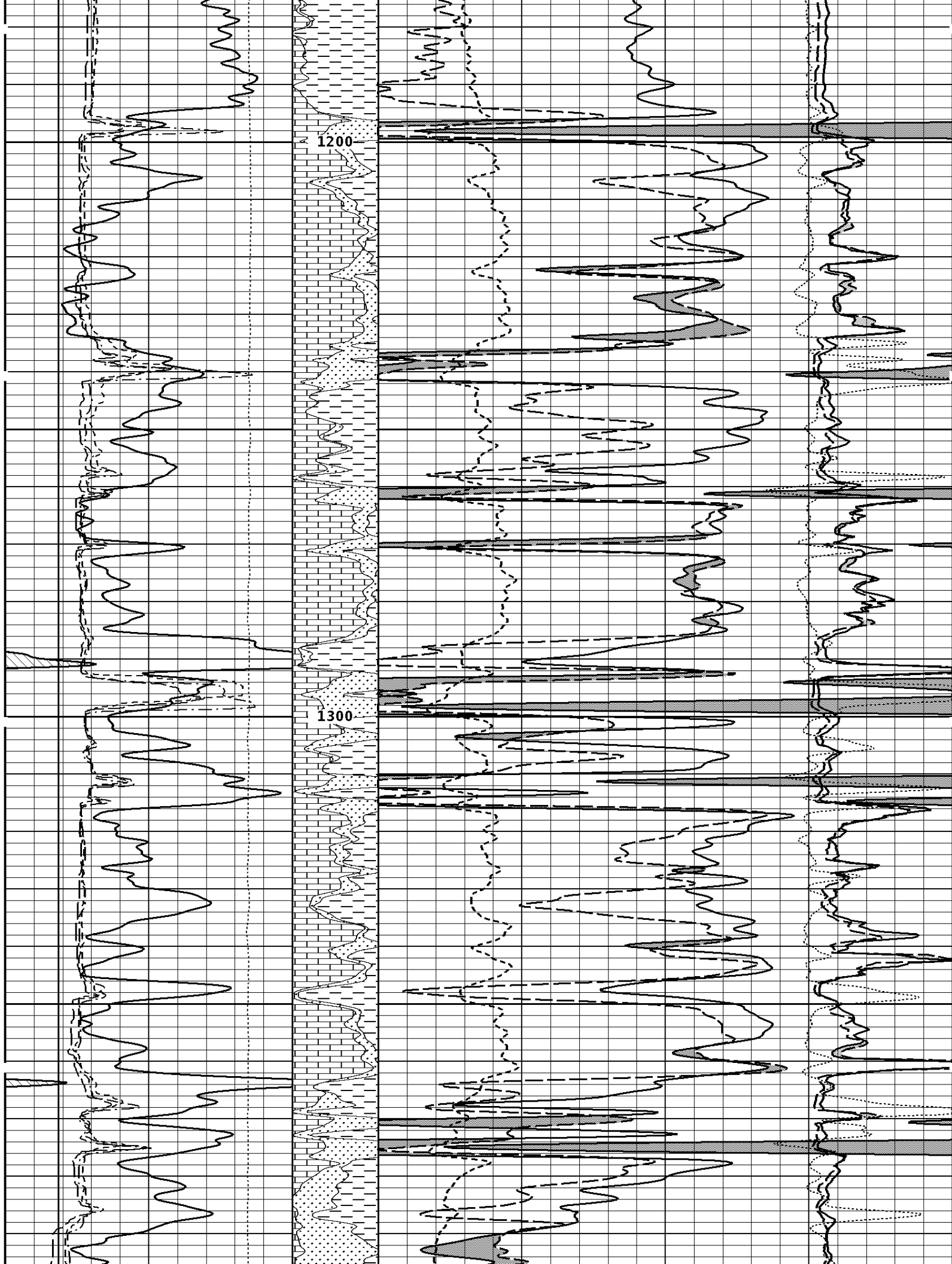
← L COR

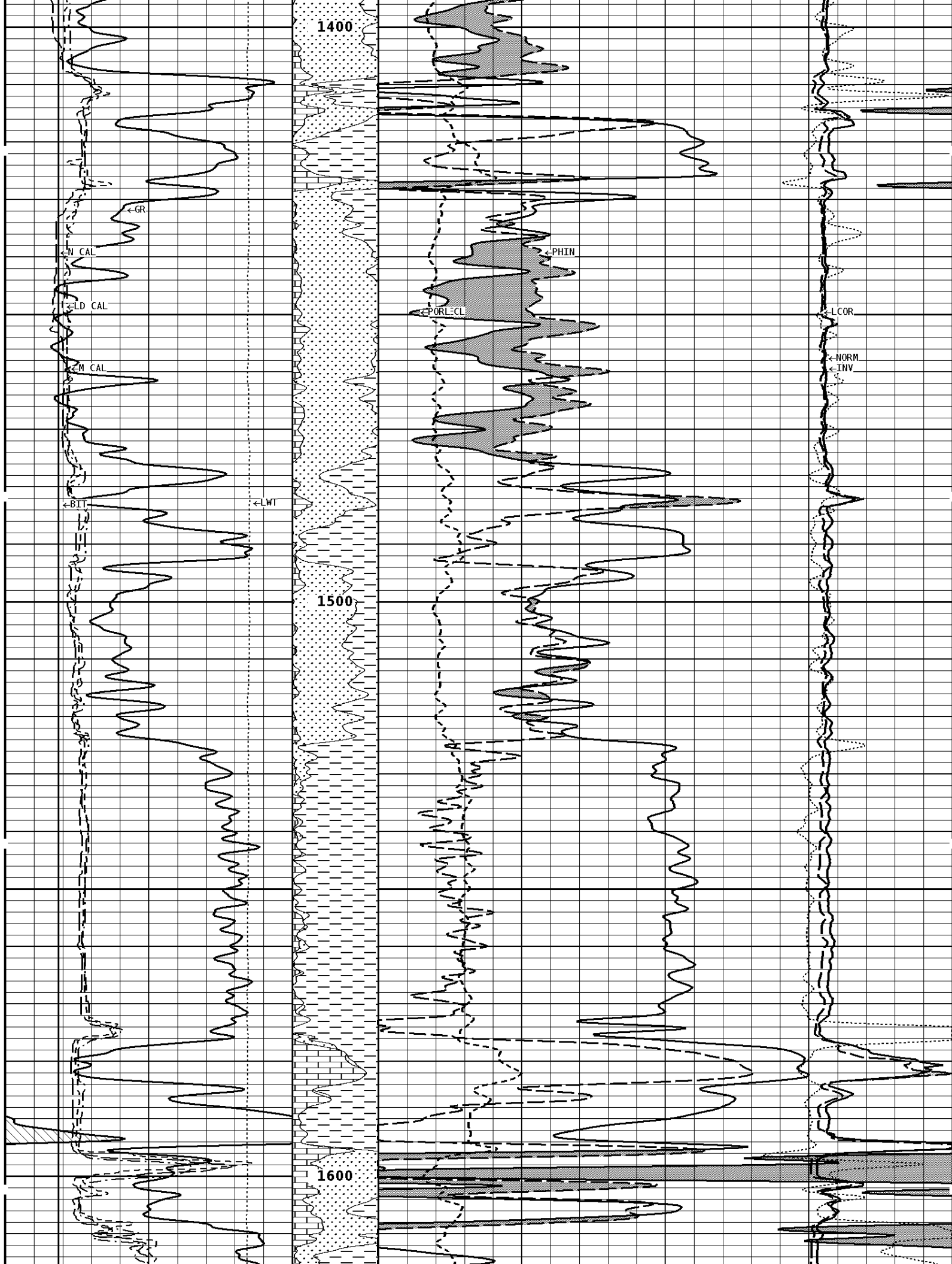
← NORM
← INV

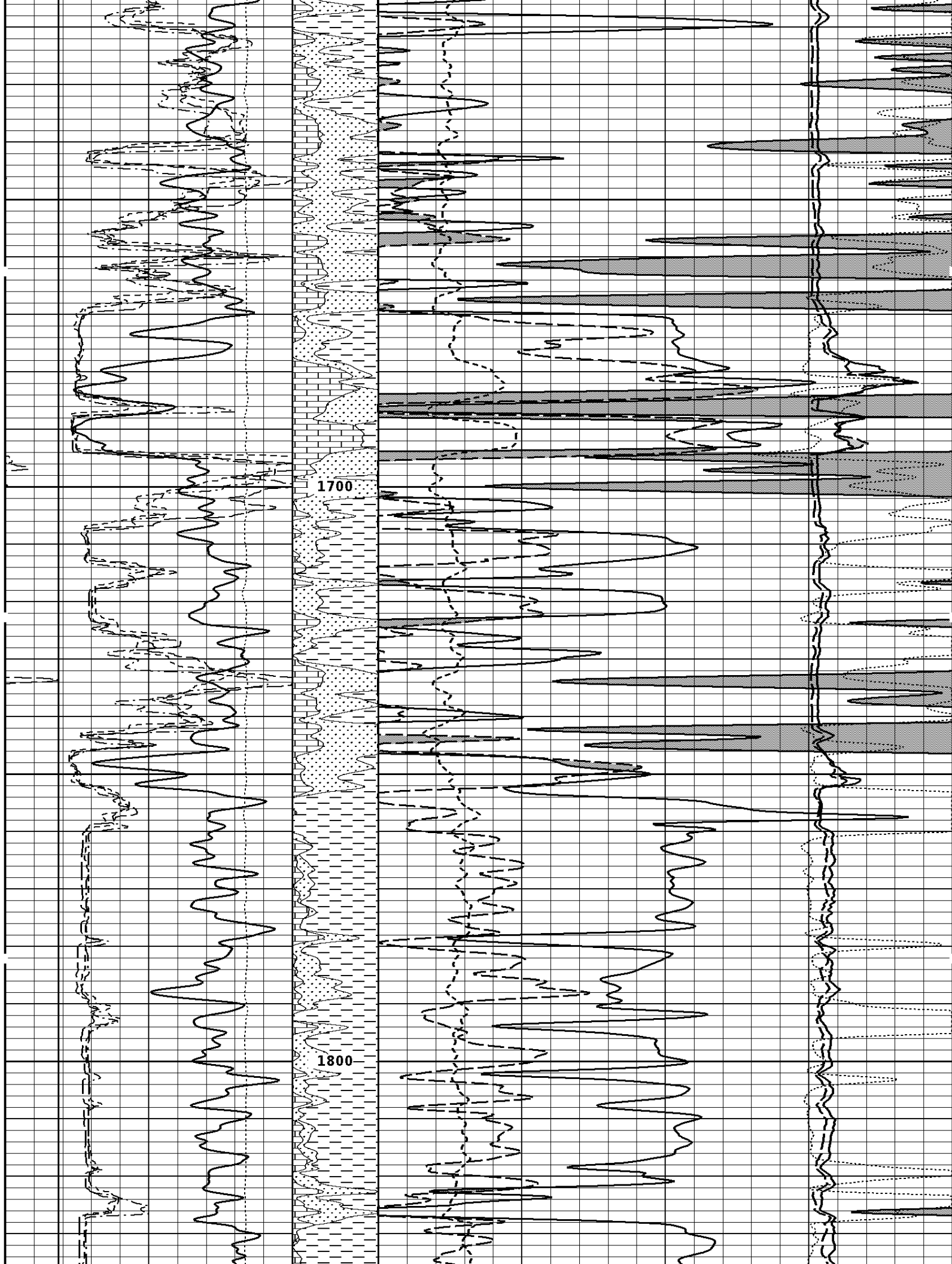


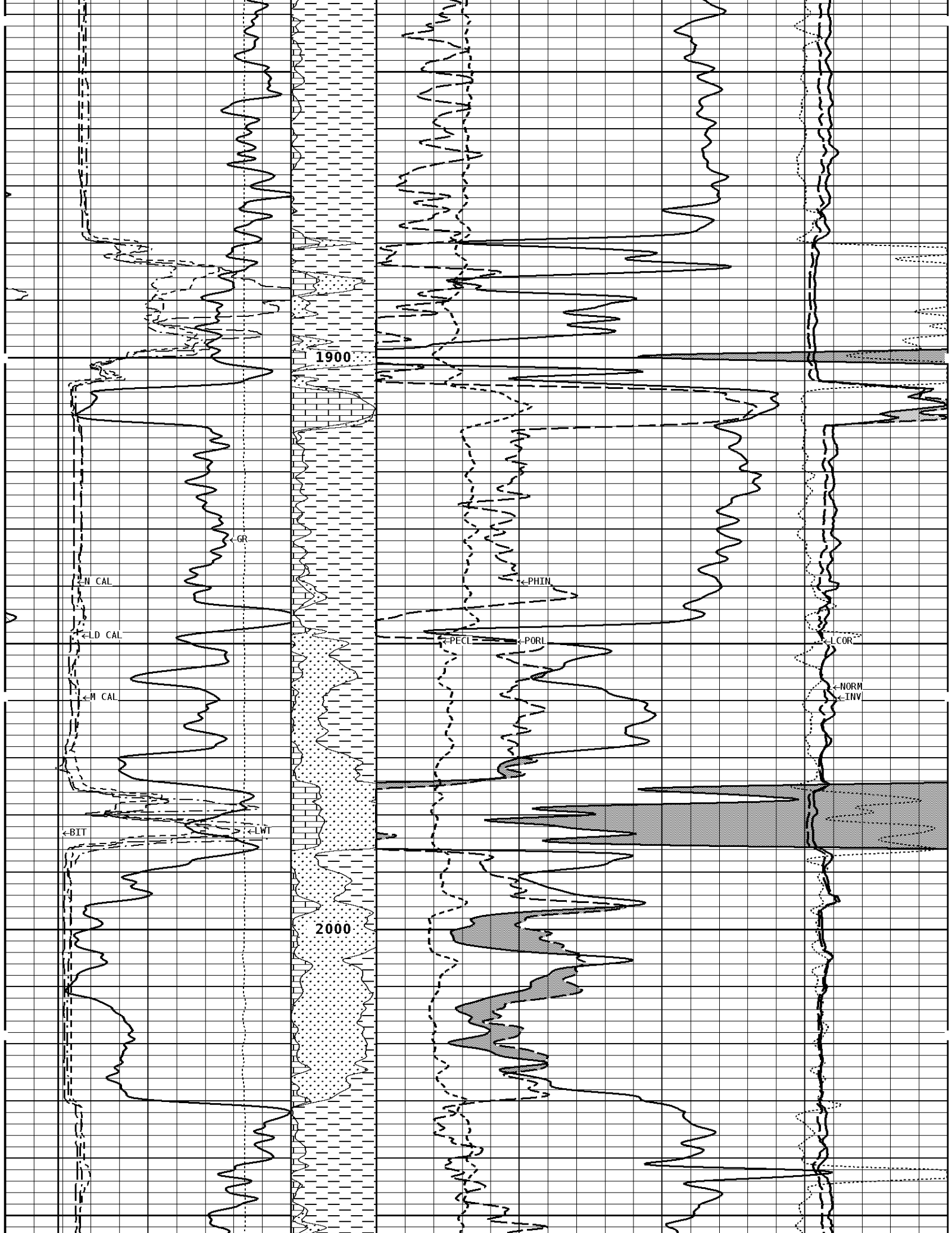












1900

2000

← 2-N CAL

← LD CAL

← M CAL

← BIT

B

← LWI

← PHIN

