



Weatherford

CALIPER LOG

COMPANY		GRAND MESA OPERATING COMPANY			
WELL		OBRIEN #1-9			
FIELD		WILDCAT			
PROVINCE/COUNTY LANE					
COUNTRY/STATE		U.S.A. / KANSAS			
LOCATION		2225' FSL & 2305' FEL			
SEC 9	TWP 16S	RGE 29W	Other Services		
Latitude		15-101-22619			
Longitude					
API Number					
Permanent Datum GL, Elevation 2656 feet					Elevations: KB 2661.00 DF 2659.00 GL 2656.00
Log Measured From KB, 5.00 feet above Permanent Datum					
Drilling Measured From KB					
Date	12-DEC-2018				
Run Number	ONE				
Service Order	4558-231823318				
Depth Driller	4520.00			feet	
Depth Logger	4521.00			feet	
First Reading	4487.00			feet	
Last Reading	219.00			feet	
Casing Driller	219.00			feet	
Casing Logger	219.00			feet	
Bit Size	7.875			inches	
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30 lb/USg		52.00 CP		
PH / Fluid Loss	10.00		7.20 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.27 @ 75.0			ohm-m	
Rmf @ Measured Temp	1.02 @ 75.0			ohm-m	
Rmc @ Measured Temp	1.52 @ 75.0			ohm-m	
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.81 @117.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	117.00			deg F	
Equipment / Base	13096		LIB		
Recorded By	ADAM SILL				
Witnessed By	GARET DINKEL				

BOREHOLE RECORD

Last Edited: 12-DEC-2018 16:55

Bit Size inches	Depth From feet	Depth To feet
7.875	219.00	4520.00

CASING RECORD

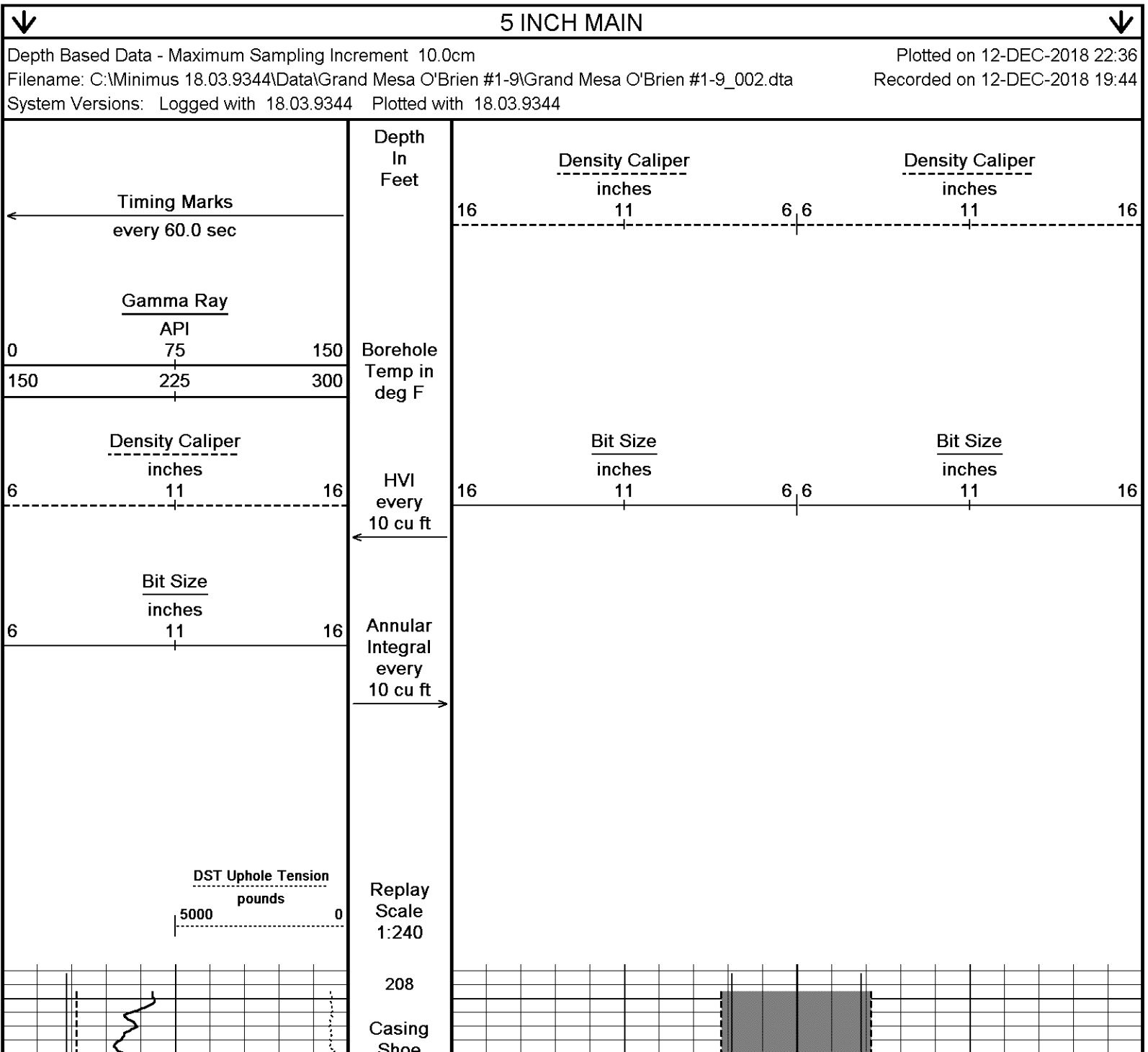
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	219.00	24.00

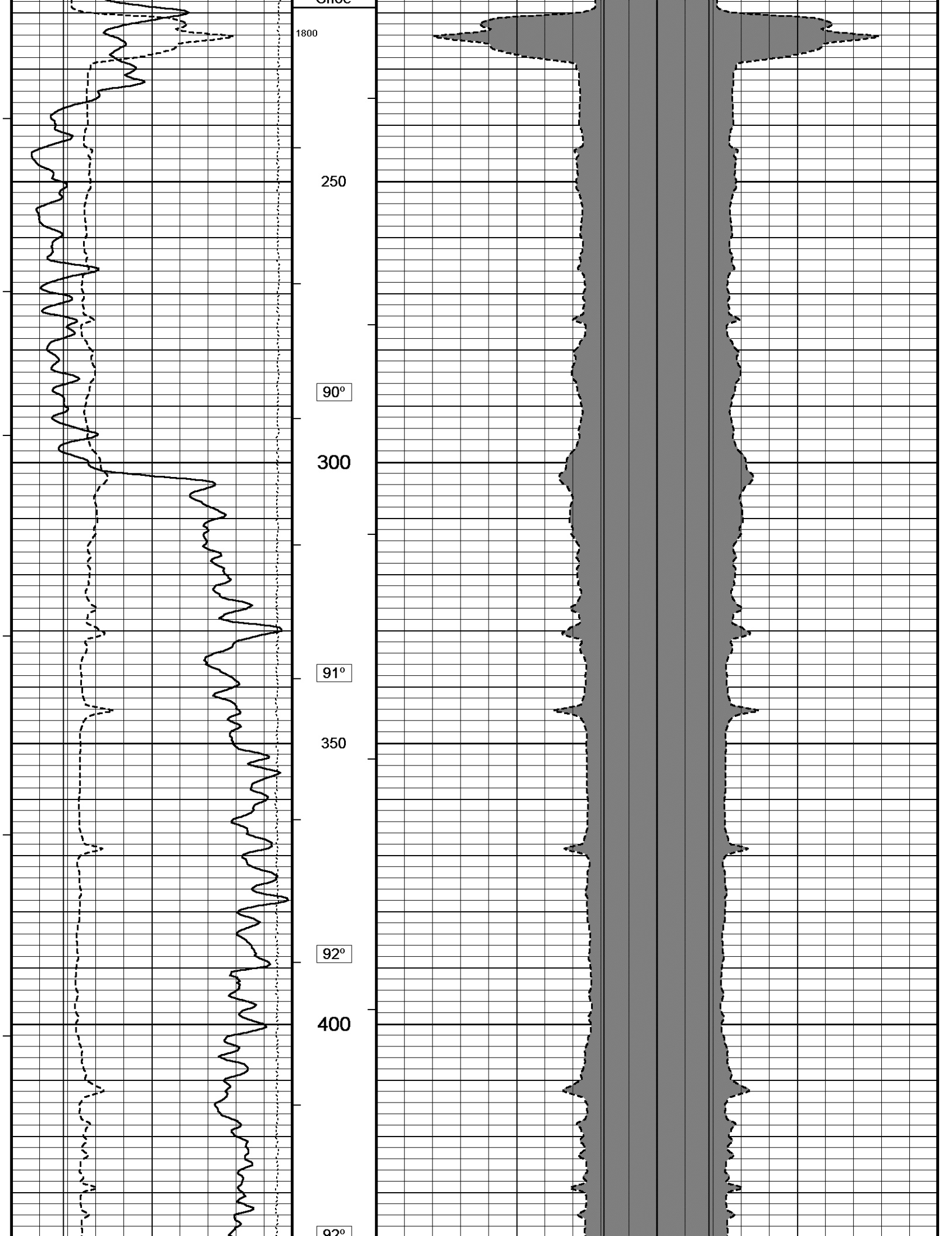
REMARKS

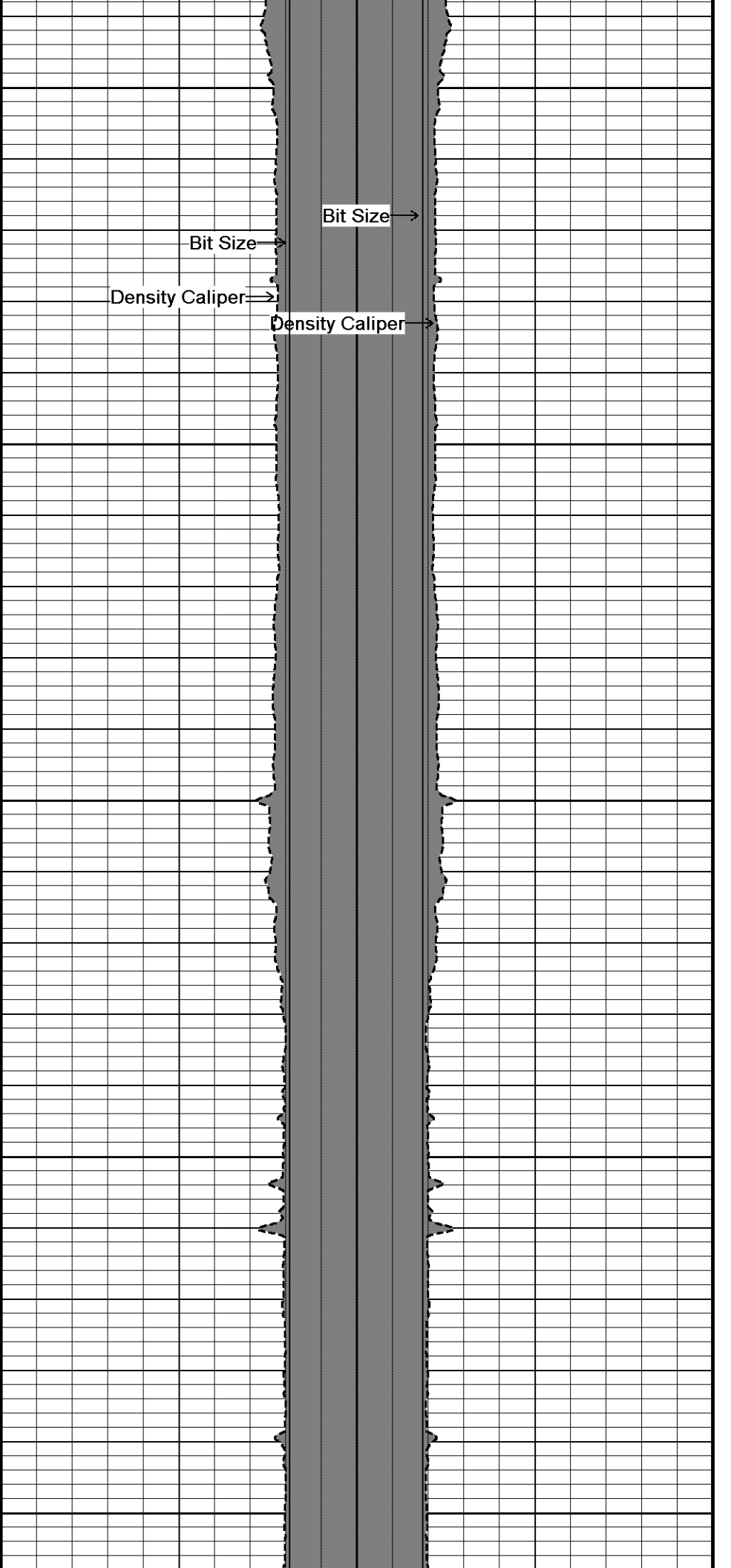
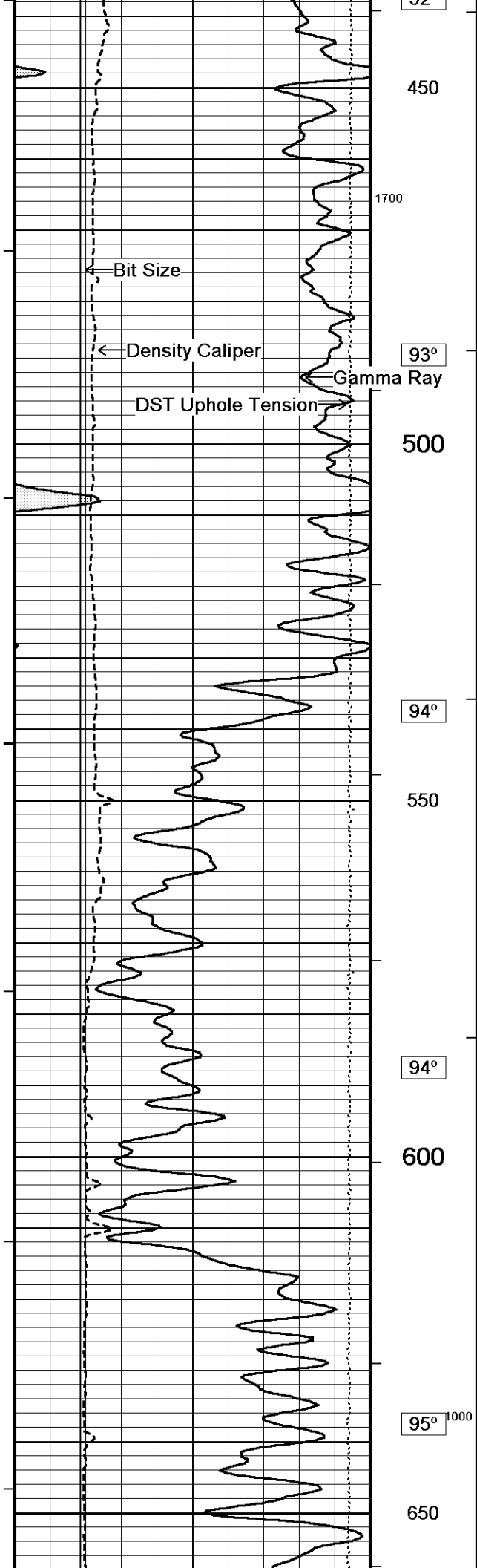
- SOFTWARE ISSUE: WLS 18.03.9344.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - 0.5 INCH STANDOFF USED ON MFE.
 - TWO 0.5 INCH STANDOFFS USED ON MSS.
 - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1802 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 1096 CU.FT.

