Tucker ENERGY SERVICES

COMPENSATED NEUTRON

PEL DENSITY MICRO LOG

Company VAL ENERGY, INC
Well HAMMER D #V4-8
Field WILSON
County COWLEY
State KANSAS
Country USA
API No. 15-035-24681-0000

File No : TUL-61419
Company : VAL ENERGY, INC
Well : HAMMER D #V4-8
Field : WILSON
County : COWLEY
State : KANSAS
Country : USA
API No : 15-035-24681-0000

Location :
660' FNL & 660' FEL
NE NE

LSD : **Sect :** 8 **Twp :** 33S **Rge :** 6E

Permanent Datum:	GL	**Elevations:**		**Services:**	
Drilling Measured From:	KB	**KB**	1351.00 Ft	CNT	PIT
Log Measured From:	KB	**DF**	1350.00 Ft	LDT	
Above Permanent Datum:	9.00 Ft	**GL**	1342.00 Ft	MLT	

Date	12-05-2017			
Run Number	1			
Depth--Driller	3446.0 Ft			
Depth--Logger	3445.0 Ft			
First Reading	3445.0 Ft			
Last Reading	304.0 Ft			
Casing--Driller	294.0 Ft			
Casing--Logger	304.0 Ft			
Bit Size	7.875 In			
Casing Size	8.625 In			
Hole Fluid Type	WBM			
Density	9.3			
Fluid Loss	8.0			
PH/Viscosity	9.0	61.0		
Sample Source	MEASURED			
RM@Measured Temp.	2.000 @ 60 F			
RMF@Measured Temp	1.600 @ 60 F			
RMC@Measured Temp.	2.400 @ 60 F			
Source RMF/RMC	CALCULATED	CALCULATED		
RM@BHT	1.140 @ 110 F			
Time Circulation Stopped	12-05-2017 08:00			
Max Recorded Temp.	110 F			
Equipment/Base	1022	TULSA, OK		
Recorded By	SHELDON TYLER			
Witnessed By	JOE BAKER			

Bitsize Intervals

Size (In)	Bottom (Ft)
7.875	3446.00

Casing Strings

Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
8.625	32.00	294.00	0.00

Run Number	1		
Date	12-05-2017		
Date/Time On Bottom	12-05-2017 11:00		
Depth to Fluid	0.0 Ft		
Salinity	650.000		
RMF@BHT	0.910 @ 110 F		
RMC@BHT	1.370 @ 110 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 5.5" PRODUCTION CASING
PHIN IS CALIPER CORRECTED

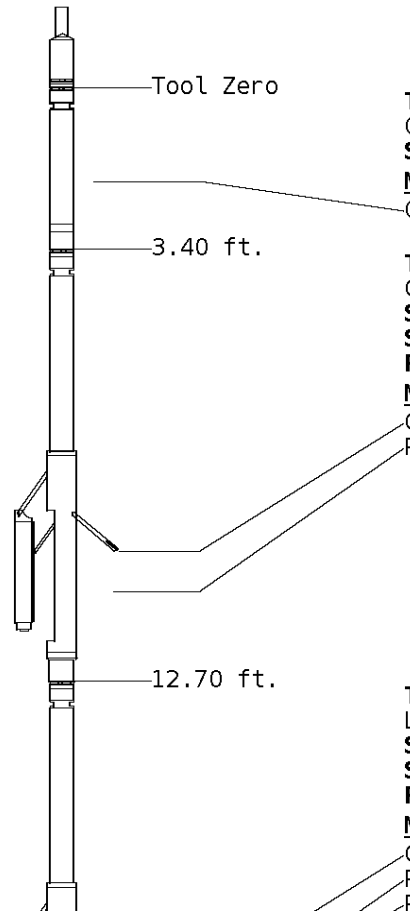
CUSTOMER REQUESTED DETAIL PULLED TO 1800'
CUSTOMER REQUESTED NO REPEAT

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:
B.BAILEY
B.BROWN

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-BA-121

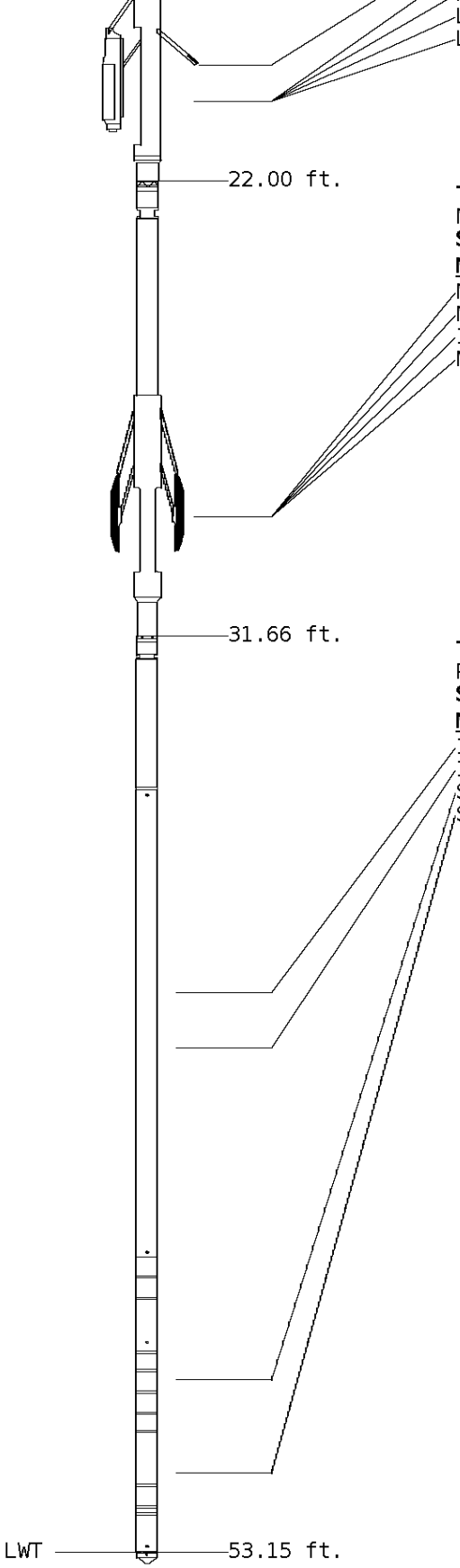
Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	51.15

Tool: CNT-AA **Length:** 9.30 **ft.** **O.D.** 4.36 **in.**
Compensated Neutron A Pad on NDT-A
Sonde ID :NDT-BB-146
Source ID :N-1044
Pad ID :CNP-AA-115

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-AF-102
Source ID :63558B
Pad ID :LDP-DA-076

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



LDEN	7.20	19.90	33.25
LCOR	7.20	19.90	33.25

Tool: MST-DA **Length:** 9.66 **ft.** **O.D.** 6.00 **in.**
Micro Spherically Focused (IC)
Sonde ID :MST-DA-021

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-069

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: VAL_ENERGY_HAMMER_D_V4-8_DEC5_MSTK **Scale:** 1:240 **Format:** NLD-240
Segment: V1.D1.S3 Reprocess of MAIN **Acquired:** 2017-12/05 10:50 3.4.0-13756
Reference: 0 **Processed:** 2017-12/05 11:41 3.4.0-13756

CALIPER MICRO
INCHES (IN)
16 26
6 16

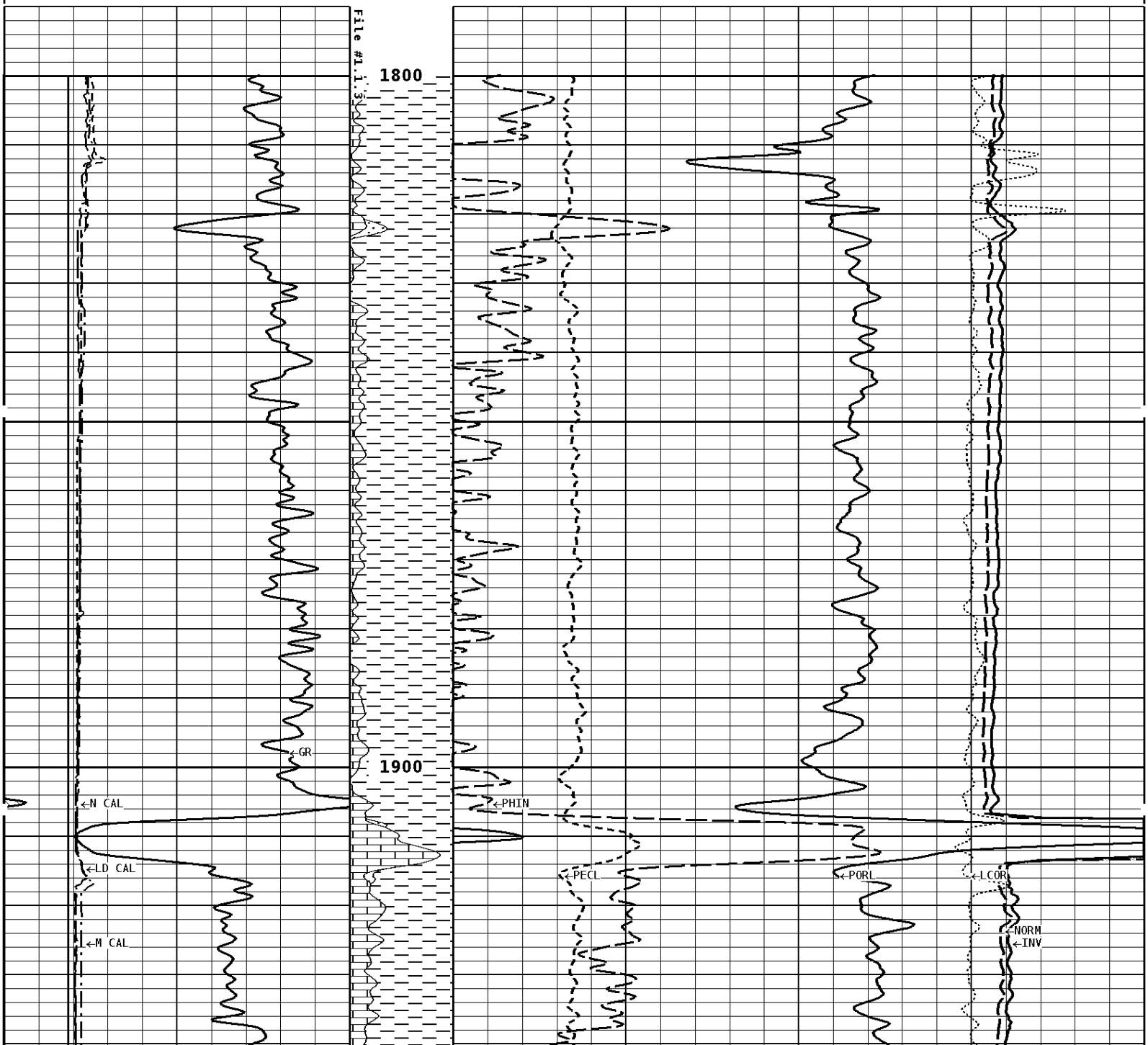
BIT SIZE
INCHES (IN)

