HALLIBURTON

BOREHOLE SONIC ARRAY LOG

COMPANY **EOG RESOURCES**

WELL **TIMKEN 22 #1**

FIELD **WILLIS**

COUNTY **STEVENS** STATE **KANSAS**

EOG RESOURCES
COMPANY
TIMKEN 22 #1
WELL
WILLIS
FIELD
STEVENS
COUNTY
KANSAS
STATE

API No. 15-189-22770

Location 1840' FNL & 780' FWL

Sect. 22 Twp. 32S Rge. 37W

Other Services:
SDL / DSN / ML
ACRT

Permanent Datum	GROUND LEVEL	Elev. 3121.0 ft	Elev.: K.B. 3132.0 ft
Log measured from	KELLY BUSHING	, 11.0 ft above perm. Datum	D.F. 3131.0 ft
Drilling measured from	KELLY BUSHING		G.L. 3121.0 ft

Date		02-Jul-11					
Run No.		ONE					
Depth - Driller		6500.00 ft					
Depth - Logger		6500.0 ft					
Bottom - Logged Interval		6473.0 ft					
Top - Logged Interval		1730.0 ft					
Casing - Driller		8.625 in @ 1730.0 ft		@		@	
Casing - Logger		1730.0 ft					
Bit Size		7.875 in		@		@	
Type Fluid in Hole		WATER BASED MUD					
Density	Viscosity	9.2 ppg	63.00 s/qt				
PH	Fluid Loss	10.00 pH	8.8 cptm				
Source of Sample		FLOW LINE					
Rm @ Meas. Temperature		1.380 ohmm @ 85.00 degF		@		@	
Rmf @ Meas. Temperature		1.17 ohmm @ 84.00 degF		@		@	
Rmc @ Meas. Temperature		1.600 ohmm @ 84.00 degF		@		@	
Source Rmf	Rmc	MEAS	MEAS				
Rm @ BHT		1.02 ohmm @ 145.0 degF		@		@	
Time Since Circulation		3.7 hr					
Time on Bottom		02-Jul-11 07:07					
Max. Rec. Temperature		145.0 degF @ 6500.0 ft		@		@	
Equipment	Location	10546696	LIBERAL				
Recorded By		S. JUNG					
Witnessed By		S. MUELLER					

Fold here

Service Ticket No.: 8284031 API Serial No.: 15-189-22770 PGM Version: WL INSITE R3.2.0 (Build 7)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE

RESISTIVITY SCALE CHANGES

	Sample No.	Type Log	Depth	Scale Up Hole	Scale Down Hole
Date					
Depth-Driller					
Type Fluid in Hole					
Density	Viscosity				
Ph	Fluid Loss				
Source of Sample					

RESISTIVITY EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
Rm @ Meas. Temp	@	@			
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.	11048627	Serial No.	10747684	Serial No.		Serial No.	
Model No.	GTET	Model No.	BSAT	Model No.		Model No.	
Diameter	3.625"	No. of Cent.	TWO	Diameter		Diameter	
Detector Model No.	T-102	Spacing	0.5'	Log Type		Log Type	
Type	SCINT			Source Type		Source Type	
Length	8"	LSA [Y/N]	Y	Serial No.		Serial No.	
Distance to Source	10'	FWDA [Y/N]	N	Strength		Strength	

LOGGING DATA

GENERAL GAMMA ACOUSTIC DENSITY NEUTRON

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	TD	CSG	REC	0	150	30	-10	47.6						

DIRECTIONAL INFORMATION

Maximum Deviation @	KOP @

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 4.5 & 5.5-INCH CASINGS

GPS COORDINATES: LAT: 37º 15' N & LONG: 101º 20' W

CHLORIDES REPORTED AT 3700 MG/L LCM REPORTED AT 10 PPB

RUBBER STANDOFFS USED INSTEAD OF CENTRALIZERS

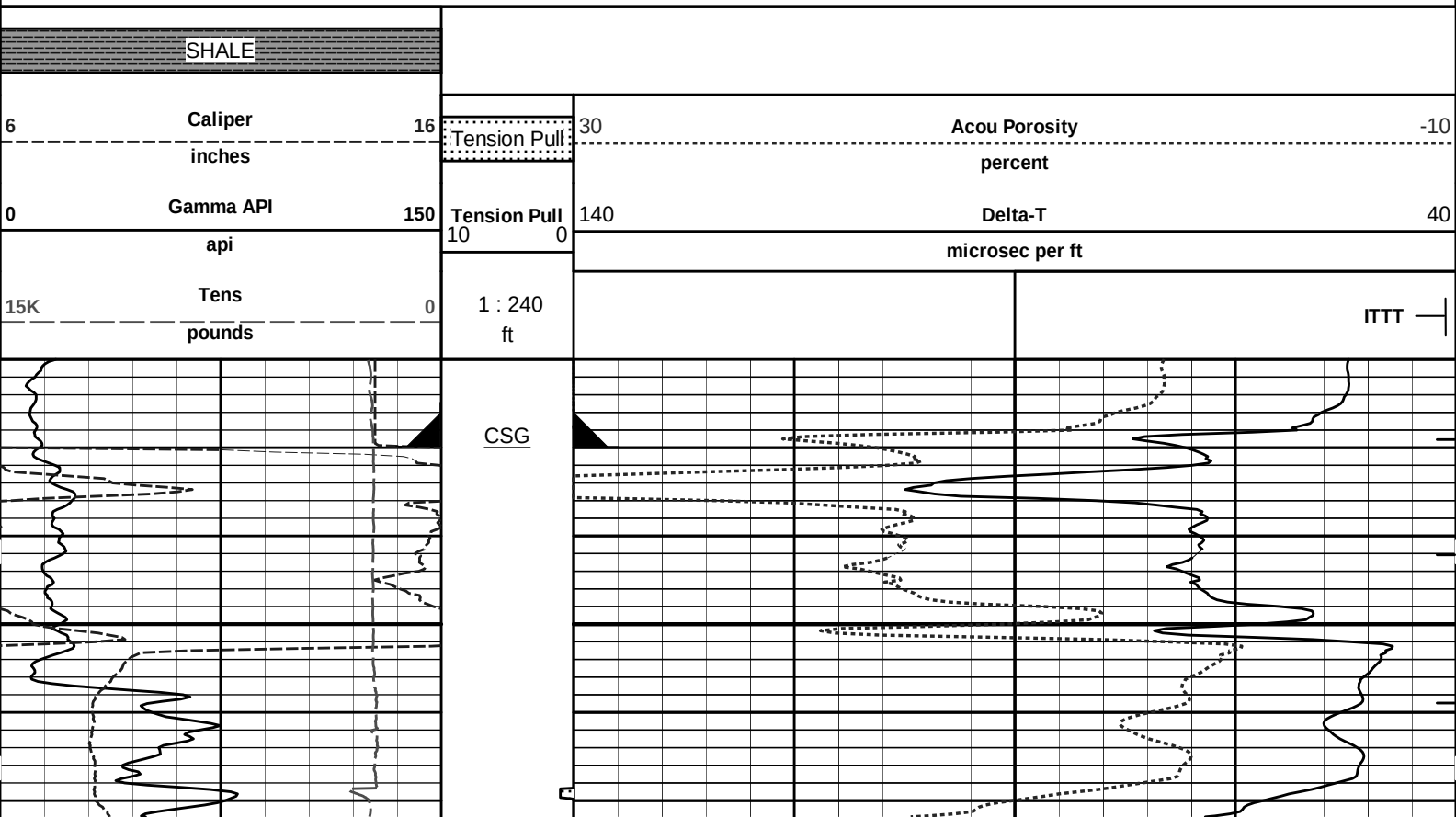
TODAY'S CREW: K. KELLY, K. KING

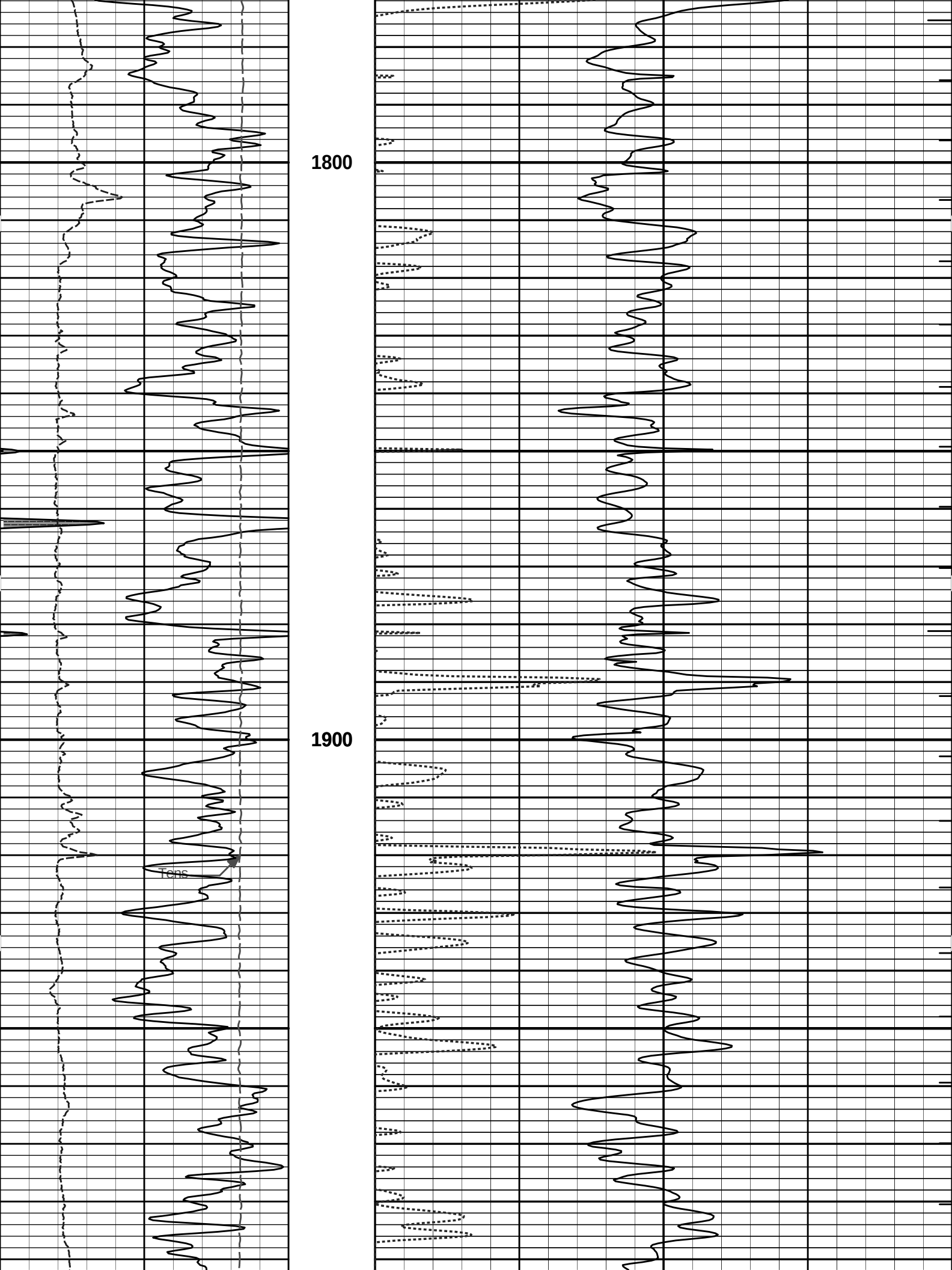
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - LIBERAL, KS (620-624-8123)

