



Weatherford

**COMPENSATED SONIC
WITH INTEGRATED TRANSIT TIME**

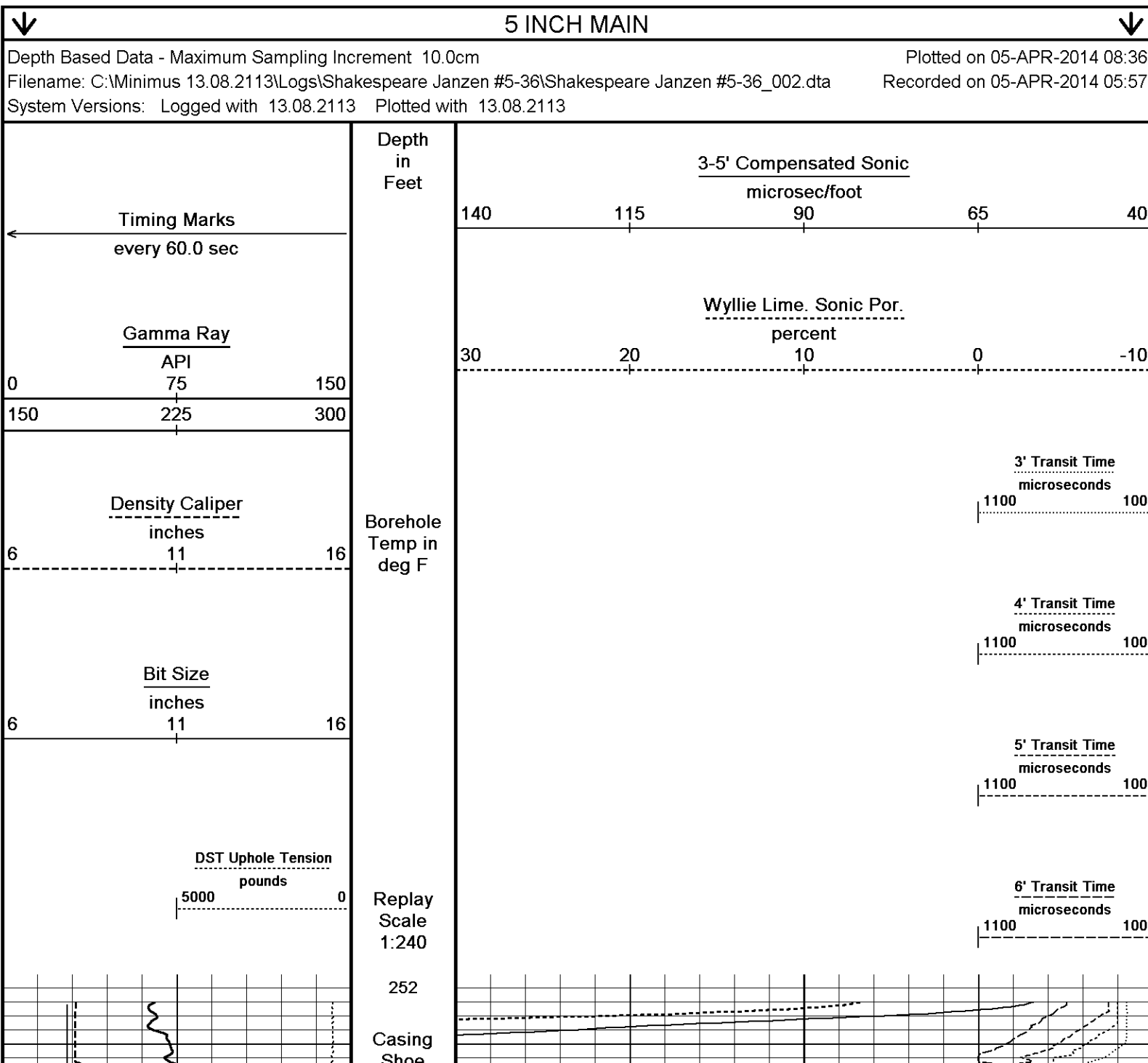
COMPANY	SHAKESPEARE OIL CO., INC.			
WELL	JANZEN #5-36			
FIELD	CAPSTONE EAST			
PROVINCE/COUNTY	SCOTT			
COUNTRY/STATE	U.S.A. / KANSAS			
LOCATION	400' FSL & 650' FWL			
SEC 36	TWP 16S	RGE 34W	Other Services	
Latitude			MPD/MDN	MAI/MFE
Longitude			MML	
API Number	15-171-21042			
Permanent Datum GL, Elevation	3104 feet			Elevations:
Log Measured From KB				KB 3114.00
Drilling Measured From KB				DF 3112.00
				GL 3104.00
Date	05-APR-2014			
Run Number	ONE			
Service Order	3487-83878012			
Depth Driller	4866.00 feet			
Depth Logger	4865.00 feet			
First Reading	4852.00 feet			
Last Reading	264.00 feet			
Casing Driller	268.00 feet			
Casing Logger	264.00 feet			
Bit Size	7.875 inches			
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.20 lb/USg 50.00 CP			
PH / Fluid Loss	10.00 8.80 ml/30Min			
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.38 @ 81.0 ohm-m			
Rmf @ Measured Temp	0.30 @ 81.0 ohm-m			
Rmc @ Measured Temp	0.46 @ 81.0 ohm-m			
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.28 @110.0 ohm-m			
Time Since Circulation	5 HOURS			
Max Recorded Temp	110.00 deg F			
Equipment / Base	13244 LIB			
Recorded By	ADAM SILL			
Witnessed By	TIM PRIEST			
JOB #	LB14-101			

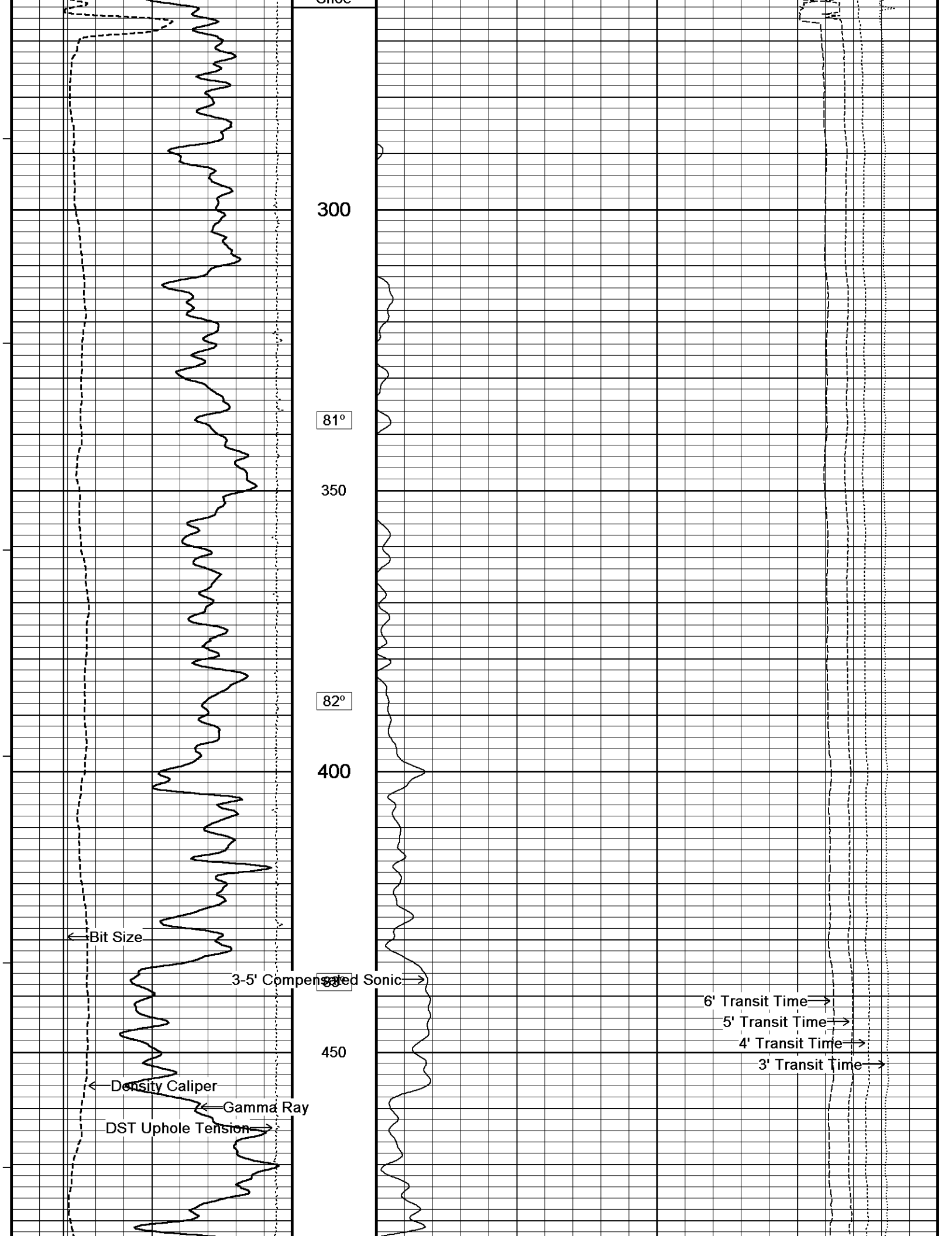
BOREHOLE RECORD					Last Edited: 05-APR-2014 03:46
Bit Size inches		Depth From feet		Depth To feet	
7.875		268.00		4866.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	268.00	24.00	

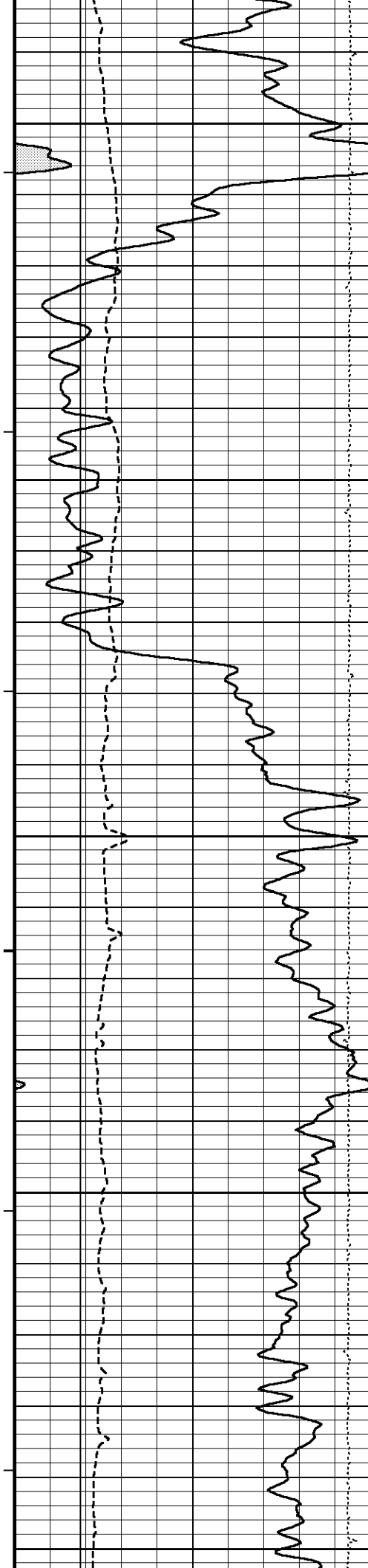
REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 2169 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 3800 FEET: 193 CU.FT.

- OPERATOR: J. LaPOINT.

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.







