Tucker ENERGY SERVICES

COMPOSITE LOG

Company CHIEFTAIN OIL CO., INC.
Well ACHENBACH B #5
Field STRANATHAN
County BARBER
State KANSAS
Country USA
API No. 15-007-24178-0000

File No : TUL-59627
Company : CHIEFTAIN OIL CO., INC.
Well : ACHENBACH B #5
Field : STRANATHAN
County : BARBER
State : KANSAS
Country : USA
API No : 15-007-24178-0000

Location :
2970' FSL & 2310' FWL
SE SE NW

LSD : **Sect :** 1 **Twp :** 35S **Rge :** 12W

Permanent Datum:	GL	**Elevations:**		**Services:**	
Drilling Measured From:	KB	**KB**	1413.00 Ft	CNT	PIT
Log Measured From:	KB	**DF**	1412.00 Ft	LDT	
Above Permanent Datum:	12.00 Ft	**GL**	1401.00 Ft	MLT	

Date	06-13-2014			
Run Number	1			
Depth--Driller	5597.0 Ft			
Depth--Logger	5597.0 Ft			
First Reading	5597.0 Ft			
Last Reading	338.0 Ft			
Casing--Driller	338.0 Ft			
Casing--Logger	338.0 Ft			
Bit Size	7.875 In			
Casing Size	13.375 In			
Hole Fluid Type	CHEM-GEL			
Density	9.3			
Fluid Loss	10.0			
PH/Viscosity	9.5	62.0		
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	1.160 @ 134 F			
Time Circulation Stopped	06-13-2014 2:00 pm			
Max Recorded Temp.	134 F			
Equipment/Base	127	TULSA		
Recorded By	SHELDON TYLER			
Witnessed By	DAVID BARKER			

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.

Casing Strings

Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
13.375	45.00	338.00	0.00

Bitsize Intervals

Size (In)	Bottom (Ft)
7.875	5597.00

Run Number	1
Date	06-13-2014
Date/Time On Bottom	06-13-2014 5:00 pm
Depth to Fluid	0.0 Ft
Salinity	4800.000
RMF@BHT	0.930 @ 134 F
RMC@BHT	1.390 @ 134 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

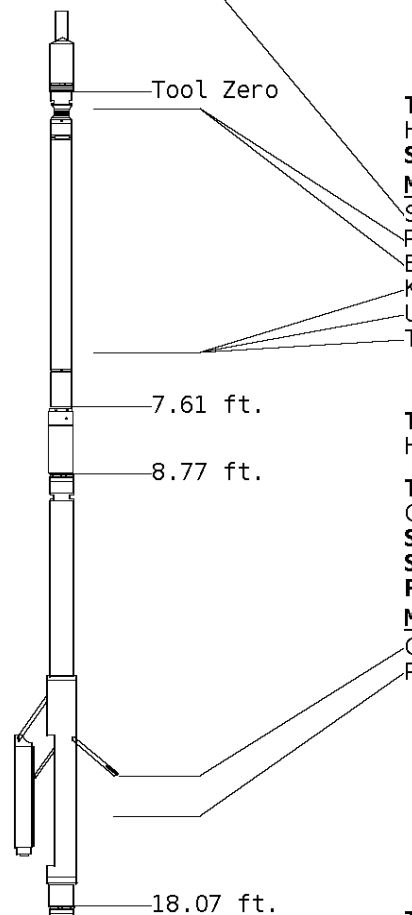
CUSTOMER REQUESTED DETAIL PULLED TO 3700'

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.JOHNSON
B.BROWN

Tool String Schematic

Total Tool Length - 58.51 **ft.**
Maximum Outside diameter - 6.00 **in.**
Net Weight in Air - 1002.50 **lbs.**



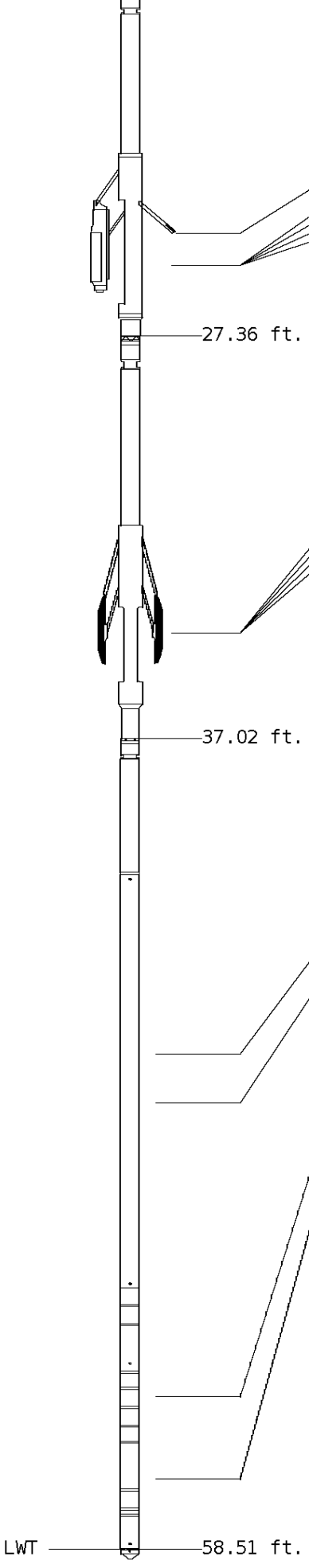
Tool: ISGRT-AB **Length:** 7.61 **ft.** **O.D.** 3.62 **in.**
HST Spectral Gamma Controller
Sonde ID :ISGRT-AA-54

Measure Point	Tool Offset	Stack Offset	Bottom Offset
SP	-4.42	-4.42	62.93
RM	0.56	0.56	57.95
BHT	0.56	0.56	57.95
K	0.00	0.00	58.51
U	0.00	0.00	58.51
T	0.00	0.00	58.51

Tool: XHST-AA **Length:** 1.15 **ft.** **O.D.** 3.62 **in.**
HST Adapter

Tool: CNT-AA **Length:** 9.30 **ft.** **O.D.** 4.36 **in.**
Compensated Neutron A Pad on NDT-A
Sonde ID :NDT-AC-027
Source ID :N-1044
Pad ID :CNP-AE-42

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLCN	6.00	14.77	43.75
PHIN	6.80	15.56	42.95



Tool: LDT-DA **Length:** 9.30 **ft.** **O.D.** 4.80 **in.**
Litho Density D Pad on NDT-A
Sonde ID :NDT-CA-137
Source ID :CSV-587
Pad ID :LDP-DA-02

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.00	24.07	34.45
PEL	7.00	25.07	33.45
PES	7.40	25.46	33.05
LDEN	7.20	25.27	33.25
LCOR	7.20	25.27	33.25

Tool: MST-DA **Length:** 9.66 **ft.** **O.D.** 6.00 **in.**
Micro Spherically Focused (IC,D)
Sonde ID :MST-DA-25

Measure Point	Tool Offset	Stack Offset	Bottom Offset
MSFL	7.60	34.97	23.55
MSCLP	7.60	34.97	23.55
INV	7.60	34.97	23.55
NOR	7.60	34.97	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	45.95	12.56
ILM	10.10	47.12	11.39
SFLU	17.49	54.51	4.00
SP	20.60	57.63	0.88

