HALLIBURTON

BOREHOLE COMPENSATED SONIC ARRAY LOG

COMPANY **CMX, INC.**

WELL **FOGHORN #1-27**

FIELD/BLOCK **CHASE-SILICA**

COUNTY **RICE** STATE **KANSAS**

API No. 15-159-22839-00-00

Location 2310' FNL & 1110' FEL

Sect. 27 Twp. 19S Rge. 10W

Other Services:
ACRT
BSAT
DSNT/SDLT
MICRO

Permanent Datum	GL	Elev. 1753.0 ft	Elev.: K.B. 1761.0 ft
Log measured from	KB	, 8.0 ft above perm. Datum	D.F. 1761.0 ft
Drilling measured from	KB		G.L. 1753.0 ft

Date		17-Mar-17					
Run No.		ONE					
Depth - Driller		3320.0 ft					
Depth - Logger		3315.0 ft					
Bottom - Logged Interval		3311.0 ft					
Top - Logged Interval		1250.0 ft					
Casing - Driller		8.625 in	@ 256.0 ft	@		@	
Casing - Logger		258.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		Water Based Mud					
Density	Viscosity	9.1 ppg	57.00 s/qt				
PH	Fluid Loss	2.60 pH	10.0 cptm				
Source of Sample		FLOWLINE					
Rm @ Meas. Temperature		0.49 ohmm	@ 75.00 degF	@		@	
Rmf @ Meas. Temperature		0.42 ohmm	@ 75.00 degF	@		@	
Rmc @ Meas. Temperature		0.57 ohmm	@ 75.00 degF	@		@	
Source Rmf	Rmc	CALC	CALC				
Rm @ BHT		0.38 ohmm	@ 98.0 degF	@		@	
Time Since Circulation		08:00 hr					
Time on Bottom		17-Mar-17 18:41					
Max. Rec. Temperature		98.00 degF	@ 3315.0 ft	@		@	
Equipment	Location	11072142	EL RENO, OK				
Recorded By		THOMAS HYDE					
Witnessed By		K. LEBLANC					

Fold here

PGM Version: WL INSITE R5.0.5 (Build 8)

Service Ticket No.: 903904174

API No.: 15-159-22839-00-00

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

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
	ONE	ACRT I-11026095	N/A	CENT.	N/A
		S-11005908			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	11013114	Serial No.	10747683	Serial No.	10960494	Serial No.	10993115
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	3.625"	Diameter	5.5"	Diameter	3.625"
Detector Model No.	T-102	Spacing	EVEN	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	Cs137	Source Type	Am241Be
Length	8"	LSA [Y/N]		Serial No.	5168GW	Serial No.	DSN-424
Distance to Source	10'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	Depth From	Depth To	Speed ft/min	Scale L	Scale R	Scale L	Scale R	Matrix Scale L	Matrix Scale R	Matrix Scale L	Matrix Scale R
ONE	3315	258	REC	0	150	30	130	30	2.71	30	LIME

ONE	3315	258	REC	0	150	30	-10	47.6	30	-10	2.71	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: RUN 1: GTET-DSNT-SDLT

RUN 2: GTET-BSAT-ACRT

TOOLS RUN PER CUSTOMER REQUEST

ANNULAR HOLE VOLUME RAN FOR 5.5 INCH CASING

CHLORIDES REPORTED AT 12,200 mg/l

TODAY'S CREW: J. WOOD J. ROBERSON

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES EL RENO, OK 405-278-9685

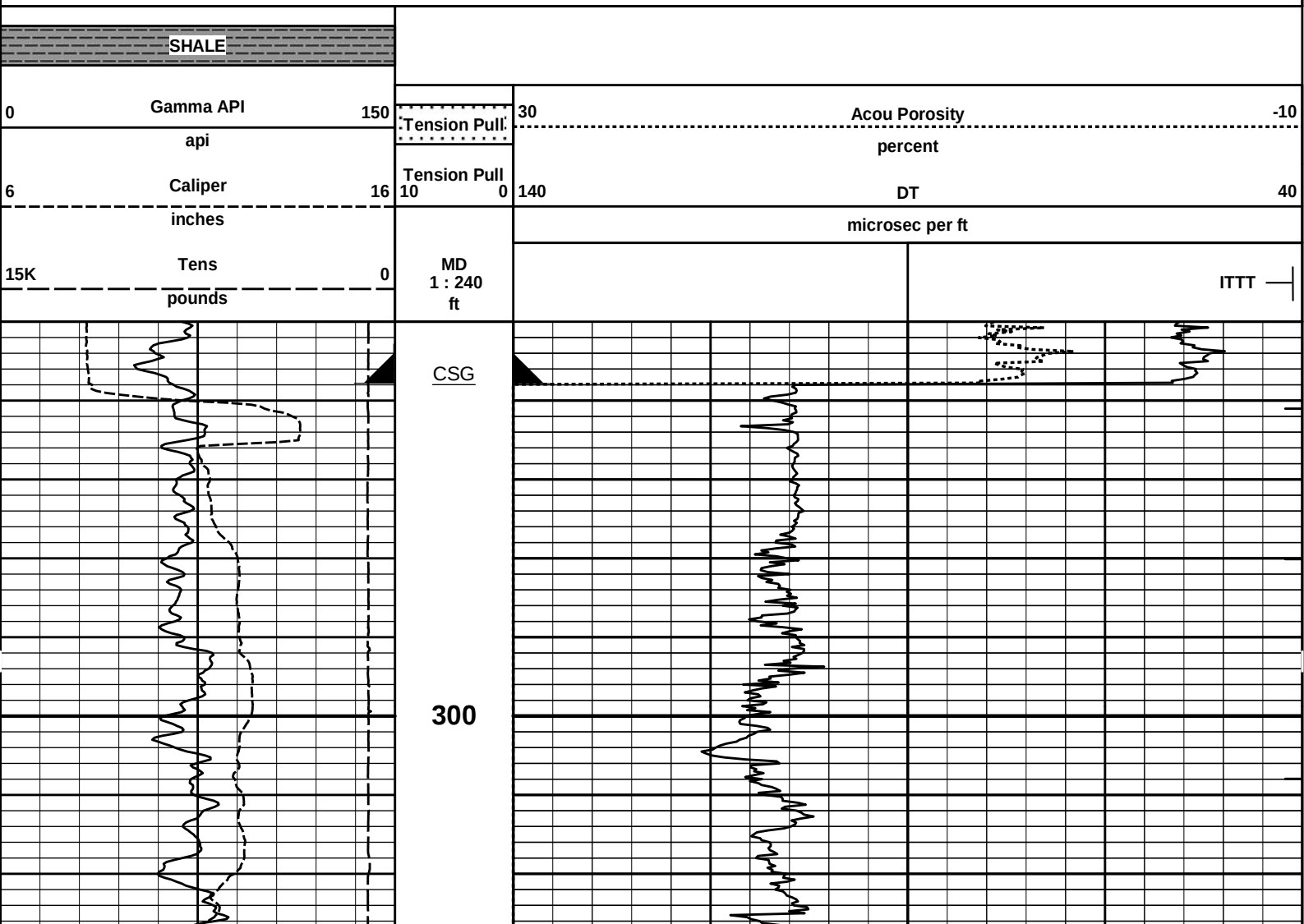
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR 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.

