

HALLIBURTON

BORE HOLE COMPENSATED SONIC LOG

HALLIBURTON										BORE HOLE COMPENSATED SONIC LOG					
COMPANY					OXY USA INC										
WELL					EDWARDS B-1										
FIELD					BIG BOW WEST										
COUNTY					STANTON										
STATE					KANSAS										
Permanent Datum					GL	Elev. 3197.0 ft					Elev.: K.B. 3208.0 ft				
Log measured from					KB	11.0 ft above perm. Datum					D.F. 3208.0 ft				
Drilling measured from					KB						G.L. 3197.0 ft				
Date					13-Apr-13										
Run No.					ONE										
Depth - Driller					6000.00 ft										
Depth - Logger					5966.0 ft										
Bottom - Logged Interval					5966 ft										
Top - Logged Interval					1797 ft										
Casing - Driller					8.625 in @ 1798.0 ft					@					
Casing - Logger					1797.0 ft										
Bit Size					7.875 in					@					
Type Fluid in Hole					WATER BASED										
Density					Viscosity		9.2 ppg		45.00 s/qt						
PH					Fluid Loss		10.70 pH		9.6 cp/m						
Source of Sample					FLOW LINE										
Rm @ Meas. Temperature					1.140 ohmm @ 85.00 degF					@					
Rmf @ Meas. Temperature					0.96 ohmm @ 70.00 degF					@					
Rmc @ Meas. Temperature					1.420 ohmm @ 70.00 degF					@					
Source Rmf					Rmc		MEASURED		MEASURED						
Rm @ BHT					0.80 ohmm @ 124.0 degF					@					
Time Since Circulation					8.0 hr										
Time on Bottom					13-Apr-13 18:11										
Max. Rec. Temperature					124.0 degF @ 5966.0 ft					@					
Equipment					Location		10549592		PVOK						
Recorded By					JEREMY COTHREN										
Witnessed By					ROBERT WEBSTER										

Fold here

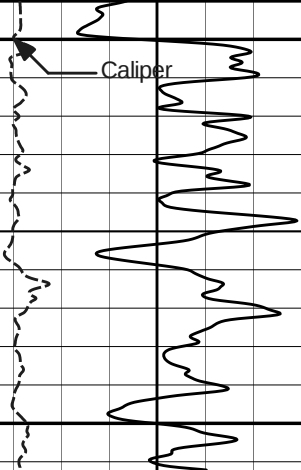
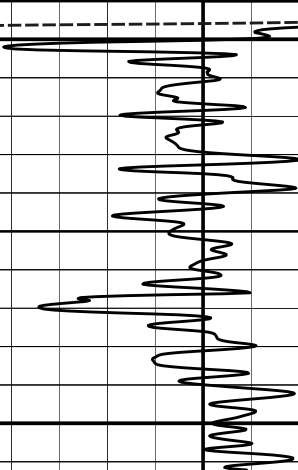
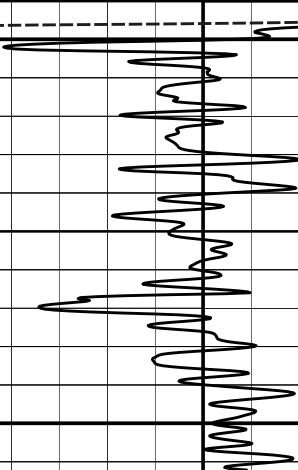
Service Ticket No.: 900357203						API Serial No.: 15187212220000						PGM Version: WL INSITE R3.6.0 (Build 3)					
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE								RESISTIVITY SCALE CHANGES									
Date	Sample No.					Type Log	Depth	Scale Up Hole		Scale Down Hole							
Depth-Driller																	
Type Fluid in Hole																	
Density	Viscosity																
Ph	Fluid Loss																
Source of Sample						RESISTIVITY EQUIPMENT DATA											
Rm @ Meas. Temp		@		@		Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other							
Rmf @ Meas. Temp.		@		@													
Rmc @ Meas. Temp.		@		@													
Source Rmf	Rmc																
Rm @ BHT		@		@													
Rmf @ BHT		@		@													
Rmc @ BHT		@		@													
EQUIPMENT DATA																	
GAMMA				ACOUSTIC				DENSITY				NEUTRON					
Run No.	ONE			Run No.	ONE			Run No.				Run No.					
Serial No.	113			Serial No.	050			Serial No.				Serial No.					
Model No.	GTET			Model No.	BSAT			Model No.				Model No.					
Diameter	3.625"			No. of Cent.	2			Diameter				Diameter					
Detector Model No.	A-102			Spacing	4			Log Type				Log Type					
Type	SCINT.							Source Type				Source Type					
Length	8"			LSA [Y/N]	N			Serial No.				Serial No.					
Distance to Source	10'			FWDA [Y/N]	N			Strength				Strength					

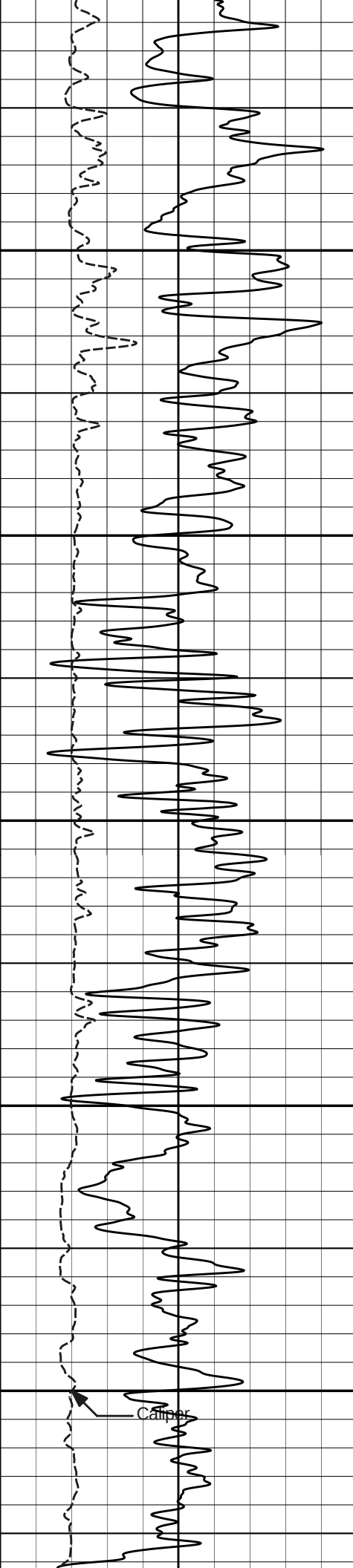
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HALLIBURTON

Plot Time: 13-Apr-13 23:43:03
Plot Range: 1790 ft to 5942.5 ft
Data: {ActiveWell}\Well Based\DAQ-0001-003\
Plot File: \\BSAT11_BSAT_2inx

2 INCH MAIN LOG

		140	Delta-T		40	
		microsec per ft				
6	Caliper	16	30	Acou Porosity		-10
inches		percent				
0	Gamma API	150	1 : 600		ITTT	
api		ft				
		1800				
Caliper 		1900				
						
						
						



2000

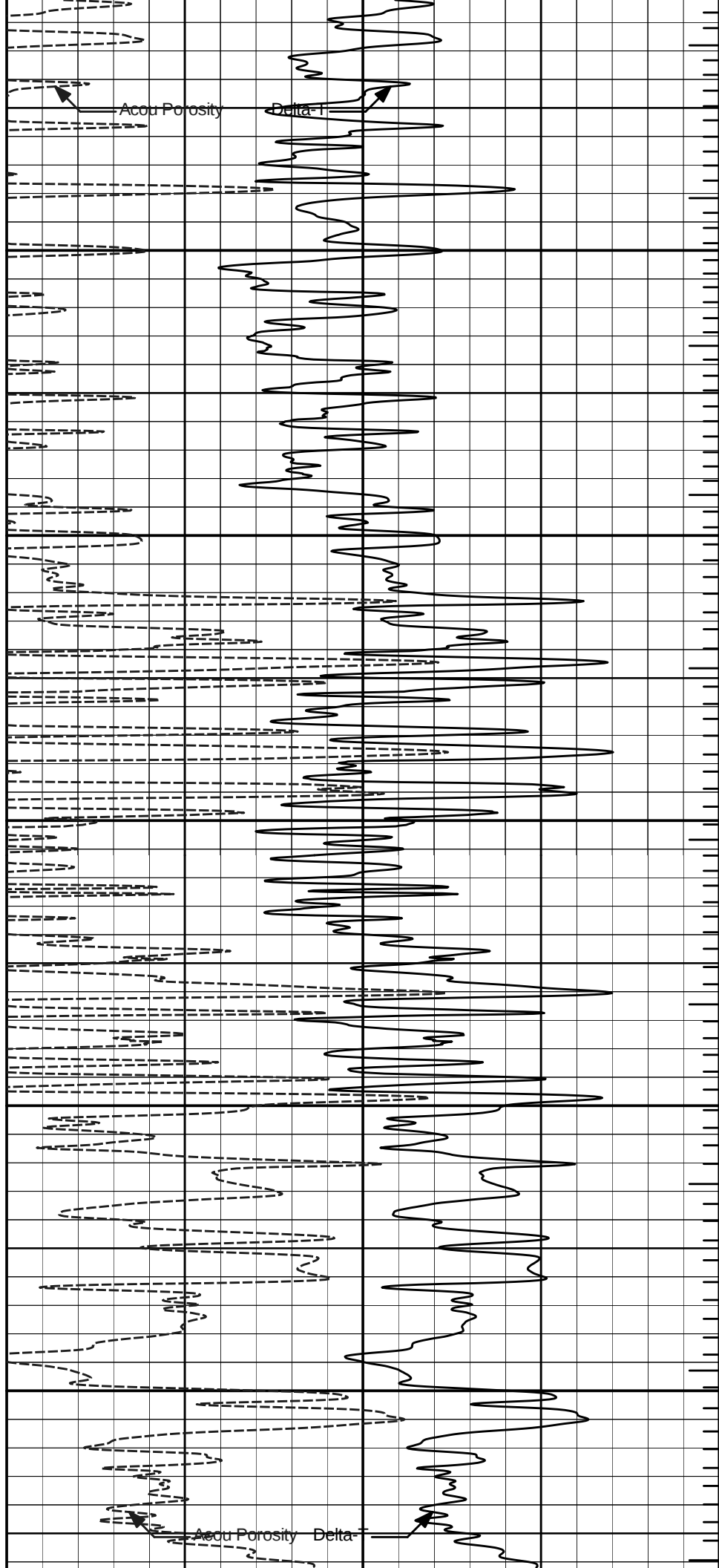
2100

2200

2300

2400

Caliper

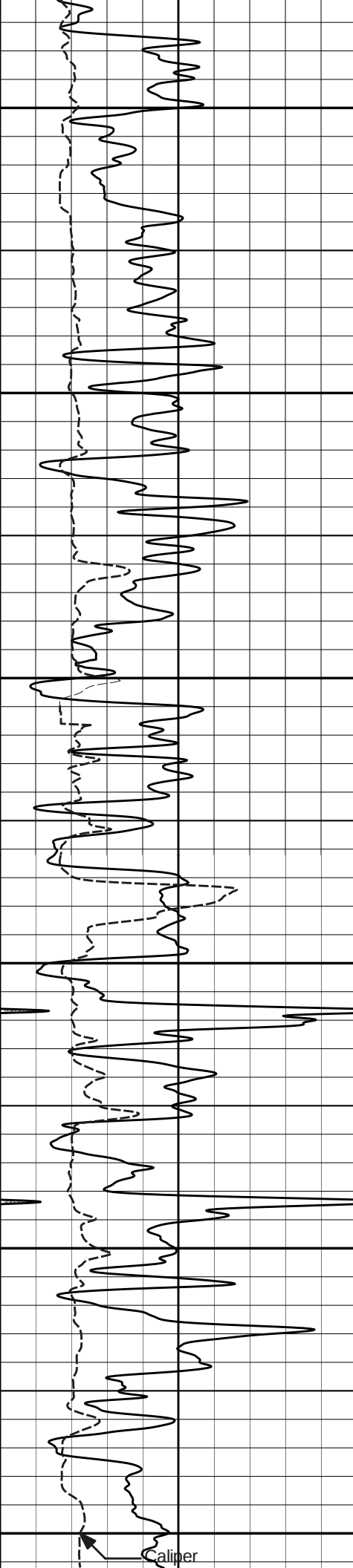


Acou Porosity

Delta-T

Acou Porosity

Delta-T



2500

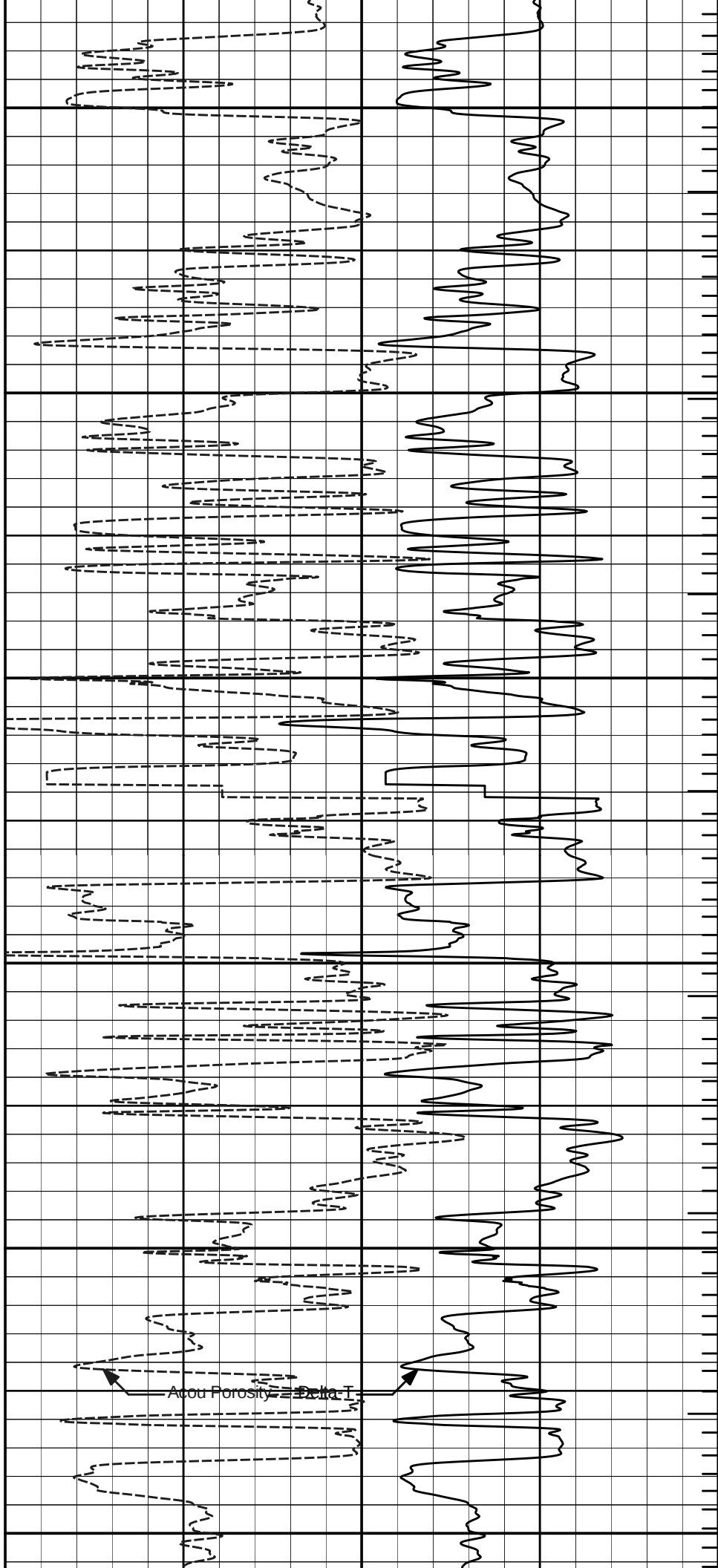
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2700

