



Tucker

ENERGY SERVICES

COMPENSATED NEUTRON

PEL DENSITY LOG

Company PICKRELL DRILLING CO., INC. Well MATSON ESTATE #3 Field SPIVEY-GRABS-BASIL County KINGMAN State KANSAS Country USA API No. 15-095-22269-00-00		File No : TUL-58780 Company : PICKRELL DRILLING CO., INC. Well : MATSON ESTATE #3 Field : SPIVEY-GRABS-BASIL County : KINGMAN State : KANSAS Country : USA API No : 15-095-22269-00-00	
Location : 660' FSL & 1980' FWL SE 1/4 SW 1/4		LSD : Sect : 31 Twp : 29S Rge : 06W	
Permanent Datum:	GL	Elevations:	Services:
Drilling Measured From:	KB	KB 1453.00	CNT
Log Measured From:	KB	DF 1452.00	PIT
Above Permanent Datum:	10.00 Ft	GL 1443.00	MLT
Date	2013-02-13		
Run Number	1		
Depth--Driller	4220.0 Ft		
Depth--Logger	4220.0 Ft		
First Reading	4187.0 Ft		
Last Reading	2800.0 Ft		
Casing--Driller	217.0 Ft		
Casing--Logger	218.0 Ft		
Bit Size	7.875 In		
Casing Size	8.625 In		
Hole Fluid Type	WBM		
Density	9.3 LBS/GAL		
Fluid Loss	8.8 CC		
PH/Viscosity	10.5 46.0 SEC		
Sample Source	MEASURED		
RM@Measured Temp.	0.500 @ 55 F		
RMF@Measured Temp	0.430 @ 55 F		
RMC@Measured Temp.	0.580 @ 55 F		
Source RMF/RMC	CALCULATED/CALCULATED		
RM@BHT	0.260 @ 114 F		
Time Circulation Stopped			
Max Recorded Temp.	114 F		
Equipment/Base	TRK 123 TULSA		
Recorded By	R. FRANKLIN		
Witnessed By	R. STOLZLE		

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)
7.875	4220.00	8.625	36.00	217.00

Run Number	1	
Date	2013-02-13	
Date/Time On Bottom	2013-02-14 00:15	
Depth to Fluid	0.0 Ft	
Salinity	0.000 PPM	
RMF@BHT	0.220 @ 114 F	
RMC@BHT	0.290 @ 114 F	

Run Number 1

Comments

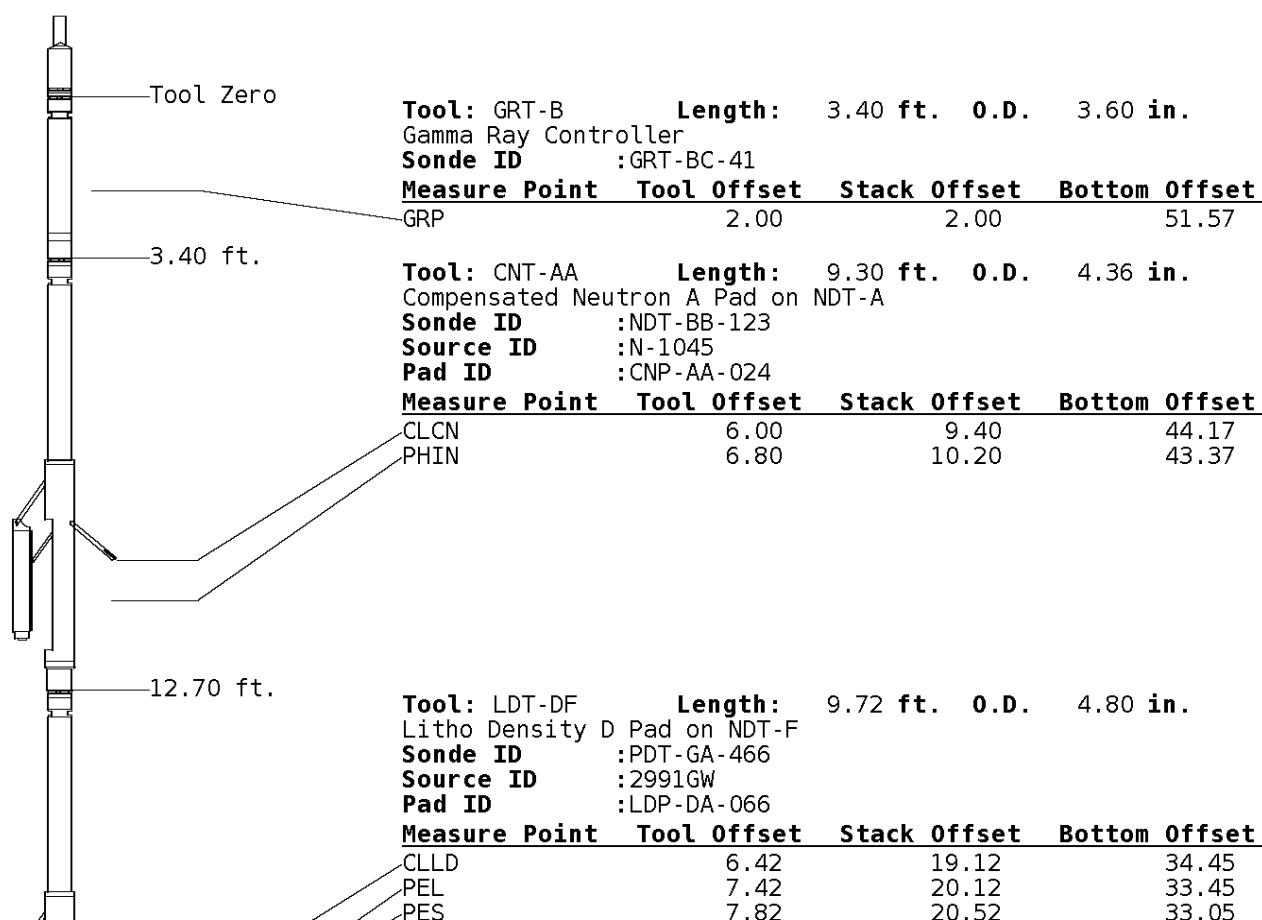
ALL PRESENTATIONS AS PER CUSTOMER REQUEST.
 GRT, CNT, LDT, MLT, AND PIT RUN IN COMBINATION.
 CALIPERS ORIENTED ON X-Y AXIS.
 2.71 G/CC USED TO CALCULATED POROSITY.
 ANNULAR HOLE VOLUME CALCULATED USING 4.50" PRODUCTION CASING.
 PHIN IS CALIPER CORRECTED
 NO MINERALOGY PRESENTED
 DETAIL PRESENTED FROM TD TO 2800'

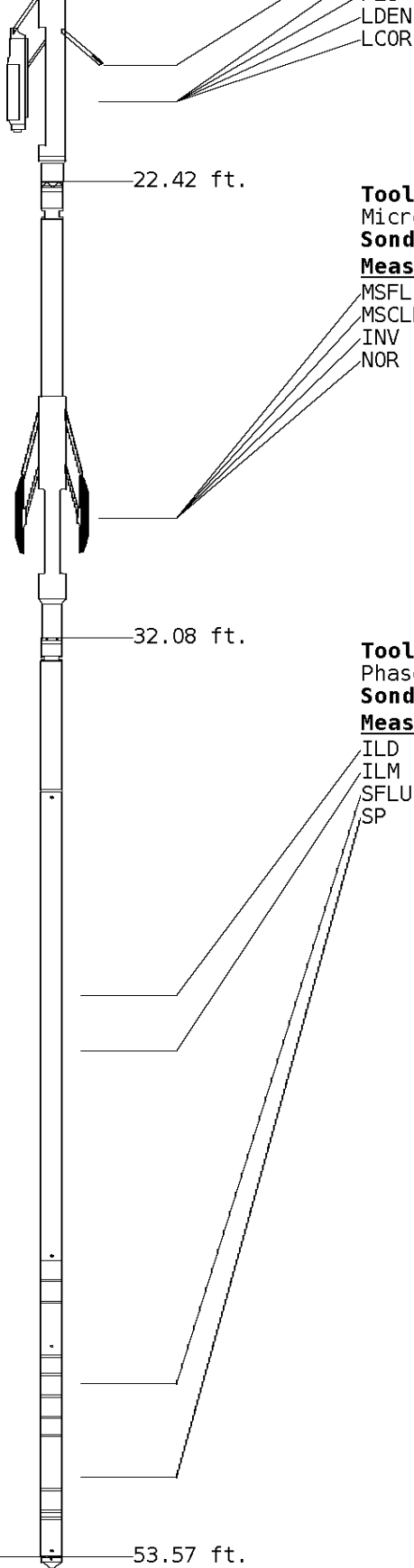
GRT: GRP.
 CNT: PHIN, CLCNIN.
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN.
 MLT: NOR_RF, INV_RF, MSCLPIN.
 PIT: ILD, ILM, SPU, SFLAEC, CIRD.

OPERATORS: S-3
 J. KLINE
 D. HOPPER

Tool String Schematic

Total Tool Length - 53.57 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 :MST-DA-36

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	30.02	23.55
MSCLP	7.60	30.02	23.55
INV	7.60	30.02	23.55
NOR	7.60	30.02	23.55

Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-AB-005

Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	41.00	12.56
ILM	10.10	42.18	11.39
SFLU	17.49	49.57	4.00
SP	20.60	52.68	0.88

