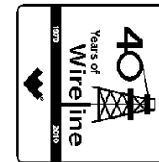


**Weatherford®****COMPACT DROP OFF
HOLE VOLUME
CALIPER**

COMPANY ENCANA OIL AND GAS (USA)
WELL NP EF 09E-27 P27 595
FIELD GRAND VALLEY
PROVINCE/COUNTY GARFIELD
COUNTRY/STATE U.S.A. / COLORADO
LOCATION SHL: 728' FSL & 594' FEL

SEC 27 TWP 5S RGE 95W
API Number 05-045-20289
Permit Number MAI
MPD/MDN

Permanent Datum G.L., Elevation 6650 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations:
KB 6672.00
DF 6672.00
GL 6650.00

Date 22-JULY-2012

Run Number 1

Depth Driller 11265.00 feet

Depth Logger 11265.00 feet

First Reading 11179.00 feet

Last Reading 1826.00 feet

Casing Driller 1826.00 feet

Casing Logger 1826.00 feet

Bit Size 7.875 inches

Hole Fluid Type WBM

Density / Viscosity 10.80 lb/USg 48.00 CP

PH / Fluid Loss 8.80 4.50 ml/30Min

Sample Source FLOWLINE

Rm @ Measured Temp 1.85 @ 96.4 ohm-m

Rmf @ Measured Temp 1.48 @ 96.4 ohm-m

Rmc @ Measured Temp 2.22 @ 96.4 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 0.77 @235.0 ohm-m

Time Since Circulation 2 HOUR

Max Recorded Temp 235.00 deg F

Equipment Name COMPACT

Equipment / Base 13037 RK SPR

Recorded By B. ROSSER

Witnessed By J. RETHERFORD

BOREHOLE RECORD

Last Edited: 22-JUL-2012 22:53

Bit Size inches	Depth From feet	Depth To feet
8.750	1826.00	7553.00
7.865	7553.00	11265.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1826.00	36.00

REMARKS

SOFTWARE VERSION USED: WLS 12.02.4401

TOOLS CONVEYED VIA COMPACT DROP OFF.

ALL DEPTHS RECORDED WITH WEATHERFORD PASON INTERFACE SYSTEM.
ALL DEPTHS CORRECTED BACK TO DRILLERS STRAP.MAI, MFE, MPD, MDN, MCG RAN IN COMBINATION.
HARDWARE USED: SEE TOOL DIAGRAM.

CUSTOMER'S SCALES USED AND INTERVALS LOGGED.

INDUCTION MODEL: RTAP WBM

CALIPER TRIGGERED CLOSED FROM 6362 FEET TO 5660 FEET DUE TO METALLIC PROPERTIES IN HOLE AT ABOUT 6490 FEET.
NO CALIPER DATA FROM 6362 FEET TO 5660 FEET.

ALL TOOLS REPROCESSED TO BIT SIZE CORRECTION FROM 6362 FEET TO 5660 FEET.

4.5 INCH PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUME.

ANNULAR HOLE VOLUME: 3262 CUBIC FEET

HOLE VOLUME: 4217 CUBIC FEET

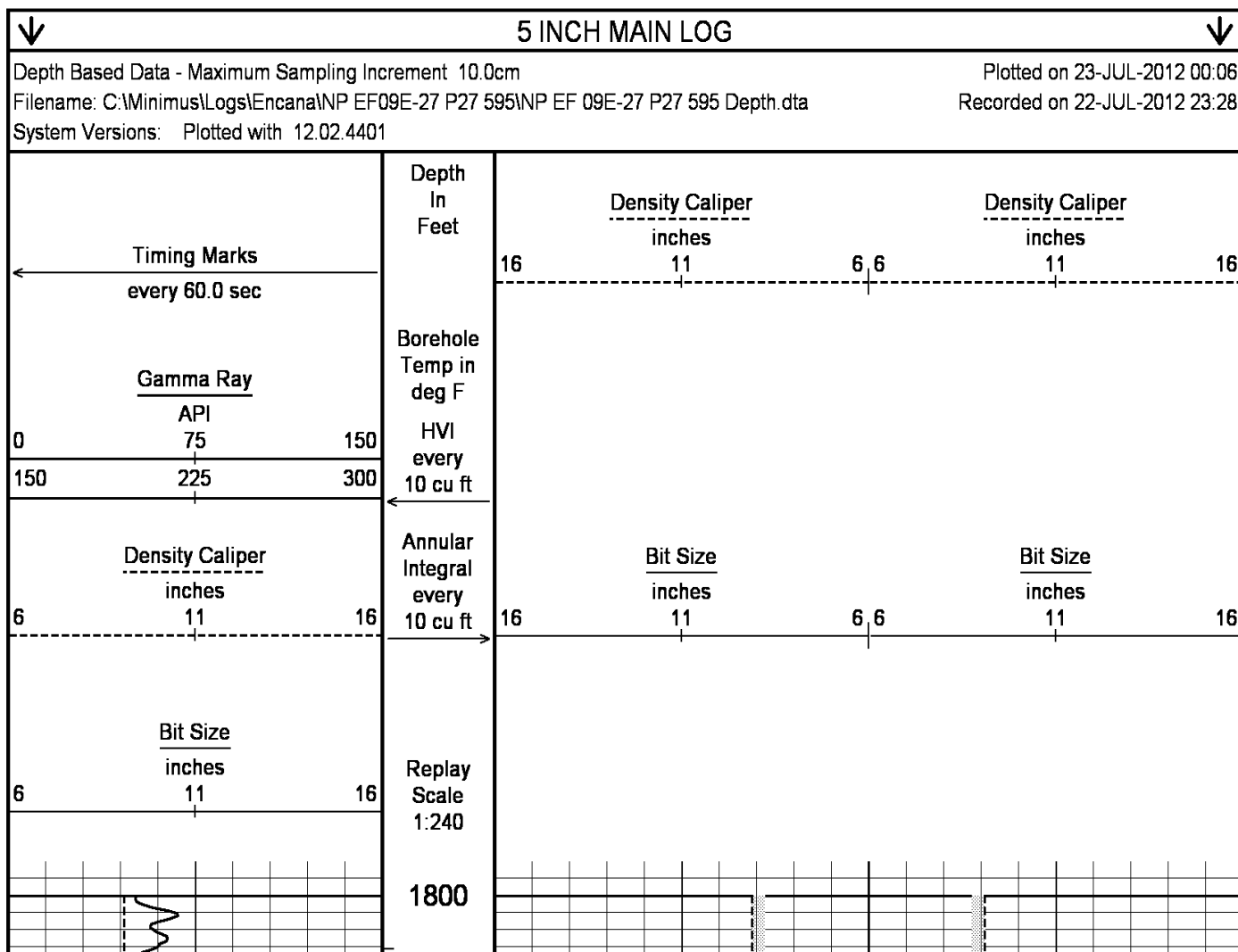
BOREHOLE SIZE AND RUGOSITY WILL AFFECT DATA QUALITY.

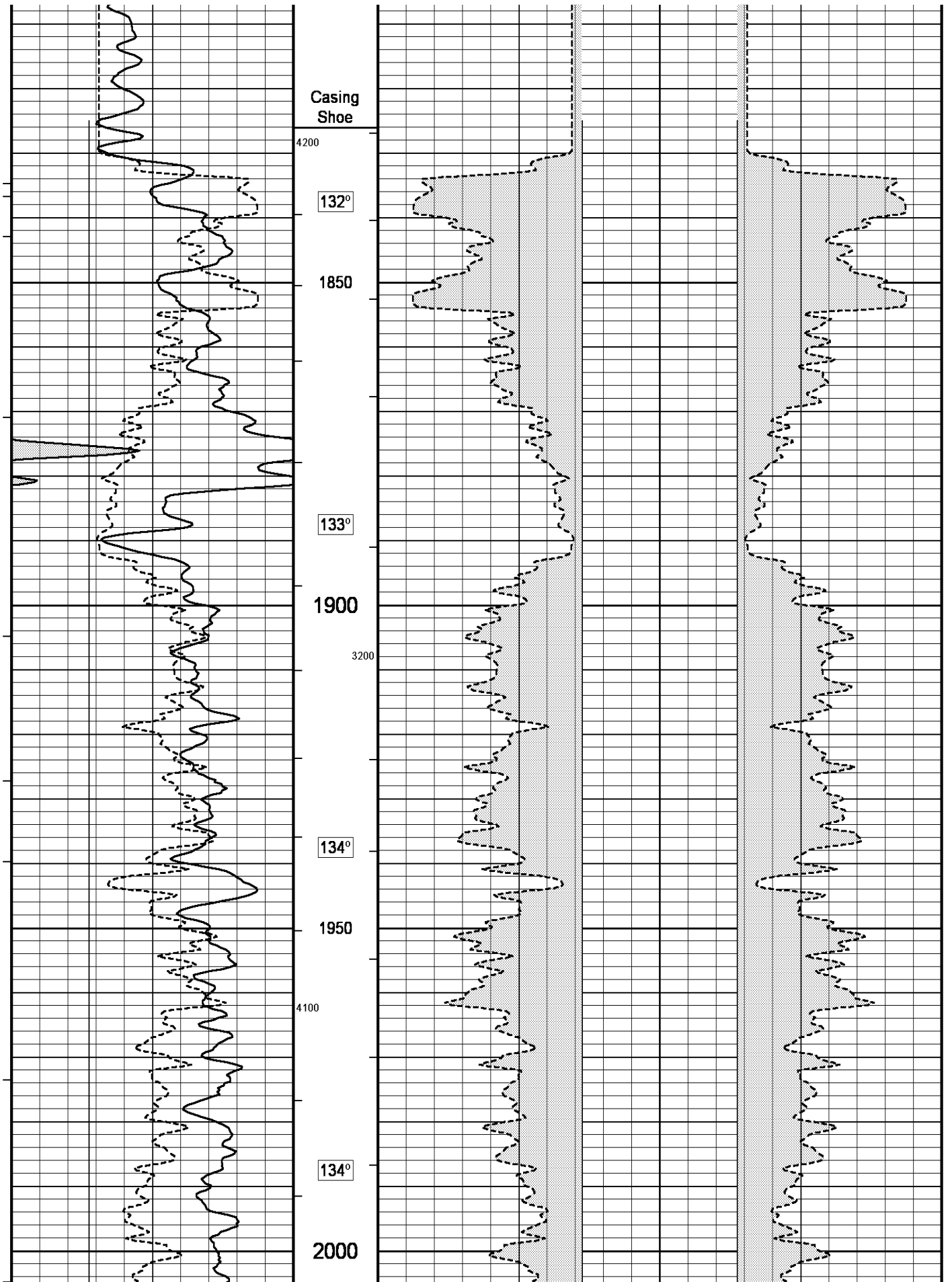
OPERATOR(S): D.SMITH, J.GERDES

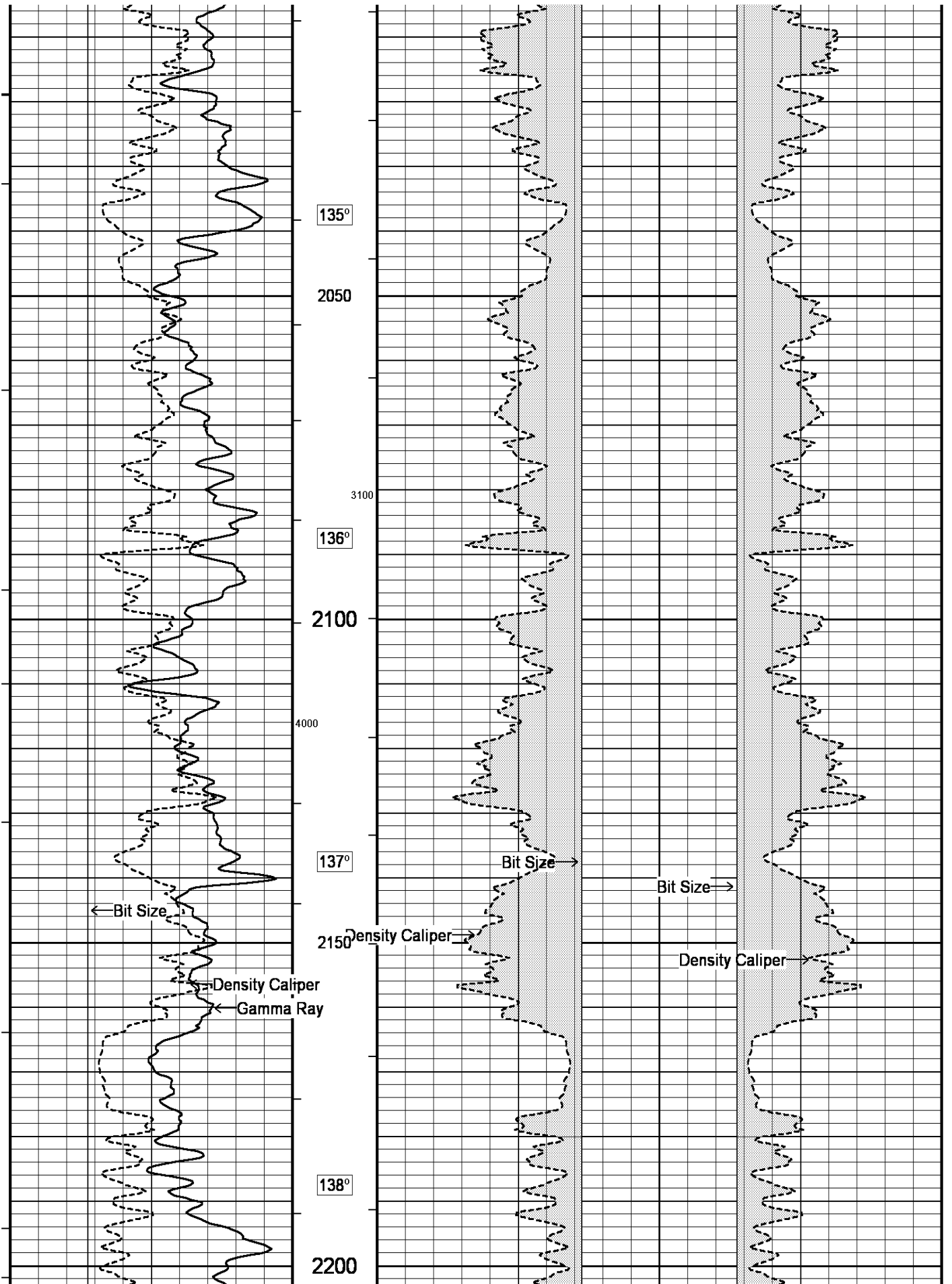
RIG: PATERSON 303

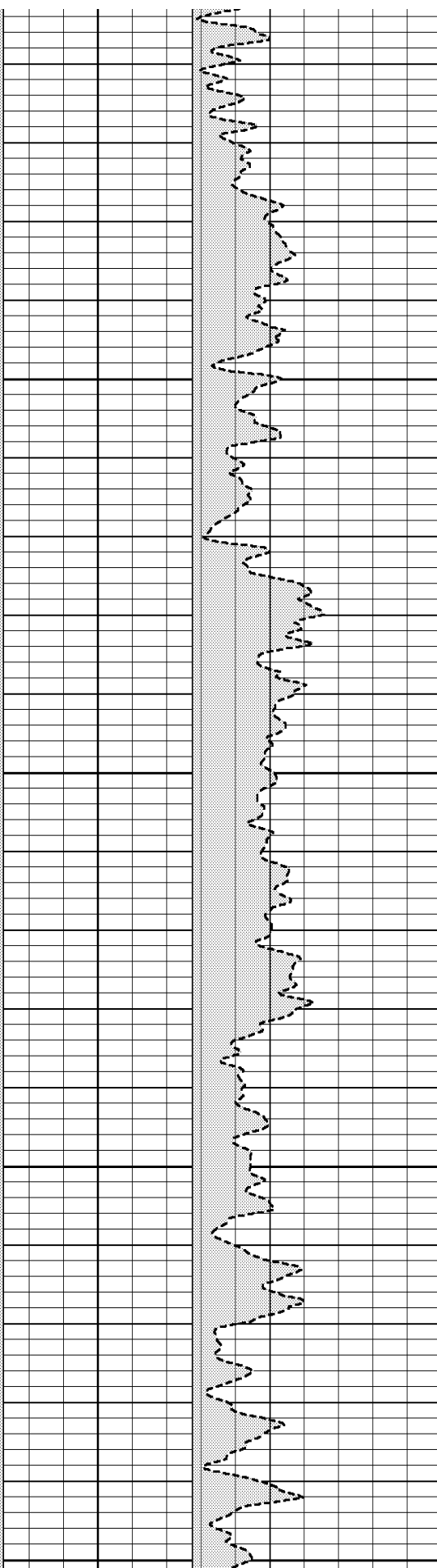
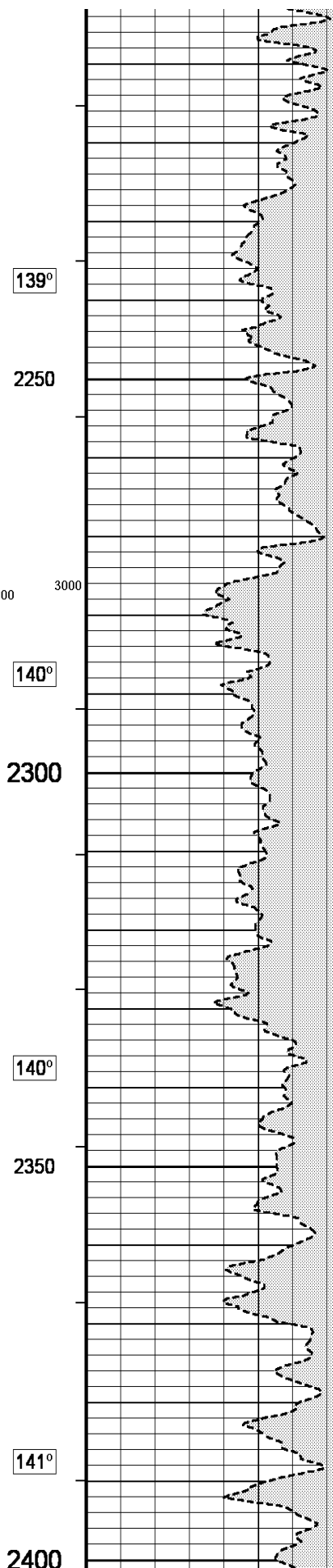
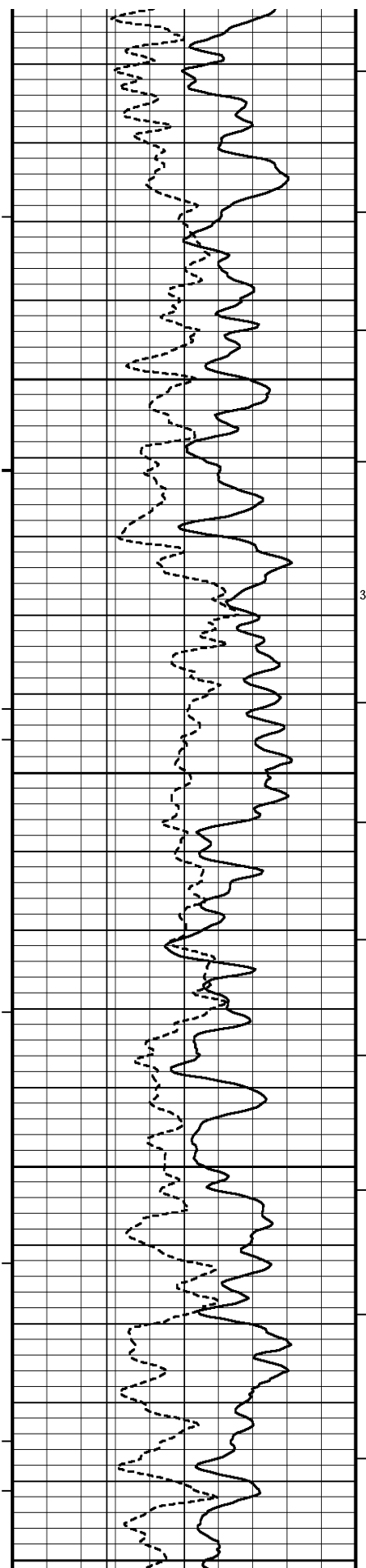
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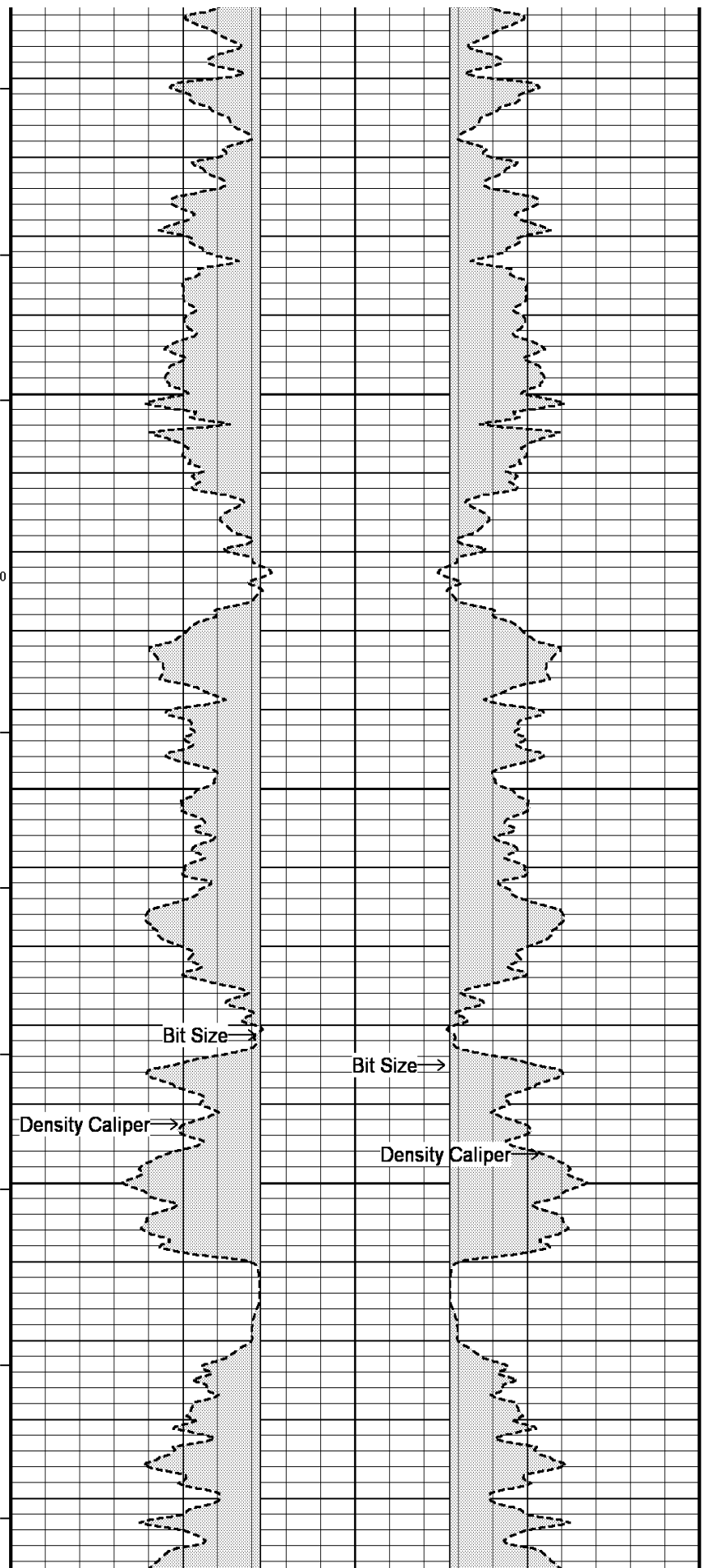
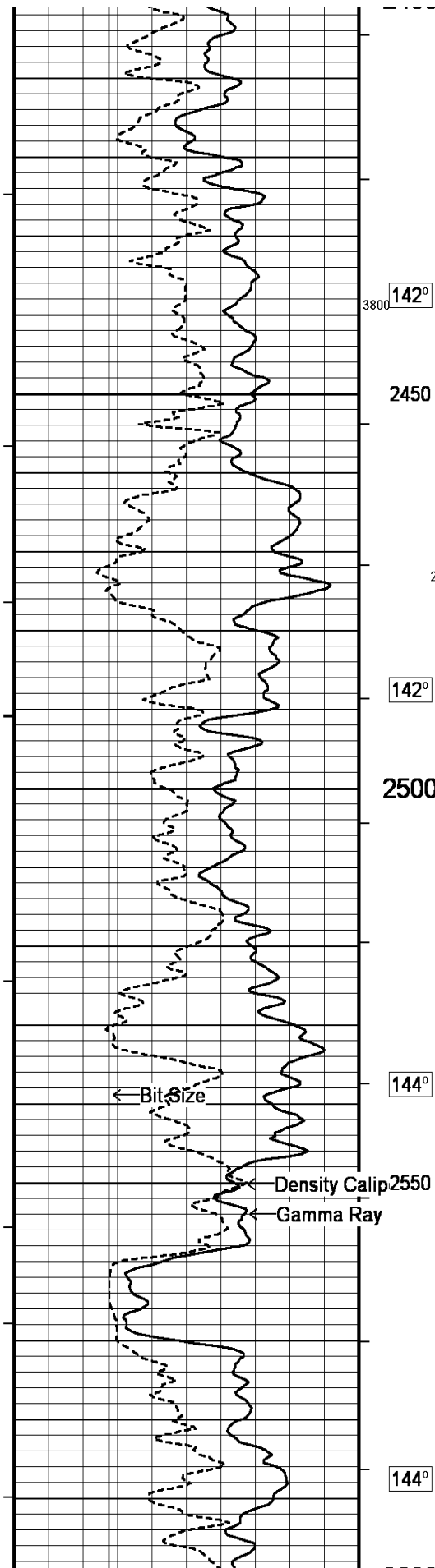
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

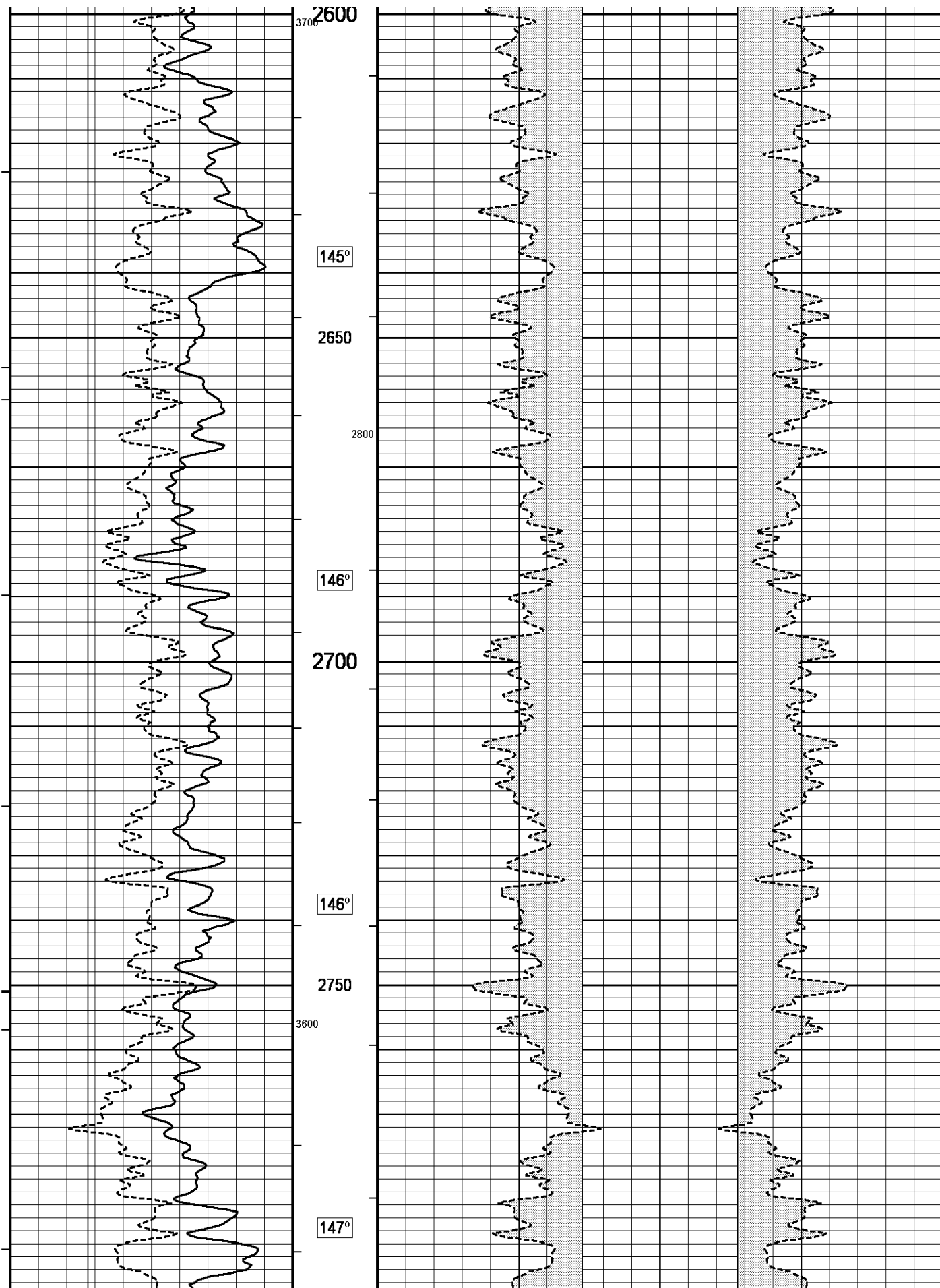


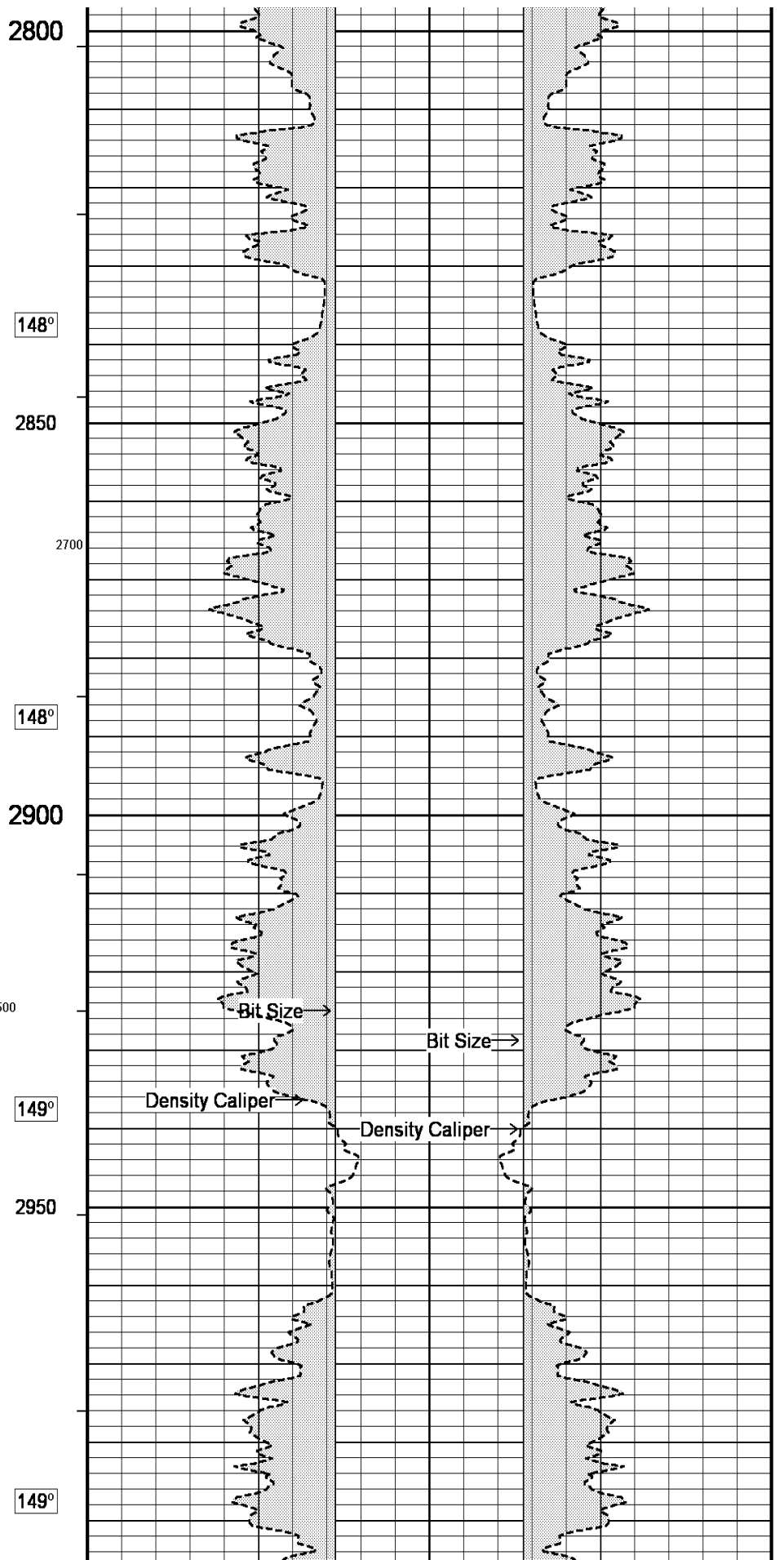
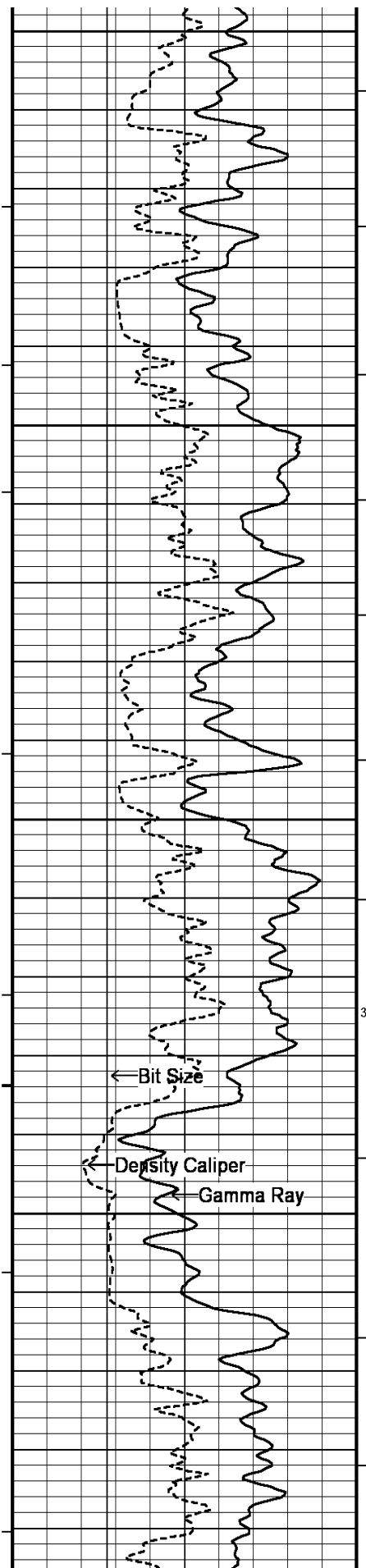


