

**BOREHOLE
COMPENSATED
SONIC
LOG**

LARIO OIL & GAS COMPANY				LARIO OIL & GAS COMPANY					
KNOBBE 2-4				KNOBBE 2-4					
OBI-WAN				OBI-WAN					
WICHITA				WICHITA					
KANSAS				KANSAS					
COMPANY	WELL	FIELD/BLOCK	COUNTY	STATE	COMPANY	WELL	FIELD/BLOCK	COUNTY	STATE
Permanent Datum					ACRT				
Log measured from					SDL-DSN				
Drilling measured from					MICLOG				
GL					SONIC				
KB									
KB									
9.0 ft above perm. Datum									
Elev. 3309.0 ft					Elev.: K.B.				
					D.F.				
					G.L.				
3318.0 ft					3316.0 ft				
3309.0 ft					3309.0 ft				
Date					Date				
03-Mar-18					03-Mar-18				
Run No.					Run No.				
1					1				
Depth - Driller					Depth - Driller				
5000.0 ft					5000.0 ft				
Depth - Logger					Depth - Logger				
5000.0 ft					5000.0 ft				
Bottom - Logged Interval					Bottom - Logged Interval				
4990					4990				
Top - Logged Interval					Top - Logged Interval				
342					342				
Casing - Driller					Casing - Driller				
8.625 in @ 348.0 ft					8.625 in @ 348.0 ft				
Casing - Logger					Casing - Logger				
342.0 ft					342.0 ft				
Bit Size					Bit Size				
7.875 in					7.875 in				
Type Fluid in Hole					Type Fluid in Hole				
Water Based Mud					Water Based Mud				
Density					Density				
9.10 g/cc					9.10 g/cc				
Viscosity					Viscosity				
65.00 s/qt					65.00 s/qt				
PH					PH				
9.50 pH					9.50 pH				
Fluid Loss					Fluid Loss				
8.8 cplm					8.8 cplm				
Source of Sample					Source of Sample				
MUD PIT					MUD PIT				
Rm @ Meas. Temperature					Rm @ Meas. Temperature				
0.44 ohmm @ 76.00 degF					0.44 ohmm @ 76.00 degF				
Rinf @ Meas. Temperature					Rinf @ Meas. Temperature				
0.38 ohmm @ 74.00 degF					0.38 ohmm @ 74.00 degF				
Rmc @ Meas. Temperature					Rmc @ Meas. Temperature				
0.53 ohmm @ 74.00 degF					0.53 ohmm @ 74.00 degF				
Source Rinf					Source Rinf				
MEAS					MEAS				
Rm @ BHT					Rm @ BHT				
0.27 ohmm @ 126.0 degF					0.27 ohmm @ 126.0 degF				
Time Since Circulation					Time Since Circulation				
23:30 hr					23:30 hr				
Time on Bottom					Time on Bottom				
03-Mar-18 04:58					03-Mar-18 04:58				
Max. Rec. Temperature					Max. Rec. Temperature				
126.00 degF @ 5000.0 ft					126.00 degF @ 5000.0 ft				
Equipment					Equipment				
12156883					12156883				
Location					Location				
EL RENO					EL RENO				
Recorded By					Recorded By				
WHITLOCK					WHITLOCK				
Witnessed By					Witnessed By				
STEVE DAVIS					STEVE DAVIS				

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Service Ticket No.: 904686784				API No.: 15-203-20327-00-00				PGM Version: WL INSITE R5.6.3 (Build 4)						
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.				
Rmf @ Meas. Temp.		@		@										
Rmc @ Meas. Temp.		@		@										
Source Rmf	Rmc													
Rm @ BHT		@		@										
Rmf @ BHT		@		@										
Rmc @ BHT		@		@										
EQUIPMENT DATA														
GAMMA			ACOUSTIC			DENSITY			NEUTRON					
Run No.				Run No.				Run No.						
Serial No.				Serial No.				Serial No.						
Model No.				Model No.				Model No.						
Diameter				No. of Cent.				Diameter						
Detector Model No.				Spacing				Log Type						
Type						Source Type				Source Type				
Length				LSA [Y/N]				Serial No.						
Distance to Source				FWDA [Y/N]				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	

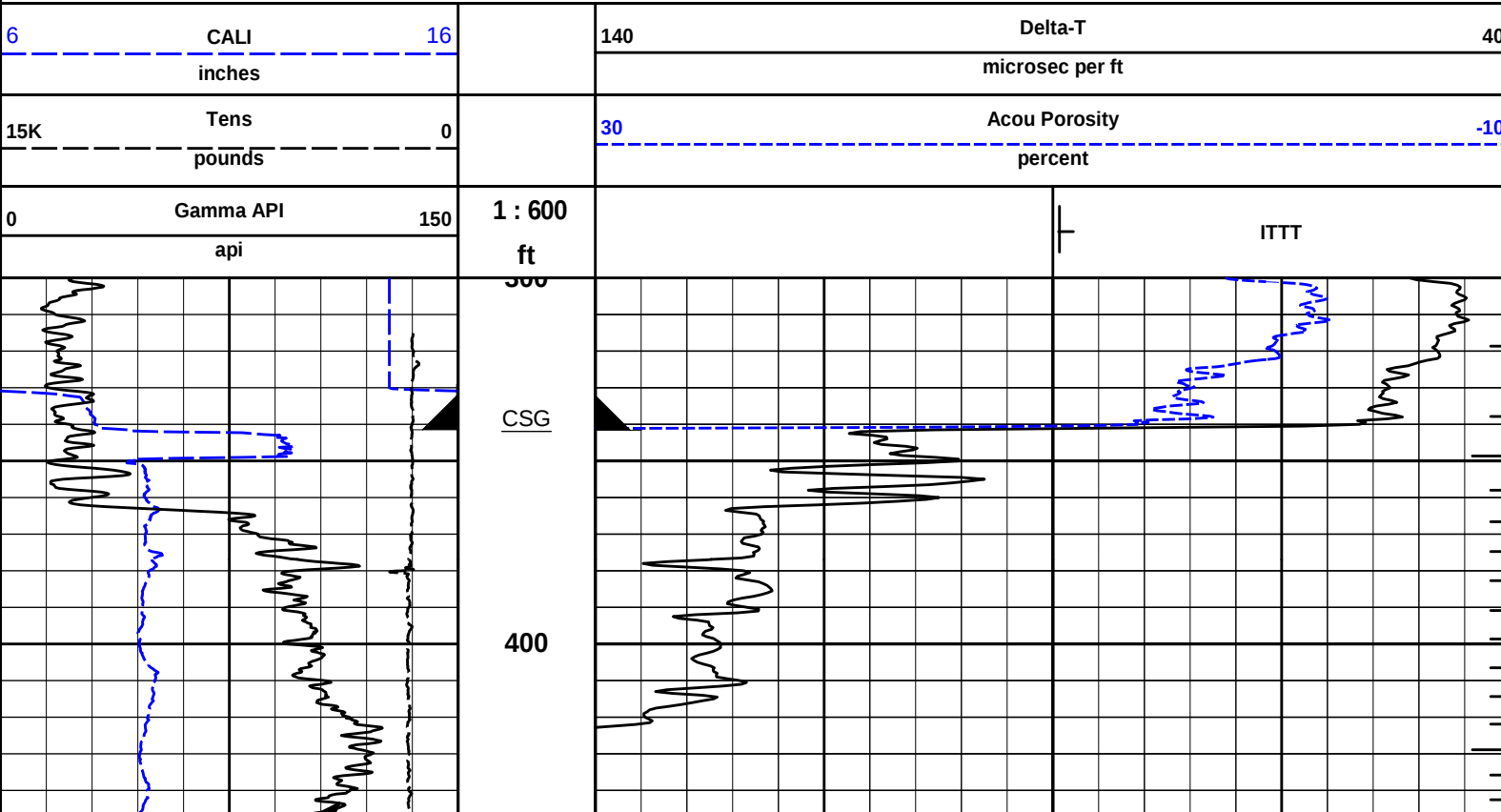
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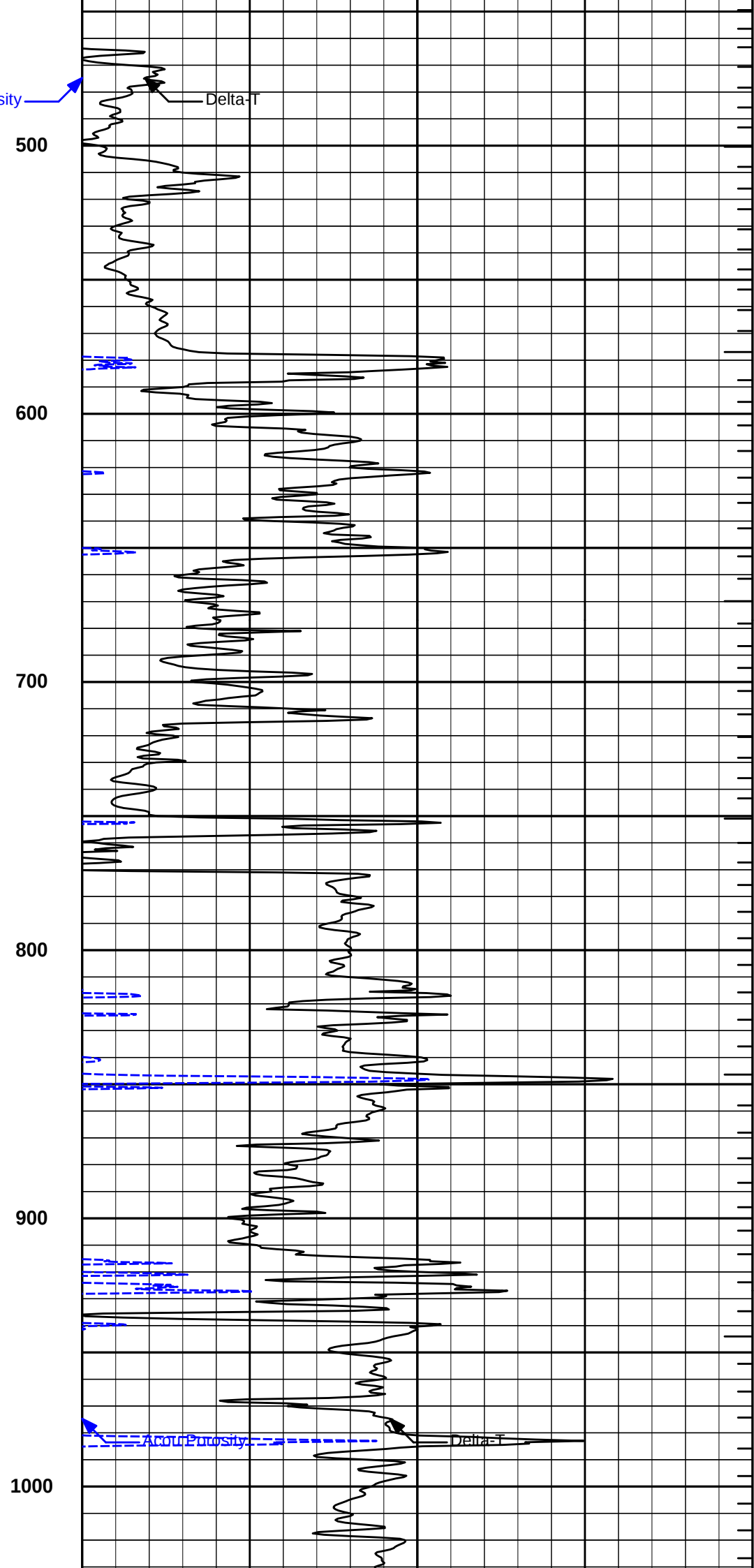
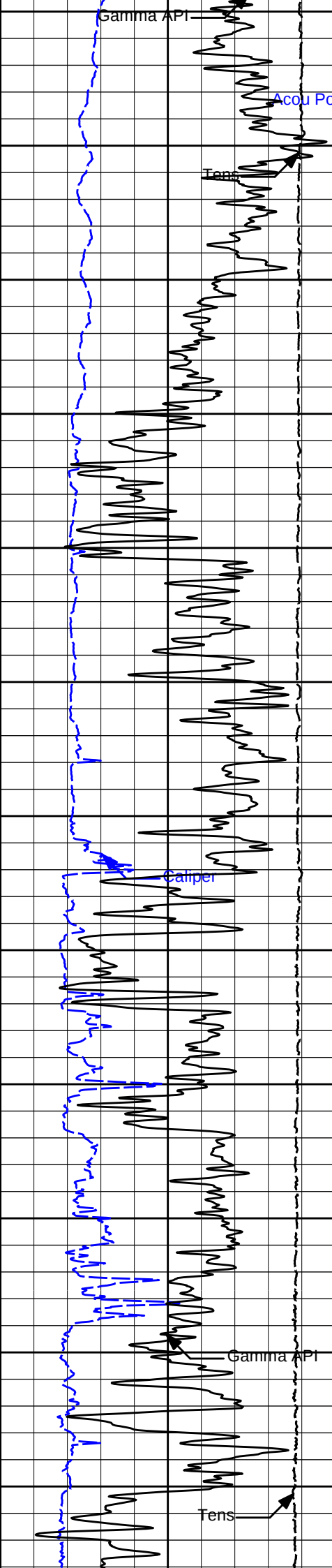
HALLIBURTON

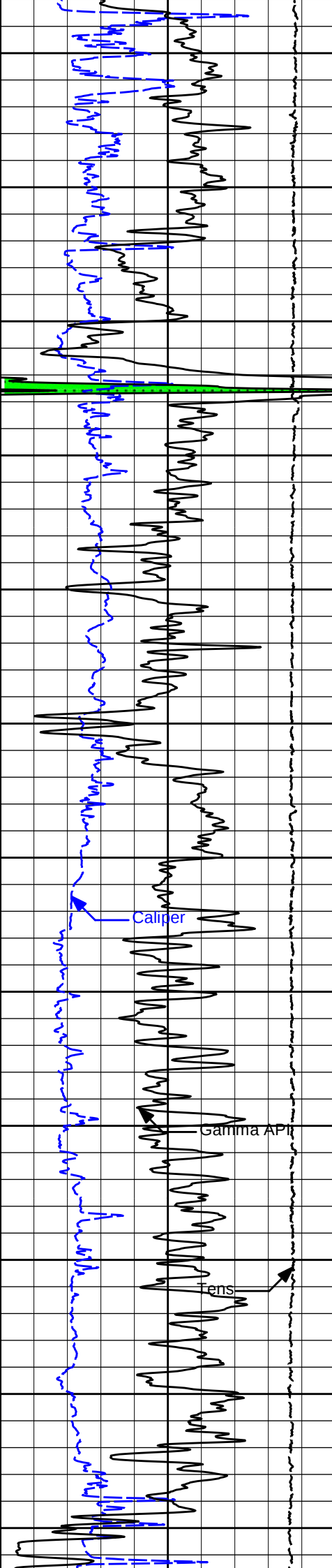
Plot Time: 03-Mar-18 08:38:22
Plot Range: 300 ft to 5002.83 ft
Data: LARIO_KNOBBE\Well Based\DAQ-0001-003\
Plot File: \\BSAT\BSAT_2inch

