



Tucker

ENERGY SERVICES

COMPENSATED NEUTRON
PEL DENSITY MICRO LOG

Company PICKRELL DRILLING COMPANY, INC		File No : TUL 59749	
Well #3 MAPLE "K"		Company : PICKRELL DRILLING COMPANY, INC	
Field SPIVEY-GRABS-BASIL		Well : #3 MAPLE "K"	
County KINGMAN		Field : SPIVEY-GRABS-BASIL	
State KANSAS		County : KINGMAN	
Country USA		State : KANSAS	
API No. 15-095-22291-0000		Country : USA	
Location : 1980' FSL & 660' FEL C NE SE		API No : 15-095-22291-0000	
LSD :		Sect : 30 Twp : 29S Rge : 6W	
Permanent Datum:		Elevations:	
Drilling Measured From:		KB 1529.00 Ft	
Log Measured From:		DF 1527.00 Ft	
Above Permanent Datum: 10.00 Ft		GL 1519.00 Ft	
Services:		CNT PIT	
LDT		MLT	
Date 10-06-2014			
Run Number 1			
Depth--Driller 4230.0 Ft			
Depth--Logger 4240.0 Ft			
First Reading 4217.0 Ft			
Last Reading 213.0 Ft			
Casing--Driller 213.0 Ft			
Casing--Logger 213.0 Ft			
Bit Size 7.875 In			
Casing Size 8.625 In			
Hole Fluid Type CHEM GEL			
Density 9.5 lb/gl			
Fluid Loss 9.0 ml/30min			
PH/Viscosity 10.0 53.0 sec/qt			
Sample Source MEASURED			
RM@Measured Temp. 2.000 @ 75 F			
RMF@Measured Temp 1.600 @ 75 F			
RMC@Measured Temp. 2.400 @ 75 F			
Source RMF/RMC CALCULATED/CALCULATED			
RM@BHT 1.670 @ 119 F			
Time Circulation Stopped 10-06-2014 6:00 pm			
Max Recorded Temp. 119 F			
Equipment/Base 127 TULSA			
Recorded By SHELDON TYLER / AMOUR DUHO			
Witnessed By JERRY SMITH			

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	4230.00	8.625	32.00	213.00	0.00

Run Number	1	
Date	10-06-2014	
Date/Time On Bottom	10-06-2014 9:30 pm	
Depth to Fluid	0.0 Ft	
Salinity	3000.000 ppm	
RMF@BHT	1.330 @ 119 F	
RMC@BHT	2.000 @ 119 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 4.5" PRODUCTION CASING
 PHIN IS CALIPER CORRECTED

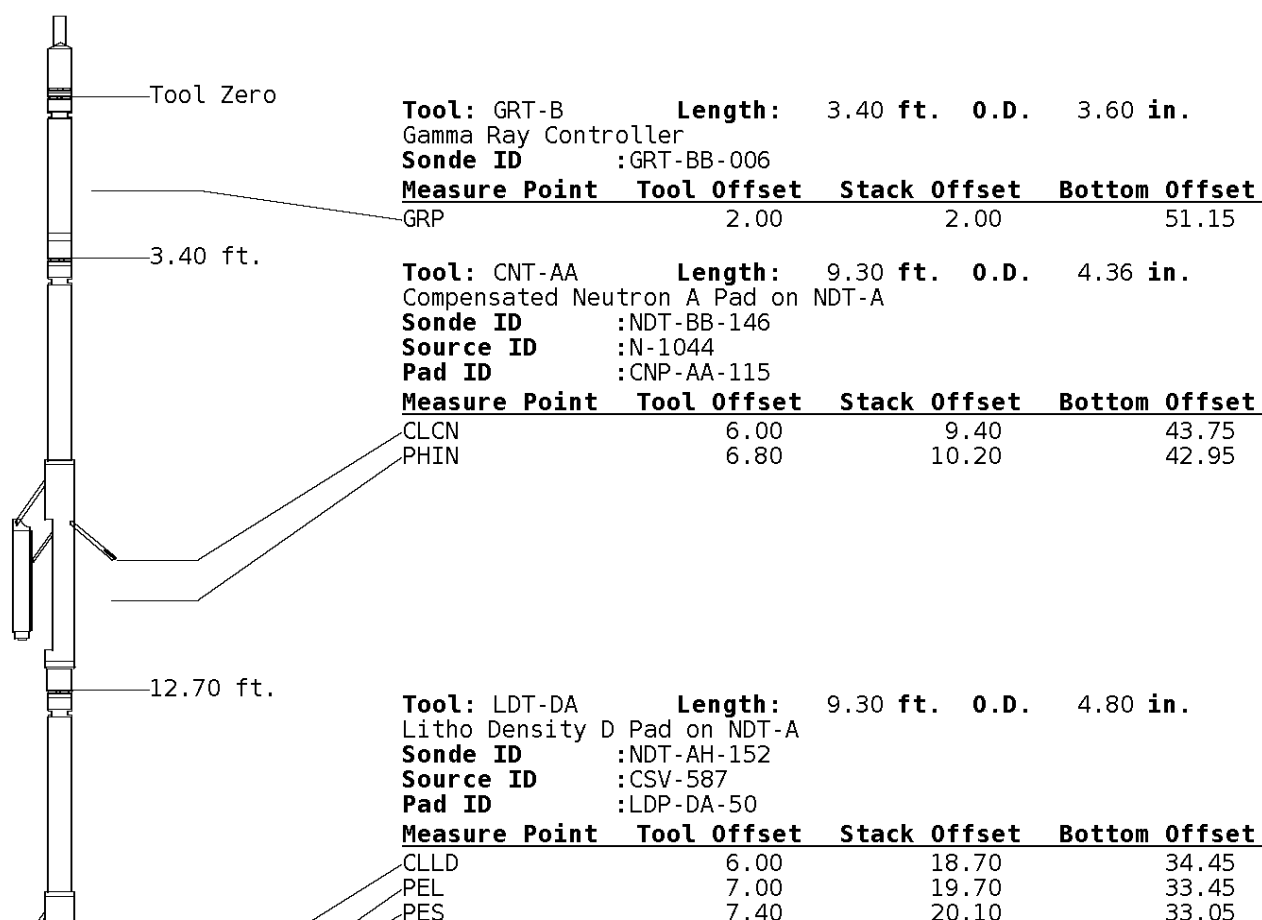
CUSTOMER REQUESTED DETAILS PULLED FROM TD TO 2800'

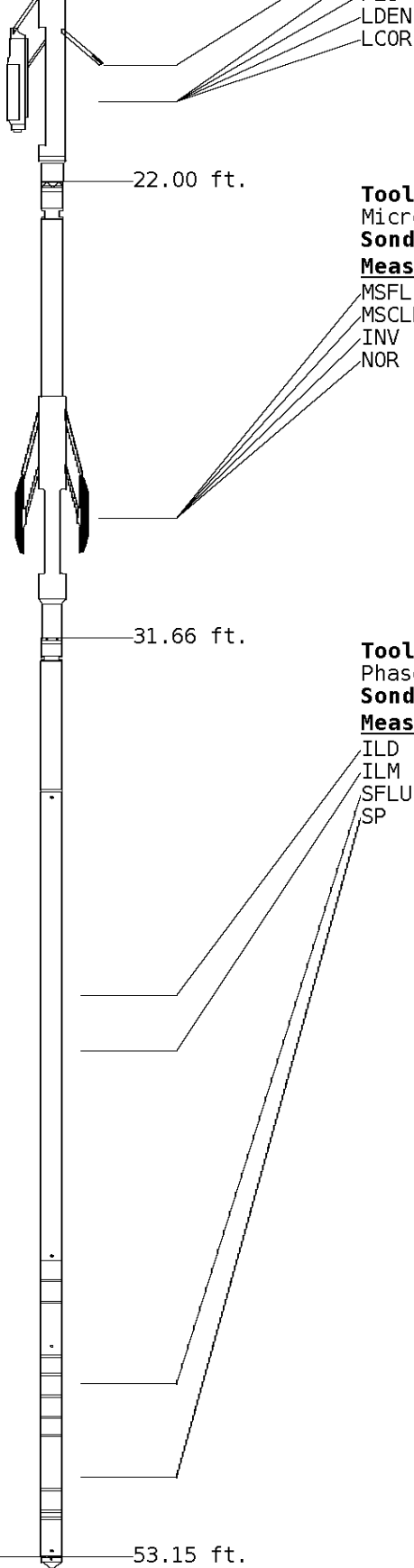
GRT: GRP, GRX
 CNT: PHIN, CLCNIN, PHXN
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN, PRXL, PECLX, LDENNX, LCORX
 MLT: NOR_RF, INV_RF, MSCLPIN
 PIT: ILD, ILM, SPU, SFLAEC, CIRD

OPERATORS: +3
 B. BROWN
 D.DUNCAN

Tool String Schematic

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





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	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-062

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: PICKRELL MAPLE_K_3_OCT6_MSTK

