

Tucker
ENERGY SERVICES

COMPENSATED NEUTRON

PEL DENSITY LOG

Company MG OIL INC.
Well POPP #4
Field NUSS SOUTH
County BARTON
State KANSAS
Country USA
API No. 15-00925785

File No : TUL-57644
Company : MG OIL INC.
Well : POPP #4
Field : NUSS SOUTH
County : BARTON
State : KANSAS
Country : USA
API No : 15-00925785

Location :
2285' FNL & 1870' FWL
NE SW SE NW

LSD : Sect : 15 Twp : 16S Rge : 14W

Permanent Datum: GL
Drilling Measured From: KB
Log Measured From: KB
Above Permanent Datum: 7.00 Ft
Elevations: KB 1911.00 Ft, DF 1910.00 Ft, GL 1904.00 Ft

Services: CNT, LDT, MLT, PIT

Date	2012-12-05	
Run Number	1	
Depth--Driller	3440.0	Ft
Depth--Logger	3439.0	Ft
First Reading	3406.0	Ft
Last Reading	890.0	Ft
Casing--Driller	890.0	Ft
Casing--Logger	890.0	Ft
Bit Size	7.875	In
Casing Size	8.625	In
Hole Fluid Type	WBM	
Density	9.3 LBS/GAL	
Fluid Loss	10.4	CC
PH/Viscosity	8.5	58.0 SEC
Sample Source	MEASURED	
RM@Measured Temp.	0.900	@ 70 F
RMF@Measured Temp	0.770	@ 70 F
RMG@Measured Temp.	1.040	@ 70 F
Source RMF/RMG	CALCULATED/CALCULATED	
RM@BHT	0.630	@ 104 F
Time Circulation Stopped		
Max Recorded Temp.	104	F
Equipment/Base	TRK 119	TULSA
Recorded By	S. DAVIS	
Witnessed By	C. COUNTS	

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	3439.00	8.625	20.00	890.00

Run Number	1	
Date	2012-12-05	
Date/Time On Bottom	2012-12-05 19:45	
Depth to Fluid	0.0	Ft
Salinity	5500.000	PPM
RMF@BHT	0.530	@ 104 F
RMC@BHT	0.720	@ 104 F

Run Number 1

Comments

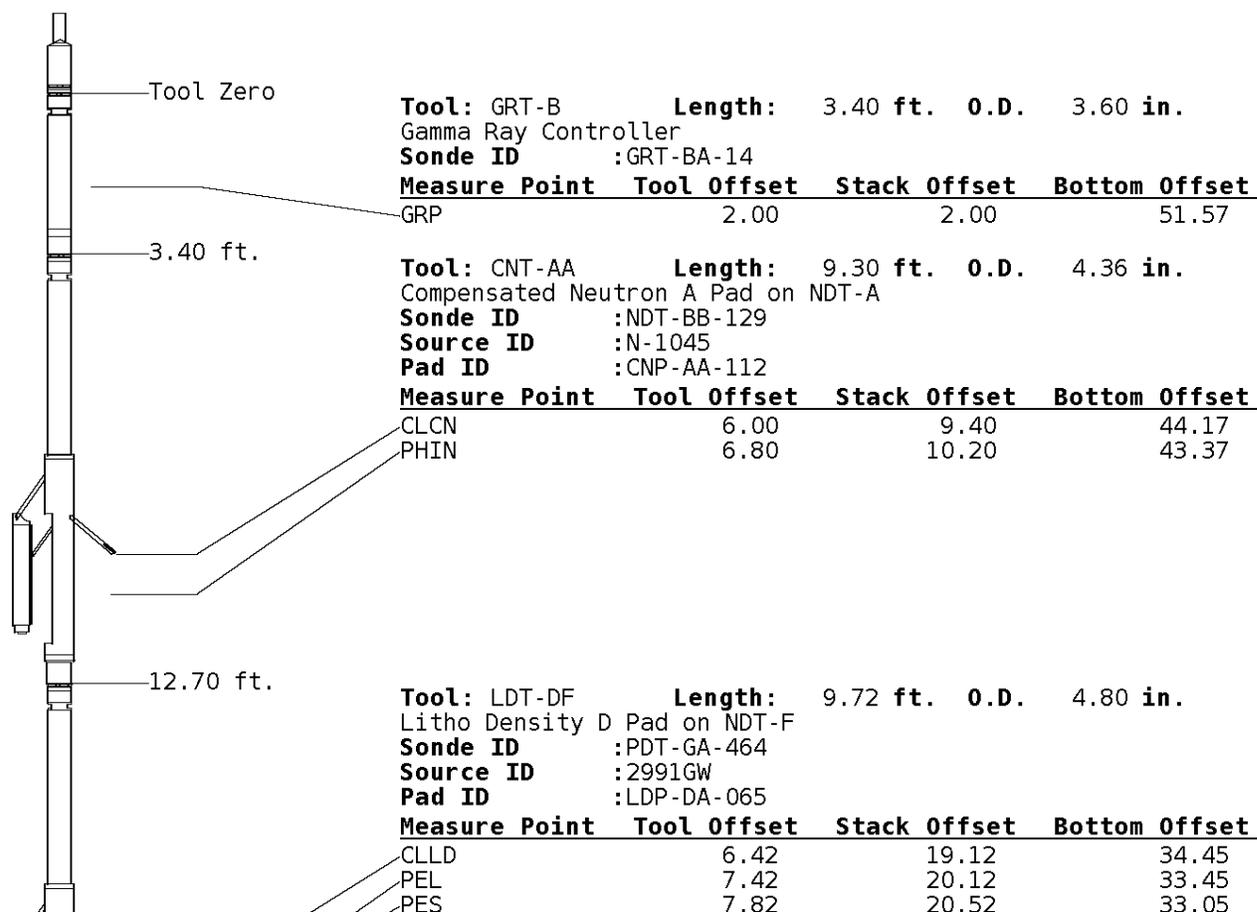
ALL PRESENTATIONS AS PER CUSTOMER REQUEST.
 GRT, CNT, LDT, MLT, AND PIT RUN IN COMBINATION.
 CALIPERS ORIENTED ON X-Y AXIS.
 2.71 G/CC USED TO CALCULATED POROSITY.
 ANNULAR HOLE VOLUME CALCULATED USING 5.50" PRODUCTION CASING.
 DETAIL PRESENTED TO 2550'
 ANHYDRATE SECTION IS 950' TO SCG

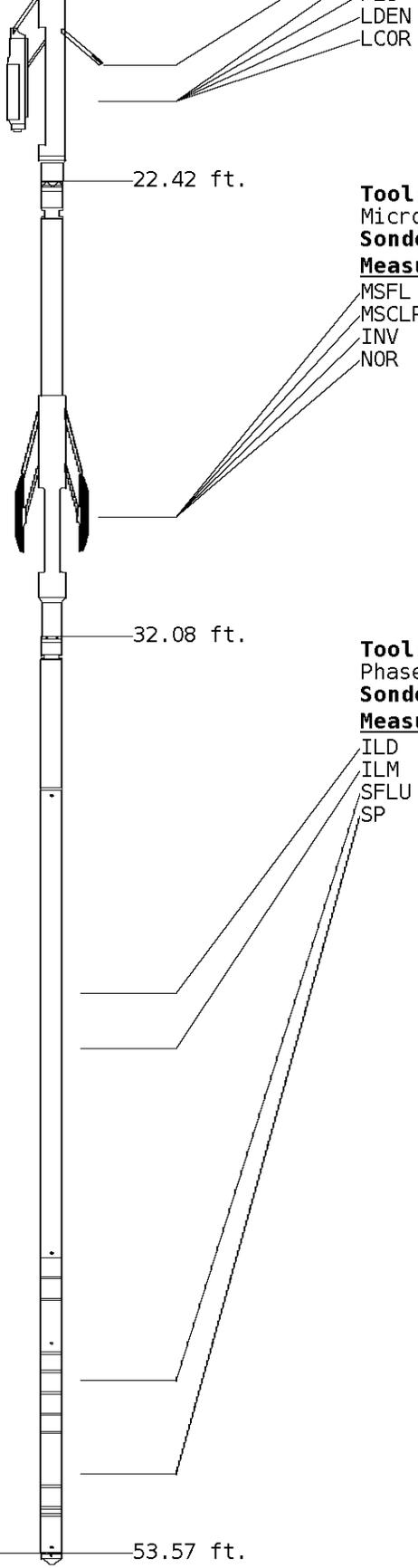
GRT: GRP.
 CNT: PHIN, CLCNIN.
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN.
 MLT: NOR_RF, INV_RF, MSCLPIN.
 PIT: ILD, ILM, SPU, SFLAEC.