2 INCH MAIN LOG

2" MAIN LOG SECTION







1100

1200

1300

1400

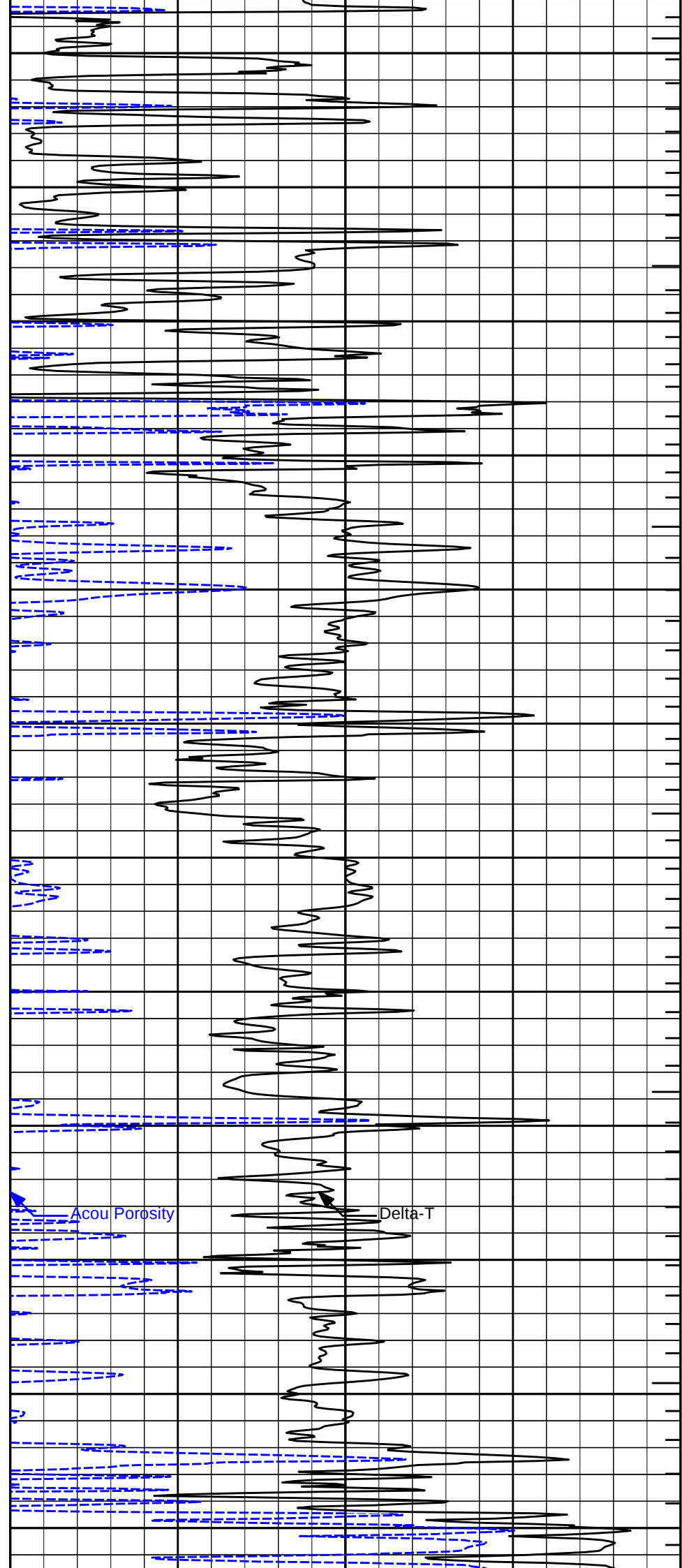
1500

1600

Caliper

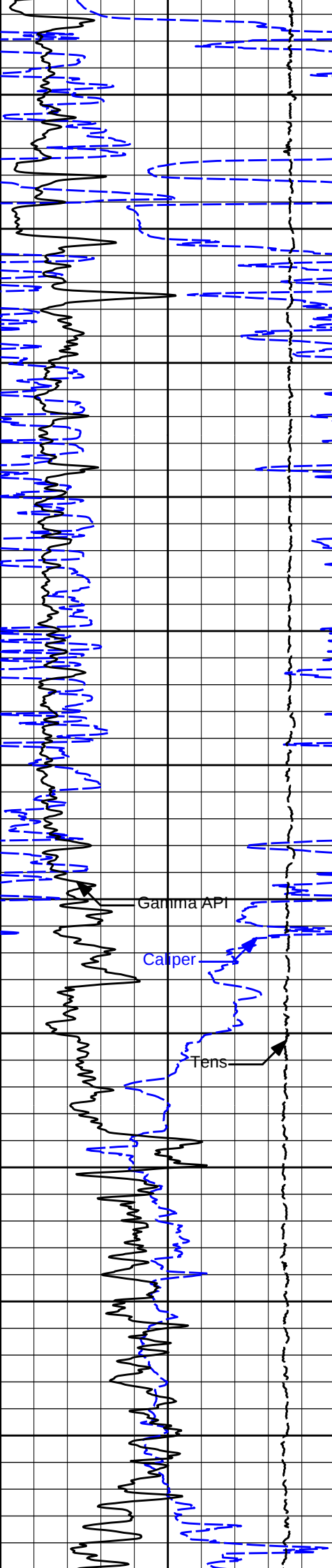
Gamma API

Tens



Delta-T

Acou Porosity



1700

1800

1900

2000

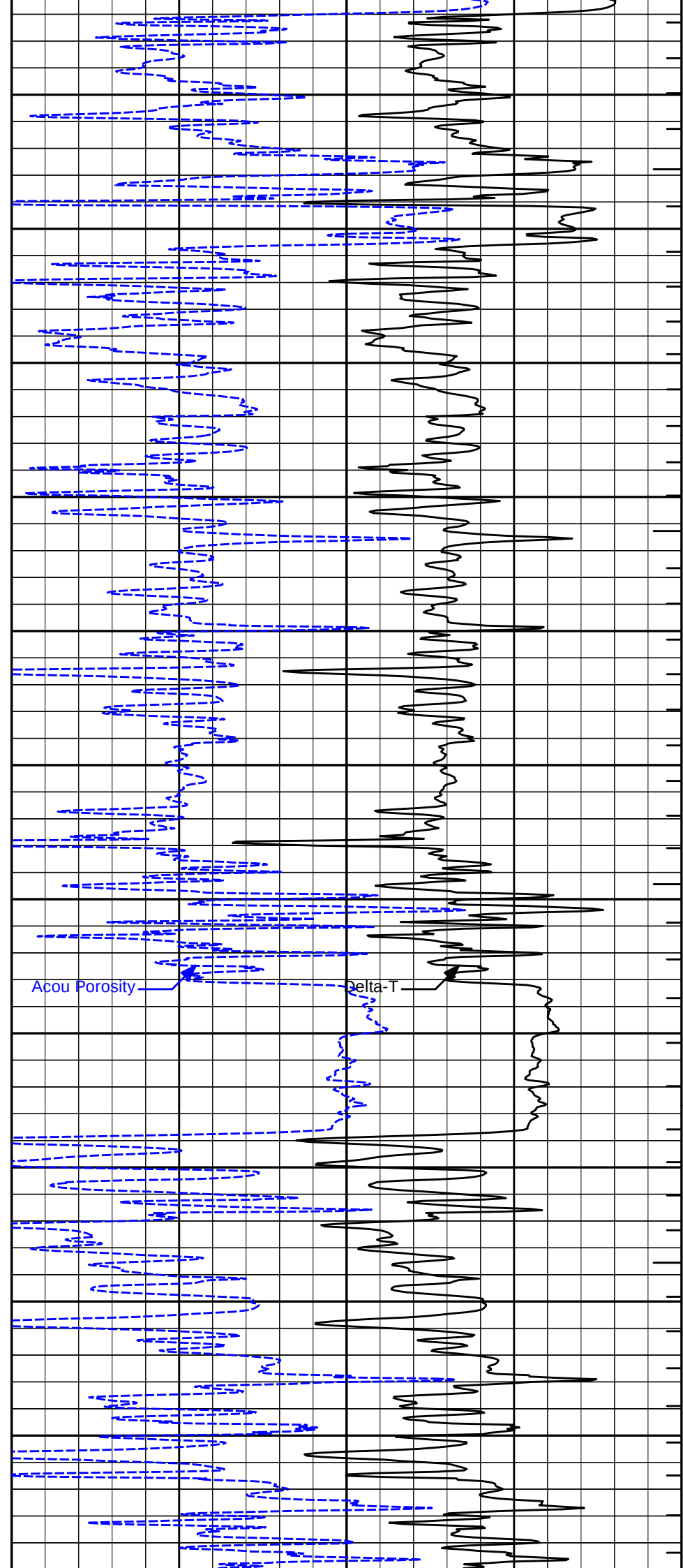
2100

2200

Gamma API

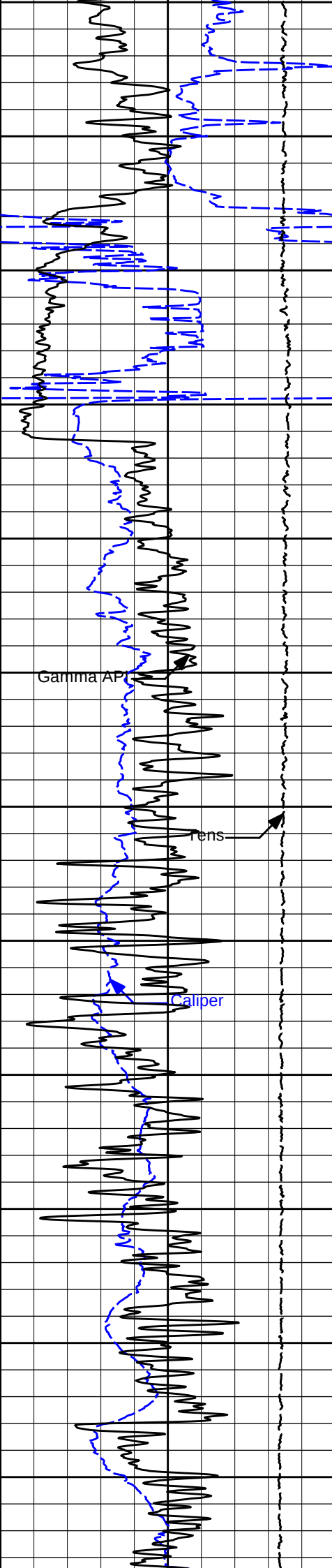
Caliper

Tens



Acou Porosity

Delta-T



2200

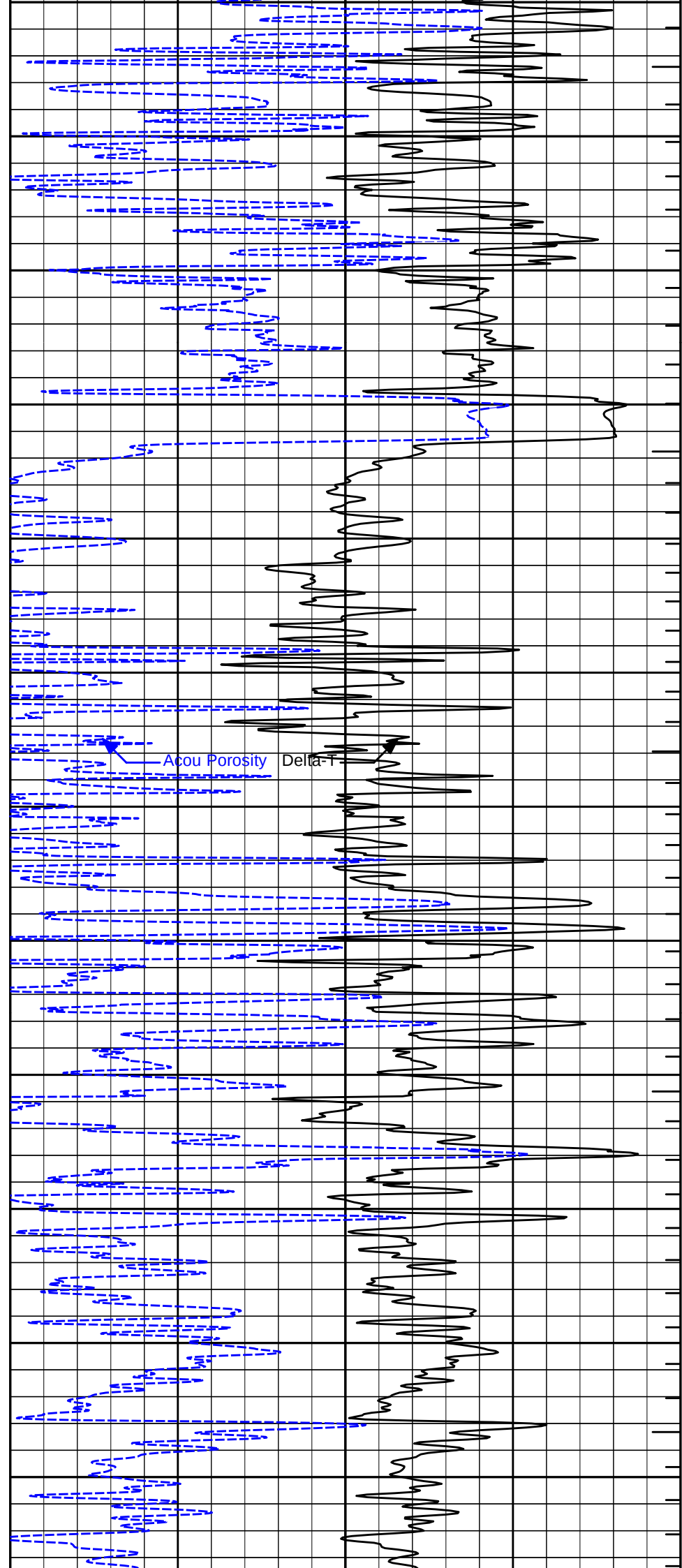
2300

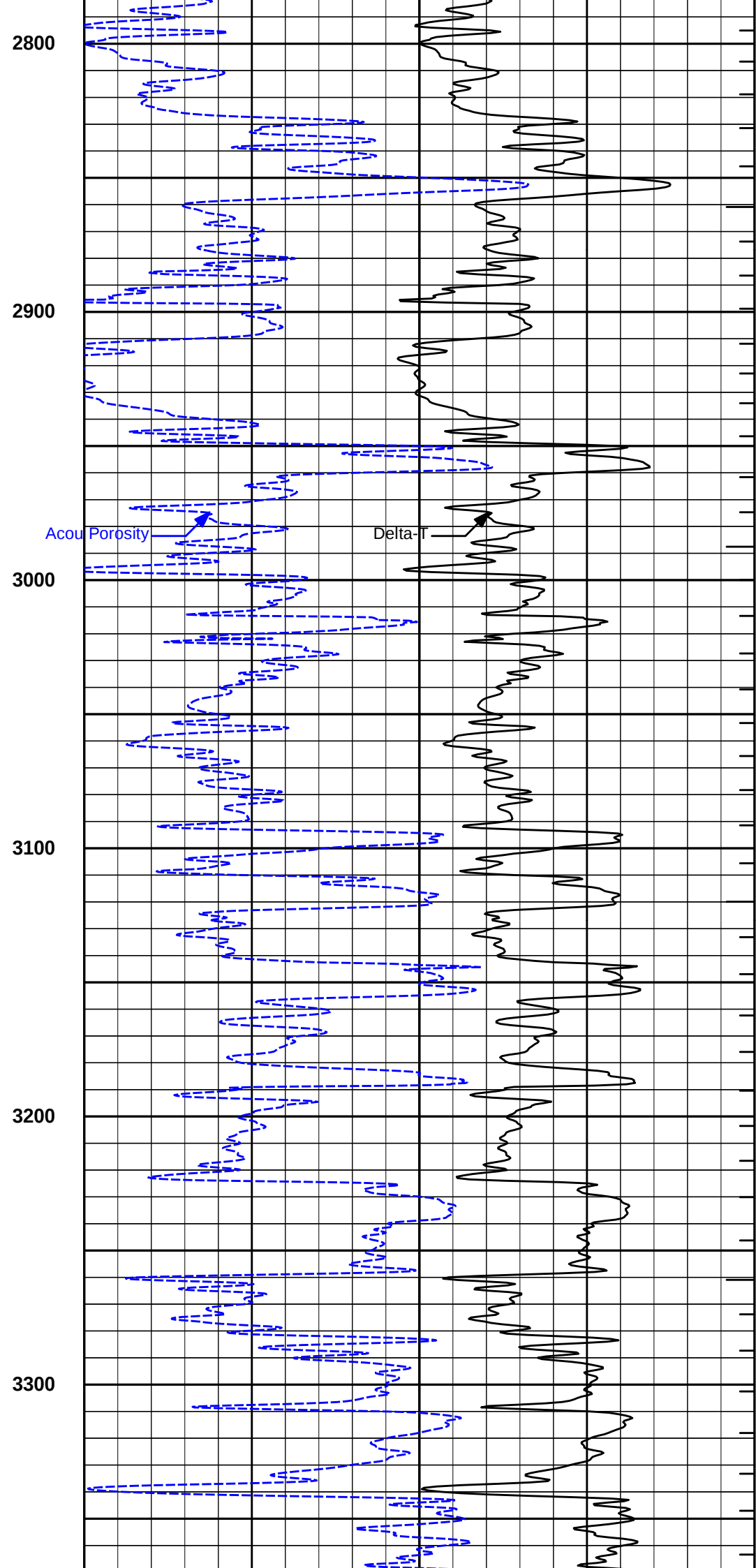
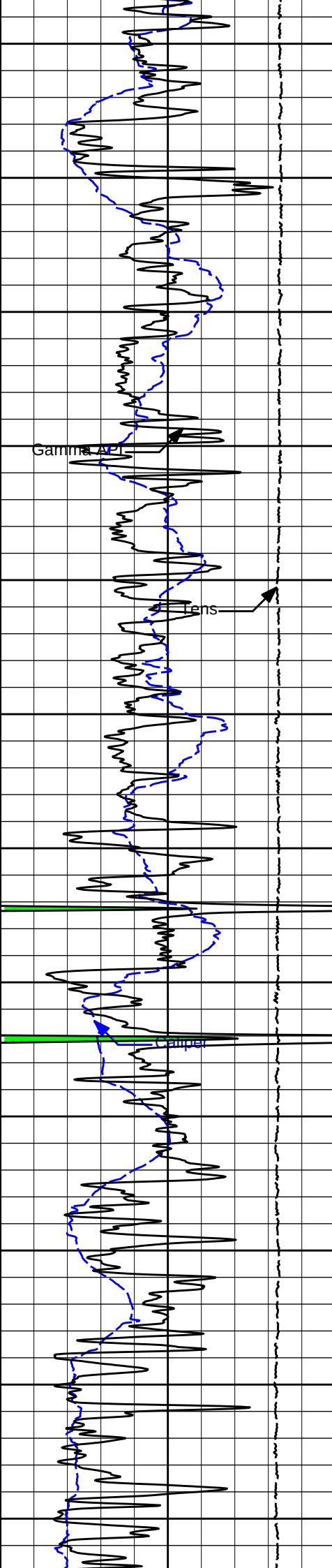
2400

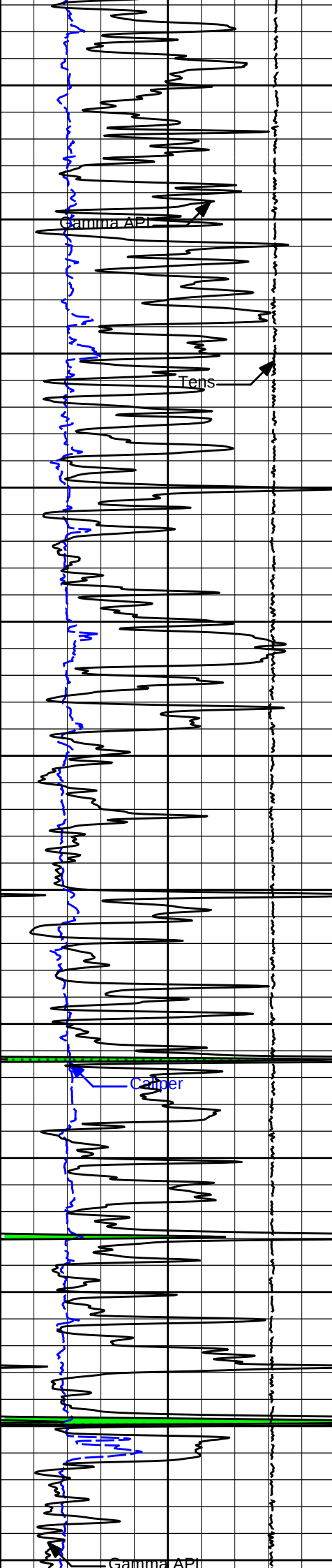
2500

2600

2700







3400

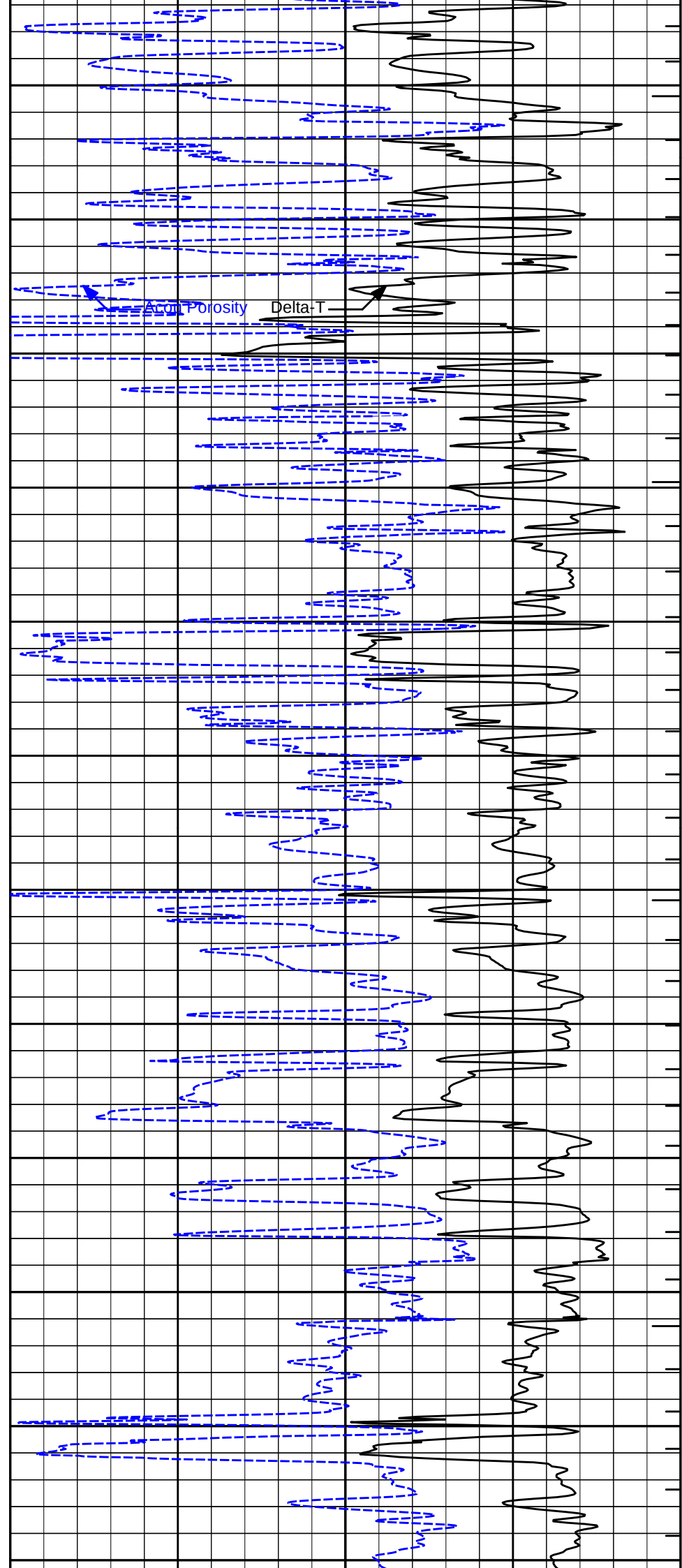
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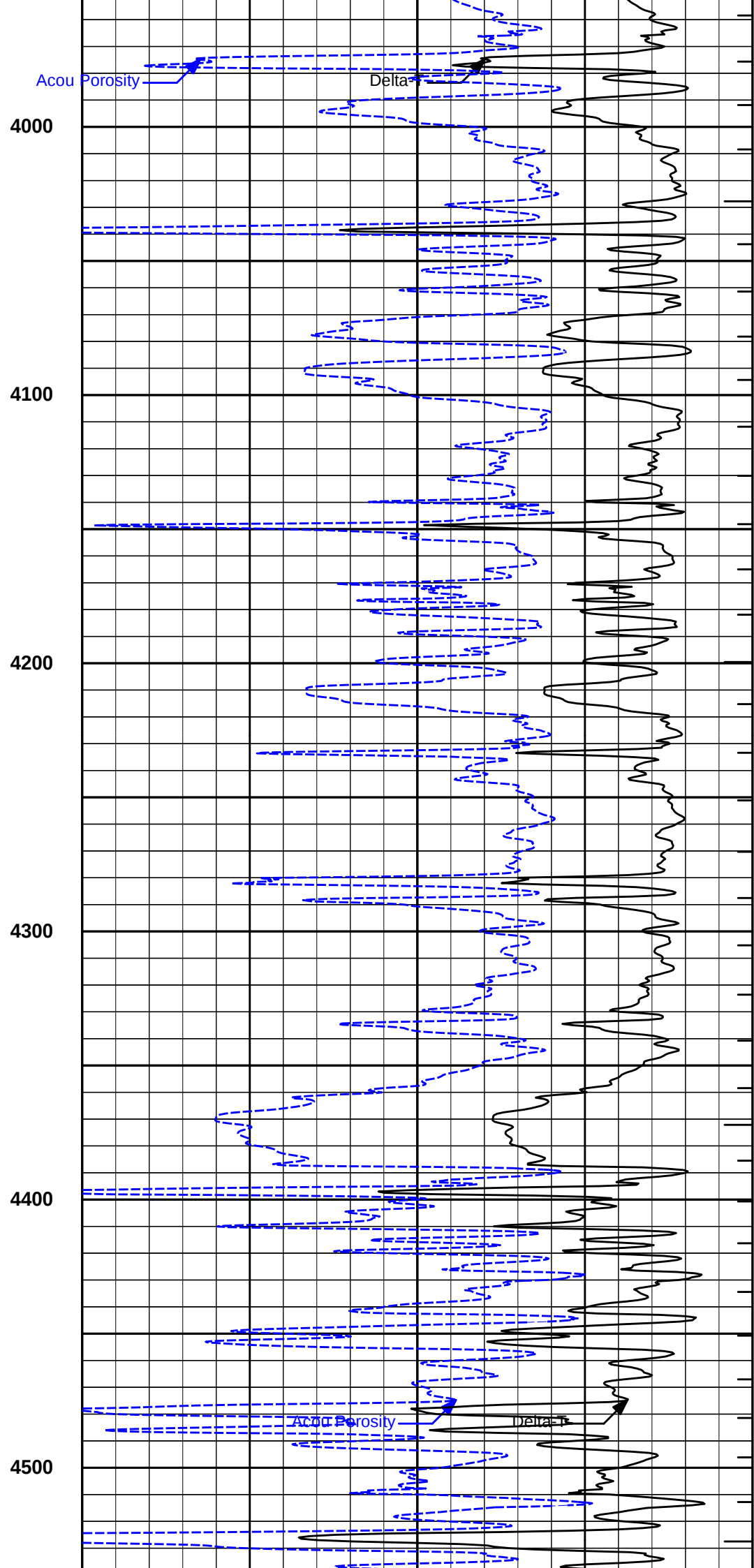
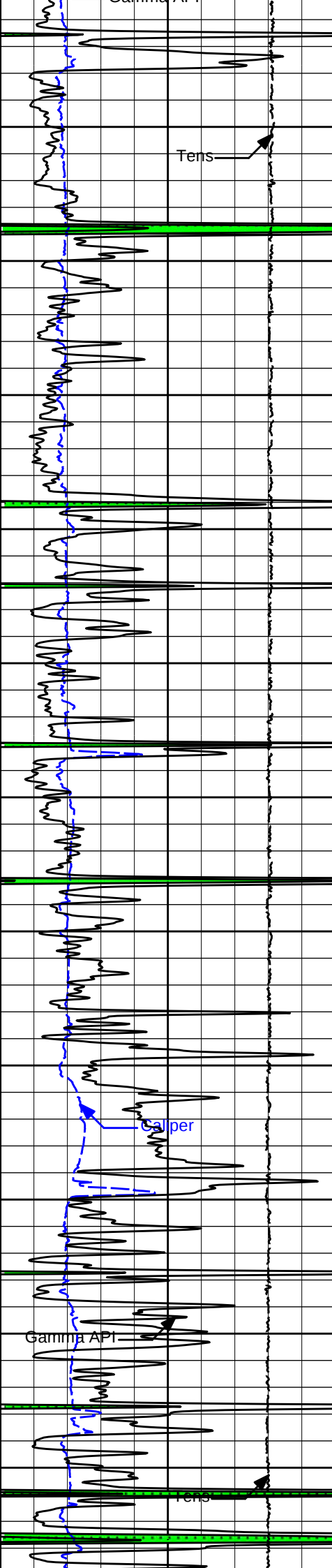
3600

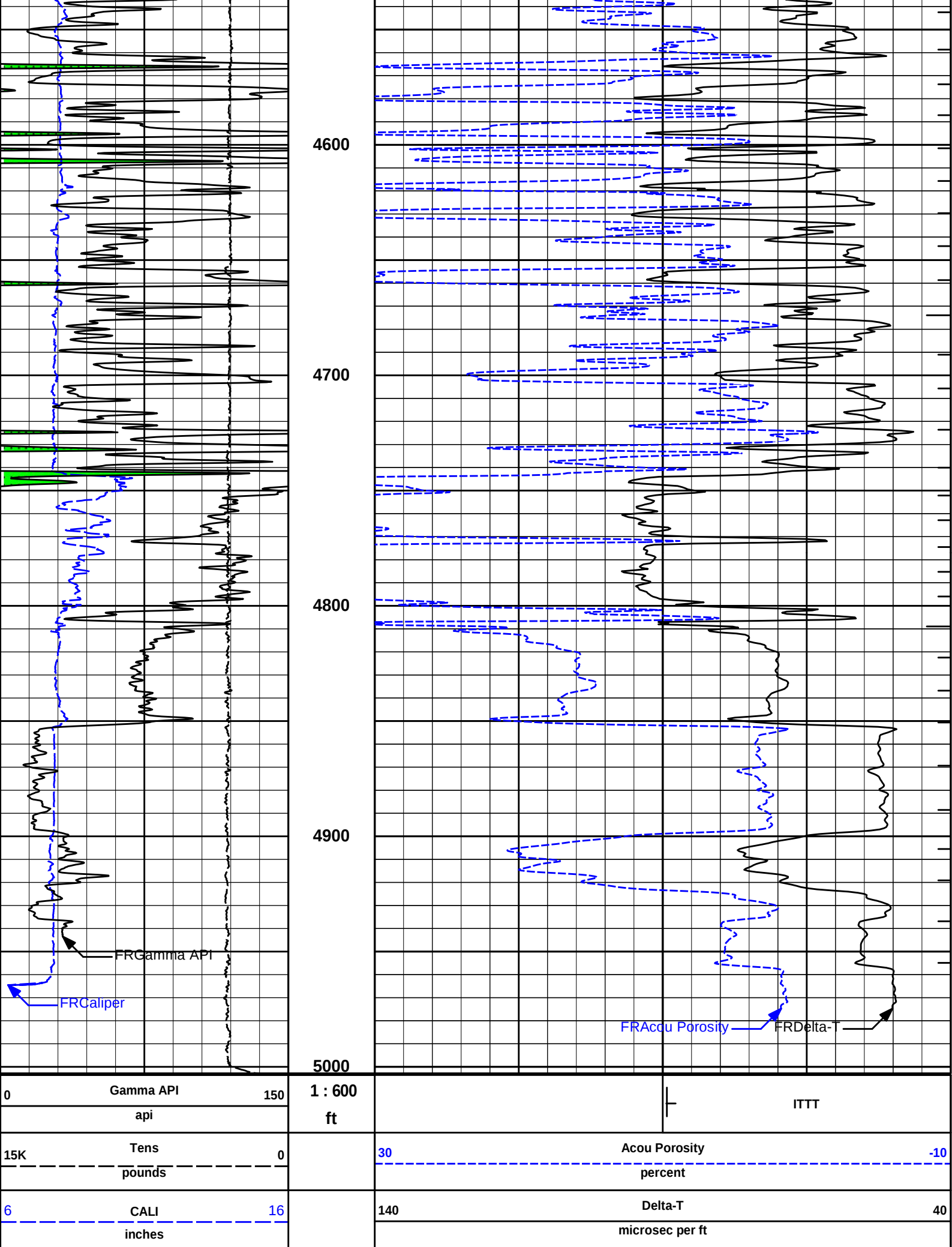
3700

3800

3900







HALLIBURTON

Plot Time: 03-Mar-18 08:38:25
Plot Range: 300 ft to 5002.83 ft
Data: LARIO_KNOBBE\Well Based\DAQ-0001-003\
Plot File: \IBSAT\IBSAT_2inch

