



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

COMPANY			O'BRIEN RESOURCES, LLC		
WELL			JECHA 4-1		
FIELD			WILDCAT		
PROVINCE/COUNTY			RUSH		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			2400' FNL & 1850' FWL OF THE SE SW SE NW		
SEC 4	TWP 19S	RGE 17W	Other Services		
Latitude			MPD/MDN	MML	
Longitude			MAI/MFE		
API Number	15-165-22058		MSS		
Permanent Datum GL, Elevation 2053 feet					
Log Measured From KB					
Drilling Measured From KB @ 5 FEET					
Date	05-MAR-2014		Elevations: KB 2058.00 DF 2056.00 GL 2053.00		
Run Number	ONE				
Service Order	5872-81241285				
Depth Driller	3851.00		feet		
Depth Logger	3851.00		feet		
First Reading	3849.00		feet		
Last Reading	259.00		feet		
Casing Driller	259.00		feet		
Casing Logger	259.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEM				
Density / Viscosity	9.40 lb/USg		50.00 CP		
PH / Fluid Loss	9.50		6.80 ml/30Min		
Sample Source	PIT				
Rm @ Measured Temp	1.0 @ 48.0		ohm-m		
Rmf @ Measured Temp	0.80 @ 48.0		ohm-m		
Rmc @ Measured Temp	1.20 @ 48.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.48 @ 99.0		ohm-m		
Time Since Circulation	4 HRS				
Max Recorded Temp	99.00		deg F		
Equipment / Base	13057		LIB		
Recorded By	D. COLE				
Witnessed By	K. TALBOTT		A. BRITTAN		
JOB #	LB 14-064				

BOREHOLE RECORD					Last Edited: 05-MAR-2014 20:13
Bit Size inches		Depth From feet		Depth To feet	
7.875		259.00		3851.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
CASING	8.625	0.00	259.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.08.211.
- RUN ONE: MCG ANS MSS RAN IN COMBINATION. - HARDWARE: TWO 0.5 INCH STANDOFFS USED ON MSS.
- RUN TWO: MCG, MML, MDN, MPD, MFE AND MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 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 2800: 415 CU.FT.

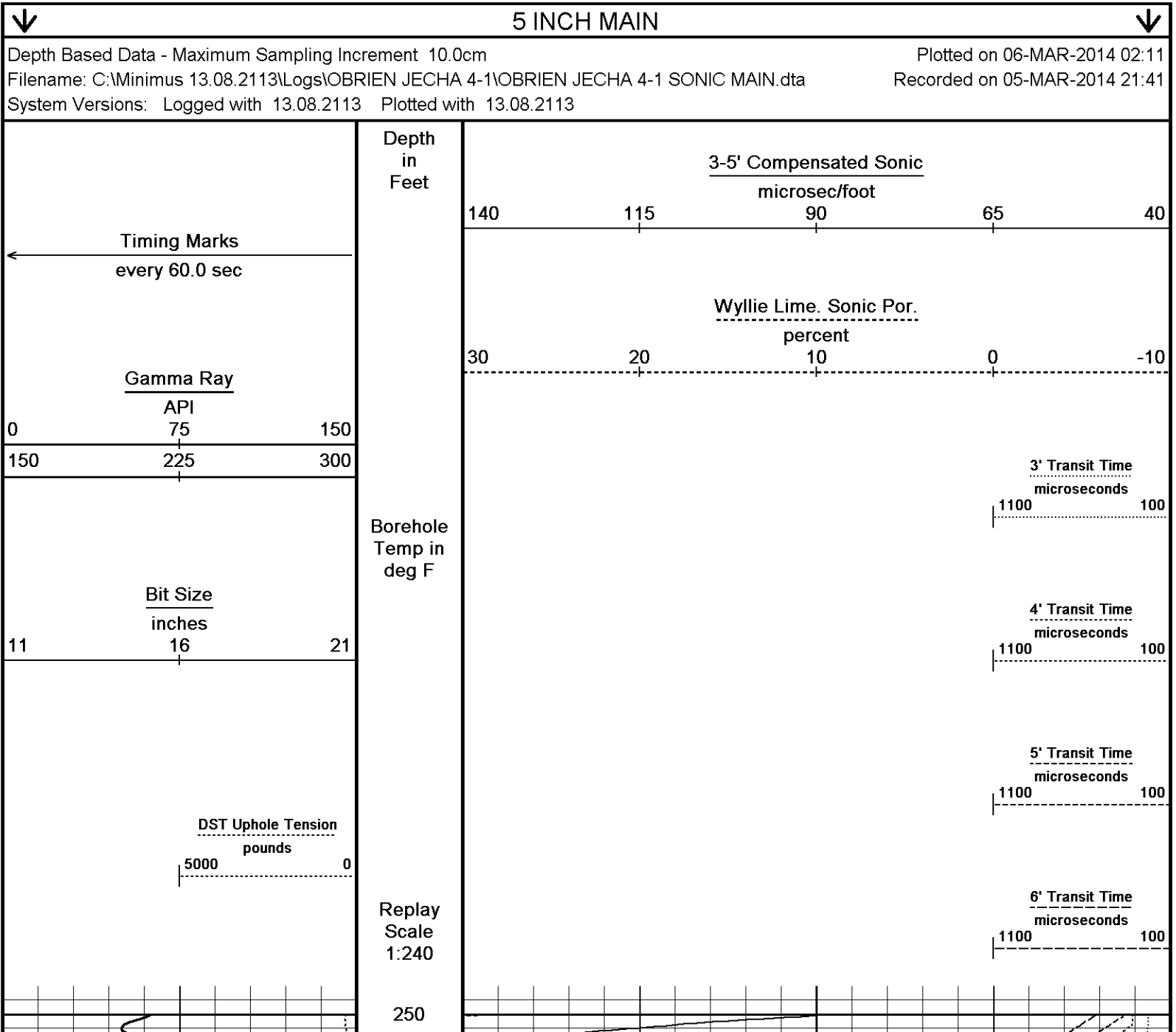
- ANNULAR HOLE VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO 2800: 300 CU.FT.

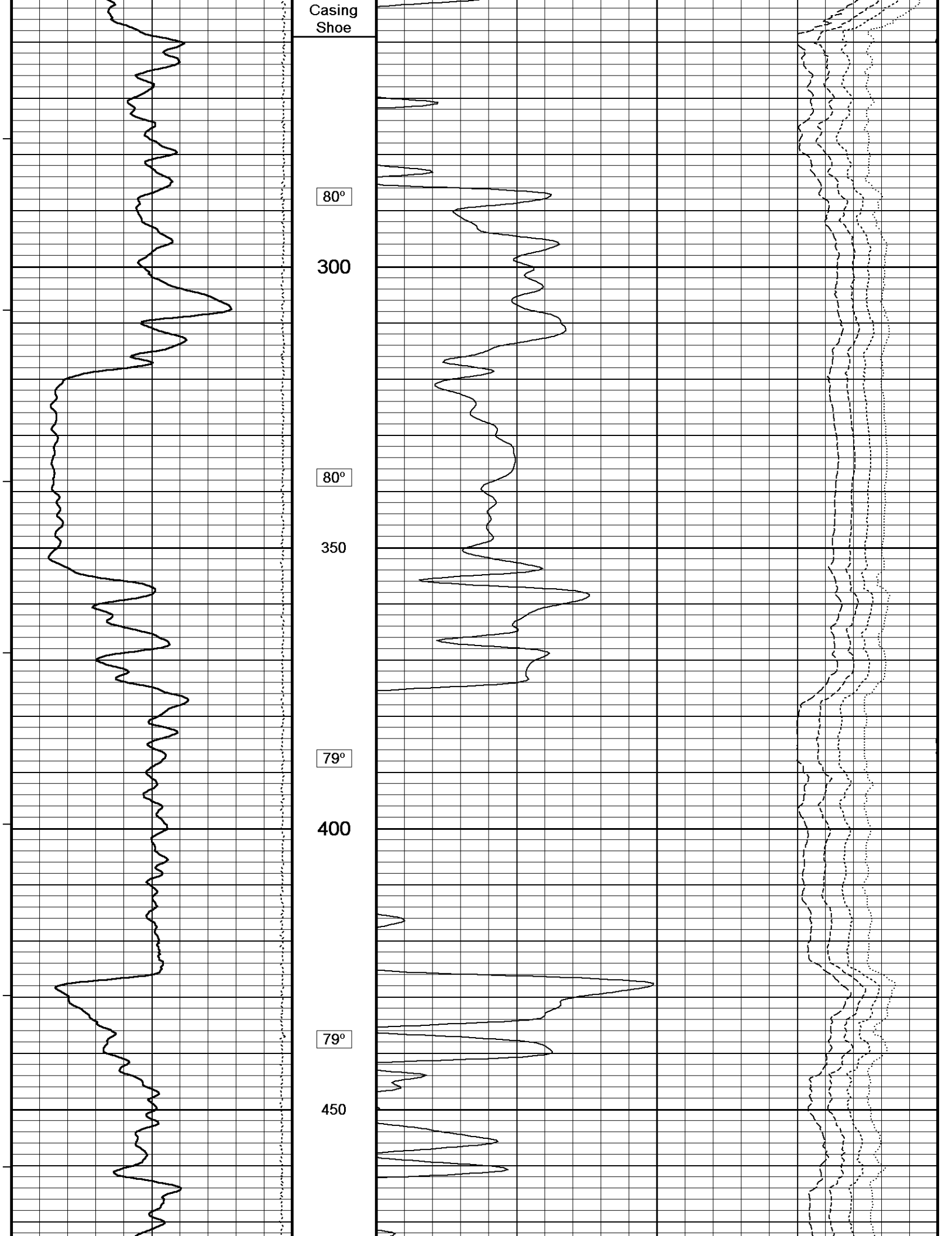
- RIG: MURFIN 16

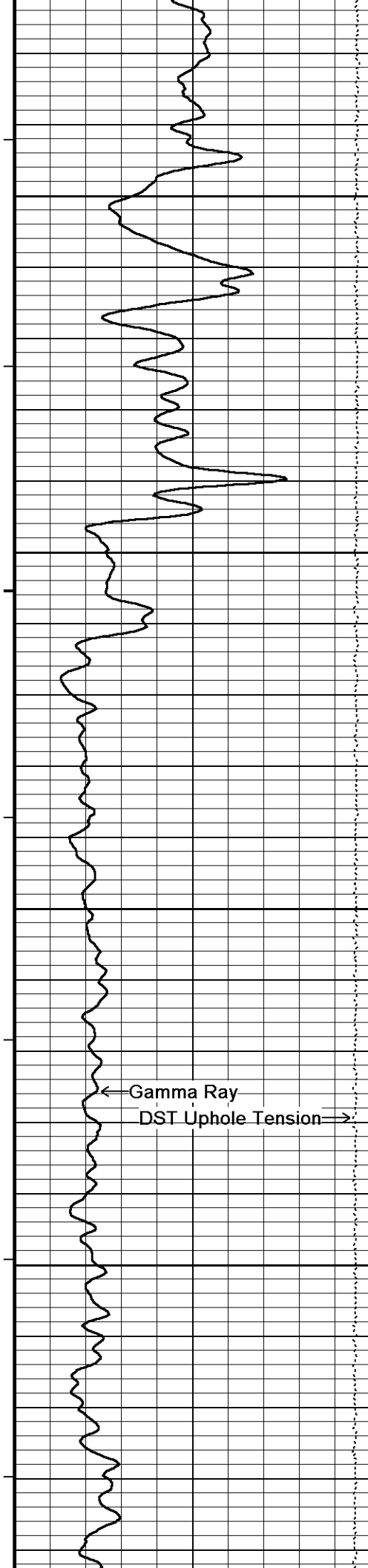
- ENGINEER: D. COLE.

- OPERATOR: C. RAMIREZ.

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.







79°

500

78°

550

79°

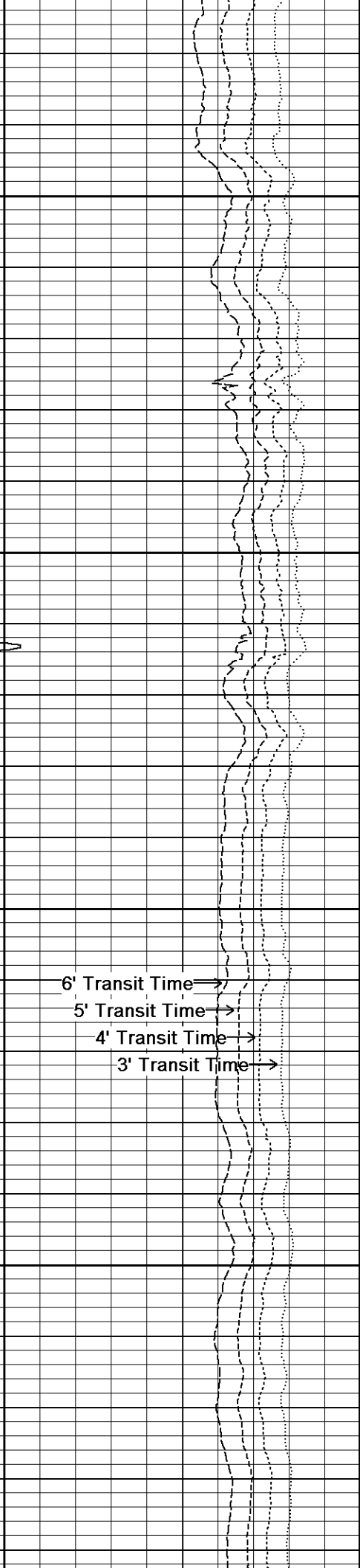
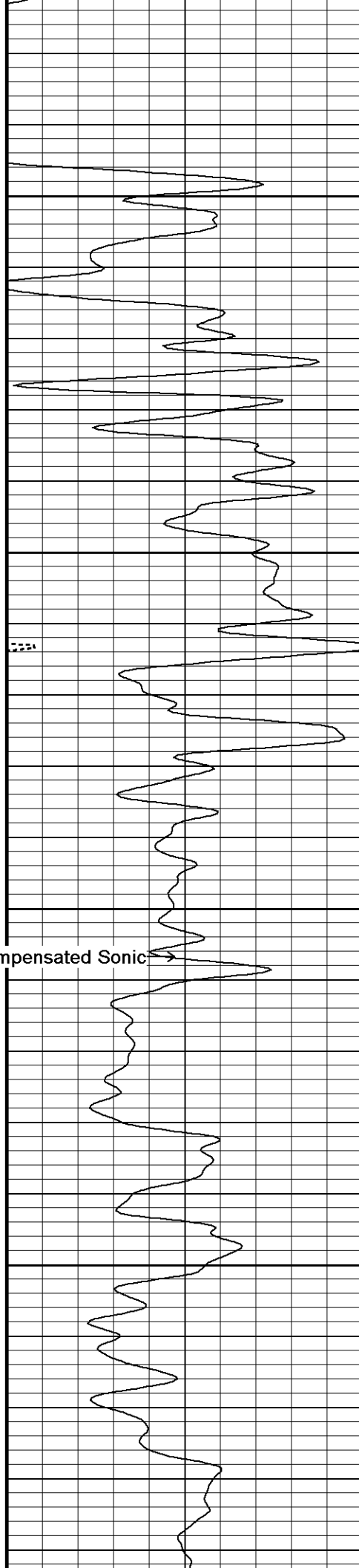
600

