



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

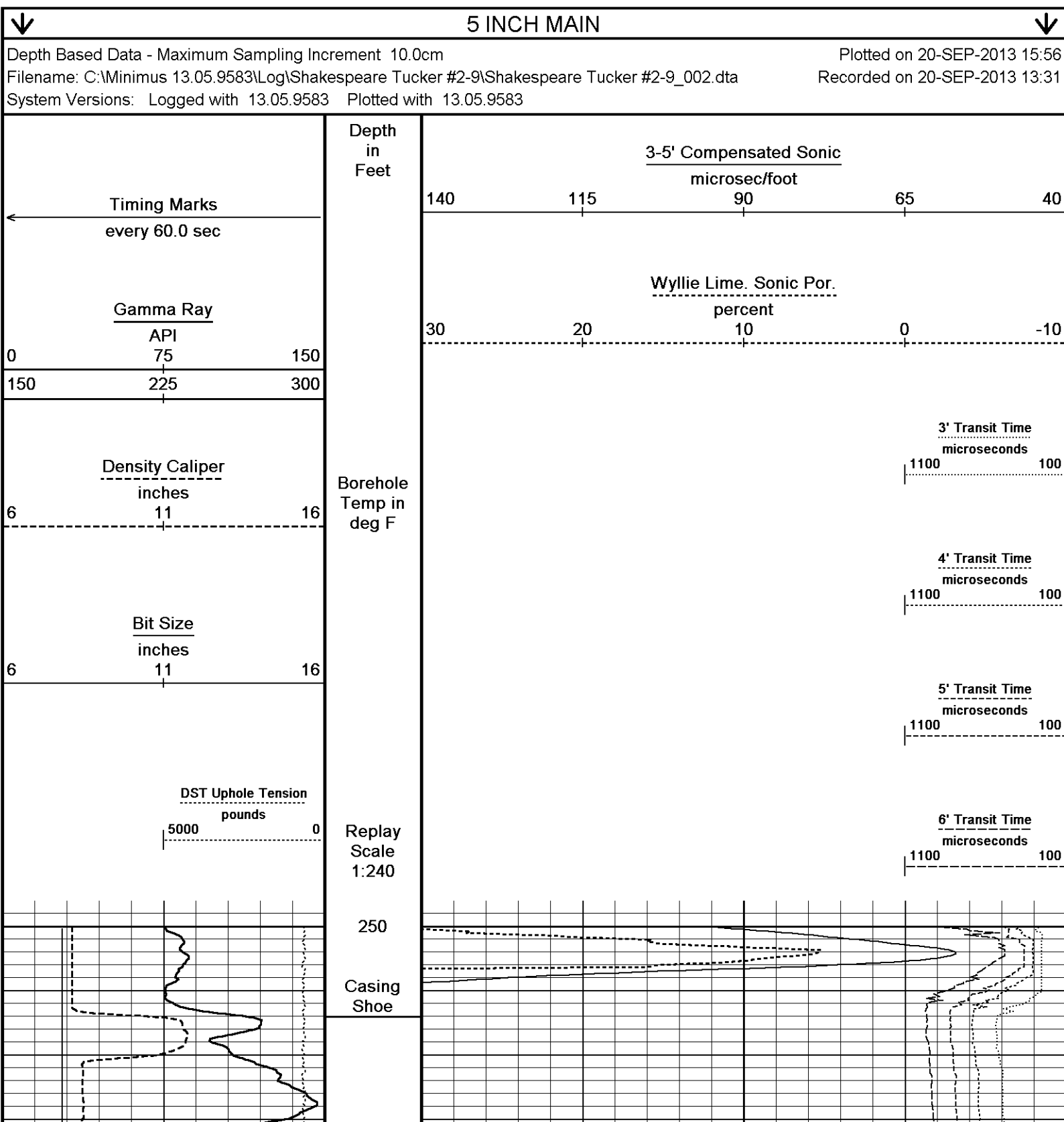
COMPANY				SHAKESPEARE OIL INC.			
WELL				TUCKER #2-9			
FIELD				WILDCAT			
PROVINCE/COUNTY				SCOTT			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				2216' FSL & 1695' FWL			
SEC	TWP	RGE	Other Services				
9	16S	34W	MPD/MDN				
API Number	15-171-20973		MAI/MFE				
Permit Number			MML				
Permanent Datum G.L., Elevation 3139 feet							Elevations:
Log Measured From KB							KB 3149.00
Drilling Measured From K.B. @ 10FEET							DF 3147.00
							GL 3139.00
Date	20-SEP-2013						
Run Number	ONE						
Service Order	3541087						
Depth Driller	4865.00		feet				
Depth Logger	4862.00		feet				
First Reading	4849.00		feet				
Last Reading	264.00		feet				
Casing Driller	260.00		feet				
Casing Logger	264.00		feet				
Bit Size	7.875		inches				
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.30 lb/USg		52.00 CP				
PH / Fluid Loss	10.00		8.80 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.72 @ 81.0		ohm-m				
Rmf @ Measured Temp	0.58 @ 81.0		ohm-m				
Rmc @ Measured Temp	0.86 @ 81.0		ohm-m				
Source Rmf / Rmc	CALC	CALC					
Rm @ BHT	0.53 @111.0		ohm-m				
Time Since Circulation	3 HOURS						
Max Recorded Temp	111.00		deg F				
Equipment / Base	13096		LIB				
Recorded By	ROB HOFFMAN						
Witnessed By	TIM PRIEST						
JOB #	LB13-266						

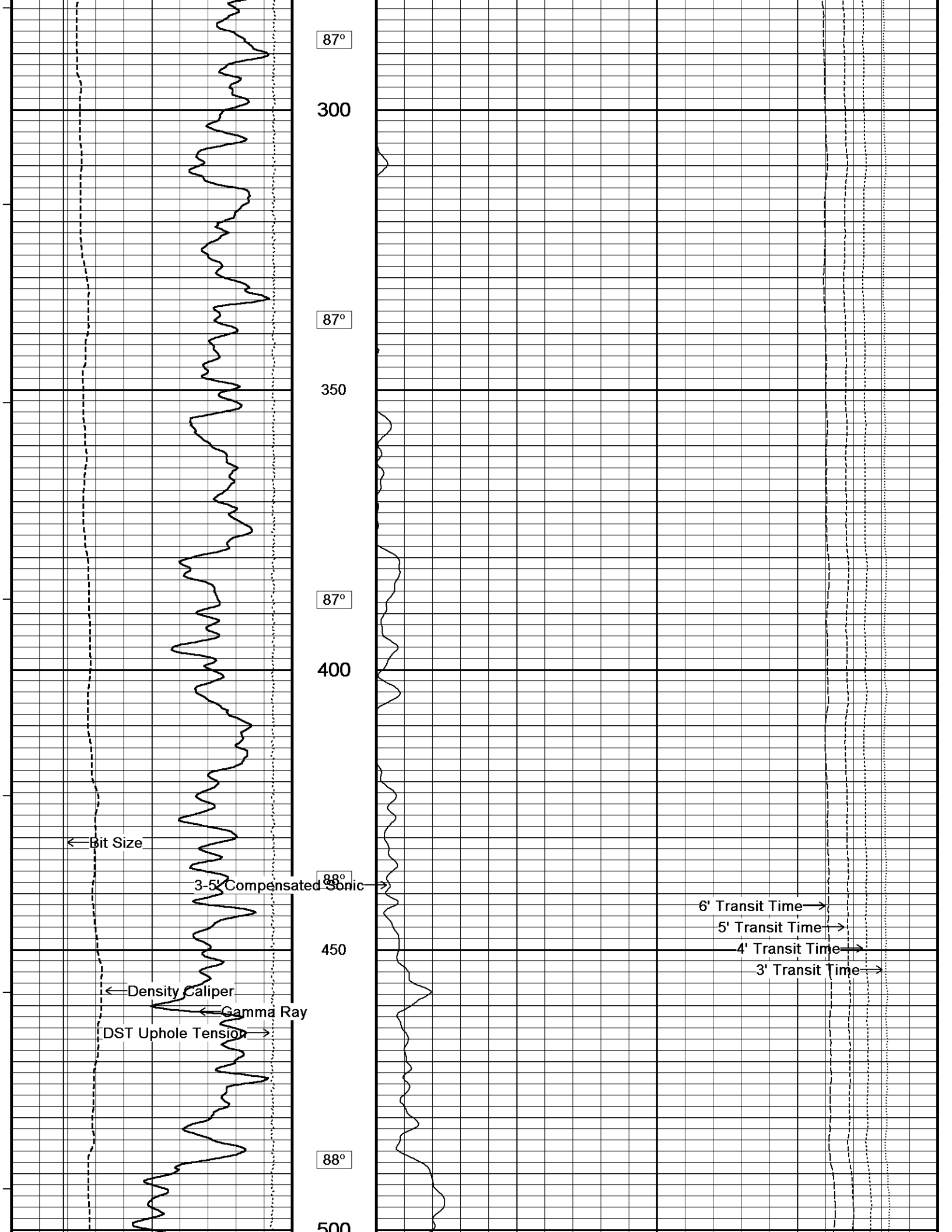
BOREHOLE RECORD				Last Edited: 20-SEP-2013 11:51
Bit Size inches		Depth From feet		Depth To feet
7.875		260.00		4865.00
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	260.00	24.00

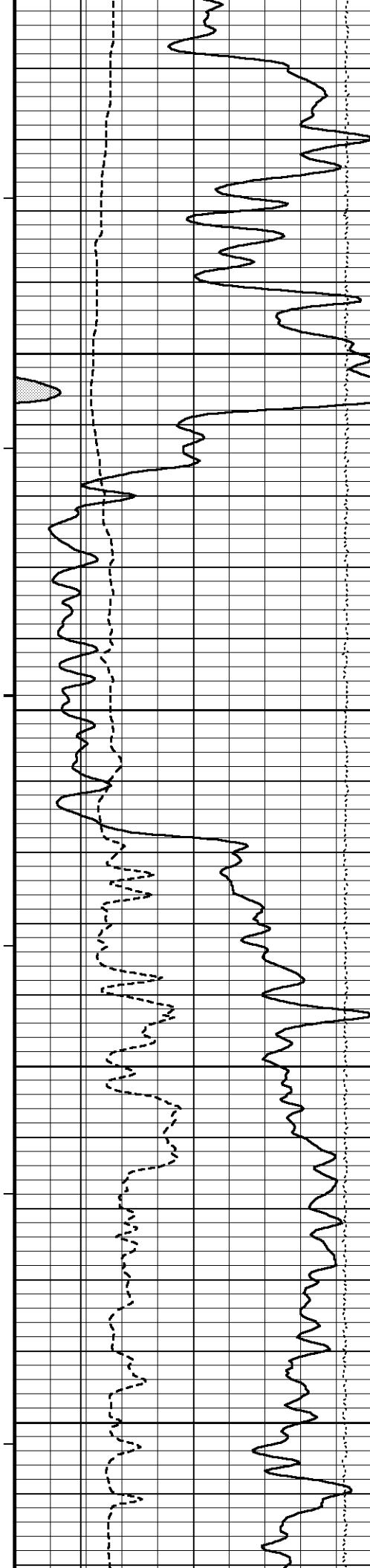
REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 2262 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 3800 FEET: 279 CU. FT.

- OPERATOR(S): K. RINEHART, D. CANADAY

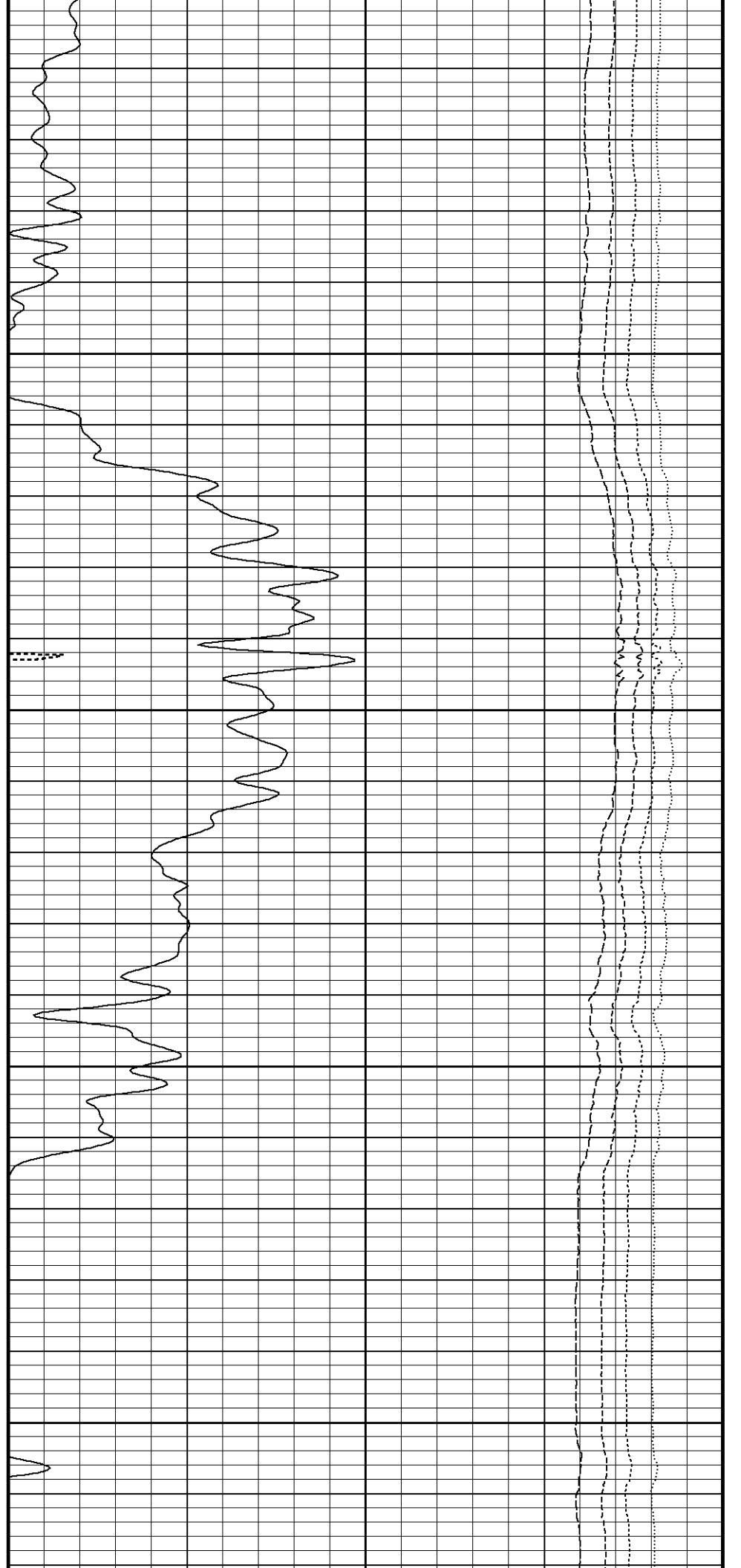
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