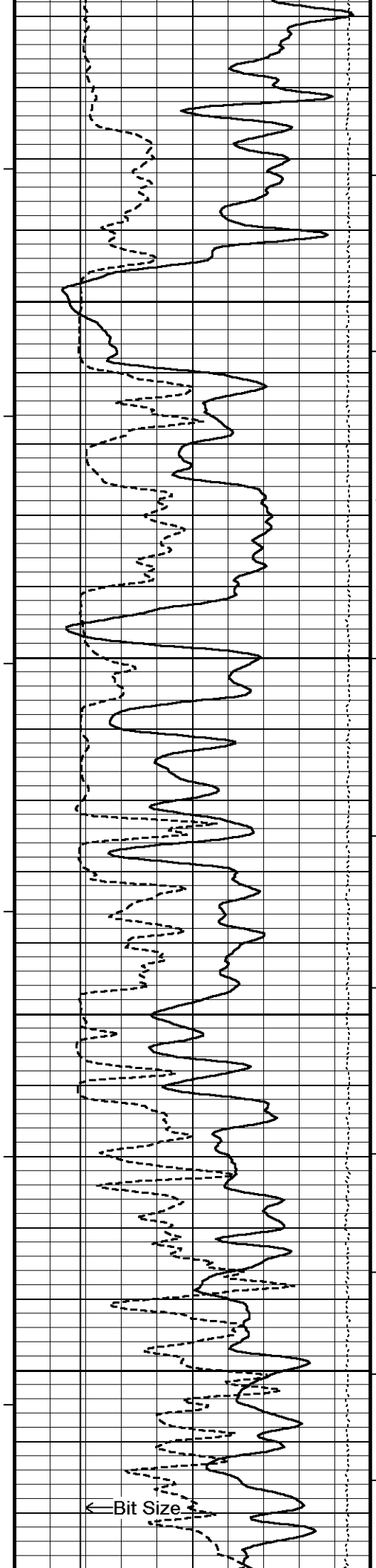
- RIG: WW DRILLING #2.
- ENGINEER: A. SILL.
- OPERATOR: B. TOVAR, B. COPELAND.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.









96°

700

1600

96°

750

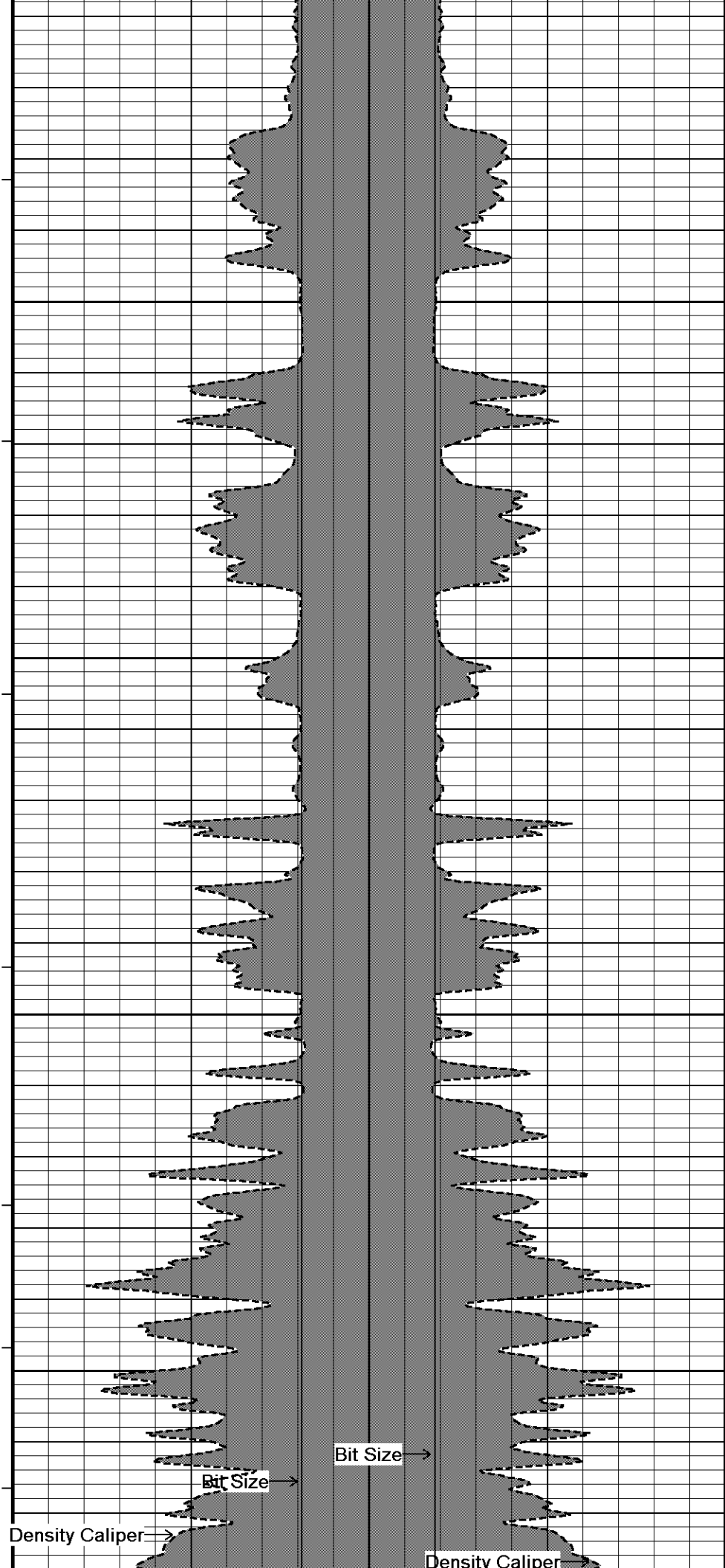
96°

800

96°

850

← Bit Size

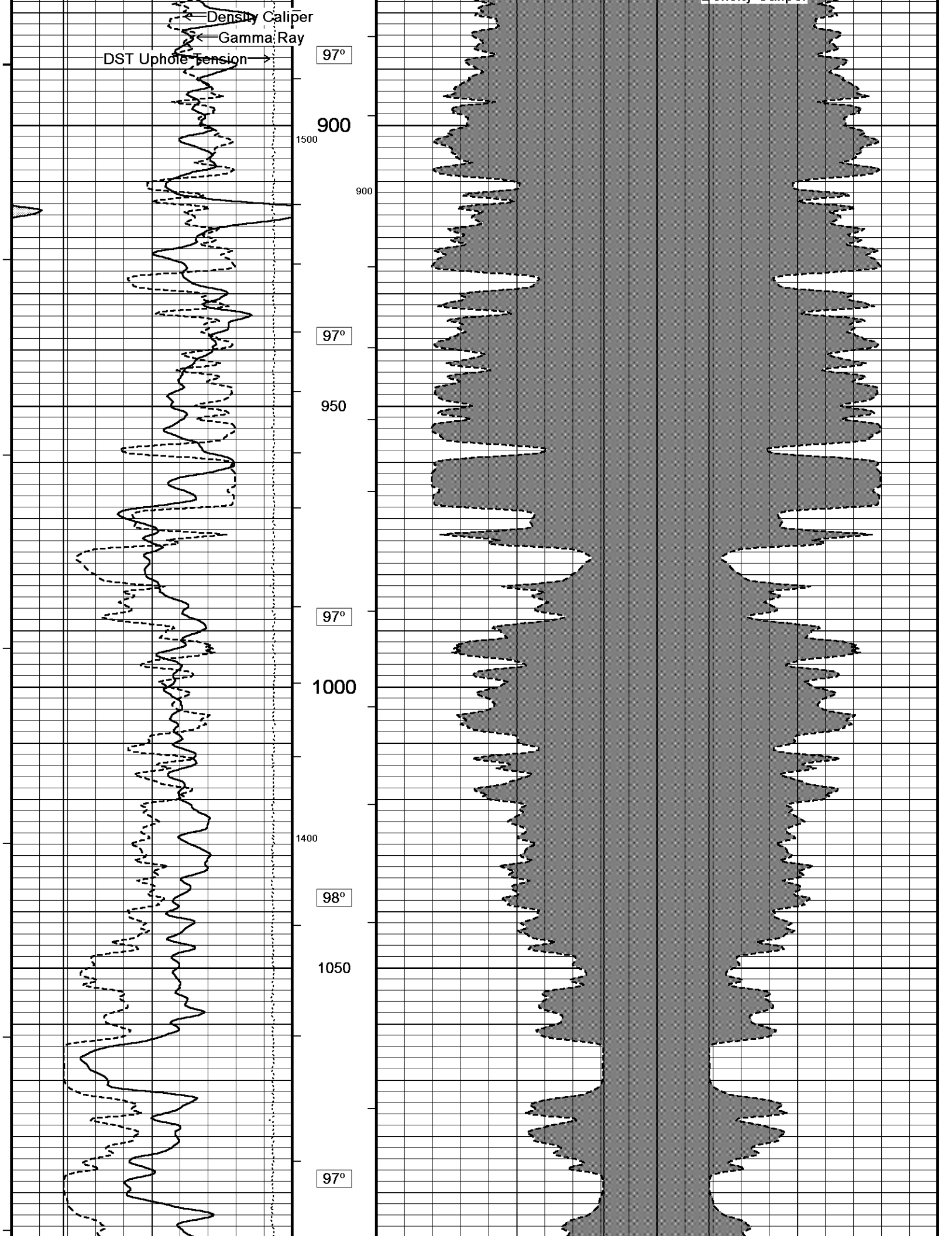


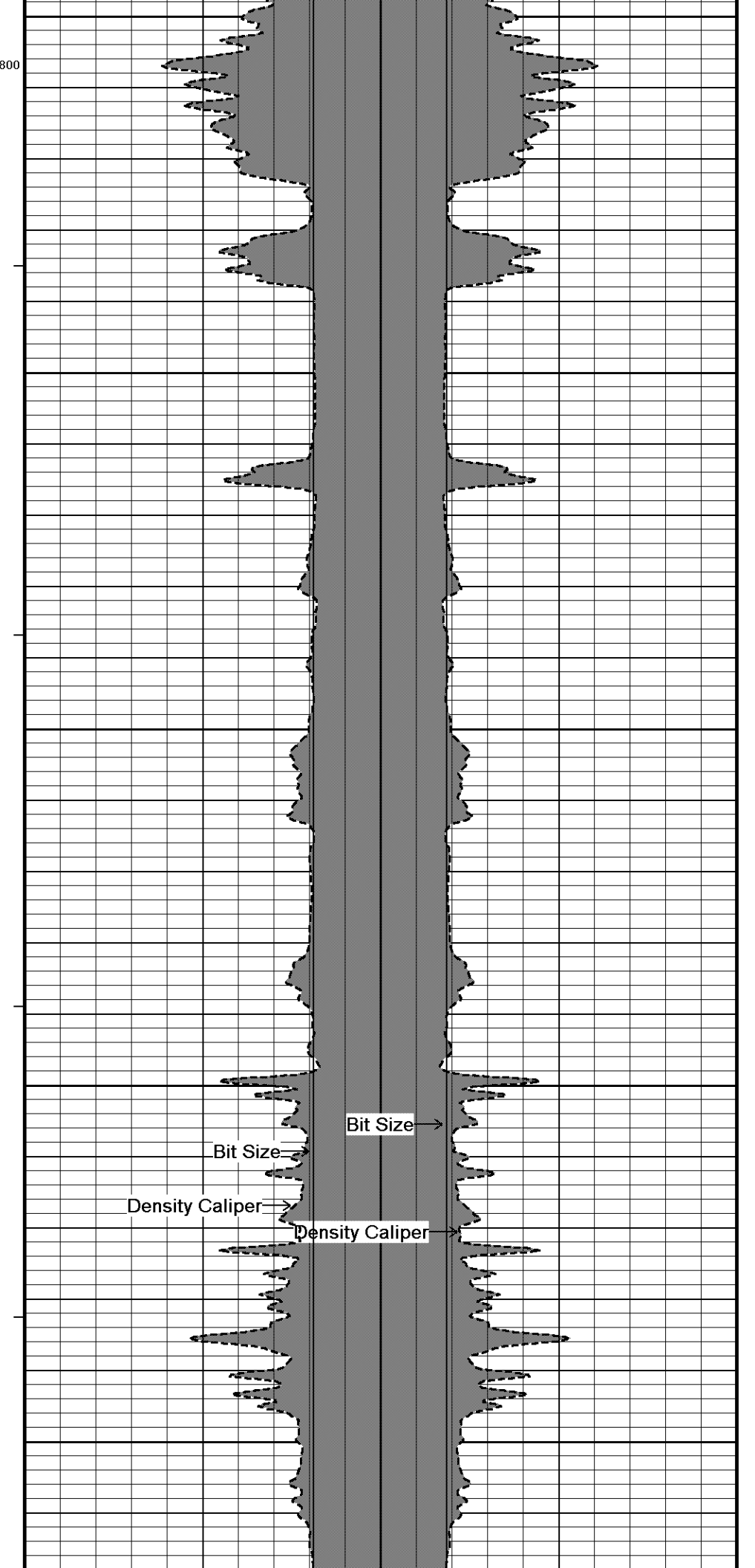
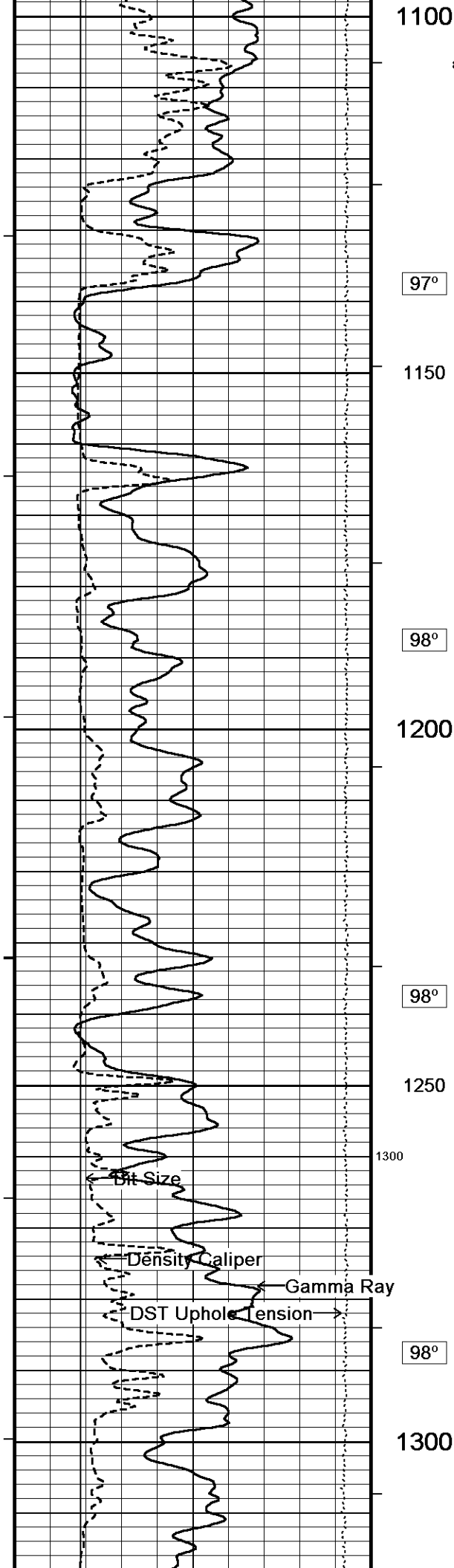
Bit Size →