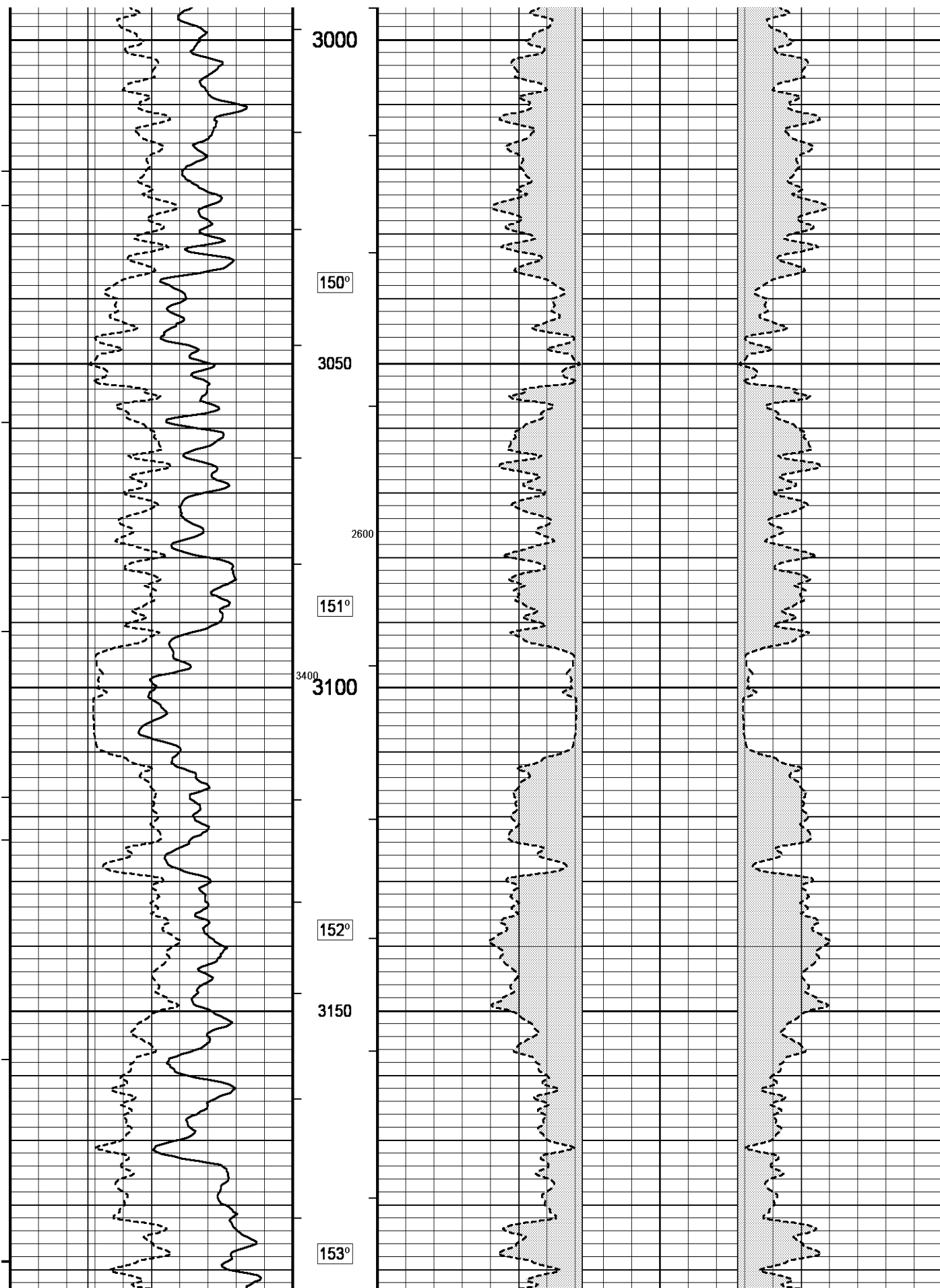


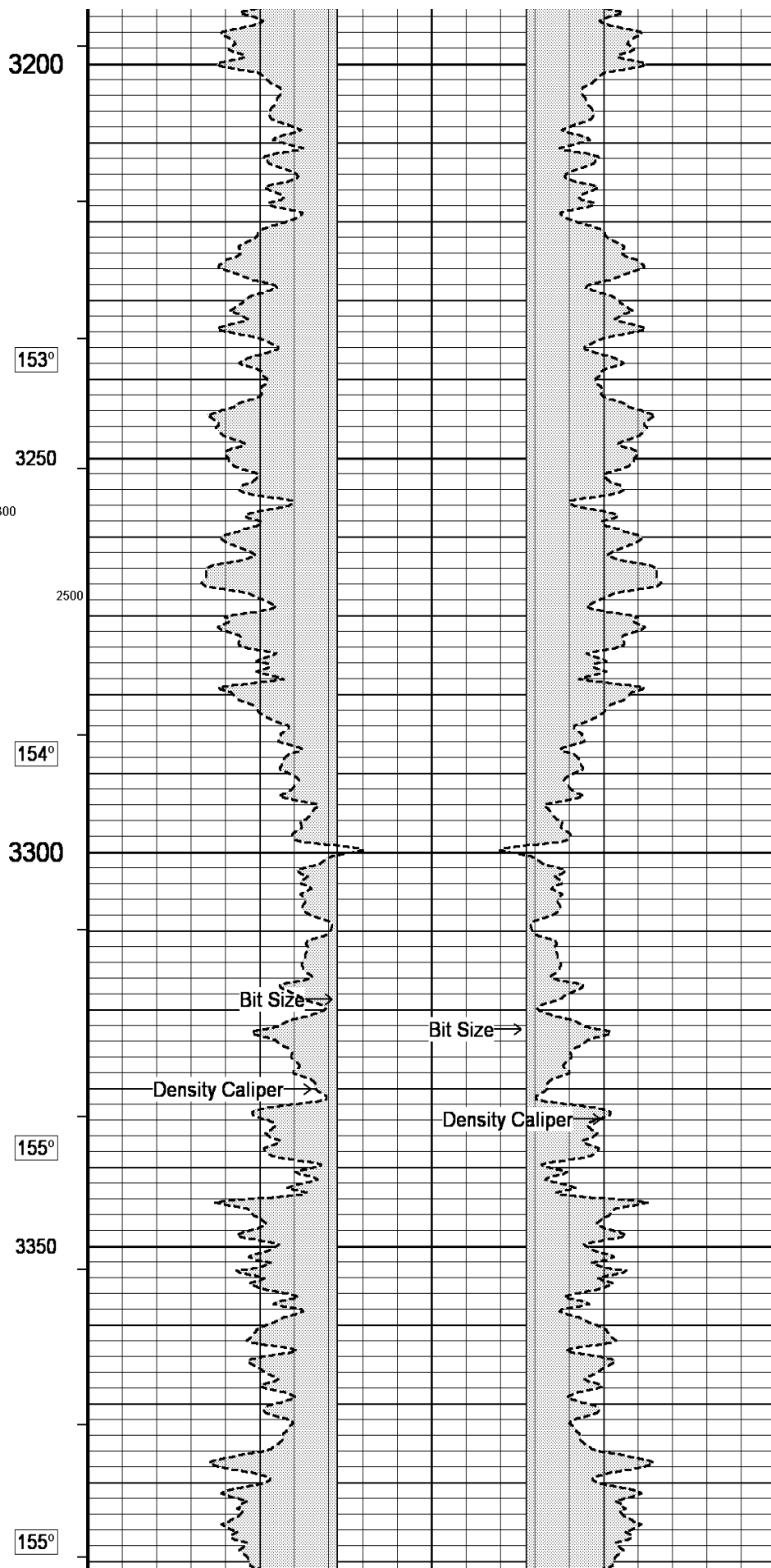
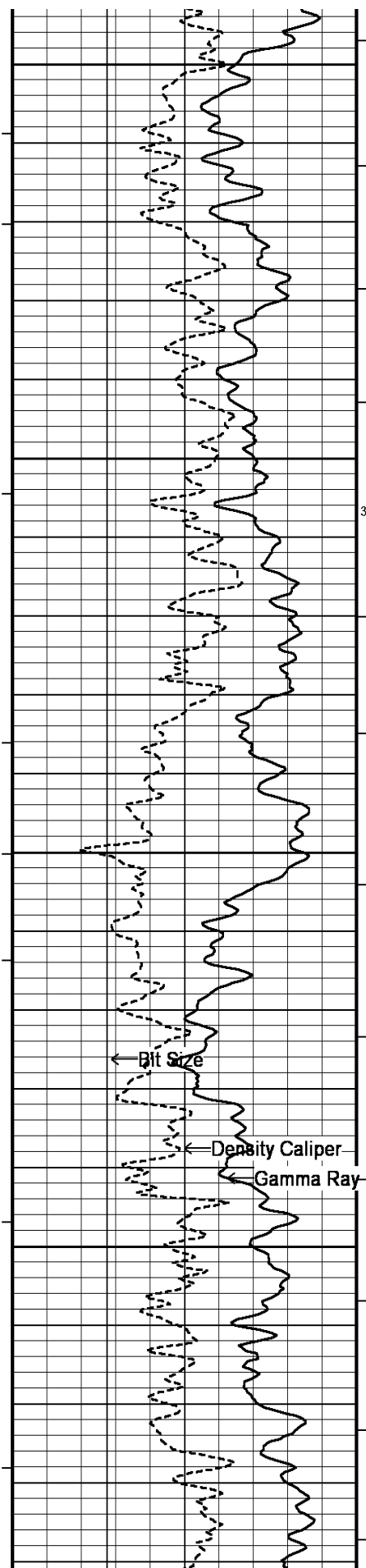


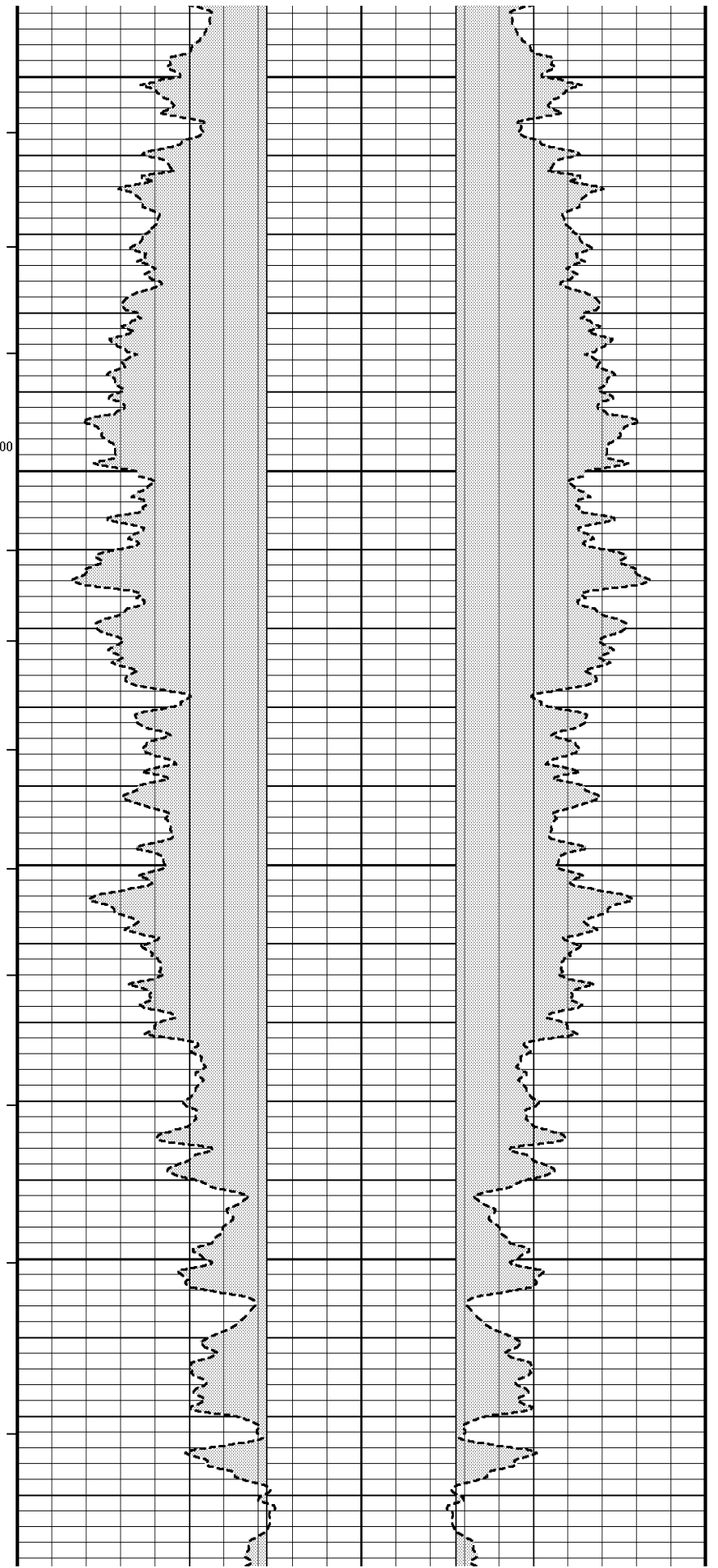
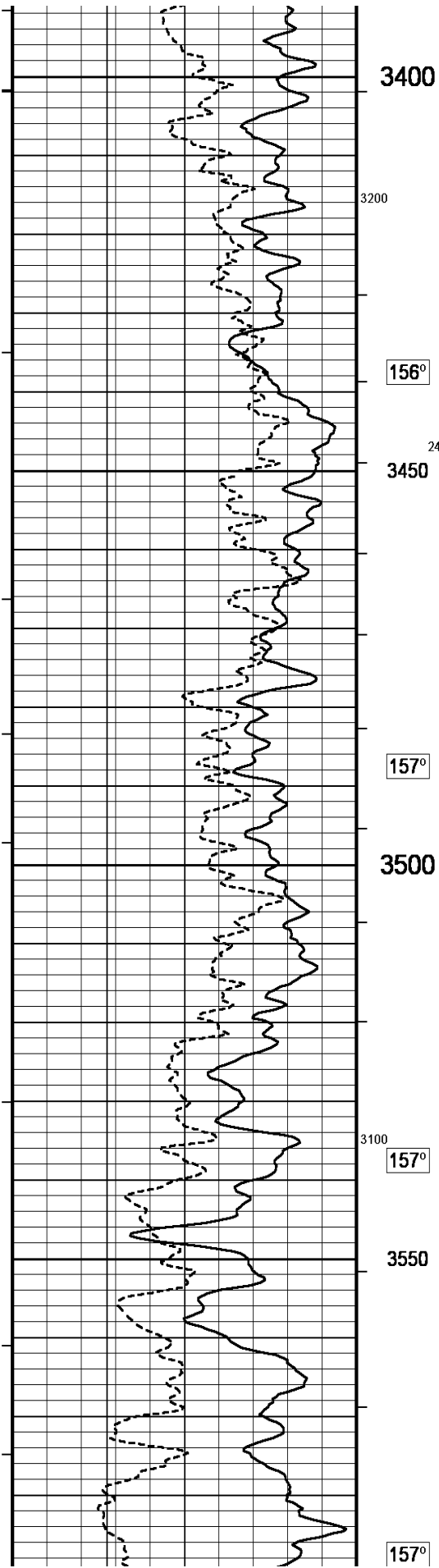


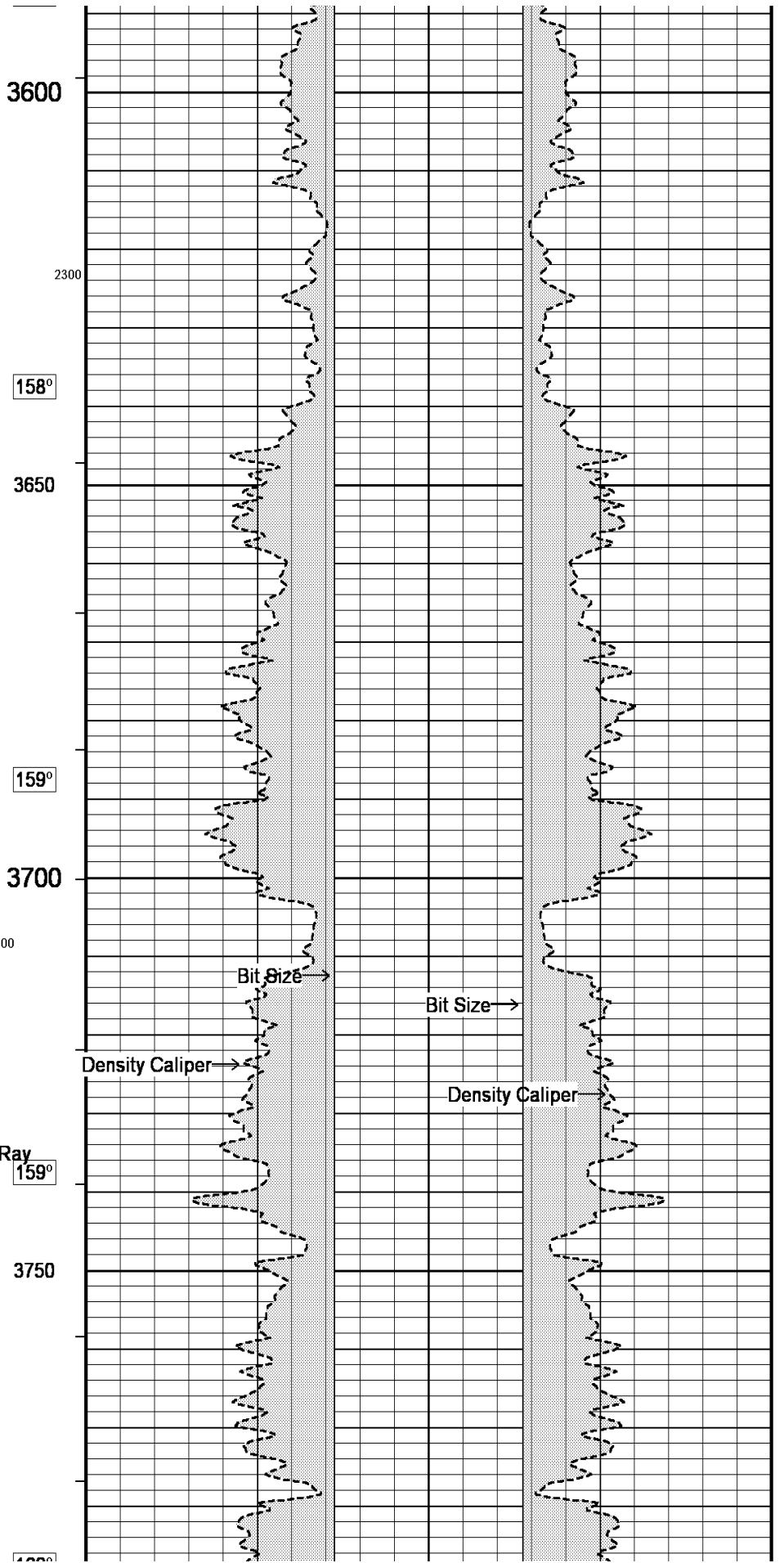
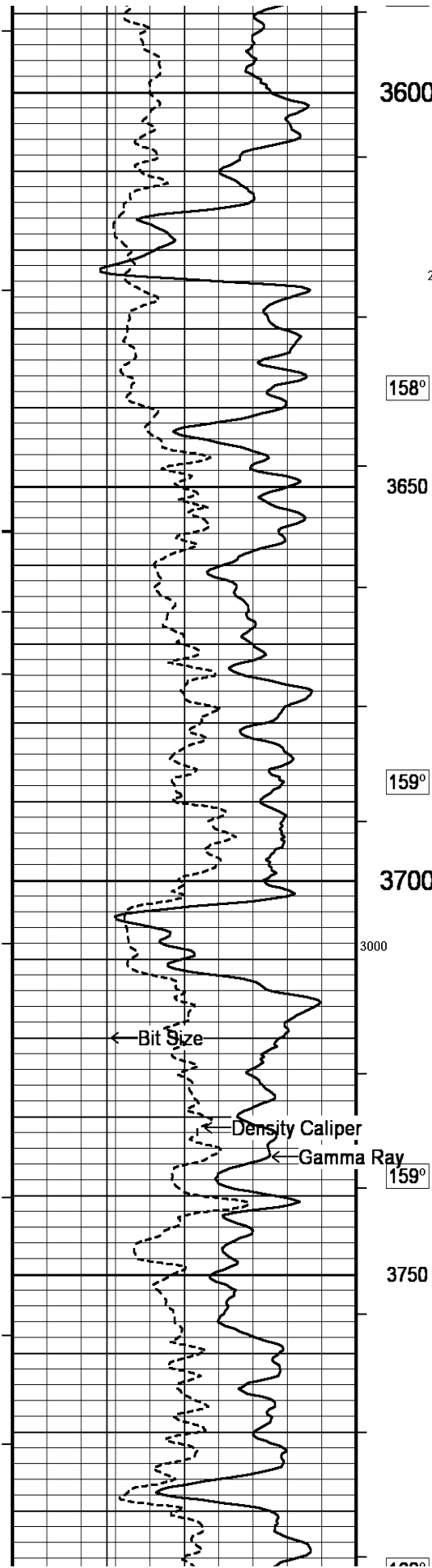


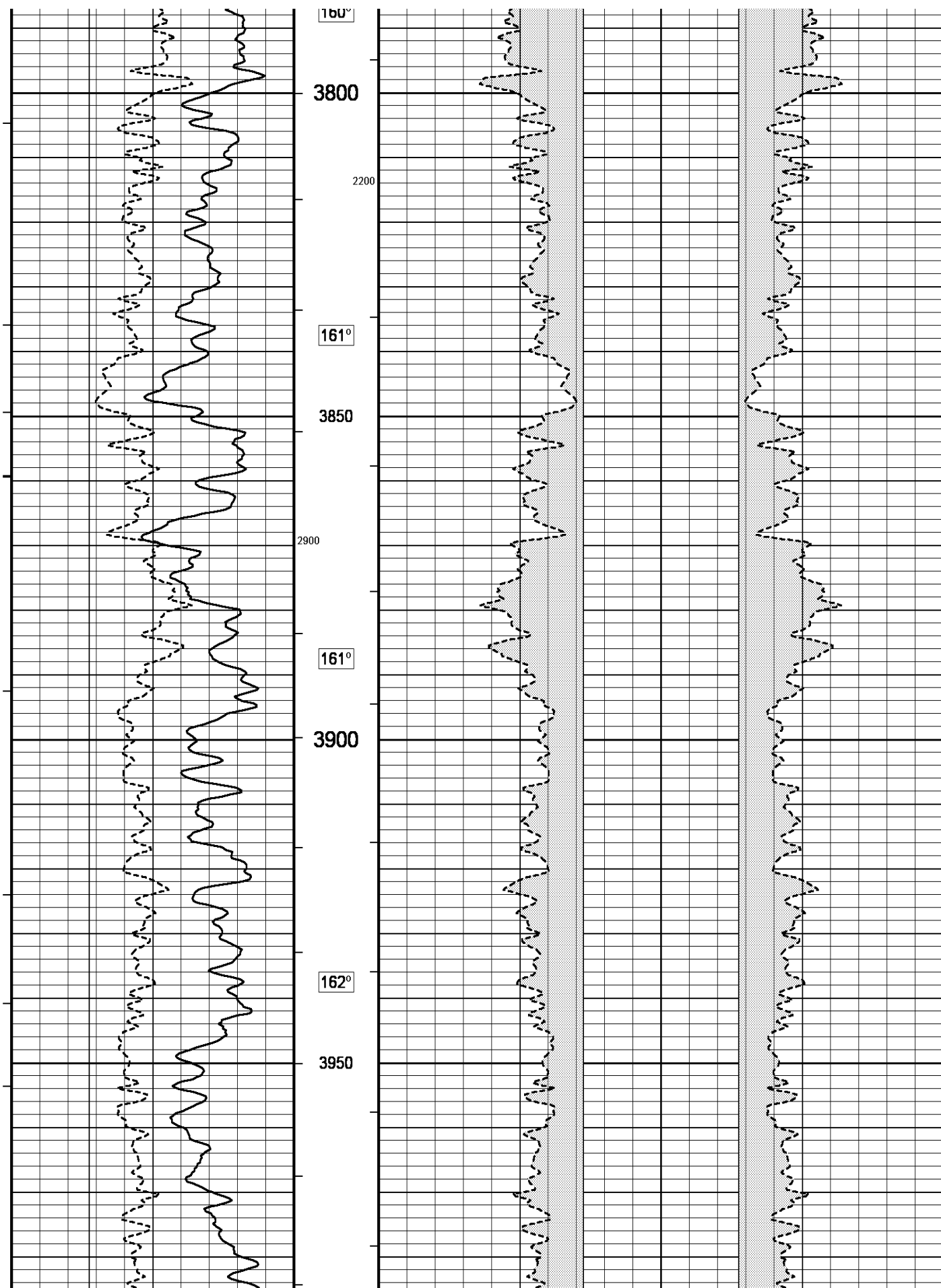


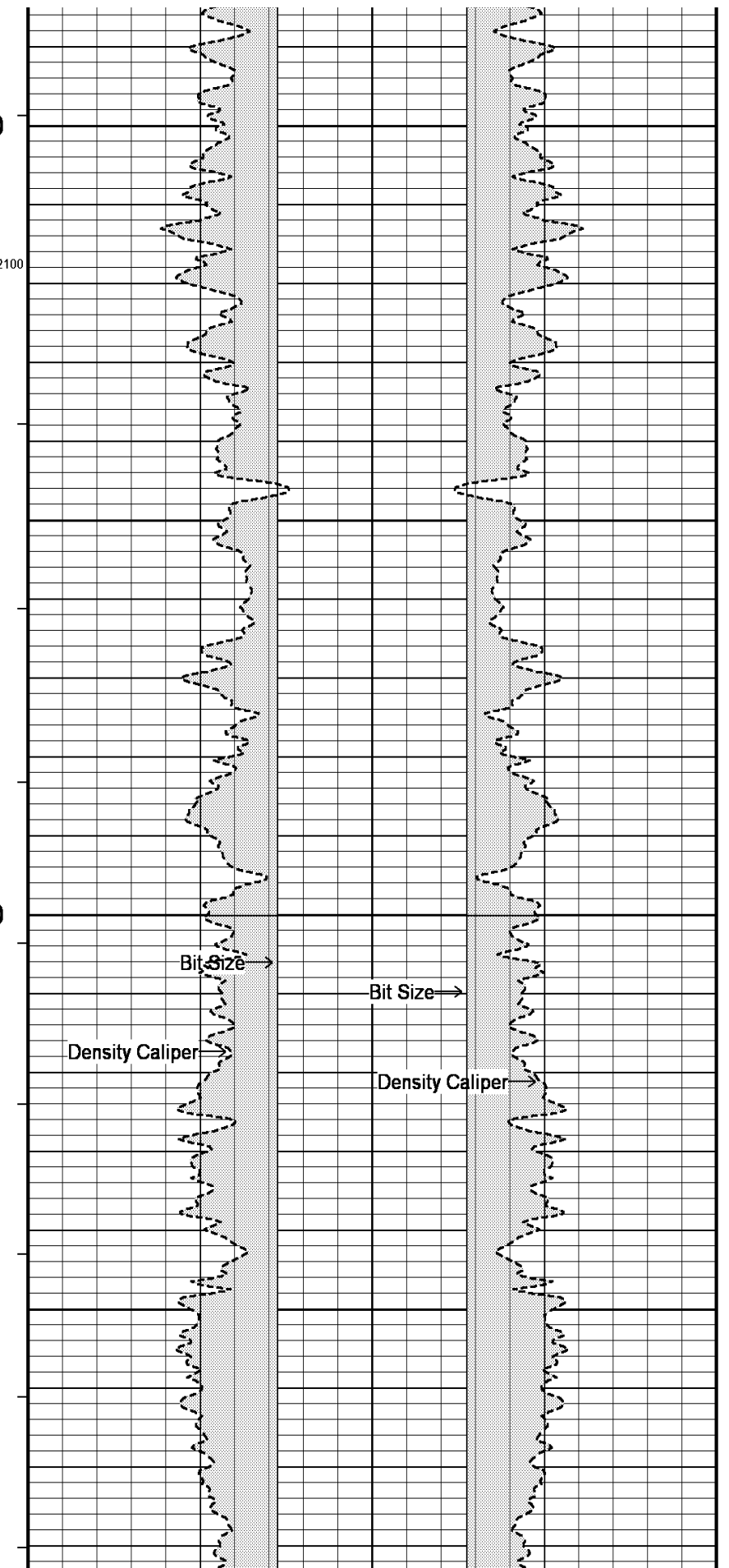
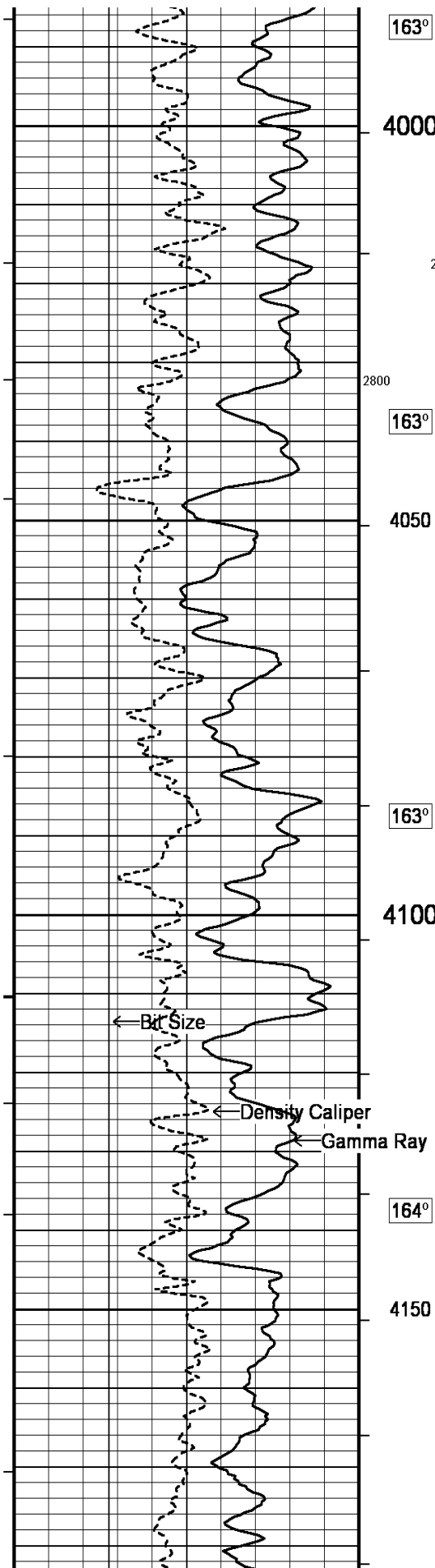


