Tucker ENERGY SERVICES

COMPOSITE LOG

Company PICKRELL DRILLING COMPANY, IN
Well HIGGINS K #3
Field SPIVEY-GRABS-BASIL
County KINGMAN
State KANSAS
Country USA
API No. 15-095-22293-00-00

File No : TUL-60360
Company : PICKRELL DRILLING COMPANY, INC.
Well : HIGGINS K #3
Field : SPIVEY-GRABS-BASIL
County : KINGMAN
State : KANSAS
Country : USA
API No : 15-095-22293-00-00

Location :
1320' FNL & 2310' FWL
E2 E2 NW

LSD : **Sect :** 15 **Twp :** 30S **Rge :** 8W

Permanent Datum:	GL	**Elevations:**		**Services:**	
Drilling Measured From:	KB	**KB** 1504.00	Ft	CNT	PIT
Log Measured From:	KB	**DF** 1503.00	Ft	LDT	
Above Permanent Datum:	10.00 Ft	**GL** 1494.00	Ft	MLT	

Date	01-15-2015						
Run Number	1						
Depth--Driller	4270.0	Ft					
Depth--Logger	4270.0	Ft					
First Reading	4269.0	Ft					
Last Reading	210.0	Ft					
Casing--Driller	211.0	Ft					
Casing--Logger	210.0	Ft					
Bit Size	7.875	In					
Casing Size	8.625	In					
Hole Fluid Type	CHEM-GEL						
Density	9.3	lb/gal					
Fluid Loss	8.8	ml/30min					
PH/Viscosity	10.0	47.0 sec/qt					
Sample Source	MEASURED						
RM@Measured Temp.	5.000 @ 60 F						
RMF@Measured Temp	4.250 @ 60 F						
RMC@Measured Temp.	5.750 @ 60 F						
Source RMF/RMC	CALCULATED	CALCULATED					
RM@BHT	1.210 @ 110 F						
Time Circulation Stopped	01-15-2015 2:00 pm						
Max Recorded Temp.	110	F					
Equipment/Base	TRK-123	TULSA					
Recorded By	J. ADAMS						
Witnessed By	A. YOUNG						

Bitsize Intervals

Size (In)	Bottom (Ft)
7.875	4270.00

Casing Strings

Size (In)	Weight (Lbs)	Bottom (Ft)	Top (Ft)
8.625	23.00	211.00	0.00

Run Number	1		
Date	01-15-2015		
Date/Time On Bottom	01-15-2015 7:30 pm		
Depth to Fluid	0.0	Ft	
Salinity	3000.000	ppm	
RMF@BHT	1.070 @ 110 F		
RMC@BHT	1.350 @ 110 F		

Run Number 1

Comments

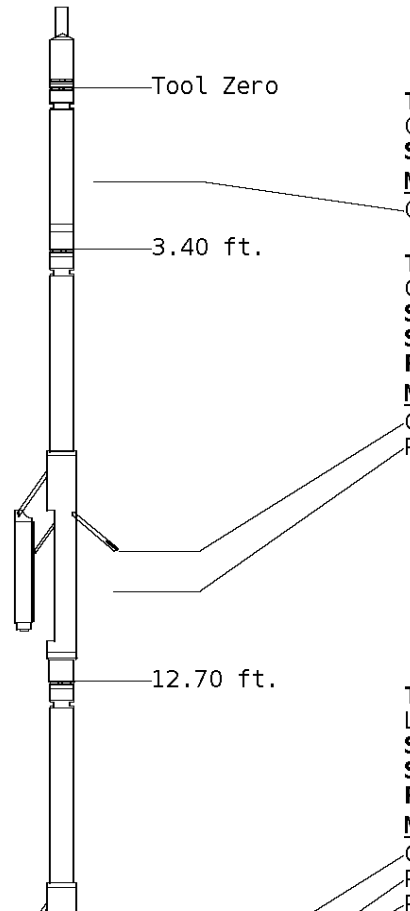
ALL PRESENTATIONS AS PER CUSTOMER REQUEST
GRT, CNT, LDT, MLT AND PIT RUN IN COMBINATION
CALIPERS ORIENTED ON X-Y AXIS
2.71 G/CC USED TO CALCULATE POROSITY
ANNULAR HOLE VOLUME CALCULATED USING 4.5" PRODUCTION CASING
PHIN IS CALIPER CORRECTED
NO REPEAT DUE TO CALIPERS FAILED TO CLOSE AFTER REPEAT, LOGGED OUT

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.OFFIEGBU
R.FRANKLIN

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-017

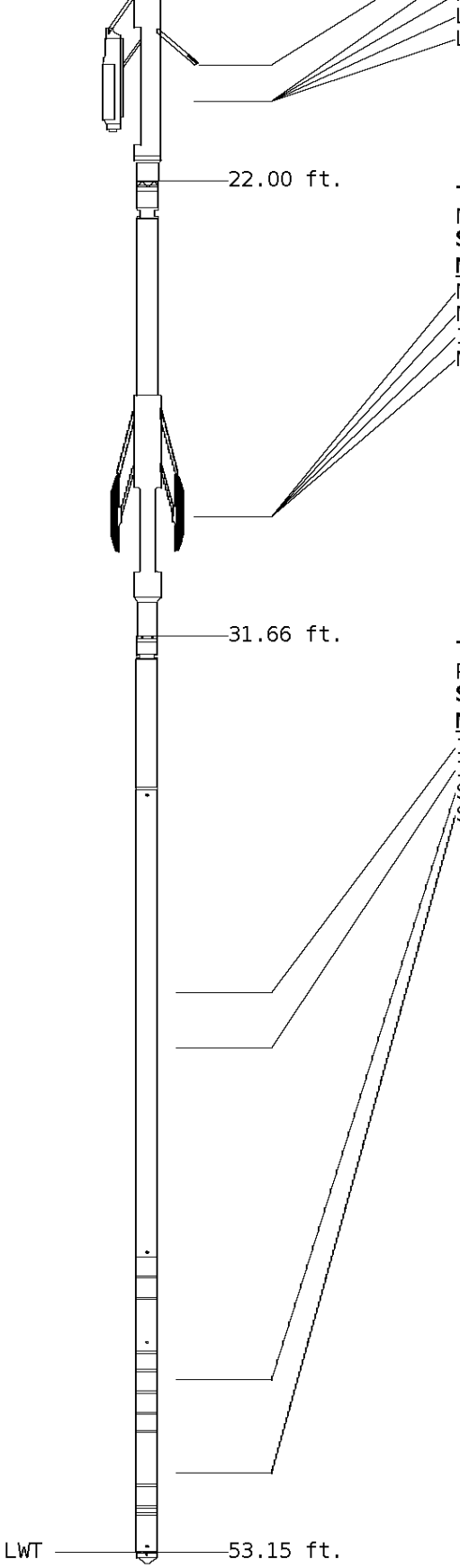
Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	51.15

Tool: CNT-AA **Length:** 9.30 **ft.** **O.D.** 4.36 **in.**
Compensated Neutron A Pad on NDT-A
Sonde ID :NDT-BB-122
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-CA-137
Source ID :CSV-587
Pad ID :LDP-DA-47

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 :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_HIGGINS_K_3_JAN16_MSTK **Scale:** 1:240 **Format:** COMSAT
Segment: V1.D1.S7 FINAL **Acquired:** Not Available
Reference: 0 **Processed:** Not Available