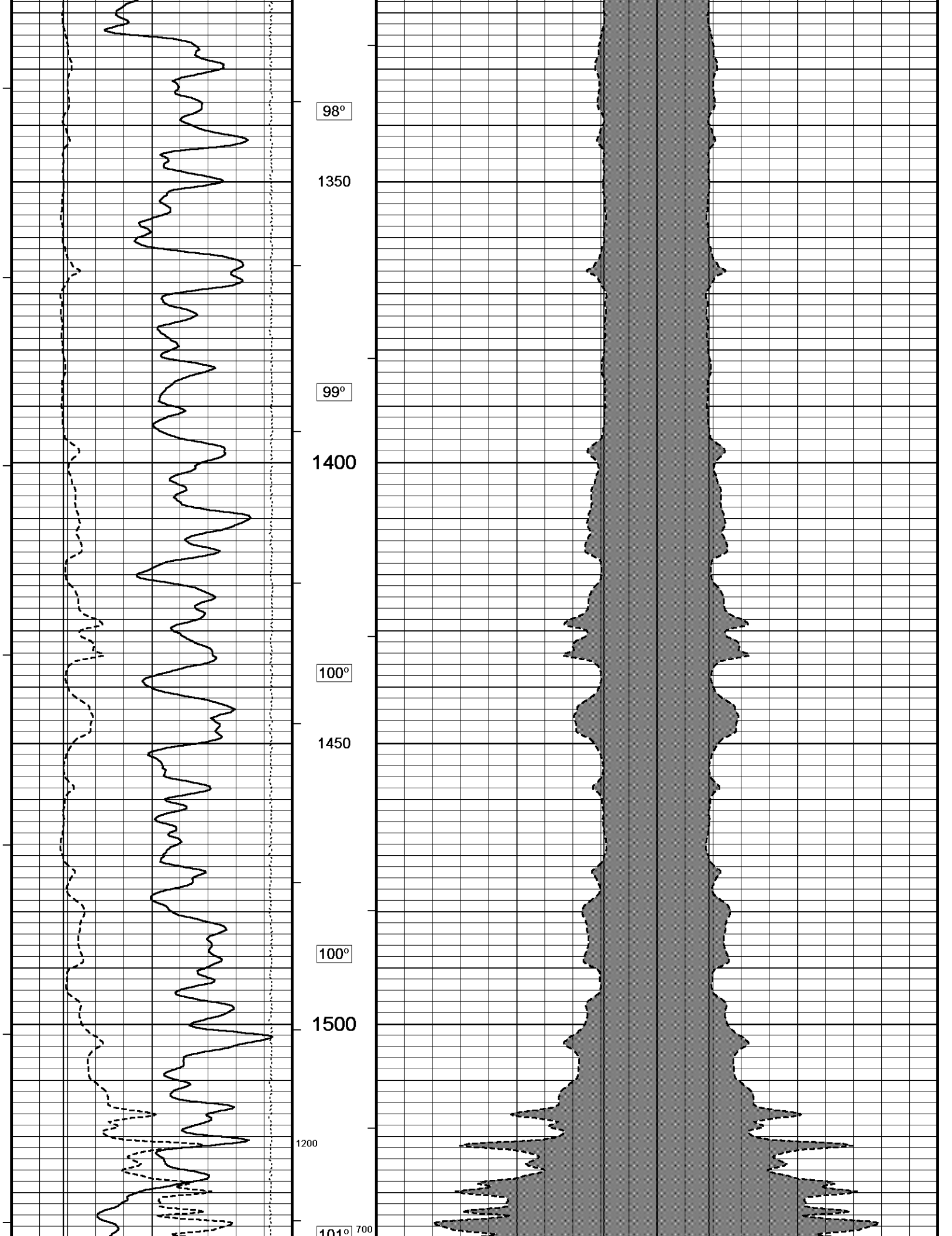
Bit Size →

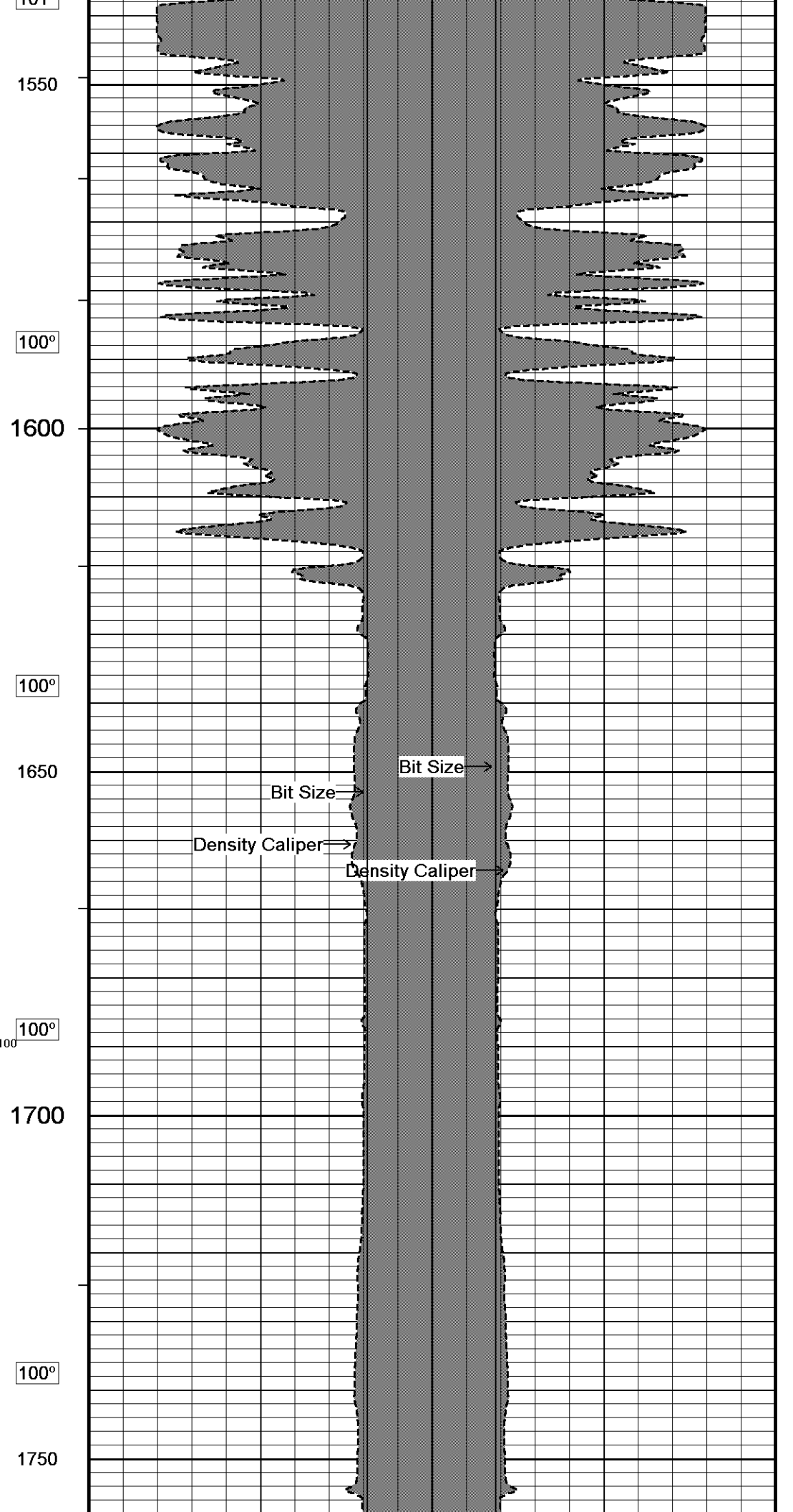
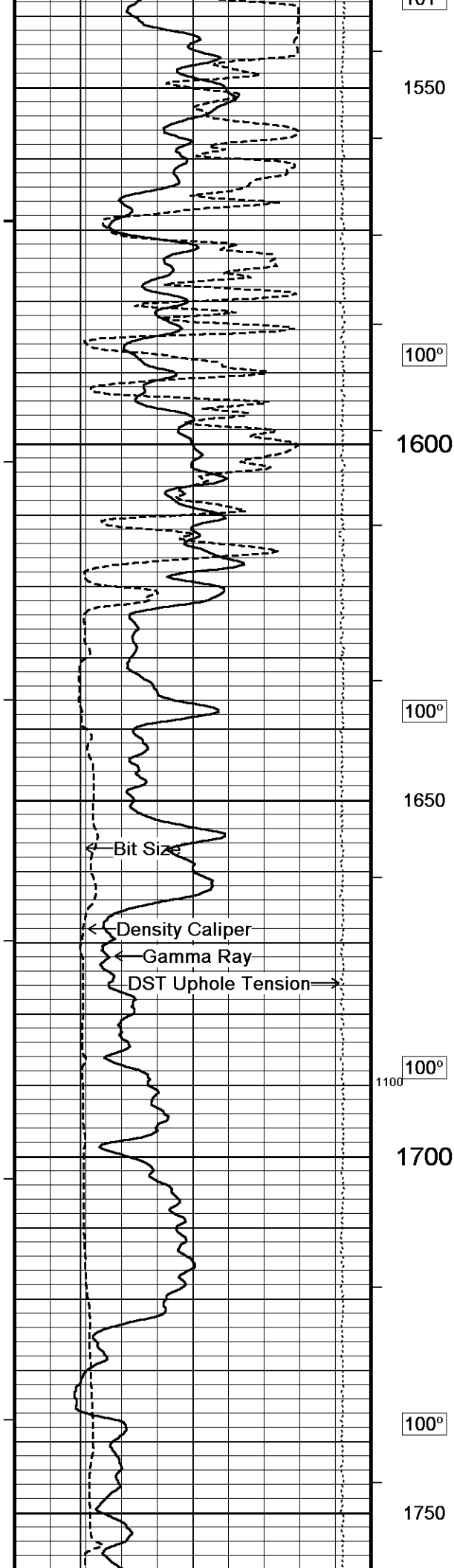
Density Caliper →

