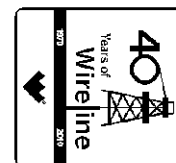




Weatherford

CALIPER LOG

COMPANY WEXPRO COMPANY
WELL MUSSER 31
FIELD POWDER WASH
PROVINCE/COUNTY MOFFAT
COUNTRY/STATE USA/COLORADO
LOCATION SHL: 348' FNL & 607' FEL



SEC	TWP	RGE	Other Services
4	11N	97W	MAI
API Number	0508107468	MPD	MDN
Permit Number	Permanent Datum G.L., Elevation 6601 feet		
Log Measured From KB			Elevations: KB 6630.00
Drilling Measured From KB			DF 6630.00
			GL 6601.00
Date	07-DEC-2011		
Run Number	1		
Depth Driller	9095.00	feet	
Depth Logger	6220.00	feet	
First Reading	6197.00	feet	
Last Reading	1537.00	feet	
Casing Driller	1539.00	feet	
Casing Logger	1537.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	WBM		
Density / Viscosity	10.40 lb/USg	15.00 CP	
PH / Fluid Loss	9.00	8.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	4.26 @ 76.4	ohm-m	
Rmf @ Measured Temp	3.41 @ 76.4	ohm-m	
Rmc @ Measured Temp	5.11 @ 76.4	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	2.27 @ 146.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	146.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13144	RK SPR	
Recorded By	J.PAULSON		J.LIU
Witnessed By	R.BUSH		

BOREHOLE RECORD

Last Edited: 07-DEC-2011 12:50

Bit Size inches	Depth From feet	Depth To feet
7.875	1539.00	9095.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1537.00	36.00

REMARKS

SOFTWARE VERSION 12.02.4401

TOOLS RUN: SHA, MCG, MDN, MPD, MIS-D, SKJ, MFE, MAI RUN IN COMBINATION.

HARDWARE: MPD: 8" PROFILE PLATE USED.
MAI: TWO 1 INCH STANDOFFS USED.
MFE: ONE 1 INCH STANDOFF USED.
MDN: DUAL BOWSPRING USED.

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING =1731 CUBIC FEET

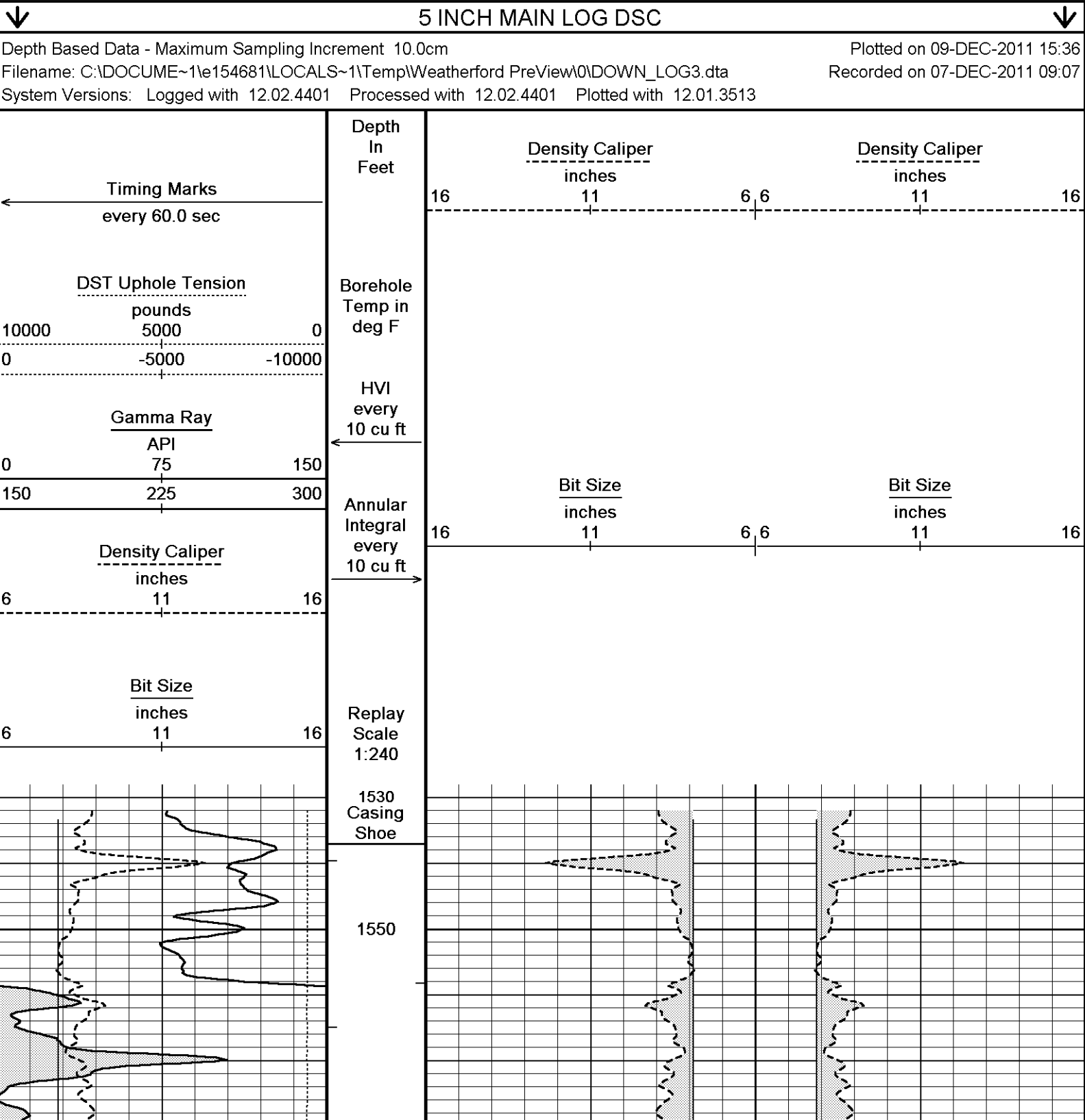
ANNUAL VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 1215 CUBIC FEET

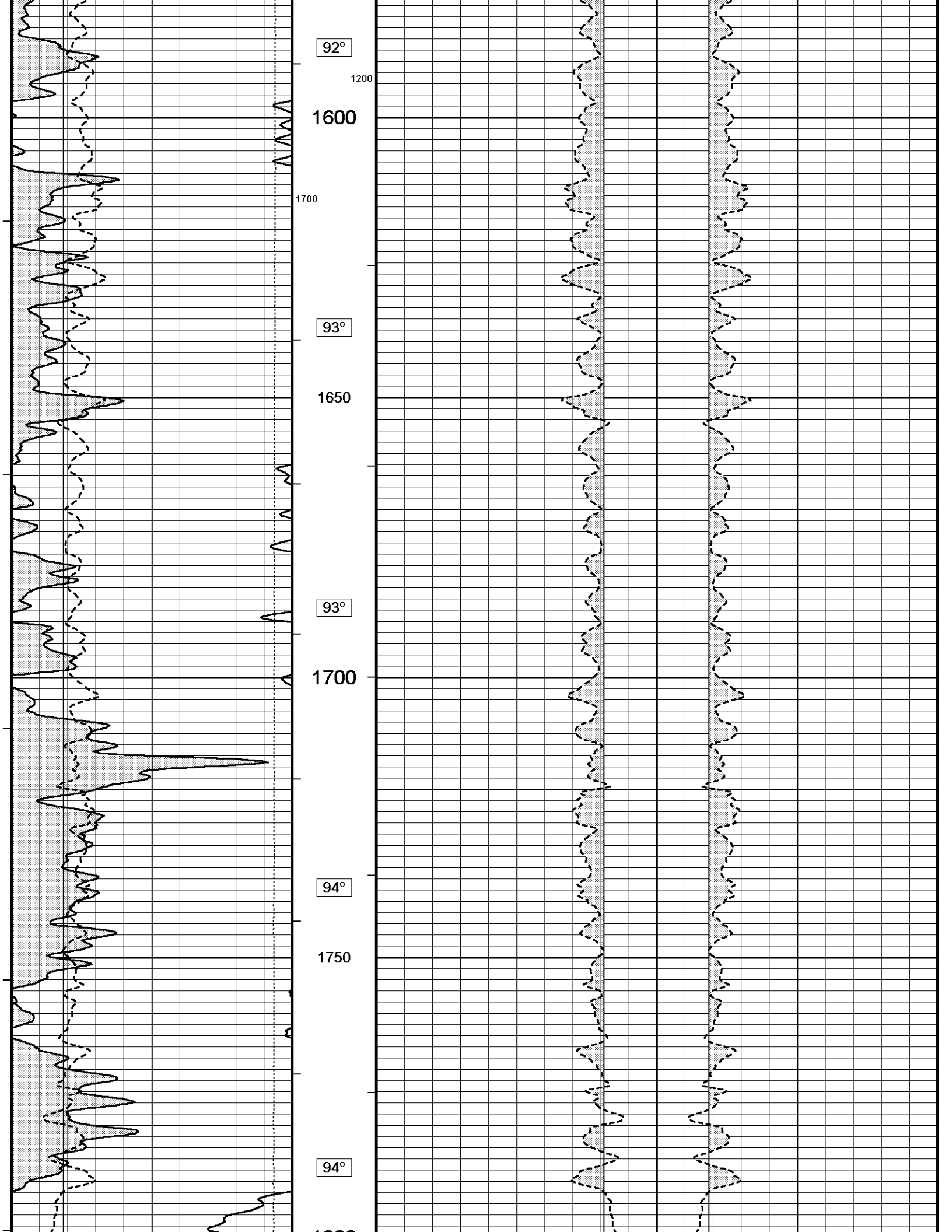
BRIDGED OFF AT 6220 AND LOGGED UP FROM THERE

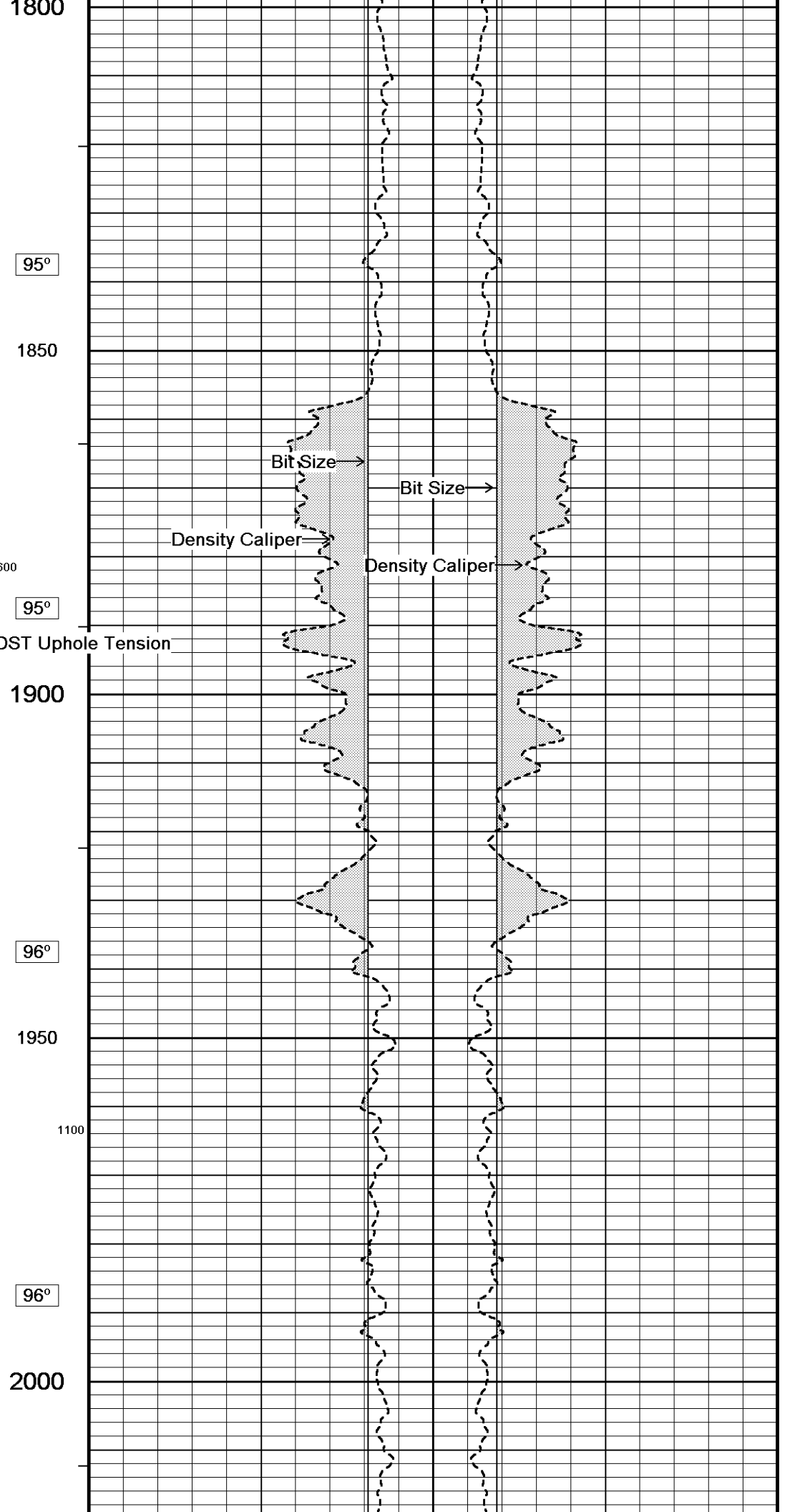
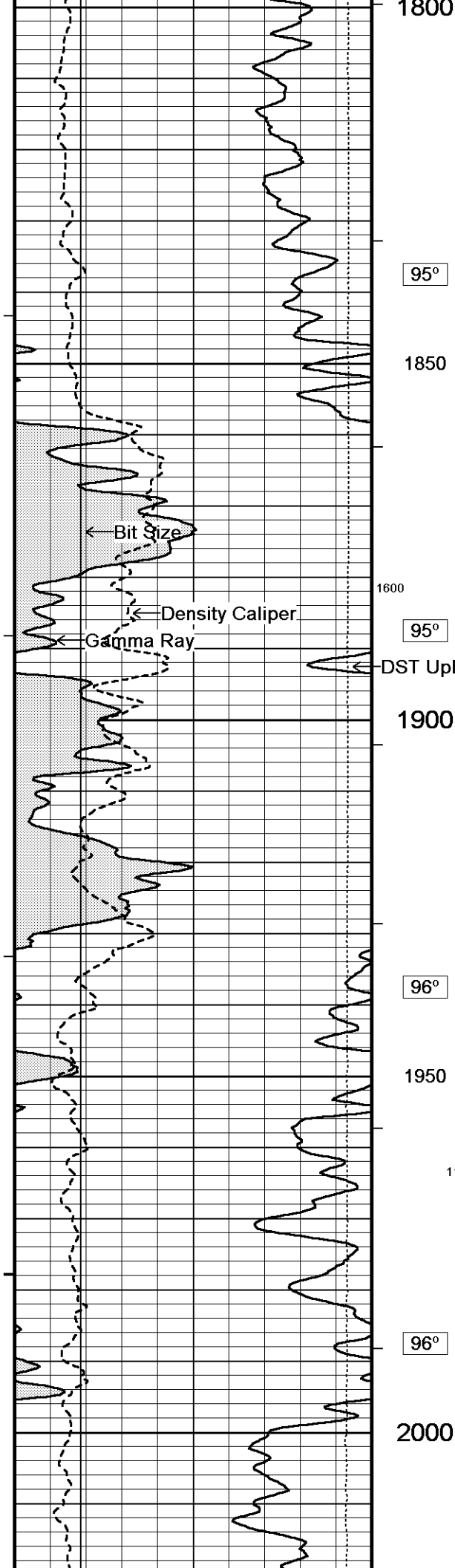
SERVICE ORDER: #3526717
OPERATOR: D. SMITH
U. KIMBASSA