83°

500

84°

550

84°

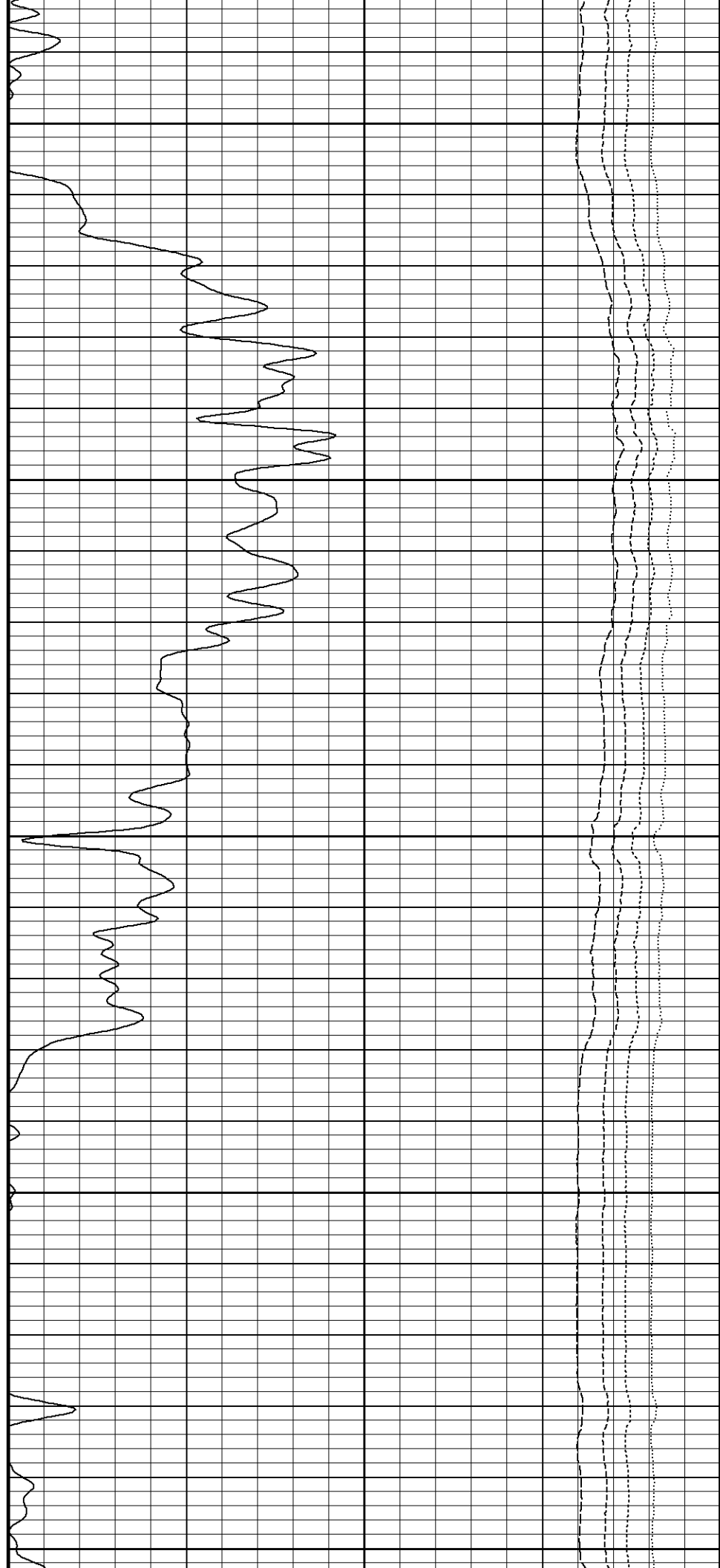
600

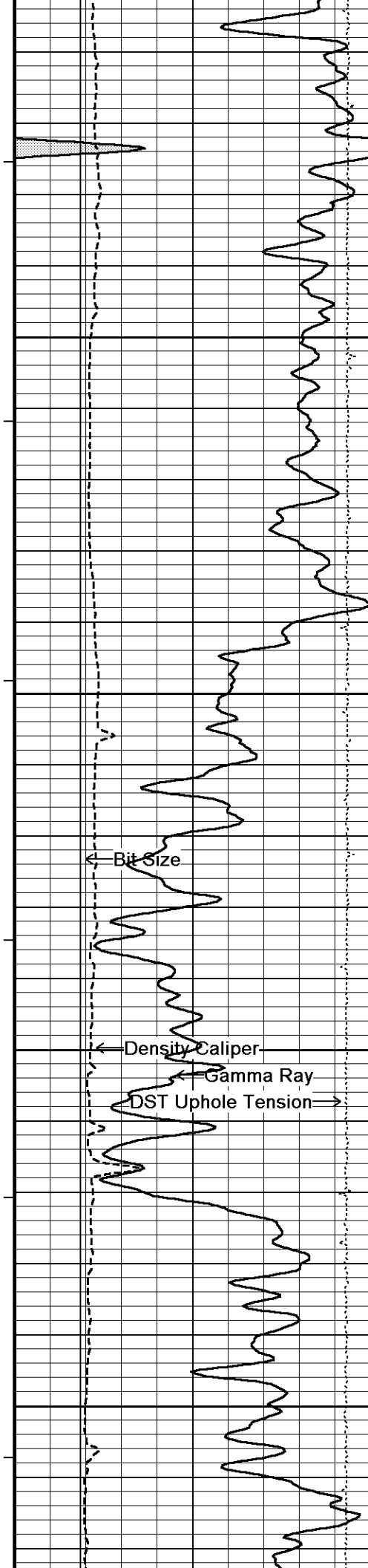
85°

650

86°

700





86°

750

86°

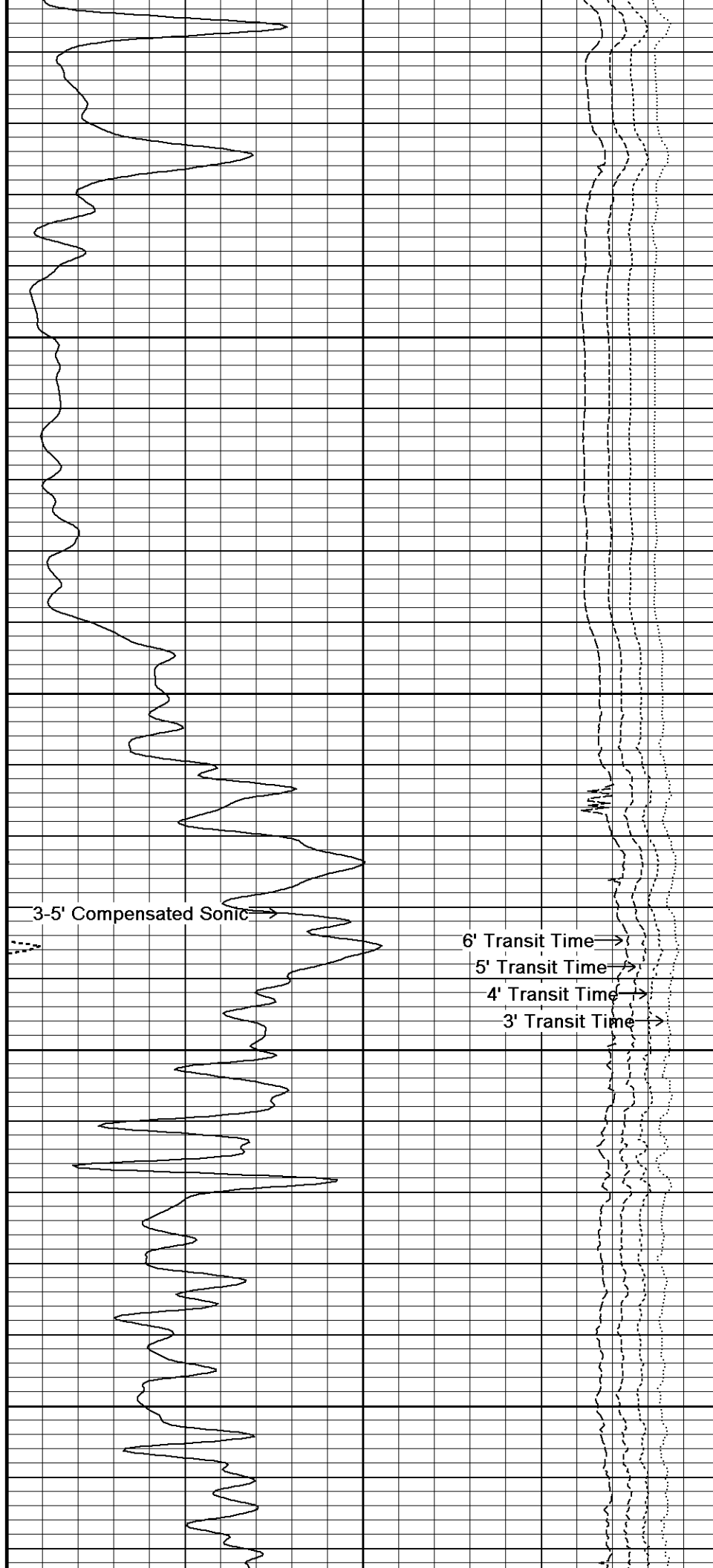
800

87°

850

87°

900



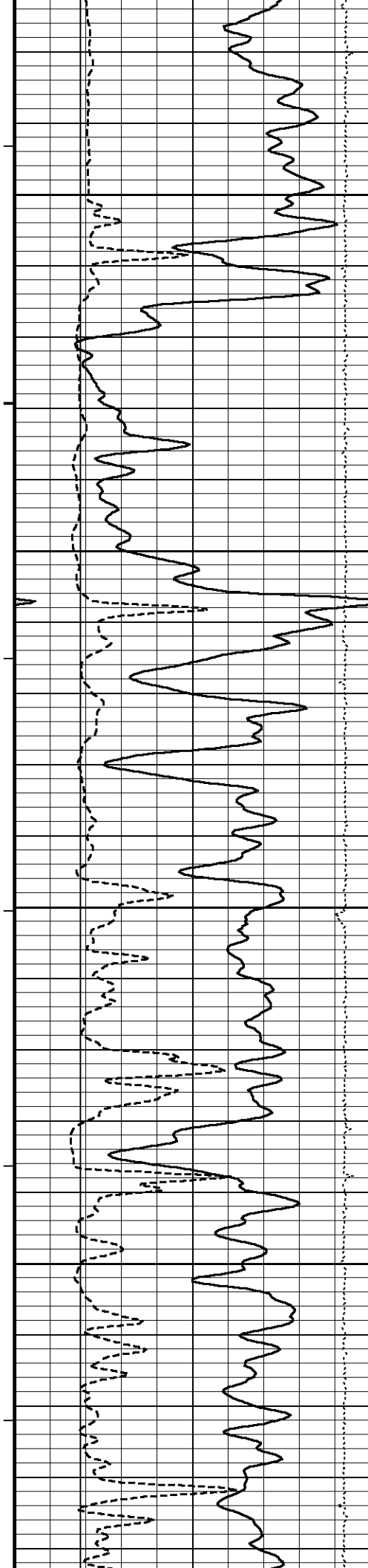
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



87°

950

88°

1000

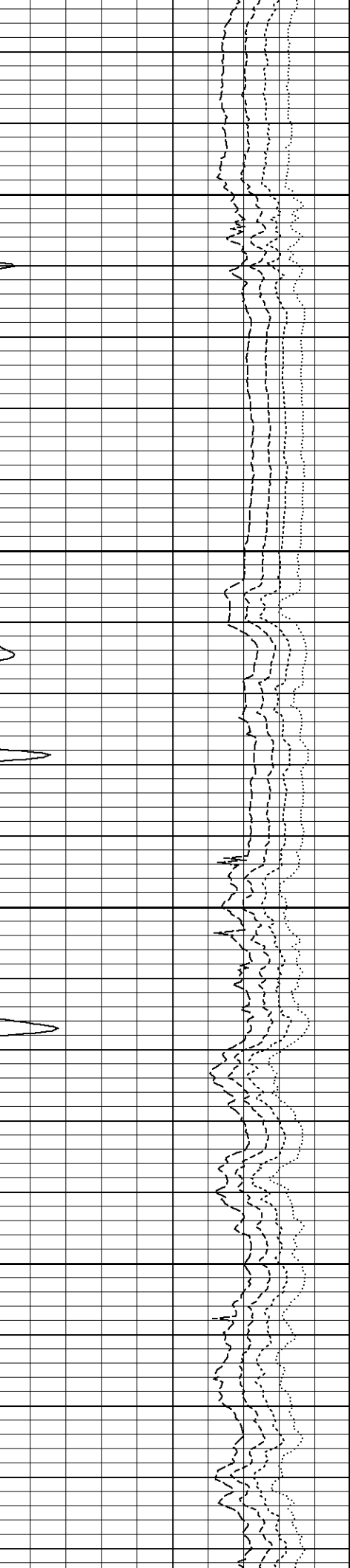
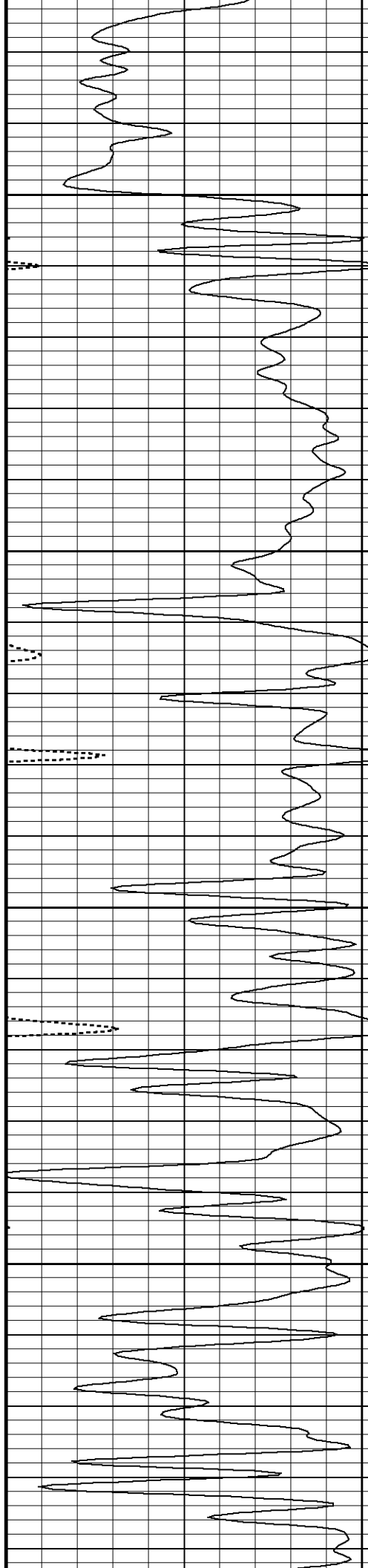
88°

