HALLIBURTON

BOREHOLE COMPENSATED SONIC LOG

COMPANY	MERIT ENERGY COMPANY LLC
WELL	EMMA WARD 3
FIELD/BLOCK	WILDCAT
COUNTY	HASKELL
STATE	KANSAS

COMPANY **MERIT ENERGY COMPANY LLC**
WELL **EMMA WARD 3**
FIELD/BLOCK **WILDCAT**
COUNTY **HASKELL** STATE **KANSAS**

API No. 15081221940000
Location (SHL) SW SW NE NW
1585' FWL & 1122' FNL

Other Services:
ACT
SDL-DSN
MICROLOG
SONIC

Sect. 35 Twp. 27S Rge. 34W

Permanent Datum	GL	Elev. 3038.4 ft	Elev.: K.B. 3050.4 ft
Log measured from	KB	12.0 ft above perm. Datum	D.F. 3048.4 ft
Drilling measured from	KB		G.L. 3038.4 ft

Date	17-Aug-19		
Run No.	1		
Depth - Driller	5529.0 ft		
Depth - Logger	5504.0 ft		
Bottom - Logged Interval	5494		
Top - Logged Interval	1771		
Casing - Driller	8.625 in @ 1772.0 ft	@	@
Casing - Logger	1771.0 ft		
Bit Size	7.875 in	@	@
Type Fluid in Hole	Water Based Mud		
Density / Viscosity	9.20 g/cc / 60.00 s/qt		
PH / Fluid Loss	11.00 pH / 6.8 cptm		
Source of Sample	FLOWLINE		
Rm @ Meas. Temperature	1.15 ohmm @ 82.00 degF	@	@
Rmf @ Meas. Temperature	0.93 ohmm @ 80.00 degF	@	@
Rmc @ Meas. Temperature	1.34 ohmm @ 80.00 degF	@	@
Source Rmf / Rmc	MEAS / MEAS		
Rm @ BHT	0.69 ohmm @ 142.0 degF	@	@
Time Since Circulation	05:00 hr		
Time on Bottom	17-Aug-19 09:45		
Max. Rec. Temperature	142.00 degF @ 5503.0 ft	@	@
Equipment / Location	12156883 / EL RENO, OK		
Recorded By	WHITLOCK		
Witnessed By	KRYSTIN ROBINSON		

Fold here

Service Ticket No.: 905916210 API No.: 15081221940000 PGM Version: WL INSITE R6.2.1 (Build 2)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE					
Date	Sample No.				
Depth-Driller					
Type Fluid in Hole					
Density	Viscosity				
Ph	Fluid Loss				
Source of Sample					
Rm @ Meas. Temp		@		@	
Rmf @ Meas. Temp.		@		@	
Rmc @ Meas. Temp.		@		@	
Source Rmf	Rmc				
Rm @ BHT		@		@	
Rmf @ BHT		@		@	
Rmc @ BHT		@		@	

RESISTIVITY SCALE CHANGES			
Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA				
Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.		Run No.		Run No.		Run No.	
Serial No.		Serial No.		Serial No.		Serial No.	
Model No.		Model No.		Model No.		Model No.	
Diameter		No. of Cent.		Diameter		Diameter	
Detector Model No.		Spacing		Log Type		Log Type	
Type				Source Type		Source Type	
Length		LSA [Y/N]		Serial No.		Serial No.	
Distance to Source		FWDA [Y/N]		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	

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: 5 1/2" CASING USED FOR ANNULAR HOLE VOLUME

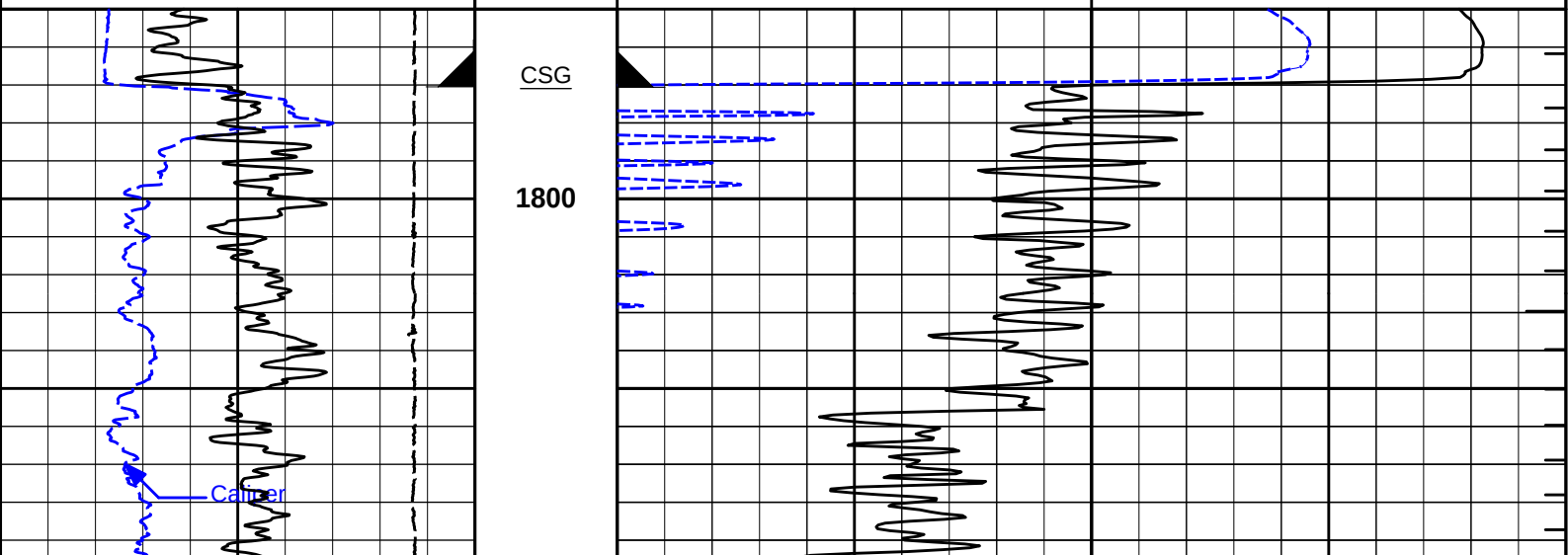
HALLIBURTON

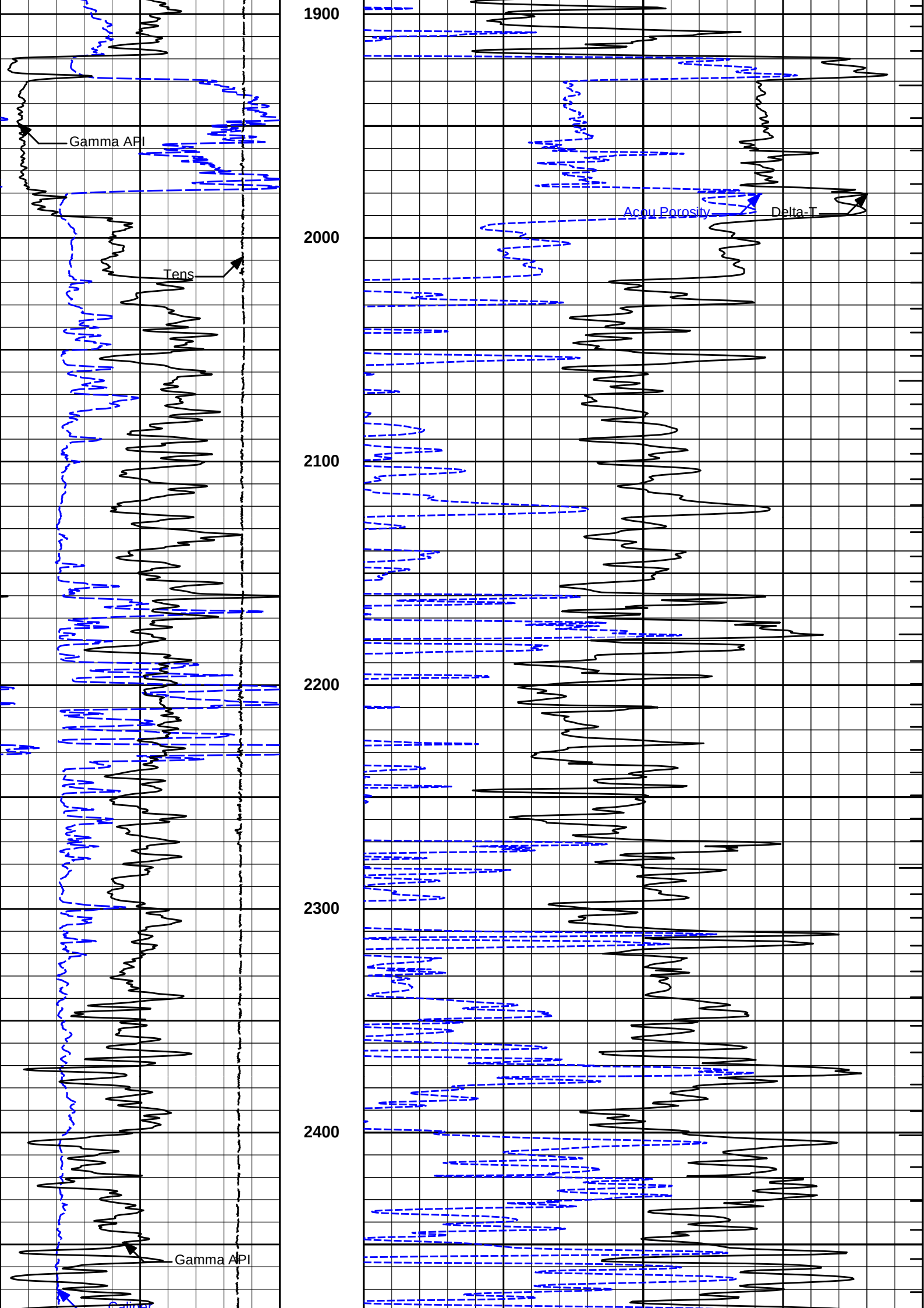
Plot Time: 17-Aug-19 12:38:23
Plot Range: 1750 ft to 5508.58 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-003
Plot File: \\BSAT\BSAT_2inch