Well File: pic mat 3 feb 13_mstk

Scale: 1:240

Segment: V1.D1.S12 MAIN

Acquired: Not Available

Reference: 0

Processed: 2013-02/14 03:33 3.2.0-11401

**BIT SIZE
INCHES (IN)**

6 16

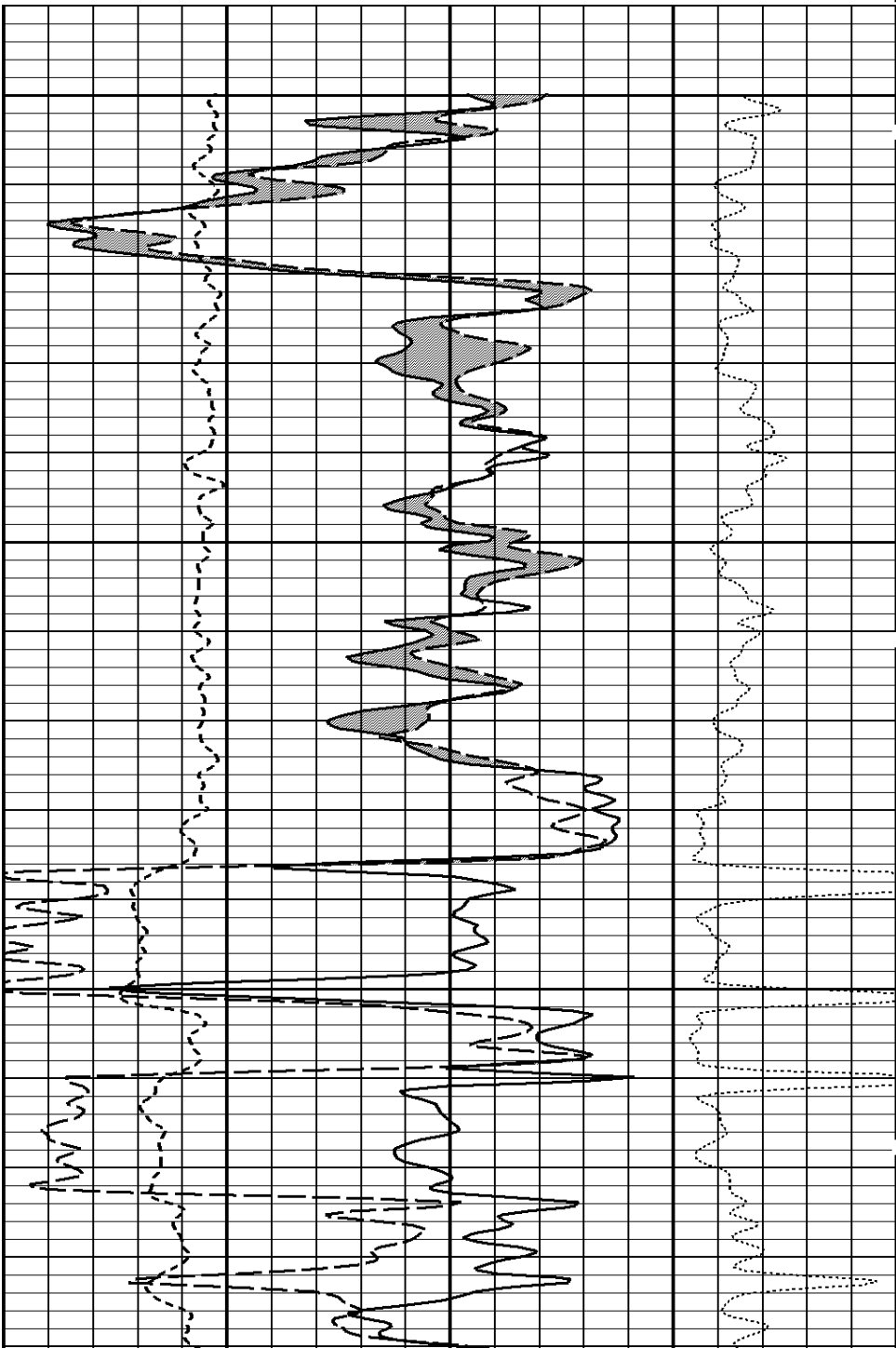
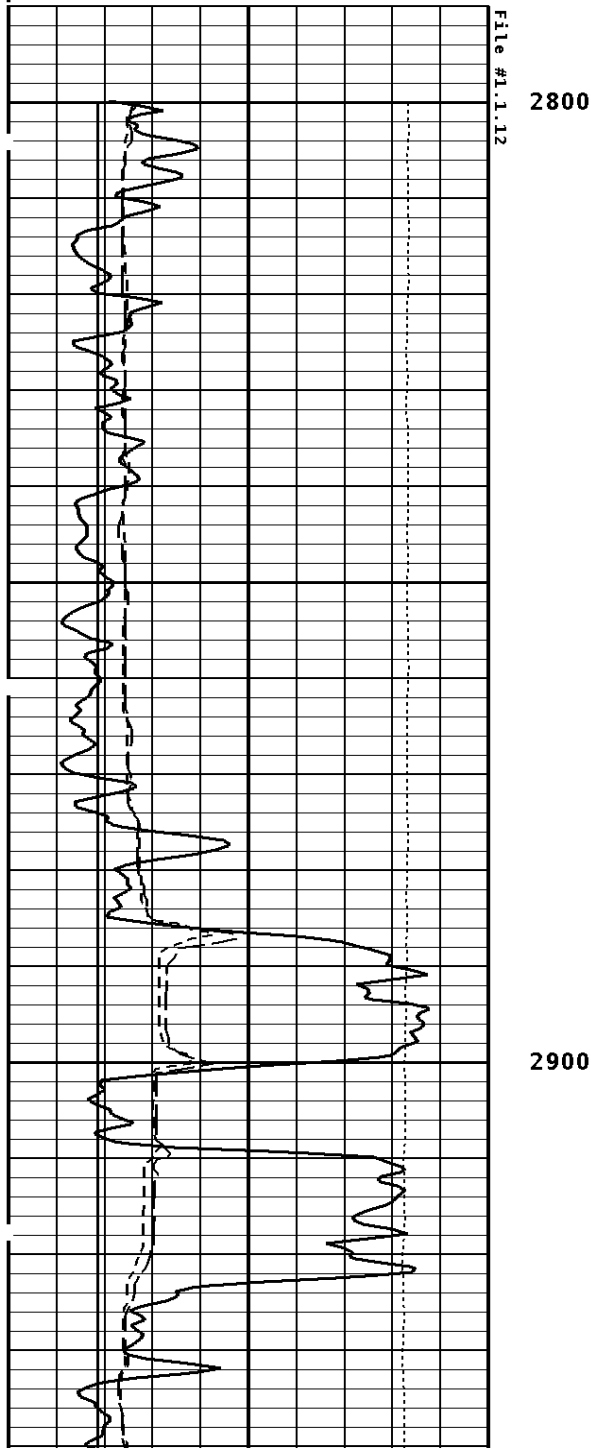
**NEUTRON (Y) CALIPER
INCHES (IN)**

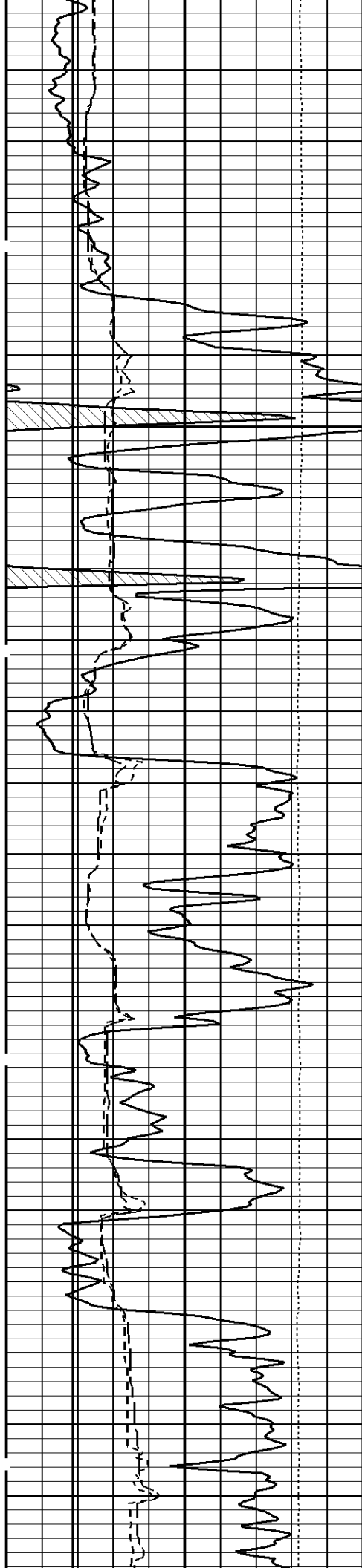
16 26

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 BARNs/ELECTRON		DENSITY CORRECTION G/CC	
0	10	-0.25	0.25
DENSITY POROSITY (2.71g/cc) PERCENT			
70			30
30			-10
-10			-50
NEUTRON POROSITY (LIMESTONE) PERCENT			
30			-10

