

HALLIBURTON

BOREHOLE COMPENSATED
SONIC ARRAY
LOG

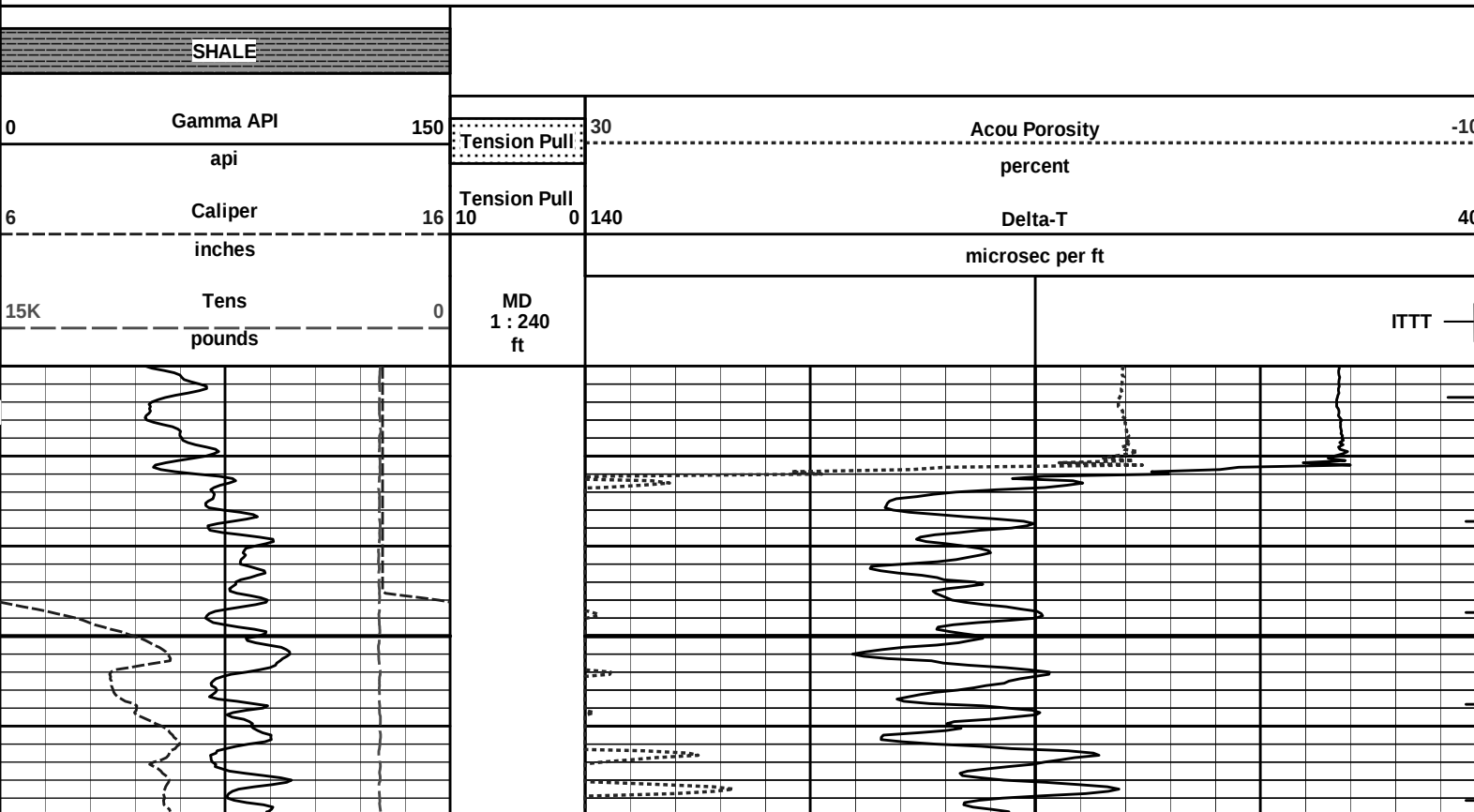
COMPANY		OXY USA INC.	
WELL		STALEY A-2	
FIELD/BLOCK		HUGOTON GAS AREA	
COUNTY		FINNEY	
STATE		KANSAS	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date		26-Aug-13	
Run No.		ONE	
Depth - Driller		5212.00 ft	
Depth - Logger		5210.0 ft	
Bottom - Logged Interval		5183.0 ft	
Top - Logged Interval		1633.0 ft	
Casing - Driller		8.625 in @ 1633.0 ft	
Casing - Logger		1633.0 ft	
Bit Size		7.875 in @	
Type Fluid in Hole		WATER BASED MUD	
Density		9.3 ppg	
Viscosity		49.00 s/qt	
PH		9.90 pH	
Fluid Loss		6.0 cpm	
Source of Sample		MUD PIT	
Rm @ Meas. Temperature		0.800 ohmm @ 75.00 degF	
Rmf @ Meas. Temperature		0.66 ohmm @ 75.00 degF	
Rmc @ Meas. Temperature		1.050 ohmm @ 75.00 degF	
Source Rmf		MEASURED	
Rmc		MEASURED	
Rm @ BHT		0.47 ohmm @ 132.0 degF	
Time Since Circulation		6.0 hr	
Time on Bottom		26-Aug-13 14:24	
Max. Rec. Temperature		132.0 degF @ 5210.0 ft	
Equipment		11230668 LIBERAL	
Recorded By		J. BOLLOM	
Witnessed By		M. BONNER	

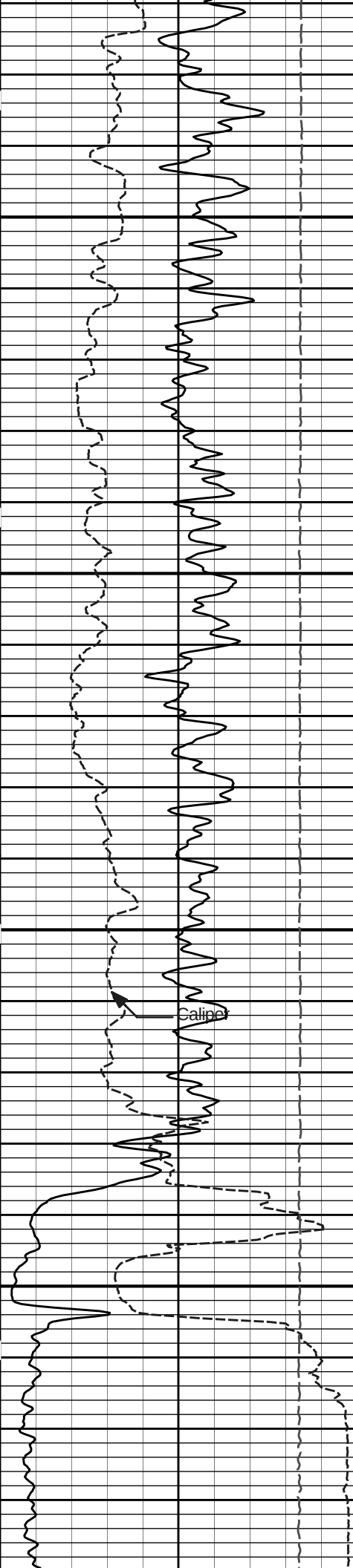
COMPANY	OXY USA INC.
WELL	STALEY A-2
FIELD/BLOCK	HUGOTON GAS AREA
COUNTY	FINNEY
STATE	KANSAS
API No.	15055222350000
Location	(SHL) 406' FSL & 1377' FWL NW SW SE SW
Other Services:	MICROLOG DSNT, SDLT ACRT
Sect. 27	Twp. 25S
Rge.	32W
Elev. 2869.0 ft	Elev.: K.B. 2880.0 ft
D.F. 2879.0 ft	D.F. 2879.0 ft
G.L. 2869.0 ft	G.L. 2869.0 ft

Fold here

Service Ticket No.: 900683880				API Serial No.: 15055222350000				PGM Version: WL INSITE R3.8.4 (Build 5)							
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.		10748374		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.		T-102		Spacing		6"		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			
LOGGING DATA															

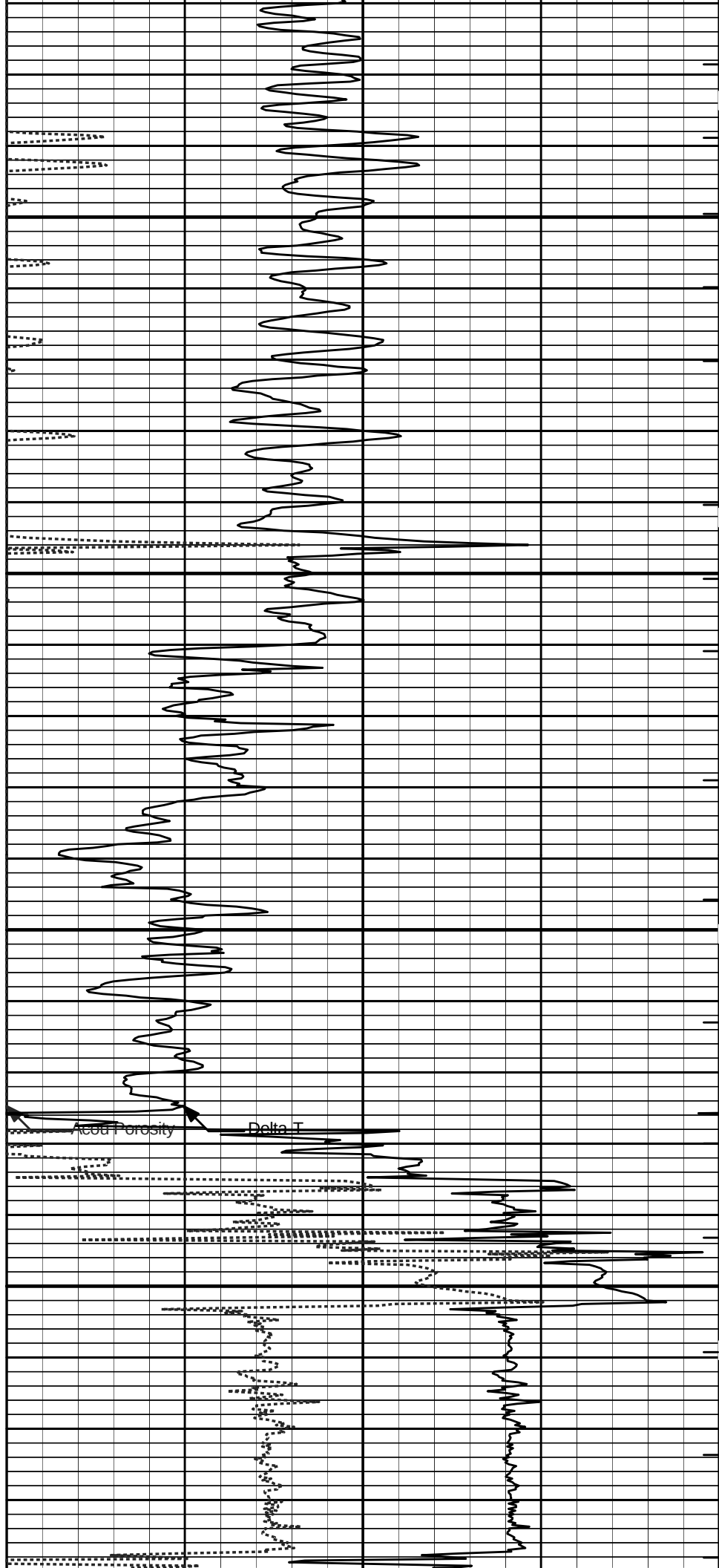
GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5210	1633	REC	0	150	30	-10	47.6						
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING														
CHLORIDES REPORTED AT 3,900 MG/L														
LCM REPORTED AT 3 LB/BBL														
GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION														
TODAY'S CREW: F. VILLA & V. JAIME														
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														

