

HALLIBURTON

BOREHOLE COMPENSATED SONIC ARRAY LOG

COMPANY										OXY USA INC.									
WELL										WIGGAINS 12-10									
FIELD										GOOCH									
COUNTY										STEVENS									
STATE										KANSAS									
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WELL										WIGGAINS 12-10									
FIELD										GOOCH									
COUNTY										STEVENS									
STATE										KANSAS									
API No.										15-189-22785									
Location										1270' FSL & 330' FEL									
Other Services:										MICROLOG DSNT, SDLT ACRT									
Permanent Datum										GL									
Log measured from										KB									
Drilling measured from										KB									
Date										04-Oct-12									
Run No.										ONE									
Depth - Driller										6957.00 ft									
Depth - Logger										6962.0 ft									
Bottom - Logged Interval										6935.0 ft									
Top - Logged Interval										1828.0 ft									
Casing - Driller										8.625 in @ 1828.0 ft									
Casing - Logger										1828.0 ft									
Bit Size										7.875 in @									
Type Fluid in Hole										WATER BASED MUD									
Density										9.4 ppq 47.00 s/qt									
PH										10.30 pH 8.0 cp/m									
Source of Sample										FLOW LINE									
Rm @ Meas. Temperature										0.900 ohmm @ 75.00 degF @									
Rmf @ Meas. Temperature										0.66 ohmm @ 75.00 degF @									
Rmc @ Meas. Temperature										1.150 ohmm @ 75.00 degF @									
Source Rmf										MEASURED MEASURED									
Rm @ BHT										0.50 ohmm @ 139.0 degF @									
Time Since Circulation										9.0 hr									
Time on Bottom										04-Oct-12 03:32									
Max. Rec. Temperature										139.0 degF @ 6962.0 ft @									
Equipment										10546696 LIBERAL									
Recorded By										J. BOLLOW									
Witnessed By										C. WYLLIE									

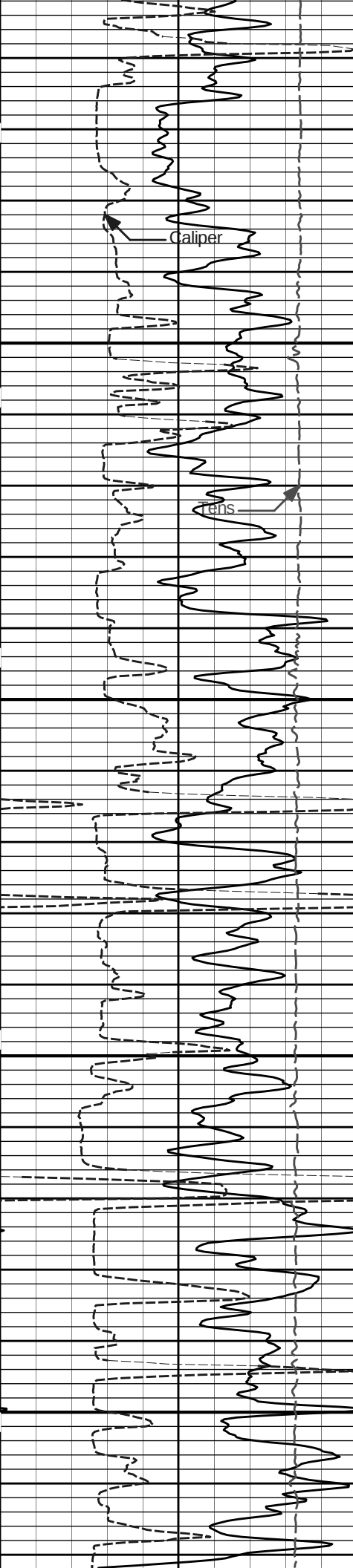
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Service Ticket No.: 9851547						API Serial No.: 15-189-22785						PGM Version: WL INSITE R3.6.0 (Build 3)																	
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE												RESISTIVITY SCALE CHANGES																	
Date		Sample No.										Type 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.		11039640				Serial No.		10747684				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.		GTET				Spacing		0.5'				Log Type						Log Type											
Type		SCINT										Source Type						Source Type											
Length		8'				LSA [Y/N]		NO				Serial No.						Serial No.											
Distance to Source		10'				FWDA [Y/N]		NO				Strength						Strength											

GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	6962	1828	REC	0	150	30	-10	47.6						
DIRECTIONAL INFORMATION														
Maximum Deviation @									KOP @					
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING														
CHLORIDES REPORTED AT 2000 MG/L														
LCM REPORTED AT 12 LB/BBL														
GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION														
TODAY'S CREW: K. KING & B. TERREL														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
HALLIBURTON														

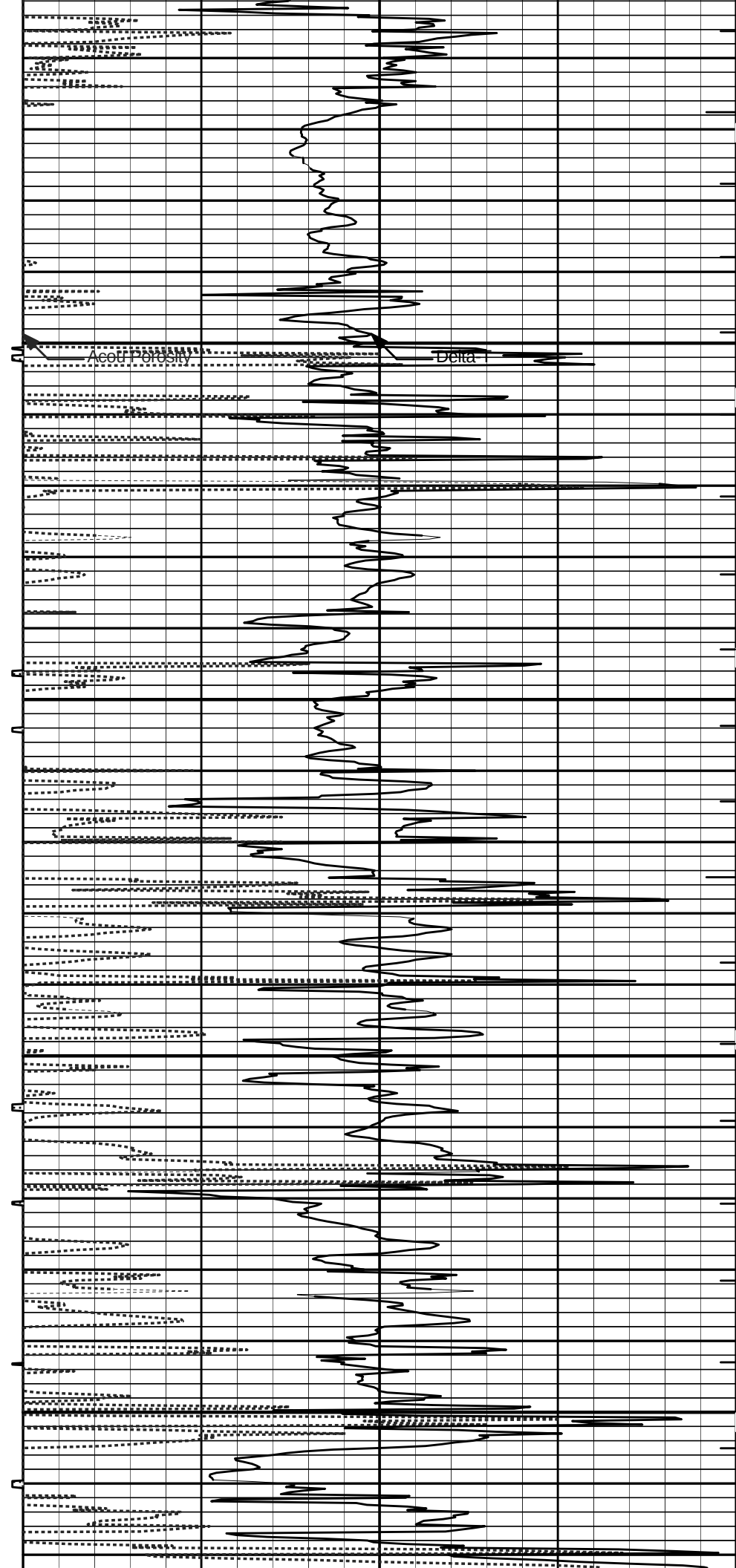
HALLIBURTON

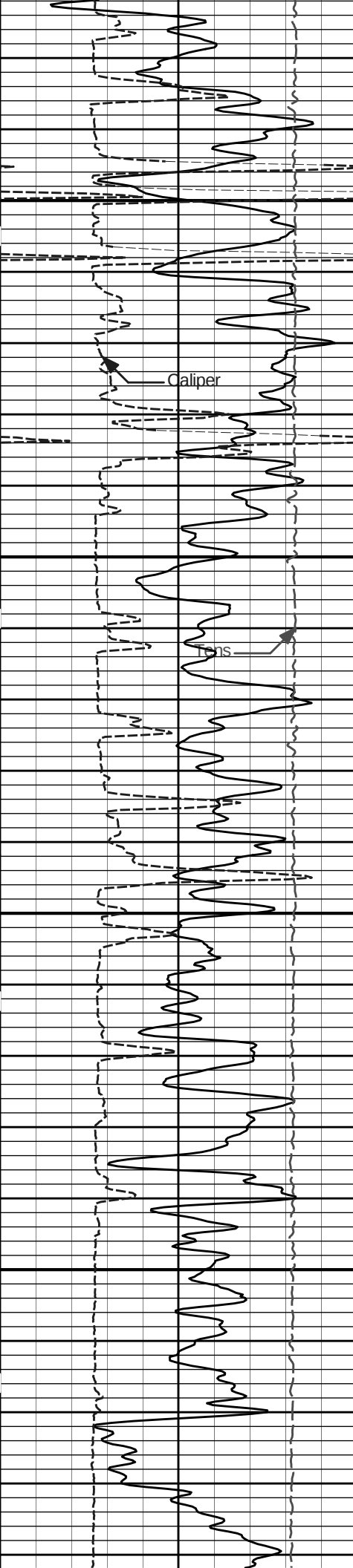
5 INCH MAIN LOG



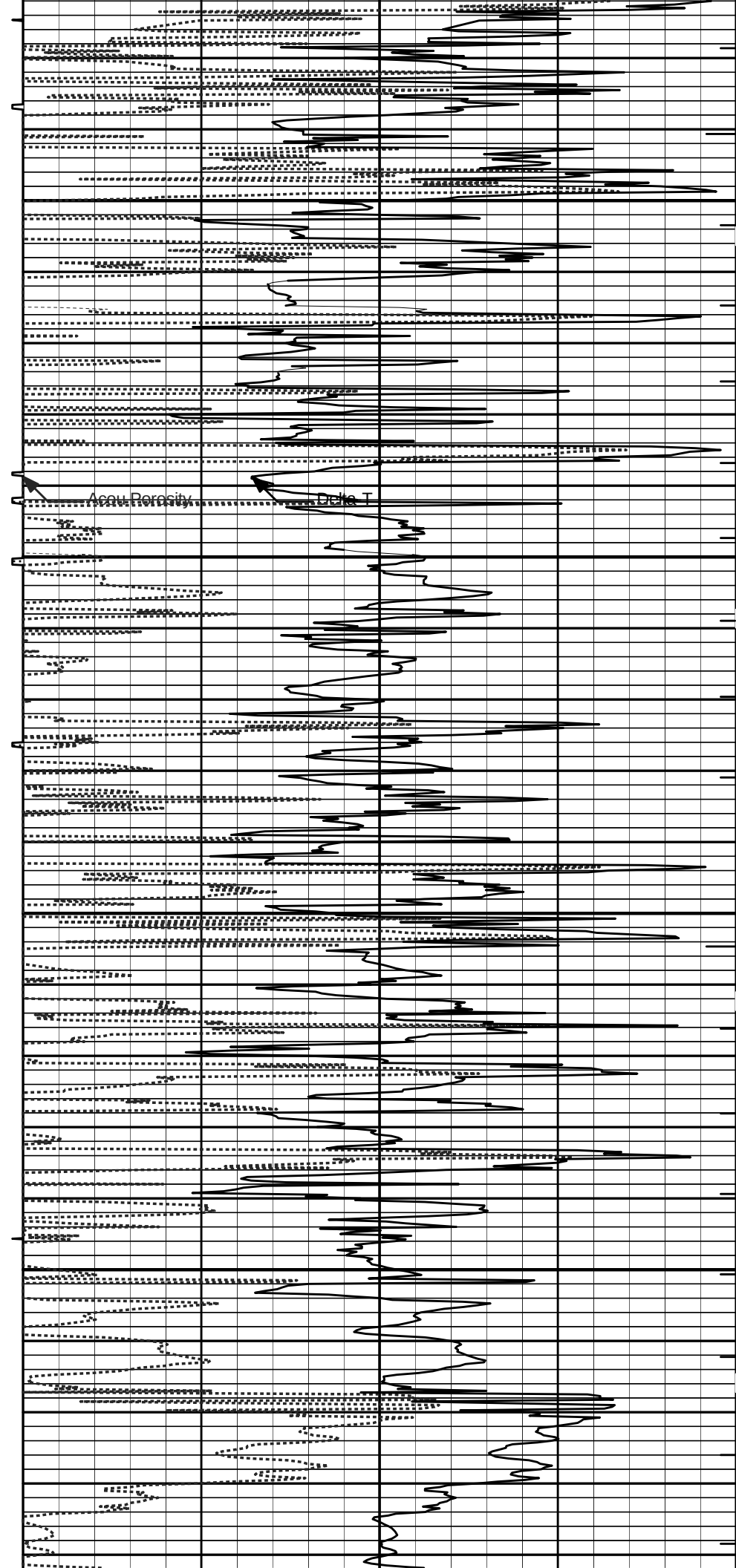
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2000





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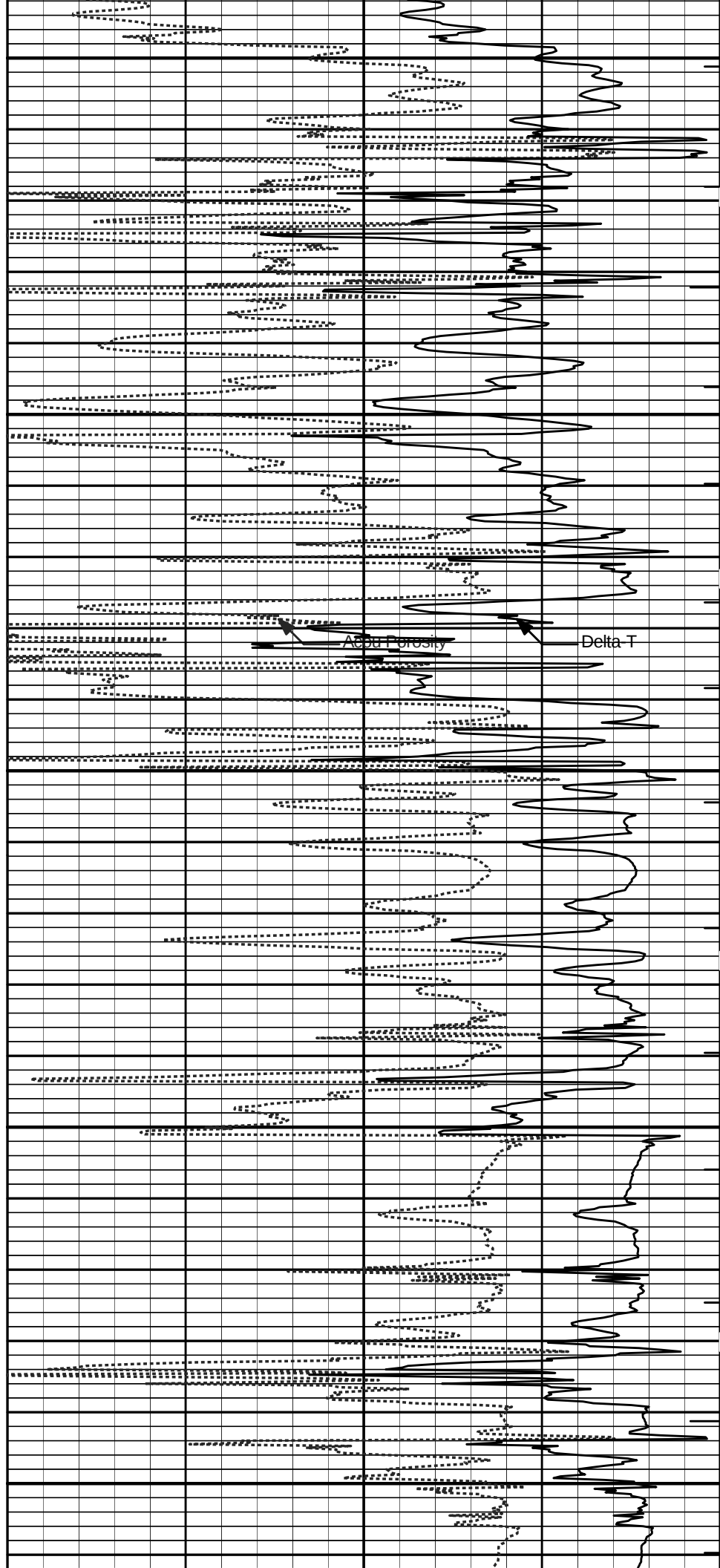
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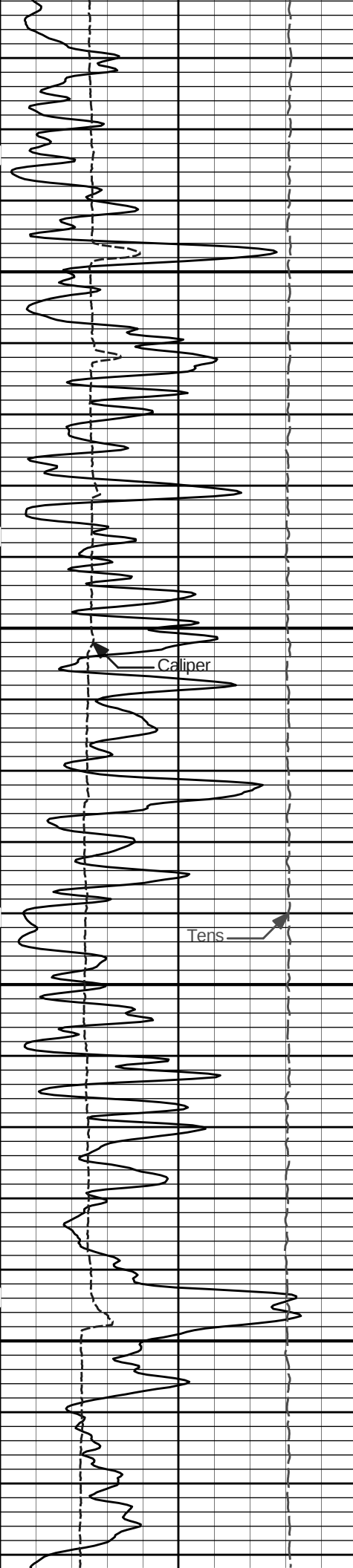


