

STEP

energy services

**COMPENSATED NEUTRON
PEL DENSITY MICRO LOG**

Company ENTRANSCO ENERGY, LLC
Well D. WIEBE #32-1
Field HAZLETT
County BULTER
State KANSAS
Country USA
API No. 15-015-24131-00-00

File No : HAYS-70384
Company : ENTRANSCO ENERGY, LLC
Well : D. WIEBE #32-1
Field : HAZLETT
County : BULTER
State : KANSAS
Country : USA
API No : 15-015-24131-00-00

Location :
 1925' FSL & 350' FWL
 NE SW NW SW

LSD : **Sect** : 32 **Twp** : 23S **Rge** : 5E

Permanent Datum:	GL	Elevations:		Services:	
Drilling Measured From:	KB	KB 1495.00	Ft	CNP	PIT
Log Measured From:	KB	DF 1494.00	Ft	LDP	
Above Permanent Datum:	9.00 Ft	GL 1486.00	Ft	MST	
Date	11-08-2019				
Run Number	0				
Depth--Driller	2615.0 Ft				
Depth--Logger	2613.0 Ft				
First Reading	2591.0 Ft				
Last Reading	221.0 Ft				
Casing--Driller	221.0 Ft				
Casing--Logger	221.0 Ft				
Bit Size	7.875 In				
Casing Size	8.625 In				
Hole Fluid Type	WBM				
Density	9.2				
Fluid Loss	10.4				
PH/Viscosity	10.0	38.0			
Sample Source	MEASURED				
RM@Measured Temp.	4.500	@ 41	F		
RMF@Measured Temp	3.830	@ 41	F		
RM@Measured Temp.	5.180	@ 41	F		
Source RMF/RMC	CALCULATED/CALCULATED				
RM@BHT	2.110	@ 95	F		
Time Circulation Stopped	11-08-2019 04:00				
Max Recorded Temp.	95		F		
Equipment/Base	TRK-137		HAYS		
Recorded By	B. BAILEY				
Witnessed By	J. WISE, R. GILBERT, B. STOUT				

The customer is hereby warned that by providing the log data herein, STEP Energy Services does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. STEP Energy Services 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 STEP Energy Services 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 STEP Energy Services 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	2615.00	8.625	15.00	221.00	0.00

Run Number	0	
Date	11-08-2019	
Date/Time On Bottom	11-08-2019 08:33	
Depth to Fluid	0.0	Ft
Salinity	0.000	
RMF@BHT	1.800	@ 95 F
RMC@BHT	2.430	@ 95 F

Run Number 0

Comments

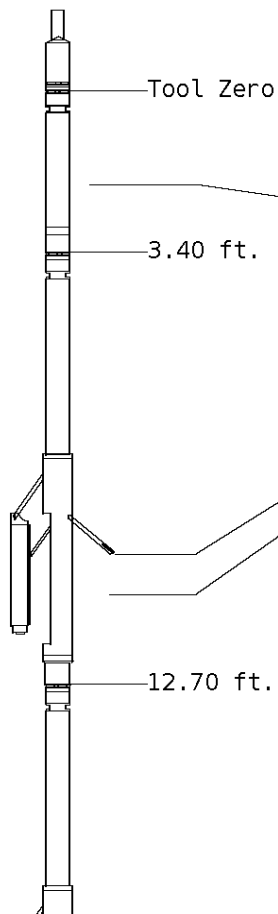
ALL PRESENTATIONS AS PER CUSTOMER REQUEST
 GRT, CNT, LDT, MLT AND PIT RUN IN COMBINATION
 CALIPERS ORIENTED ON X-Y AXIS
 2.71 G/CC USED TO CALCULATE POROSITY
 ANNULAR HOLE VOLUME CALCULATED USING 5.5" PRODUCTION CASING
 PHIN IS CALIPER CORRECTED
 SURFS MESURED FROM GL AT 212' SO ADD 9FT BECAUSE LOGGER MEASURED FORM GL

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:
 J.VAUGH
 D.RAGSDALE
 D.LEGLEITER

Tool String Schematic

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



Tool: GRT-B **Length:** 3.40 ft. **O.D.** 3.60 in.
 Gamma Ray Controller

Sonde ID :GRT-BC-038

Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	51.15

Tool: CNT-AA **Length:** 9.30 ft. **O.D.** 4.36 in.
 Compensated Neutron A Pad on NDT-A

Sonde ID :NDT-AF-411

Source ID :N-1104

Pad ID :CNP-AE-41

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLCN	6.00	9.40	43.75
PHIN	6.80	10.20	42.95

Tool: LDT-DA **Length:** 9.30 ft. **O.D.** 4.80 in.
 Litho Density D Pad on NDT-A

Sonde ID :NDT-FA-404

Source ID :1637GW

Pad ID :LDP-DA-062

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.00	18.70	34.45
PEL	7.00	19.70	33.45
PES	7.40	20.10	33.05



7.20 19.90 33.25
 7.20 19.90 33.25

Tool: MST-DA **Length:** 9.66 ft. **O.D.** 6.00 in.
 Micro Spherically Focused (IC,D)
Sonde ID :MST-DA-29

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-AC-043

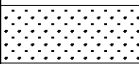
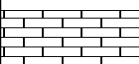
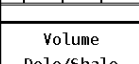
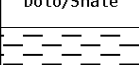

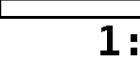
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	40.58	12.56
ILM	10.10	41.76	11.39
SFLU	17.49	49.15	4.00
SP	20.60	52.26	0.88

Well File: ENTRANSCO D-WIEBE 32-1 NOV 8 MST **Scale:** 1:240 **Format:** NLD-240
Segment: V1.D1.S6 Reprocess MAIN **Acquired:** 2019-11/08 07:32 3.4.1-13972
Reference: 0 **Processed:** 2019-11/08 08:32 3.4.1-13972

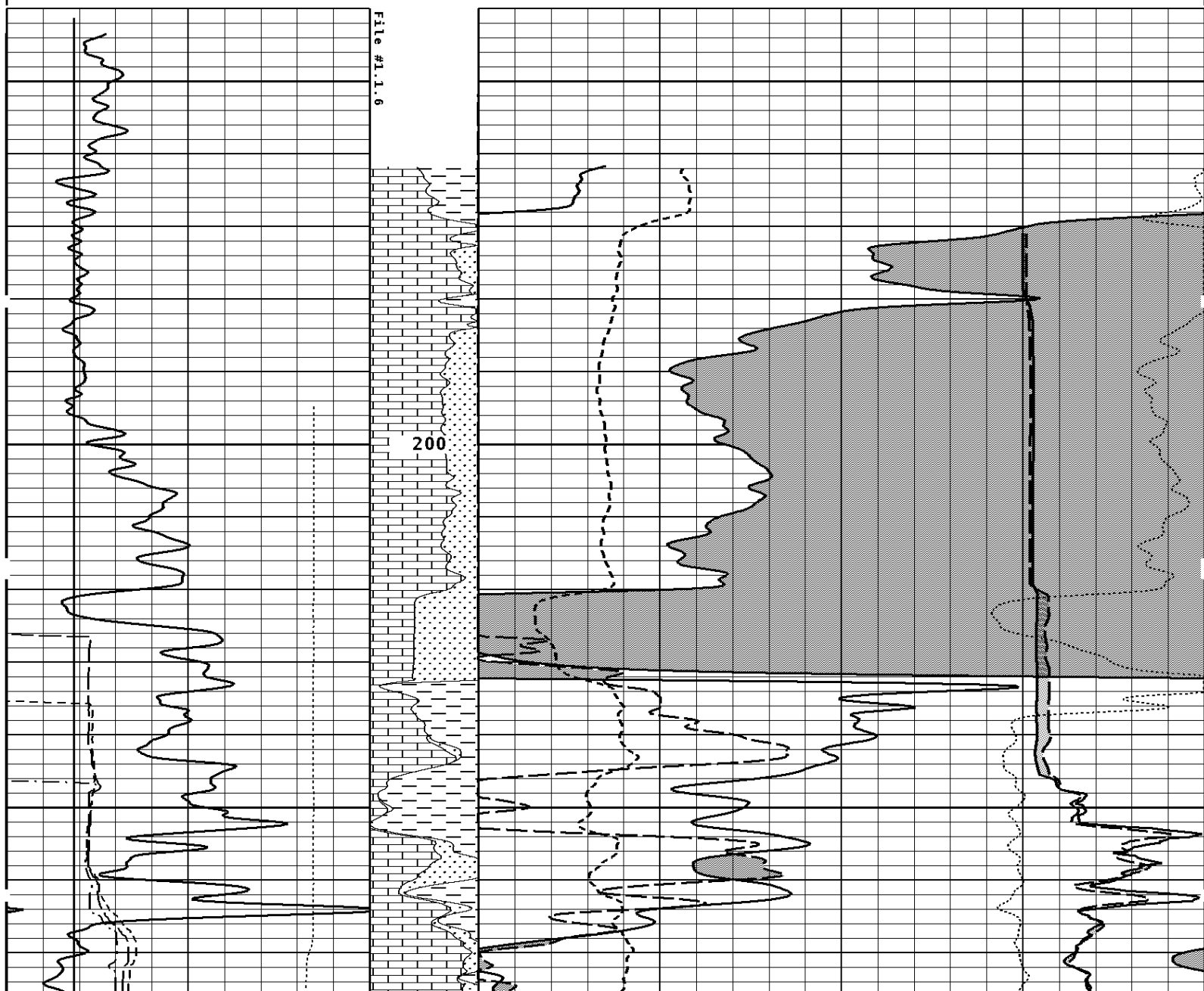
CALIPER MICRO INCHES (IN)	
16	26
6	16

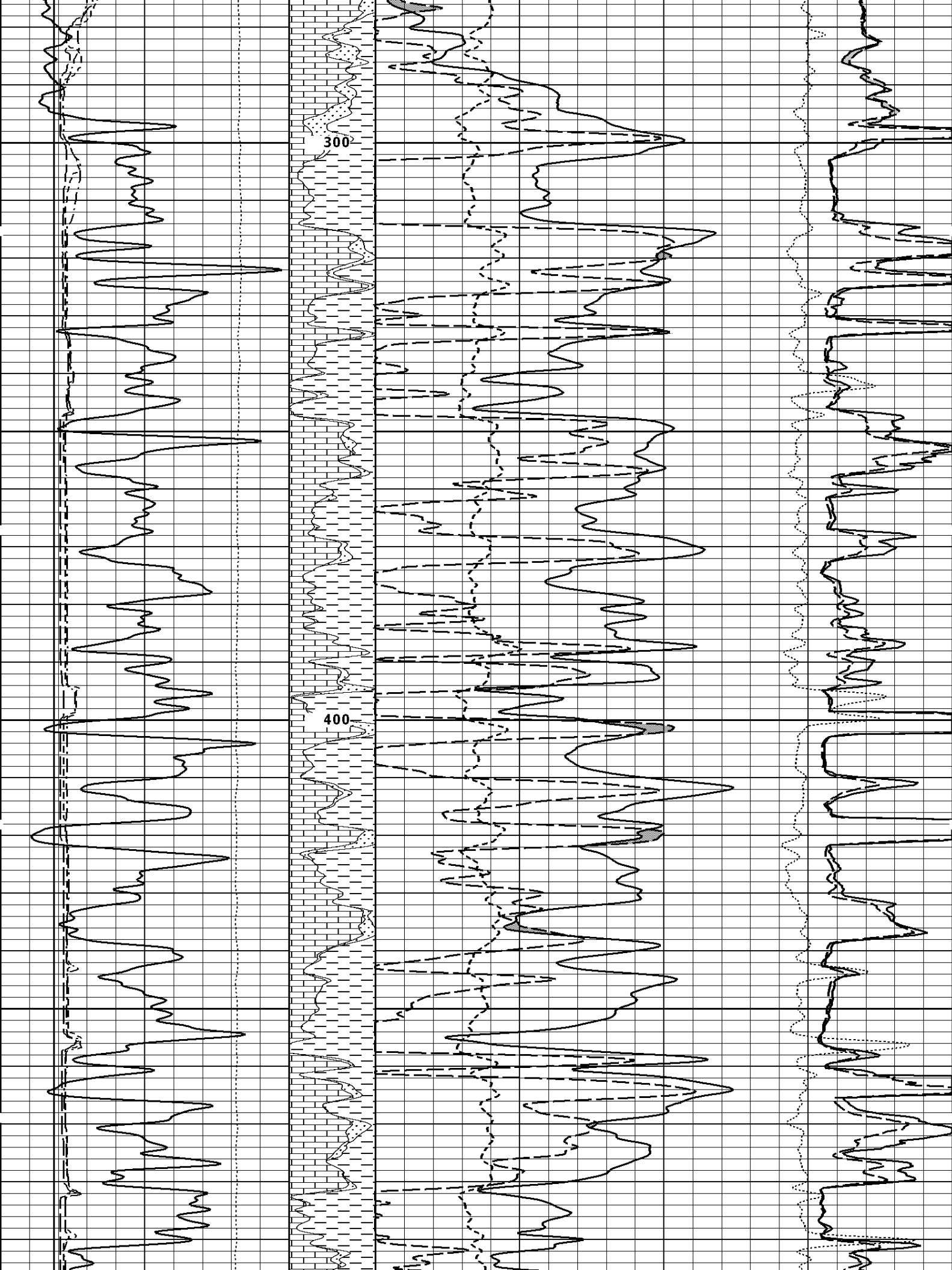
BIT SIZE INCHES (IN)