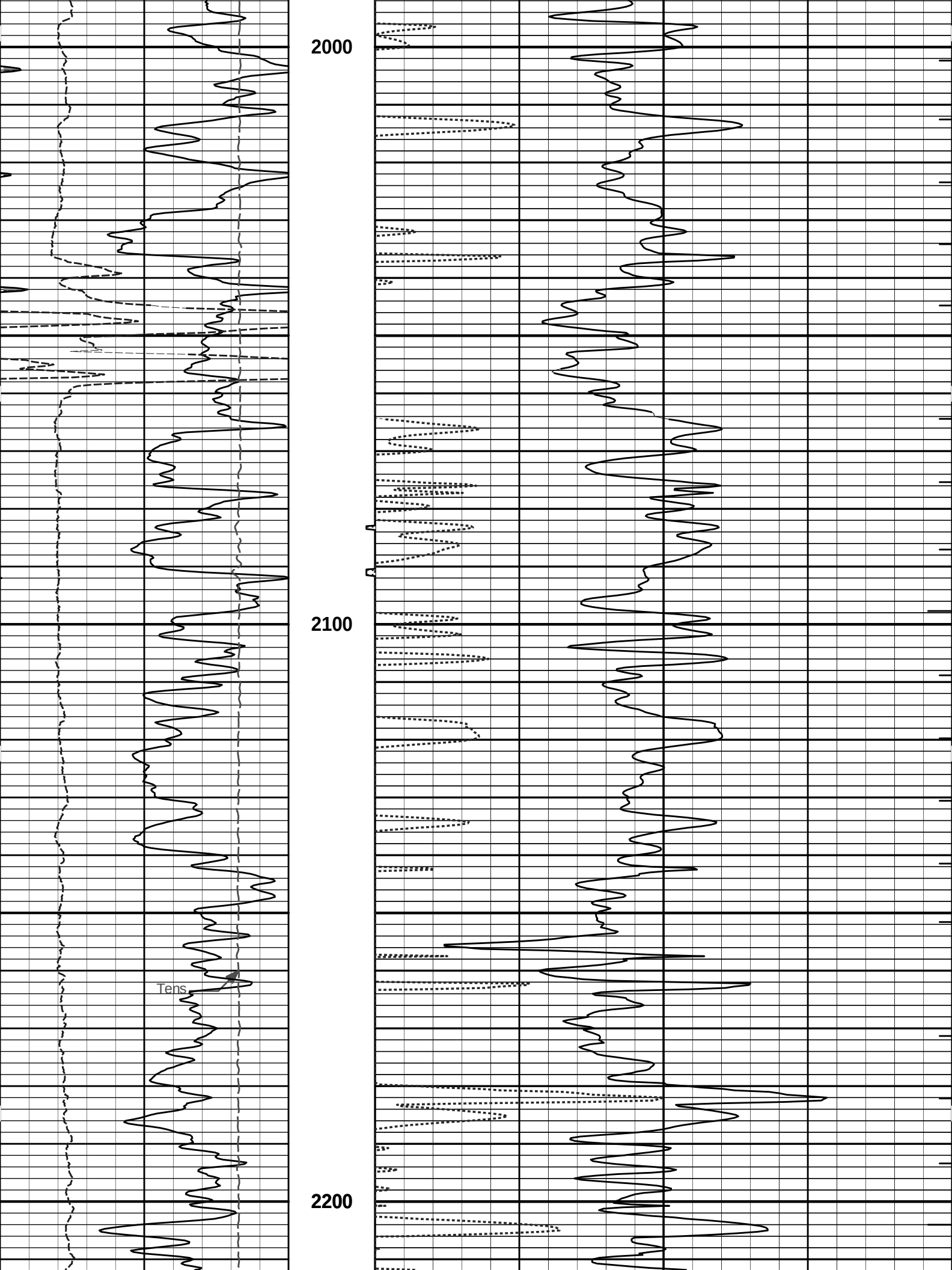
HALLIBURTON

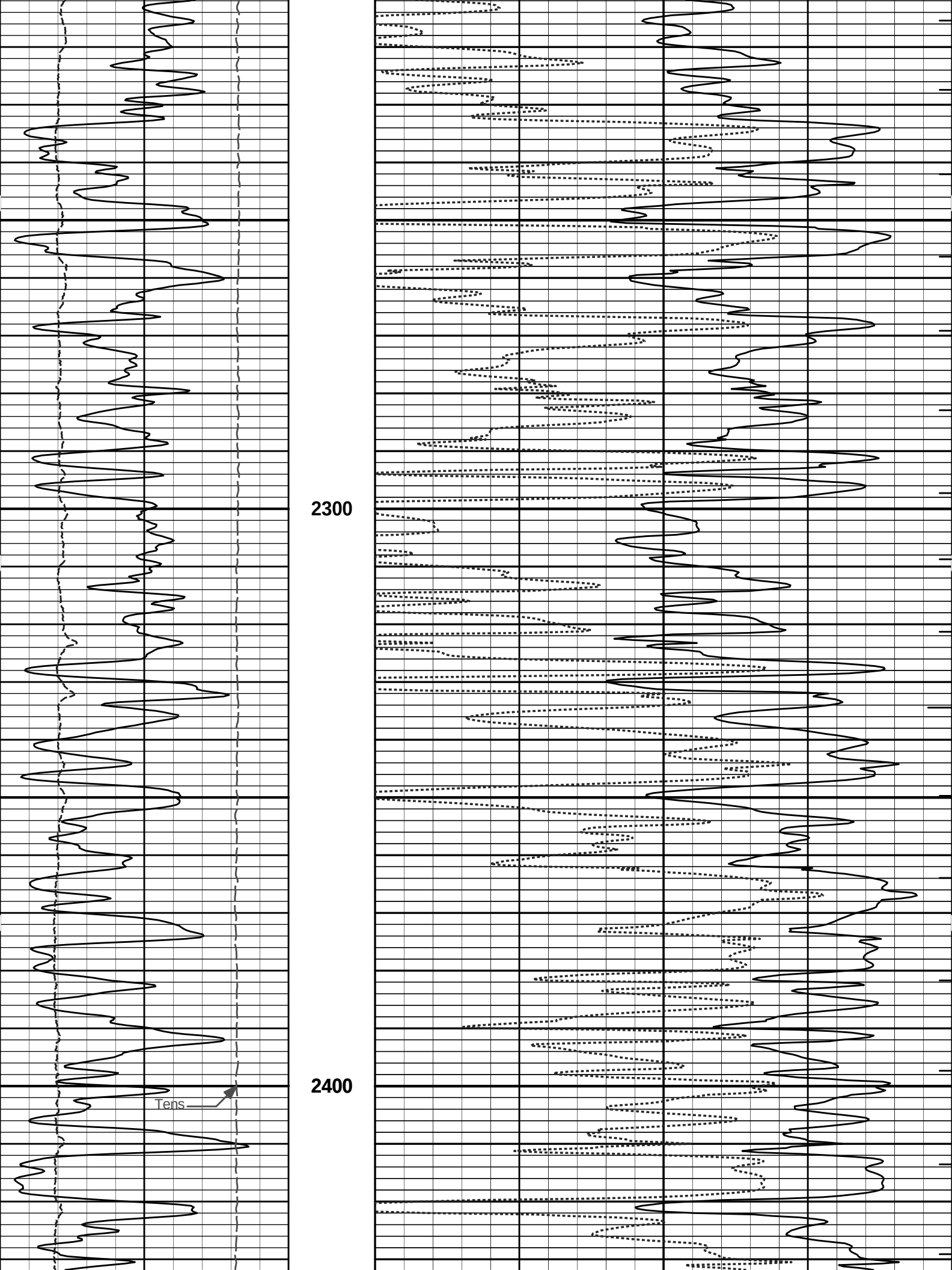
Plot Time: 02-Jul-11 10:40:59
Plot Range: 1720 ft to 6507.08 ft
Data: TIMKEN_22_1\Well Based\DAQ-0001-CSG
Plot File: \\BSAT\BSAT_5_MAIN_LIB