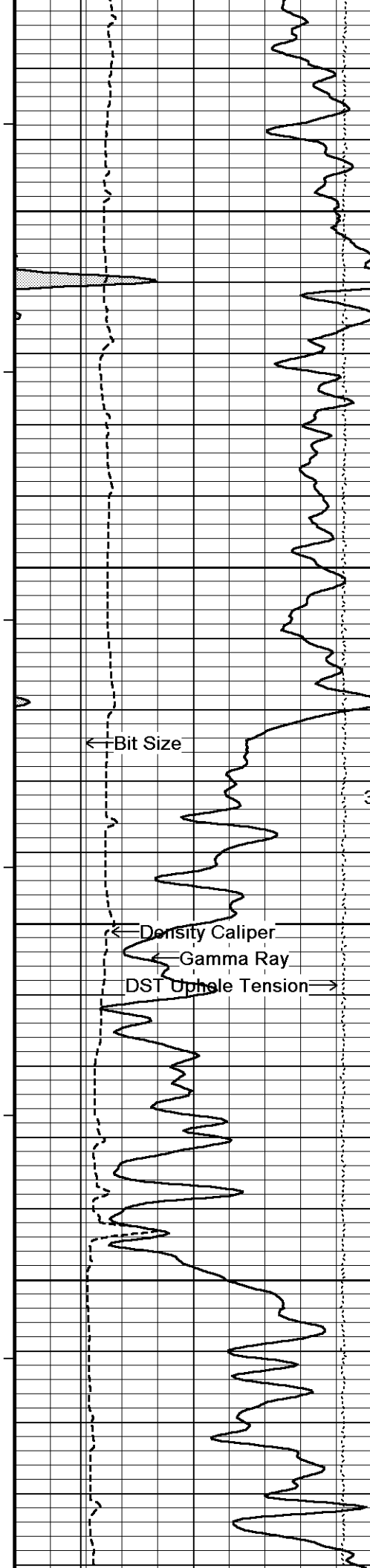






500
88°
550
89°
600
89°
650
90°
700





91°

750

91°

800

3-5' Compensated Sonic

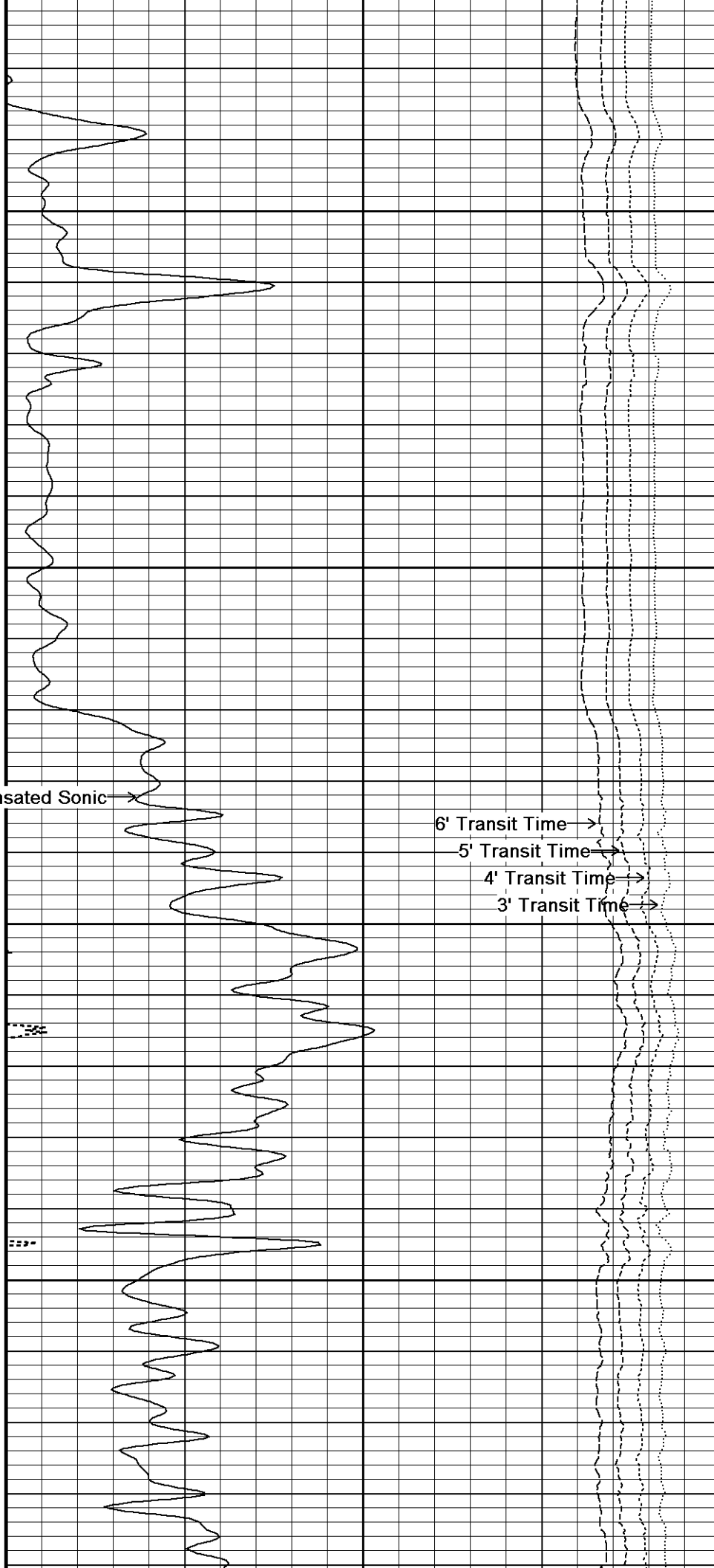
91°

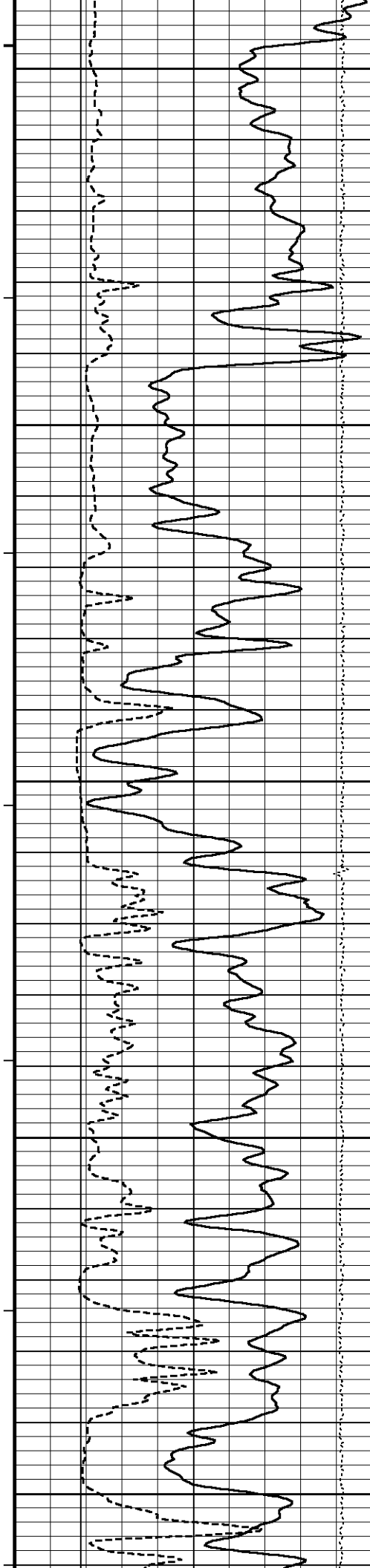
850

91°

900

92°





950

92°

1000

93°

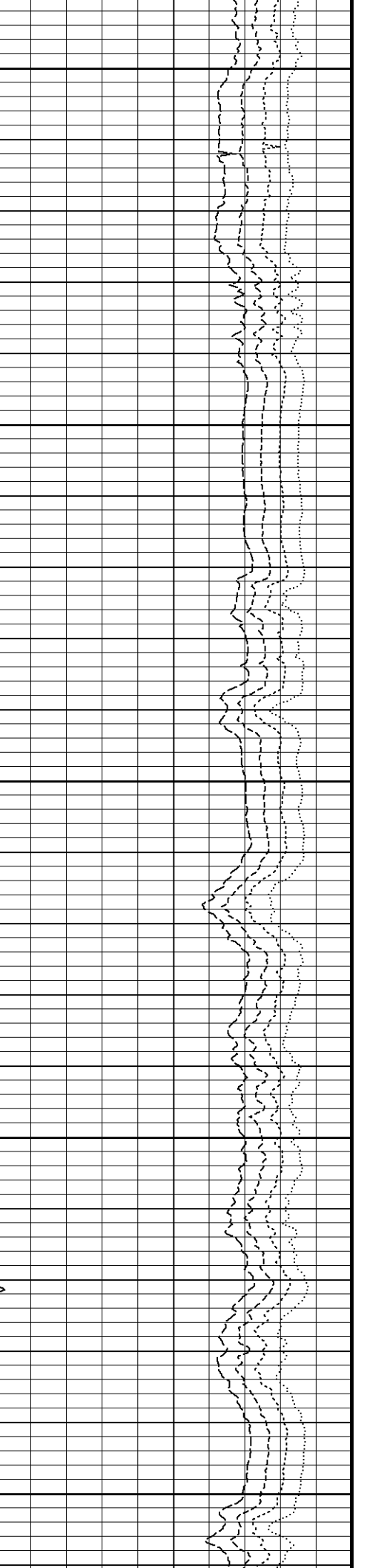
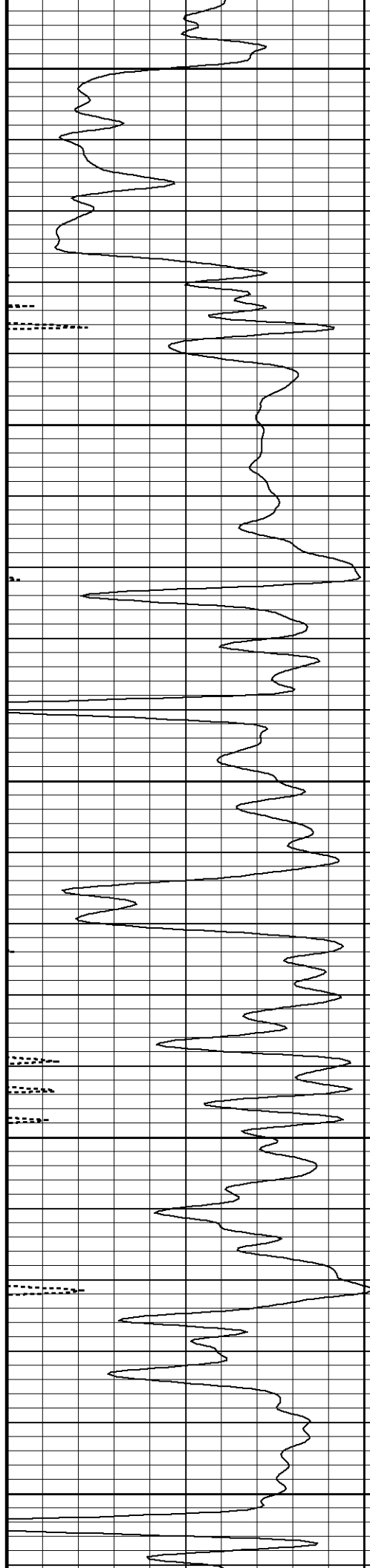
1050

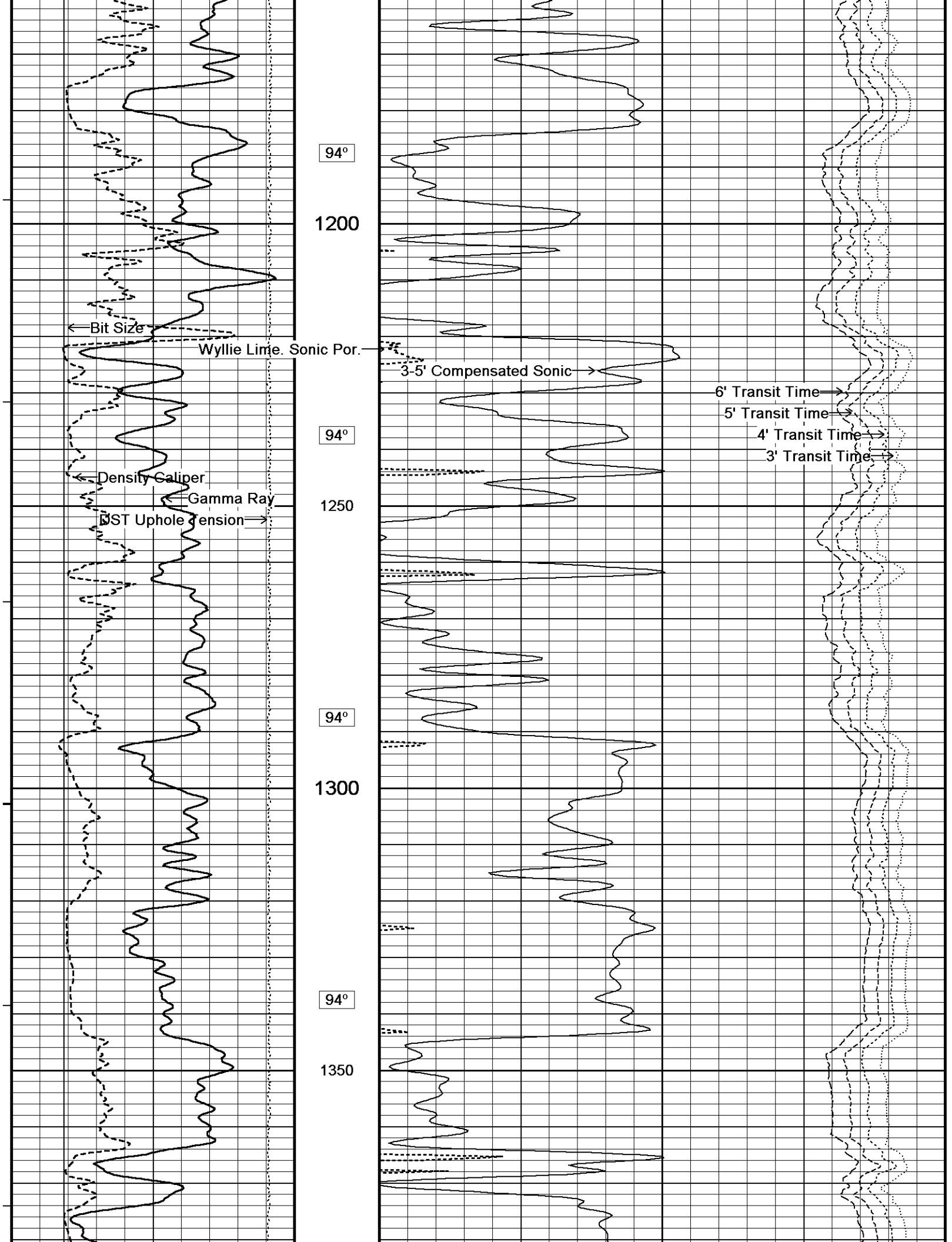
93°

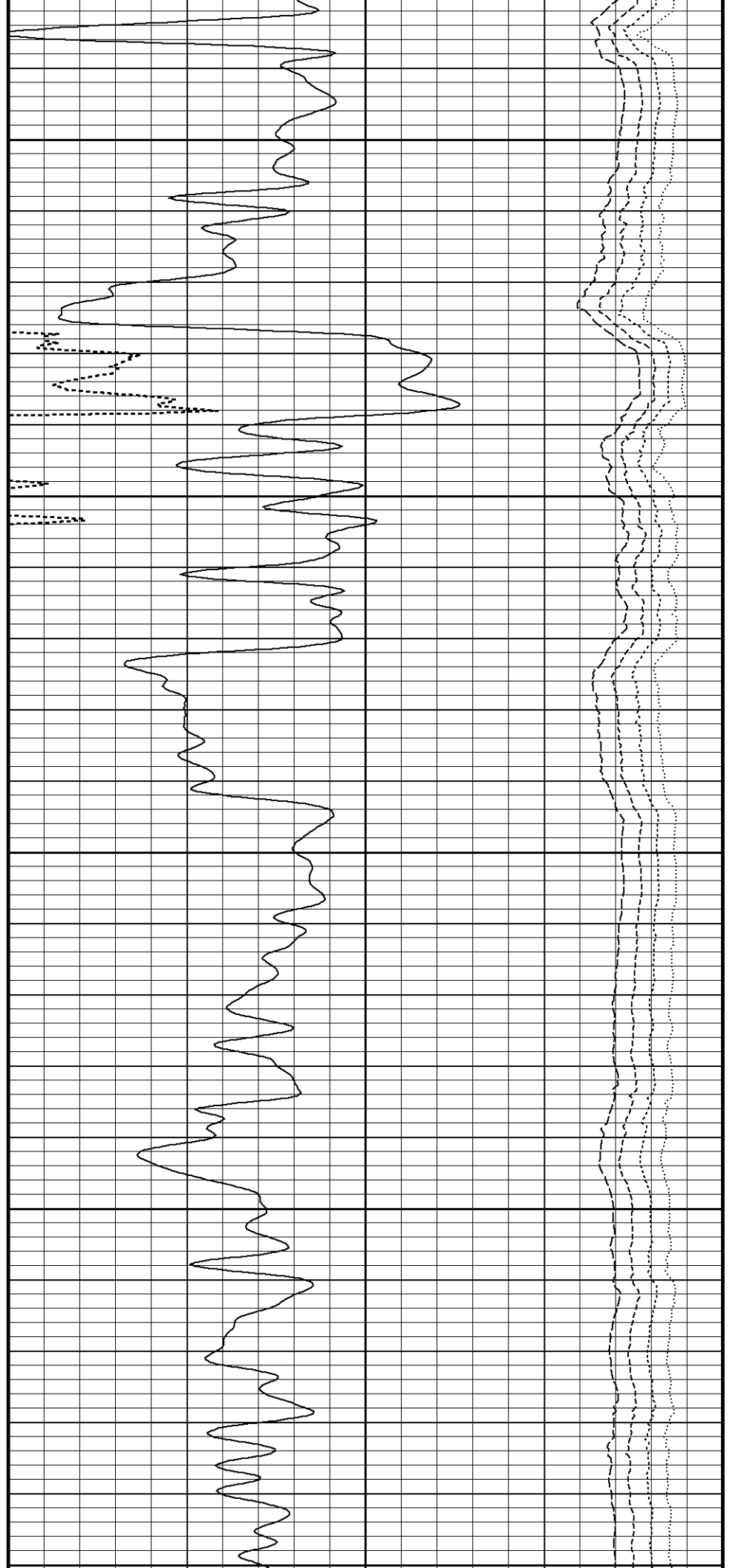
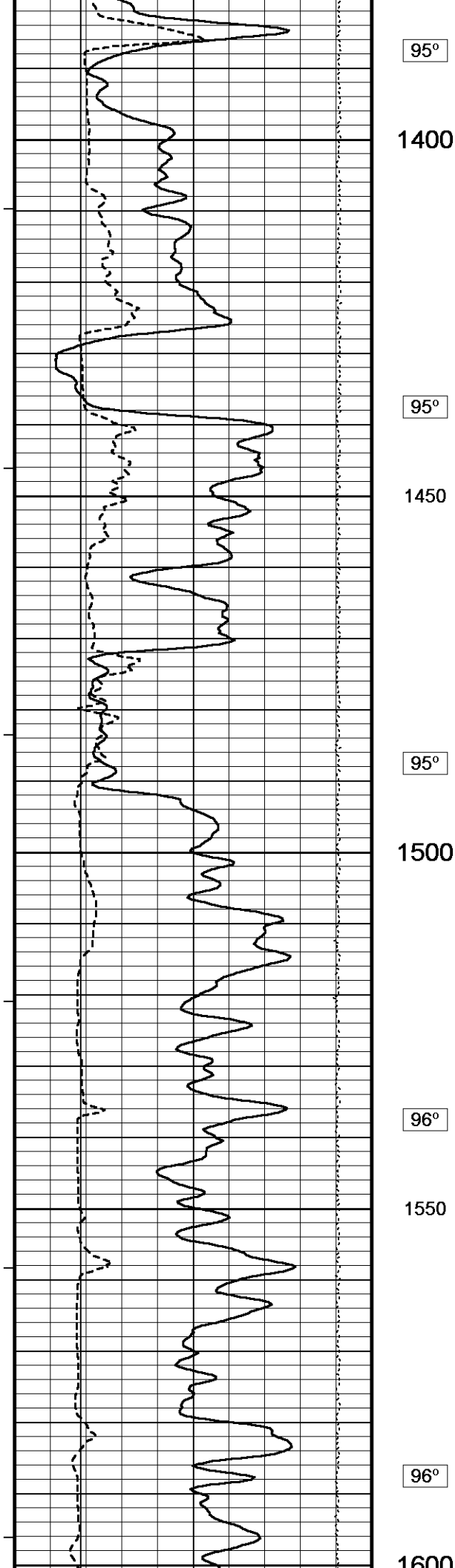
1100