2800

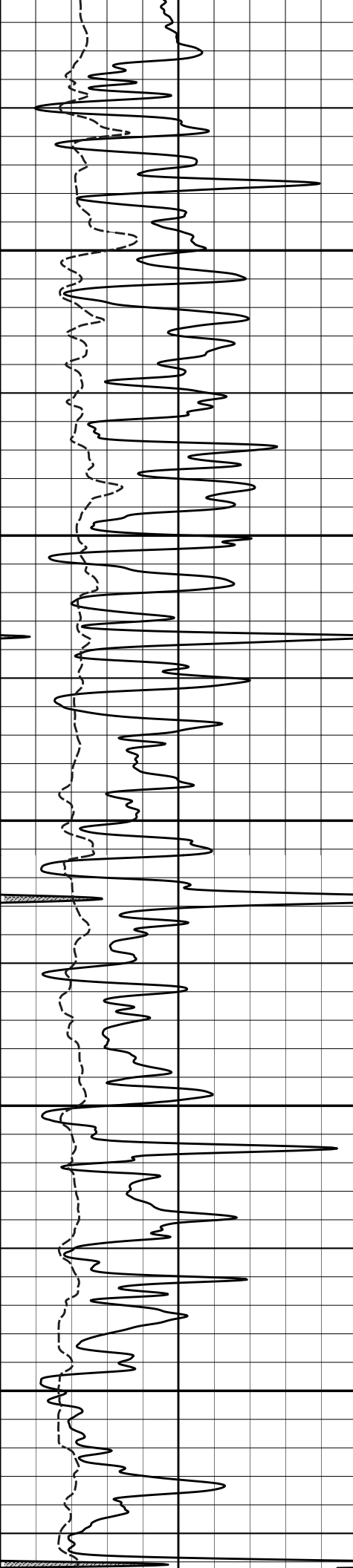
2900

3000



Acou Porosity = Delta T

Caliper



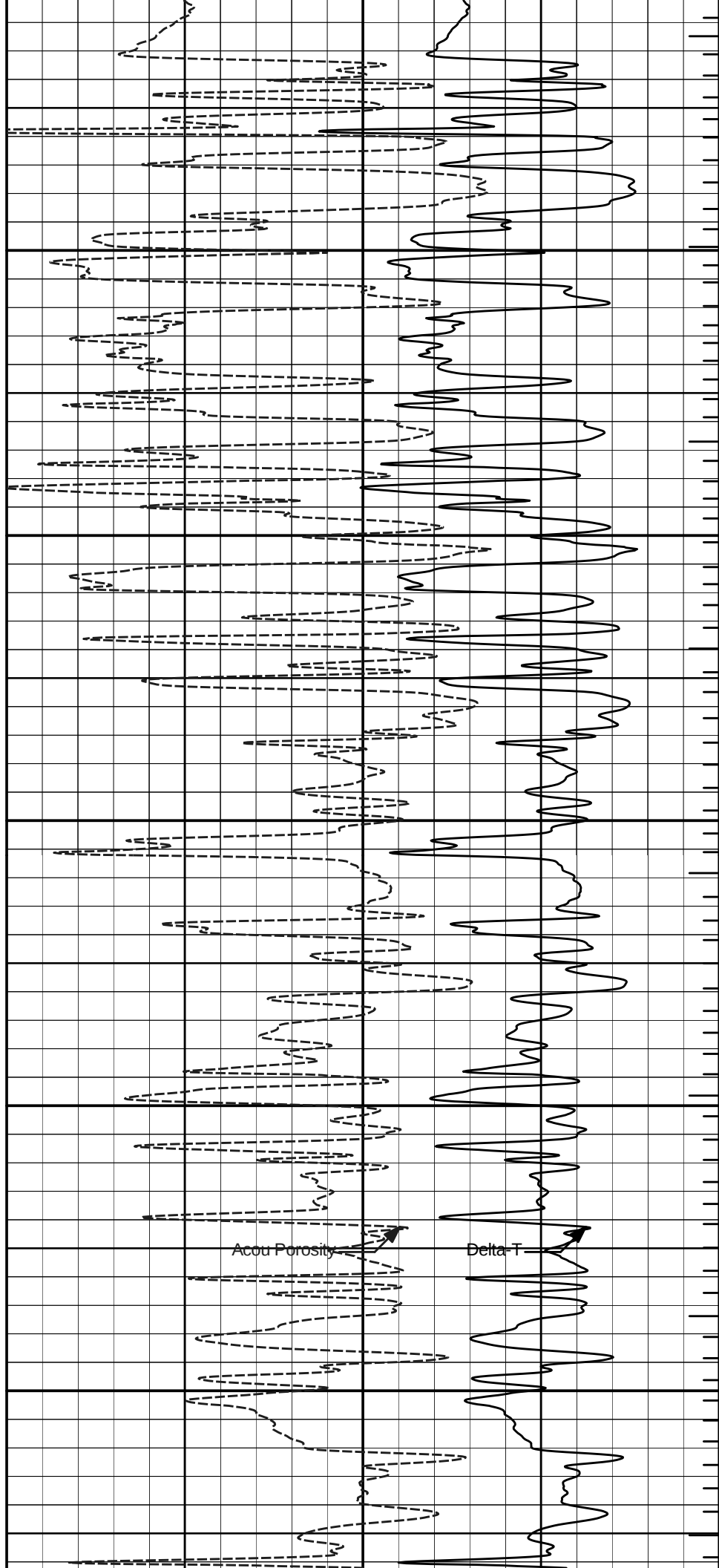
3100

3200

3300

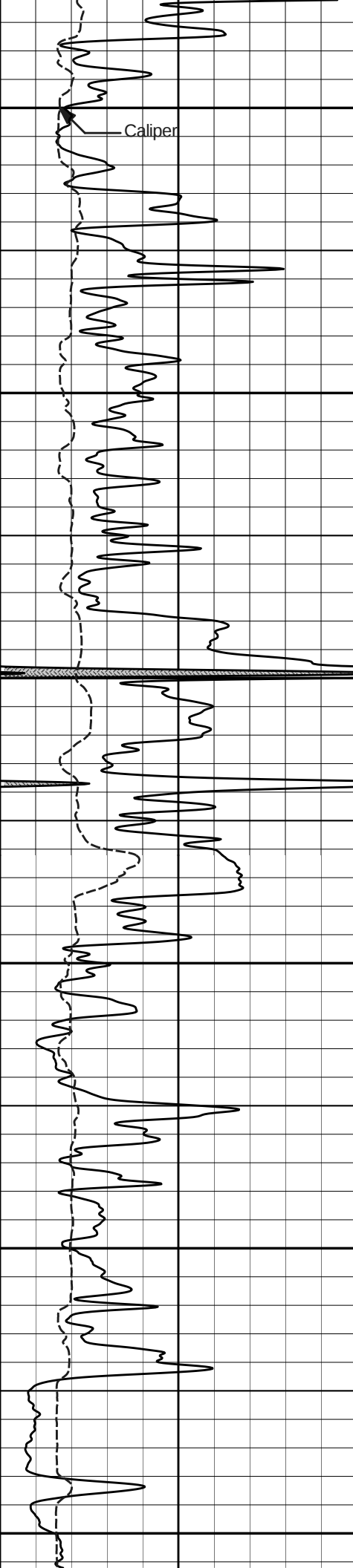
3400

3500



Acoustic Porosity

Delta-T



3600

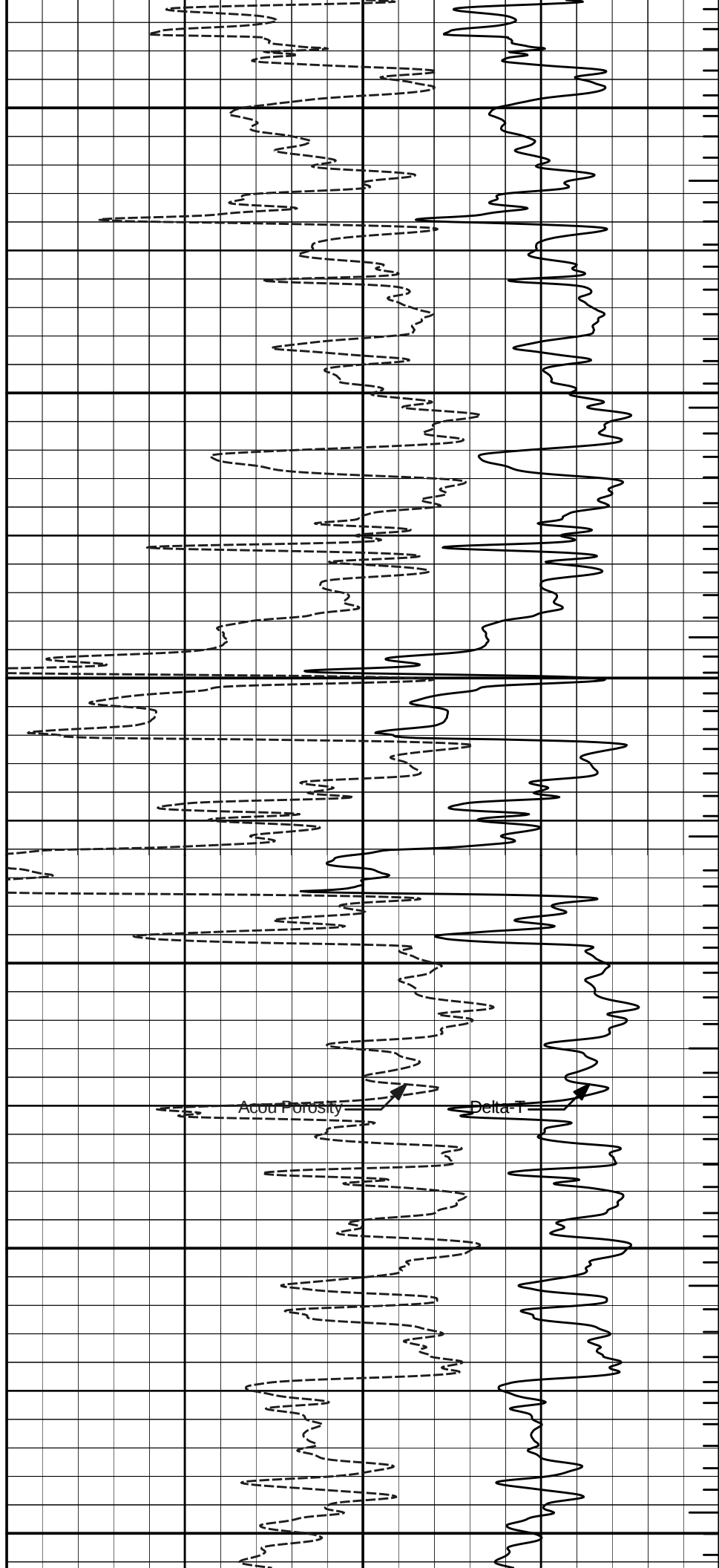
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3800

3900

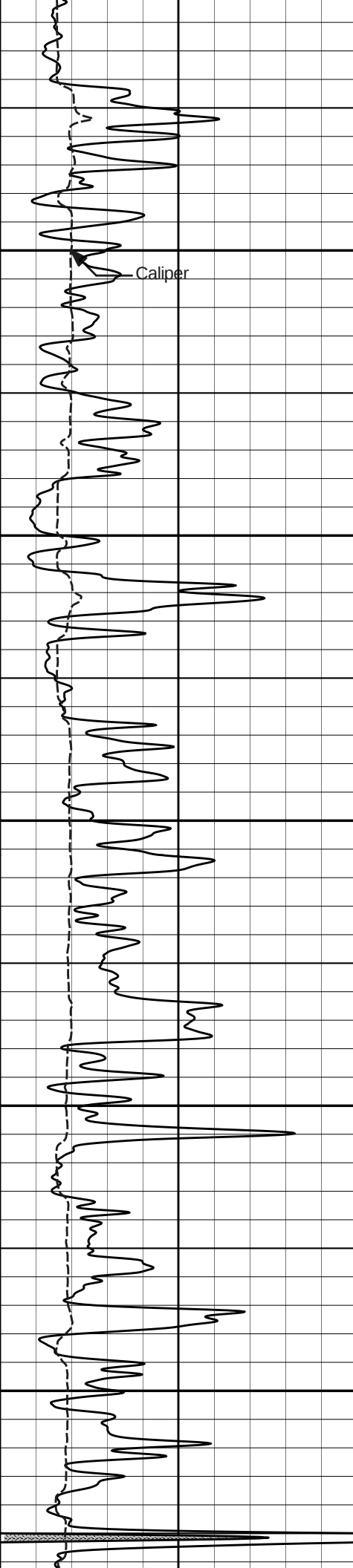
4000

4100



Acoustic Porosity

Delta-T



Caliper

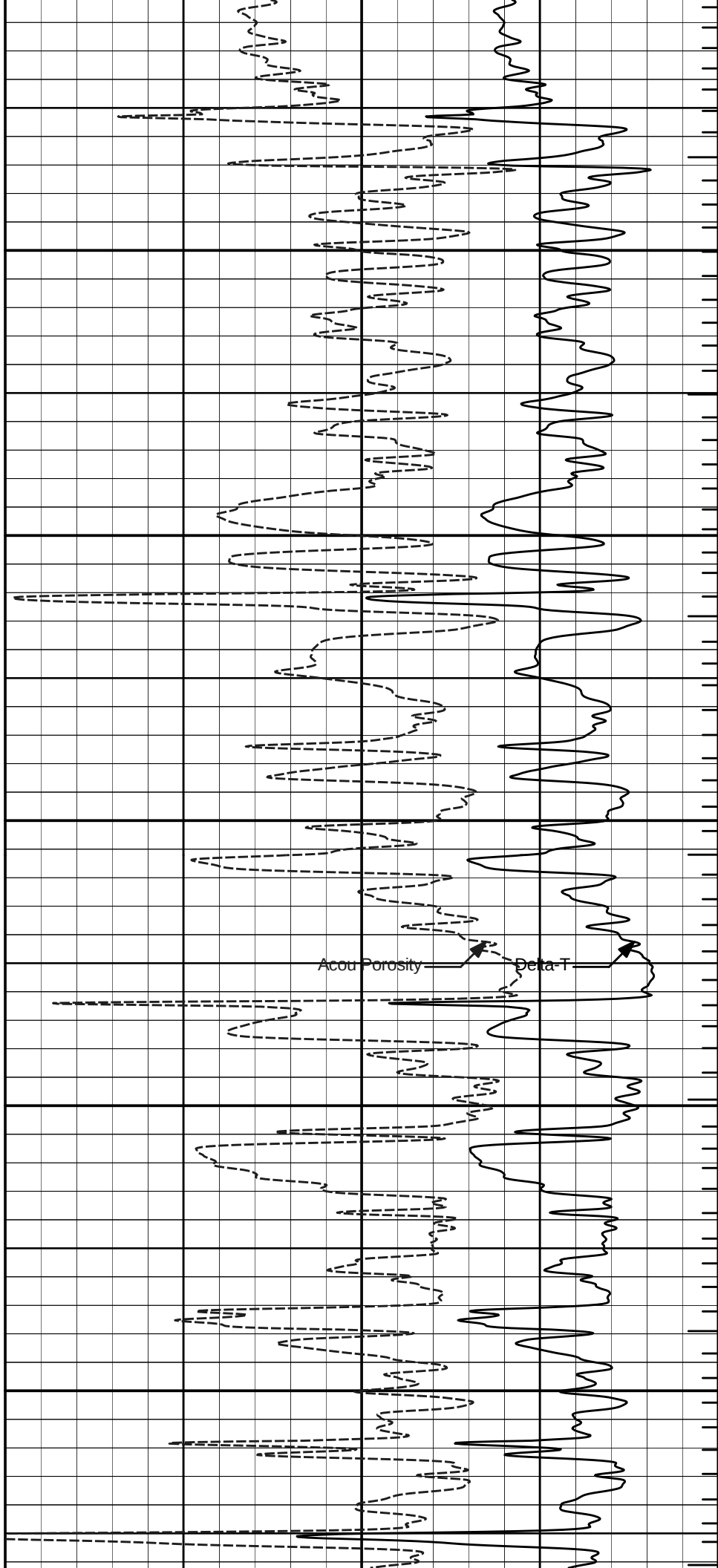
4200

4300

4400

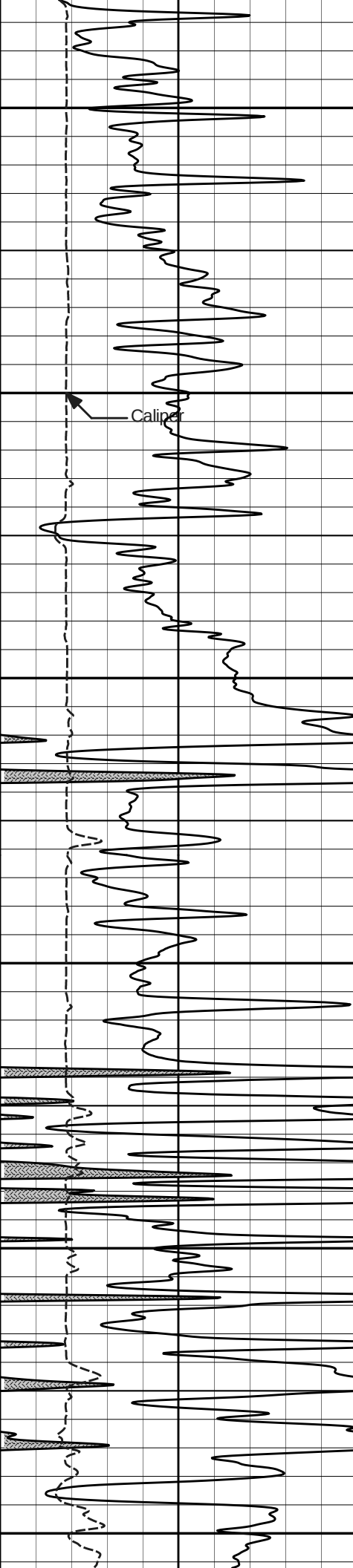
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4600



Acoustic Porosity

Delta-T



4700

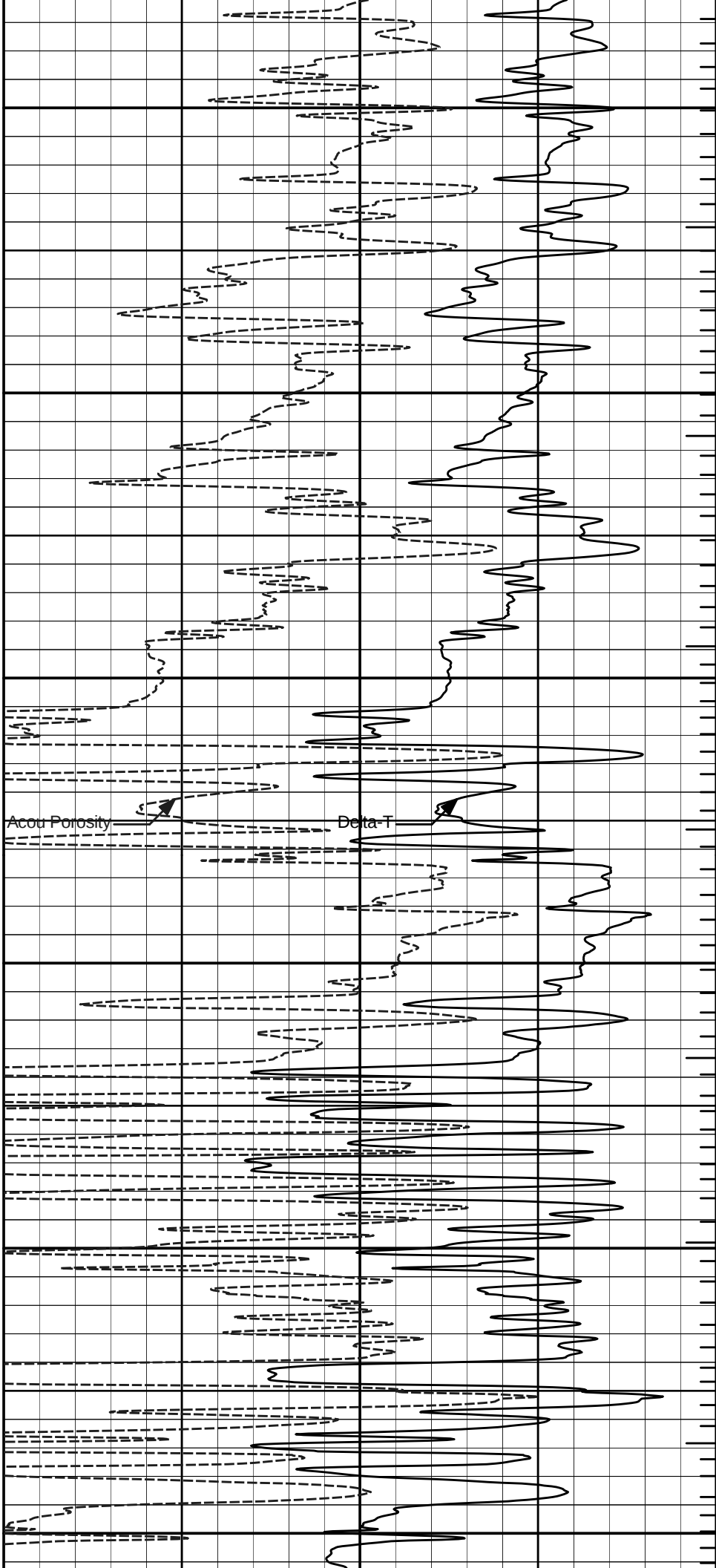
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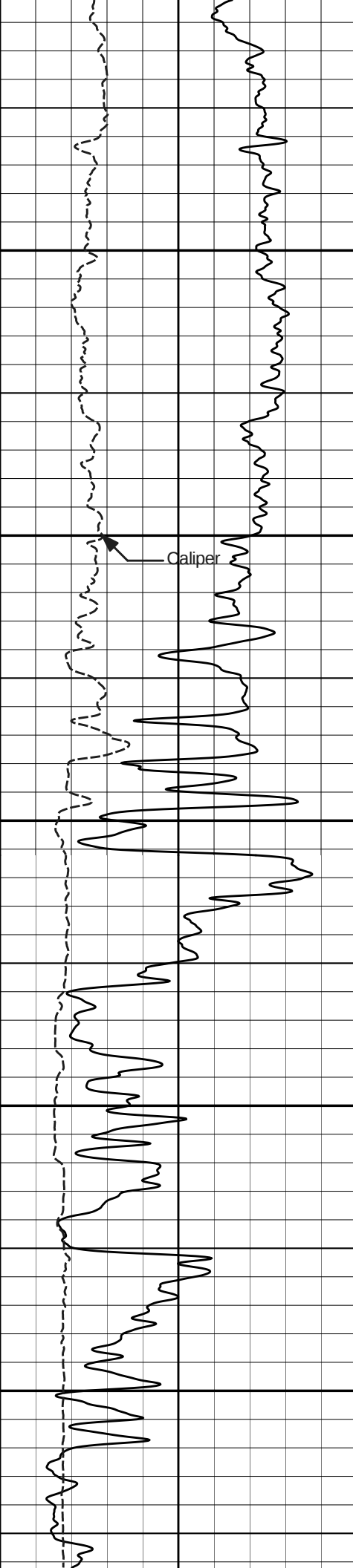
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5000

5100

5200





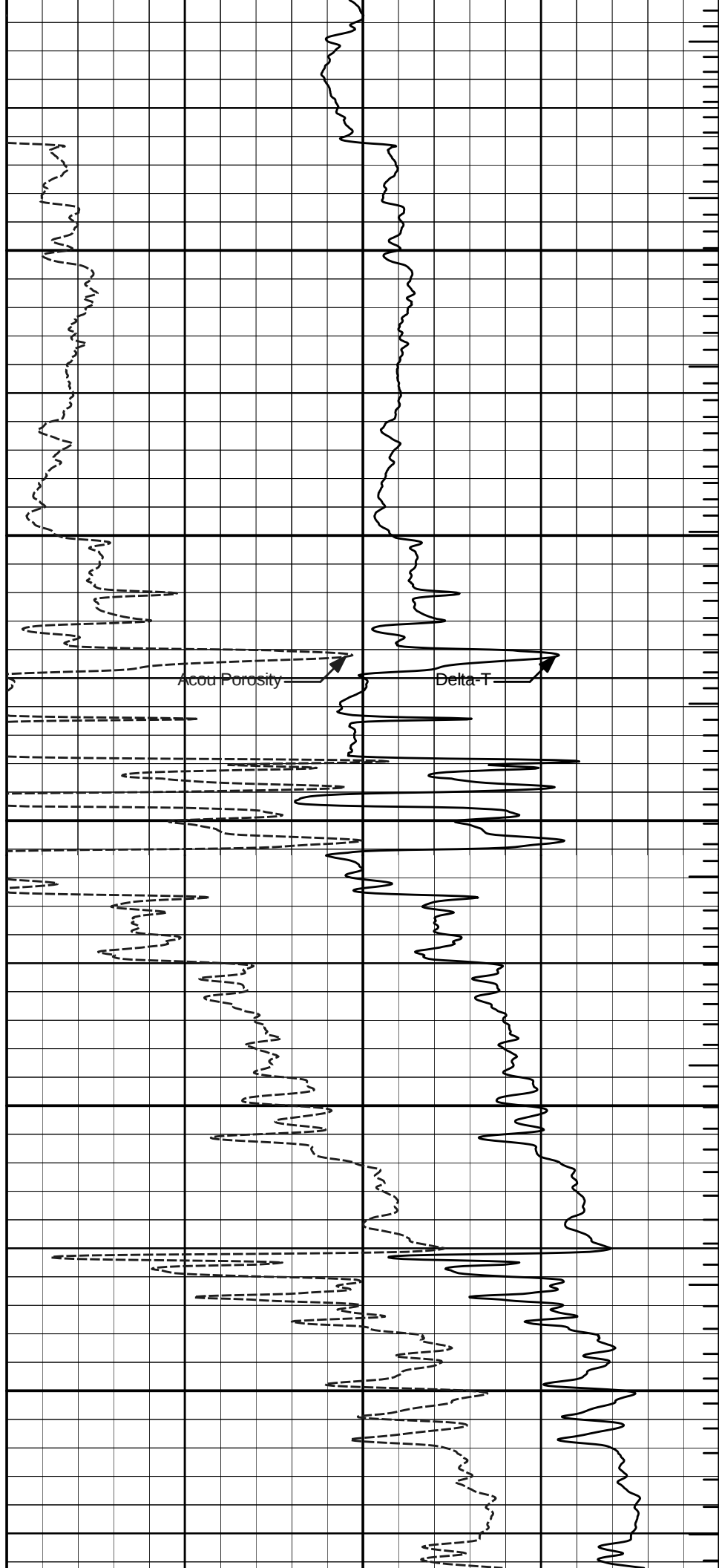
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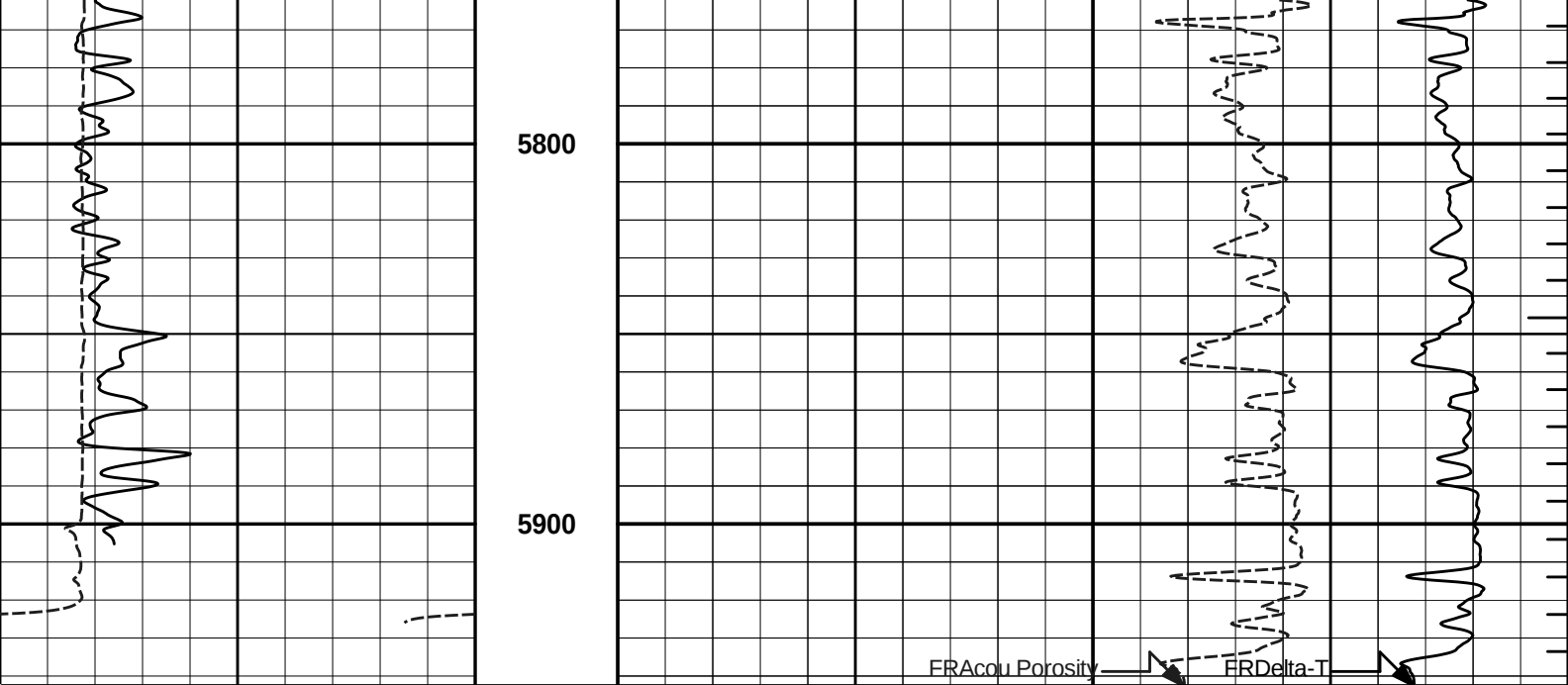
5400

