



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY		SHAKESPEARE OIL CO., INC.			
WELL		CARSON 3-25			
FIELD		PENCE EAST			
PROVINCE/COUNTY		SCOTT			
COUNTRY/STATE		U.S.A. / KANSAS			
LOCATION		1000' FSL & 1600' FWL			
SEC 25	TWP 16S	RGE 34W	Other Services		MAI
Latitude			MPD/MDN		
Longitude			MML		
API Number		15-171-21064			
Permanent Datum GL, Elevation 3102 feet					
Log Measured From KB					
Drilling Measured From KB					
Date	08-JUN-2014				
Run Number	ONE				
Service Order	4558-89434029				
Depth Driller	4870.00		feet		
Depth Logger	4869.00		feet		
First Reading	4856.00		feet		
Last Reading	267.00		feet		
Casing Driller	266.00		feet		
Casing Logger	267.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.30 lb/USg		50.00 CP		
PH / Fluid Loss	10.50		9.60 ml/30Min		
Sample Source	MUDPIT				
Rm @ Measured Temp	0.57 @ 70.0		ohm-m		
Rmf @ Measured Temp	0.46 @ 70.0		ohm-m		
Rmc @ Measured Temp	0.68 @ 70.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.35 @115.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	115.00		deg F		
Equipment / Base	13244		LIB		
Recorded By	ADAM SILL				
Witnessed By	WES HANSON				
JOB #	LB14-174				

BOREHOLE RECORD					Last Edited: 08-JUN-2014 15:40
Bit Size inches		Depth From feet		Depth To feet	
7.875		265.00		4870.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	265.00	24.00	

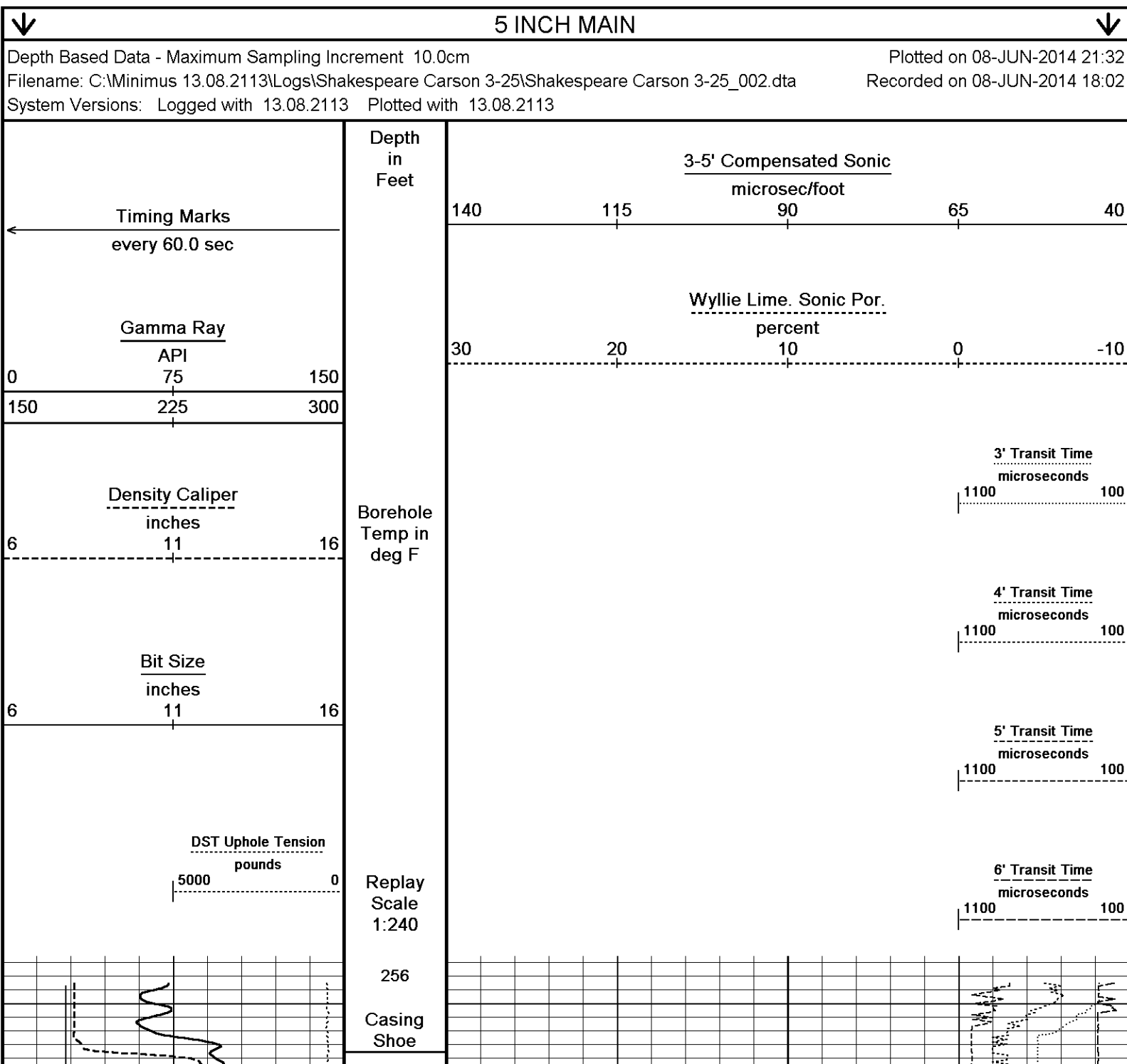
REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2141 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3750 FEET: 198 CU.FT.
- RIG: SOUTHWIND #70

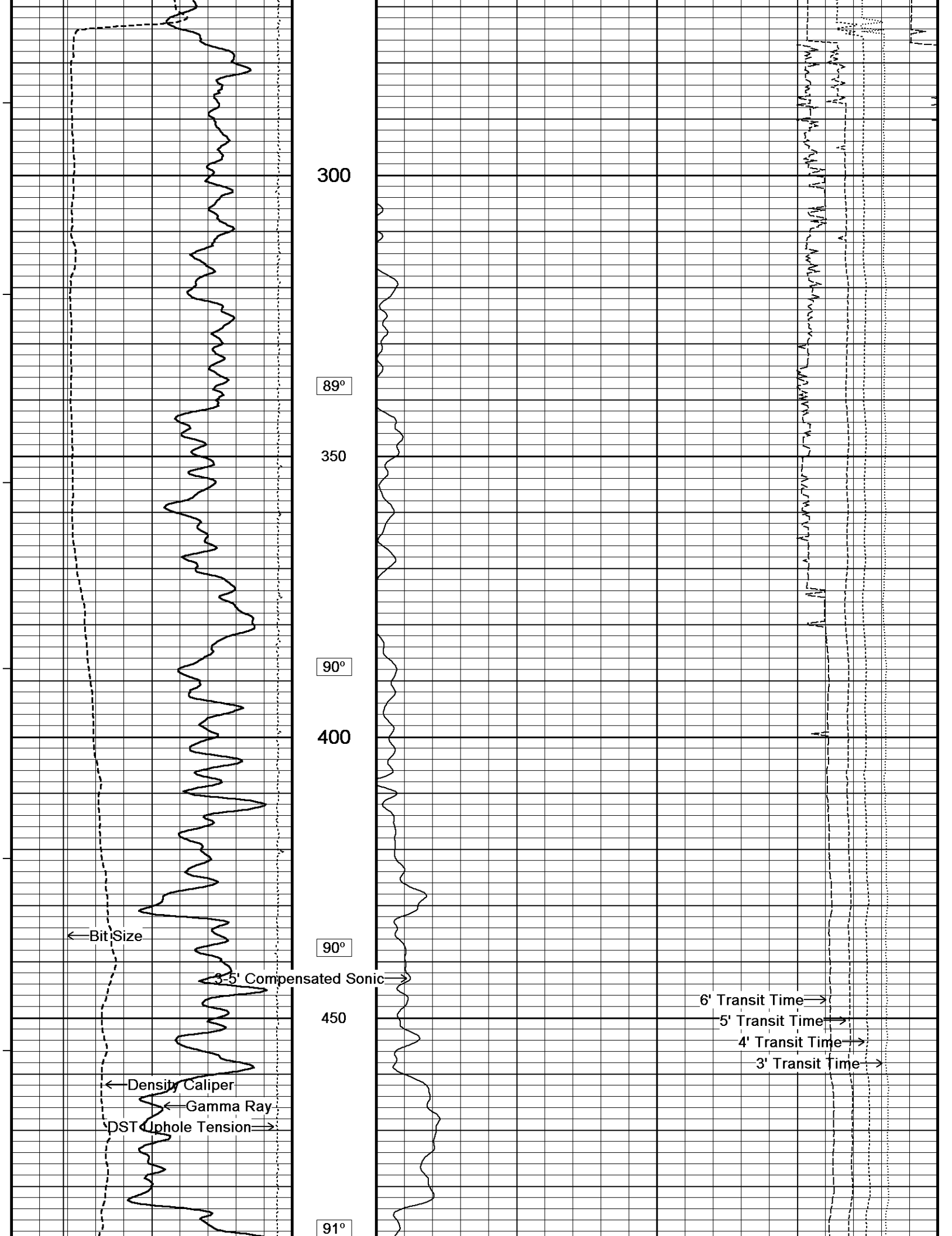
RIS: 00011 WIND #70:

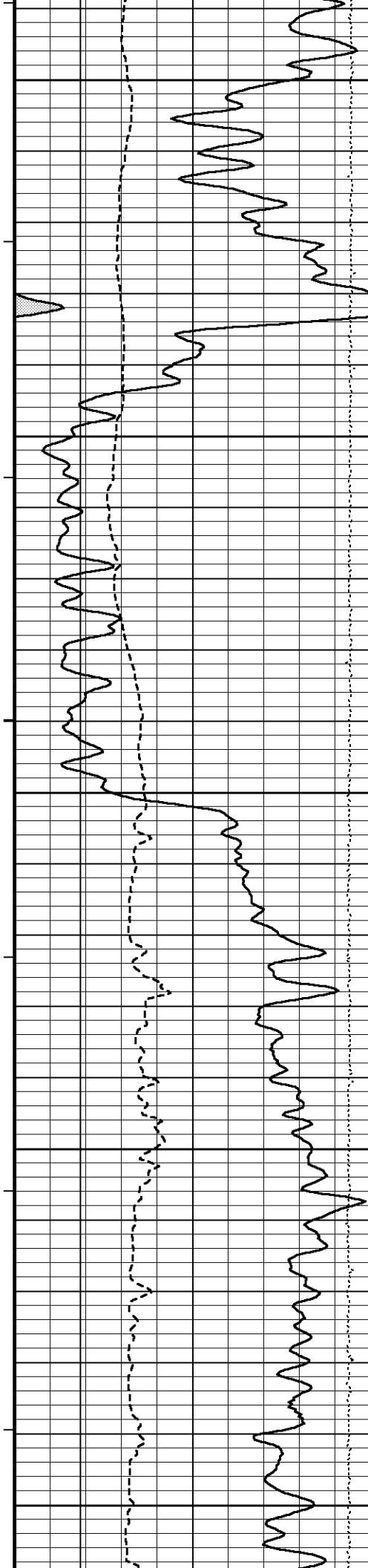
- ENGINEER: A. SILL.

- OPERATOR: K. RINEHART.

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.







500

91°

550

91°

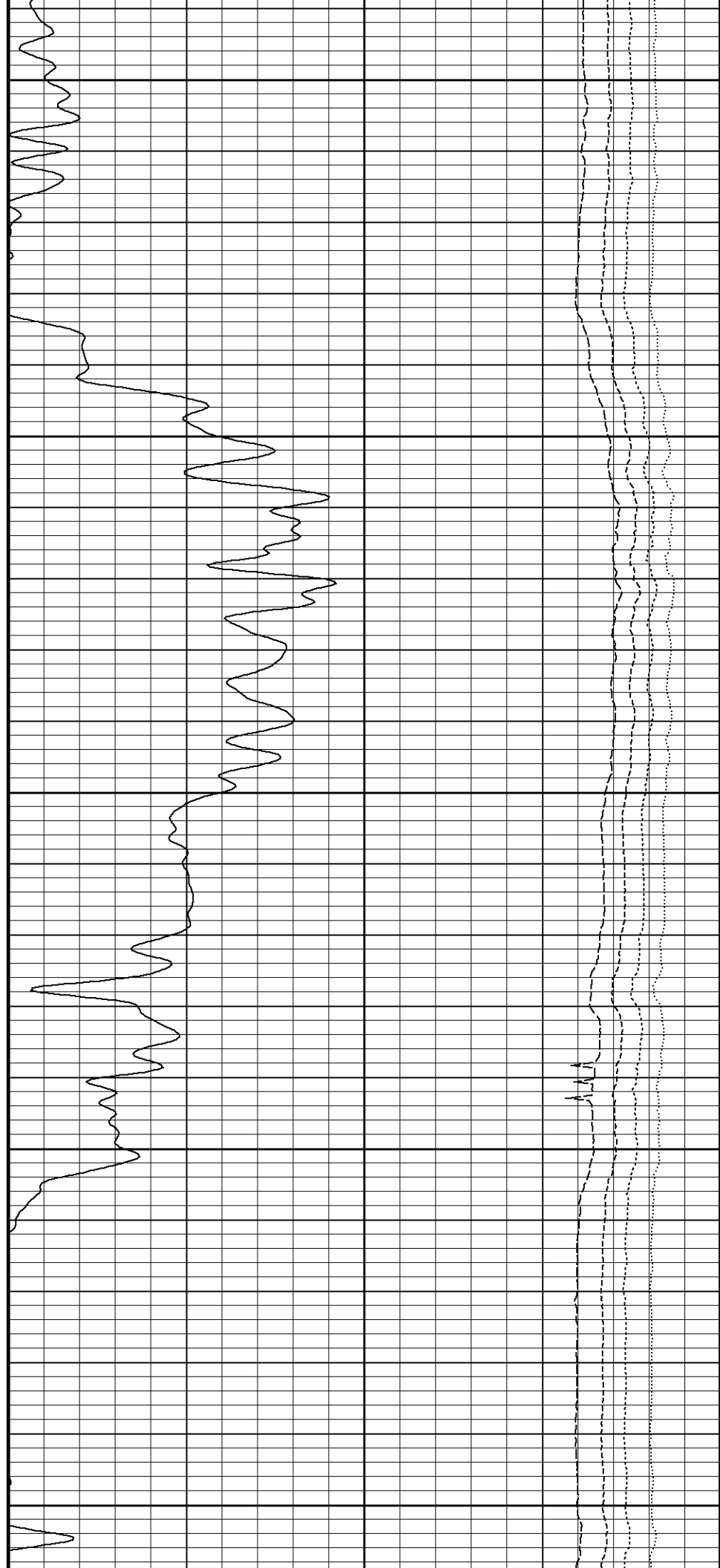
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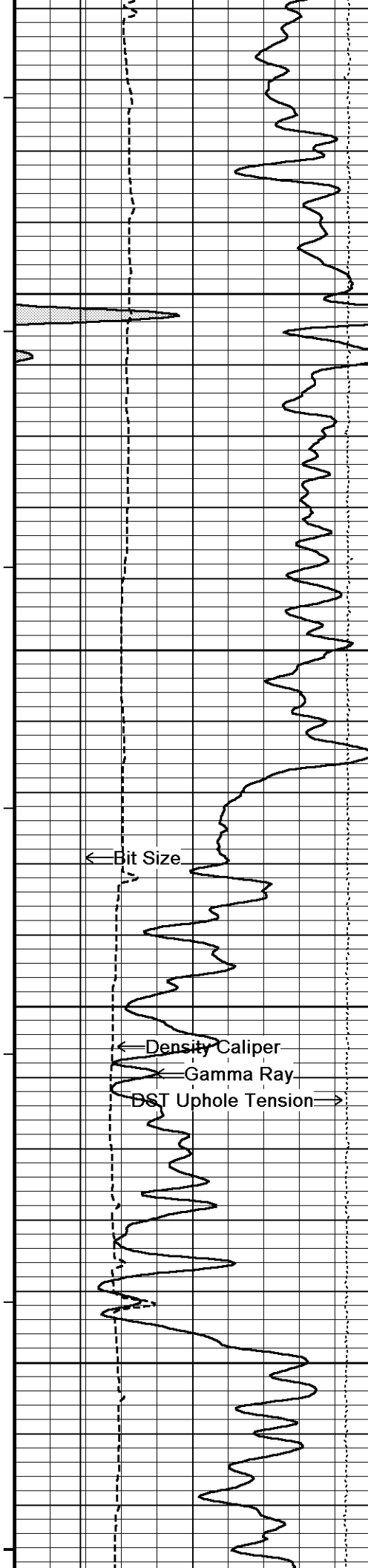
92°

650

92°

700





93°

750

93°

800

93°

850

94°

900

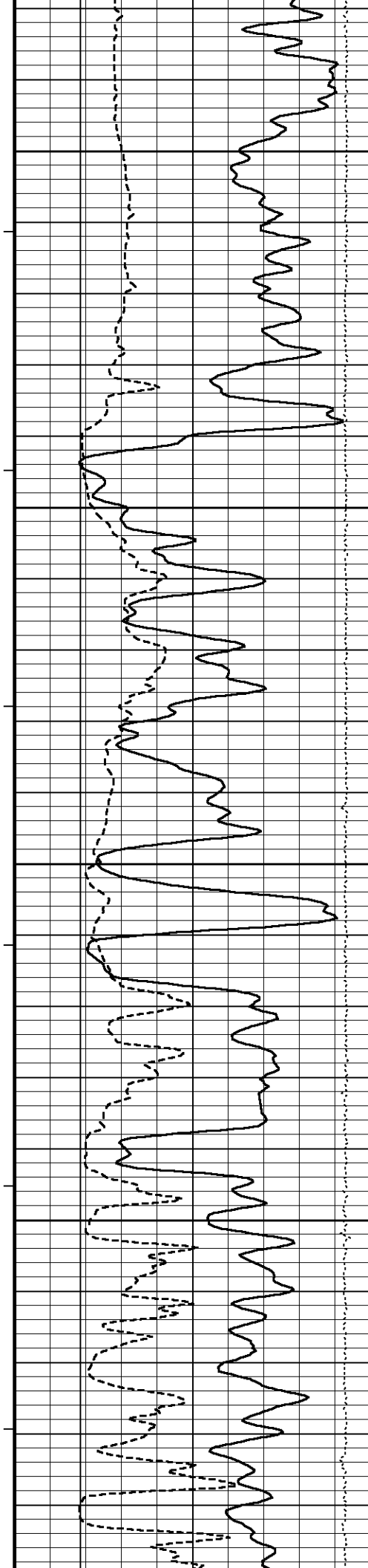
93° 5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