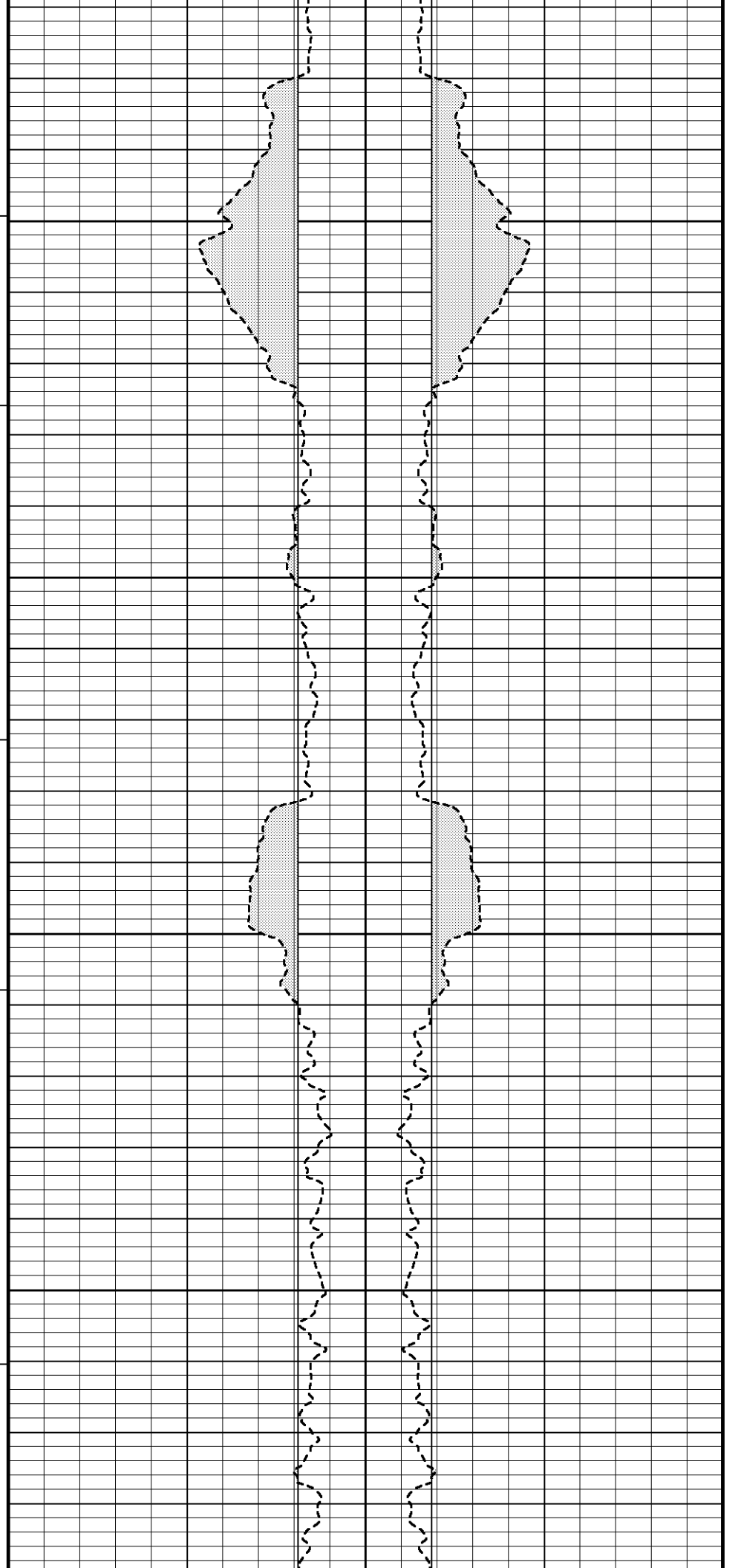
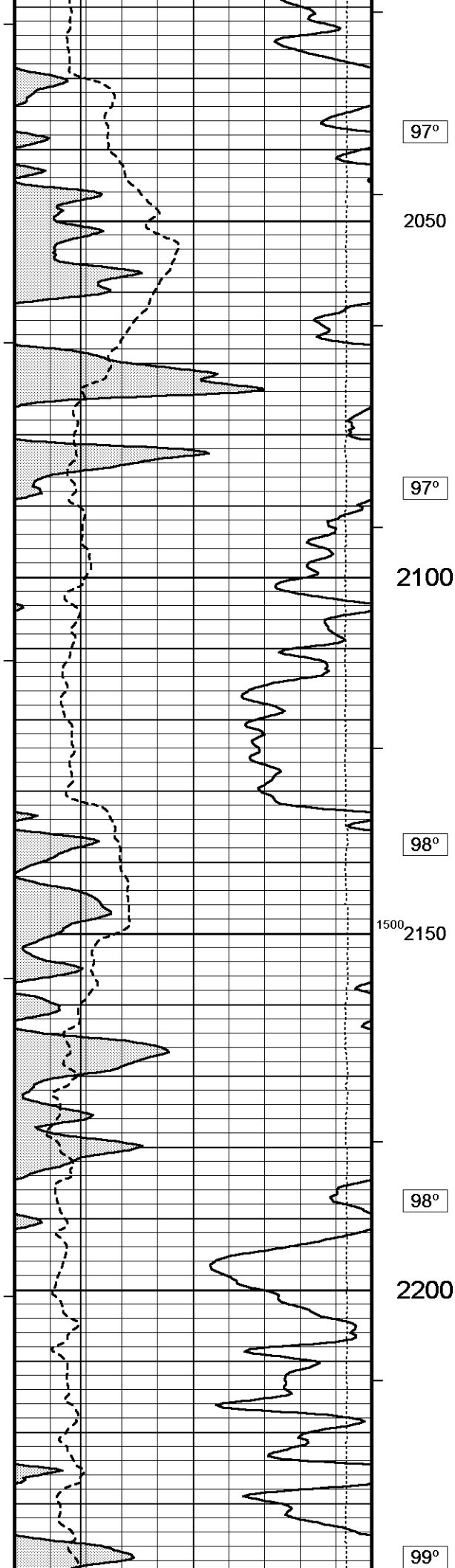
RIG: SST 88

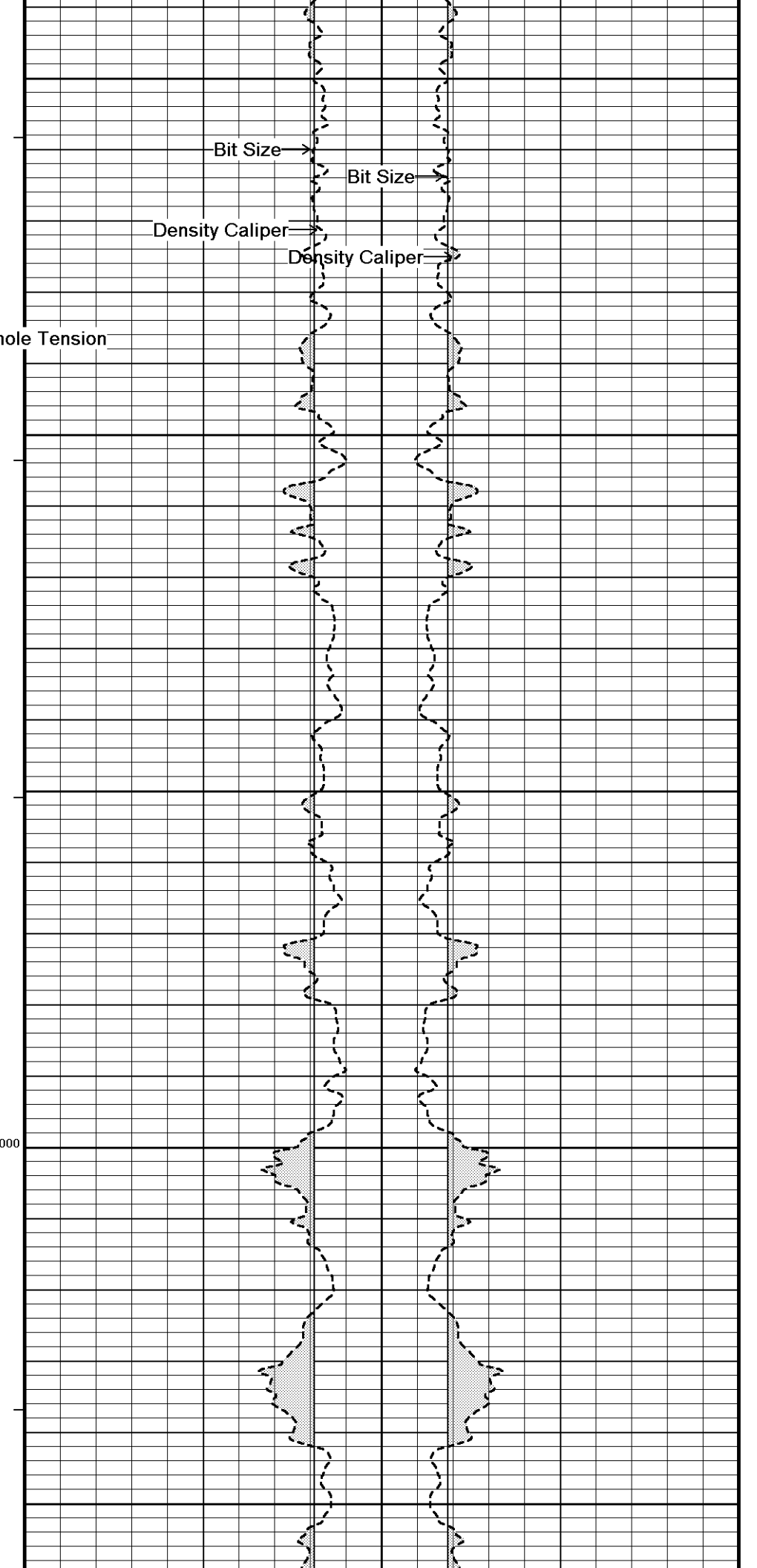
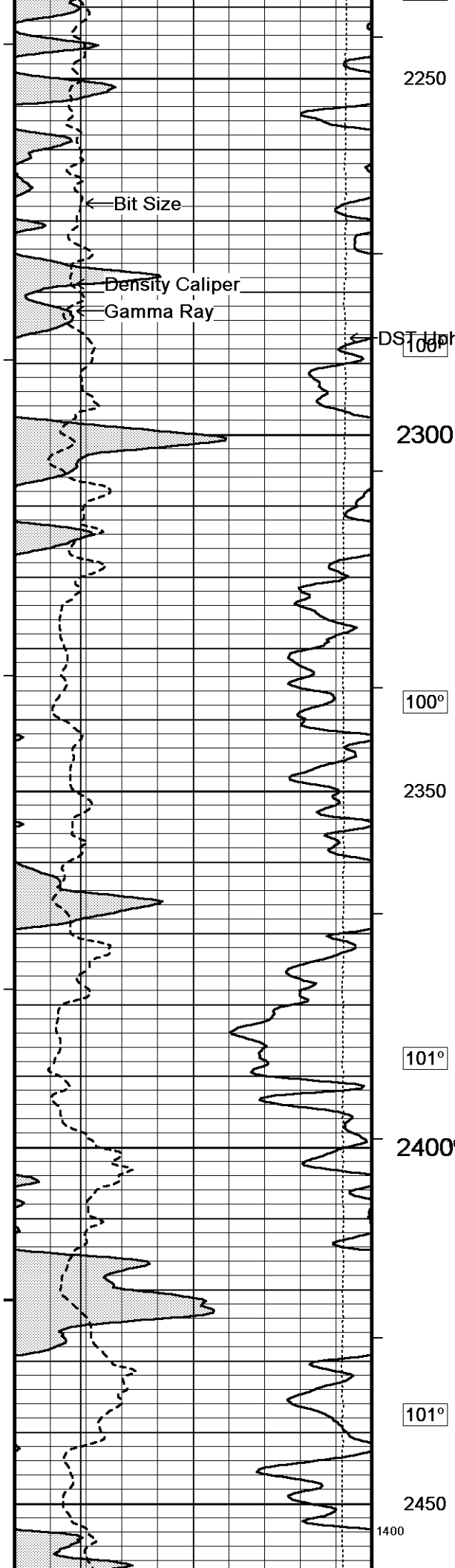
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

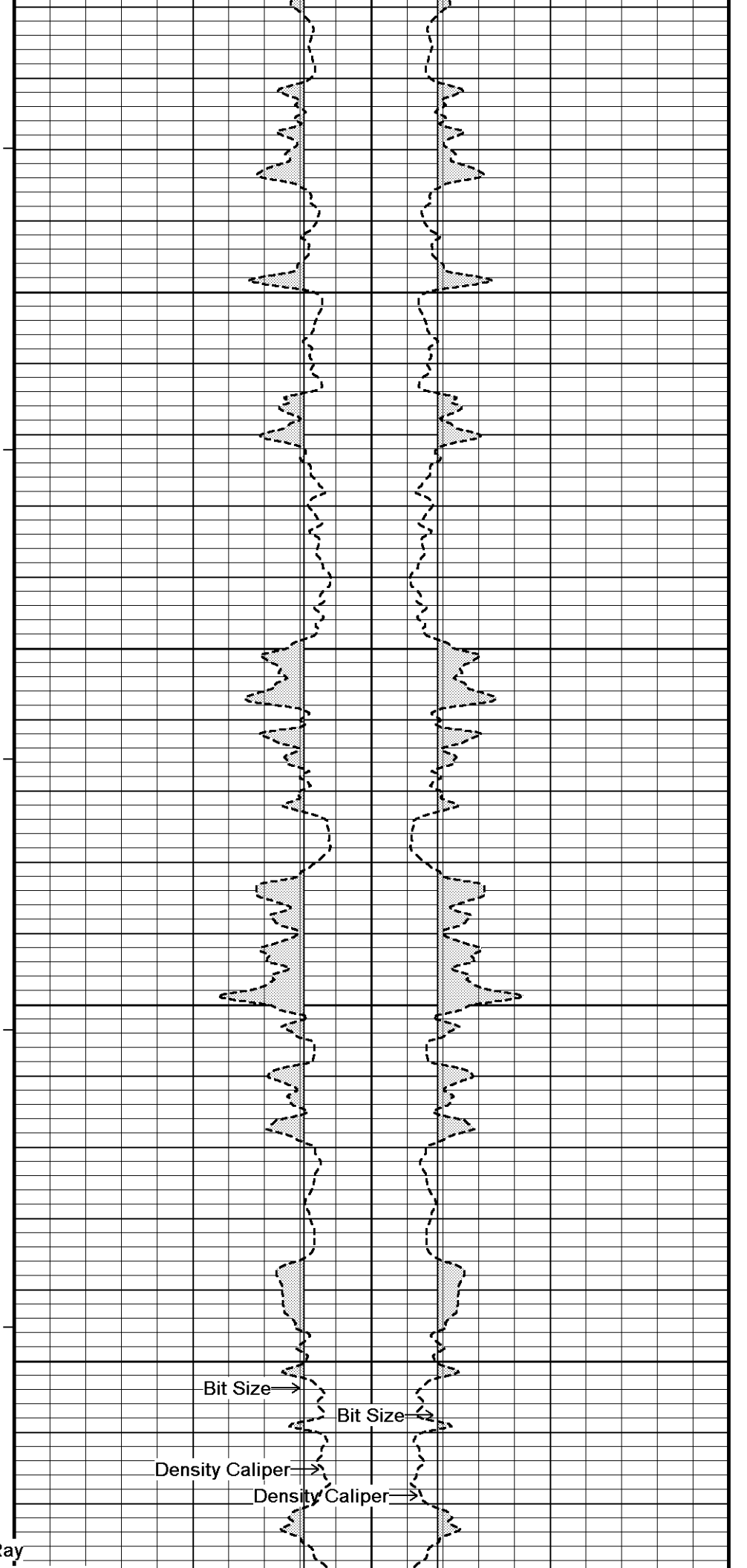
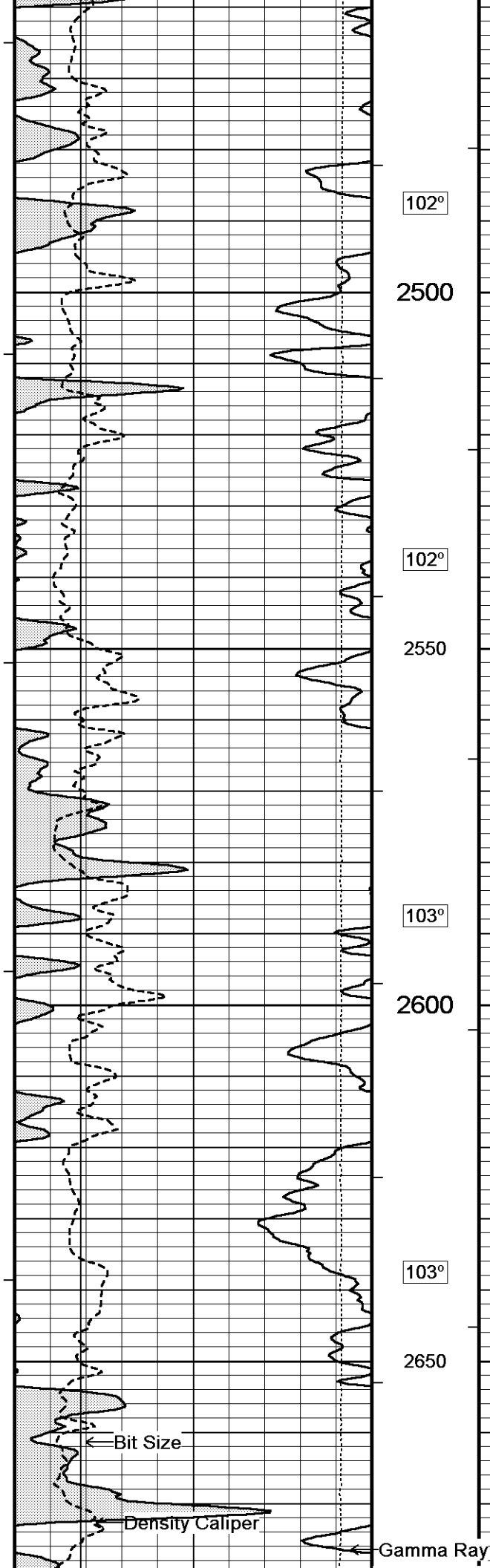