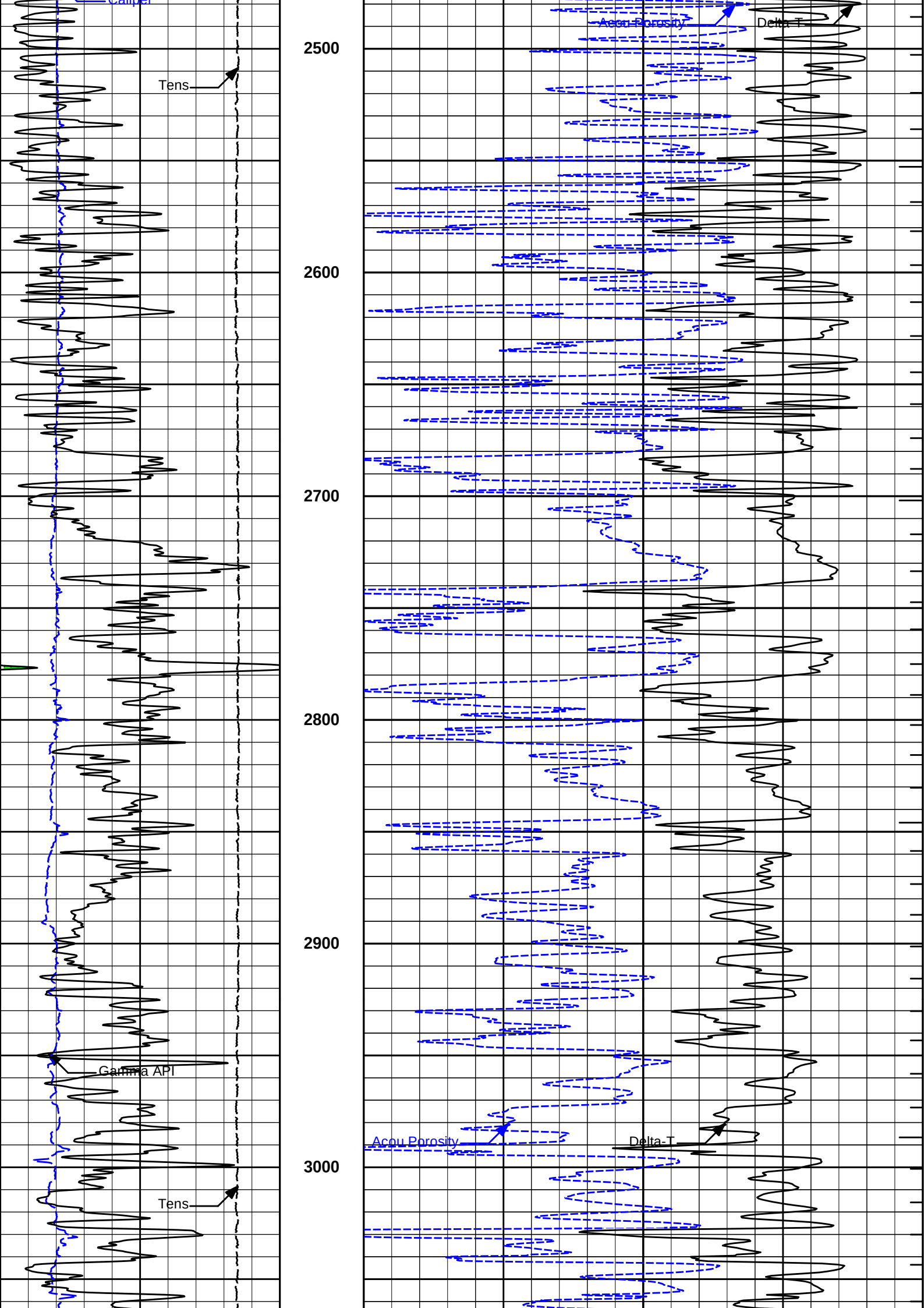
2 INCH MAIN LOG

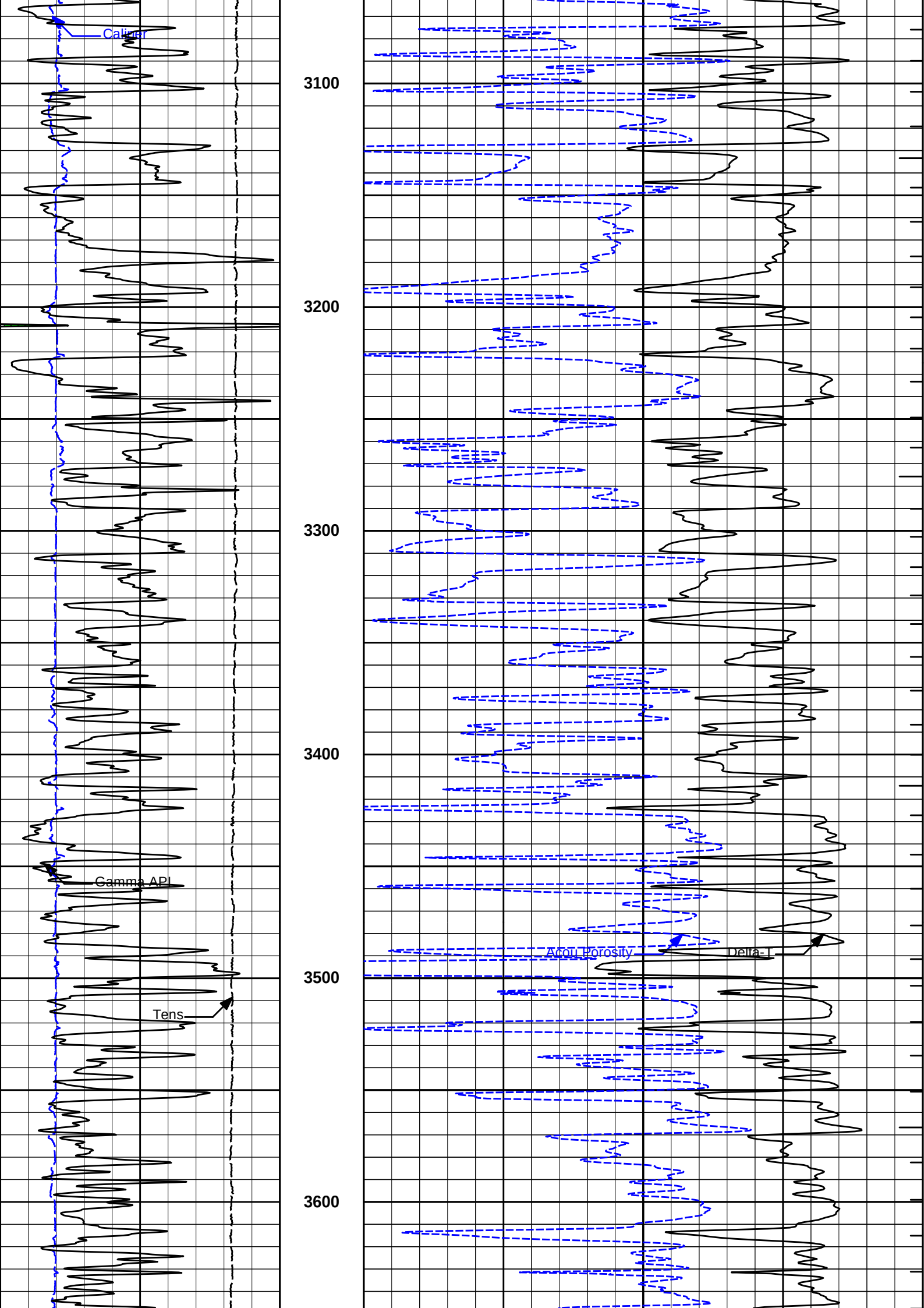
2" MAIN LOG SECTION

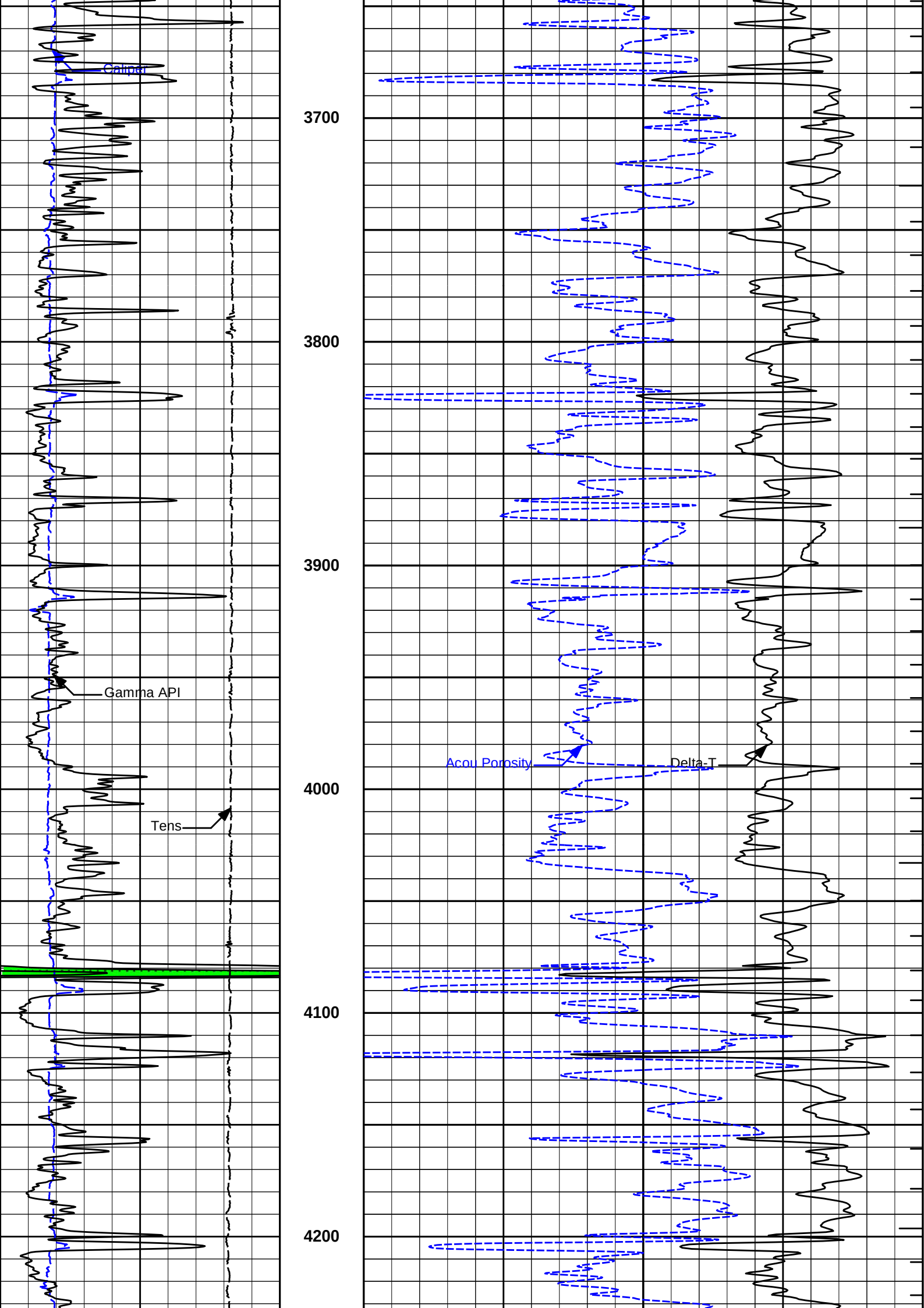
6 CALI 16 (inches)		140 Delta-T 40 (microsec per ft)
15K Tens 0 (pounds)		30 Acou Porosity -10 (percent)
0 Gamma API 150 (api)	1 : 600 ft	ITTT

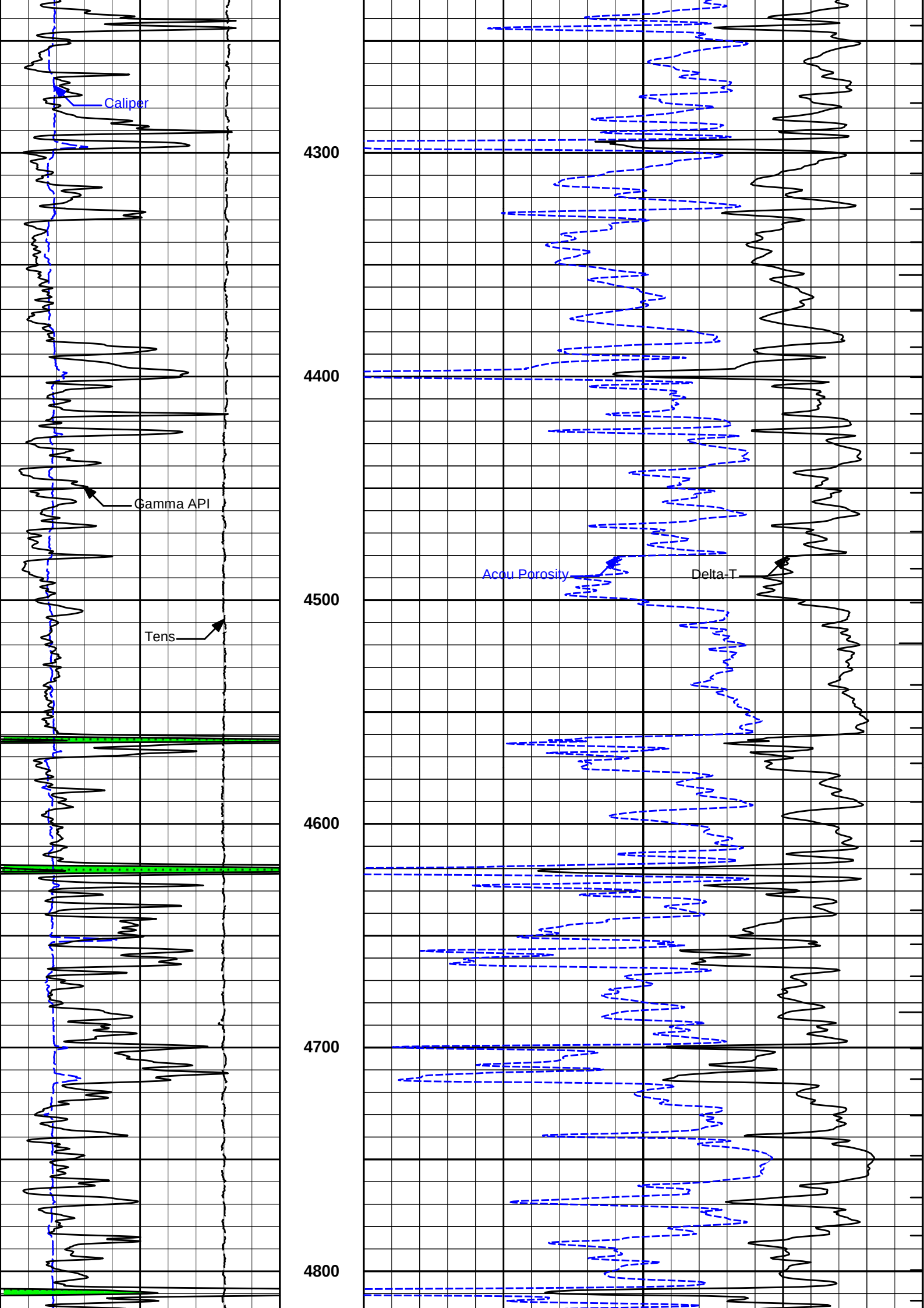


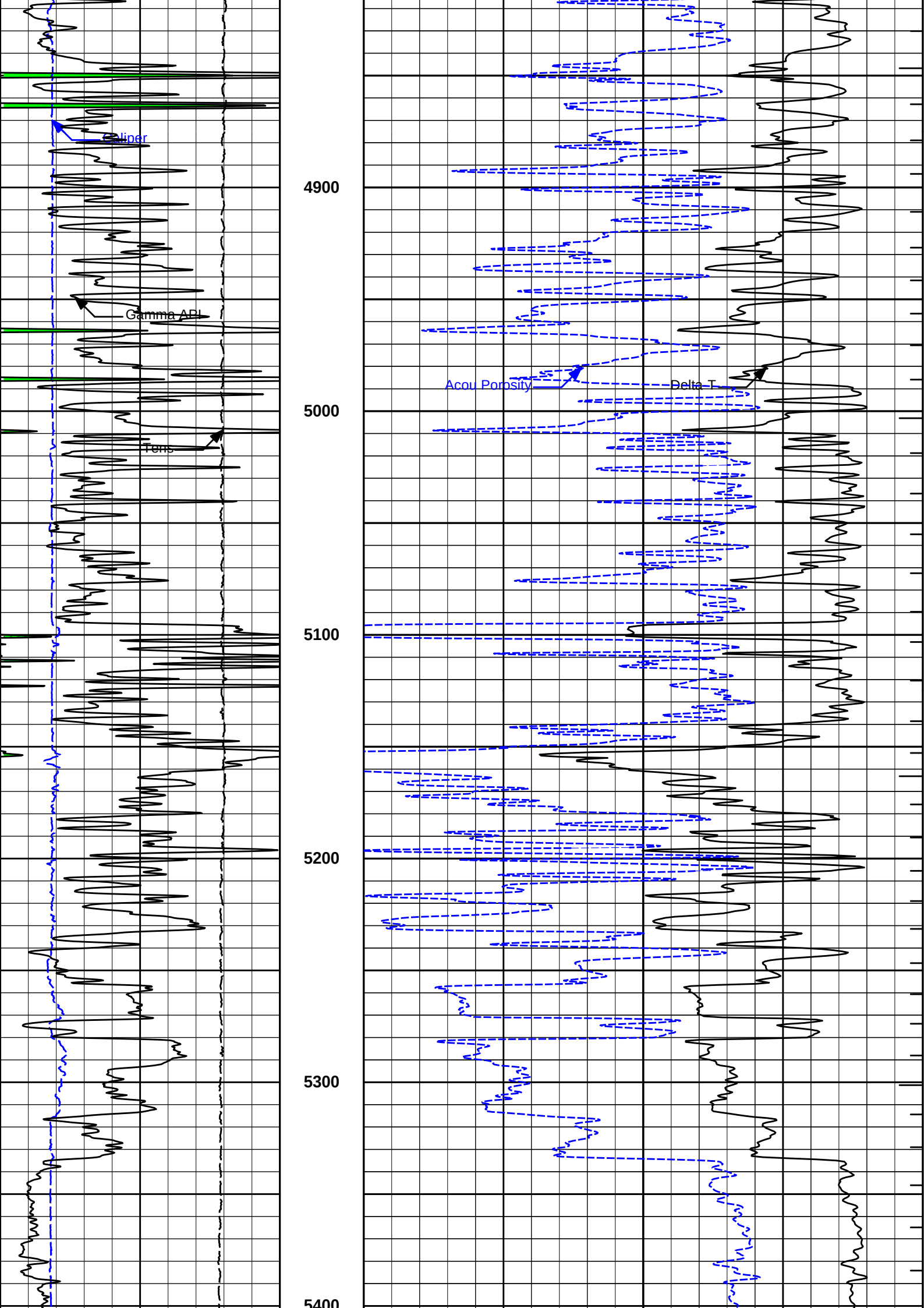

Gamma API
Tens
Gamma API
Acou Porosity
Delta-T
1900
2000
2100
2200
2300
2400

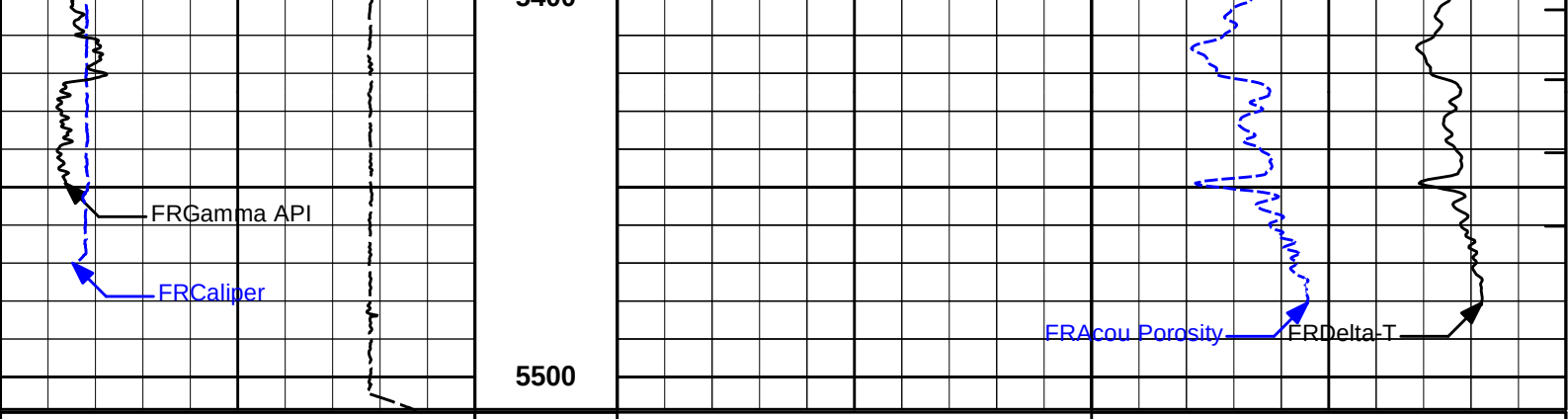

Caliper
Tens
Gamma API
Tens
2500
2600
2700
2800
2900
3000
Acou Porosity
Delta-T
Acou Porosity
Delta-T


Caliper
3100
3200
3300
3400
Gamma API
Accu Porosity
Delta-T
3500
Tens
3600


Caliper
Gamma API
Tens
3700
3800
3900
4000
4100
4200
Acou Porosity
Delta-T


Caliper
Gamma API
Tens
Acou Porosity
Delta-T
4300
4400
4500
4600
4700
4800


Caliper
Gamma API
Tens
Acou Porosity
Delta-T
4900
5000
5100
5200
5300
5400



0 Gamma API 150 api	1 : 600 ft	ITTT
15K Tens 0 pounds		30 Acou Porosity -10 percent
6 CALI 16 inches		140 Delta-T 40 microsec per ft

HALLIBURTON

Plot Time: 17-Aug-19 12:38:26
Plot Range: 1750 ft to 5508.58 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-003\
Plot File: \\BSAT\BSAT_2inch