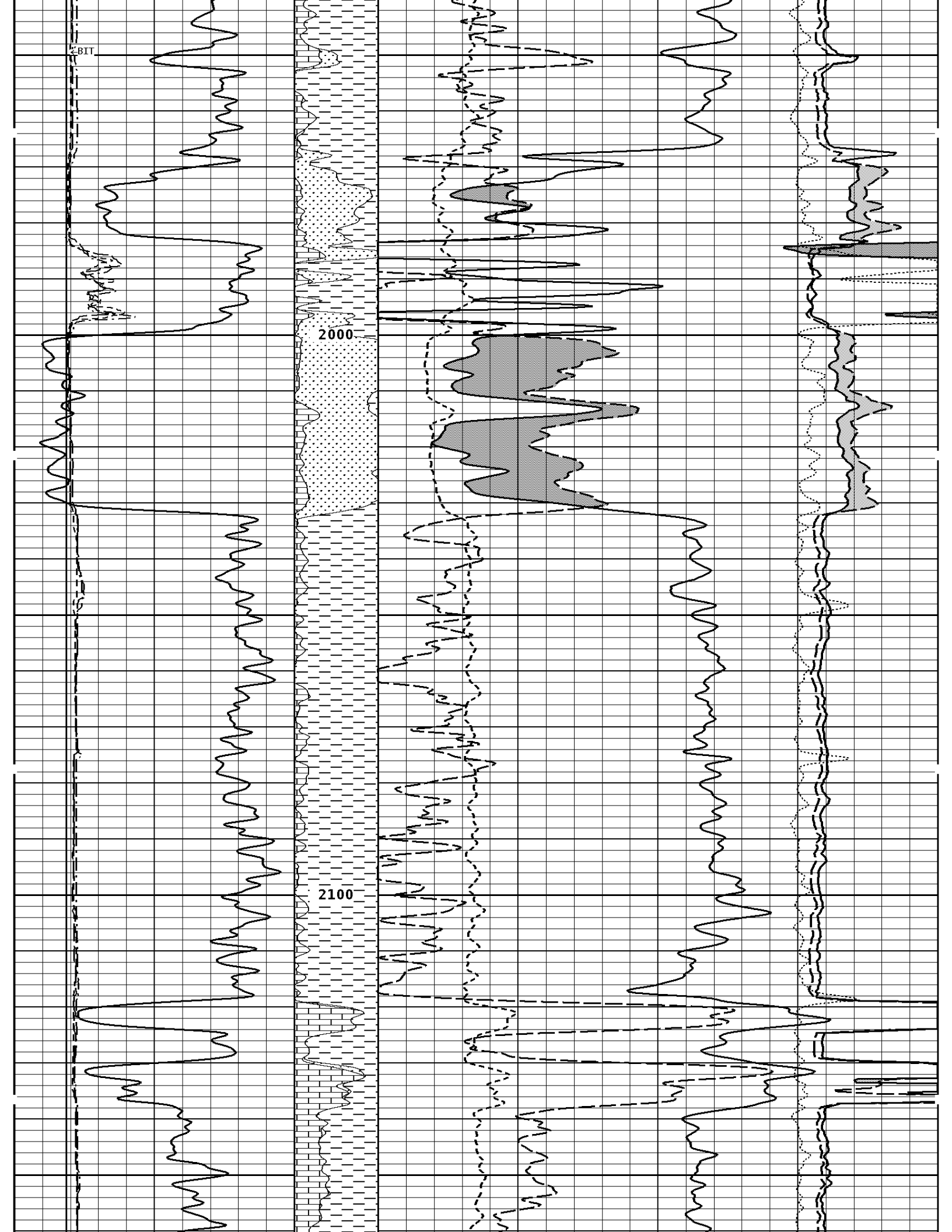
NORMAL
OHMM
0 40

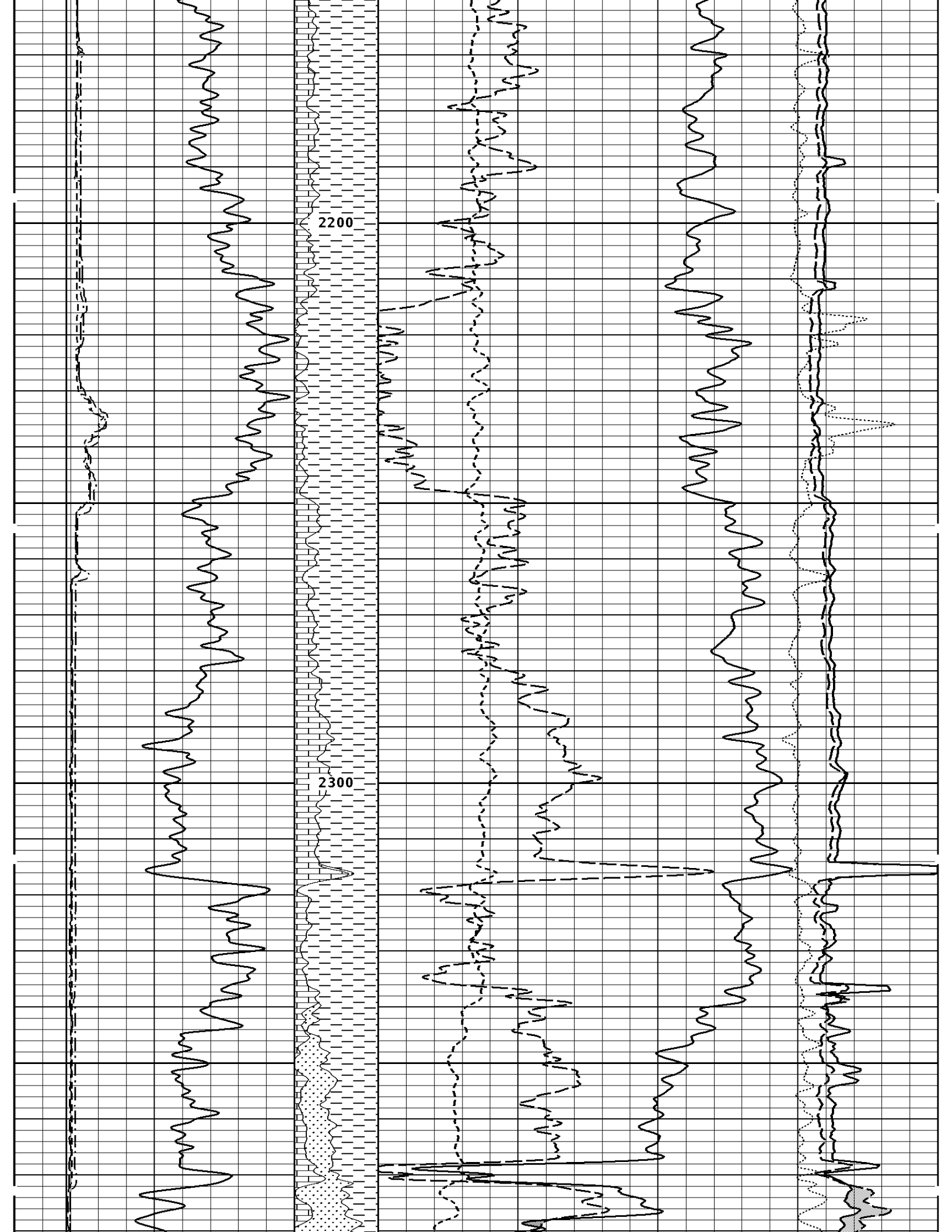
INVERSE
OHMM

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