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2400

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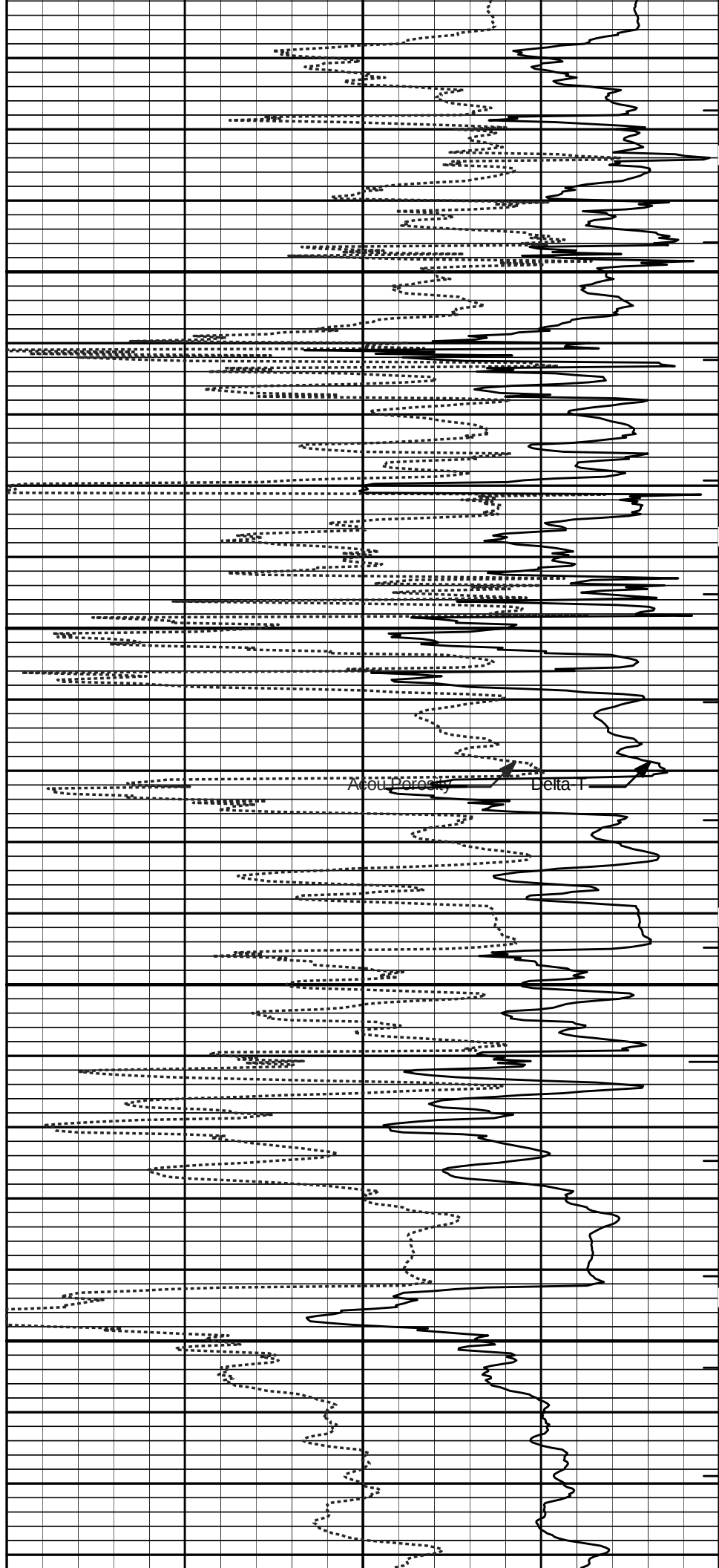


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2700

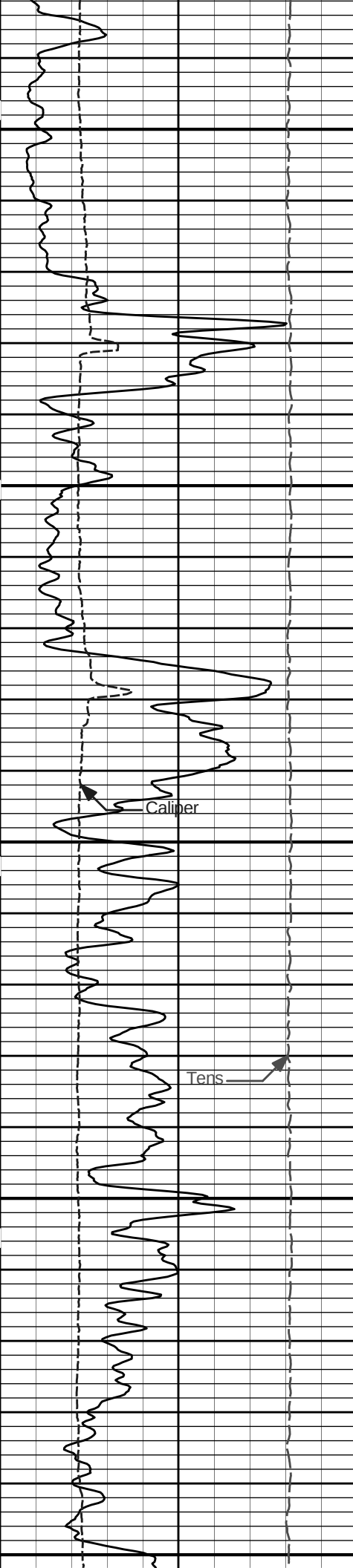
Caliper

Tens



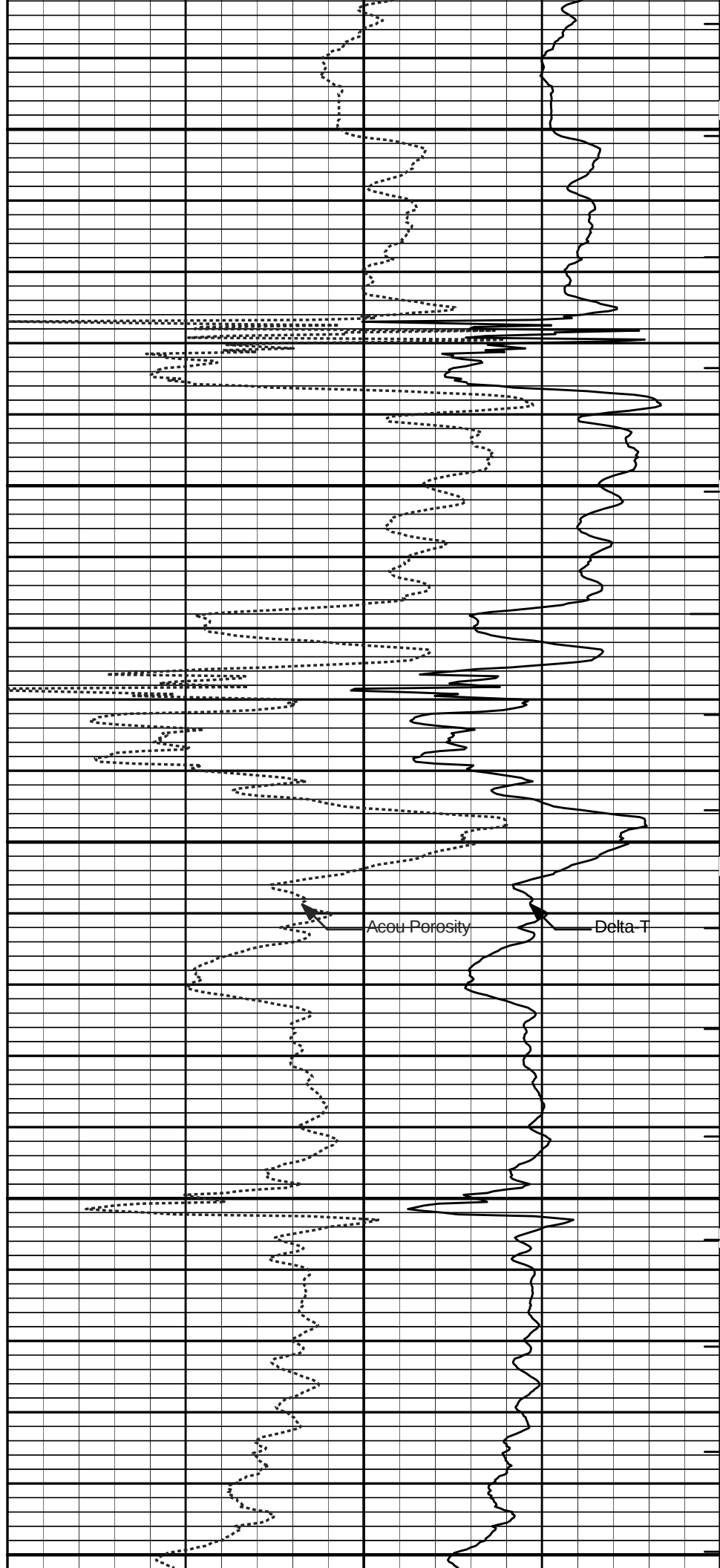
Acoustic

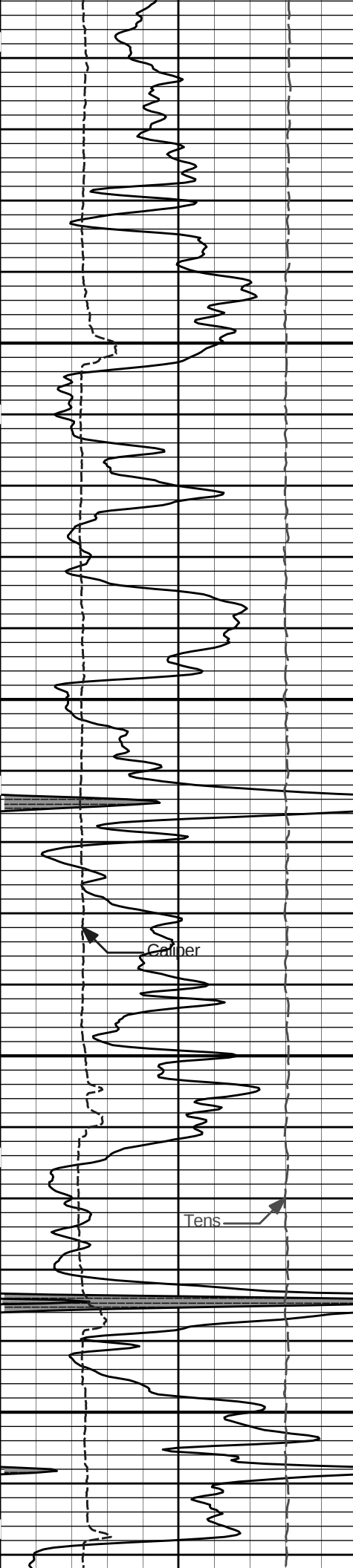
Delta T



2800

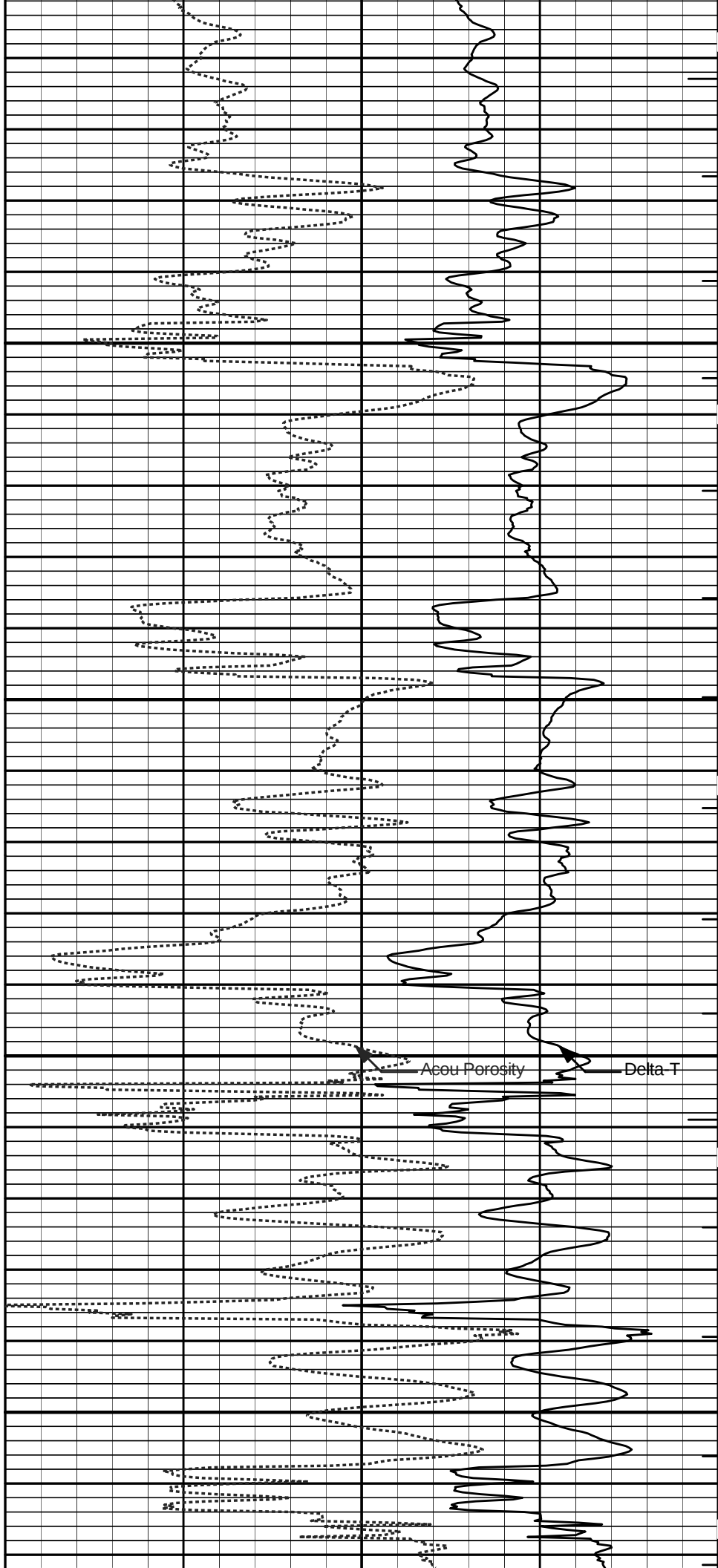
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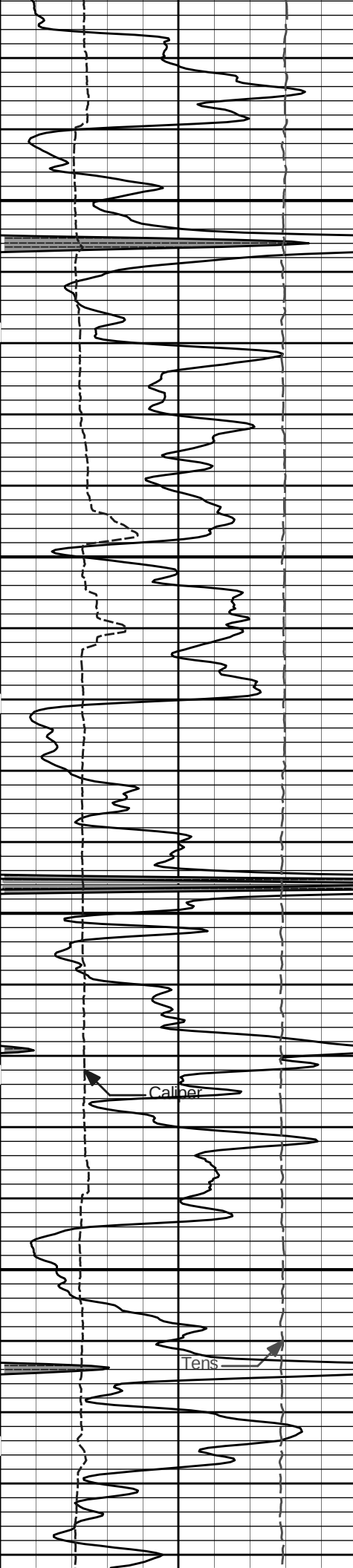




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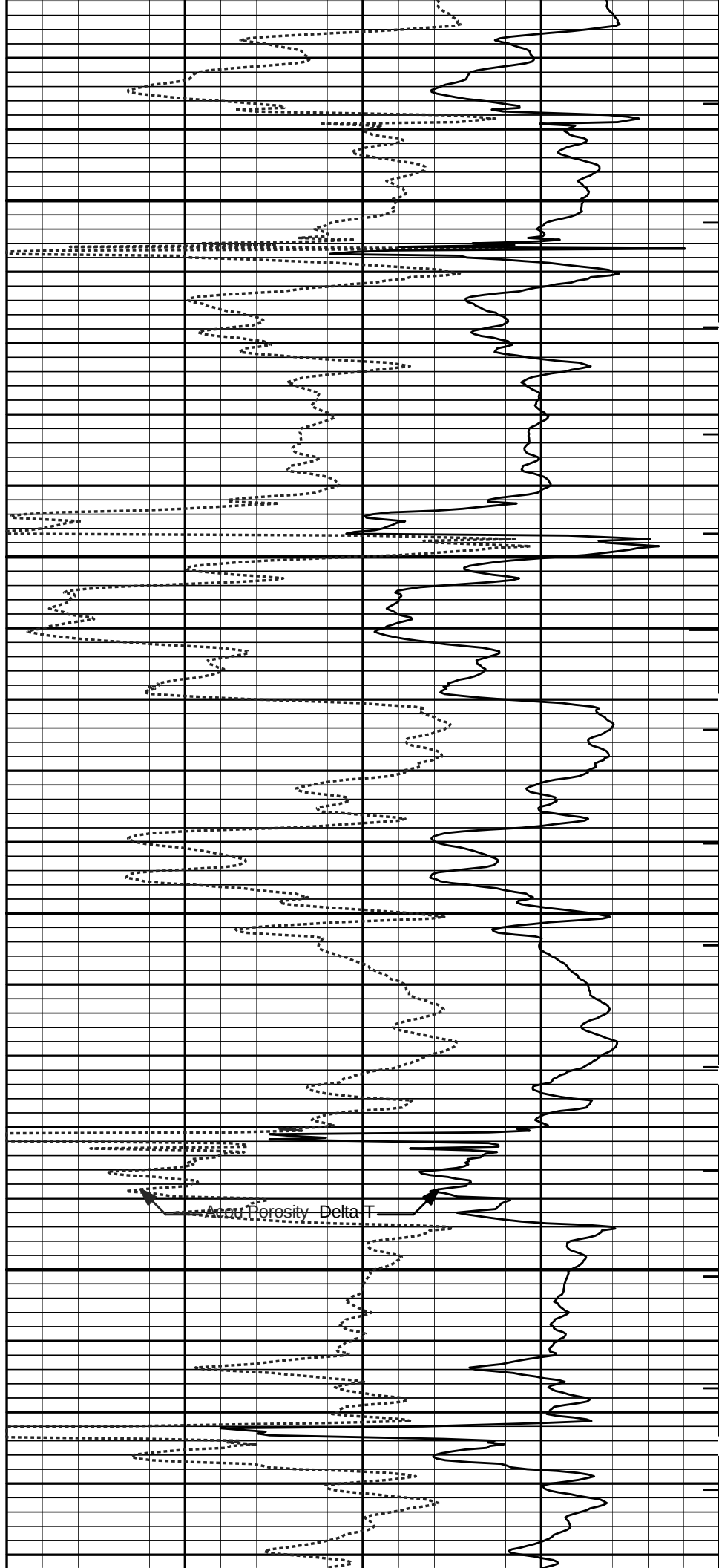
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3300