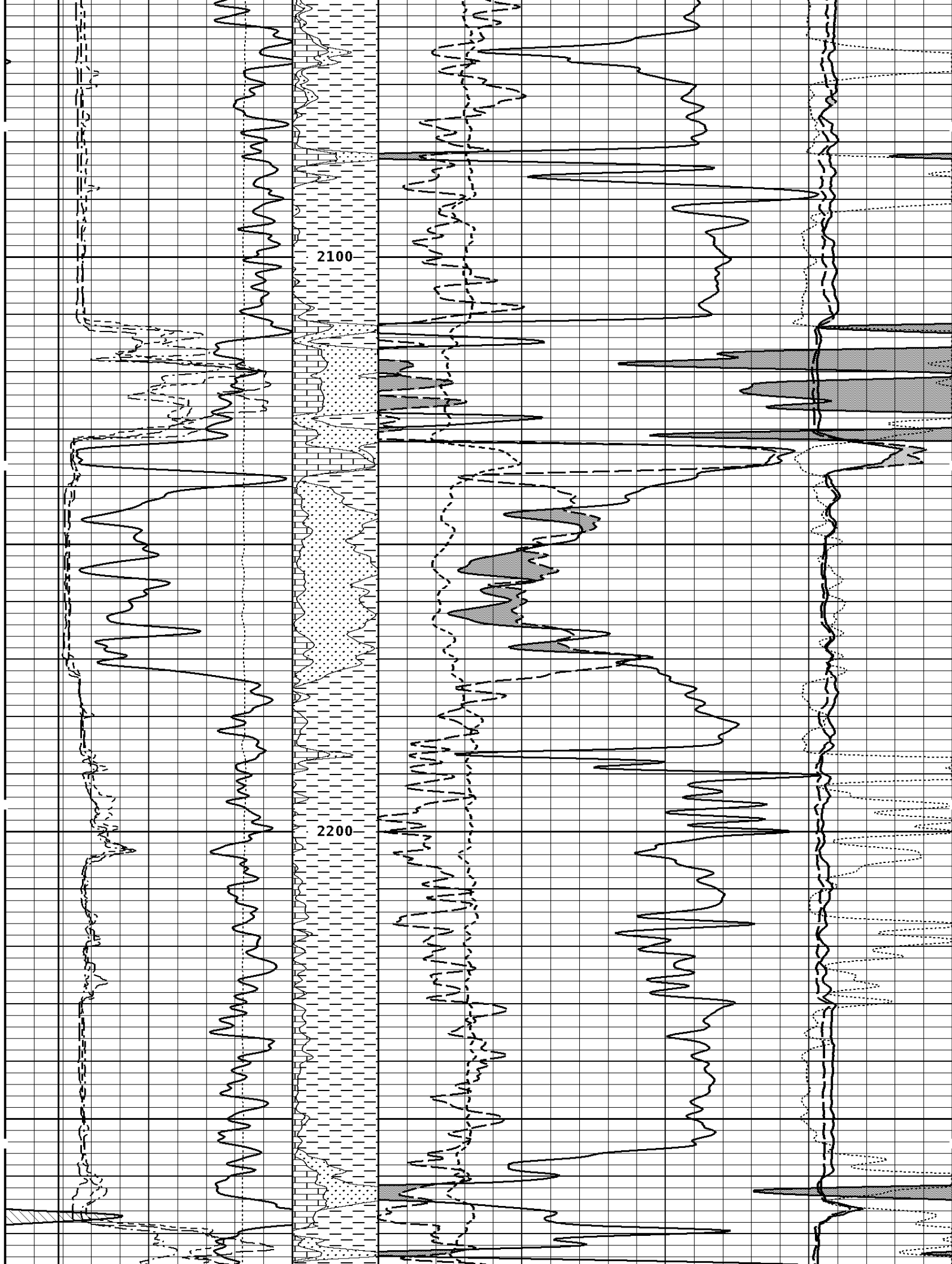
← PECL

← PORI

← L COR

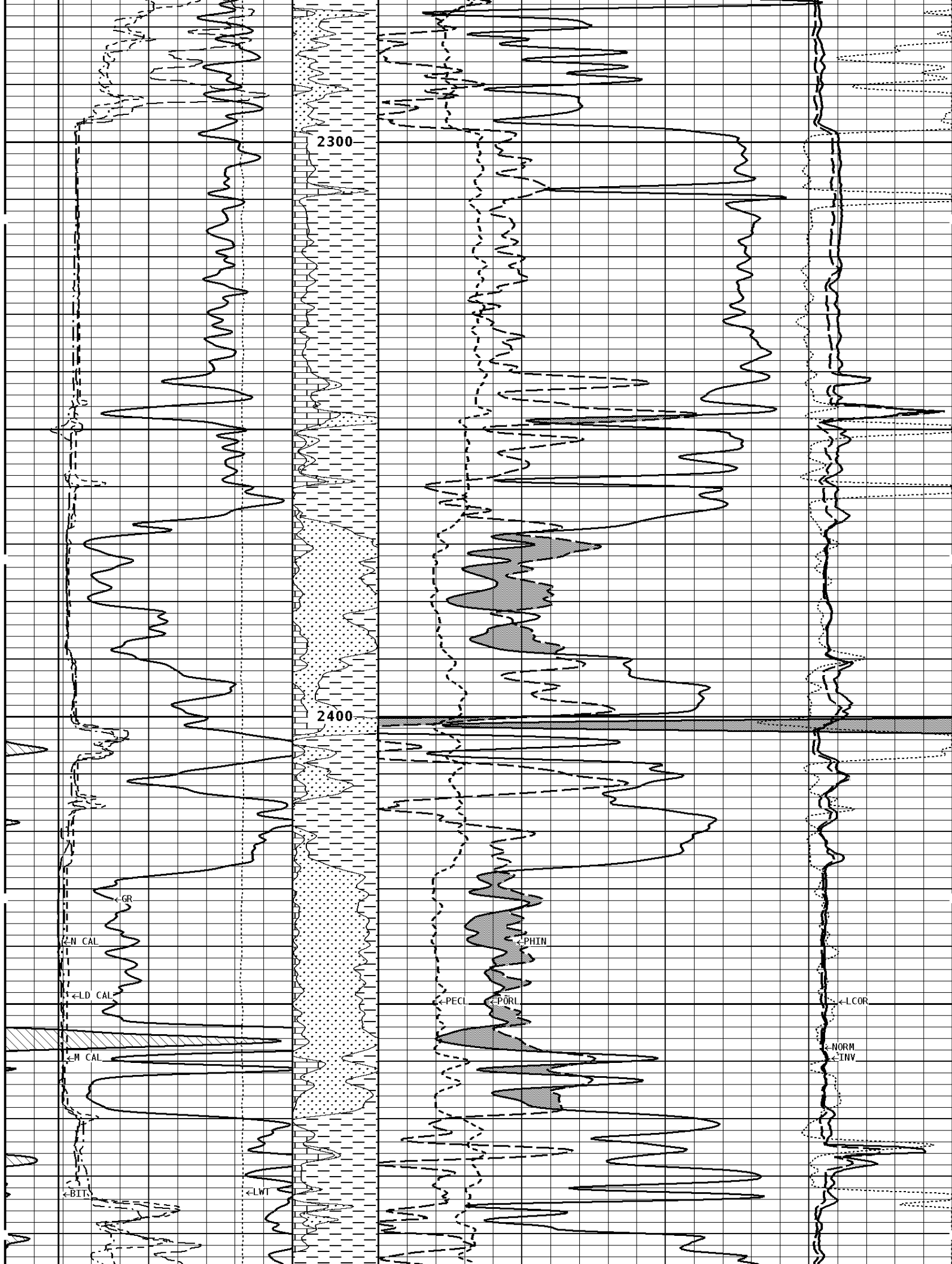
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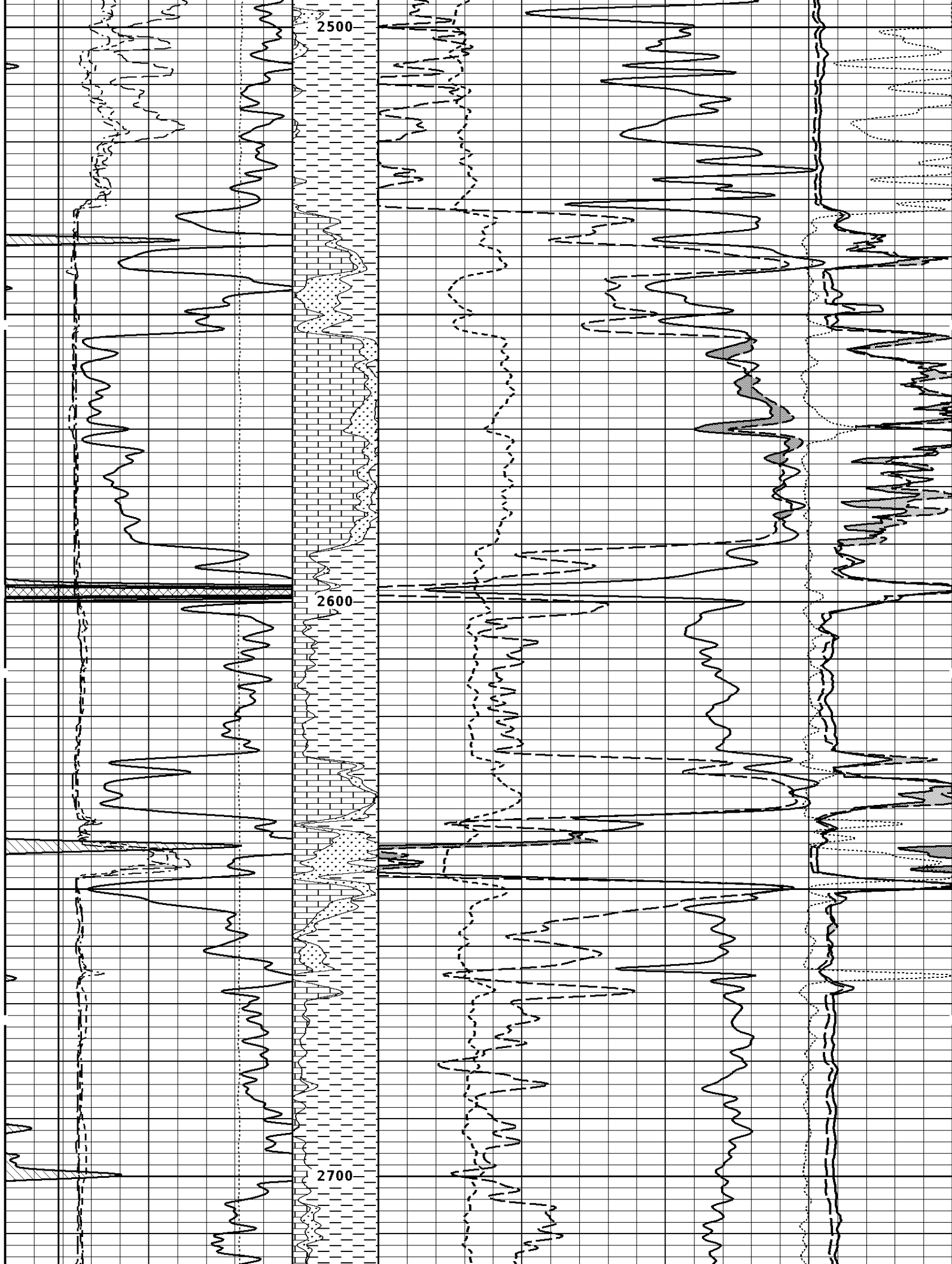
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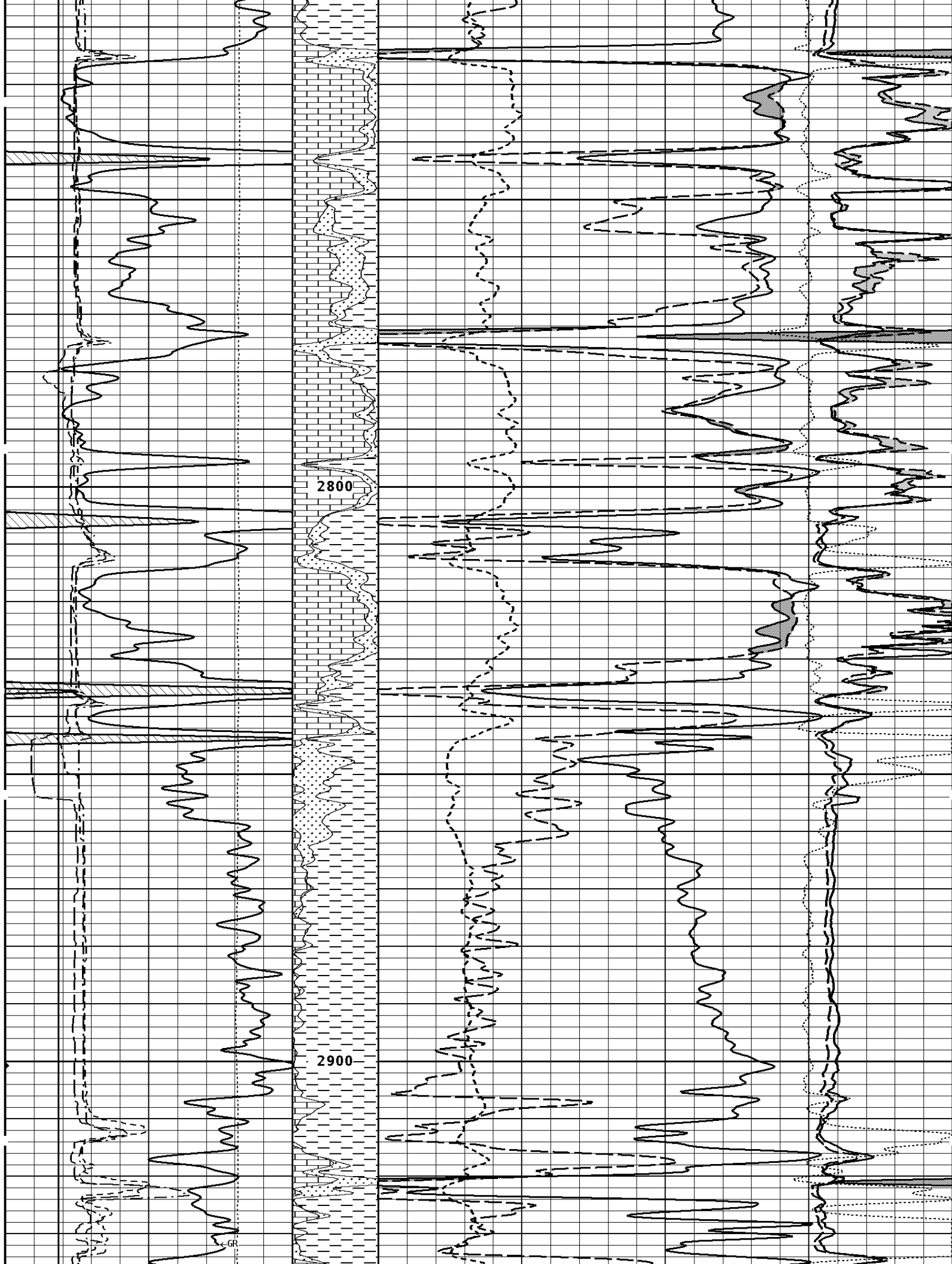