2 INCH MAIN LOG

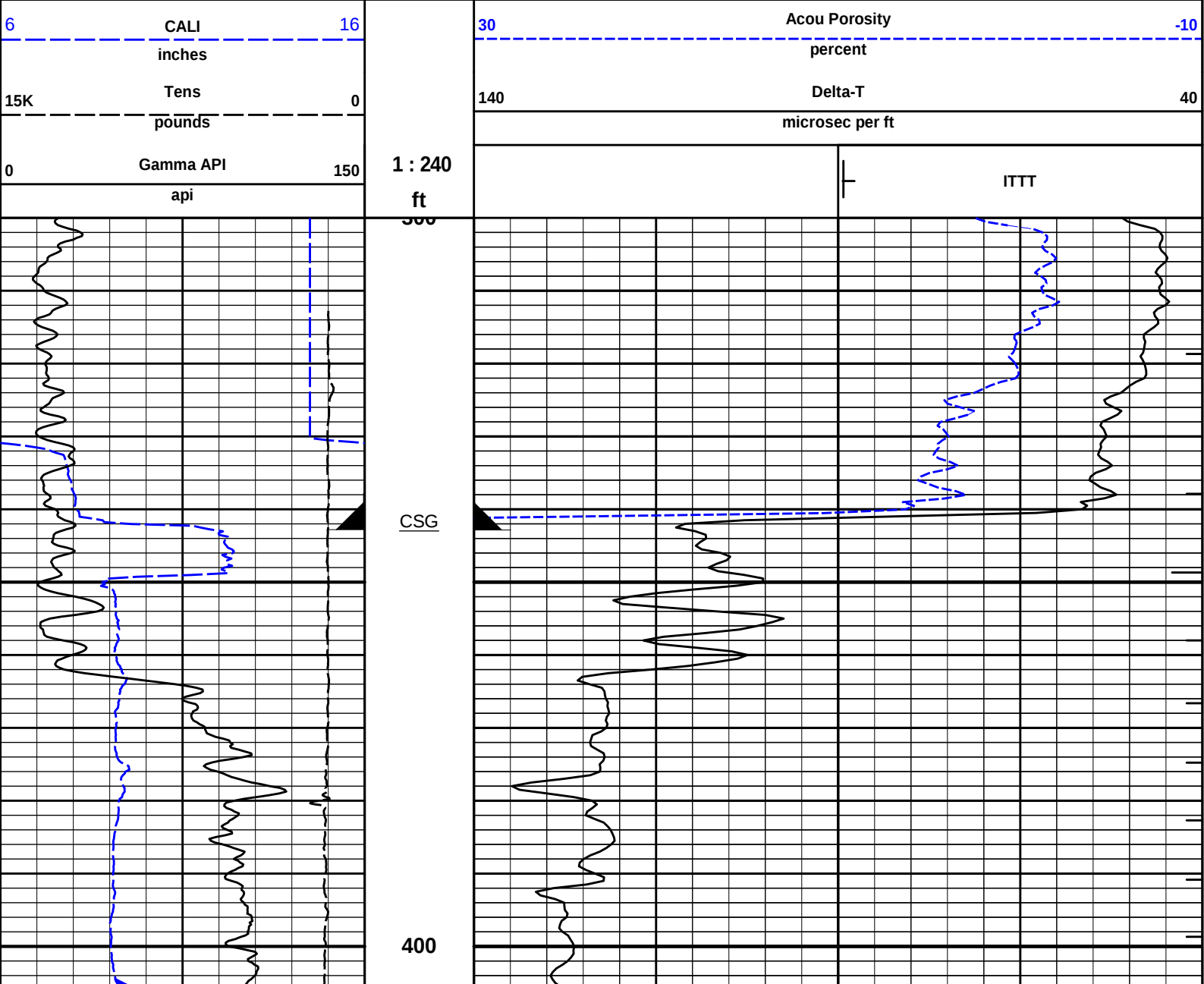
2" MAIN LOG SECTION

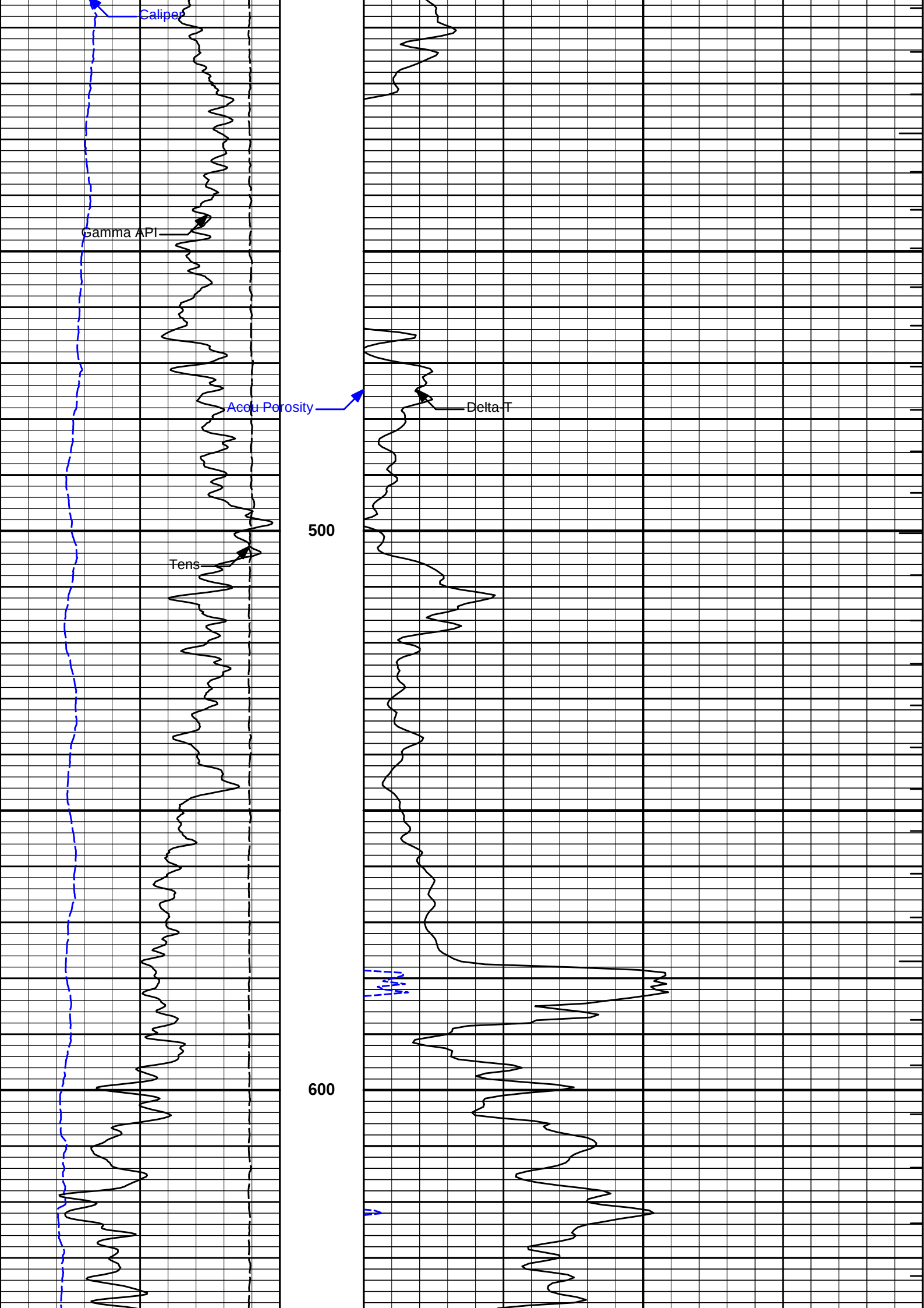
HALLIBURTON

Plot Time: 03-Mar-18 08:38:26
Plot Range: 300 ft to 5002.83 ft
Data: LARIO_KNOBBE\Well Based\DAQ-0001-003\
Plot File: \\BSAT\BSAT_5inch

