

**Weatherford®****RESISTIVITY LOG
MCG-MDL****SCALE 5":100 LOGARITHMIC**

COMPANY

SAVIA PERU S.A

WELL

LOG-31D

FIELD

LOBITOS OFFSHORE

PROVINCE/COUNTY

PIURA

COUNTRY/STATE

PERU

LOCATION

N: 9°508,651.50 m
E: 459,047.72 mLatitude
LongitudeOther Services
MDN
MPD

Permanent Datum SEA LVL, Elevation 335 feet

Log Measured From KB

Drilling Measured From KB

Elevations:	feet
KB	50.00
DF	50.00
GL	335.00

Date

12-JUN-2013

Run Number

1

Service Order

825

Depth Driller

7668.00 feet

Depth Logger

7638.60 feet

First Reading

7611.00 feet

Last Reading

4950.00 feet

Casing Driller

2521.00 feet

Casing Logger

2521.00 feet

Bit Size

8.500 inches

Hole Fluid Type

WBAC

Density / Viscosity

11.30 lb/USg 51.00 Sec/qt

PH / Fluid Loss

9.20 5.20 ml/30Min

Sample Source

ACTIVE PIT

Rm @ Measured Temp

0.15 @ 70.0 ohm-m

Rmf @ Measured Temp

0.07 @ 70.0 ohm-m

Rmc @ Measured Temp

0.34 @ 70.0 ohm-m

Source Rmf / Rmc

PRESS

Rm @ BHT

0.10 @102.0 ohm-m

Time Since Circulation

1 HOUR

Max Recorded Temp

102.00 deg F

Equipment / Base

2 TALARA

Recorded By

J. GUERRERO

Witnessed By

A. ORTEGA

REMARKS

1. Objective: To obtain accurate open hole Gamma Ray, Neutron, Caliper, Resistivity Log (Dual Laterolog) in Compact Well Shuttle - Messenger Conveyance.
2. Maximum recorded temperature 102 degF recorded.
3. Fluid resistivity measurements during logging operation: Rmf= 0.07 @ 70deg F, Rm=0.15@ 70Deg F, Rmc=0.34@ 70degF.
4. This is a deviated well with a maximum deviation of 63.84 degrees @ 4376 ft.
5. Well sketch per driller's depth.
6. Bottom not tagged due to nature of the conveyance. Maximum depth recorded in Log header (7638.60ft) is the maximum depth reached by the induction tool in the run.
7. Main Section from 7638.60ft ft to 4950 ft, as requested.
8. No Repeat Section performed due to deployment method used in the job.
9. Resistivity curves (Dual laterolog) presented in this log are not corrected for borehole conditions.
10. Neutron log is corrected by temperature and borehole size by the density caliper.
11. Density log is corrected for mud density and borehole size by density caliper.
12. Calculated Volumes and caliper averages from 7638.60ft to 4950 ft, for a future 5.5 O.D casing:
Hole Volume= 1240 FT 3
Annular Volume = 805 FT 3
Caliper Average = 9.30 in.
Caliper Max = 12.64 in @ 7445 ft.
13. Operation started at 20:00 11-06-2013.
We reached bottom at 11:00 12-06-2013.
Deployment was done at 11:30 12-06-2013.
Log interval was finished at 15:30 12-06-2013.
Job was finished at 20:00 12-06-2013.

Crew at your service

J. Guerrero, J Jimenez, J. Escobar, E. Cruz

Bit Size
inchesDepth From
feetDepth To
feet

12.250

0.00

2521.00

8.500

2521.00

7668.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	2521.00	43.00

WELL DIAGRAM

9.63 in Casing: 0.00 ft

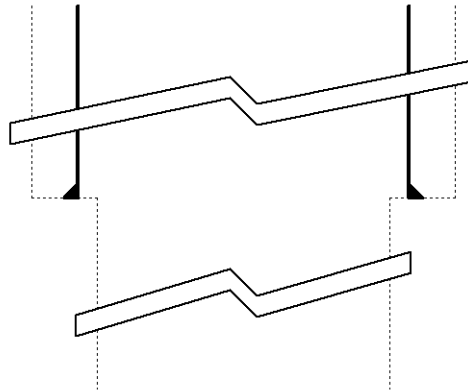
12.25 in Bit size: 0.00 - 2521.00 ft

9.63 in Casing shoe: 2521.00 ft

8.50 in Bit size: 2521.00 - 7668.00 ft

Total bit depth: 7668.00 ft

Temperature: 102.00 Degrees F



DOWNHOLE EQUIPMENT

D:\LOGS\PERU\ITALARA\LO6-CWS\LO6-31D-DSC-FINAL-HVOL-AVOL-COMPLETE.dta

Shuttle Running Tool 5" (SRT B)

SRT-A 2 LG: 6.47 ft WT: 37.5 lb OD: 2.52 in

SKJ-E.A Compact Knuckle Joint

SKJ-E.A 170 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MBS-A.A 400v Compact Battery Sub

MBS-A.A 56 LG: 14.24 ft WT: 105.8 lb OD: 2.24 in

Compact Stiff Bridle Electrode Sub.

MBE-C.B 261 LG: 12.33 ft WT: 77.2 lb OD: 2.28 in

Compact Stiff Bridle Electrode Sub.

MBE-C.B 262 LG: 12.33 ft WT: 77.2 lb OD: 2.28 in

Compact Stiff Bridle Electrode Sub.



Compact Gain Drive Electrode Sub.
MBE-A.A 56 LG: 12.33 ft WT: 77.2 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.A 261 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Memory Sub. A.C
MMS-A.C 1 LG: 3.12 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 171 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 479 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 755 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-C.A 441 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 197 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 756 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 180 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint
SKJ-E.A 180 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

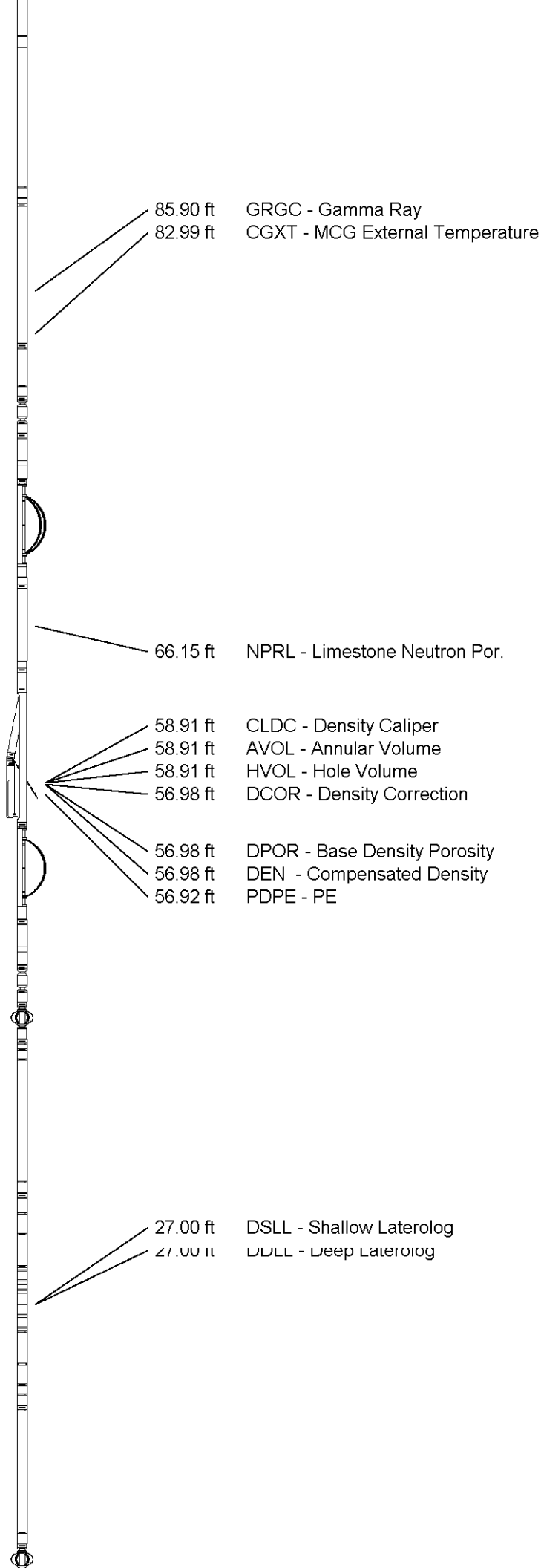
MIS-B Compact Inline Standoff sub
MIS-B 99 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Upper Guard sub
MUG-B.B 260 LG: 8.98 ft WT: 68.3 lb OD: 2.24 in

Compact Laterolog Electrode Sub.
MLE-D.A 228 LG: 12.34 ft WT: 92.6 lb OD: 2.24 in

Compact Lower Guard Sub.
MLG-B.B 257 LG: 8.00 ft WT: 55.1 lb OD: 2.24 in

MIS-B Compact Inline Standoff sub

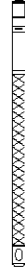


MIS-B 98 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction

MAI-B.A 223 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 151.05 ft Weight: 1080.3 lb