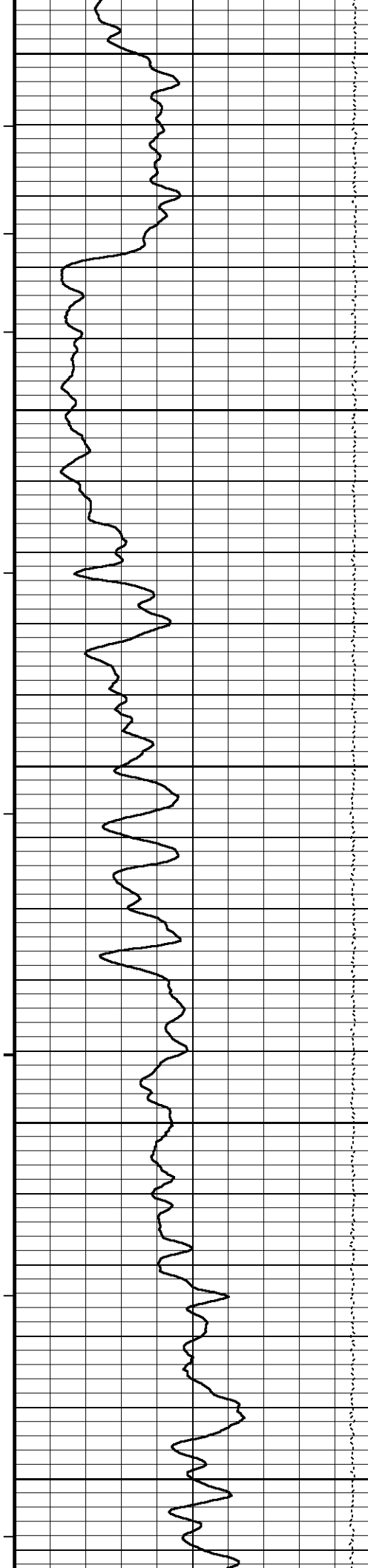
3-5' Compensated Sonic

79°

650

80°





700

80°

750

81°

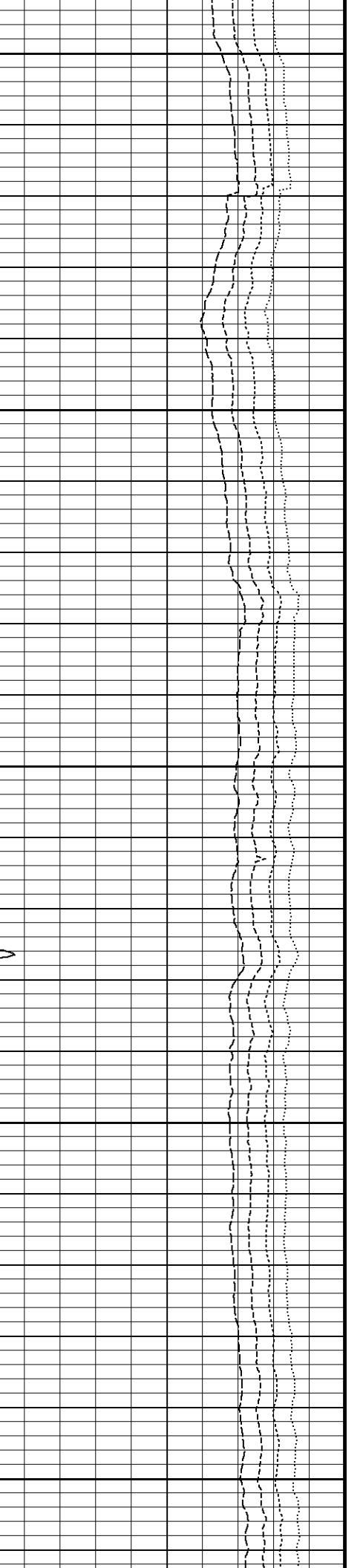
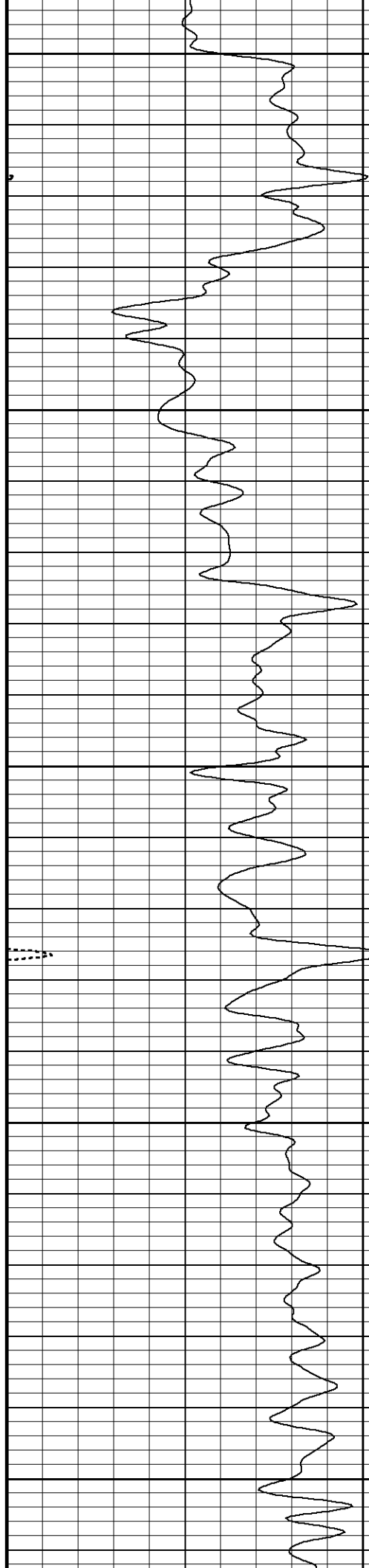
800