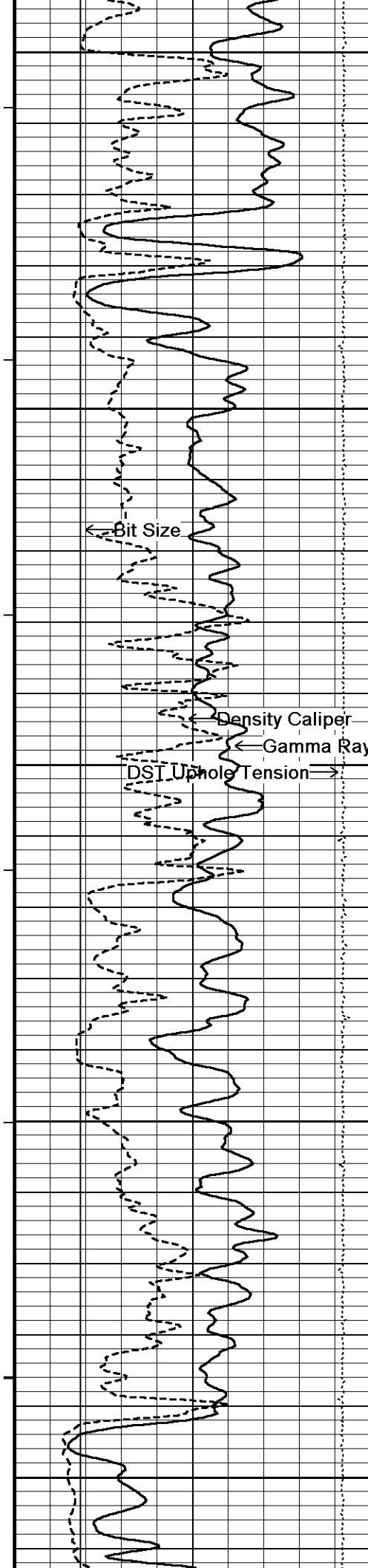
1050

89°

1100

89°





1150

90°

1200

90°

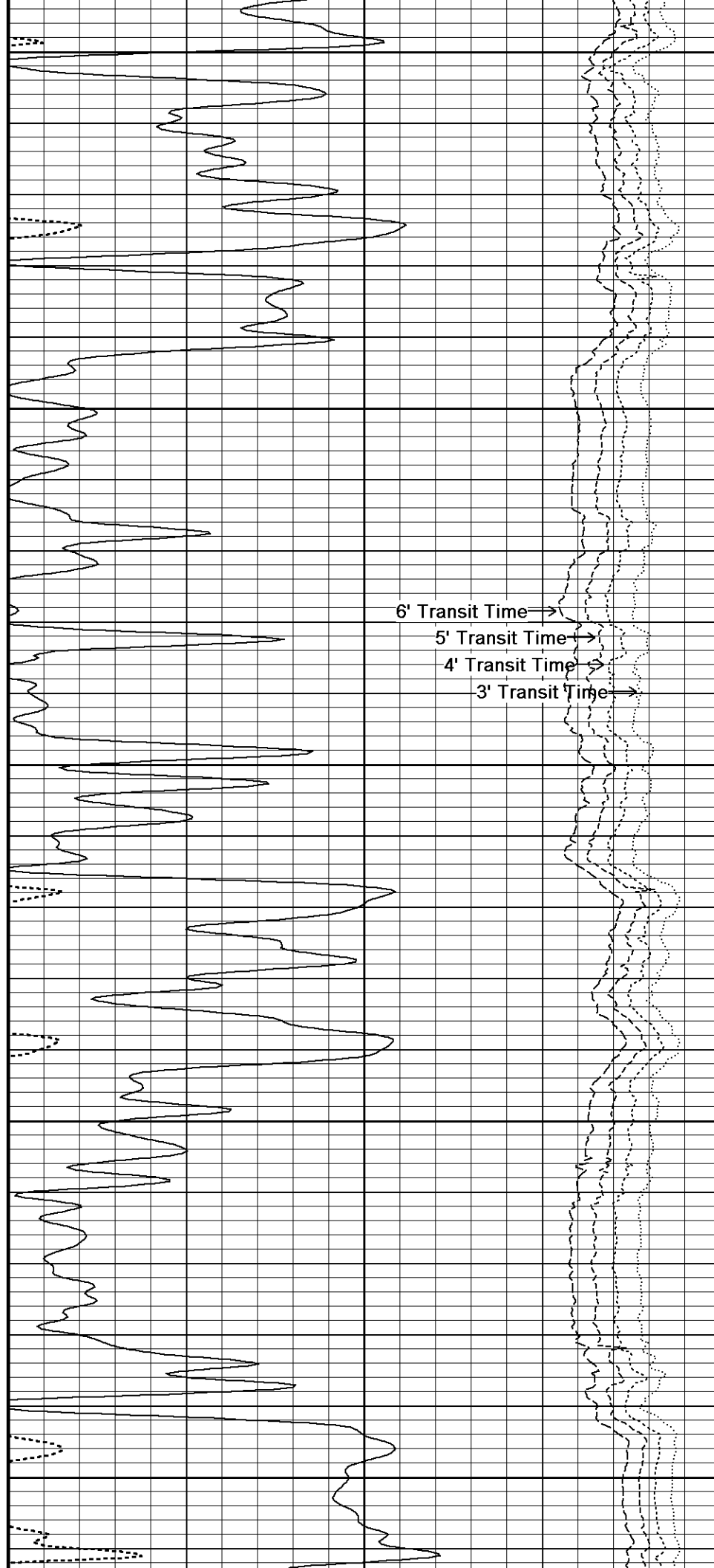
1250

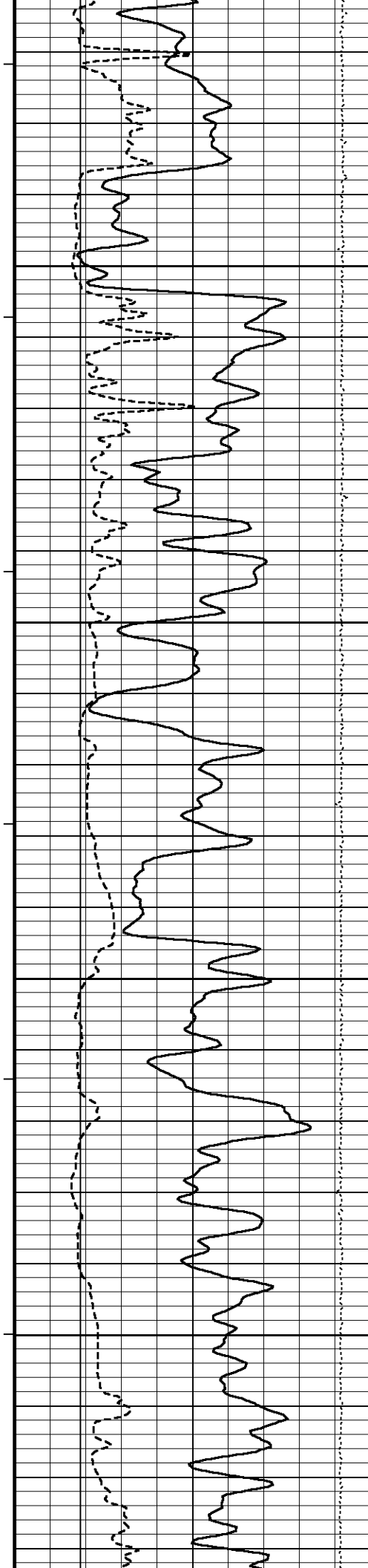
90°

1300

91°

1350





91°

1400

91°

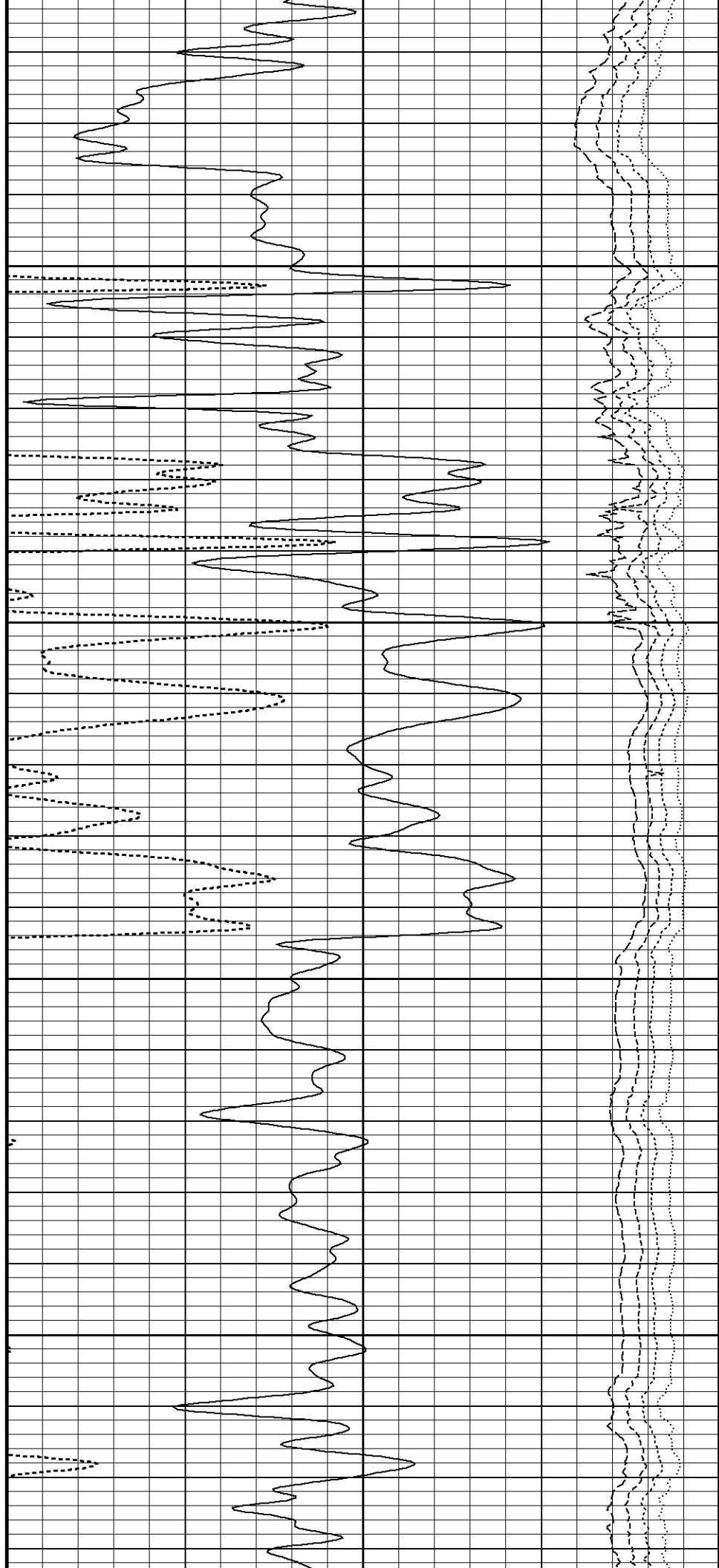
1450

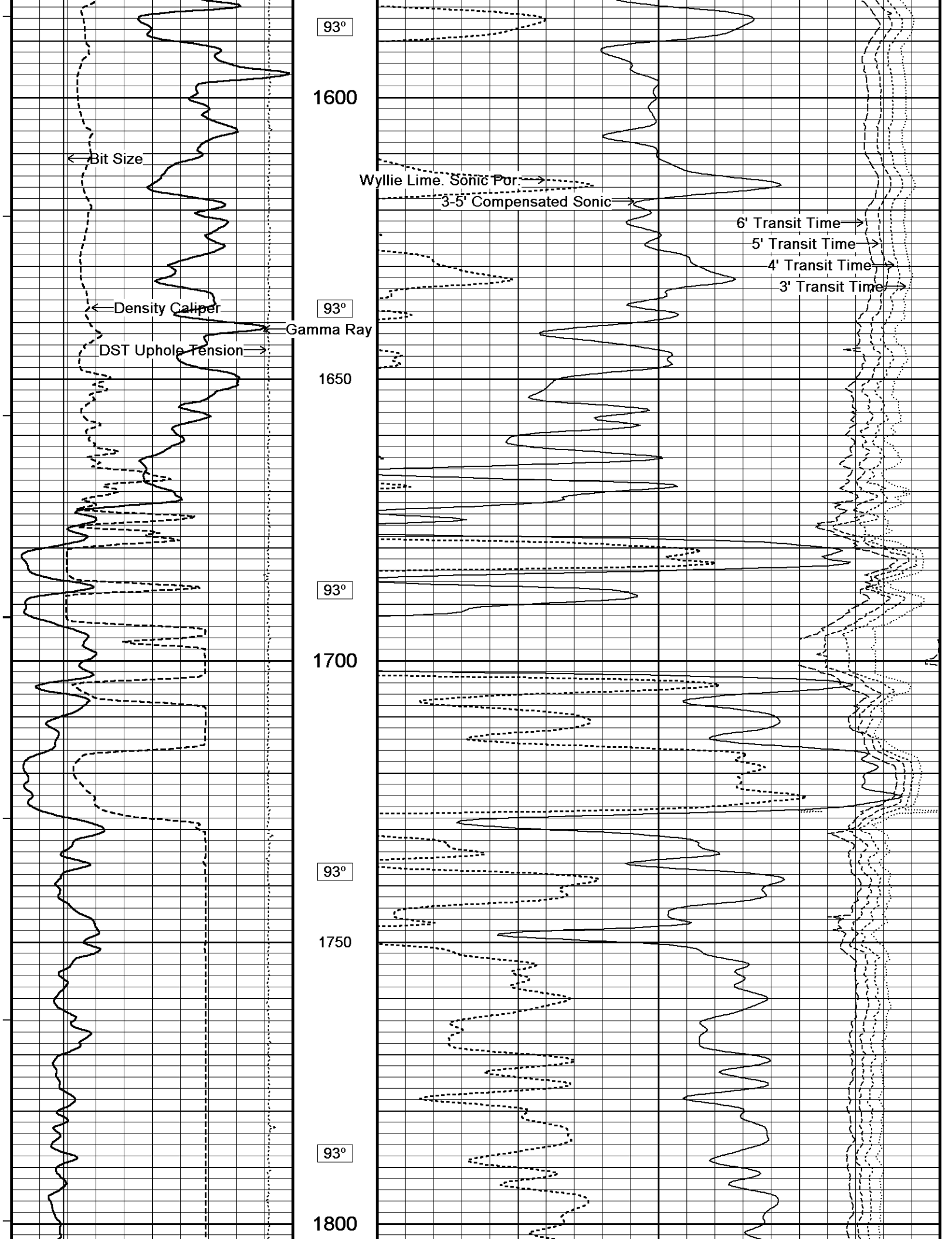
92°

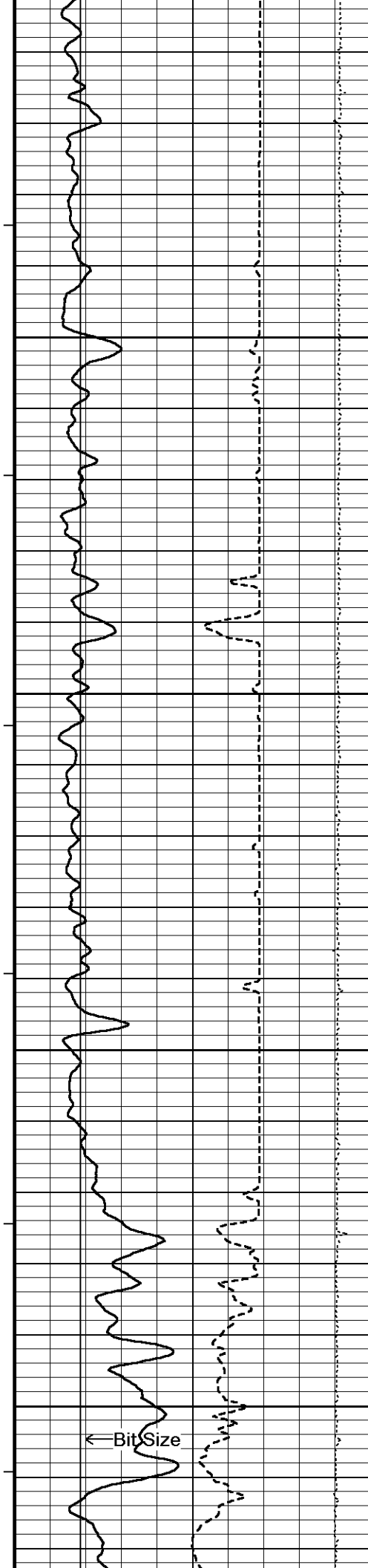
1500

92°

1550







93°

1850

93°

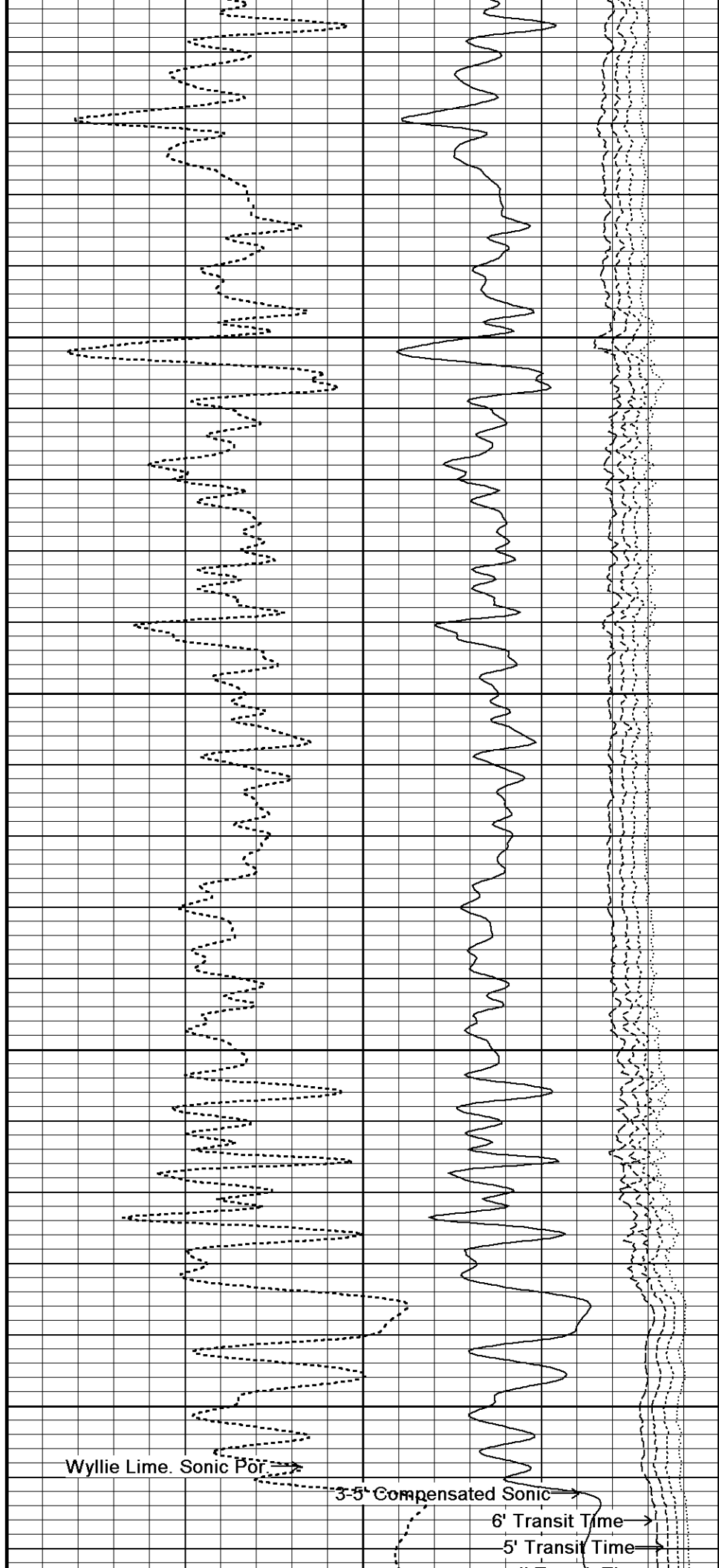
1900

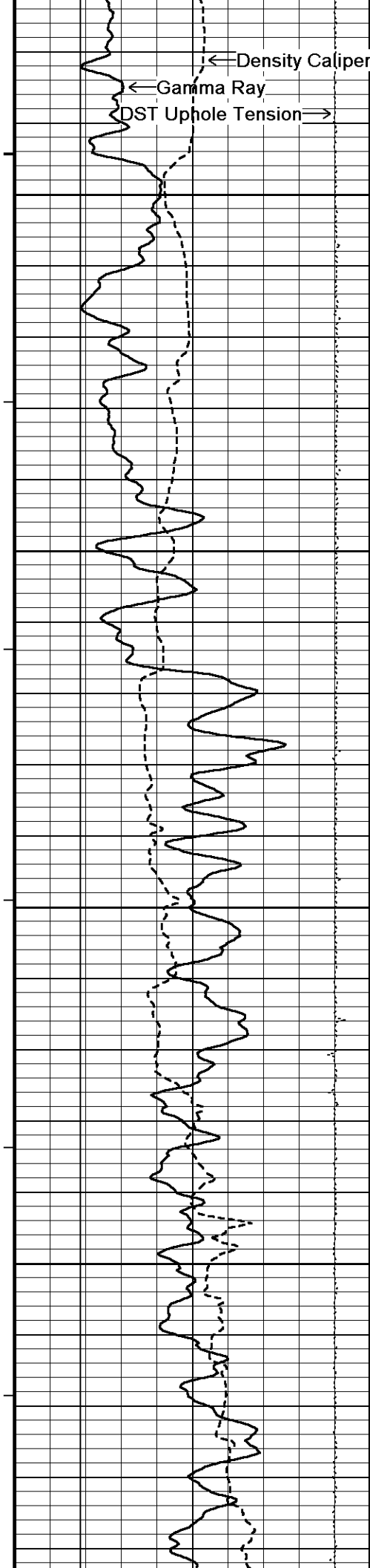
93°

1950