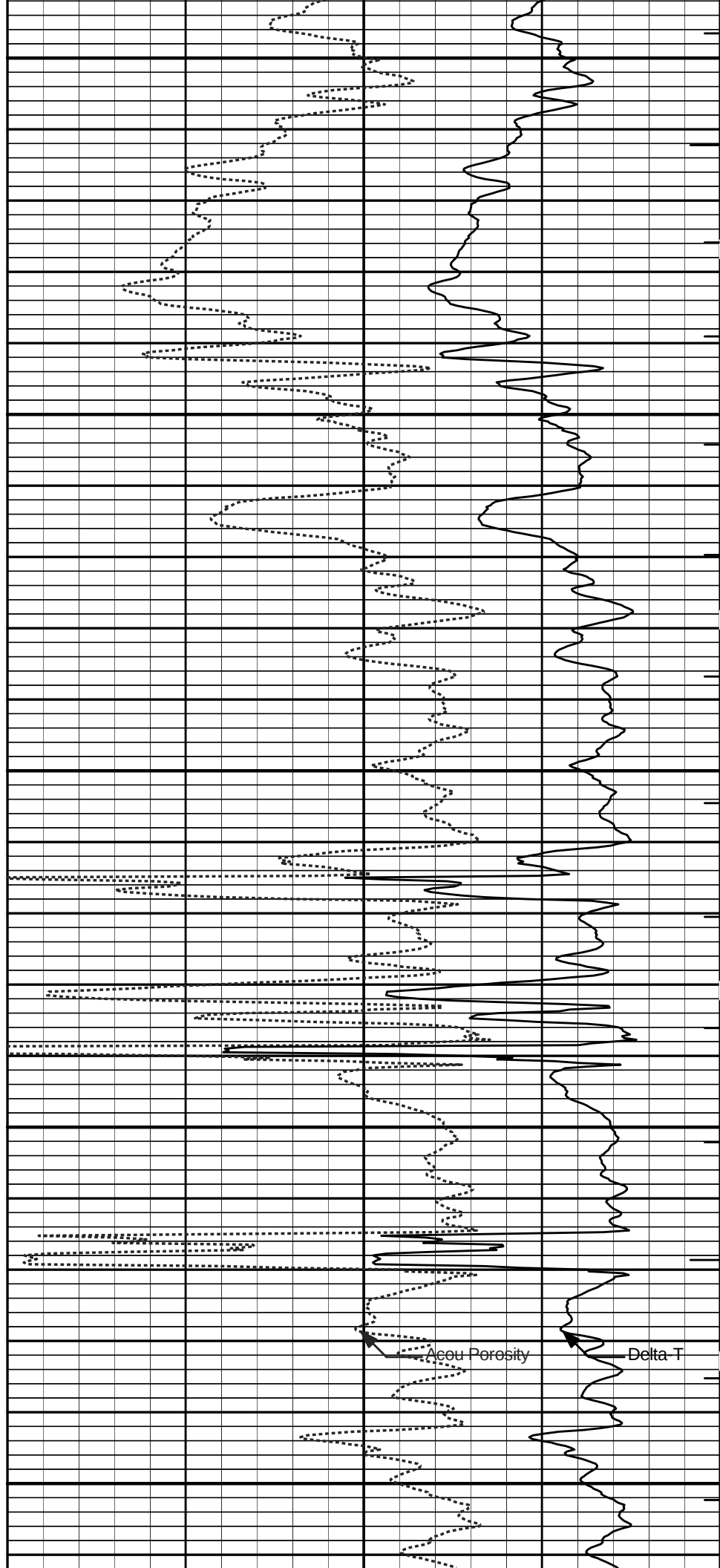


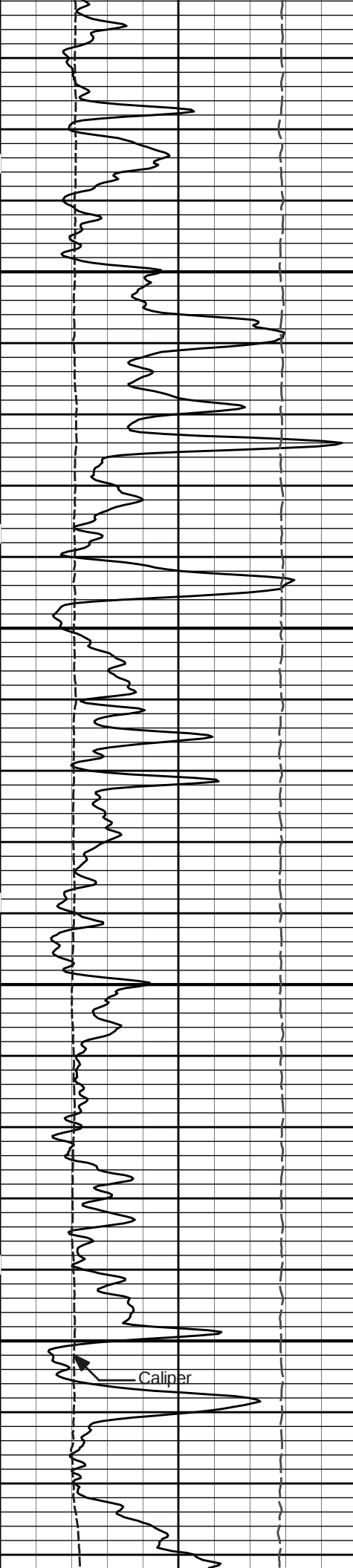


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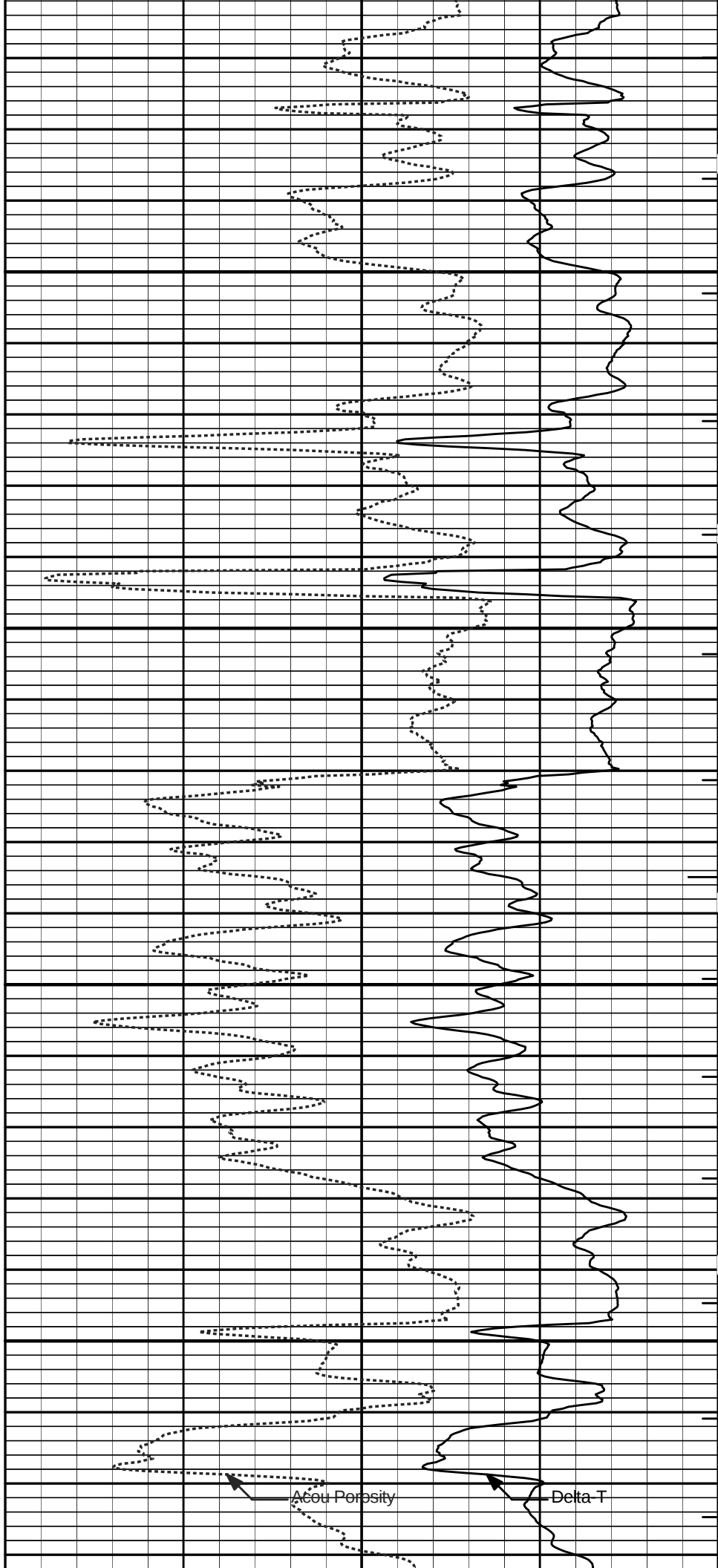
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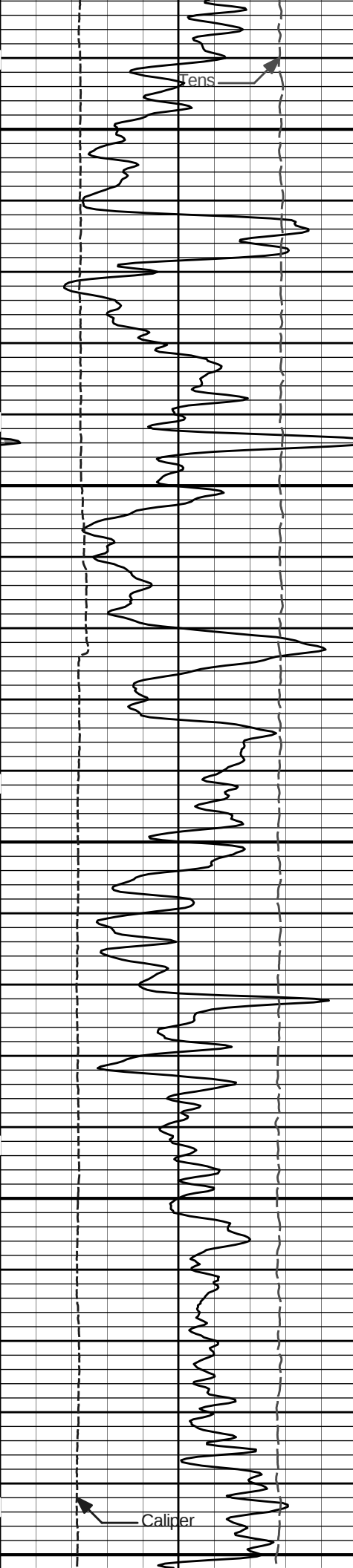
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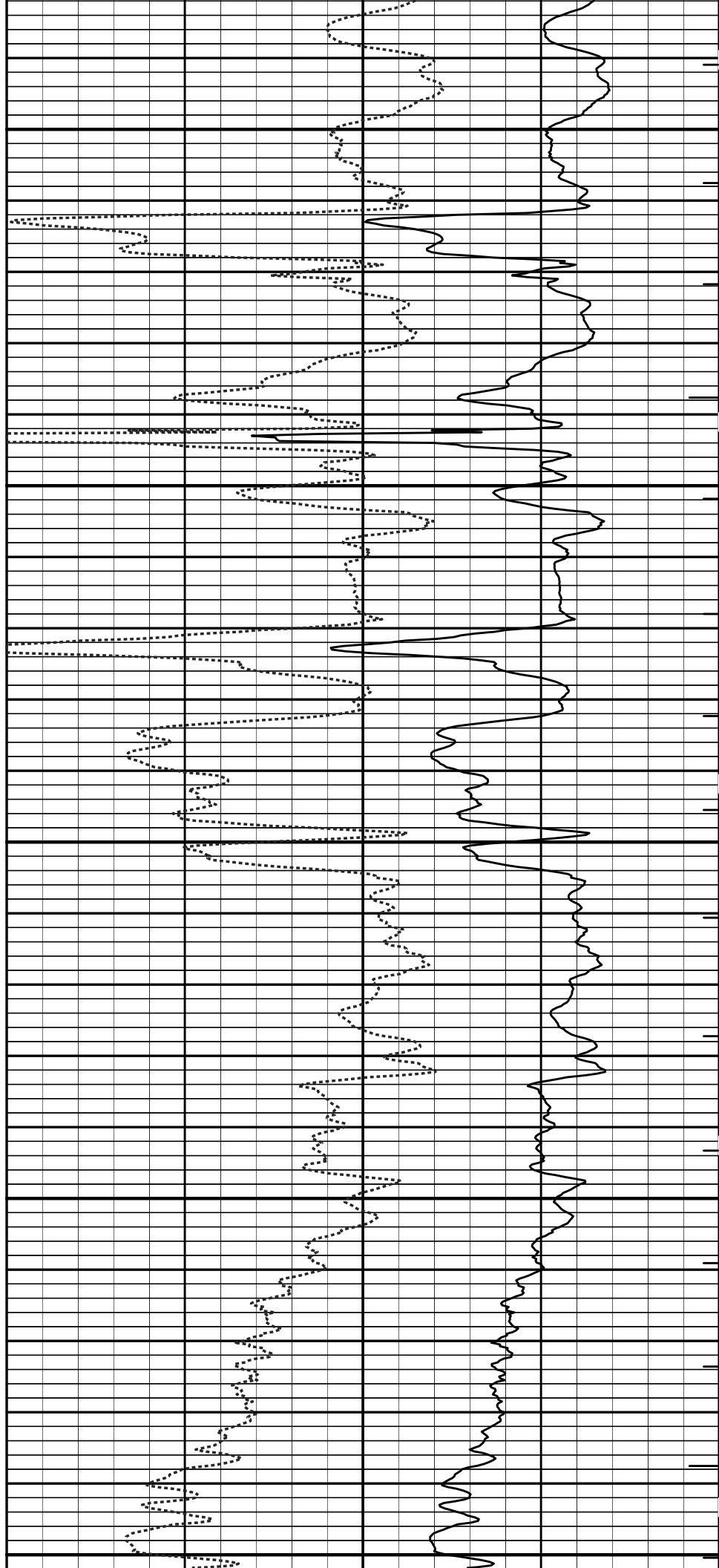
Acou Porosity

Delta T



3900

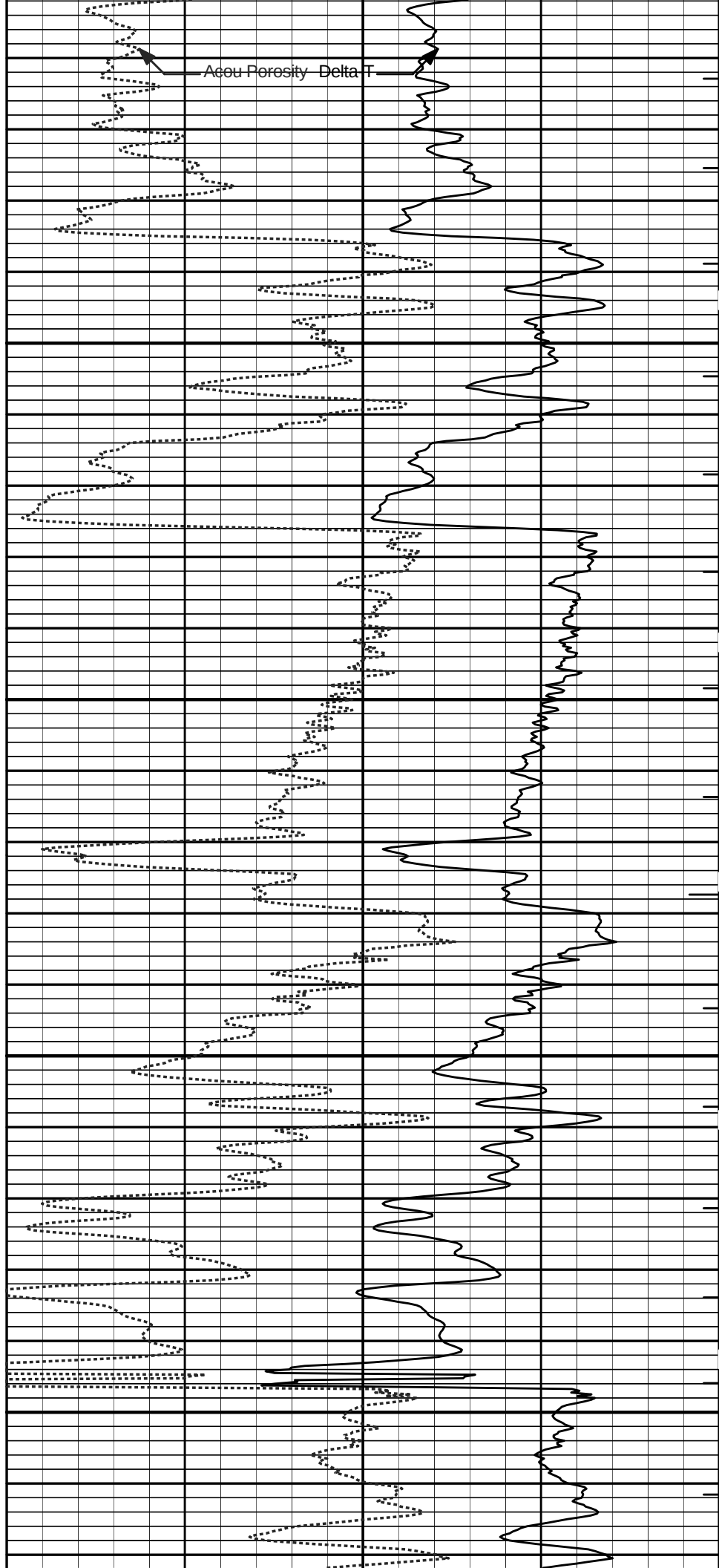
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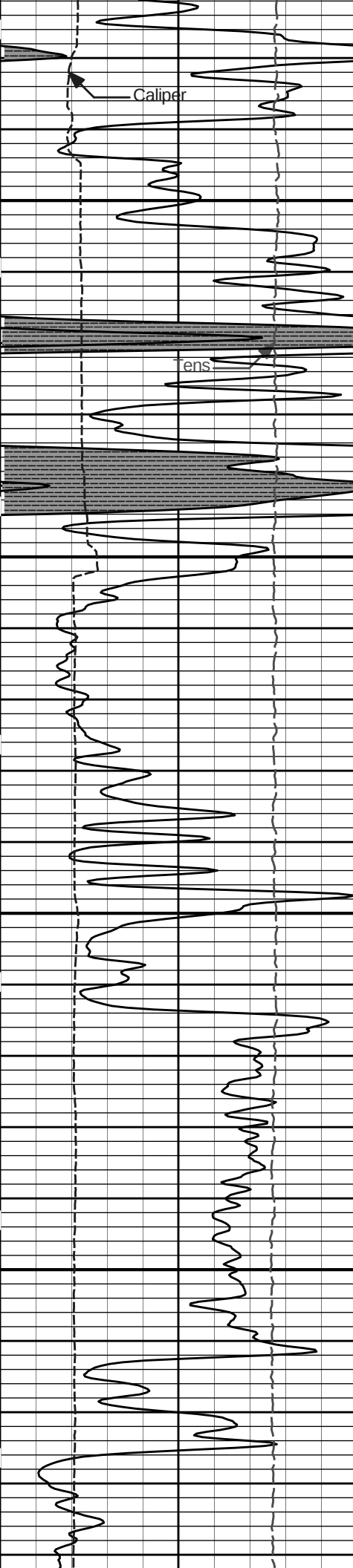