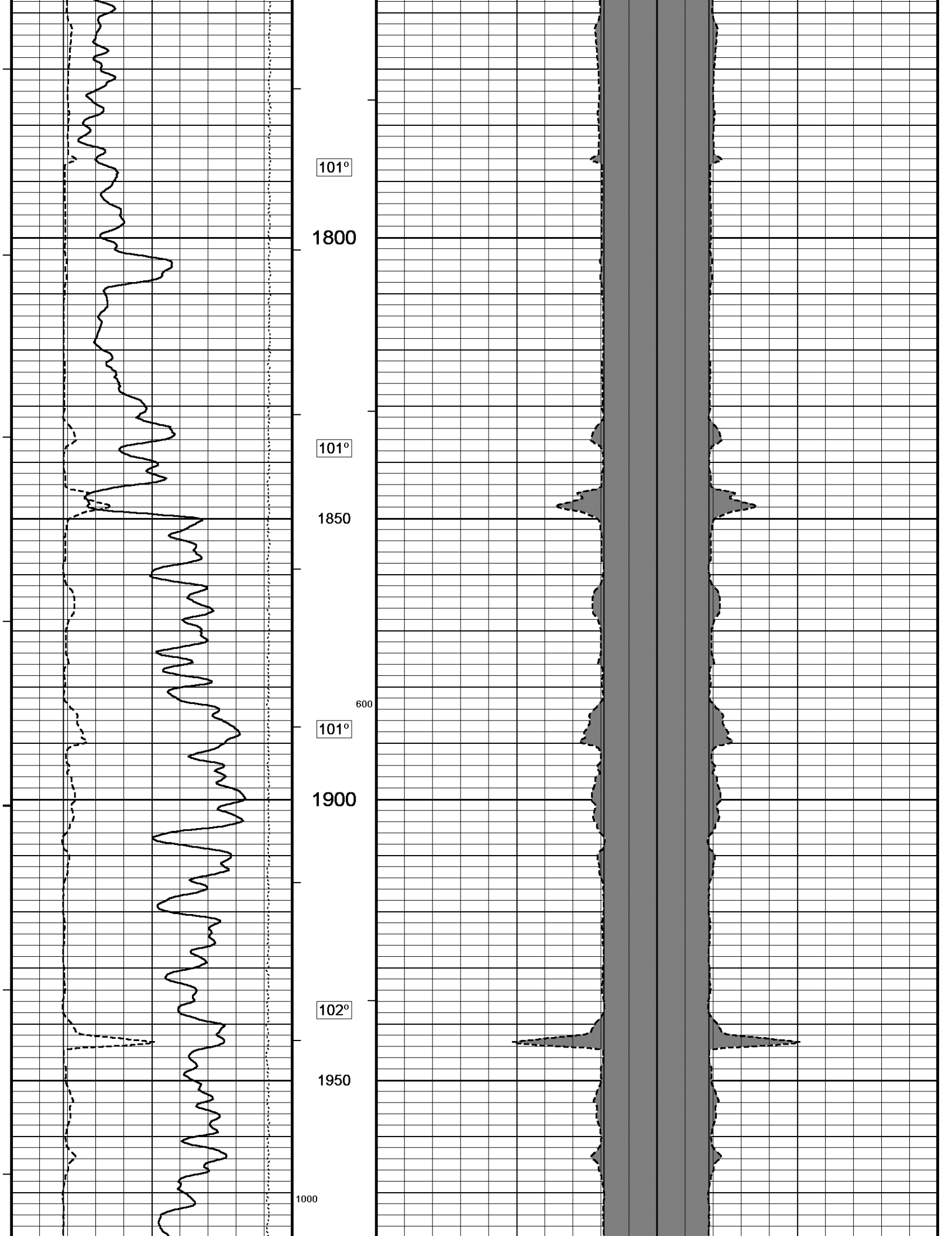
Density Caliper →

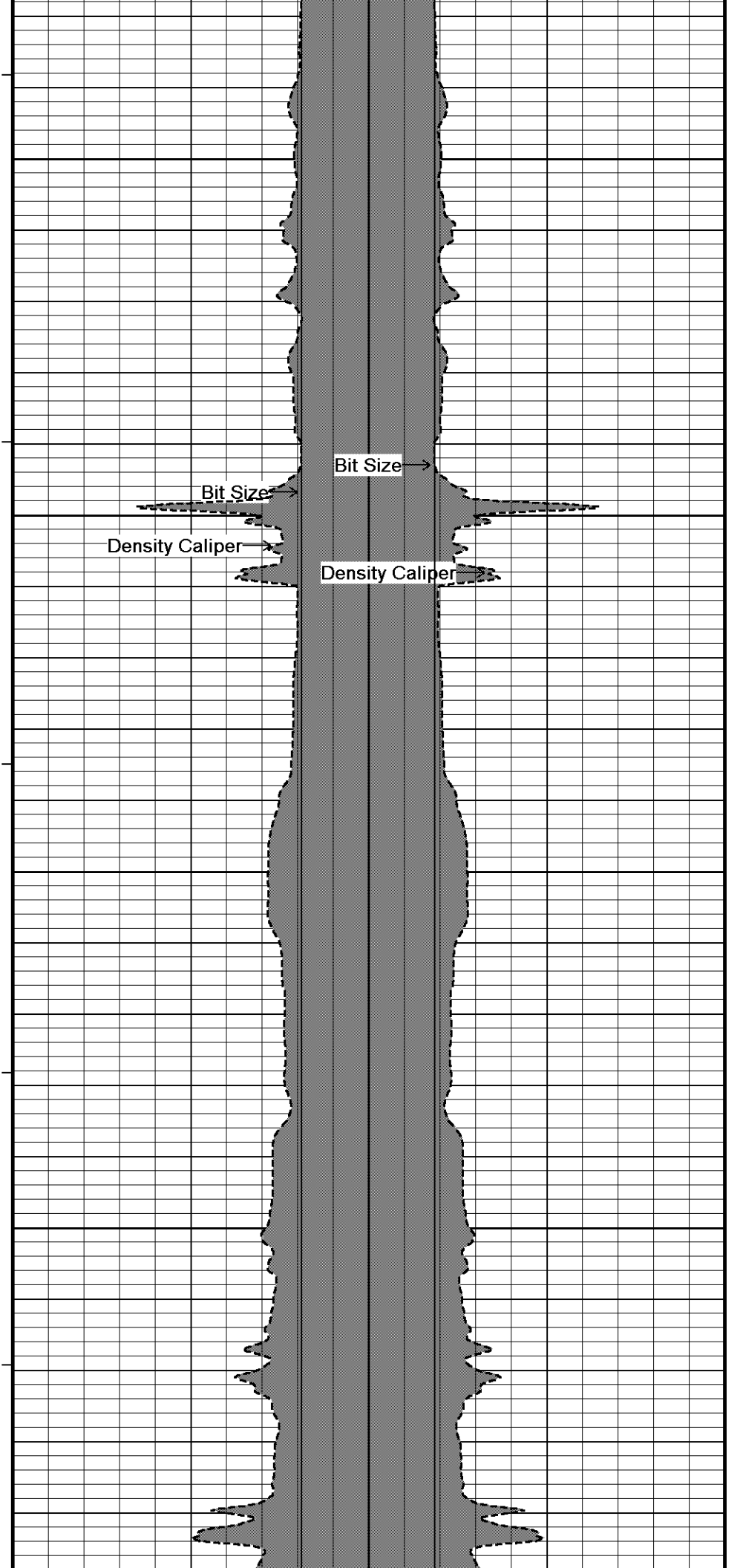
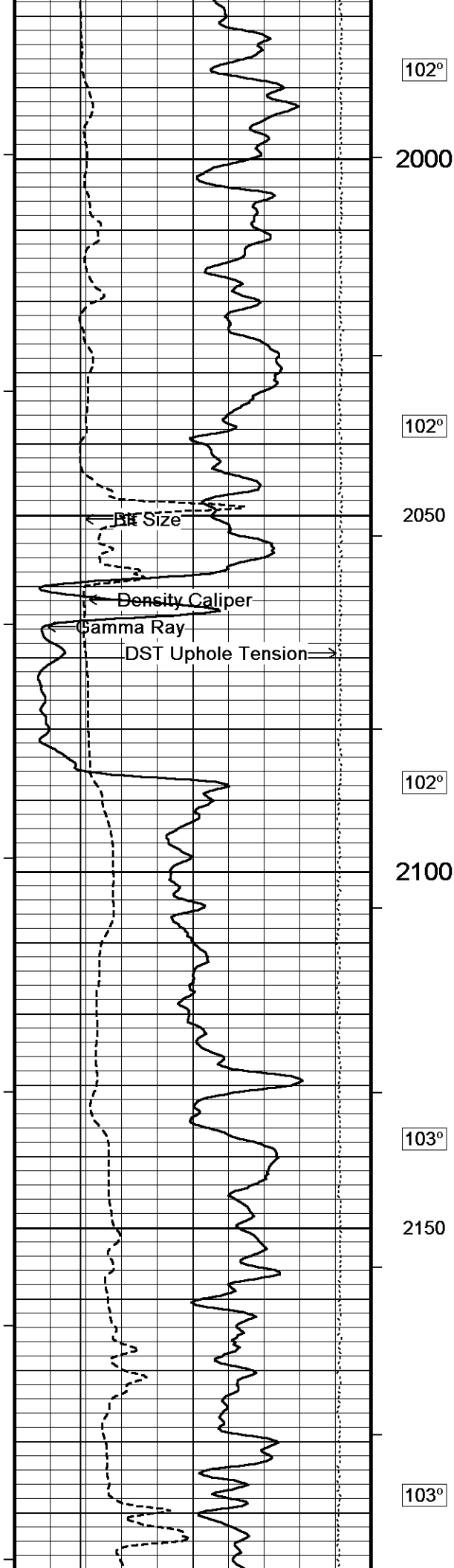