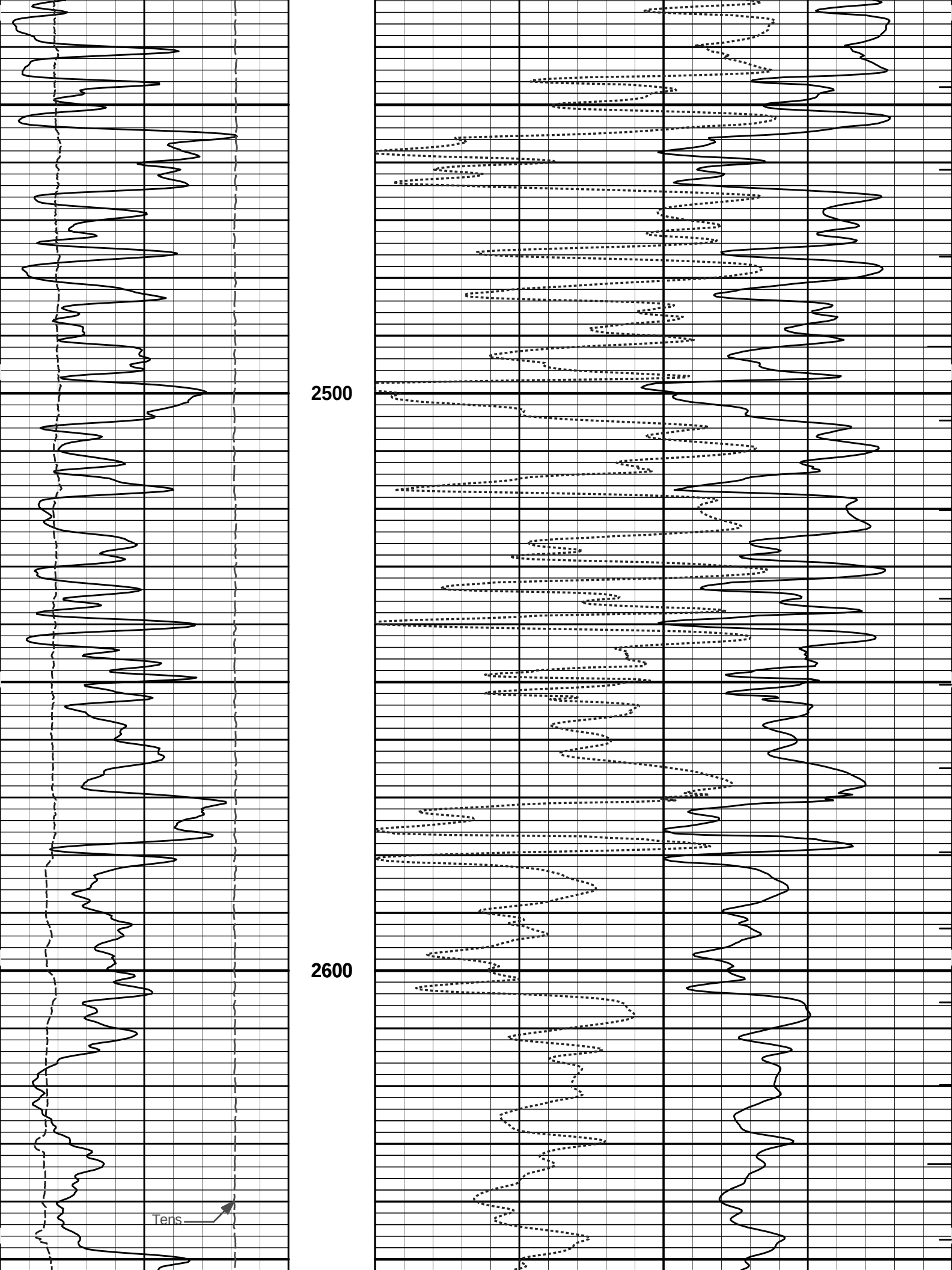
5 INCH MAIN LOG

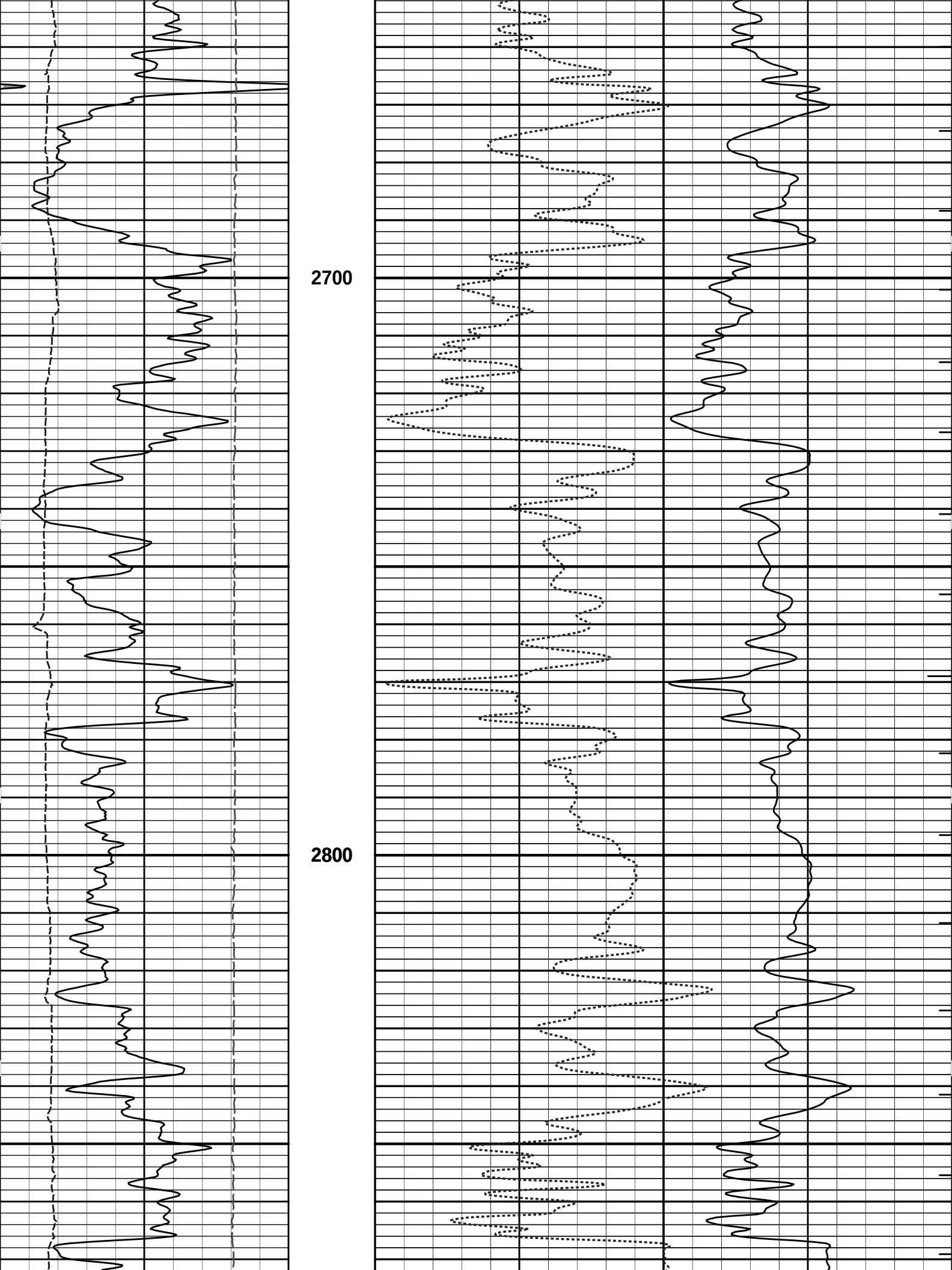


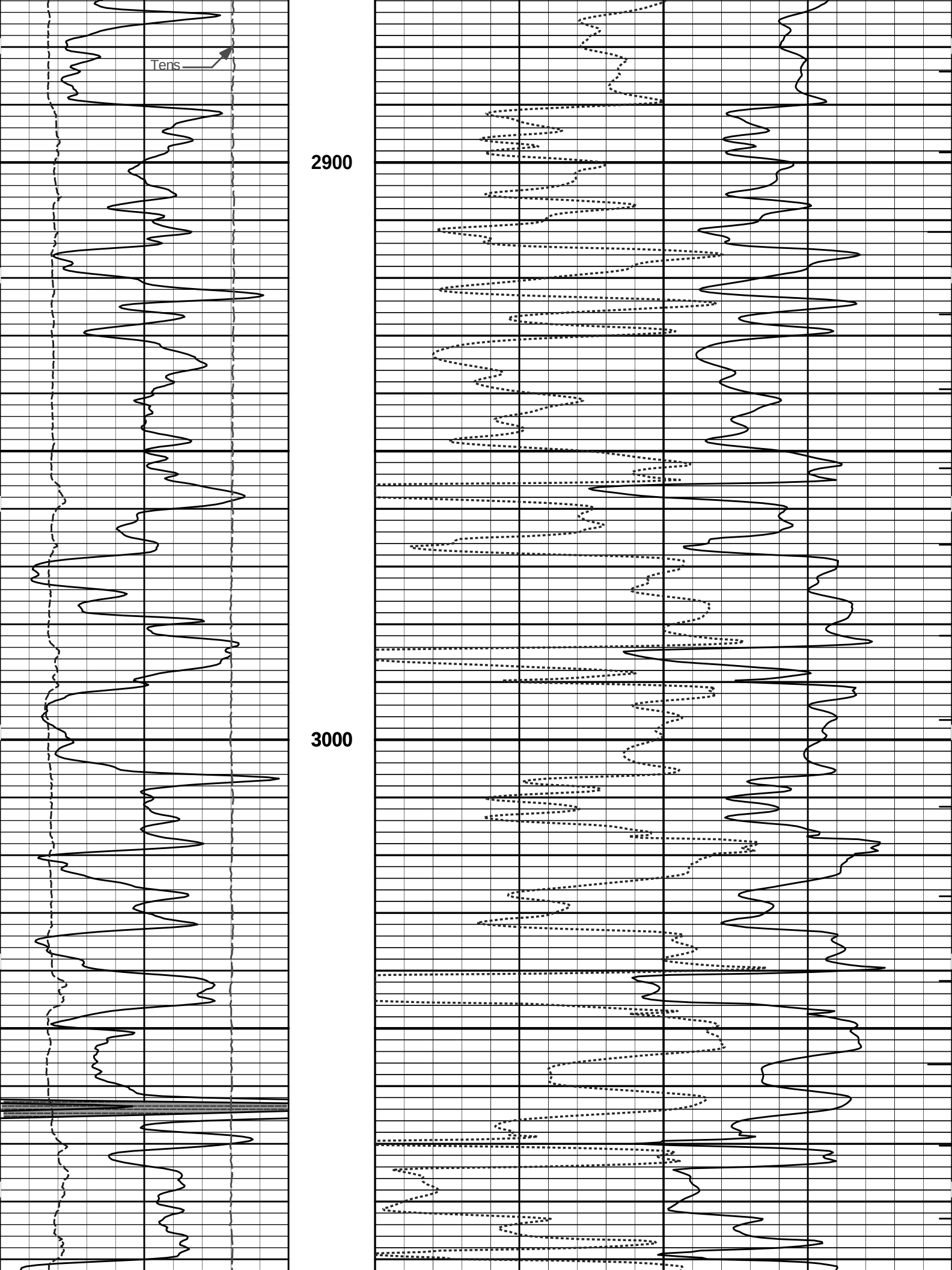

1800
1900
Tens

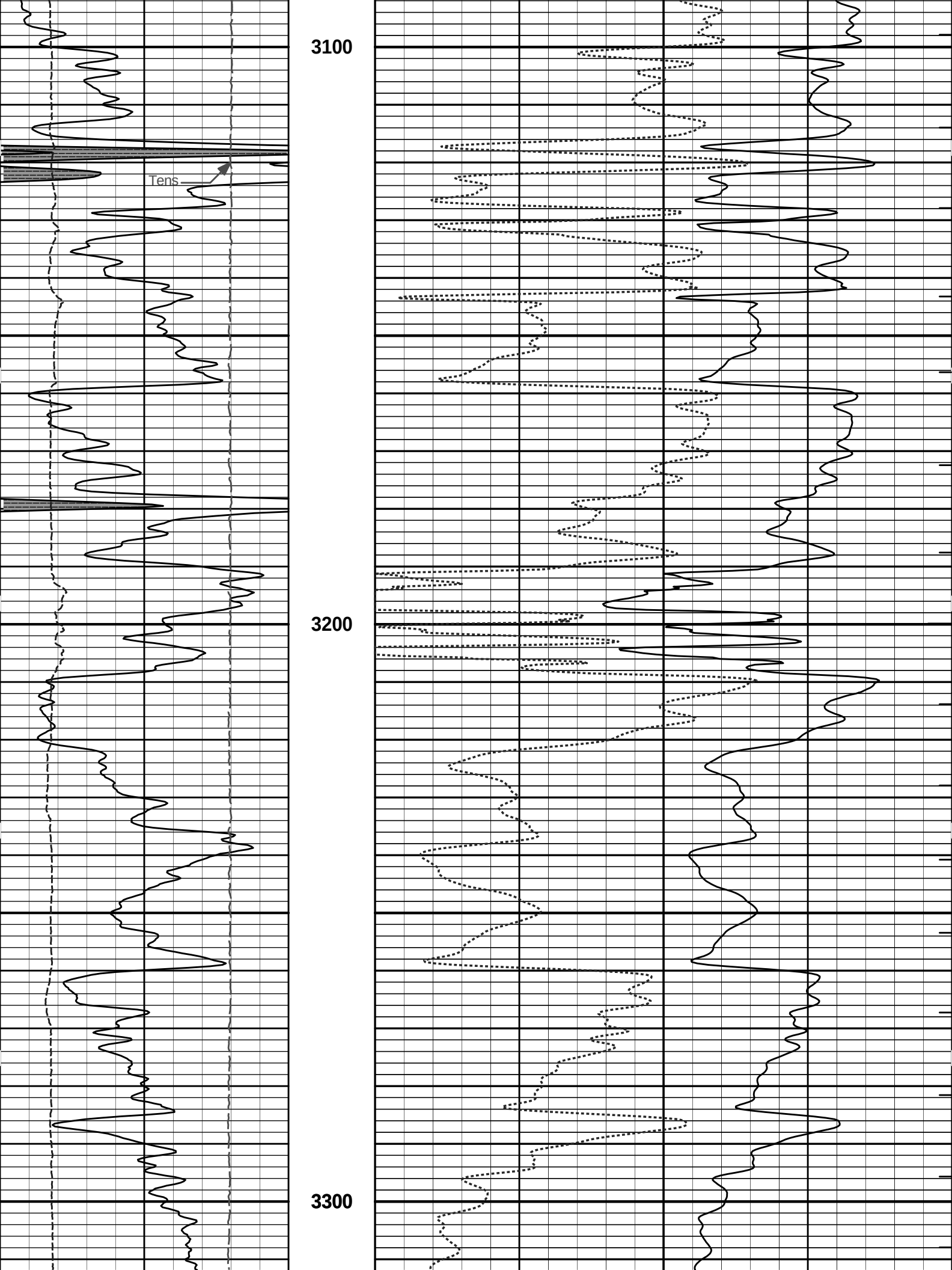

2000
2100
2200
Tens

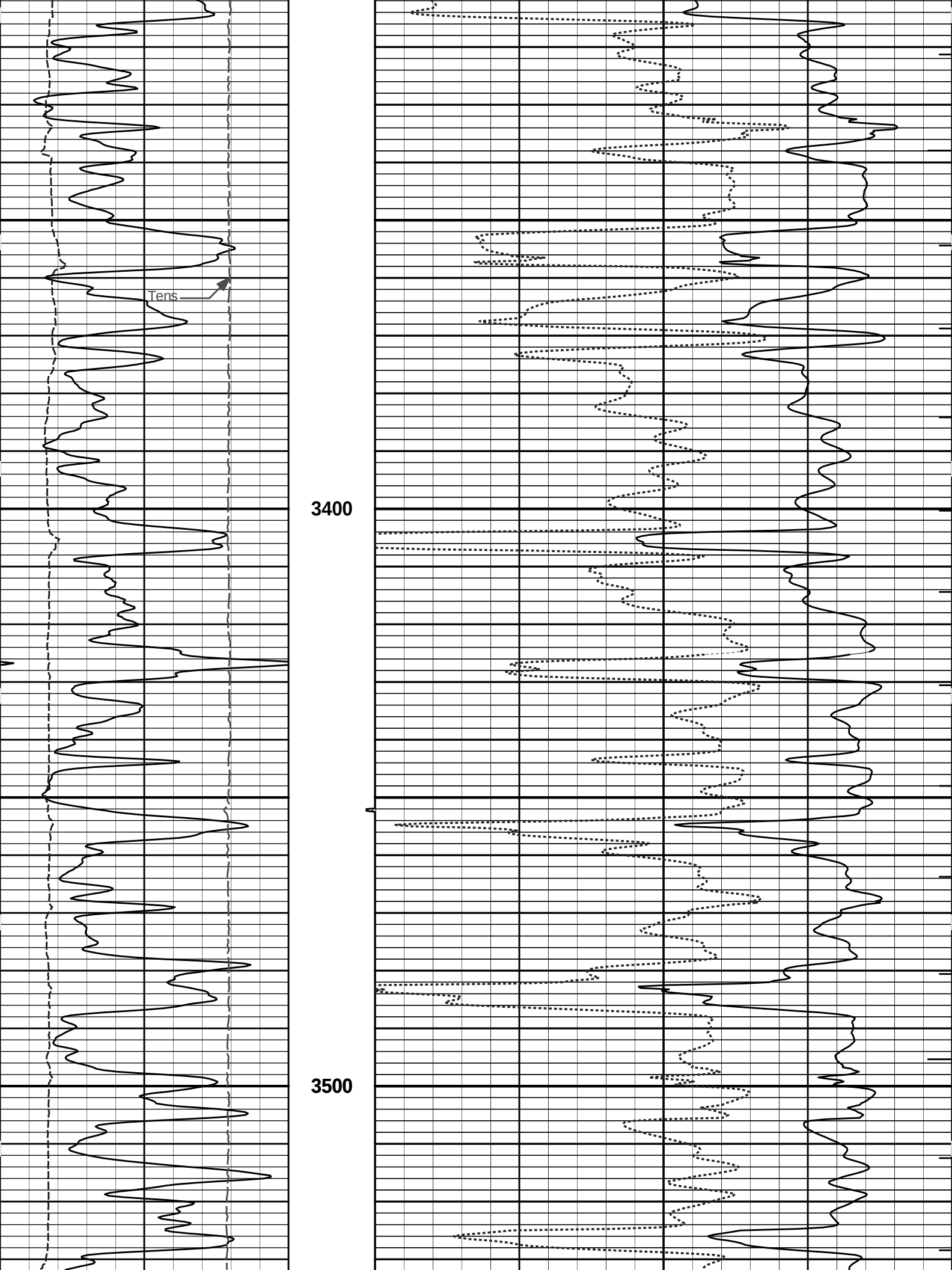

2300
2400