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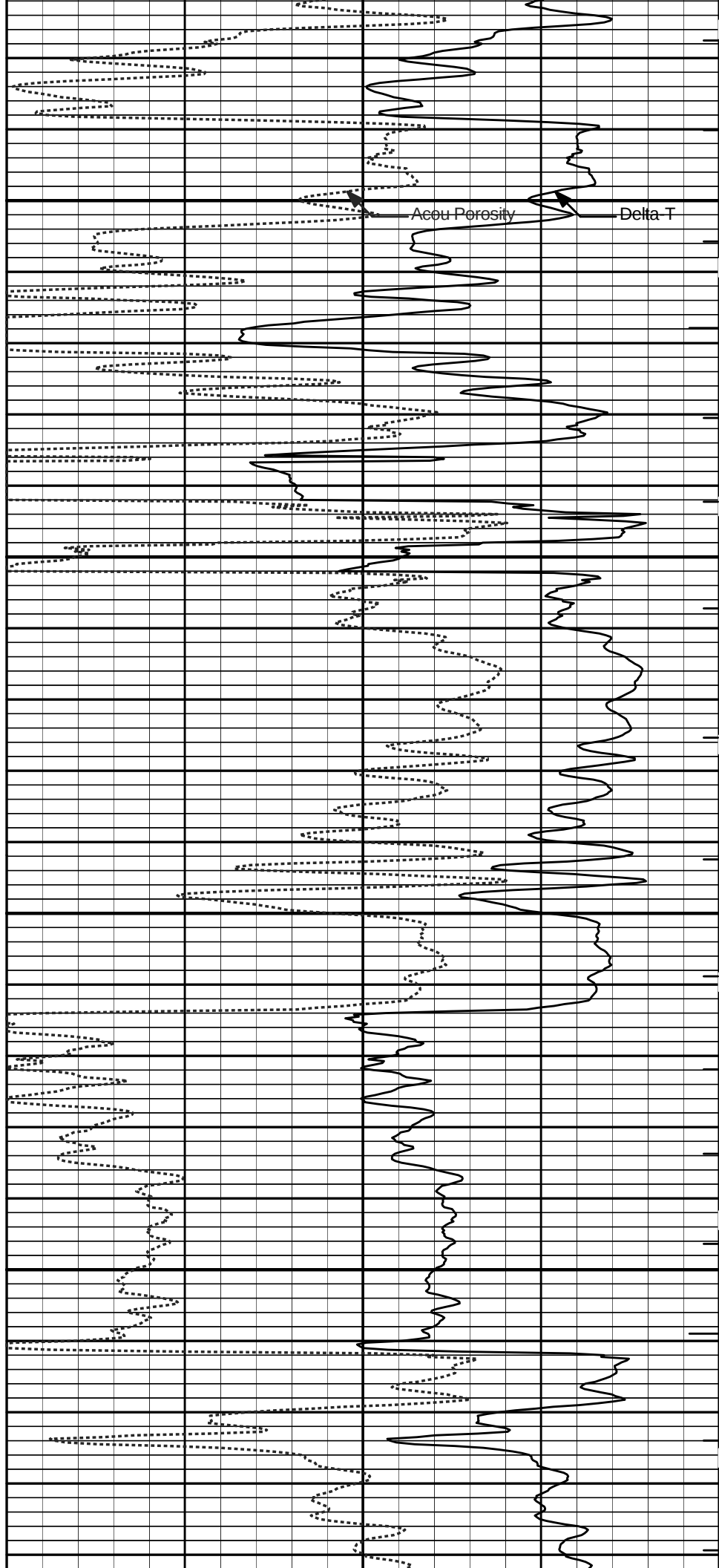
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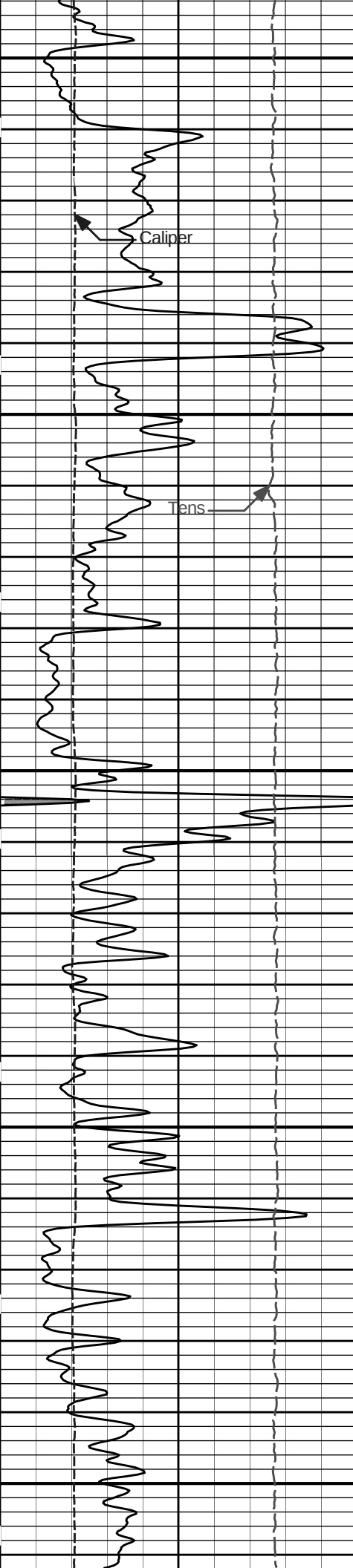




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4400





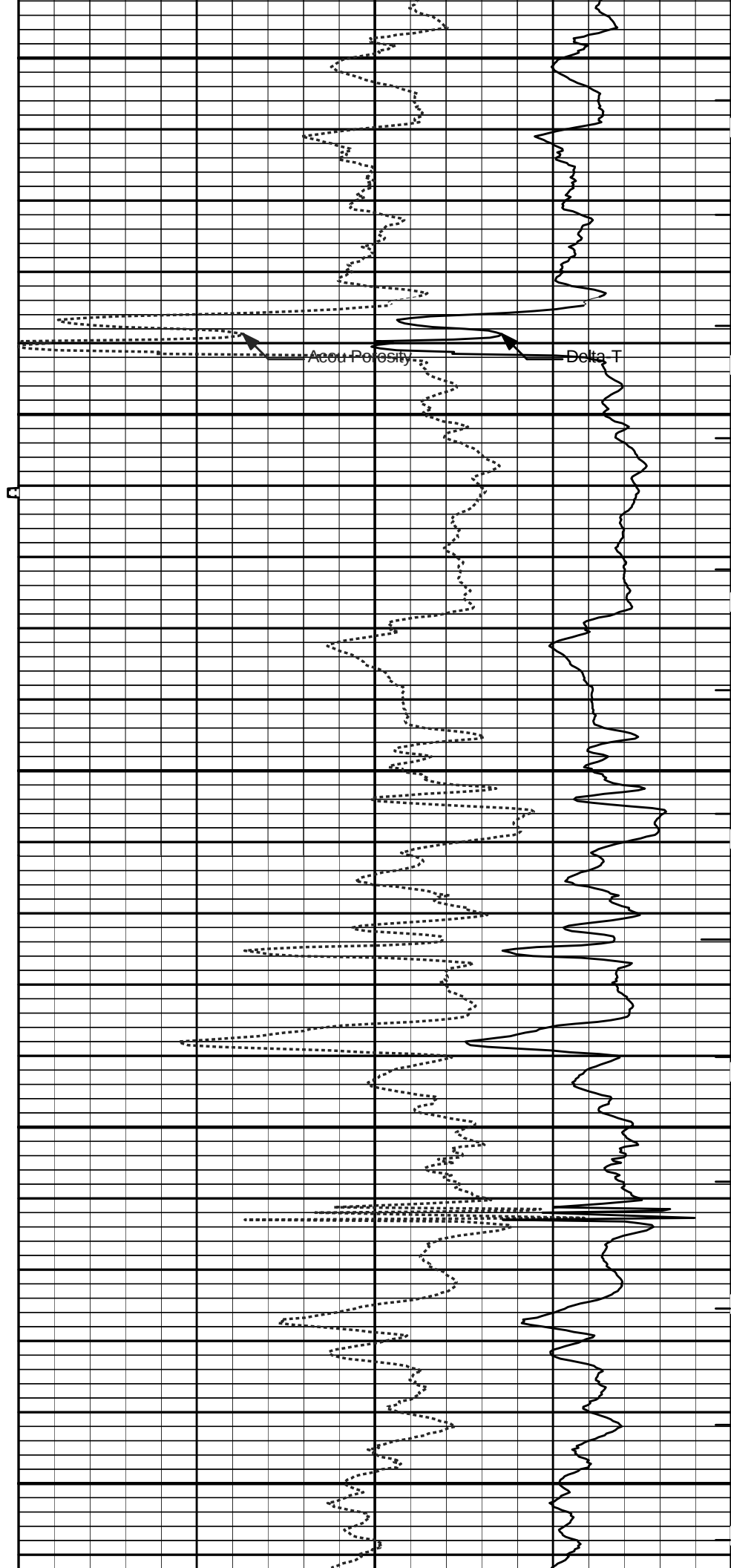
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Caliper

Tens

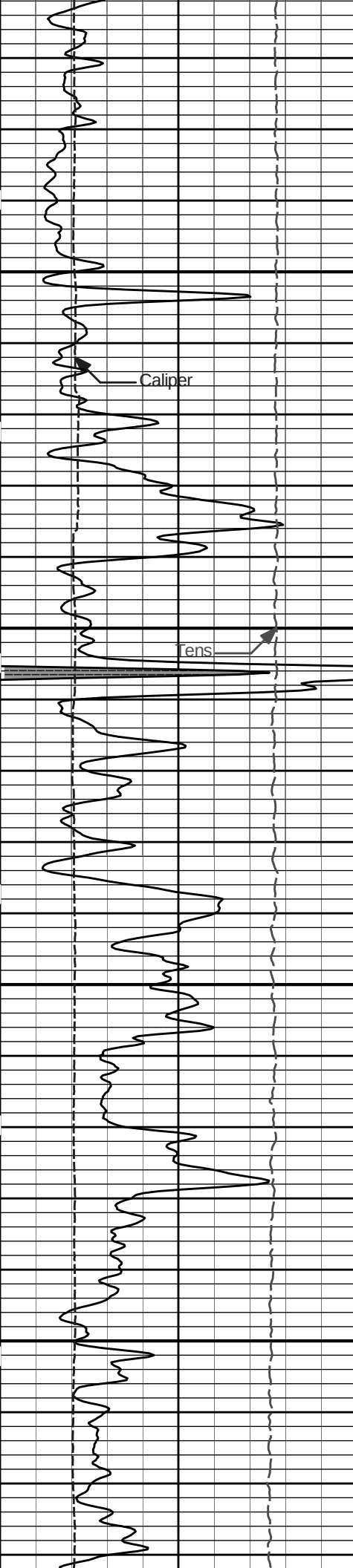
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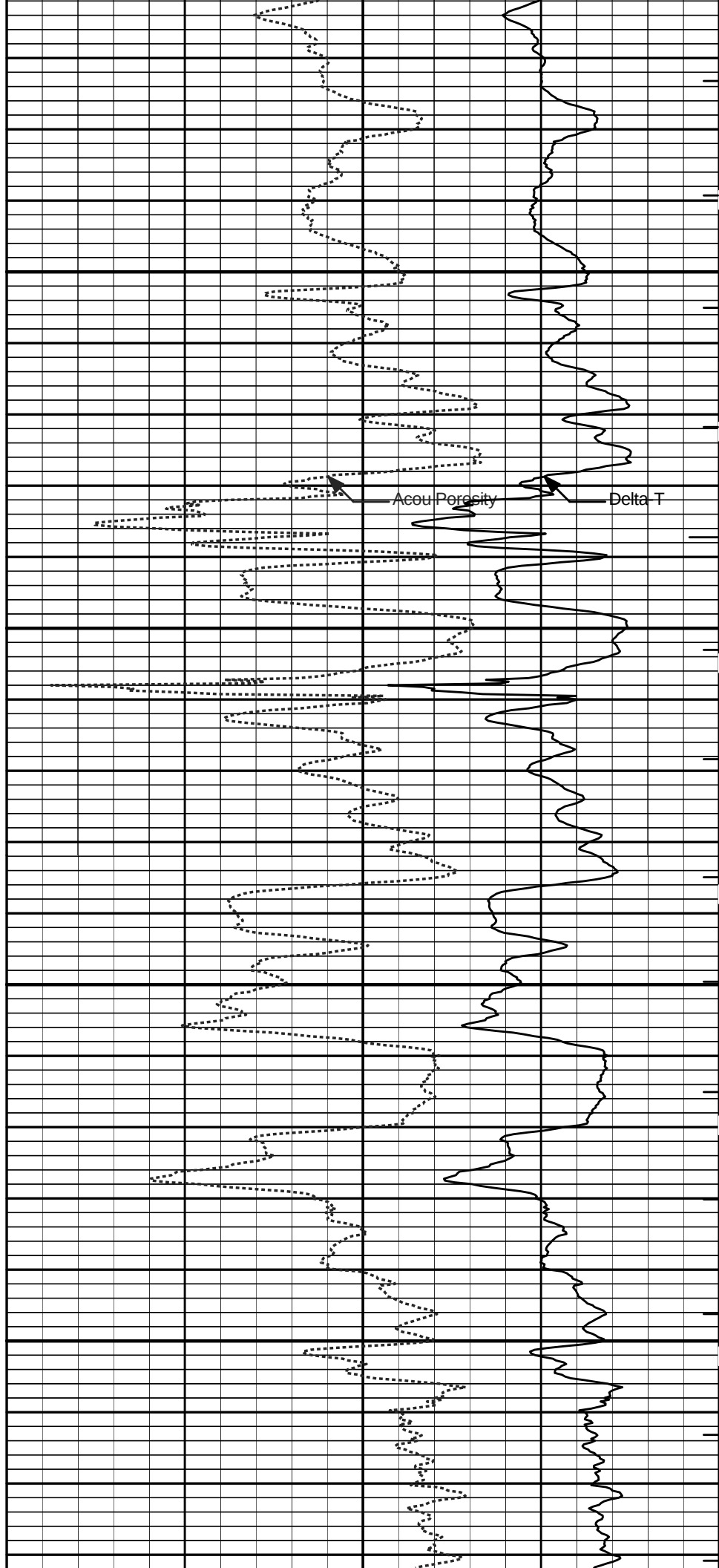
Acoustic Porosity