5 INCH MAIN LOG

MAIN LOG SECTION

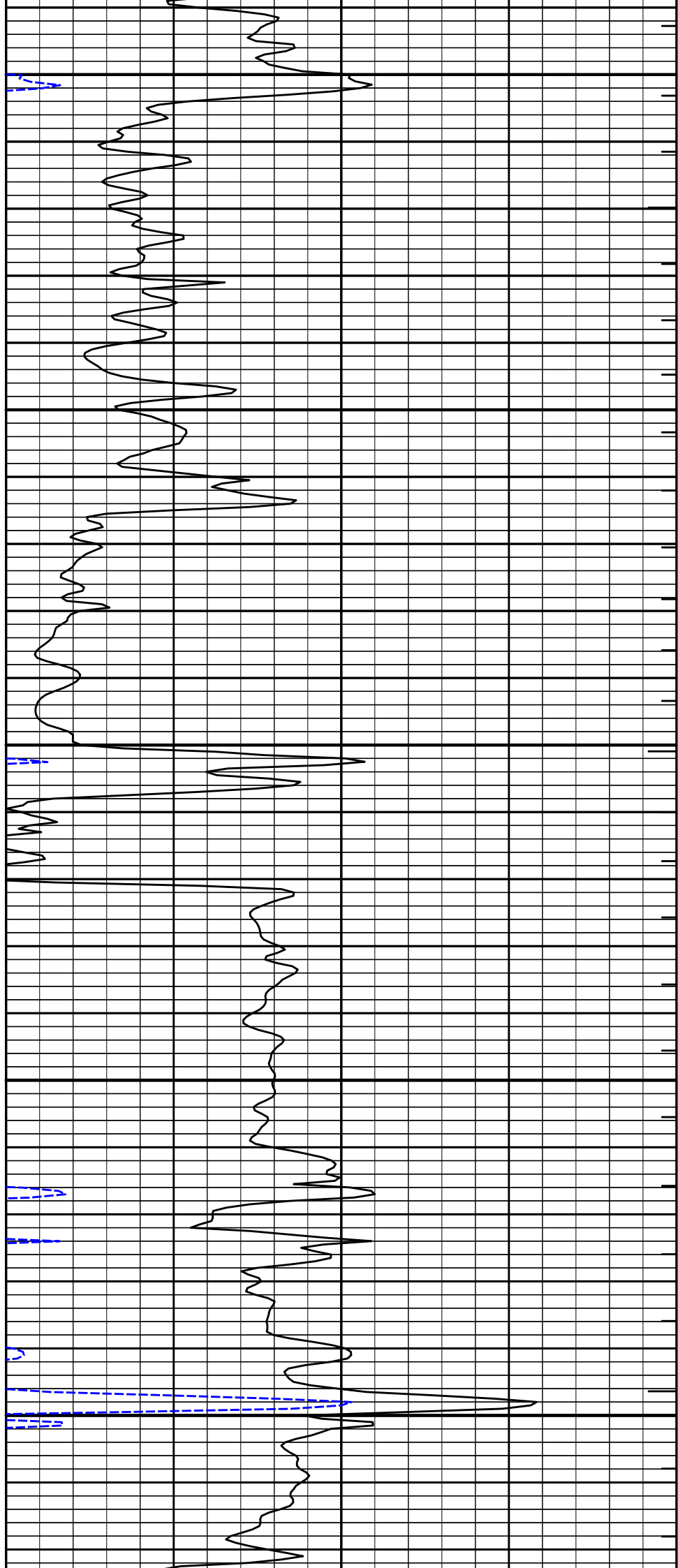


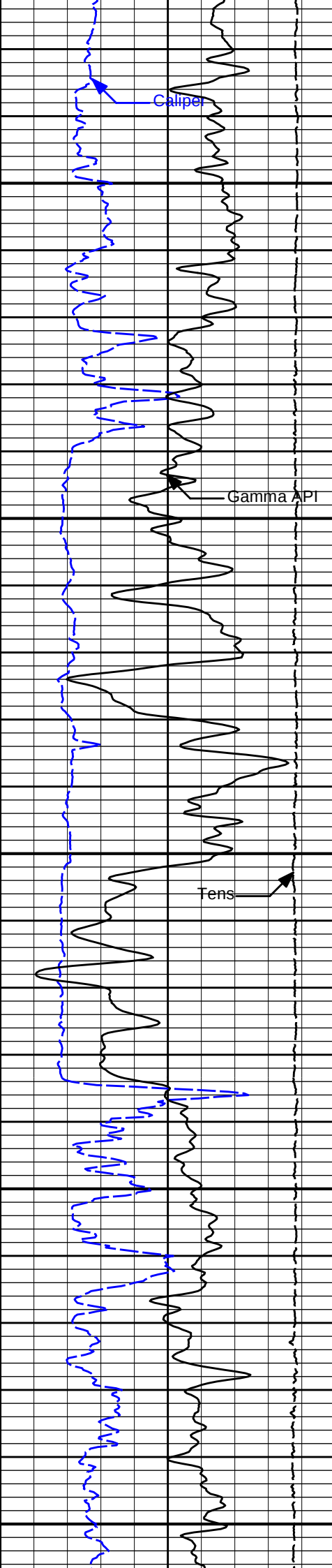




700

800

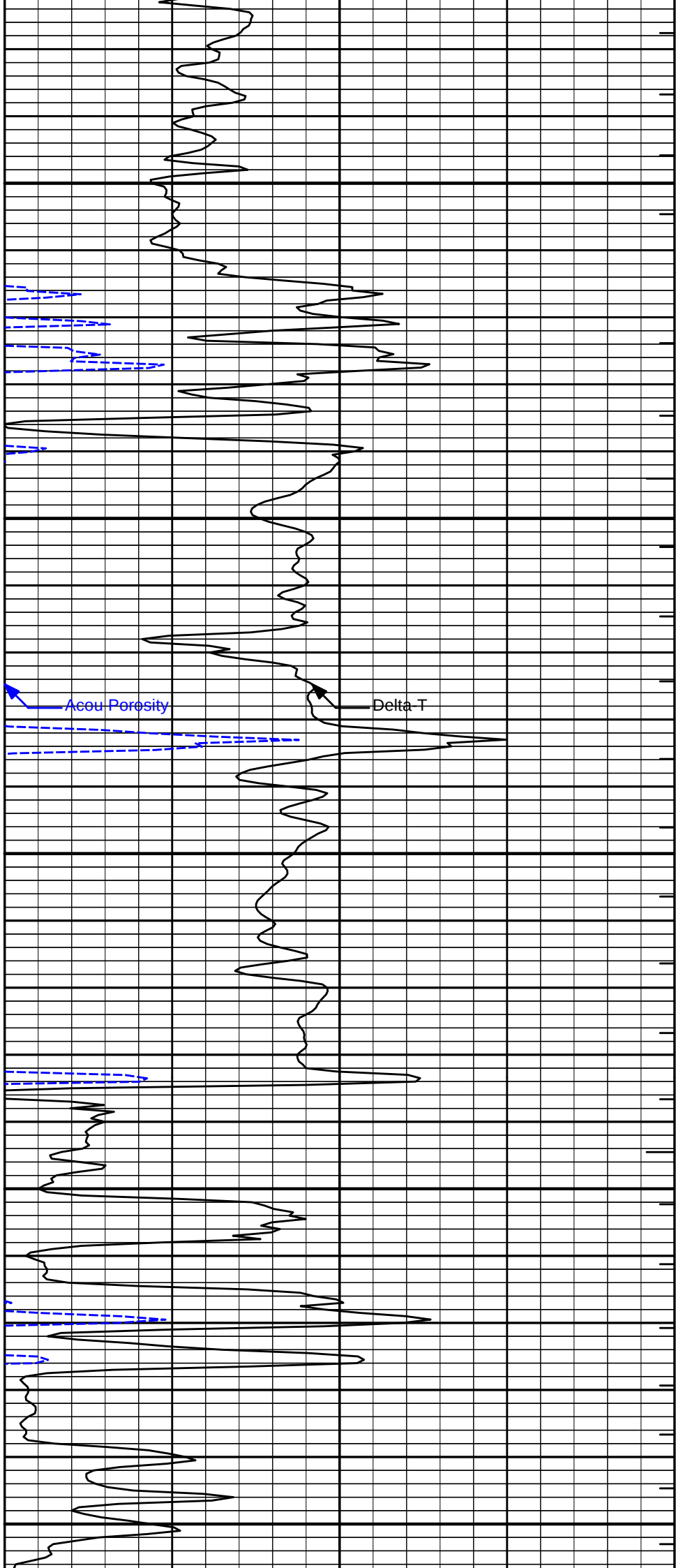




900

1000

1100



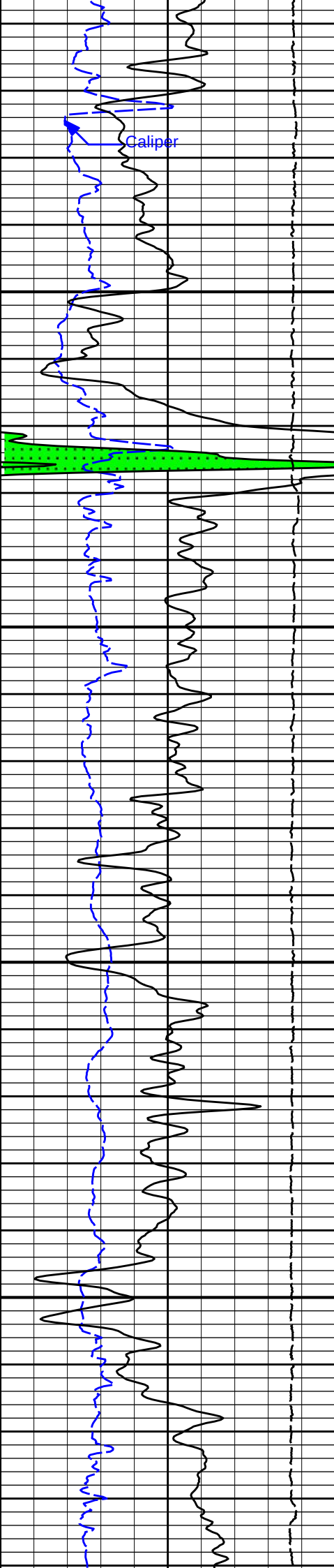
Caliper

Gamma API

Tens

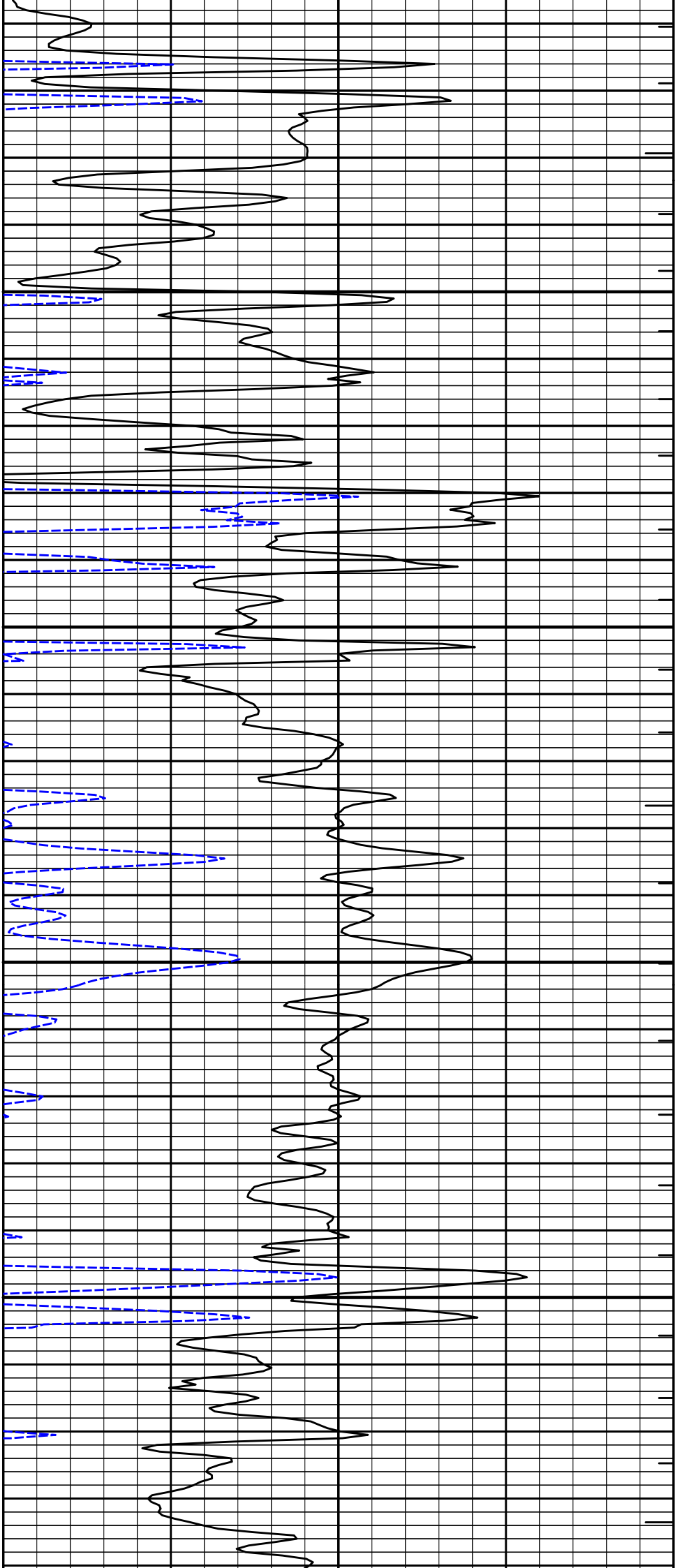
Acou Porosity

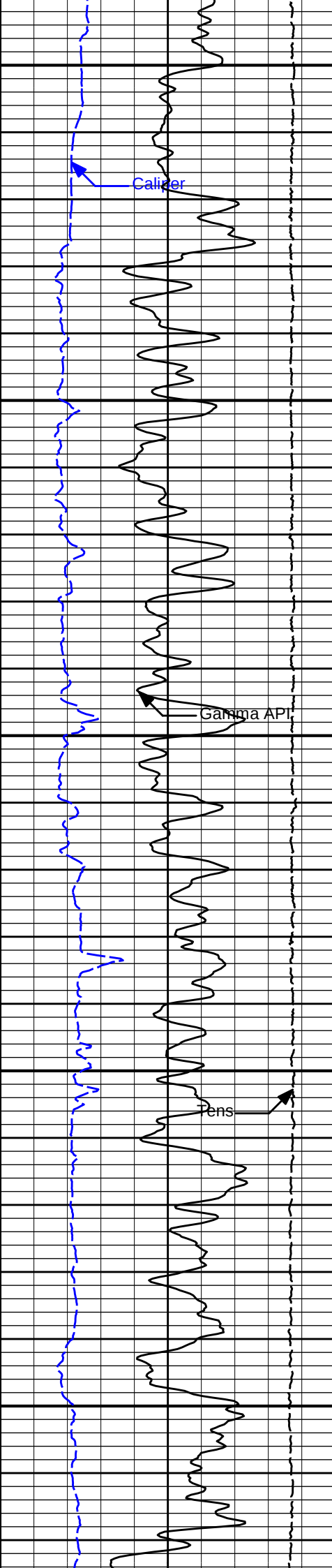
Delta T



1200

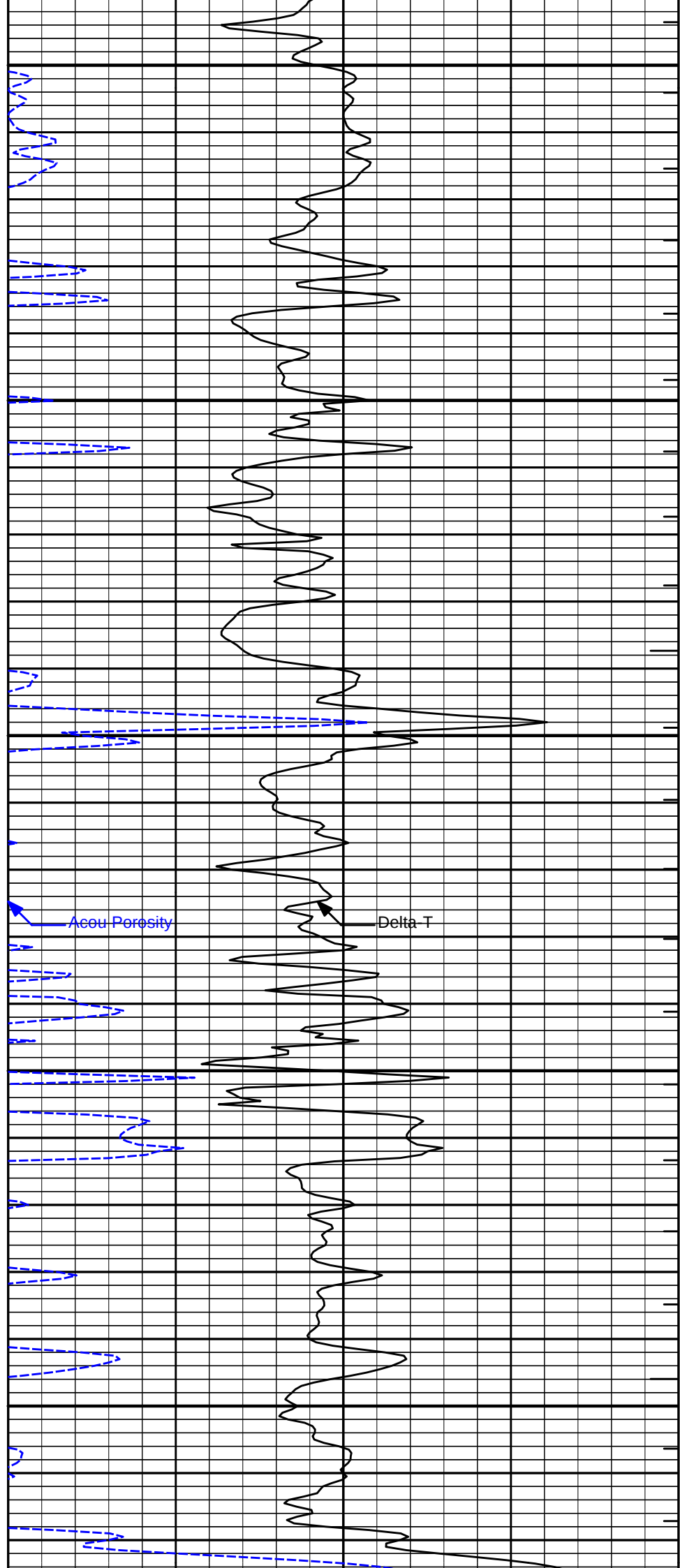
1300

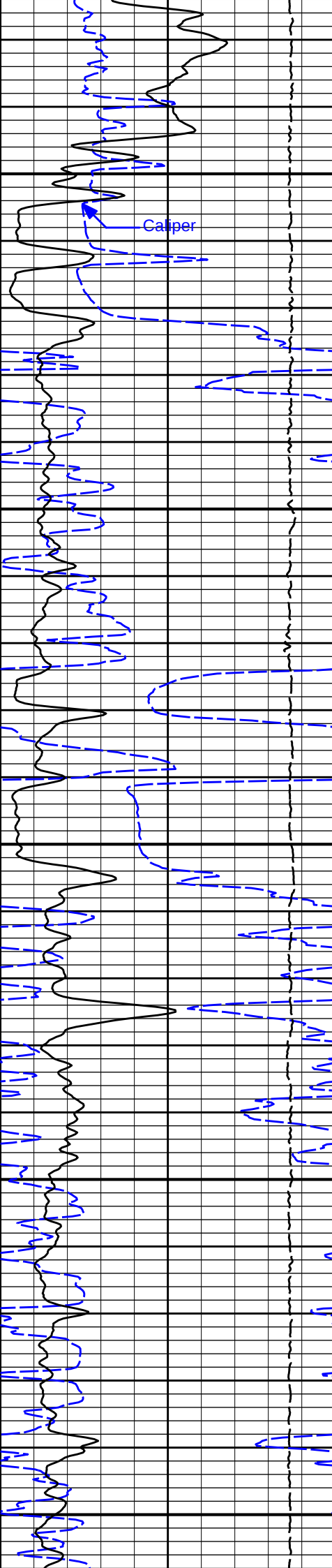




1400

1500

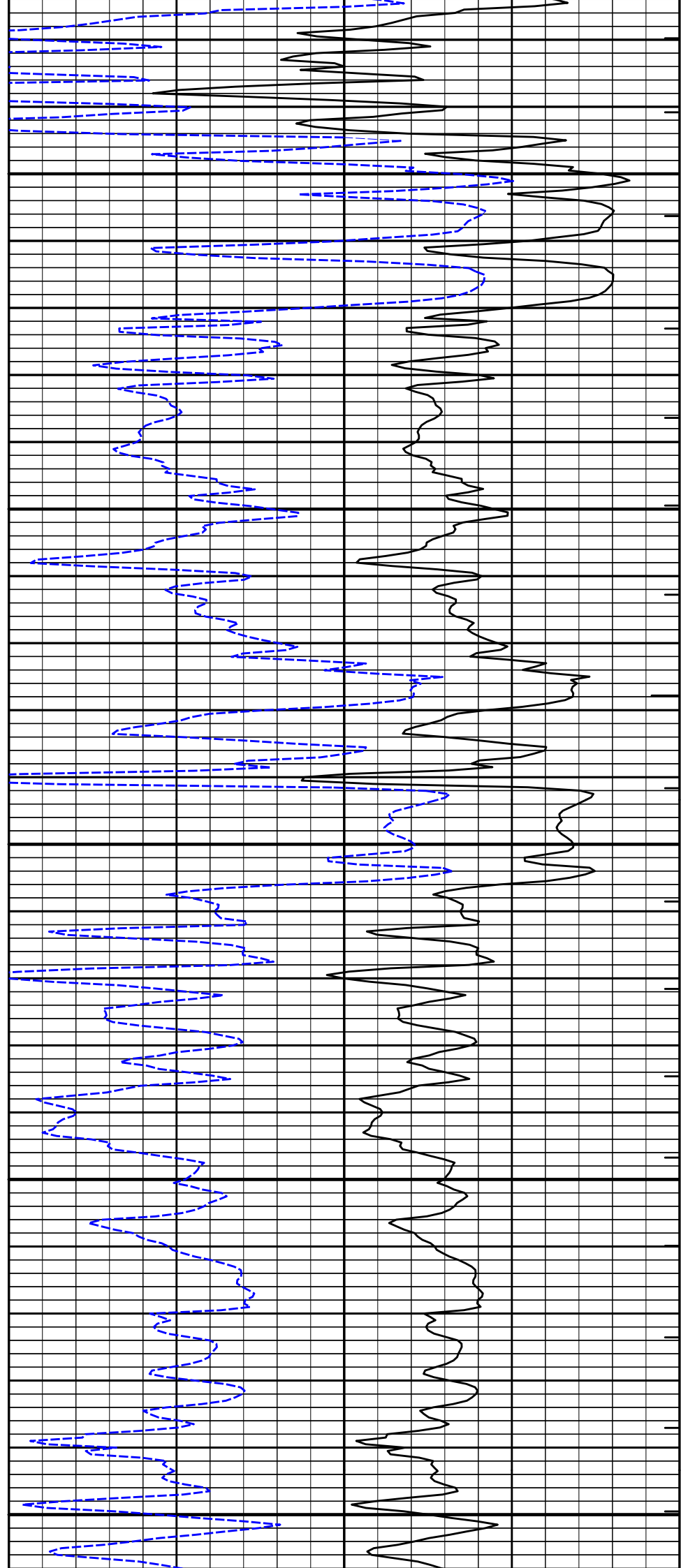


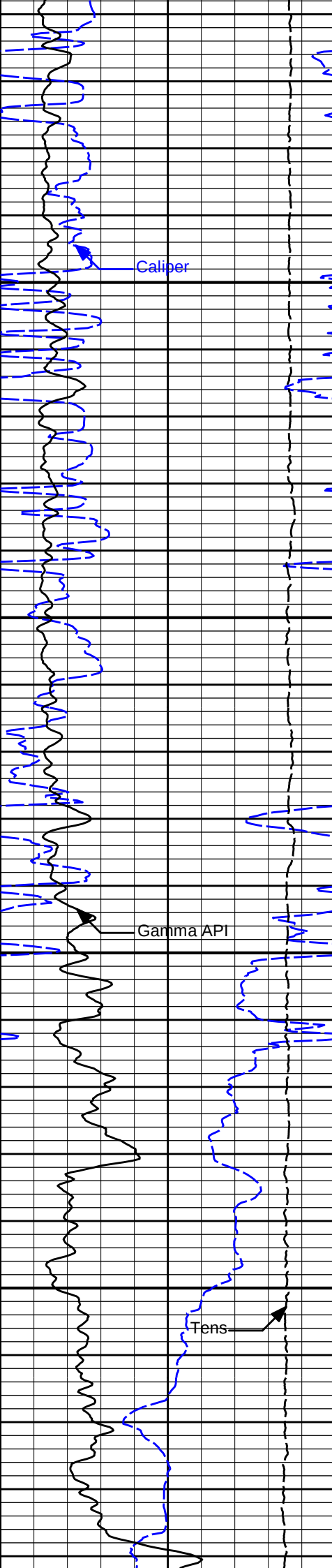


1600

1700

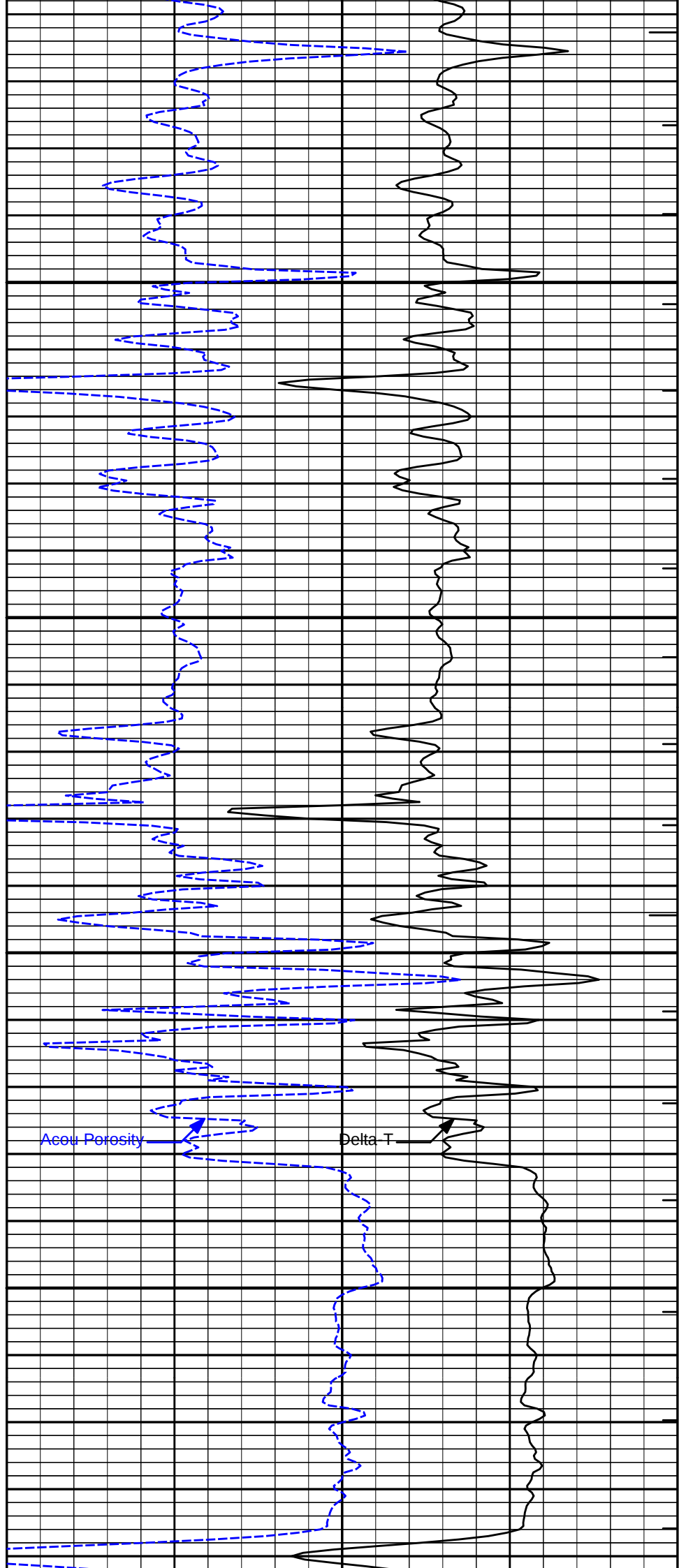
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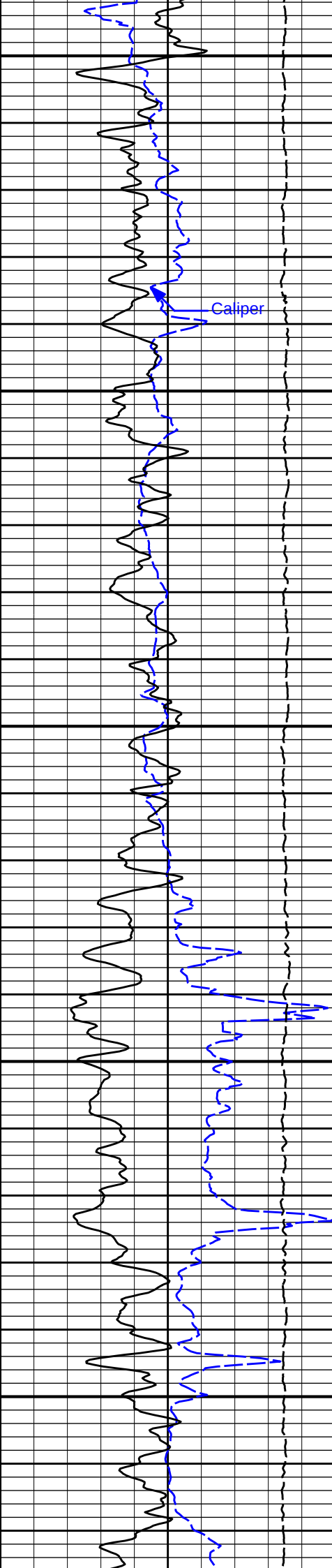