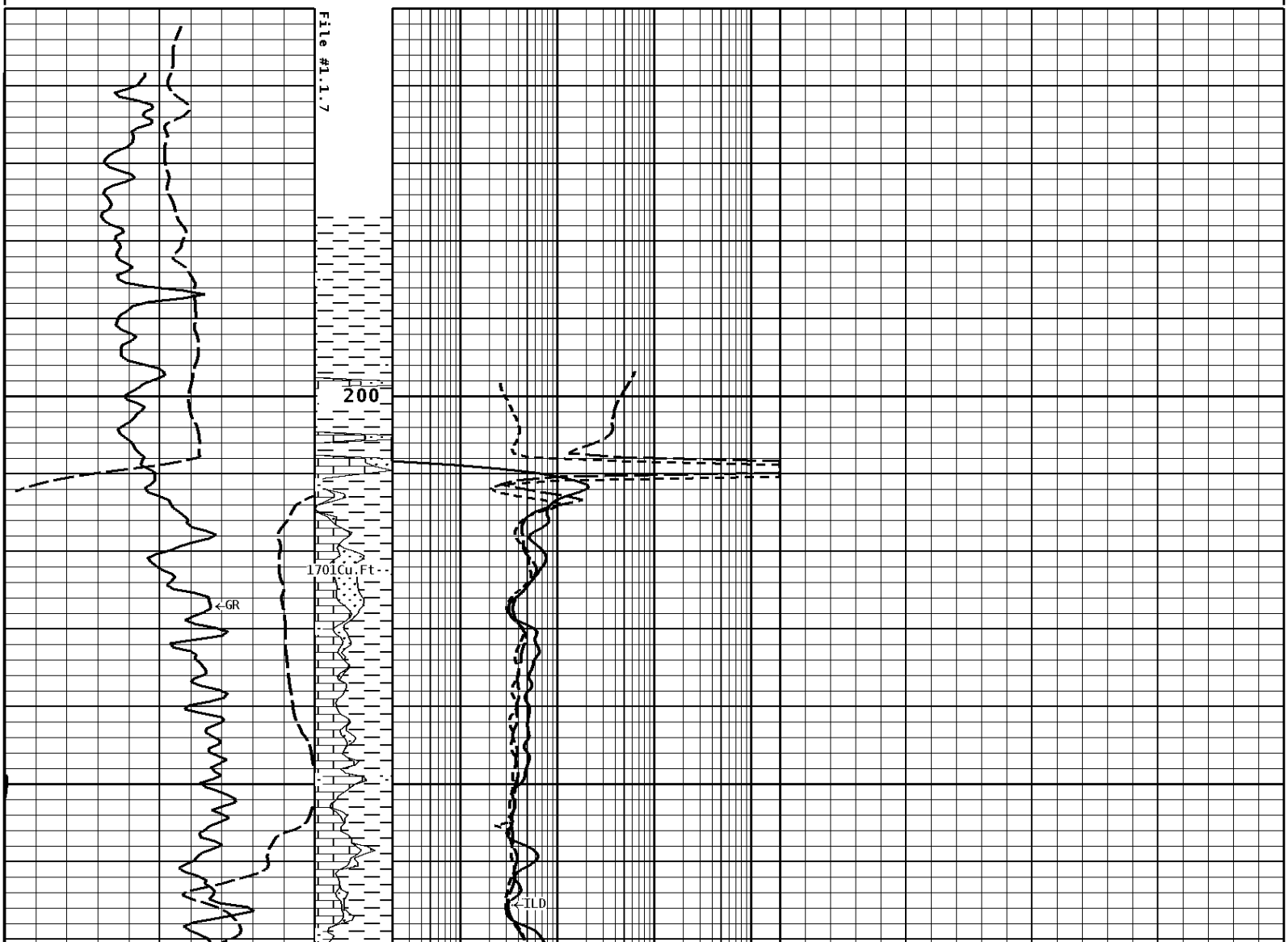
CALIPER MICRO
INCHES (IN)
16 26
6 16

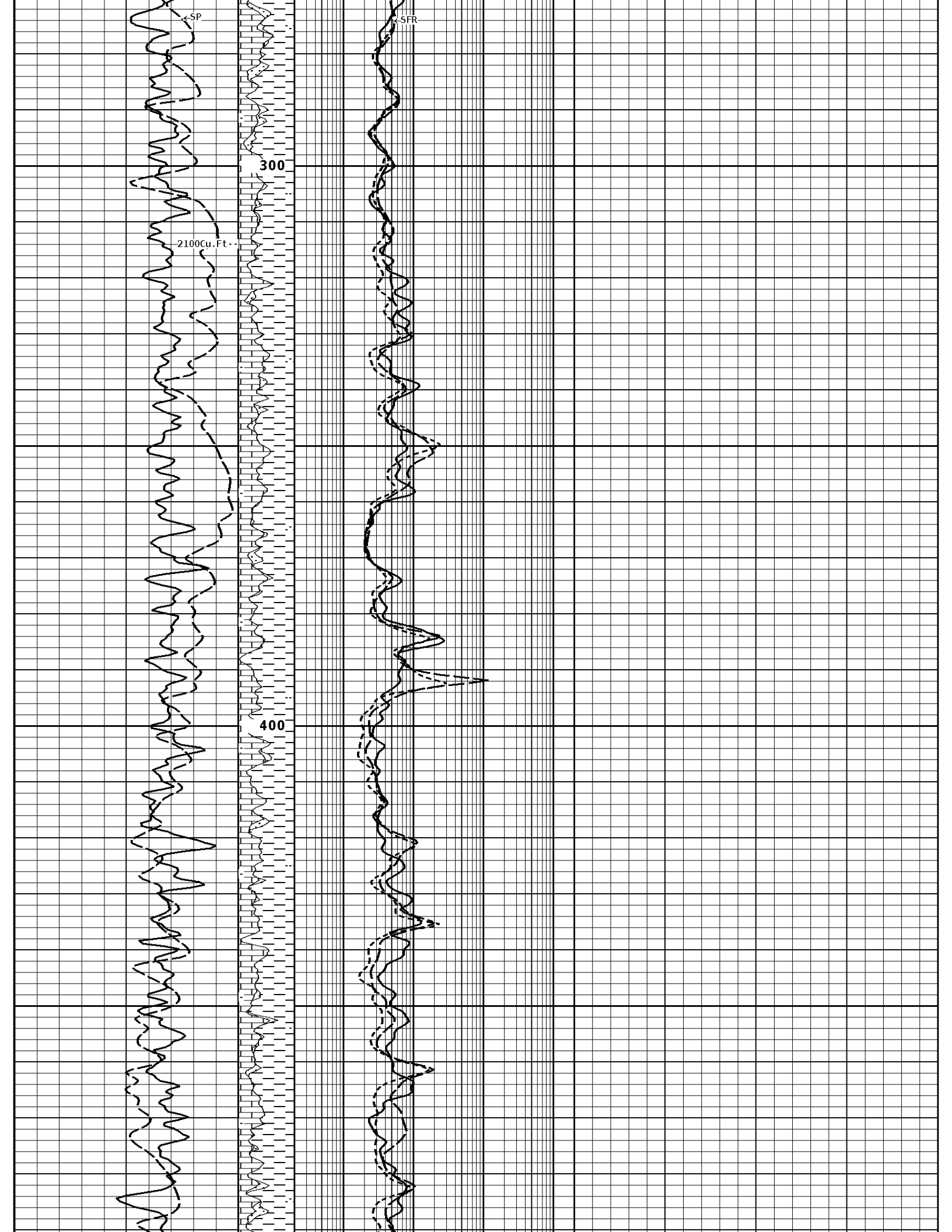
BIT SIZE
INCHES (IN)

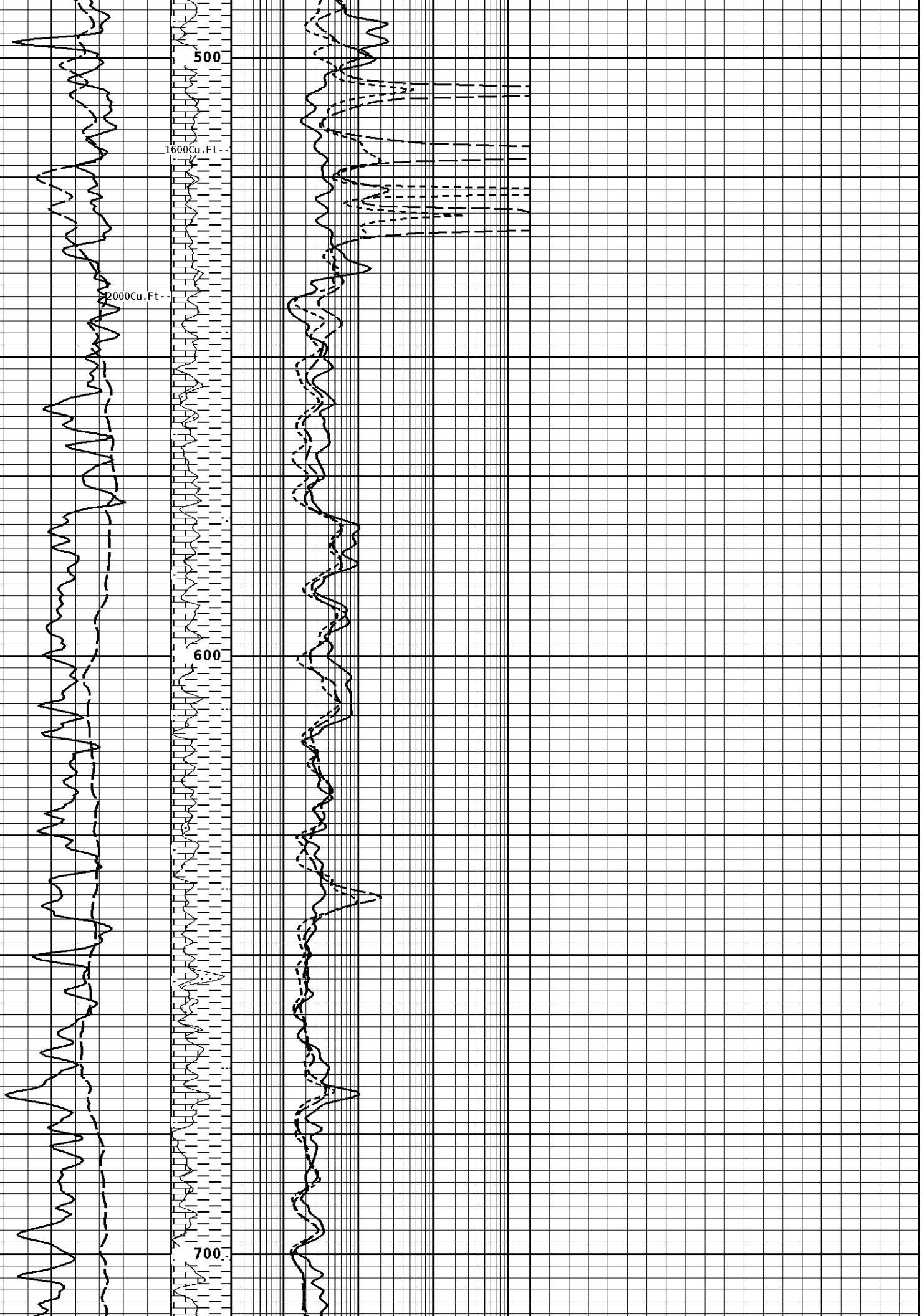
NORMAL
OHMM

6 16			0 40
NEUTRON (Y) CALIPER INCHES (IN) 16 26 6 16			INVERSE OHMM 0 40
DENSITY (X) CALIPER INCHES (IN) 16 26 6 16	Volume Quartz		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 →| |←30	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