Scale: 1:240 **Format:** NLD-240

Segment: V1.D1.S5 Reprocess of MAIN

Acquired: 2014-10/06 21:15 3.4.0-13115

Reference: 0

Processed: 2014-10/06 22:22 3.4.0-13115

**CALIPER MICRO
INCHES (IN)**

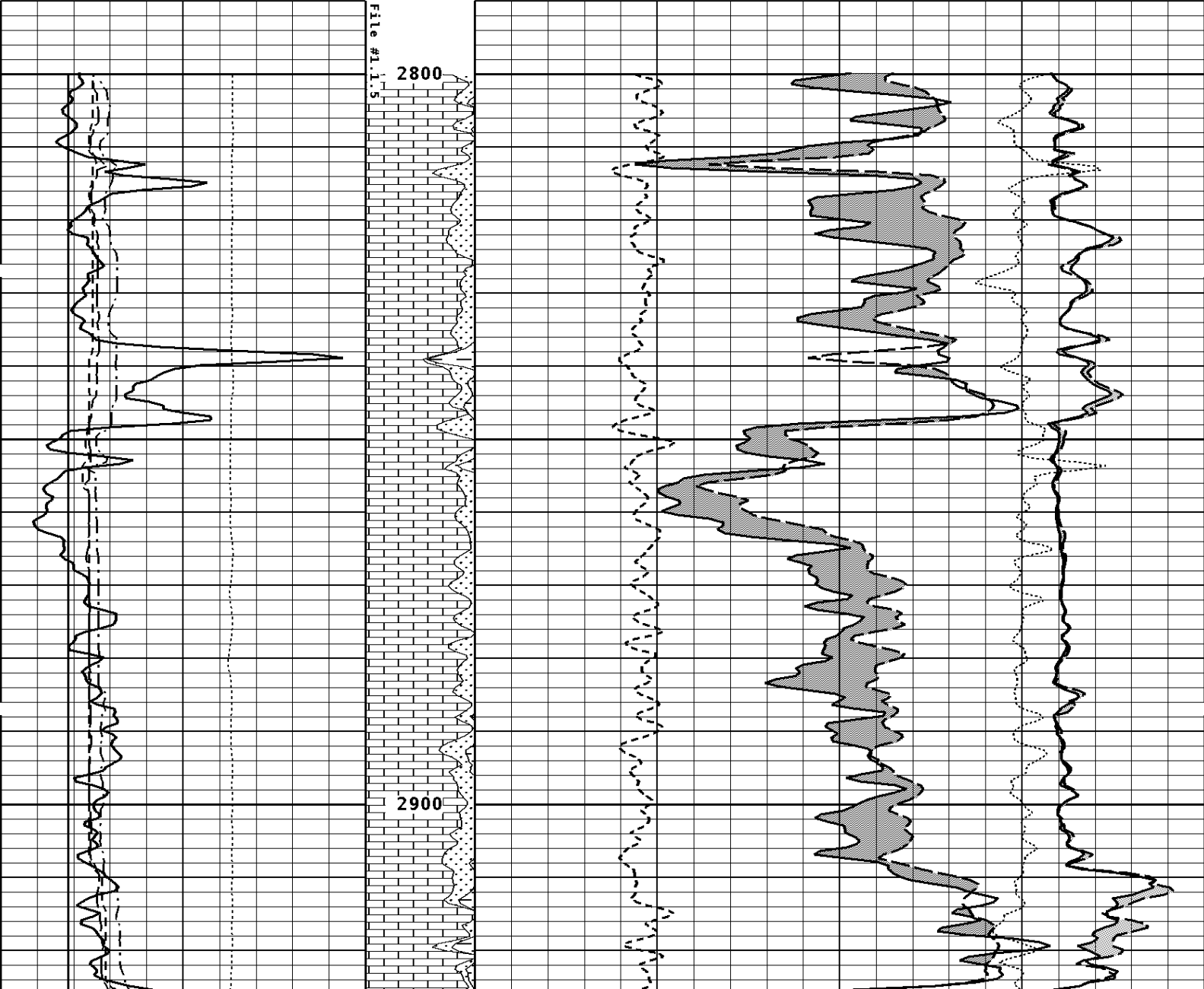
16 26
6 16

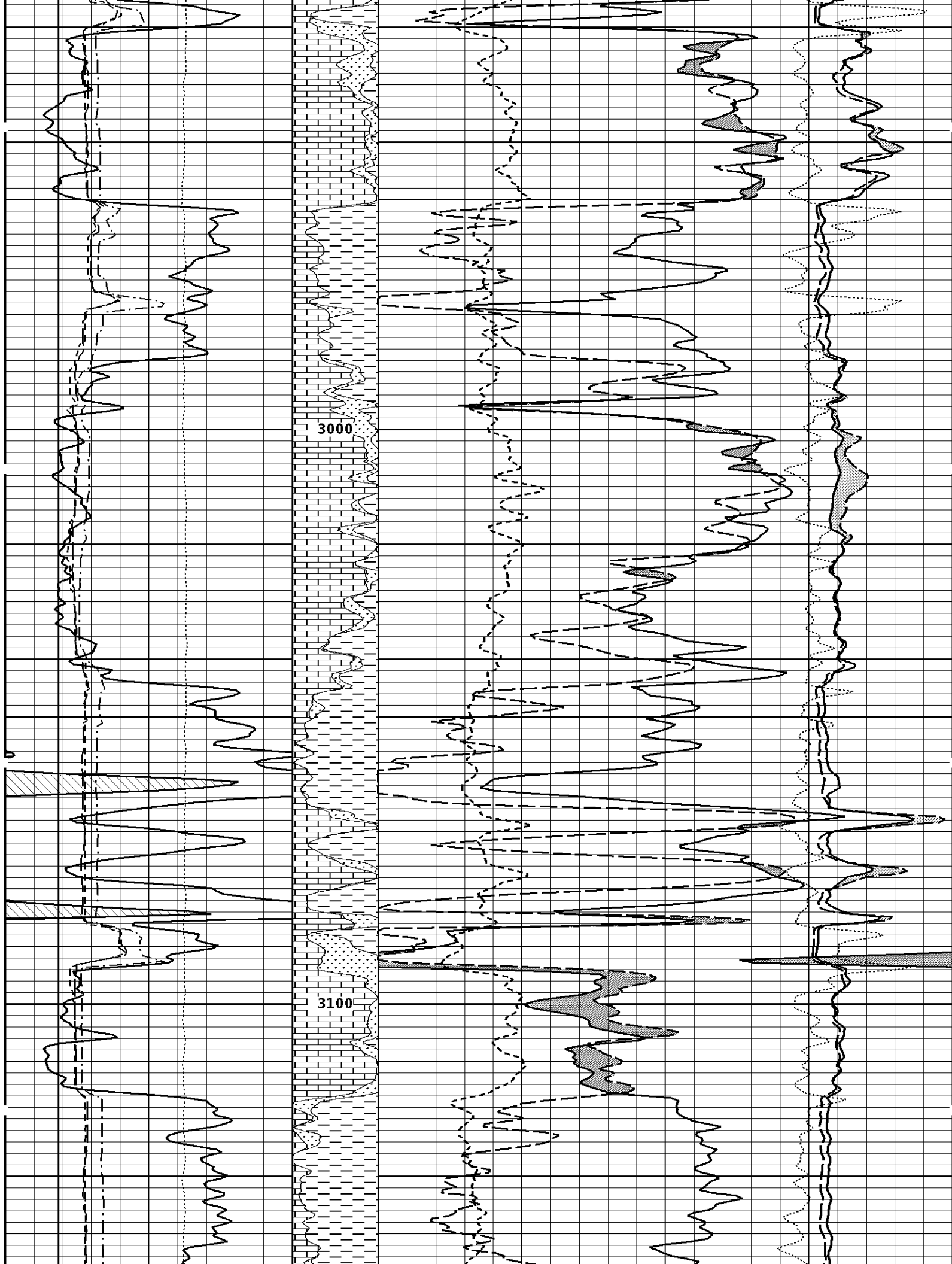
**BIT SIZE
INCHES (IN)**

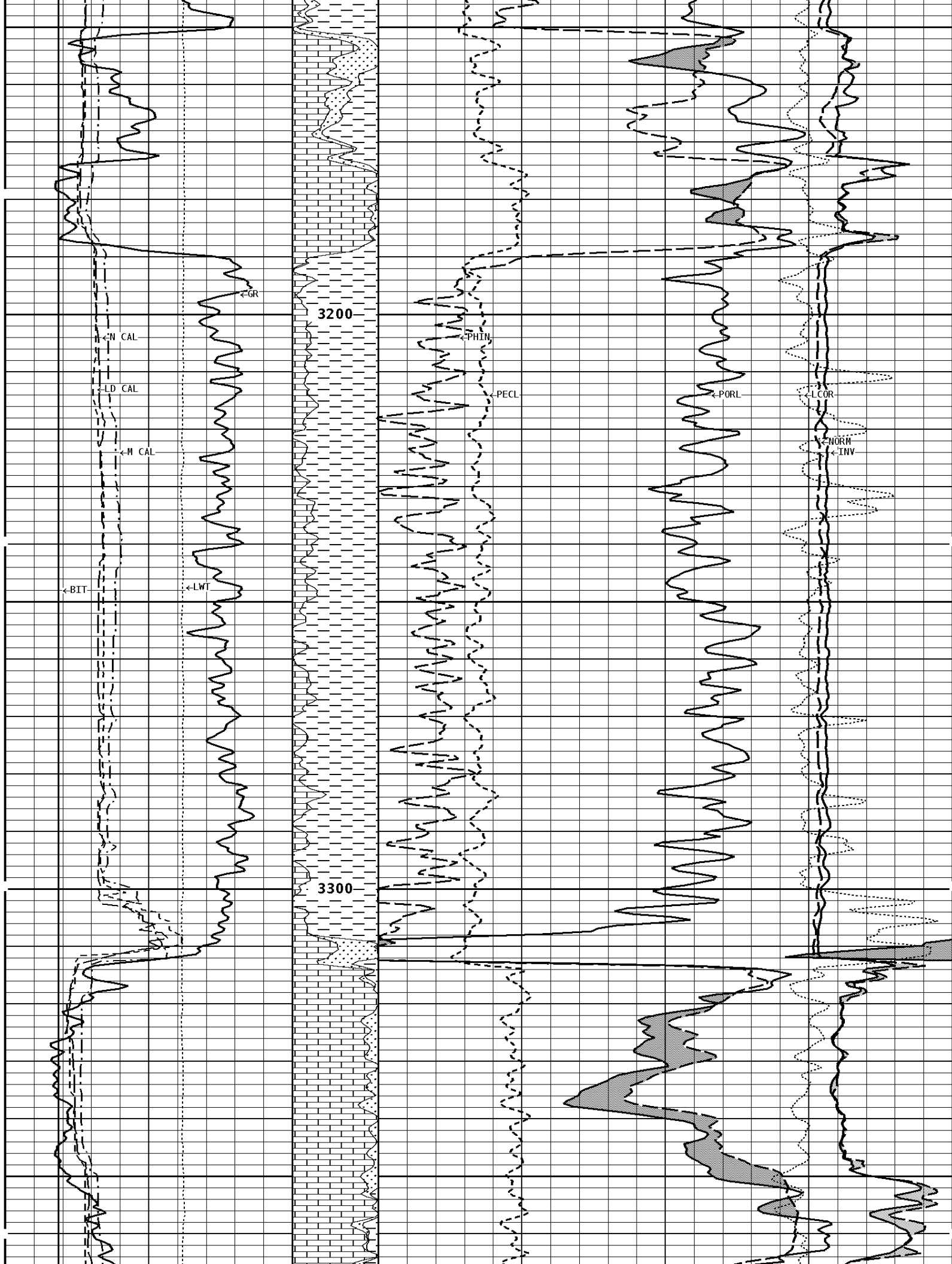
**NORMAL
OHMM**

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 BARNs/ELECTRON		DENSITY CORRECTION G/CC				
16									
6			10		-0.25				0.25
TENSION LBS		Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT						
10000			70	30					
			30	-10					
			-10	-50					
GAMMA RAY API UNITS		Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT						
150									
0			30	-10					