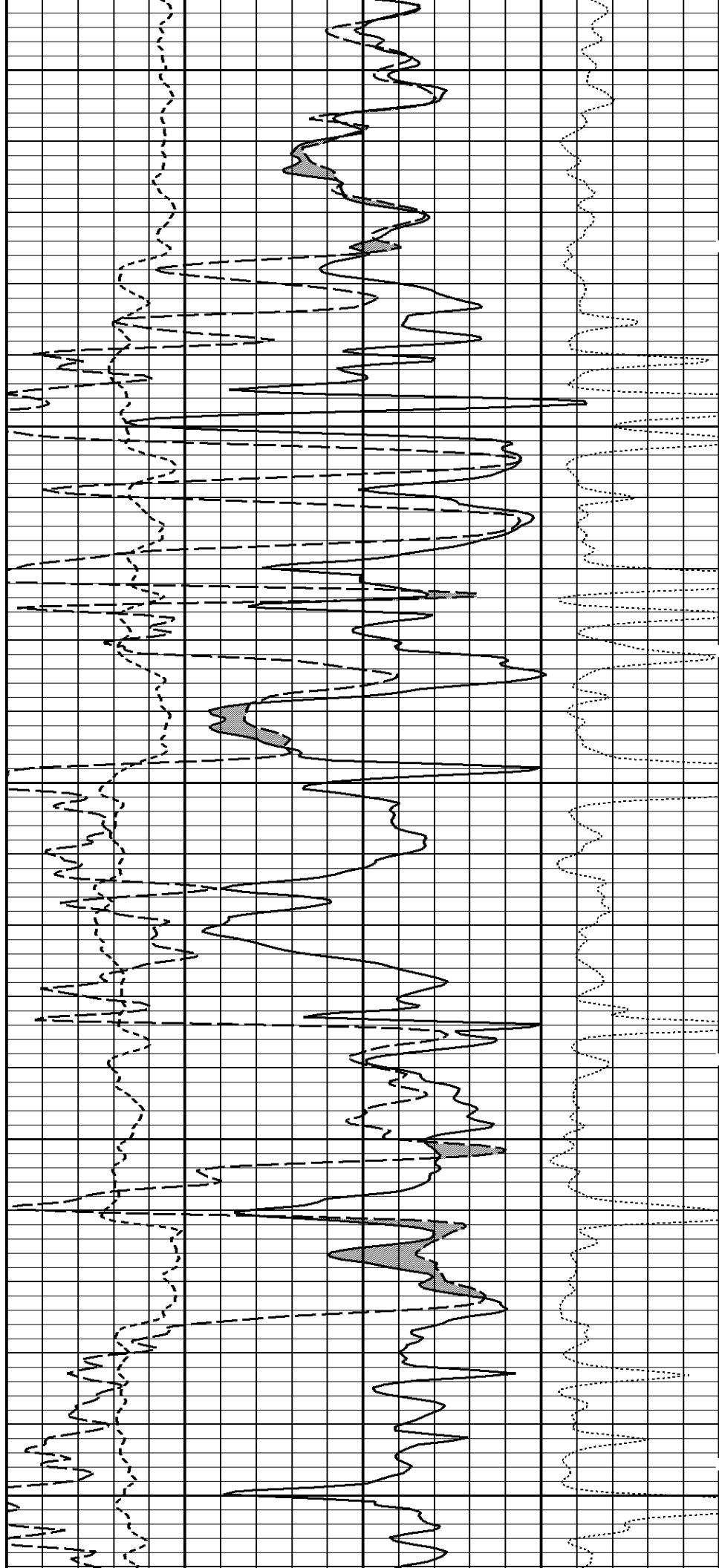
1:240 MAIN SECTION

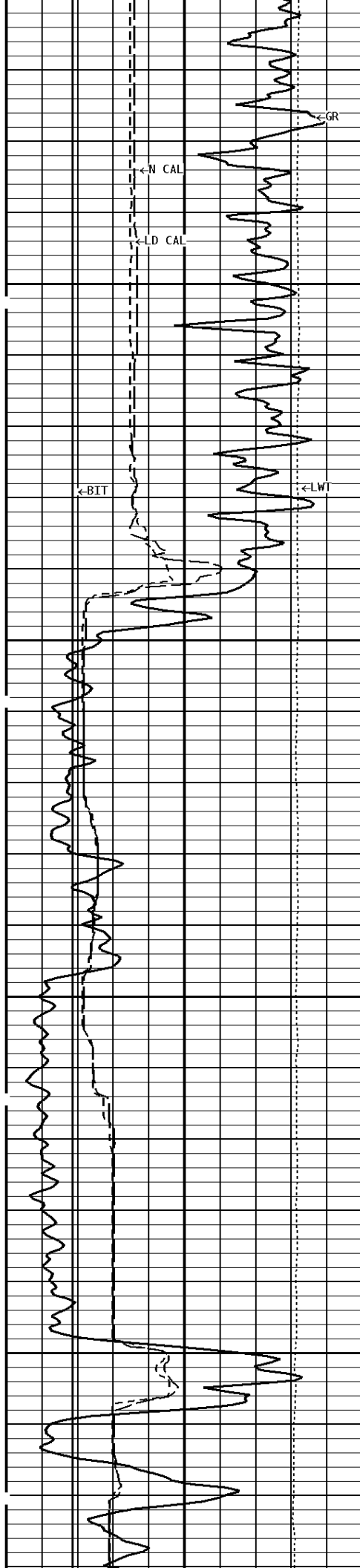




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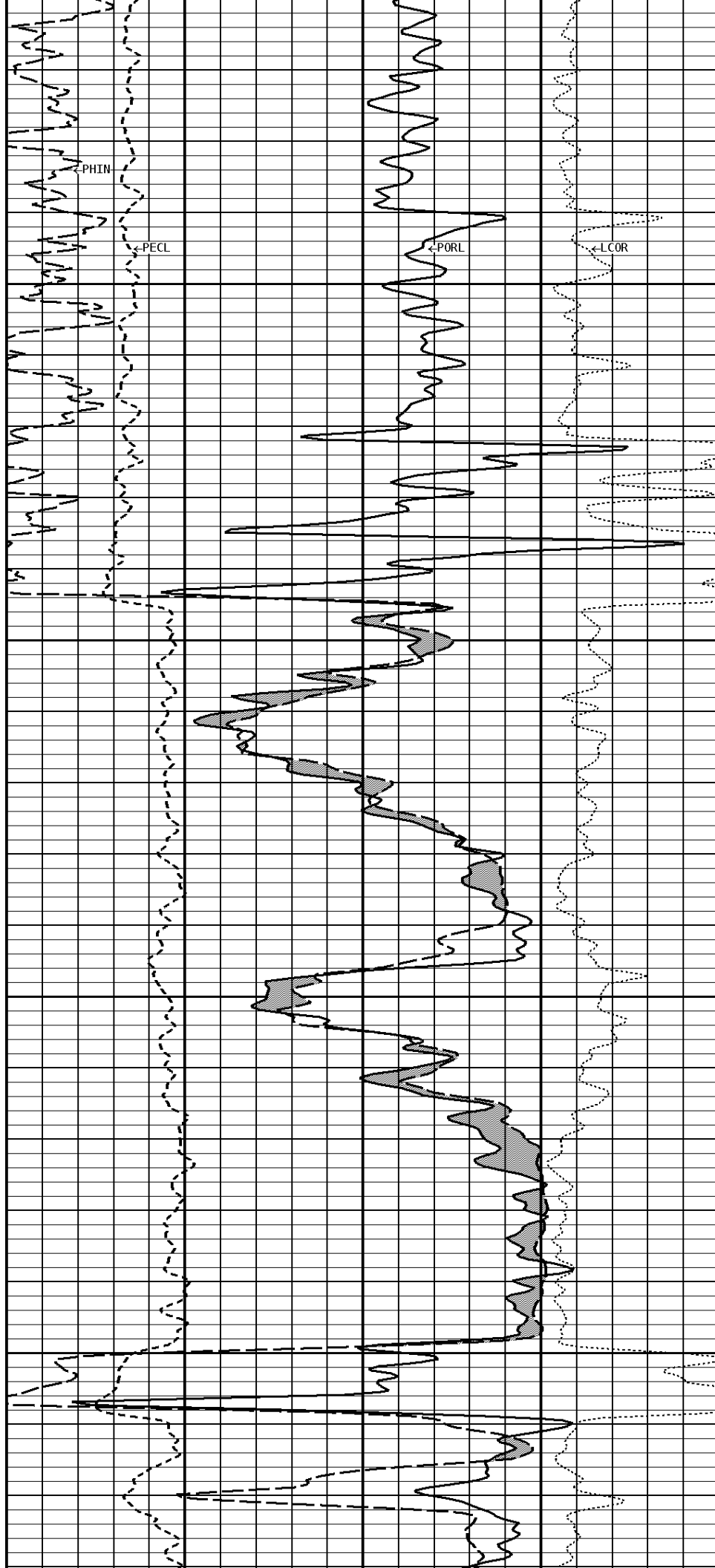
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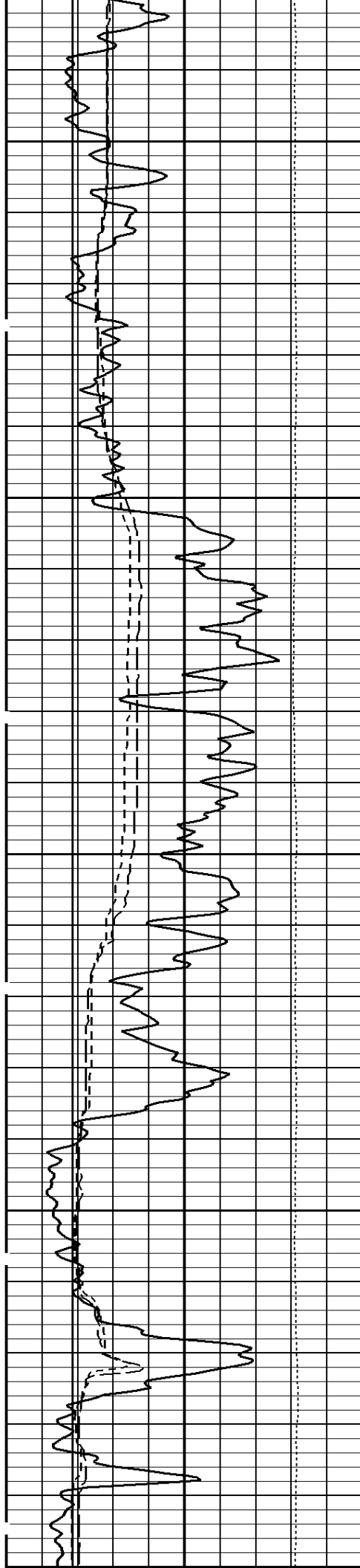




