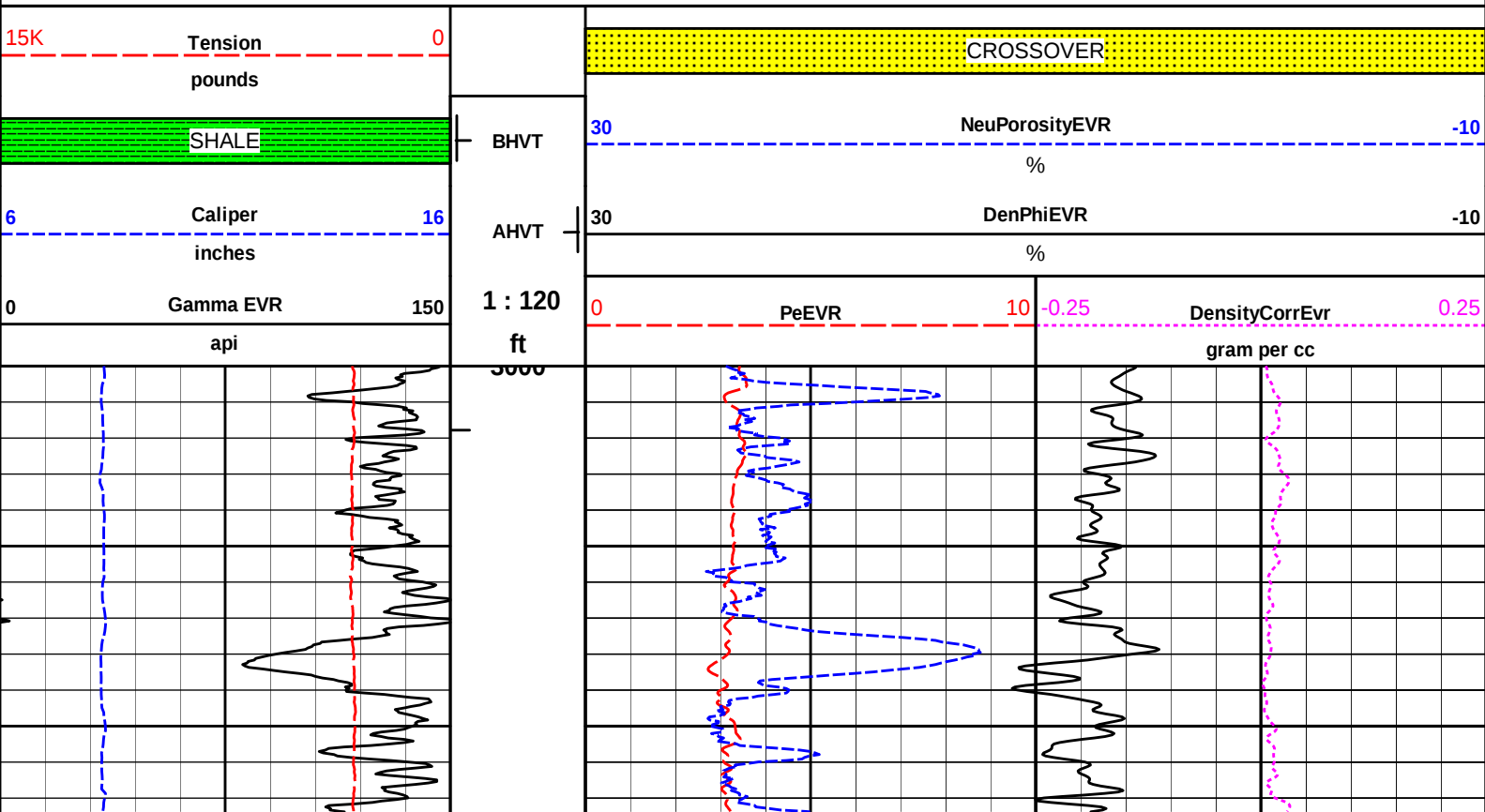


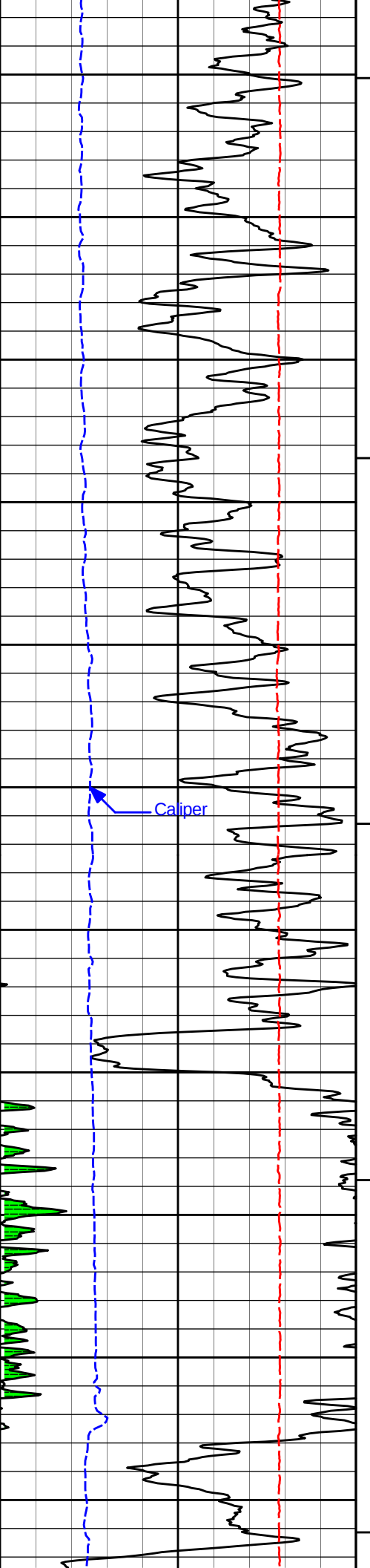
SPECTRAL DENSITY DUAL SPACED NEUTRON LOG

Fold here

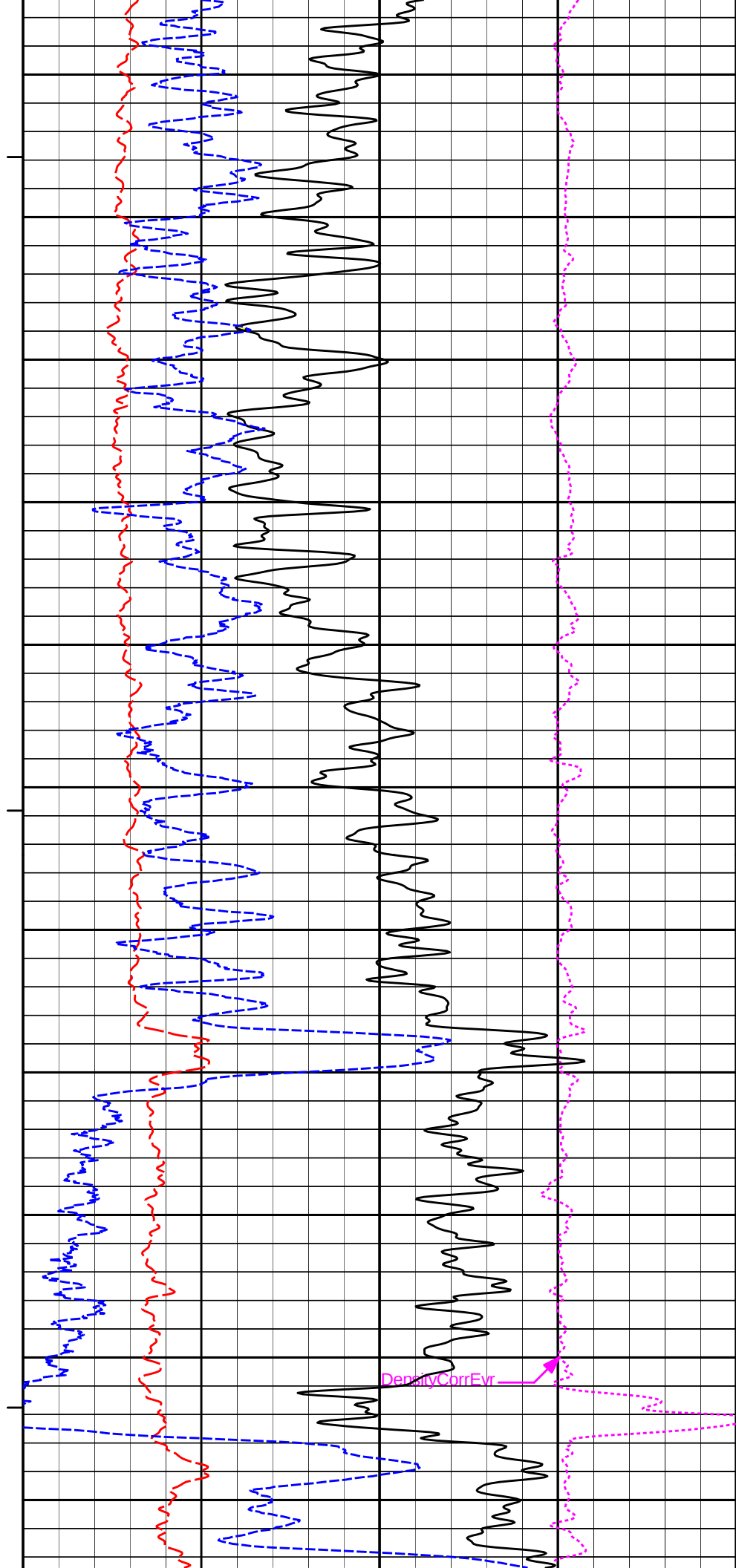
LOGGING DATA

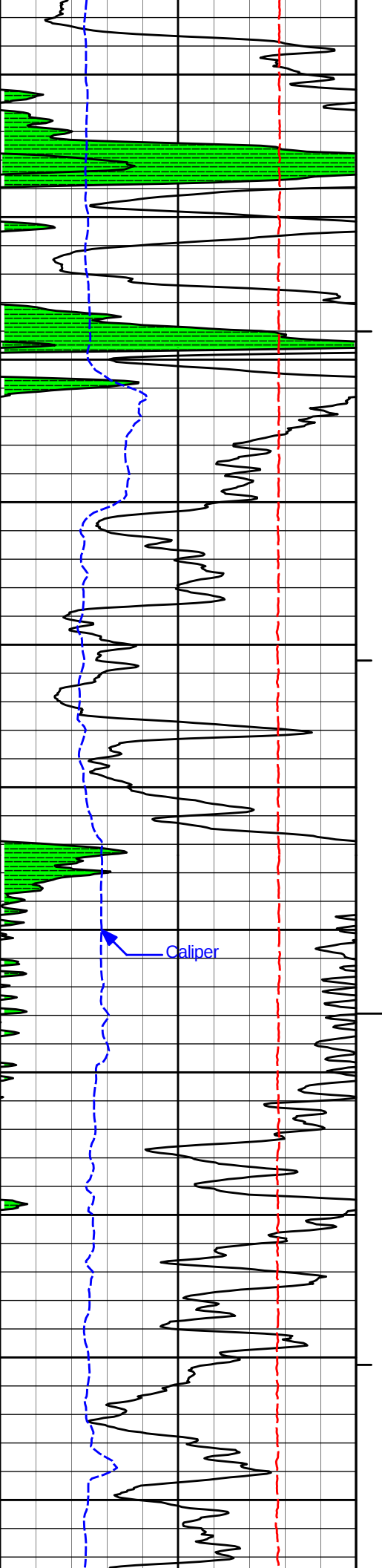
GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix	
No.	From	To	ft/min	L	R	L	R		L	R		L	R		
ONE	4960	3000	REC	0	150				30	-10	2.71	30	-10	LIME	
DIRECTIONAL INFORMATION															
Maximum Deviation								@	KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING															
CHLORIDES REPORTED AT 3,400 MG/L															
GTET-CSNG-DSNT-SDLT-IDT-ICT-WSTT-ACRT RUN IN COMBINATION															
TODAY'S CREW: F. VILLA & D. MILLER															
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123															
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															



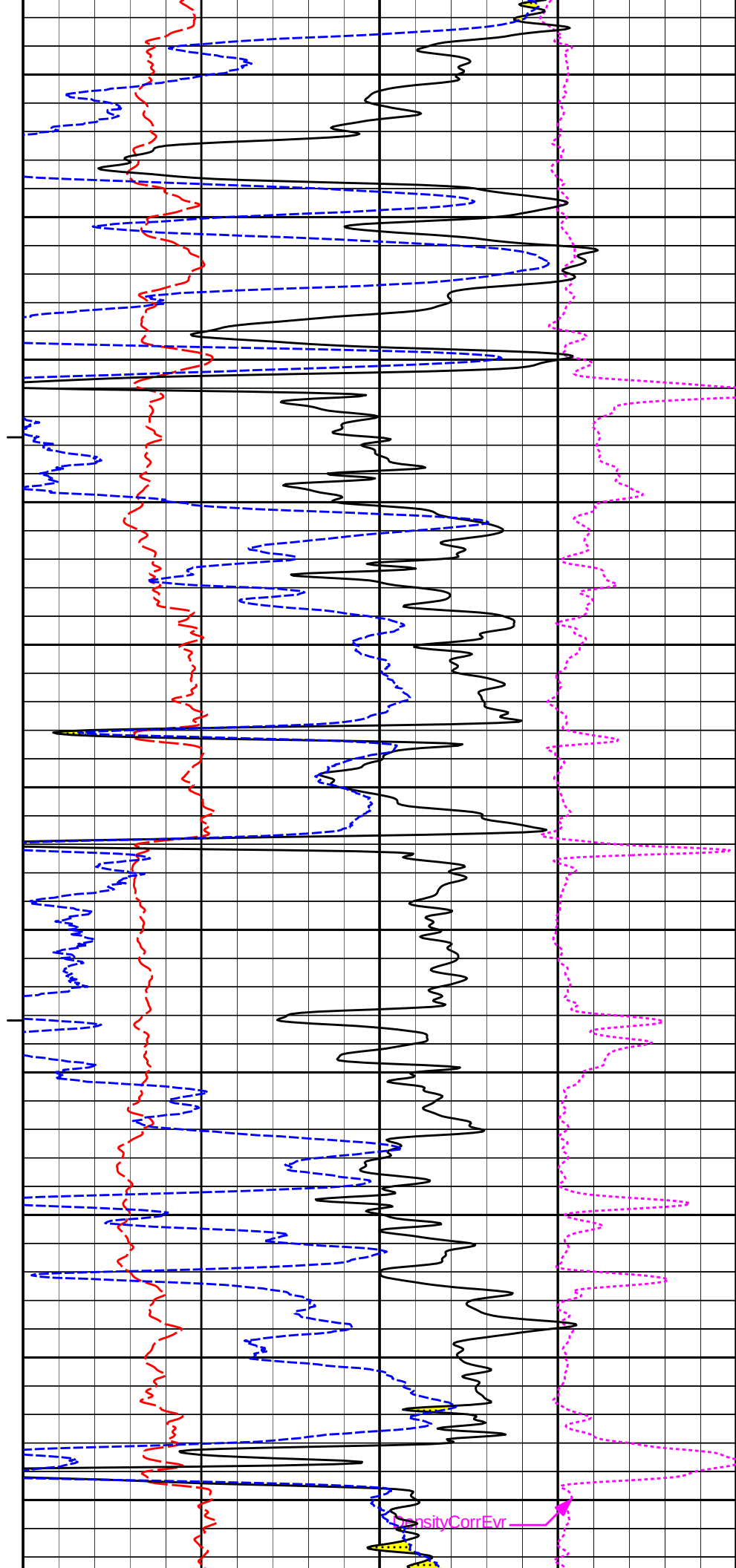


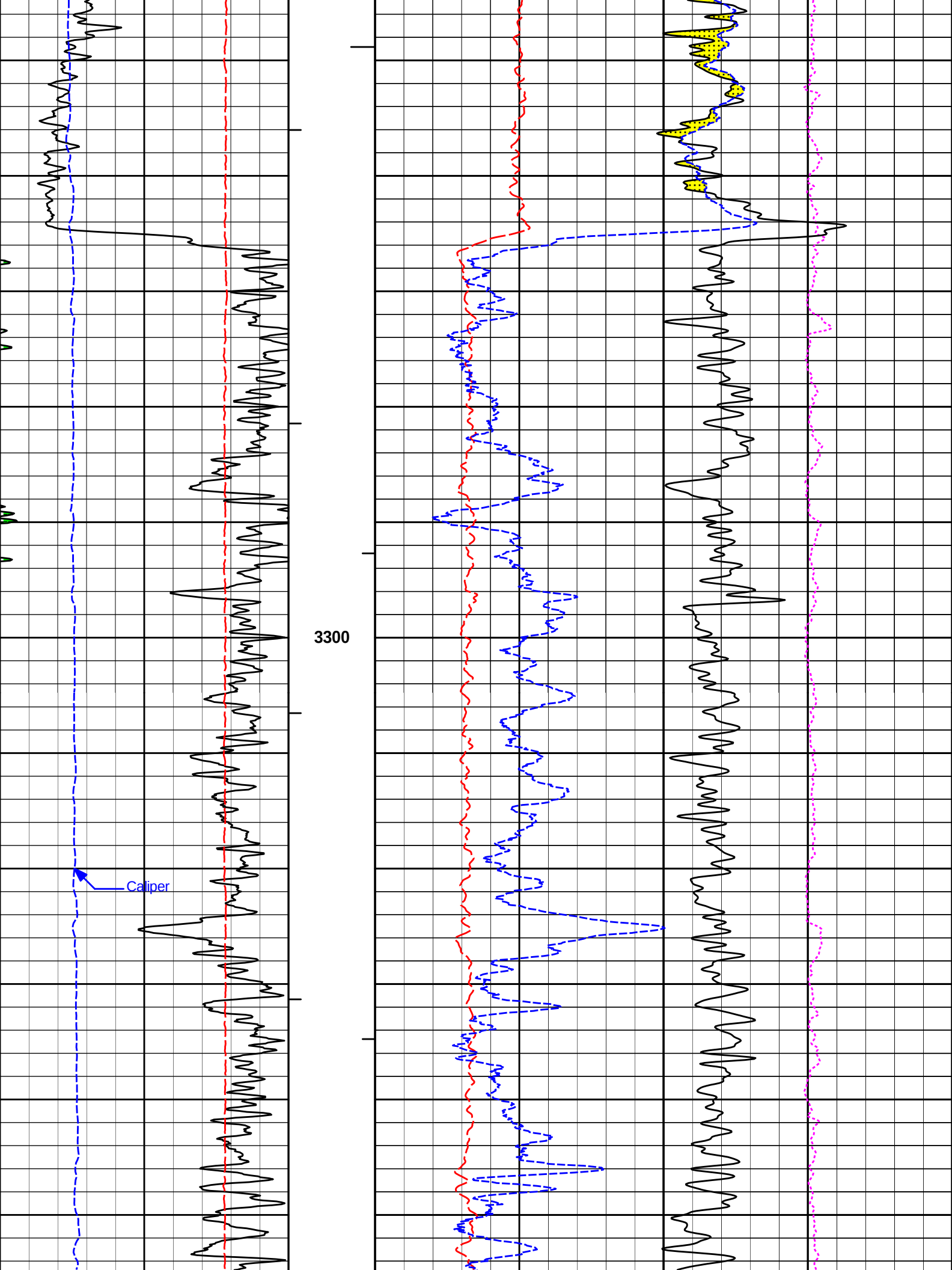
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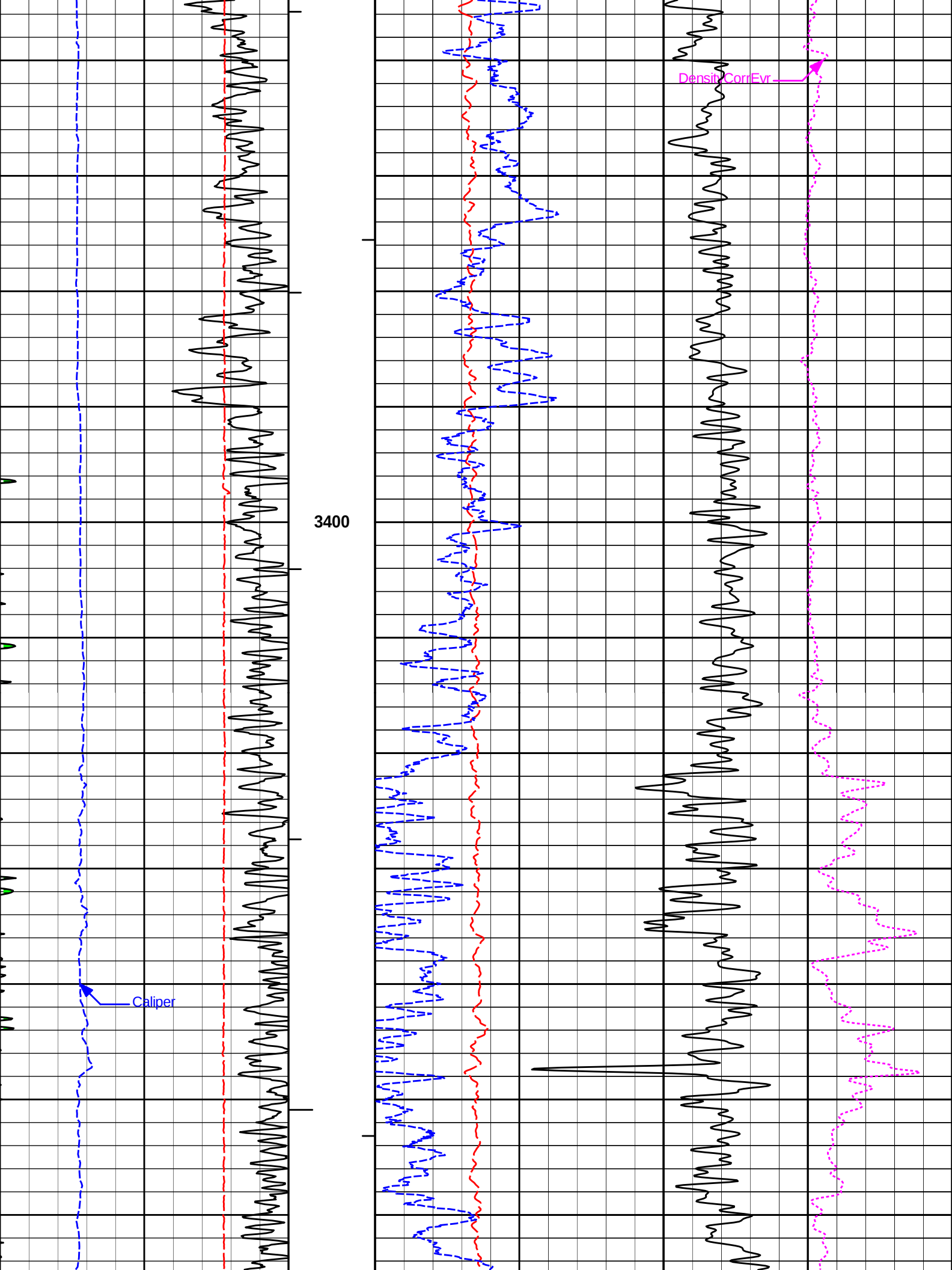


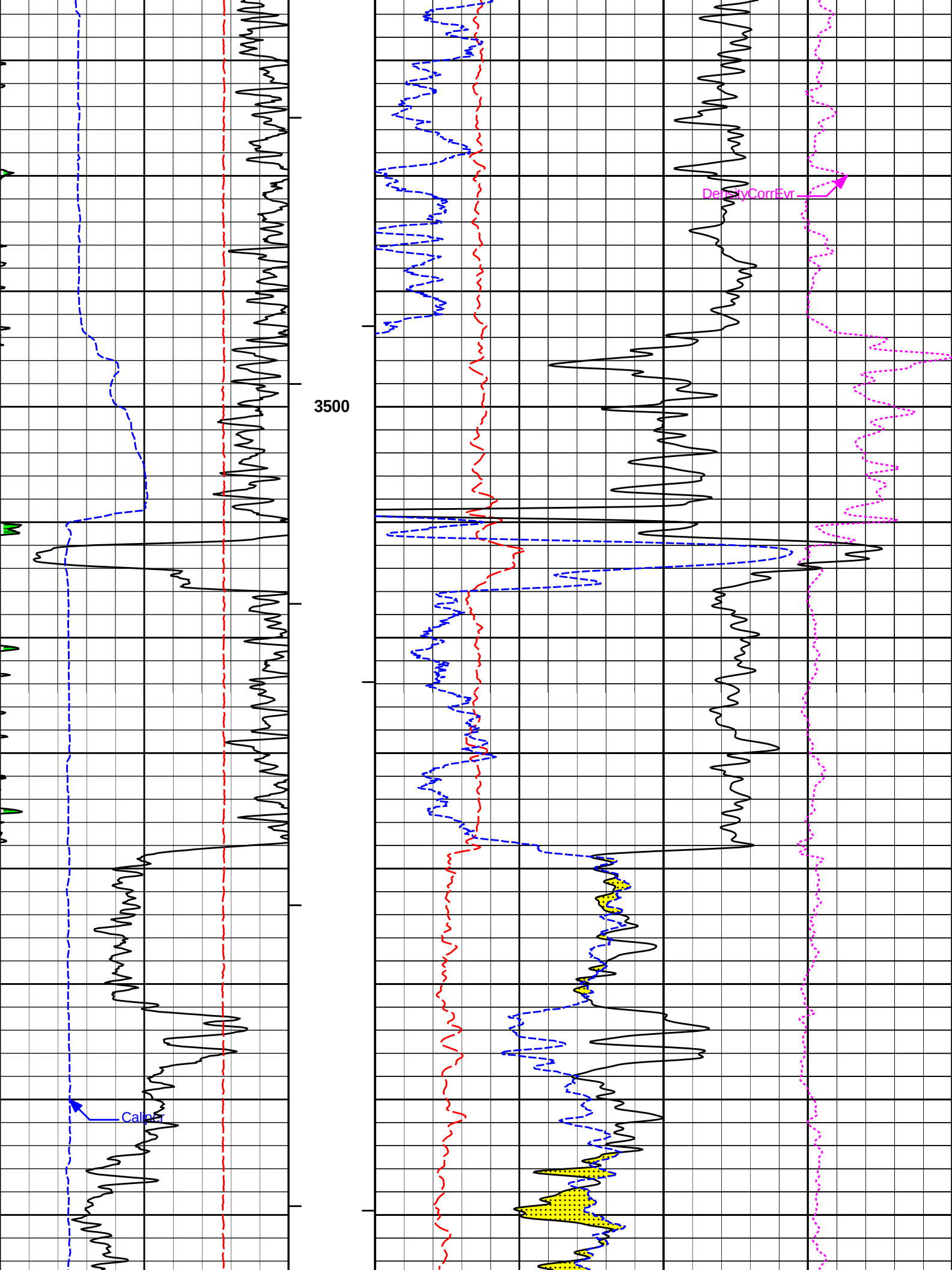


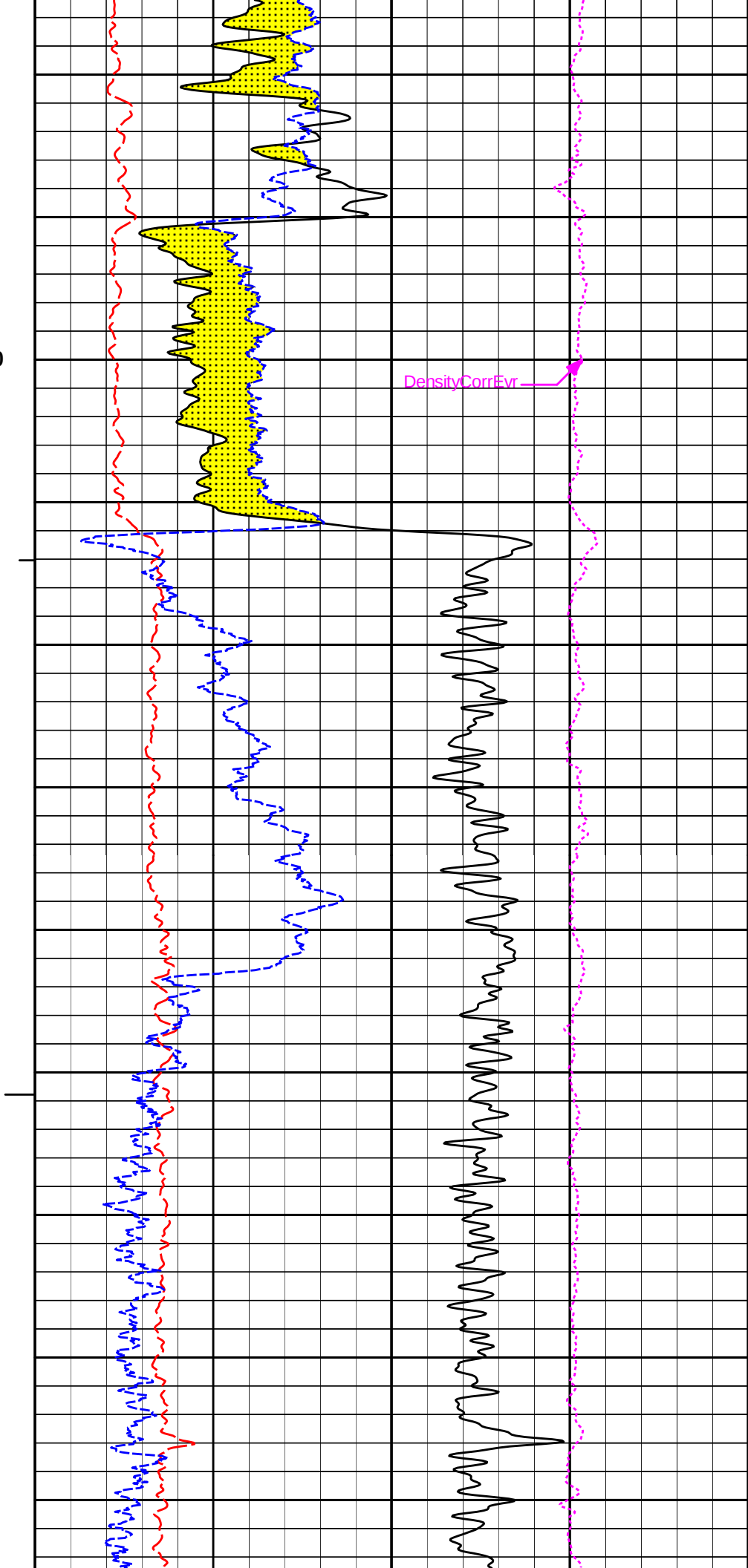
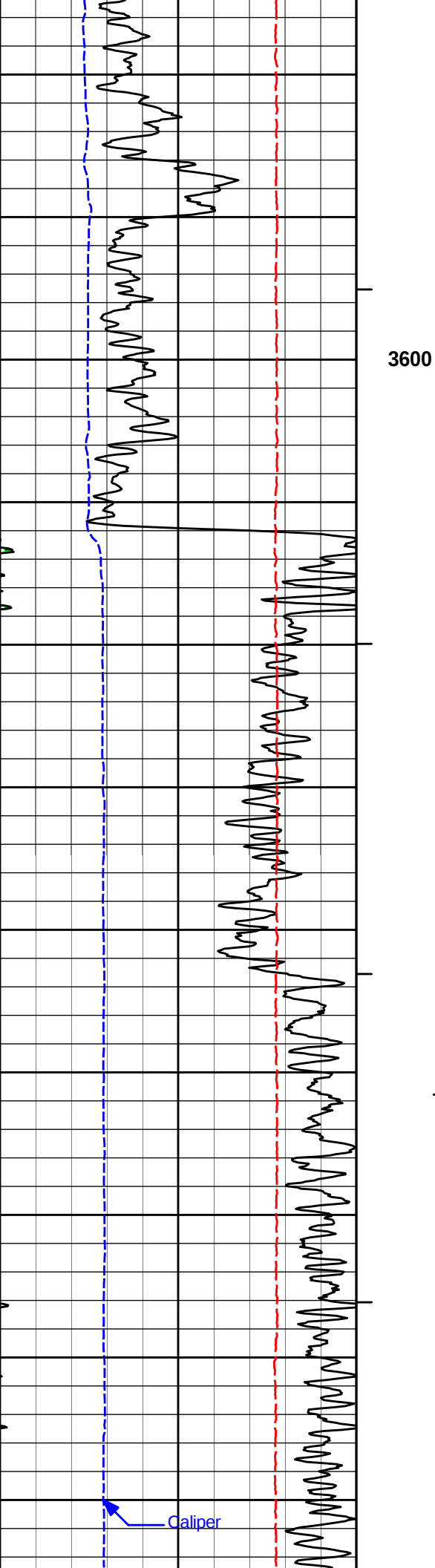
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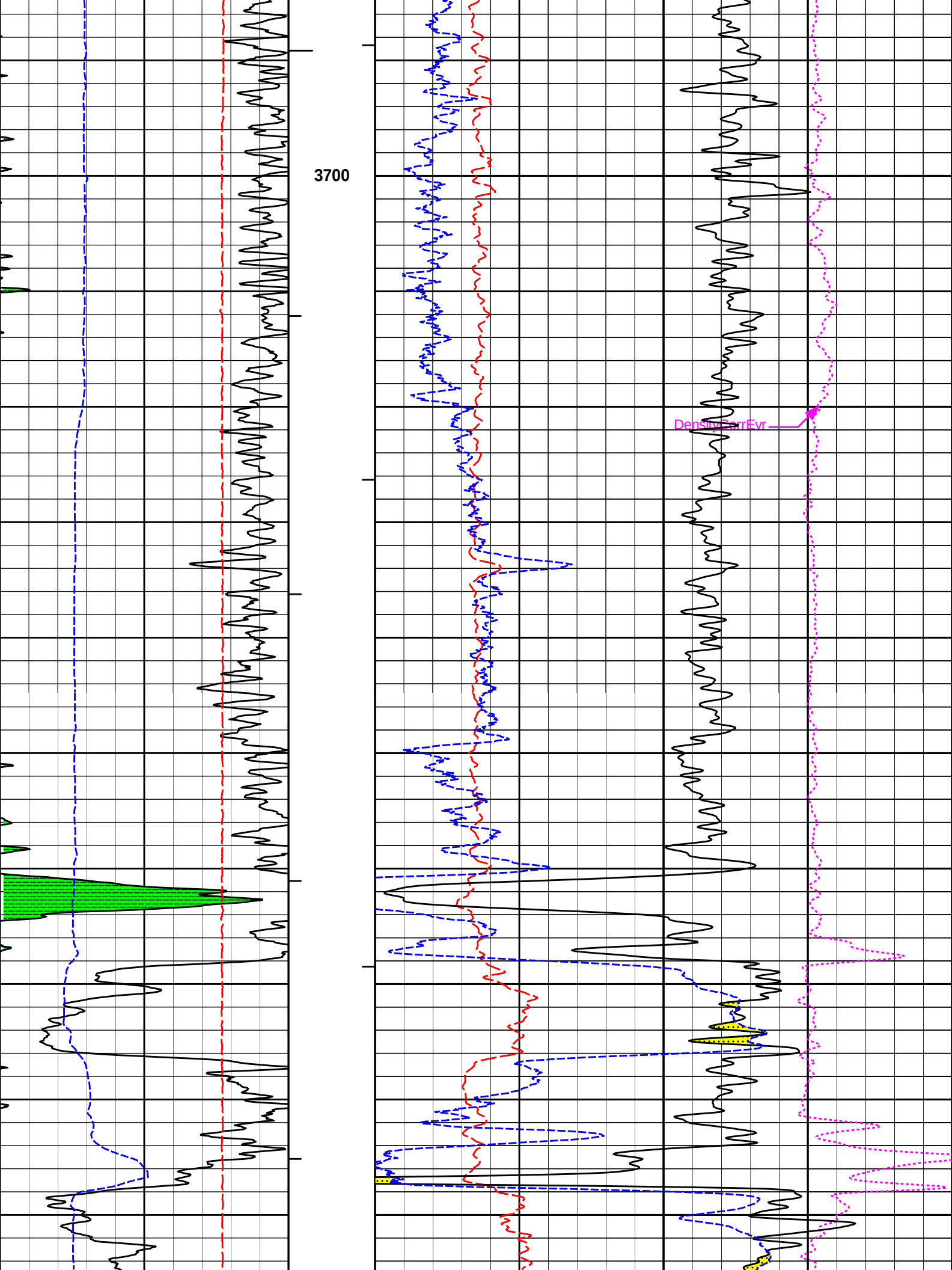