Tens

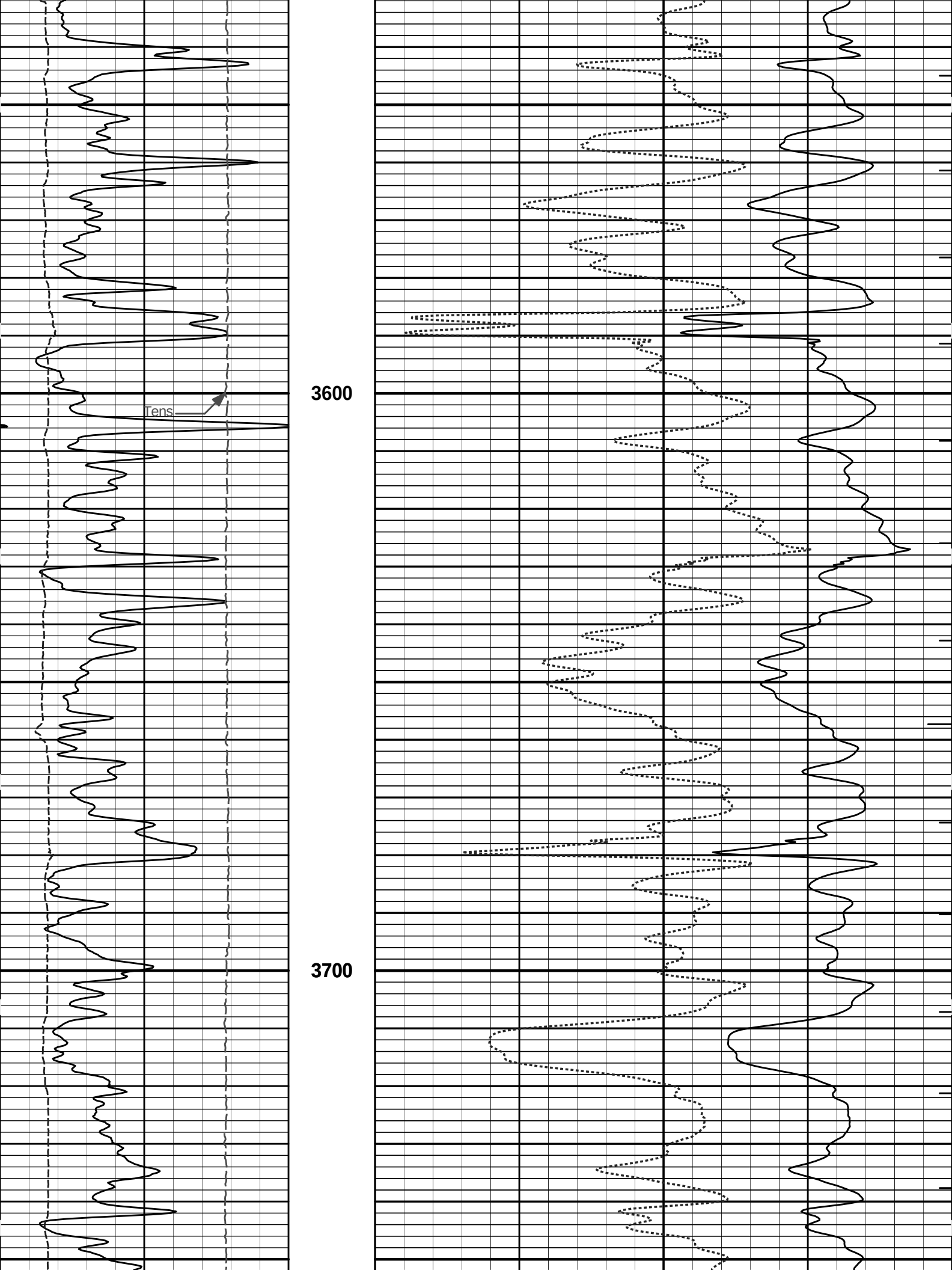

2500
2600
Tens

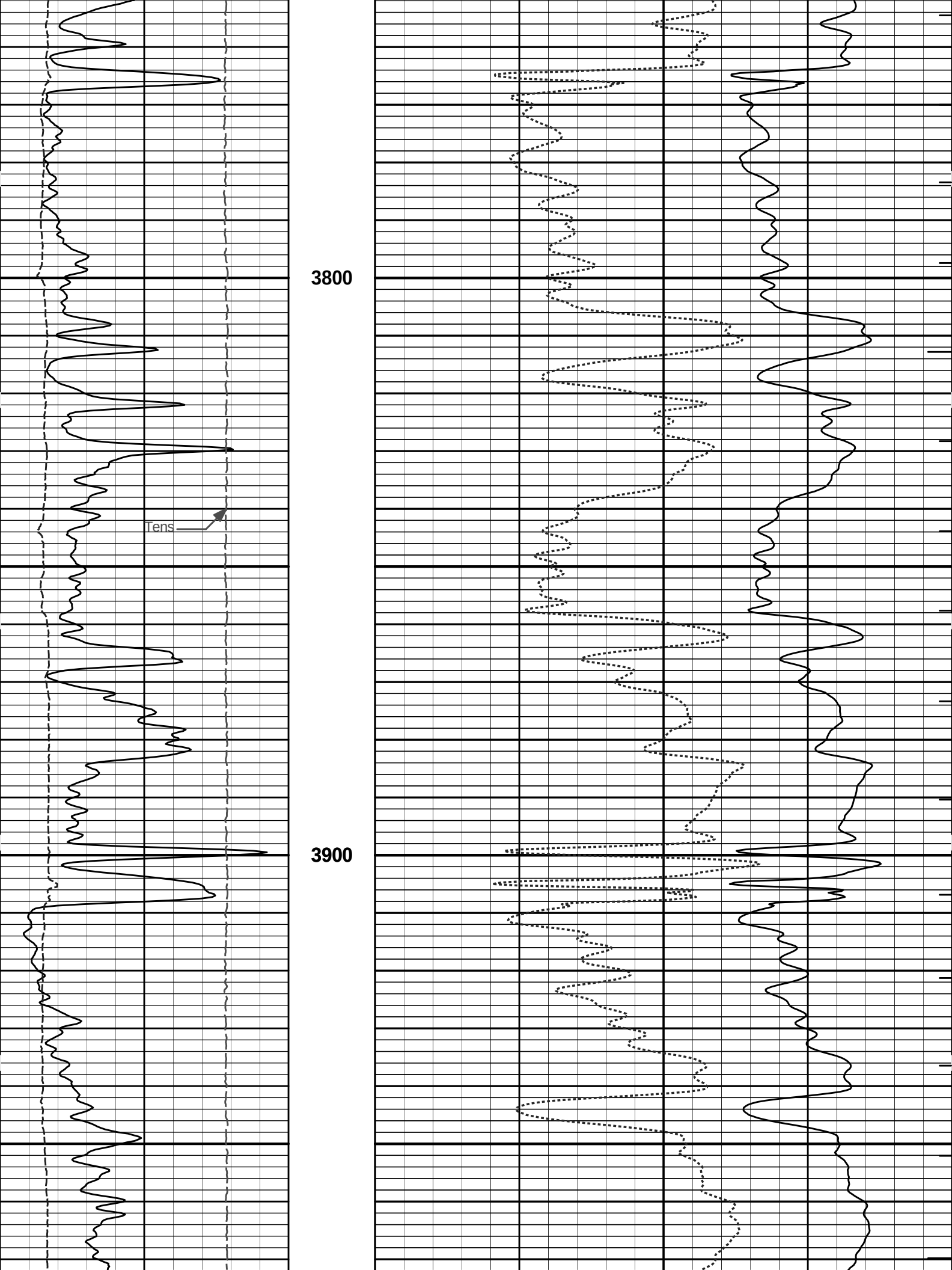

2700
2800

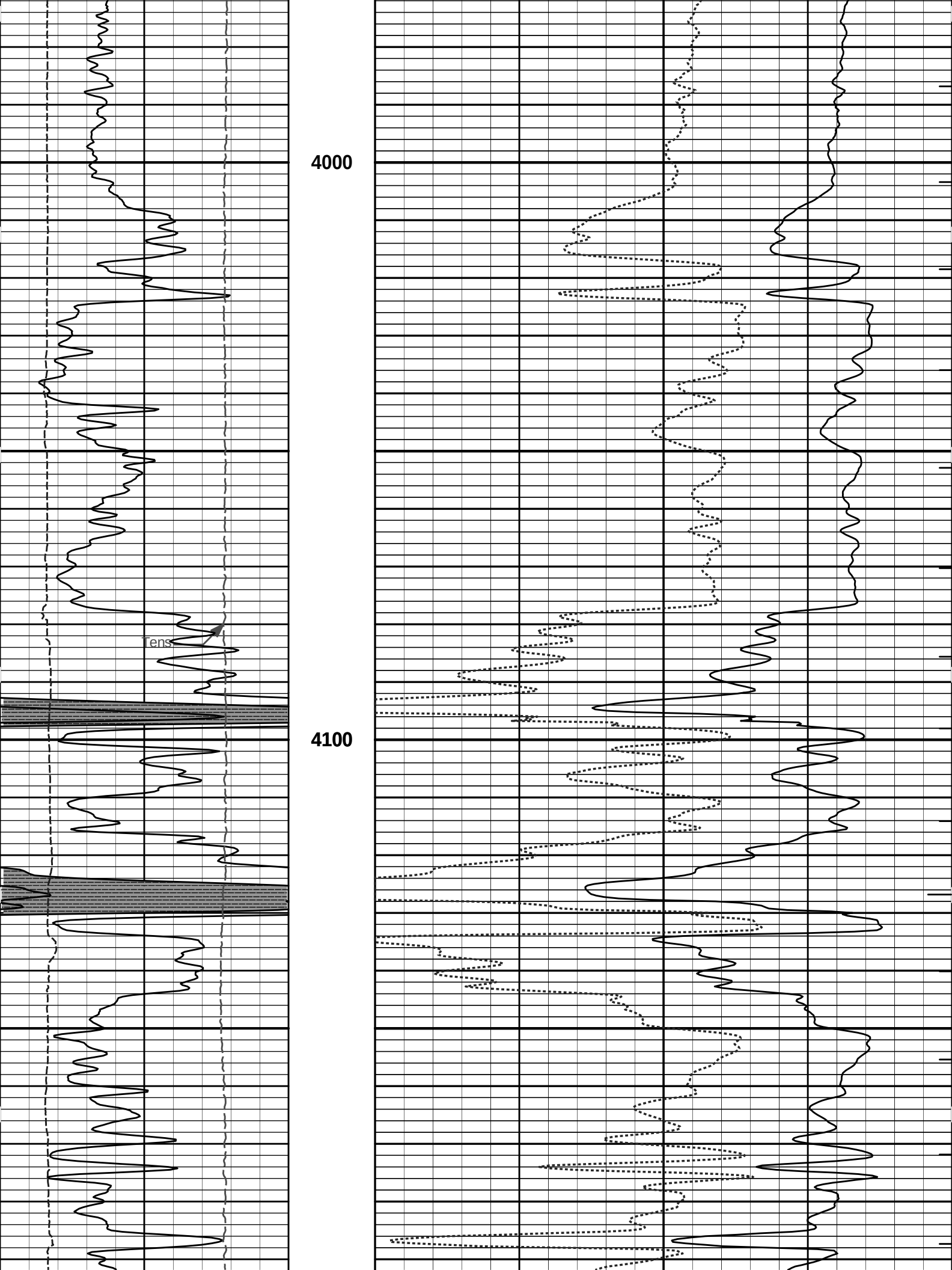

Tens
2900
3000

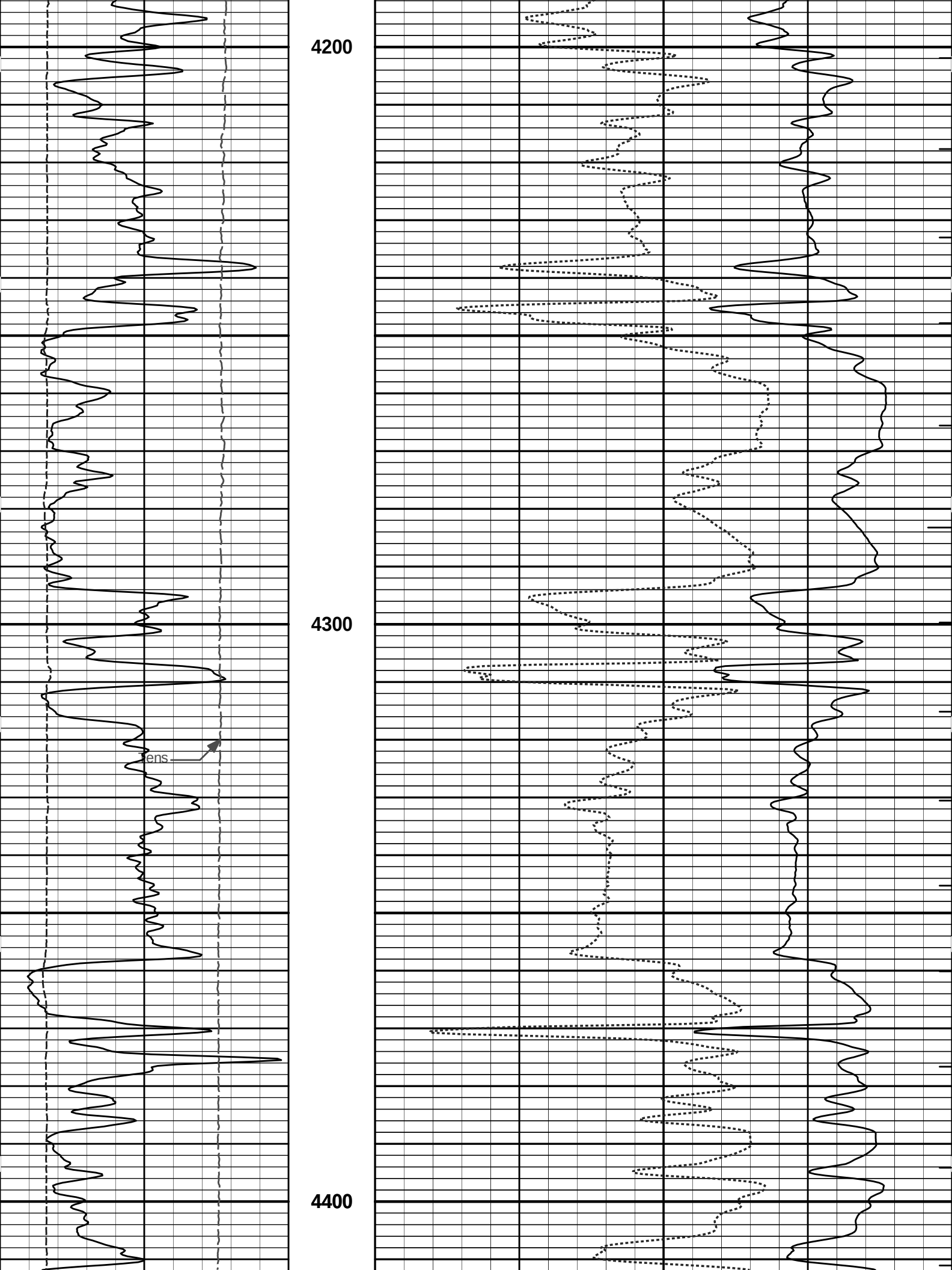

Tens
3100
3200
3300

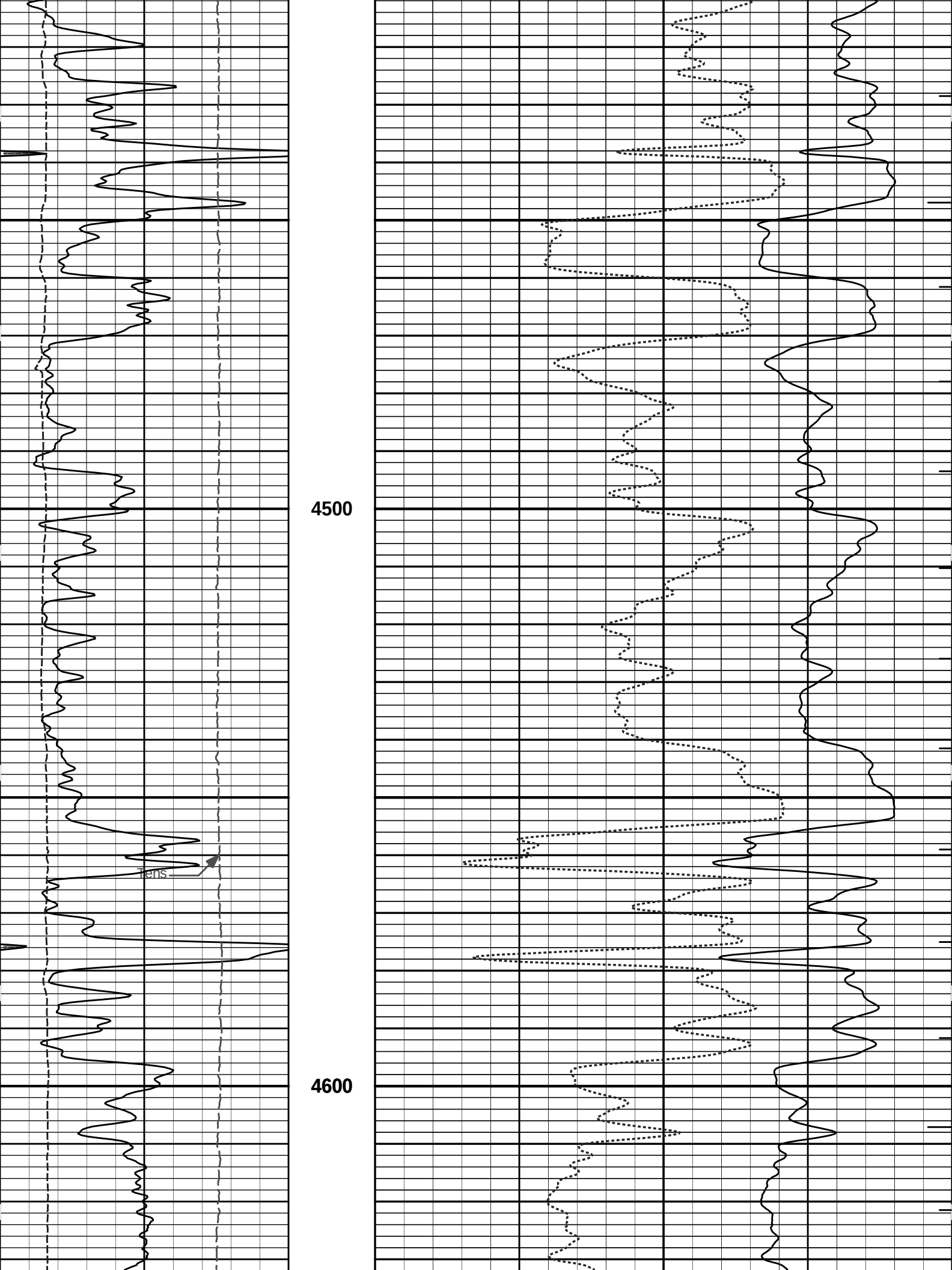