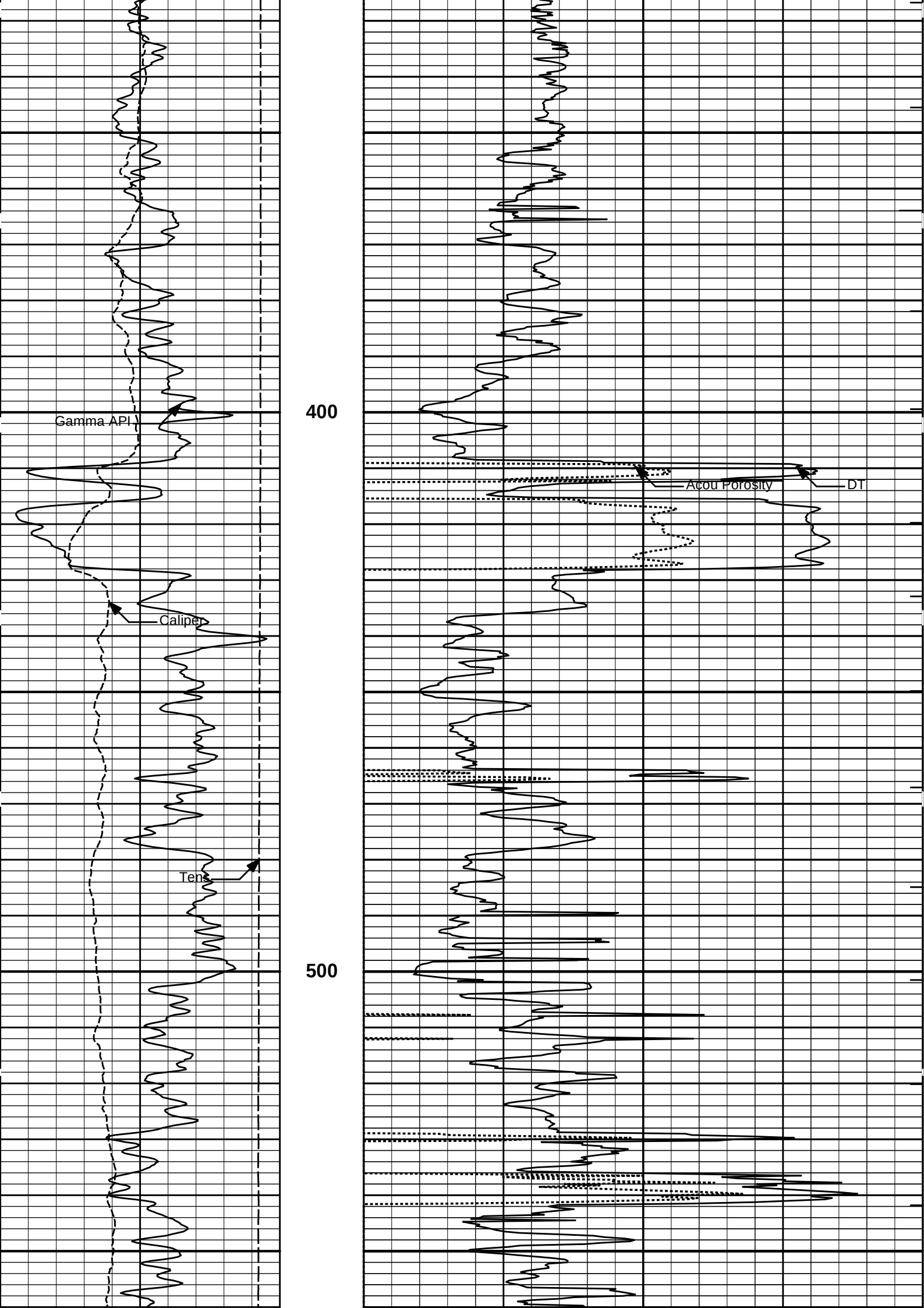
HALLIBURTON

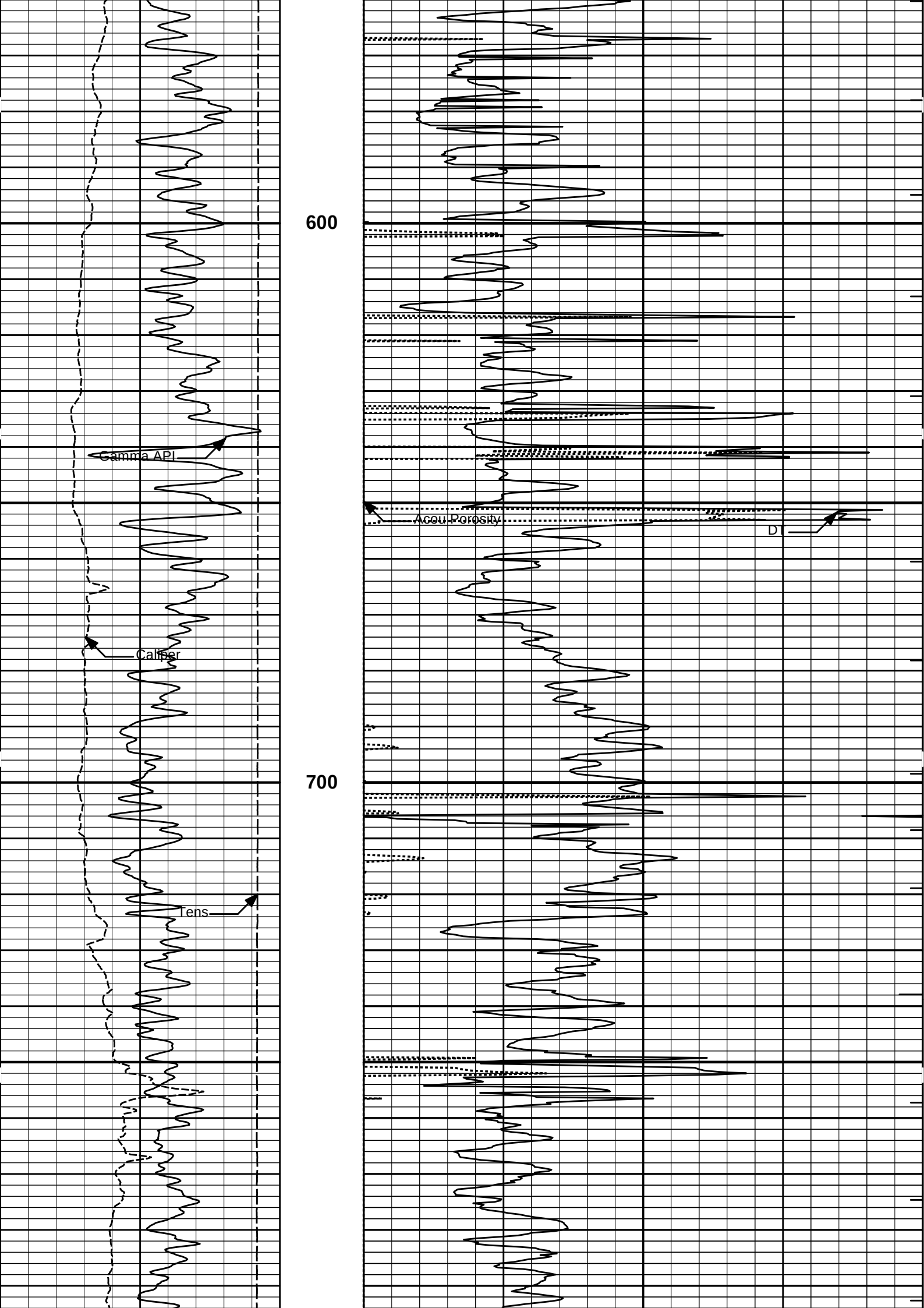
HALLIBURTON

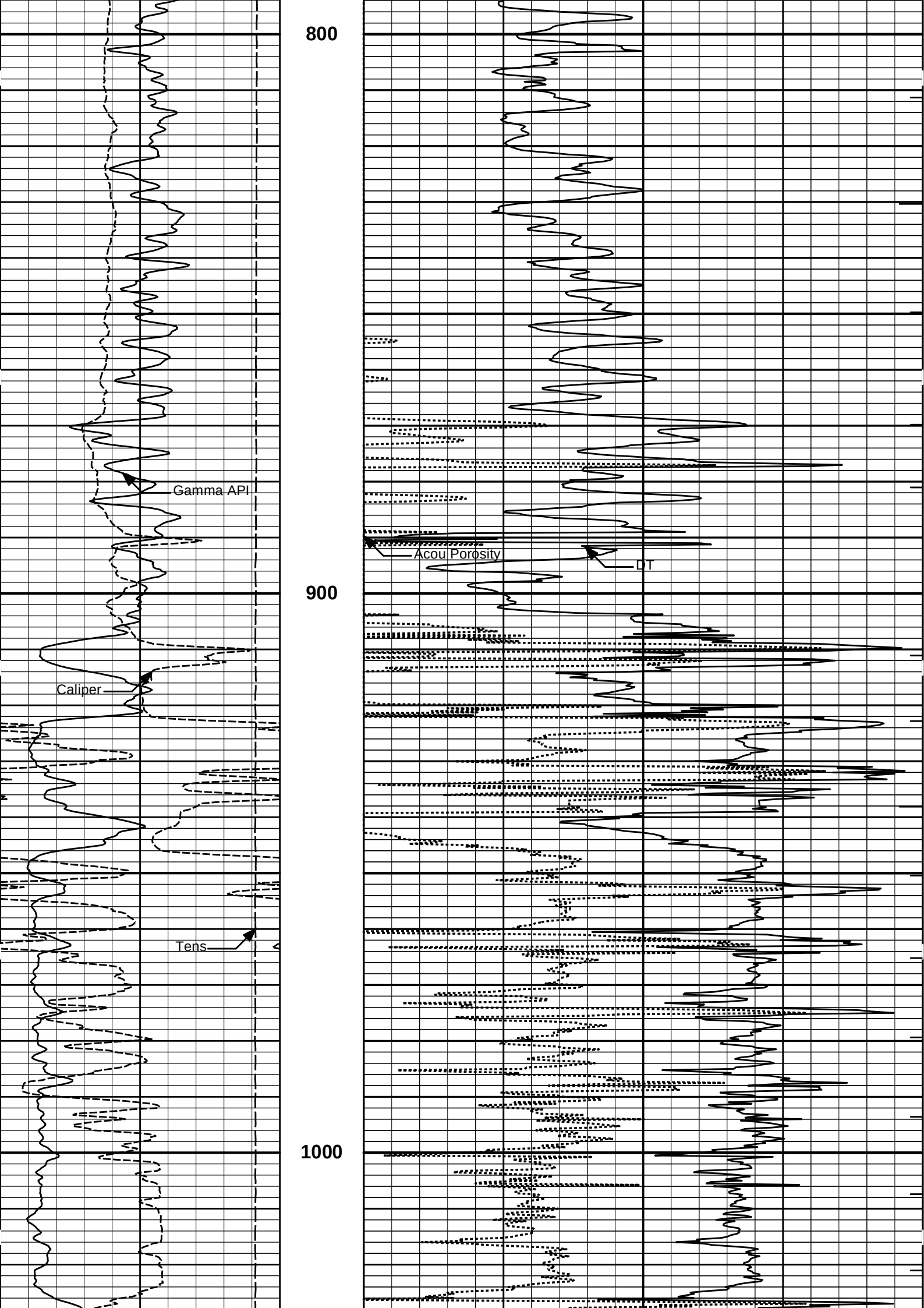
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Plot File: \\BSAT\BSAT_5_MAIN_LIB