OPERATORS:
 B. COLWILL
 J. KLINE

Tool String Schematic

Total Tool Length - 53.57 ft.
Maximum Outside diameter - 6.00 in.
Net Weight in Air - 943.00 lbs.





LDEN	7.62	20.32	33.25
LCOR	7.62	20.32	33.25

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

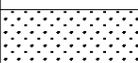
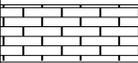
Tool: PIT-CA **Length:** 21.49 ft. **O.D.** 3.62 in.
 Phased Dual Induction w/ RM & D
Sonde ID :PIT-AC-22

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

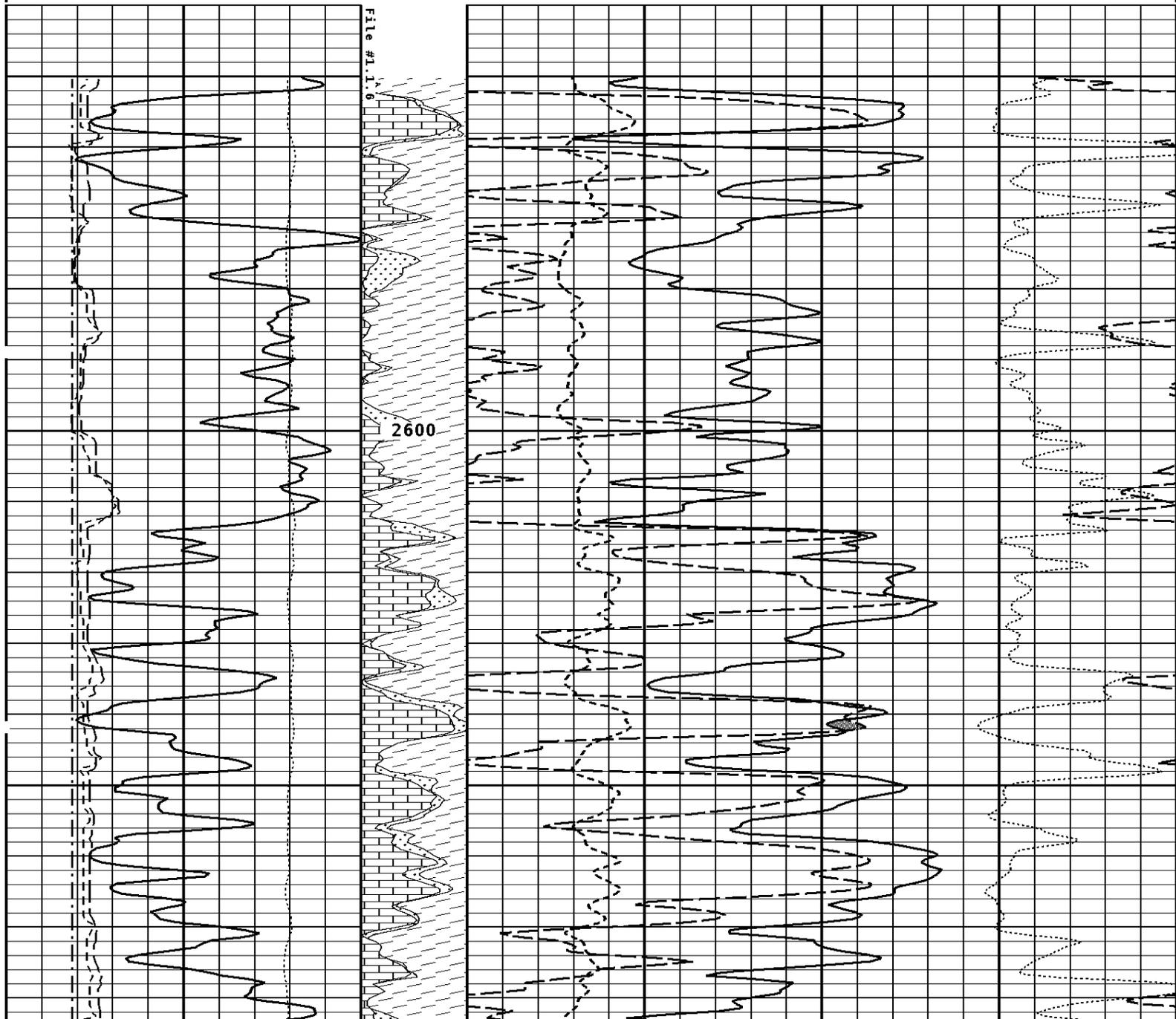
Well File: mg-oil-popp-4-mstk-dec-05	Scale: 1:240
Segment: V1.D1.S6 MN	Acquired: 2012-12/05 19:58 3.2.0-11401
Reference: 0	Processed: 2012-12/05 21:01 3.2.0-11401