1900

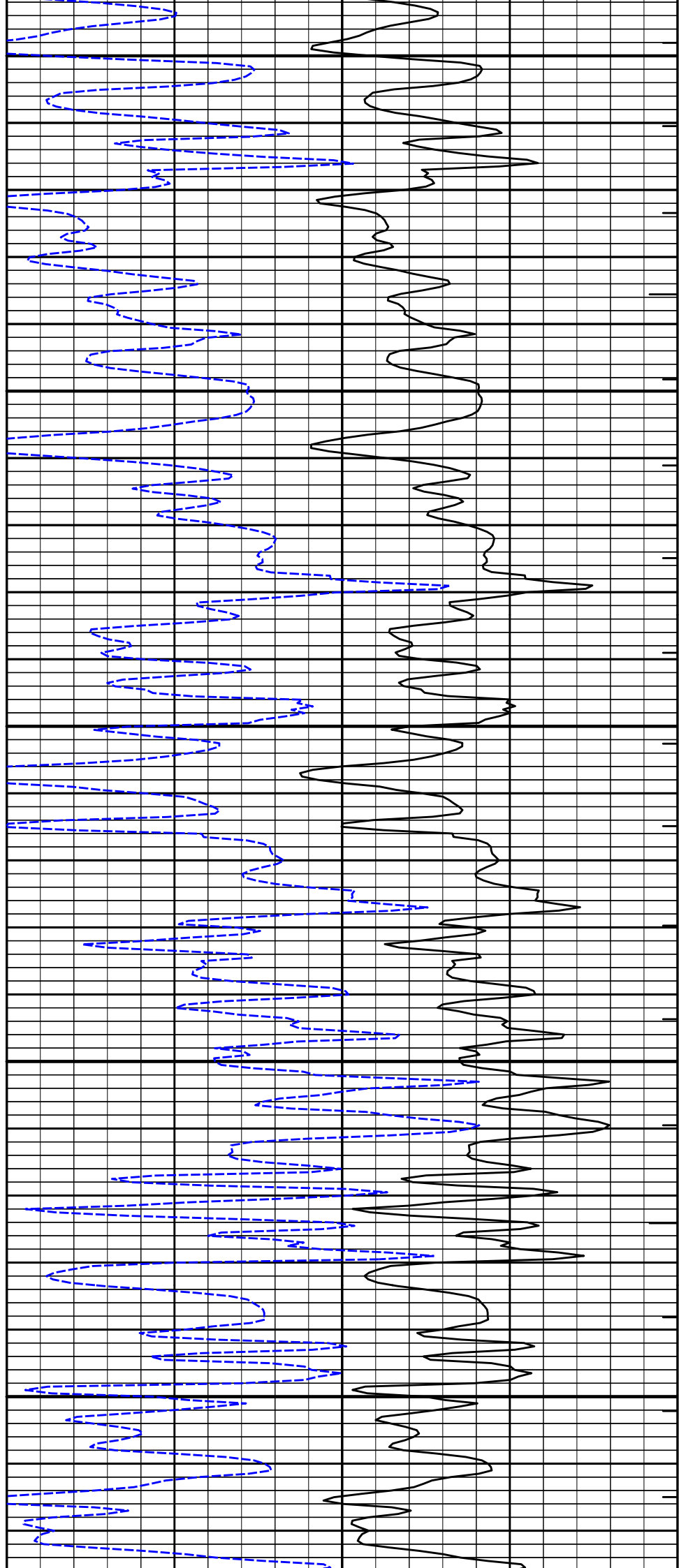
2000

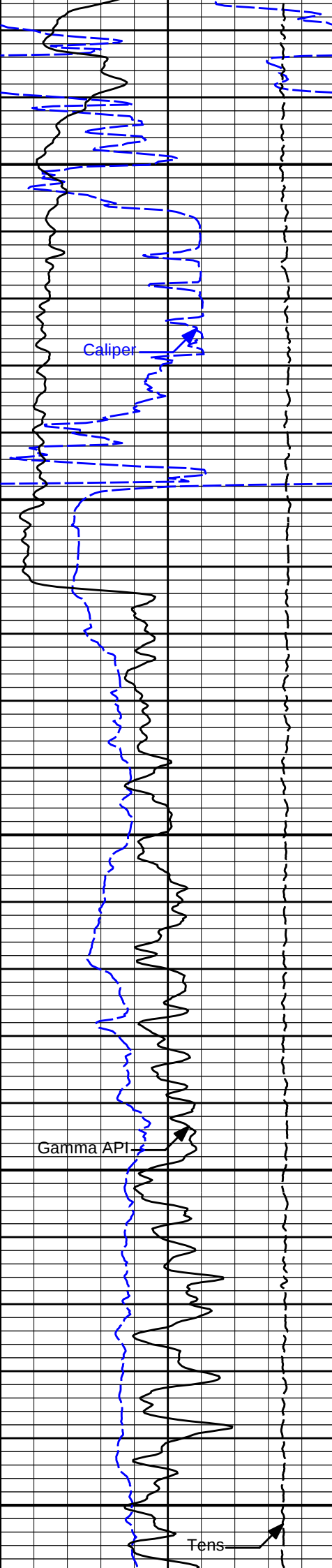




2100

2200

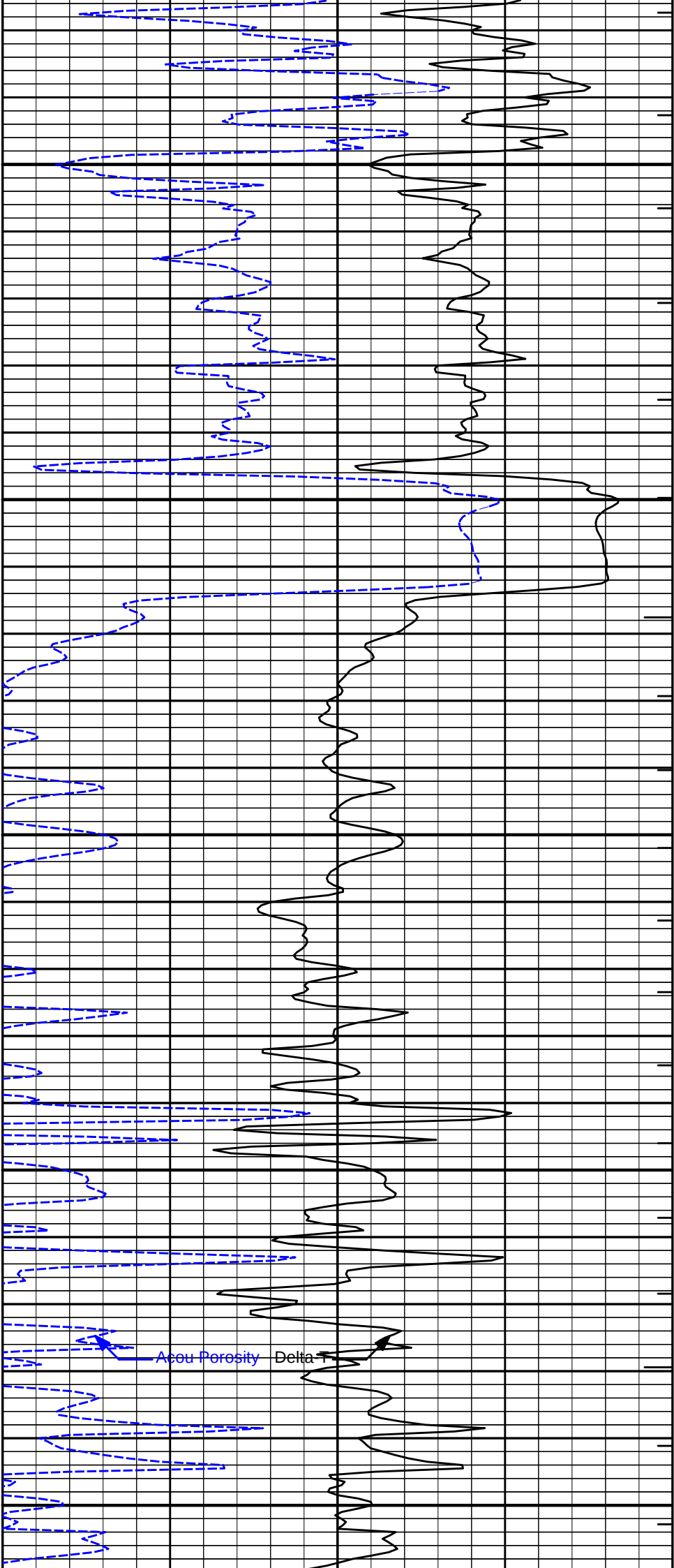




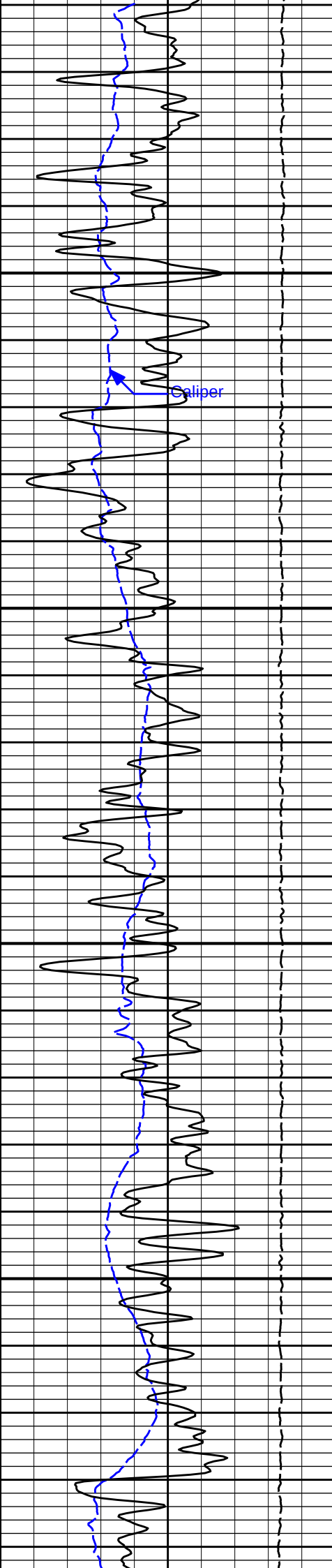
2300

2400

2500

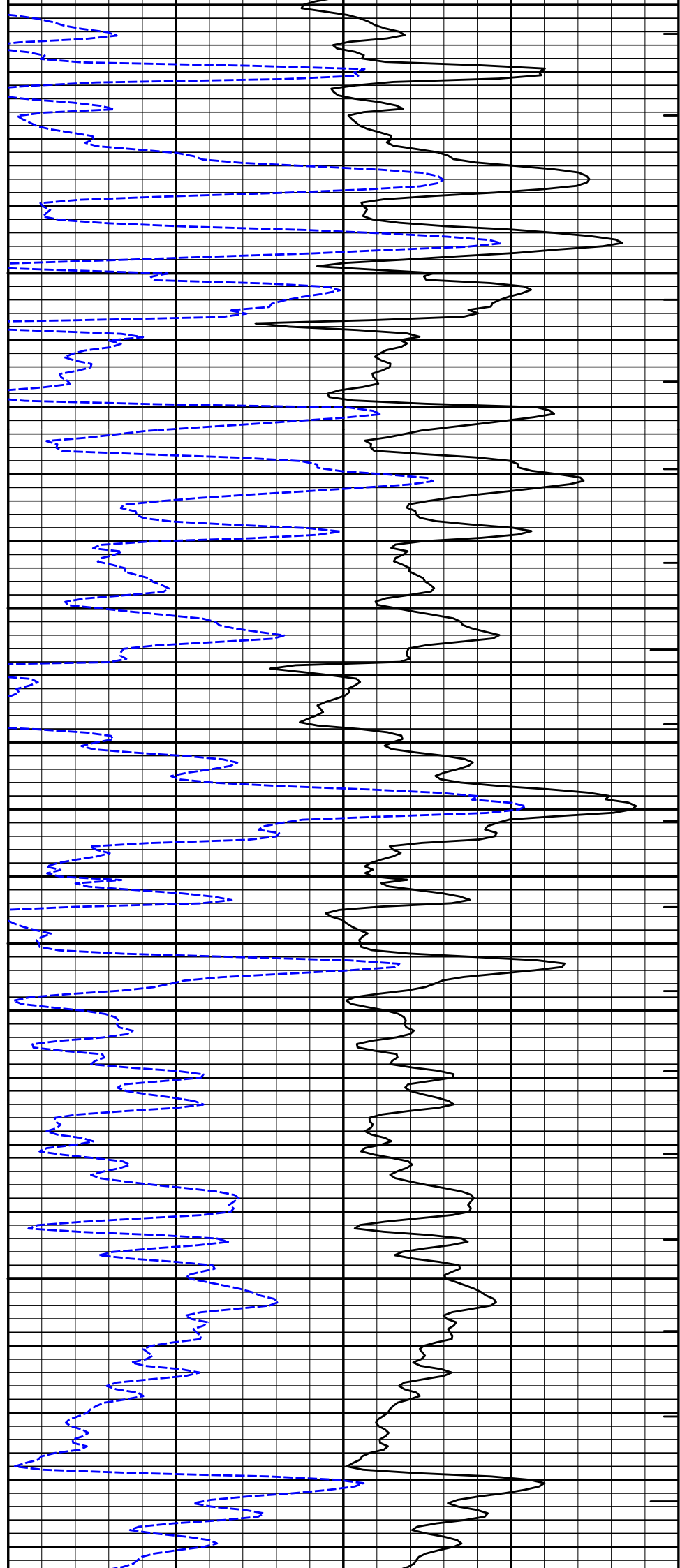


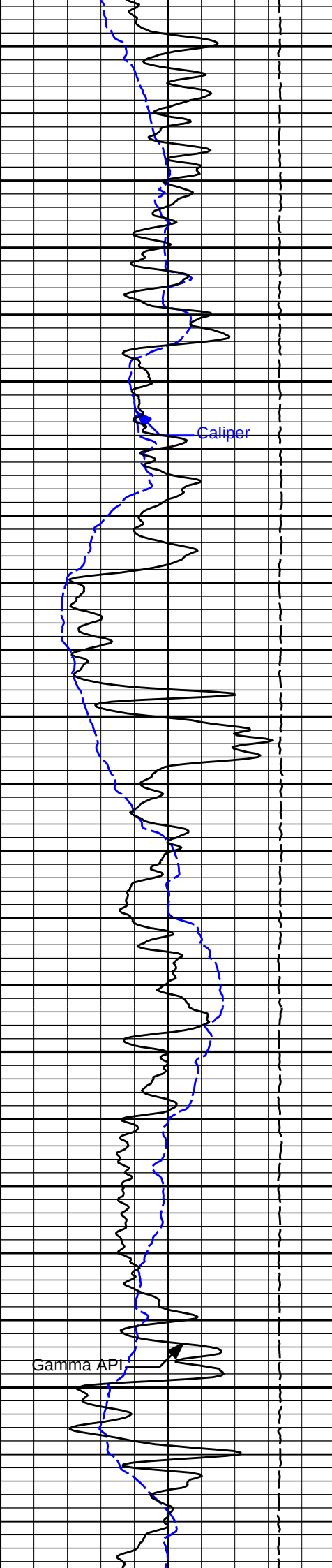
Acou Porosity Delta T



2600

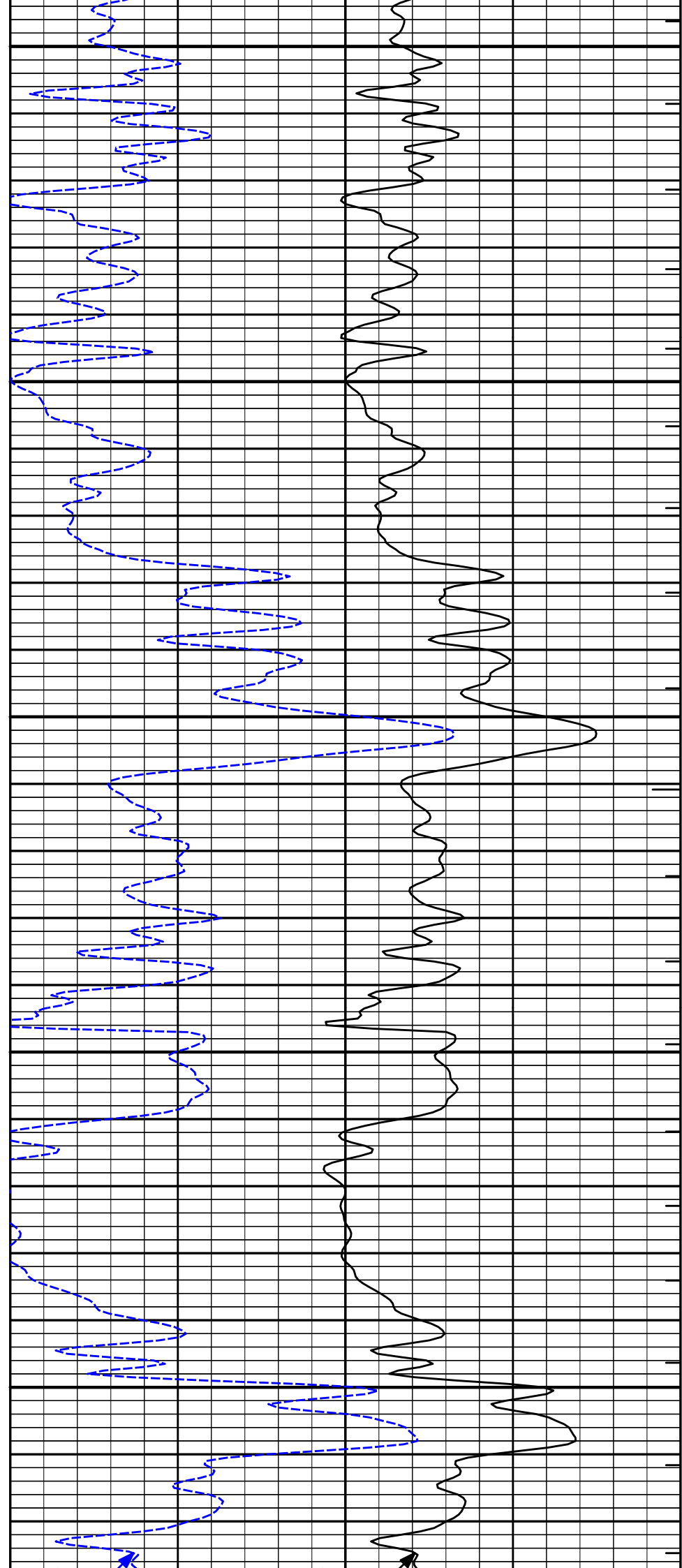
2700

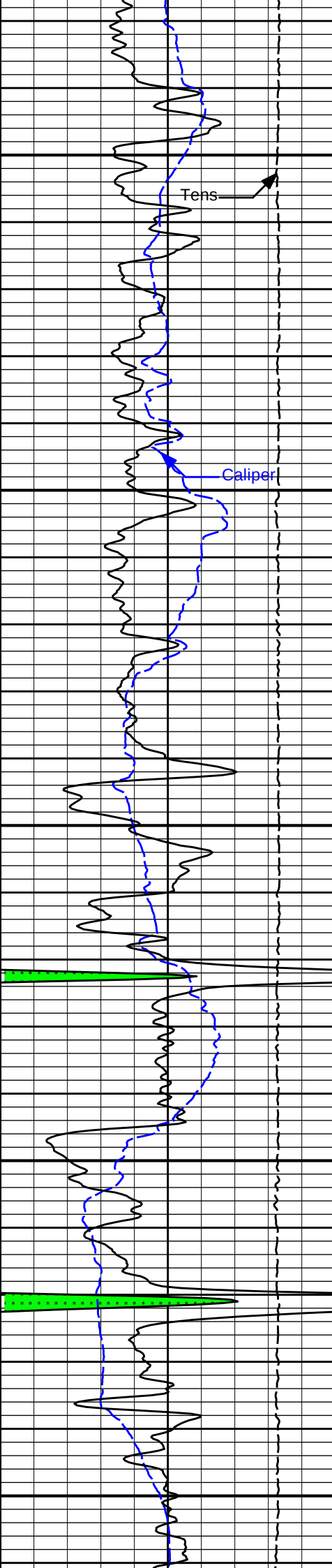




2800

2900

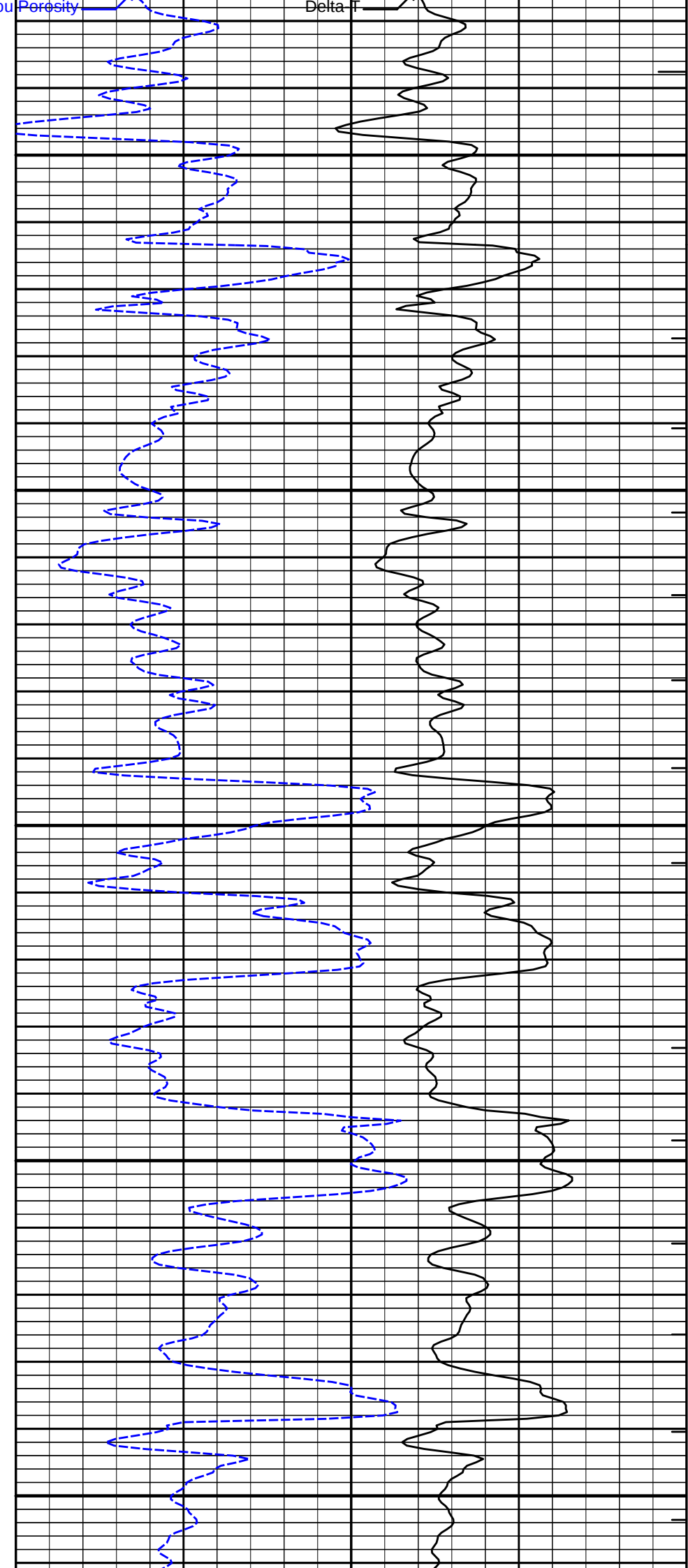


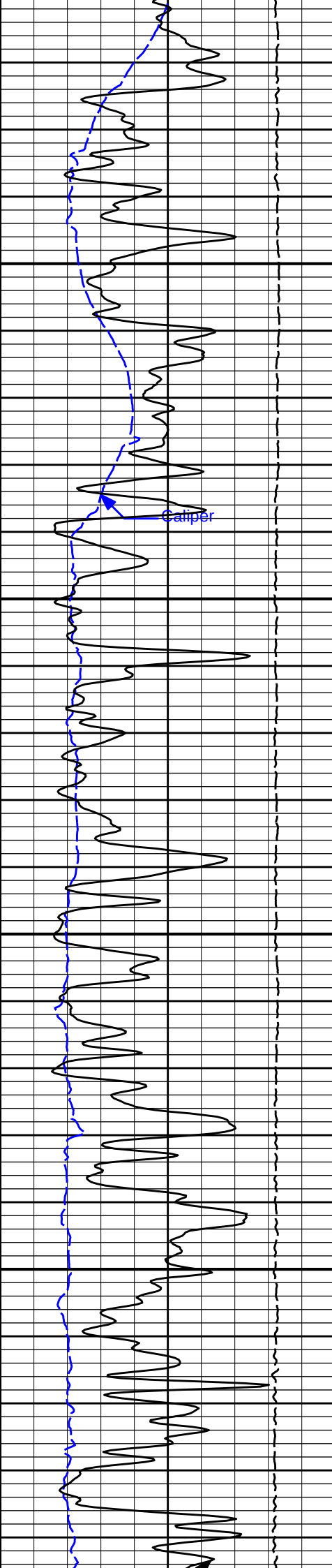


3000

3100

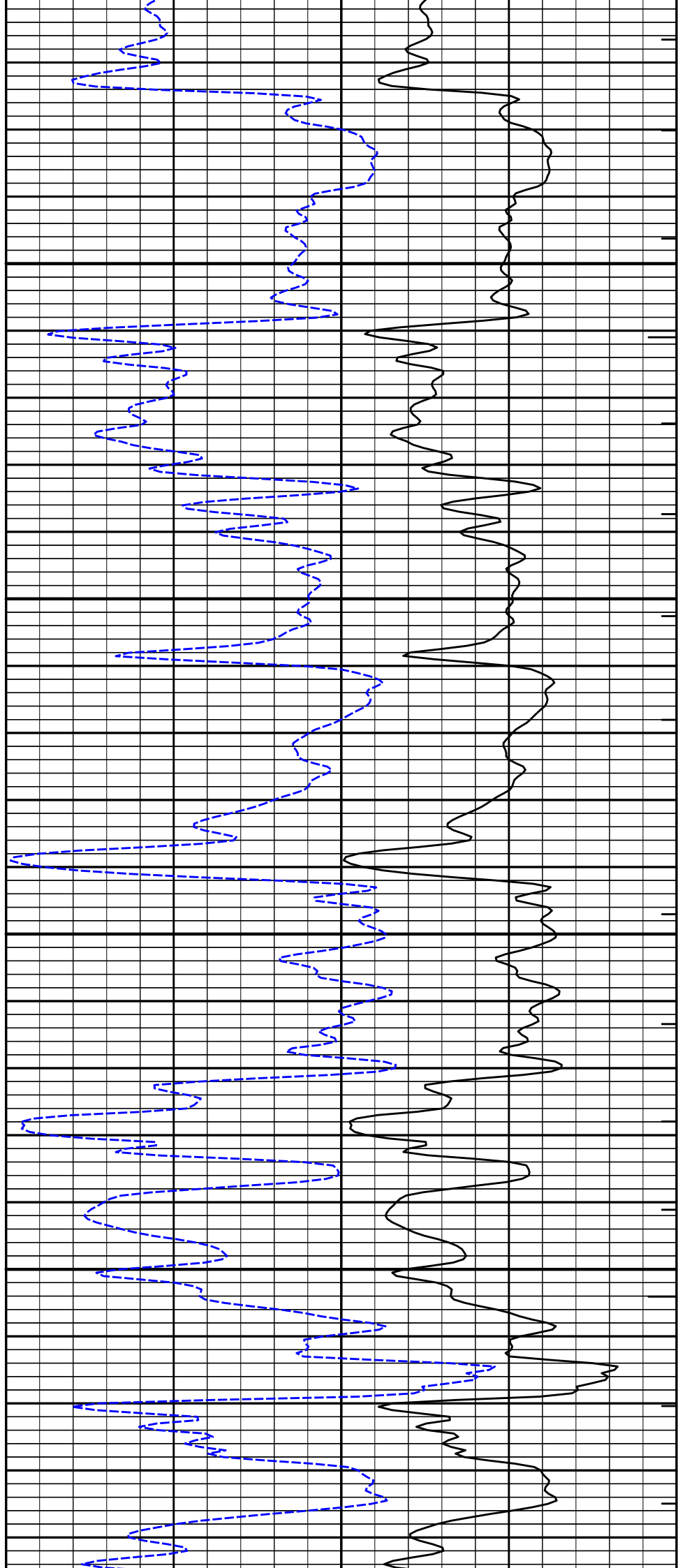
3200

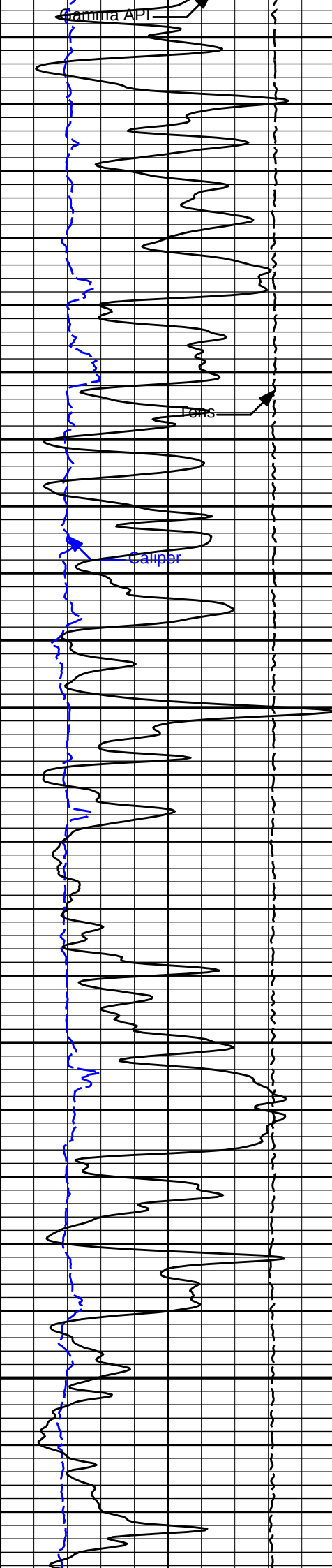




3300

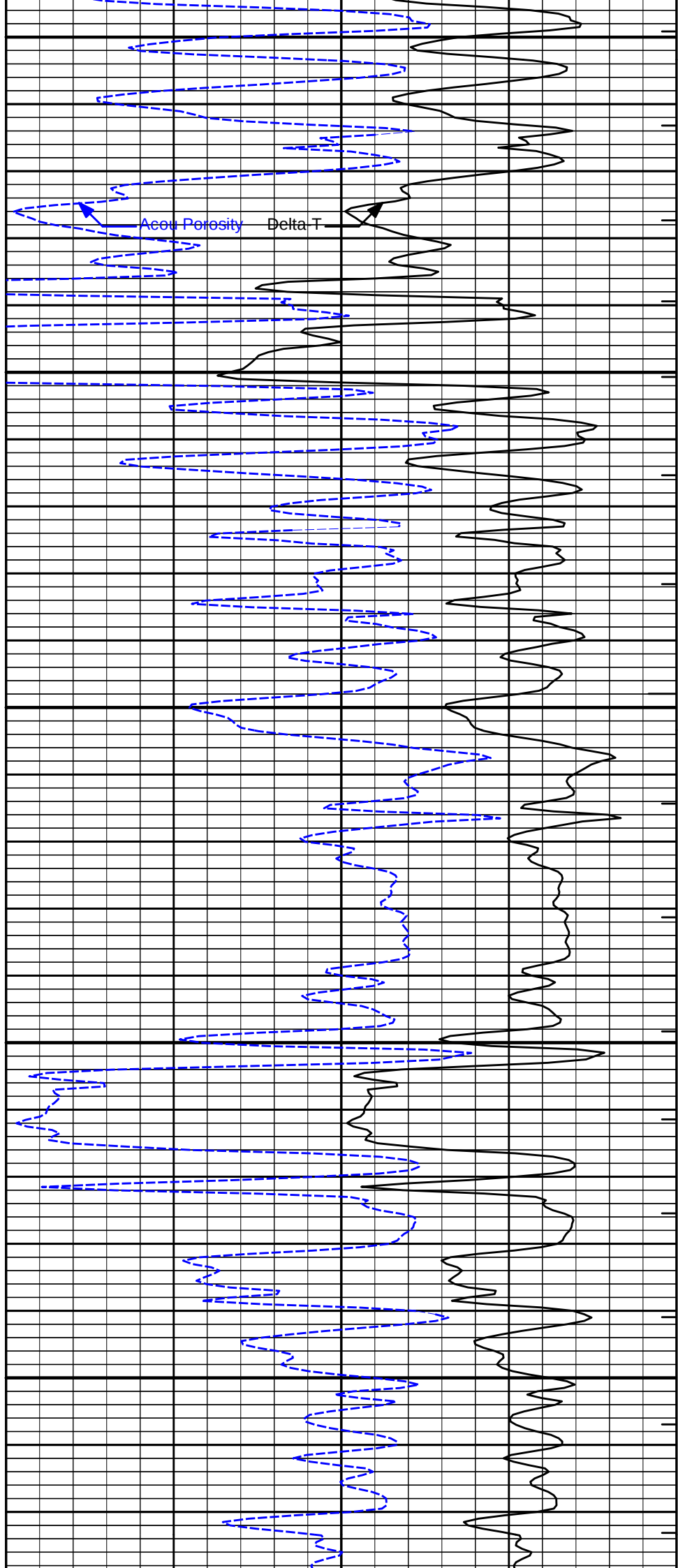