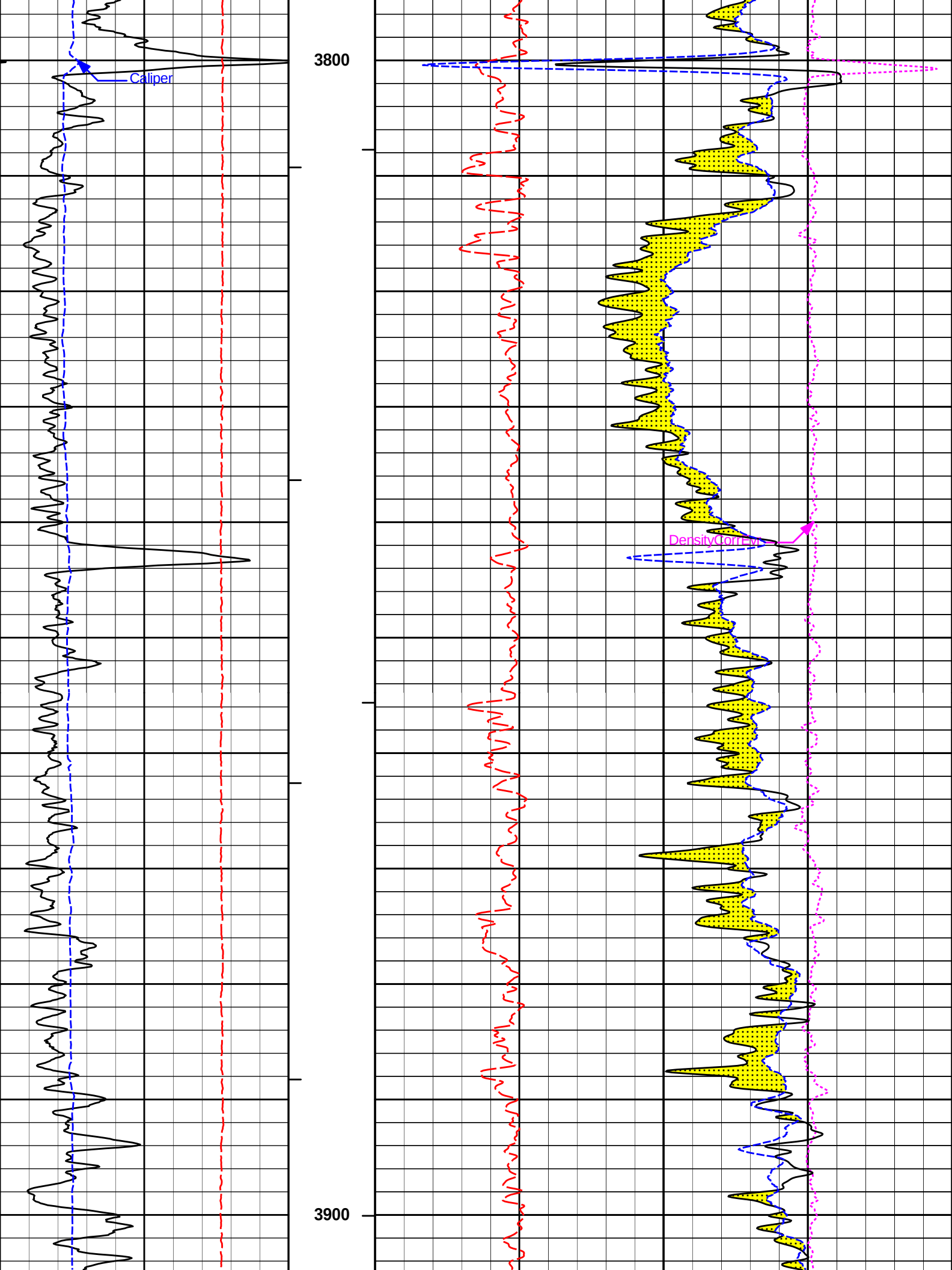


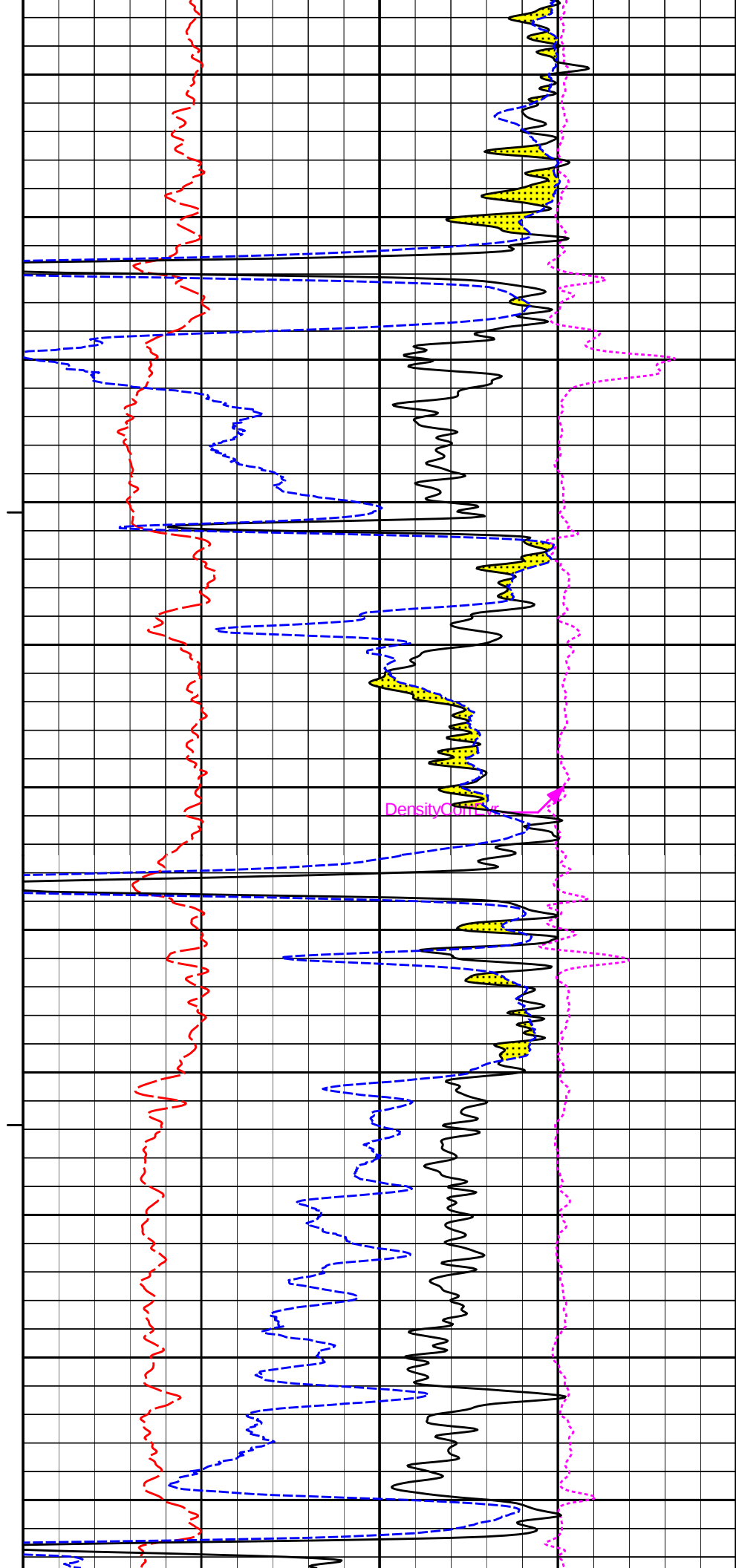
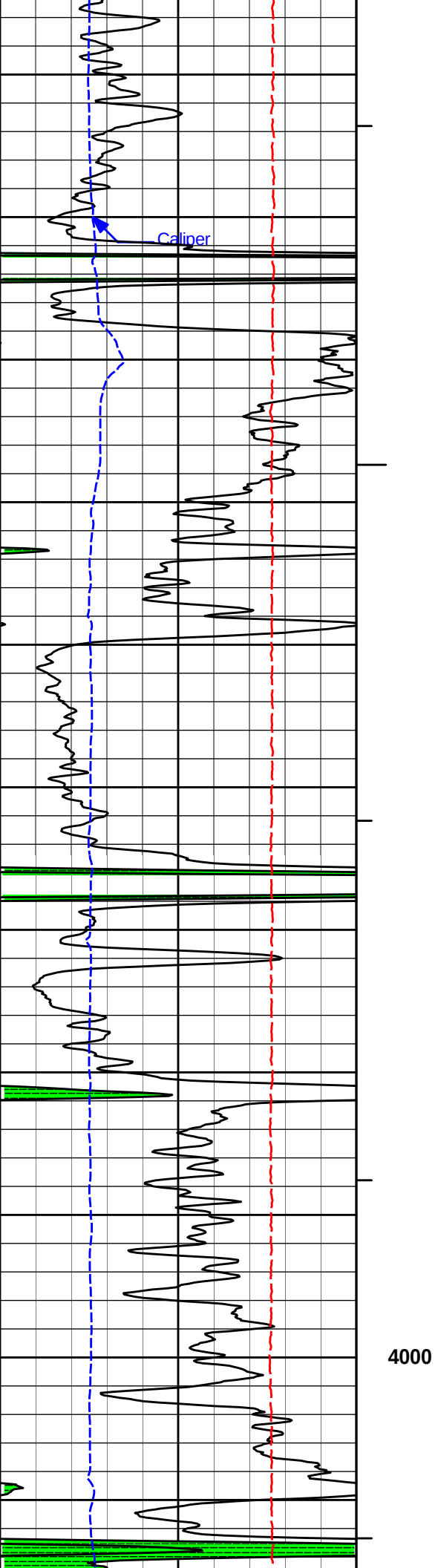


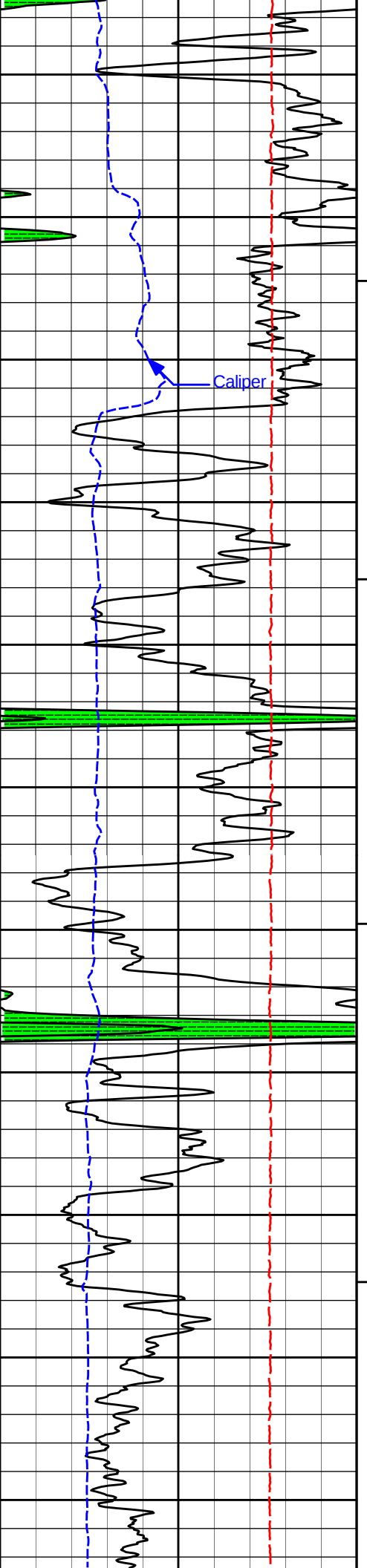




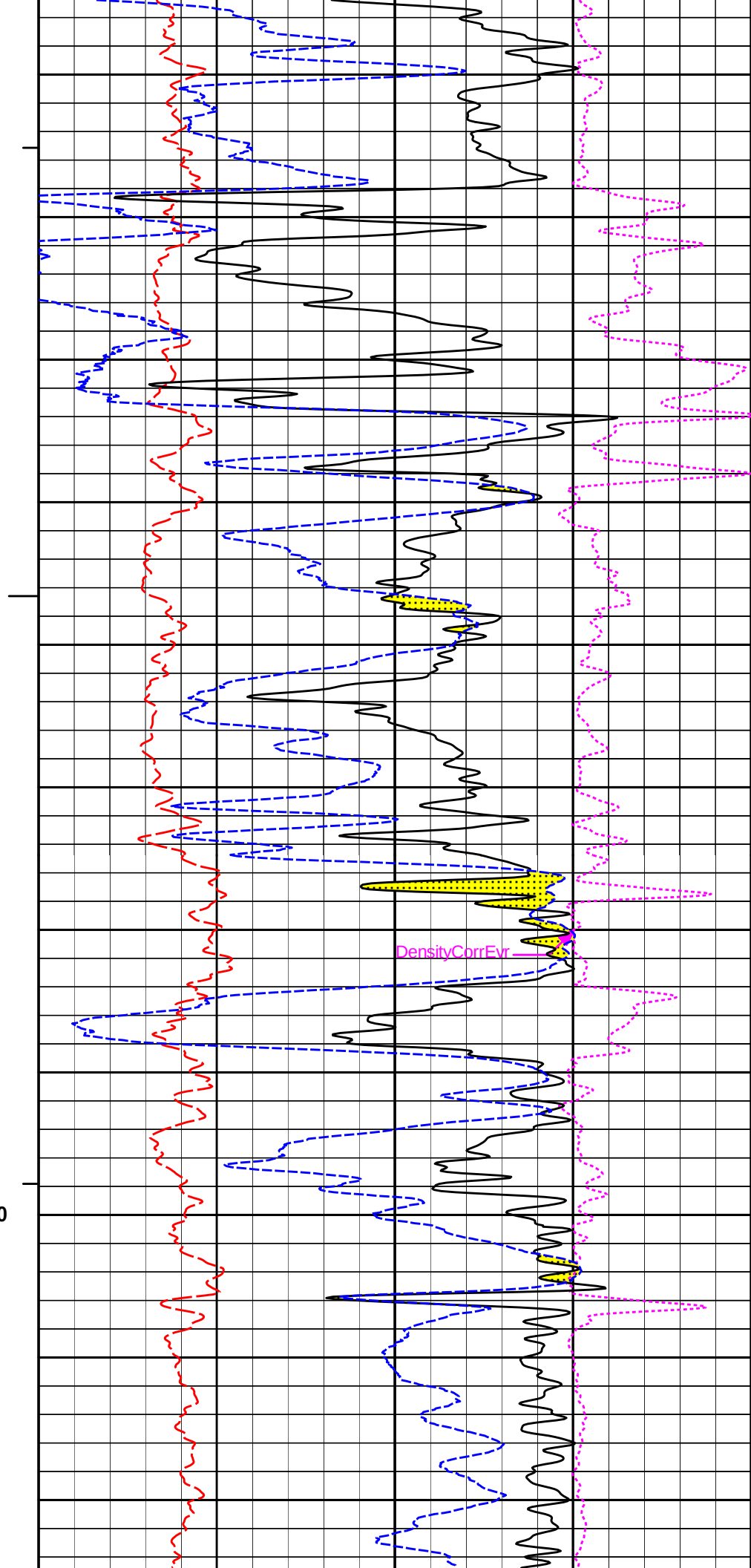


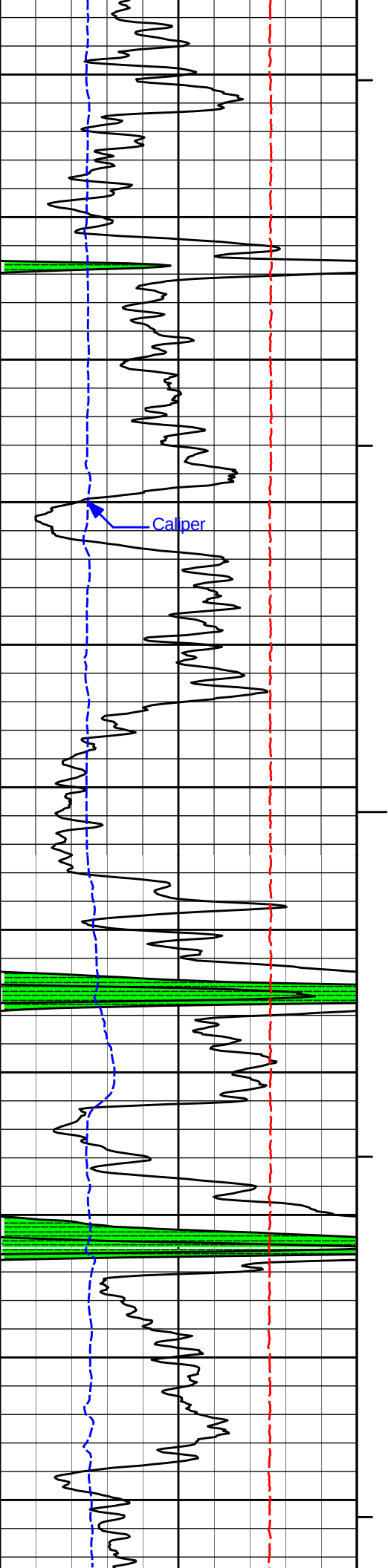




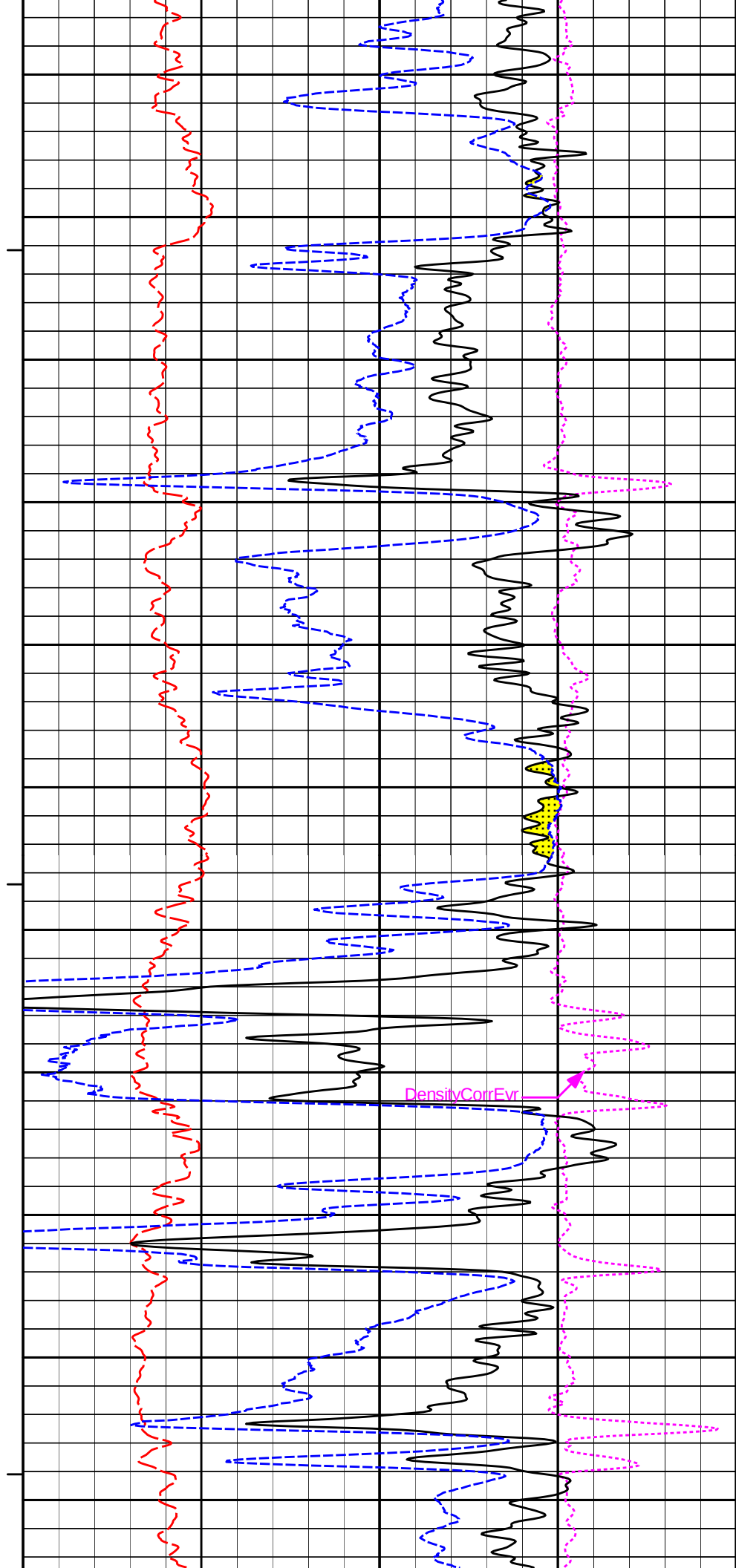


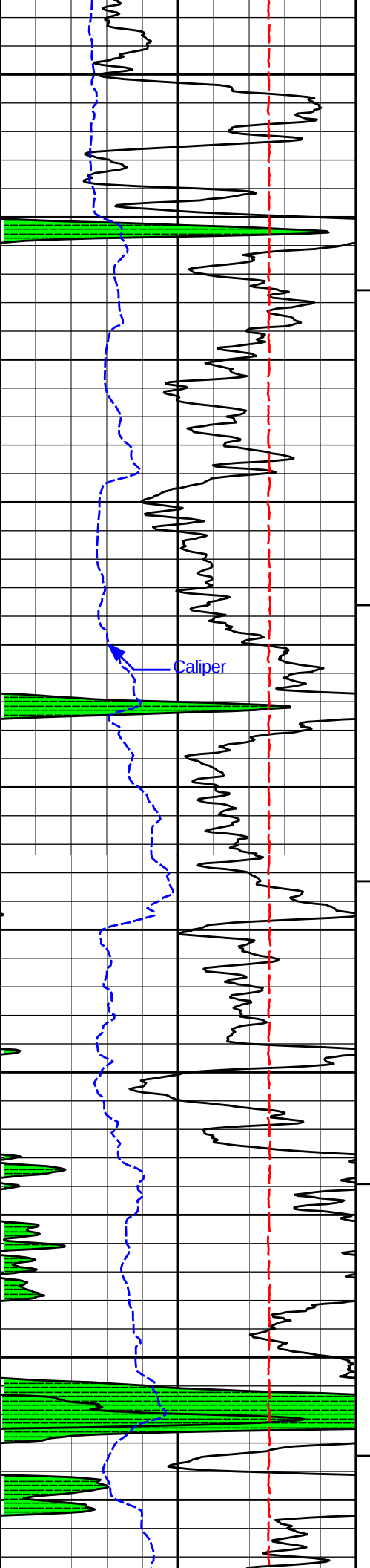
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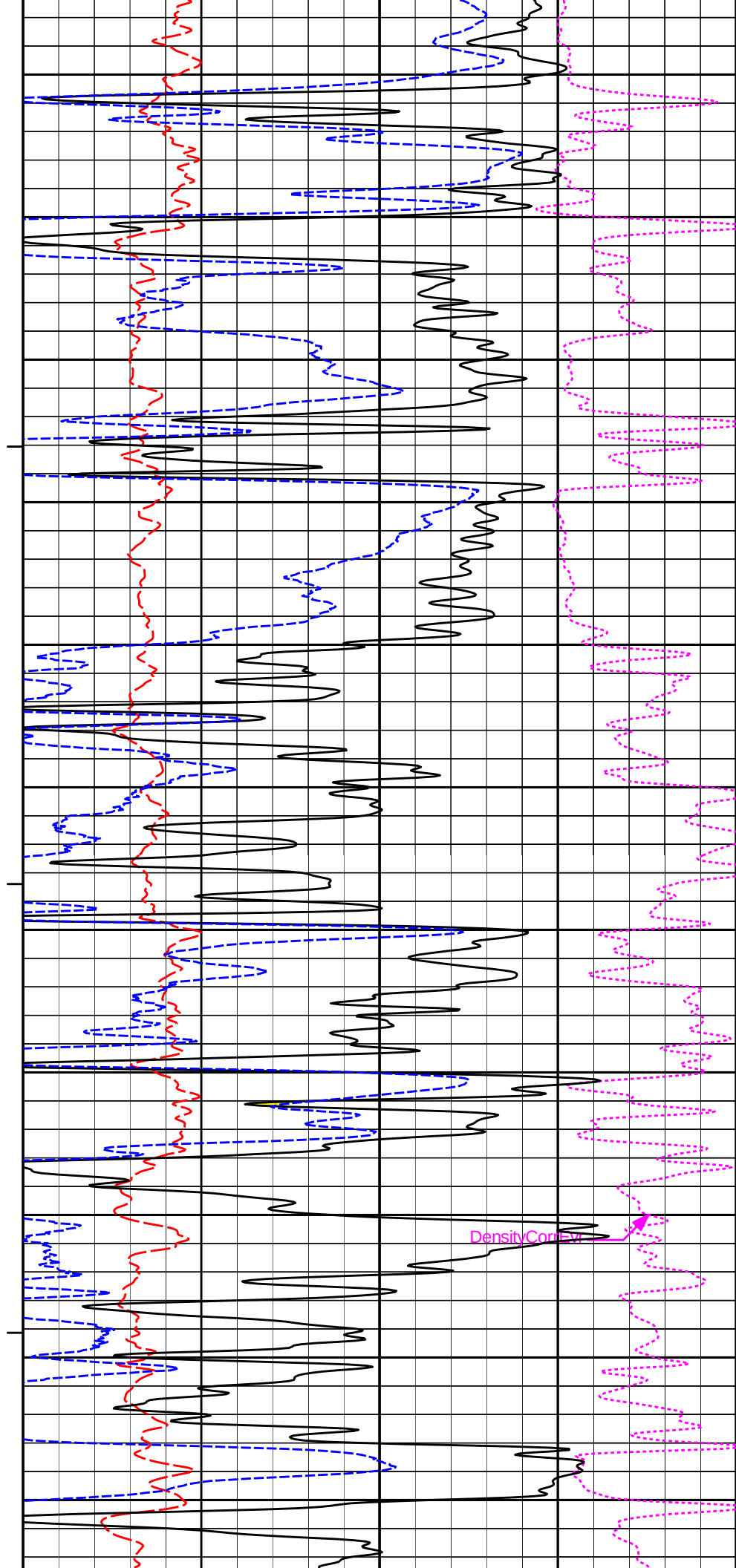
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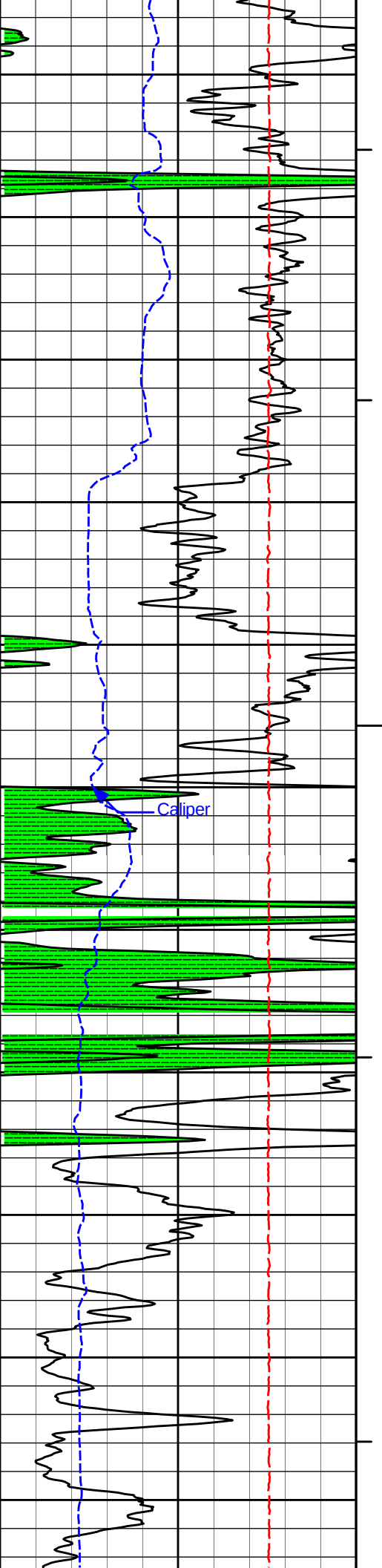