94°

950

94°

1000

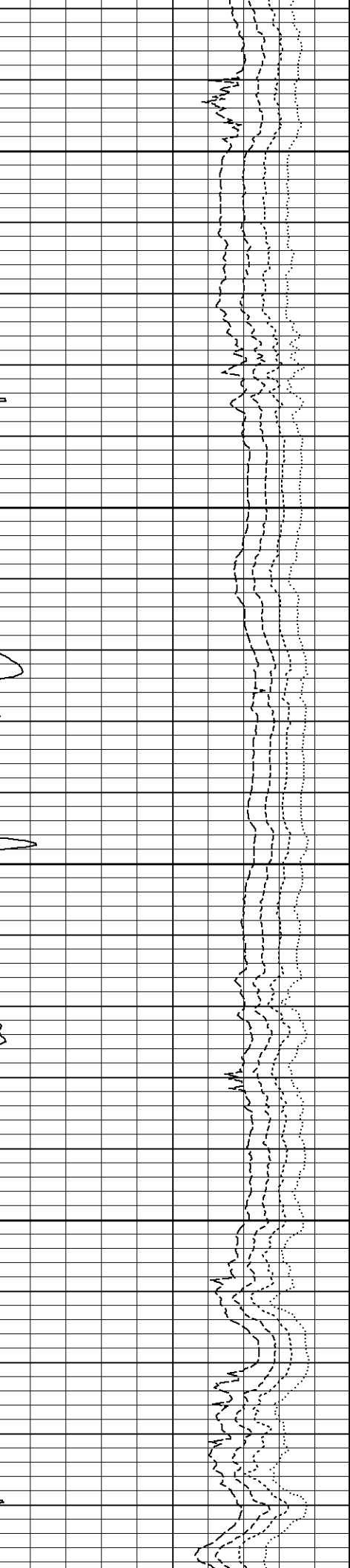
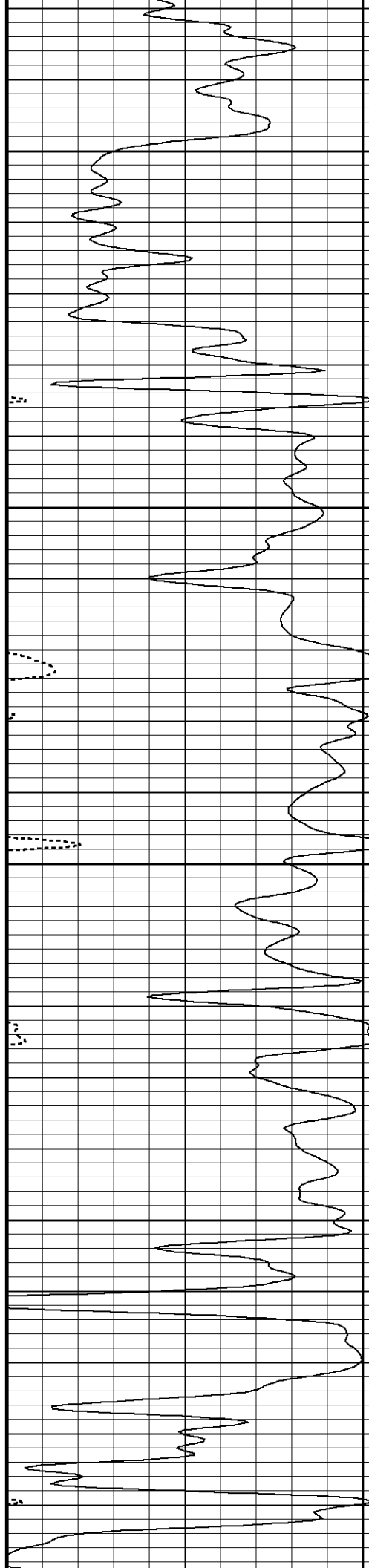
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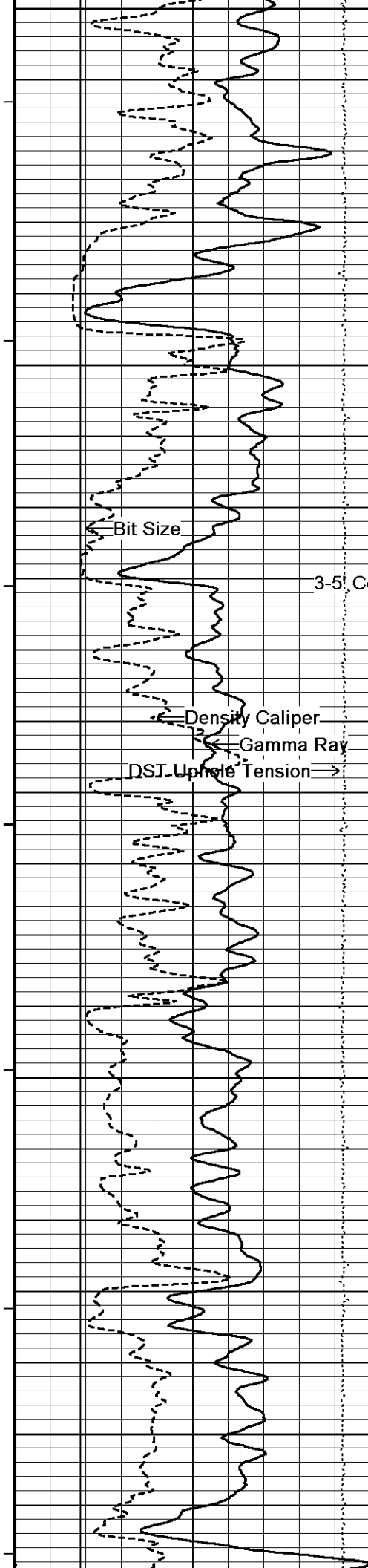
1050

96°

1100

96°





1150

96°

1200

97°

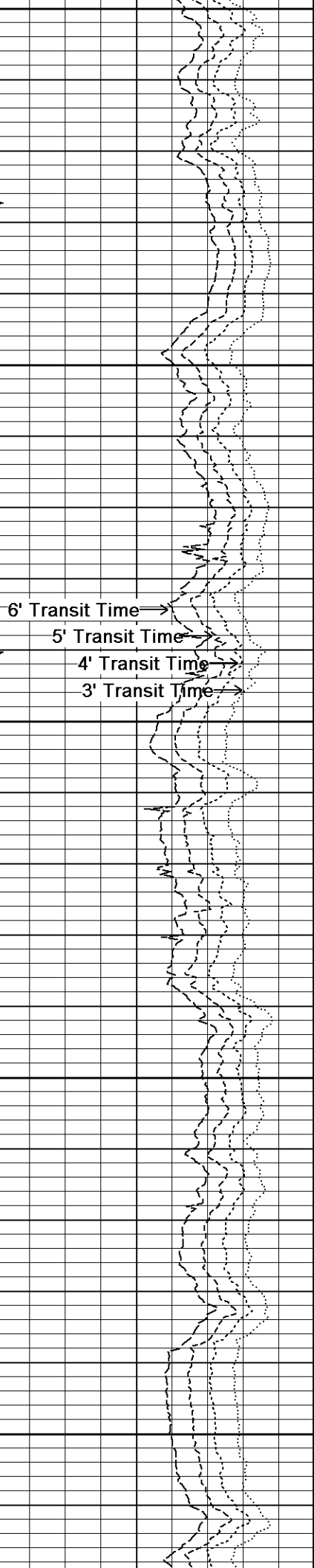
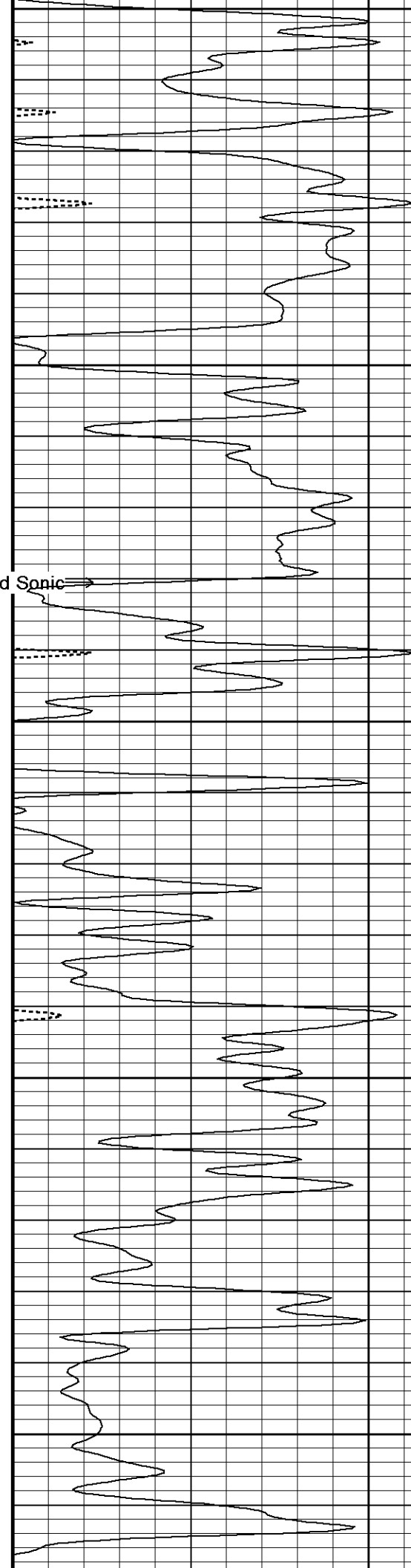
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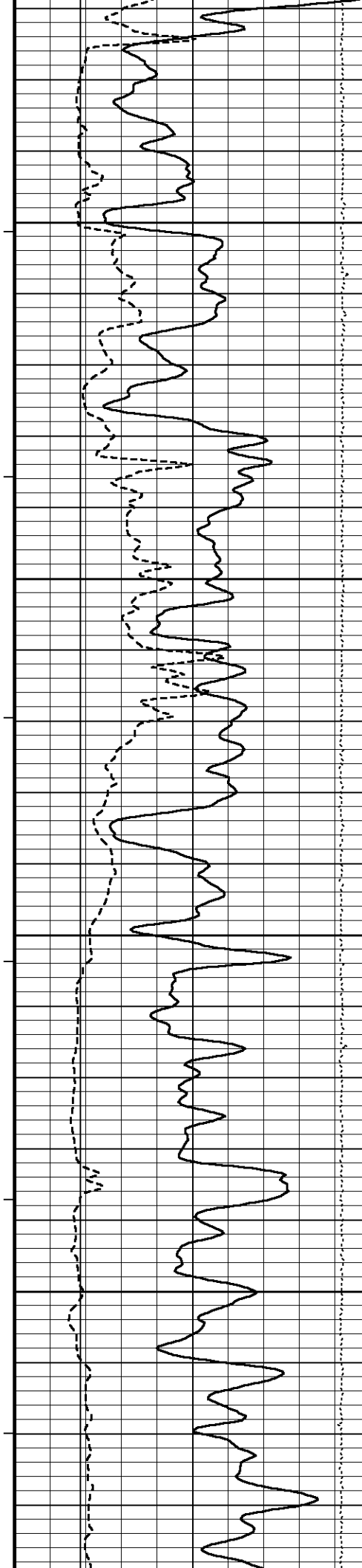
97°

1300

97°

1350





98°

1400

98°

1450

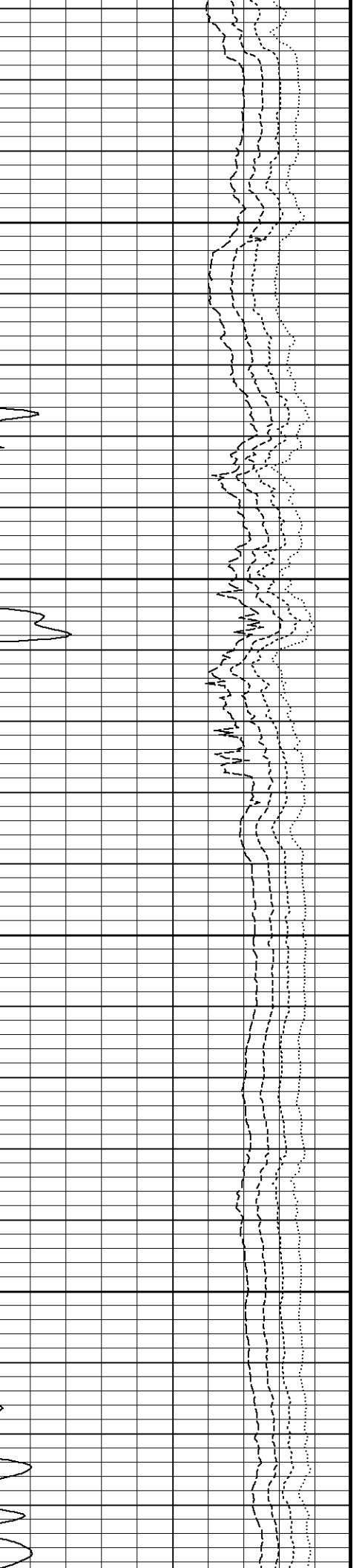
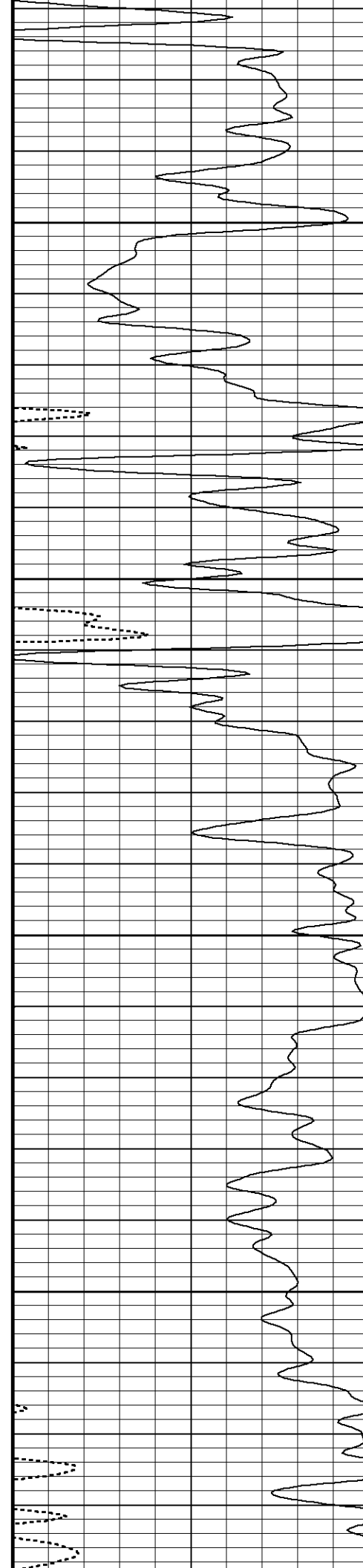
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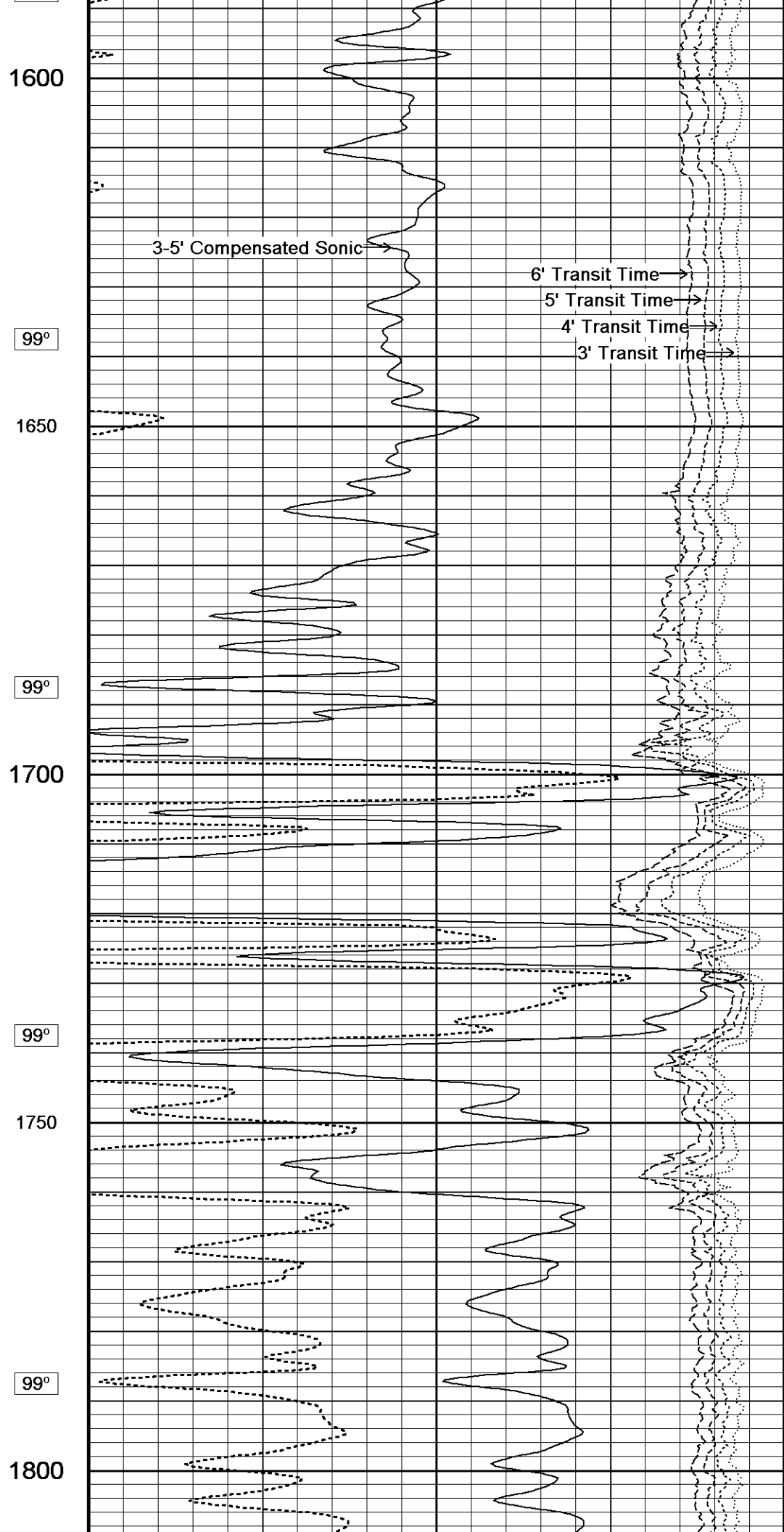
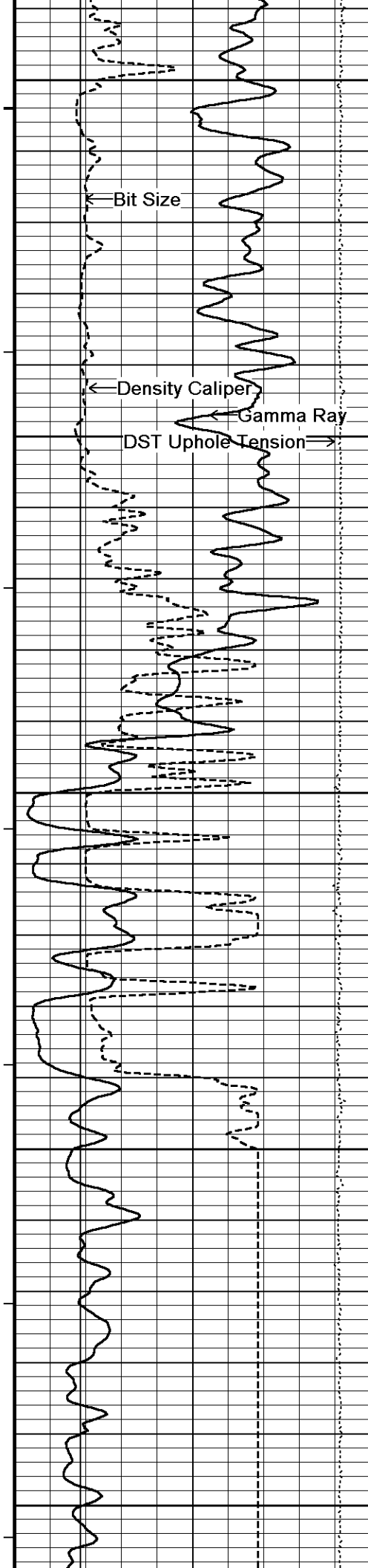
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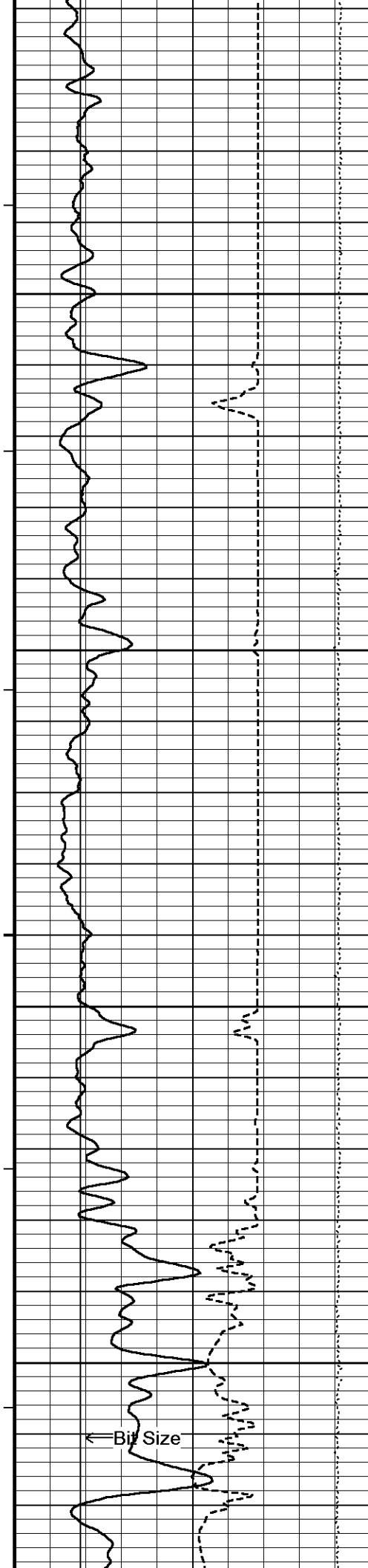
98°