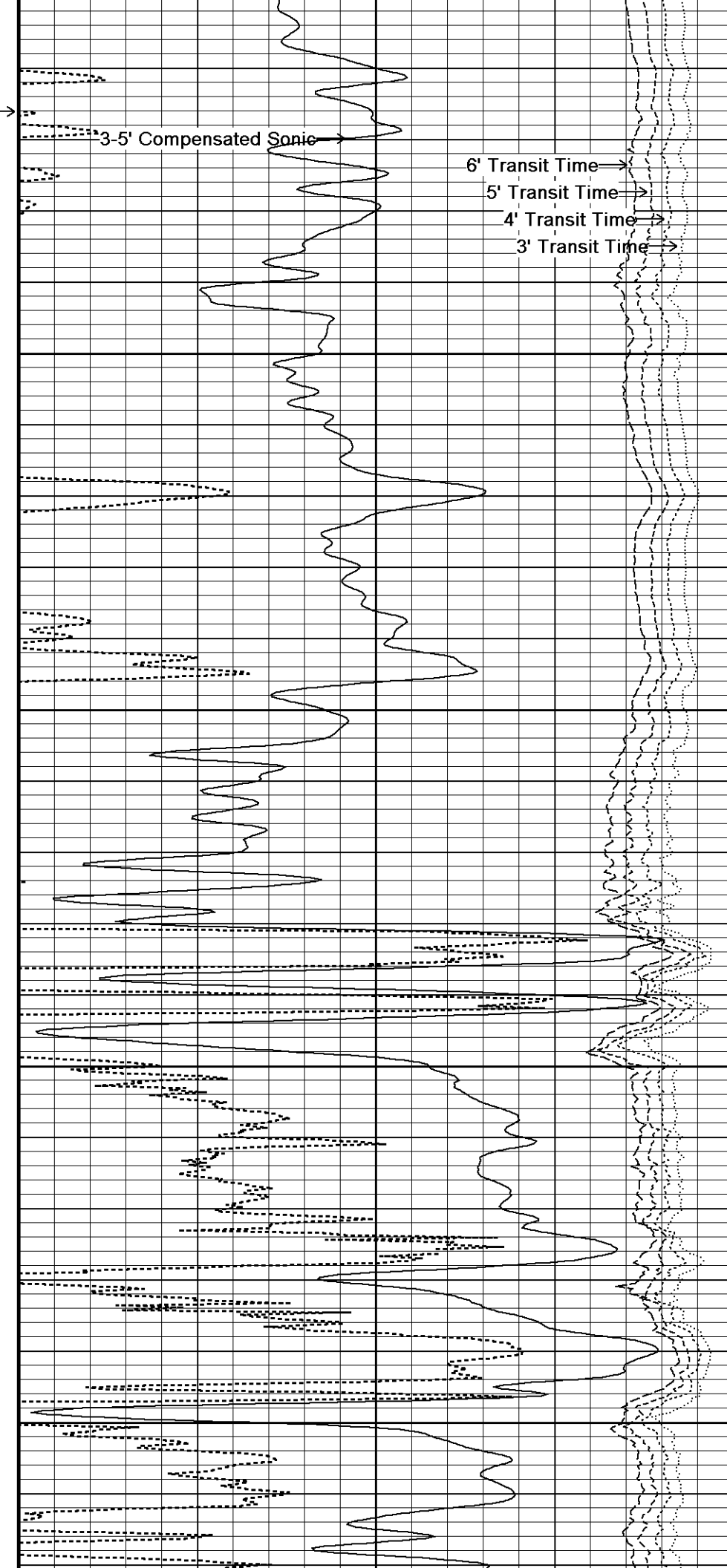
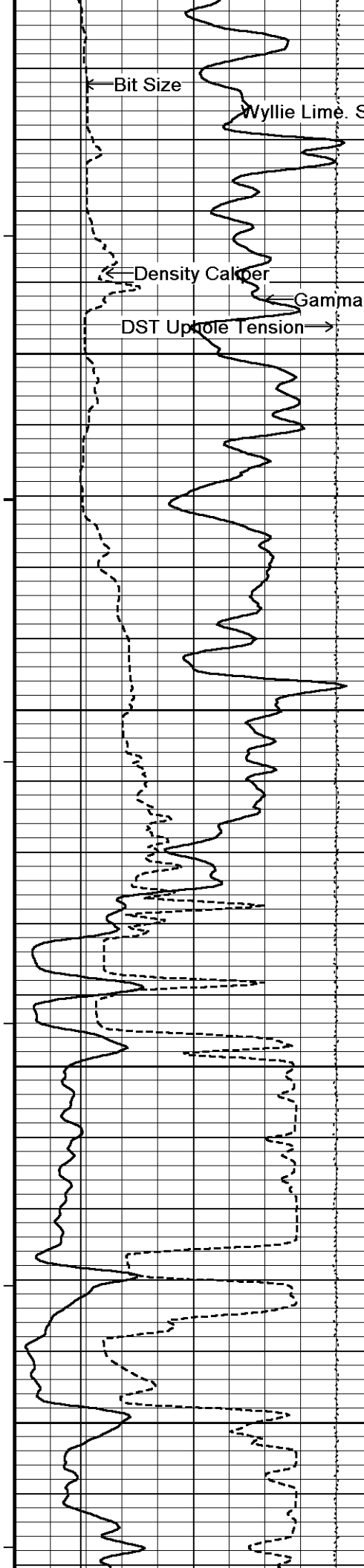
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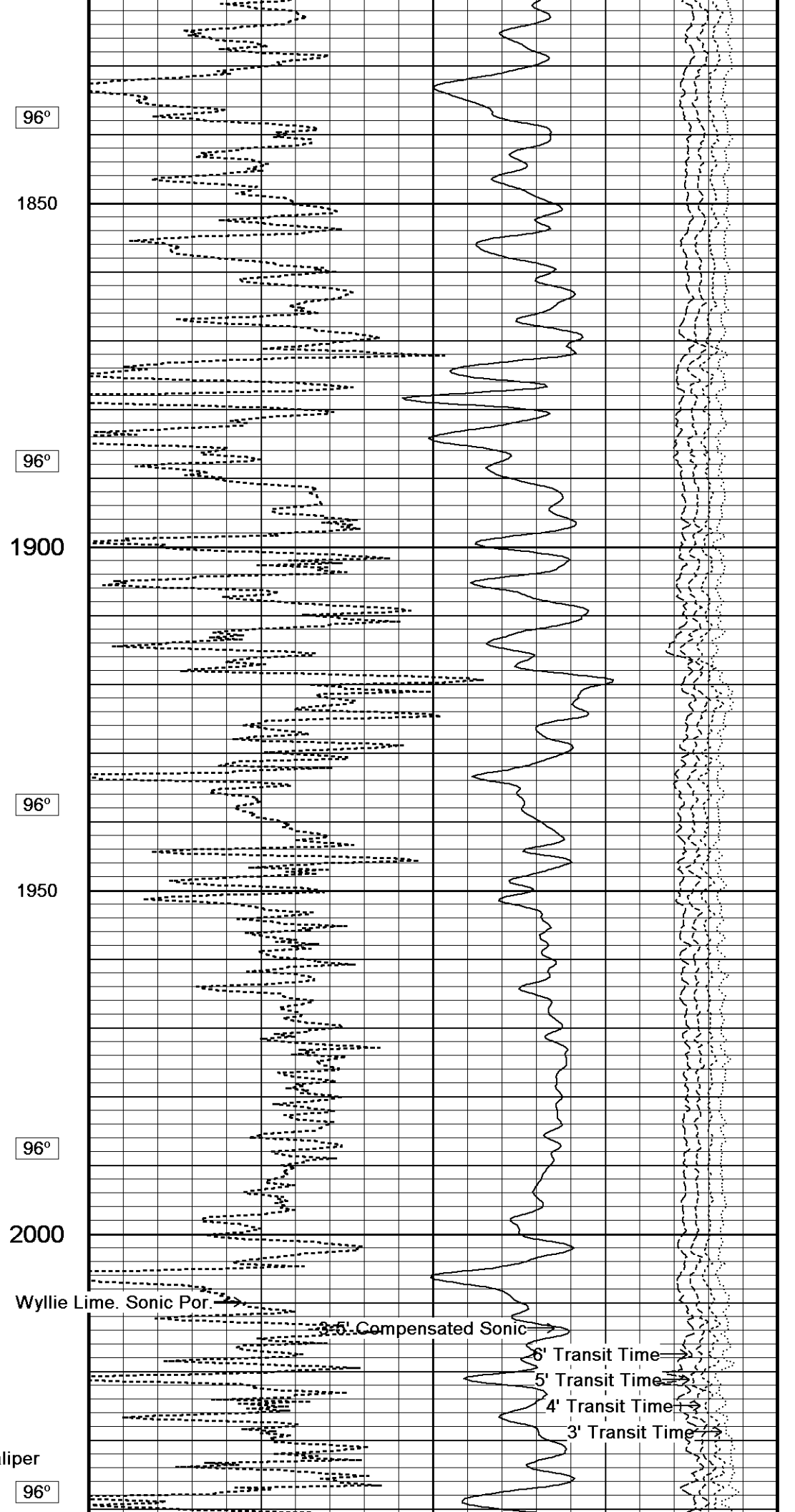
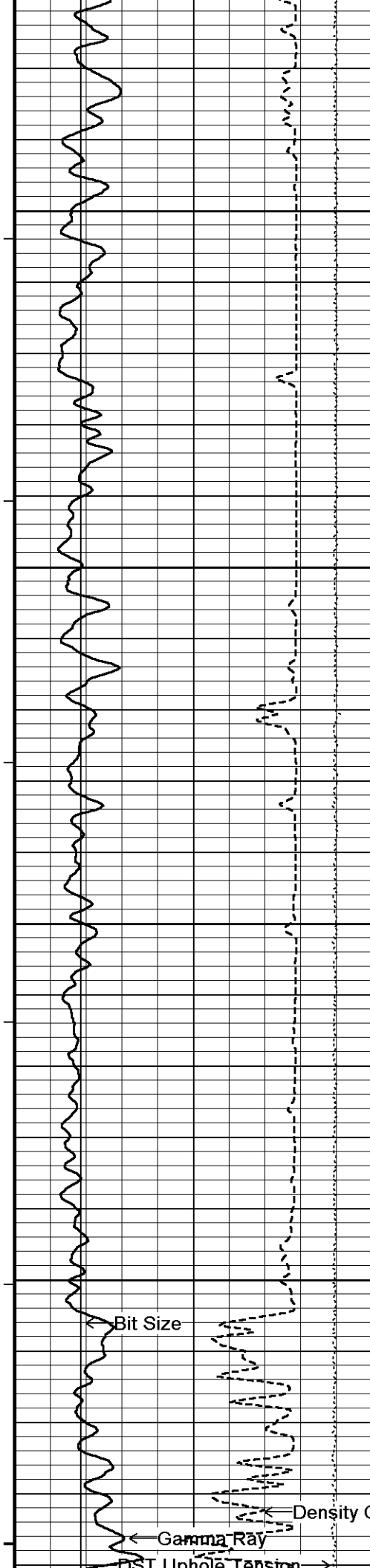
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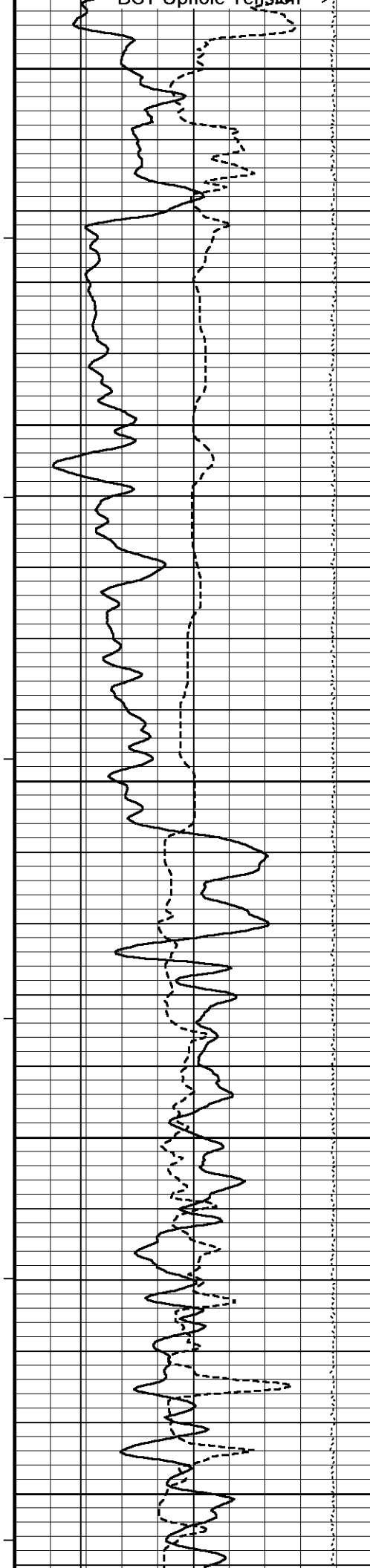












2050

96°

2100

96°

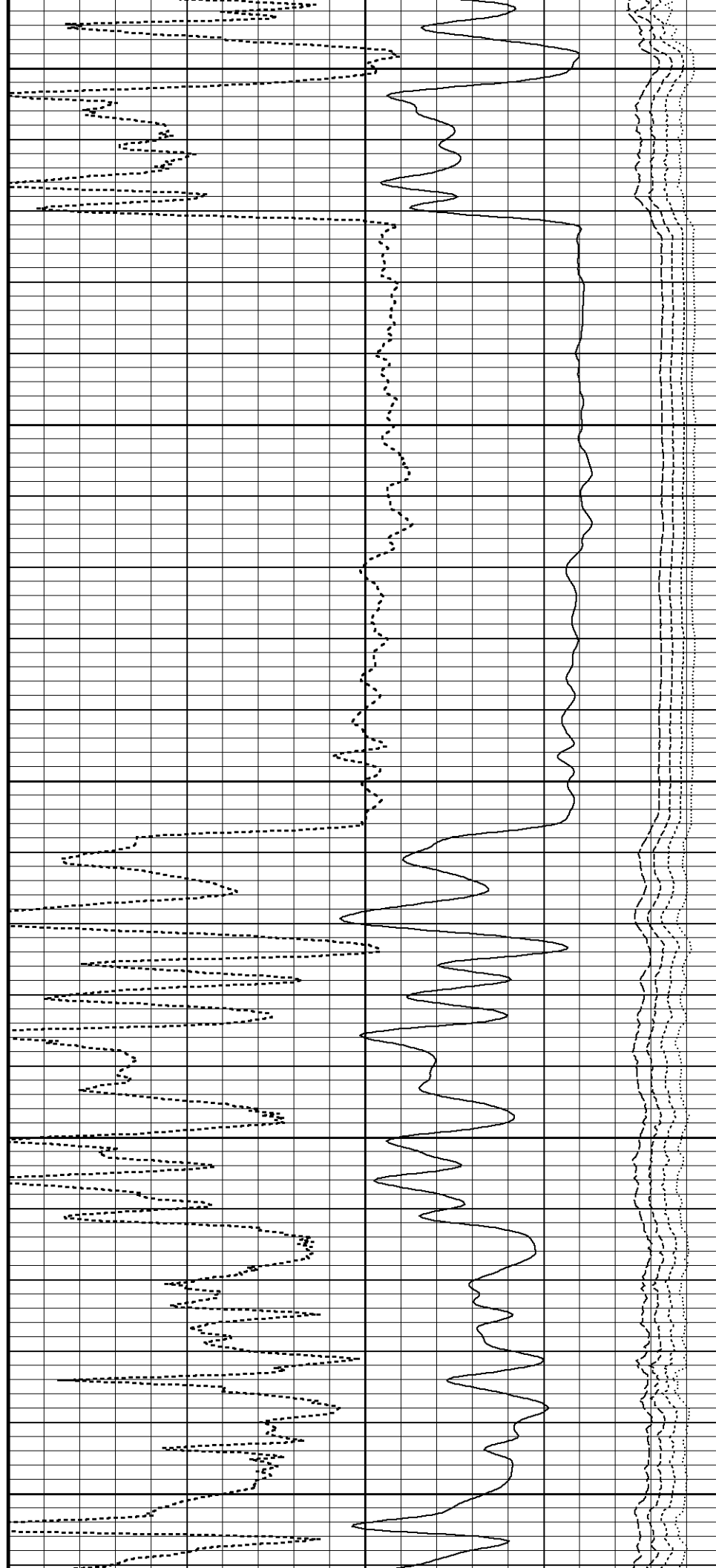
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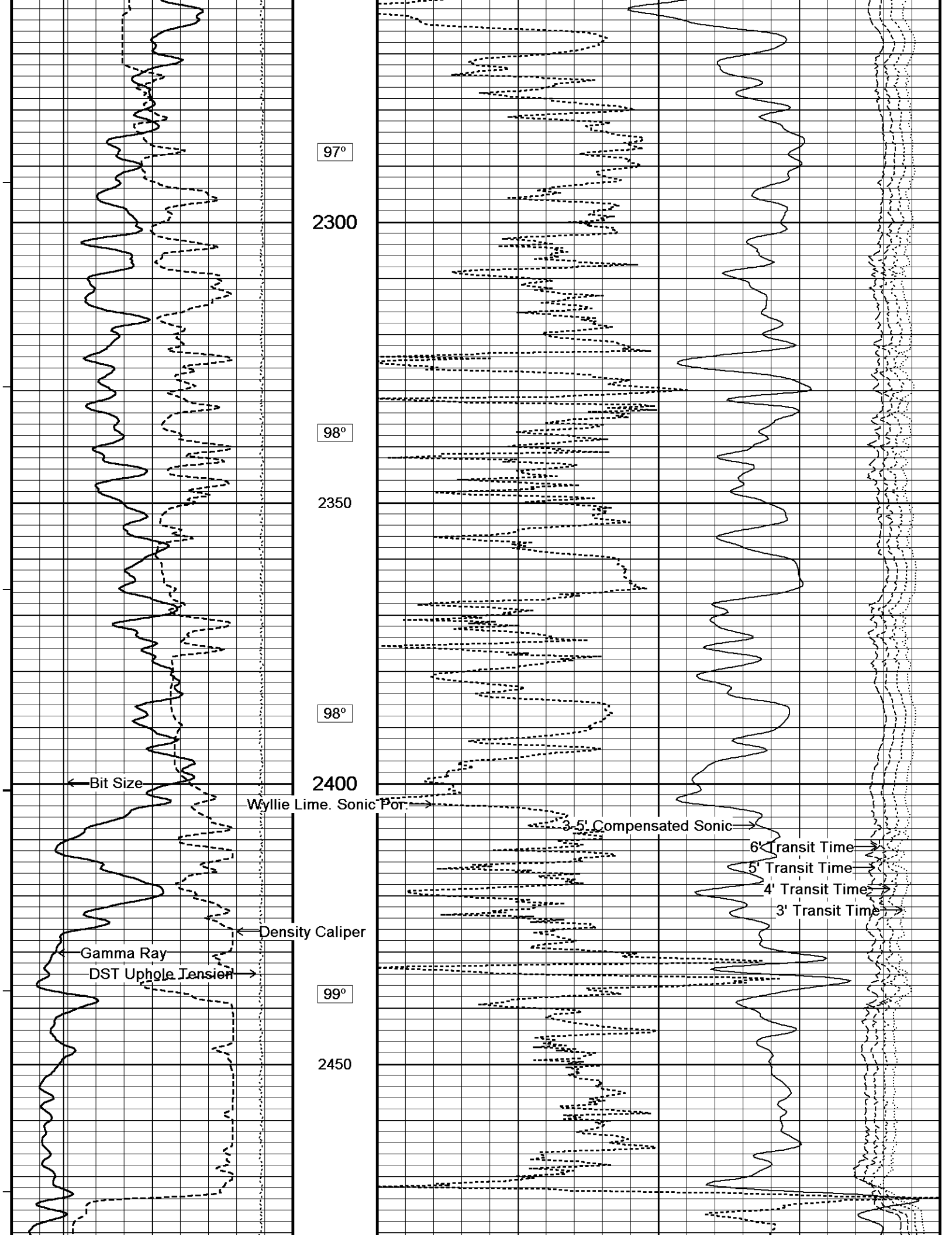
97°

