



Tucker
ENERGY SERVICES

COMPENSATED NEUTRON

PEL DENSITY LOG

Company BLACK STAR 231 CORP. Well SNYDER #4-16 Field KANASKA County SNYDER State KANSAS Country USA API No. 15-131-20243-00-00		File No : TUL-60812 Company : BLACK STAR 231 CORP. Well : SNYDER #4-16 Field : KANASKA County : SNYDER State : KANSAS Country : USA API No : 15-131-20243-00-00	
Location : 330' FNL & 1532' FWL W2 NW NE NW		LSD : Sect : 01 Twp : 01S Rge : 14E	
Permanent Datum:	GL	Elevations:	Services:
Drilling Measured From:	GL	KB 1126.00	CNT WOT
Log Measured From:	GL	DF 1125.00	LDT PIT
Above Permanent Datum:	0.00 Ft	GL 1121.00	MLT
Date	12-22-2016		
Run Number	1		
Depth--Driller	3607.0	Ft	
Depth--Logger	3606.0	Ft	
First Reading	3567.0	Ft	
Last Reading	263.0	Ft	
Casing--Driller	269.0	Ft	
Casing--Logger	263.0	Ft	
Bit Size	7.875	In	
Casing Size	8.625	In	
Hole Fluid Type	WBM		
Density	9.6		
Fluid Loss	0.0		
PH/Viscosity	0.0	70.0	
Sample Source	MEASURED		
RMF@Measured Temp.	2.600	@ 40 F	
RMF@Measured Temp	2.210	@ 40 F	
RMF@Measured Temp.	2.990	@ 40 F	
Source RMF/RMC	CALCULATED/CALCULATED		
RM@BHT	1.090	@ 105 F	
Time Circulation Stopped			
Max Recorded Temp.	105	F	
Equipment/Base	TRK-126	TULSA	
Recorded By	R. FRANKLIN		
Witnessed By	L. NICHOLSON		

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	3607.00	8.625	0.00	260.00	0.00

Run Number	1	
Date	12-22-2016	
Date/Time On Bottom	12-22-2016 4:30 am	
Depth to Fluid	0.0 Ft	
Salinity	0.000	
RMF@BHT	0.920 @ 105 F	
RMC@BHT	1.250 @ 105 F	

Run Number 1

Comments

ALL PRESENTATION PER CUSTOMER REQUEST
 GRT, CNT, LDT, MLT, WOT, PIT RUN IN COMBINATION
 CALIPERS ORIENTED ON X-Y AXIS
 2.71 G/CC USED TO CALCULATE POROSITY
 ANNULAR & BOREHOLE VOLUME CALCULATED USING 5.5 PRODUCTION CASING
 PHIN IS CALIPER CORRECTED
 DETAIL IS PRESENTED FROM TD TO SCG

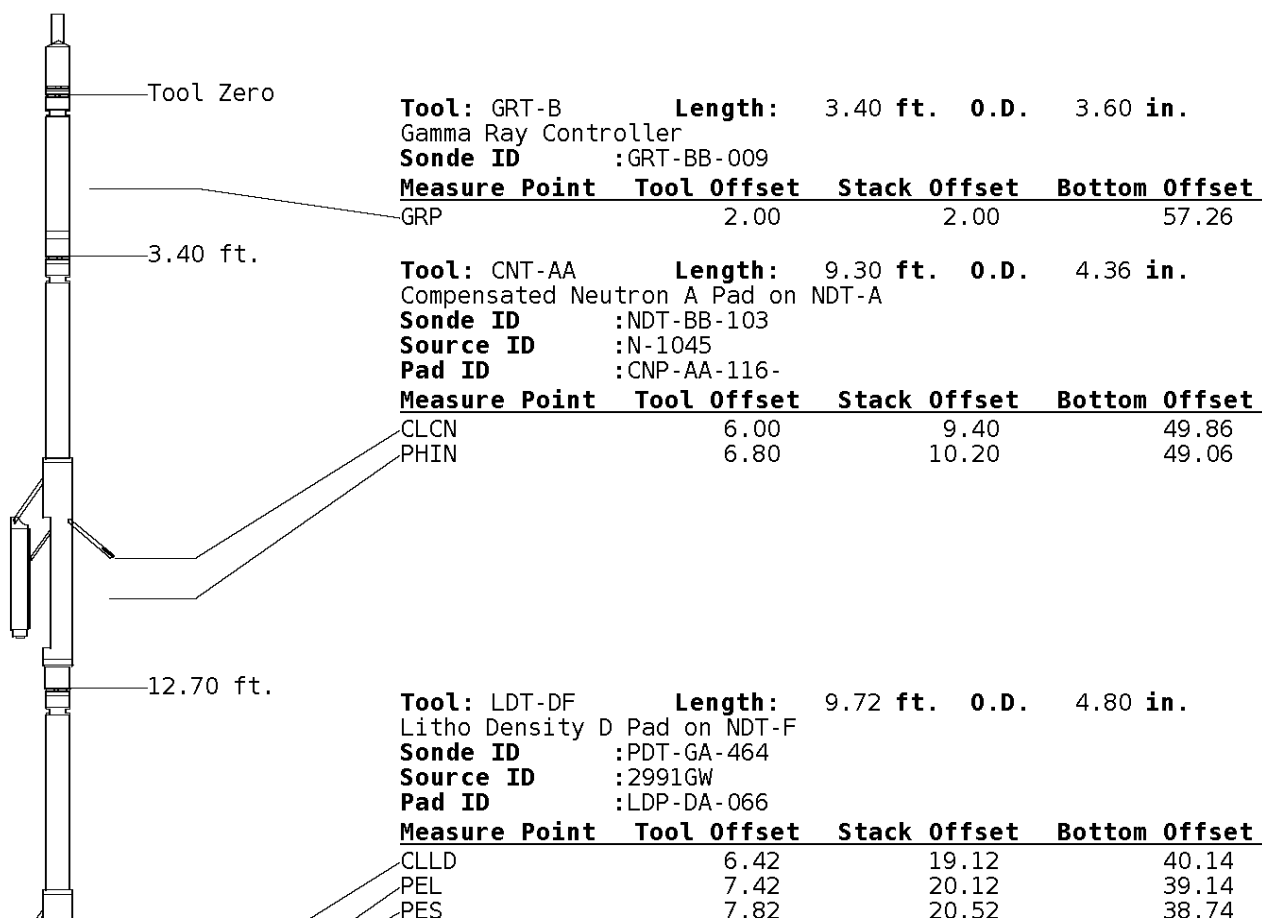
GRT; GRP
 CNT; PHIN, CLCNIN
 LDT; PORL, LCORN, PECLN, LDENN, CLLDIN
 MLT; NOR-RF, INV-RF, MSCLPIN
 PIT; ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS;

S. TYLER
 B. BAILEY

Tool String Schematic

Total Tool Length - 59.26 ft.
Maximum Outside diameter - 6.00 in.
Net Weight in Air - 1031.00 lbs.



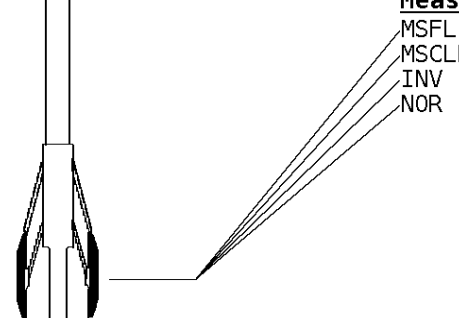


LDEN	7.62	20.32	38.94
LCOR	7.62	20.32	38.94

22.42 ft.

Tool: MST-DA **Length:** 9.66 ft. **O.D.** 6.00 in.
 Micro Spherically Focused (IC)
Sonde ID :MST-DA-26

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	30.02	29.24
MSCLP	7.60	30.02	29.24
INV	7.60	30.02	29.24
NOR	7.60	30.02	29.24



32.08 ft.

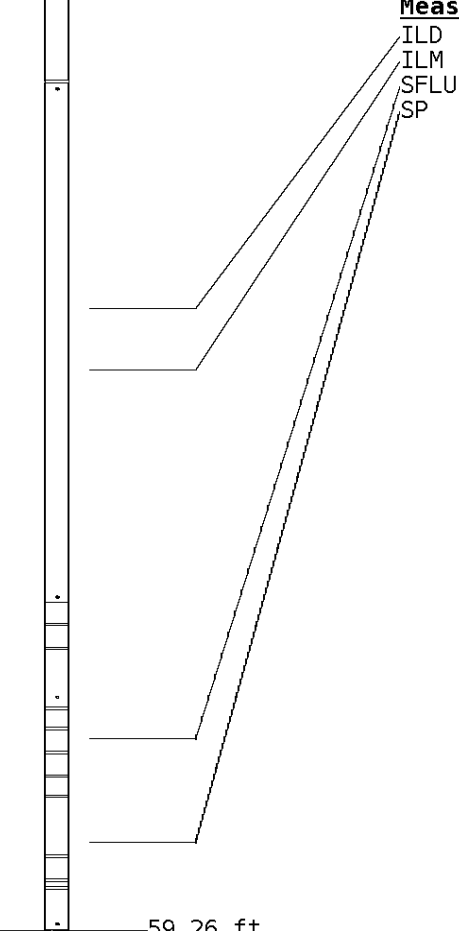
Tool: WOT-AE **Length:** 5.69 ft. **O.D.** 3.50 in.
 Well Orientation Tool
Sonde ID :WOT-AE-014

Measure Point	Tool Offset	Stack Offset	Bottom Offset
NAVTEMPE	3.00	35.08	24.18
ACCXE, ACCYE, ACCZE	3.00	35.08	24.18
MAGXE, MAGYE, MAGZE	3.00	35.08	24.18

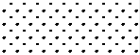
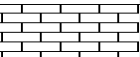
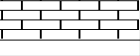
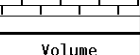
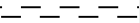
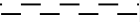
37.77 ft.

Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-AC-043

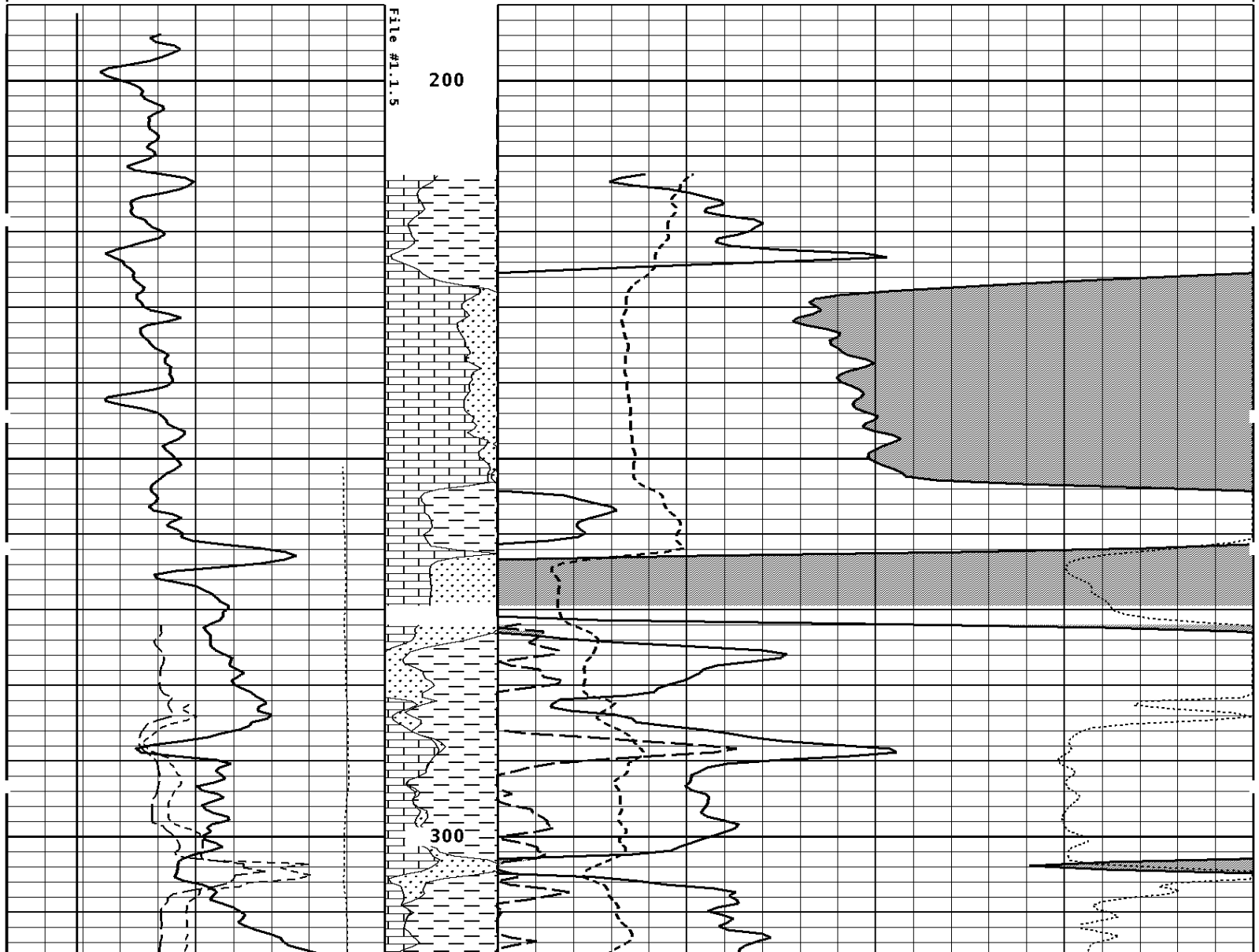
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	46.69	12.56
ILM	10.10	47.87	11.39
SFLU	17.49	55.26	4.00
SP	20.60	58.37	0.88

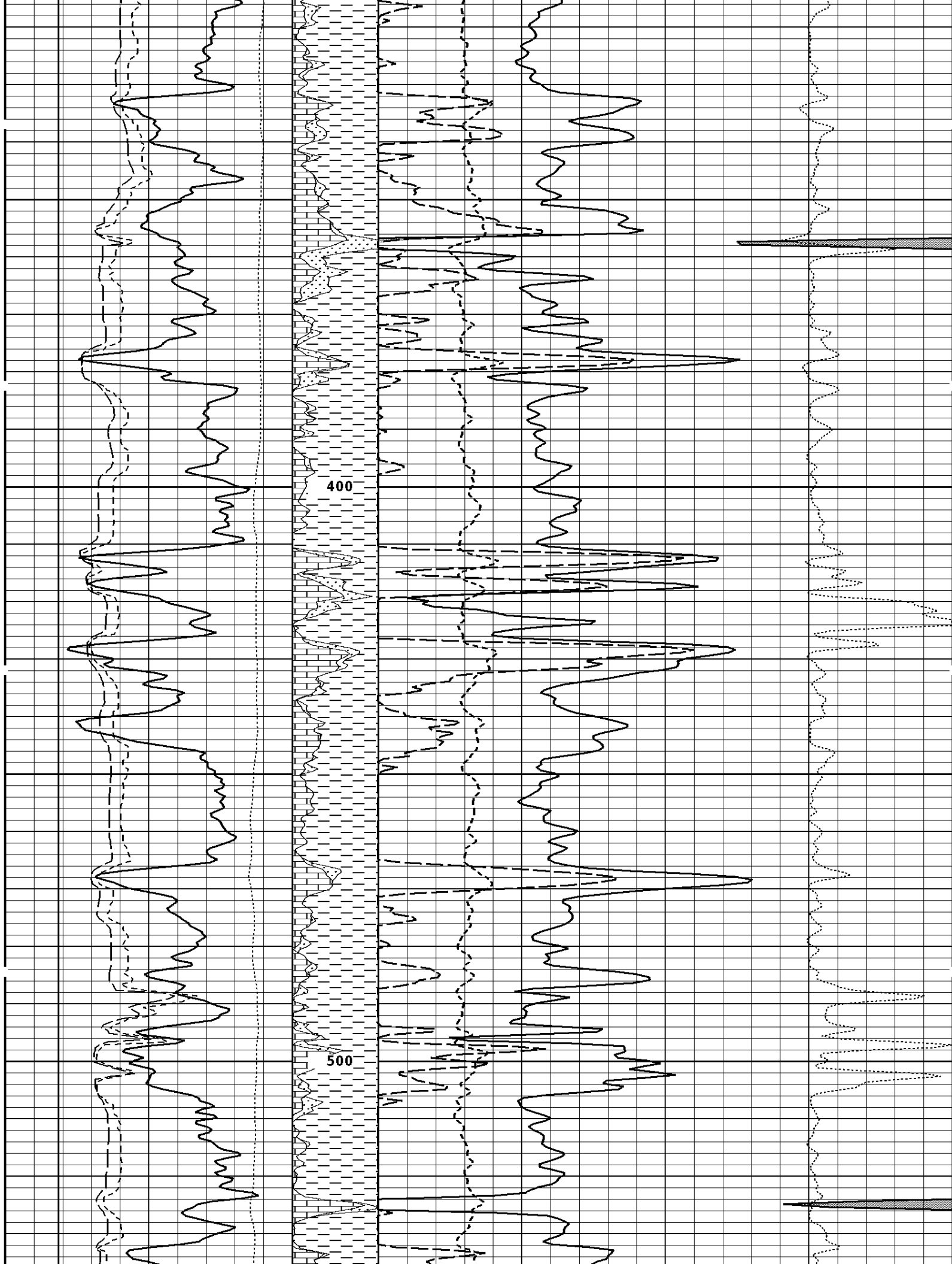


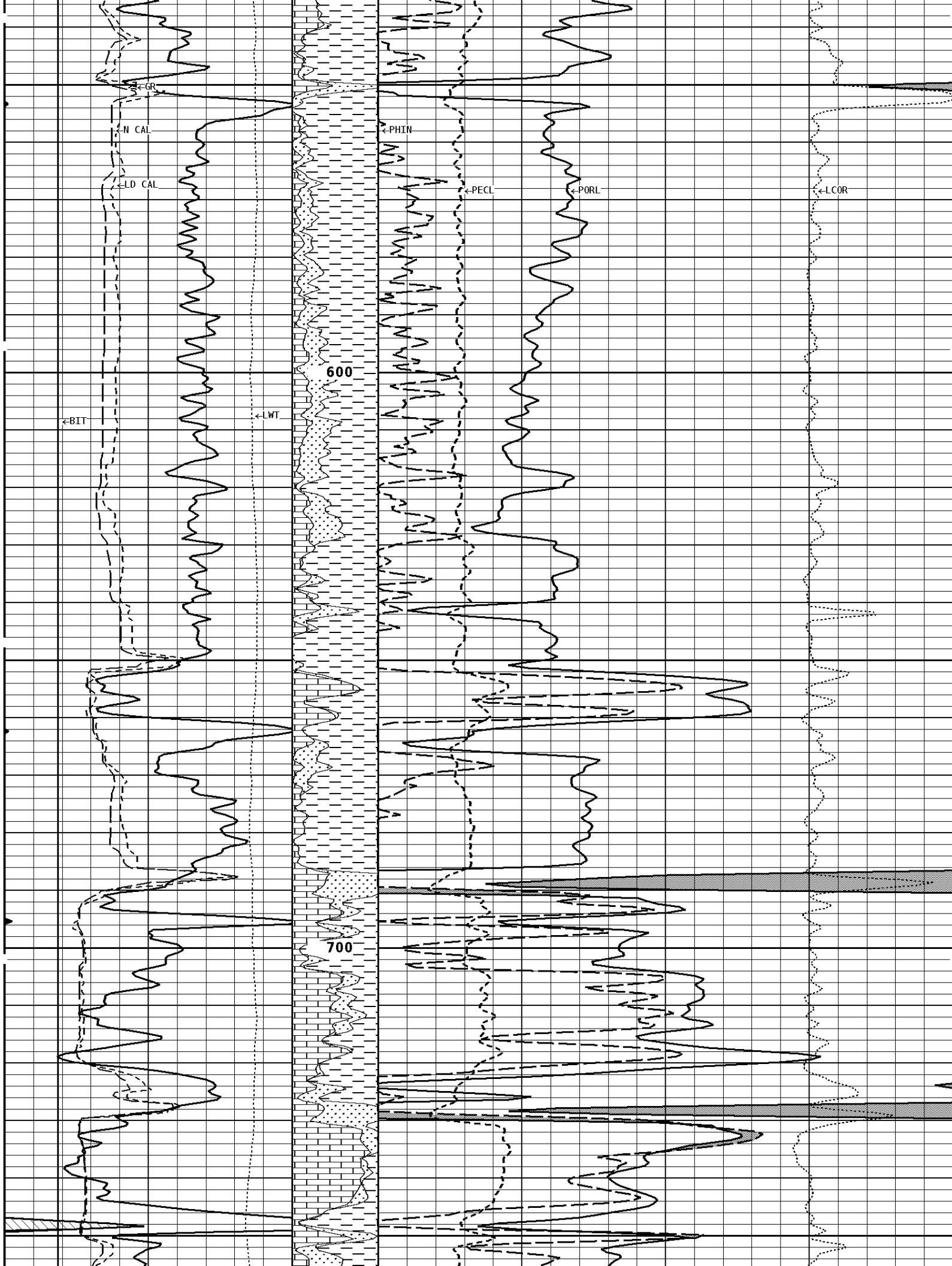
LWT 59.26 ft.