Caliper

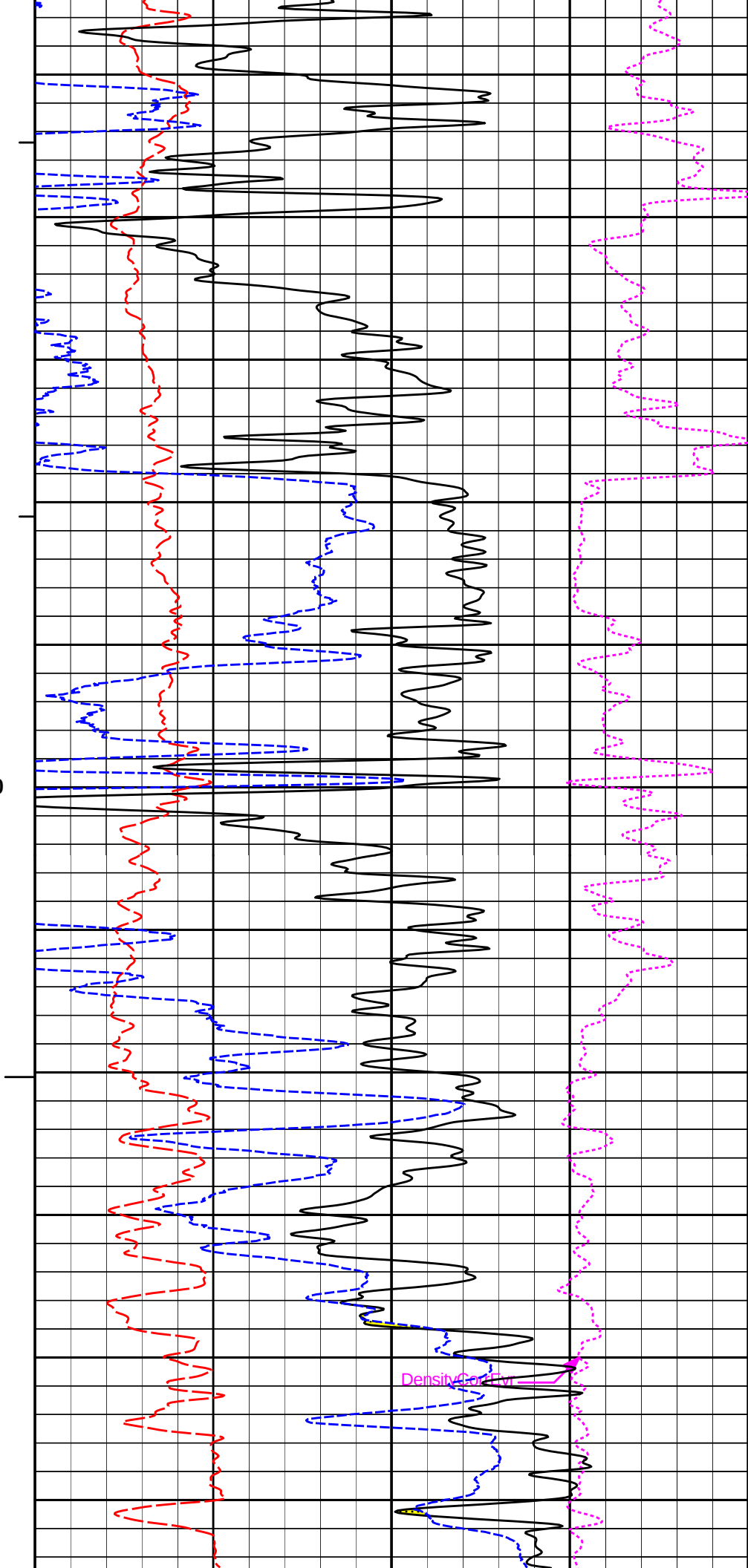
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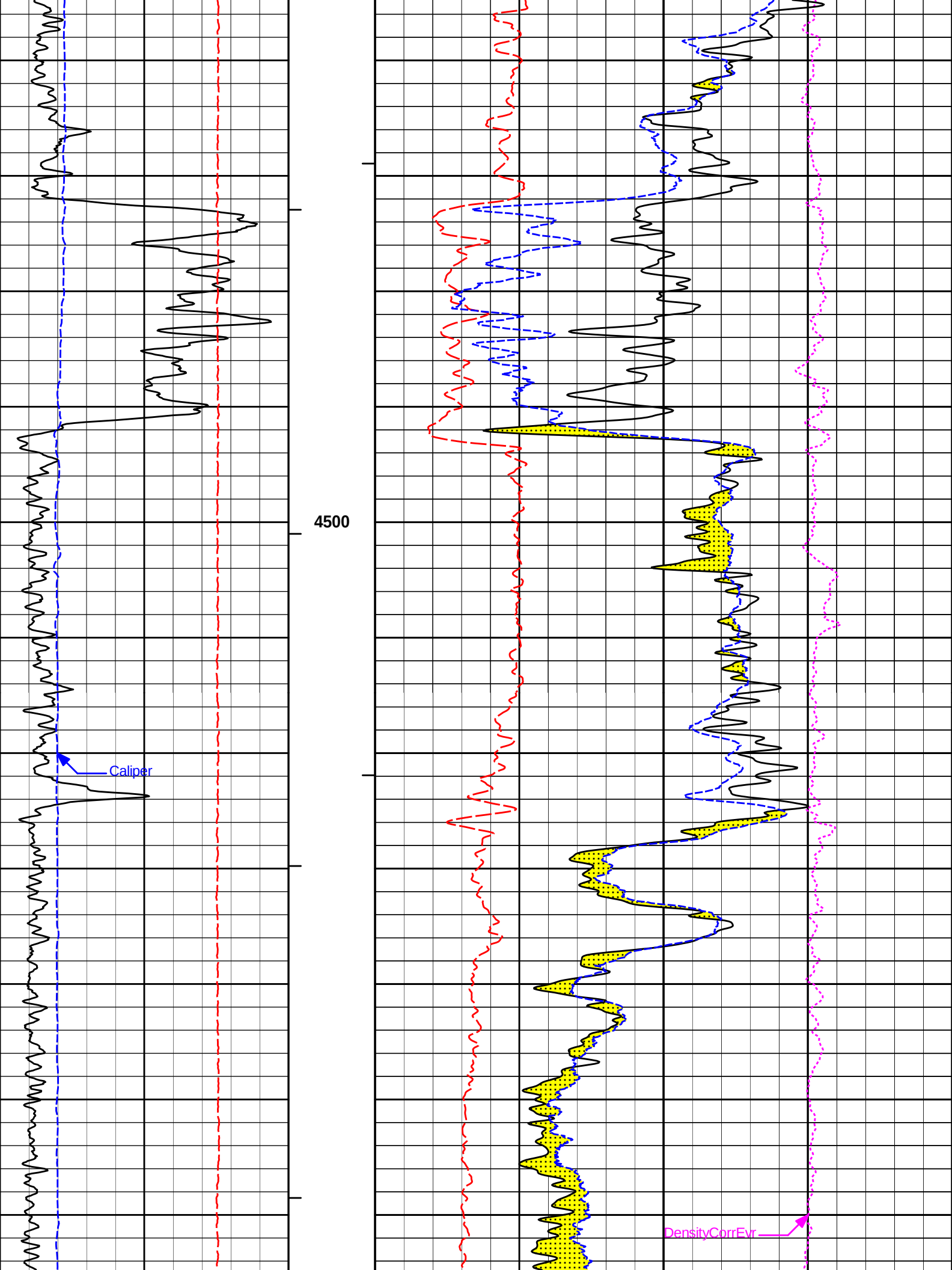


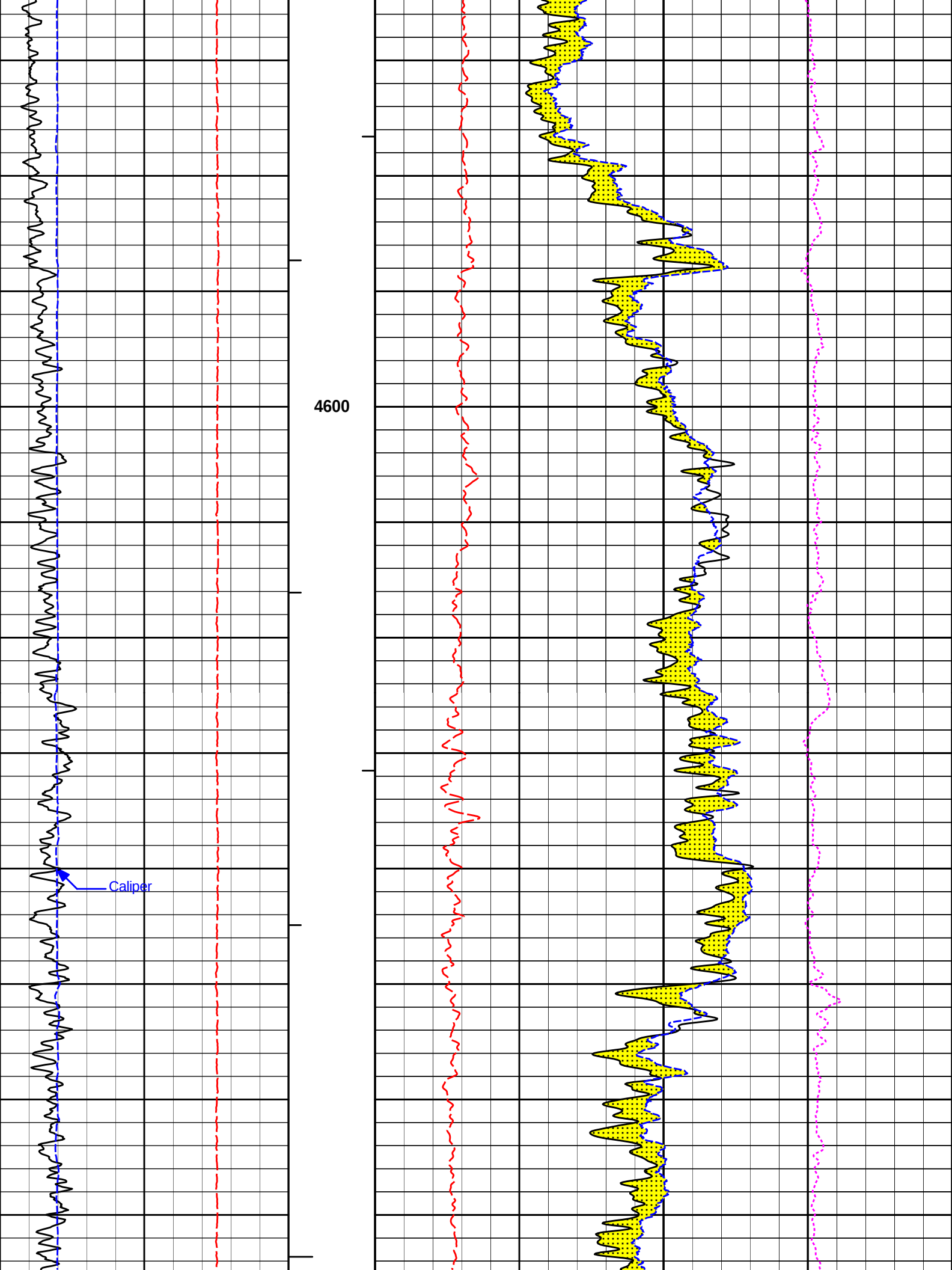
DensityCore

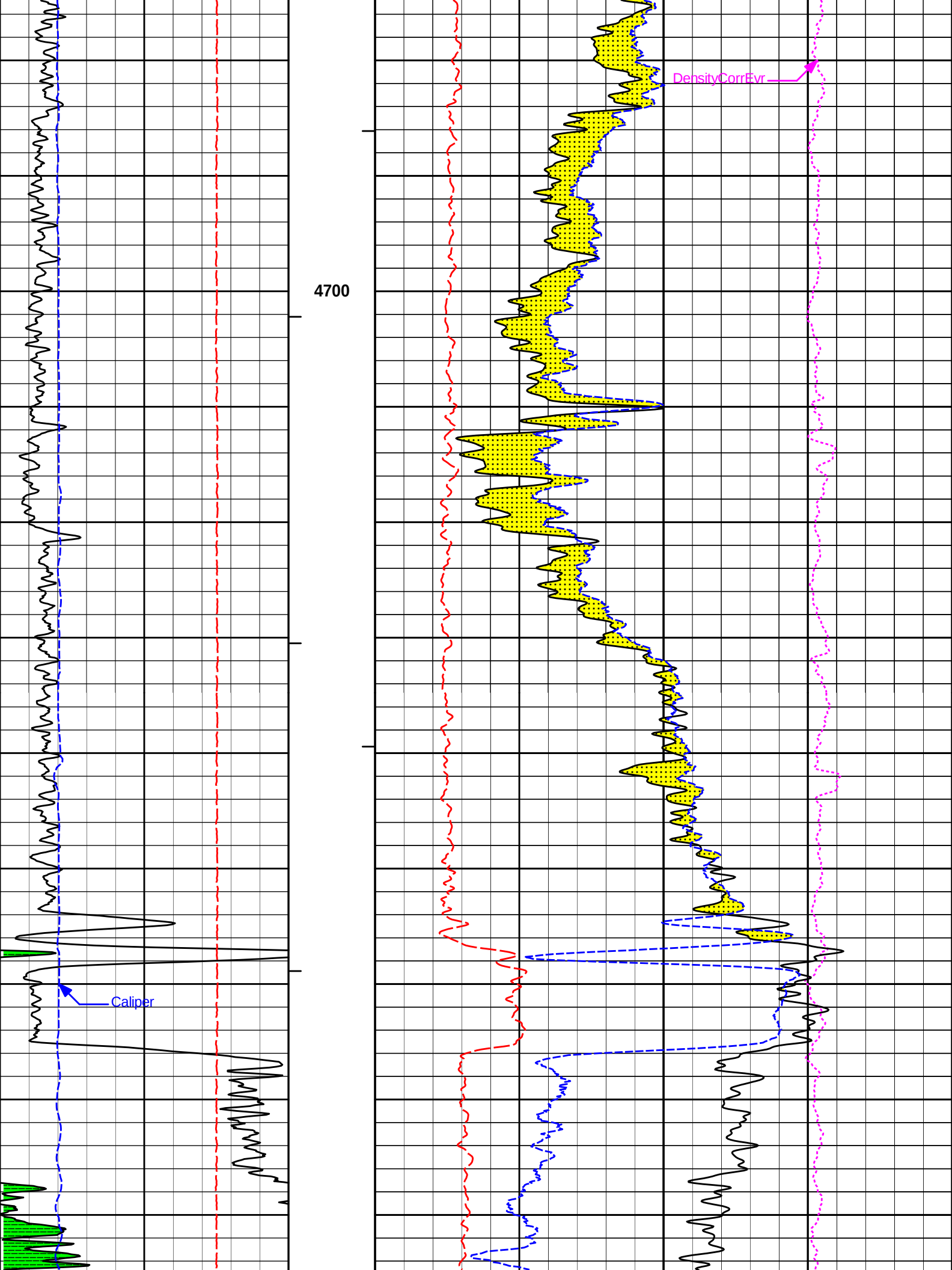


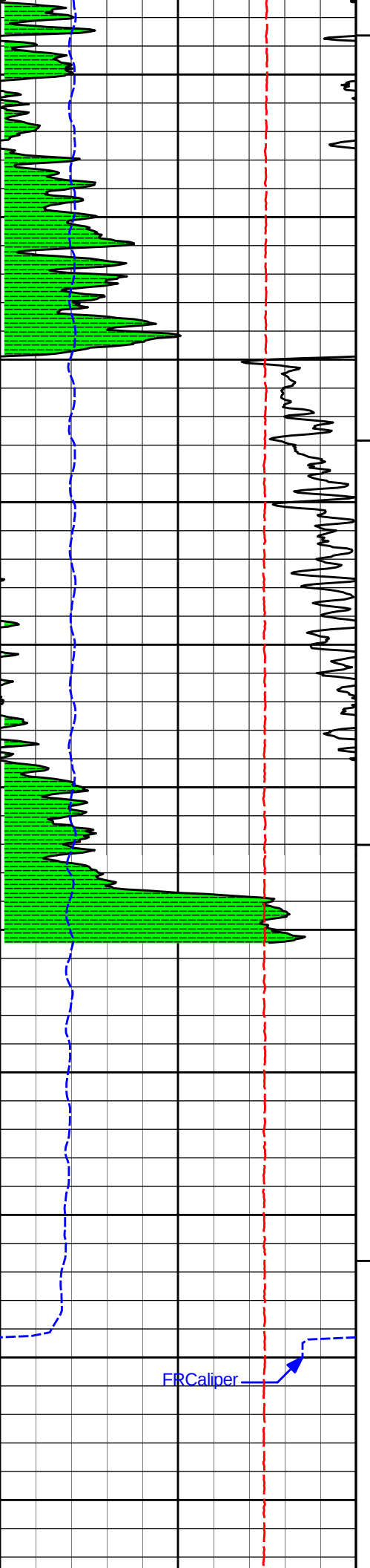
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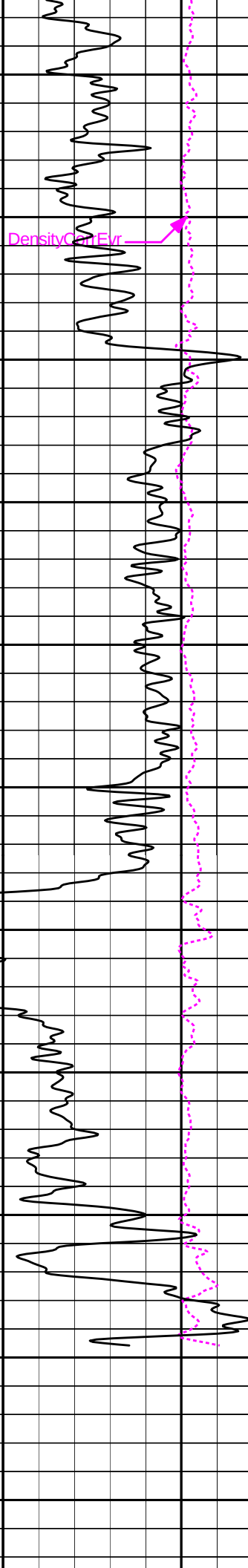
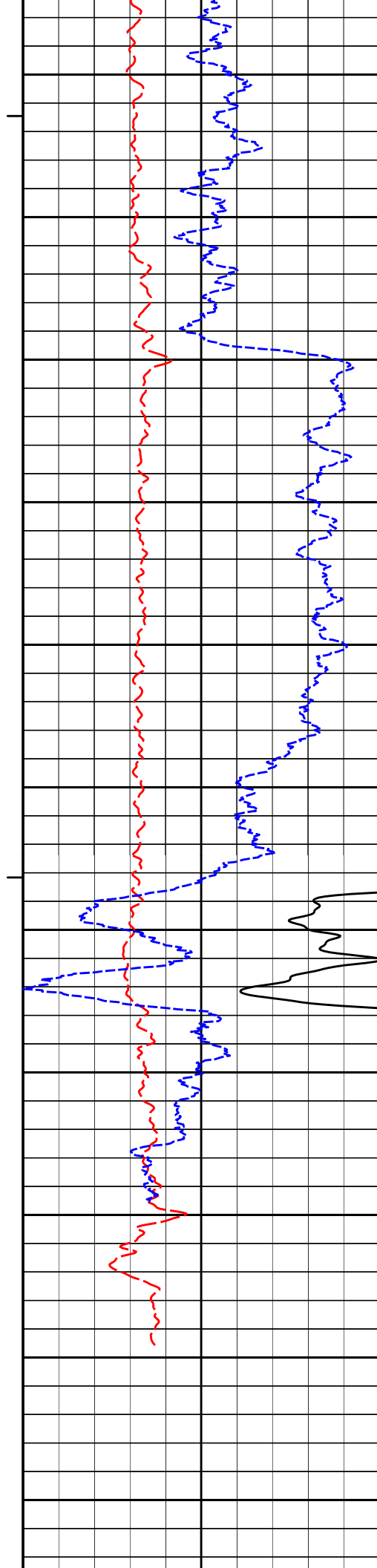


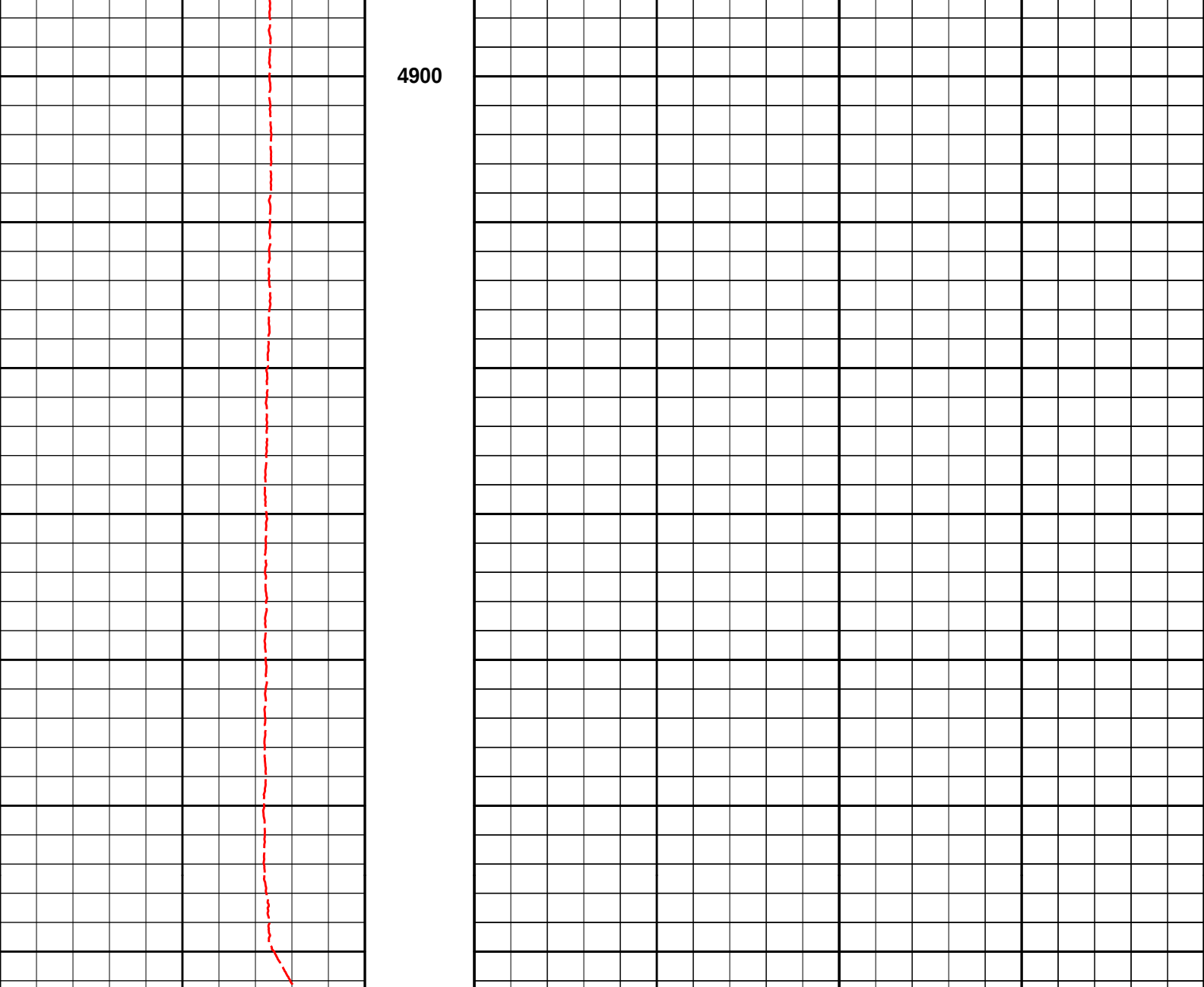






4800





4900

0	Gamma EVR	150	1 : 120 ft	0	PeEVR	10	-0.25	DensityCorrEvr	0.25	
	api							gram per cc		
6	Caliper	16	AHVT	30	DenPhiEVR					-10
	inches				%					
	SHALE		BHVT	30	NeuPorosityEVR					-10
					%					
15K	Tension	0		CROSSOVER						
	pounds									

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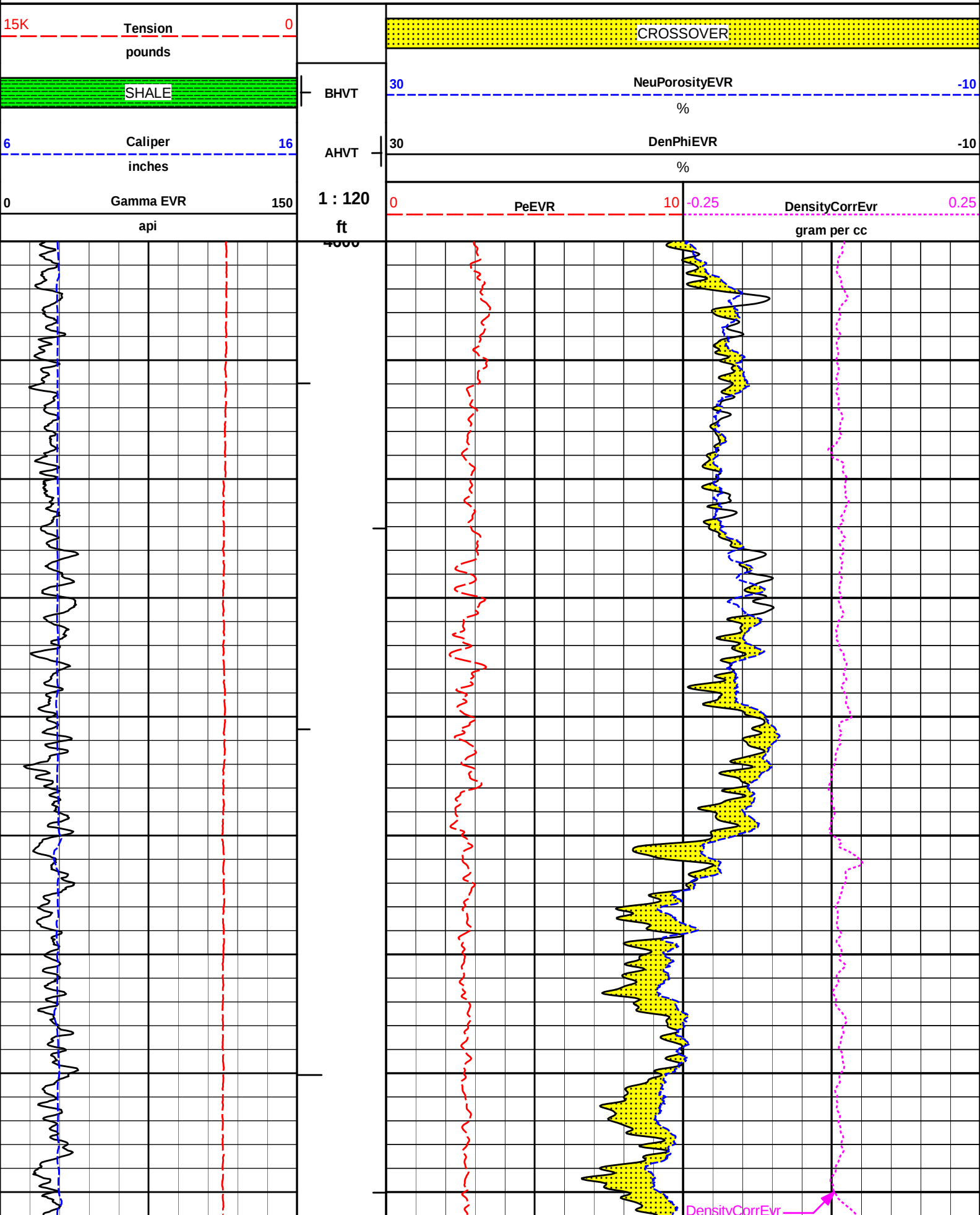
Plot Time: 30-Jun-13 13:14:37
Plot Range: 3000 ft to 4962.67 ft
Data: VOGEL_3306_1-1\Well Based\DETAIL*
Plot File: \\PORO\Porosity_EVRLIB

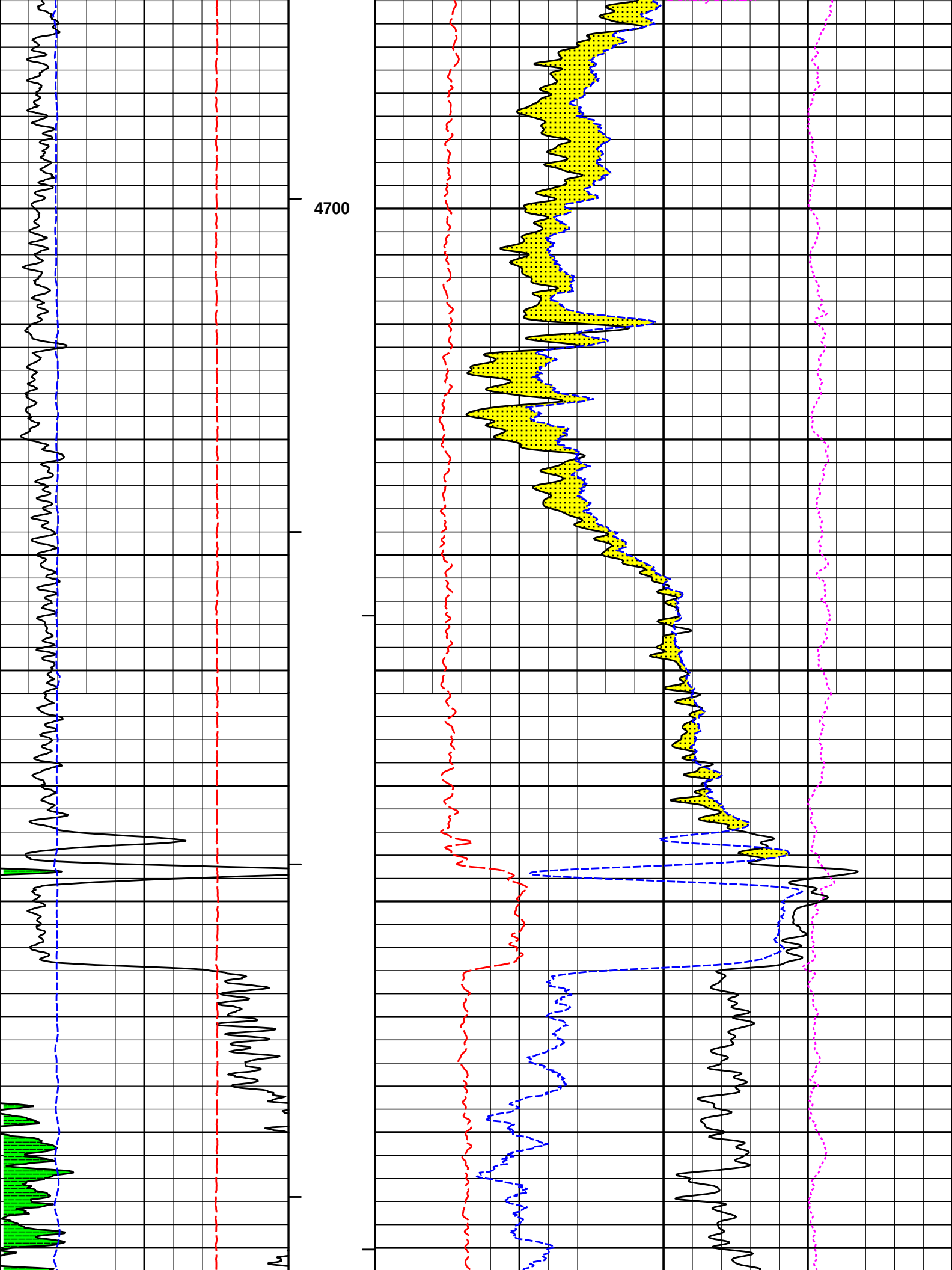
MAIN PASS EVR 10" = 100'