Reference: 0 Processed: Not Available

CALIPER MICRO
INCHES (IN)
16 26
6 16

BIT SIZE
INCHES (IN)
6 16

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

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

Volume
Quartz

NORMAL
OHMM
0 40

INVERSE
OHMM
0 40

DENSITY CORRECTION
G/CC
-0.75 0.25

TENSION
LBS
10000 0

Volume
Calcite

SHALLOW FOCUSED RESISTIVITY
OHMM
0.2 2000.0

PE CROSS-SECTION
BARNS/ELECTRON
0 20

SPONTANEOUS POTENTIAL
mV
→|_|←20

Volume
Dolo/Shale

DEEP INDUCTION
OHMM
0.2 2000.0

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

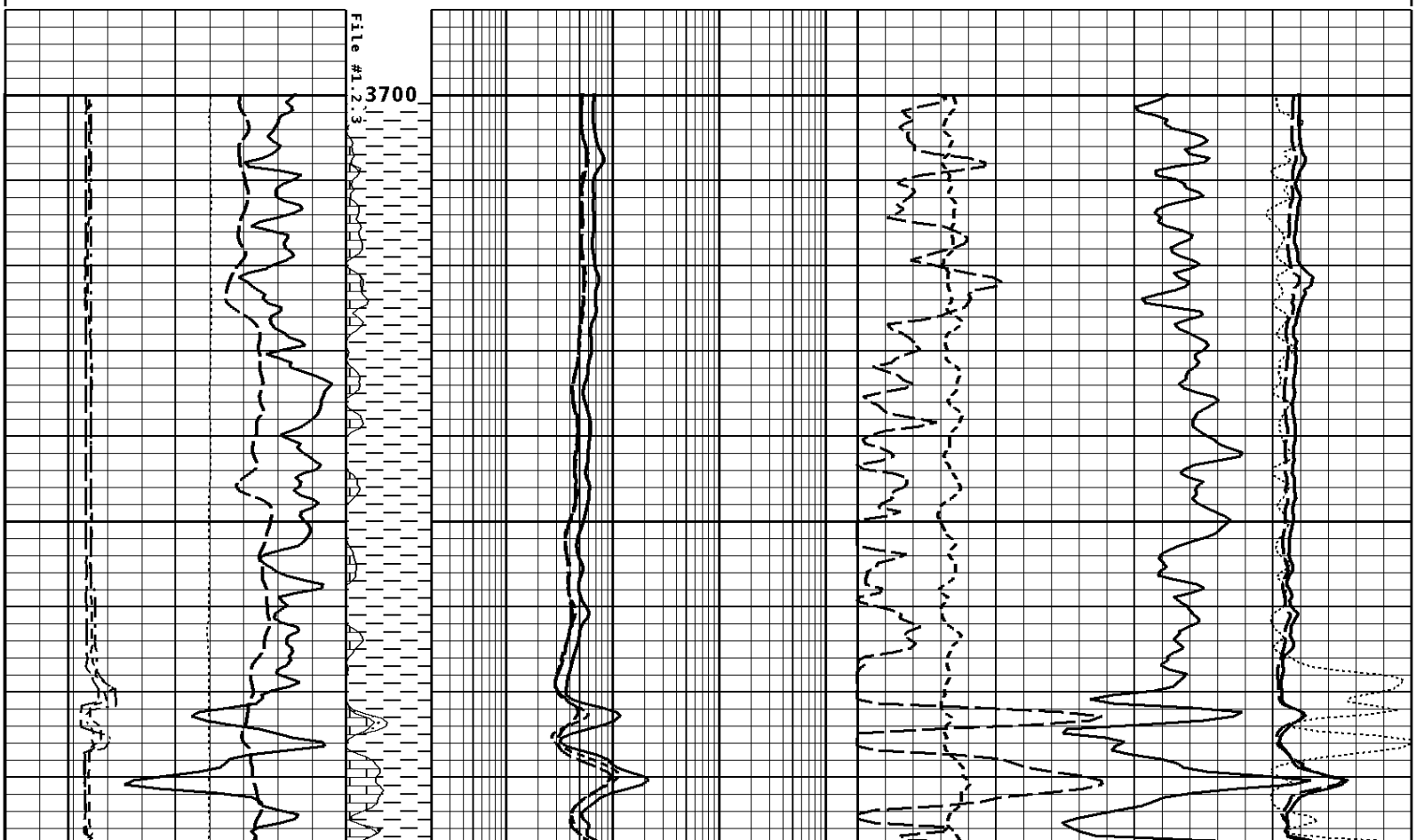
GAMMA RAY
API UNITS
150 300
0 150

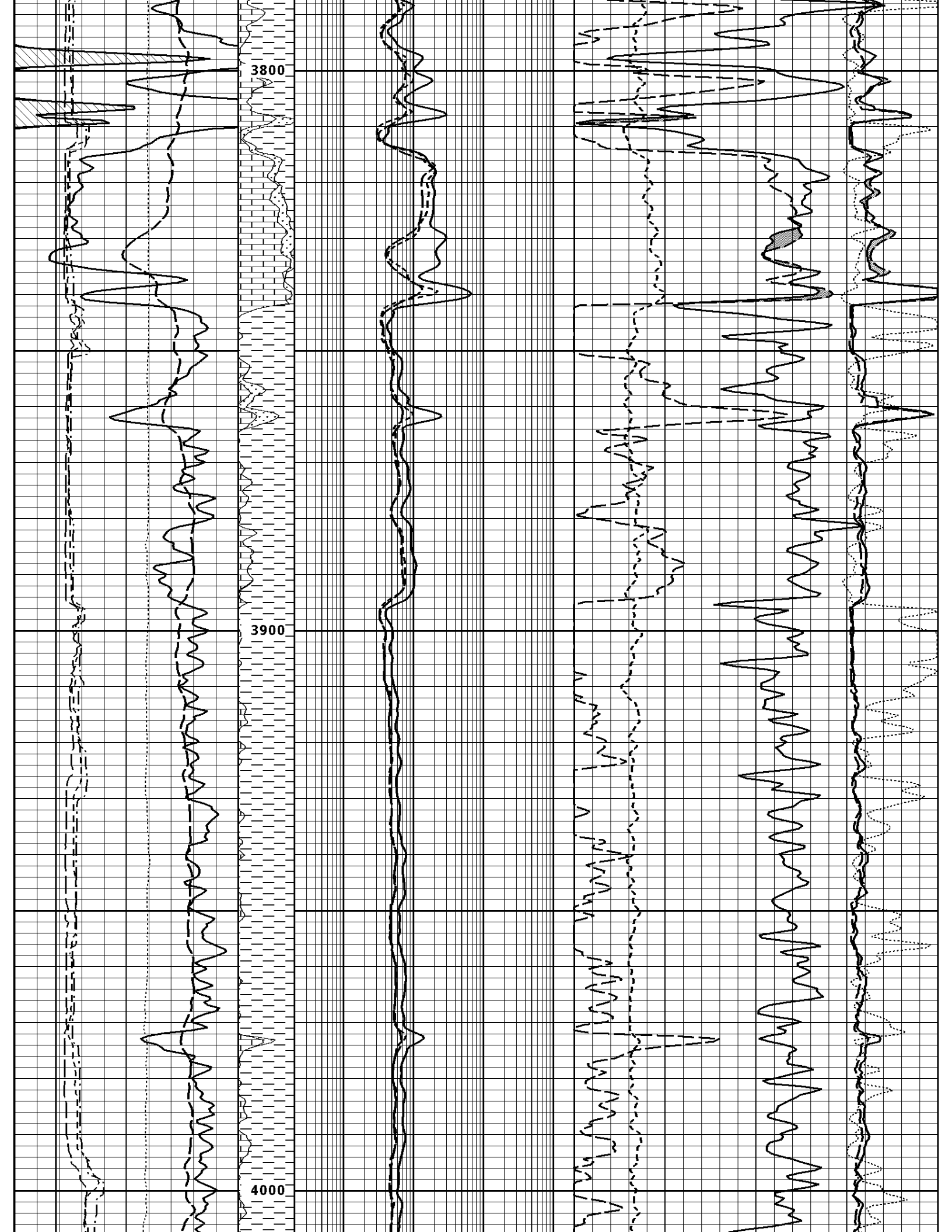
-BHV AHV-
CU.FT

MEDIUM INDUCTION
OHMM
0.2 2000.0

NEUTRON POROSITY (LIMESTONE)
PERCENT
30 -10

1:240 MAIN SECTION

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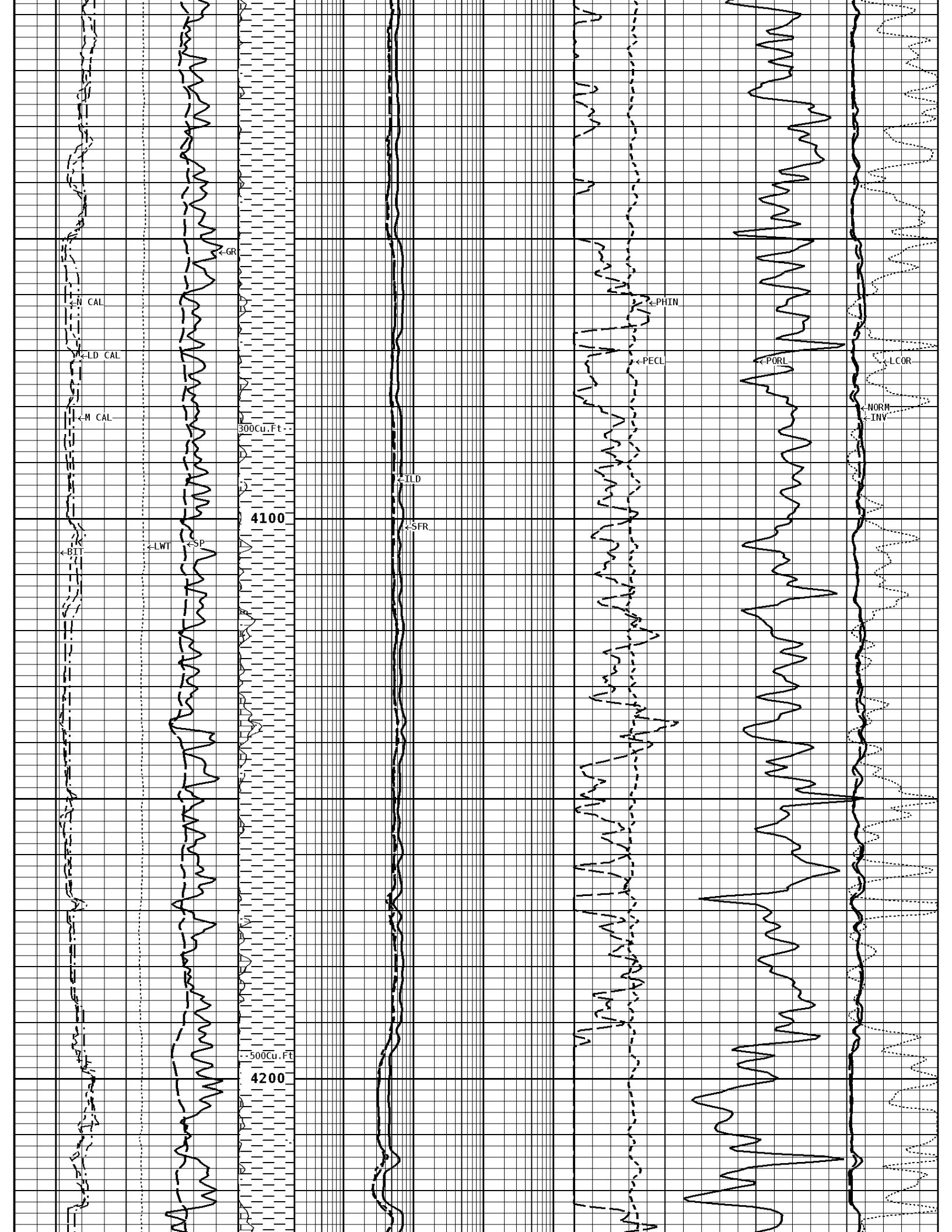
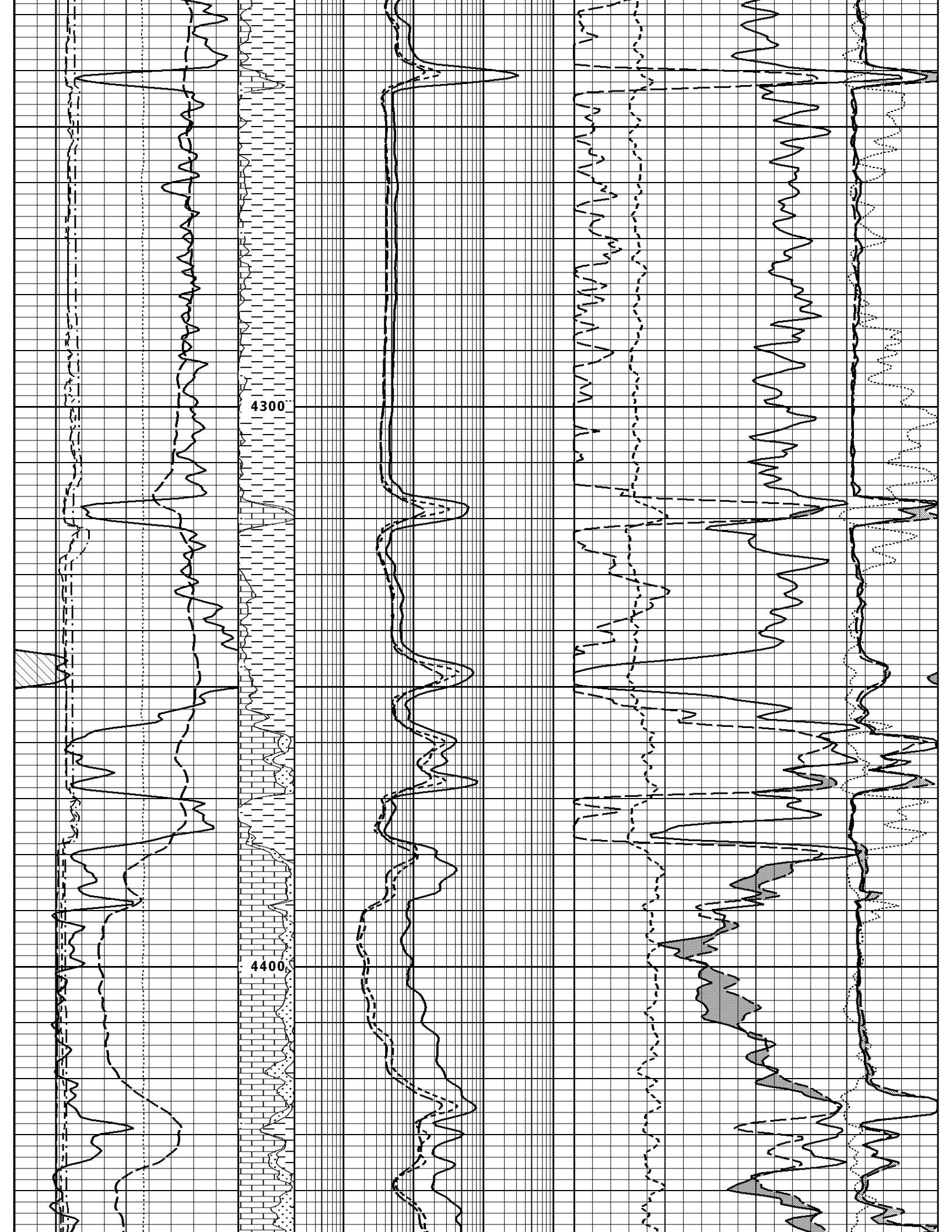