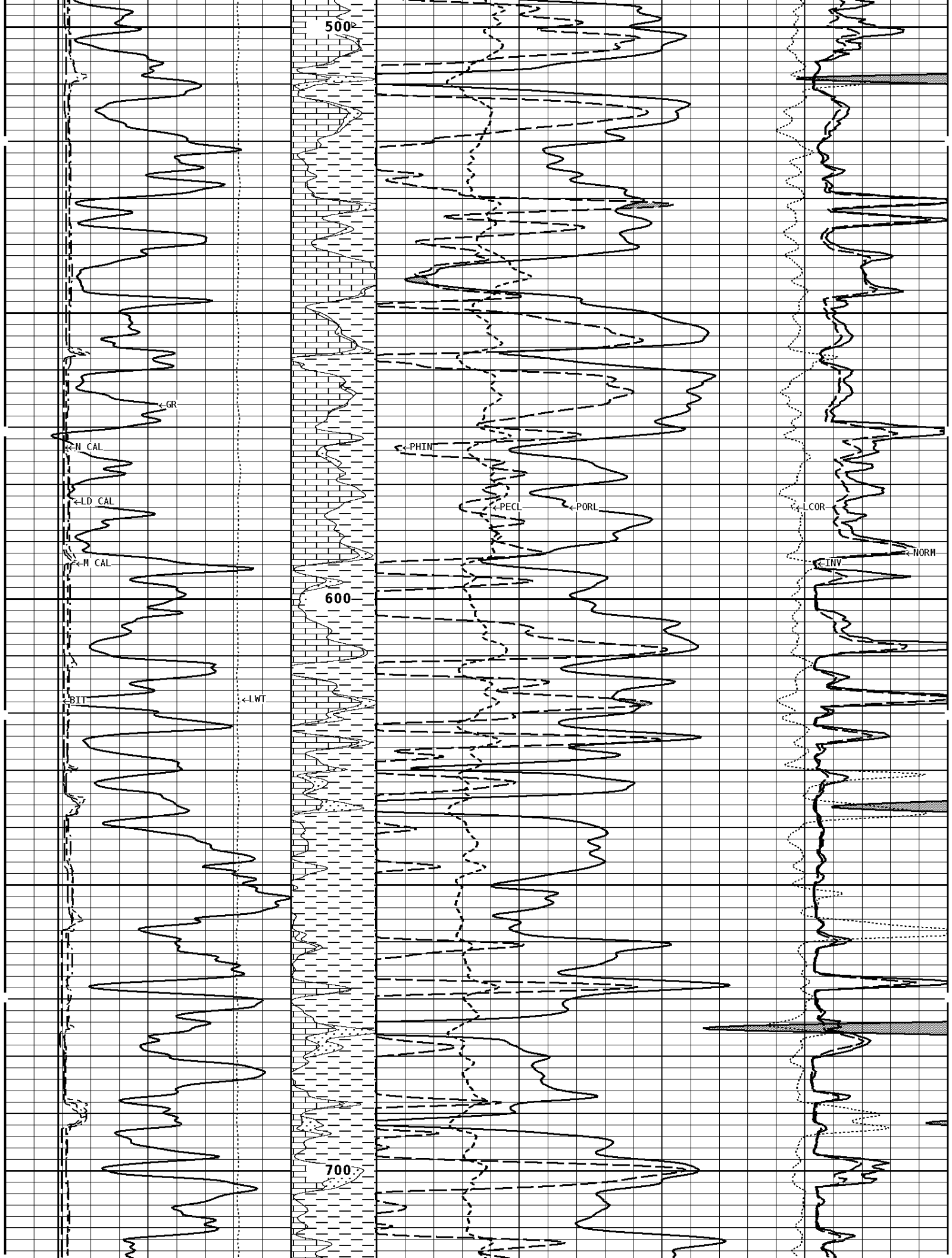
NORMAL
OHMH

6	16			0	40
NEUTRON (Y) CALIPER INCHES (IN)				INVERSE OHM	
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







500

600

700

← GR

← N CAL

← LD CAL

← H CAL

← BIT

← LWT

← PHIN

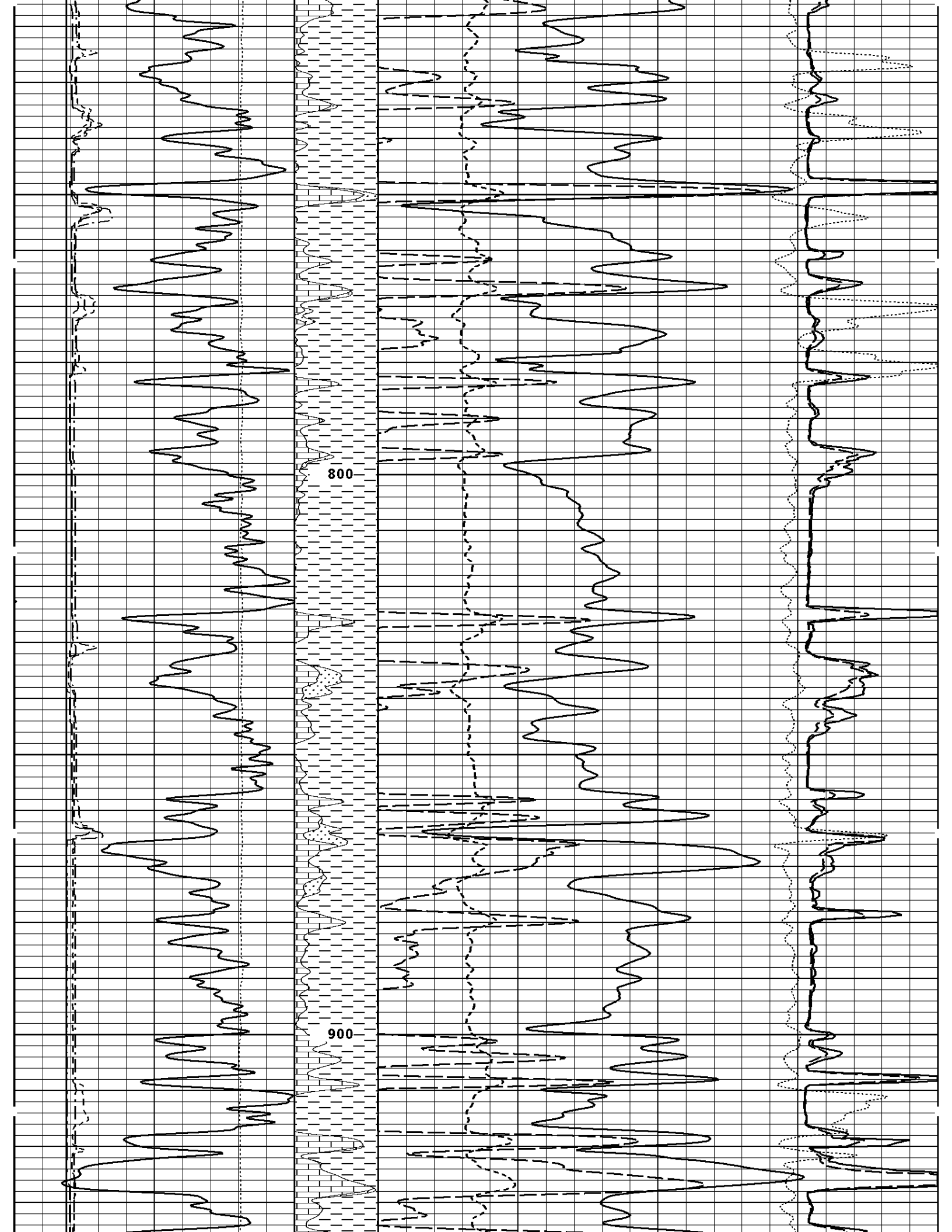
← PECL

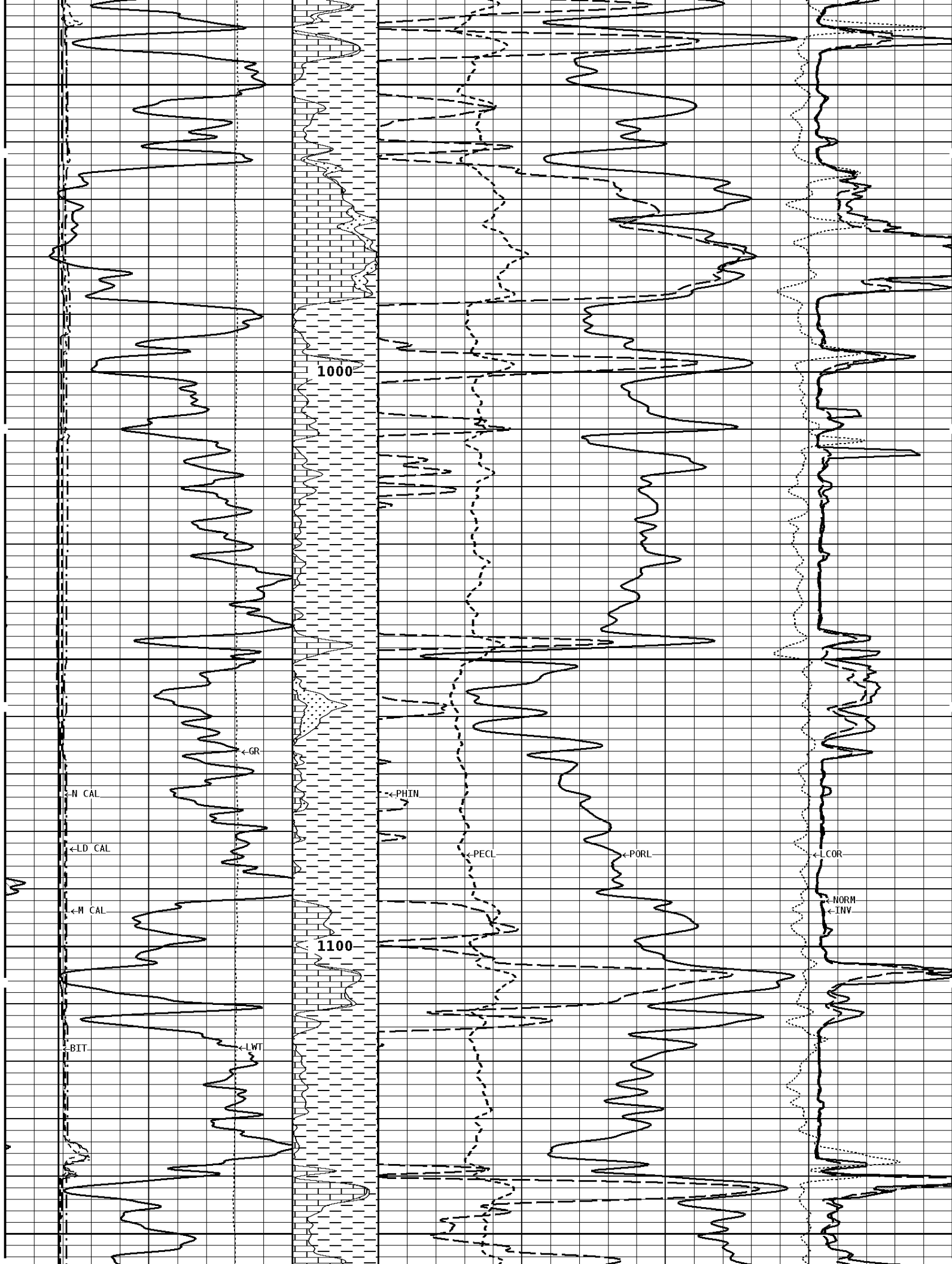
← PORL

← COR

← INV

← NORM





1000

1100

N CAL

LD CAL

M CAL

BIT

GR

PHIN

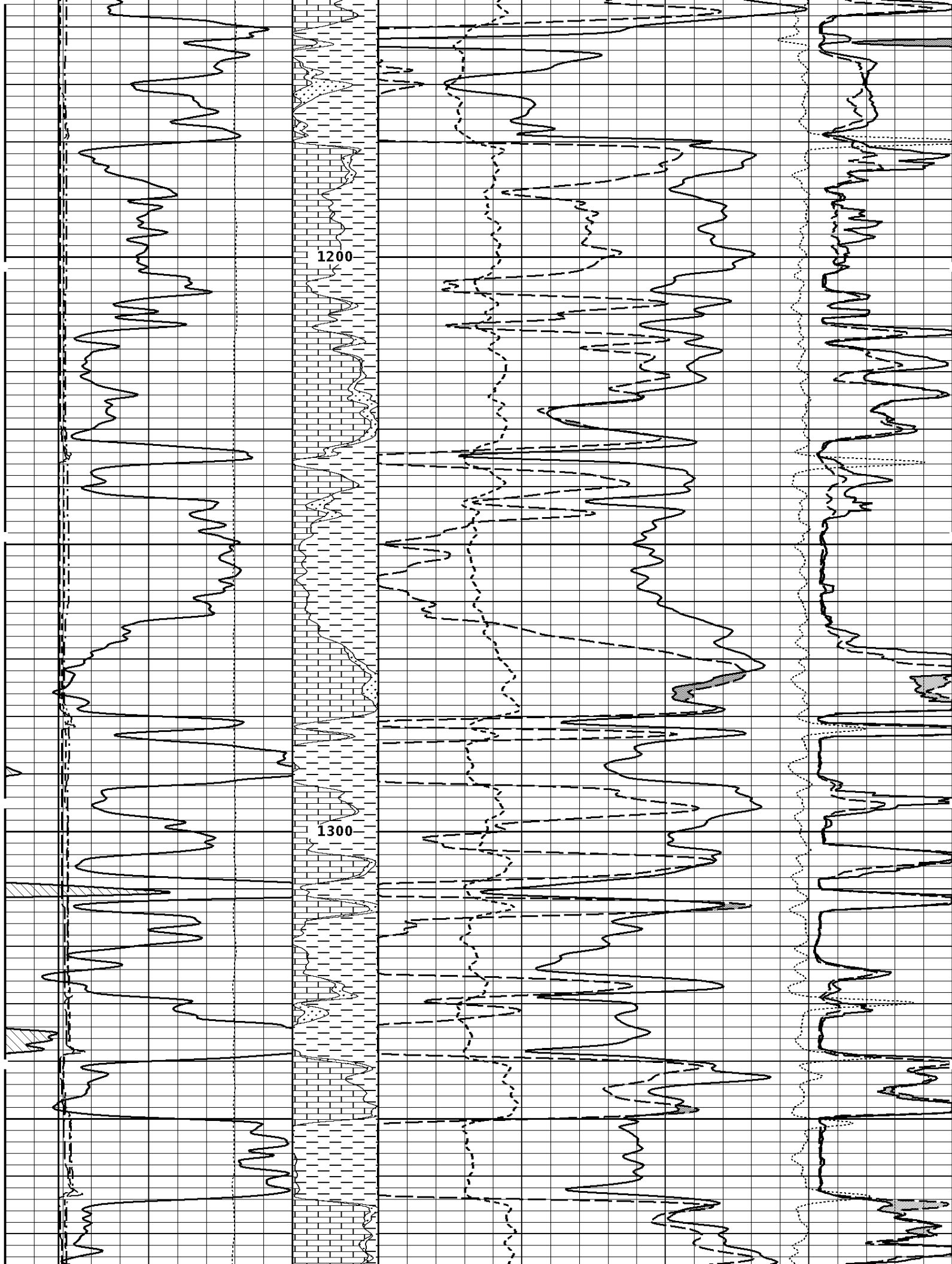
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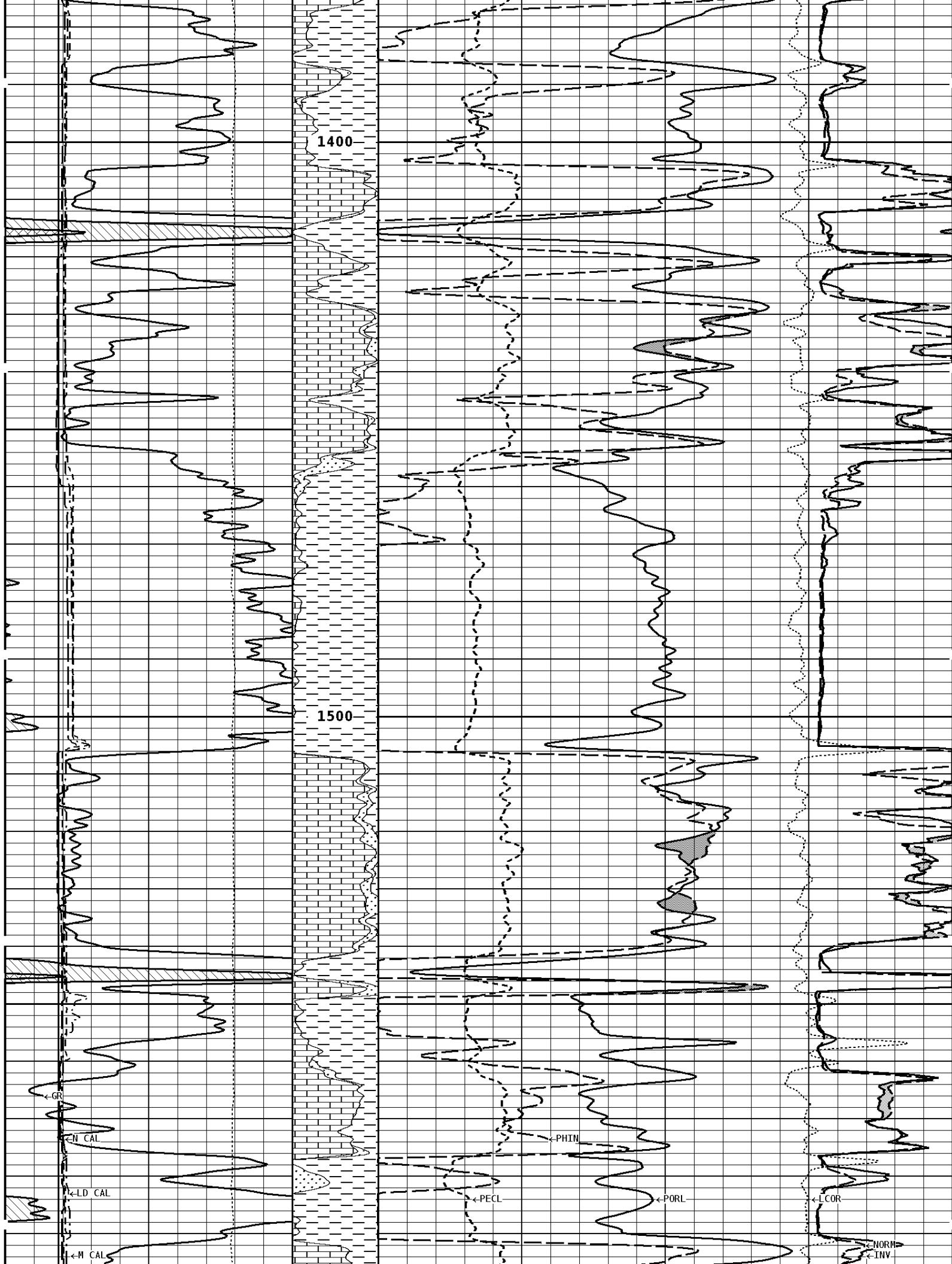
PORL