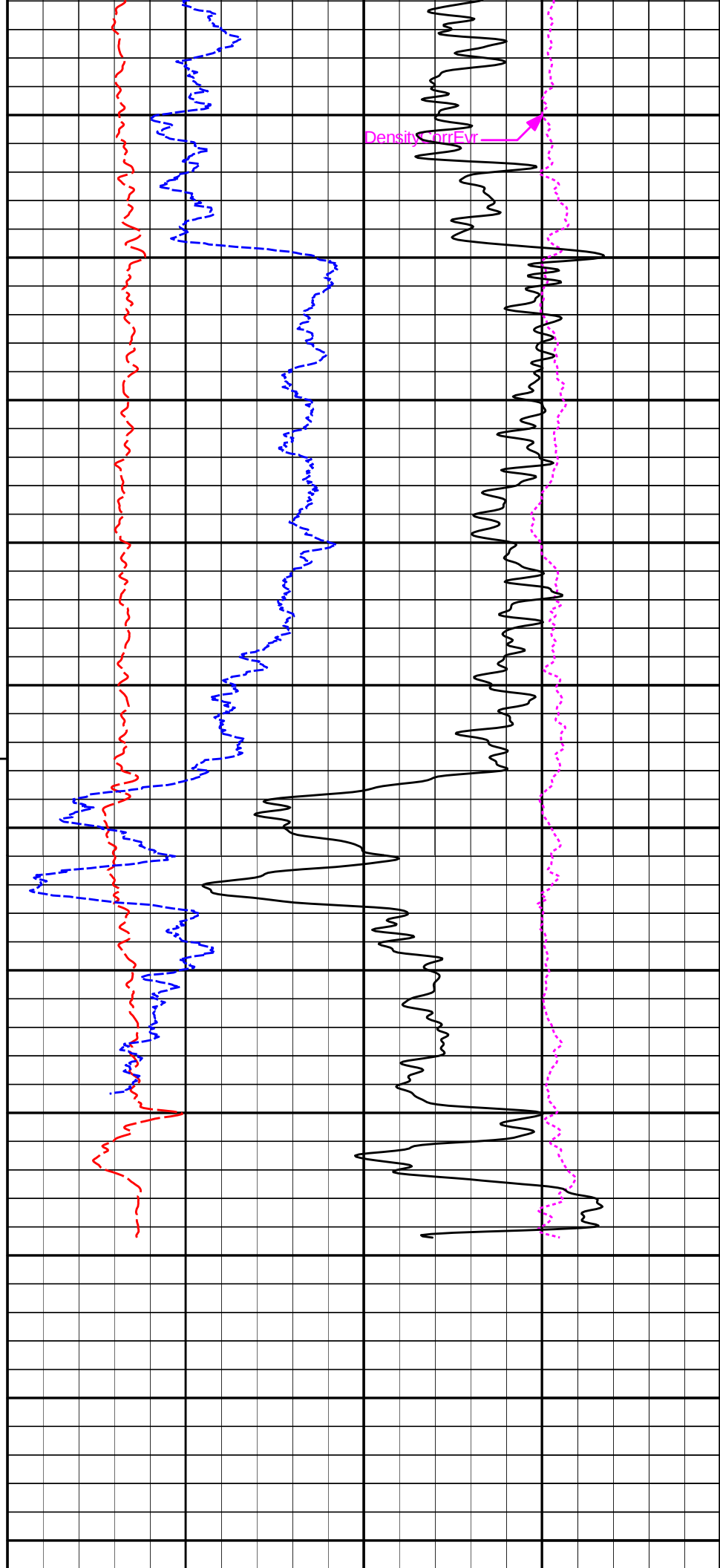
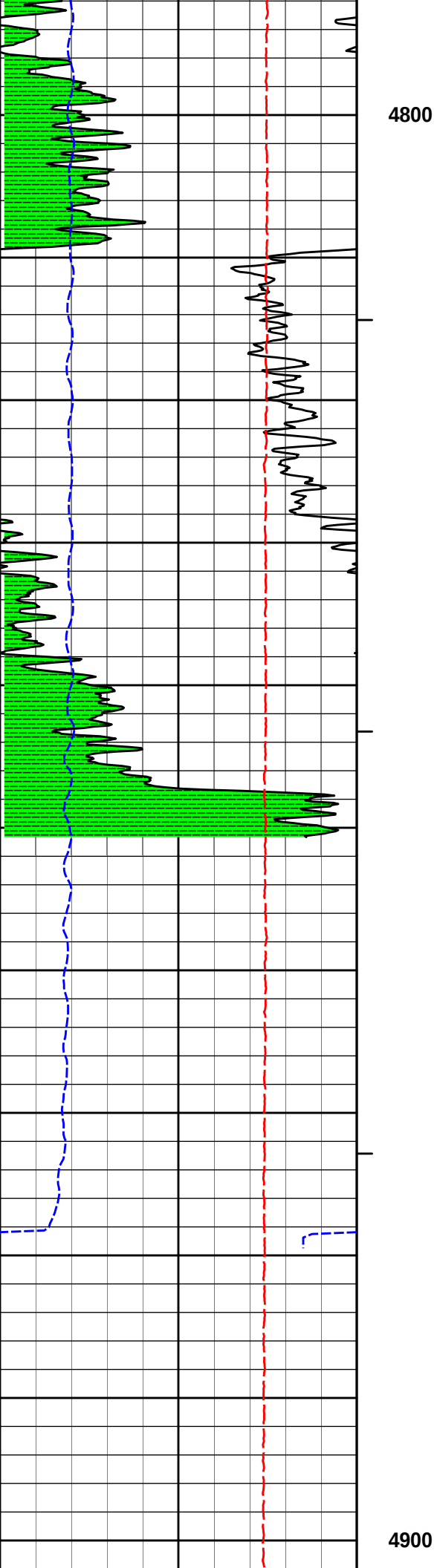
HALLIBURTON

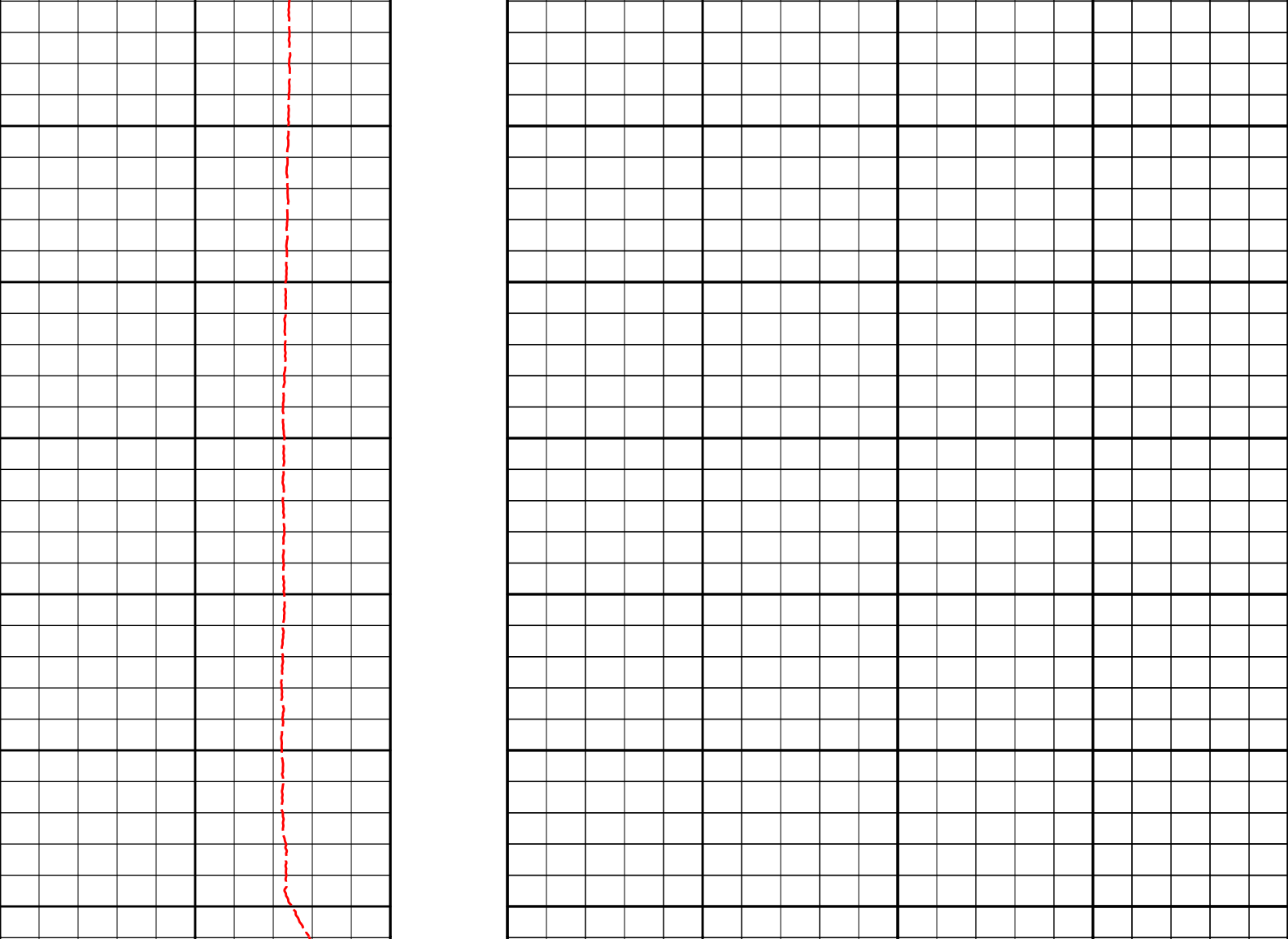
Plot Time: 30-Jun-13 13:14:37
Plot Range: 4600 ft to 4962.17 ft
Data: VOGEL_3306_1-1\Well Based\REPEAT*
Plot File: \\PORO\Porosity_EVRLIB

REPEAT PASS EVR 10" = 100'









0	Gamma EVR	150	1 : 120	0	PeEVR	10	-0.25	DensityCorrEvr	0.25
	api		ft					gram per cc	
6	Caliper	16	AHVT	30	DenPhiEVR				-10
	inches				%				
	SHALE		BHVT	30	NeuPorosityEVR				-10
					%				
15K	Tension	0			CROSSOVER				
	pounds								

HALLIBURTON

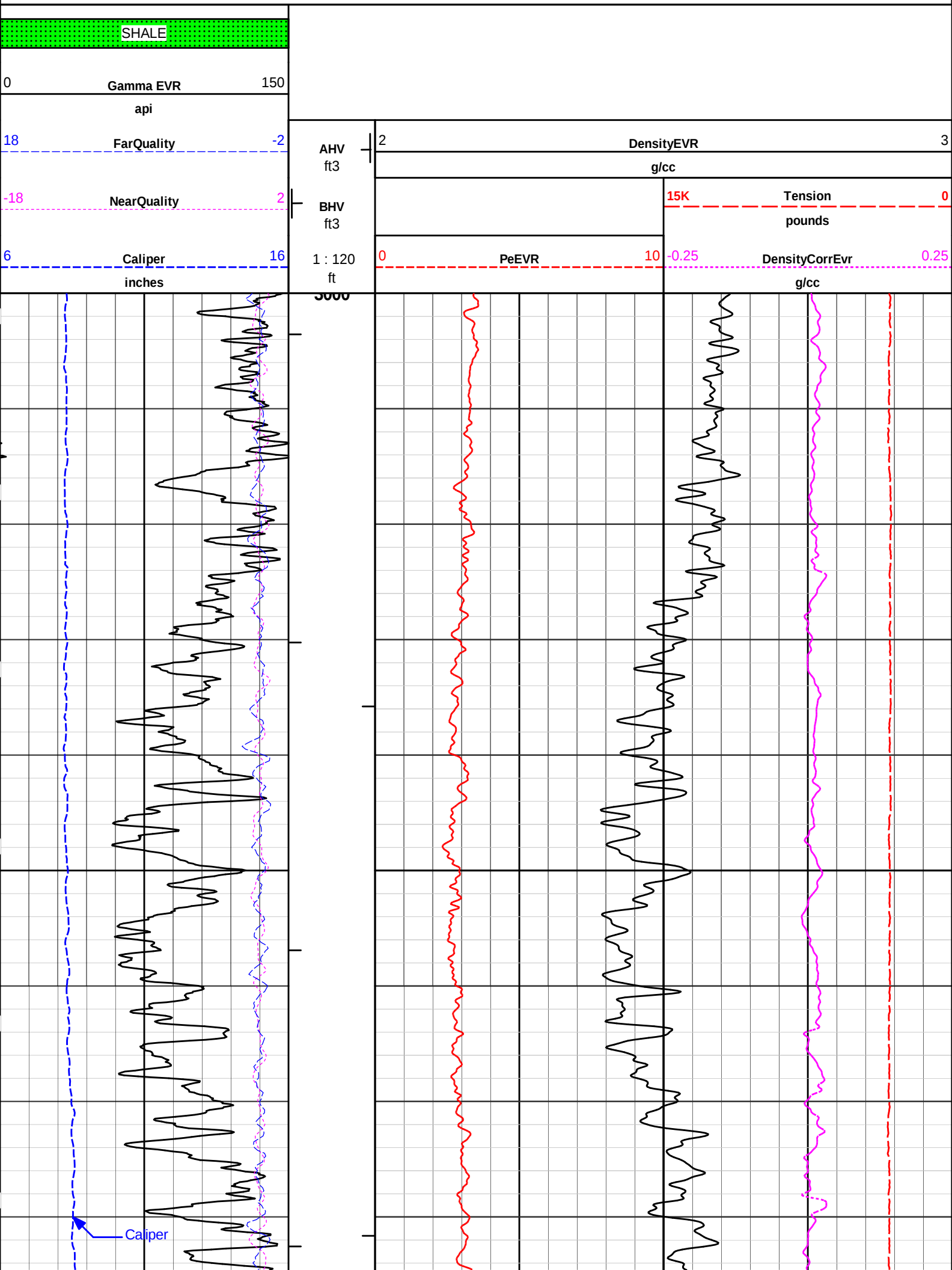
Plot Time: 30-Jun-13 13:14:40
Plot Range: 4600 ft to 4962.17 ft
Data: VOGEL_3306_1-1\Well Based\REPEAT*
Plot File: \\PORO\Poros_IQ_EVR_LIB

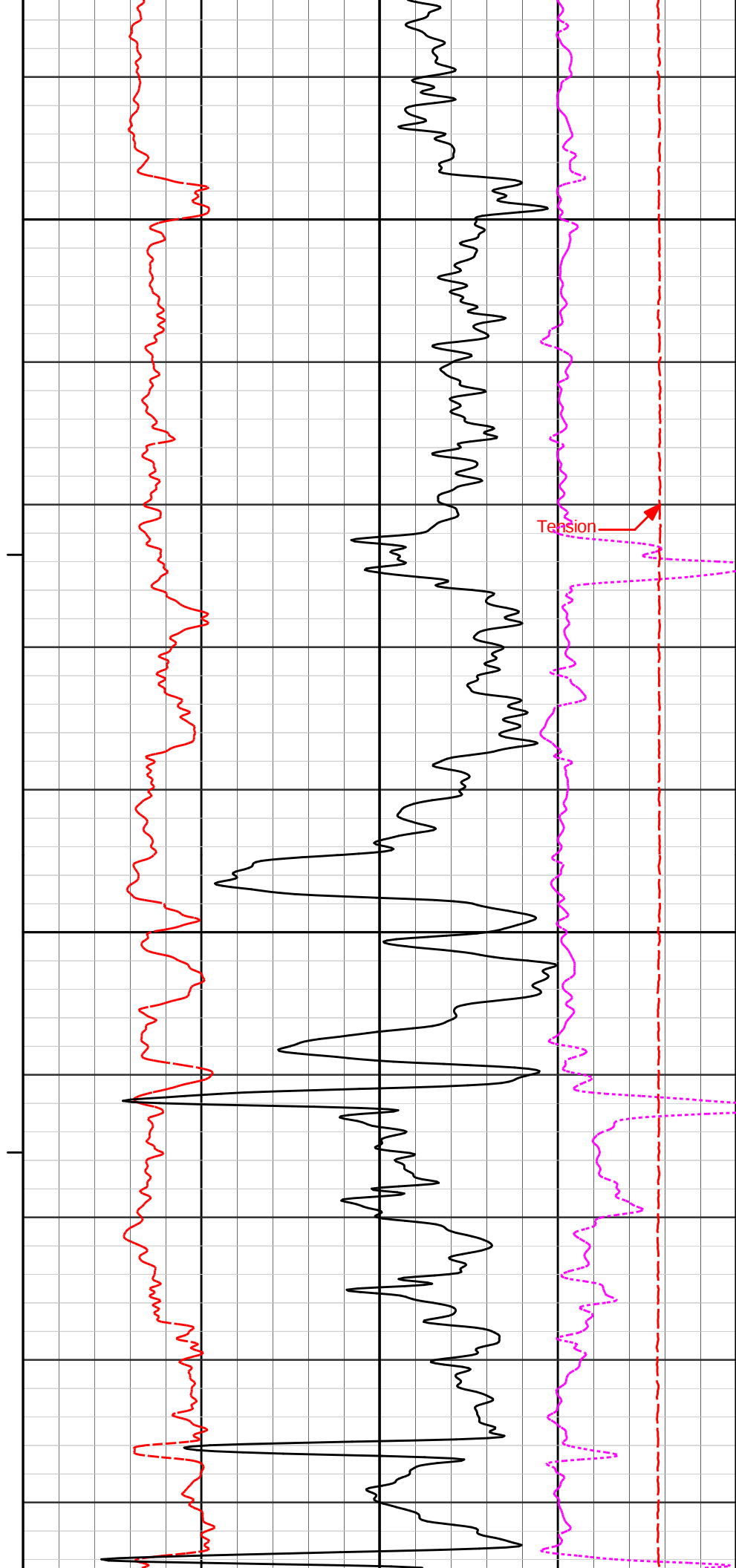
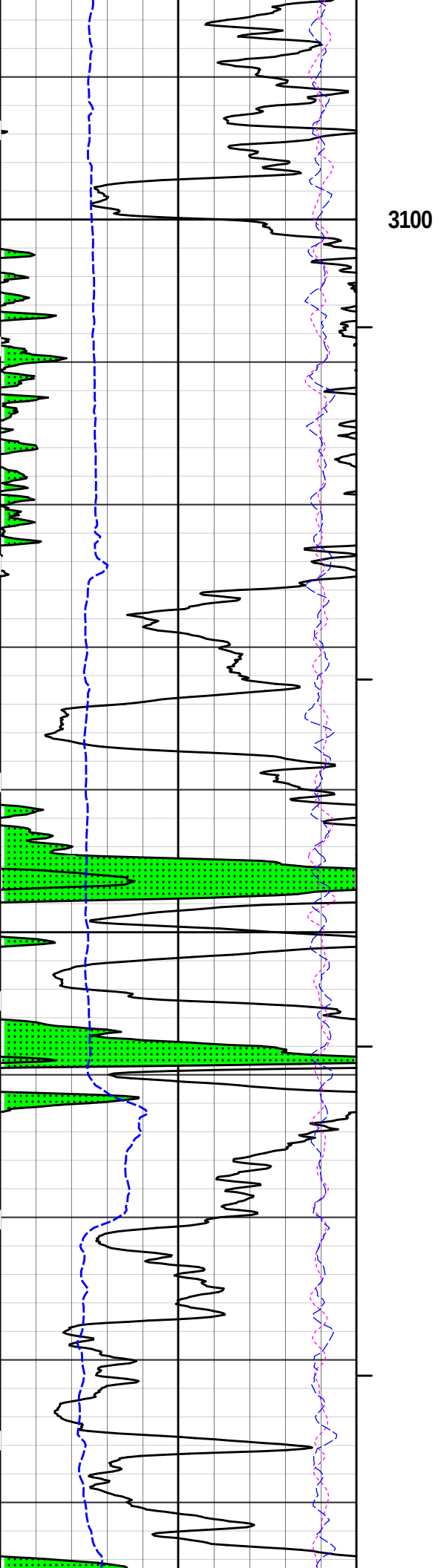
REPEAT PASS EVR 10" = 100'

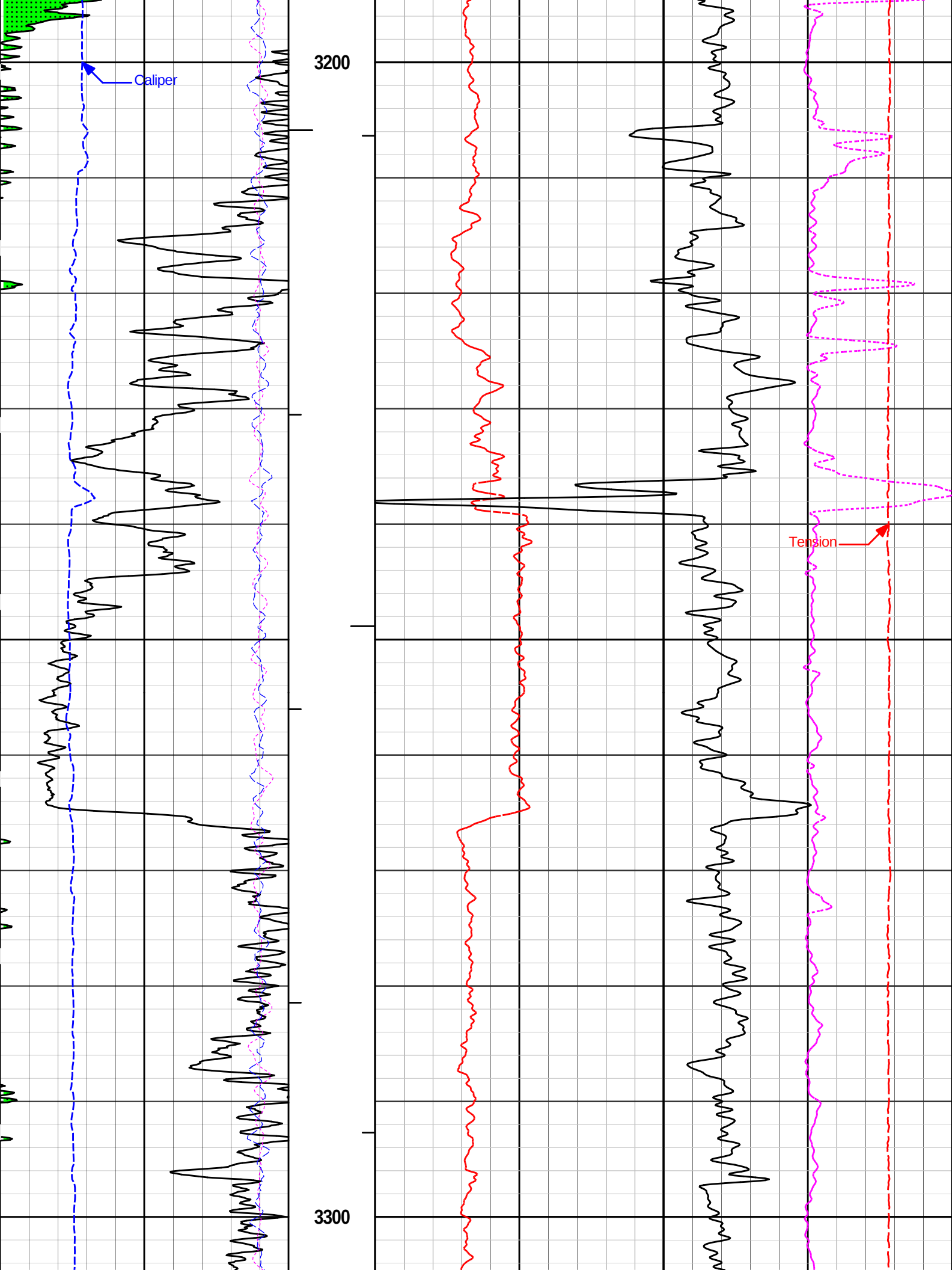
HALLIBURTON

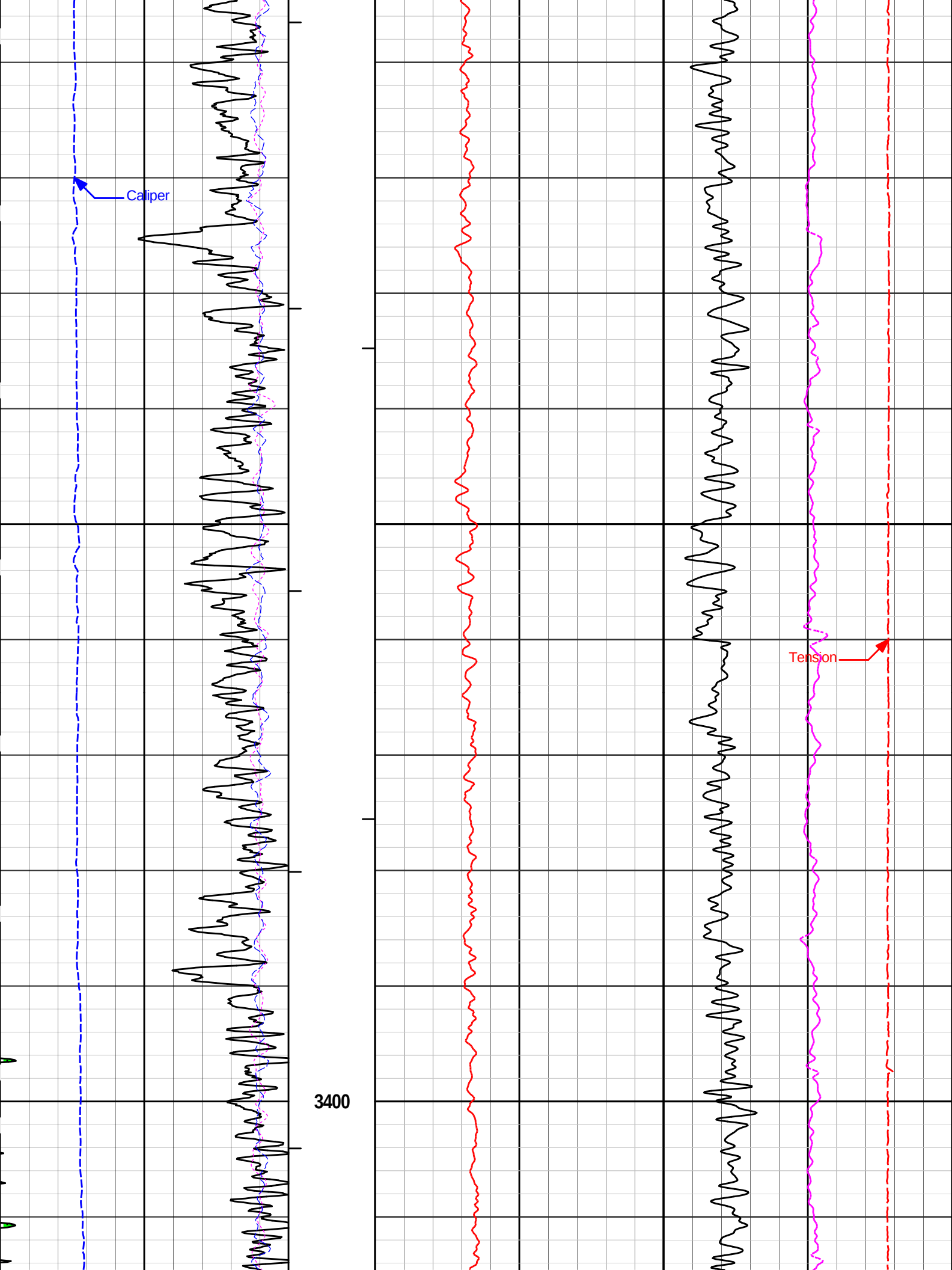
Plot Time: 30-Jun-13 13:14:40
Plot Range: 3000 ft to 4962.67 ft
Data: VOGEL_3306_1-1\Well Based\DETAIL\
Plot File: \\LOCAL\VOGEL_3306_1-1\0001 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WSTT-ACRT-CHIPORO\BULKD_5_EVR

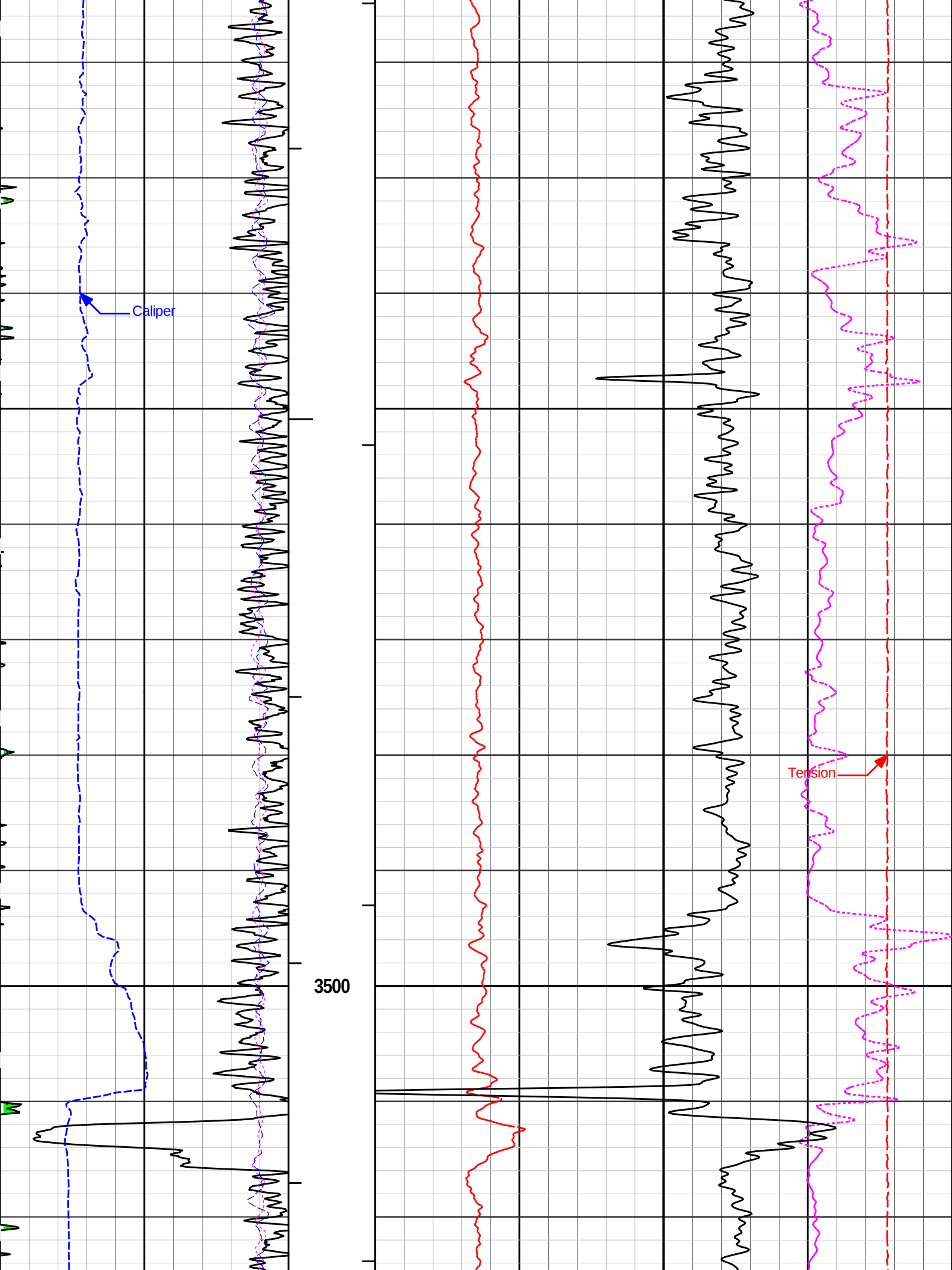
MAIN LOG EVR 10" = 100'