2 INCH MAIN LOG

2" MAIN LOG SECTION

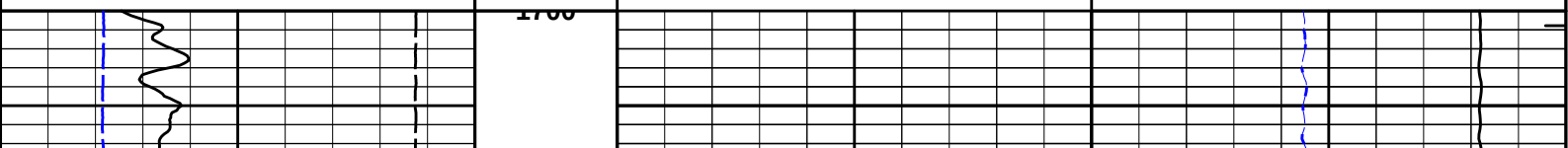
HALLIBURTON

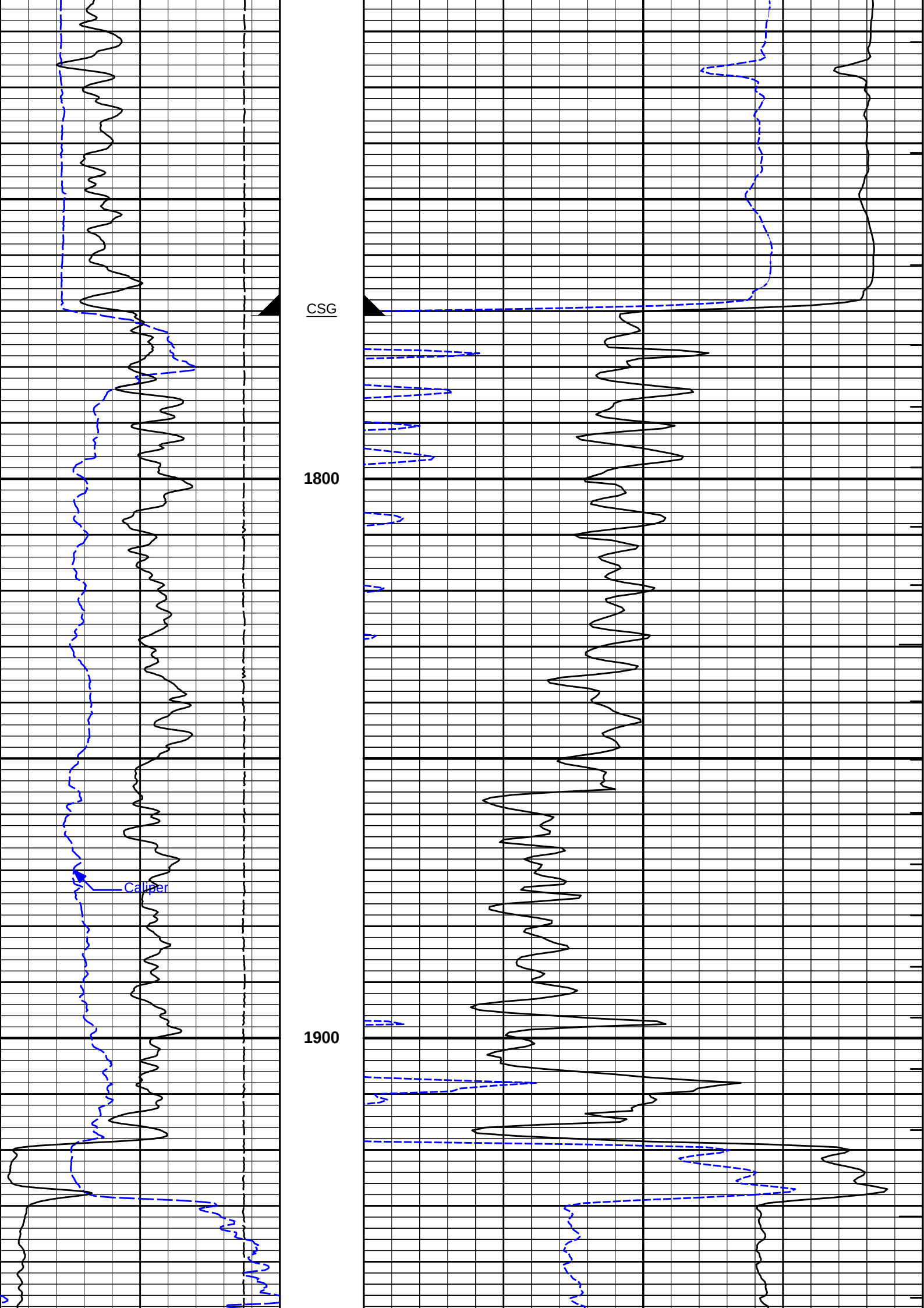
Plot Time: 17-Aug-19 12:38:26
Plot Range: 1700 ft to 5508.58 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-003\
Plot File: \\BSAT\BSAT_5inch

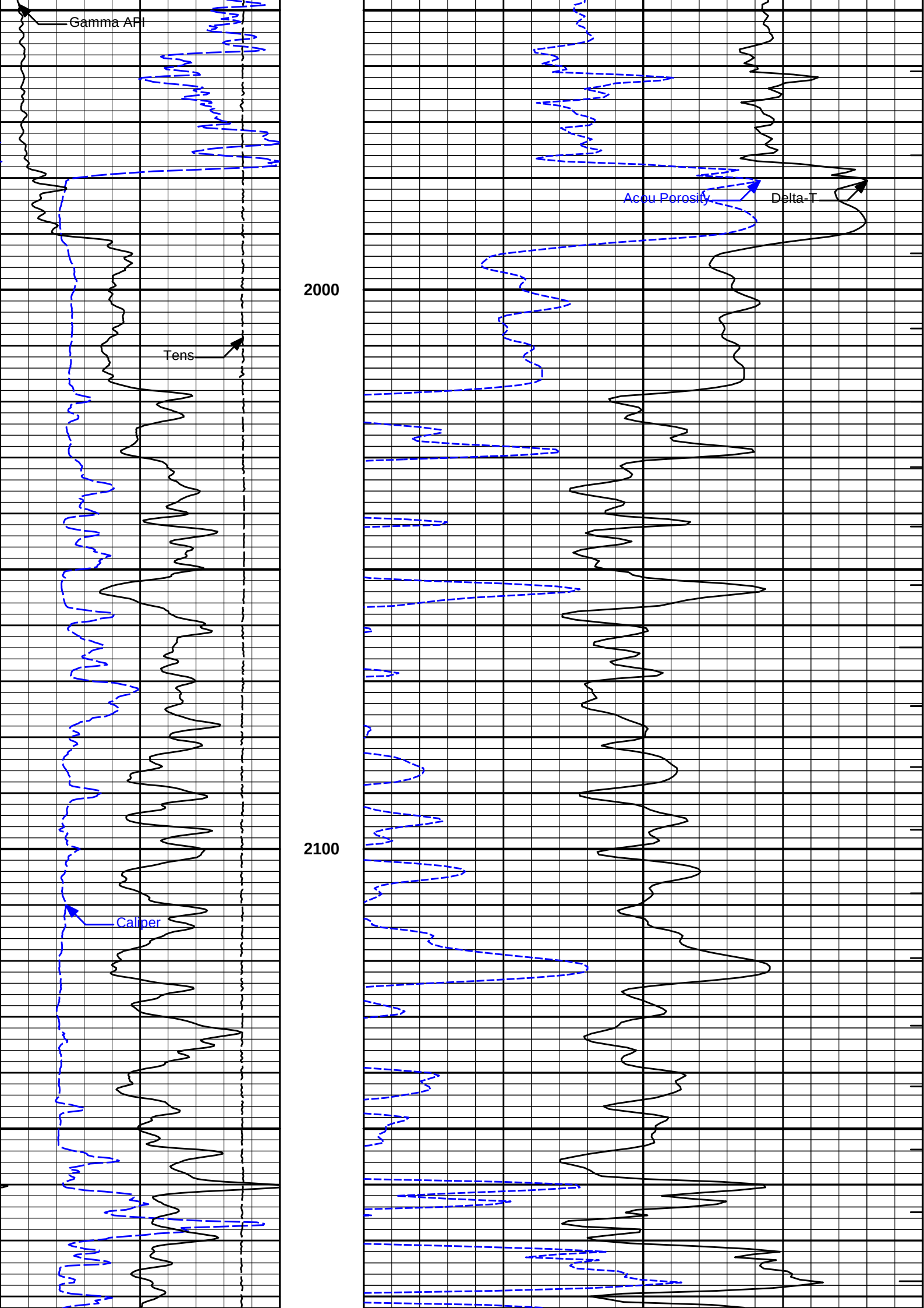
5 INCH MAIN LOG

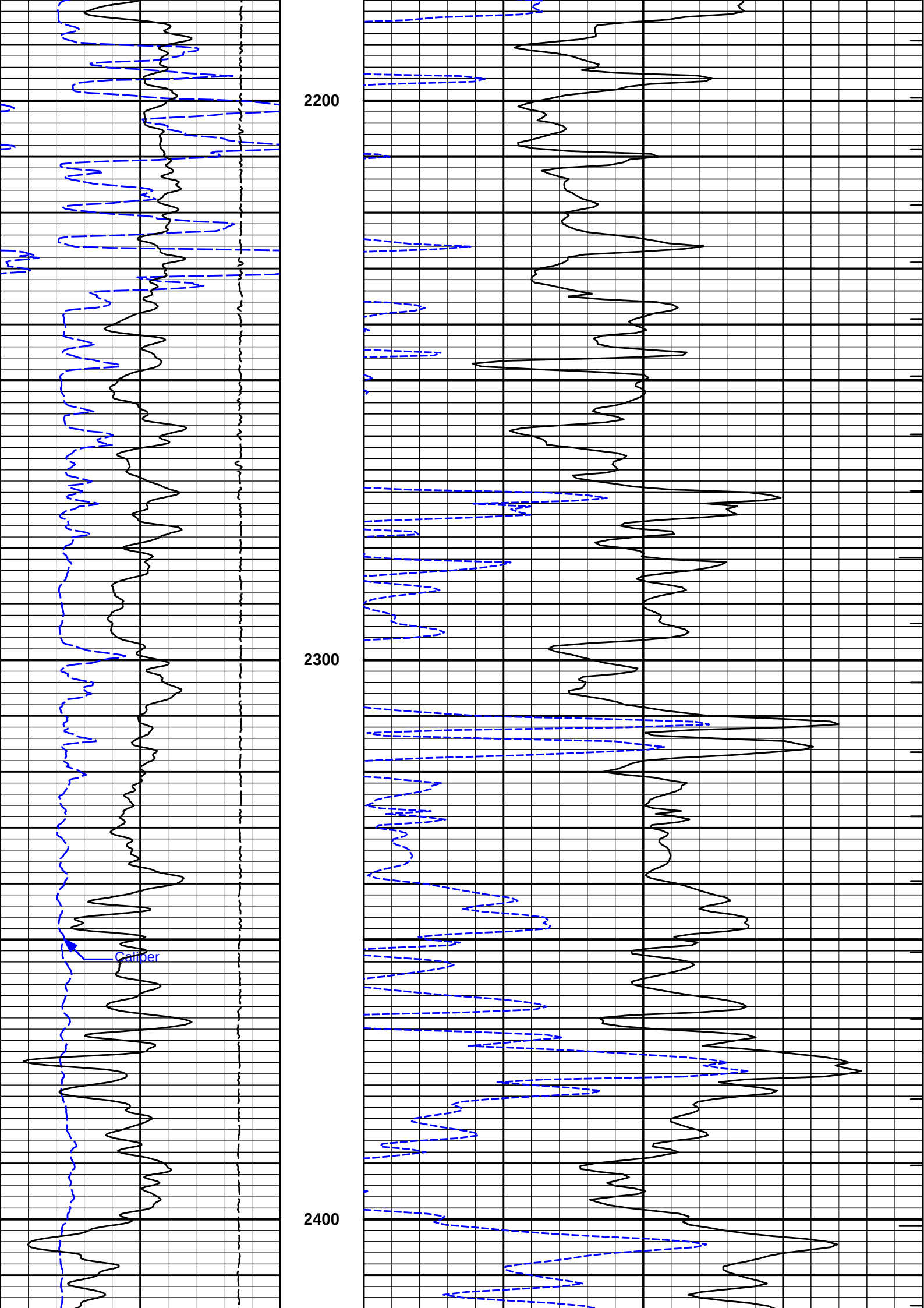
MAIN LOG SECTION

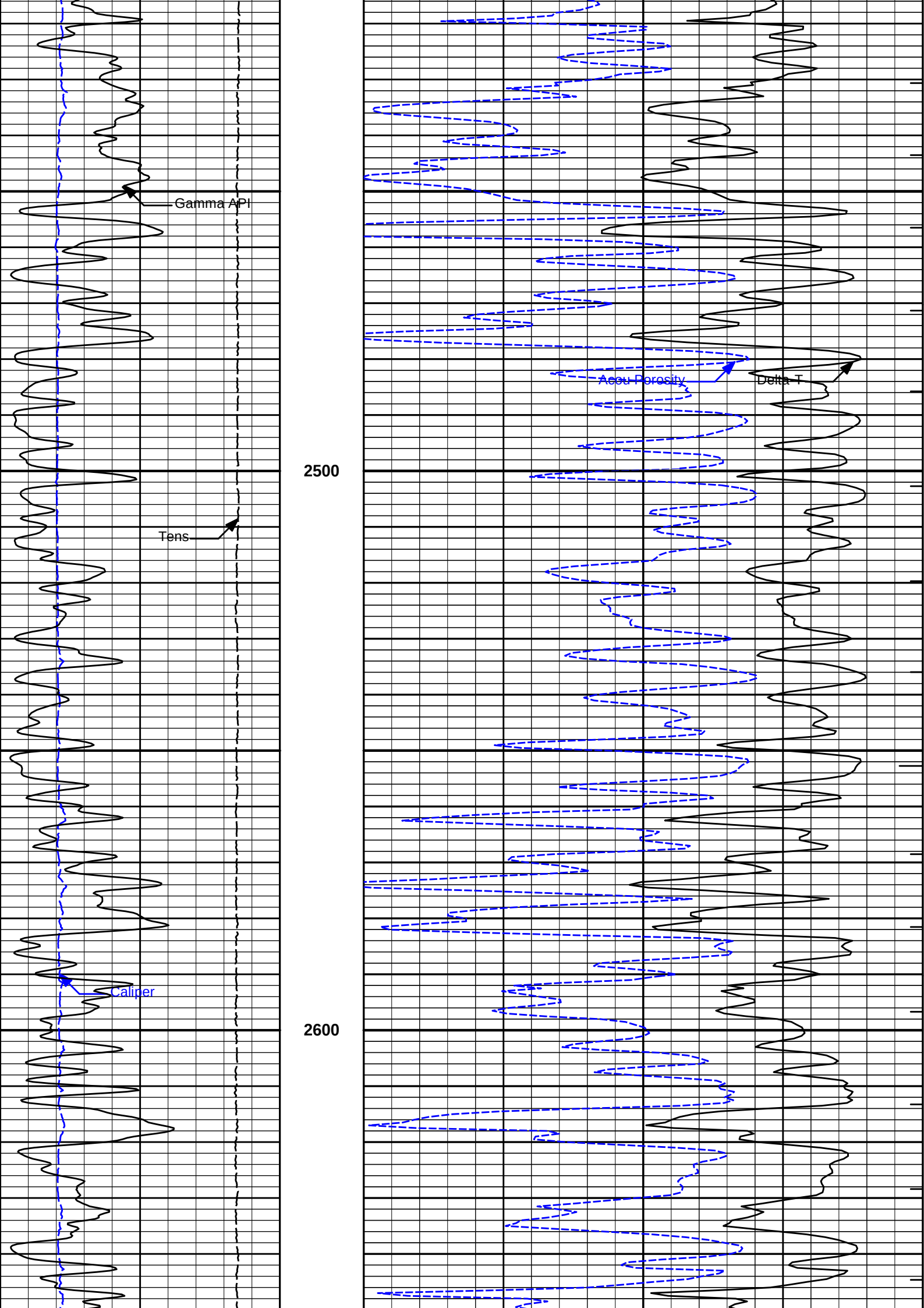
6 CALI 16 inches	1 : 240 ft	30 Acou Porosity -10 percent
15K Tens 0 pounds		140 Delta-T 40 microsec per ft
0 Gamma API 150 api		ITTT