1550

98°







99°

1850

99°

1900

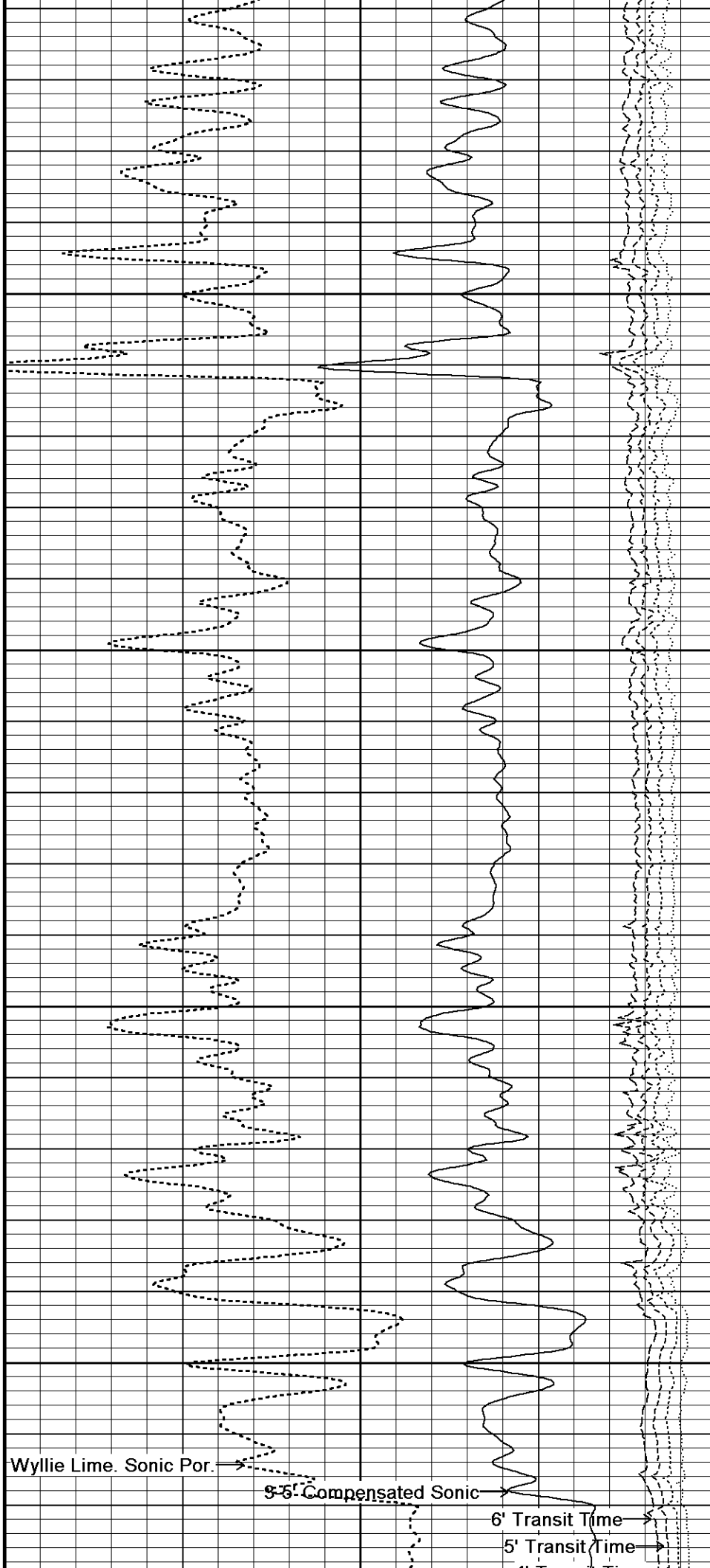
99°

1950

99°

2000

← Bit Size

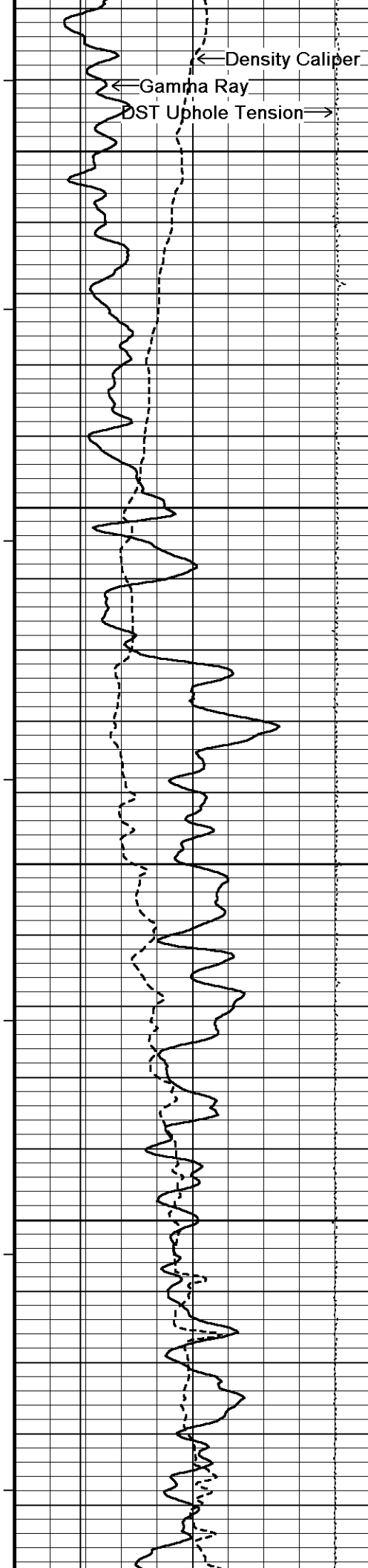


Wyllie Lime. Sonic Por. →

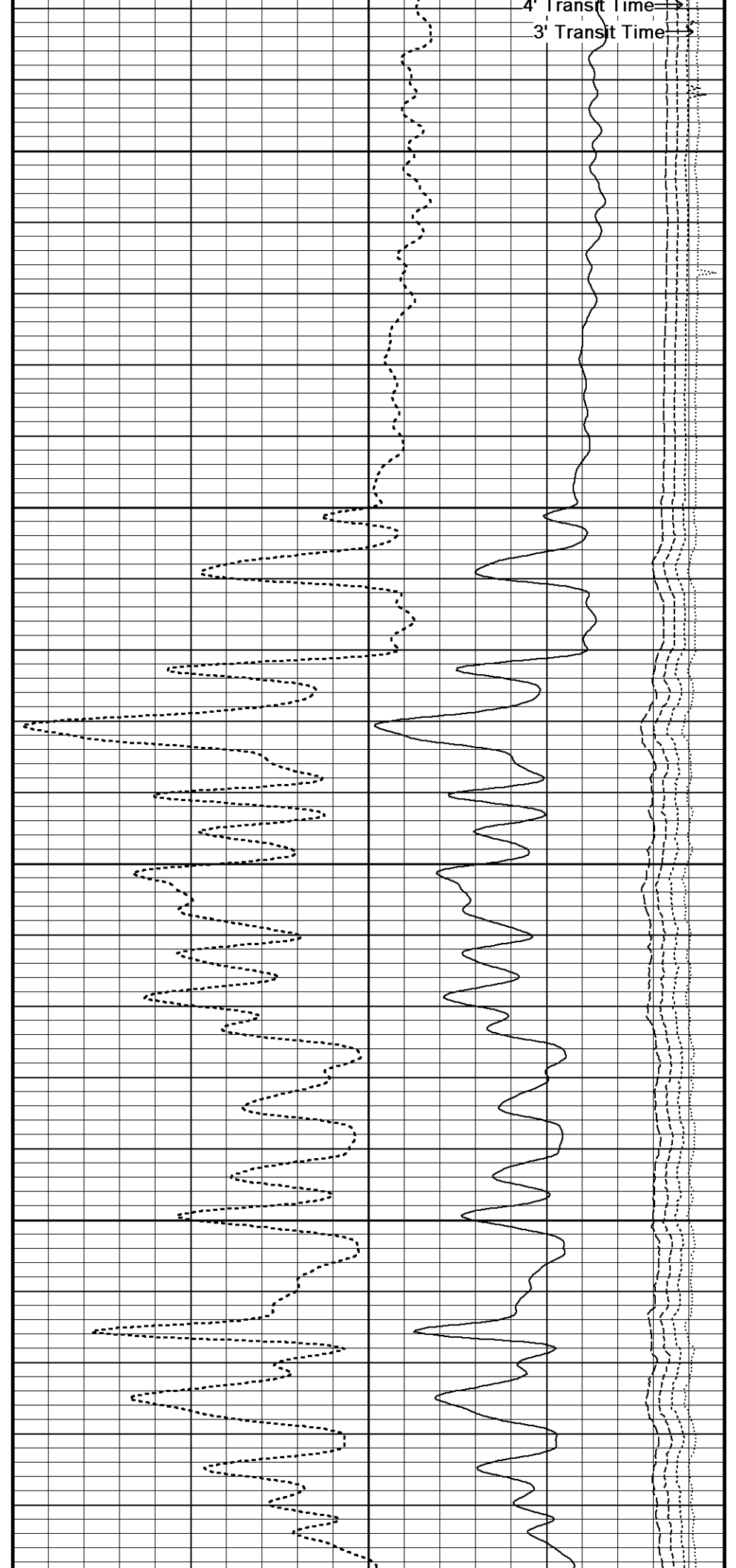
3-5' Compensated Sonic →

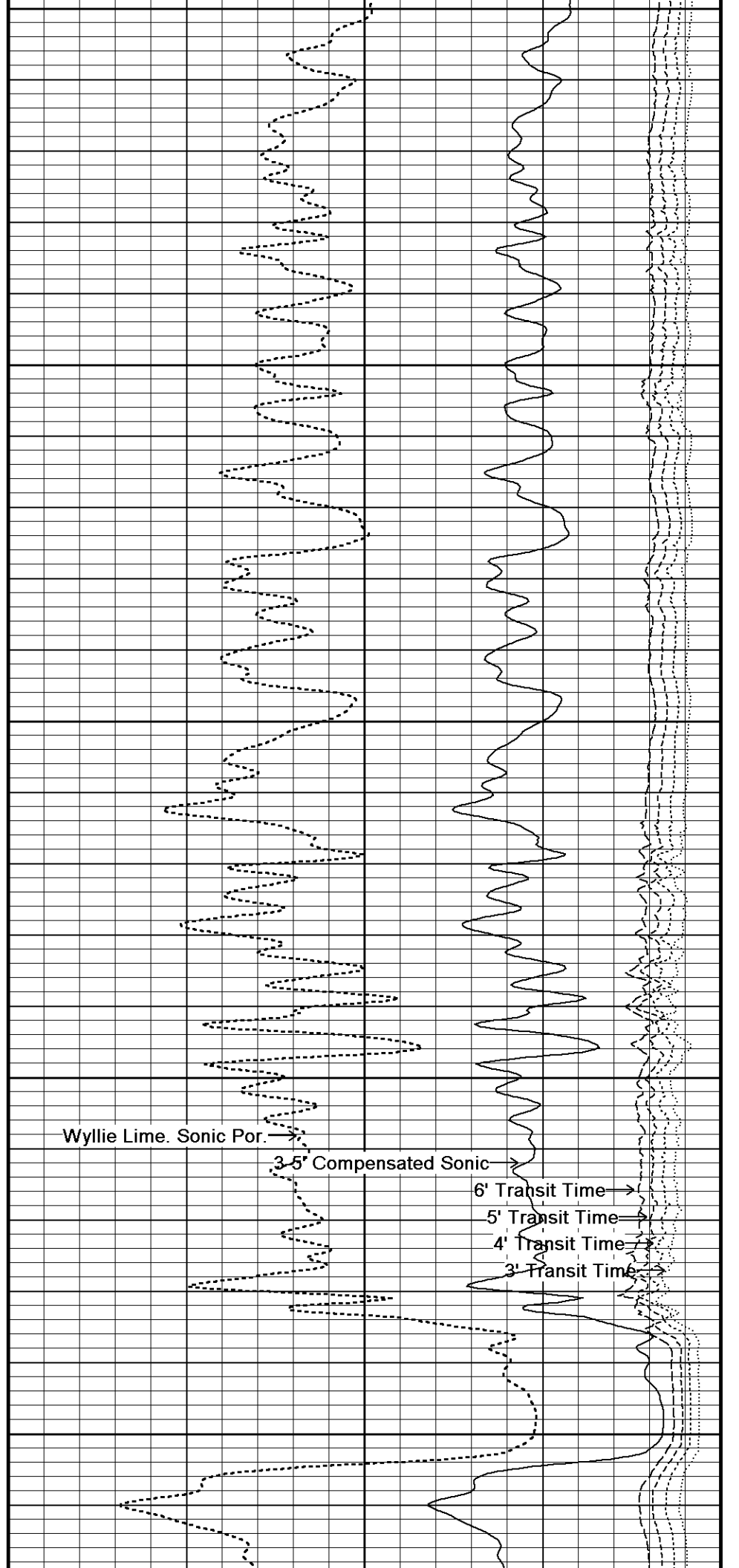
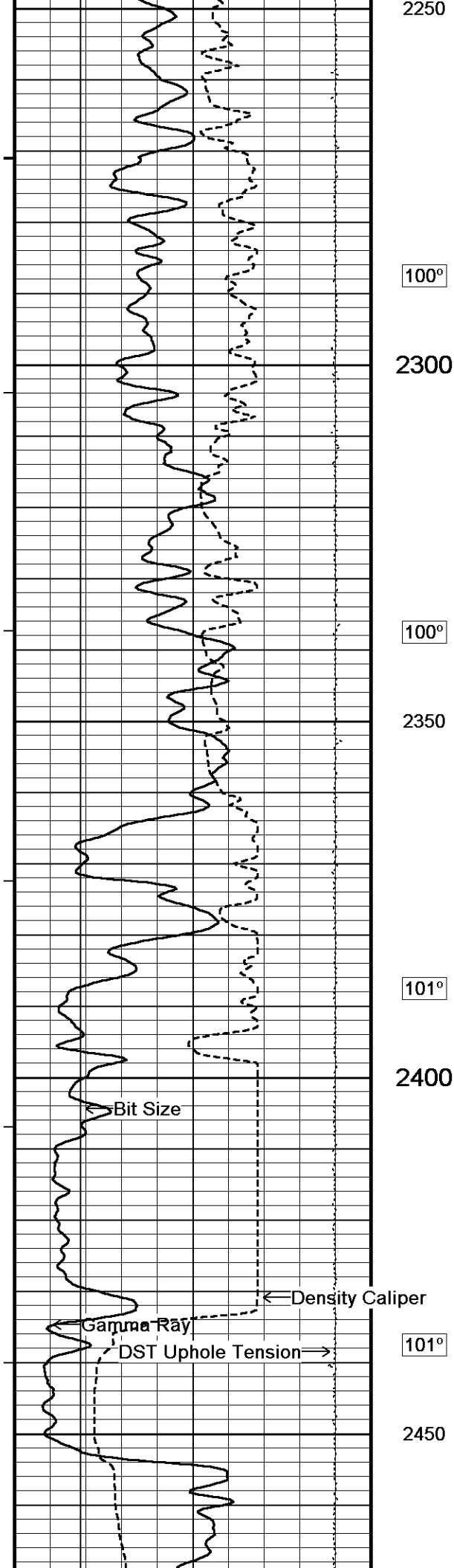
6' Transit Time →