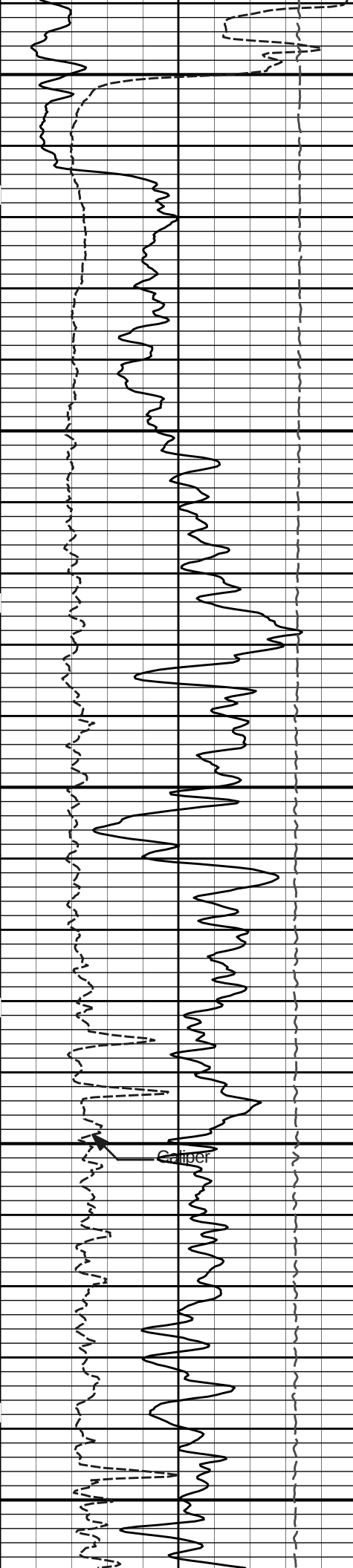




1700

1800

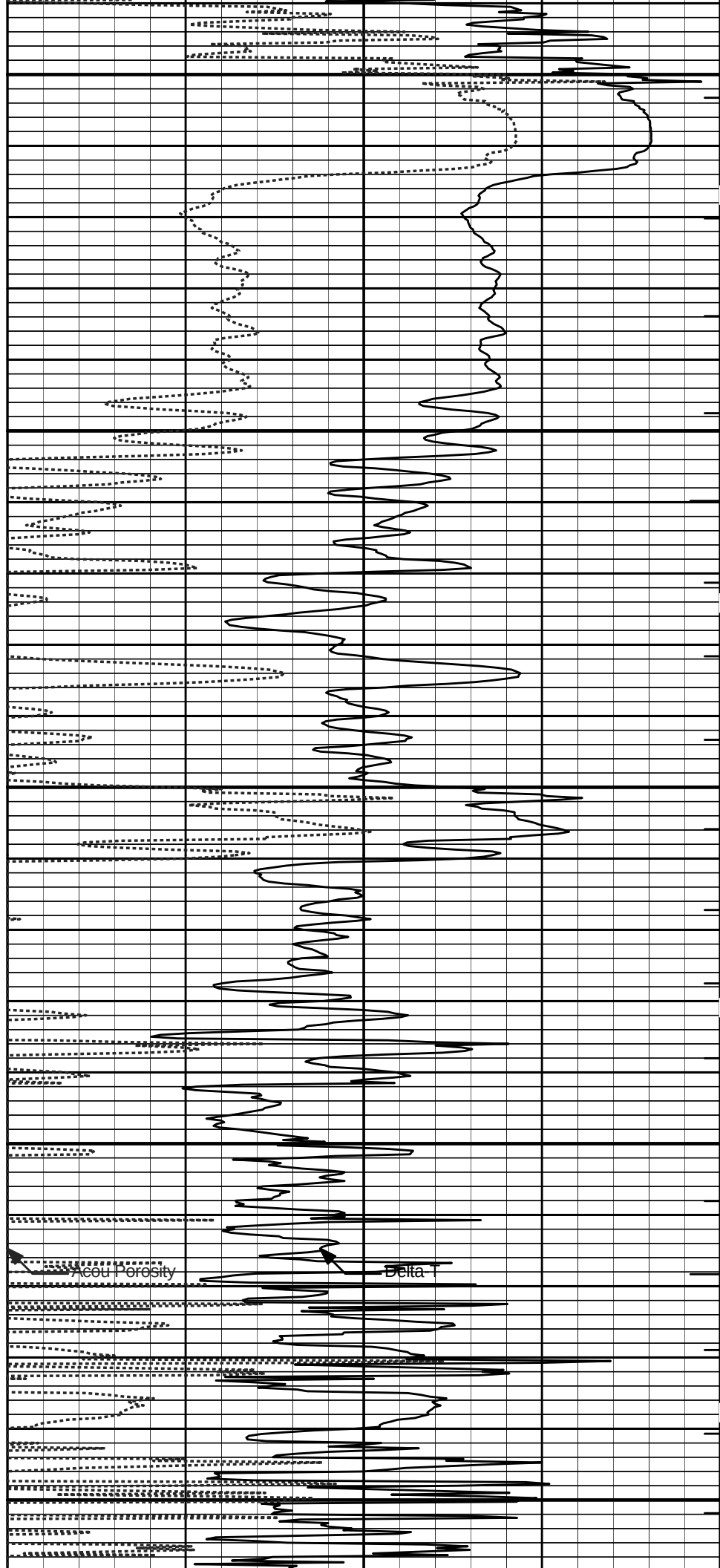


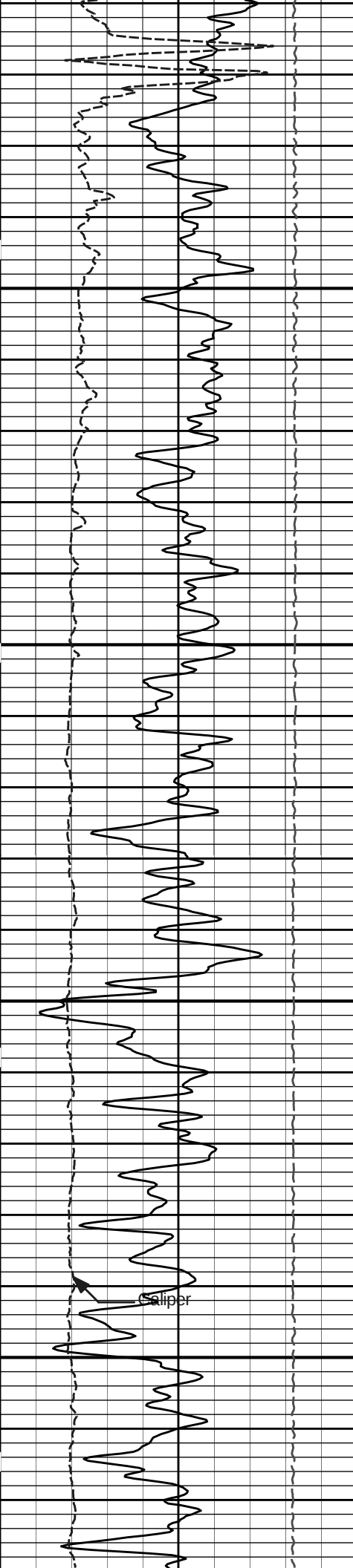


1900

2000

2100

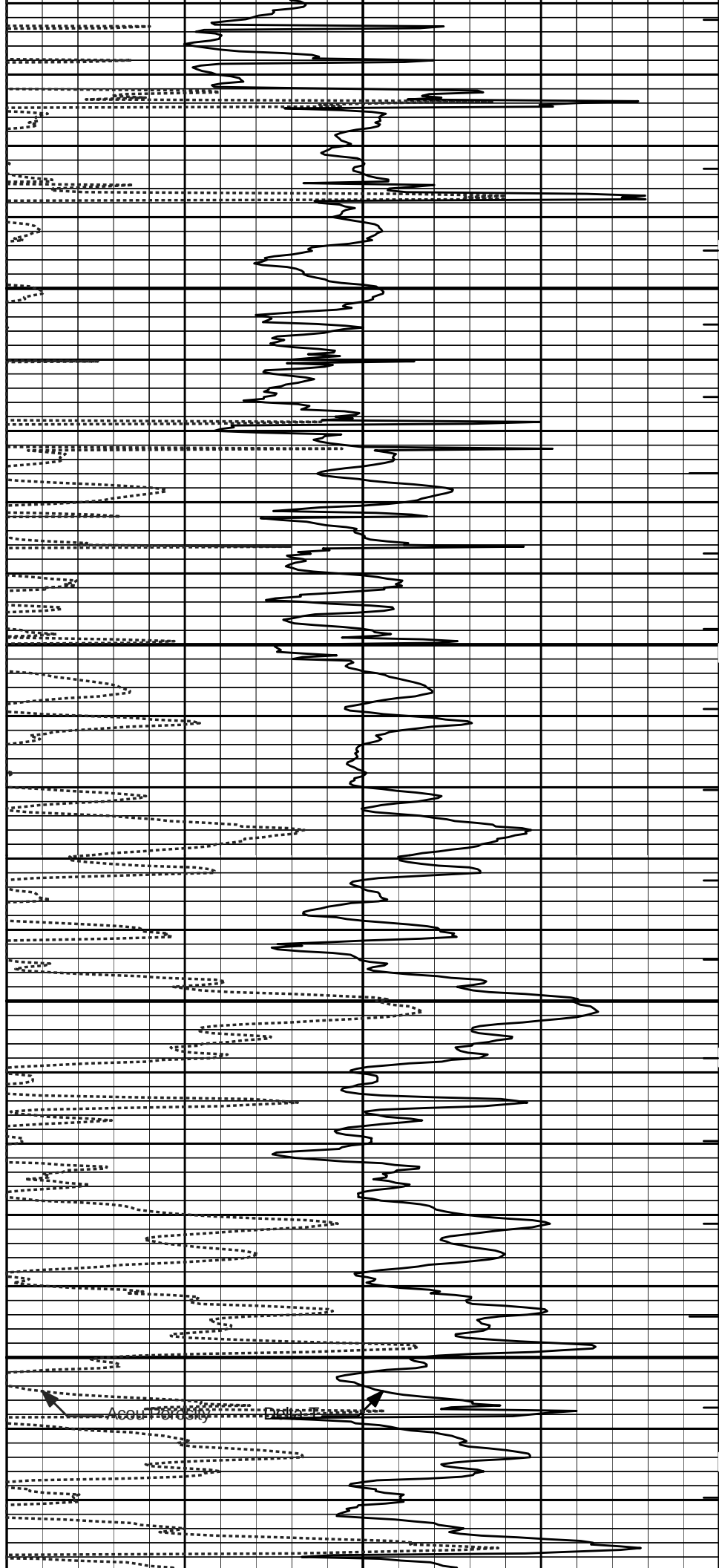




2200

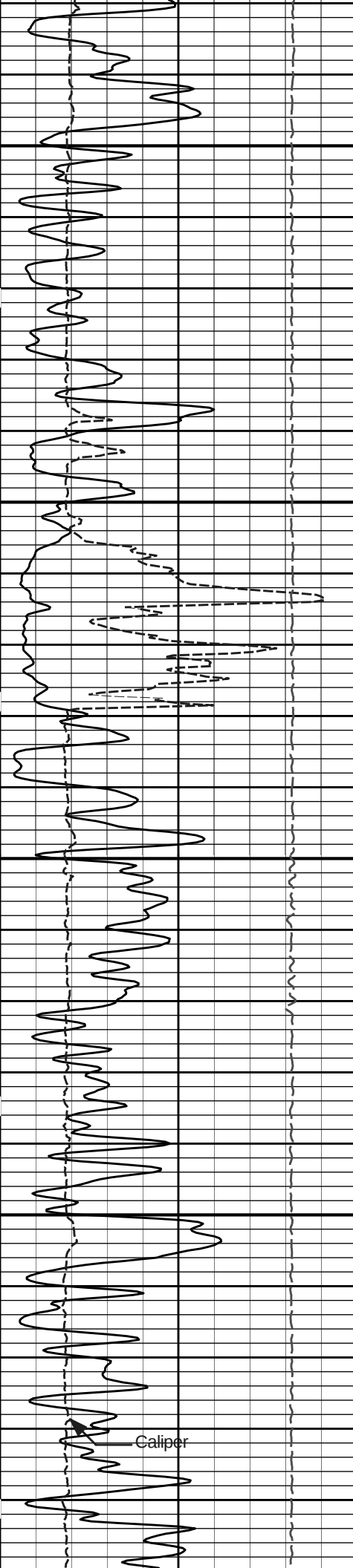
2300

Caliper



Acoustic Porosity

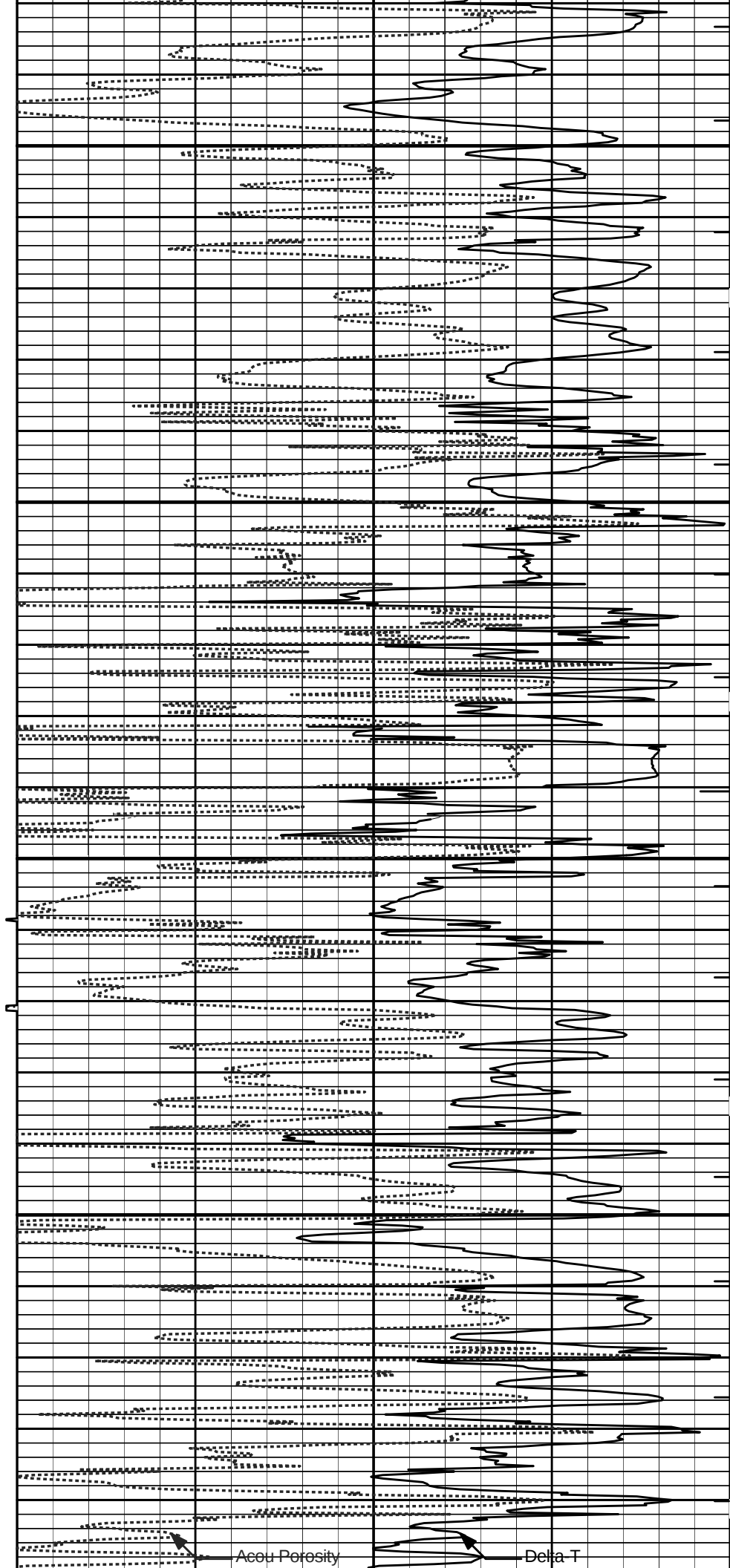