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3300

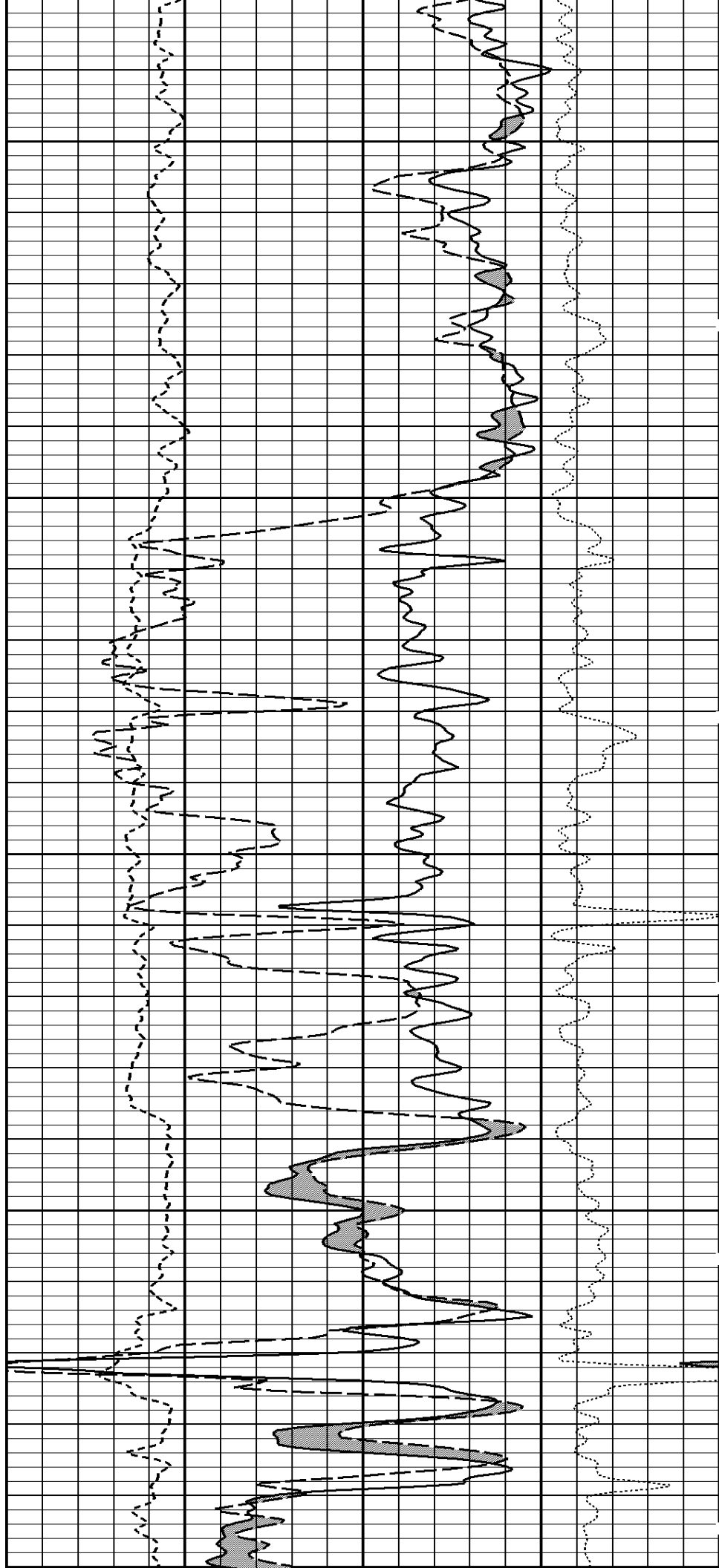


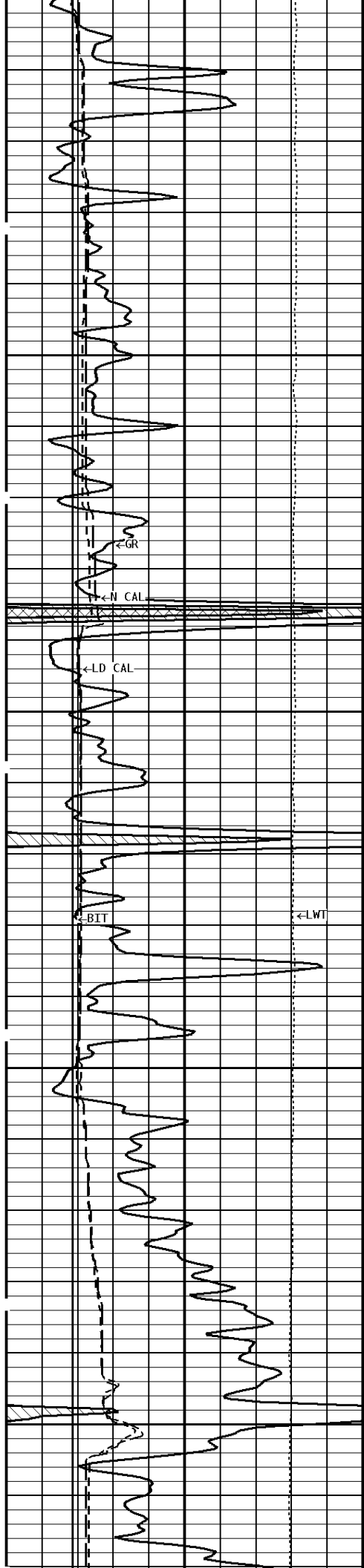


3400

3500

3600

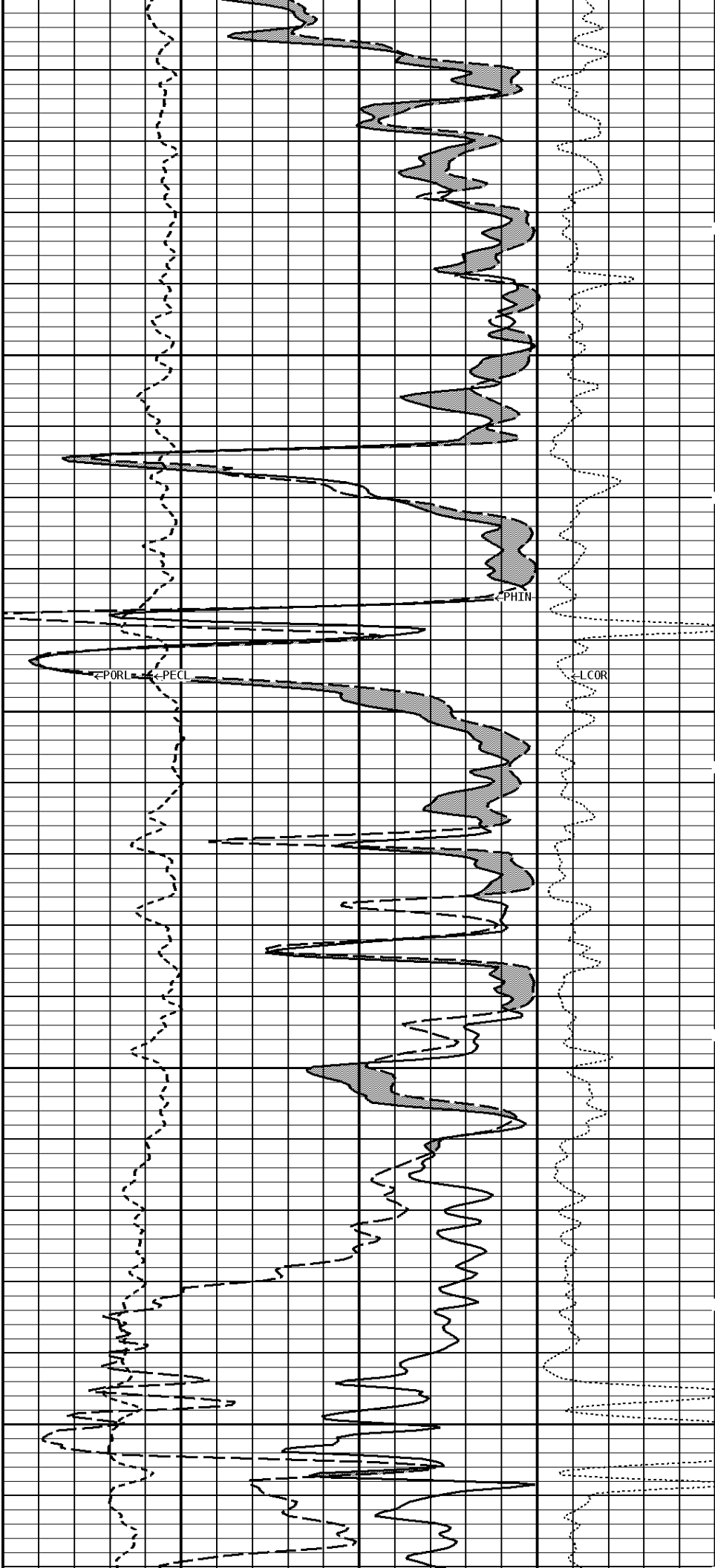


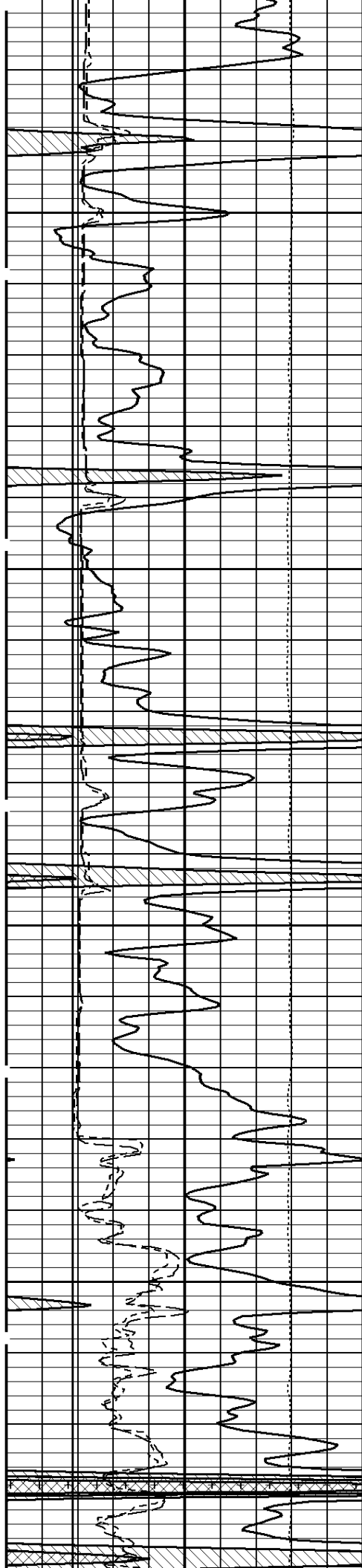


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3700

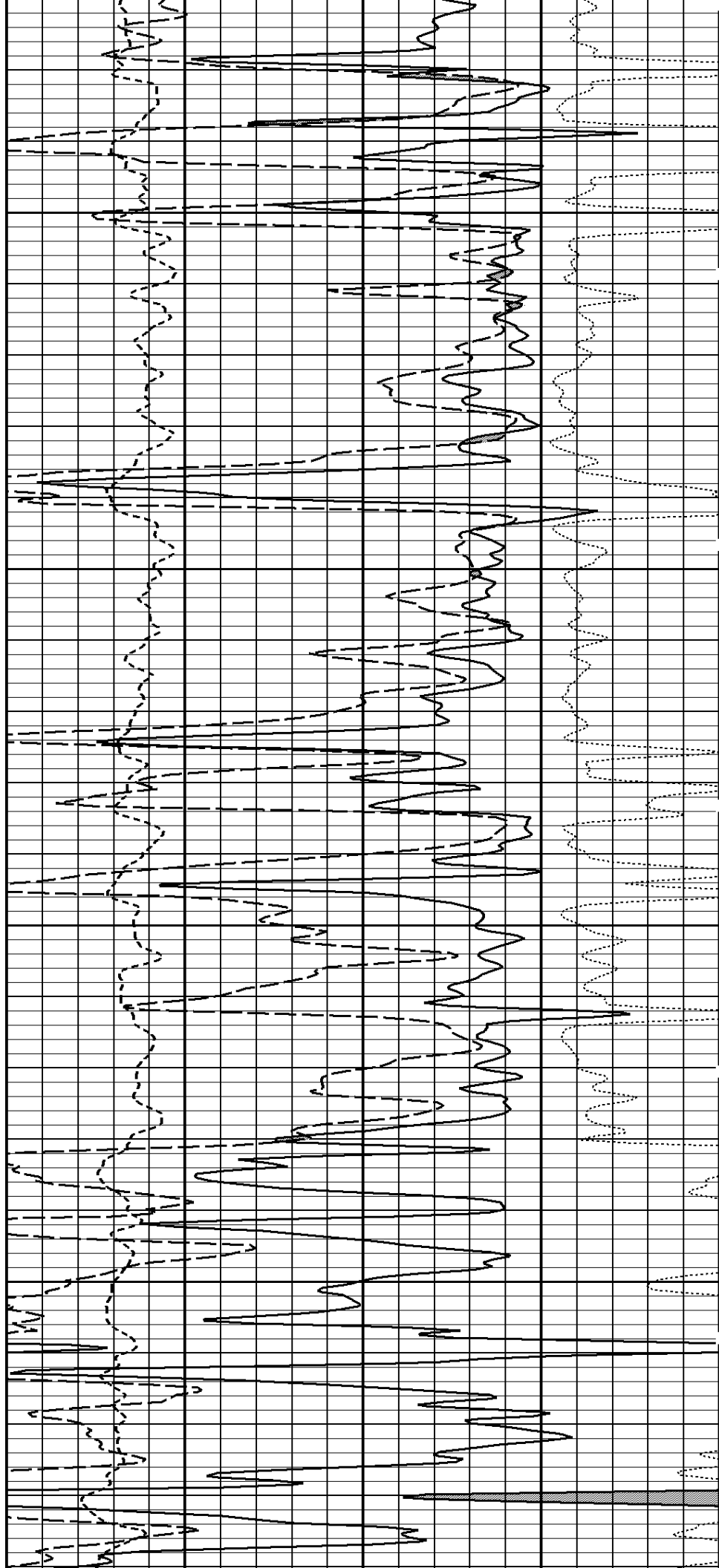
3800

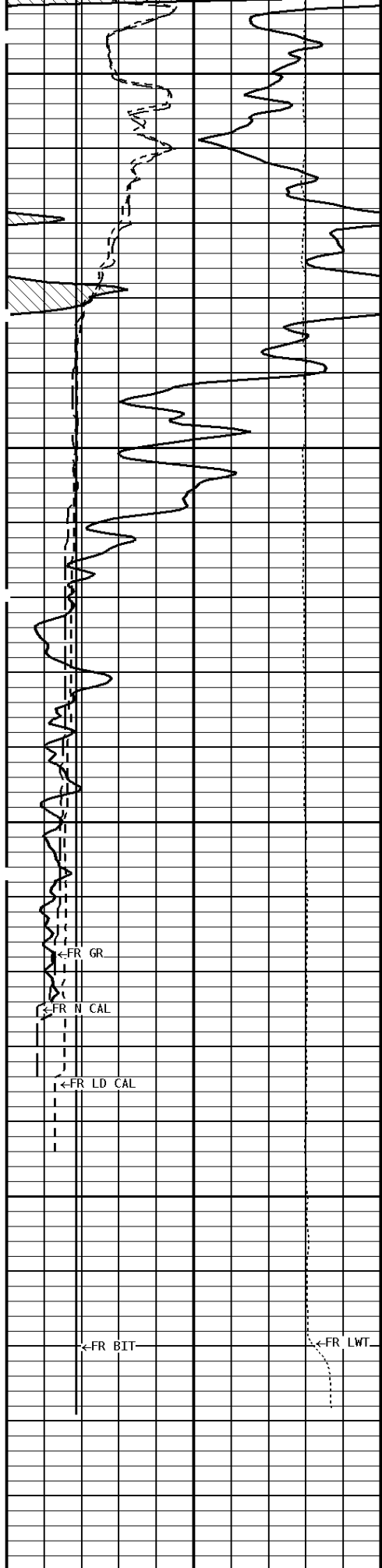




3900

4000



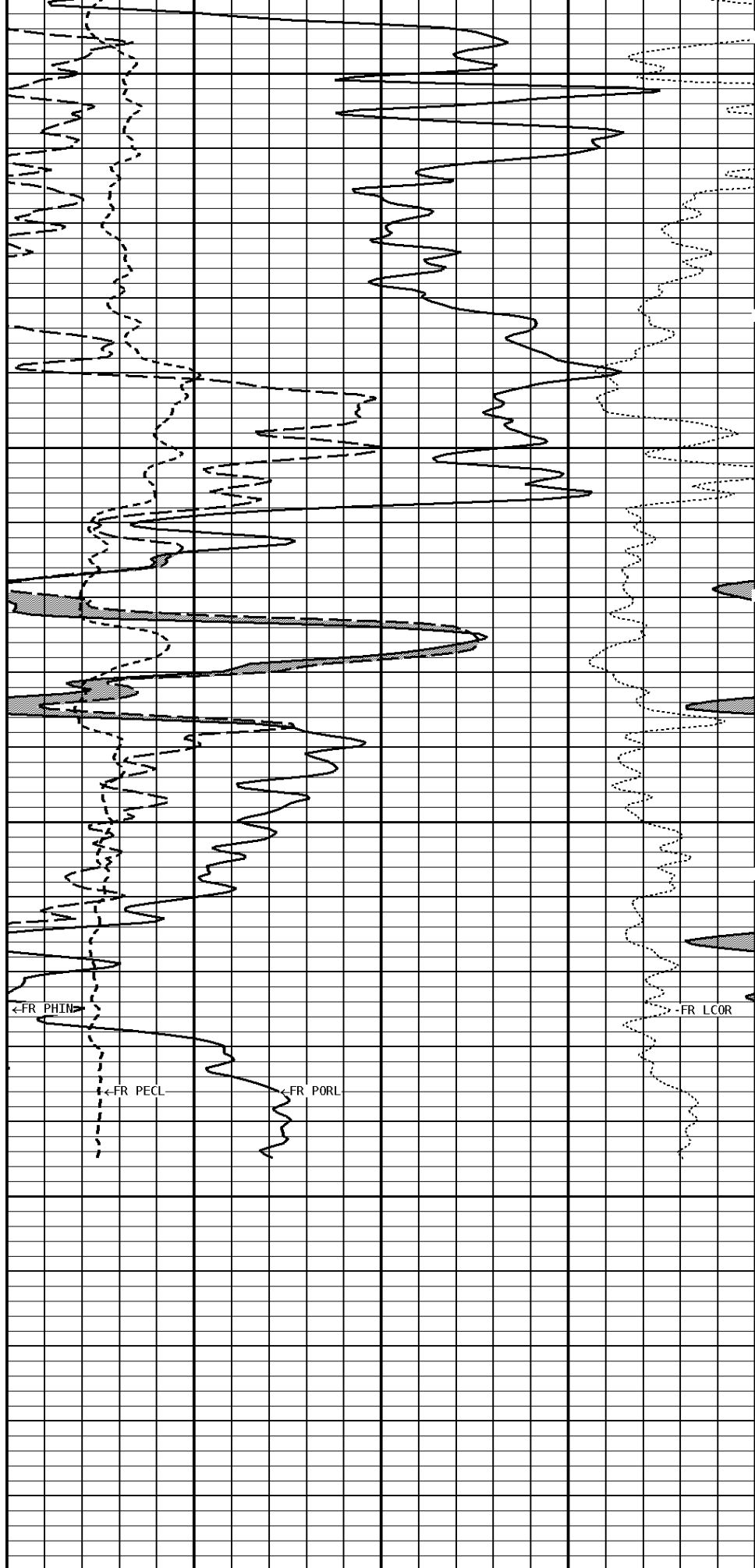


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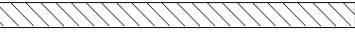
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4220

File #1.1.12



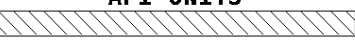
1:240 MAIN SECTION

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

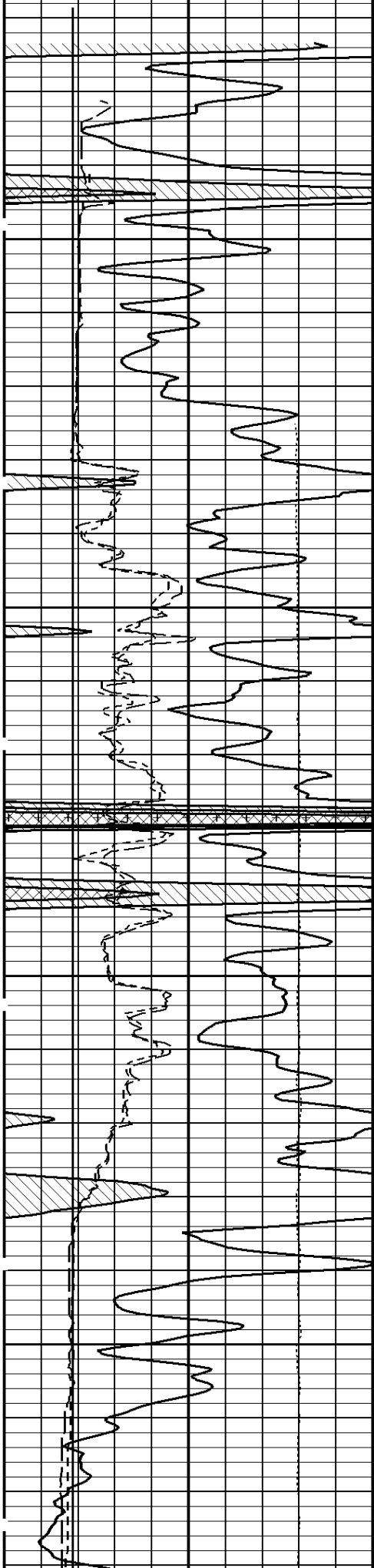
*** Borehole Zone Factors ***

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

Well File: pic mat 3 feb 13 mstk	Scale: 1:240
Segment: V1.D1.S11 REPEAT	Acquired: 2013-02/14 00:10 3.2.0-11401
Reference: 0	Processed: 2013-02/14 03:33 3.2.0-11401