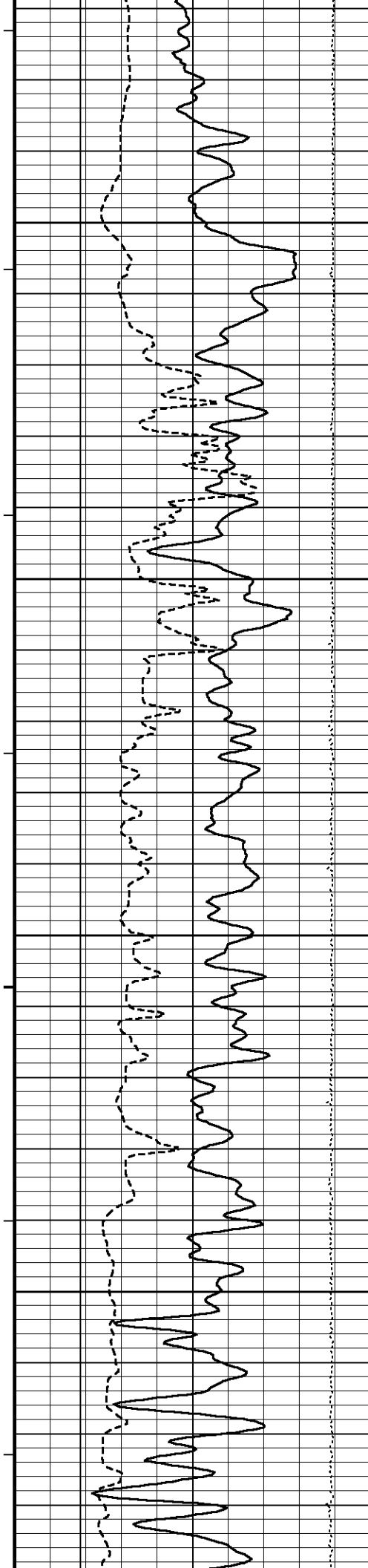
5' Transit Time →



99°
2050
99°
2100
99°
2150
99°
2200
99°







101°

2500

101°

2550

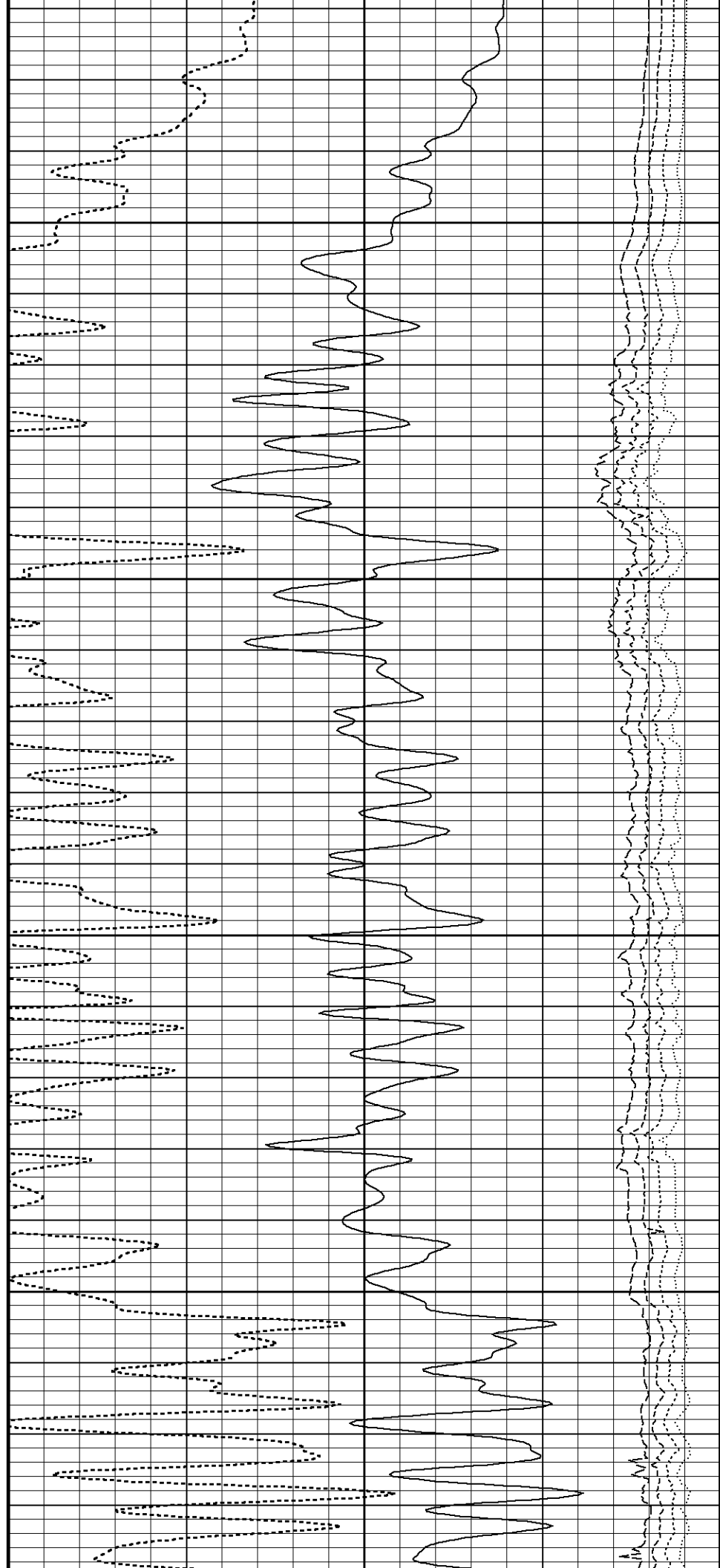
101°

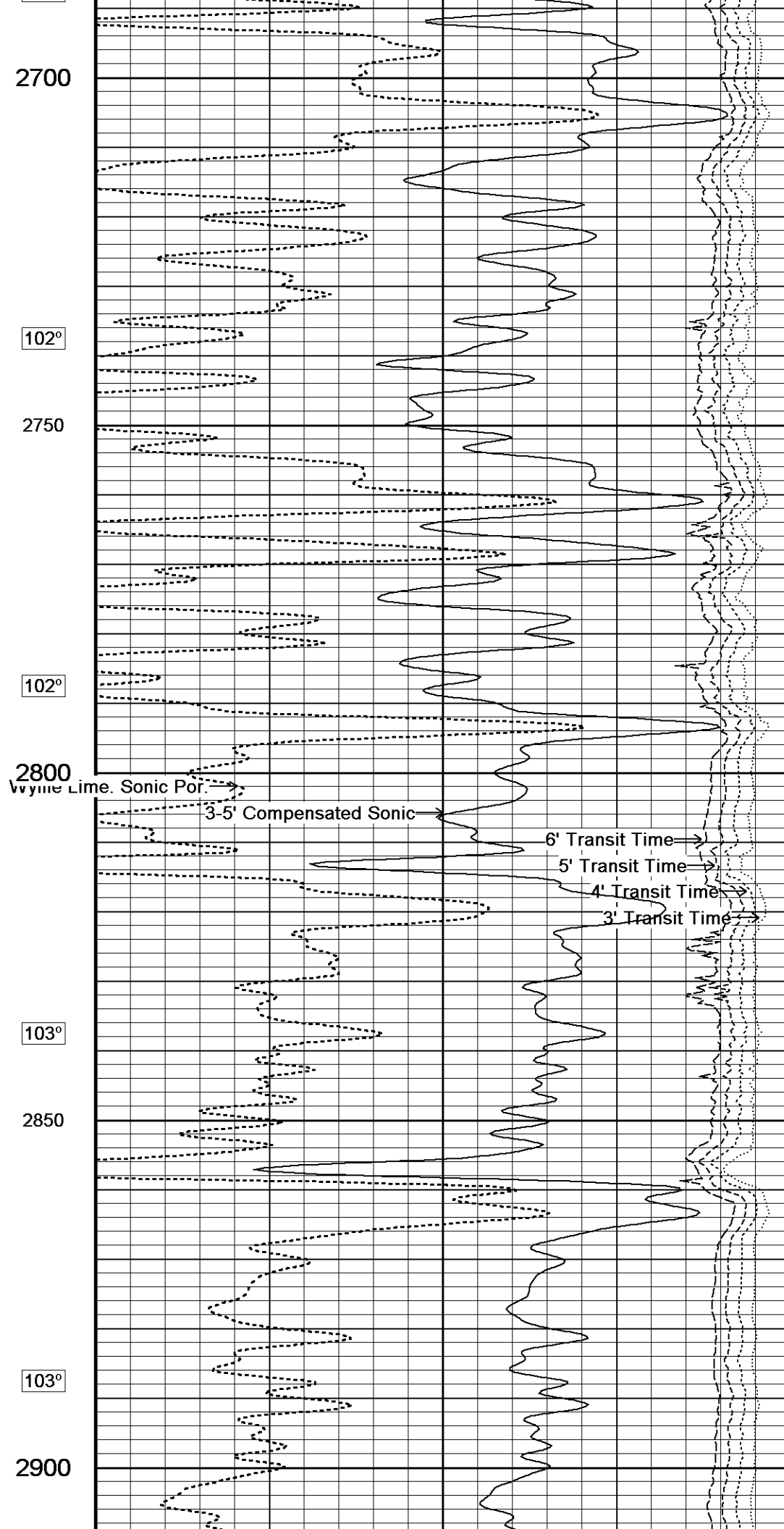
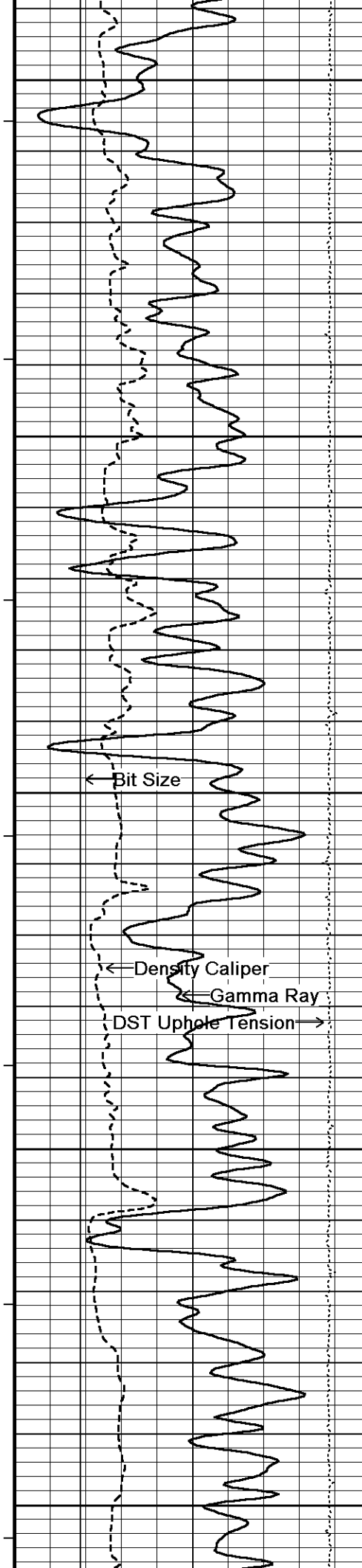
2600

102°

2650

102°





2700

102°

2750

102°

2800

Sonic Por.