Delta T



4800

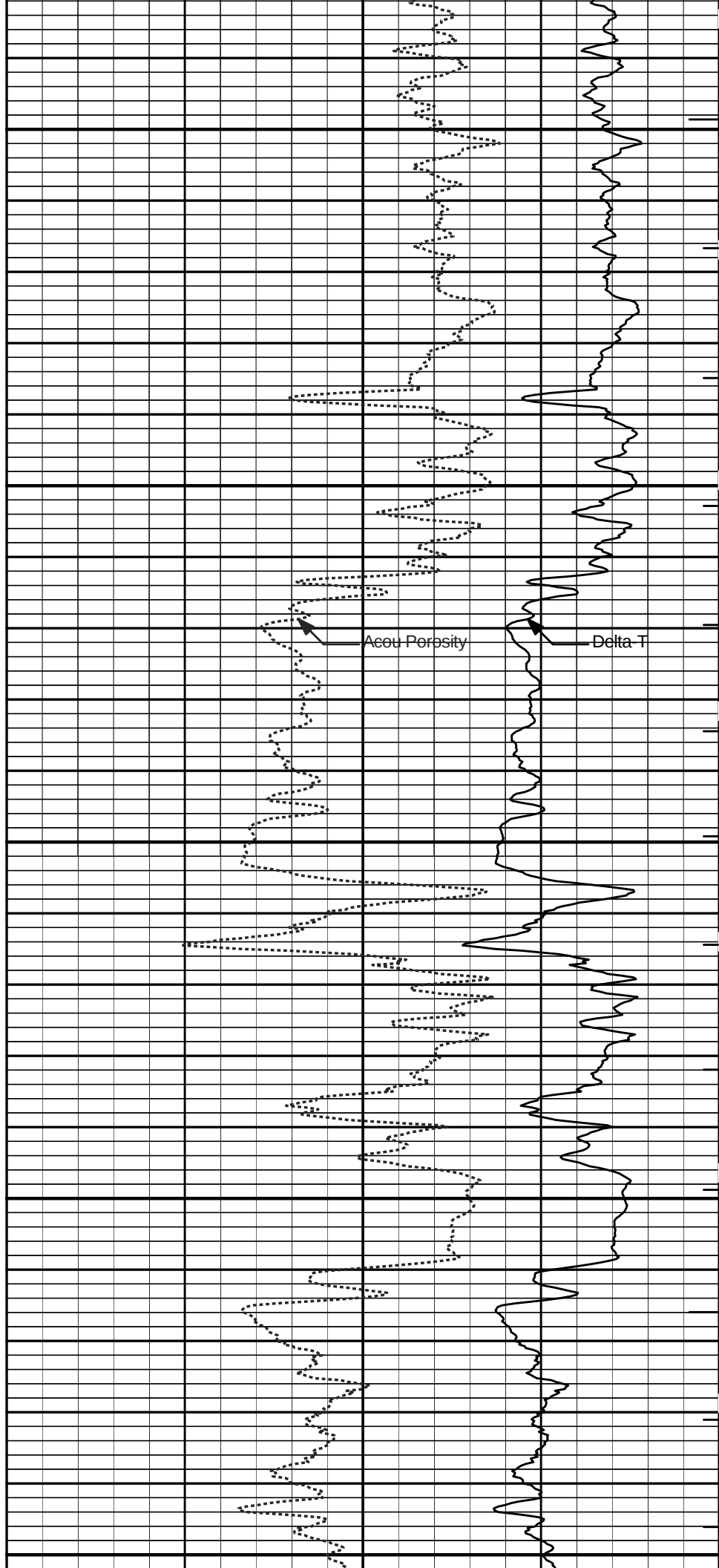
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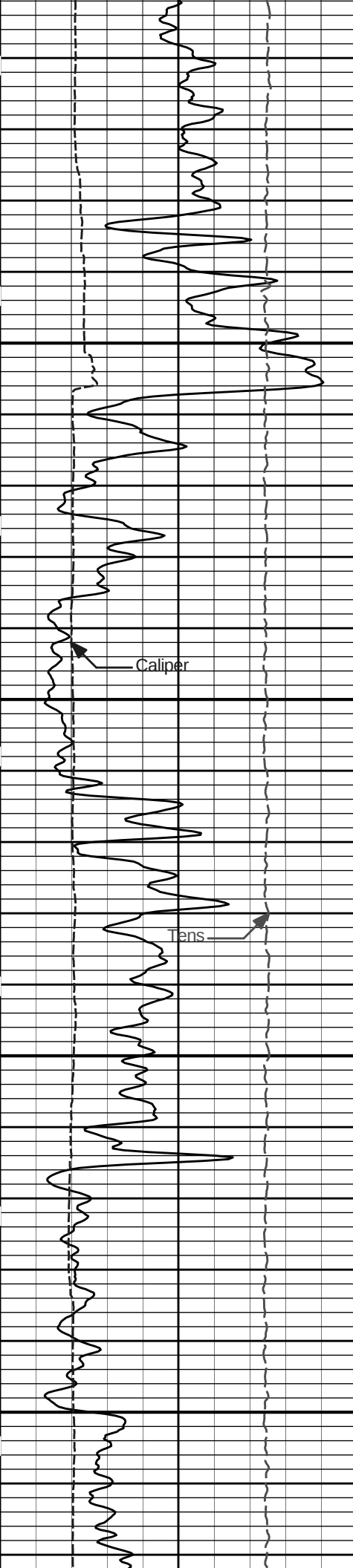




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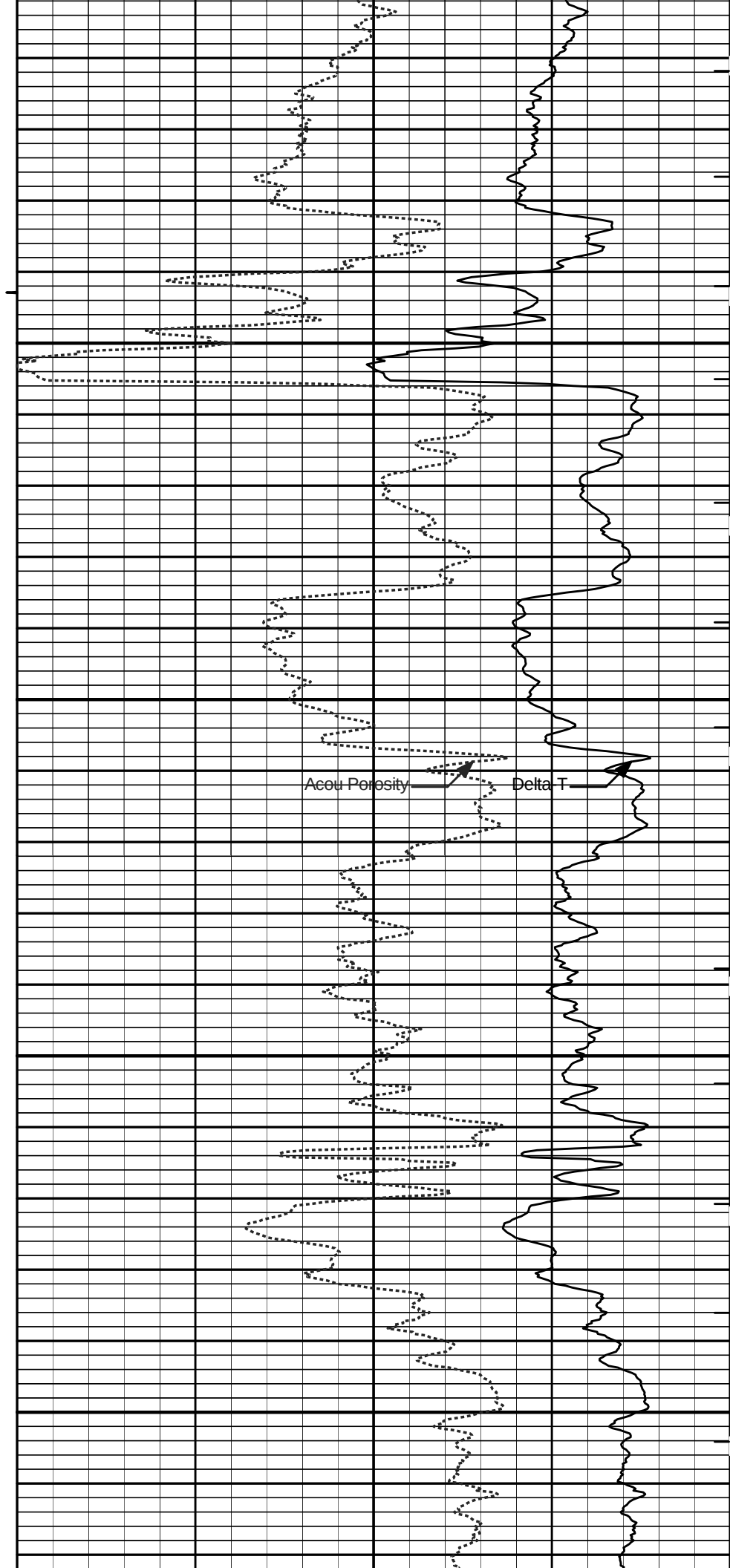
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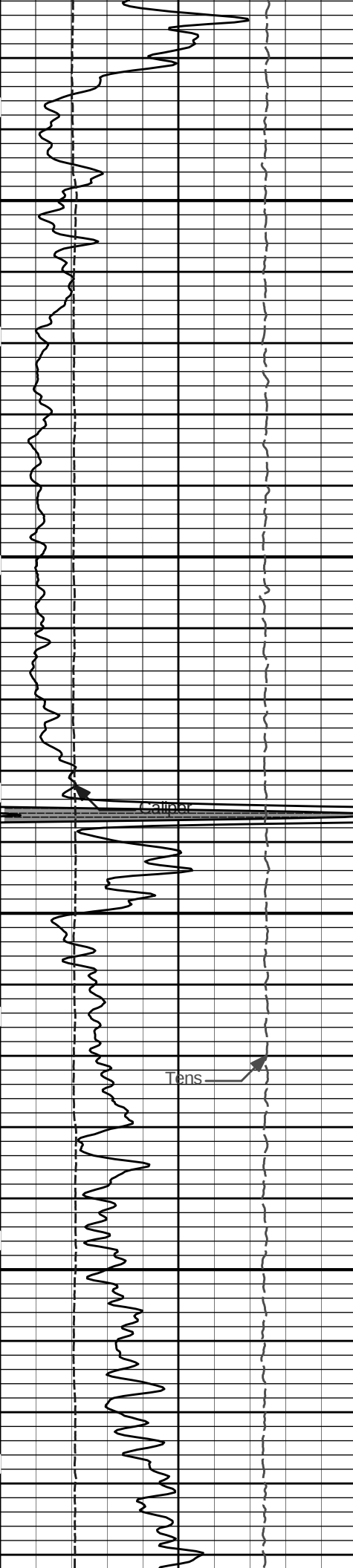




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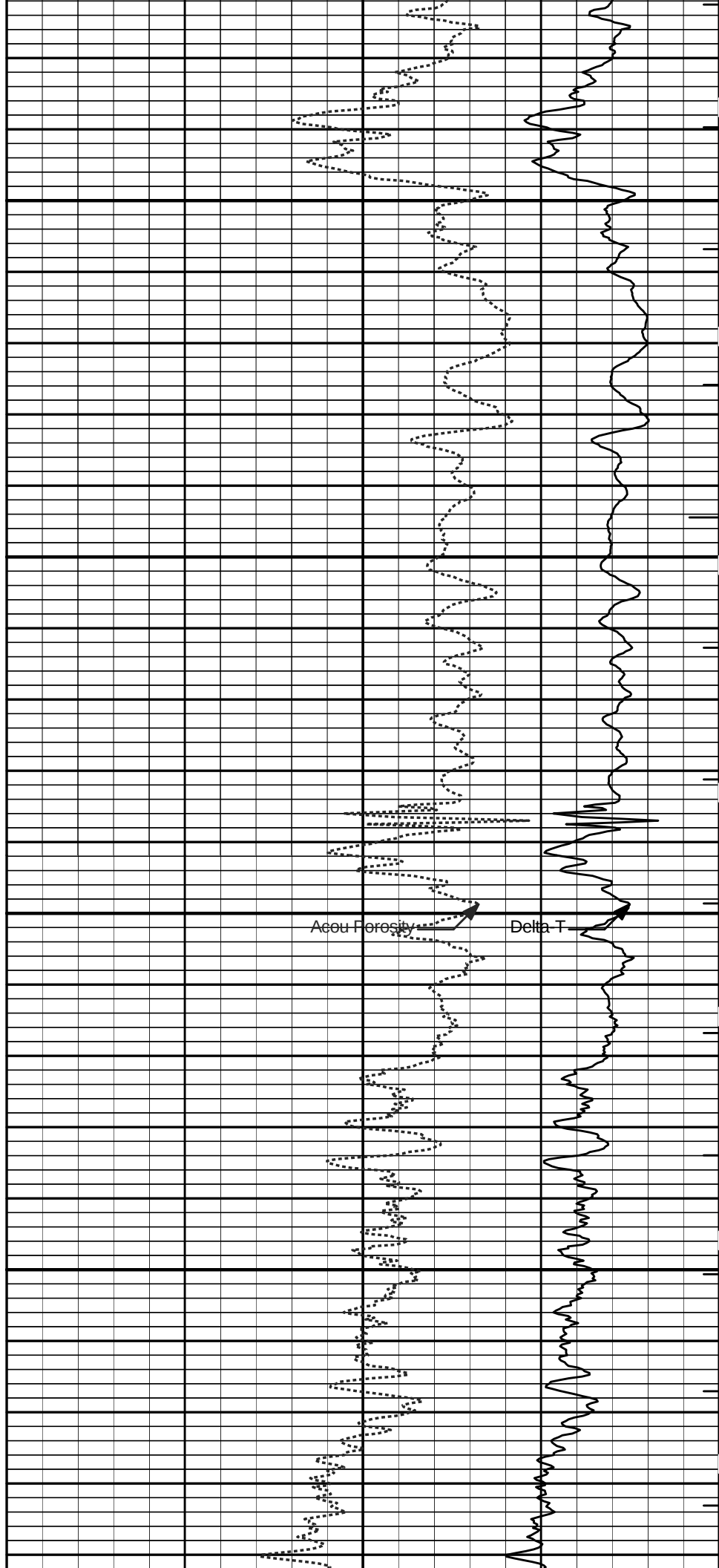
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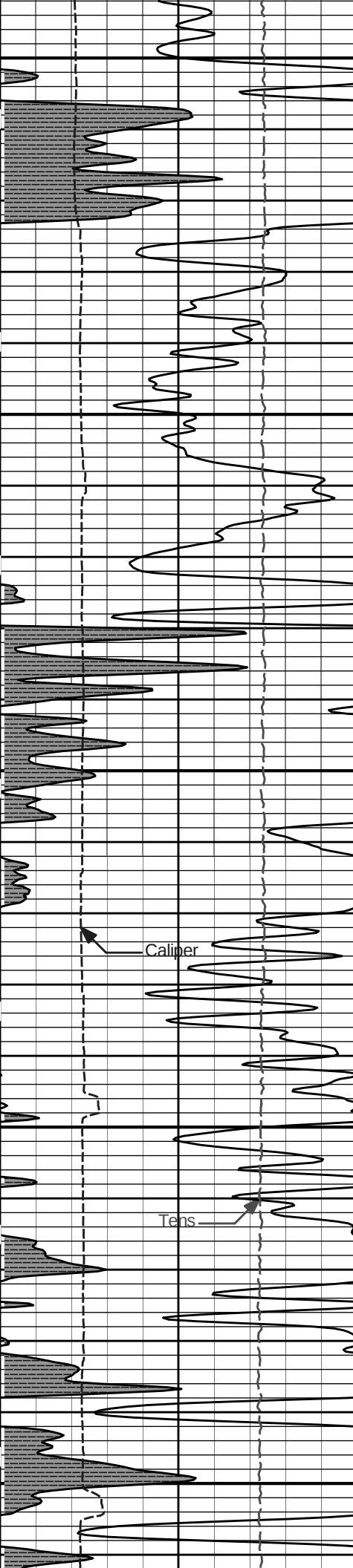




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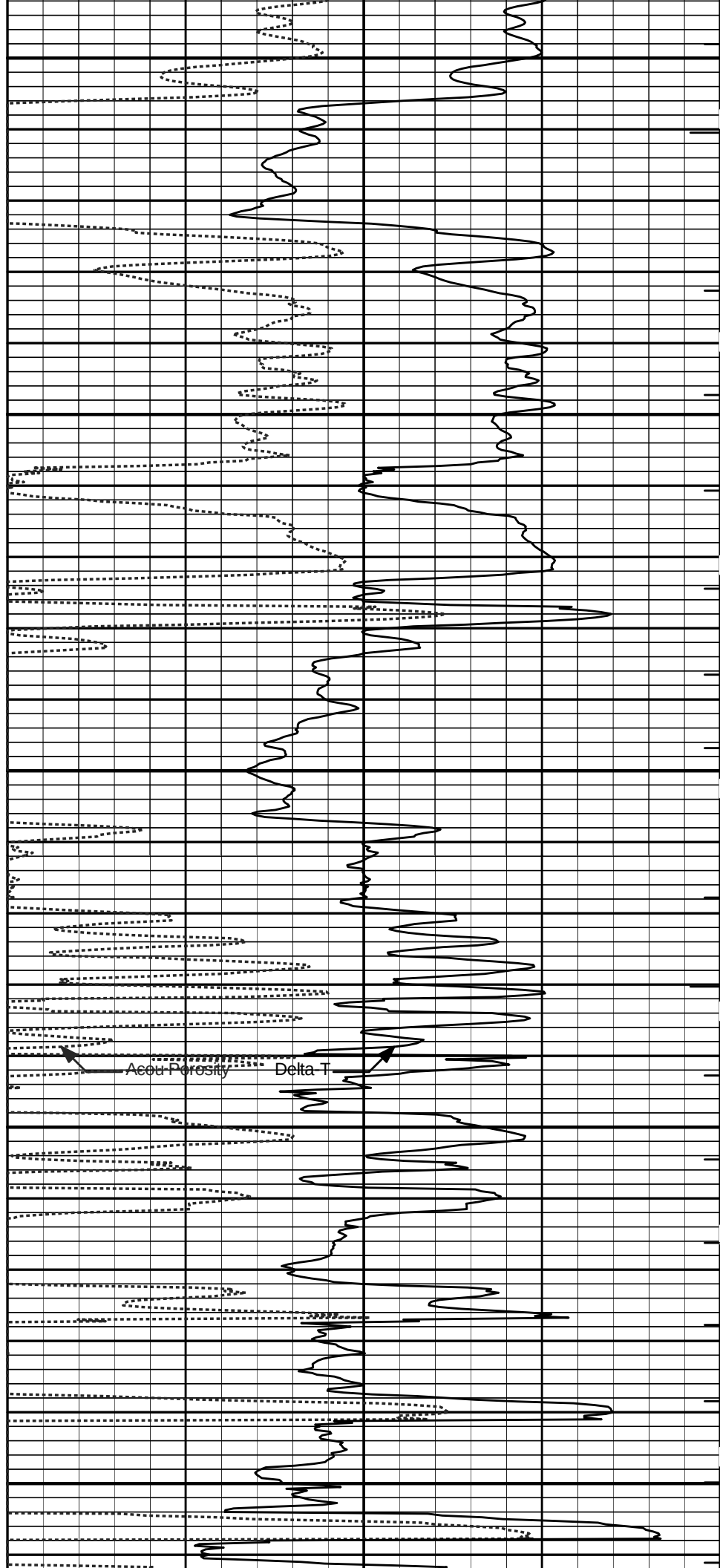
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5800

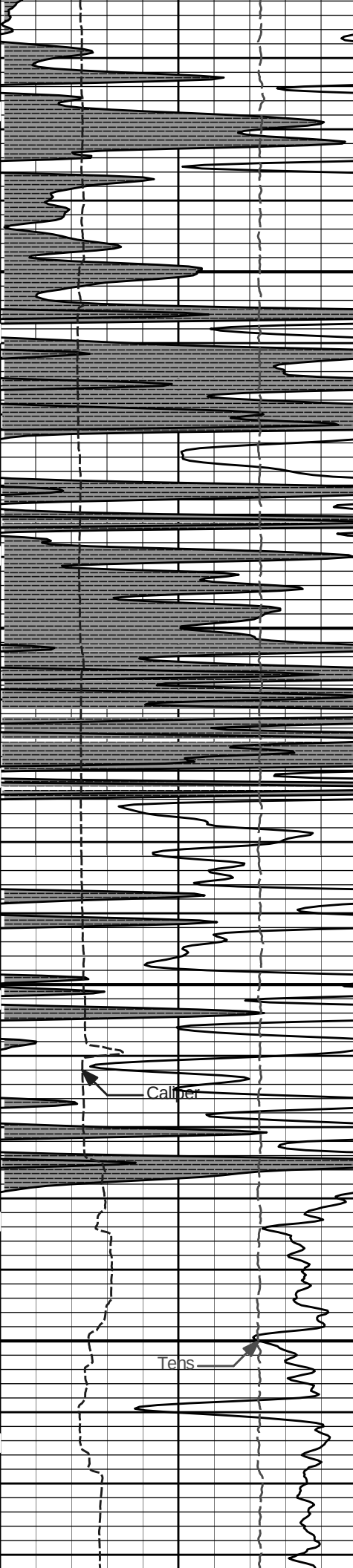
Caliper

Tens.