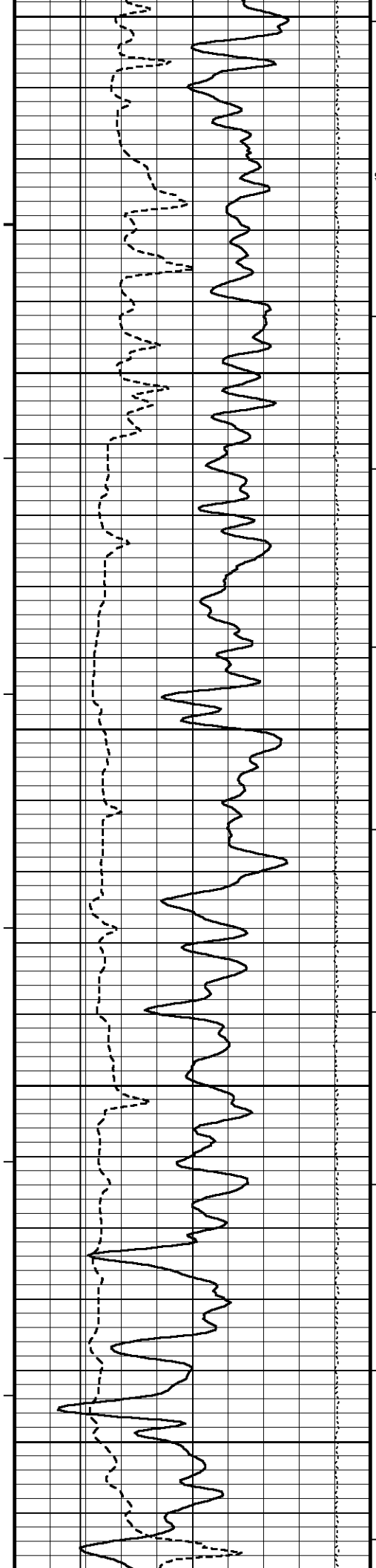




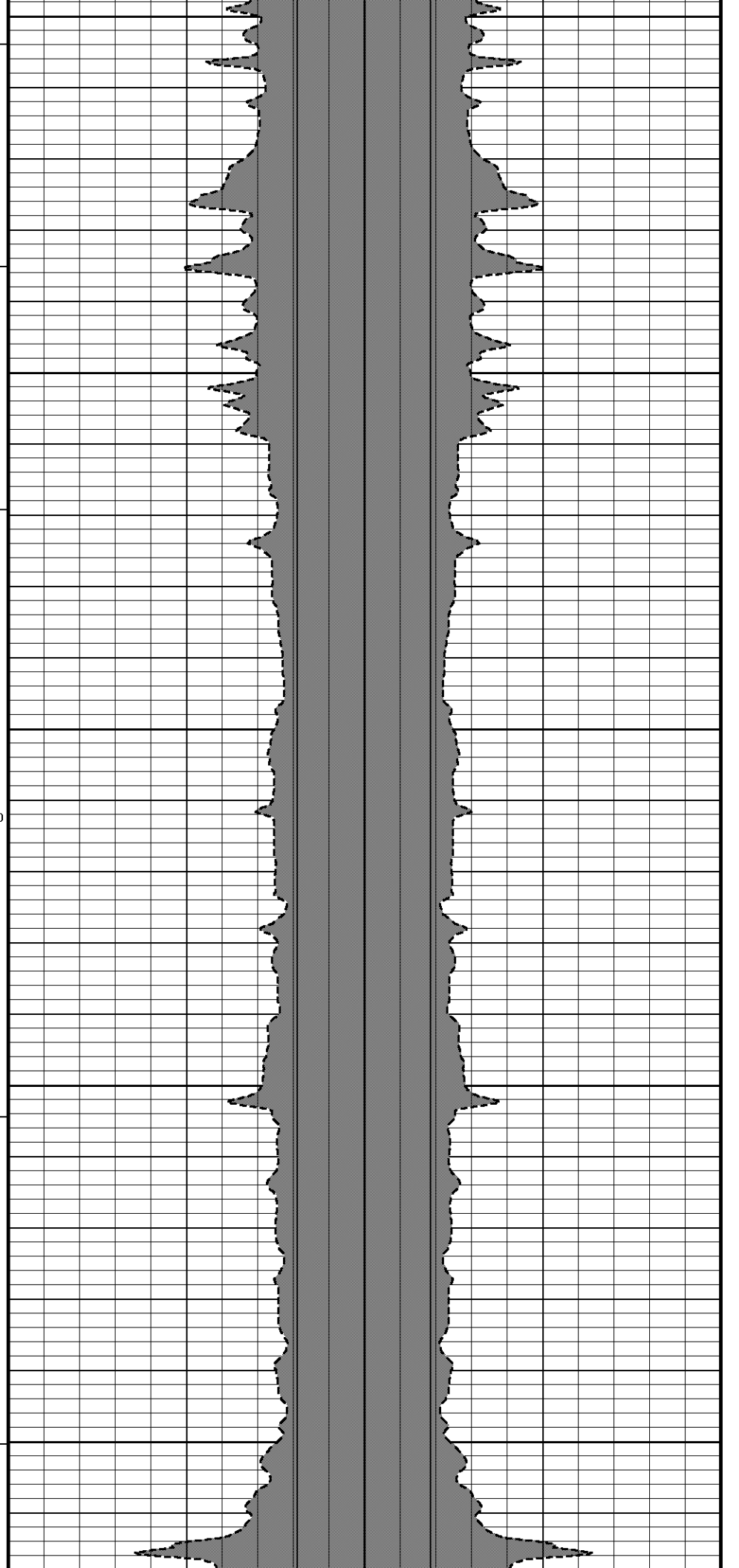


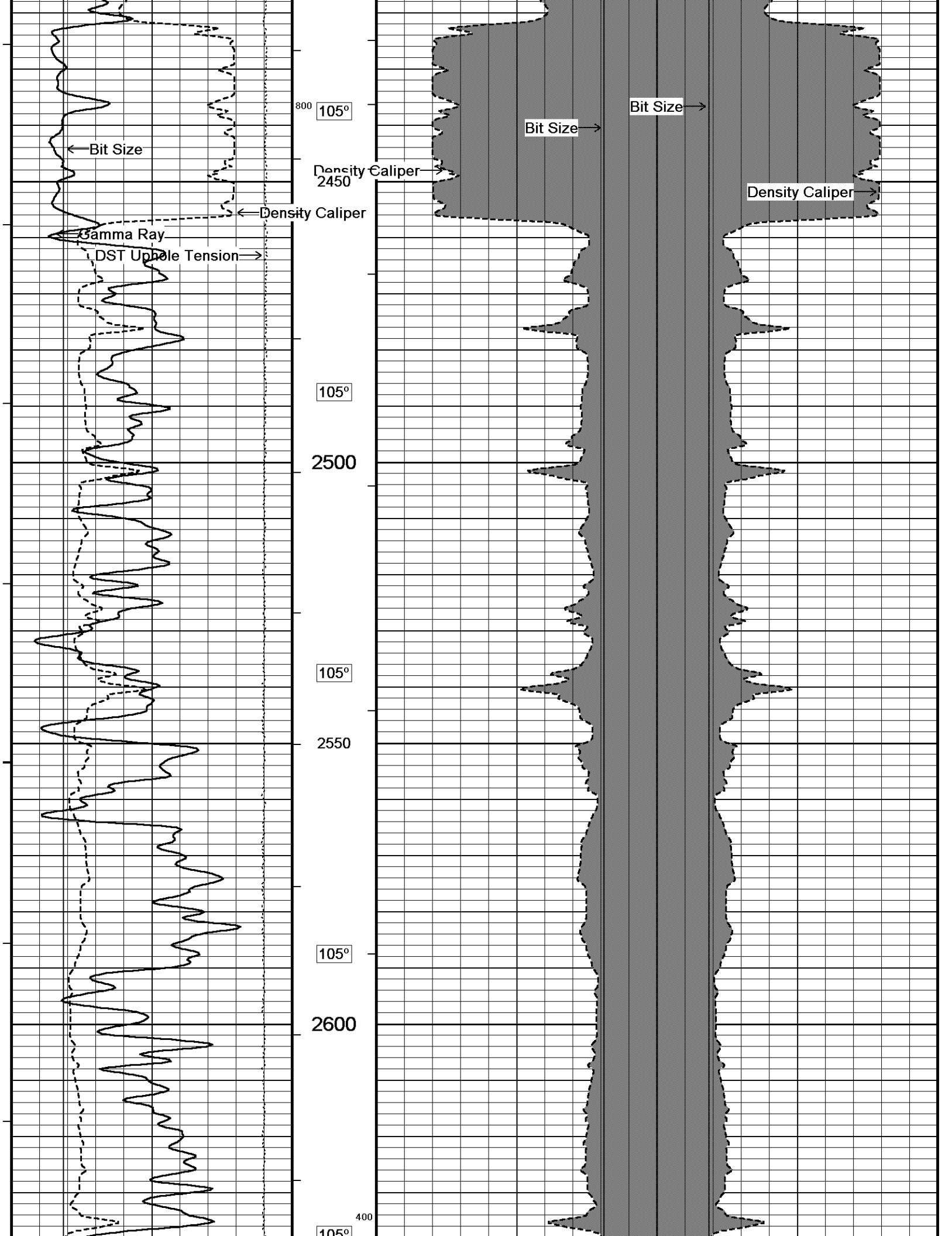


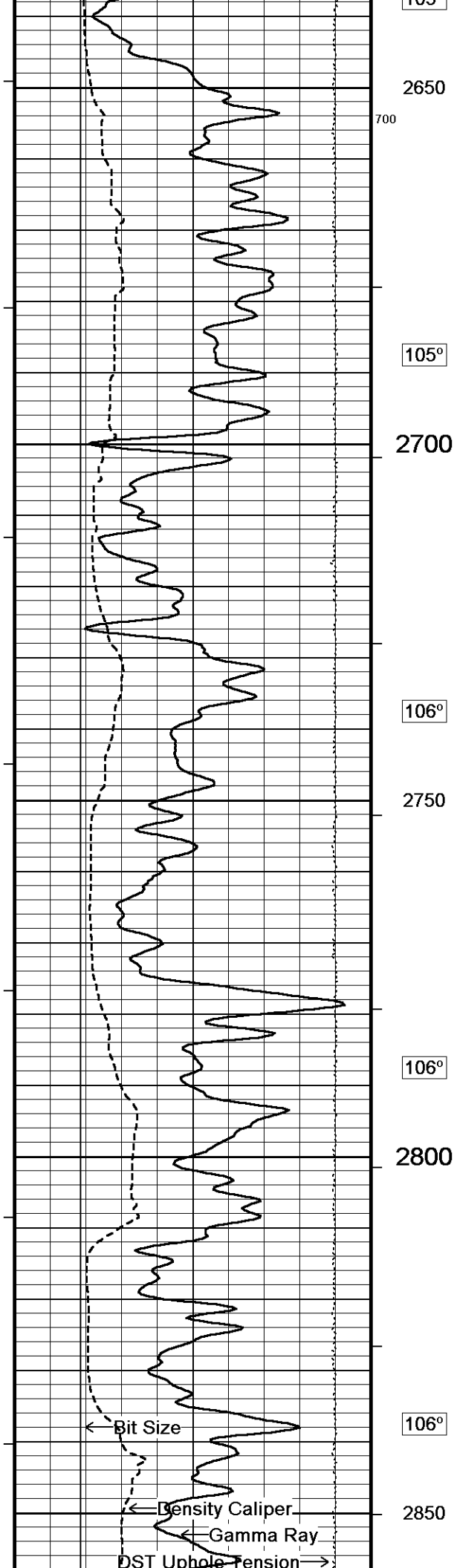




2200
900
104°
2250
104°
2300
500
104°
2350
105°
2400







105

2650

700

105°

2700

106°

2750

106°

2800

106°

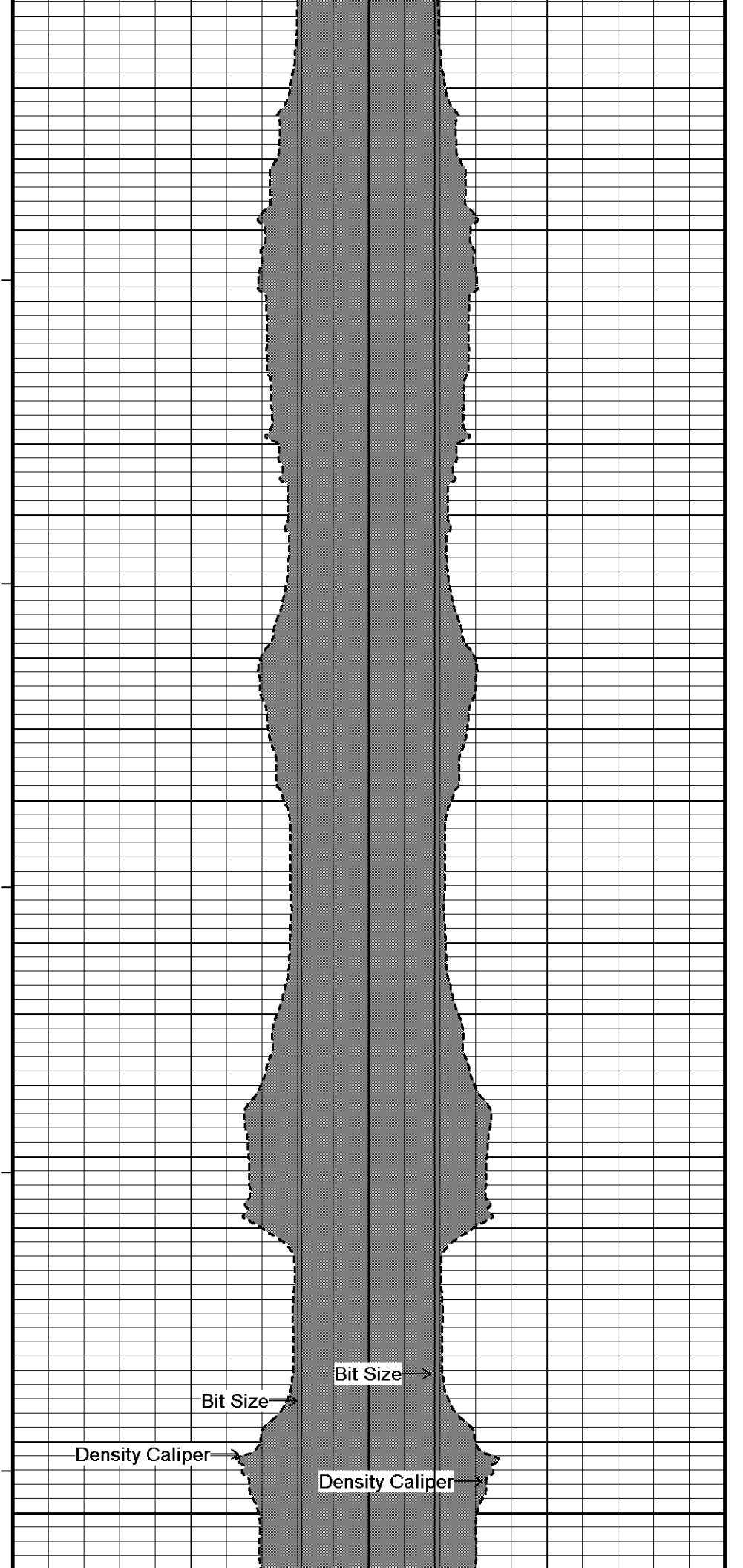