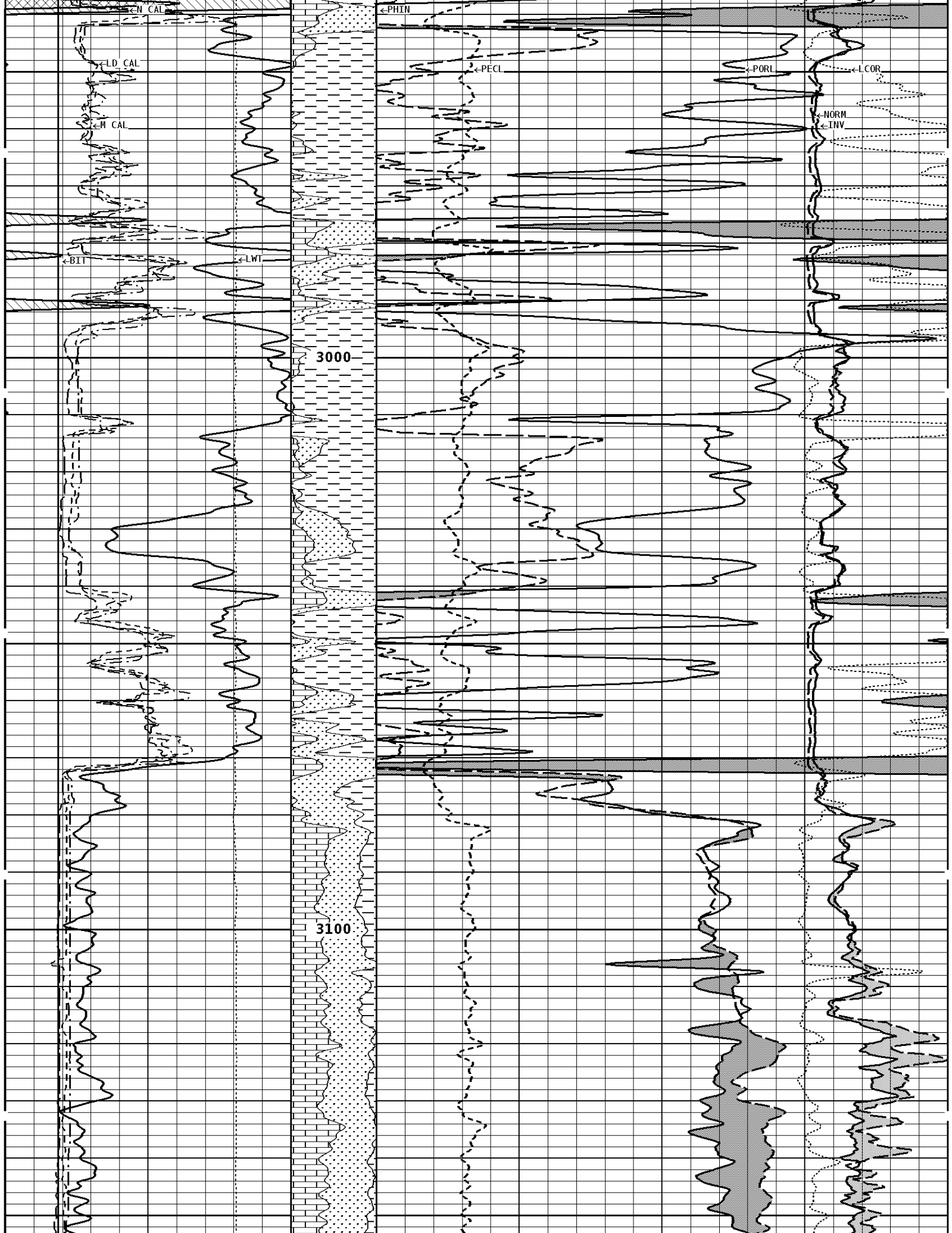
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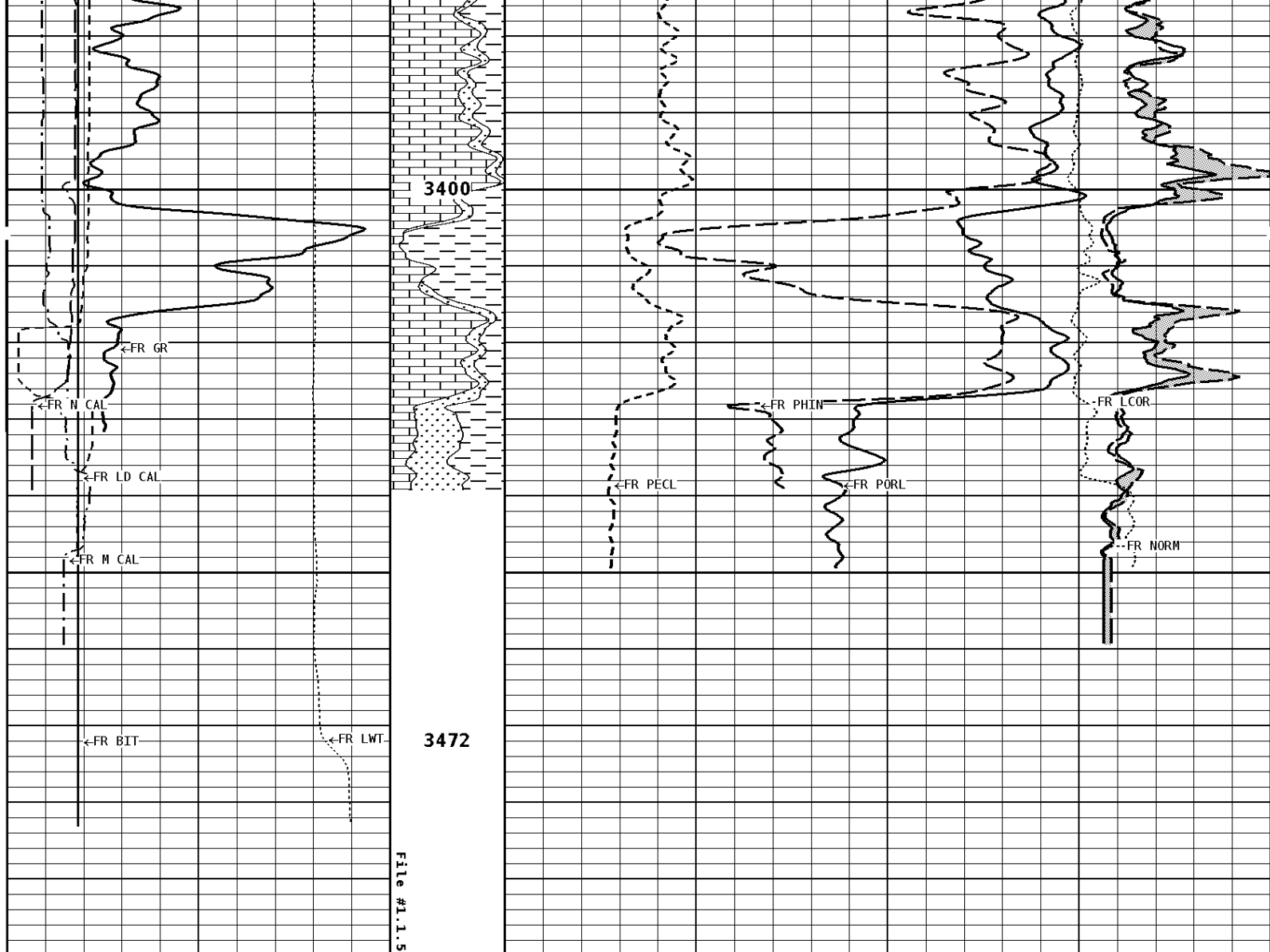
2200











1:240 MAIN SECTION

GAMMA RAY API UNITS 150 0 300 150		Volume Dolo/Shale 30	NEUTRON POROSITY (LIMESTONE) PERCENT -10	
TENSION LBS 10000 0		Volume Calcite 70 30 -10	DENSITY POROSITY (2.71g/cc) PERCENT 30 -10 -50	
DENSITY (X) CALIPER INCHES (IN) 16 6 26 16		Volume Quartz 0	PE CROSS-SECTION BARNS/ELECTRON 10	DENSITY CORRECTION G/CC -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 6 26 16				INVERSE OHM 0 40
BIT SIZE INCHES (IN) 6 16				NORMAL OHM 0 40
CALIPER MICRO INCHES (IN)				

16	INCHES (IN)	26
6		16

Well File: VAL ENERGY BIRDZELL OWWO 1-23 NOV3 MSTK Scale: 1:240 Format: LDT-240
 Segment: V1.D1.S5 FINAL MAIN Acquired: Not Available
 Reference: 0 Processed: Not Available

BIT SIZE INCHES (IN)	
6	16

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

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

TENSION LBS	
10000	0

GAMMA RAY API UNITS	
150	300
0	150

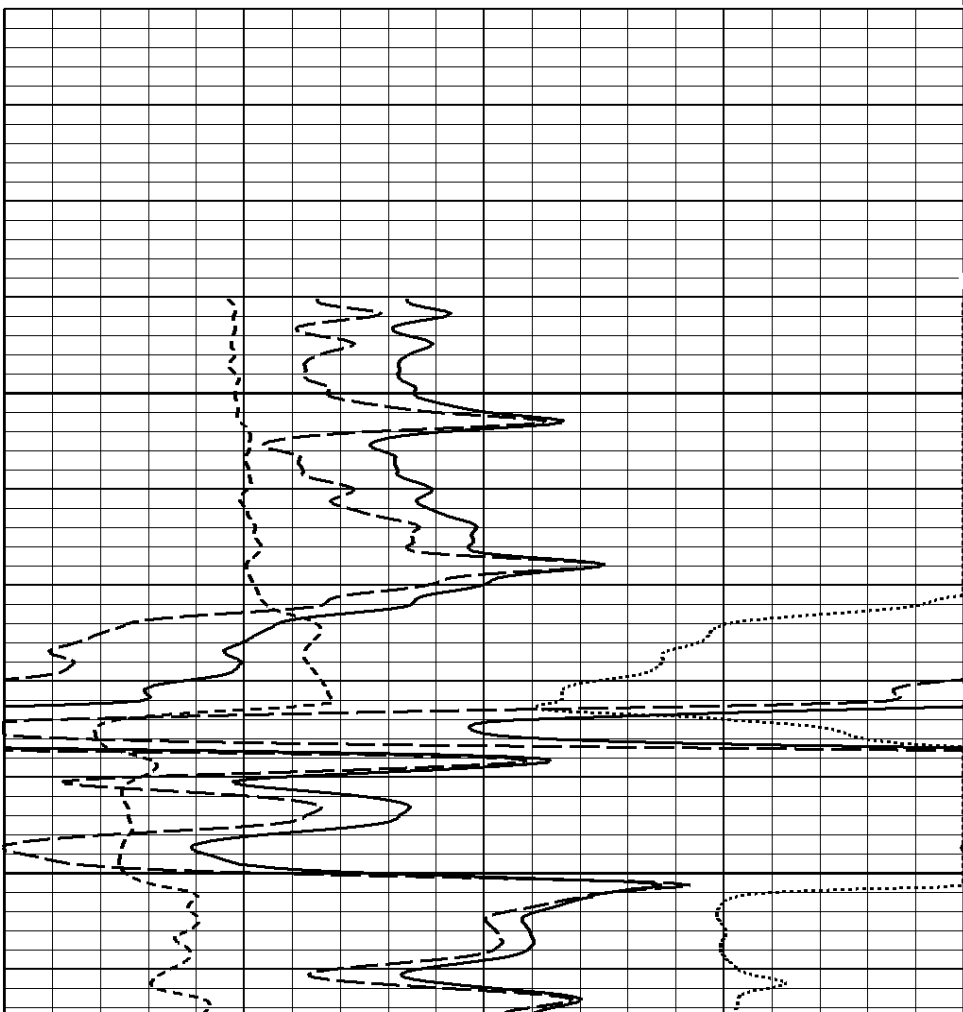
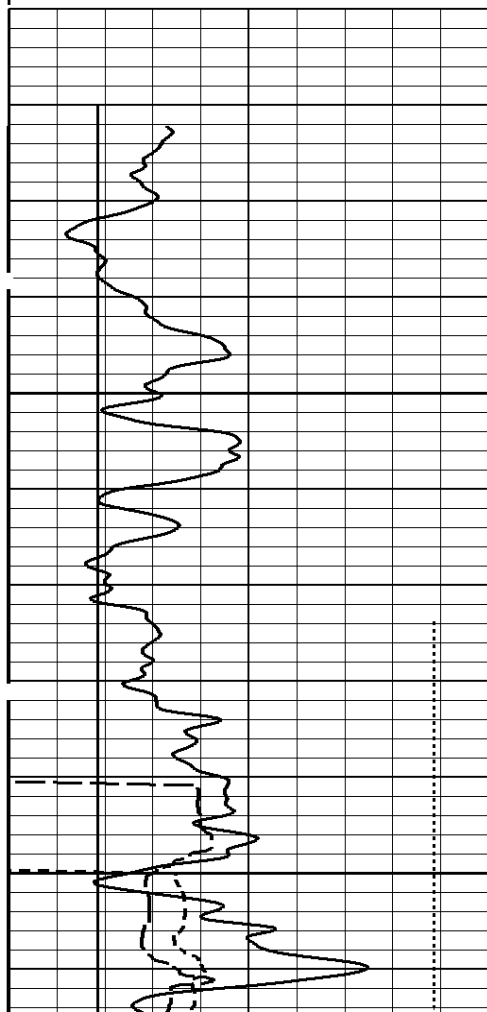
PE CROSS-SECTION BARN/ELECTRON	DENSITY CORRECTION G/CC
0	10 -0.25