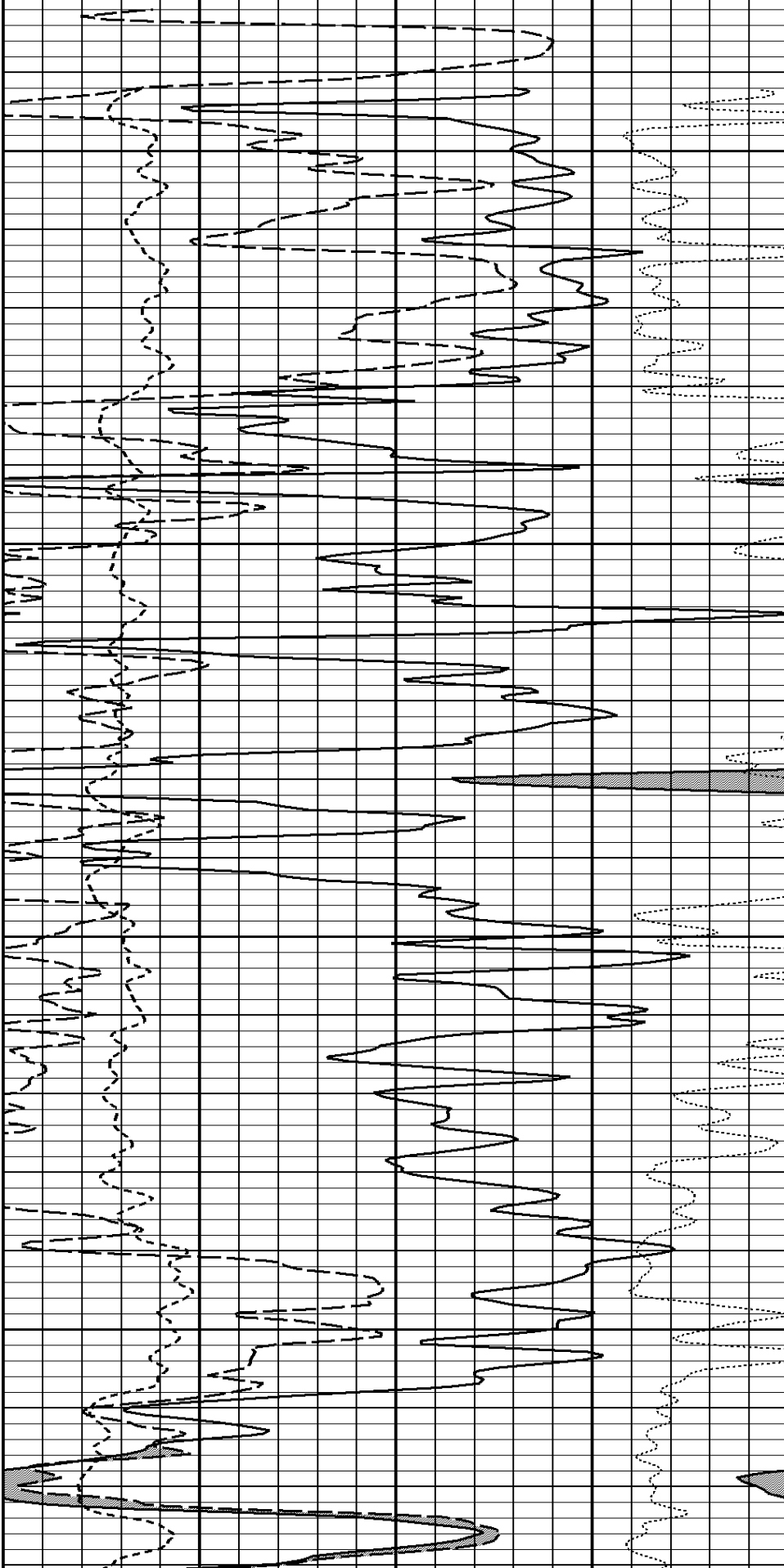
BIT SIZE INCHES (IN) 6 ----- 16			
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16 -----			
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16 -----		PE CROSS-SECTION BARNS/ELECTRON 0 ----- 10	DENSITY CORRECTION G/CC -0.25 ----- 0.25
TENSION LBS 10000 ----- 0		DENSITY POROSITY (2.71g/cc) PERCENT 70 30 30 -10 -10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

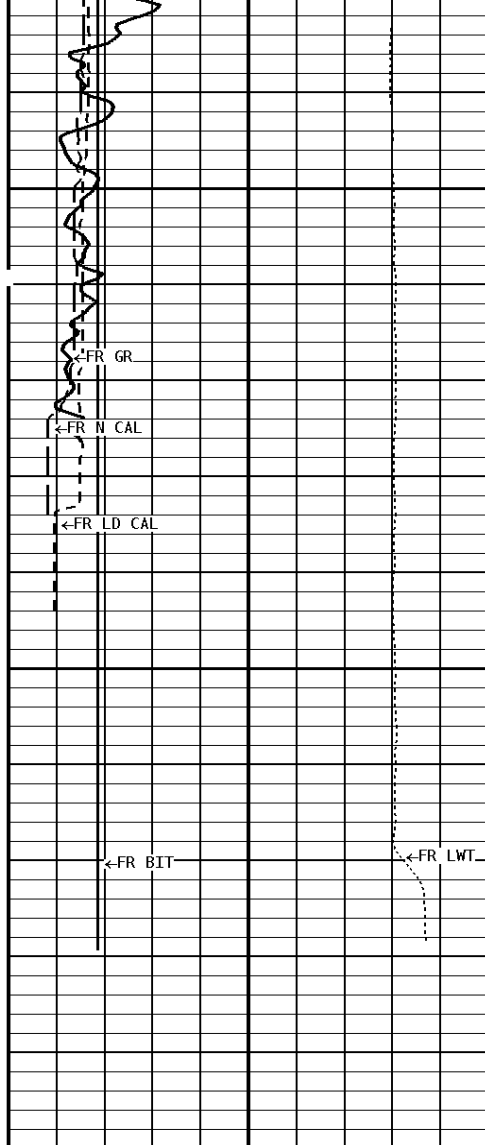
1:240 REPEAT SECTION



4000

4100

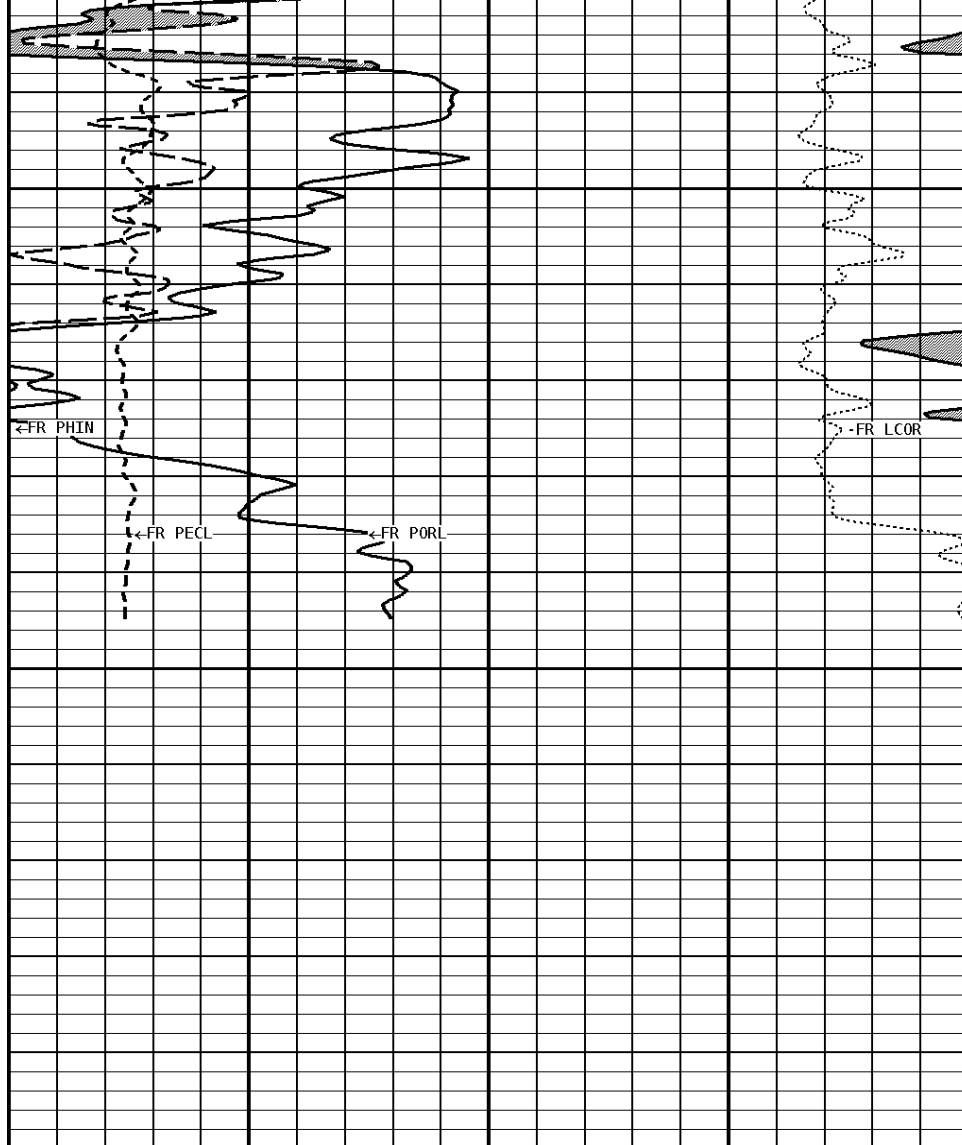




File #1.1.11

4200

4220



1:240 REPEAT SECTION

GAMMA RAY API UNITS	
150 0	300 150
TENSION LBS	
10000	0
DENSITY (X) CALIPER INCHES (IN)	
16 6	26 16
NEUTRON (Y) CALIPER INCHES (IN)	
16 6	26 16
BIT SIZE INCHES (IN)	
6	16

NEUTRON POROSITY (LIMESTONE) PERCENT	
30	-10
DENSITY POROSITY (2.71g/cc) PERCENT	
70 30 -10	30 -10 -50
PE CROSS-SECTION BARN/ELECTRON	DENSITY CORRECTION G/CC
0	10 -0.25 0.25

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	

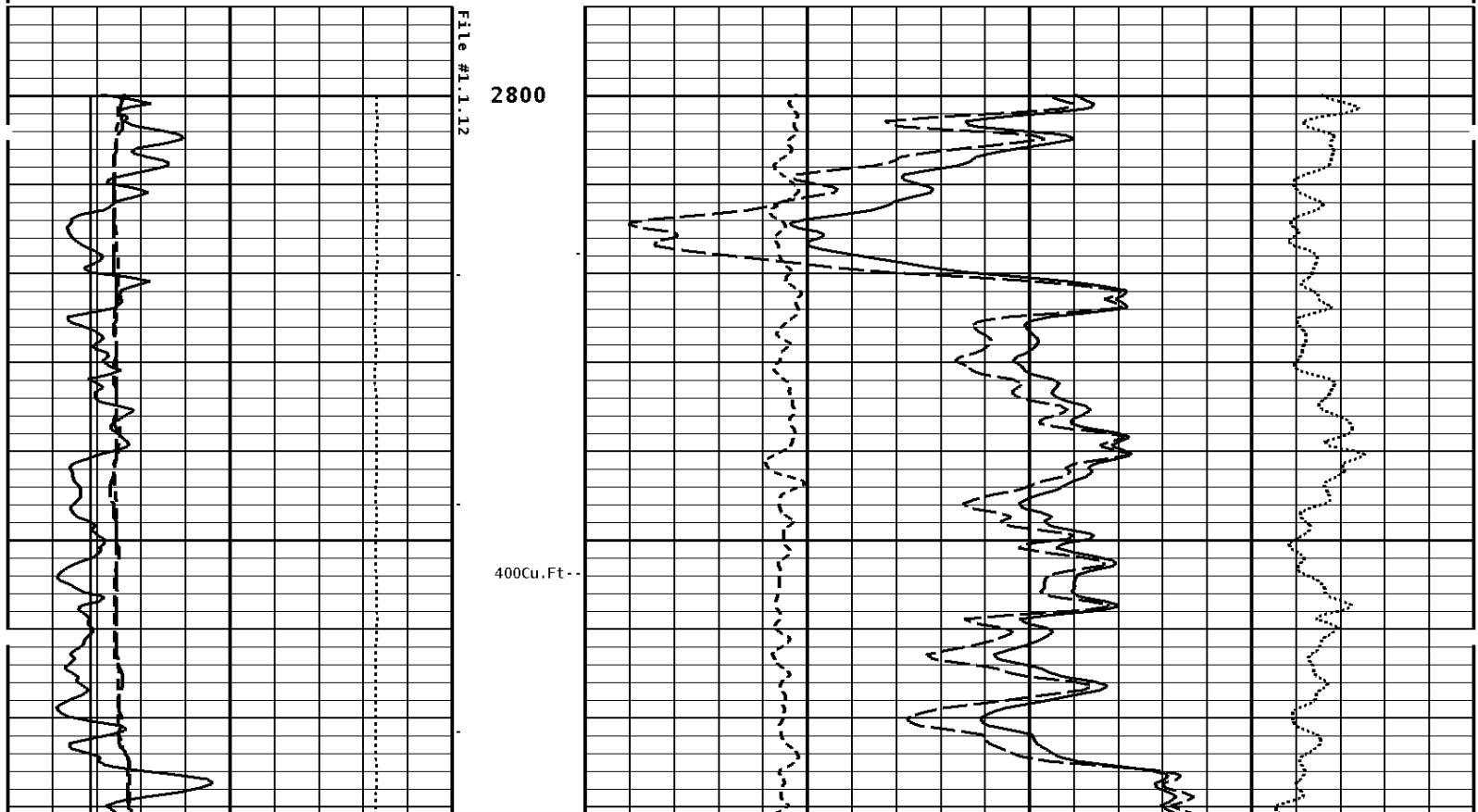
Well File: pic mat 3 feb 13_mstk
 Segment: V1.D1.S12 MAIN
 Reference: 0