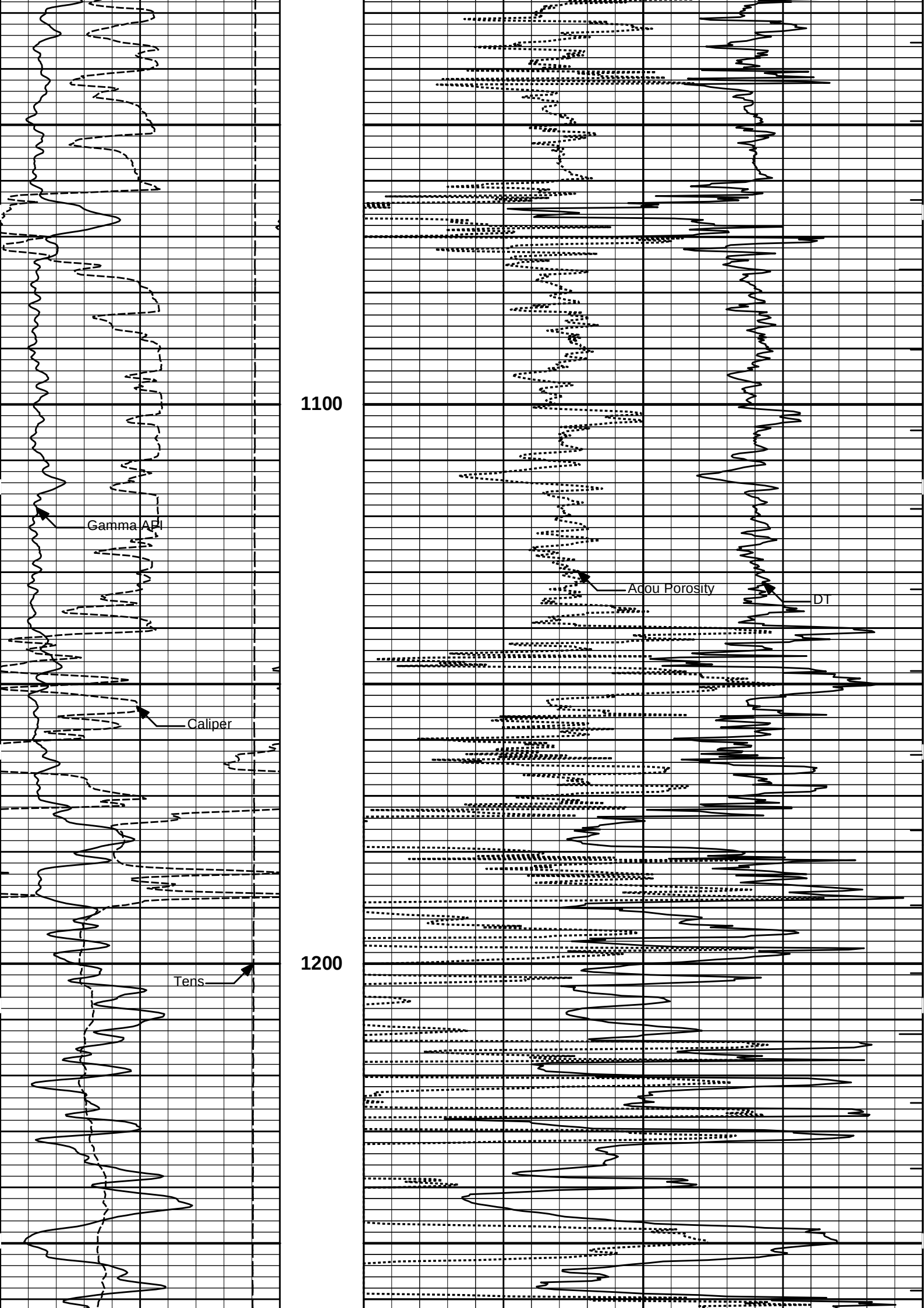
5 INCH MAIN LOG

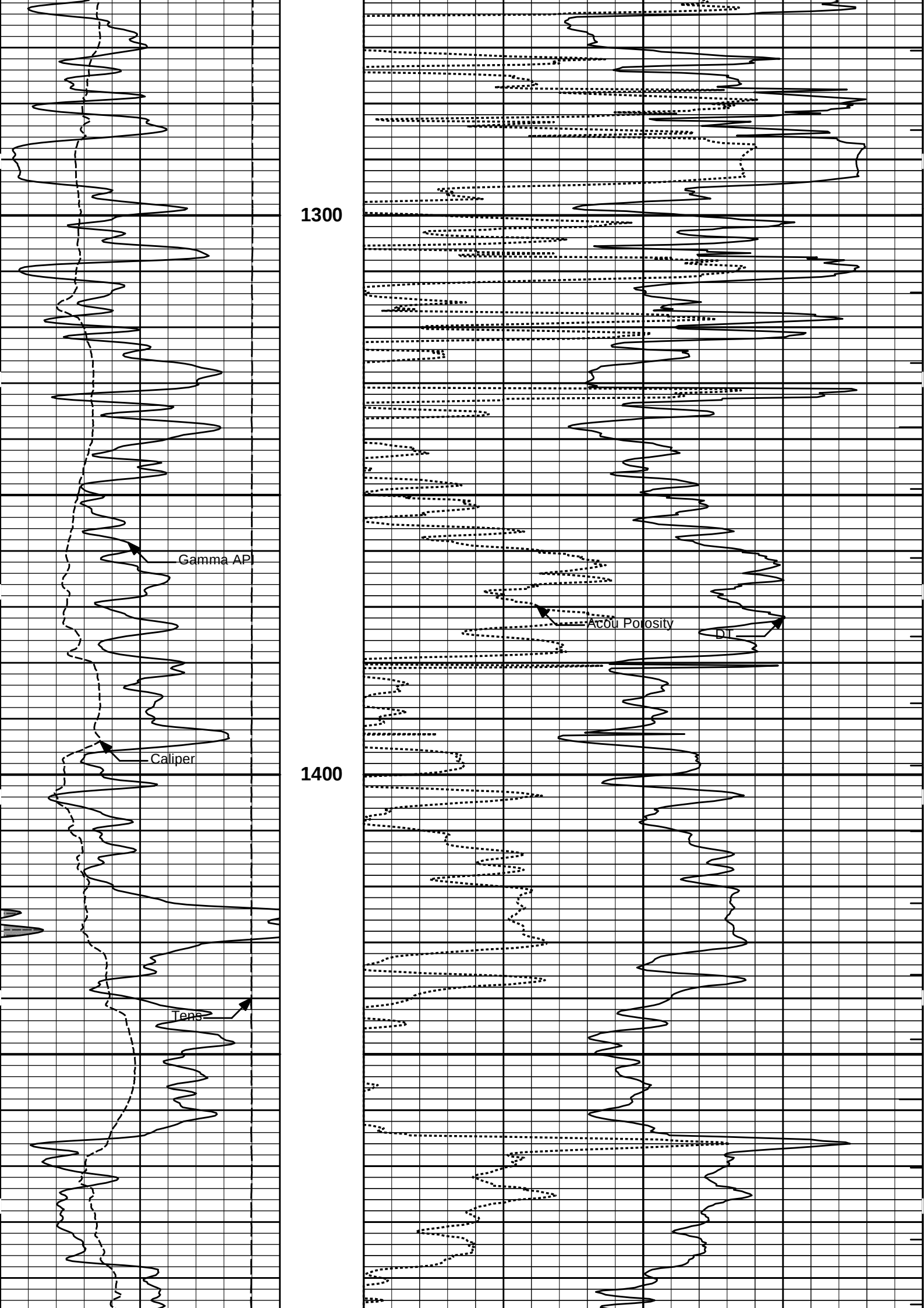


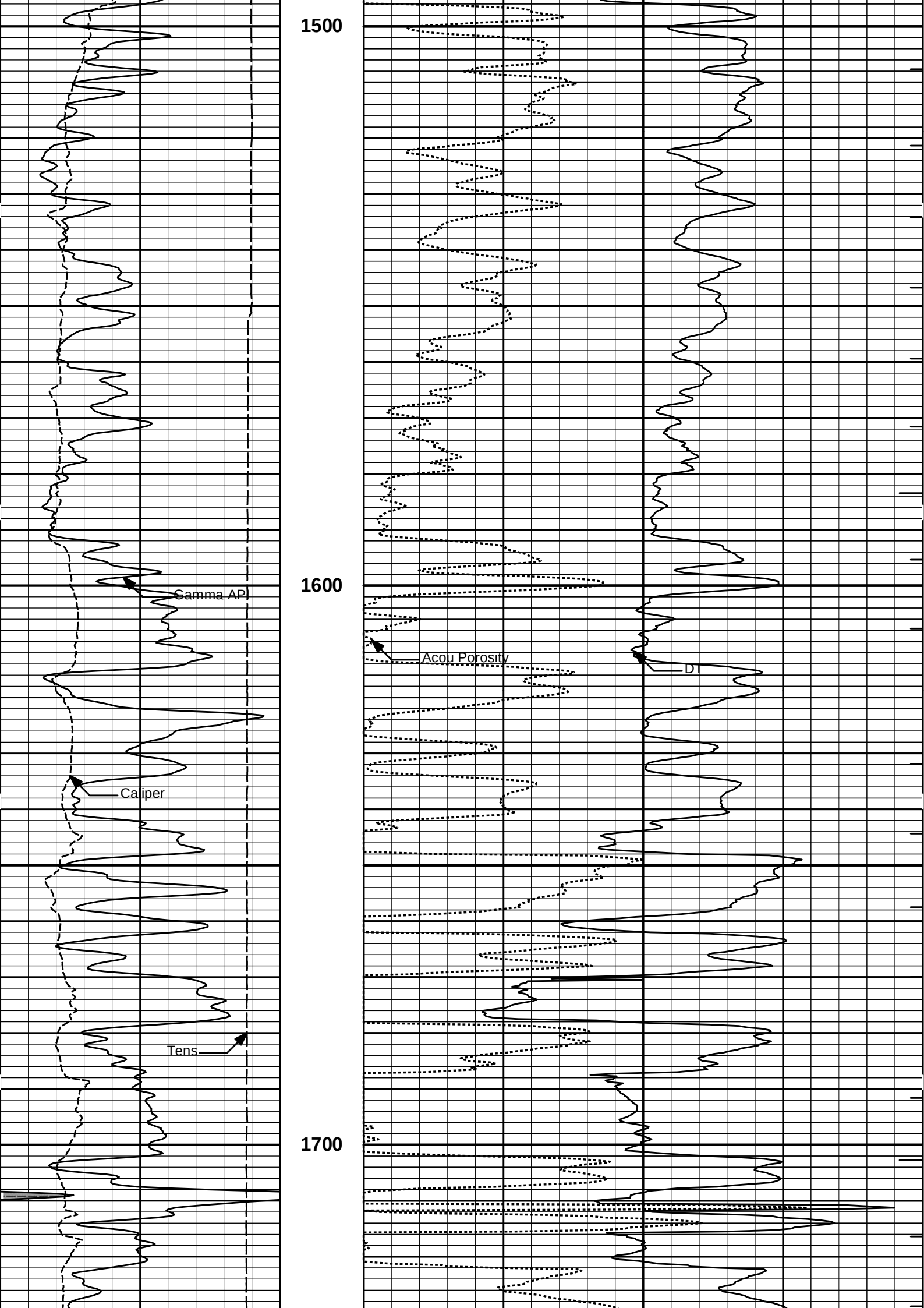

Gamma API
400
Acou Porosity
DT
Caliper
Tens
500

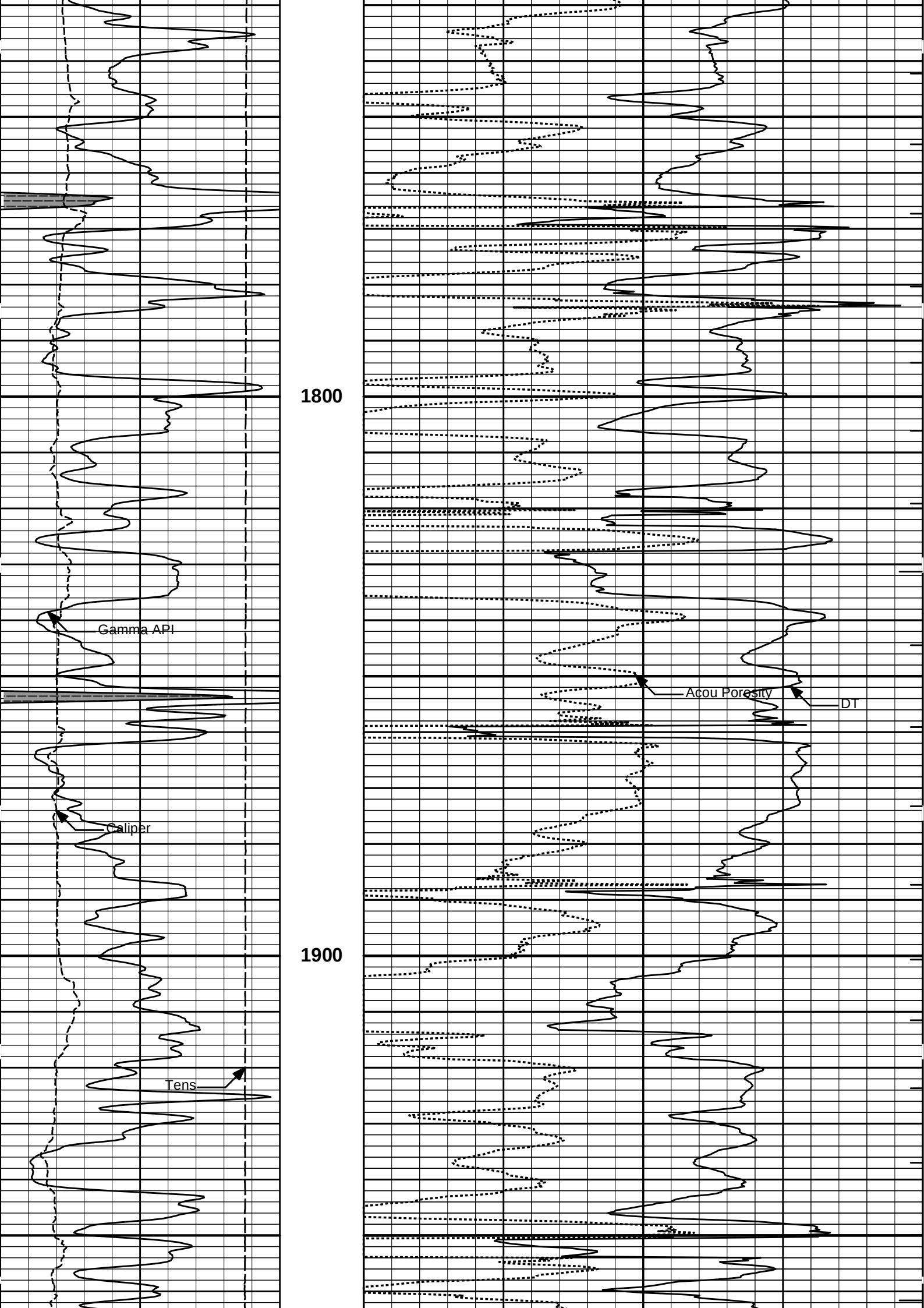

600
Gamma API
Acou Porosity
DT
Caliper
700
Tens

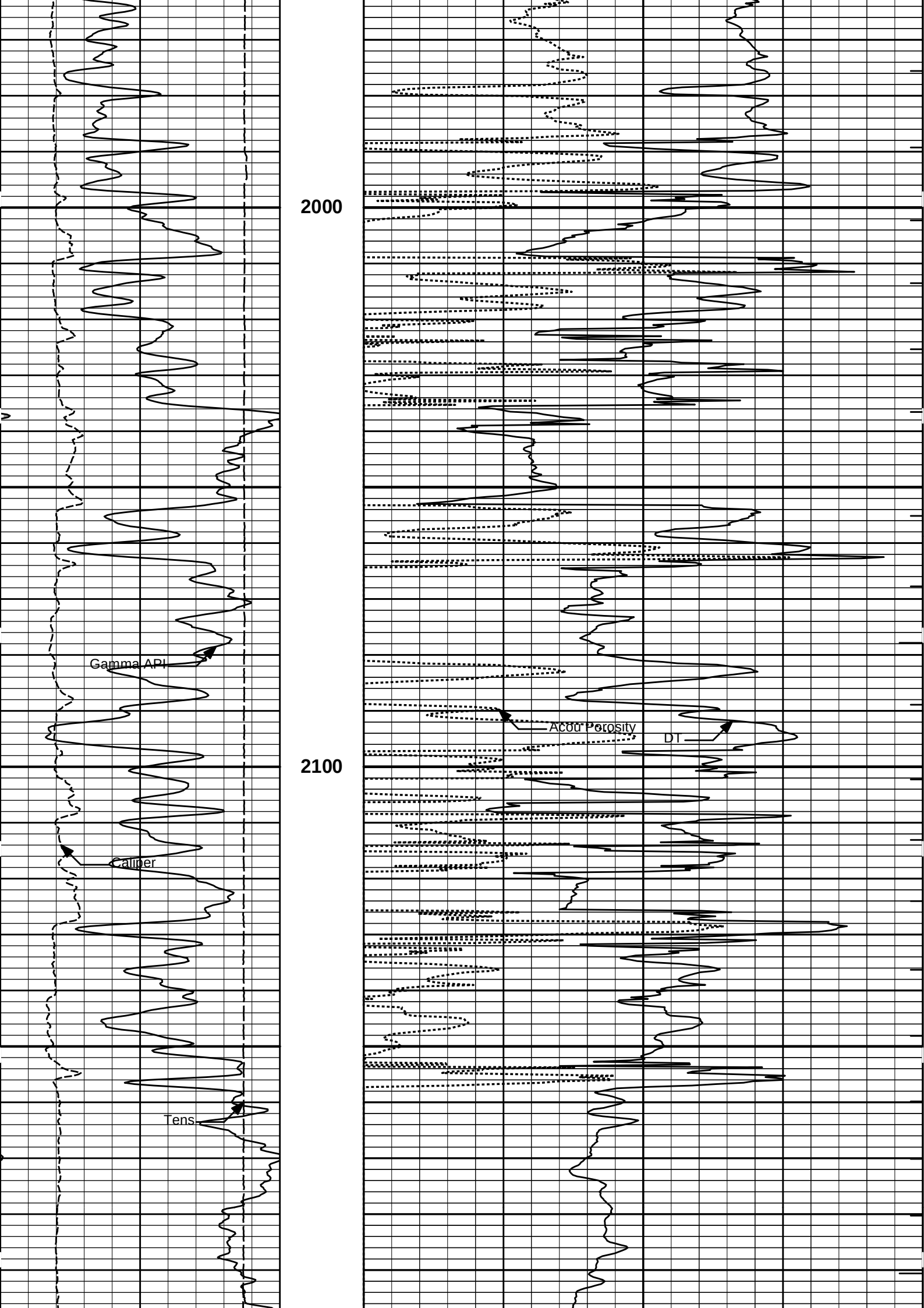