3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

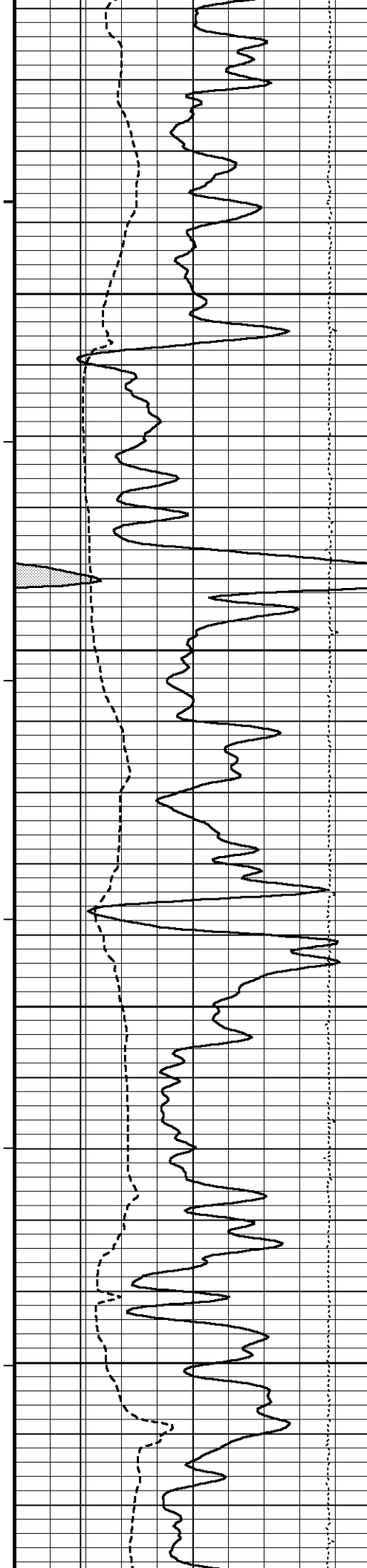
3' Transit Time

103°

2850

103°

2900



103°

2950

103°

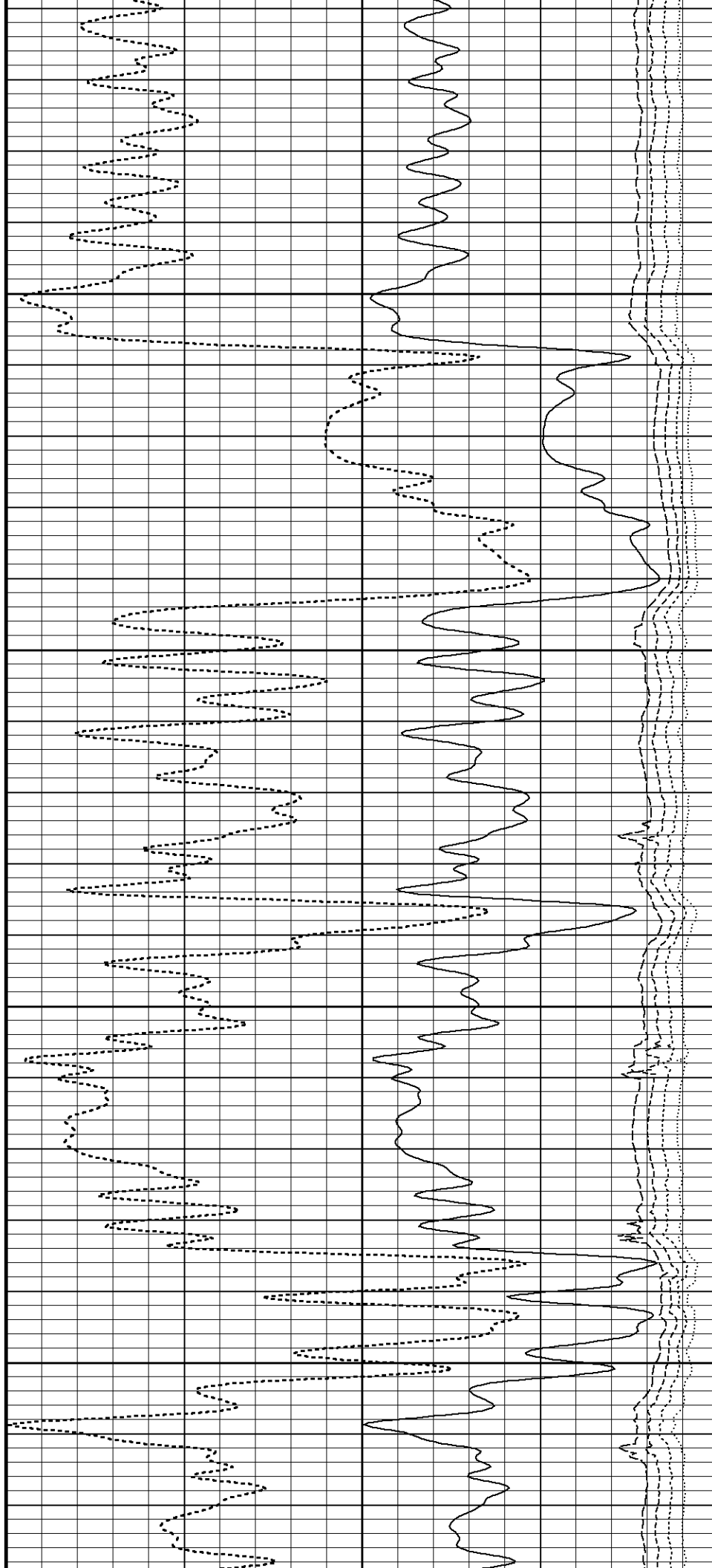
3000

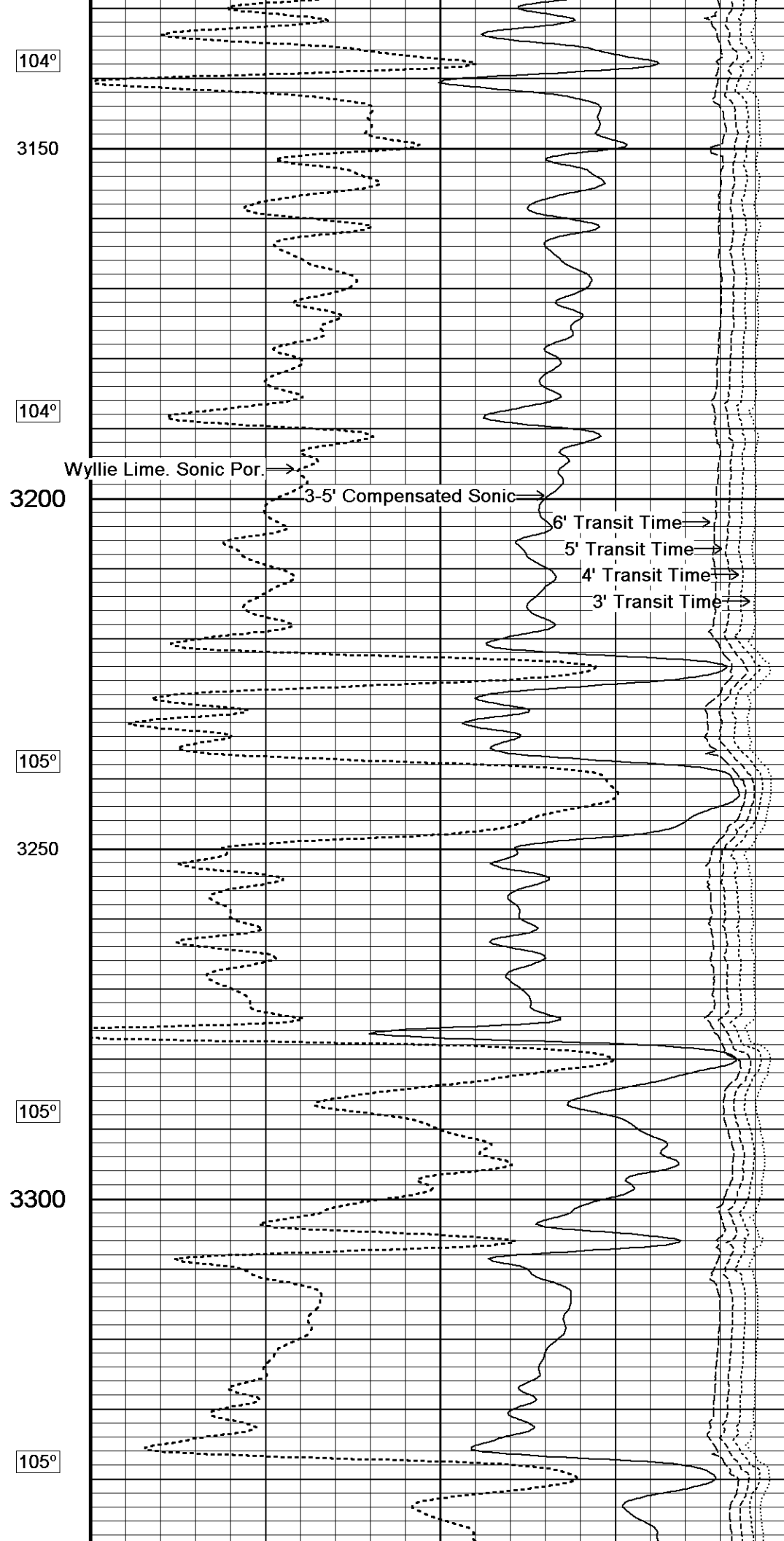
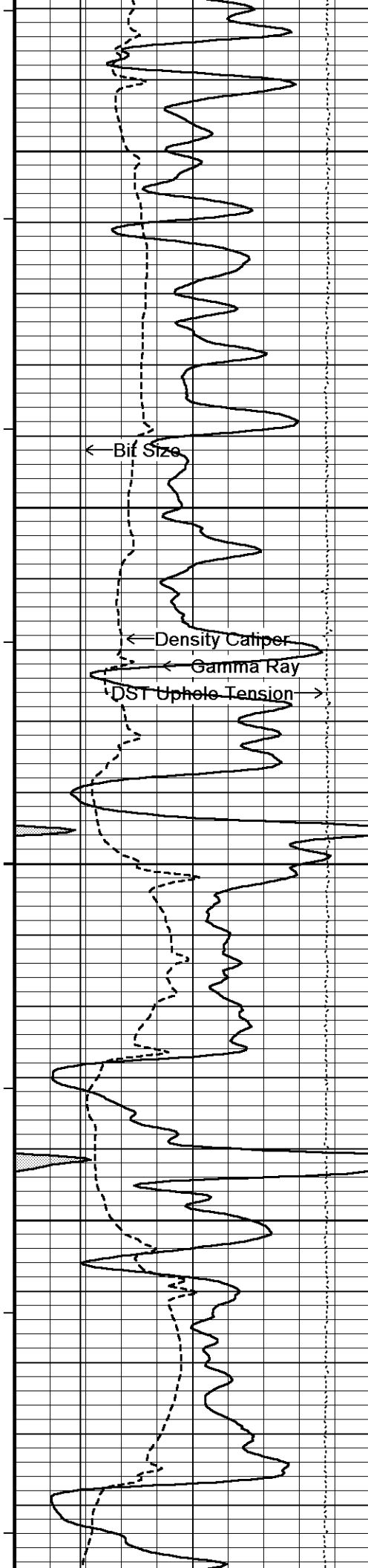
104°

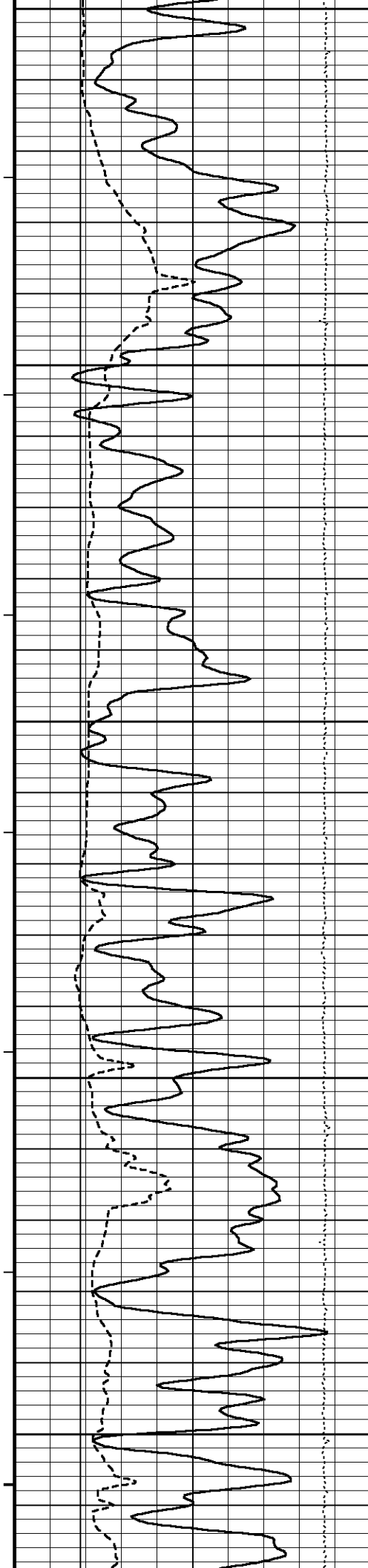
3050

104°

3100







3350

105°

3400

106°

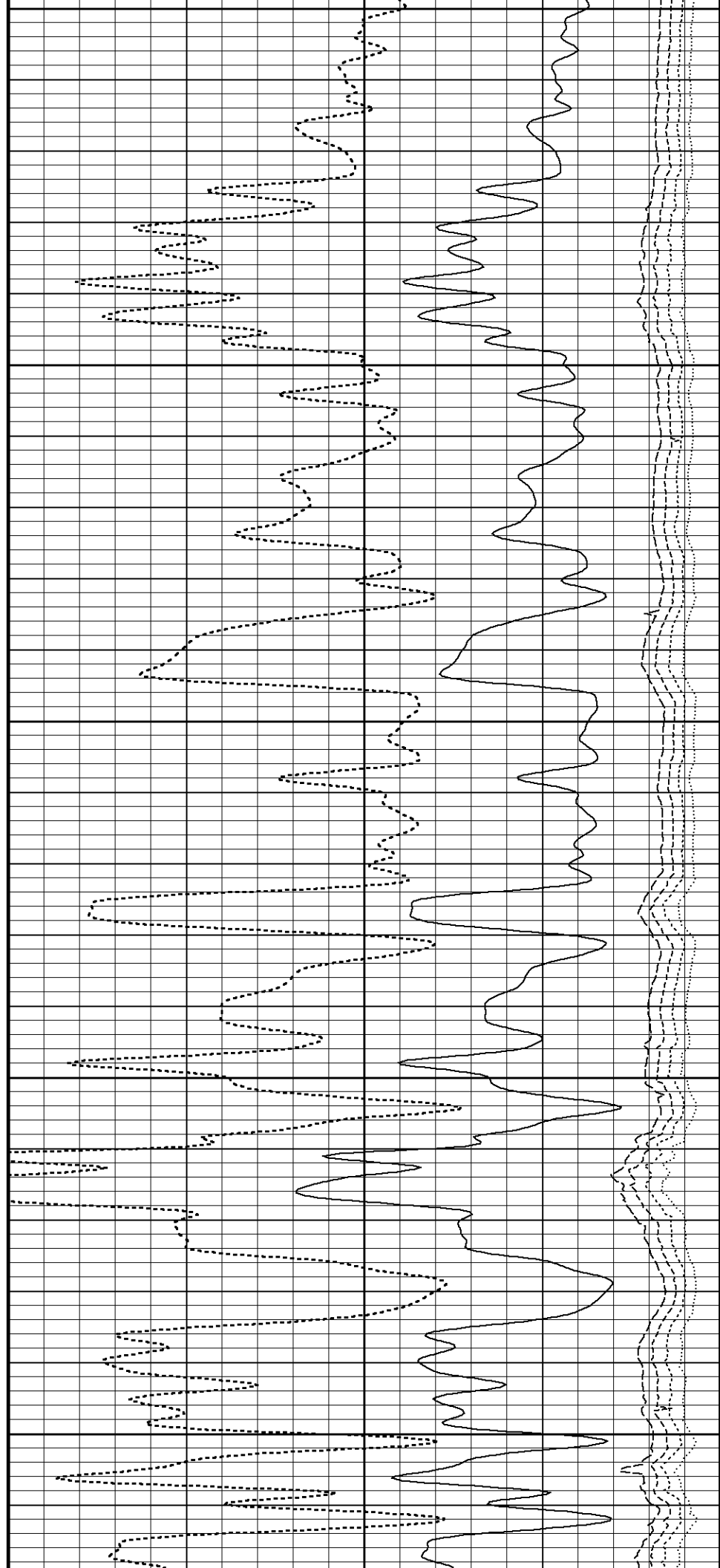
3450

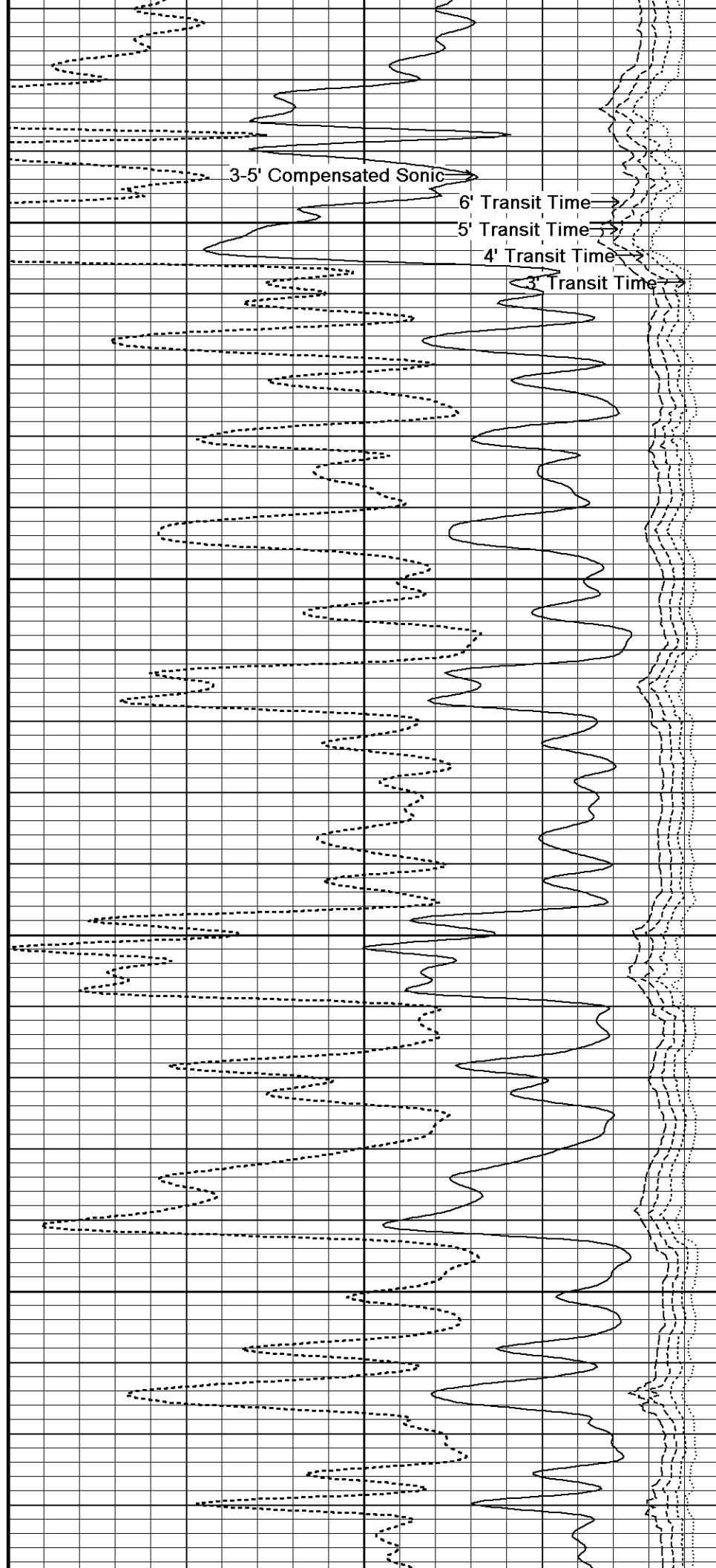
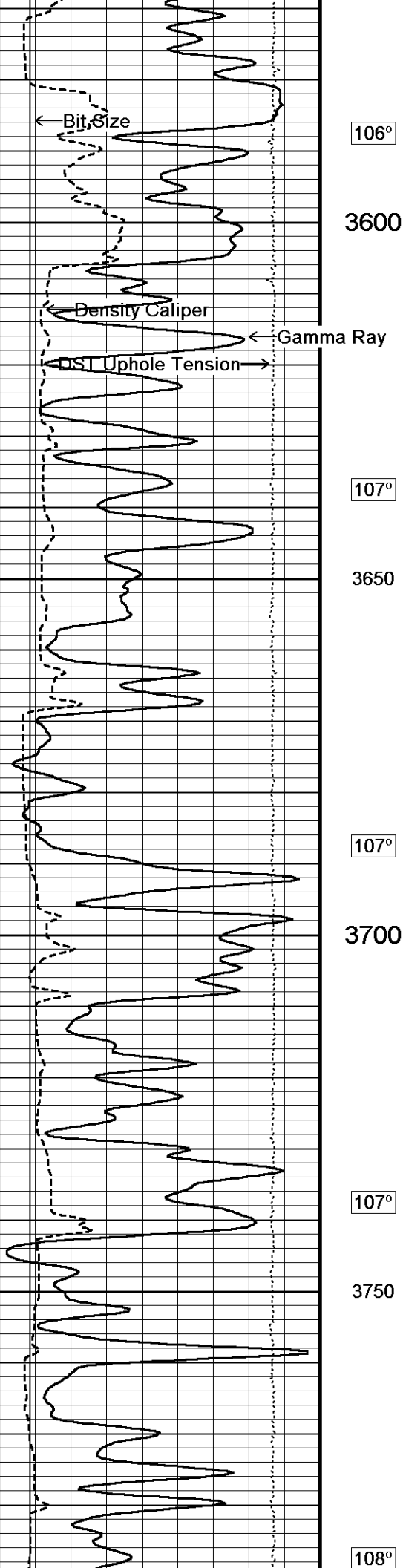
106°