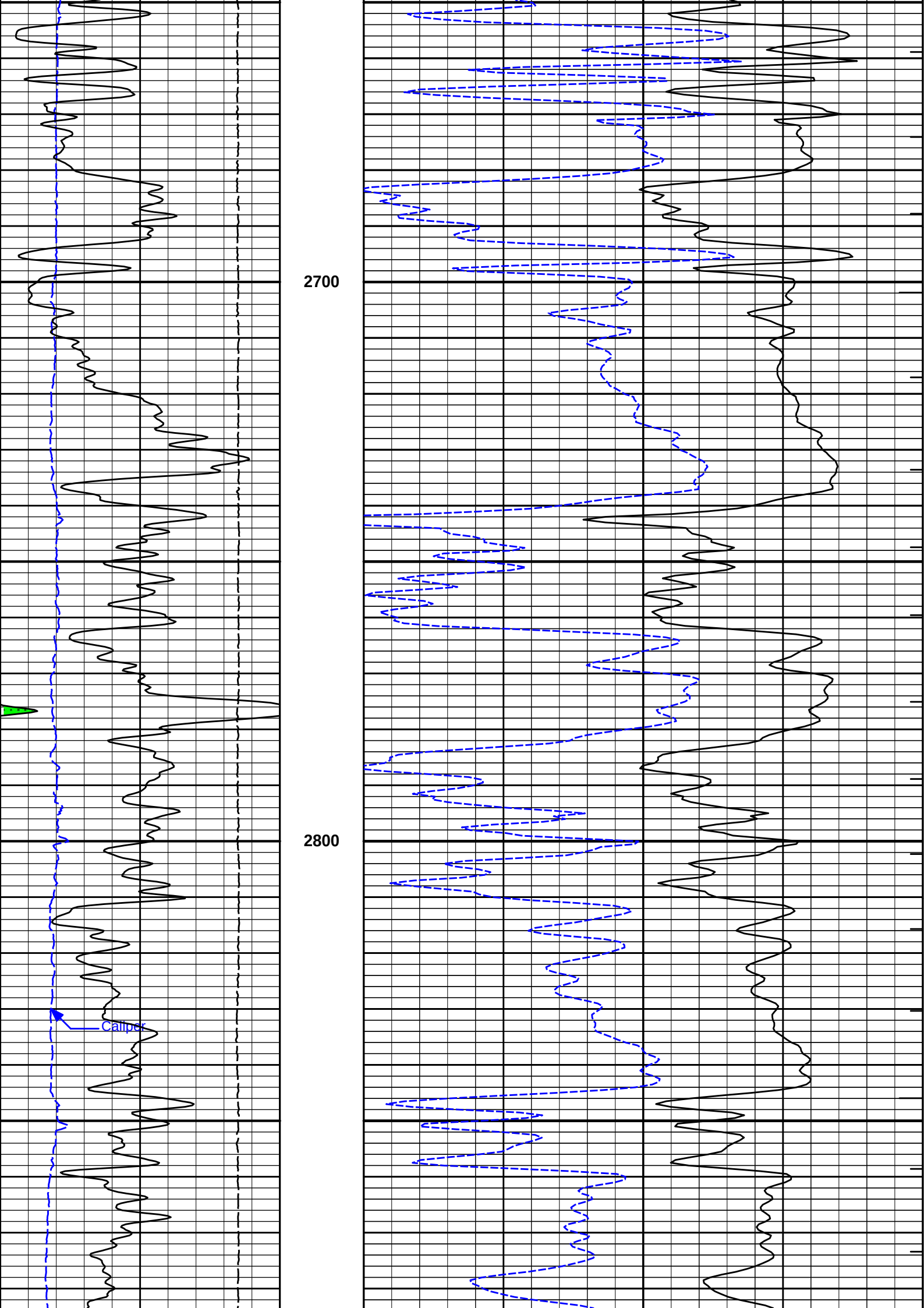


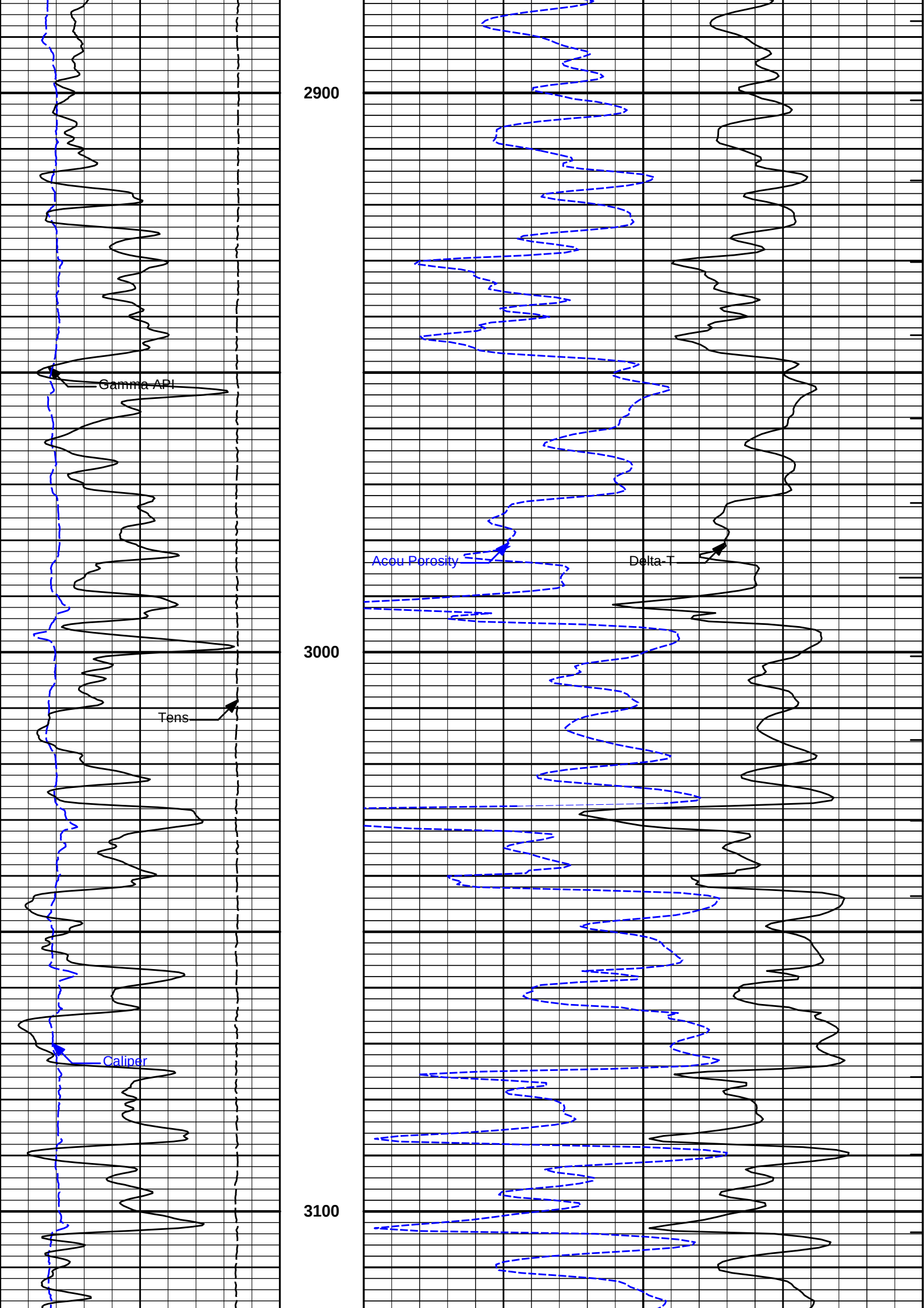

CSG
1800
Caliper
1900


Gamma API
Acou Porosity
Delta-T
2000
Tens
2100
Caliper


2200
2300
2400
Caliper


Gamma API
Tens
Caliper
Acou Porosity
Delta T
2500
2600


2700
2800
Caliper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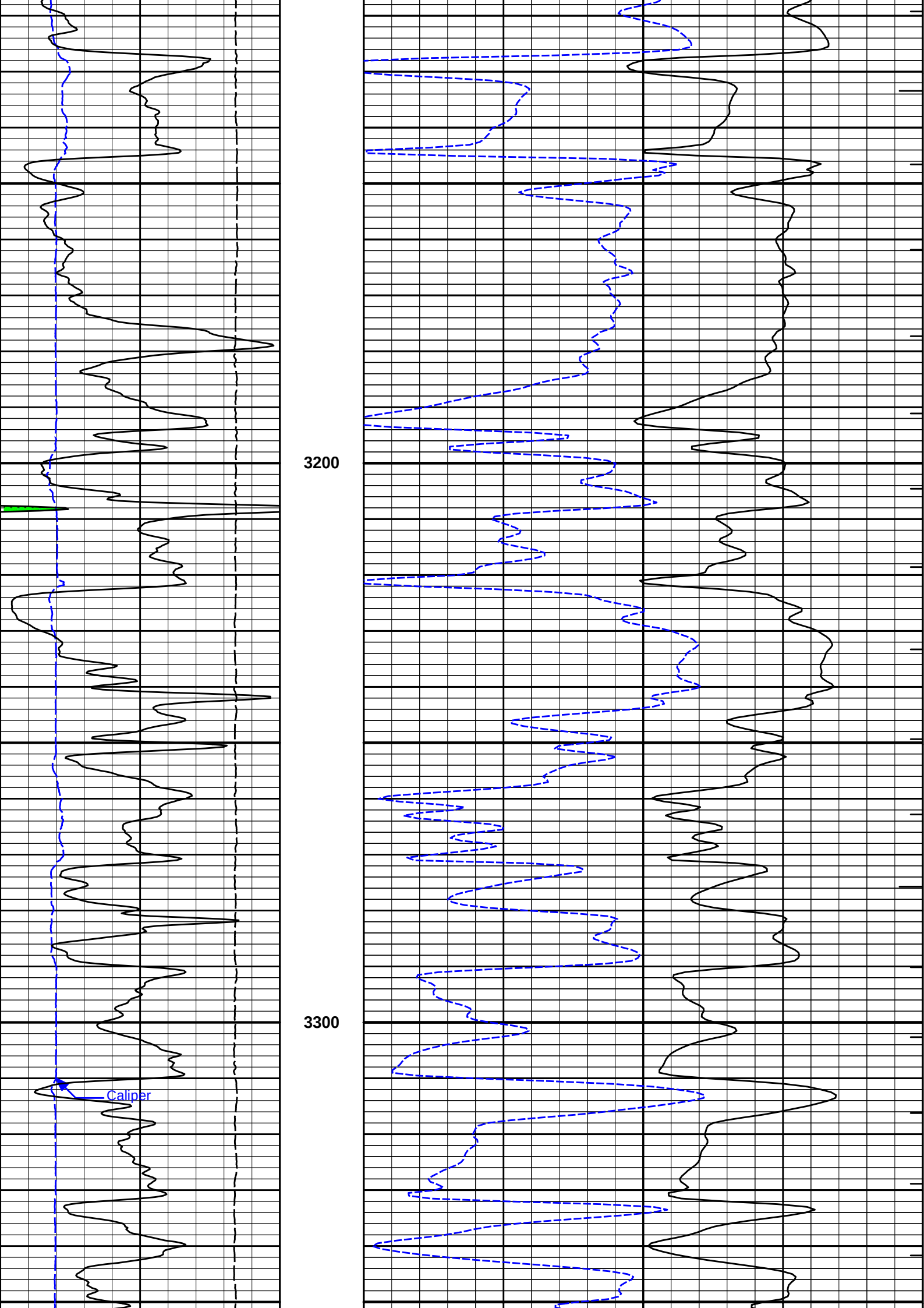
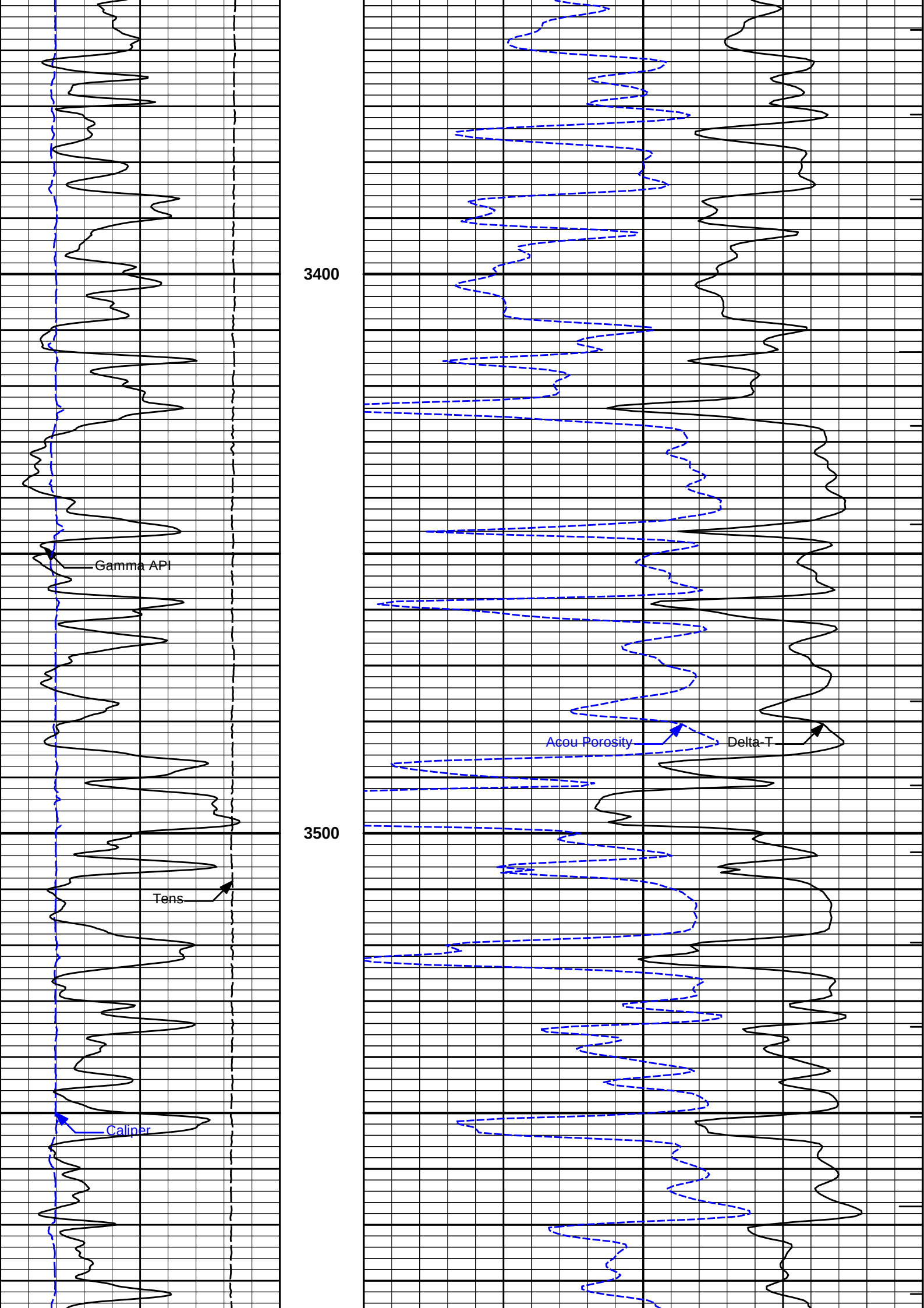
Gamma API
Acou Porosity
Delta-T
3000
Tens
Caliper
3100