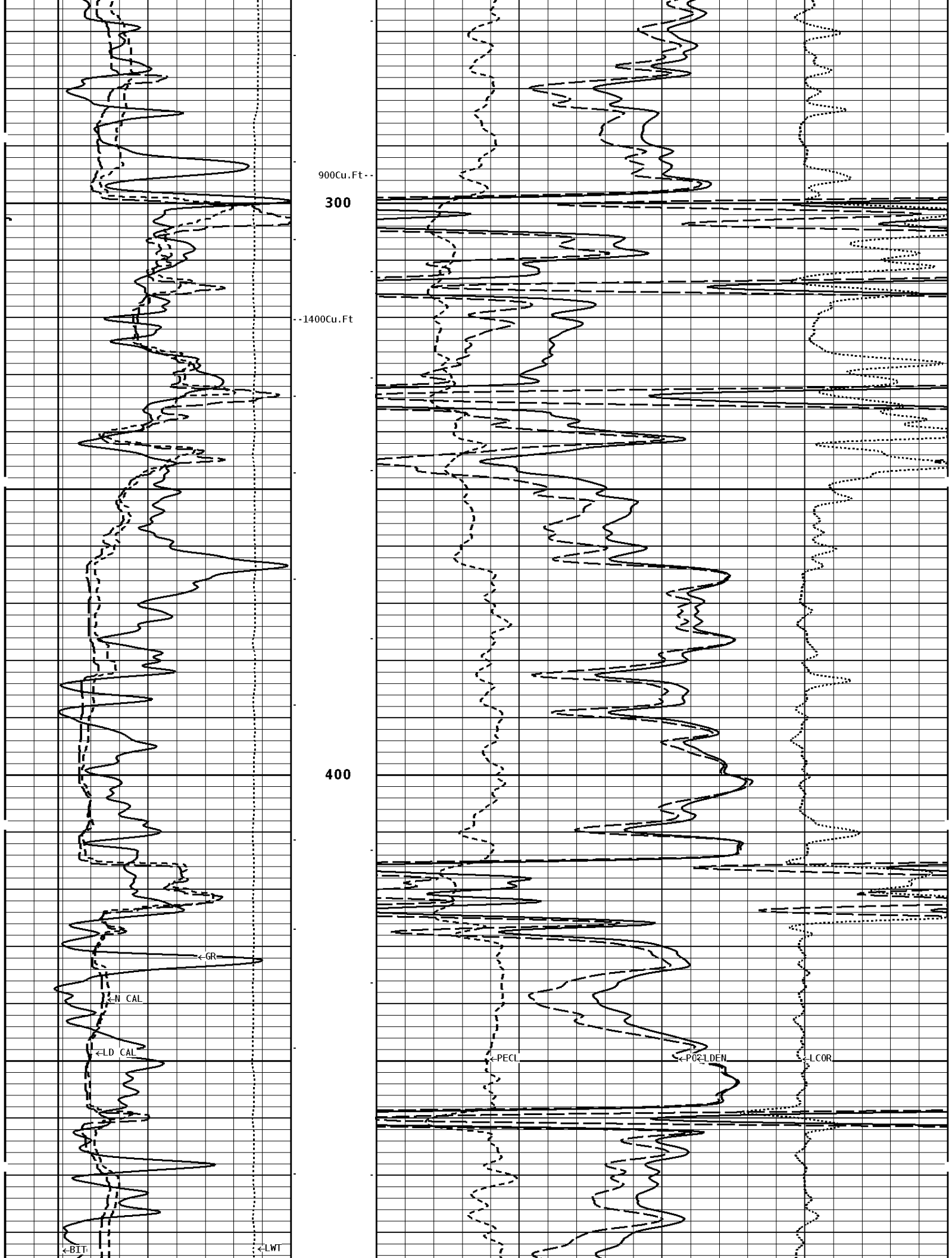
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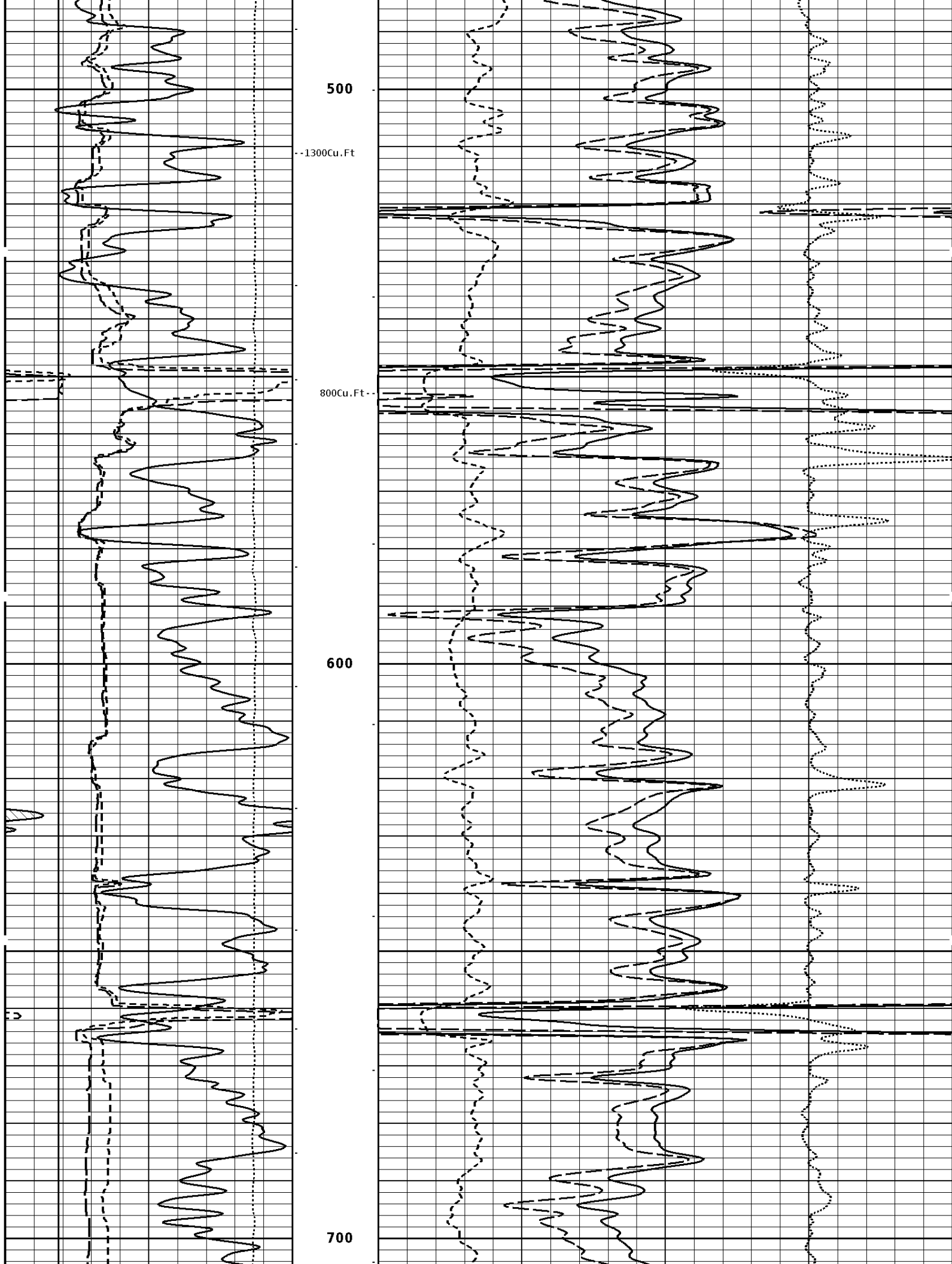
COMPENSATED BULK DENSITY G/CC	
3.0	4.0
2.0	3.0
1.0	2.0