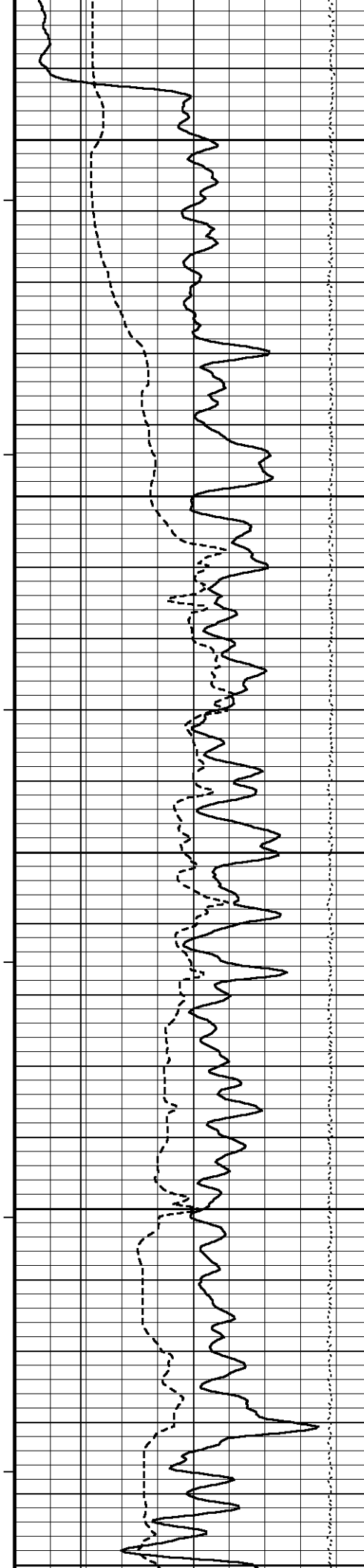
2200

97°

2250







99°

2500

99°

2550

99°

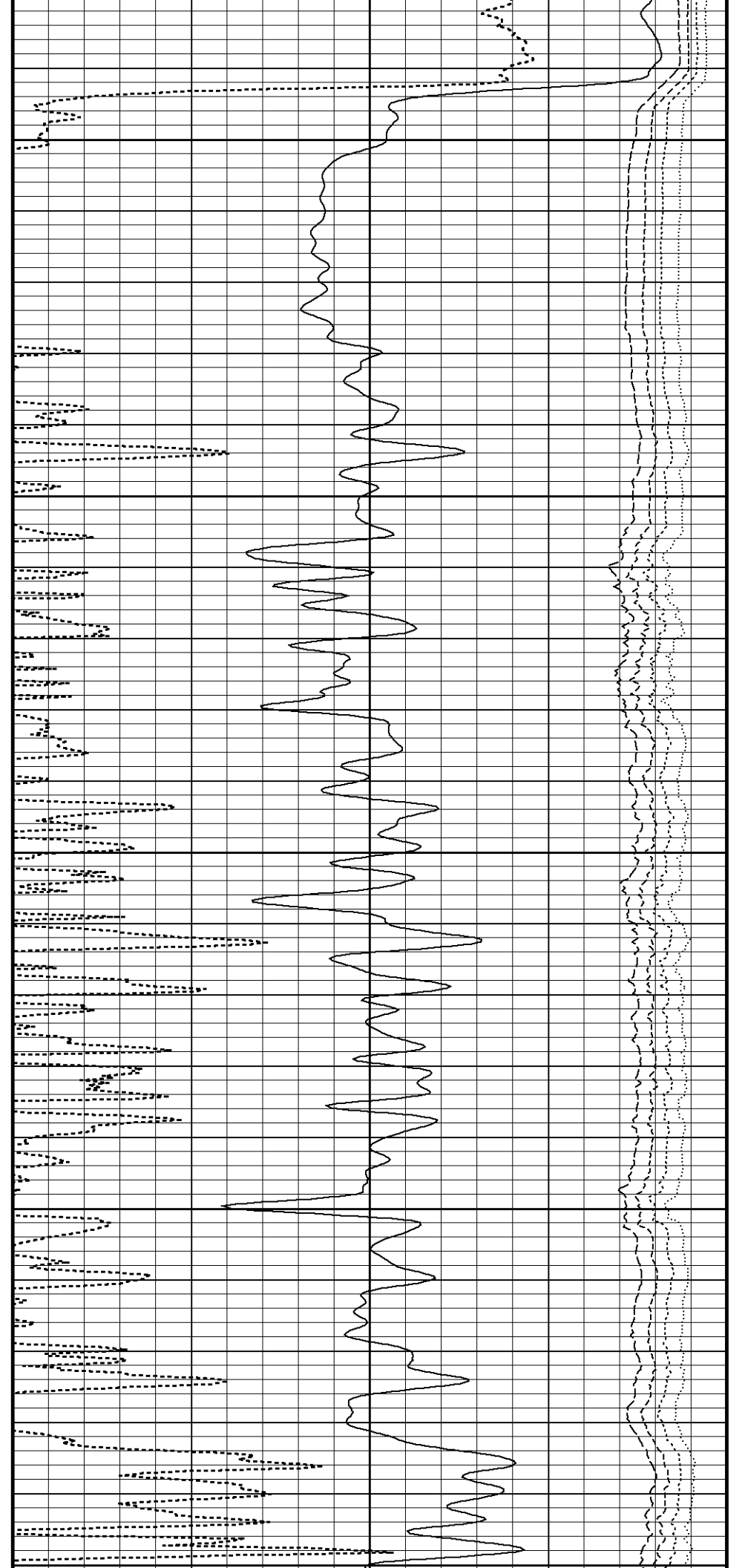
2600

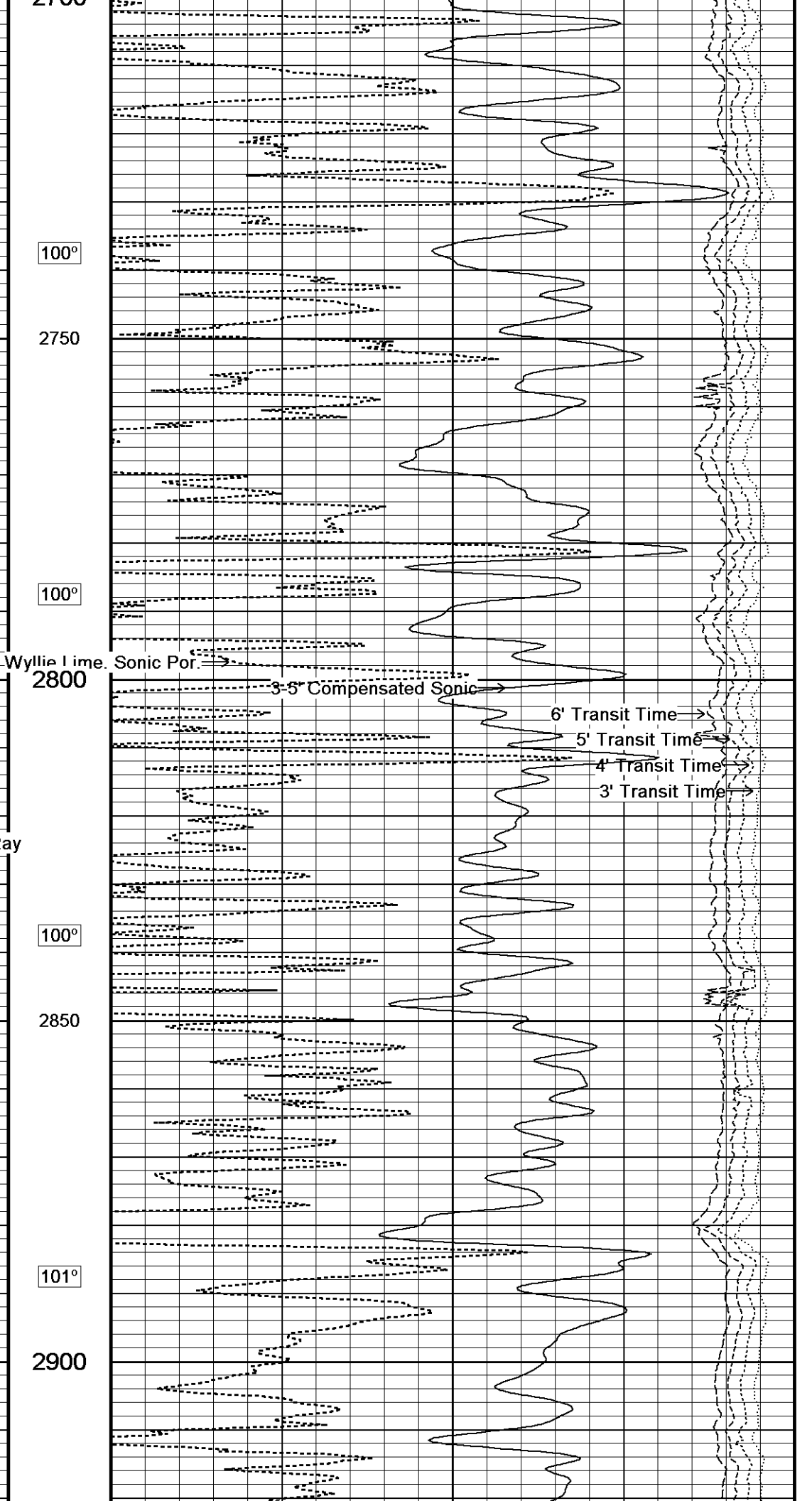
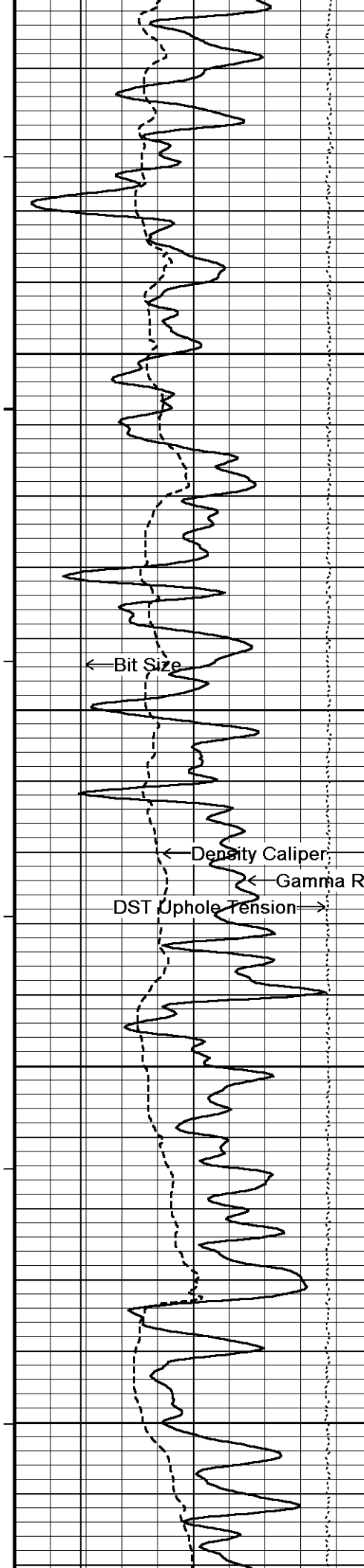
99°

2650

99°

2700





100°

2750

100°

2800

100°

2850

101°

2900

← Bit Size

← Density Caliper

← Gamma Ray

DST Uphole Tension →

Wyllie Time. Sonic Por. →

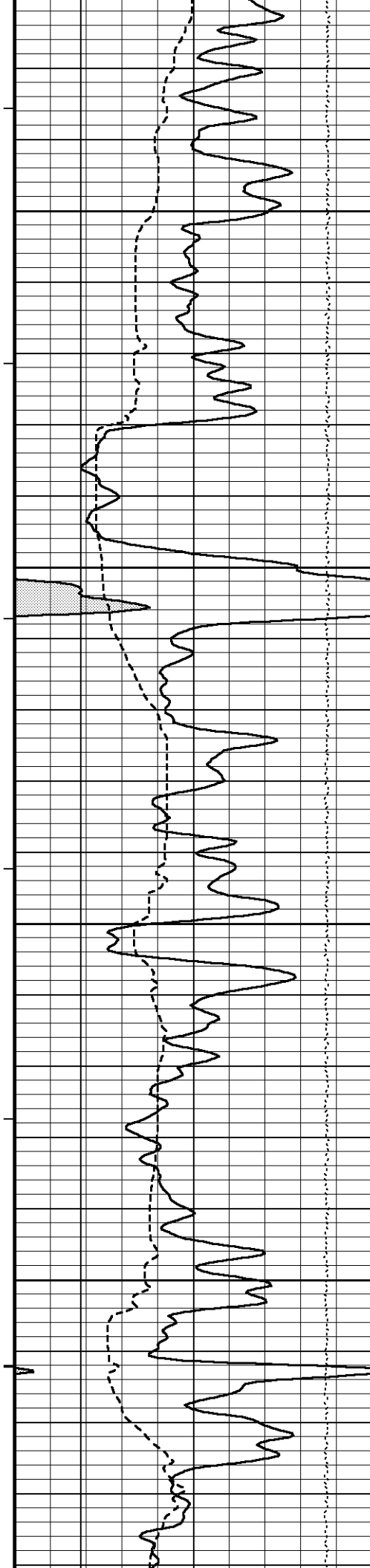
3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →



101°

2950

101°

3000

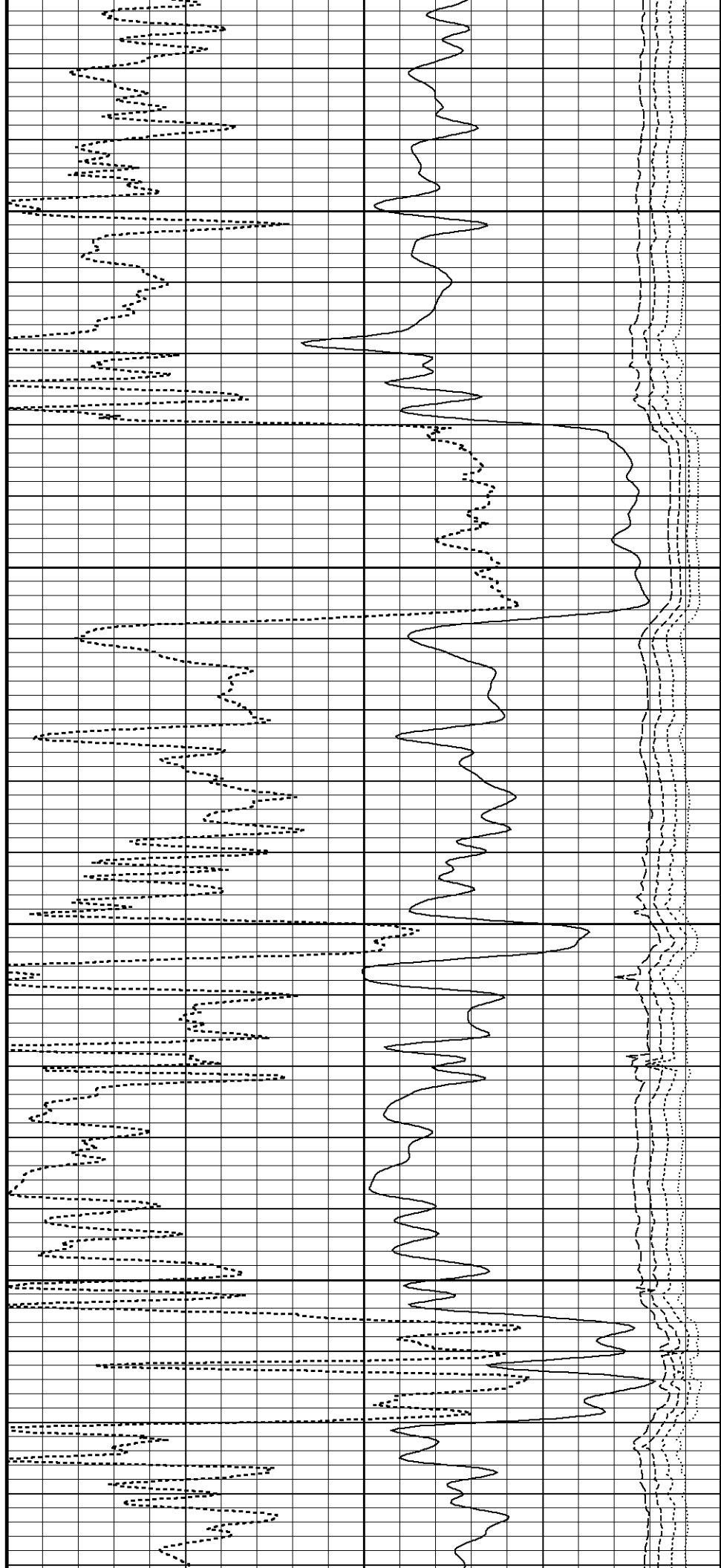
102°

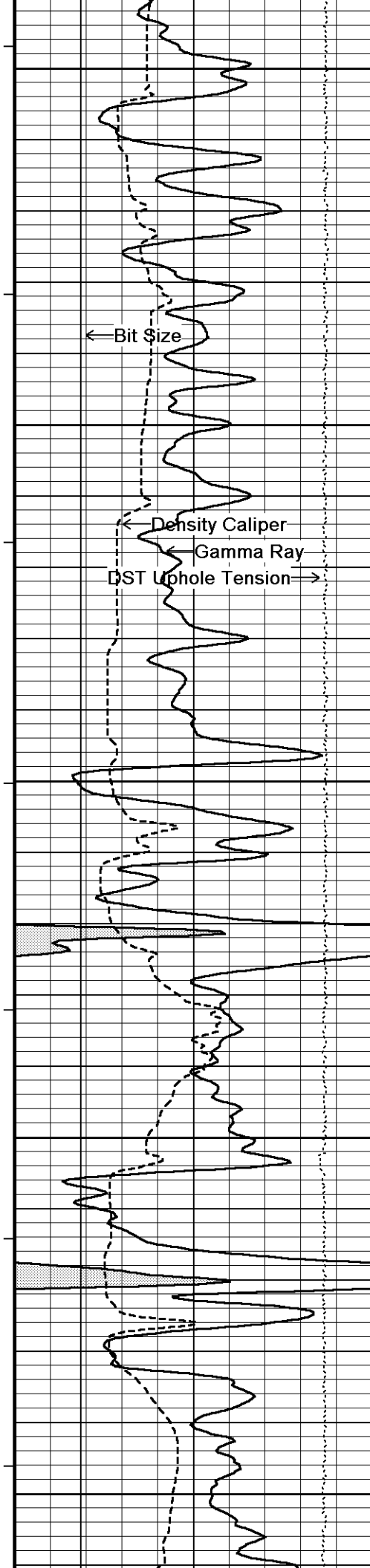
3050

102°

3100

102°





3150

102°

3200

102°

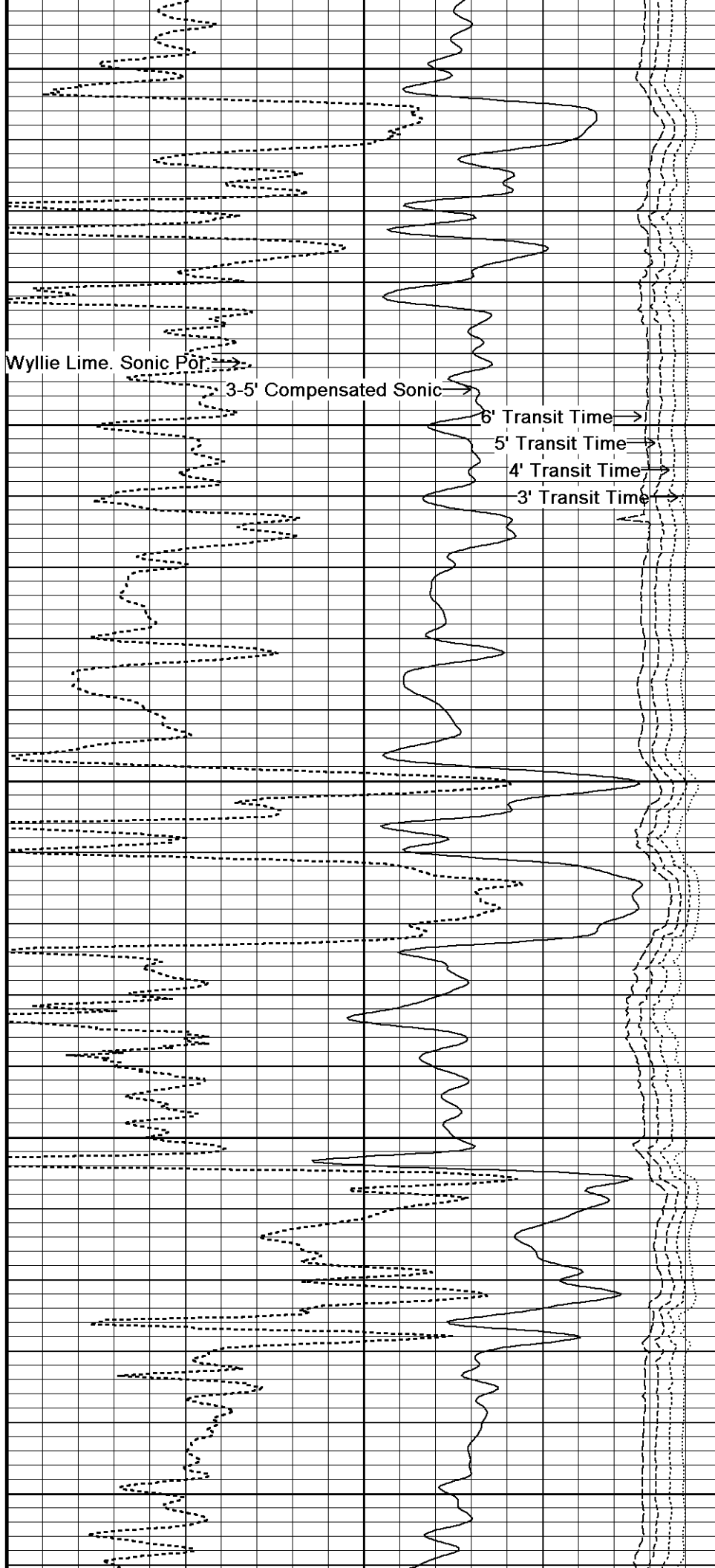
3250

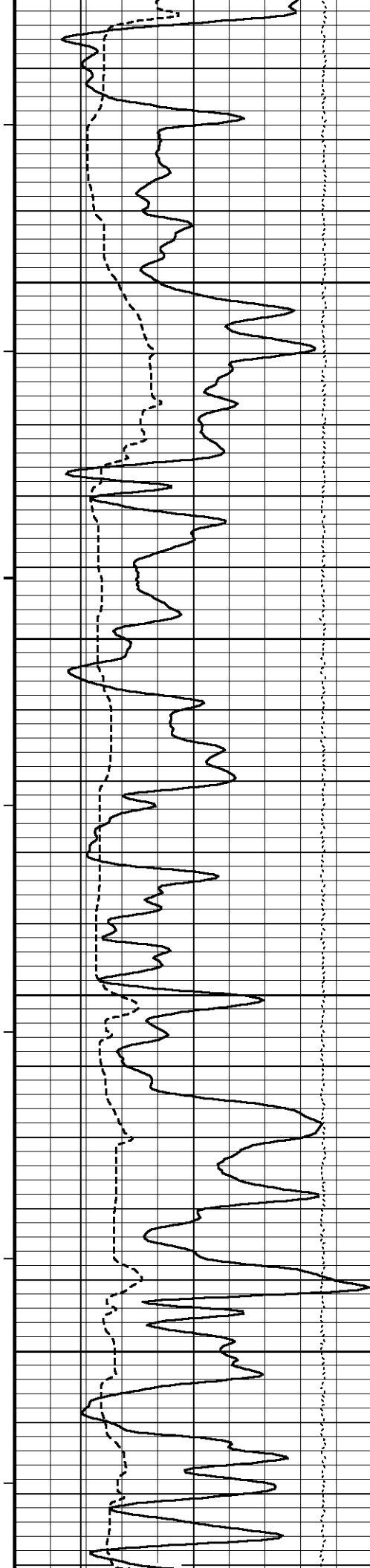
102°

3300

103°

3350





103°

3400

103°

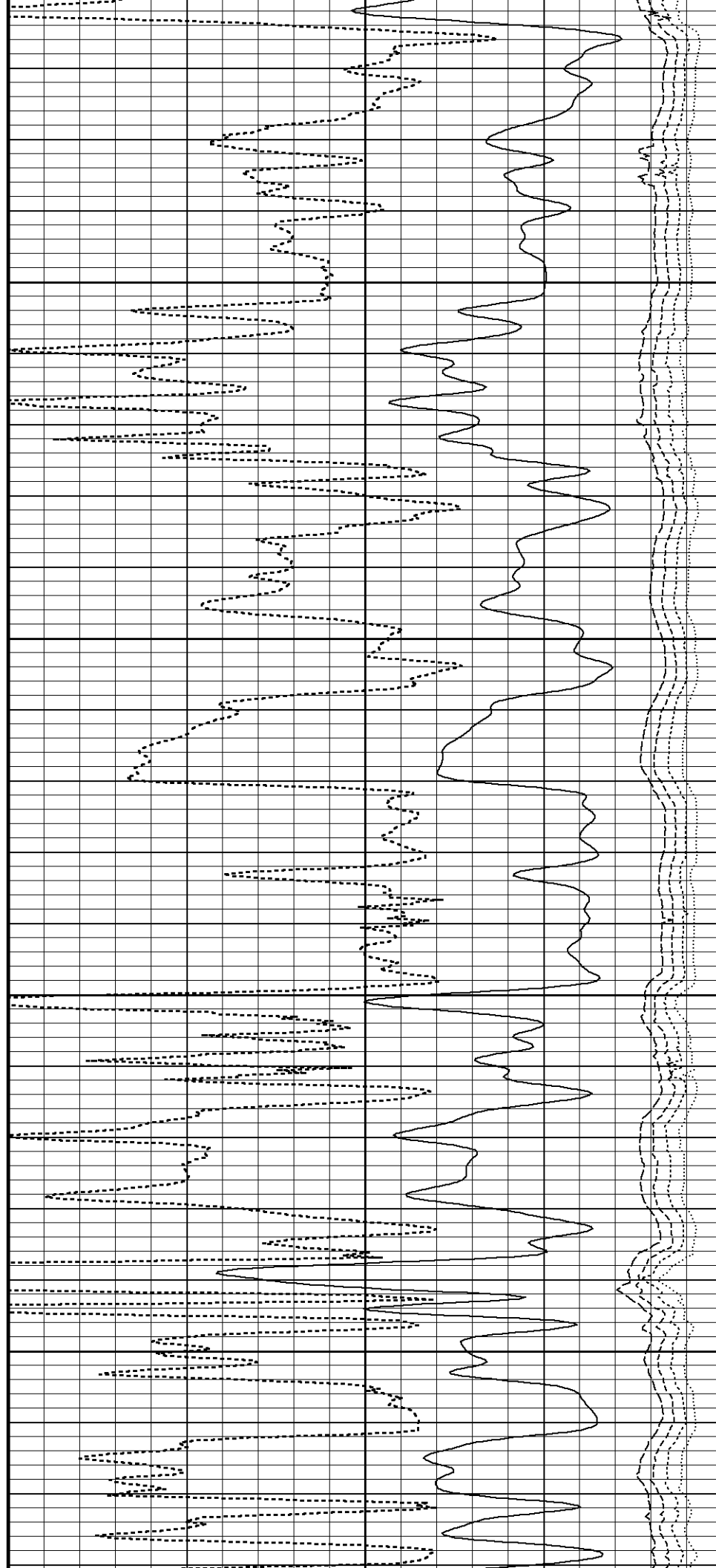
3450

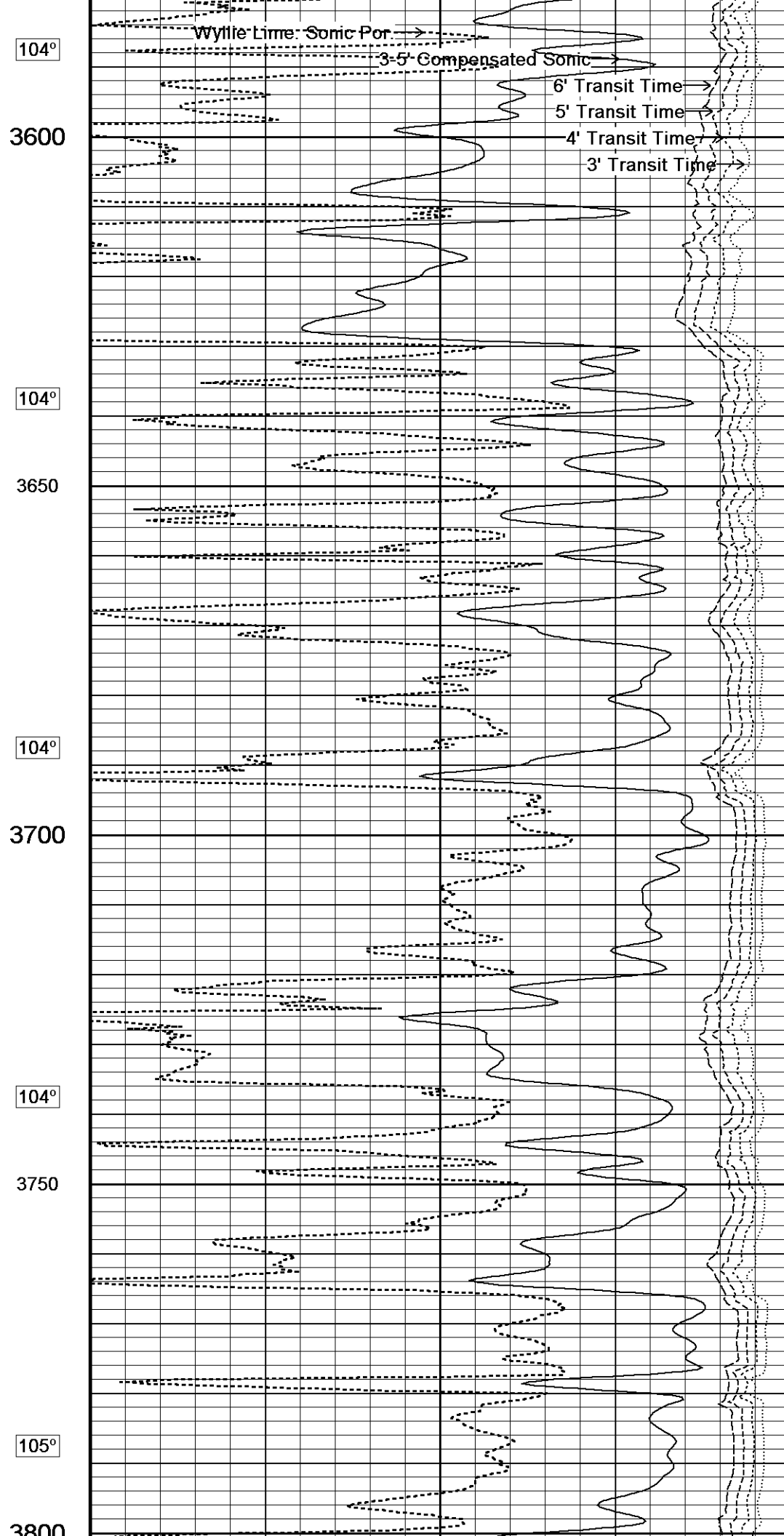
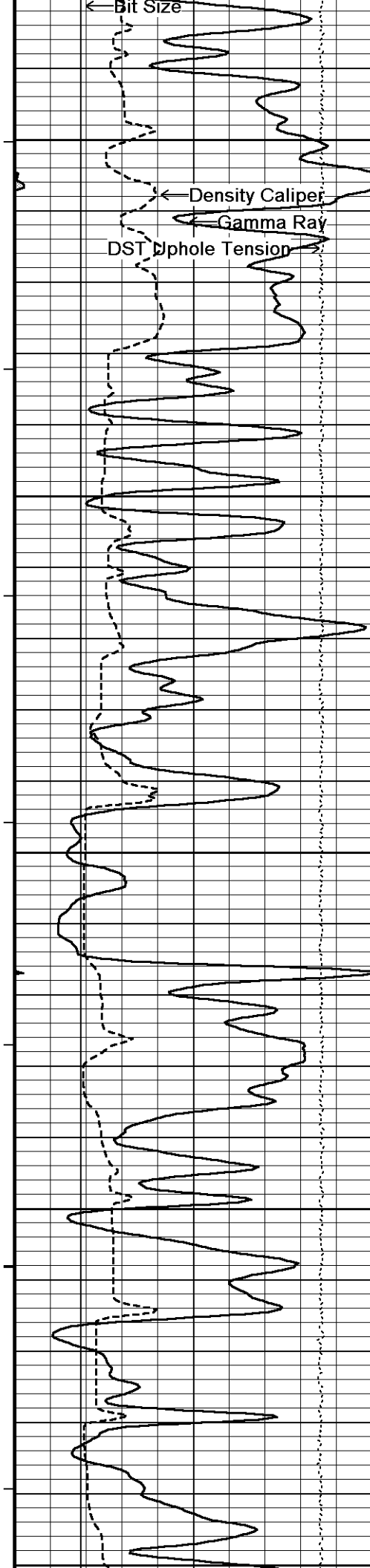
103°