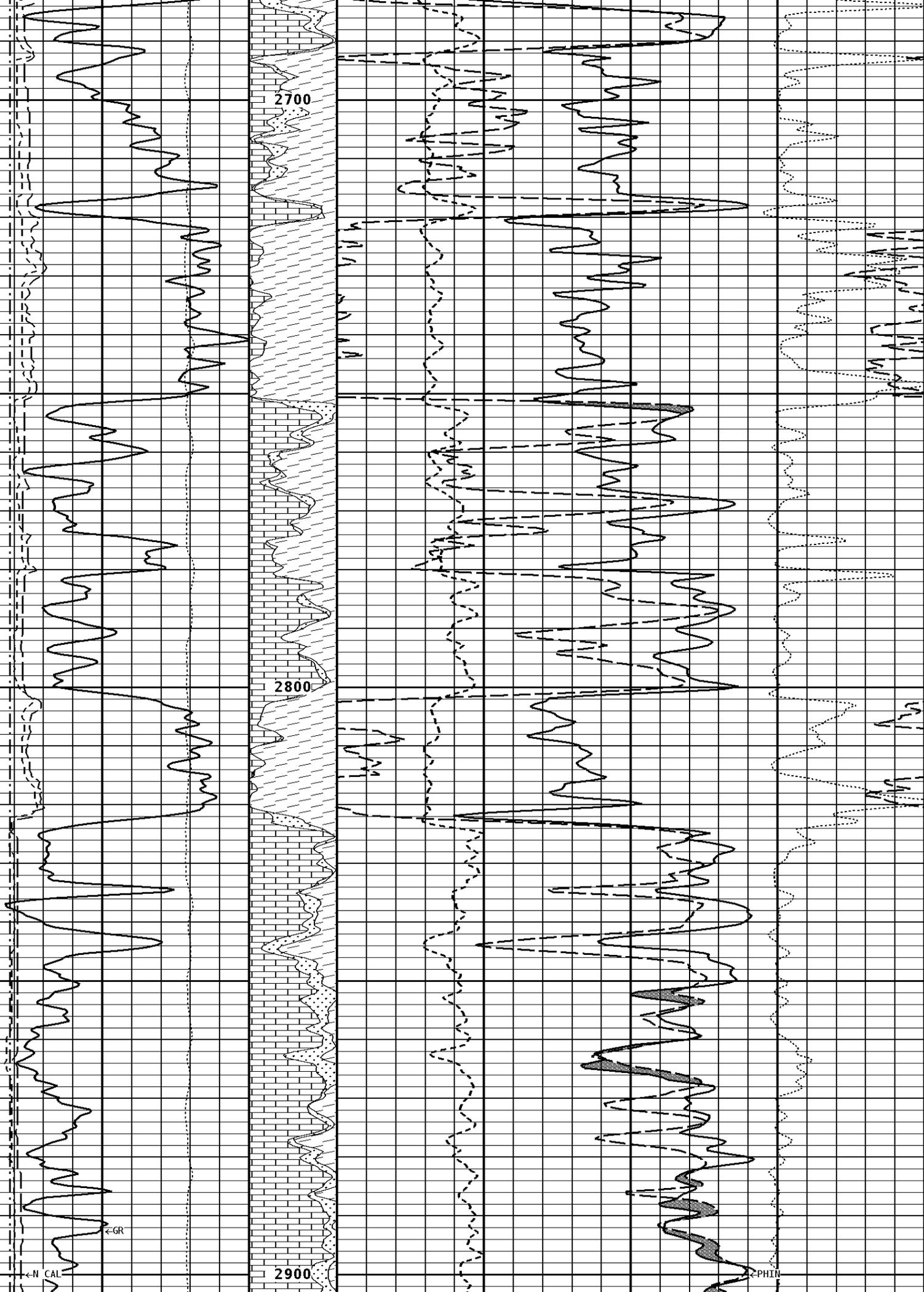
TENSION LBS	0

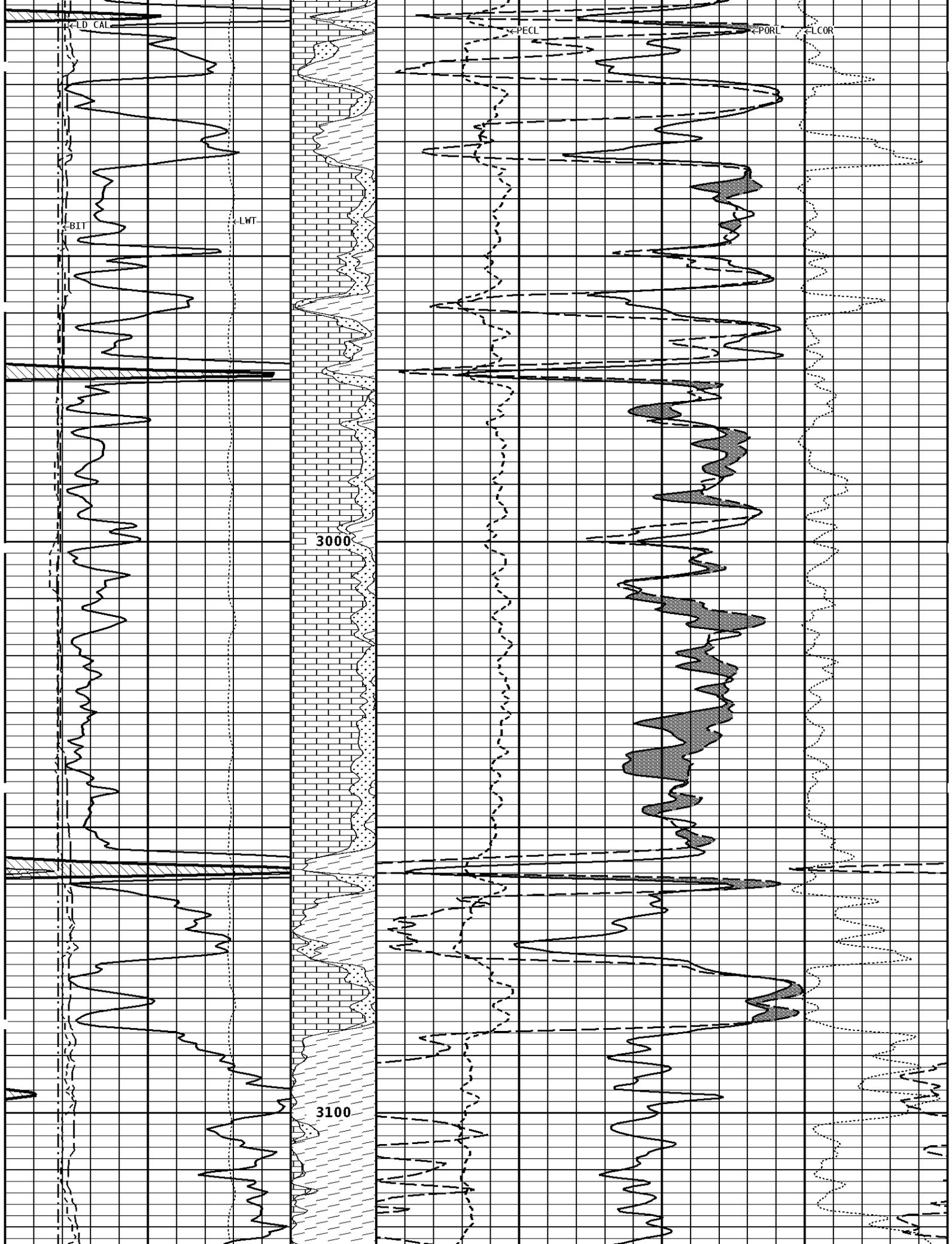
BIT SIZE INCHES (IN)

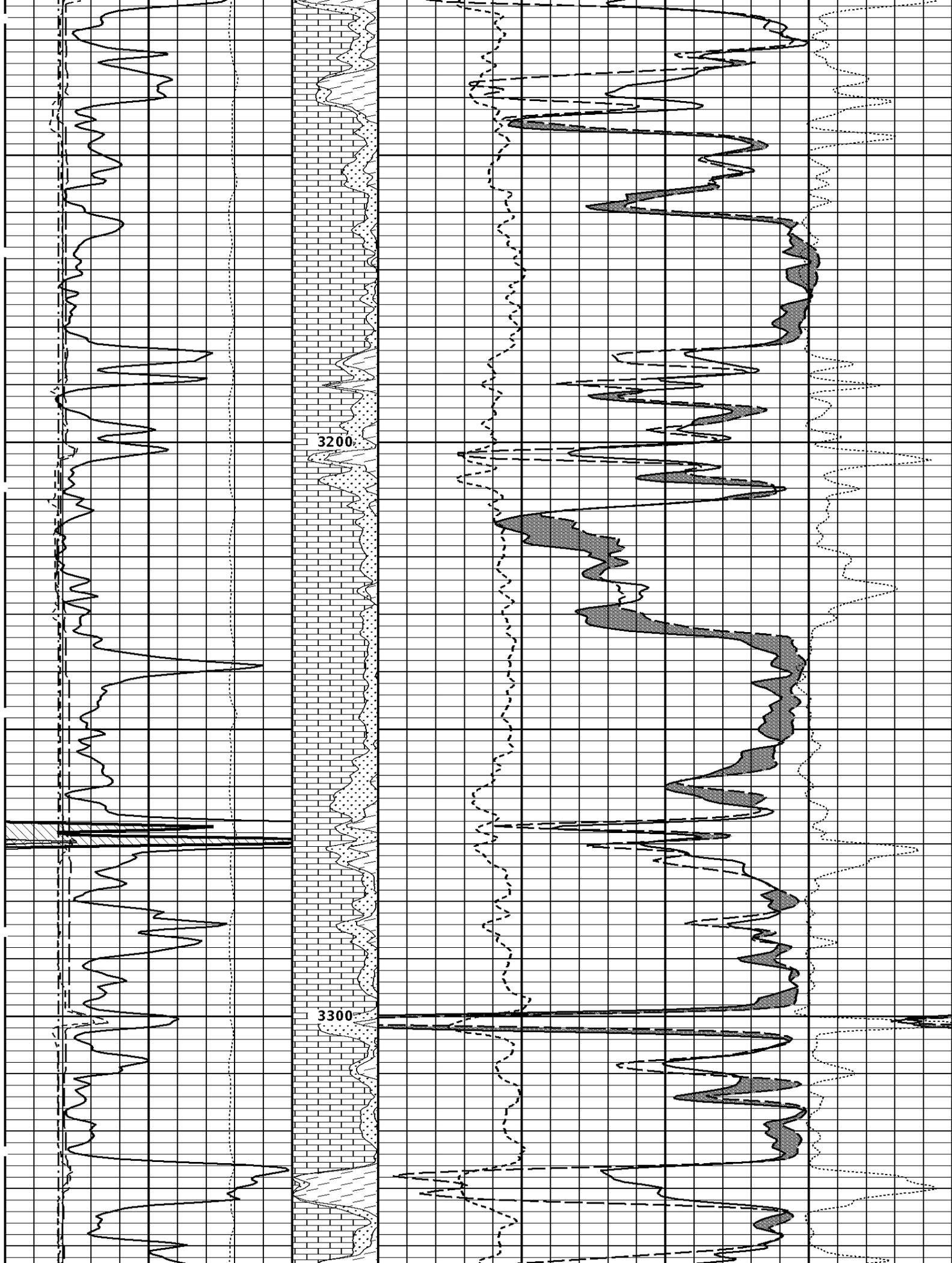
6	16				
DENSITY (X) CALIPER INCHES (IN)		Volume Quartz	PE CROSS-SECTION BARN/ ELECTRON		DENSITY CORRECTION G/CC
16 6	26 16		0	10	-0.25
					0.25
NEUTRON (Y) CALIPER INCHES (IN)		Volume Calcite	NEUTRON POROSITY PERCENT (LIMESTONE MATRIX)		
16 6	26 16		70		30
			30		-10
			-10		-50
GAMMA RAY API UNITS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