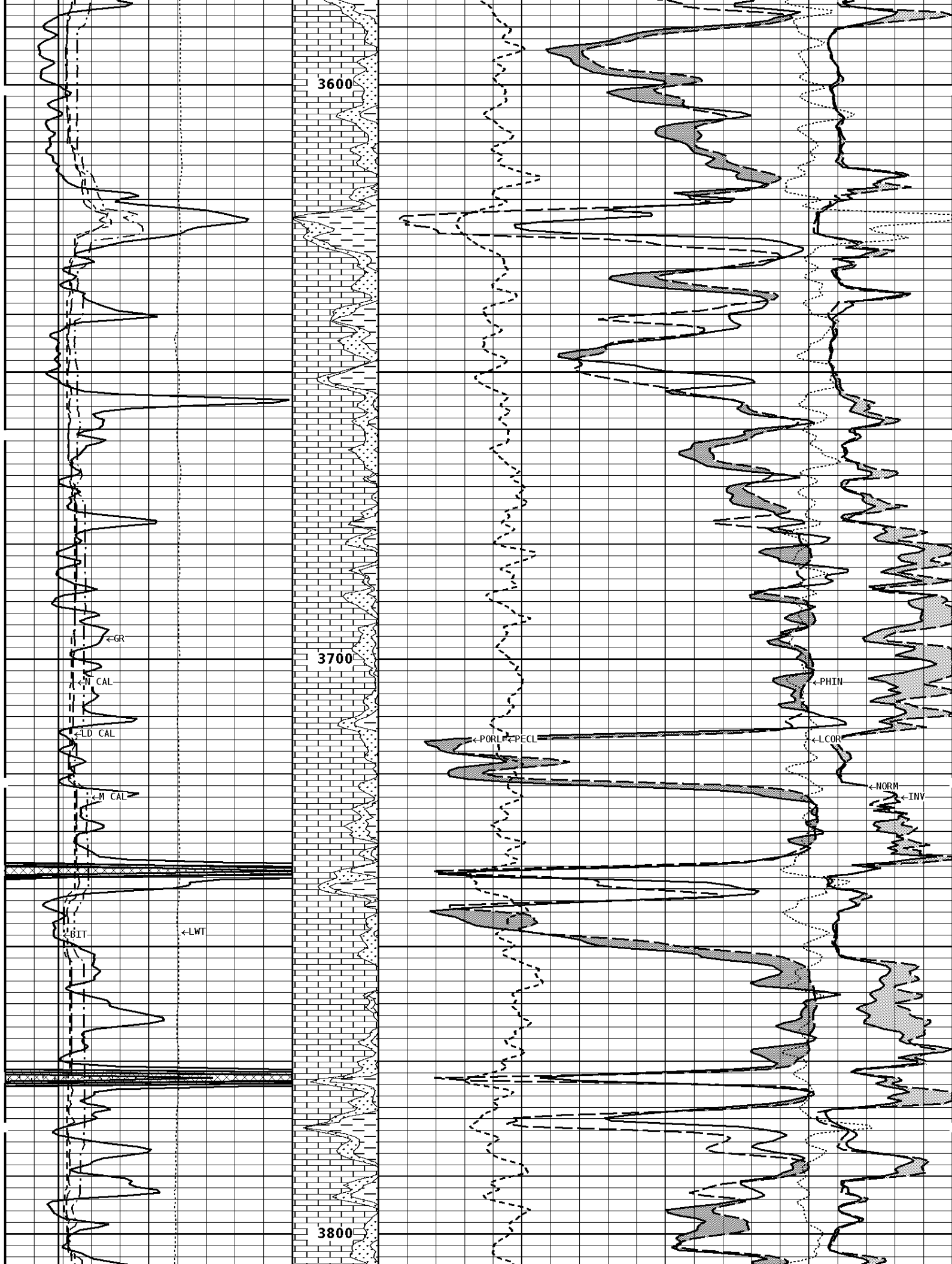
1:240 MAIN SECTION

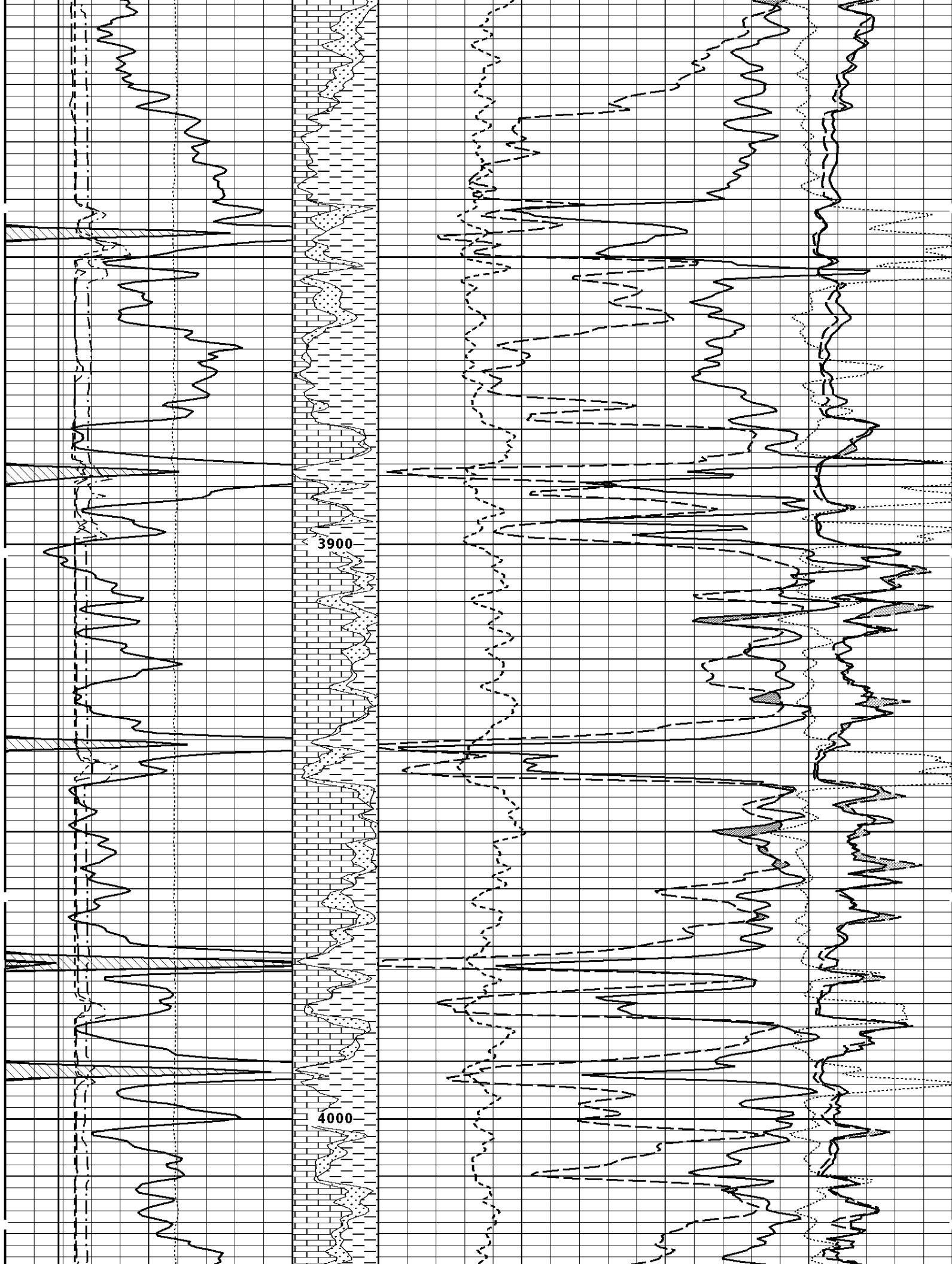


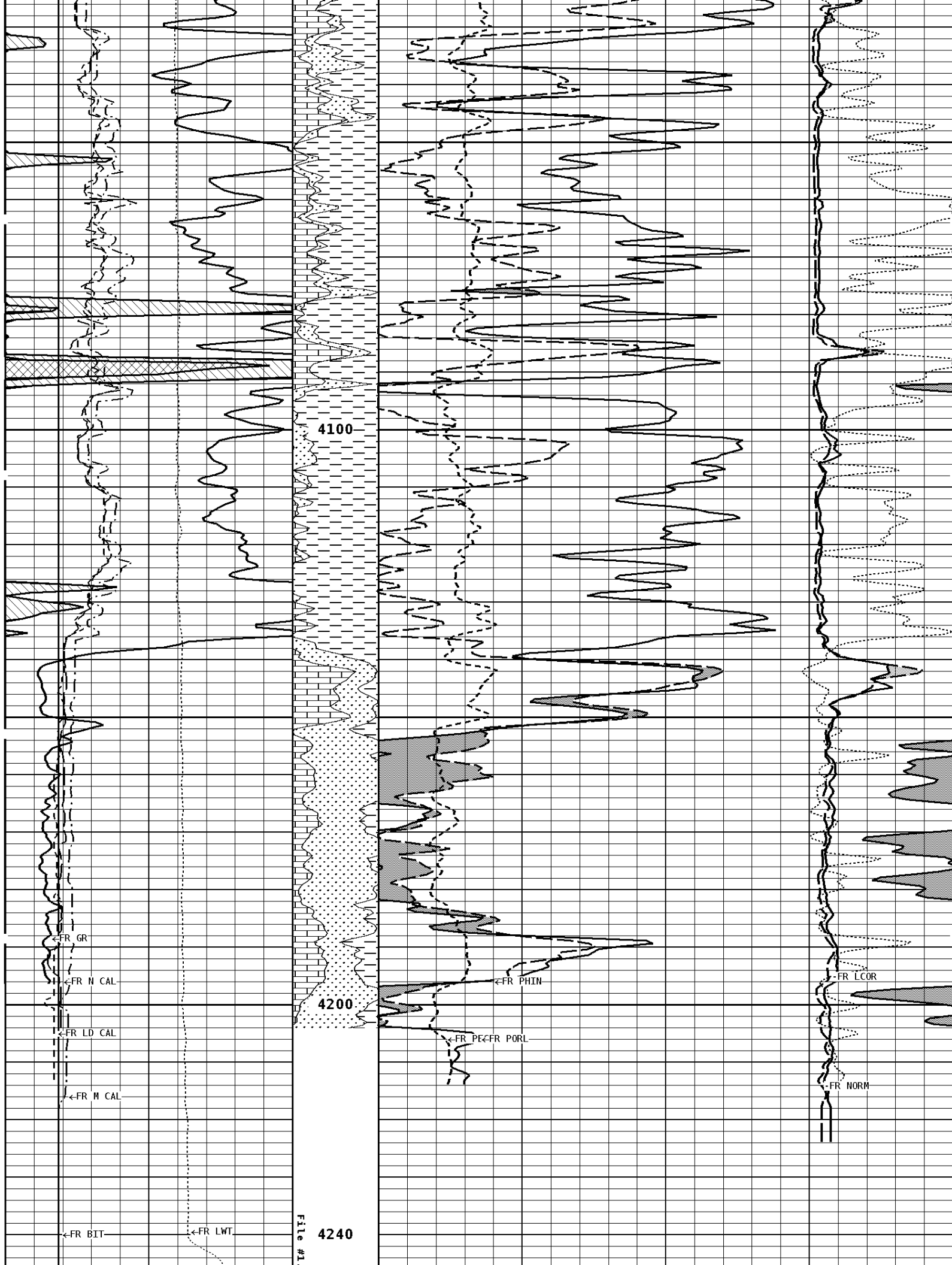




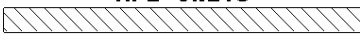
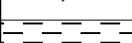
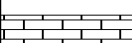
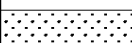