3200
3300
Caliper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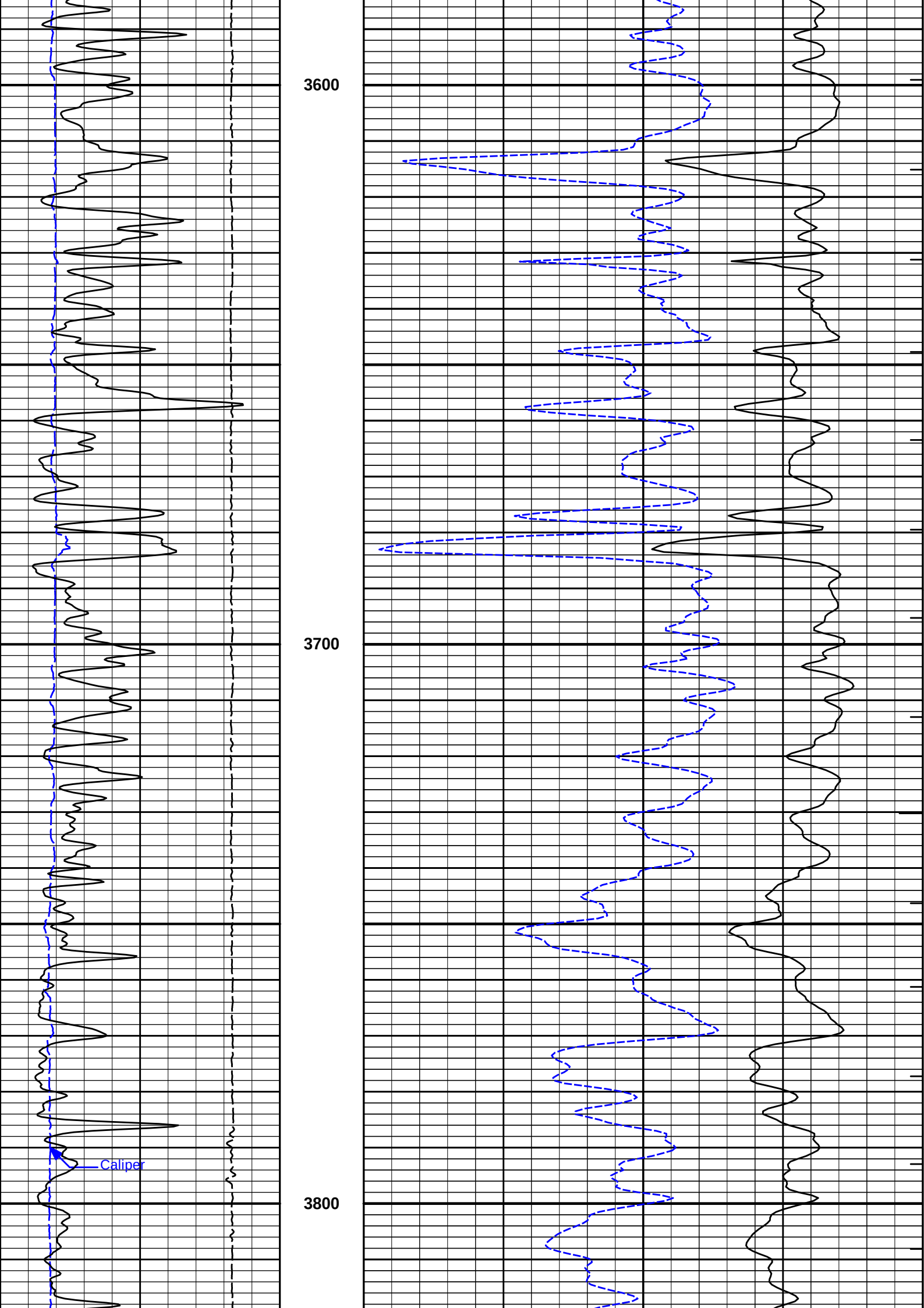
Gamma API
Acou Porosity
Delta-T
3500
Tens
Caliper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3700
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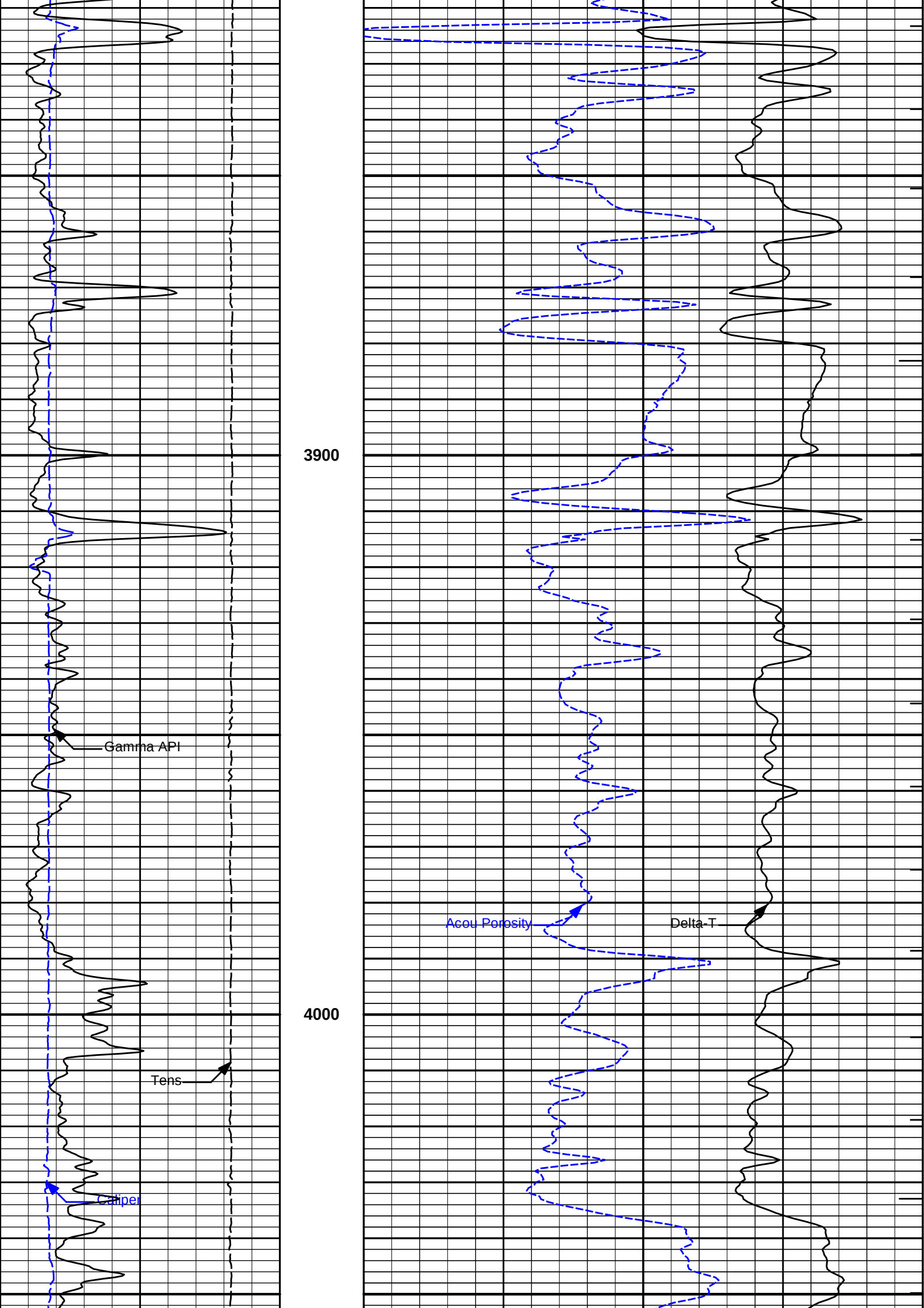
Caliper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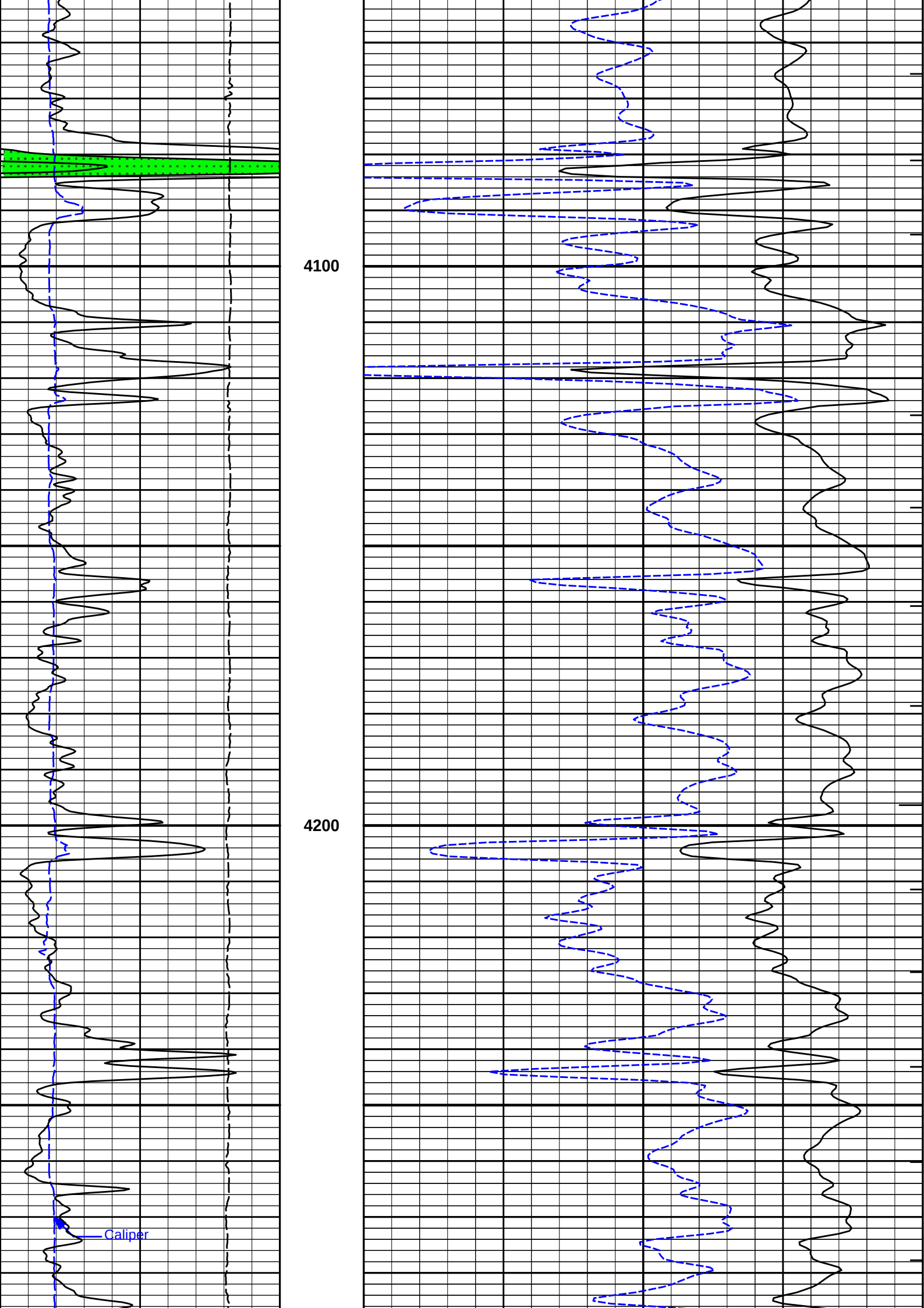
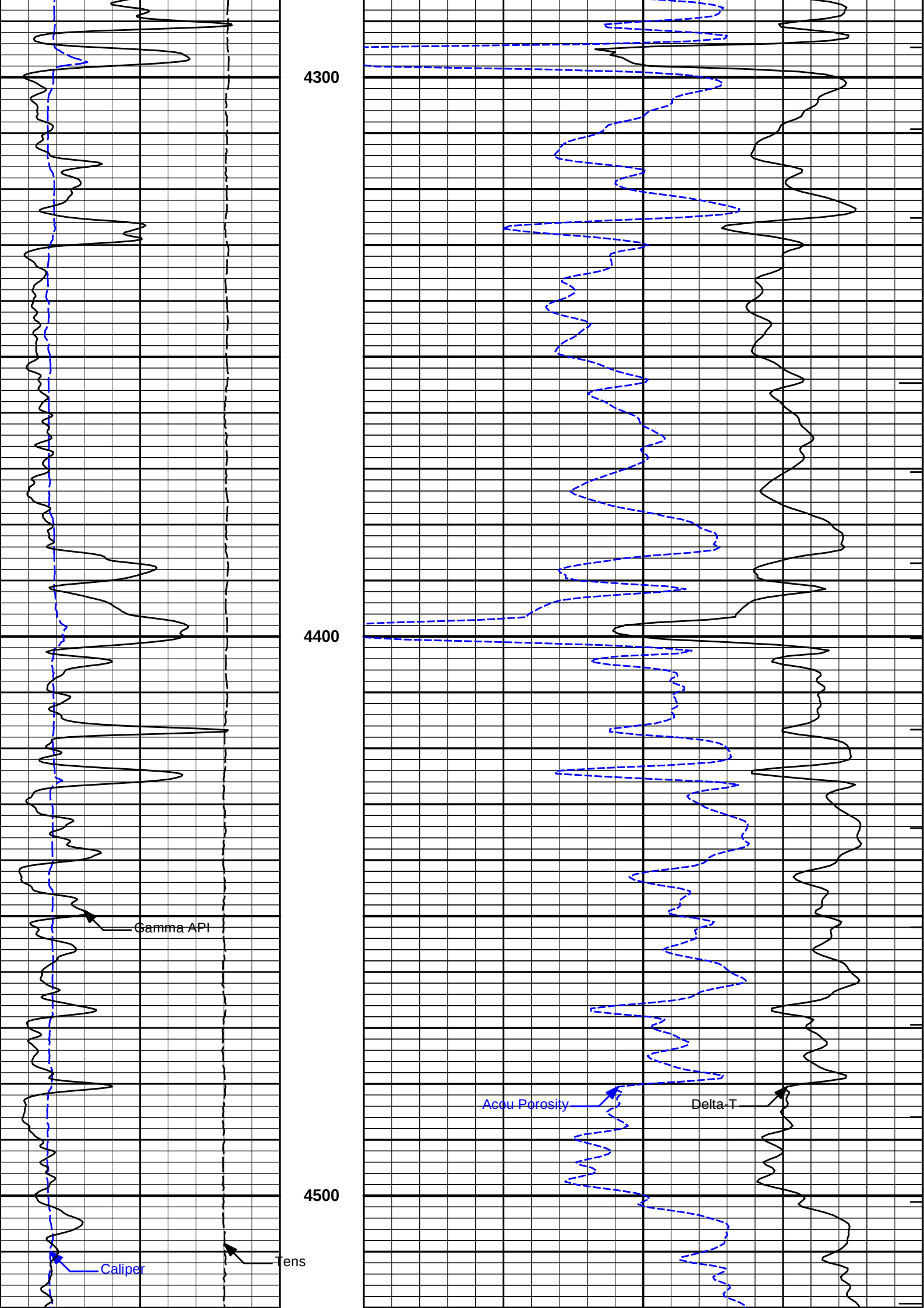
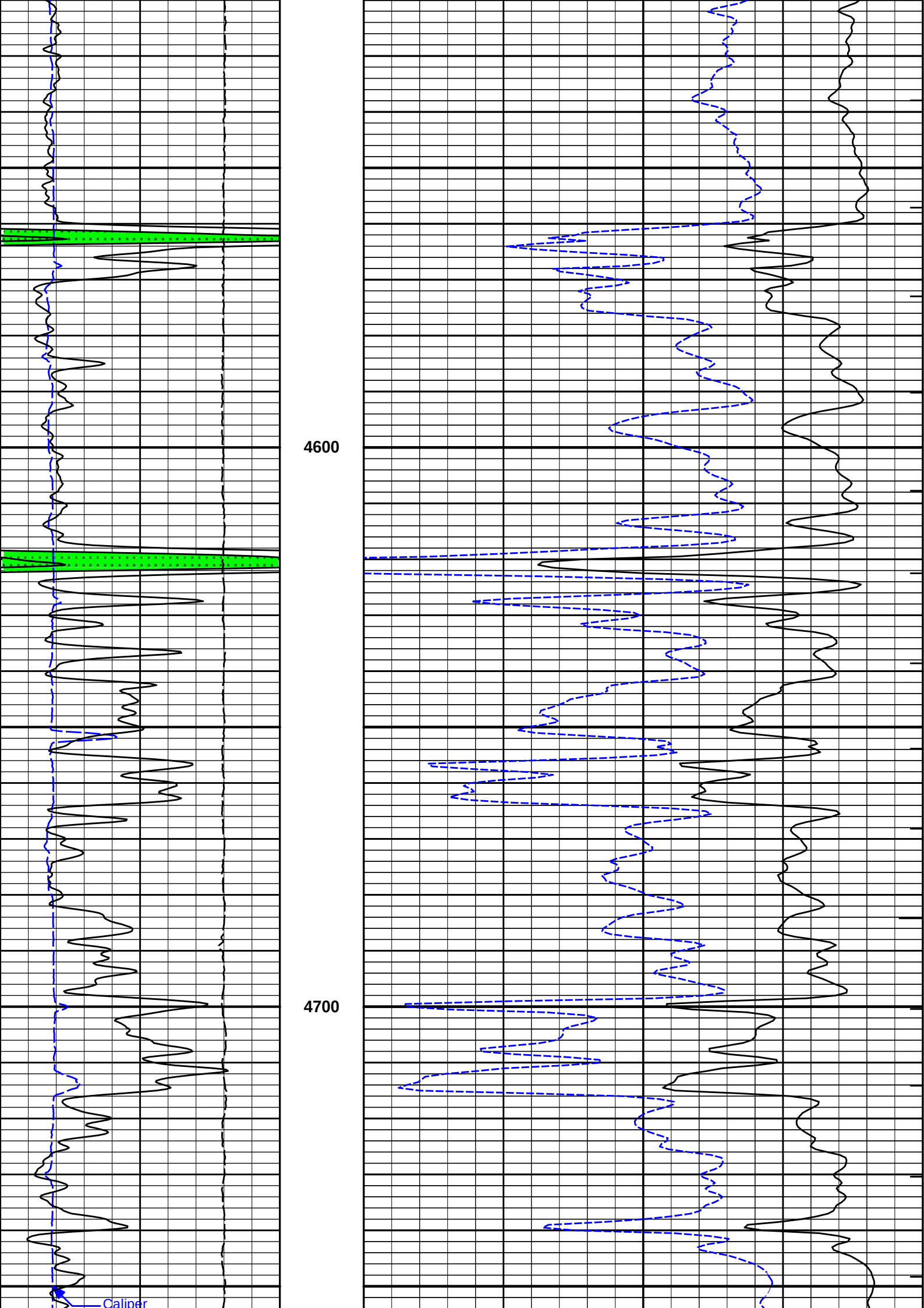
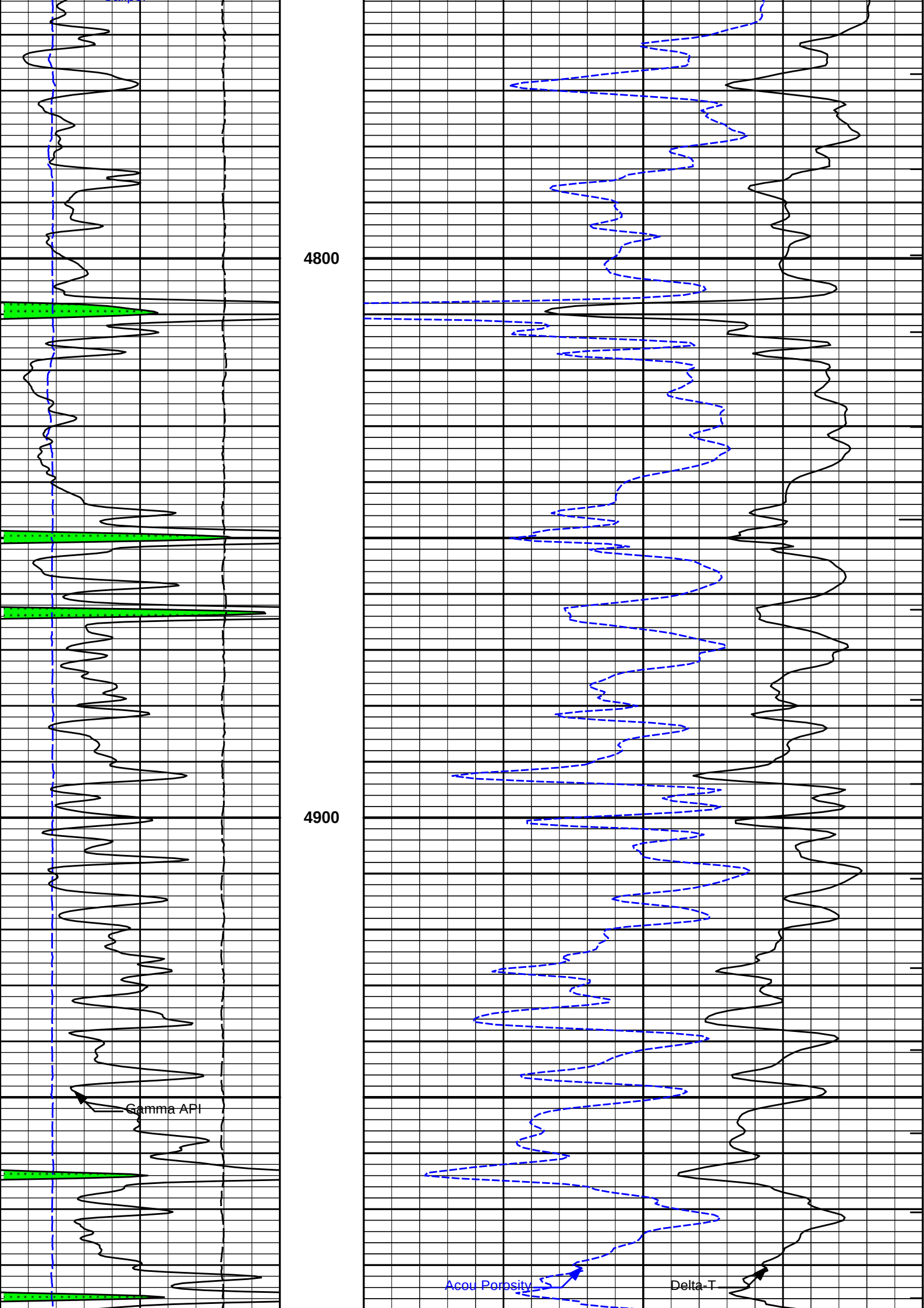
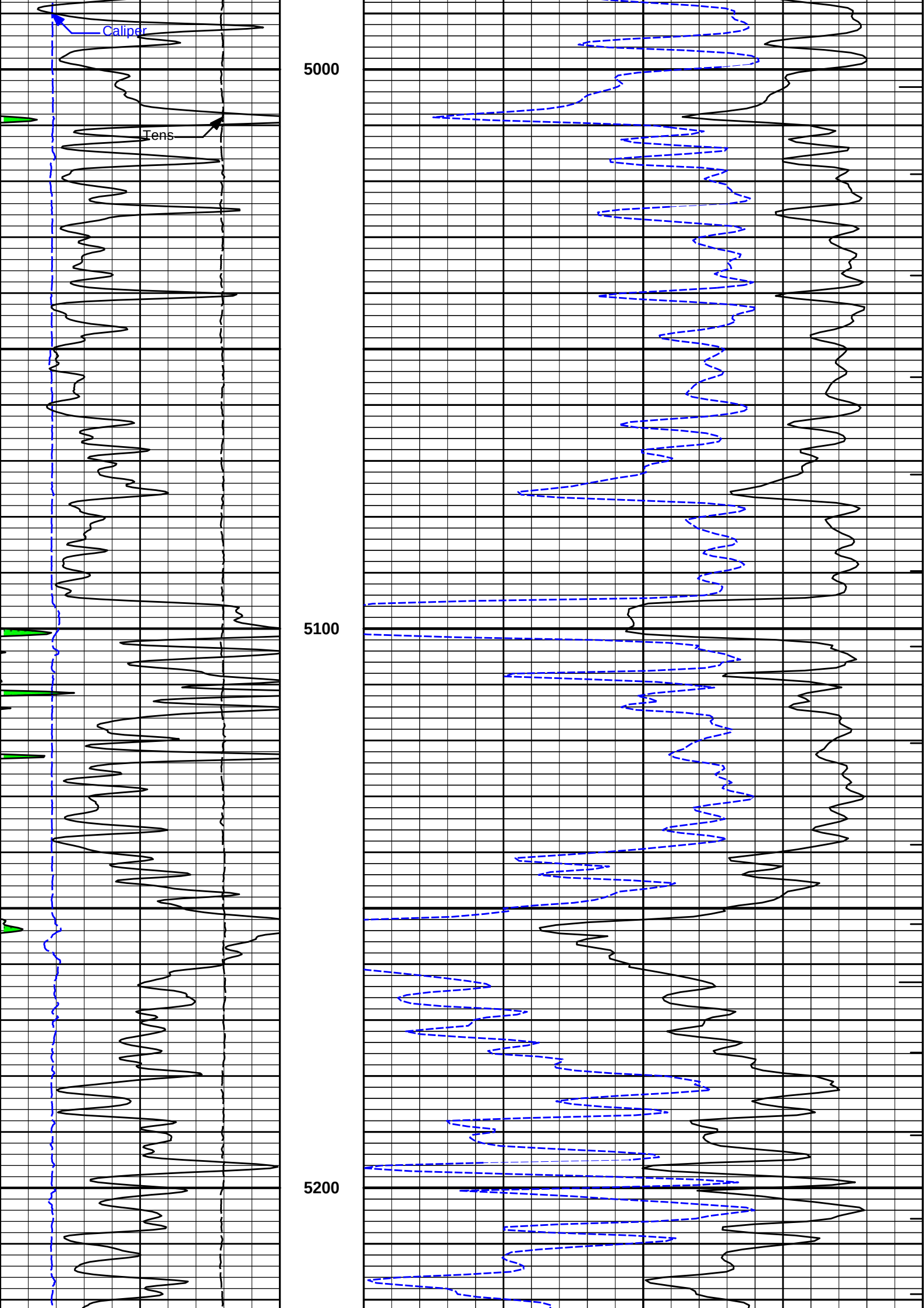
4000
Gamma API
Tens
Caliper
Acou Porosity
Delta-T