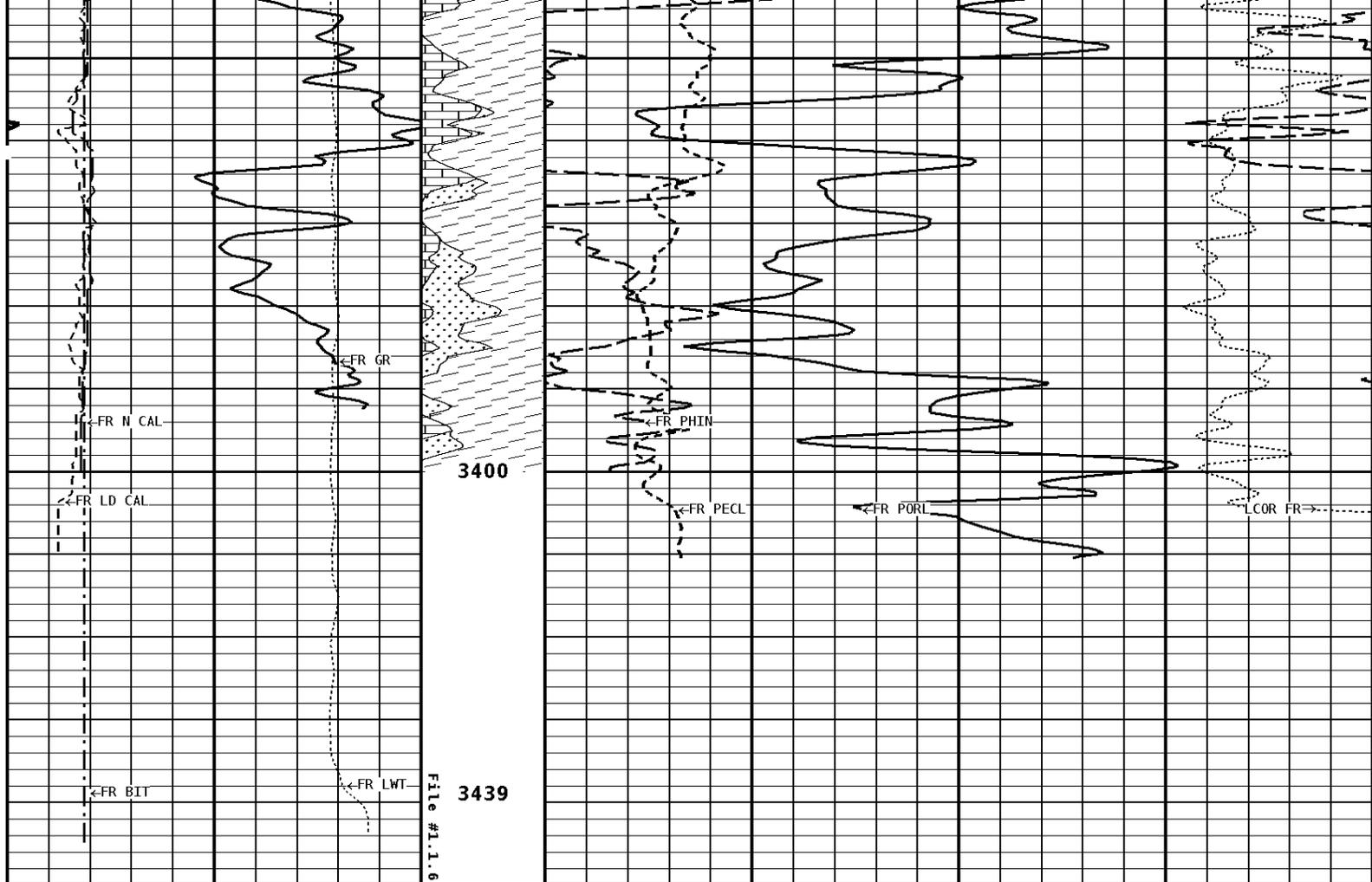
1:240 MAIN SECTION











1:240 MAIN SECTION

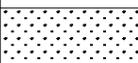
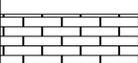
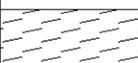
GAMMA RAY API UNITS 		Volume Dolo/Shale 	DENSITY POROSITY PERCENT (2.71 g/cc) 30 -10 -50	
NEUTRON (Y) CALIPER INCHES (IN) 		Volume Calcite 	NEUTRON POROSITY PERCENT (LIMESTONE MATRIX) 30 -10 -50	
DENSITY (X) CALIPER INCHES (IN) 		Volume Quartz 	PE CROSS-SECTION BARN/ELECTRON 10	DENSITY CORRECTION G/CC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

* Borehole Zone Factors *

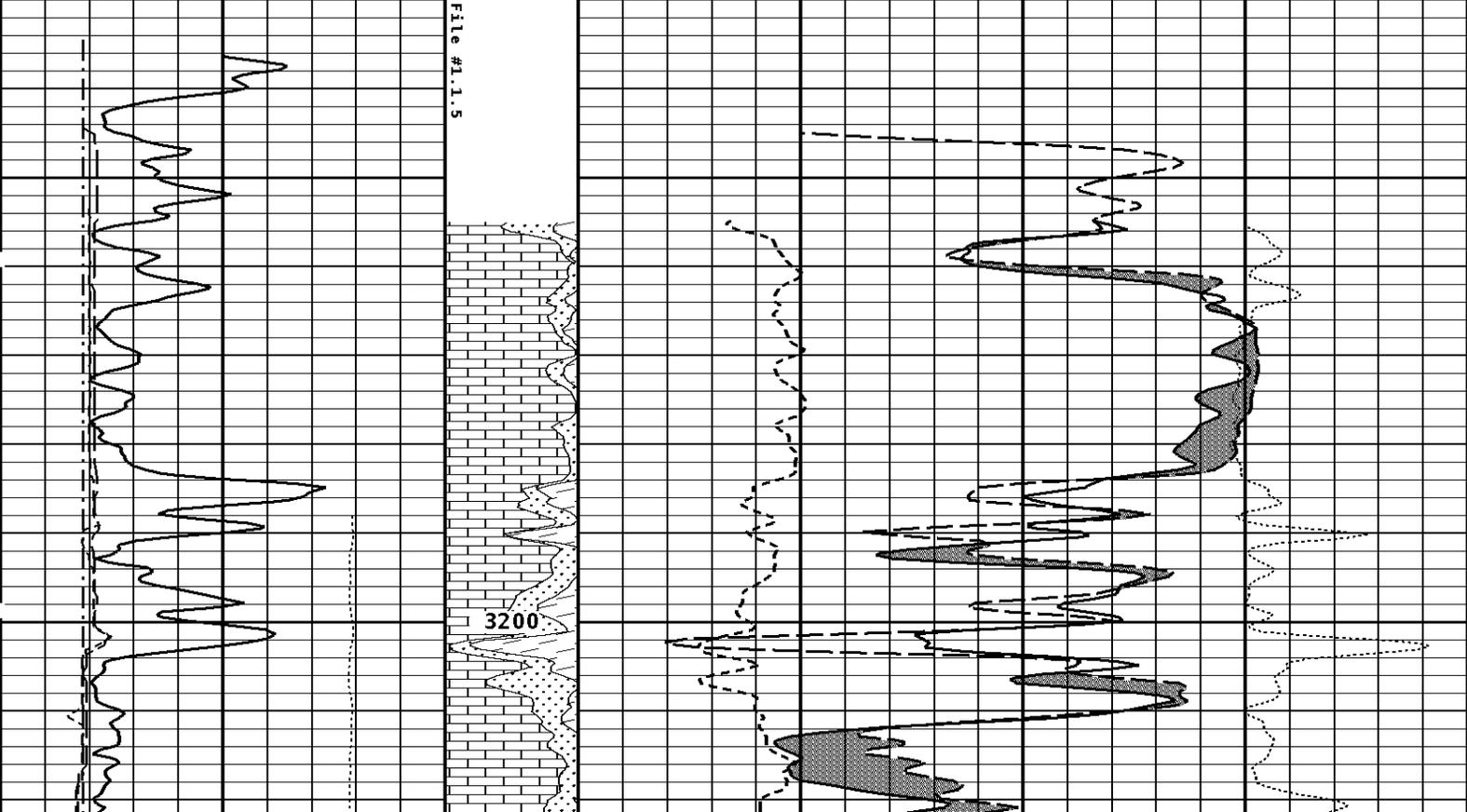
Zone 1	99999.0	to	0.0	Feet
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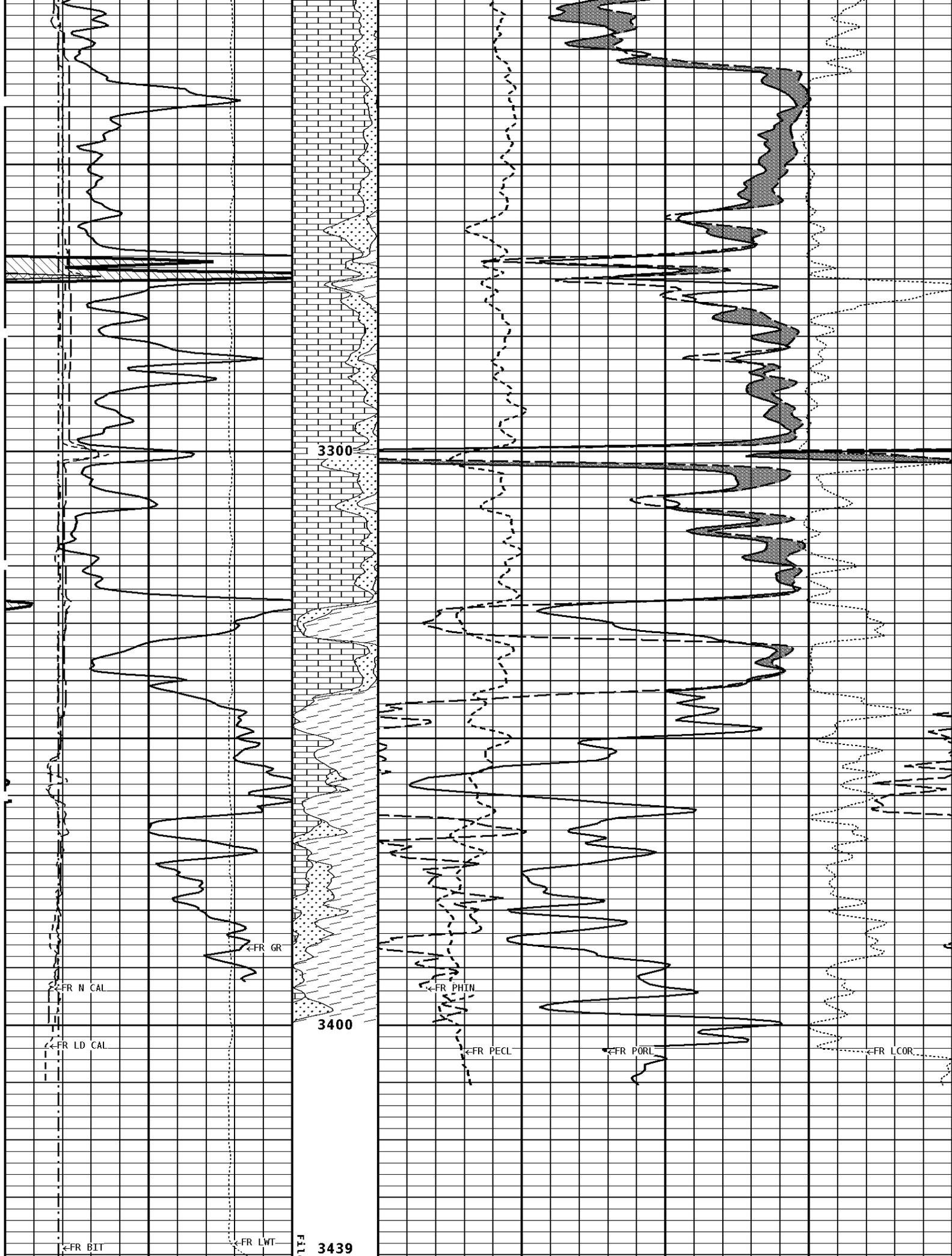
Matrix Density	2.71	g/cc
Fluid Density	1.00	g/cc
Formation Matrix	Limestone	
Drill Bit Size	7.875	in
Casing Diameter	5.500	in
Casing Correction (PHI N)	Disable	