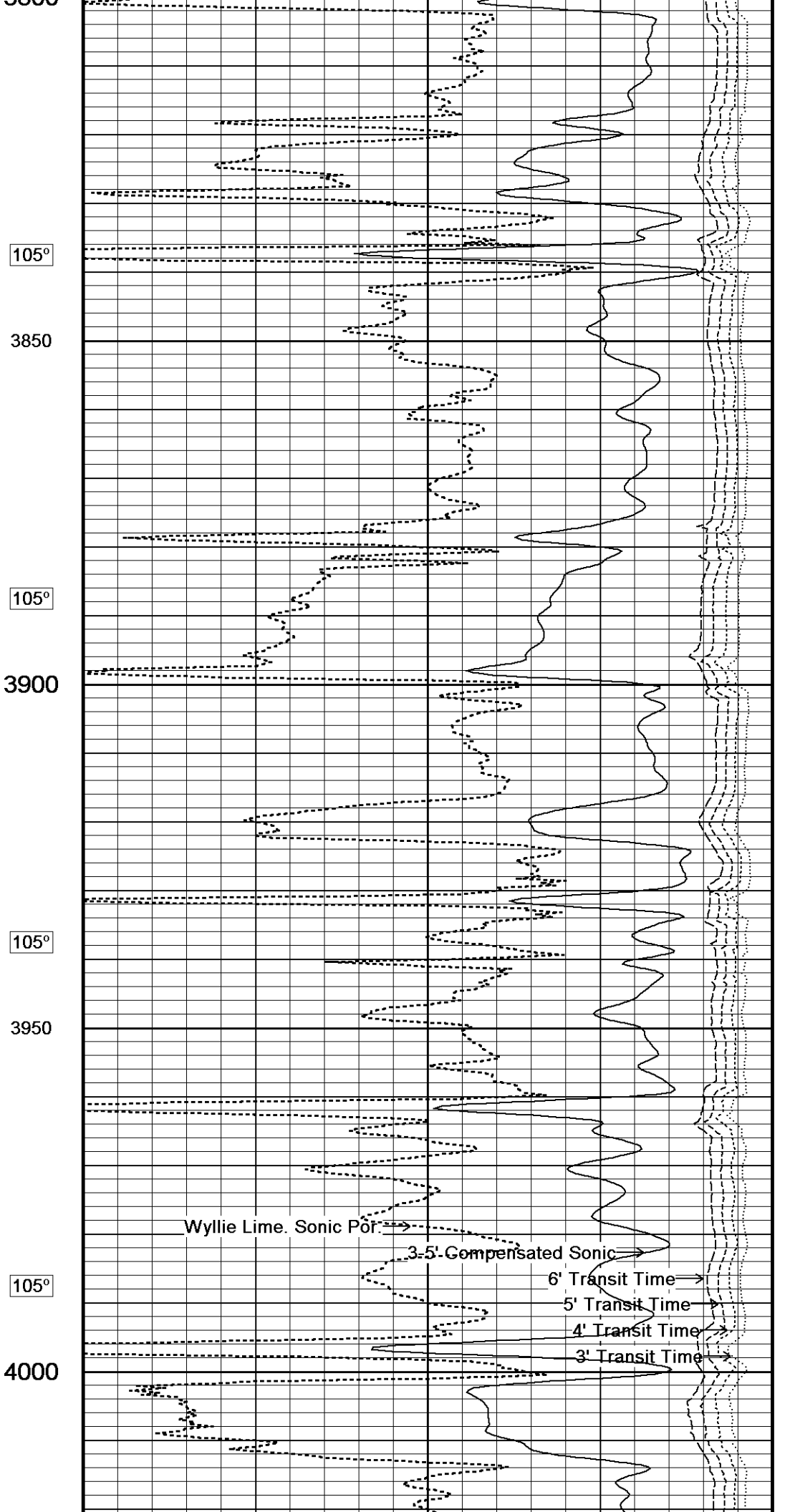
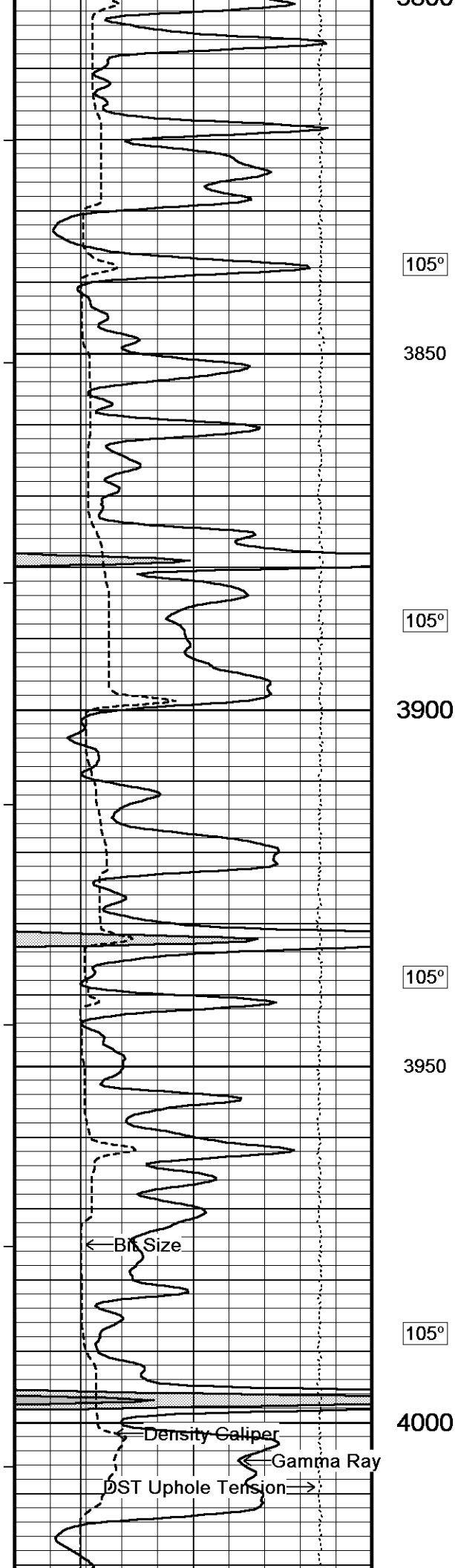
3500

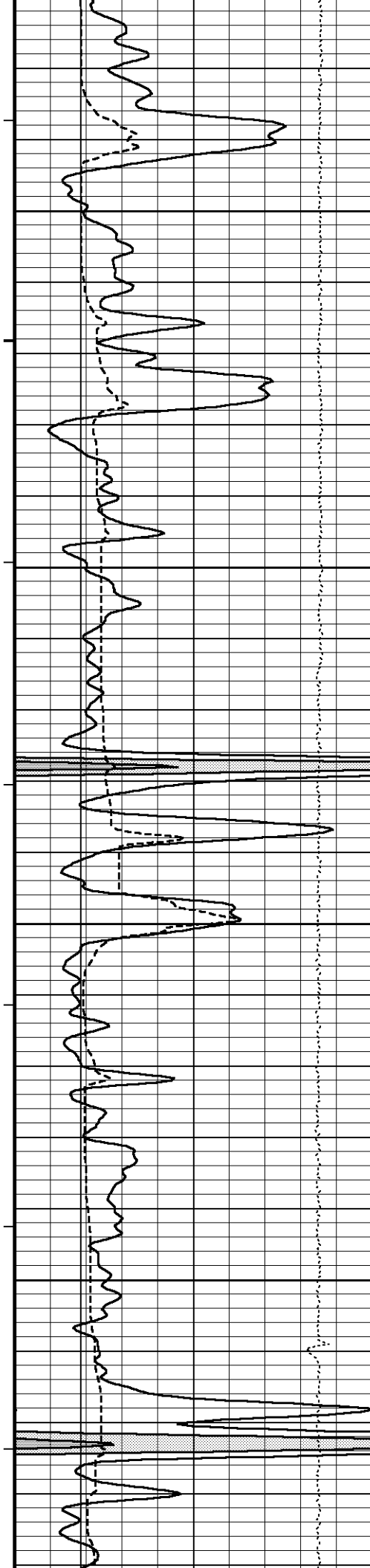
104°

3550









106°

4050

106°

4100

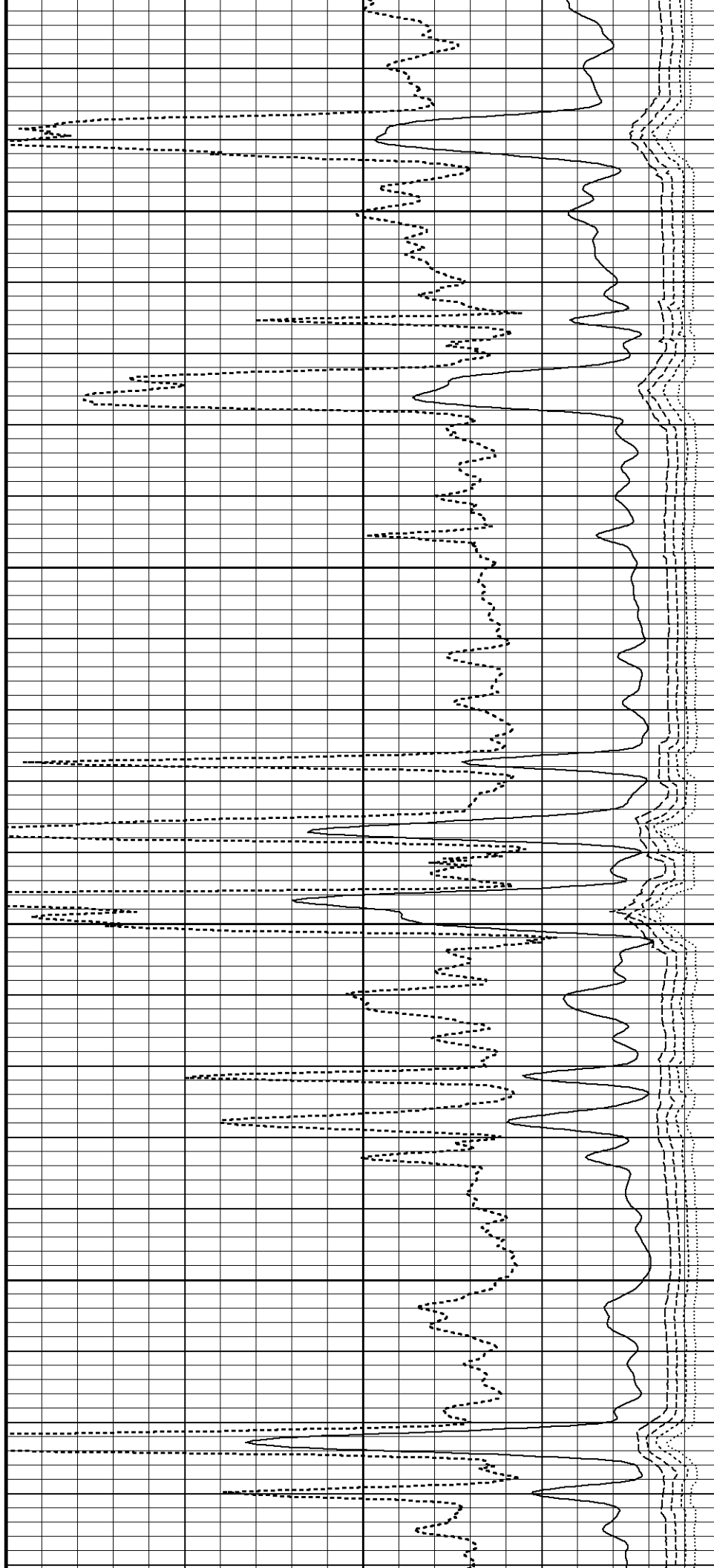
107°

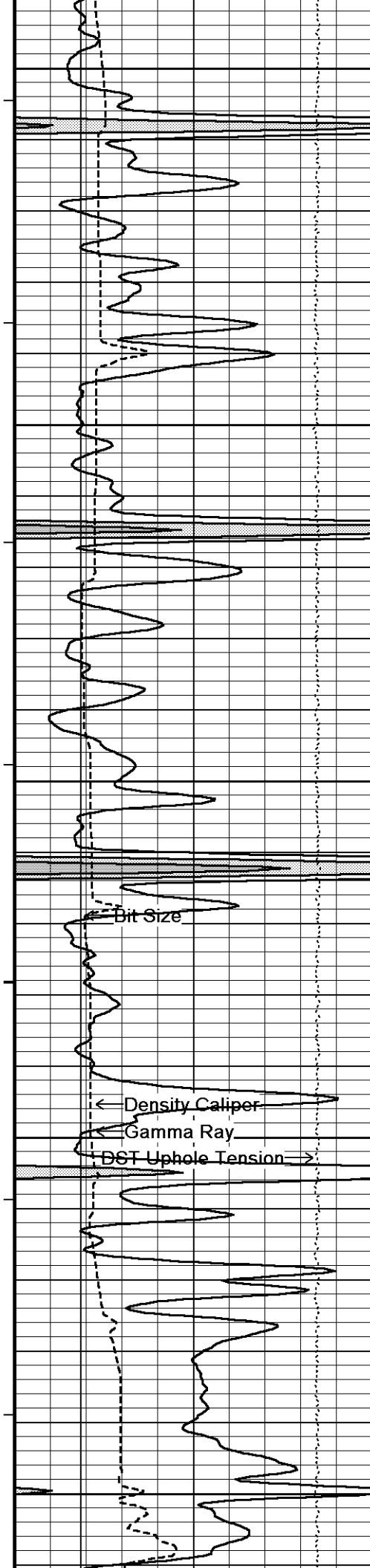
4150

107°

4200

107°





4250

107°

4300

108°

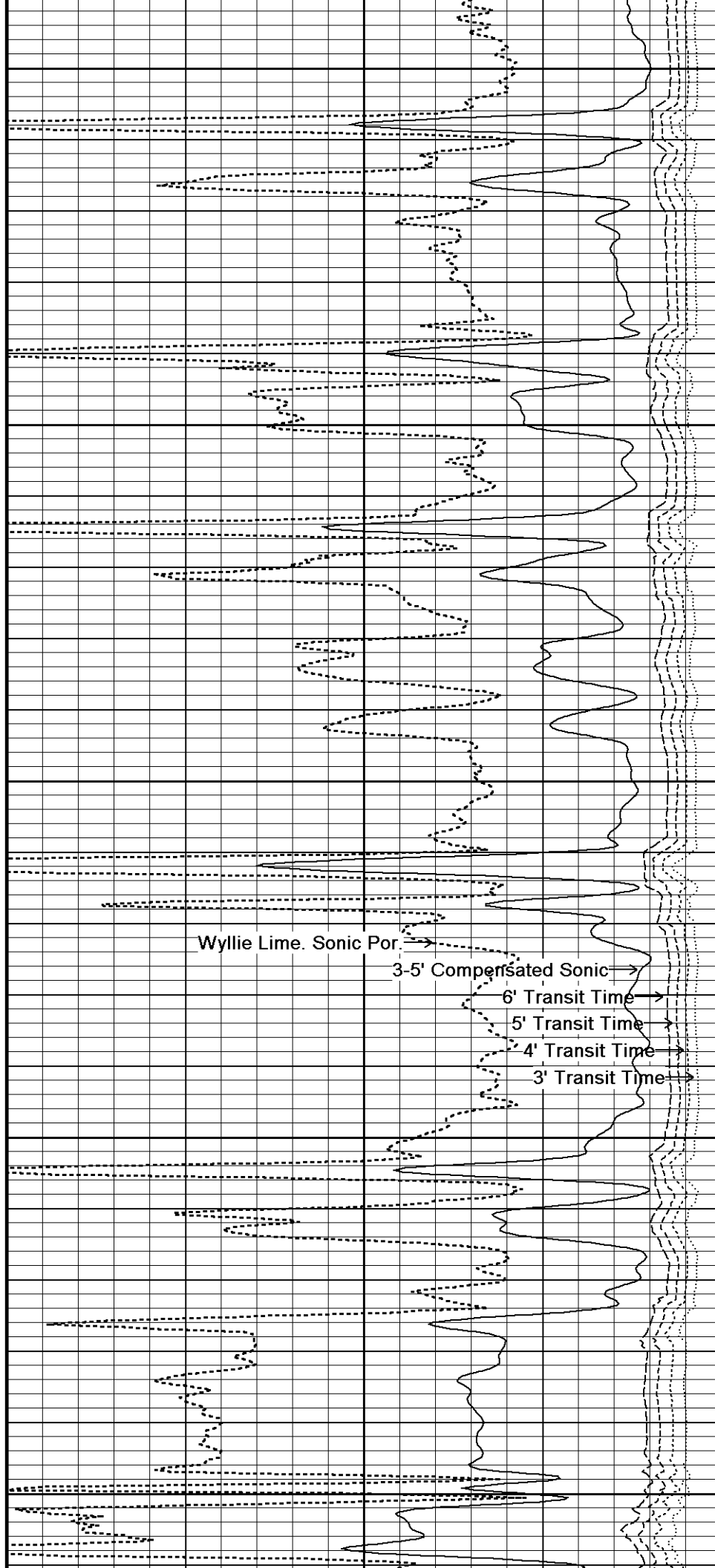
4350

108°

4400

108°

4450



Wyllie Lime. Sonic Por.