5500

5600

5700





0	Gamma API	150	1 : 600		ITTT
	api		ft		
6	Caliper	16		30	Acou Porosity
	inches				percent
				140	Delta-T
					microsec per ft
					40

HALLIBURTON

Plot Time: 13-Apr-13 23:43:06
Plot Range: 1790 ft to 5942.5 ft
Data: {ActiveWell}\Well Based\DAQ-0001-003\
Plot File: \\BSAT\1_BSAT_2inx

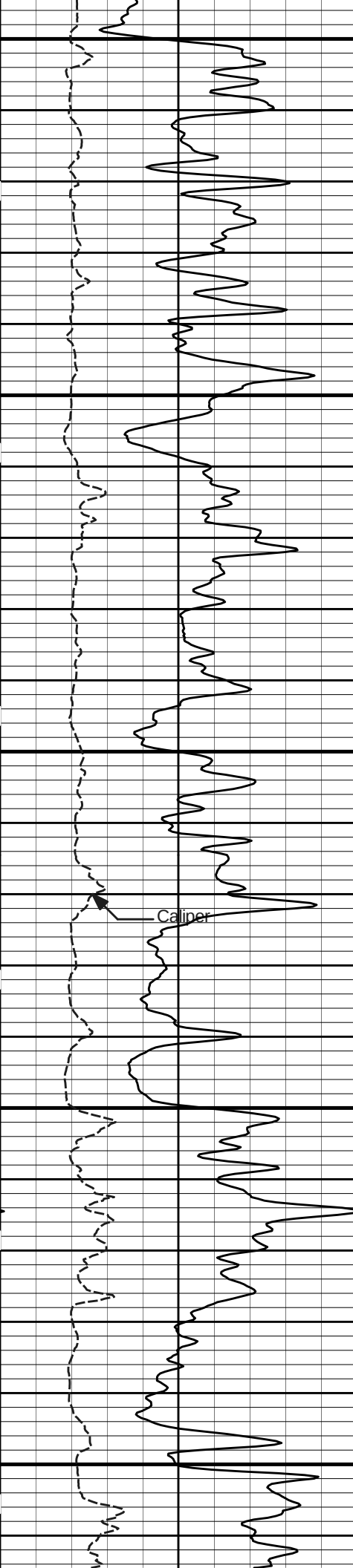
2 INCH MAIN LOG

HALLIBURTON

Plot Time: 13-Apr-13 23:43:06
Plot Range: 1790 ft to 5970.08 ft
Data: {ActiveWell}\Well Based\DAQ-0001-003\
Plot File: \\BSAT\1_BSAT_5_mainx

5 INCH MAIN LOG

			30	Acou Porosity	-10
				percent	
			140	Delta-T	40
				microsec per ft	
6	Caliper	16		ITTT	
	inches				
0	Gamma API	150	1 : 240	15K	Tension
	api		ft		pounds
					0



1800

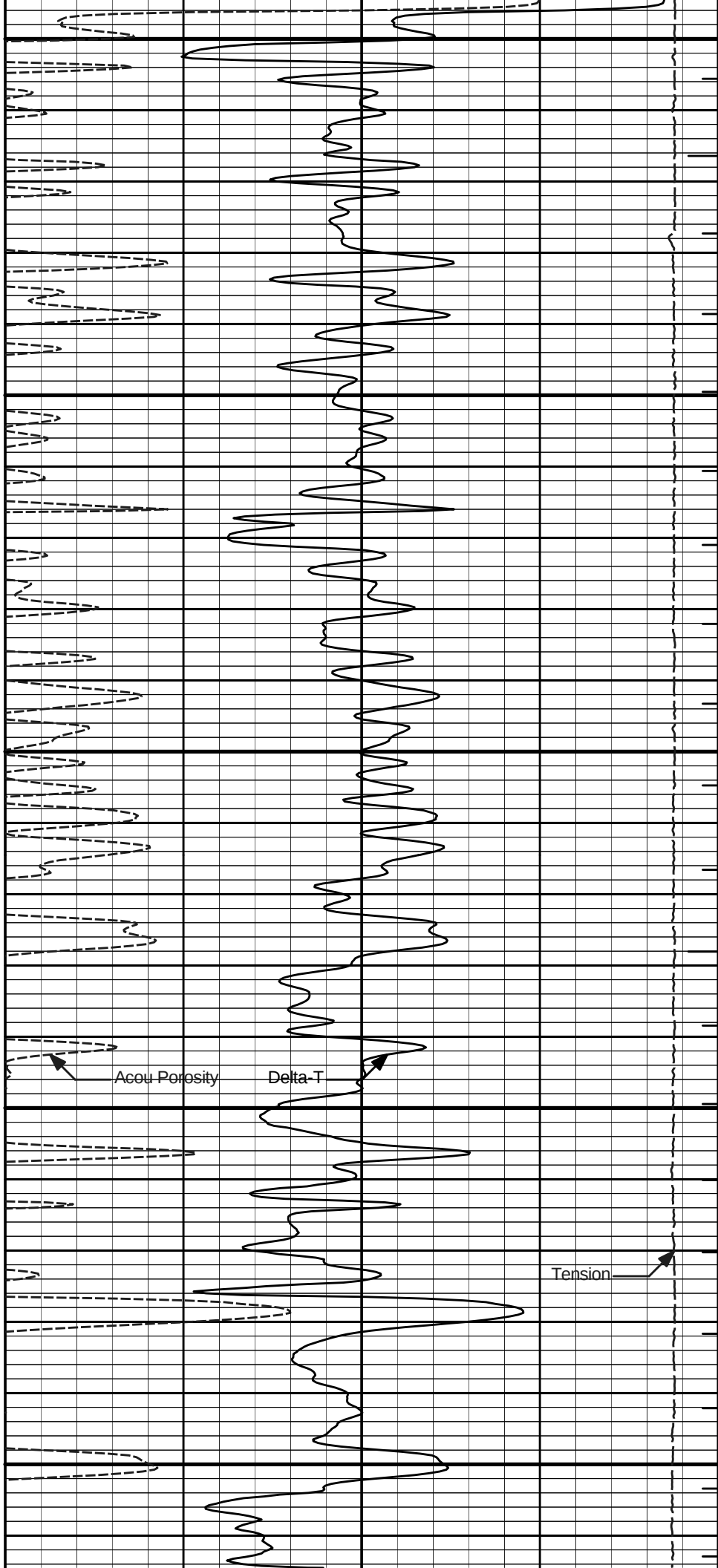
1850

1900

1950

2000

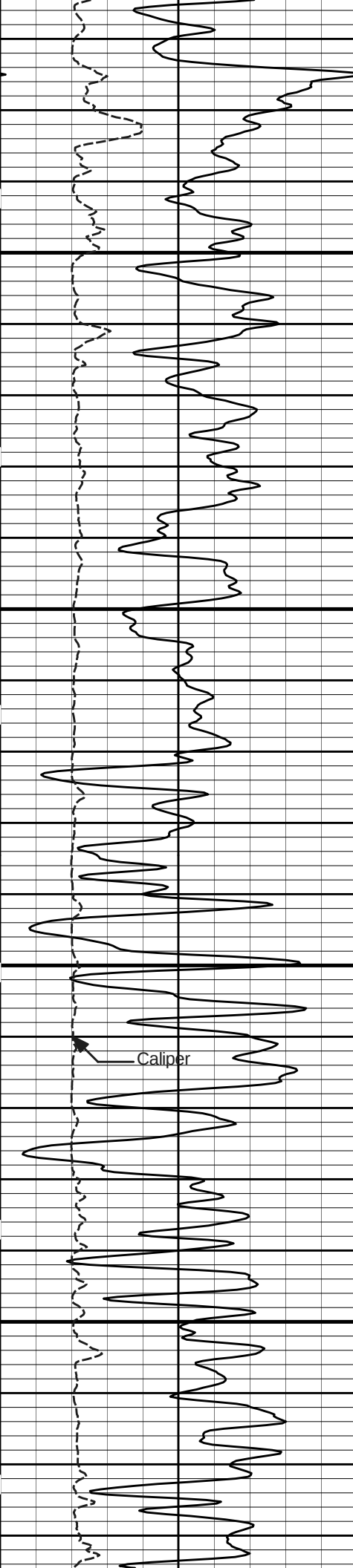
Caliper



Acou Porosity

Delta-T

Tension

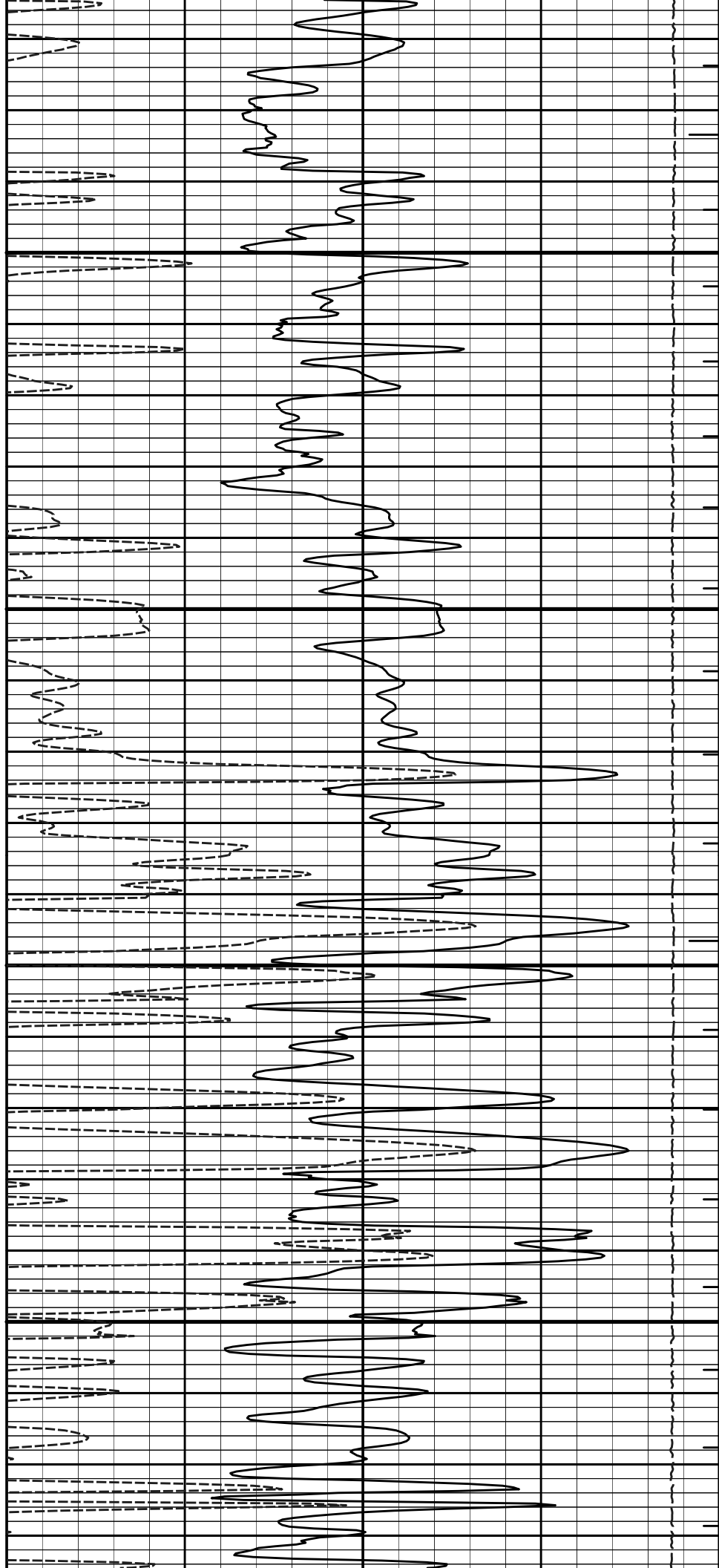


2050

2100

2150

2200





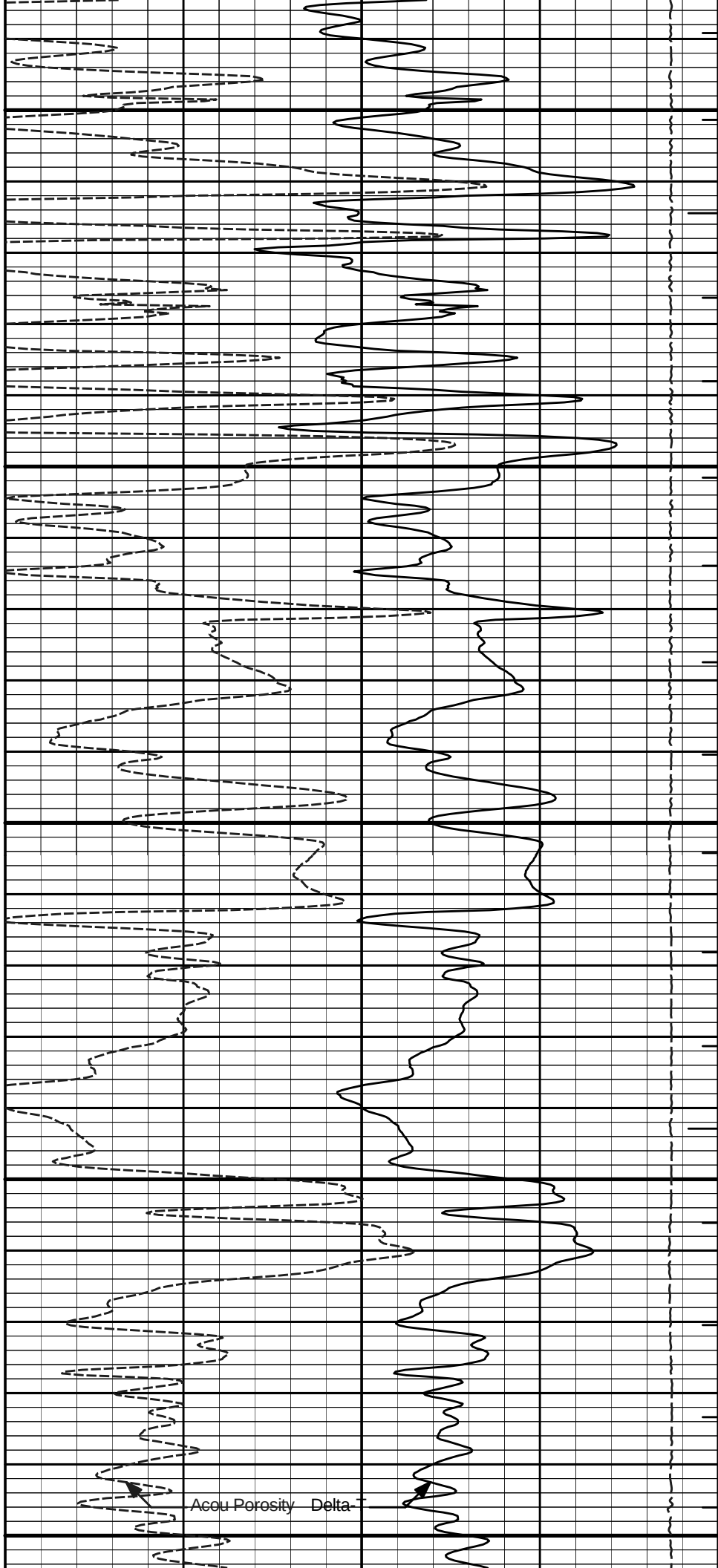
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2300