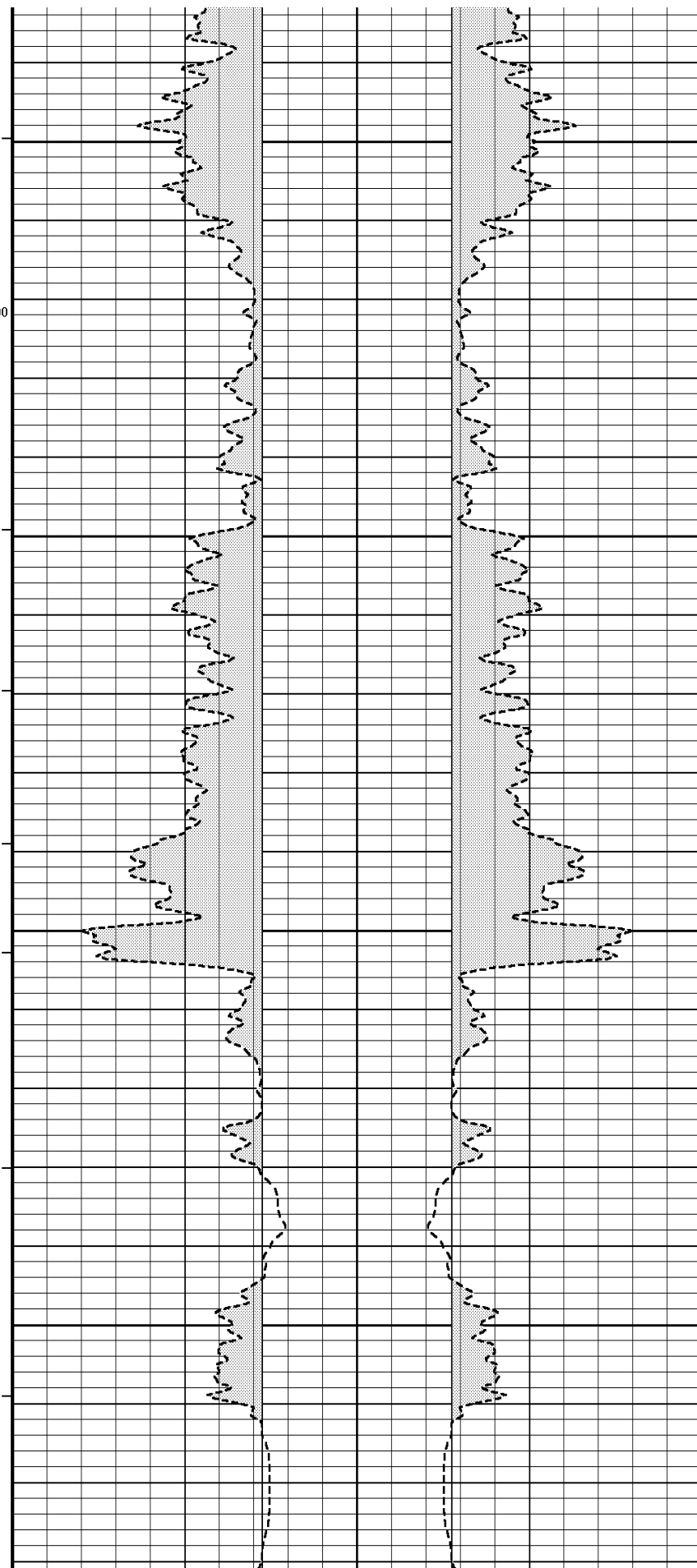
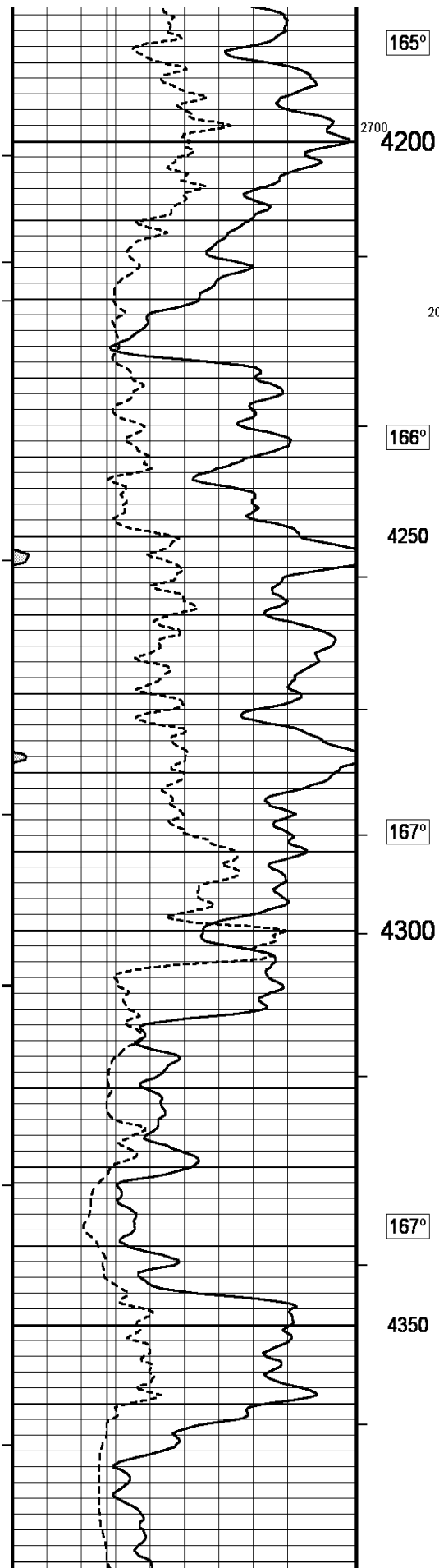


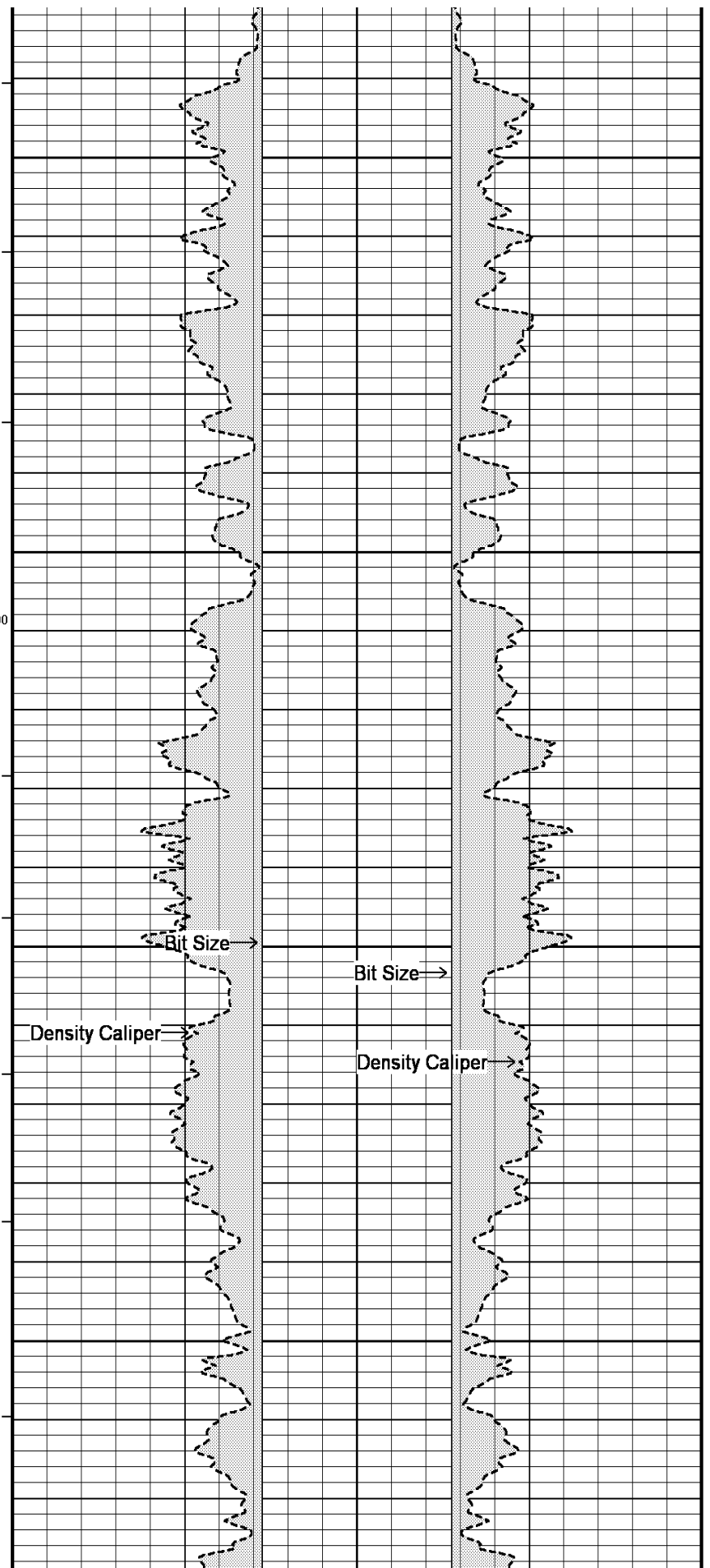
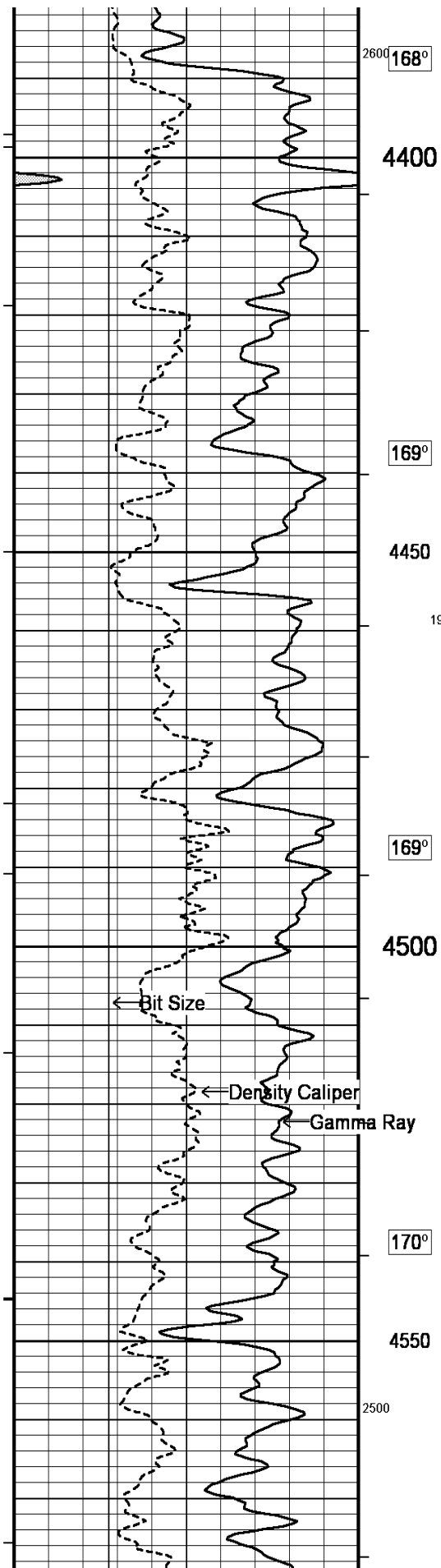


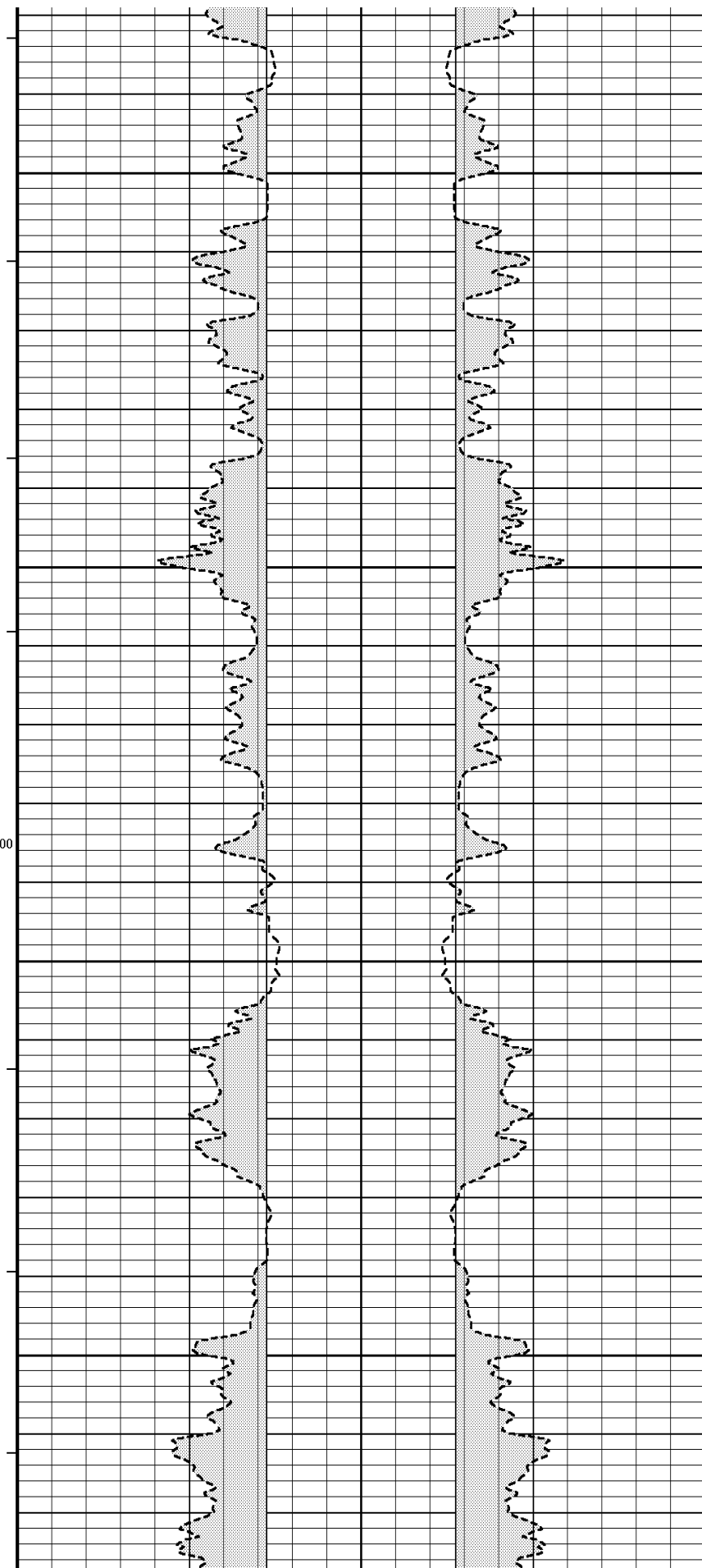
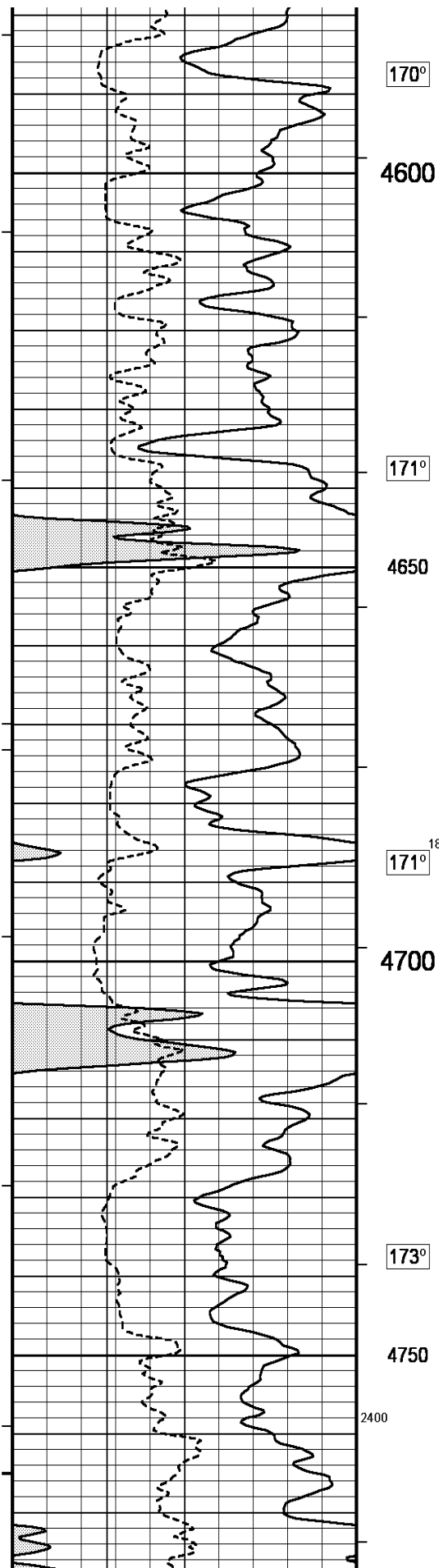


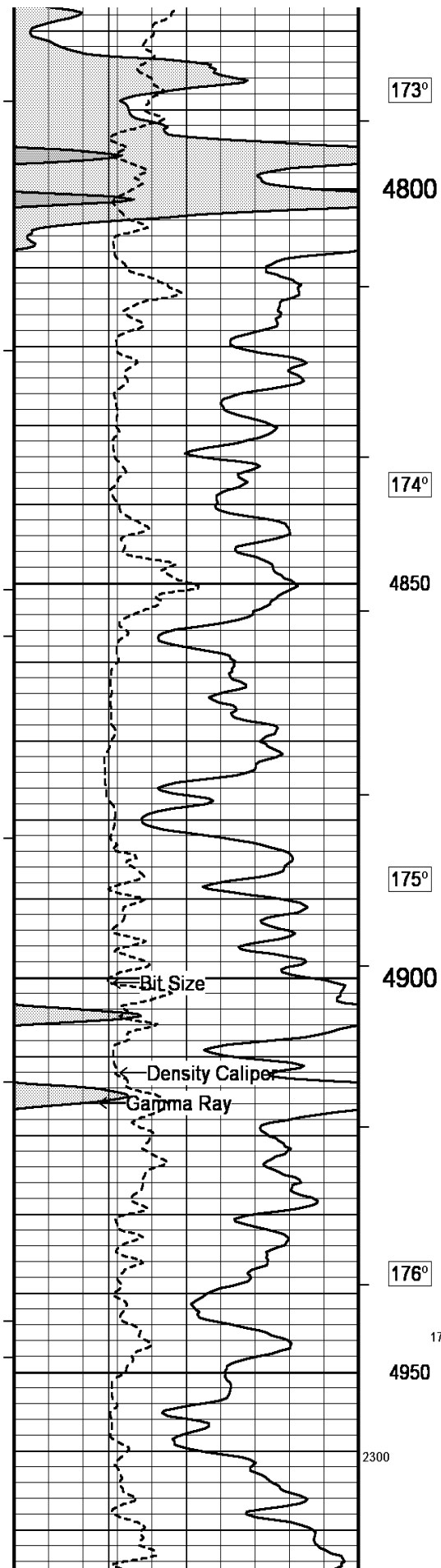












173°

4800

174°

4850

175°

4900

176°

1700

4950

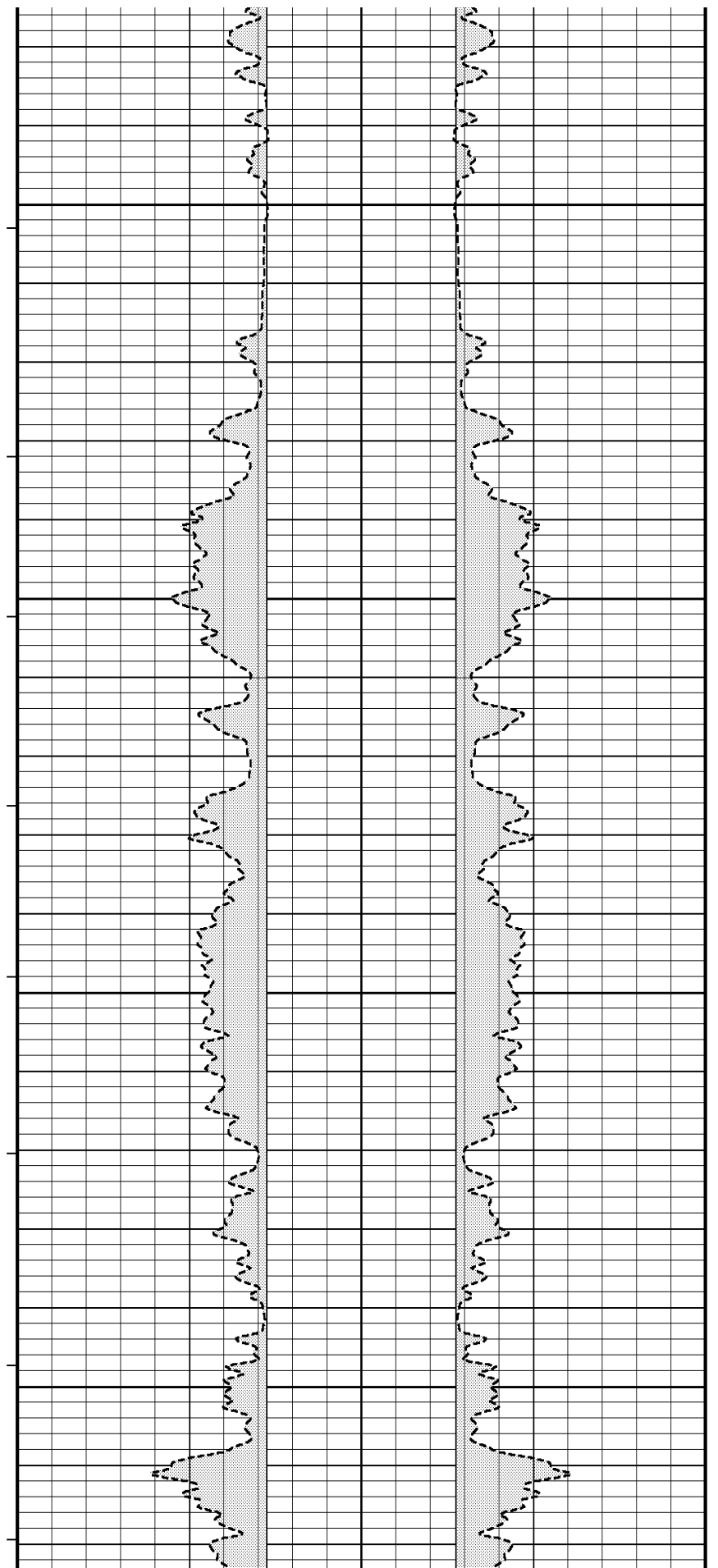
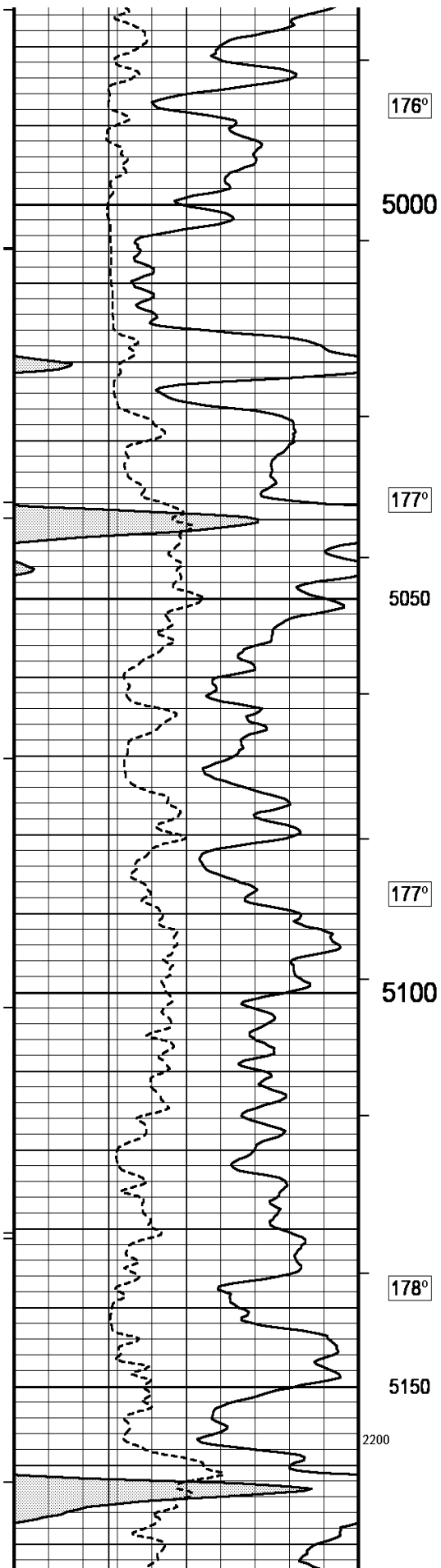
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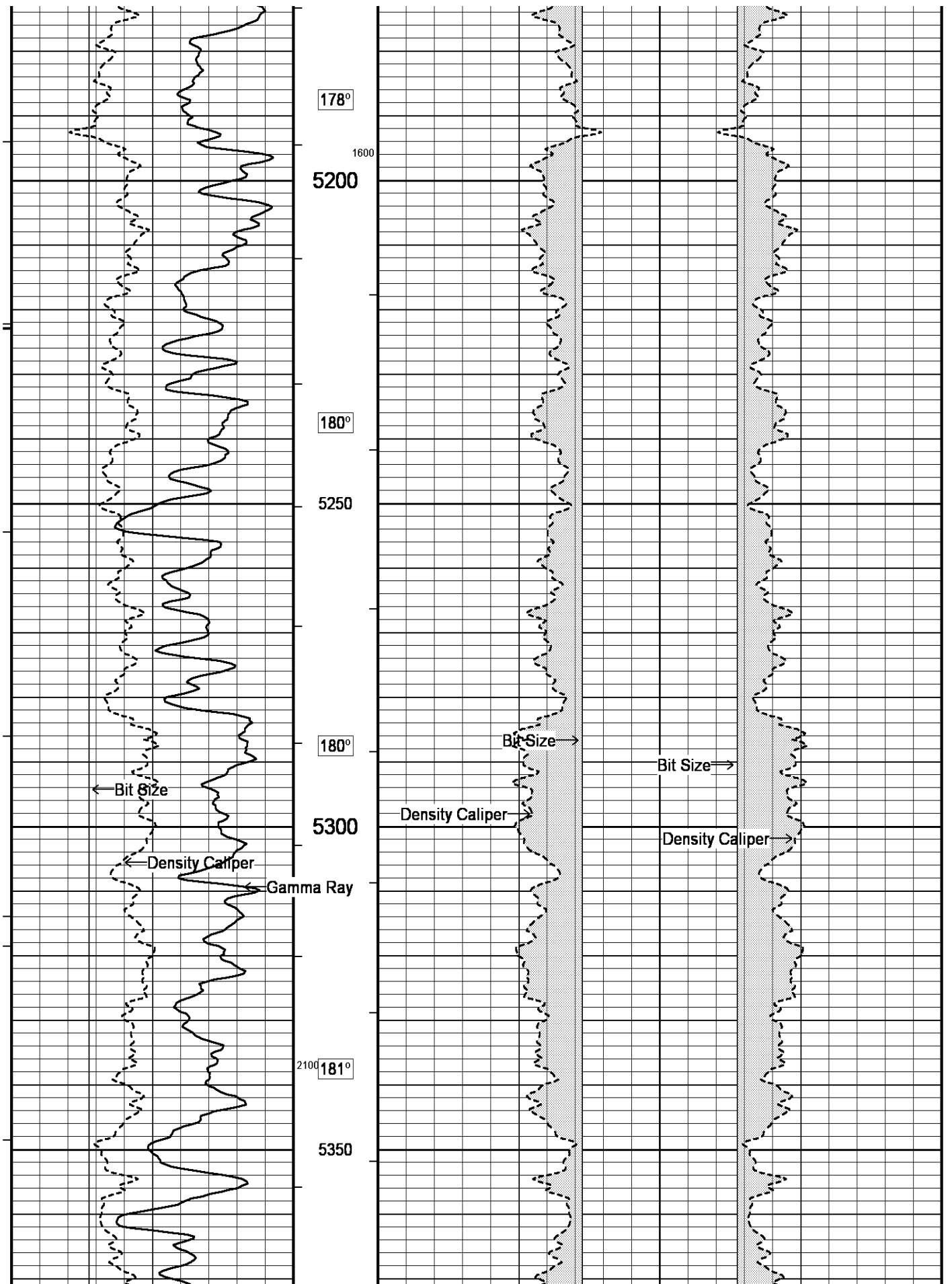
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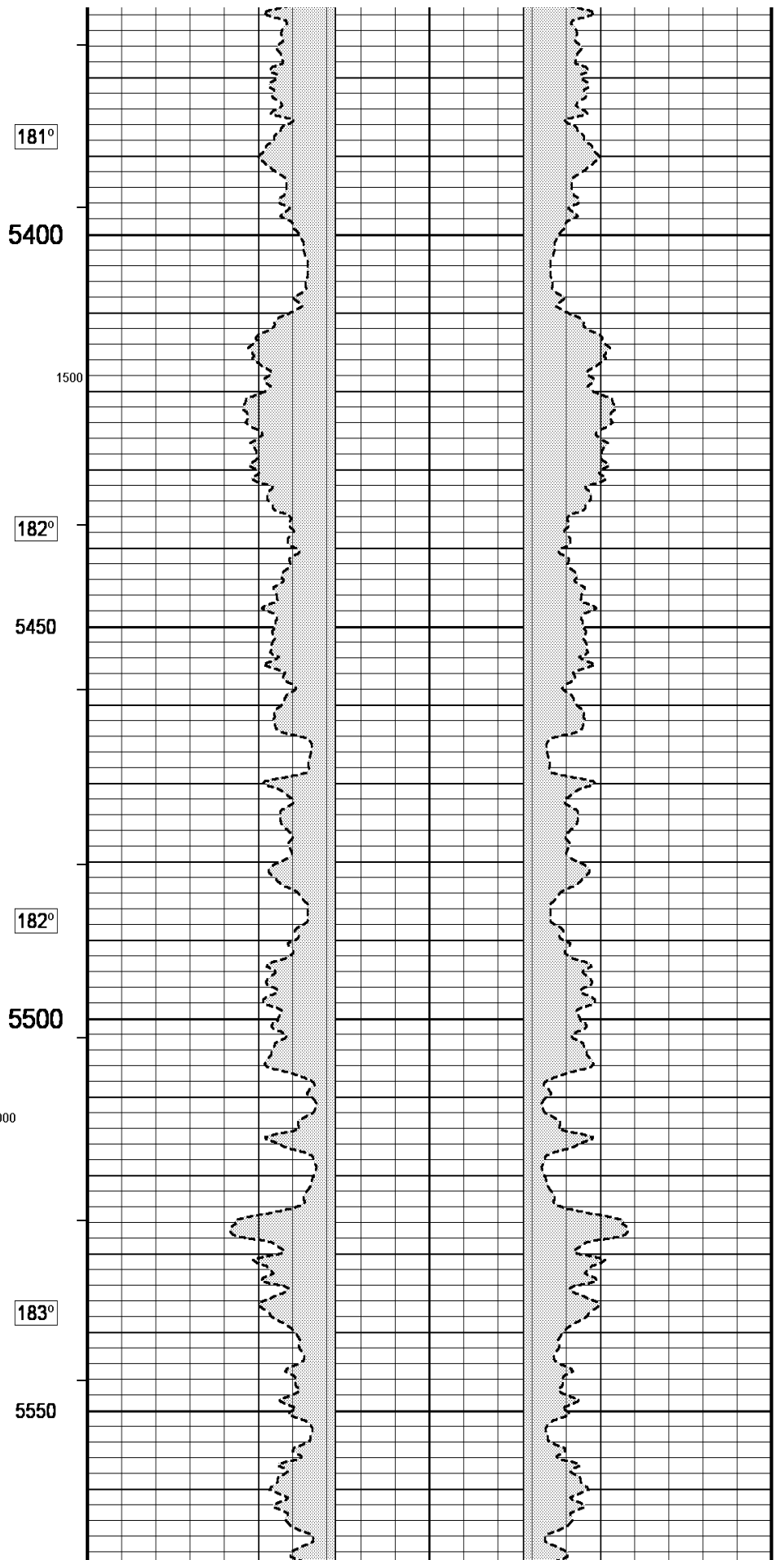
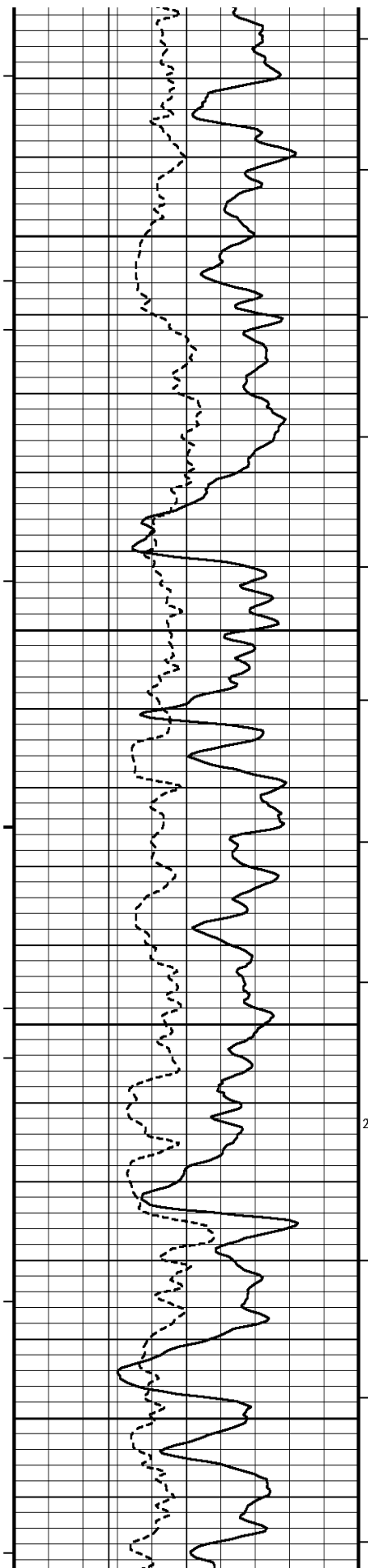
Density Caliper