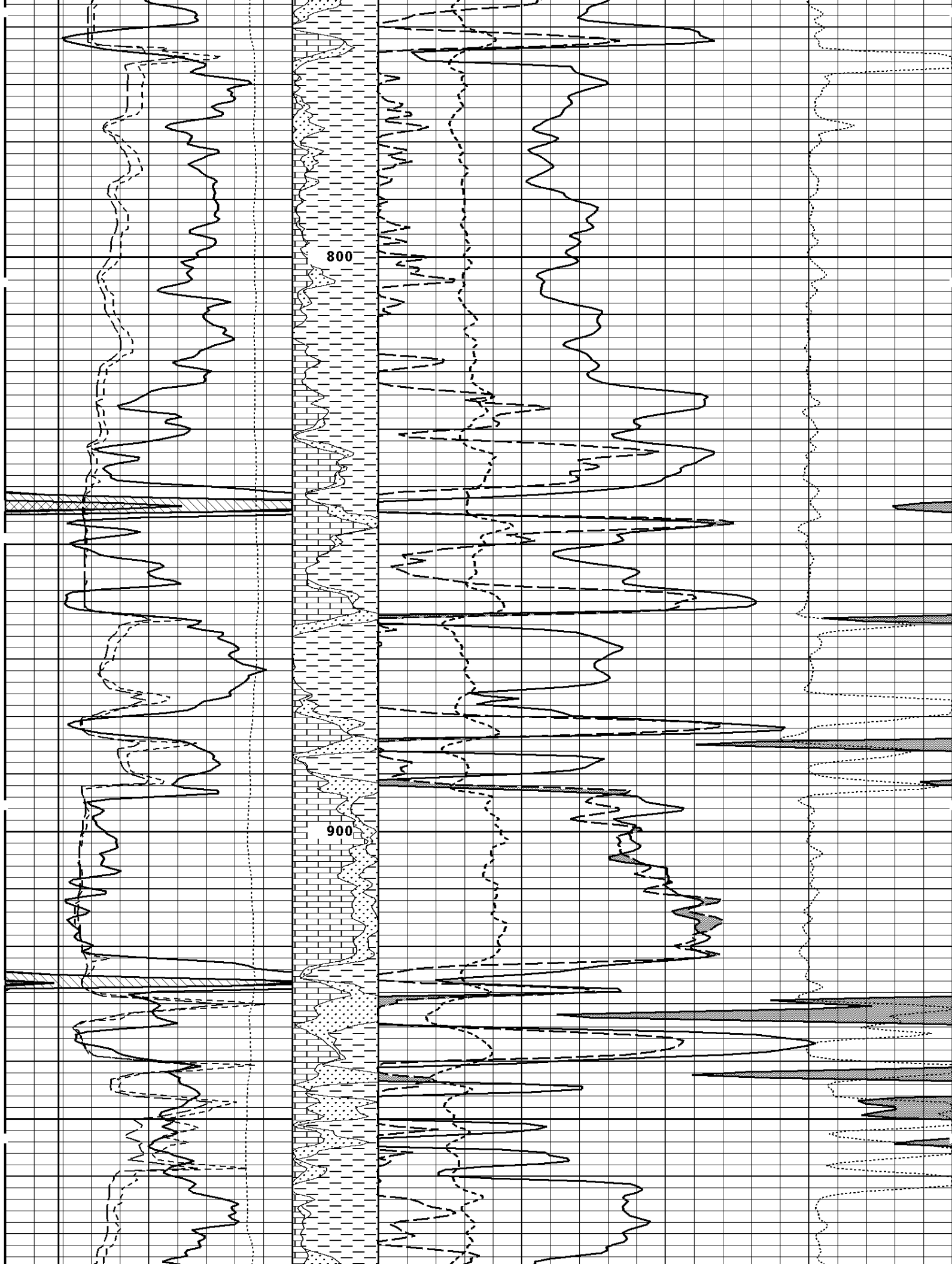
BIT SIZE INCHES (IN)					
6	16				
NEUTRON (Y) CALIPER INCHES (IN)					
16	26				
6	16				
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARNs/ELECTRON		DENSITY CORRECTION G/CC
16	26				
6	16		0	10	-0.25 0.25
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT		
10000	0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