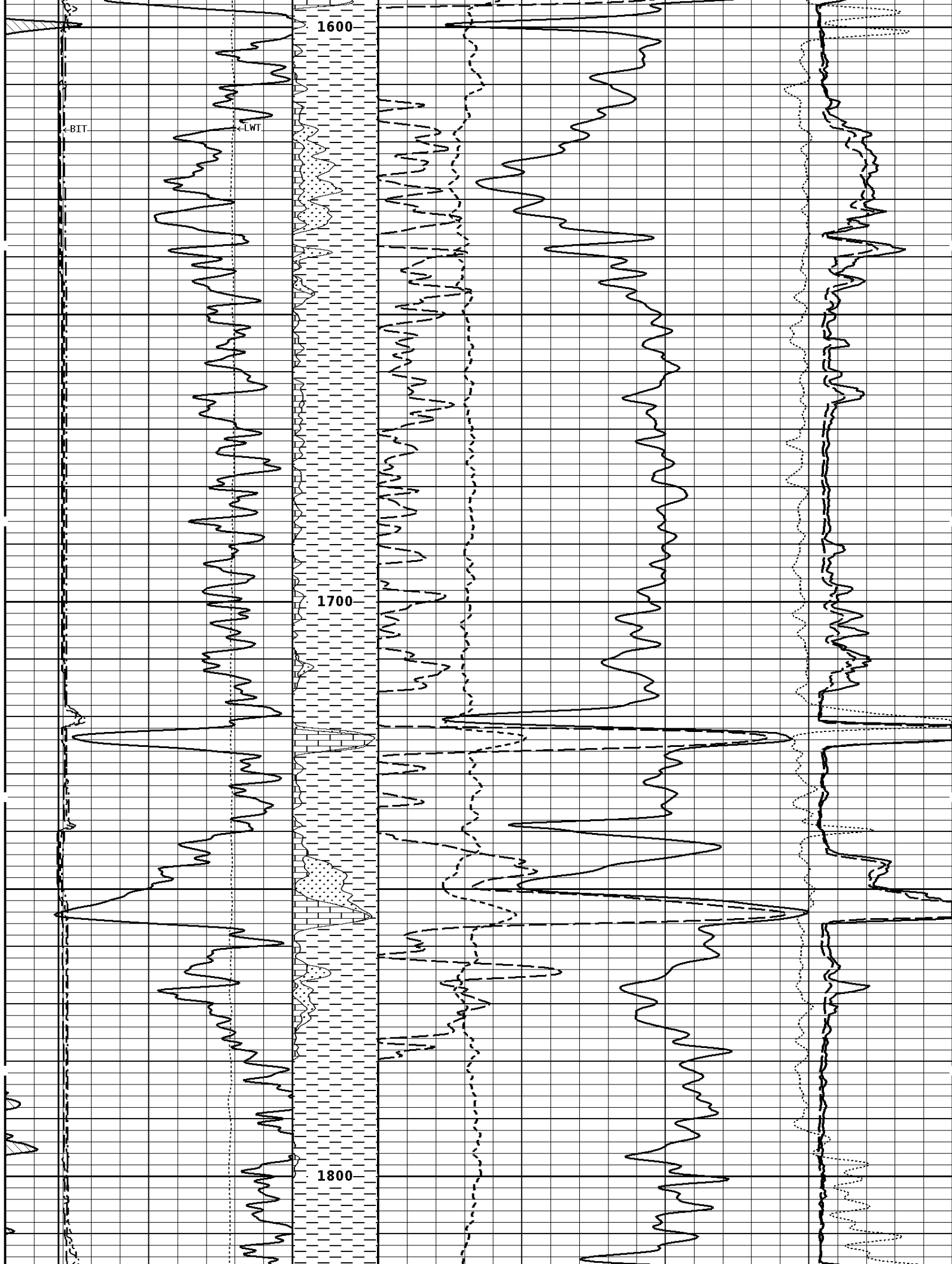
LWT

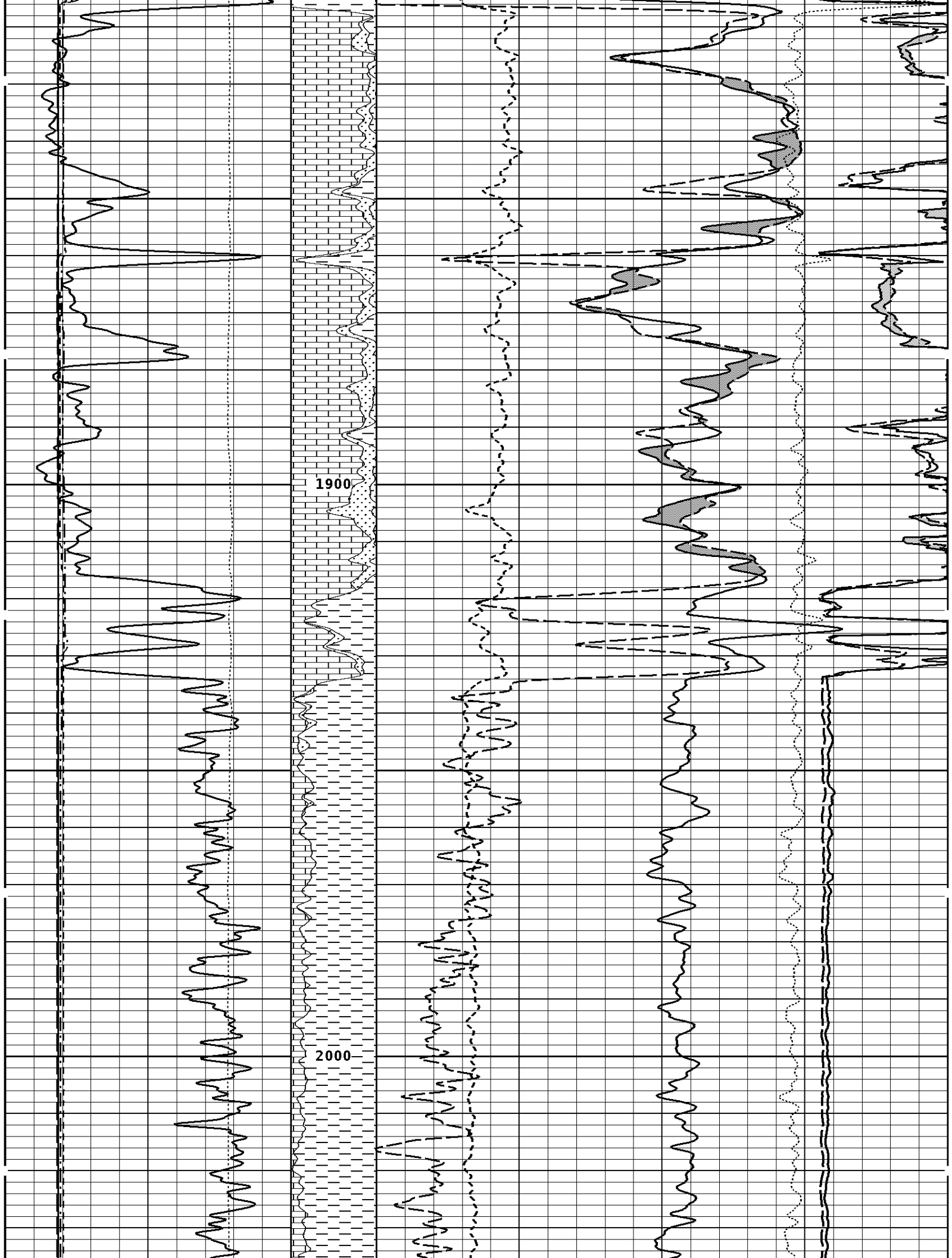
LCOR

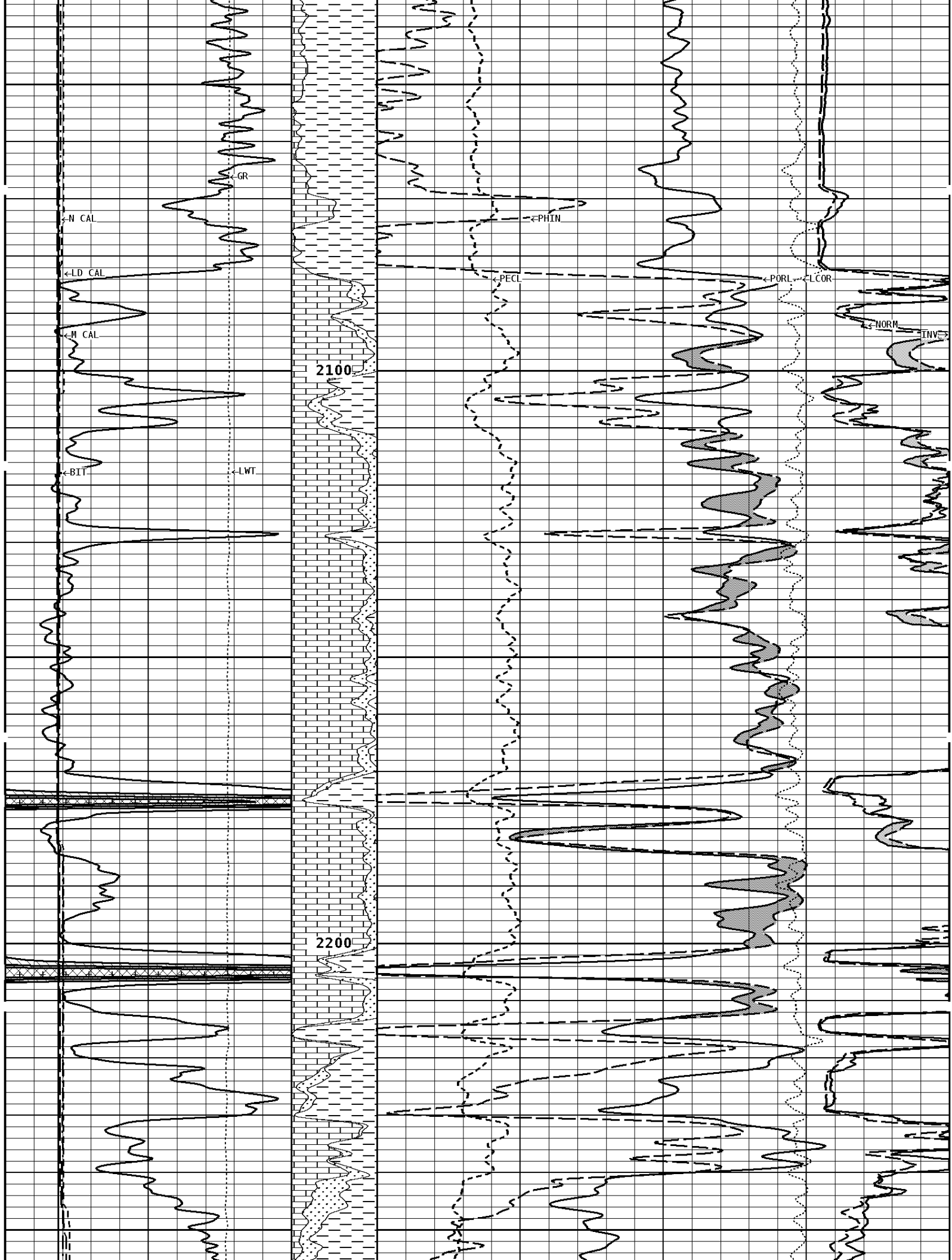
NORM
INV

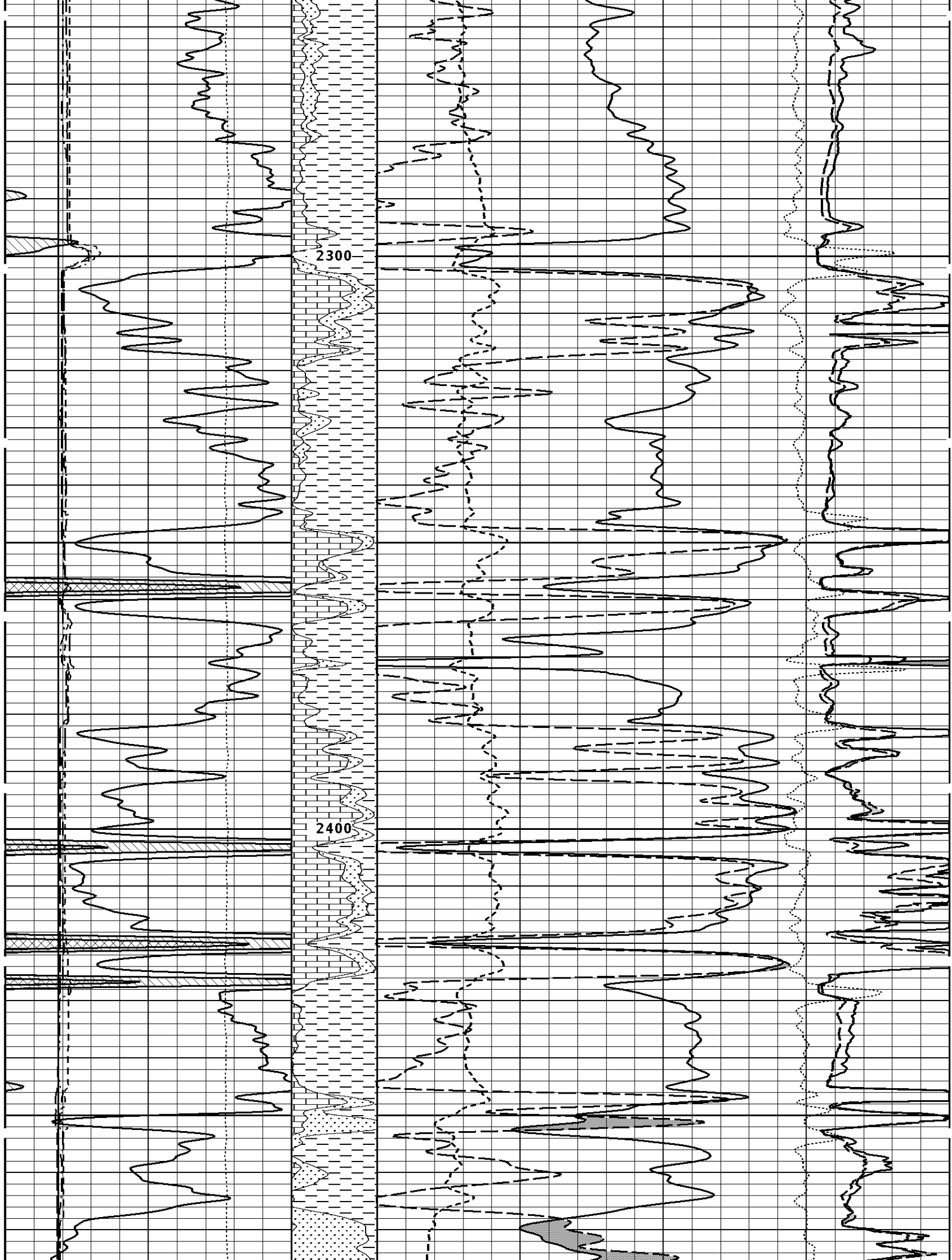


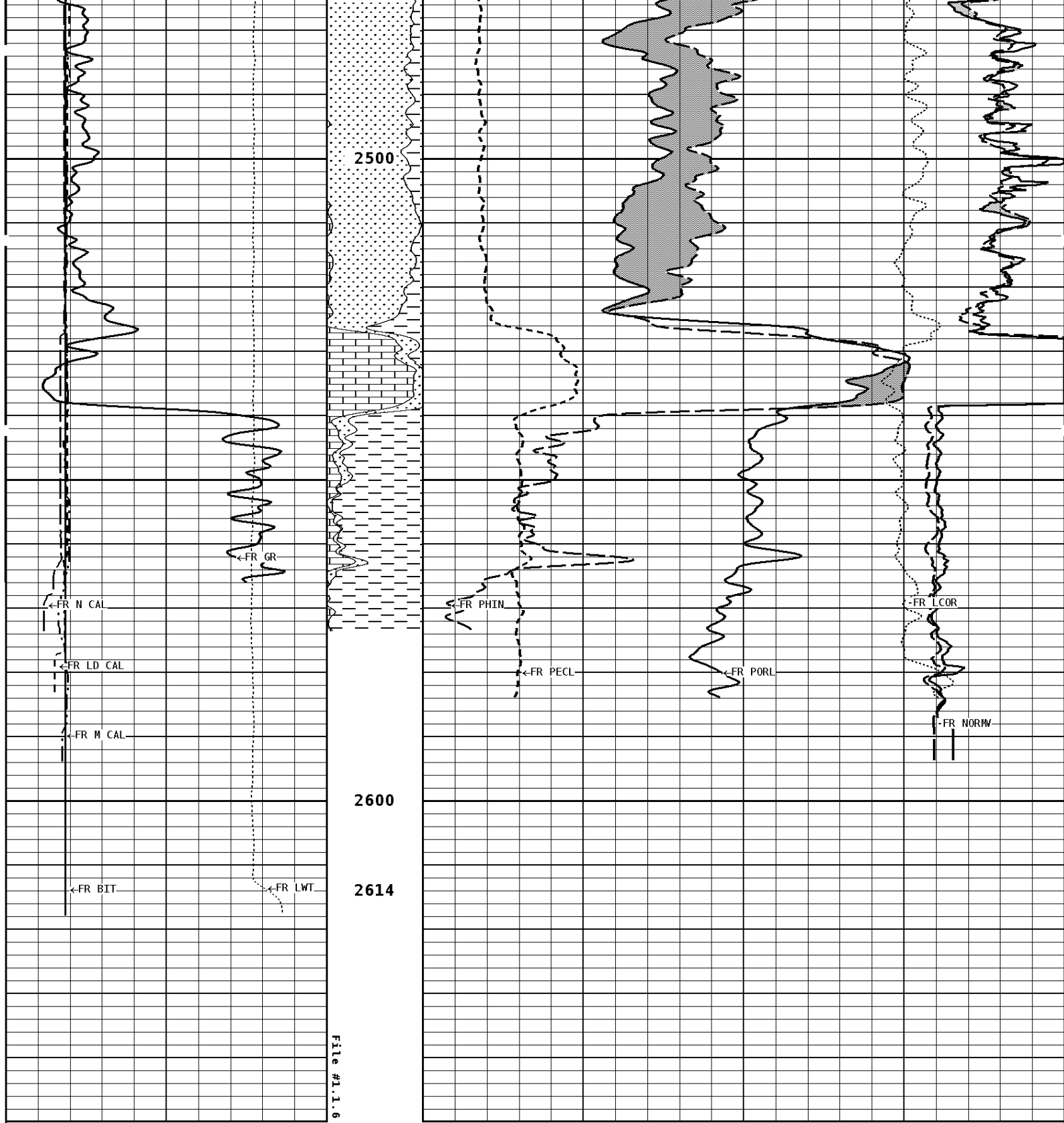






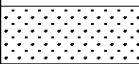






1:240 MAIN SECTION

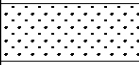
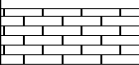
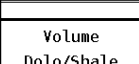
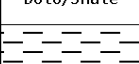
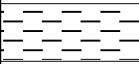
<p>GAMMA RAY API UNITS</p> <p>150 0 300 150</p>	<p>Volume Dolo/Shale</p> <p>30</p>	<p>NEUTRON POROSITY (LIMESTONE) PERCENT</p> <p>-10</p>
<p>TENSION LBS</p> <p>10000 0</p>	<p>Volume Calcite</p> <p>70 30 -10</p>	<p>DENSITY POROSITY (2.71g/cc) PERCENT</p> <p>30 -10 -50</p>

DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARN/ELECTRON		DENSITY CORRECTION G/CC		
16 6	26 16		0	10	-0.25	0.25	