1:240 MAIN SECTION




BIT
2000
2100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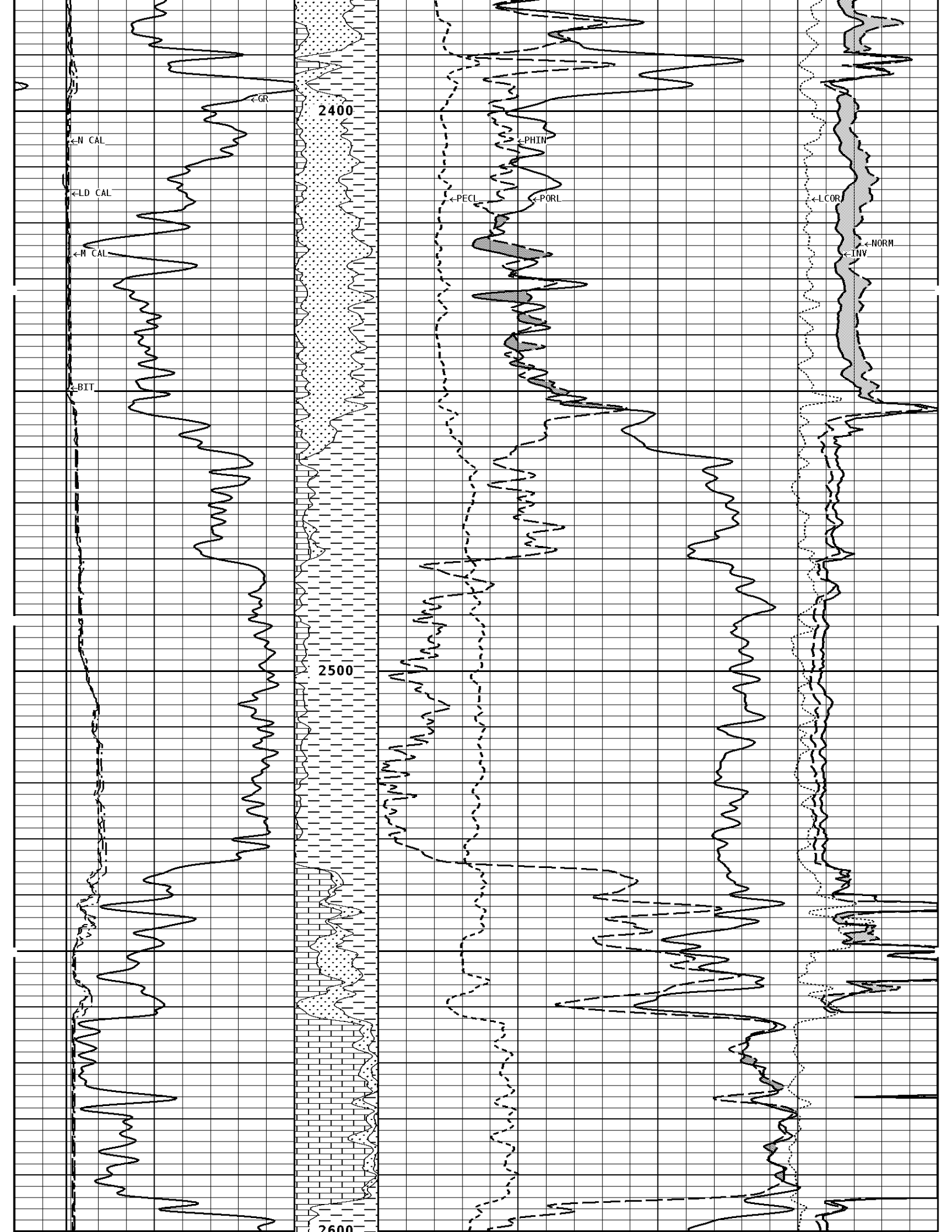
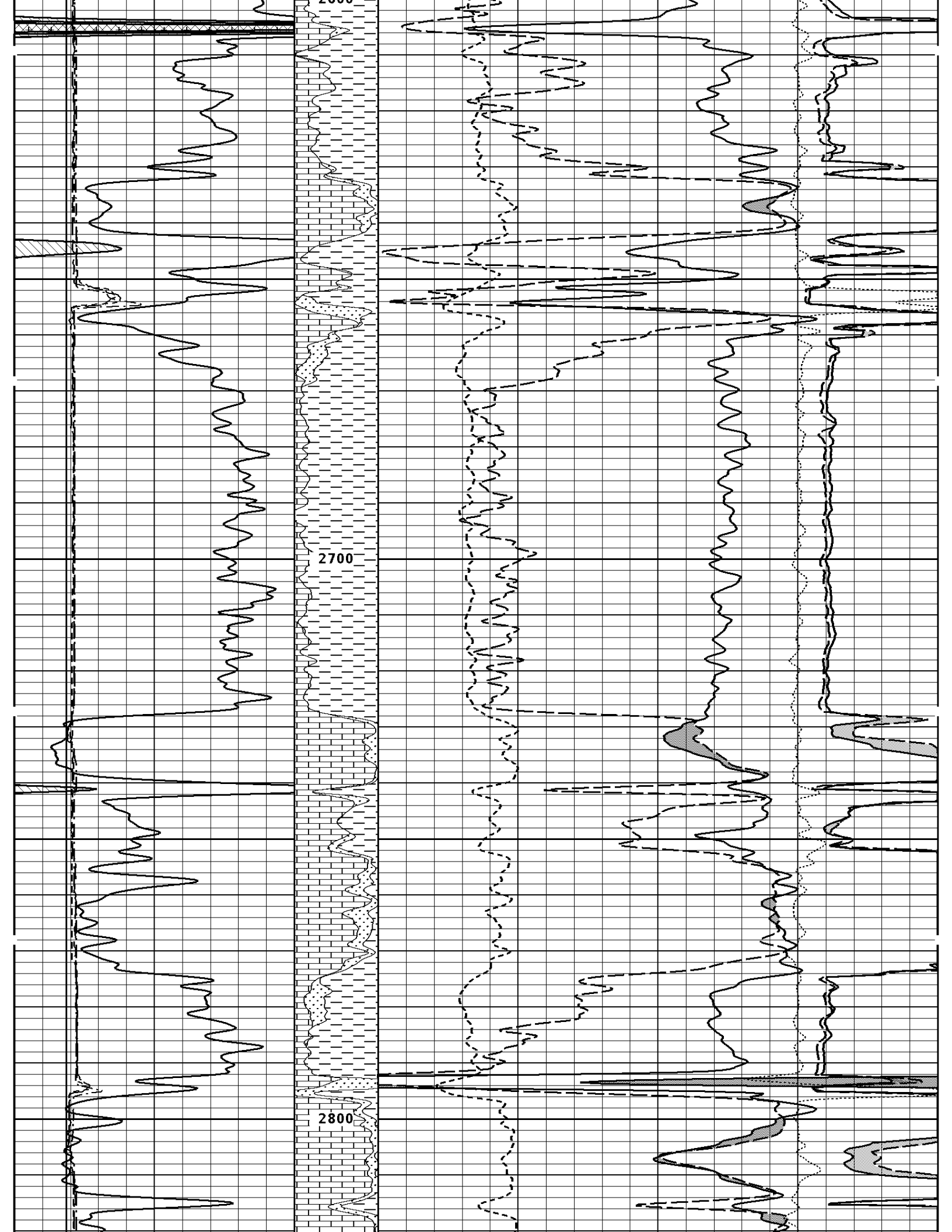
2300