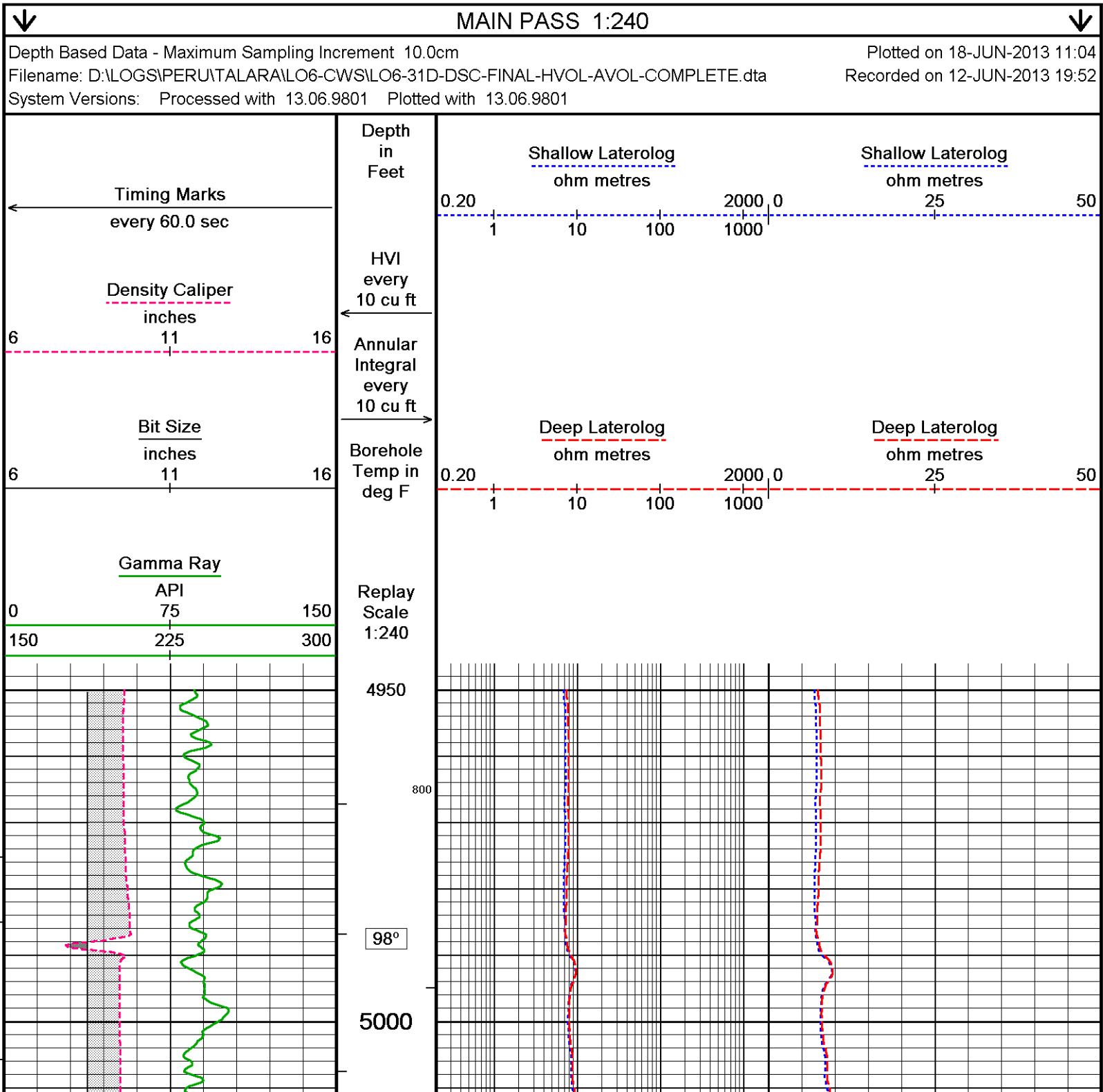


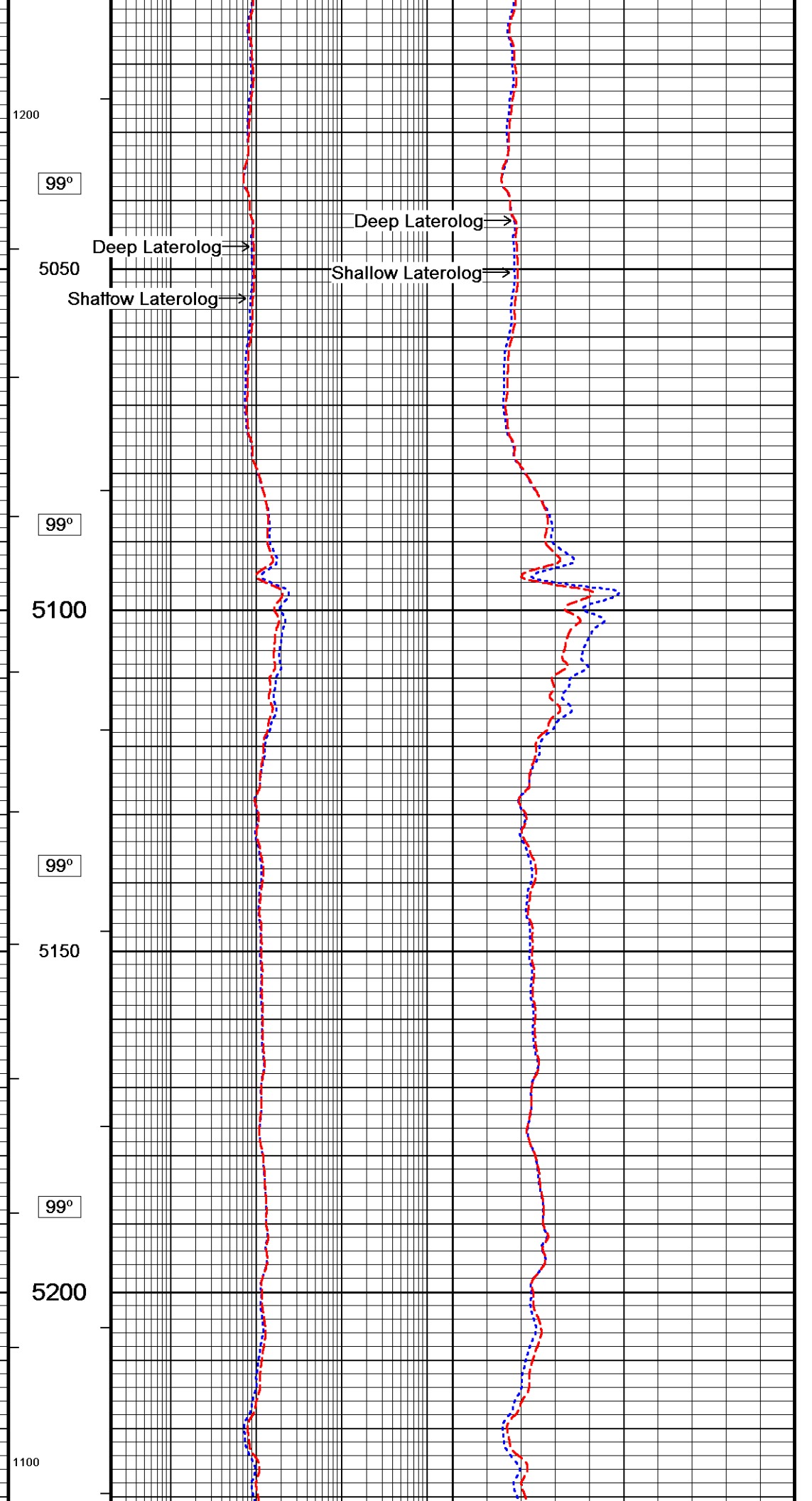
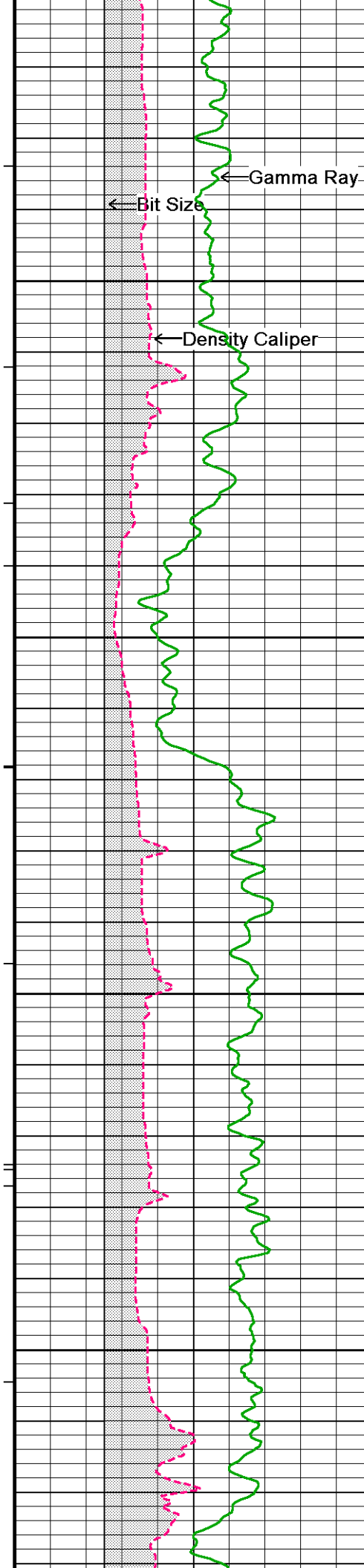
Tool Zero

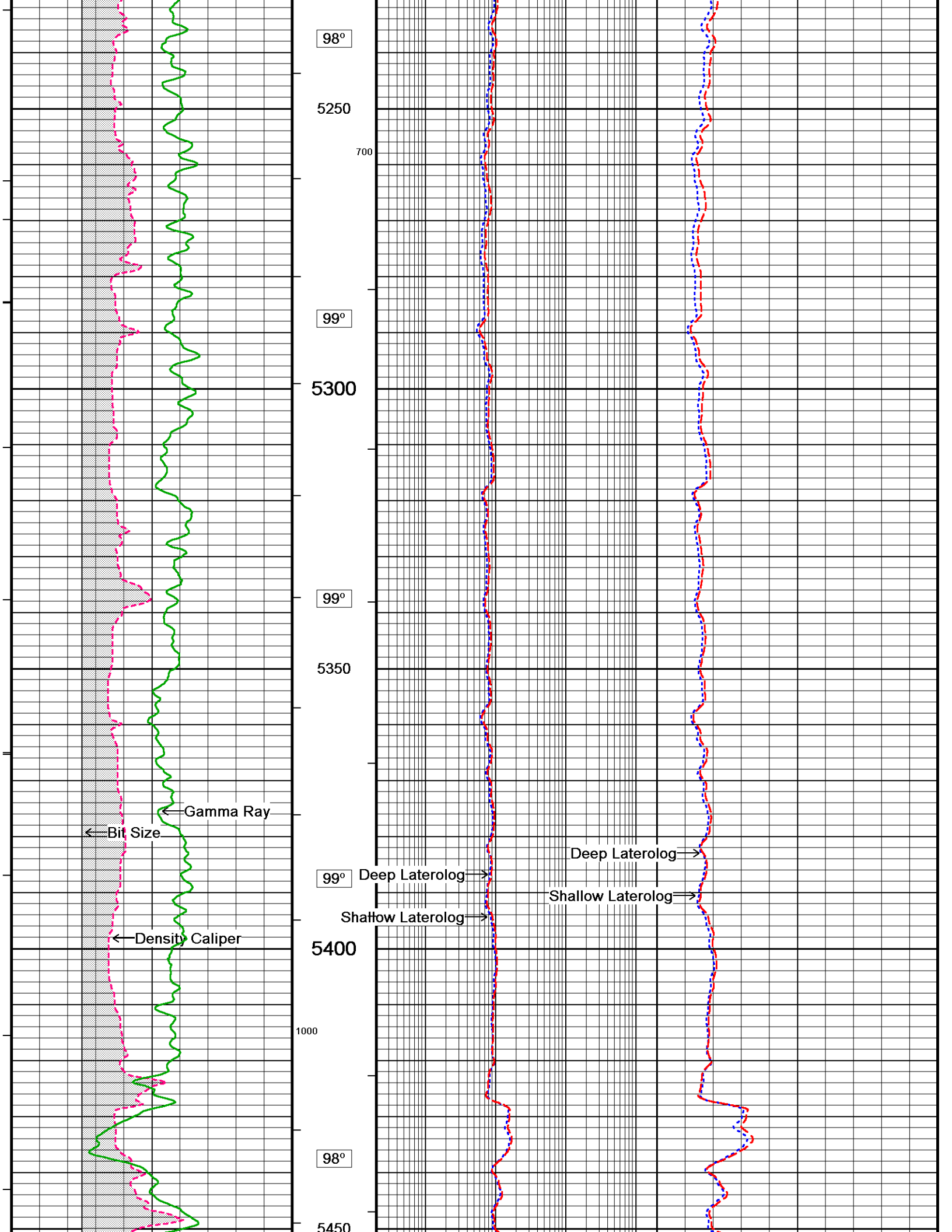
(0.13ft from bottom)