GR
N CAL
LD CAL
M CAL
300Cu.Ft
4100
BIT
LWT
SP
ILD
SFR
PHIN
PECL
PORL
LCOR
NORM
INV
500Cu.Ft
4200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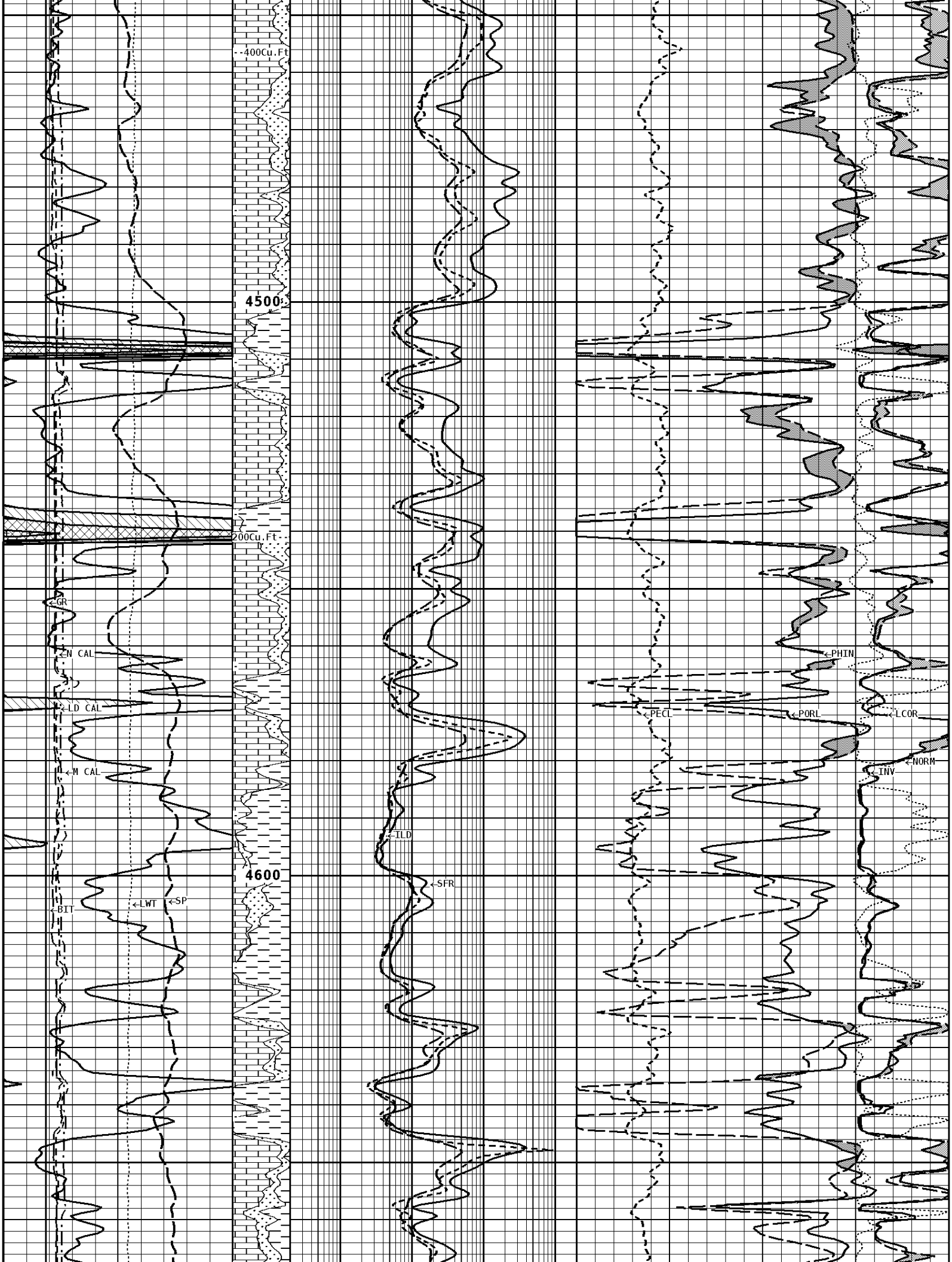
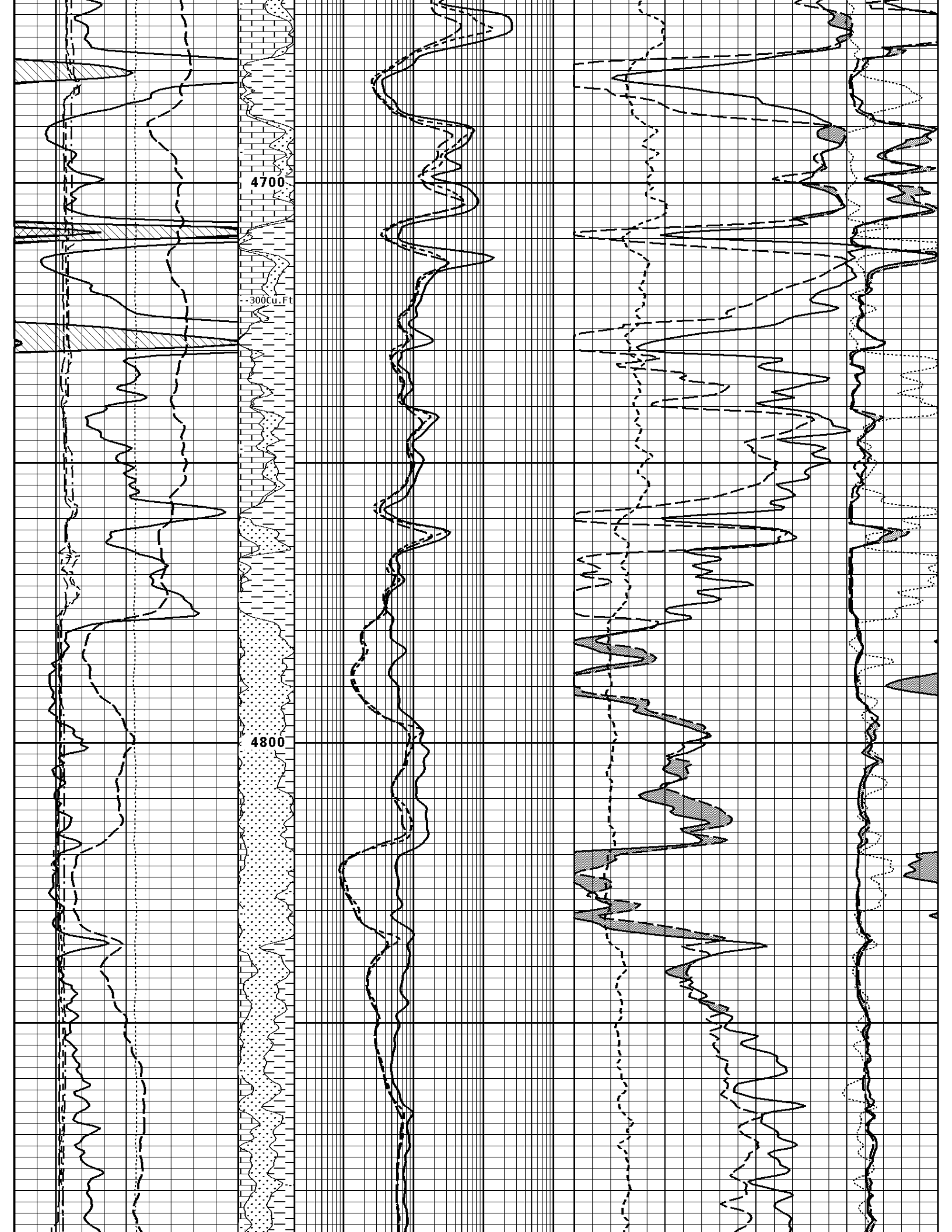
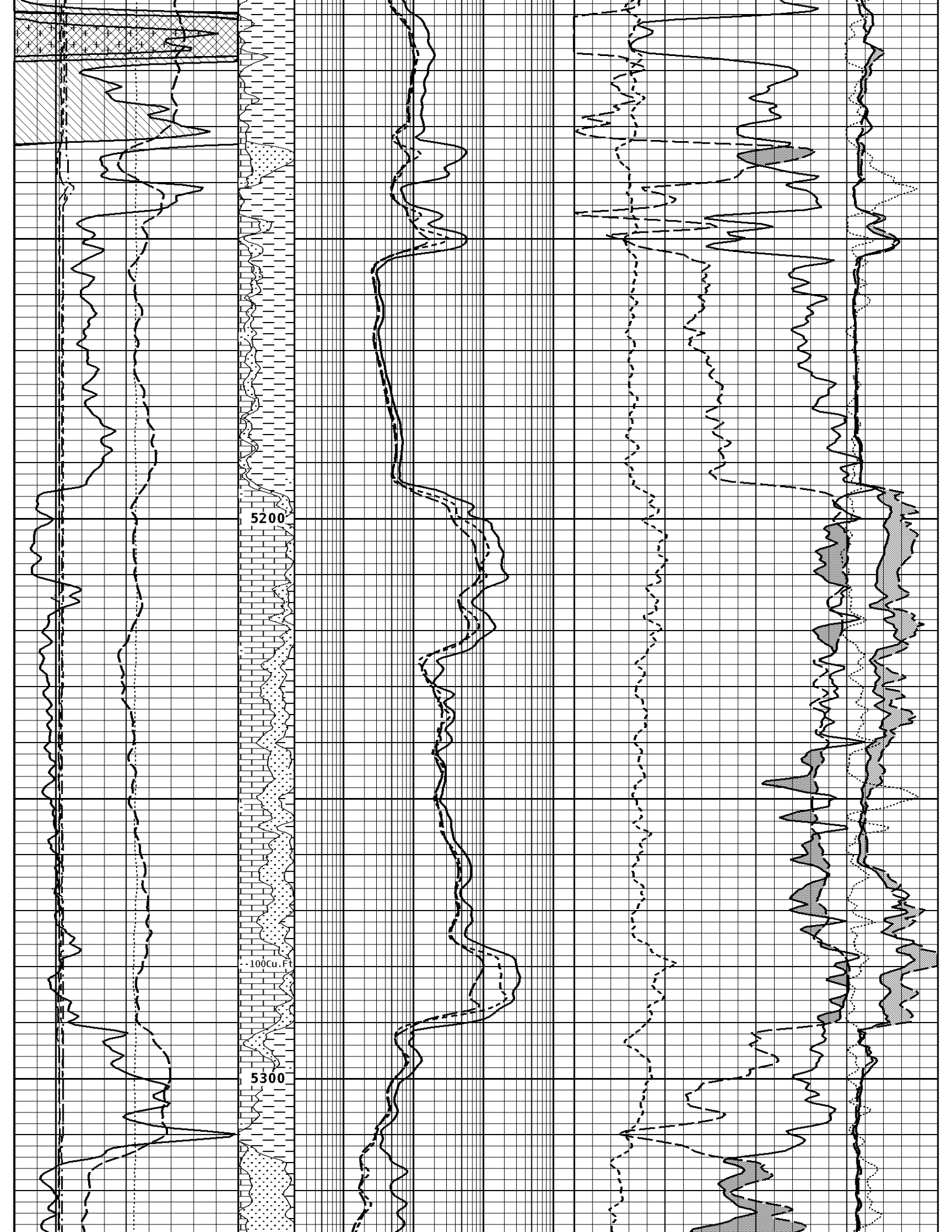
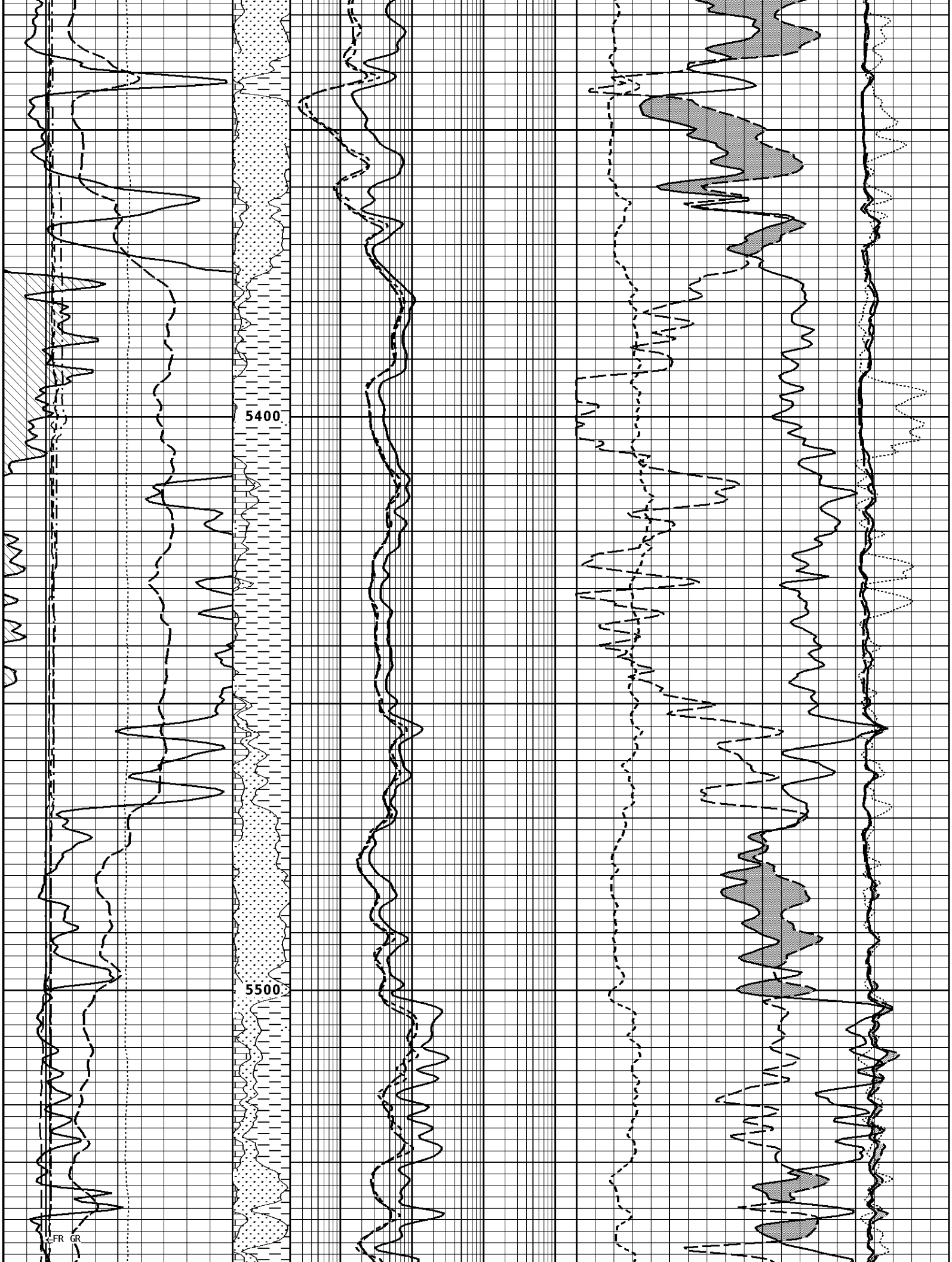