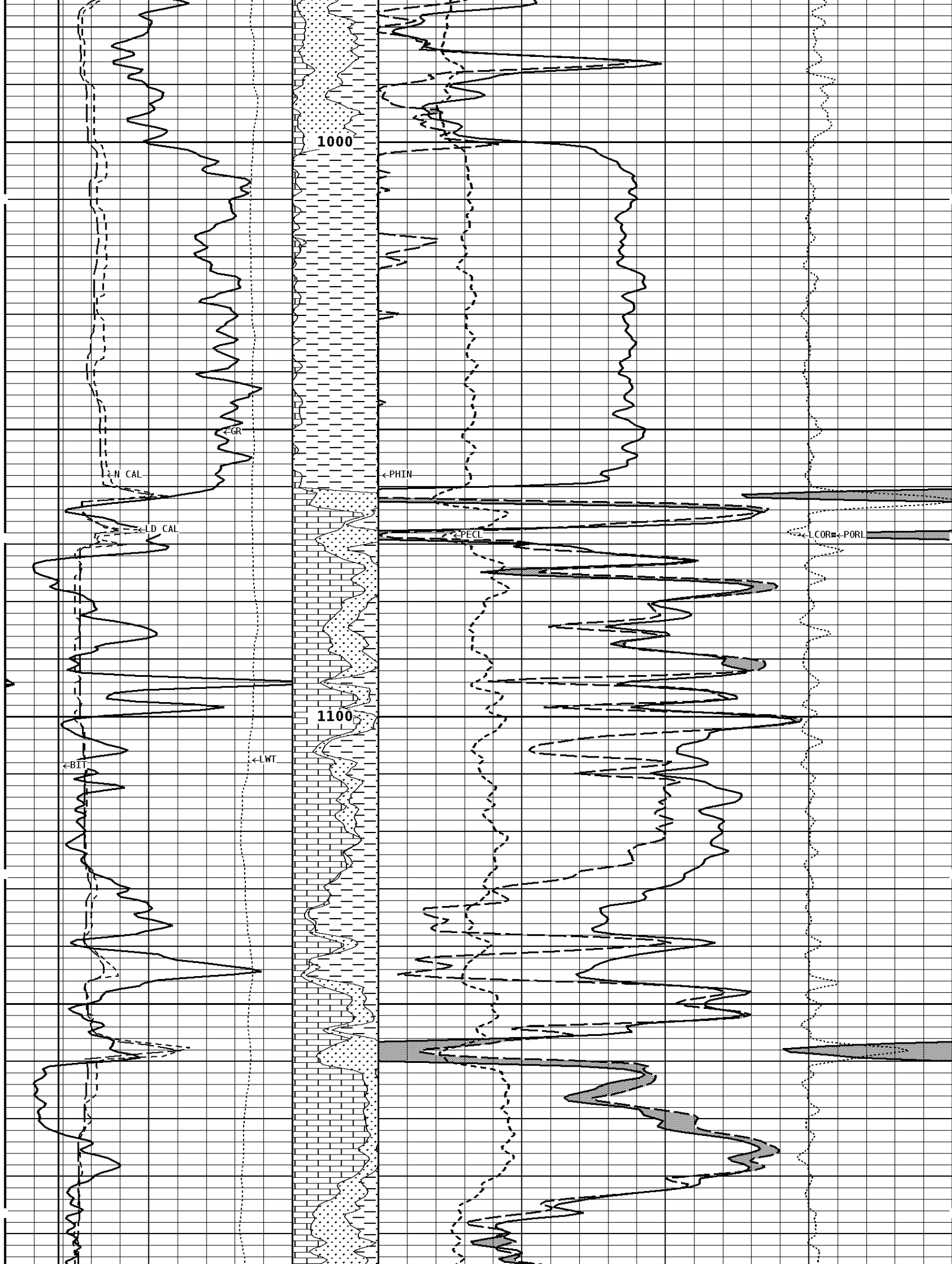
1:240 MAIN SECTION

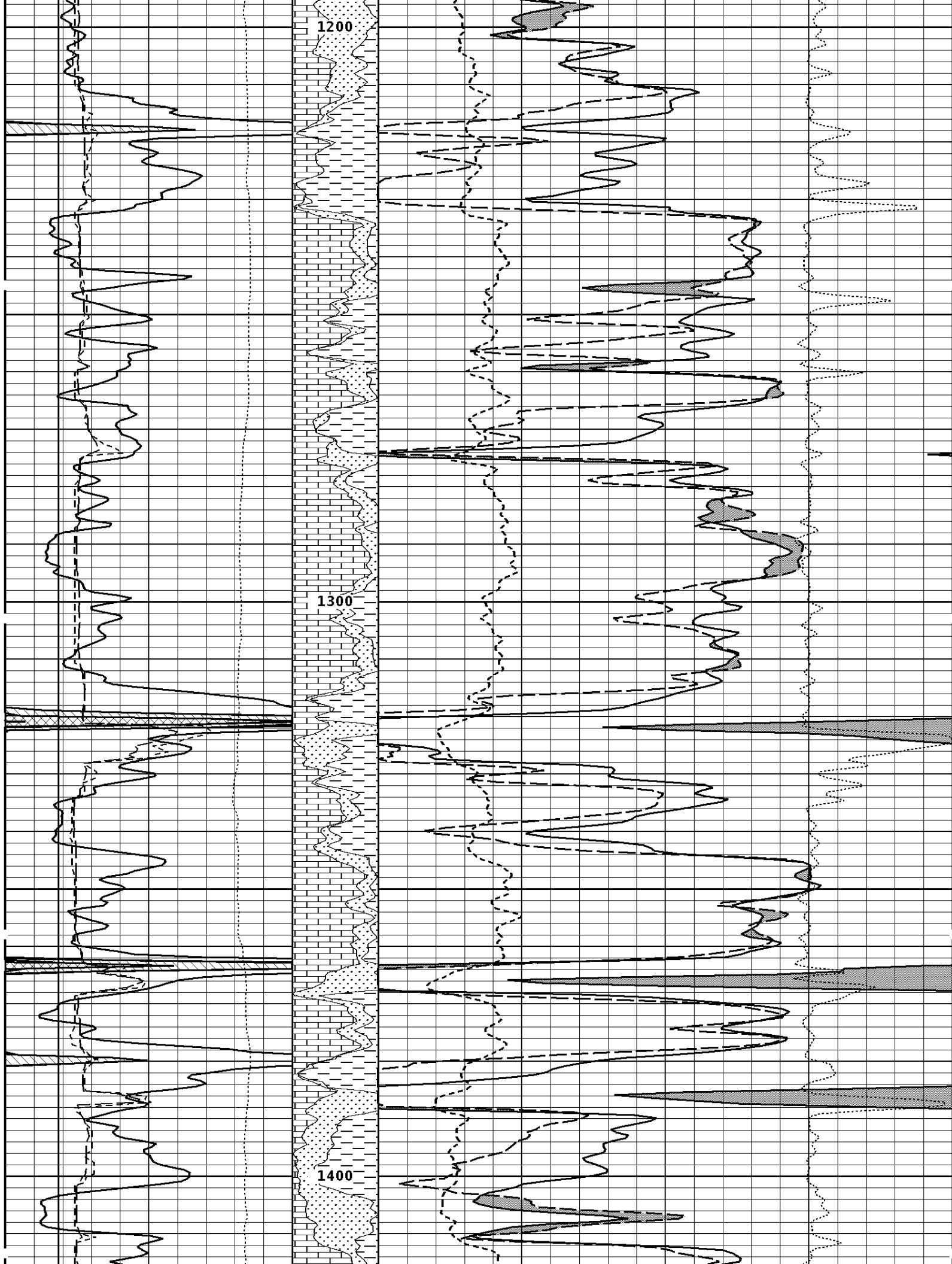


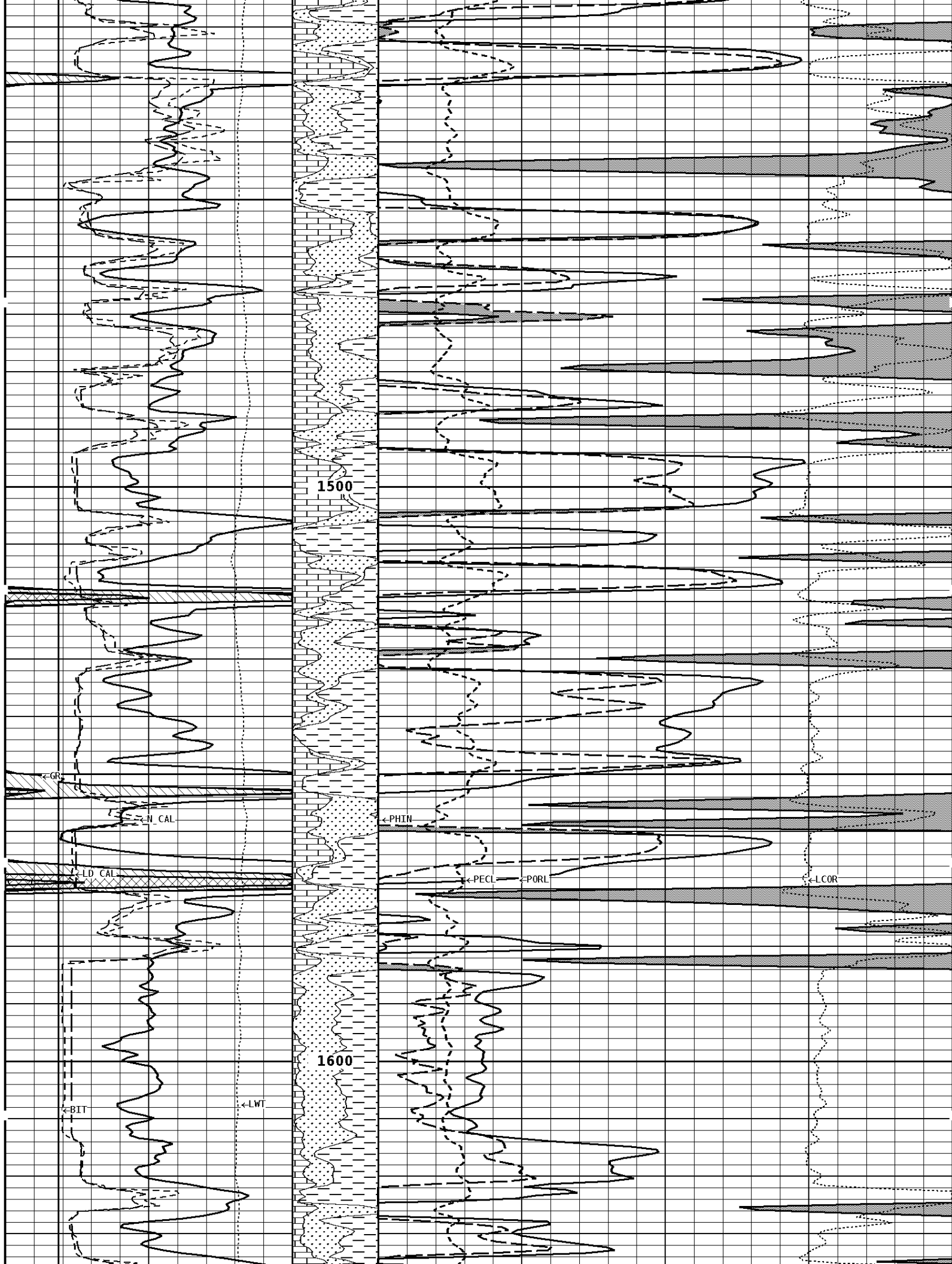


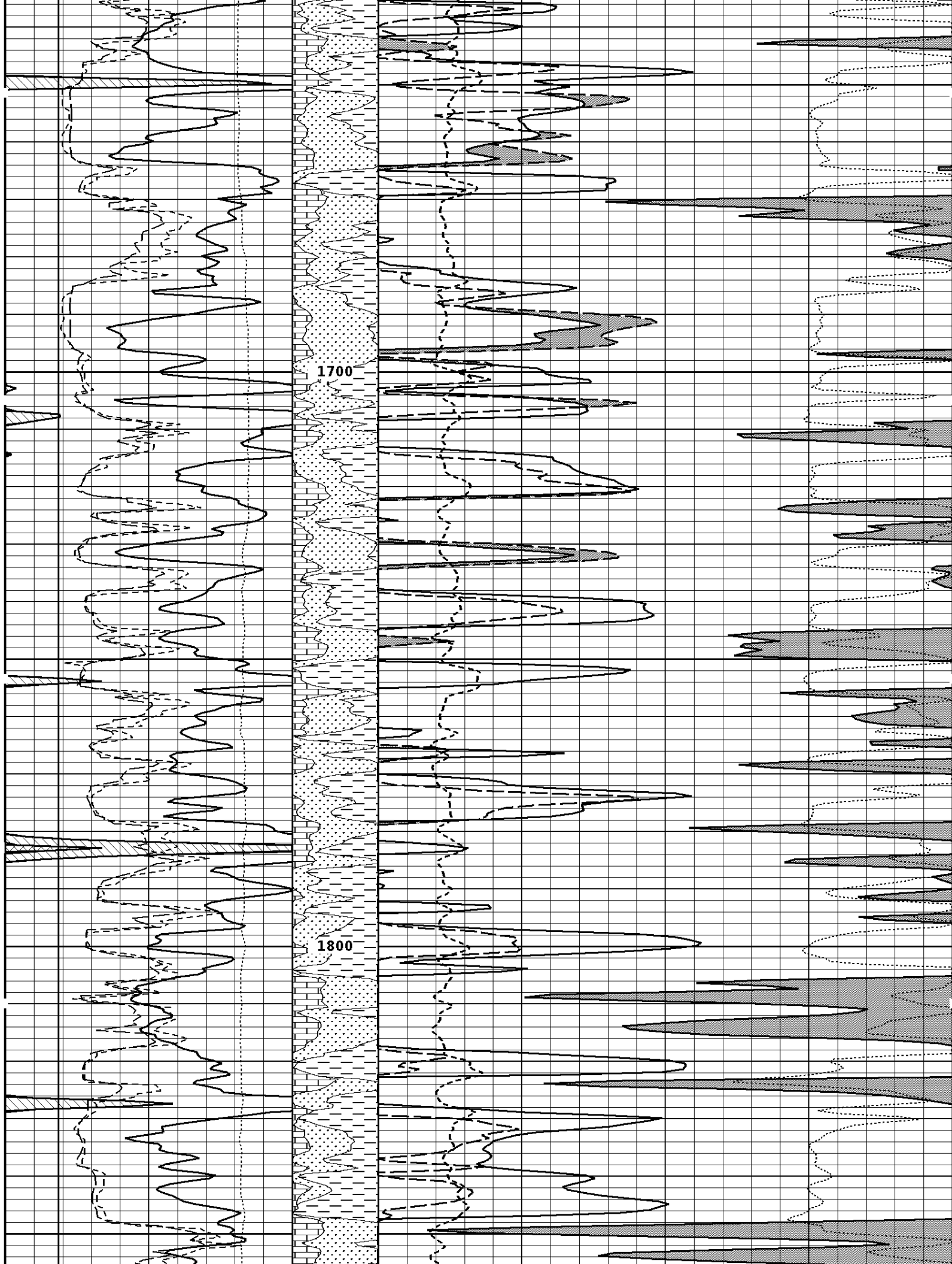


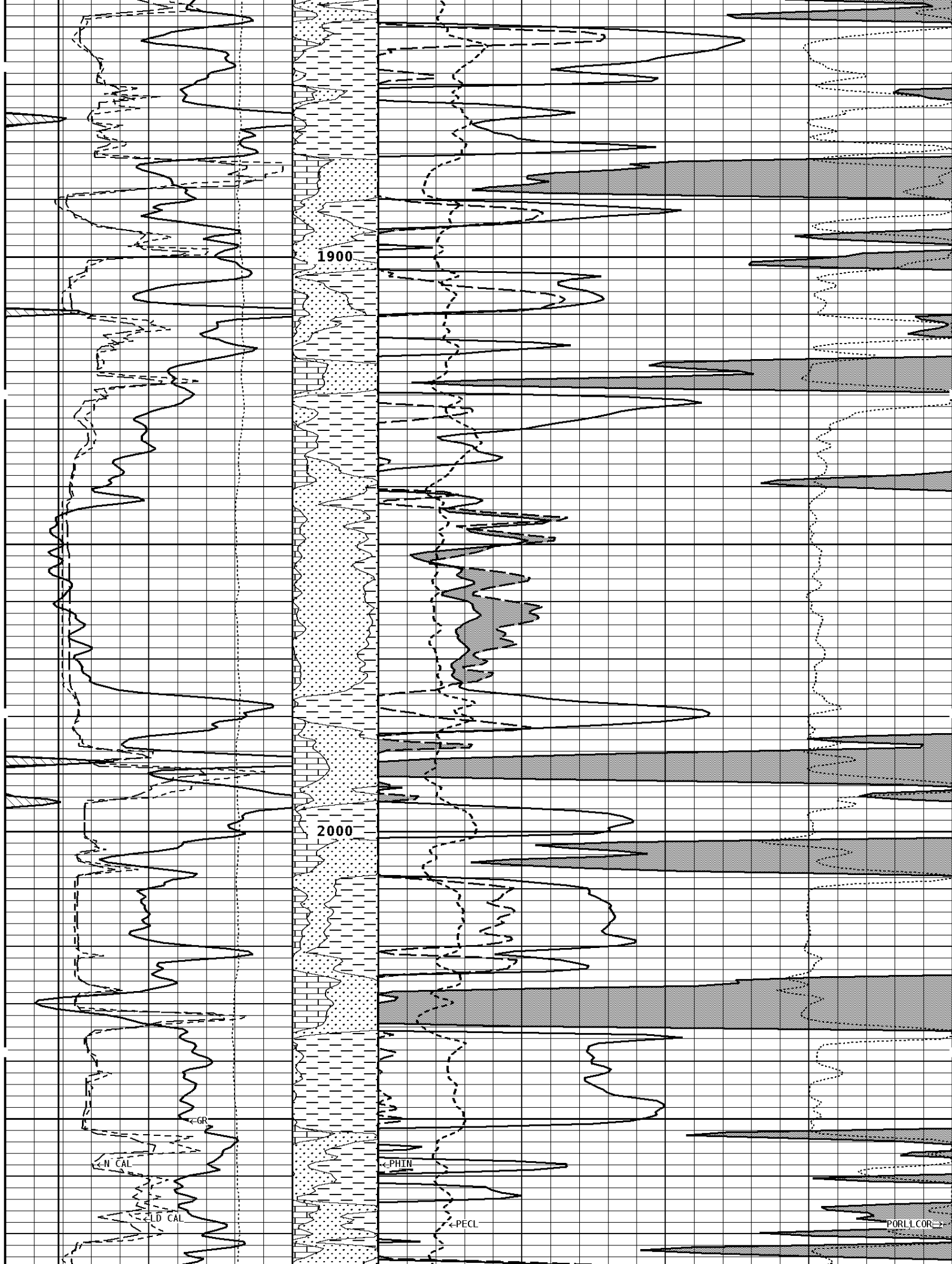


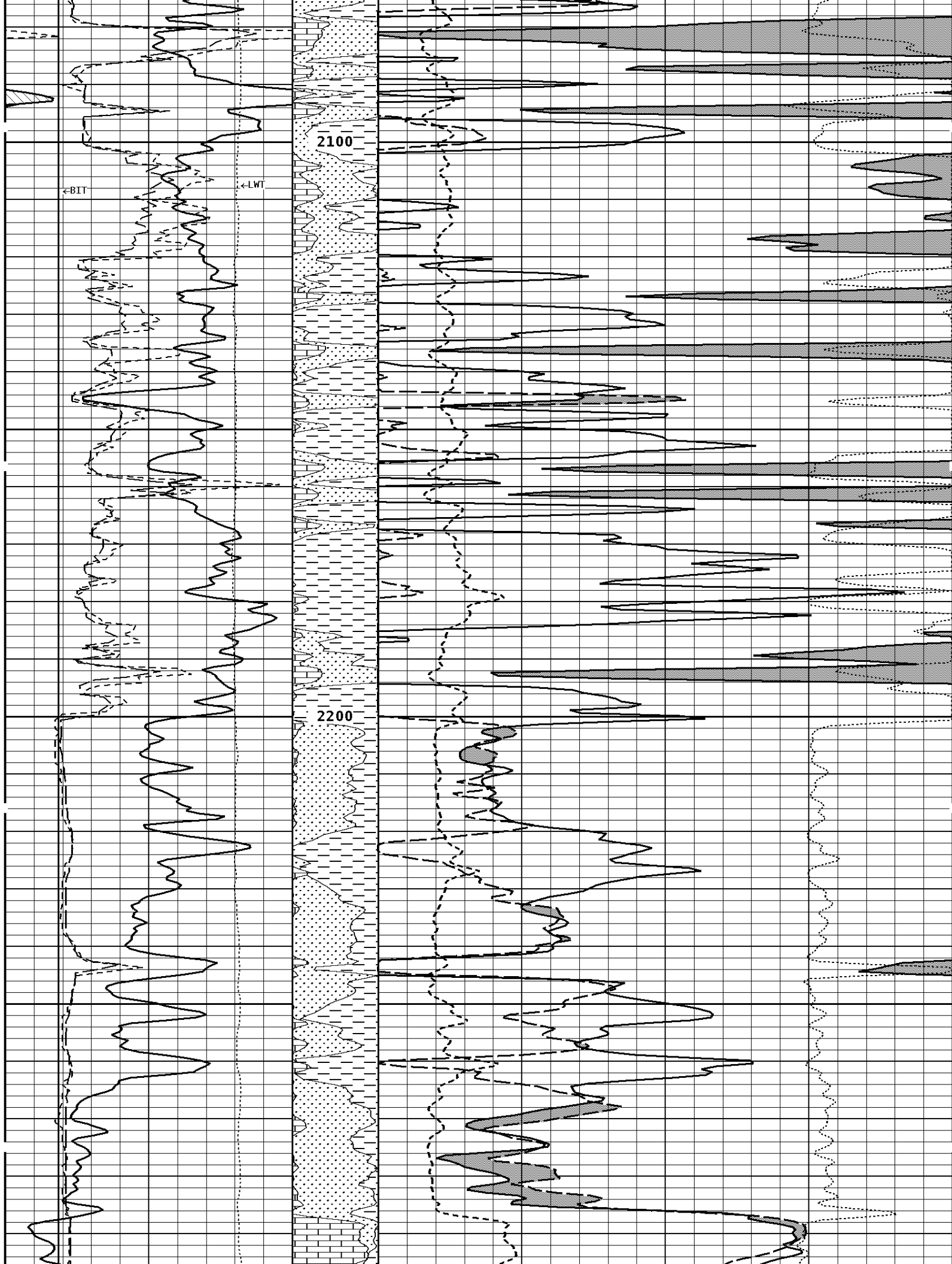


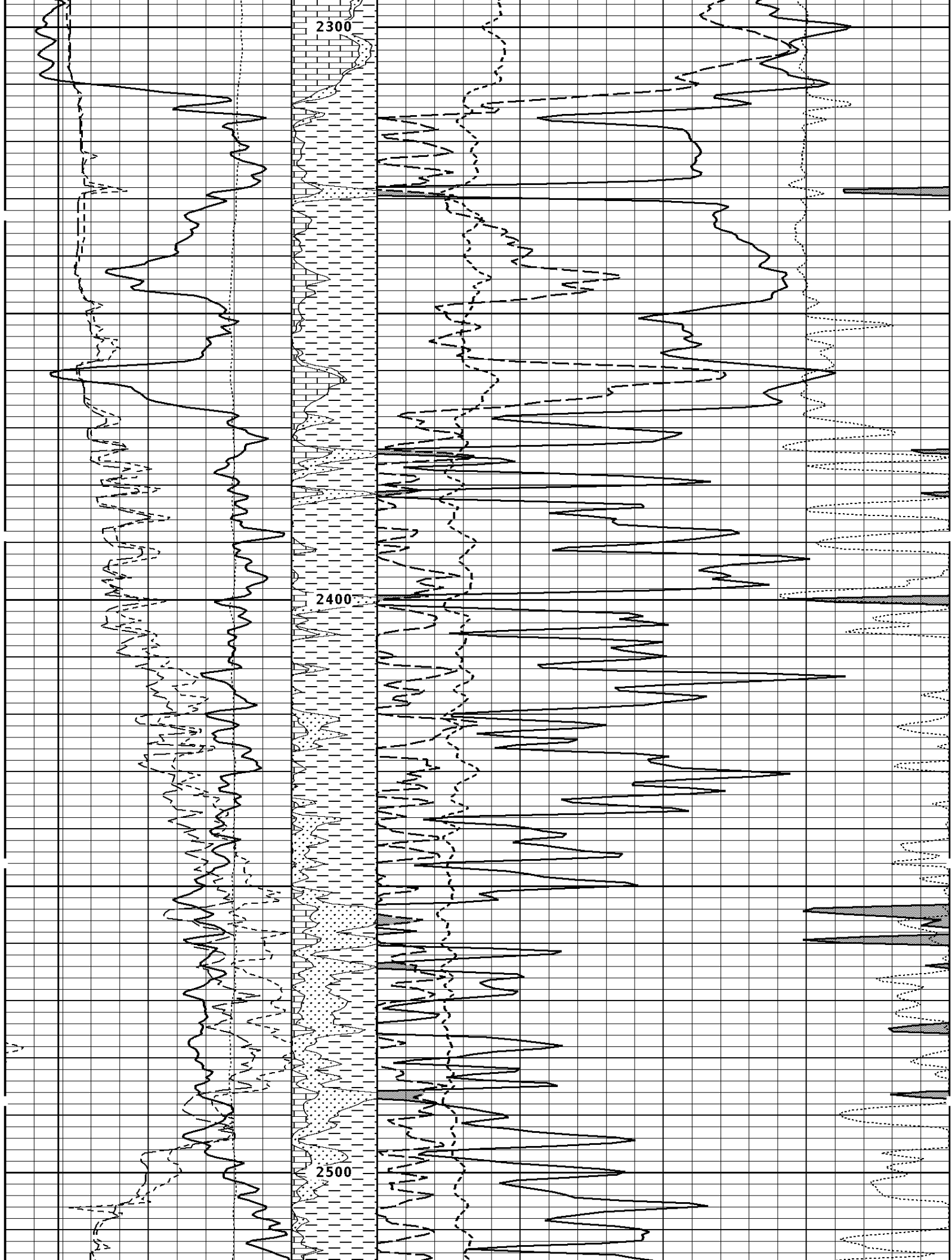


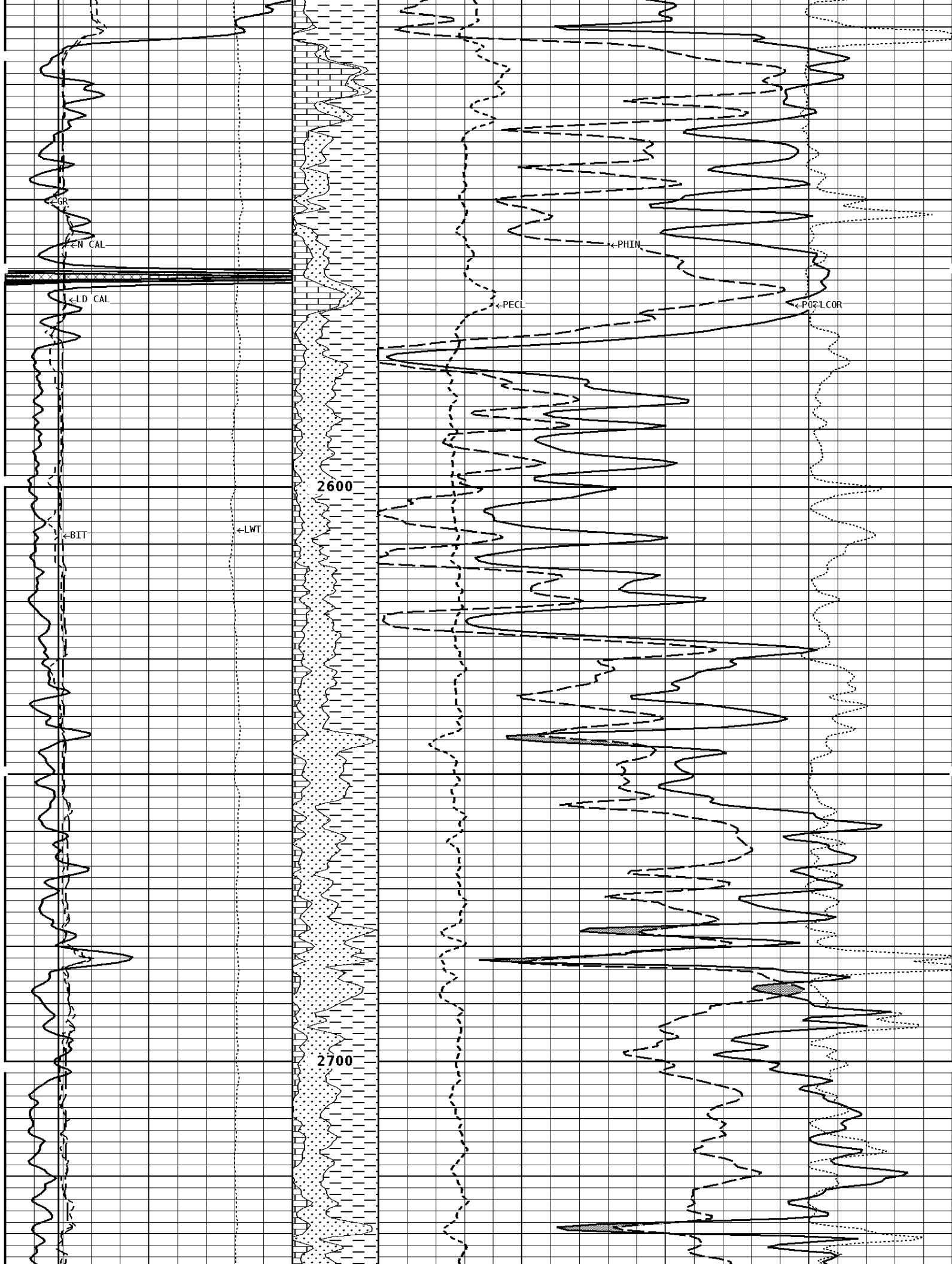


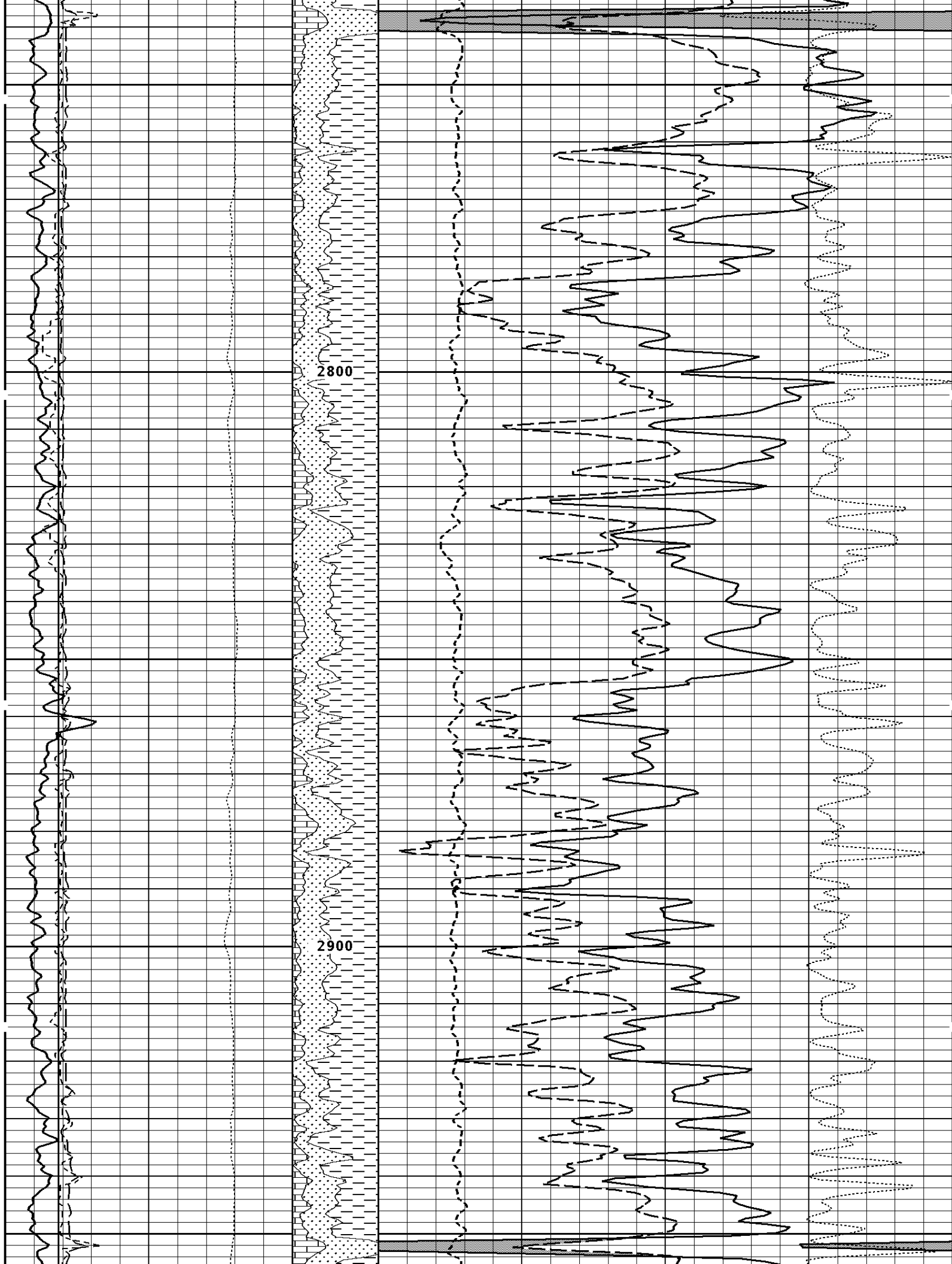


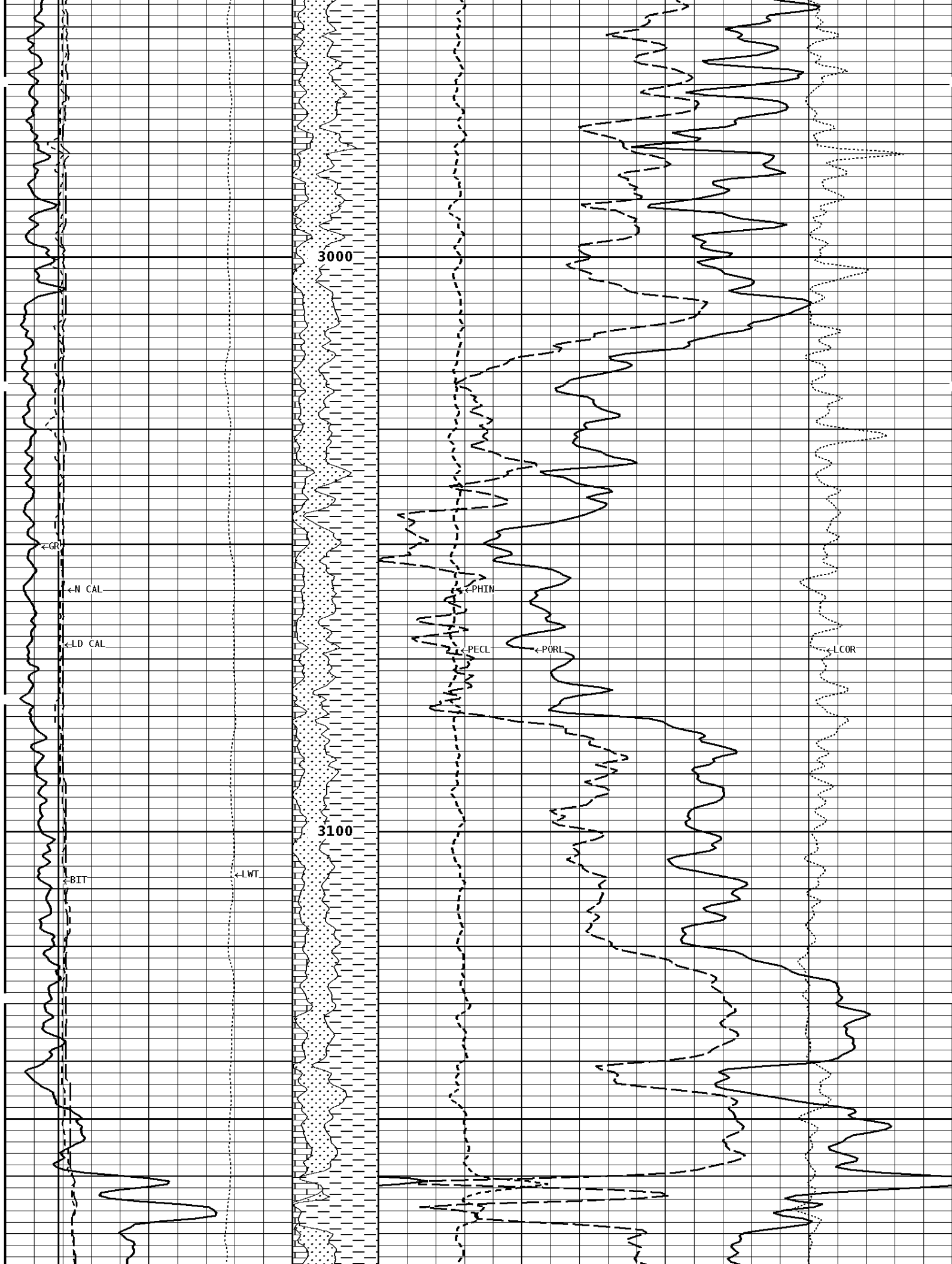


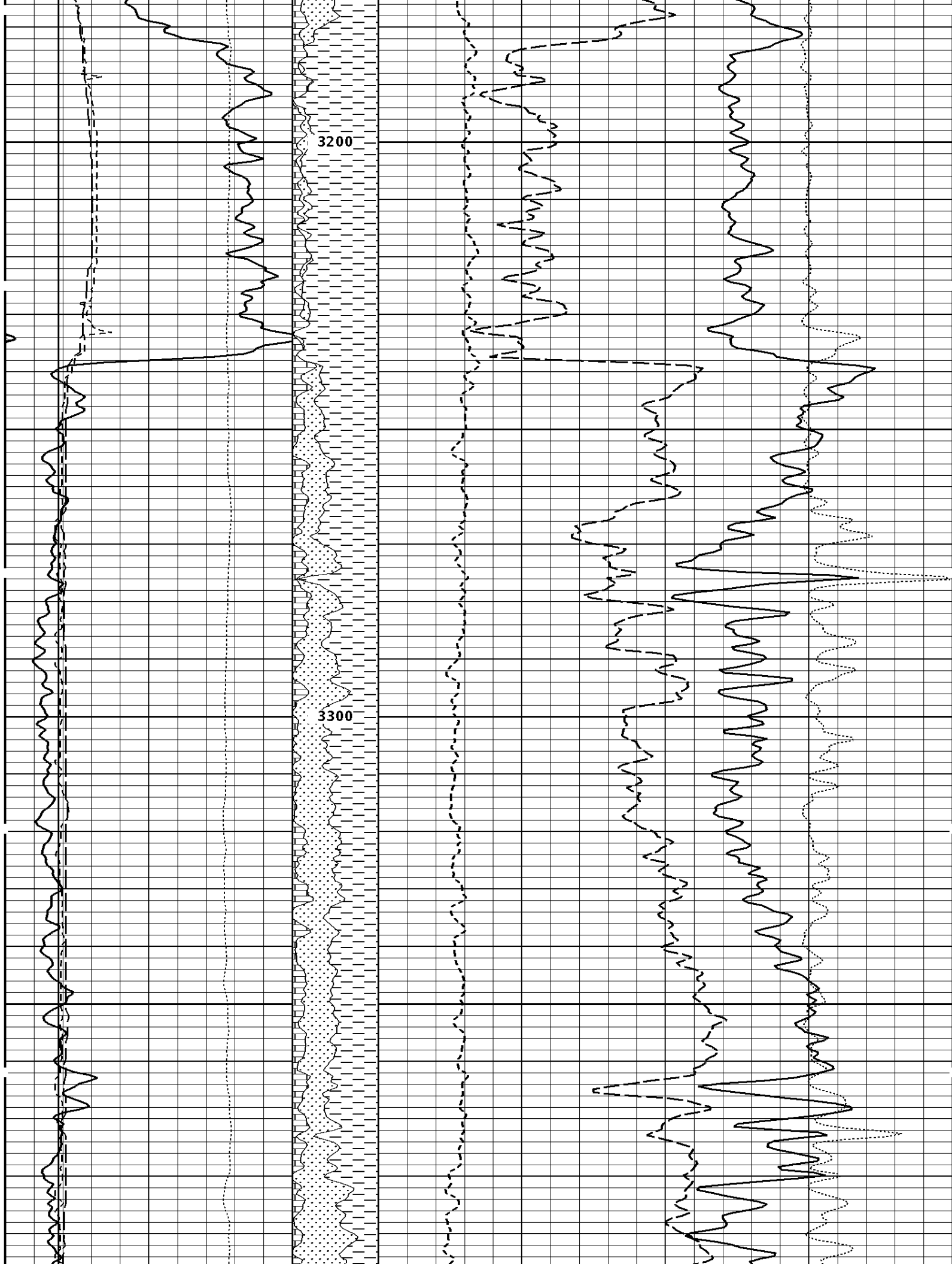


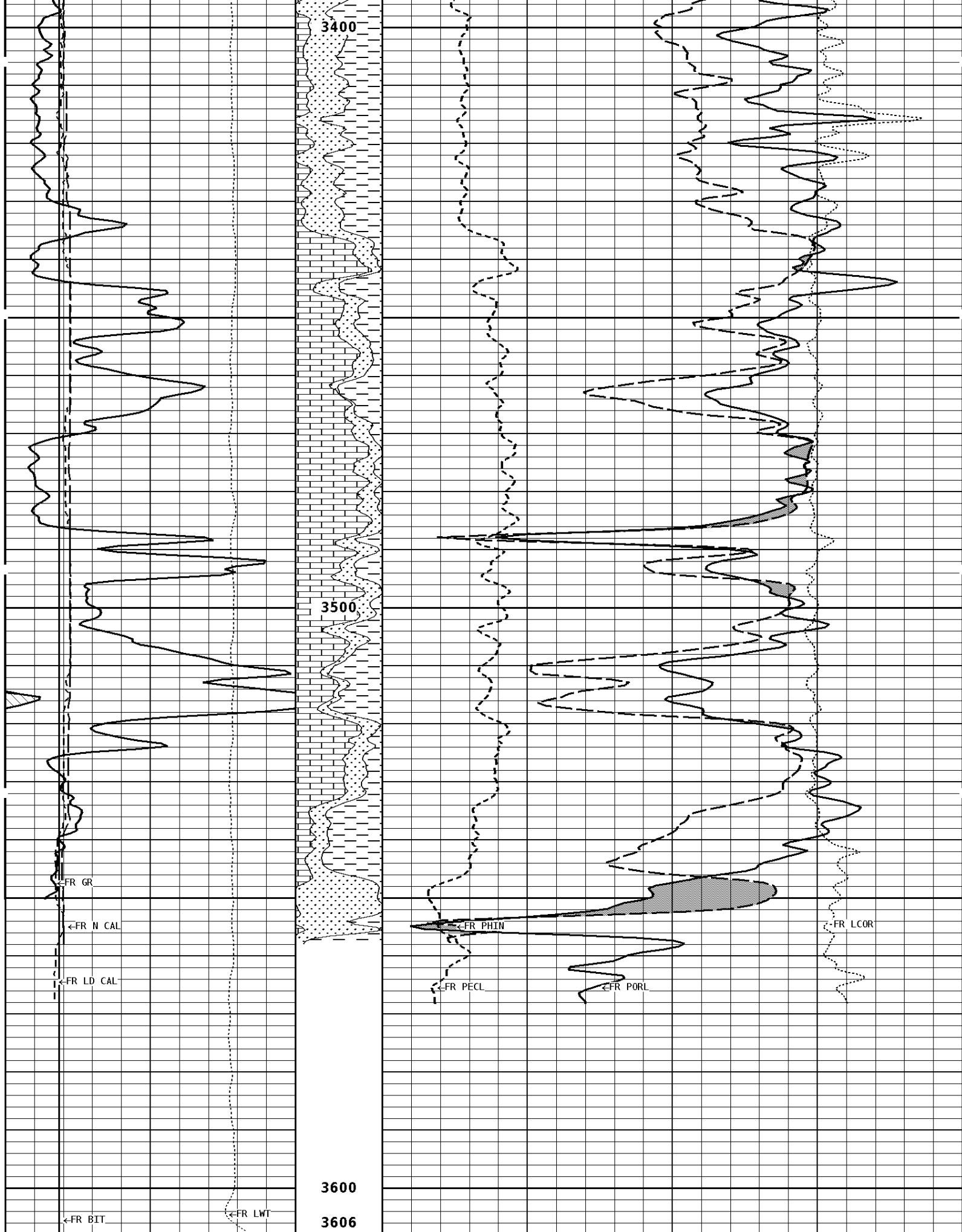












[illegible]

File #1.1.5

[illegible]

1:240 MAIN SECTION

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

*** Borehole Zone Factors ***

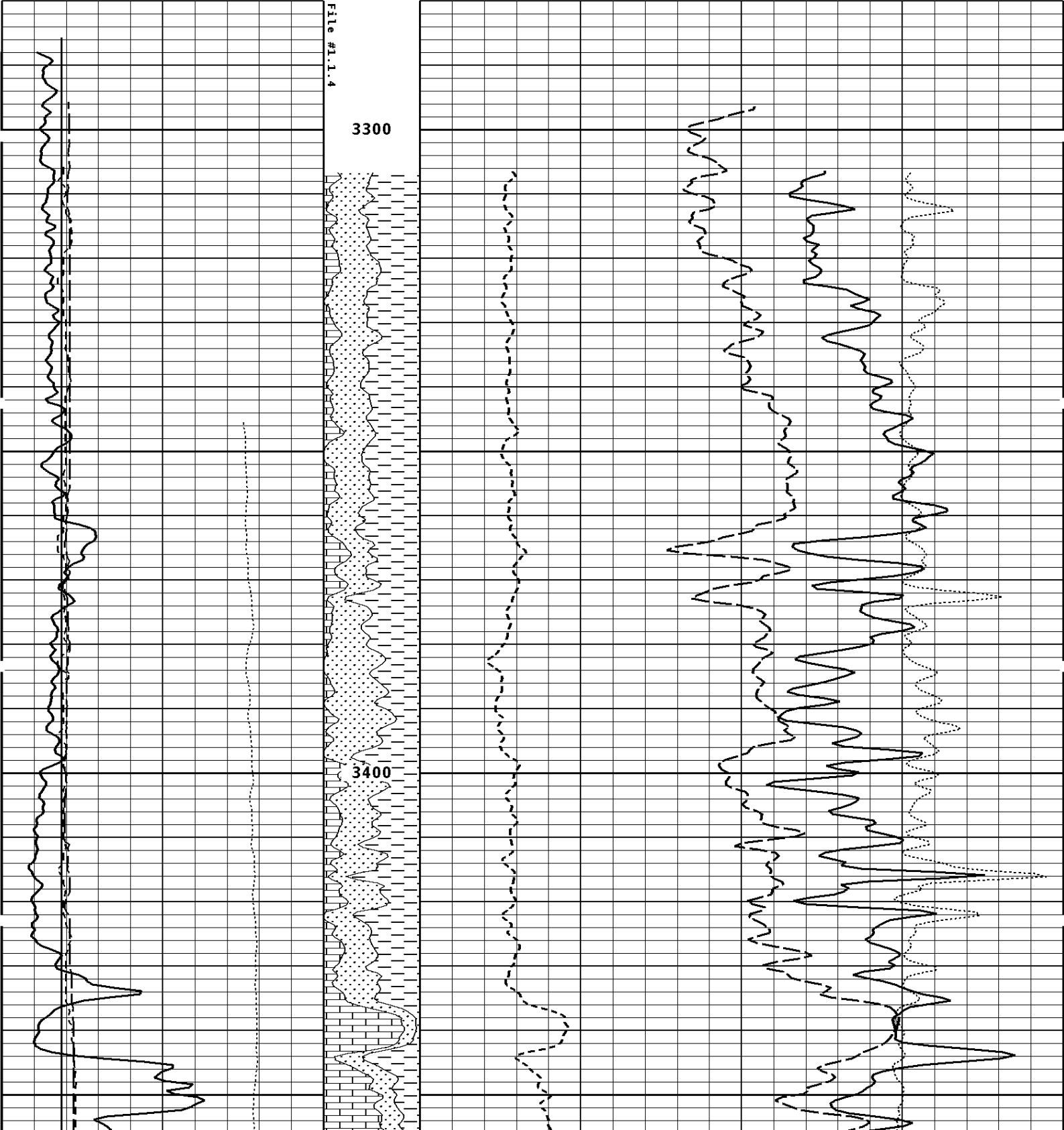
Zone 1 99999.0 to 0.0 Feet		
Matrix Density _____	2.71	g/cc
Fluid Density _____	1.00	g/cc