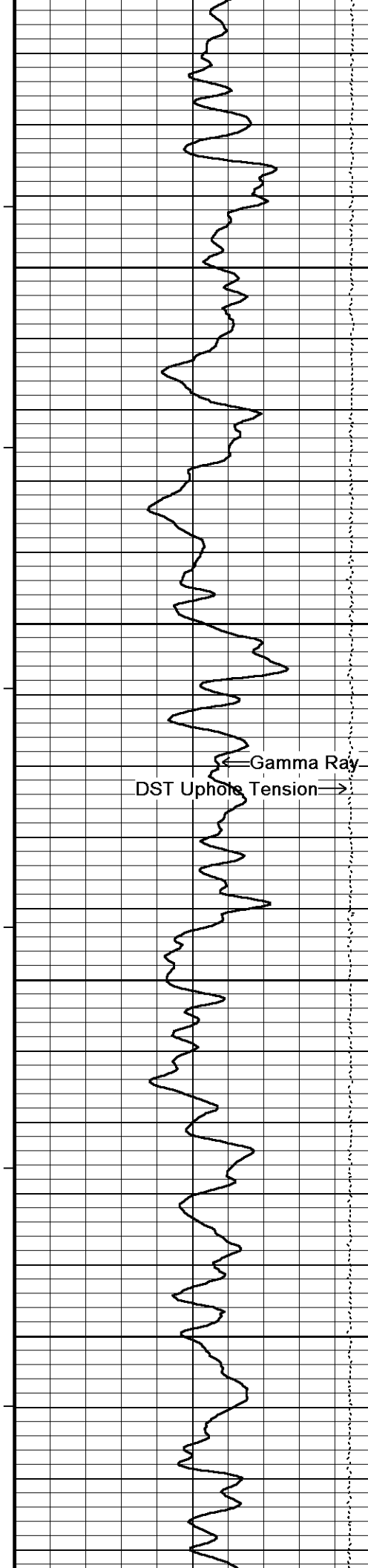
82°

850

82°

900





82°

950

82°

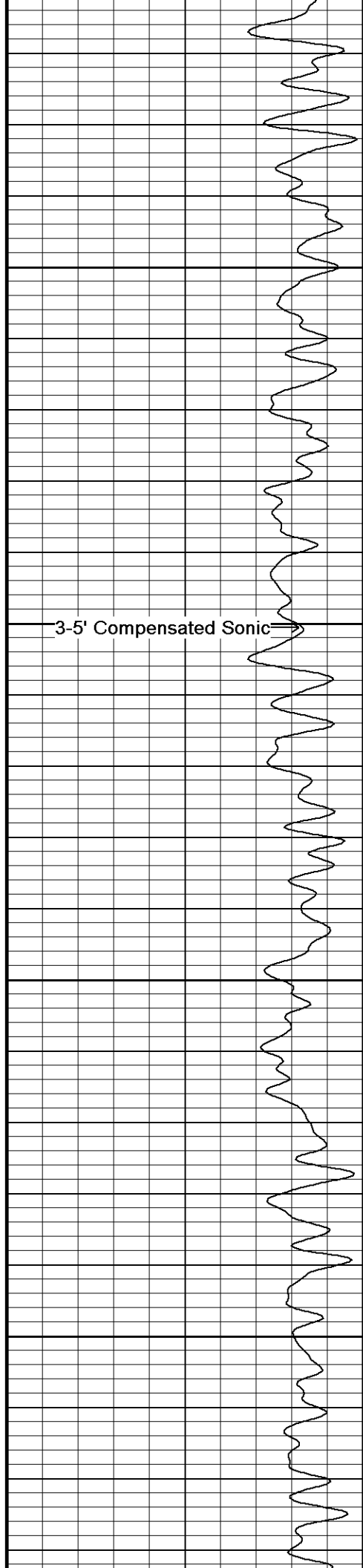
1000

82°

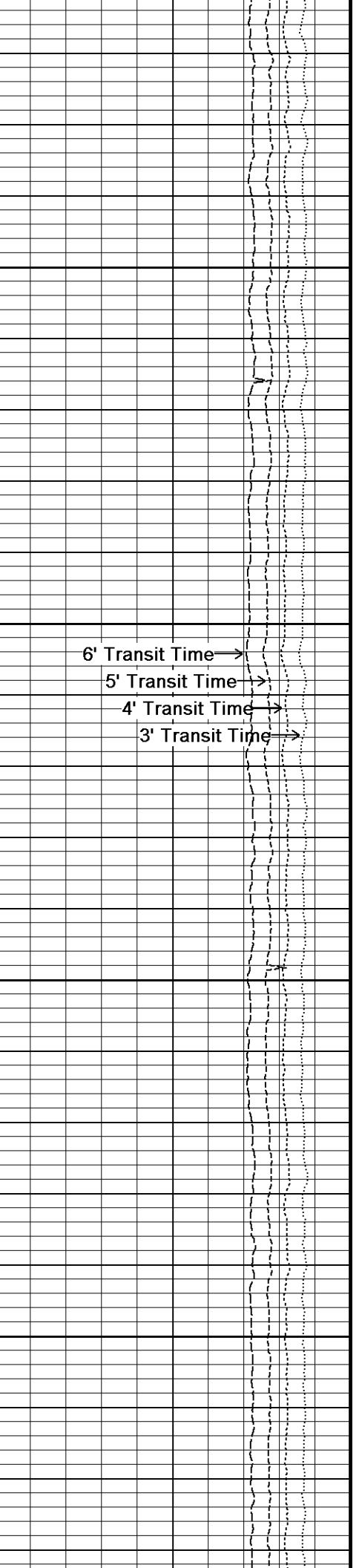
1050

83°

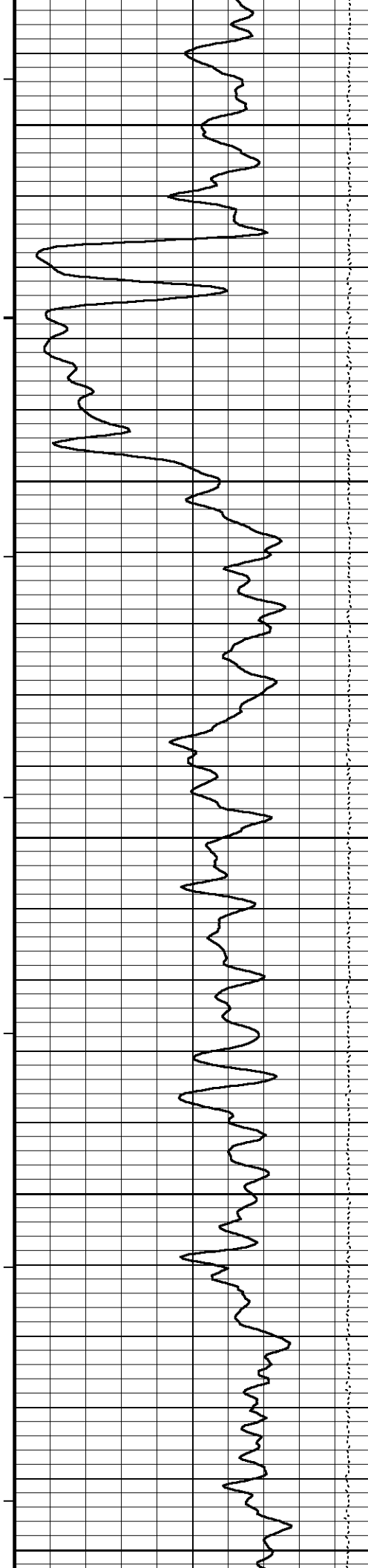
1100



3-5' Compensated Sonic



6' Transit Time
5' Transit Time
4' Transit Time
3' Transit Time



83°

1150

83°

1200

84°

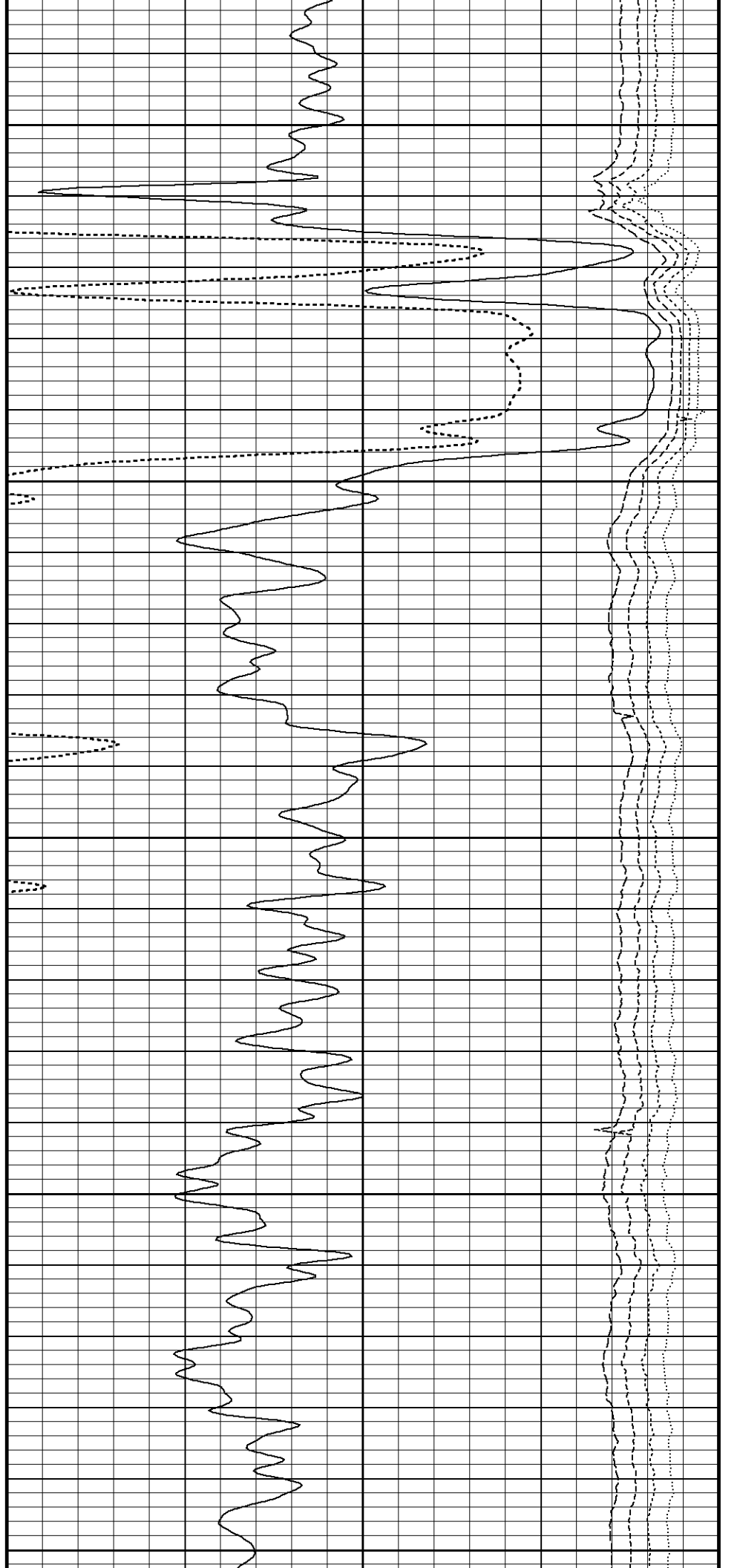
1250

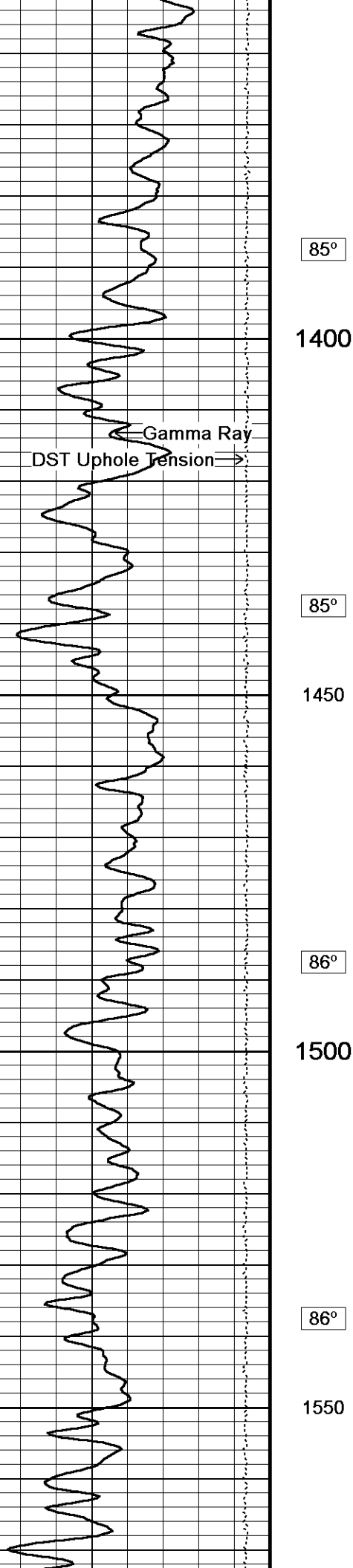
84°

1300

85°

1350





85°

1400

85°

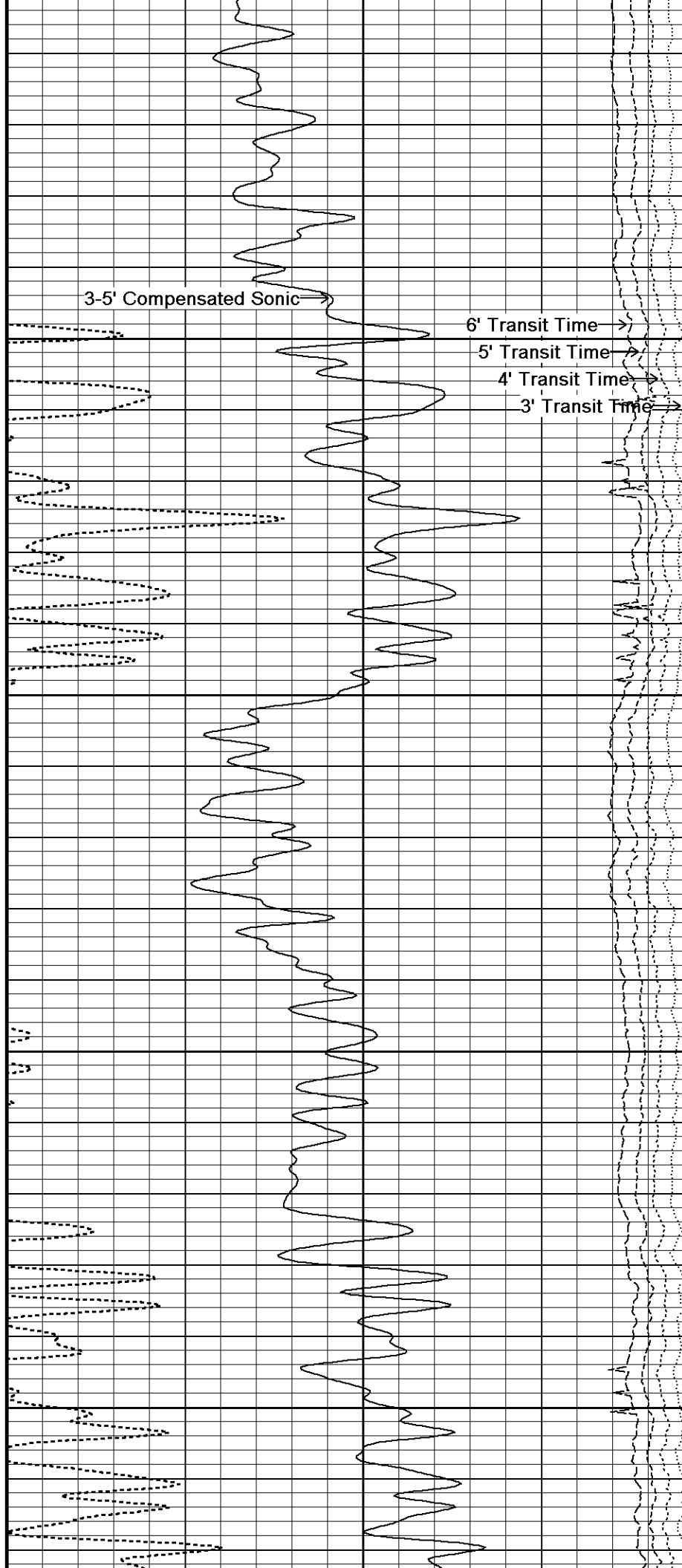
1450