2350

2400

2450



Acou Porosity Delta

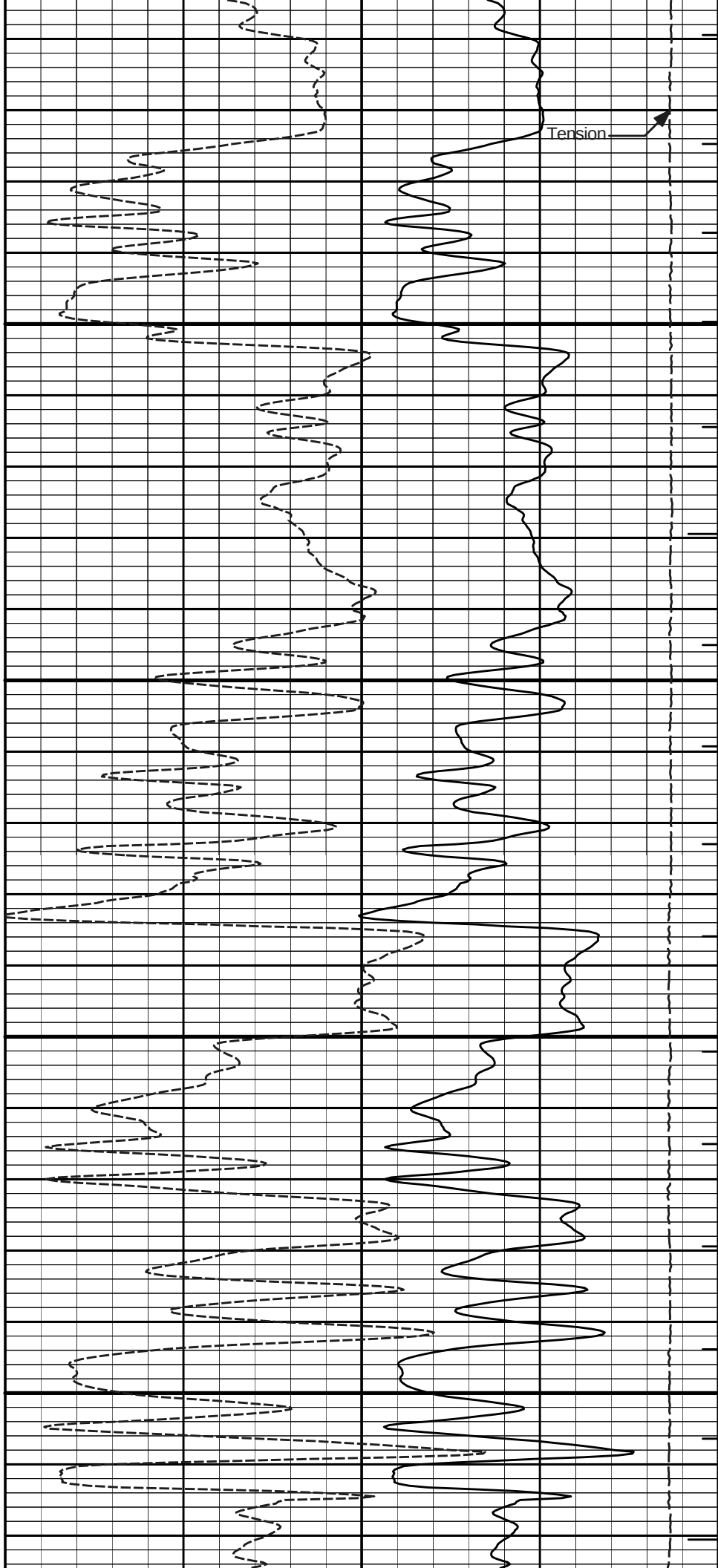


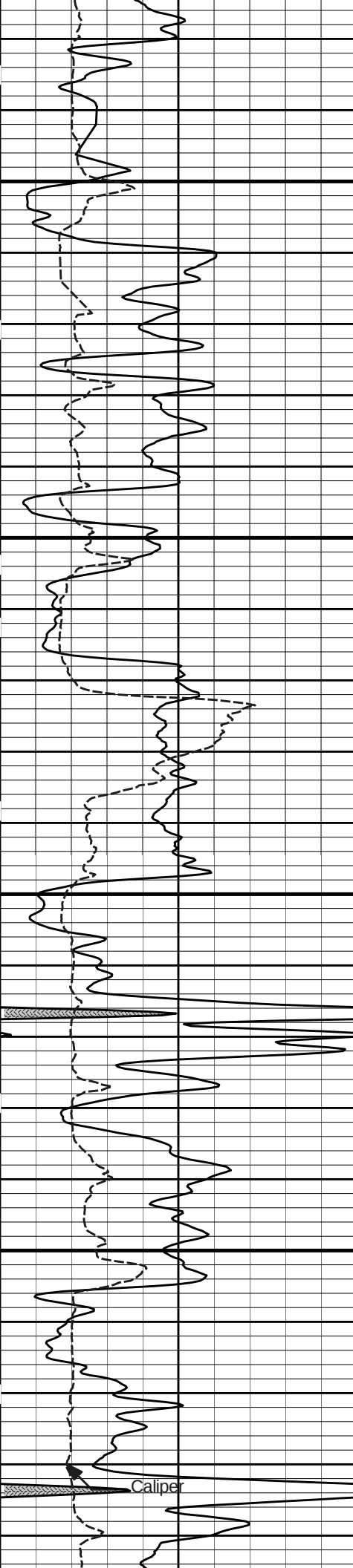
2500

2550

2600

2650



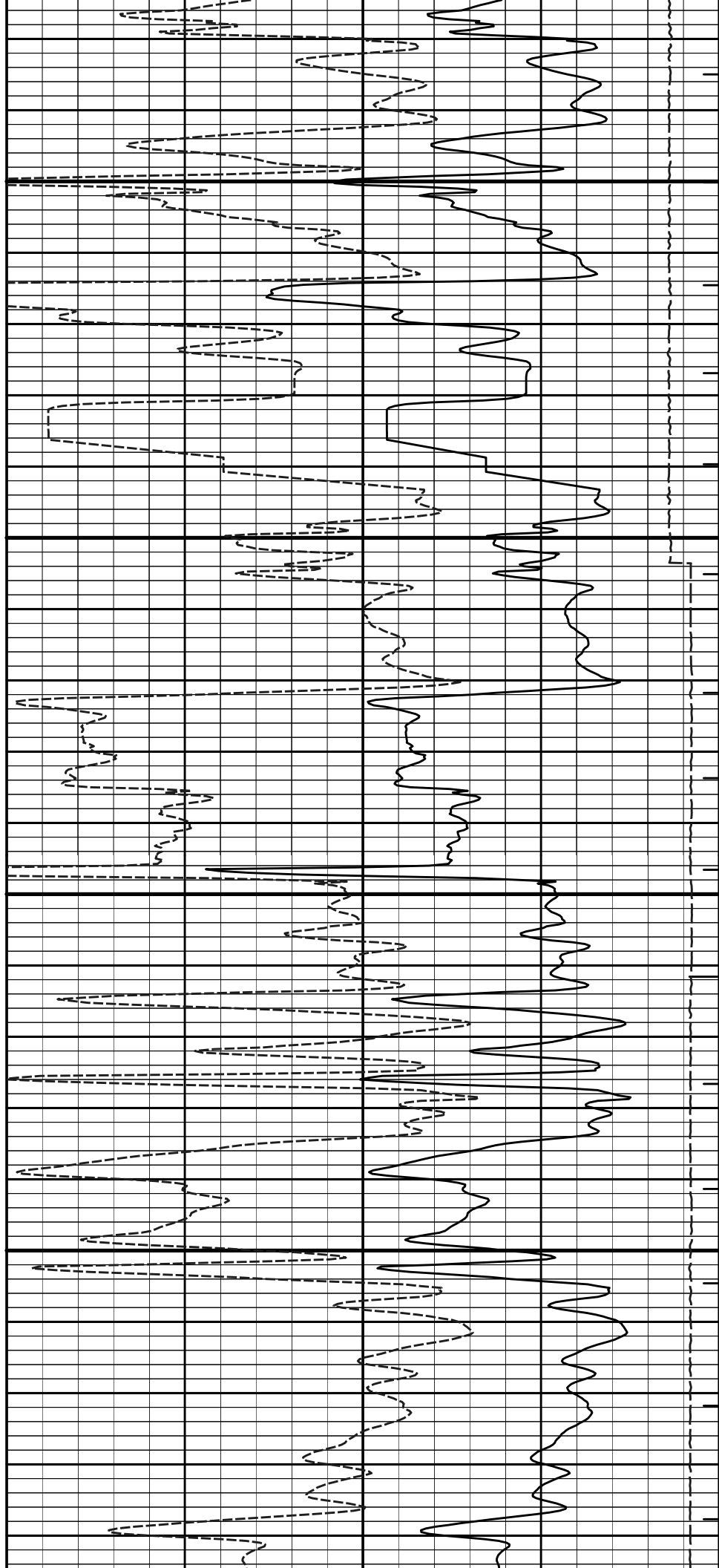


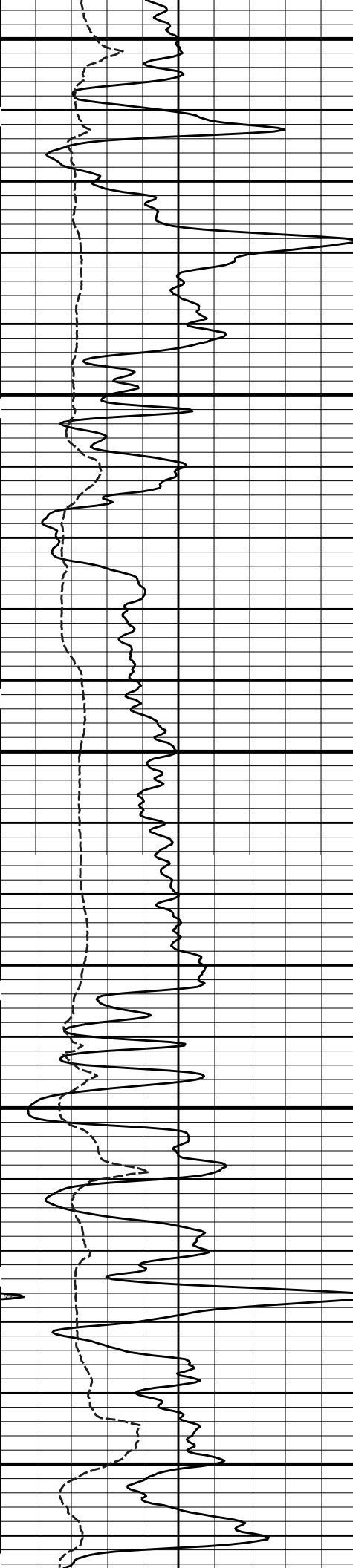
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2750

2800

2850





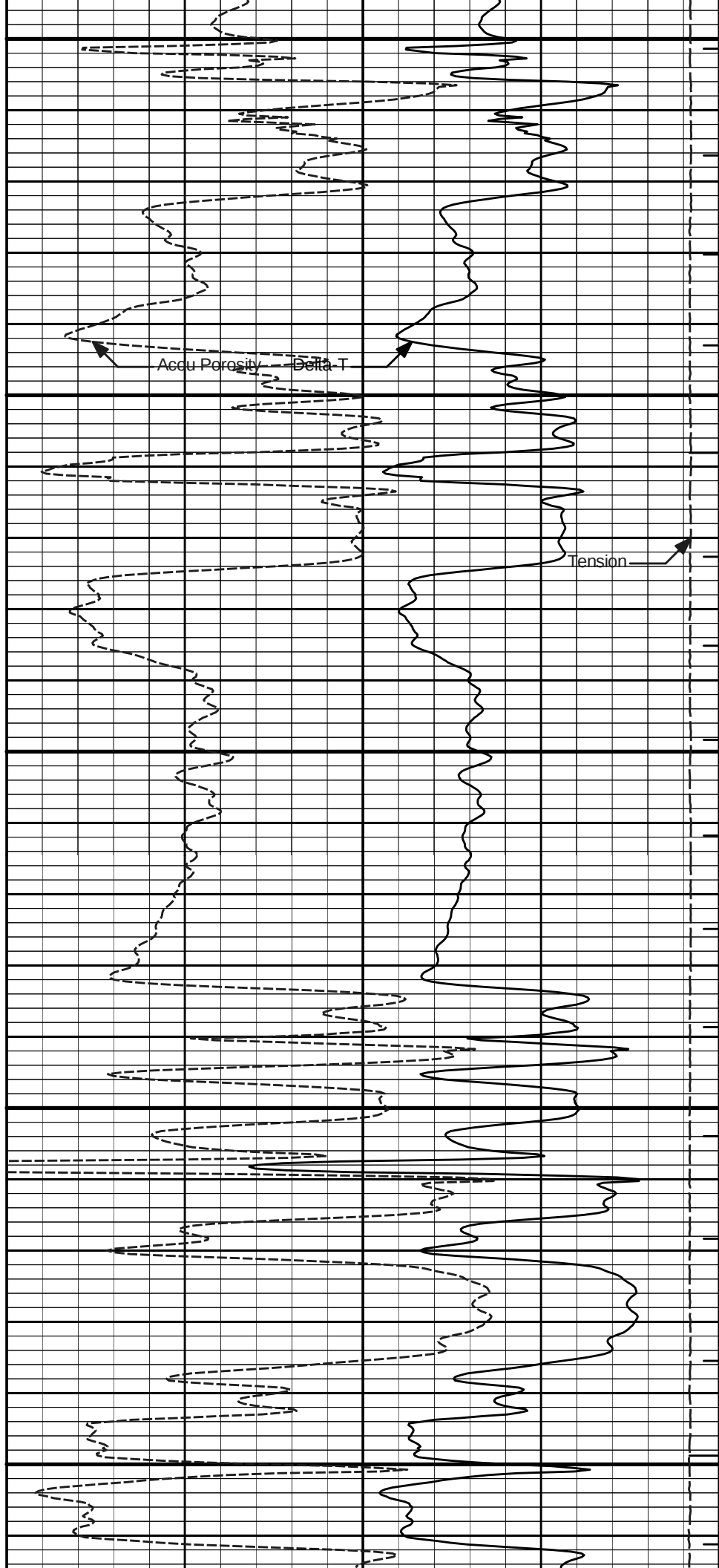
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2950

3000

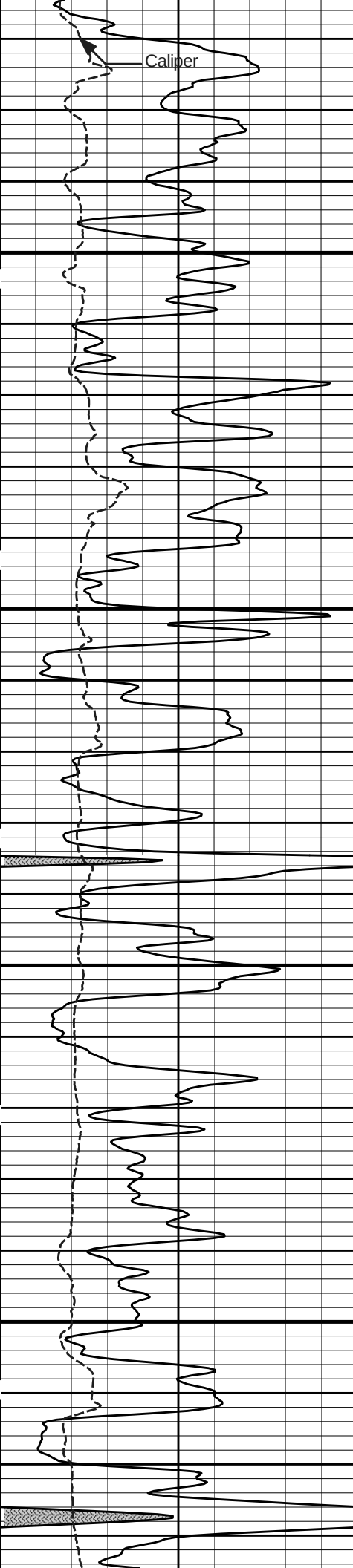
3050

3100



Accu Porosity Delta T

Tension

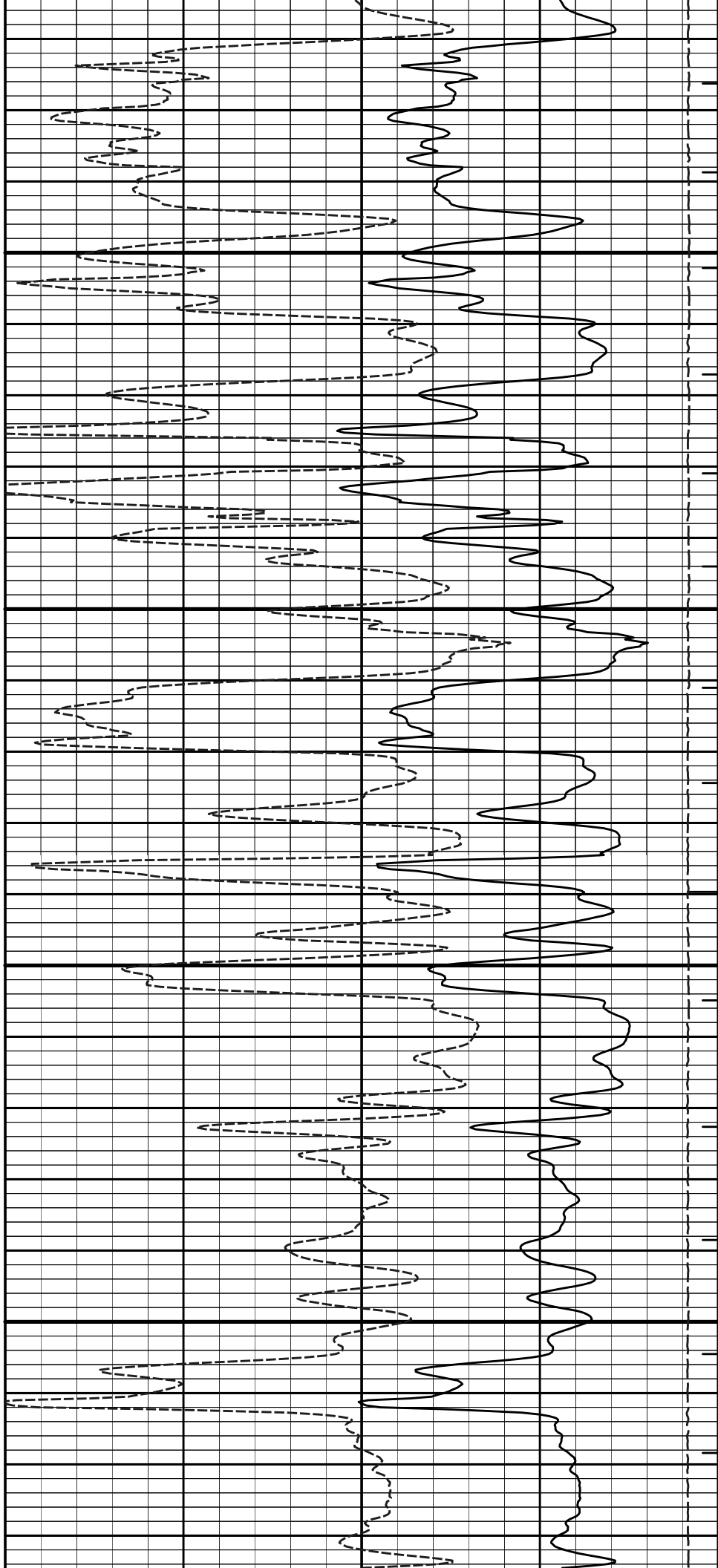


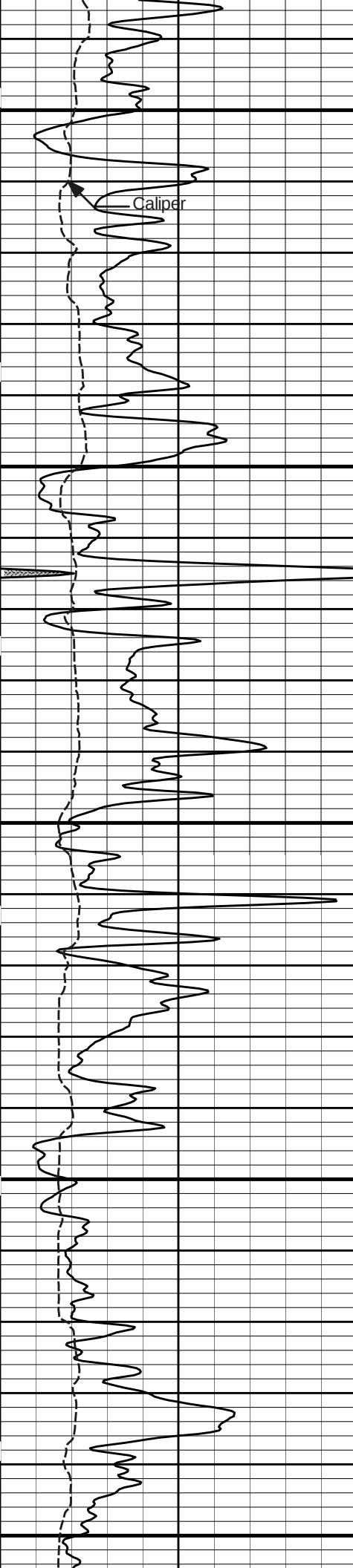
3150

3200

3250

3300





3350

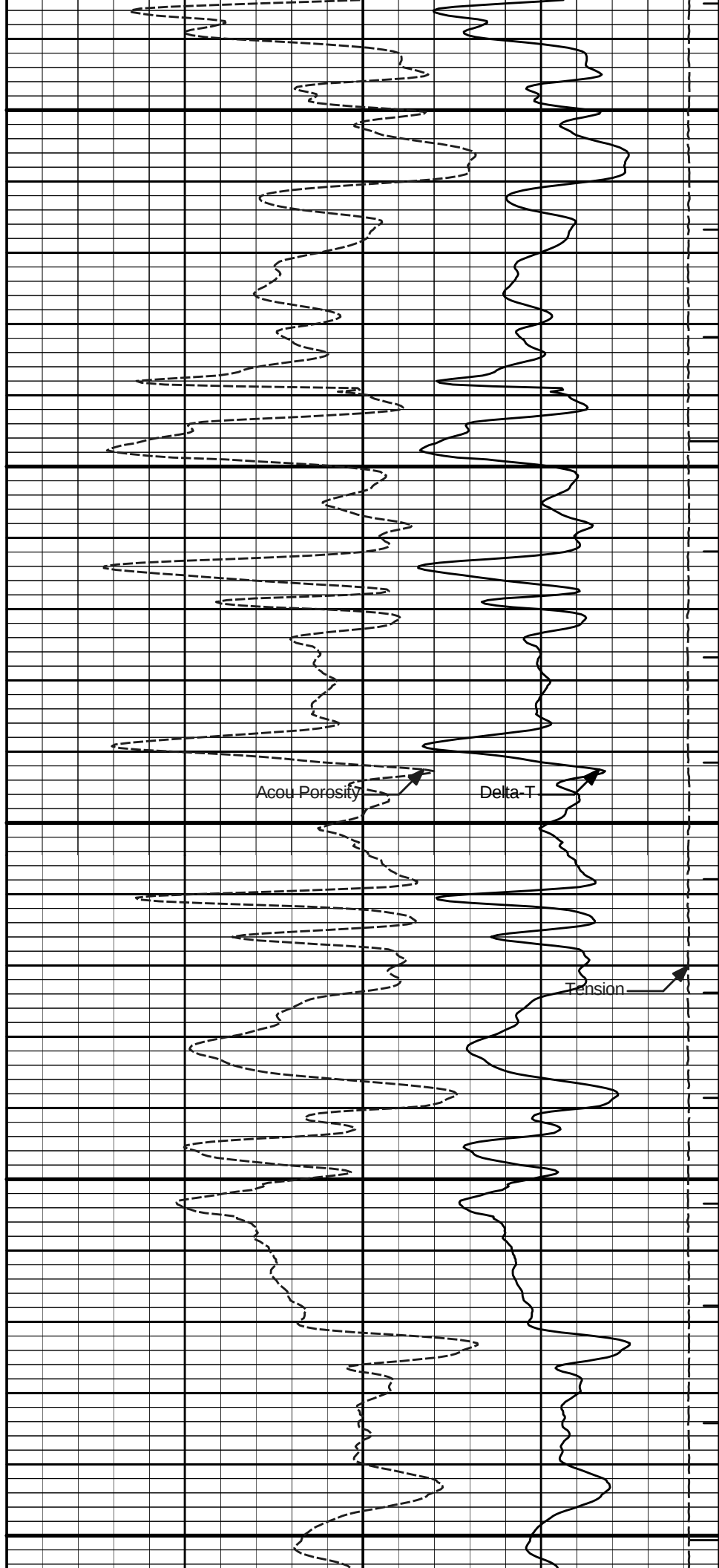
Caliper

3400

3450

3500

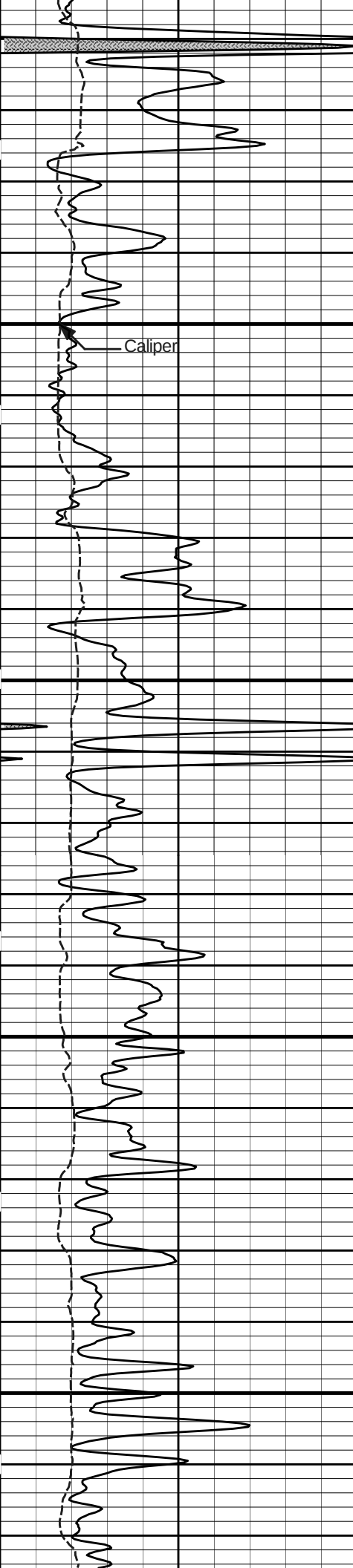
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Acou Porosity