SP
SFR
300
2100Cu.Ft
400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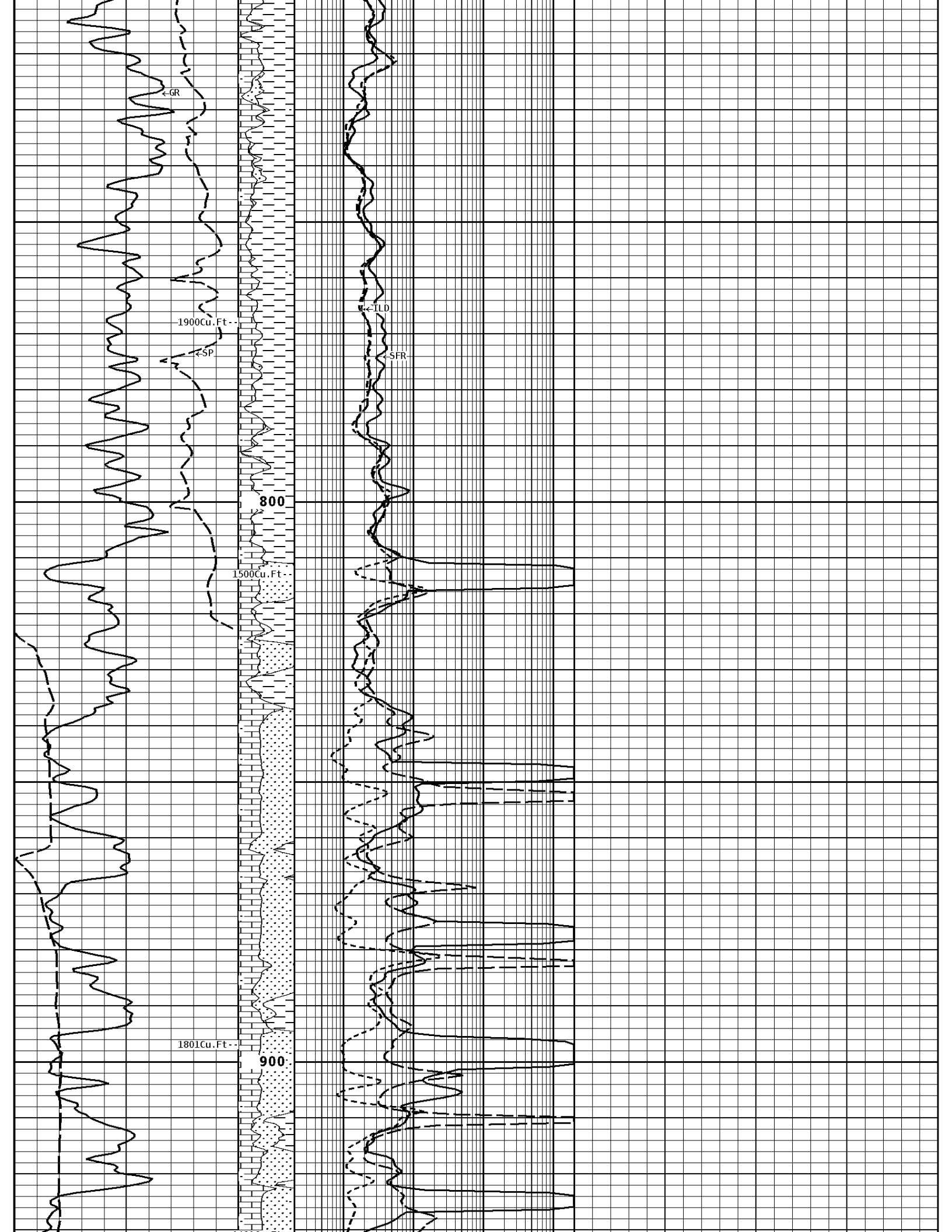
1600Cu.Ft
2000Cu.Ft
600
700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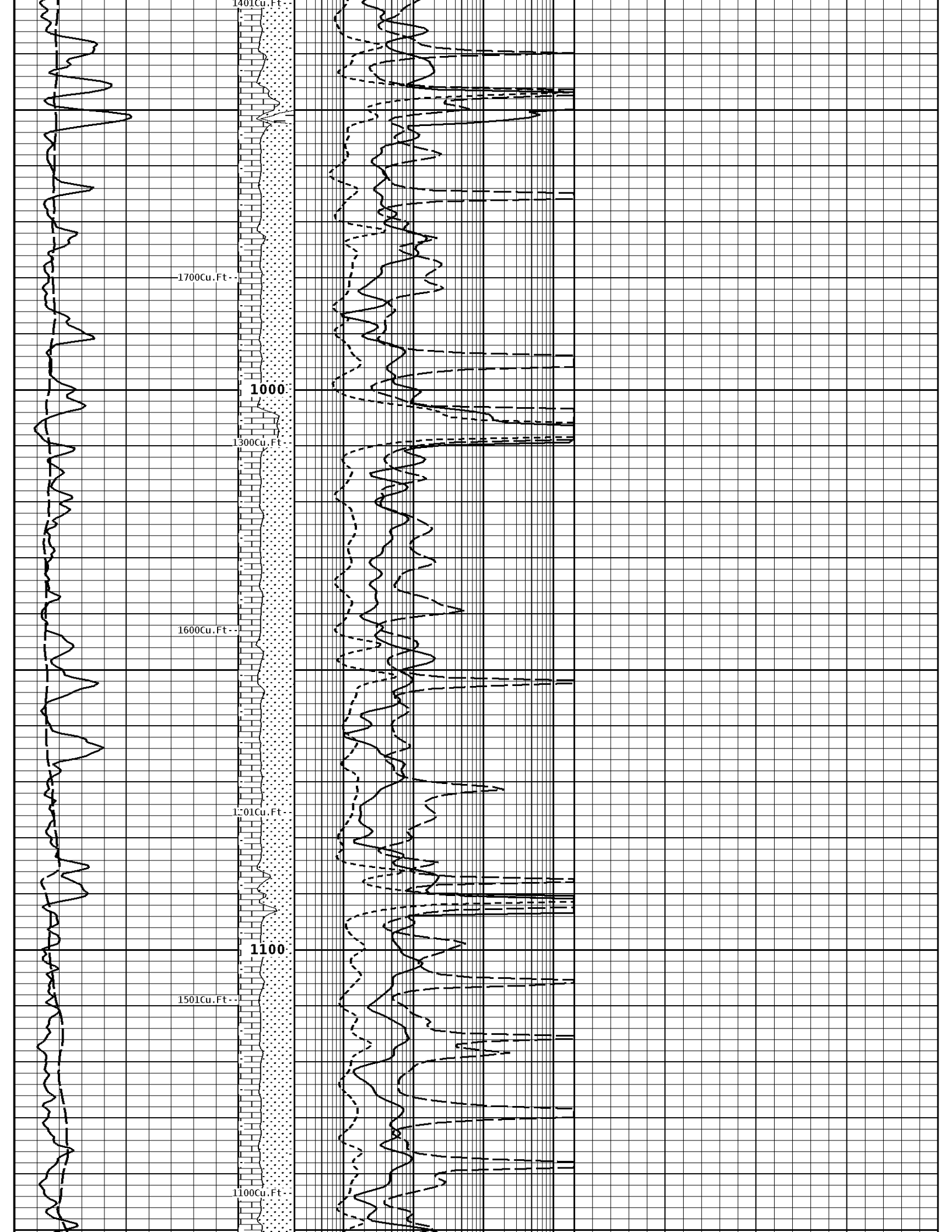