93°

2000





93°

2050

93°

2100

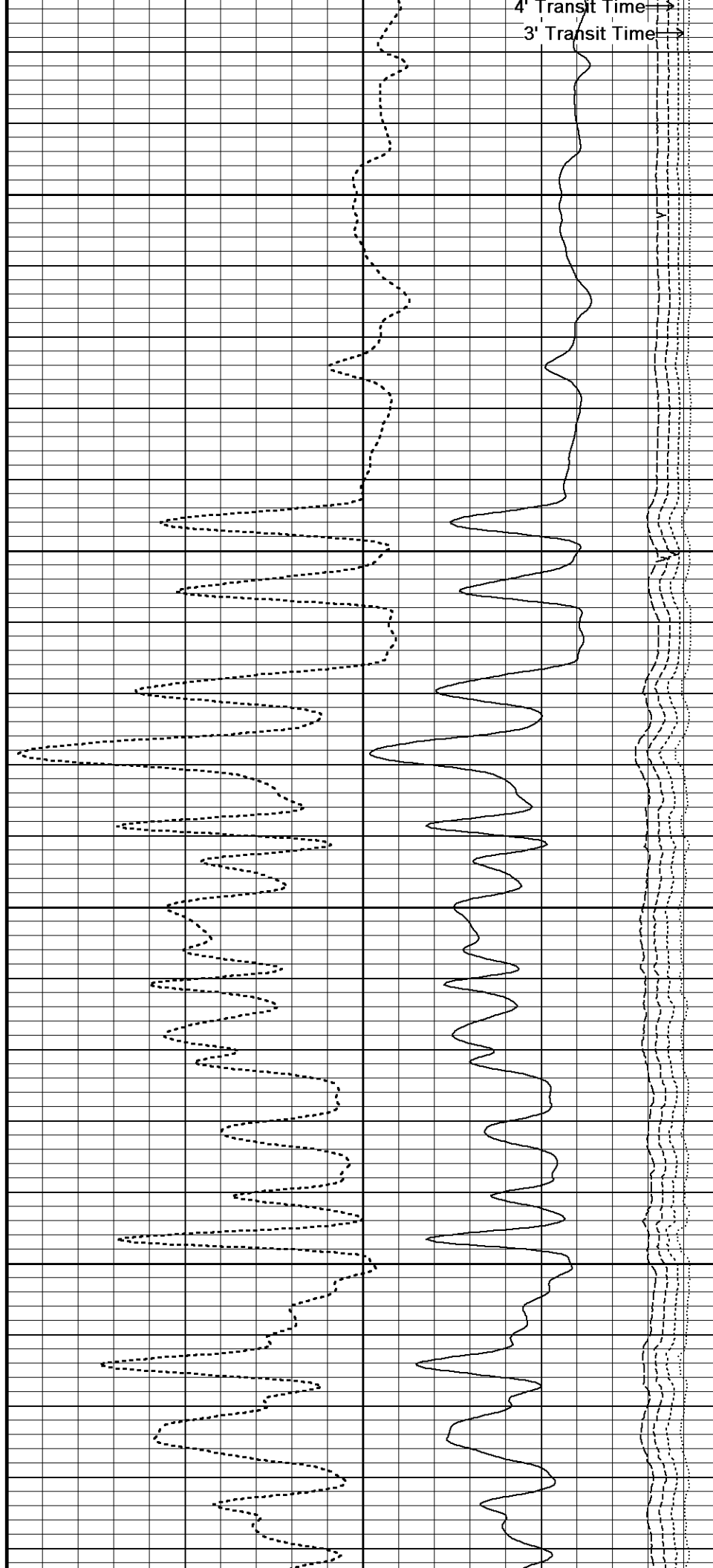
94°

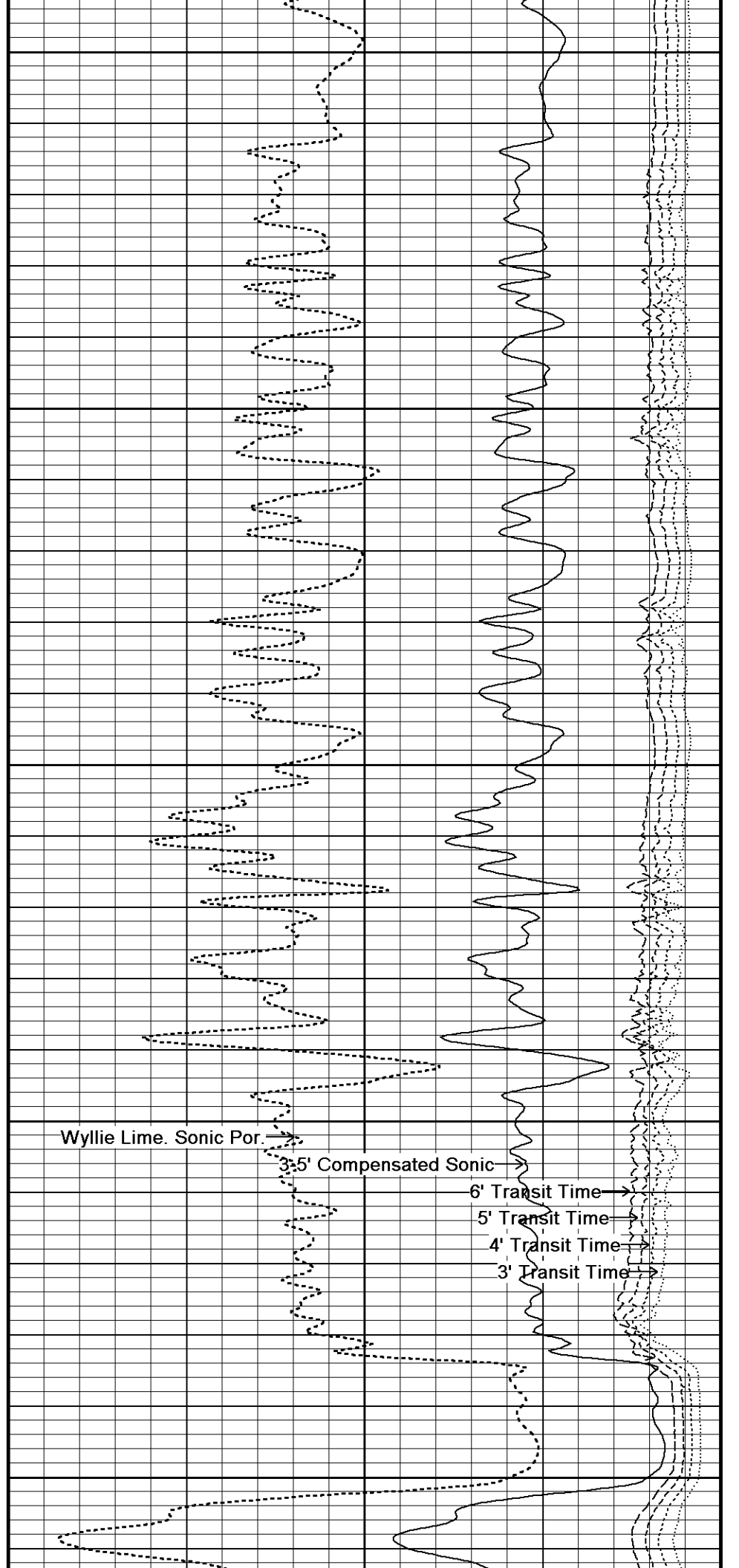
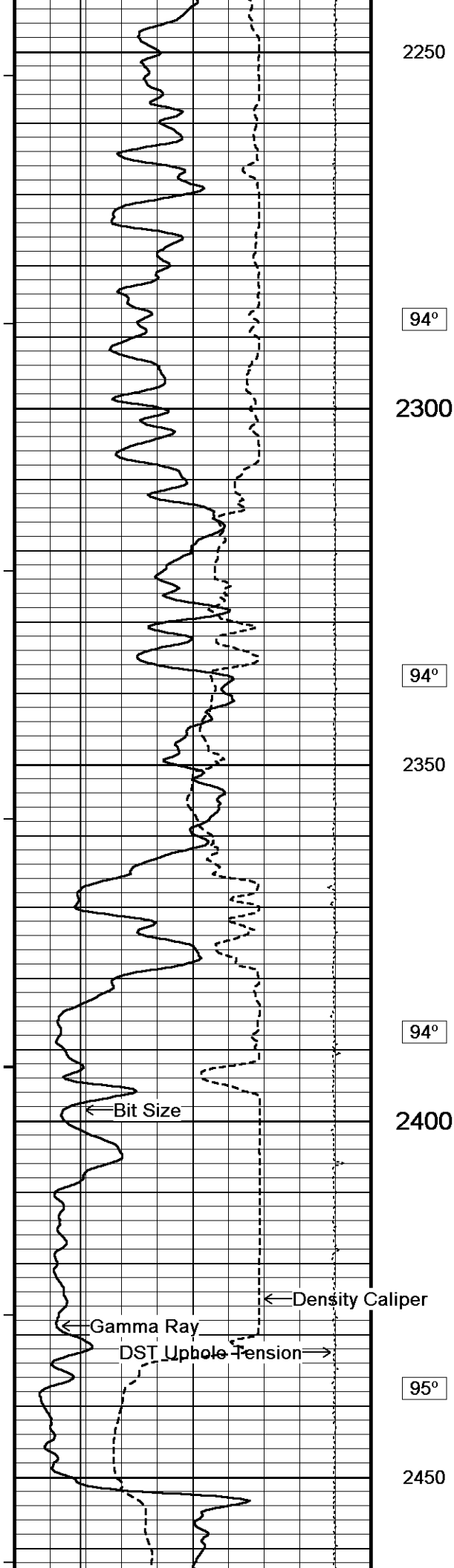
2150

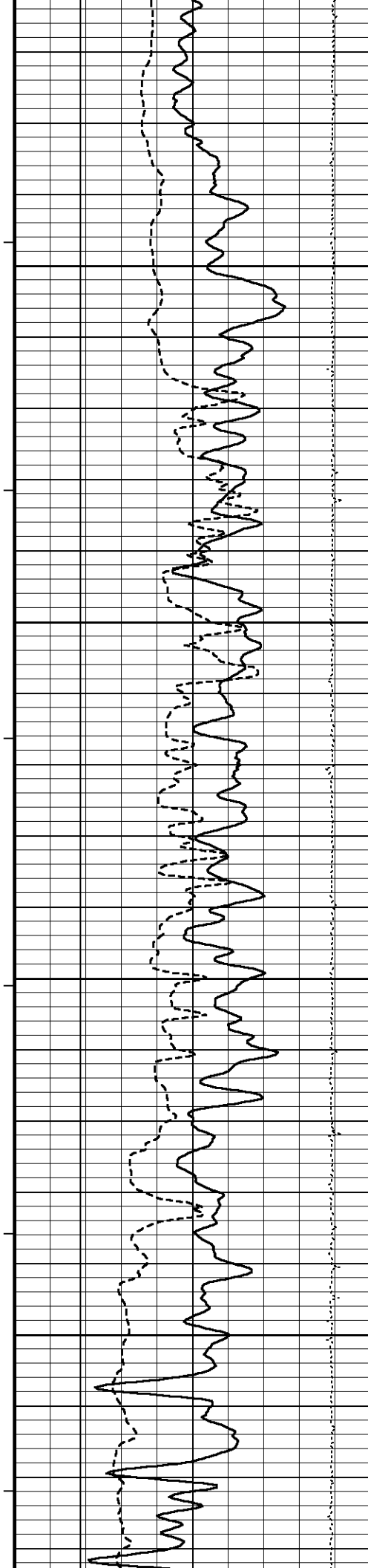
94°

2200

94°







95°

2500

95°

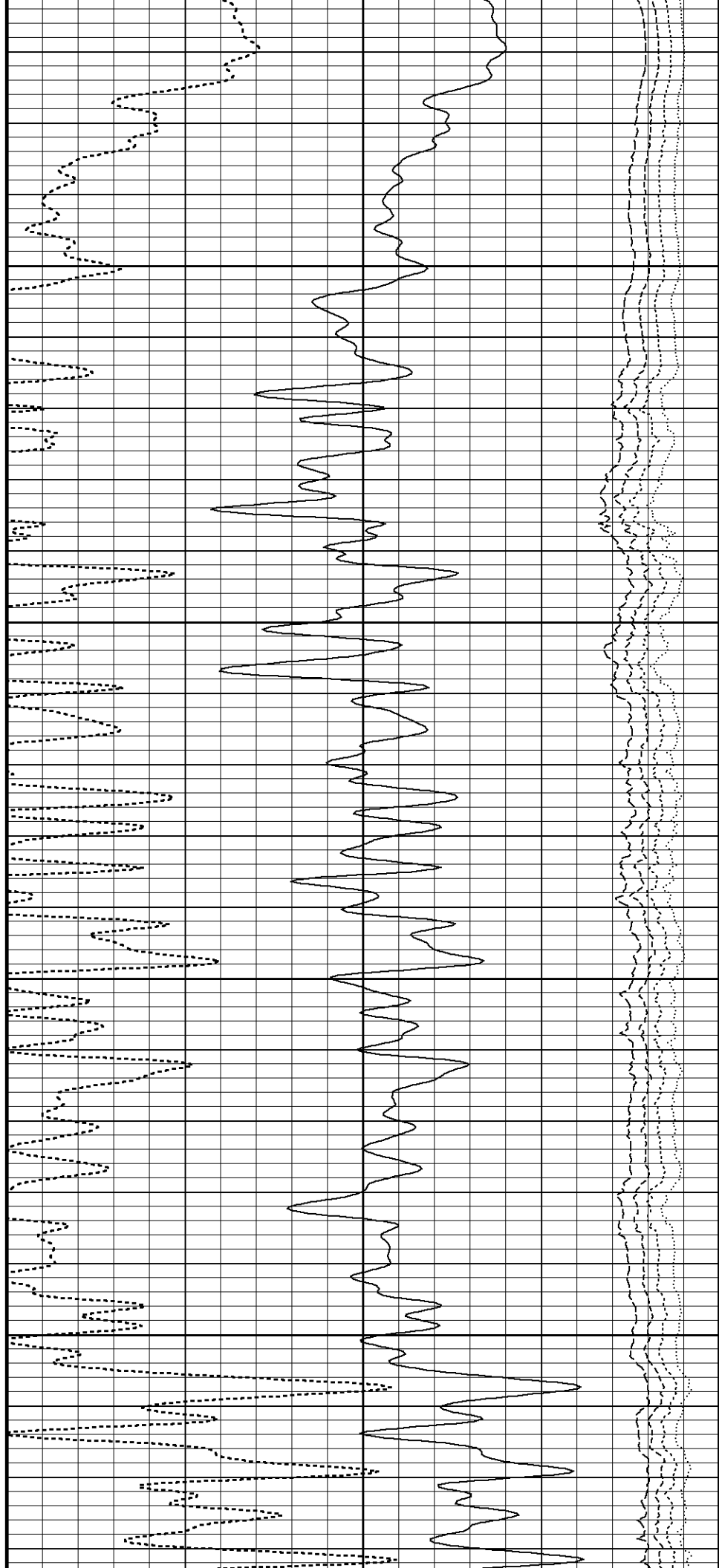
2550

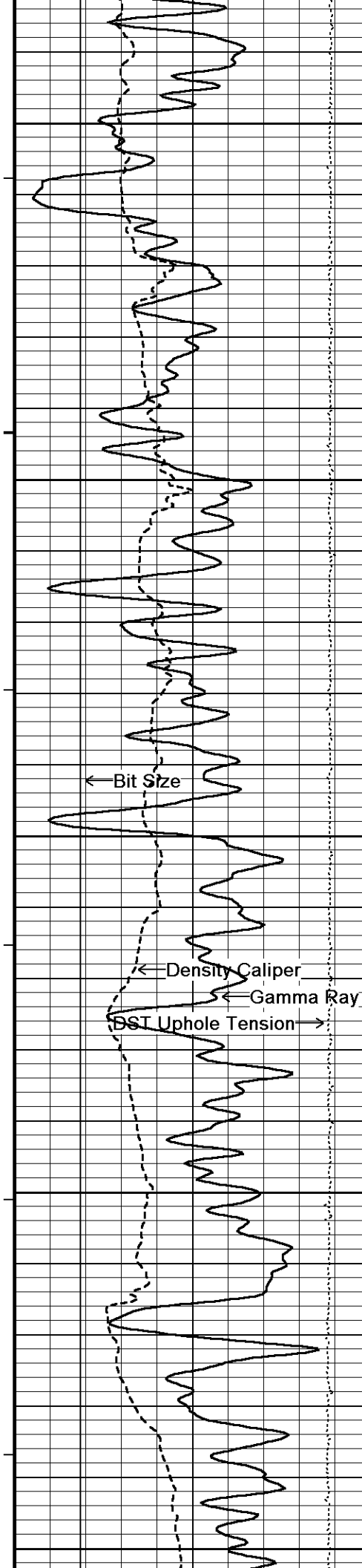
96°

2600

96°

2650





96°

2700

96°

2750

96°

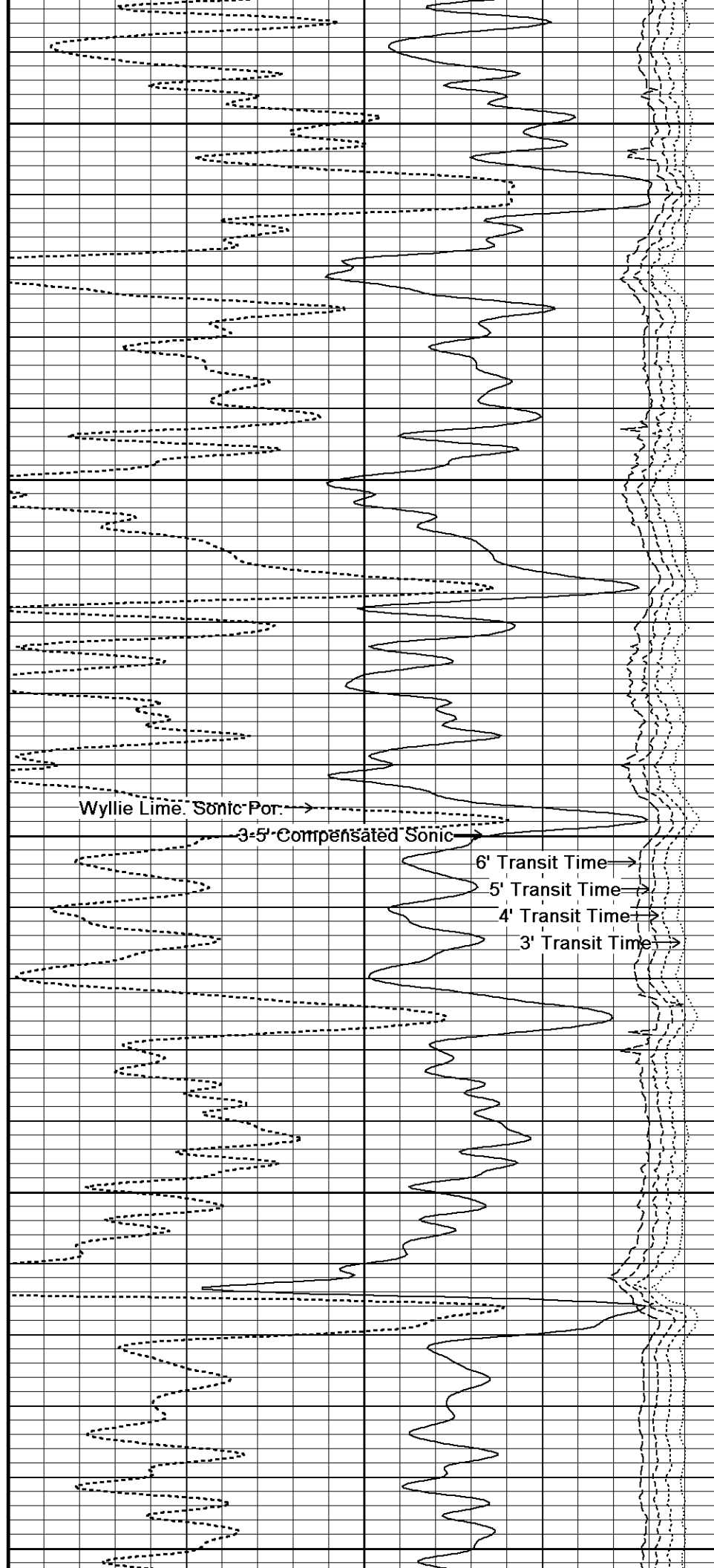
2800

97°

2850

97°

2900



Wyllie Lime Sonic Por.