Delta-T

Tension



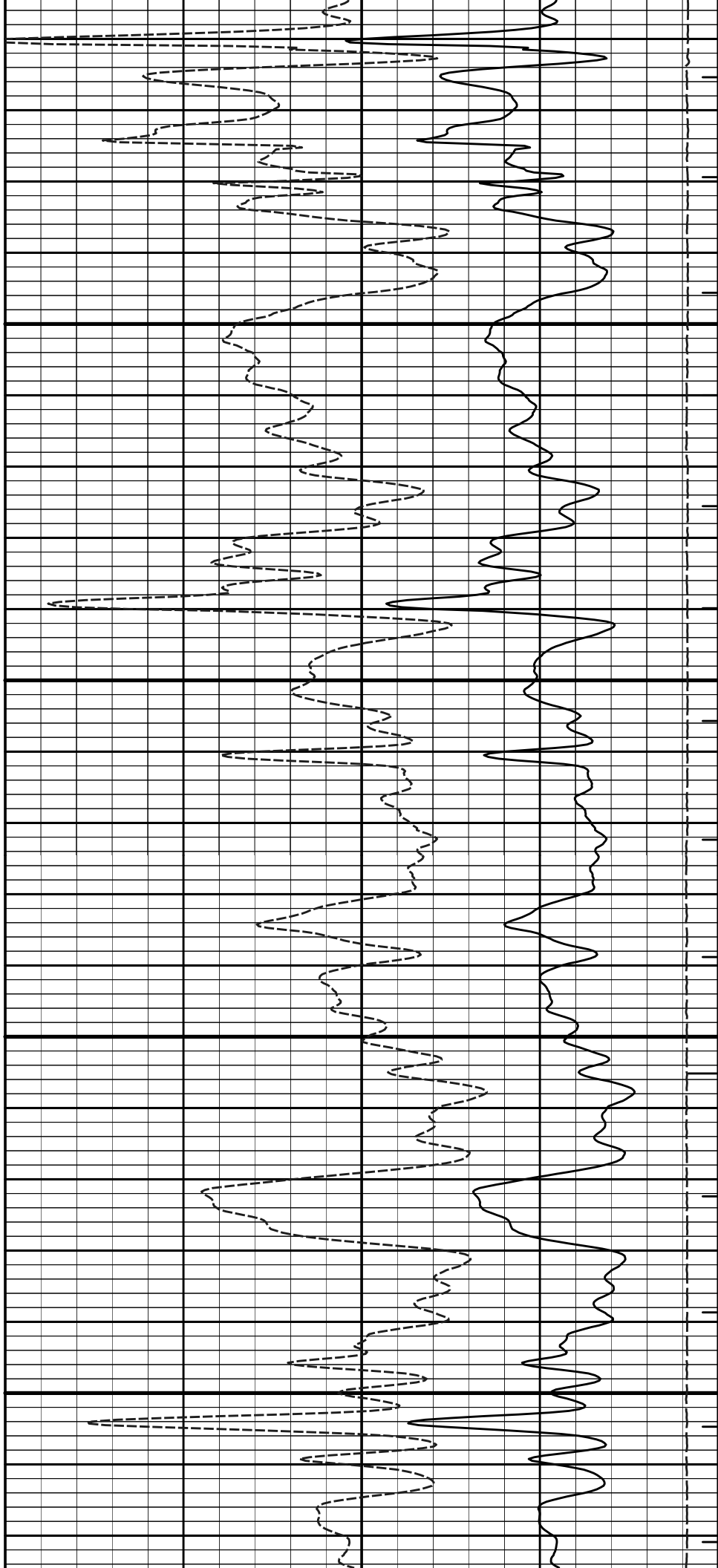
Caliper

3600

3650

3700

3750



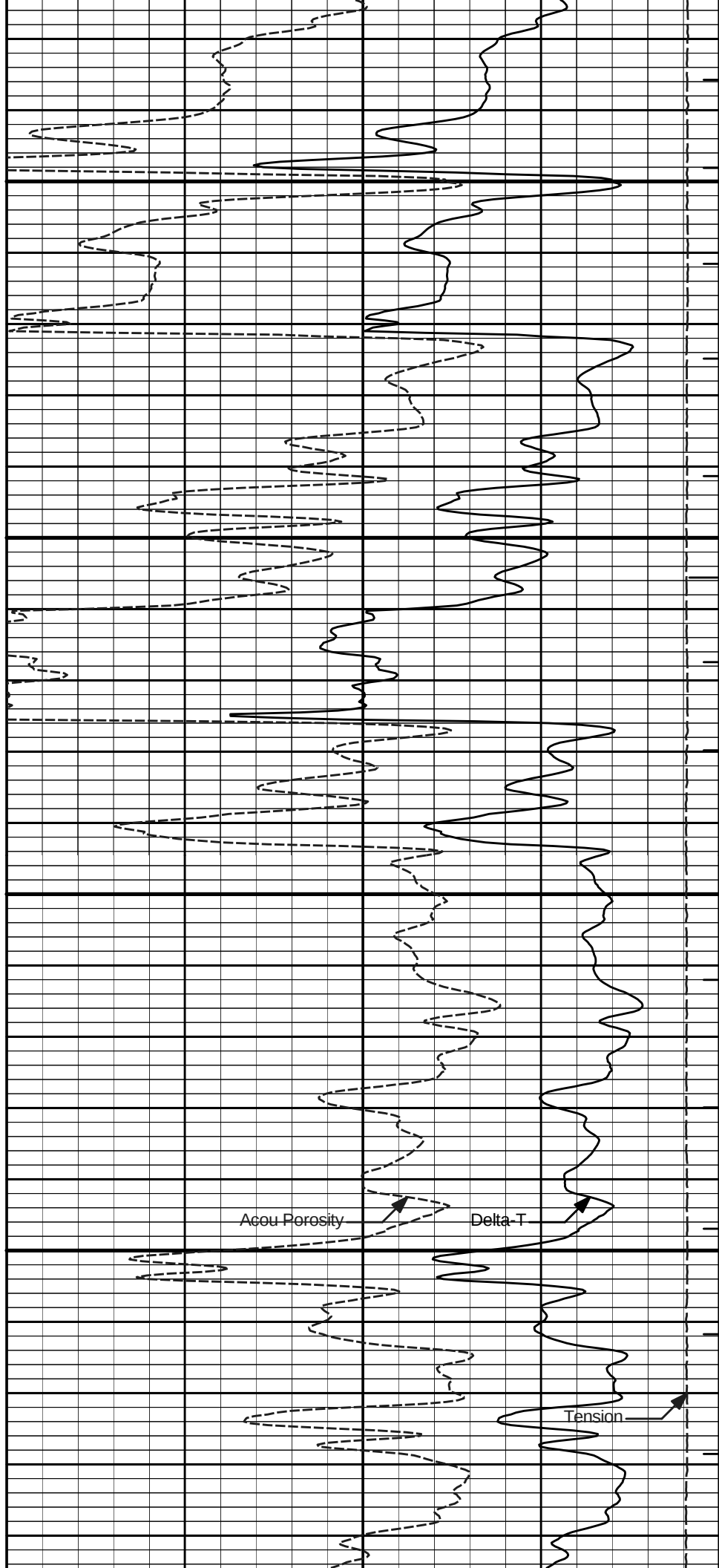


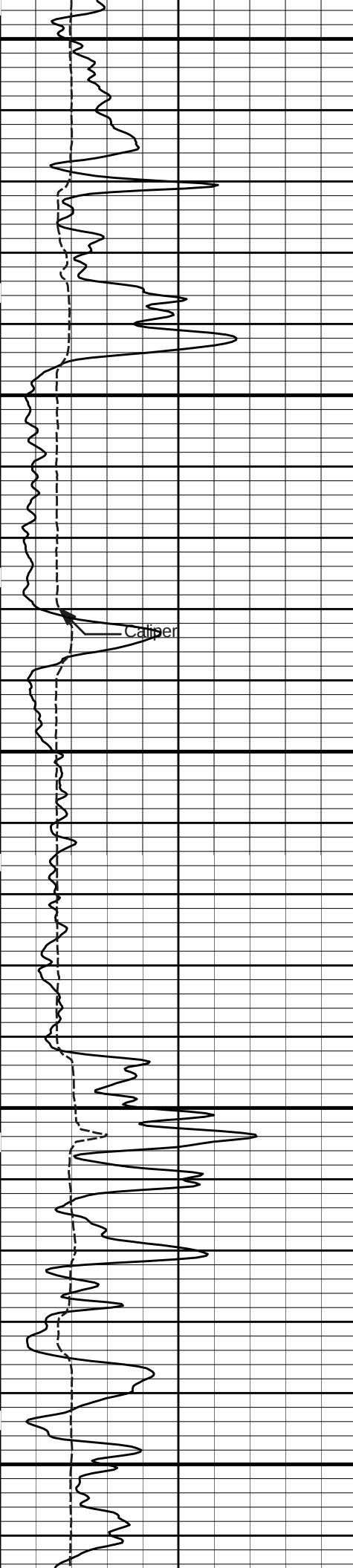
3800

3850

3900

3950





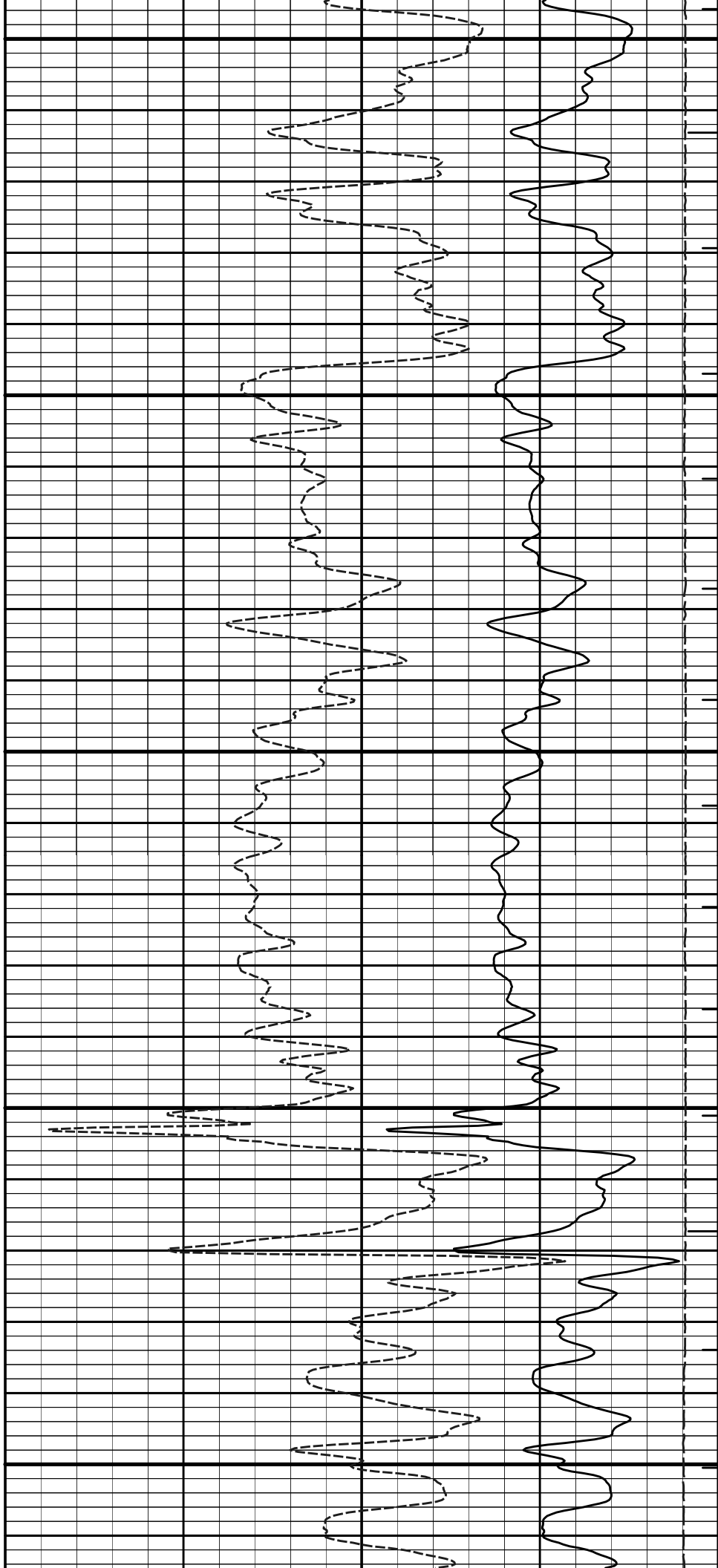
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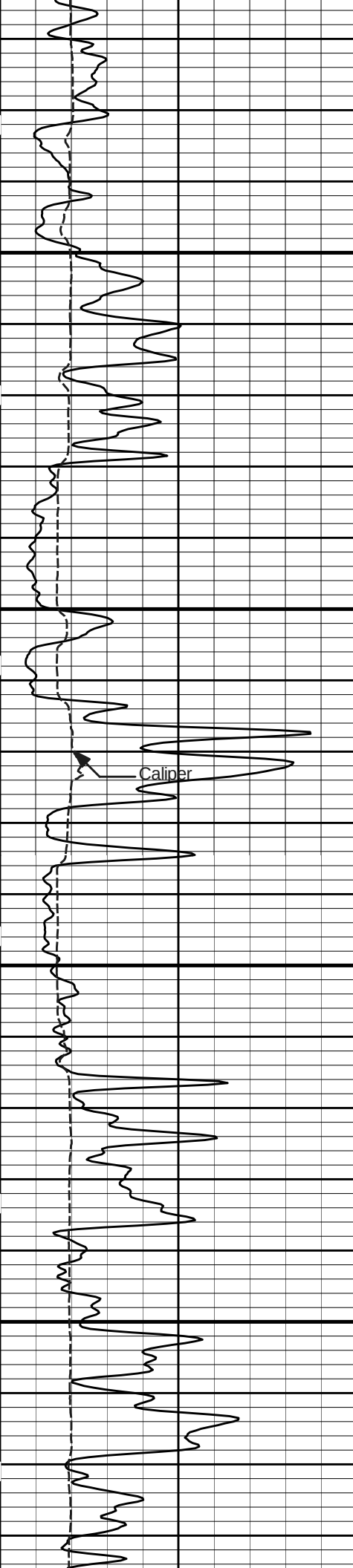
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4100

4150

4200



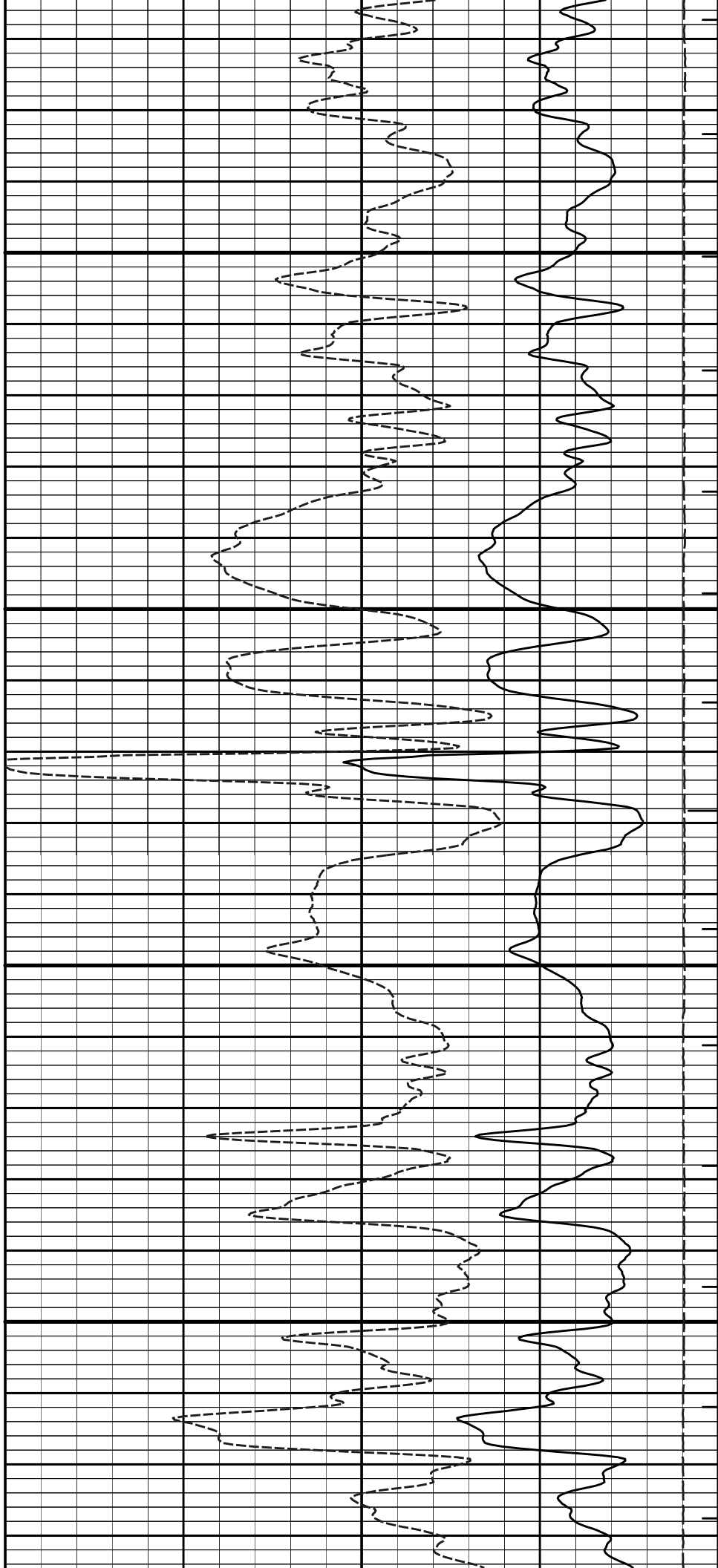


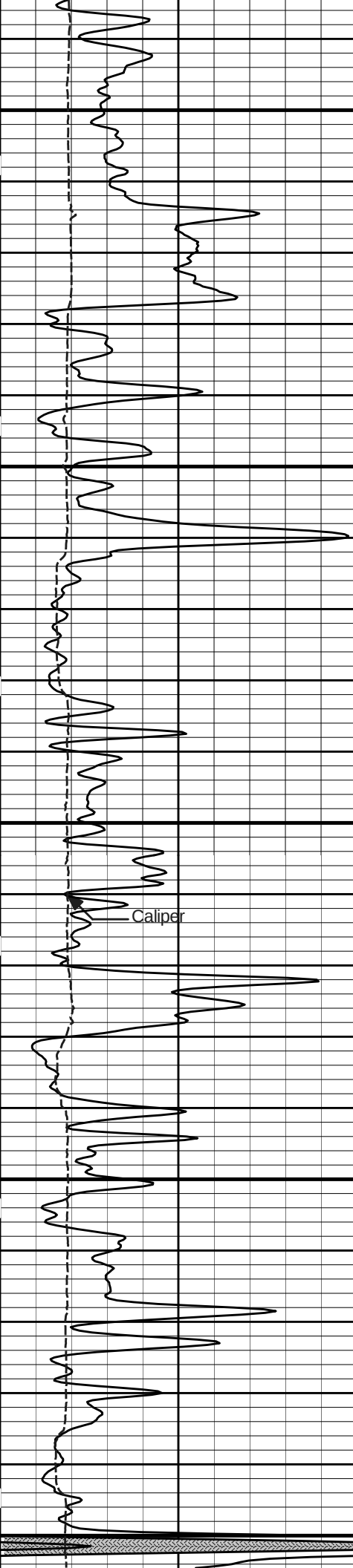
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4400