NEUTRON (Y) CALIPER INCHES (IN)						INVERSE OHM	
16 6	26 16					0	40
BIT SIZE INCHES (IN)						NORMAL OHM	
6	16					0	40
CALIPER MICRO INCHES (IN)							
16 6	26 16						

*** Borehole Zone Factors ***

Zone 1 9999.0 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: ENTRANSCO D-WIEBE 32-1 NOV 8 MST **Scale:** 1:240 **Format:** NLD-240
Segment: V1.D1.S4 Reprocess REPEAT **Acquired:** 2019-11/08 07:18 3.4.1-13972
Reference: 0 **Processed:** 2019-11/08 08:31 3.4.1-13972

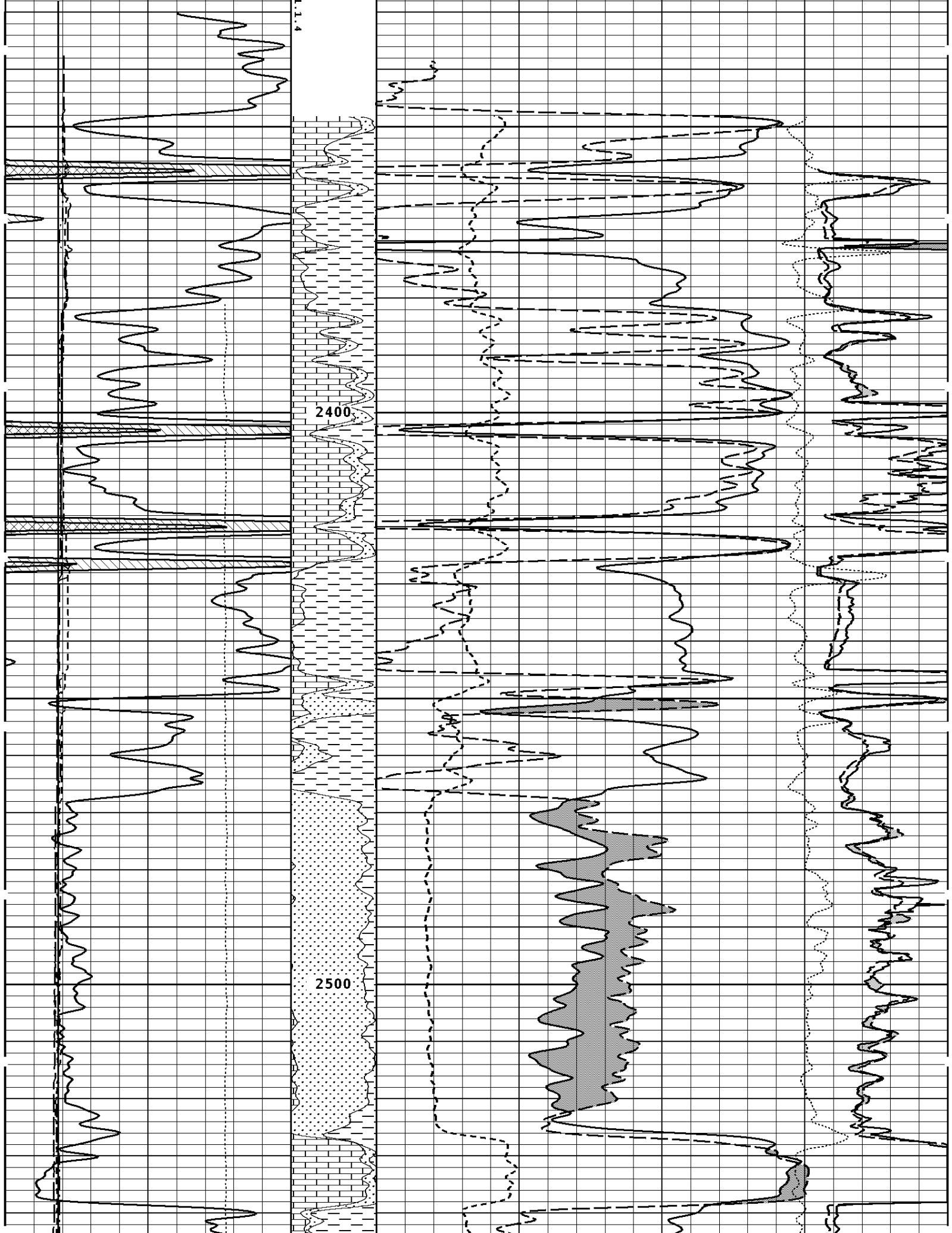
CALIPER MICRO INCHES (IN)						NORMAL OHM	
16 6	26 16					0	40
BIT SIZE INCHES (IN)						INVERSE OHM	
6	16					0	40
NEUTRON (Y) CALIPER INCHES (IN)							
16 6	26 16						
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARN/ELECTRON		DENSITY CORRECTION G/CC		
16 6	26 16		0	10	-0.25	0.25	
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 0	300 150		30			-10	