2850

Bit Size

Density Caliper

Gamma Ray

DST Uphole Pressure

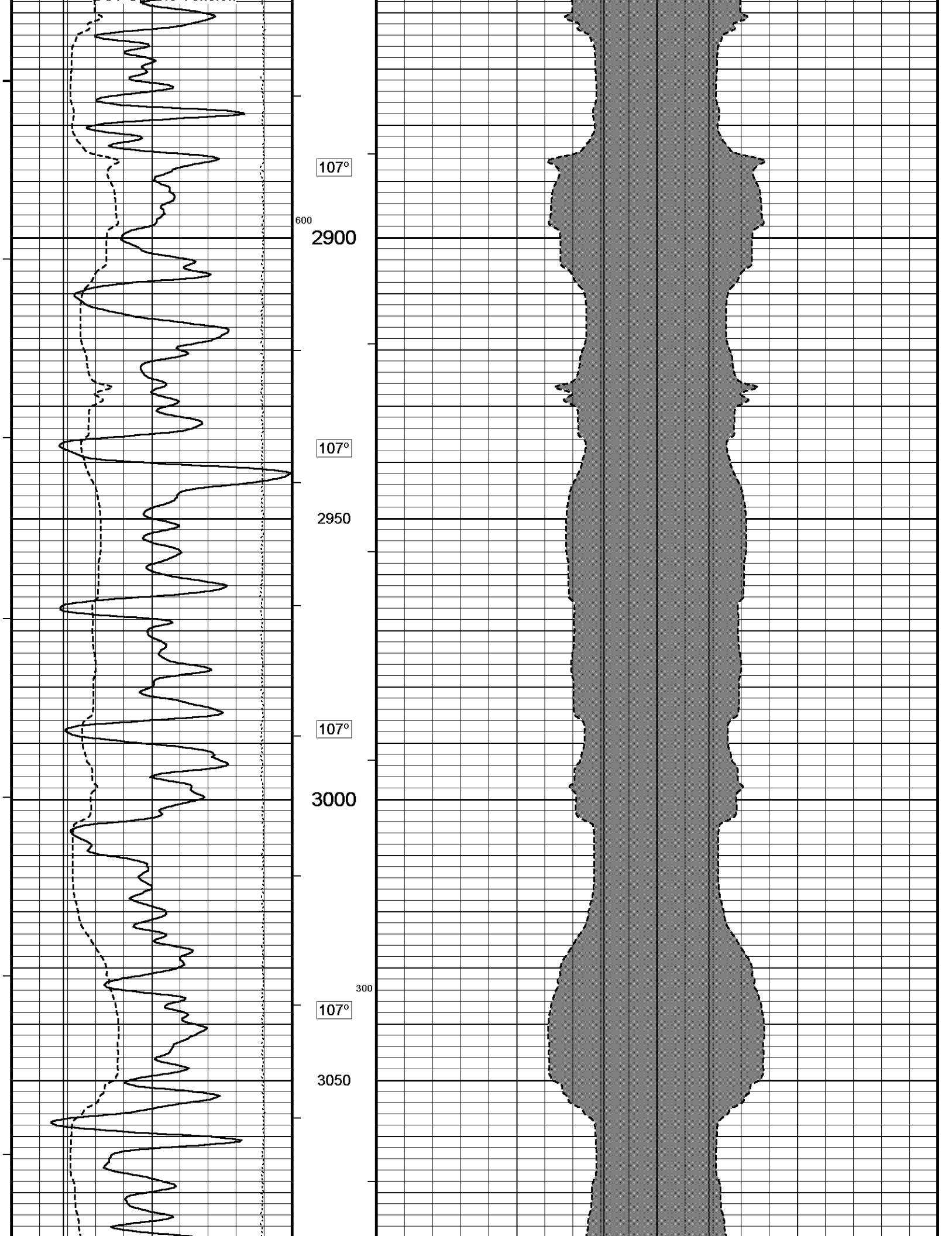


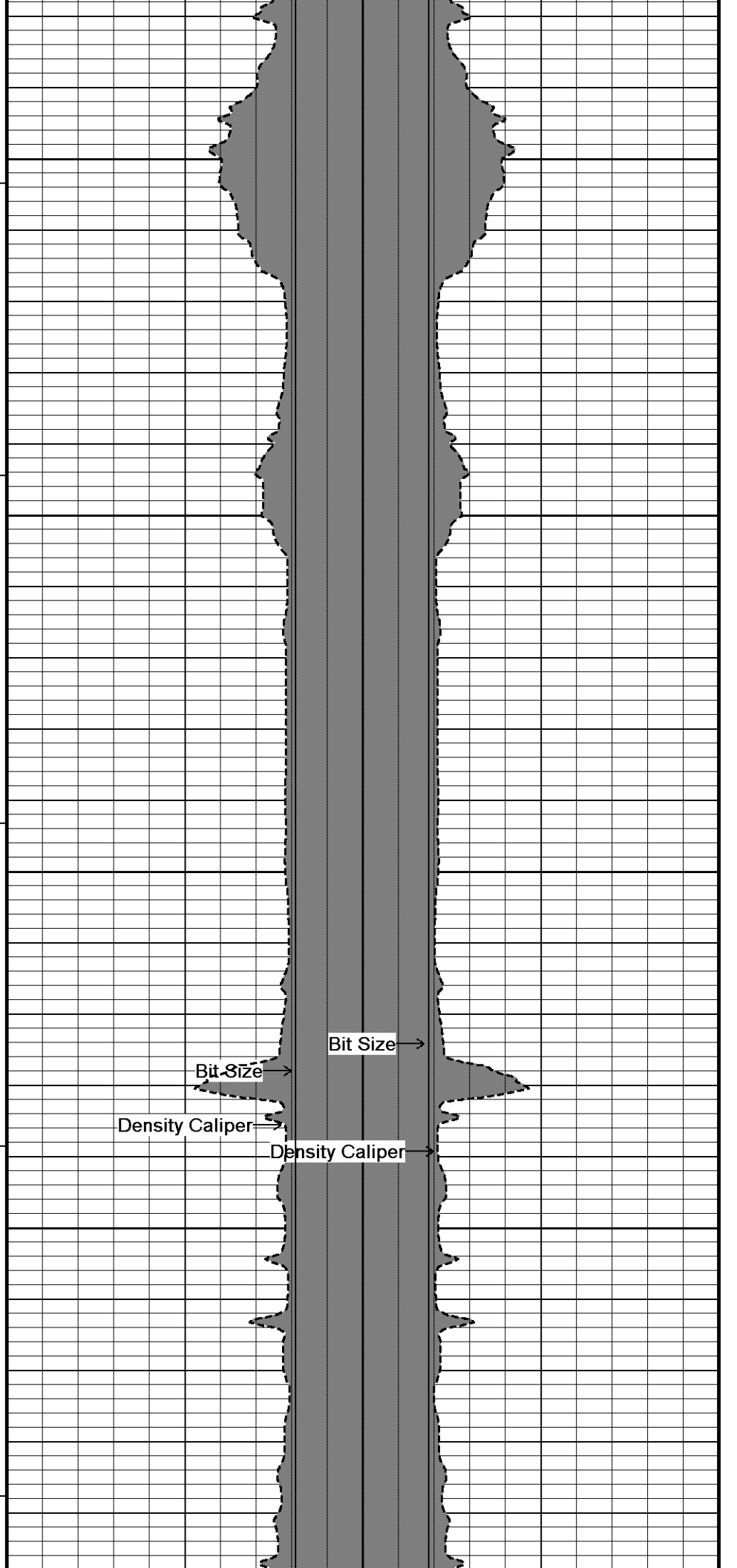
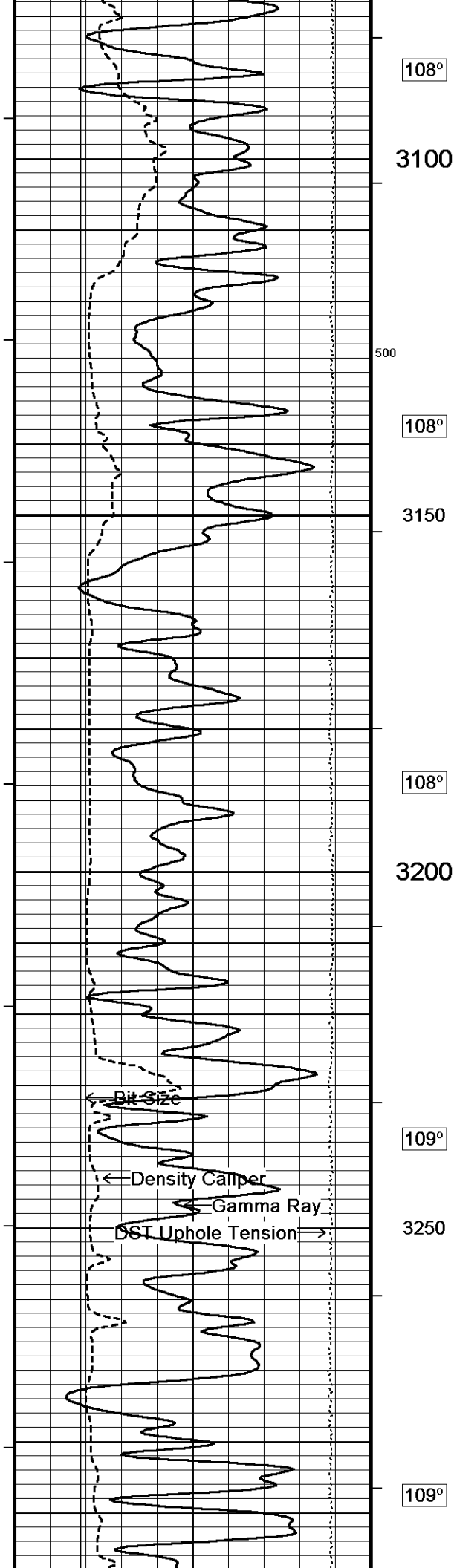
Bit Size

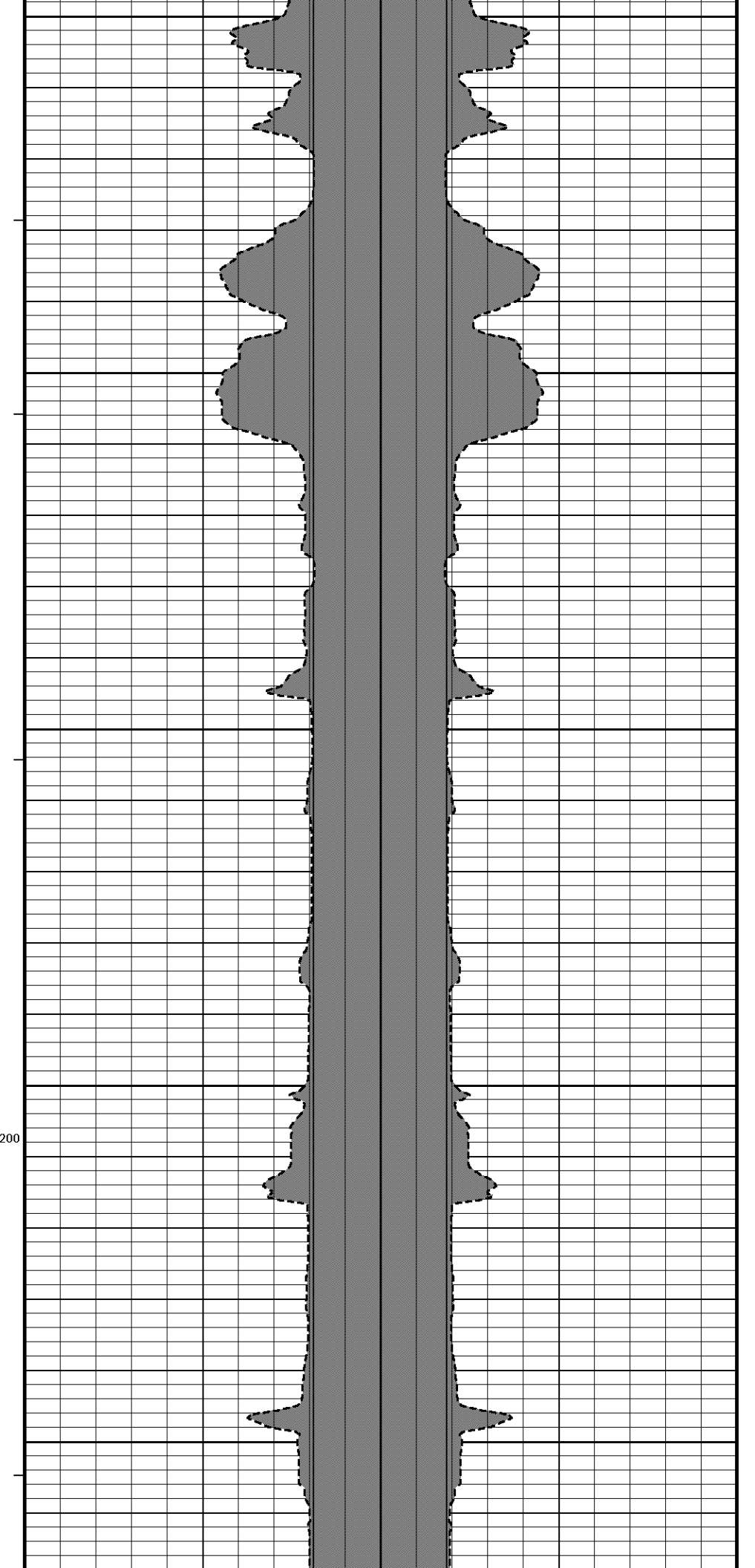
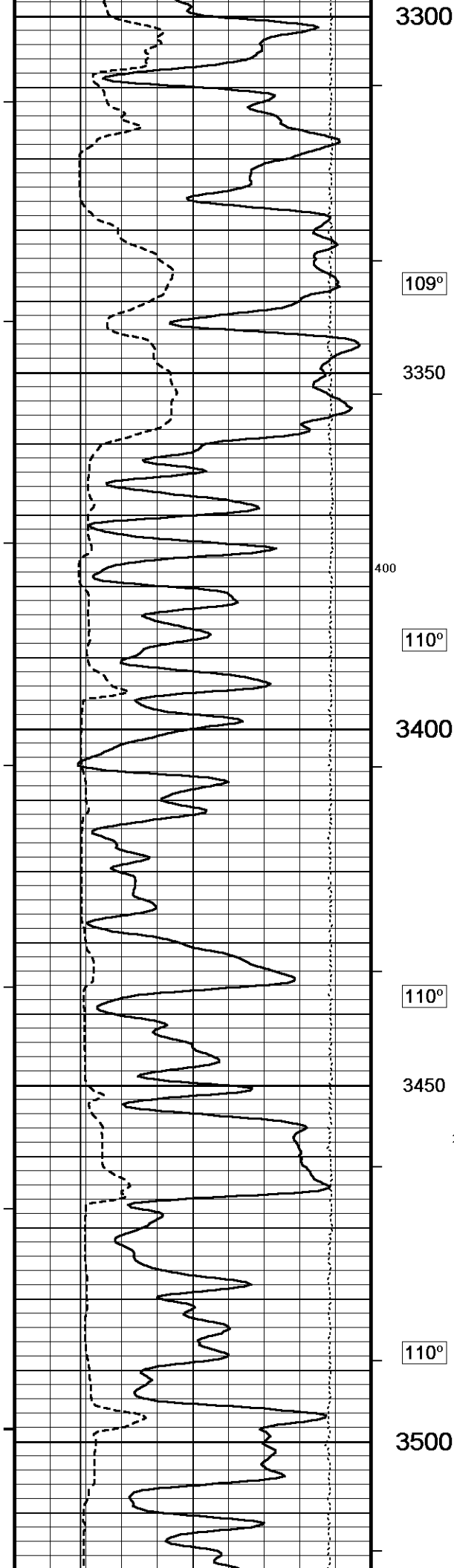
Density Caliper