86°

1500

86°

1550



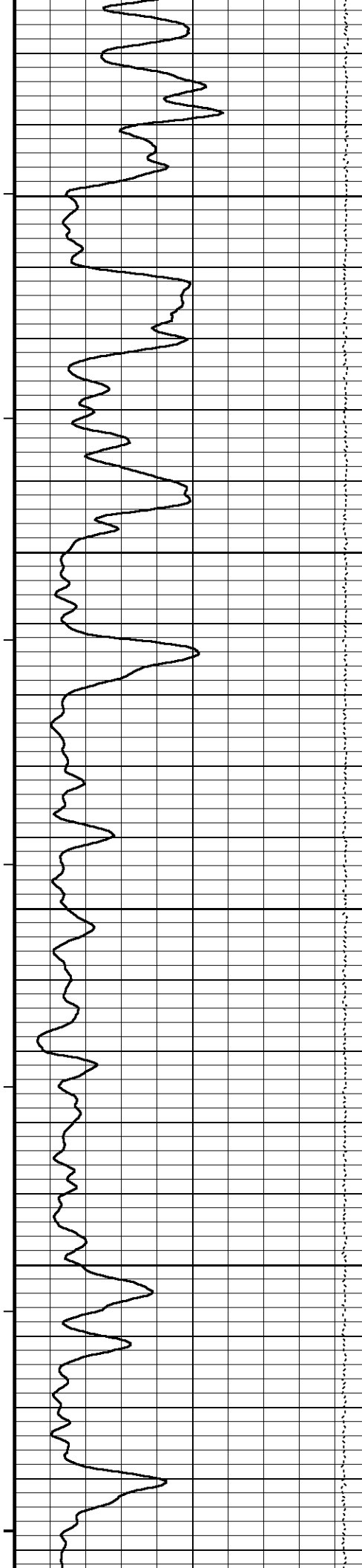
3-5' Compensated Sonic

6' Transit Time

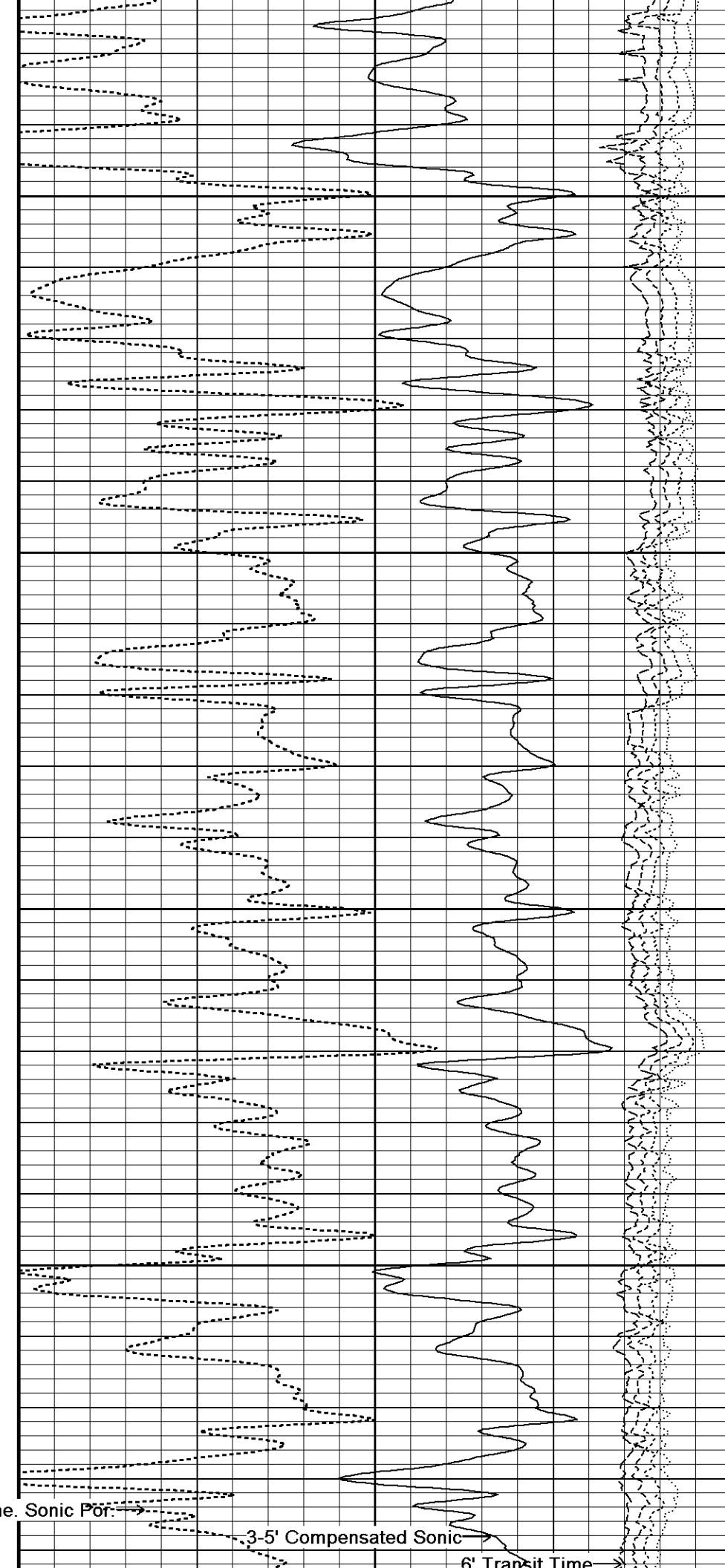
5' Transit Time

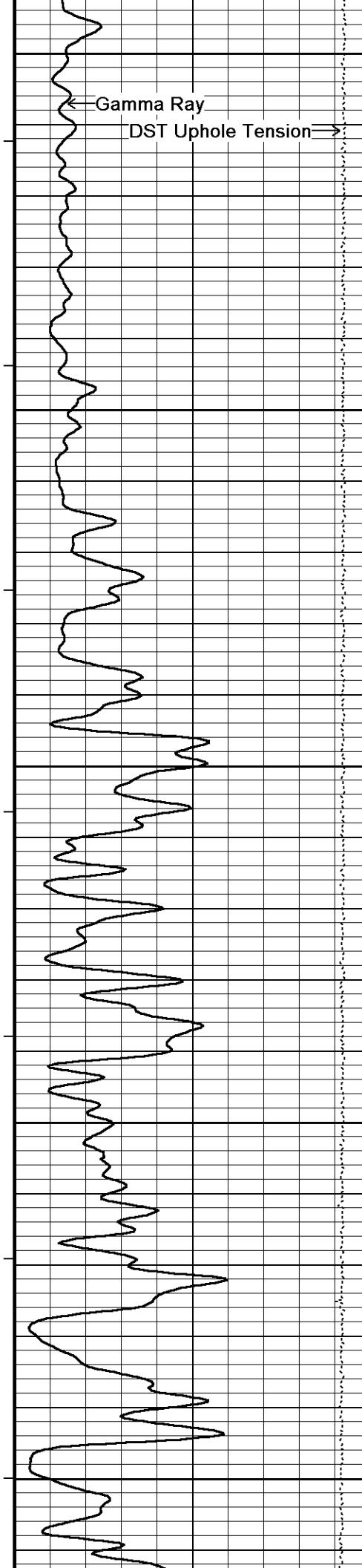
4' Transit Time

3' Transit Time



87°
1600
87°
1650
88°
1700
88°
1750
Wyllie Lime. Sonic Por. →
88°





1800

88°

1850

87°

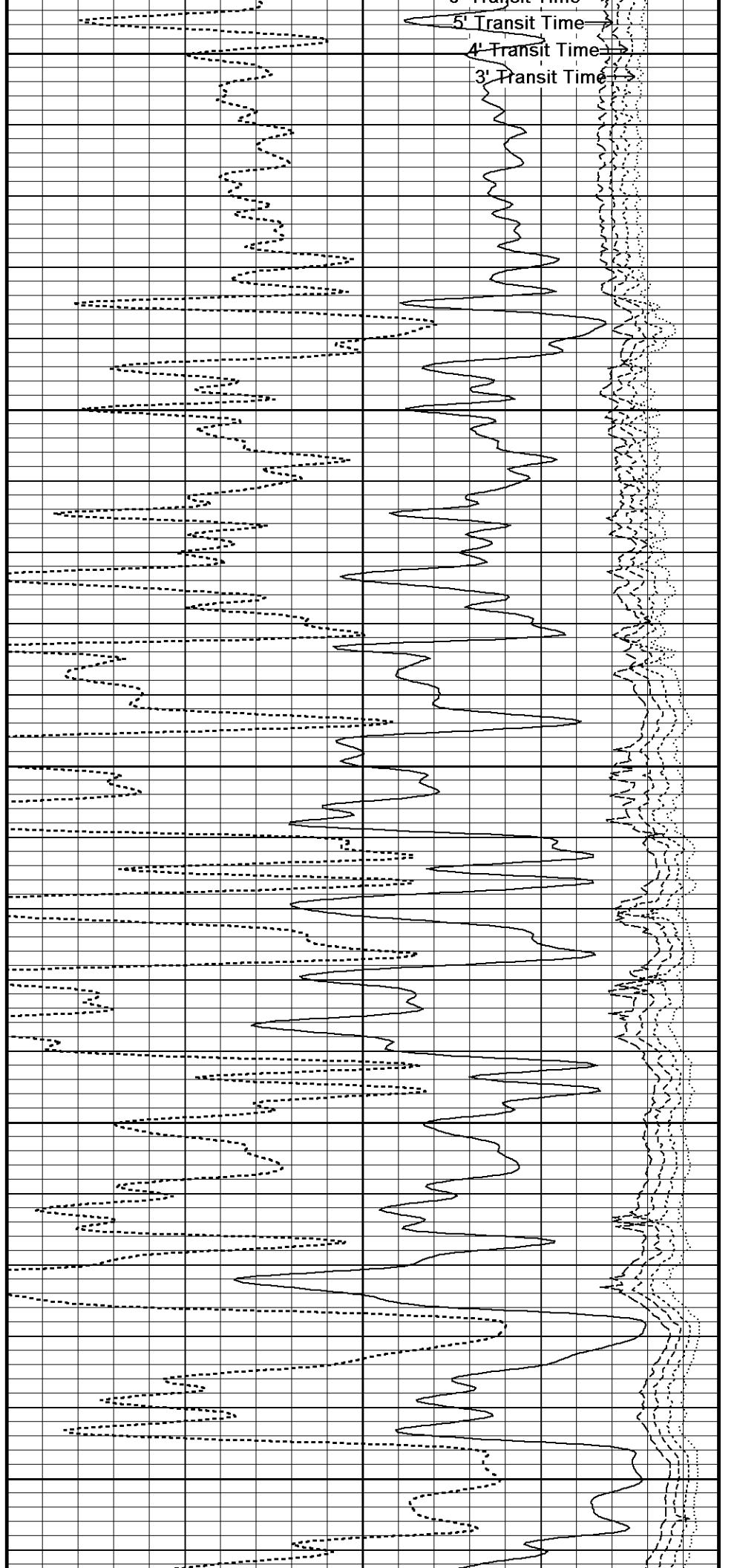
1900

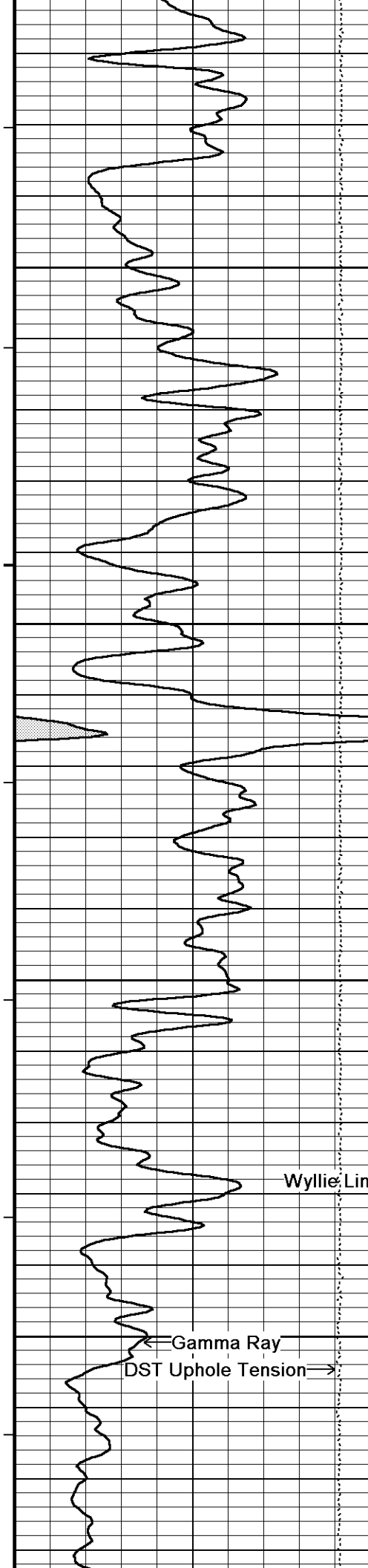
87°

1950

88°

2000





88°

2050

88°

2100

88°

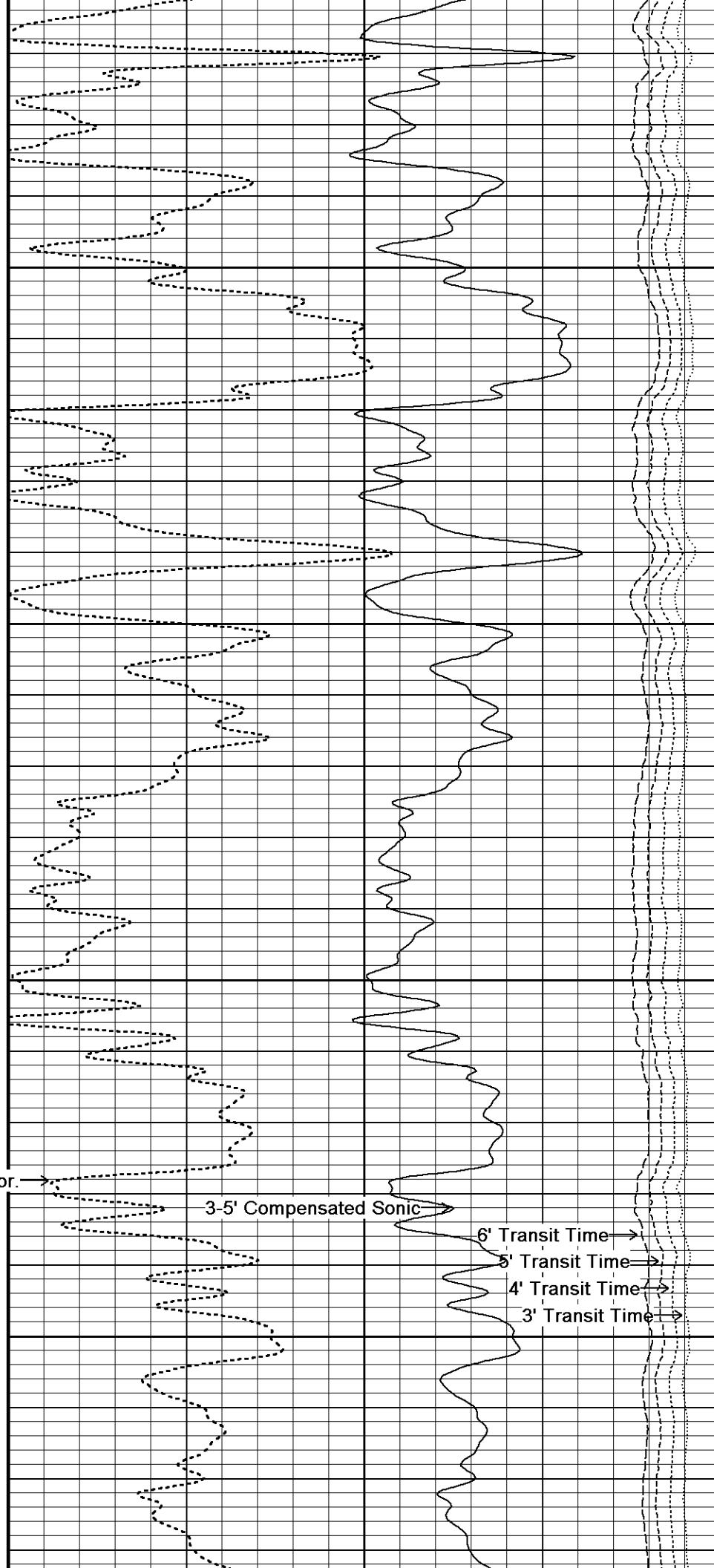
2150