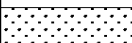
1:240 MAIN SECTION

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 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				INVERSE OHMM 0 ----- 40
BIT SIZE INCHES (IN) 6 ----- 16				NORMAL OHMM 0 ----- 40
CALIPER MICRO INCHES (IN) 16 26 6 16				

* Borehole Zone Factors *

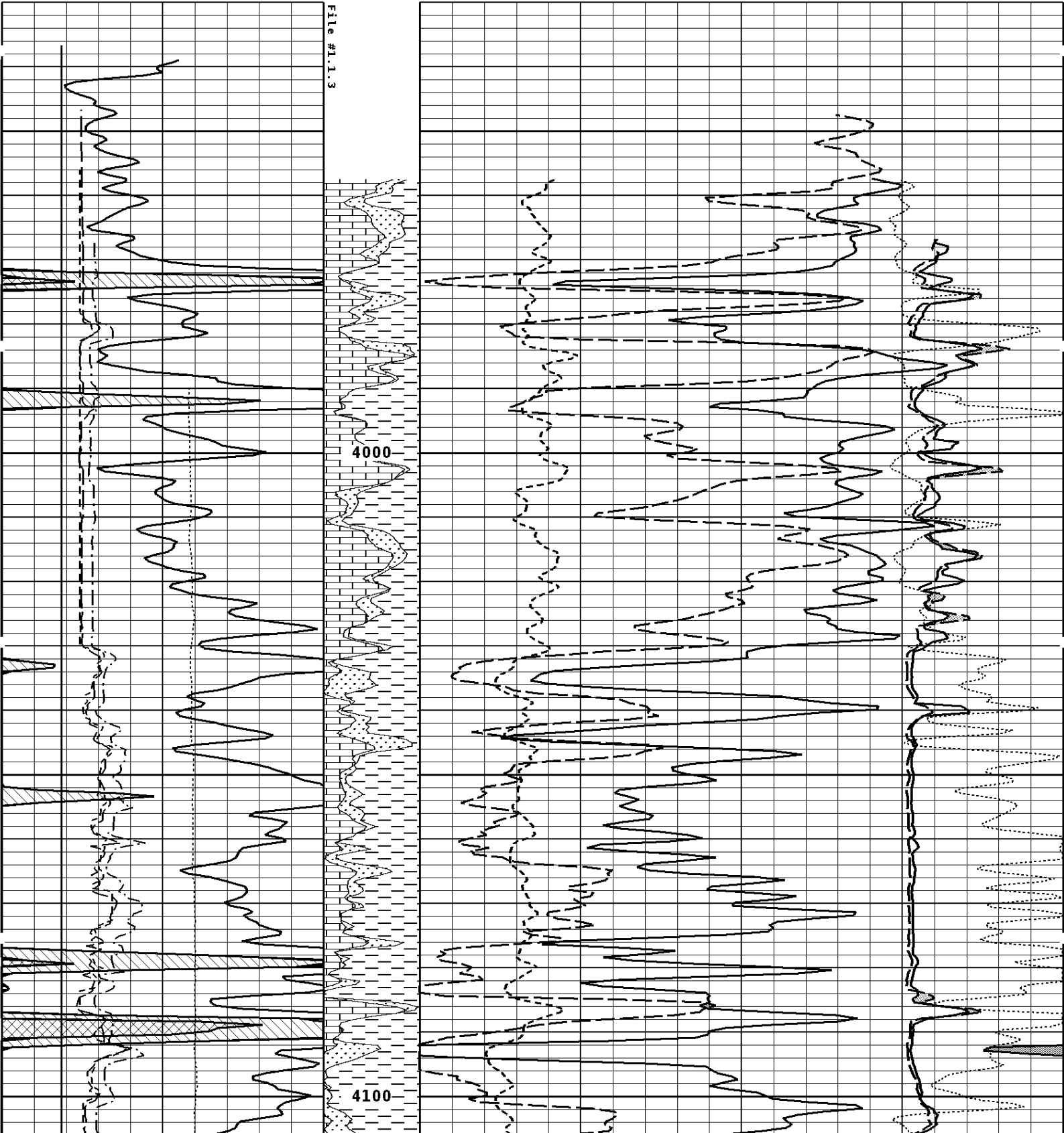
Zone 1 99999.0 to 0.0 Feet			
Matrix Density	_____	2.71	g/cc
Fluid Density	_____	1.00	g/cc
Formation Matrix	_____	Limestone	
Drill Bit Size	_____	7.875	in
Casing Diameter	_____	4.500	in
Casing Thickness	_____	0.250	in
Casing Correction (PHI N)	_____	Disable	

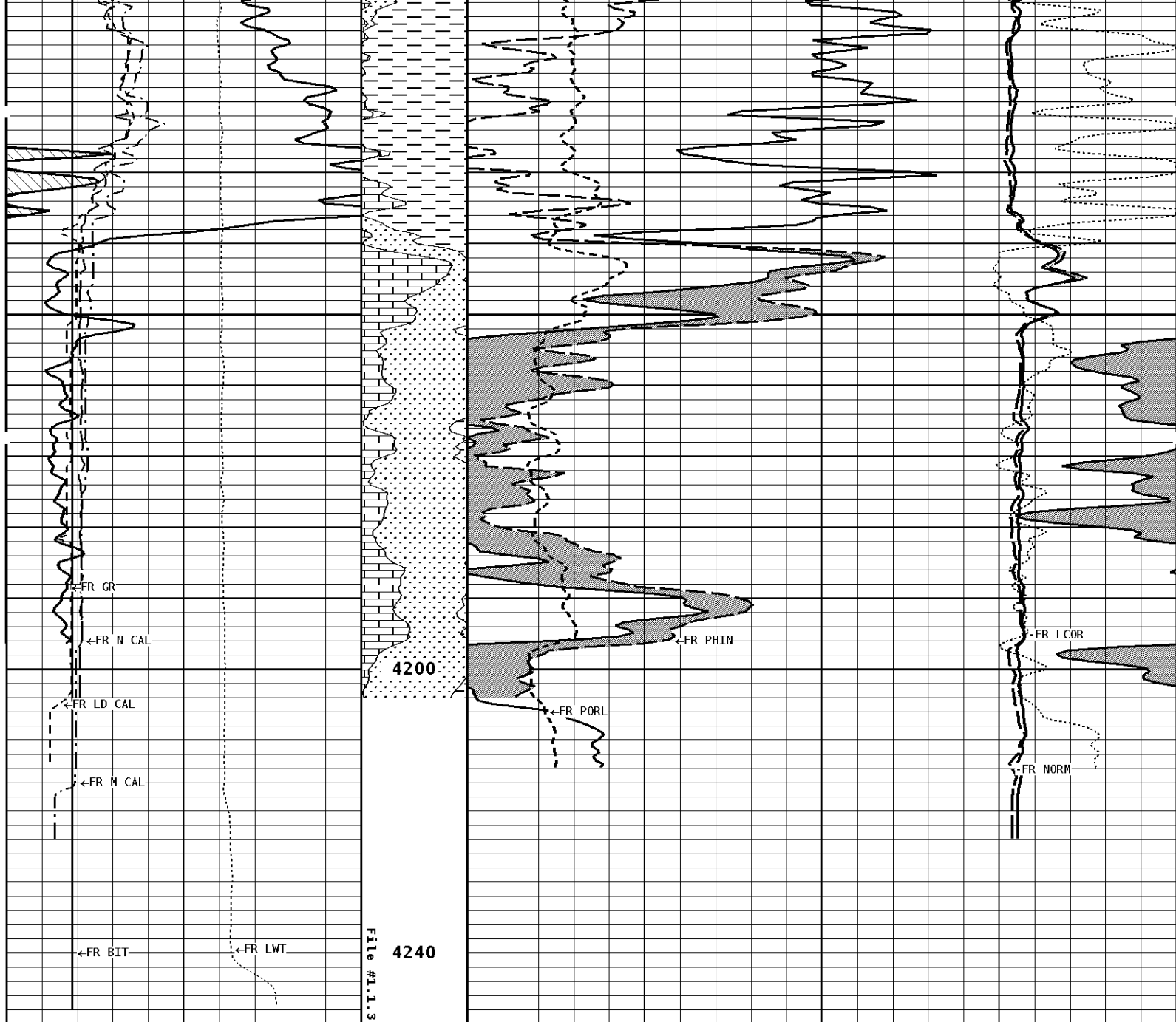
Well File: PICKRELL MAPLE_K_3_OCT6_MSTK	Scale: 1:240	Format: NLD-240
Segment: V1.D1.S3 Reprocess of REPEAT	Acquired: 2014-10/06 21:03 3.4.0-13115	
Reference: 0	Processed: 2014-10/06 21:14 3.4.0-13115	

CALIPER MICRO INCHES (IN) 16 26 6 16				NORMAL OHMM 0 ----- 40
BIT SIZE INCHES (IN) 6 ----- 16				INVERSE OHMM 0 ----- 40
NEUTRON (Y) CALIPER INCHES (IN) 16 26 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
TENSION -----		Volume -----	DENSITY POROSITY (2.71g/cc) -----	

LBS		Calcite	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 REPEAT SECTION





1:240 REPEAT SECTION

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

BIT SIZE
INCHES (IN)

6 16

CALIPER MICRO
INCHES (IN)