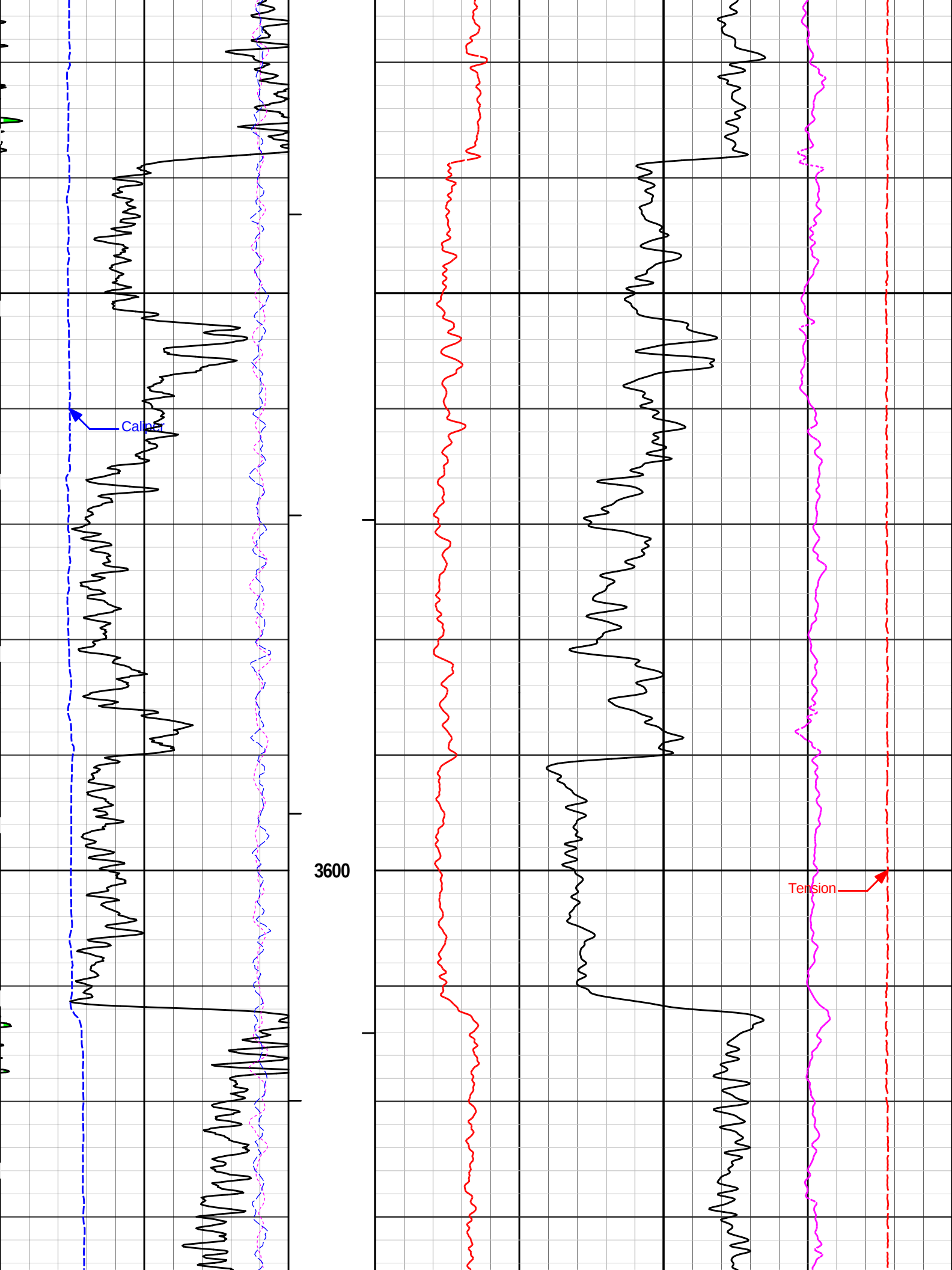


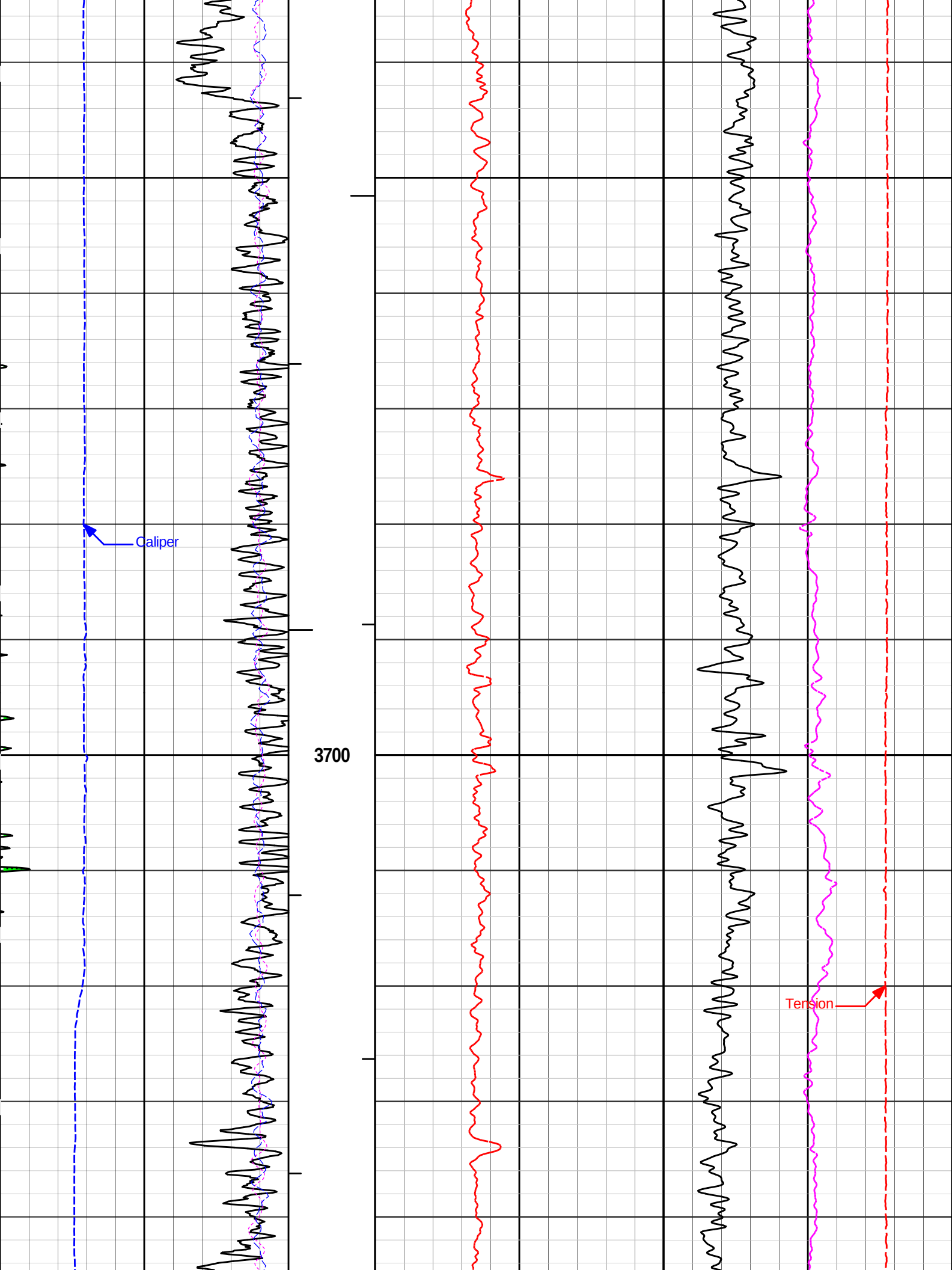


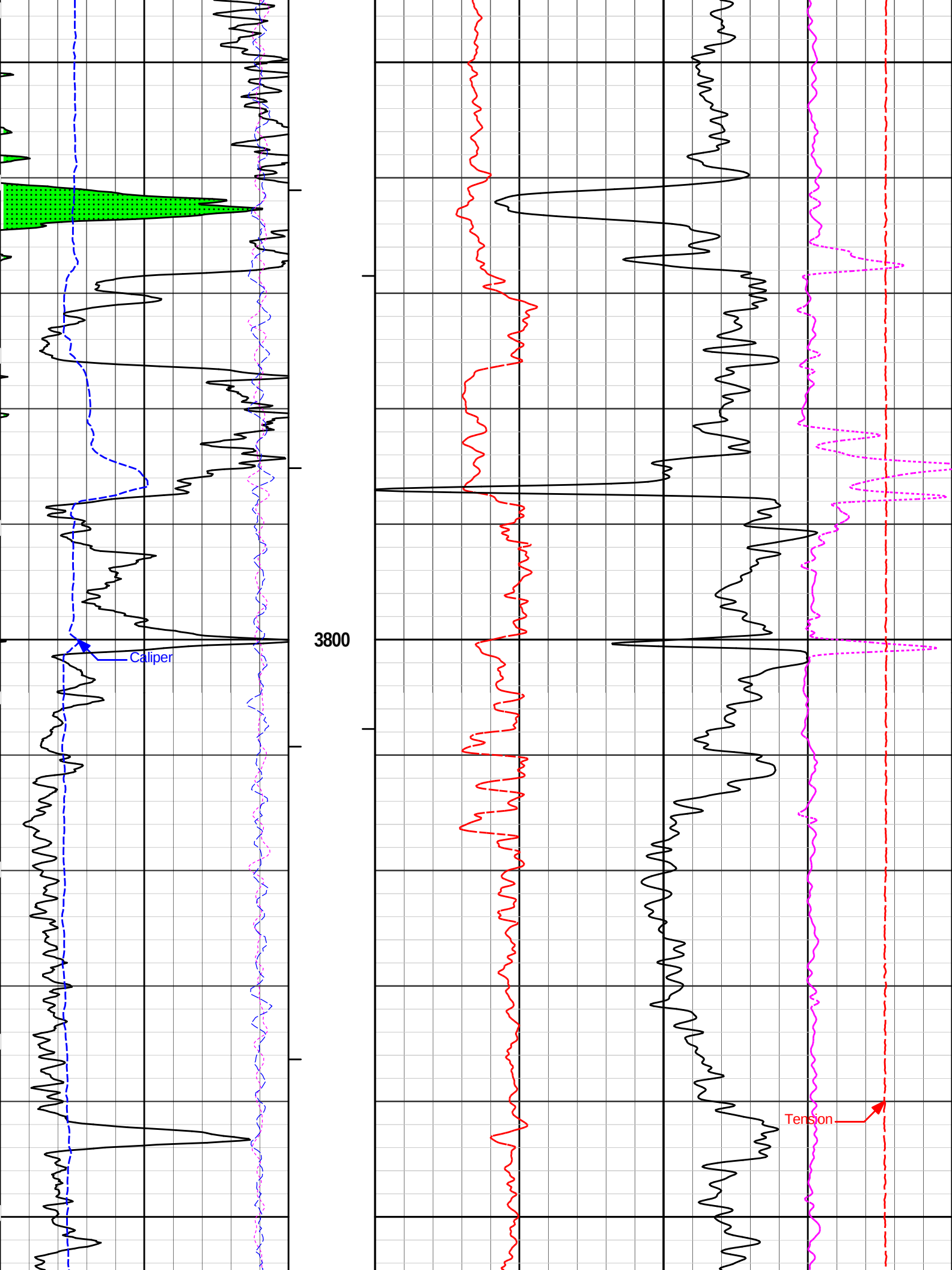


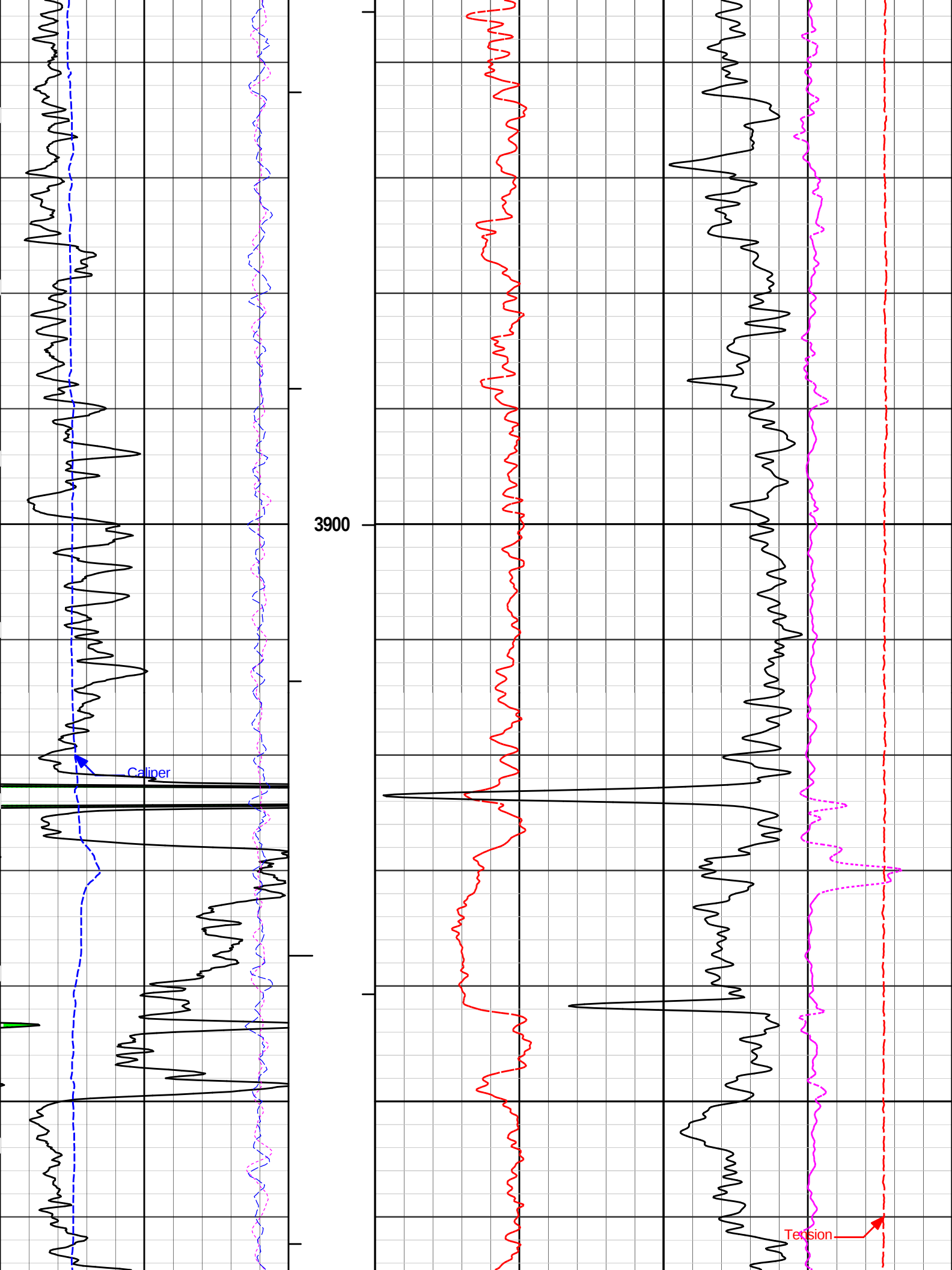


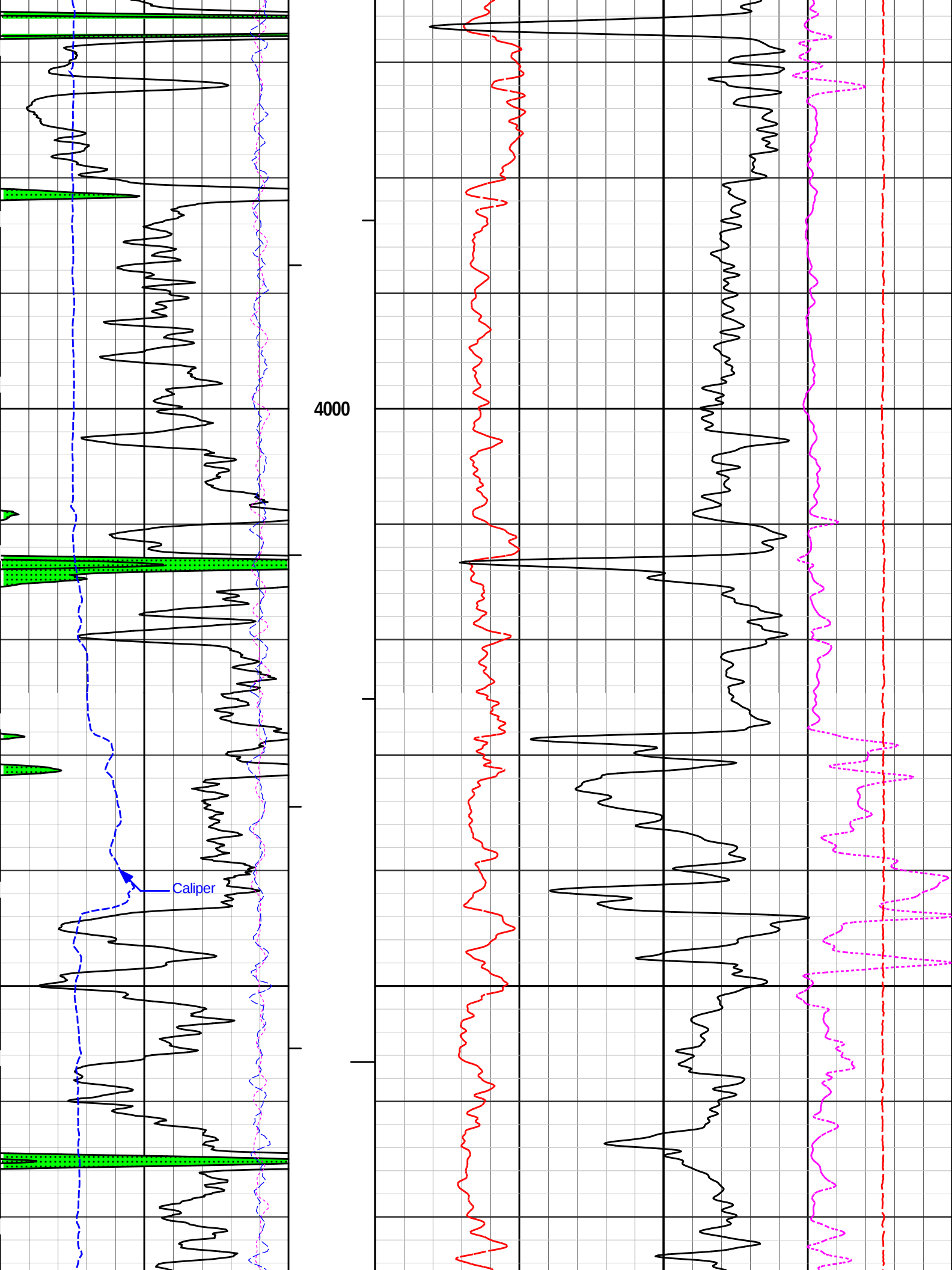


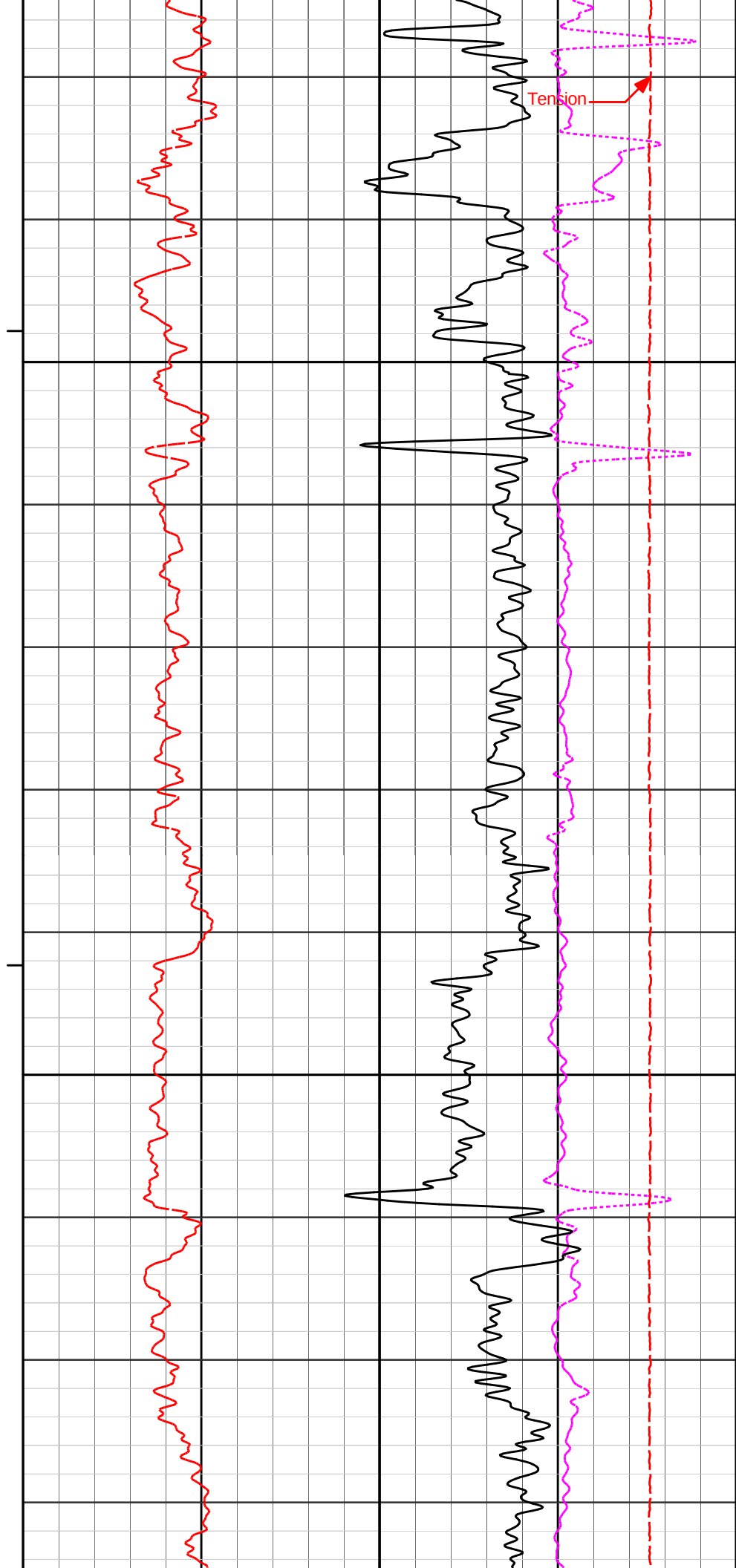
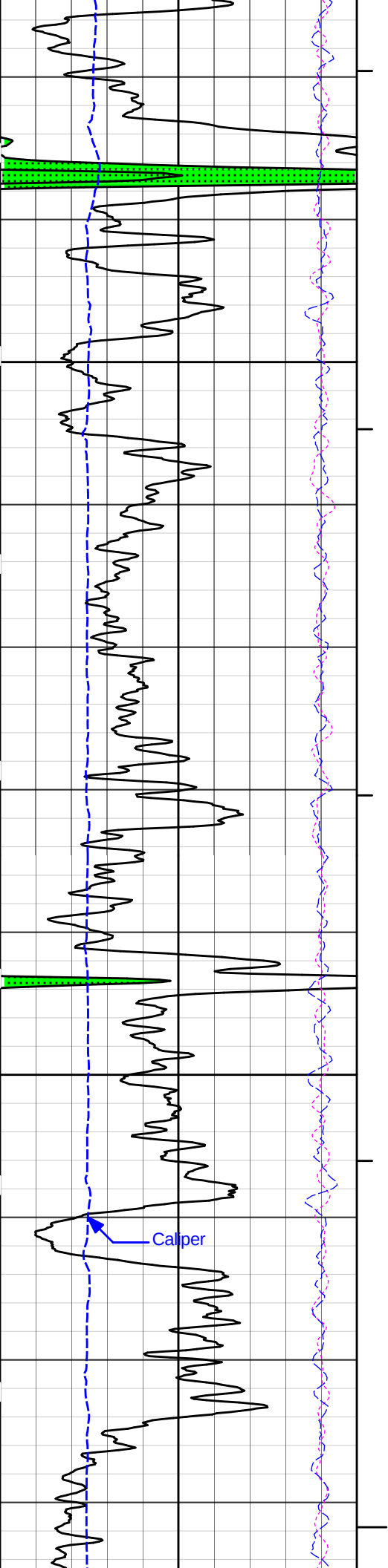