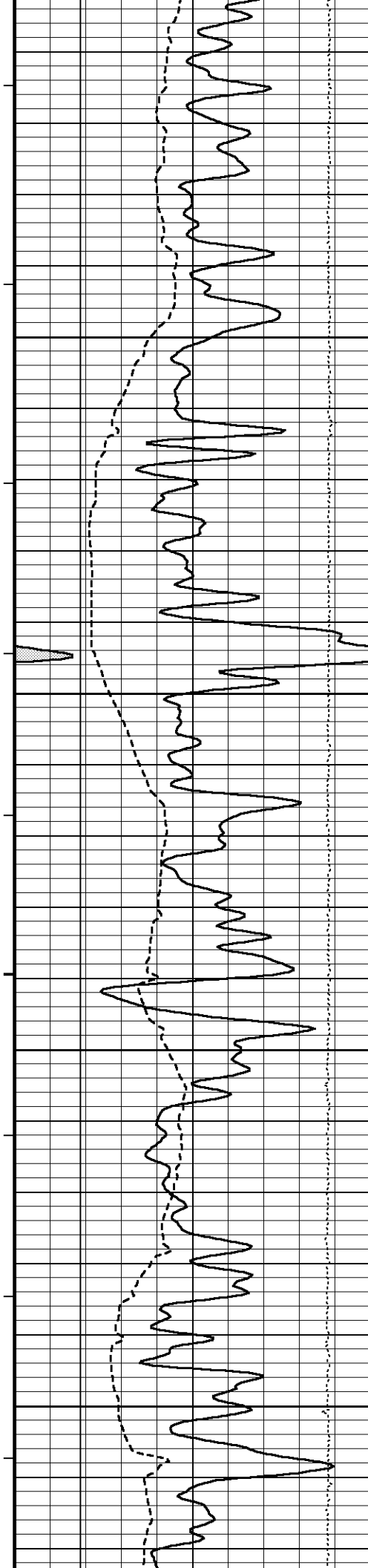
3-5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



97°

2950

97°

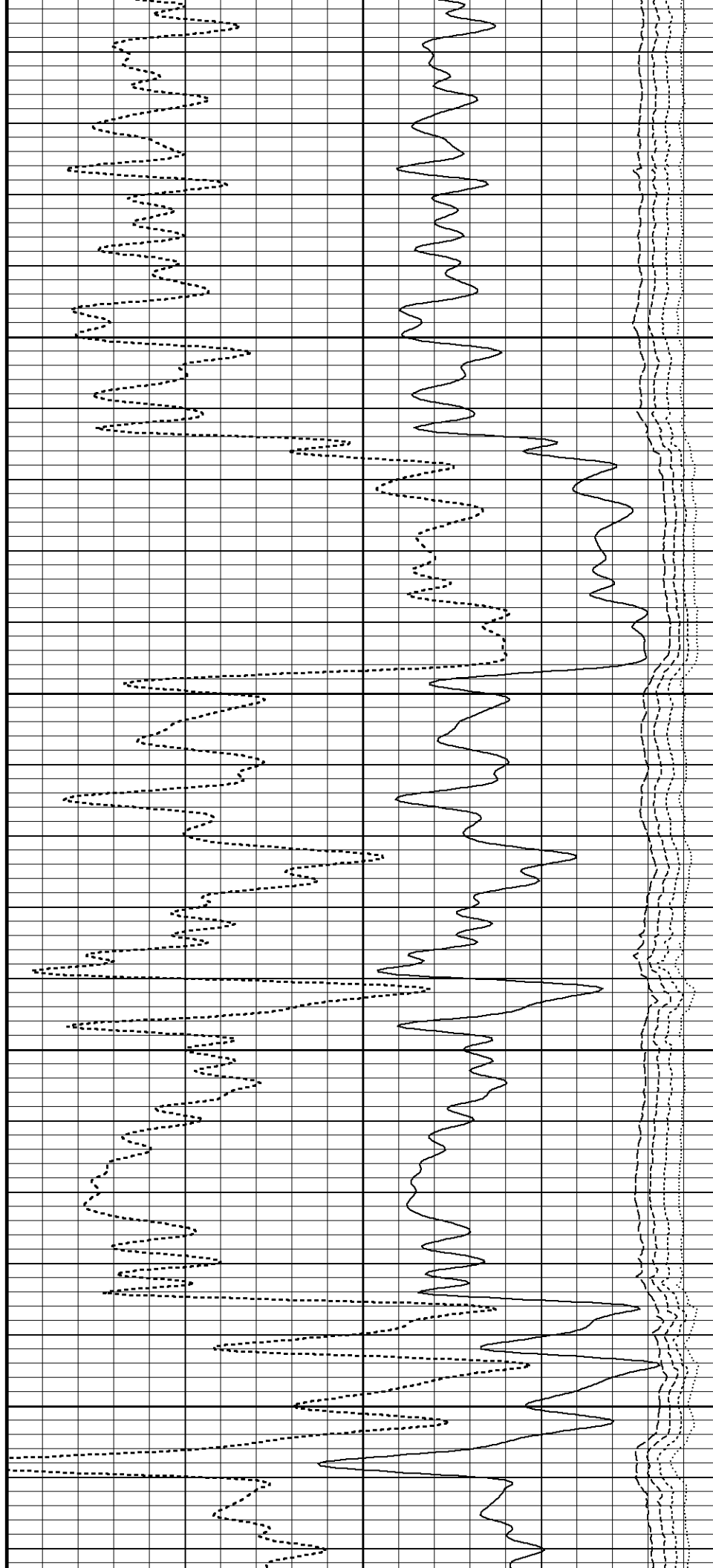
3000

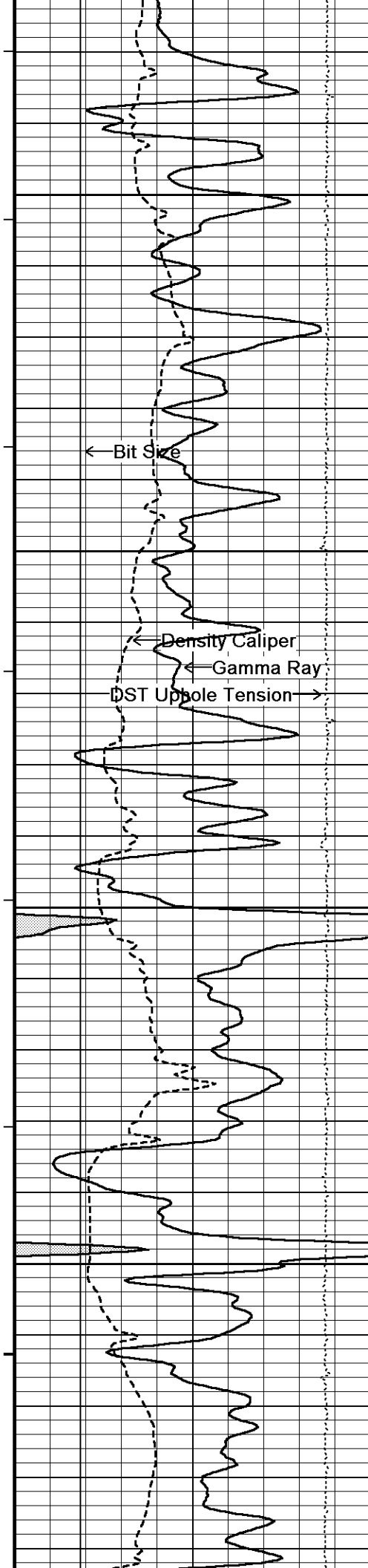
98°

3050

98°

3100





98°

3150

98°

3200

99°

3250

99°

3300

99°

Wyllie Lime. Sonic Por.

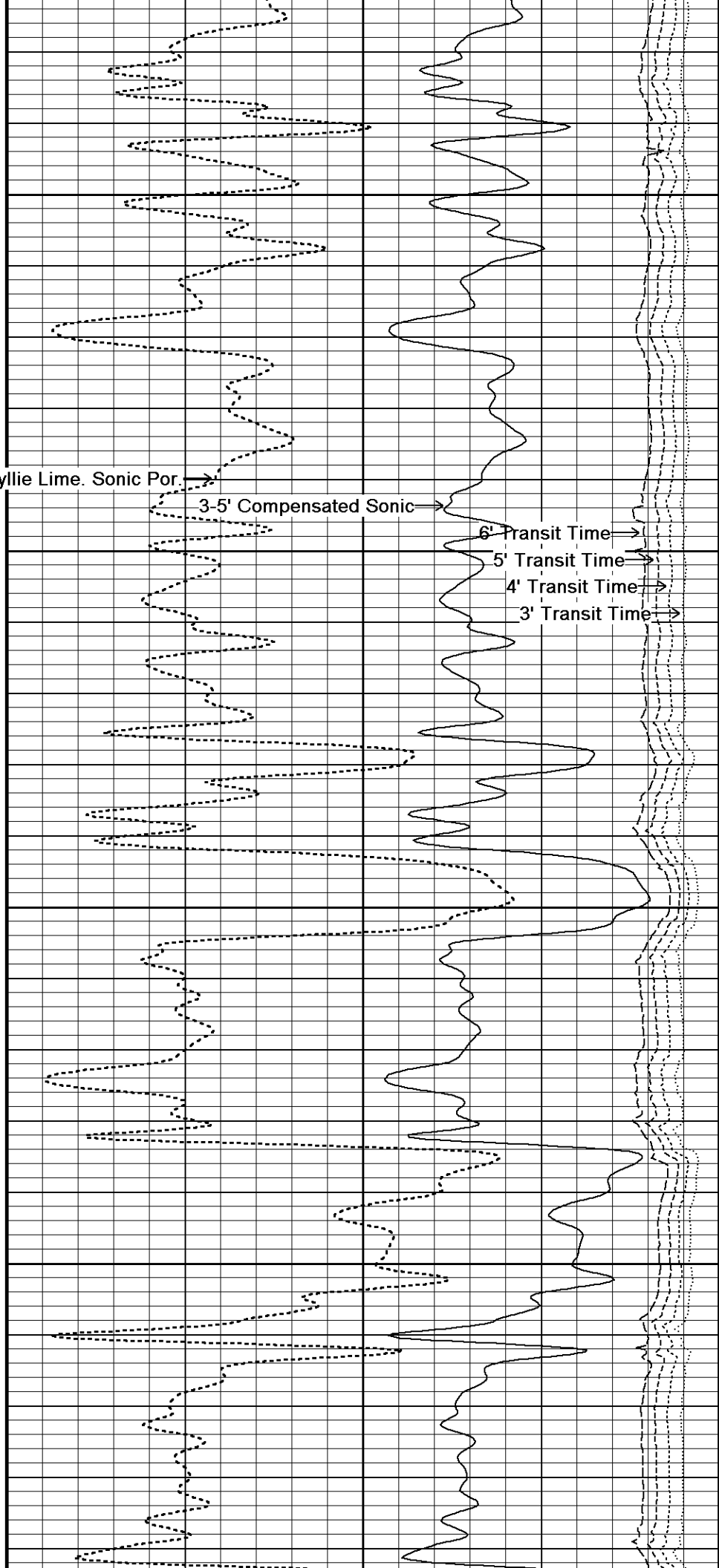
3-5' Compensated Sonic

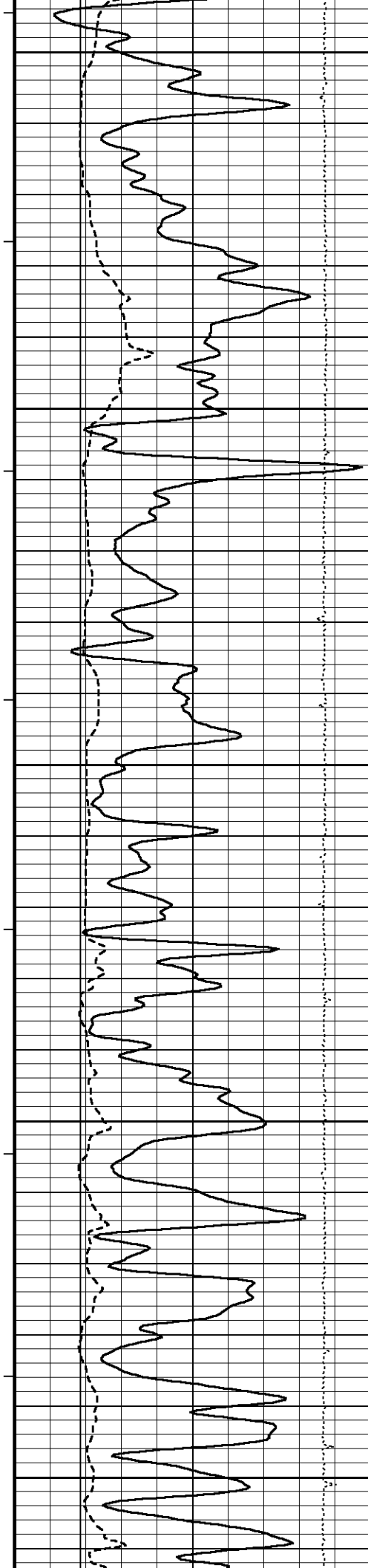
6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time