Formation Matrix _____	Limestone	
Drill Bit Size _____	7.875	in
Casing Diameter _____	5.500	in
Casing Thickness _____	0.250	in
Casing Correction (PHI N) _____	Disable	

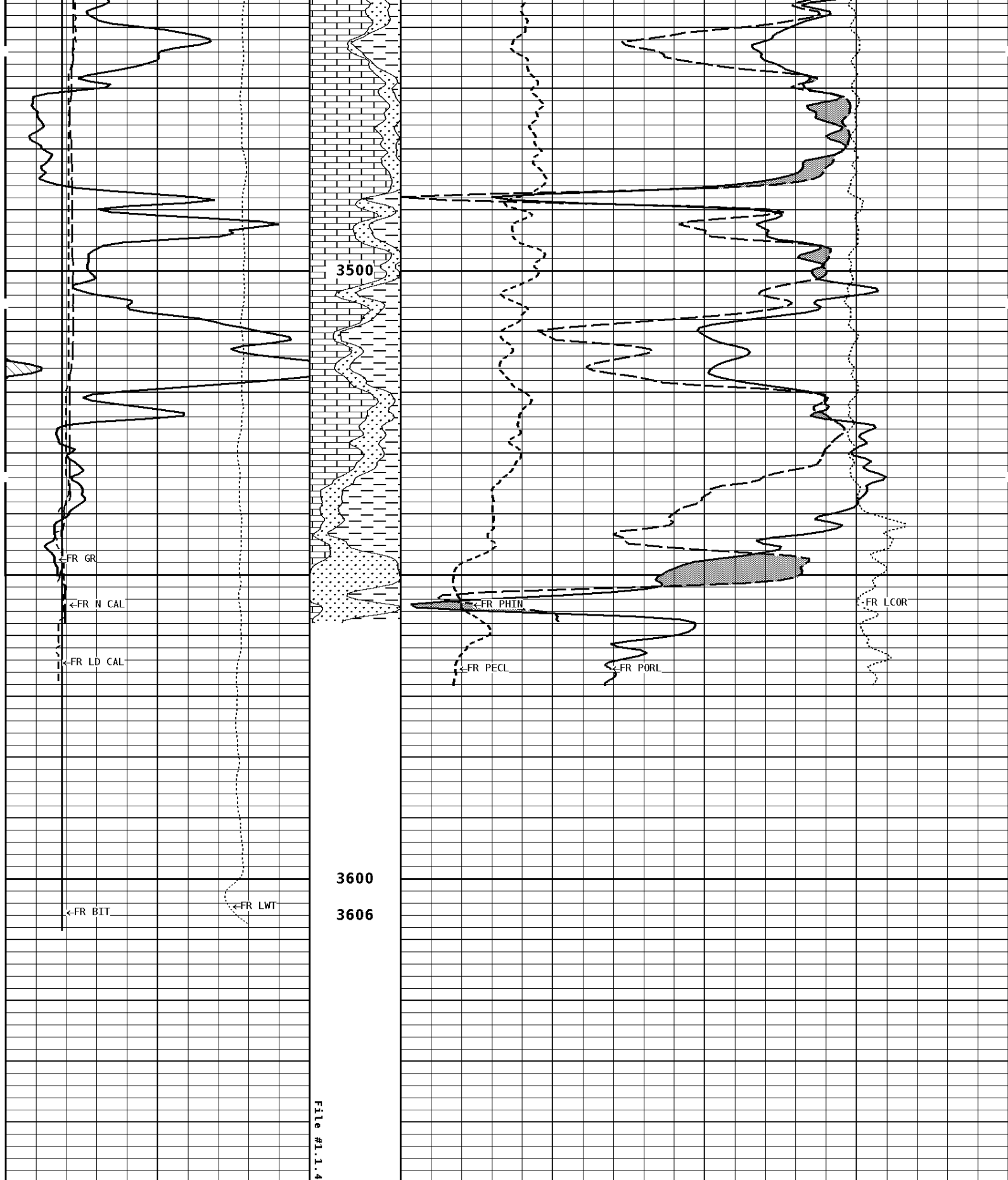
Well File: BLACK_SNYDER_4-16_MSTKWOT_DEC-22	Scale: 1:240	Format: NLD-240
Segment: V1.D1.S4 REPEAT	Acquired: 2016-12/22 04:22 3.4.0-13711	
Reference: 0	Processed: 2016-12/22 05:49 3.4.0-13711	

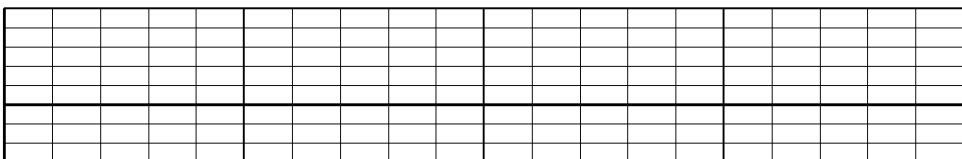
BIT SIZE INCHES (IN)					
6	16				
NEUTRON (Y) CALIPER INCHES (IN)					
16	26				
6	16				
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARNs/ELECTRON	DENSITY CORRECTION G/CC	
16	26				
6	16				
TENSTON		Volume	DENSITY POROSITY (2.71g/cc)		

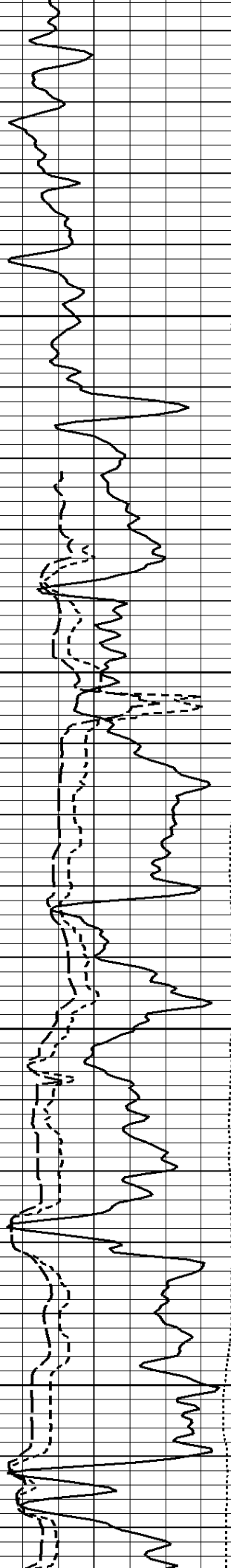
10000		0		70 30 -10	30 -10 -50
GAMMA RAY API UNITS		150 0 300 150		NEUTRON POROSITY (LIMESTONE) PERCENT	
				30	-10