800
Gamma API
Acou Porosity
DT
900
Caliper
Tens
1000

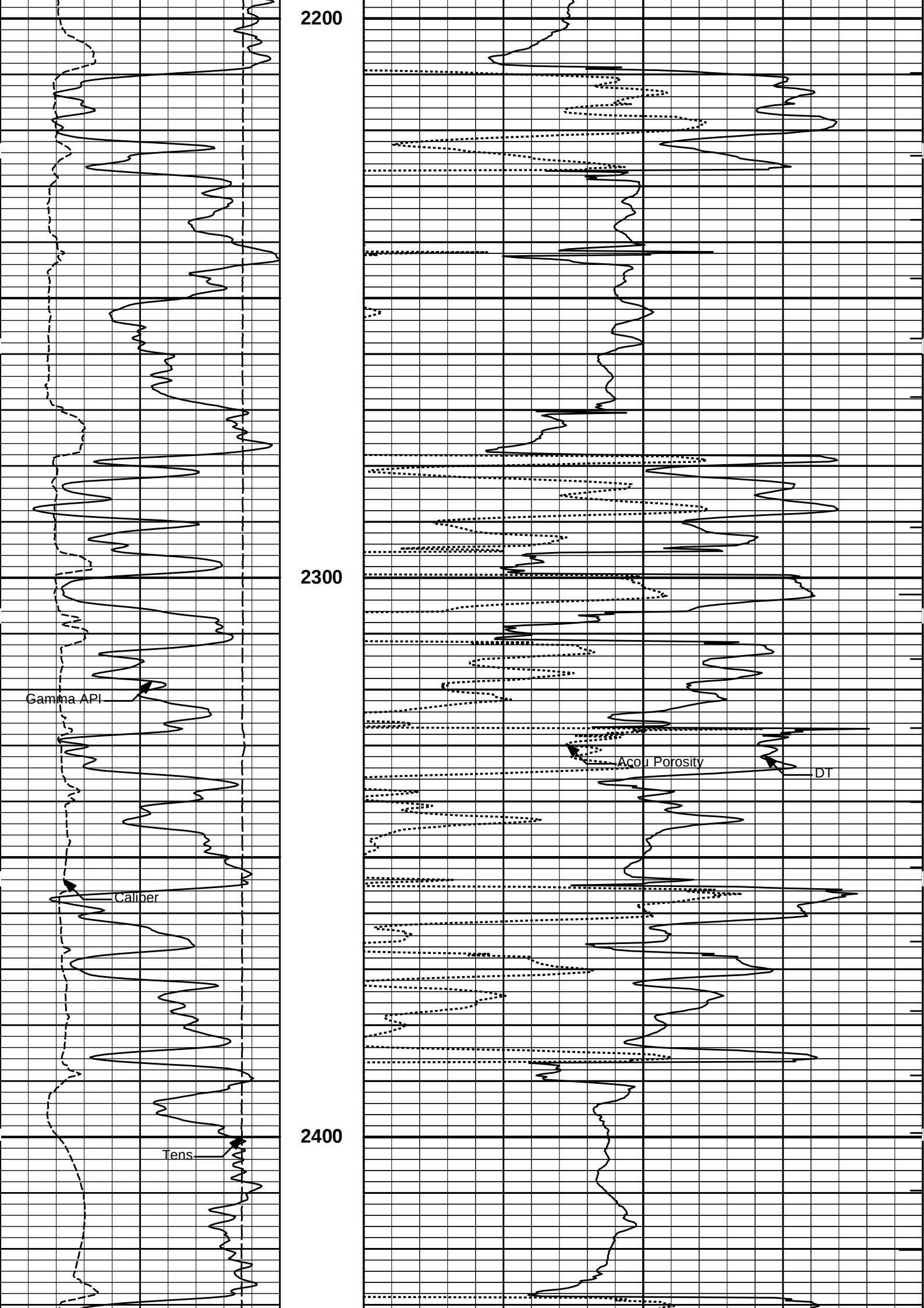

1100
Gamma API
Caliper
Acou Porosity
DT
1200
Tens

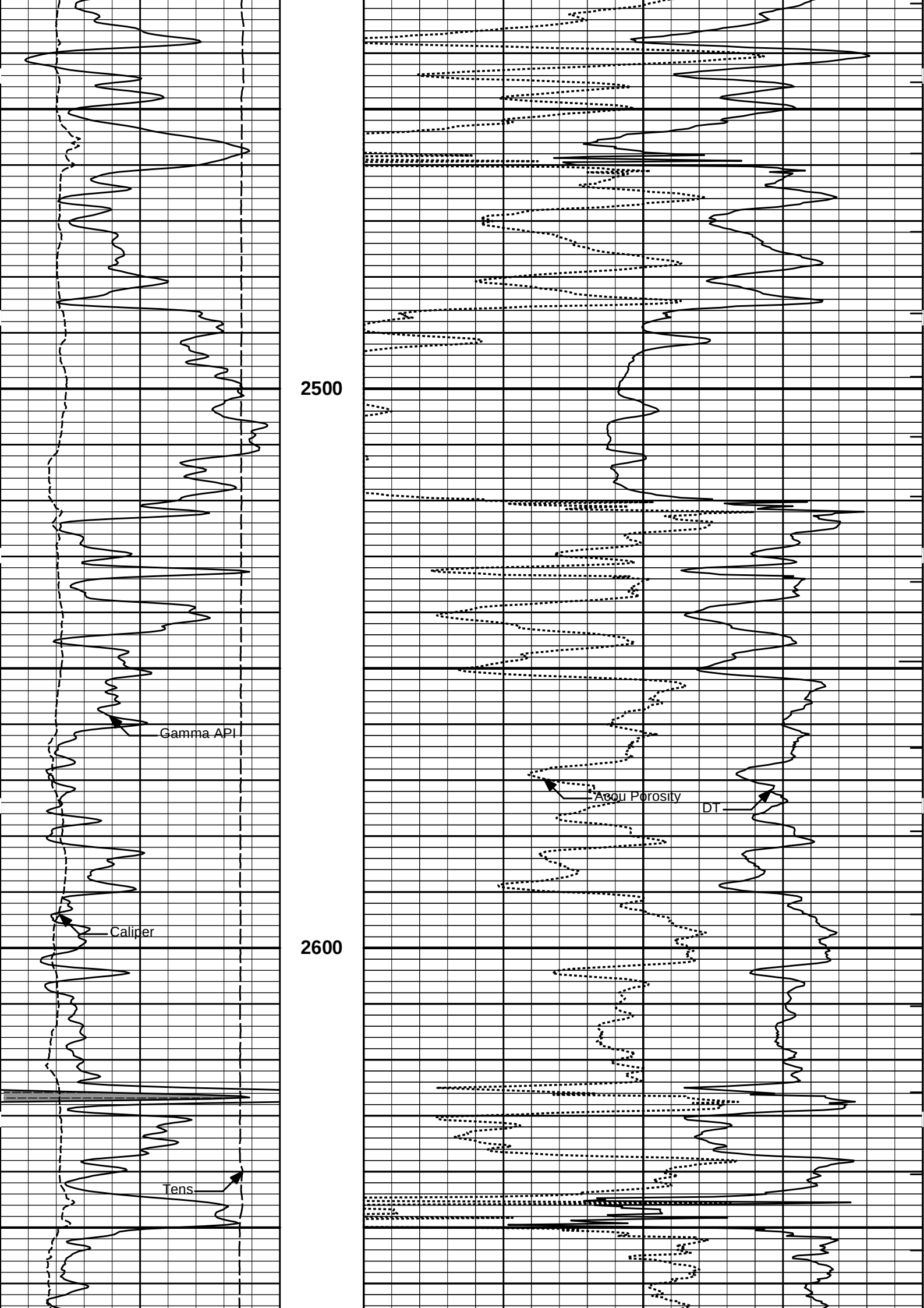

1300
Gamma API
Acou Porosity
DT
Caliper
1400
Tens

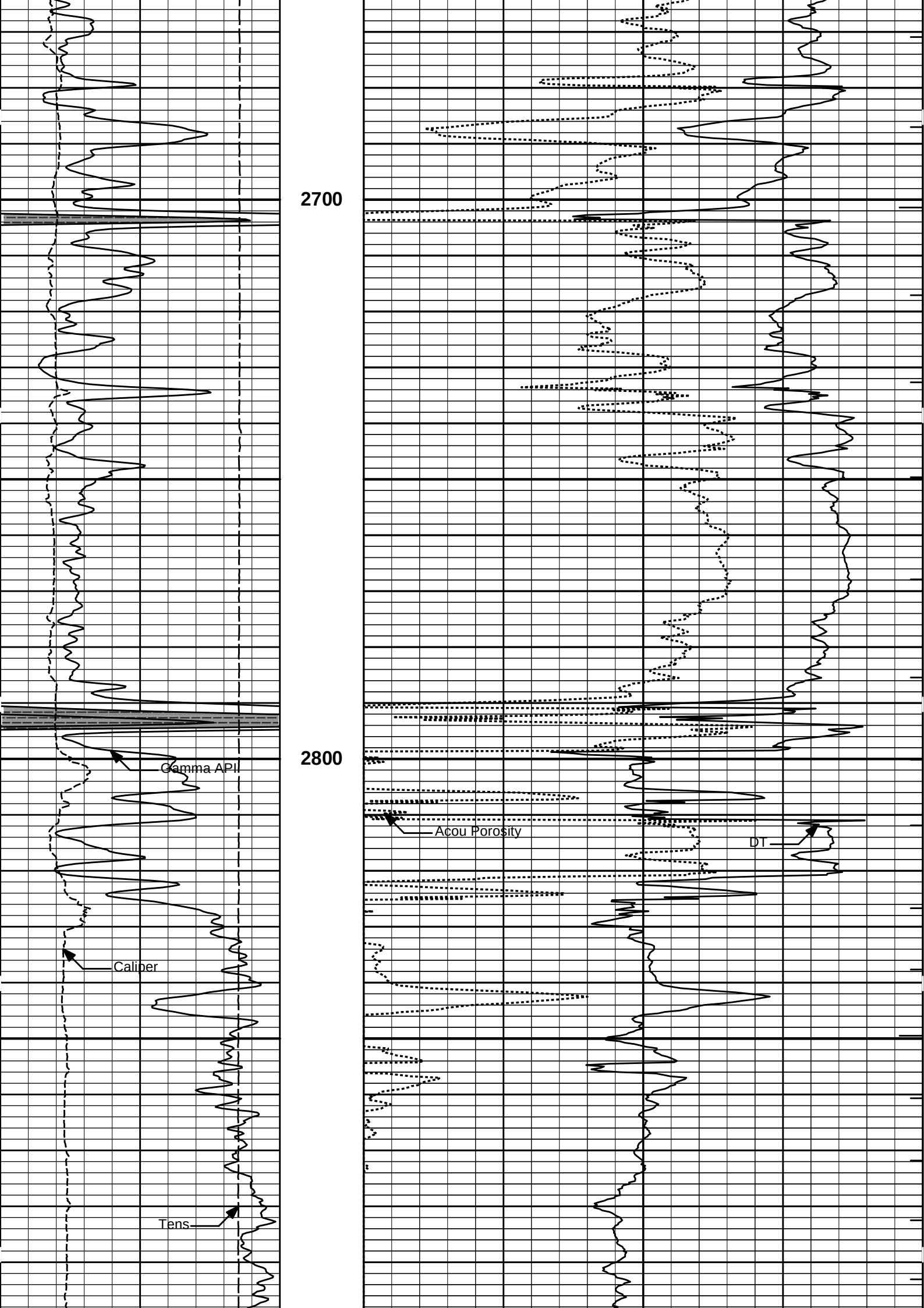

1500
1600
1700
Gamma API
Caliper
Tens