Delta T



2400

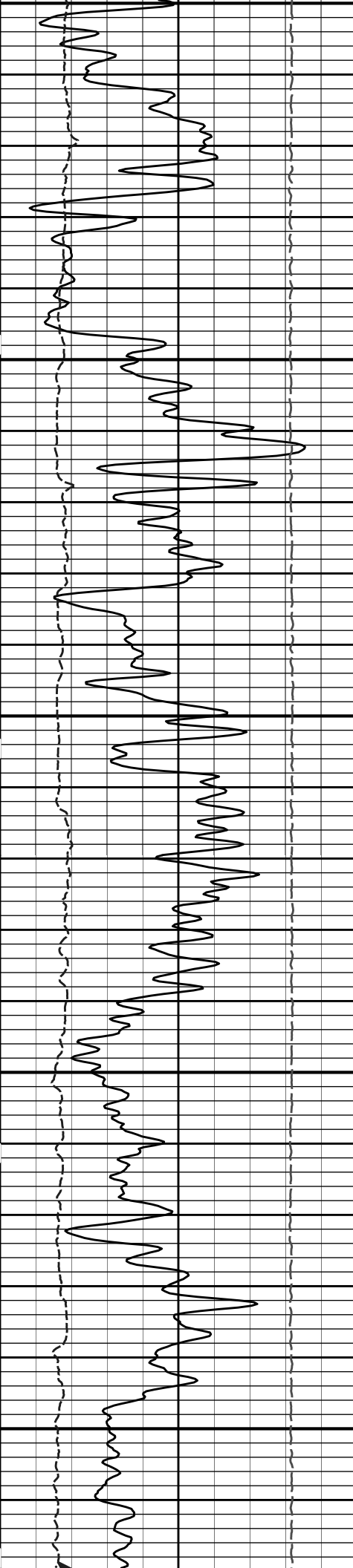
2500

Caliper



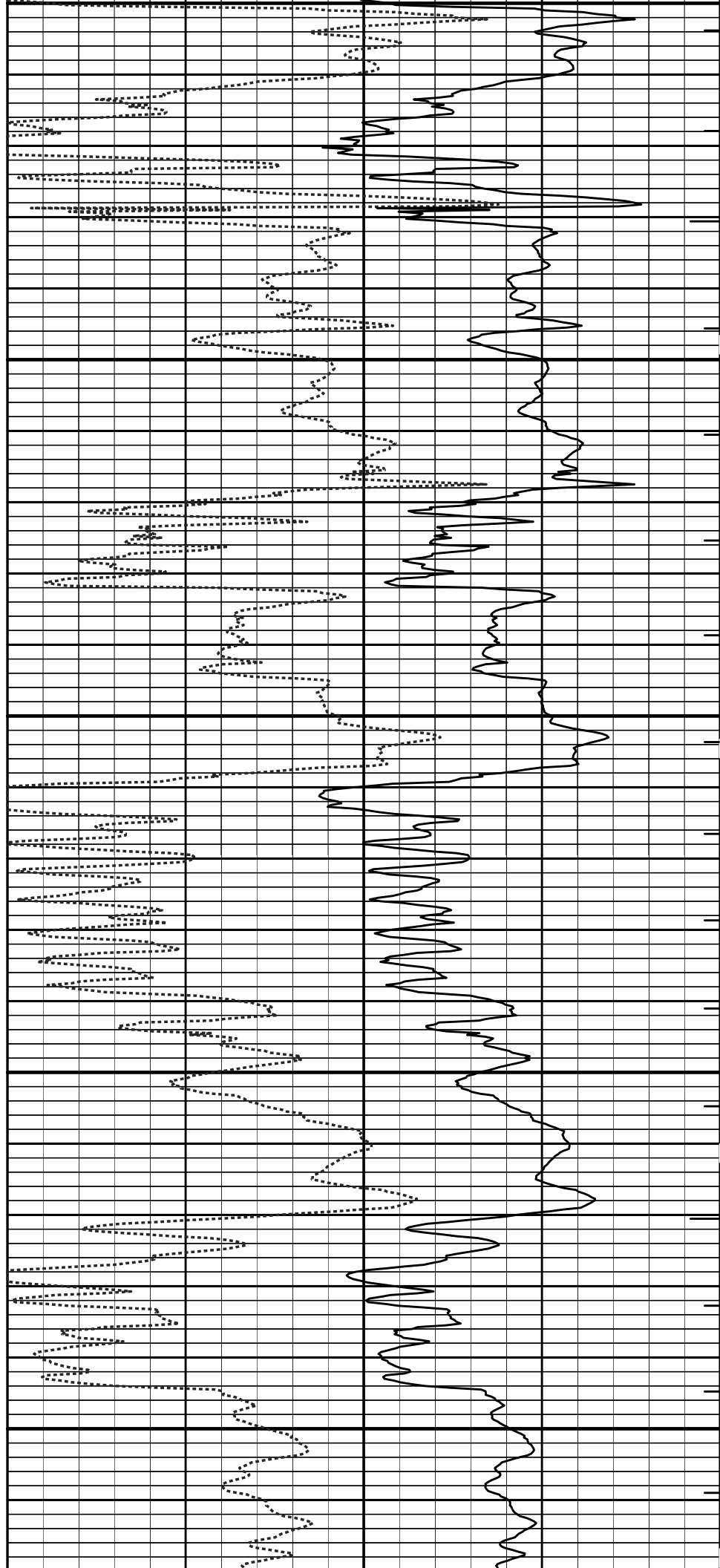
Acou Porosity

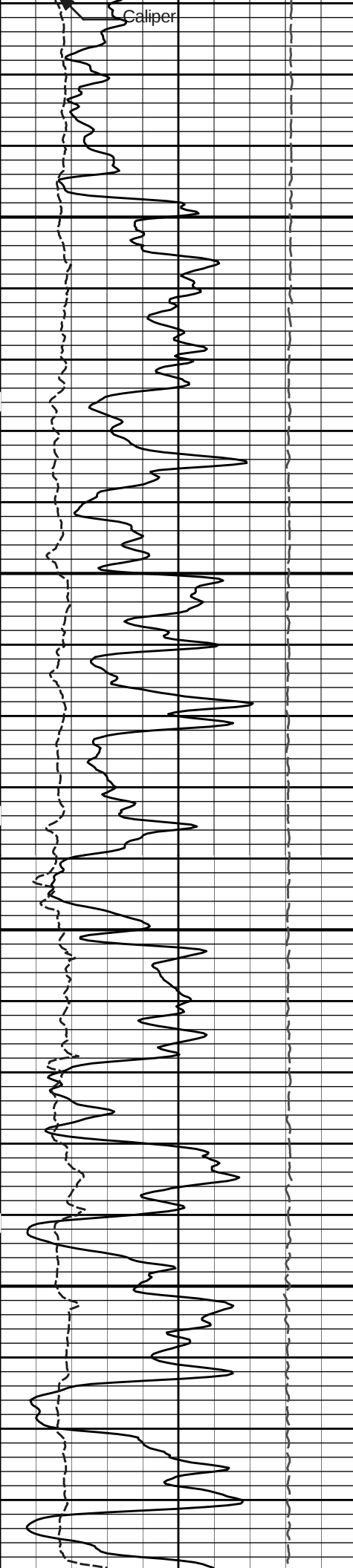
Delta T



2600

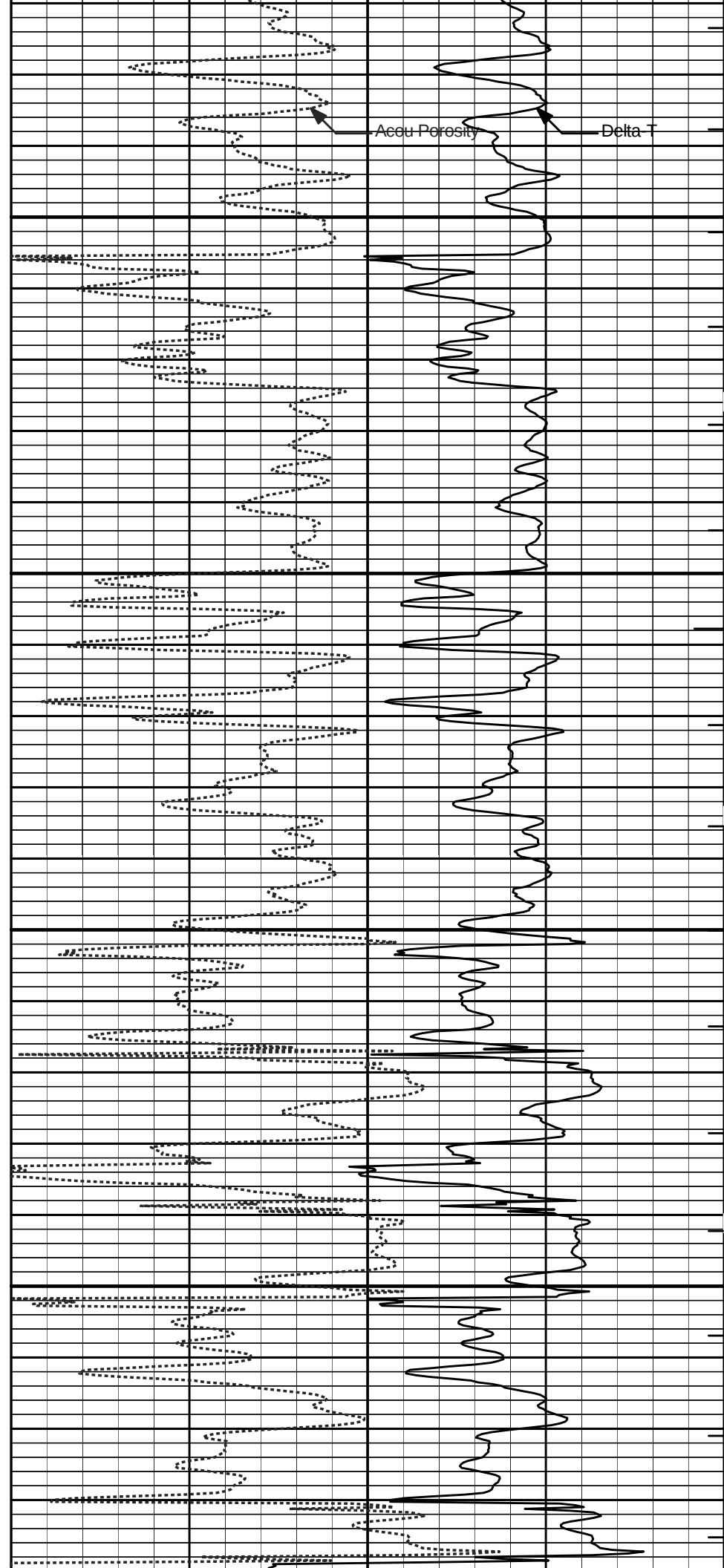
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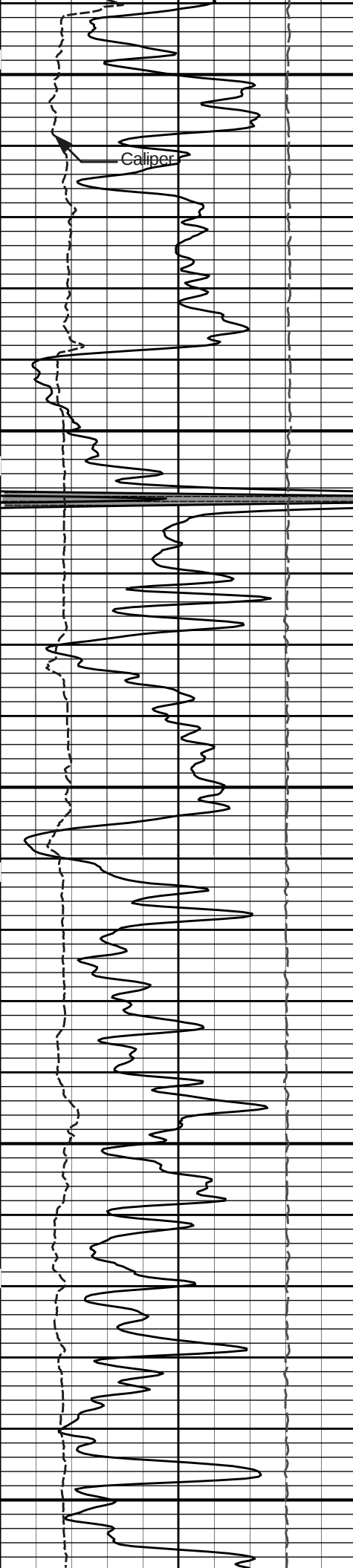