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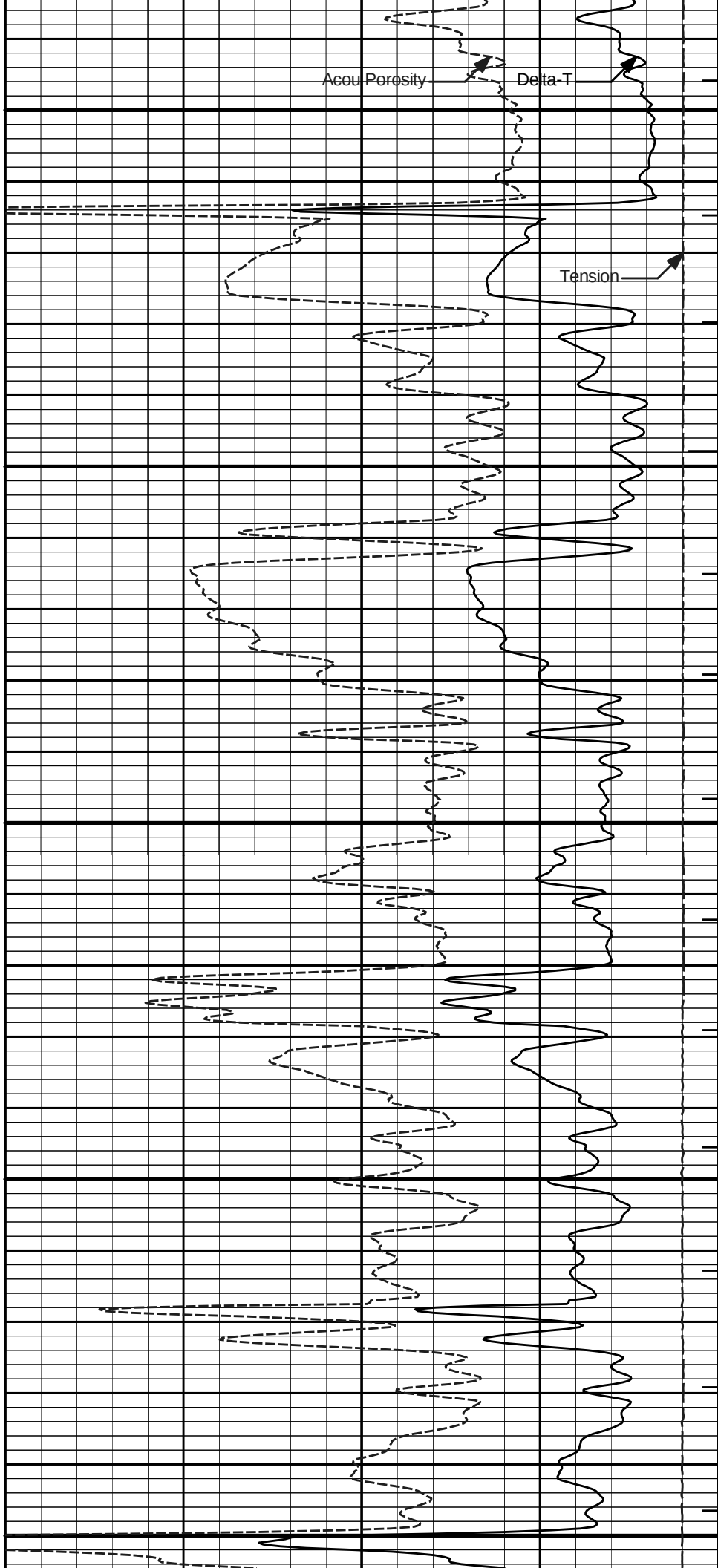
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4550

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4650

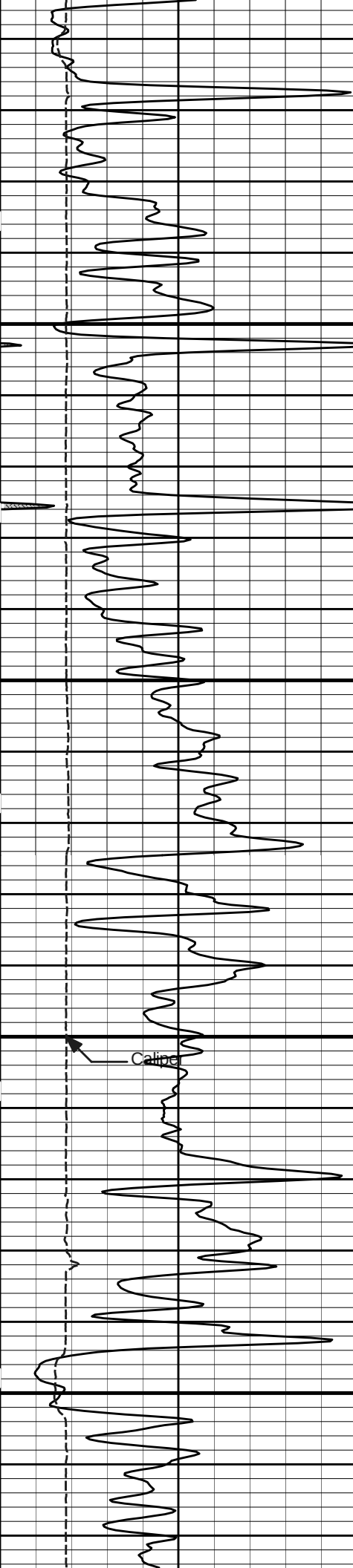
Caliper



Acoustic Porosity

Delta-T

Tension

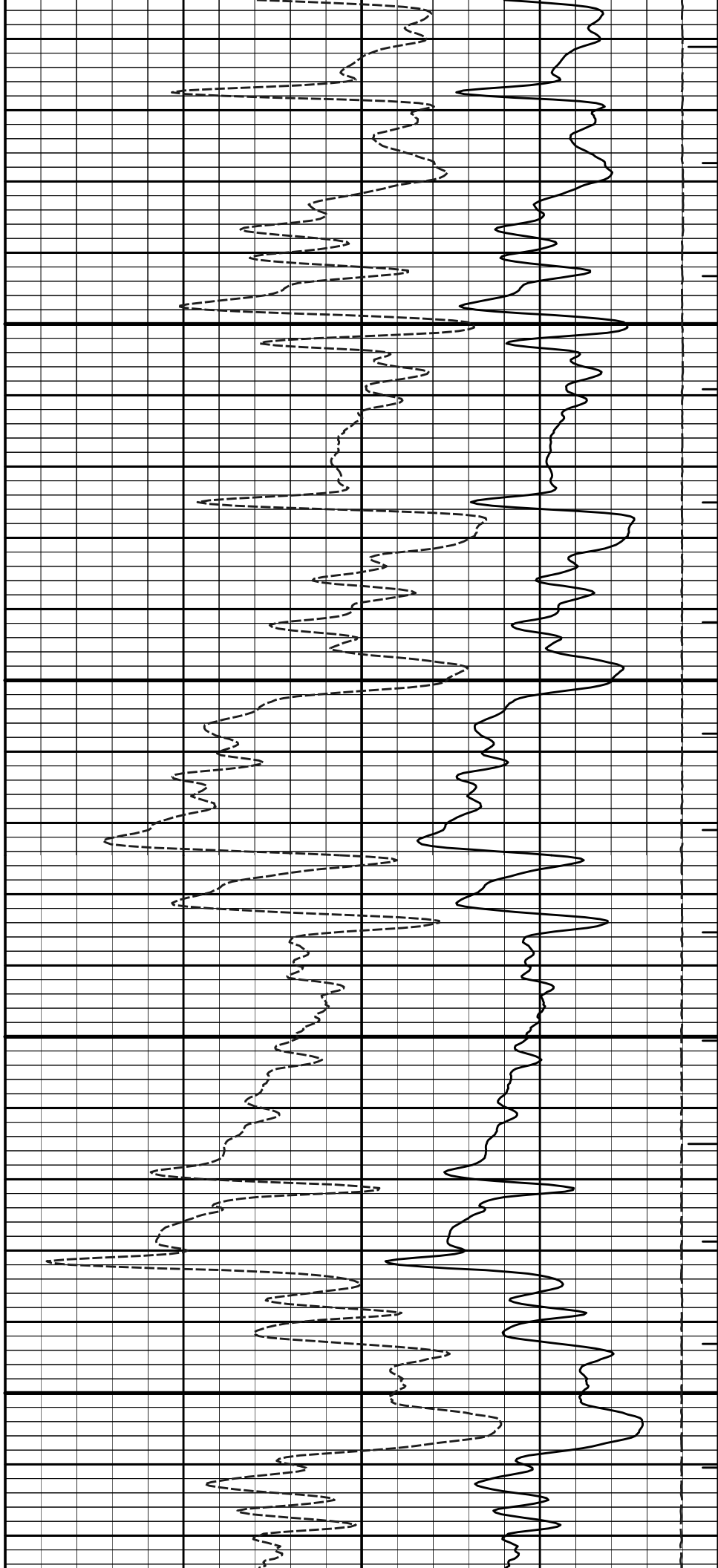


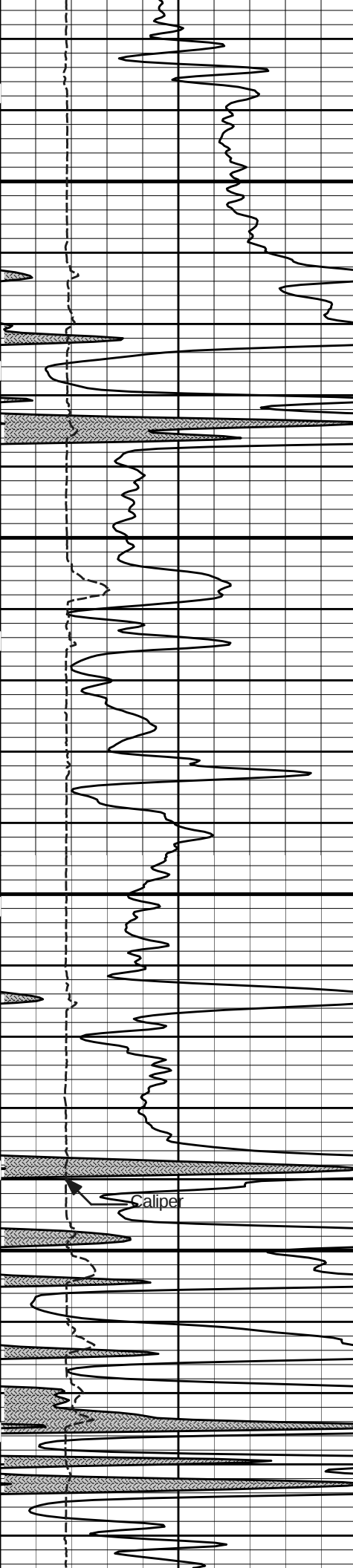
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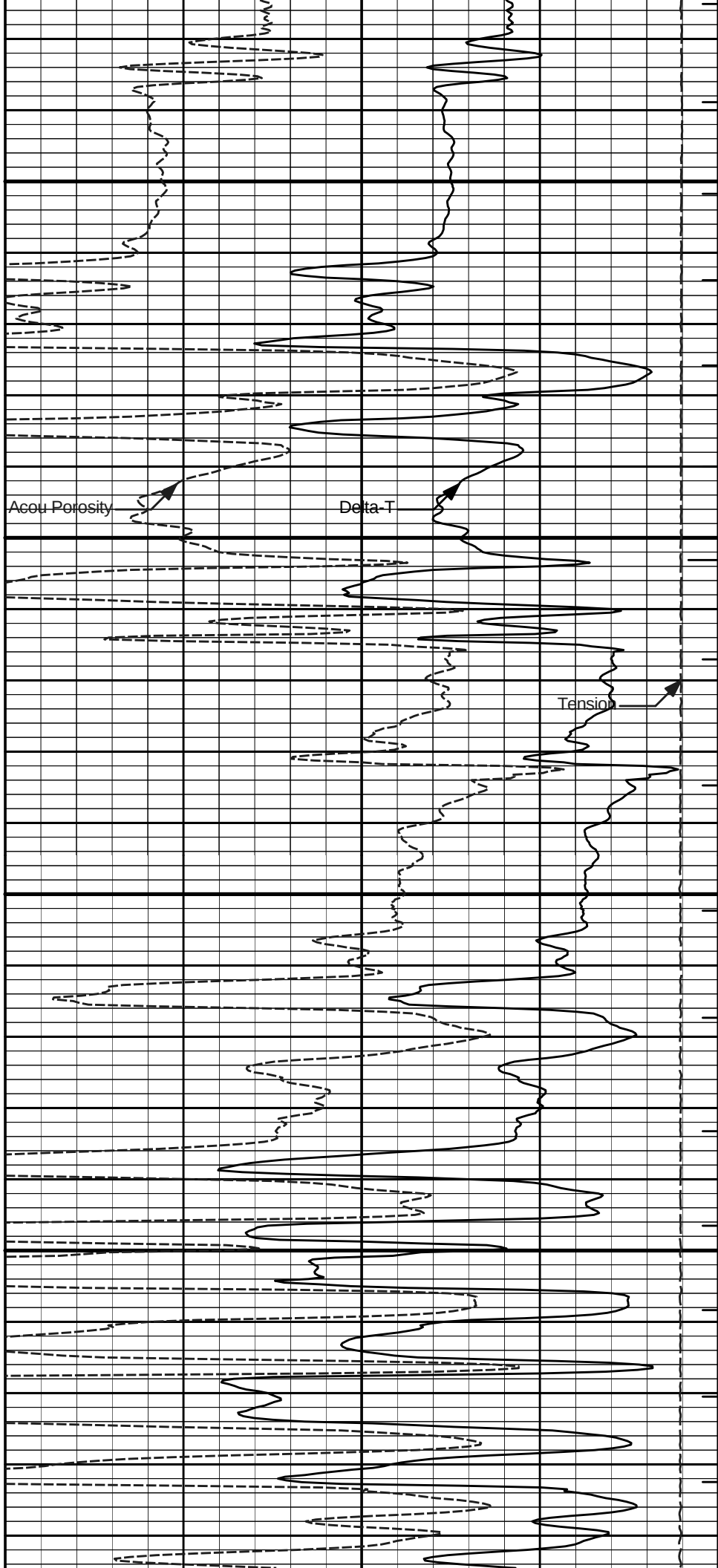
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4950

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5050

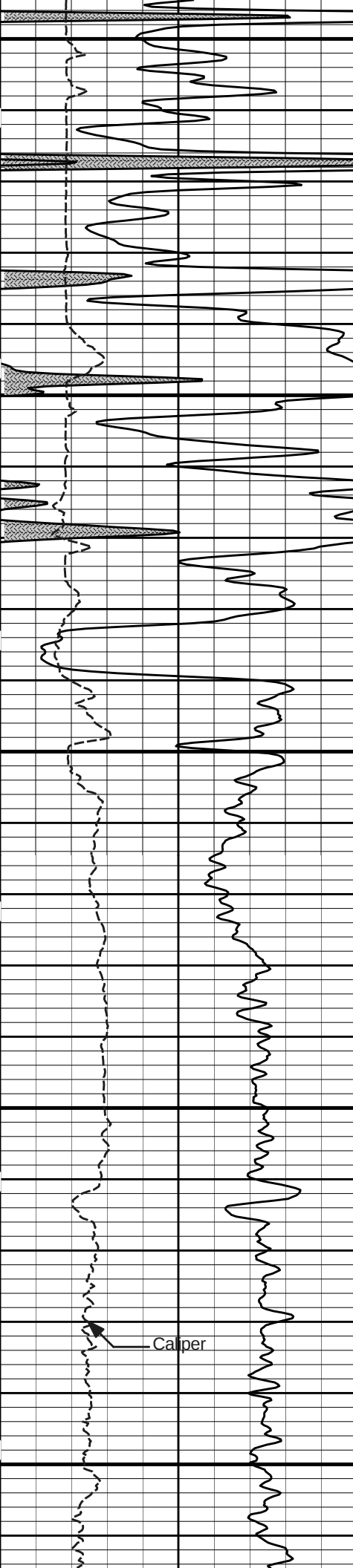
Caliper



Acou Porosity

Delta-T

Tension



5100

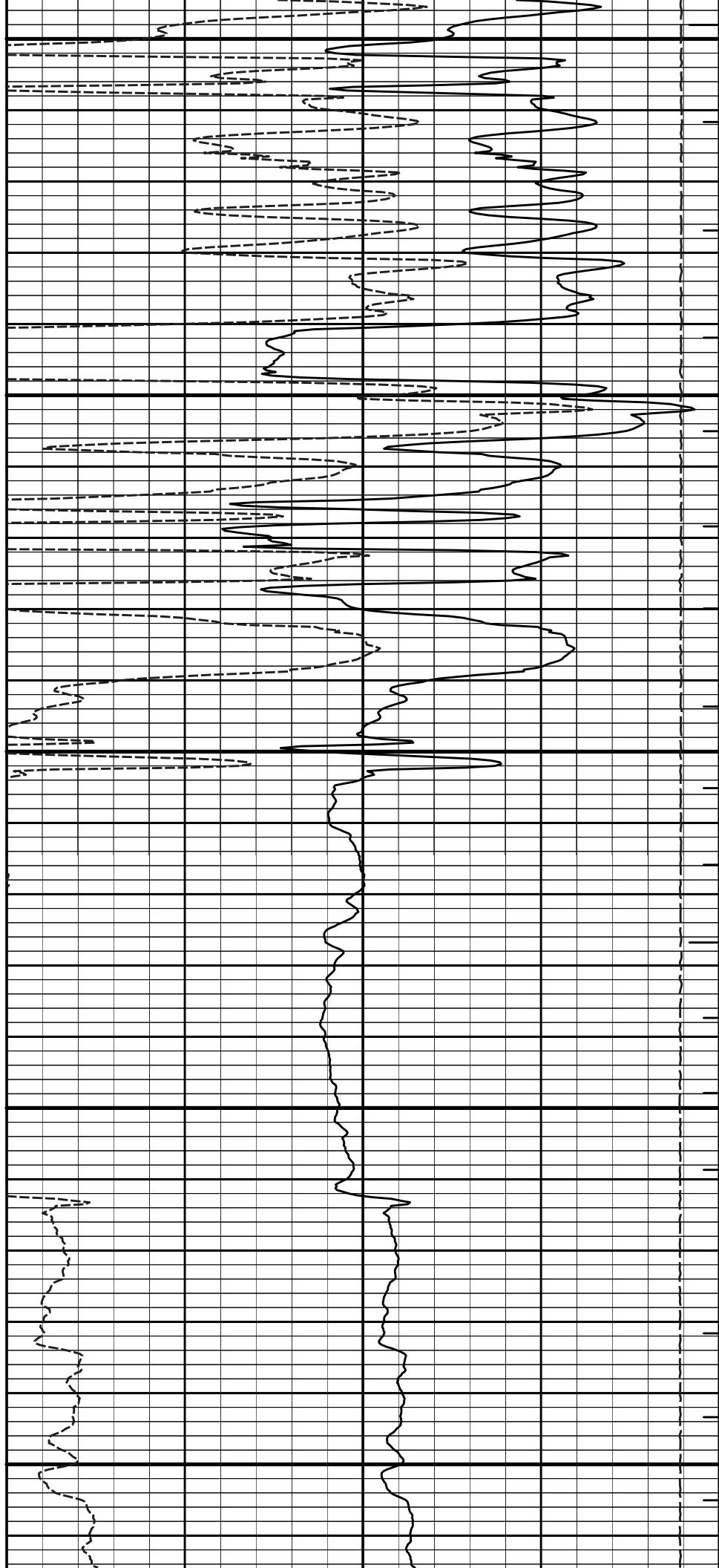
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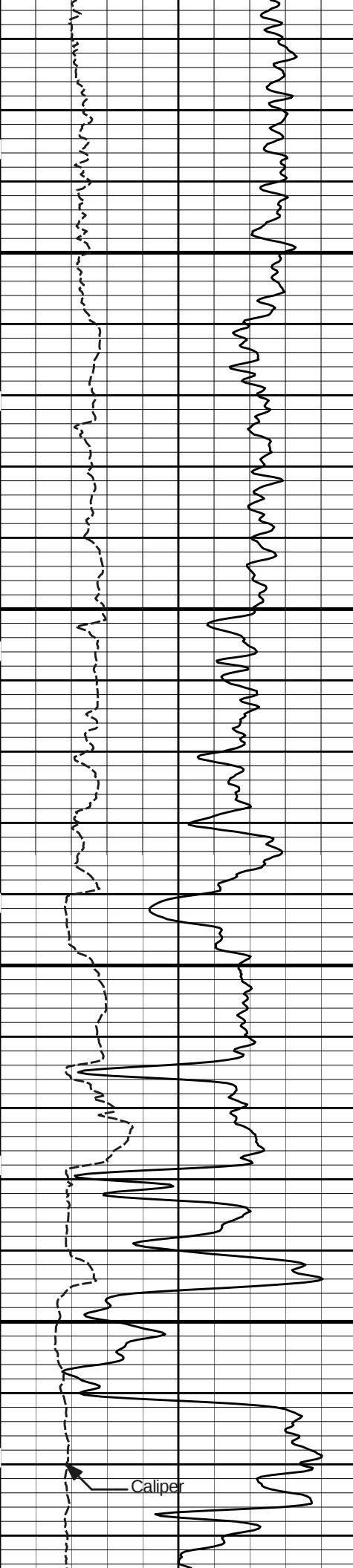
5200