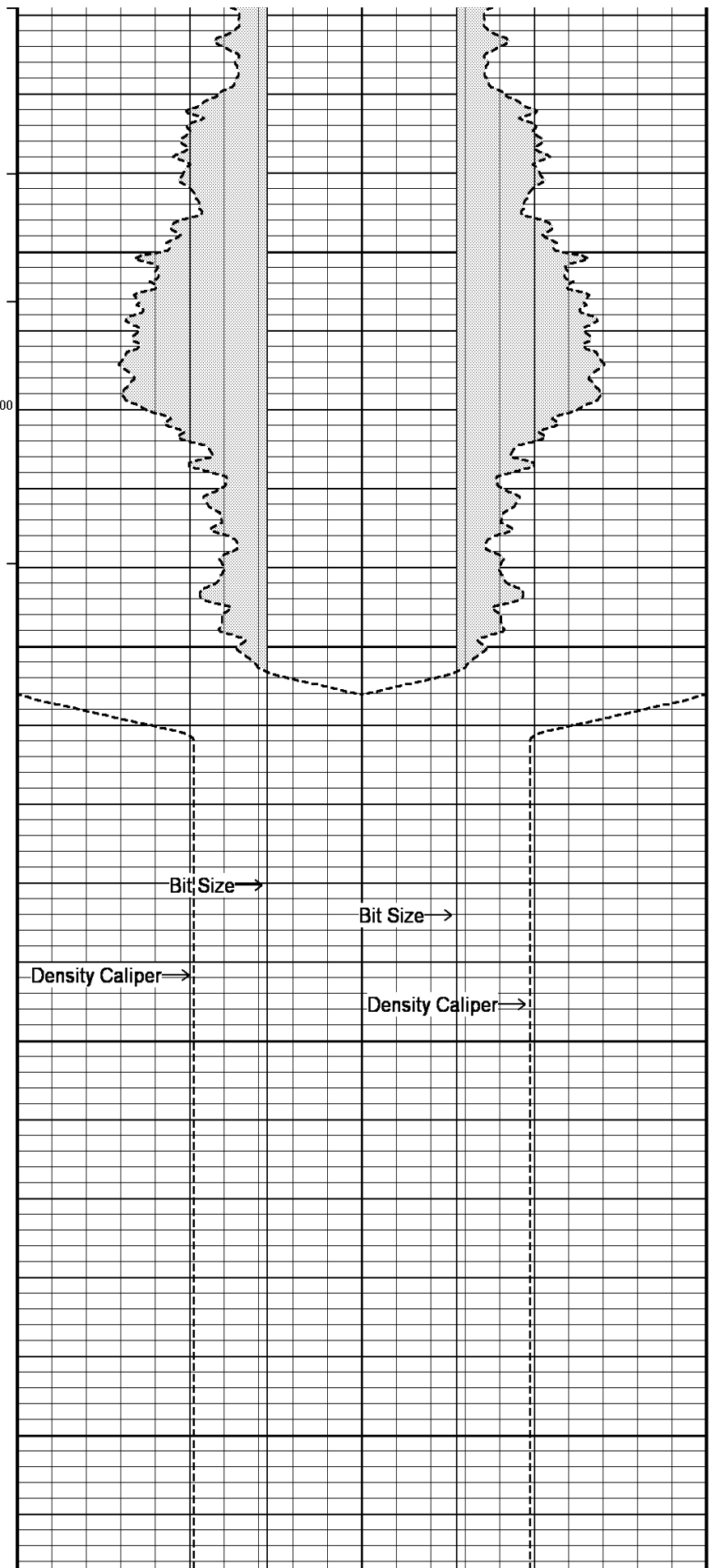
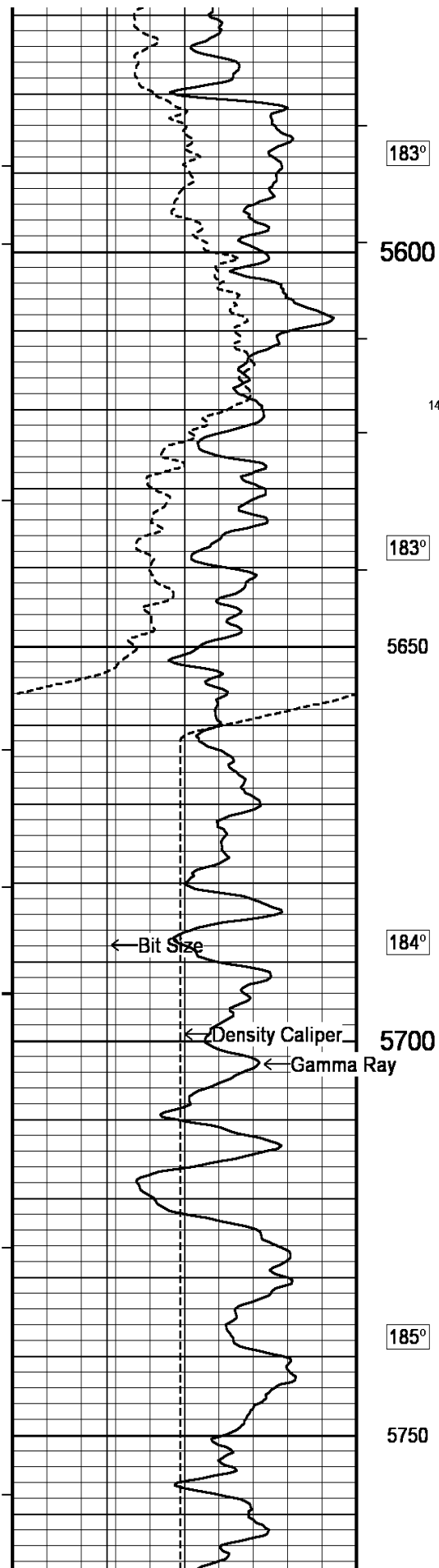
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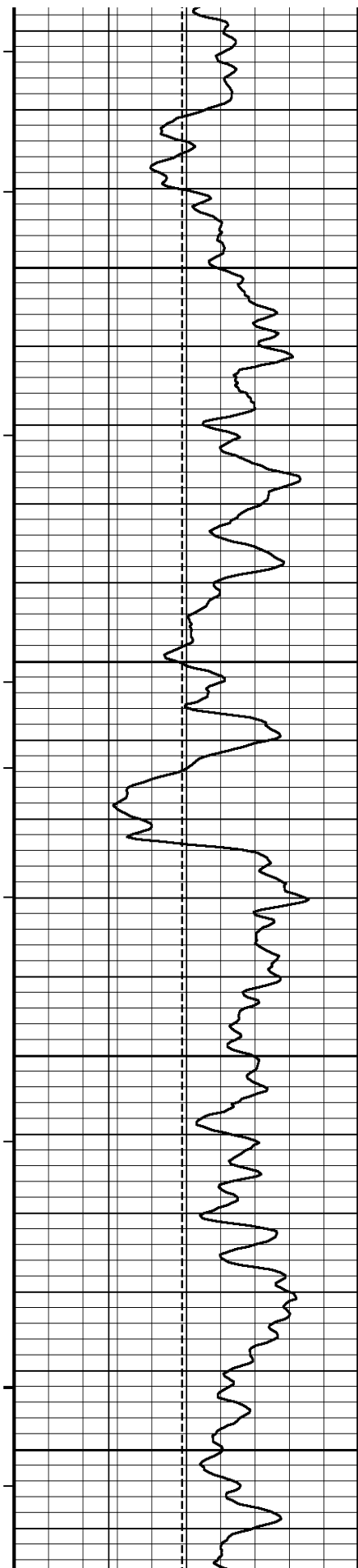
Density Caliper











185°

5800

185°

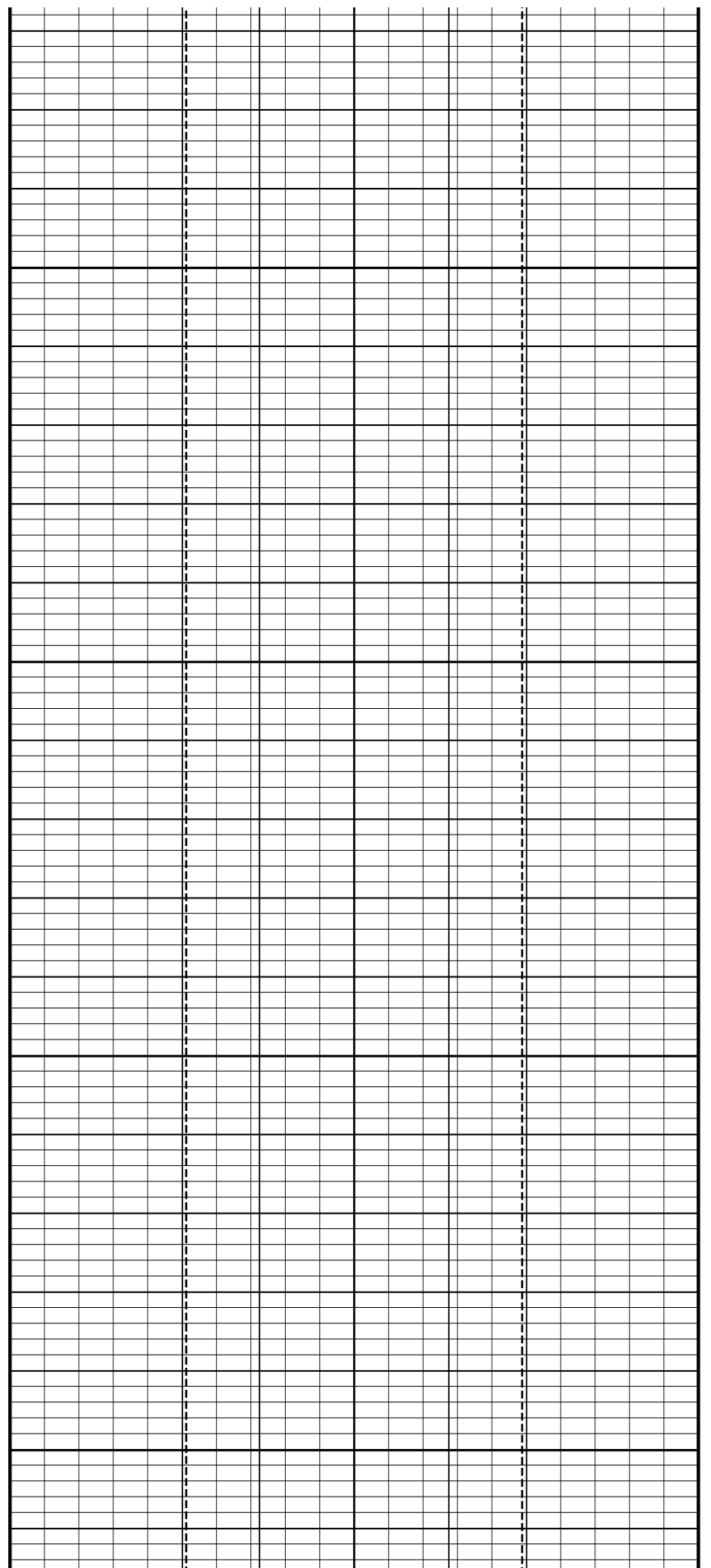
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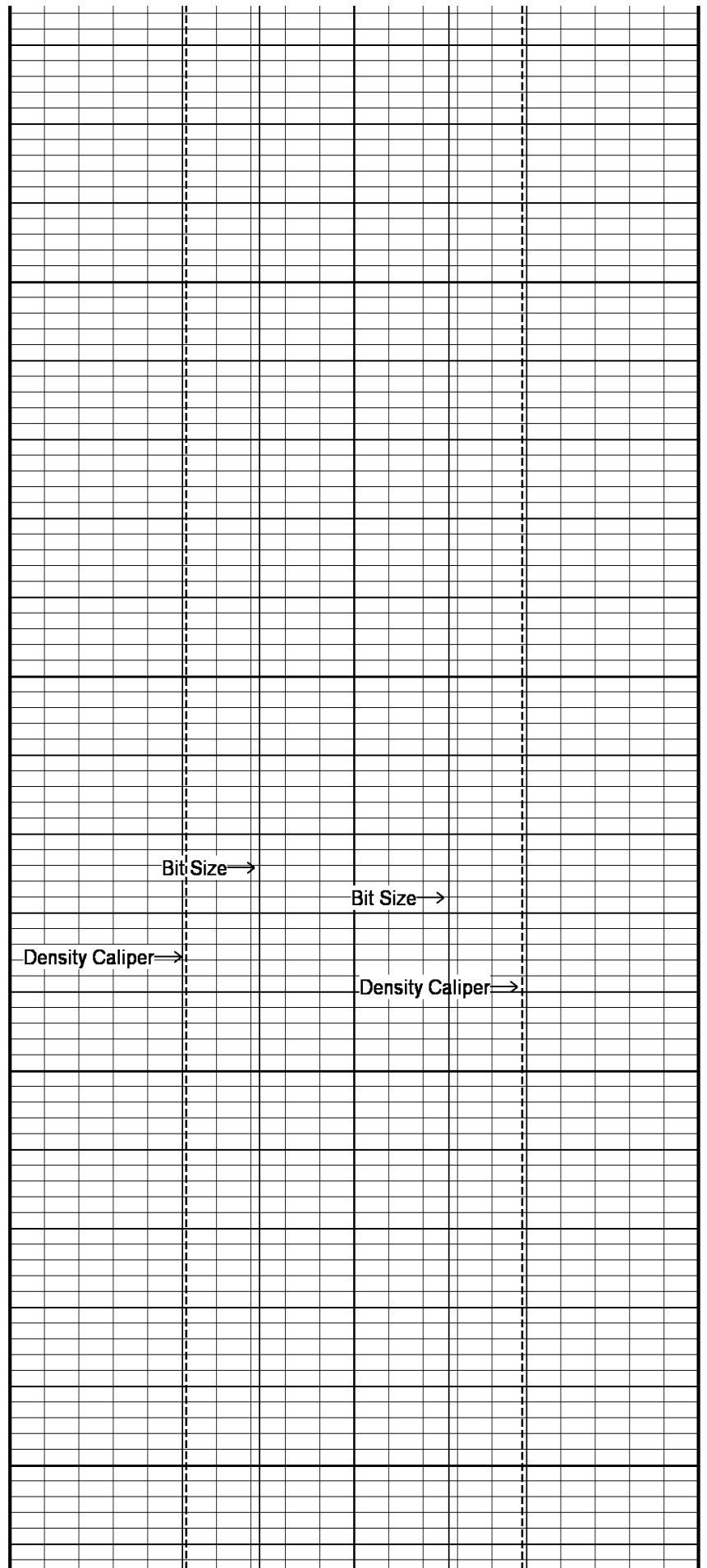
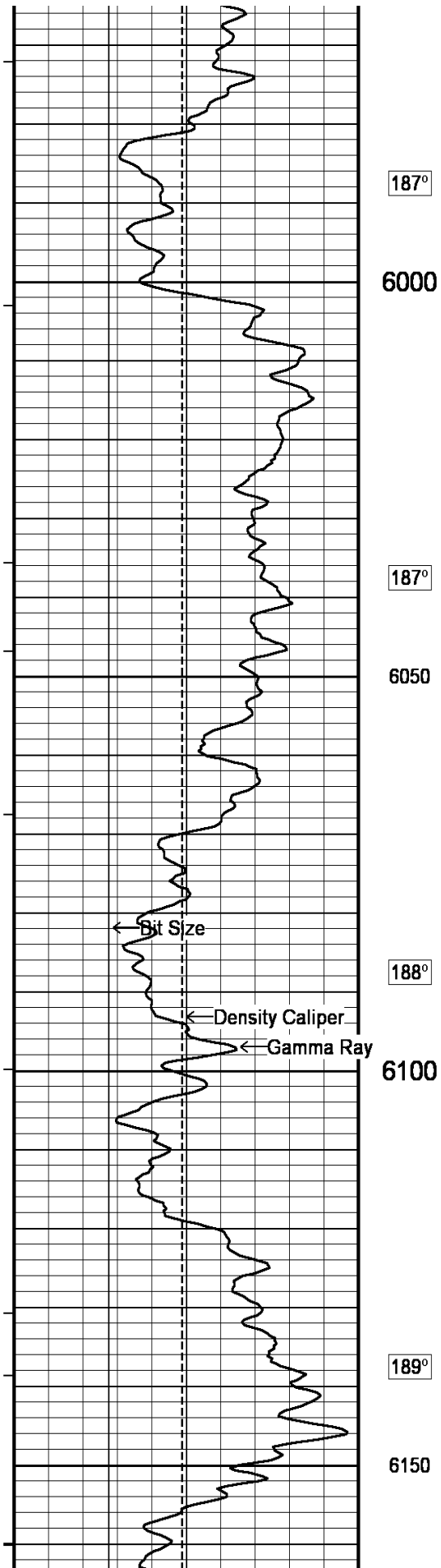
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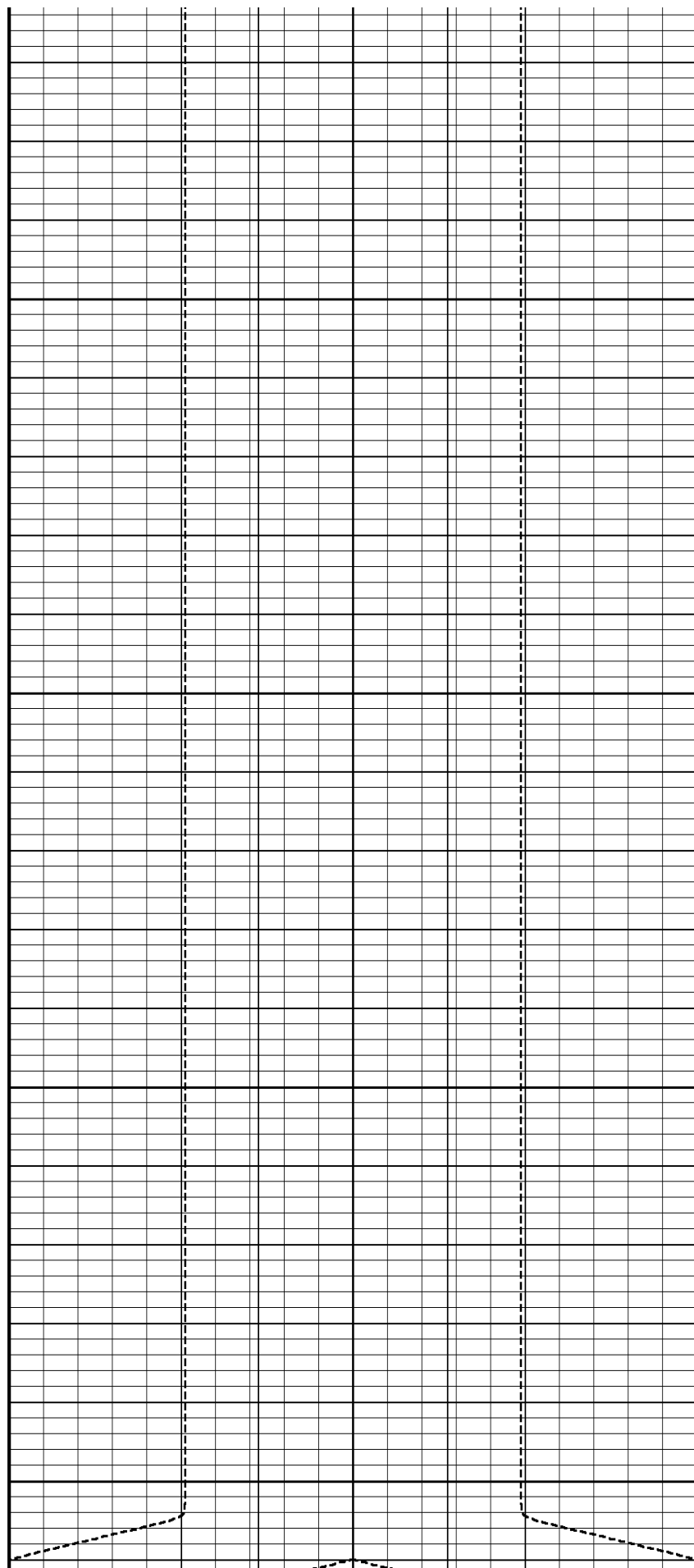
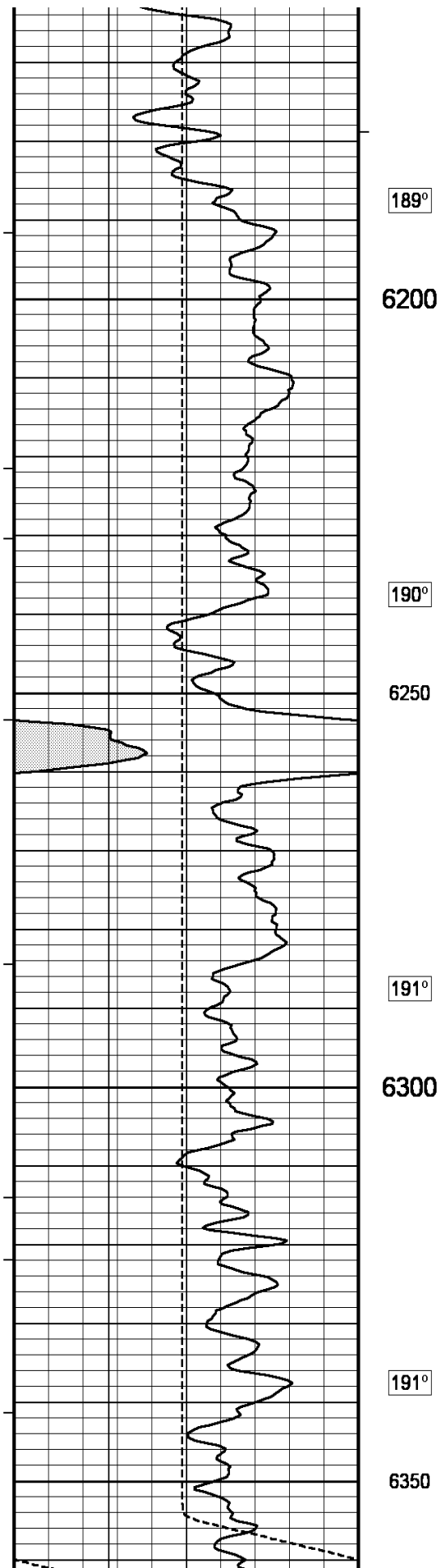
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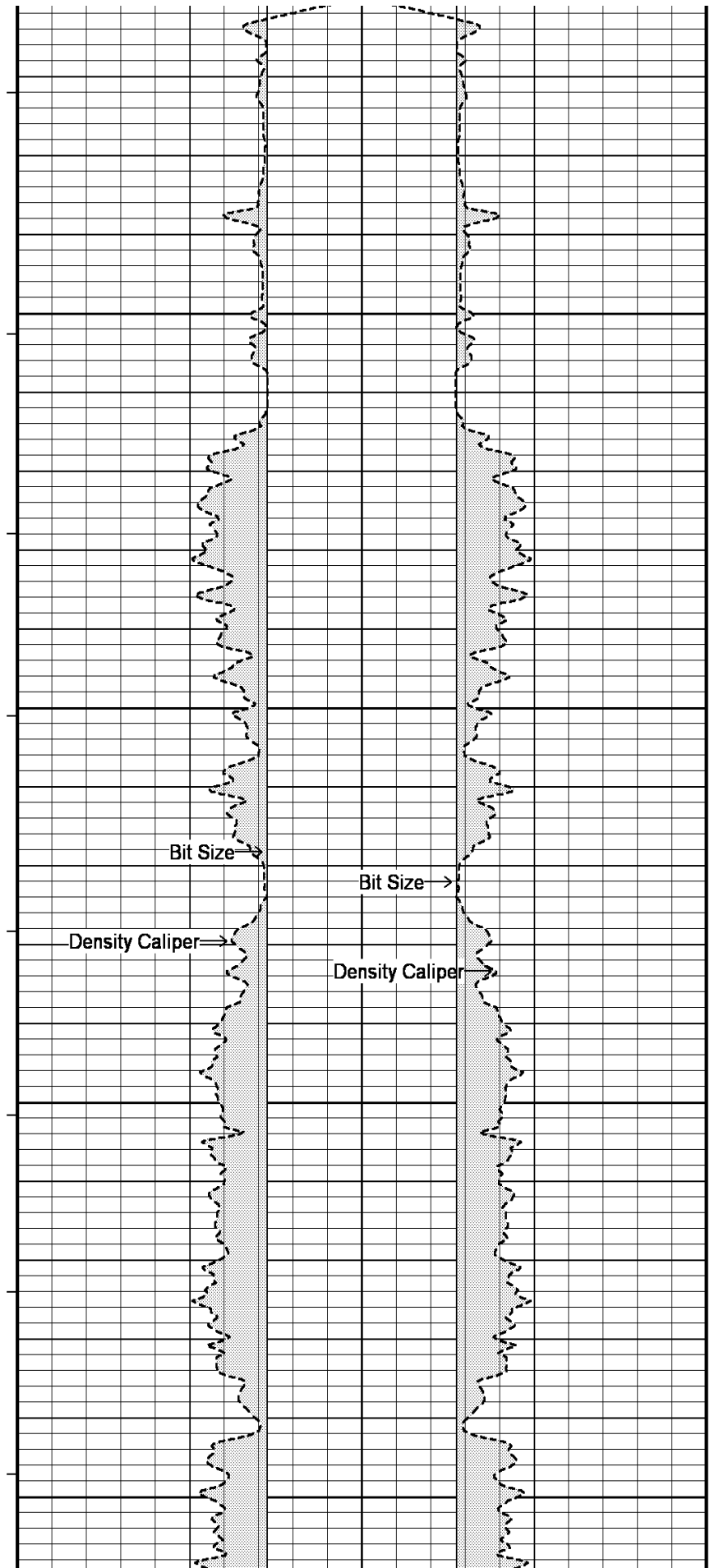
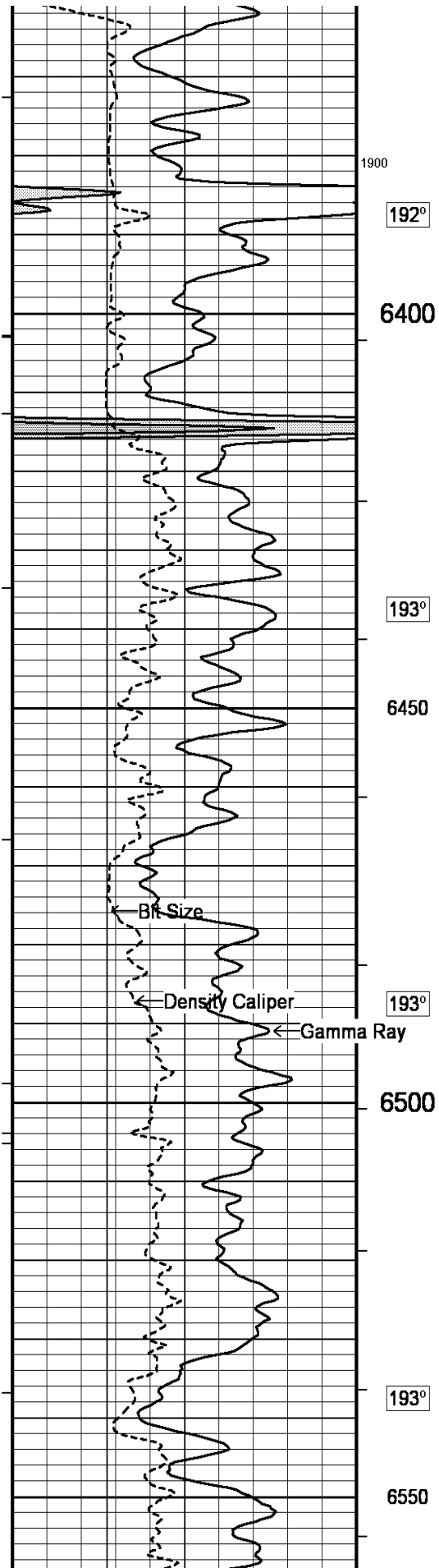
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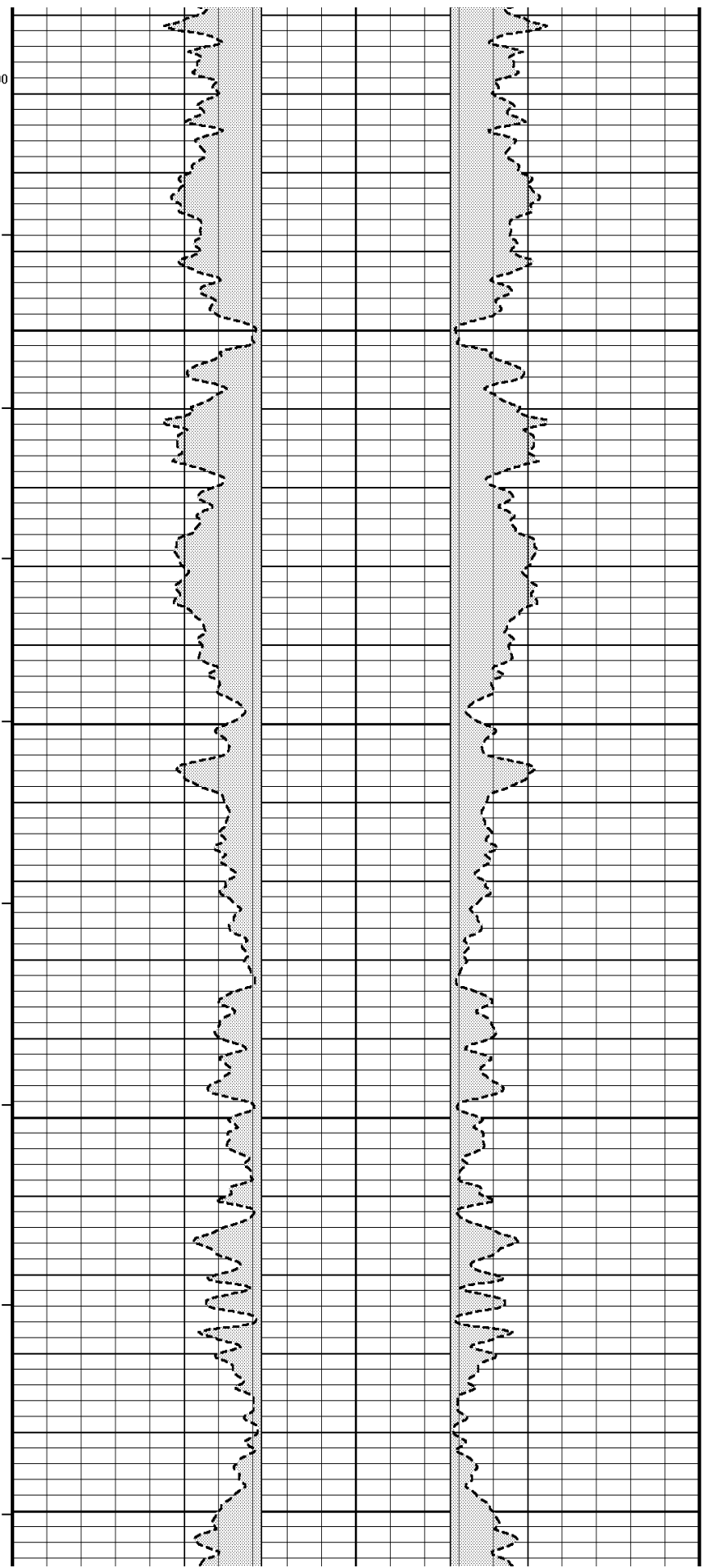
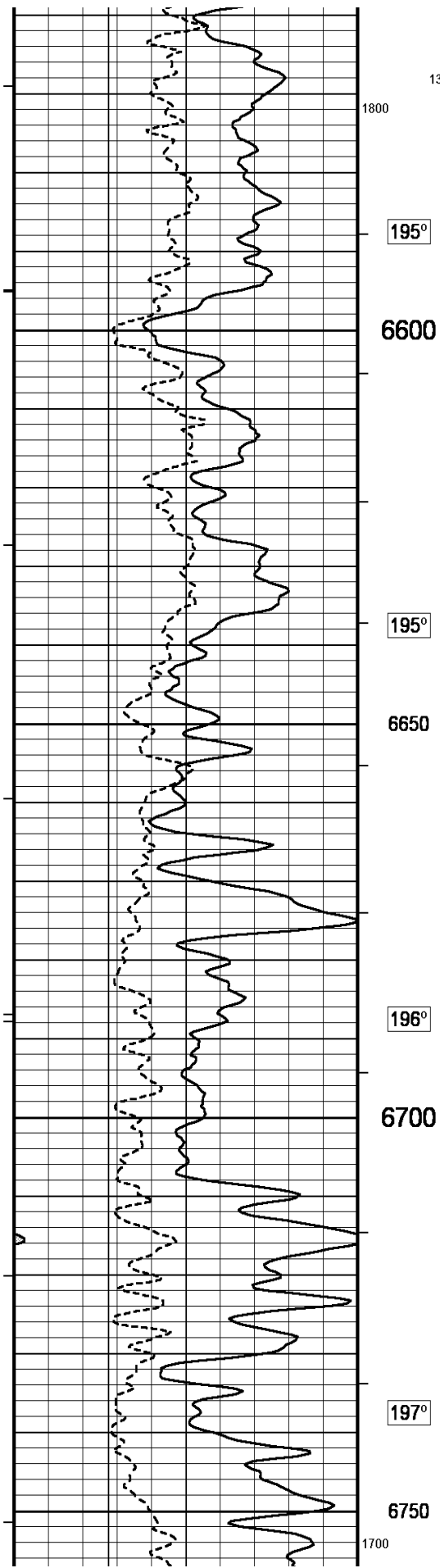
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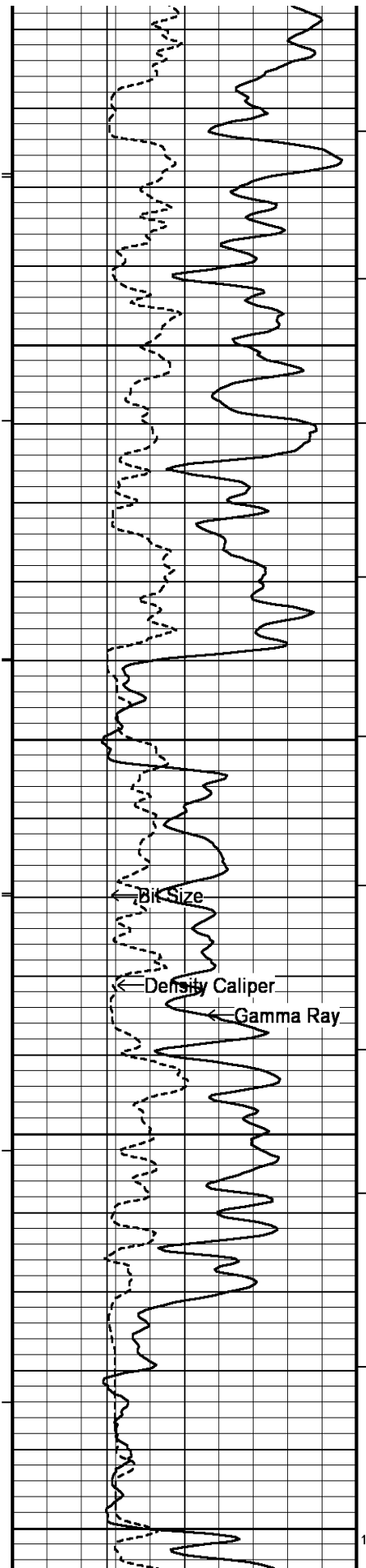