2800

2900

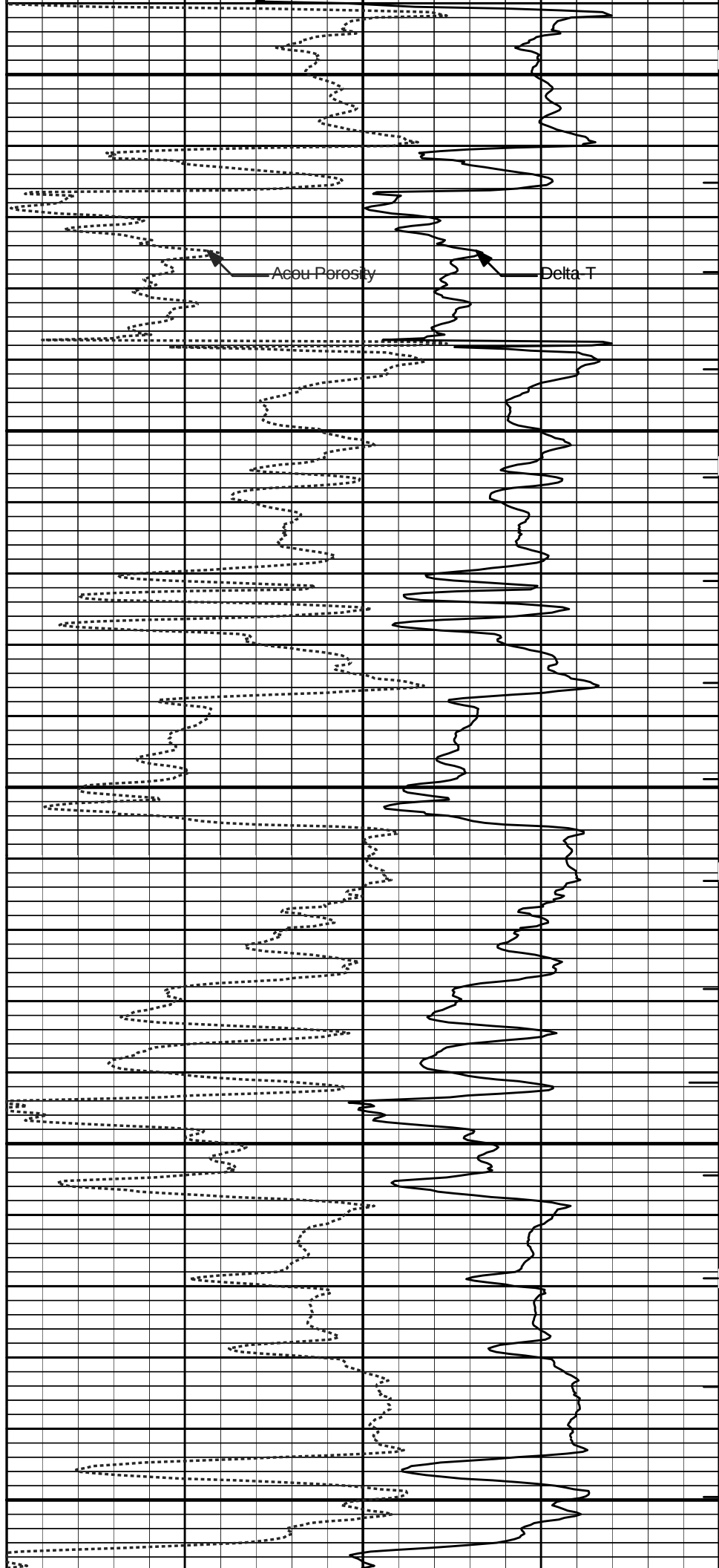




3000

3100

3200



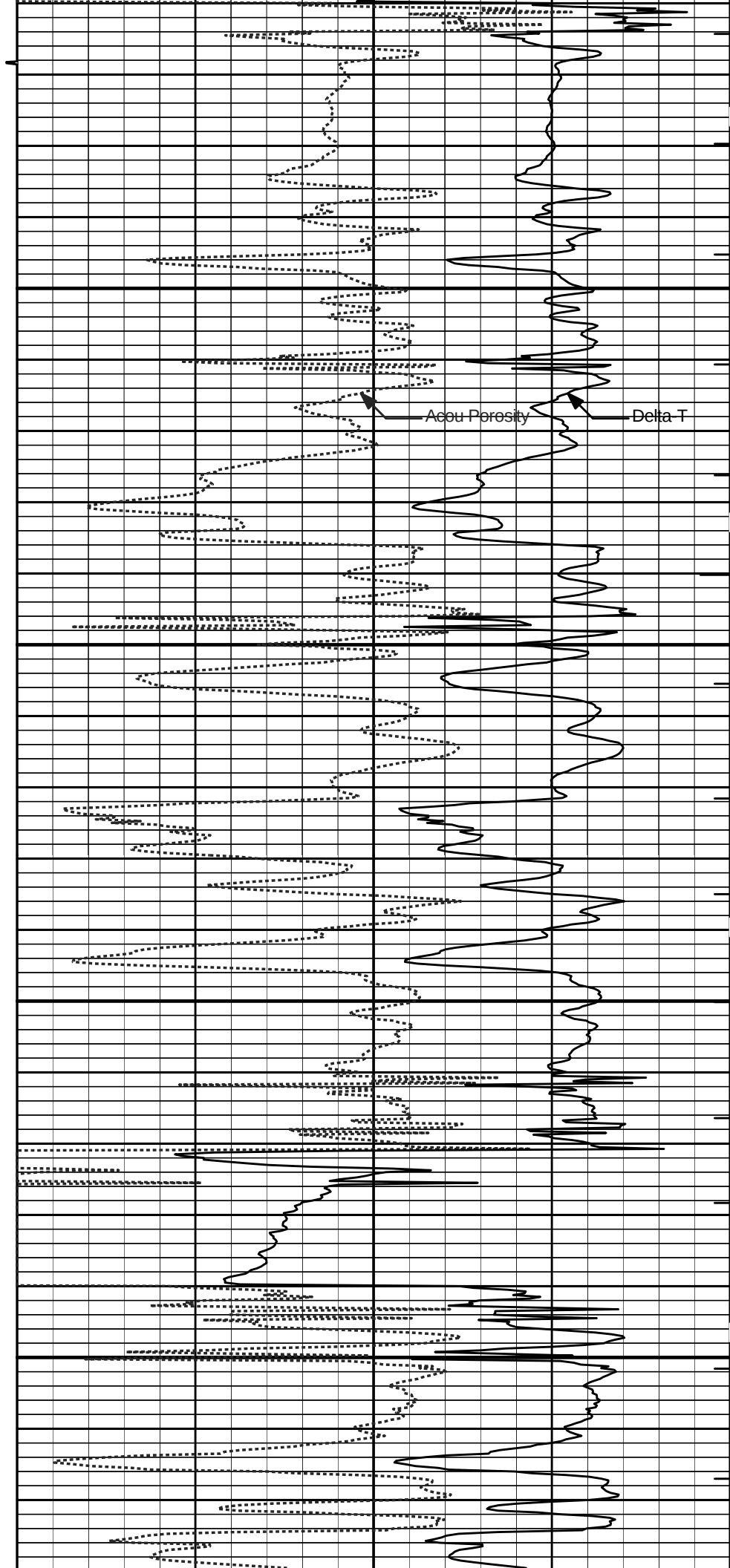
Accu Porosity

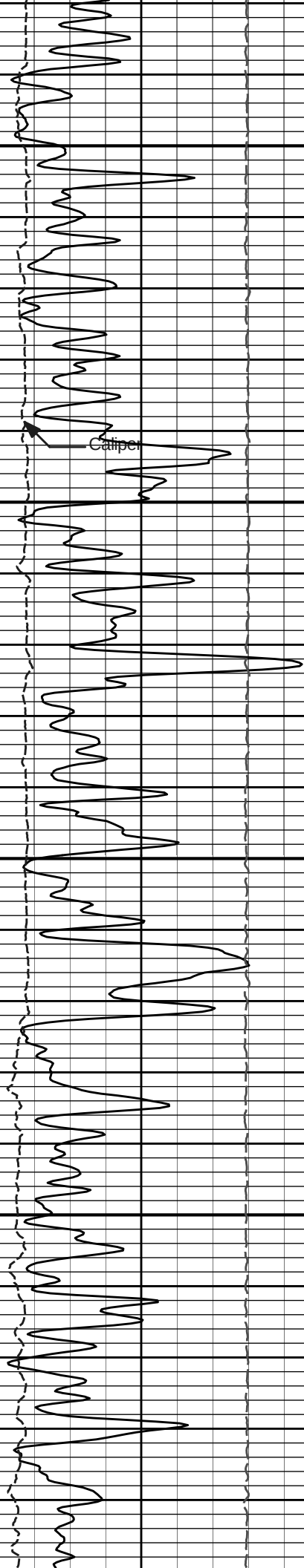
Delta T



3300

3400

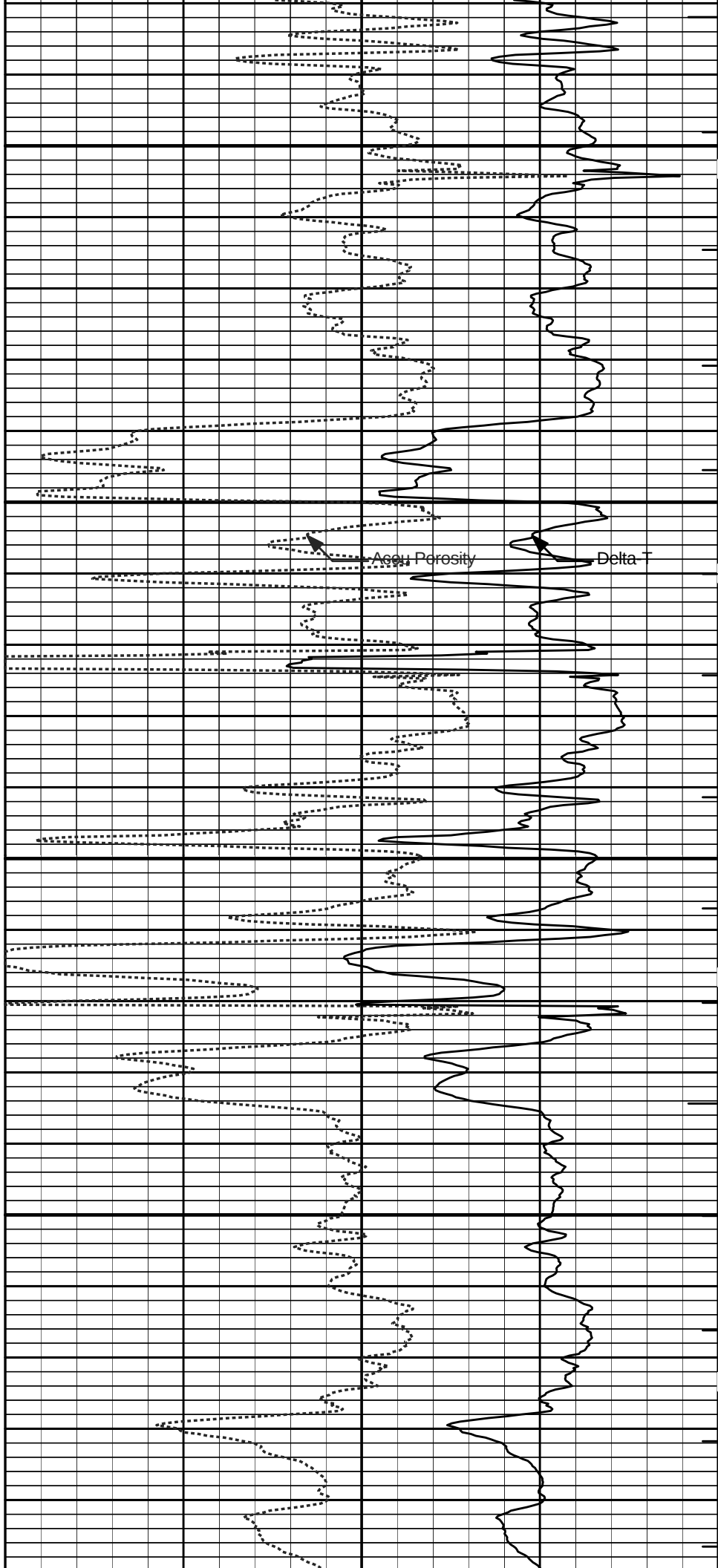




Caliper

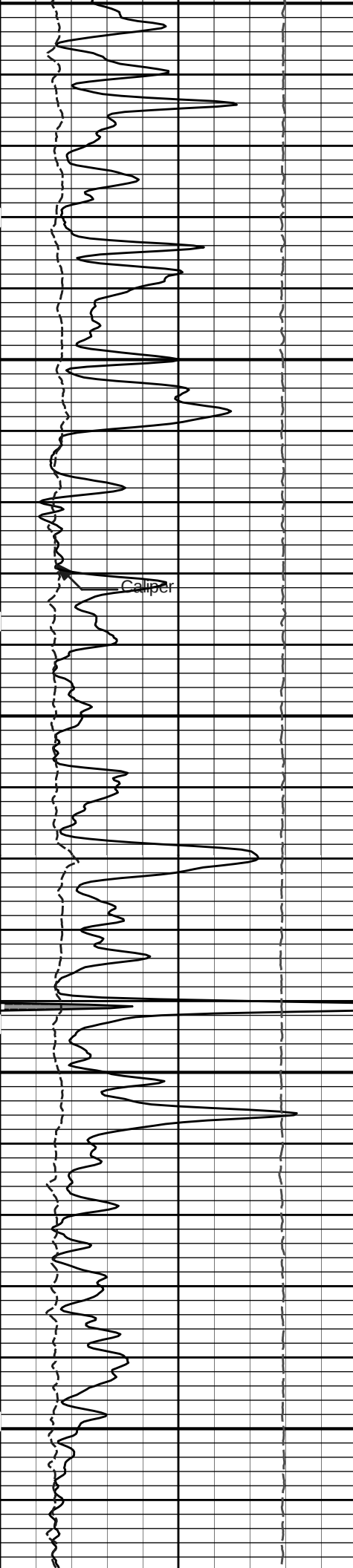
3500

3600