-BHV AHV - CU. FT	DENSITY POROSITY (2.71g/cc) PERCENT
70	30
30	-10
-10	-50

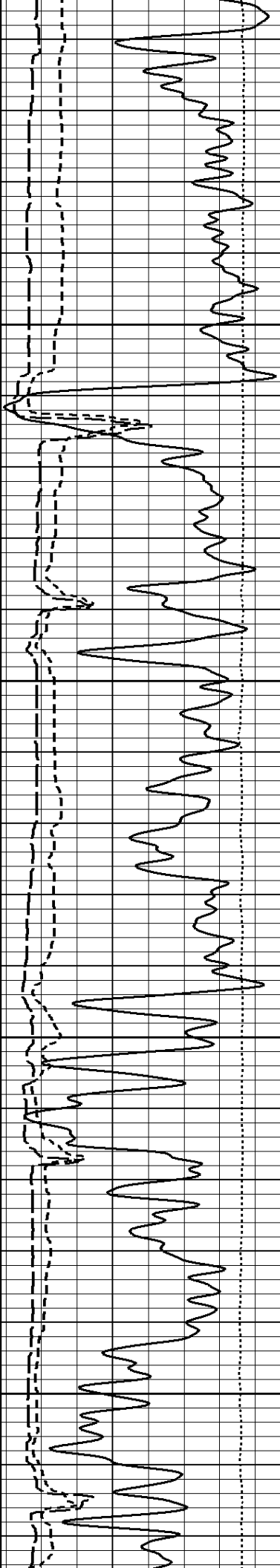
1:240 MAIN SECTION
BULK DENSITY







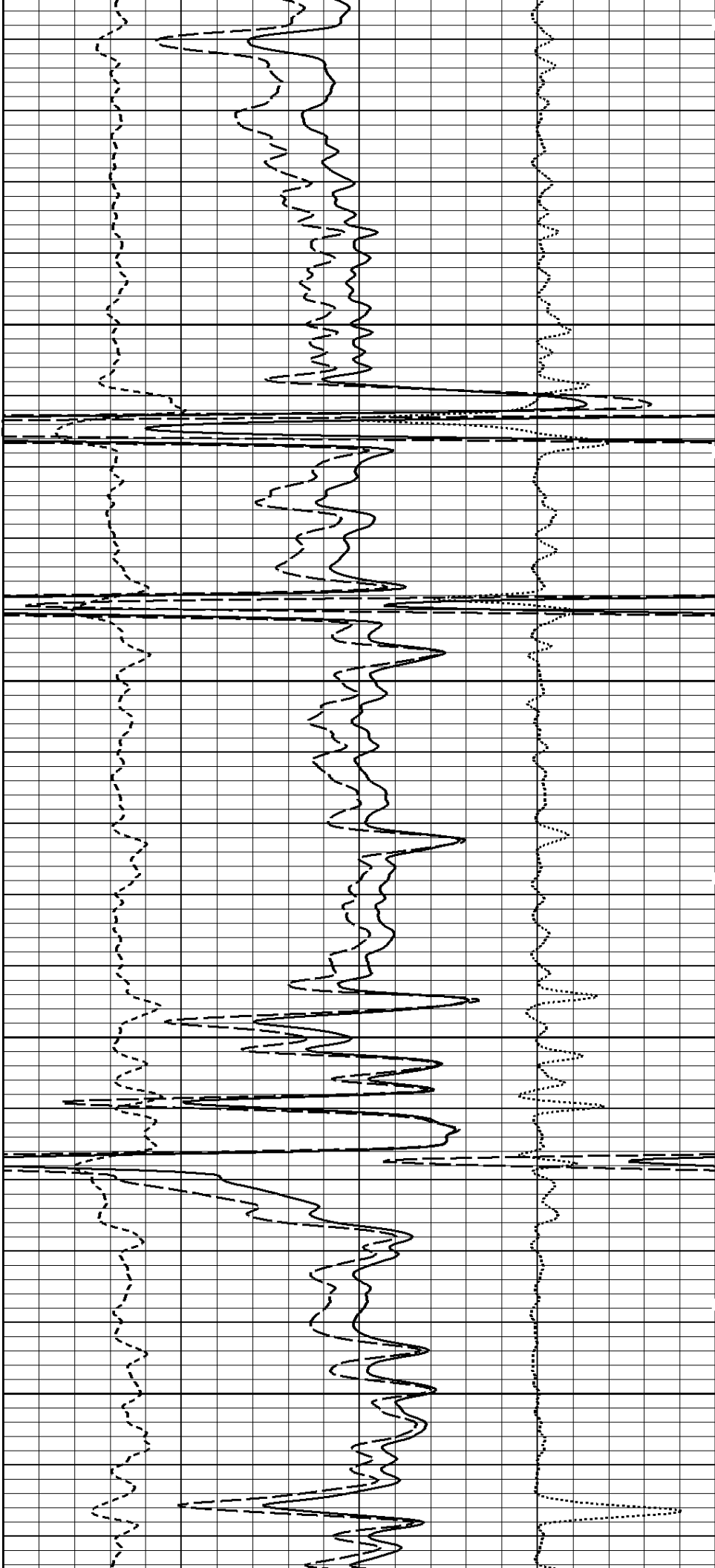
-1200Cu.Ft



800

700Cu.Ft

900



-1100Cu.Ft

← GR
← EN CAL
← LD CAL

← BIT ← WT

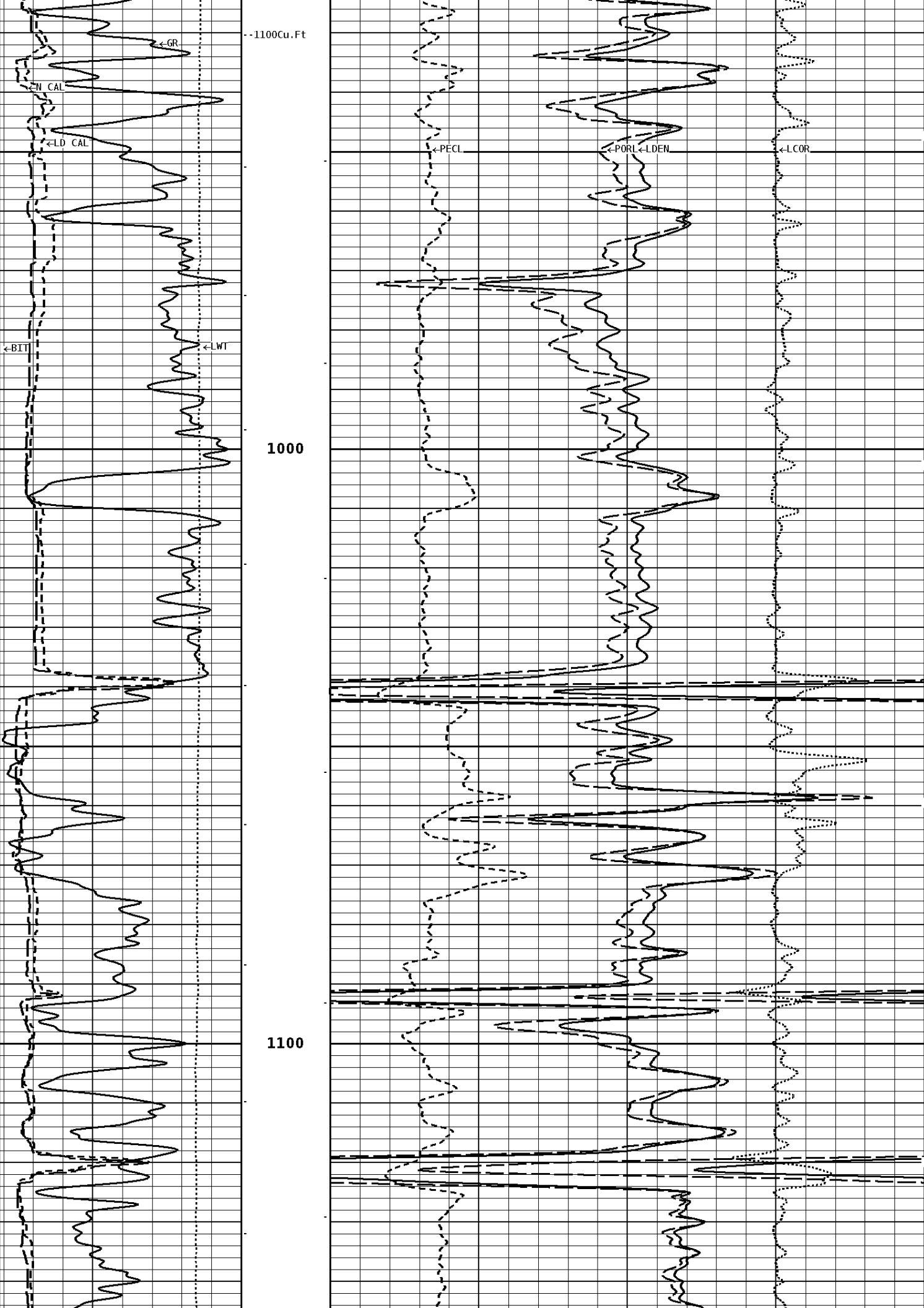
1000

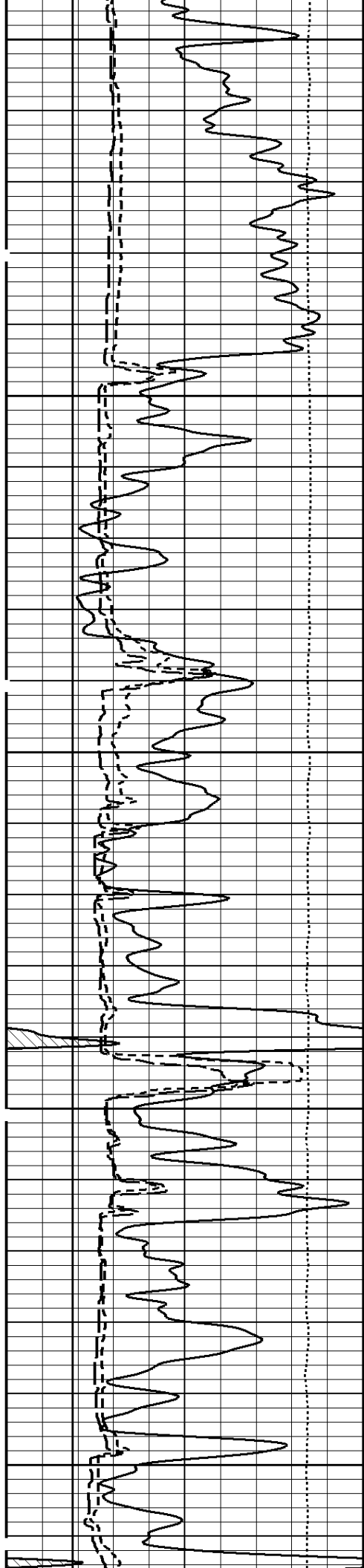
1100

← PECL

← PORL ← LDEN

← LCOR



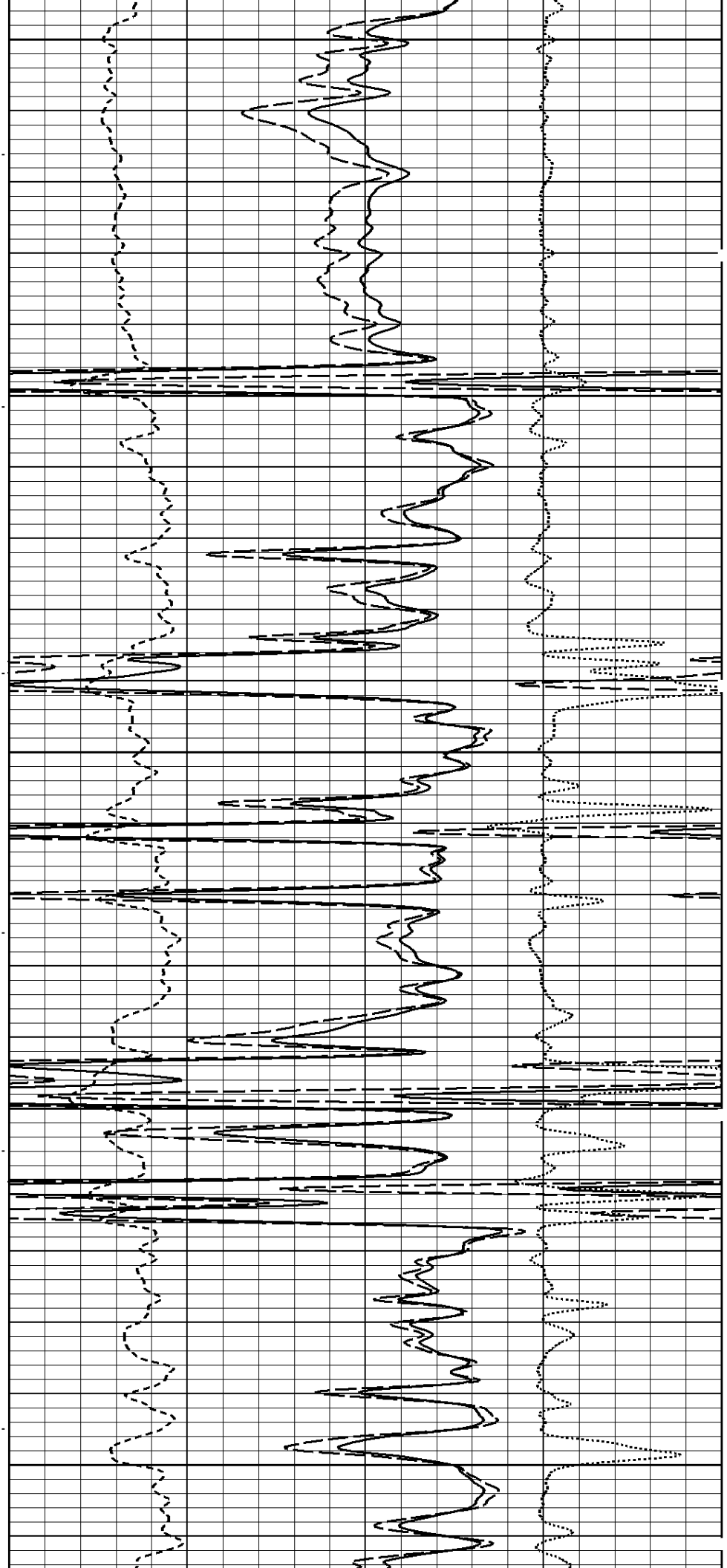


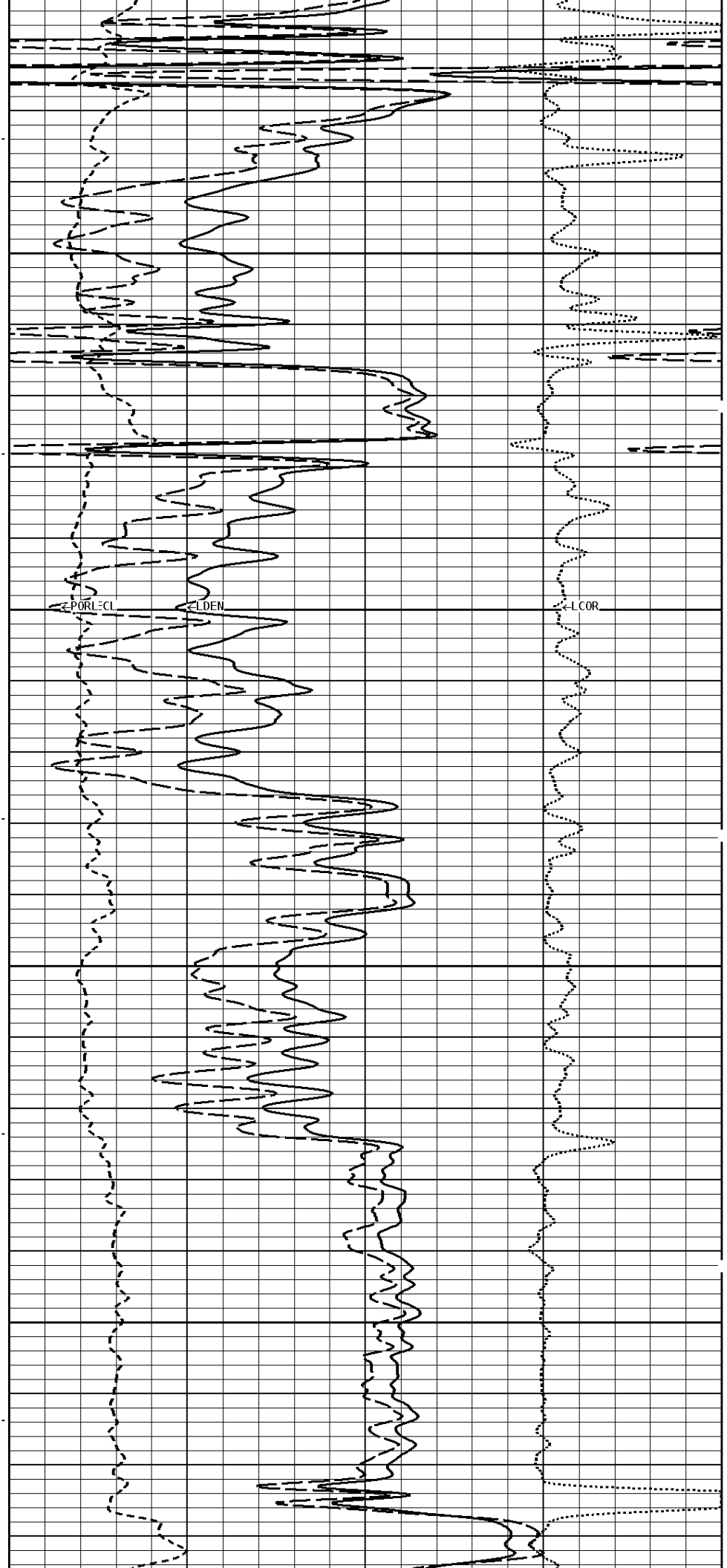
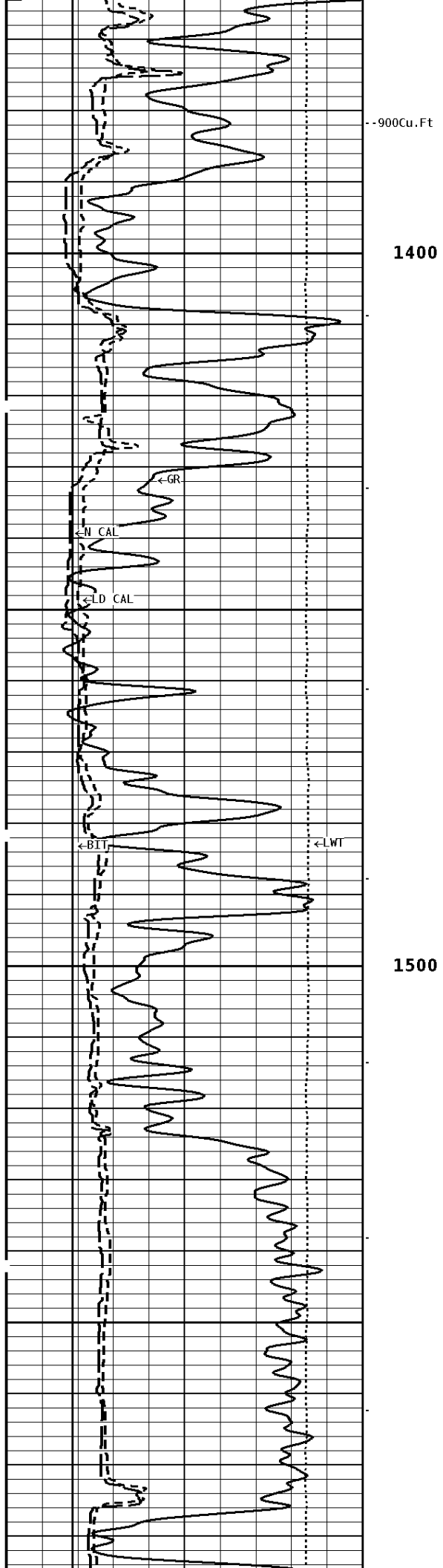
1000Cu.Ft