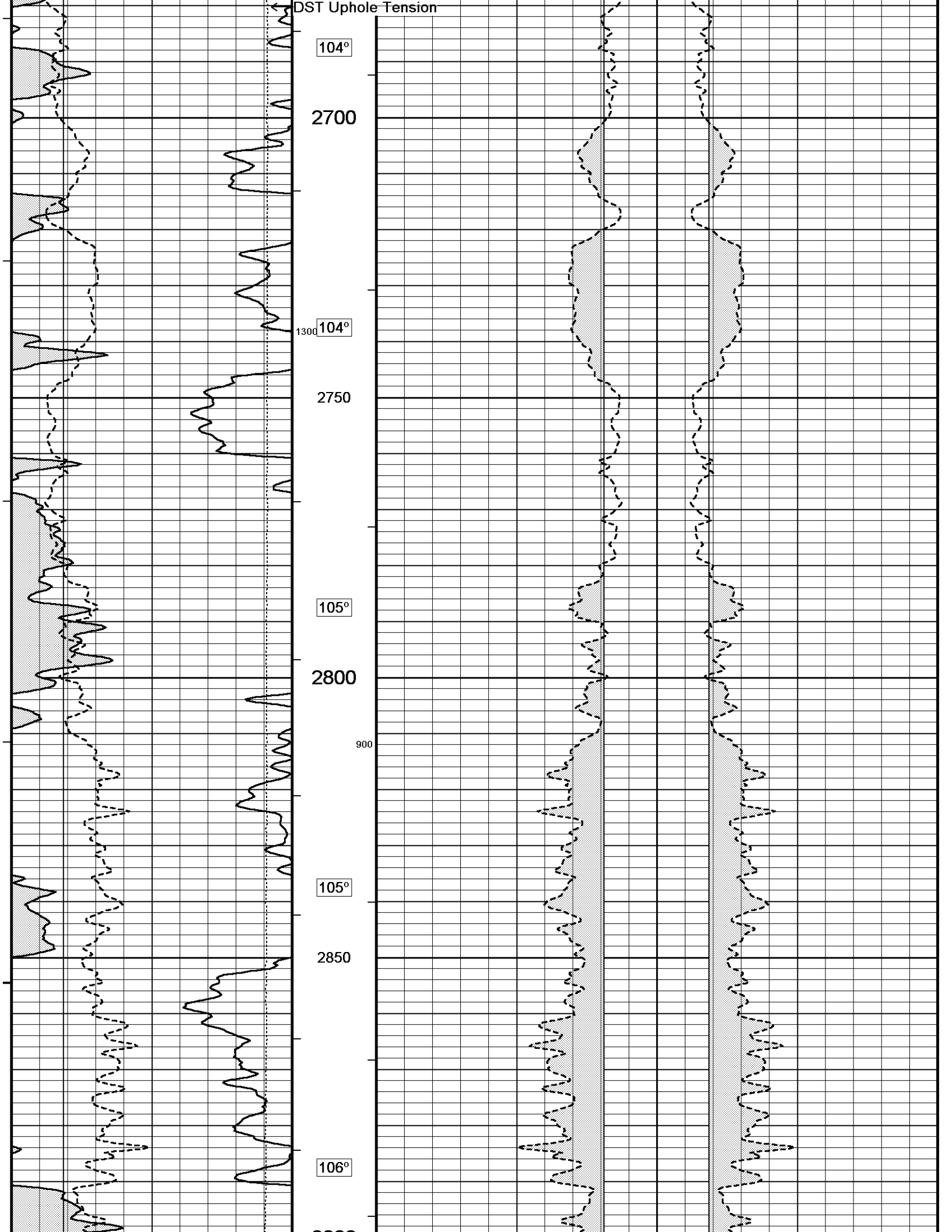


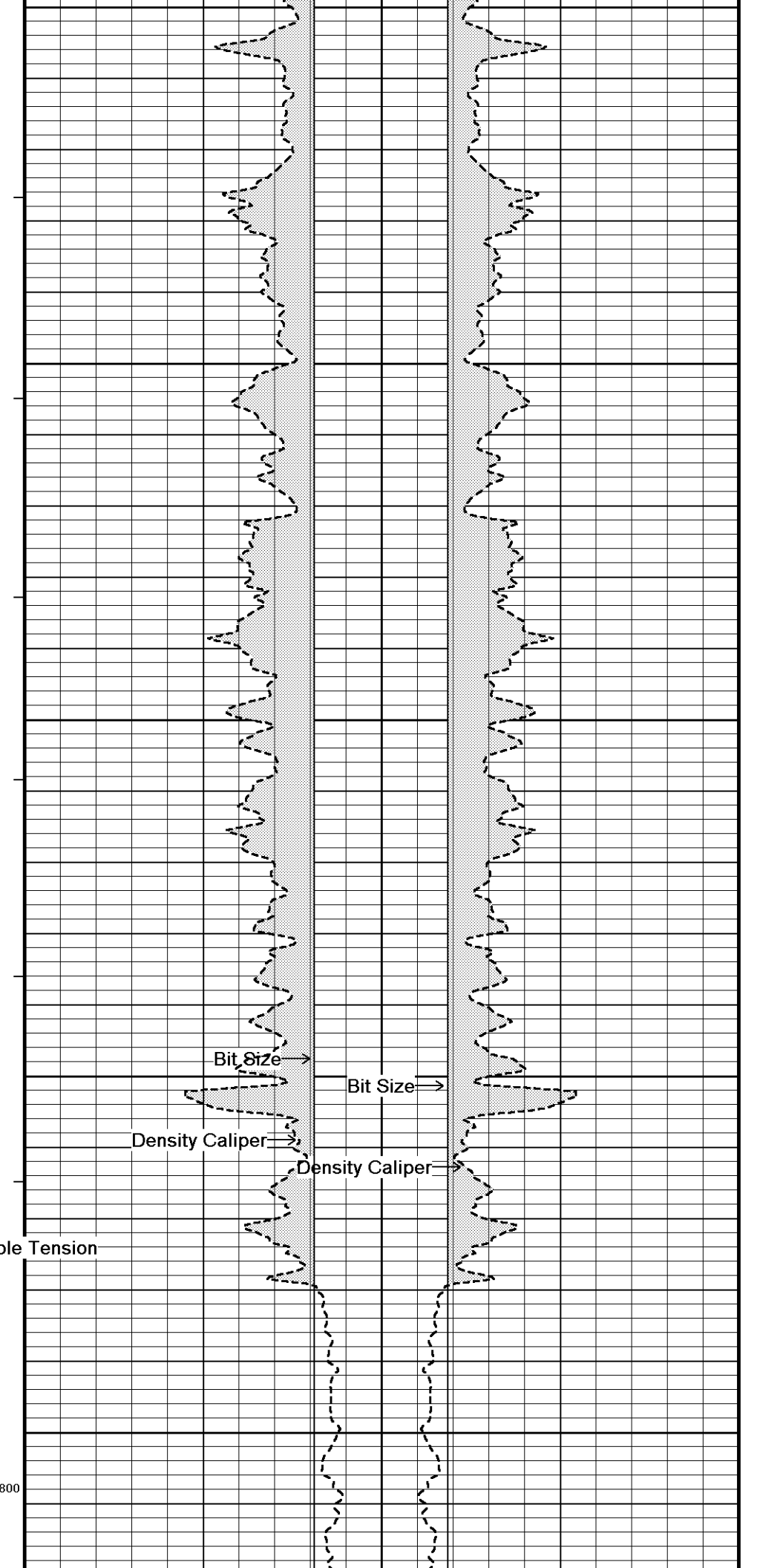
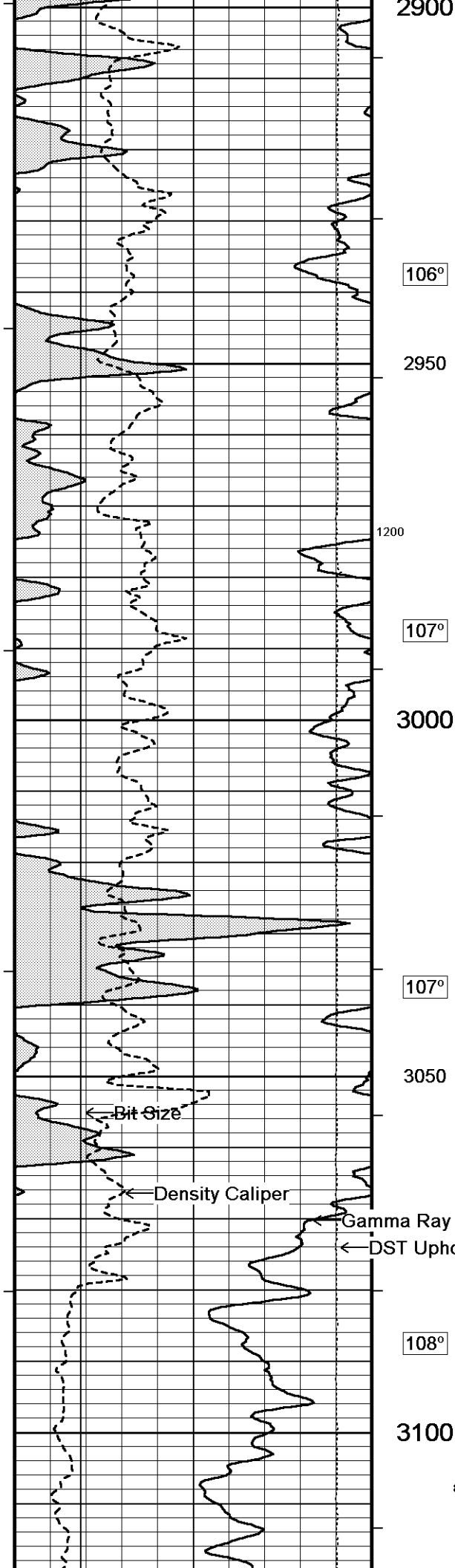


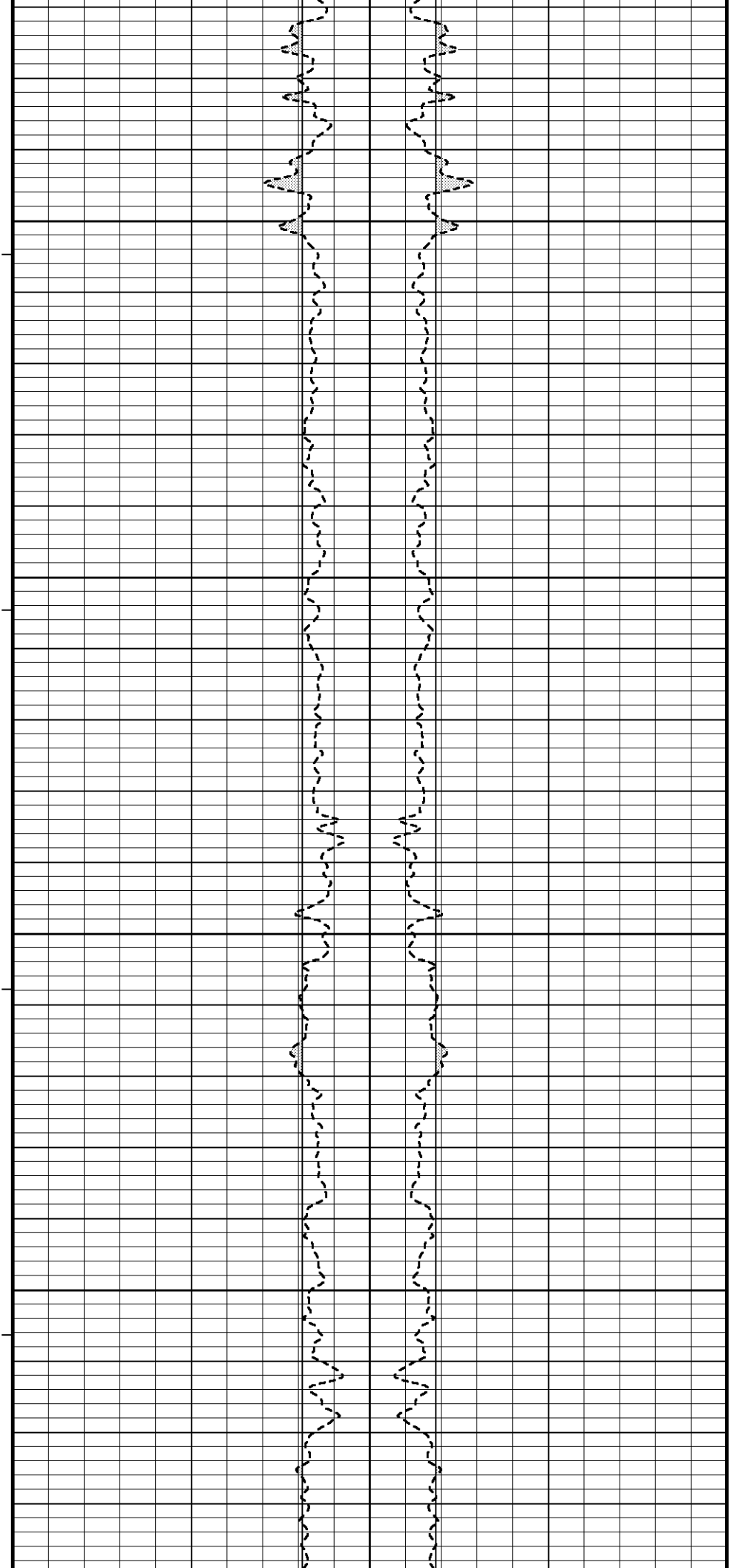
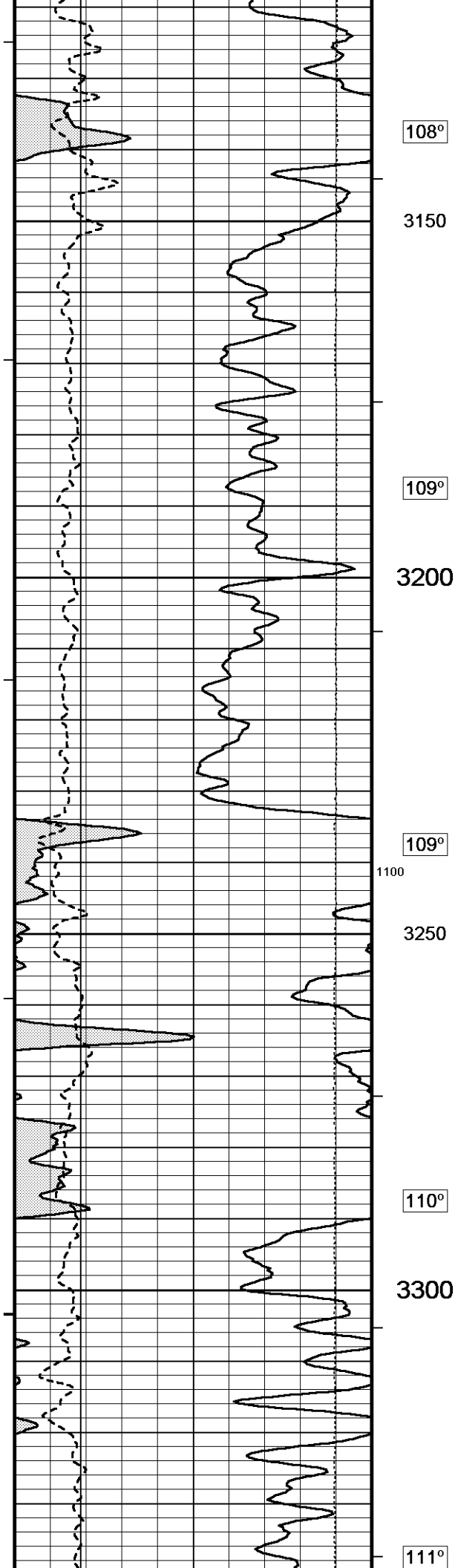