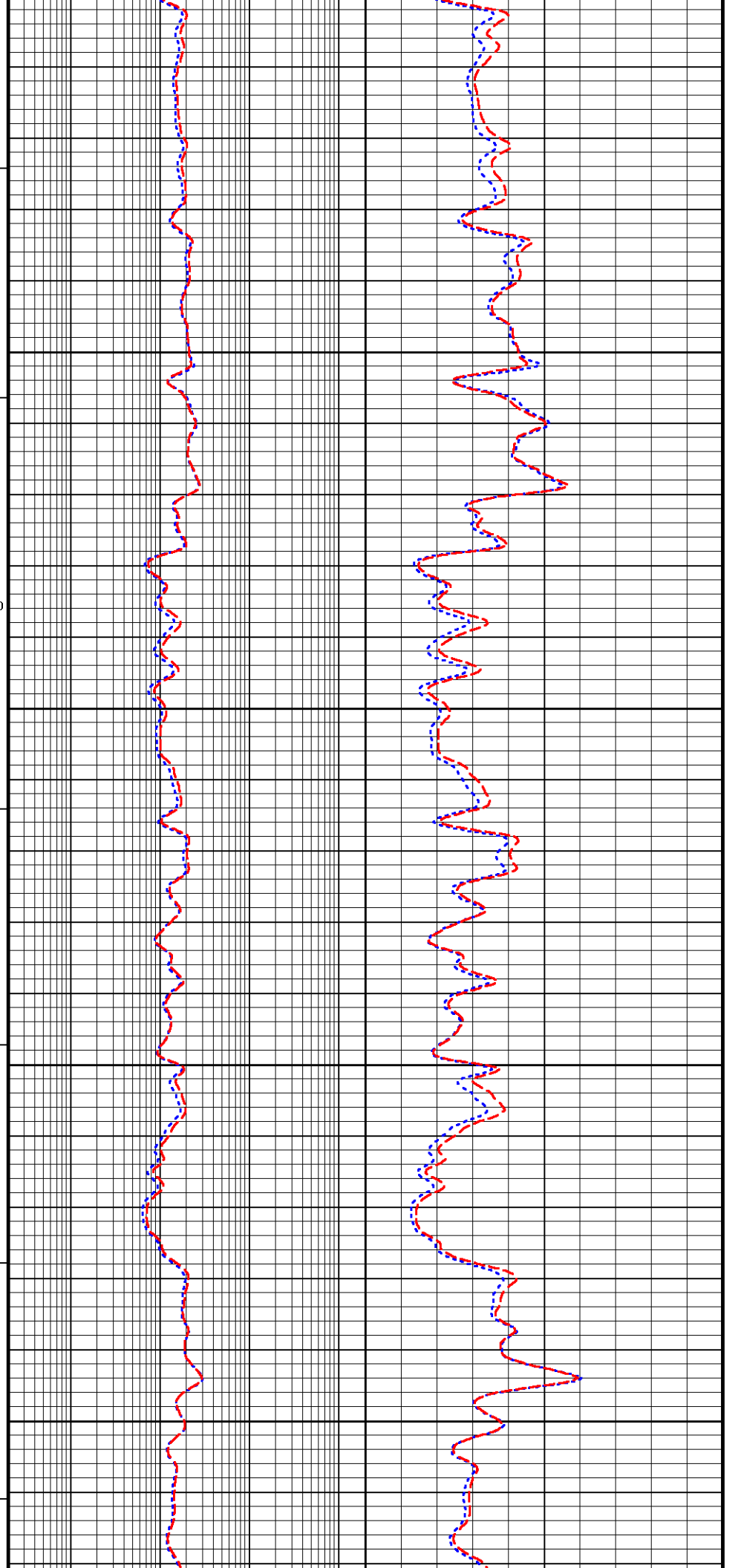
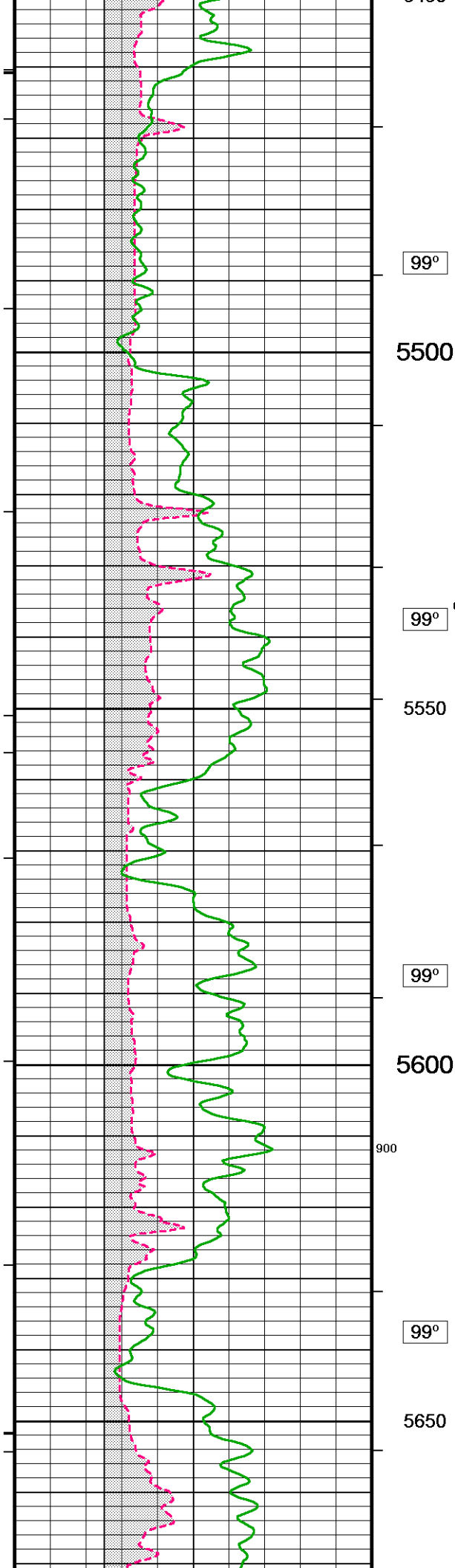
All measurements relative to tool zero.