400Cu.Ft
4500
200Cu.Ft
GR
N CAL
LD CAL
M CAL
4600
BIT
LWT
SP
ILD
SFR
PHIN
PECL
PORL
LCOR
NORM
INV


4700
300Cu.Ft
4800


4900
5000
200Cu.Ft
100Cu.Ft
GR
N CAL
LD CAL
M CAL
BIT
LWT
SP
ILD
SFR
PHIN
PECL
PORL
LCOR
NORM
INV
5100


5200
-100Cu.Ft
5300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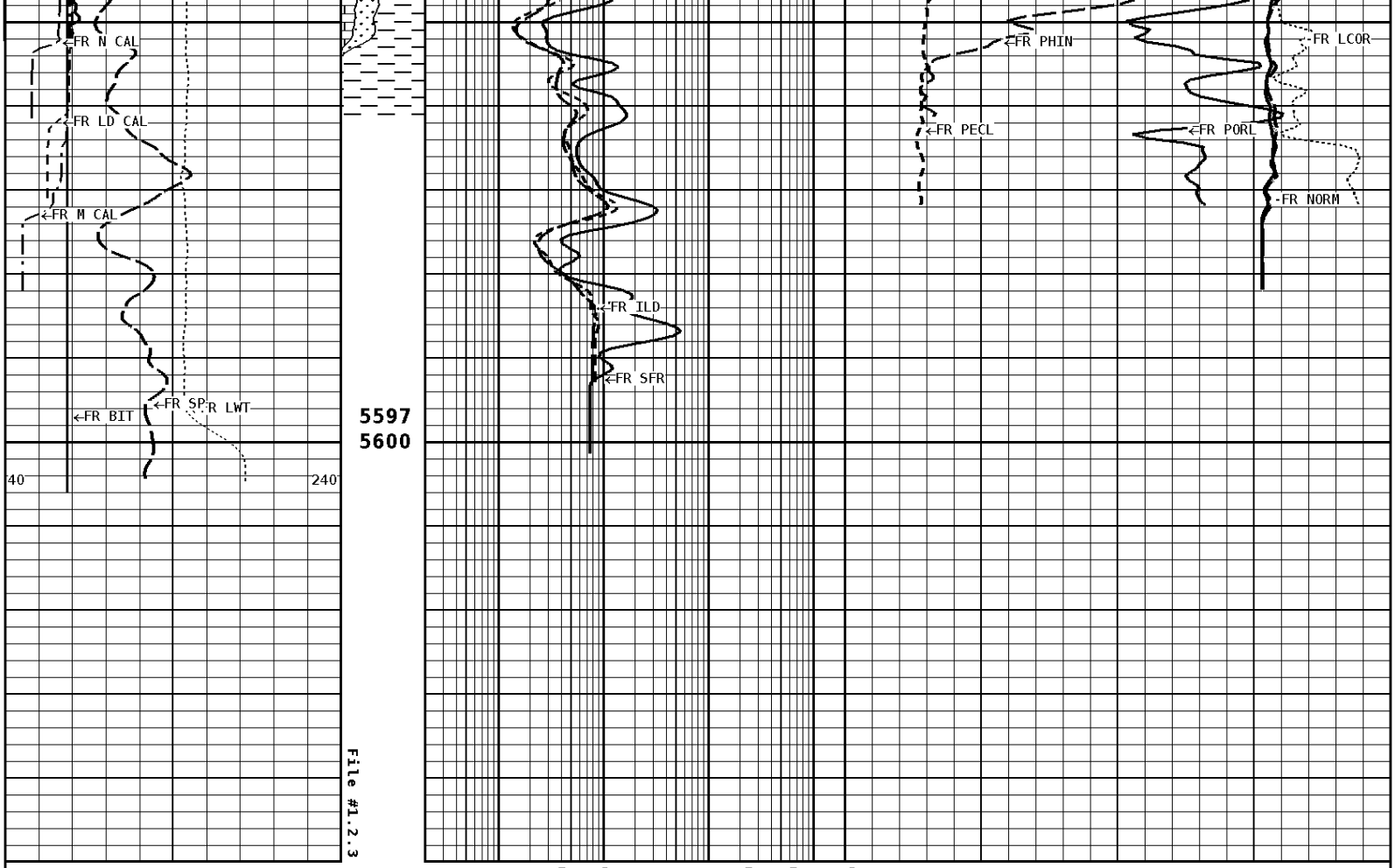
5500
←FR GR



1:240 MAIN SECTION

GAMMA RAY API UNITS 150 300 0 150	-BHV AHV- CU.FT	MEDIUM INDUCTION OHMM 0.2 2000.0	NEUTRON POROSITY (LIMESTONE) PERCENT 30 -10
SPONTANEOUS POTENTIAL mV →| |←20	Volume Dolo/Shale	DEEP INDUCTION OHMM 0.2 2000.0	DENSITY POROSITY (2.71g/cc) PERCENT 70 30 30 -10 -10 -50
TENSION LBS 10000 0	Volume Calcite	SHALLOW FOCUSED RESISTIVITY OHMM 0.2 2000.0	PE CROSS-SECTION BARNS/ELECTRON 0 20
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16	Volume Quartz		DENSITY CORRECTION G/CC -0.75 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	5.500	in
Casing Thickness	0.250	in
Casing Correction (PHI N)	Disable	
Hole Substance	Fluid	
BHT Depth	5597.000	ft
Borehole Temperature	134.0	degF
Temperature Gradient	1.00	DFHF
Resistivity Of Mud	2.000	ohm/m
MSTNG Normal Correction	0.00	ohm/m
MSTNG Inverse Correction	1.25	ohm/m

Well File: CHIEFTAIN_OIL_ACHENBACHB_5_JUNE13_MSTK_MSTK **Scale:** 1:240 **Format:** COMSAT
Segment: V1.D1.S4 Reprocess of REPEAT **Acquired:** 2014-06/13 16:44 3.5.0-12850
Reference: 0 **Processed:** 2014-06/13 18:37 3.5.0-12850

CALIPER MICRO INCHES (IN) 16 / 6 — 26 / 16

BIT SIZE INCHES (IN) 6 — 16

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

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

Volume Quartz

Volume Calcite

Volume Dolo/Shale

BHV AHV CU.FT

NORMAL OHMM 0 — 40

INVERSE OHMM 0 — 40

DENSITY CORRECTION G/CC -0.75 — 0.25

TENSION LBS 10000 — 0

SHALLOW FOCUSED RESISTIVITY OHMM 0.2 — 2000.0

PE CROSS-SECTION BARNS/ELECTRON 0 — 20

SPONTANEOUS POTENTIAL mV →| |←20

DEEP INDUCTION OHMM 0.2 — 2000.0

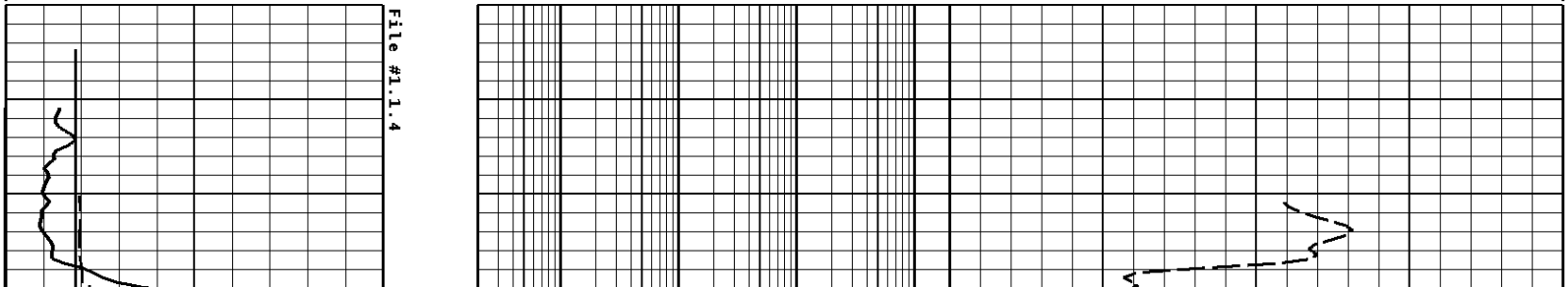
DENSITY POROSITY (2.71g/cc) PERCENT 70 / 30 — 30 / -10 / -10 / -50