GR
N CAL
LD CAL
M CAL
BIT
2400
2500
2600
PHIN
PECL
PORL
LCOR
NORM
INV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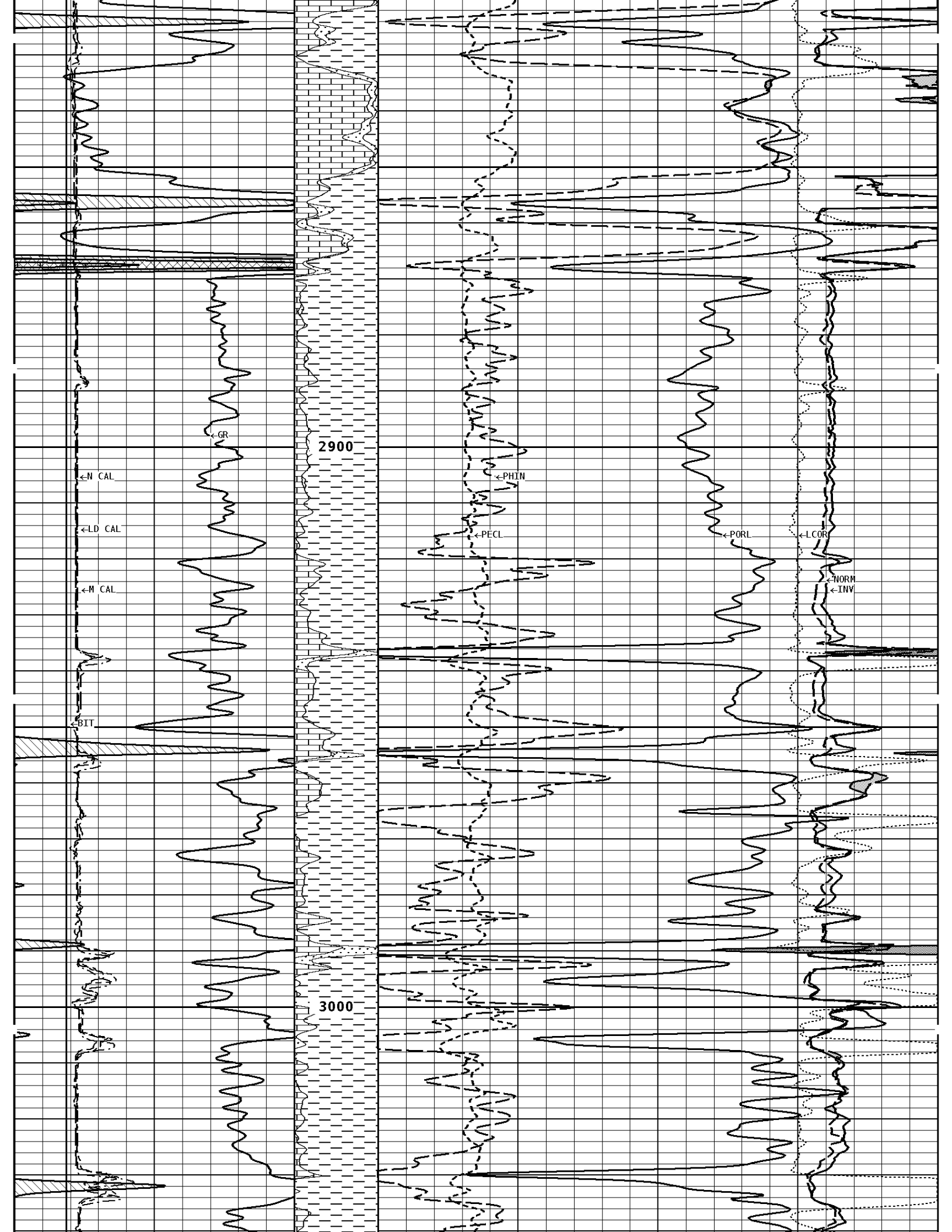
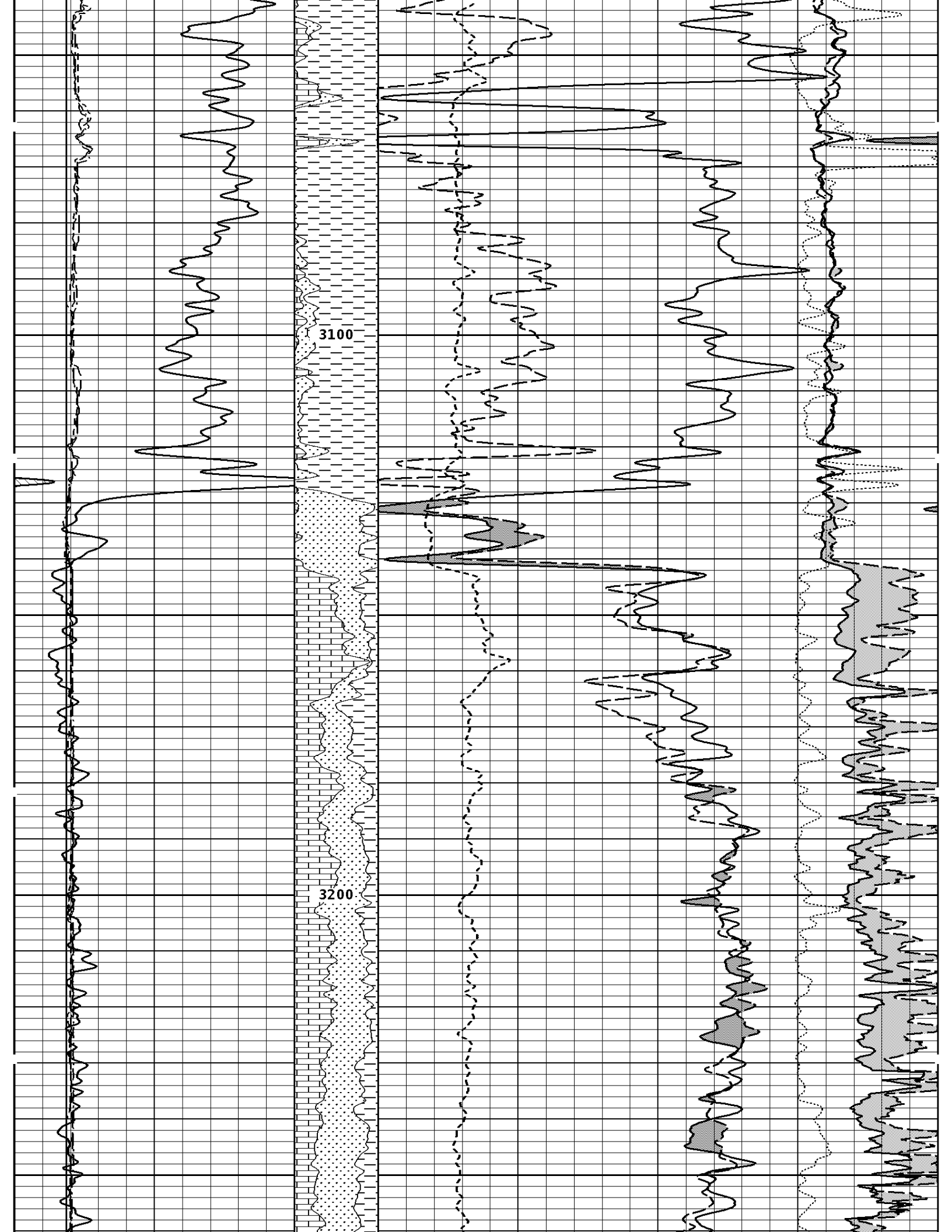
2800


GR
N CAL
LD CAL
M CAL
BIT
2900
3000
PHIN
PECL
PORL
LCOR
NORM
INV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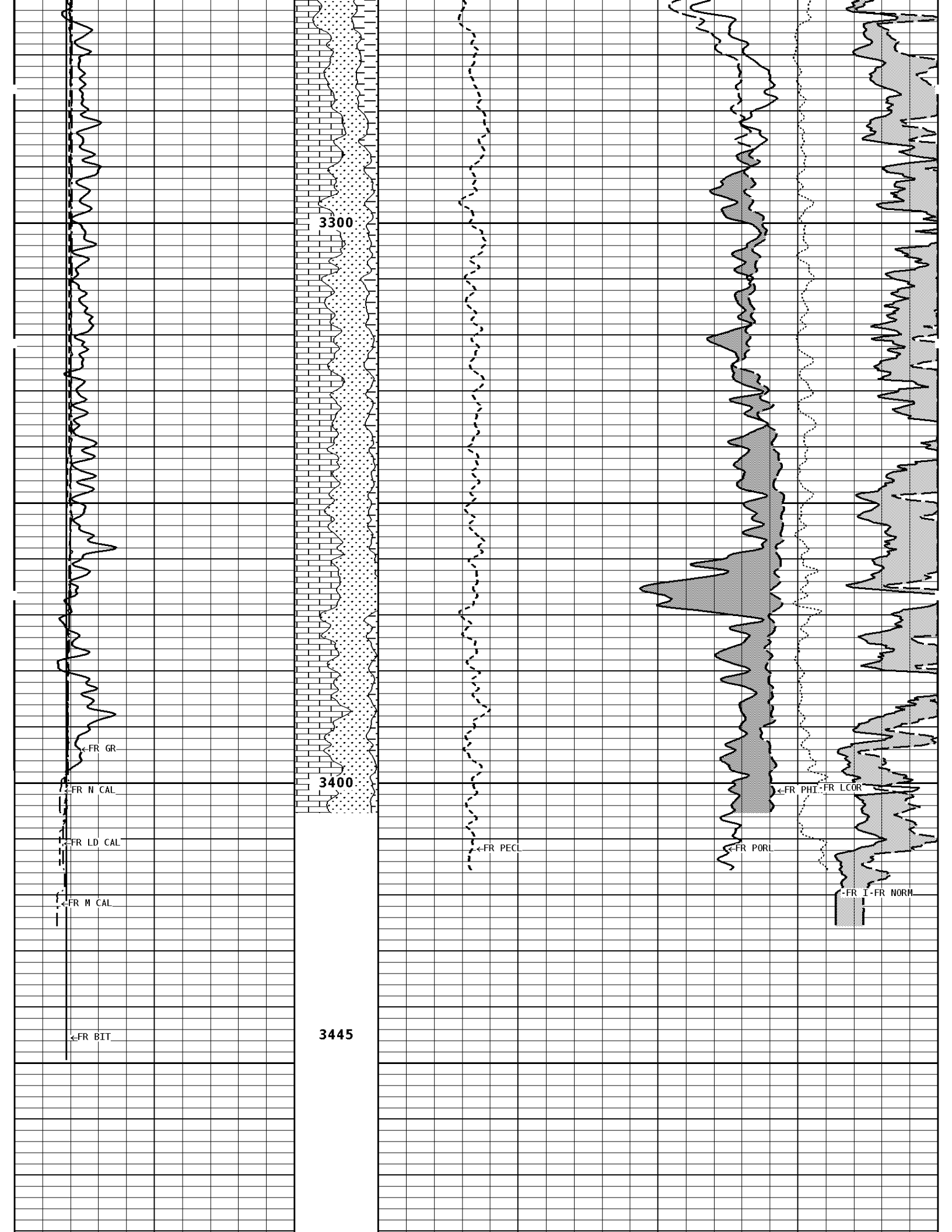
3200