Well File: mg-oil-popp-4-mstk-dec-05 Scale: 1:240
 Segment: V1.D1.S5 RP Acquired: 2012-12/05 19:45 3.2.0-11401
 Reference: 0 Processed: 2012-12/05 21:01 3.2.0-11401

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

1:240 REPEAT SECTION





3300

3400

FR N CAL

FR LD CAL

FR BIT

FR GR

FR LWT

FR PHIN

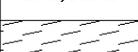
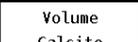
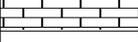
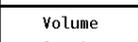
FR PECL

FR PORE

FR LCOR

FILE 3439

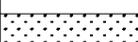
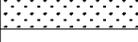
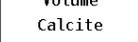
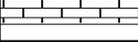
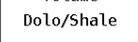
1:240 REPEAT SECTION

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

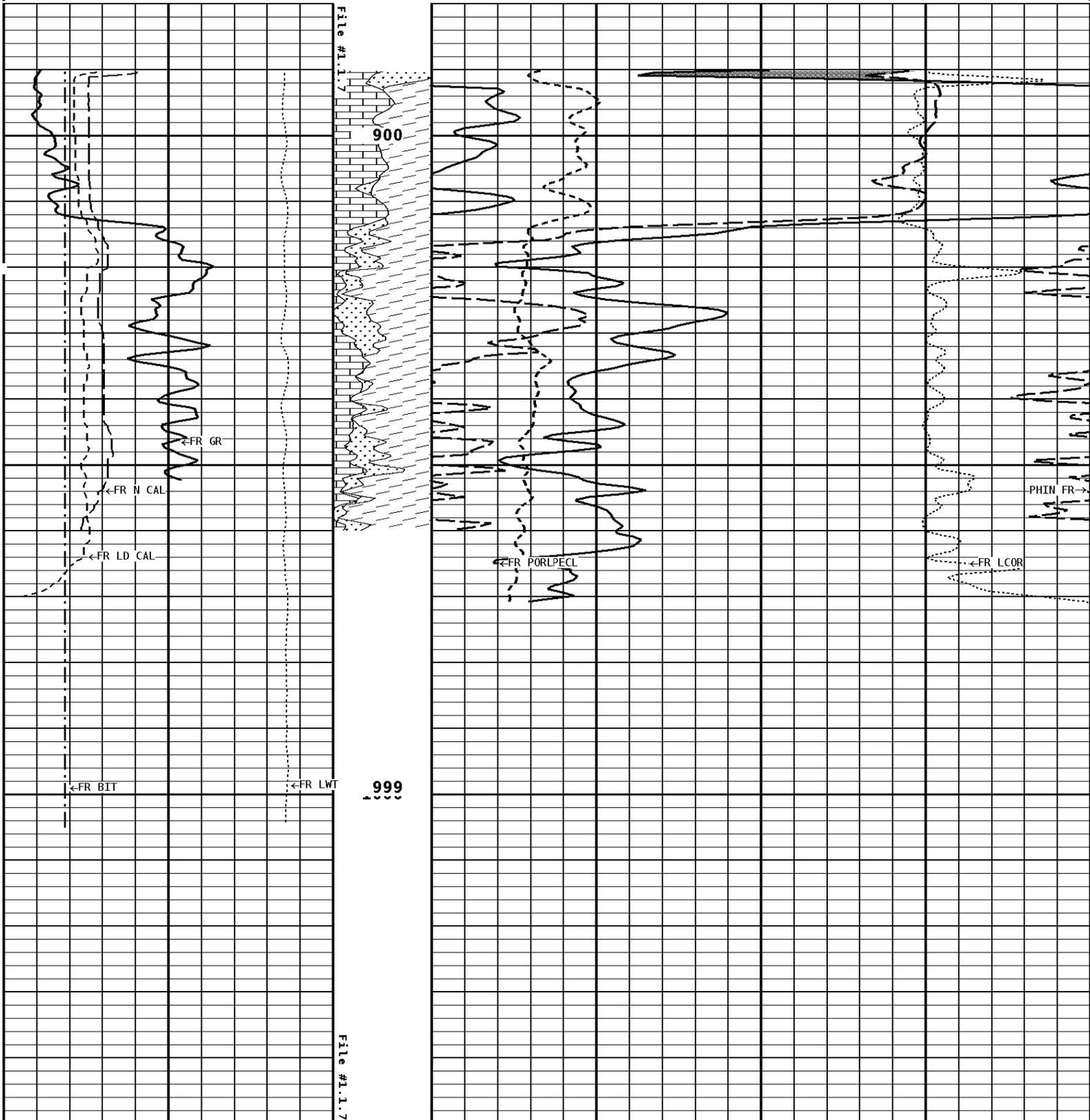
*** Borehole Zone Factors ***

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

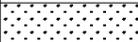
Well File: mg-oil-popp-4-mstk-dec-05	Scale: 1:240
Segment: V1.D1.S7 ANHYDRITE	Acquired: 2012-12/05 20:53 3.2.0-11401
Reference: 0	Processed: 2012-12/05 21:02 3.2.0-11401

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

1:240 ANHYDRITE SECTION



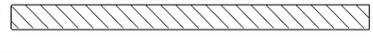
1:240 ANHYDRITE SECTION

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

*** 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

Well File: mg-oil-popp-4-mstk-dec-05	Scale: 1:240
Segment: V1.D1.S6 MN	Acquired: 2012-12/05 19:58 3.2.0-11401
Reference: 0	Processed: 2012-12/05 21:01 3.2.0-11401