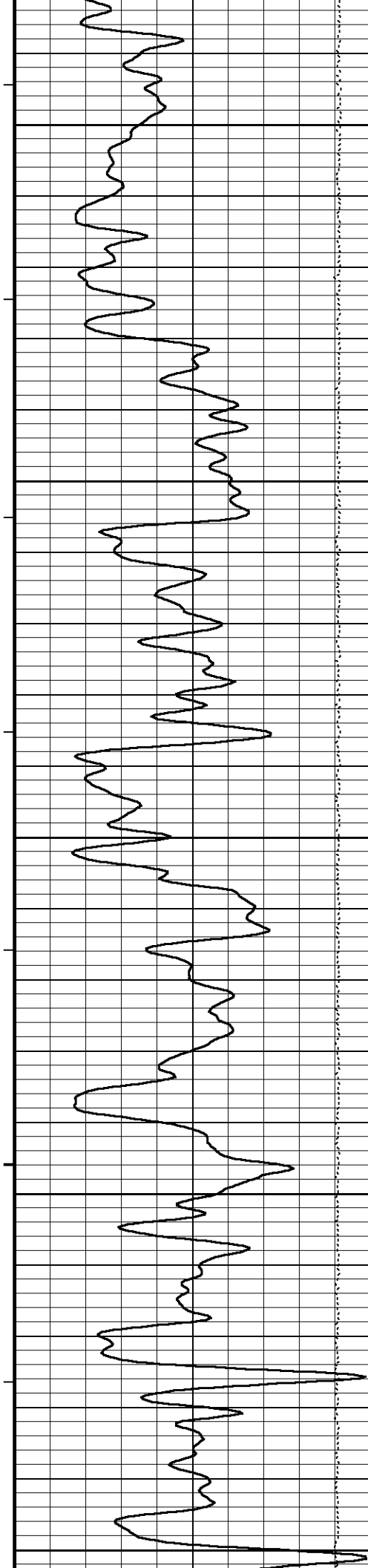
Wyllie Lime. Sonic Por. →

89°

2200

← Gamma Ray
DST Uphole Tension →





89°

2250

89°

2300

89°

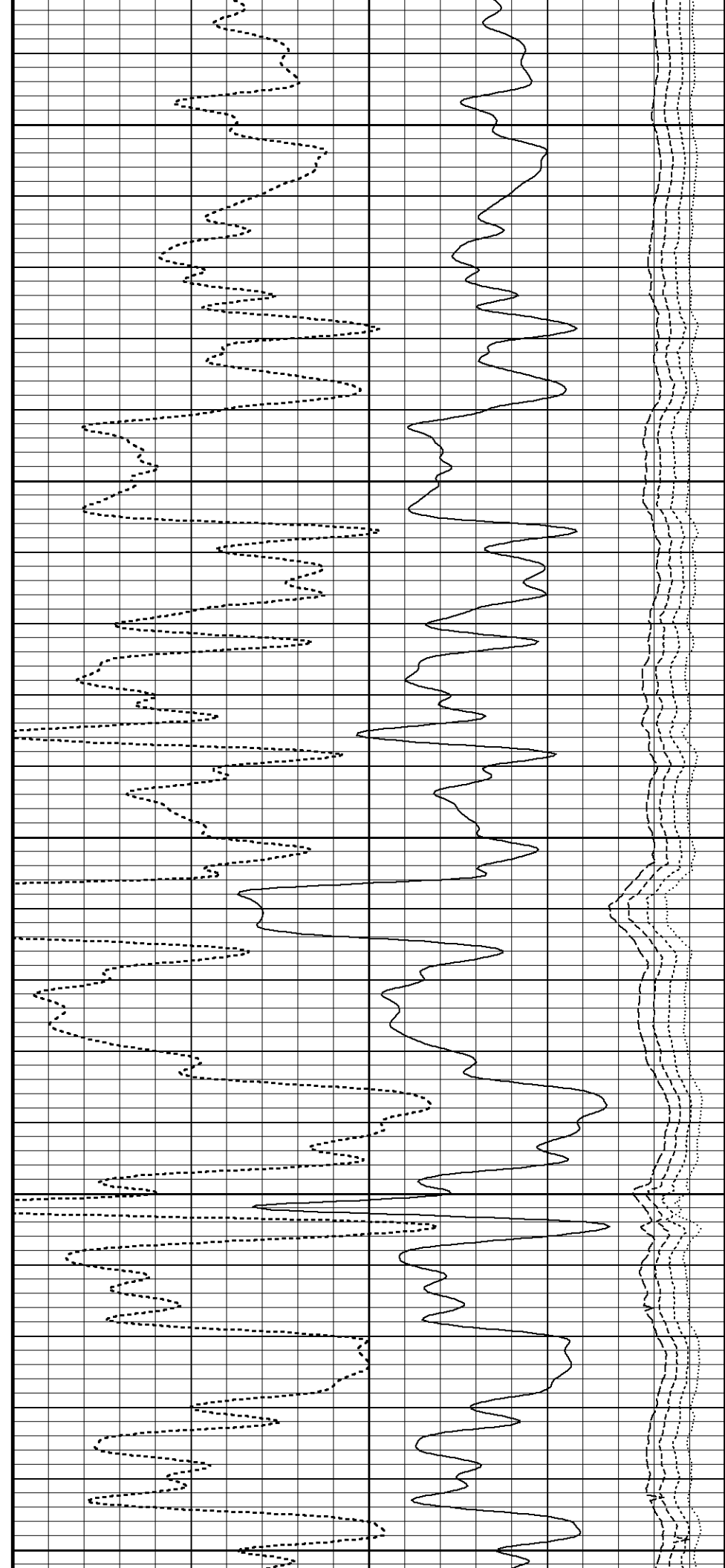
2350

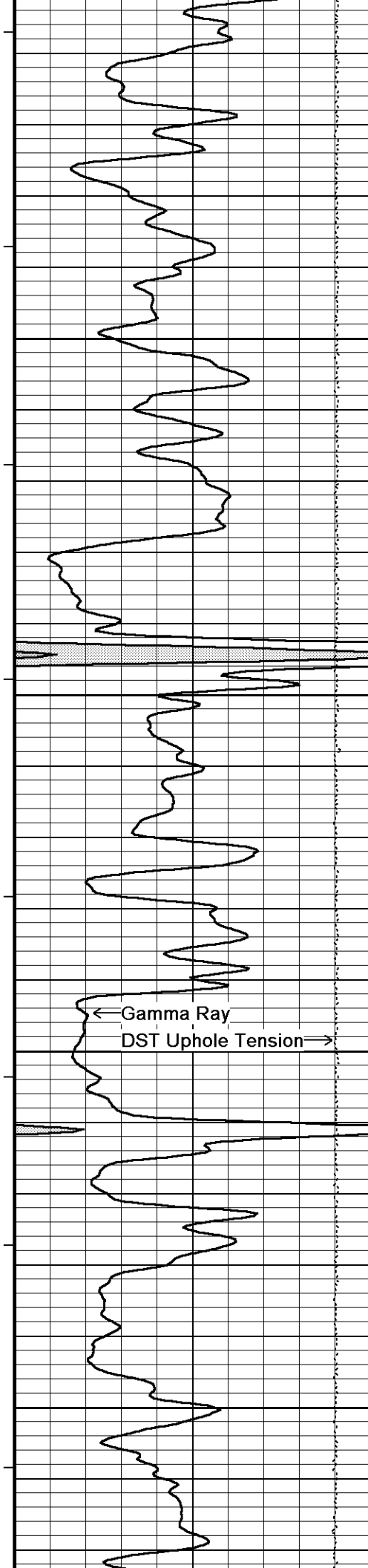
90°

2400

90°

2450





90°

2500

91°

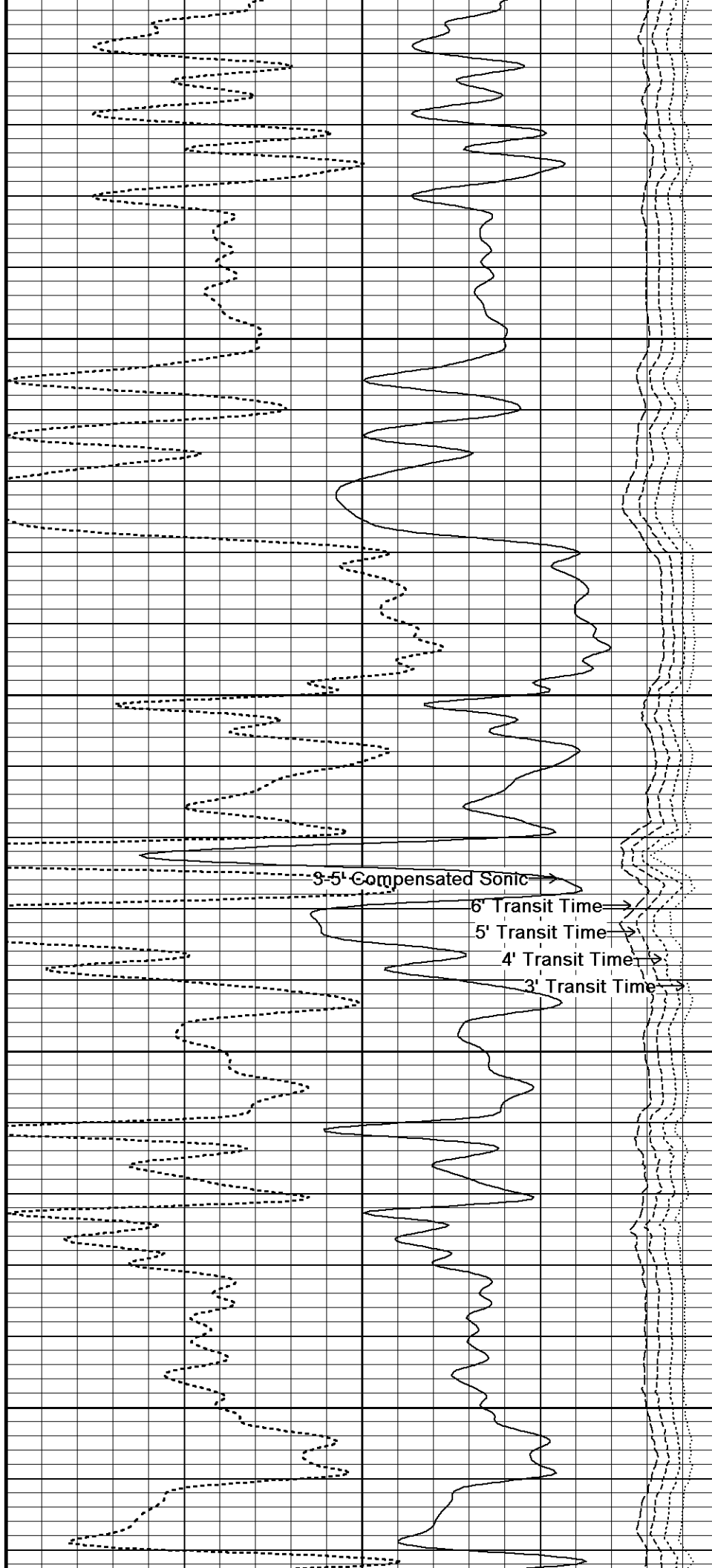
2550

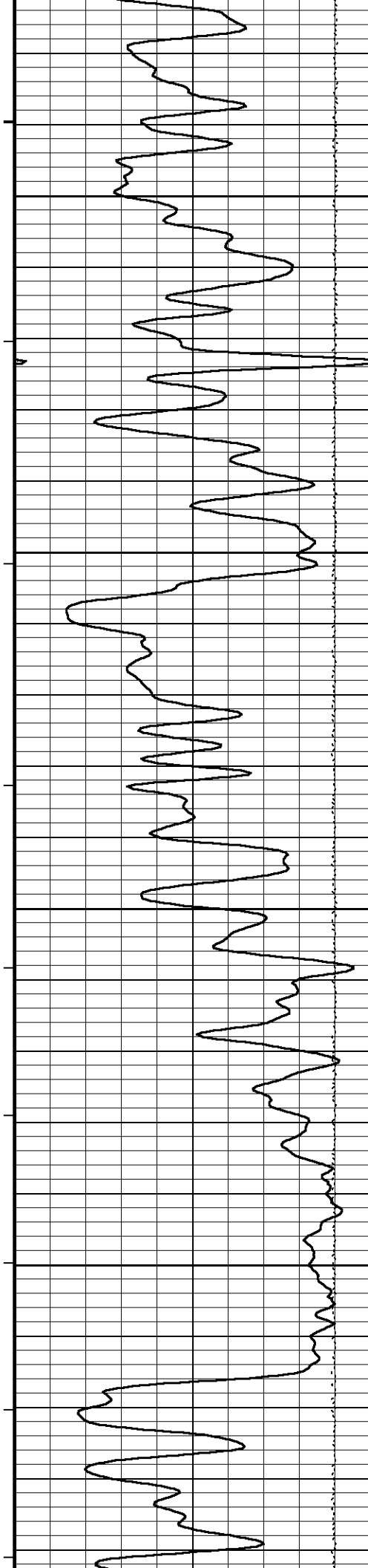
91°

2600

91°

2650





91°

2700

92°

2750

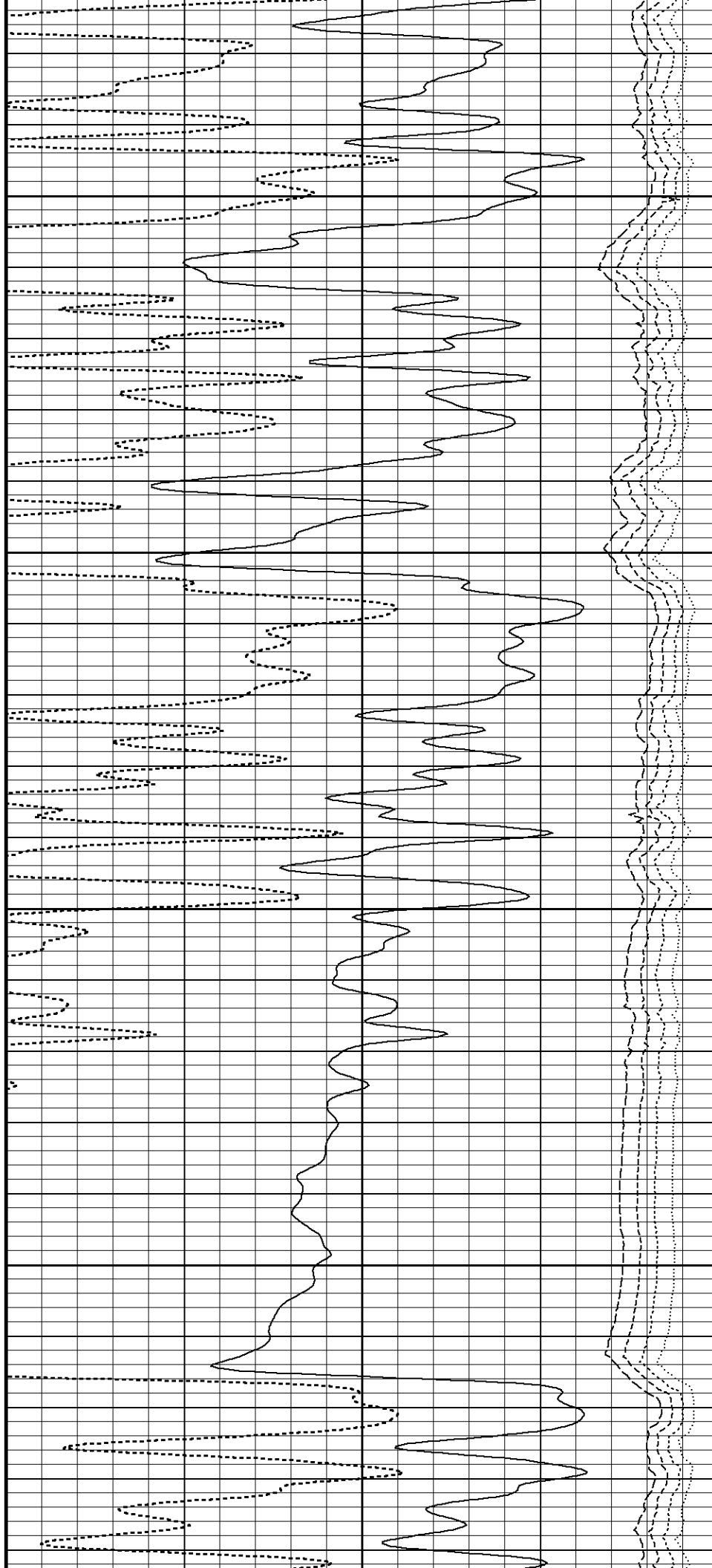
92°

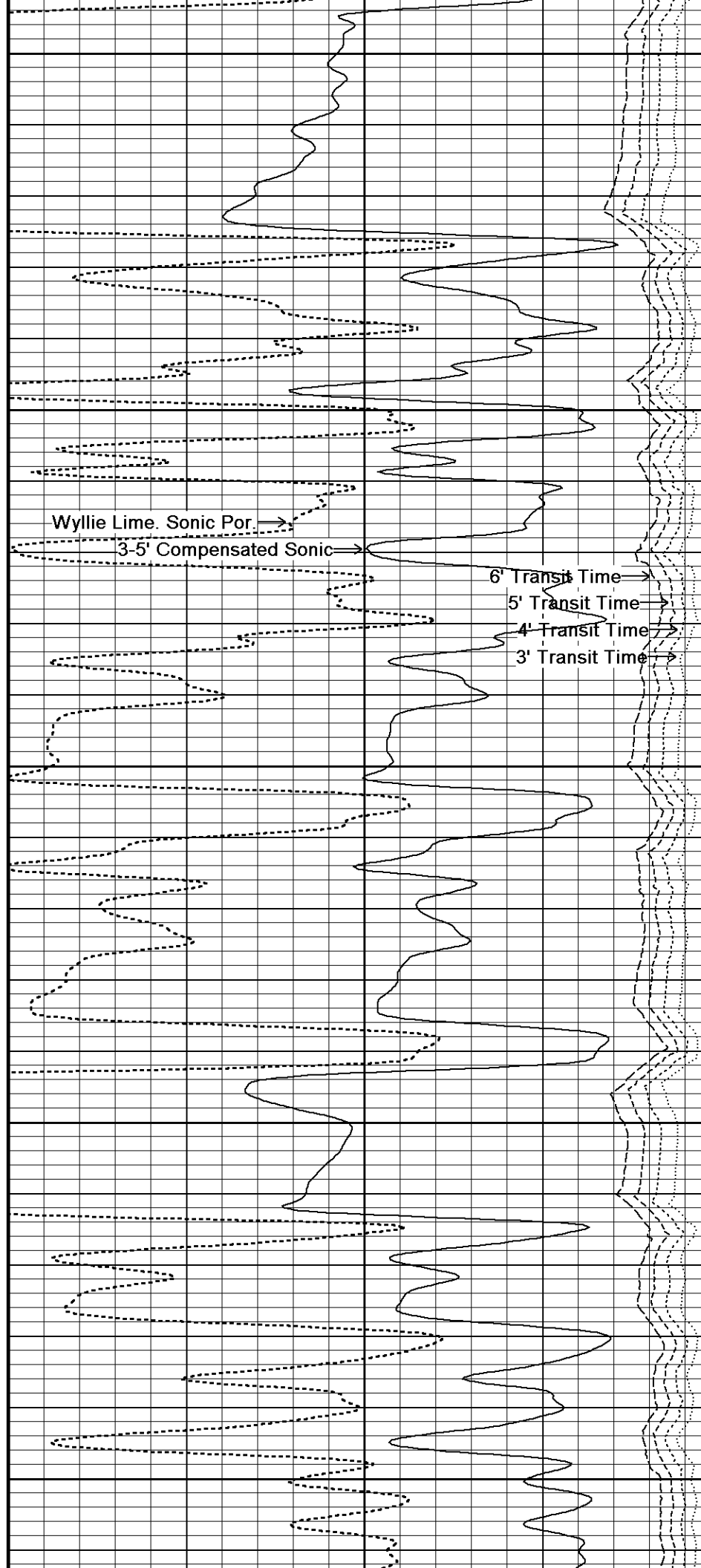
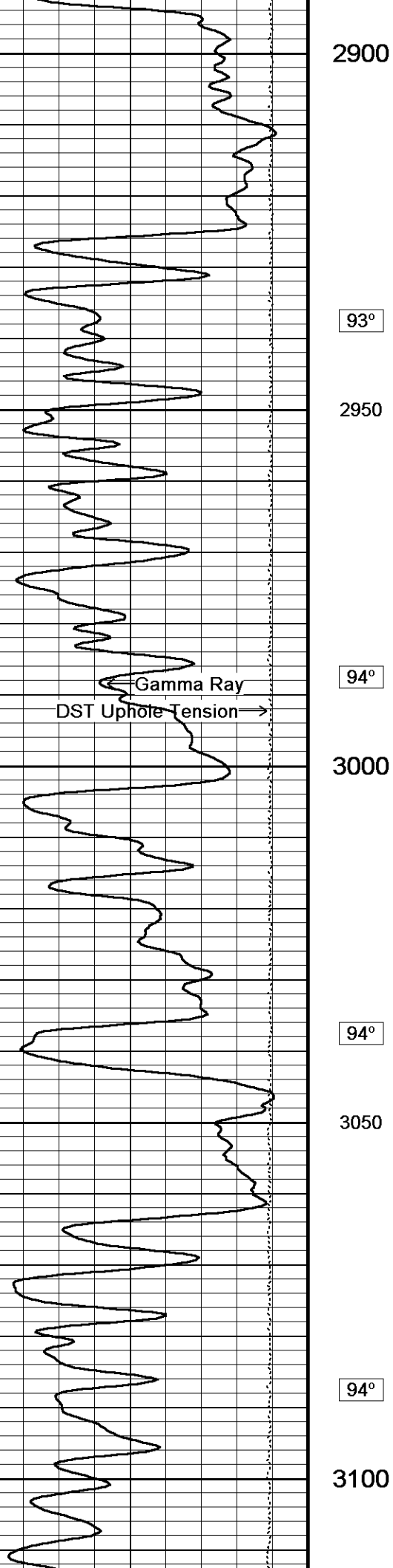
2800