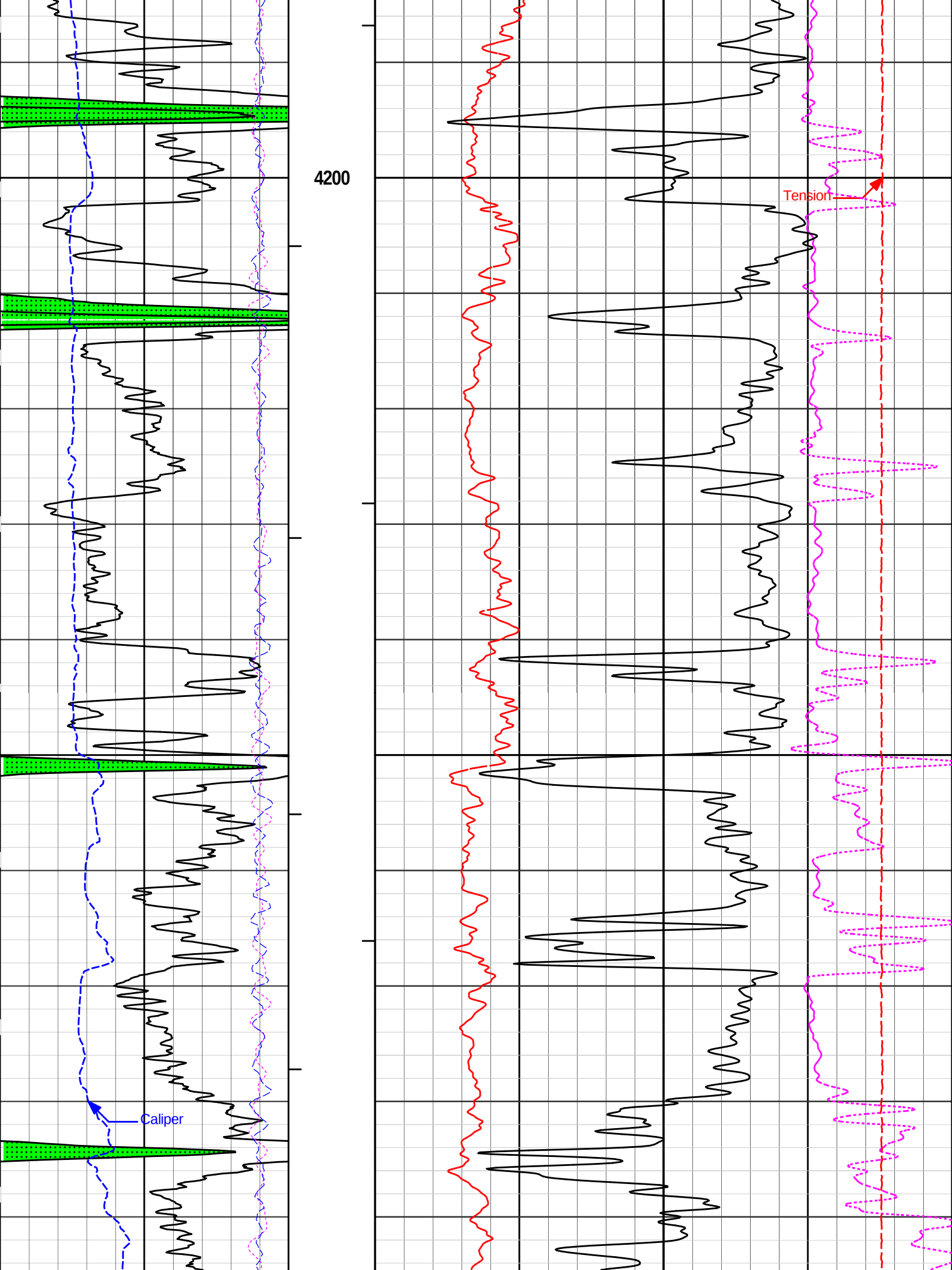


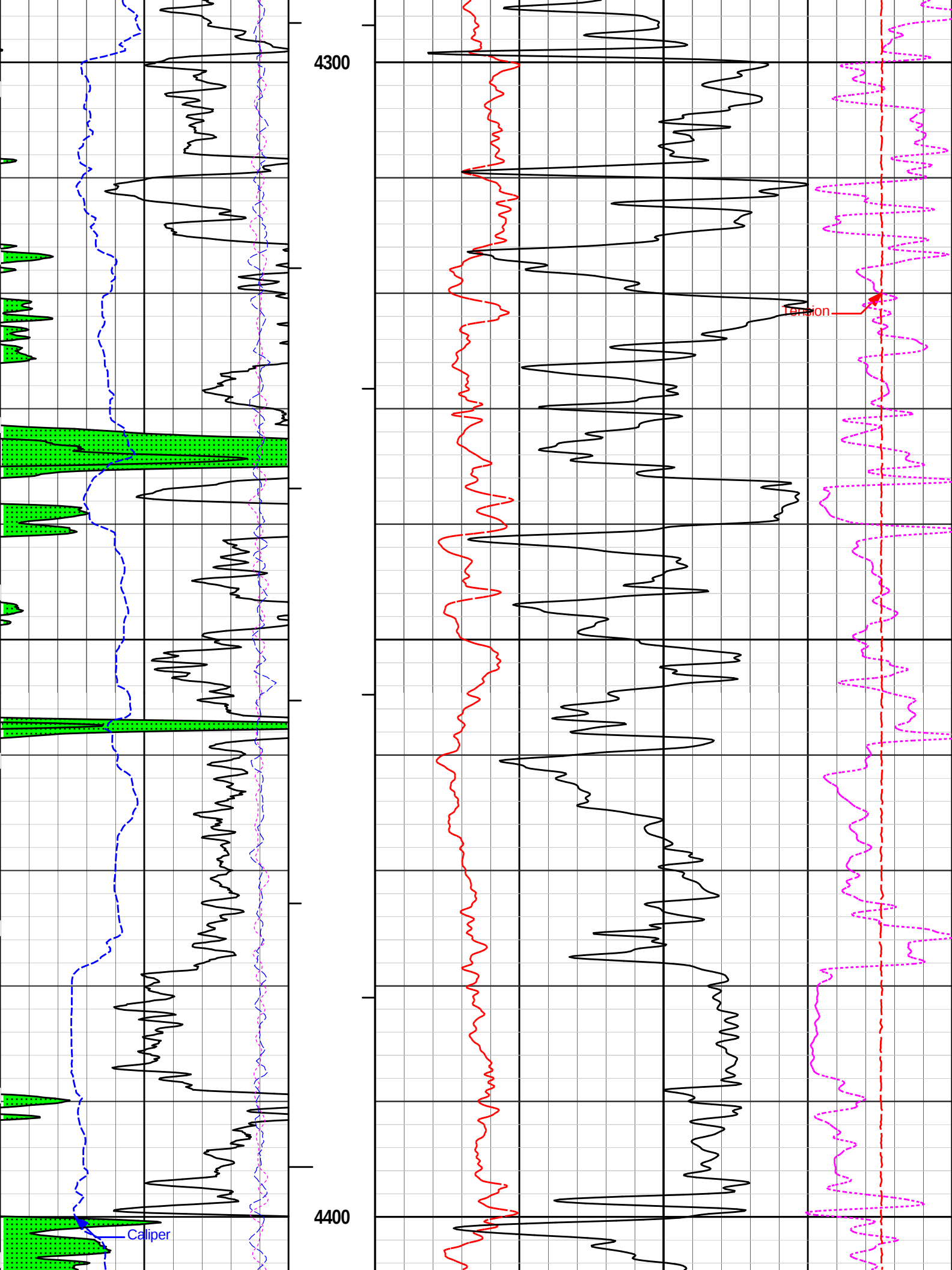


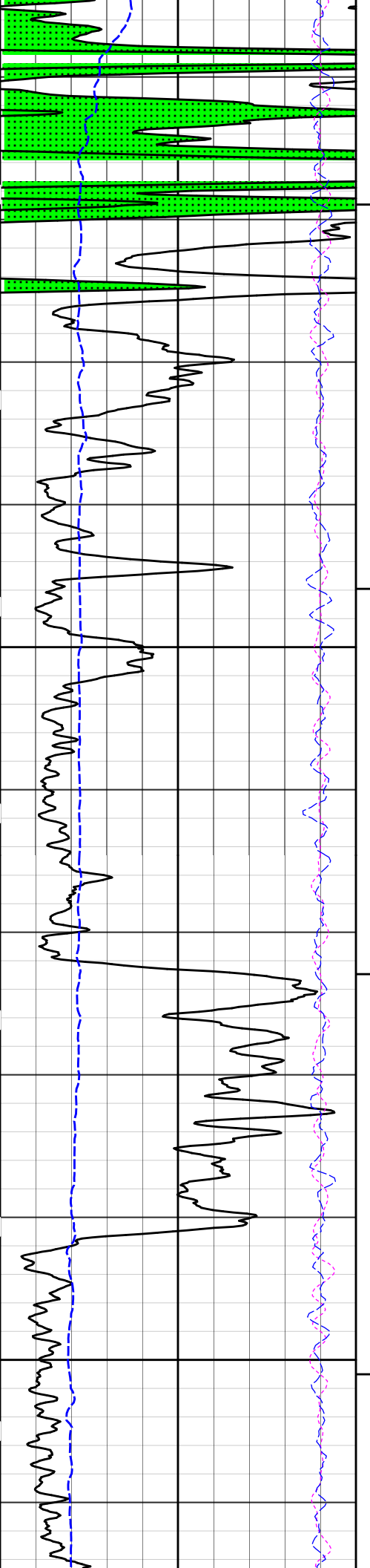




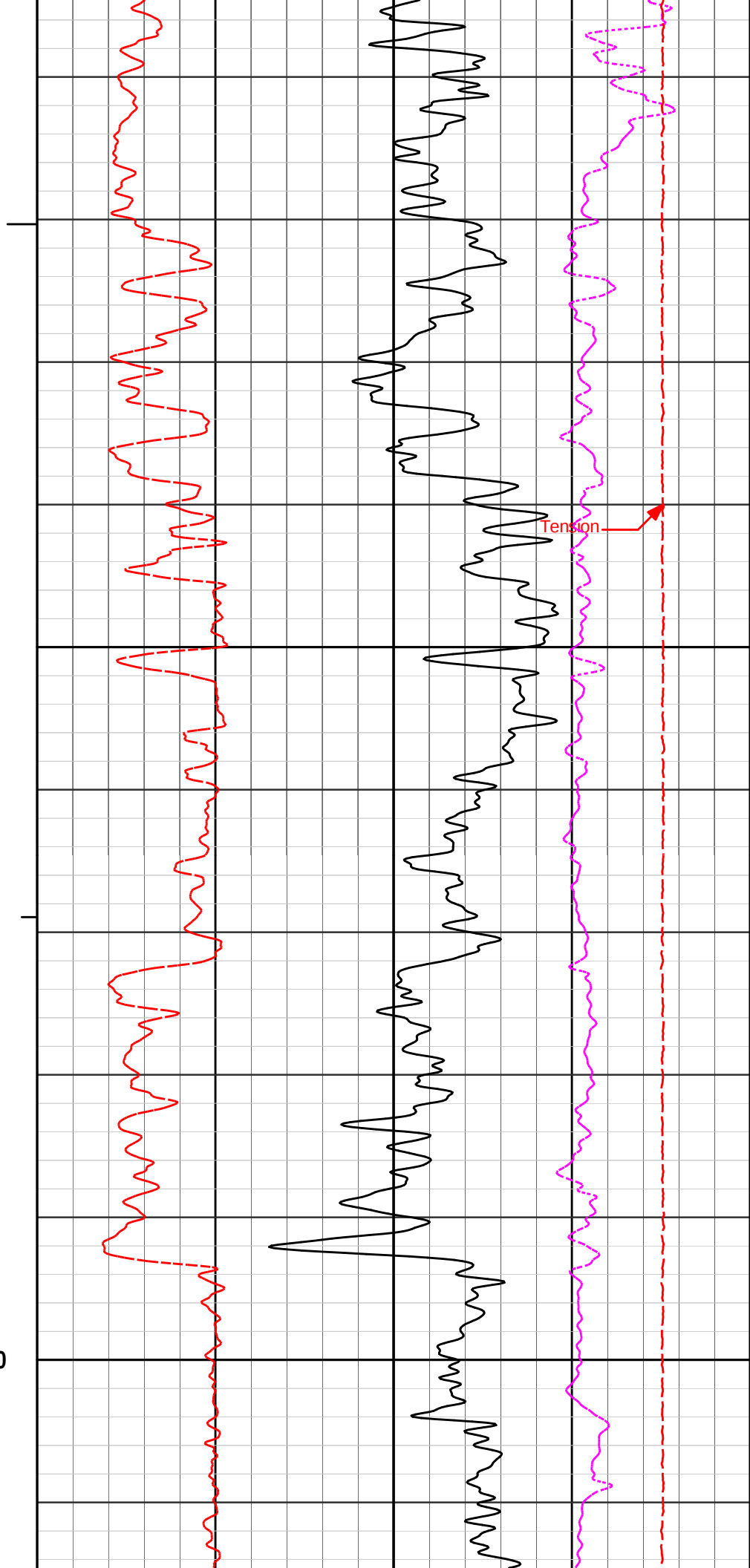


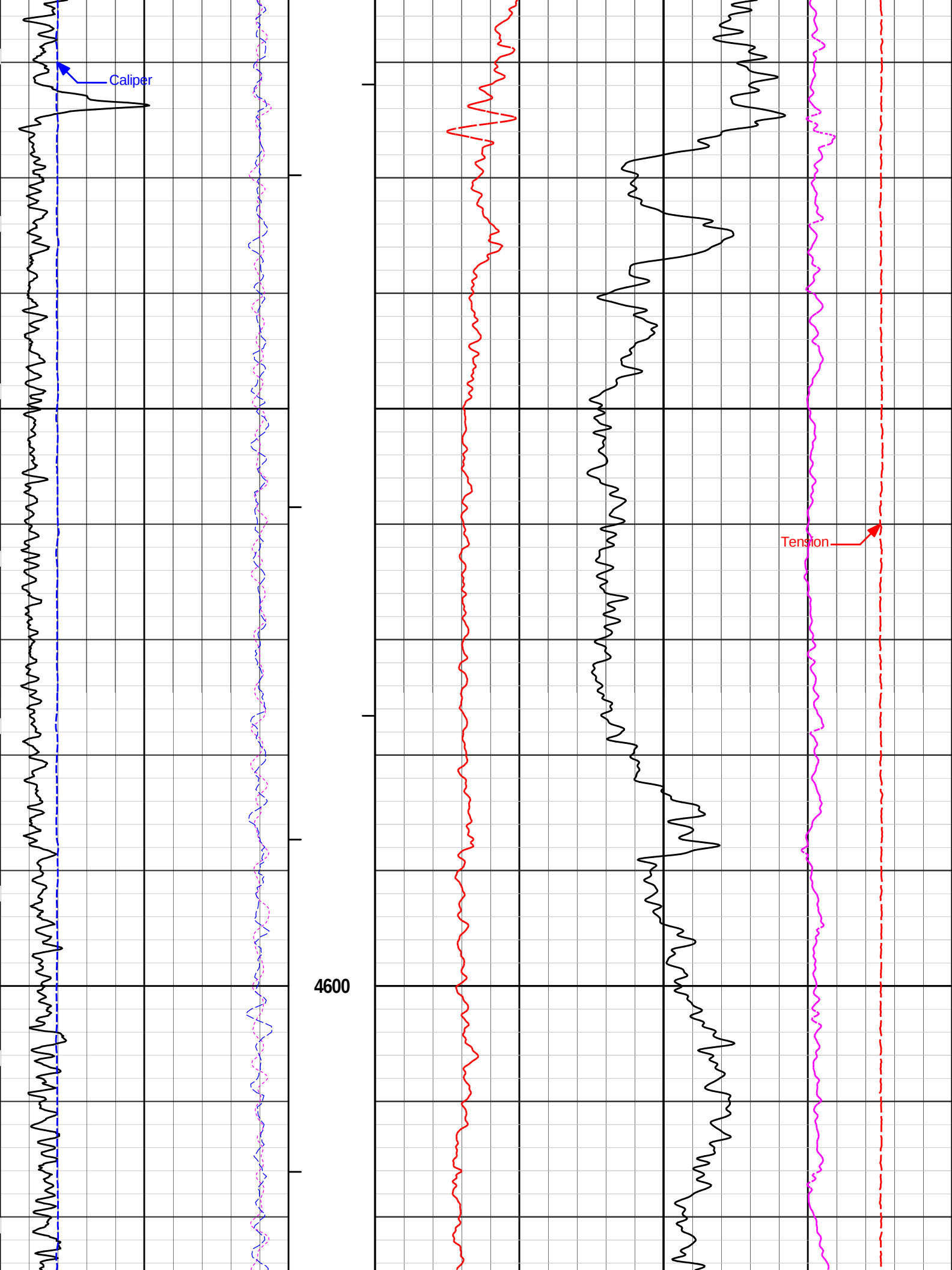


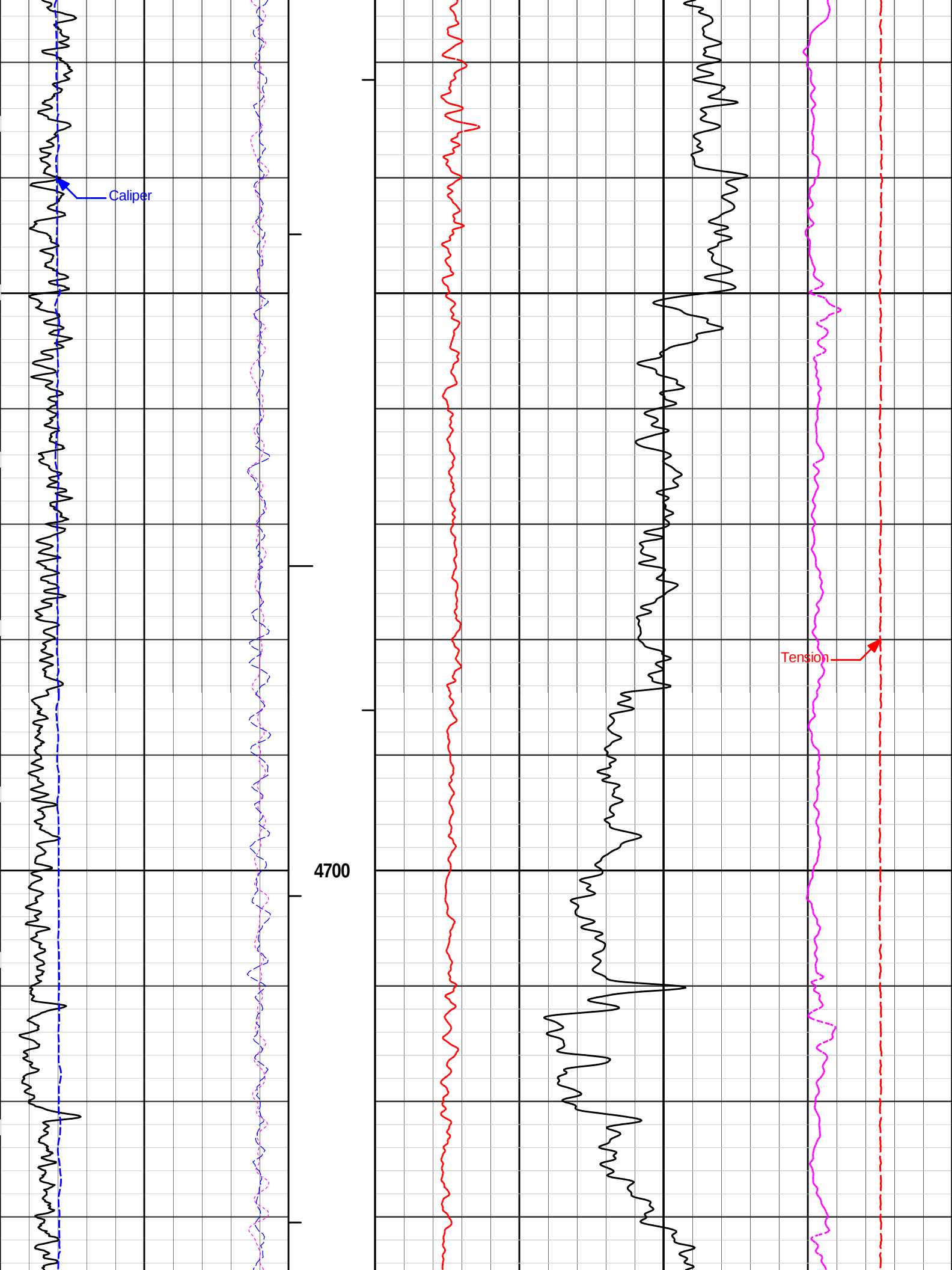


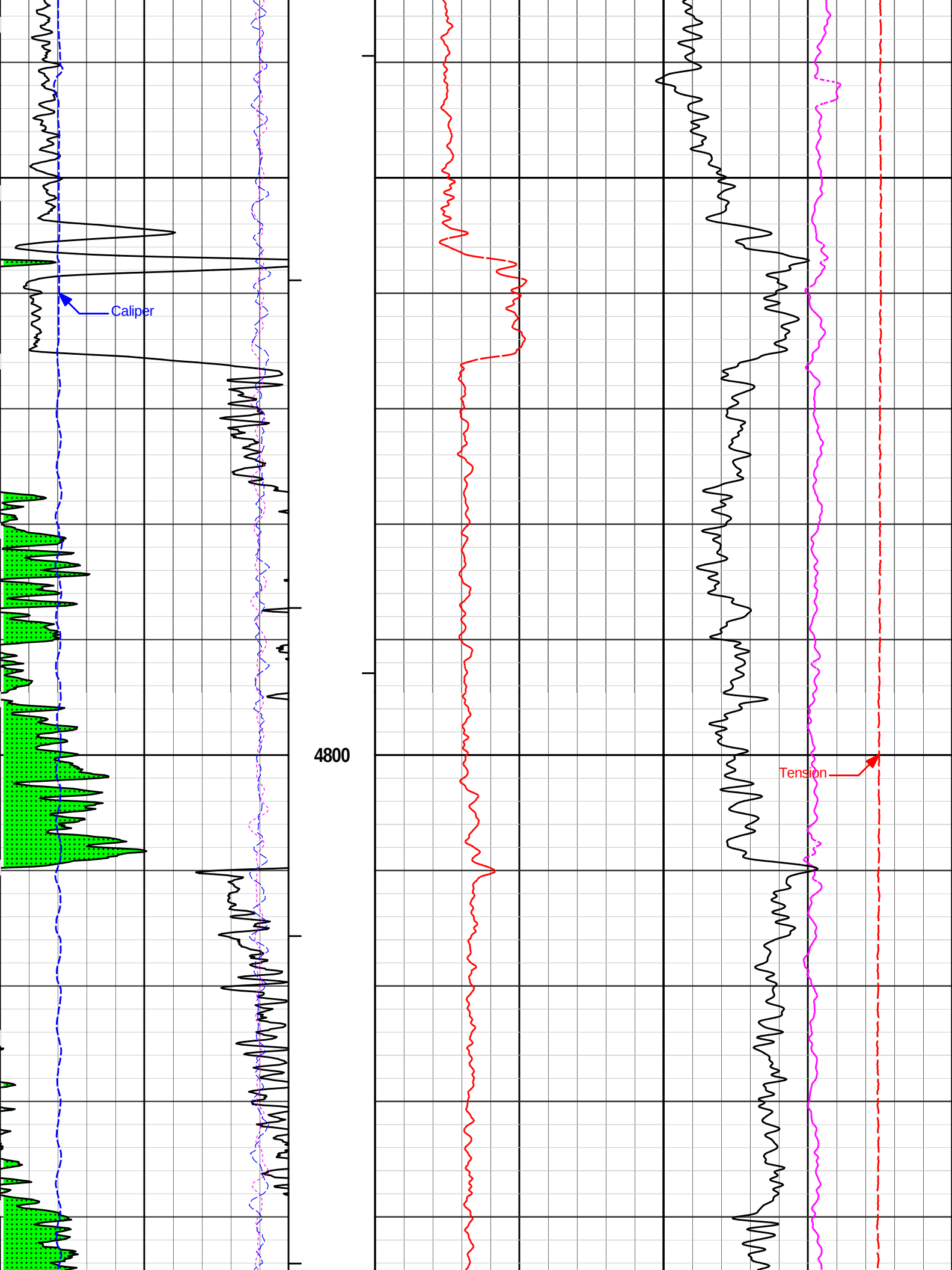


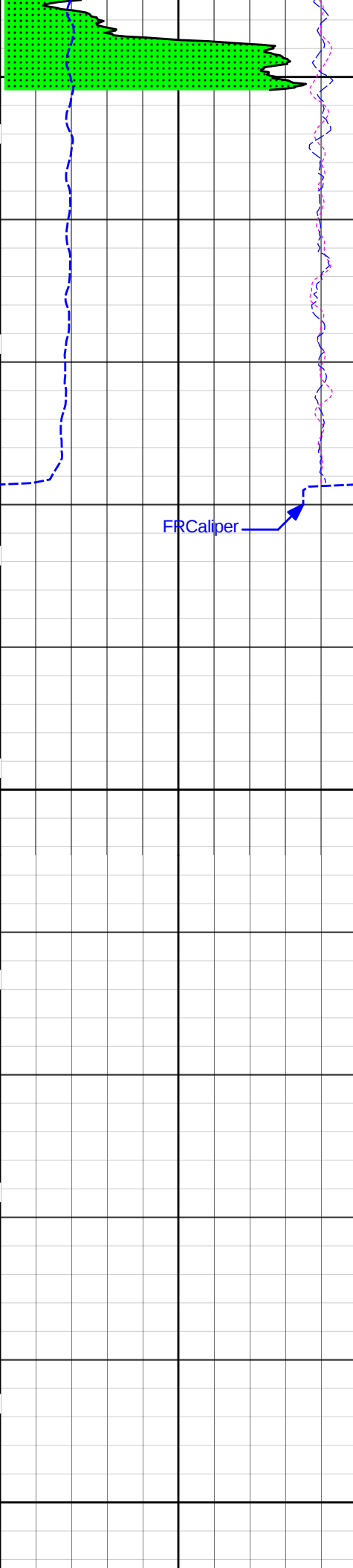
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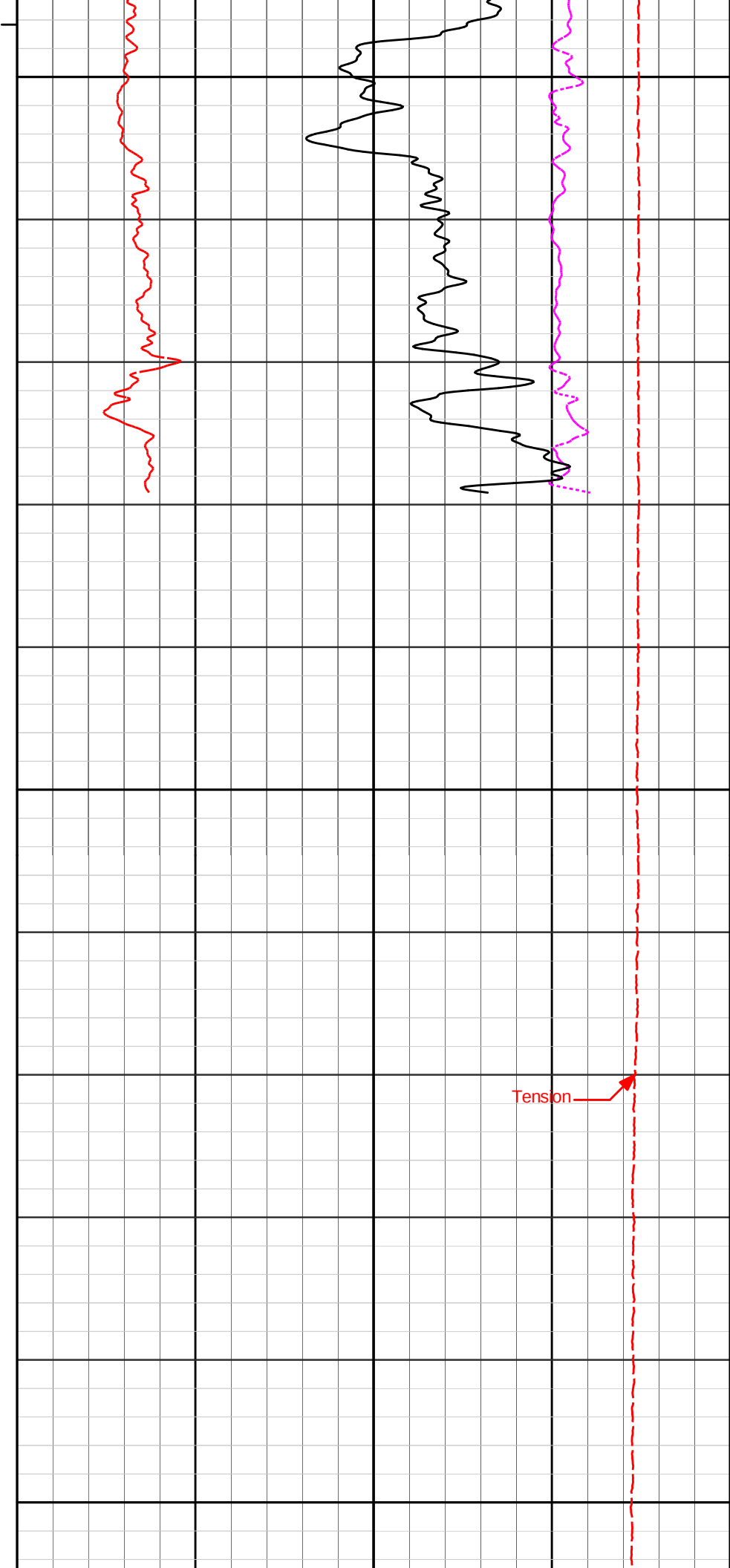


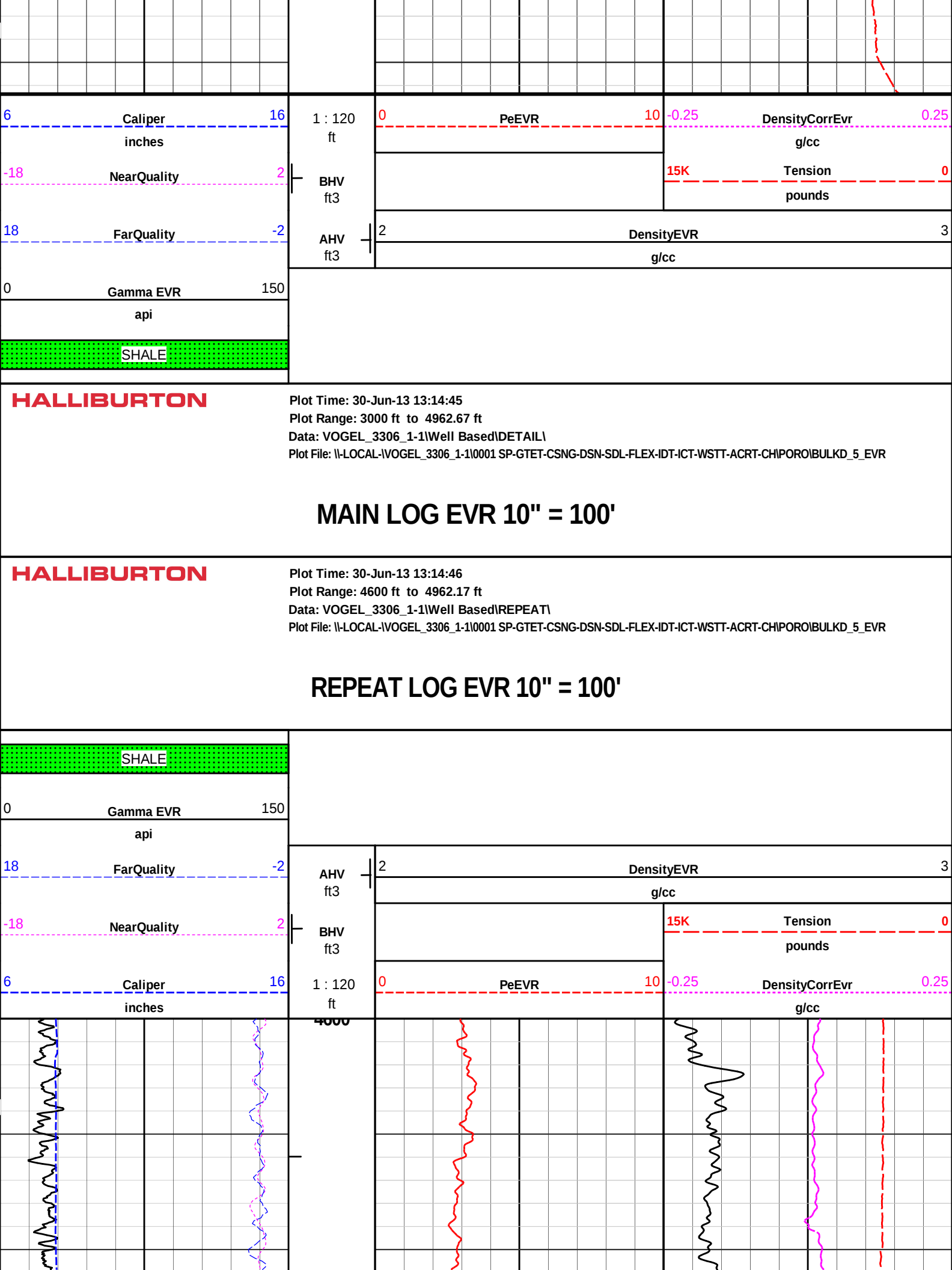


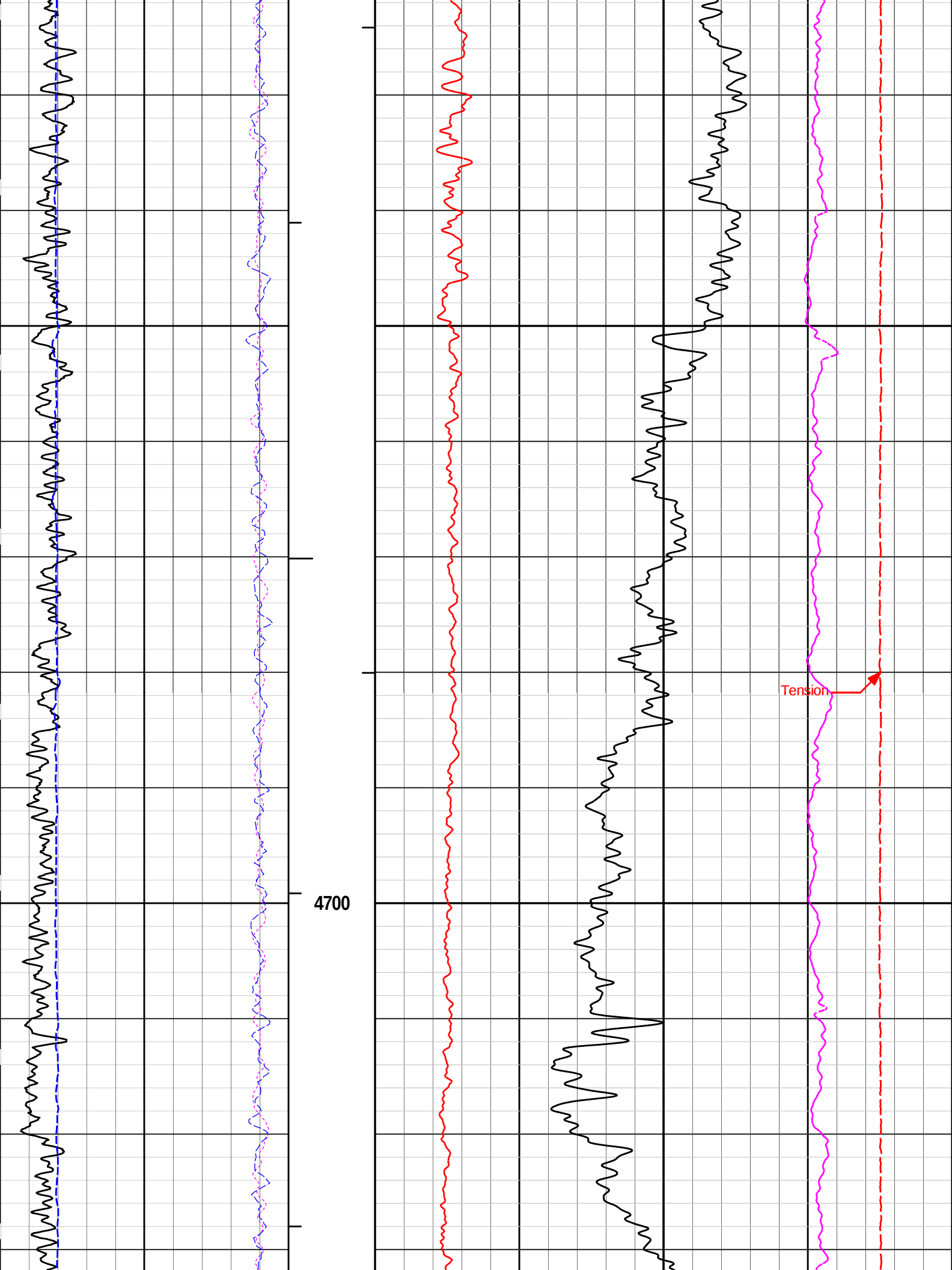


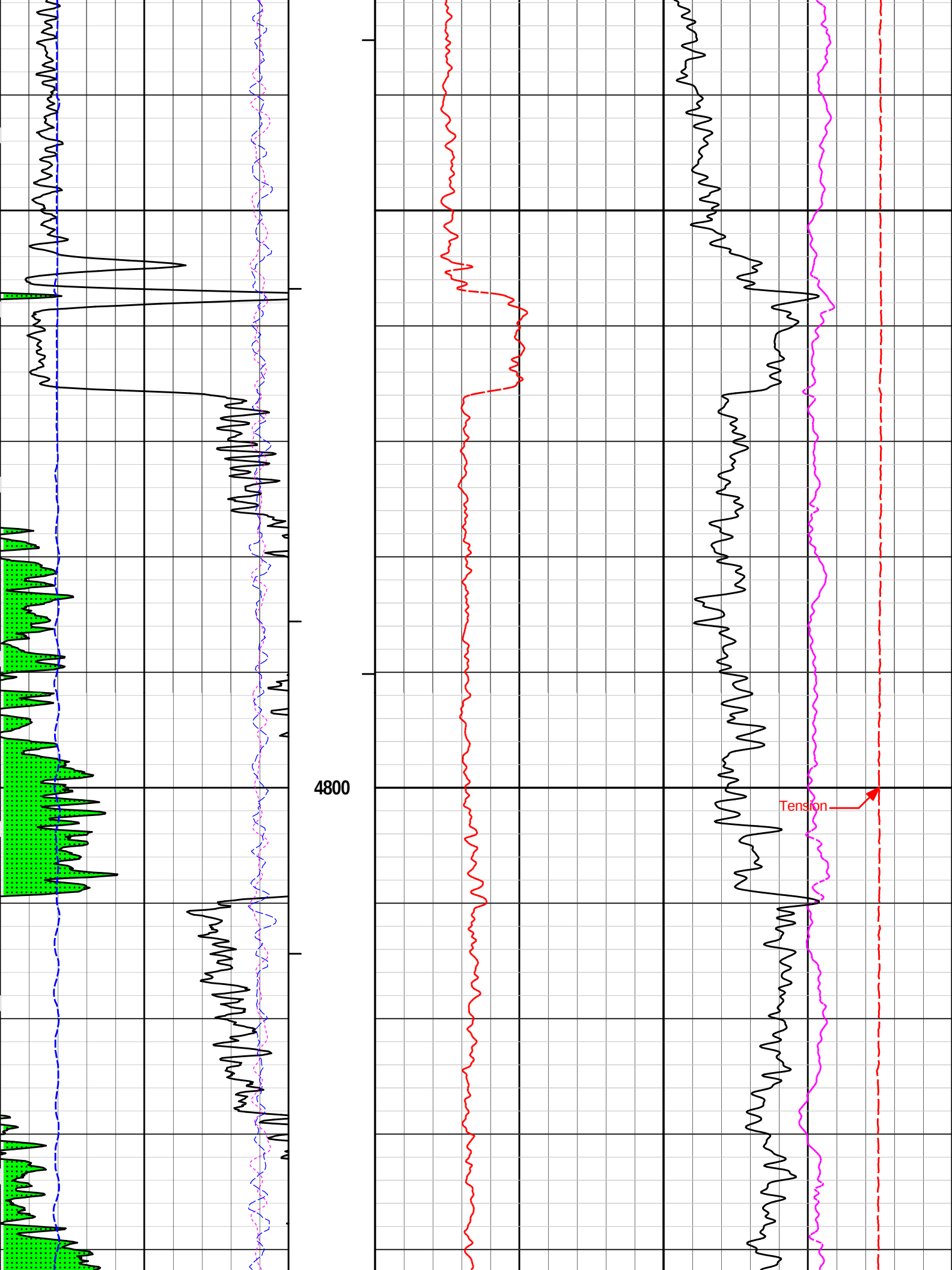


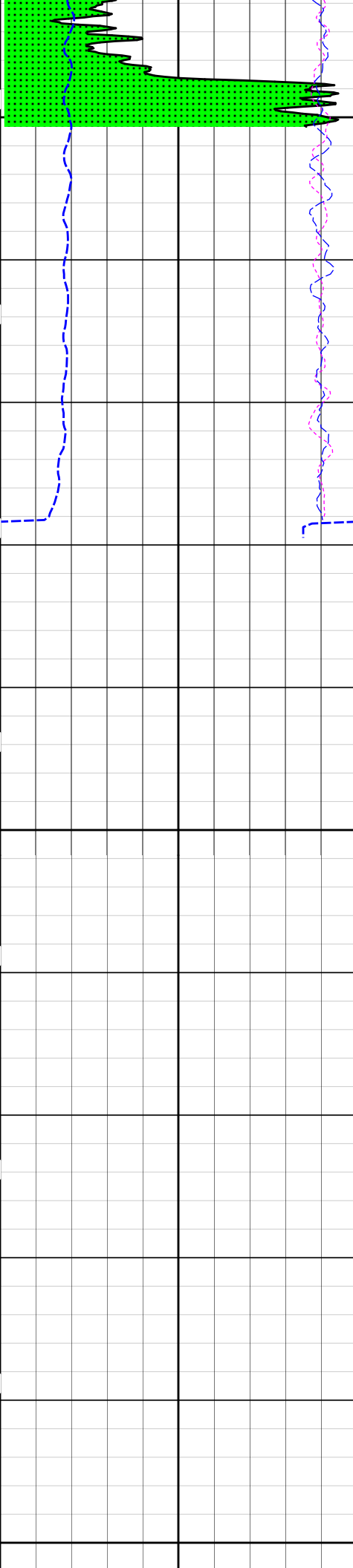
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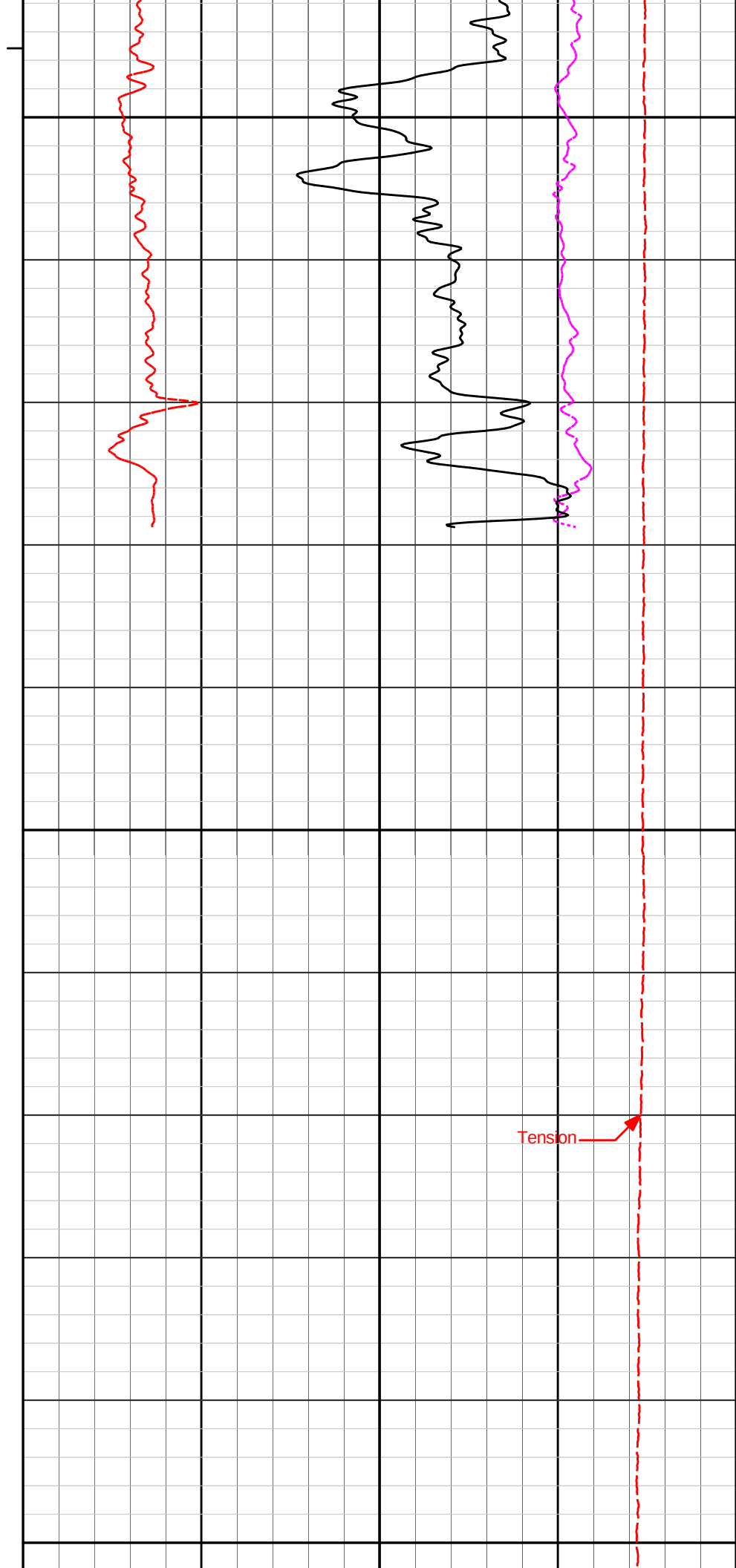