TENSION LBS 10000 0		
BIT SIZE INCHES (IN) 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
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16	DENSITY POROSITY PERCENT (2.71 g/cc)	
	70 30	30 -10
	-10	-50
GAMMA RAY API UNITS 	COMPENSATED BULK DENSITY G/CC	
150 300	3.0	4.0
0 150	2.0	3.0
	1.0	2.0

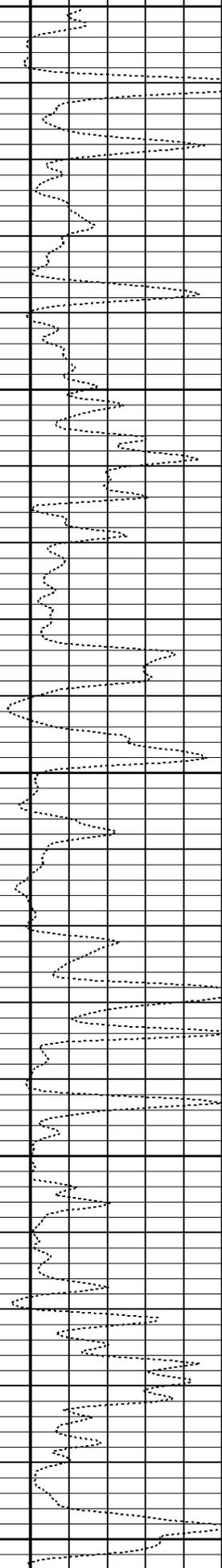
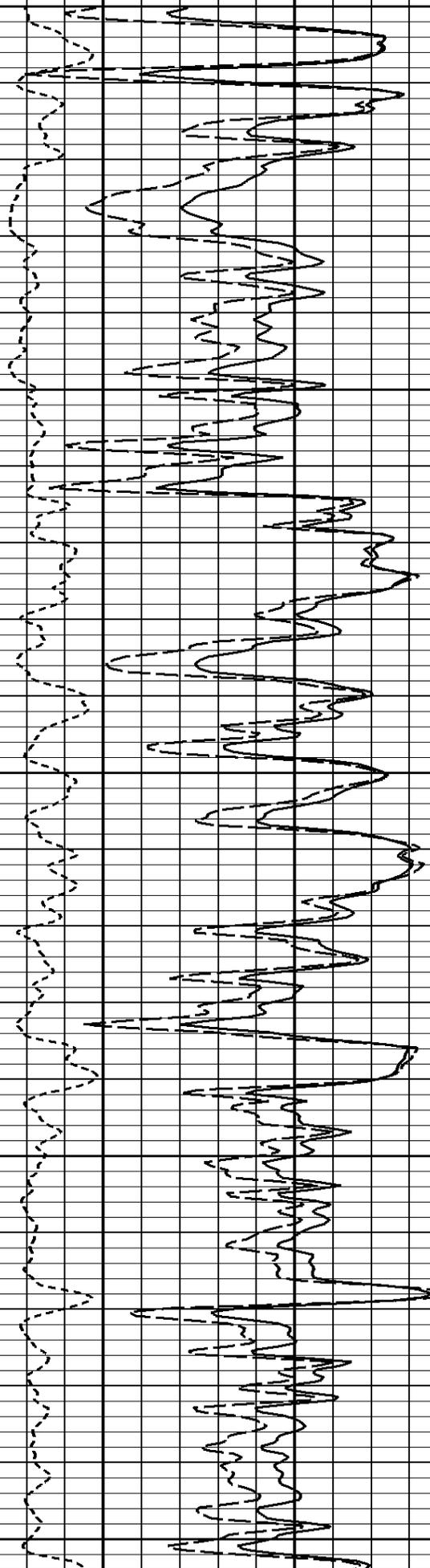
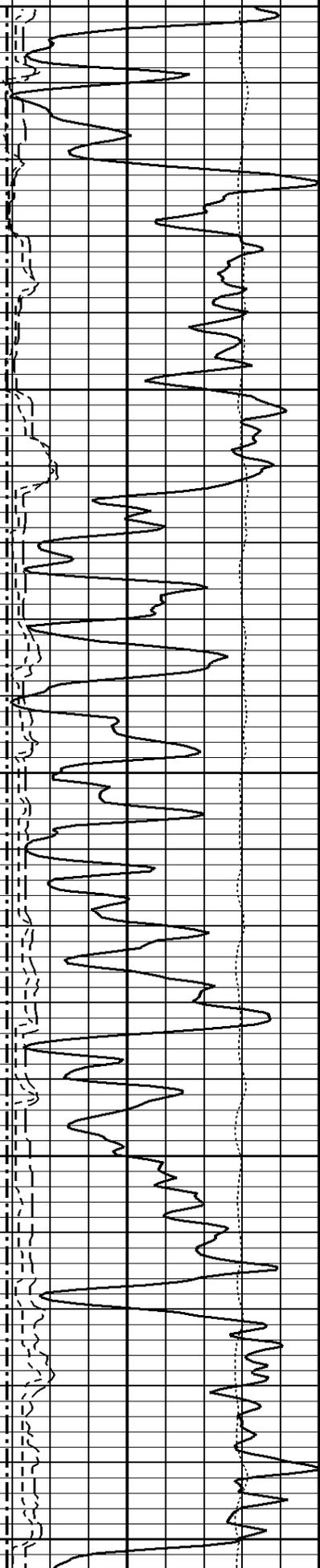
**1:240 MAIN SECTION
BULK DENSITY**