198°

1200
6800

199°

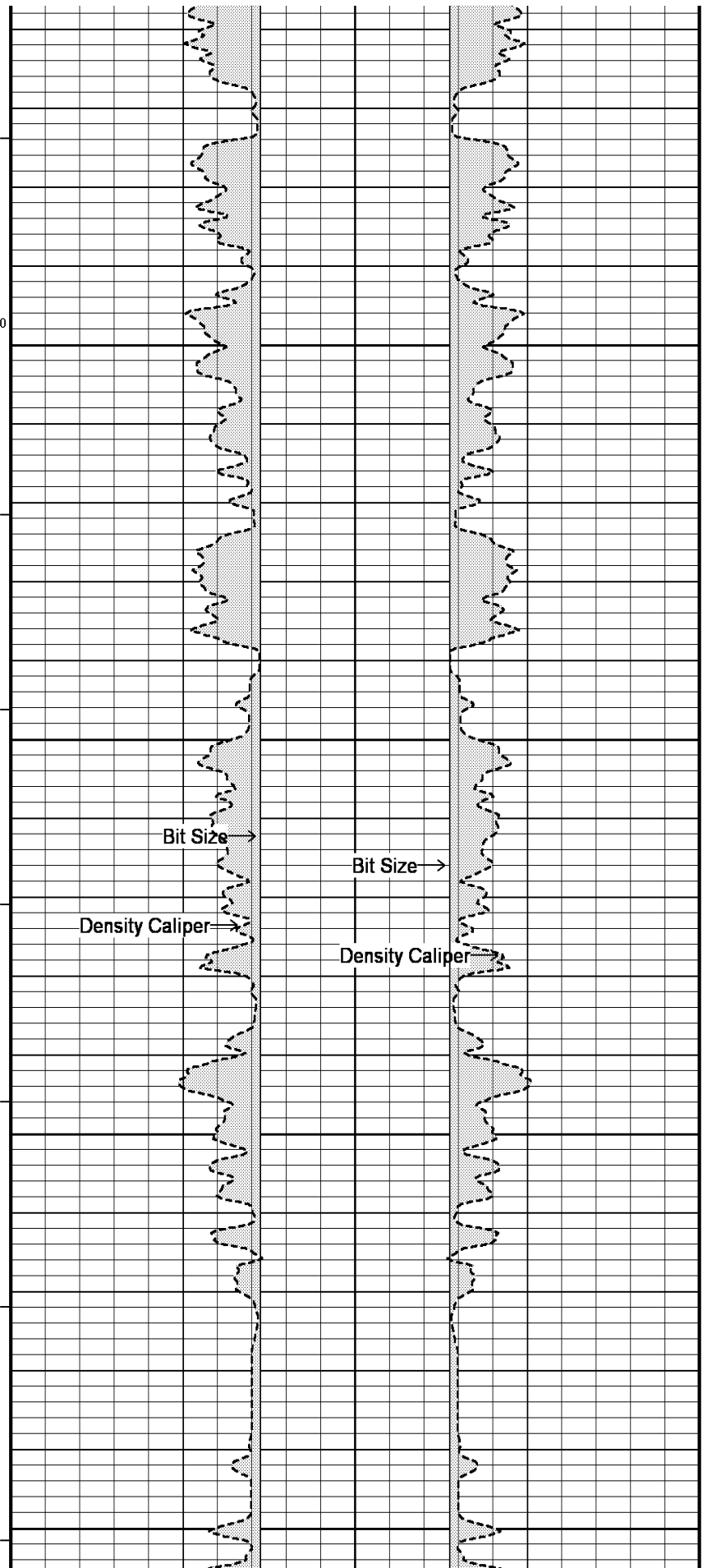
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199°

6900

200°

1600
6950

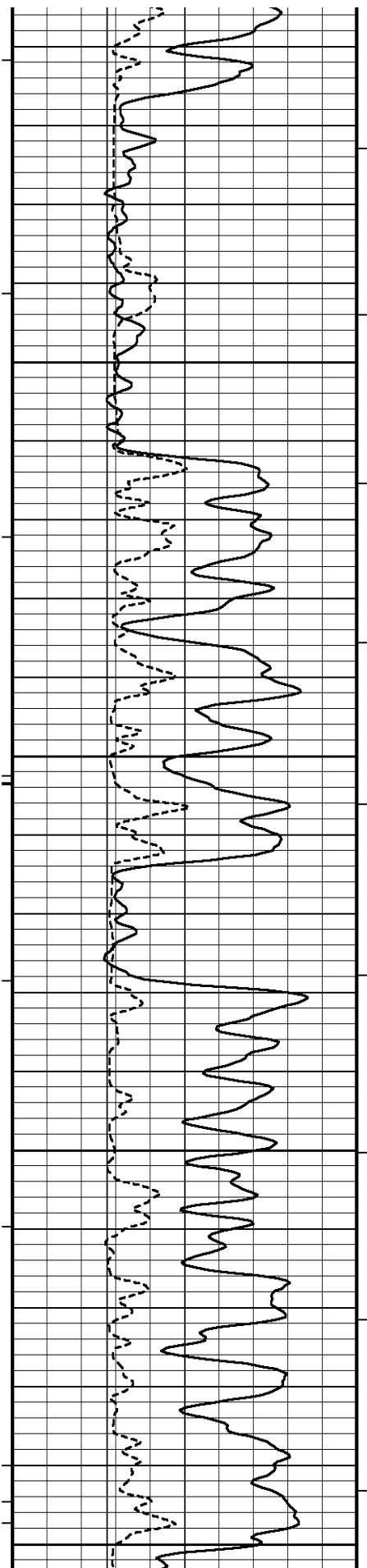


Bit Size →

Density Caliper →

Bit Size →

Density Caliper →



200°

7000

201°

7050

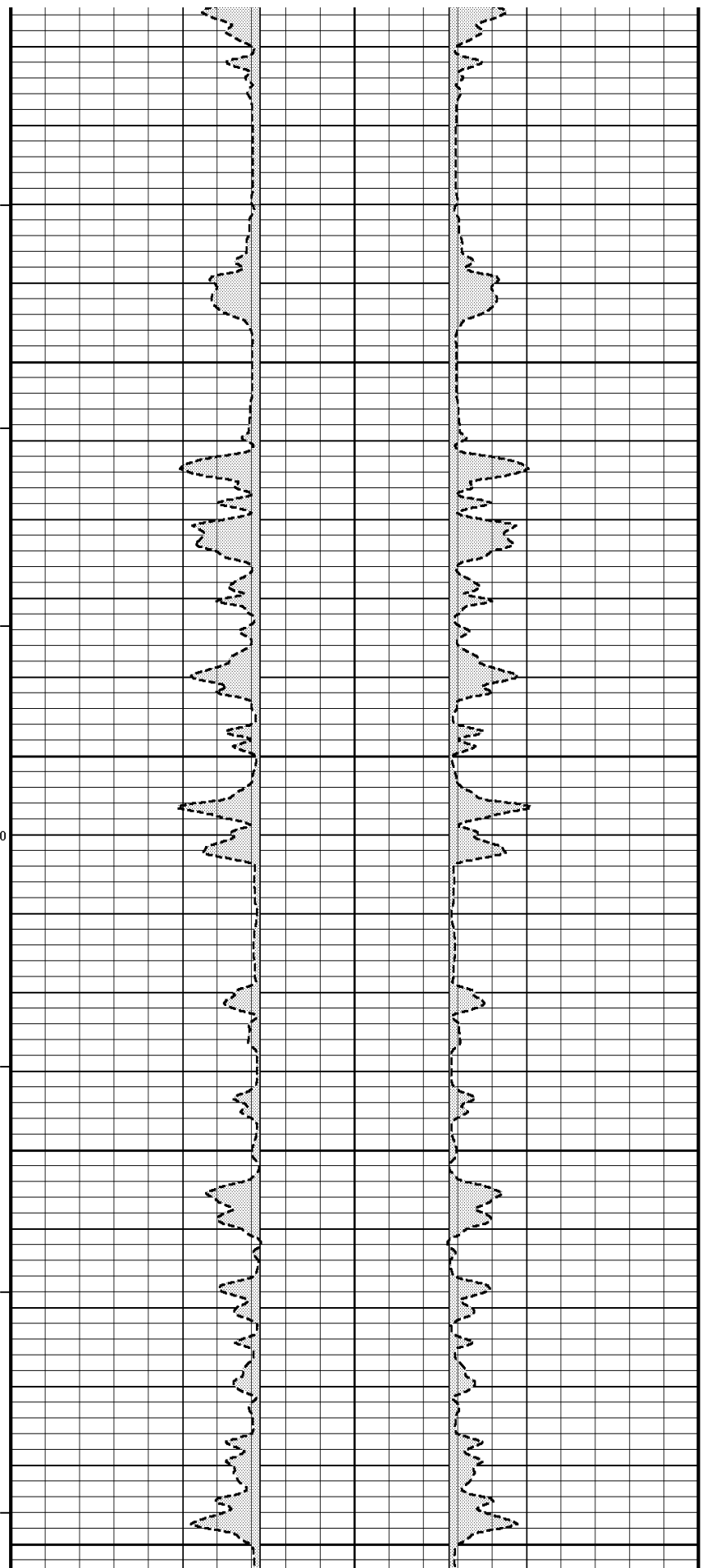
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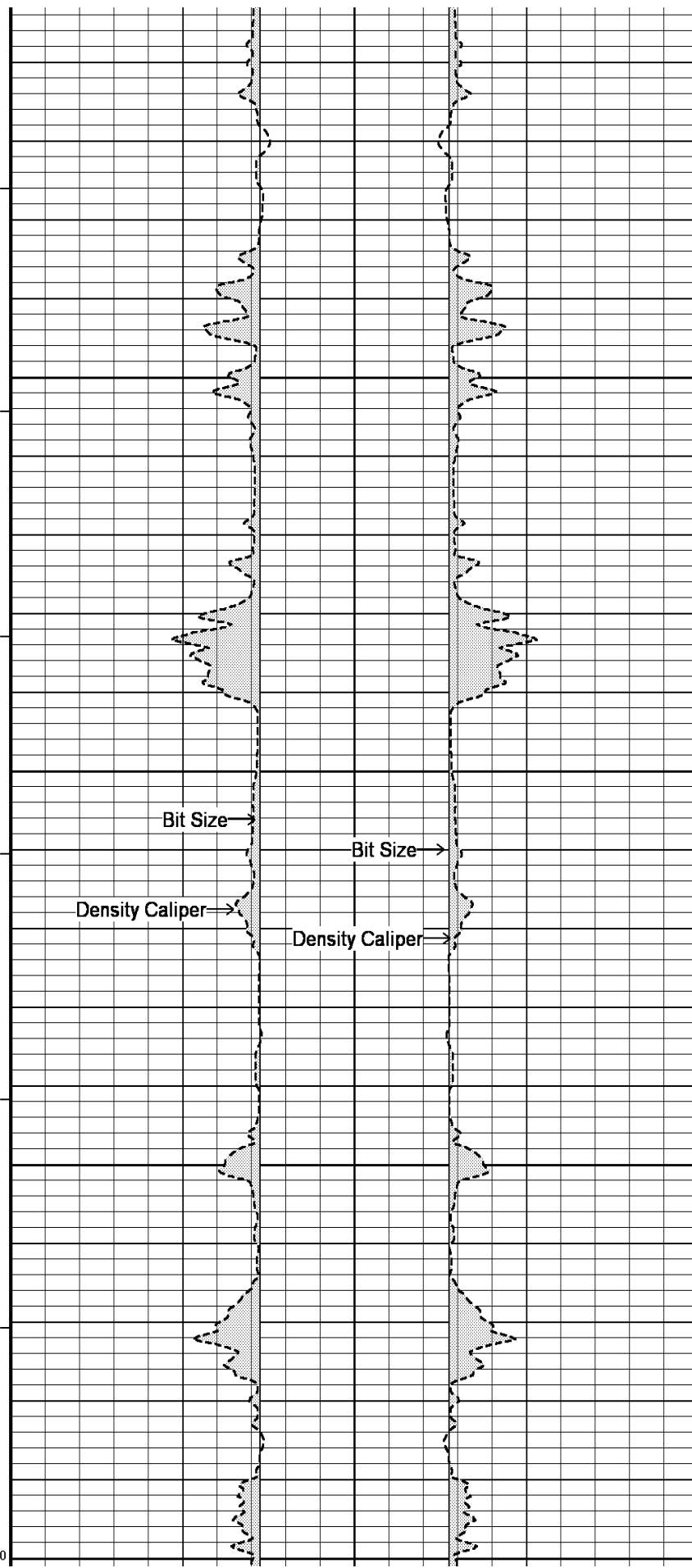
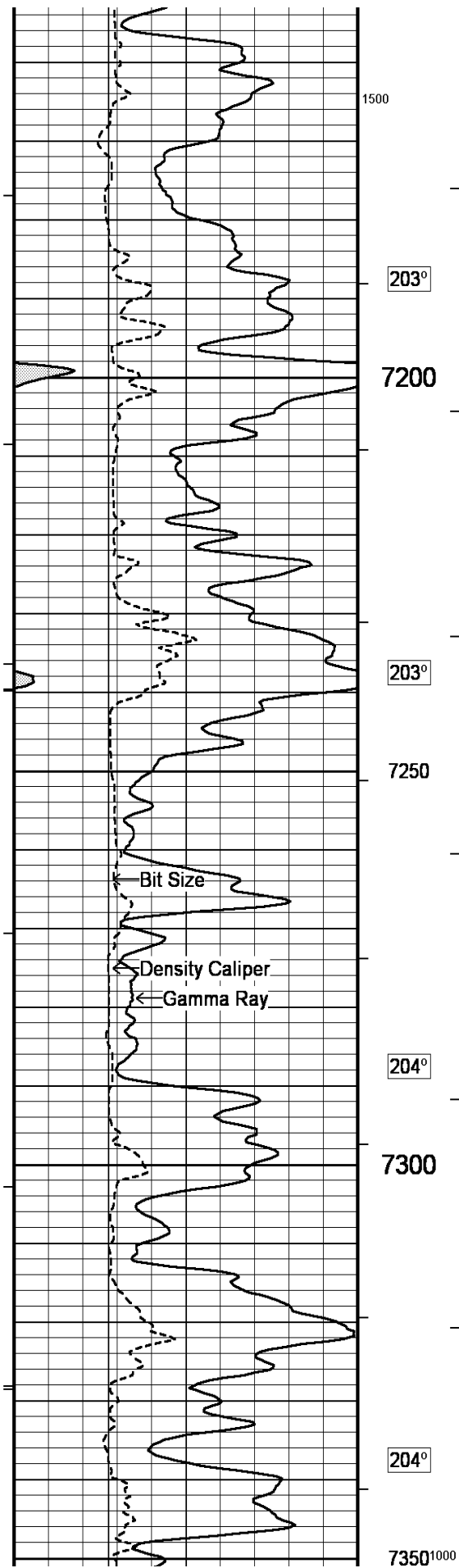
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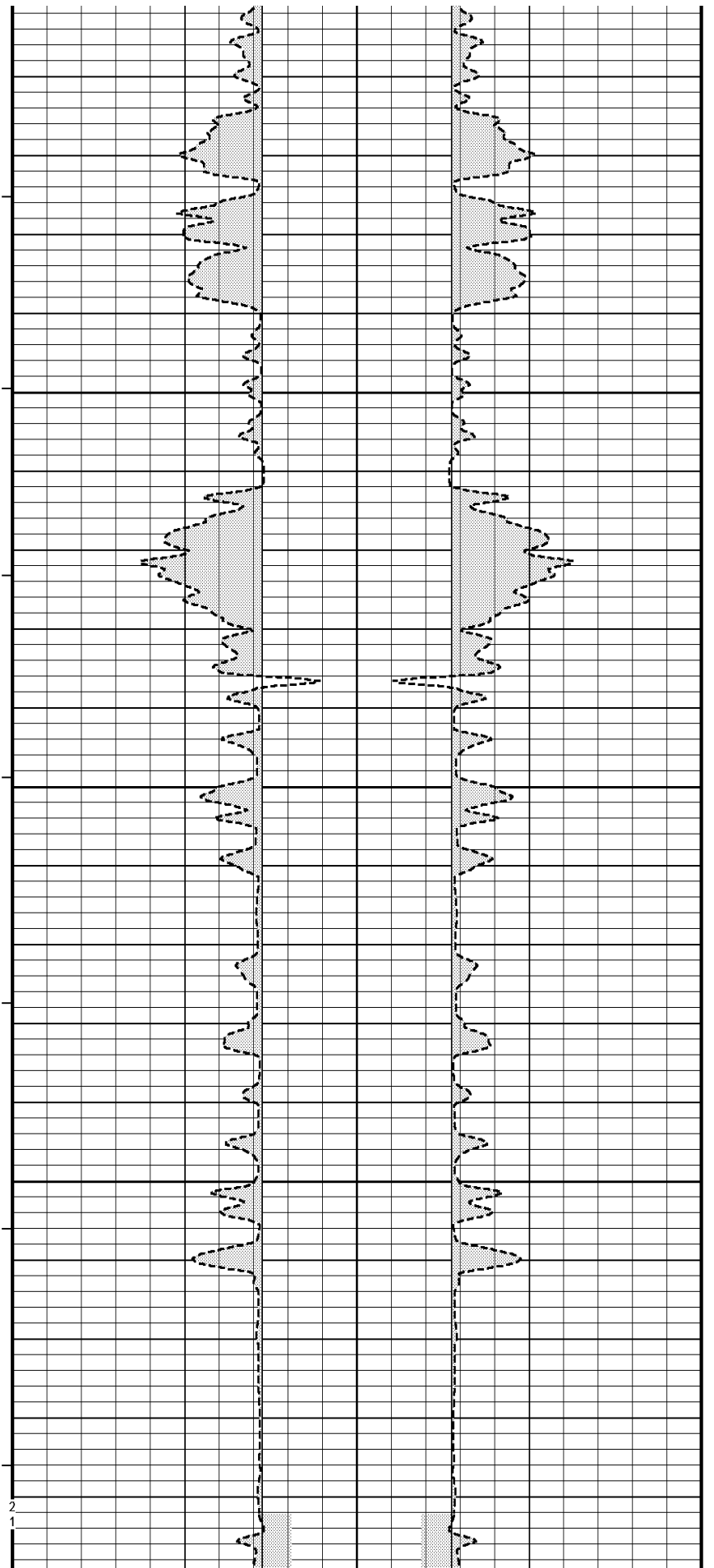
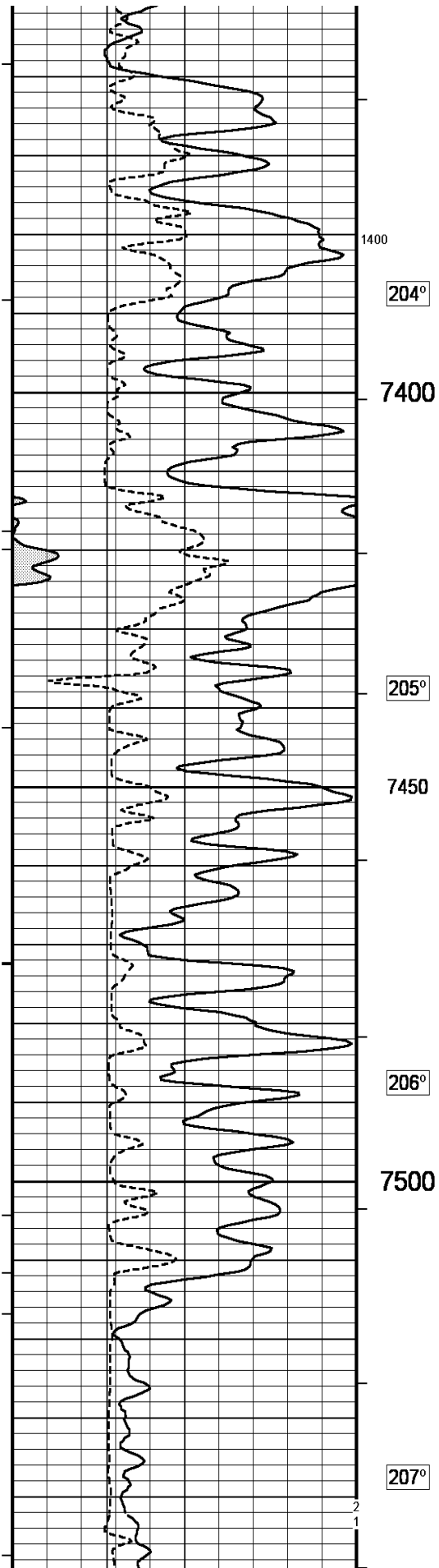
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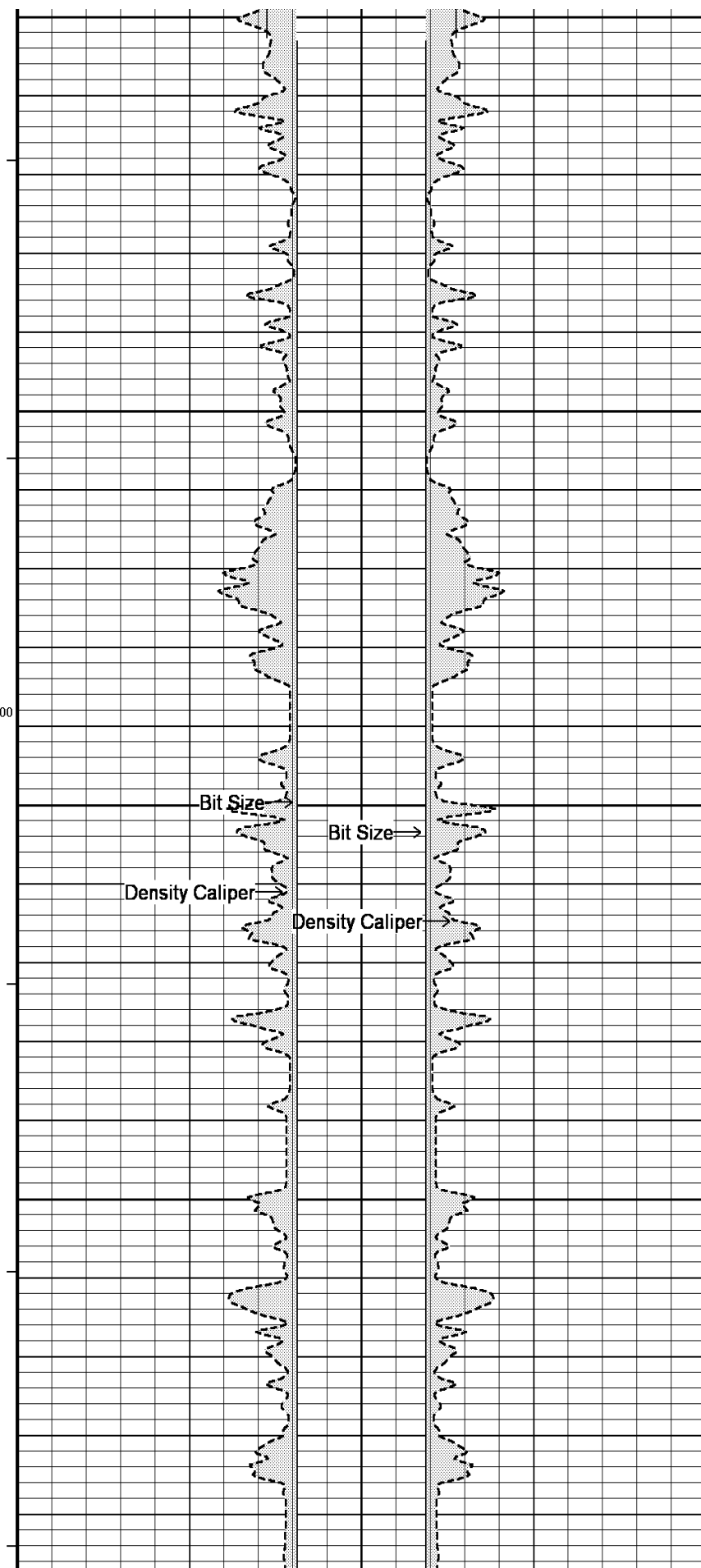
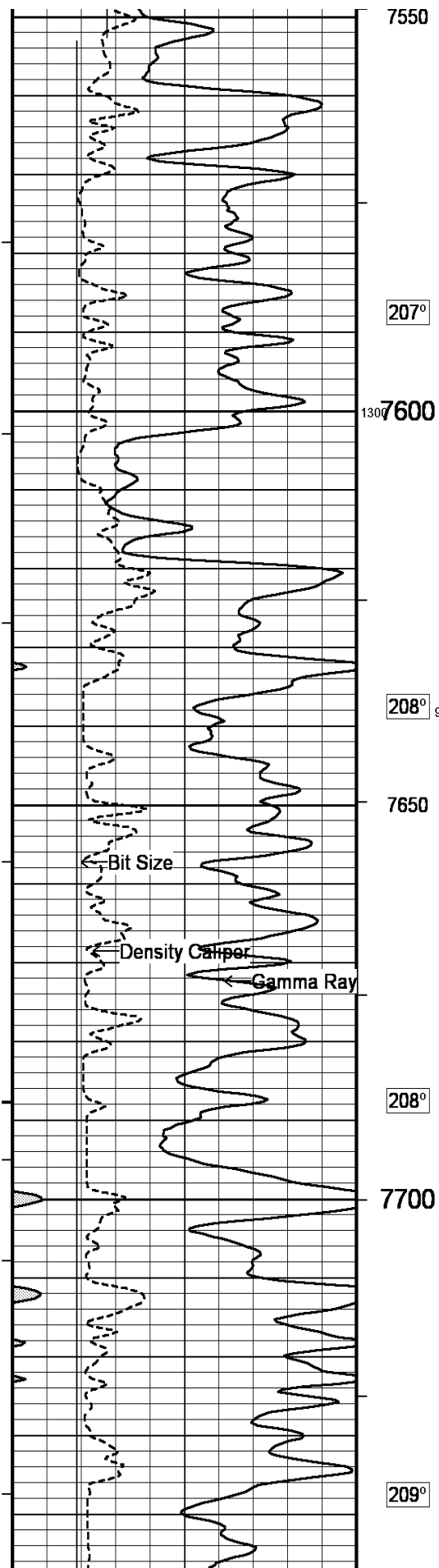
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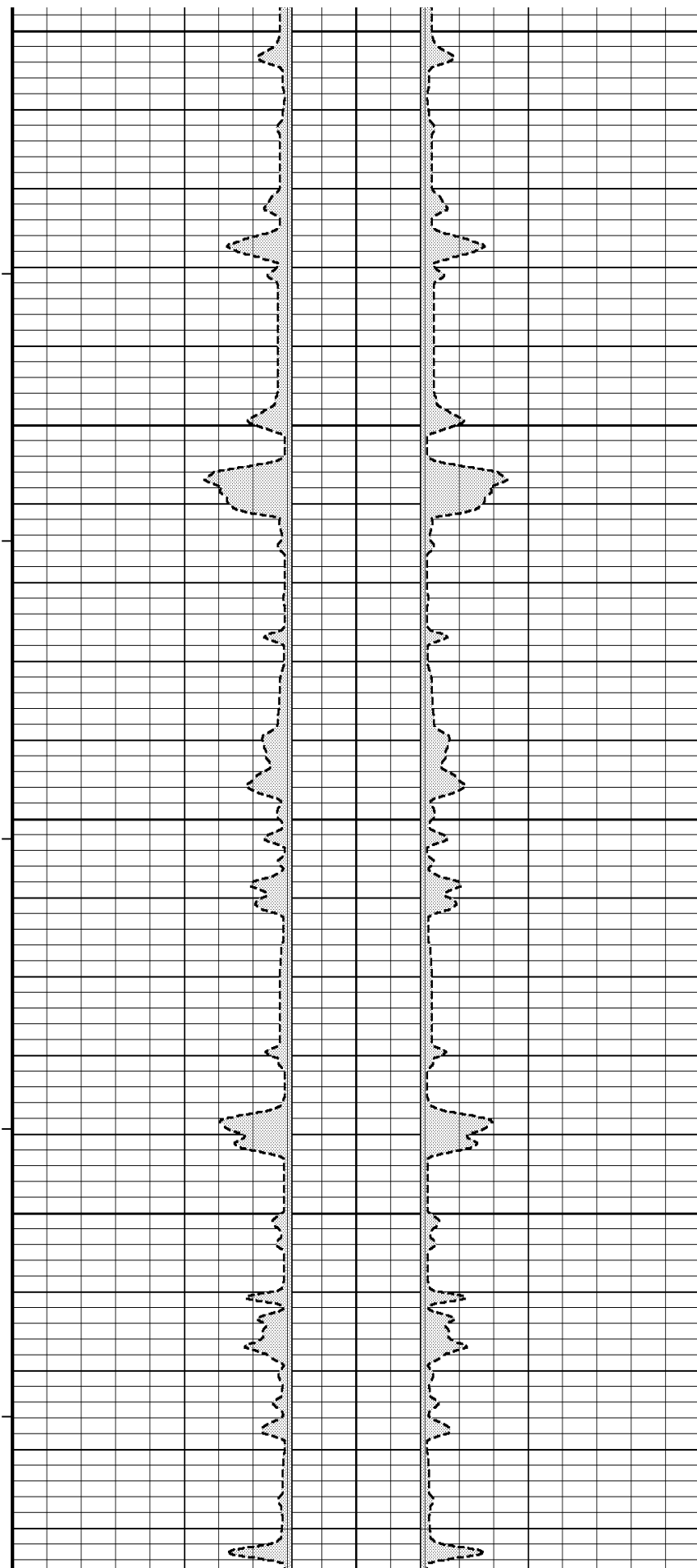
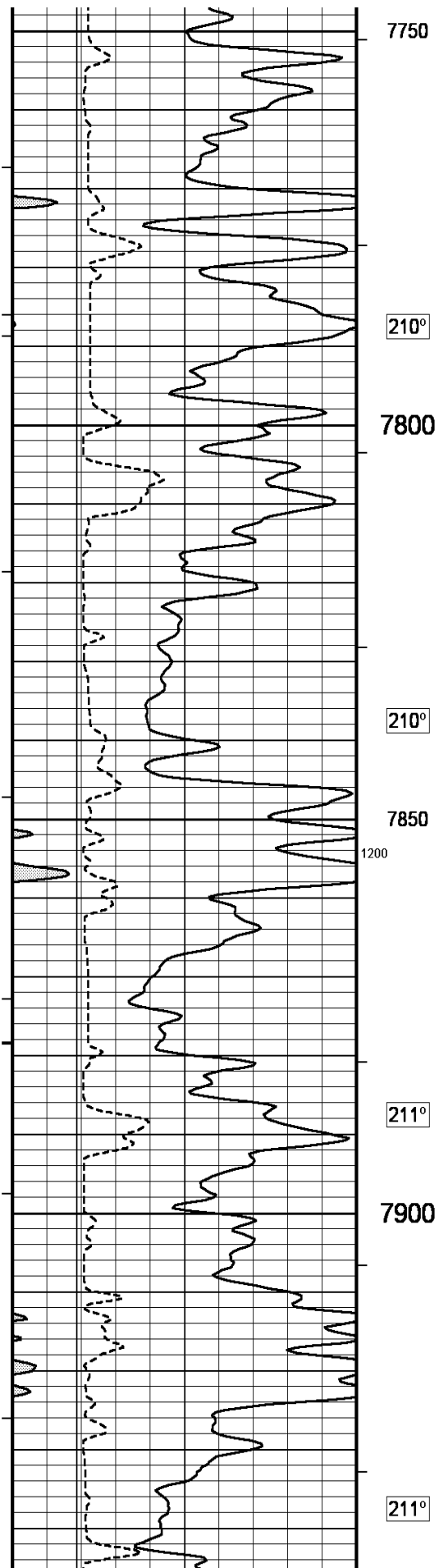
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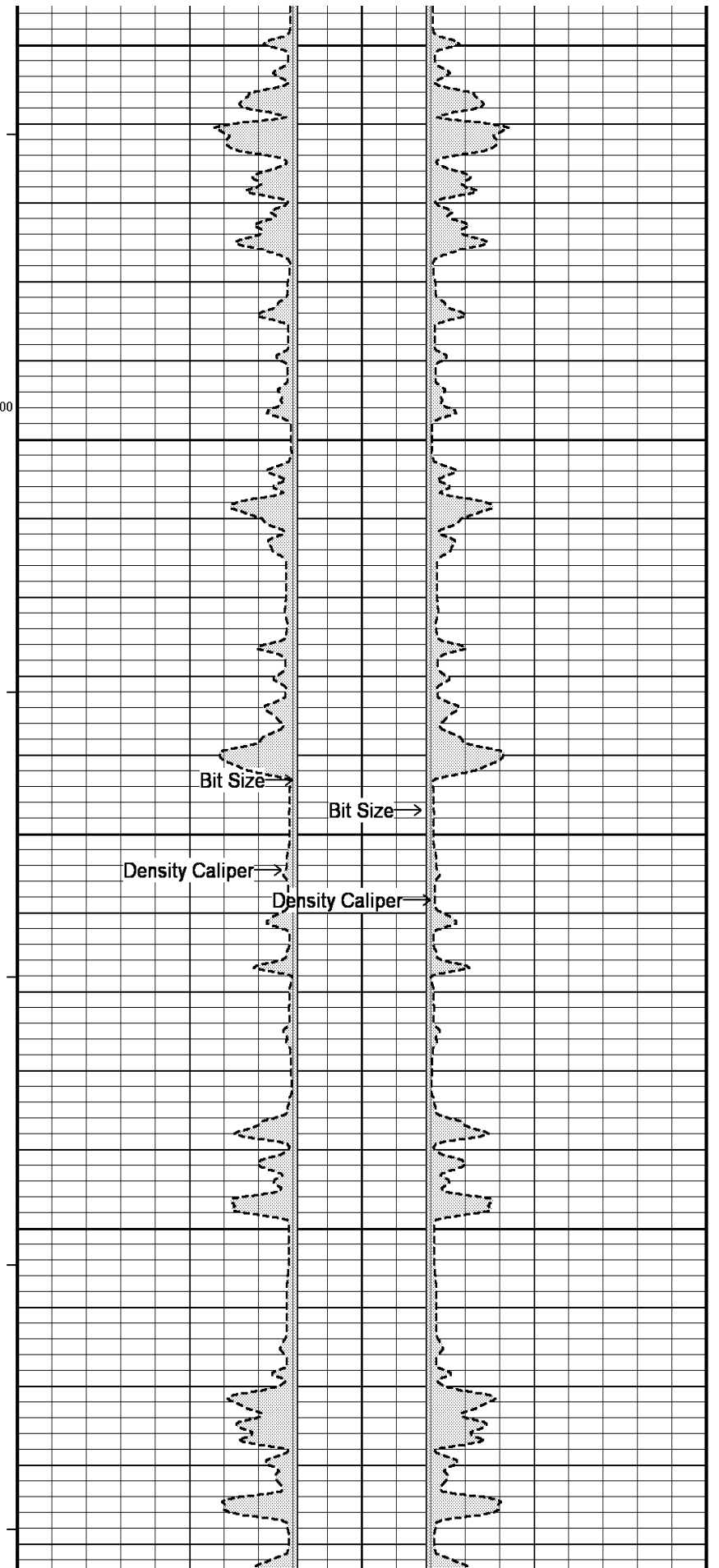
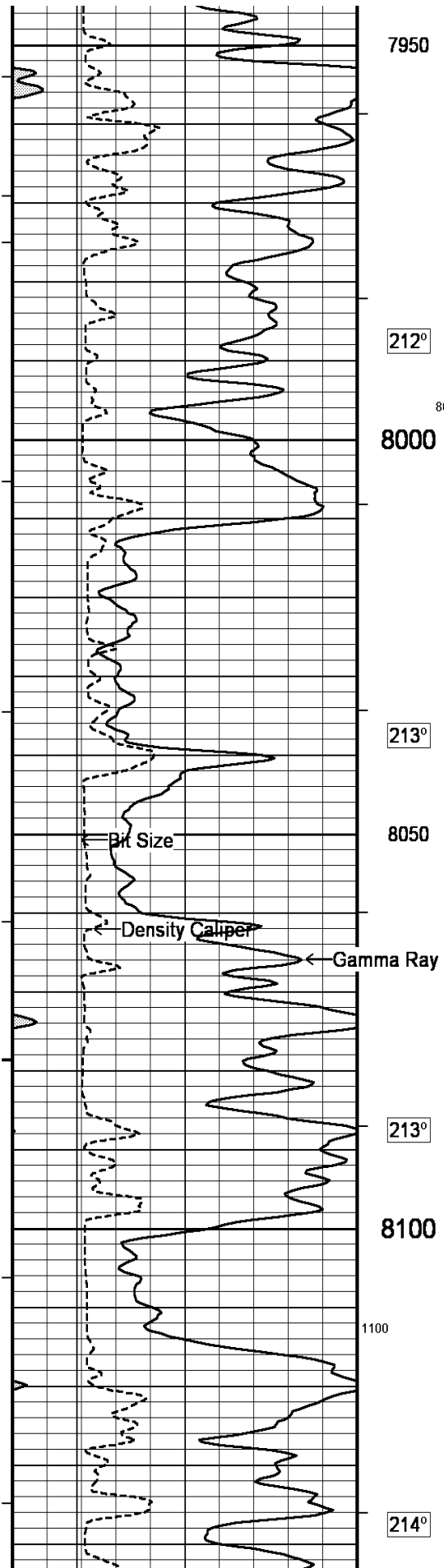


