HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG

COMPANY **OXY USA INC.**

WELL **WIGGAINS 12-11**

FIELD/BLOCK **GOOCH**

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

COMPANY OXY USA INC.
WELL WIGGAINS 12-11
FIELD/BLOCK GOOCH
COUNTY STEVENS
STATE KANSAS

API No. 15189227880000
Location (SHL) 330' FSL & 330' FEL

Sect. 12 Twp. 35S Rge. 36W

Other Services:
DSN / SDL
MICROLOG
BSAT
ACRT

Permanent Datum	GL	Elev. 3012.0 ft	Elev.: K.B. 3026.0 ft
Log measured from	KB	, 14.0 ft above perm. Datum	D.F. 3026.0 ft
Drilling measured from	KB		G.L. 3012.0 ft

Date		17-Feb-13					
Run No.		ONE					
Depth - Driller		6850.00 ft					
Depth - Logger		6824.0 ft					
Bottom - Logged Interval		6780					
Top - Logged Interval		4200					
Casing - Driller		8.625 in	@ 1819.0 ft		@		@
Casing - Logger		1816.0 ft					
Bit Size		7.875 in			@		@
Type Fluid in Hole		WATER BASED					
Density	Viscosity	9.2 ppg	48.00 s/qt				
PH	Fluid Loss	9.00 pH	7.6 cptm				
Source of Sample		MUD PIT					
Rm @ Meas. Temperature		1.670 ohmm	@ 60.00 degF		@		@
Rmf @ Meas. Temperature		1.40 ohmm	@ 60.00 degF		@		@
Rmc @ Meas. Temperature		1.900 ohmm	@ 60.00 degF		@		@
Source Rmf	Rmc	MEASURED	MEASURED				
Rm @ BHT		0.68 ohmm	@ 157.0 degF		@		@
Time Since Circulation		24.5 hr					
Time on Bottom		17-Feb-13 07:09					
Max. Rec. Temperature		157.0 degF	@ 6824.0 ft		@		@
Equipment	Location	10782954	LIBERAL				
Recorded By		S. INGERSOLL					
Witnessed By		C. WYLIE		AUSTIN GARNER			

Fold here

PGM Version: WL INSITE R3.8.4 (Build 5)

Service Ticket No.: 900213985 API Serial No.: 15189227880000

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							

RESISTIVITY EQUIPMENT DATA

	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
Source of Sample					
Rm @ Meas. Temp	@	@			
Rmf @ Meas. Temp.	@	ONE	ACRT	N/A	CENT.
Rmc @ Meas. Temp.	@		10929775		
Source Rmf	Rmc				
Rm @ BHT	@				
Rmf @ BHT	@				
Rmc @ BHT	@				

EQUIPMENT DATA

	GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE	
Serial No.	102811258	Serial No.	10747684	Serial No.	10685803	Serial No.	10755066	
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT	
Diameter	3.625"	No. of Cent.	2	Diameter	5.3"	Diameter	3.625"	
Detector Model No.	GTET	Spacing	.5'	Log Type	GAM-GAM	Log Type	NEU-NEU	
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE	
Length	8"	LSA [Y/N]		Serial No.	5073GW	Serial No.	DSN-436	
Distance to Source	N/A	FWDA [Y/N]		Strength	1.5 CI	Strength	15 CI	

LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	6824	1816	REC	0	150	30	-10	47.6 us/ft	30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

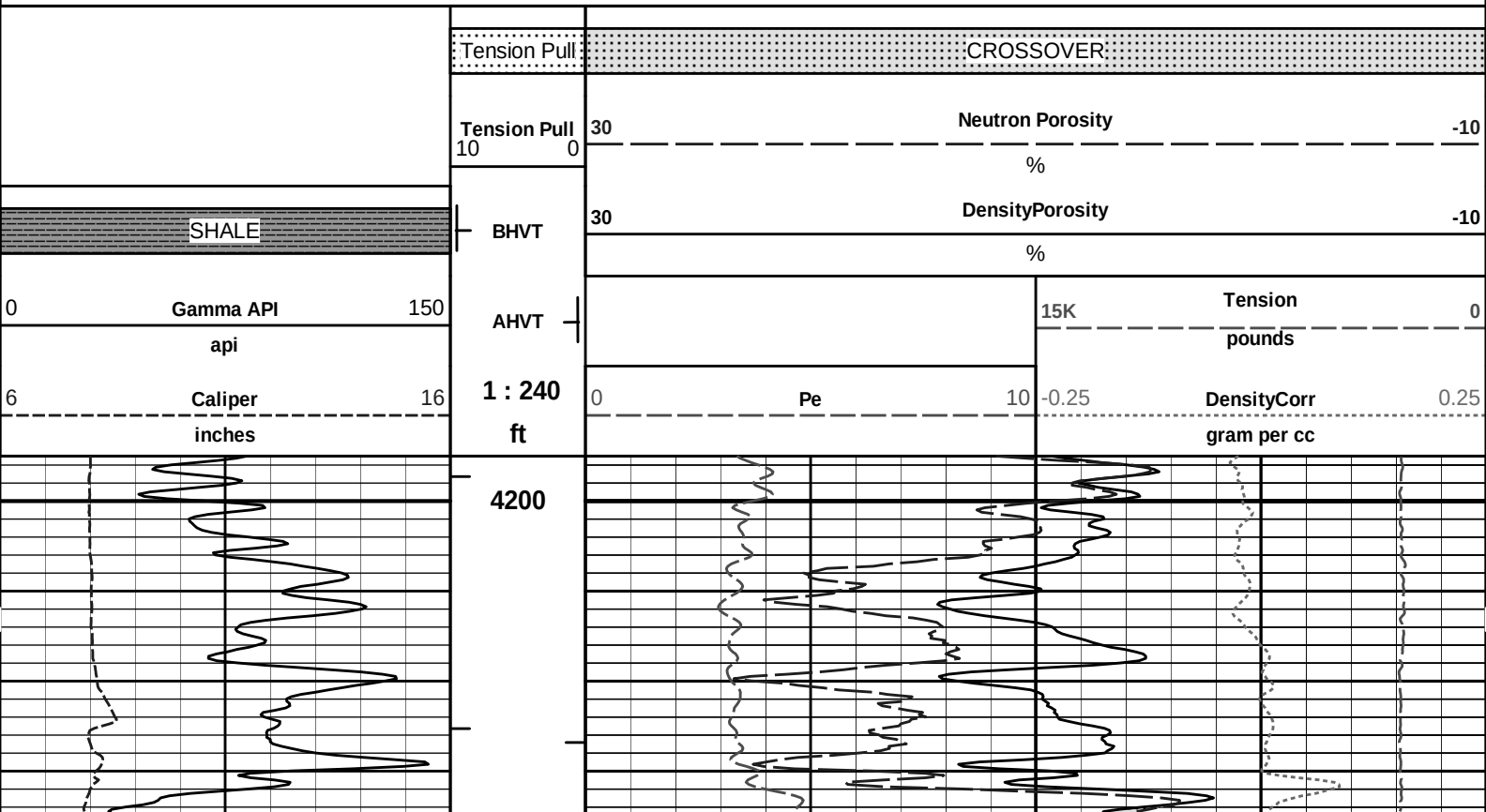
Maximum Deviation	@	KOP	@

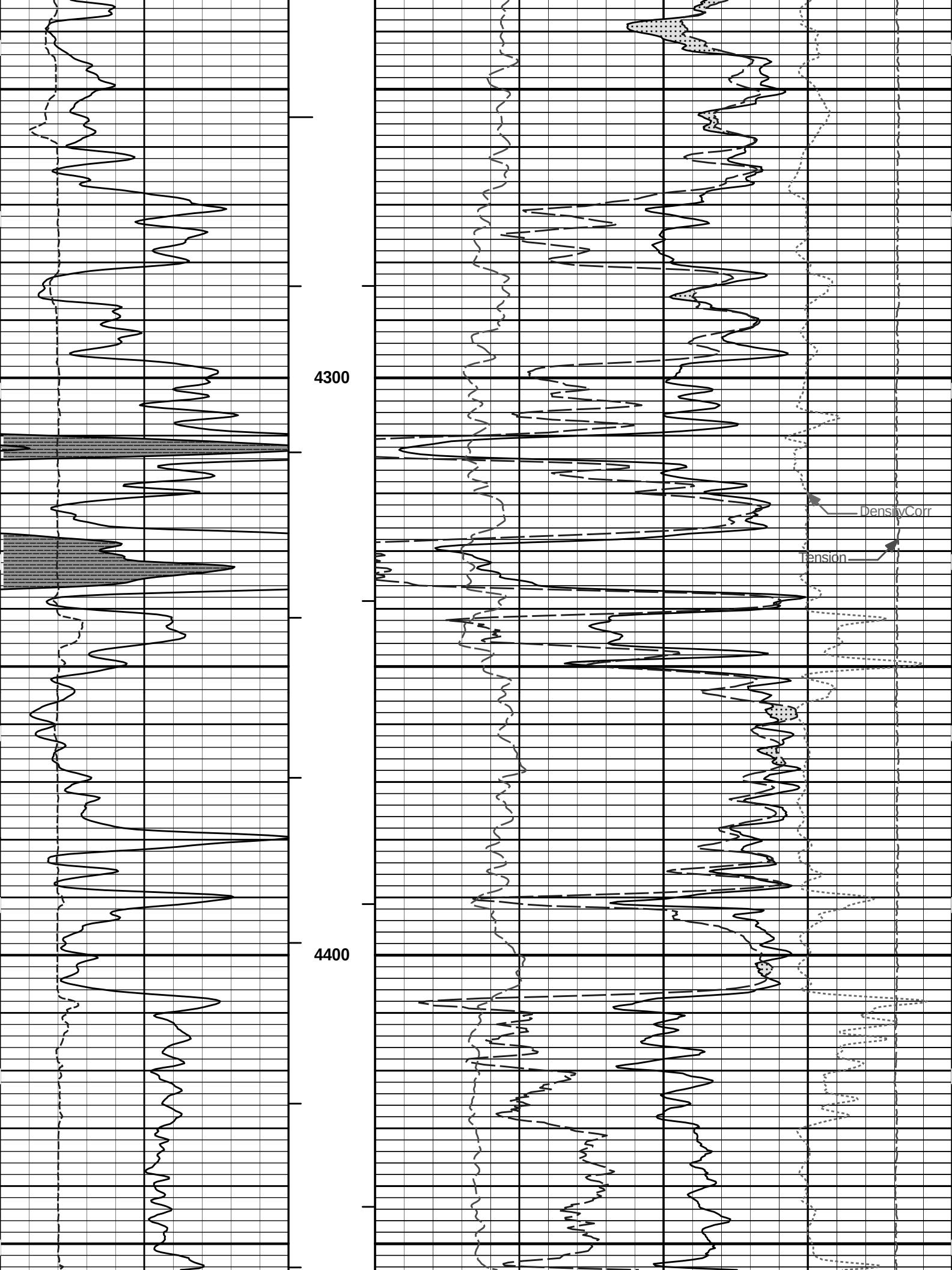
Remarks: ANNULAR HOLE VOLUME CACLULATED FOR 5.5 INCH CASING.

HALLIBURTON

Plot Time: 17-Feb-13 09:35:46
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