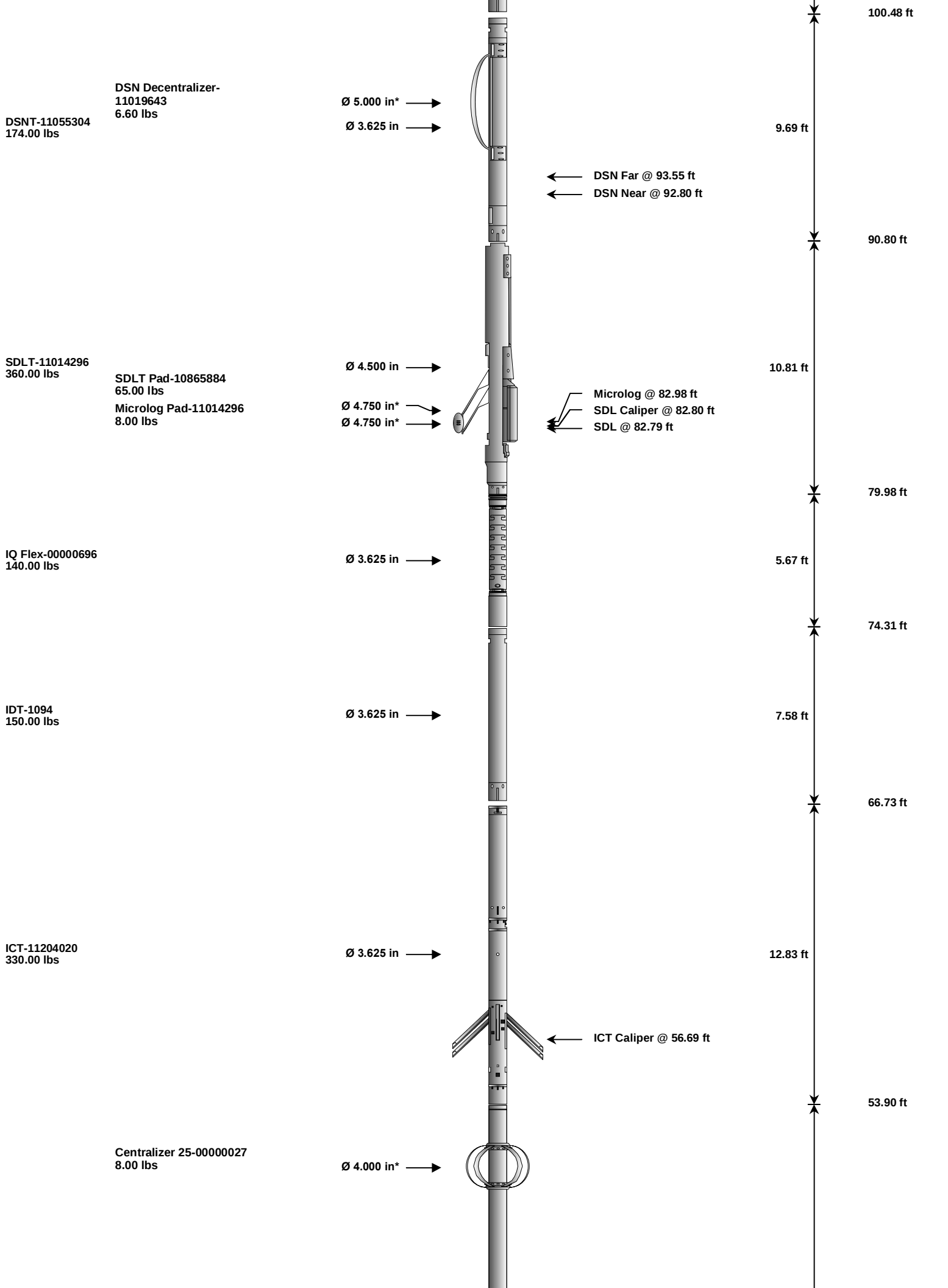






4900





Wavesonic-I-
10753396
520.00 lbs

Ø 3.625 in →

34.07 ft

← Wavesonic Delay @ 31.33 ft

Centralizer 25-00000029
8.00 lbs

Ø 4.000 in* →



19.83 ft

ACRt Instrument-
11022962
50.00 lbs

Regal Standoff 6_75-
00000044
20.00 lbs

Ø 6.750 in* →
Ø 3.625 in →

5.03 ft

14.80 ft

← Mud Resistivity @ 13.44 ft

ACRt Sonde-
11005909
200.00 lbs

Ø 3.625 in →

14.22 ft

← ACRt @ 9.46 ft

Cabbage Head-
TRK696
10.00 lbs

Ø 3.625 in →
Ø 6.000 in →

0.58 ft

0.58 ft

0.00 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	00000062	37.50	3.03	120.91	300.00
SP	SP Sub	11441455	60.00	3.74	117.17	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52	108.65	60.00
CSNG	Compensated Spectral Natural Gamma	10965402	114.00	8.17	100.48	15.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	90.80	60.00
DCNT	DSN Decentralizer	11019643	6.60	5.13	* 94.13	300.00

SDLT	Spectral Density Tool	11014296	360.00	10.81	79.98	60.00
SDLP	Density Insite Pad	10865884	65.00	2.55 *	82.19	60.00
MICP	Microlog Pad	11014296	8.00	1.00 *	82.48	60.00
IQF	IQ Flex tool	00000696	140.00	5.67	74.31	300.00
IDT	Insite Directional Tool	1094	150.00	7.58	66.73	30.00
ICT	Six Independent Arm Caliper	11204020	330.00	12.83	53.90	30.00
WSTT	WaveSonic Insite	10753396	520.00	34.07	19.83	30.00
OBCEN	Centralizer - 25 in. Overbody	00000029	8.00	2.08 *	22.81	300.00
OBCEN	Centralizer - 25 in. Overbody	00000027	8.00	2.08 *	50.16	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11022962	50.00	5.03	14.80	300.00
RSOF	Regal Standoff 6.75in	00000044	20.00	0.52 *	17.55	300.00
ACRt	Array Compensated True Resistivity Sonde Section	11005909	200.00	14.22	0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58	0.00	300.00
Total			2,426.10	123.94		
* Not included in Total Length and Length Accumulation.						
Data: VOGEL_3306_1-110001 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WSTT-ACRT-CH1IDLE					Date: 30-Jun-13 07:31:01	

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION			
Tool Name:	GTET - 11048627	Reference Calibration Date:	06-Jun-13 12:46:30
Engineer:	SHELDON INGERSOLL	Calibration Date:	17-Jun-13 14:38:32
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Calibrator Source S/N: TB146			
Calibrator API Reference:265.00 api			
Equivalent Calibrator API Reference:269.6 api			
Measurement	Measured	Calibrated	Units
Background	16.6	16.4	api
Background + Calibrator	288.6	286.1	api
Calibrator	272.1	269.6	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION			
Tool Name:	GTET - 11048627	Reference Calibration Date:	17-Jun-13 14:38:32
Engineer:	J. BOLLLOM	Calibration Date:	30-Jun-13 07:37:59
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Calibrator Source S/N: TB146			
Calibrator API Reference:265.00 api			
Equivalent Calibrator API Reference:269.6 api			
Field Verification	Shop	Field	Units
Background	16.4	40.9	api
Background + Calibrator	286.1	303.0	api
Calibrator	269.6	262.1	api
Shop	Field	Difference	Tolerance
269.6	262.1	7.5	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION			
Tool Name:	DSNT - 11055304	Reference Calibration Date:	20-May-13 09:50:12
Engineer:	THOMAS HYDE	Calibration Date:	20-May-13 10:05:01
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Logging Source S/N: 606			
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Logging Source S/N: 696
Tank Serial Number: LIBERAL_NEUTRON
Reference value assigned to Tank: 51.680
Snow Block S/N: 696
Calibration Tank Water Temperature: 72 degF
Min. Tool Housing Outside Diameter: 3.620 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value

Gain:	0.971	0.975	0.900 - 1.100
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WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change

Porosity (decp):	0.2097	0.2107	0.0009	+/- 0.0020
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Calibrated Ratio:	9.69	9.72	0.031	+/- 0.050
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VERIFIER		
Measurement	Value	Control Limit

Snow-Block Porosity (decp):	0.0635	0.02000 - 0.09000
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PASS/FAIL SUMMARY	
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Background Check:	Passed
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Gain-Range Check:	Passed
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Snow-Block Check:	Passed
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DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	DSNT - 11055304	Reference Calibration Date:	20-May-13 10:05:01
Engineer:	J. BOLLOM	Calibration Date:	30-Jun-13 07:48:13
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Logging Source S/N: 696
Snow Block S/N: 696

NEUTRON FIELD-CHECK SUMMARY			
	Shop	Field	Control Limit On Change

Snow-Block Porosity (decp):	0.0635	0.0614	+/- 0.0150
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PASS/FAIL SUMMARY	
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Block Change Check:	Passed
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Snow Block Stat Check:	Passed
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Temperature Check:	Passed
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DENSITY CALIPER SHOP CALIBRATION

Tool Name:	SDLT - 11014296	Reference Calibration Date:	16-Apr-13 08:29:16
Engineer:	THOMAS HYDE	Calibration Date:	30-May-13 08:27:38
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1
Host Tool Name:	DSNT - 11055304		

CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value

Pad Offset	-4390.41	-4151.69	-7000.00 - -1000.00
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Pad Gain	0.0003927	0.0004028	0.000200 - 0.000600
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Arm Offset	-2117.94	-2550.43	-5000.00 - 3000.00
Arm Gain	0.0004920	0.0005352	0.000300 - 0.000700
Arm Power	-0.000003440	-0.000007104	-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)	1.86	2.00	0.14	+/- 0.20
Medium Ring (in)	3.56	3.75	0.19	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.47	6.50	0.03	+/- 0.20
Medium Ring (in)	8.15	8.25	0.10	+/- 0.20
Large Ring (in)	15.19	15.00	-0.19	+/- 0.20

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

SDLT CALIPER FIELD CALIBRATION

Tool Name:	SDLT - 11014296	Reference Calibration Date:	30-May-13 08:27:38
Engineer:	J. BOLLUM	Calibration Date:	30-Jun-13 07:41:16
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	3.84	0.09	+/- 0.10
Ring Diameter	8.25	8.38	0.13	+/- 0.15

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	SDLT Pad - 10865884	Reference Calibration Date:	09-Apr-13 11:34:03
Engineer:	THOMAS HYDE	Calibration Date:	30-May-13 07:48:06
Software Version:	WL INSITE R3.8.4 (Build 5)	Calibration Version:	1

Logging Source S/N: 5168GW

Aluminum Block S/N: LIBERAL

Density: 2.598g/cc

Pe: 3.170

Magnesium Block S/N: LIBERAL

Density: 1.684g/cc

Pe: 2.598

DENSITY CALIBRATION SUMMARY			
Measurement	Previous Value	New Value	Control Limit
Near Bar Gain	1.0458	1.0217	0.90 - 1.10
Near Dens Gain	1.0099	1.0088	0.90 - 1.10
Near Peak Gain	1.0073	0.9995	0.90 - 1.10
Near Lith Gain	0.9733	0.9661	0.90 - 1.10
Far Bar Gain	1.0117	1.0092	0.90 - 1.10
Far Dens Gain	1.0020	1.0004	0.90 - 1.10

Far Peak Gain	0.9931	0.9944	0.90 - 1.10
Far Lith Gain	0.9700	0.9674	0.90 - 1.10
Near Bar Offset	-0.2172	0.0023	NONE
Near Dens Offset	0.0802	0.0870	NONE
Near Peak Offset	0.0793	0.1396	NONE
Near Lith Offset	0.3210	0.3762	NONE
Far Bar Offset	0.0401	0.0594	NONE
Far Dens Offset	0.0981	0.1059	NONE
Far Peak Offset	0.1441	0.1250	NONE
Far Lith Offset	0.2803	0.2869	NONE
Near Bar Background	829.86	824.65	700 - 1450
Near Dens Background	274.06	273.73	230 - 480
Near Peak Background	120.83	119.39	100 - 210
Near Lith Background	147.93	146.80	125 - 260
Far Bar Background	510.54	511.66	450 - 900
Far Dens Background	200.45	199.80	175 - 345
Far Peak Background	78.57	79.58	70 - 140
Far Lith Background	81.79	82.15	75 - 145

CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.683	1.684	0.001	+/- 0.015
Pe	2.539	2.561	0.022	+/- 0.150
ALUMINUM				
Density (g/cc)	2.594	2.598	0.004	+/- 0.01500
Pe	3.088	3.129	0.041	+/- 0.150

TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0011	+/- 0.0110	-0.0018	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	0.0005	+/- 0.0140
Aluminum Block	0.0008	+/- 0.0110	0.0003	+/- 0.0140
Resolution	9.15	6.00 - 11.50	8.87	6.00 - 11.50
Internal Verifier(B+D+P+L)	1365	1200 - 2700	873	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 - 10865884		Reference Calibration Date: 30-May-13 07:48:06				
Engineer: J. BOLLLOM		Calibration Date: 30-Jun-13 07:37:21				
Software Version: WL INSITE R3.8.4 (Build 5)		Calibration Version: 1				
Pad Temperature: 74.3 degF						
DENSITY FIELD CALIBRATION SUMMARY						
Measurement	Shop	Field	Change	Control Limit +/-		
Near (B+D+P+L) cps	1364.575	1368.201	3.626	14.931		
Far (B+D+P+L) cps	873.199	878.710	5.511	16.144		
Near Resolution	9.15	9.43	0.280	0.50		
Far Resolution	8.87	9.51	0.640	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-11048627						
Gamma Ray Calibrator	269.6	262.1	-----	7.5	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0635	0.0614	-----	0.0021	+/- 0.0150	decp
SDLT-11014296						
Pad Extension	3.75	3.84	-----	-0.09	+/-0.10	in
Ring Diameter	8.25	8.38	-----	-0.13	+/-0.15	in
SDLT Pad-10865884						
Near(B+D+P+L)	1364.575	1368.201	-----	-3.626	+/-14.931	cps
Far(B+D+P+L)	873.199	878.710	-----	-5.511	+/-16.144	cps
Data: VOGEL 3306 1-110001 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WSTT-ACRT-CHUDLE				Date: 30-Jun-13 08:03:51		
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	8.400	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	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	ST	Surface Temperature	75.0	degF	
	SHARED	TD	Total Well Depth	4969.00	ft	
	SHARED	BHT	Bottom Hole Temperature	200.0	degF	
	SHARED	SVTM	Navigation and Survey Master Tool	IDT		

	SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	ICT	
	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?	Yes	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	CSNG	CGOK	Process CSNG Data?	Yes	
	CSNG	CENT	Is Tool Centralized?	No	
	CSNG	GBOK	Gamma Enviromental Corrections?	Yes	
	CSNG	BARF	Barite Correction Factor	1.00	
	CSNG	ORDG	Use Fixed Gain	No	
	CSNG	ORDO	Use Fixed Offset	No	
	CSNG	ORDR	Use Fixed Resolution Degradation Factor	No	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	Yes	
	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	
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	SDLT Pad	DNOK	Process Density?	Yes	
	SDLT Pad	DNOK	Process Density EVR?	Yes	
	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
	IDT	WRTI	Survey Writing Interval	30	ft
	IDT	SOPT	Smoothing Option	None	
	ICT	CLOK	Process Caliper Outputs?	Yes	
	ICT	DARM	Disable Caliper Arm	No	
	ICT	ATDS	Arm To Disable	0	
	ICT	REPM	Method to replace arm?	Caliper Average	
	ICT	ARMV	Diameter to use for disabled arm	0.00	in
	ICT	DARM	Disable Second Caliper Arm	No	
	ICT	ATDS	Second Arm To Disable	0	
	ICT	REPM	Method to replace second arm?	Caliper Average	
	ICT	ARMV	Diameter to use for second disabled arm	0.00	in

ICT	NAVS	Navigation Source Tool	IDT	
ICT	CL1O	Radius 1 Offset	0.0	in
ICT	CL2O	Radius 2 Offset	0.0	in
ICT	CL3O	Radius 3 Offset	0.0	in
ICT	CL4O	Radius 4 Offset	0.0	in
ICT	CL5O	Radius 5 Offset	0.0	in
ICT	CL6O	Radius 6 Offset	0.0	in
ICT	BHVC	Radius type for borehole volume calcuations	Elliptical	
Wavesonic-I	WSOK	Process WSTT?	Yes	
Wavesonic-I	AFIL	Adaptive Filtering?	No	
Wavesonic-I	PINT	Process 1 Sample and Skip	0	
Wavesonic-I	PROM	Process Mode: M=1,MX=2,MY=3,MXY=4	4	
Wavesonic-I	DTSH	Delta -T Shale	100.00	uspf
Wavesonic-I	DTMT	Delta -T Matrix Type	User define	
Wavesonic-I	DTMA	Delta -T Matrix	47.60	uspf
Wavesonic-I	DTFL	Delta -T Fluid	189.00	uspf
Wavesonic-I	RHOM	Matrix Density	2.7100	g/cc
Wavesonic-I	RHOF	Fluid Density	1.0000	g/cc
Wavesonic-I	SMTH	Semblance Threshold	0.25	
Wavesonic-I	VPVS	VPVS Ratio for Porosity	1.40	
Wavesonic-I	APEQ	Acoustic Porosity Equation	Wyllie	
Wavesonic-I	NAVS	Navigation Source Tool	IDT	
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

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		119.13	NO	
SP	Spontaneous Potential		119.13	BLK	1.250
SPR	Raw Spontaneous Potential		119.13	NO	
SPO	Spontaneous Potential Offset		119.13	NO	
GTET					
TPUL	Tension Pull		111.11	NO	
GR	Natural Gamma Ray API		111.11	TRI	1.750

GRU	Unfiltered Natural Gamma Ray API	111.11	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	111.11	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
CSNG				
TPUL	Tension Pull	103.02	NO	
STAT	Status	103.02	NO	
FRMC	Tool Frame Count	103.02	BLK	0.250
TFRM	Total Frames	103.02	NO	
LSPD	Line Speed	103.02	BLK	0.250
CTIM	Accumulation time for sample	103.02	BLK	0.250
NOIS	Spectral Noise	103.02	BLK	0.250
STAB	Stabilizer Voltage in mv	103.02	BLK	0.250
STBP	Stabilizer 60 KEV Peak	103.02	BLK	0.250
AMER	Americium	103.02	BLK	0.250
FTMP	Flask PCB Temperature	103.02	BLK	0.250
SPEL	Low Energy Spectrum	103.02	BLK	0.250
SPEH	High Energy Spectrum	103.02	BLK	0.250
SSP	Stabilization Energy Spectrum	103.02	BLK	0.250
CSPC	CSNG Lo Hi Spectrum Data	103.02	NO	
DSNT				
TPUL	Tension Pull	92.70	NO	
RNDS	Near Detector Telemetry Counts	92.80	BLK	1.417
RFDS	Far Detector Telemetry Counts	93.55	TRI	0.583
DNTT	DSN Tool Temperature	92.80	NO	
DSNS	DSN Tool Status	92.70	NO	
ERND	Near Detector Telemetry Counts EVR	92.80	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	93.55	BLK	0.000
ENTM	DSN Tool Temperature EVR	92.80	NO	
SDLT				
TPUL	Tension Pull	82.80	NO	
PCAL	Pad Caliper	82.80	TRI	0.250
ACAL	Arm Caliper	82.80	TRI	0.250
IDT				
TPUL	Tension Pull	67.73	NO	
ACCX	Accelerometer X	67.73	NO	
ACCY	Accelerometer Y	67.73	NO	
ACCZ	Accelerometer Z	67.73	NO	
MAGX	magnetometer x with unit	67.73	NO	
MAGY	Magnetometer Y with unit	67.73	NO	
MAGZ	magnetometer z with unit	67.73	NO	
IAMP	Accelerometer Temperature	67.73	NO	
MTMP	Magnetometer Temperature	67.73	NO	
ICT				
TPUL	Tension Pull	56.69	NO	
	Arm Potentiometer excitation V	53.90	NO	
	Caliper 1 measurement	56.69	BLK	1.250
	Caliper 2 measurement	56.69	BLK	1.250
	Caliper 3 measurement	56.69	BLK	1.250
	Caliper 4 measurement	56.69	BLK	1.250
	Caliper 5 measurement	56.69	BLK	1.250

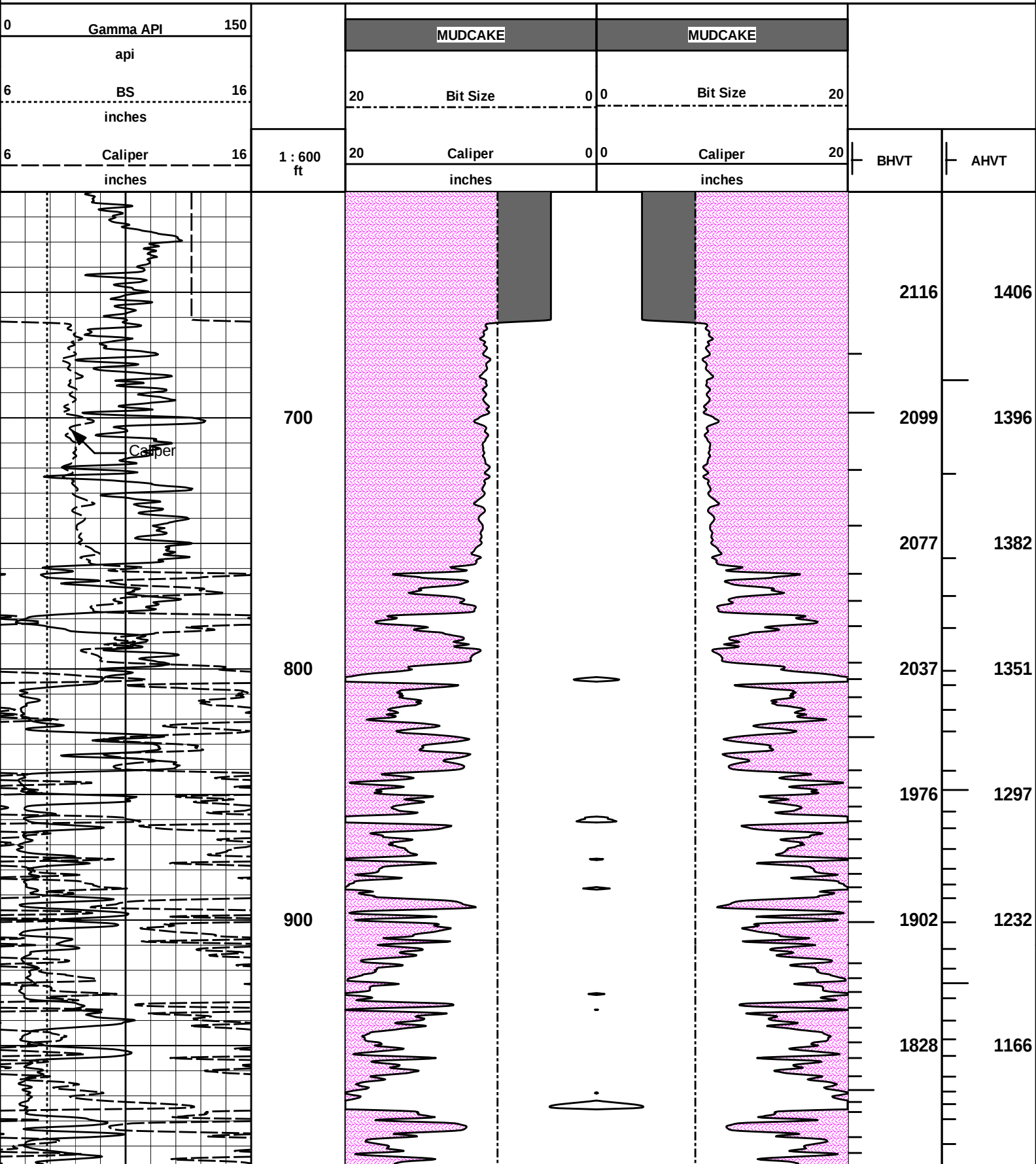
	Caliper 6 measurement	56.69	BLK	1.250
	Caliper Global measurement	56.69	BLK	1.250
MOTI	Motor Current	53.90	NO	
MOT1	Motor Voltage Monitor 1	53.90	NO	
STA1	Status word #1	53.90	NO	
STA2	Status word #2	53.90	NO	
PRES	Caliper percentage of total compression of the spring	53.90	NO	
HAZI	Hole Azimuth	56.69	NO	
RB	Relative Bearing	56.69	NO	
AZI1	PAD1 Azimuth	56.69	NO	
DEVI	Inclination	56.69	NO	
Wavesonic-I				
TPUL	Tension Pull	31.33	NO	
DPSX	Dipole Source X StructureI	19.83	NO	
DPSY	Dipole Source Y StructureI	19.83	NO	
DPSM	Monopole Source Structure	19.83	NO	
WVST	Wavesonic Compressed Data	31.33	NO	
TPUL	Tension Pull	31.33	NO	
XMS1	Wave Sonic Status Word 1	19.83	NO	
XMS2	Wave Sonic Status Word 2	19.83	NO	
XMS1	Wave Sonic XMITStatus Word 1	19.83	NO	
XMS1	Wave Sonic XMITStatus Word 2	19.83	NO	
F1HA	Dipole 1 HV After	19.83	NO	
F1HB	Dipole 1 HV Before	19.83	NO	
F2HA	Dipole 2 HV After	19.83	NO	
F2HB	Dipole 2 HV Before	19.83	NO	
F3HA	Monopole HV After	19.83	NO	
F3HB	Monopole HV Before	19.83	NO	
INVT	Input Voltage	19.83	NO	
5VOL	5 Volts	19.83	NO	
MI5A	Minus 5 Volts Analog	19.83	NO	
ITMP	Instrument Temperature	19.83	NO	
PL5A	Plus 5 Volts Analog	19.83	NO	
5VD	Plus 5 Volts Digital	19.83	NO	
TCUR	Tool Current	19.83	NO	
SUPV	Supply Voltage	19.83	NO	
PRVT	Preregulated voltage	19.83	NO	
PRVT	Pre-regulated voltage Xmter	19.83	NO	
TEMP	Temperature	19.83	NO	
ACQN	Acquisition Number	19.83	NO	
XDP	Delay Reference	31.33	NO	
MITM	MIT Mode	31.33	NO	
VERS	Version	19.83	NO	
D1CT	Dipole 1 Compressed Word Count	31.33	NO	
D2CT	Dipole 2 Compressed Word Count	31.33	NO	
MCNT	Monopole Compressed Word Count	31.33	NO	
SEQN	Sequence Number	19.83	NO	
FREV	Firmware Revision	19.83	NO	
MSMP	Monopole Sample Rate	19.83	NO	
MSMP	Dipole Sample Rate	19.83	NO	
MFWF	Monopole Firing Waveform	19.83	NO	
MFRQ	Monopole Frequency	19.83	NO	
MDLY	Monopole Delay	19.83	NO	
DXWF	Dipole X Firing Waveform	19.83	NO	
XFRQ	Dipole X F	19.83	NO	