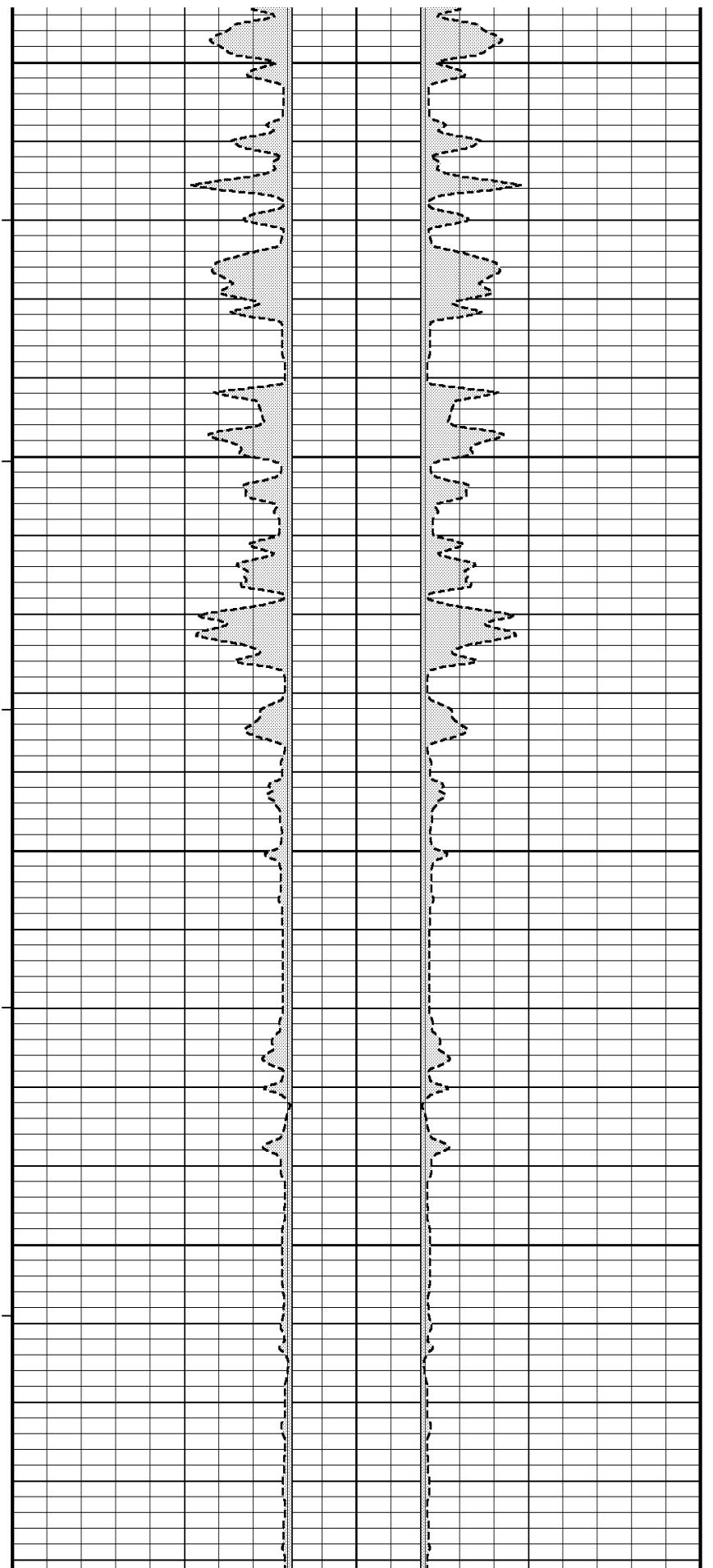
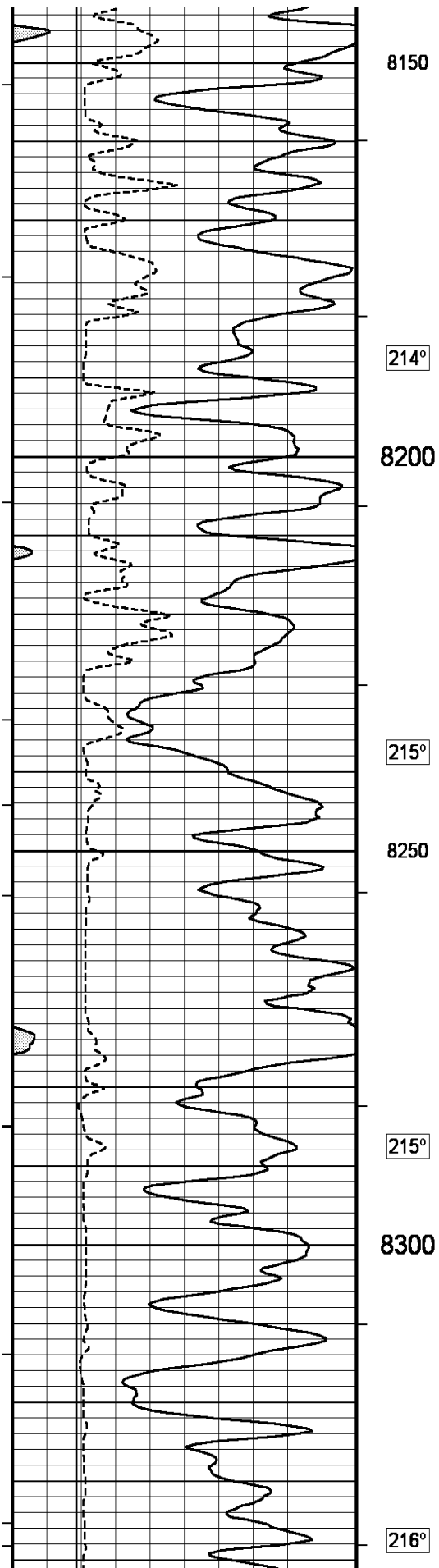


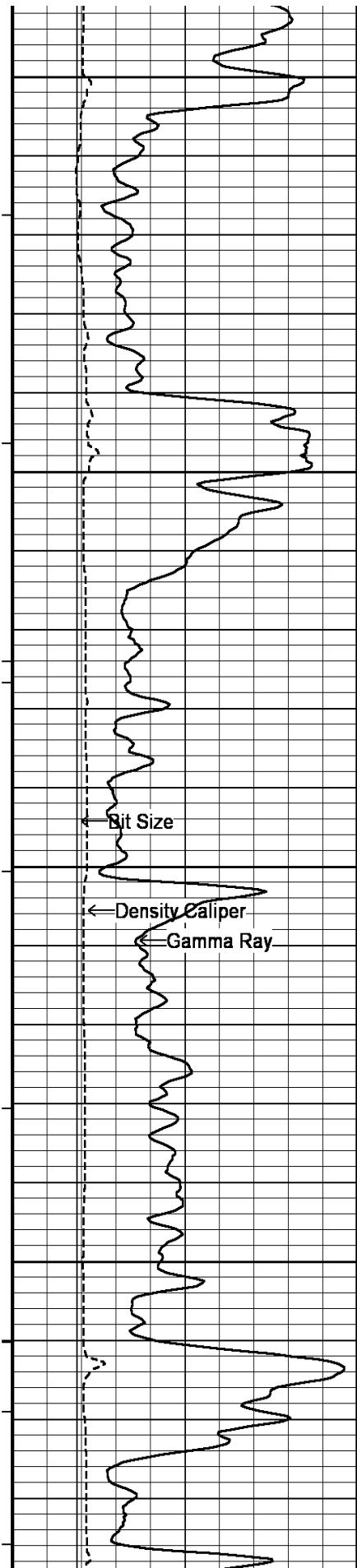












8350 700

1000

217°

8400

217°

8450

218°

8500

218°

Bit Size

Density Caliper

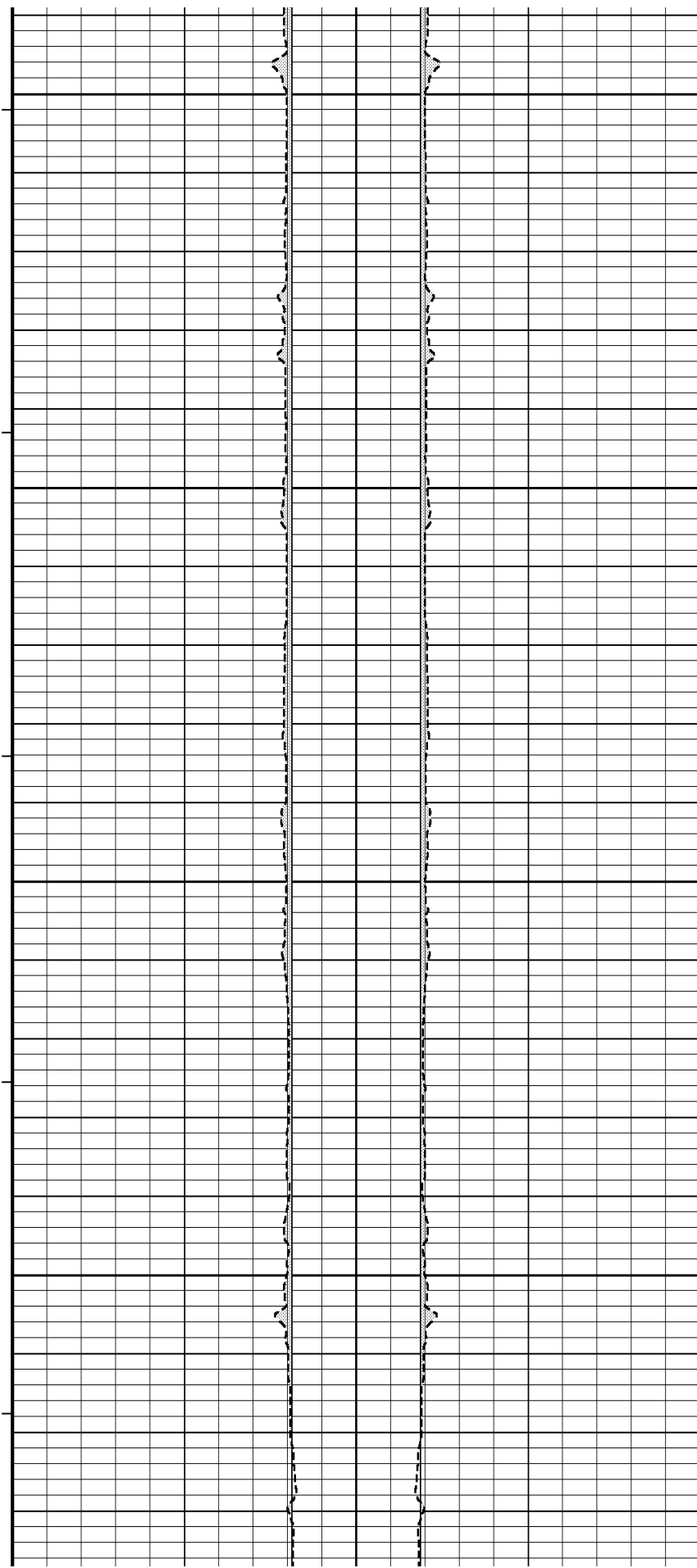
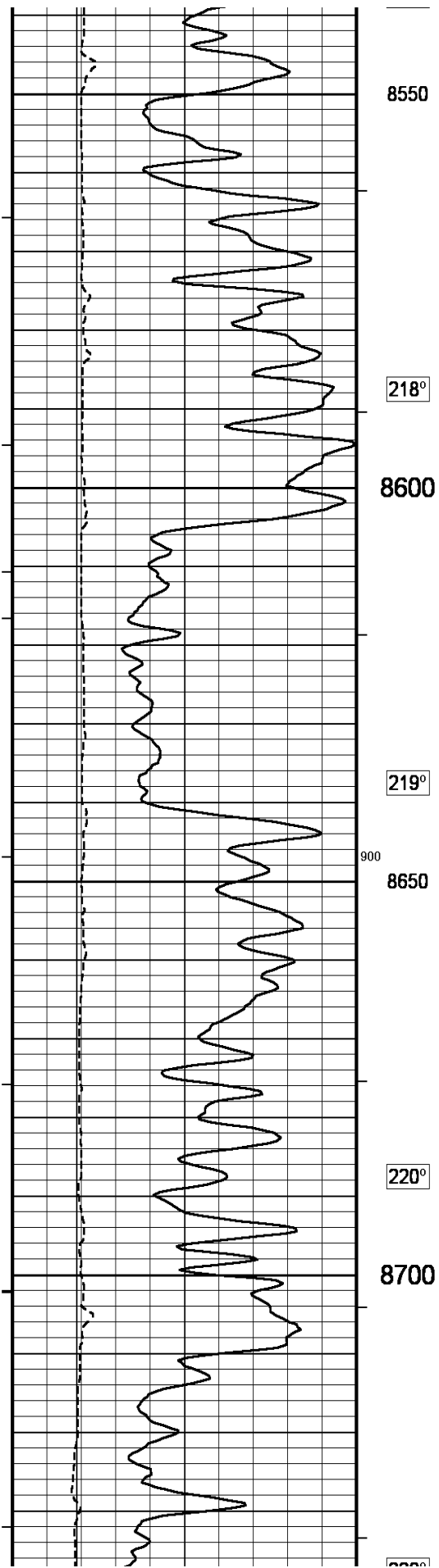
Gamma Ray

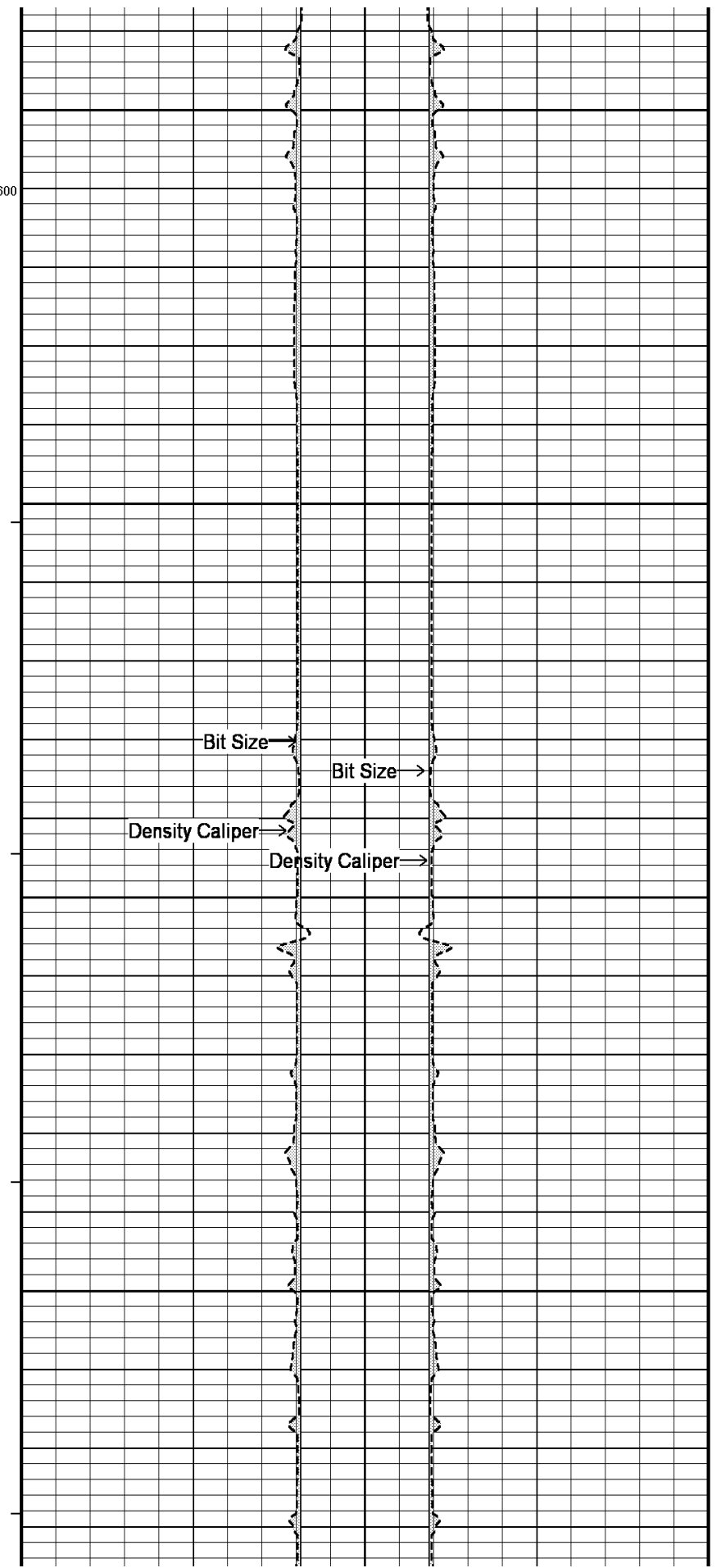
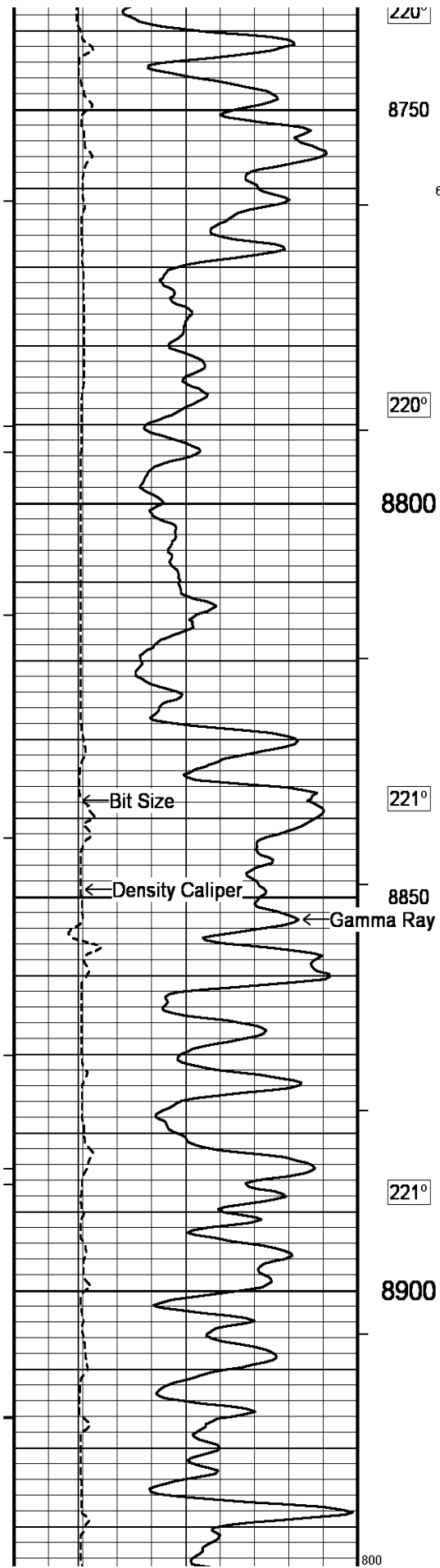
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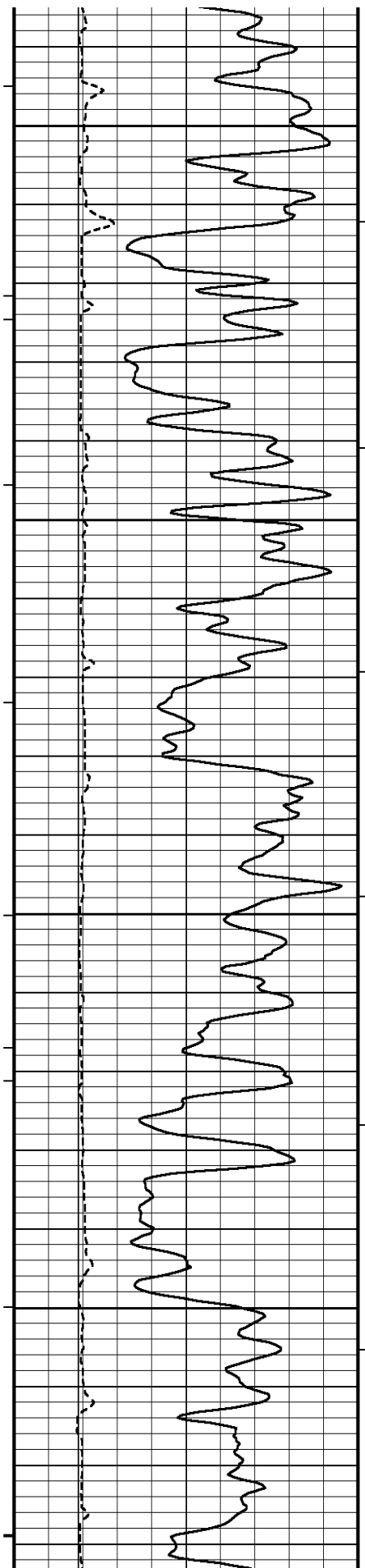
Density Caliper