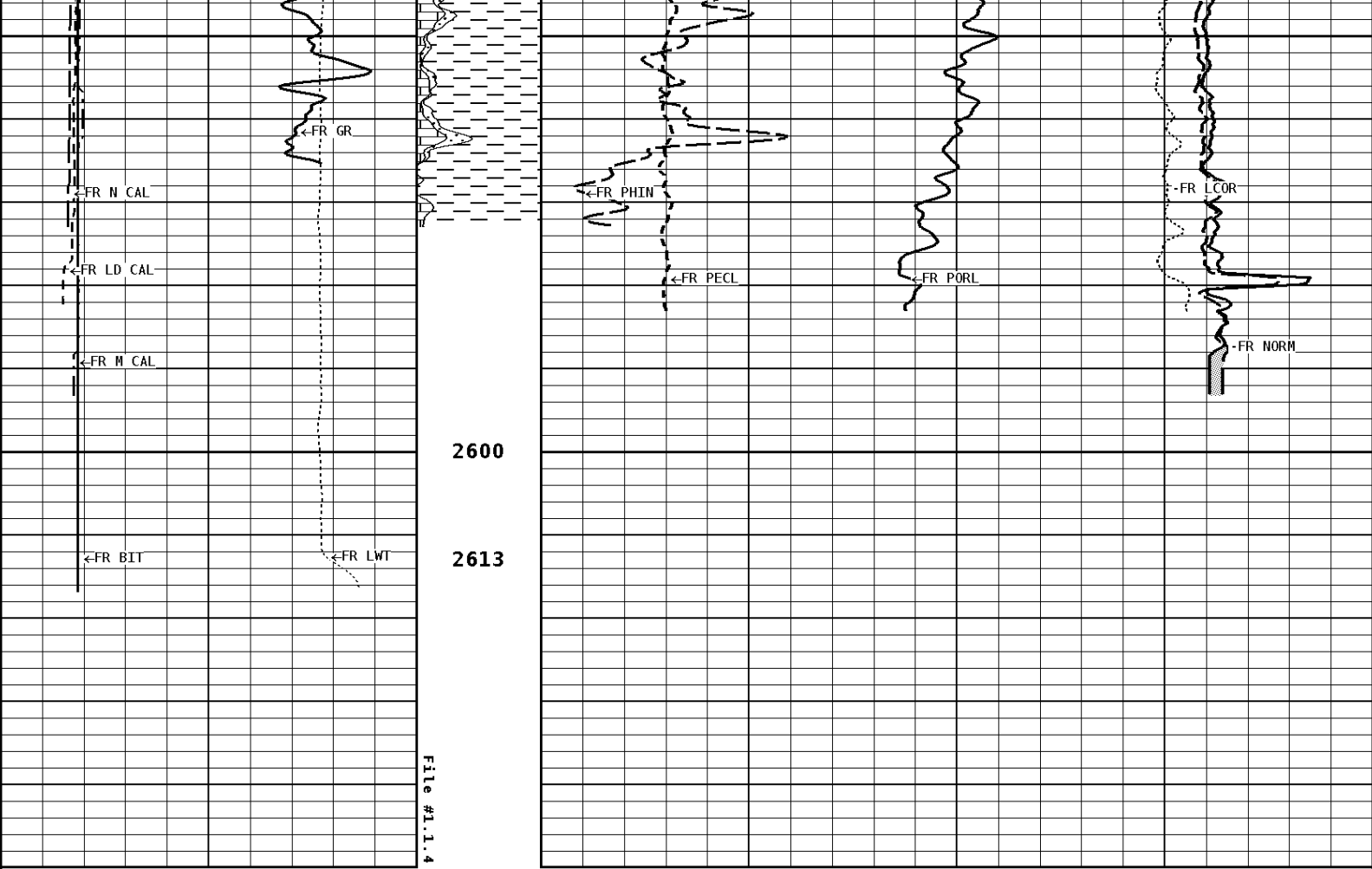
1:240 REPEAT SECTION

#1.1.4

2400

2500





1:240 REPEAT SECTION

GAMMA RAY API UNITS 150 300 0 150		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 26 6 16		Volume Quartz 0	PE CROSS-SECTION BARN/ELECTRON 10	DENSITY CORRECTION G/CC -0.25 0.25
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16		INVERSE OHMH 0 40		
BIT SIZE INCHES (IN) 6 16		NORMAL OHMH 0 40		
CALIPER MICRO INCHES (IN) 16 26 6 16				

* Borehole Zone Factors *

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: ENTRANSCO D-WIEBE 32-1 NOV 8 MST Scale: 1:240 Format: LDT-240
 Segment: V1.D1.S6 Reprocess MAIN Acquired: 2019-11/08 07:32 3.4.1-13972
 Reference: 0 Processed: 2019-11/08 08:32 3.4.1-13972

BIT SIZE INCHES (IN)	
6	16

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

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

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

TENSION LBS	
10000	0

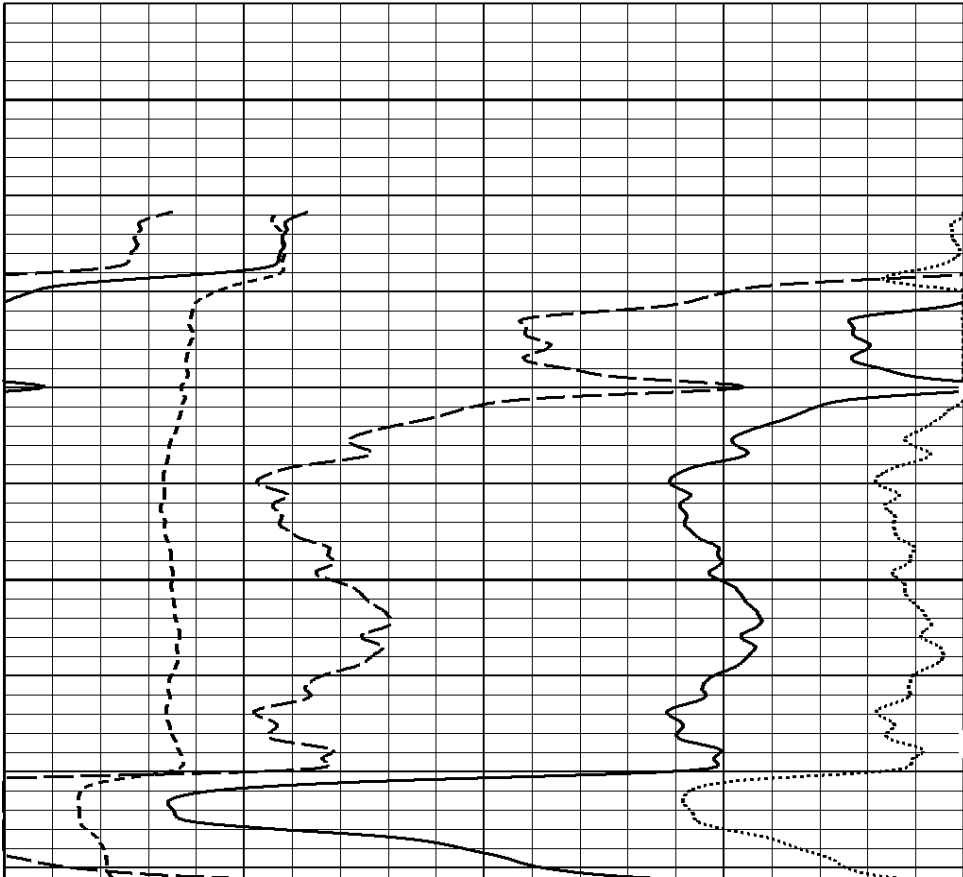
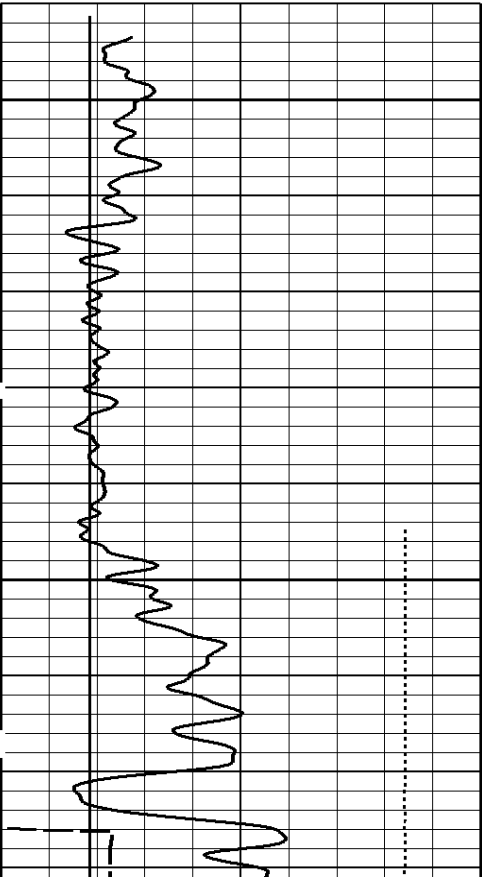
COMPENSATED BULK DENSITY G/CC	
3.0	4.0
2.0	3.0
1.0	2.0