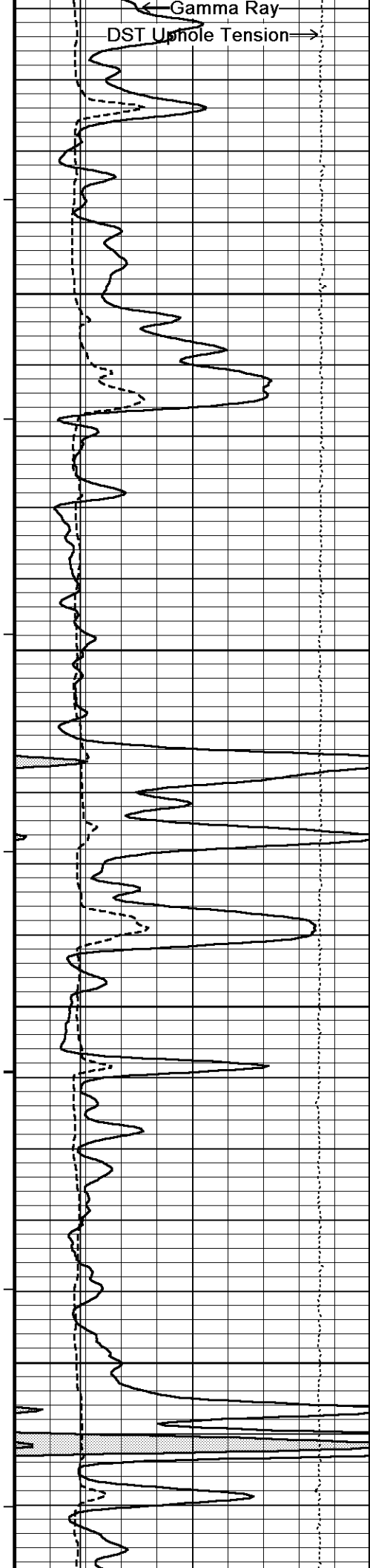
3500

106°

3550







109°

4050

109°

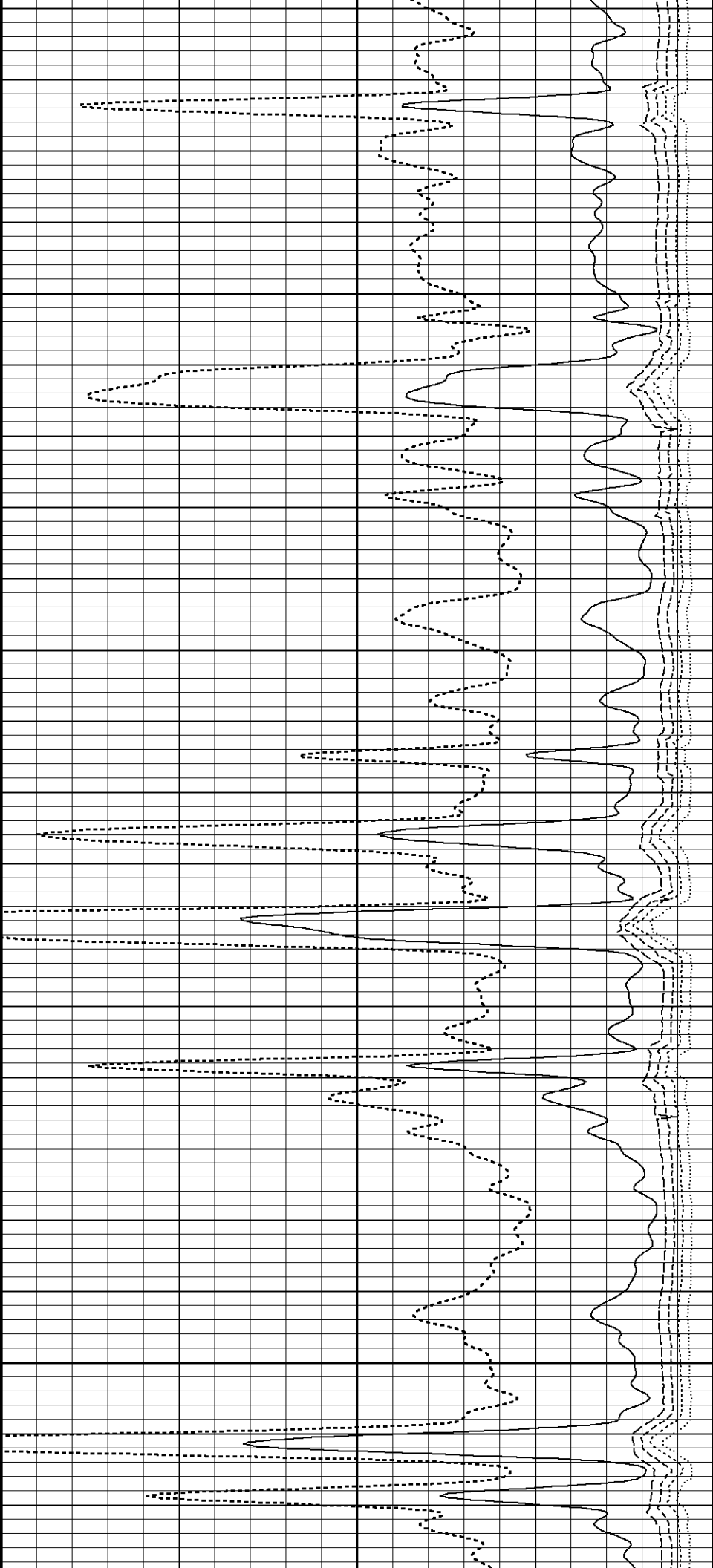
4100

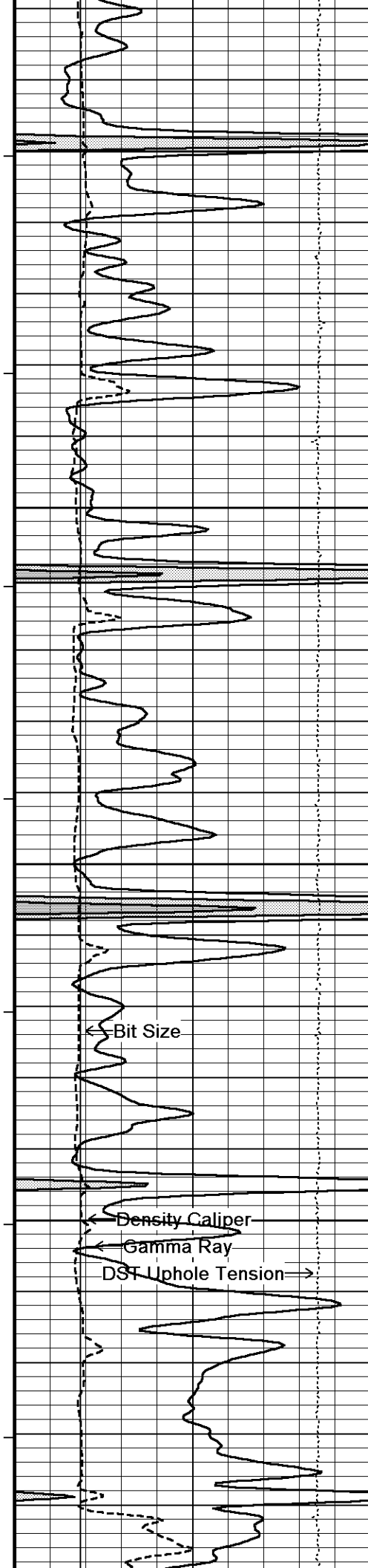
110°

4150

110°

4200





110°

4250

110°

4300

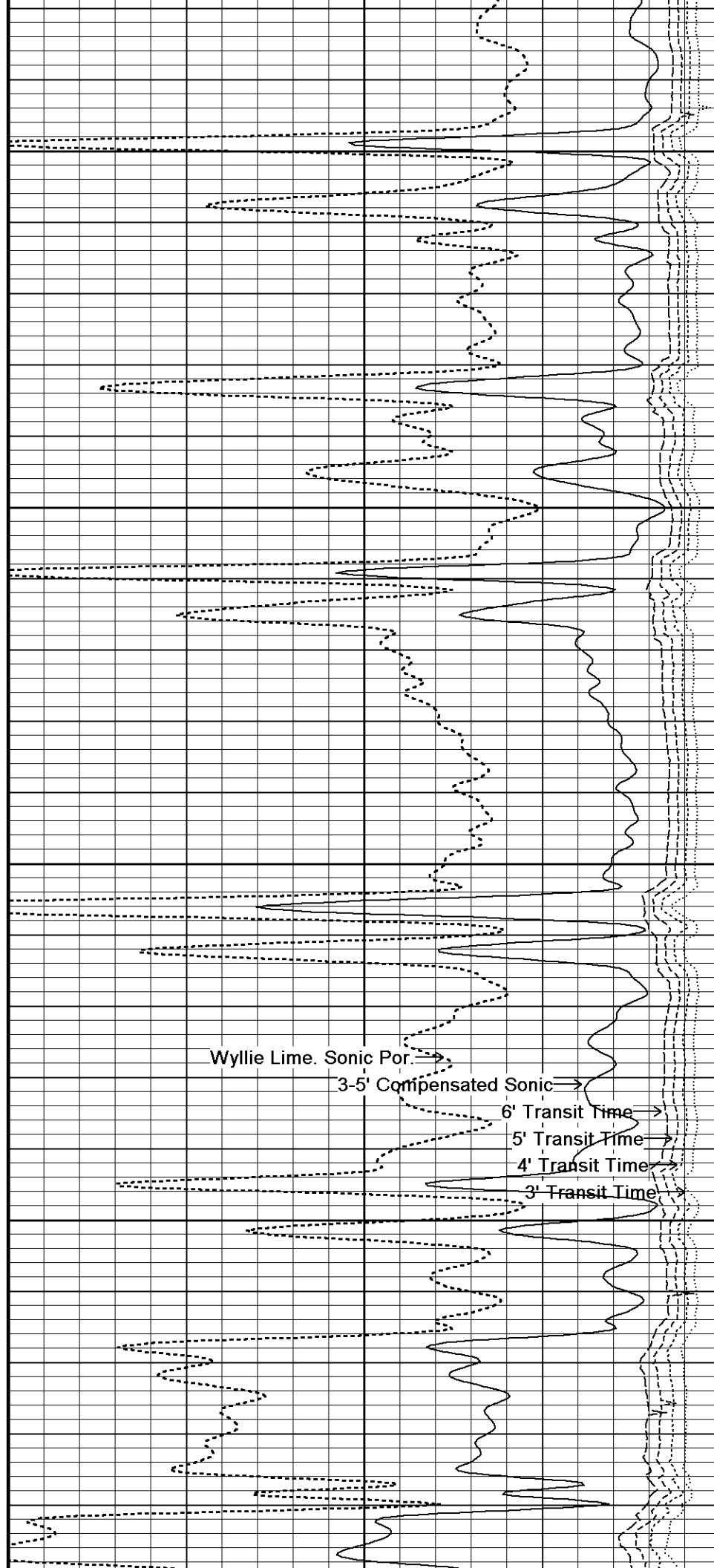
111°

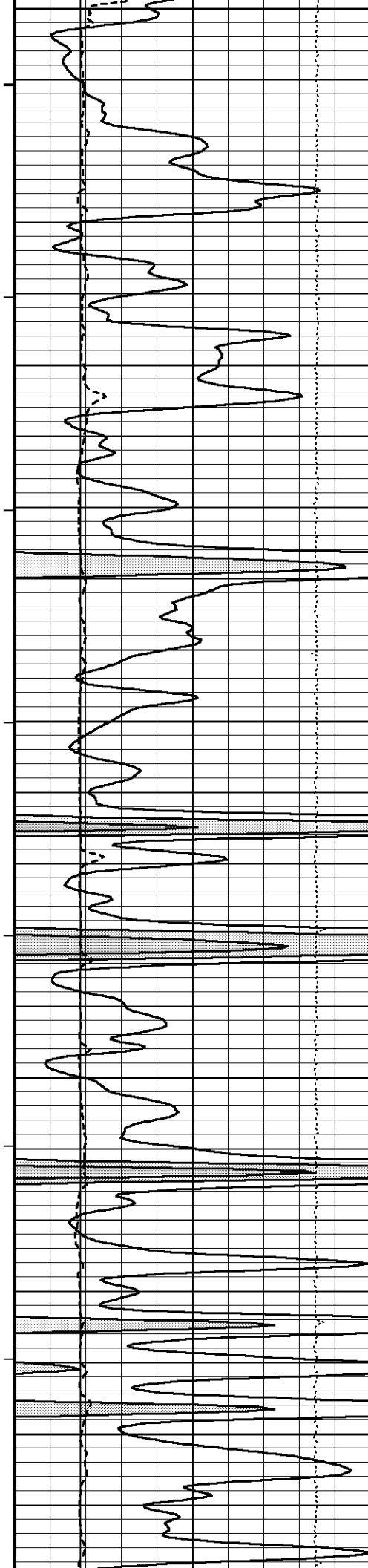
4350

111°

4400

111°





4450

111°

4500

112°

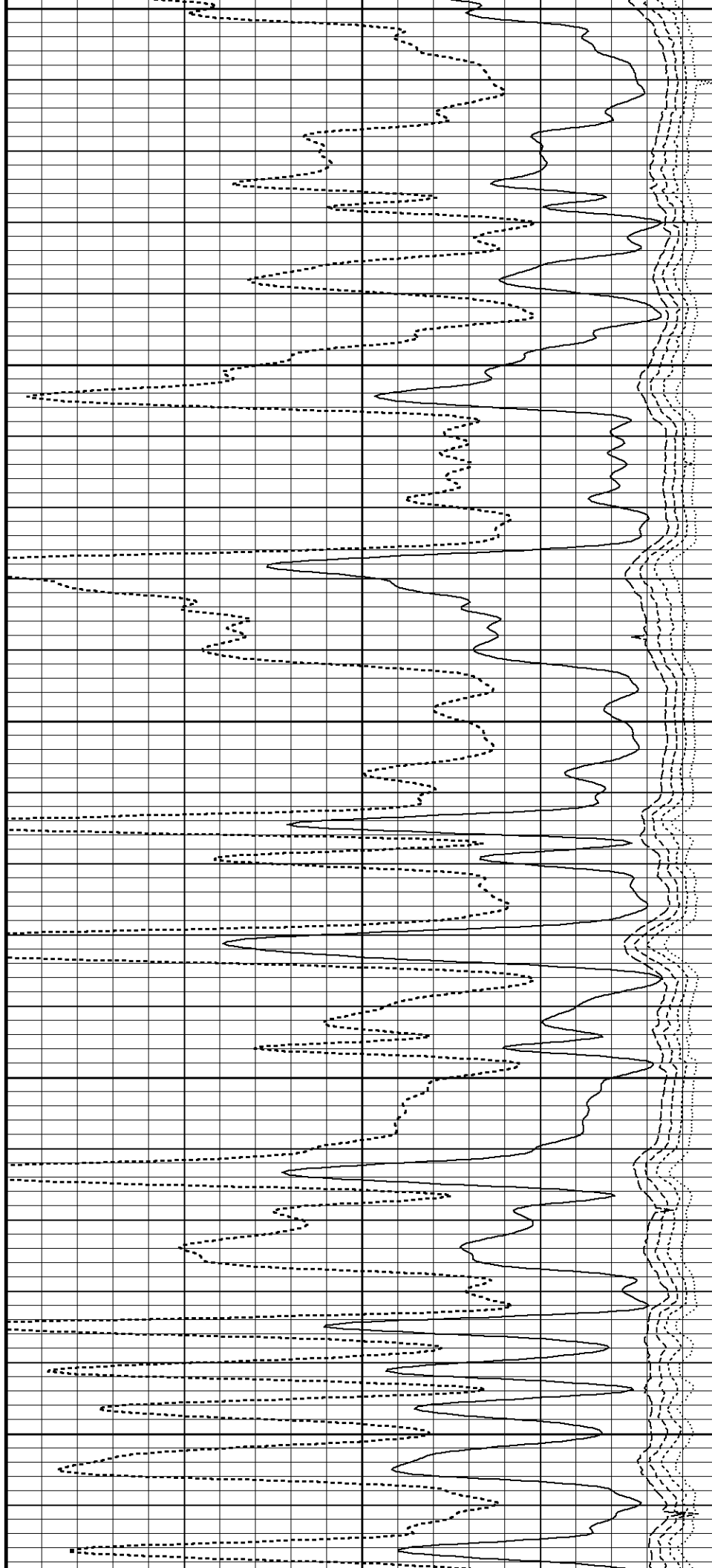
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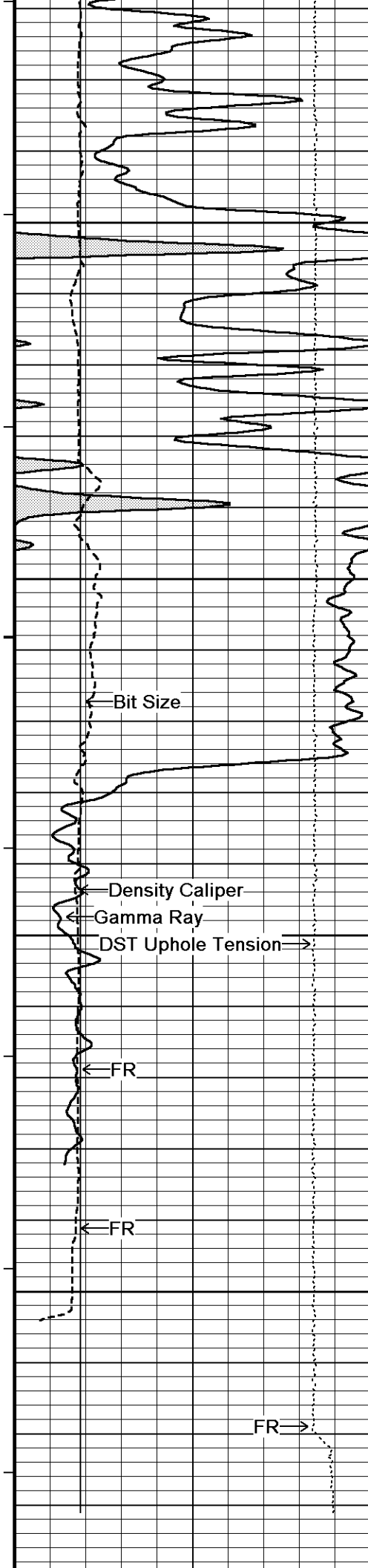
112°