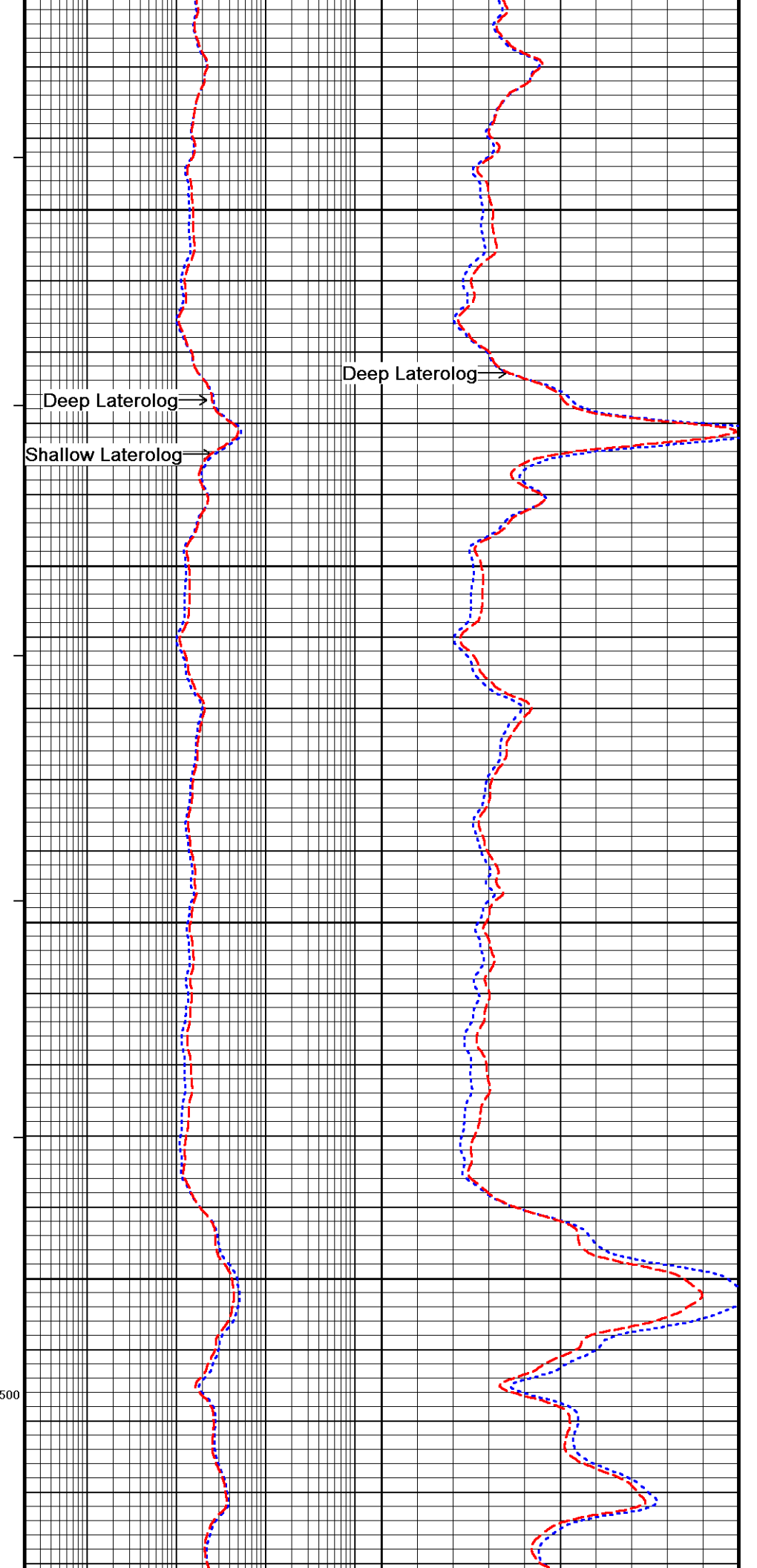
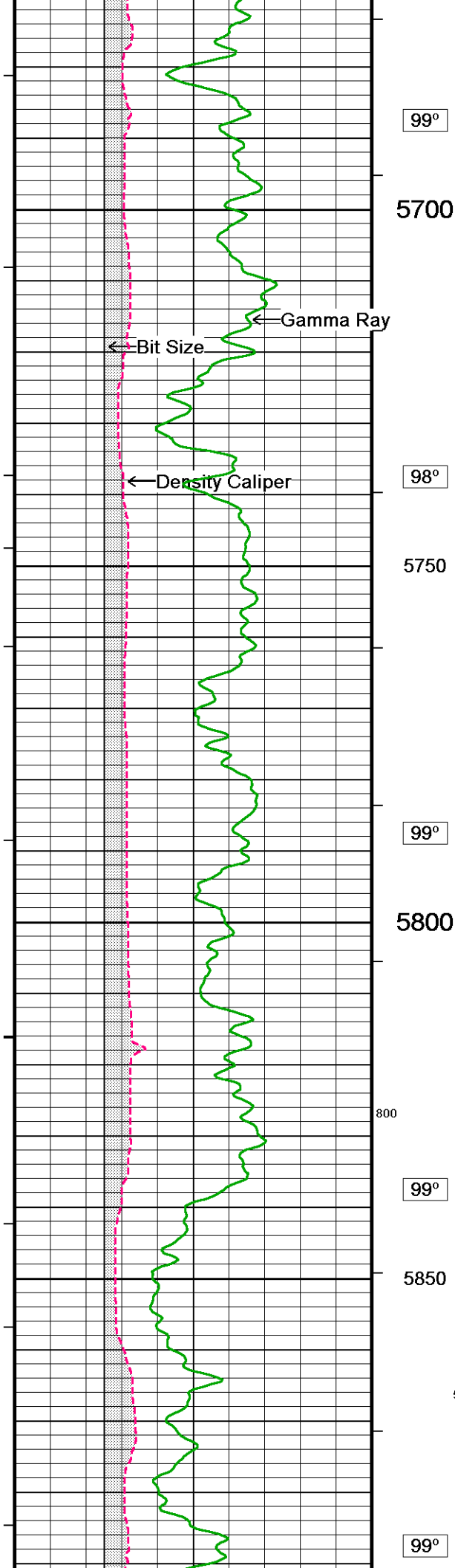
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

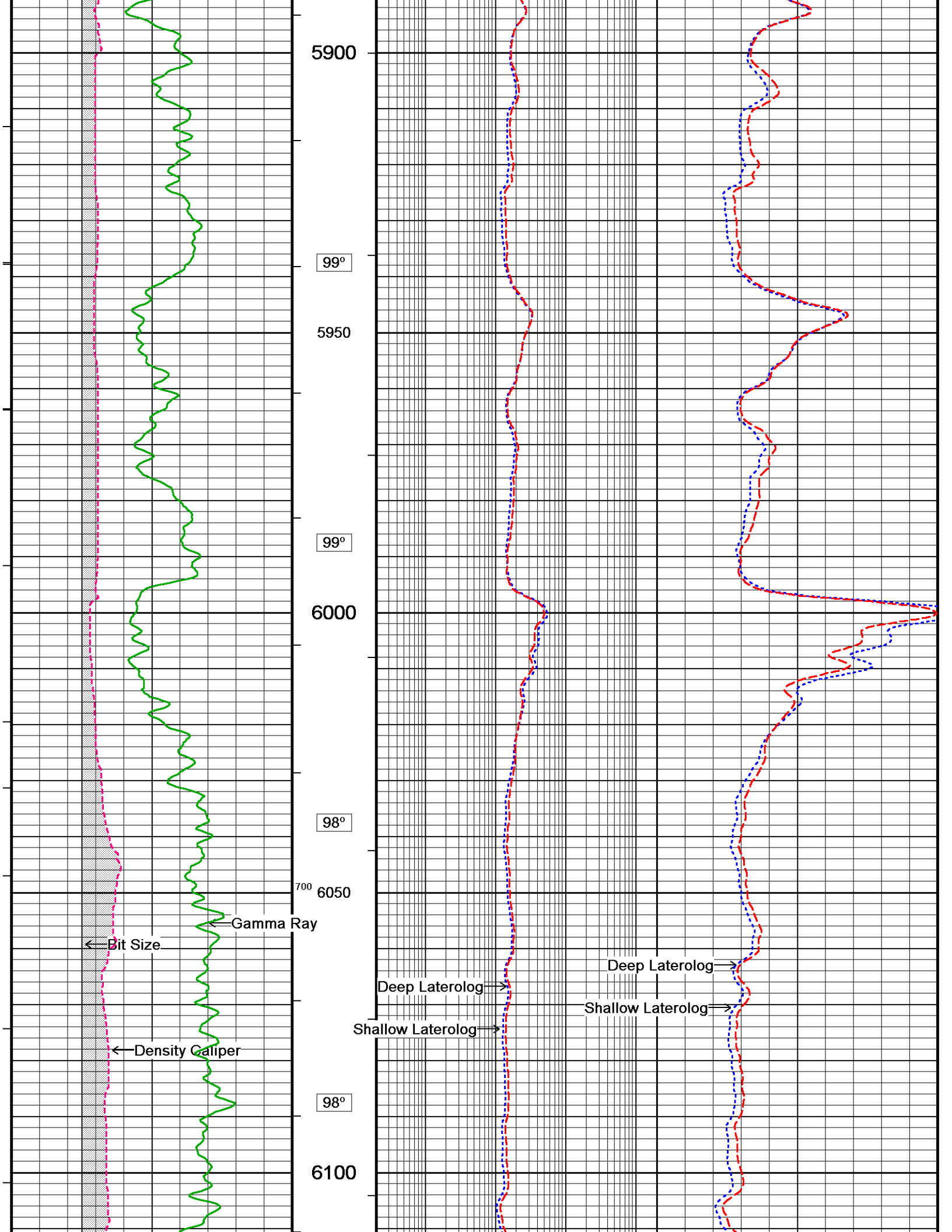


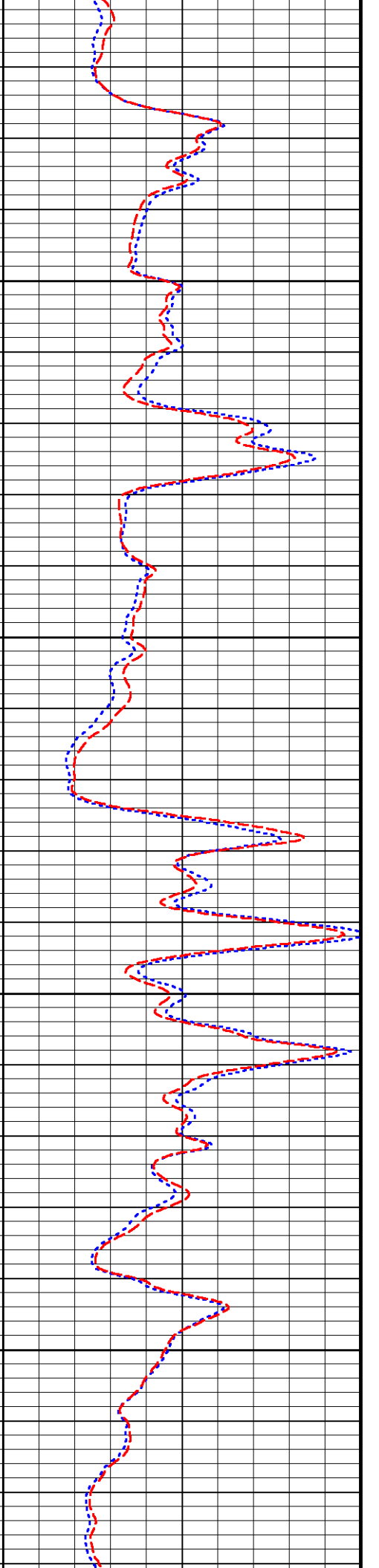
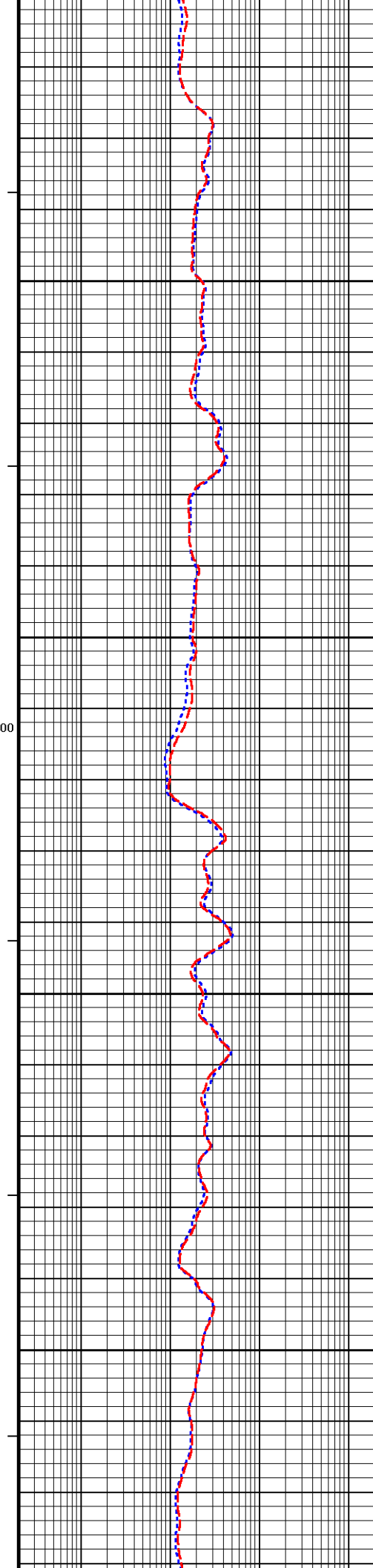
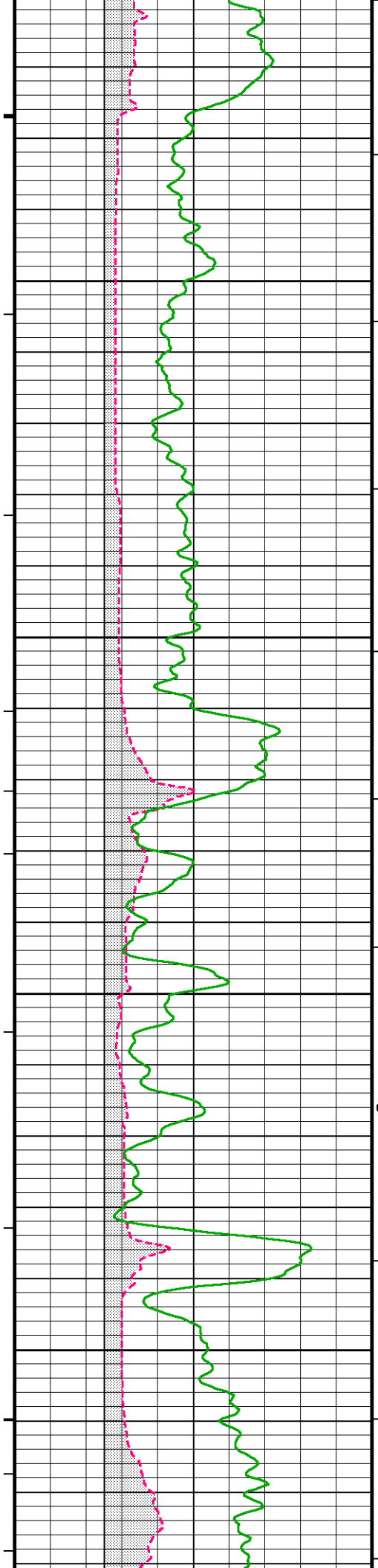