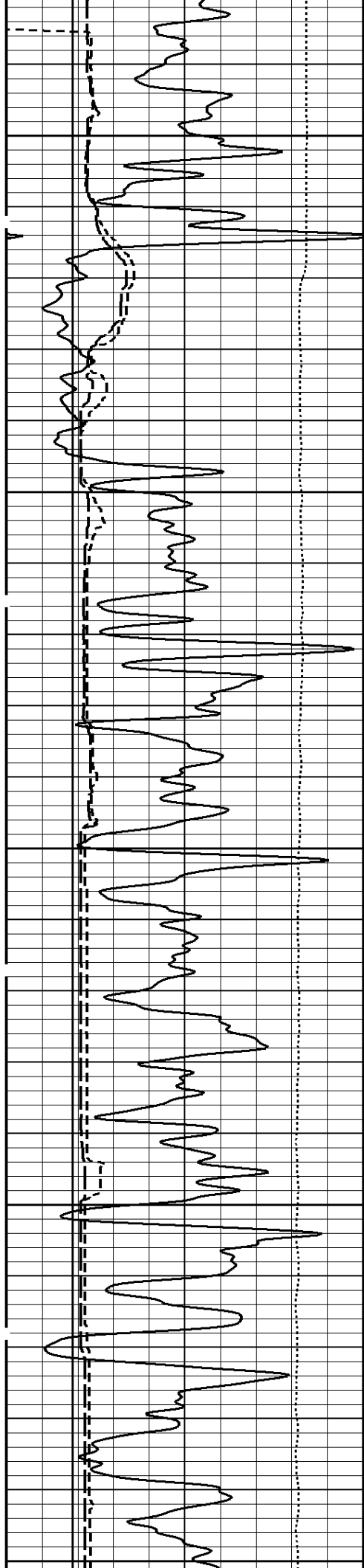
GAMMA RAY API UNITS	
150	300
0	150

- BHV AHV -
CU. FT

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

1:240 MAIN SECTION
BULK DENSITY



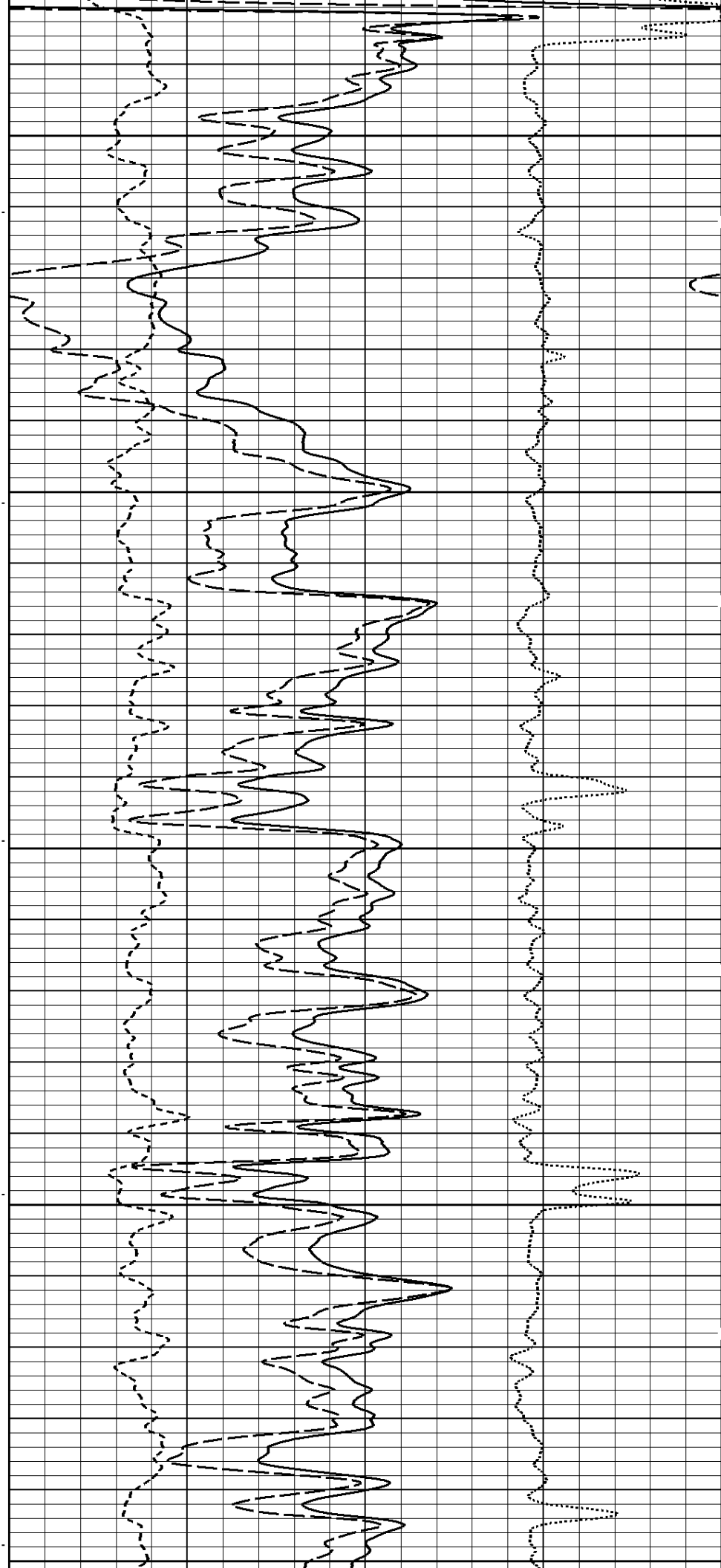


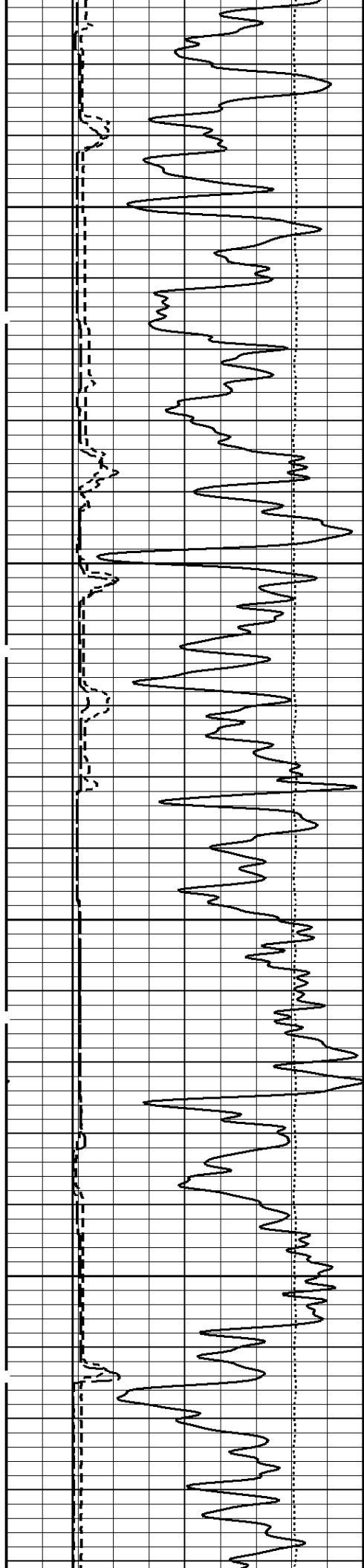
300

-800Cu.Ft

400

400Cu.Ft

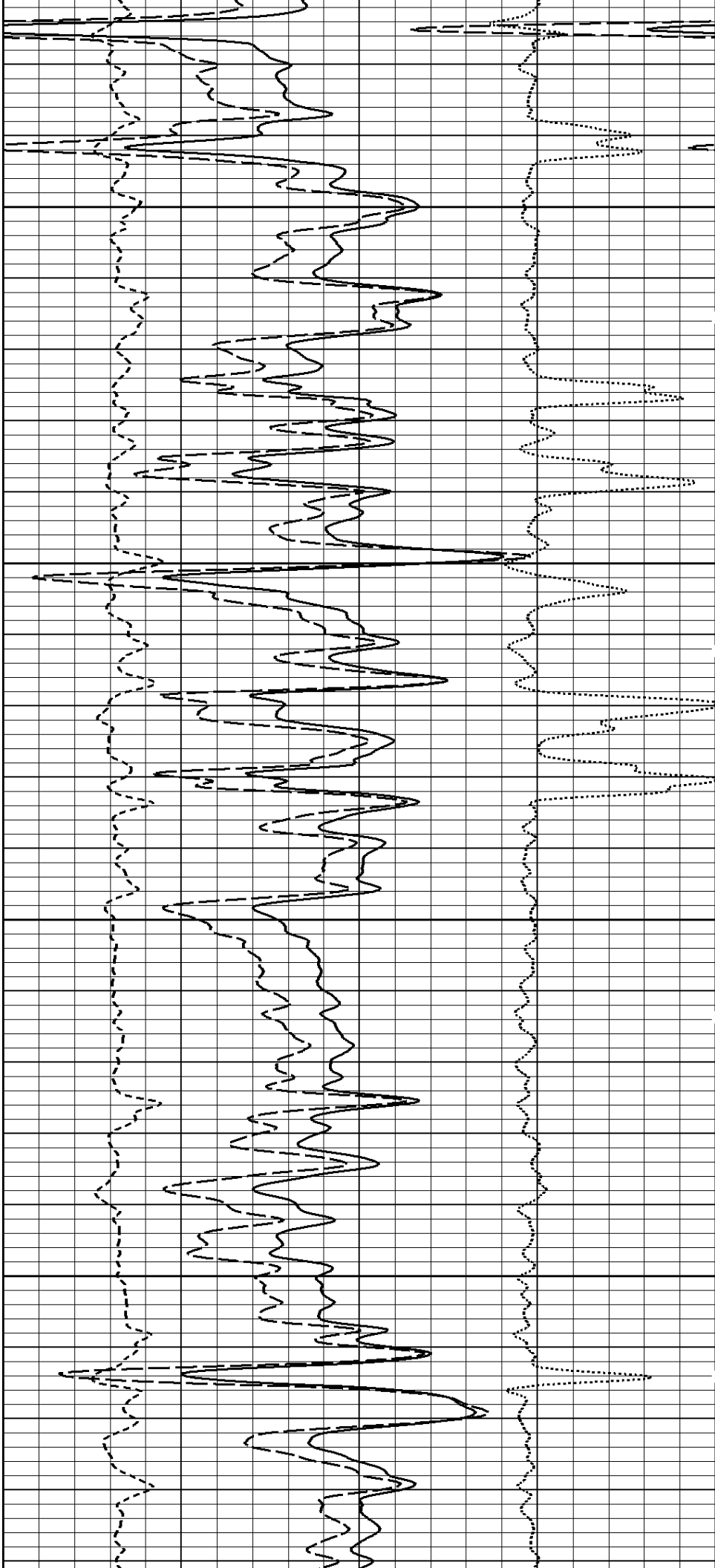




700

800

-600Cu.Ft

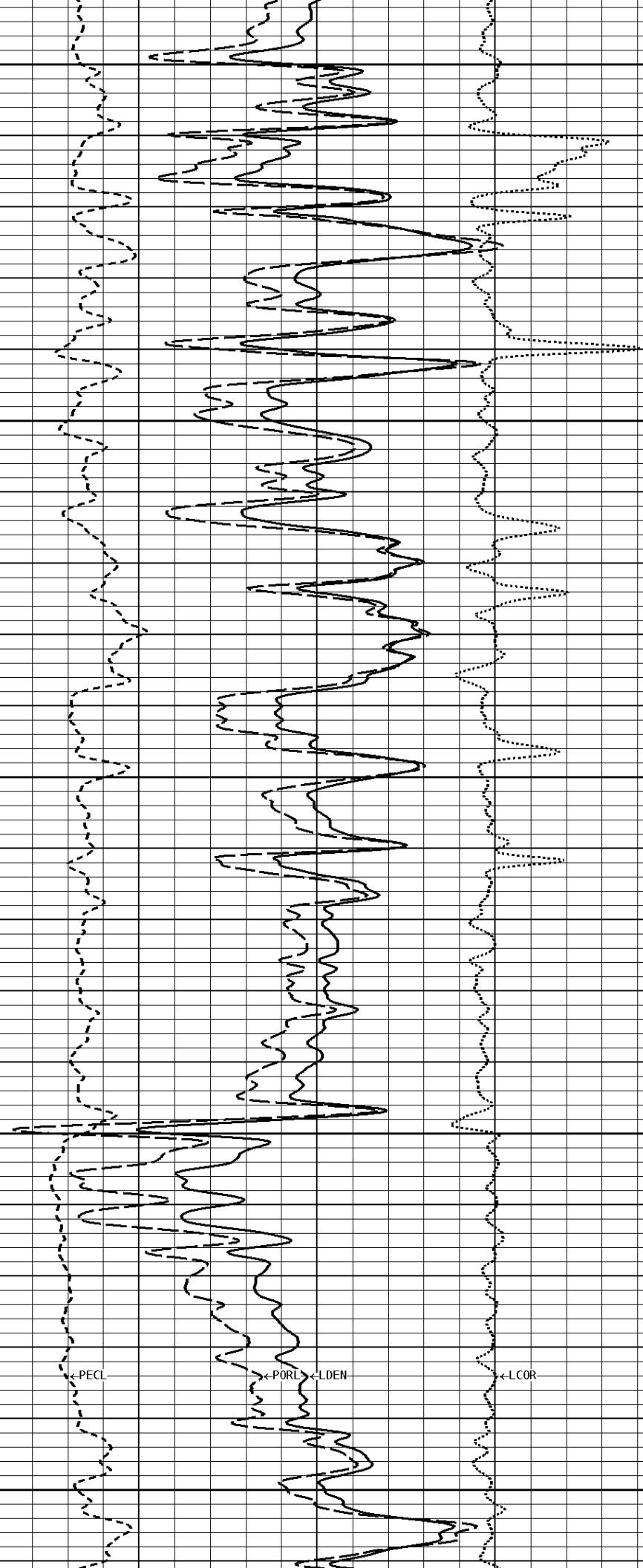
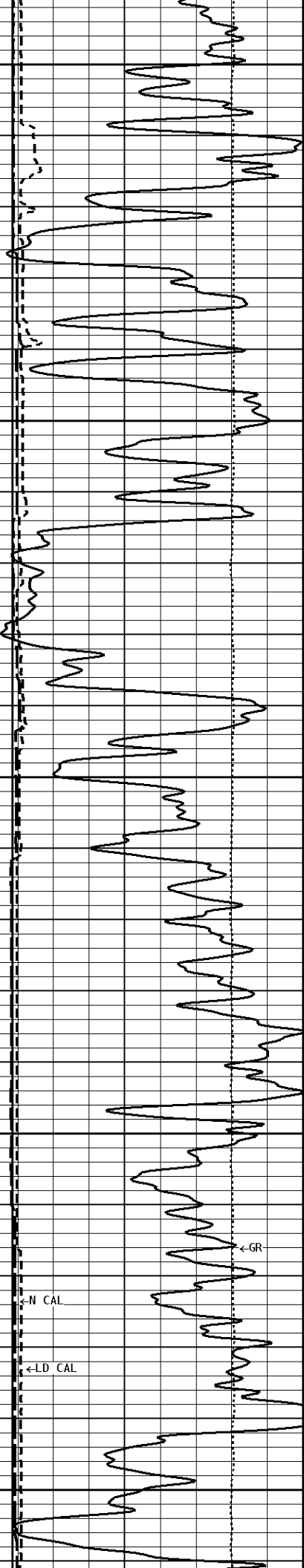