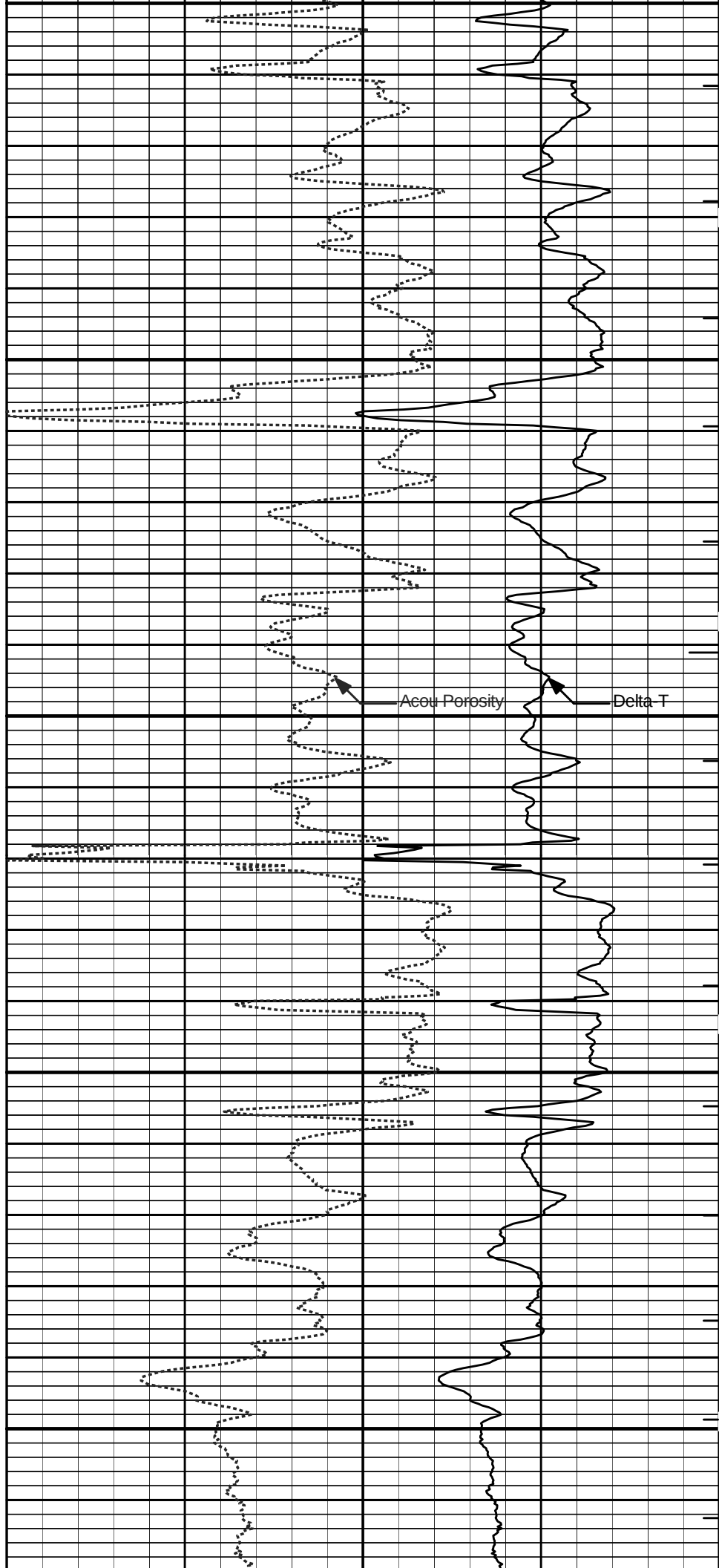
Acq. Porosity

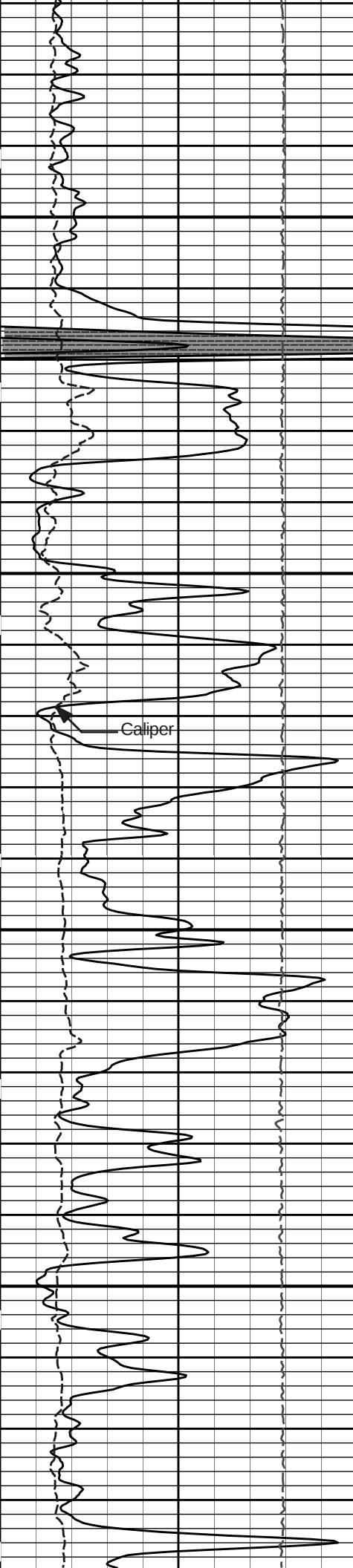
Delta T



3700

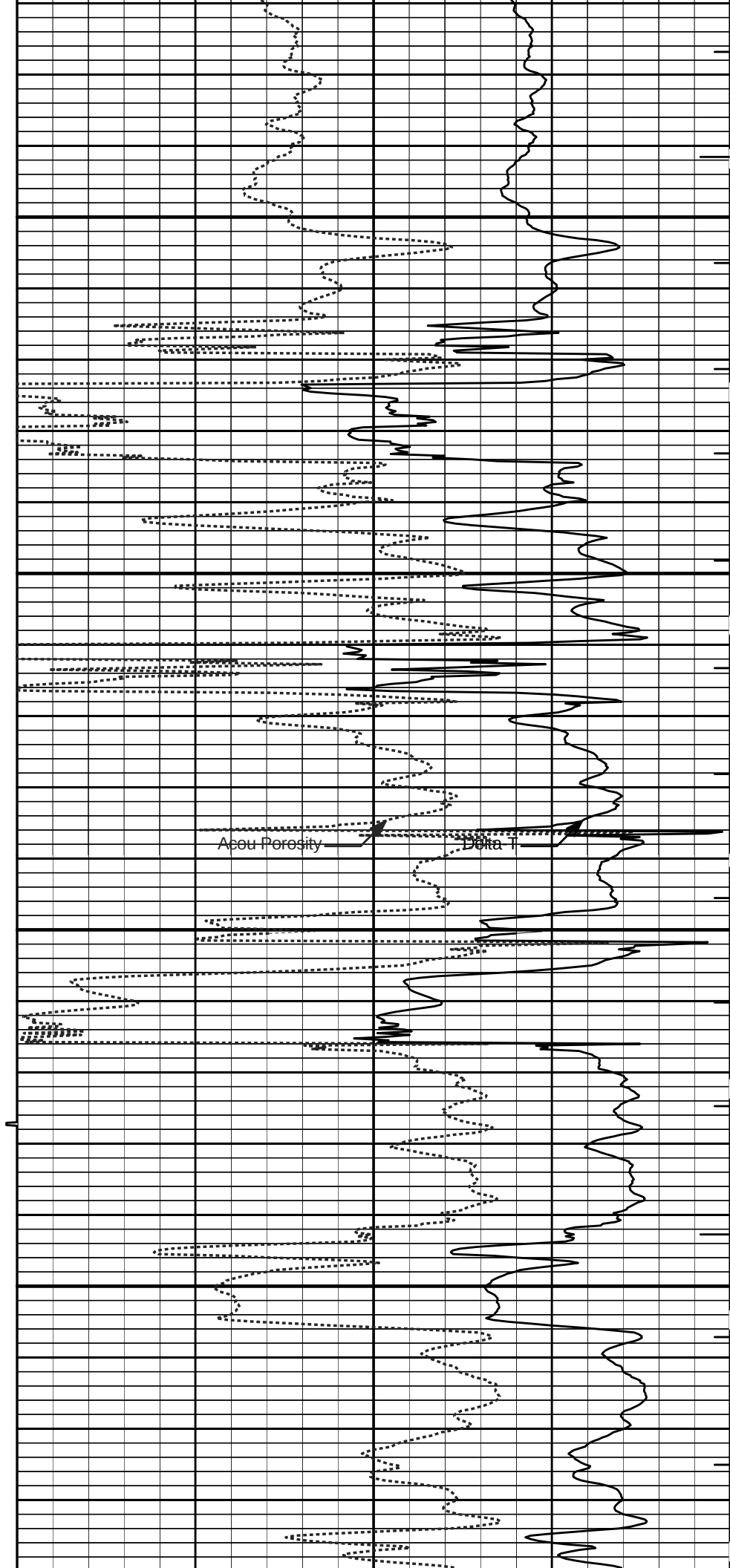
3800





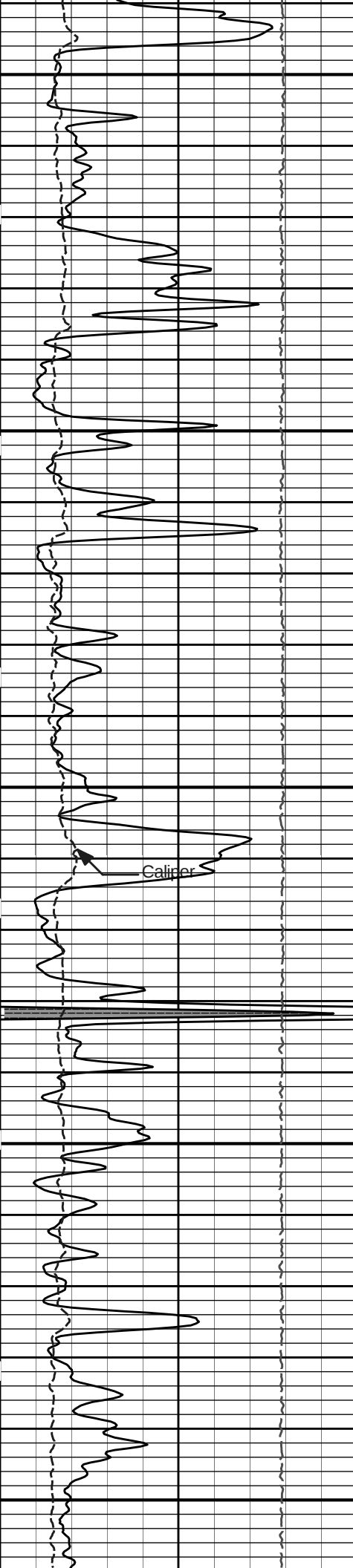
3900

4000



Acou Porosity

Delta T

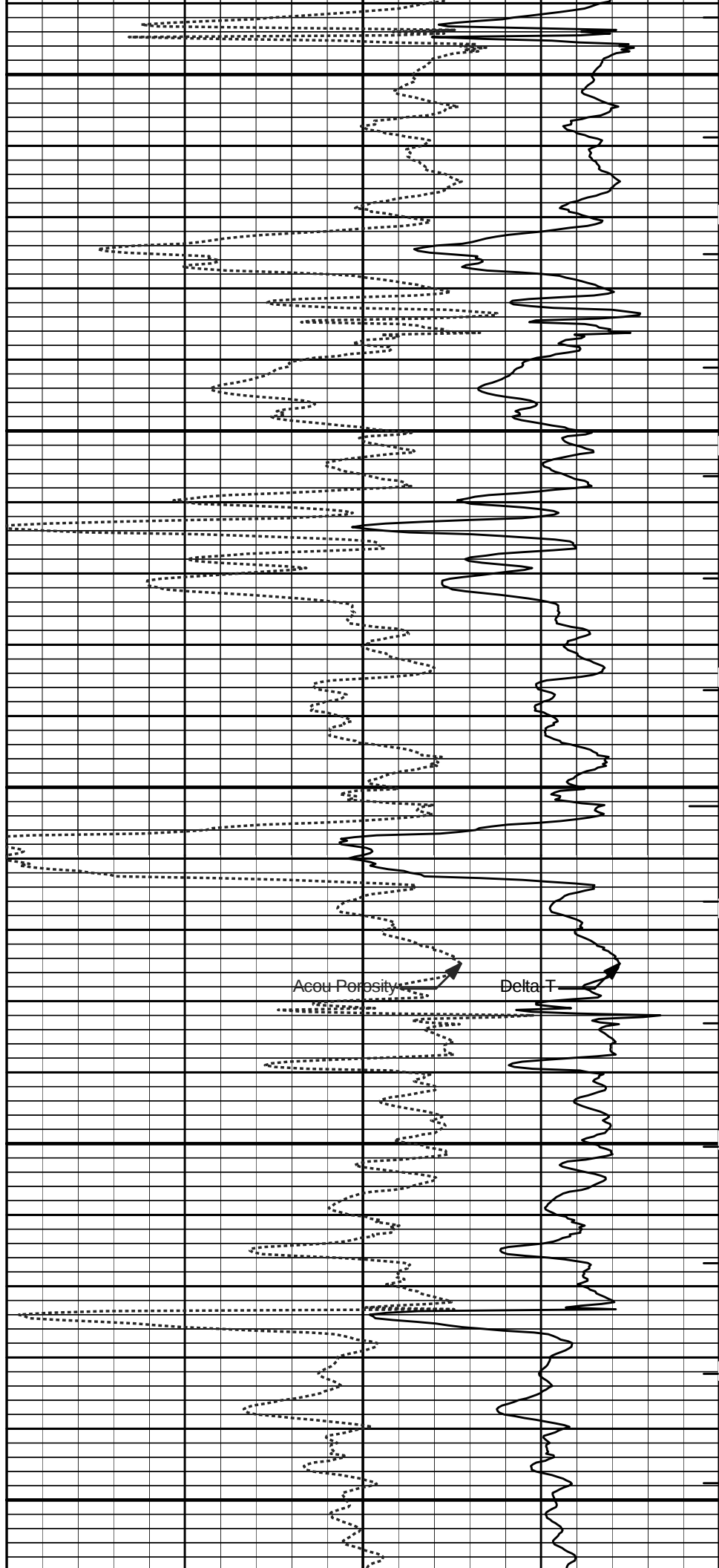


4100

4200