3300
3400
3445
←FR GR
←FR N CAL
←FR LD CAL
←FR M CAL
←FR BIT
←FR PECL
←FR PORL
←FR PHI-FR LCOR
-FR I-FR NORM

File #1.1.3

1:240 MAIN SECTION

GAMMA RAY API UNITS	Volume Dolo/Shale	NEUTRON POROSITY (LIMESTONE) PERCENT
150 300		30 -10
0 150		

DENSITY (X) CALIPER INCHES (IN)	Volume Calcite	DENSITY POROSITY (2.71g/cc) PERCENT
16 26		70 30
6 16		30 -10
		-10 -50

NEUTRON (Y) CALIPER INCHES (IN)	Volume Quartz	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26			
6 16		0 10	-0.25 0.25

BIT SIZE INCHES (IN)	INVERSE OHMM
6 16	0 40

CALIPER MICRO INCHES (IN)	NORMAL OHMM
16 26	
6 16	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	5.500	in
Casing Thickness	0.250	in
Casing Correction (PHI N)	Disable	

Well File: VAL_ENERGY_HAMMER_D_V4-8_DEC5_MSTK **Scale:** 1:240 **Format:** LDT-240
Segment: V1.D1.S3 Reprocess of MAIN **Acquired:** 2017-12/05 10:50 3.4.0-13756
Reference: 0 **Processed:** 2017-12/05 11:41 3.4.0-13756

BIT SIZE INCHES (IN)
6 16

NEUTRON (Y) CALIPER INCHES (IN)	PE CROSS-SECTION BARNS/ELECTRON	DENSITY CORRECTION G/CC
16 26		
6 16	0 10	-0.25 0.25

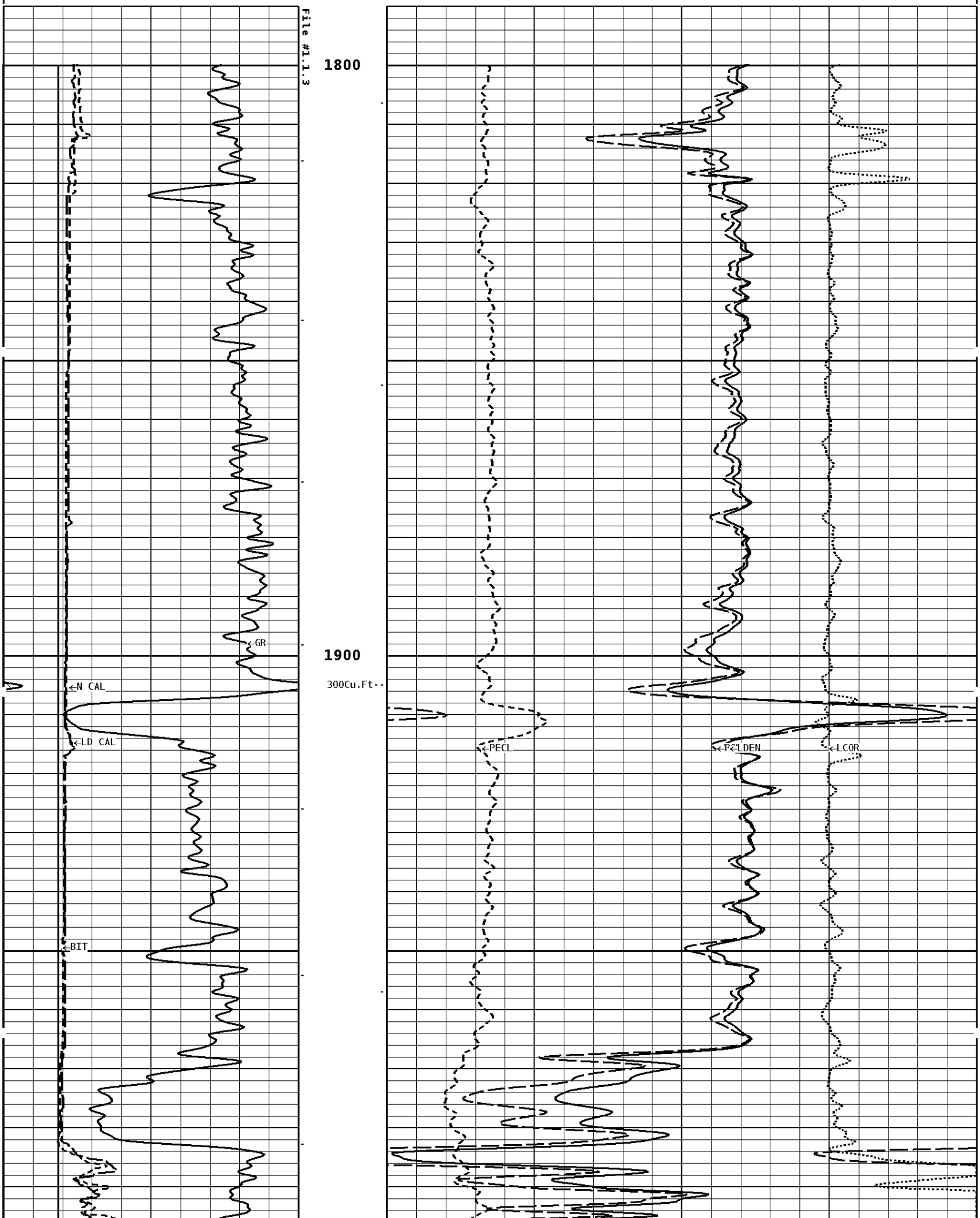
DENSITY (X) CALIPER INCHES (IN)	COMPENSATED BULK DENSITY G/CC
16 26	3.0 4.0
6 16	2.0 3.0
	1.0 2.0

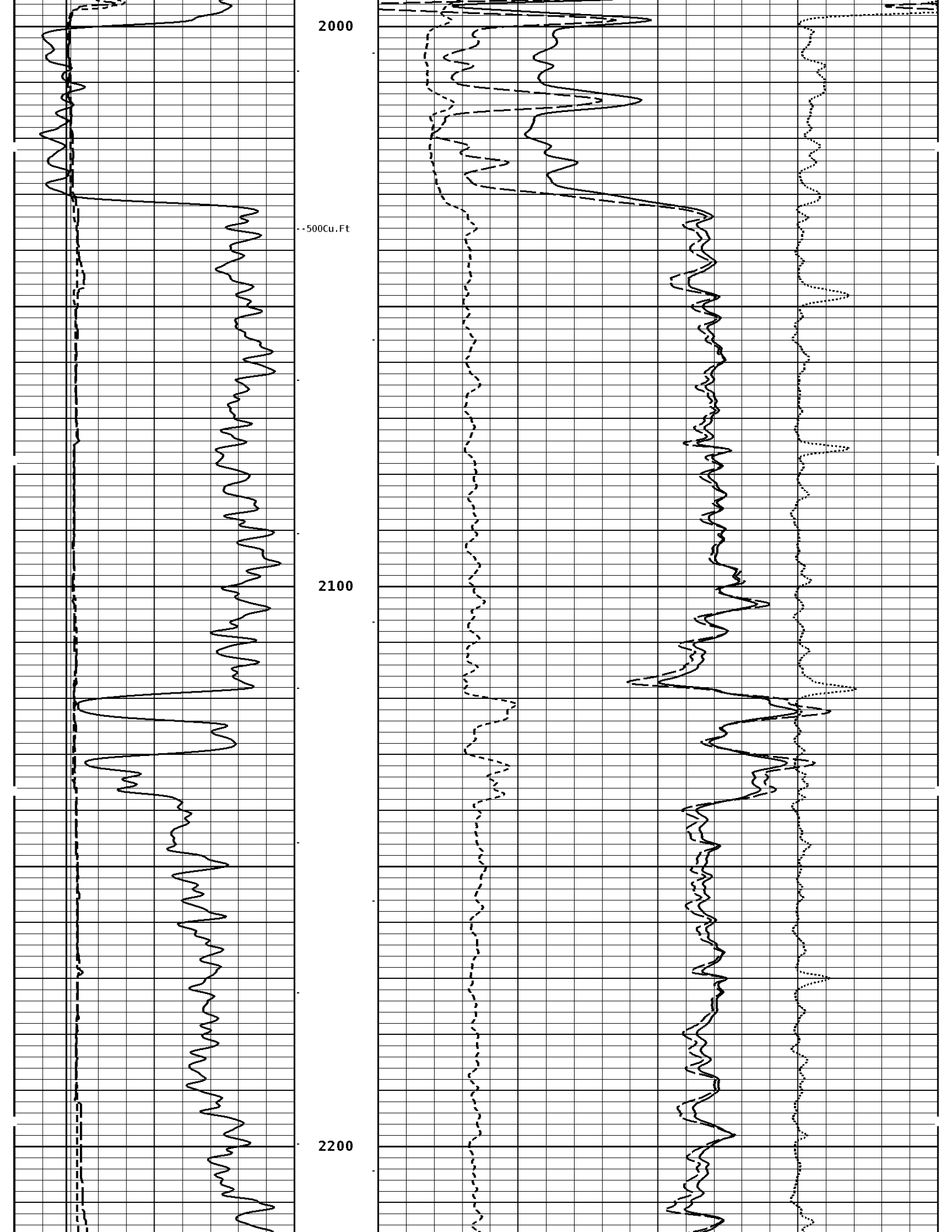
GAMMA RAY API UNITS	-BHV AHV-CU.FT	DENSITY POROSITY (2.71g/cc) PERCENT
150 300		70 30
0 150		30 -10
		-10 -50