3350

99°

3400

100°

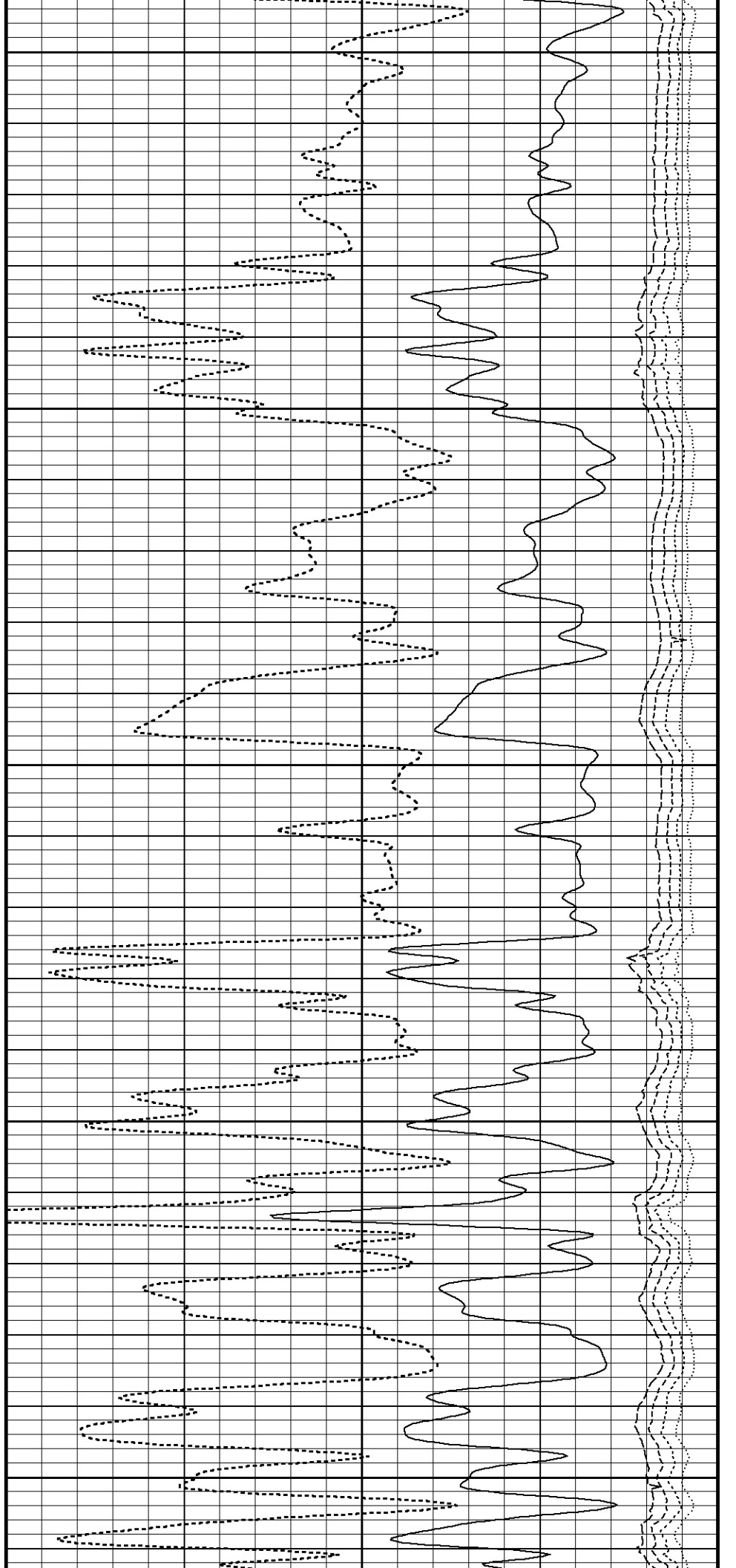
3450

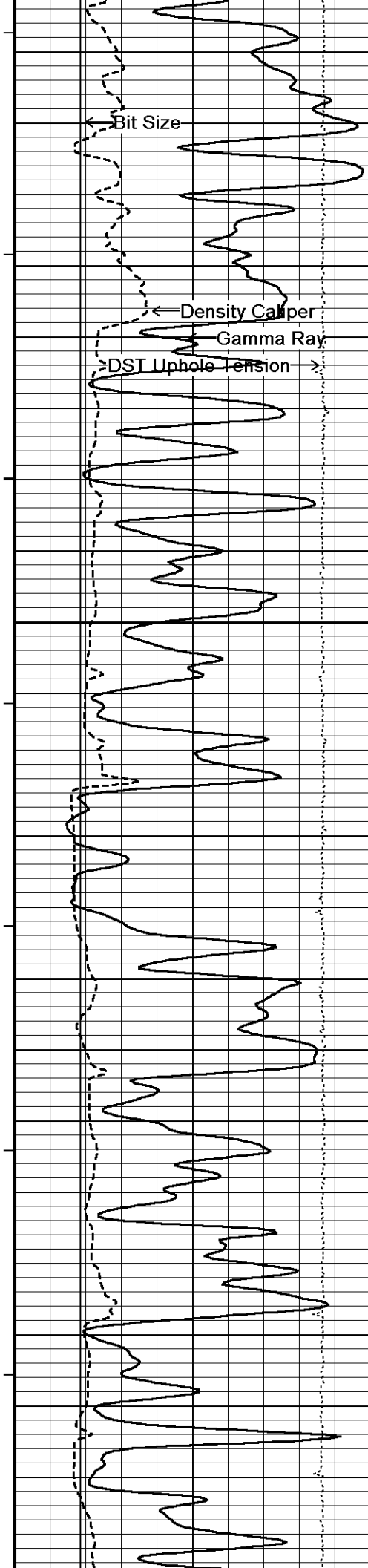
100°

3500

100°

3550





Wyllie Lime Sonic Por. →

101°

3600

101°

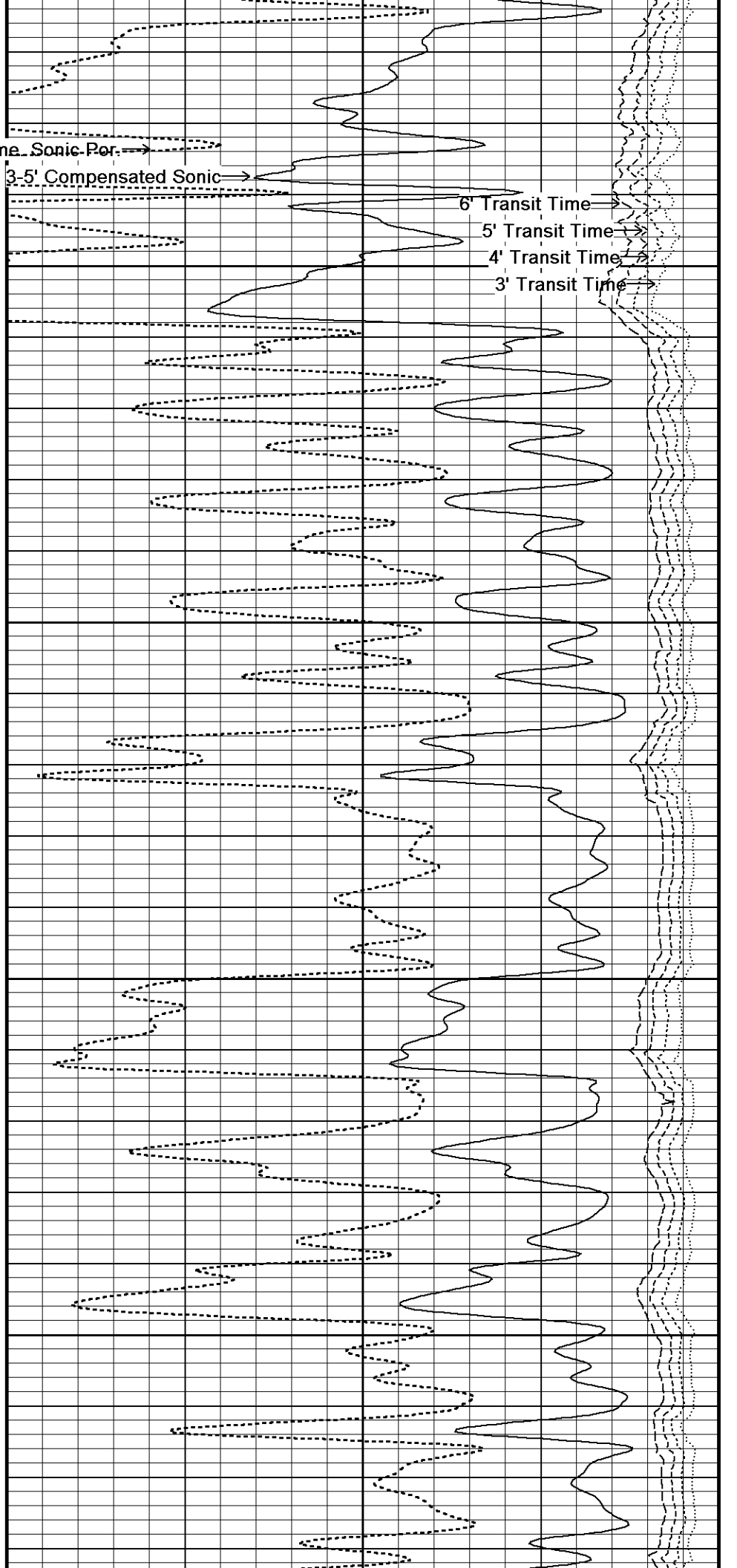
3650

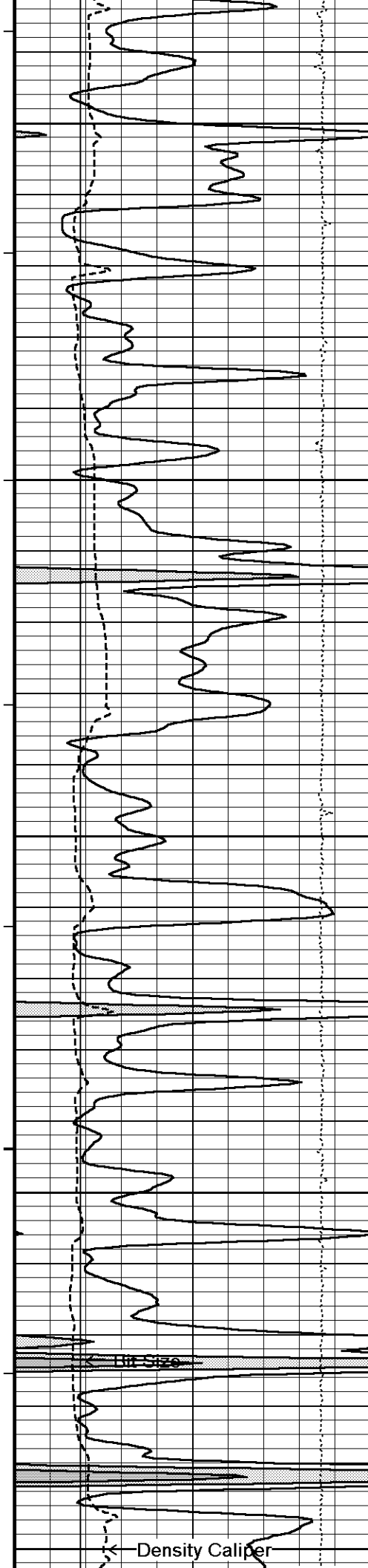
102°

3700

102°

3750





103°

3800

103°

3850

103°

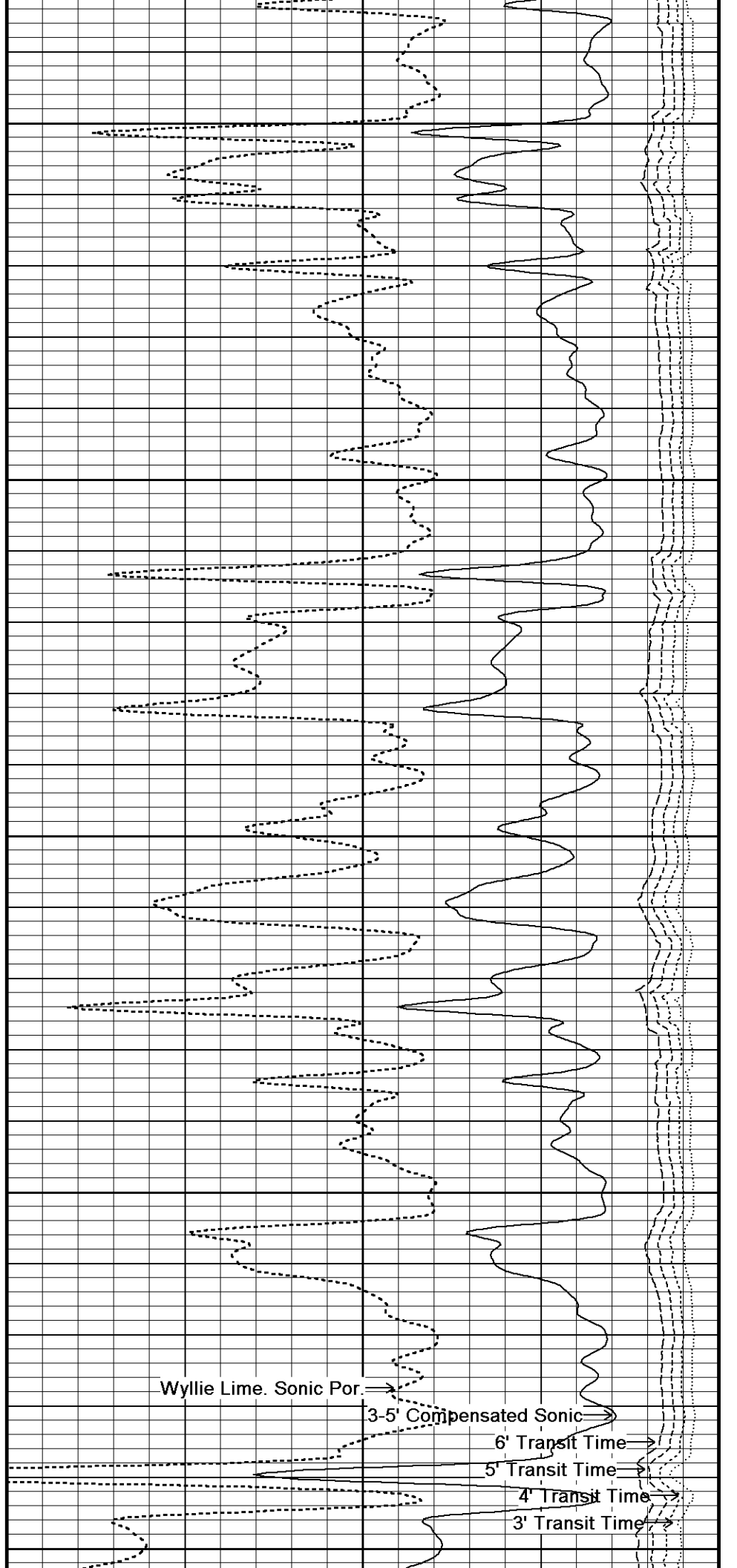
3900

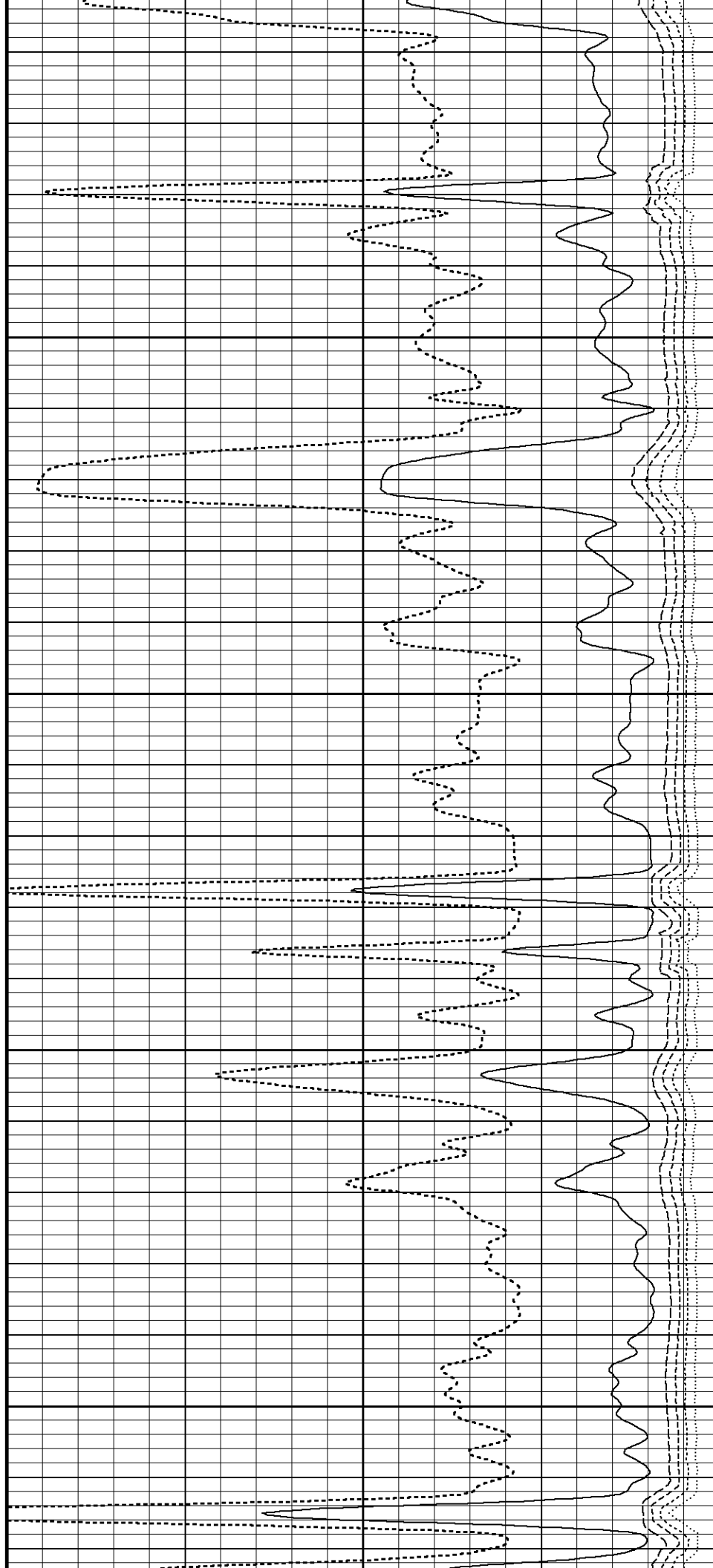
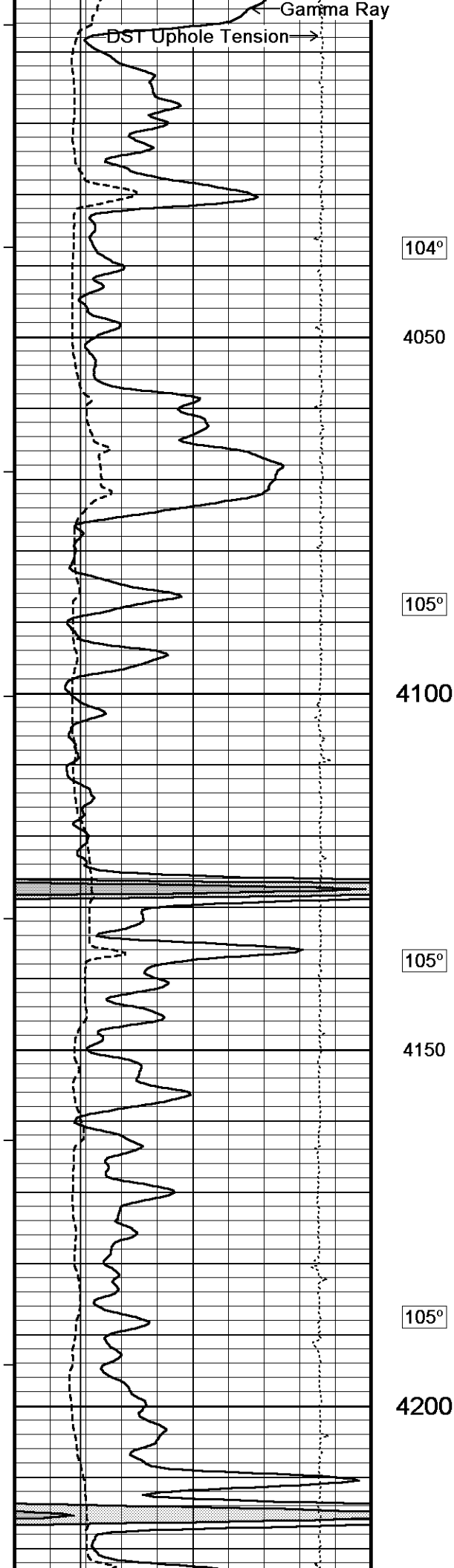
103°

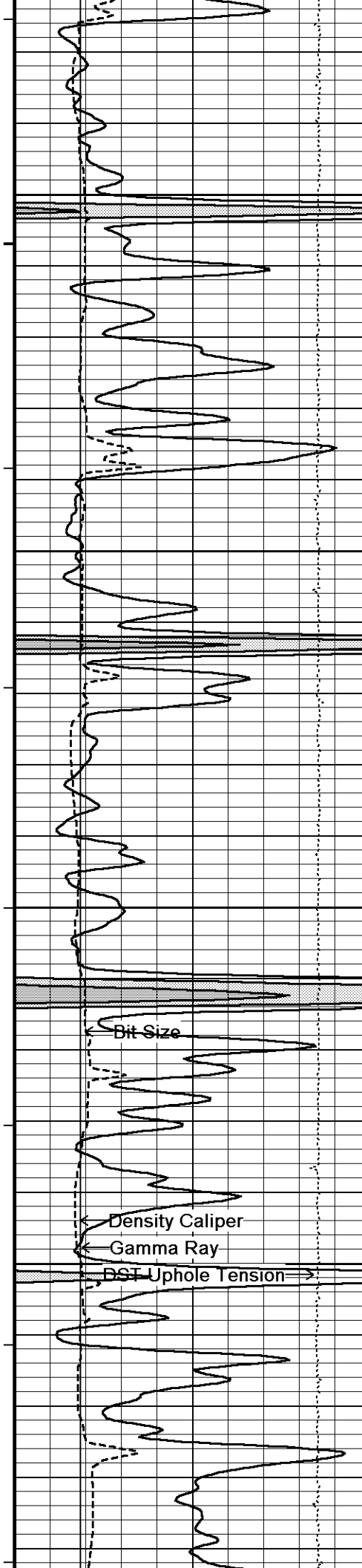
3950

104°

4000







106°

4250

106°

4300

107°

4350

107°

4400

108°

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

Wyllie Lime. Sonic Por.