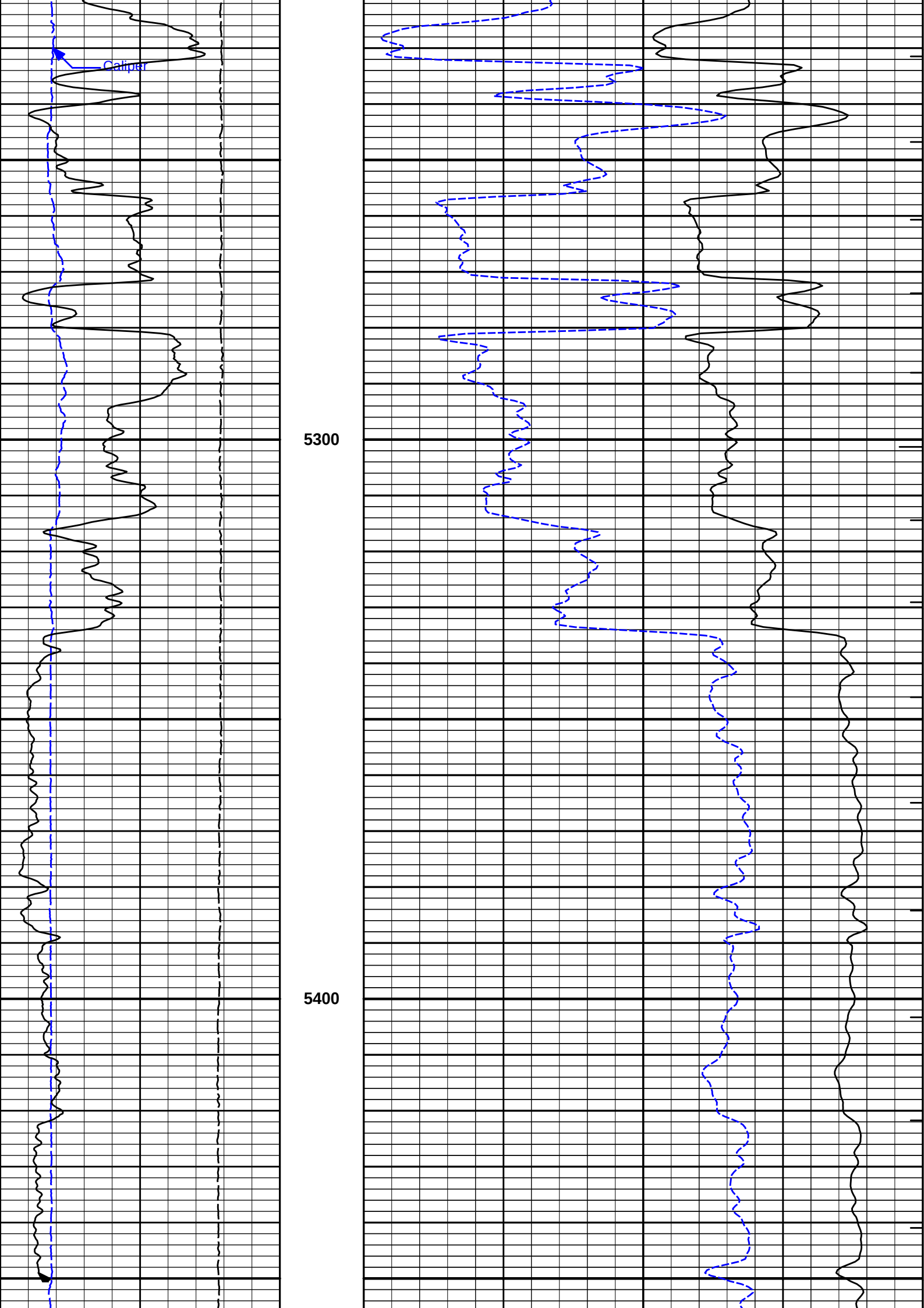

4100
4200
Caliper


4300
4400
4500
Gamma API
Caliper
Tens
Acou Porosity
Delta-T


4600
4700
Caliper


4800
4900
Gamma API
Acou Porosity
Delta-T


Caliper
Tens
5000
5100
5200


Caliper
5300
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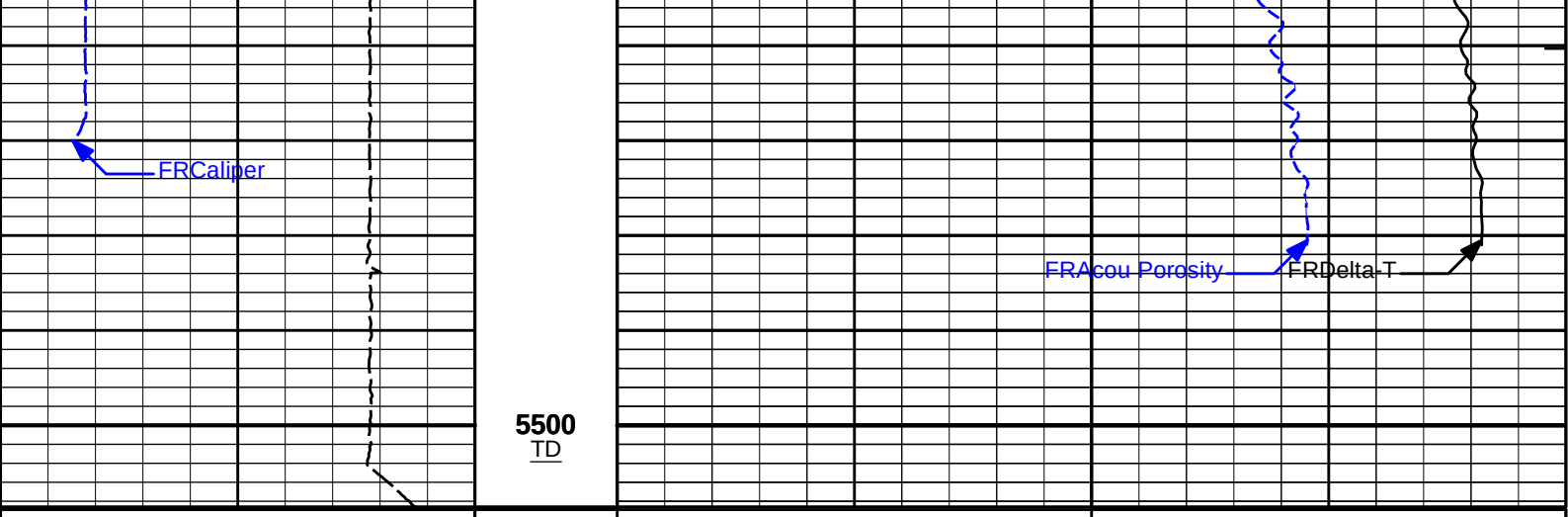