16 26
6 16

NORMAL
OHMM

0 40

* 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 4.500 in
Casing Thickness 0.250 in
Casing Correction (PHI N) Disable

Well File: PICKRELL MAPLE_K_3 OCT6 MSTK

Scale: 1:240 Format: LDT-240

Segment: V1.D1.S5 Reprocess of MAIN

Acquired: 2014-10/06 21:15 3.4.0-13115

Reference: 0

Processed: 2014-10/06 22:22 3.4.0-13115

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

0 10 -0.25 0.25

DENSITY CORRECTION
G/CC

COMPENSATED BULK DENSITY
G/CC

3.0 4.0
2.0 3.0
1.0 2.0

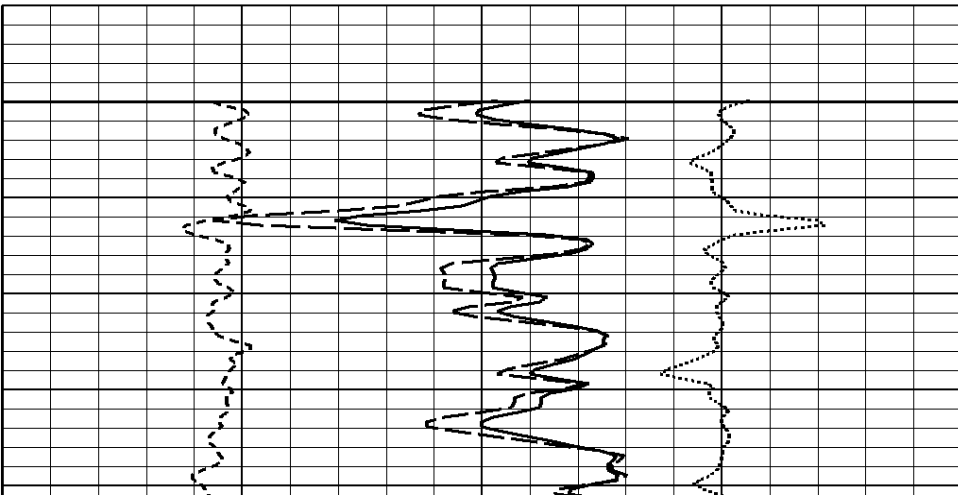
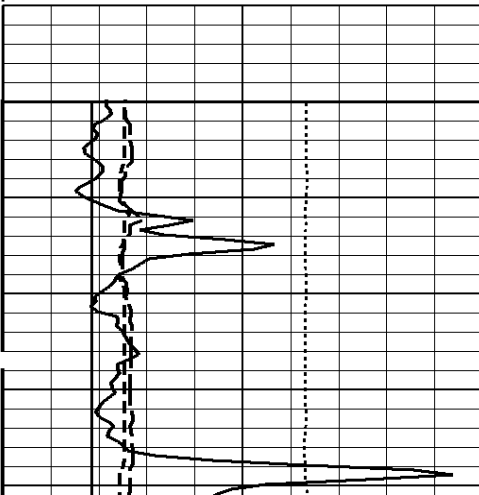
DENSITY POROSITY (2.71g/cc)
PERCENT