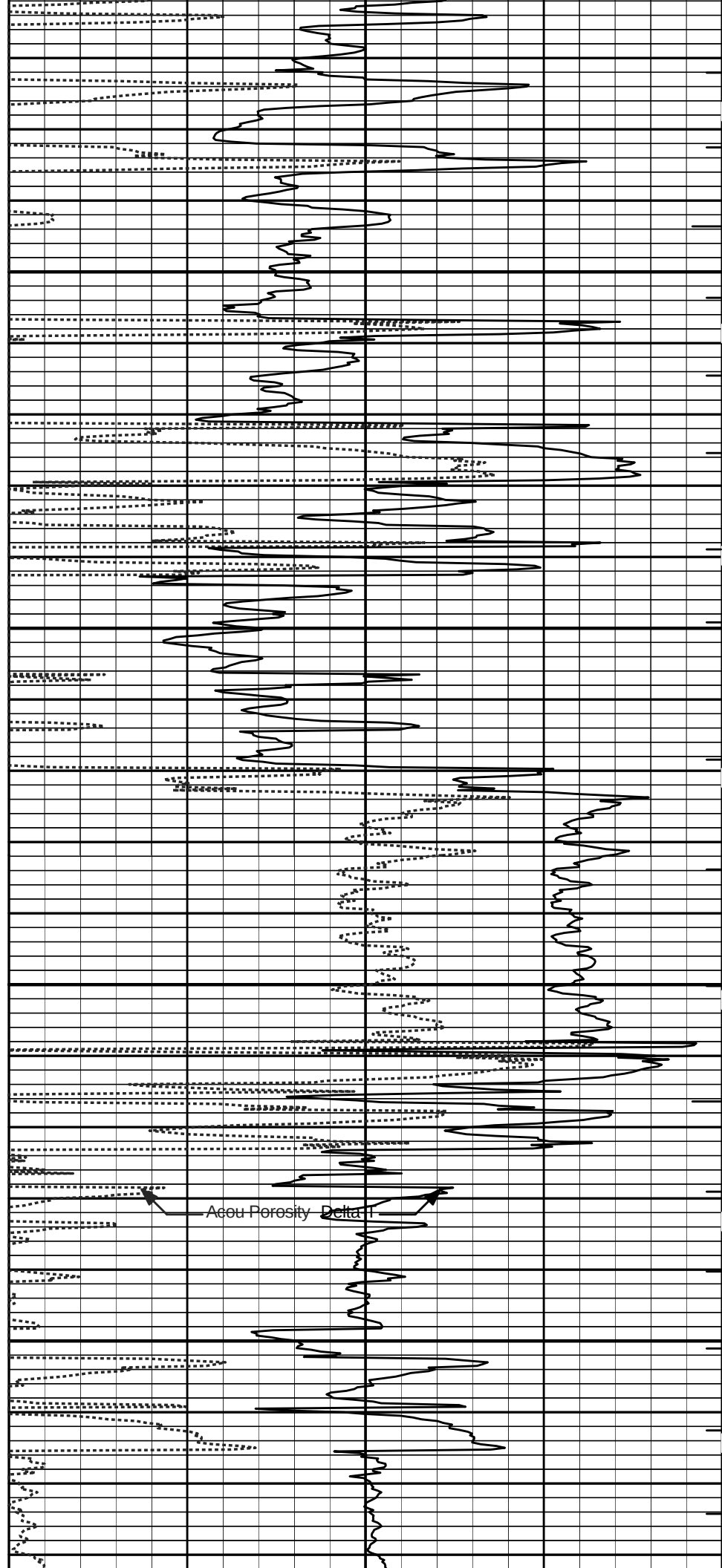
Acou Porosity

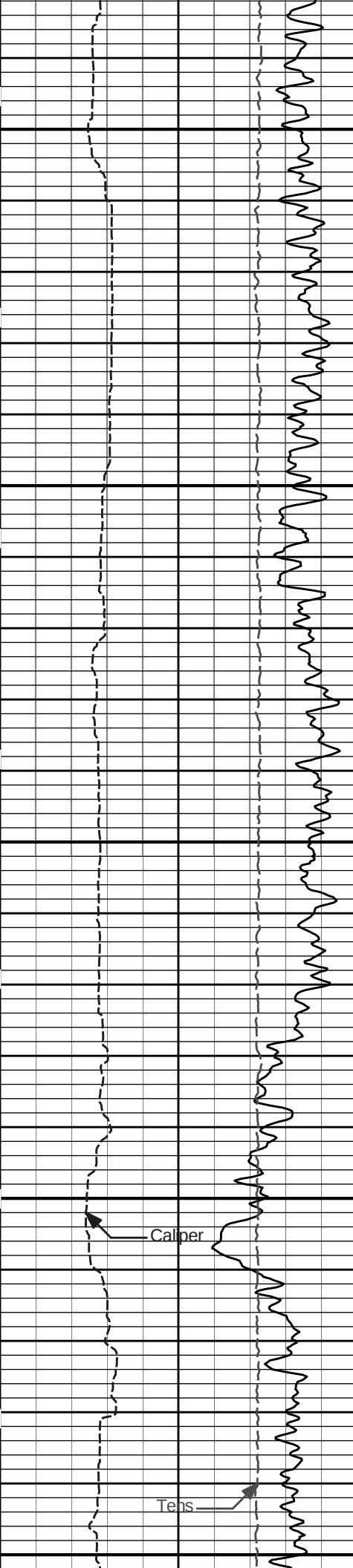
Delta T



5900

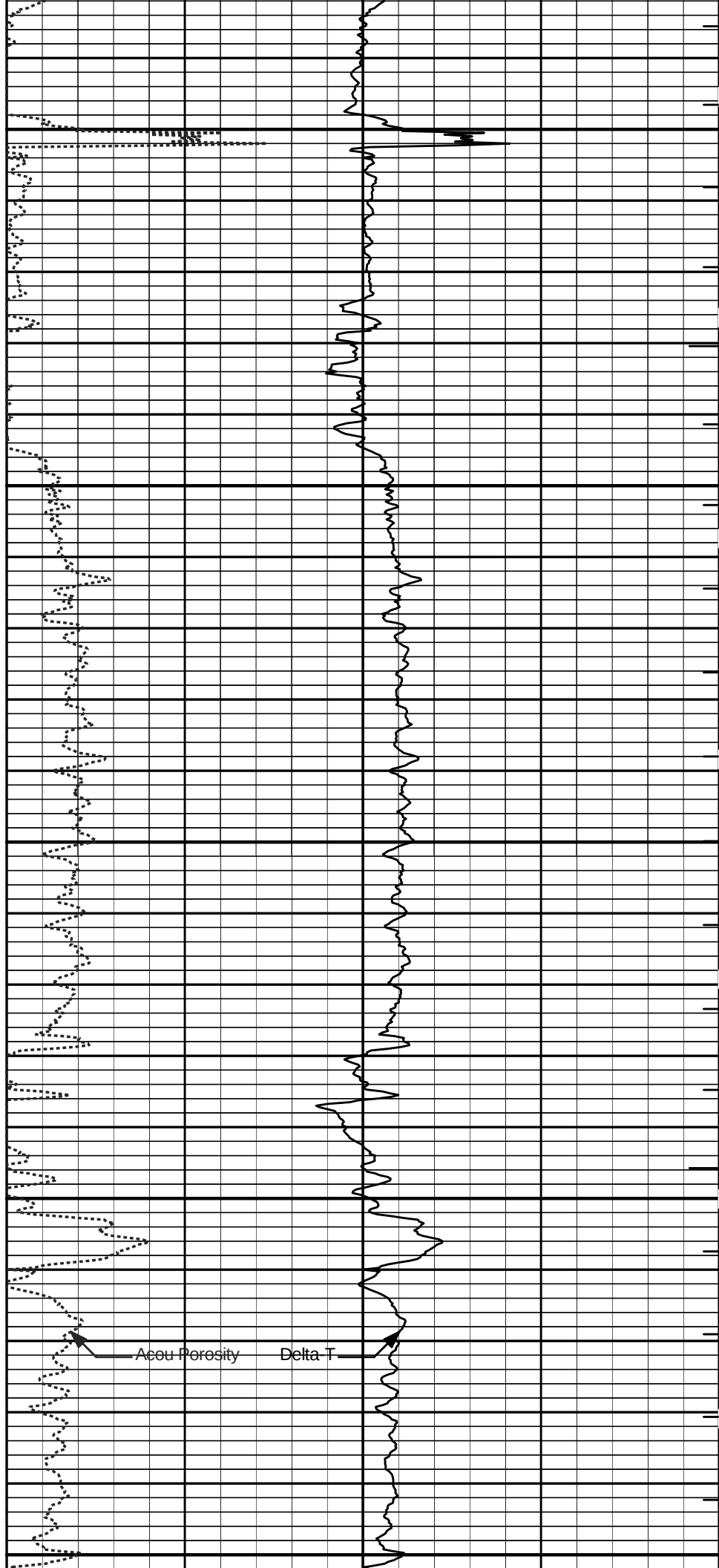
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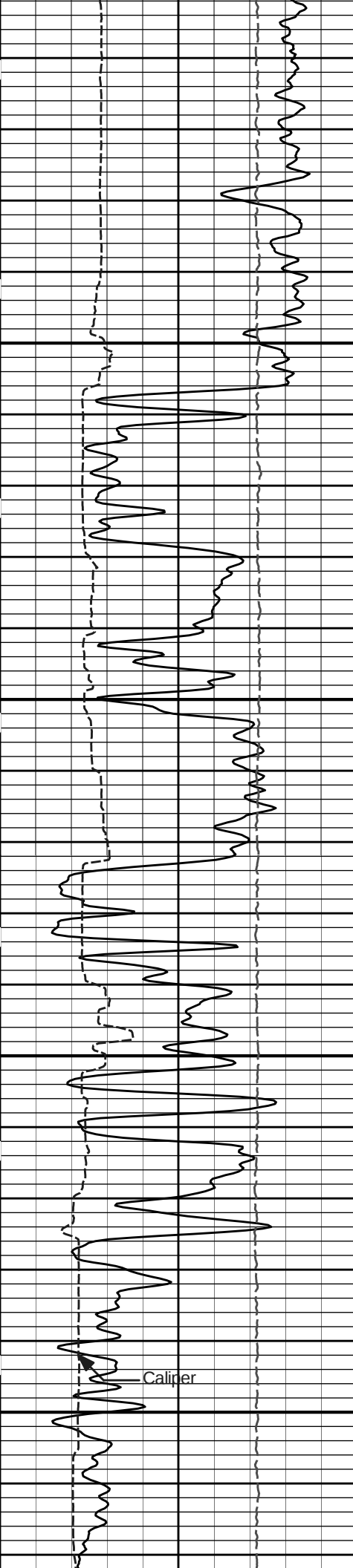




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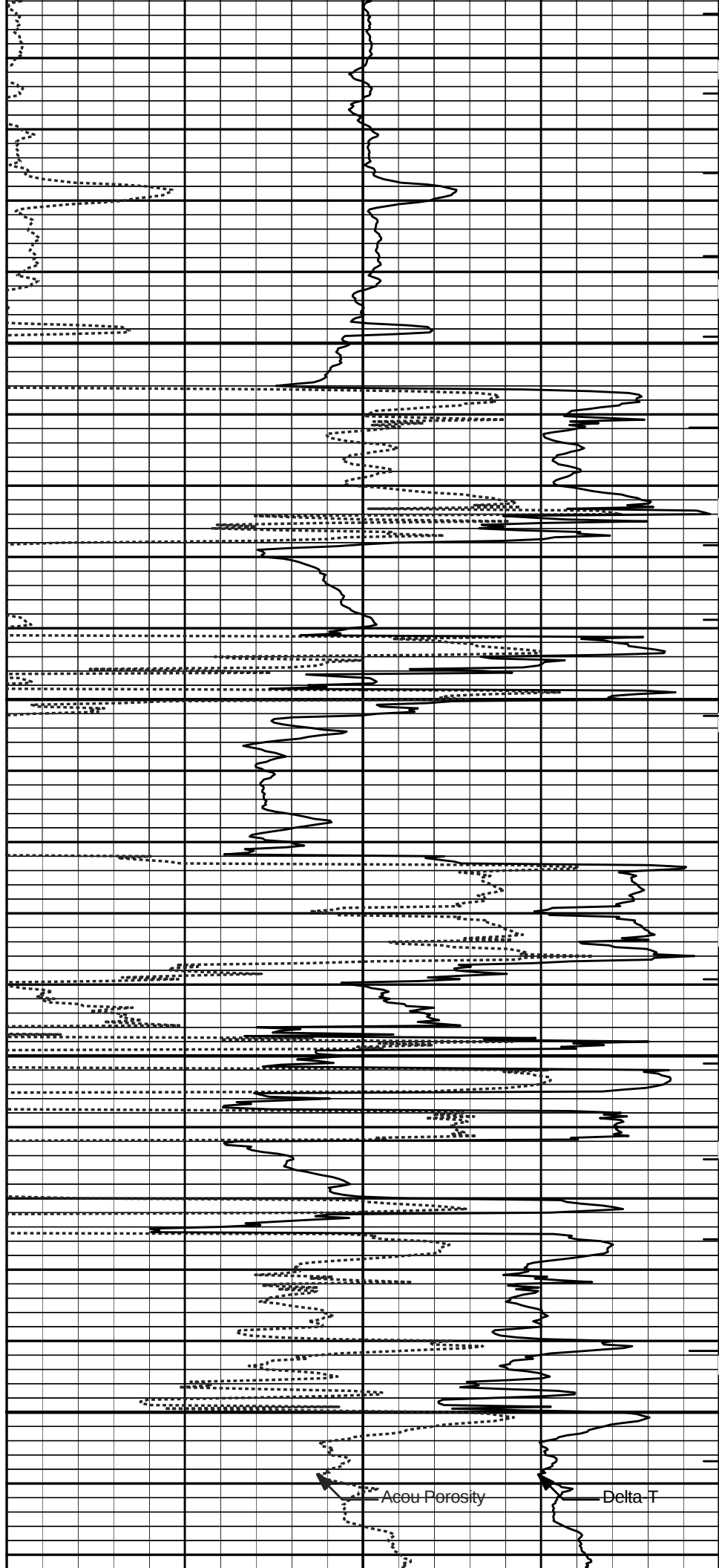




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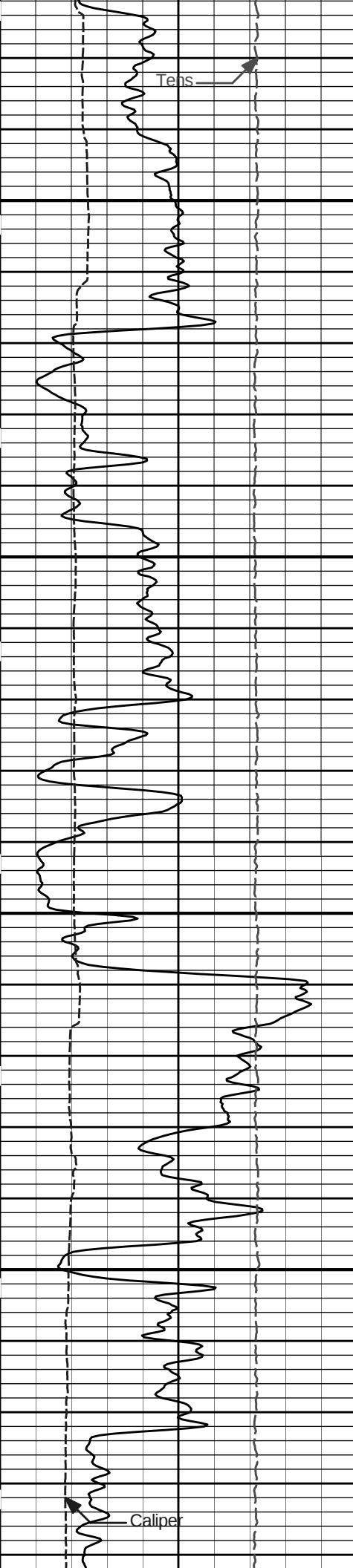
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Caliper