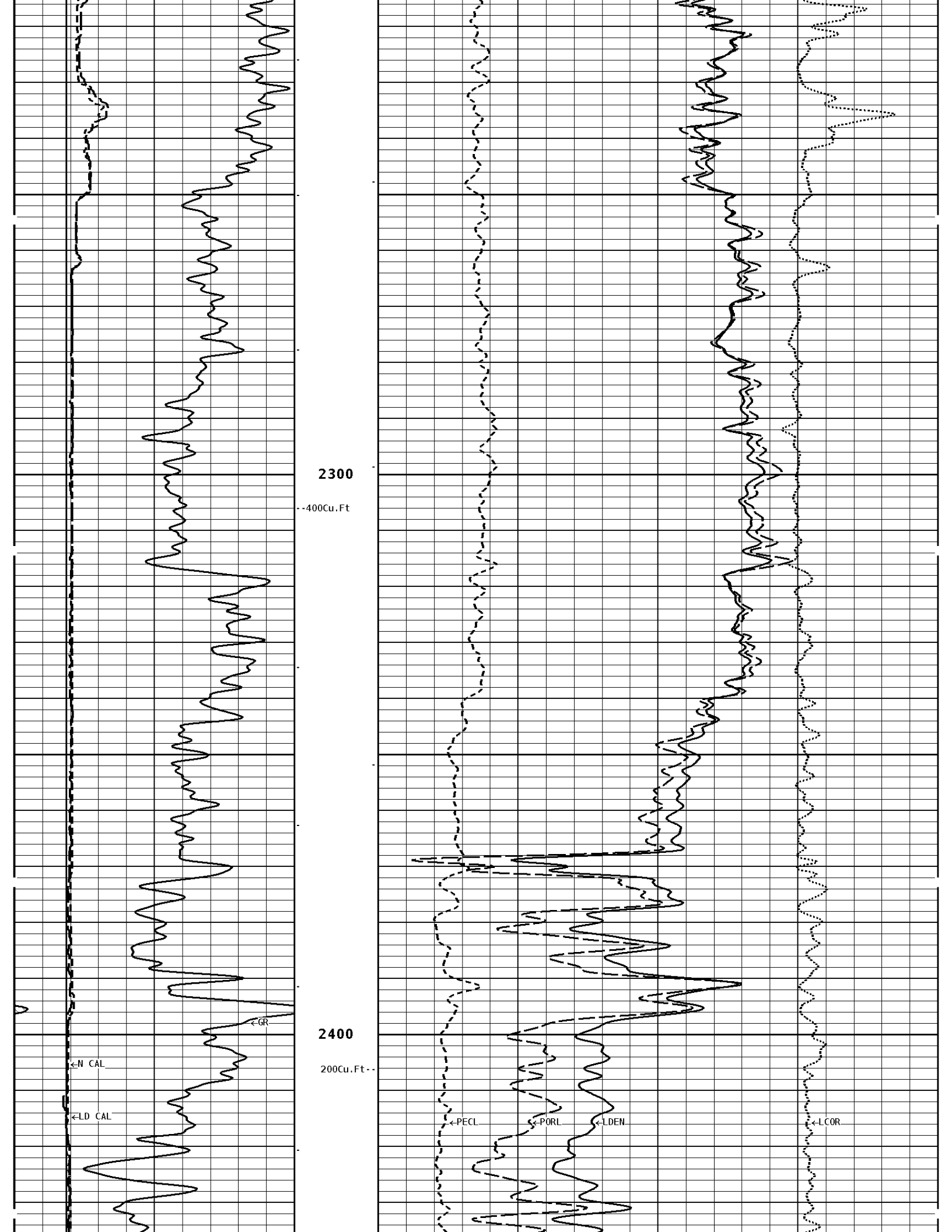
1:240 MAIN SECTION

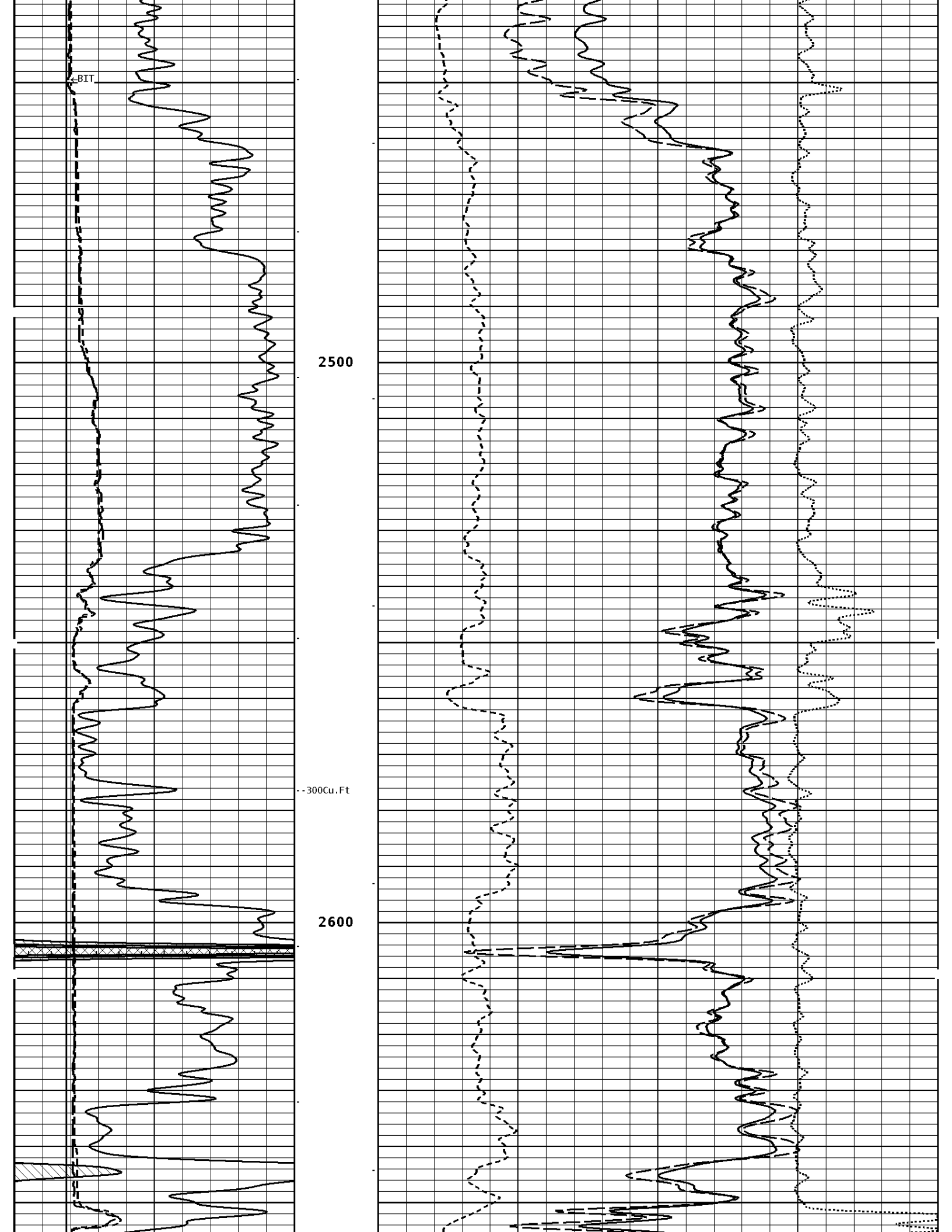
1:240 MAIN SECTION

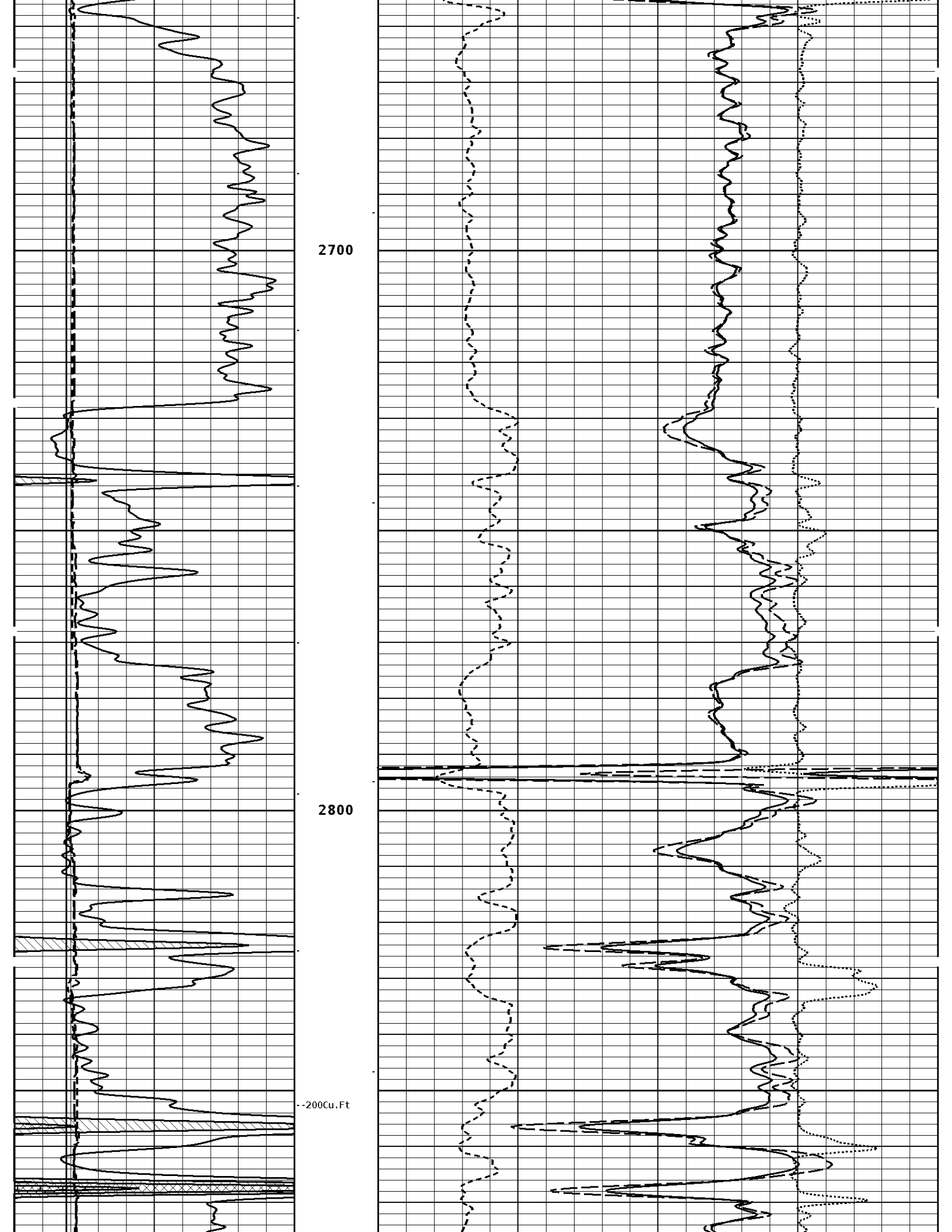
BULK DENSITY

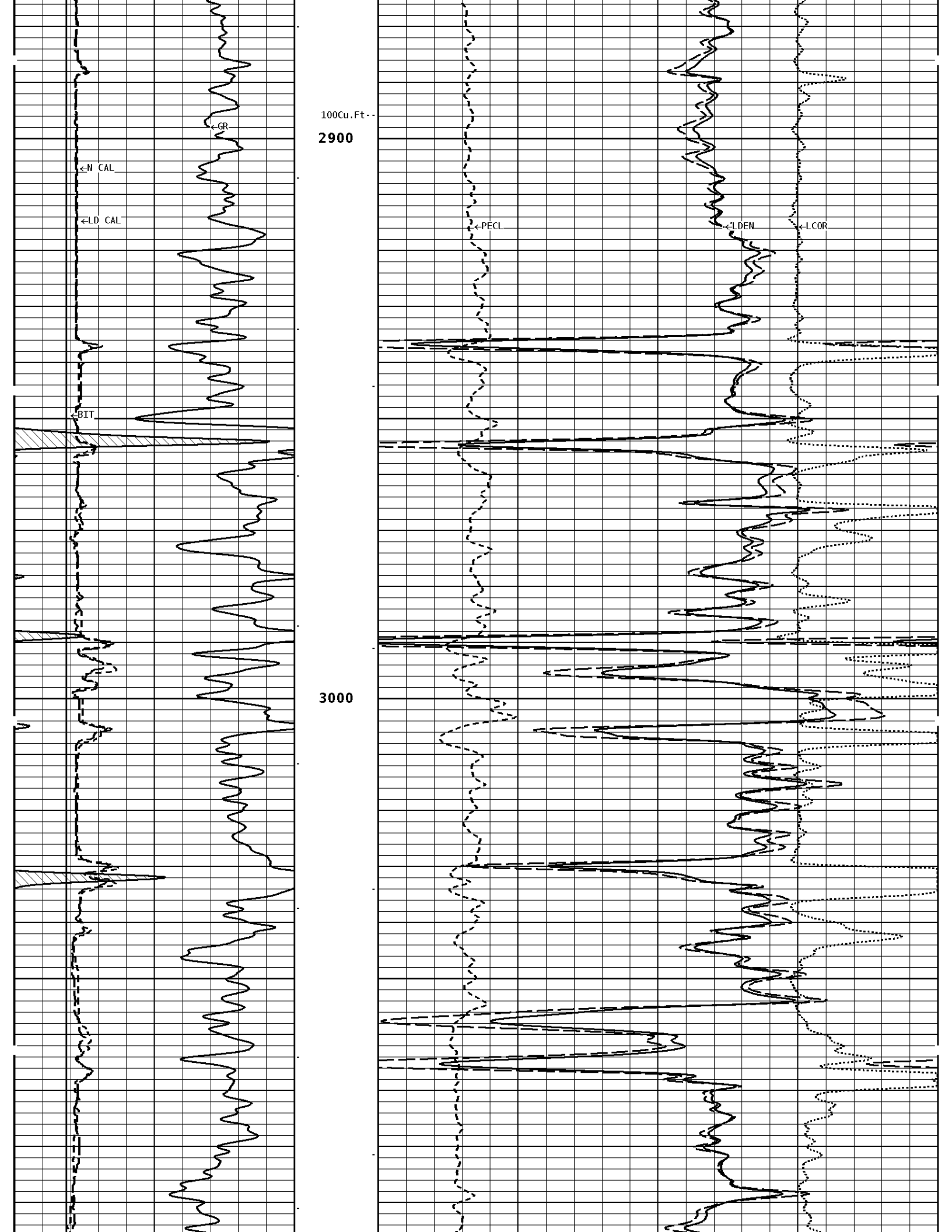


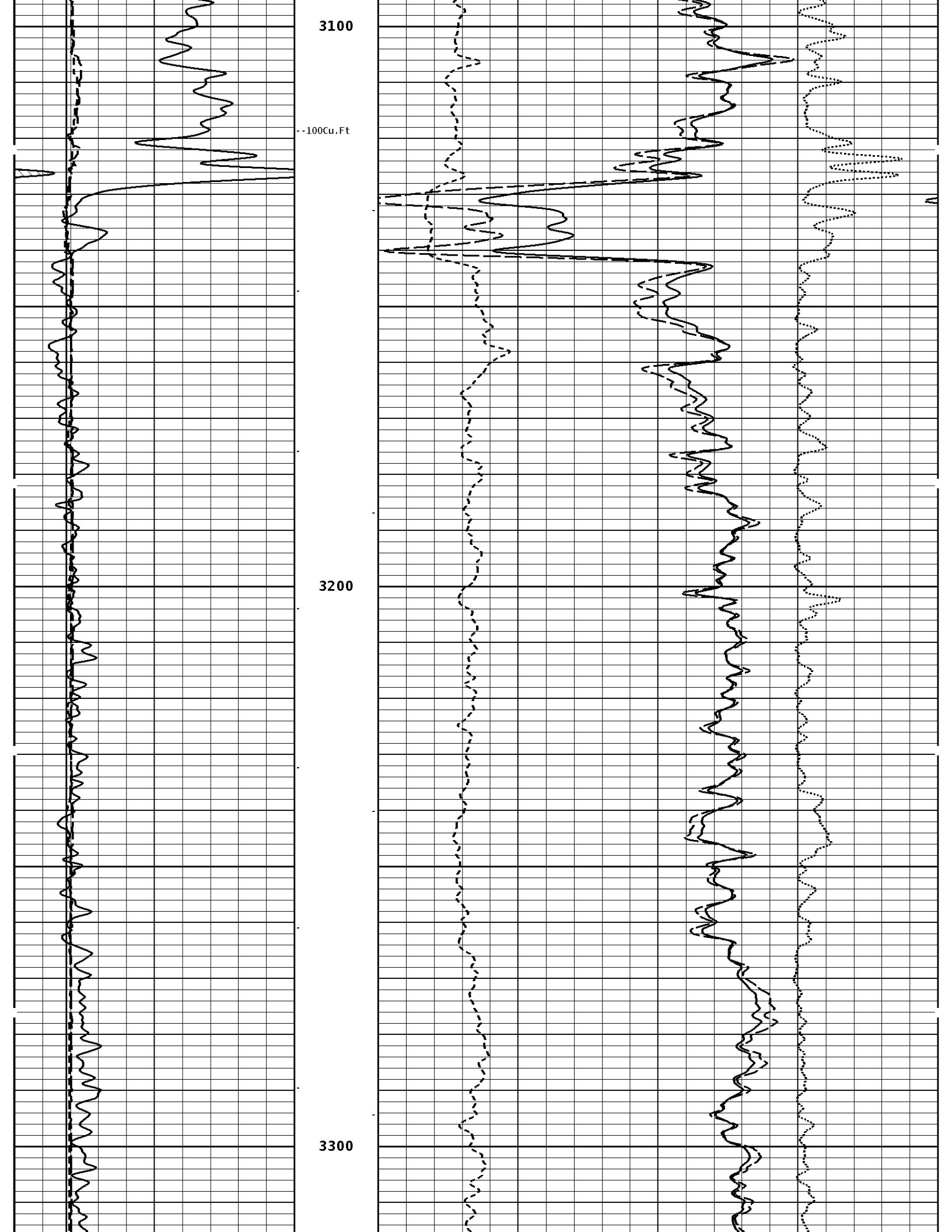

2000
500Cu.Ft
2100
2200

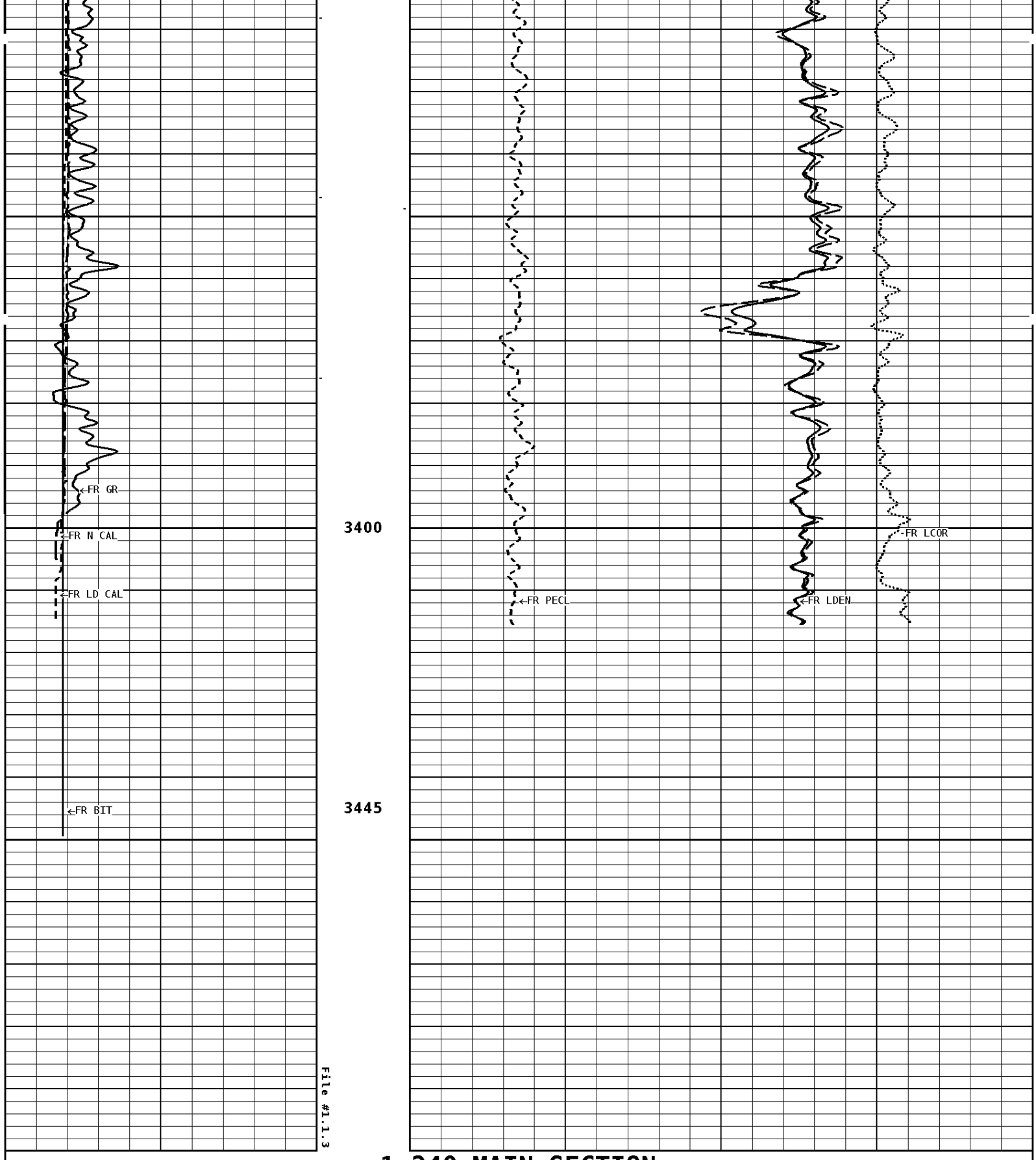

2300
--400Cu.Ft
GR
2400
N CAL
200Cu.Ft--
LD CAL
PECL
PORL
LDEN
LCOR


BIT
2500
--300Cu.Ft
2600


2700
2800
--200Cu.Ft


100Cu.Ft--
GR
2900
N CAL
LD CAL
PECL
LDEN
LCOR
BIT
3000


3100
--100Cu.Ft
3200
3300



1:240 MAIN SECTION

BULK DENSITY

GAMMA RAY API UNITS	-BHV AHV- CU.FT	DENSITY POROSITY (2.71g/cc) PERCENT
150 300 0 150		70 30 30 -10 -10 -50
DENSITY (X) CALIPER INCHES (IN)		COMPENSATED BULK DENSITY g/cc

INCHES (IN)	
16	26
6	16

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

BIT SIZE INCHES (IN)	
6	16

G/CC	
3.0	4.0
2.0	3.0
1.0	2.0

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

* 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 : 05-SEP-2017 Time : 10:52
Sensor Suite : GR-GR5 ID : GRT-BA-121

	Measured Background	Measured Jig	Units	Calibrated Jig	Units
GR	57	373	CPS	175	GRAPI

Shop Calibration CNT-AA