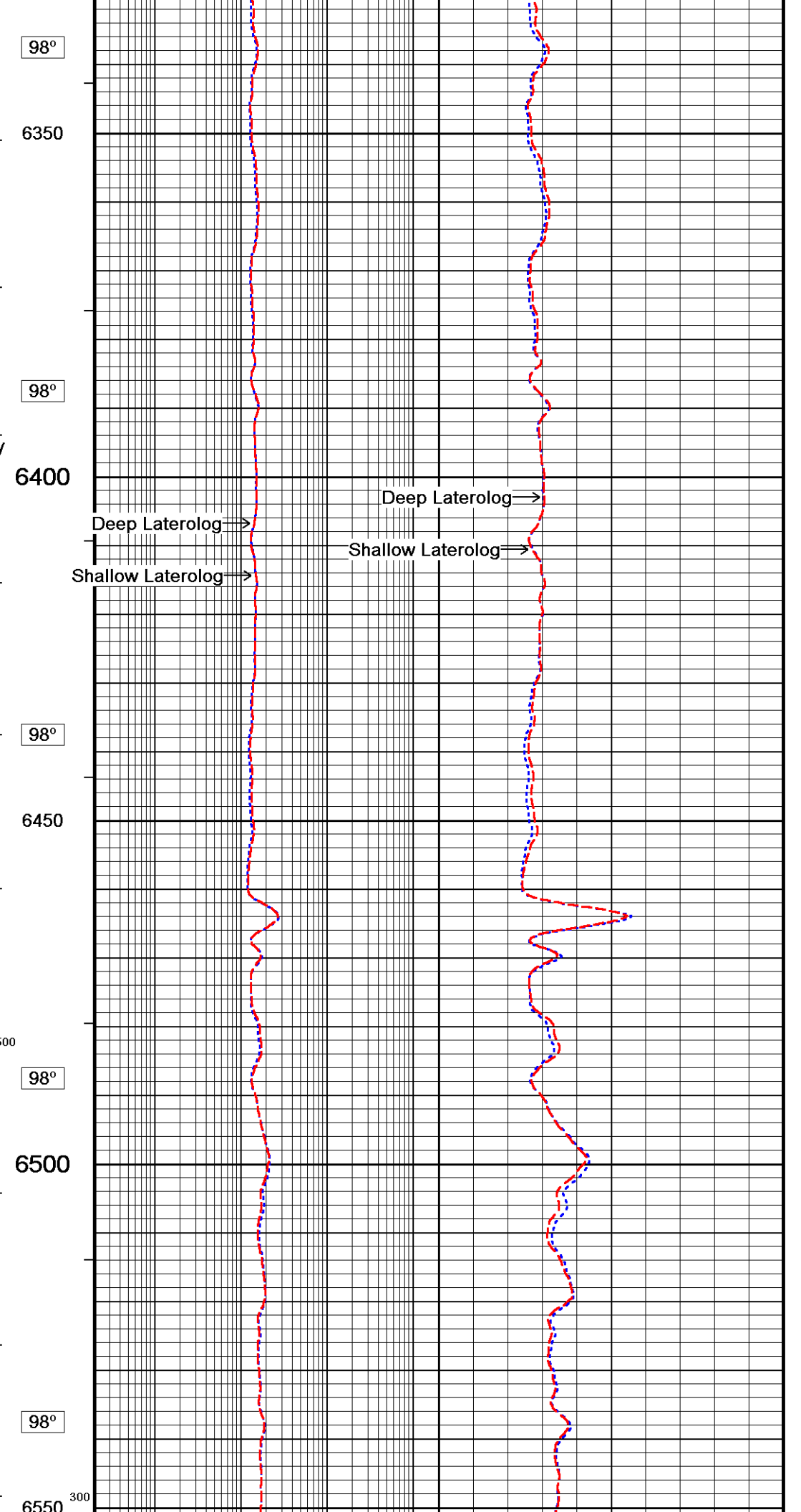
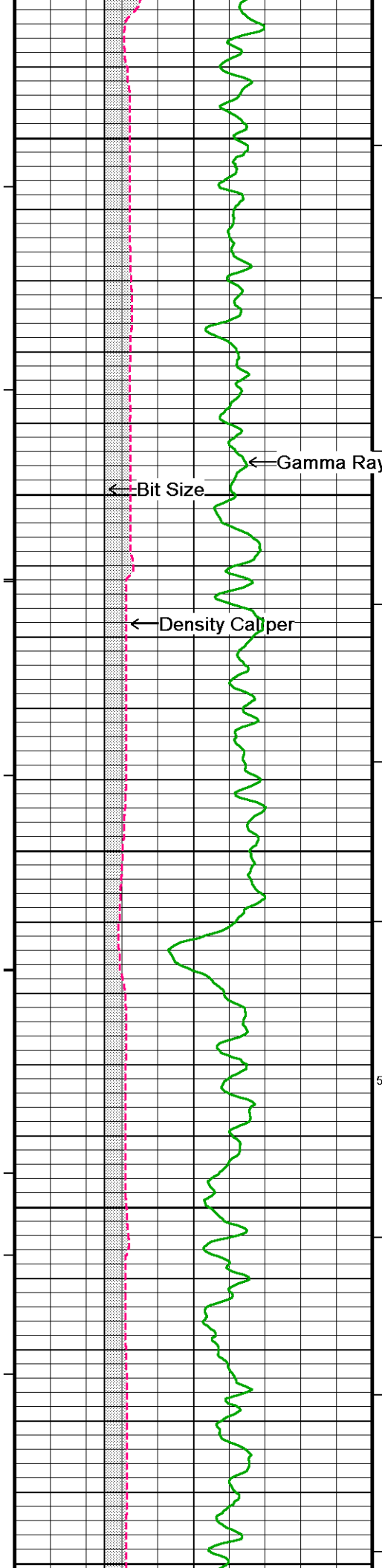