1:240 REPEAT SECTION



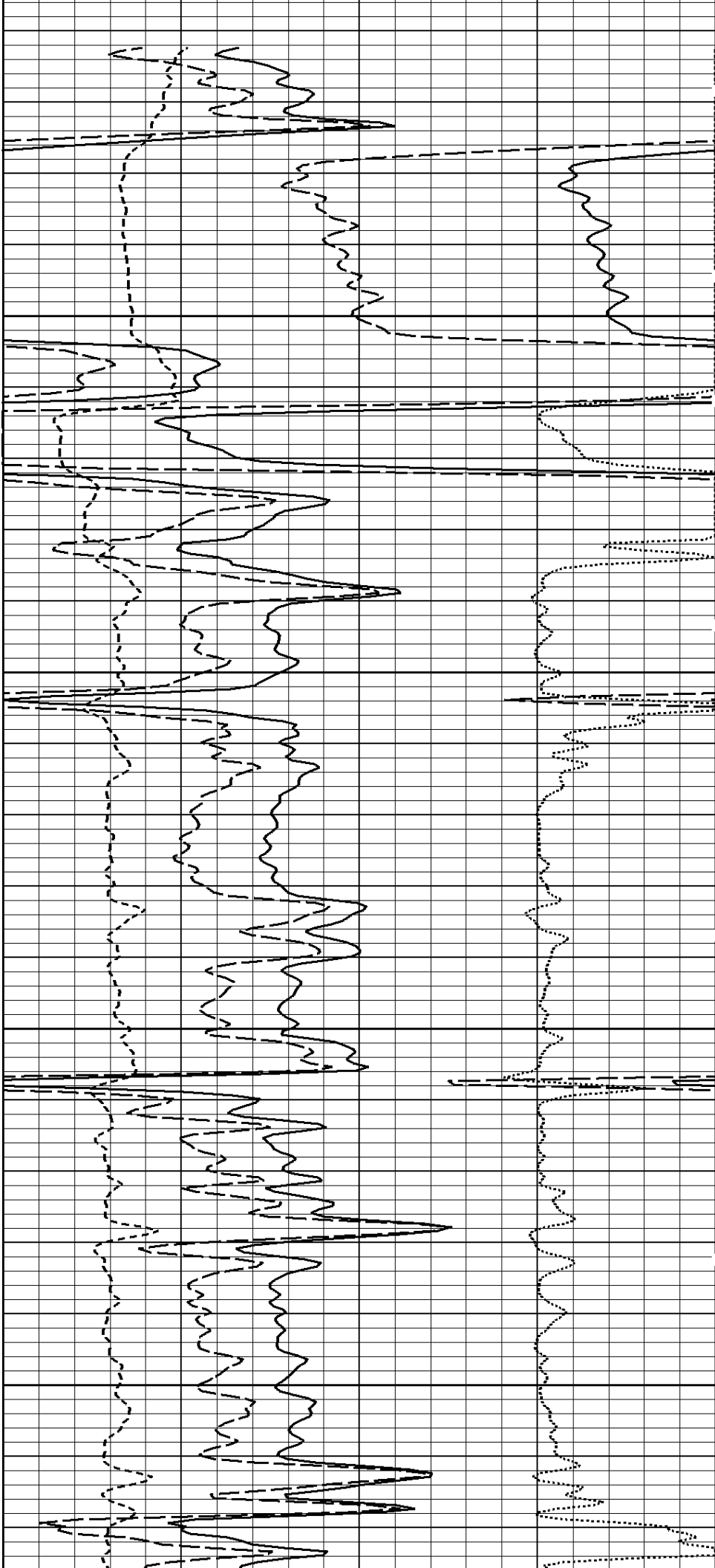


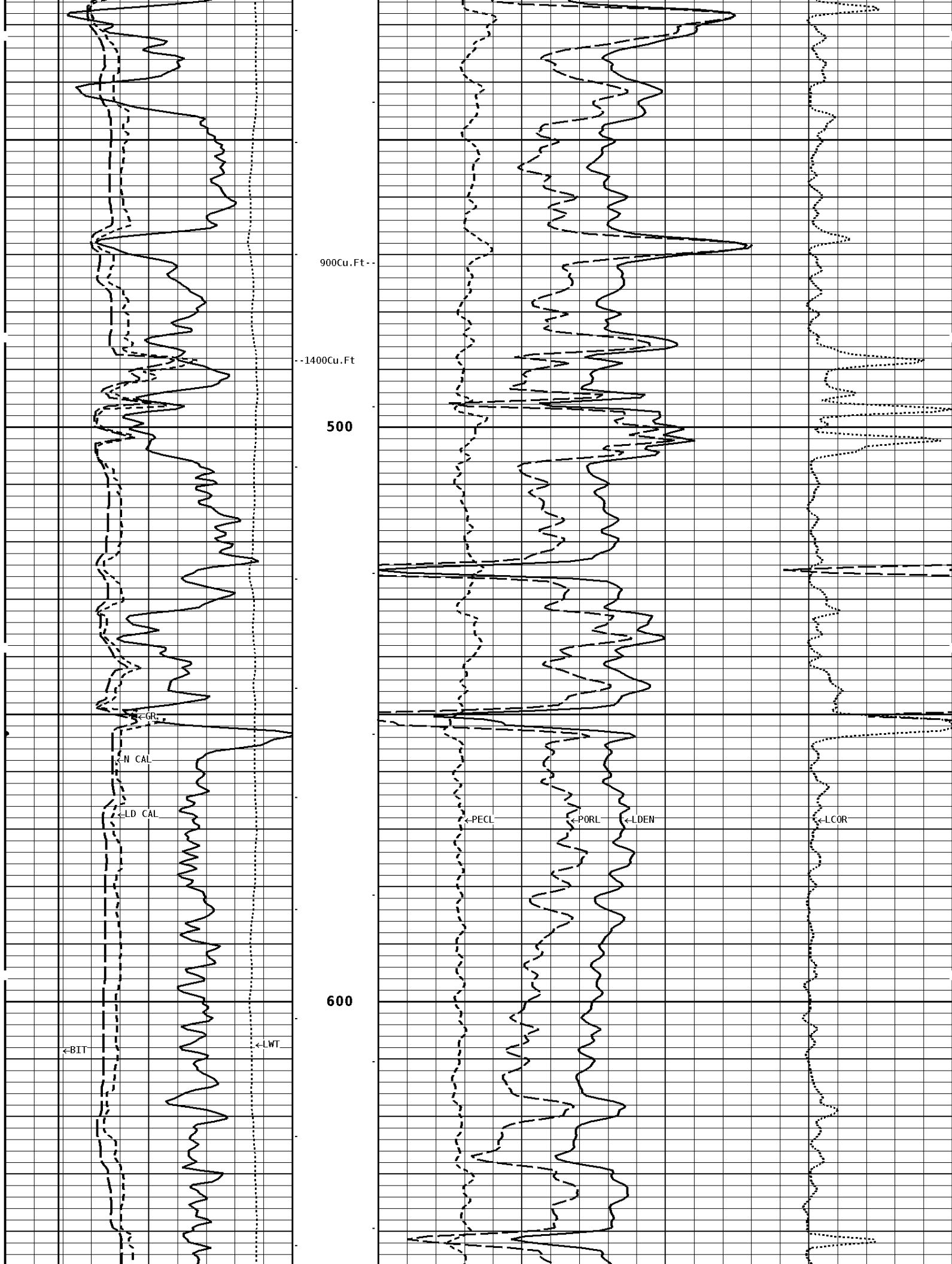


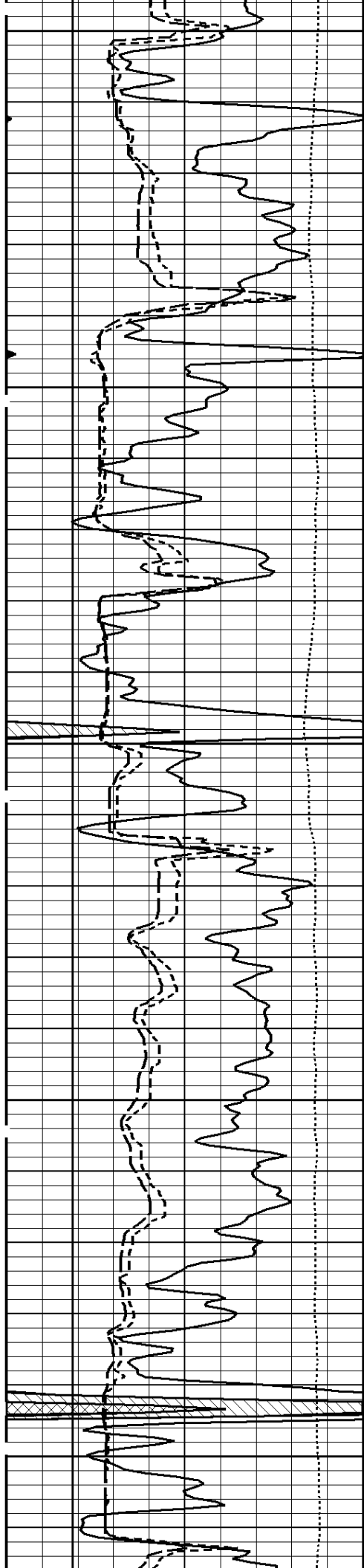


300

400





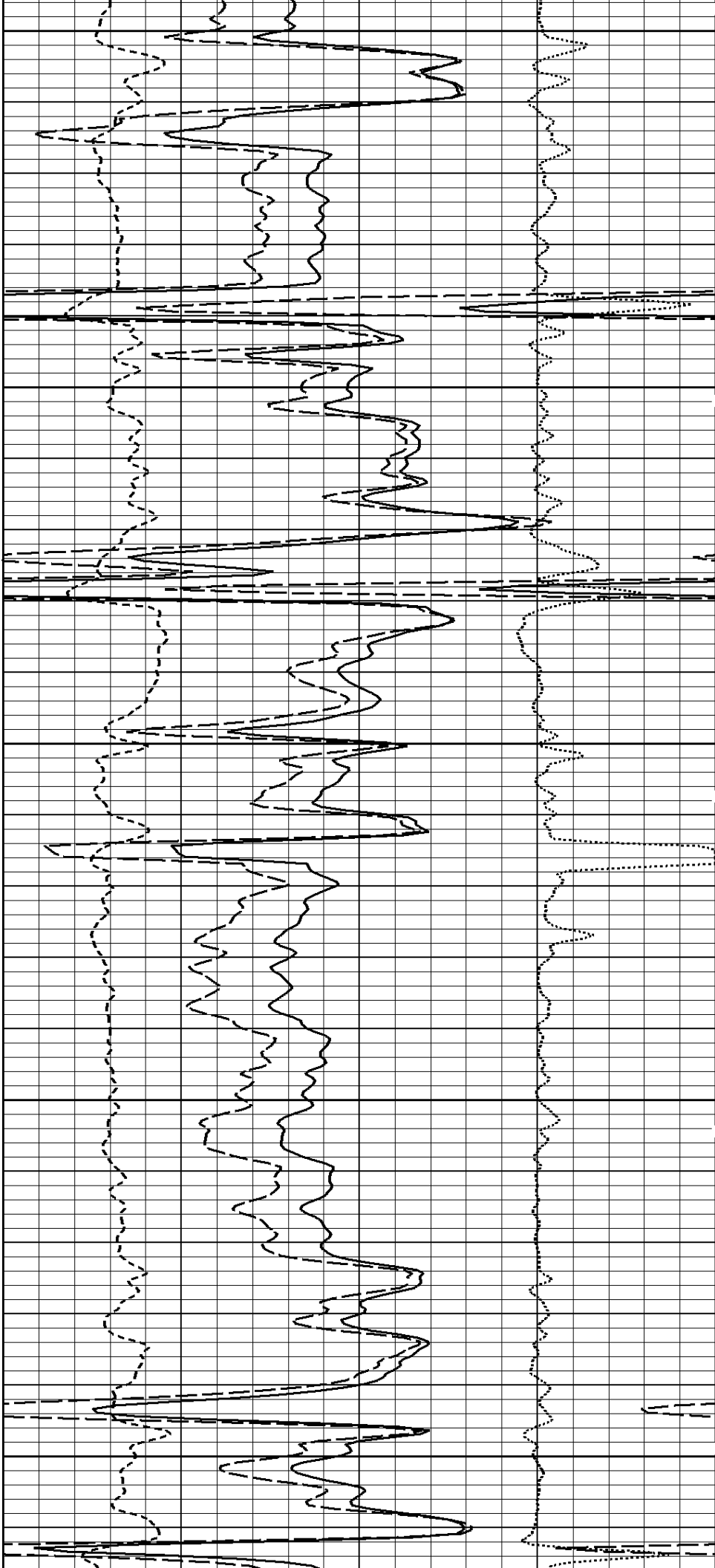


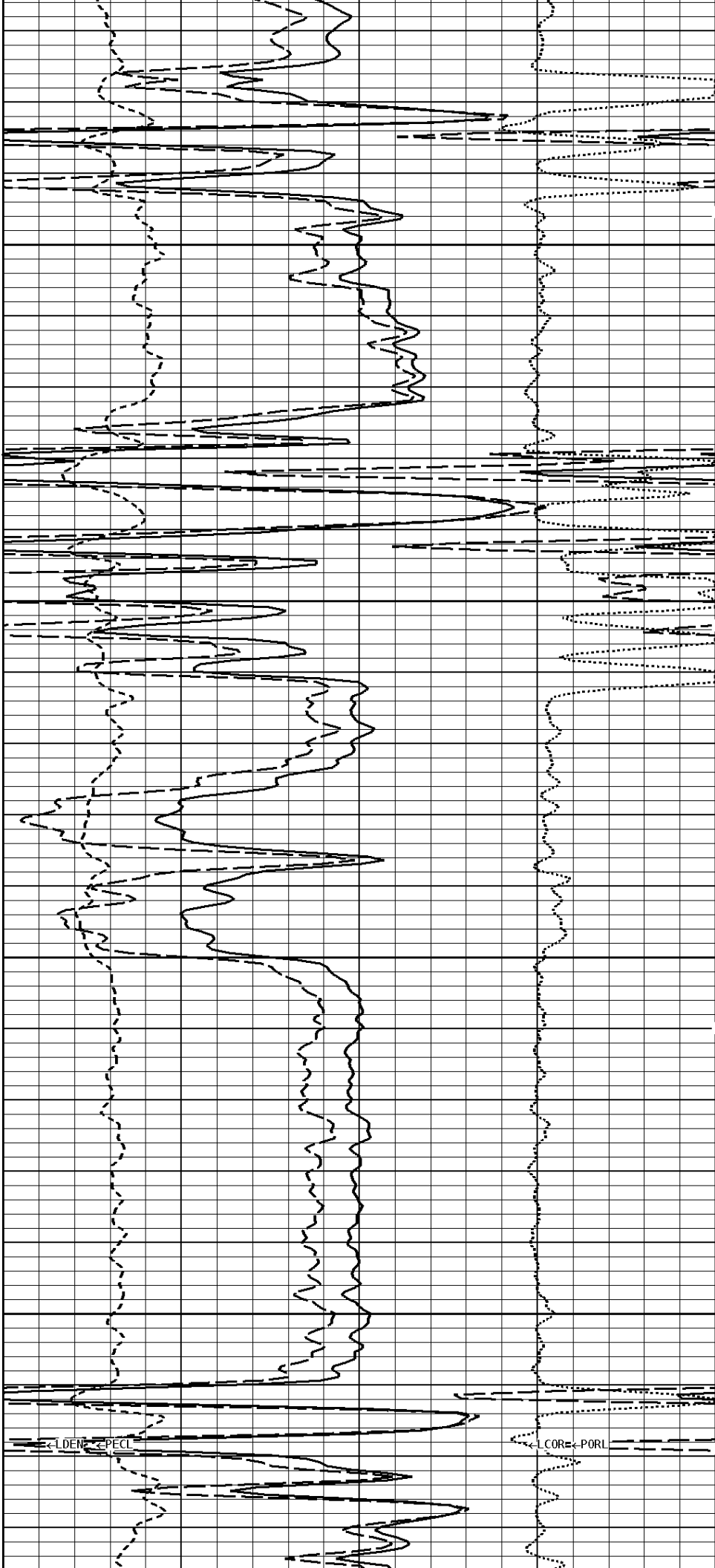
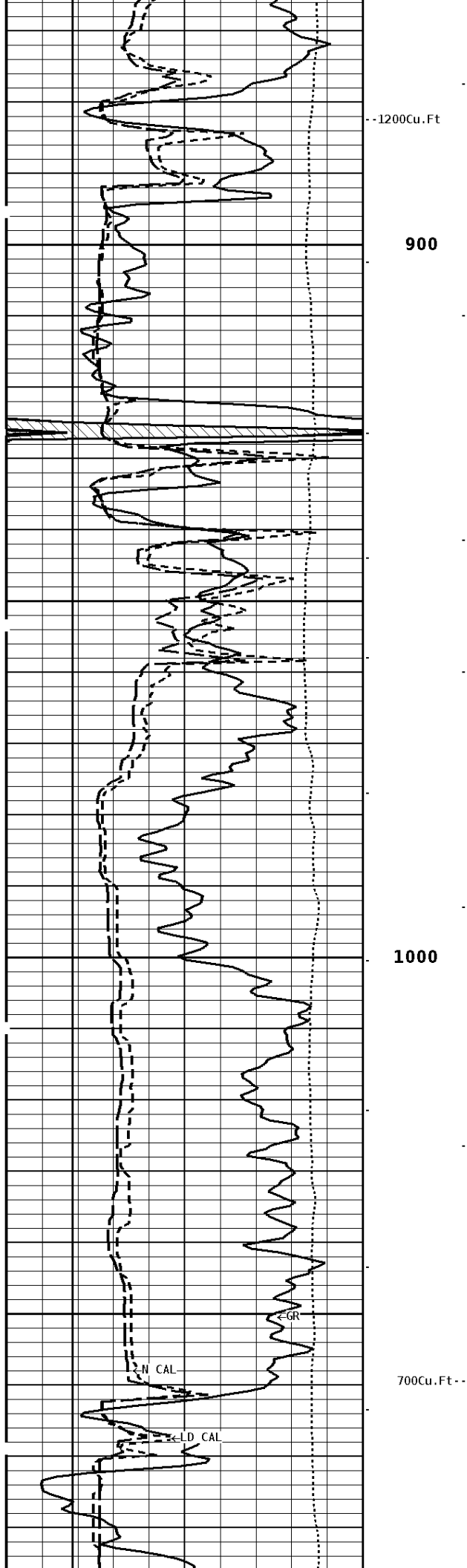
--1300Cu.Ft--