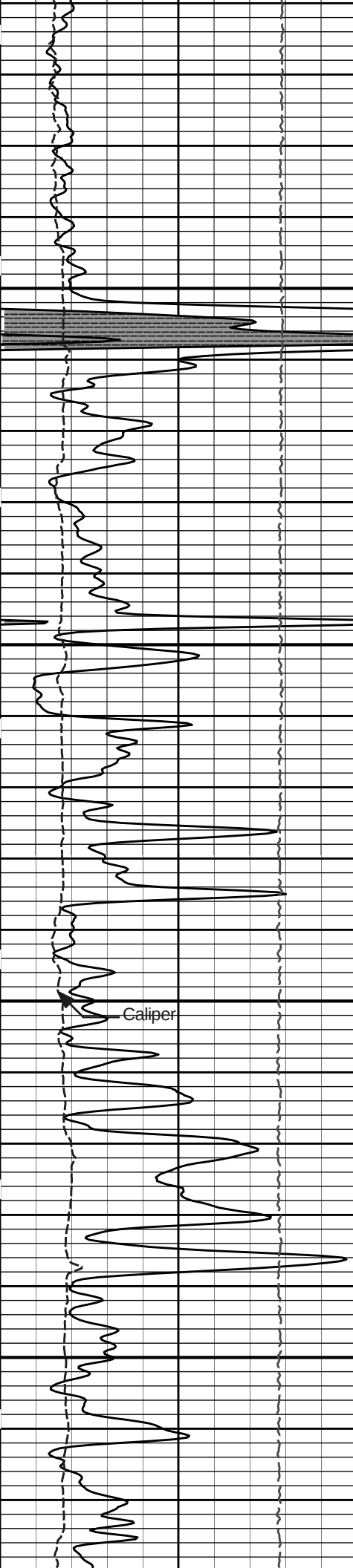
4300

Caliper



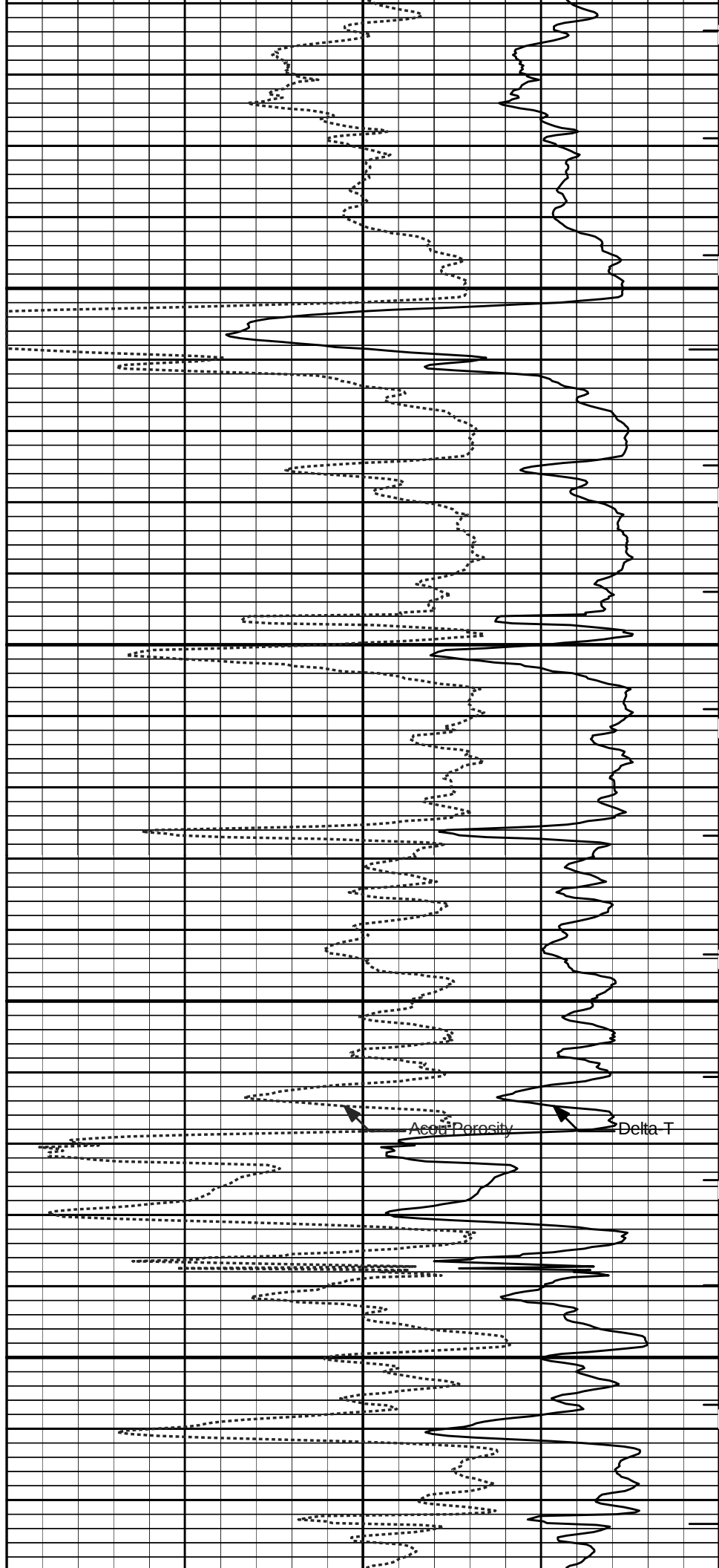
Acoustic Porosity

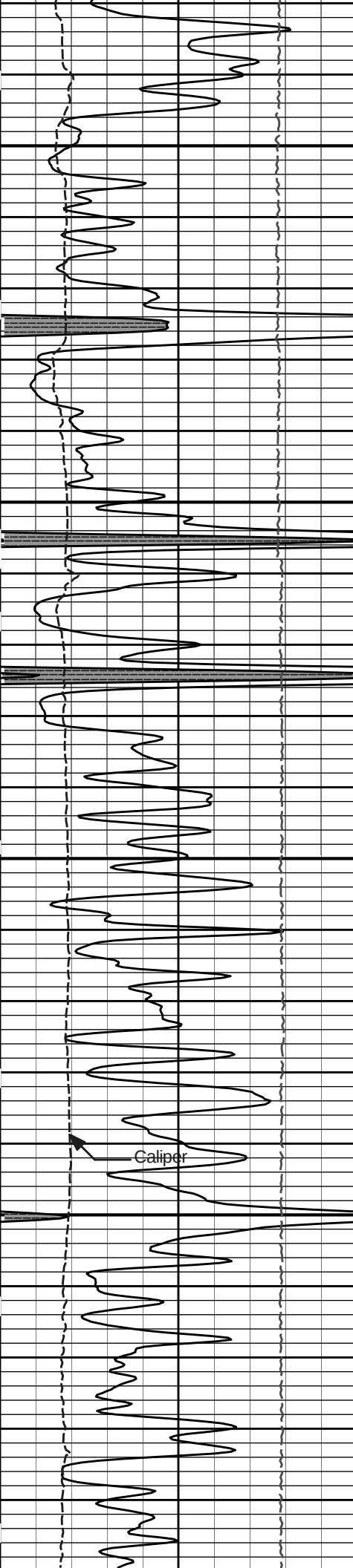
Delta T



4400

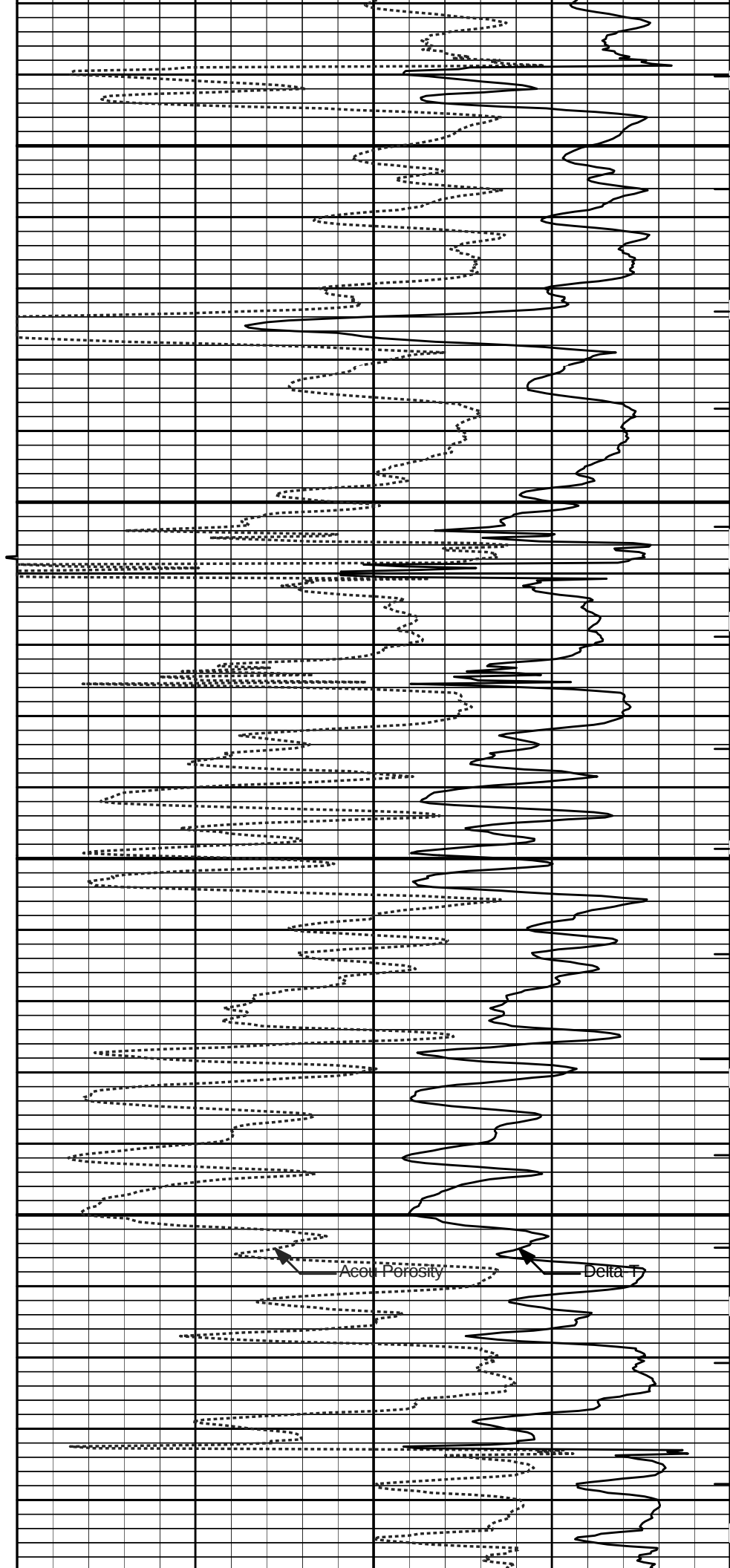
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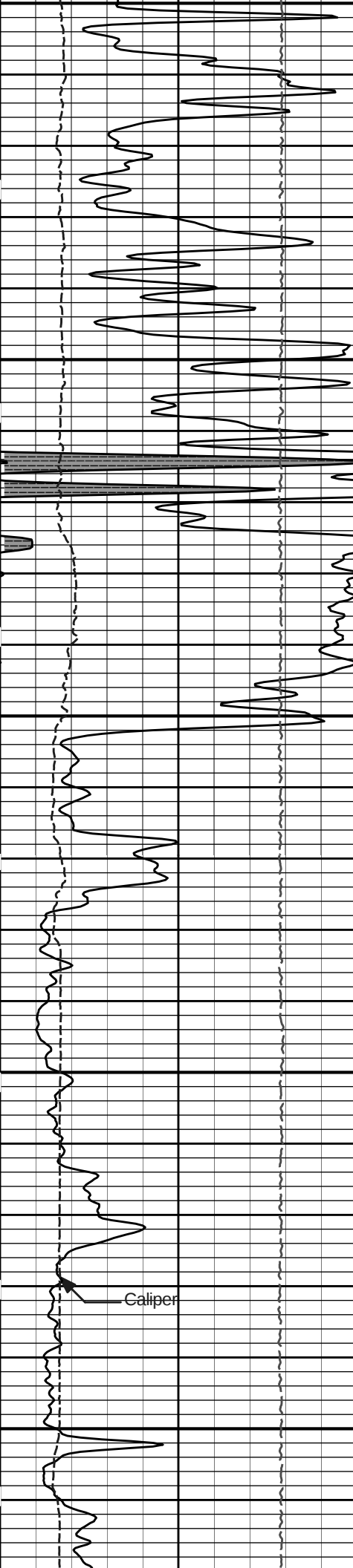
4600