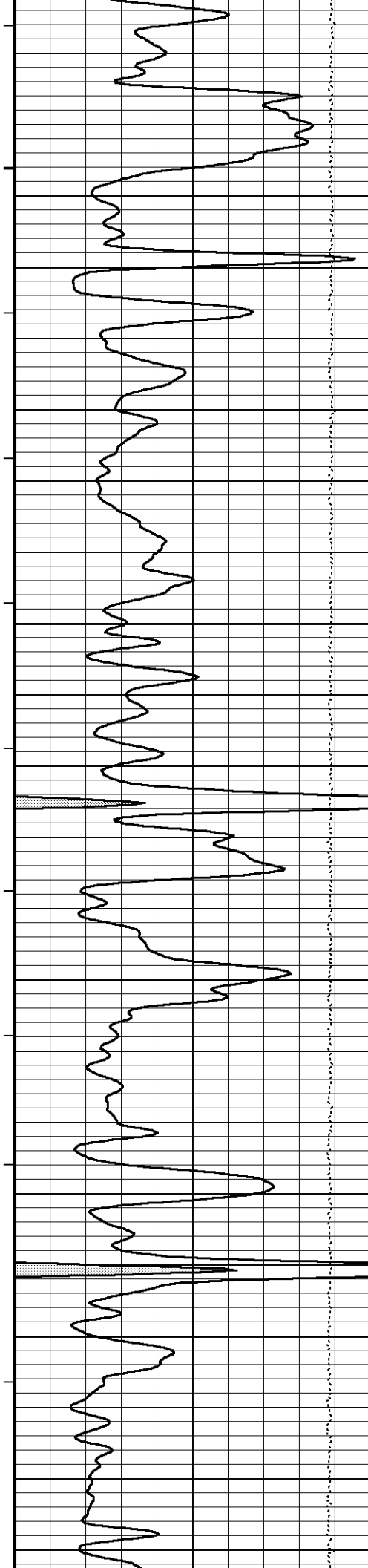
92°

2850

93°







94°

3150

95°

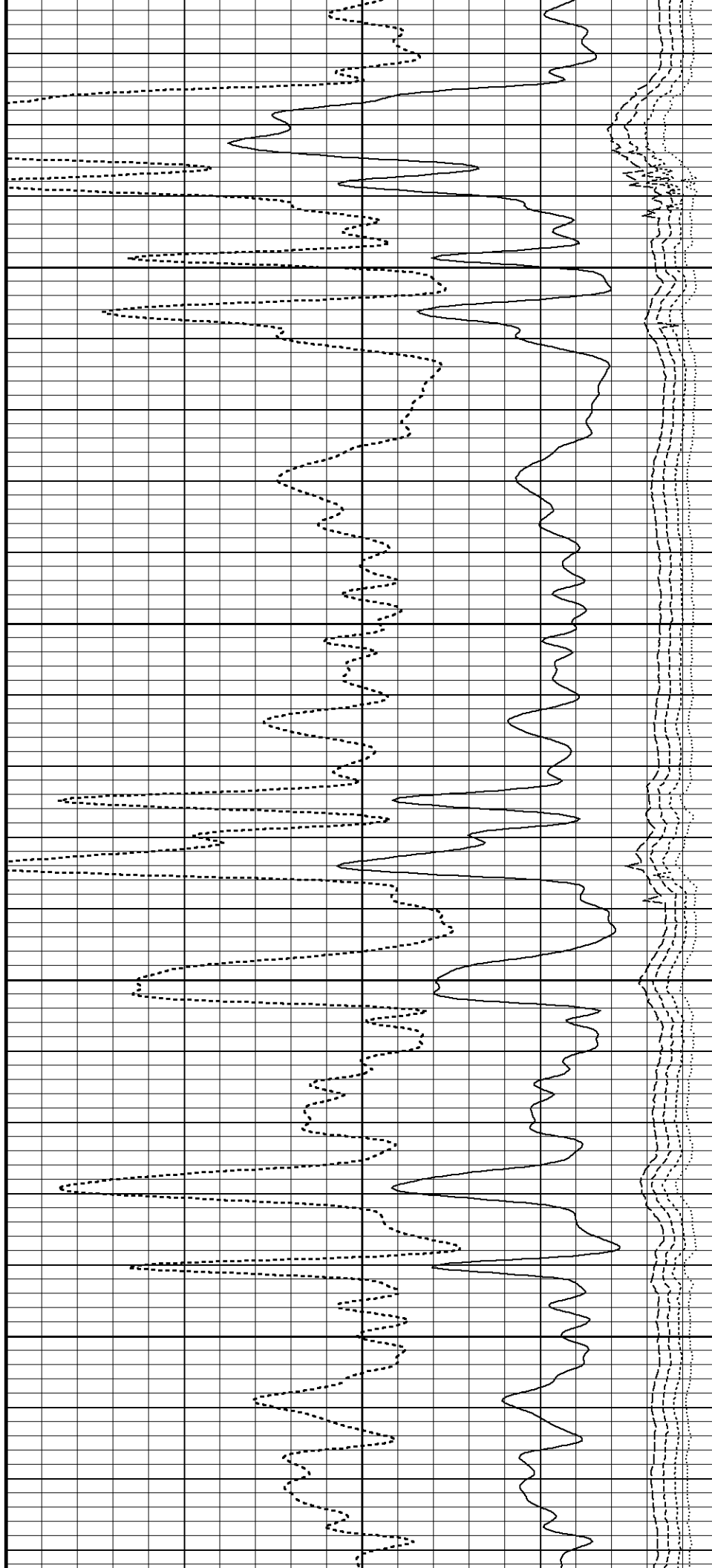
3200

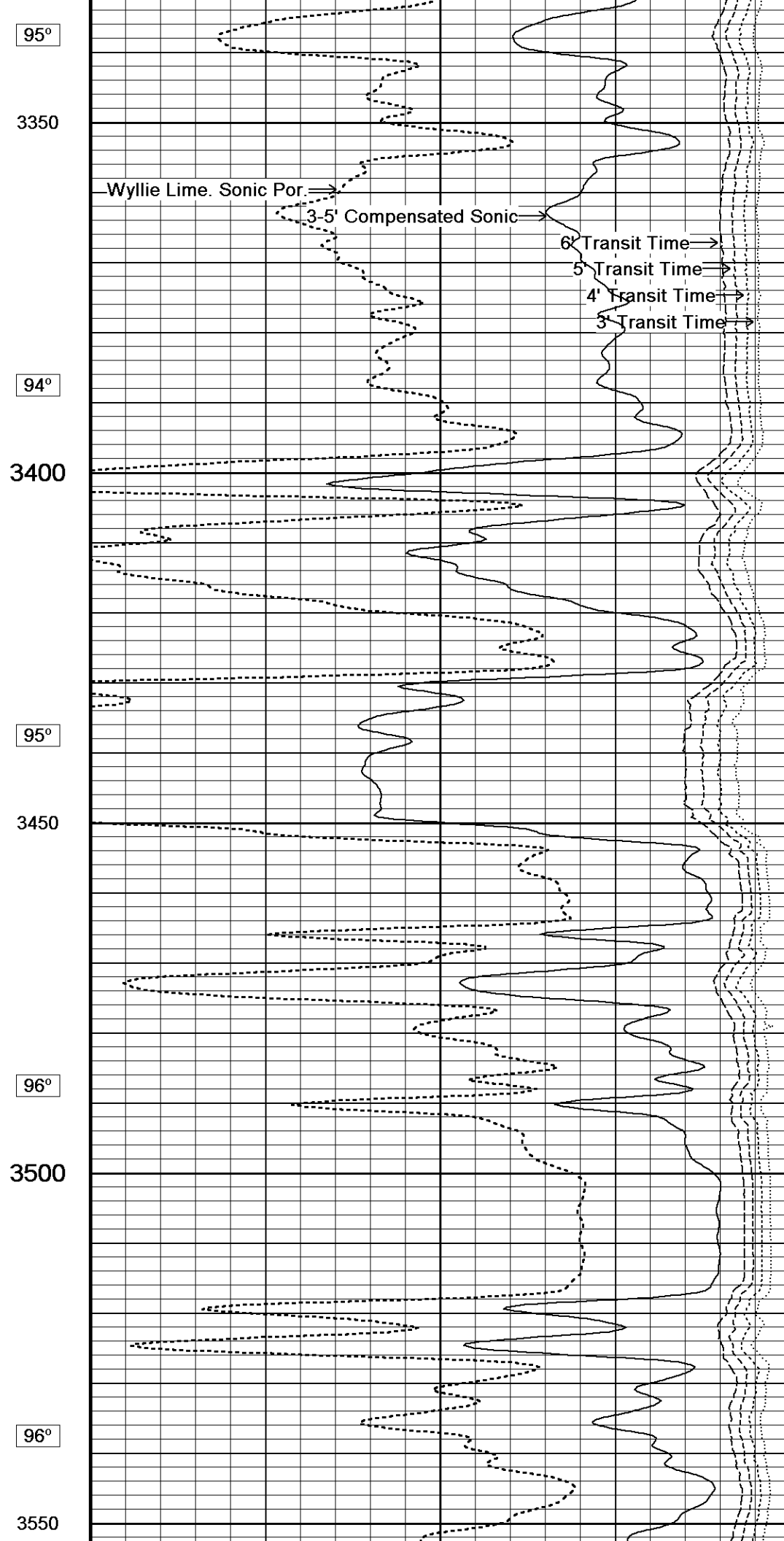
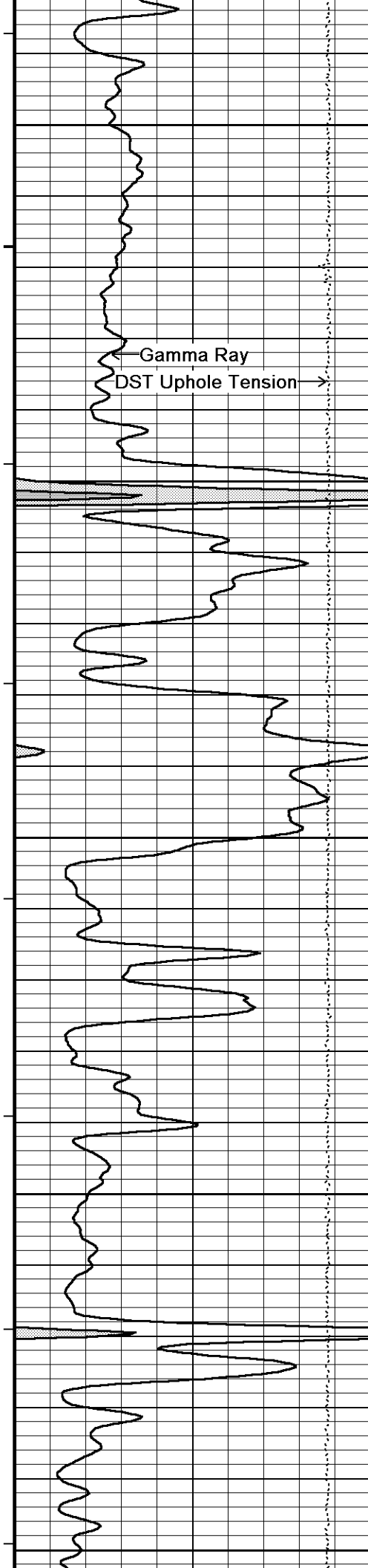
95°