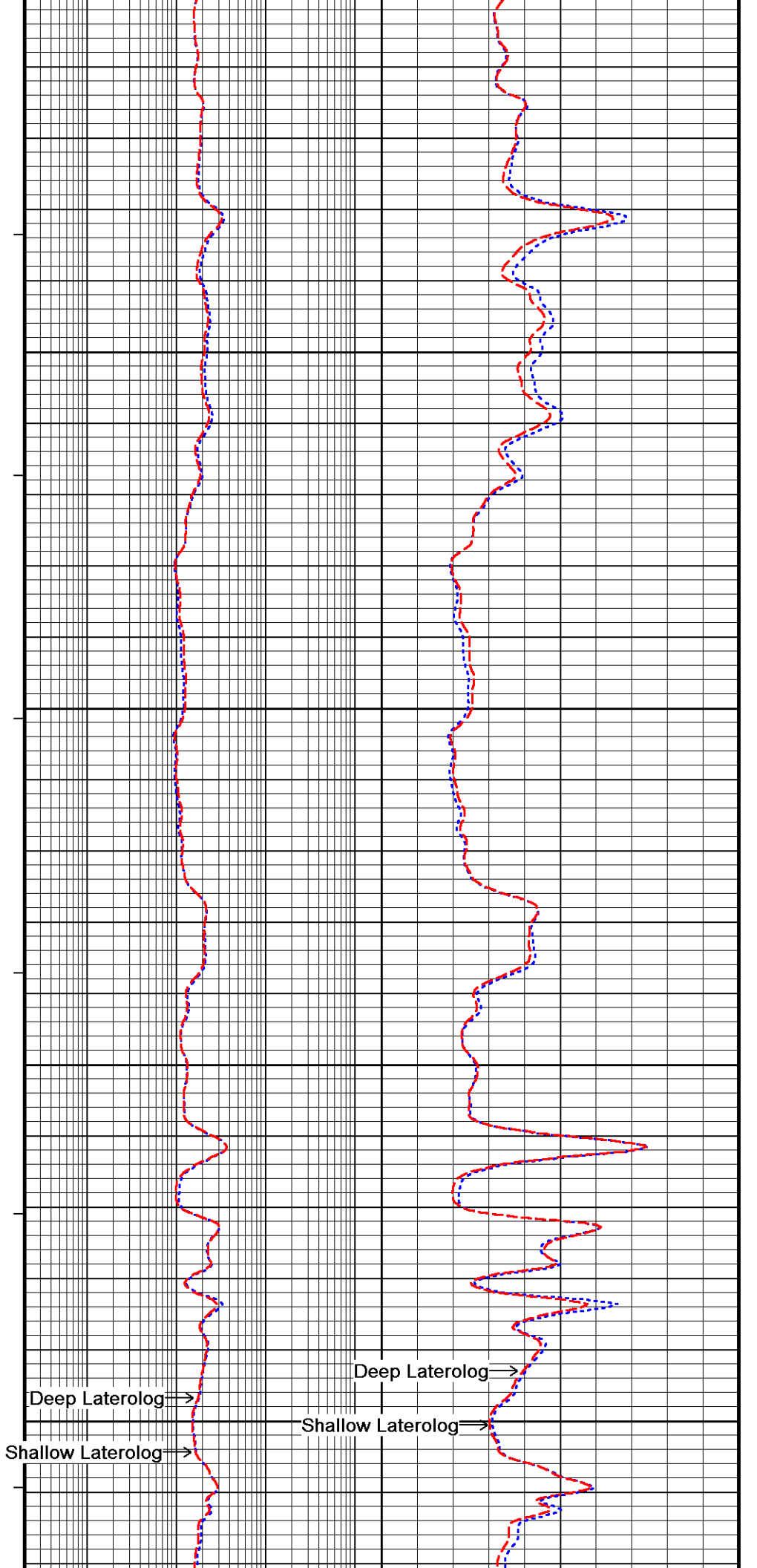
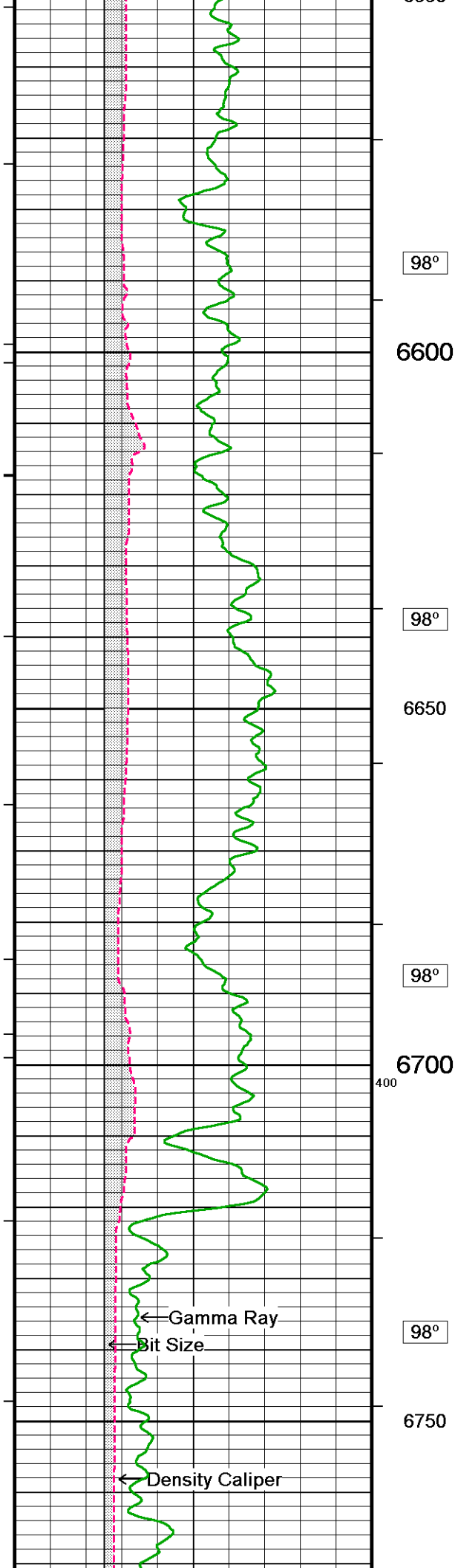


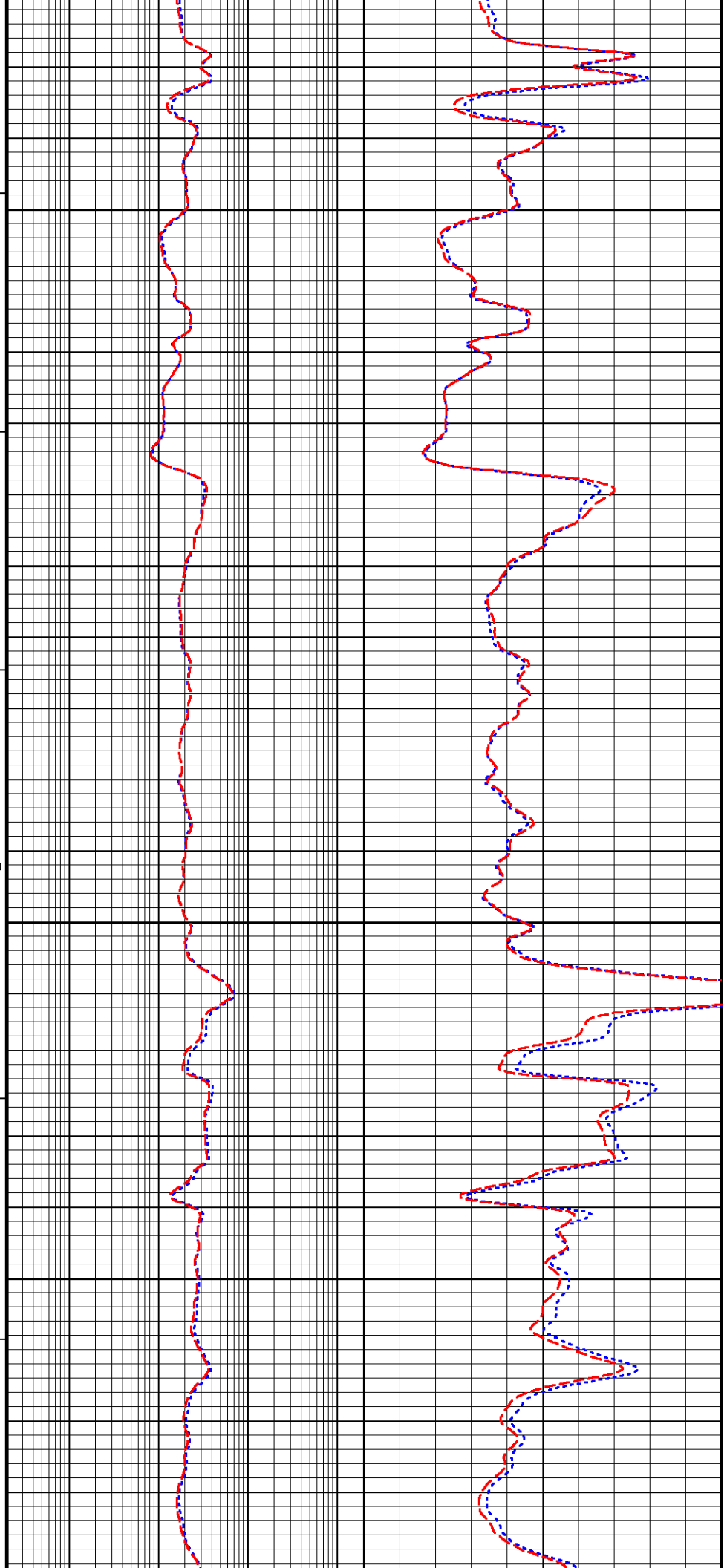
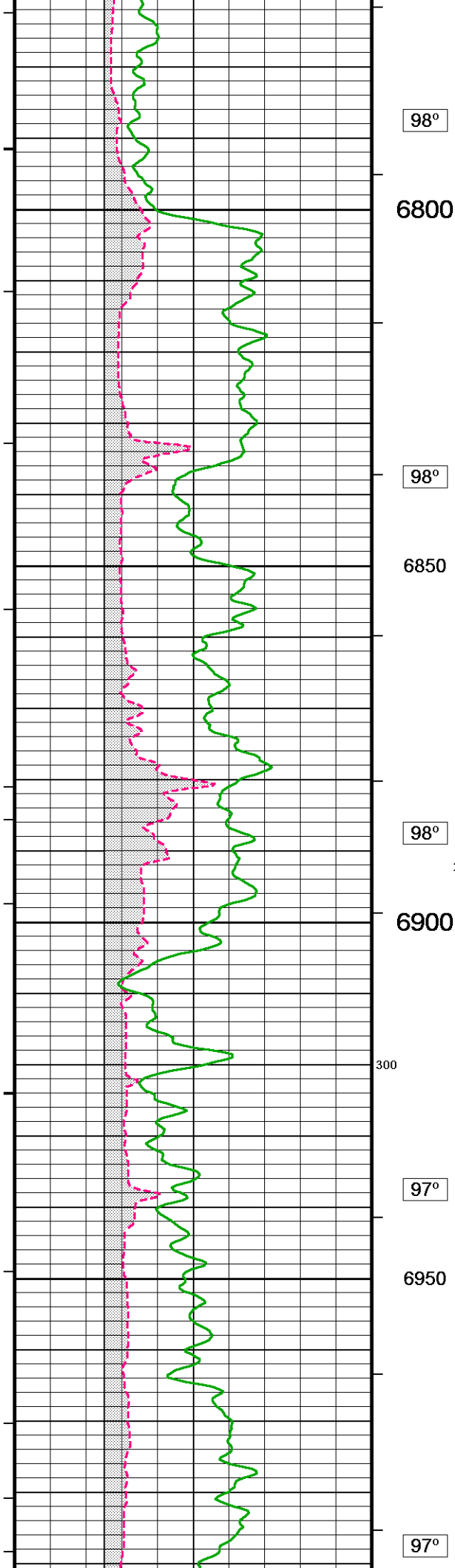