4700



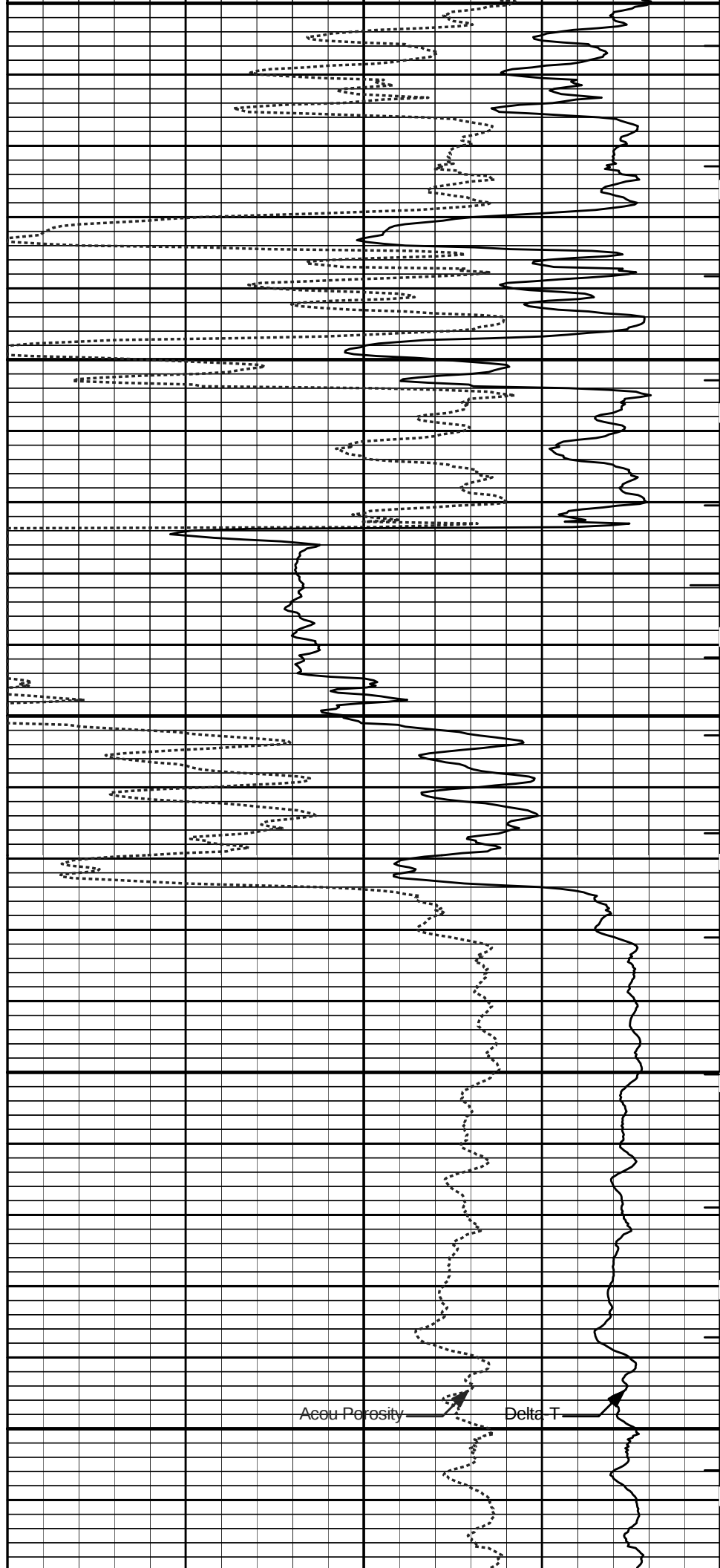
Acoustic Porosity

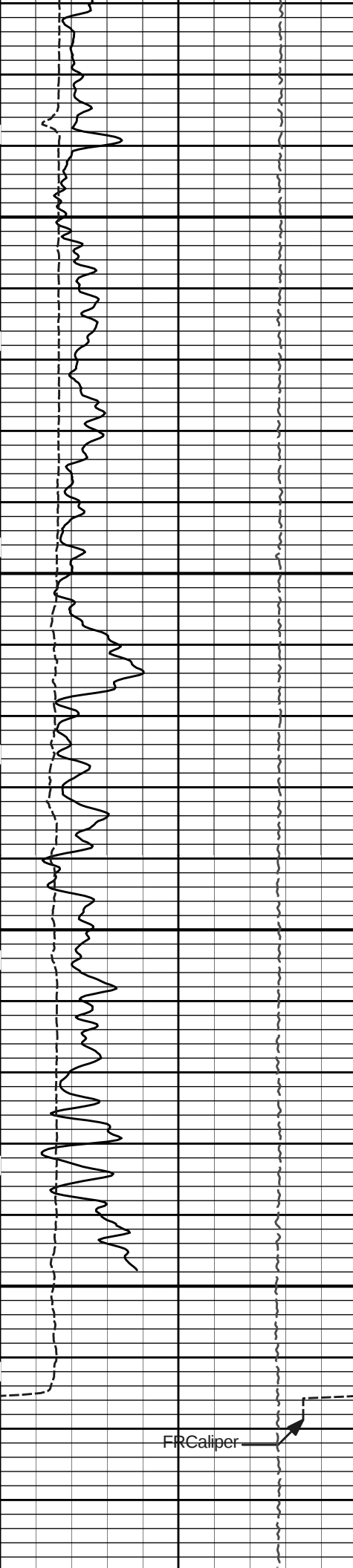
Delta T



4800

4900

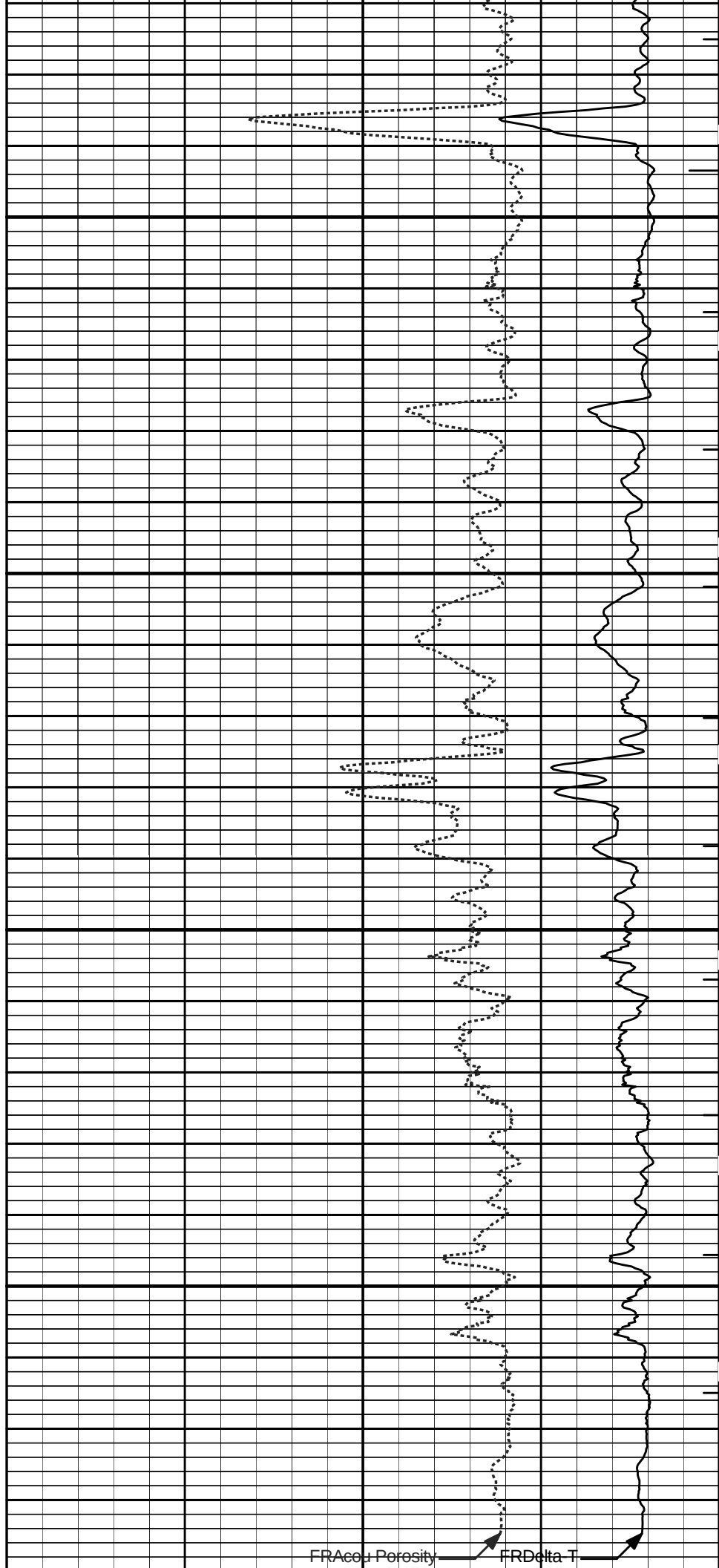




5000

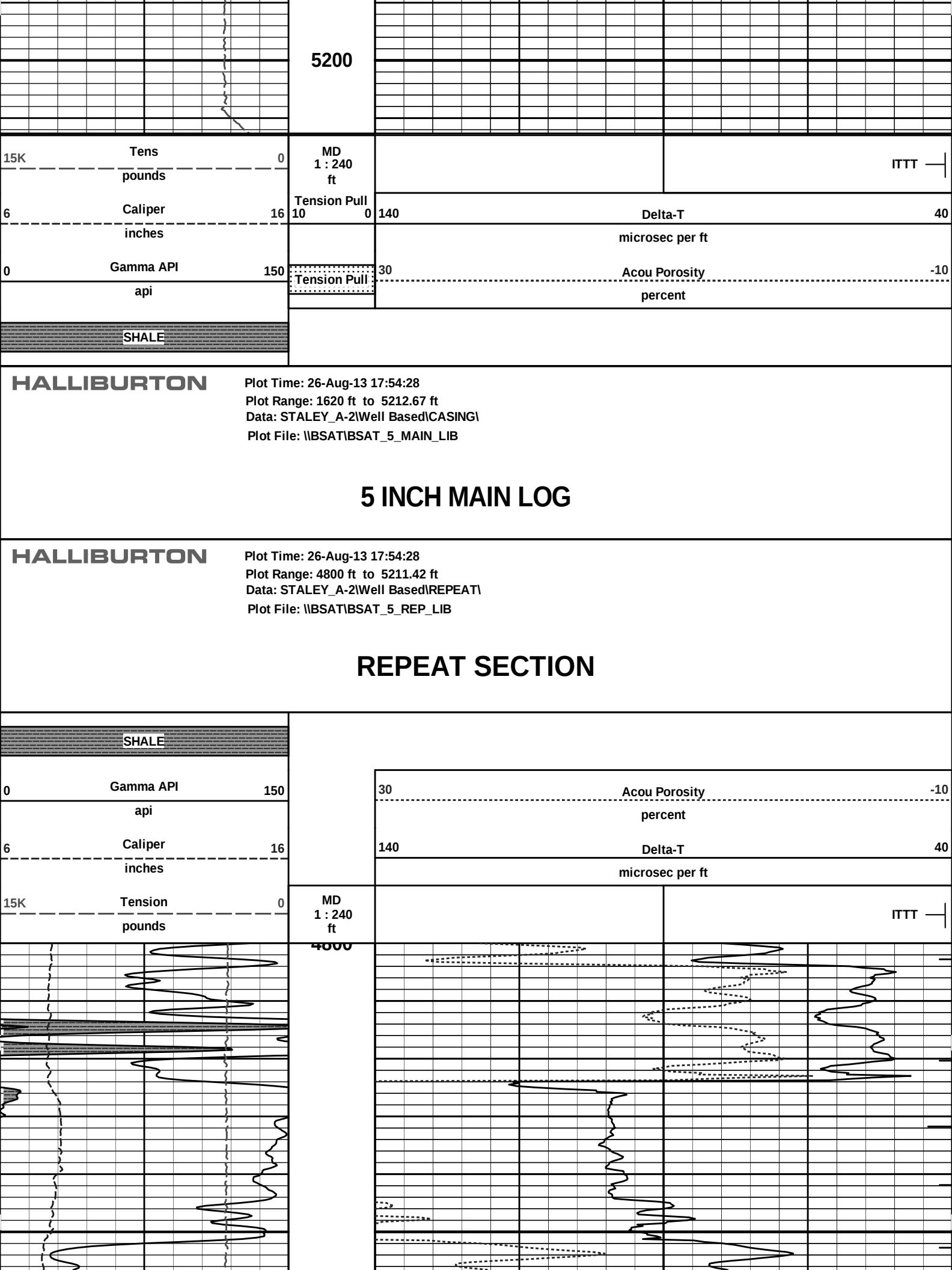
5100

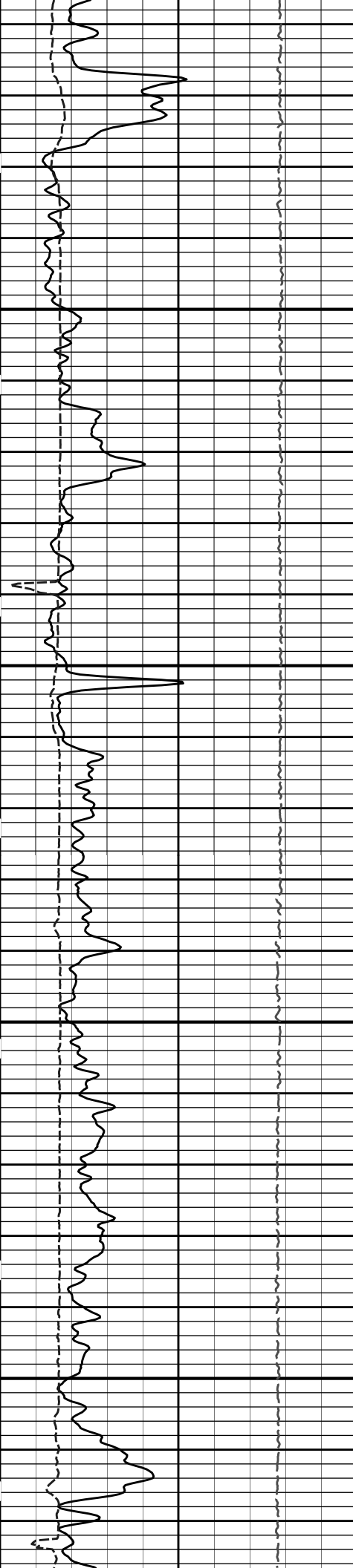
FRCaliper



FRAcou Porosity

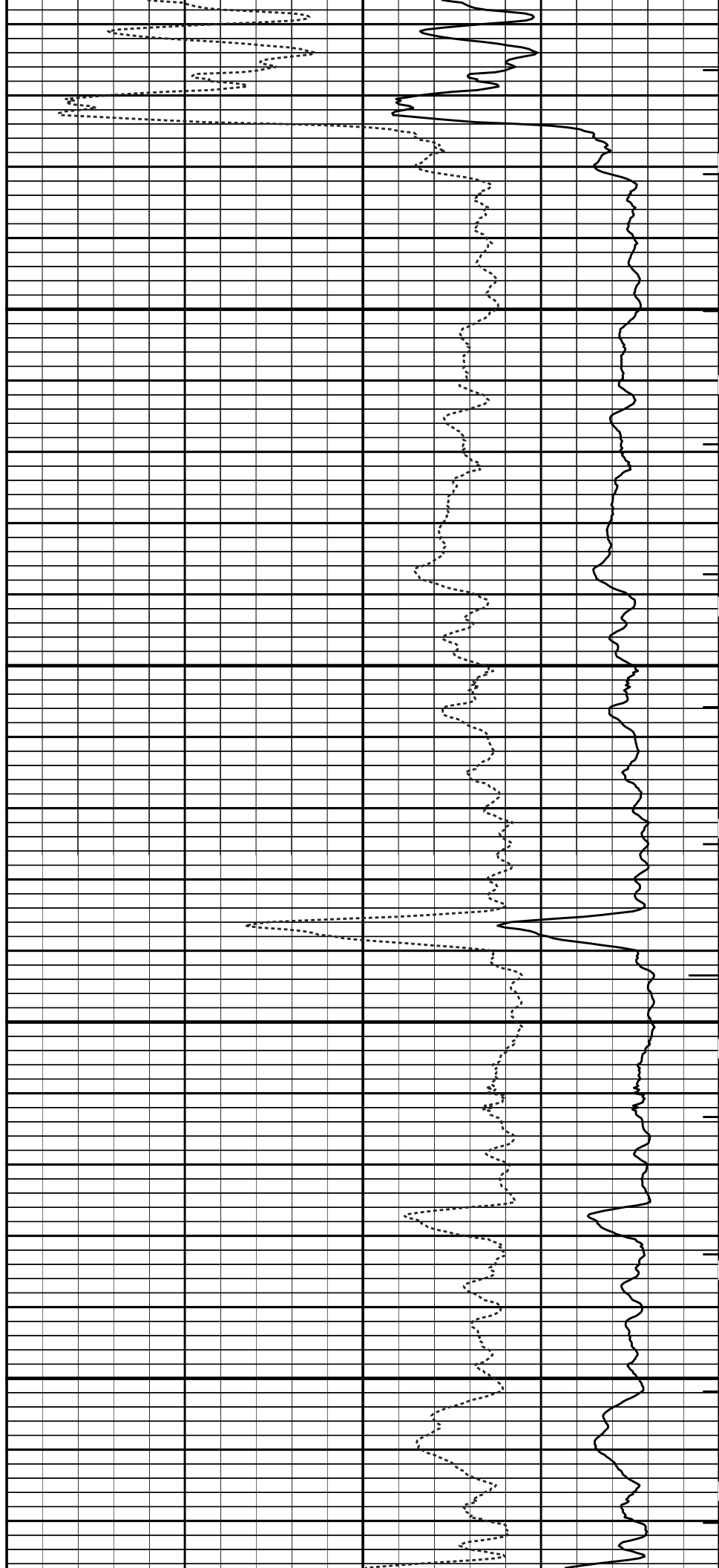
FRDelta T

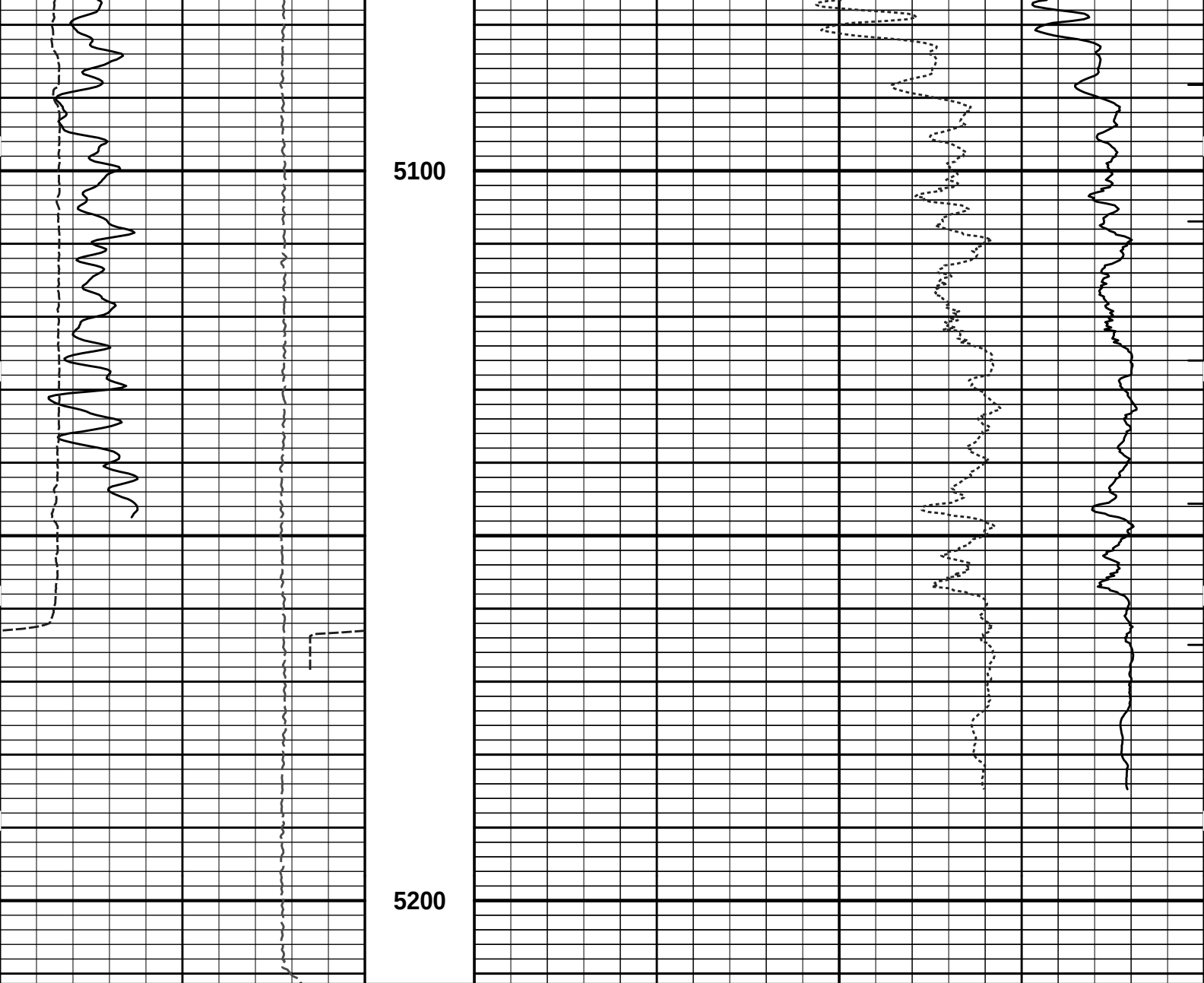




4900

5000





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

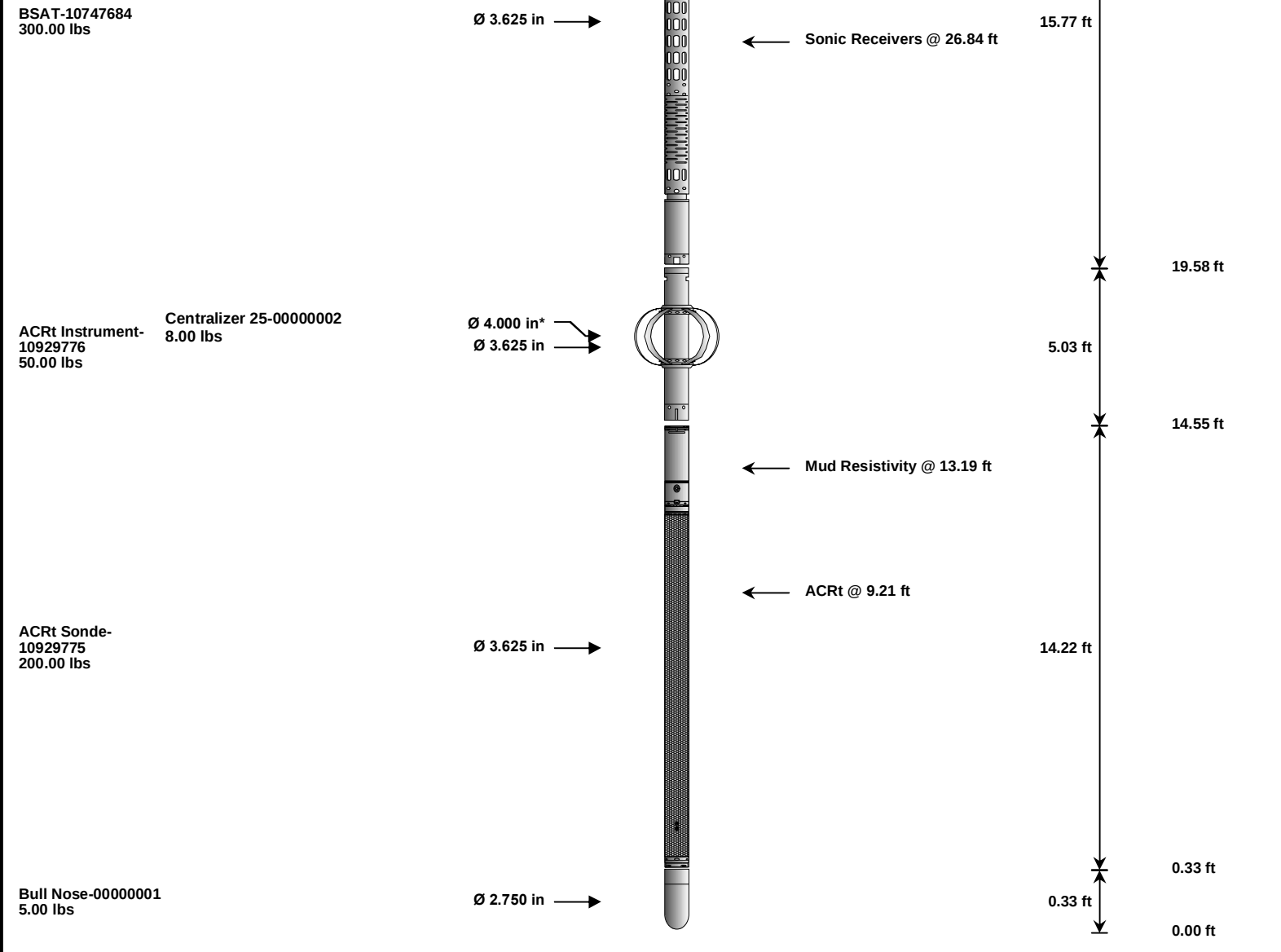
HALLIBURTON

Plot Time: 26-Aug-13 17:54:33
Plot Range: 4800 ft to 5211.42 ft
Data: STALEY_A-2\Well Based\REPEAT\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION

HALLIBURTON

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
					80.04 ft	
RWCH-12027542 135.00 lbs		Ø 3.625 in →		← Load Cell @ 76.35 ft ← BH Temperature @ 75.79 ft	6.25 ft	
SP Sub-12345678 60.00 lbs		Ø 3.625 in →		← SP @ 72.01 ft	3.74 ft	73.79 ft
GTET-10748374 165.00 lbs		Ø 3.625 in →		← GammaRay @ 63.99 ft	8.52 ft	70.05 ft
DSNT-10735145 174.00 lbs	DSN Decentralizer- 10755066 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 54.59 ft ← DSN Near @ 53.84 ft	9.69 ft	61.53 ft
SDLT-10673803 360.00 lbs	SDLT Pad-10673790 65.00 lbs Microlog Pad-10673803 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		← Microlog @ 44.03 ft ← SDL Caliper @ 43.84 ft ← SDL @ 43.83 ft	10.81 ft	51.84 ft
Flex Joint-00000001 140.00 lbs		Ø 3.625 in →			5.67 ft	41.03 ft
Centralizer 25-00000001 8.00 lbs		Ø 4.000 in* →				35.36 ft



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)	
RWCH	Releasable Wireline Cable Head		12027542	135.00	6.25	73.79	300.00	
SP	SP Sub		12345678	60.00	3.74	70.05	300.00	
GTET	Gamma Telemetry Tool		10748374	165.00	8.52	61.53	60.00	
DSNT	Dual Spaced Neutron		10735145	174.00	9.69	51.84	60.00	