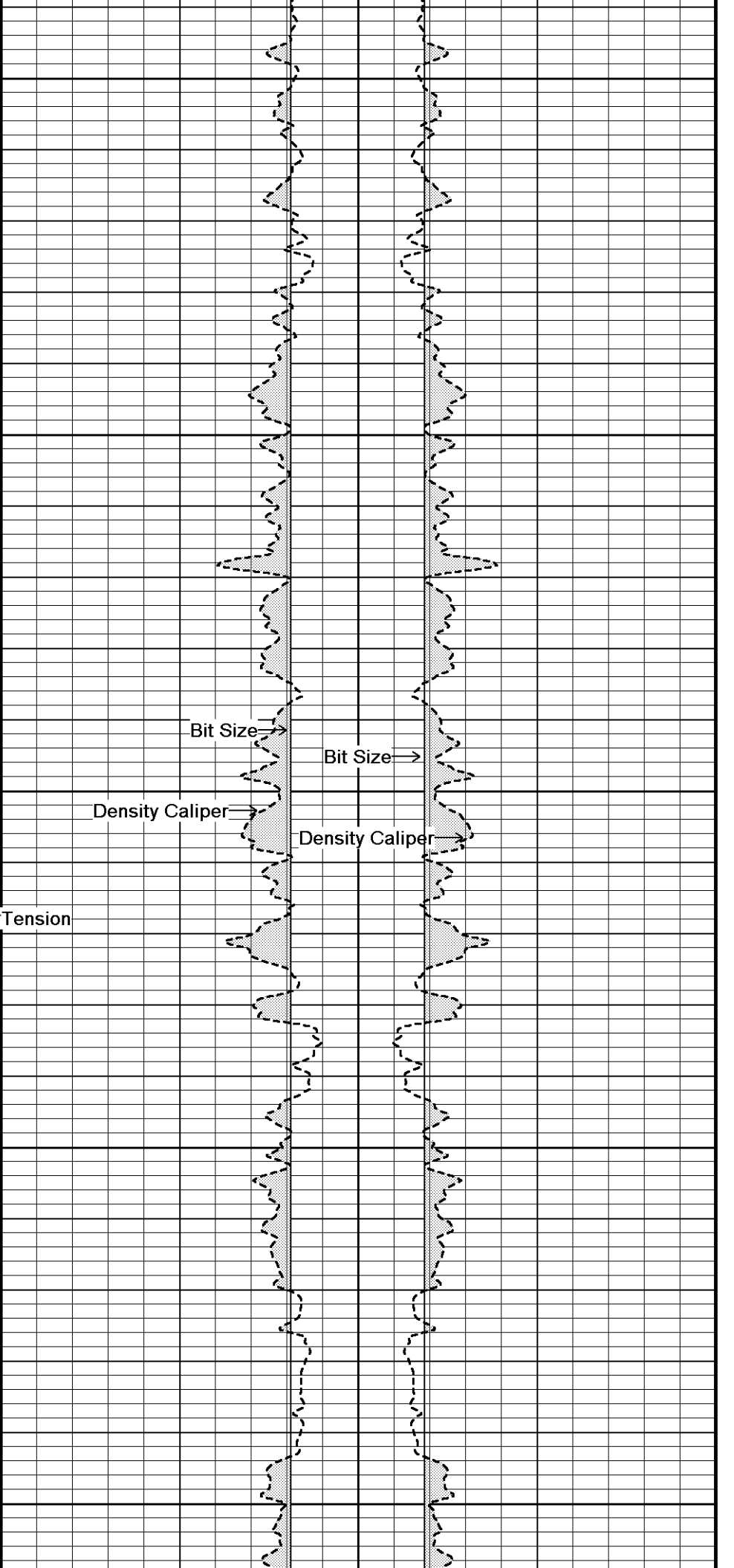
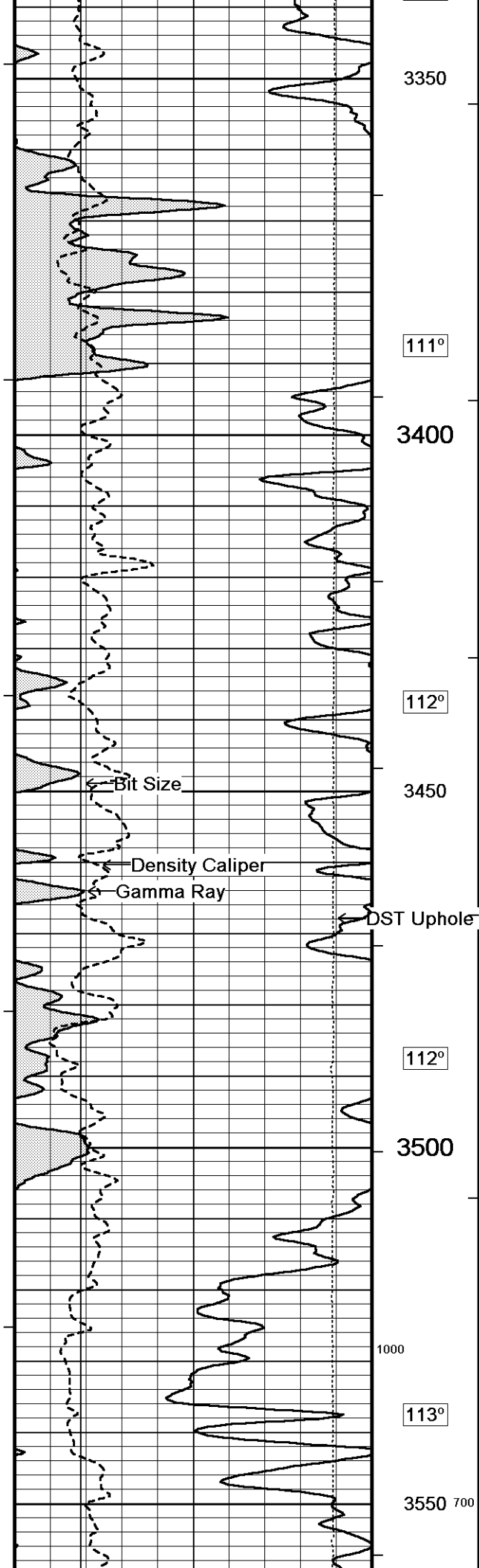


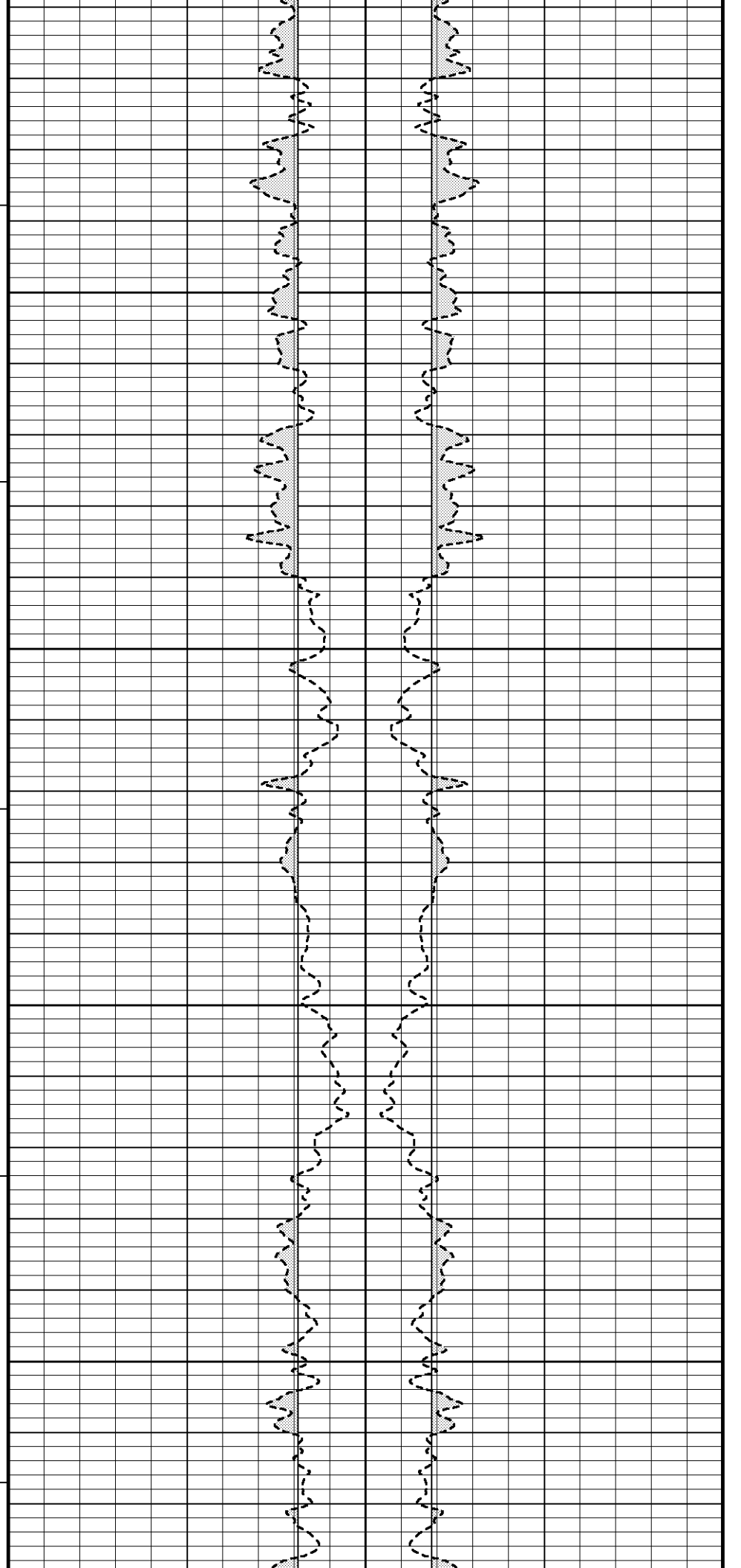
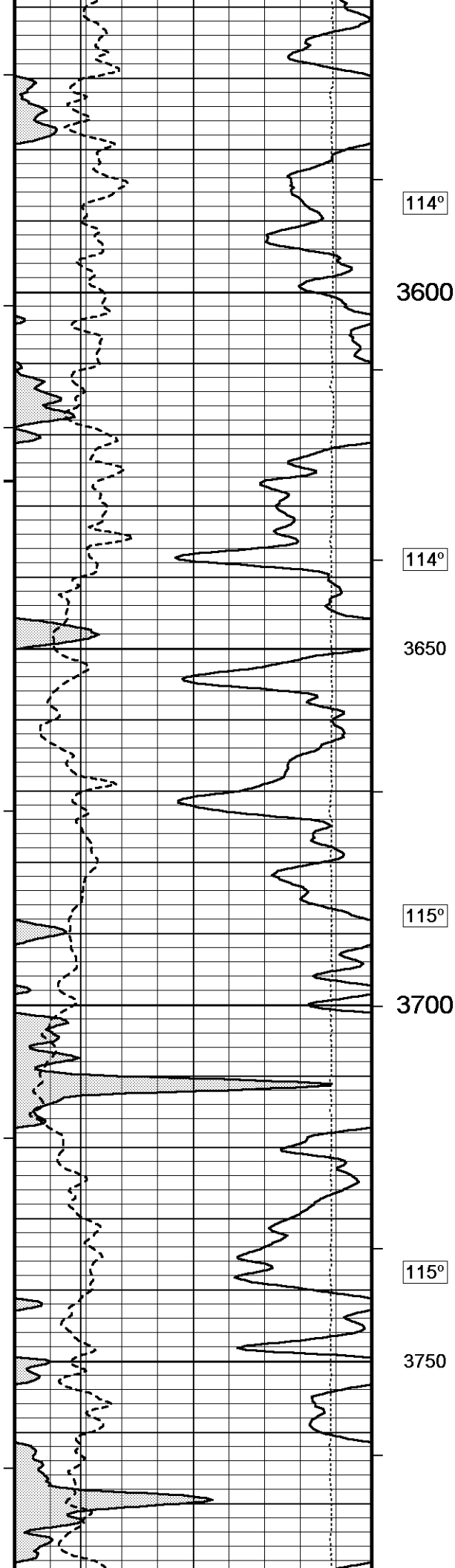


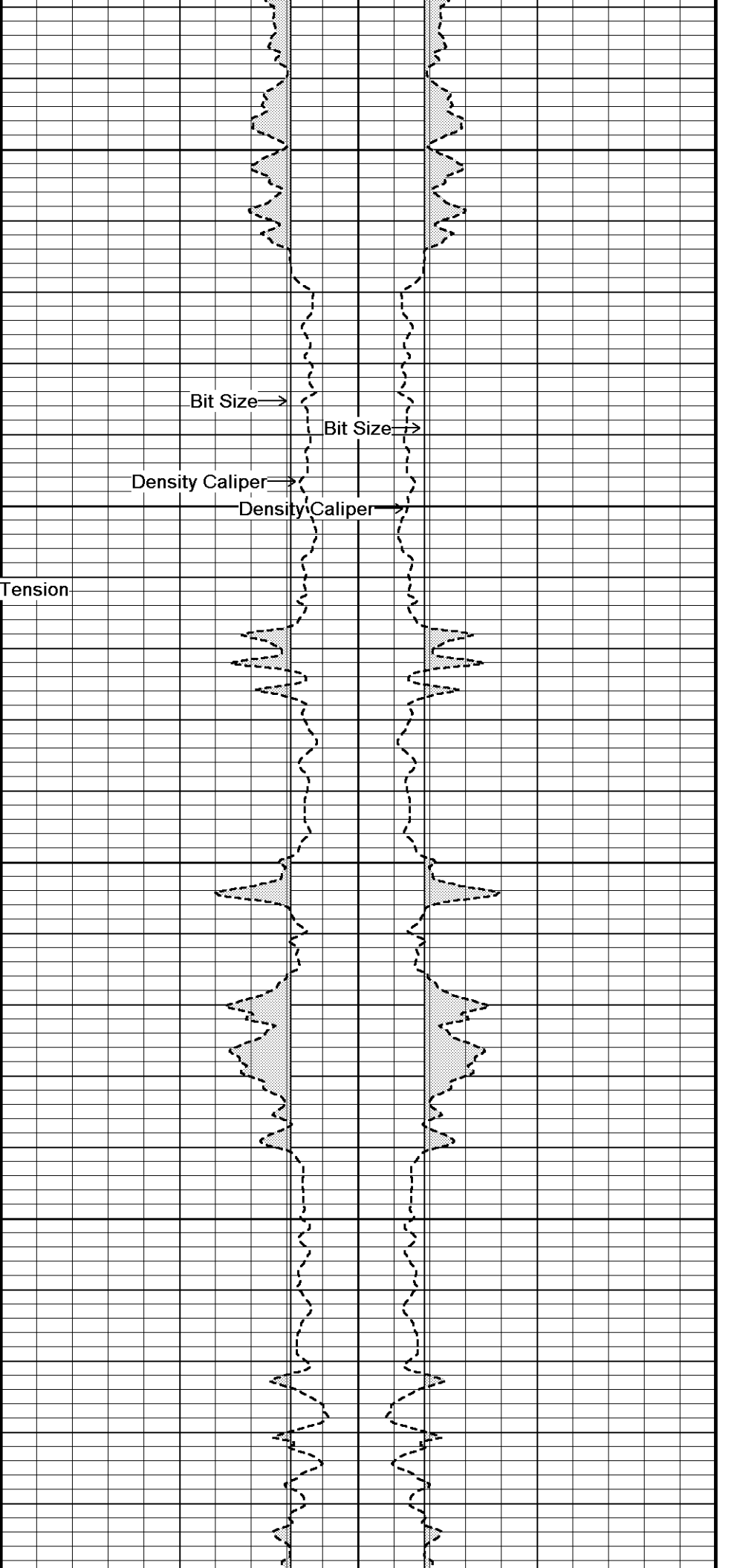
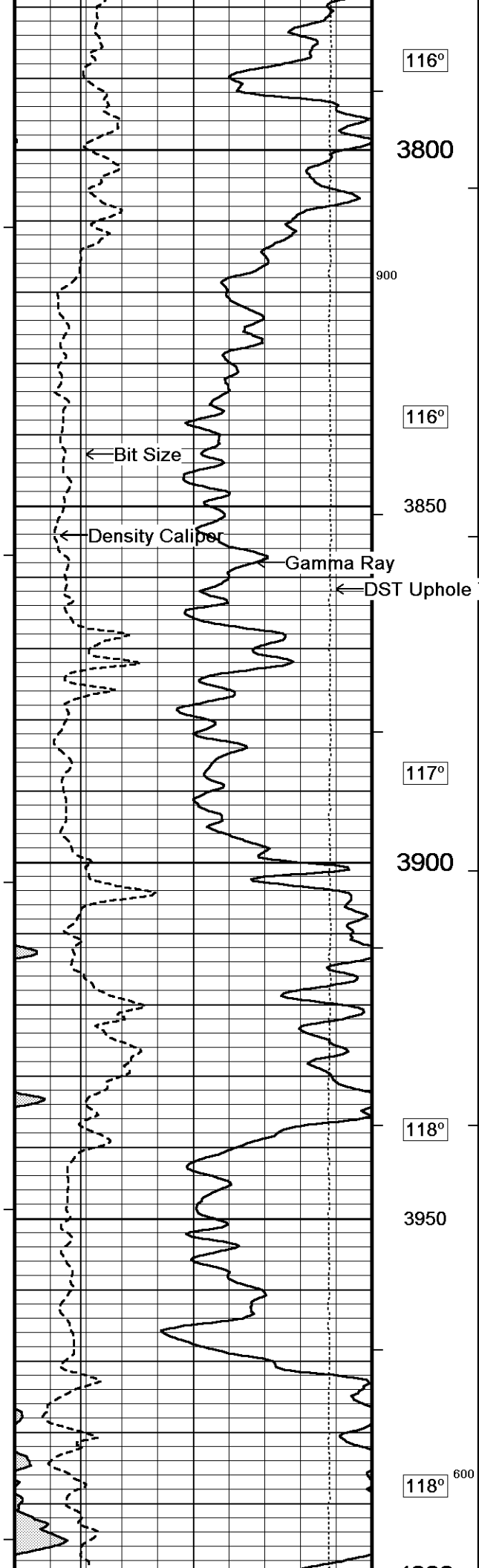