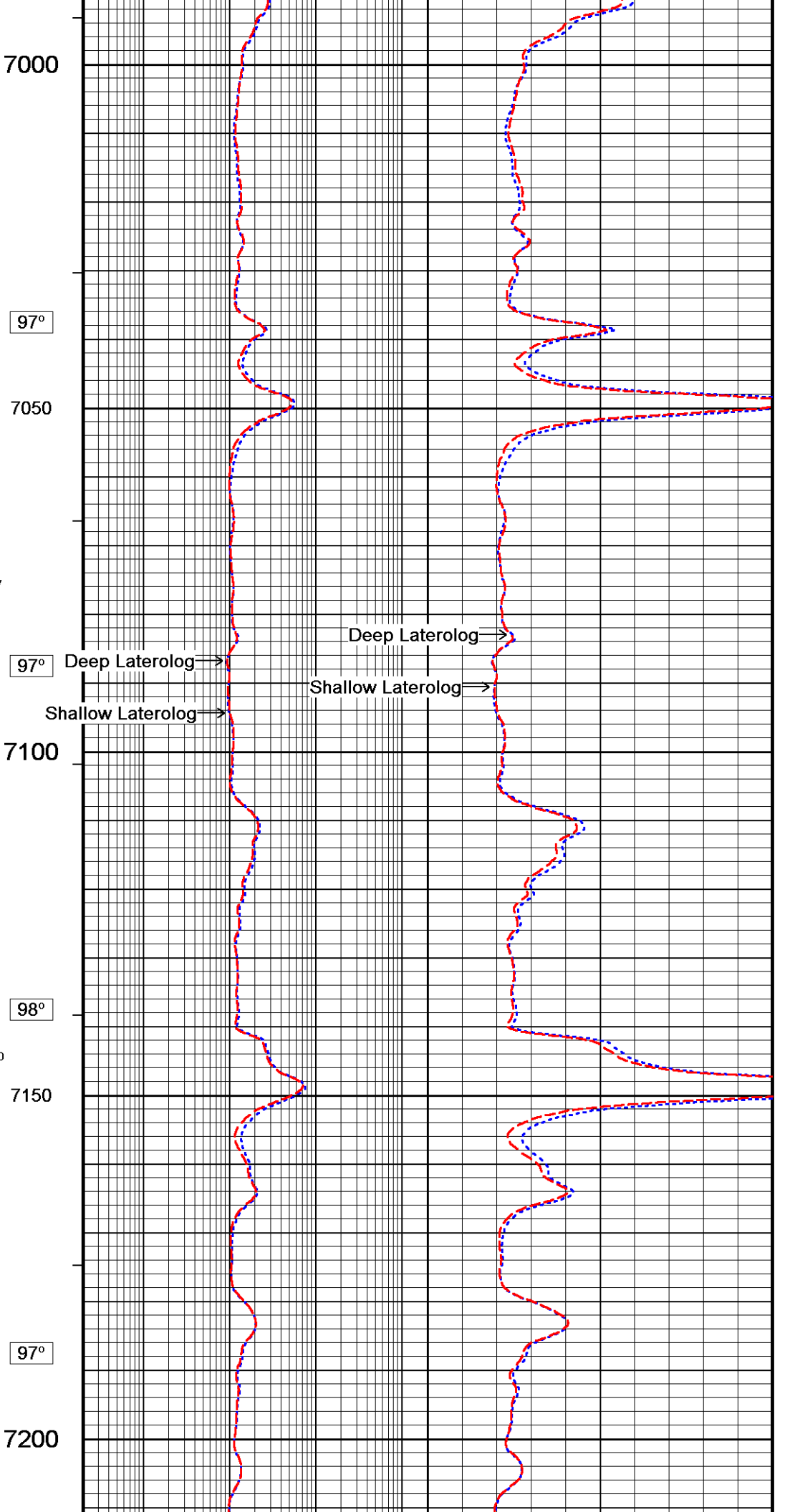
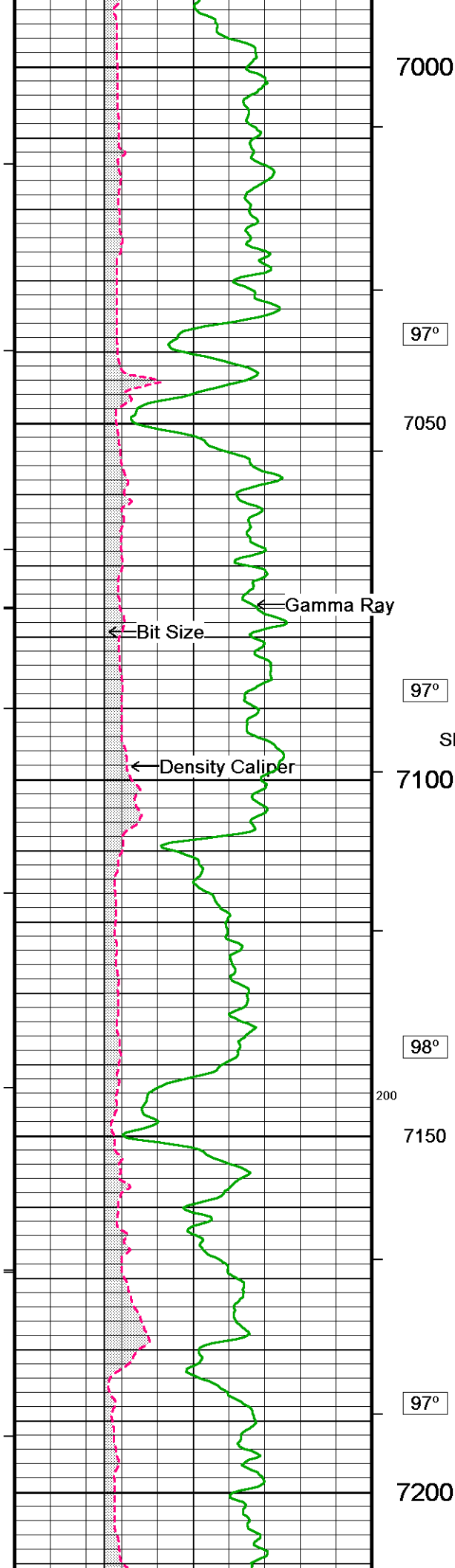