Acou Porosity
DT

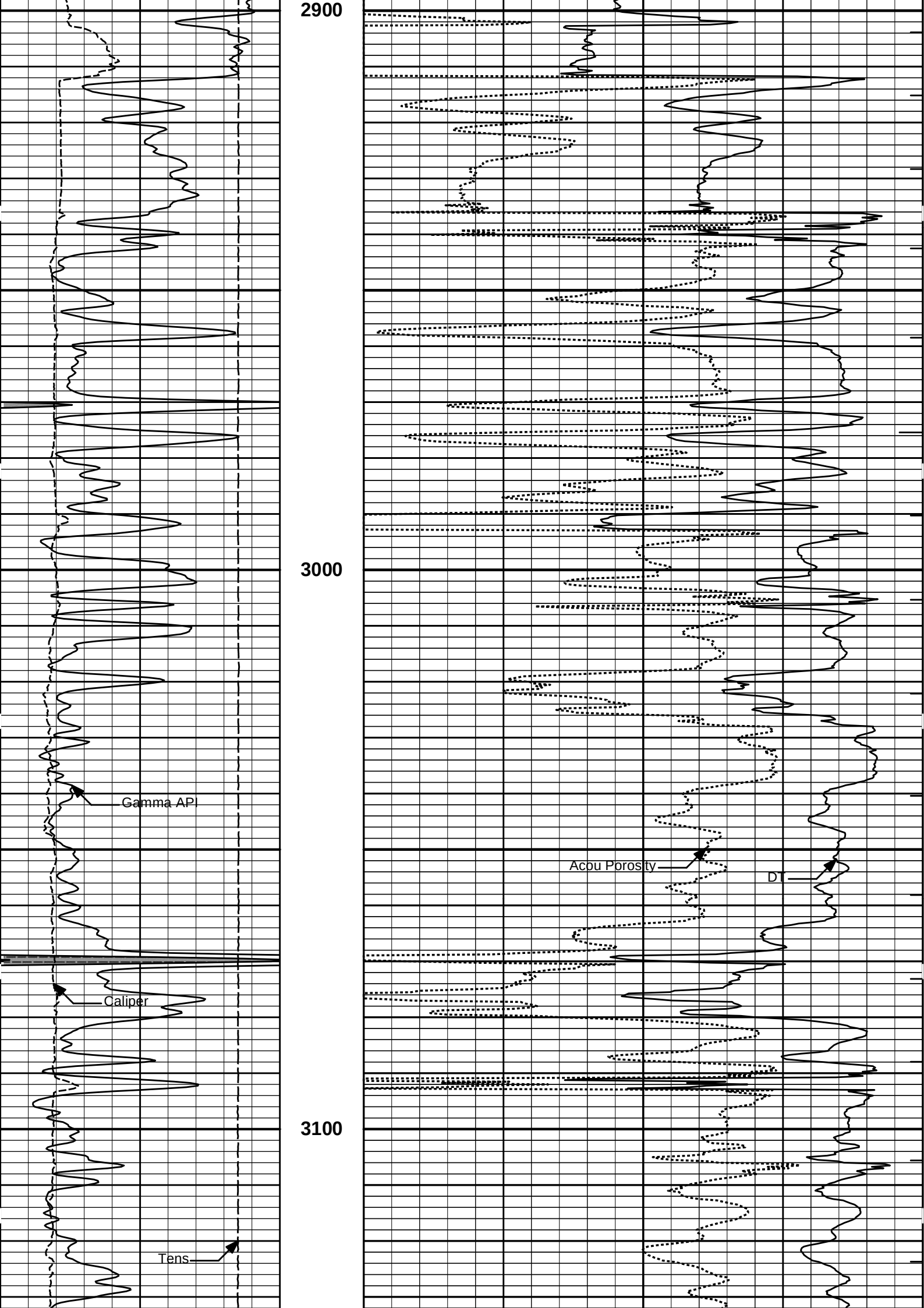

1800
Gamma API
Acou Porosity
DT
Caliper
1900
Tens

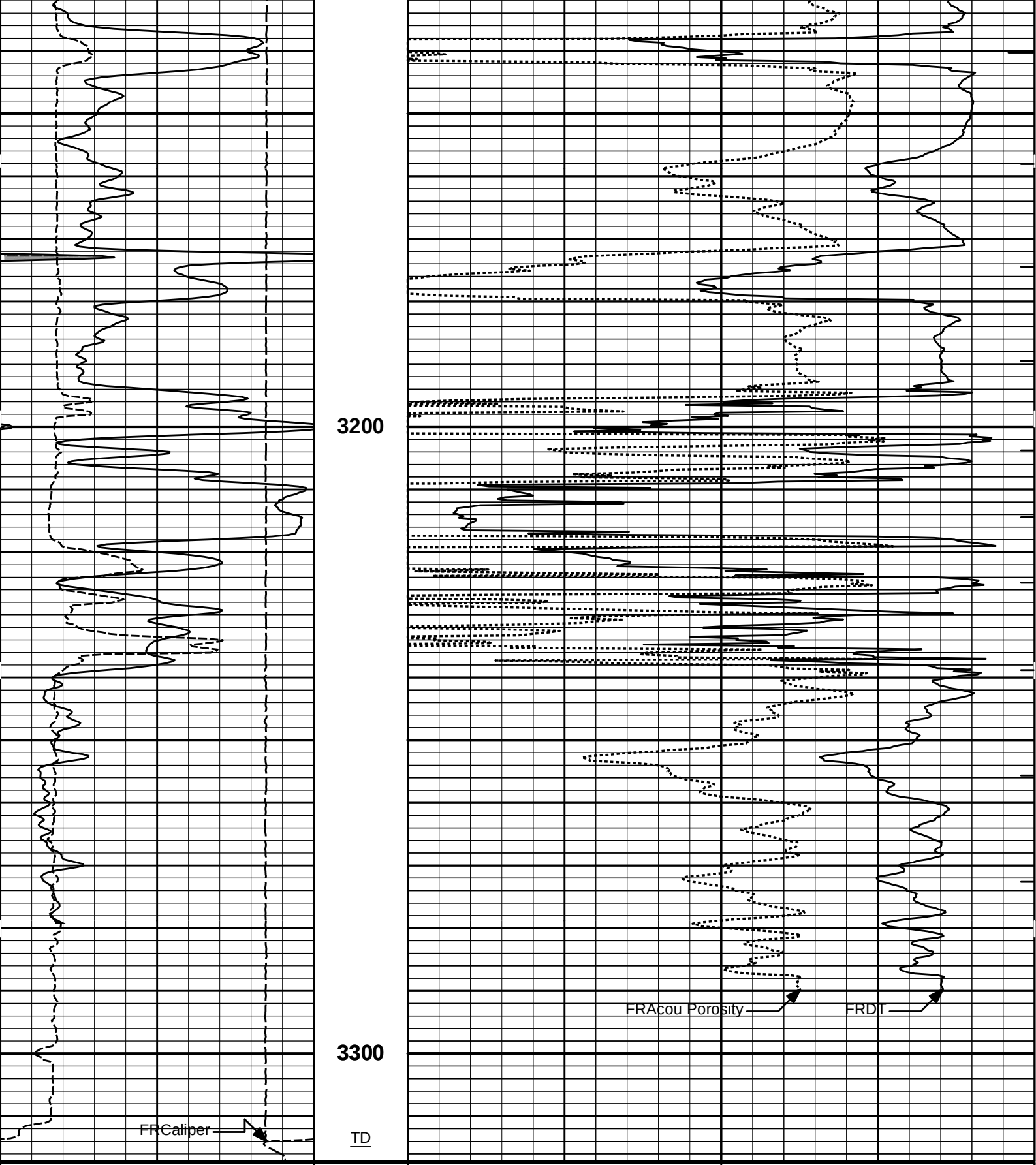

2000
Gamma API
Accu Porosity
DT
2100
Caliper
Tens


2200
2300
2400
Gamma API
Caliber
Tens
Acou Porosity
DT


2500
Gamma API
Acou Porosity
DT
Caliper
2600
Tens


2700