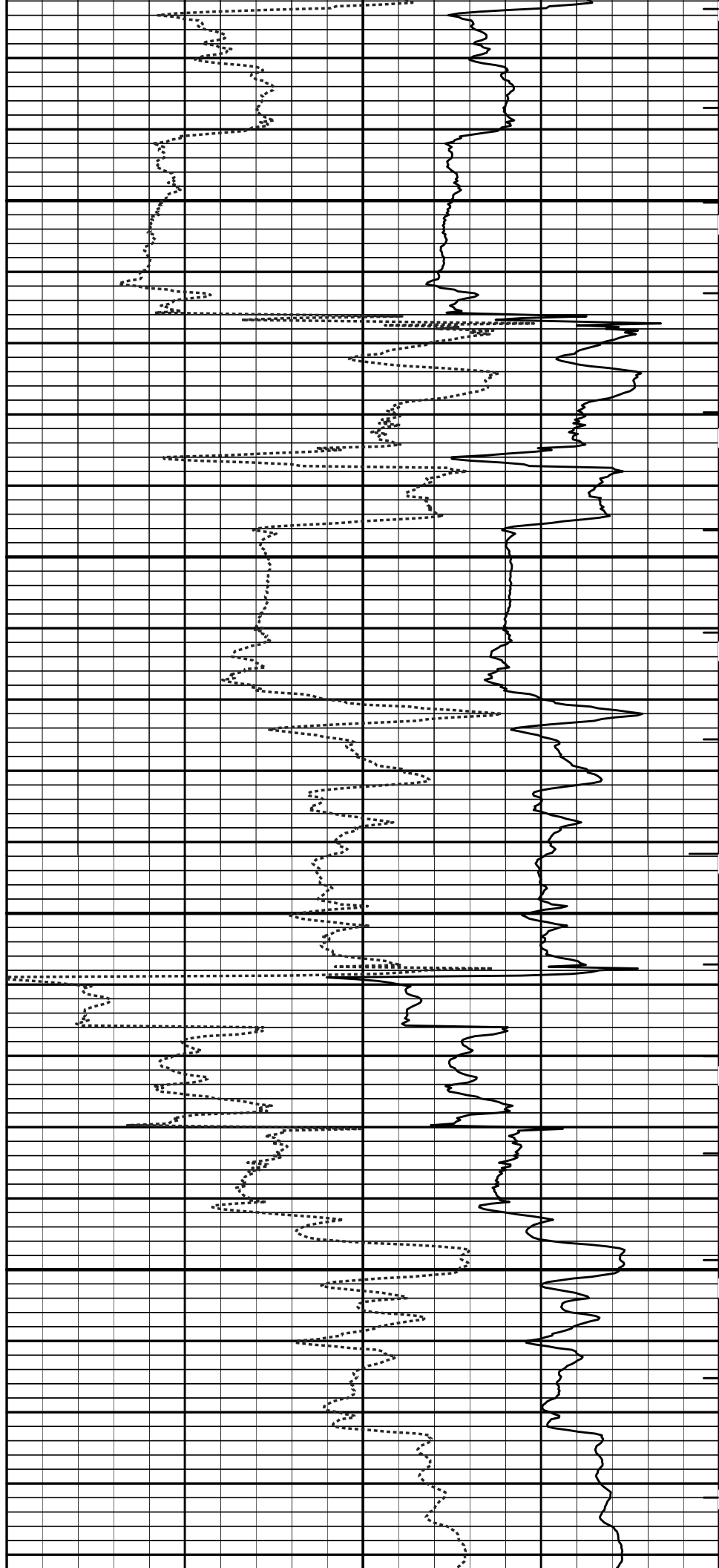
Acou Porosity

Delta T



6500

6600



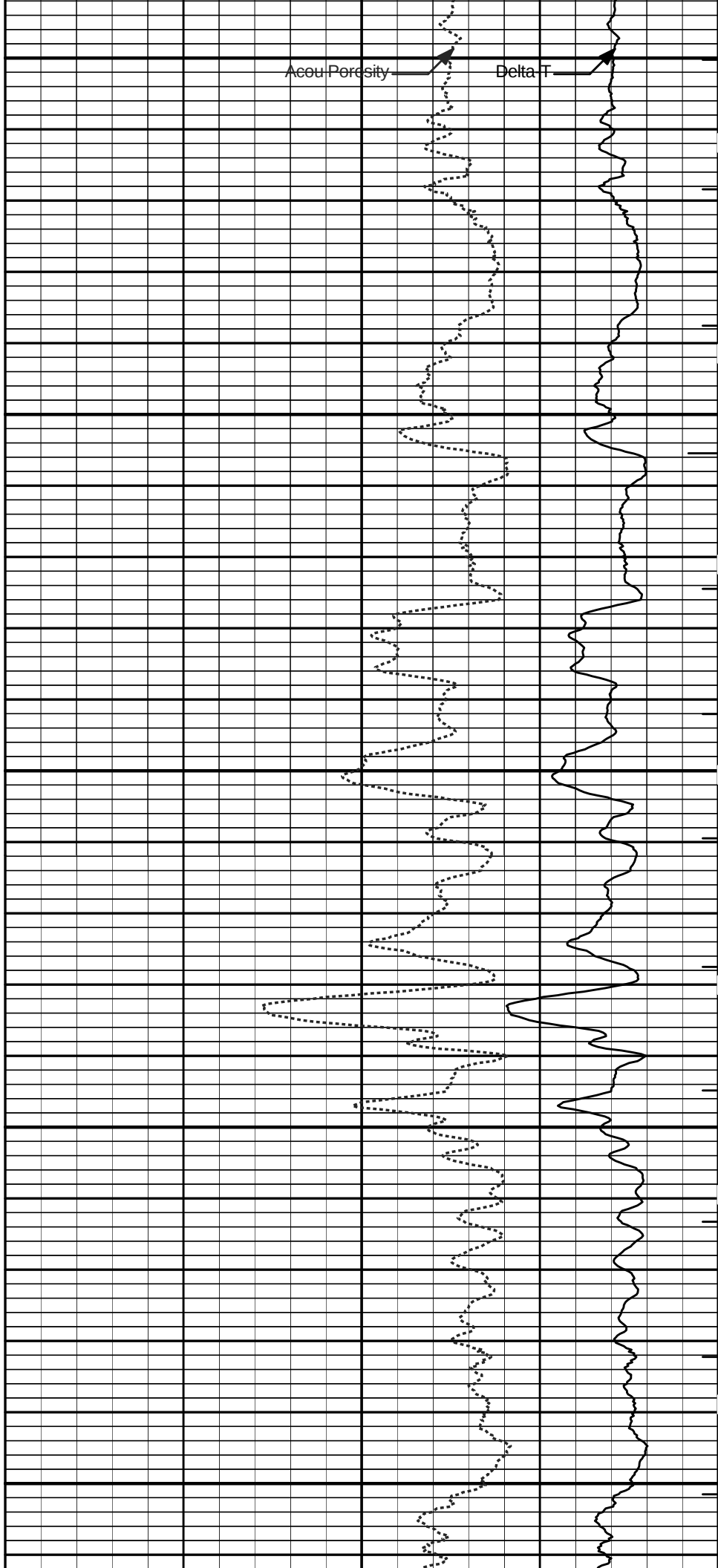


6700

Tens

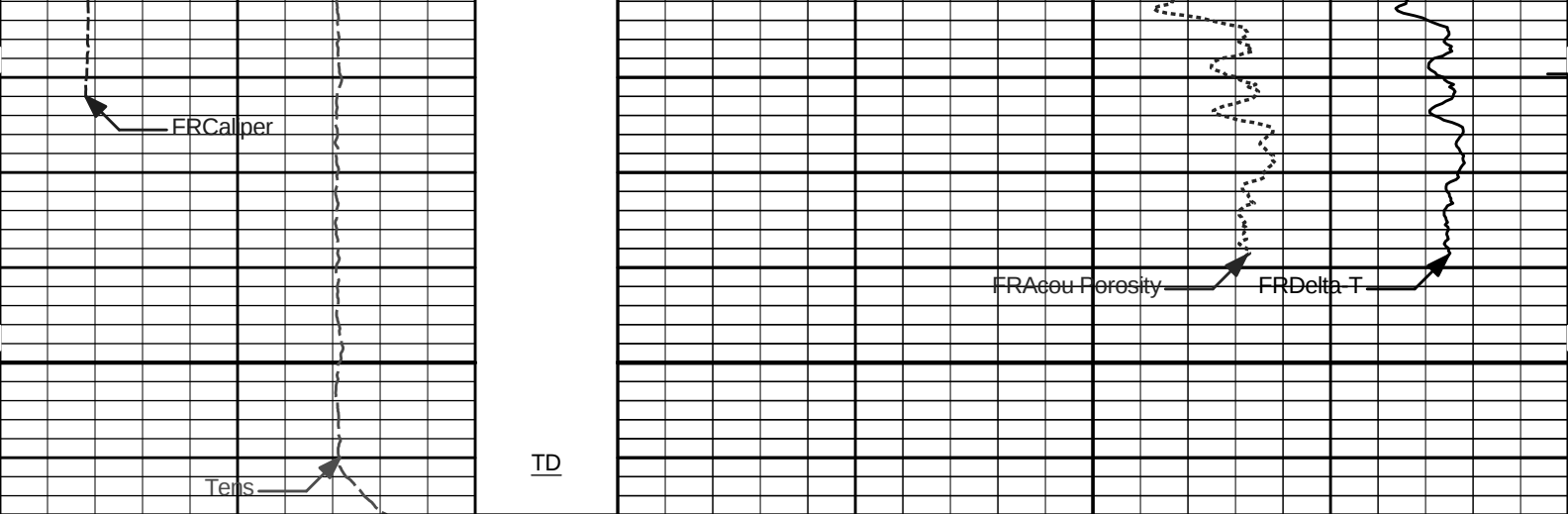
6800

6900



Acoustic Poreosity

Delta T



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

HALLIBURTON

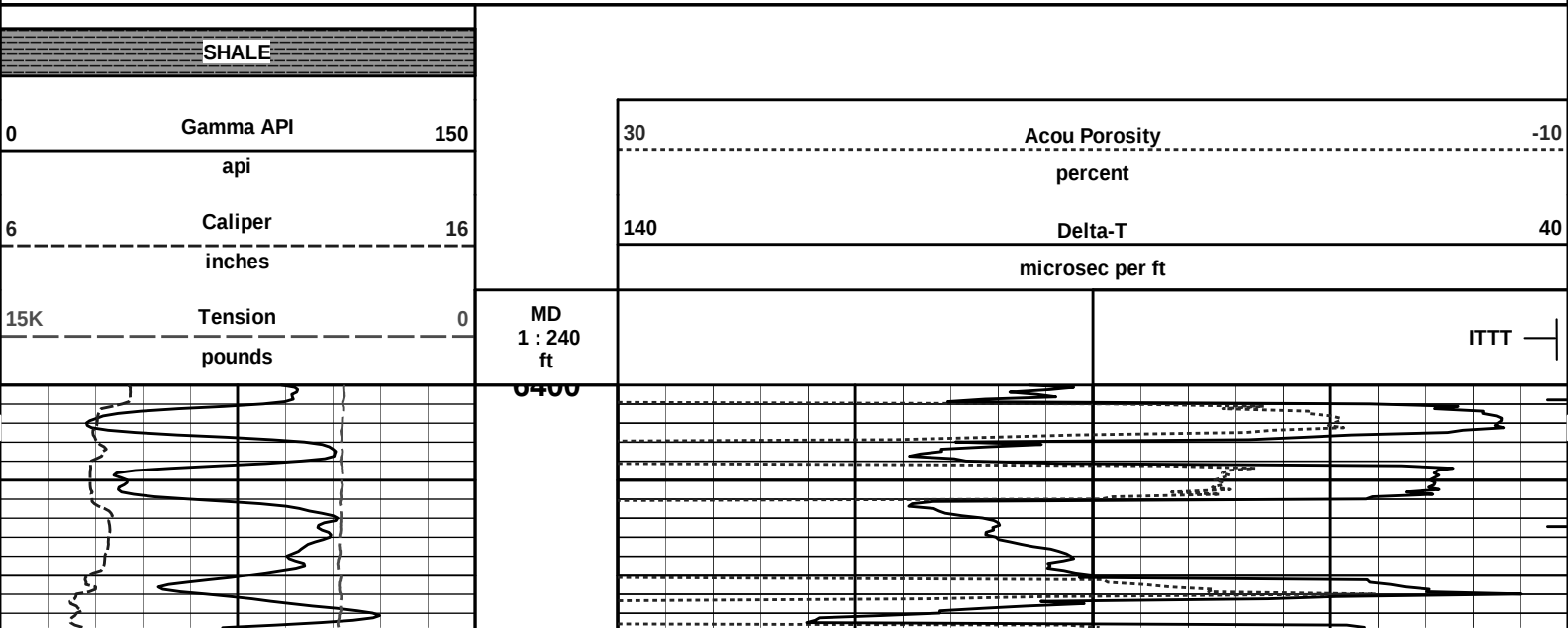
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Plot Range: 1800 ft to 6966 ft
Data: WIGGAINS_12_10\Well Based\CASING\
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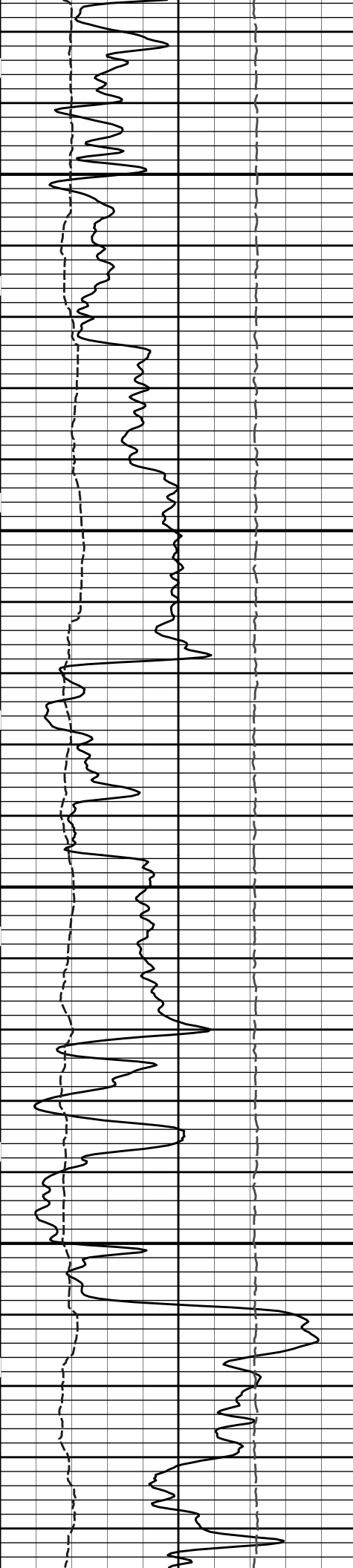
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 04-Oct-12 07:38:17
Plot Range: 6400 ft to 6965.67 ft
Data: WIGGAINS_12_10\Well Based\REPEAT\
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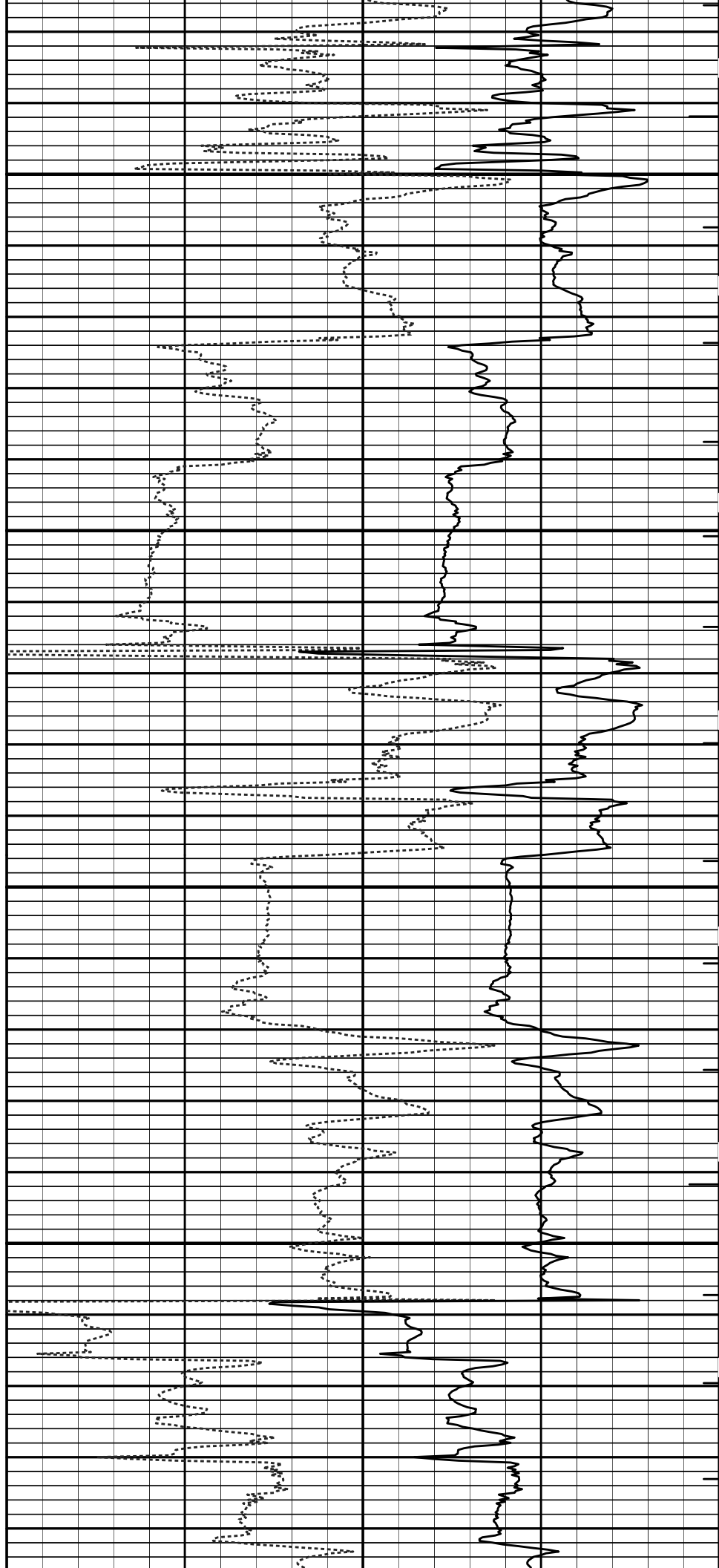
REPEAT SECTION