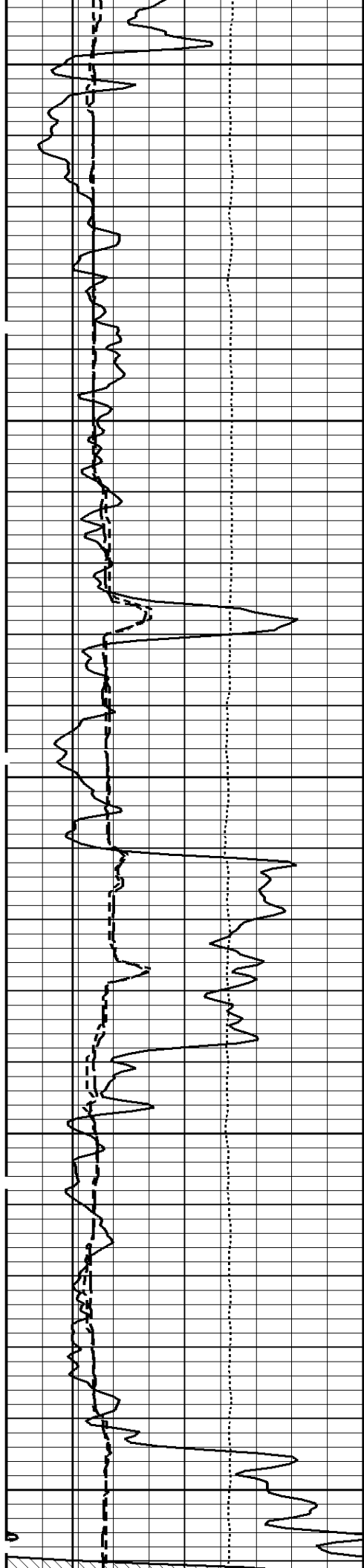
70 30
30 -10
-10 -50

1:240 MAIN SECTION
BULK DENSITY

File #1.1.5

2800



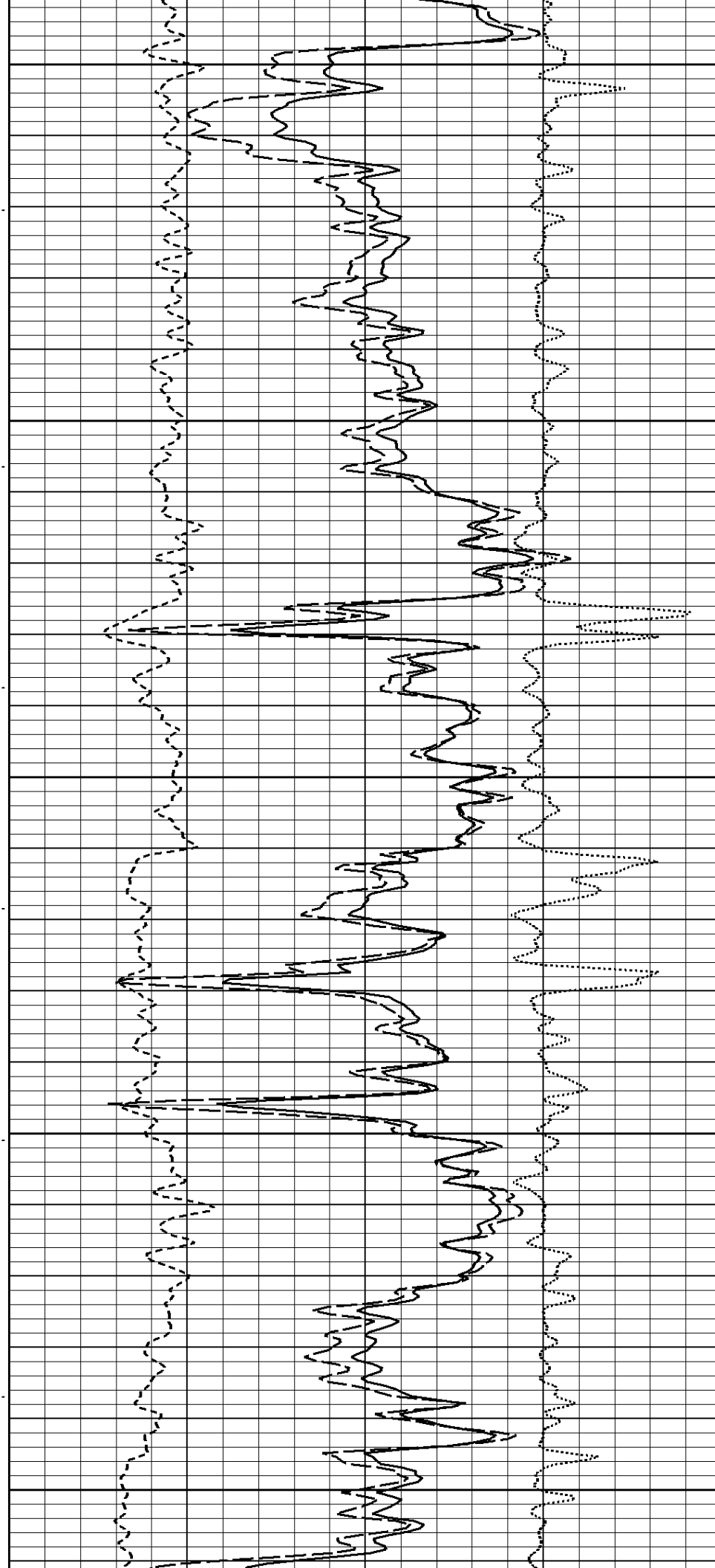


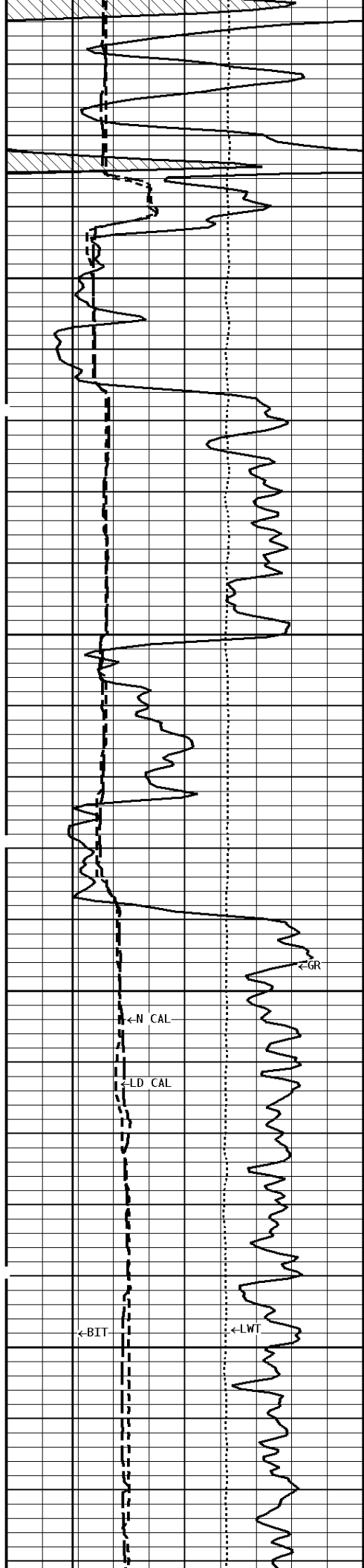
2900

400Cu.Ft--

3000

--500Cu.Ft



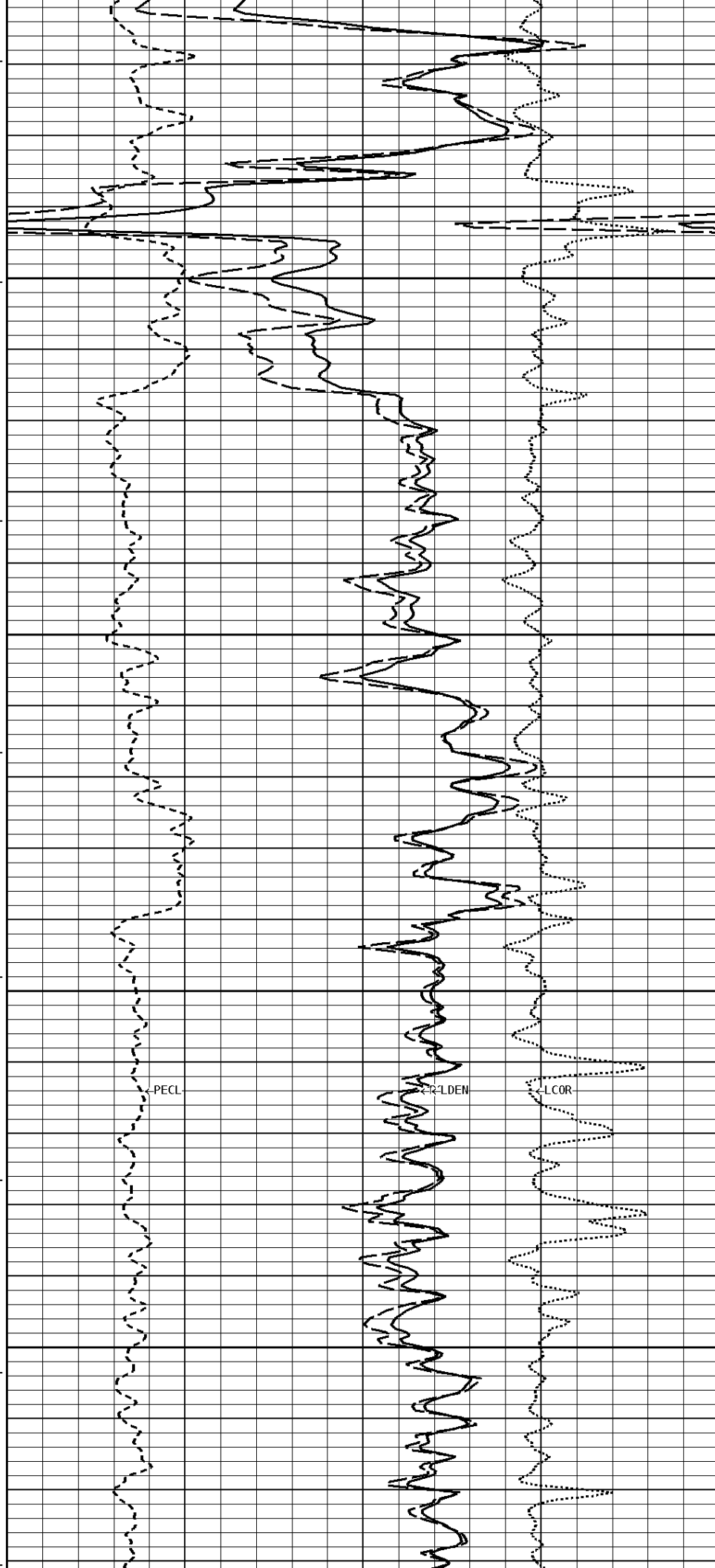


3100

3200

300Cu.Ft

400Cu.Ft

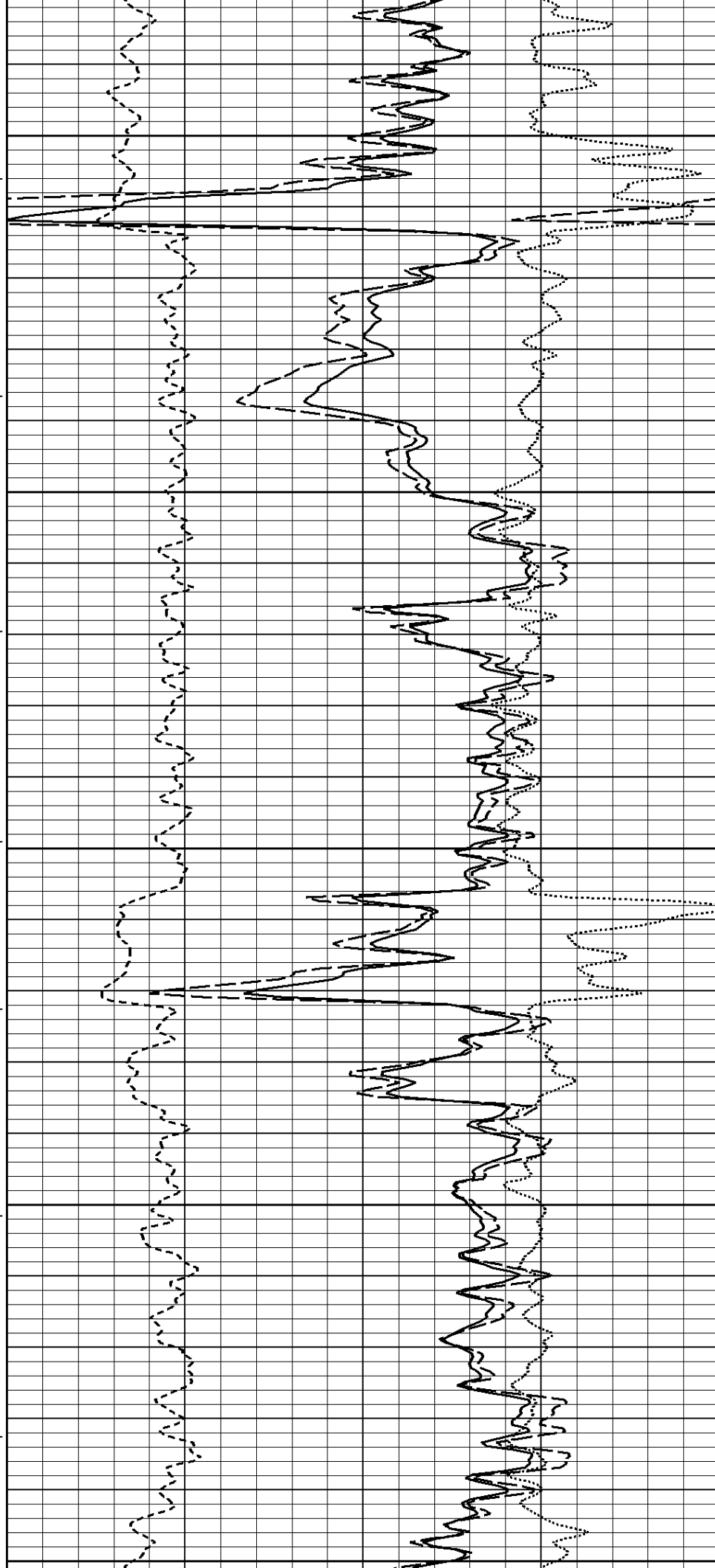


3300

3400

--300Cu.Ft

3500



--200Cu.Ft--

3600

--200Cu.Ft
3700

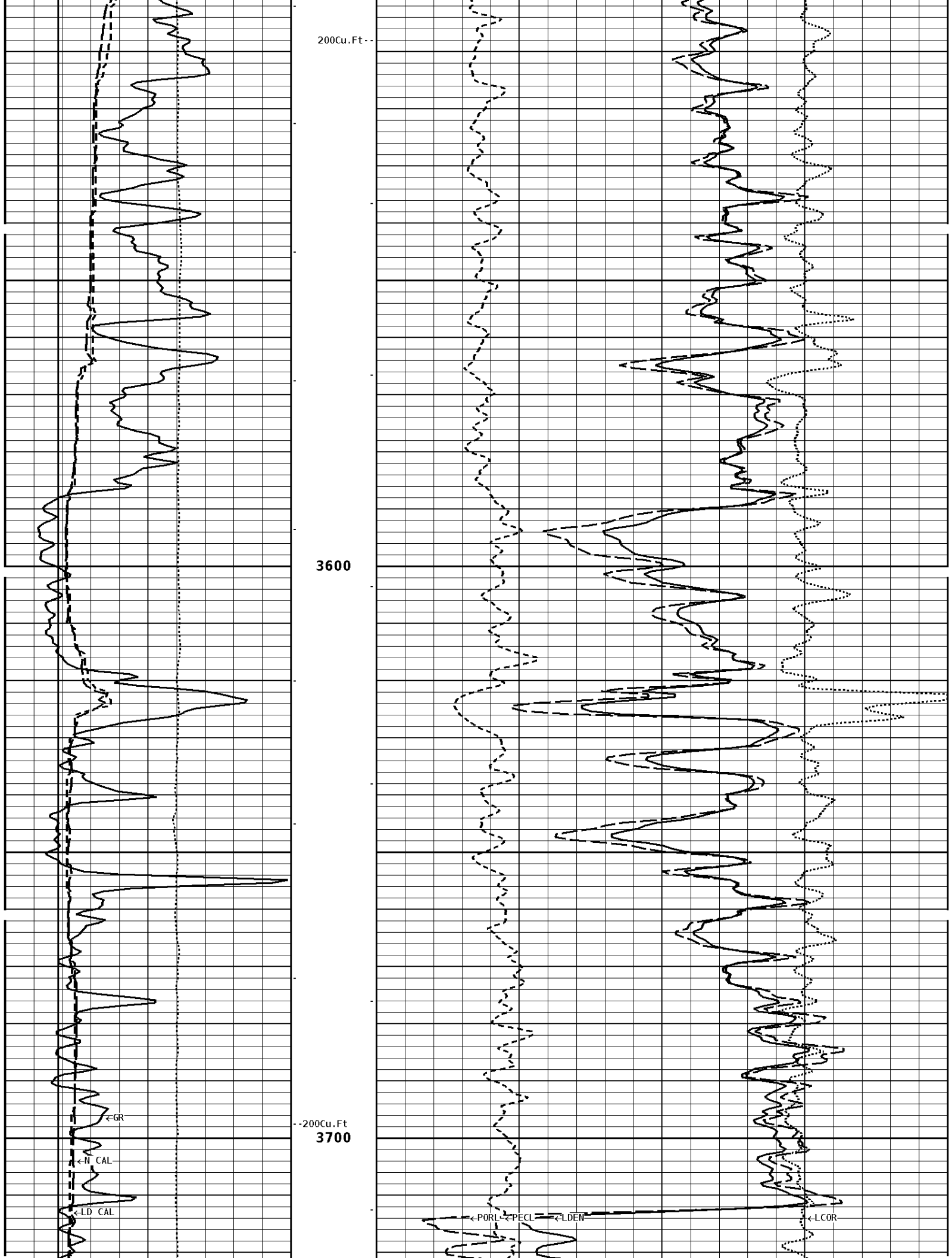
←GR

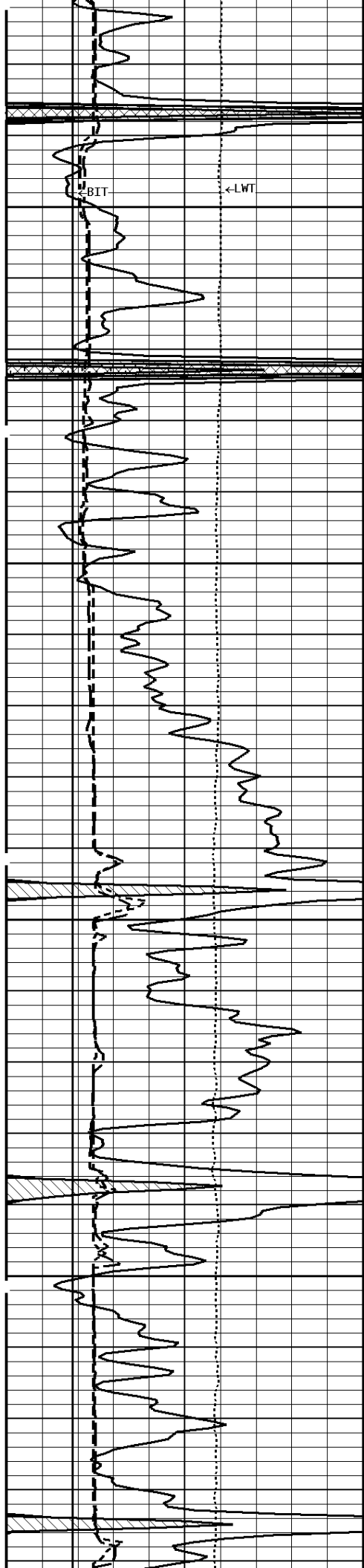
←N CAL

←LD CAL

←PORL ←PECL ←LDEN

←LCOR

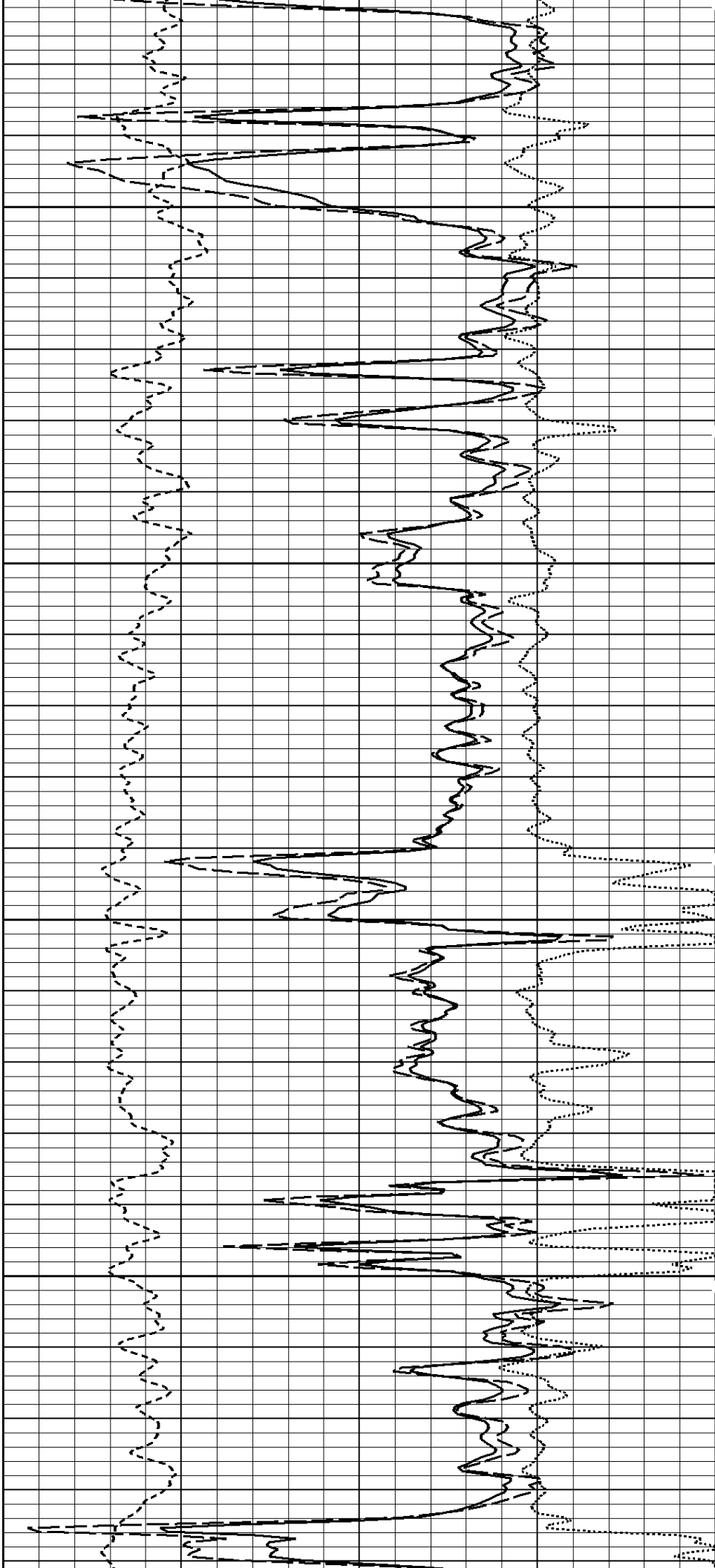


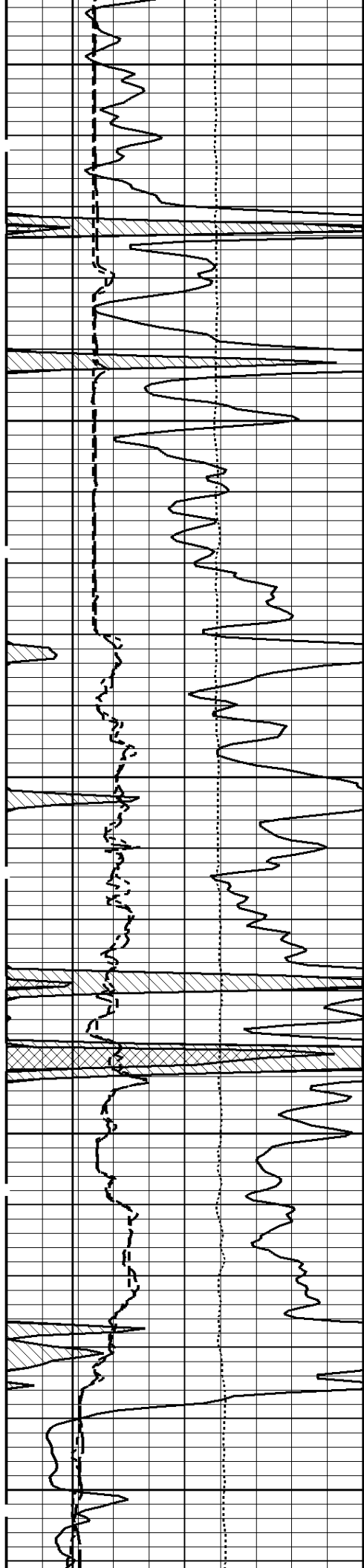


3800

100Cu.Ft--

3900

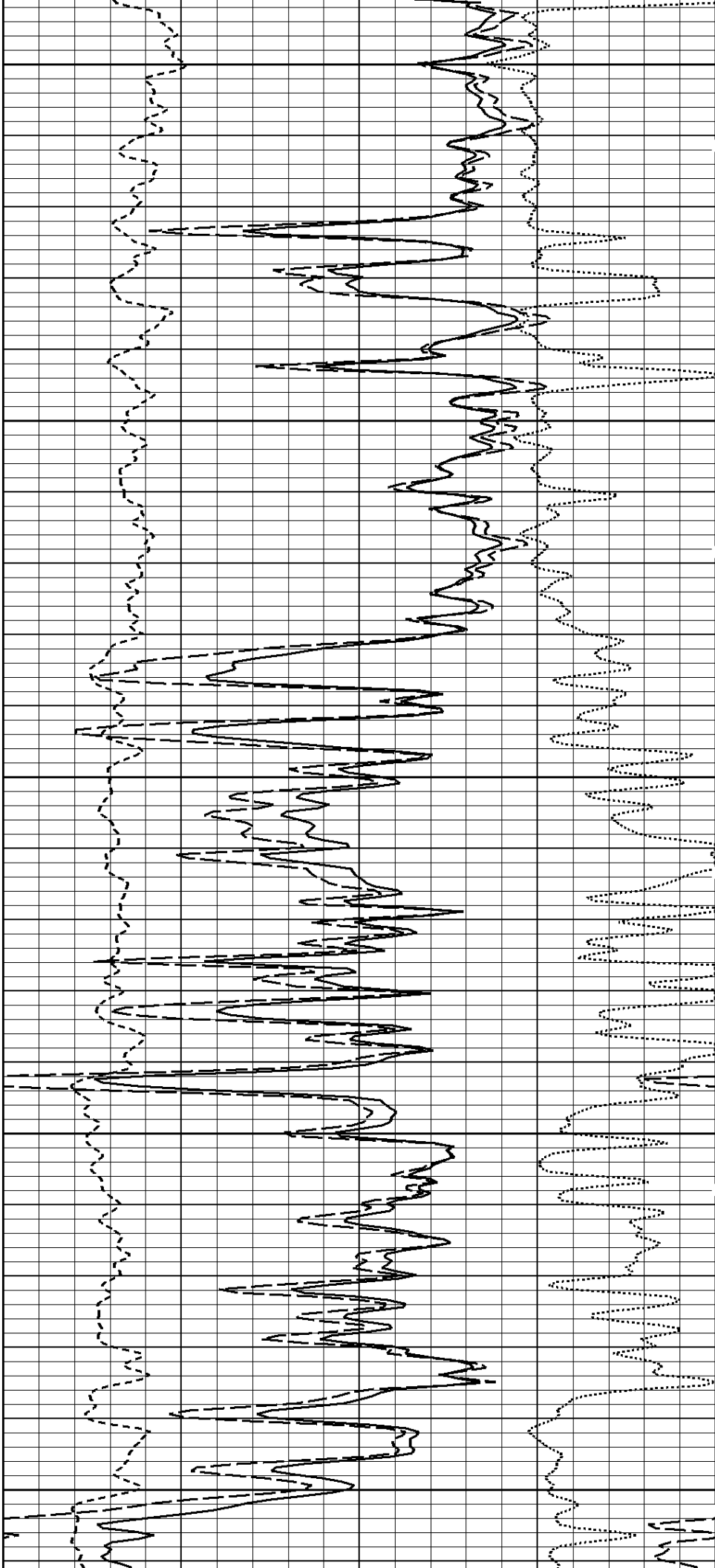


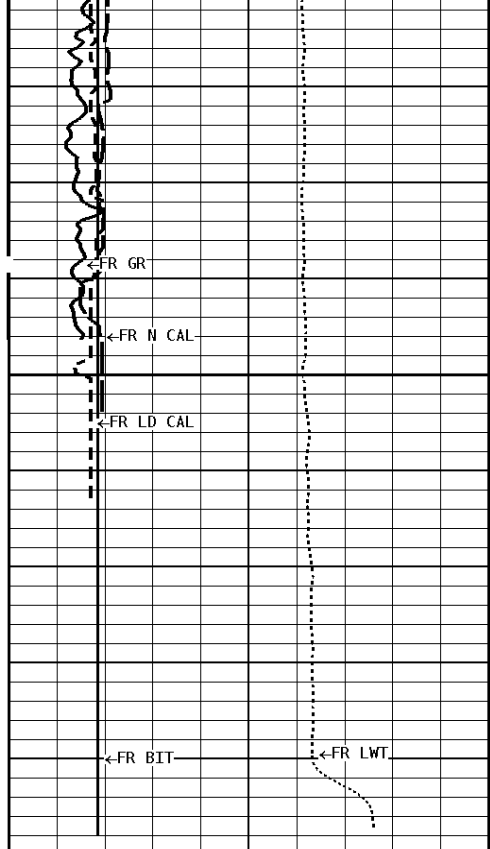


--100Cu.Ft

4000

4100

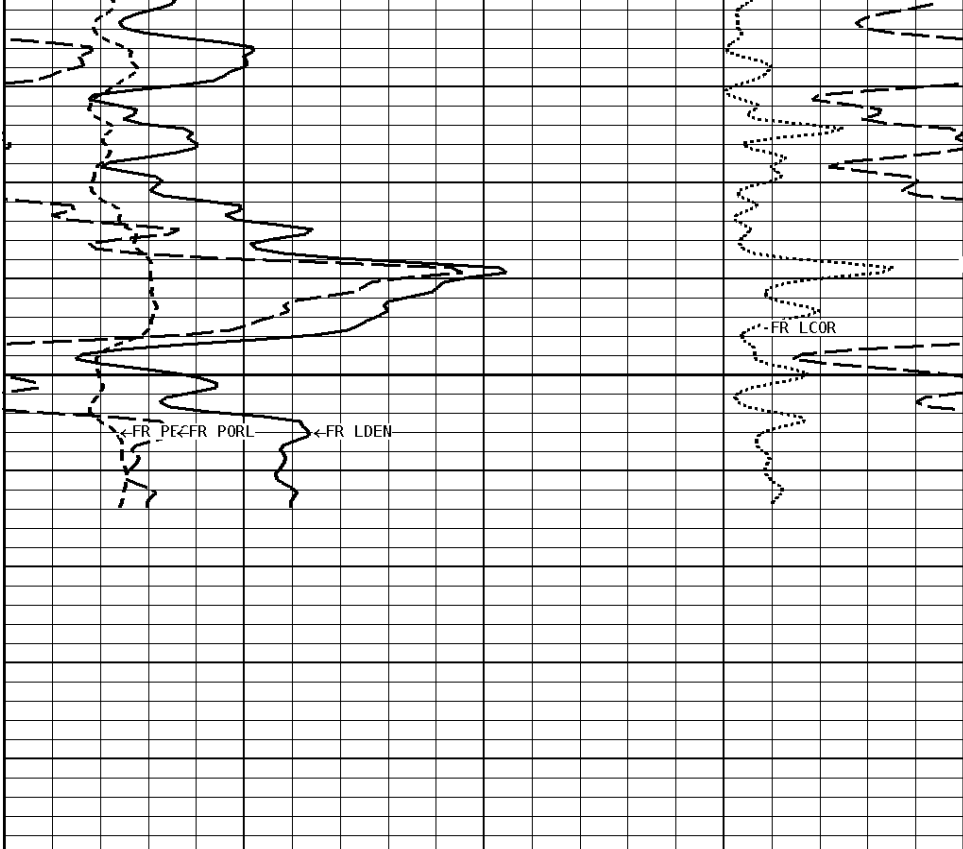




File #1.1.5

4200

4240



1:240 MAIN SECTION BULK DENSITY

GAMMA RAY API UNITS 150 0 300 150		DENSITY POROSITY (2.71g/cc) PERCENT 70 30 -10 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 -0.25 0.25	
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16		DENSITY CORRECTION G/CC 0.25	
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	4.500	in	
Casing Correction (PHI N)	Disable		

* Calibration Summary *

Shop Calibration GRT-B					
Performed : 22-SEP-2014			Time : 09:30		
Sensor Suite : GR-GR5			ID : GRT-BB-006		
	Measured	Units	Calibrated	Units	
GR	Background Jig		Jig		
	62 374	CPS	175		GRAPI

Shop Calibration CNT-AA					
Performed : 18-SEP-2014			Time : 17:15		
Sensor Suite : CALI-BCN			ID : NDT-BB-146		
	Jig - Measured		Jig - Calibrated	Units	
CL # 1	Ring#1 Ring#2		Ring#1 Ring#2		IN.
	9.2 14.0		6.0 12.0		