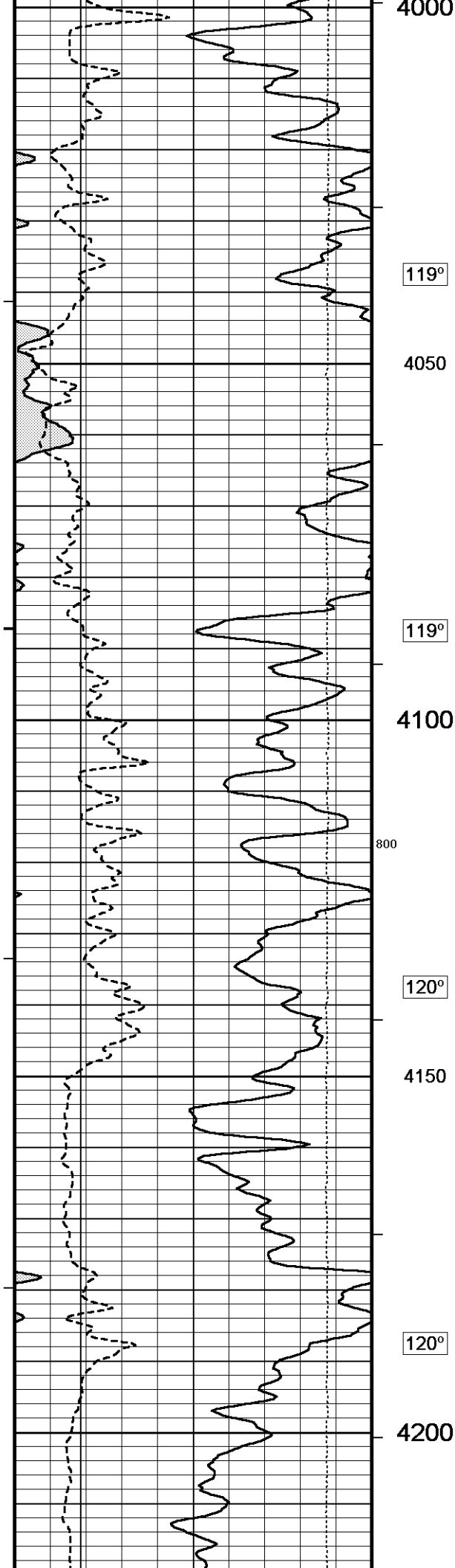










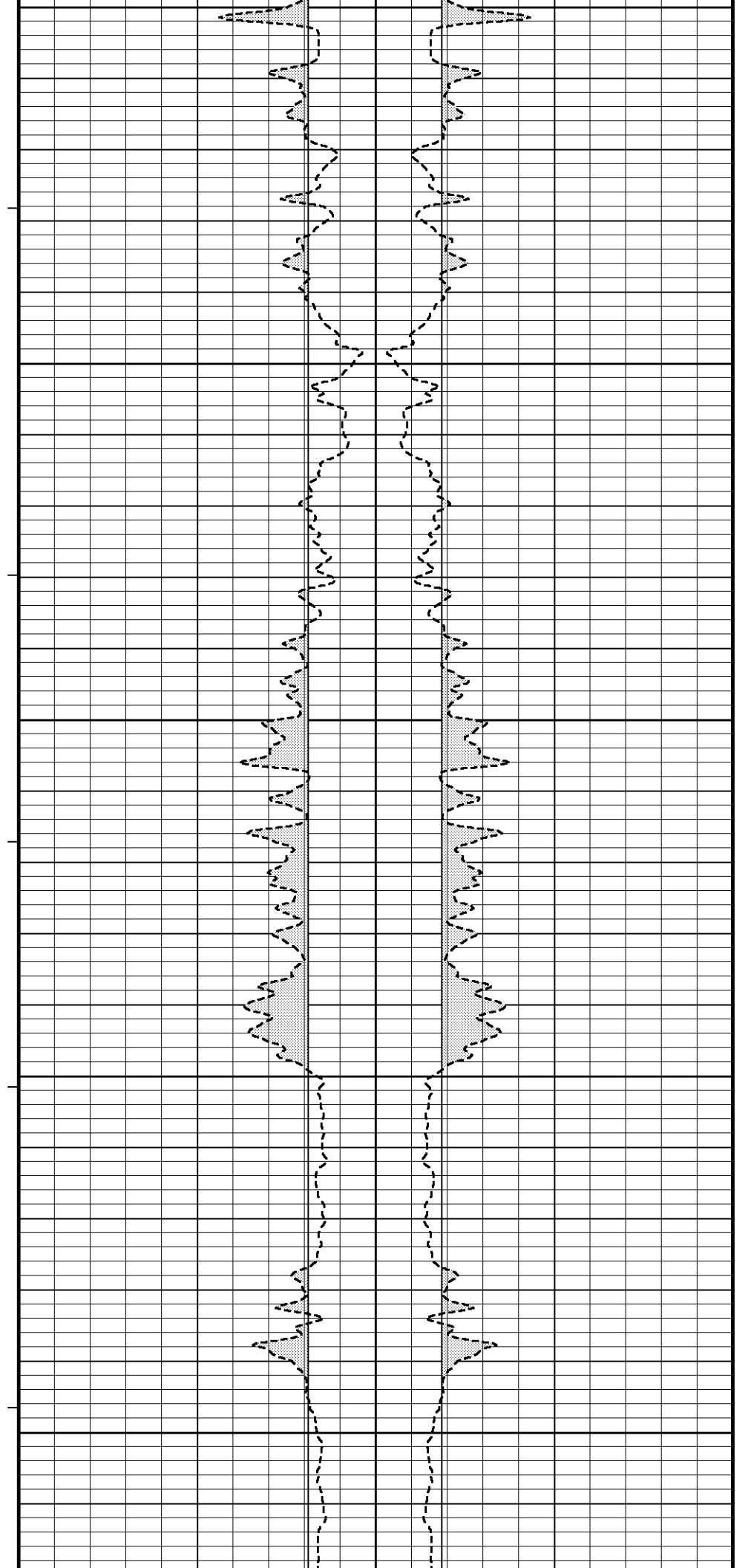


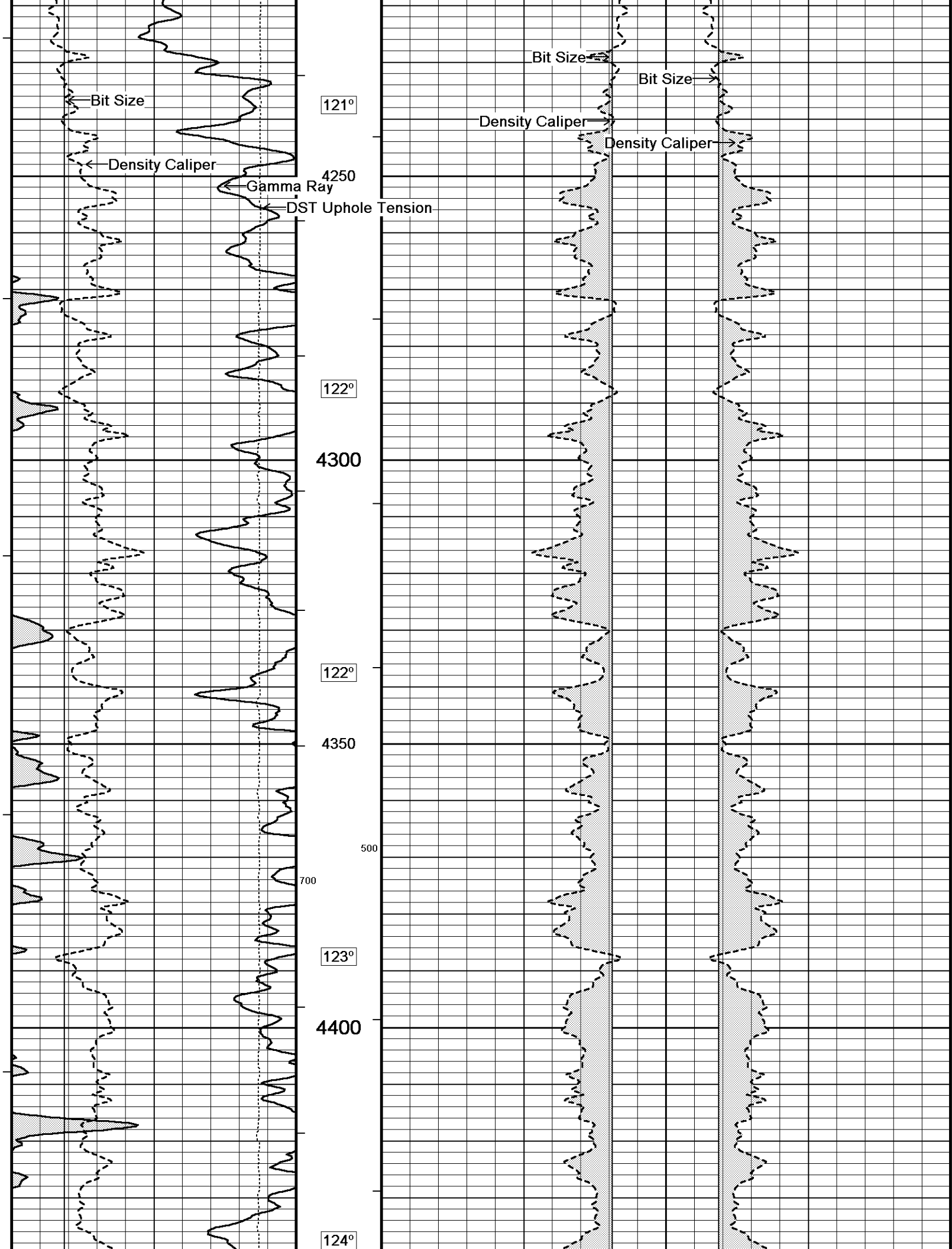
119°

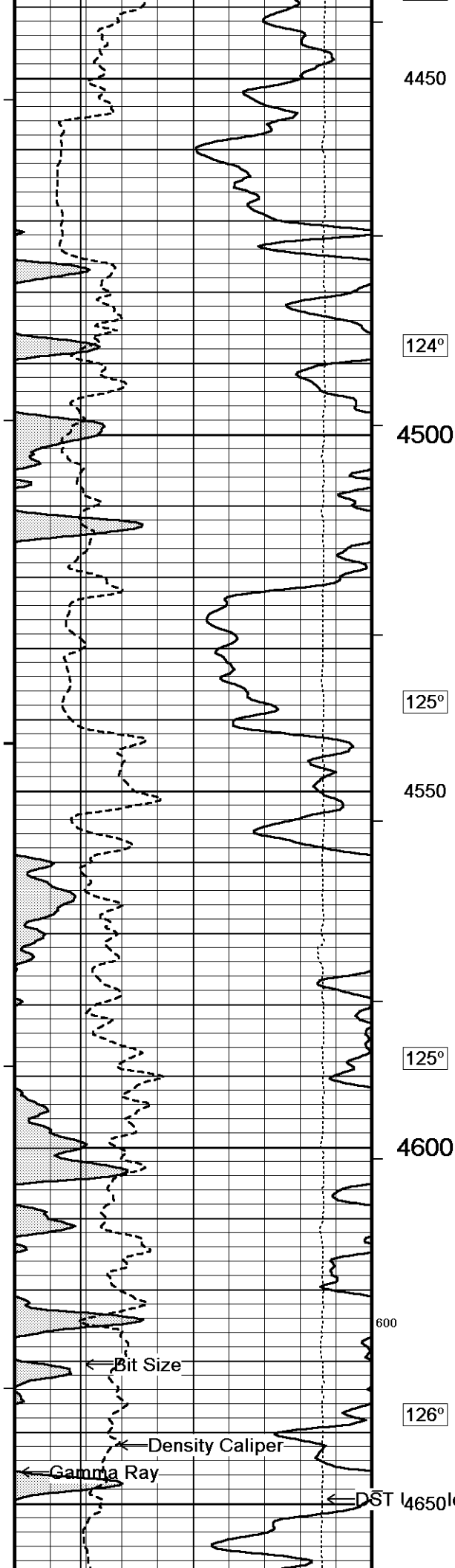
119°

120°

120°





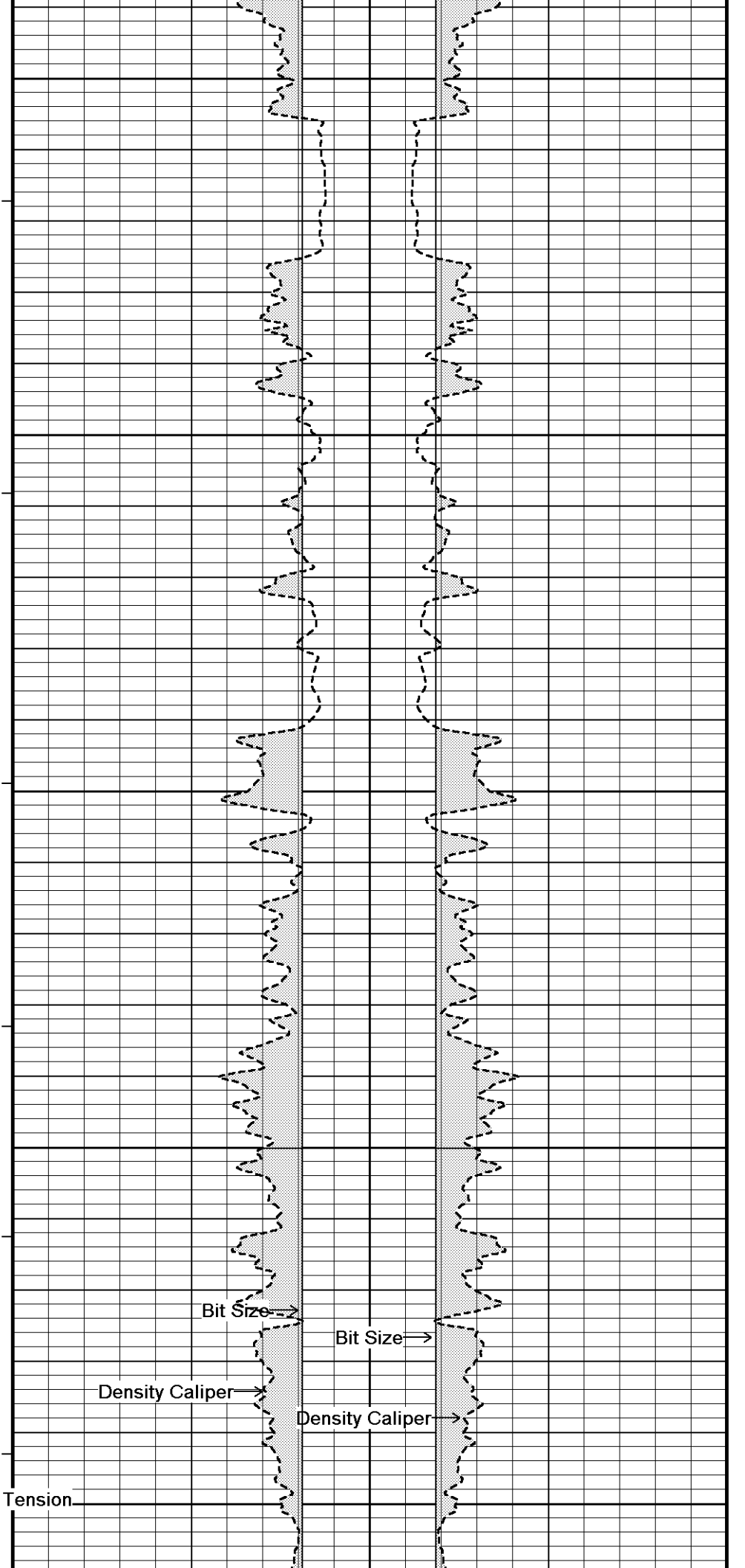


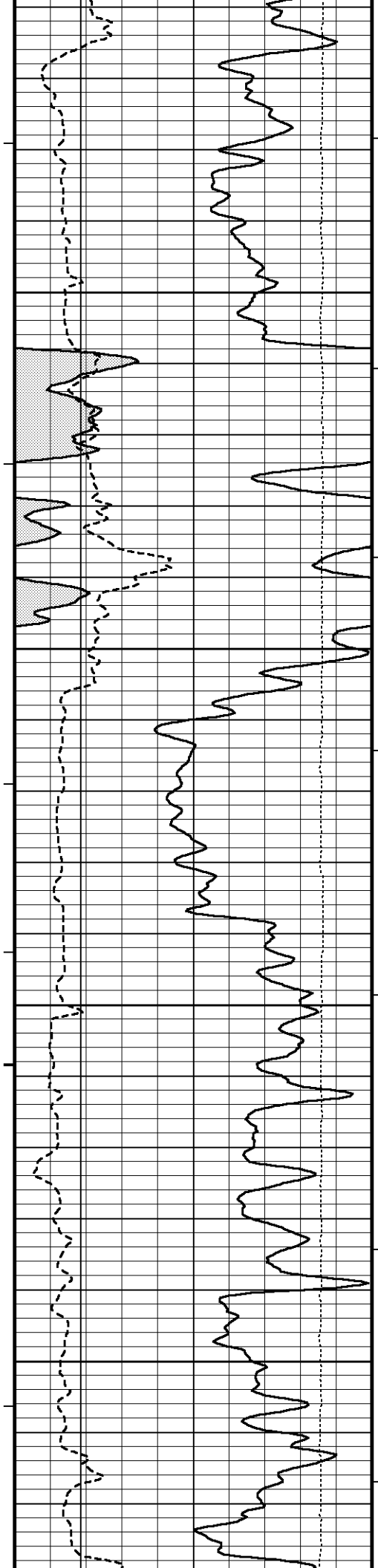
124°

125°

125°

126°





126°

4700

127°

4750

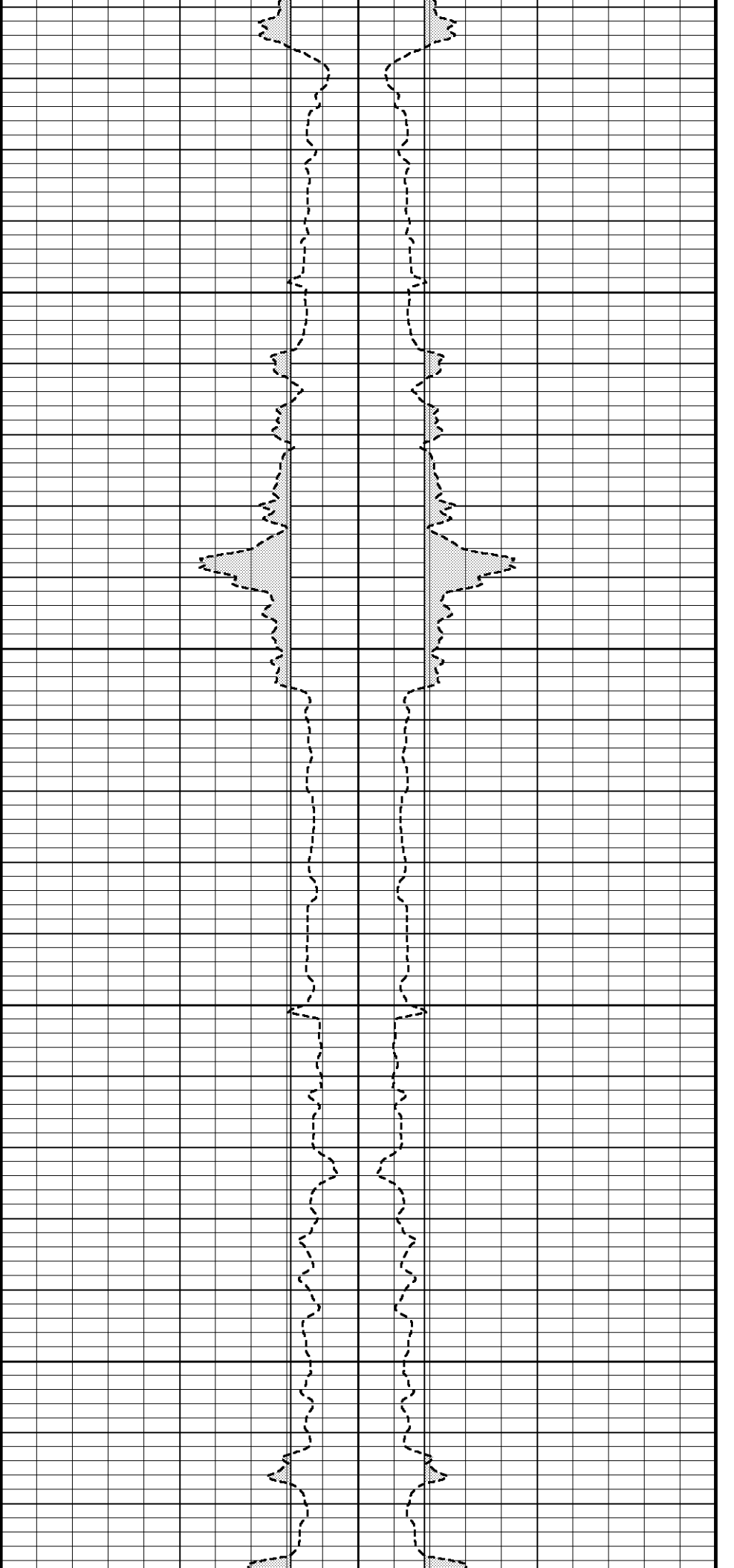