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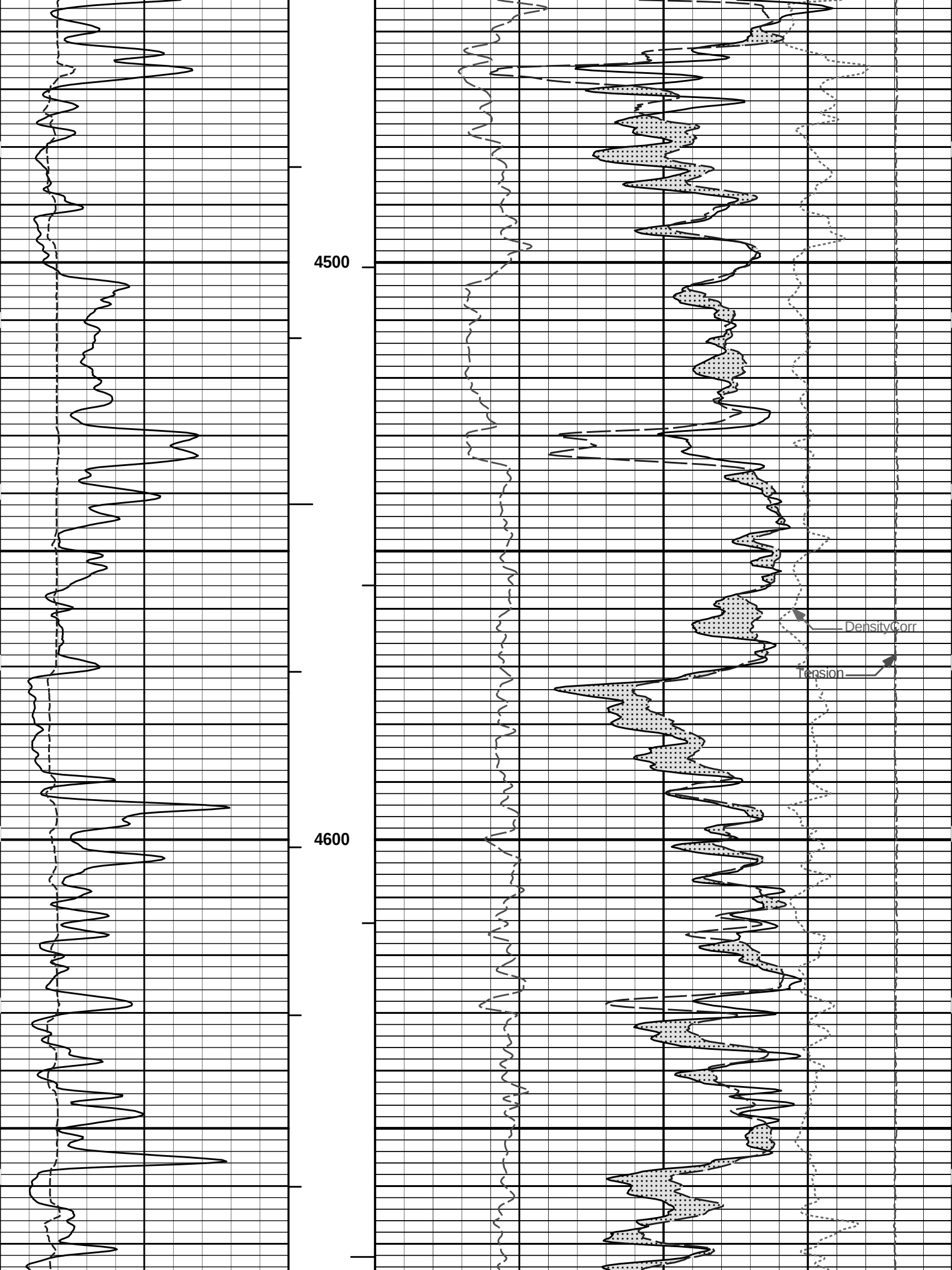
DensityCorr
Tension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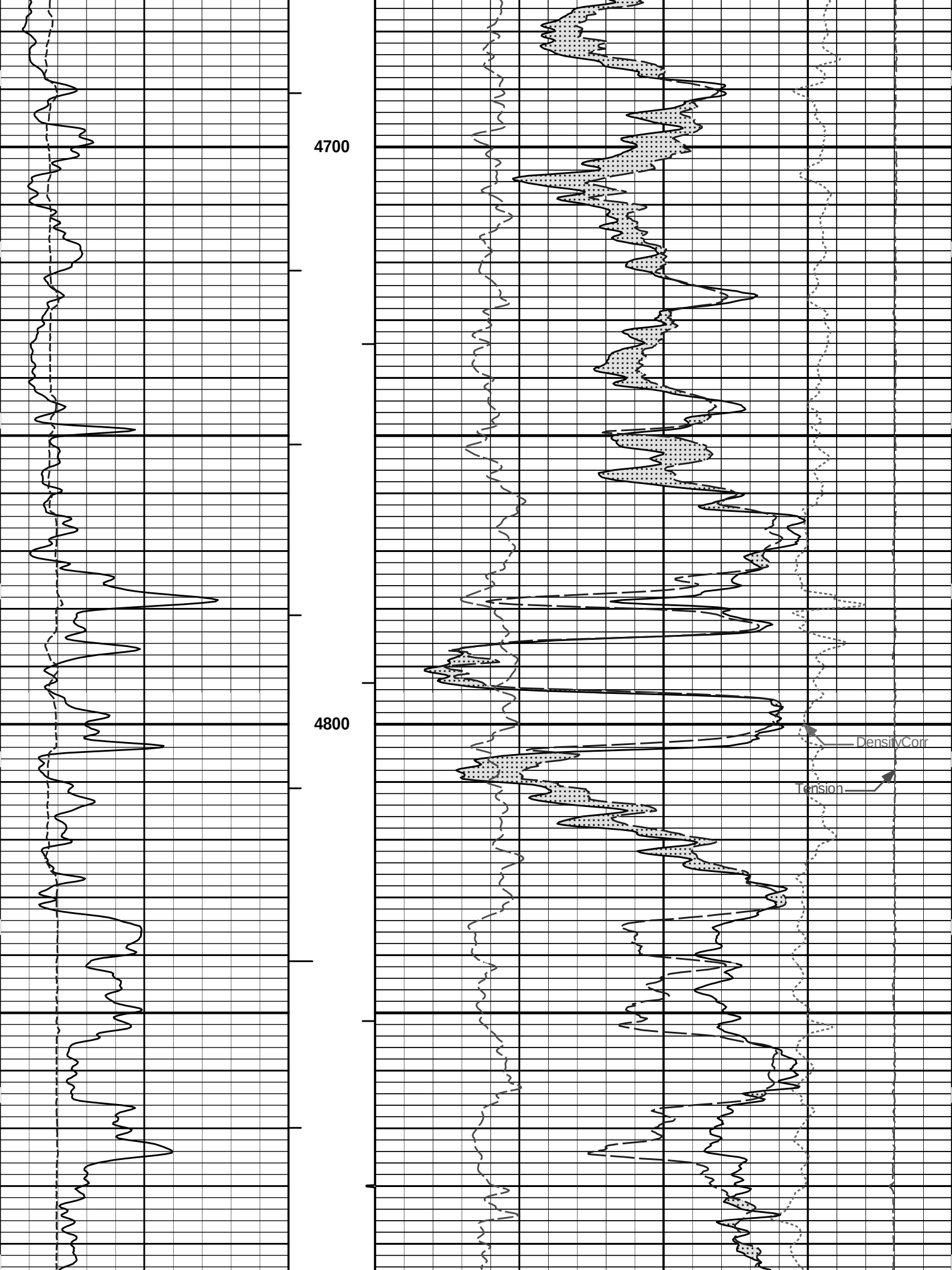
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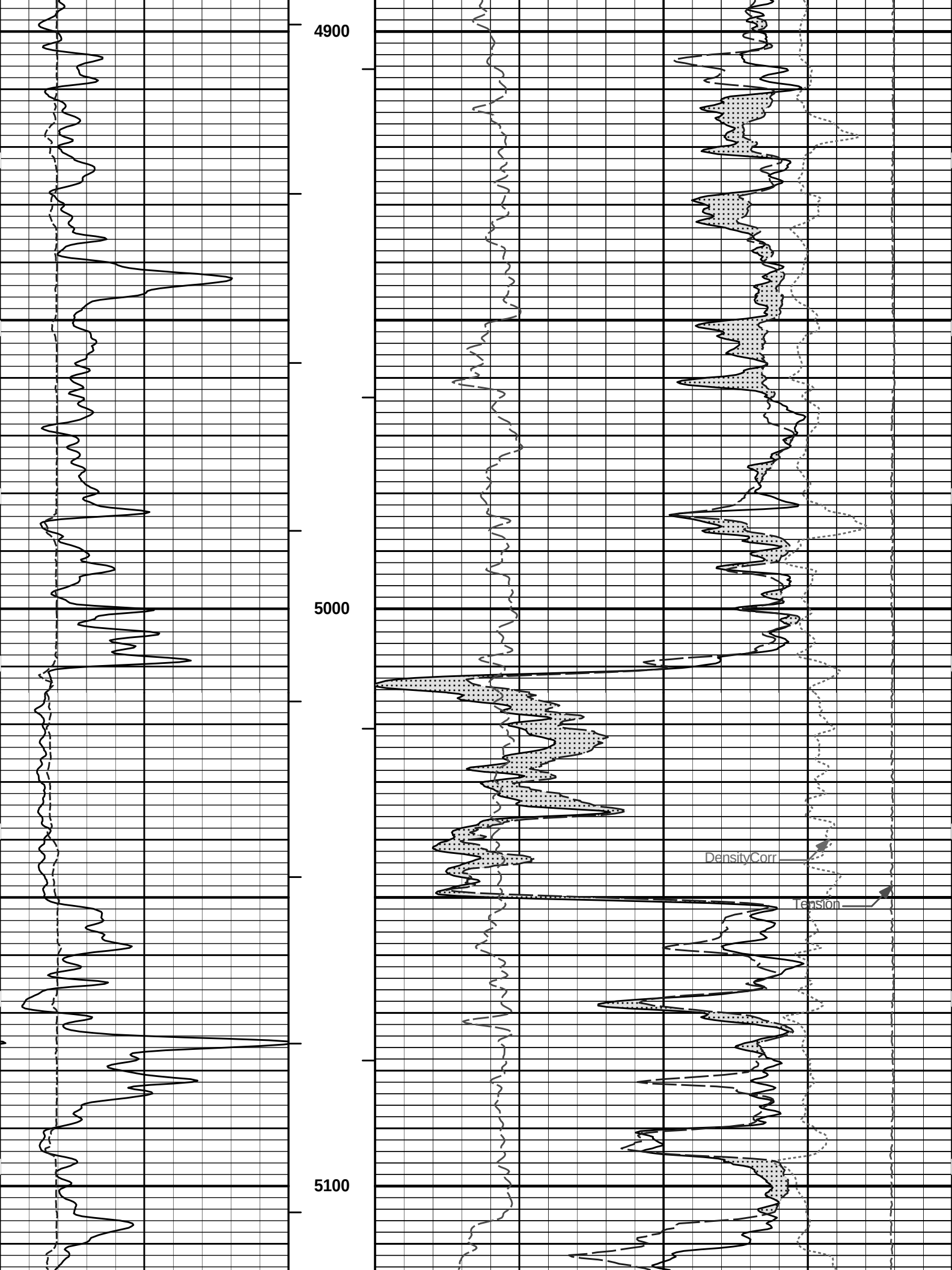
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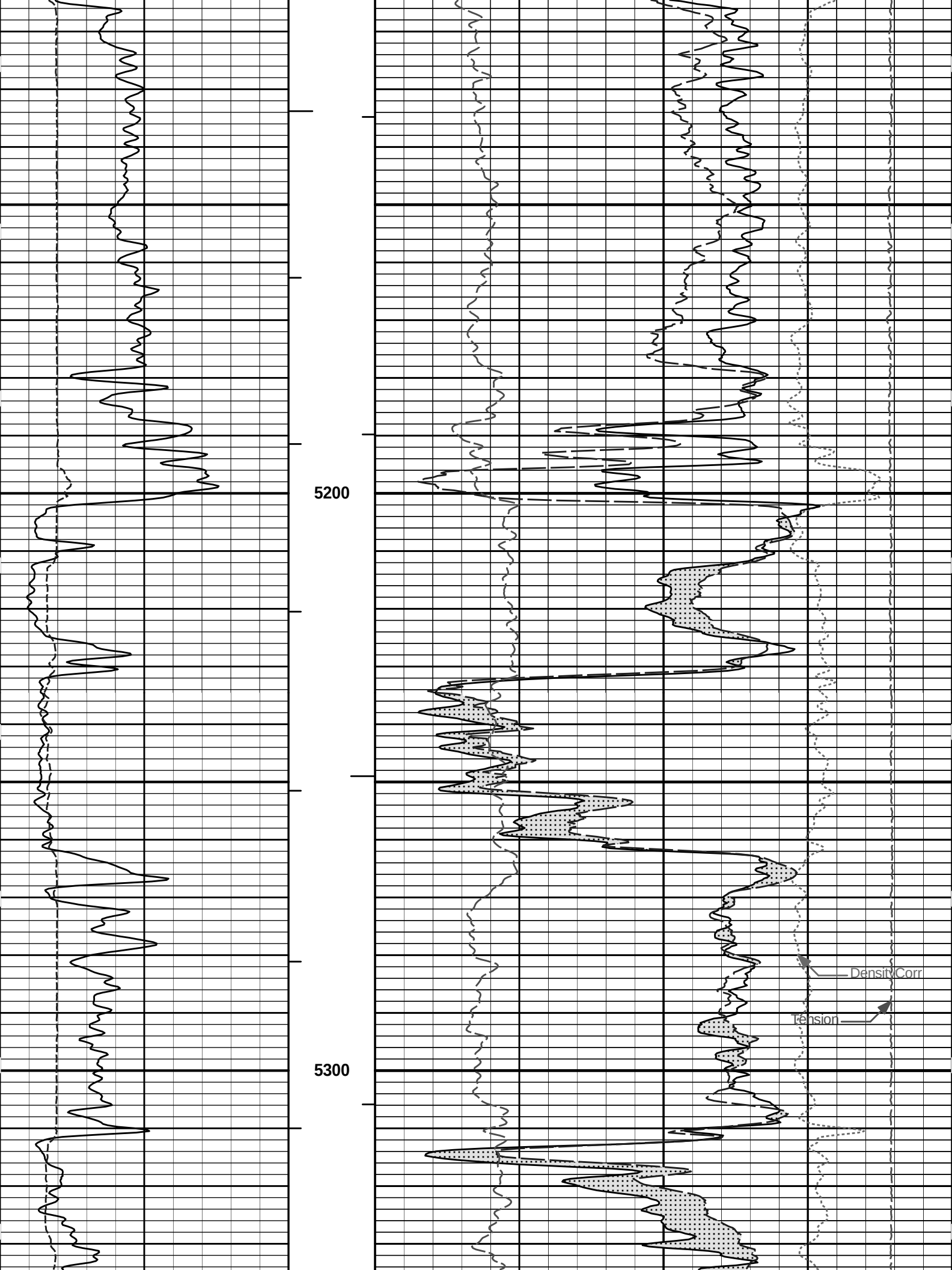
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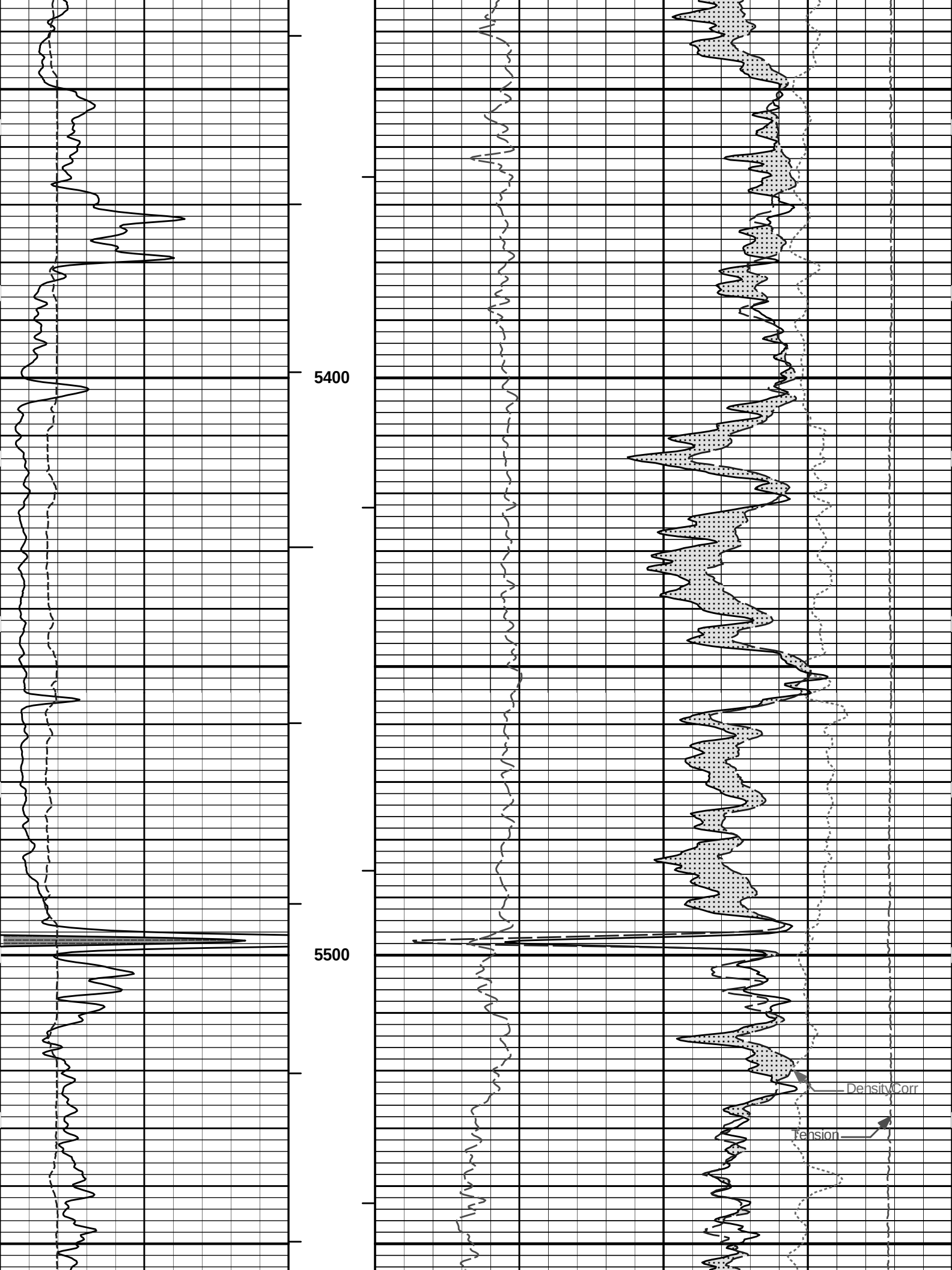
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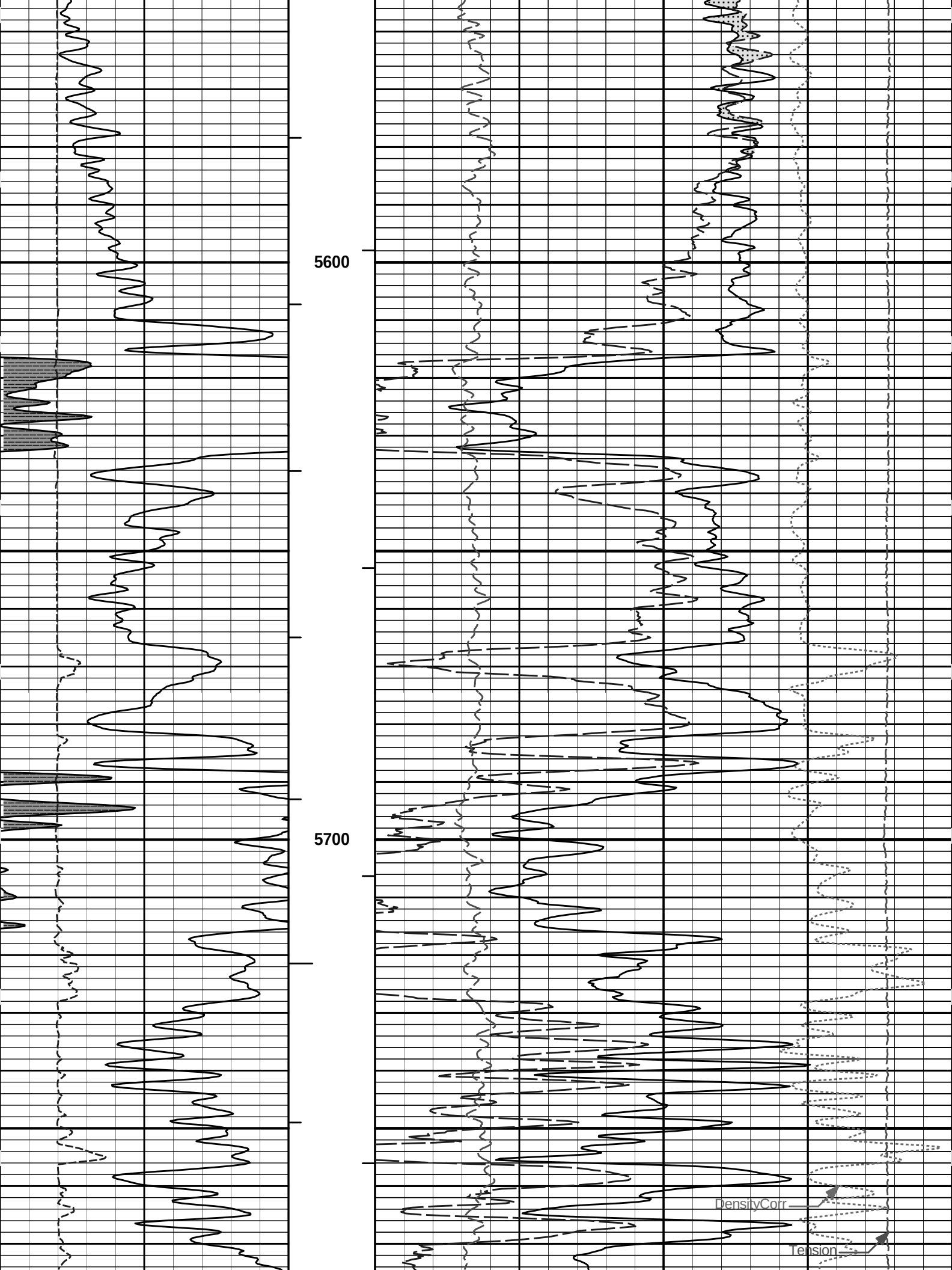
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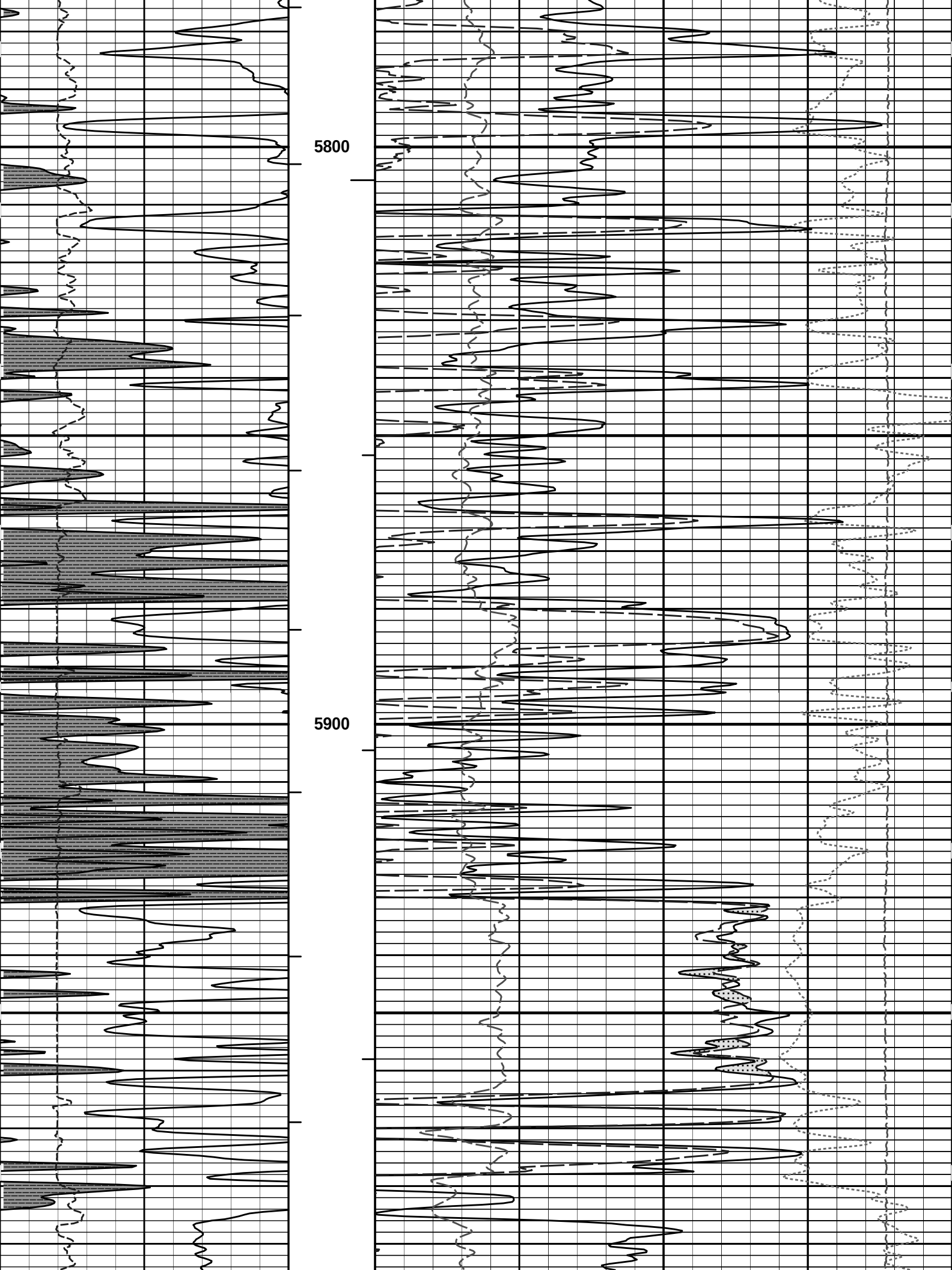
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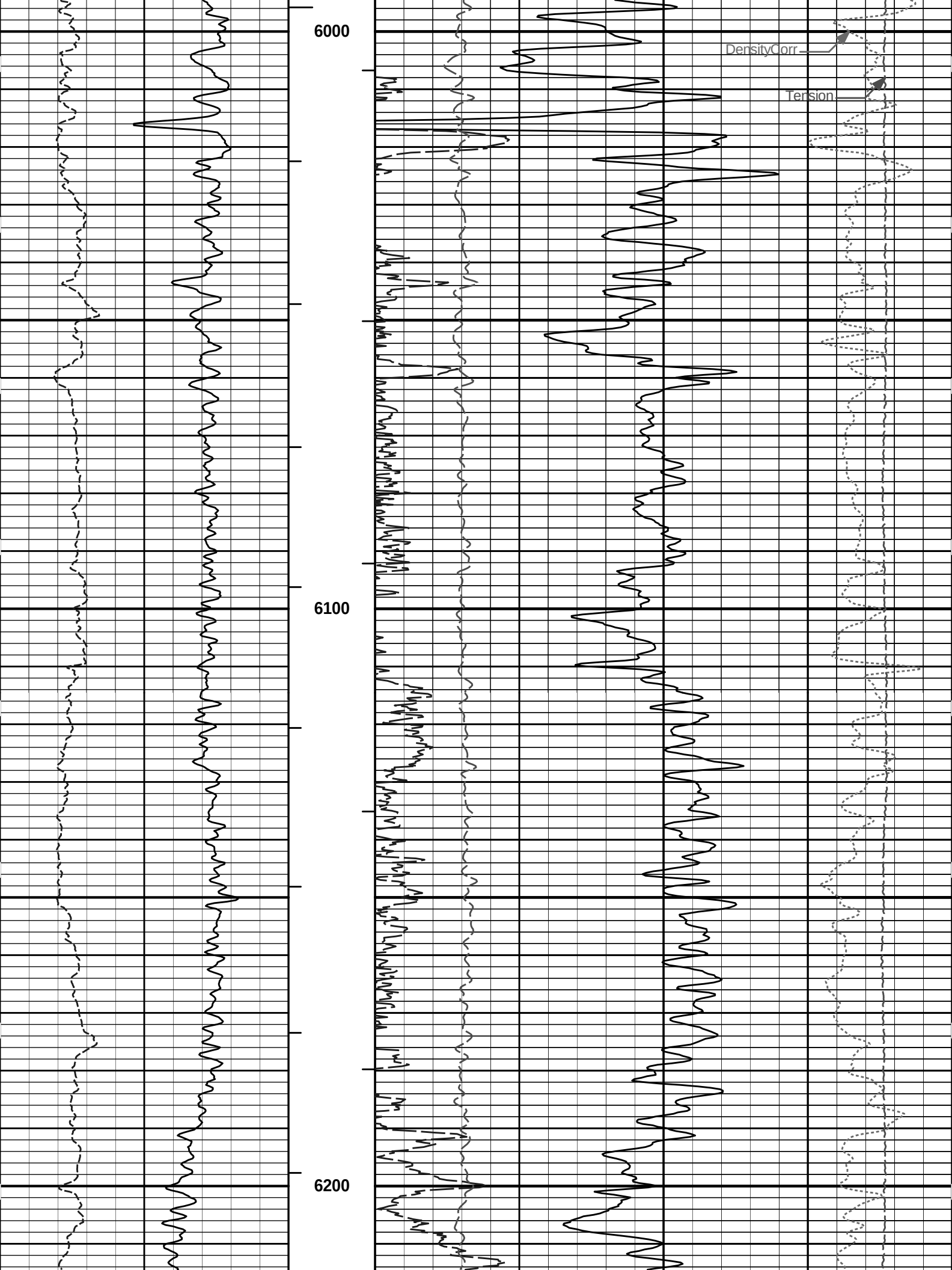
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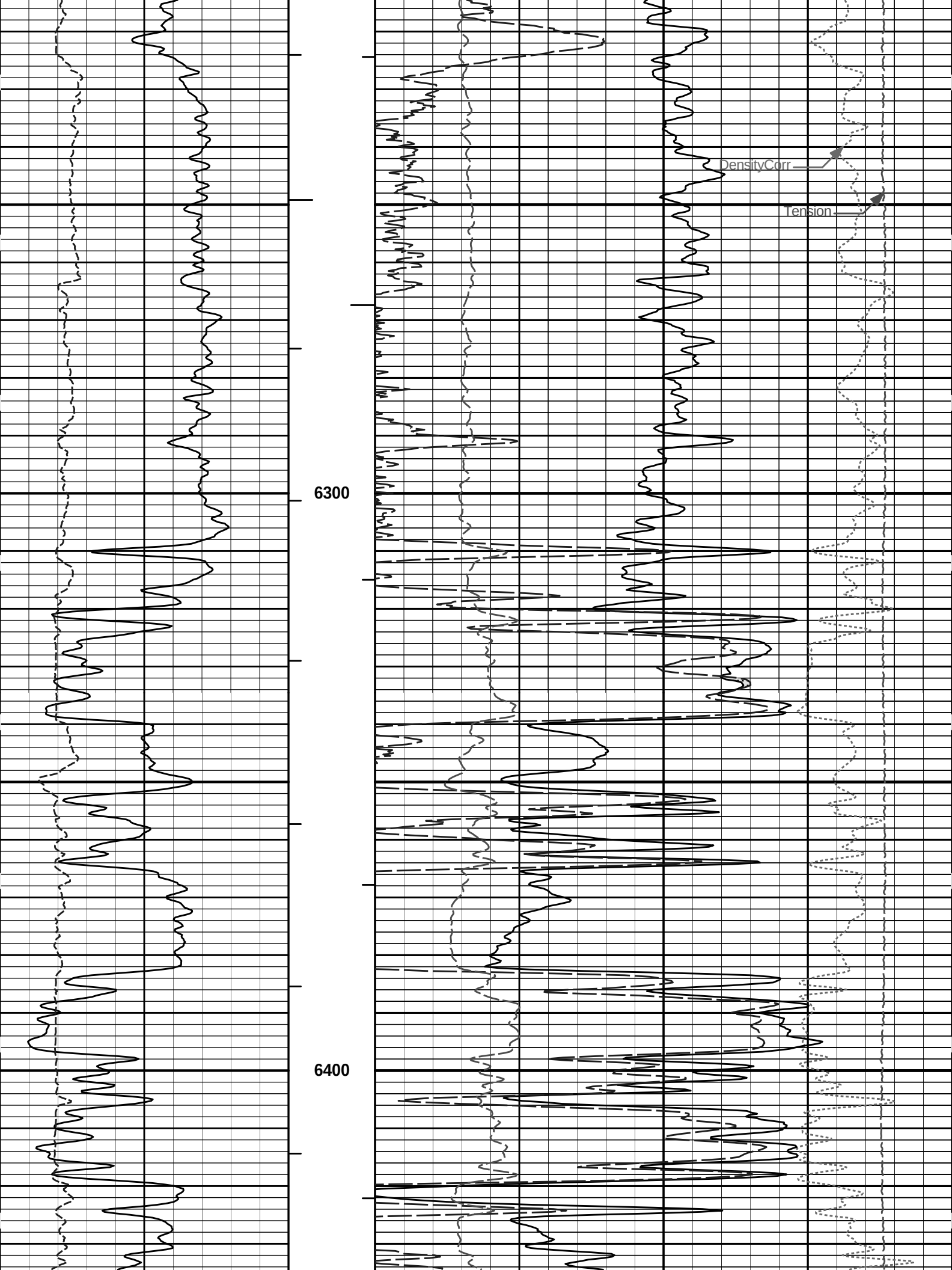
DensityCorr
Tension