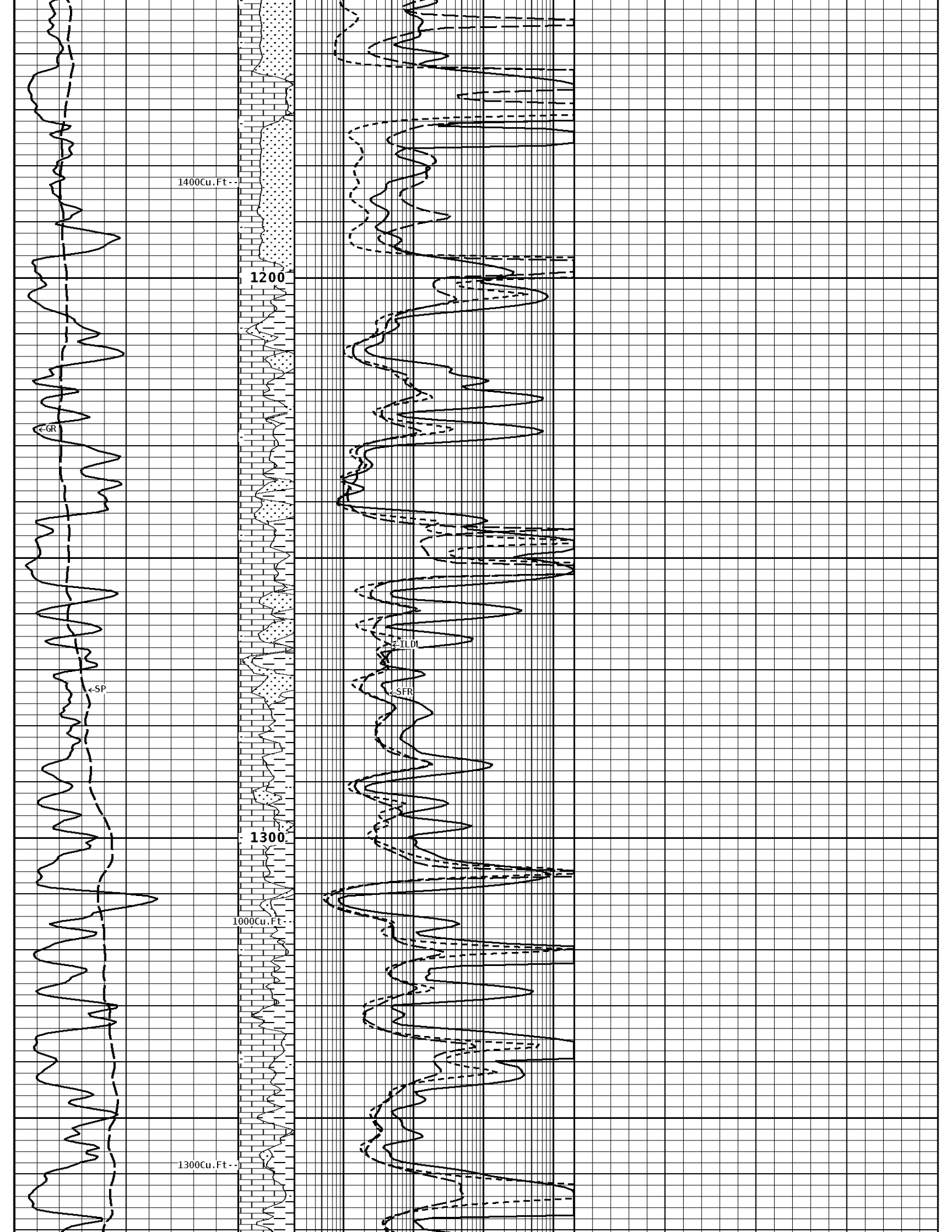
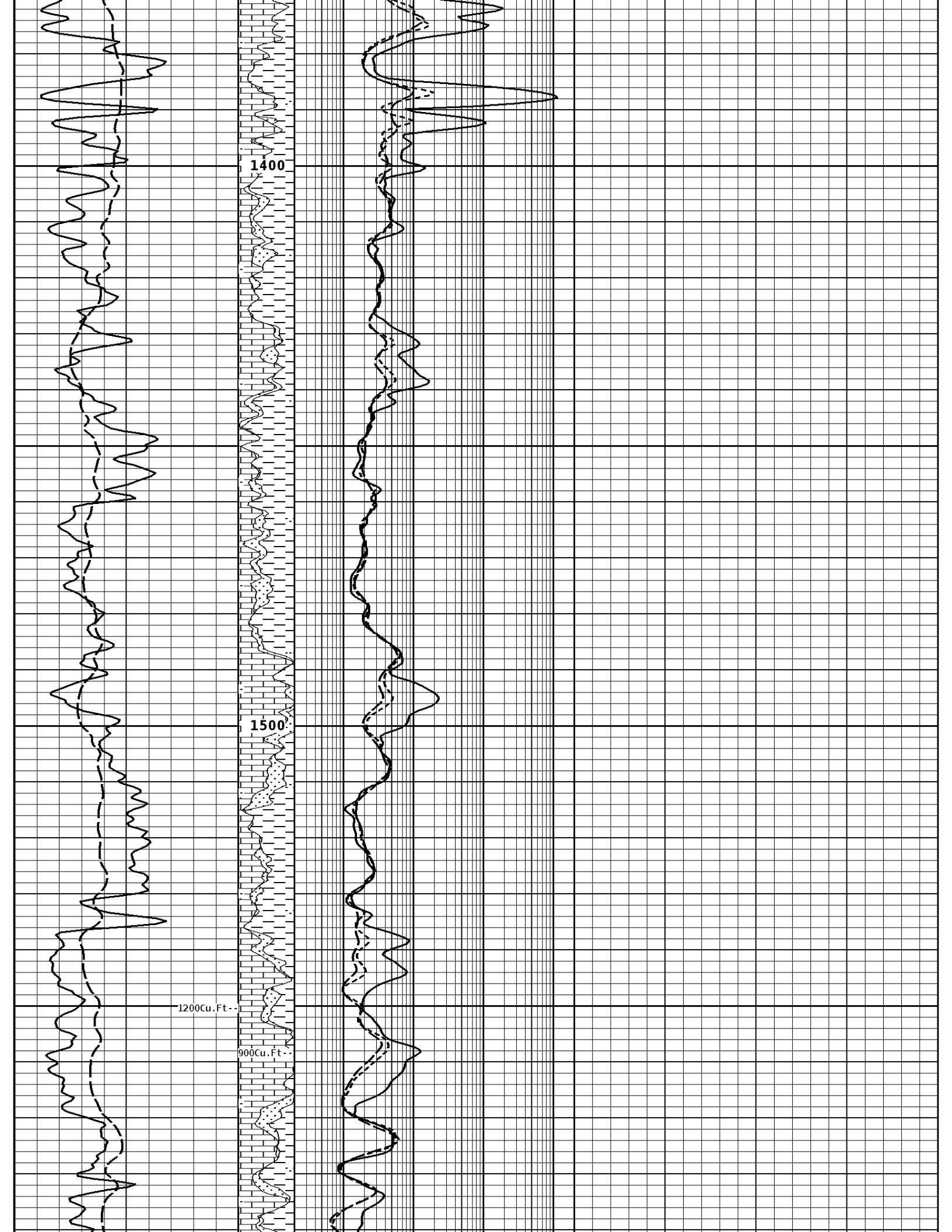
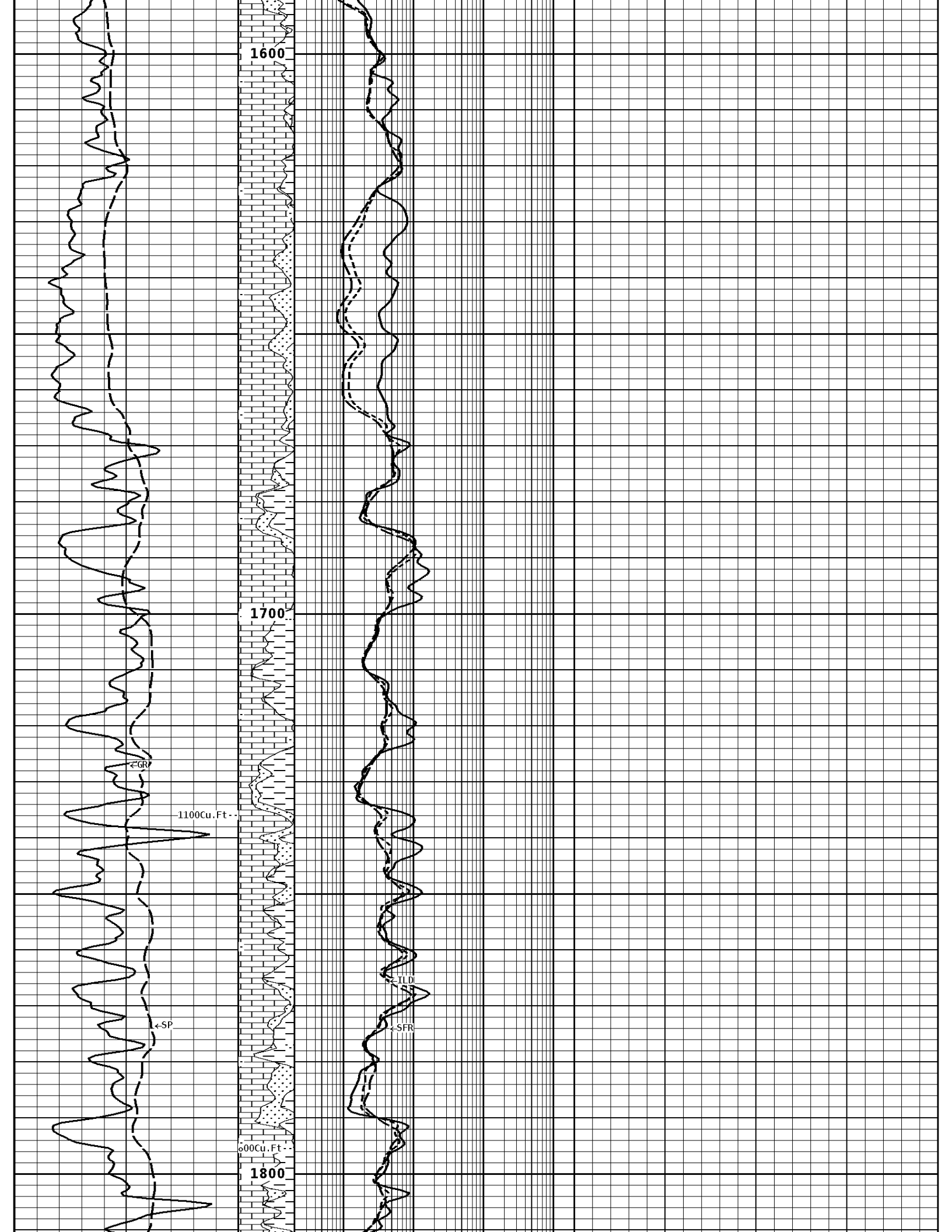
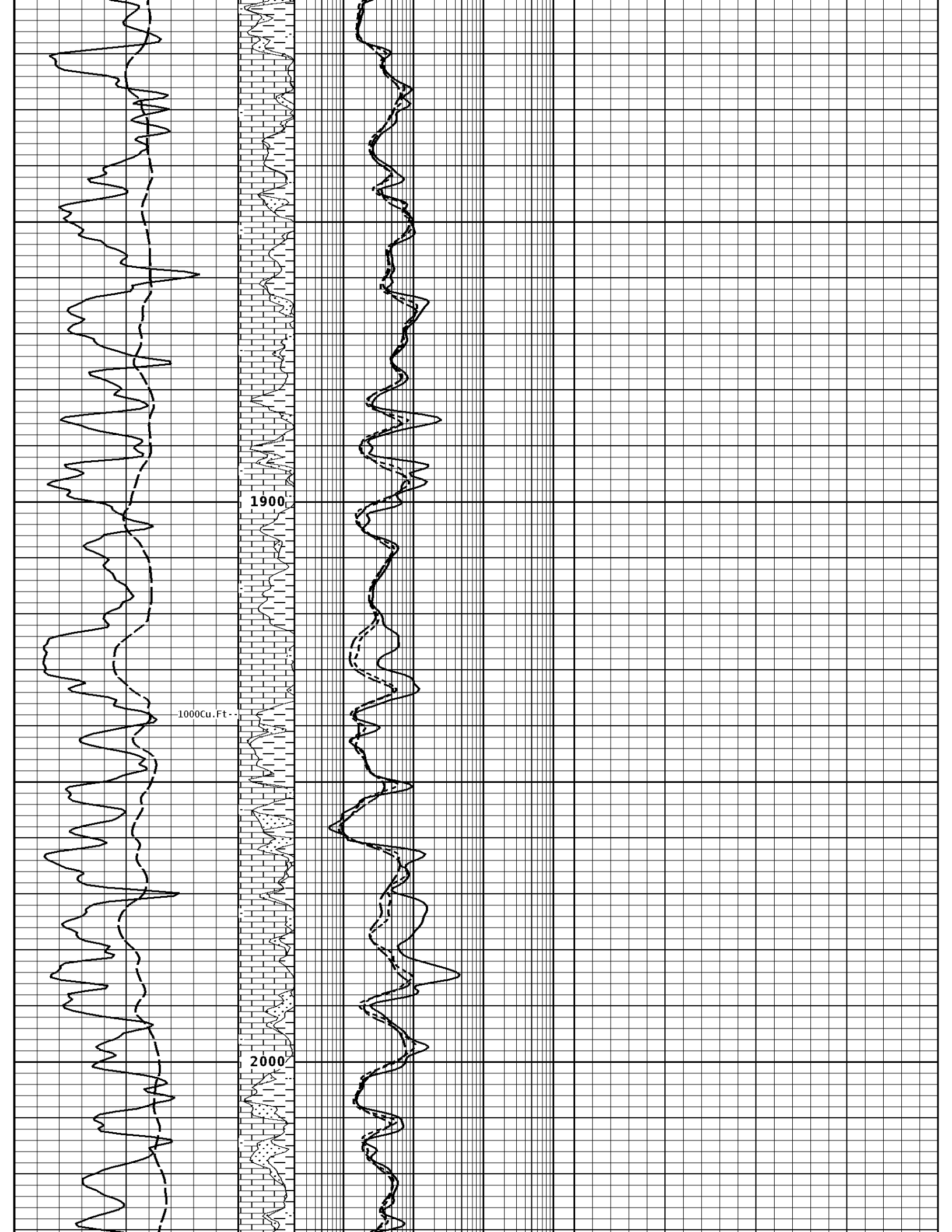
1900Cu.Ft--
←SP
←ILD
←SFR
800
1500Cu.Ft--
1801Cu.Ft--
900