700

800Cu.Ft--

800





--1100Cu.Ft

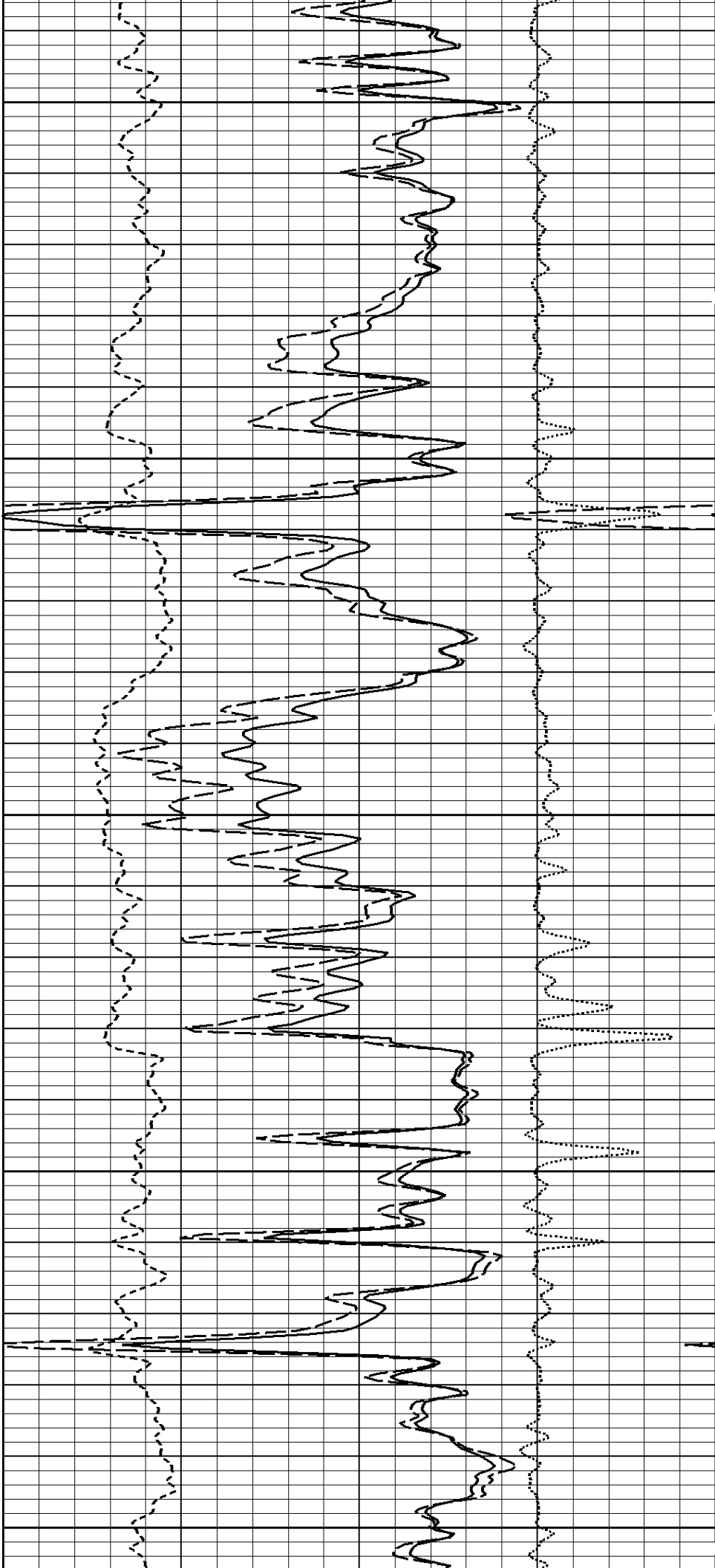
1100

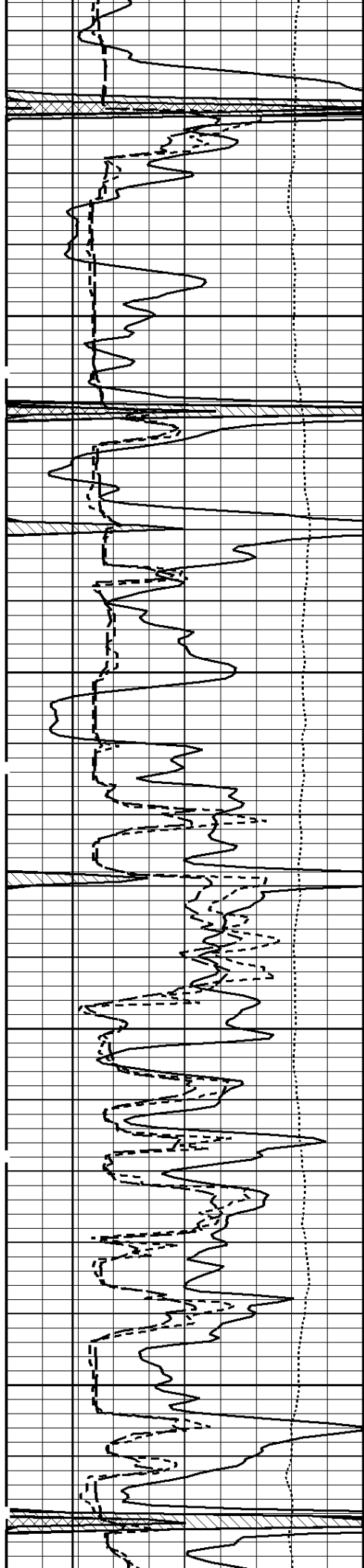
←BT

←LWT

1200

1300



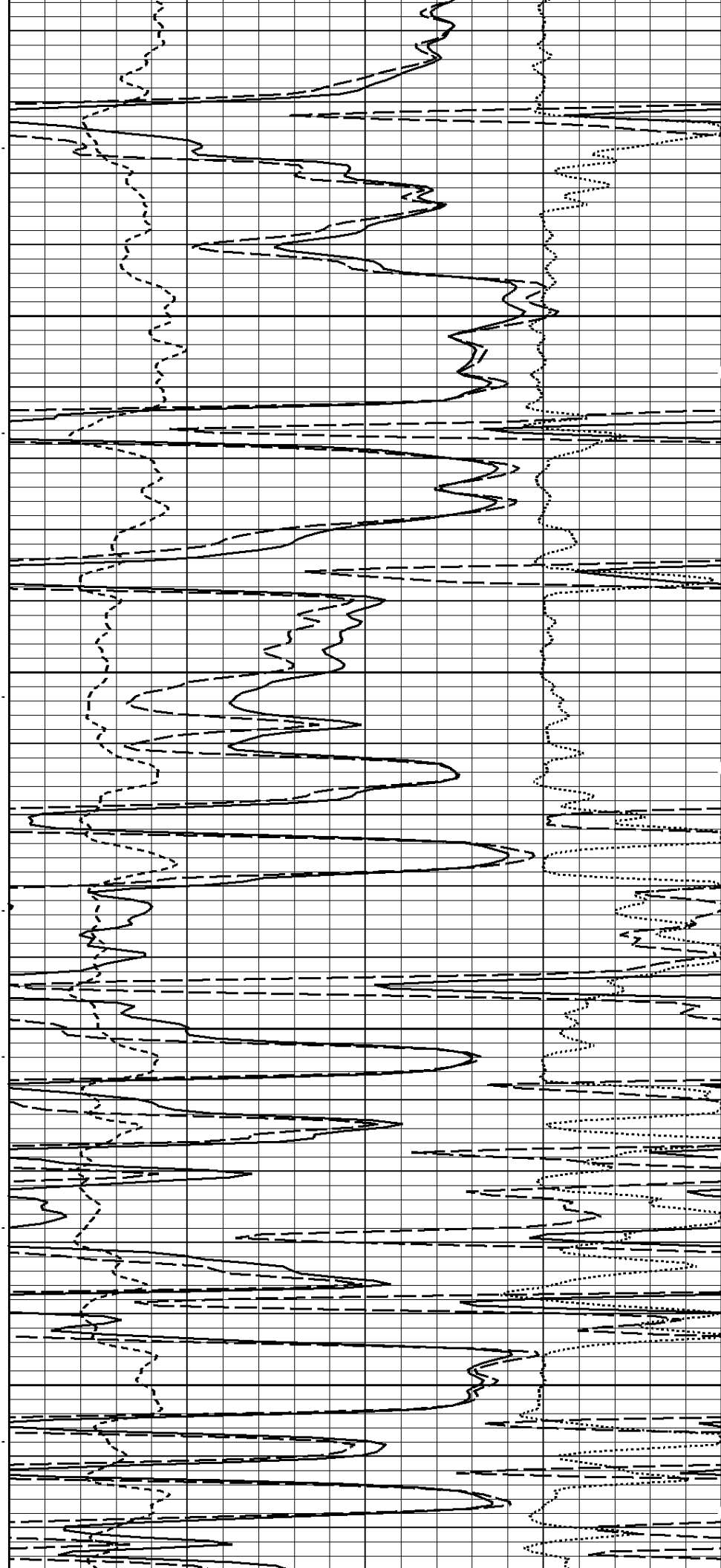


--1000Cu.Ft

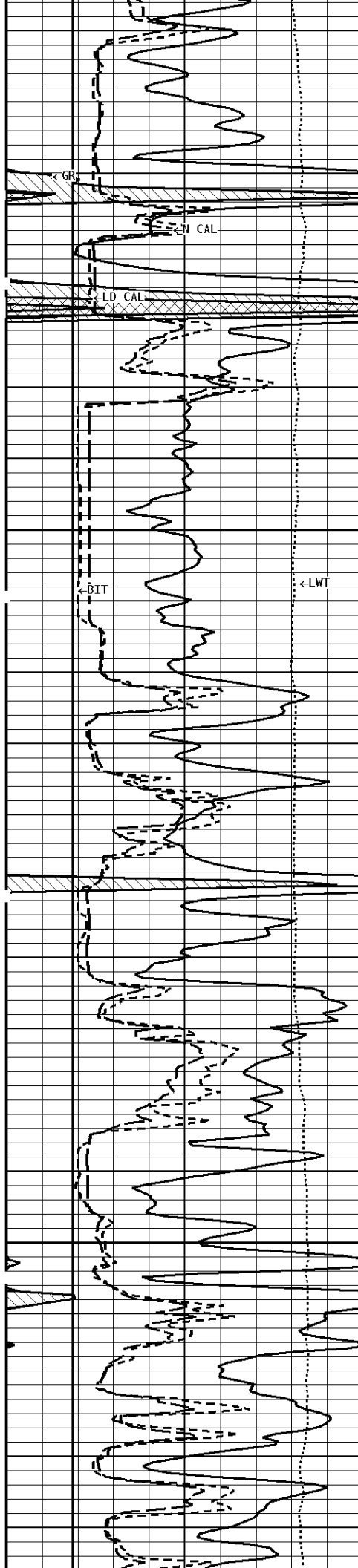
1400

600Cu.Ft--

1500



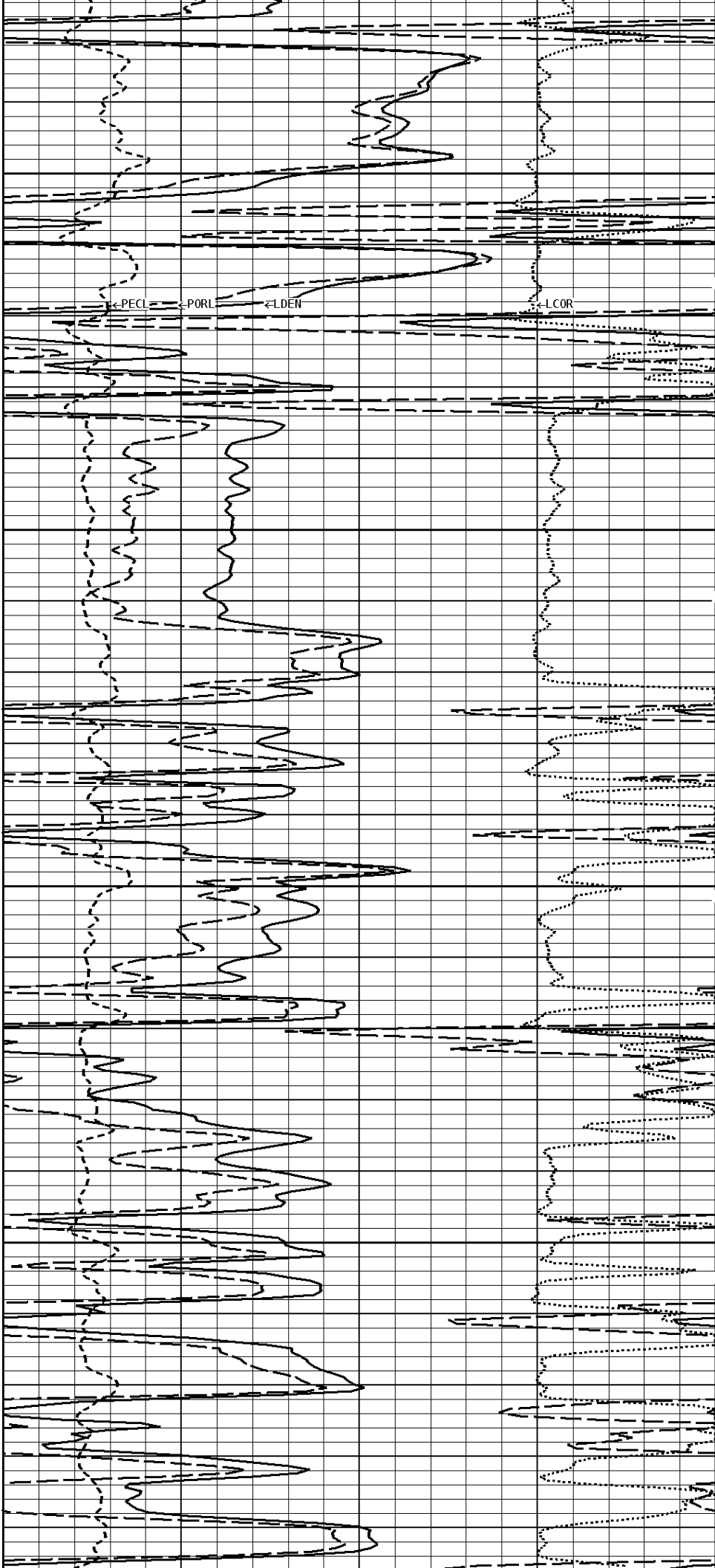
--900Cu.Ft

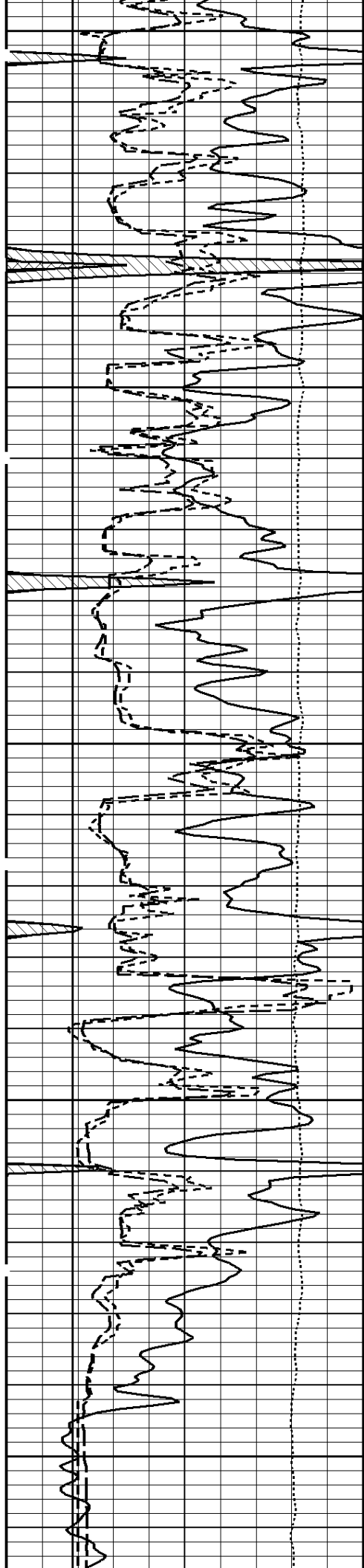


1600

1700

--80c500Cu.Ft--

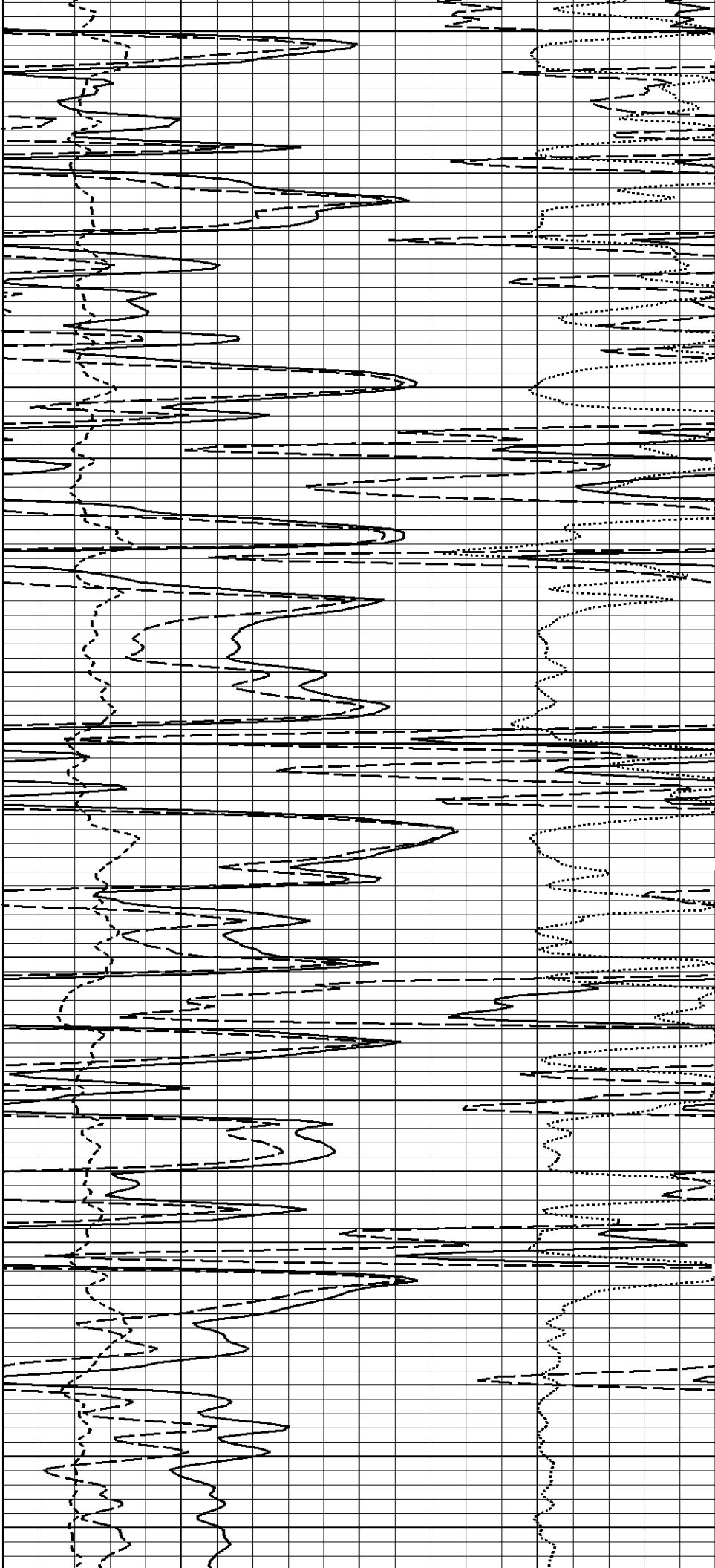


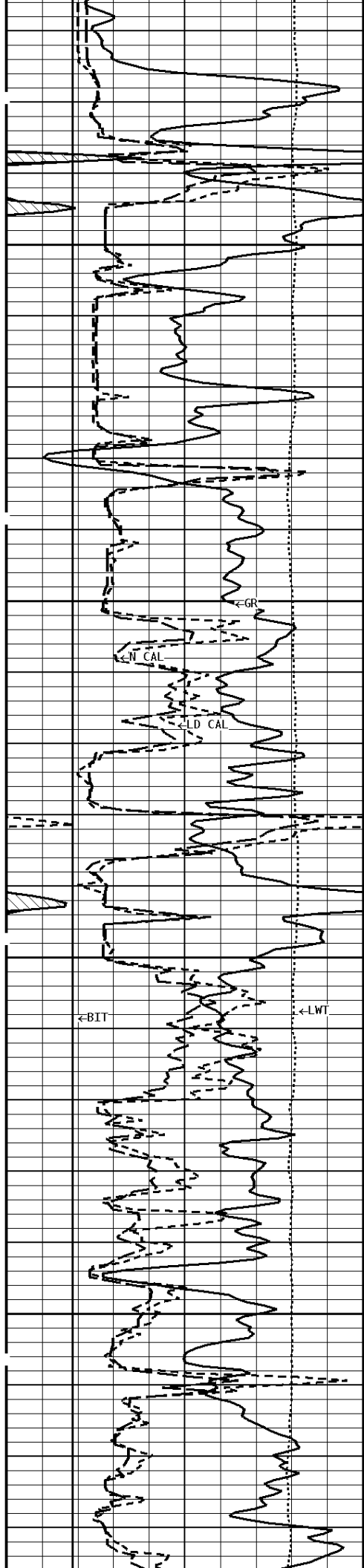


1800

1900

--700Cu.Ft





2000

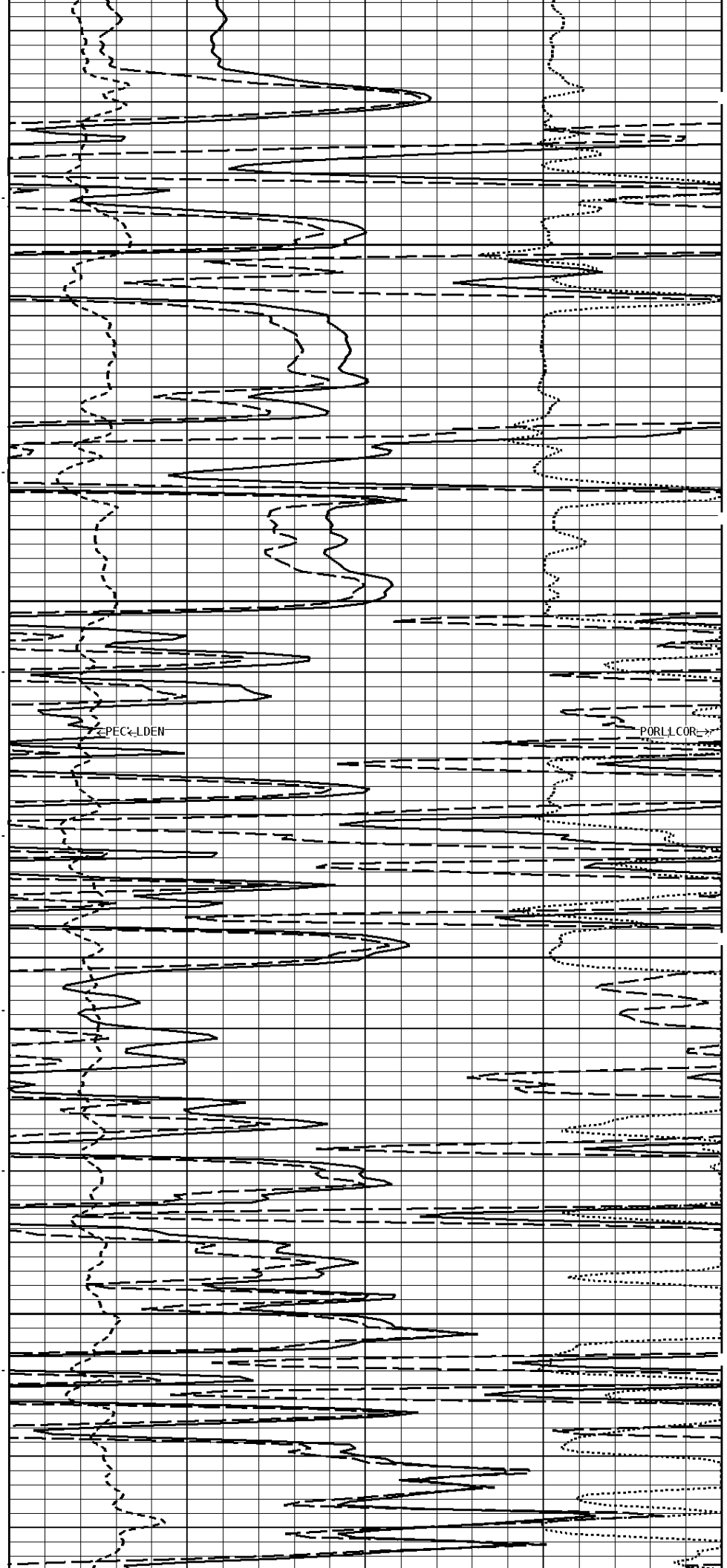
400Cu.Ft.