DensityCorr
Tension
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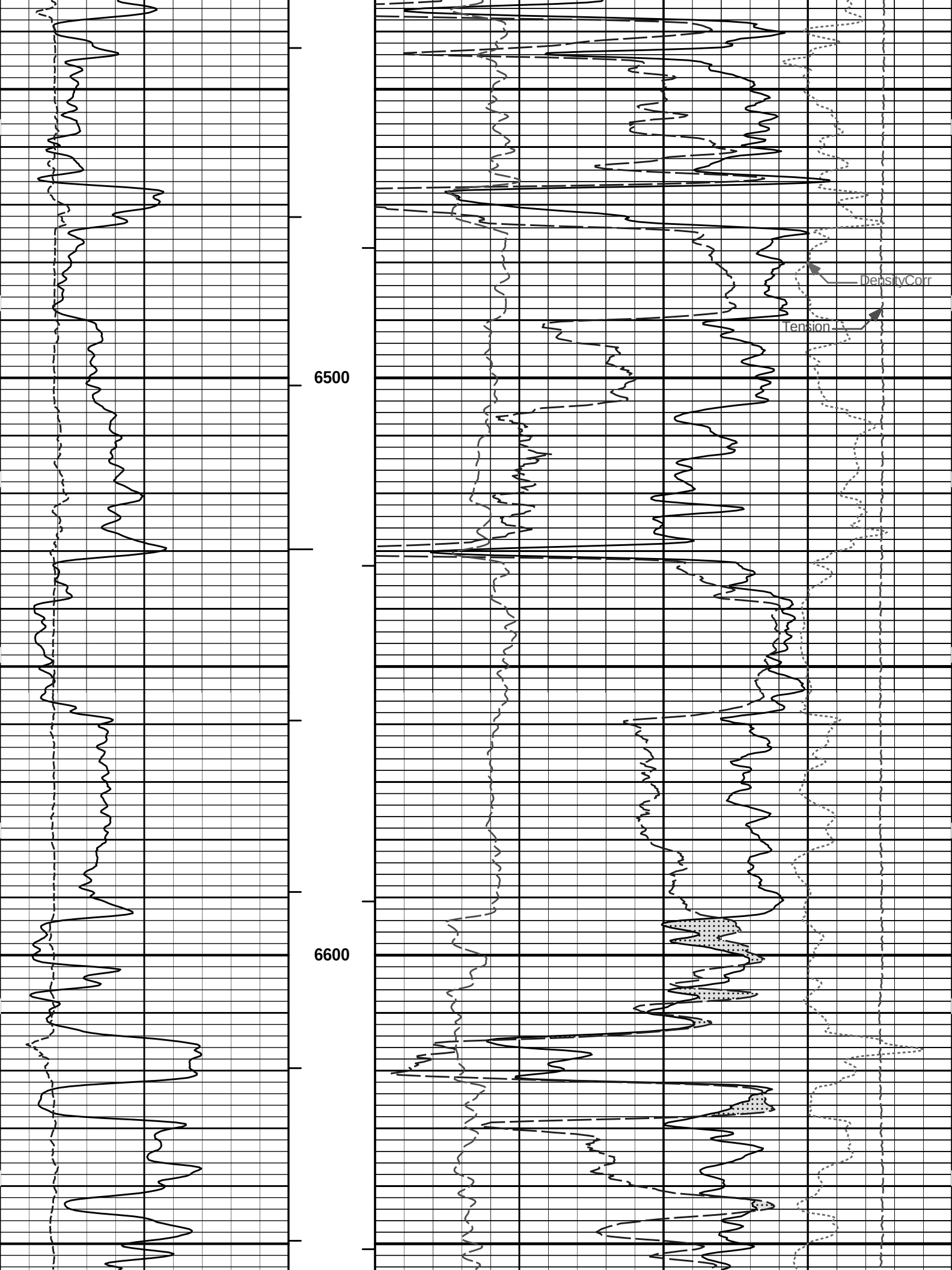
DensityCorr
Tension
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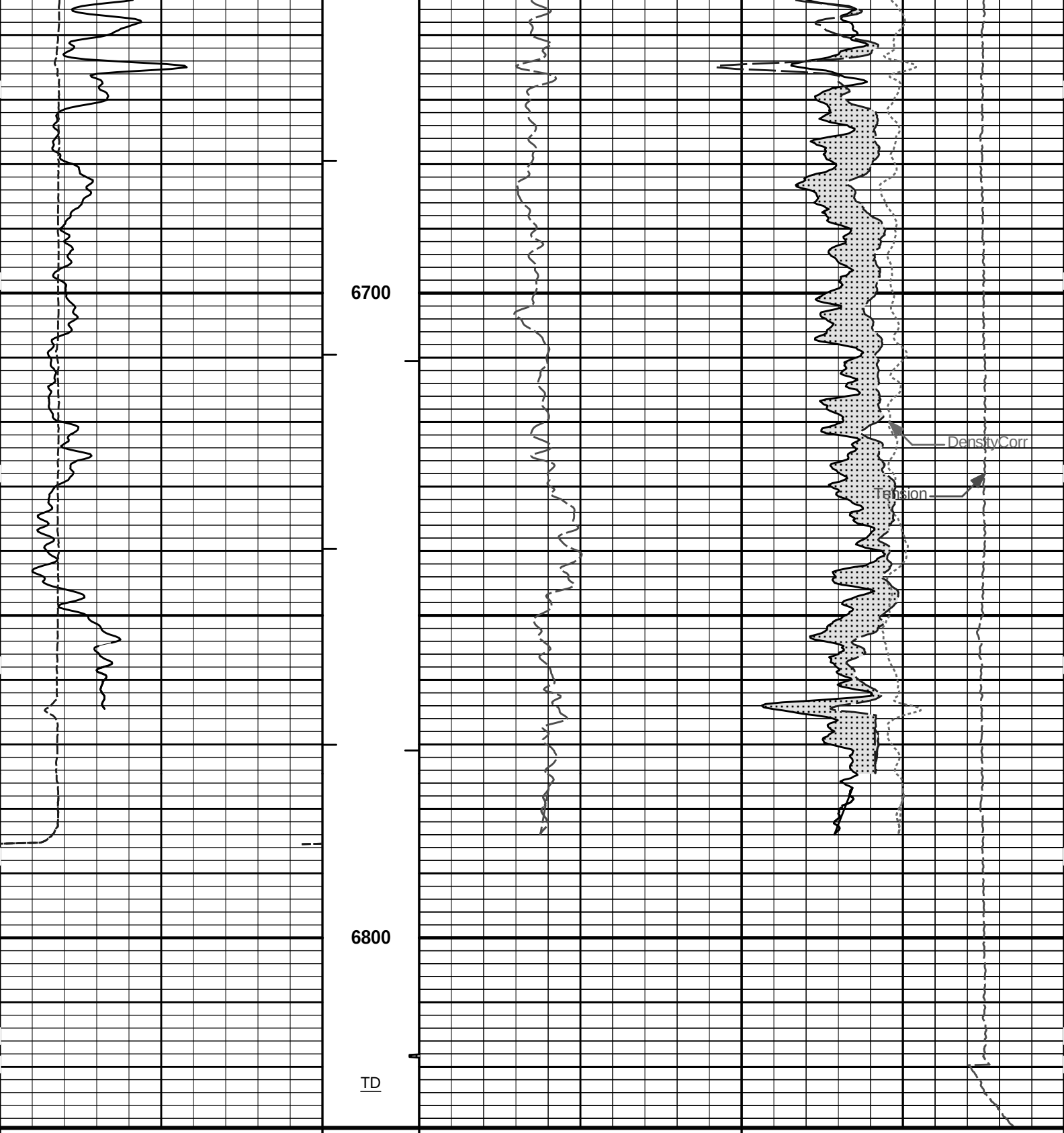


6 Caliper 16 inches	1 : 240 ft	0 Pe 10
0 Gamma API 150 api	AHVT	
SHALE	BHVT	
	Tension Pull 10 0	

-0.25 DensityCorr 0.25 gram per cc	
15K Tension 0 pounds	
30 DensityPorosity -10 %	
30 Neutron Porosity -10 %	
Tension Pull	CROSSOVER

Tension Pull

CROSSOVER

HALLIBURTON

Plot Time: 17-Feb-13 09:36:05
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS\
Plot File: \\POROSITY\Poro_IQ_5_MAIN_LIB

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 17-Feb-13 09:36:05
Plot Range: 6295 ft to 6831.58 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_REPEAT\
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