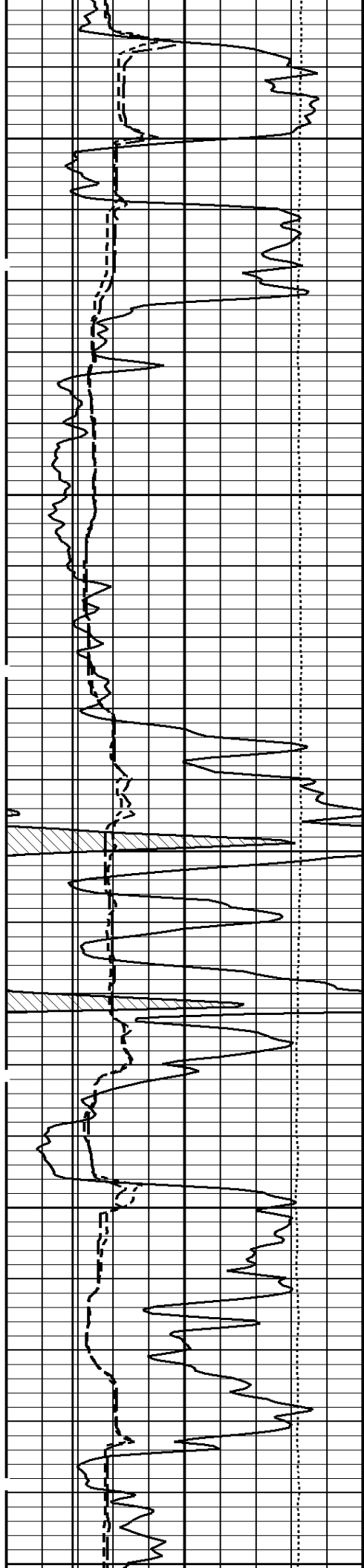
Scale: 1:240
 Acquired: Not Available
 Processed: 2013-02/14 03:33 3.2.0-11401

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/SECTRON		DENSITY CORRECTION G/CC	
0	10	-0.25	0.25
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

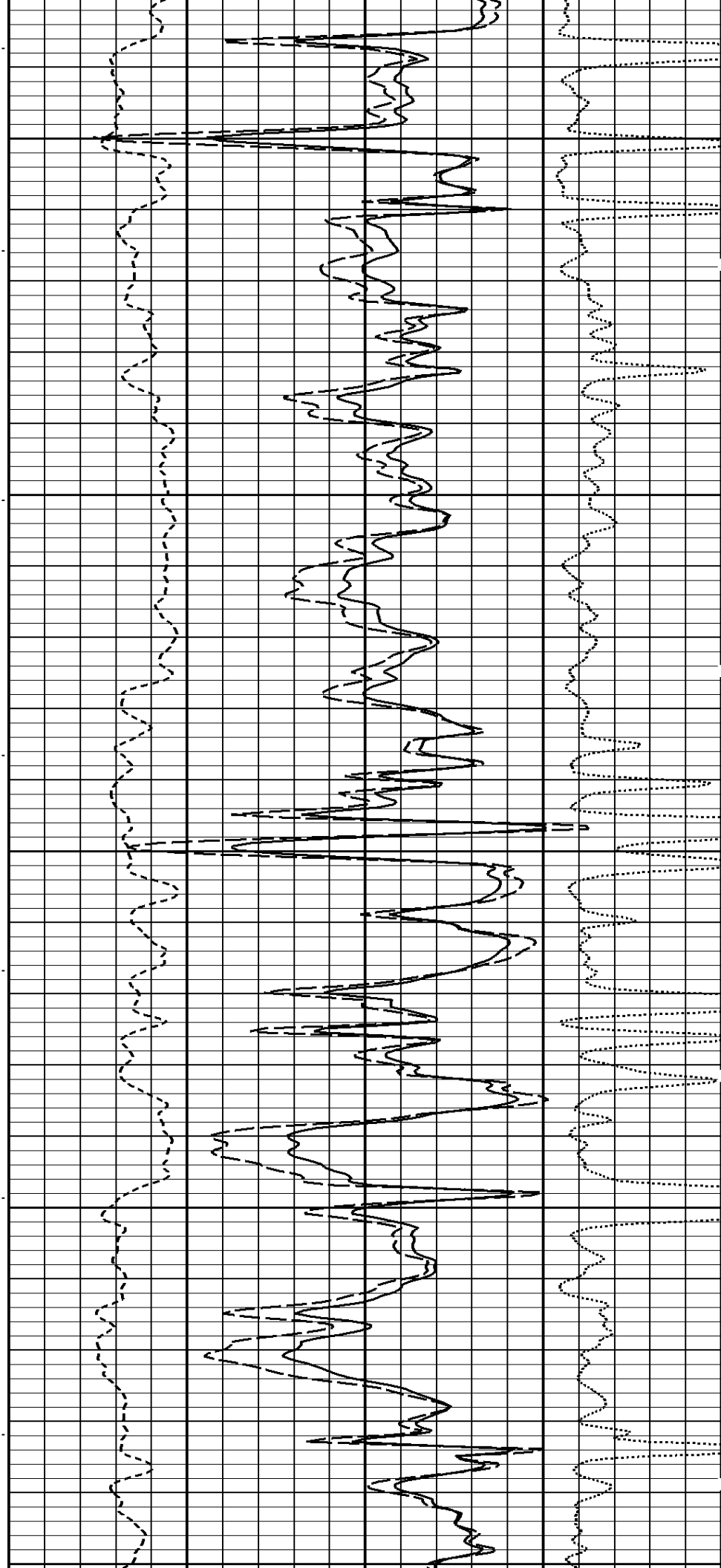


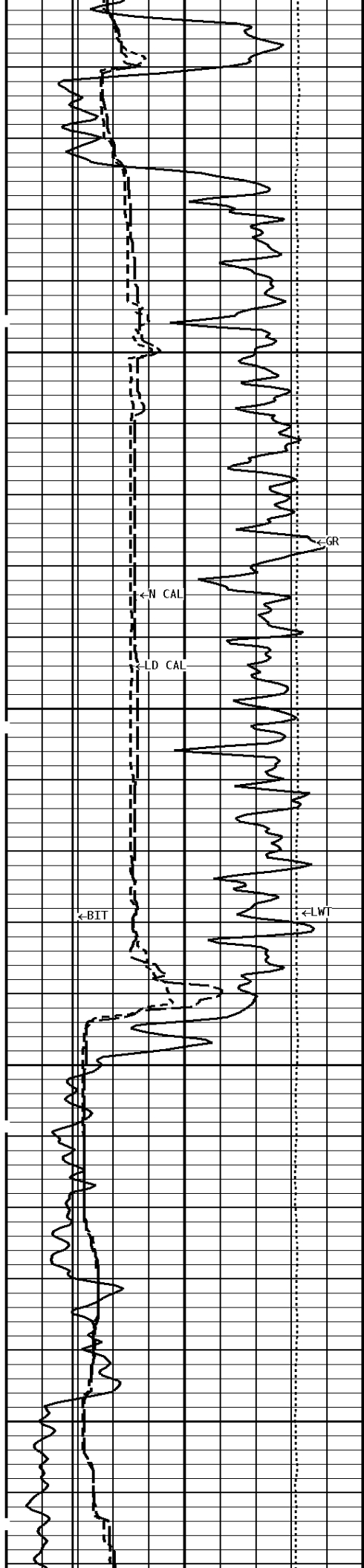


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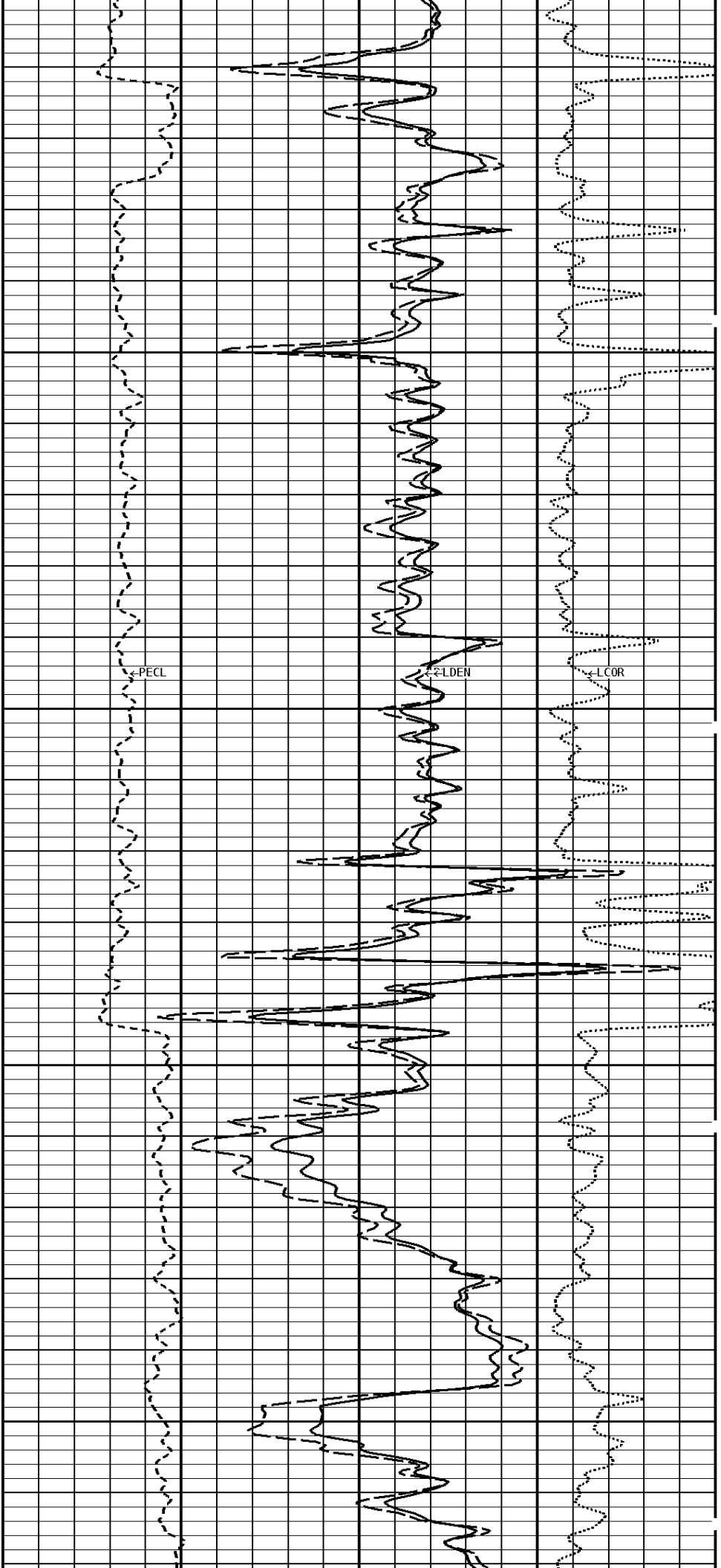
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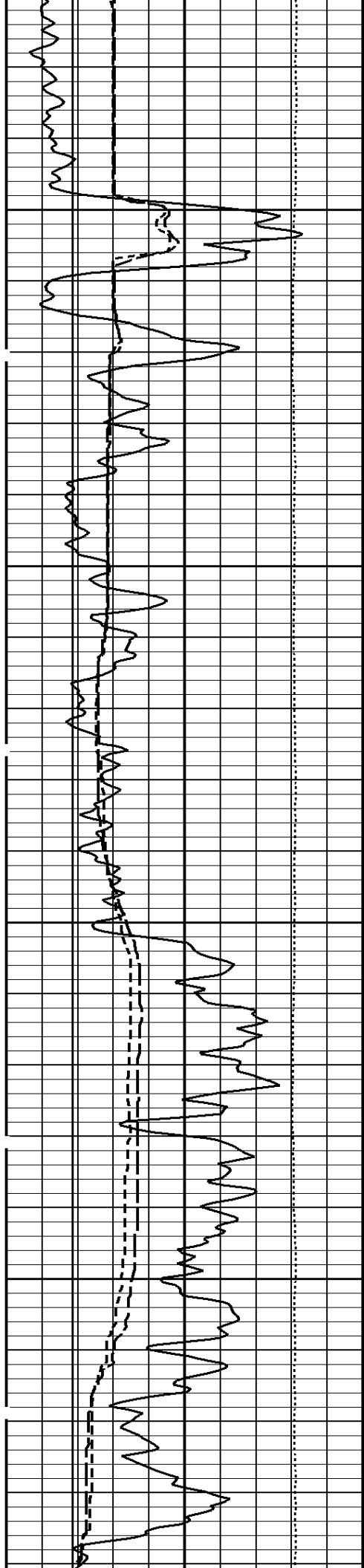
3100