Performed : 01-NOV-2017 Time : 11:35
Sensor Suite : CALI-BCN ID : NDT-BB-146

	Jig - Measured Ring#1	Jig - Measured Ring#2	Jig - Calibrated Ring#1	Jig - Calibrated Ring#2	Units
CL # 1	9.2	13.9	6.0	12.0	IN.

Performed : 01-Nov-2017 Time : 11:40
Sensor Suite : BHC NEUT ID : CNP-AA-115
Source ID : N-1044

	Tank Measured	Tank Calibrated	Verification Jig	Units
N/F	4.1449	3.6893	3.6916	
Porosity	28.1	20.5	20.5	%

Shop Calibration LDT-DA

Performed : 01-NOV-2017 Time : 10:46
Sensor Suite : CALI-LTH ID : NDT-AF-102

	Jig - Measured Ring#1	Jig - Measured Ring#2	Jig - Calibrated Ring#1	Jig - Calibrated Ring#2	Units
CL # 1	9.7	14.4	6.0	12.0	IN.

Performed : 01-Nov-2017 Time : 11:02
Sensor Suite : BHCPELNG ID : LDP-DA-076
Source ID : 63558B

	Short Space BKGD	Short Space Al	Short Space Mg	Short Space Al+Fe	Units
LSW1	94	1222	1953	808	CPS
LSW2	100	1463	2305	1056	CPS
LSW3	375	3410	5429	2935	CPS
LSW4	457	3052	4376	2725	CPS
LSW5	40	69	78	65	CPS
LSW6	129	128	129	129	CPS
LSW7	82	83	83	82	CPS
LSW8	2	6	8	5	CPS
QS	0.220	0.213	0.214	0.221	
PES			2.778	5.967	
SSDN		2.688	1.688		G/CC

SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	92	1347	5534	819	CPS