REPEAT SECTION

CROSSOVER

30 Neutron Porosity -10
%
30 DensityPorosity -10
%

SHALE

BHVT

0 Gamma API 150
api

AHVT

15K Tension 0
pounds

6 Caliper 16
inches

1 : 240
ft

0 Pe 10

-0.25 DensityCorr 0.25
gram per cc

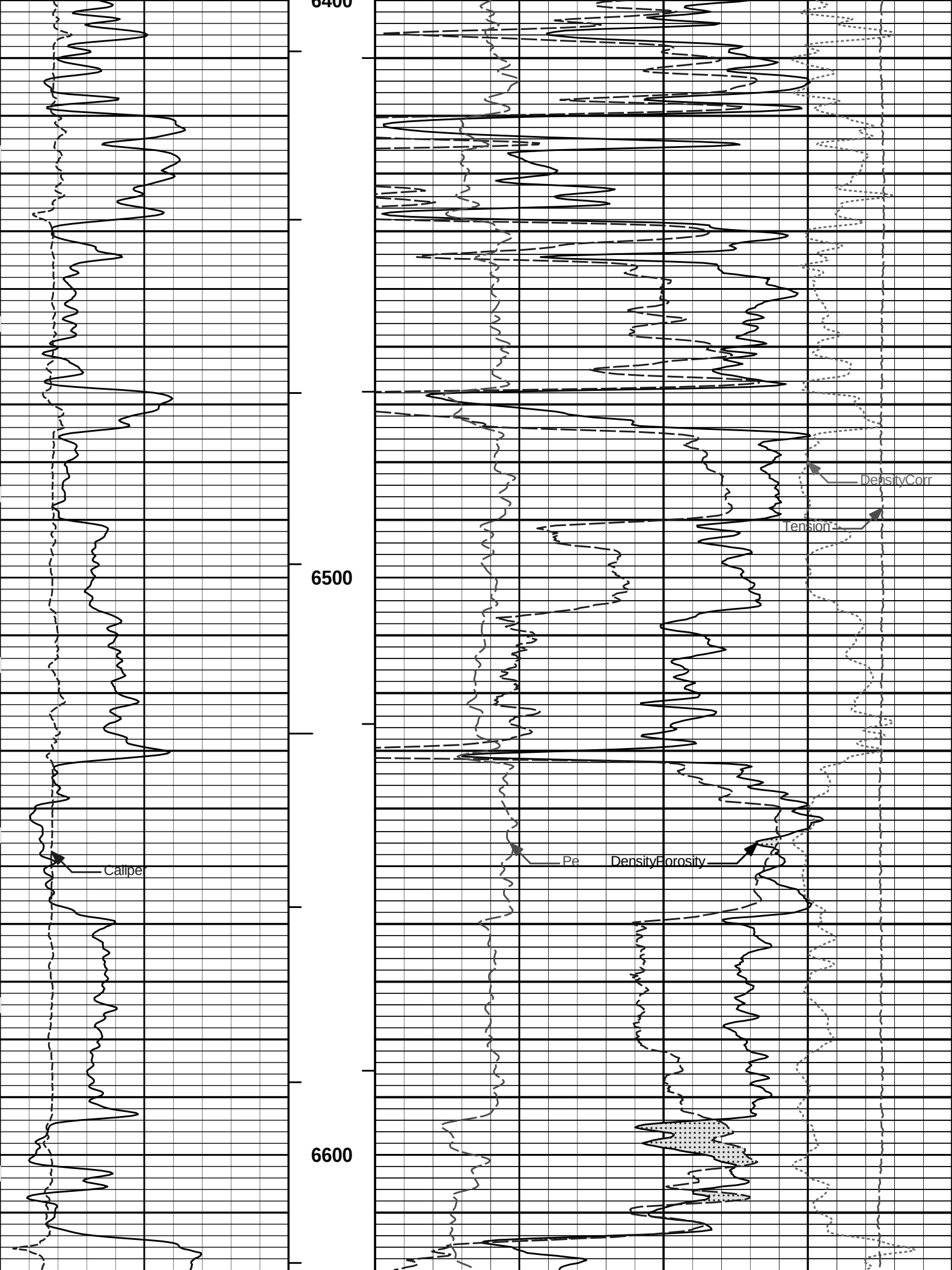
6300

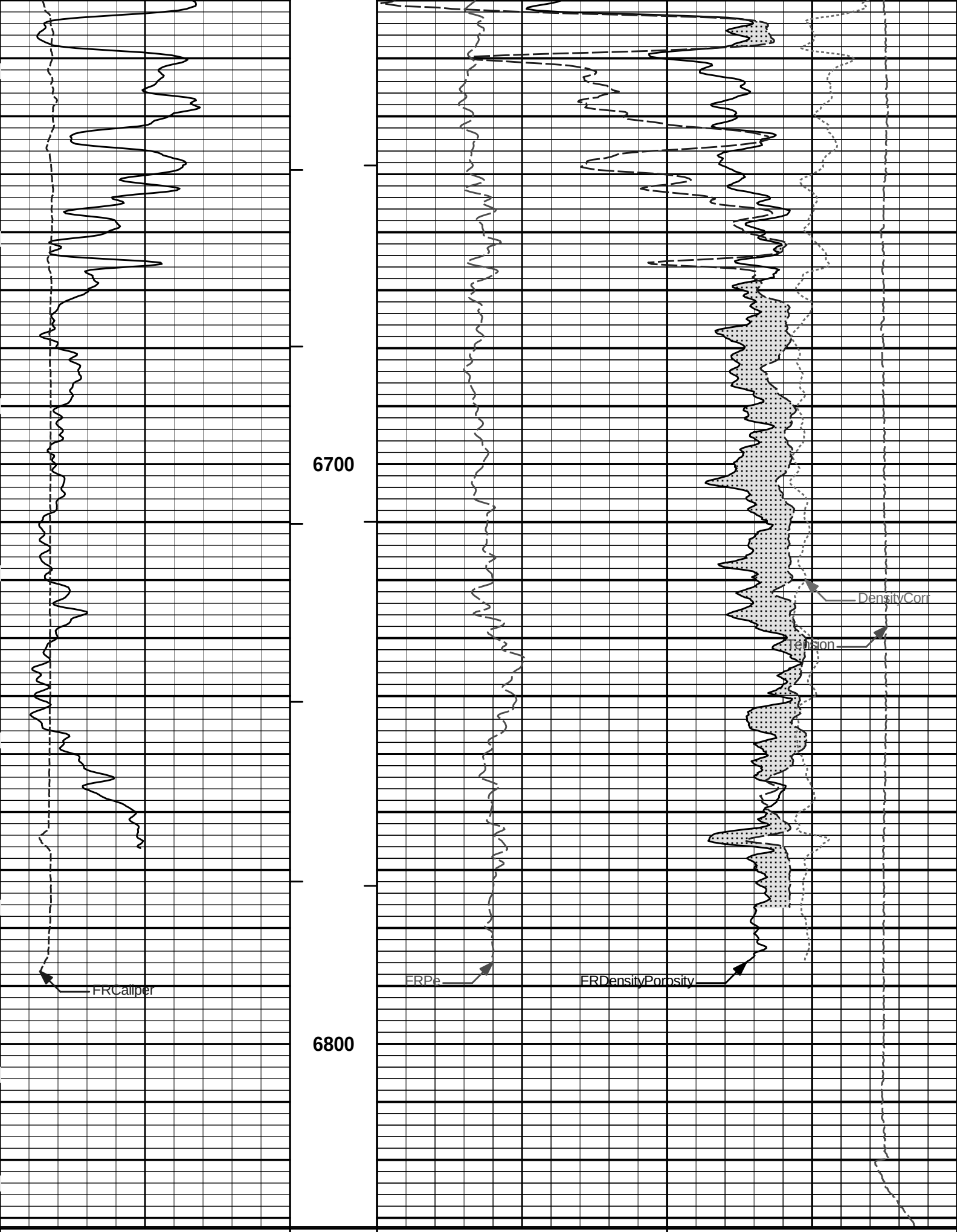
Caliper

Pe

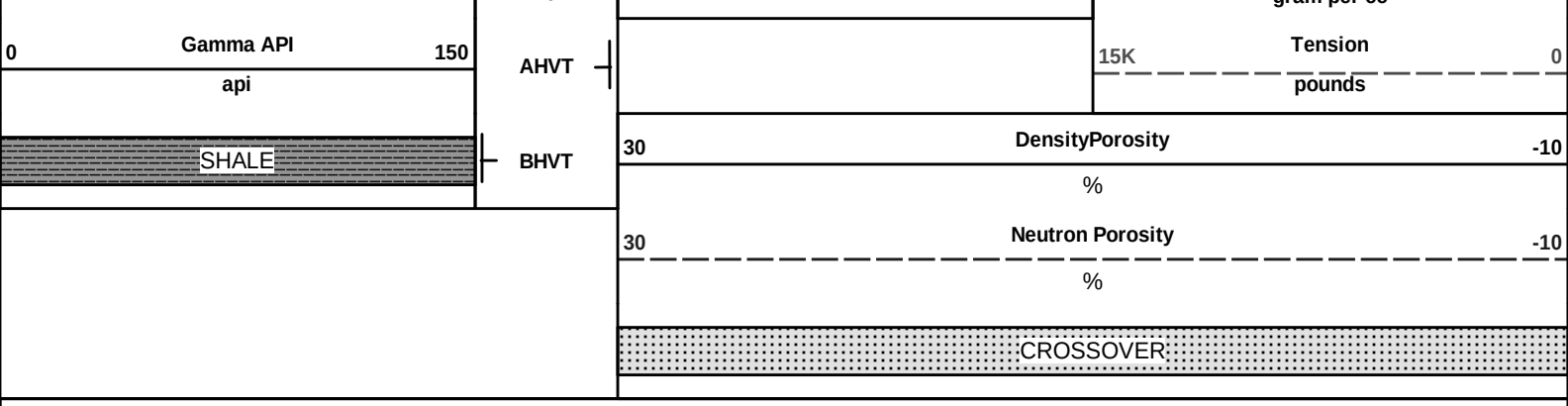
DensityPorosity

6400


6400
6500
6600
DensityCorr
Tension
Caliper
Pe
DensityPorosity



6	Caliper	16	1 : 240	0	Pe	10	-0.25	DensityCorr	0.25
	inches		ft					gram per cc	



HALLIBURTON

Plot Time: 17-Feb-13 09:36:10
Plot Range: 6295 ft to 6831.58 ft
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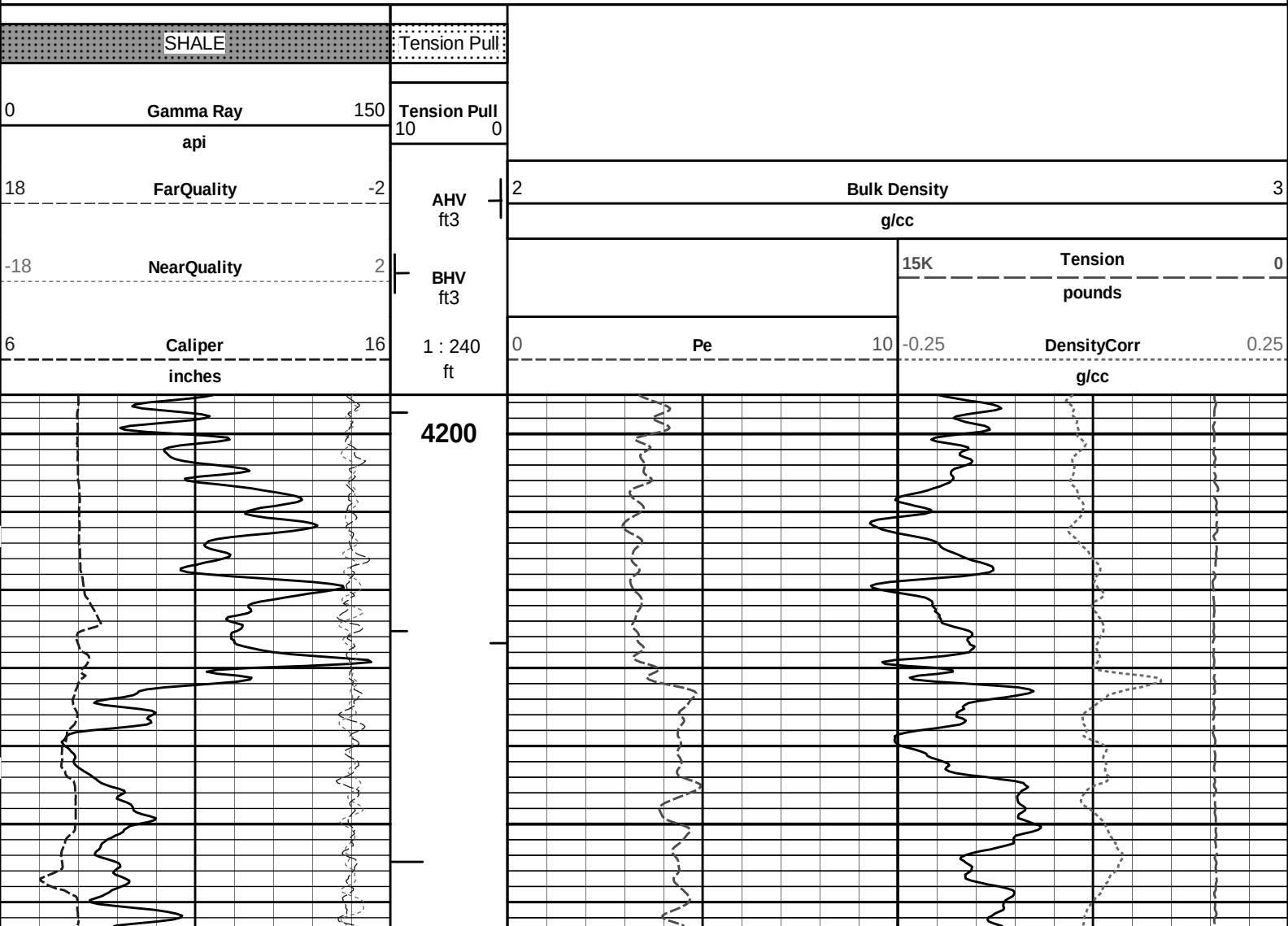
Plot File: \\POROSITY\Poro_IQ_5_REP_LIB

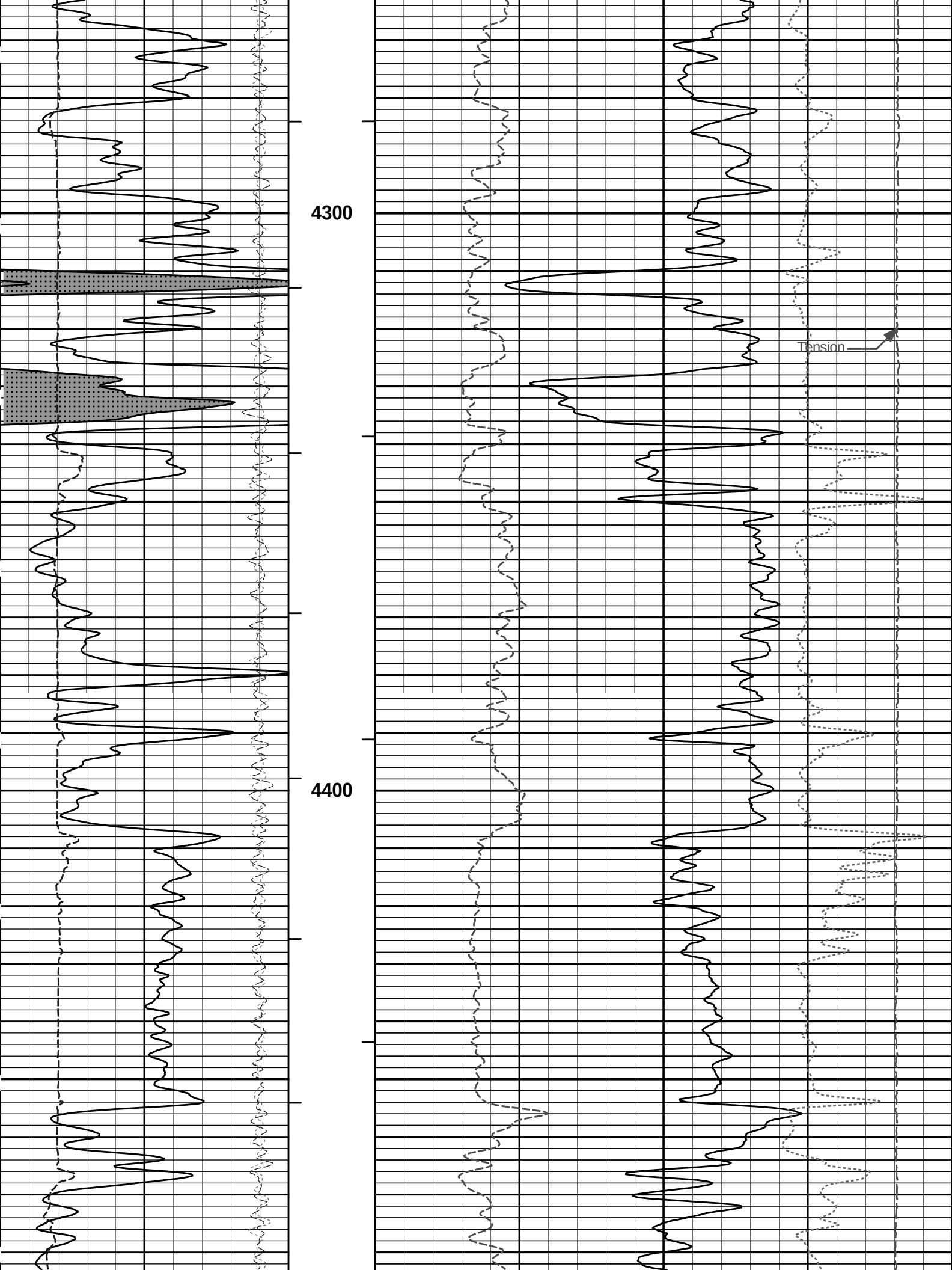
REPEAT SECTION

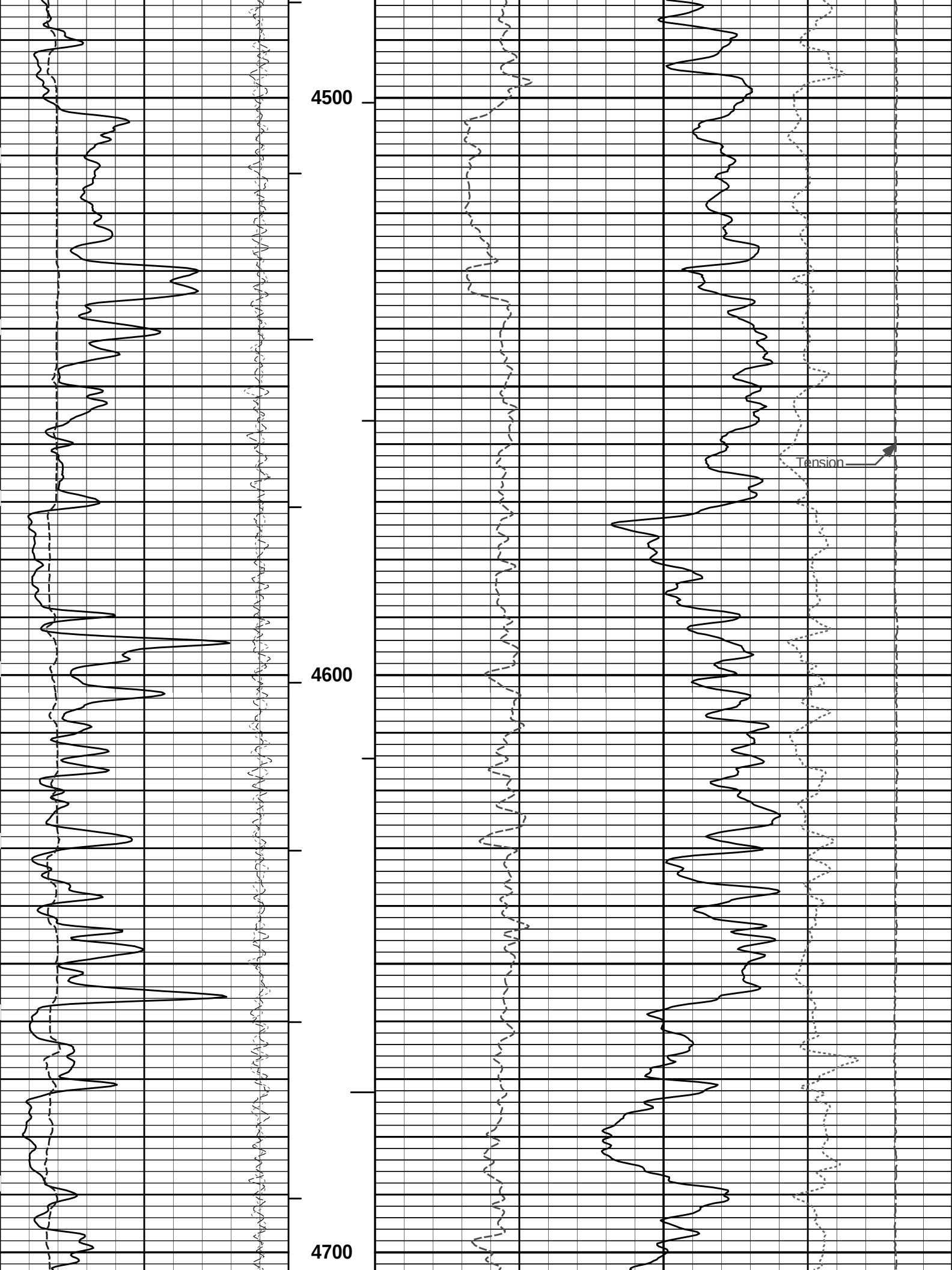
HALLIBURTON

Plot Time: 17-Feb-13 09:36:11
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS\
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\BULKD_5_MAIN_LIB

5 INCH MAIN LOG




4300
4400
Tension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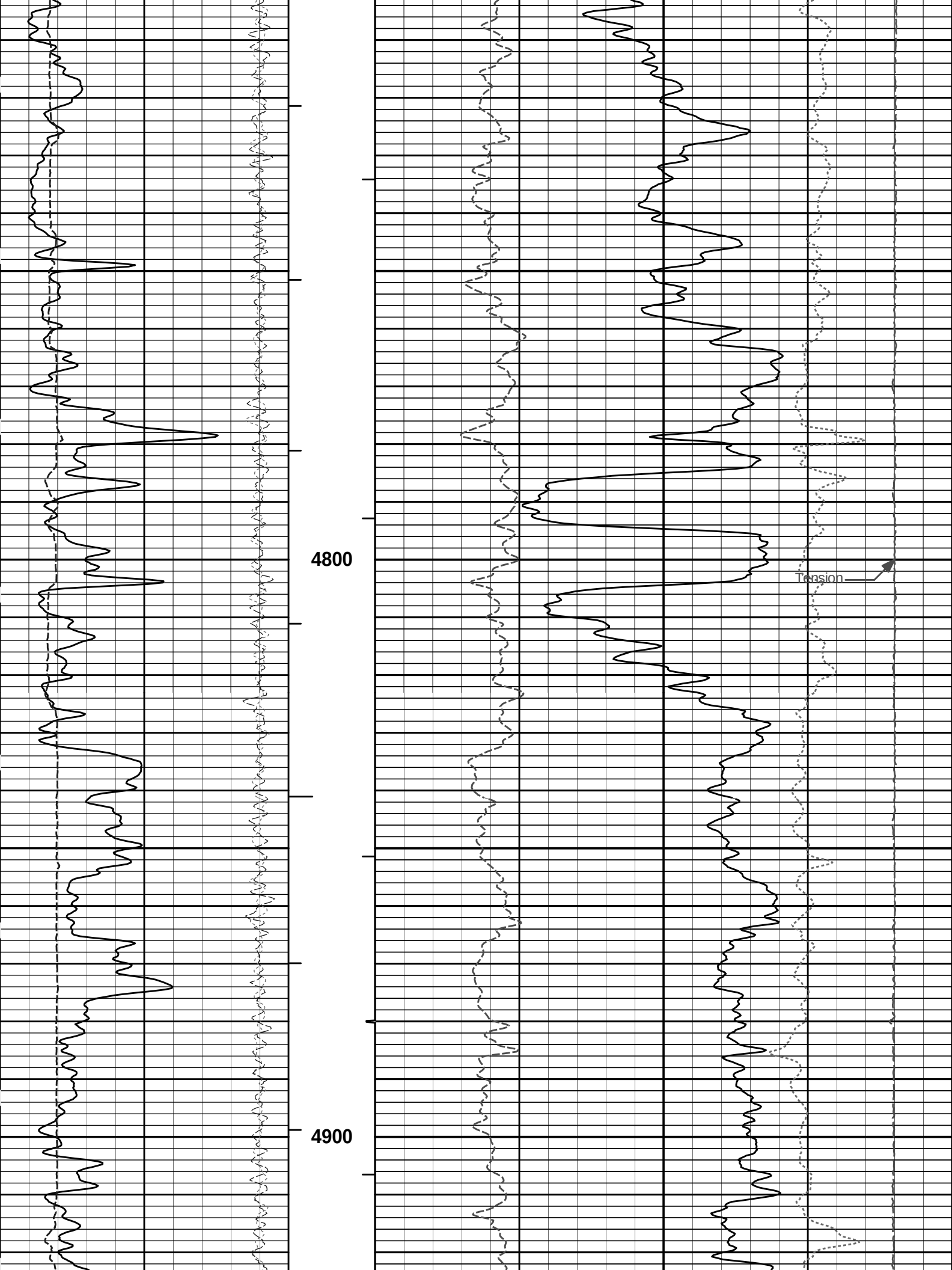
4600
4700
Tension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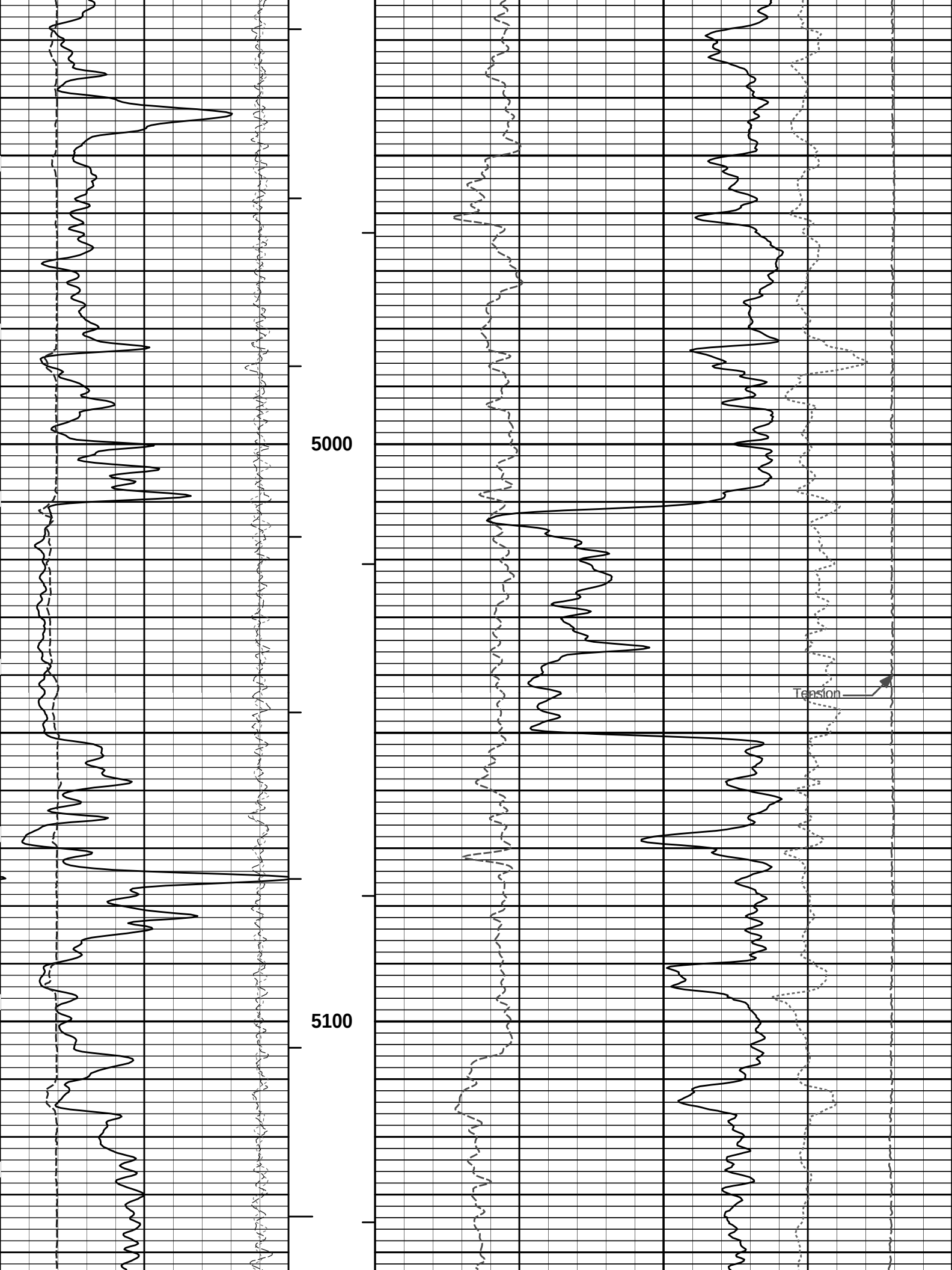
Tension