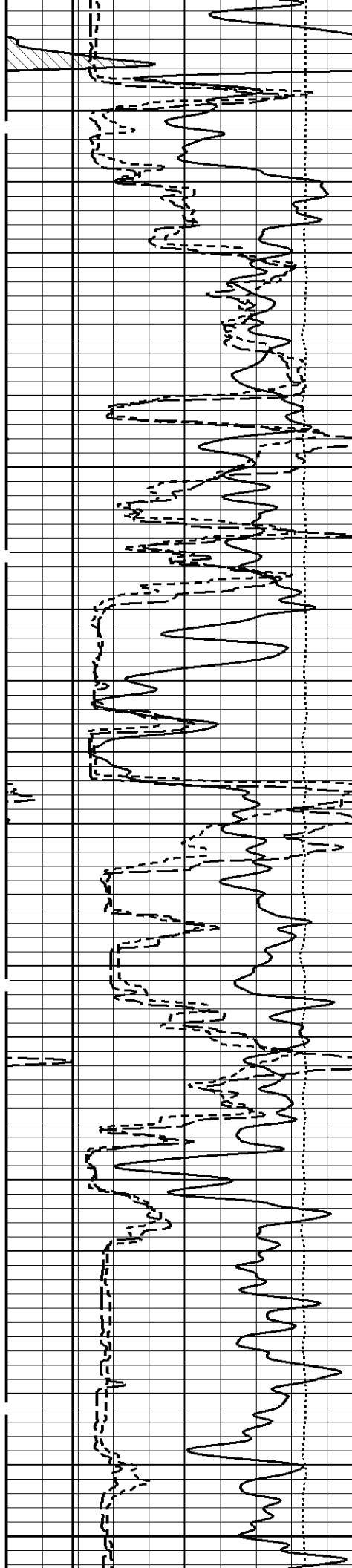
1200

600Cu.Ft

1300







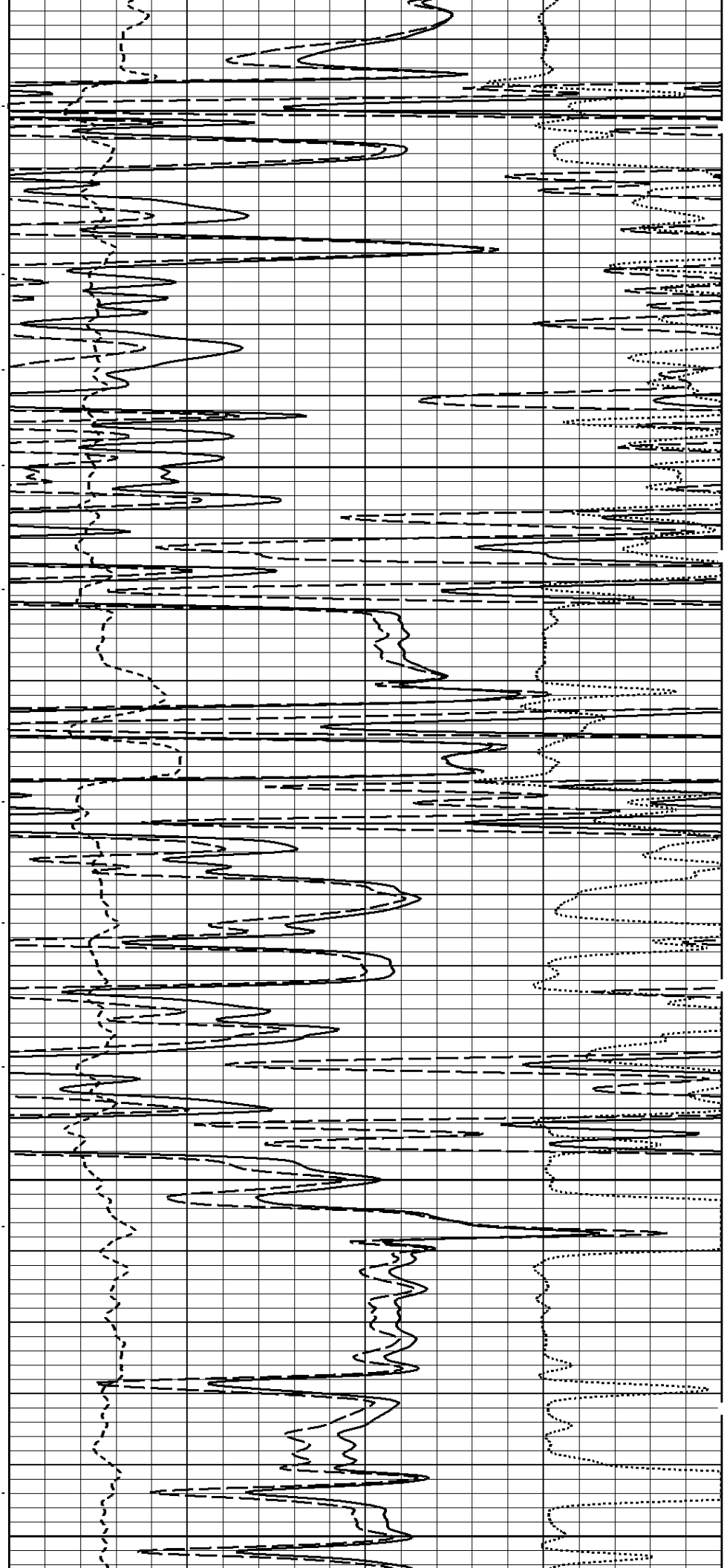
1600

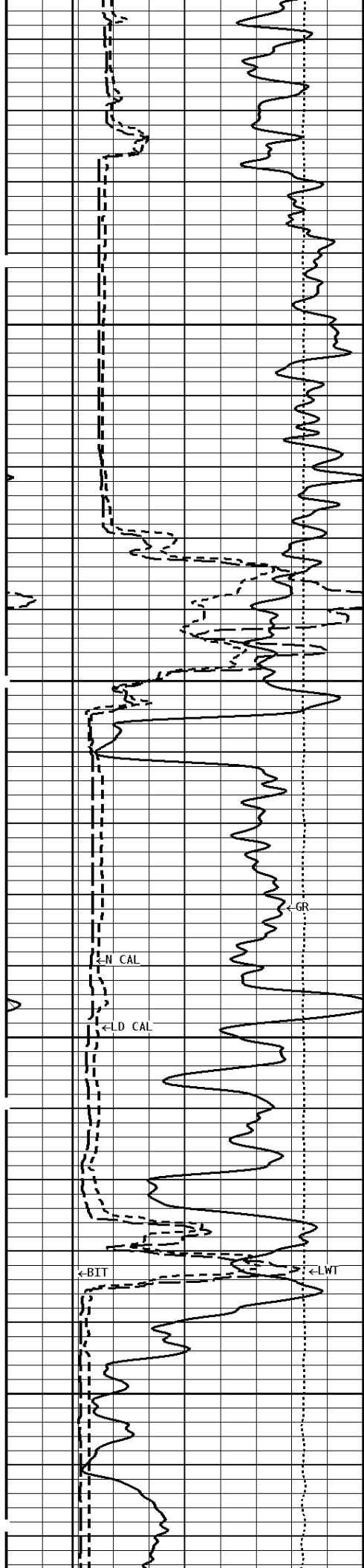
-800Cu.Ft.Ft.-

1700

-700Cu.Ft

1800



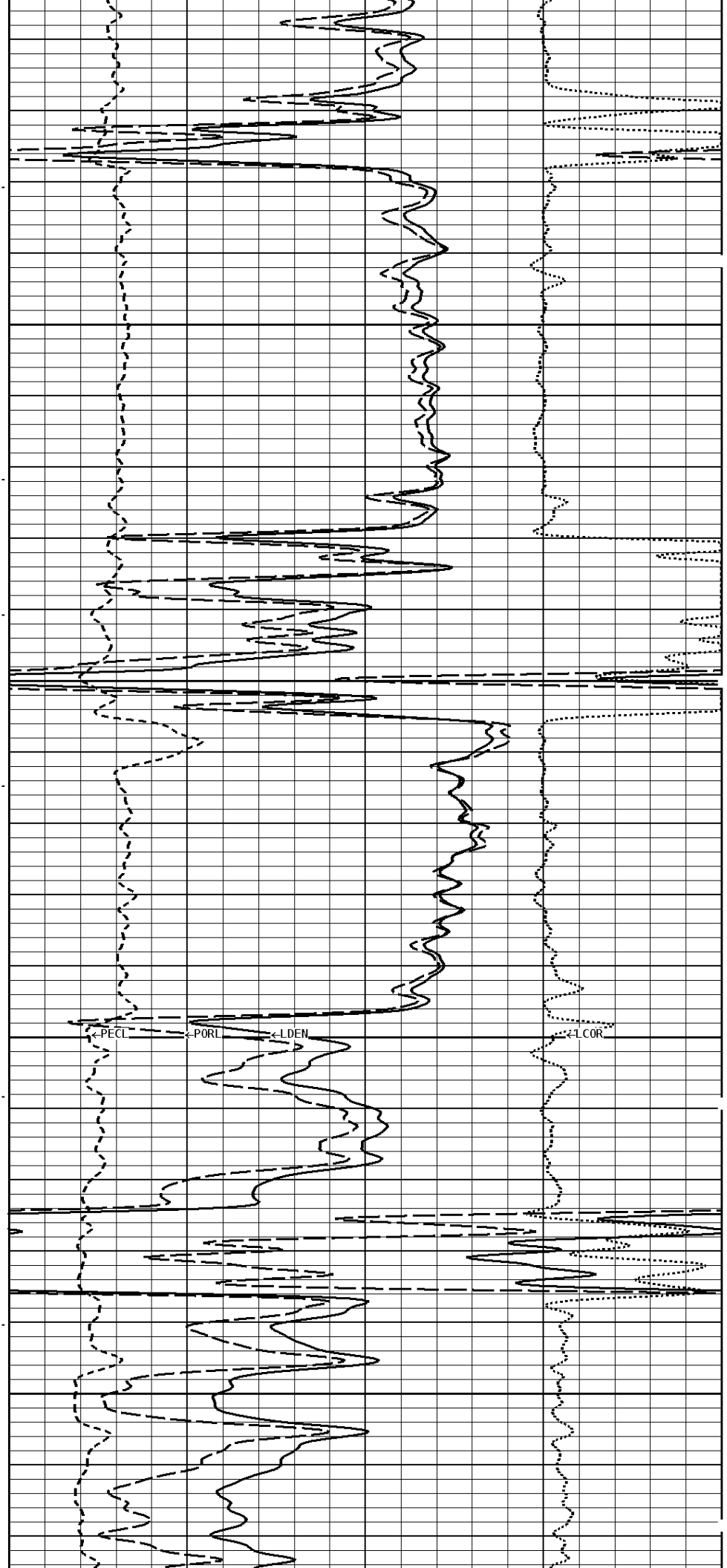


400Cu.Ft

1900

600Cu.Ft

2000

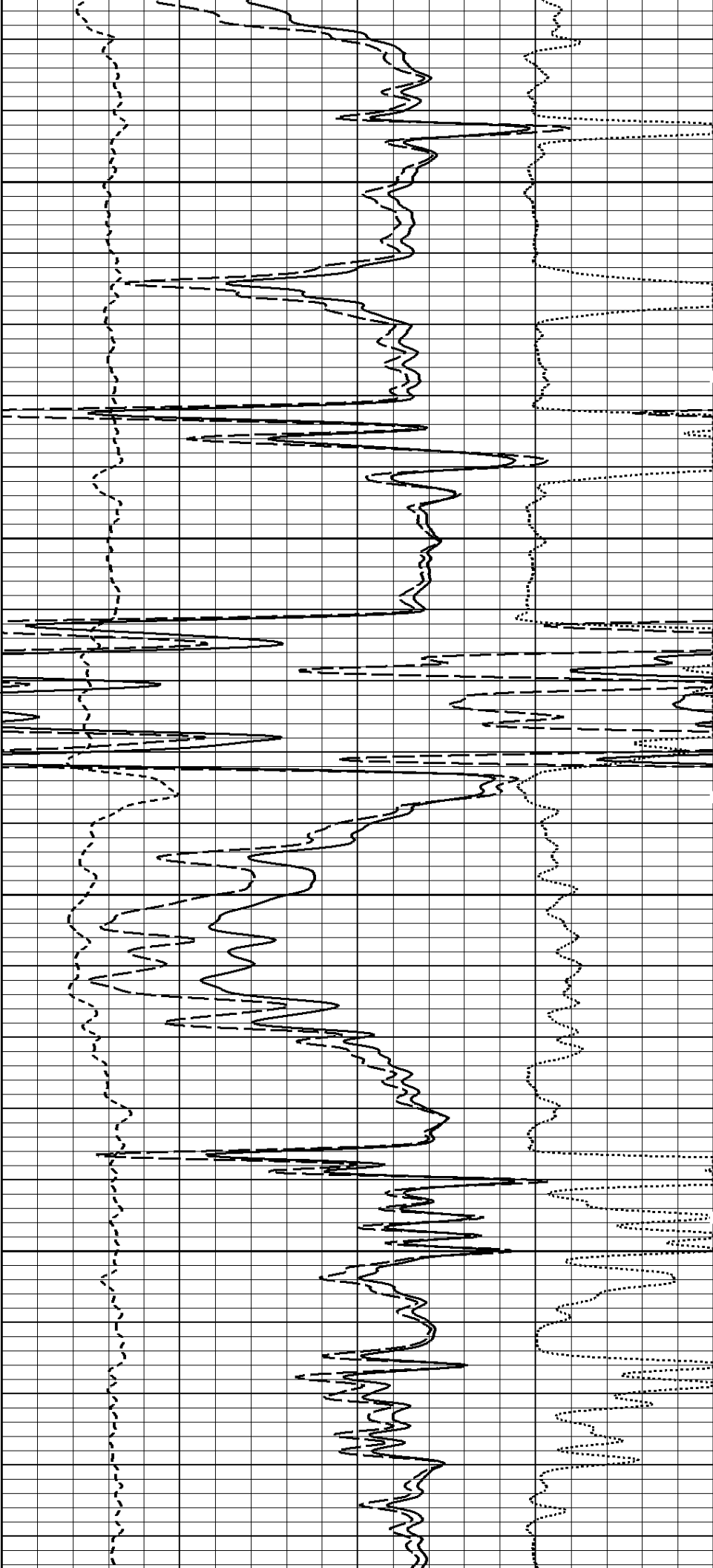
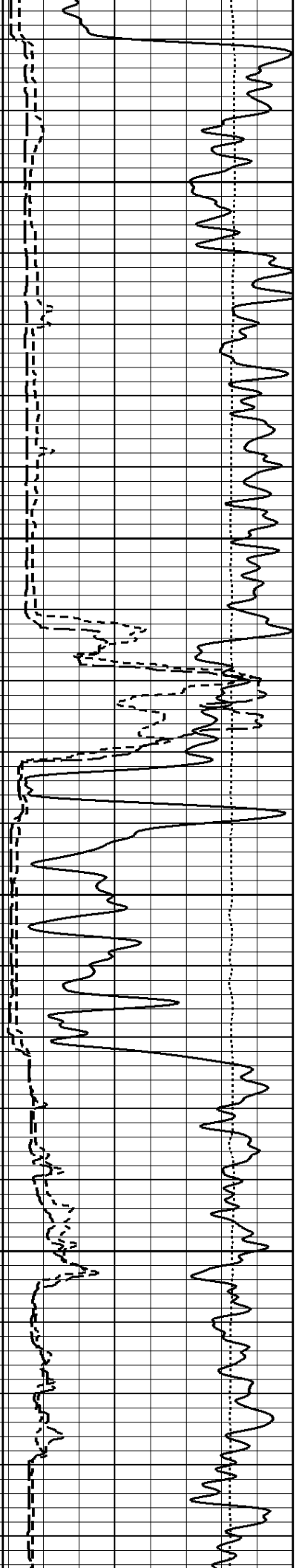


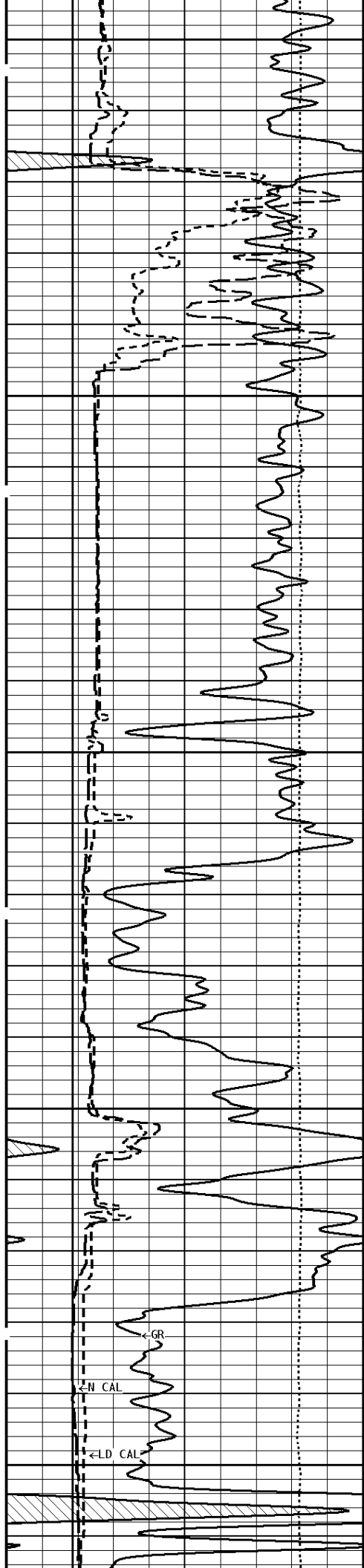
2100

2200

300Cu.Ft--

--500Cu.Ft



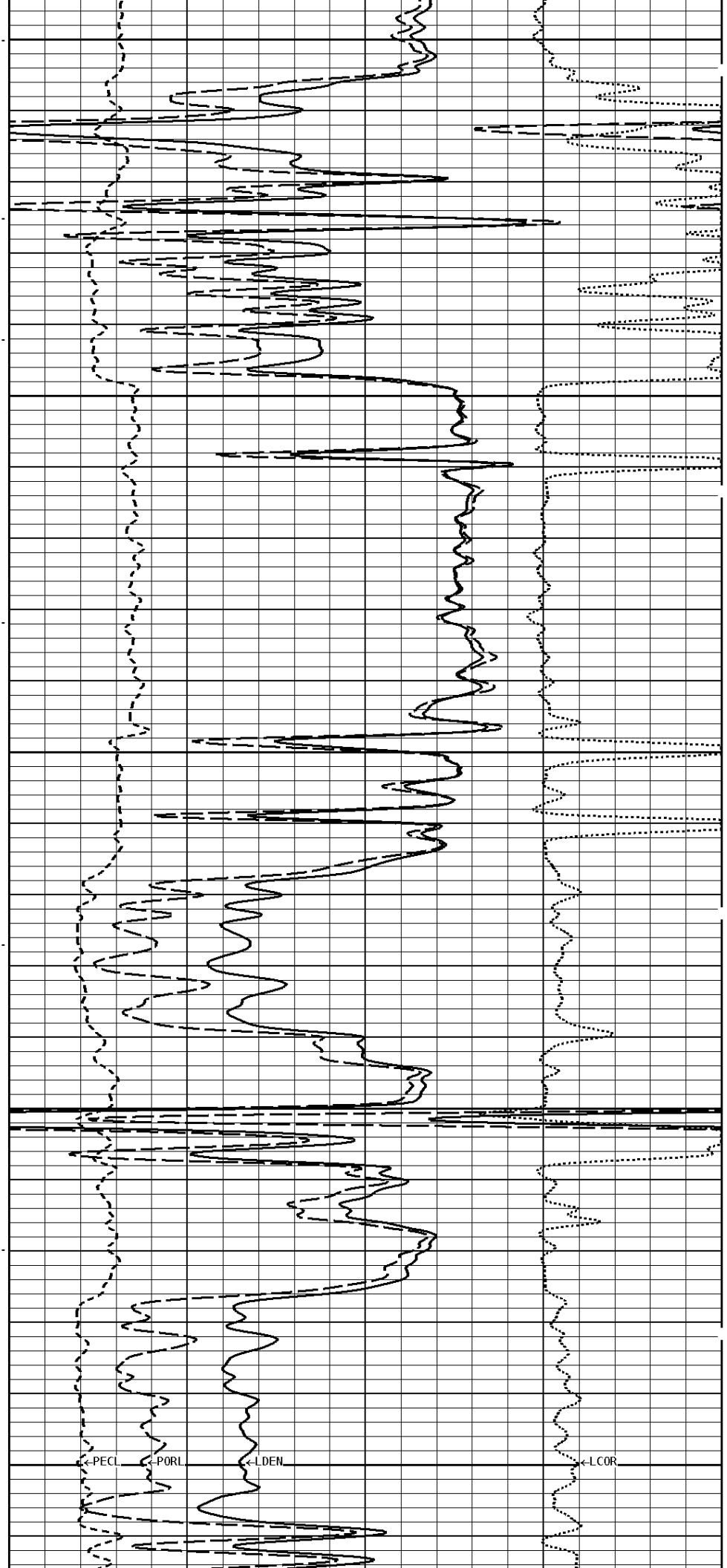


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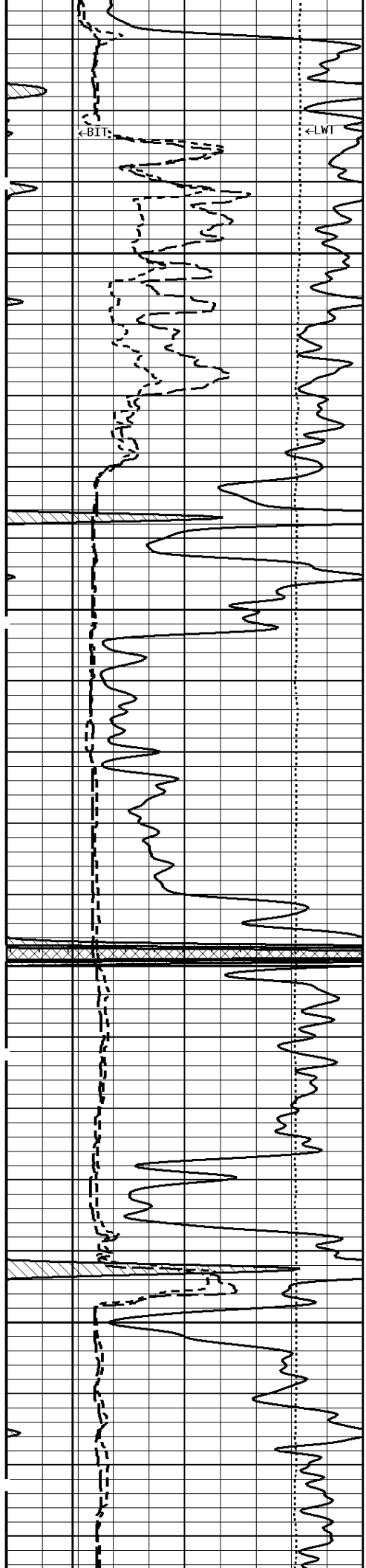
2400