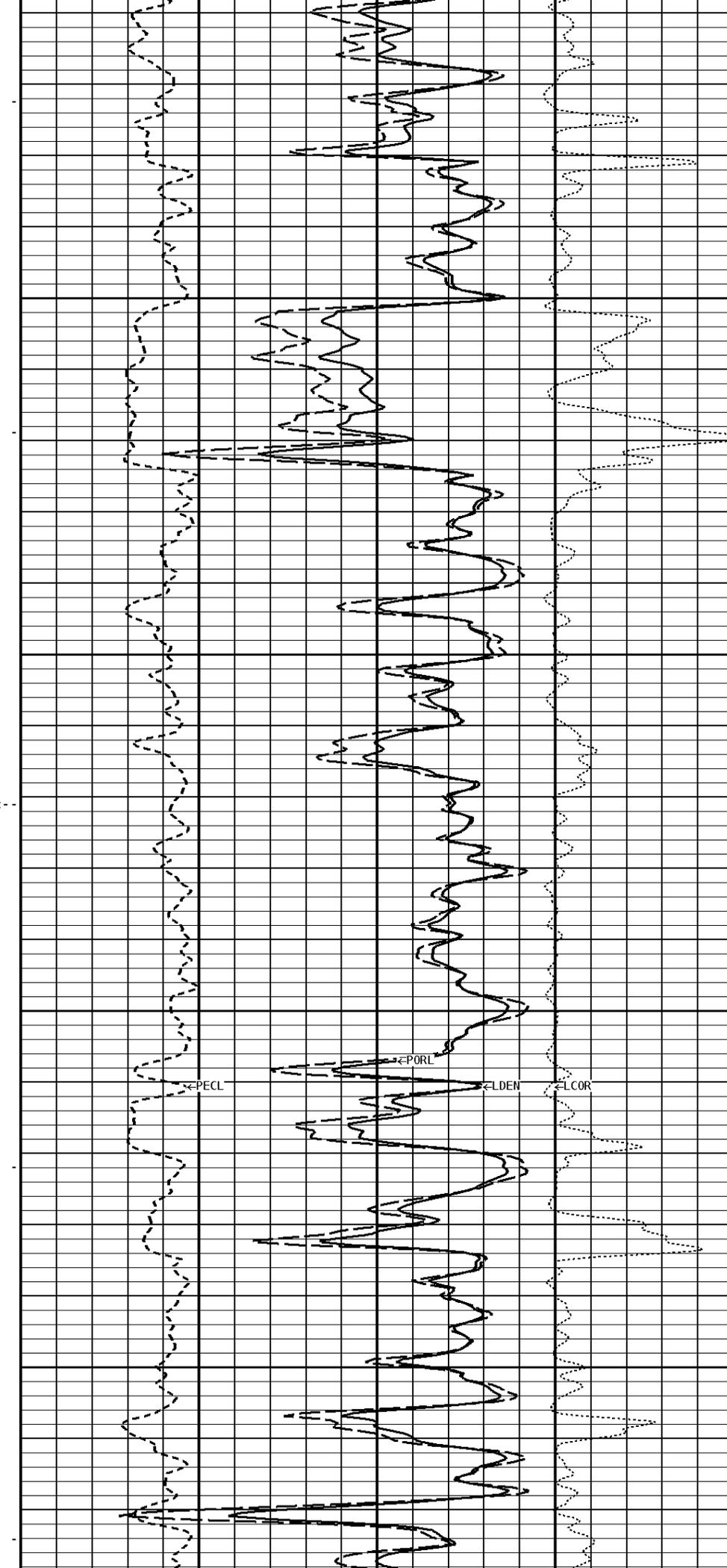
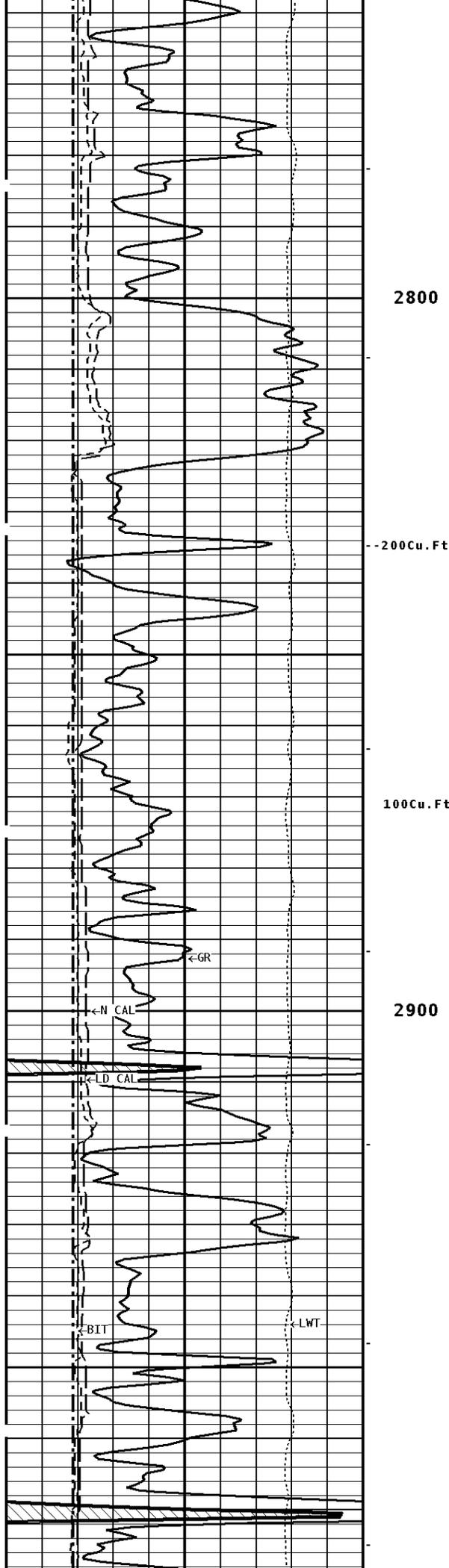
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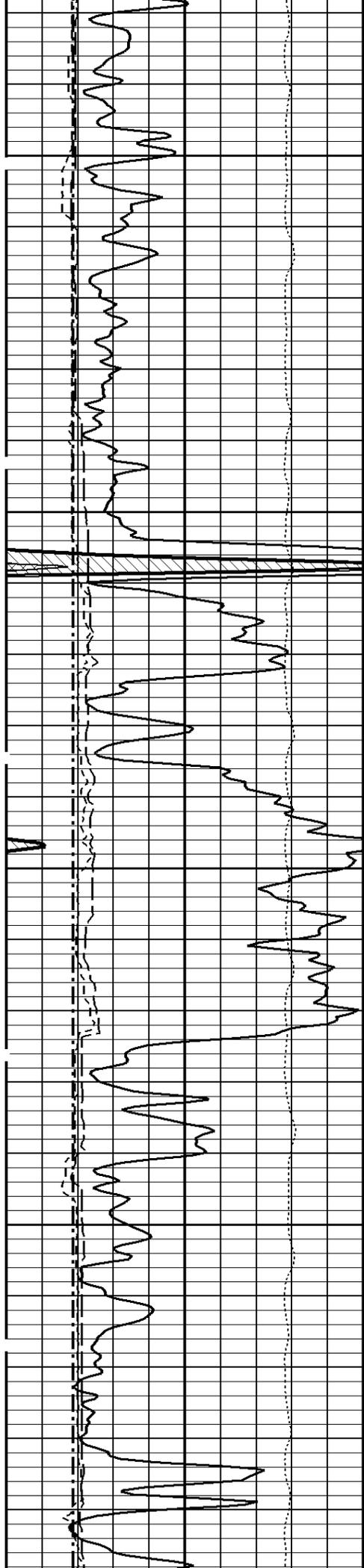
300 Cu. Ft