2100

-600Cu.Ft

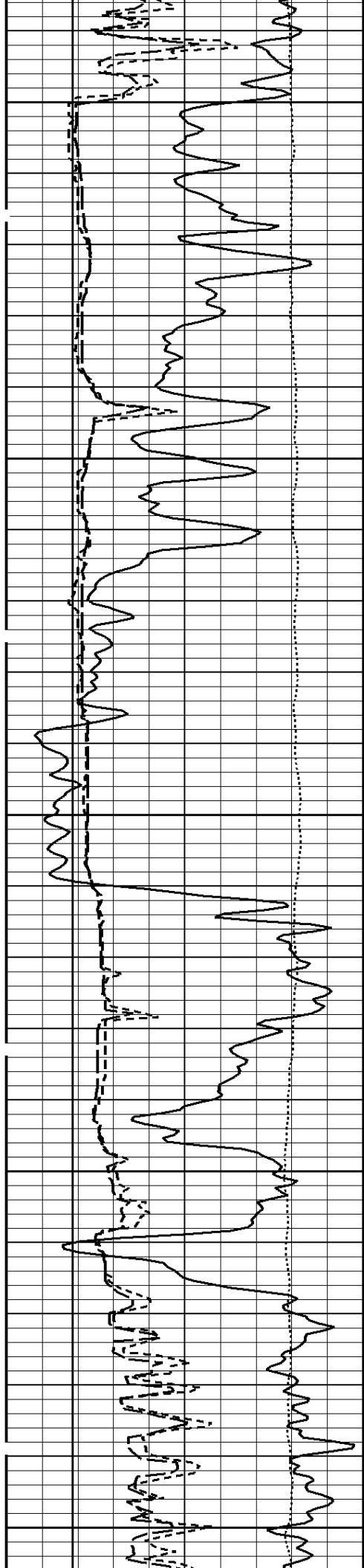
←GR
←N CAL
←LD CAL

←BIT ←LWT



←PEC←LDEN

←PORTCOR→



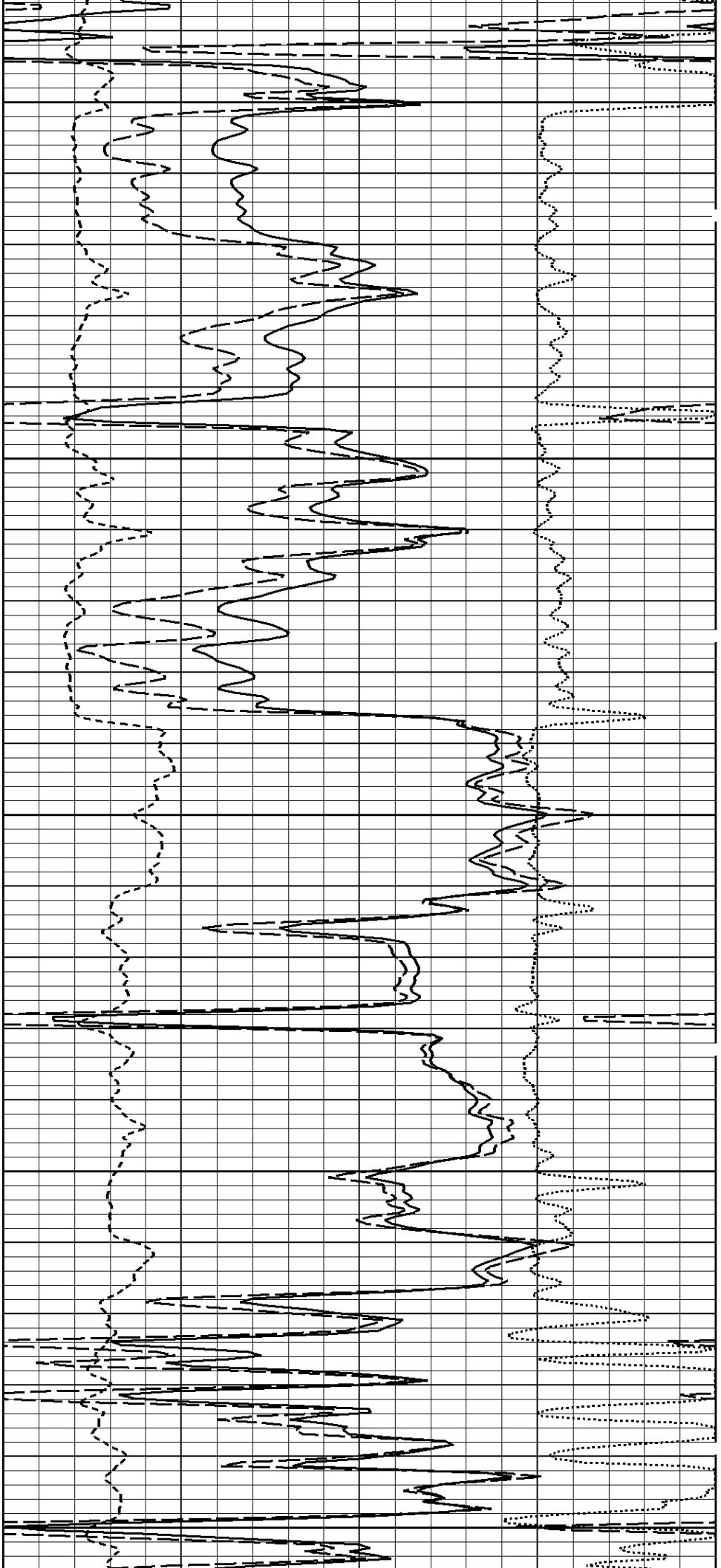
2200

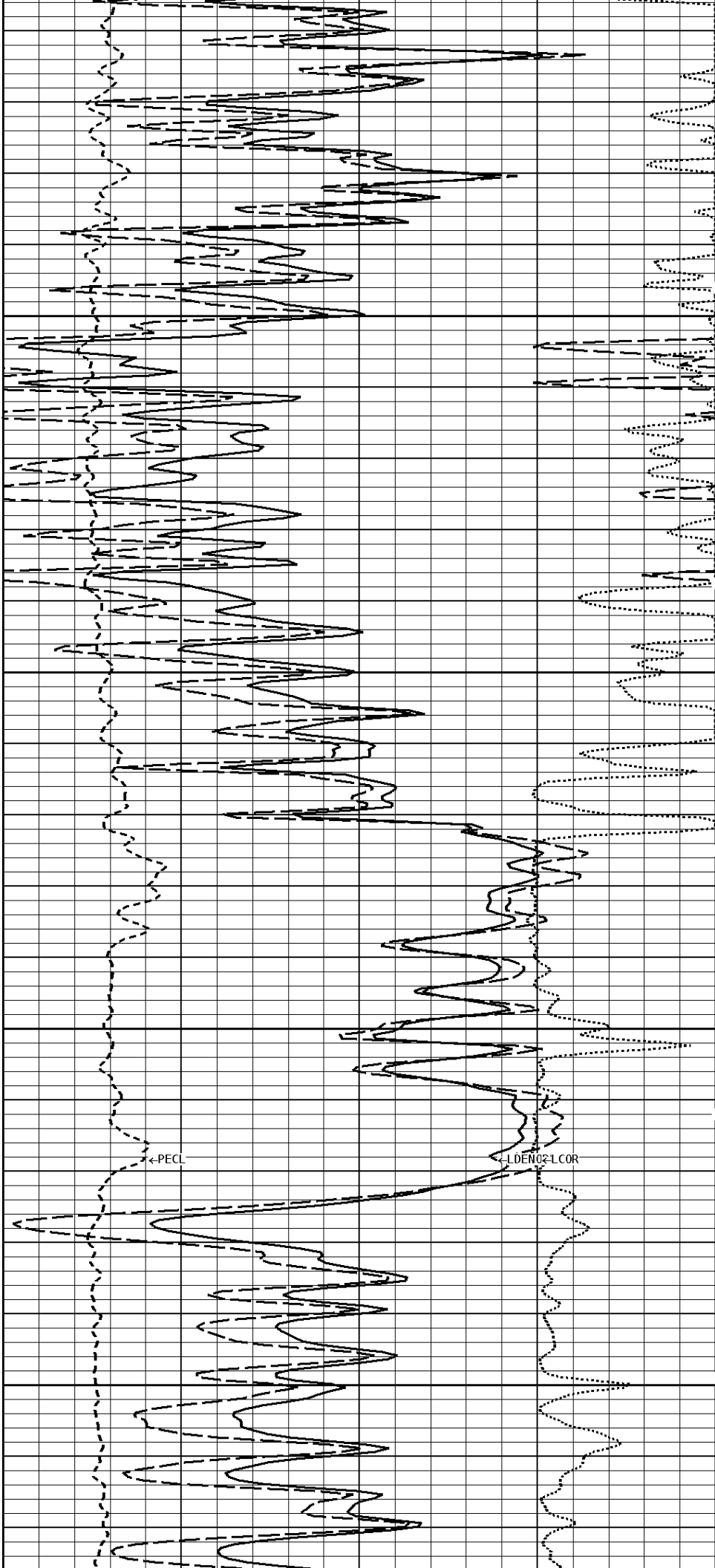
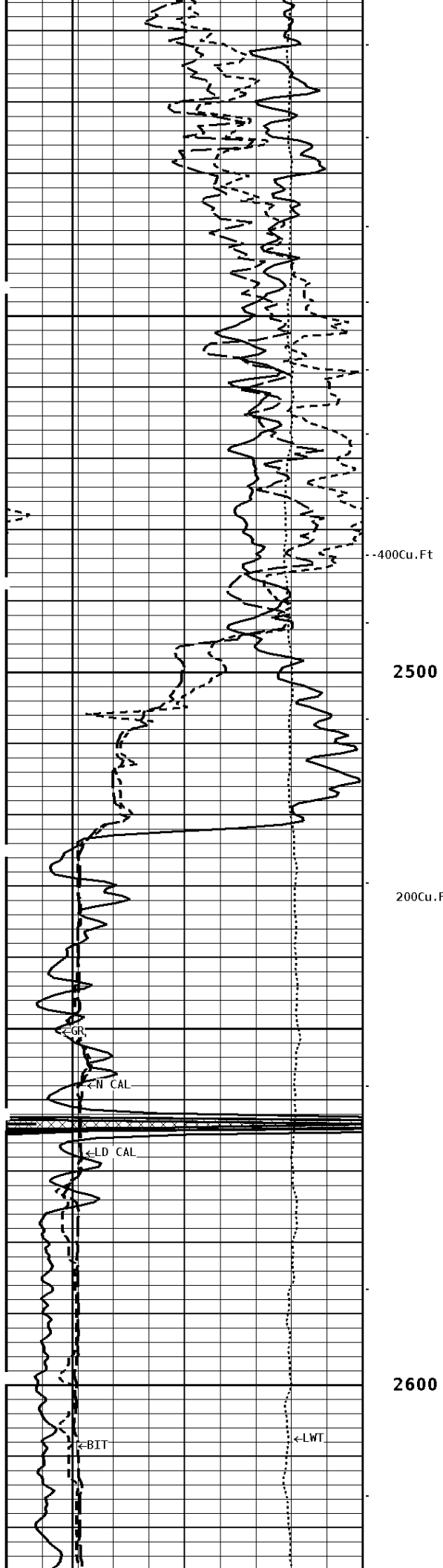
2300