Performed : 18-Sep-2014			Time : 09:49		
Sensor Suite : BHC NEUT			ID : CNP-AA-115		
Source ID : N-1044					
	Tank		Verification	Units	
	Measured Calibrated		Jig		
N/F	4.0236 3.6893		3.7013		
Porosity	25.9 20.5		20.7		%

Shop Calibration LDT-DA					
Performed : 18-SEP-2014			Time : 16:47		
Sensor Suite : CALI-LTH			ID : NDT-AH-152		
	Jig - Measured		Jig - Calibrated	Units	
CL # 1	Ring#1 Ring#2		Ring#1 Ring#2		IN.
	7.4 10.7		6.0 12.0		

Performed : 18-Sep-2014			Time : 11:25		
Sensor Suite : BHCPELNG			ID : LDP-DA-50		
Source ID : CSV-587					
Short Space					
	BKGD	Al	Mg	Al+Fe	Units
LSW1	72	478	767	325	CPS
LSW2	76	543	860	409	CPS
LSW3	280	1302	2026	1138	CPS
LSW4	340	1235	1702	1115	CPS
LSW5	31	40	41	38	CPS
LSW6	95	95	93	96	CPS
LSW7	56	59	57	59	CPS
LSW8	1	3	3	2	CPS
QS	0.257	0.235	0.239	0.238	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC
Long Space					
	BKGD	Al	Mg	Al+Fe	Units
LLW1	102	567	2352	371	CPS
LLW2	115	888	3622	682	CPS
LLW3	429	1761	6311	1548	CPS
LLW4	547	1061	2629	994	CPS
LLW5	65	69	78	67	CPS
LLW6	169	169	164	171	CPS
LLW7	114	108	109	111	CPS
LLW8	5	6	10	6	CPS
QL	0.196	0.221	0.199	0.212	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration MST-DA					
Performed : 21-MAR-2013			Time : 13:53		
Sensor Suite : CALI-MSN			ID : MLT-DA-21		
	Jig - Measured		Jig - Calibrated	Units	
CL # 1	Ring#1 Ring#2		Ring#1 Ring#2		IN.
	7.5 11.9		6.0 12.0		

Performed : 21-MAR-2013		Time : 13:53		
Sensor Suite : MSTDA-NI		ID : MLT-DA-21		
Internal				
	Measured		Calibrated	
	Zero Reference	Units	Zero Reference	Units
INM V	0.0 28815.7		0.00 1846.00	MV

INV-V	0.0	29815.7	0.00	1948.00	MV																																				
NOR-V	49.2	30179.6	0.00	1546.00	MV																																				