3400





3500

3600

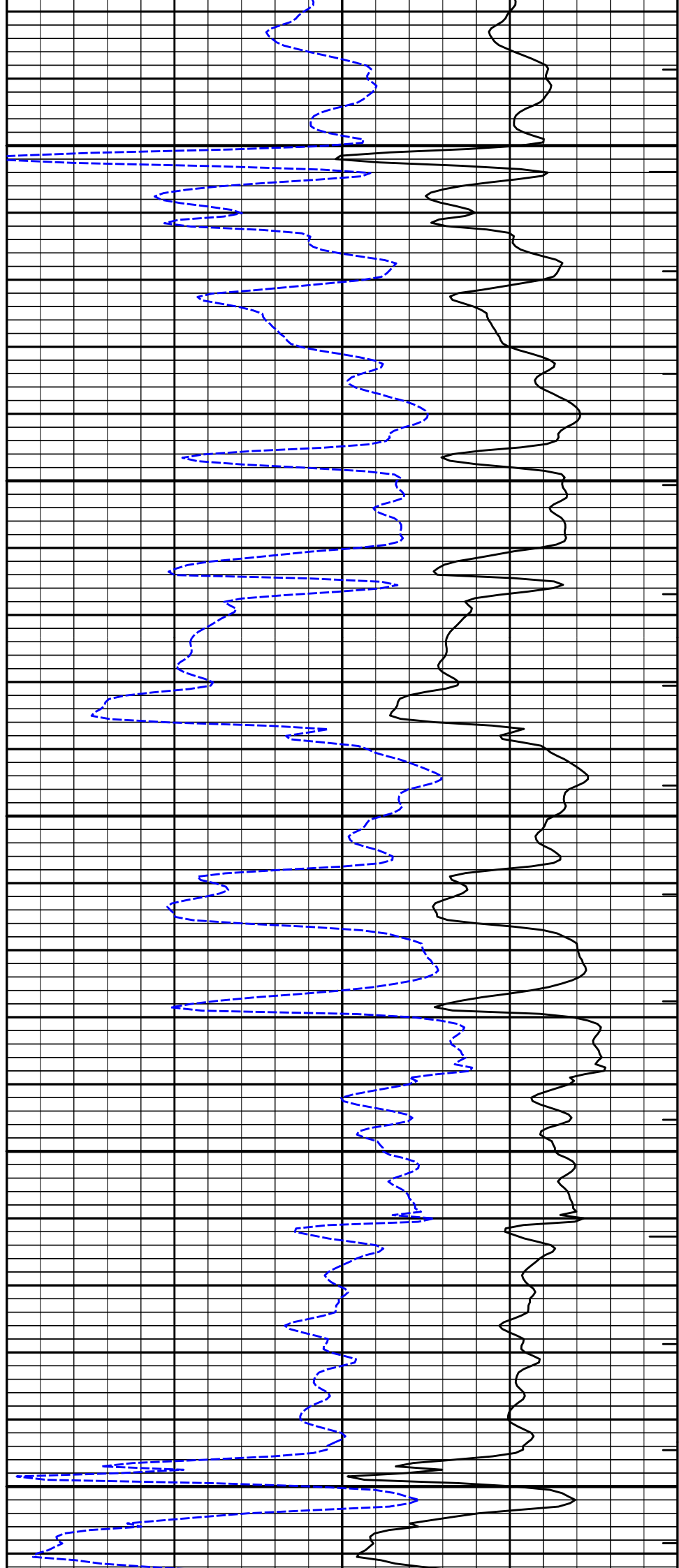


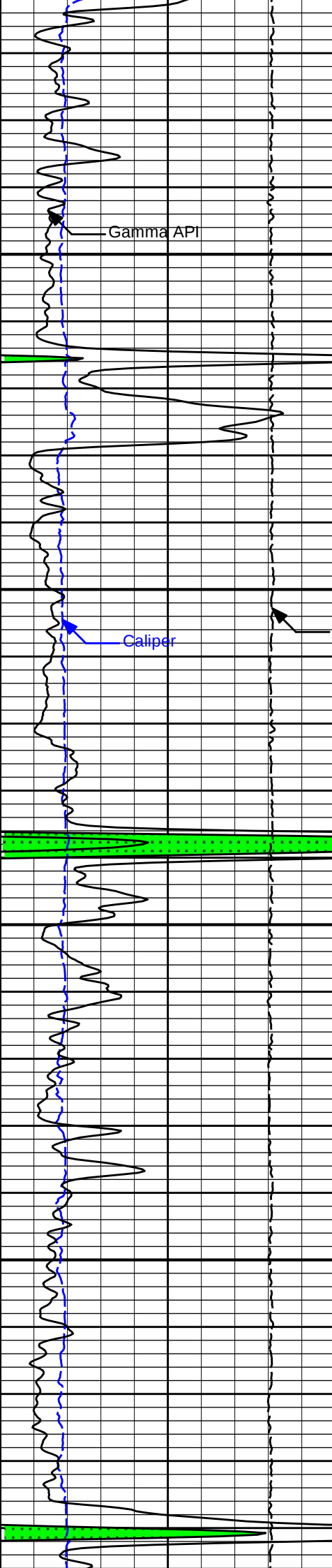


3700

3800

3900



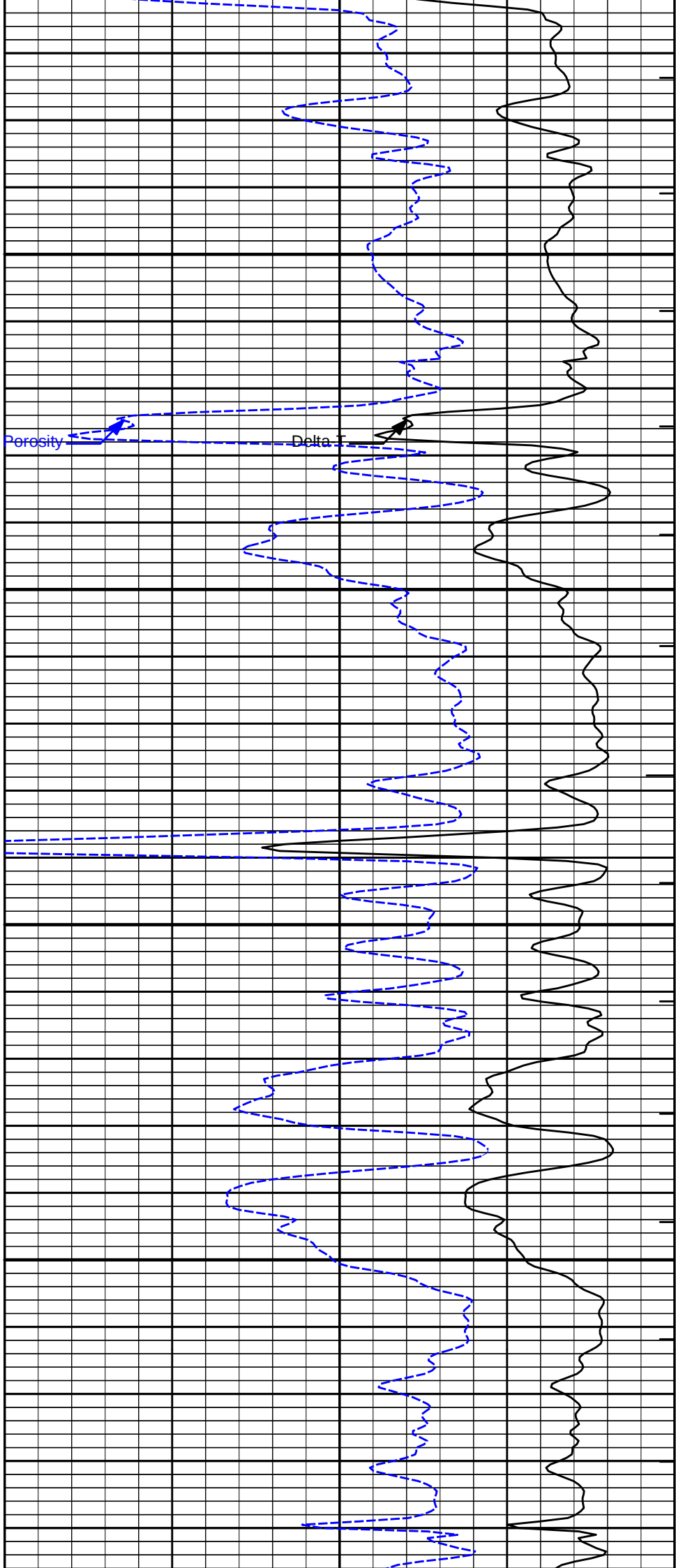


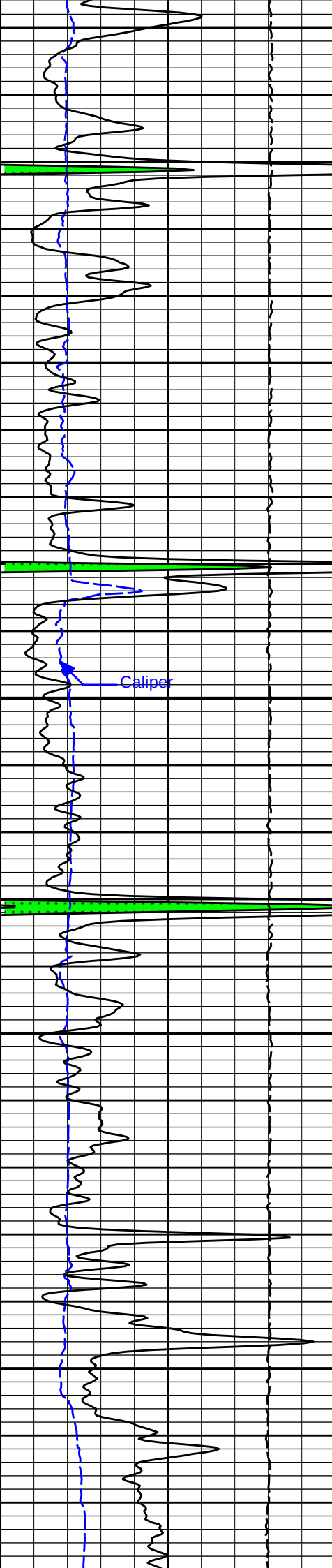
4000

4100

Acou Porosity

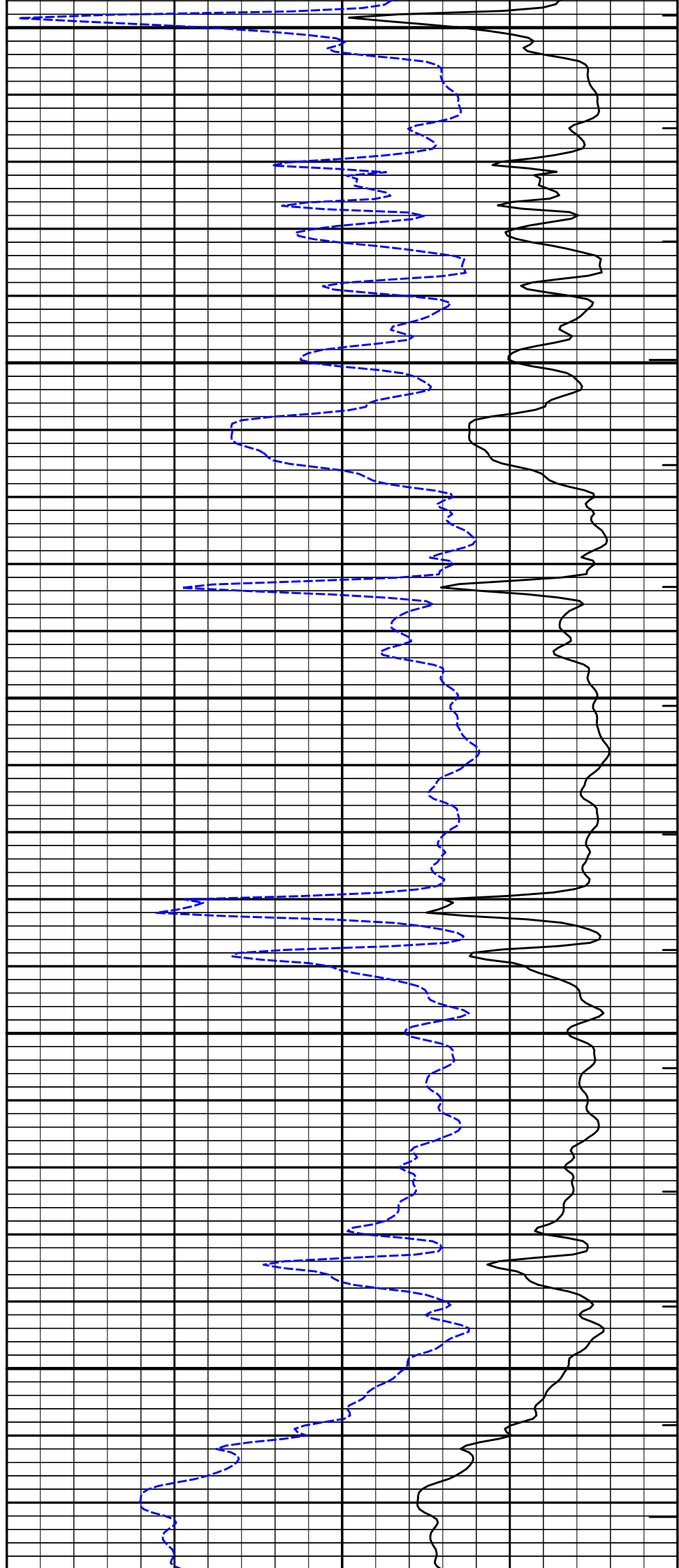
Delta F

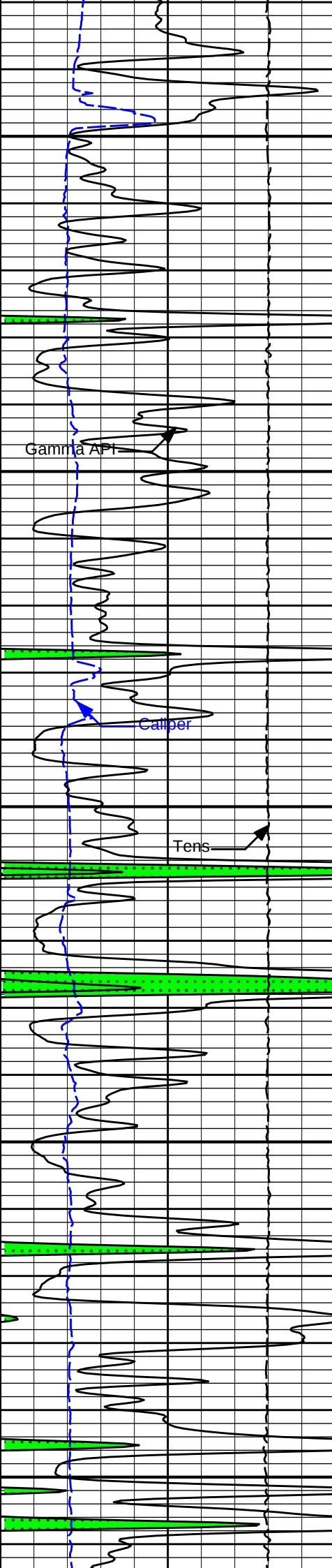




4200

4300

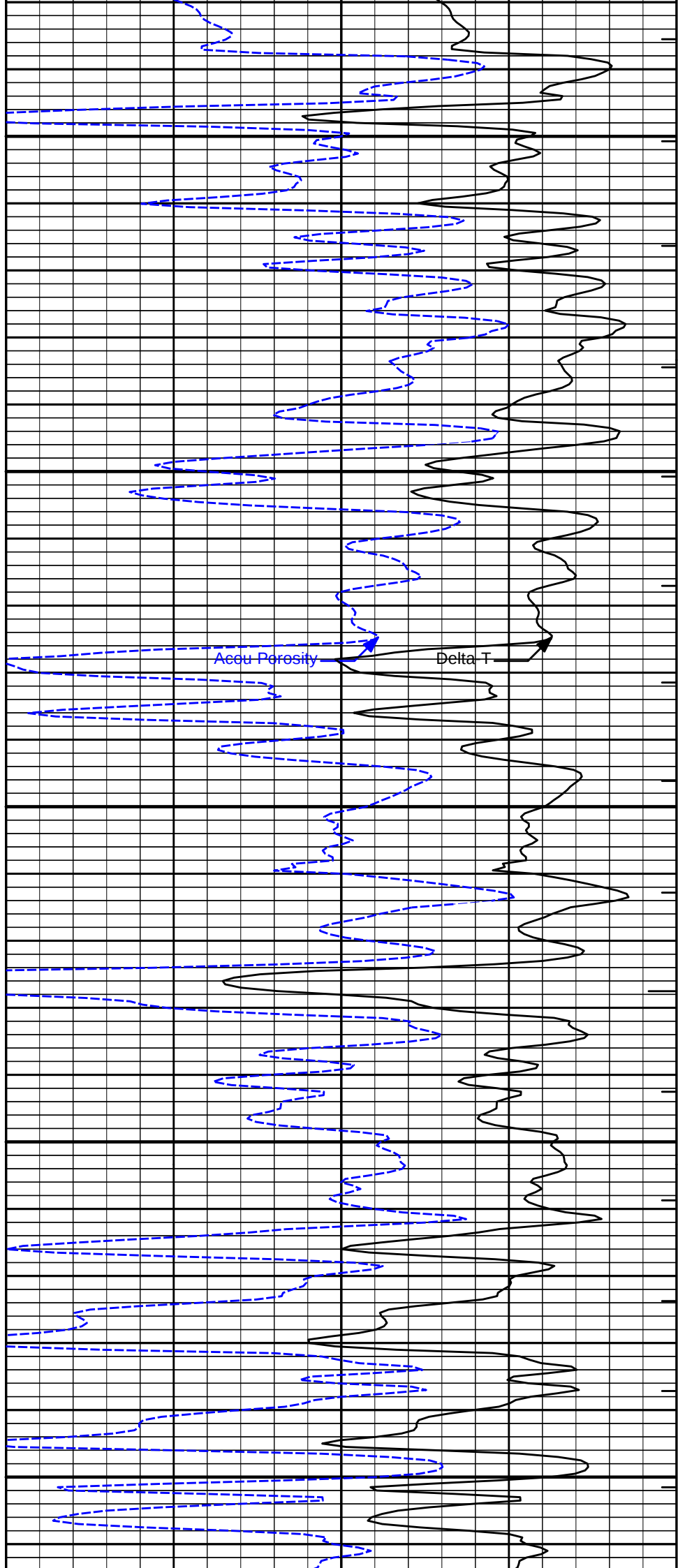


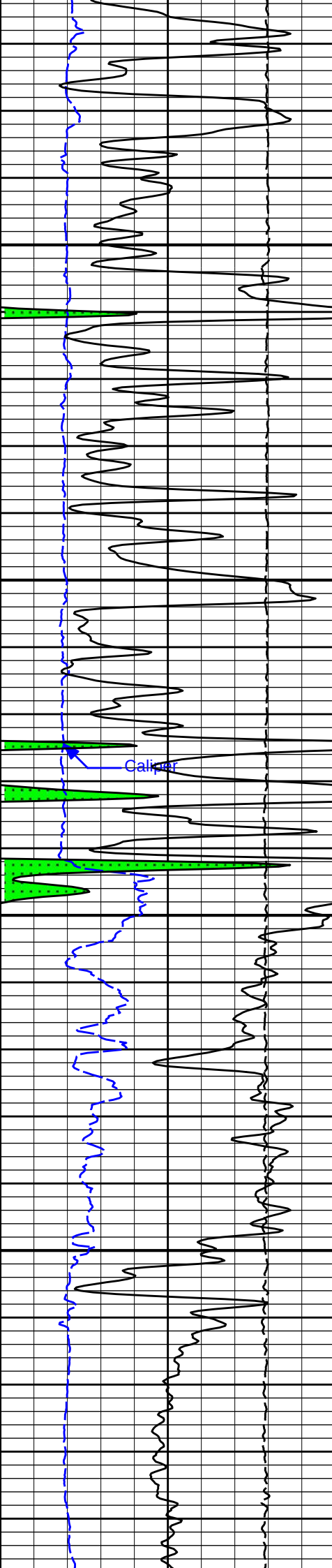


4400

4500

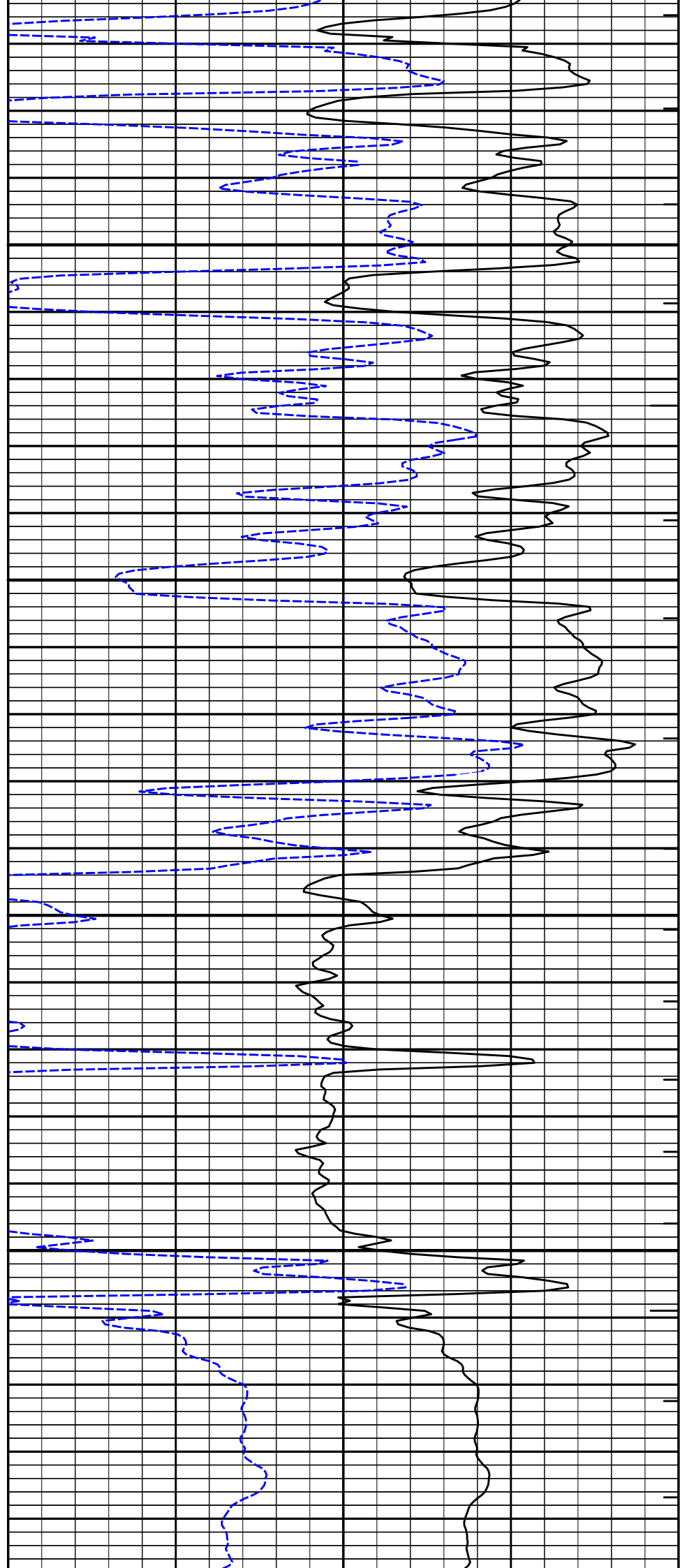
4600

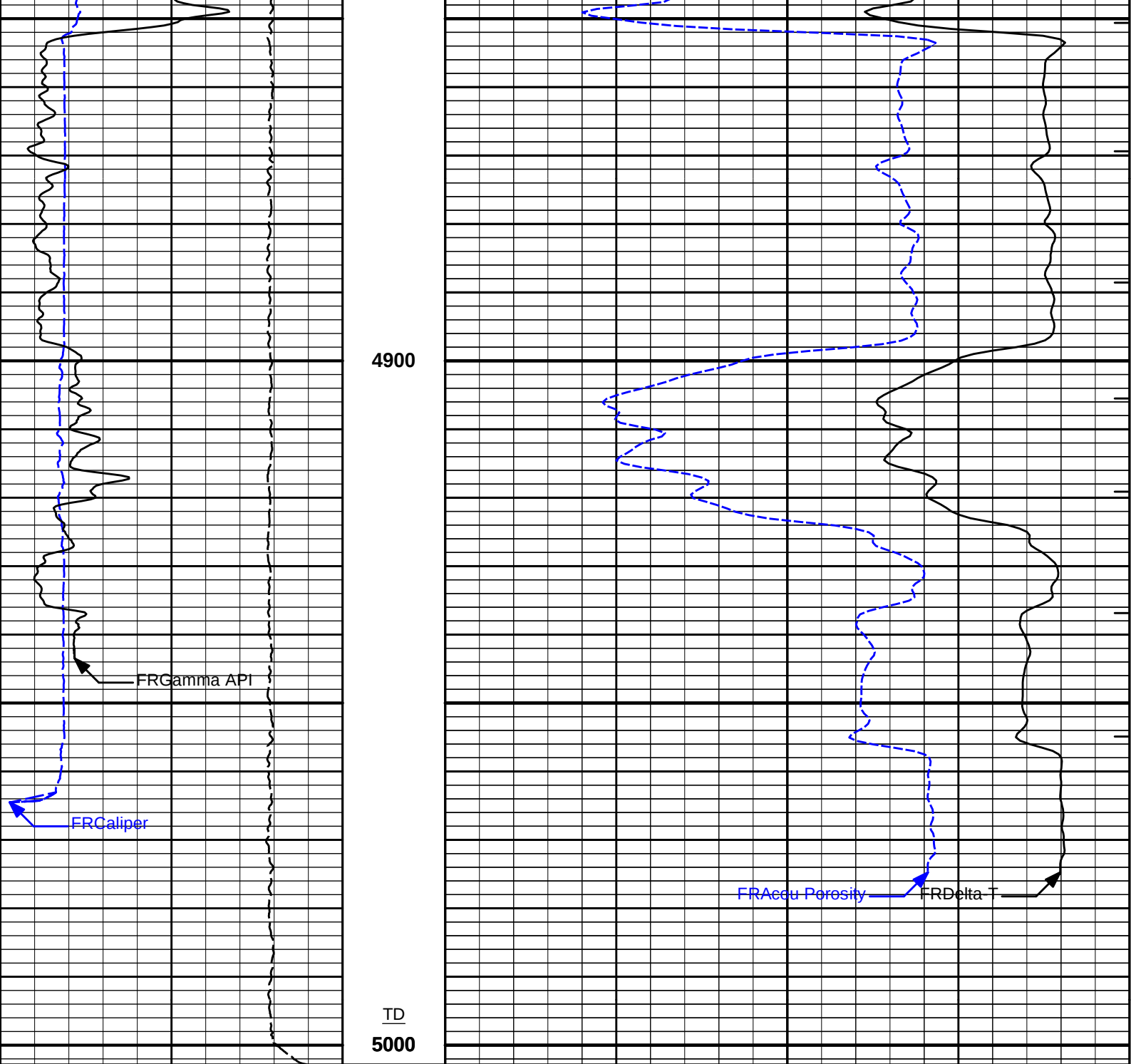




4700

4800





0Gamma API150		1 : 240 ft		ITTT
api				
15KTens0			140Delta-T40	
pounds			microsec per ft	
6CALI16			30Acou Porosity-10	