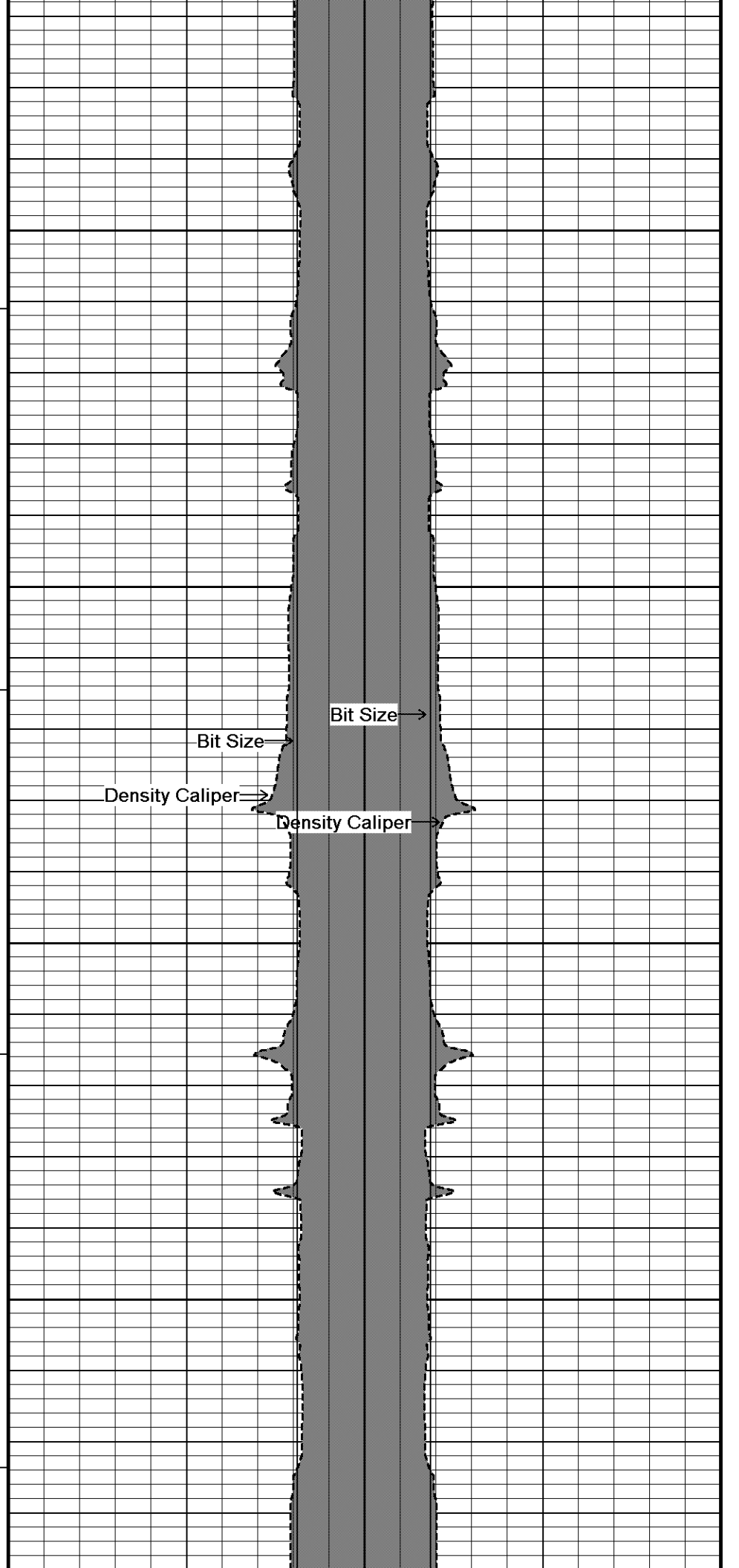
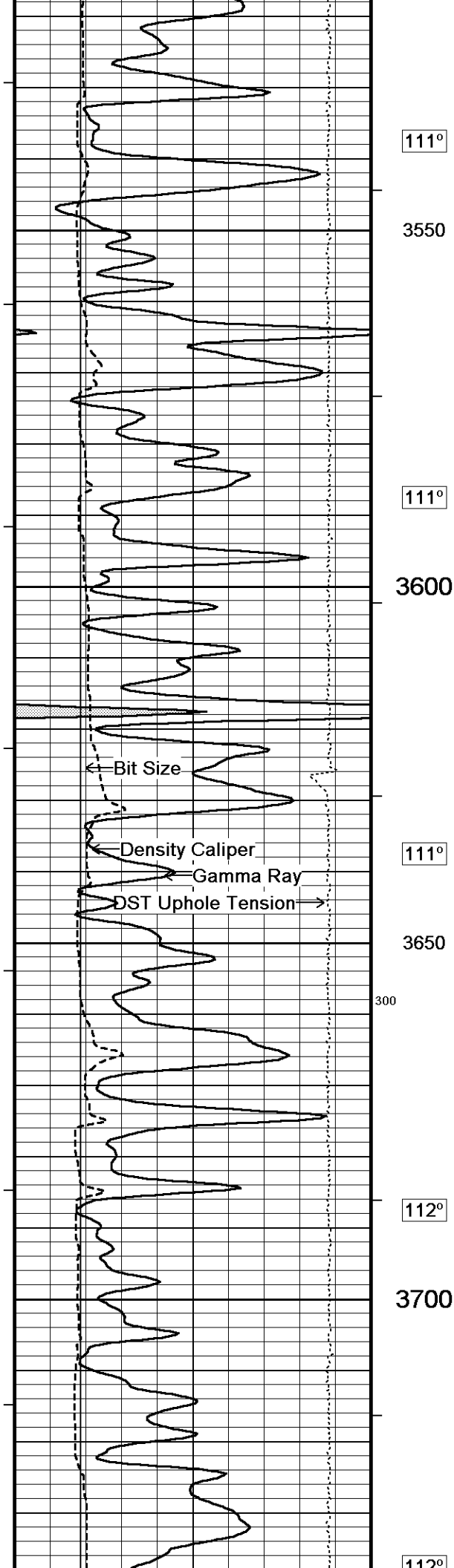
Bit Size