5000
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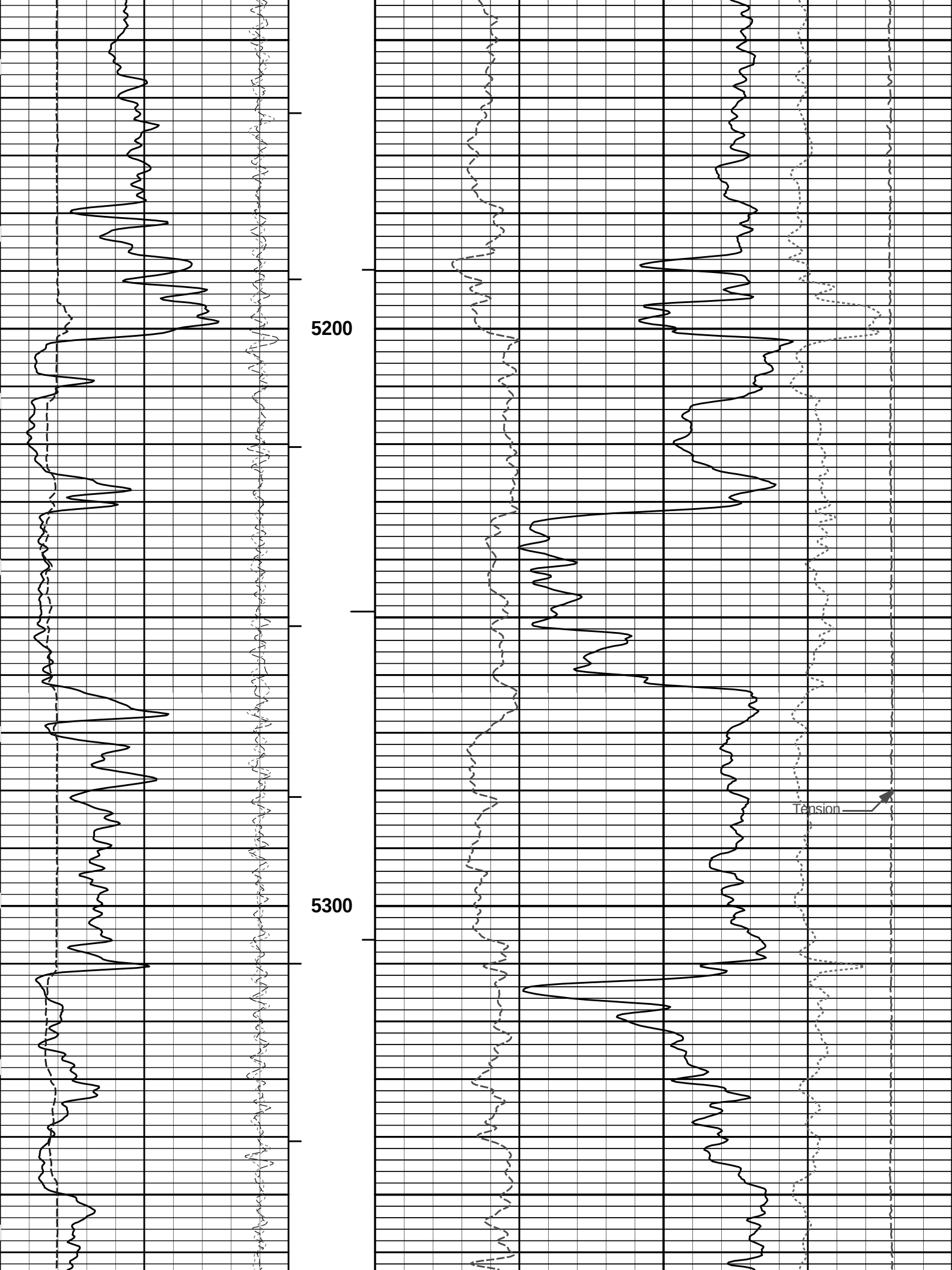
Tension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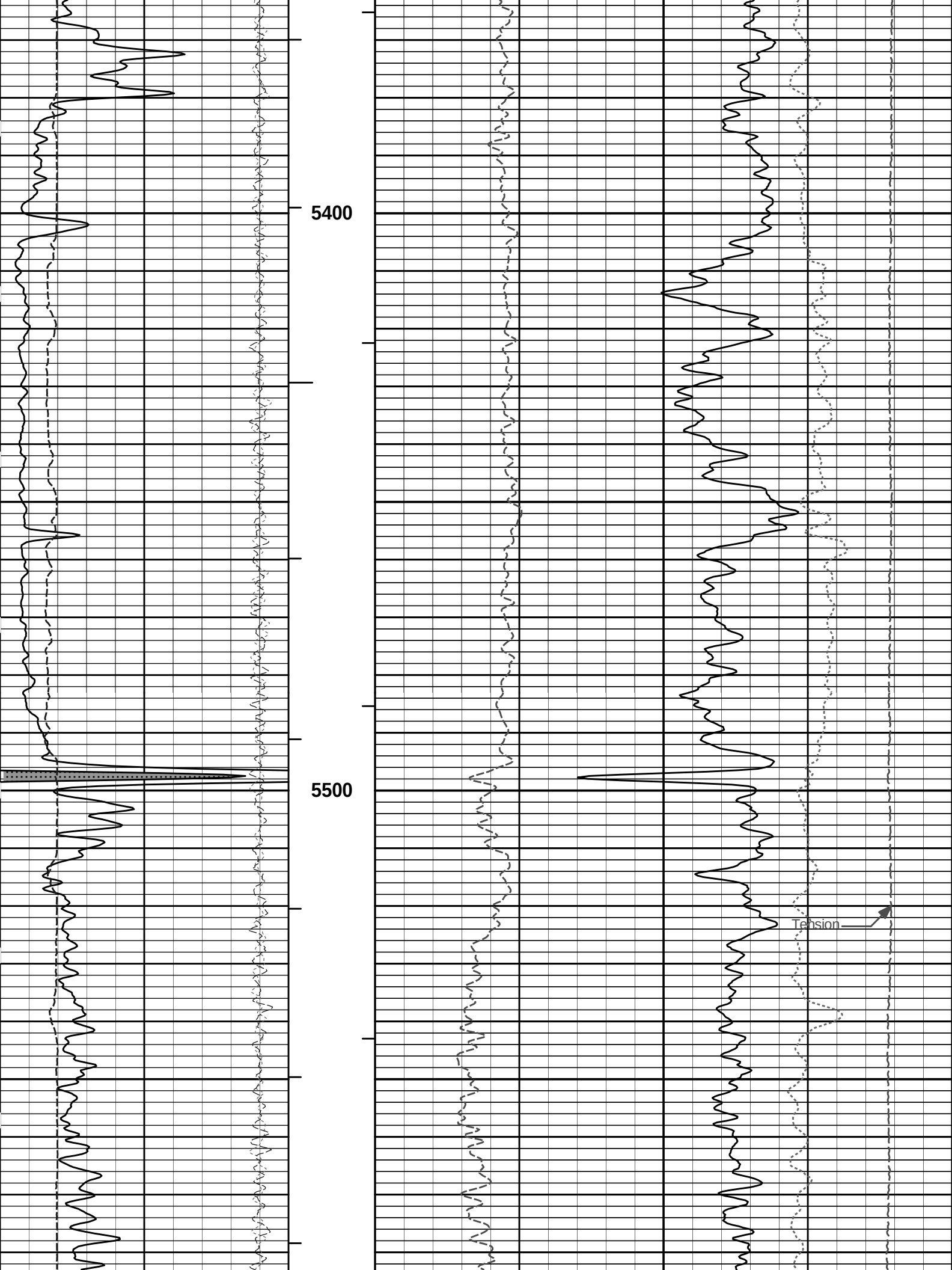
Tension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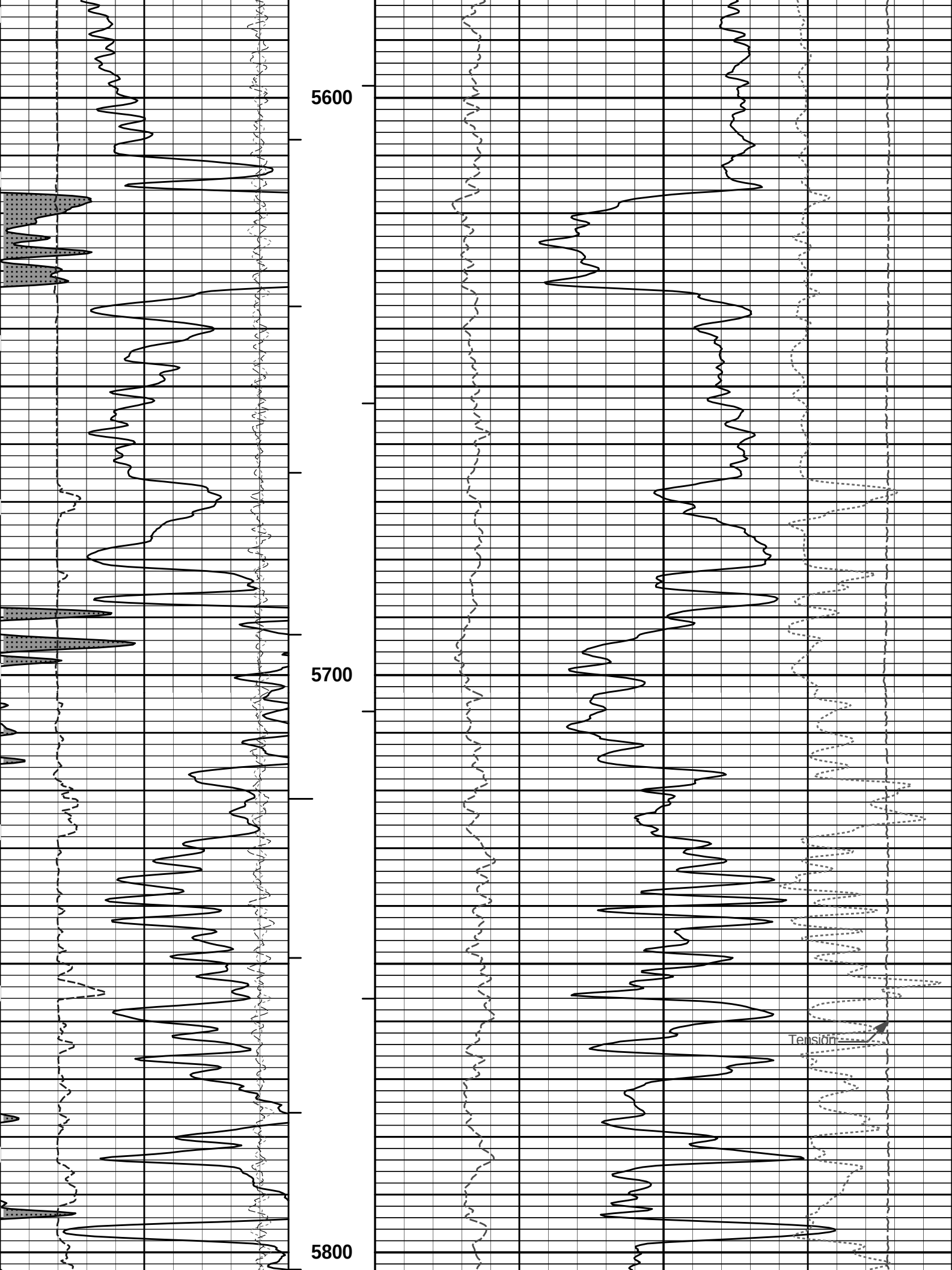
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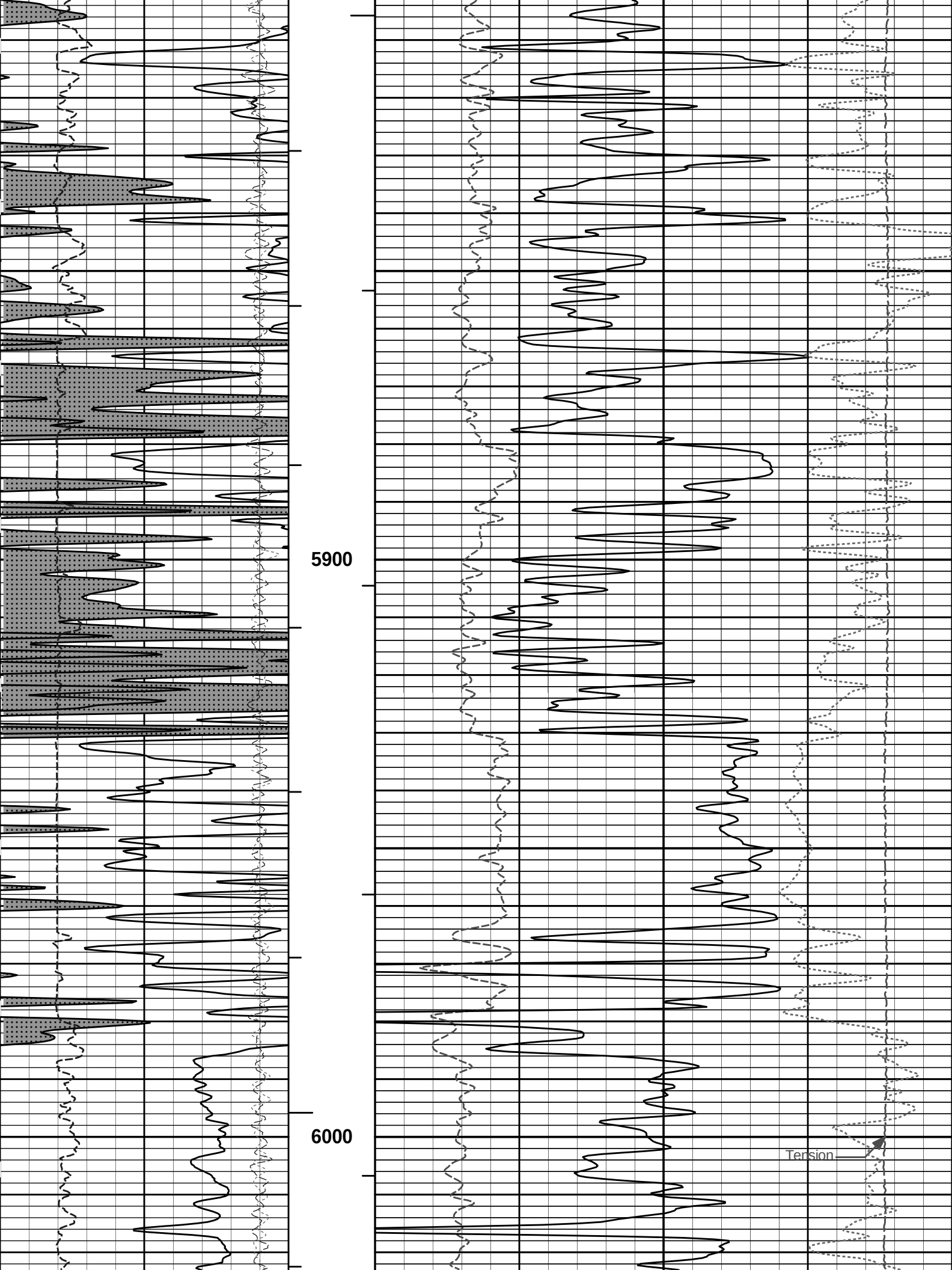
Tension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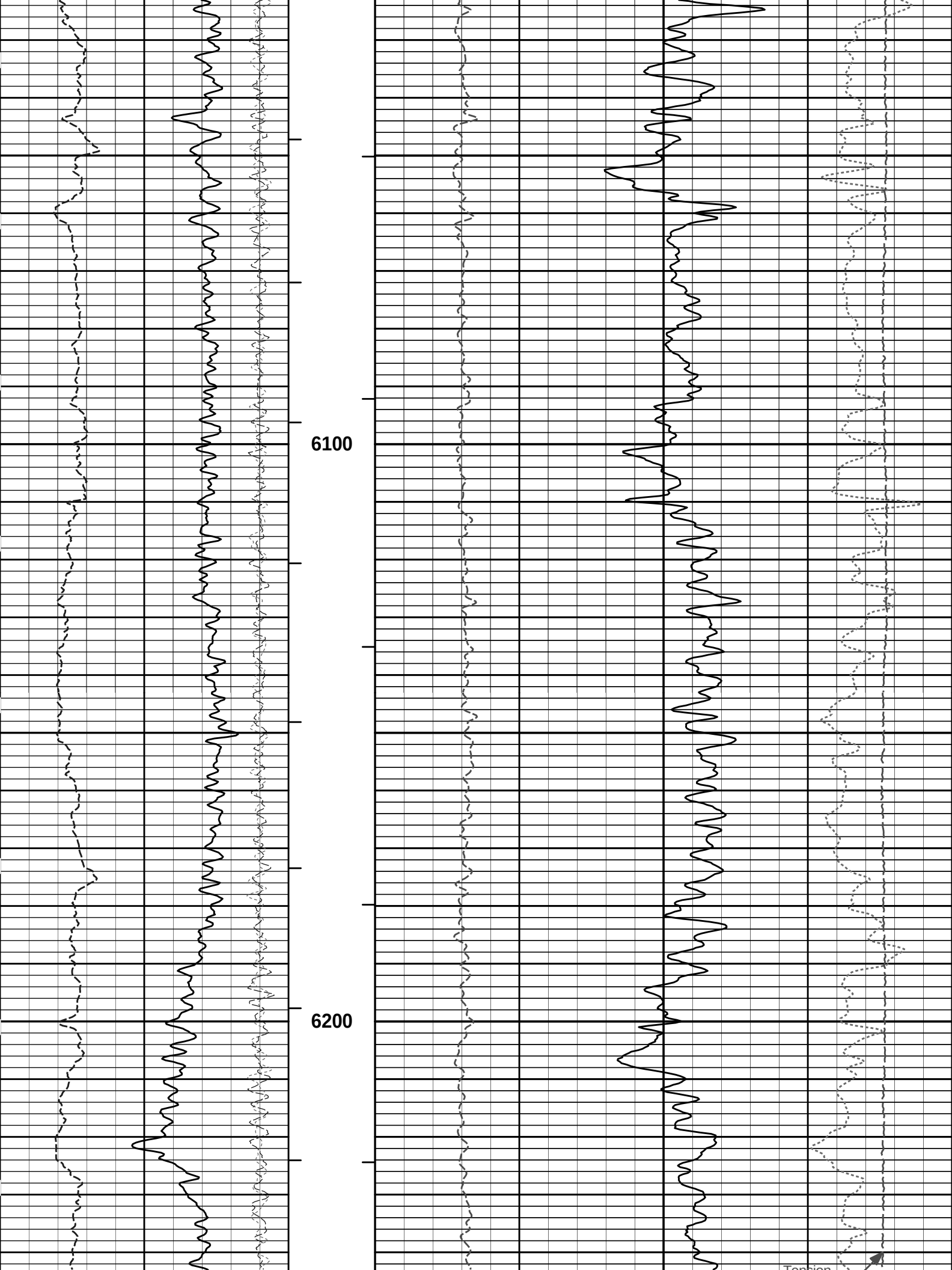
Tension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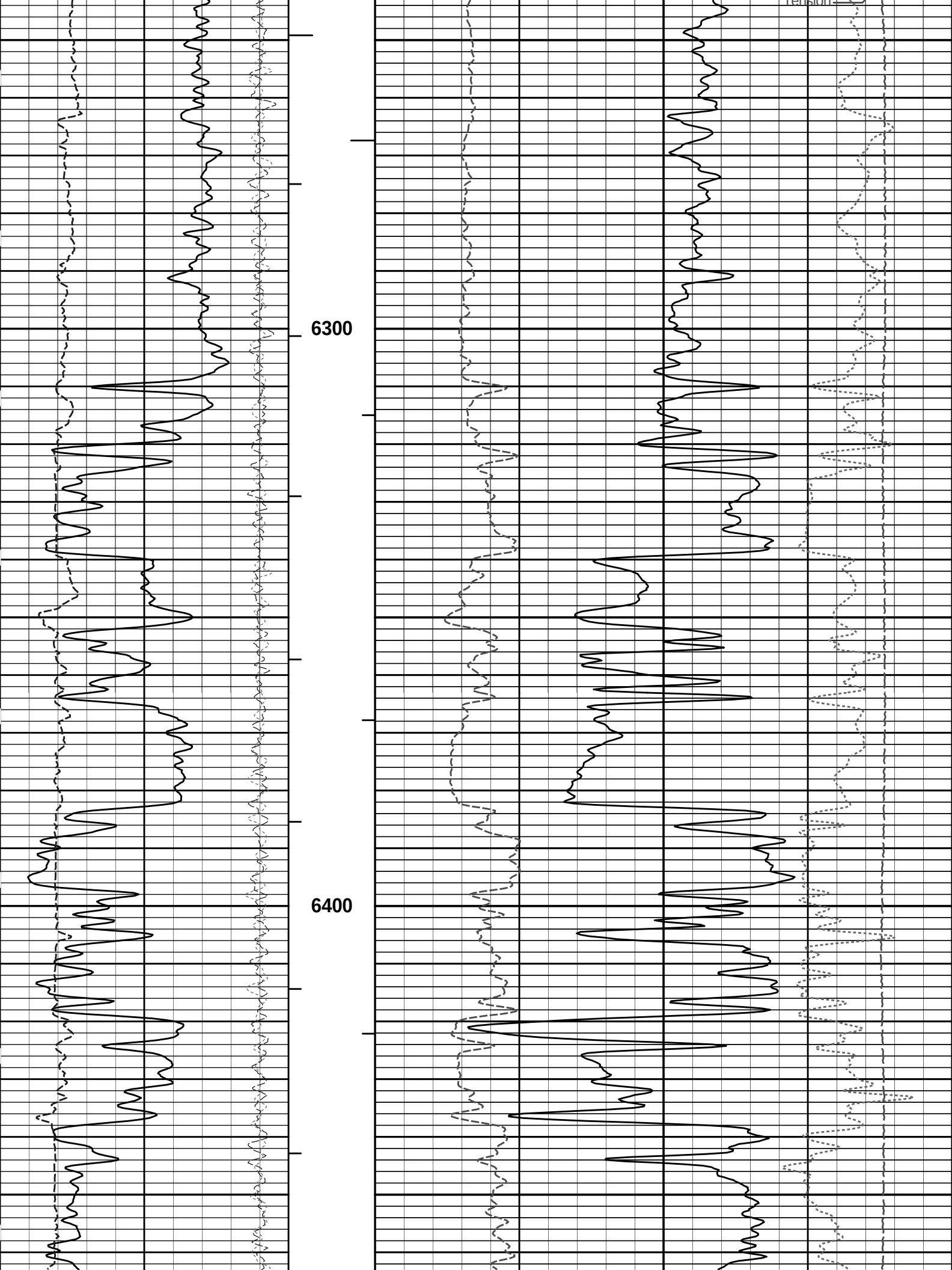
Tension
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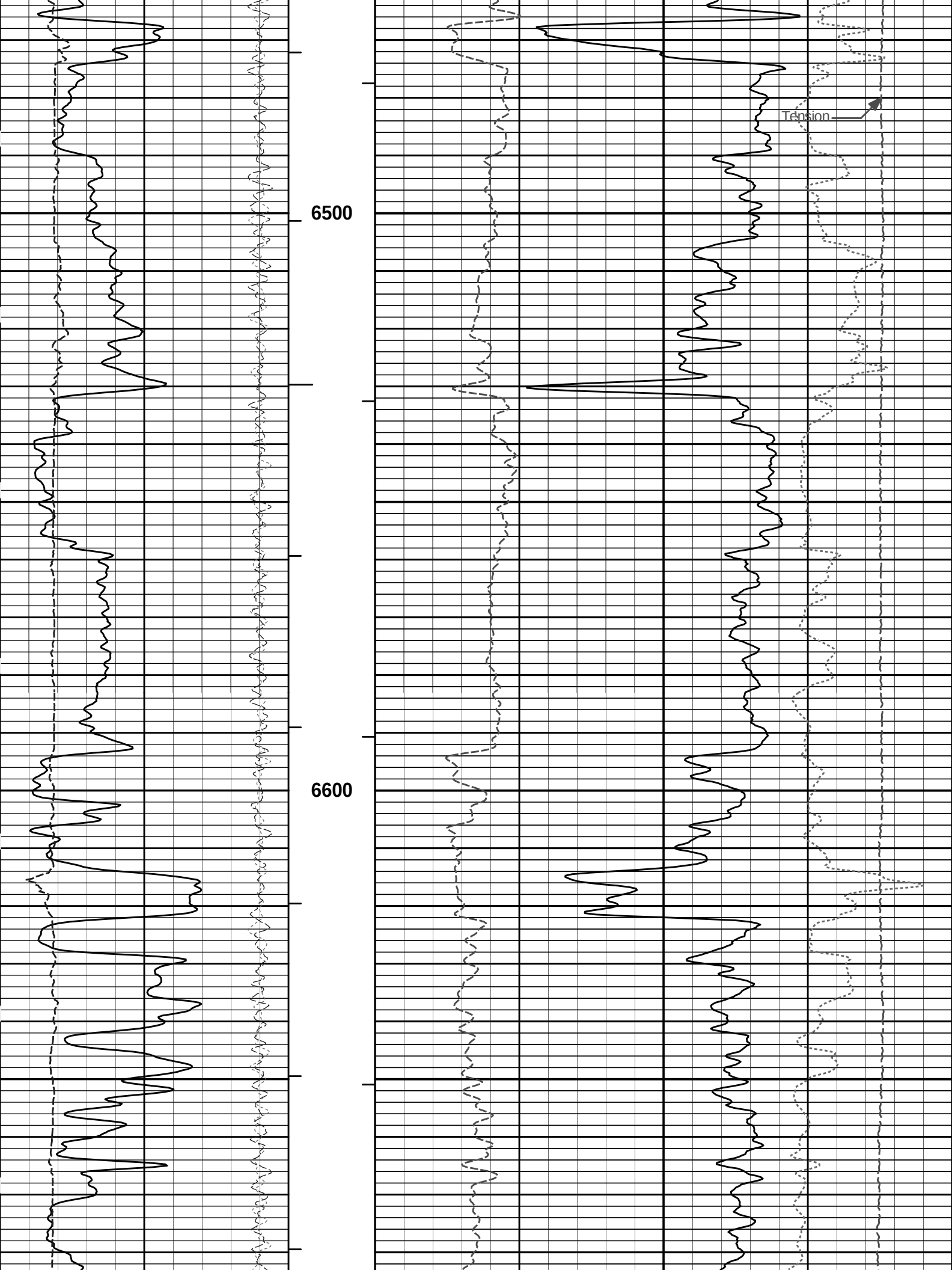
Tension
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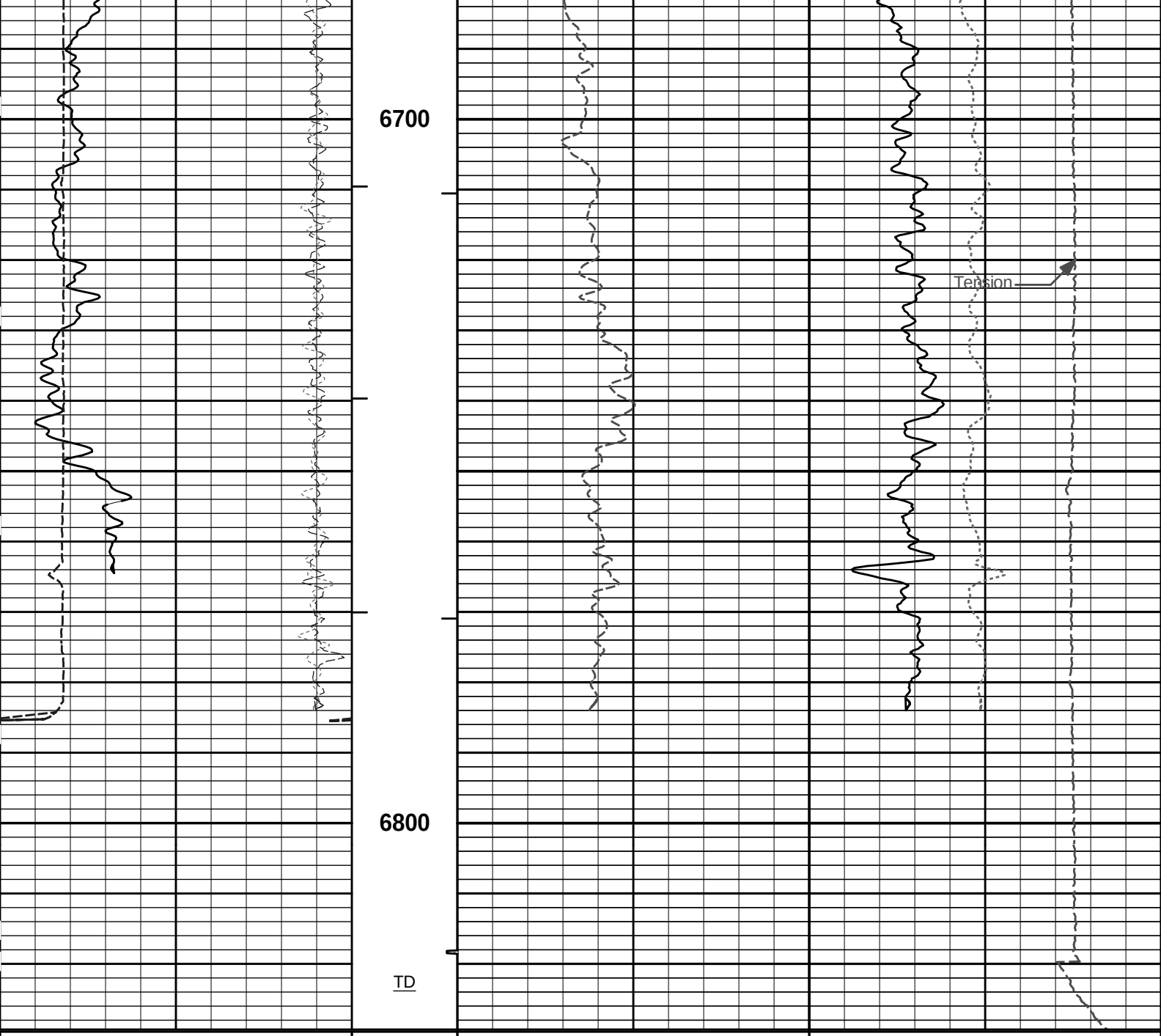