-400Cu.Ft

GR
N CAL
LD CAL



PECL PORL LDEN LCOR

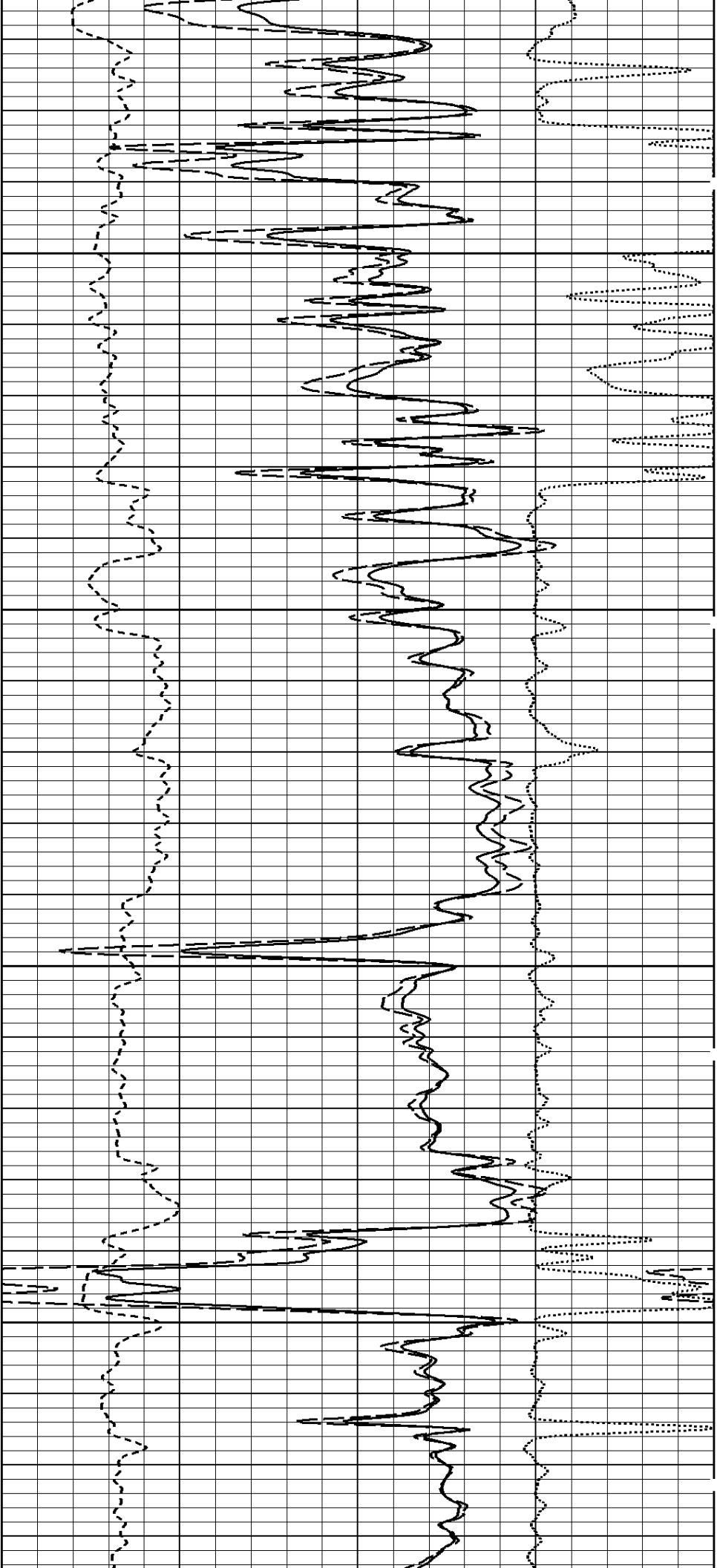


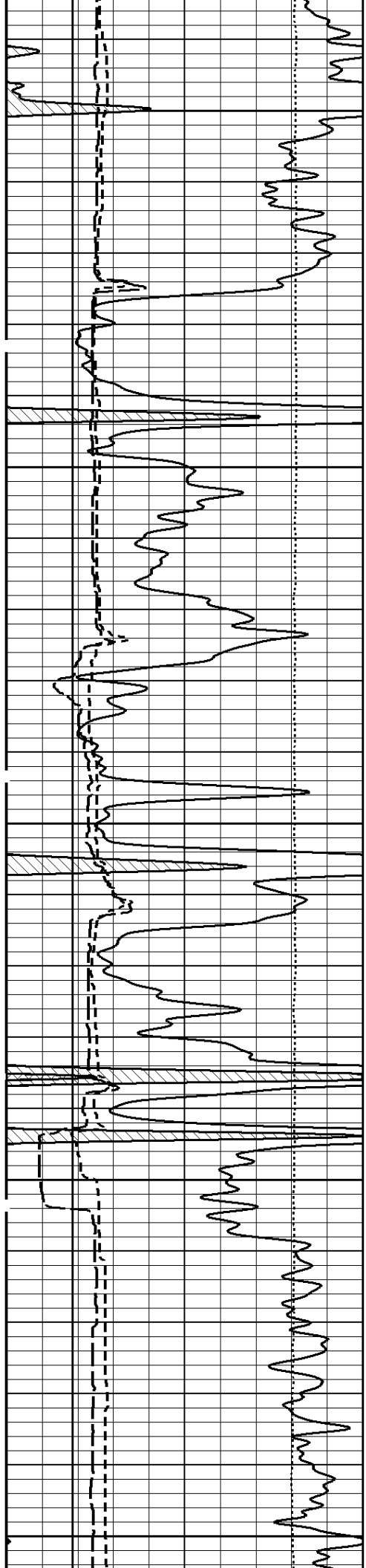
2500

200Cu.Ft--

2600

--300Cu.Ft

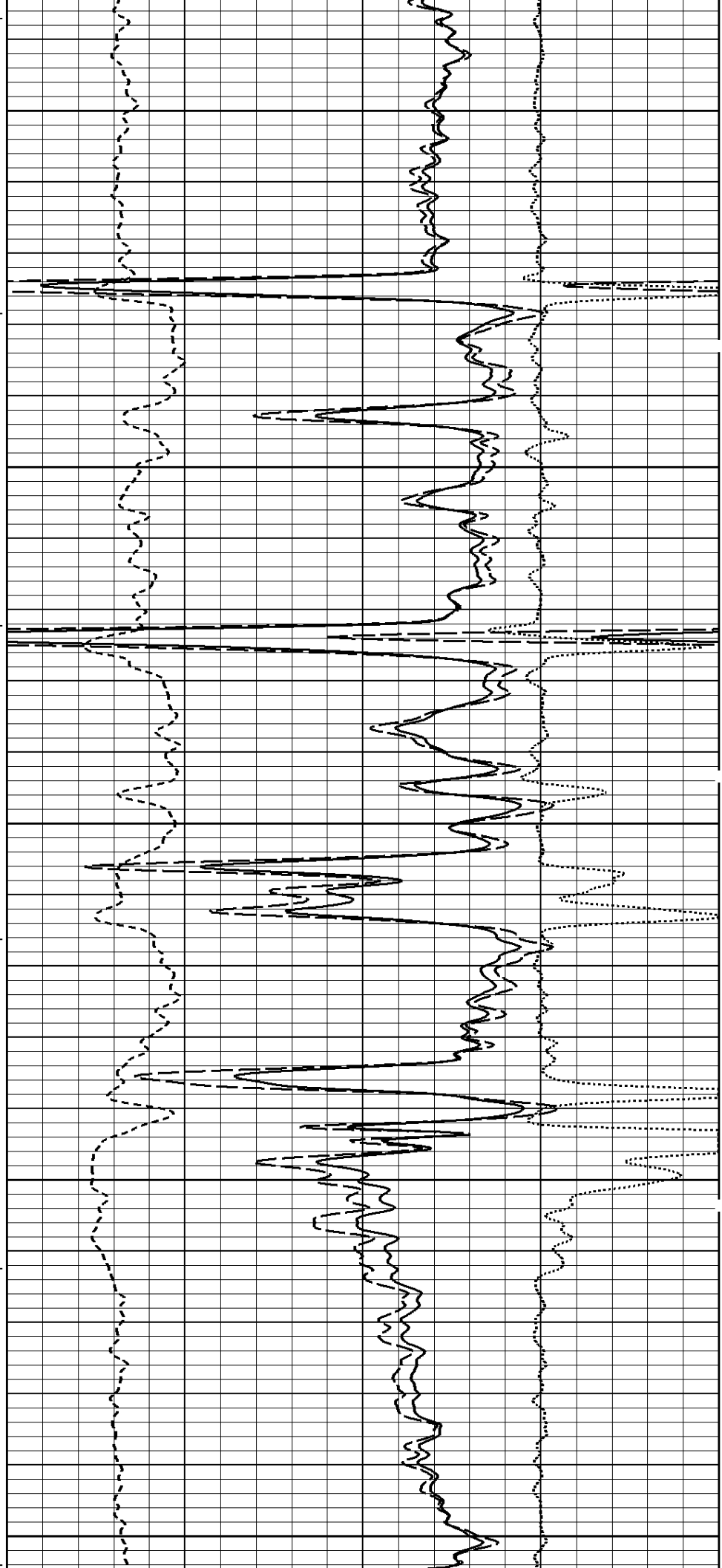


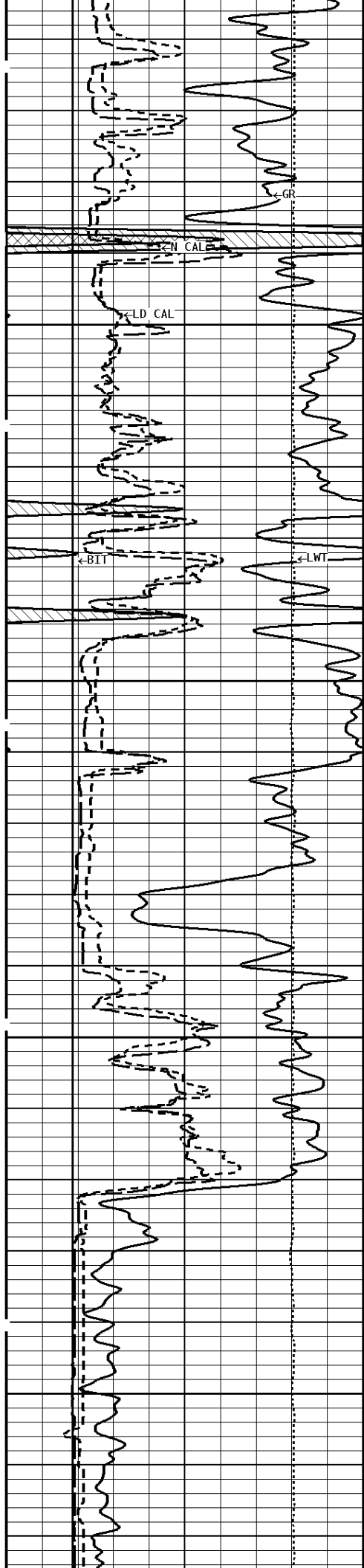


2700

2800

2900



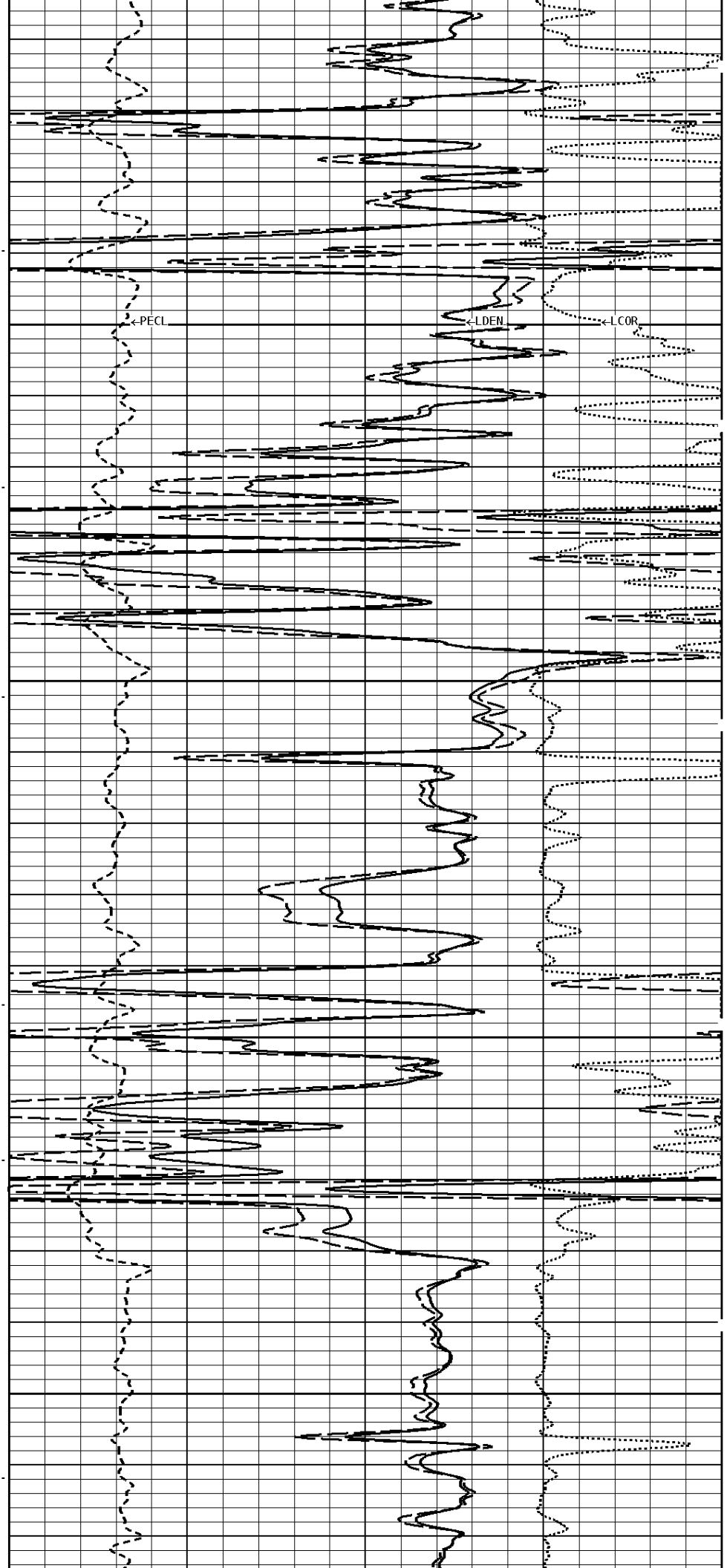


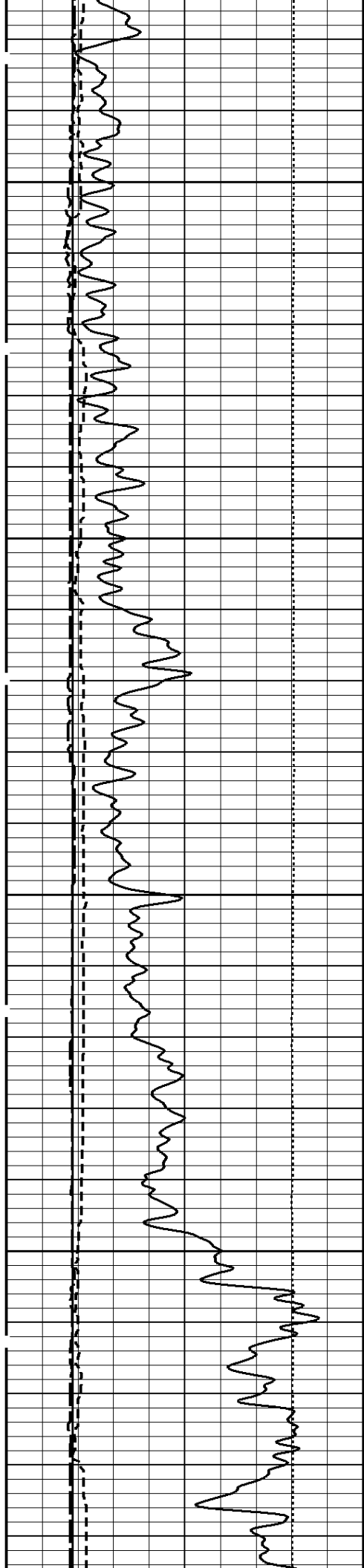
--200Cu.Ft

100Cu.Ft--

3000

3100

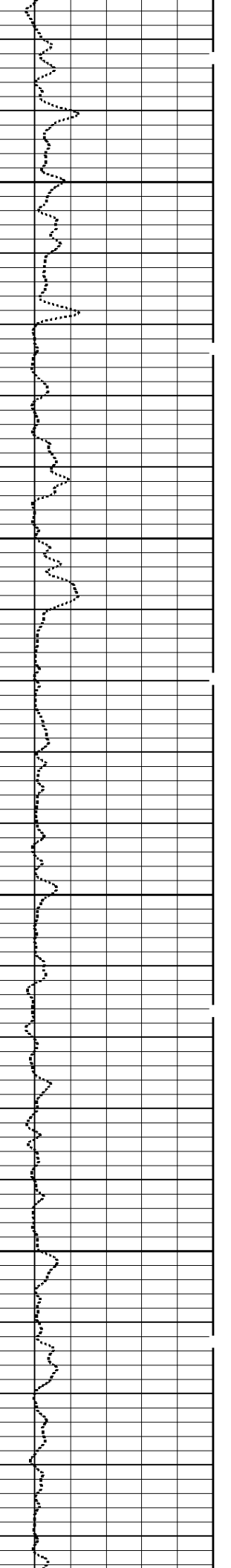
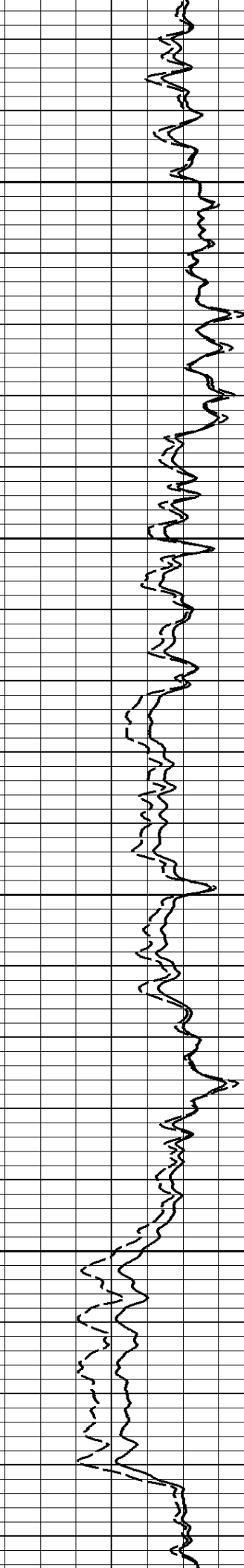
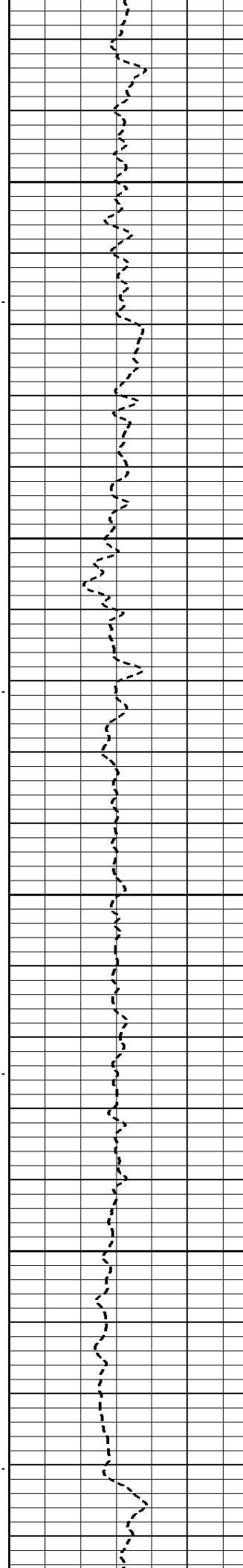


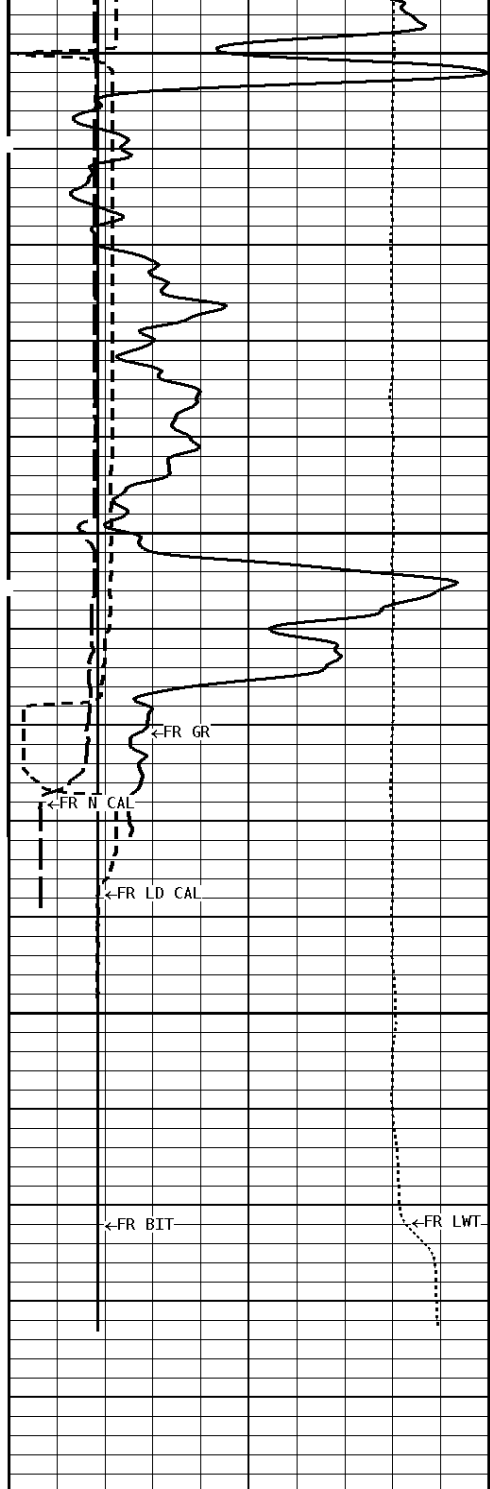


-100Cu.Ft

3200

3300

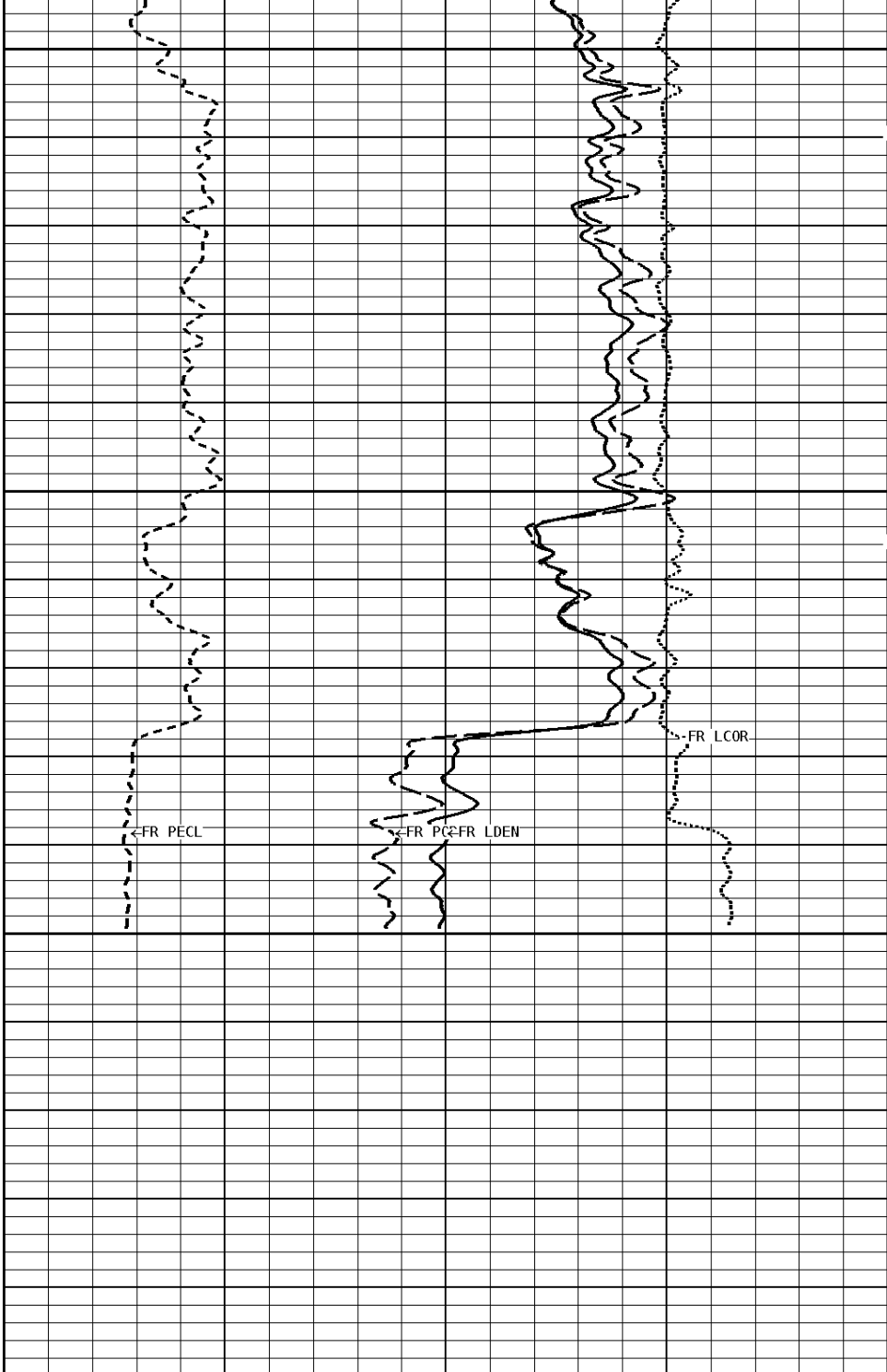




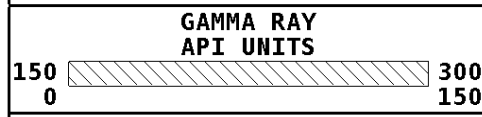
3400

3472

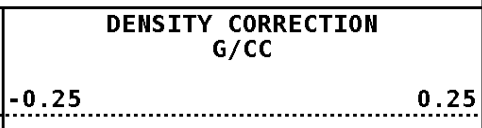
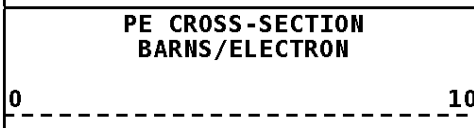
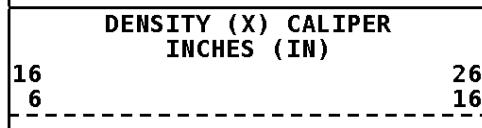
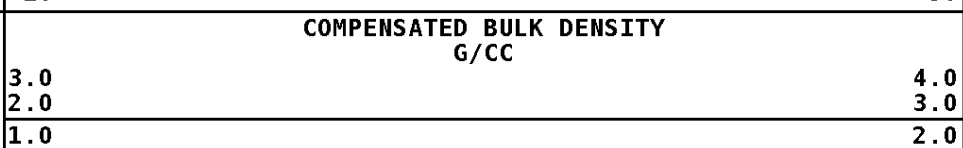
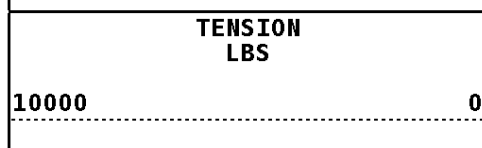
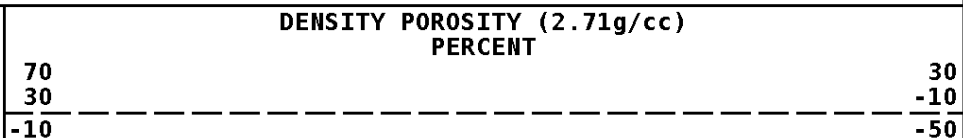
File #1.1.5



1:240 MAIN SECTION
BULK DENSITY



- BHV AHV -
CU. FT



NEUTRON (Y) CALIPER

16	INCHES (IN)	26
6		16

BIT SIZE INCHES (IN)		
6		16

* Calibration Summary *

Shop Calibration						
GRT-B						
Performed : 18-SEP-2018			Time : 09:08			
Sensor Suite : GR-GR5			ID : GRT-BA-121			
	Measured	Units	Calibrated	Units		
GR	Background	Jig	Jig	GRAPI		
	44	309	160			
CNT-AA						
Performed : 11-OCT-2018			Time : 10:59			
Sensor Suite : CALI-BCN			ID : NDT-BB-146			
	Jig - Measured	Jig - Calibrated	Units			
CL # 1	Ring#1 Ring#2	Ring#1 Ring#2	IN.			
	9.3 14.0	6.0 12.0				
BHC NEUT						
Performed : 11-Oct-2018			Time : 11:04			
Sensor Suite : BHC NEUT			ID : CNP-AA-115			
Source ID : N-1044						
	Measured	Tank	Verification	Units		
N/F	4.1436	Calibrated	Jig			
Porosity	28.0	3.6893	3.7046			
		20.5	20.7	%		
LDT-DA						
Performed : 11-OCT-2018			Time : 09:59			
Sensor Suite : CALI-LTH			ID : PDT-GA-466			