0 Gamma API 150 api	1 : 240 ft	ITTT
15K Tens 0 pounds		140 Delta-T 40 microsec per ft
6 CALI 16 inches		30 Acou Porosity -10 percent

HALLIBURTON

Plot Time: 17-Aug-19 12:38:29
Plot Range: 1700 ft to 5508.58 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-003\
Plot File: \\BSAT\BSAT_5inch

5 INCH MAIN LOG

MAIN LOG SECTION

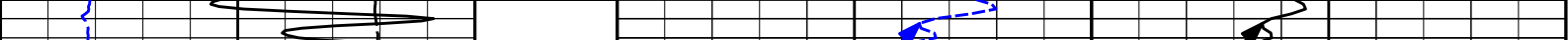
HALLIBURTON

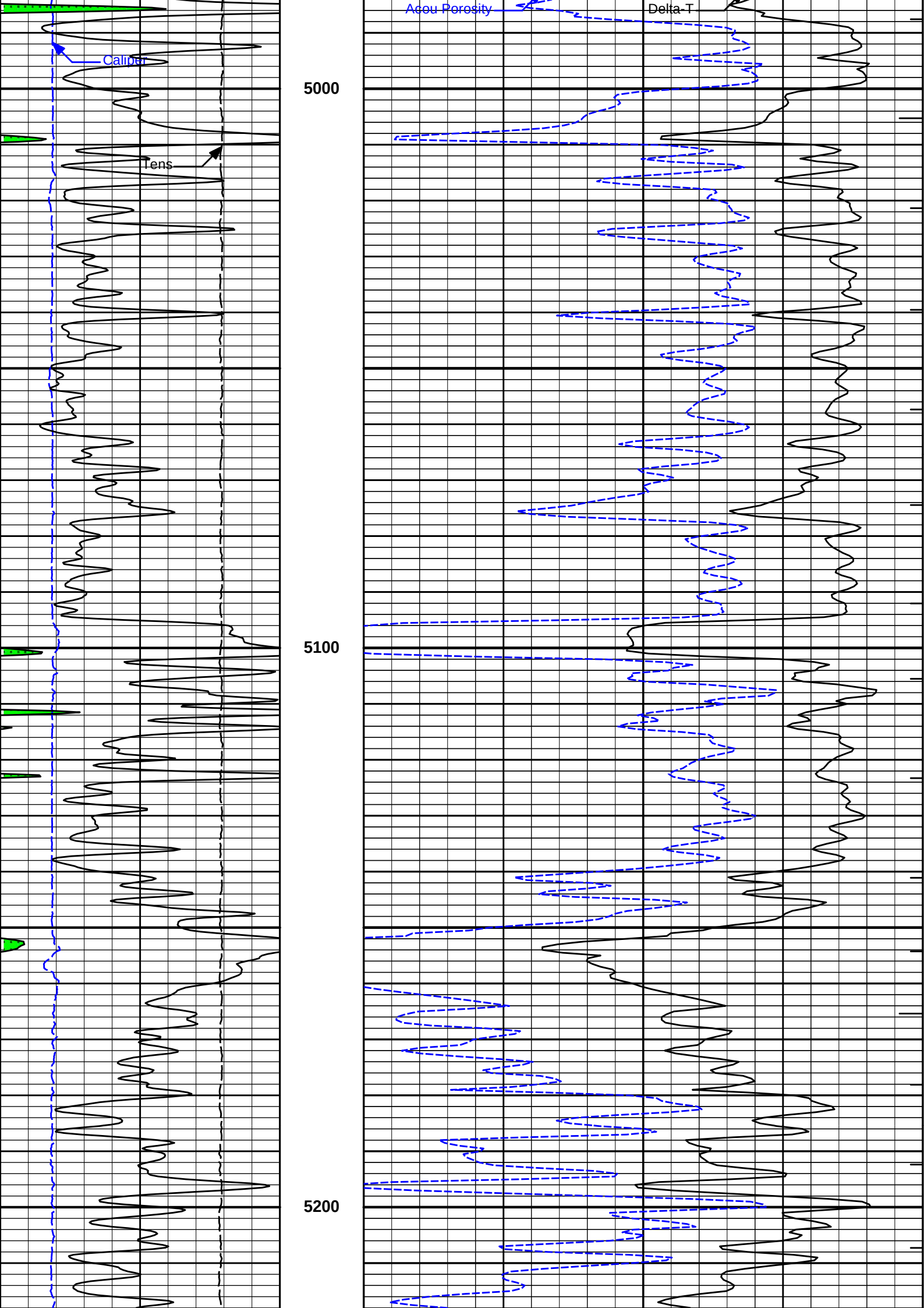
Plot Time: 17-Aug-19 12:38:29
Plot Range: 4980 ft to 5510.42 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-002\
Plot File: \\BSAT\BSAT_5inch

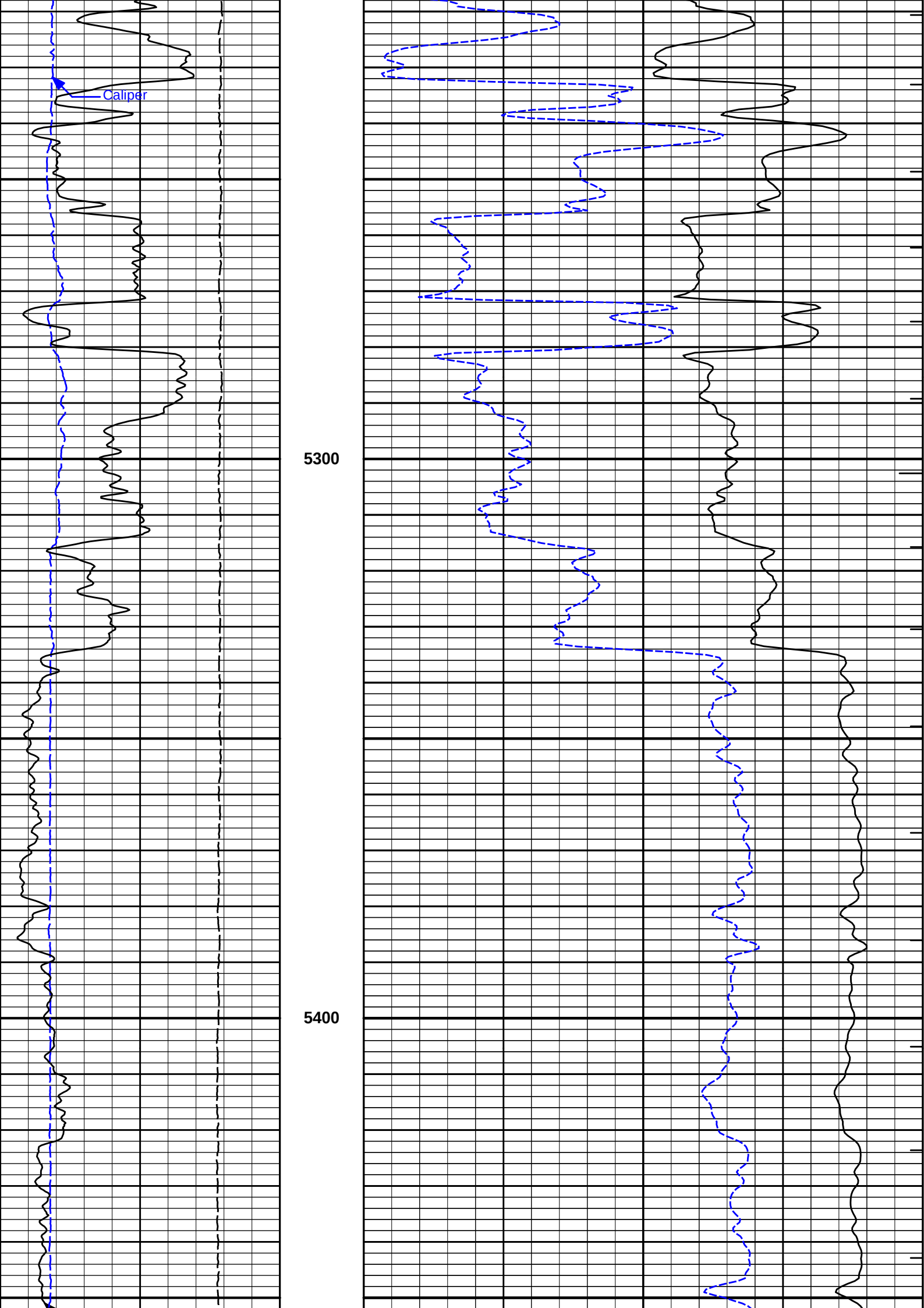
REPEAT SECTION

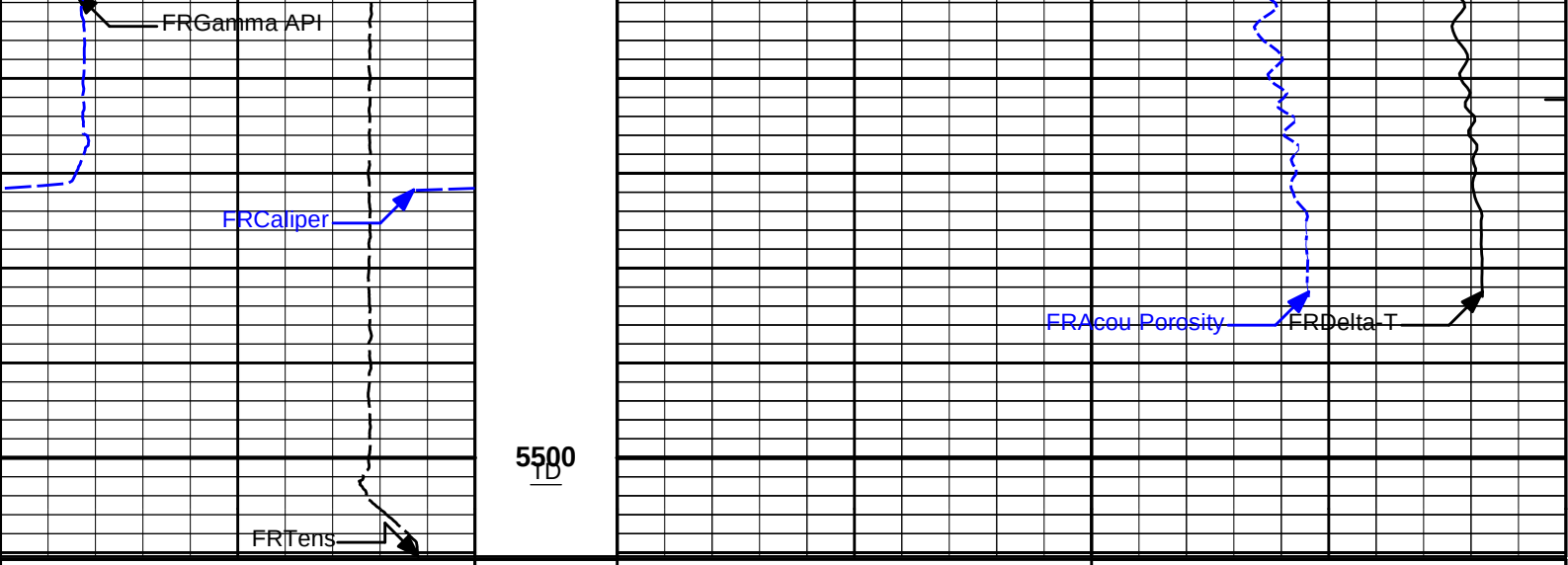
REPEAT SECTION

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




Caliper
Tens
Acou Porosity
Delta-T
5000
5100
5200


Caliper
5300
5400



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

HALLIBURTON

Plot Time: 17-Aug-19 12:38:31
Plot Range: 4980 ft to 5510.42 ft
Data: MERIT_EMMA_WARD\Well Based\DAQ-0001-002\
Plot File: \\BSAT\BSAT_5inch

REPEAT SECTION

REPEAT SECTION

HALLIBURTON

CALIBRATION REPORT

SURFACE TENSION SHOP CALIBRATION

Tool Name:	**Depth Panel - 00000032**	**Reference Calibration Date:**	**28-Jul-19 00:13:55**
Engineer:	**WOLTEMATH**	**Calibration Date:**	**11-Aug-19 11:46:33**
Software Version:	**WL INSITE R6.2.1 (Build 2)**	**Calibration Version:**	**1**

SURFACE TENSION LOAD CELL

Measurement	Load Cell Value	Measurement	Calibrated	Units
Low	10092.65	101.47	0.00	lbs
High	17292.40	7827.14	7830.00	lbs

DOWNHOLE TENSION SHOP CALIBRATION

Tool Name:	**RWCH - 11830866**	**Reference Calibration Date:**	**13-Aug-19 15:10:06**
Engineer:	**WHITLOCK**	**Calibration Date:**	**16-Aug-19 21:04:45**
Software Version:	**WL INSITE R6.2.1 (Build 2)**	**Calibration Version:**	**1**

DOWNHOLE LOAD CELL

Measurement	Tool Value	Measurement	Calibrated	Units

Low	-580.34	-18.90	0.00	lbs
High	4275.88	612.00	1220.00	lbs

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name: GTET - 11021139 **Reference Calibration Date:** 14-May-19 09:57:38

Engineer: WHITLOCK **Calibration Date:** 29-Jun-19 15:22:45

Software Version: WL INSITE R6.2.1 (Build 2) **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	21.7	21.5	api
Background + Calibrator	249.2	247.4	api
Calibrator	227.5	225.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name: GTET - 11021139 **Reference Calibration Date:** 29-Jun-19 15:22:45

Engineer: WHITLOCK **Calibration Date:** 03-Aug-19 10:00:11

Software Version: WL INSITE R6.2.1 (Build 2) **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	21.5	22.6	api
Background + Calibrator	247.4	248.8	api
Calibrator	225.9	226.2	api

Shop	Field	Difference	Tolerance
225.9	226.2	-0.3	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 11660709 **Reference Calibration Date:** 14-Feb-19 11:05:14

Engineer: WHITLOCK **Calibration Date:** 14-May-19 11:28:42

Software Version: WL INSITE R6.2.1 (Build 2) **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: 74 degF

Min. Tool Housing Outside Diameter: 3.625 in

CALIBRATION CONSTANTS			
Measurement	**Prev. Value**	**New Value**	**Control Limit On New Value**
Gain:	1.01152	1.00941	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):	0.2364	0.2358	0.0007	+/- 0.0020
Calibrated Ratio:	10.5816	10.5596	0.022	+/- 0.050

VERIFIER		
Measurement	**Value**	**Control Limit**
Snow-Block Porosity (decp):	0.0724	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:**	**14-May-19 11:28:42**
Engineer:	**WHITLOCK**	**Calibration Date:**	**03-Aug-19 10:16:16**
Software Version:	**WL INSITE R6.2.1 (Build 2)**	**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):	0.0724	0.0623	-0.0102	+/- 0.0150

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name:	**SDLT - 12153526**	**Reference Calibration Date:**	**01-Jan-70 00:00:00**
Engineer:	**WOLTEMATH**	**Calibration Date:**	**08-Jul-19 10:59:56**
Software Version:	**WL INSITE R6.2.1 (Build 2)**	**Calibration Version:**	**1**
Host Tool Name:	**DSNT - 11660709**		

CALIBRATION COEFFICIENTS			
Measurement	**Previous Value**	**New Value**	**Control Limit On New Value**
Pad Offset	-3224.77	-3224.77	-7000.00 - -1000.00
Pad Gain	0.0003783	0.0003783	0.0002000 - 0.0006000
Arm Offset	-2193.01	-2193.01	-5000.00 - 3000.00
Arm Gain	0.0005237	0.0005237	0.000300 - 0.000700
Arm Power	-0.000005118	-0.000005118	-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 - 12153526**	**Reference Calibration Date:**	**08-Jul-19 10:59:56**
Engineer:	**WOLTEMATH**	**Calibration Date:**	**08-Jul-19 11:01:50**

Software Version: WL INSITE R6.2.1 (Build 2) **Calibration Version:** 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.76	0.01	+/- 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:** 30-May-19 10:30:10

Engineer: WHITLOCK **Calibration Date:** 30-May-19 16:04:26

Software Version: WL INSITE R6.2.1 (Build 2) **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	1.0436	1.05	0.95	1.0233	1.05	0.95	1.0105	1.05
A2 (50")	0.95	1.0425	1.05	0.95	1.0248	1.05	0.95	1.0169	1.05
A3 (29")	0.95	1.0370	1.05	0.95	1.0178	1.05	0.95	1.0085	1.05
A4 (17")	0.95	1.0325	1.05	0.95	1.0108	1.05	0.95	1.0026	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.0032	1.05	0.95	0.9929	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9937	1.05	0.95	0.9859	1.05