Bit Size

Density Caliper







222°

8950

222°

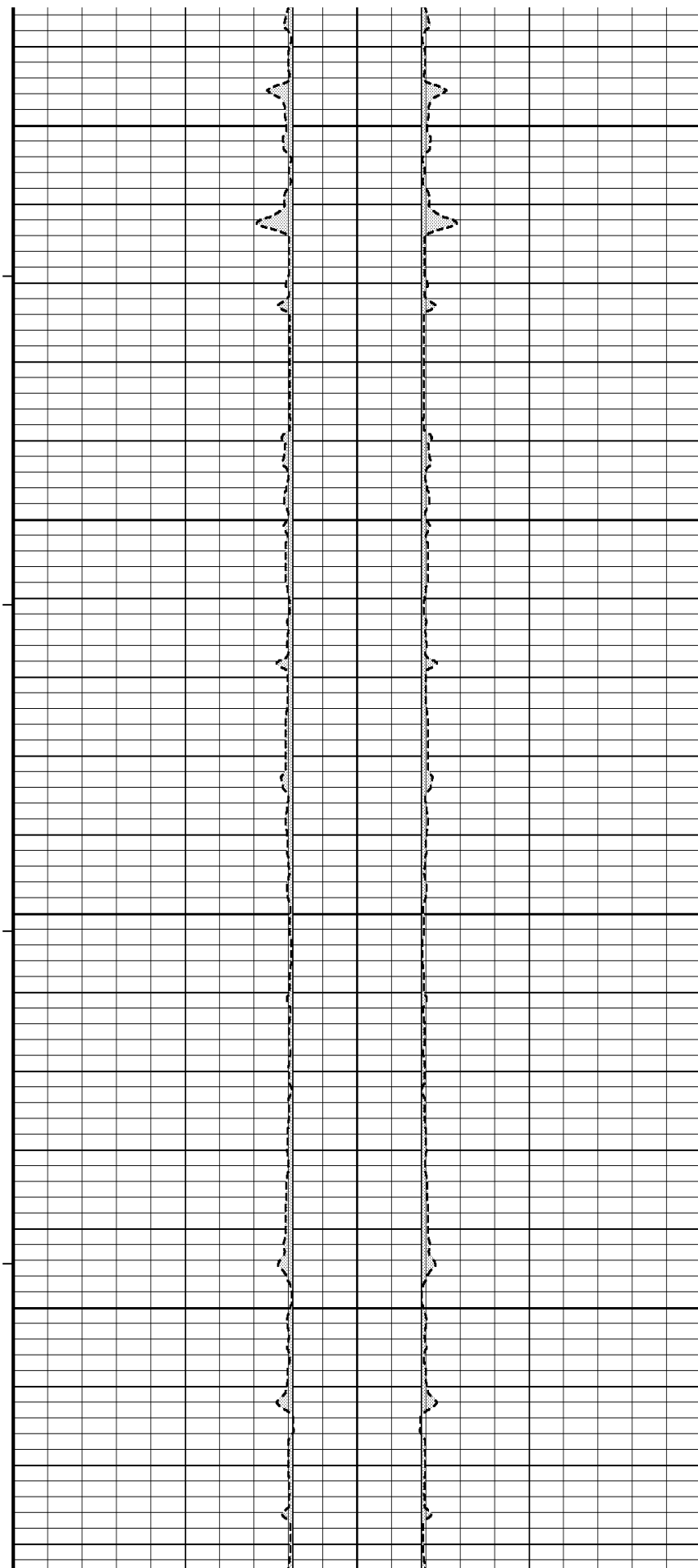
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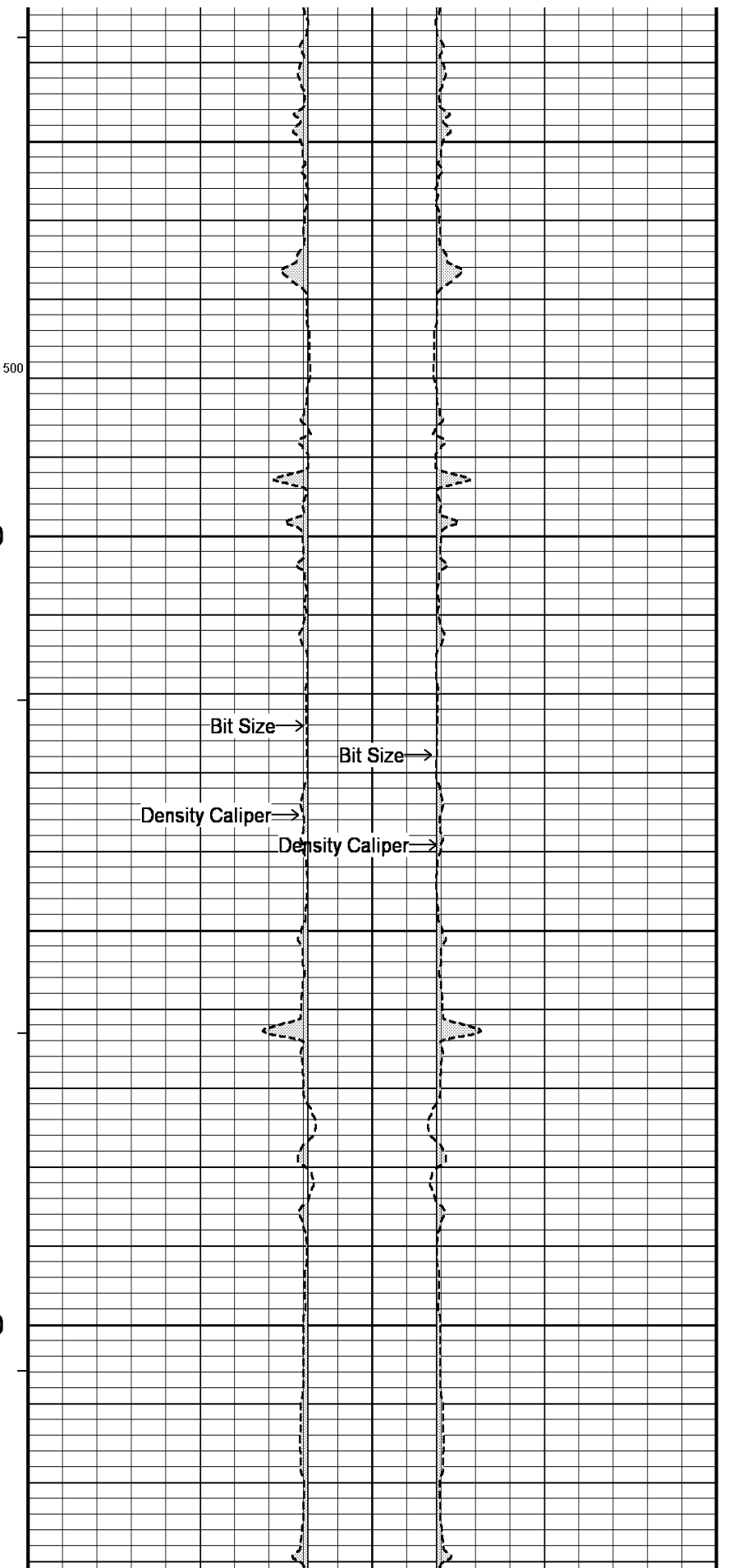
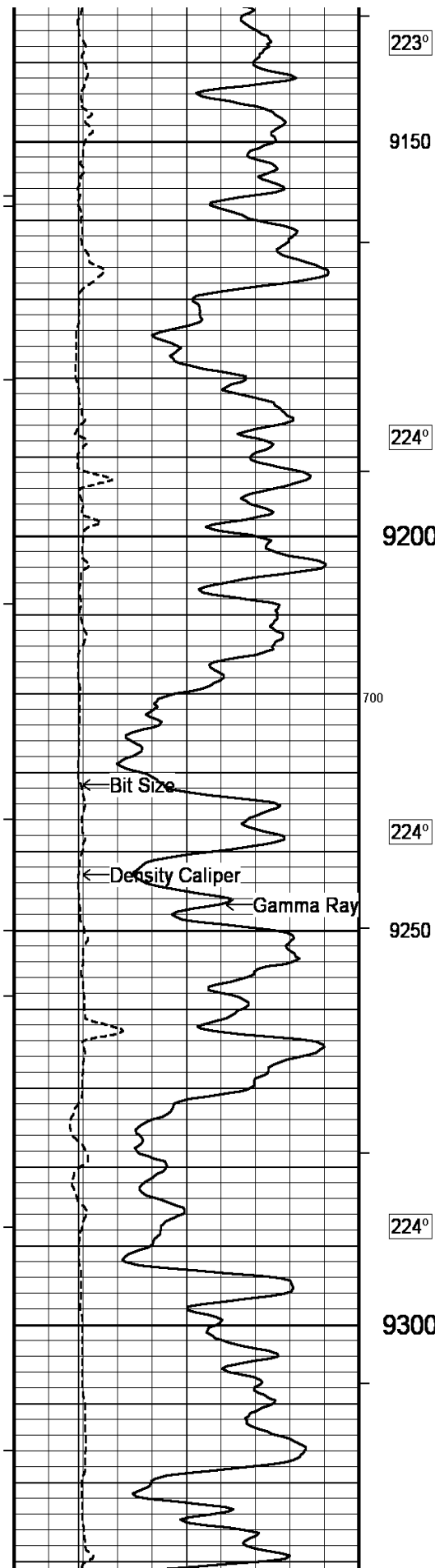
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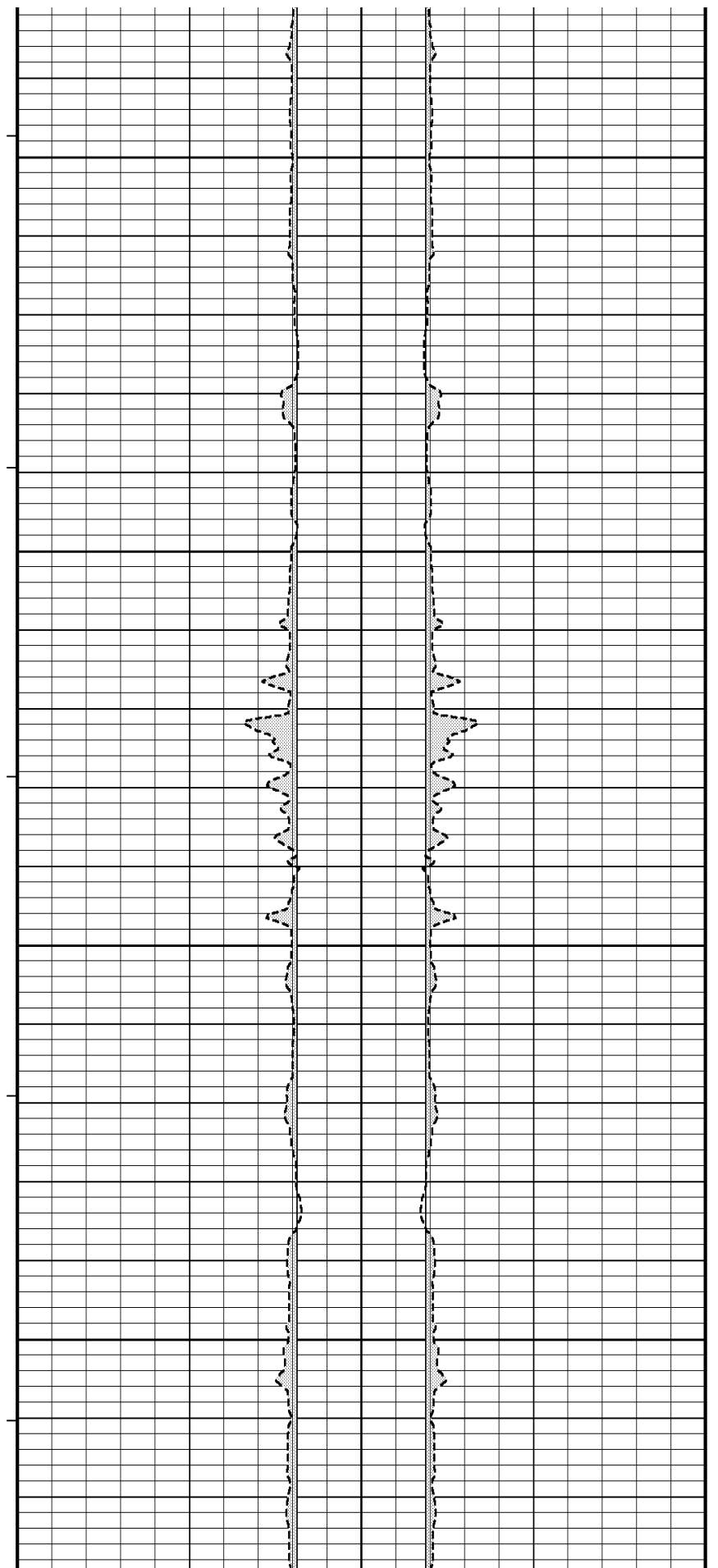
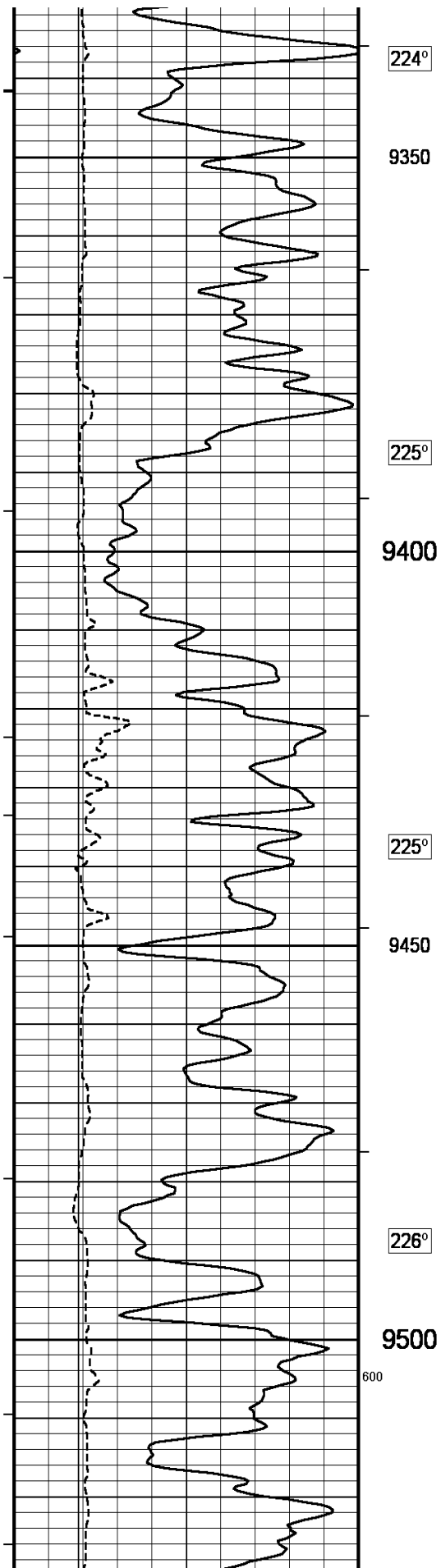
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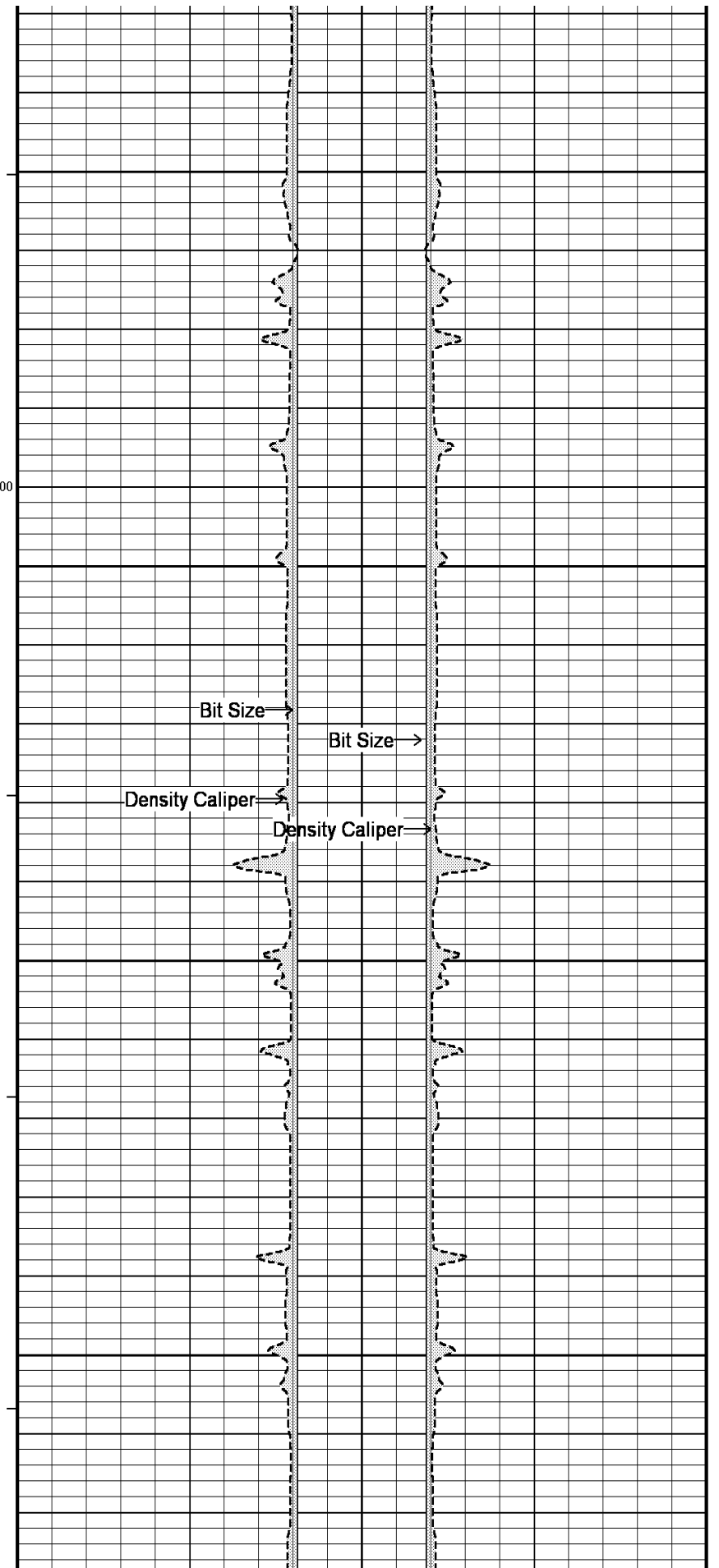
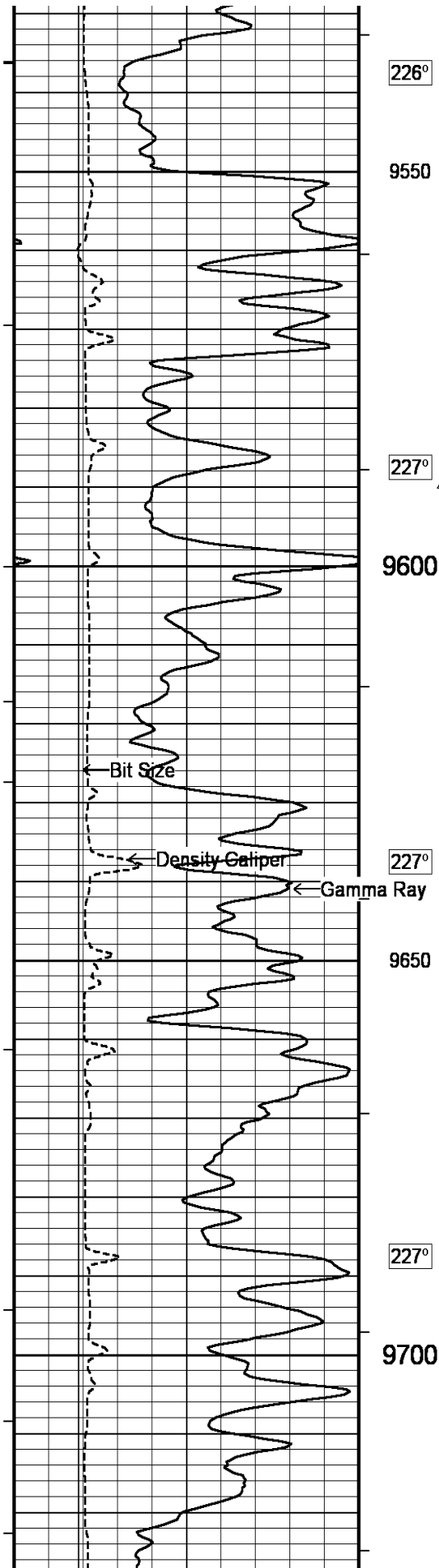
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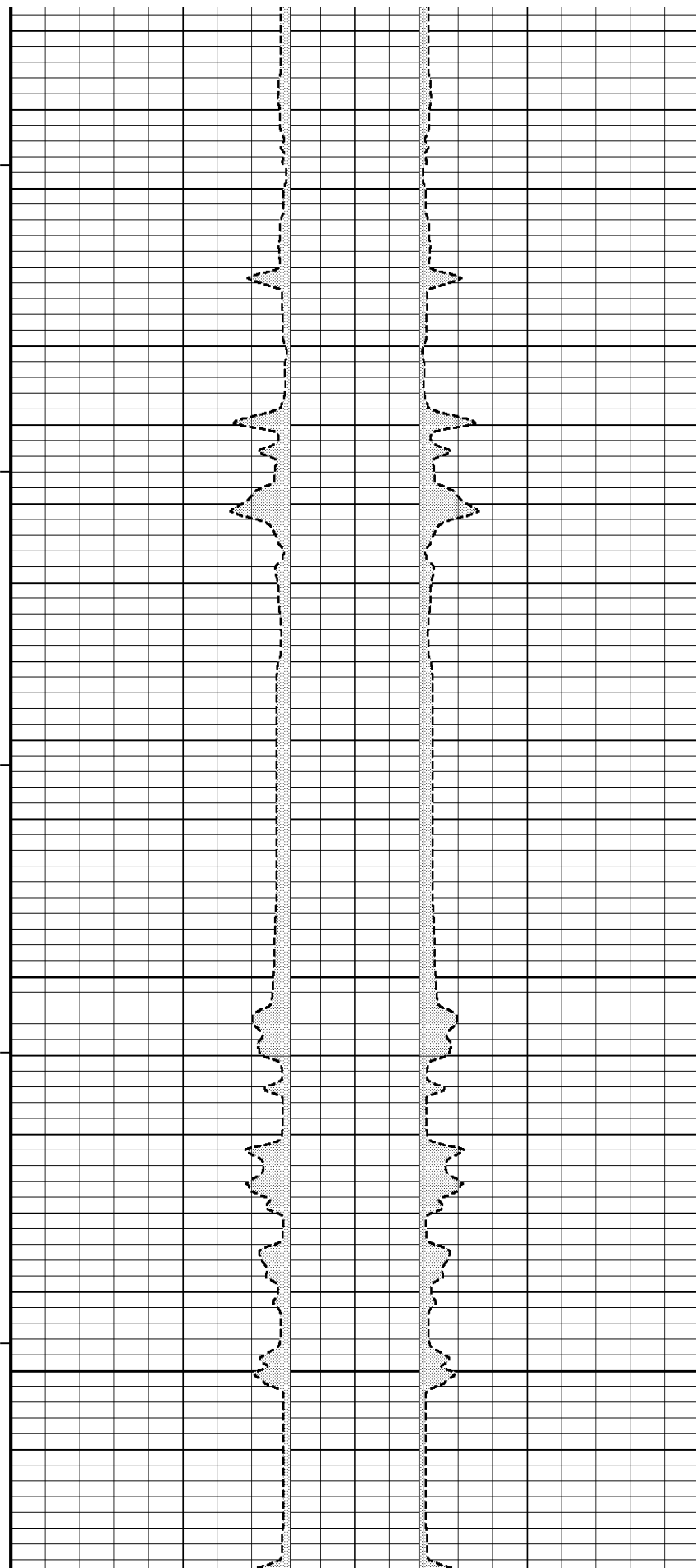
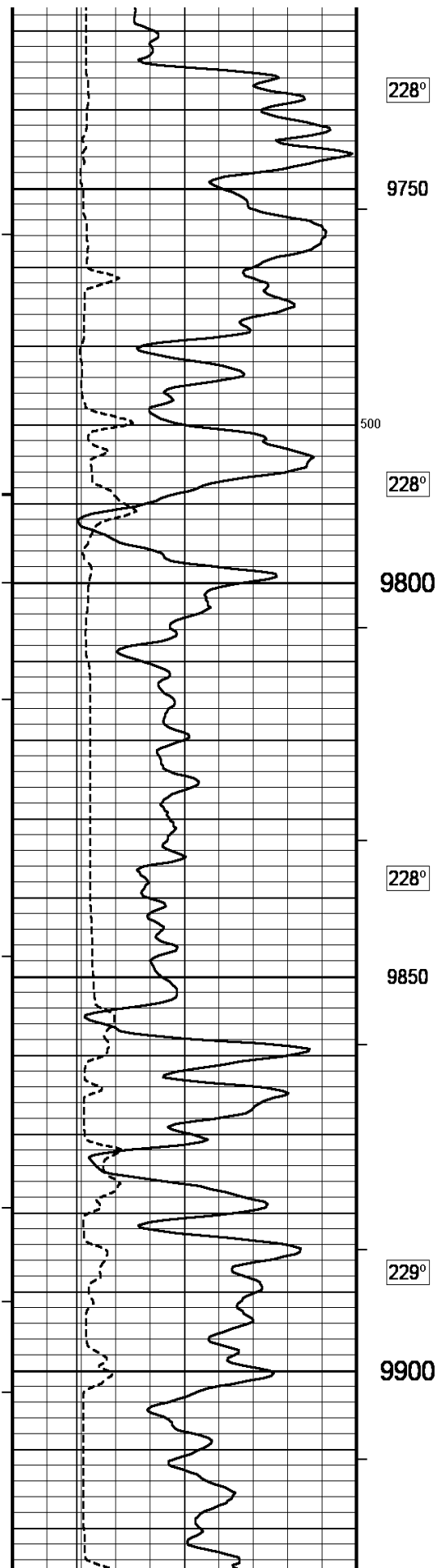
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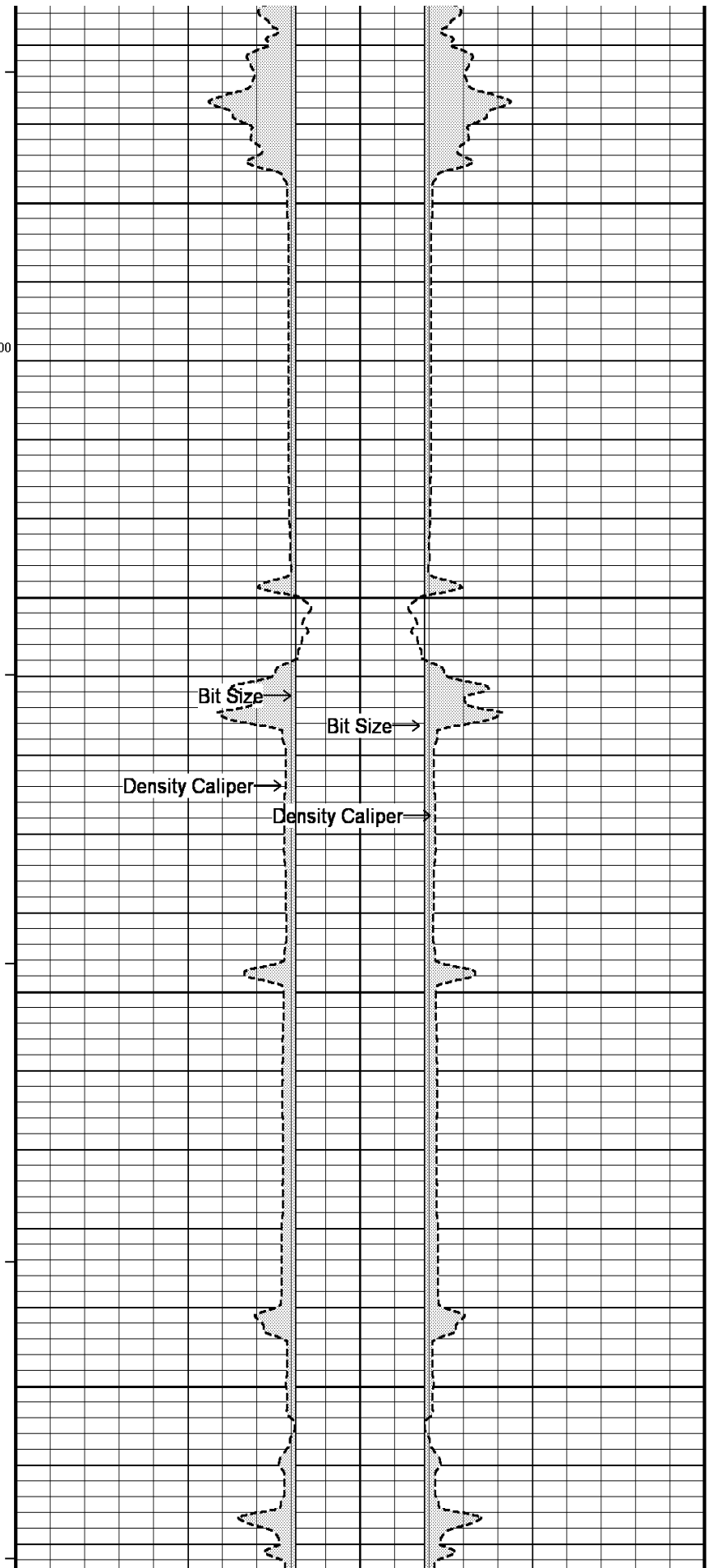
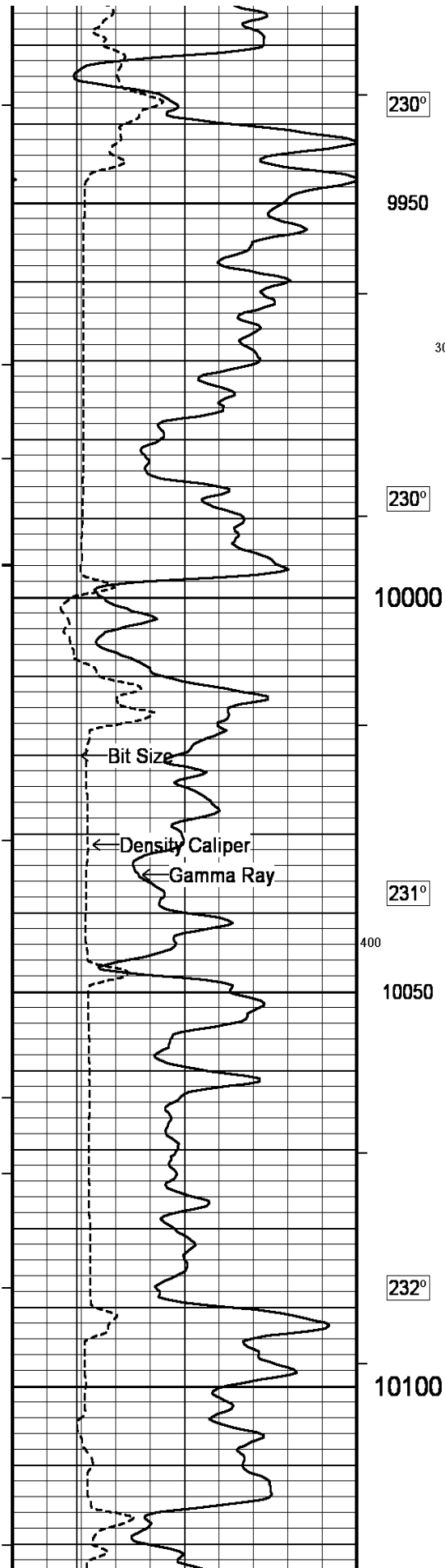


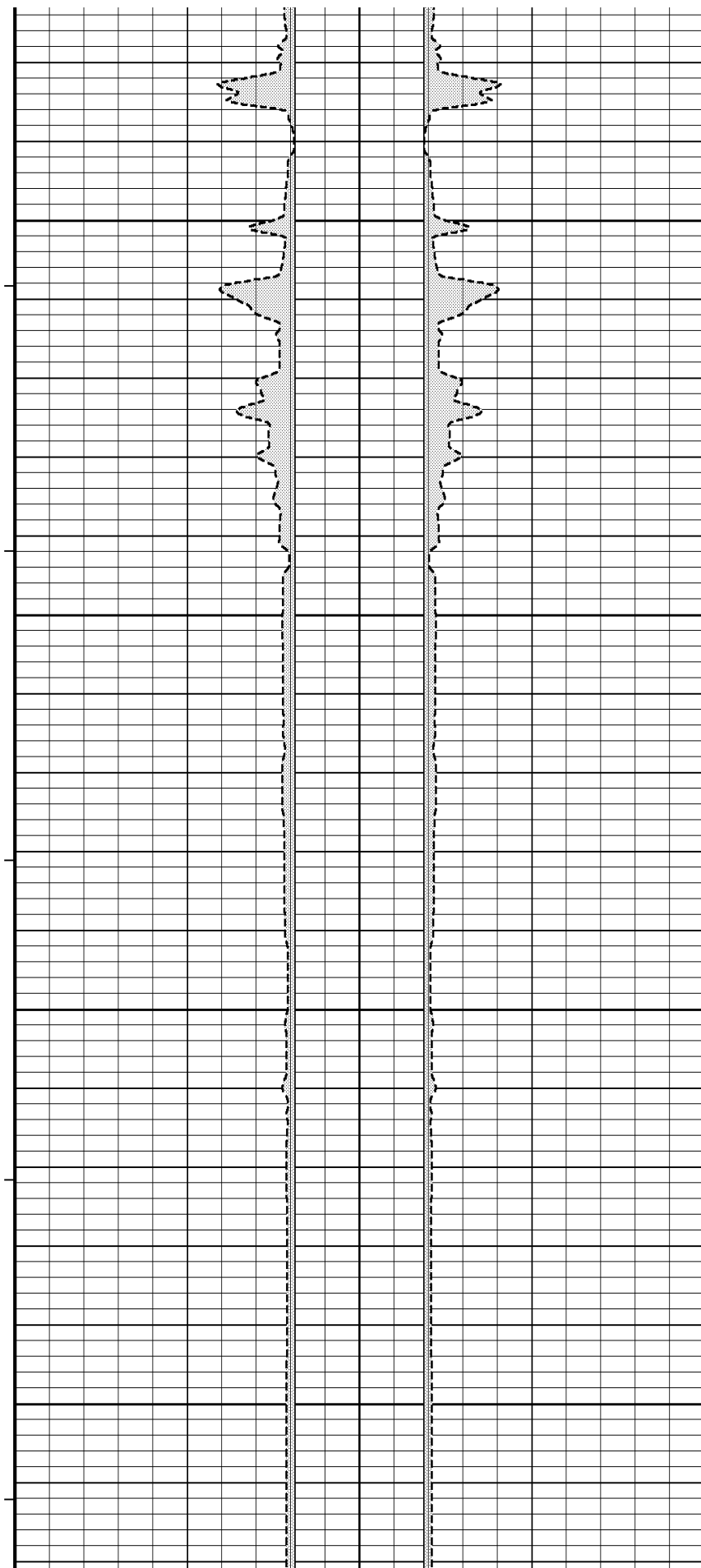
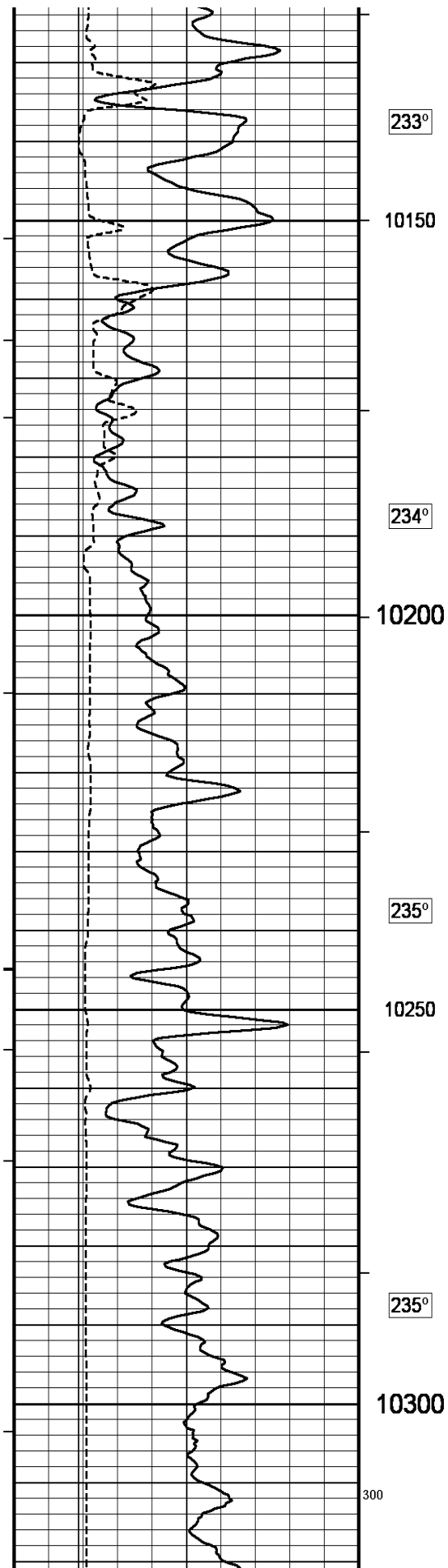