6 Caliper 16	1 : 240 ft	0 Pe 10 / -0.25 DensityCorr 0.25
inches		g/cc
-18 NearQuality 2	BHV ft3	15K Tension 0
		pounds
18 FarQuality -2	AHV ft3	2 Bulk Density 3
		g/cc
0 Gamma Ray 150	Tension Pull 10 0	
api		
SHALE	Tension Pull	

HALLIBURTON

Plot Time: 17-Feb-13 09:36:16
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\BULKD_5_MAIN_LIB

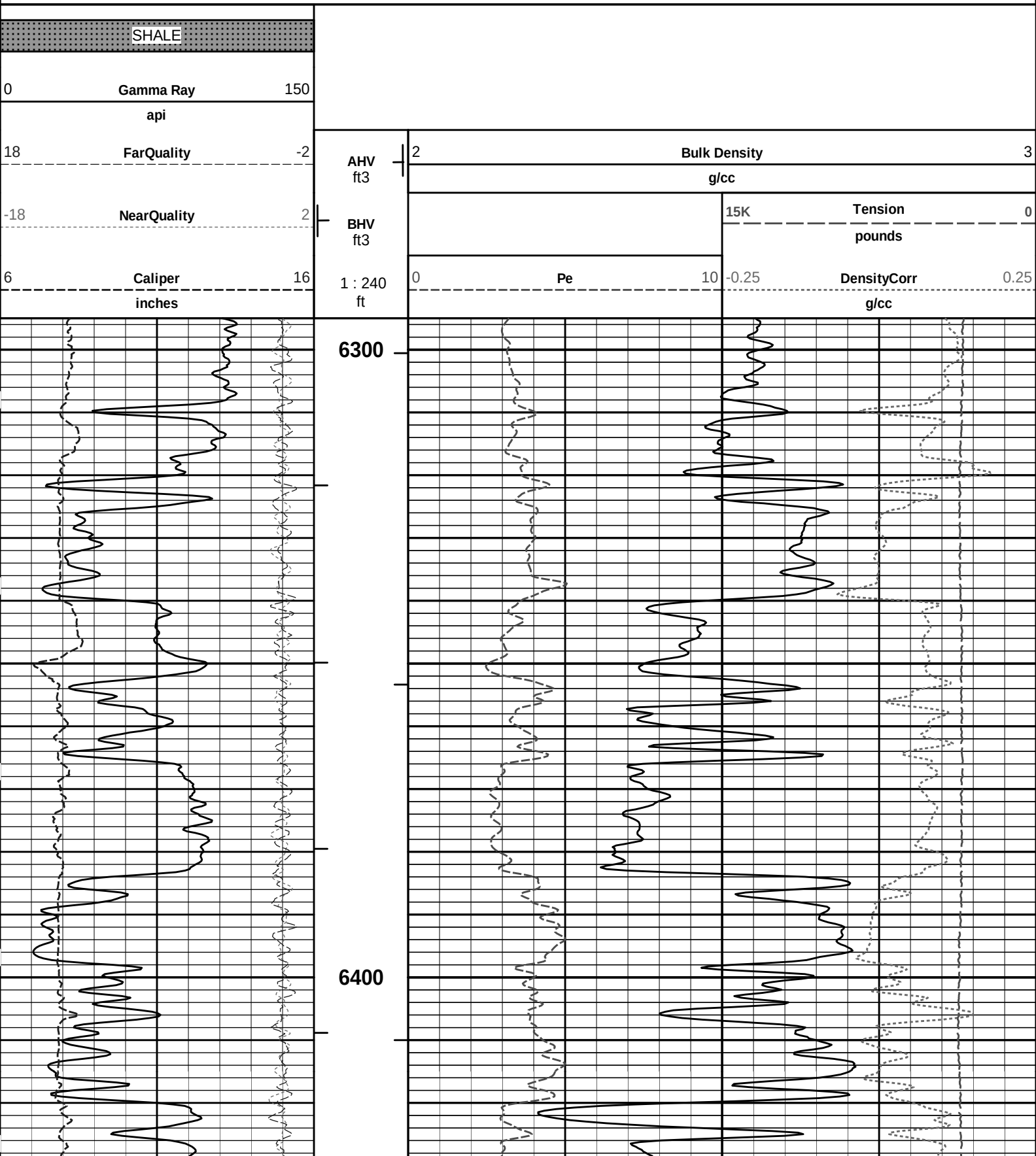
5 INCH MAIN LOG

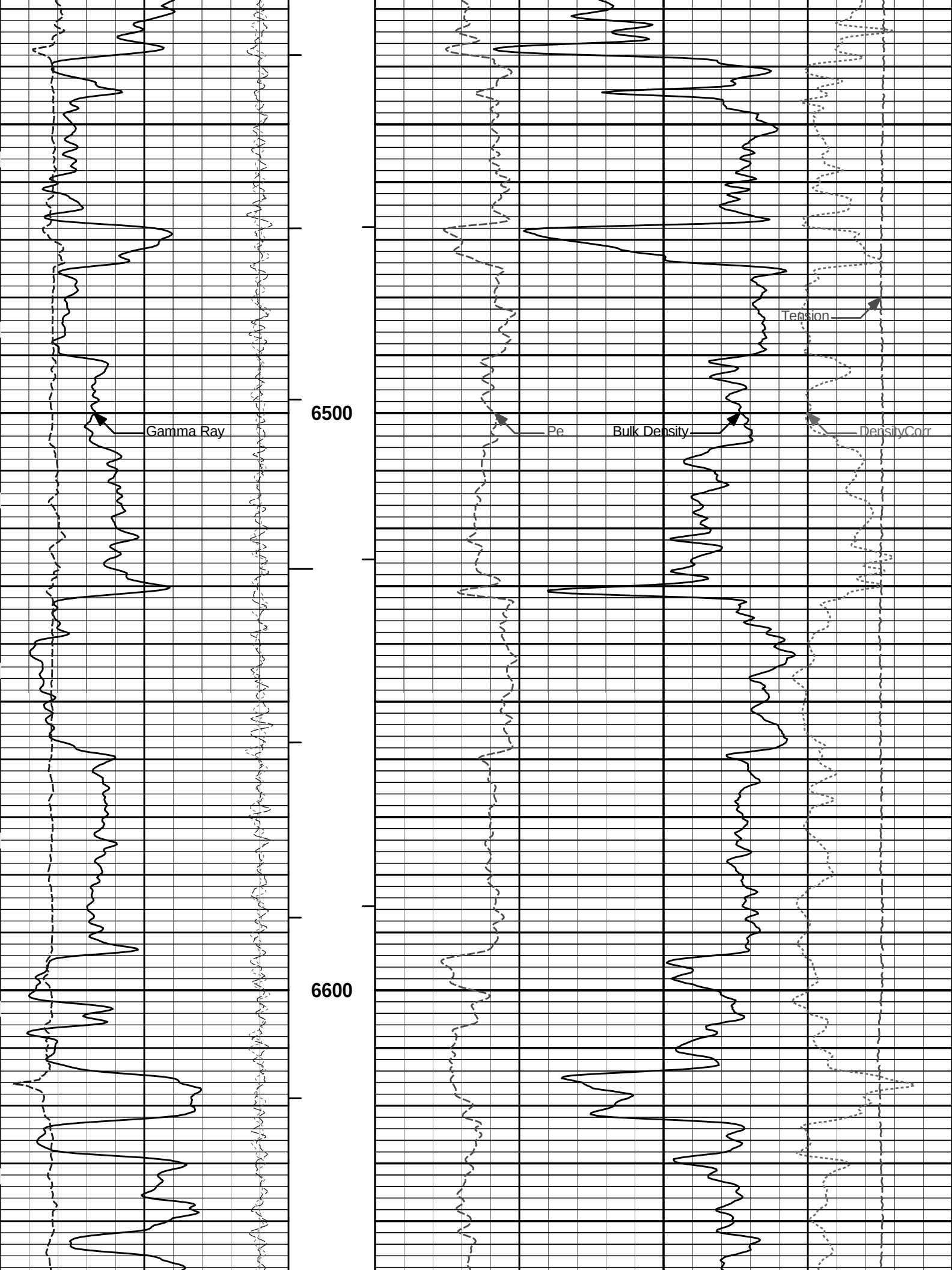
5 INCH MAIN LOG

HALLIBURTON

Plot Time: 17-Feb-13 09:36:16
Plot Range: 6295 ft to 6831.58 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_REPEAT\
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION




Gamma Ray
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Pe
Bulk Density
Tension
DensityCorr
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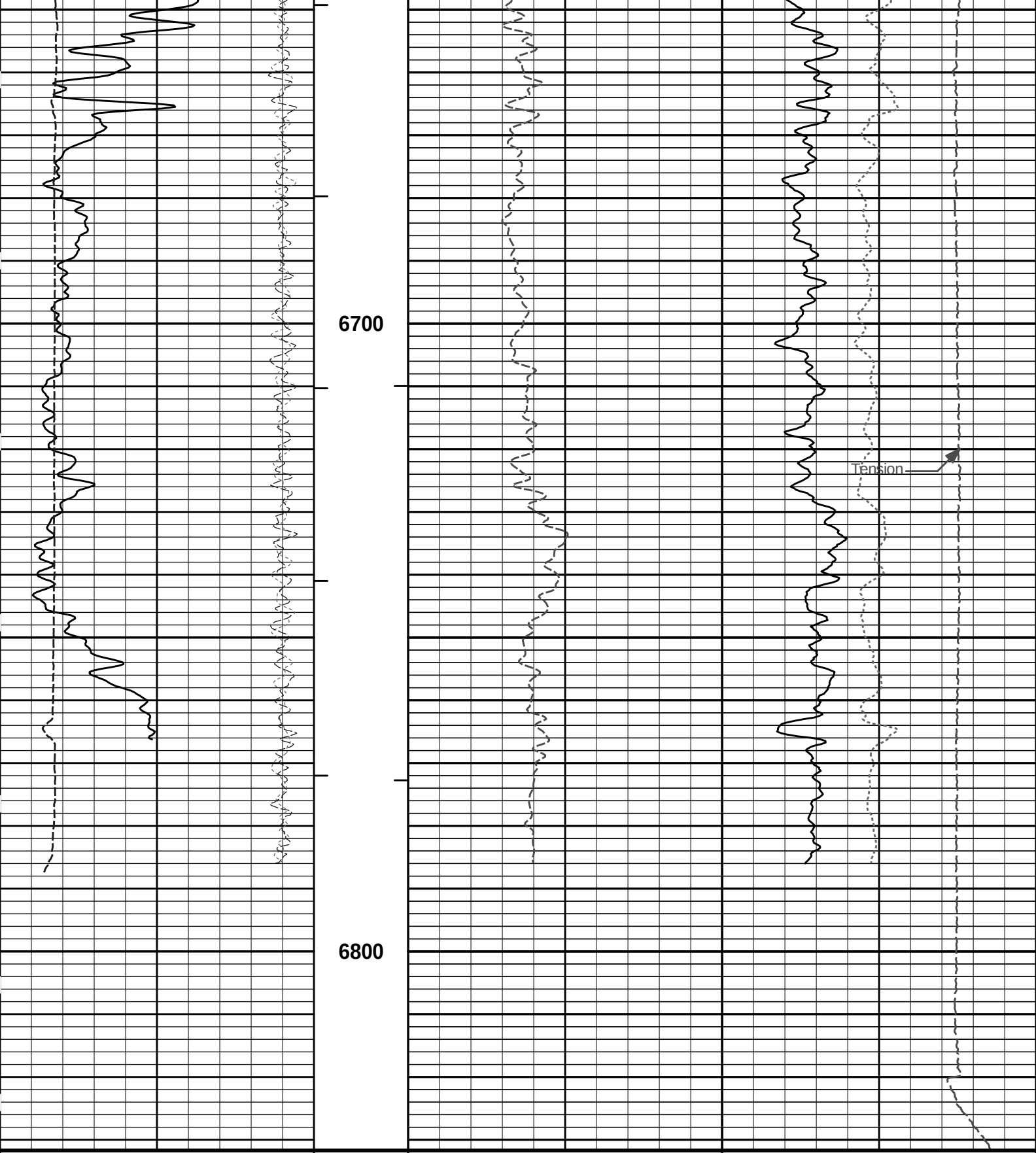