127°

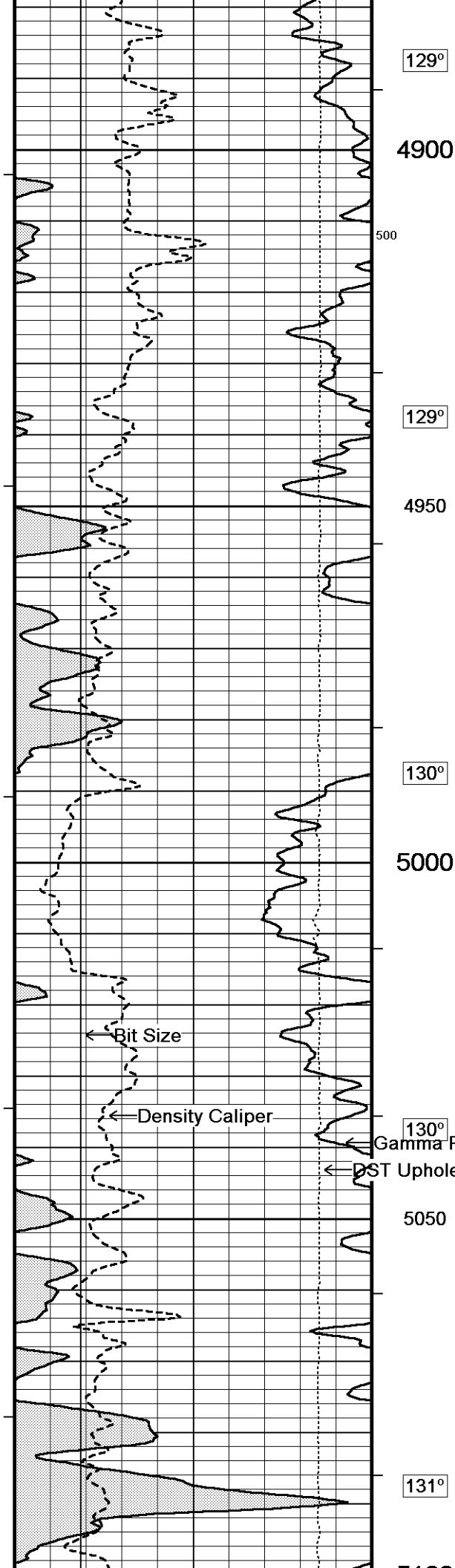
4800

128°

4850

400





129°

4900

500

129°

4950

130°

5000

Bit Size

Density Caliper

130°

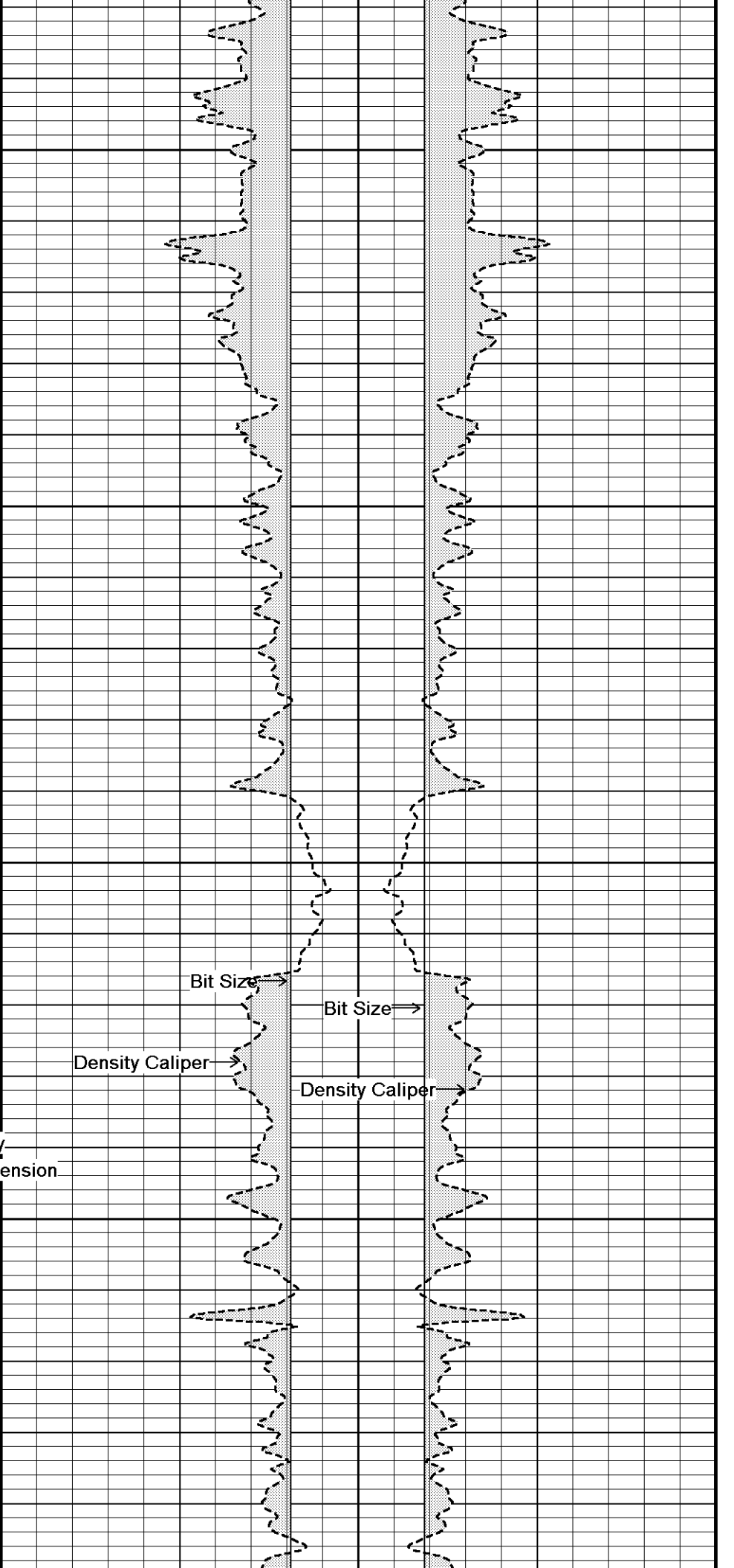
Gamma Ray

DST Uphole Tension

5050

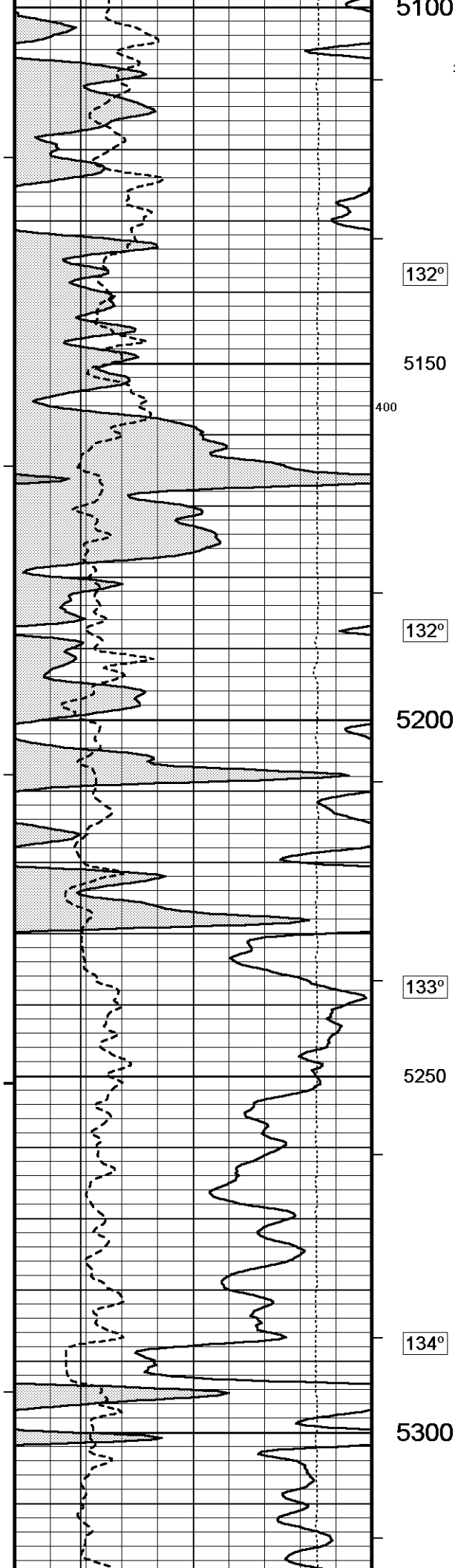
131°

5100

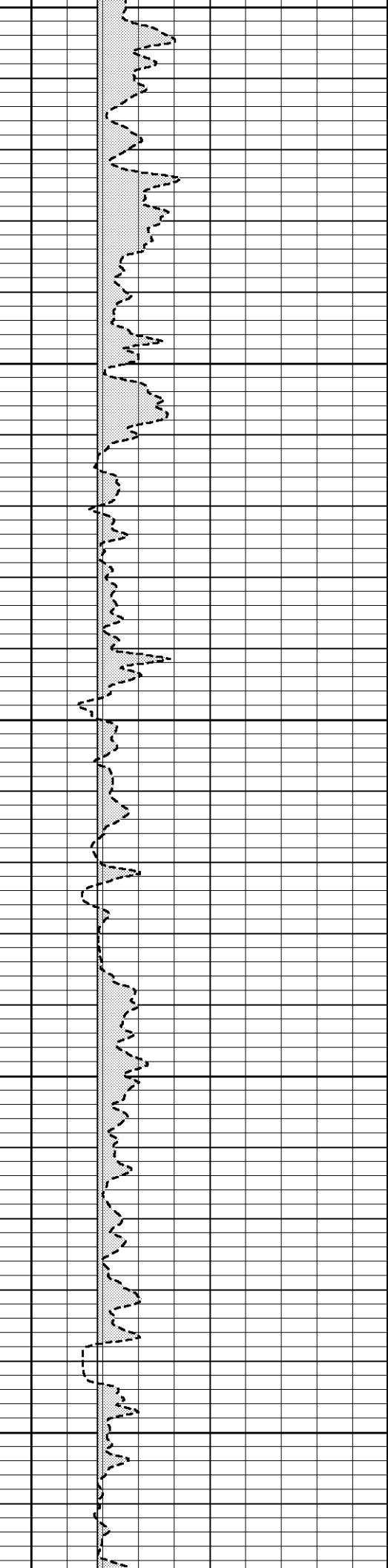
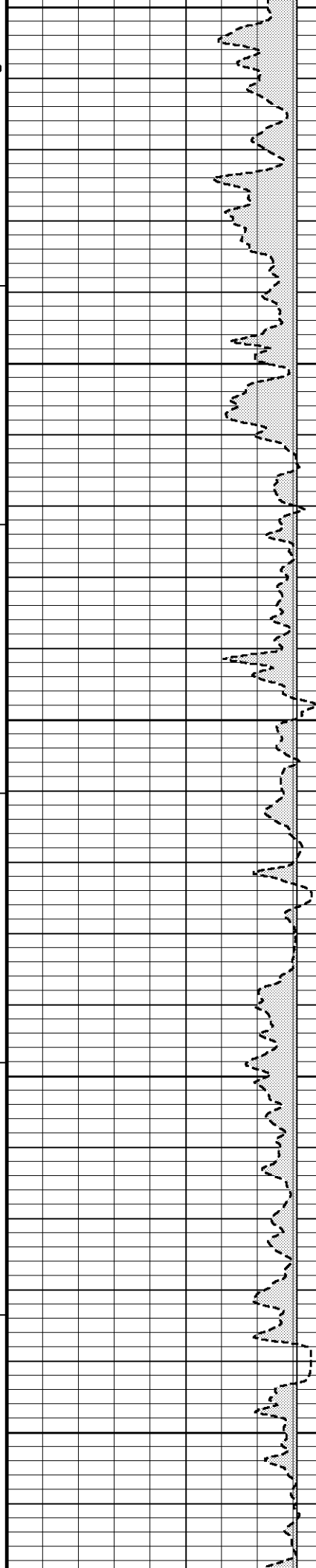