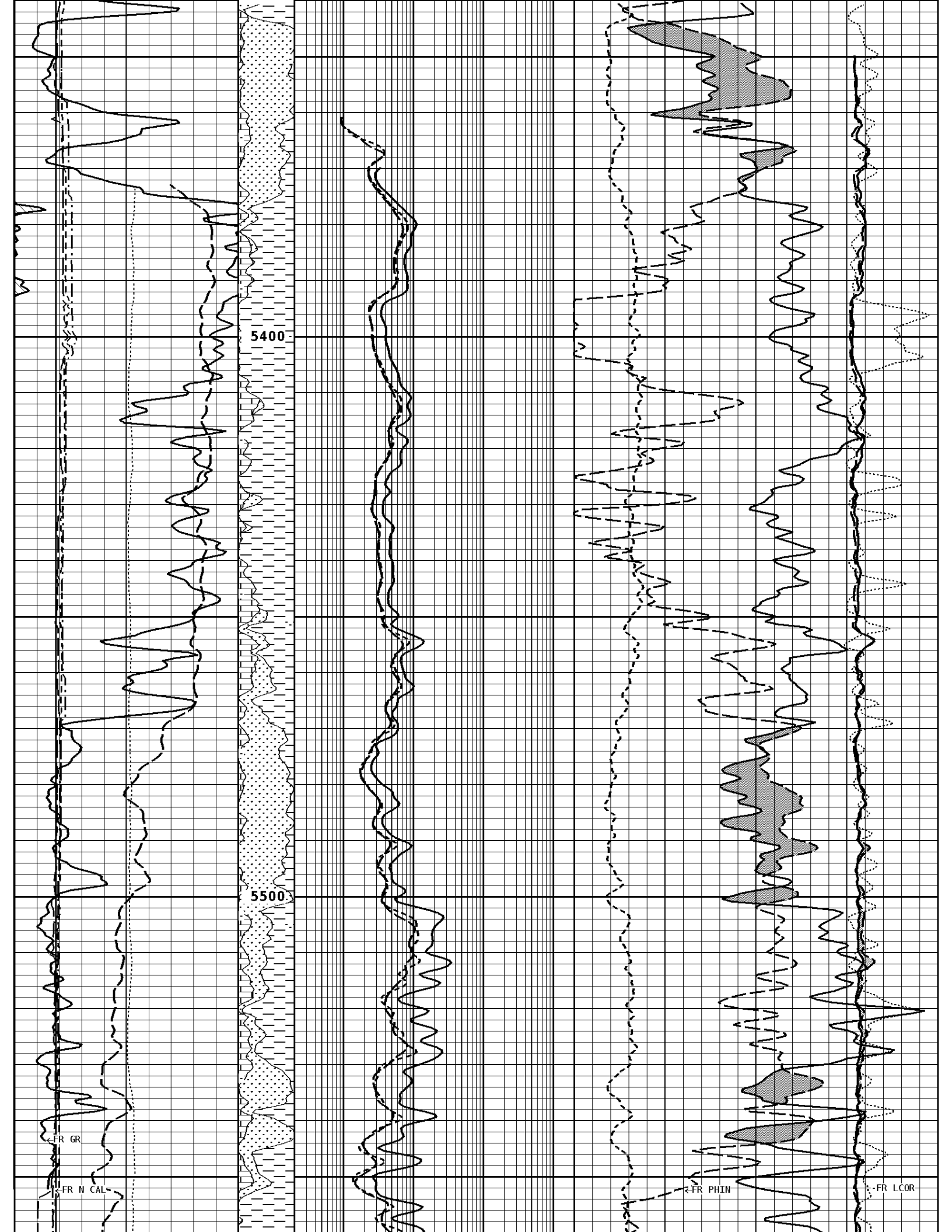
GAMMA RAY API UNITS 150 / 0 — 300 / 150

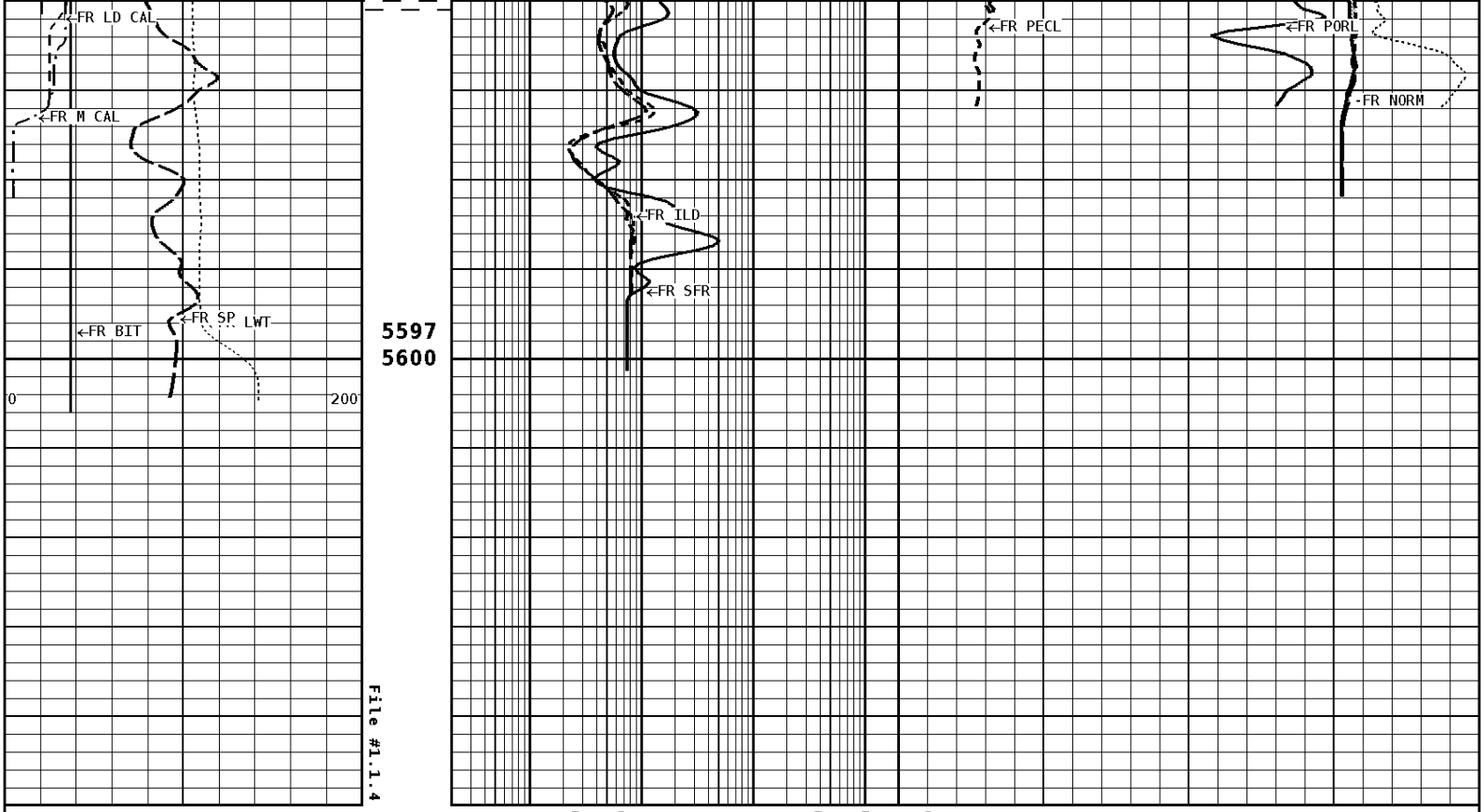
MEDIUM INDUCTION OHMM 0.2 — 2000.0

NEUTRON POROSITY (LIMESTONE) PERCENT 30 — -10

1:240 REPEAT SECTION




5400
5500
FR GR
FR N CAL
FR PHIN
FR LCOR



1:240 REPEAT SECTION

GAMMA RAY **API UNITS** 150 300 0 150	-BHV AHV- CU.FT	**MEDIUM INDUCTION** **OHMM** 0.2 2000.0	**NEUTRON POROSITY (LIMESTONE)** **PERCENT** 30 -10
SPONTANEOUS POTENTIAL **mV** → ←20	Volume Dolo/Shale	**DEEP INDUCTION** **OHMM** 0.2 2000.0	**DENSITY POROSITY (2.71g/cc)** **PERCENT** 70 30 30 -10 -10 -50
TENSION **LBS** 10000 0	Volume Calcite	**SHALLOW FOCUSED RESISTIVITY** **OHMM** 0.2 2000.0	**PE CROSS-SECTION** **BARNS/ELECTRON** 0 20
DENSITY (X) CALIPER **INCHES (IN)** 16 26 6 16	Volume Quartz		**DENSITY CORRECTION** **G/CC** -0.75 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	5.500	in
Casing Thickness	0.250	in
Casing Correction (PHI N)	Disable	
Hole Substance	Fluid	
BHT Depth	5597.000	ft
Borehole Temperature	134.0	degF
Temperature Gradient	1.00	DFHF
Resistivity Of Mud	2.000	ohm/m
MSTNG Normal Correction	0.00	ohm/m
MSTNG Inverse Correction	1.25	ohm/m

* Calibration Summary *

Shop Calibration
ISGRT-AB

Performed : 12-JUN-2014 Time : 10:56
Sensor Suite : SPGCGR ID : ISGRT-AA-54

	Measured		Units	Calibrated	Units
	Background	Jig		Jig	
GR	123	859	CPS	205	GRAPI

Performed : 12-JUN-2014 Time : 11:00
Sensor Suite : SPGCRM ID : ISGRT-AA-54

	Internal				
	Measured		Calibrated		
	Zero	Reference	Zero	Reference	Units
Rmi	0.0	34825.0	0.0	290.6	mA
Rmv	0.0	34825.0	0.0	290.6	mV
Equivalent Rm				0.0871	OHMM

Shop Calibration
CNT-AA

Performed : 28-MAY-2014 Time : 10:00
Sensor Suite : CALI-BCN ID : NDT-AC-027

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	8.0	14.6	6.0	12.0	IN.

Performed : 28-May-2014 Time : 10:06
Sensor Suite : BHC NEUT ID : CNP-AE-42
Source ID : N-1044

	Tank		Verification	Units
	Measured	Calibrated	Jig	
N/F	3.6559	3.6893	3.7007	
Porosity	20.0	20.5	20.7	%

Shop Calibration
LDT-DA

Performed : 28-May-2014 Time : 11:43
Sensor Suite : CALI-LTH ID : NDT-CA-137

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	7.9	11.3	6.0	12.0	IN.

Performed : 28-May-2014 Time : 11:37
Sensor Suite : BHCPELNG ID : LDP-DA-02
Source ID : CSV-587

	Short Space				
	BKGD	Al	Mg	Al+Fe	Units