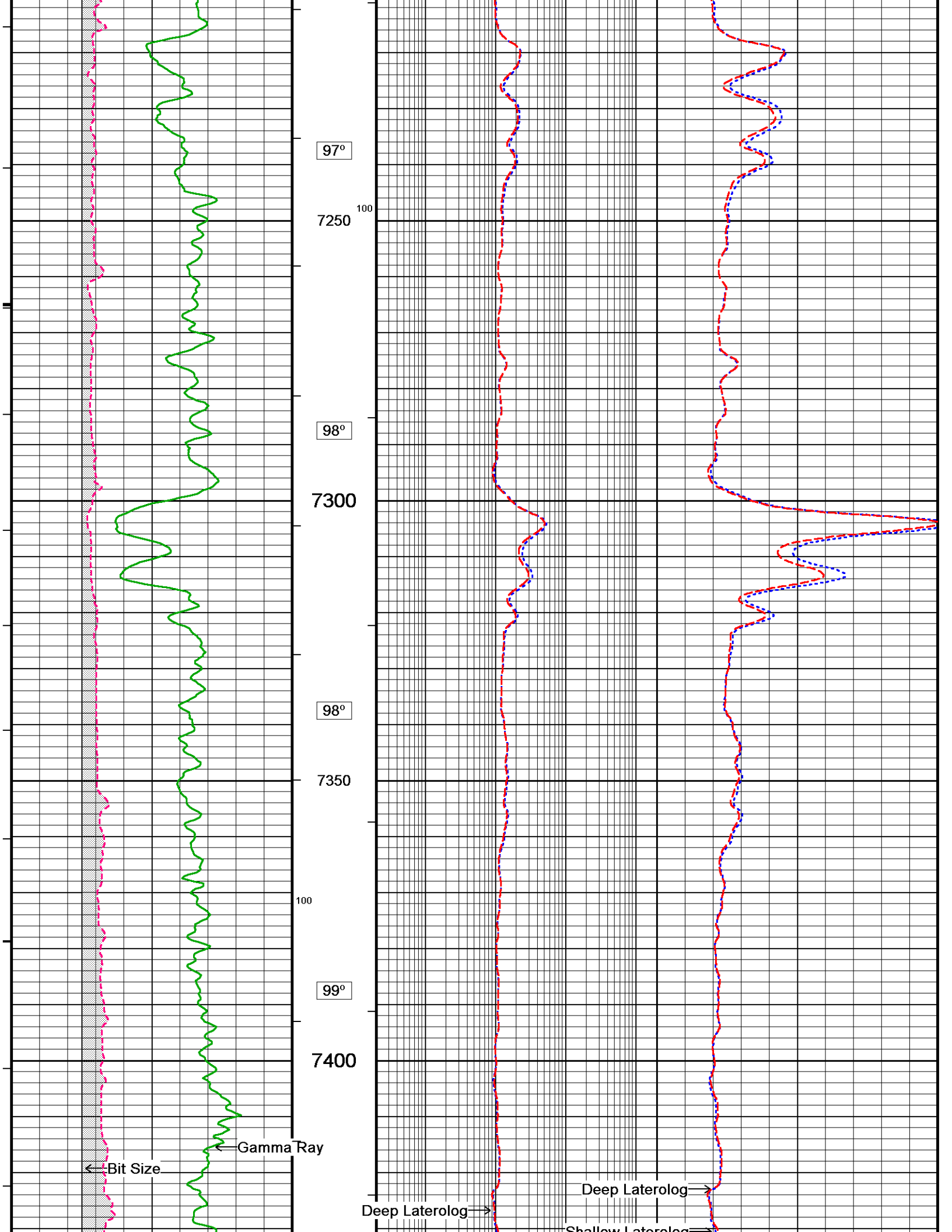


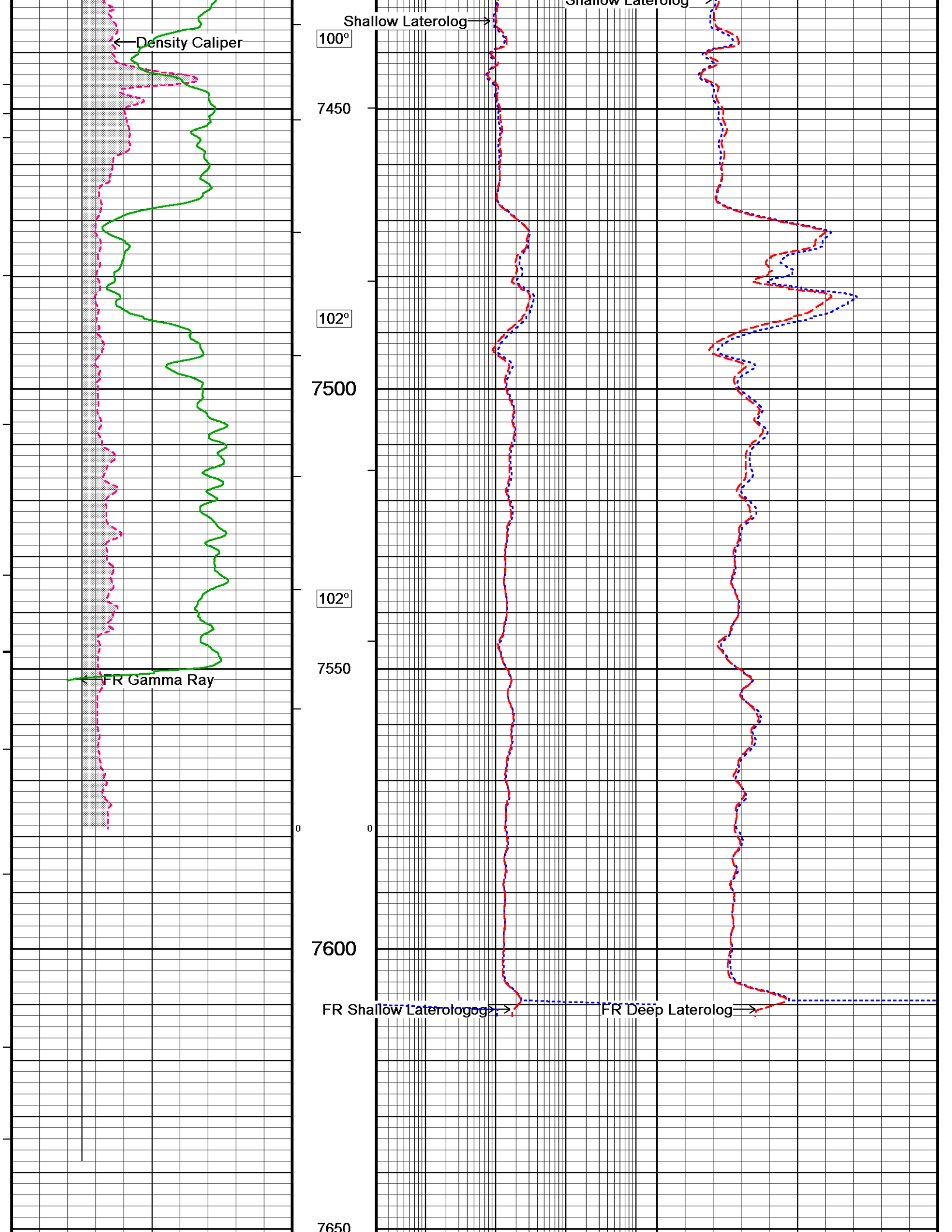


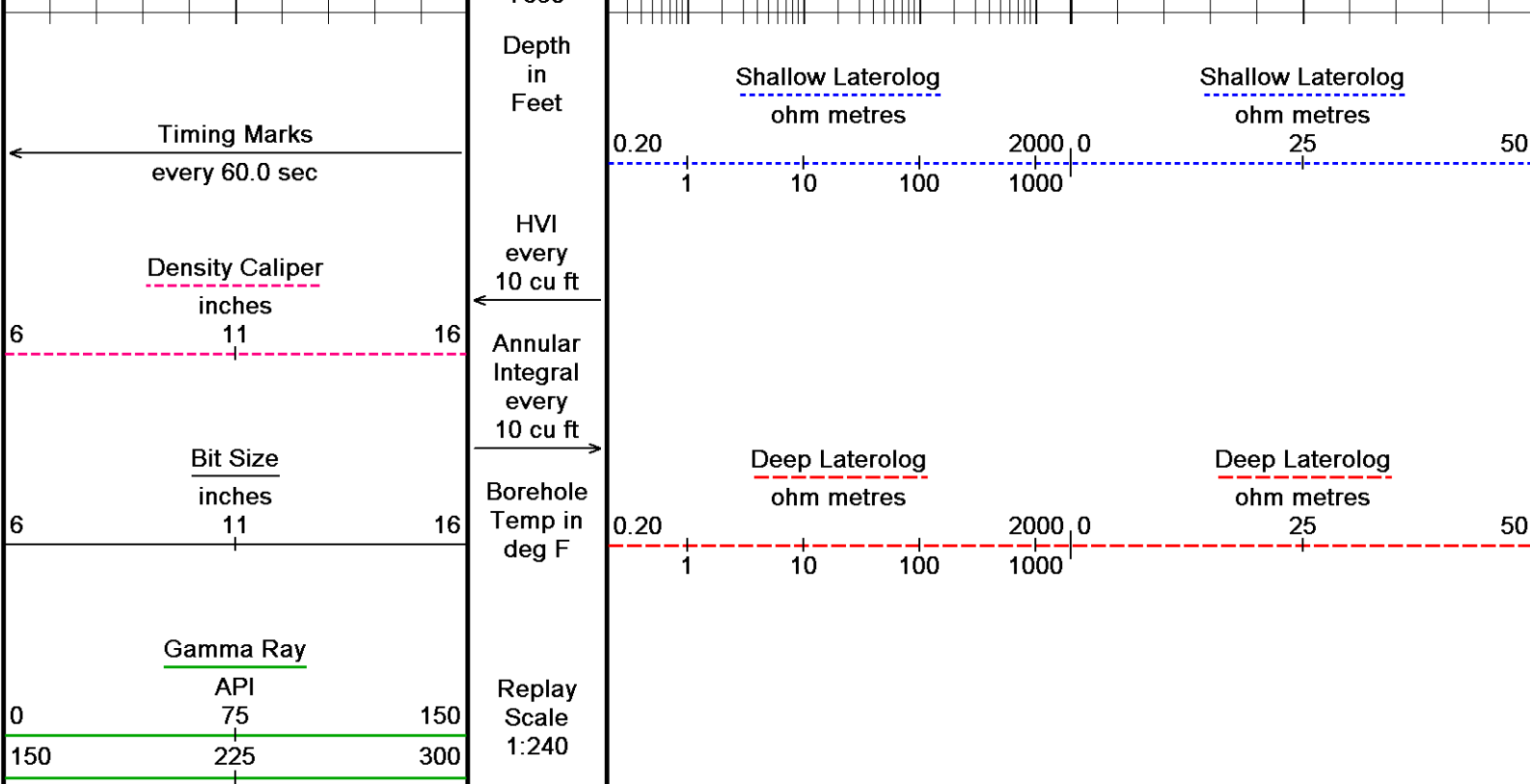












Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: D:\LOGS\PERUITALARA\LO6-CWS\LO6-31D-DSC-FINAL-HVOL-AVOL-COMPLETE.dta
 System Versions: Processed with 13.06.9801 Plotted with 13.06.9801

Plotted on 18-JUN-2013 11:04
 Recorded on 12-JUN-2013 19:52

MAIN PASS 1:240

BEFORE SURVEY CALIBRATION

D:\LOGS\PERUITALARA\LO6-CWS\porcess1.dta

General Constants All 000 Last Edited on 12-JUN-2013,22:12

General Parameters		
Mud Resistivity	0.150	ohm-metres
Mud Resistivity Temperature	70.000	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	None	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Gamma Calibration MCG-D.A 261			Field Calibration on 09-JUN-2013 13:39
	Measured	Calibrated (API)	
Background	72	48	
Calibrator (Gross)	931	616	
Calibrator (Net)	858	568	

Gamma Constants MCG-D.A 261 Last Edited on 12-JUN-2013,22:07

Gamma Calibrator Number			145
Mud Density	1.35	gm/cc	
Caliper Source for Processing	Density Caliper		

Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

High Resolution Temperature Calibration MCG-D.A 261			Field Calibration on 09-JUN-2013,13:05
	Measured	Calibrated(Deg F)	
Lower	10.00	10.00	
Upper	200.00	200.00	

High Resolution Temperature Constants MCG-D.A 261		Last Edited on 09-JUN-2013,13:05
Pre-filter Length	11	

Laterolog Calibration MLE-D.A 228				Base Calibration on 20-MAY-2013 17:20	
				Field Check on 11-JUN-2013 15:01	
Base Calibration					
		Measured		Calibrated (ohm-m)	
Channel	Resistor 1	Resistor 2	Resistor 1	Resistor 2	
Shallow	0.0	1010.4	0.0	1284.6	
Deep	0.0	1010.4	0.0	747.1	
Groningen	0.0	1010.3	0.0	796.8	
Channel	Base Check (ohm-m)		Field Check (ohm-m)		
Shallow	45.7		45.7		
Deep	26.6		26.6		
Groningen	226.9		226.9		

Laterolog Constants MLE-D.A 228		Last Edited on 12-JUN-2013,19:44
Squasher Start	40000	ohm-m
Shallow Laterolog K Factor	1.2846	
Deep Laterolog K Factor	0.7471	
Groningen Laterolog K Factor	0.7968	
Interference Rejection	50 Hz	
SP Connection	SP Bridle Electrode (Lower)	
Groningen Connection	Groningen Electrode (Upper)	
Borehole Correction Constants		
Bridle Type	Shuttle	
Stand-off	0.50	inches
Caliper Source	Density Caliper	
Hole Size	N/A	inches
Mud Resistivity Source	Temperature Corrected	
Temp. for Rm Corr.	MCG External Temperature	
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 197		Base Calibration on 09-JUN-2013 17:47
		Field Calibration on 11-JUN-2013 16:26
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	16640	3.98
2	26014	5.96
3	36160	7.99
4	45792	9.86
5	56928	11.93
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.97	7.99

Logging Parameters

Firmware Version	3v18	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	60.0	seconds
Pulse Duration Status Pulse From	20.0	seconds
Pulse Duration Caliper Close From	145.0	seconds
Pulse Duration Caliper Open From	150.0	seconds
Pulse Duration Release Pulse From	215.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	141.0	seconds
Pulse Pressure Discriminator	314.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	18732.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	80.0	seconds
Caliper Close To		seconds
Caliper Open To	210.0	seconds

Configuration

MCG,MDN,MPD,MPD,MLE,MAI

COMPANY SAVIA PERU S.A
WELL LO6-31D
FIELD LOBITOS OFFSHORE
PROVINCE/COUNTY PIURA
COUNTRY/STATE PERU

Elevation Kelly Bushing	50.00	feet	First Reading	7611.00	feet
Elevation Drill Floor	50.00	feet	Depth Driller	7668.00	feet
Elevation Ground Level	335.00	feet	Depth Logger	7638.60	feet



RESISTIVITY LOG

MCG-MDL

SCALE 5":100 LOGARITHMIC

Weatherford®