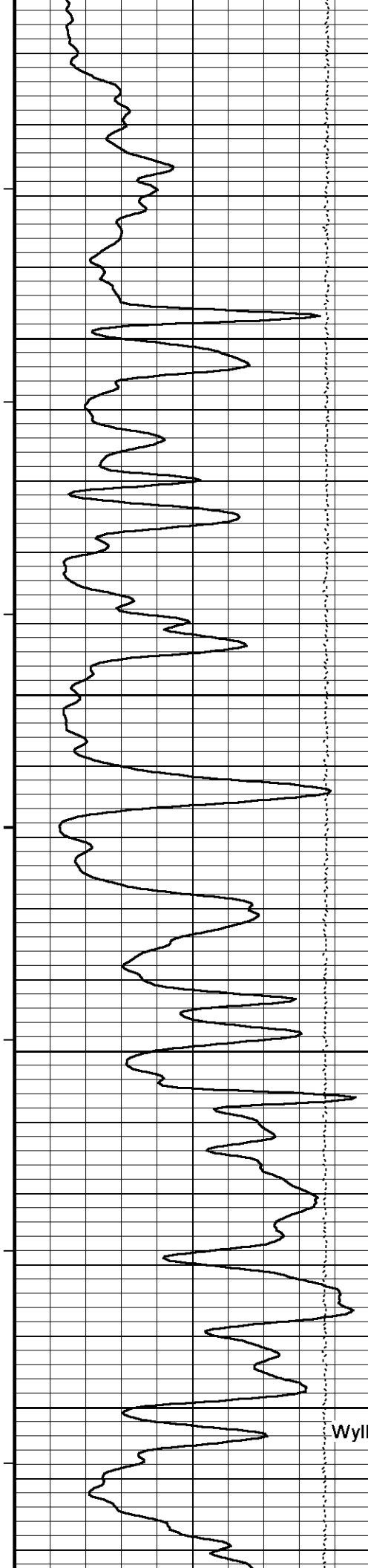
3250

95°

3300







97°

3600

97°

3650

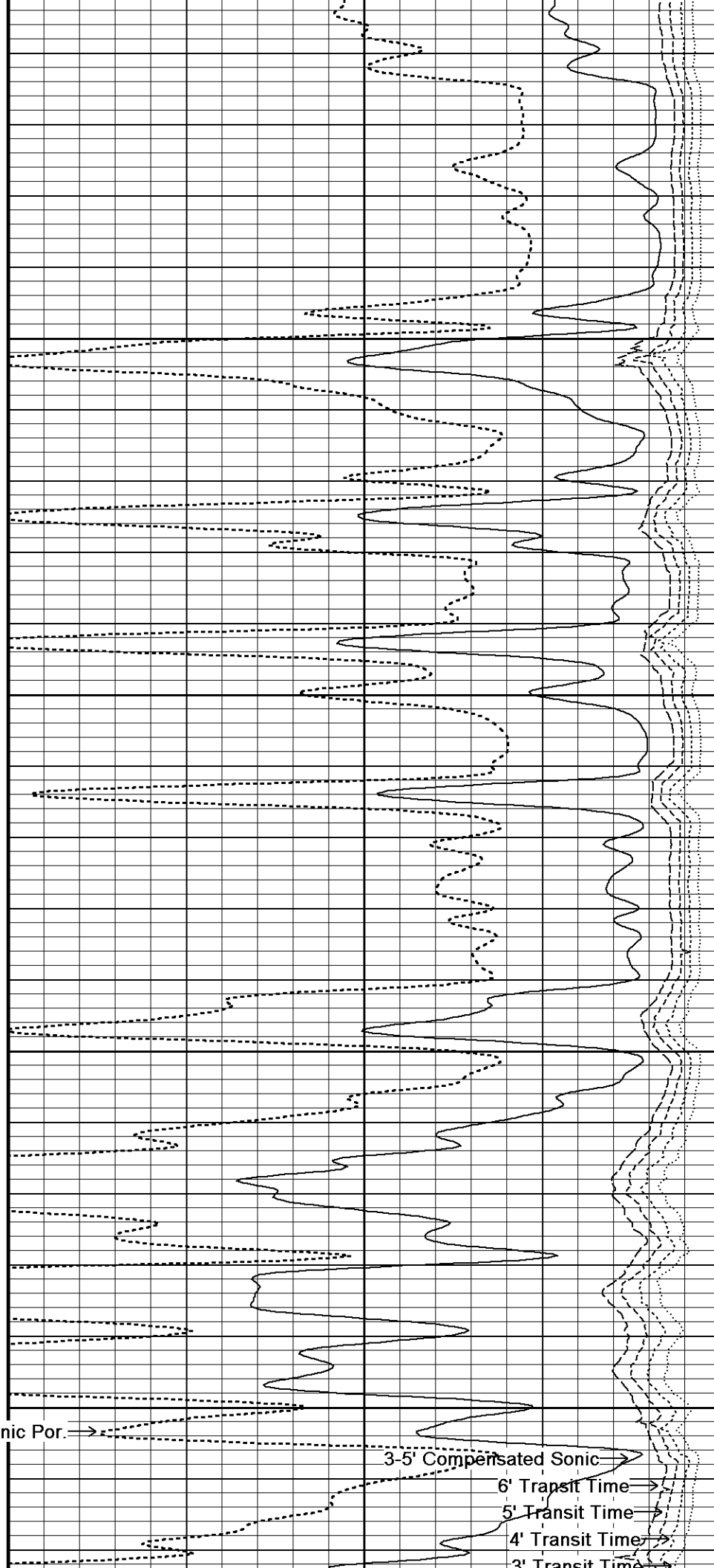
97°

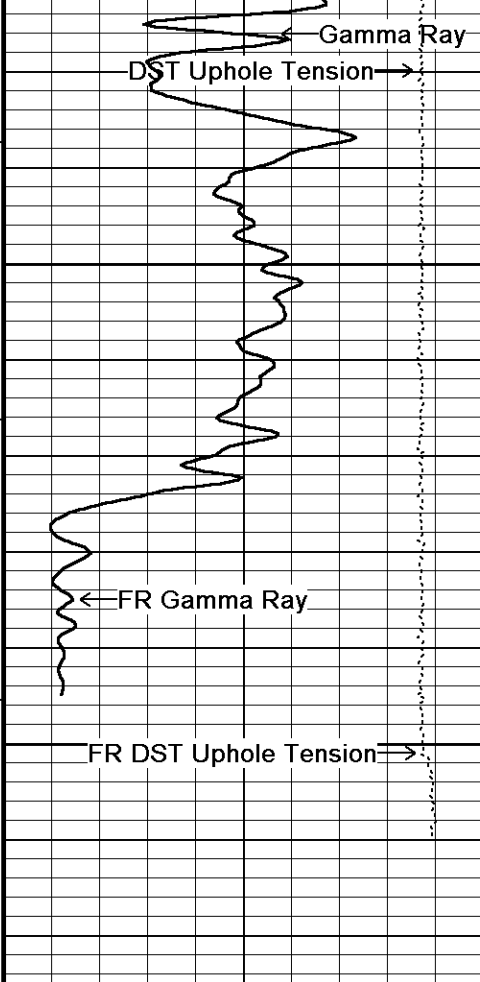
3700

98°

3750

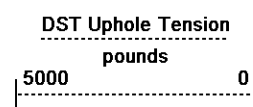
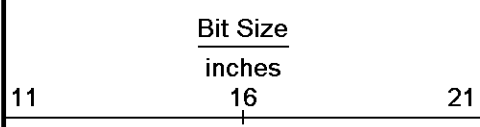
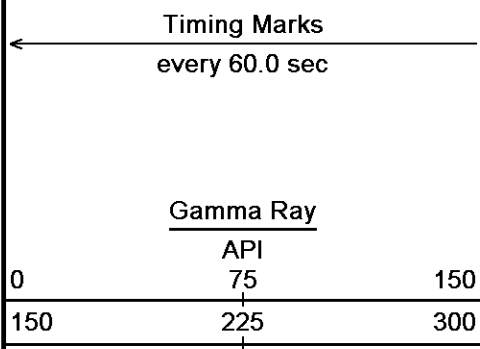
Wyllie Lime. Sonic Por. →





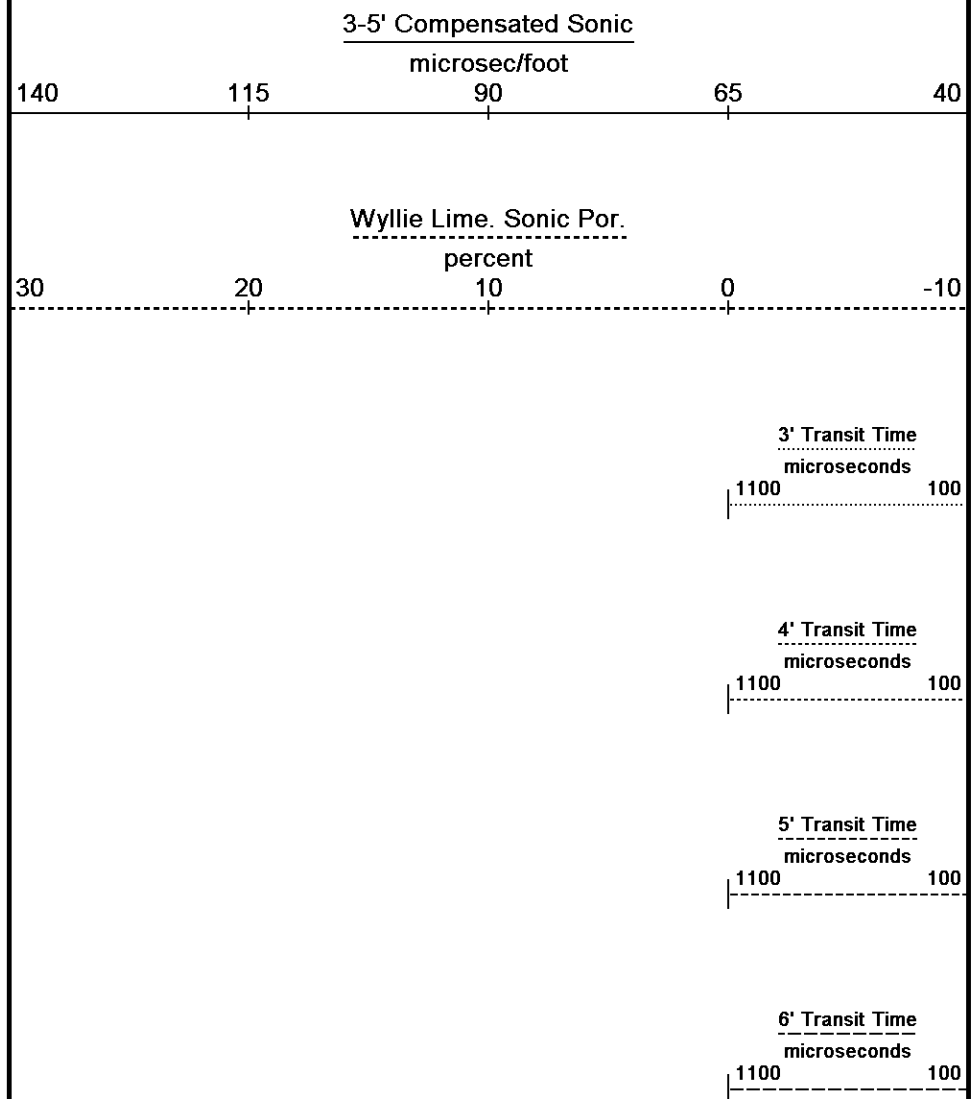
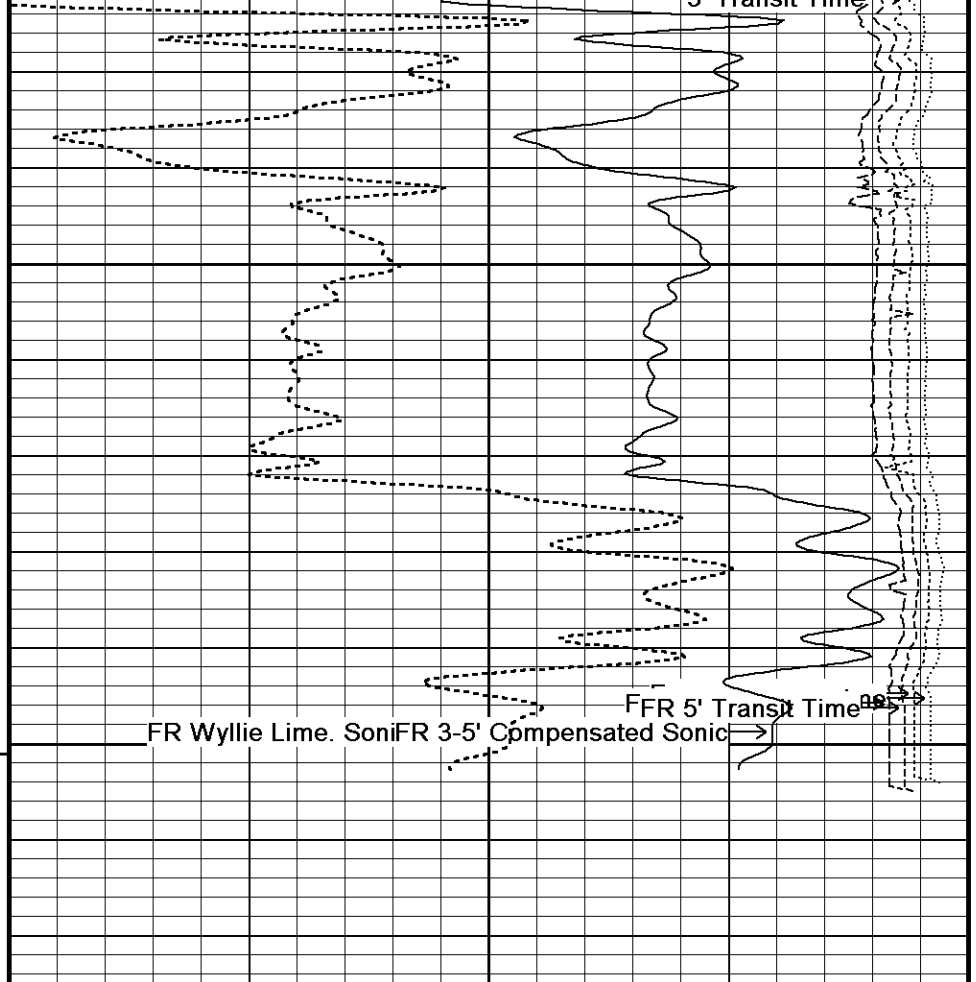
99°
3800
98°
3850