SONDE OFFSET

Subarray	R12KHz	R36KHz	R72KHz
	(mmho/m)	(mmho/m)	(mmho/m)
A1 (80")	1.105	-4.185	-6.175
A2 (50")	-2.031	-4.364	-5.644
A3 (29")	-15.630	-4.663	-3.991
A4 (17")	-113.327	-34.718	-27.228
A5 (10")	N/A	-86.739	-42.245
A6 (6")	N/A	334.526	172.566

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.93	1.3
36K	1.0	1.39	2.0
72K	1.0	1.66	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	1.00	1.05

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET CHK	PASS

TOOL OK TO LOG

TOOL OK TO LOG

QUALITY CHECK SHOP CALIBRATION

Tool Name:	**ACRt Sonde - 11038385**	**Reference Calibration Date:**	**27-Mar-19 10:28:27**
Engineer:	**WHITLOCK**	**Calibration Date:**	**30-May-19 10:32:26**
Software Version:	**WL INSITE R6.2.1 (Build 2)**	**Calibration Version:**	**1**
Host Tool Name:	**ACRt Instrument - 11055059**		

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	-0.006	> -0.500	Pass
A3 (29")	-0.000	< 0.500	Pass	-0.001	> -0.500	Pass	-0.004	> -0.500	Pass
A4 (17")	-0.003	> -0.500	Pass	-0.008	> -0.500	Pass	-0.028	> -0.500	Pass
A5 (10")	-0.012	> -0.500	Pass	-0.020	> -0.500	Pass	-0.043	> -0.500	Pass
A6 (6")	0.015	< 0.500	Pass	0.074	< 0.500	Pass	0.160	< 0.500	Pass

GAIN TOLERANCE

R12KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-222464160.000	-219334160.000	3130000.000	10966708.000	Pass
A2 (50")	-218296048.000	-217147632.000	1148416.000	10857381.600	Pass
A3 (29")	-215615984.000	-213416928.000	2199056.000	10670846.400	Pass
A4 (17")	-212439408.000	-210205136.000	2234272.000	10510256.800	Pass
A5 (10")	-213281584.000	-210744480.000	2537104.000	10537224.000	Pass
A6 (6")	-213757744.000	-212744384.000	1013360.000	10637219.200	Pass

R36KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	58226652.000	59308716.000	1082064.000	2965435.800	Pass
A2 (50")	59078976.000	60516680.000	1437704.000	3025834.000	Pass
A3 (29")	50762576.000	52467084.000	1704508.000	2623354.200	Pass
A4 (17")	47774380.000	48963324.000	1188944.000	2448166.200	Pass
A5 (10")	49758800.000	51107628.000	1348828.000	2555381.400	Pass
A6 (6")	48666176.000	49936832.000	1270656.000	2496841.600	Pass

R72KHz

	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-92092456.000	-91475104.000	617352.000	4573755.200	Pass
A2 (50")	-88448376.000	-88531624.000	83248.000	4426581.200	Pass
A3 (29")	-88454672.000	-88284496.000	170176.000	4414224.800	Pass
A4 (17")	-83513648.000	-83029816.000	483832.000	4151490.800	Pass
A5 (10")	-82220840.000	-81717560.000	503280.000	4085878.000	Pass

A6 (6")	-83857920.000	-83900568.000	42648.000	4195028.400	Pass

PASS/FAIL SUMMARY	
Std Deviation Verification	Pass
Average Verification	Pass
Gain Tolerance Verification	Pass

MICRO LOG SHOP CALIBRATION

Tool Name: Microlog Pad - 12153526
Reference Calibration Date: 29-Jul-19 12:21:32
Engineer: WHITLOCK
Calibration Date: 03-Aug-19 10:05:03
Software Version: WL INSITE R6.2.1 (Build 2)
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	-0.15	-0.15	-0.01	-0.01	ohmm
Calibration Point #1	0.00	0.00	-0.00	0.00	ohmm
Calibration Point #2	20.01	20.00	19.97	20.00	ohmm
Internal Reference	19.86	19.86	19.97	20.00	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-0.05	0.24	V
Calibration Point #1	39.39	2.10	V
Calibration Point #2	5334.68	6957.33	V
Internal Reference	5296.44	6958.07	V

MICRO LOG FIELD CHECK

Tool Name: Microlog Pad - 12153526
Reference Calibration Date: 03-Aug-19 10:05:03
Engineer: WHITLOCK
Calibration Date: 03-Aug-19 10:05:58
Software Version: WL INSITE R6.2.1 (Build 2)
Calibration Version: 1

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.15	-0.16	-0.01	-0.01	ohmm
Internal Reference	19.86	19.86	20.00	20.00	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.86	19.86	0.00	+/- 0.80
Microlog Lateral	20.00	20.00	0.00	+/- 0.80

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 11284007
Reference Calibration Date: 14-May-19 10:35:42
Engineer: WHITLOCK
Calibration Date: 14-May-19 11:01:04
Software Version: WL INSITE R6.2.1 (Build 2)
Calibration Version: 1

Logging Source S/N: 5475GW
Aluminum Block S/N: EL RENO AL BLK — Density: 2.581g/cc — Pe: 3.170
Magnesium Block S/N: EL RENO MG BLK — Density: 1.687g/cc — Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0672	1.0696	0.90 - 1.10
Near Dens Gain	1.0399	1.0253	0.90 - 1.10
Near Peak Gain	1.0698	1.0607	0.90 - 1.10

Near Lith Gain	1.0707	1.0600	0.90 - 1.10
Far Bar Gain	1.0119	1.0132	0.90 - 1.10
Far Dens Gain	1.0014	1.0004	0.90 - 1.10
Far Peak Gain	0.9998	0.9988	0.90 - 1.10
Far Lith Gain	0.9842	0.9832	0.90 - 1.10
Near Bar Offset	-0.4646	-0.4868	NONE
Near Dens Offset	-0.1638	-0.0376	NONE
Near Peak Offset	-0.4118	-0.3374	NONE
Near Lith Offset	-0.4691	-0.3841	NONE
Far Bar Offset	-0.0627	-0.0742	NONE
Far Dens Offset	0.0569	0.0650	NONE
Far Peak Offset	0.0511	0.0583	NONE
Far Lith Offset	0.1514	0.1583	NONE
Near Bar Background	993.88	993.91	700 - 1450
Near Dens Background	329.23	327.28	230 - 480
Near Peak Background	147.25	146.97	100 - 210
Near Lith Background	178.05	176.81	125 - 260
Far Bar Background	582.67	585.21	450 - 900
Far Dens Background	227.13	227.13	175 - 345
Far Peak Background	91.02	90.90	70 - 140
Far Lith Background	94.76	94.27	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.688	1.687	-0.001	+/- 0.015
Pe	2.523	2.556	0.033	+/- 0.150
ALUMINUM				
Density (g/cc)	2.580	2.581	0.001	+/- 0.01500
Pe	3.116	3.129	0.013	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0004	+/- 0.0110	-0.0020	+/- 0.0140
Magnesium Block	0.0005	+/- 0.0110	0.0007	+/- 0.0140
Aluminum Block	0.0003	+/- 0.0110	0.0001	+/- 0.0140
Resolution	8.86	6.00 - 11.50	9.16	6.00 - 11.50
Internal Verifier(B+D+P+L)	1645	1200 - 2700	998	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 - 11284007 **Reference Calibration Date:** 14-May-19 11:01:04

Engineer: WHITLOCK **Calibration Date:** 03-Aug-19 10:00:22

Software Version: WL INSITE R6.2.1 (Build 2) **Calibration Version:** 1

Pad Temperature: 85.8 degF

DENSITY FIELD CALIBRATION SUMMARY

Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1644.977	1639.111	-5.866	16.295
Far (B+D+P+L) cps	997.505	993.961	-3.544	16.911
Near Resolution	8.86	8.87	0.010	0.50
Far Resolution	9.16	9.12	-0.040	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-00000032						
Tension Zero	0.00	----------	----------	0.00	----------	lbs
Tension Cal	7830.00	----------	----------	0.00	----------	lbs
RWCH-11830866						
DH Tension Zero	0.00	----------	----------	0.00	----------	lbs
DH Tension Cal	1220.00	----------	----------	0.00	----------	lbs
GTET-11021139						
Gamma Ray Calibrator	225.9	226.2	----------	-0.3	+/- 9.00	api
DSNT-11660709						
Snow-Block Porosity	0.0724	0.0623	----------	0.0101	+/- 0.0150	decp
SDLT-12153526						
Pad Extension	3.75	3.76	----------	-0.01	+/-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-12153526						
MicroLog Normal	19.86	19.86	----------	0.00	+/-0.80	ohmm
MicroLog Lateral	20.00	20.00	----------	0.00	+/-0.80	ohmm
SDLT Pad-11284007						
Near(B+D+P+L)	1644.977	1639.111	----------	5.866	+/-16.295	cps
Far(B+D+P+L)	997.505	993.961	----------	3.544	+/-16.911	cps

Data: MERIT_EMMA_WARD\0001 GTET-DSN-SDL-BSAT-ACRT\IDLE **Date: 17-Aug-19 08:46:54**

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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	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	CSTR	Compressive Strength	1000.00	psia
SHARED	ST	Surface Temperature	75.0	degF
SHARED	TD	Total Well Depth	5529.00	ft
SHARED	BHT	Bottom Hole Temperature	135.0	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	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	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	SDLT	
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	DNTT	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	
DSNT	UCLA	Classic Neutron Parameter utilized?	No	
DSNT	BHSM	Borehole Size Source Tool	SDLT	
SDLT	CLOK	Process Caliper Outputs?	Yes	
Microlog Pad	MLOK	Process MicroLog 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
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
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 Pore Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.6	
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 Upr	
	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	RMAX	Maximum Resistivity for MAP	200.00	ohmm
	ACRt Sonde	THQY	Threshold Quality	0.50	
	ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
	ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
	ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	
BOTTOM					

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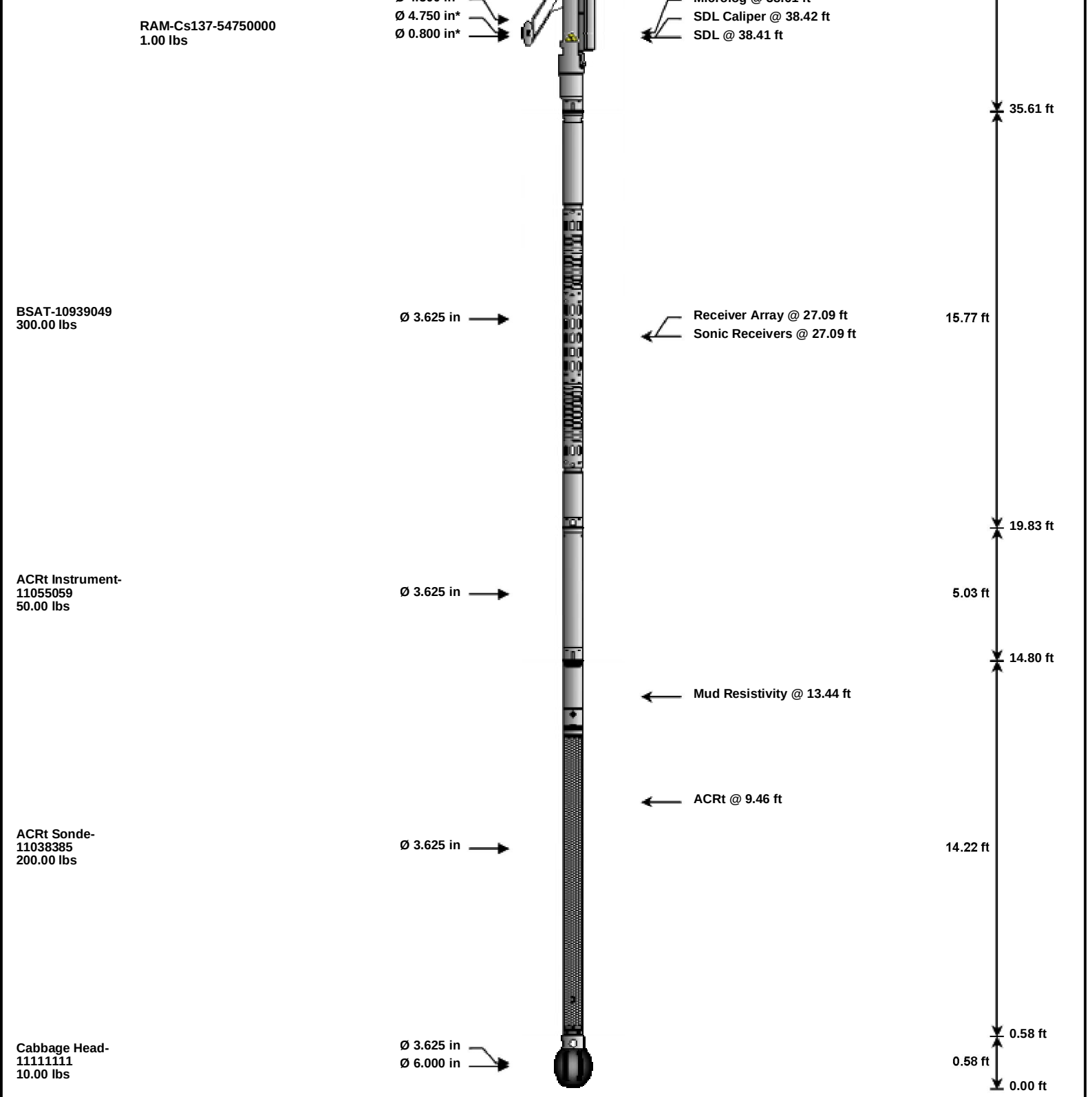
TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
		Ø 2.310 in		Fishing Neck @ 73.73 ft		74.61 ft
RWCH-11830866 135.00 lbs		Ø 3.625 in		Load Cell @ 70.93 ft BH Temperature @ 70.36 ft	6.25 ft	
	Weak Point Solid-11111111 0.01 lbs	Ø 0.010 in*				68.36 ft
SP Sub-10904995 60.00 lbs		Ø 3.625 in		SP @ 66.59 ft	3.74 ft	
				Z-Accelerometer @ 64.17 ft		64.63 ft
GTET-11021139 165.00 lbs		Ø 3.625 in		GammaRay @ 58.56 ft	8.52 ft	
						56.11 ft
	DSN Decentralizer-11055304 6.60 lbs	Ø 5.000 in*				
DSNT-11660709 174.00 lbs		Ø 3.625 in		DSN Far @ 49.17 ft DSN Near @ 48.42 ft	9.69 ft	
						46.42 ft
SDLT-12153526 360.00 lbs	SDLT Pad-11284007 65.00 lbs Microlog Pad-12153526 8.00 lbs	Ø 4.500 in			10.81 ft	
		Ø 4.500 in*		Microlog @ 38.61 ft		35.61 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	11830866	135.00	6.25		68.36	300.00
WPSS	Weak Point Solid	11111111	0.01	0.01	*	68.36	300.00
SP	SP Sub	10904995	60.00	3.74		64.63	300.00
GTET	Gamma Telemetry Tool	11021139	165.00	8.52		56.11	60.00
DSNT	Dual Spaced Neutron	11660709	174.00	9.69		46.42	60.00
DCNT	DSN Decentralizer	11055304	6.60	5.13	*	49.75	300.00
SDLT	Spectral Density Tool	12153526	360.00	10.81		35.61	60.00
SDLP	Density Insite Pad	11284007	65.00	2.55	*	37.82	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	54750000	1.00	0.80	*	38.05	300.00
MICP	Microlog Pad	12153526	8.00	1.00	*	38.11	60.00
BSAT	Borehole Sonic Array Tool	10939049	300.00	15.77		19.83	60.00
ACRt	Array Compensated True Resistivity Instrument Section	11055059	50.00	5.03		14.80	120.00
ACRt	Array Compensated True Resistivity Sonde Section	11038385	200.00	14.22		0.58	120.00
CBHD	Cabbage Head	11111111	10.00	0.58		0.00	300.00
Total			**1,534.61**	**74.61**			

* Not included in Total Length and Length Accumulation.

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