1401Cu.Ft
1700Cu.Ft
1000
1300Cu.Ft
1600Cu.Ft
1201Cu.Ft
1100
1501Cu.Ft
1100Cu.Ft

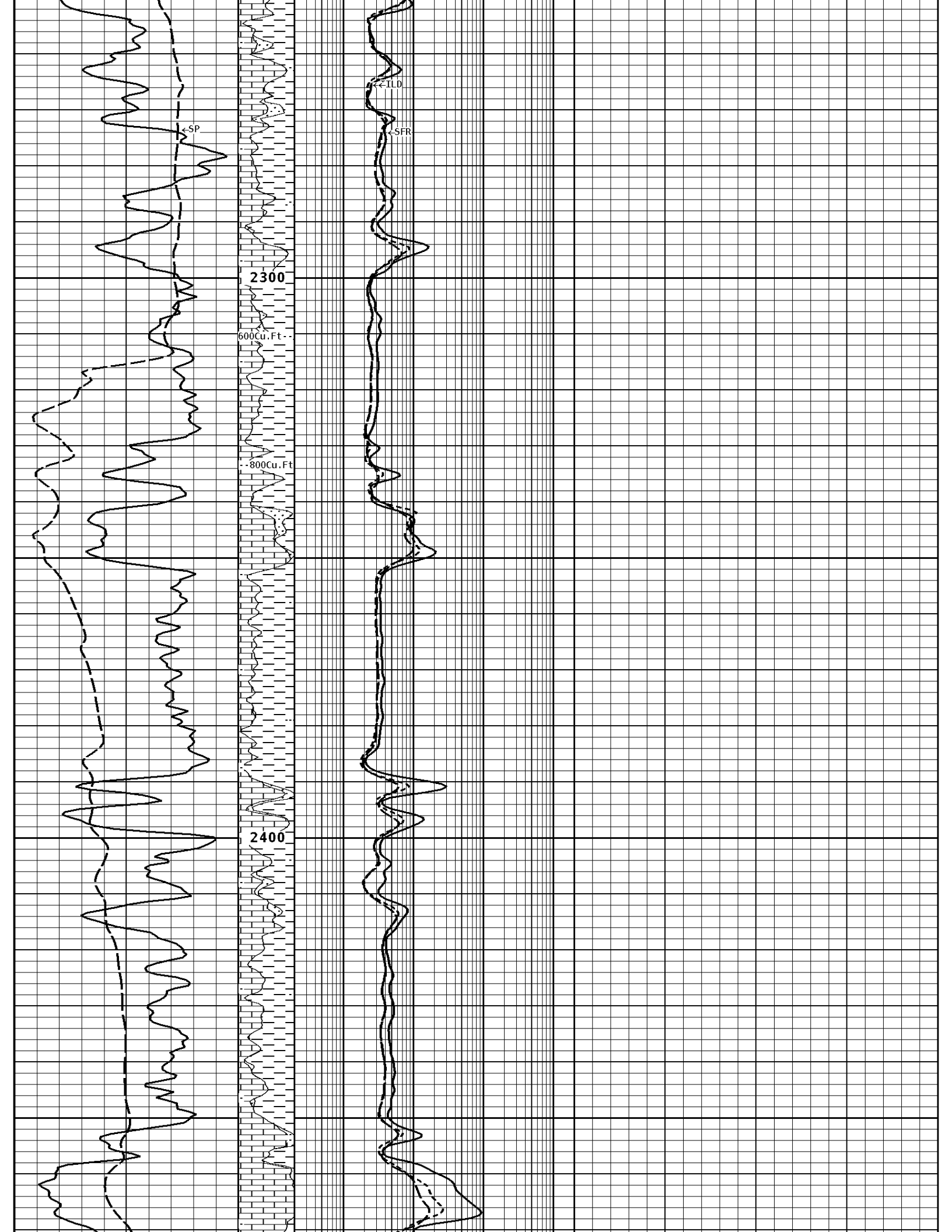

1400Cu.Ft
1200
←GR
←SP
←TLD
←SFR
1300
1000Cu.Ft
1300Cu.Ft

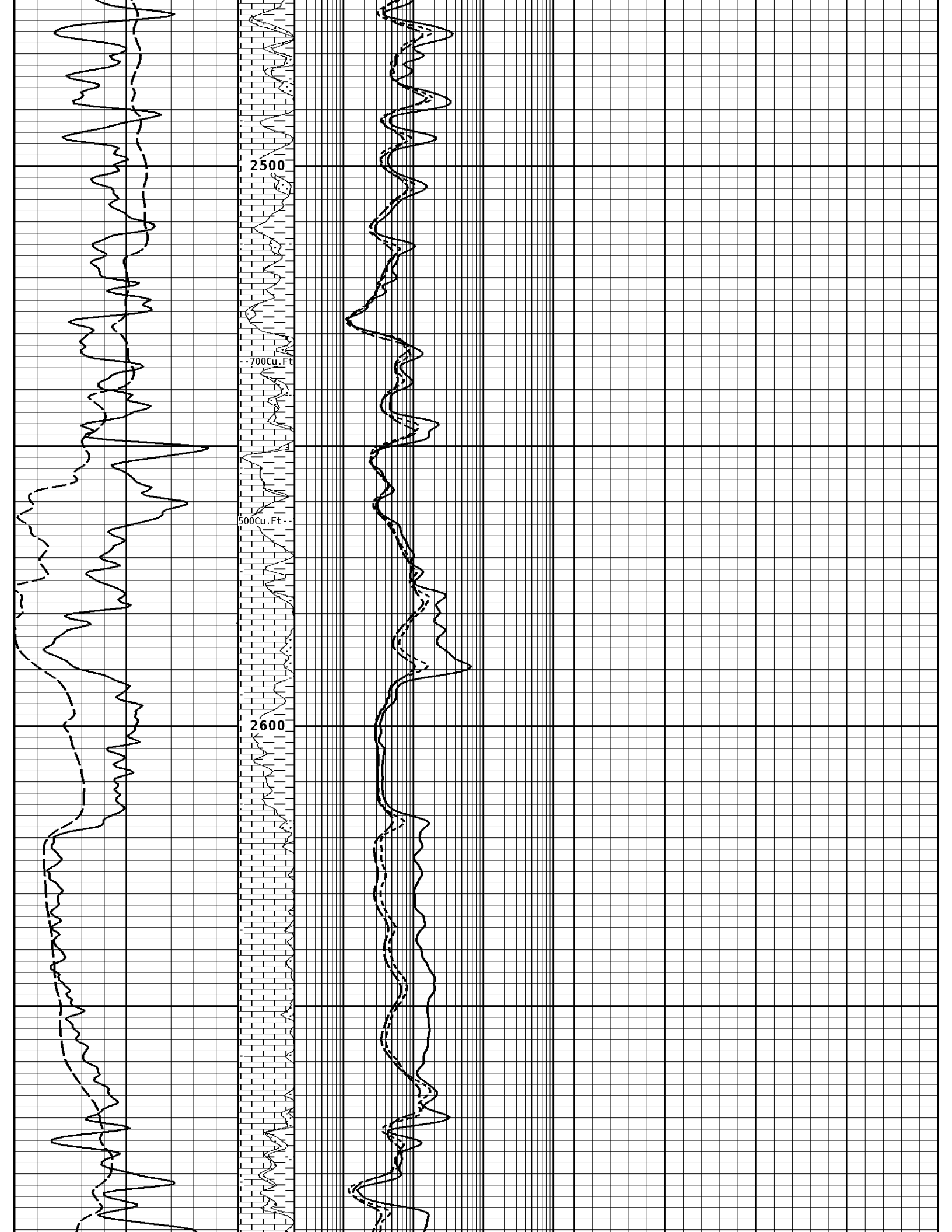

1400
1500
1200Cu.Ft
900Cu.Ft


1600
1700
1800
GR