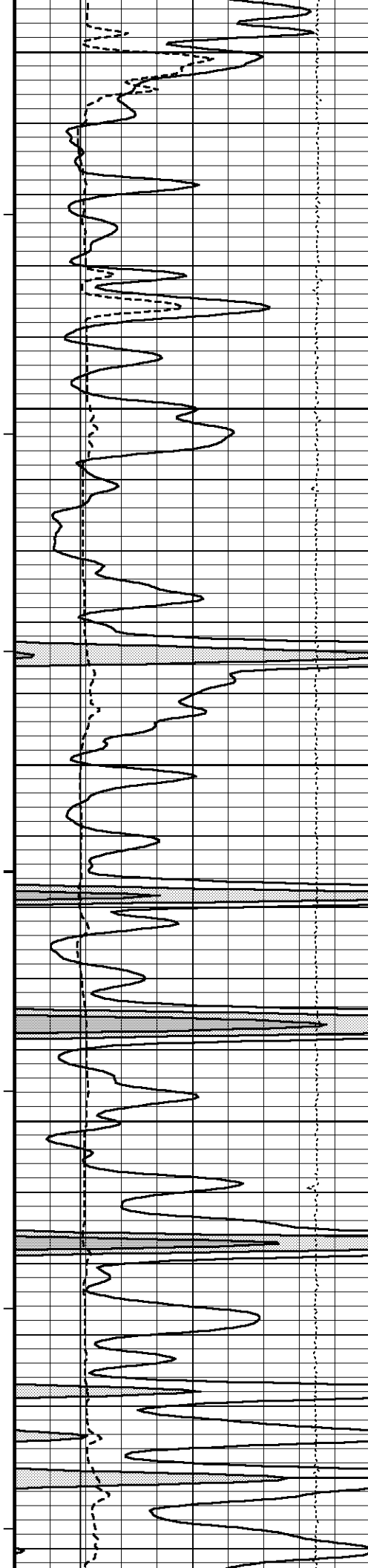
3.5' Compensated Sonic

6' Transit Time

5' Transit Time

4' Transit Time

3' Transit Time



4450

109°

4500

109°

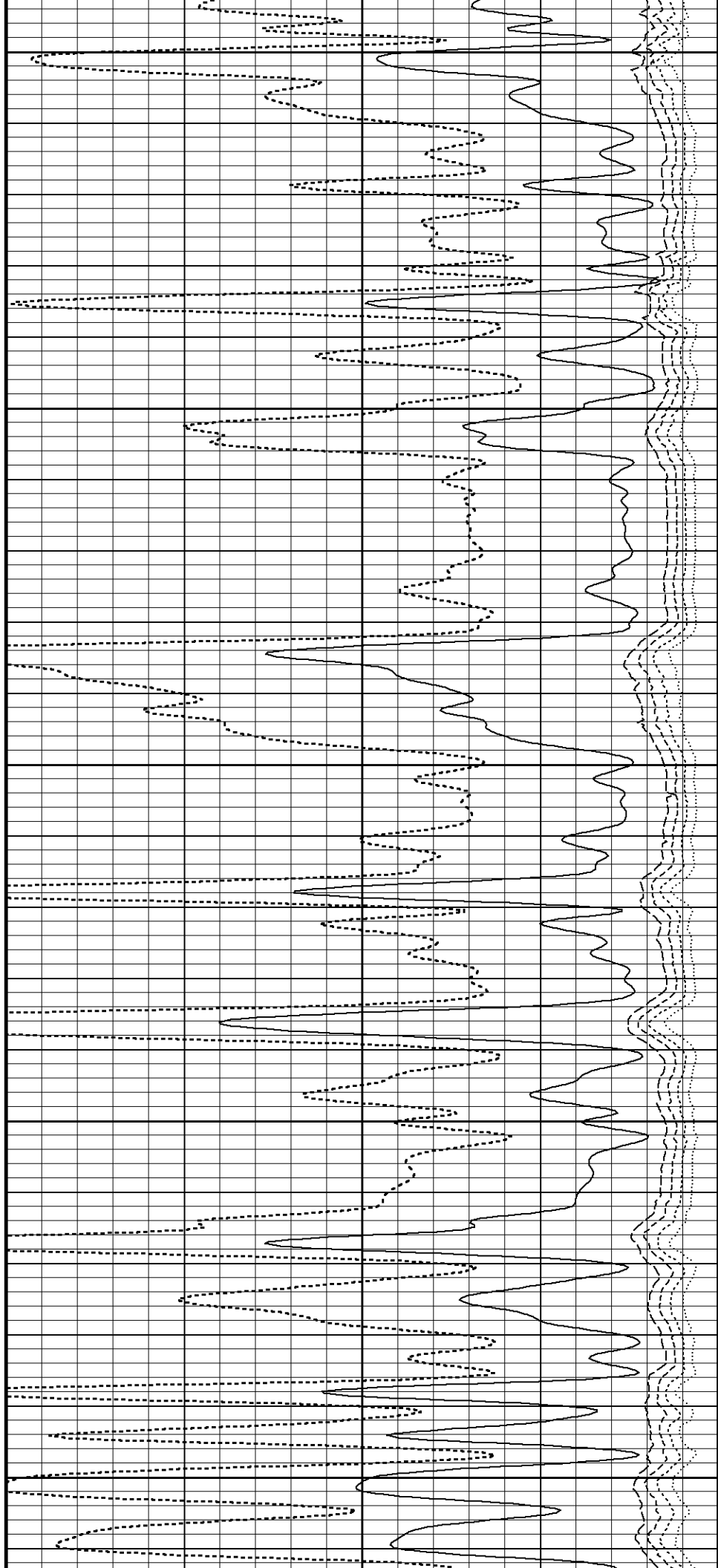
4550

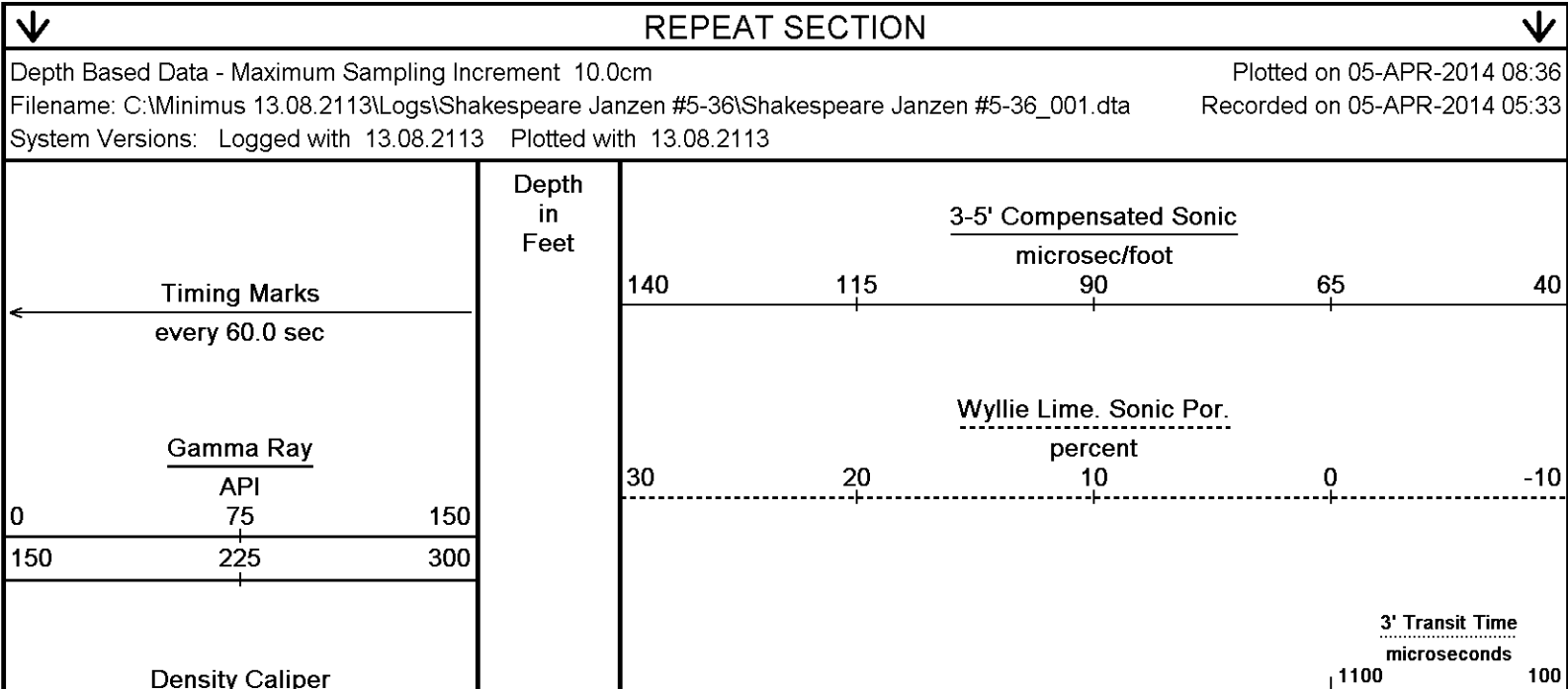
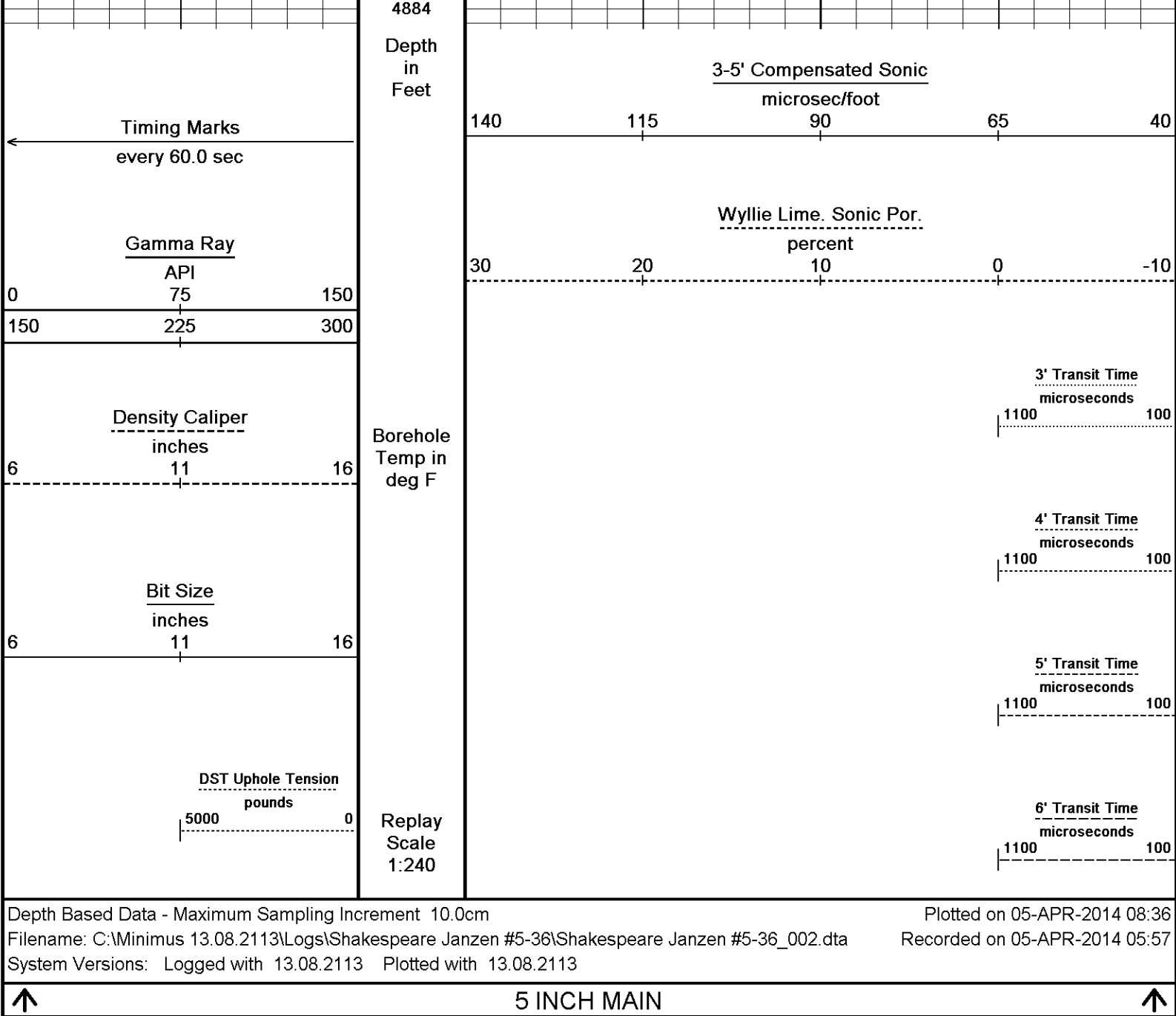
110°