6 Caliper 16 inches	1 : 240 ft	0 Pe 10
-18 NearQuality 2	BHV ft3	
18 FarQuality -2	AHV ft3	2 Bulk Density 3 g/cc
0 Gamma Ray 150		

-0.25 DensityCorr 0.25 g/cc	
15K Tension 0 pounds	

api

SHALE

HALLIBURTON

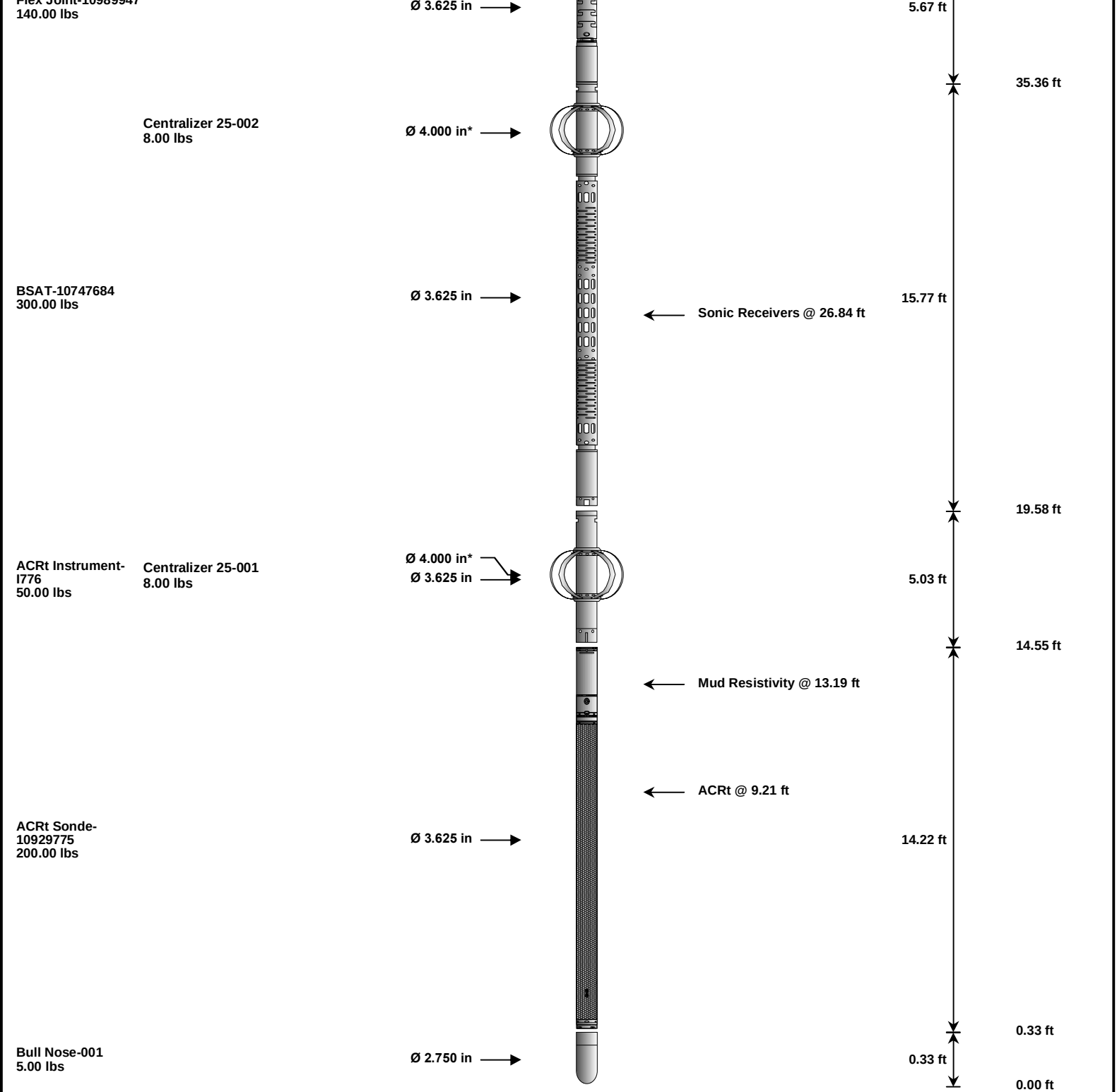
Plot Time: 17-Feb-13 09:36:18
Plot Range: 6295 ft to 6831.58 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_REPEAT\
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\BULKD_5_REP_LIB

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						75.71 ft
Cable Head-PROT01 30.00 lbs		Ø 3.625 in			1.92 ft	
						73.79 ft
SP Sub-11441709 60.00 lbs		Ø 3.625 in		SP @ 72.01 ft	3.74 ft	
						70.05 ft
GTET-10811258 165.00 lbs		Ø 3.625 in		GammaRay @ 63.99 ft	8.52 ft	
						61.53 ft
DSNT-10755066 174.00 lbs	DSN Decentralizer-10735145 6.60 lbs	Ø 5.000 in* Ø 3.625 in		DSN Far @ 54.59 ft DSN Near @ 53.84 ft	9.69 ft	
						51.84 ft
SDLT-10685803 360.00 lbs	SDLT Pad-10714945 65.00 lbs Microlog Pad-10685803 8.00 lbs	Ø 4.500 in Ø 4.750 in* Ø 4.750 in*		Microlog @ 44.03 ft SDL Caliper @ 43.84 ft SDL @ 43.83 ft	10.81 ft	
						41.03 ft
Flex Joint-10989947						



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CH	Standard OH Cable Head	PROT01	30.00	1.92		73.79	300.00
SP	SP Sub	11441709	60.00	3.74		70.05	300.00
GTET	Gamma Telemetry Tool	10811258	165.00	8.52		61.53	60.00
DSNT	Dual Spaced Neutron	10755066	174.00	9.69		51.84	60.00
DCNT	DSN Decentralizer	10735145	6.60	5.13	*	55.17	300.00
SDLT	Spectral Density Tool	10685803	360.00	10.81		41.03	60.00
MICP	Microlog Pad	10685803	8.00	1.00	*	43.53	60.00
SDLP	Density Insite Pad	10714945	65.00	2.55	*	43.24	60.00
FLEX	Flex Joint	10989947	140.00	5.67		35.36	300.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77		19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	002	8.00	2.08	*	32.52	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I776	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	001	8.00	2.08	*	16.10	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22		0.33	300.00
BLNS	Bull Nose	001	5.00	0.33		0.00	300.00

Total	**1,579.60**	**75.71**

* Not included in Total Length and Length Accumulation.

Data: WIGGAINS_12-11\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\IDLE **Date: 17-Feb-13 03:51:57**

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	1.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	6850.00	ft
	SHARED	BHT	Bottom Hole Temperature	140.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	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	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP 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	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm

BOTTOM

Data: WIGGAINS_12-11\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\005 17-Feb-13 07:09 Up @6829.8f **Date: 17-Feb-13 08:00:12**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**31-Dec-12 23:10:29**
Engineer:	**T. HYDE**	**Calibration Date:**	**03-Feb-13 11:19:35**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Measurement	Measured	Calibrated	Units
Background	49.5	50.6	api
Background + Calibrator	276.4	282.6	api
Calibrator	226.9	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**03-Feb-13 11:19:35**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**17-Feb-13 04:12:27**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Calibrator Source S/N: TB-185

Calibrator API Reference:228.00 api

Equivalent Calibrator API Reference:232.0 api

Field Verification	Shop	Field	Units
Background	50.6	23.7	api
Background + Calibrator	282.6	254.2	api
Calibrator	232.0	230.4	api

Shop	Field	Difference	Tolerance
232.0	230.4	1.6	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10755066 **Reference Calibration Date:** 19-Dec-12 09:31:50

Engineer: T. HYDE **Calibration Date:** 18-Jan-13 10:41:33

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Logging Source S/N: DSN-436

Tank Serial Number: 105060

Reference value assigned to Tank: 51.680

Snow Block S/N: TRK_954

Calibration Tank Water Temperature: 62 degF

Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.947	0.946	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):	0.2111	0.2106	0.0004	+/- 0.0020
Calibrated Ratio:	9.73	9.72	0.015	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0612	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 - 10755066 **Reference Calibration Date:** 18-Jan-13 10:41:33

Engineer: S. INGERSOLL **Calibration Date:** 17-Feb-13 04:16:03

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Logging Source S/N: DSN-436

Snow Block S/N: TRK_954

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0612	0.0592	-0.0020	+/- 0.0150

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

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - 10685803 **Reference Calibration Date:** 18-Jan-13 09:58:36

Engineer: T. HYDE **Calibration Date:** 18-Jan-13 10:03:41

Software Version: WL INSITE R3.6.0 (Build 3) **Calibration Version:** 1

Host Tool Name: DSNT - 10755066

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-4650.98	-4634.87	-7000.00 - -1000.00
Pad Gain	0.0003964	0.0003949	0.000200 - 0.000600
Arm Offset	-2226.61	-2519.31	-5000.00 - 3000.00
Arm Gain	0.0005361	0.0005659	0.000300 - 0.000700
Arm Power	-0.000006657	-0.000008059	-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)	3.76	3.75	-0.01	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.54	6.50	-0.04	+/- 0.20
Medium Ring (in)	8.22	8.25	0.03	+/- 0.20
Large Ring (in)	14.94	15.00	0.06	+/- 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 - 10685803 **Reference Calibration Date:** 18-Jan-13 10:03:41

Engineer: S. INGERSOLL **Calibration Date:** 17-Feb-13 04:19:24

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.66	-0.09	+/- 0.10
Ring Diameter	8.25	8.23	-0.02	+/- 0.15

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name: SDLT Pad - 10714945 **Reference Calibration Date:** 27-Dec-12 14:52:08

Engineer:	**S. INGERSOLL**	**Calibration Date:**	**01-Feb-13 09:26:12**
Software Version:	**WL INSITE R3.8.4 (Build 5)**	**Calibration Version:**	**1**

Logging Source S/N: 5073GW

Aluminum Block S/N: 63061 Density: 2.591g/cc Pe: 3.170

Magnesium Block S/N: 63393 Density: 1.690g/cc Pe: 2.594

DENSITY CALIBRATION SUMMARY

Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0194	1.0208	0.90 - 1.10
Near Dens Gain	0.9911	1.0031	0.90 - 1.10
Near Peak Gain	0.9996	0.9933	0.90 - 1.10
Near Lith Gain	0.9637	0.9847	0.90 - 1.10
Far Bar Gain	0.9937	0.9939	0.90 - 1.10
Far Dens Gain	0.9836	0.9879	0.90 - 1.10
Far Peak Gain	0.9803	0.9842	0.90 - 1.10
Far Lith Gain	0.9626	0.9682	0.90 - 1.10
Near Bar Offset	0.1283	0.1040	NONE
Near Dens Offset	0.3542	0.2430	NONE
Near Peak Offset	0.2642	0.3129	NONE
Near Lith Offset	0.5301	0.3541	NONE
Far Bar Offset	0.2561	0.2422	NONE
Far Dens Offset	0.3280	0.2800	NONE
Far Peak Offset	0.3491	0.3058	NONE
Far Lith Offset	0.4598	0.4088	NONE
Near Bar Background	978.58	975.57	700 - 1450
Near Dens Background	325.54	323.82	230 - 480
Near Peak Background	141.17	141.75	100 - 210
Near Lith Background	173.43	173.14	125 - 260
Far Bar Background	504.27	501.11	450 - 900
Far Dens Background	195.52	195.62	175 - 345
Far Peak Background	76.60	75.55	70 - 140
Far Lith Background	80.95	80.24	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.690	1.690	0.000	+/- 0.015
Pe	2.598	2.547	-0.051	+/- 0.150
ALUMINUM				
Density (g/cc)	2.587	2.591	0.004	+/- 0.01500
Pe	3.159	3.120	-0.039	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0006	+/- 0.0110	-0.0016	+/- 0.0140
Magnesium Block	0.0004	+/- 0.0110	0.0013	+/- 0.0140
Aluminum Block	-0.0003	+/- 0.0110	0.0002	+/- 0.0140

Resolution	9.84	6.00 - 11.50	9.26	6.00 - 11.50
Internal Verifier(B+D+P+L)	1614	1200 - 2700	853	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 - 10714945 **Reference Calibration Date:** 01-Feb-13 09:26:12

Engineer: S. INGERSOLL **Calibration Date:** 17-Feb-13 04:22:59

Software Version: WL INSITE R3.8.4 (Build 5) **Calibration Version:** 1

Pad Temperature: 43.5 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	**Shop**	**Field**	**Change**	**Control Limit +/-**
Near (B+D+P+L) cps	1614.287	1623.100	8.813	16.152
Far (B+D+P+L) cps	852.517	850.209	-2.308	16.011
Near Resolution	9.84	10.07	0.230	0.50
Far Resolution	9.26	9.72	0.460	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
GTET-10811258						
Gamma Ray Calibrator	232.0	230.4	----------	1.6	+/- 9.00	api
DSNT-10755066						
Snow-Block Porosity	0.0612	0.0592	----------	0.0020	+/- 0.0150	decp
SDLT-10685803						
Pad Extension	3.75	3.66	----------	0.09	+/-0.10	in
Ring Diameter	8.25	8.23	----------	0.02	+/-0.15	in
SDLT Pad-10714945						
Near(B+D+P+L)	1614.287	1623.100	----------	-8.813	+/-16.152	cps
Far(B+D+P+L)	852.517	850.209	----------	2.308	+/-16.011	cps

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel				
TENS	Tension	0.00	NO	

SP Sub				
PLTC	Plot Control Mask	72.01	NO	
SP	Spontaneous Potential	72.01	BLK	1.250
SPR	Raw Spontaneous Potential	72.01	NO	
SPO	Spontaneous Potential Offset	72.01	NO	
GTET				
TPUL	Tension Pull	63.99	NO	
GR	Natural Gamma Ray API	63.99	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	63.99	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	63.99	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
DSNT				
TPUL	Tension Pull	53.74	NO	
RNDS	Near Detector Telemetry Counts	53.84	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.59	TRI	0.583
DNTT	DSN Tool Temperature	53.84	NO	
DSNS	DSN Tool Status	53.74	NO	
ERND	Near Detector Telemetry Counts EVR	53.84	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.59	BLK	0.000
ENTM	DSN Tool Temperature EVR	53.84	NO	
SDLT				
TPUL	Tension Pull	43.84	NO	
PCAL	Pad Caliper	43.84	TRI	0.250
ACAL	Arm Caliper	43.84	TRI	0.250
BSAT				
TPUL	Tension Pull	26.84	NO	
STAT	Status	26.84	NO	
DLYT	Delay Time	26.84	NO	
SI	Sample Interval	26.84	NO	
TXRX	Raw Telemetry 10 Receivers	26.84	NO	
FRMC	Tool Frame Count	26.84	NO	
GMOD	Gain processing mode	19.58	NO	
ACRt Sonde				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000

F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	4.98	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	4.98	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	3.98	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	3.98	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.48	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.48	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.23	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.23	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	8.98	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	8.98	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.48	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.48	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	4.98	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	4.98	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	3.98	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	3.98	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.48	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.48	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.23	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.23	BLK	0.000
RMUD	Mud Resistivity	12.52	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.73	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.73	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.73	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.73	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.73	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.73	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.73	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.73	BLK	0.000
ITMP	Instrument Temperature	2.73	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.73	NO	
TIDV	Instrument Temperature Derivative	2.73	NO	
TUDV	Upper Temperature Derivative	2.73	NO	
TLDV	Lower Temperature Derivative	2.73	NO	
TRBD	Receiver Board Temperature	2.73	NO	

SDLT Pad				
TPUL	Tension Pull	43.83	NO	
NAB	Near Above	43.66	BLK	0.920
NHI	Near Cesium High	43.66	BLK	0.920
NLO	Near Cesium Low	43.66	BLK	0.920
NVA	Near Valley	43.66	BLK	0.920
NBA	Near Barite	43.66	BLK	0.920
NDE	Near Density	43.66	BLK	0.920
NPK	Near Peak	43.66	BLK	0.920
NLI	Near Lithology	43.66	BLK	0.920
NBAU	Near Barite Unfiltered	43.66	BLK	0.250
NLIU	Near Lithology Unfiltered	43.66	BLK	0.250
FAB	Far Above	44.01	BLK	0.250
FHI	Far Cesium High	44.01	BLK	0.250
FLO	Far Cesium Low	44.01	BLK	0.250
FVA	Far Valley	44.01	BLK	0.250
FBA	Far Barite	44.01	BLK	0.250
FDE	Far Density	44.01	BLK	0.250
FPK	Far Peak	44.01	BLK	0.250

FPK	Far Peak	44.01	BLK	0.250
FLI	Far Lithology	44.01	BLK	0.250
PTMP	Pad Temperature	43.84	BLK	0.920
NHV	Near Detector High Voltage	43.24	NO	
FHV	Far Detector High Voltage	43.24	NO	
ITMP	Instrument Temperature	43.24	NO	
DDHV	Detector High Voltage	43.24	NO	

Microlog Pad

TPUL	Tension Pull	44.03	NO	
MINV	Microlog Lateral	44.03	BLK	0.750
MNOR	Microlog Normal	44.03	BLK	0.750

Data: WIGGAINS_12-11\0001 SP-GTET-DSNT-SDLT-FLEX-BSAT-ACRT-BN\005 17-Feb-13 07:09 Up @6829.8f **Date: 17-Feb-13 07:56:20**