2600

2700



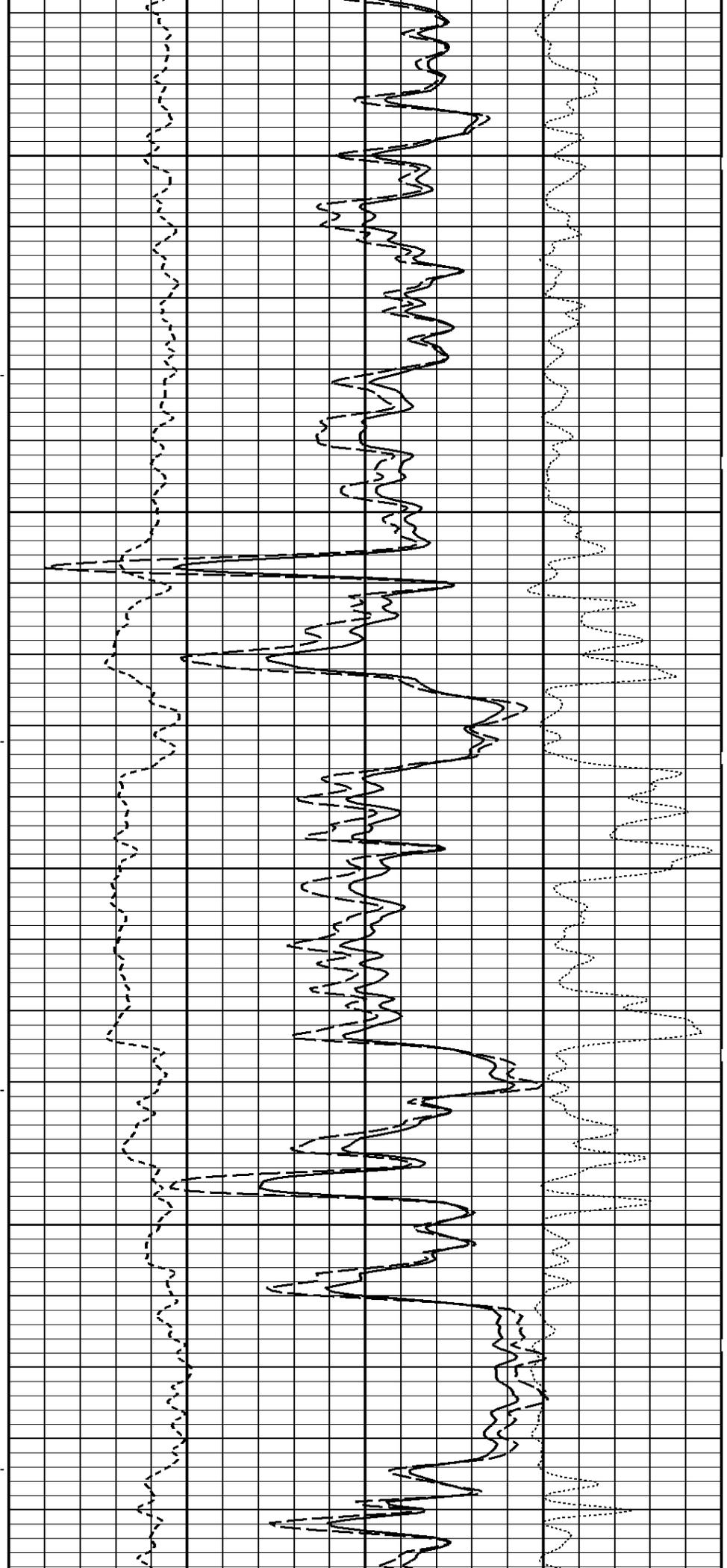




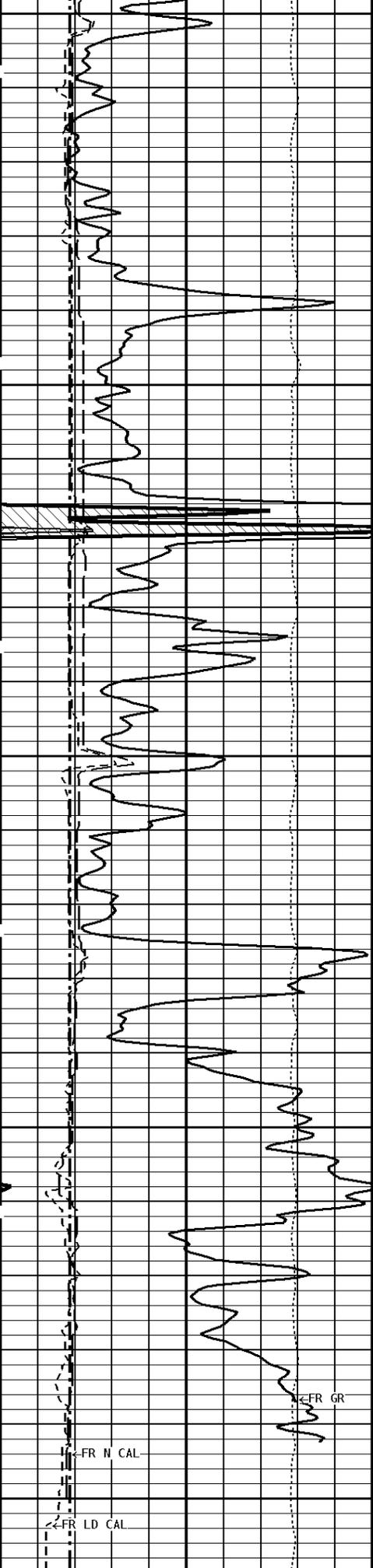
3000

3100

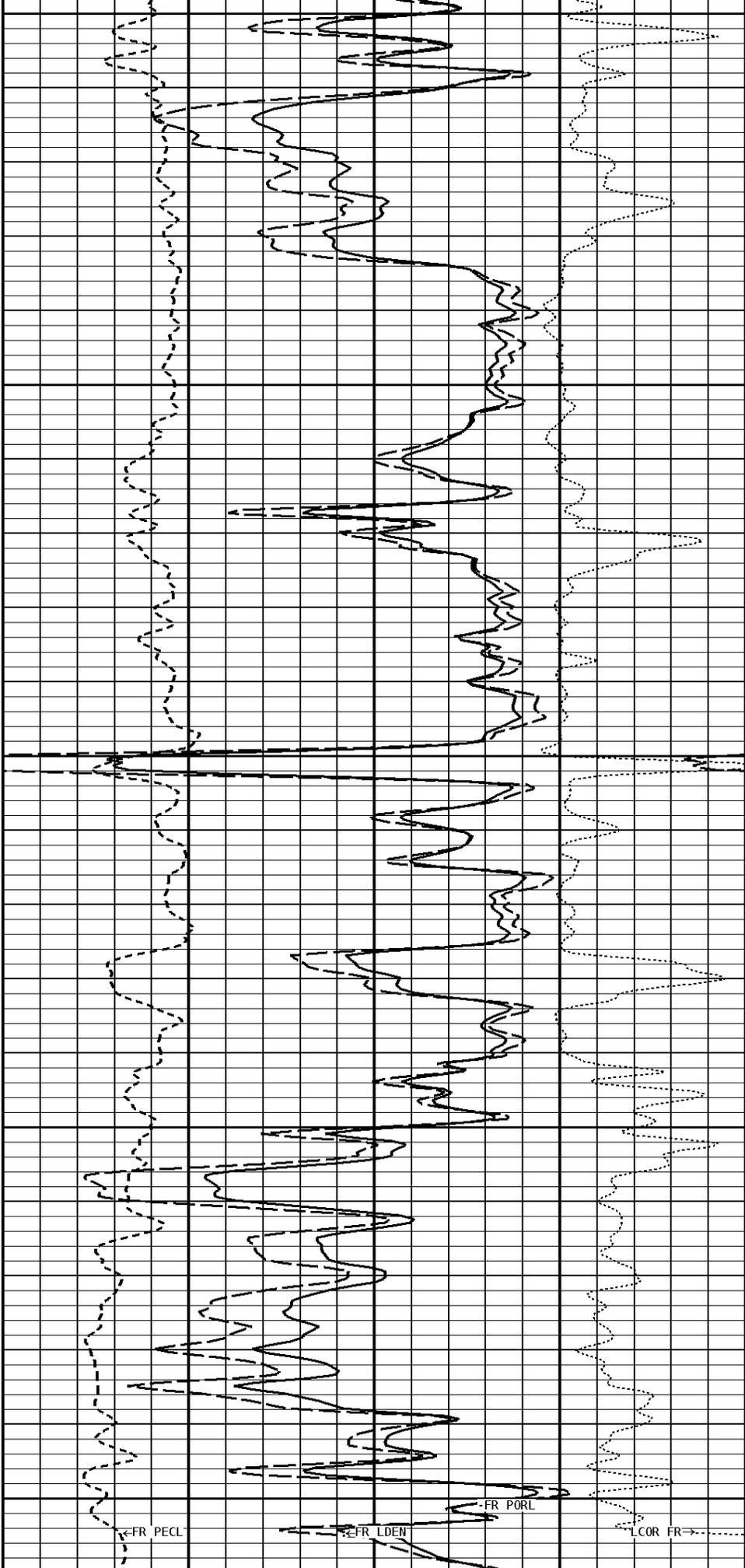
100 Cu. Ft



3200



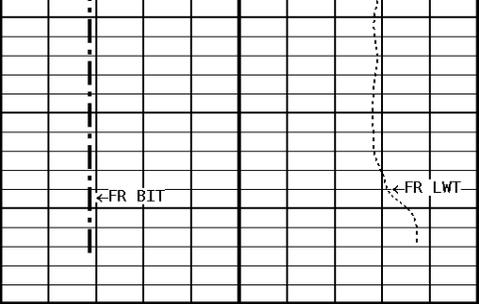
3300



3400

FR N CAL
FR LD CAL

FR PECL
FR LDEN
FR PORL
L COR FR



3439

**1:240 MAIN SECTION
BULK DENSITY**

GAMMA RAY API UNITS 150 0 300 150		- BHV AHV - CU. FT	COMPENSATED BULK DENSITY G/CC 3.0 4.0 2.0 3.0 1.0 2.0	
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16			DENSITY POROSITY PERCENT (2.71 g/cc) 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
BIT SIZE INCHES (IN) 6 16				
TENSION LBS 10000 0				

*** 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 : 16-NOV-2012			Time : 13:00		
Sensor Suite : GR-GR5			ID : GRT-BA-14		
	Measured	Units	Calibrated	Units	
	Background	Jig	Jig	GRAPI	
GR	52	368	CPS	175	
Shop Calibration CNT-AA					
Performed : 01-AUG-2012			Time : 10:49		
Sensor Suite : CALI-BCN			ID : NDT-BB-129		
	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	8.9	13.6	6.0	12.0	IN.

Performed : 16-Nov-2012 Time : 10:42
 Sensor Suite : BHC NEUT ID : CNP-AA-112
 Source ID : N-1045

	Tank		Verification	Units
	Measured	Calibrated	Jig	
N/F	4.0468	3.6893	3.6967	
Porosity	26.3	20.5	20.6	%

**Shop Calibration
LDT-DF**

Performed : 01-AUG-2012 Time : 11:07
 Sensor Suite : CALI-LTH ID : PDT-GA-464

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	7.7	11.0	6.0	12.0	IN.

Performed : 16-Nov-2012 Time : 12:04
 Sensor Suite : BHCPENGL ID : LDP-DA-065
 Source ID : 2991GW

Short Space					
	BKGD	Al	Mg	Al+Fe	Units
LSW1	69	1130	1826	730	CPS
LSW2	72	1384	2205	977	CPS
LSW3	271	3164	5106	2659	CPS
LSW4	336	2818	4101	2452	CPS
LSW5	30	57	65	52	CPS
LSW6	91	95	95	96	CPS
LSW7	57	60	62	61	CPS
LSW8	2	4	6	4	CPS
QS	0.228	0.223	0.207	0.226	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space					
	BKGD	Al	Mg	Al+Fe	Units
LLW1	99	1278	5213	769	CPS
LLW2	106	2260	8832	1622	CPS
LLW3	412	4130	15623	3531	CPS
LLW4	529	1998	6444	1802	CPS
LLW5	62	73	138	73	CPS
LLW6	163	161	152	159	CPS
LLW7	107	104	101	108	CPS
LLW8	4	8	21	8	CPS
QL	0.206	0.216	0.200	0.193	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC