HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
MICROLOG

COMPANY	NEW GULF OPERATING, LLC
WELL	HORTON #1
FIELD	LANGDON
COUNTY	RENO
STATE	KANSAS

COMPANY **NEW GULF OPERATING, LLC**
WELL **HORTON #1**
FIELD **LANGDON**
COUNTY **RENO** STATE **KANSAS**

API No. 15-155-21574
Location 964' FNL & 670' FWL

Other Services:
ACRT
BSAT

Sect. 32 Twp. 24S Rge. 9W

Permanent Datum	GROUND LEVEL	Elev. 1707.0 ft	Elev.: K.B. 1717.0 ft
Log measured from	KELLY BUSHING	10.0 ft above perm. Datum	D.F. 1716.0 ft
Drilling measured from	KELLY BUSHING		G.L. 1707.0 ft

Date		23-Jun-11				
Run No.		ONE				
Depth - Driller		4320.00 ft				
Depth - Logger		4300.0 ft				
Bottom - Logged Interval		4262.0 ft				
Top - Logged Interval		222.0 ft				
Casing - Driller		8.625 in @ 226.0 ft		@		@
Casing - Logger		222.0 ft				
Bit Size		7.875 in		@		@
Type Fluid in Hole		WATER BASED MUD				
Density	Viscosity	9.0 ppg	48.00 s/qt			
PH	Fluid Loss	11.50 pH	8.0 cptm			
Source of Sample		FLOW LINE				
Rm @ Meas. Temperature		0.320 ohmm @ 74.00 degF		@		@
Rmf @ Meas. Temperature		0.27 ohmm @ 73.00 degF		@		@
Rmc @ Meas. Temperature		0.380 ohmm @ 73.00 degF		@		@
Source Rmf	Rmc	MEASURED	MEASURED			
Rm @ BHT		0.16 ohmm @ 120.0 degF		@		@
Time Since Circulation		3.3 hr				
Time on Bottom		23-Jun-11 21:59				
Max. Rec. Temperature		120.0 degF @ 4300.0 ft		@		@
Equipment	Location	10549592	LIBERAL			
Recorded By		S. JUNG				
Witnessed By		R. RODRIGUEZ				

Fold here

Service Ticket No.: 8264517 API Serial No.: 15-155-21574 PGM Version: WL INSITE R3.2.5 (Build 2)

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

RESISTIVITY SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

RESISTIVITY EQUIPMENT DATA

Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other
ONE	MICRO M73803	RUBBER	ADJ	N/A

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.	ONE	Run No.	ONE
Serial No.	10811258	Serial No.		Serial No.	I145_M73803_P90	Serial No.	10735145
Model No.	GTET	Model No.		Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.		Diameter	4.75"	Diameter	3.625"
Detector Model No.	T-102	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS137	Source Type	AM241BE
Length	8"	LSA [Y/N]		Serial No.	5073GW	Serial No.	DSN-436
Distance to Source	10'	FWDA [Y/N]		Strength	1.5 Ci	Strength	15 Ci

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	2.71	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING

GPS COORDINATES: LAT: 37.77 N & LONG: 98.51 W

CHLORIDES REPORTED AT 12,000 PPM LCM REPORTED AT 2 PPB

POST TOOL SURVEY NOT PERFORMED ON LOCATION PER CUSTOMER REQUEST

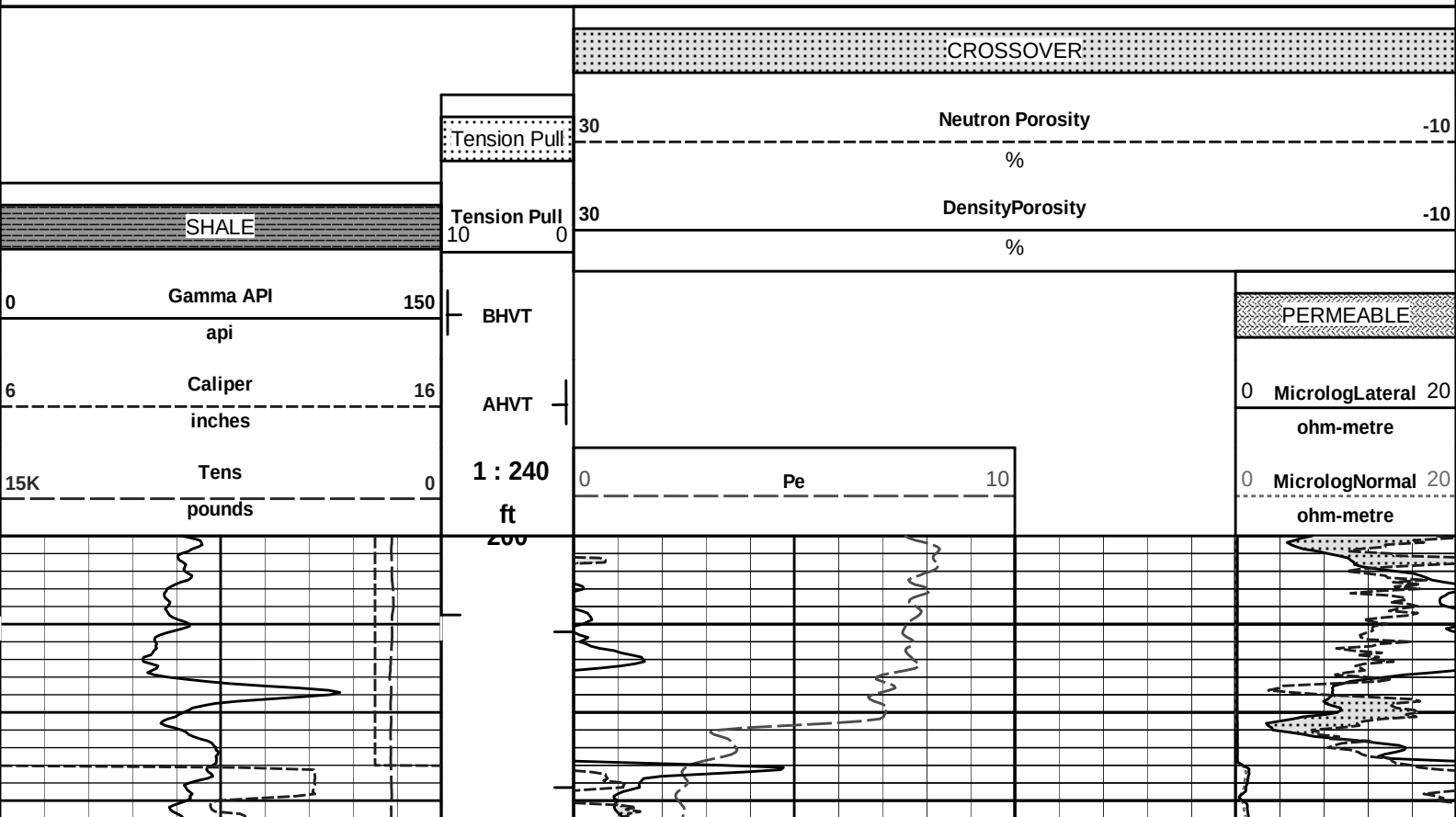
TODAY'S CREW: F. VILLA, P. COBLE

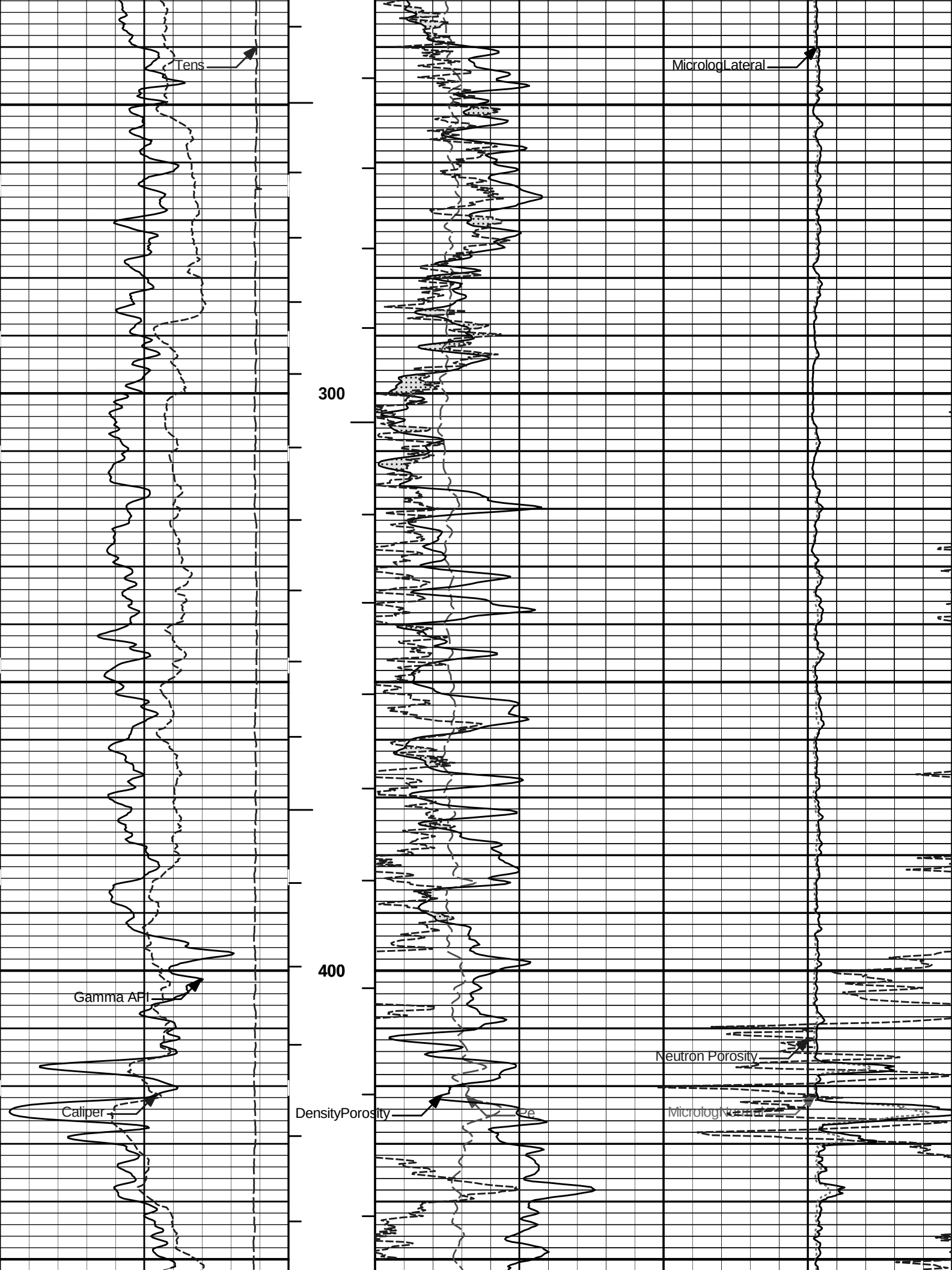
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - LIBERAL, KS (620-624-8123)

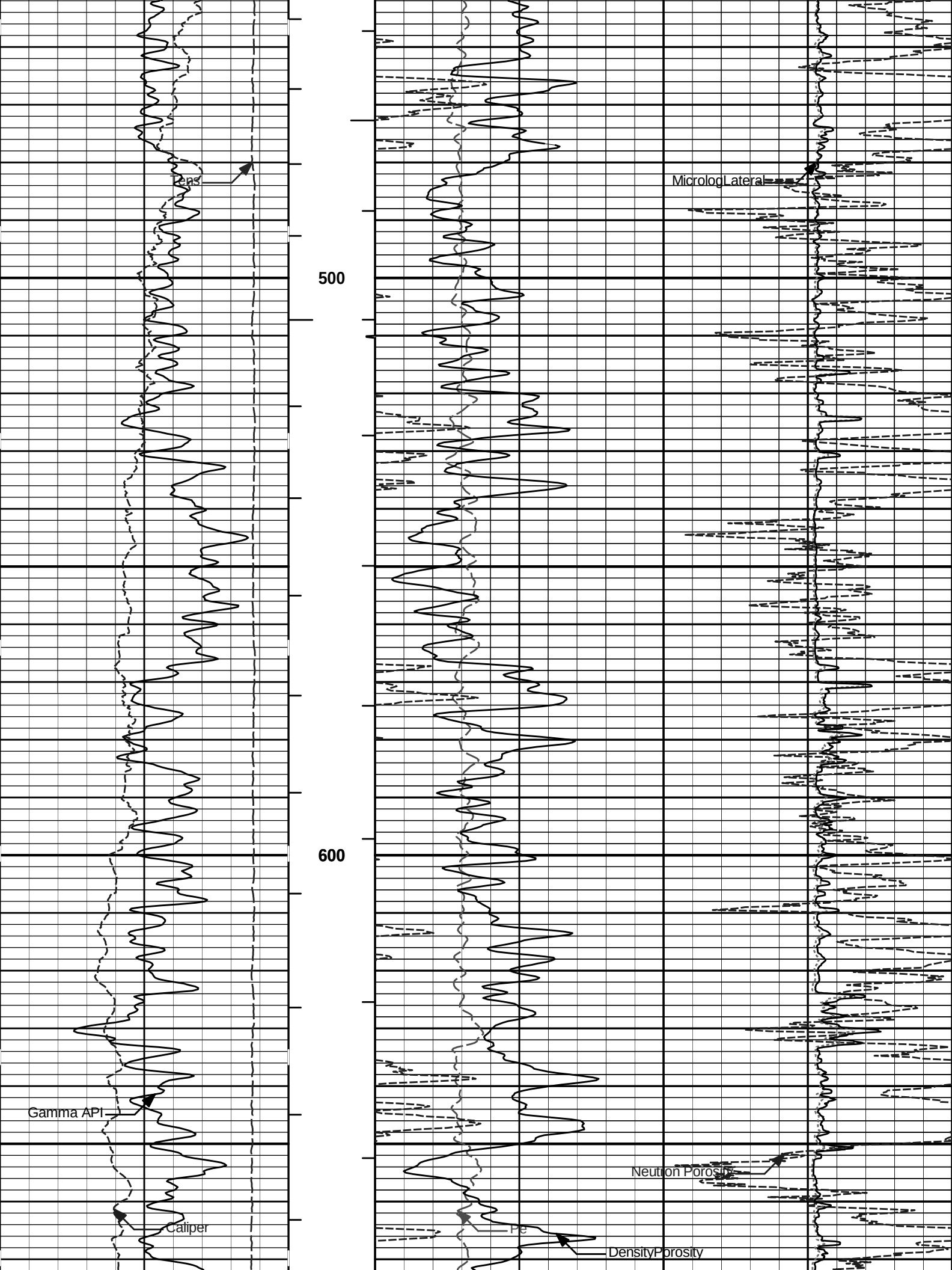
HALLIBURTON

Plot Time: 24-Jun-11 10:22:19
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG
Plot File: \\POROML\PoroML_5_main_IQ_LIB

5 INCH MAIN LOG




Tens
MicrologLateral
300
400
Gamma API
Neutron Porosity
Caliper
DensityPorosity
Pe
MicrologNormal


Cons
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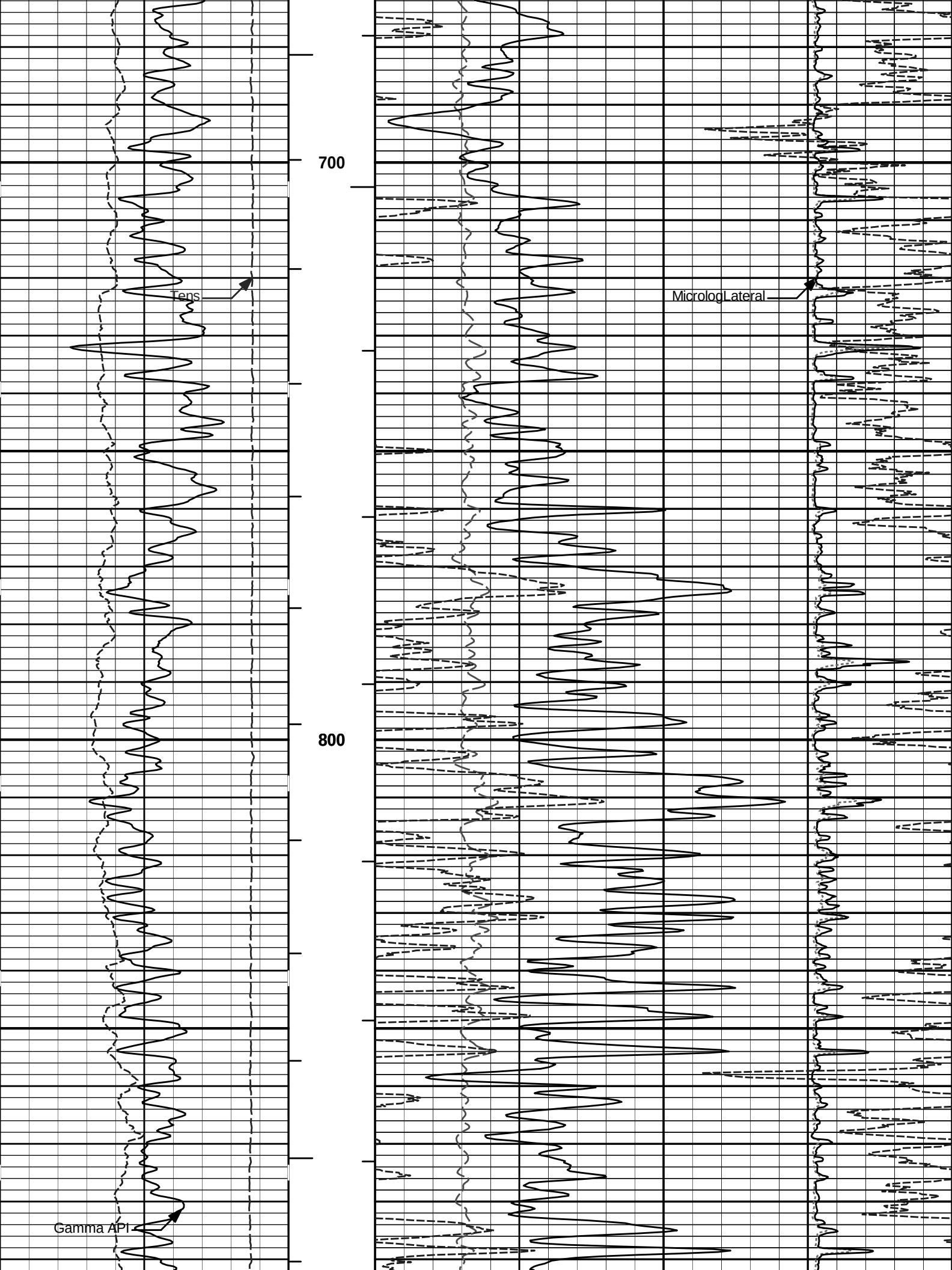
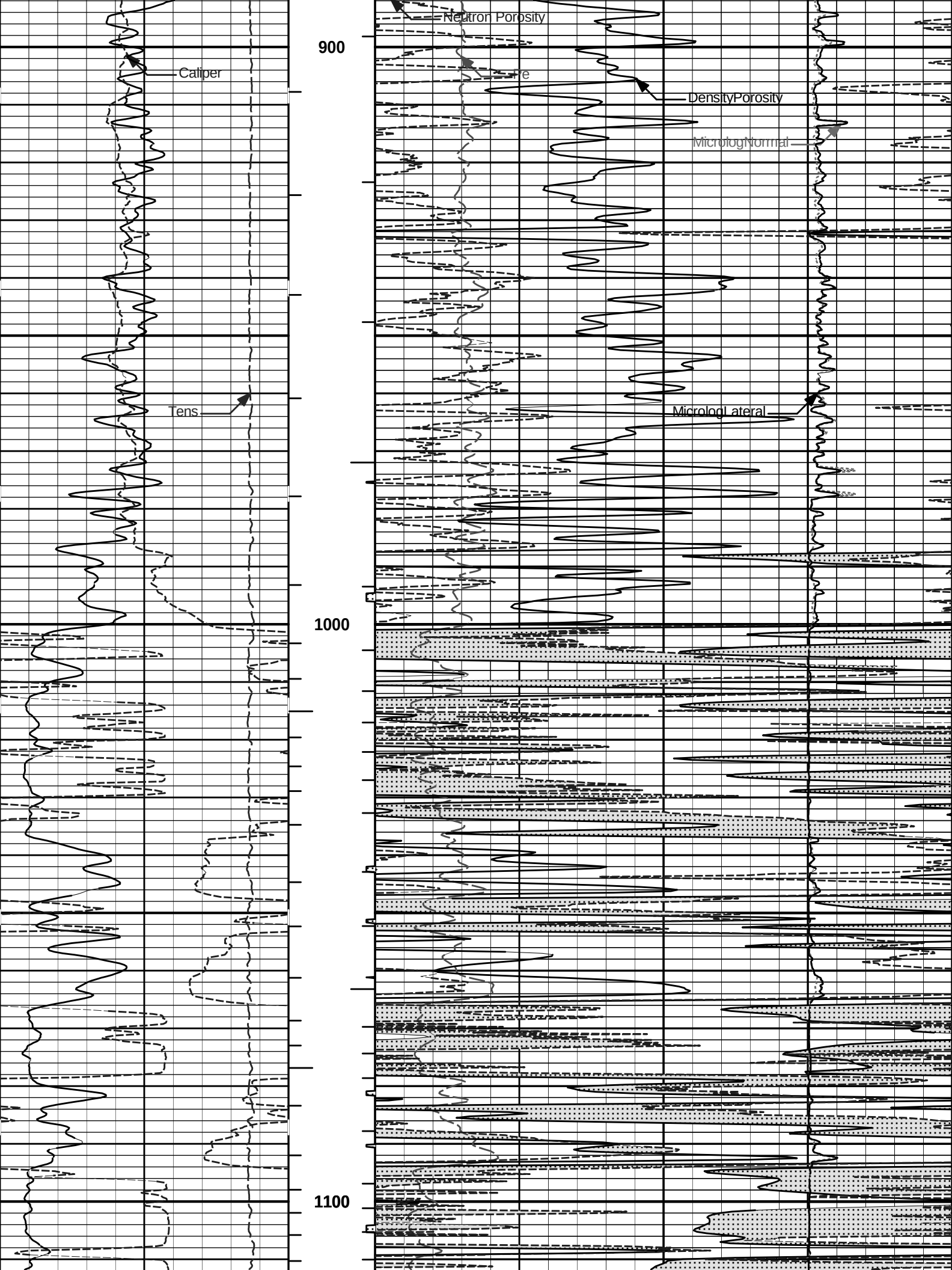
500
600
Gamma API
Caliper
Pe
DensityPorosity
Neution Porosity


700
800
Tens
MicrologLateral
Gamma API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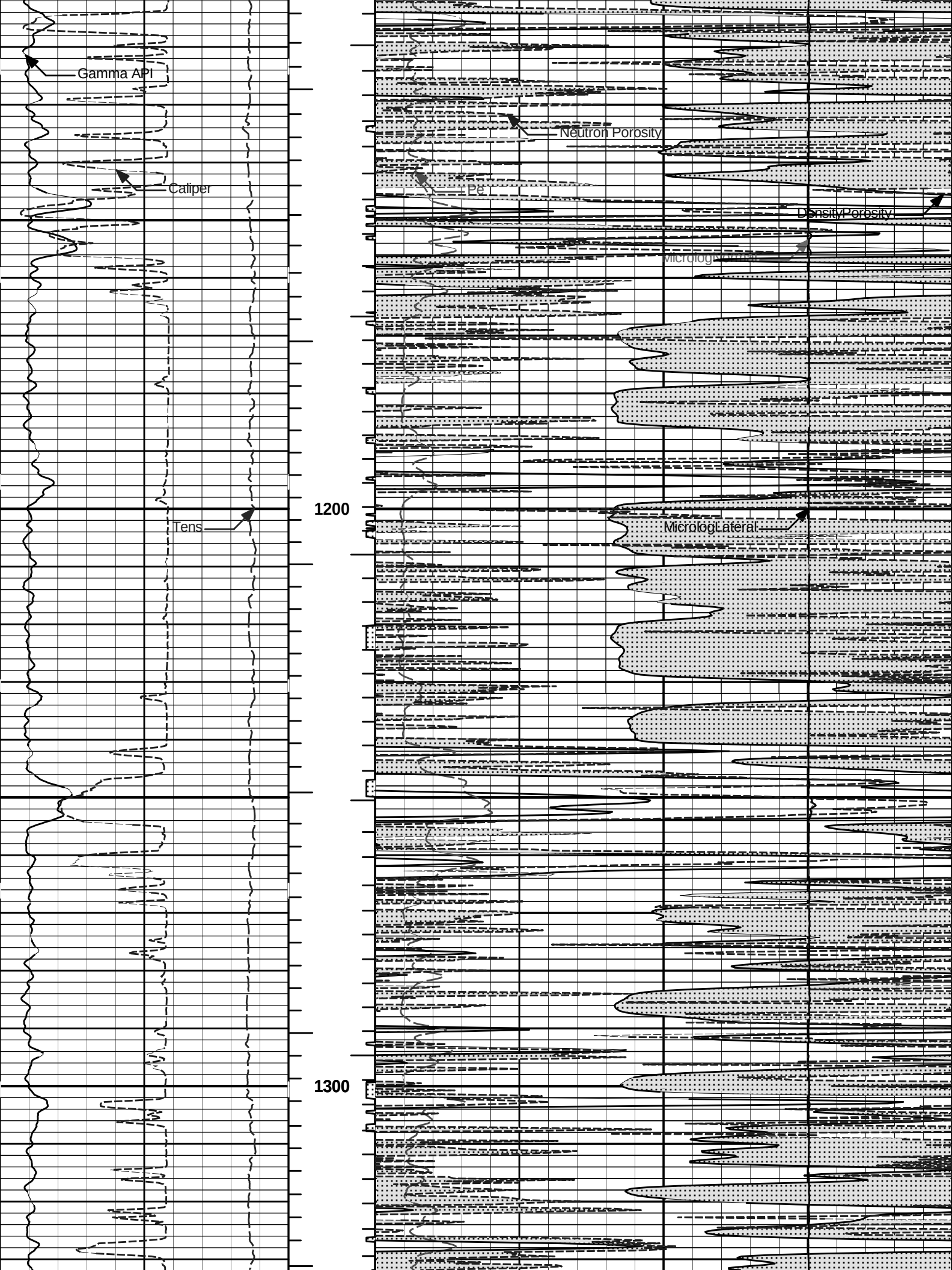
Caliper
DensityPorosity
MicrologNormal
Tens
MicrologLateral
900
1000
1100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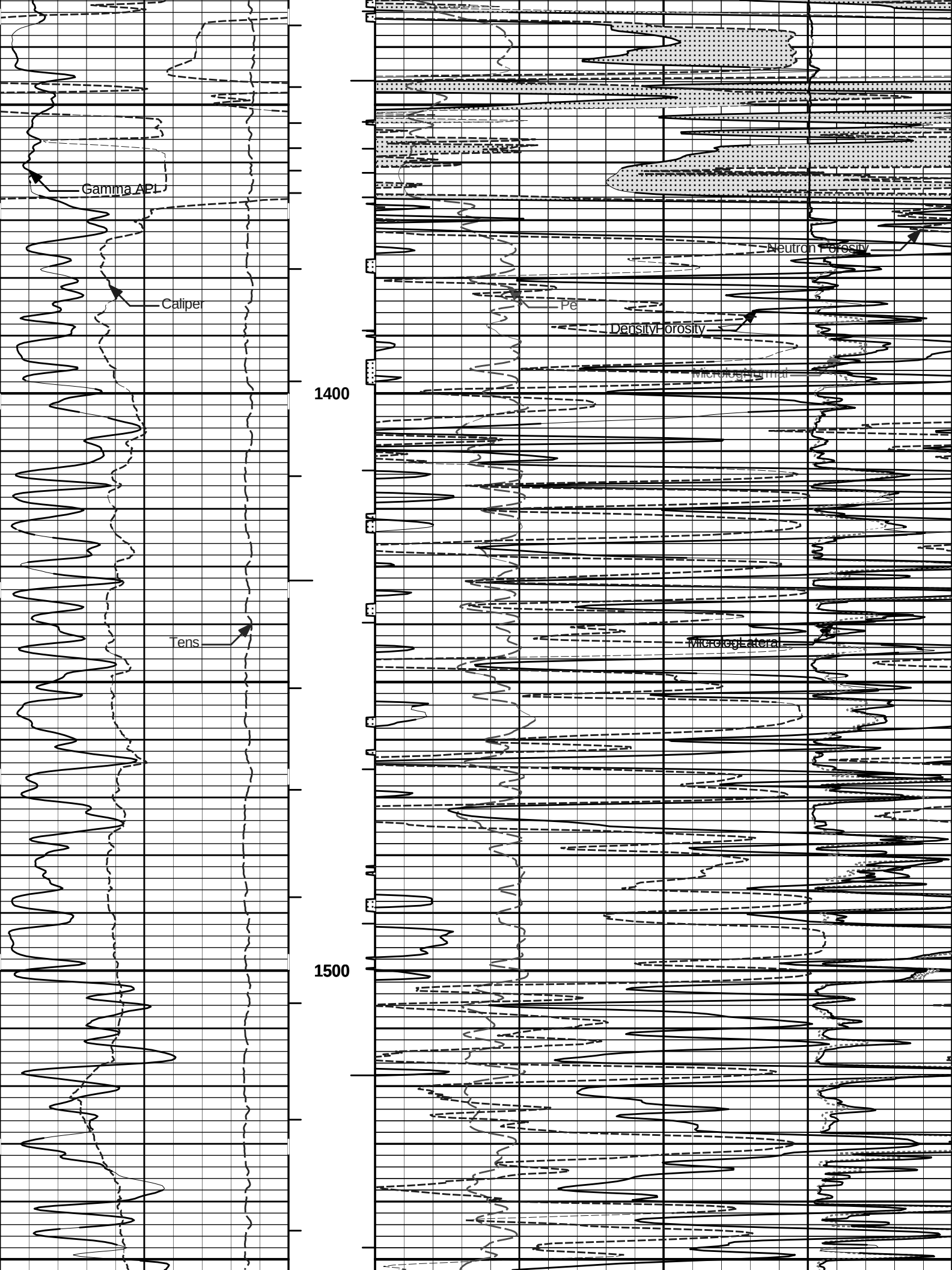
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologLateral
1200
1300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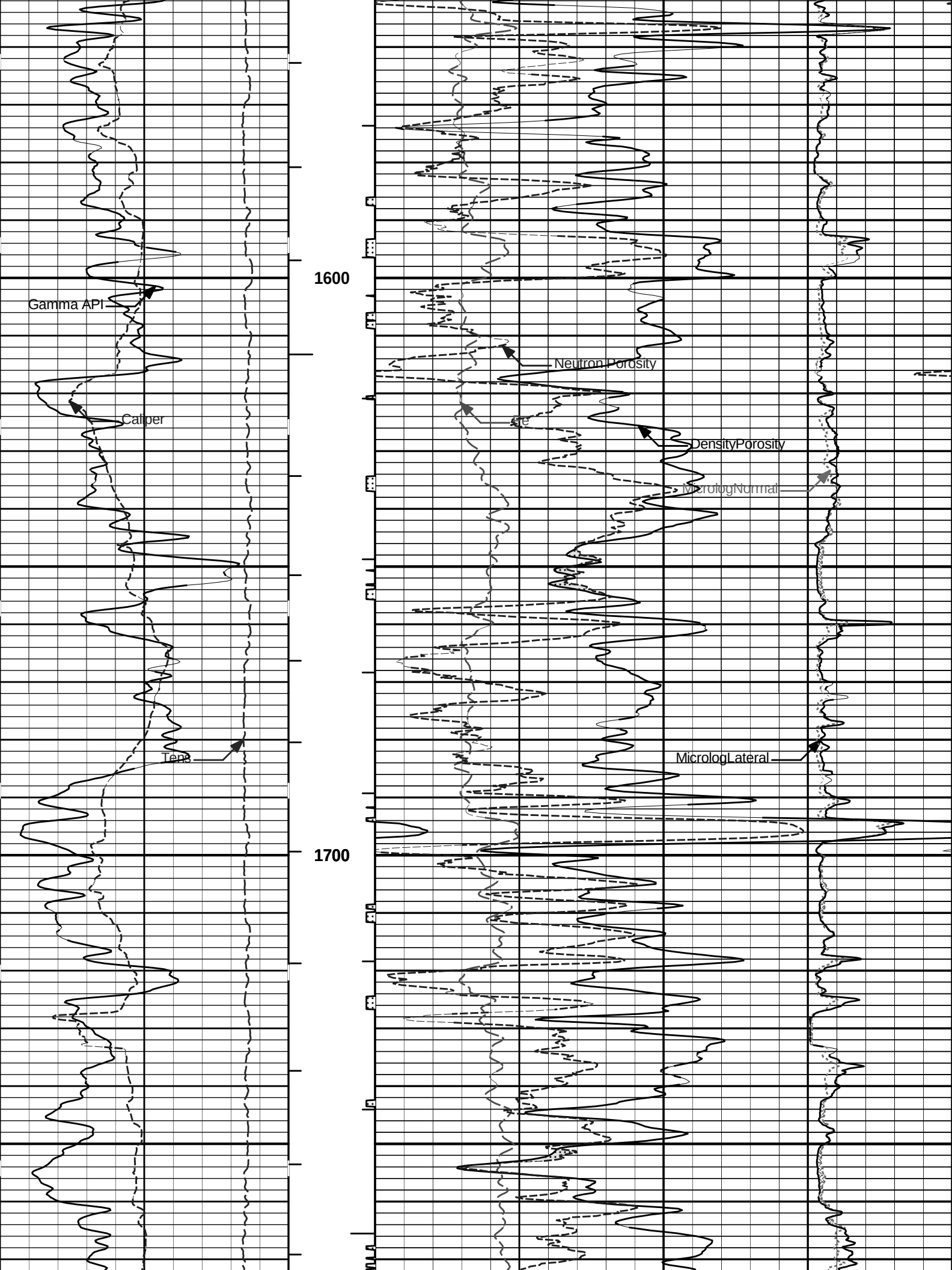
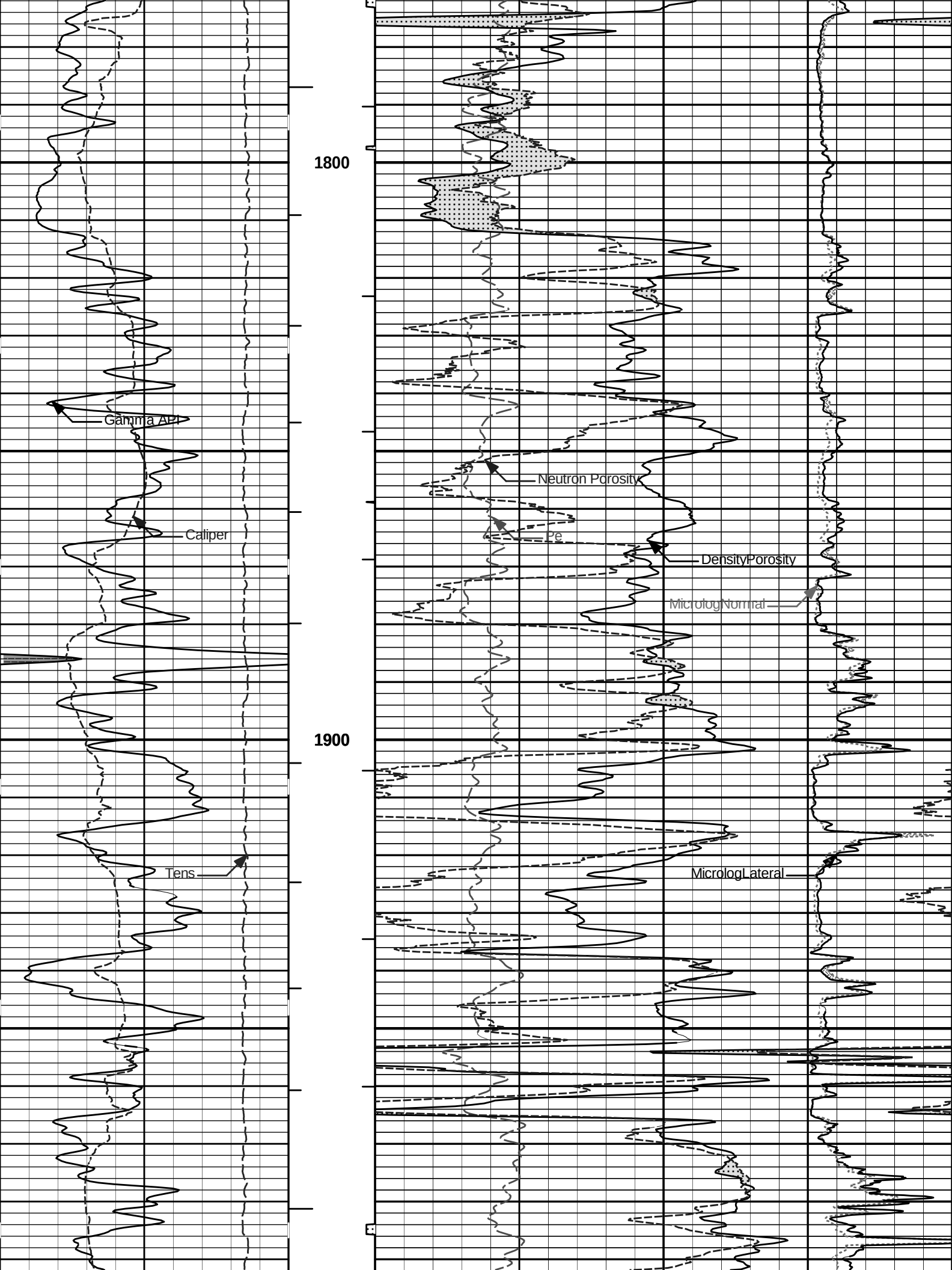
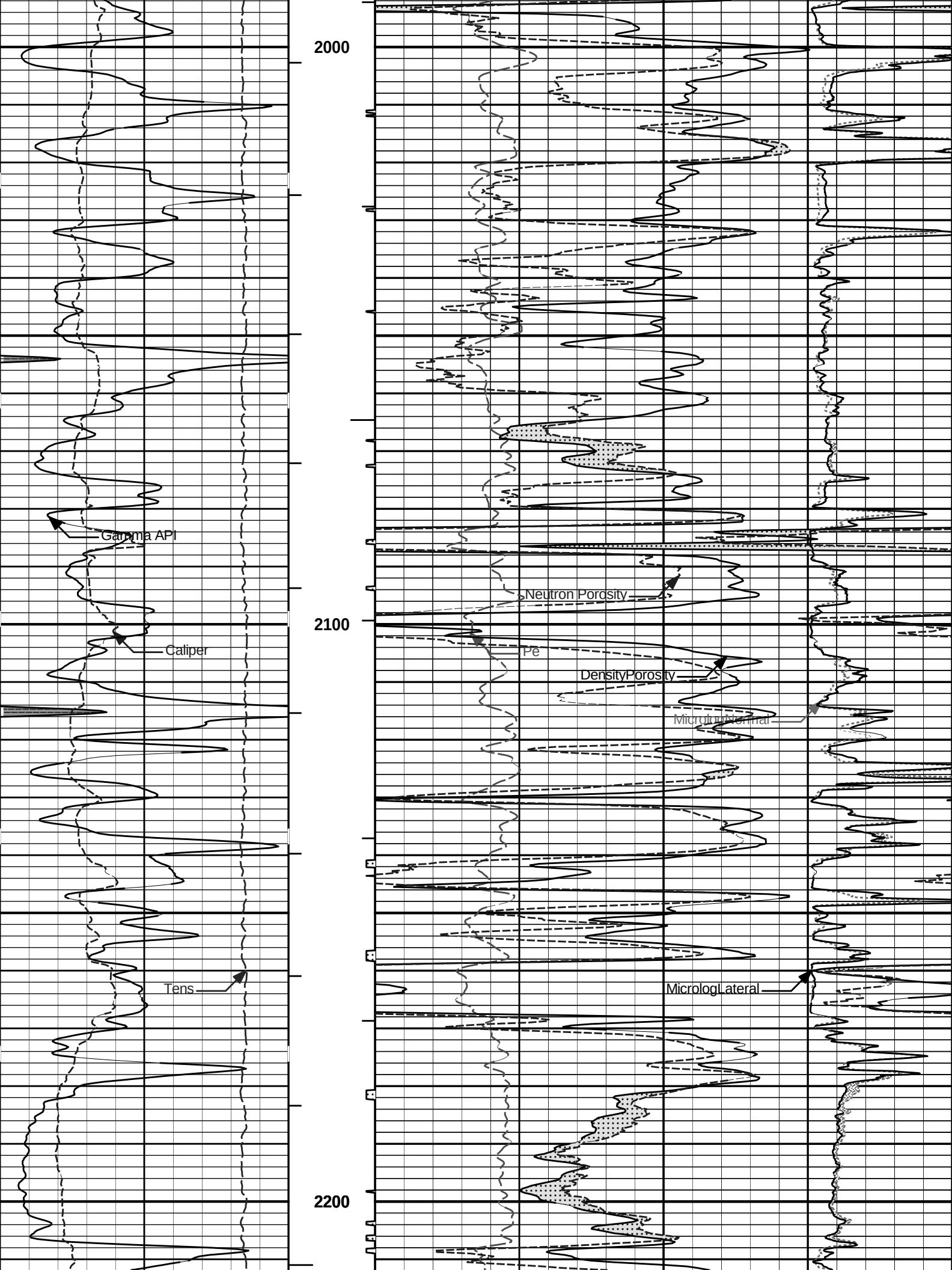
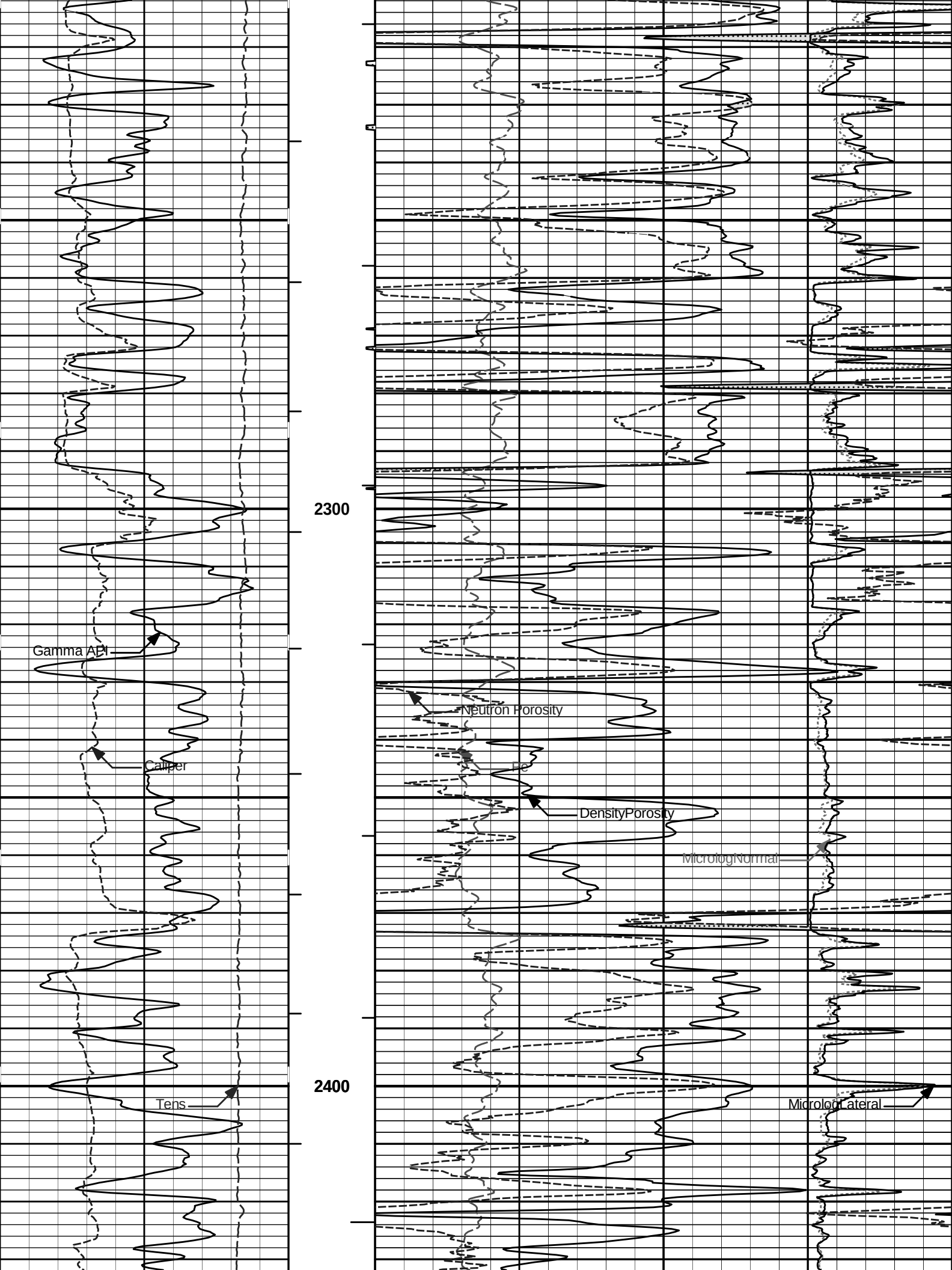
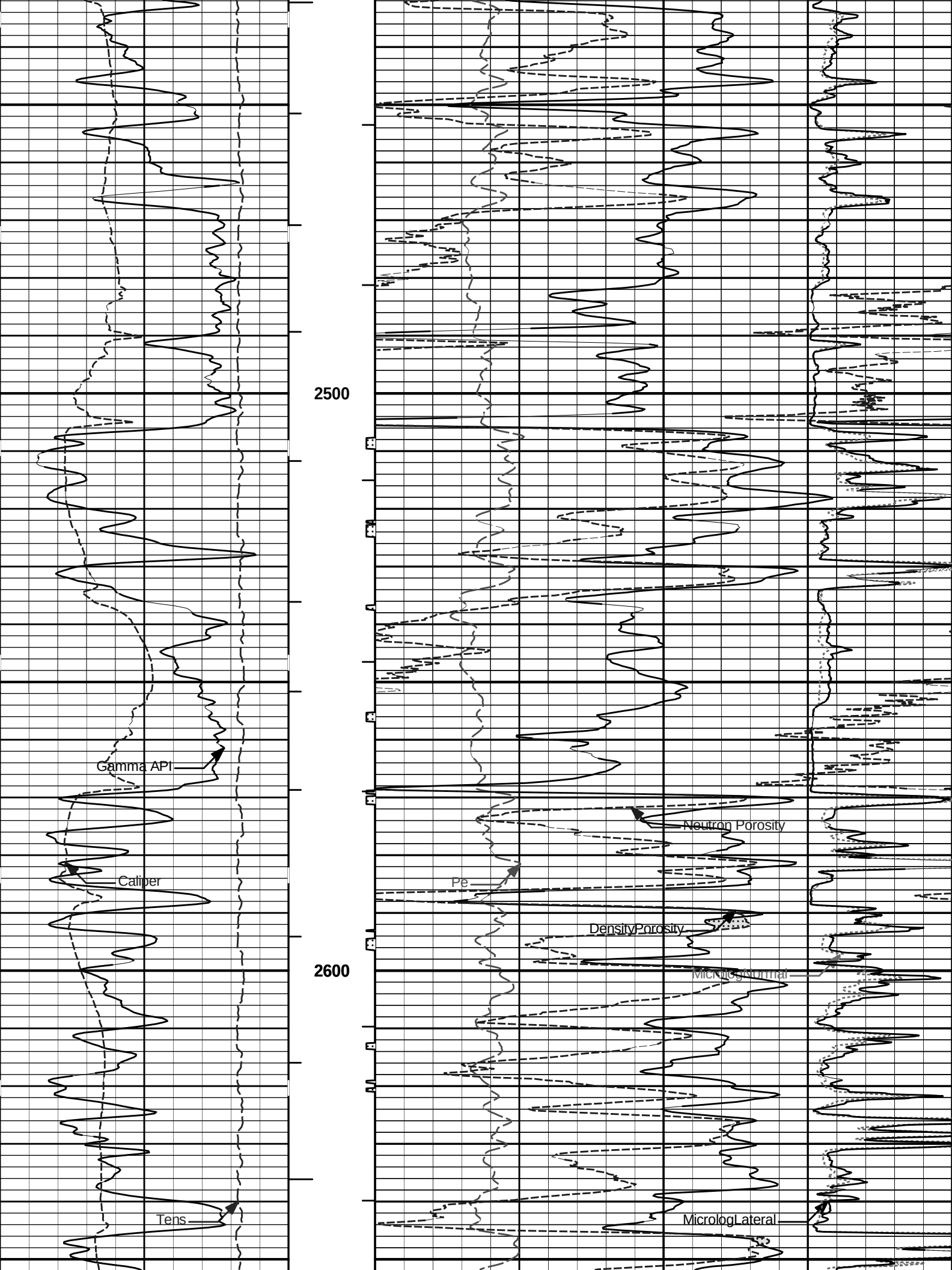
Caliper
Tens
1400
1500
Neutron Porosity
Pe
DensityPorosity
MicroInverse
MicroNormal
MicroLateral


1600
Gamma API
Neutron Porosity
Caliper
DensityPorosity
MicrologNormal
Tens
MicrologLateral
1700


1800
1900
Gamma API
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral


2000
2100
2200
Gamma API
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral


2300
2400
Gamma API
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral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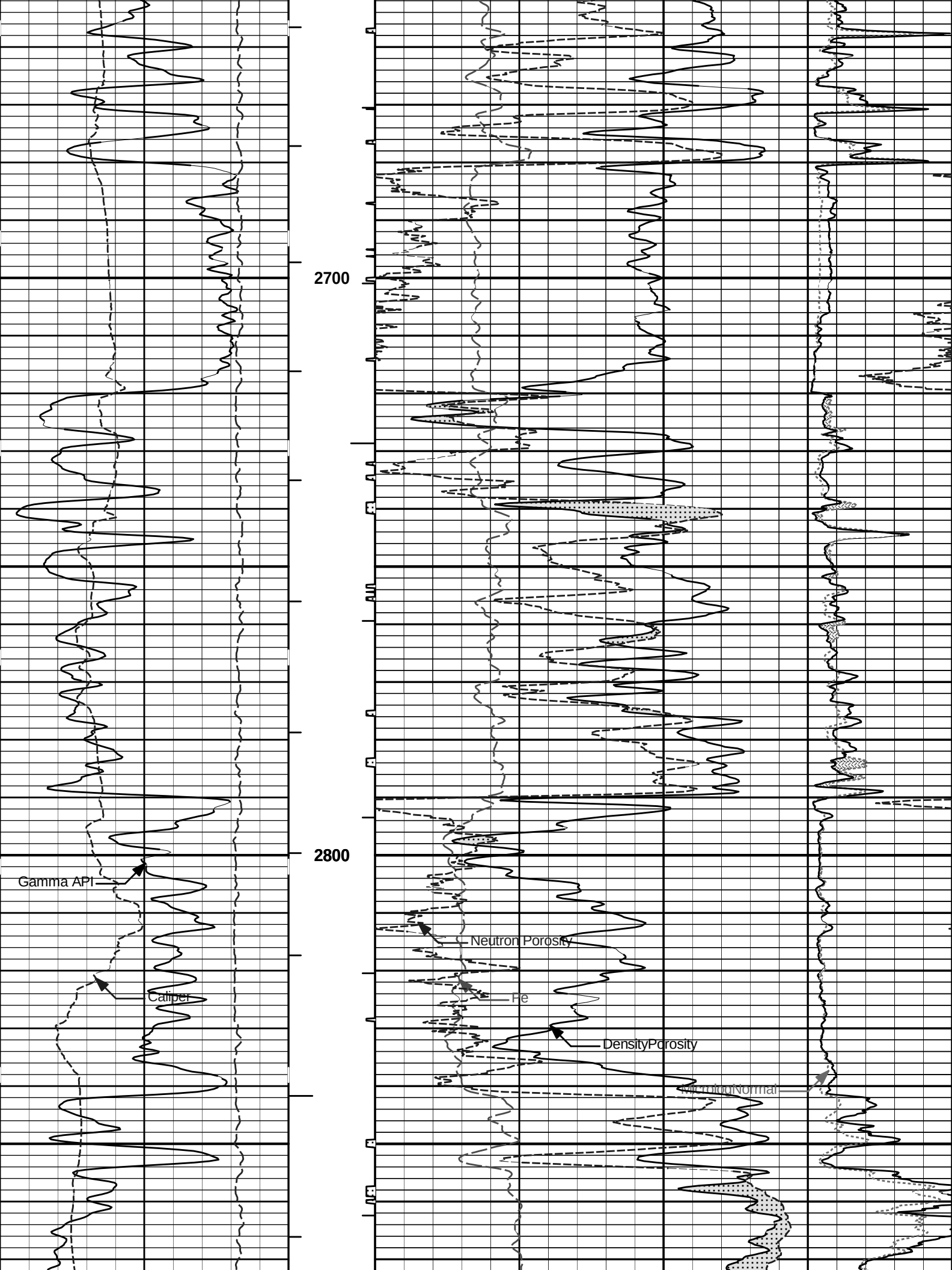
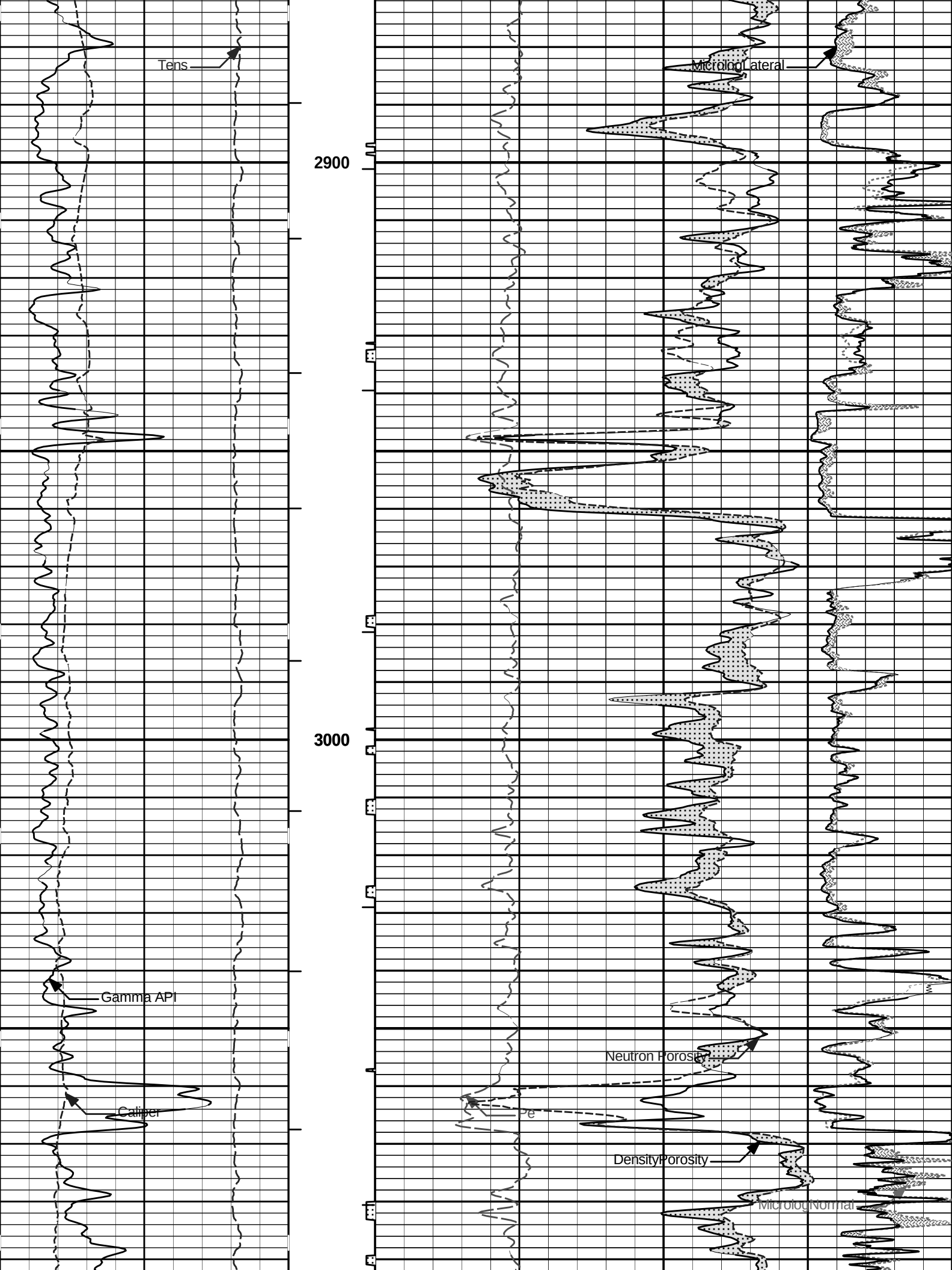
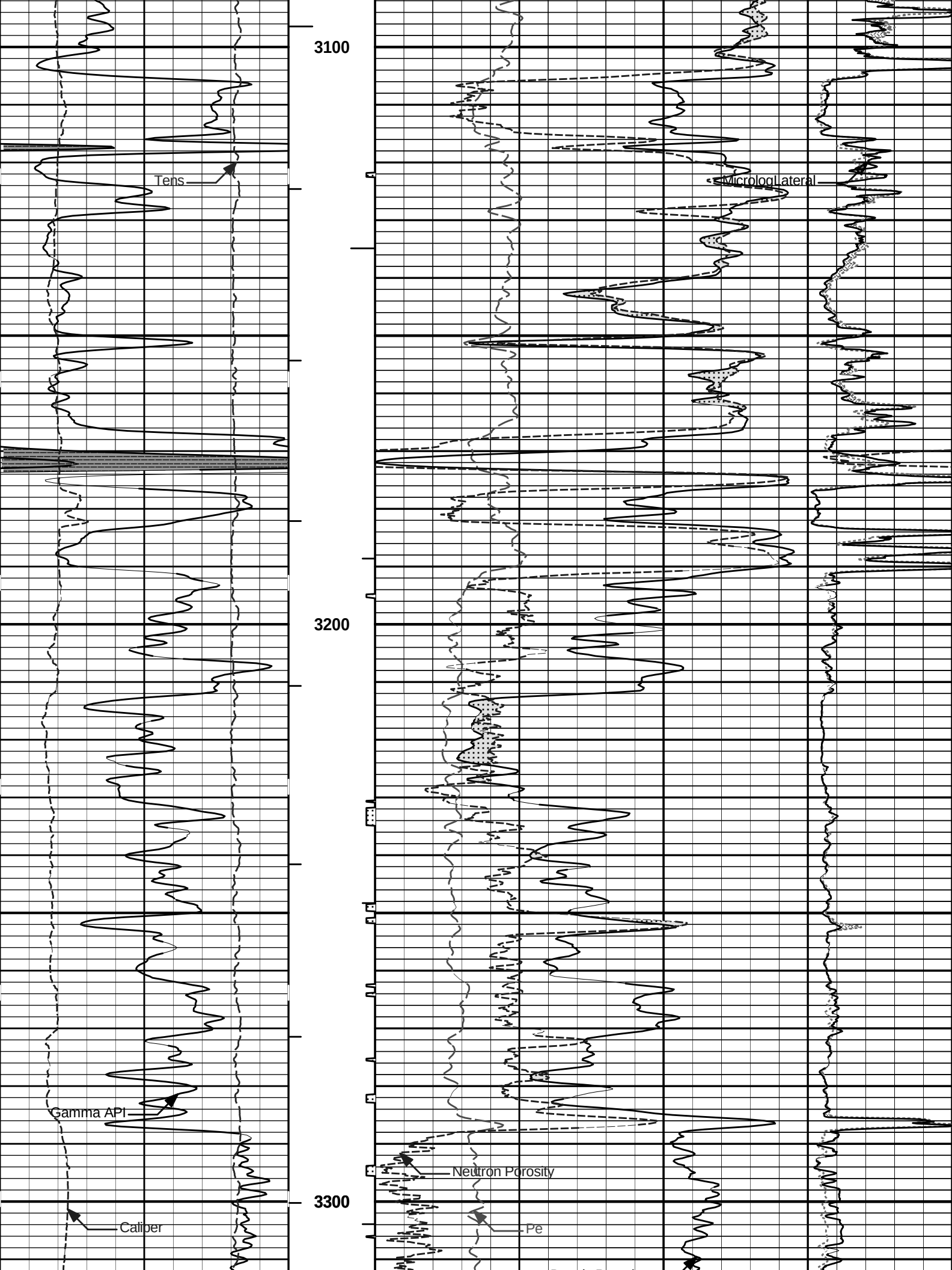
2600
Gamma API
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral


2700
2800
Gamma API
Caliper
Neutron Porosity
He
DensityPorosity
MicrologNormal


Tens
MicrologLateral
2900
3000
Gamma API
Caliper
Neutron Porosity
Pe
DensityPorosity
MicrologNormal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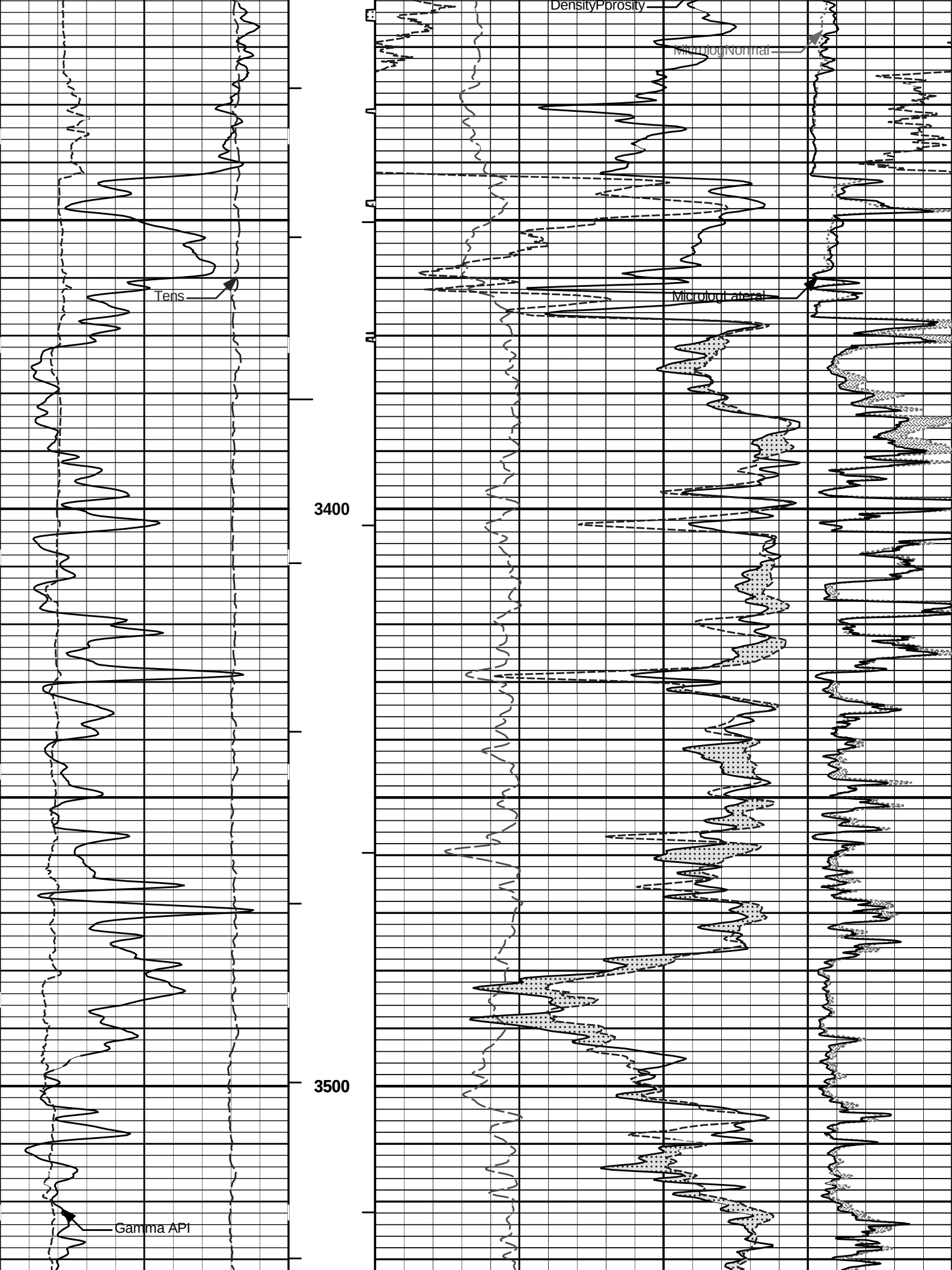
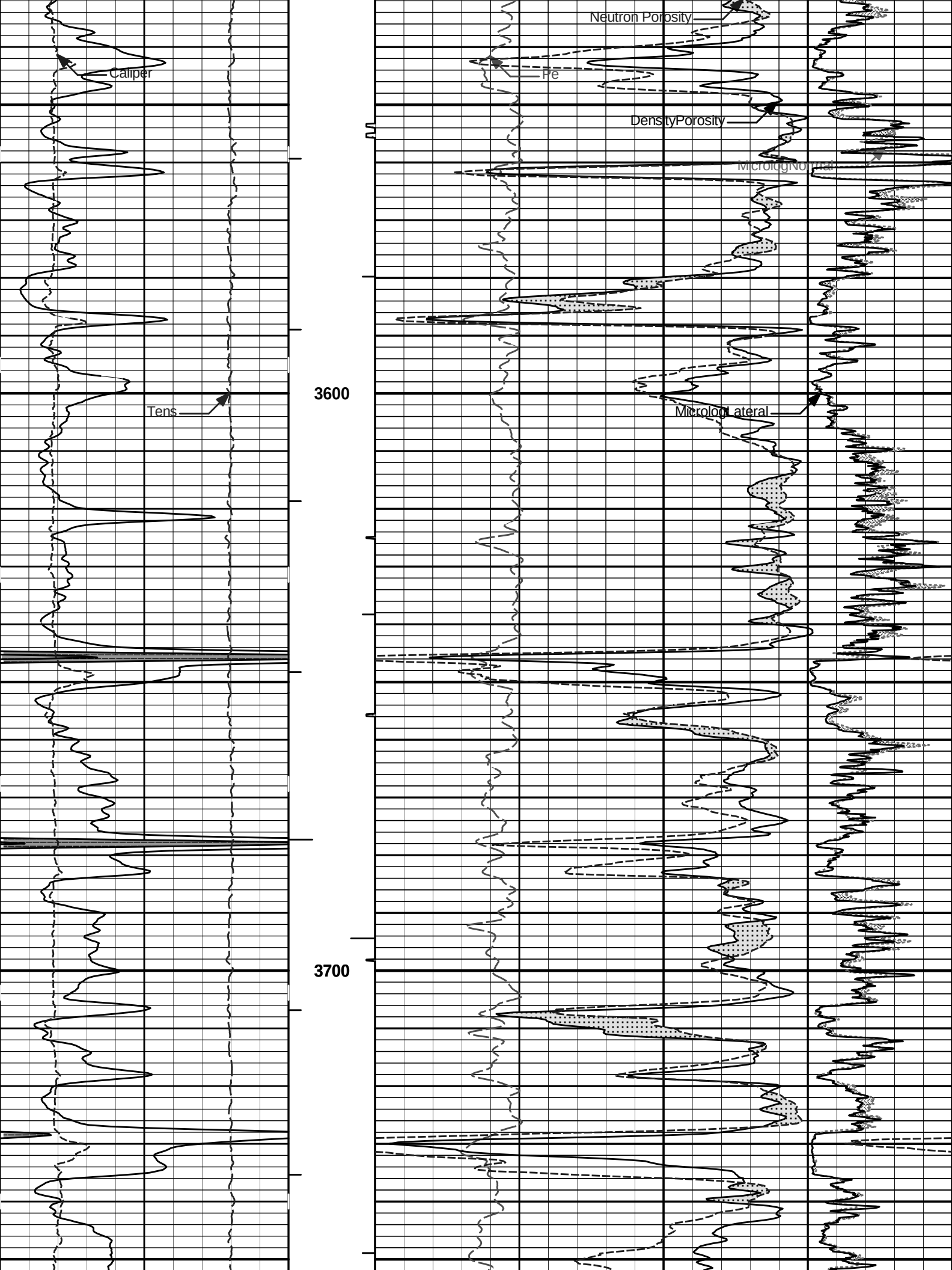
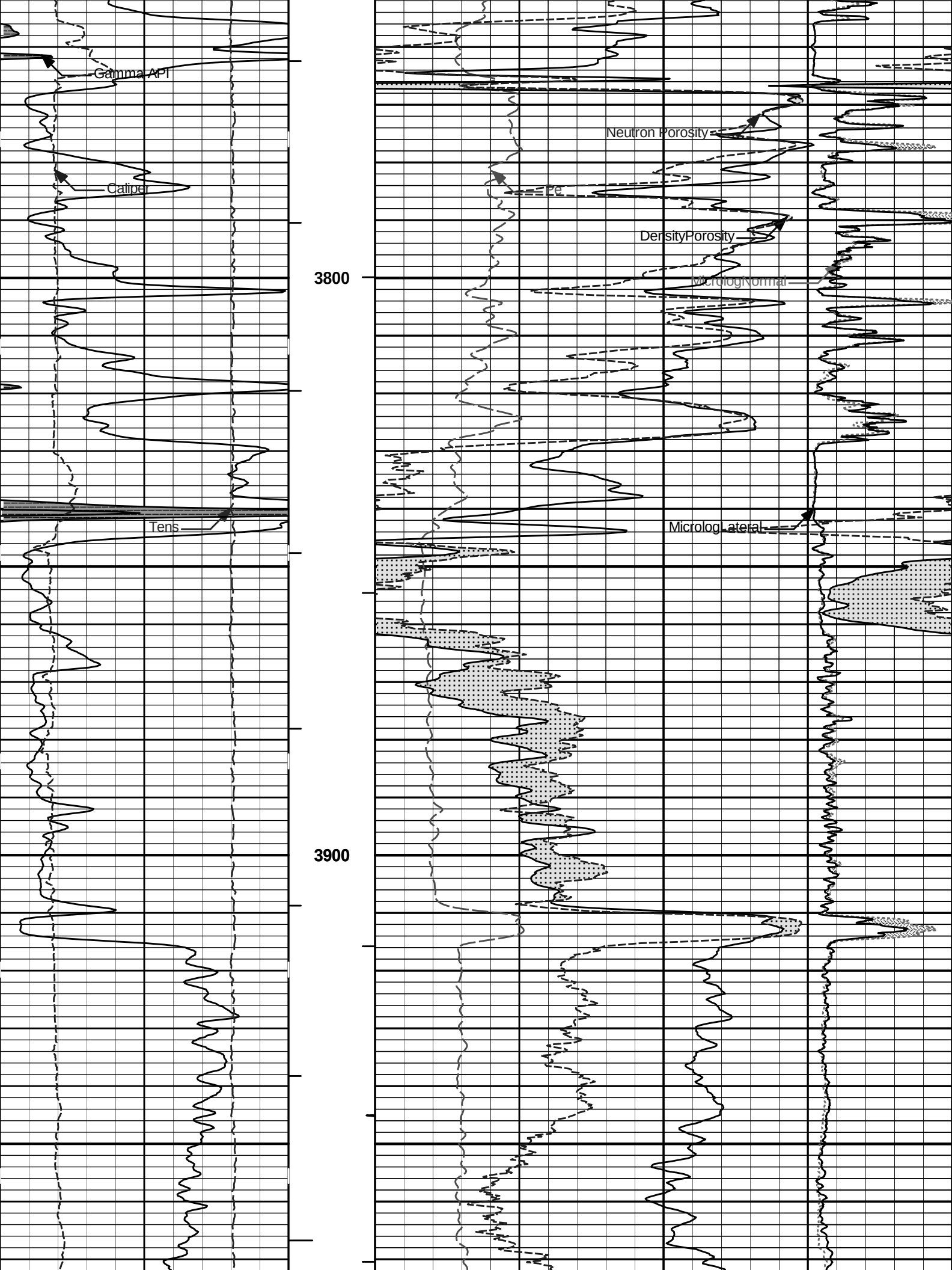
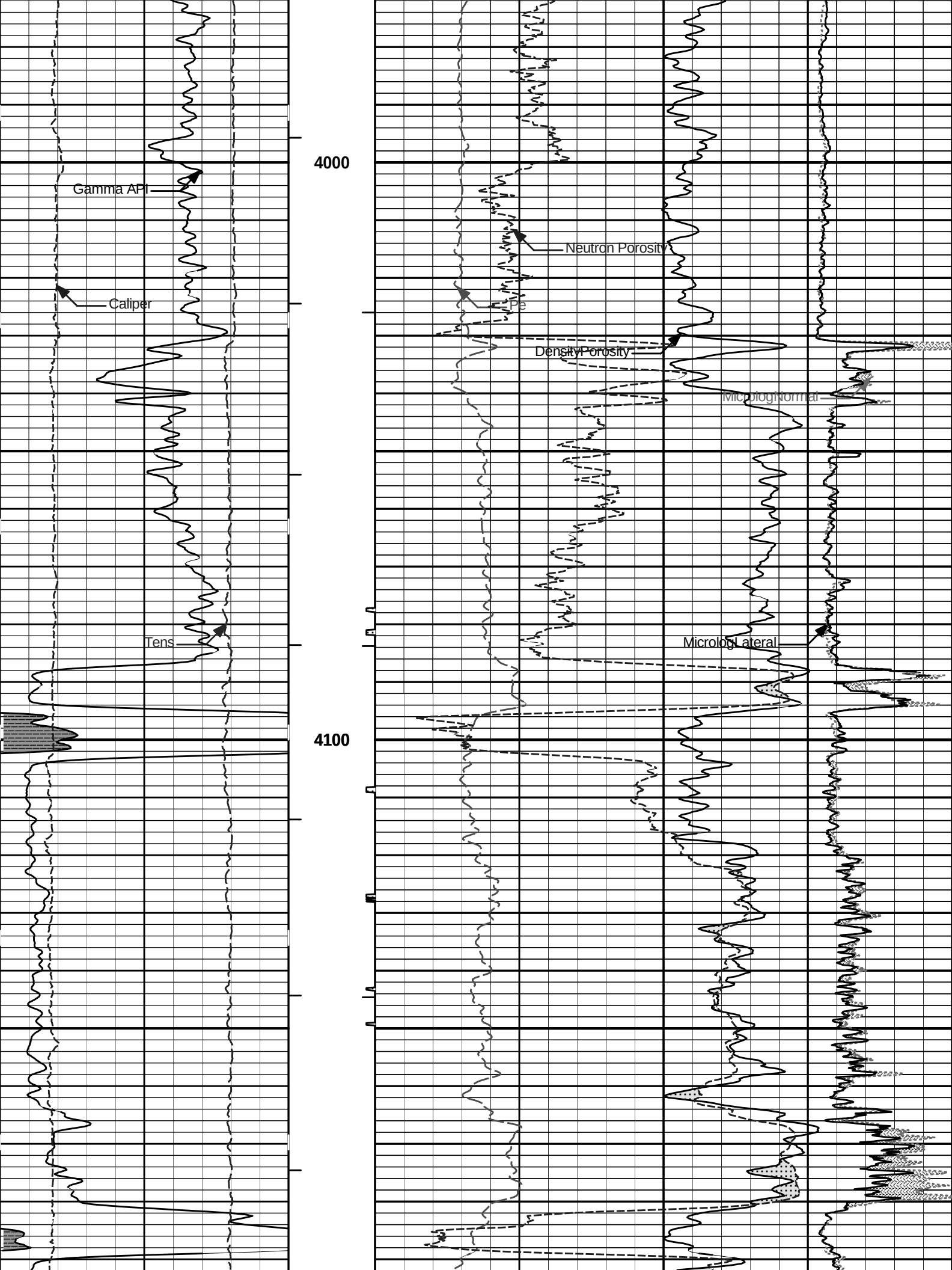