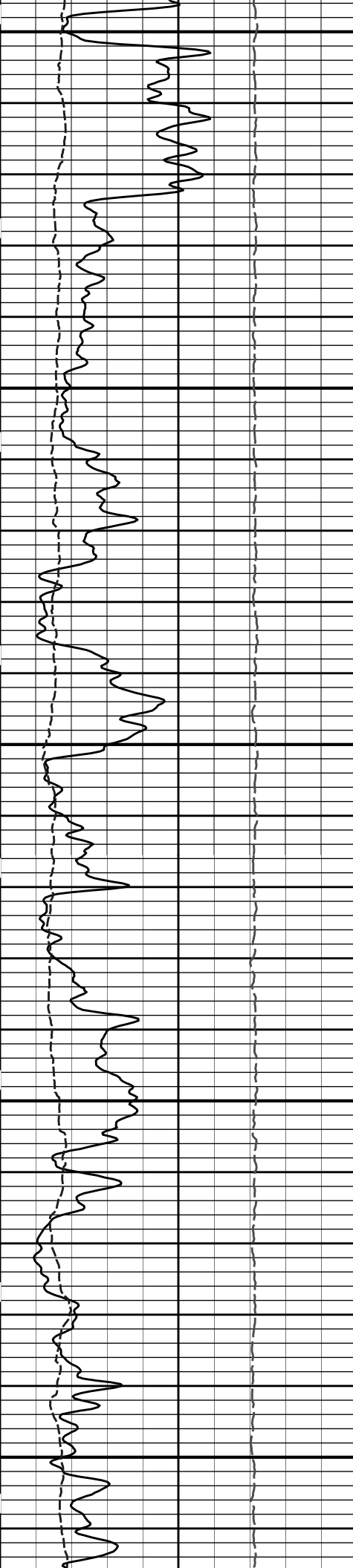




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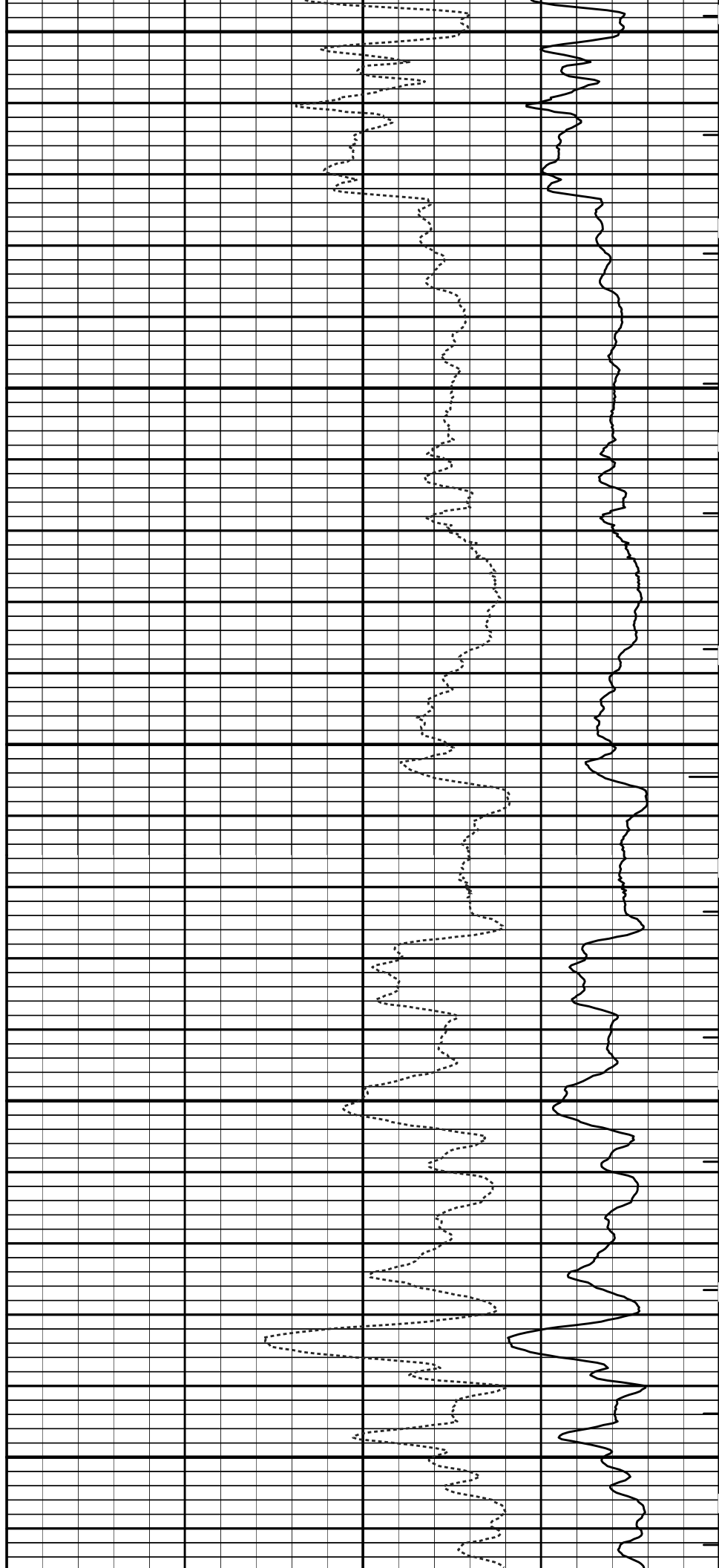
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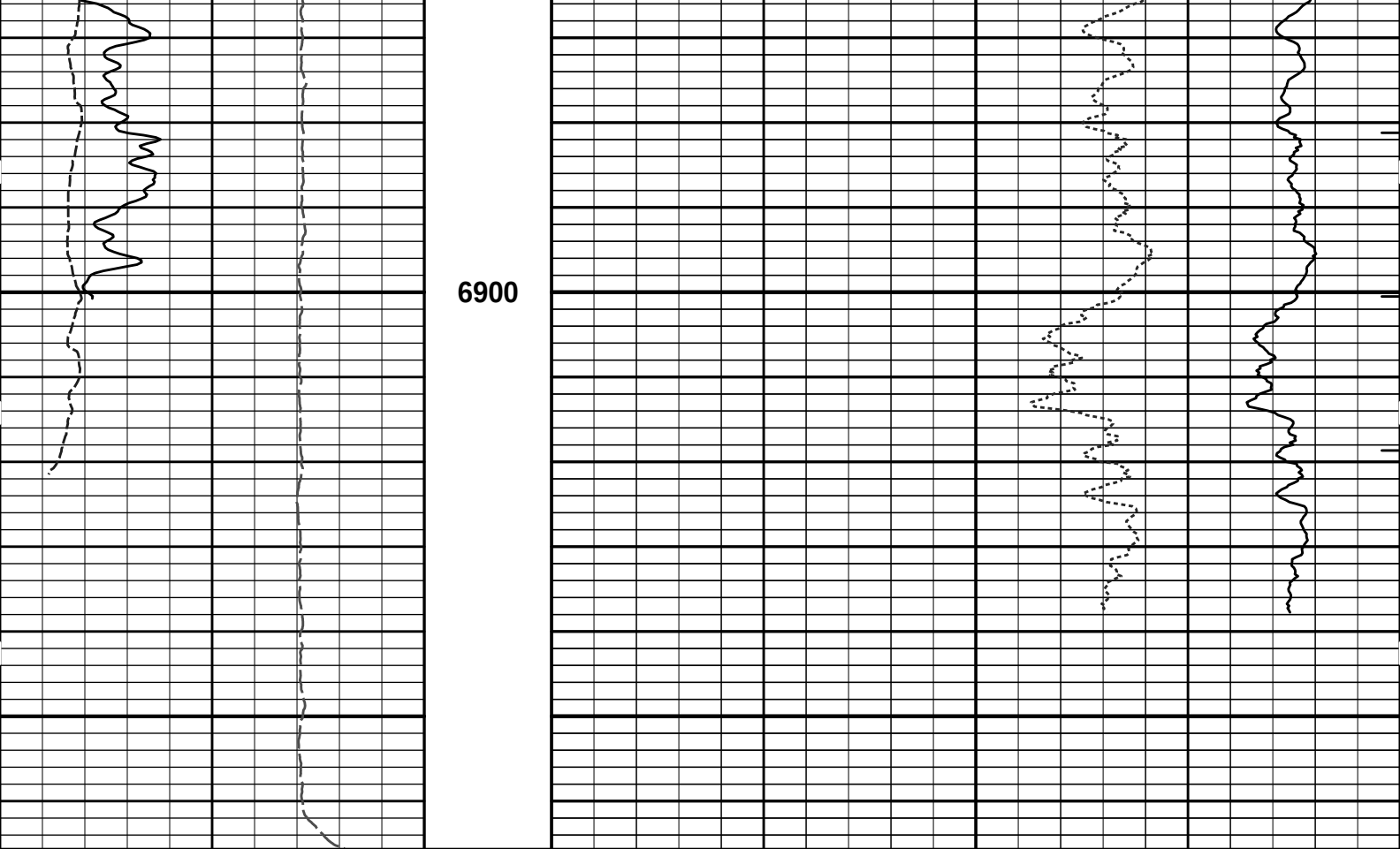




6700

6800





6900

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

HALLIBURTON

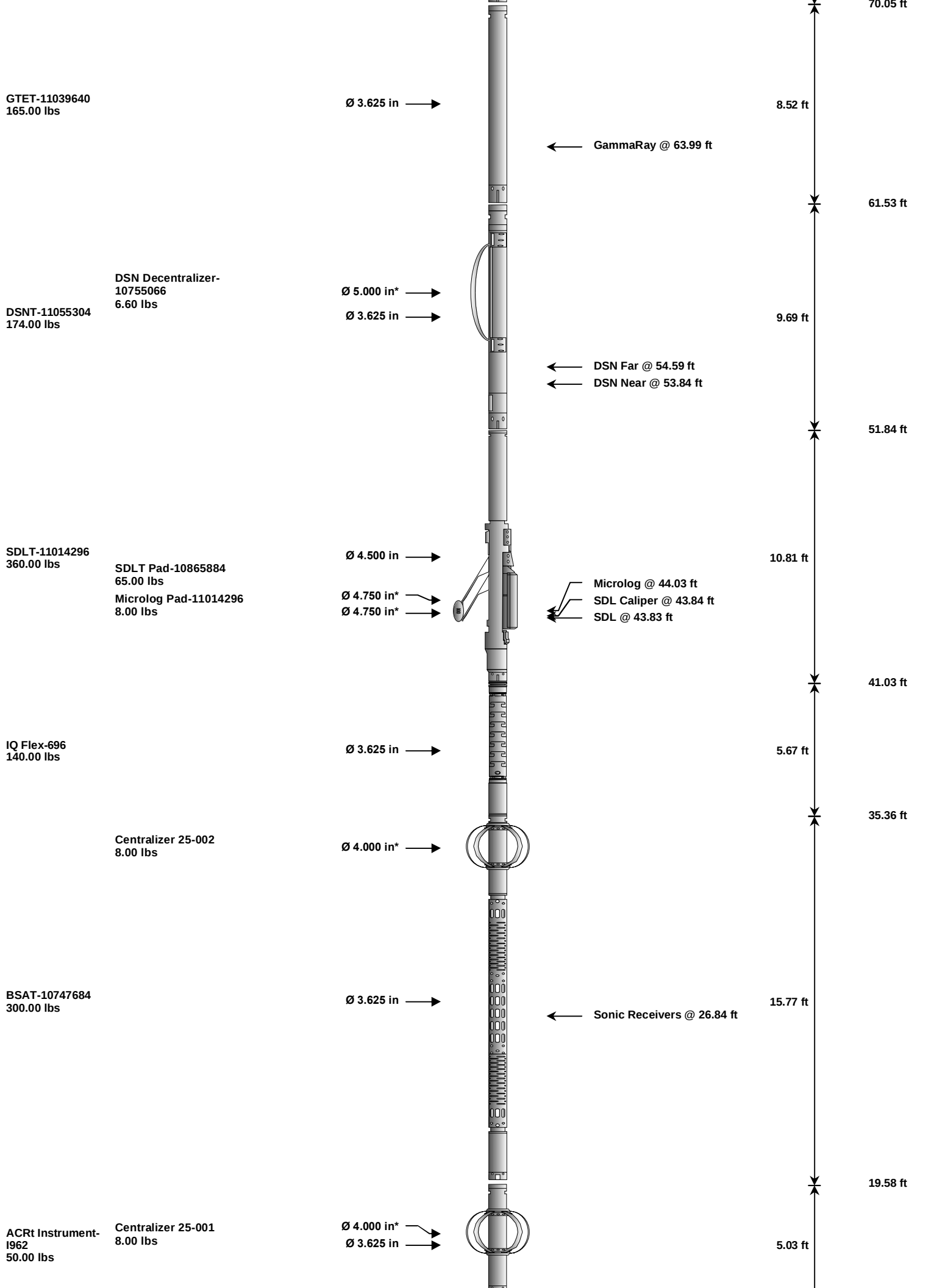
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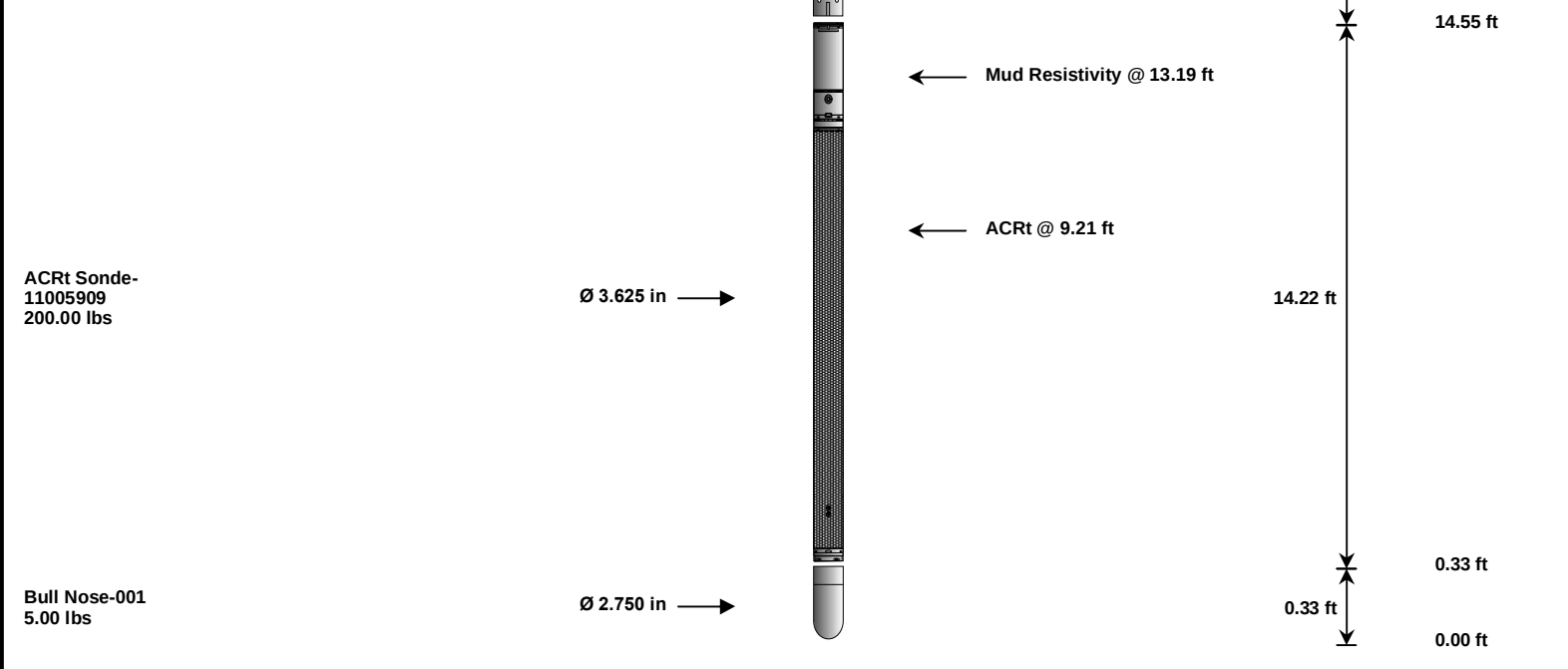
REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head- PROT01 30.00 lbs		Ø 3.625 in	→		1.92 ft	75.71 ft
SP Sub-11441455 60.00 lbs		Ø 3.625 in	→	← SP @ 72.01 ft	3.74 ft	73.79 ft





Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH	Standard OH Cable Head		PROT01	30.00	1.92	73.79	300.00
SP	SP Sub		11441455	60.00	3.74	70.05	300.00
GTET	Gamma Telemetry Tool		11039640	165.00	8.52	61.53	60.00
DSNT	Dual Spaced Neutron		11055304	174.00	9.69	51.84	60.00
DCNT	DSN Decentralizer		10755066	6.60	5.13	* 55.17	300.00
SDLT	Spectral Density Tool		11014296	360.00	10.81	41.03	60.00
MICP	Microlog Pad		11014296	8.00	1.00	* 43.53	60.00
SDLP	Density Insite Pad		10865884	65.00	2.55	* 43.24	60.00
IQF	IQ Flex tool		696	140.00	5.67	35.36	300.00
BSAT	Borehole Sonic Array Tool		10747684	300.00	15.77	19.58	60.00
OBCEN	Centralizer - 25 in. Overbody		002	8.00	2.08	* 32.96	300.00
ACRt	Array Compensated True Resistivity Instrument Section		I962	50.00	5.03	14.55	300.00
OBCEN	Centralizer - 25 in. Overbody		001	8.00	2.08	* 16.39	300.00
ACRt	Array Compensated True Resistivity Sonde Section		11005909	200.00	14.22	0.33	300.00
BLNS	Bull Nose		001	5.00	0.33	0.00	300.00
Total				1,579.60	75.71		
* Not included in Total Length and Length Accumulation.							
Data: WIGGAINS_12_10\0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BN\IDLE							
Date: 04-Oct-12 03:28:11							

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	9.400	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	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	6957.00	ft
SHARED	BHT	Bottom Hole Temperature	200.0	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	DNSO	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	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	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
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					
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HALLIBURTON					
INPUTS, DELAYS AND FILTERS TABLE					
Mnemonic		Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel					
TENS	Tension		0.00	NO	
SP Sub					
PLTC	Plot Control Mask		72.01	NO	
SP	Spontaneous Potential		72.01	BLK	1.250
SPR	Raw Spontaneous Potential		72.01	NO	
SPO	Spontaneous Potential Offset		72.01	NO	
GTET					
TPUL	Tension Pull		63.99	NO	
GR	Natural Gamma Ray API		63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API		63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution		63.99	W	1.416 , 0.750
ACCZ	Accelerometer Z		0.00	BLK	0.083
DEVI	Inclination		0.00	NO	
DSNT					
TPUL	Tension Pull		53.74	NO	
RNDS	Near Detector Telemetry Counts		53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts		54.59	TRI	0.583
DNTT	DSN Tool Temperature		53.84	NO	
DSNS	DSN Tool Status		53.74	NO	
ERND	Near Detector Telemetry Counts EVR		53.84	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR		54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR		53.84	NO	
SDLT					
TPUL	Tension Pull		43.84	NO	
PCAL	Pad Caliper		43.84	TRI	0.250
ACAL	Arm Caliper		43.84	TRI	0.250
BSAT					
TPUL	Tension Pull		26.84	NO	
STAT	Status		26.84	NO	
DLYT	Delay Time		26.84	NO	
SI	Sample Interval		26.84	NO	
TXRX	Raw Telemetry 10 Receivers		26.84	NO	
FRMC	Tool Frame Count		26.84	NO	
GMOD	Gain processing mode		19.58	NO	
ACRt Sonde					

ACRT 30kHz				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	
SDLT Pad				
TPUL	Tension Pull	43.83	NO	
NAB	Neap Aberration	12.66	BLK	0.000

NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920
NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	
Microlog Pad				
TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750
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COMPANY	OXY USA INC.		
WELL	WIGGAINS 12-10		
FIELD	GOOCH		
COUNTY	STEVENS	STATE	KANSAS
HALLIBURTON		BOREHOLE COMPENSATED SONIC ARRAY LOG	