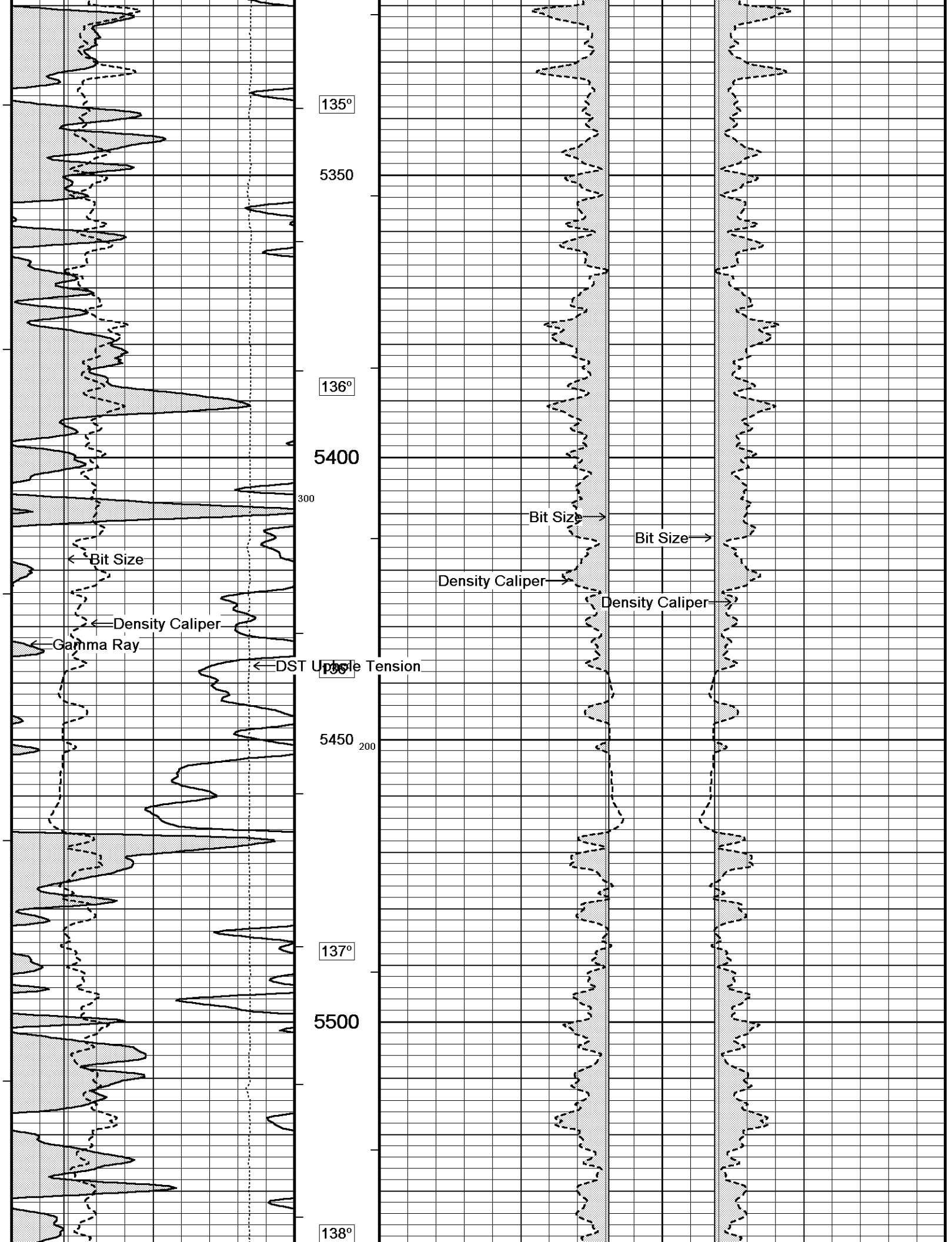
Bit Size

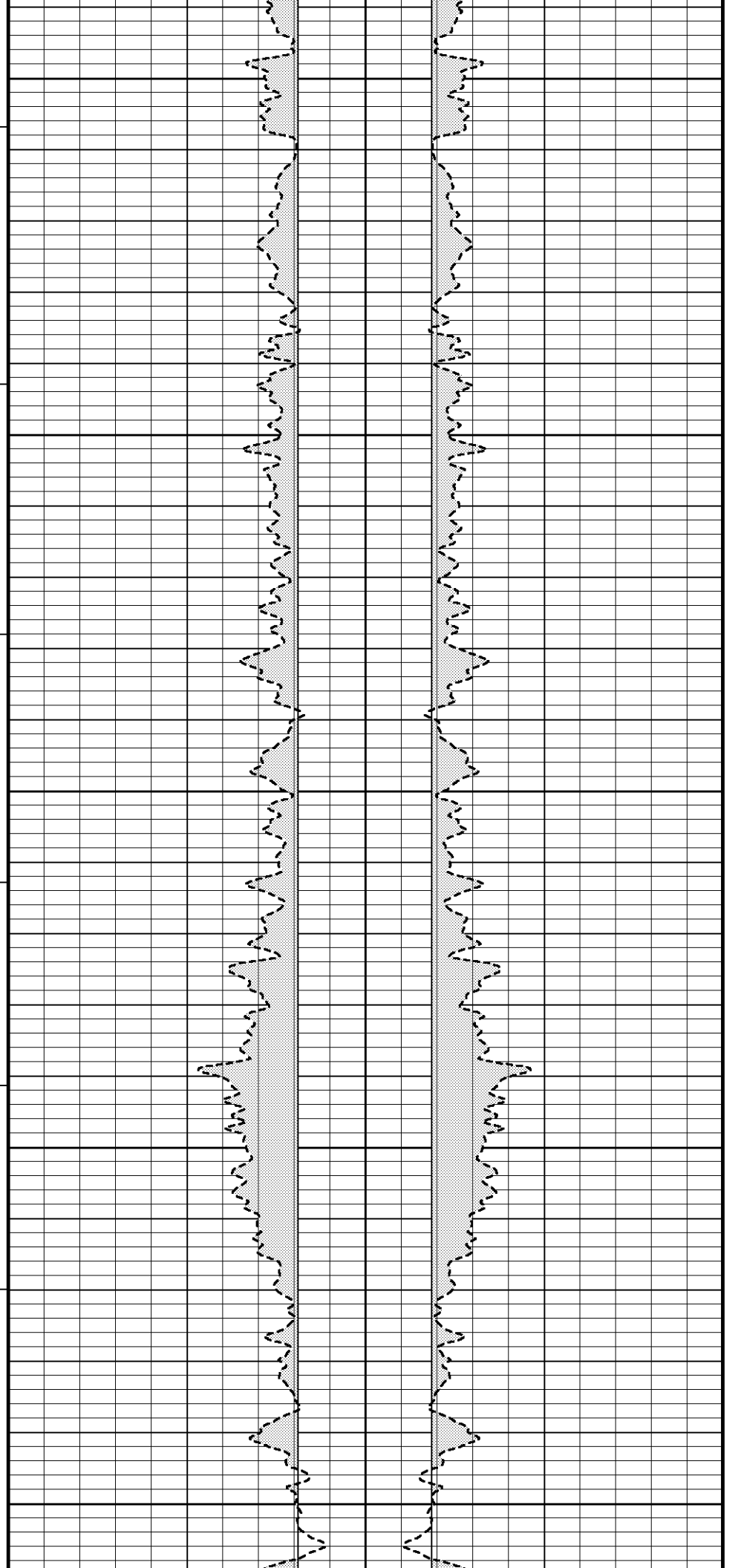
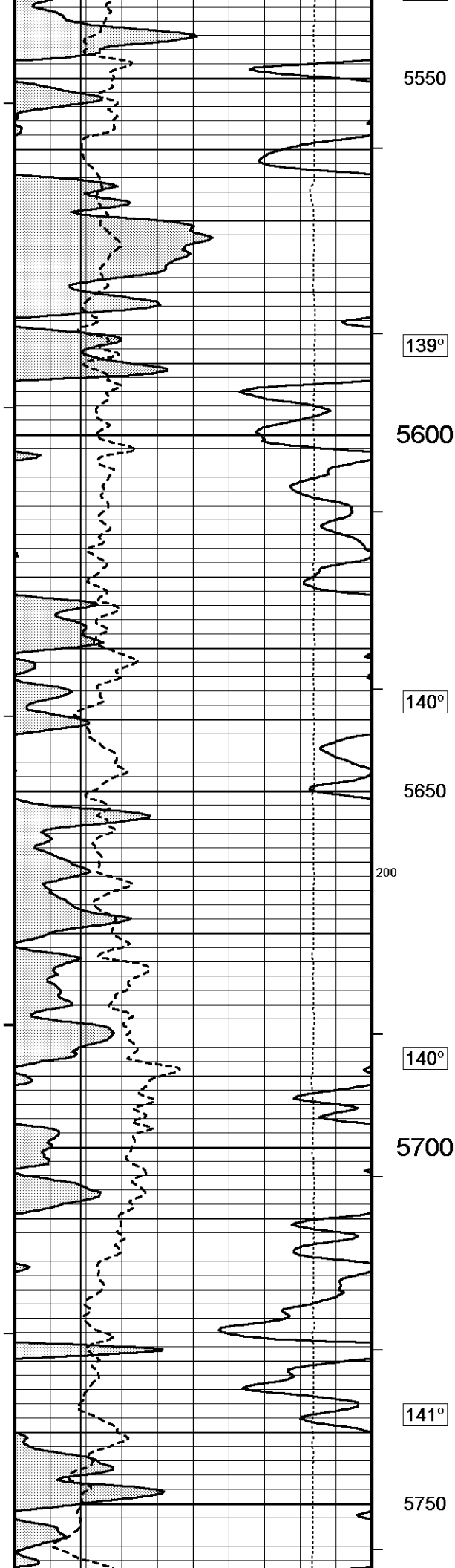
Density Caliper

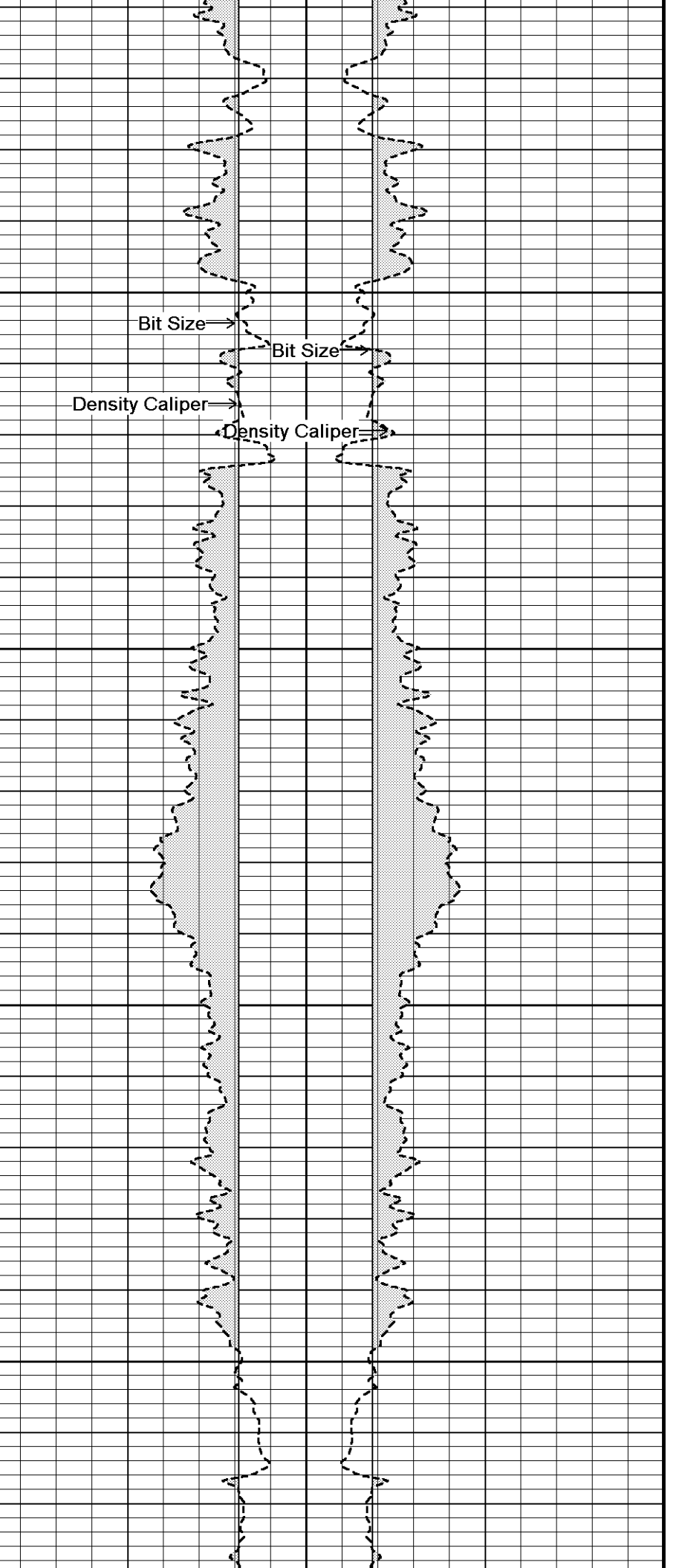
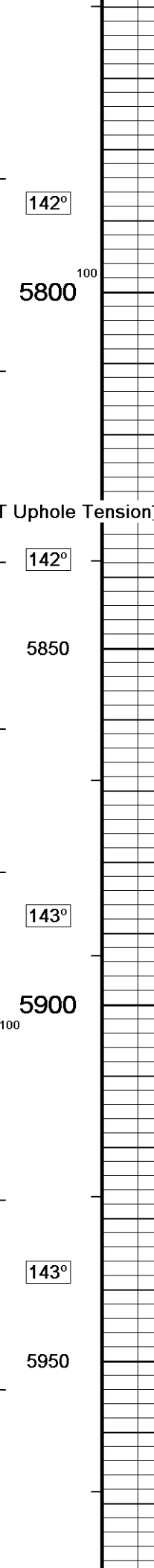
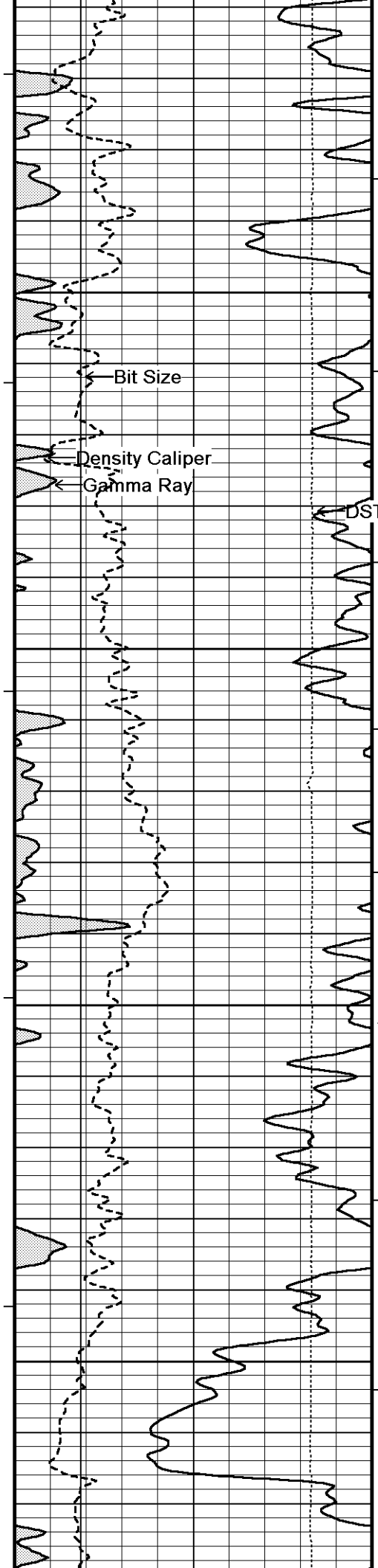