900

300Cu.Ft--

1000

1100



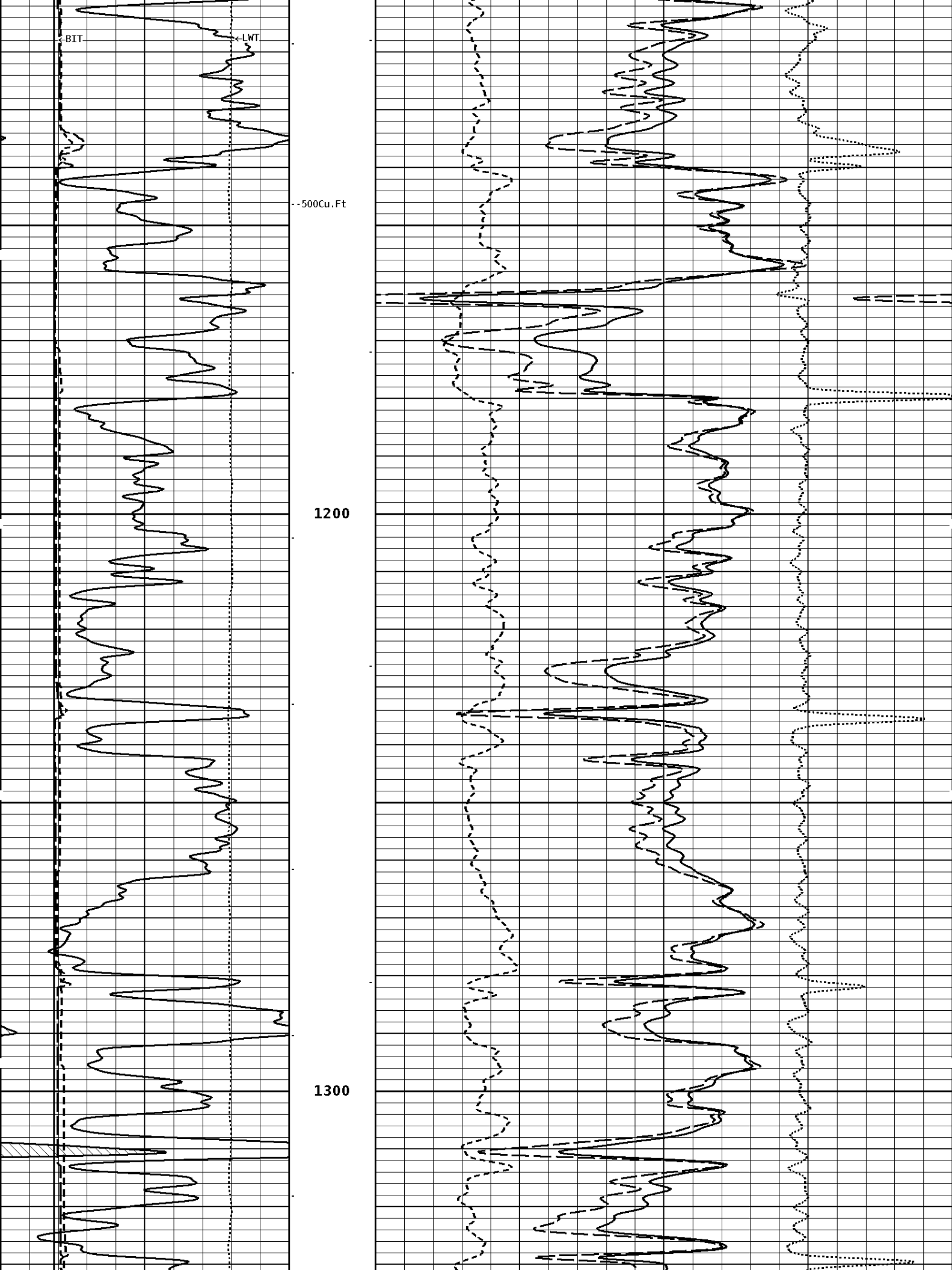
BIT

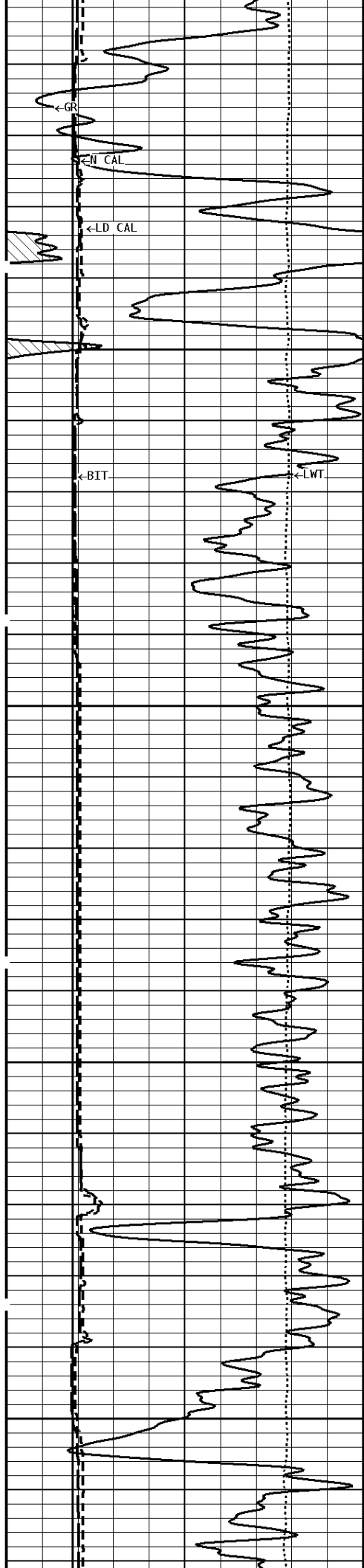
LWT

-500Cu.Ft

1200

1300

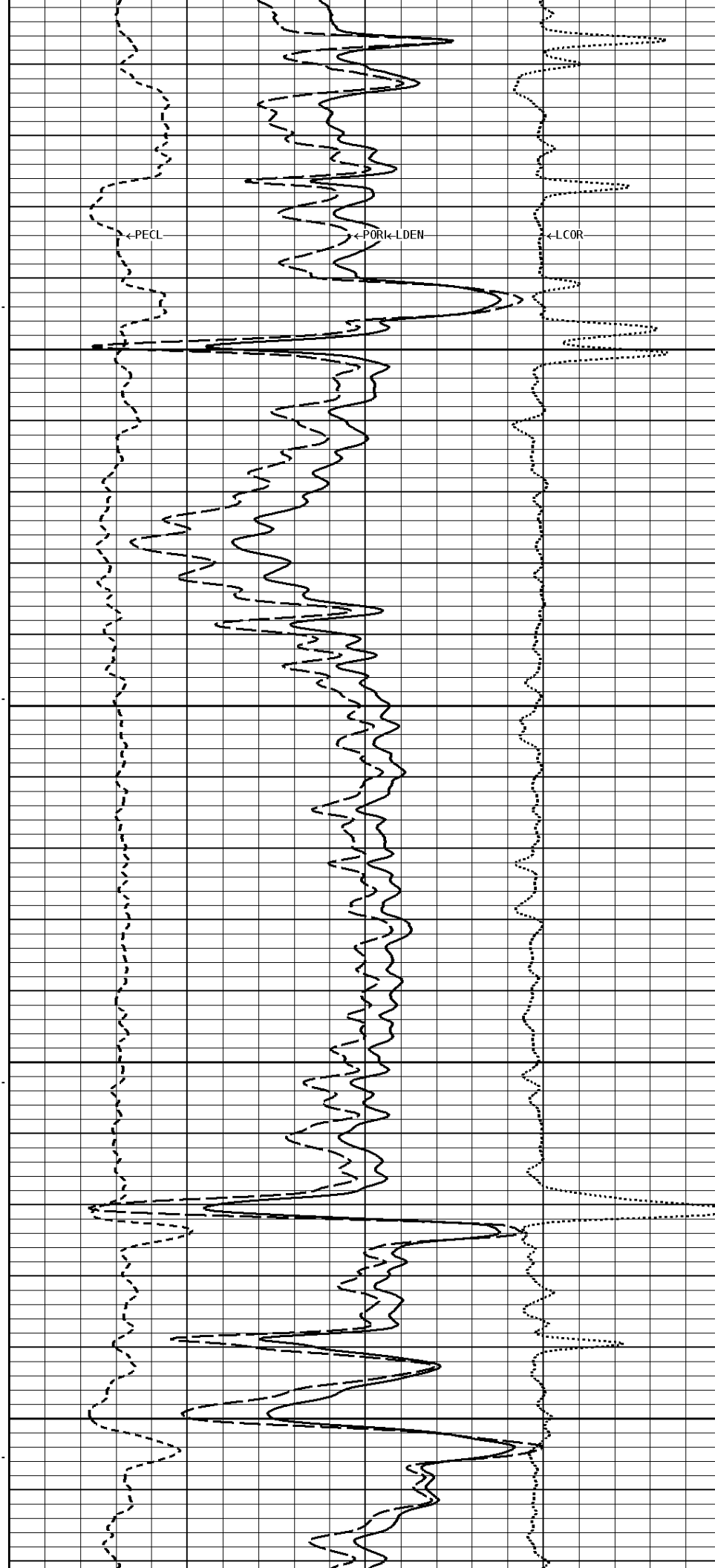


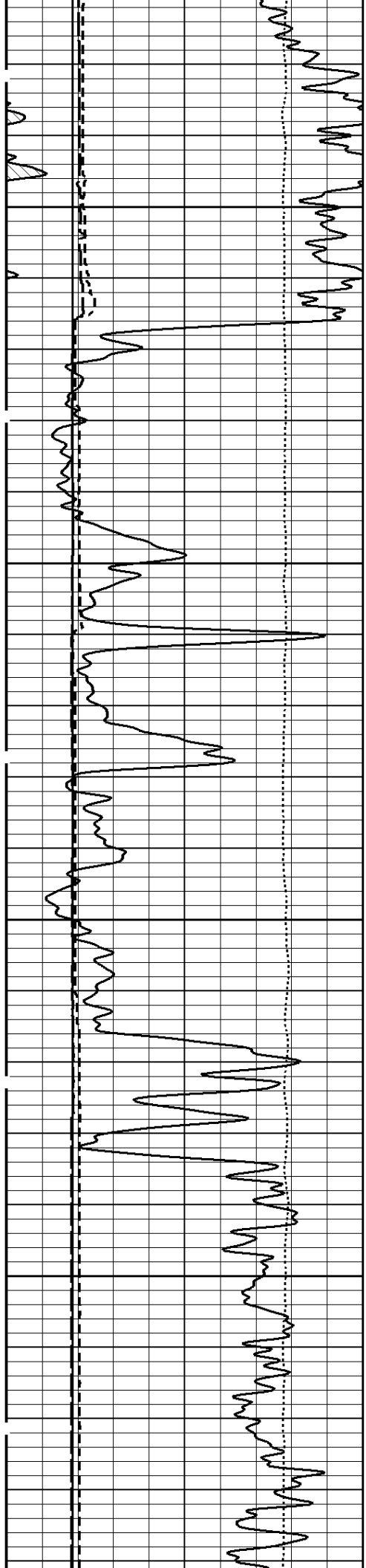


1600

1700

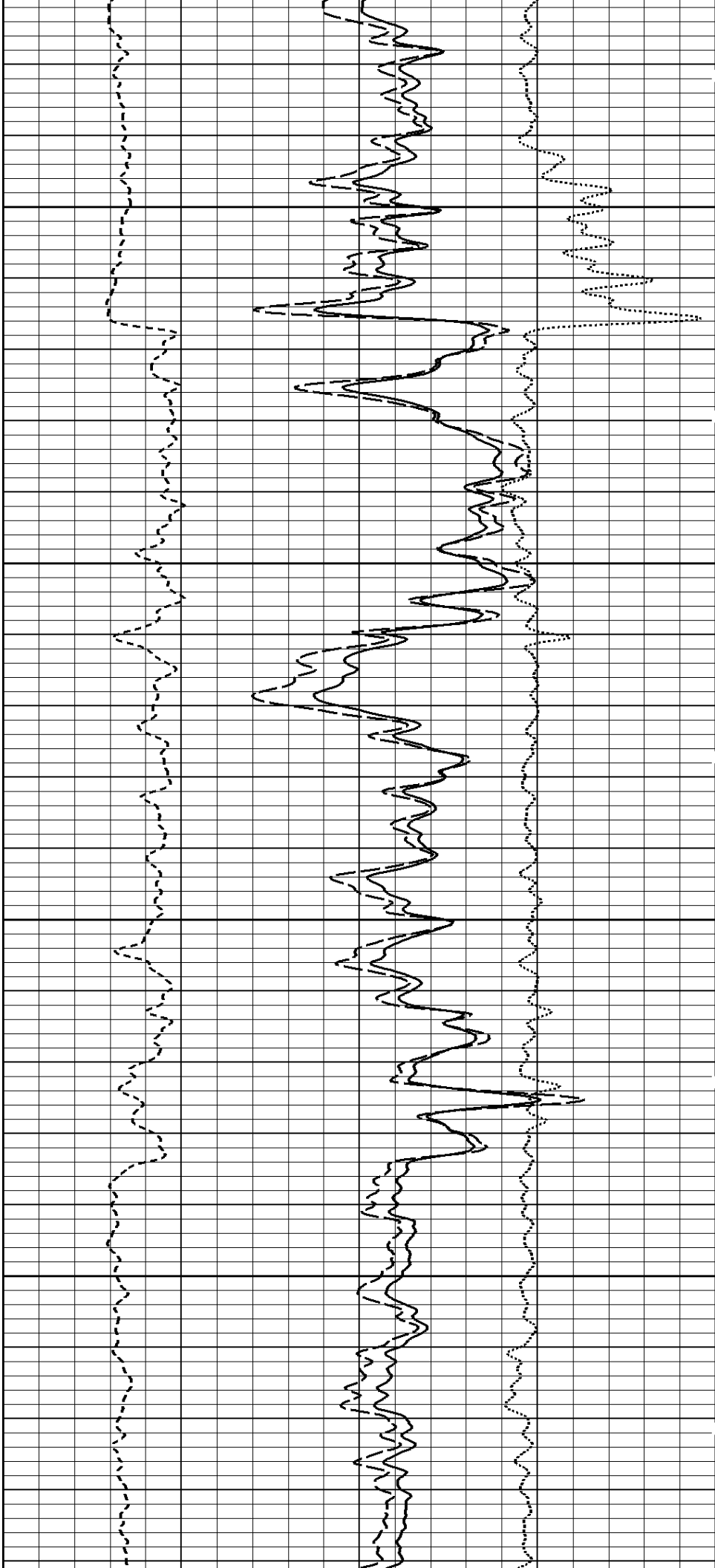
300Cu.Ft

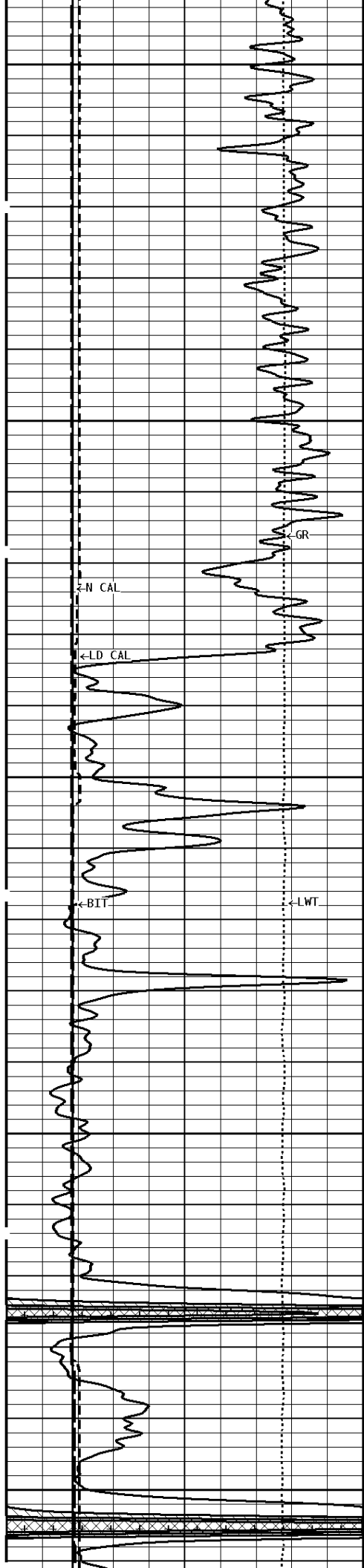




1800

1900



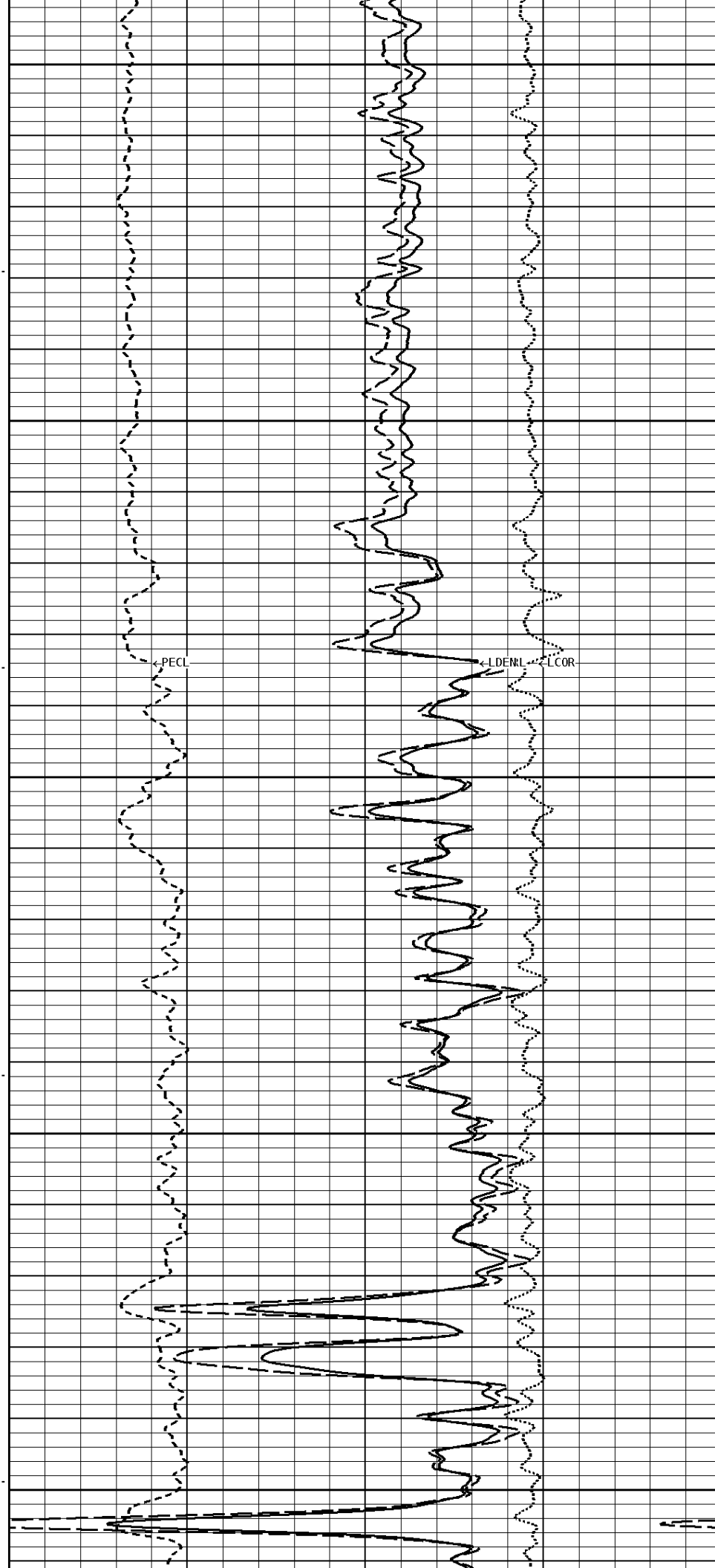


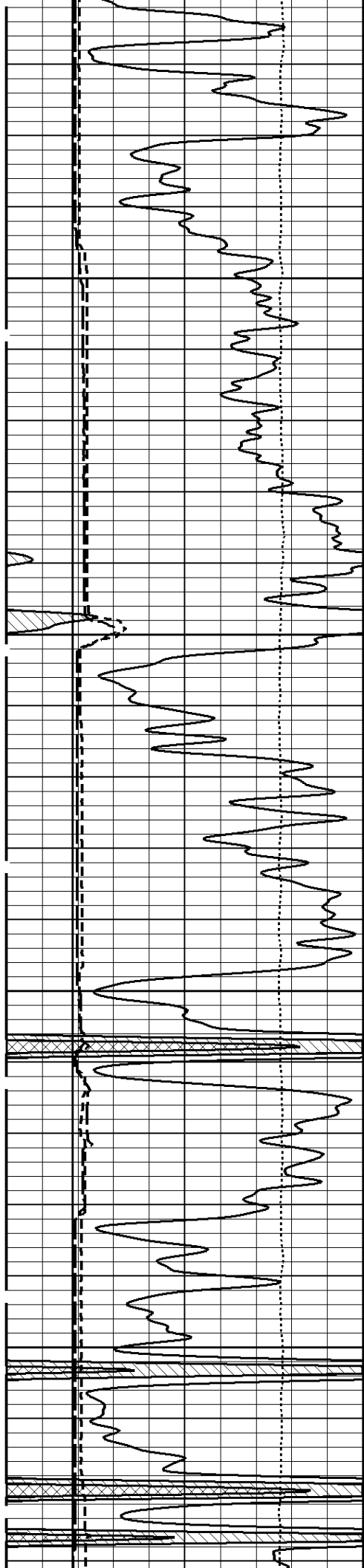
200 Cu.Ft

100 Cu.Ft

2100

2200

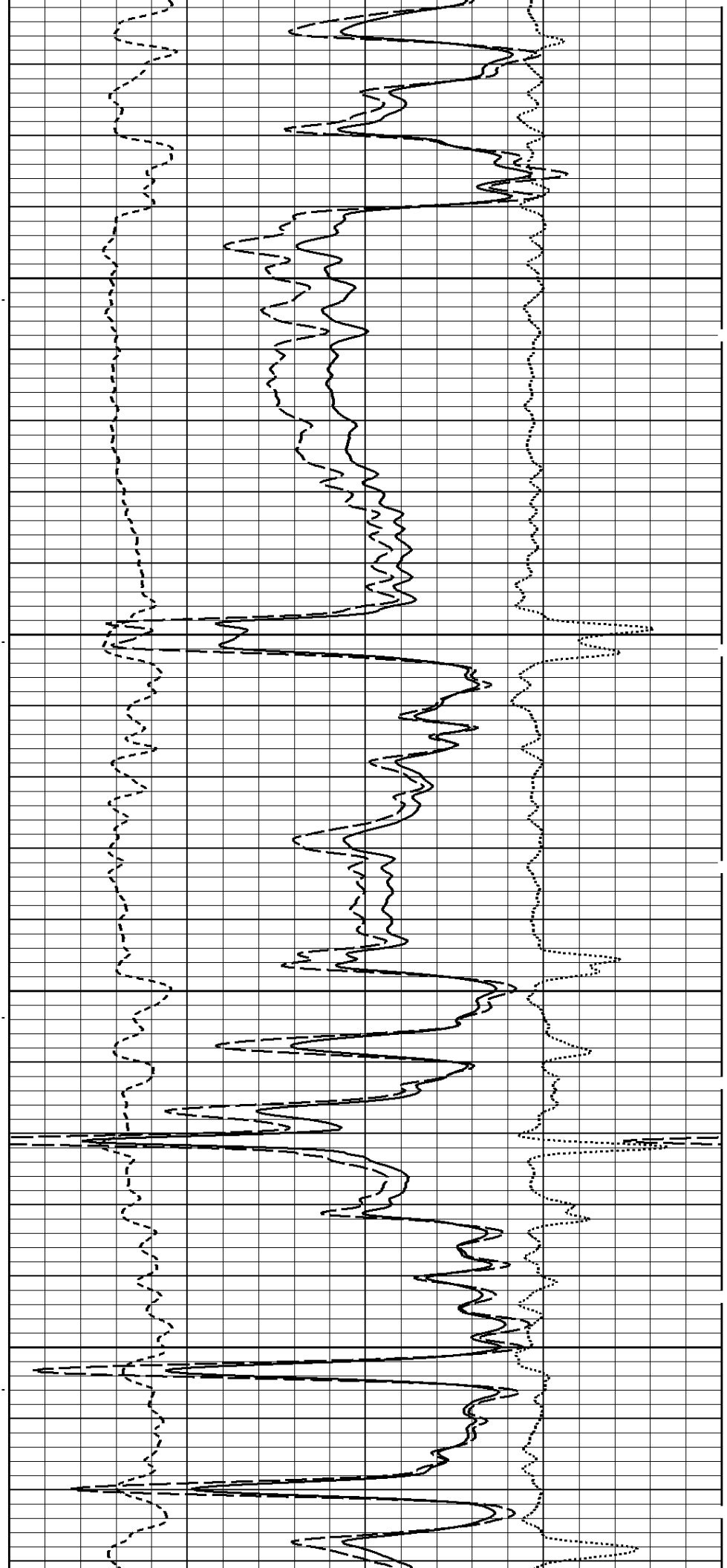


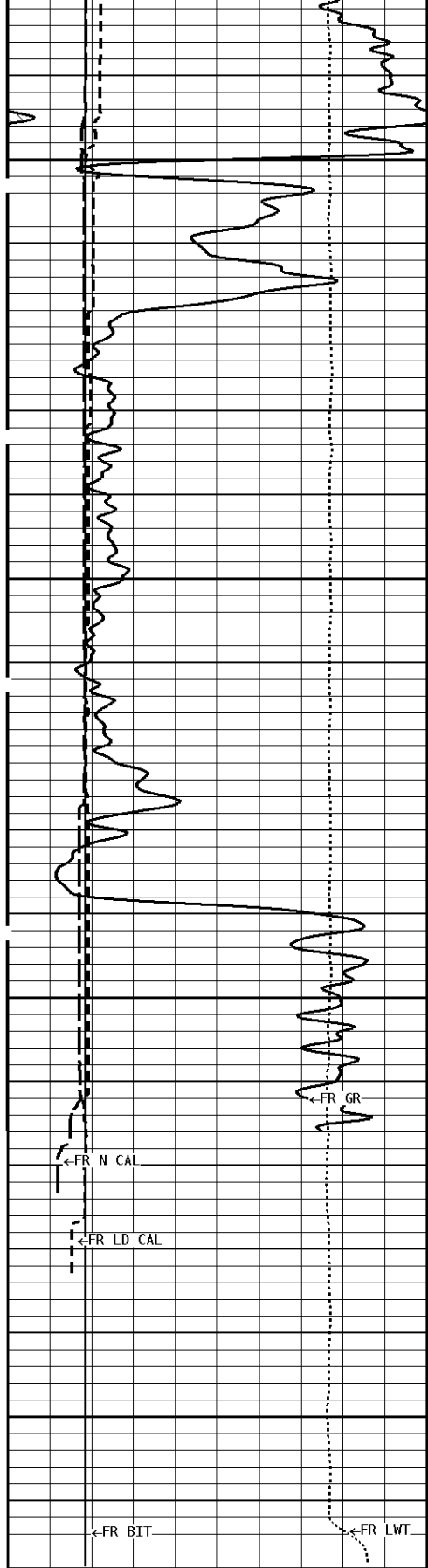


-100Cu.Ft

2300

2400

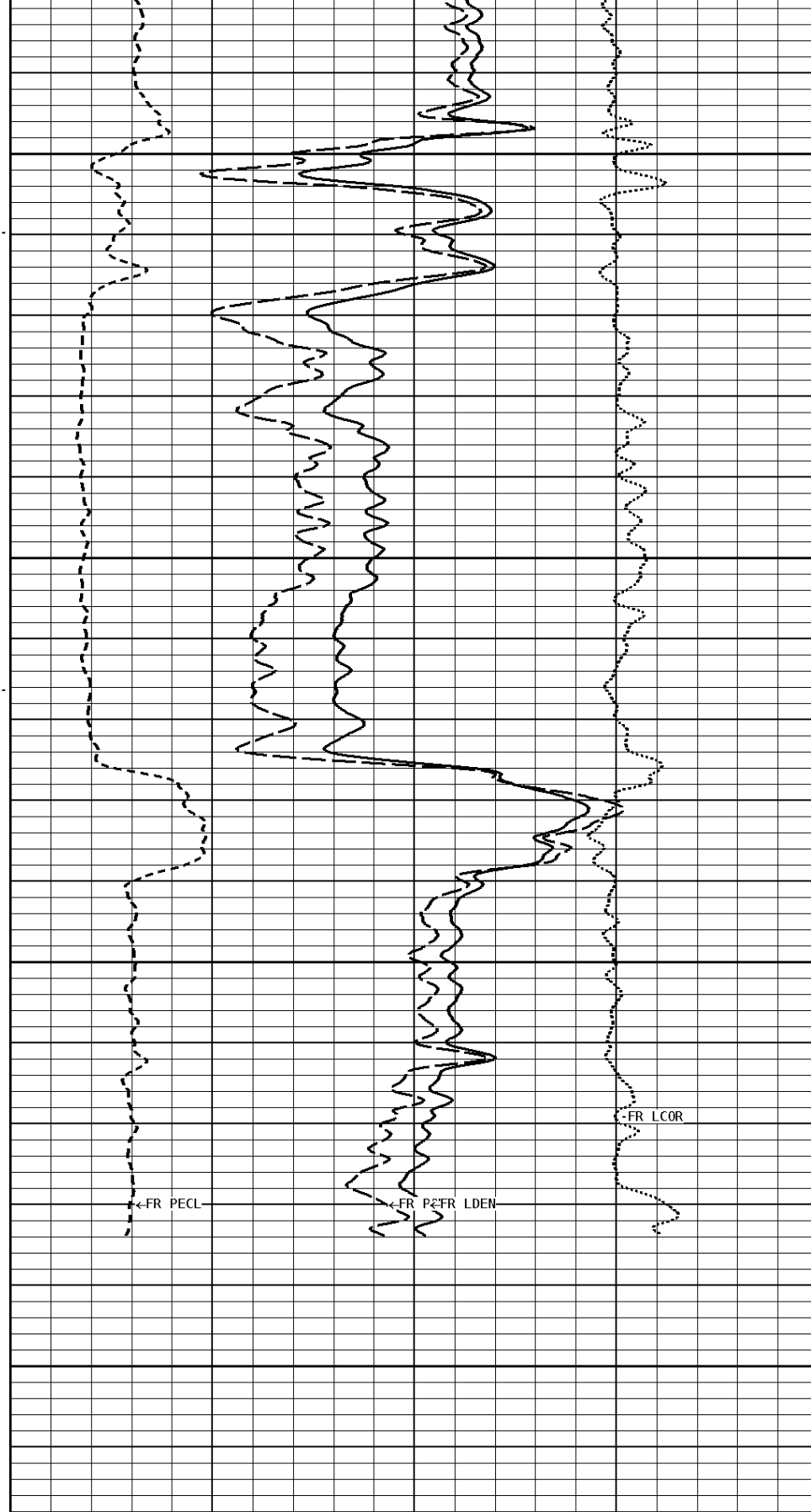




2500

2600

2614



1:240 MAIN SECTION

BULK DENSITY

<p style="text-align: center;">GAMMA RAY API UNITS</p> <p>150 300 0 150</p>	<p style="text-align: center;">- BHV AHV - CU. FT</p>	<p style="text-align: center;">DENSITY POROSITY (2.71g/cc) PERCENT</p> <p style="text-align: right;">30 -10 ----- -50</p>				
<p style="text-align: center;">TENSION LBS</p> <p>10000 0</p>		<p style="text-align: center;">COMPENSATED BULK DENSITY G/CC</p> <p style="text-align: right;">3.0 4.0 2.0 3.0 1.0 2.0</p>				
<p style="text-align: center;">DENSITY (X) CALIPER INCHES (IN)</p> <p>16 26 6 16</p>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">PE CROSS-SECTION BARNs/ELECTRON</td> <td style="width: 50%; text-align: center;">DENSITY CORRECTION G/CC</td> </tr> <tr> <td style="text-align: right;">0 10</td> <td style="text-align: right;">-0.25 0.25</td> </tr> </table>	PE CROSS-SECTION BARNs/ELECTRON	DENSITY CORRECTION G/CC	0 10	-0.25 0.25
PE CROSS-SECTION BARNs/ELECTRON	DENSITY CORRECTION G/CC					
0 10	-0.25 0.25					
<p style="text-align: center;">NEUTRON (Y) CALIPER INCHES (IN)</p> <p>16 26 6 16</p>						
<p style="text-align: center;">BIT SIZE INCHES (IN)</p> <p>6 16</p>						

*** 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 : 24-JUN-2019		Time : 12:20			
Sensor Suite : GR-GR5		ID : GRT-BC-038			
	Measured	Units	Calibrated	Units	
GR	Background	Jig	Jig	GRAPI	
	36	266	160		
Shop Calibration CNT-AA					
Performed : 03-JUN-2019		Time : 11:01			