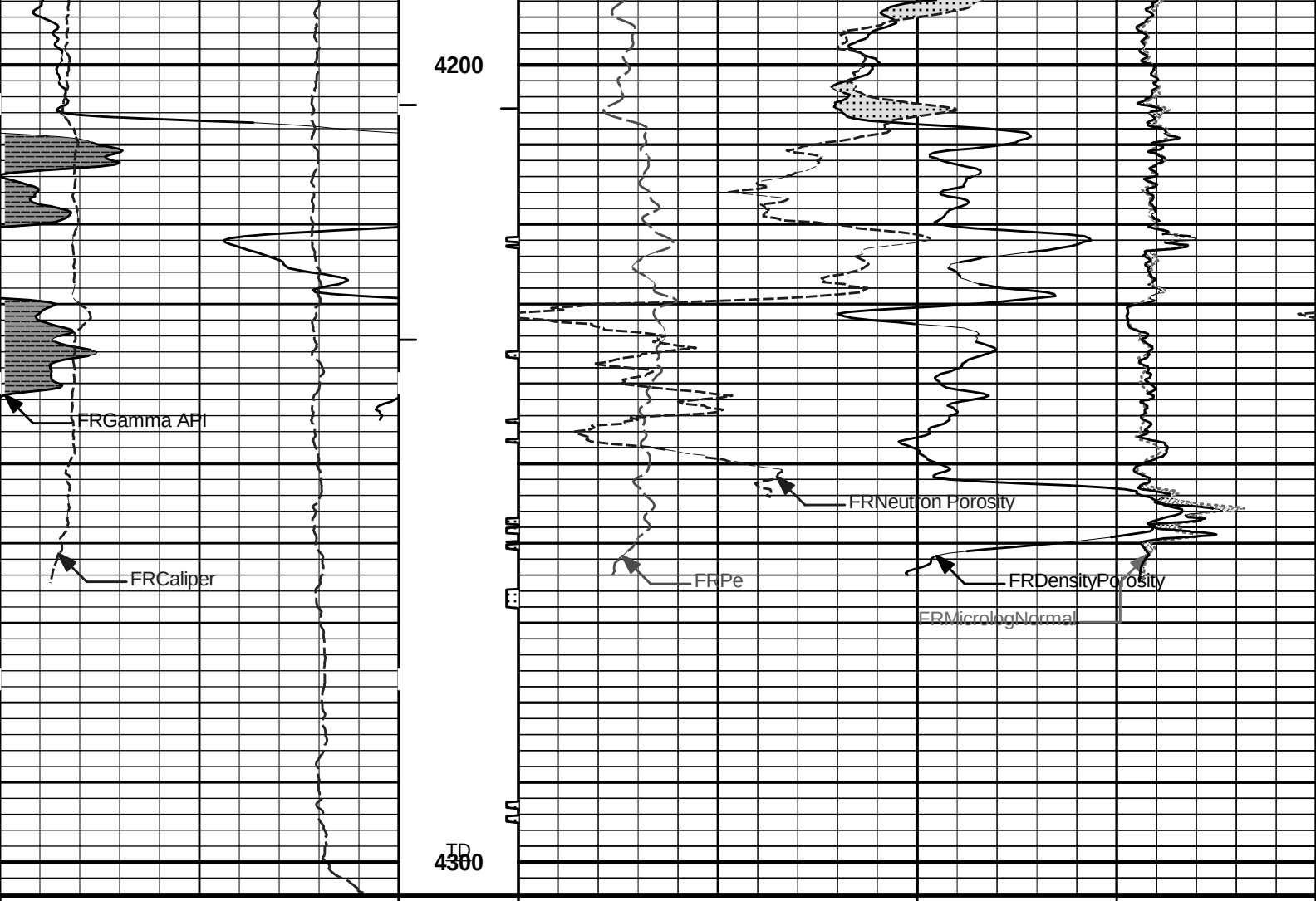
3200
3300
Tens
MicrologLateral
Gamma API
Caliper
Neutron Porosity
Pe


DensityPorosity
MicrologNormal
Tens
Micrologt ateral
3400
3500
Gamma API


Caliper
Tens
3600
3700
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
Microlog Lateral


Gamma API
Caliper
Tens
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral
3800
3900