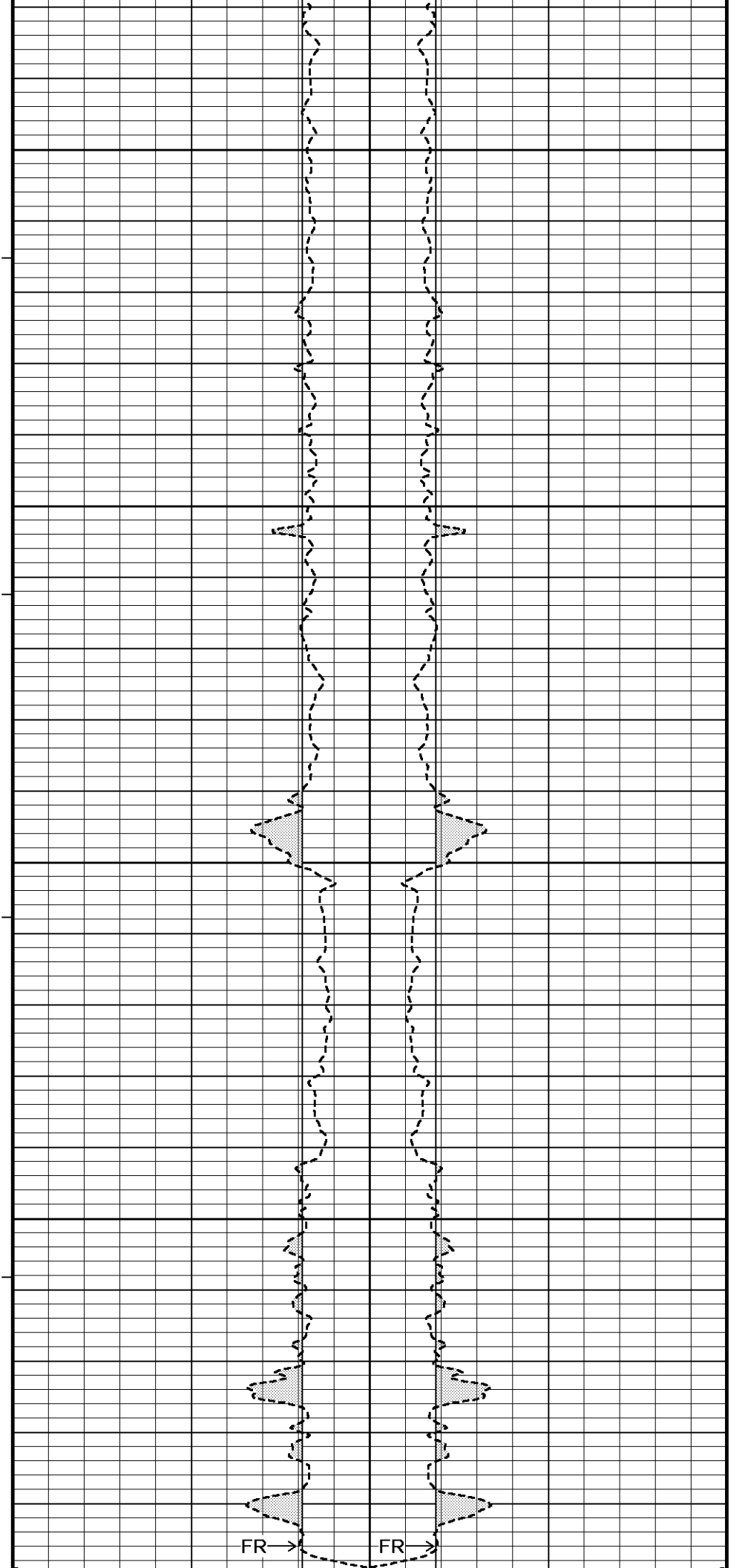
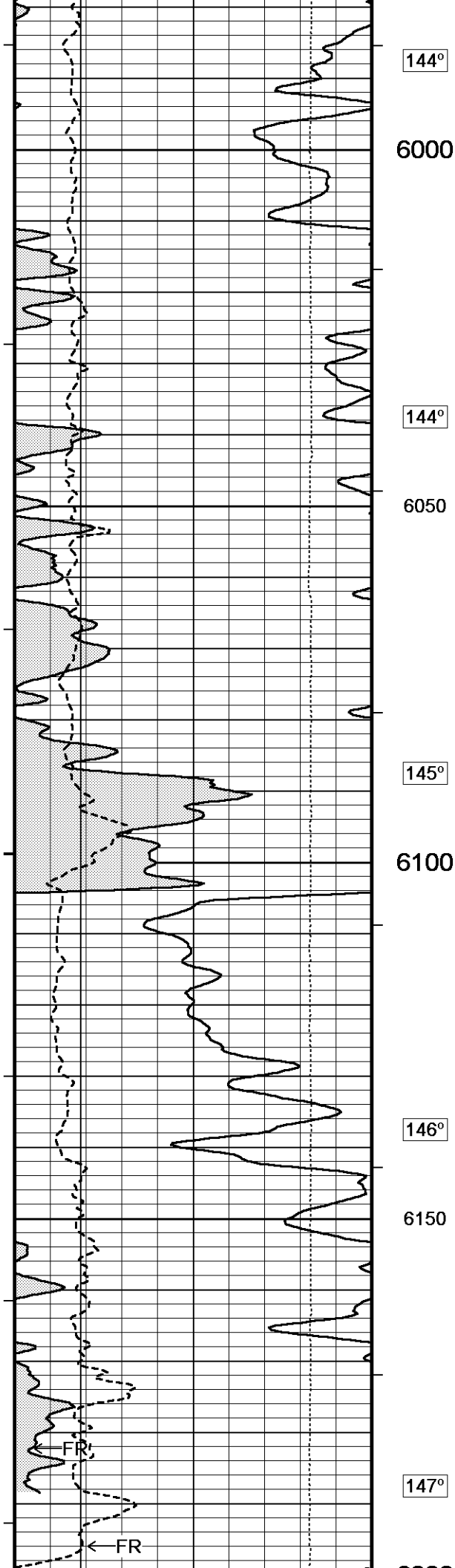
5100
300
132°
5150
400
132°
5200
133°
5250
134°
5300

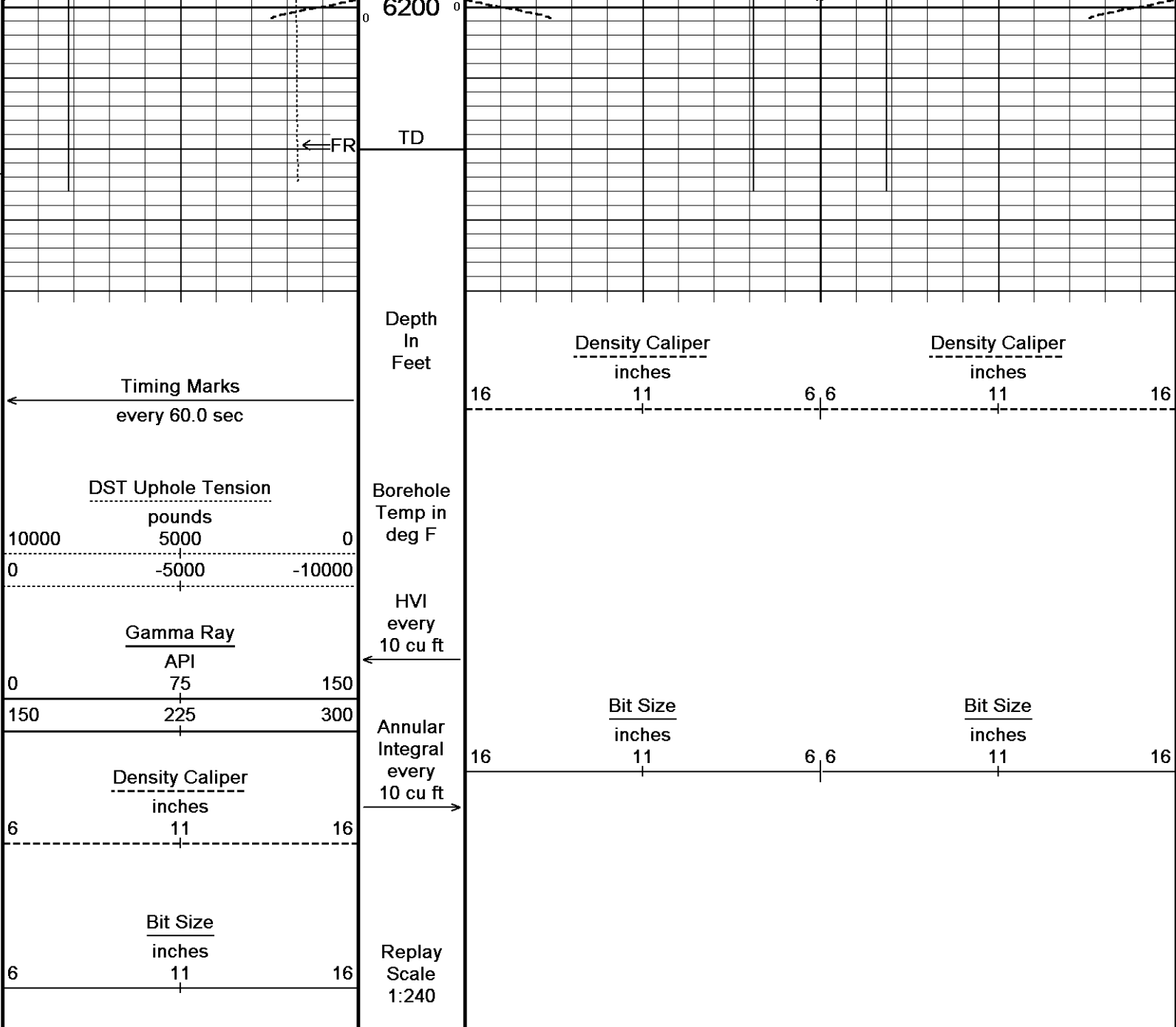












Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta
System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513
Plotted on 09-DEC-2011 15:36
Recorded on 07-DEC-2011 09:07

5 INCH MAIN LOG DSC

BEFORE SURVEY CALIBRATION		
C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta		
General Constants All 000		Last Edited on 07-DEC-2011 05:31
General Parameters		
Mud Resistivity	4.260	ohm-metres
Mud Resistivity Temperature	76.400	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	Density Caliper	

Caliper for Differential Caliper		Density Caliper	
Rwa Parameters		Base Density Porosity	
Porosity used		Array Ind. One Res Rt	
Resistivity used		0.610	
RWA Constant A		2.150	
RWA Constant M			
Down-hole Tension Calibration All 000			
			Field Calibration on 24-OCT-2010 04:34
Reading No	Measured	Calibrated (lbs)	
1	15659.85	0.00	
2	15734.68	370.00	
Down-hole Tension Calibration SMS 0			
			Field Calibration on 07-DEC-2011 06:41
Reading No	Measured	Calibrated (lbs)	
1	17182.45	0.00	
2	17346.58	300.00	
High Resolution Temperature Calibration MCG-C 115			
			Field Calibration on 01-JUL-2011 11:21
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 115			
			Last Edited on
Pre-filter Length	11		
SP Calibration MCG-C 115			
			Field Calibration on 28-NOV-2011 15:19
	Measured	Calibrated (mV)	
Reference 1	103.4	100.2	
Reference 2	-97.4	-100.2	
Gamma Calibration MCG-C 115			
			Field Calibration on 06-DEC-2011 14:39
	Measured	Calibrated (API)	
Background	76	51	
Calibrator (Gross)	853	570	
Calibrator (Net)	777	519	
Gamma Constants MCG-C 115			
			Last Edited on 07-DEC-2011 07:03
Gamma Calibrator Number	GRCC-119		
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.J 372			
			Base Calibration on 07-NOV-2011 14:49 Field Check on 06-DEC-2011 14:55
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near	Far
	2901 89	3714	110
Ratio	32.694	33.764	
Field Calibrator at Base			
		Calibrated (cps)	
		2354	3415
Ratio		0.689	
Field Check			
		Calibrated (cps)	
		2315	3427
Ratio		0.676	
Neutron Constants MDN-B.J 372			
			Last Edited on 07-DEC-2011 07:03
Neutron Source Id	P31115B		
Neutron Jig Number	NJ5299		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	

Mud Density	7.10	g/cc
Limestone Sigma	7.00	cu
Sandstone Sigma	4.70	cu
Dolomite Sigma	None	
Formation Pressure Source	N/A	kpsi
Formation Pressure	None	
Temperature Source	N/A	degrees F
Temperature	0.00	kppm
Mud Salinity	None	
Formation Fluid Salinity Source	N/A	kppm
Formation Fluid Salinity	Not Applied	
Barite Mud Correction		

FE Calibration MFE-A.A 102		Base Calibration on 07-NOV-2011 11:17 Field Check on 06-DEC-2011 14:45	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	978.7	126.8	
Base Check		280.0	
Field Check		280.0	

FE Constants MFE-A.A 102			Last Edited on 07-DEC-2011 05:29		
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.		MCG External Temperature			
Stand-off		1.0		inches	

High Resolution Temperature Calibration MAI-B.A 268		Field Calibration on 10-OCT-2011 15:43	
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MAI-B.A 268		Last Edited on	
Pre-filter Length	11		

Induction Calibration MAI-B.A 268				Base Calibration on 07-NOV-2011 13:33	
				Field Check on 06-DEC-2011 14:33	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.2	459.3	9.3	966.2	
2	6.5	375.4	7.6	821.4	
3	3.7	255.1	5.2	566.0	
4	2.2	131.8	2.6	279.2	
Array Temperature		74.3	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	10.8	3926.0	
2	0.0	0.0	28.5	3565.8	
3	0.0	0.0	27.7	3080.5	
4	0.0	0.0	18.7	2084.4	
Deep	0.0	0.0	17.0	2012.9	
Medium	0.0	0.0	40.9	4058.0	
Shallow	0.0	0.0	42.2	5266.3	
Array Temperature		0.0	47.9	Deg F	

Induction Constants MAI-B.A 268		Last Edited on 07-DEC-2011 06:55	
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	1.00 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

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-B 104

Base Calibration on 06-DEC-2011 11:01
Field Calibration on 06-DEC-2011 11:05

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	11778	3.99
2	20380	5.97
3	29068	7.96
4	37241	9.86
5	46400	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.95	7.96

Photo Density Calibration MPD-B 104

Base Calibration on 06-DEC-2011 10:30
Field Check on 06-DEC-2011 10:42

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	36975	12896	52994	19128
Reference 2	17425	2405	25185	2558

Field Check at Base

1270.5	1474.5
--------	--------

Field Check

1271.6	1479.2
--------	--------

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	236	1146		
Reference 1	12925	36819	0.356	0.309
Reference 2	5134	17296	0.303	0.274

Field Check at Base

Field Check	235.8	1145.9
	238.5	1148.4
Density Constants MPD-B 104		Last Edited on 07-DEC-2011 05:30
Density Source Id	P15771B	
Nylon Calibrator Number	DNC -D 527	
Aluminium Calibrator Number	DAC-D 527	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.25	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:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView0\DOWN_LOG3.dta		
3/8" Triple Cone Cable Head (MCB C A) MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in		
SHA-F Compact Swivel Head Adaptor SHA-F 67 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in		
Compact Comms Gamma MCG-C 115 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in	37.07 ft	GRGC - Gamma Ray
	34.16 ft	CGXT - MCG External Temperature
Compact Neutron MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in	30.61 ft	NPRS - Sandstone Neutron Por.
Compact Density/Caliper MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in	23.37 ft	AVOL - Annular Volume
	23.37 ft	HVOL - Hole Volume
	23.37 ft	CLDC - Density Caliper
SKJ-D Compact Knuckle Joint SKJ-D 34 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in	21.44 ft	DPRS - Sandstone Density Por.
	21.44 ft	DCOR - Density Correction
	21.38 ft	PDPE - PE
Compact Focussed Electric MFE-A.A 102 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in		
Compact Induction MAI-B.A 268 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in		
Total Length: 46.67 ft Weight: 368.2 lb	3.34 ft	R200 - Array Ind. One Res 20
	3.34 ft	R400 - Array Ind. One Res 40
	3.34 ft	R300 - Array Ind. One Res 30
	3.34 ft	RTAO - Array Ind. One Res Rt
	3.34 ft	R850 - Array Ind. One Res 85
	3.34 ft	R600 - Array Ind. One Res 60
	0.23 ft	SPCG - Spontaneous Potential
	Tool Zero	(0.13ft from bottom)
	-0.13 ft	SMTU - DST Uphole Tension
	All measurements relative to tool zero.	

COMPANY	WEXPRO COMPANY
WELL	MUSSER 31
FIELD	POWDER WASH
PROVINCE/COUNTY	MOFFAT
COUNTRY/STATE	USA/COLORADO

Elevation Kelly Bushing	6630.00	feet	First Reading	6197.00	feet
Elevation Drill Floor	6630.00	feet	Depth Driller	9095.00	feet
Elevation Ground Level	6601.00	feet	Depth Logger	6220.00	feet



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