Tens
3400
3500

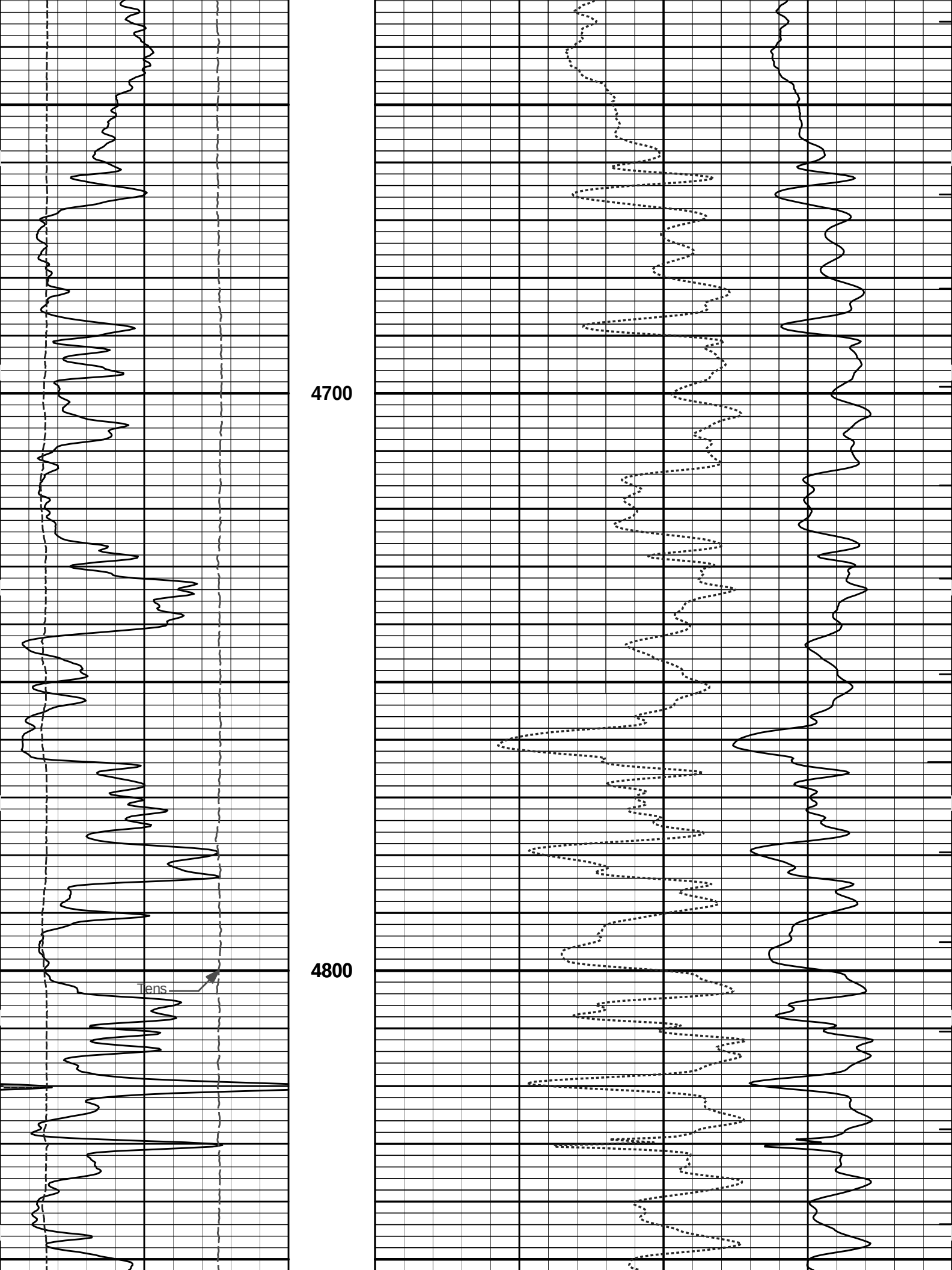

Tens
3600
3700

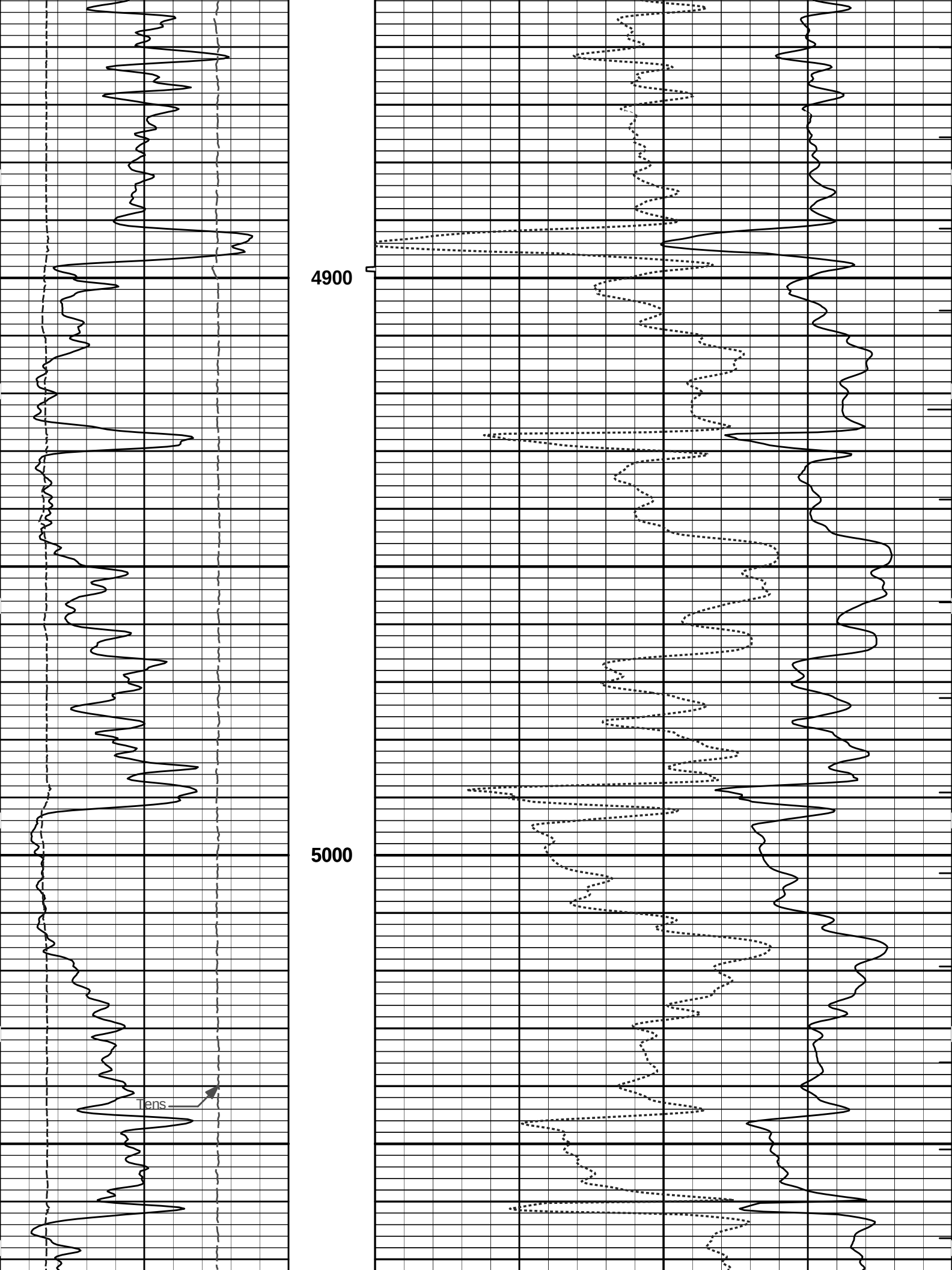

3800
Tens
3900

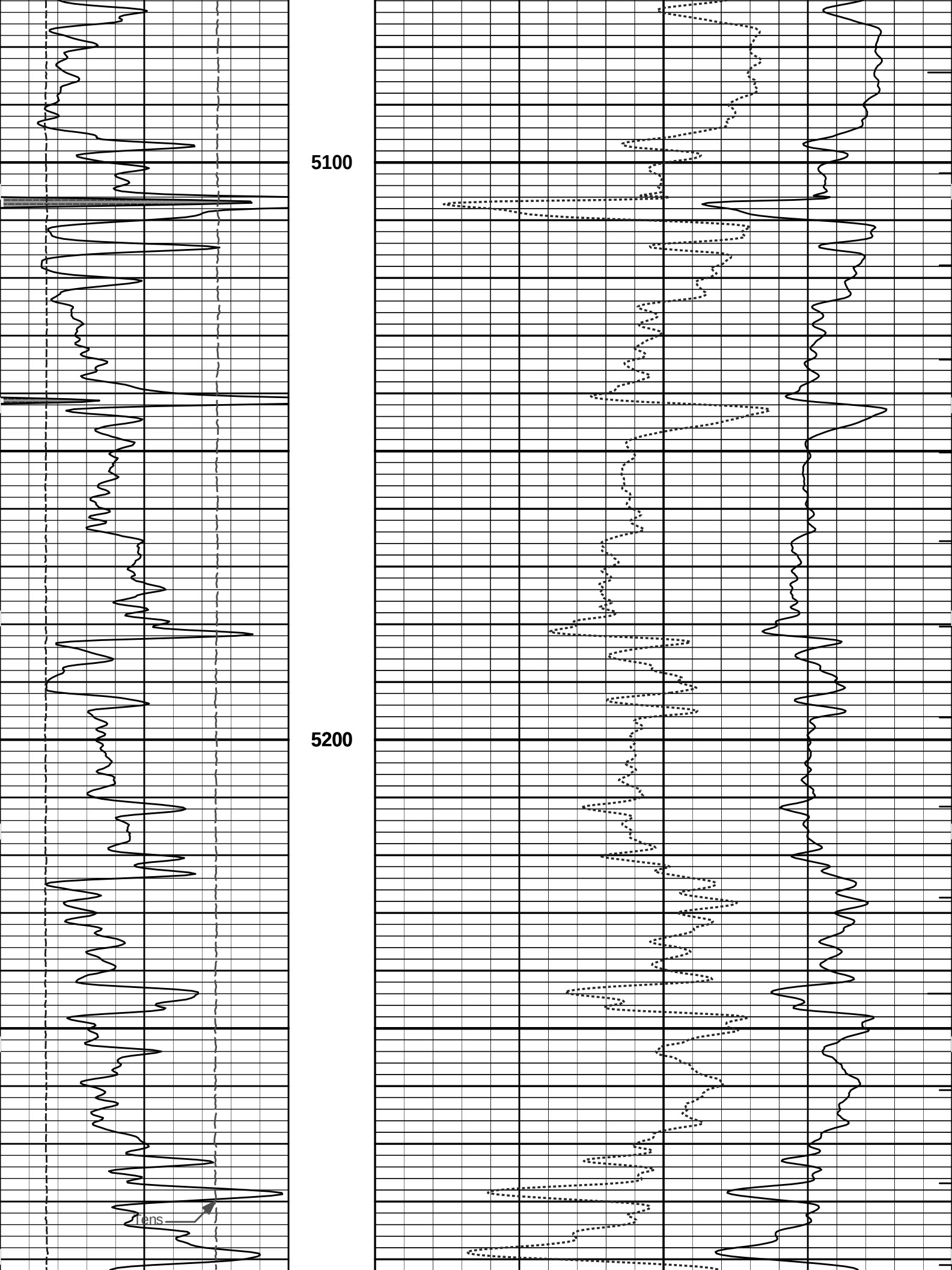

4000
Tens
4100

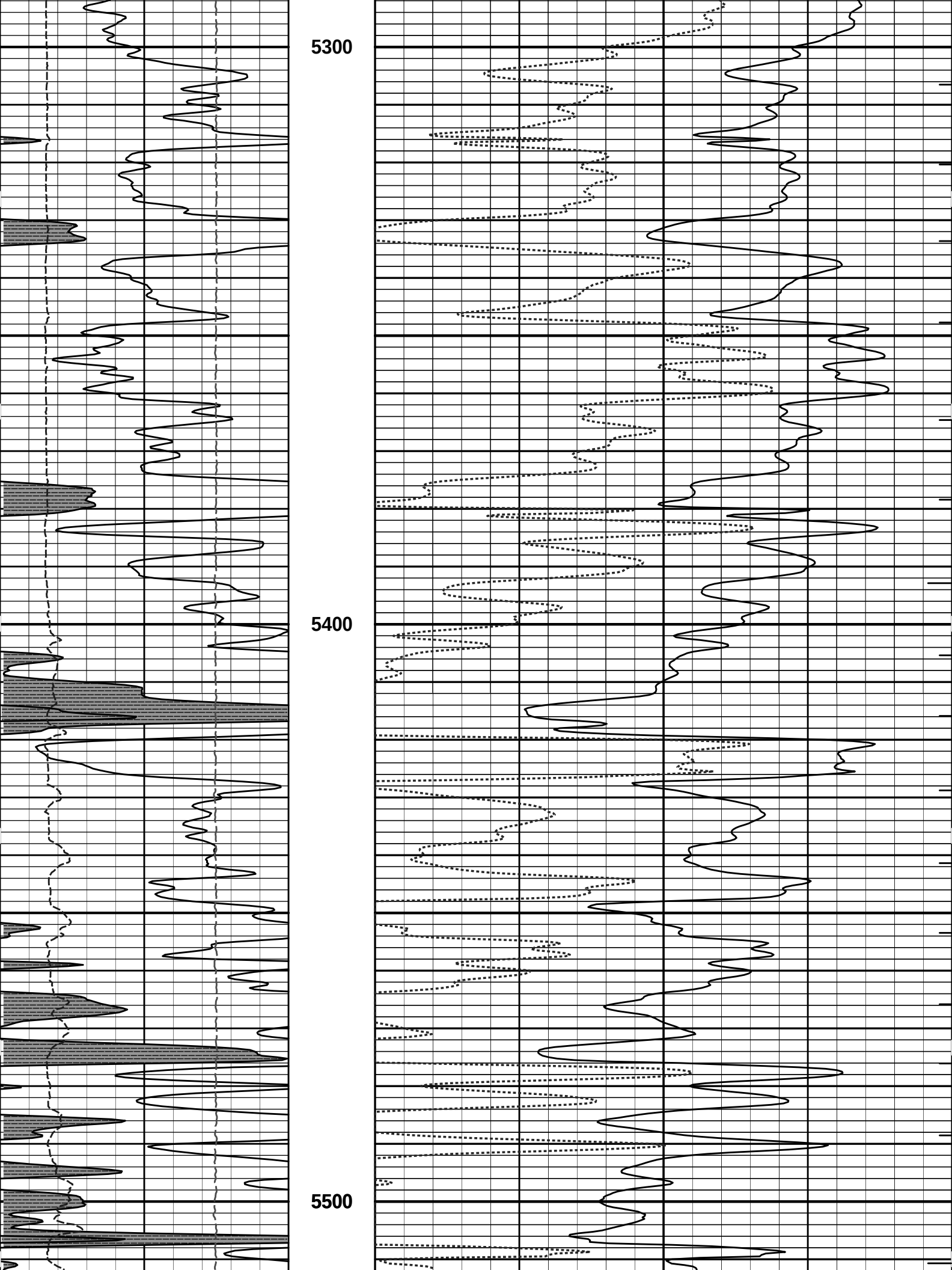

4200
4300
4400
Tens