	Jig - Measured	Jig - Calibrated	Units			
CL # 1	Ring#1 Ring#2	Ring#1 Ring#2	IN.			
	7.9 11.5	6.0 12.0				
BHCPELNG						
Performed : 11-Oct-2018			Time : 10:16			
Sensor Suite : BHCPELNG			ID : LDP-DA-038			
Source ID : 63558B						
Short Space						
	BKGD	Al	Mg	Al+Fe	Units	
LSW1	60	1141	1841	739	CPS	
LSW2	63	1413	2265	993	CPS	
LSW3	238	3335	5418	2801	CPS	
LSW4	287	2980	4359	2579	CPS	
LSW5	29	55	65	52	CPS	
LSW6	78	82	82	82	CPS	
LSW7	48	53	54	53	CPS	
LSW8	2	5	6	4	CPS	
QS	0.238	0.213	0.208	0.216		
PES			2.778	5.967		
SSDN		2.600	1.680		G/CC	
Long Space						
	BKGD	Al	Mg	Al+Fe	Units	
LLW1	93	1414	5687	843	CPS	
LLW2	104	2564	9869	1837	CPS	
LLW3	395	4649	17485	3981	CPS	
LLW4	508	2141	7035	1928	CPS	
LLW5	53	68	139	66	CPS	
LLW6	166	160	153	161	CPS	
LLW7	103	102	98	103	CPS	
LLW8	3	7	20	6	CPS	
QL	0.235	0.220	0.222	0.218		
PEL			2.697	5.458		
LSDN		2.600	1.680		G/CC	
MST-DA						

Performed : 09-FEB-2018		Time : 11:28				
Sensor Suite : CALI-MSN		ID : MST-DA-021				
CL # 1	Jig - Measured		Jig - Calibrated	Units		
	Ring#1	Ring#2	Ring#1	Ring#2		
	8.2	12.5	6.0	12.0	IN.	
Performed : 09-FEB-2018		Time : 11:11				
Sensor Suite : MSTDA-NI		ID : MST-DA-021				
		Internal				
	Zero	Measured Reference	Units	Zero	Calibrated Reference	Units
INV-V	0.0	30239.2		0.00	1546.00	MV
NOR-V	3.9	30805.8		0.00	1646.00	MV
IN-C	0.0	29403.5		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					58.67	OHMM
Performed : 09-FEB-2018		Time : 11:28				
Sensor Suite : MSTDAMSF		ID : MST-DA-021				
		Internal				
	Zero	Measured Reference	Units	Zero	Calibrated Reference	Units
MSFC	35.0	62277.7		0.00	1522.00	UA
MSFB	13098.0	44123.4		0.00	1522.00	MA
MOM1	0.0	64536.5		0.00	1522.00	MV
MSFRA					43.30	OHMM



Company: VAL ENERGY, INC
 Well: BIRDZELL #1-23 0WW0
 Location: 660' FSL & 3630' FEL
 Logged: 11-03-2018
 K.B. Elev: 0.0 Ft