IN-C	0.0	60547.2	0.00	15.46	UA																																				
INV-R				40.71	OHMM																																				
NOR-R				55.11	OHMM																																				
Performed : 21-MAR-2013 Sensor Suite : MSTDAMSF Time : 13:53 ID : MLT-DA-21																																									
Internal <table> <tr> <th></th><th>Measured</th><th></th><th>Calibrated</th><th></th><th></th></tr> <tr> <th></th><th>Zero</th><th>Reference</th><th>Units</th><th>Zero</th><th>Reference</th></tr> <tr> <td>MSFC</td><td>16.0</td><td>42149.4</td><td></td><td>0.00</td><td>1522.00</td></tr> <tr> <td>MSFB</td><td>32723.0</td><td>54933.0</td><td></td><td>0.00</td><td>1522.00</td></tr> <tr> <td>MOM1</td><td>0.0</td><td>43079.5</td><td></td><td>0.00</td><td>1522.00</td></tr> <tr> <td>MSFRA</td><td></td><td></td><td></td><td></td><td>43.30</td></tr> </table>							Measured		Calibrated				Zero	Reference	Units	Zero	Reference	MSFC	16.0	42149.4		0.00	1522.00	MSFB	32723.0	54933.0		0.00	1522.00	MOM1	0.0	43079.5		0.00	1522.00	MSFRA					43.30
	Measured		Calibrated																																						
	Zero	Reference	Units	Zero	Reference																																				
MSFC	16.0	42149.4		0.00	1522.00																																				
MSFB	32723.0	54933.0		0.00	1522.00																																				
MOM1	0.0	43079.5		0.00	1522.00																																				
MSFRA					43.30																																				
					OHMM																																				



Tucker

ENERGY SERVICES

Company:

PICKRELL DRILLING COMPANY, INC

Well:

#3 MAPLE "K"

Location:

1980' FSL & 660' FEL

Logged:

10-06-2014

K.B. Elev:

1529.0 Ft