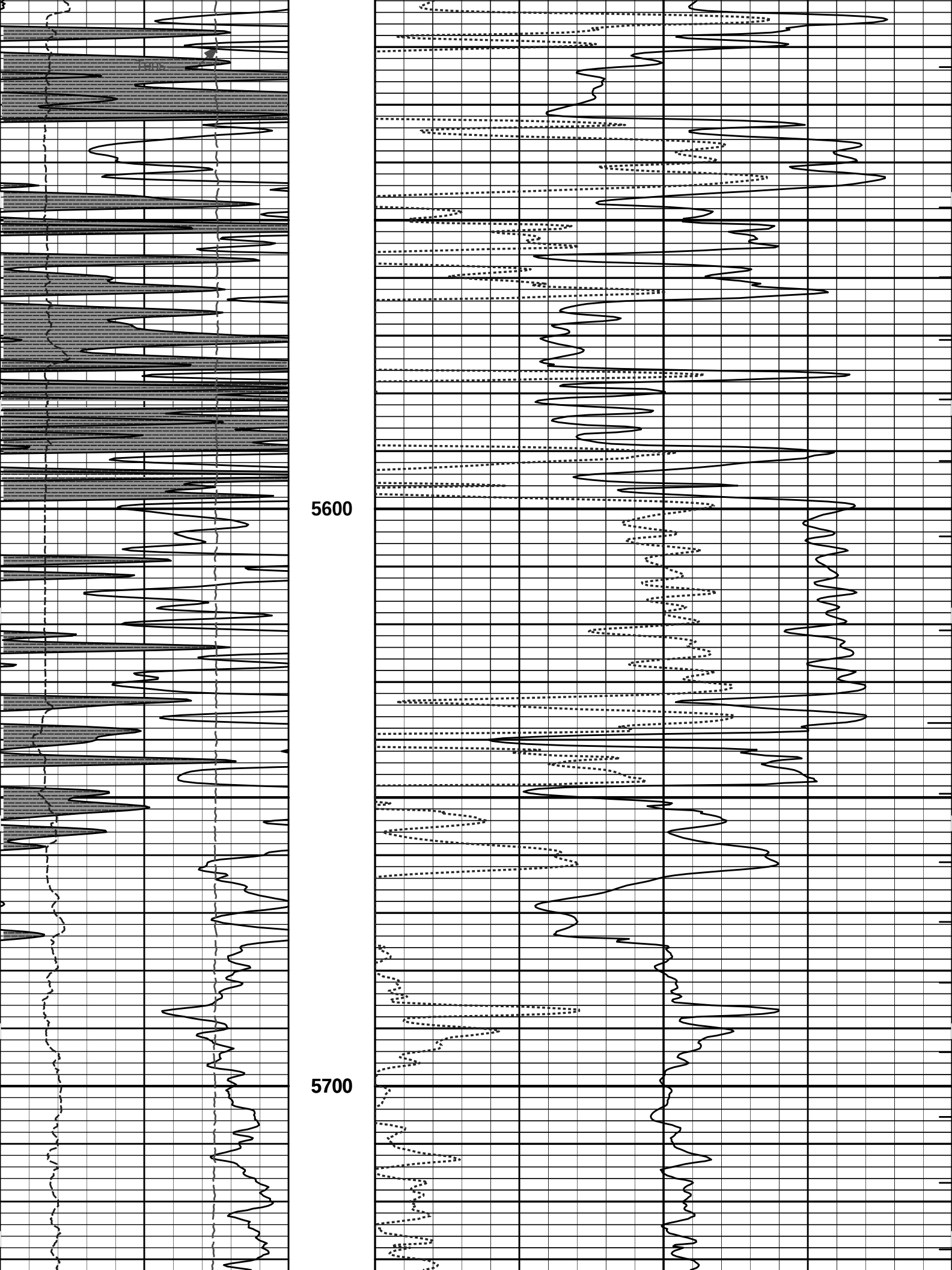

4500
4600
Tens

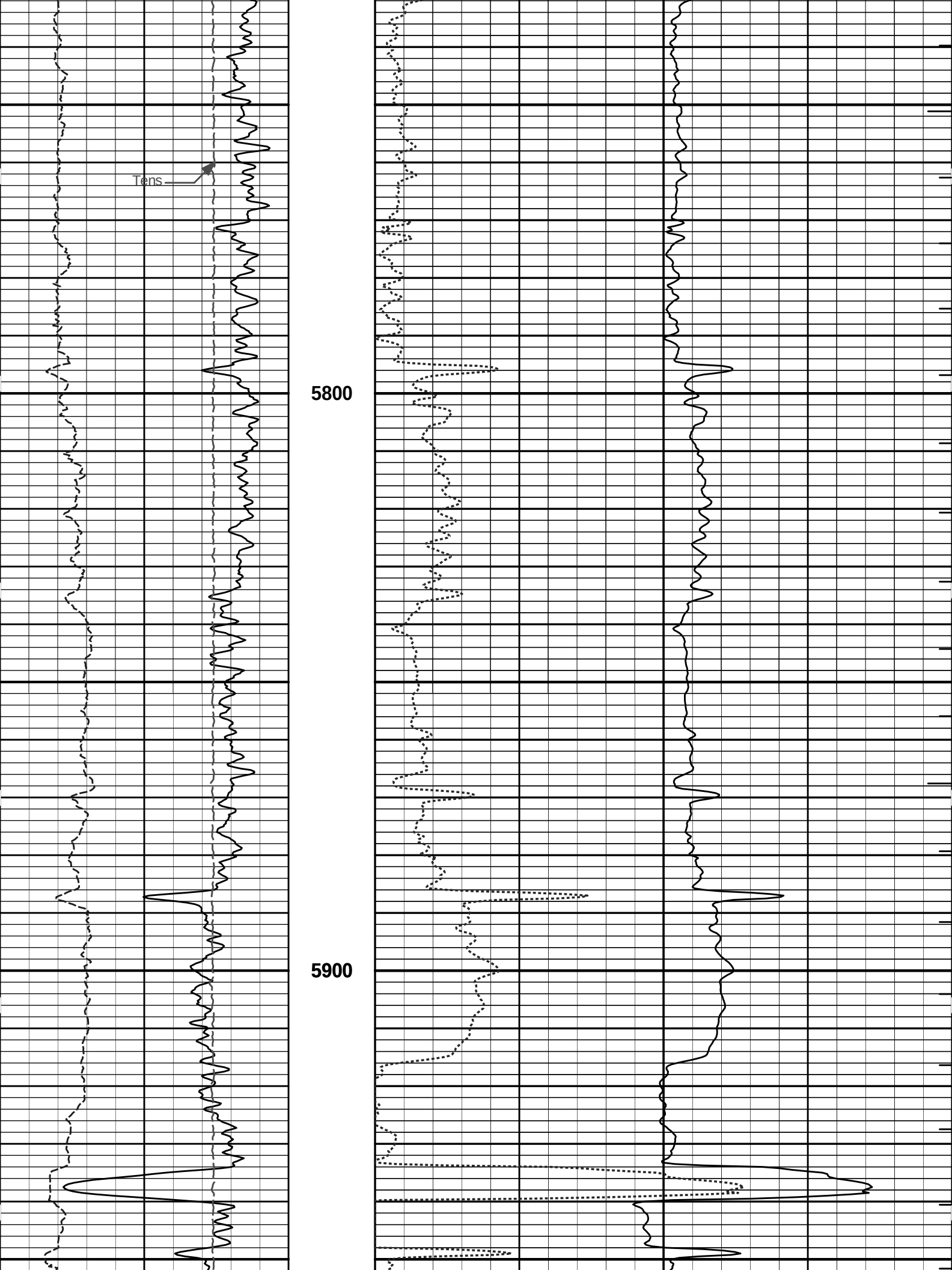

4700
4800
Tens

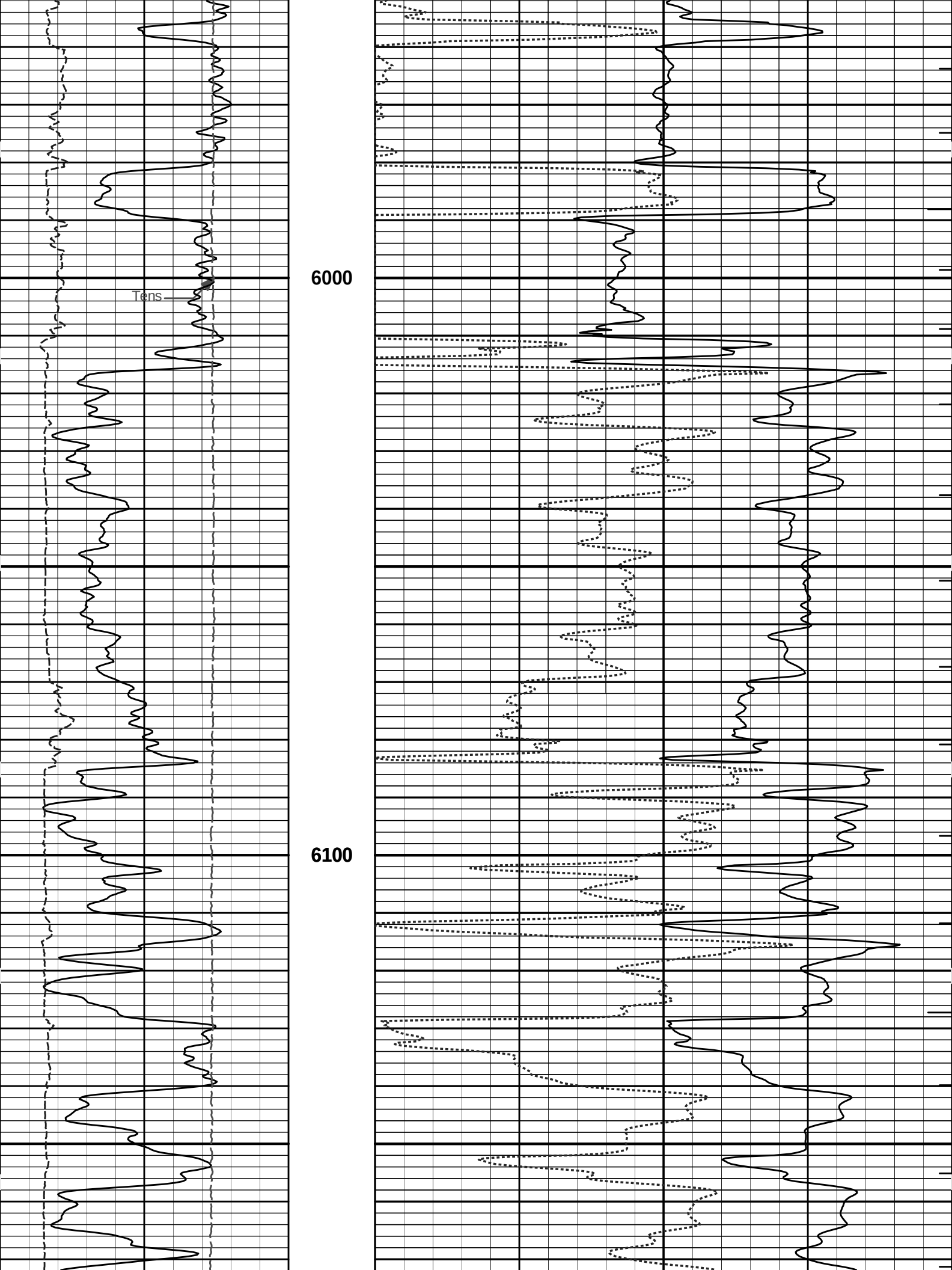

4900
5000
Tens

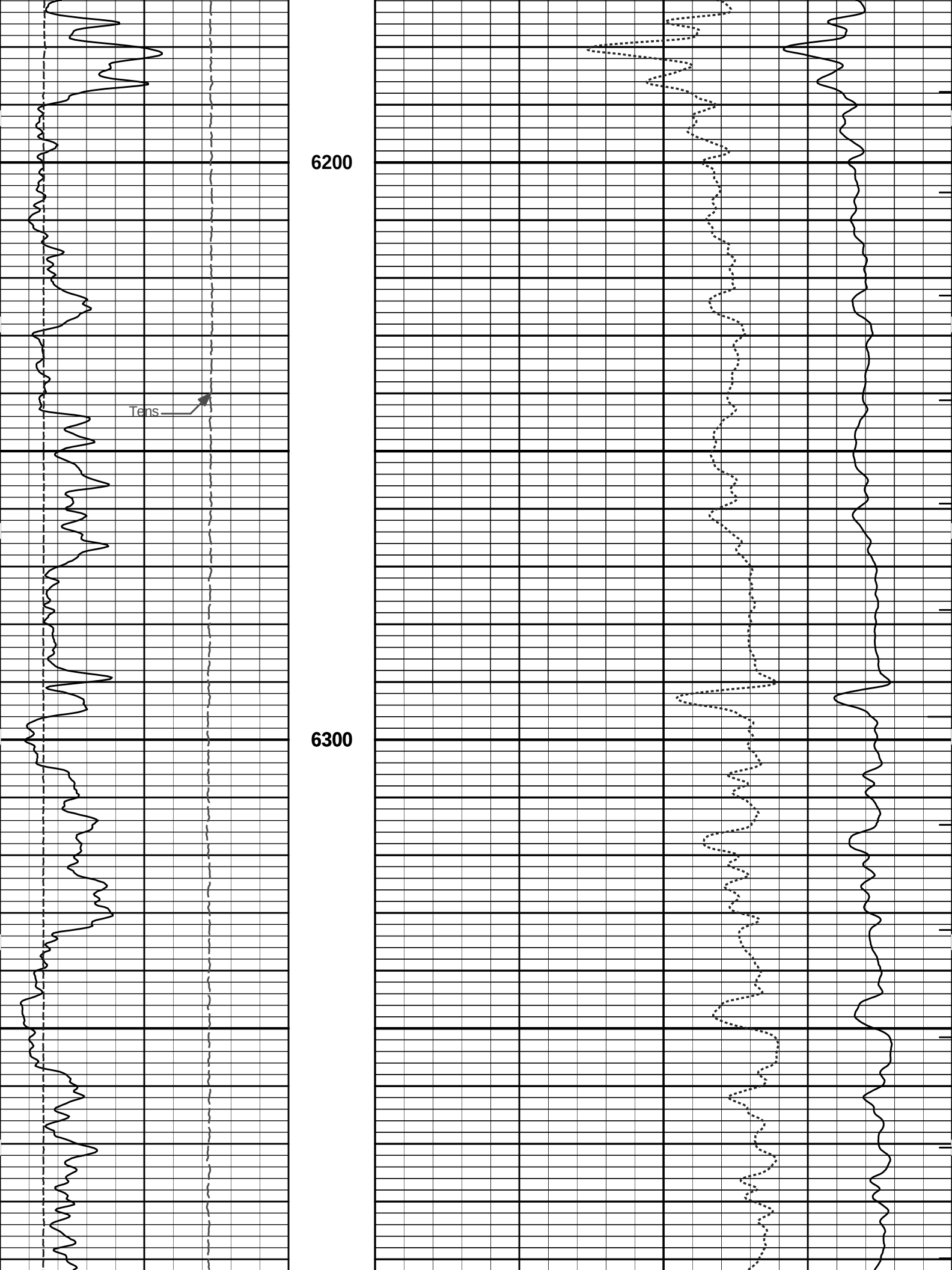

5100
5200
Tens

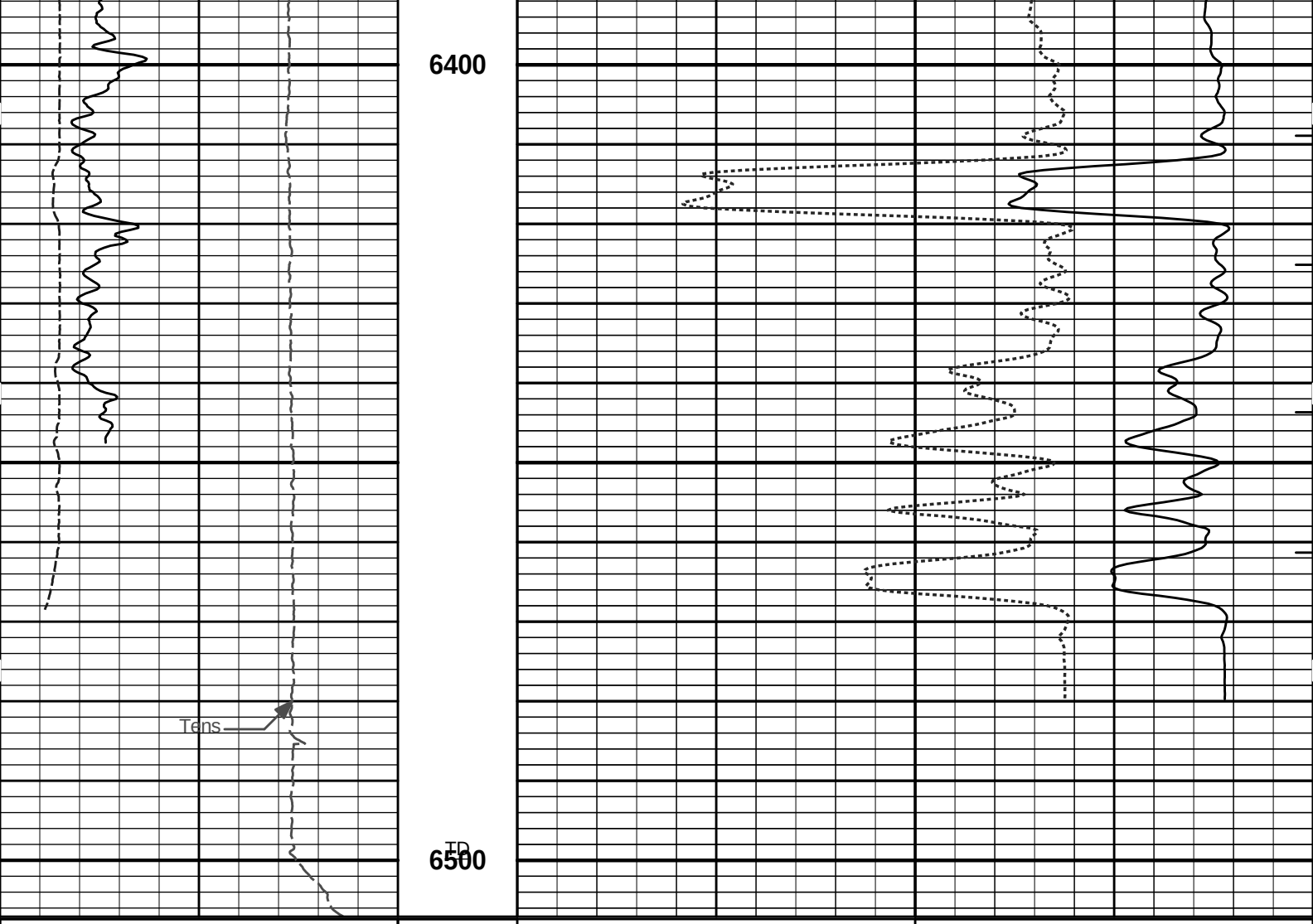

5300
5400
5500


5600
5700


Tens
5800
5900


Tens
6000
6100


6200
Tens
6300



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

HALLIBURTON

Plot Time: 02-Jul-11 10:41:38
Plot Range: 1720 ft to 6507.08 ft
Data: TIMKEN_22_1\Well Based\DAQ-0001-CSG\
Plot File: \\BSAT\BSAT_5_MAIN_LIB