LLW2	100	2472	9575	1806	CPS
LLW3	382	4535	17237	3953	CPS
LLW4	493	2078	6876	1894	CPS
LLW5	56	69	142	67	CPS
LLW6	153	153	140	154	CPS
LLW7	103	97	94	99	CPS
LLW8	4	7	21	7	CPS
QL	0.195	0.222	0.193	0.215	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration
MST-DA

Performed : 05-SEP-2017 Time : 11:00
Sensor Suite : CALI-MSN ID : MST-DA-021

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	8.3	12.6	6.0	12.0	IN.

Performed : 06-NOV-2017 Time : 11:02
Sensor Suite : MSTDA-NI ID : MST-DA-021

Internal

	Measured			Calibrated		
	Zero	Reference	Units	Zero	Reference	Units
INV-V	0.0	30239.5		0.00	1546.00	MV
NOR-V	3.9	30809.3		0.00	1646.00	MV
IN-C	0.0	29408.3		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					58.67	OHMM

Performed : 05-SEP-2017 Time : 10:54
Sensor Suite : MSTDAMSF ID : MST-DA-021

Internal

	Measured			Calibrated		
	Zero	Reference	Units	Zero	Reference	Units
MSFC	35.0	62277.7		0.00	1522.00	UA
MSFB	13098.0	44123.4		0.00	1522.00	MA
MOM1	0.0	64536.5		0.00	1522.00	MV
MSFRA					43.30	OHMM

Tucker ENERGY SERVICES

Company: VAL ENERGY, INC
Well: HAMMER D #V4-8
Location: 660' FNL & 660' FEL
Logged: 12-05-2017
K.B. Elev: 1351.0 Ft