Depth
in
Feet



Borehole
Temp in
deg F

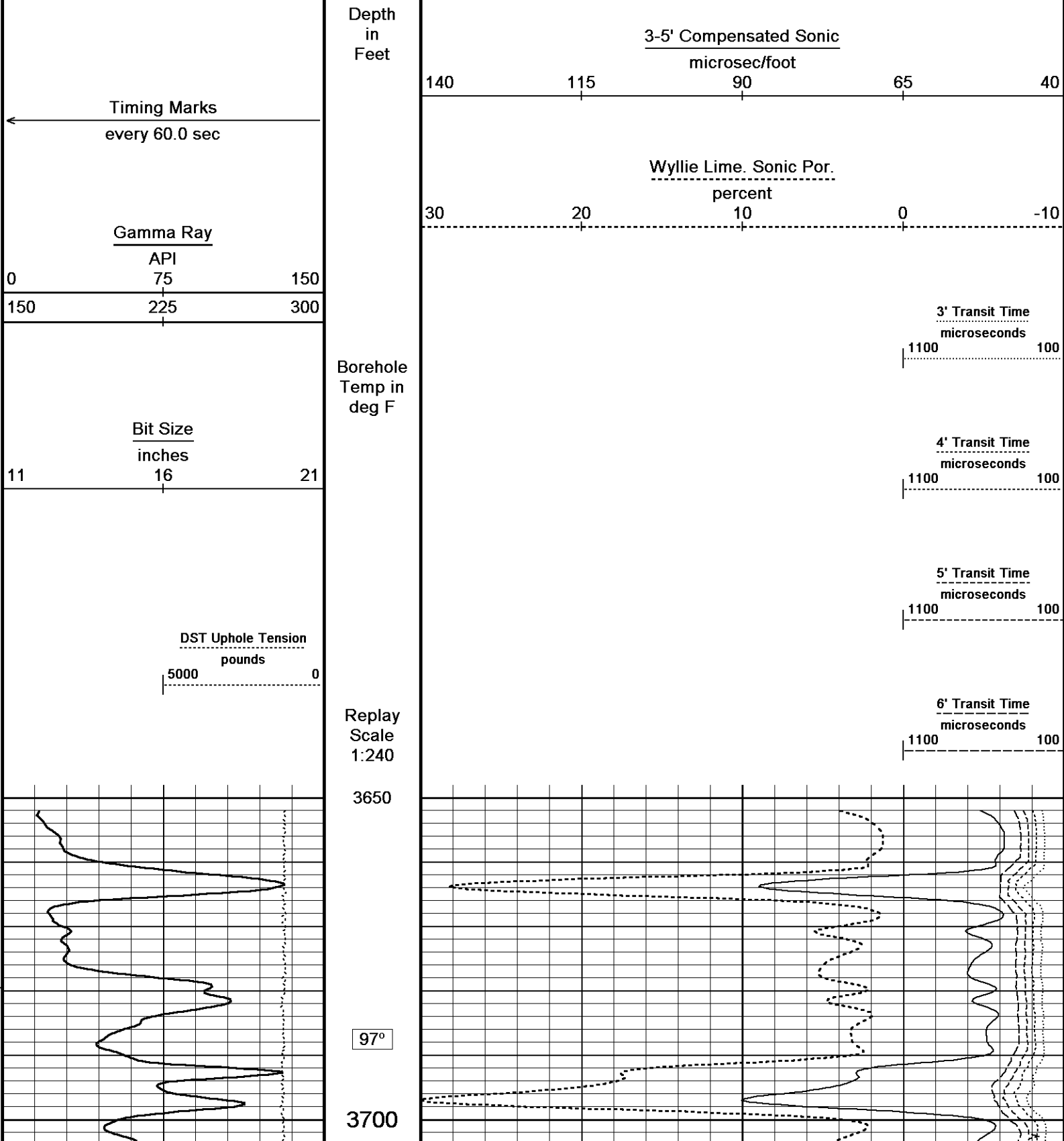
Replay
Scale
1:240

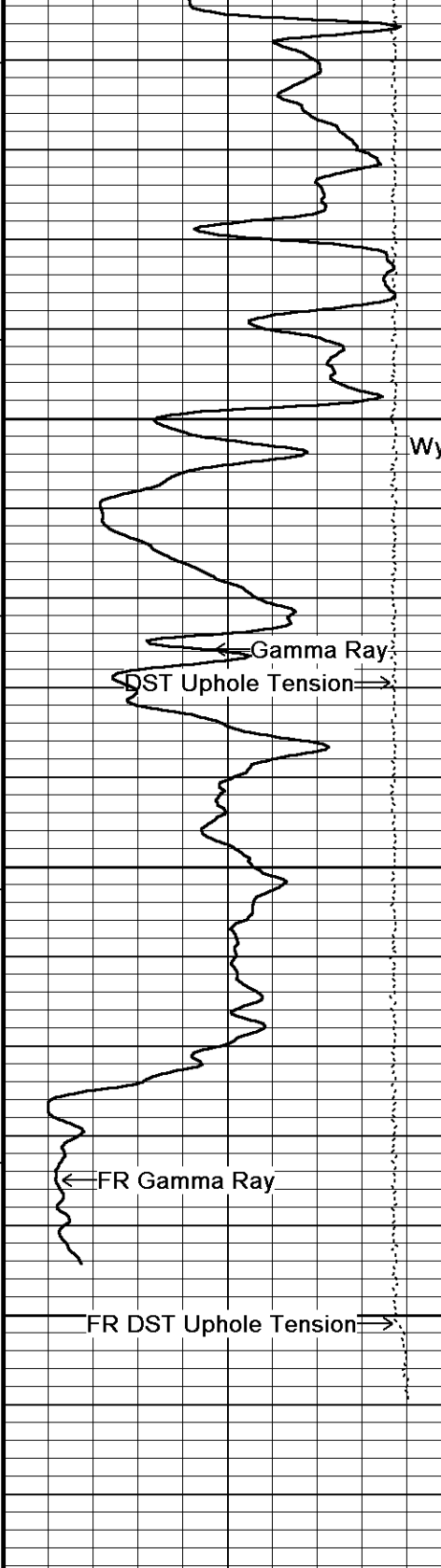


↓REPEAT SECTION↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Logs\OBRIEN JECHA 4-1\OBRIEN JECHA 4-1 SONIC REPEAT.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

Plotted on 06-MAR-2014 02:11
Recorded on 05-MAR-2014 21:29





97°

3750

Wyllie Lime. Sonic Por. →

99°

3800

97°

3850

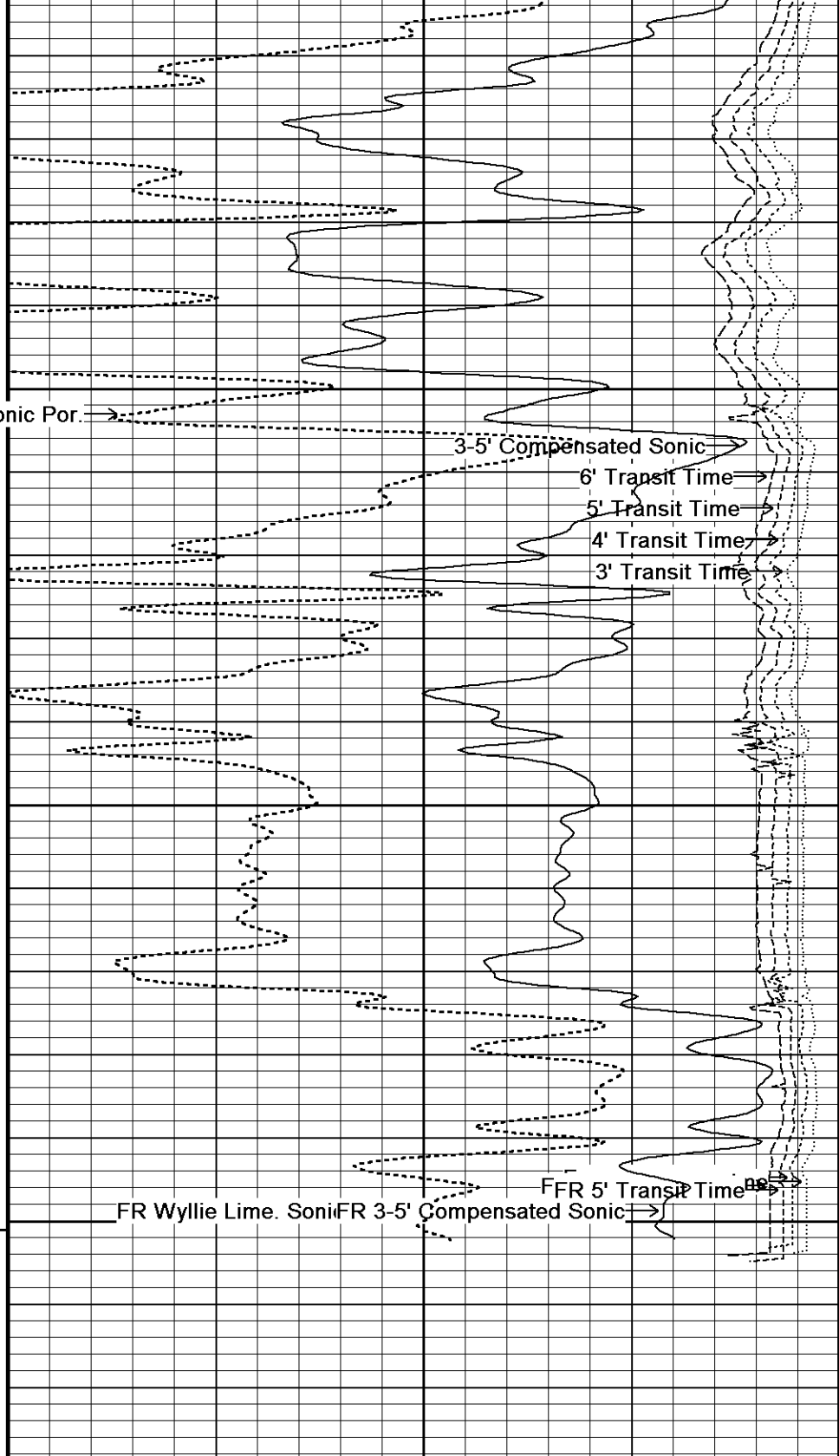
Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray

API
75

150



3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

FFR 5' Transit Time →

FR Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic

microsec/foot

140

115

90

65

40

Wyllie Lime. Sonic Por.

percent

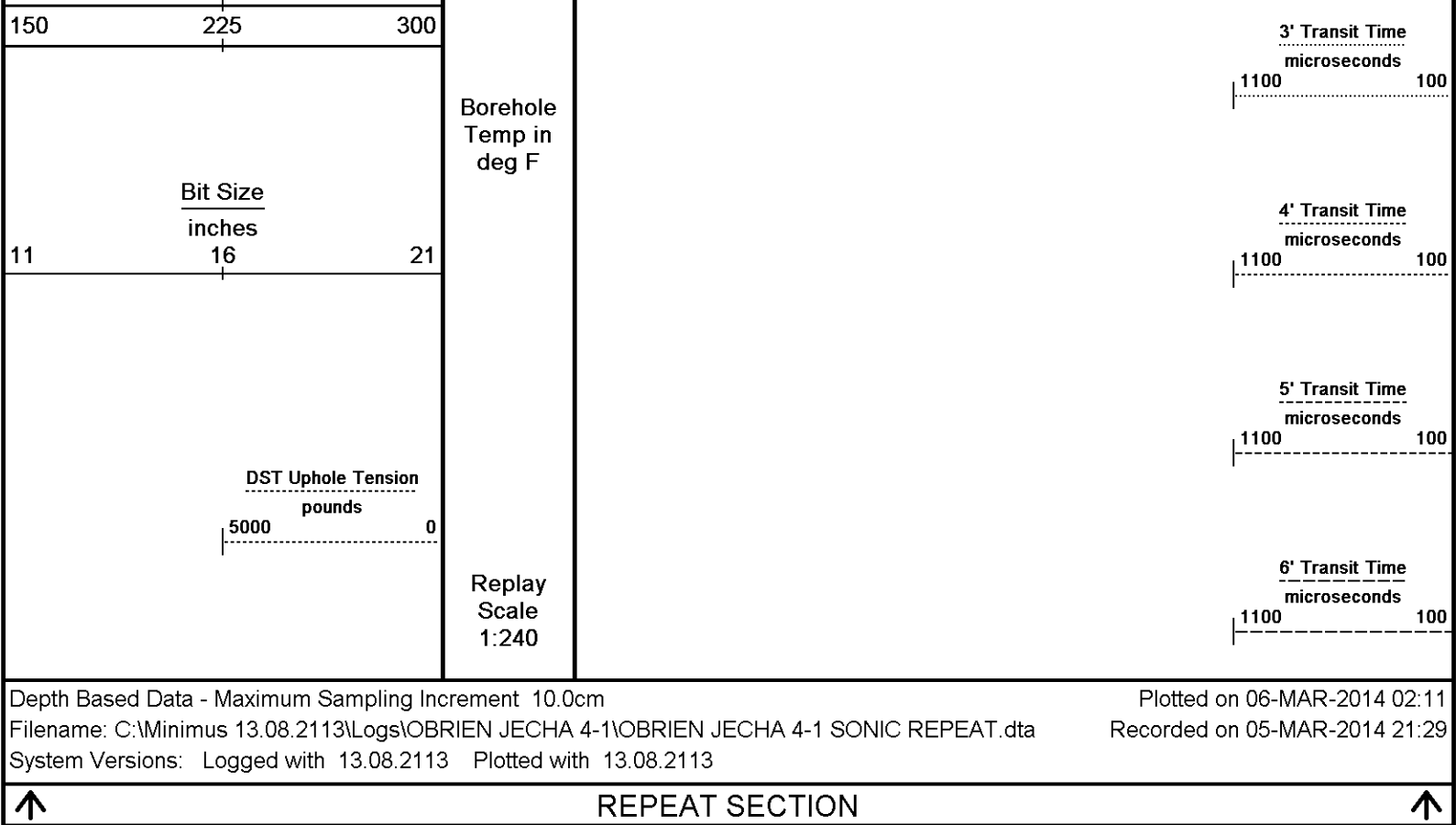
30

20

10

0

-10



↑

REPEAT SECTION

↑

BEFORE SURVEY CALIBRATION			
C:\Minimus 13.08.2113\Logs\OBRIEN JECHA 4-1\OBRIEN JECHA 4-1 SONIC REPEAT.dta			
General Constants All 000		Last Edited on 05-MAR-2014,20:56	
General Parameters			
Mud Resistivity	1.000	ohm-metres	
Mud Resistivity Temperature	48.000	degrees F	
Water Level	0.000	feet	
Borehole Fluid Processing	Water Level Switch		
Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	None		
HVOL Caliper 2	N/A		
Annular Volume Diameter	5.500	inches	
Caliper for Differential Caliper	None		
Rwa Parameters			
Porosity used	N/A		
Resistivity used	N/A		
RWA Constant A	N/A		
RWA Constant M	N/A		
SW/APOR Tool Source			
Gamma Calibration MCG-D.K 443		Field Calibration on 05-MAR-2014,20:49	
	Measured	Calibrated (API)	
Background	75	48	
Calibrator (Gross)	1215	773	
Calibrator (Net)	1140	725	
Gamma Constants MCG-D.K 443		Last Edited on 05-MAR-2014,20:51	
Gamma Calibrator Number GRC38			
Mud Density	1.12	gm/cc	
Caliper Source for Processing	Bit Size		
Tool Position	Centred		
Concentration of KCl		kppm	

K Mud Type		Chloride	
K Mud Concentration		0.00	%
High Resolution Temperature Calibration MCG-D.K 443			Field Calibration on 05-MAR-2014,20:50
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-D.K 443			Last Edited on 05-MAR-2014,20:50
Pre-filter Length	11		
Sonic Constants MSS-C.K 330			Last Edited on 05-MAR-2014,20:12
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
3'	N/A	N/A	N/A
4'	N/A	N/A	N/A
5'	N/A	N/A	N/A
6'	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
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	

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Logs\OBRIEN JECHA 4-1\OBRIEN JECHA 4-1 SONIC REPEAT.dta

MCB-A 11B Tension Cablehead

MCB-A 170 LG: 2.18 ft WT: 19.8 lb OD: 2.240 in

Compact Comms Gamma

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

Compact Sonic

MSS-C.K 330 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Total Length: 23.40 ft Weight: 156.5 lb



13.79 ft

GRGC - Gamma Ray

10.88 ft

CGXT - MCG External Temperature

4.00 ft

TR11 - 4' Transit Time

3.50 ft

TR21 - 3' Transit Time

3.00 ft

TR12 - 6' Transit Time

2.50 ft

TR22 - 5' Transit Time

0.00 ft

DT35 - 3-5' Compensated Sonic

0.00 ft

SPRL - Wyllie Lime. Sonic Por.

Tool Zero

(2.28ft from bottom)

-2.28 ft

SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY

O'BRIEN RESOURCES, LLC

WELL

JECHA 4-1

FIELD

WILDCAT

PROVINCE/COUNTY

RUSH

COUNTRY/STATE

U.S.A. / KANSAS

Elevation Kelly Bushing 2058.00 feet

Elevation Drill Floor 2056.00 feet

Elevation Ground Level 2053.00 feet

First Reading 3849.00 feet

Depth Driller 3851.00 feet

Depth Logger 3851.00 feet



COMPENSATED SONIC

WITH INTEGRATED TRANSIT TIME

Weatherford®