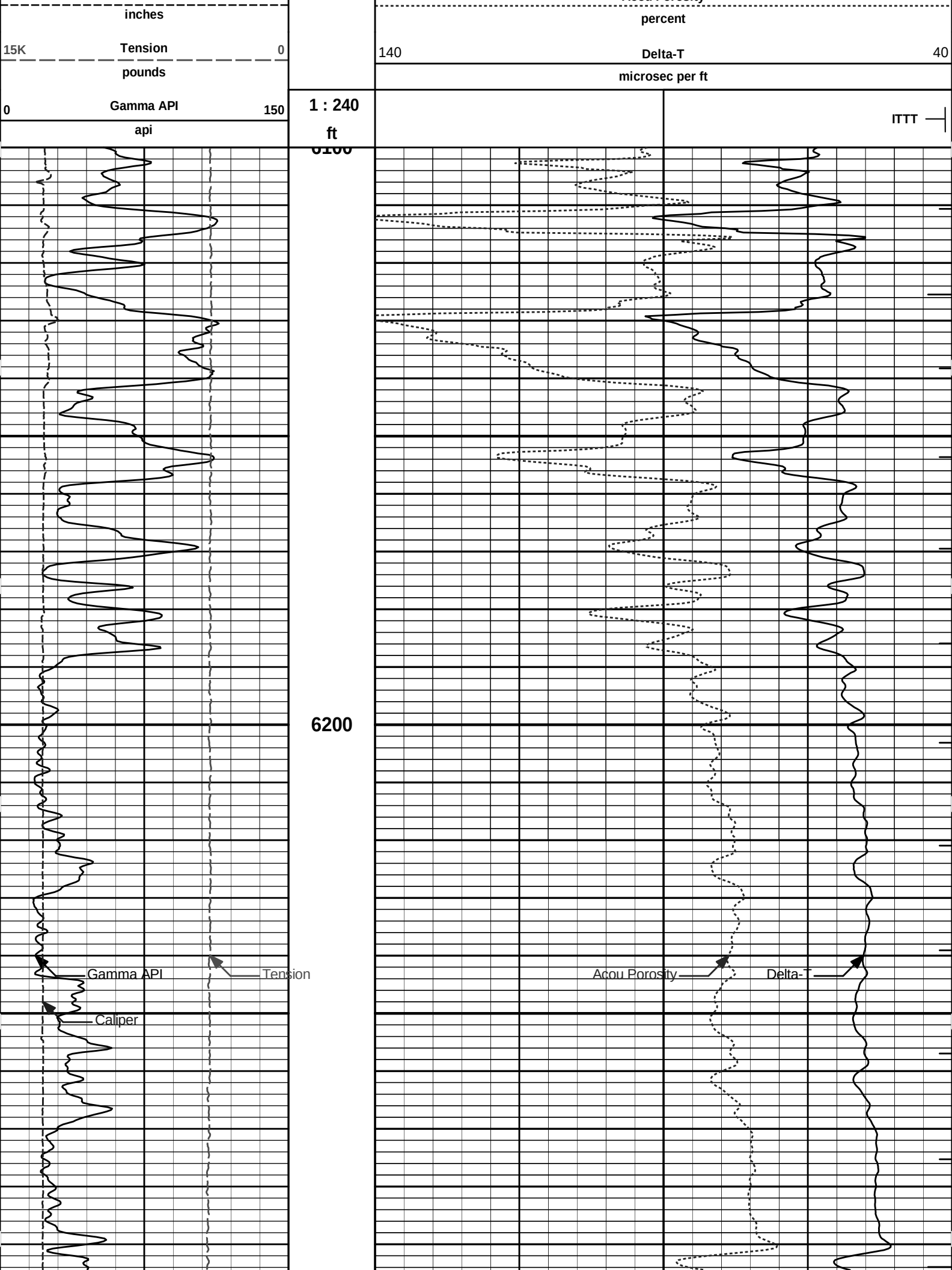
5 INCH MAIN LOG

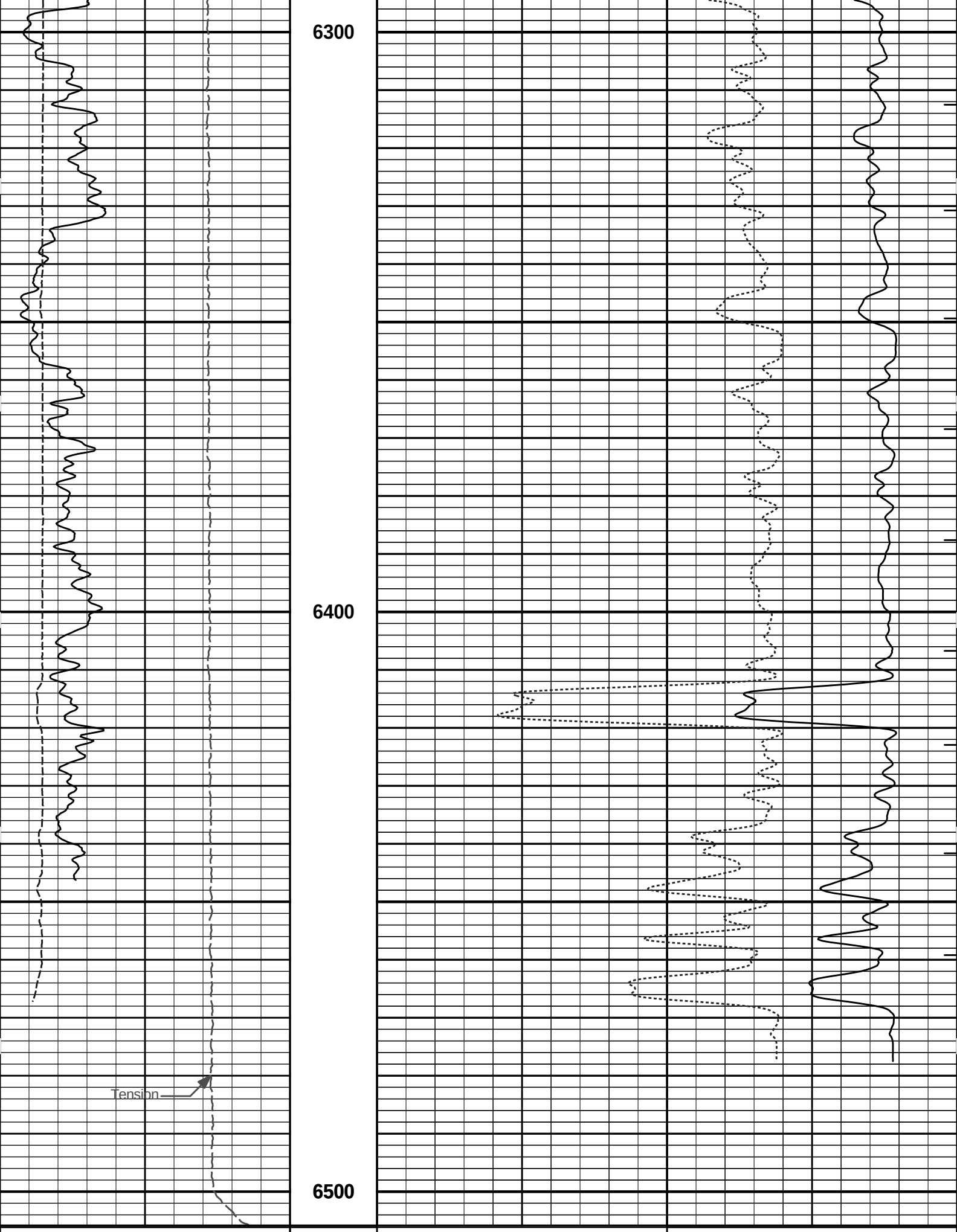
HALLIBURTON

Plot Time: 02-Jul-11 10:41:39
Plot Range: 6100 ft to 6505.83 ft
Data: TIMKEN_22_1\Well Based\DAQ-0001-REPEAT\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION

6 Caliper 16		30 Acou Porosity -10


inches
15K
Tension
0
pounds
0
Gamma API
150
api
1 : 240
ft
percent
140
Delta-T
40
microsec per ft
ITTT
6100
6200
Gamma API
Tension
Caliper
Acou Porosity
Delta-T



0	Gamma API	150	1 : 240		ITTT
	api		ft		

15K	Tension	0	140	Delta-T	40
	pounds			microsec per ft	
6	Caliper	16	30	Acou Porosity	-10
	inches			percent	

HALLIBURTON

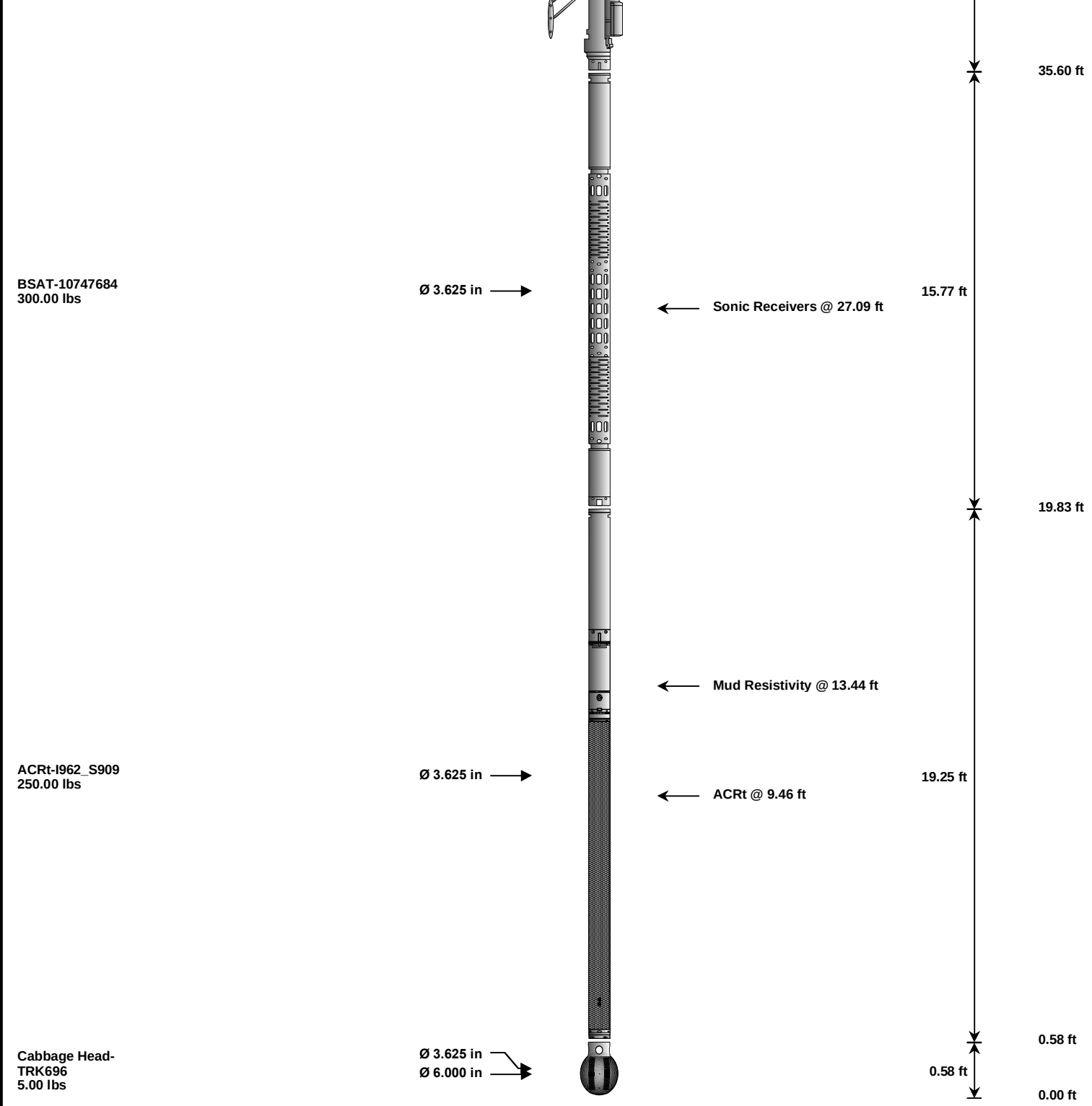
Plot Time: 02-Jul-11 10:41:45
Plot Range: 6100 ft to 6505.83 ft
Data: TIMKEN_22_1\Well Based\DAQ-0001-REPEAT\
Plot File: \\BSAT\BSAT_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						72.34 ft
CH_HOS-CH_696 37.50 lbs		Ø 2.750 in		Temperature @ 71.31 ft	3.03 ft	
						69.31 ft
XOHD-TRK696 20.00 lbs		Ø 2.750 in Ø 3.625 in			0.95 ft	
						68.36 ft
SP Sub-PROT01 60.00 lbs		Ø 3.625 in		SP @ 66.59 ft	3.74 ft	
						64.63 ft
GTET-11048627 165.00 lbs		Ø 3.625 in			8.52 ft	
				GammaRay @ 58.56 ft		
						56.10 ft
	DSN Decentralizer-10755066 6.60 lbs	Ø 3.625 in*				
DSNT-11055304 174.00 lbs		Ø 3.625 in			9.69 ft	
				DSN Far @ 49.17 ft DSN Near @ 48.42 ft		
						46.42 ft
SDLT-I04_P84 360.00 lbs		Ø 4.500 in			10.81 ft	
		Ø 4.750 in		SDL Microlog @ 38.60 ft SDL Caliper @ 38.42 ft SDL @ 38.41 ft		



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_696	37.50	3.03		69.31	300.00
XOHD	Hostile to Dits Cross Over	TRK696	20.00	0.95		68.36	300.00
SP	SP Sub	PROT01	60.00	3.74		64.63	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52		56.10	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69		46.42	60.00
DCNT	DSN Decentralizer	10755066	6.60	5.13	*	49.75	300.00
SDLT	Spectral Density Tool	I04 P84	360.00	10.81		35.60	60.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77		19.83	60.00
ACRt	Array Compensated True Resistivity	I962_S909	250.00	19.25		0.58	300.00
CBHD	Cabbage Head	TRK696	5.00	0.58		0.00	300.00
Total			**1,378.10**	**72.34**			

* Not included in Total Length and Length Accumulation.

Data: TIMKEN_22_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 02-Jul-11 08:33:19**

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	9.200	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	1.380	ohmm
	SHARED	TRM	Temperature of Mud	85.0	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	6500.00	ft
	SHARED	BHT	Bottom Hole Temperature	145.0	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	1.17	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	84.00	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	Centered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	Temperature Correction Type	None	
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	SHCO	View More Correction Options	No	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	
	DSNT	LHWT	Logging Horizontal Water Tank?	No	
	SDLT	DNOK	Process Density?	Yes	
	SDLT	DNOK	Process Density EVR?	No	
	SDLT	CB	Logging Calibration Blocks?	No	

	SDLT	SPVT	SDLT Pad Temperature Valid?	Yes	
	SDLT	DTWN	Disable temperature warning	No	
	SDLT	DMA	Formation Density Matrix	2.710	g/cc
	SDLT	DFL	Formation Density Fluid	1.000	g/cc
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	SDLT	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	RTOK	Process ACRt?	Yes	
	ACRt	MNSO	Minimum Tool Standoff	1.50	in
	ACRt	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
	ACRt	TPOS	Tool Position	Free Hanging	
	ACRt	RMOP	Rmud Source	Mud Cell	
	ACRt	RMIN	Minimum Resistivity for MAP	0.20	ohmm
	ACRt	RMIN	Maximum Resistivity for MAP	200.00	ohmm
	ACRt	THQY	Threshold Quality	0.50	
BOTTOM					

Data: TIMKEN_22_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 02-Jul-11 08:33:55**

HALLIBURTON

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	CH_HOS			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	66.58	NO	
SP	Spontaneous Potential	66.58	BLK	1.250
SPR	Raw Spontaneous Potential	66.58	NO	
SPO	Spontaneous Potential Offset	66.58	NO	
	GTET			
TPUL	Tension Pull	58.56	NO	
GR	Natural Gamma Ray API	58.56	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	58.56	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	58.56	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	48.32	NO	
RNDS	Near Detector Telemetry Counts	48.42	BLK	1.417
RFDS	Far Detector Telemetry Counts	49.17	TRI	0.583

RFDS	Far Detector Telemetry Counts	49.17	TRI	0.583
DNTT	DSN Tool Temperature	48.42	NO	
DSNS	DSN Tool Status	48.32	NO	
ERND	Near Detector Telemetry Counts EVR	48.42	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	49.17	BLK	0.000
ENTM	DSN Tool Temperature EVR	48.42	NO	
	SDLT			
TPUL	Tension Pull	38.41	NO	
NAB	Near Above	38.24	BLK	0.920
NHI	Near Cesium High	38.24	BLK	0.920
NLO	Near Cesium Low	38.24	BLK	0.920
NVA	Near Valley	38.24	BLK	0.920
NBA	Near Barite	38.24	BLK	0.920
NDE	Near Density	38.24	BLK	0.920
NPK	Near Peak	38.24	BLK	0.920
NLI	Near Lithology	38.24	BLK	0.920
NBAU	Near Barite Unfiltered	38.24	BLK	0.250
NLIU	Near Lithology Unfiltered	38.24	BLK	0.250
FAB	Far Above	38.58	BLK	0.250
FHI	Far Cesium High	38.58	BLK	0.250
FLO	Far Cesium Low	38.58	BLK	0.250
FVA	Far Valley	38.58	BLK	0.250
FBA	Far Barite	38.58	BLK	0.250
FDE	Far Density	38.58	BLK	0.250
FPK	Far Peak	38.58	BLK	0.250
FLI	Far Lithology	38.58	BLK	0.250
PTMP	Pad Temperature	38.42	BLK	0.920
NHV	Near Detector High Voltage	35.60	NO	
FHV	Far Detector High Voltage	35.60	NO	
ITMP	Instrument Temperature	35.60	NO	
DDHV	Detector High Voltage	35.60	NO	
TPUL	Tension Pull	38.42	NO	
PCAL	Pad Caliper	38.42	TRI	0.250
ACAL	Arm Caliper	38.42	TRI	0.250
TPUL	Tension Pull	38.60	NO	
MINV	Microlog Lateral	38.60	BLK	0.750
MNOR	Microlog Normal	38.60	BLK	0.750
	BSAT			
TPUL	Tension Pull	27.09	NO	
STAT	Status	27.09	NO	
DLYT	Delay Time	27.09	NO	
SI	Sample Interval	27.09	NO	
TXRX	Raw Telemetry 10 Receivers	27.09	NO	
FRMC	Tool Frame Count	27.09	NO	
	ACRt			
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000

F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	

Data: TIMKEN_22_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\IDLE **Date: 02-Jul-11 08:34:14**

COMPANY	**EOG RESOURCES**		
WELL	**TIMKEN 22 #1**		
FIELD	**WILLIS**		
COUNTY	**STEVENS**	STATE	**KANSAS**

HALLIBURTON

BOREHOLE

HALLIBURTON

SONIC ARRAY
LOG