1100Cu.Ft
SP
TLD
SFR
00Cu.Ft


1900
1000Cu.Ft
2000


700Cu.Ft
2100
900Cu.Ft
2200
GR


←SP
←ILD
←SFR
2300
600Cu.Ft--
--800Cu.Ft
2400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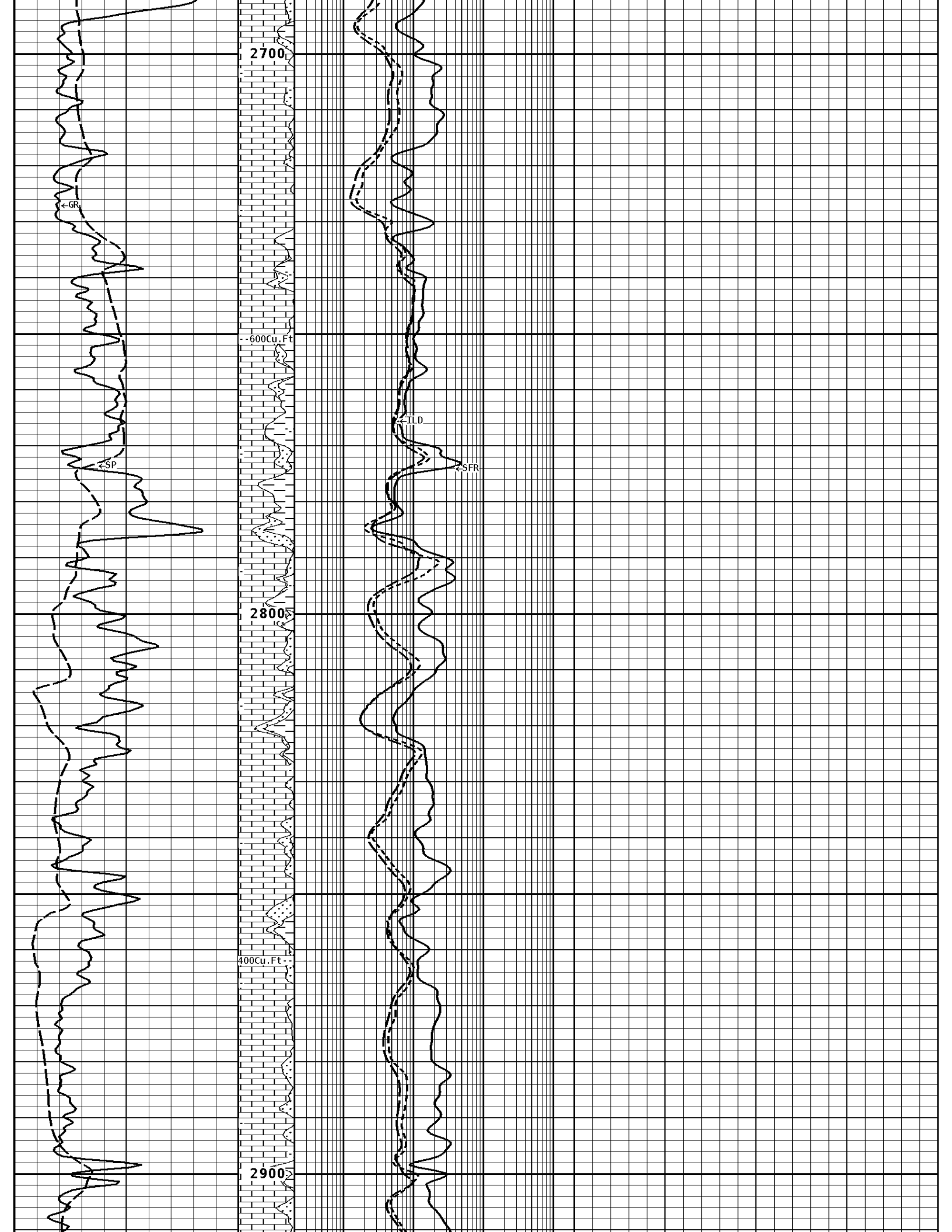
500Cu.Ft--