3100
300Cu.Ft.
-400Cu.Ft
3200
3300



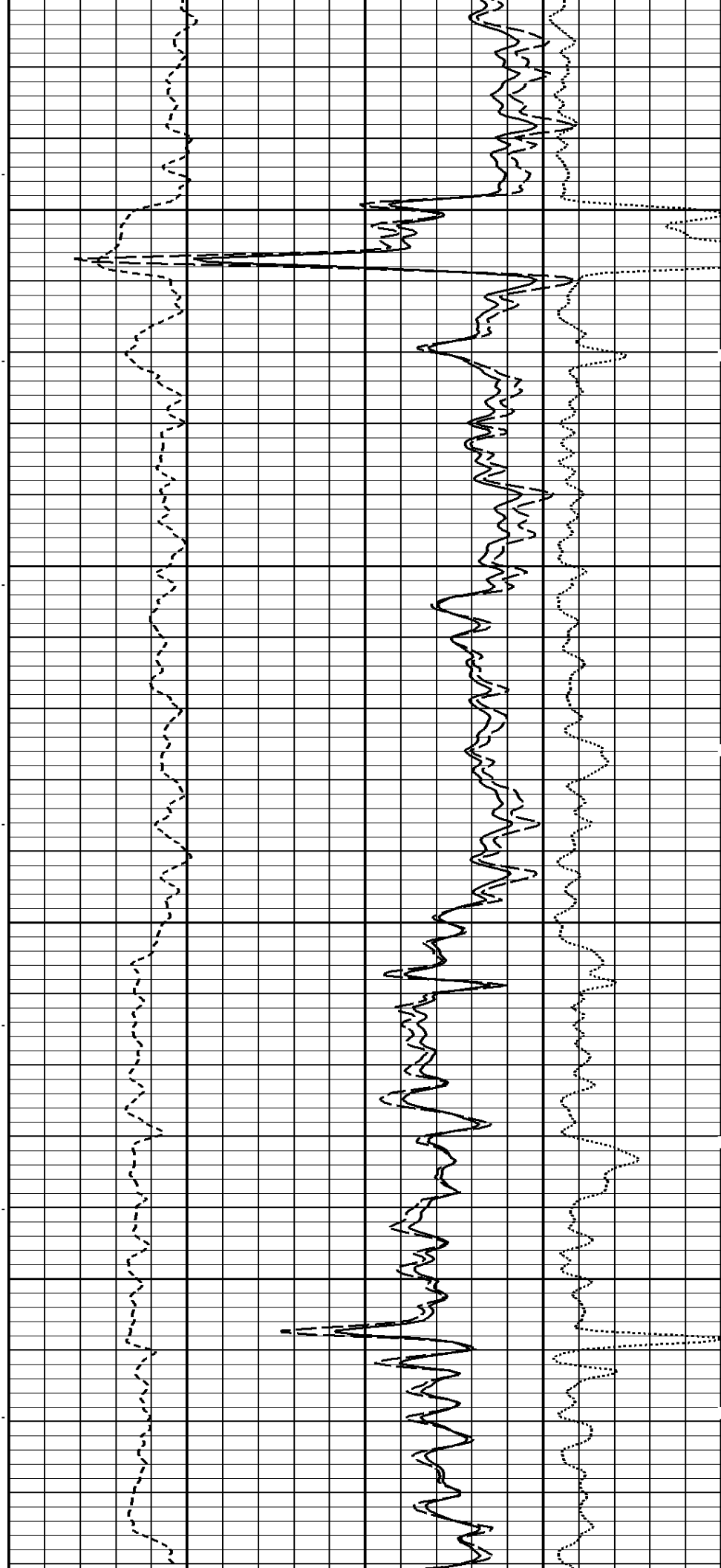


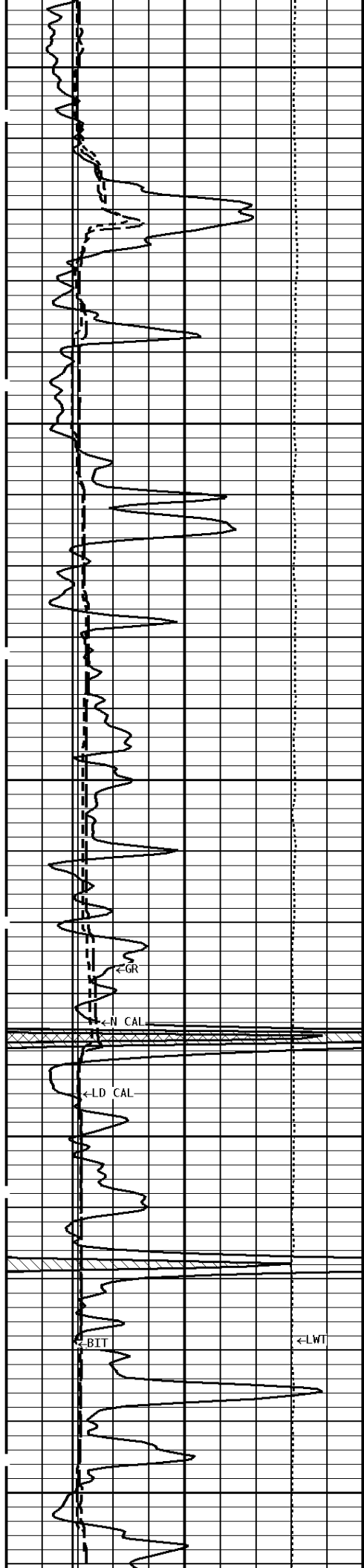
3400

--300Cu.Ft--

200Cu.Ft--

3500

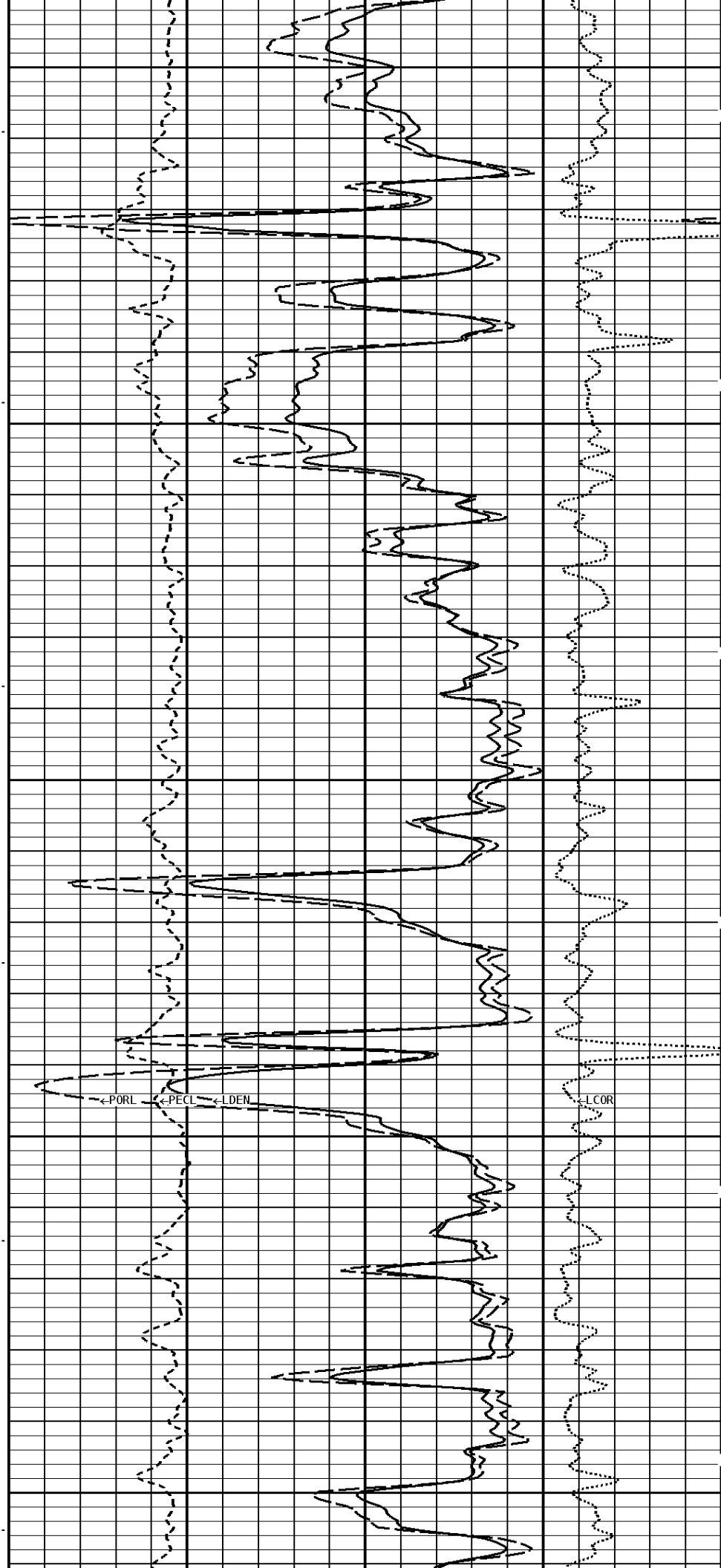


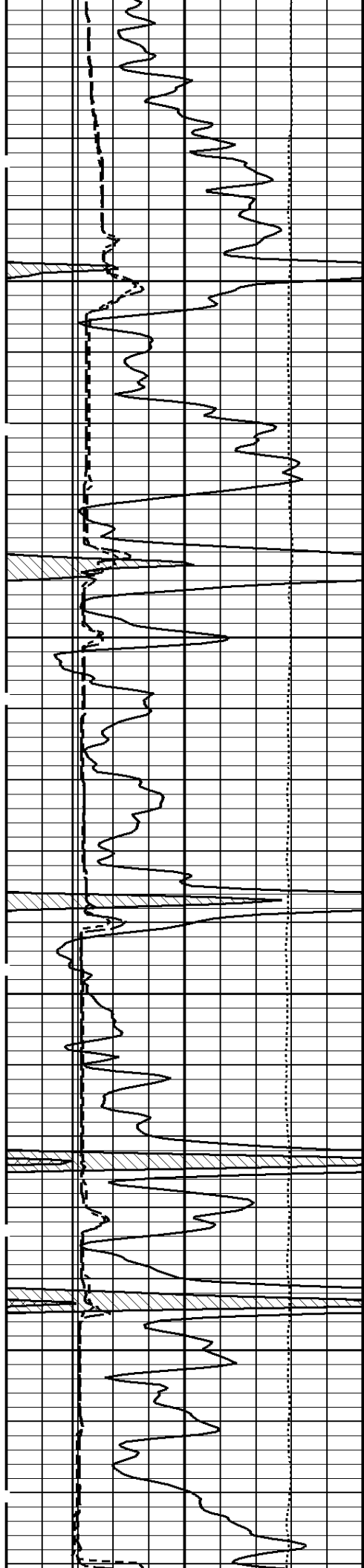


3600

--200Cu.Ft

3700



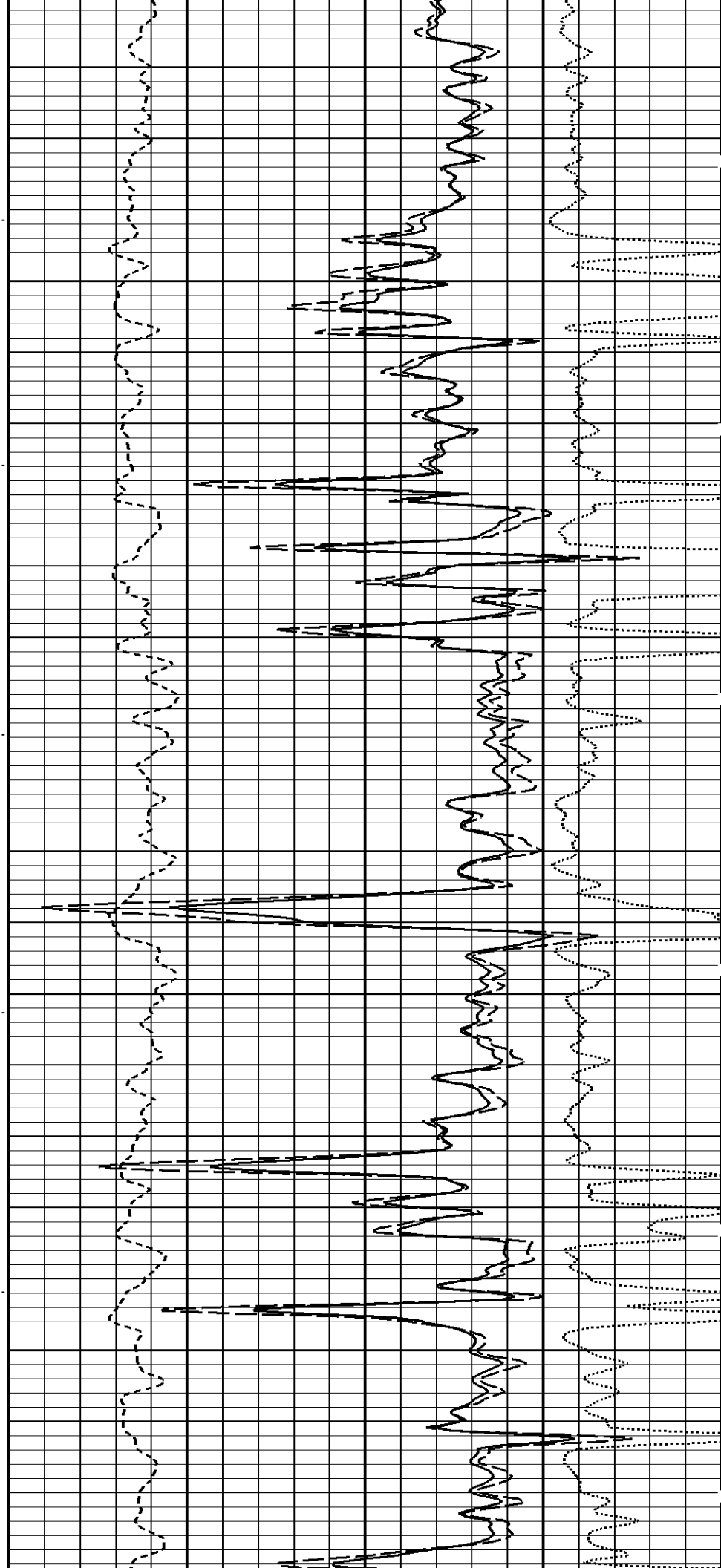


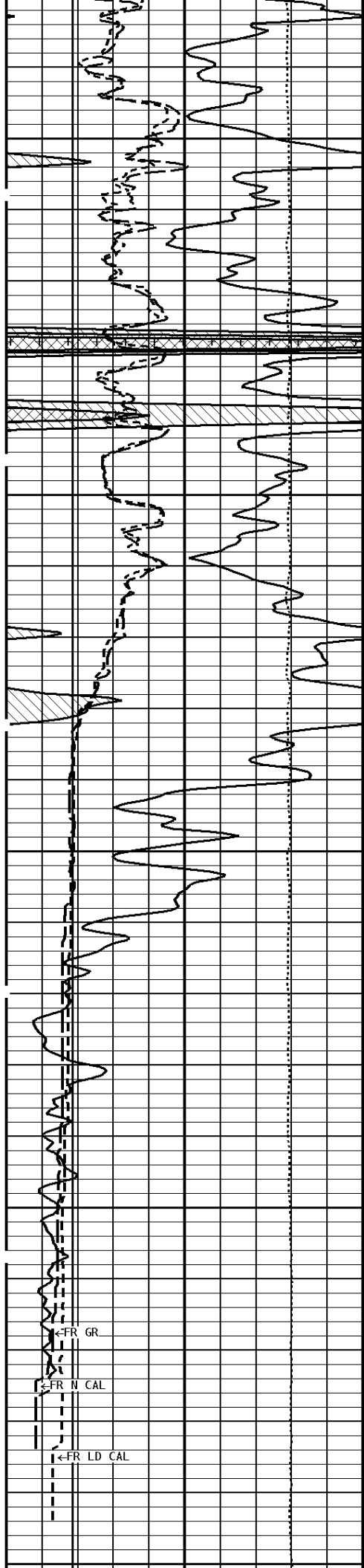
3800

100Cu.Ft--

3900

--100Cu.Ft

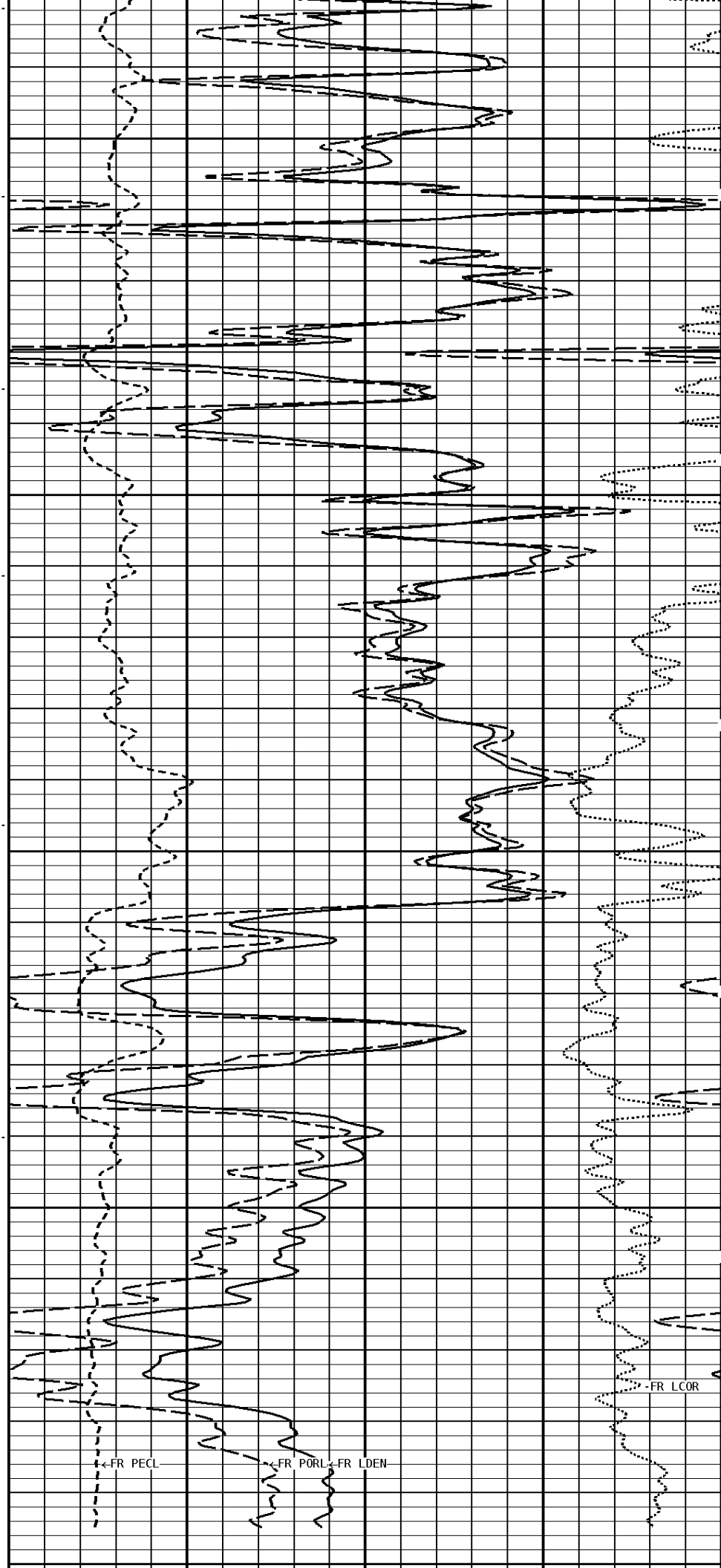


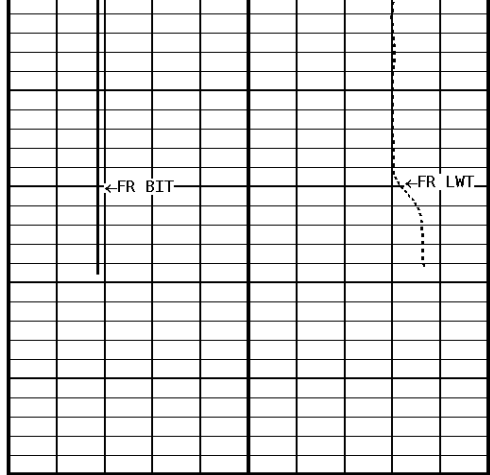


4000

4100

4200

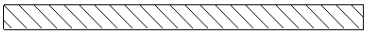




4220

1:240 MAIN SECTION

BULK DENSITY

GAMMA RAY API UNITS 150 0  300 0 150		DENSITY POROSITY (2.71g/cc) PERCENT 70 30 -10 -10 -50 -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		<table> <tr> <th colspan="2">PE CROSS-SECTION BARNS/ELECTRON</th><th colspan="2">DENSITY CORRECTION G/CC</th></tr> <tr> <td>0</td><td>10</td><td>-0.25</td><td>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								
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 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	4.500	in	
Casing Correction (PHI N)	Disable		

* Calibration Summary *

Shop Calibration GRT-B					
Performed : 04-SEP-2012			Time : 19:28		
Sensor Suite : GR-GR5			ID : GRT-BC-41		
	Measured	Units	Calibrated	Units	
GR	Background	Jig	Jig	GRAPI	
	46	346	175		
	CPS				
Shop Calibration CNT-AA					
Performed : 23-Jan-2013			Time : 11:28		
Sensor Suite : CALI-BCN			ID : NDT-BB-123		