4600

113°

4650





114°

4700

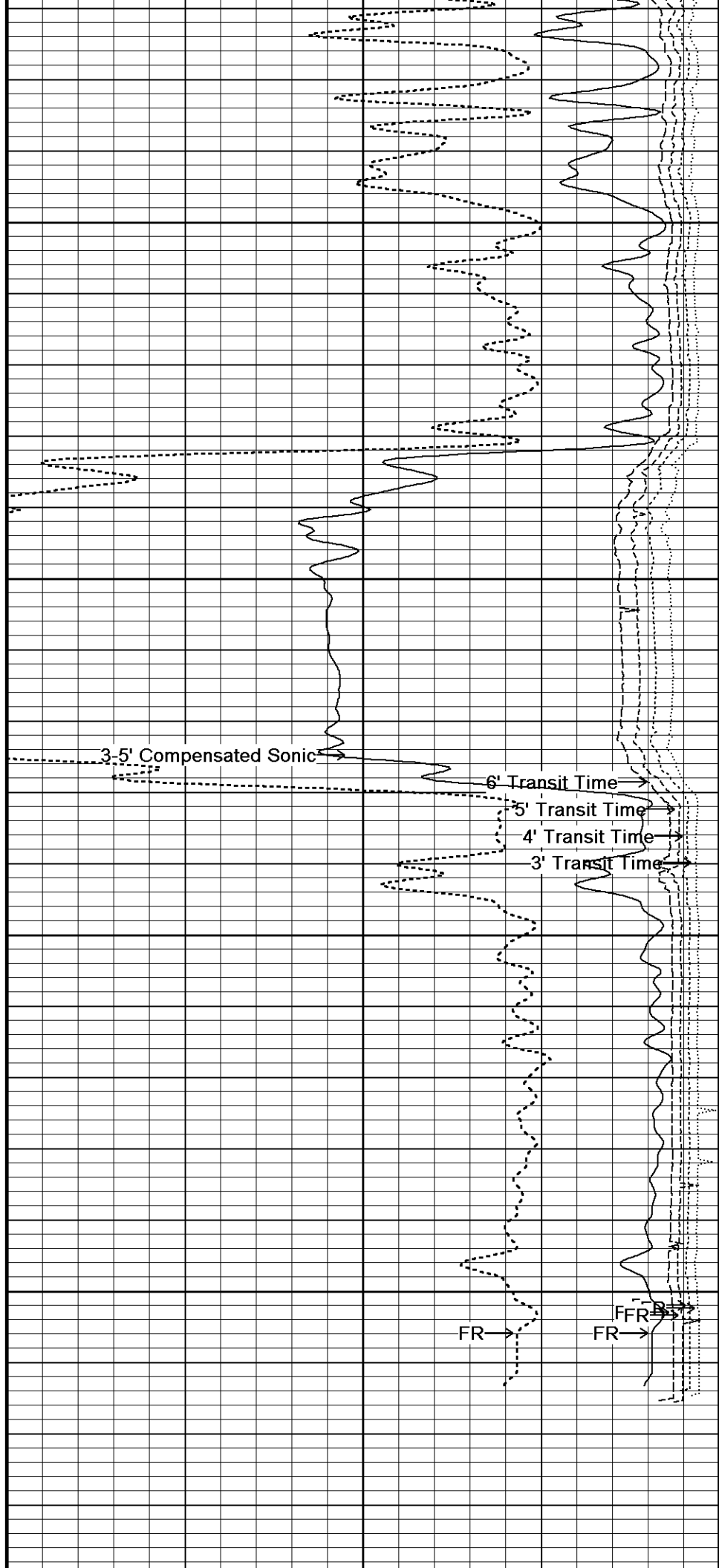
114°

4750

115°

4800

4850



3-5' Compensated Sonic

6' Transit Time

5' Transit Time

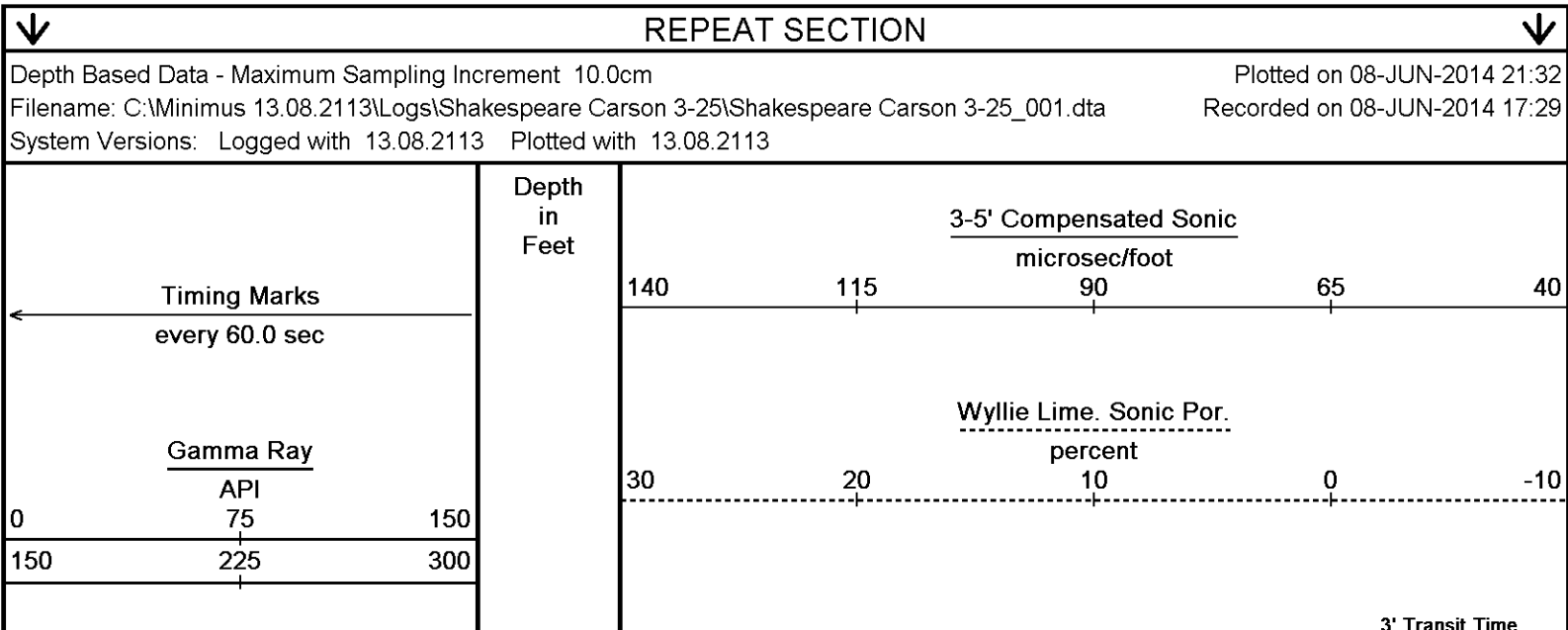
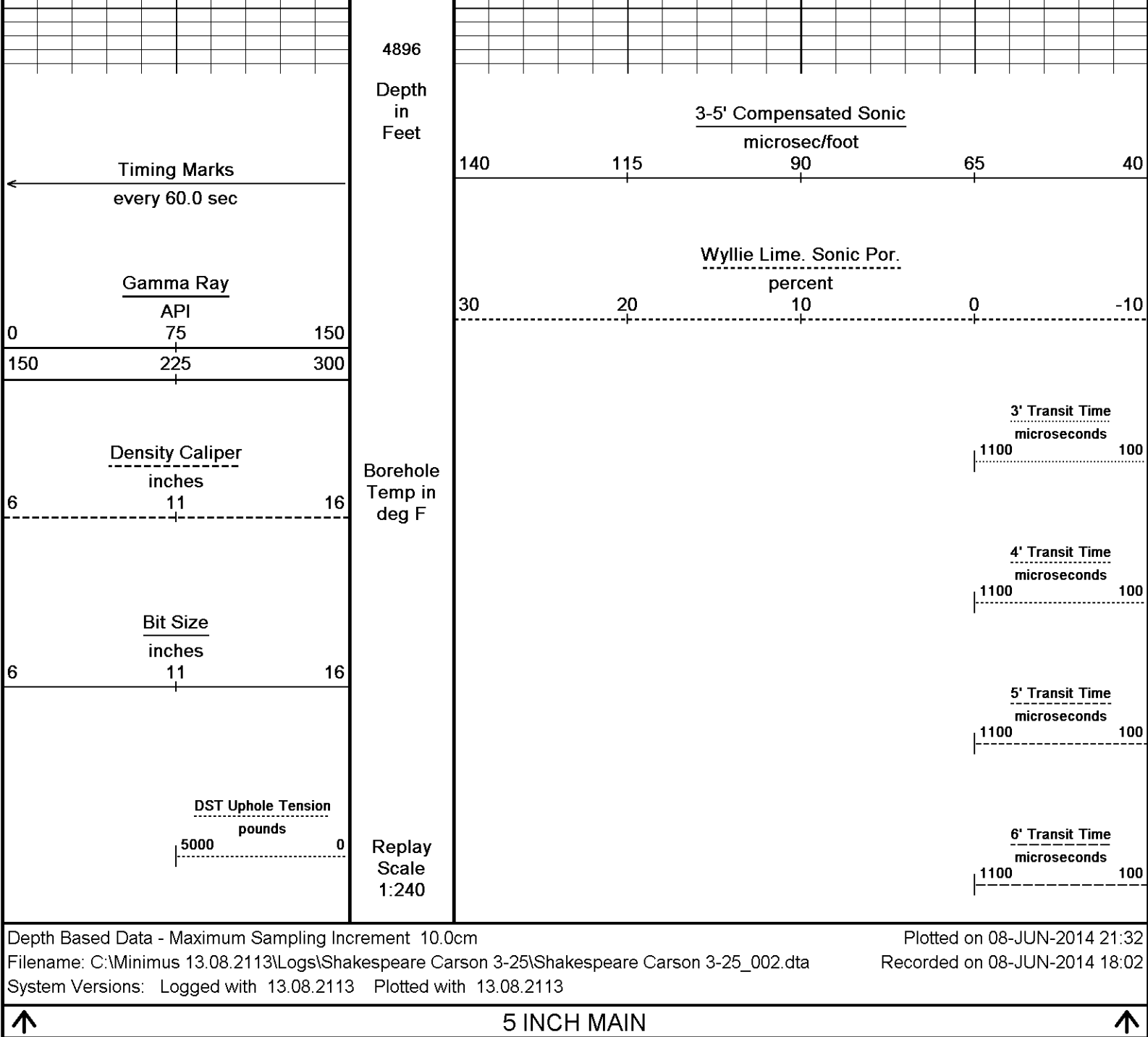
4' Transit Time

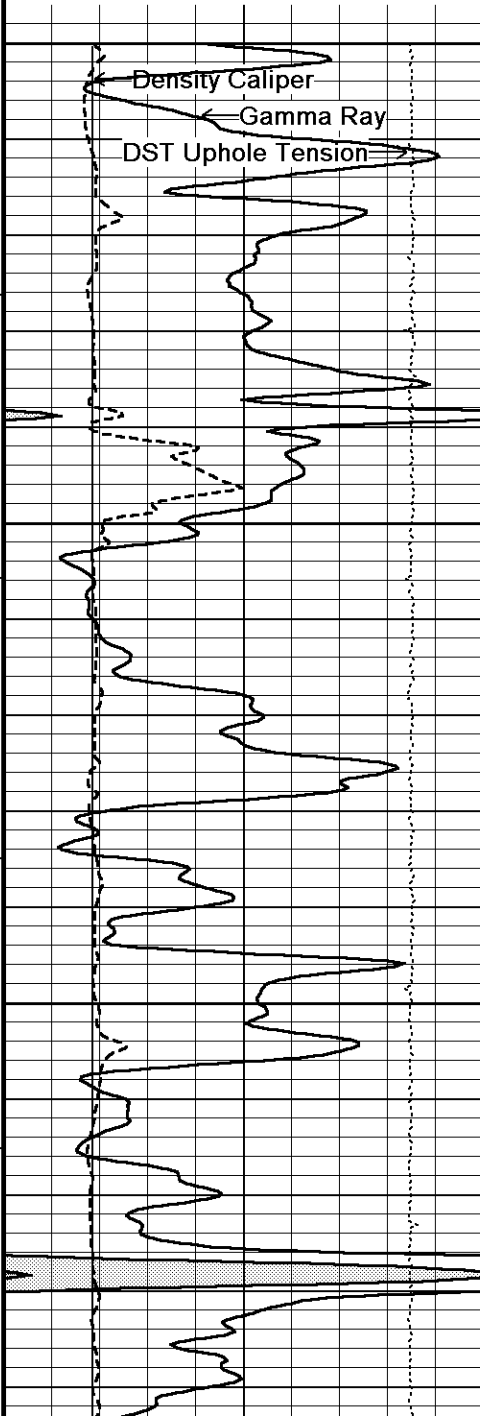
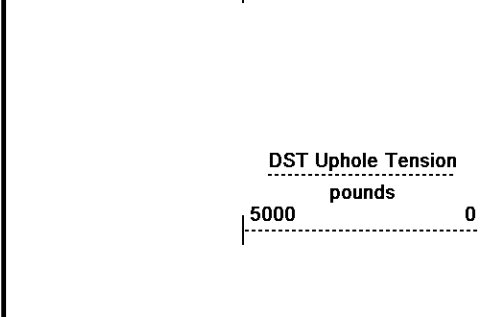
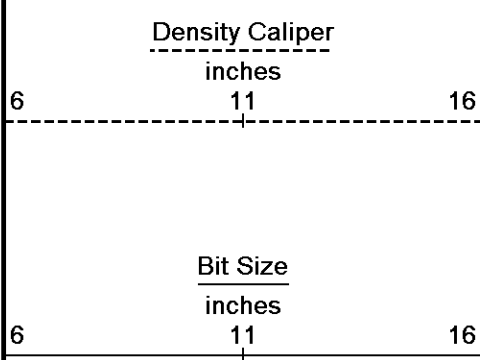
3' Transit Time

FR

FR

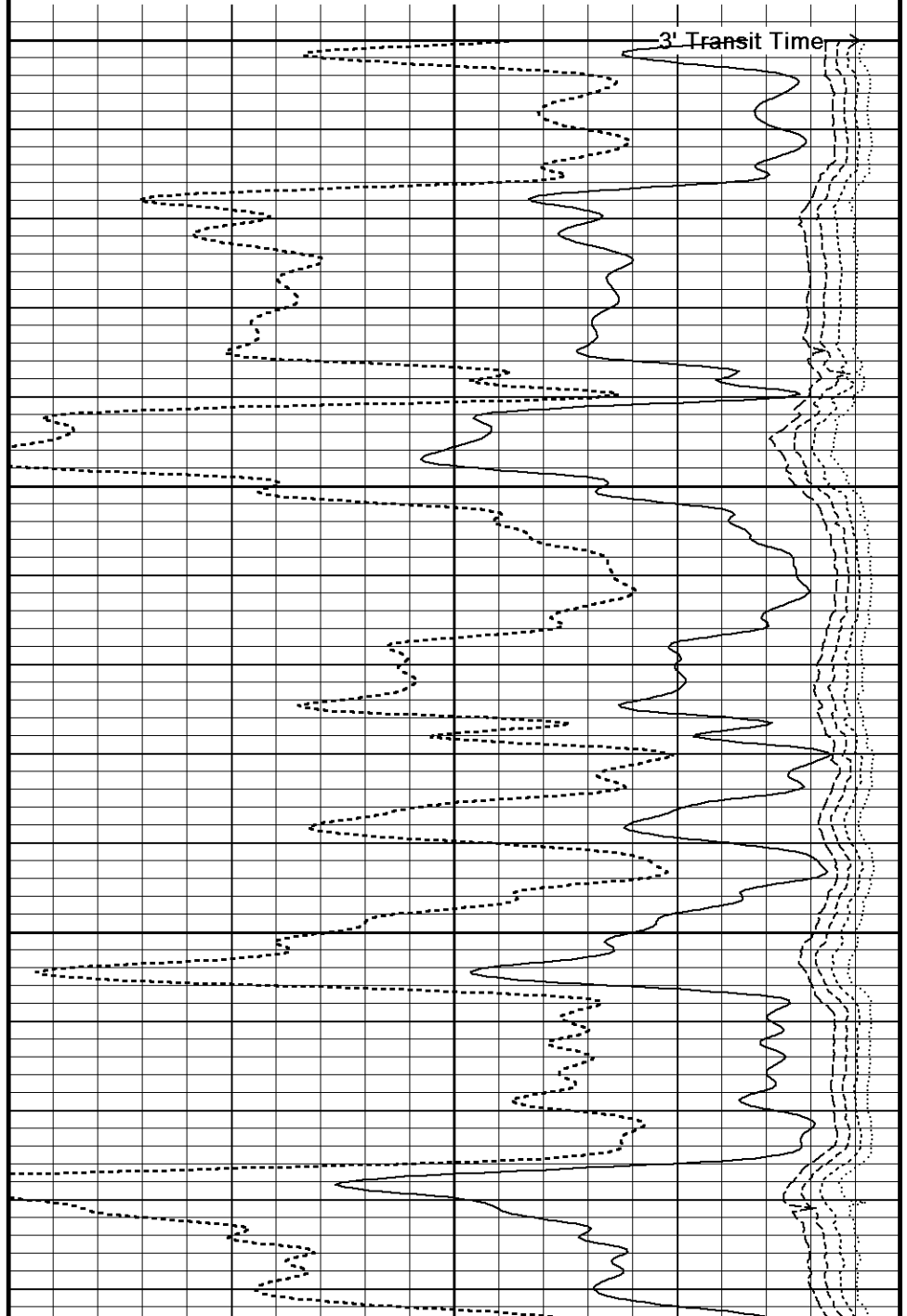
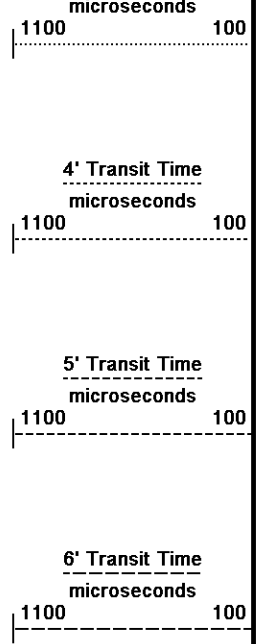
FR