2600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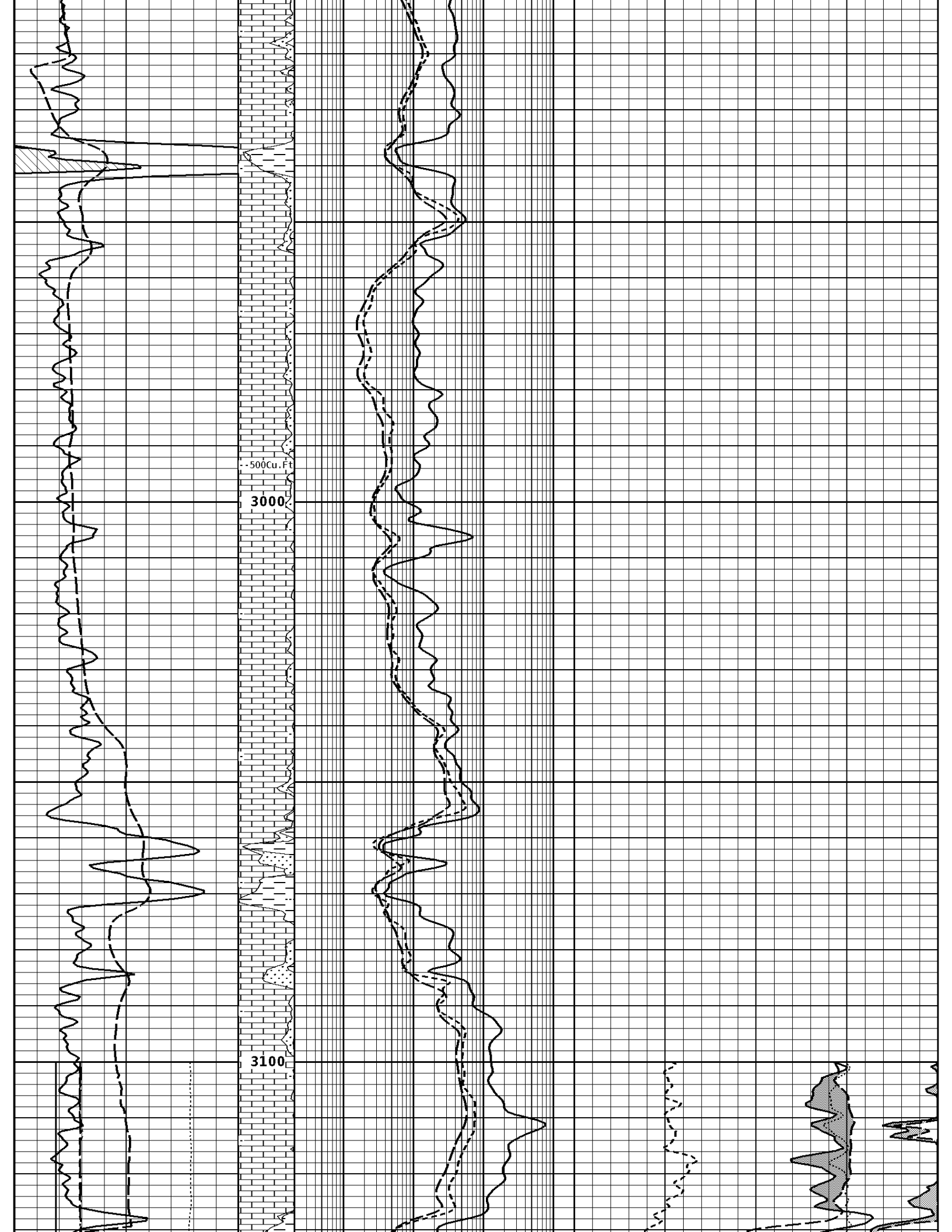
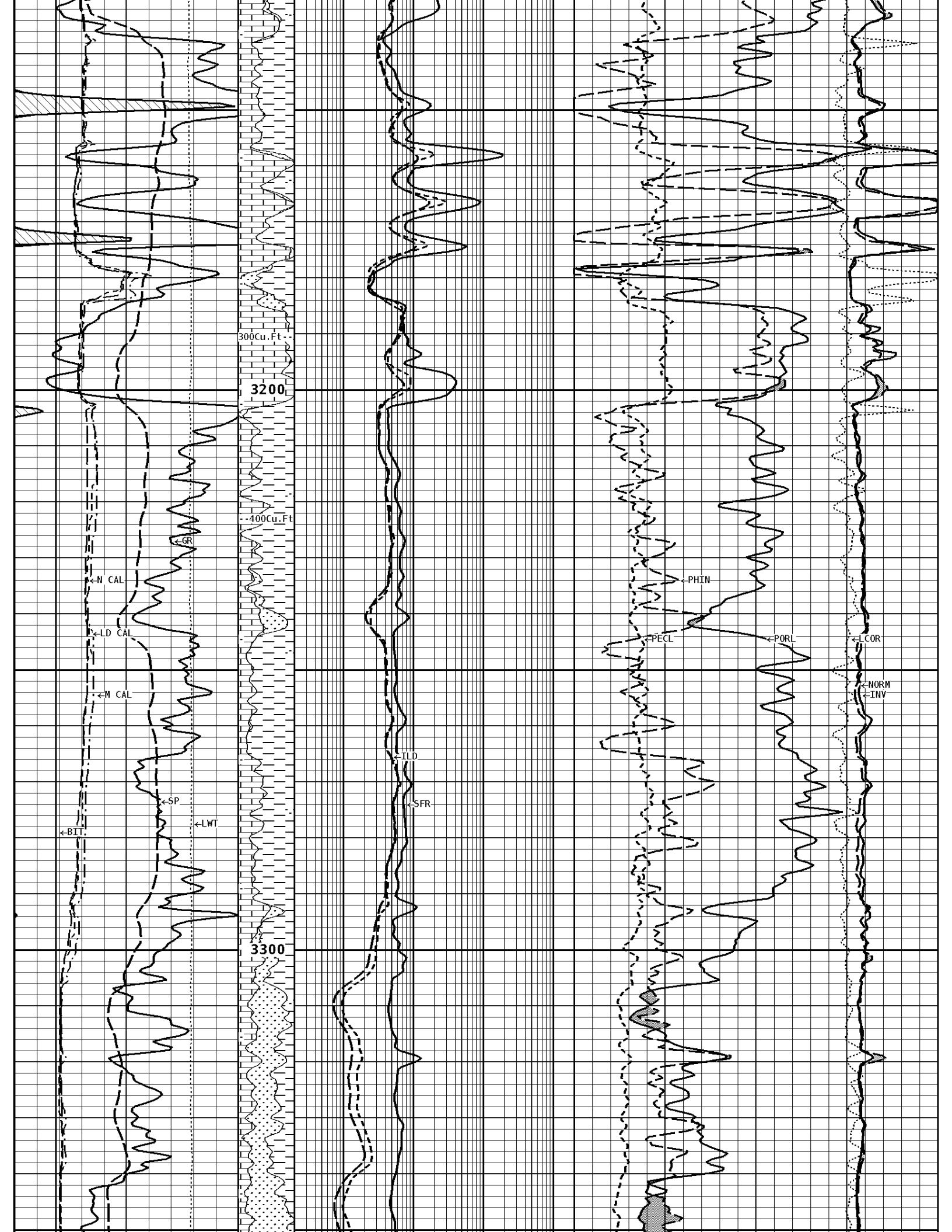
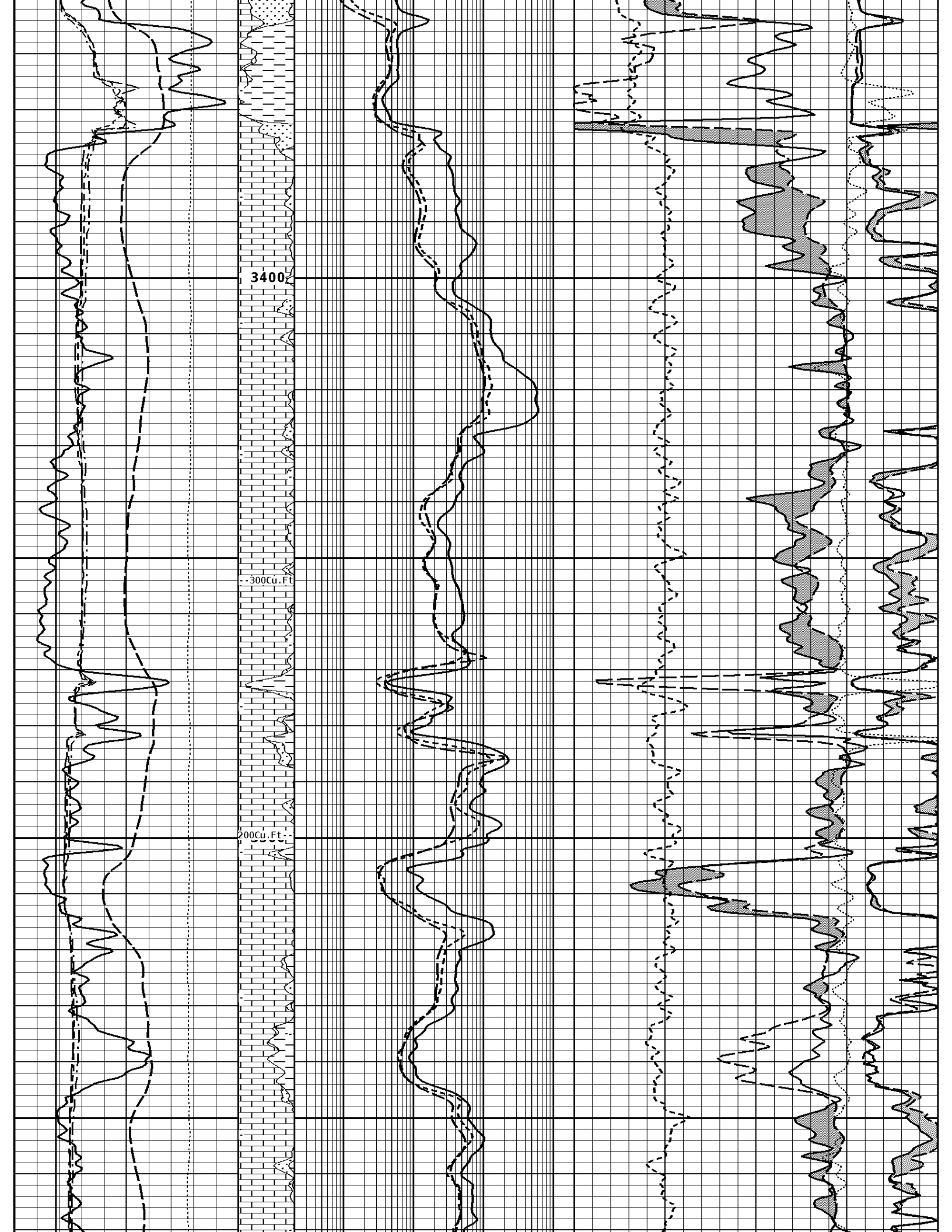
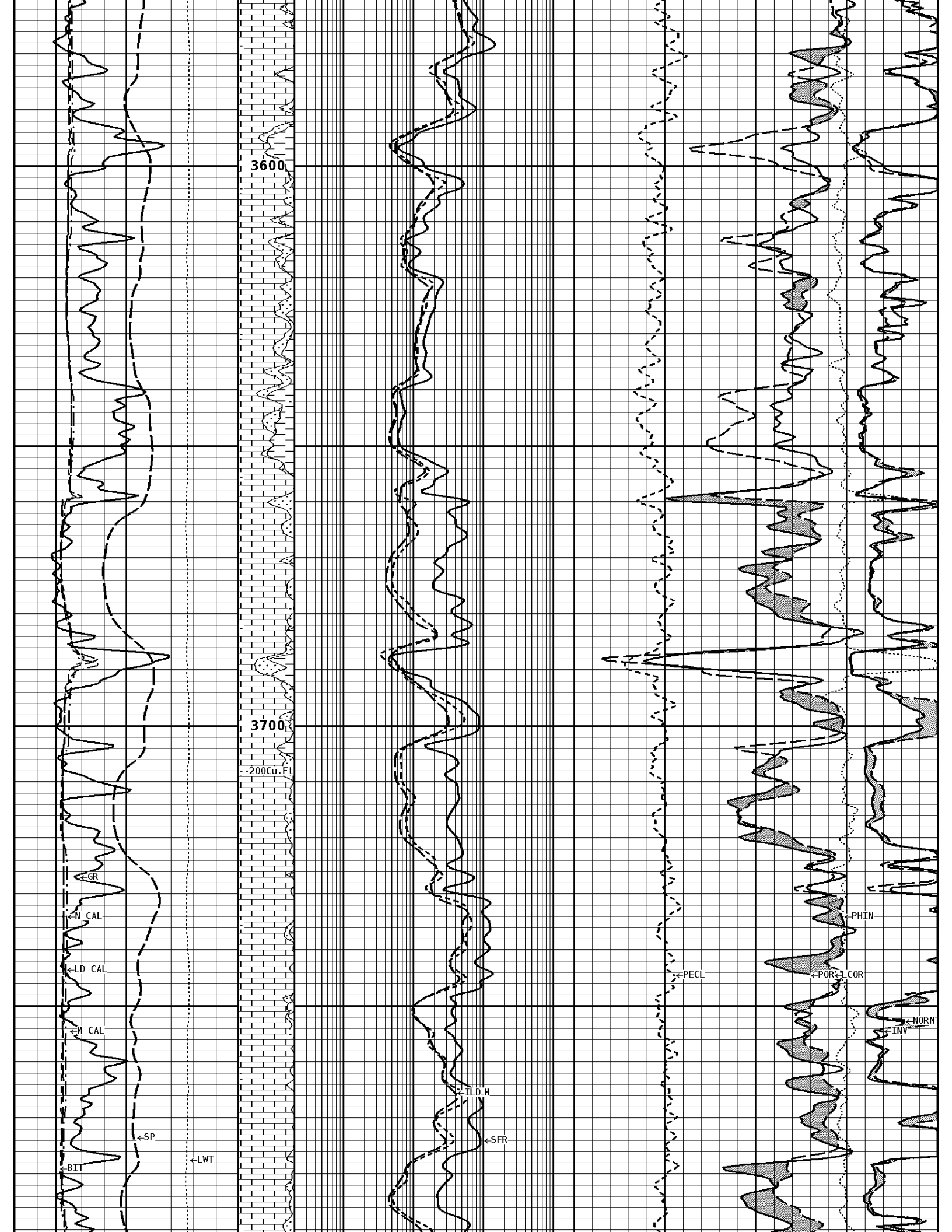
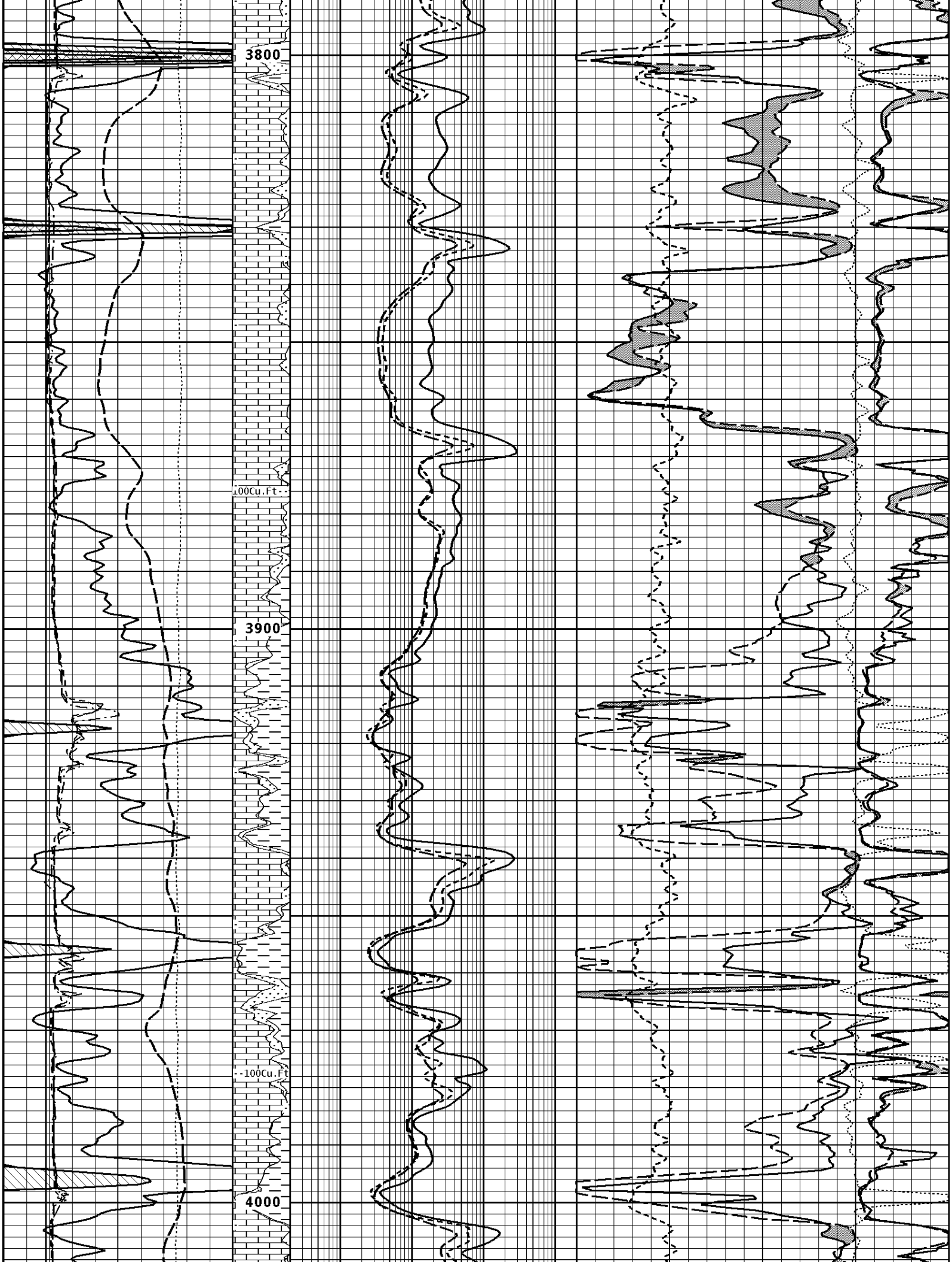
600Cu.Ft
←TLD
←SP
←SFR
2800
400Cu.Ft
2900