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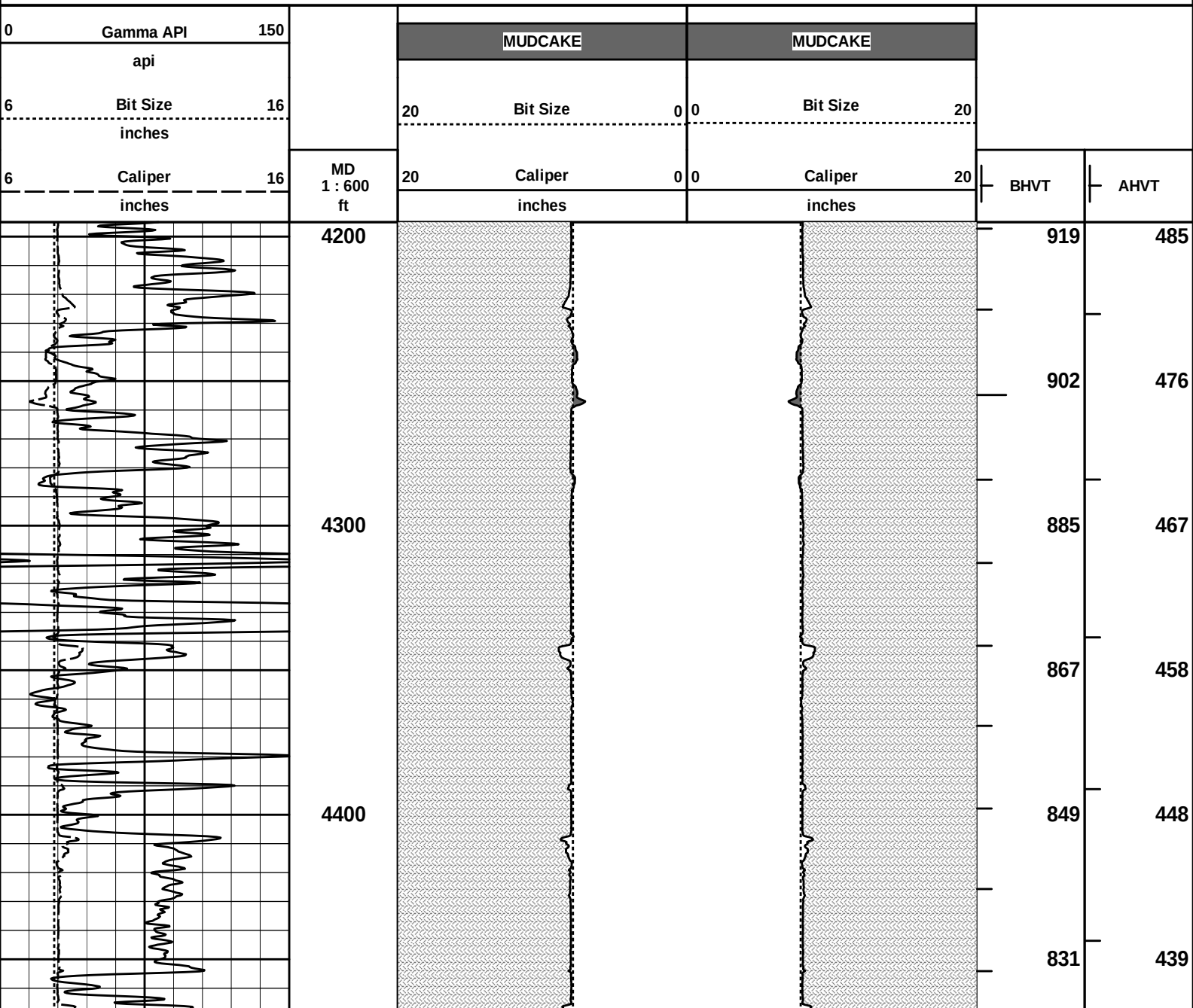
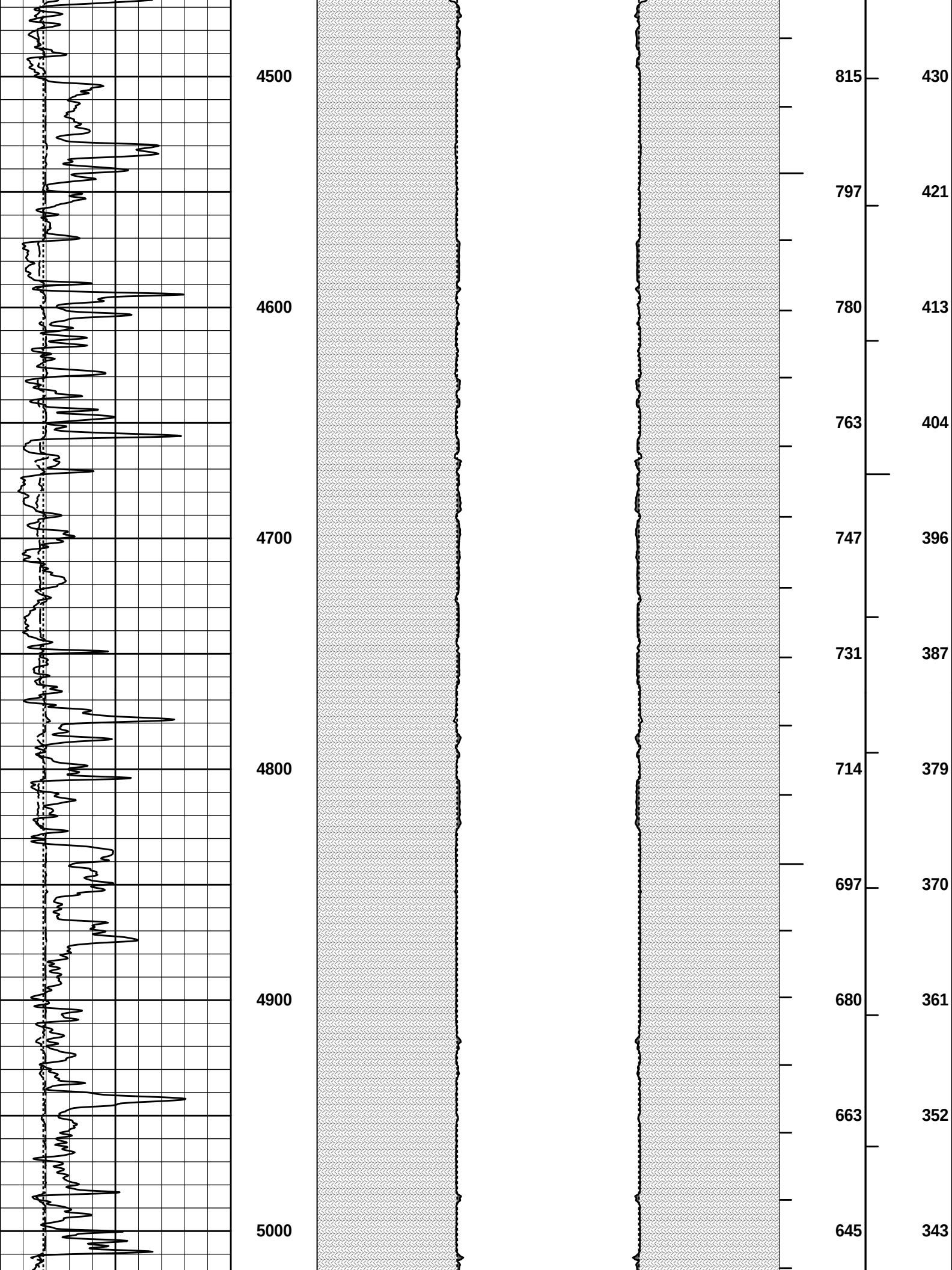
Plot Time: 17-Feb-13 09:36:19
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

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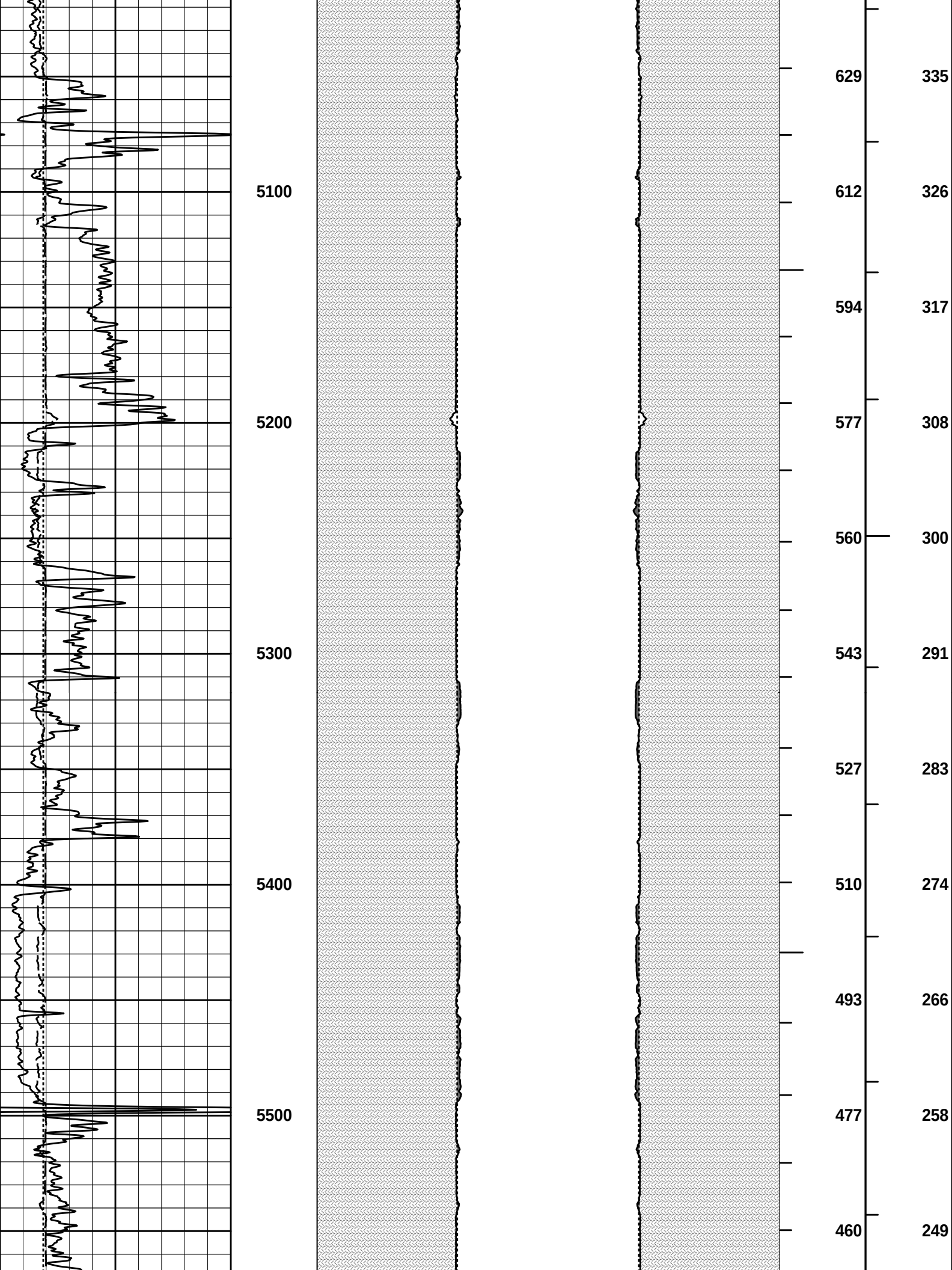
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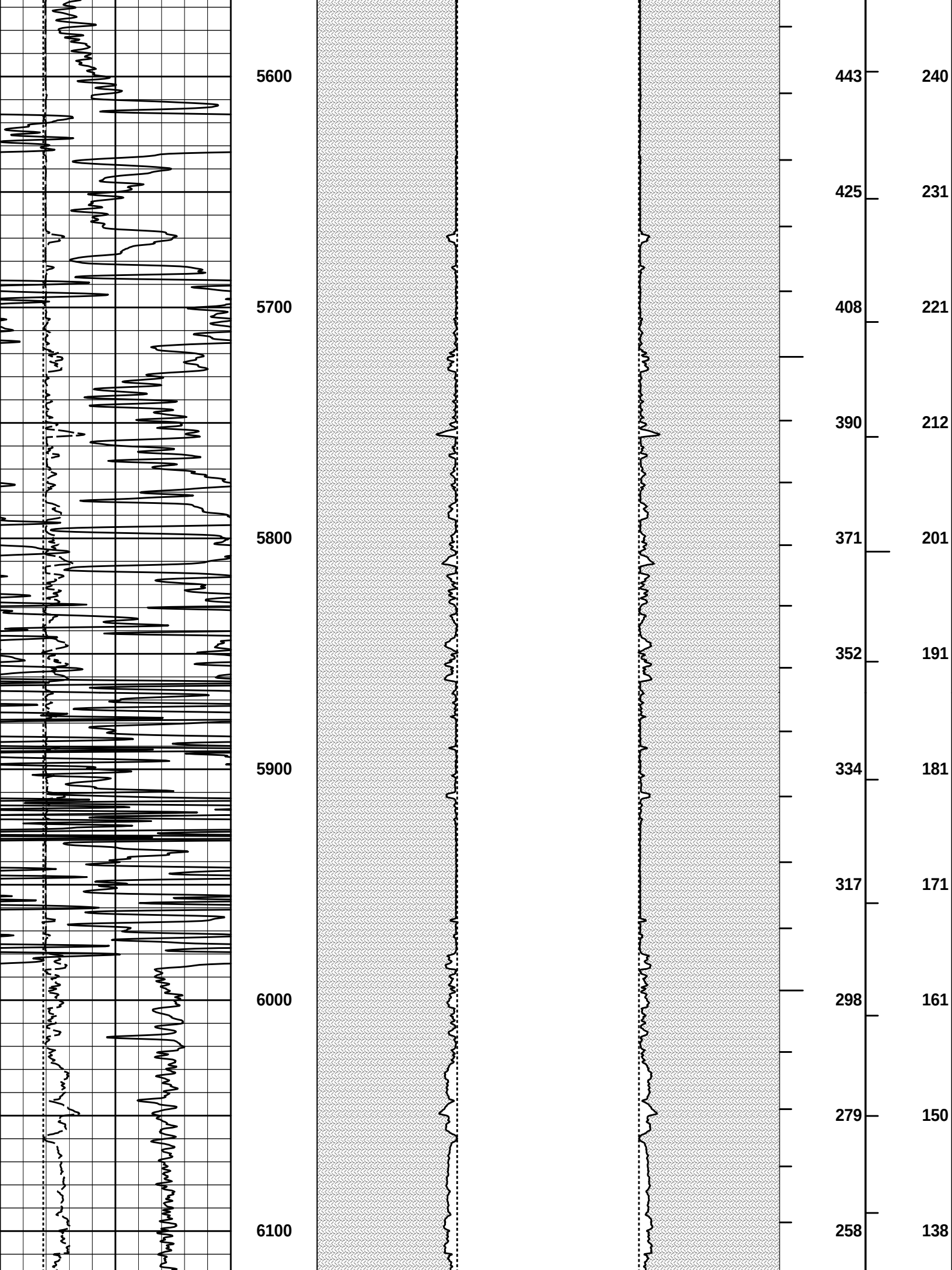
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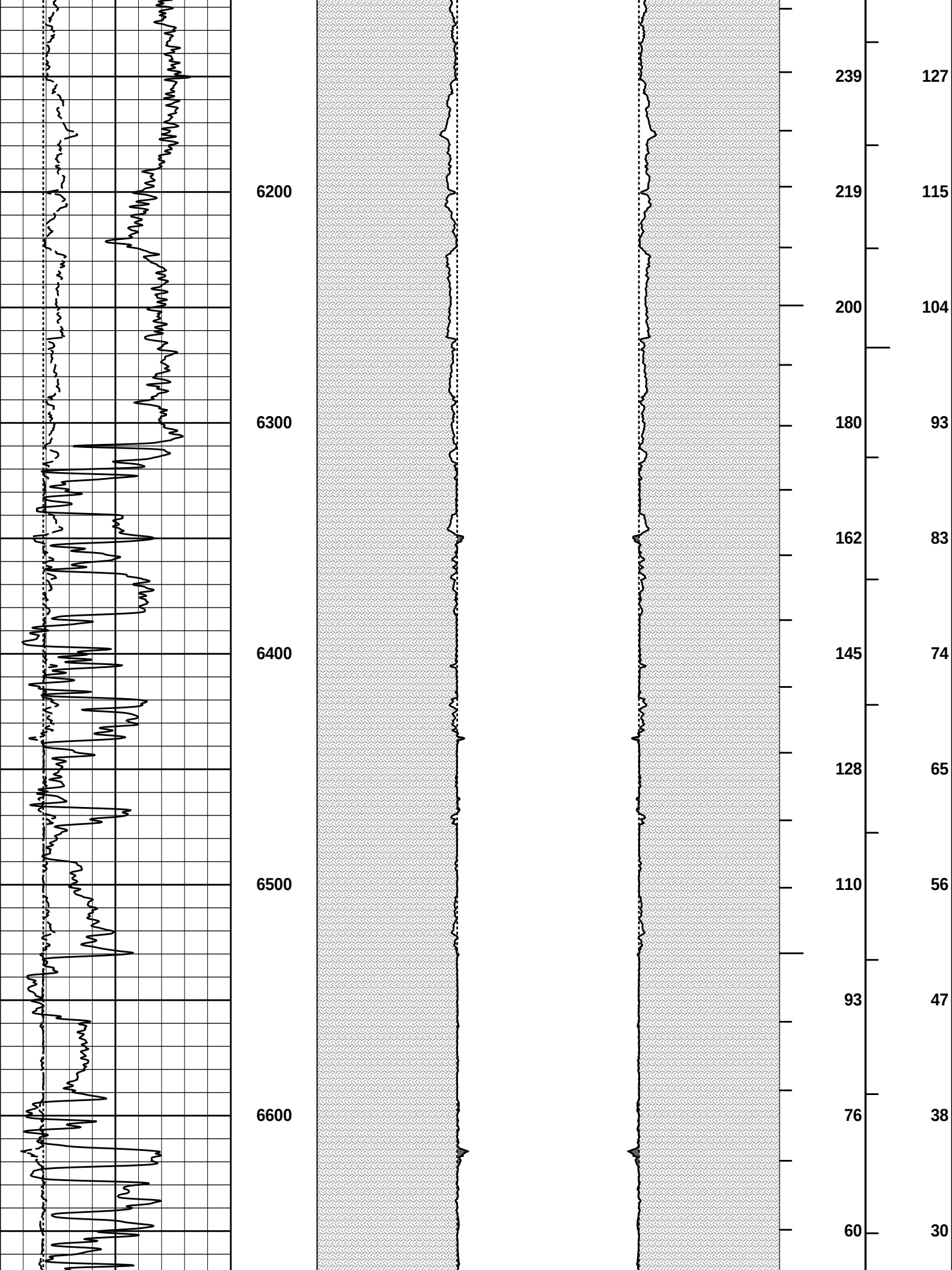
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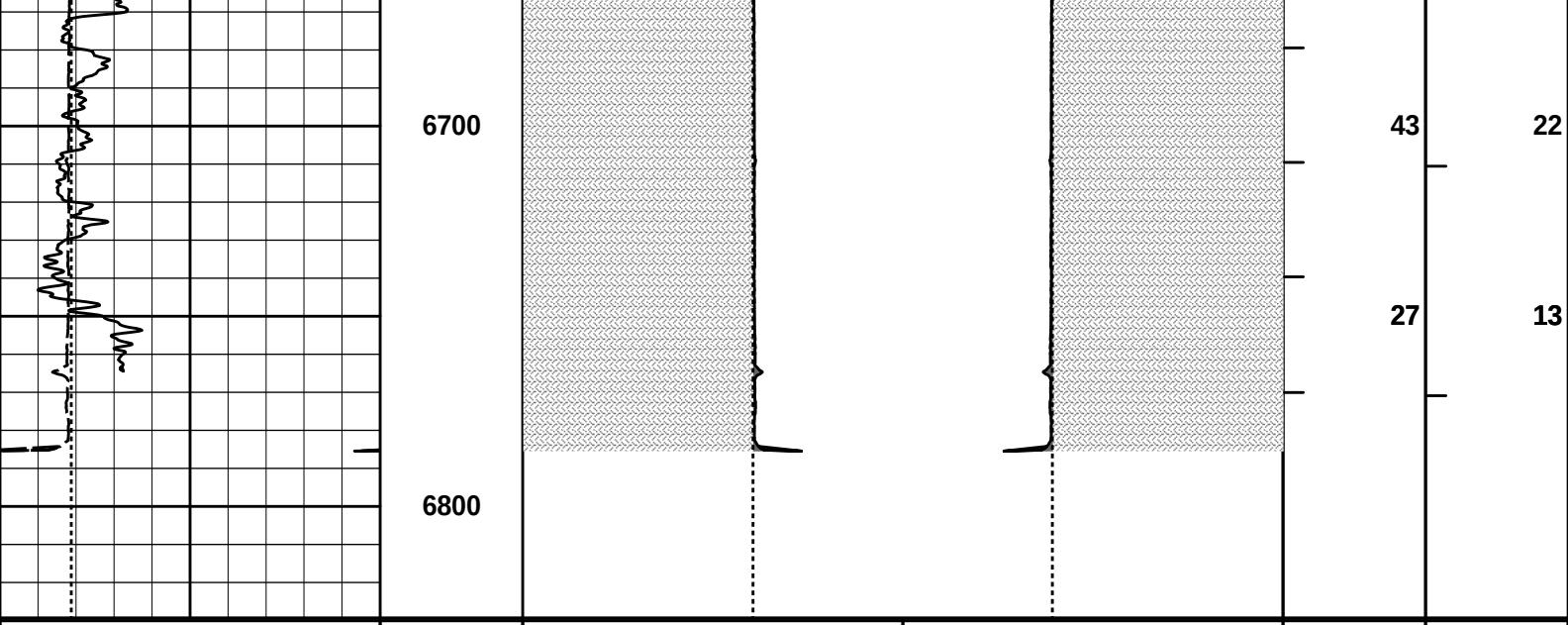

6 Caliper 16 inches	MD 1 : 600 ft	20 Caliper 0 inches	0 Caliper 20 inches	BHVT	AHVT
6 Bit Size 16 inches		20 Bit Size 0	0 Bit Size 20		
0 Gamma API 150 api		MUDCAKE	MUDCAKE		

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Plot Time: 17-Feb-13 09:36:25
Plot Range: 4195 ft to 6829.33 ft
Data: WIGGAINS_12-11\Well Based\WIGGAINS_12-11_DETAIL_PASS\
Plot File: \\-LOCAL-\WIGGAINS_12-11\Well Based\POROSITY\AHV_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT

COMPANY	**OXY USA INC.**		
WELL	**WIGGAINS 12-11**		
FIELD	**GOOCH**		
COUNTY	**STEVENS**	STATE	**KANSAS**

HALLIBURTON

DUAL SPACED NEUTRON SPECTRAL DENSITY LOG