LSW1	64	431	708	293	CPS
LSW2	65	520	849	376	CPS
LSW3	262	1290	2059	1122	CPS
LSW4	335	1250	1752	1123	CPS
LSW5	31	42	42	40	CPS
LSW6	85	88	88	88	CPS
LSW7	57	56	55	57	CPS
LSW8	2	2	3	2	CPS
QS	0.191	0.217	0.226	0.215	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	99	575	2378	365	CPS
LLW2	110	994	4156	724	CPS
LLW3	417	1918	7161	1683	CPS
LLW4	546	1120	2919	1044	CPS
LLW5	60	64	80	63	CPS
LLW6	177	173	170	174	CPS
LLW7	109	110	104	110	CPS
LLW8	3	5	9	4	CPS
QL	0.237	0.222	0.240	0.225	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration
MST-DA

Performed : 28-MAY-2014 Time : 11:44
Sensor Suite : CALI-MSN ID : MST-DA-25

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	6.8	12.5	6.0	12.0	IN.

Performed : 28-MAY-2014 Time : 11:44
Sensor Suite : MSTDA-NI ID : MST-DA-25

Internal

	Measured			Calibrated		
	Zero	Reference	Units	Zero	Reference	Units
INV-V	0.0	30010.6		0.00	1546.00	MV
NOR-V	0.1	30159.6		0.00	1546.00	MV
IN-C	0.0	57334.5		0.00	15.46	UA
INV-R					32.34	OHMM
NOR-R					55.11	OHMM

Shop Calibration
PIT-CA

Performed : 15-APR-2014 Time : 14:04
Sensor Suite : P-IND-T ID : PIT-CA-062

Medium

	Measured		Calibrated		
	R	X	R	X	Units
Air	130583	130713	-0.1	-0.1	MMHOS
Zero	131074	131072	27.3	6.4	MMHOS
Reference	253427	250043	5027.3	5006.4	MMHOS
Loop	130592	221688	3823.7	3823.0	MMHOS
Sonde Error			-1.3	-15.8	MMHOS
Cond			5027.3	5006.4	MMHOS

Deep

	Measured		Calibrated		
	R	X	R	X	Units
Air	129032	131483	-0.0	0.1	MMHOS
Zero	131074	131059	39.8	-17.0	MMHOS
Reference	233823	231658	2039.8	1983.0	MMHOS
Loop	129039	222242	1804.5	1804.3	MMHOS
Sonde Error			-8.5	-8.7	MMHOS
Cond			2039.8	1983.0	MMHOS

Temperature

Measured		Calibrated		
Low	High	Low	High	Units
16980.0	56920.0	70.0	350.0	DEGF

Performed : 15-Apr-2014 Time : 13:51
Sensor Suite : SFL ID : PIT-CA-062

Internal

	Measured		Calibrated		
	Zero	Reference	Zero	Reference	Units
Im	32763.3	48949.7	0.0	7028.0	uA
Ib	32767.3	48756.3	0.0	1750.0	mA
MOM1	32726.5	57507.3	0.0	175.0	mV
Equivalent SFL				43.97	OHMM

Performed : 15-Apr-2014 Time : 13:49
Sensor Suite : P-SP ID : PIT-CA-062

Internal

Measured		Calibrated		
Zero	Reference	Zero	Reference	Units
32765.9	58980.4	0.0	1000.0	mV

Tucker ENERGY SERVICES

Company:	CHIEFTAIN OIL CO., INC.
Well:	ACHENBACH B #5
Location:	2970' FSL & 2310' FWL
Logged:	06-13-2014
K.B. Elev:	1413.0 Ft