500Cu.Ft
3000
3100


300Cu.Ft
3200
400Cu.Ft
GR
N CAL
LD CAL
M CAL
BIT
SP
LWT
ILD
SFR
PHIN
PECL
PORL
LCOR
NORM
INV
3300


3400
300Cu.Ft
200Cu.Ft


3600
3700
200Cu.Ft
GR
N_CAL
LD CAL
M CAL
SP
BIT
LWT
ILD_M
SFR
PECL
PHIN
POR
LCOR
NORM
INV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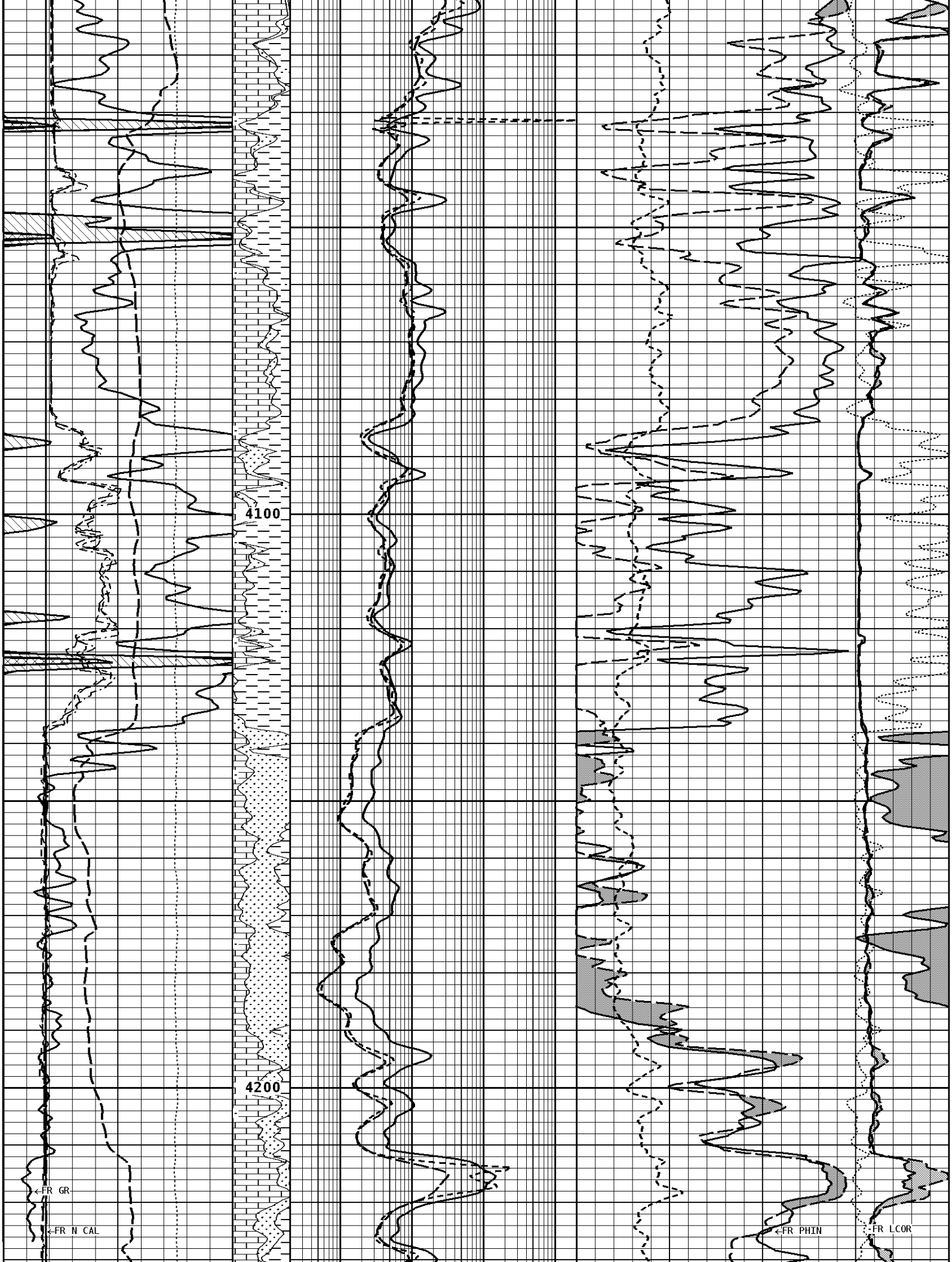
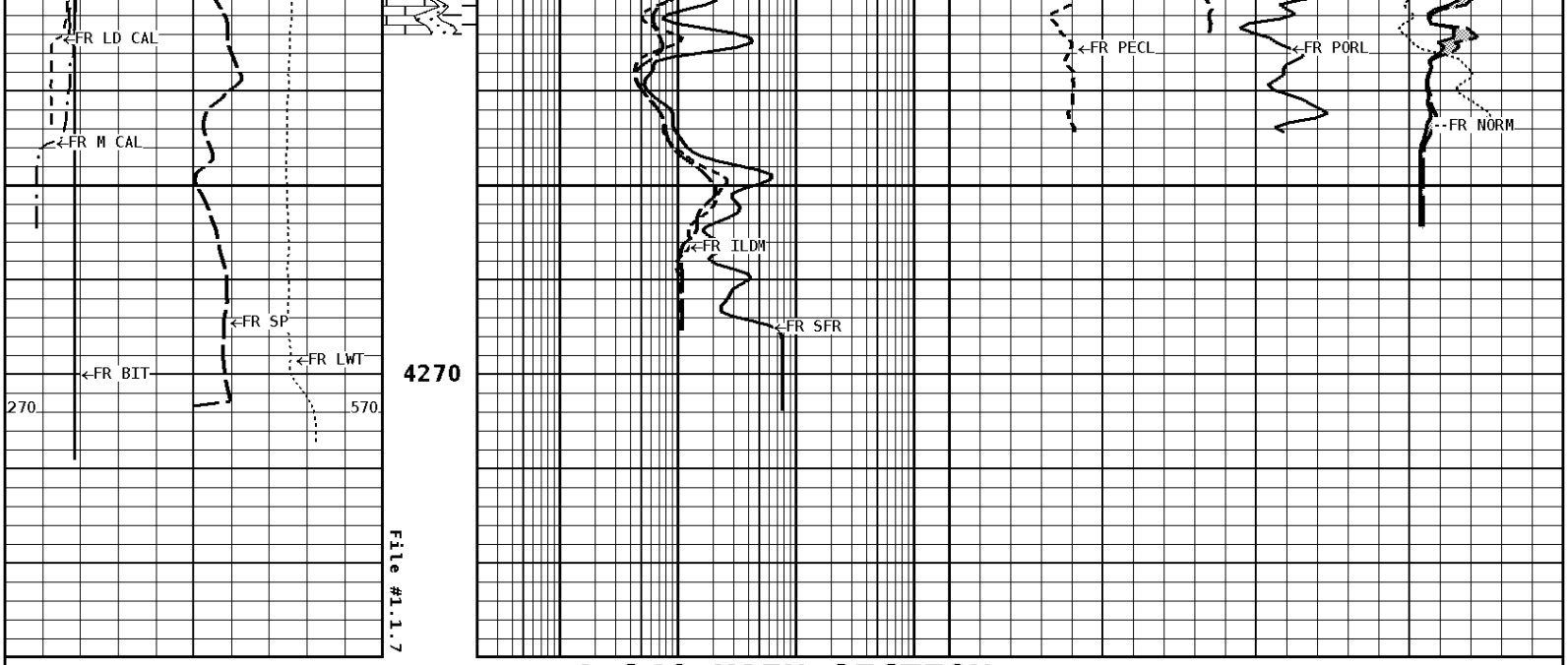
100Cu.Ft
3900
100Cu.Ft
4000


4100
4200
←FR GR
←FR N CAL
←FR PHIN
←FR LCOR



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** → | |← 30	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			

*** Calibration Summary ***

Shop Calibration
GRT-B

Performed : 02-Jan-2015 Time : 13:01
Sensor Suite : GR-GR5 ID : GRT-BA-017

	Measured Background	Measured Jig	Units	Calibrated Jig	Units

GR	61	378	CPS	175	GRAPI

Shop Calibration
CNT-AA

Performed : 02-Jan-2015 Time : 13:12
Sensor Suite : CALI-BCN ID : NDT-BB-122

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	9.0	13.7	6.0	12.0	IN.

Performed : 02-Jan-2015 Time : 12:24
Sensor Suite : BHC NEUT ID : CNP-AA-115
Source ID : N-1044

	Tank		Verification	Units
	Measured	Calibrated	Jig	
N/F	3.9759	3.6893	3.7035	
Porosity	25.1	20.5	20.7	%

Shop Calibration
LDT-DA

Performed : 02-Jan-2015 Time : 13:15
Sensor Suite : CALI-LTH ID : NDT-CA-137

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	8.0	12.1	6.0	12.0	IN.

Performed : 02-Jan-2015 Time : 11:25
Sensor Suite : BHCPELNG ID : LDP-DA-47
Source ID : CSV-587

Short Space

	BKGD	Al	Mg	Al+Fe	Units
LSW1	68	337	520	251	CPS
LSW2	74	437	683	335	CPS
LSW3	271	1186	1829	1026	CPS
LSW4	332	1159	1586	1032	CPS
LSW5	38	47	48	46	CPS
LSW6	79	79	77	79	CPS
LSW7	55	56	55	57	CPS
LSW8	6	6	7	6	CPS
QS	0.180	0.174	0.161	0.164	
PES			2.778	5.967	
SSDN		2.600	1.680		G/CC

Long Space

	BKGD	Al	Mg	Al+Fe	Units
LLW1	101	432	1697	290	CPS
LLW2	109	797	3263	584	CPS
LLW3	431	1764	6350	1536	CPS
LLW4	570	1113	2785	1032	CPS
LLW5	63	68	80	66	CPS
LLW6	179	178	175	178	CPS
LLW7	114	114	109	115	CPS
LLW8	3	5	9	5	CPS
QL	0.221	0.219	0.234	0.217	
PEL			2.697	5.458	
LSDN		2.600	1.680		G/CC

Shop Calibration
MST-DA

Performed : 04-DEC-2014 Time : 14:45
Sensor Suite : CALI-MSN ID : MLT-DA-21

	Jig - Measured		Jig - Calibrated		Units
	Ring#1	Ring#2	Ring#1	Ring#2	
CL # 1	7.9	12.3	6.0	12.0	IN.

Performed : 04-DEC-2014 Time : 02:18
Sensor Suite : MSTDA-NI ID : MLT-DA-21

Internal

	Measured			Calibrated		
	Zero	Reference	Units	Zero	Reference	Units
INV-V	0.0	29815.7		0.00	1746.00	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					36.53	OHMM
NOR-R					55.11	OHMM

Shop Calibration
PIT-CA

PIT-CA

Performed : 10-Nov-2014 Time : 10:45
Sensor Suite : P-IND-T ID : PIT-CA-062

Medium

	Measured R	Measured X	Calibrated R	Calibrated X	Units
Air	130581	130719	-1.4	-1.4	MMHOS
Zero	131070	131071	25.8	5.1	MMHOS
Reference	253678	249876	5025.8	5005.1	MMHOS
Loop	131482	220909	3831.0	3757.5	MMHOS
Sonde Error			-1.0	-15.6	MMHOS
Cond			5025.8	5005.1	MMHOS

Deep

	Measured R	Measured X	Calibrated R	Calibrated X	Units
Air	129104	131422	1.0	0.9	MMHOS
Zero	131066	131070	40.8	-16.1	MMHOS
Reference	234020	231481	2040.8	1983.9	MMHOS
Loop	130025	221327	1809.7	1773.8	MMHOS
Sonde Error			-8.4	-11.7	MMHOS
Cond			2040.8	1983.9	MMHOS

Temperature

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

Performed : 10-Nov-2014 Time : 10:35
Sensor Suite : SFL ID : PIT-CA-062

Internal

	Measured Zero	Measured Reference	Calibrated Zero	Calibrated Reference	Units
Im	32763.6	48943.6	0.0	7028.0	uA
Ib	32767.1	48748.6	0.0	1750.0	mA
MOM1	32729.9	57504.3	0.0	175.0	mV
Equivalent SFL				43.97	OHMM

Performed : 10-Nov-2014 Time : 10:33
Sensor Suite : P-SP ID : PIT-CA-062

Internal

Measured Zero	Measured Reference	Calibrated Zero	Calibrated Reference	Units
32765.9	58978.1	0.0	1000.0	mV

Tucker ENERGY SERVICES

Company: PICKRELL DRILLING COMPANY, INC.

Well: HIGGINS K #3

Location: 1320' FNL & 2310' FWL

Logged: 01-15-2015

K.B. Elev: 1504.0 Ft