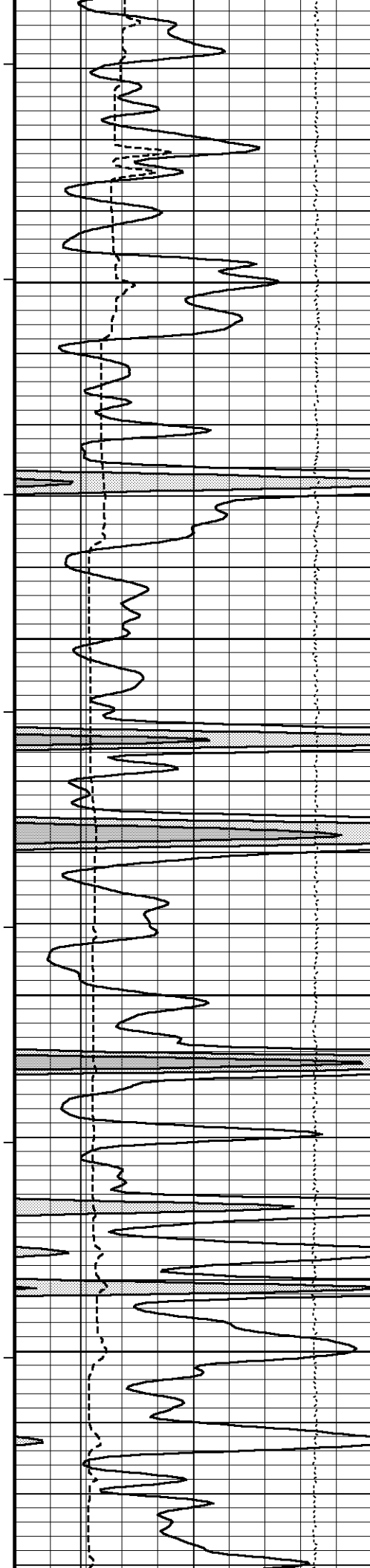
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



109°

4500

109°

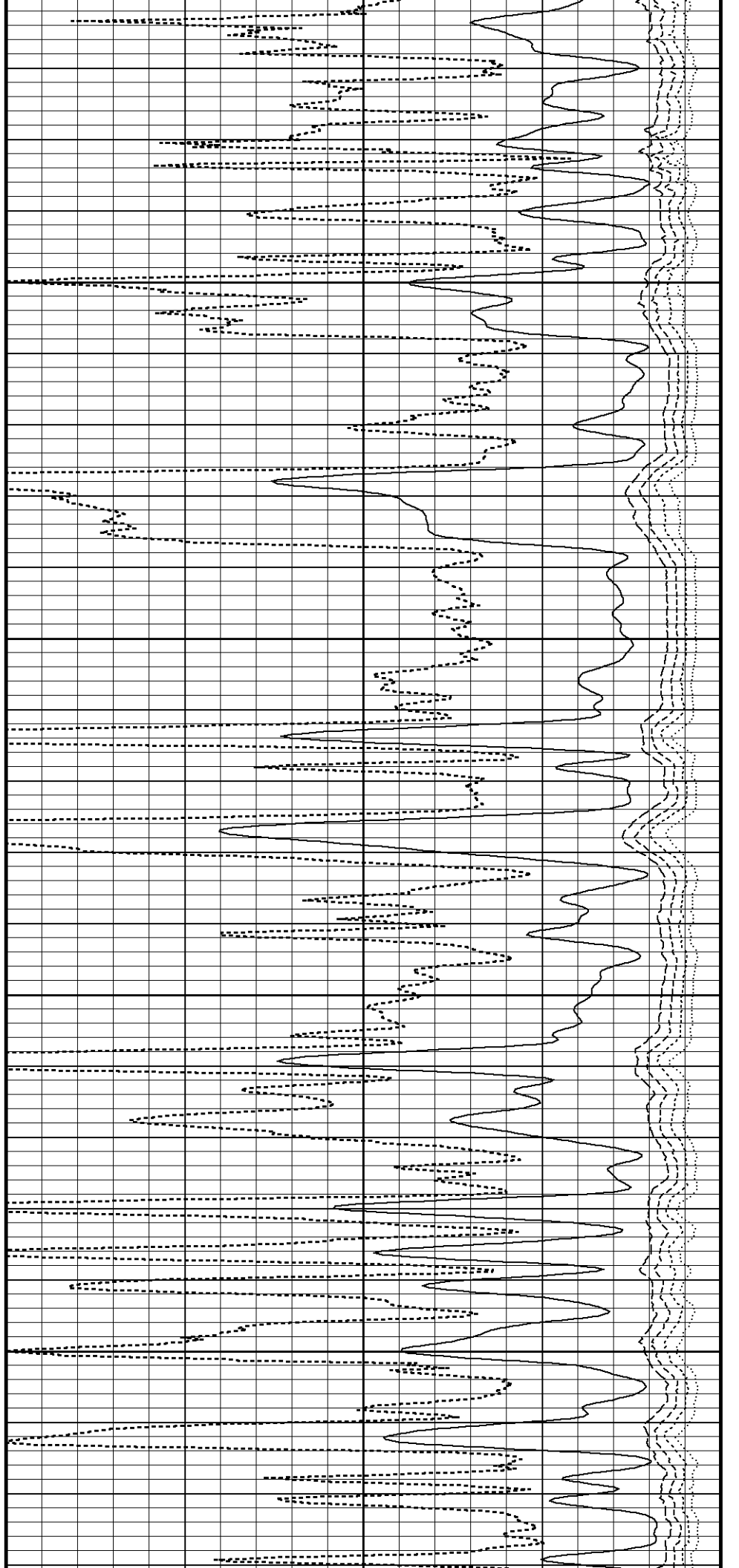
4550

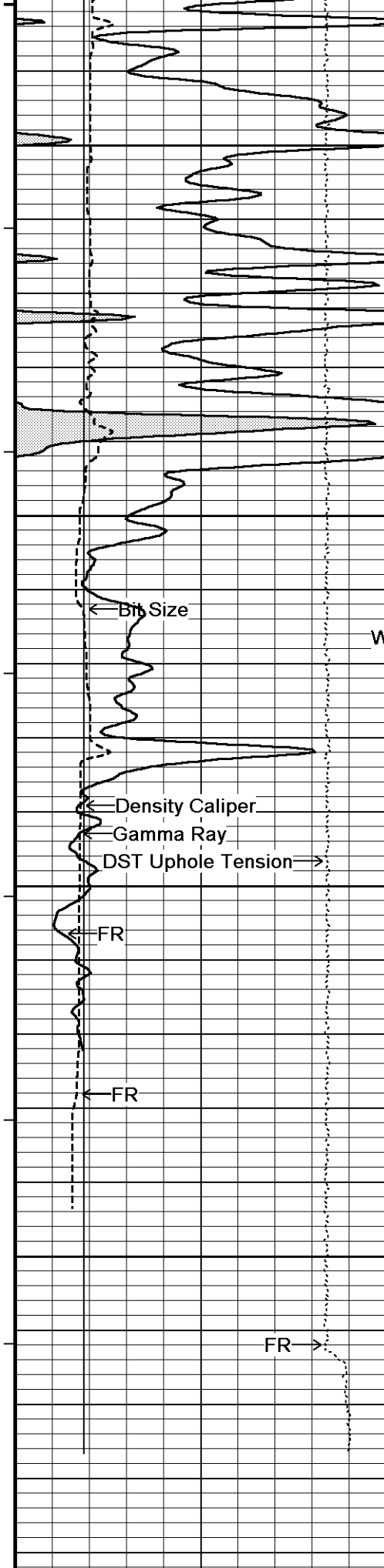
110°

4600

110°

4650





111°

4700

112°

4750

111°

4800

4850

4890

Depth
in
Feet

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

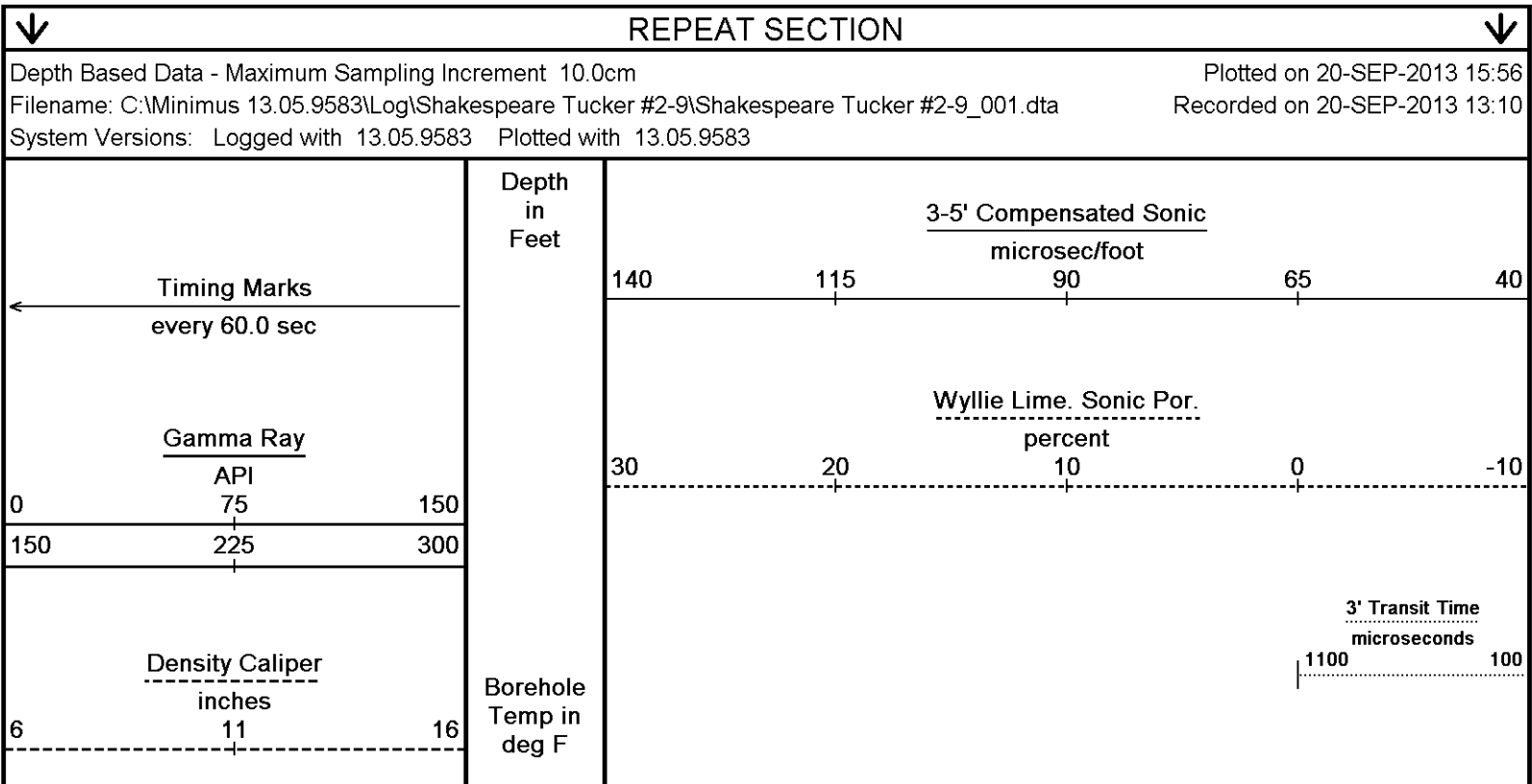
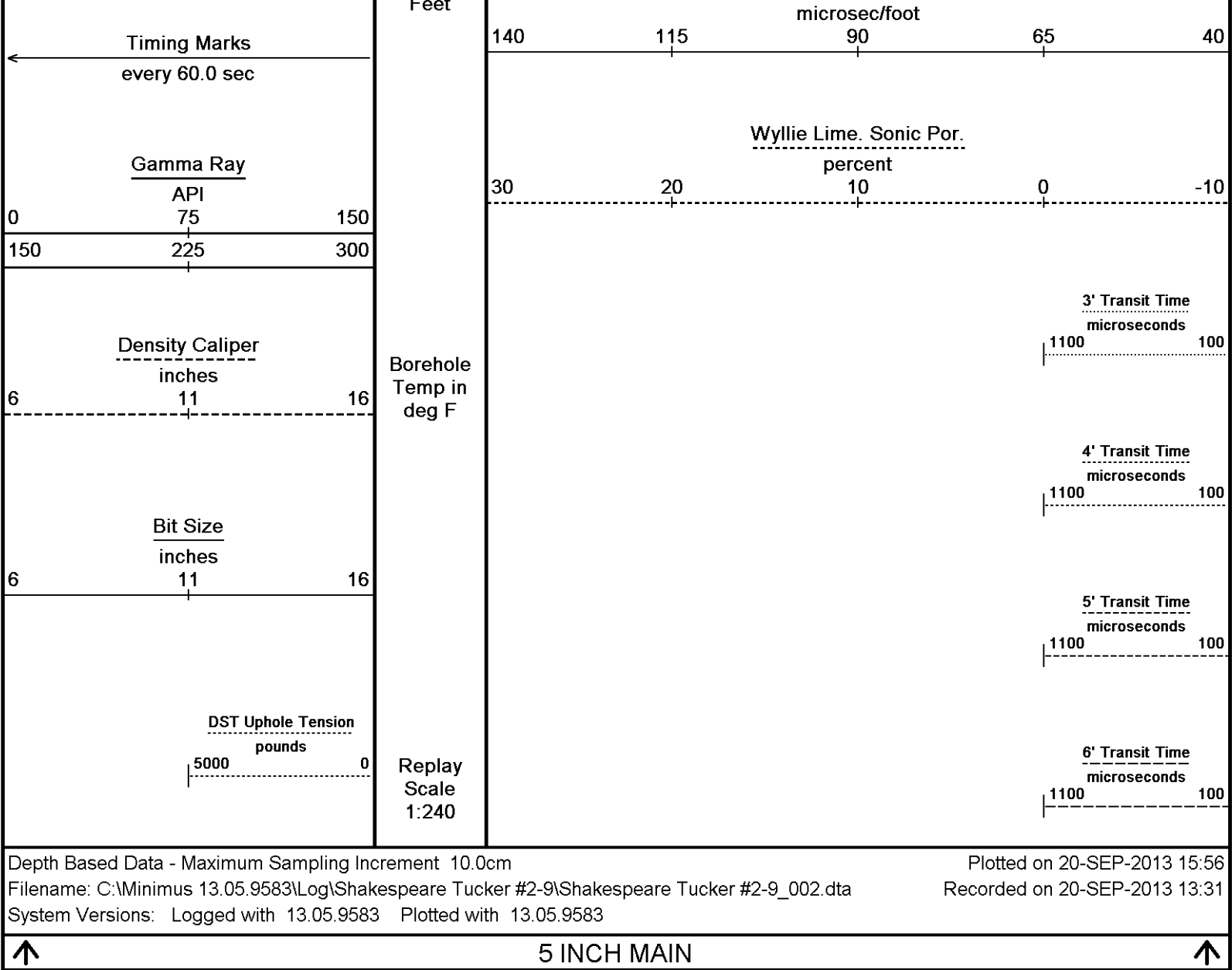
FR →