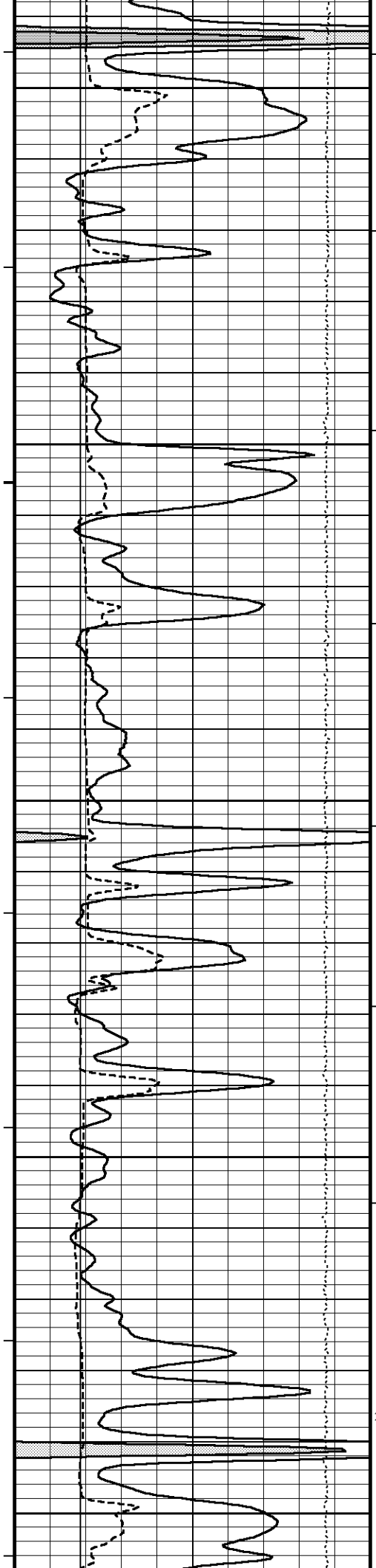
Density Caliper



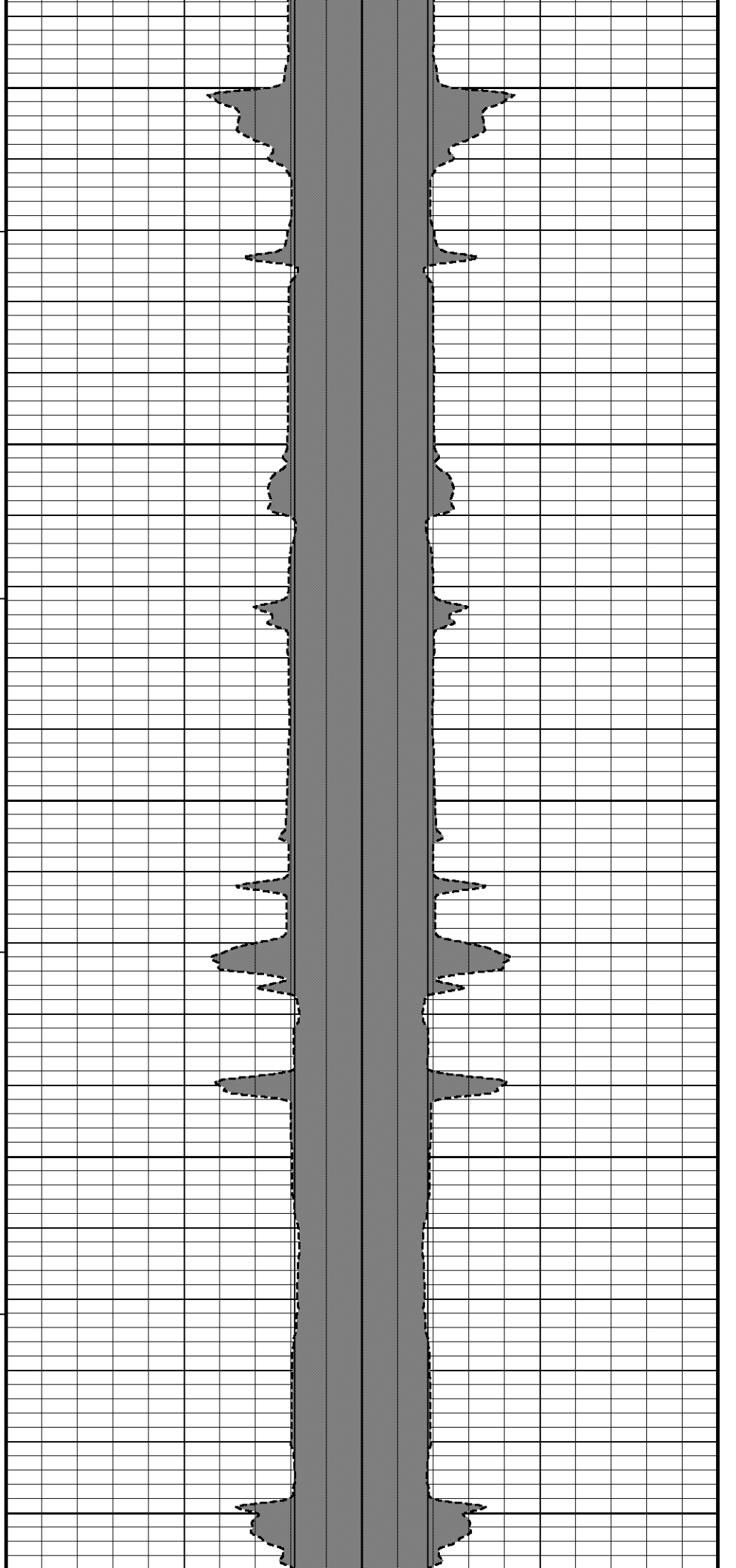


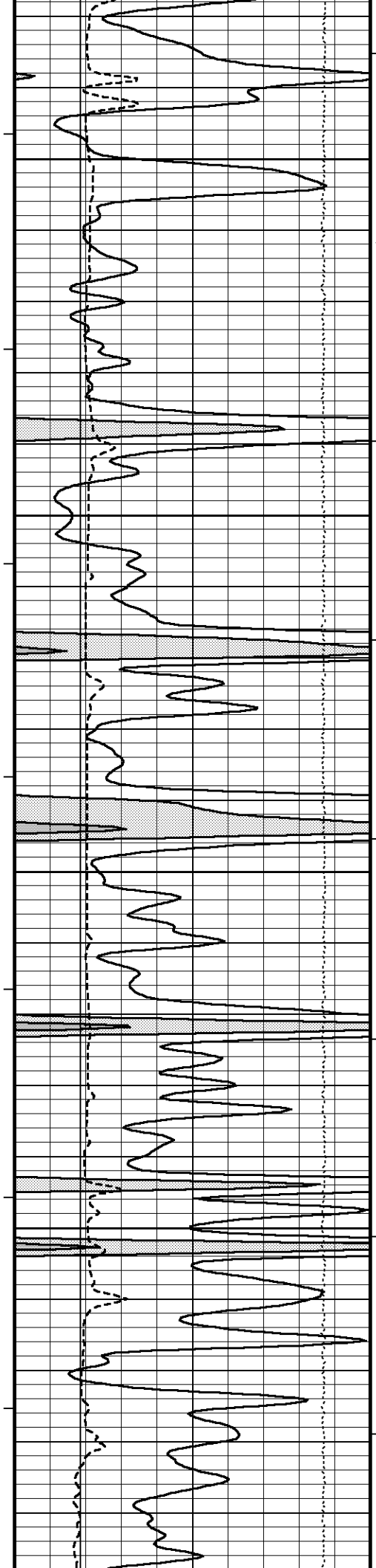






112°
3750
112°
3800
113°
3850
113°
3900
200 113°
3950





115°

4200

100

115°

4250

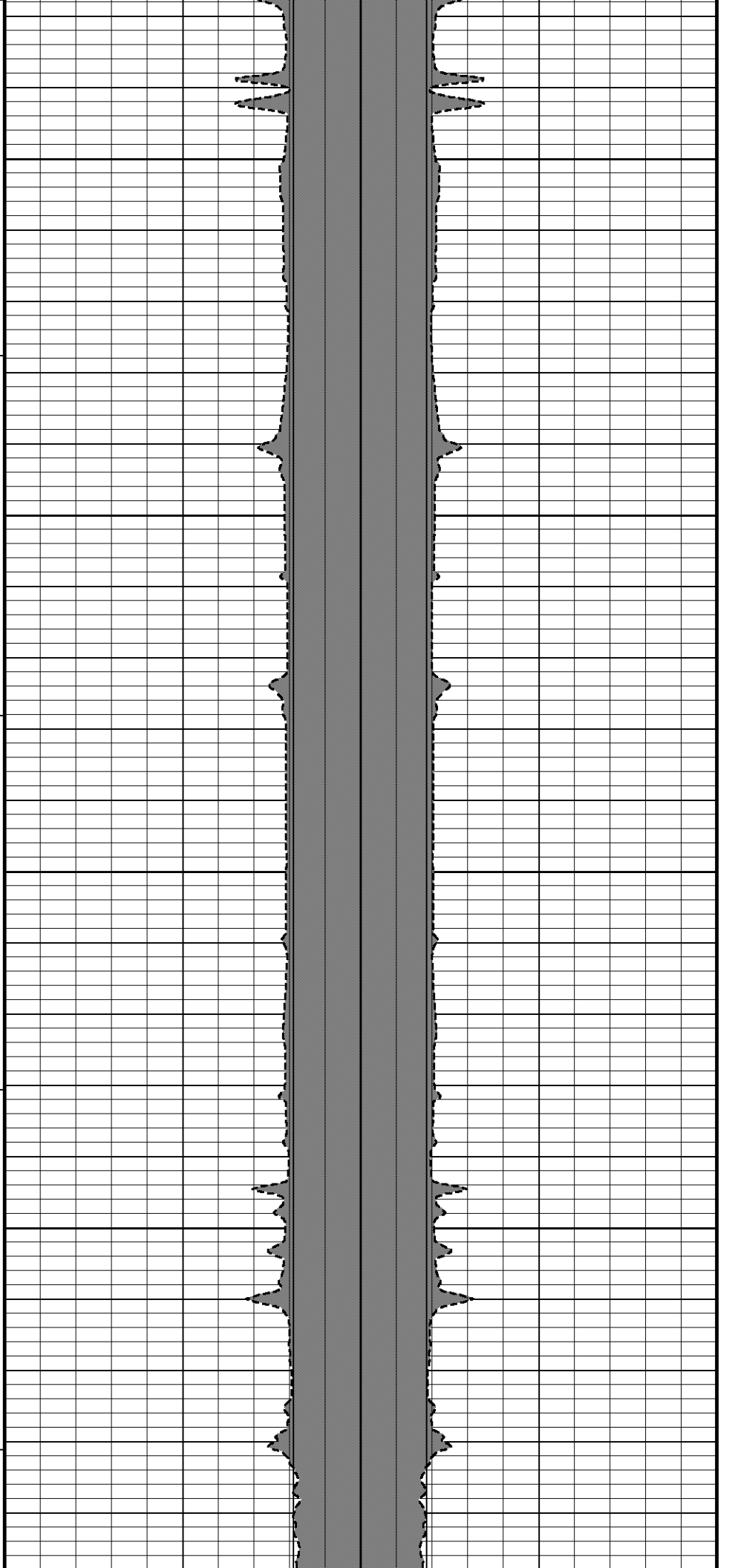
116°

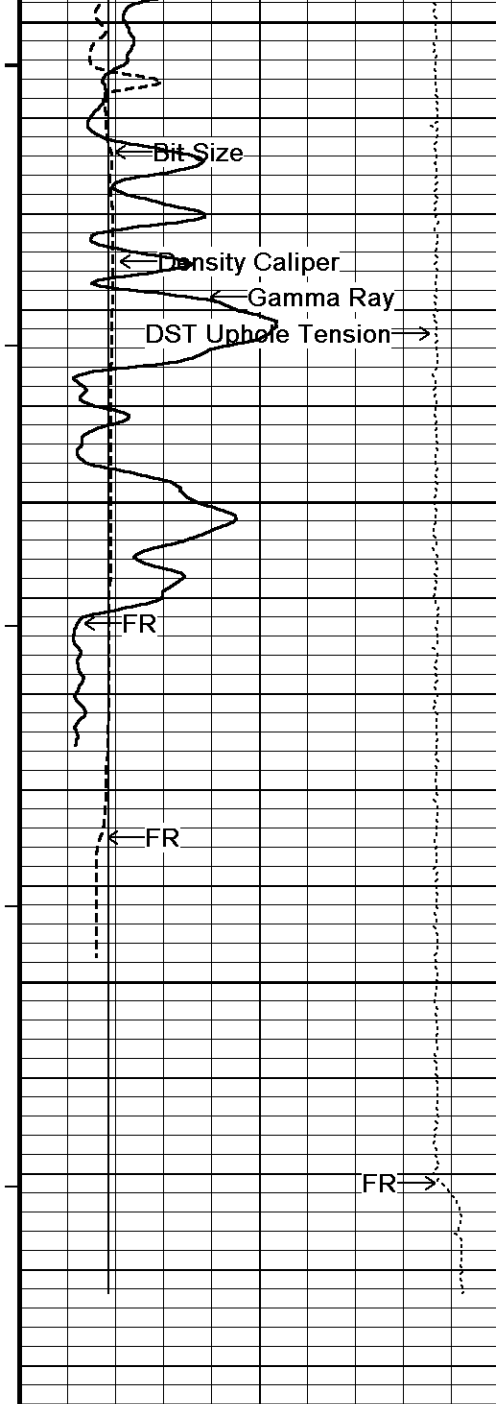
4300

117°

4350

117°





4400

117°

4450

4500

TD

Depth
In
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

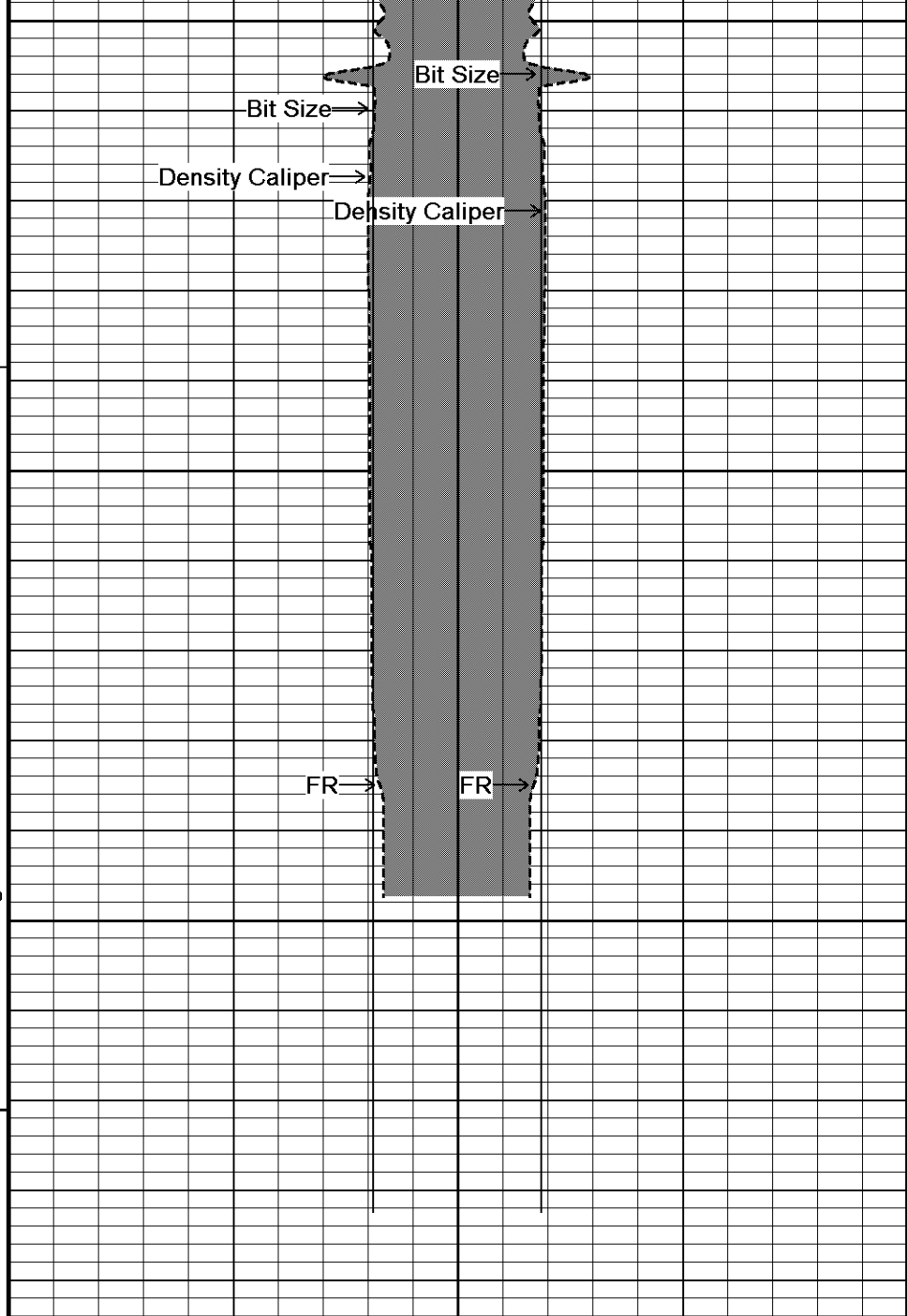
Annular

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

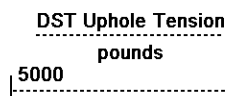
Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16



Density Caliper
inches
16 11 6 6 11 16

Bit Size
inches
16 11 6 6 11 16



Integral
every
10 cu ft

Replay
Scale
1:240

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 12-DEC-2018 22:36
Filename: C:\Minimus 18.03.9344\Data\Grand Mesa O'Brien #1-9\Grand Mesa O'Brien #1-9_002.dta
Recorded on 12-DEC-2018 19:44
System Versions: Logged with 18.03.9344 Plotted with 18.03.9344



5 INCH MAIN



BEFORE SURVEY CALIBRATION

C:\Minimus 18.03.9344\Data\Grand Mesa O'Brien #1-9\Grand Mesa O'Brien #1-9_001.dta

General Constants All 000

Last Edited on 12-DEC-2018,18:23

General Parameters

Mud Resistivity	1.270	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Crossplot Porosity
Resistivity used	Array Ind. Two Res Rt
RWA Constant A	0.620
RWA Constant M	2.150
SW/APOR Tool Source	0.000

High Resolution Temperature Calibration MCG-D.K 443

Field Calibration on 12-OCT-2018,05:20

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	212.00	212.00

High Resolution Temperature Constants MCG-D.K 443

Last Edited on 12-OCT-2018,05:20

Pre-filter Length 11

Gamma Calibration MCG-D.K 443

Field Calibration on 10-DEC-2018 18:45

	Measured	Calibrated (API)
Background	103	72
Calibrator (Gross)	759	528
Calibrator (Net)	656	456

Gamma Calibration Tolerances MCG-D.K 443

Ratio 1.439  Counts/API

Gamma Constants MCG-D.K 443

Last Edited on 12-DEC-2018,16:59

Gamma Calibrator Number MCGGRCC141

GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.12	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

Caliper Calibration MPD-C.A 216

Base Calibration on 04-DEC-2018 12:24
Field Calibration on 10-DEC-2018 18:22

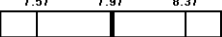
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	15599	3.99
2	24289	5.98
3	32989	7.97
4	41250	9.86
5	50464	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.99	7.97

Caliper Calibration Tolerances MPD-C.A 216

Long Arm Field Cal. 7.99  in

DOWNHOLE EQUIPMENT

C:\Minimus 18.03.9344\Data\Grand Mesa O'Brien #1-9\Grand Mesa O'Brien #1-9_001.dta

Cablehead, 11 pin

CBH-CB 264 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor

SHA-J.B 595 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma

MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity

MMR-B.A 91 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron

MDN-B.A 292 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper

MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.913 in

Compact Knuckle Joint

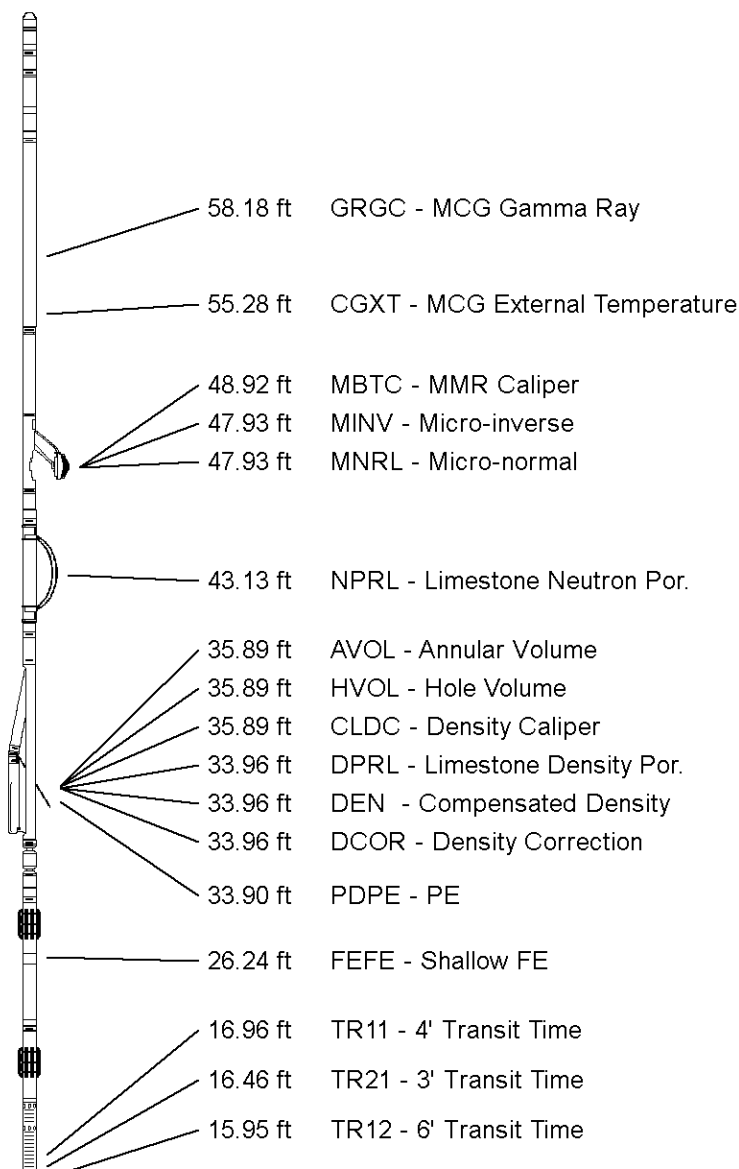
SKJ-D.A 167 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Focussed Electric

MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

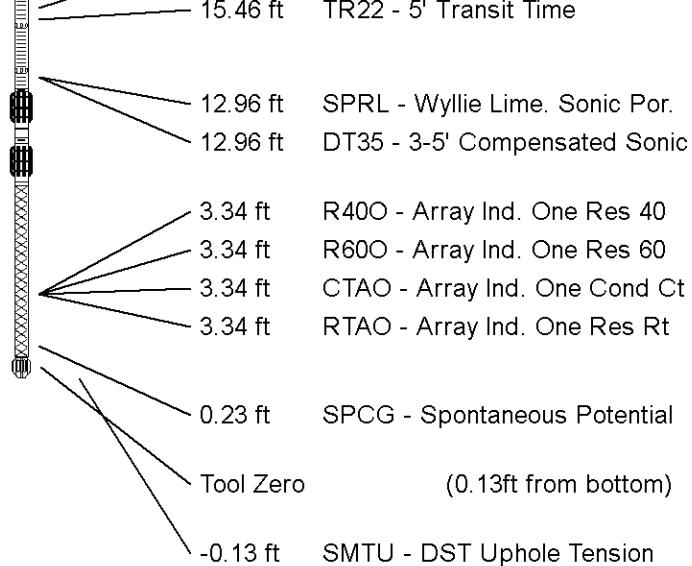
Compact Sonic

MSS-C.K 319 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in



Compact Induction
MAI-B.J 390 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 68.16 ft Weight: 526.9 lb



All measurements relative to tool zero.

COMPANY	GRAND MESA OPERATING COMPANY
WELL	OBRIEN #1-9
FIELD	WILDCAT
PROVINCE/COUNTY	LANE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2661	feet	First Reading	4487.00	feet
Elevation Drill Floor	2659	feet	Depth Driller	4520.00	feet
Elevation Ground Level	2656	feet	Depth Logger	4521.00	feet



Weatherford®

CALIPER LOG