5250

5300

Caliper



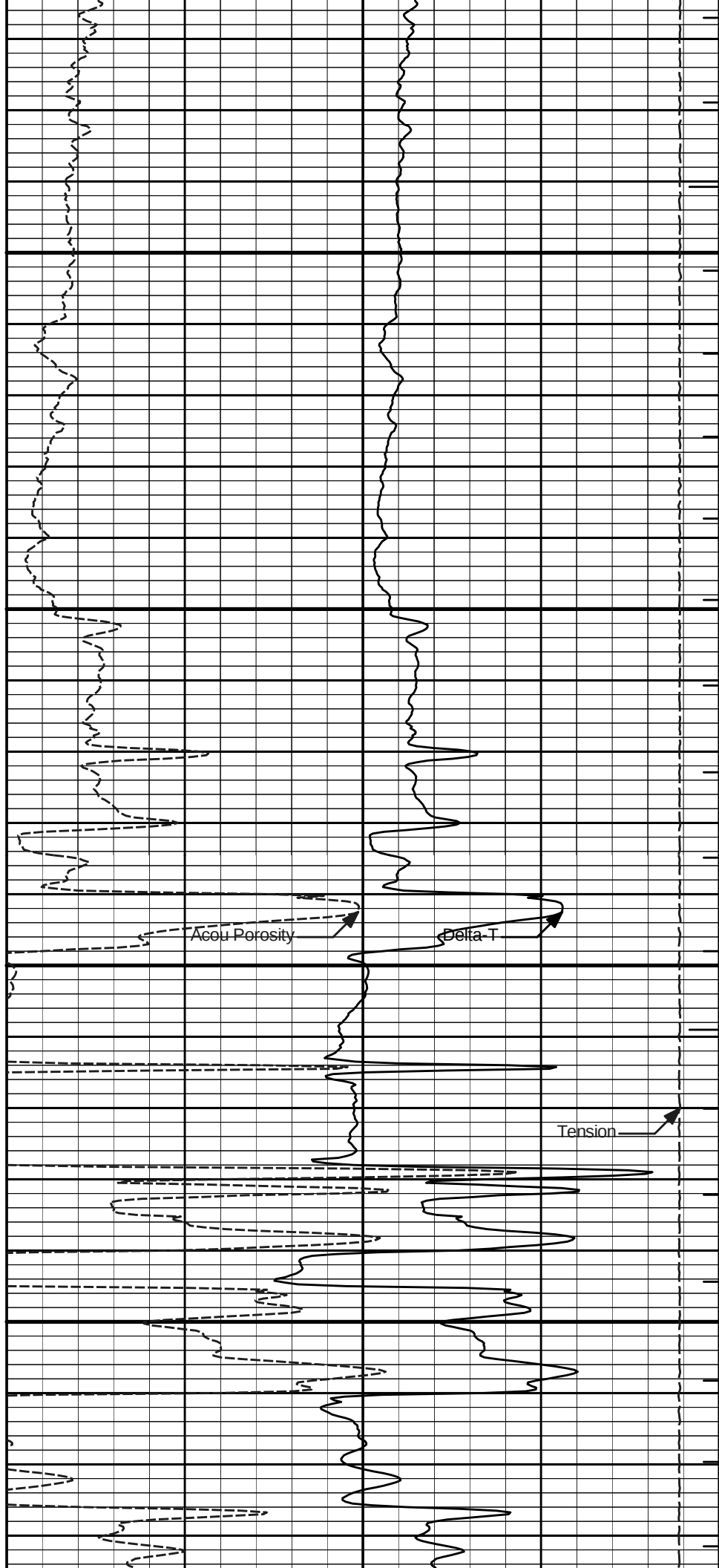


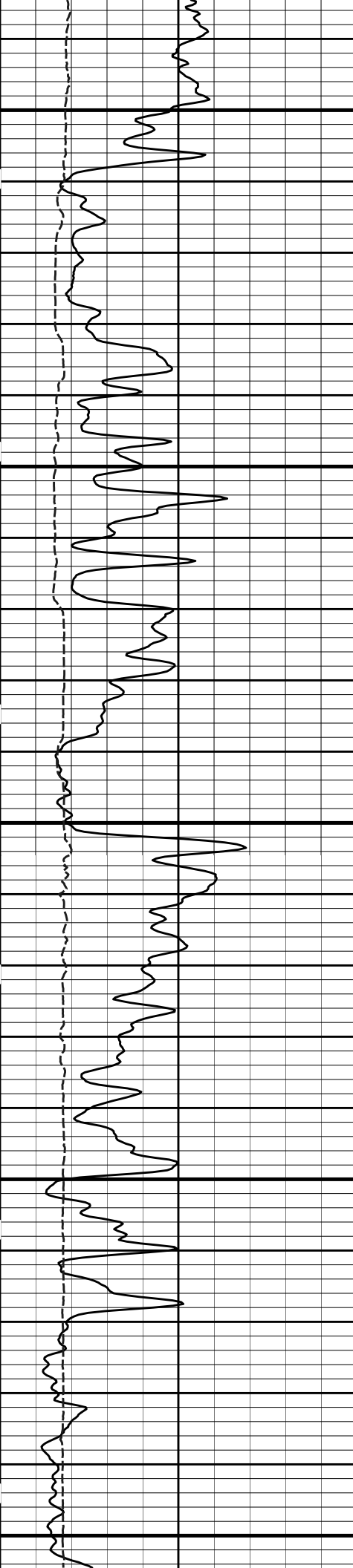
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5400

5450

5500





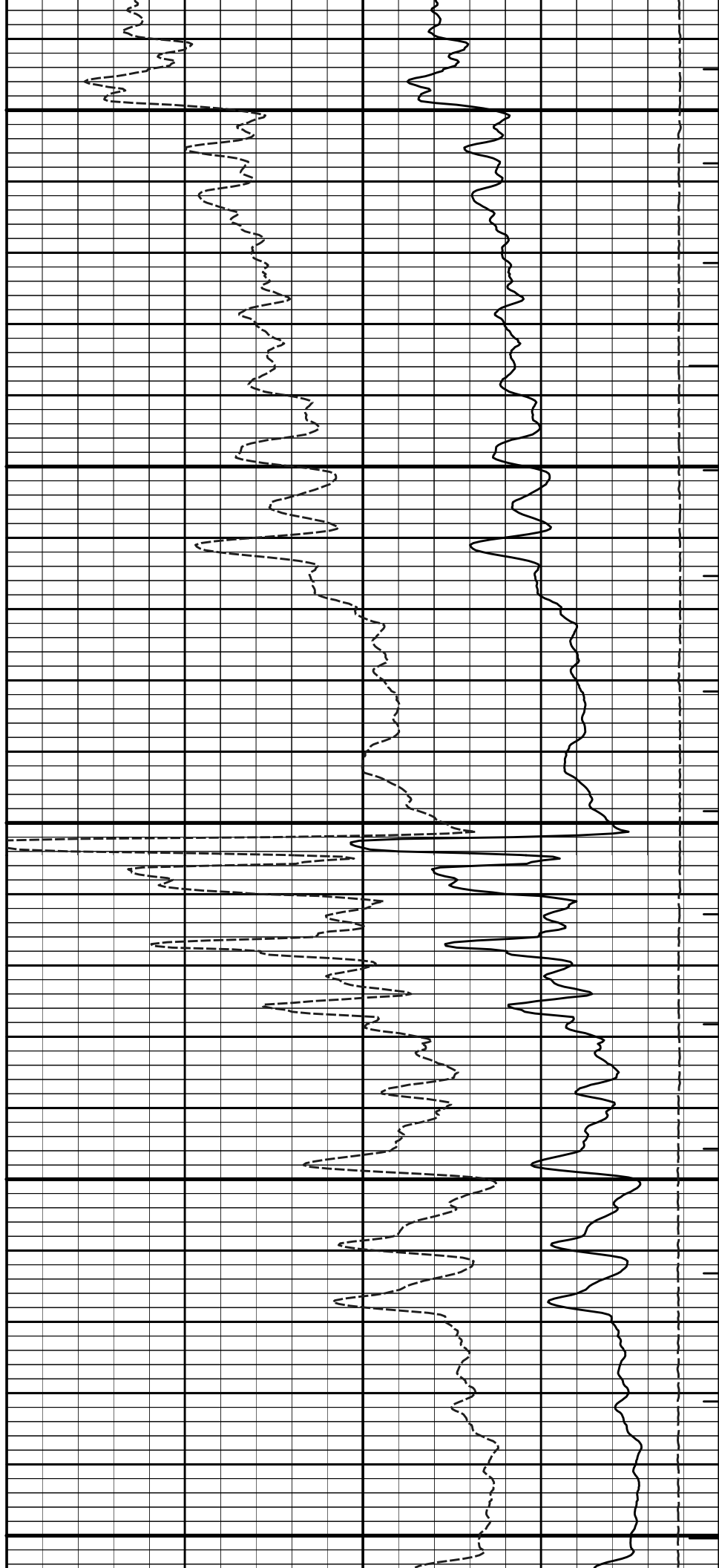
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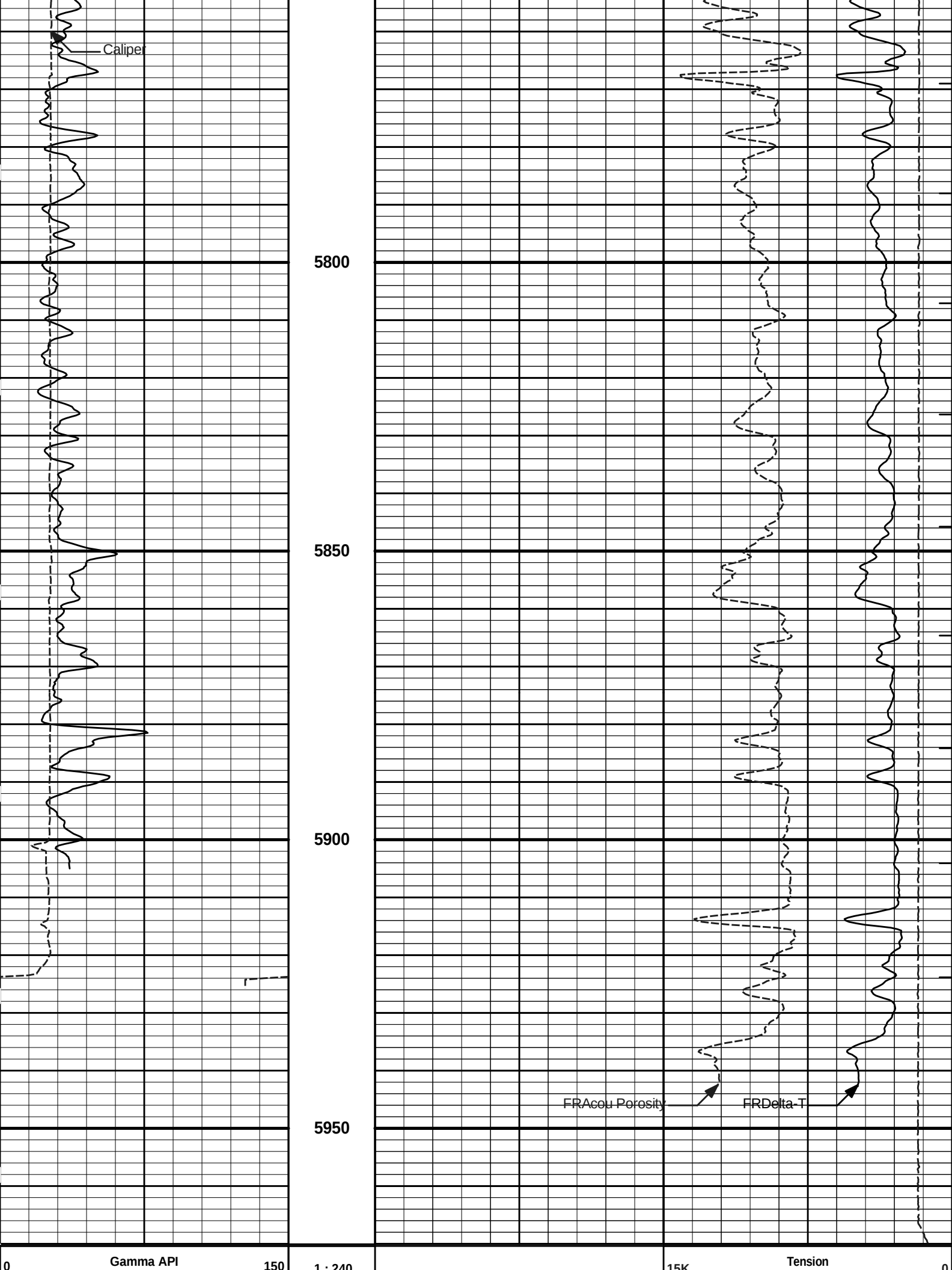
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5750





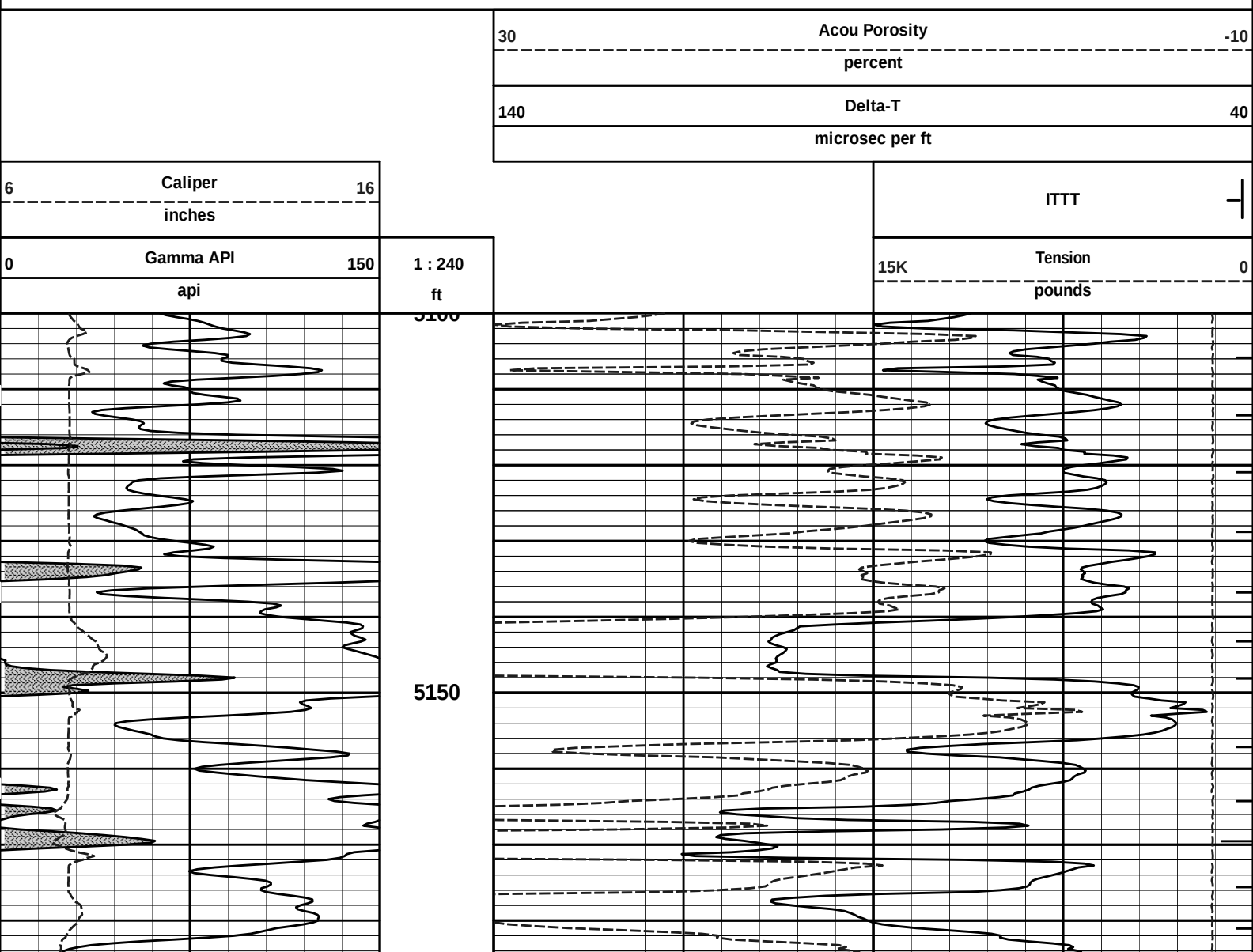
	api		1 : 240 ft			10K	pounds	-9
6	Caliper	16					ITTT	+1
	inches							
						140	Delta-T	40
							microsec per ft	
						30	Acou Porosity	-10
							percent	

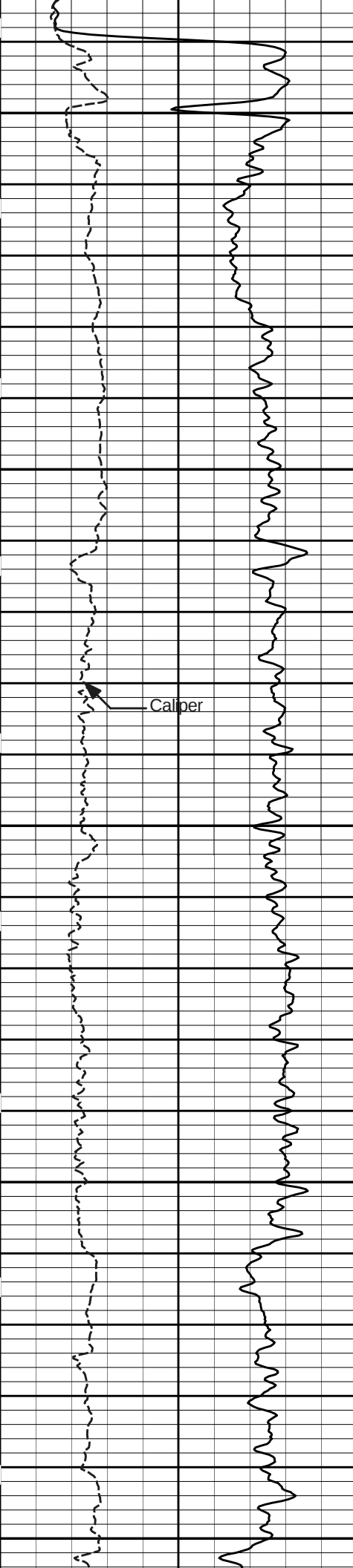
Plot Time: 13-Apr-13 23:43:11
Plot Range: 1790 ft to 5970.08 ft
Data: {ActiveWell}\Well Based\DAQ-0001-0031
Plot File: \\BSAT\1_BSAT_5_main.x

5 INCH MAIN LOG

Plot Time: 13-Apr-13 23:43:11
Plot Range: 5100 ft to 5971.33 ft
Data: {ActiveWell}\Well Based\DAQ-0001-002\
Plot File: \\BSAT\1_BSAT_5_rptx