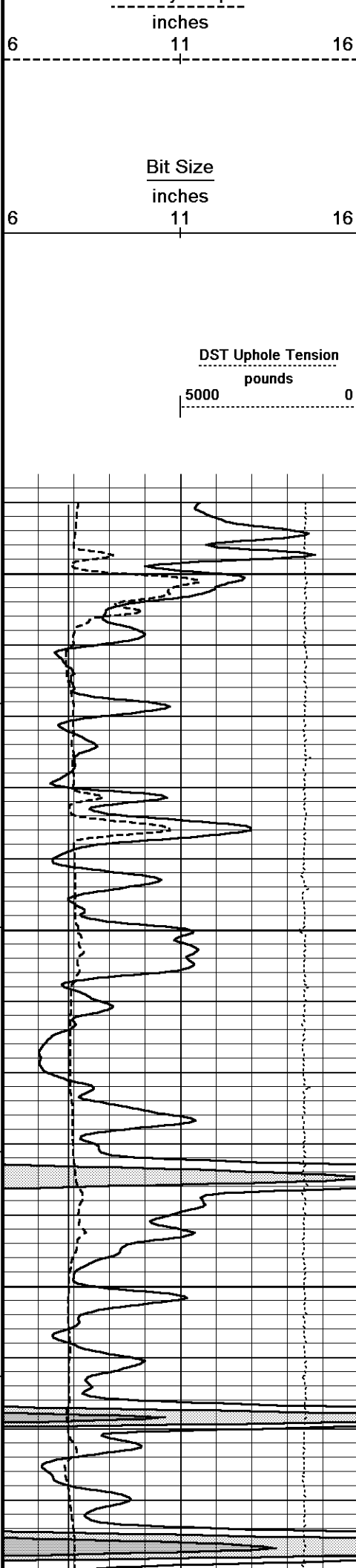
4600

110°

4650







Borehole
Temp in
deg F

Replay
Scale
1:240

4438

4450

108°

4500

109°

4550

109°

4' Transit Time
microseconds

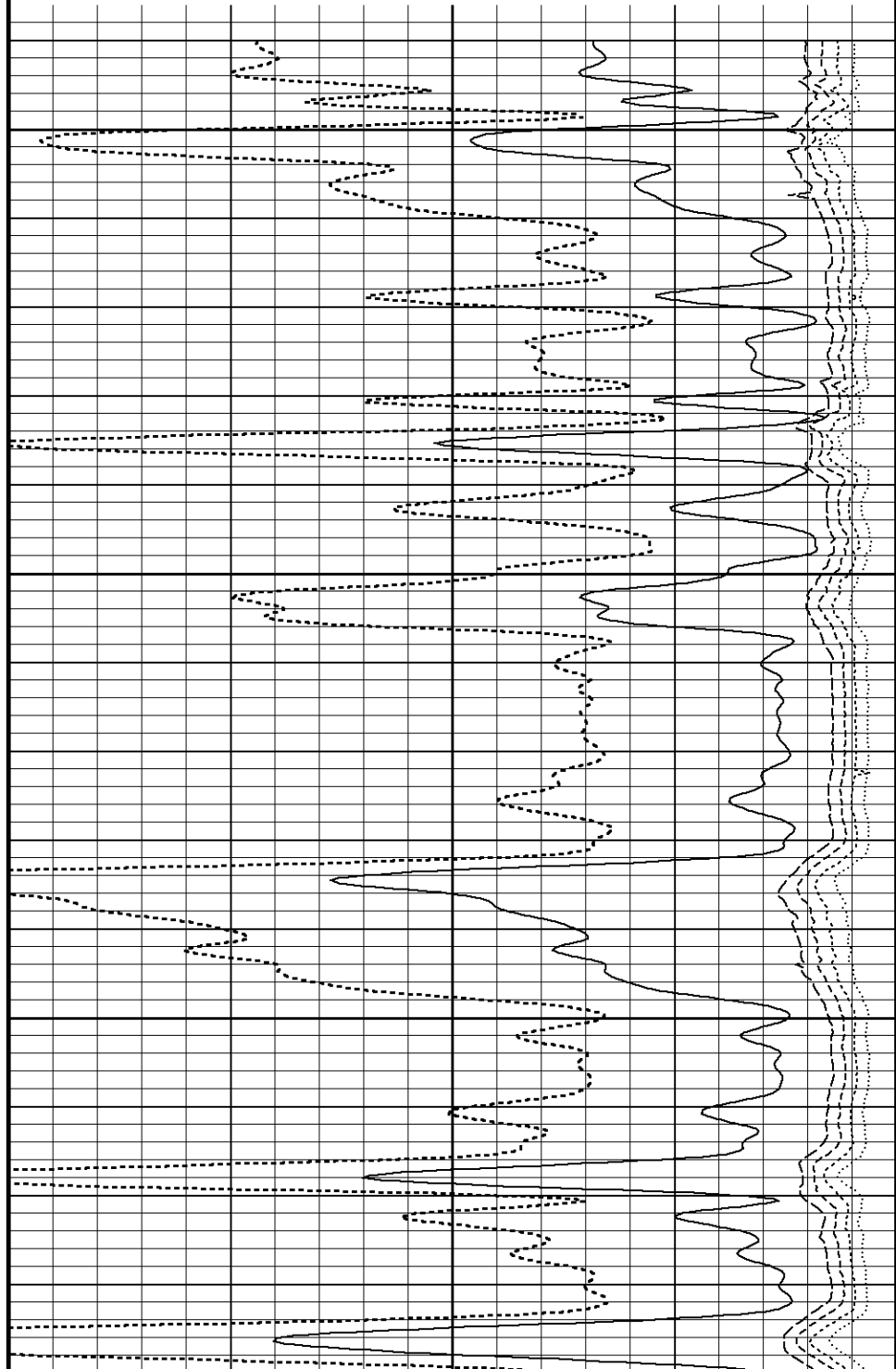
1100 100

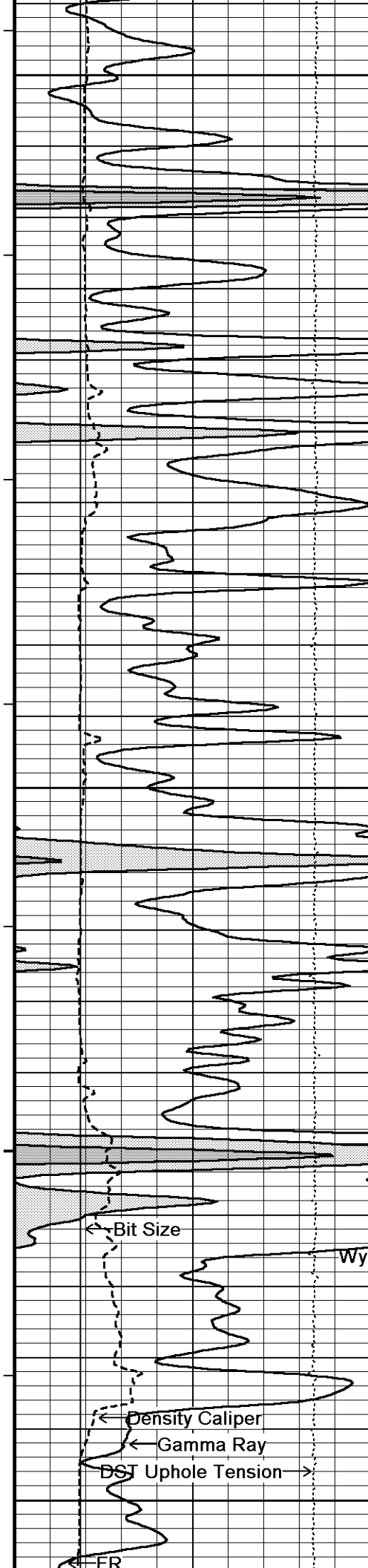
5' Transit Time
microseconds

1100 100

6' Transit Time
microseconds

1100 100





4600

110°

4650

110°

4700

109°

4750

Wyllie Lime. Sonic Por. →

3-5' Compensated Sonic →

6' Transit Time →

5' Transit Time →

4' Transit Time →

3' Transit Time →

108°

4800

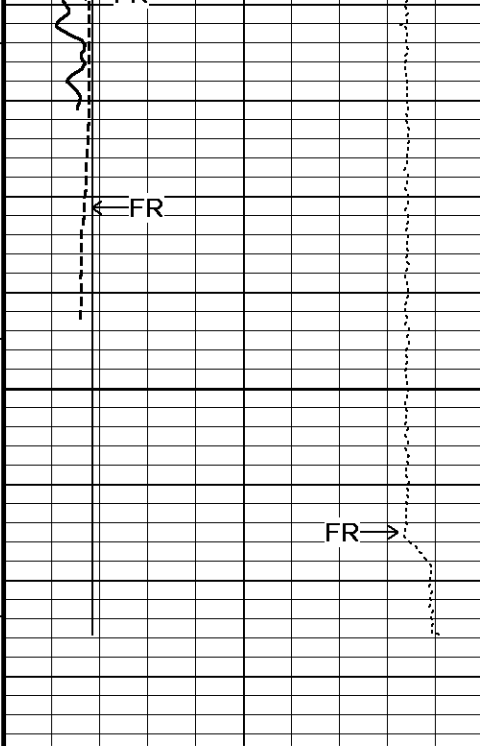
← Bit Size

← Density Caliper

← Gamma Ray

DST Uphole Tension →

← FR



4850

4884

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

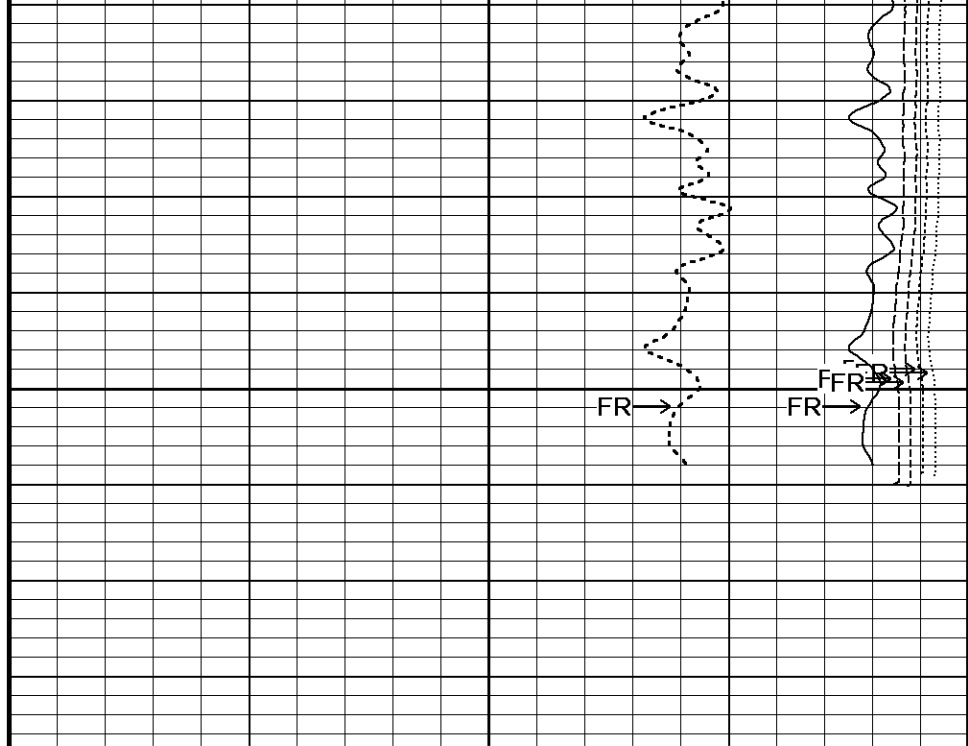
Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

DST Uphole Tension
pounds
5000 0

Borehole
Temp in
deg F

Replay
Scale
1:240



3-5' Compensated Sonic
microsec/foot

Wyllie Lime. Sonic Por.
percent

3' Transit Time
microseconds
1100 100

4' Transit Time
microseconds
1100 100

5' Transit Time
microseconds
1100 100

6' Transit Time
microseconds
1100 100

BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Logs\Shakespeare Janzen #5-36\Shakespeare Janzen #5-36_002.dta

General Constants All 000

Last Edited on 05-APR-2014,05:06

General Parameters

Mud Resistivity	0.380	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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density 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 18-MAR-2014 09:04

Reading No	Measured	Calibrated (lbs)
1	15374.81	0.00
2	15847.36	399.00

Gamma Calibration MCG-C 150

Field Calibration on 04-APR-2014 11:36

	Measured	Calibrated (API)
Background	70	48
Calibrator (Gross)	1142	773
Calibrator (Net)	1071	725

Gamma Constants MCG-C 150

Last Edited on 05-APR-2014,03:48

Gamma Calibrator Number	GRC038	
Mud Density	1.10	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MCG-C 150

Field Calibration on 10-MAR-2014 13:42

	Measured	Calibrated (mV)
Reference 1	99.9	99.0
Reference 2	-97.7	-98.8

High Resolution Temperature Calibration MCG-C 150

Field Calibration on 08-MAR-2014,10:59

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

High Resolution Temperature Constants MCG-C 150

Last Edited on 04-APR-2014,15:47

Pre-filter Length	11
-------------------	----

Caliper Calibration MMR-C.A 248

Base Calibration on 24-MAR-2014 11:12

Field Calibration on 01-APR-2014 09:23

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13253	5.96
2	16528	7.97
3	19726	9.95
4	23473	11.91
5	26720	13.88

5	0	0.00
6	N/A	N/A
Field Calibration	Measured Caliper (in) 8.00	Actual Caliper (in) 7.97
Micro Normal and Micro Inverse Calibration MMR-C.A 248		Base Calibration on 24-MAR-2014 11:03 Field Check on 01-APR-2014 09:24
Base Calibration		
Channel	Resistor 1	Measured Resistor 2 Calibrated (ohm-m) 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 21-JAN-2014 13:56 Field Check on 04-APR-2014 11:42
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	2848 86	3714 110
Ratio	32.942	33.764
Field Calibrator at Base		Calibrated (cps)
		1737 2564
Ratio		0.677
Field Check		Calibrated (cps)
		1718 2552
Ratio		0.674
Neutron Constants MDN-B.J 387		Last Edited on 05-APR-2014,03:48
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	
FE Calibration MFE-A.A 55		Base Calibration on 24-MAR-2014 10:21 Field Check on 04-APR-2014 11:19
Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	951.2	126.8
Base Check		281.7
Field Check		281.6

FE Constants MFE-A.A 55			Last Edited on 05-APR-2014,03:48		
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-A.A 73			Last Edited on 05-APR-2014,03:47		
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		
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		

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	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	13.7	3863.6	13.6	3863.5
2	31.5	3592.9	31.4	3592.8
3	29.7	2973.4	29.7	2973.5
4	20.8	2127.8	20.8	2127.8
Deep	18.3	1913.7	18.4	1913.7
Medium	43.0	3863.9	43.0	3864.1
Shallow	46.8	5375.4	46.7	5375.3

Array Temperature 47.7 47.5 Deg F

Induction Constants MAI-A.A 5

Last Edited on 05-APR-2014,03:47

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	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 04-APR-2014,15:47

Pre-filter Length

Caliper Calibration MPD-D.A 480

Base Calibration on 02-APR-2014 14:28
Field Calibration on 02-APR-2014 14:29

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17565	3.99
2	27501	5.98
3	37544	7.97
4	47406	9.86
5	58484	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.94	7.97

Photo Density Calibration MPD-D.A 480

Base Calibration on 02-APR-2014 14:48
Field Check on 02-APR-2014 14:55

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1280	1474		
Reference 1	56490	26296	59556	30836
Reference 2	23070	2655	24941	2541

Field Check at Base

1280.1 1473.9

Field Check

1276.2 1470.6

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	244	1141		
Reference 1	23700	56281	0.425	0.371
Reference 2	6865	22924	0.304	0.272

Field Check at Base

243.9 1141.4

Field Check

239.9 1140.2

Density Constants MPD-D.A 480

Last Edited on 04-APR-2014,15:46

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	1.10 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

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 150 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

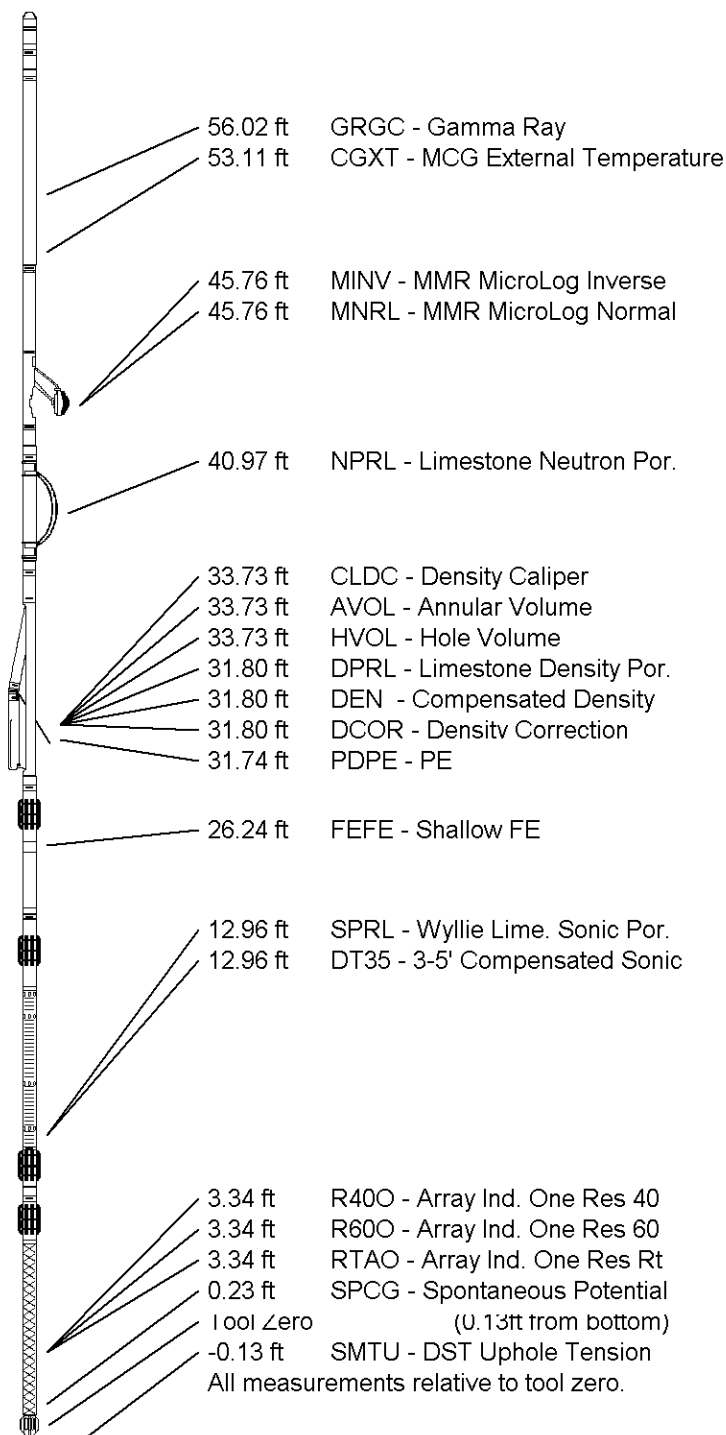
Compact Density/Caliper
MPD-D.A 480 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 73 LG: 12.52 ft WT: 72.8 lb OD: 2.240 in

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

Total Length: 63.70 ft Weight: 480.6 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	JANZEN #5-36
FIELD	CAPSTONE EAST
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3114.00	feet	First Reading	4852.00	feet
Elevation Drill Floor	3112.00	feet	Depth Driller	4866.00	feet
Elevation Ground Level	3104.00	feet	Depth Logger	4865.00	feet



COMPENSATED SONIC

WITH INTEGRATED TRANSIT TIME

Weatherford®

WITH INTEGRATED TRANSIT TIME