2800
Gamma API
Caliper
Tens
Acou Porosity
DT


2900
3000
3100
Gamma API
Caliper
Tens
Acou Porosity
DT



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

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Plot Time: 17-Mar-17 20:42:34
Plot Range: 250 ft to 3317.17 ft

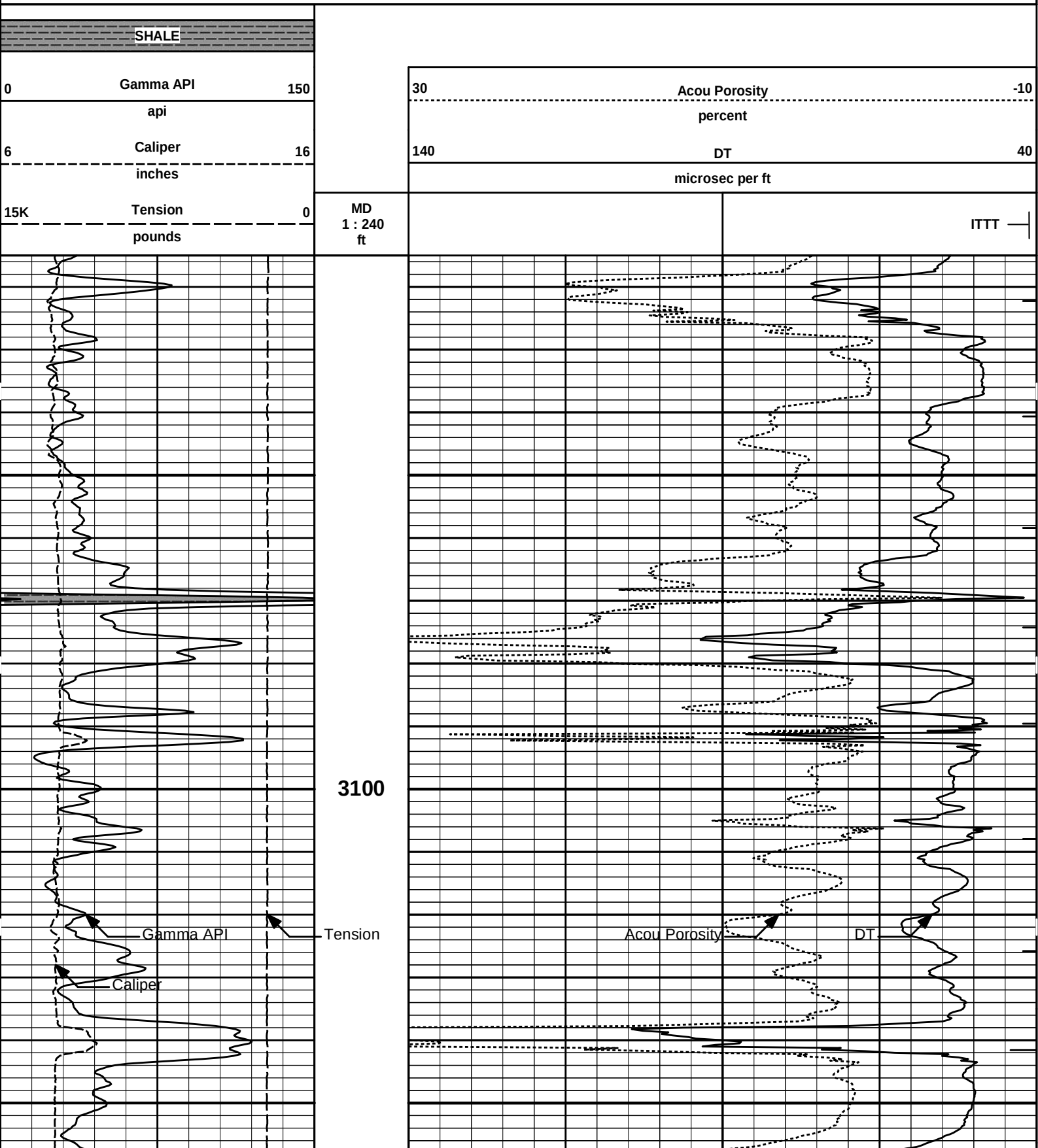