REPEAT SECTION





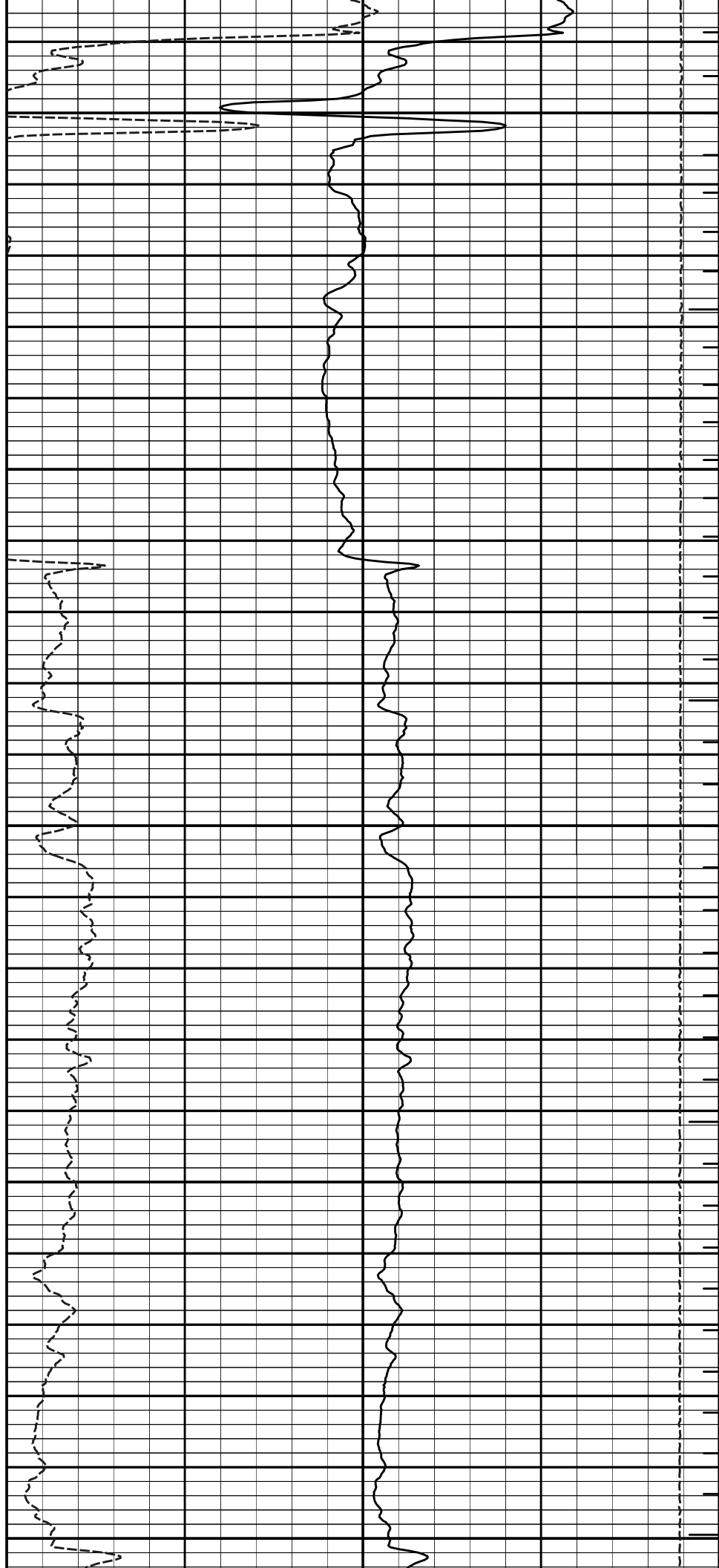
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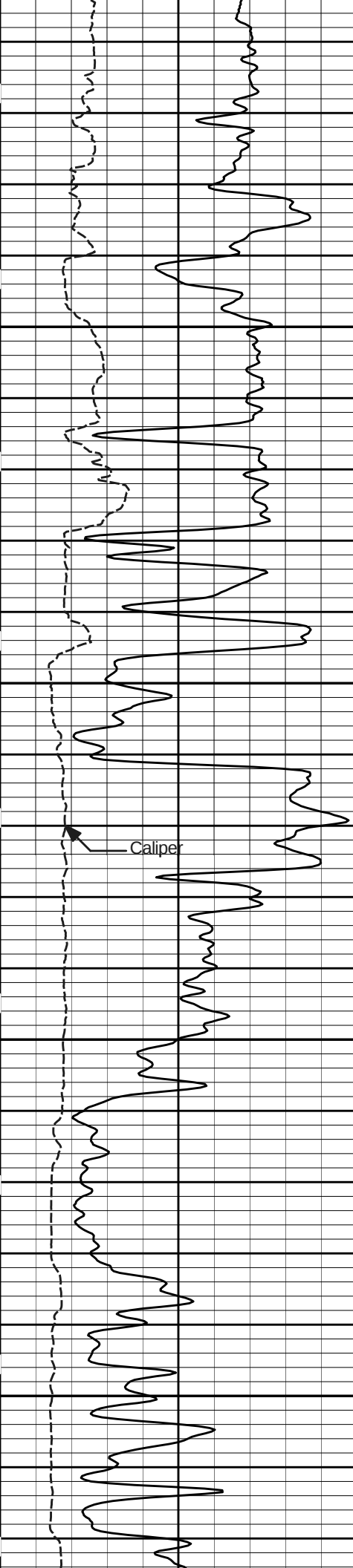
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5350

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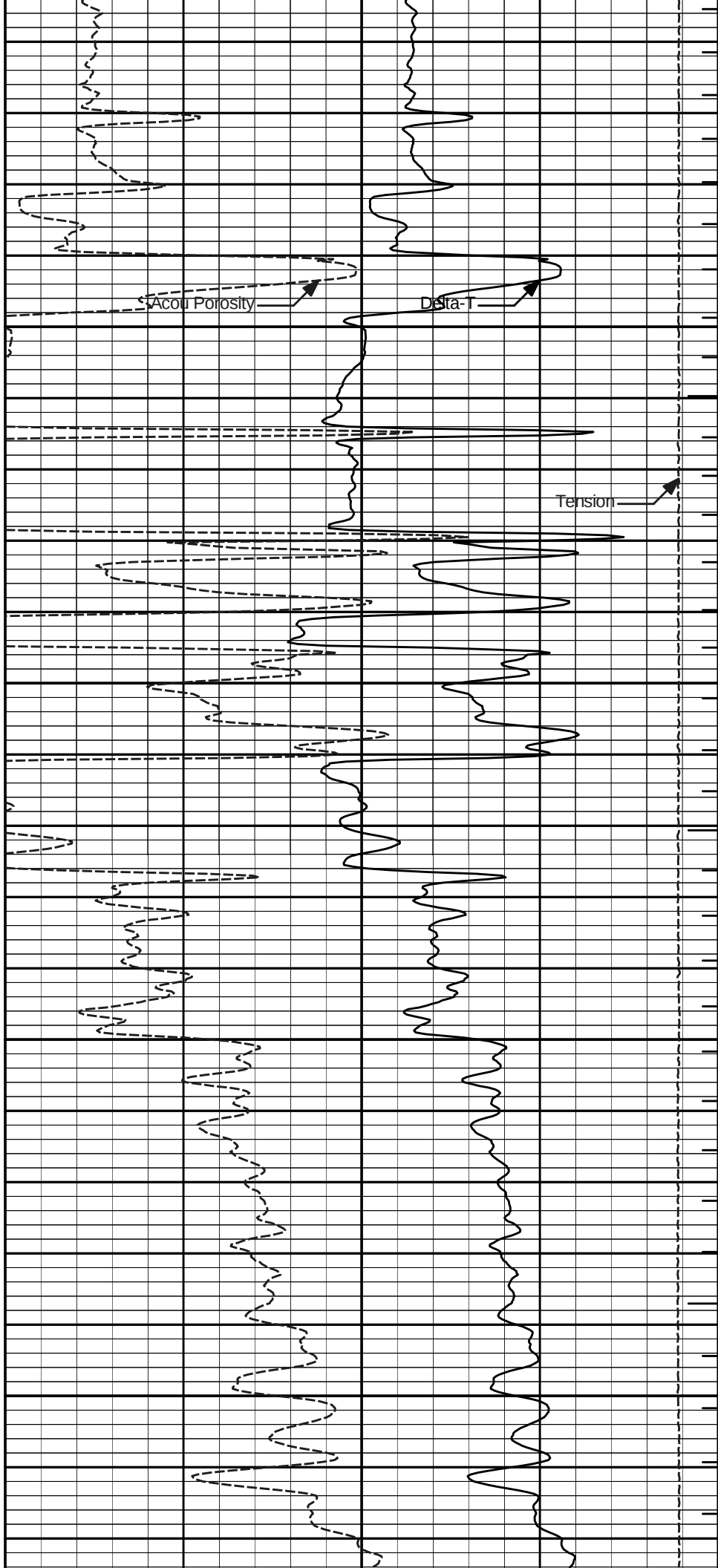


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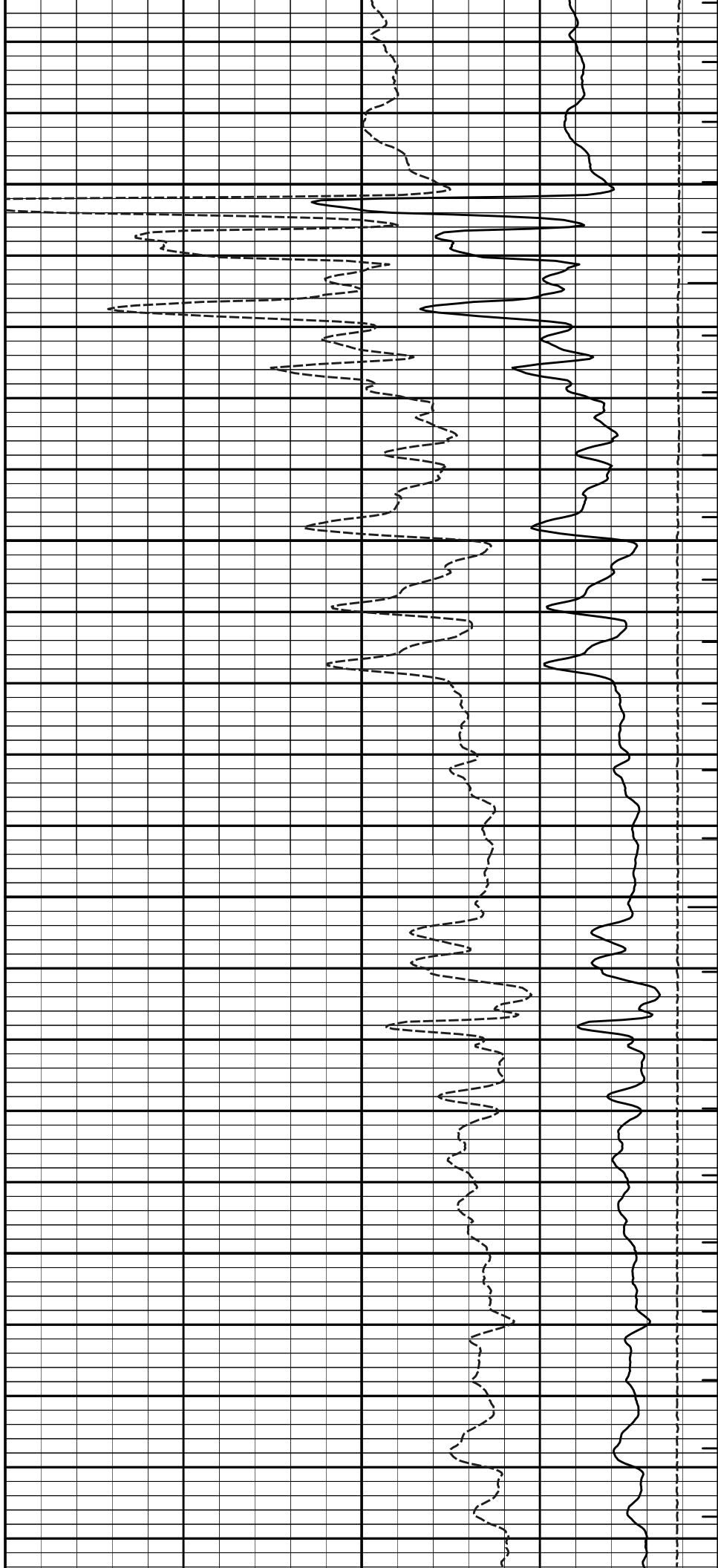
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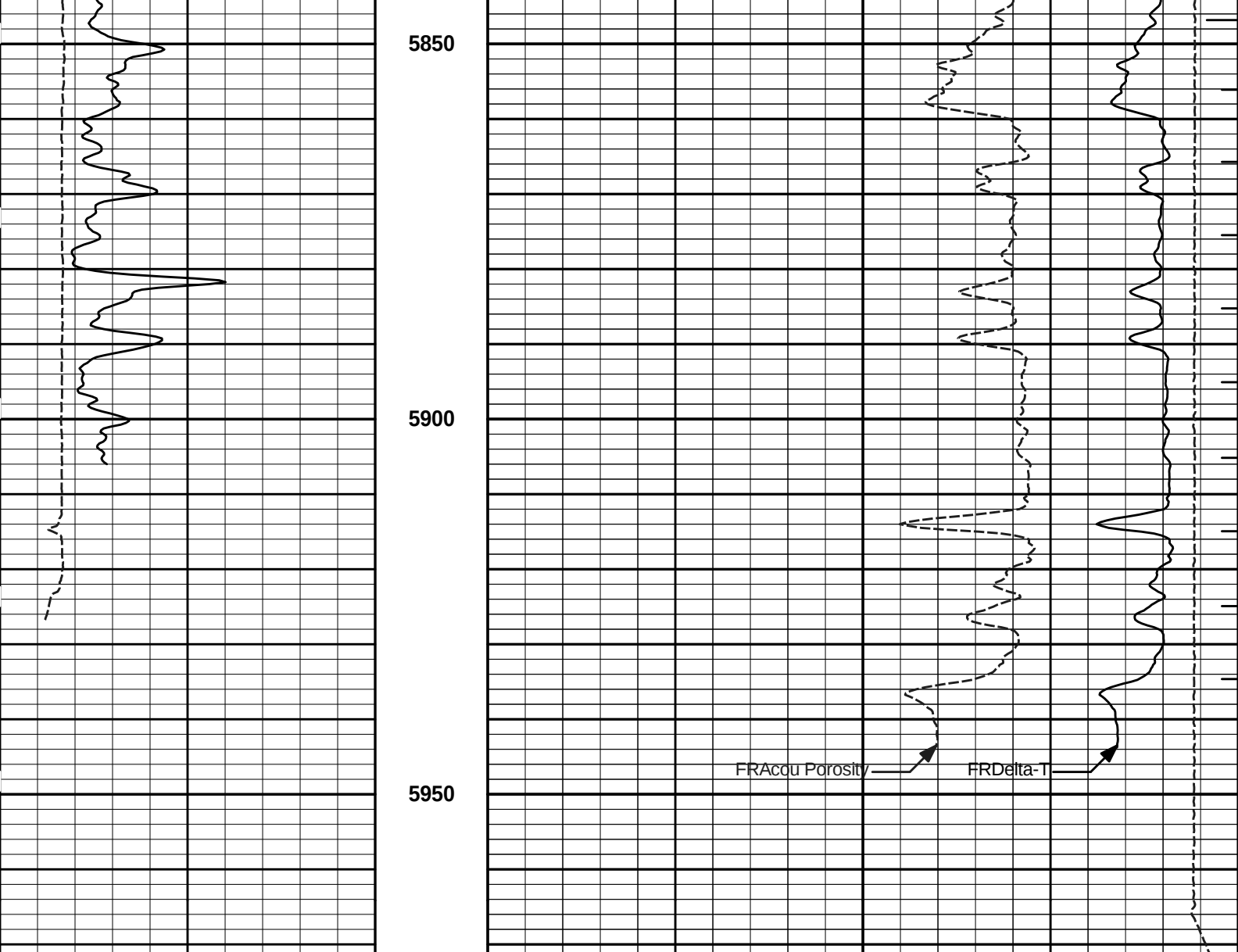
5700

5750

5800

Caliper





0	Gamma API	150	1 : 240 ft		15K	Tension	0	
	api				pounds			
6	Caliper	16			ITTT			┐
	inches							
				140	Delta-T			40
				microsec per ft				
				30	Acou Porosity			-10
				percent				

HALLIBURTON

Plot Time: 13-Apr-13 23:43:14
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Data: {ActiveWell}\Well Based\DAQ-0001-002\
Plot File: \\BSAT\1_BSAT_5_rptx

REPEAT SECTION

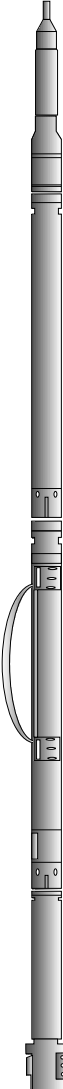
HALLIBURTON

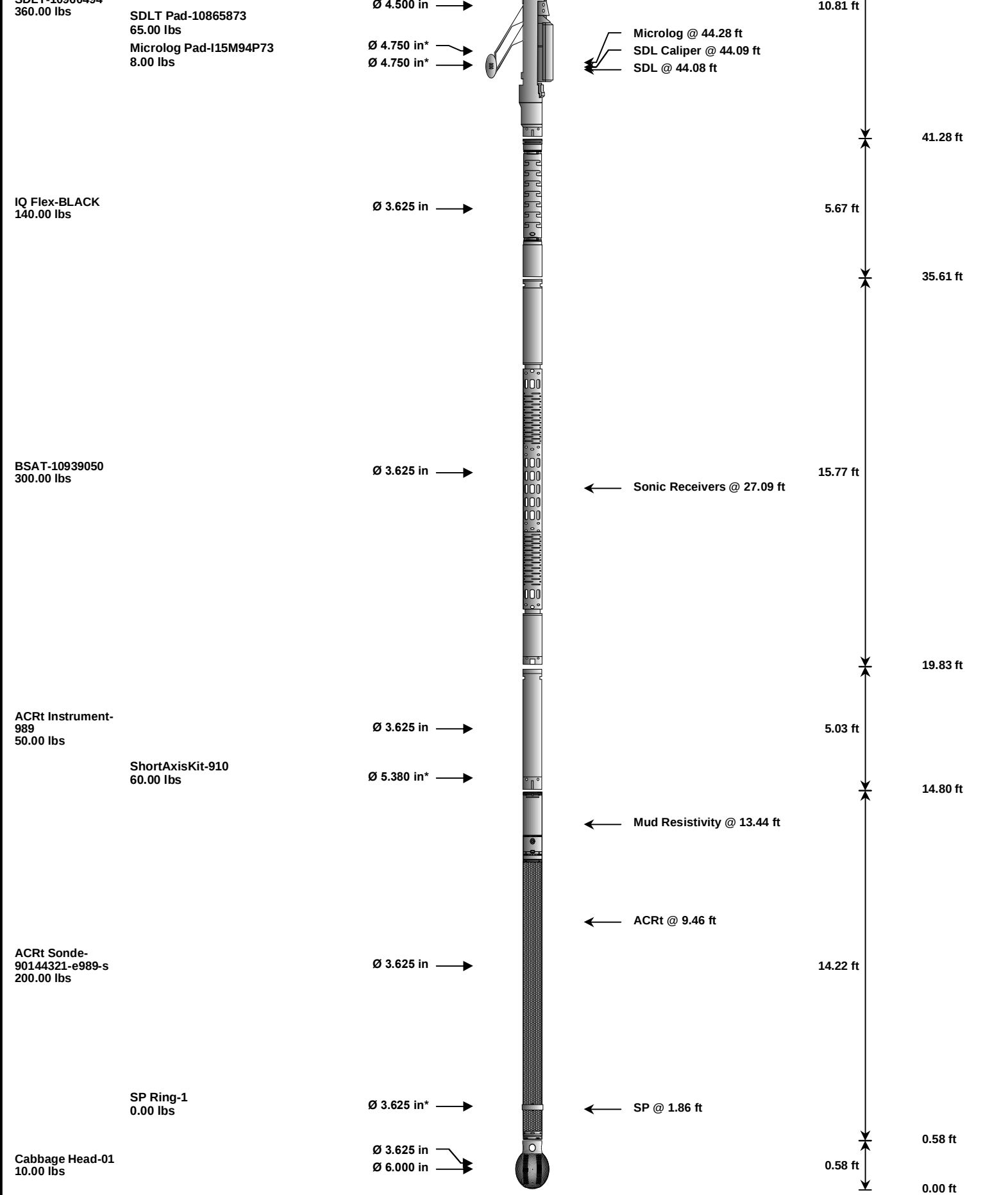
PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
---------------	-----------	----------	-------------	-------	-------

TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.200	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	SHARED	BSAL	Borehole salinity	2000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	6000.00	ft
	SHARED	BHT	Bottom Hole Temperature	110.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DSNO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	Temperature Correction Type	None	
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	SHCO	View More Correction Options	No	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	
	DSNT	LHWT	Logging Horizontal Water Tank?	No	
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	No	
	SDLT Pad	CB	Logging Calibration Blocks?	No	
	SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
	SDLT Pad	DTWN	Disable temperature warning	No	
	SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
	SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	BSAT	MBOK	Generate BSAT Results?	Yes	

BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.5	
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
BOTTOM				
Data: EDWARDS_B_110001 BLACK_TRIPLEIDLE				Date: 13-Apr-13 18:27:07

HALLIBURTON						
TOOL STRING DIAGRAM REPORT						
Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
CH_HOS-590_RED 37.50 lbs		Ø 2.750 in →		← Temperature @ 73.25 ft	3.03 ft	74.27 ft
XOHD-01 20.00 lbs		Ø 2.750 in → Ø 3.625 in →			0.95 ft	71.25 ft
						70.30 ft
GTET-11013113 165.00 lbs		Ø 3.625 in →		← GammaRay @ 64.23 ft	8.52 ft	
						61.78 ft
DSN Decentralizer-10993115 6.60 lbs		Ø 5.000 in* → Ø 3.625 in →			9.69 ft	
DSNT-10993115 174.00 lbs				← DSN Far @ 54.84 ft ← DSN Near @ 54.09 ft		52.09 ft
SDI T-10960494						



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	590_RED	37.50	3.03	71.25	300.00
XOHD	Hostile to Dits Cross Over	01	20.00	0.95	70.30	300.00
GTET	Gamma Telemetry Tool	11013113	165.00	8.52	61.78	60.00
DSNT	Dual Spaced Neutron	10993115	174.00	9.69	52.09	60.00
DCNT	DSN Decentralizer	10993115	6.60	5.13 *	55.42	300.00

SDLT	Spectral Density Tool	10960494	360.00	10.81	41.28	60.00
MICP	Microlog Pad	I15M94P73	8.00	1.00 *	43.78	60.00
SDLP	Density Insite Pad	10865873	65.00	2.55 *	43.49	60.00
IQF	IQ Flex tool	BLACK	140.00	5.67	35.61	300.00
BSAT	Borehole Sonic Array Tool	10939050	300.00	15.77	19.83	60.00
ACRt	Array Compensated True Resistivity Instrument Section	989	50.00	5.03	14.80	300.00
SAK	Short Axis Kit for logging short axis of a borehole.	910	60.00	1.02 *	14.80	300.00
ACRt	Array Compensated True Resistivity Sonde Section	90144321-e989-s	200.00	14.22	0.58	300.00
SP	SP Ring	1	0.00	0.25 *	1.86	300.00
CBHD	Cabbage Head	01	10.00	0.58	0.00	300.00
Total			1,596.10	74.27		
* Not included in Total Length and Length Accumulation.						
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COMPANY	OXY USA INC					
WELL	EDWARDS B-1					
FIELD	BIG BOW WEST					
COUNTY	STANTON	STATE	KANSAS			
HALLIBURTON			BORE HOLE COMPENSATED SONIC LOG			