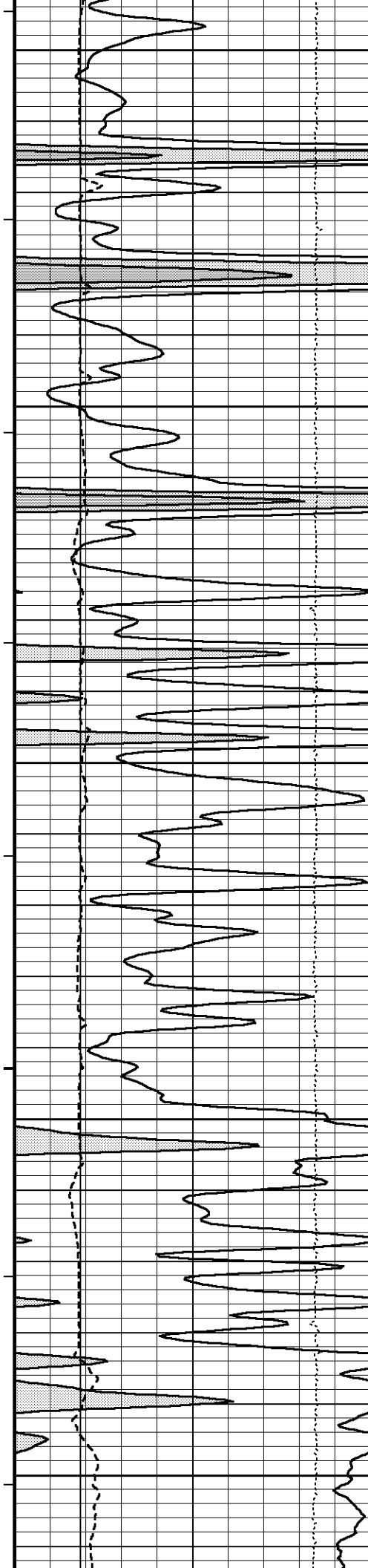




Borehole
Temp in
deg F

Replay
Scale
1:240





4550

112°

4600

112°

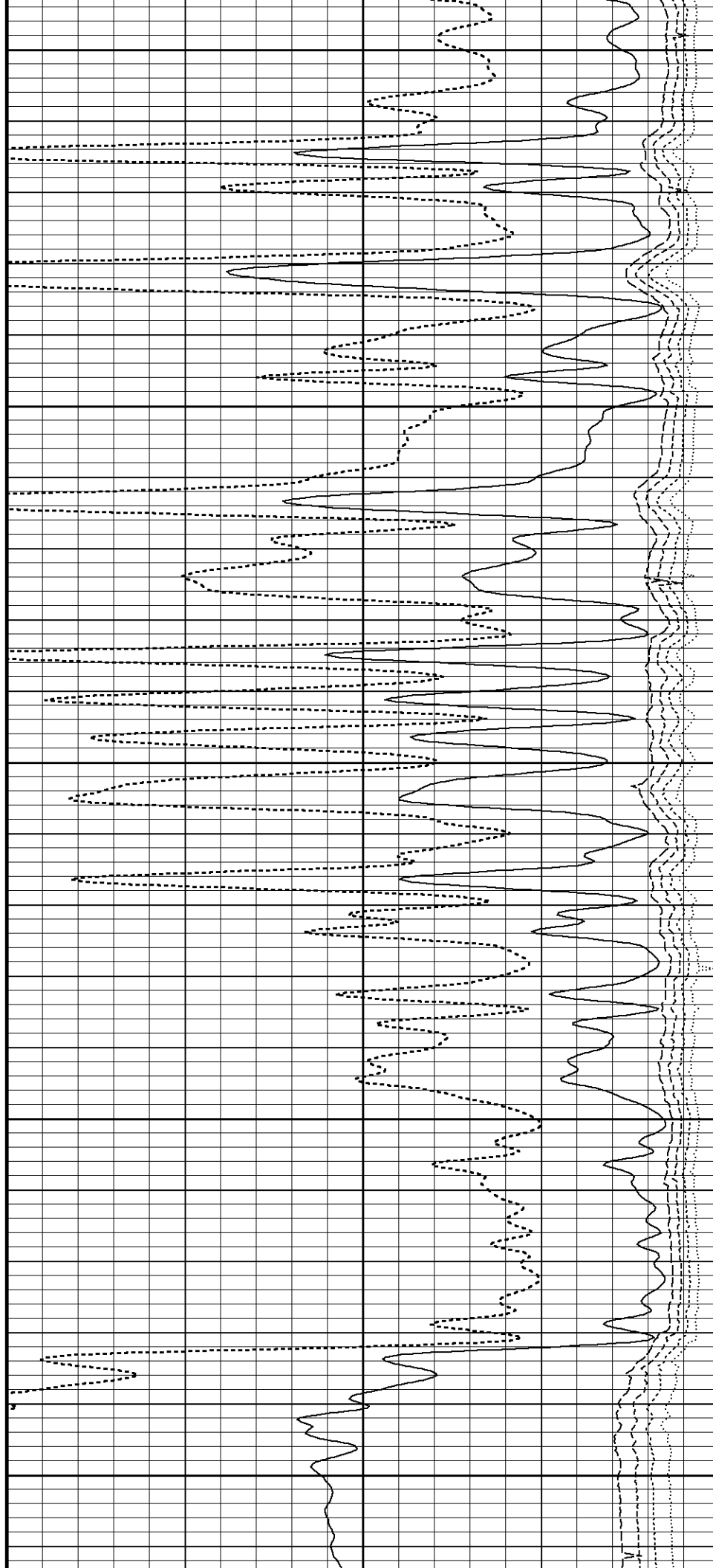
4650

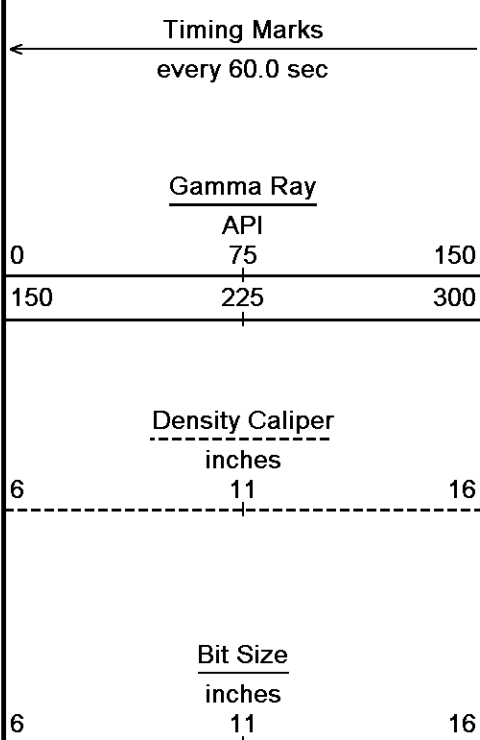
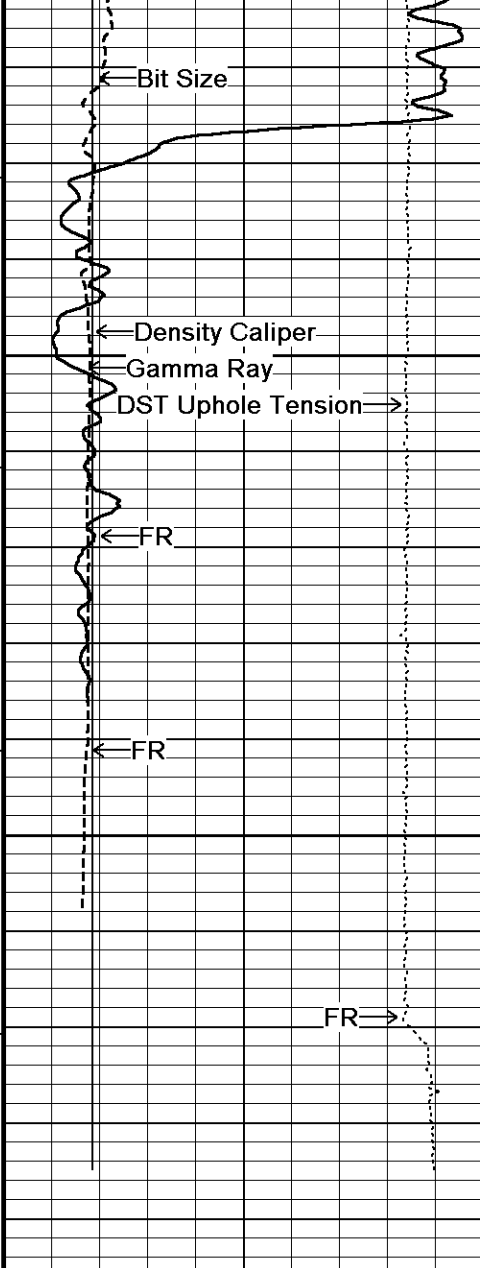
113°

4700

113°

4750





114°

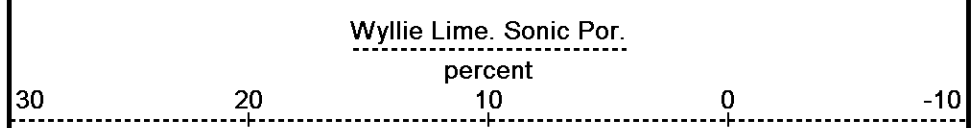
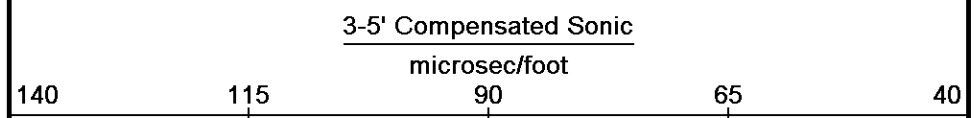
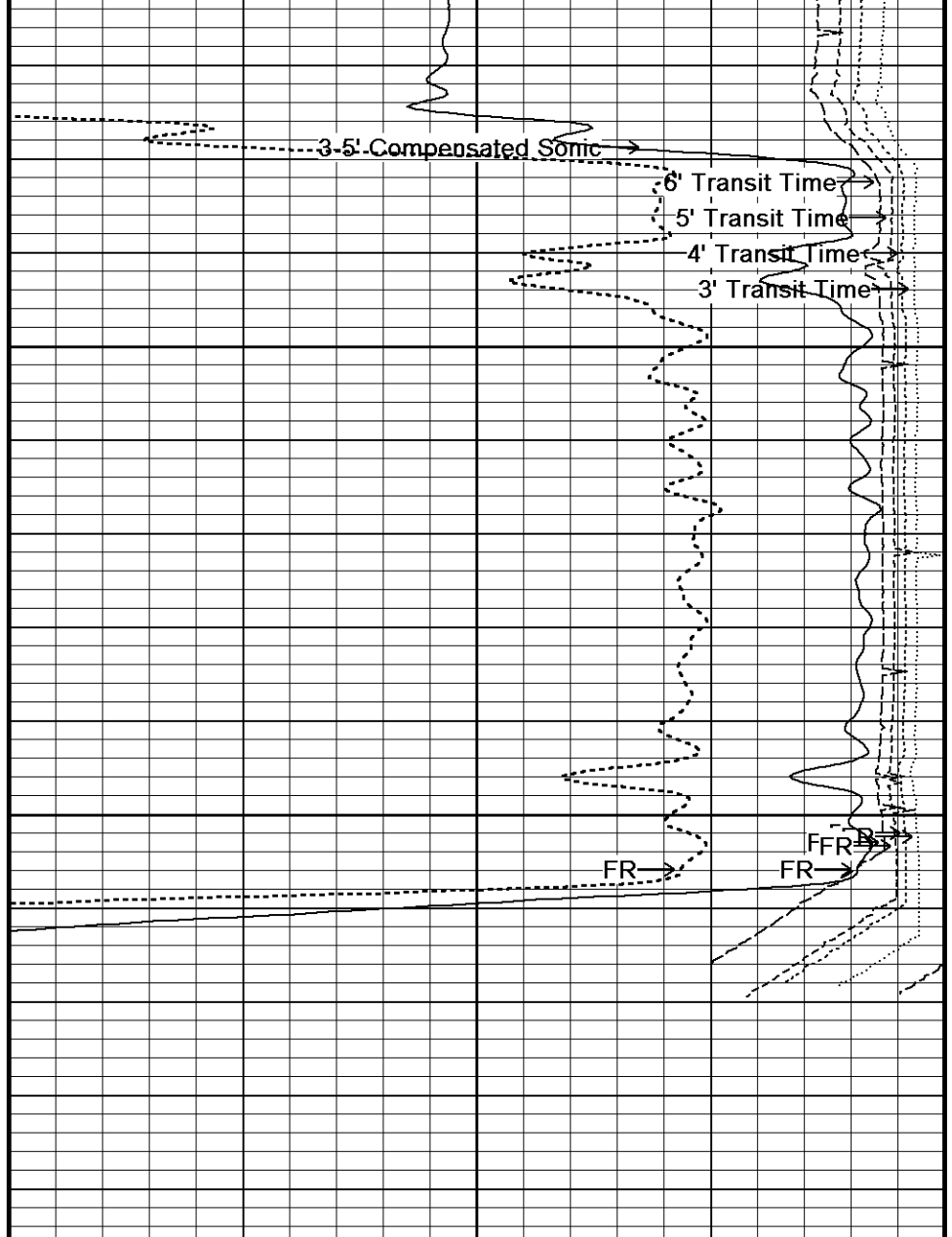
4800

112°

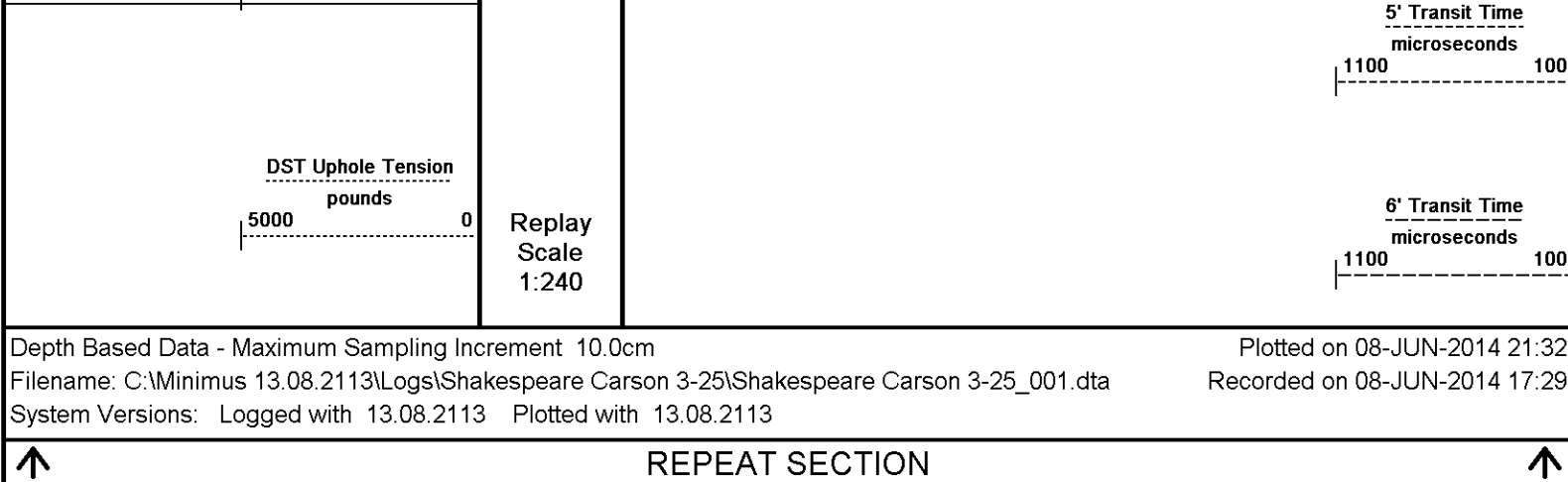
4850

4892

Depth
in
Feet



Borehole
Temp in
deg F



BEFORE SURVEY CALIBRATION			
C:\Minimus 13.08.2113\Logs\Shakespeare Carson 3-25\Shakespeare Carson 3-25_001.dta			
General Constants All 000		Last Edited on 08-JUN-2014,16:12	
General Parameters			
Mud Resistivity	0.570	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	Density Caliper		
HVOL Caliper 2	N/A		
Annular Volume Diameter	5.500	inches	
Caliper for Differential Caliper	MMR Caliper		
Rwa Parameters			
Porosity used	Crossplot Porosity		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0		Field Calibration on 06-JUN-2014 13:04	
Reading No	Measured	Calibrated (lbs)	
1	15091.74	0.00	
2	15786.19	408.00	
SP Calibration MCG-C 208		Field Calibration on 04-JUN-2014 10:39	
	Measured	Calibrated (mV)	
Reference 1	99.6	99.0	
Reference 2	-98.1	-98.8	
High Resolution Temperature Calibration MCG-C 208		Field Calibration on 23-JAN-2014,17:11	
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 208		Last Edited on 23-JAN-2014,17:11	
Pre-filter Length	11		
Gamma Calibration MCG-C 208		Field Calibration on 04-JUN-2014 10:53	
	Measured	Calibrated (API)	
Background	68	46	
Calibrator (Gross)	1134	771	
Calibrator (Net)	1067	725	

Gamma Calibrator Number	GRC038	
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	%

Caliper Calibration MMR-C.A 248

Base Calibration on 10-MAY-2014 09:28

Field Calibration on 04-JUN-2014 10:29

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13446	5.98
2	16585	7.97
3	19782	9.86
4	23693	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
8.02	7.97

Micro Normal and Micro Inverse Calibration MMR-C.A 248

Base Calibration on 10-MAY-2014 09:40

Field Check on 04-JUN-2014 10:27

Base Calibration

Channel	Resistor 1	Measured		Calibrated (ohm-m)	
		Resistor 2	Resistor 1	Resistor 2	
Micro Normal	10.1	49.8	5.1	25.6	
Micro Inverse	9.9	49.5	3.4	16.9	

Channel	Base Check (ohm-m)	Field Check (ohm-m)
Micro Normal	93.6	93.6
Micro Inverse	62.2	62.2

Micro Normal and Micro Inverse Constants MMR-C.A 248

Last Edited on 23-JAN-2014,17:04

Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159
Micro Normal K Factor	0.5110
Micro Inverse K Factor	0.3380
Standoff Offset	0.0000 inches

Neutron Calibration MDN-B.J 387

Base Calibration on 08-MAY-2014 14:03

Field Check on 04-JUN-2014 10:59

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	2970	91	3714	110
Ratio	32.668		33.764	

Field Calibrator at Base

Calibrated (cps)
1688 2486
Ratio 0.679

Field Check

Calibrated (cps)
1689 2475
Ratio 0.683

Neutron Constants MDN-B.J 387

Last Edited on 08-JUN-2014,15:53

Neutron Source Id	P58125B
Neutron Jig Number	5824NE
Epithermal Neutron	
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	

Sonic Constants MSS-A.A 73

Last Edited on 08-JUN-2014,15:53

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	3-5' 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 5

Base Calibration on 21-JAN-2014,09:50

Field Check on 04-JUN-2014 10:24

Base Calibration		
Test Loop Calibration	Measured	Calibrated (mmho/m)

Channel	Low	High	Low	High
1	16.3	470.8	9.3	966.2
2	5.6	376.1	7.6	821.4
3	2.6	266.1	5.2	566.0
4	1.6	130.0	2.6	279.2
Array Temperature	71.1		Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			15.3	3863.0
2			31.7	3590.9
3			29.7	2971.5
4			20.7	2126.3
Deep			18.4	1912.3
Medium			42.9	3861.3
Shallow			47.2	5372.6
Array Temperature			79.2	Deg F

Induction Constants MAI-A.A 5

Last Edited on 08-JUN-2014,16:02

Induction Model	RtAP-NC		
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	45.00		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 5

Field Calibration on 21-JAN-2014,15:43

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

High Resolution Temperature Constants MAI-A.A 5

Last Edited on 09-MAY-2014,12:22

Pre-filter Length	11
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Caliper Calibration MPD-D.A 480

Base Calibration on 08-MAY-2014 14:36

Field Calibration on 04-JUN-2014 10:32

Base Calibration

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17491	3.99
2	27463	5.98
3	37484	7.97
4	47415	9.86
5	58518	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.98	7.97

Photo Density Calibration MPD-D.A 480

Base Calibration on 08-MAY-2014 14:53

Field Check on 04-JUN-2014 10:37

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1275	1464		
Reference 1	55908	26147	59556	30836
Reference 2	22982	2651	24941	2541

Field Check at Base

1274.5 1464.0

Field Check

1273.2 1468.7

PE Calibration

Base Calibration	WS	Measured		Calibrated	
		WH	Ratio	Ratio	
Background	241	1140			
Reference 1	23265	55701	0.422	0.371	
Reference 2	6806	22836	0.303	0.272	

Field Check at Base

240.7 1139.6

Field Check

237.3 1137.1

Density Constants MPD-D.A 480

Last Edited on 08-JUN-2014,15:53

Density Source Id	P50557B
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
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\Shakespeare Carson 3-25\Shakespeare Carson 3-25_001.dta

CBH-C, Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 208 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 248 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

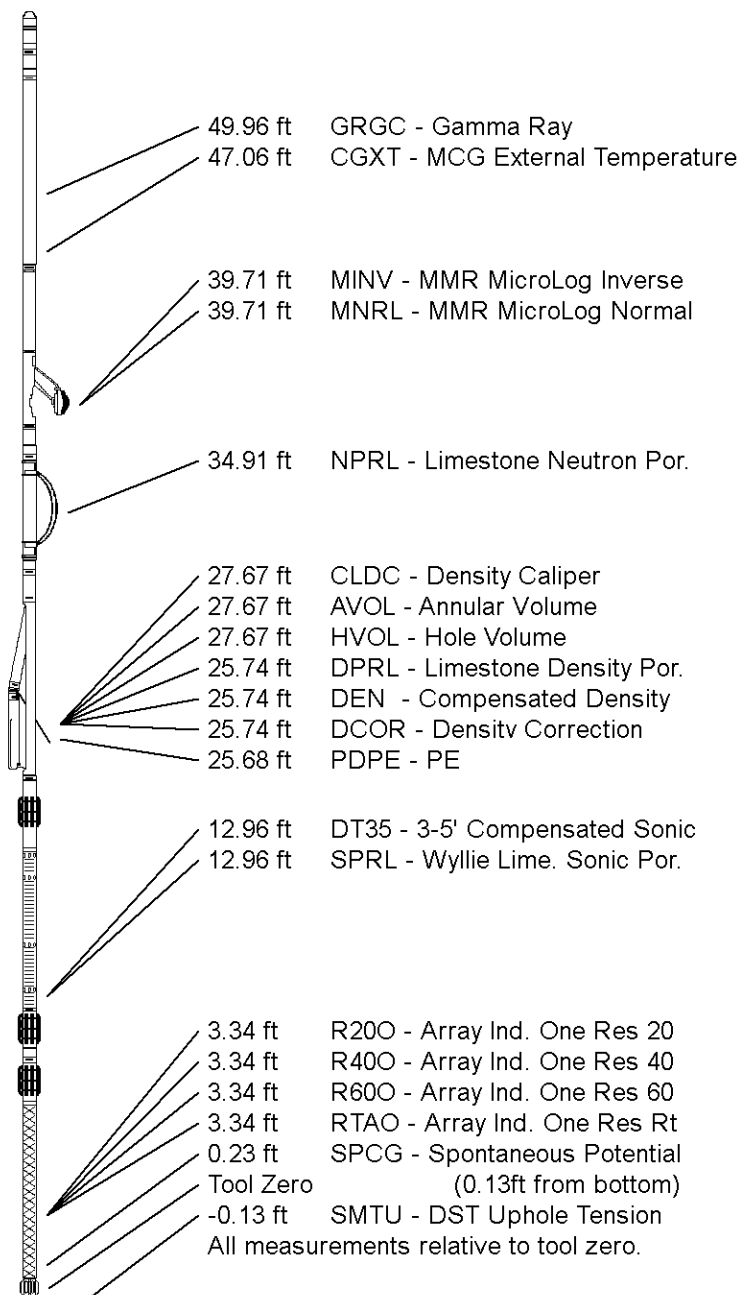
Compact Neutron
MDN-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-D.A 480 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Sonic
MSS-A.A 73 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 5 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 57.64 ft Weight: 432.1 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	CARSON 3-25
FIELD	PENCE EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3114.00	feet	First Reading	4856.00	feet
Elevation Drill Floor	3112.00	feet	Depth Driller	4870.00	feet
Elevation Ground Level	3102.00	feet	Depth Logger	4869.00	feet



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WITH INTEGRATED TRANSIT TIME