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Plot File: \\BSAT\BSAT_5_MAIN_LIB

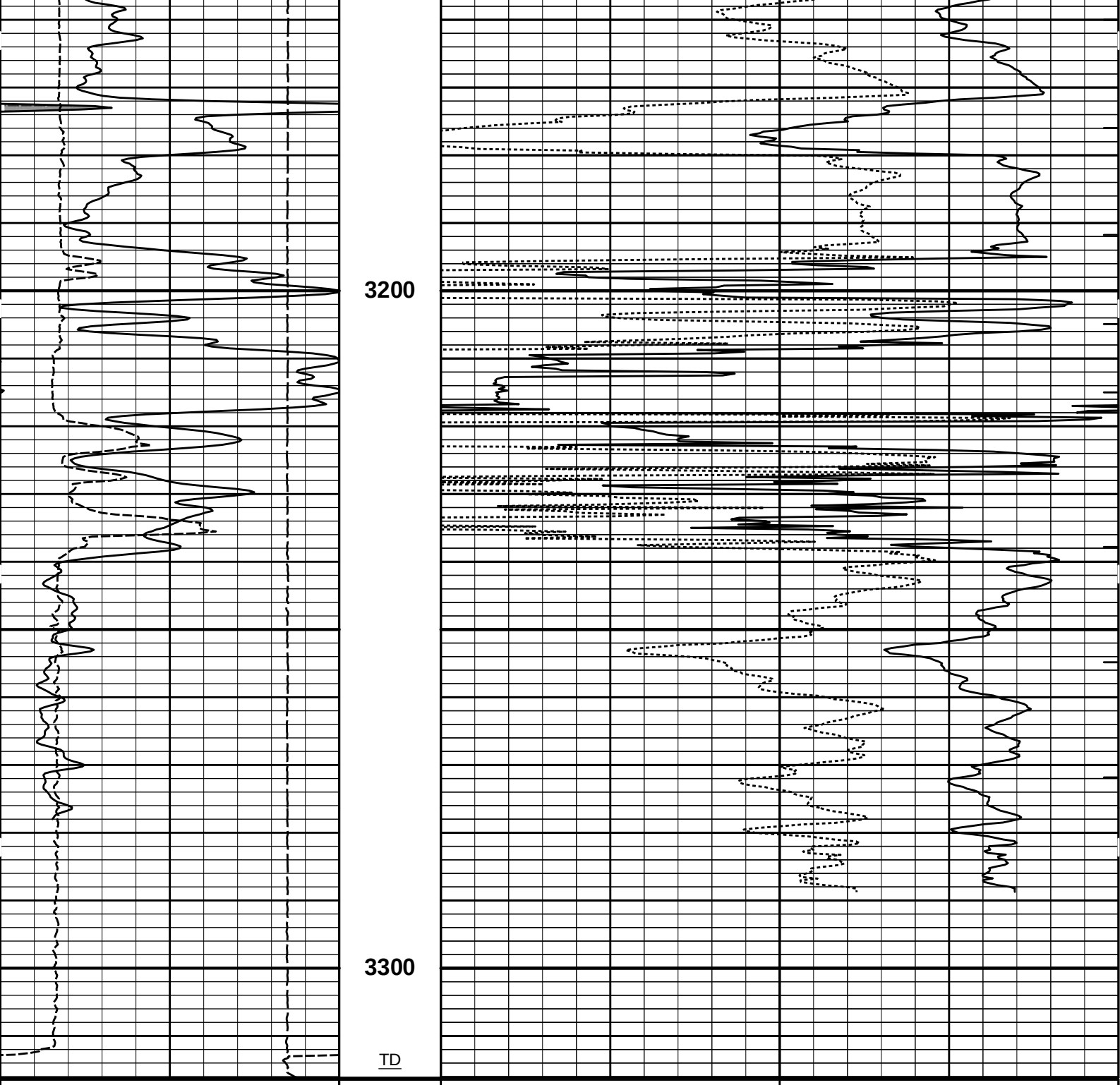
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 17-Mar-17 20:42:34
Plot Range: 3015 ft to 3316.17 ft
Data: FOG_1-27\Well Based*\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION





15K	Tension	0
	pounds	
6	Caliper	16
	inches	
0	Gamma API	150
	api	

SHALE

MD
1 : 240
ft

ITTT

140	DT	40
	microsec per ft	
30	Acou Porosity	-10
	percent	

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Plot Time: 17-Mar-17 20:42:35
Plot Range: 3015 ft to 3316.17 ft
Data: FOG_1-27\Well Based*\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION

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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	9.100	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	0.490	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	3315.00	ft
	SHARED	BHT	Bottom Hole Temperature	98.0	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	
	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	Bit Size	
	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	Bit Size	
	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	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	1.19	in
	ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
	ACRt Sonde	TPOS	Tool Position	Centered	
	ACRt Sonde	RMOP	Rmud Source	Mud Cell	
	ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm

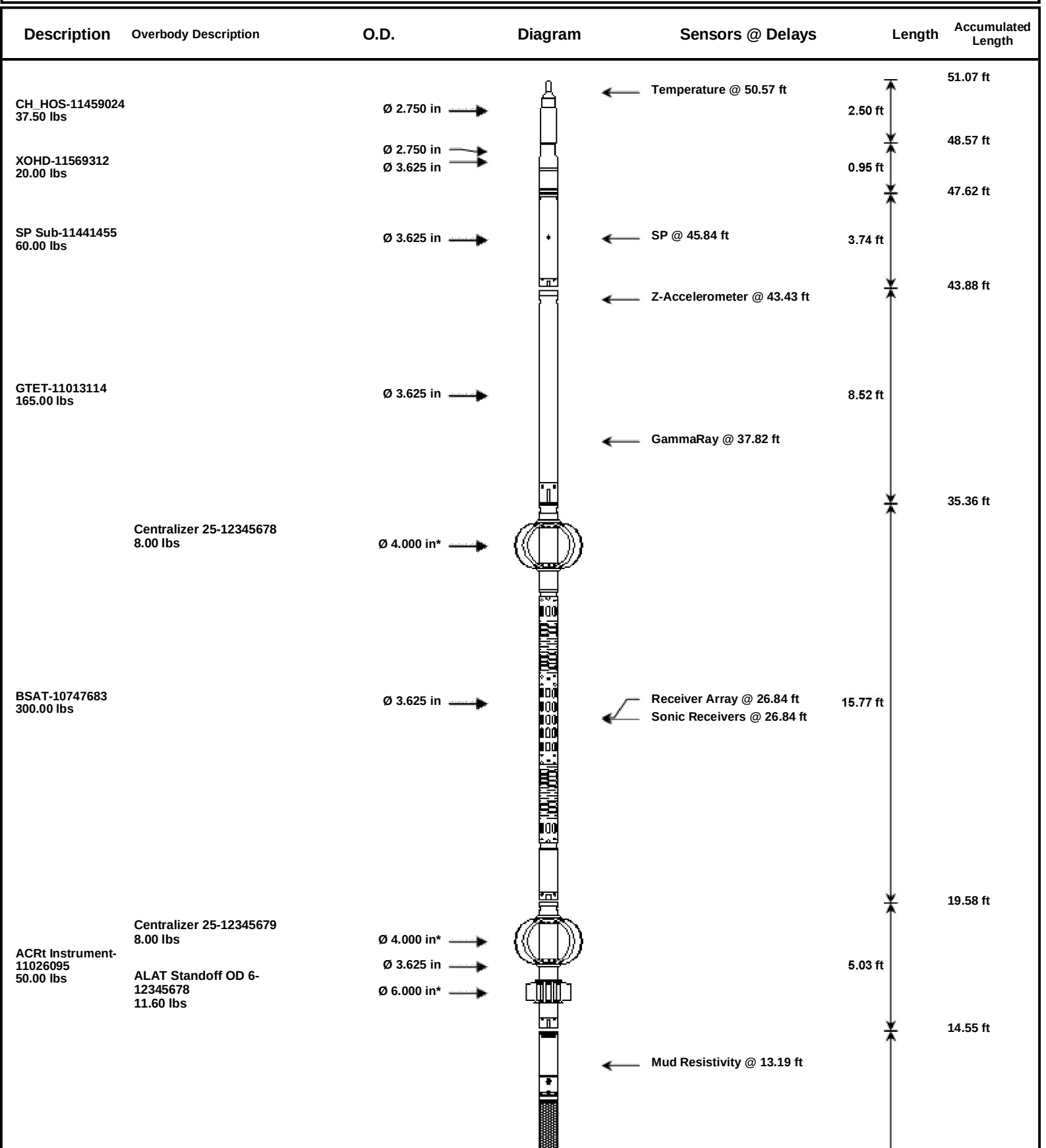
ACRt Sonde	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	Bit Size	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	

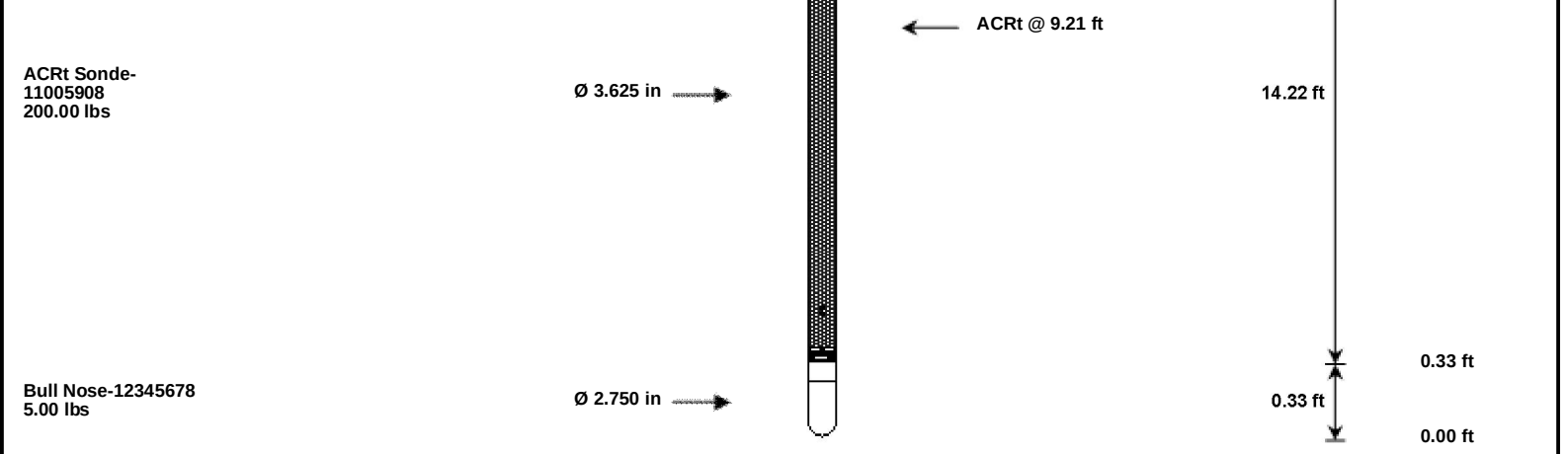
BOTTOM

Data: FOG_1-27\0004 GTET-BSAT-ACRT\IDLE **Date: 17-Mar-17 19:12:57**

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TOOL STRING DIAGRAM REPORT





Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CH_HOS	Hostile Cable Head with Load Cell	11459024	37.50	2.50		48.57	300.00
XOHD	Hostile to Dits Cross Over	11569312	20.00	0.95		47.62	300.00
SP	SP Sub	11441455	60.00	3.74		43.88	300.00
GTET	Gamma Telemetry Tool	11013114	165.00	8.52		35.36	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	12345678	8.00	2.08	*	32.63	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11026095	50.00	5.03		14.55	120.00
ALATS	Array Laterolog Tool OD 6 Standoff	12345678	11.60	1.00	*	15.53	60.00
OBCEN	Centralizer - 25 in. Overbody	12345679	8.00	2.08	*	17.01	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11005908	200.00	14.22		0.33	120.00
BLNS	Bull Nose	12345678	5.00	0.33		0.00	300.00
Total			**865.10**	**51.07**			

* Not included in Total Length and Length Accumulation.

Data: FOG_1-27\0004 GTET-BSAT-ACRT\IDLE **Date: 17-Mar-17 18:14:55**

COMPANY	**CMX, INC.**
WELL	**FOGHORN #1-27**
FIELD	**CHASE-SILICA**
COUNTY	**RICE** STATE **KANSAS**

HALLIBURTON

BOREHOLE COMPENSATED SONIC ARRAY LOG