Sensor Suite : CALI-BCN		ID : NDT-AF-411			
	Jig - Measured		Jig - Calibrated	Units	
CL # 1	Ring#1	Ring#2	Ring#1	Ring#2	IN.
	8.4	13.4	6.0	12.0	
Shop Calibration LDT-DA					
Performed : 03-Jun-2019		Time : 14:53			
Sensor Suite : CALI-LTH		ID : NDT-FA-404			
	Tank	Verification	Units		
N/F	Measured	Calibrated	Jig		
Porosity	3.7537	3.6893	3.6964		
	21.5	20.5	20.6	%	

CL # 1	Ring#1	Ring#2	Ring#1	Ring#2	IN.
Performed : 18-SEP-2019		Time : 12:05			
Sensor Suite : BHCPENGL		ID : LDP-DA-062			
Source ID : 1637GW					
Short Space					
	BKGD	Al	Mg	Al+Fe	Units
LSW1	65	1048	1693	671	CPS
LSW2	68	1209	1923	869	CPS
LSW3	248	2723	4386	2317	CPS
LSW4	304	2339	3355	2060	CPS
LSW5	27	46	51	43	CPS
LSW6	87	88	86	86	CPS
LSW7	51	56	57	57	CPS
LSW8	1	3	4	3	CPS
QS	0.261	0.222	0.203	0.205	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space					
	BKGD	Al	Mg	Al+Fe	Units
LLW1	96	1171	4837	704	CPS
LLW2	106	2047	8062	1488	CPS
LLW3	404	3698	14047	3196	CPS
LLW4	517	1760	5509	1595	CPS
LLW5	59	67	114	66	CPS
LLW6	161	160	148	159	CPS
LLW7	108	104	99	106	CPS
LLW8	4	7	17	6	CPS
QL	0.195	0.215	0.198	0.198	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration MST-DA					
Performed : 08-NOV-2019		Time : 08:27			
Sensor Suite : CALI-MSN		ID : MST-DA-29			
	Jig - Measured	Jig - Calibrated		Units	
CL # 1	Ring#1 Ring#2	Ring#1	Ring#2	IN.	
	6.5 12.4	6.0	12.0		

Performed : 18-APR-2012		Time : 14:41				
Sensor Suite : MSTDA-NI		ID : MST-DA-29				
Internal						
	Measured		Units	Calibrated		
	Zero	Reference		Zero	Reference	
INV-V	90.1	30452.9		0.00	2146.00	MV
NOR-V	167.8	31641.5		0.00	1546.00	MV
IN-C	158.5	61272.2		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					55.11	OHMM

Performed : 18-APR-2012		Time : 14:41				
Sensor Suite : MSTDAMSF		ID : MST-DA-29				
Internal						
	Measured		Units	Calibrated		
	Zero	Reference		Zero	Reference	
MSFC	17.6	59927.7		0.00	1522.00	UA
MSFB	32752.5	32602.8		0.00	1522.00	MA
MOM1	0.0	61154.9		0.00	1522.00	MV
MSFRA					43.30	OHMM



Company: ENTRANSCO ENERGY, LLC
 Well: D. WIEBE #32-1
 Location: 1925' FSL & 350' FWL
 Logged: 11-08-2019
 K.B. Elev: 1495.0 Ft