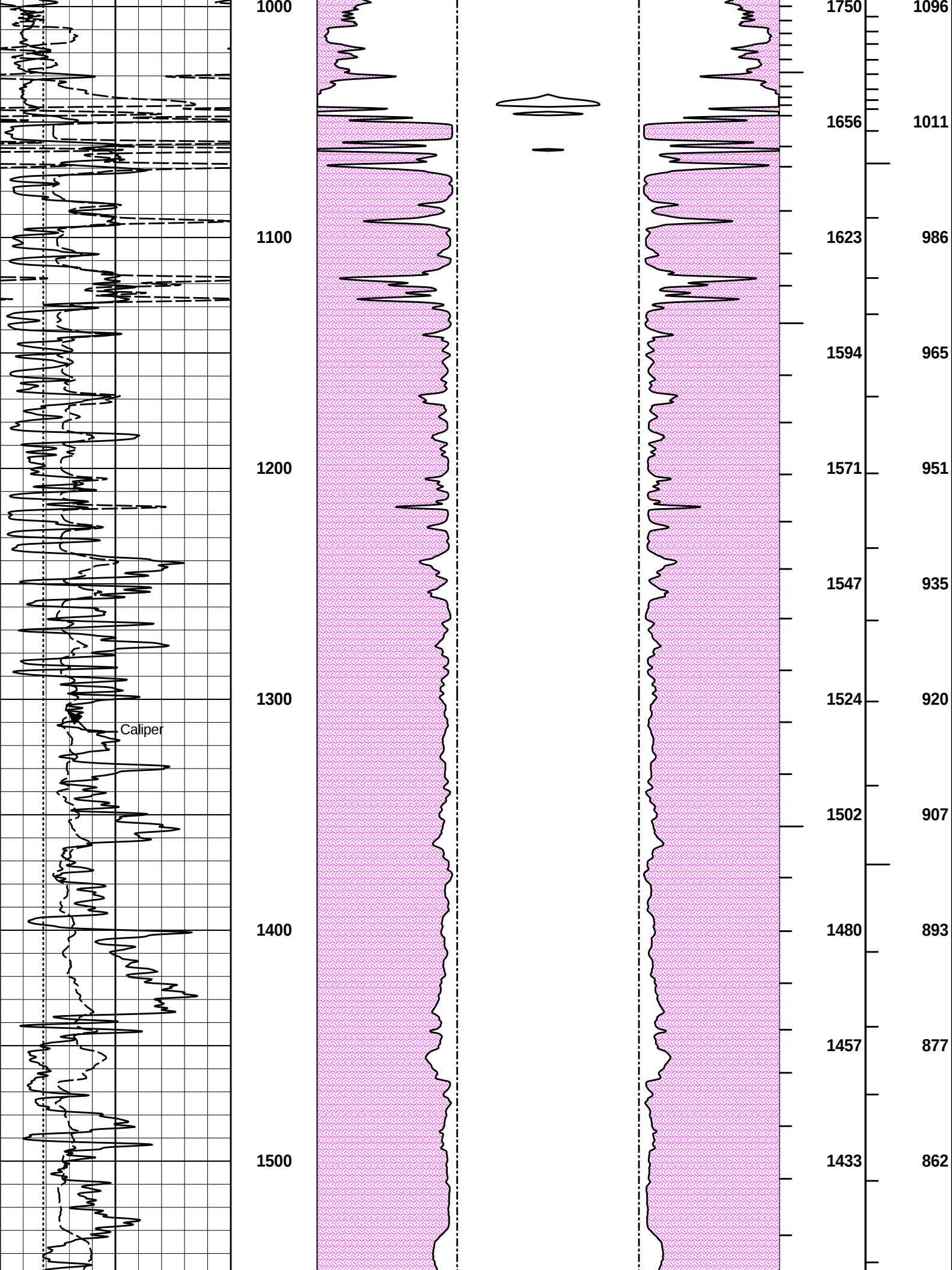
XFRQ	Dipole X Frequency	19.83	NO
XDLY	Dipole X Delay	19.83	NO
DYWF	Dipole Y Firing Waveform	19.83	NO
YFRQ	Dipole Y Frequency	19.83	NO
YDLY	Dipole Y Delay	19.83	NO
DPSX	Dipole Source X StructureI	19.83	NO
DPSY	Dipole Source Y StructureI	19.83	NO
DPSM	Monopole Source Structure	19.83	NO
WVST	Wavesonic Compressed Data	31.33	NO
AUTM	Auto Mode	19.83	NO
SONM	tool mode for sonic - 0 for normal or 3 for calibration	19.83	NO
MSL	Monopole Lower Travel Time	31.33	NO
MSH	Monopole Upper Travel Time	31.33	NO
MLFC	Monopole-1 Lower Filter Bandpass Frequency Cut-off	19.83	NO
MUFC	Monopole-1 Upper Filter Bandpass Frequency Cut-off	19.83	NO
DLTT	Dipole Lower Travel Time	19.83	NO
DUTT	Dipole Upper Travel Time	19.83	NO
DLFC	Dipole Lower Filter Bandpass Frequency Cut-off	19.83	NO
DUFC	Dipole Upper Filter Bandpass Frequency Cut-off	19.83	NO
MUTE	WaveSonic Mute/Enable Channels and Sides map	19.83	NO
MUTS	Mute/Enable Sides	19.83	NO
WSRB	Relative Bearing	31.33	NO
WSAZ	WSX Azimuth Pad 1	31.33	NO
TPUL	Tension Pull	31.33	NO
WMP	Summed array of Monopole for SIDES - A,B,C,D	31.33	NO
WXX	Dipole X for SIDES - A-C	31.33	NO
WYY	Dipole Y for SIDES - B-D	31.33	NO
WXY	Dipole X for SIDES - B-D	31.33	NO
WYX	Dipole Y for SIDES - A-C	31.33	NO
TPUL	Tension Pull	31.33	NO
WMA	Monopole Waveform Side A - Channel 1 to Channel 8 Receivers	31.33	NO
WMB	Monopole Waveform Side B - Channel 1 to Channel 8 Receivers	31.33	NO
WMC	Monopole Waveform Side C - Channel 1 to Channel 8 Receivers	31.33	NO
WMD	Monopole Waveform Side D - Channel 1 to Channel 8 Receivers	31.33	NO
WXA	Dipole X Waveform Side A - Channel 1 to Channel 8 Receivers	31.33	NO
WXB	Dipole X Waveform Side B - Channel 1 to Channel 8 Receivers	31.33	NO
WXC	Dipole X Waveform Side C - Channel 1 to Channel 8 Receivers	31.33	NO
WXD	Dipole X Waveform Side D - Channel 1 to Channel 8 Receivers	31.33	NO
WYA	Dipole Y Waveform Side A - Channel 1 to Channel 8 Receivers	31.33	NO
WYB	Dipole Y Waveform Side B - Channel 1 to Channel 8 Receivers	31.33	NO
WYC	Dipole Y Waveform Side C - Channel 1 to Channel 8 Receivers	31.33	NO
WYD	Dipole Y Waveform Side D - Channel 1 to Channel 8 Receivers	31.33	NO
GAR1	Gain Side A Receiver 1	19.83	NO
GAR2	Gain Side A Receiver 2	19.83	NO
GAR3	Gain Side A Receiver 3	19.83	NO
GAR4	Gain Side A Receiver 4	19.83	NO
GAR5	Gain Side A Receiver 5	19.83	NO
GAR6	Gain Side A Receiver 6	19.83	NO
GAR7	Gain Side A Receiver 7	19.83	NO
GAR8	Gain Side A Receiver 8	19.83	NO

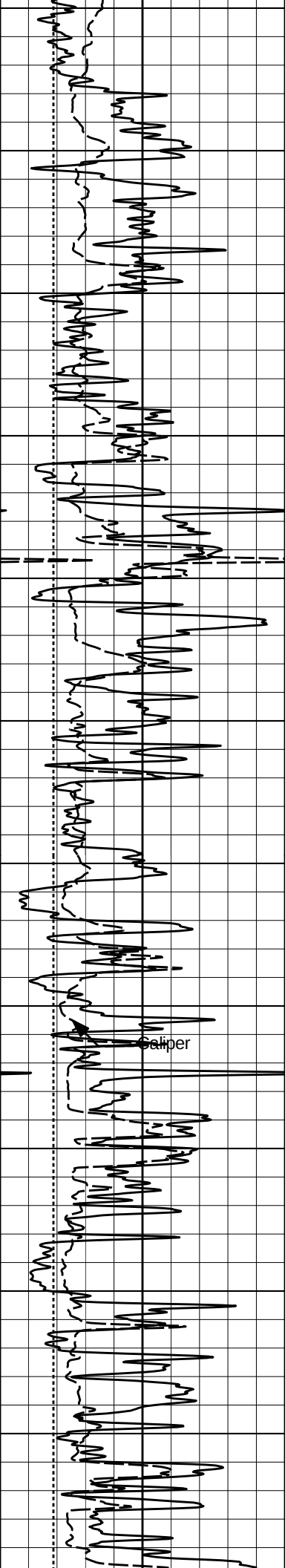
GAR8	Gain Side A Receiver 8	19.83	NO	
GBR1	Gain Side B Receiver 1	19.83	NO	
GBR2	Gain Side B Receiver 2	19.83	NO	
GBR3	Gain Side B Receiver 3	19.83	NO	
GBR4	Gain Side B Receiver 4	19.83	NO	
GBR5	Gain Side B Receiver 5	19.83	NO	
GBR6	Gain Side B Receiver 6	19.83	NO	
GBR7	Gain Side B Receiver 7	19.83	NO	
GBR8	Gain Side B Receiver 8	19.83	NO	
GCR1	Gain Side C Receiver 1	19.83	NO	
GCR2	Gain Side C Receiver 2	19.83	NO	
GCR3	Gain Side C Receiver 3	19.83	NO	
GCR4	Gain Side C Receiver 4	19.83	NO	
GCR5	Gain Side C Receiver 5	19.83	NO	
GCR6	Gain Side C Receiver 6	19.83	NO	
GCR7	Gain Side C Receiver 7	19.83	NO	
GCR8	Gain Side C Receiver 8	19.83	NO	
GDR1	Gain Side D Receiver 1	19.83	NO	
GDR2	Gain Side D Receiver 2	19.83	NO	
GDR3	Gain Side D Receiver 3	19.83	NO	
GDR4	Gain Side D Receiver 4	19.83	NO	
GDR5	Gain Side D Receiver 5	19.83	NO	
GDR6	Gain Side D Receiver 6	19.83	NO	
GDR7	Gain Side D Receiver 7	19.83	NO	
GDR8	Gain Side D Receiver 8	19.83	NO	
ACRt Sonde				
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

F3R2	ACRT 72KHz - 29in R value	5.22	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 Current Raw 12K X Receiver	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	
Microlog Pad				
TPUL	Tension Pull	82.98	NO	
MINV	Microlog Lateral	82.98	BLK	0.750
MNOR	Microlog Normal	82.98	BLK	0.750
SDLT Pad				
TPUL	Tension Pull	82.79	NO	
NAB	Near Above	82.61	BLK	0.920
NHI	Near Cesium High	82.61	BLK	0.920
NLO	Near Cesium Low	82.61	BLK	0.920
NVA	Near Valley	82.61	BLK	0.920
NBA	Near Barite	82.61	BLK	0.920
NDE	Near Density	82.61	BLK	0.920
NPK	Near Peak	82.61	BLK	0.920
NLI	Near Lithology	82.61	BLK	0.920
NBAU	Near Barite Unfiltered	82.61	BLK	0.250
NLIU	Near Lithology Unfiltered	82.61	BLK	0.250
FAB	Far Above	82.96	BLK	0.250
FHI	Far Cesium High	82.96	BLK	0.250
FLO	Far Cesium Low	82.96	BLK	0.250
FVA	Far Valley	82.96	BLK	0.250
FBA	Far Barite	82.96	BLK	0.250
FDE	Far Density	82.96	BLK	0.250
FPK	Far Peak	82.96	BLK	0.250
FLI	Far Lithology	82.96	BLK	0.250
PTMP	Pad Temperature	82.80	BLK	0.920
NHV	Near Detector High Voltage	82.19	NO	
FHV	Far Detector High Voltage	82.19	NO	
ITMP	Instrument Temperature	82.19	NO	
DDHV	Detector High Voltage	82.19	NO	
Data: VOGEL_3306_1-1\0001 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WSTT-ACRT-CHIDLE			Date: 30-Jun-13 08:02:22	

ANNULAR HOLE VOLUME PLOT







1600

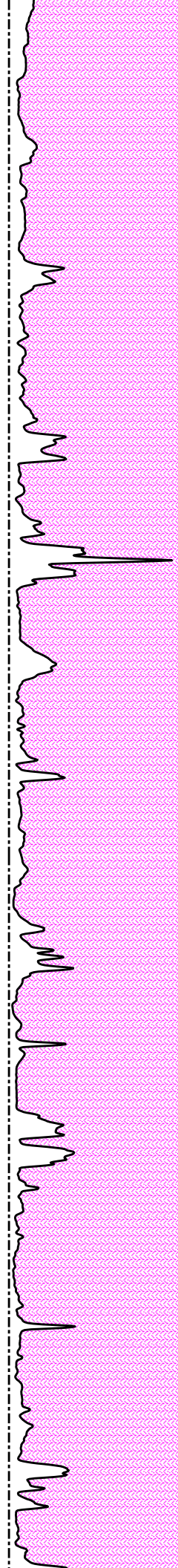
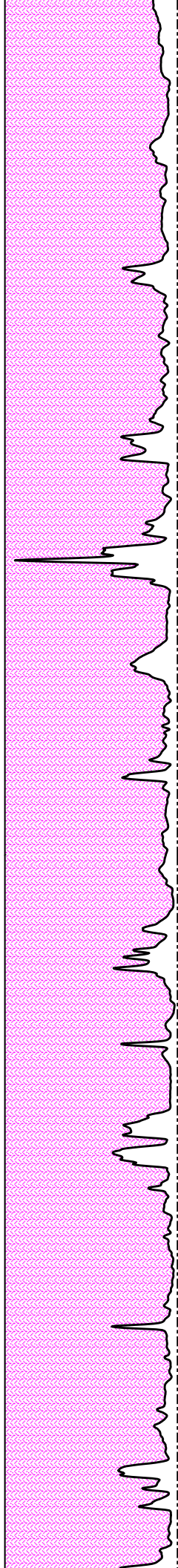
1700

1800

1900

2000

salper



1411

1389

1365

1343

1313

1290

1268

1245

1223

1200

1179

848

834

819

805

783

769

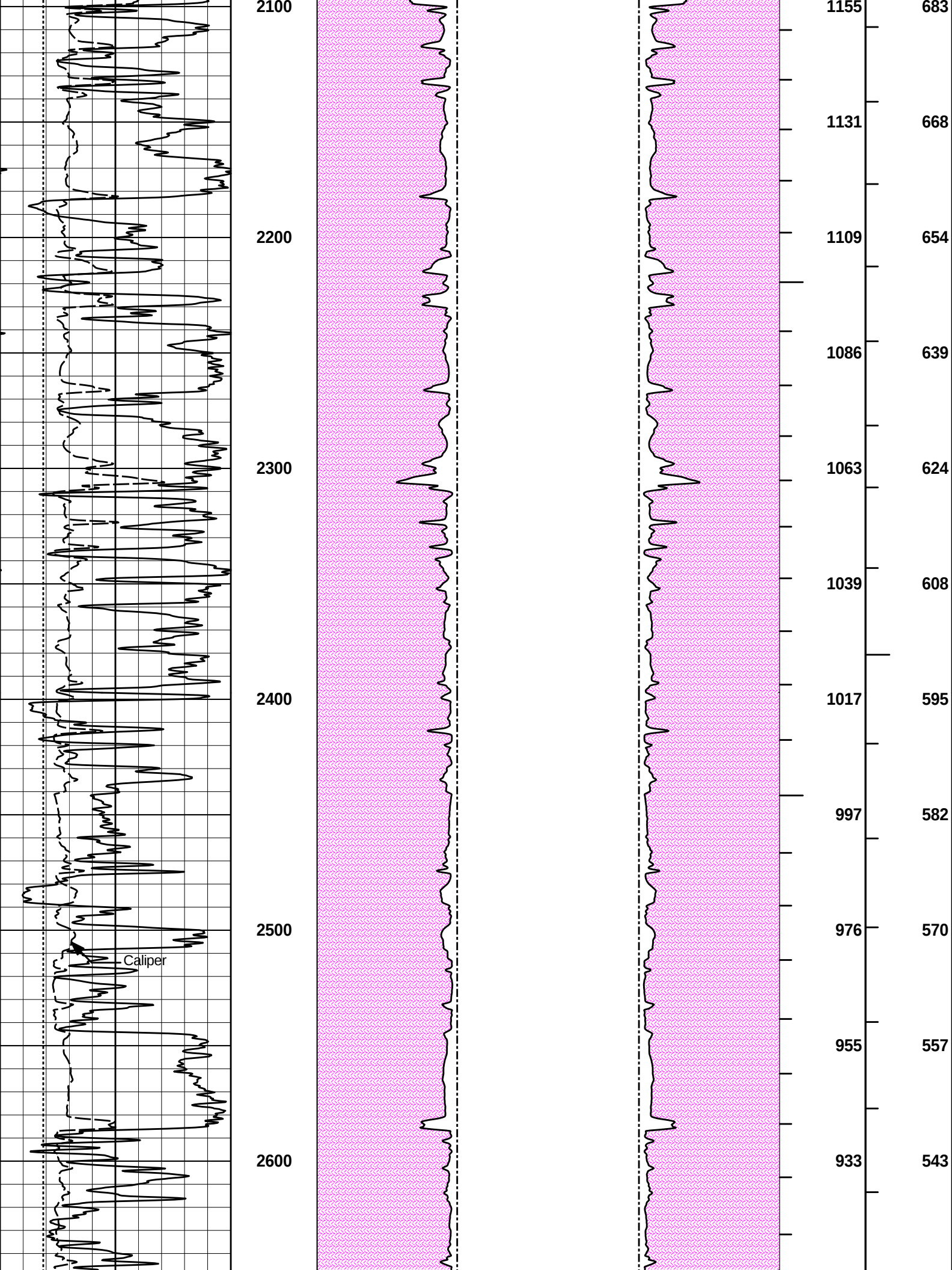
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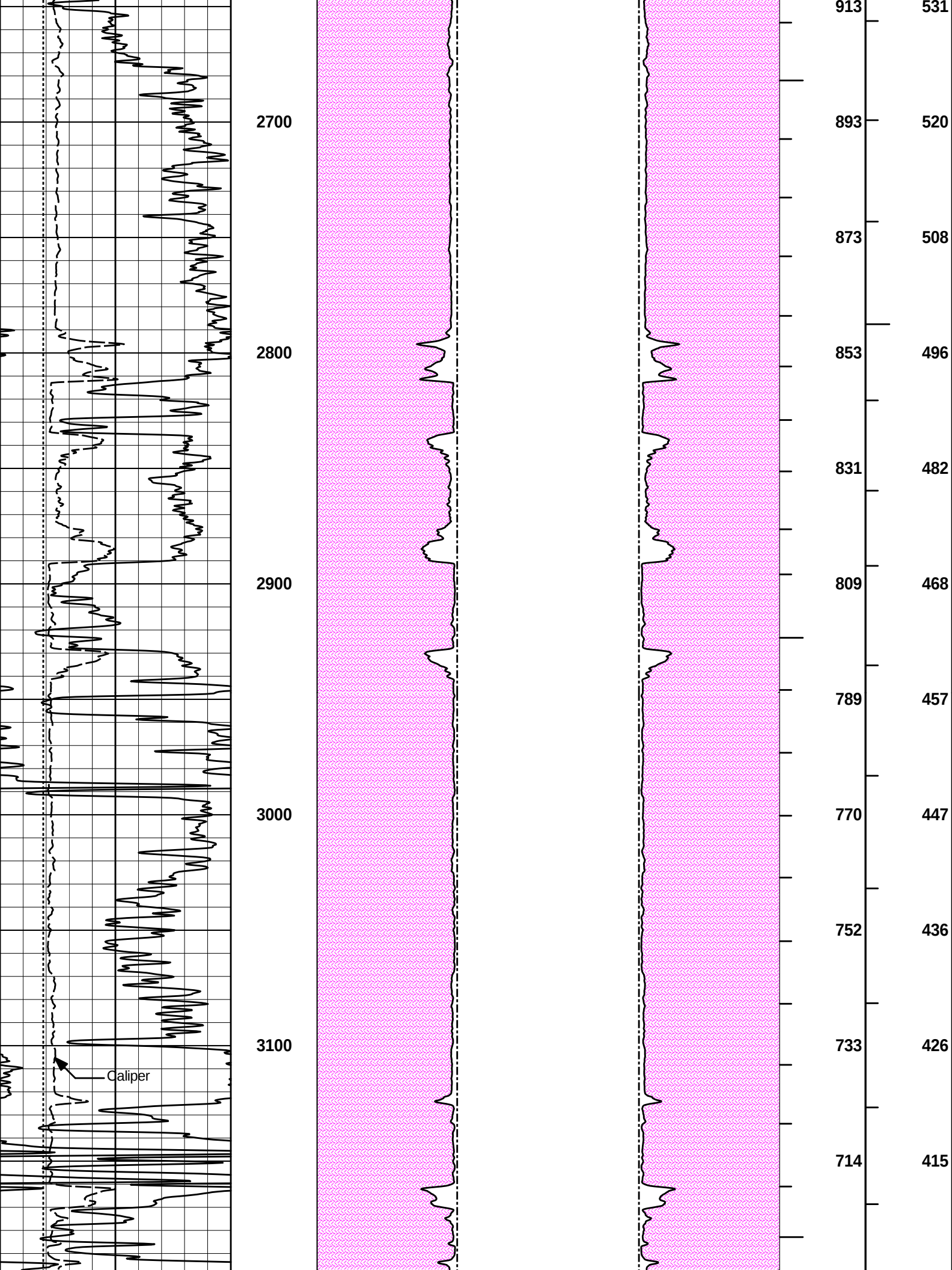
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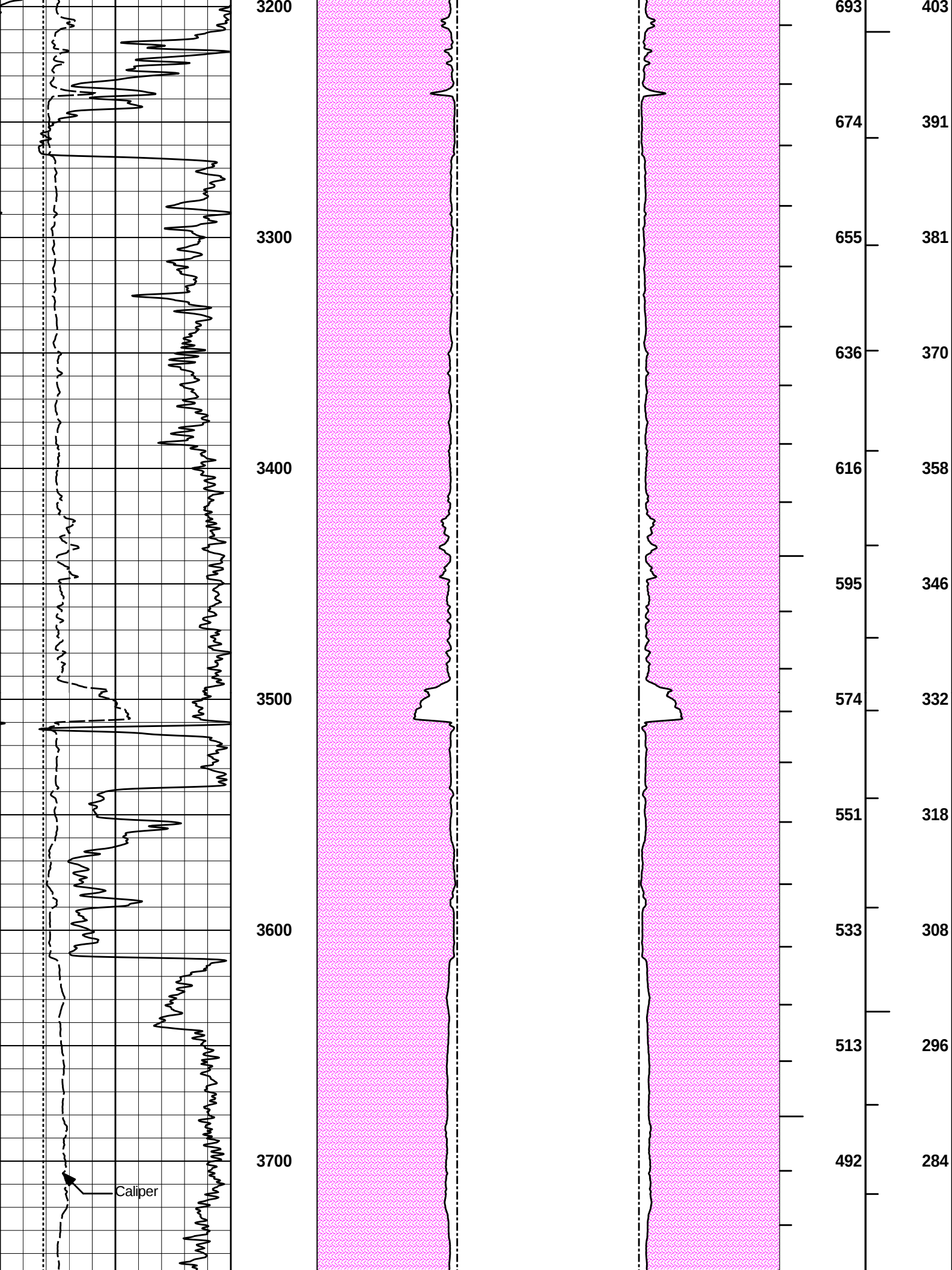
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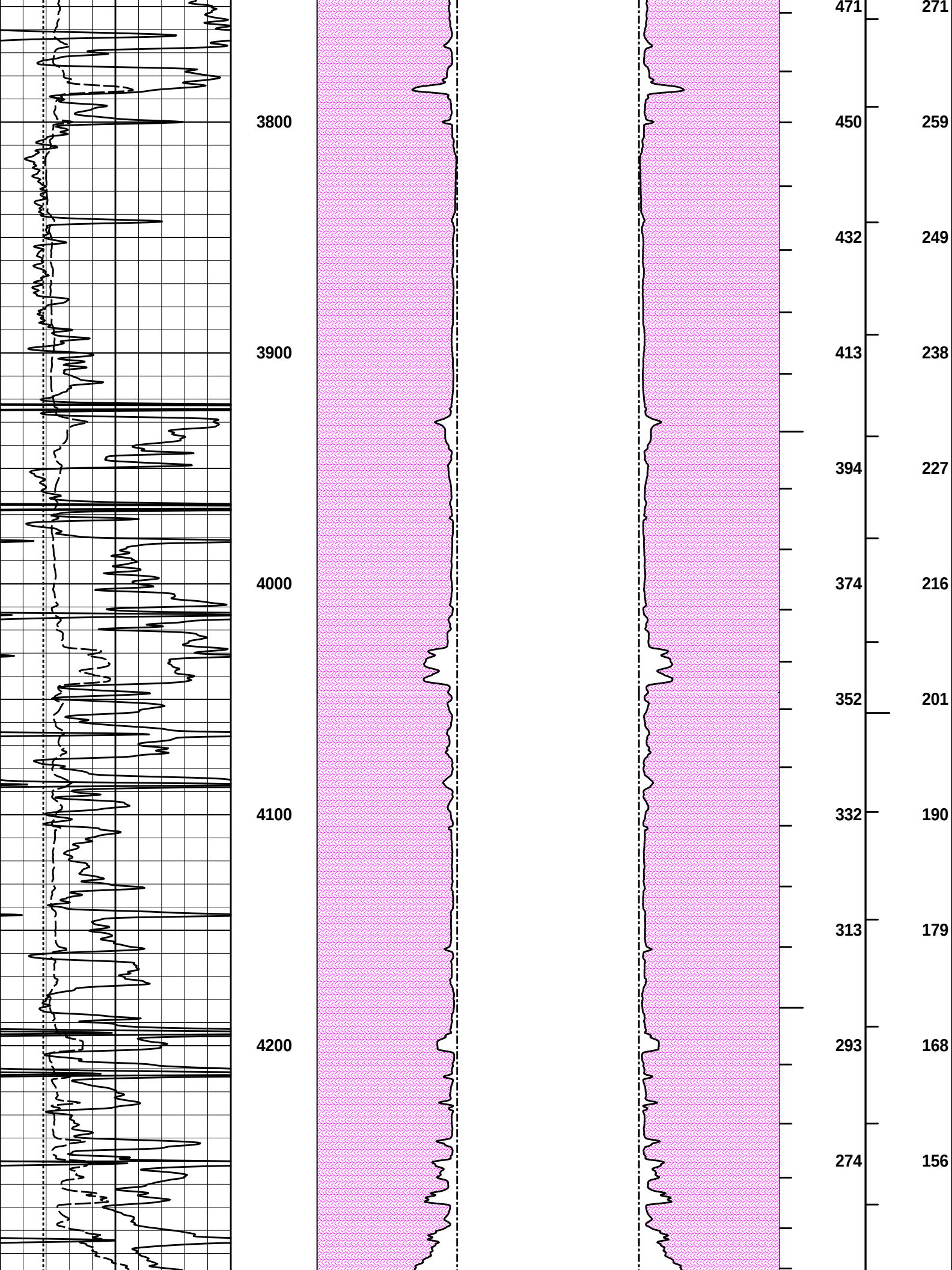
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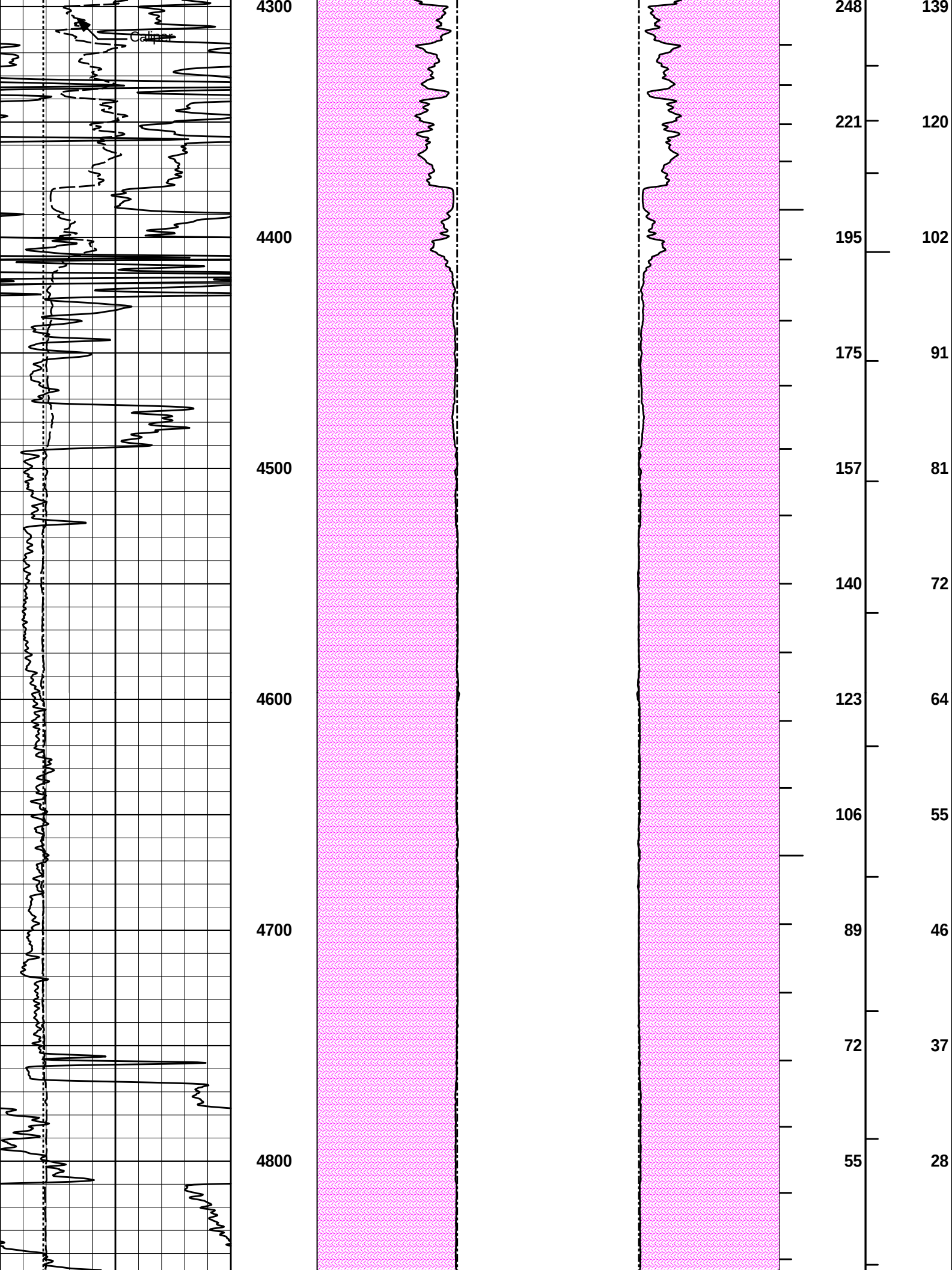
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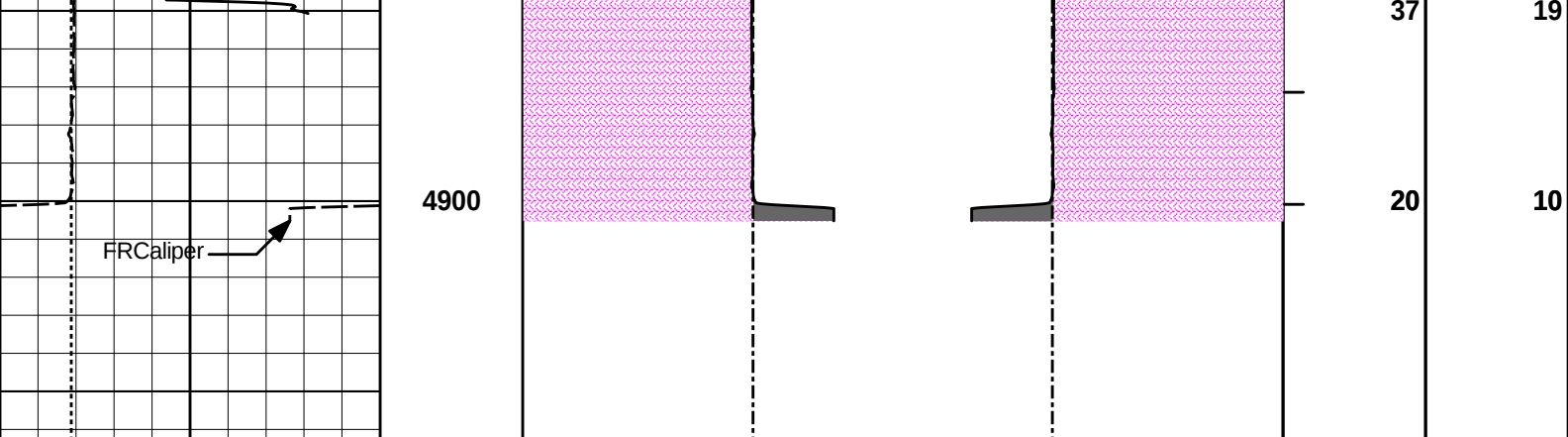












6	Caliper	16	1 : 600 ft	20	Caliper	0 0	20	Caliper	20	BHVT	AHVT
	inches				inches			inches			
6	BS	16		20	Bit Size	0 0	20	Bit Size	20		
	inches										
0	Gamma API	150			MUDCAKE			MUDCAKE			
	api										

HALLIBURTON

Plot Time: 30-Jun-13 13:14:53
Plot Range: 610 ft to 4962.67 ft
Data: VOGEL_3306_1-1\Well Based\CASING\
Plot File: \\-LOCAL-\\VOGEL_3306_1-1\0001 SP-GTET-CSNG-DSN-SDL-FLEX-IDT-ICT-WSTT-ACRT-CH\PORO\AHV_2 ICT

ANNULAR HOLE VOLUME PLOT

COMPANY	SANDRIDGE ENERGY				
WELL	VOGEL 3306 1-1				
FIELD	STOHRVILLE				
COUNTY	HARPER	STATE	KANSAS		
HALLIBURTON			SPECTRAL DENSITY DUAL SPACED NEUTRON LOG		