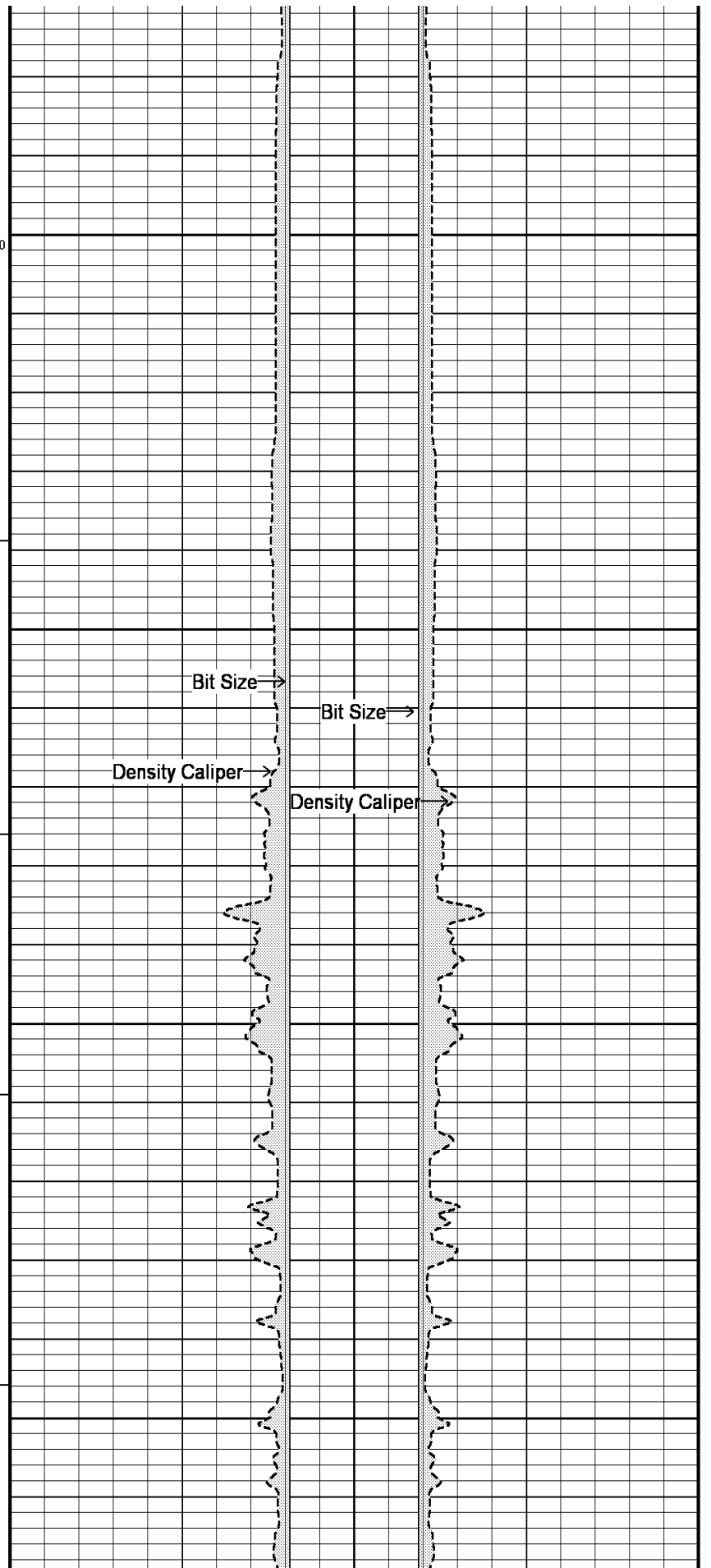
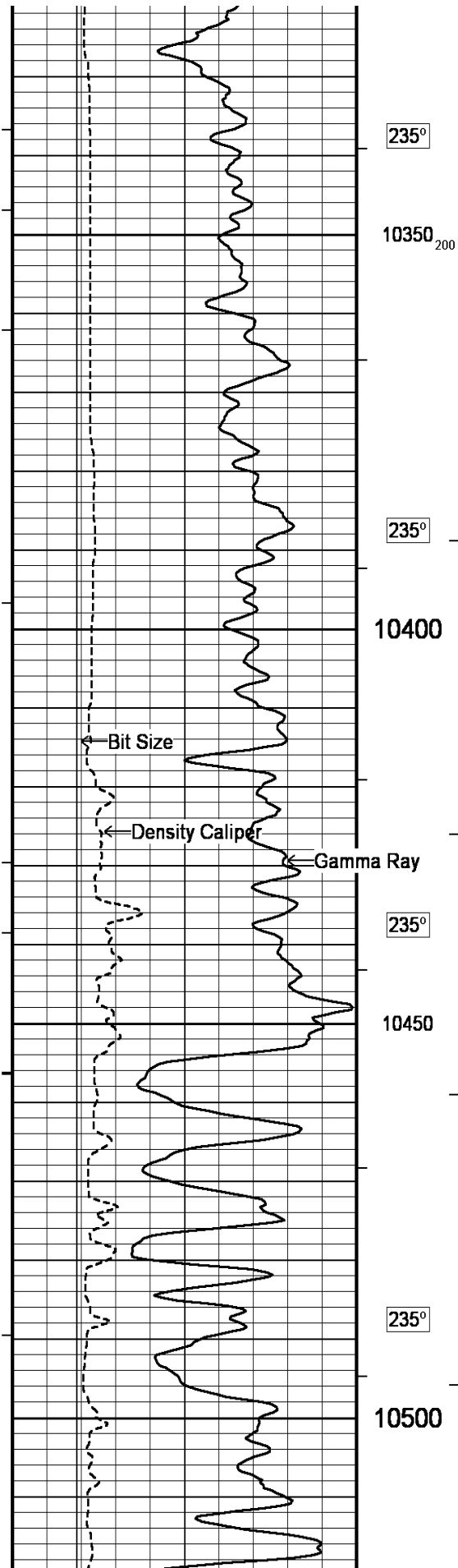


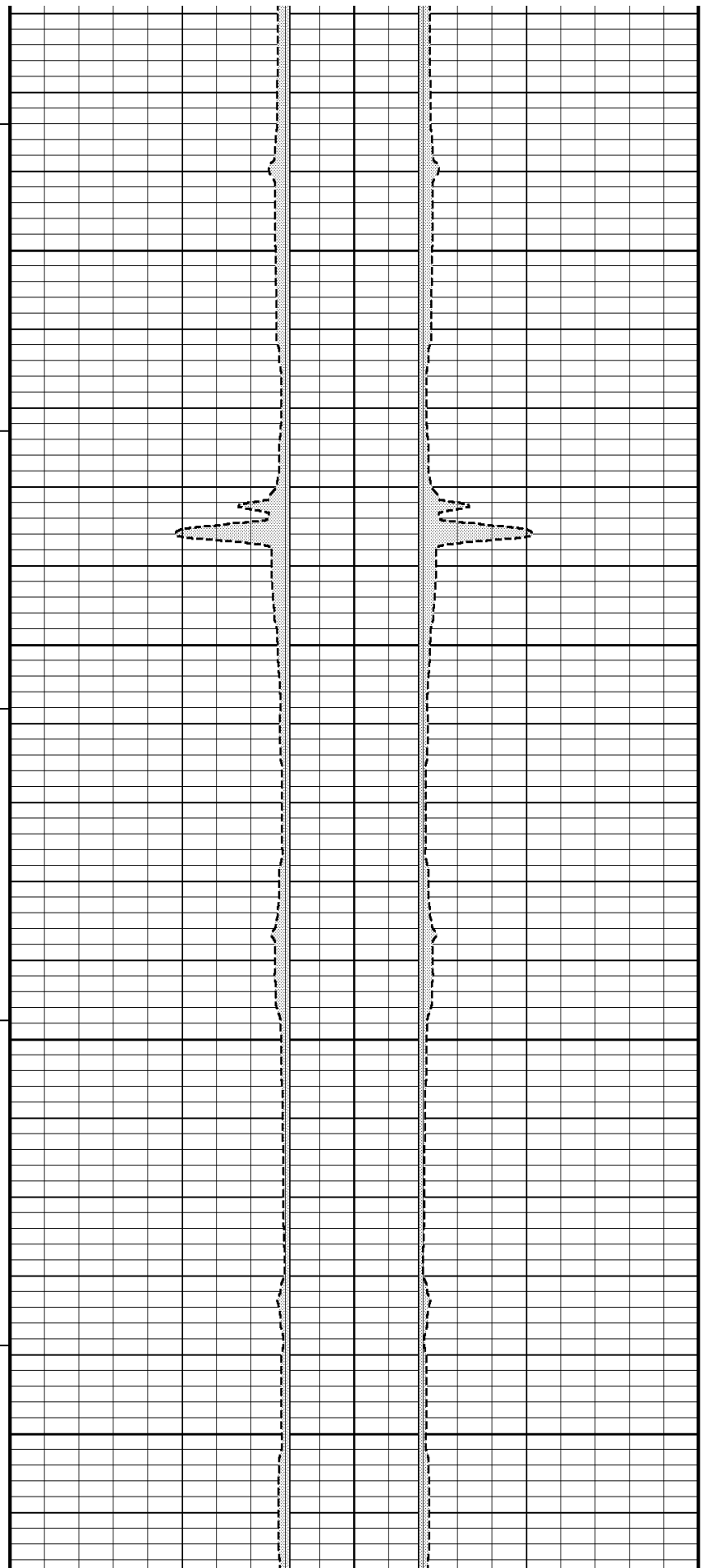
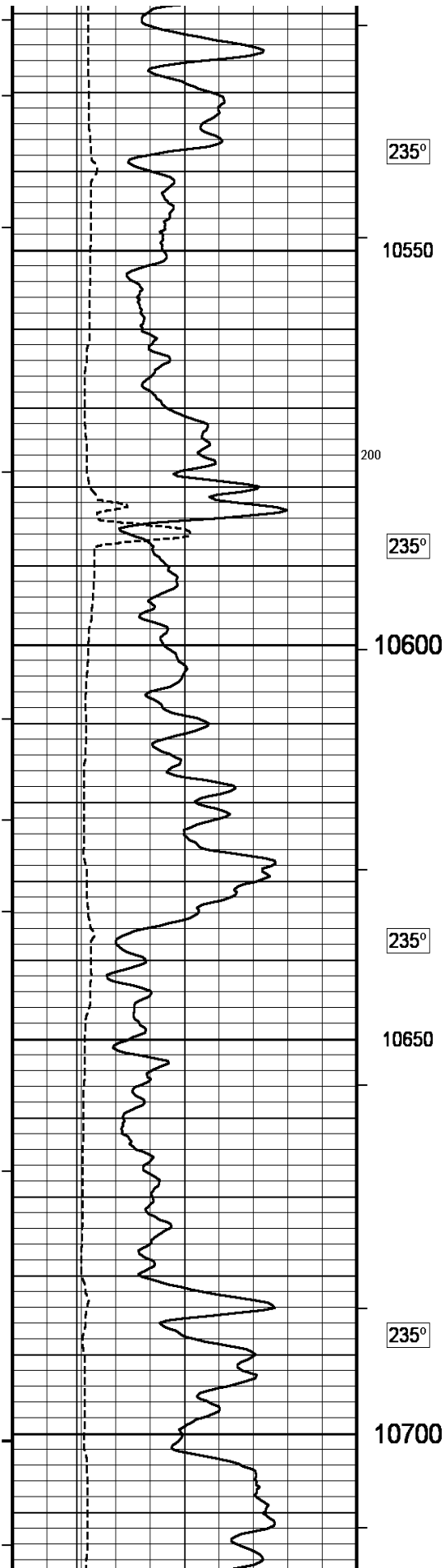


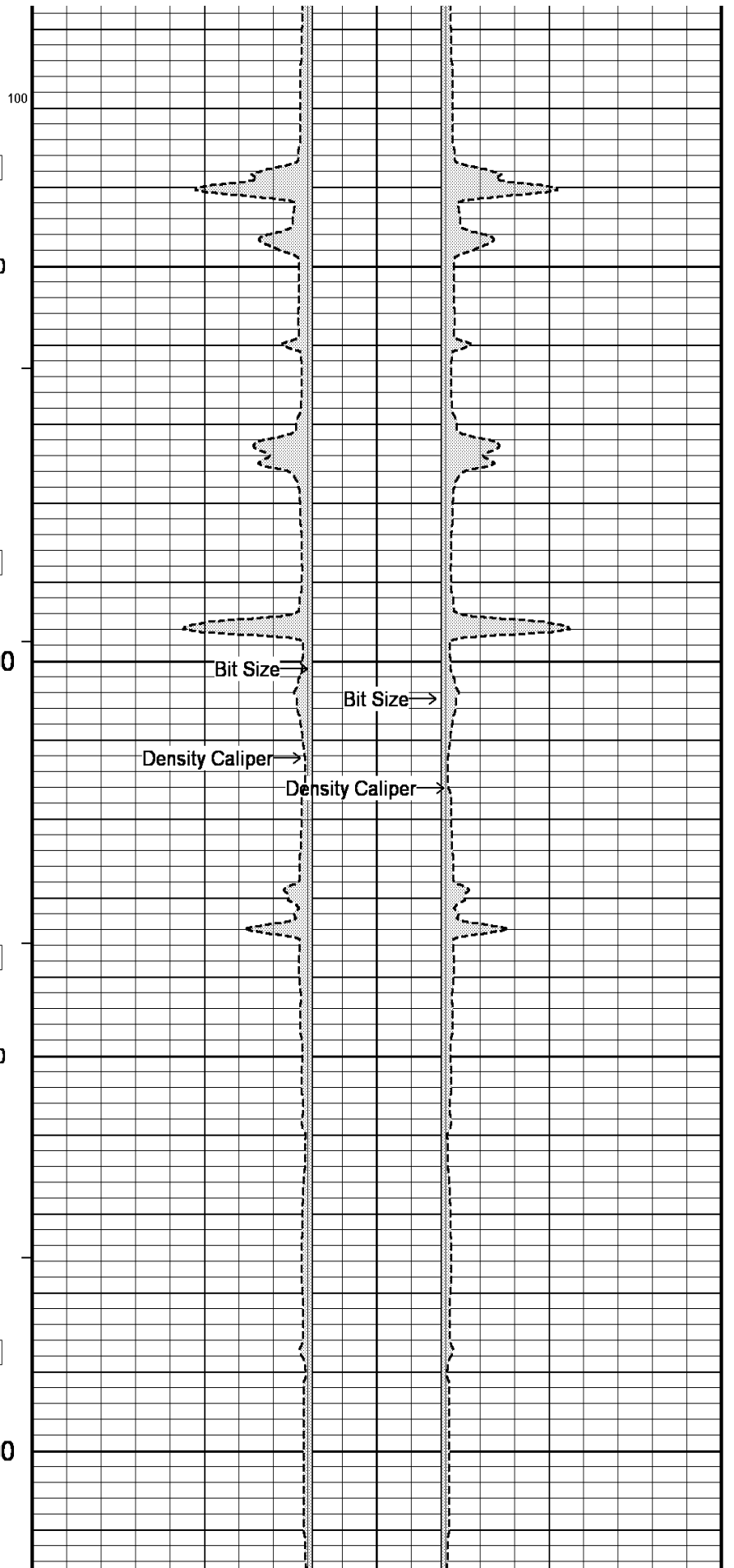
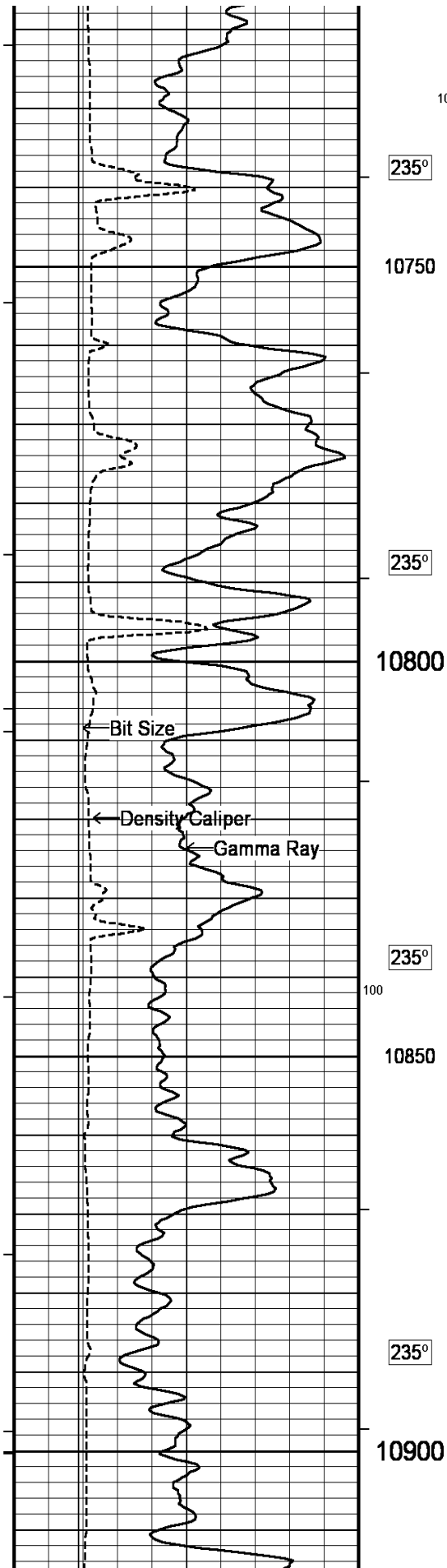


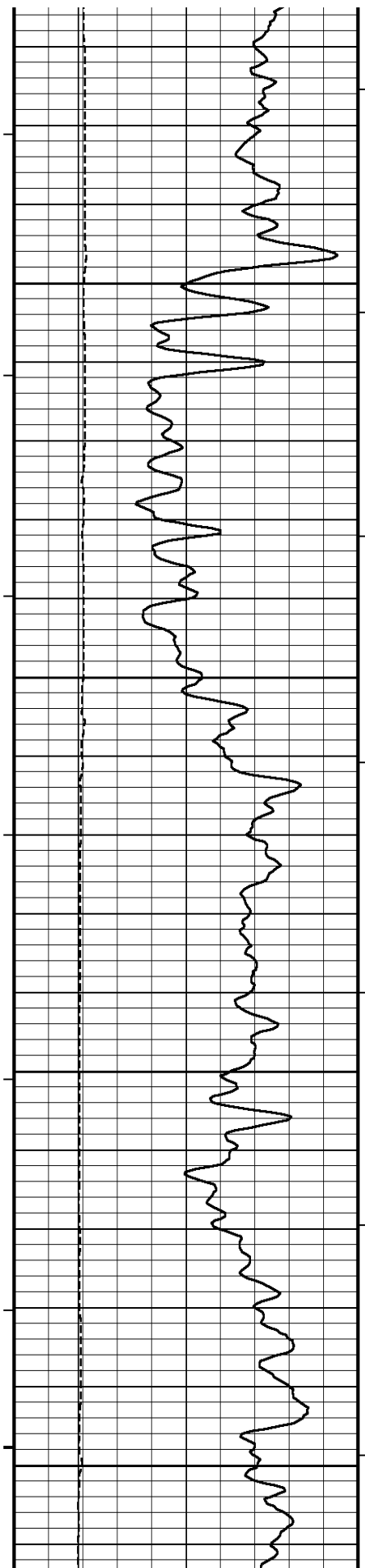












236°

10950

235°

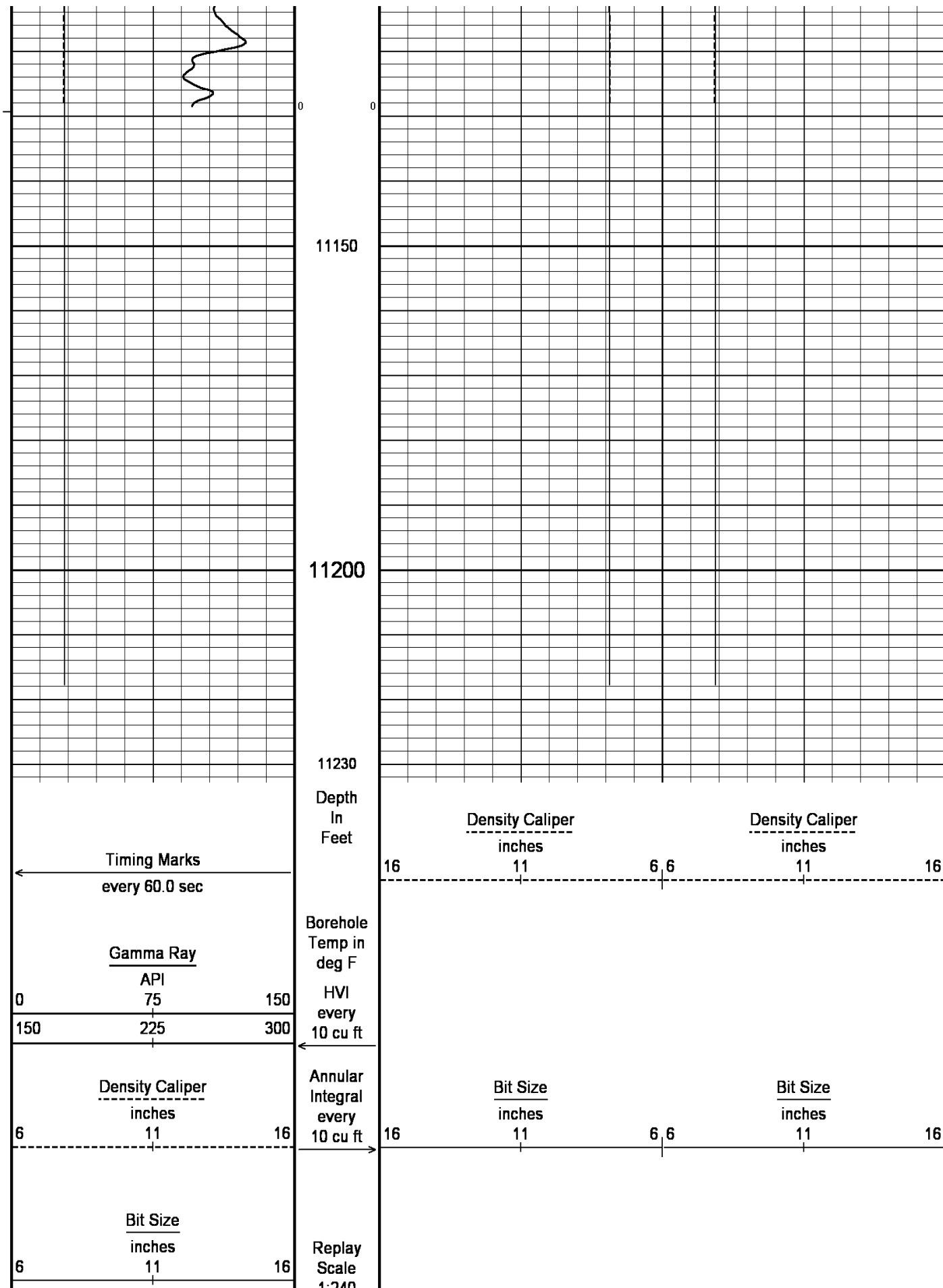
11000

234°

11050

233°

11100



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 23-JUL-2012 00:07

Filename: C:\Minimus\Logs\Encana\NP EF09E-27 P27 595\NP EF 09E-27 P27 595 Depth.dta

Recorded on 22-JUL-2012 23:28

System Versions: Plotted with 12.02.4401



5 INCH MAIN LOG



BEFORE SURVEY CALIBRATION

C:\Minimus\Logs\Encana\NP EF09E-27 P27 595\NP EF 09E-27 P27 595 Depth.dta

Down-hole Tension Calibration All 000

Field Calibration on 24-OCT-2010 03:34

Reading No	Measured	Calibrated (lbs)
1	15659.85	0.00
2	15734.68	370.00

General Constants All 000

Last Edited on 22-JUL-2012 23:03

General Parameters

Mud Resistivity	1.850	ohm-metres
Mud Resistivity Temperature	96.400	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	None	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. Two Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration SMS 0

Field Calibration on 06-MAY-2012 06:21

Reading No	Measured	Calibrated (lbs)
1	12185.49	0.00
2	13145.20	430.00

High Resolution Temperature Calibration MCG-D.A 221

Field Calibration on 22-SEP-2011 10:19

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MCG-D.A 221

Last Edited on

Pre-filter Length	11
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SP Calibration MCG-D.A 221

Field Calibration on 05-JUN-2012 15:23

	Measured	Calibrated (mV)
Reference 1	100.3	100.1
Reference 2	-99.7	-100.1

Gamma Calibration MCG-D.A 221

Field Calibration on 21-JUL-2012 20:30

	Measured	Calibrated (API)
Background	70	47
Calibrator (Gross)	782	527

Calibrator (Net)	712	480	
Gamma Constants MCG-D.A 221			Last Edited on 06-MAY-2012 00:11
Gamma Calibrator Number	GRCC112		
Mud Density	1.00	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
Neutron Calibration MDN-B.A 193			Base Calibration on 05-JUL-2012 14:50 Field Check on 21-JUL-2012 20:47
Base Calibration			
	Measured		Calibrated (cps)
	Near	Far	Near Far
	2944	91	3714 110
Ratio	32.520		33.764
Field Calibrator at Base			
			Calibrated (cps)
			1629 2362
Ratio			0.690
Field Check			
			Calibrated (cps)
			1663 2409
Ratio			0.690
Neutron Constants MDN-B.A 193			Last Edited on 22-JUL-2012 23:04
Neutron Source Id	P44382B		
Neutron Jig Number	6531NK		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	7.00	cu	
Dolomite Sigma	4.70	cu	
Formation Pressure Source	None		
Formation Pressure	N/A	kpsi	
Temperature Source	None		
Temperature	N/A	degrees F	
Mud Salinity	0.00	kppm	
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
Salinity Correction	Not Applied		
FE Calibration MFE-B.A 248			Base Calibration on 03-JUL-2012 11:46 Field Check on 21-JUL-2012 20:36
Base Calibration			
	Measured		Calibrated (ohm-m)
Reference 1	0.0		0.0
Reference 2	972.6		126.8
Base Check			
			279.0
Field Check			
			279.1
FE Constants MFE-B.A 248			Last Edited on 21-JUL-2012 20:36
Running Mode	No Sleeve		
MFE K Factor	0.1268		
Caliper Source for FE correction	Density Caliper		
Caliper Value for FE correction	N/A	inches	
Rm Source for FE correction	Temperature Corr		

Temp. for Rm Corr. Stand-off	MCG External Temperature 0.5		inches	
High Resolution Temperature Calibration MAI-B.J 362			Field Calibration on 06-JUL-2012 14:06	
	Measured	Calibrated(Deg F)		
Lower	10.00	50.00		
Upper	100.00	212.00		
High Resolution Temperature Constants MAI-B.J 362			Last Edited on	
Pre-filter Length	11			
Induction Calibration MAI-B.J 362			Base Calibration on 21-JUL-2012 20:31 Field Check on 21-JUL-2012 20:34	
Base Calibration				
Test Loop Calibration		Measured	Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	16.0	468.7	9.3	966.2
2	6.2	374.5	7.6	821.4
3	3.6	258.3	5.2	566.0
4	1.8	133.1	2.6	279.2
Array Temperature	74.8		Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	15.1	3874.4
2	0.0	0.0	30.5	3604.8
3	0.0	0.0	28.5	3067.8
4	0.0	0.0	19.8	2078.1
Deep	0.0	0.0	17.5	1953.0
Medium	0.0	0.0	41.1	4074.9
Shallow	0.0	0.0	45.5	5399.7
Array Temperature	0.0		63.3	Deg F
Induction Constants MAI-B.J 362			Last Edited on 22-JUL-2012 23:04	
Induction Model		RtAP-WBM		
Caliper for Borehole Corr.		Density Caliper		
Hole Size for Borehole Correction		N/A inches		
Tool Centred		No		
Stand-off Type		Fins		
Stand-off		0.50 inches		
Number of Fins on Stand-off		6.0000		
Stand-off Fin Angle		60.00 degrees		
Stand-off Fin Width		0.5000 inches		
Borehole Corr. Rm Source		Temperature Corr		
Temp. for Rm Corr.		MCG External Temperature		
Squasher Start		0.0020 mhos/metre		
Squasher Offset		N/A mhos/metre		
Borehole Normalisation				
DRM1	0.0000	DRC1	0.0000	
DRM2	0.0000	DRC2	0.0000	
MRM1	0.0000	MRC1	0.0000	
MRM2	0.0000	MRC2	0.0000	
SRM1	0.0000	SRC1	0.0000	
SRM2	0.0000	SRC2	0.0000	
Calibration Site Corrections				
Channel 1	0.00		mmhos/metre	
Channel 2	0.00		mmhos/metre	
Channel 3	0.00		mmhos/metre	
Channel 4	0.00		mmhos/metre	

Channel 1		0.00	milliosmeters
Apparent Porosity and Water Saturation Constants			
Archie Constant (A)		1.00	
Cementation Exponent (M)		2.00	
Saturation Exponent (N)		2.00	
Saturation of Water for Apor	100.00		percent
Resistivity of Water for Apor and Sw	0.05		ohm-m
Resistivity of Mud Filtrate for Sw	0.00		ohm-m
Source for Rt	0.00		
Source for Rxo	0.00		
Caliper Calibration MPD-C.A 215		Base Calibration on 03-JUL-2012 14:31 Field Calibration on 21-JUL-2012 20:37	
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	13984	3.99	
2	22368	5.96	
3	30960	7.99	
4	39000	9.86	
5	48256	11.93	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	7.82	7.99	
Photo Density Calibration MPD-C.A 215		Base Calibration on 03-JUL-2012 14:15 Field Check on 21-JUL-2012 20:42	
Density Calibration			
Base Calibration		Measured	
	Near	Far	Calibrated (sdu)
		Near	Far
Reference 1	44788	15011	52994 19128
Reference 2	21362	2474	25185 2558
Field Check at Base			
	1279.3	1358.9	
Field Check			
	1279.2	1369.3	
PE Calibration			
Base Calibration		Measured	
	WS	WH	Ratio
			Calibrated
			Ratio
Background	233	1145	
Reference 1	14407	44606	0.326 0.309
Reference 2	5946	21223	0.285 0.274
Field Check at Base			
	232.9	1145.1	
Field Check			
	231.9	1147.4	
Density Constants MPD-C.A 215		Last Edited on 21-JUL-2012 20:42	
Density Source Id		2859GW	
Nylon Calibrator Number		527	
Aluminium Calibrator Number		527	
Density Shoe Profile		4 inch	
Caliper Source for Processing		Density Caliper	
PE Correction to Density		Not Applied	
Mud Density		1.29	gm/cc
Mud Density Z/A Multiplier		1.11	
Mud Filtrate Density		1.00	gm/cc

Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.68	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	

DOWNHOLE EQUIPMENT

C:\Minimus\Logs\Encana\NP EF09E-27 P27 595\NP EF 09E-27 P27 595 Depth.dta

Drop-off Running Tool (DRT A A)
DRT-A.A 105 LG: 9.42 ft WT: 66.1 lb OD: 2.60 in

MBS-A 400v Compact Battery Sub
MBS-A 11 LG: 7.84 ft WT: 57.3 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.A 221 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Memory Sub D.A
MMS-D.A 154 LG: 3.12 ft WT: 30.9 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 536 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 571 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 653 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-B.A 193 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 215 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 728 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 142 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 66 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 199 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in



62.63 ft GRGC - Gamma Ray
59.72 ft CGXT - MCG External Temperature

42.89 ft NPRS - Sandstone Neutron Por.
42.89 ft NPOR - Base Neutron Porosity

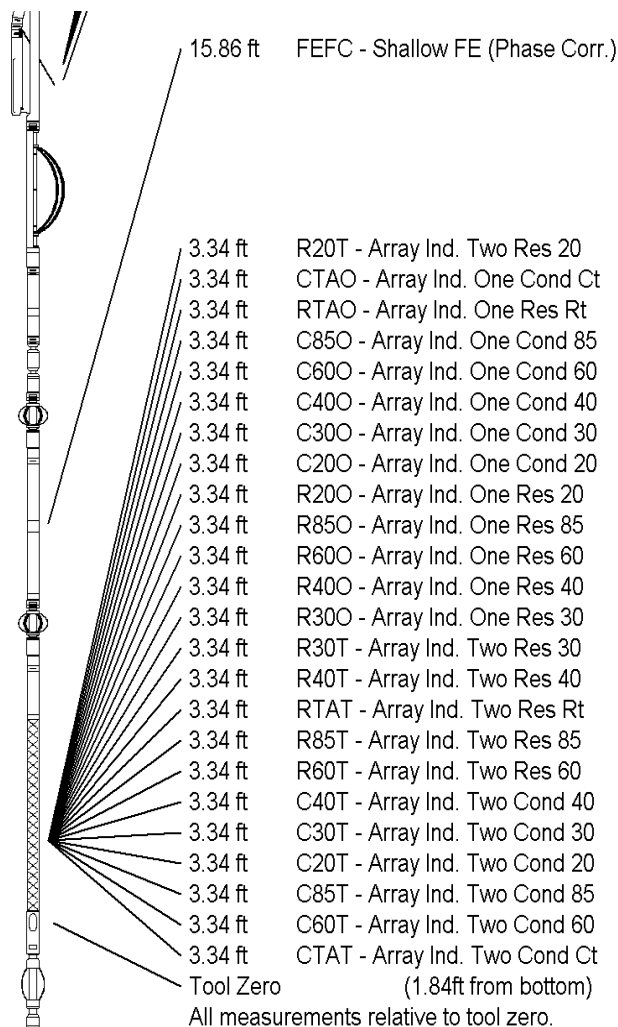
35.65 ft AVOL - Annular Volume
35.65 ft HVOL - Hole Volume
35.65 ft CLDC - Density Caliper
33.72 ft DPOR - Base Density Porosity
33.72 ft DEN - Compensated Density
33.72 ft DCOR - Density Correction
33.65 ft PDPE - PE

Compact Focussed Electric
MFE-B.A 248 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 326 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-B.J 362 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 86.88 ft Weight: 646.0 lb



COMPANY	ENCANA OIL AND GAS (USA)
WELL	NP EF 09E-27 P27 595
FIELD	GRAND VALLEY
PROVINCE/COUNTY	GARFIELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	6672.00	feet	First Reading	11179.00	feet
Elevation Drill Floor	6672.00	feet	Depth Driller	11265.00	feet
Elevation Ground Level	6650.00	feet	Depth Logger	11265.00	feet



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COMPACT DROP OFF
HOLE VOLUME
CALIPER