DCNT	DSN Decentralizer		10755066	6.60	5.13	*	55.17	300.00
SDLT	Spectral Density Tool		10673803	360.00	10.81		41.03	60.00
MICP	Microlog Pad		10673803	8.00	1.00	*	43.53	60.00
SDLP	Density Insite Pad		10673790	65.00	2.55	*	43.24	60.00
FLEX	Flex Joint		00000001	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		00000001	8.00	2.08	*	32.82	300.00
ACRt	Array Compensated True Resistivity Instrument Section		10929776	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody		00000002	8.00	2.08	*	16.30	300.00
ACRt	Array Compensated True Resistivity Sonde Section		10929775	200.00	14.22		0.33	300.00
BLNS	Bull Nose		00000001	5.00	0.33		0.00	300.00
Total				1,684.60	80.04			
* Not included in Total Length and Length Accumulation.								
Data: STALEY_A-2I0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BNIDLE								
Date: 26-Aug-13 14:28:22								

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	9.300	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	5212.00	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	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	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_____				
Data: STALEY_A-210001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BNIDLE			Date: 26-Aug-13 14:30:42	

HALLIBURTON				
INPUTS, DELAYS AND FILTERS TABLE				
Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
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				
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 Current Raw 12K X Receiver	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	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
Data: STALEY_A-2I0001 SP-GTET-DSN-SDL-FLEX-BSAT-ACRT-BNIDLE			Date: 26-Aug-13 14:30:19	

COMPANY	OXY USA INC.		
WELL	STALEY A-2		
FIELD	HUGOTON GAS AREA		
COUNTY	FINNEY	STATE	KANSAS
HALLIBURTON		BOREHOLE COMPENSATED	