inches			percent	

HALLIBURTON

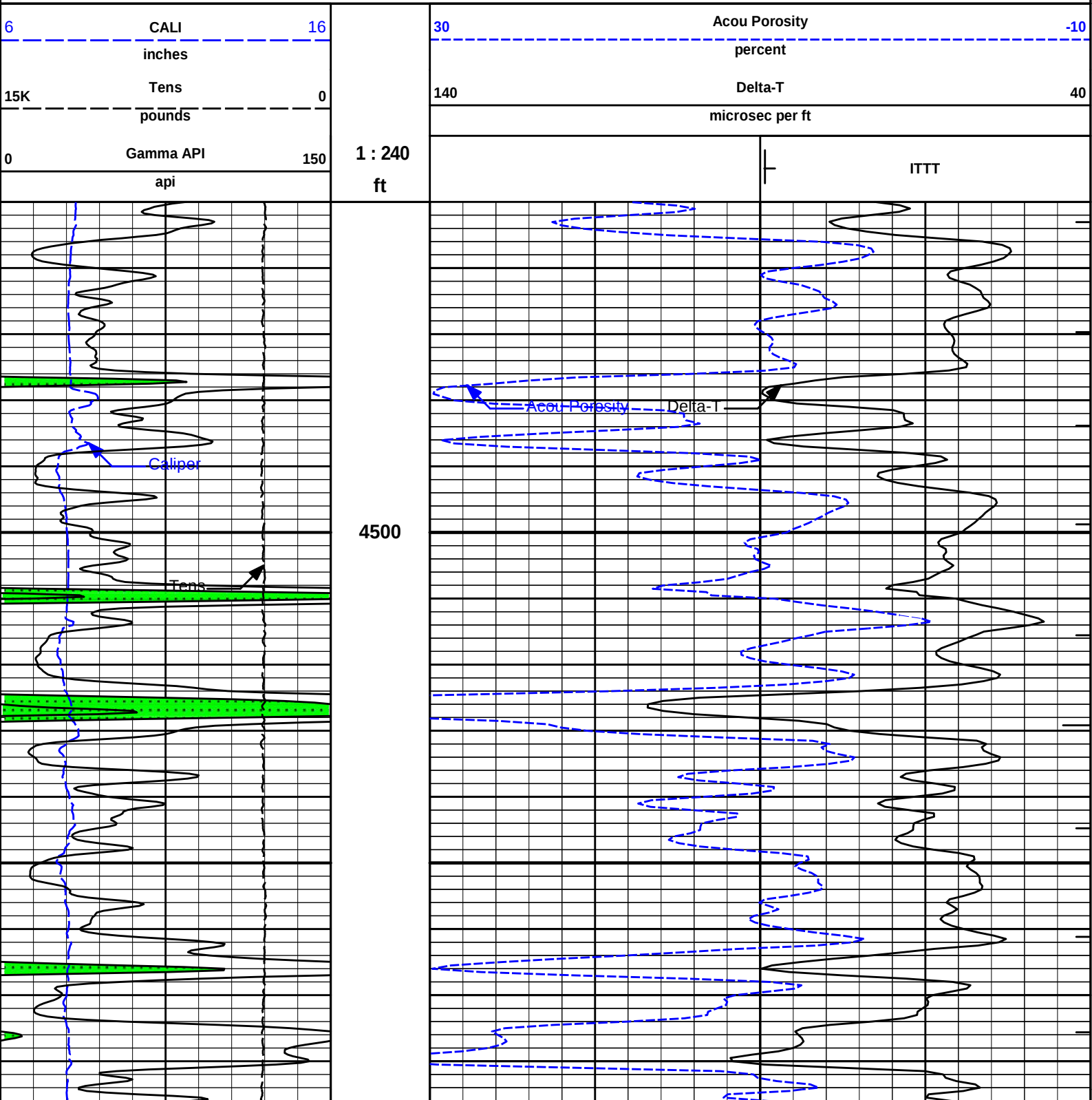
Plot Time: 03-Mar-18 08:38:30
Plot Range: 300 ft to 5002.83 ft
Data: LARIO_KNOBBE\Well Based\DAQ-0001-003\
Plot File: \IBSAT\IBSAT_5inch

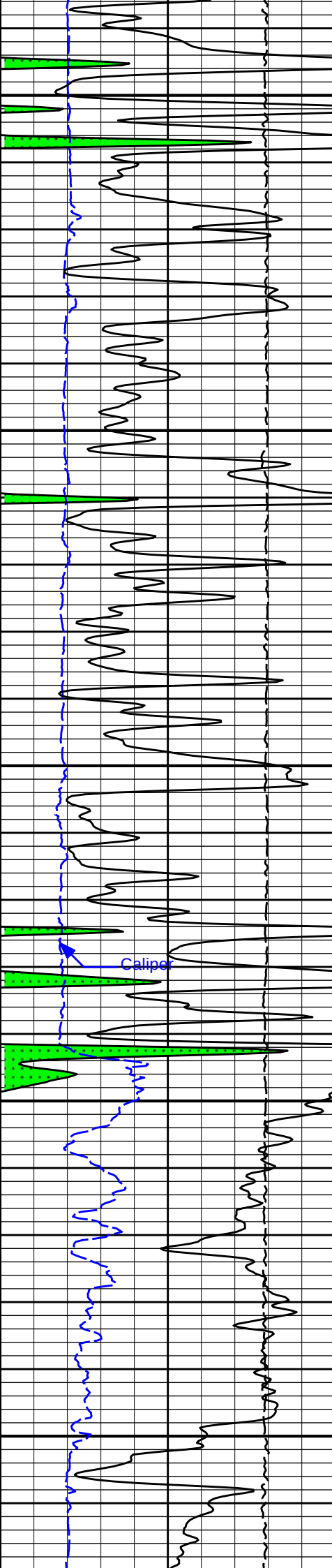
5 INCH MAIN LOG

MAIN LOG SECTION

REPEAT SECTION

REPEAT SECTION

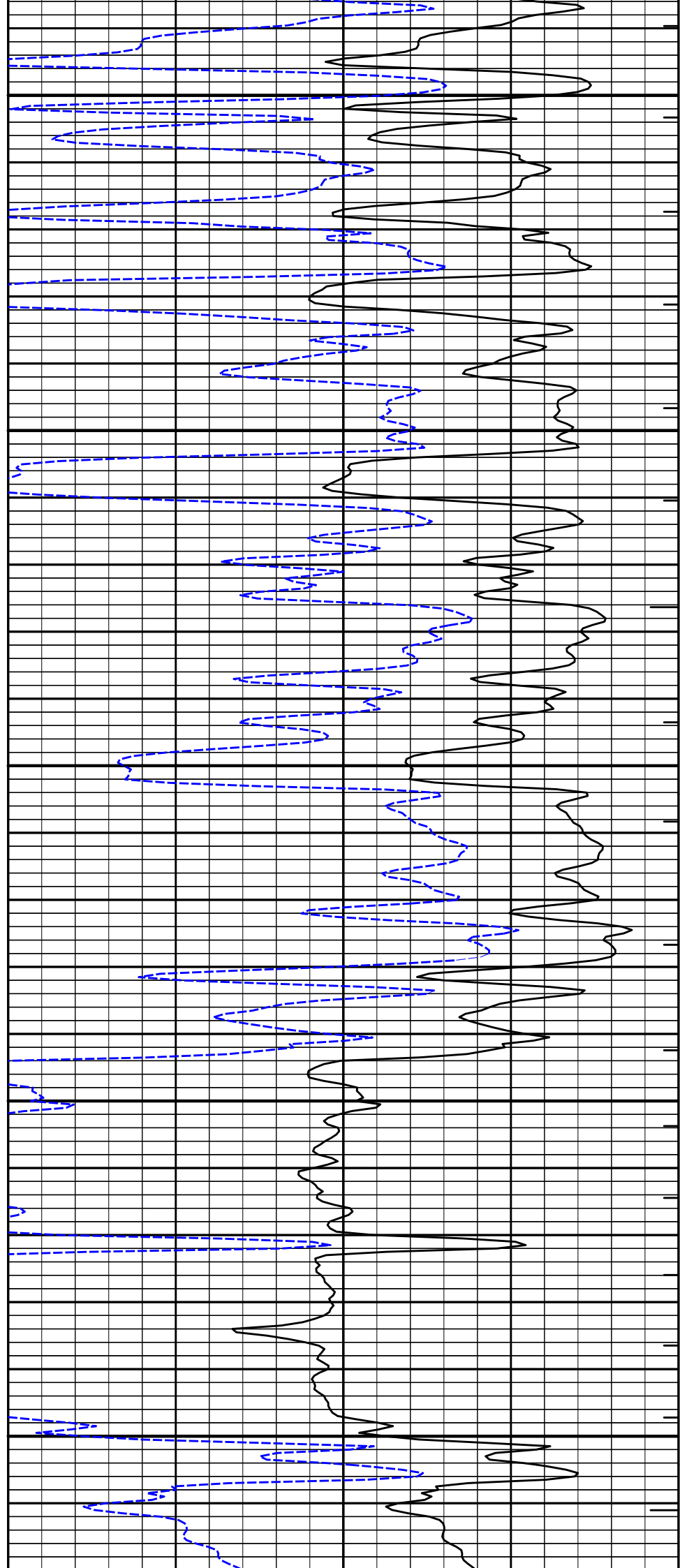


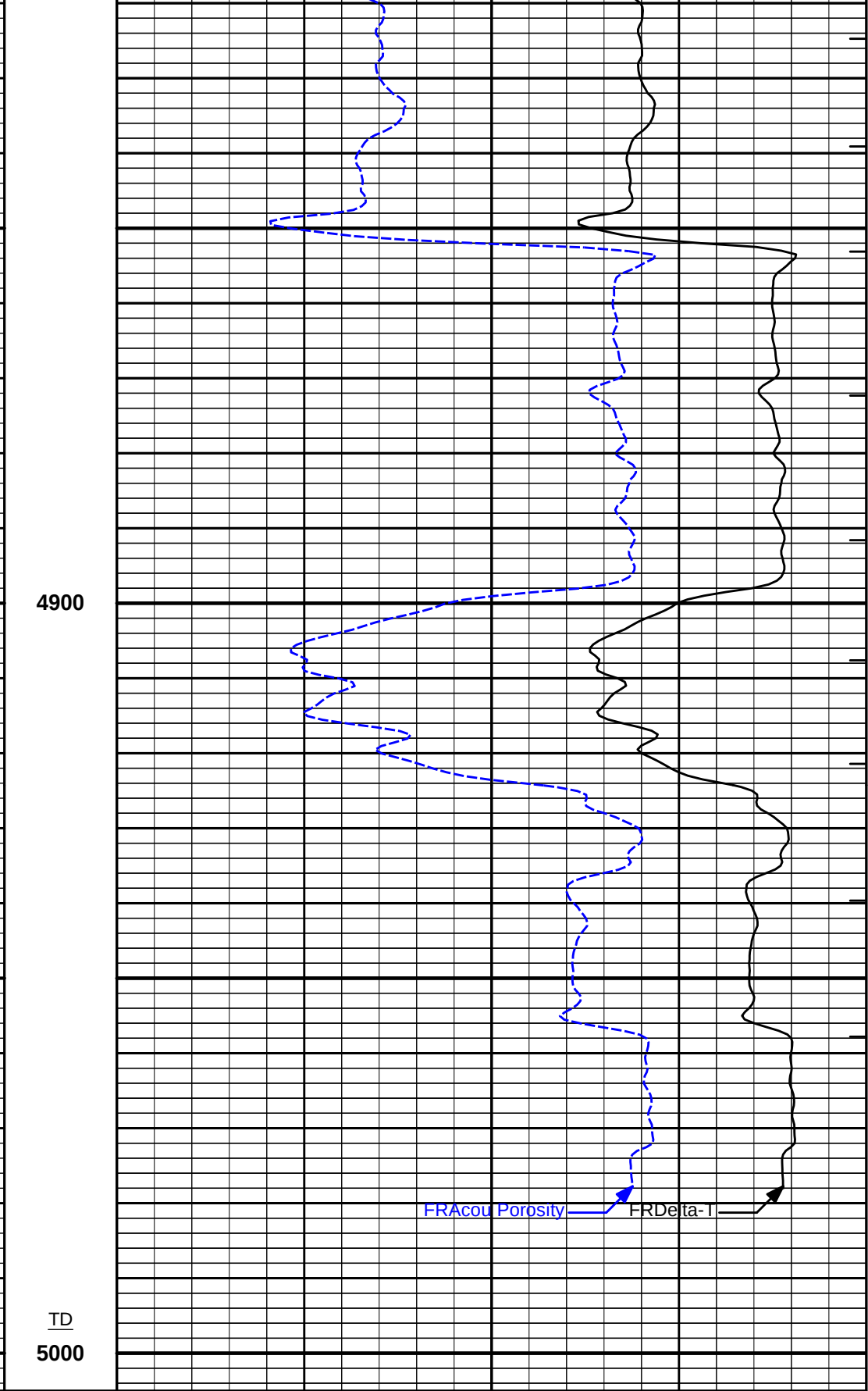
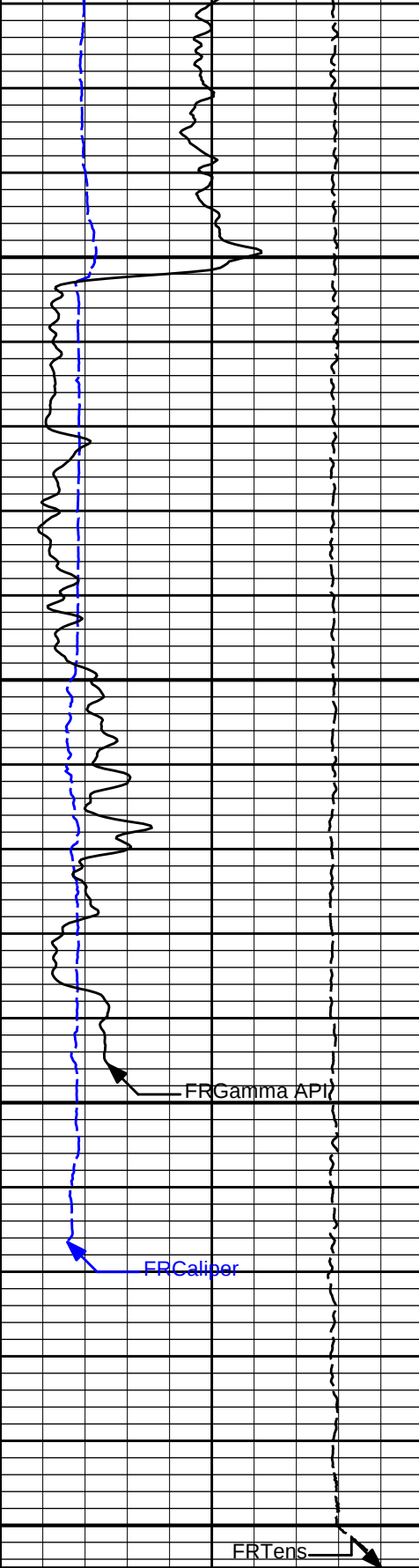


4600

4700

4800





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

HALLIBURTON

Plot Time: 03-Mar-18 08:38:31
Plot Range: 4450 ft to 5005 ft
Data: LARIO_KNOBBE\Well Based\DAQ-0001-002\
Plot File: \IBSAT\IBSAT_5inch