		Jig - Measured		Jig - Calibrated		Units
CL # 1	Ring#1	Ring#2	Ring#1	Ring#2		IN.
	6.8	11.6	6.0	12.0		
Performed : 23-Jan-2013			Time : 10:57			
Sensor Suite : BHC NEUT			ID : CNP-AA-024			
Source ID : N-1045						
		Tank	Verification		Units	
	Measured	Calibrated	Jig			
N/F	3.8958	3.6893	3.6946			
Porosity	23.8	20.5	20.6		%	
Shop Calibration						
LDT-DF						
Performed : 28-Jan-2013			Time : 12:16			
Sensor Suite : CALI-LTH			ID : PDT-GA-466			
		Jig - Measured	Jig - Calibrated		Units	
CL # 1	Ring#1	Ring#2	Ring#1	Ring#2	IN.	
	6.8	10.2	6.0	12.0		
Performed : 28-JAN-2013			Time : 02:09			
Sensor Suite : BHCPELNG			ID : LDP-DA-066			
Source ID : 2991GW						
Short Space						
	BKGD	Al	Mg	Al+Fe	Units	
LSW1	69	1045	1706	691	CPS	
LSW2	69	1215	1955	899	CPS	
LSW3	260	2798	4501	2418	CPS	
LSW4	324	2623	3742	2340	CPS	
LSW5	30	62	68	57	CPS	
LSW6	86	91	91	91	CPS	
LSW7	54	59	59	59	CPS	
LSW8	2	4	6	4	CPS	
QS	0.229	0.214	0.219	0.213		
PES			2.778	5.967		
SSDN		2.580	1.680		G/CC	
Long Space						
	BKGD	Al	Mg	Al+Fe	Units	
LLW1	134	1185	4823	727	CPS	
LLW2	177	2152	8379	1568	CPS	
LLW3	539	3934	14831	3408	CPS	
LLW4	584	1936	6099	1761	CPS	
LLW5	67	72	133	71	CPS	
LLW6	173	169	159	173	CPS	
LLW7	114	106	106	108	CPS	
LLW8	3	7	18	6	CPS	
QL	0.206	0.230	0.203	0.232		
PEL			2.697	5.458		
LSDN		2.580	1.680		G/CC	



Company: PICKRELL DRILLING CO., INC.

Well: MATSON ESTATE #3

Location: 660' FSL & 1980' FWL

Logged: 2013-02-13

K.B. Elev: 1453.0 Ft