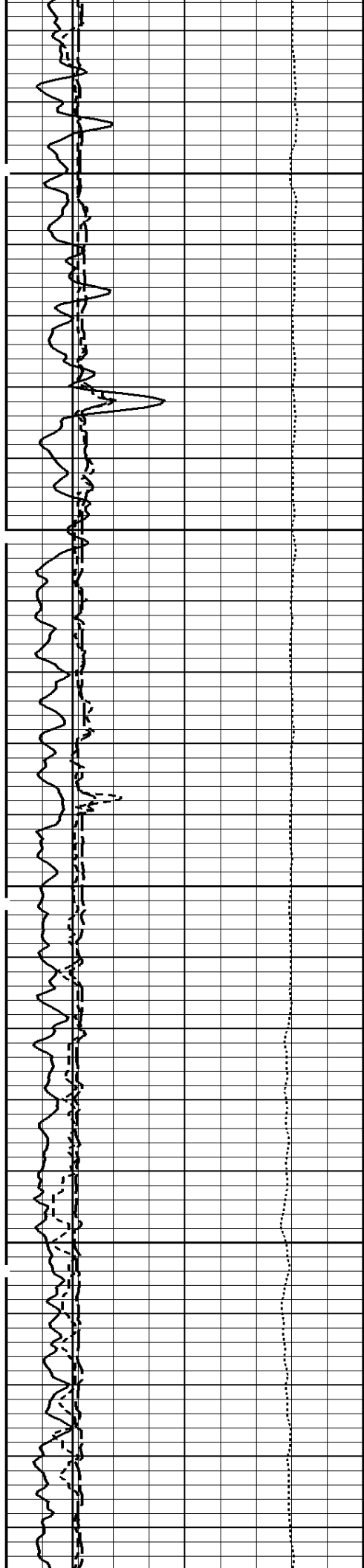
--500Cu.Ft

300Cu.Ft--

2400



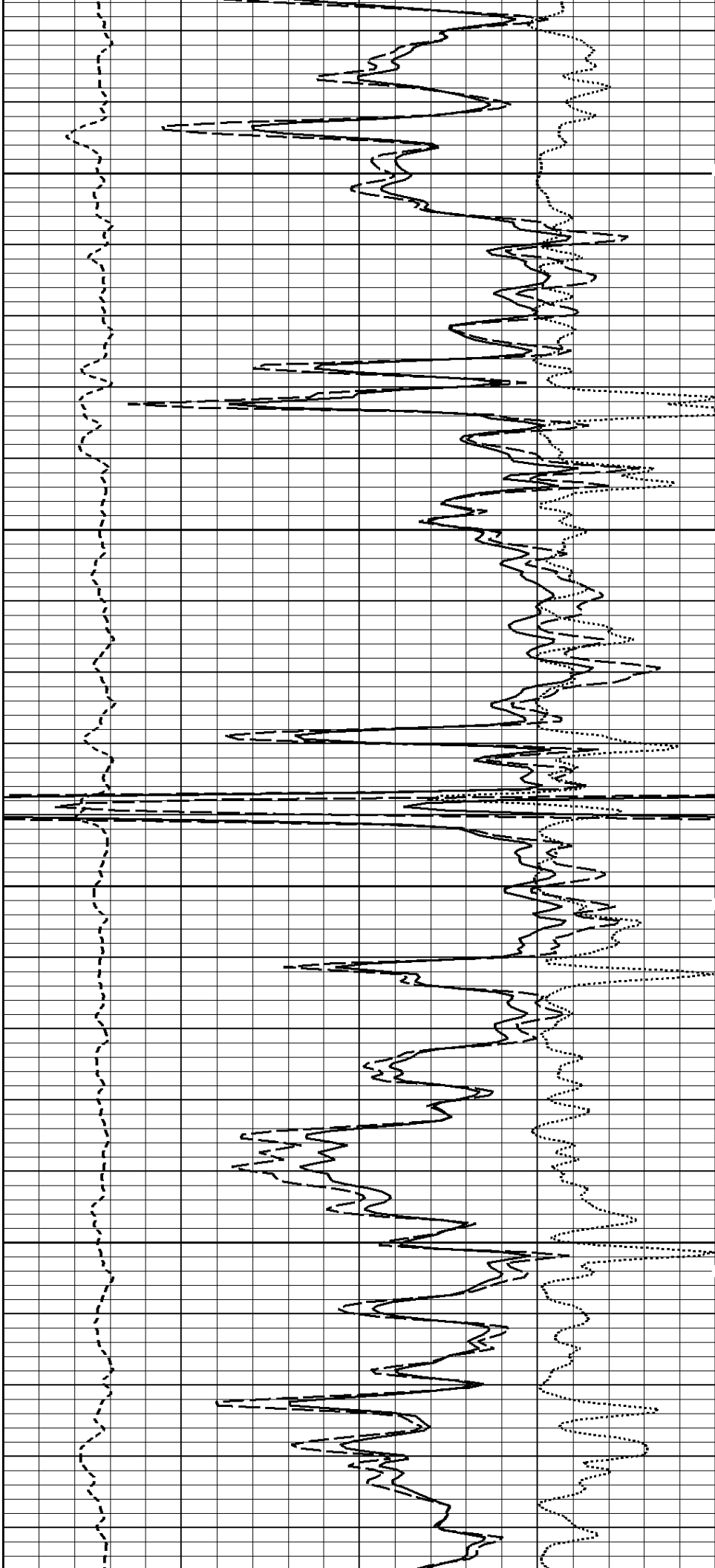


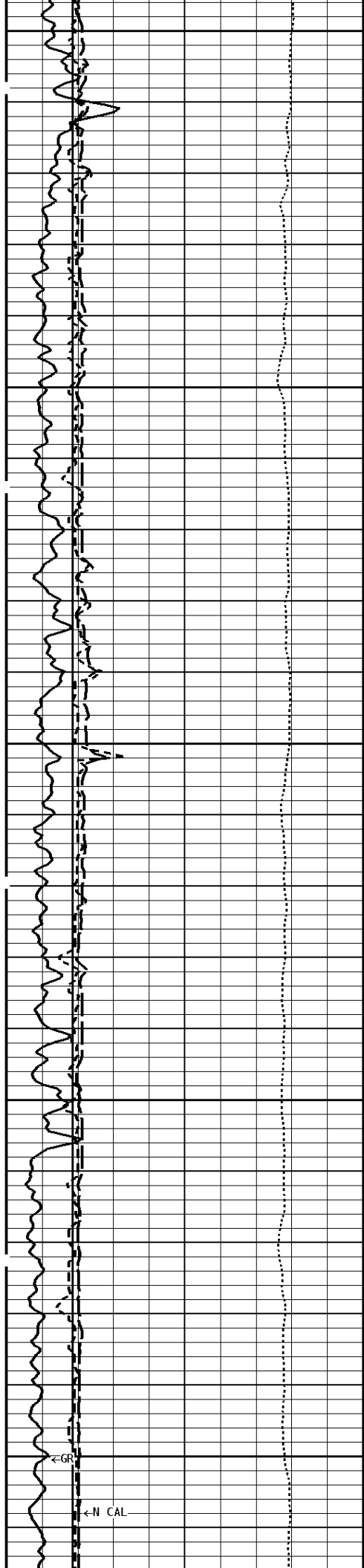


2700

--300Cu.Ft

2800



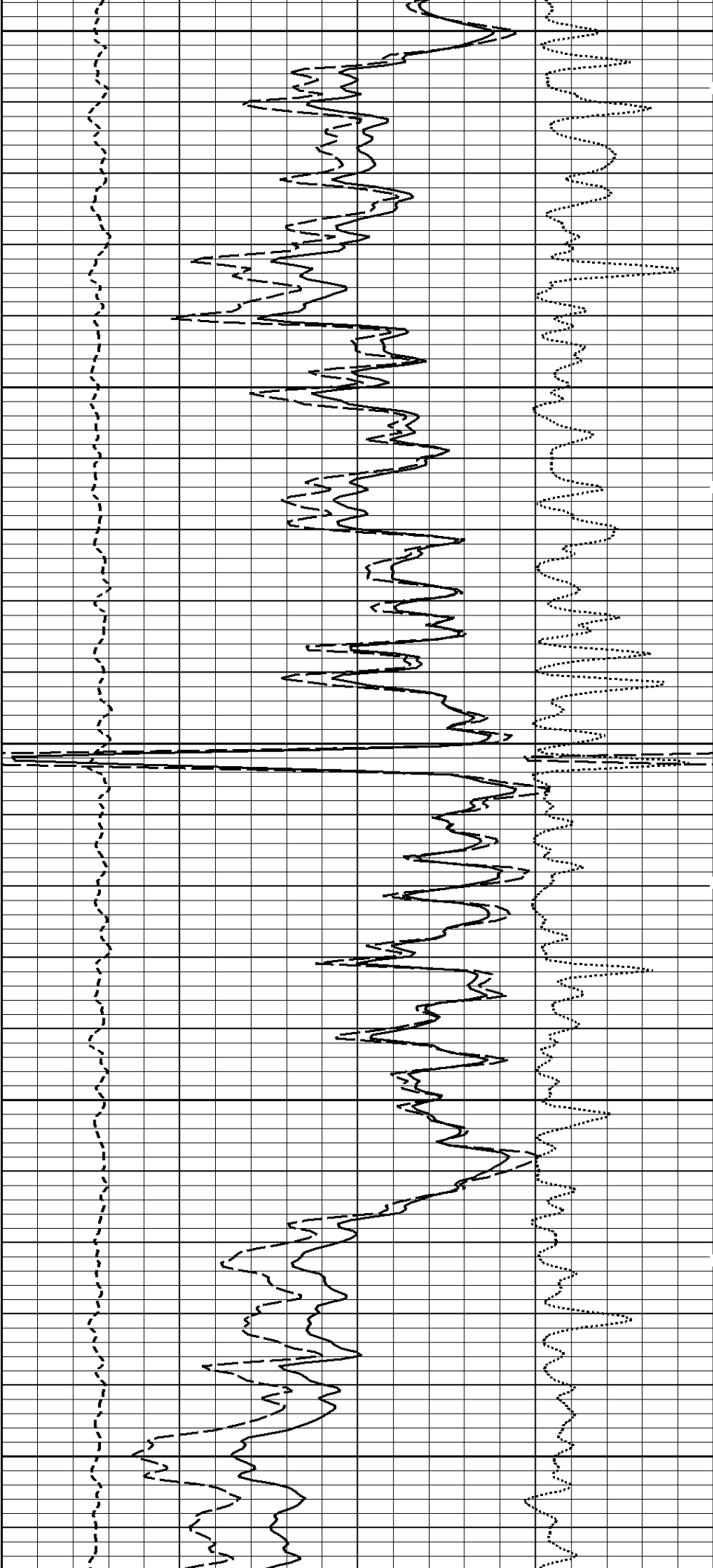


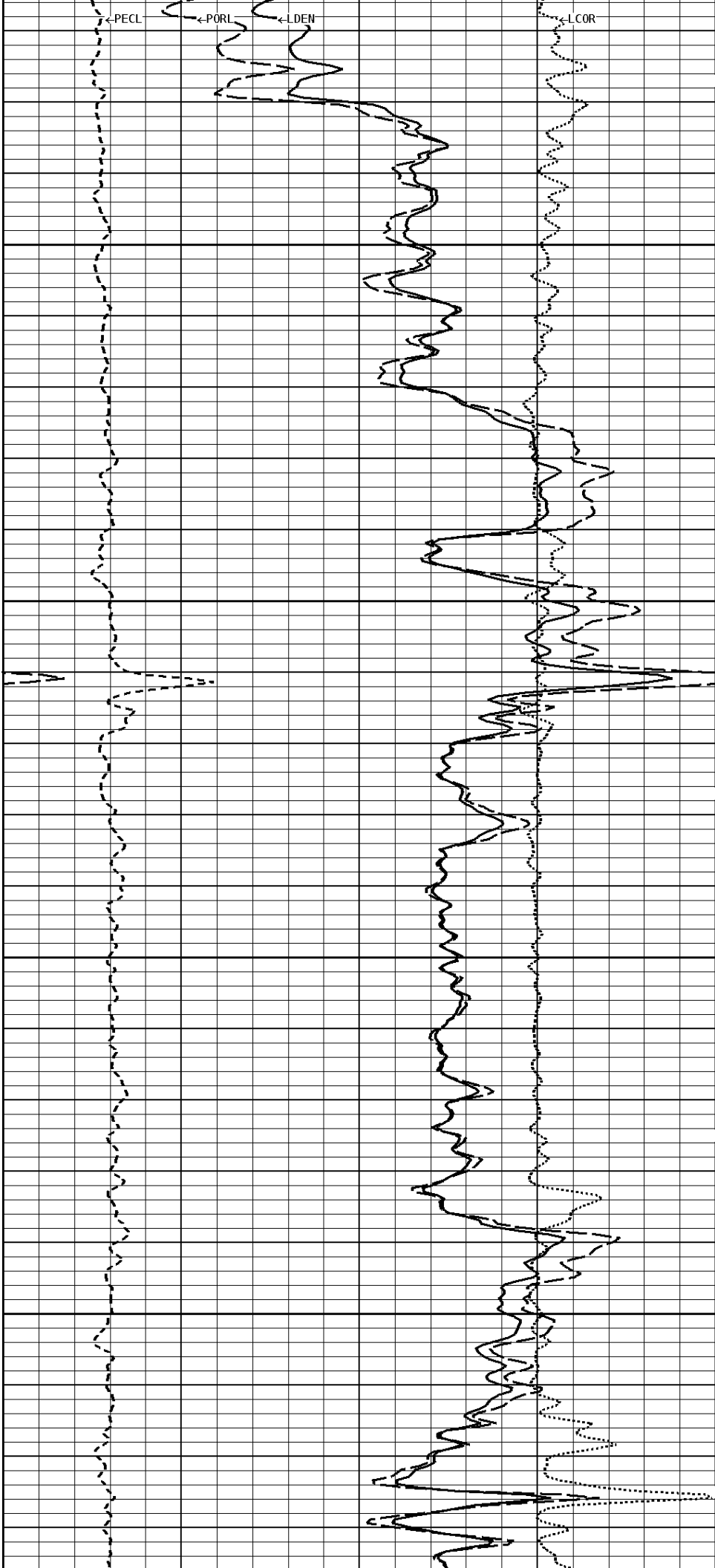
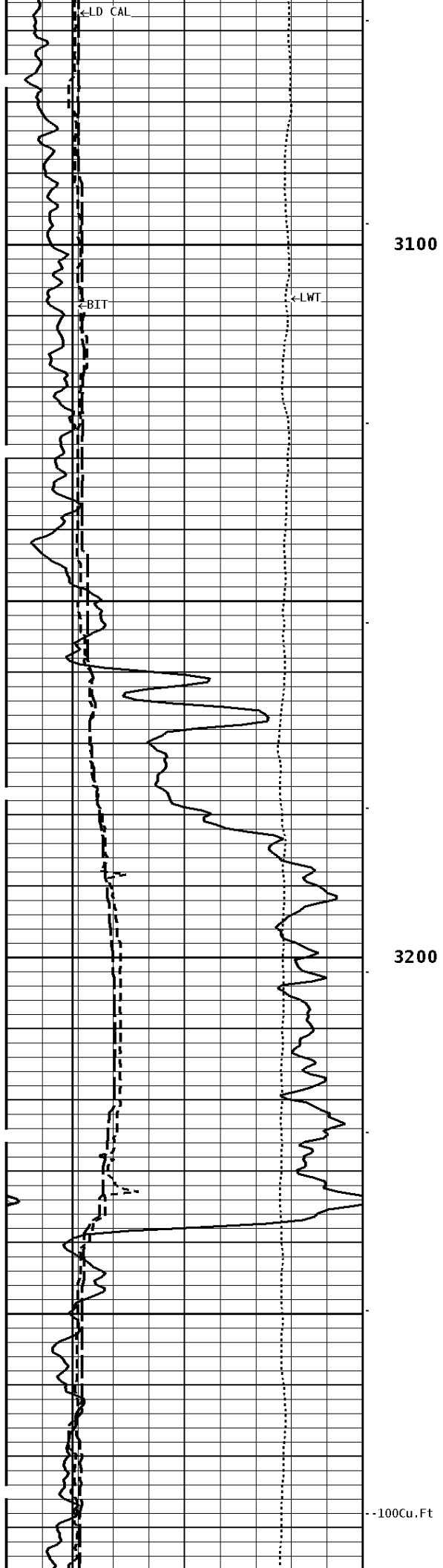
2900

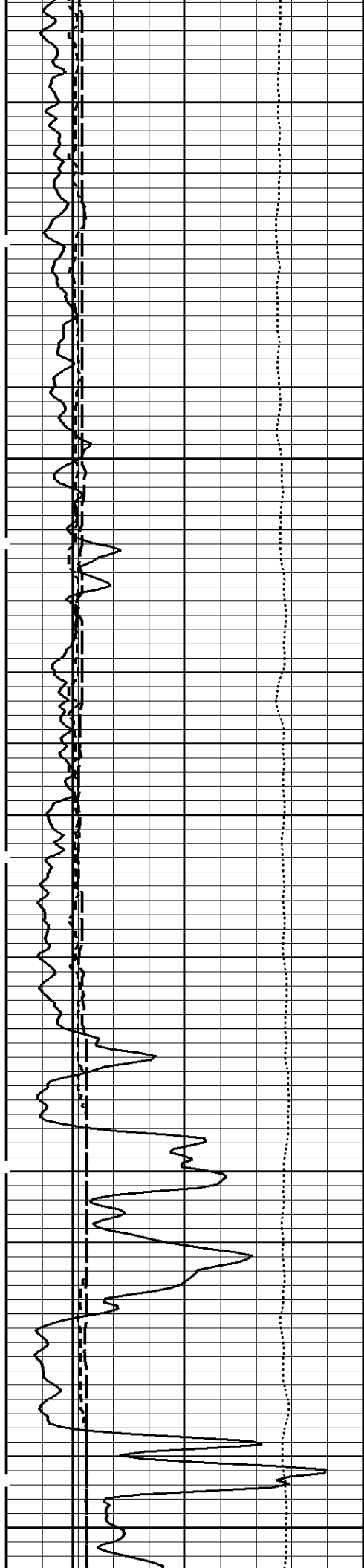
3000

--200Cu.Ft--

100Cu.Ft--



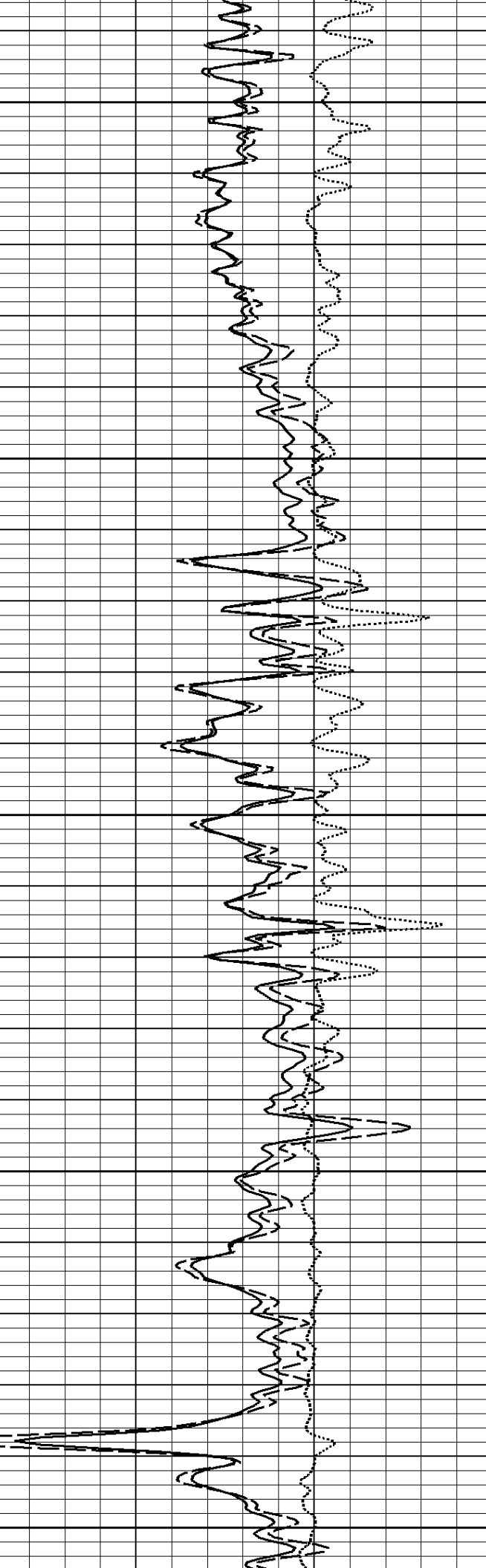
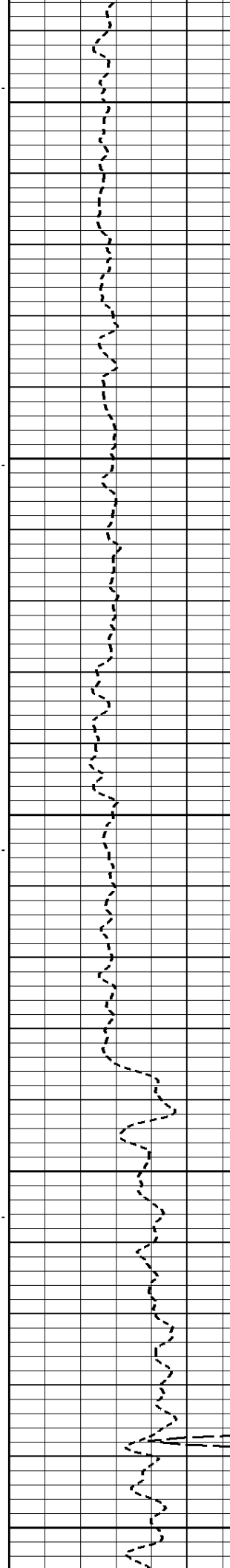


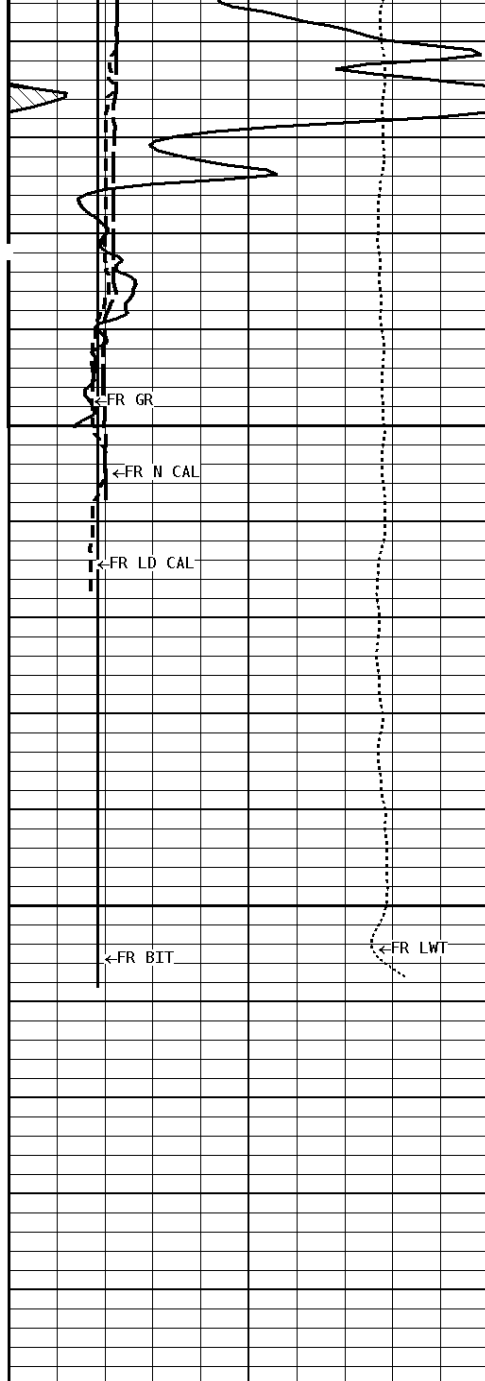


3300

3400

3500

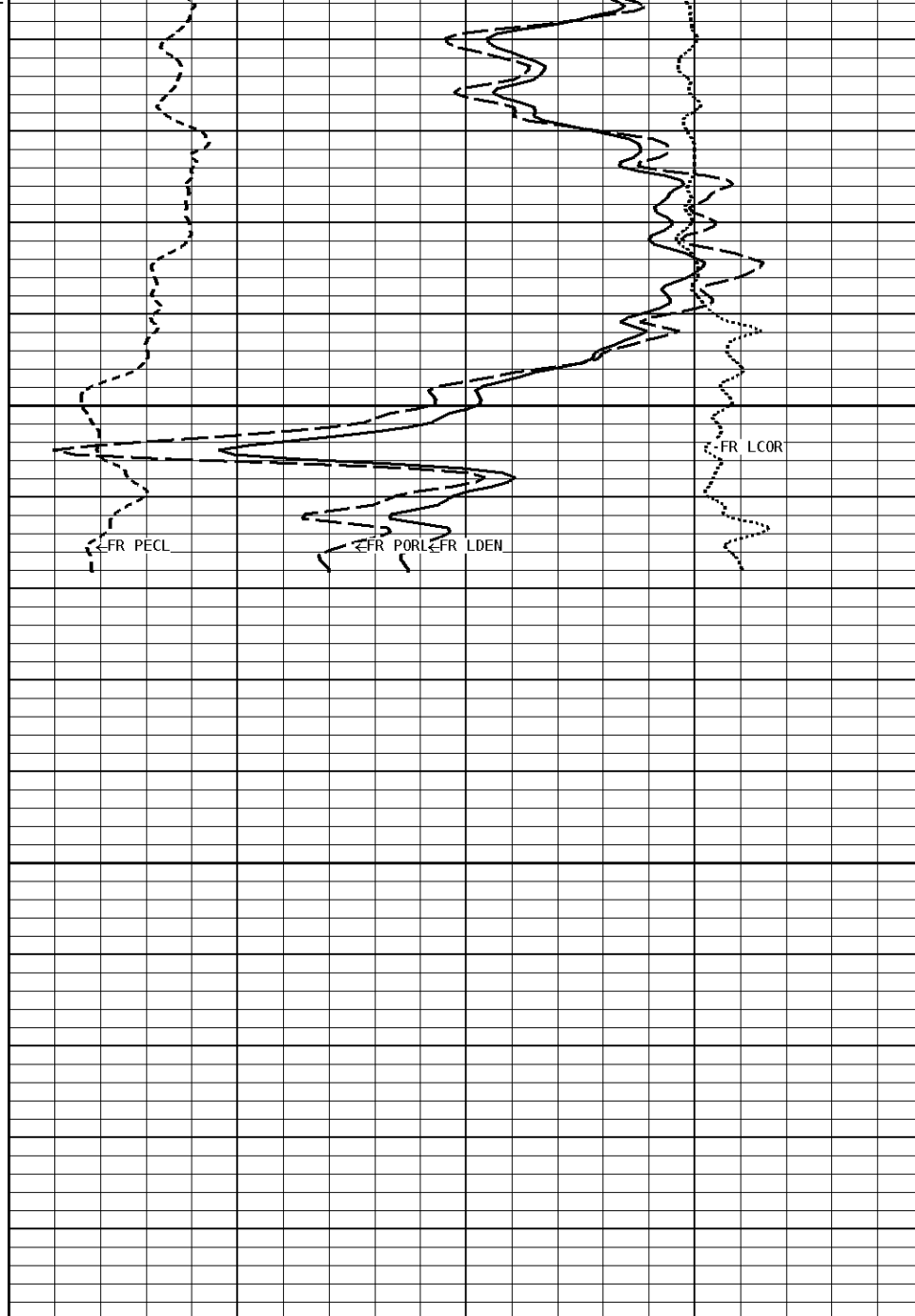




File #1.1.5

3600

3606



1:240 MAIN SECTION

BULK DENSITY

GAMMA RAY API UNITS 150 0 300 150	- BNH ANH - CU. FT	DENSITY POROSITY (2.71g/cc) PERCENT 70 30 -10 -50	
TENSION LBS 10000 0		COMPENSATED BULK DENSITY G/CC 3.0 4.0 2.0 3.0 1.0 2.0	
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16		PE CROSS-SECTION BARN/ ELECTRON 0 10	DENSITY CORRECTION G/CC -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16			

* Borehole Zone Factors *

Zone 1 99999.0 to 0.0 Feet		
Matrix Density	2.71	g/cc
Fluid Density	1.00	g/cc
Formation Matrix	Limestone	
Drill Bit Size	7.875	in
Casing Diameter	5.500	in
Casing Correction (PHI N)	Disable	

* Calibration Summary *

Shop Calibration GRT-B					
Performed : 13-OCT-2016			Time : 12:25		
Sensor Suite : GR-GR5			ID : GRT-BB-009		
	Measured	Units	Calibrated	Units	
	Background	Jig	Jig		
GR	46	361	175	GRAPI	
Shop Calibration CNT-AA					
Performed : 18-NOV-2016			Time : 10:55		
Sensor Suite : CALI-BCN			ID : NDT-BB-103		
	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	9.0	13.9	6.0	12.0	IN.
Performed : 19-Dec-2016			Time : 11:13		
Sensor Suite : BHC NEUT			ID : CNP-AA-116-		
Source ID : N-1045					
	Tank	Verification	Units		
	Measured	Calibrated	Jig		
N/F	3.8198	3.6893	3.6963		
Porosity	22.5	20.5	20.6		%
Shop Calibration LDT-DF					
Performed : 18-NOV-2016			Time : 09:42		
Sensor Suite : CALI-LTH			ID : PDT-GA-464		
	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	7.9	11.3	6.0	12.0	IN.
Performed : 19-Dec-2016			Time : 13:43		
Sensor Suite : BHCPELNG			ID : LDP-DA-066		
Source ID : 2991GW					
Short Space					
	BKGD	Al	Mg	Al+Fe	Units
LSW1	61	970	1572	631	CPS
LSW2	63	1176	1875	845	CPS
LSW3	238	2758	4438	2336	CPS
LSW4	296	2444	3533	2157	CPS
LSW5	29	52	57	49	CPS
LSW6	80	84	82	82	CPS
LSW7	49	54	53	55	CPS
LSW8	2	4	4	3	CPS
QS	0.236	0.215	0.214	0.199	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC
Long Space					
	BKGD	Al	Mg	Al+Fe	Units
LLW1	90	1026	4229	626	CPS
LLW2	101	1963	7849	1416	CPS
LLW3	381	3725	14363	3213	CPS
LLW4	494	1775	5718	1617	CPS
LLW5	55	66	113	62	CPS
LLW6	158	153	147	155	CPS

LLW7	100	99	99	101	CPS
LLW8	3	6	16	5	CPS
QL	0.225	0.211	0.194	0.212	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC



Tucker
ENERGY SERVICES

Company: BLACK STAR 231 CORP.
 Well: SNYDER #4-16
 Location: 330' FNL & 1532' FWL
 Logged: 12-22-2016
 K.B. Elev: 1126.0 Ft