REPEAT SECTION

REPEAT SECTION

HALLIBURTON

CALIBRATION REPORT

SURFACE TENSION SHOP CALIBRATION

Tool Name: Depth Panel - 12345678

Reference Calibration Date: 12-Jan-18 13:33:22

Engineer: MICHAEL RICHTER

Calibration Date: 12-Jan-18 13:44:15

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

SURFACE TENSION LOAD CELL				
Measurement	Load Cell Value	Measurement	Calibrated	Units
Low	10821.18	-24.71	0.00	lbs
High	17332.25	7807.54	7830.00	lbs

DOWNHOLE TENSION SHOP CALIBRATION

Tool Name: CH_HOS - CH_HOS_I

Reference Calibration Date: 02-Feb-18 06:13:08

Engineer: WHITLOCK

Calibration Date: 18-Feb-18 06:03:11

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

DOWNHOLE LOAD CELL				
Measurement	Tool Value	Measurement	Calibrated	Units
Low	-112.94	7.68	0.00	lbs
High	11487.97	1449.21	1452.00	lbs

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11021139

Reference Calibration Date: 23-Jan-18 09:35:26

Engineer: WHITLOCK

Calibration Date: 02-Mar-18 09:54:20

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Measurement	Measured	Calibrated	Units
Background	23.3	23.8	api
Background + Calibrator	244.0	249.7	api
Calibrator	220.7	225.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11021139

Reference Calibration Date: 02-Mar-18 09:54:20

Engineer: WHITLOCK

Calibration Date: 02-Mar-18 09:57:13

Software Version: WL INSITE R5.6.3 (Build 4)

Calibration Version: 1

Calibrator Source S/N: TB-79
Calibrator API Reference:222.00 api
Equivalent Calibrator API Reference:225.9 api

Field Verification	Shop	Field	Units
Background	23.8	23.7	api
Background + Calibrator	249.7	249.1	api
Calibrator	225.9	225.9	api

Shop	Field	Difference	Tolerance
225.9	225.3	0.6	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 11660709	Reference Calibration Date:	23-Jan-18 10:26:10
Engineer:	WHITLOCK	Calibration Date:	23-Jan-18 10:51:49
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Logging Source S/N: DSN-436
Tank Serial Number: EL RENO HWT
Reference value assigned to Tank: 56.100
Snow Block S/N: 12156883
Calibration Tank Water Temperature: 72 degF
Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	1.00976	1.00603	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2369	0.2358	0.0012	+/- 0.0020
Calibrated Ratio:	10.5988	10.5596	0.039	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0699	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	DSNT - 11660709	Reference Calibration Date:	23-Jan-18 10:51:49
Engineer:	WHITLOCK	Calibration Date:	02-Mar-18 10:11:17
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Logging Source S/N: DSN-436
Snow Block S/N: 12156883

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0699	0.0627	-0.0072	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - 11014296	Reference Calibration Date:	01-Jan-70 00:00:00
Engineer:	WHITLOCK	Calibration Date:	24-Nov-17 12:28:28
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4006.36	-4006.36	-7000.00 - -1000.00
Pad Gain	0.0003890	0.0003890	0.0002000 - 0.0006000
Arm Offset	-2182.86	-2182.86	-5000.00 - 3000.00
Arm Gain	0.0004129	0.0004129	0.000300 - 0.000700
Arm Power	0.000002297	0.000002297	-0.000010000 - 0.000010000

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS				
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	2.00	2.00	0.00	+/- 0.20
Medium Ring (in)	3.75	3.75	0.00	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.50	6.50	0.00	+/- 0.20
Medium Ring (in)	8.25	8.25	0.00	+/- 0.20
Large Ring (in)	15.00	15.00	0.00	+/- 0.20

PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed
PASS/FAIL SUMMARY	
Calibration-Coefficients Range Check:	Passed

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 11014296	Reference Calibration Date:	24-Nov-17 12:28:28
Engineer:	WHITLOCK	Calibration Date:	02-Mar-18 09:01:46
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.79	0.04	+/- 0.10
Ring Diameter	8.25	8.25	0.00	+/- 0.15

PASS/FAIL SUMMARY	
Pad Extension Check:	Passed
Diameter Check:	Passed

BSAT FIELD CASING CHECK

Tool Name:	BSAT - 10939049	Calibration Date:	30-Mar-17 10:01:32
Engineer:	HARRIS		
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Pre-Log Check	Check Depth	Shop	Field	Difference	Tolerance	Units
Delta-T Compensated	147.01	57.00	56.56	0.4400	1.00	uspf

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	ACRt Sonde - 11038385	Reference Calibration Date:	12-Sep-17 13:58:19
Engineer:	WHITLOCK	Calibration Date:	15-Dec-17 10:45:06
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11055059		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0500	1.05	0.95	1.0229	1.05	0.95	1.0048	1.05
A2 (50")	0.95	1.0500	1.05	0.95	1.0261	1.05	0.95	1.0131	1.05
A3 (29")	0.95	1.0472	1.05	0.95	1.0179	1.05	0.95	1.0025	1.05
A4 (17")	0.95	1.0401	1.05	0.95	1.0093	1.05	0.95	0.9956	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0012	1.05	0.95	0.9839	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9883	1.05	0.95	0.9739	1.05
SONDE OFFSET									
Subarray	R12KHz			R36KHz			R72KHz		
	(mmho/m)			(mmho/m)			(mmho/m)		
A1 (80")	1.490			-4.736			-6.418		
A2 (50")	-0.183			-4.133			-5.504		
A3 (29")	-12.250			-3.671			-3.367		
A4 (17")	-109.670			-32.737			-24.656		
A5 (10")	N/A			-82.133			-35.124		
A6 (6")	N/A			347.353			195.364		
TRANSMITTER CURRENT GAIN						R-MUD VERIFICATION			
Signal	Lower		R	Upper		Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
12K	0.6		0.86	1.3		Mud Cell	0.95	1.00	1.05
36K	1.0		1.34	2.0					
72K	1.0		1.61	2.0					
PASS/FAIL SUMMARY									
GAIN RANGE CHK						PASS			
SONDE OFFSET CHK						PASS			
TOOL OK TO LOG									

QUALITY CHECK SHOP CALIBRATION

Tool Name:ACRt Sonde - 11038385

Engineer:WHITLOCK

Software Version:WL INSITE R5.6.3 (Build 4)

Host Tool Name:ACRt Instrument - 11055059

Reference Calibration Date:12-Sep-17 14:00:57

Calibration Date:15-Dec-17 10:50:30

Calibration Version:1

STANDARD DEVIATIONS									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A2 (50")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A3 (29")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A4 (17")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A5 (10")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
A6 (6")	0.000	< 0.750	Pass	0.000	< 0.750	Pass	0.000	< 0.750	Pass
AVERAGES									
	R12KHz			R36KHz			R72KHz		
	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail	Measured (mmho/m)	Expected (mmho/m)	Pass/Fail
A1 (80")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.007	> -0.500	Pass
A2 (50")	0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.005	> -0.500	Pass
A3 (29")	-0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.003	> -0.500	Pass

A4 (17")	-0.003	> -0.500	Pass	-0.008	> -0.500	Pass	-0.024	> -0.500	Pass
A5 (10")	-0.011	> -0.500	Pass	-0.018	> -0.500	Pass	-0.034	> -0.500	Pass
A6 (6")	0.016	< 0.500	Pass	0.078	< 0.500	Pass	0.183	< 0.500	Pass
GAIN TOLERANCE									
R12KHz									
	Measured (mmho/m)		Last Month (mmho/m)		Difference (mmho/m)		Tolerance (mmho/m)		Pass/Fail
A1 (80")	-220721488.000		-223155904.000		2434416.000		11157795.200		Pass
A2 (50")	-218488224.000		-220713888.000		2225664.000		11035694.400		Pass
A3 (29")	-214911568.000		-216614880.000		1703312.000		10830744.000		Pass
A4 (17")	-211434368.000		-214578320.000		3143952.000		10728916.000		Pass
A5 (10")	-211949376.000		-214986432.000		3037056.000		10749321.600		Pass
A6 (6")	-213895760.000		-214394544.000		498784.000		10719727.200		Pass
R36KHz									
	Measured (mmho/m)		Last Month (mmho/m)		Difference (mmho/m)		Tolerance (mmho/m)		Pass/Fail
A1 (80")	59105928.000		60628184.000		1522256.000		3031409.200		Pass
A2 (50")	60252356.000		62049960.000		1797604.000		3102498.000		Pass
A3 (29")	52147940.000		53214172.000		1066232.000		2660708.600		Pass
A4 (17")	48569380.000		50561756.000		1992376.000		2528087.800		Pass
A5 (10")	50672468.000		52600244.000		1927776.000		2630012.200		Pass
A6 (6")	49458680.000		50656572.000		1197892.000		2532828.600		Pass
R72KHz									
	Measured (mmho/m)		Last Month (mmho/m)		Difference (mmho/m)		Tolerance (mmho/m)		Pass/Fail
A1 (80")	-92108696.000		-92698504.000		589808.000		4634925.200		Pass
A2 (50")	-89118672.000		-89662344.000		543672.000		4483117.200		Pass
A3 (29")	-88812376.000		-89109216.000		296840.000		4455460.800		Pass
A4 (17")	-83501792.000		-84842648.000		1340856.000		4242132.400		Pass
A5 (10")	-82094160.000		-83337800.000		1243640.000		4166890.000		Pass
A6 (6")	-84269728.000		-84561904.000		292176.000		4228095.200		Pass
PASS/FAIL SUMMARY									
Std Deviation Verification						Pass			
Average Verification						Pass			
Gain Tolerance Verification						Pass			

MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - 11014296	Reference Calibration Date:	21-Oct-17 17:42:32
Engineer:	WHITLOCK	Calibration Date:	05-Feb-18 09:59:26
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1
Host Tool Name:	DSNT - 11660709		

	CALIBRATION COEFFICIENT SUMMARY					
	Measurement	Micro Log Normal		Micro Log Lateral		
		Measured	Calibrated	Measured	Calibrated	
	Units					
	Tool Zero	-0.09	-0.14	0.00	-0.00	ohmm
	Calibration Point #1	0.04	0.00	0.01	0.00	ohmm
	Calibration Point #2	20.18	20.00	19.94	20.00	ohmm
	Internal Reference	19.86	19.67	19.92	19.98	ohmm
	Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
	Tool Zero	0.66		0.77		V
	Calibration Point #1	36.64		2.18		V
	Calibration Point #2	5310.85		6855.63		V
	Internal Reference	5299.85		6844.63		V

Calibration Point #2	5310.85	6855.62	V
Internal Reference	5224.72	6848.83	V

MICRO LOG FIELD CHECK			
Tool Name:	Microlog Pad - 11014296	Reference Calibration Date:	05-Feb-18 09:59:26
Engineer:	WHITLOCK	Calibration Date:	02-Mar-18 09:48:34
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

	Measurement	Micro Log Normal		Micro Log Lateral	
		Shop	Field	Shop	Field
	Tool Zero	-0.14	-0.16	-0.00	-0.01
	Internal Reference	19.67	19.62	19.98	19.92
					Units
					ohmm
					ohmm
Summary					
	Signal	Shop	Field	Difference	Tolerance
	Microlog Normal	19.67	19.62	0.05	+/- 0.80
	Microlog Lateral	19.98	19.92	0.06	+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION			
Tool Name:	SDLT Pad - 10865881	Reference Calibration Date:	16-Dec-17 18:39:59
Engineer:	WHITLOCK	Calibration Date:	16-Dec-17 19:00:32
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Logging Source S/N: 5155GW		
Aluminum Block S/N: EL RENO	Density: 2.581g/cc	Pe: 3.170
Magnesium Block S/N: EL RENO	Density: 1.687g/cc	Pe: 2.594

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0190	1.0130	0.90 - 1.10
Near Dens Gain	1.0005	0.9951	0.90 - 1.10
Near Peak Gain	1.0223	1.0145	0.90 - 1.10
Near Lith Gain	1.0517	1.0503	0.90 - 1.10
Far Bar Gain	1.0054	1.0046	0.90 - 1.10
Far Dens Gain	0.9942	0.9923	0.90 - 1.10
Far Peak Gain	0.9912	0.9917	0.90 - 1.10
Far Lith Gain	0.9770	0.9734	0.90 - 1.10
Near Bar Offset	0.1872	0.2425	NONE
Near Dens Offset	0.3382	0.3842	NONE
Near Peak Offset	0.1850	0.2490	NONE
Near Lith Offset	-0.0438	-0.0306	NONE
Far Bar Offset	0.1527	0.1576	NONE
Far Dens Offset	0.2431	0.2592	NONE
Far Peak Offset	0.2590	0.2565	NONE
Far Lith Offset	0.3383	0.3725	NONE
Near Bar Background	930.24	932.15	700 - 1450
Near Dens Background	311.45	312.35	230 - 480
Near Peak Background	133.79	134.32	100 - 210
Near Lith Background	164.51	164.96	125 - 260
Far Bar Background	601.19	603.41	450 - 900
Far Dens Background	235.51	235.02	175 - 345
Far Peak Background	91.58	93.10	70 - 140
Far Lith Background	95.48	97.57	75 - 145
CALIBRATION BLOCK SUMMARY			
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change Control Limit On Change

MAGNESIUM				
Density (g/cc)	1.687	1.687	0.000	+/- 0.015
Pe	2.557	2.553	-0.004	+/- 0.150
ALUMINUM				
Density (g/cc)	2.579	2.581	0.002	+/- 0.01500
Pe	3.126	3.125	-0.001	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0001	+/- 0.0110	-0.0014	+/- 0.0140
Magnesium Block	-0.0009	+/- 0.0110	0.0002	+/- 0.0140
Aluminum Block	-0.0006	+/- 0.0110	-0.0004	+/- 0.0140
Resolution	9.58	6.00 - 11.50	8.95	6.00 - 11.50
Internal Verifier(B+D+P+L)	1544	1200 - 2700	1029	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name:	SDLT Pad - 10865881	Reference Calibration Date:	16-Dec-17 19:00:32
Engineer:	WHITLOCK	Calibration Date:	02-Mar-18 09:57:00
Software Version:	WL INSITE R5.6.3 (Build 4)	Calibration Version:	1

Pad Temperature: 43.5 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1543.777	1531.829	-11.948	15.818
Far (B+D+P+L) cps	1029.100	1016.707	-12.393	17.098
Near Resolution	9.58	9.78	0.200	0.50
Far Resolution	8.95	9.10	0.150	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

CALIBRATION SUMMARY

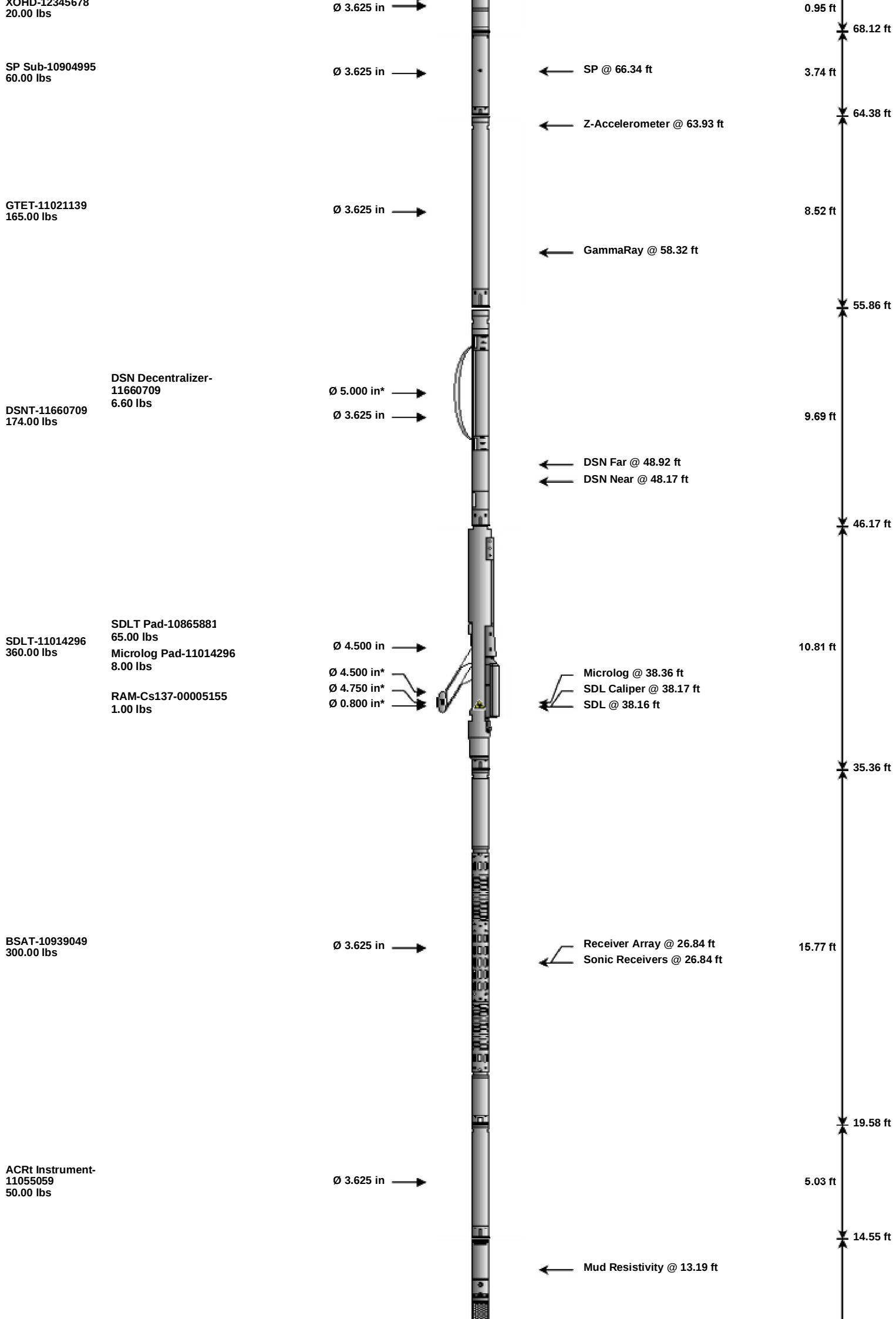
Sensor	Shop	Field	Post	Difference	Tolerance	Units
Depth Panel-12345678						
Tension Zero	0.00	-----	-----	0.00	-----	lbs
Tension Cal	7830.00	-----	-----	0.00	-----	lbs
CH_HOS-CH_HOS_I						
DH Tension Zero	0.00	-----	-----	0.00	-----	lbs
DH Tension Cal	1452.00	-----	-----	0.00	-----	lbs
GTET-11021139						
Gamma Ray Calibrator	225.9	225.3	-----	0.6	+/- 9.00	api

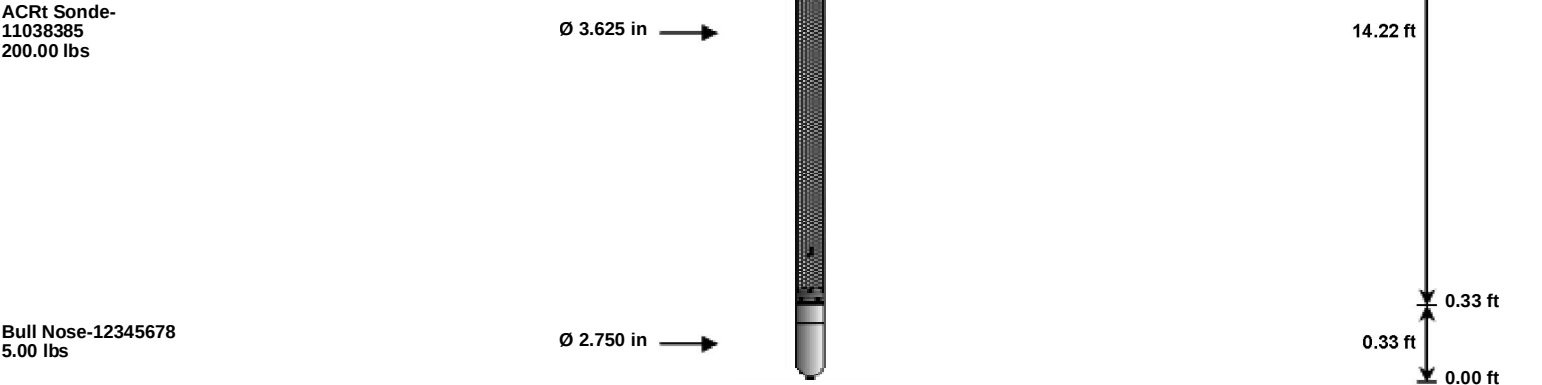
DSNT-11660709						
Snow-Block Porosity	0.0699	0.0627	-----	0.0072	+/- 0.0150	decp
SDLT-11014296						
Pad Extension	3.75	3.79	-----	-0.04	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
ACRt Sonde-11038385						
Mud Cell	1.00	-----	-----	0	-----	ohm-m
Microlog Pad-11014296						
MicroLog Normal	19.67	19.62	-----	0.05	+/-0.80	ohmm
MicroLog Lateral	19.98	19.92	-----	0.06	+/-0.80	ohmm
SDLT Pad-10865881						
Near(B+D+P+L)	1543.777	1531.829	-----	11.948	+/-15.818	cps
Far(B+D+P+L)	1029.100	1016.707	-----	12.393	+/-17.098	cps
Data: LARIO_KNOBBE\0001 GTET-DSNT-SDLT-BSAT-ACRT\IDLE						
Date: 03-Mar-18 03:41:08						

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	9.100	ppg
	SHARED	WAGT	Weighting Agent	Barite	
	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	0.850	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	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	5000.00	ft
	SHARED	BHT	Bottom Hole Temperature	131.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	CBM Temperature Master Tool	GTET	
	SHARED	SOCI	Source of Casing Information	Parameters	
	SHARED	MSAL	Water-base mud filtrate salinity	0.00	ppm
	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	
	Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	CH_HOS_I	37.50	3.03	69.07	300.00
WP7K	Weak Point 7000 lbs	CH_HOS_I	0.01	0.01	*	69.87
XOHD	Hostile to Dits Cross Over	12345678	20.00	0.95	68.12	300.00
SP	SP Sub	10904995	60.00	3.74	64.38	300.00
GTET	Gamma Telemetry Tool	11021139	165.00	8.52	55.86	60.00
DSNT	Dual Spaced Neutron	11660709	174.00	9.69	46.17	60.00
DCNT	DSN Decentralizer	11660709	6.60	5.13	*	49.50
SDLT	Spectral Density Tool	11014296	360.00	10.81	35.36	60.00
SDLP	Density Insite Pad	10865881	65.00	2.55	*	37.57
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	00005155	1.00	0.80	*	37.80
MICP	Microlog Pad	11014296	8.00	1.00	*	37.86
BSAT	Borehole Sonic Array Tool	10939049	300.00	15.77	19.58	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11055059	50.00	5.03	14.55	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11038385	200.00	14.22	0.33	120.00
BLNS	Bull Nose	12345678	5.00	0.33	0.00	300.00
Total			1,452.11	72.10		
* Not included in Total Length and Length Accumulation.						
Data: LARIO_KNOBBE0001 GTET-DSNT-SDLT-BSAT-ACRTIDLE					Date: 03-Mar-18 03:49:14	