FR →

FFR →

FR →

3-5' Compensated Sonic



Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

4500

109°

4550

109°

4600

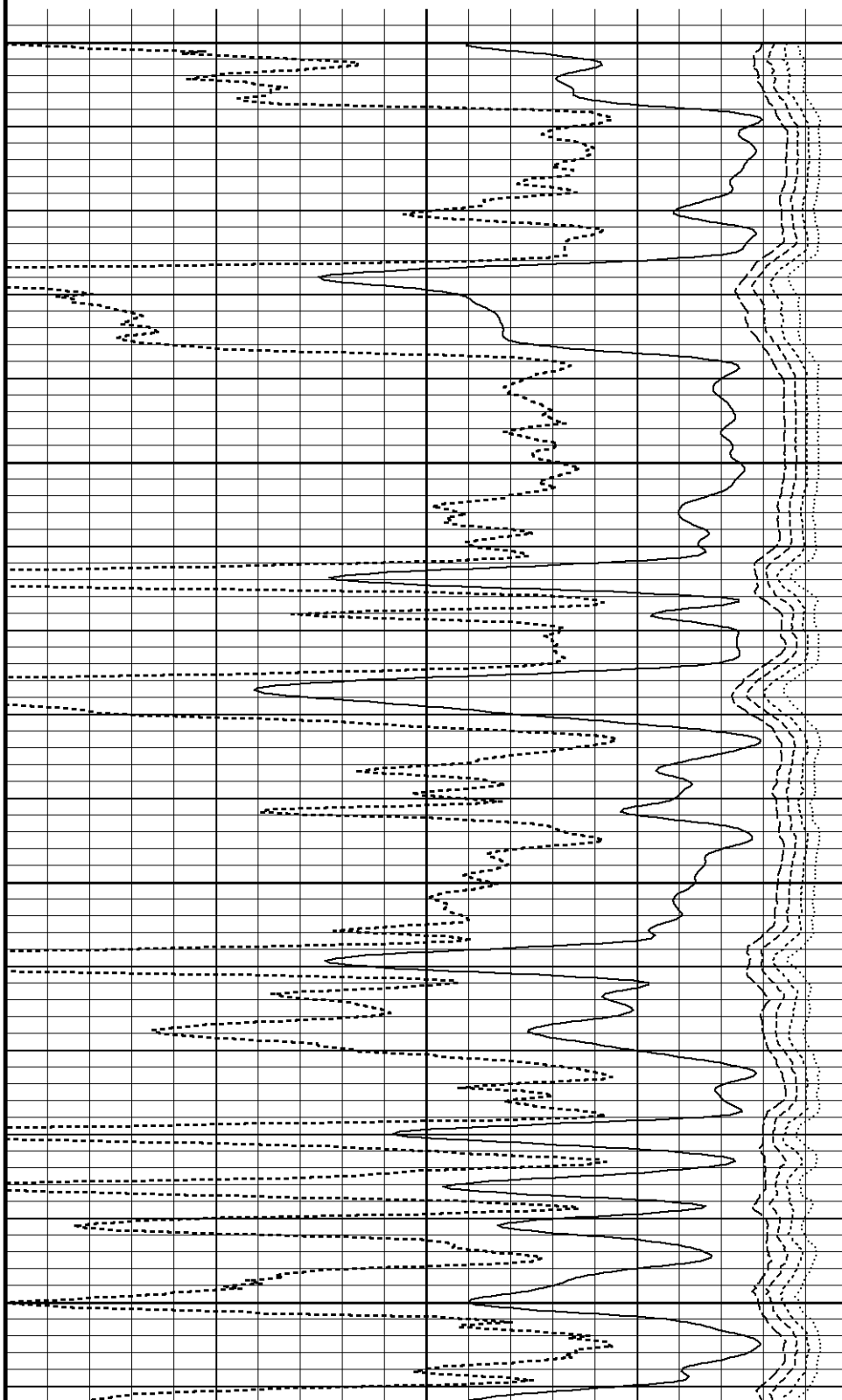
110°

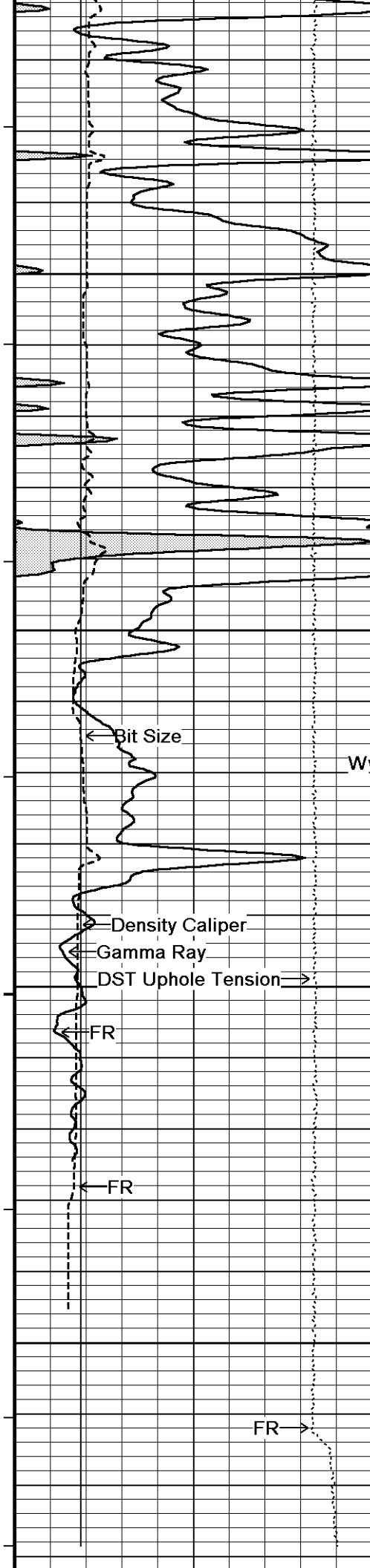
4650

4' Transit Time
microseconds
1100 100

5' Transit Time
microseconds
1100 100

6' Transit Time
microseconds
1100 100





110°

4700

111°

4750

110°

4800

4850

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

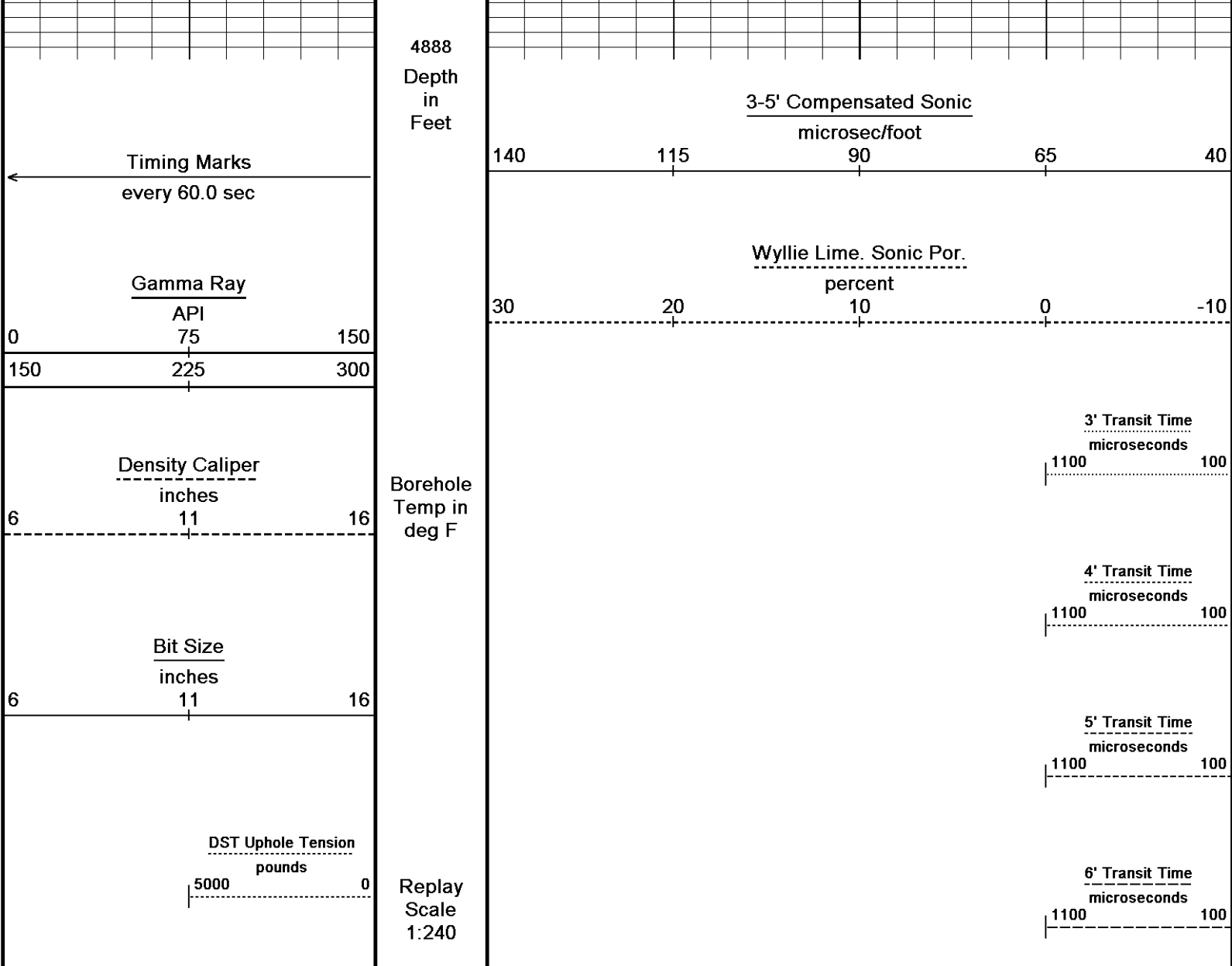
3' Transit Time →

FR →

FR →

FR →

FR →



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\Shakespeare Tucker #2-9\Shakespeare Tucker #2-9_001.dta
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

Plotted on 20-SEP-2013 15:56
Recorded on 20-SEP-2013 13:10

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION		
C:\Minimus 13.05.9583\Log\Shakespeare Tucker #2-9\Shakespeare Tucker #2-9_002.dta		
General Constants All 000		Last Edited on 20-SEP-2013,11:53
General Parameters		
Mud Resistivity	0.720	ohm-metres
Mud Resistivity Temperature	81.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	

RWA Constant A	1.000	
RWA Constant M	2.000	
SW/APOR Tool Source	0.000	
Down-hole Tension Calibration SMS 0		
Reading No	Measured	Calibrated (lbs)
1	13525.61	0.00
2	14214.48	470.00
Field Calibration on 20-SEP-2013 12:33		
Gamma Calibration MCG-D.K 469		
	Measured	Calibrated (API)
Background	67	46
Calibrator (Gross)	1127	771
Calibrator (Net)	1061	725
Field Calibration on 18-SEP-2013 10:56		
Gamma Constants MCG-D.K 469		
Last Edited on 20-SEP-2013,11:53		
Gamma Calibrator Number	GRC38	
Mud Density	1.12	gm/cc
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.K 469		
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00
Field Calibration on 18-AUG-2013,02:35		
High Resolution Temperature Constants MCG-D.K 469		
Last Edited on 18-AUG-2013,02:35		
Pre-filter Length	11	
SP Calibration MCG-D.K 469		
	Measured	Calibrated (mV)
Reference 1	100.2	100.0
Reference 2	-99.2	-100.1
Field Calibration on 12-SEP-2013 15:11		
Neutron Calibration MDN-A.B 66		
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	3180 99	3714 110
Ratio	32.180	33.764
Field Calibrator at Base		
		Calibrated (cps)
		1617 2323
Ratio		0.696
Field Check		
		Calibrated (cps)
		1626 2326
Ratio		0.690
Neutron Constants MDN-A.B 66		
Last Edited on 18-SEP-2013,10:57		
Neutron Source Id	P0204NN	
Neutron Jig Number	5824NE	
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	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F

Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 353		Base Calibration on 15-AUG-2013 09:33 Field Check on 18-SEP-2013 10:37	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.1	126.8	
Base Check		280.9	
Field Check		281.1	

FE Constants MFE-B.J 353		Last Edited on 18-SEP-2013,10:32	
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	0.5	inches	

Sonic Constants MSS-C.K 330			Last Edited on 29-JUN-2013,19:32		
Maximum Boundary Contrast	100.00	micro-sec/ft			
Fluid Transit Time	189.00	micro-sec/ft			
Limestone Transit Time	47.50	micro-sec/ft			
Sandstone Transit Time	55.50	micro-sec/ft			
Dolomite Transit Time	43.50	micro-sec/ft			
Sonic used for Porosities	3-4' Compensated Sonic				
Correction for Sonde Skew	Applied				
Cycle Stretch Algorithm	Applied				
MN3FT	N/A	micro-sec			
MX3FT	N/A	micro-sec			
Hunt-Raymer Constant	83.13	micro-sec/ft			
Sonde Mode	Compensated				
Hole Type	Open Hole				
Sonde Parameters					
	Measured	Calibrated			
Offset	N/A	0.0000			
Free Pipe	N/A	N/A			
Peak Amplitude Source	N/A				
Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A
Processed Fixed Gate Parameters					
Waveform Used For Processing	N/A				
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	N/A		
N/A	N/A	N/A		N/A	
N/A	N/A	N/A		N/A	
N/A	N/A	N/A		N/A	
N/A	N/A	N/A		N/A	
N/A	N/A	N/A		N/A	

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A
Use 4' Waveform to derive TR	N/A
Use 5' Waveform to derive TR	N/A
Use 6' Waveform to derive TR	N/A

3' Waveform Discriminator Level	N/A	mV
4' Waveform Discriminator Level	N/A	mV
5' Waveform Discriminator Level	N/A	mV
6' Waveform Discriminator Level	N/A	mV
3' Waveform Filter	N/A	
4' Waveform Filter	N/A	
5' Waveform Filter	N/A	
6' Waveform Filter	N/A	
Semblance Level	N/A	
Semblance Window Width	N/A	micro-sec
Sonic 1 Despiker	N/A	N/A
Sonic 2 Despiker	N/A	N/A

Induction Calibration MAI-A.A 167

Base Calibration on 19-APR-2013,13:41

Field Check on 18-SEP-2013 10:27

Base Calibration

Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel		Low	High	Low	High
1		17.3	474.2	9.3	966.2
2		6.3	388.4	7.6	821.4
3		3.3	259.4	5.2	566.0
4		1.9	133.0	2.6	279.2

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			13.2	3838.7
2			29.6	3476.3
3			29.2	3052.4
4			19.8	2081.2
Deep			18.7	2048.5
Medium			42.3	3990.4
Shallow			43.0	5053.3

Array Temperature 75.7 Deg F

Induction Constants MAI-A.A 167

Last Edited on 18-SEP-2013,10:24

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	8.0000		
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		
High Resolution Temperature Calibration MAI-A.A 167			
	Measured	Calibrated(Deg F)	Field Calibration on 18-AUG-2013,02:21
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MAI-A.A 167			
Pre-filter Length	11		Last Edited on 15-SEP-2013,16:14
Caliper Calibration MML-A 3			
			Base Calibration on 15-AUG-2013 08:50
			Field Calibration on 18-SEP-2013 10:50
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14887	5.98	
2	18120	7.97	
3	21042	9.86	
4	25322	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.08	5.98	
Micro Normal and Micro Inverse Calibration MML-A 3			
			Base Calibration on 15-AUG-2013 09:16
			Field Check on 18-SEP-2013 10:45
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2	
Micro Normal	12.3 60.3	5.0 25.0	
Micro Inverse	15.7 78.4	5.0 25.0	
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	62.9	62.9	
Micro Inverse	48.2	48.2	
Micro Normal and Micro Inverse Constants MML-A 3			
			Last Edited on 18-SEP-2013,10:44
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	1.0000		
Micro Inverse K Factor	1.0000		
Standoff Offset	N/A	inches	
Caliper Calibration MPD-B 64			
			Base Calibration on 15-AUG-2013 14:54
			Field Calibration on 18-SEP-2013 10:44
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	16560	3.99	
2	24992	5.98	
3	32880	7.97	
4	41184	9.86	
5	50688	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.04	5.96	
Photo Density Calibration MPD-B 64			
			Base Calibration on 15-AUG-2013 14:37
			Field Check on 18-SEP-2013 10:42
Density Calibration			
Base Calibration			
	Measured	Calibrated (sdu)	
	Near Far	Near Far	
Reference 1	60206 33560	59556 30836	
Reference 2	25378 2915	24941 2541	

Field Check at Base

1155.1 1345.7

Field Check

1158.4 1339.4

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	211	1029		
Reference 1	22957	60005	0.386	0.371
Reference 2	6904	25238	0.276	0.272

Field Check at Base

211.2 1028.9

Field Check

209.9 1029.8

Density Constants MPD-B 64

Last Edited on 20-SEP-2013,11:53

Density Source Id	18235B
Nylon Calibrator Number	DNCE695
Aluminium Calibrator Number	DACD698
Density Shoe Profile	8 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.12 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 (m)
2.71	
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 13.05.9583\Log\Shakespeare Tucker #2-9\Shakespeare Tucker #2-9_002.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

Compact Comms Gamma

MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log

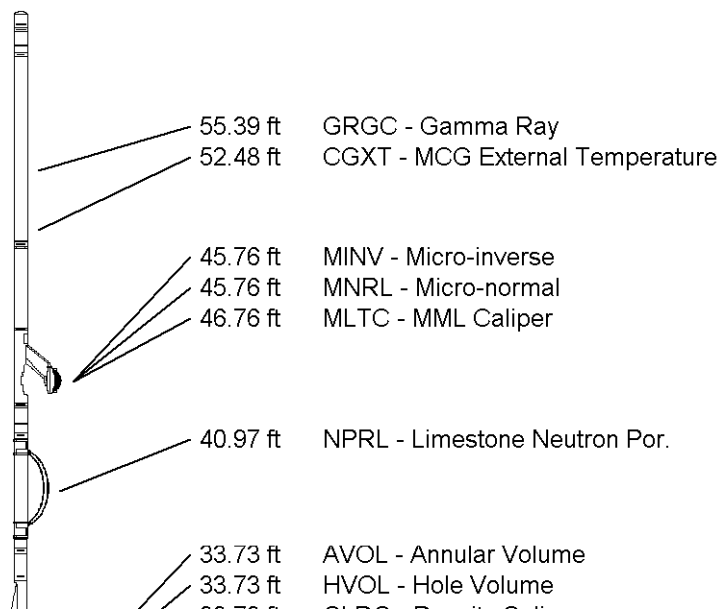
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron

MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

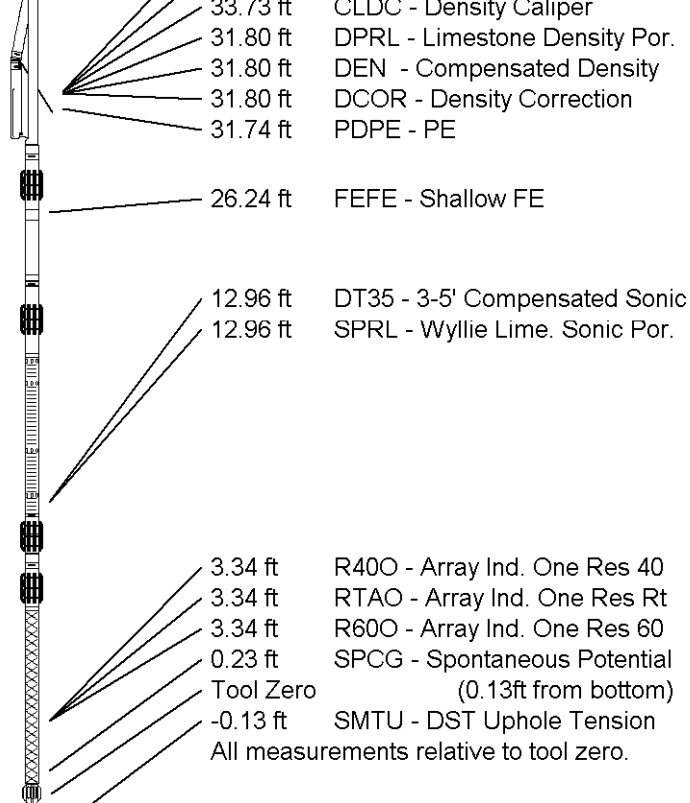


Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic
MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 62.25 ft Weight: 471.8 lb



COMPANY	SHAKESPEARE OIL INC.
WELL	TUCKER #2-9
FIELD	WILDCAT
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3149.00	feet	First Reading	4849.00	feet
Elevation Drill Floor	3147.00	feet	Depth Driller	4865.00	feet
Elevation Ground Level	3139.00	feet	Depth Logger	4862.00	feet



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