4000
Gamma API
Caliper
Tens
Neutron Porosity
Pe
Density Porosity
MicrologNormal
MicrologLateral
4100



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

1 : 240
ft
AHVT
BHVT
Tension Pull
10 0
Tension Pull

0 Pe 10

0 MicrologNormal 20
ohm-metre
0 MicrologLateral 20
ohm-metre
PERMEABLE

30 DensityPorosity -10
%
30 Neutron Porosity -10
%
CROSSOVER

HALLIBURTON

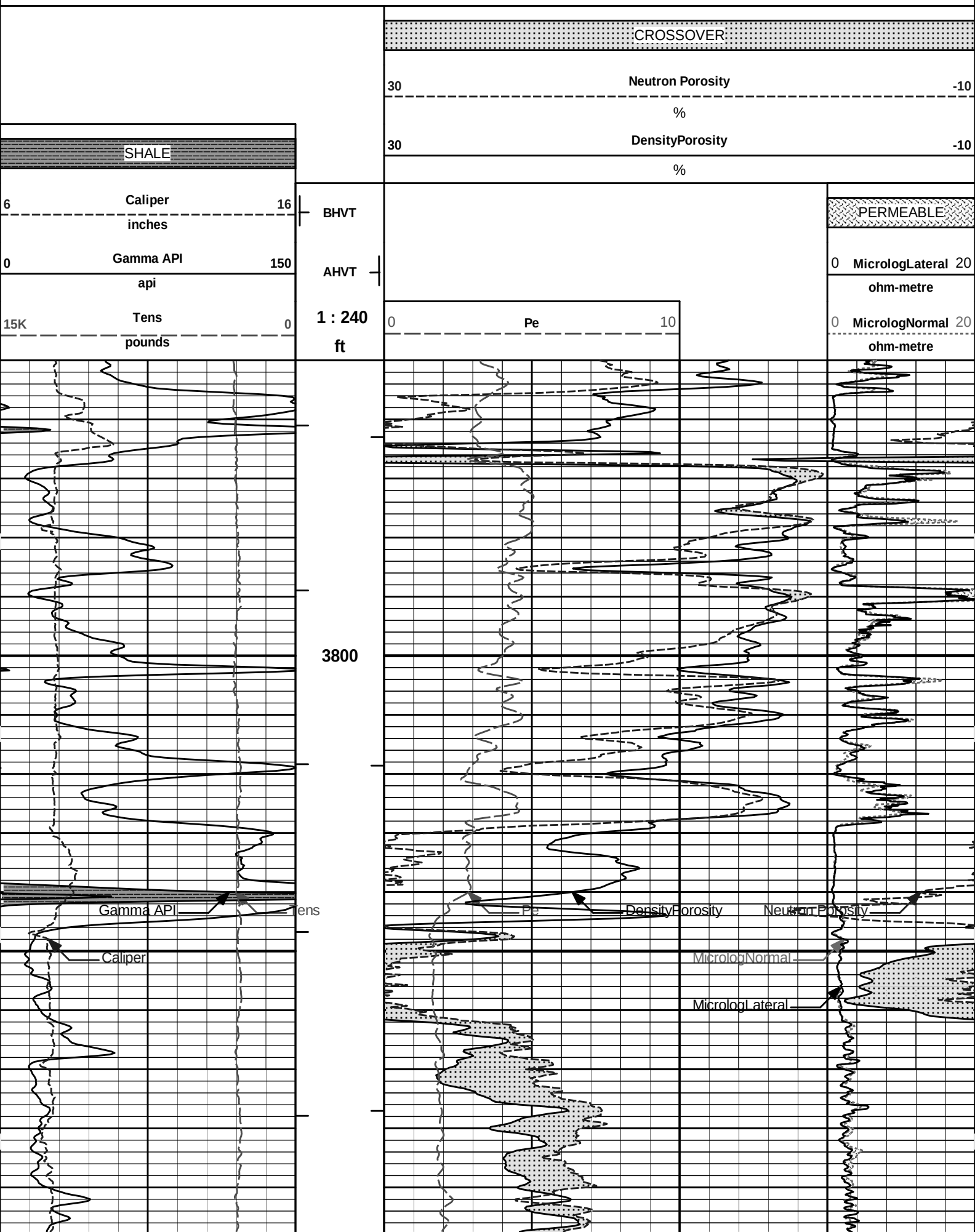
Plot Time: 24-Jun-11 10:22:41
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG\
Plot File: \\POROML\PoroML_5_main_IQ_LIB

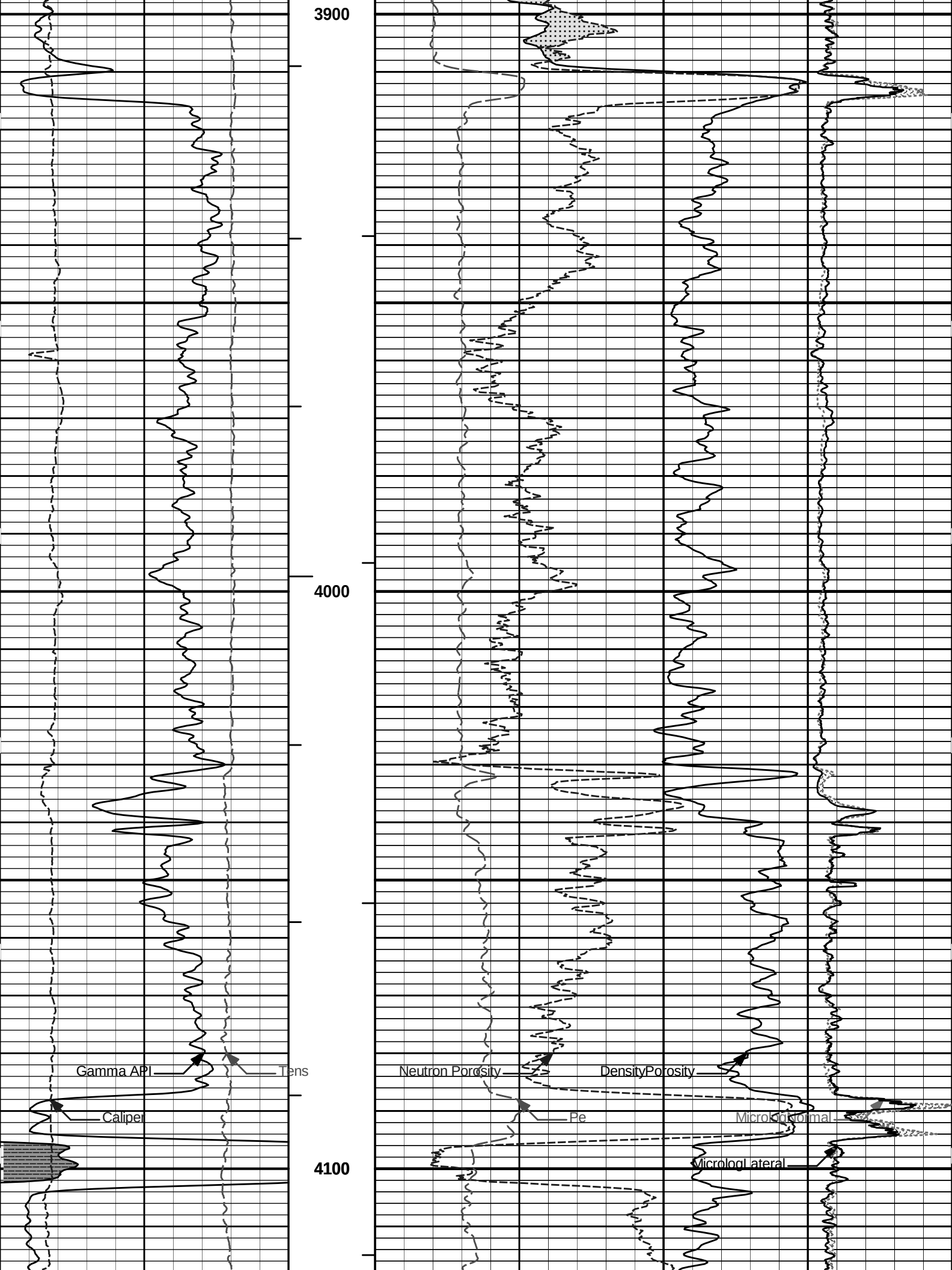
5 INCH MAIN LOG

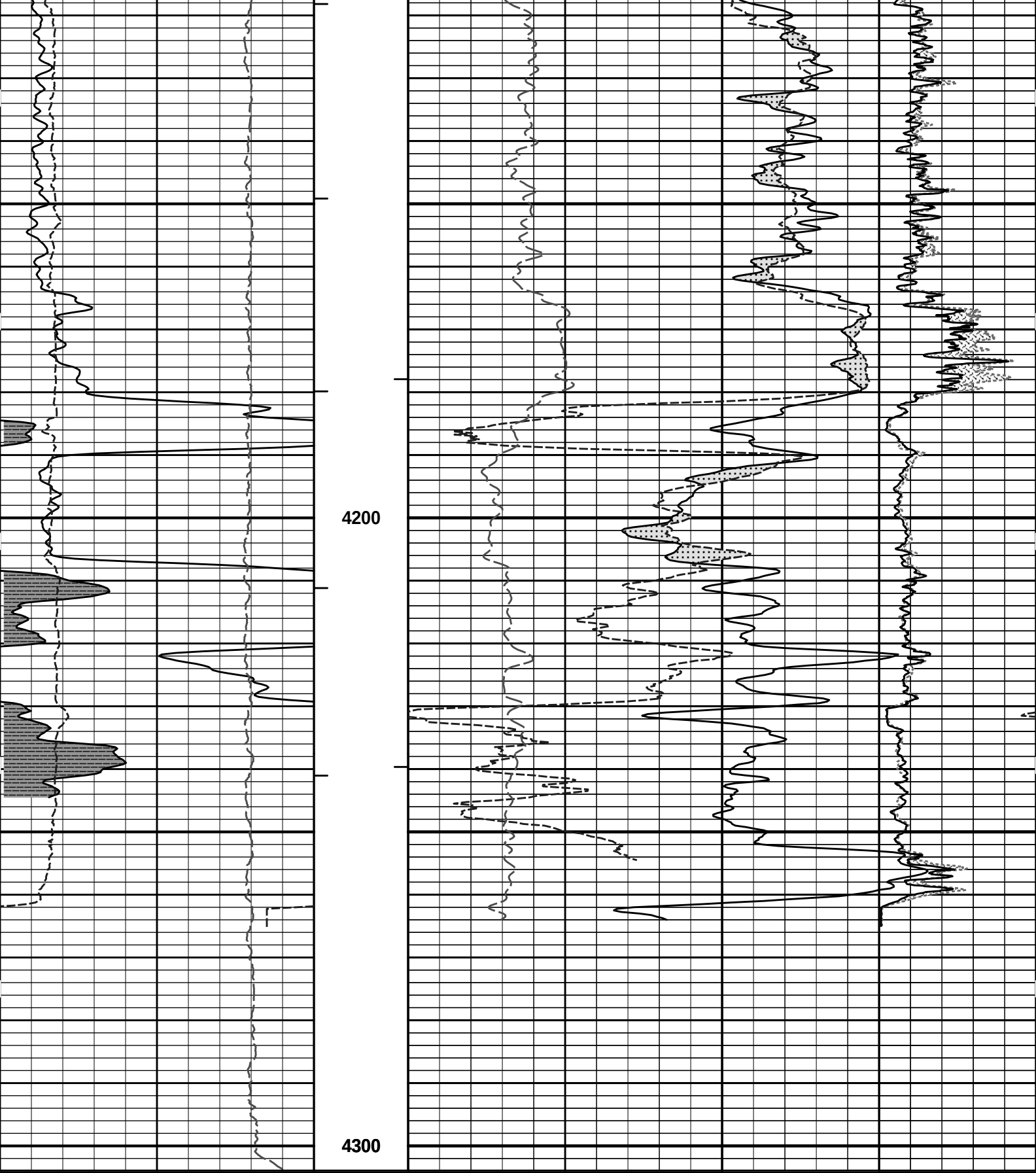
HALLIBURTON

Plot Time: 24-Jun-11 10:22:42
Plot Range: 3750 ft to 4303.92 ft
Data: HORTON_1\Well Based\DAQ-0001-REPEAT\
Plot File: \\POROML\PoroML_IQ_5_REPEAT_LIB

REPEAT SECTION




3900
4000
4100
Gamma API
Tens
Caliper
Neutron Porosity
Pe
DensityPorosity
MicrologNormal
MicrologLateral



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

1 : 240
ft
AHVT
BHVT

0 Pe 10

0 MicrologNormal 20
ohm-metre
0 MicrologLateral 20
ohm-metre
PERMEABLE

20 DensityPorosity -10

SHALE

30 -10

%

30 Neutron Porosity -10

%

CROSSOVER

HALLIBURTON

Plot Time: 24-Jun-11 10:22:45
Plot Range: 3750 ft to 4303.92 ft
Data: HORTON_1\Well Based\DAQ-0001-REPEAT\
Plot File: \\POROML\PoroML_IQ_5_REPEAT_LIB

REPEAT SECTION

HALLIBURTON

Plot Time: 24-Jun-11 10:22:46
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG\
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\BULKD_5_MAIN_LIB

5 INCH MAIN LOG

SHALE

Tension Pull

0 Gamma Ray 150
api

Tension Pull
10 0

18 FarQuality -2

AHV
ft3

-18 NearQuality 2

BHV
ft3

6 Caliper 16
inches

1 : 240
ft

2 Bulk Density 3
g/cc

15K Tension 0
pounds

0 Pe 10

-0.25 DensityCorr 0.25
g/cc

200

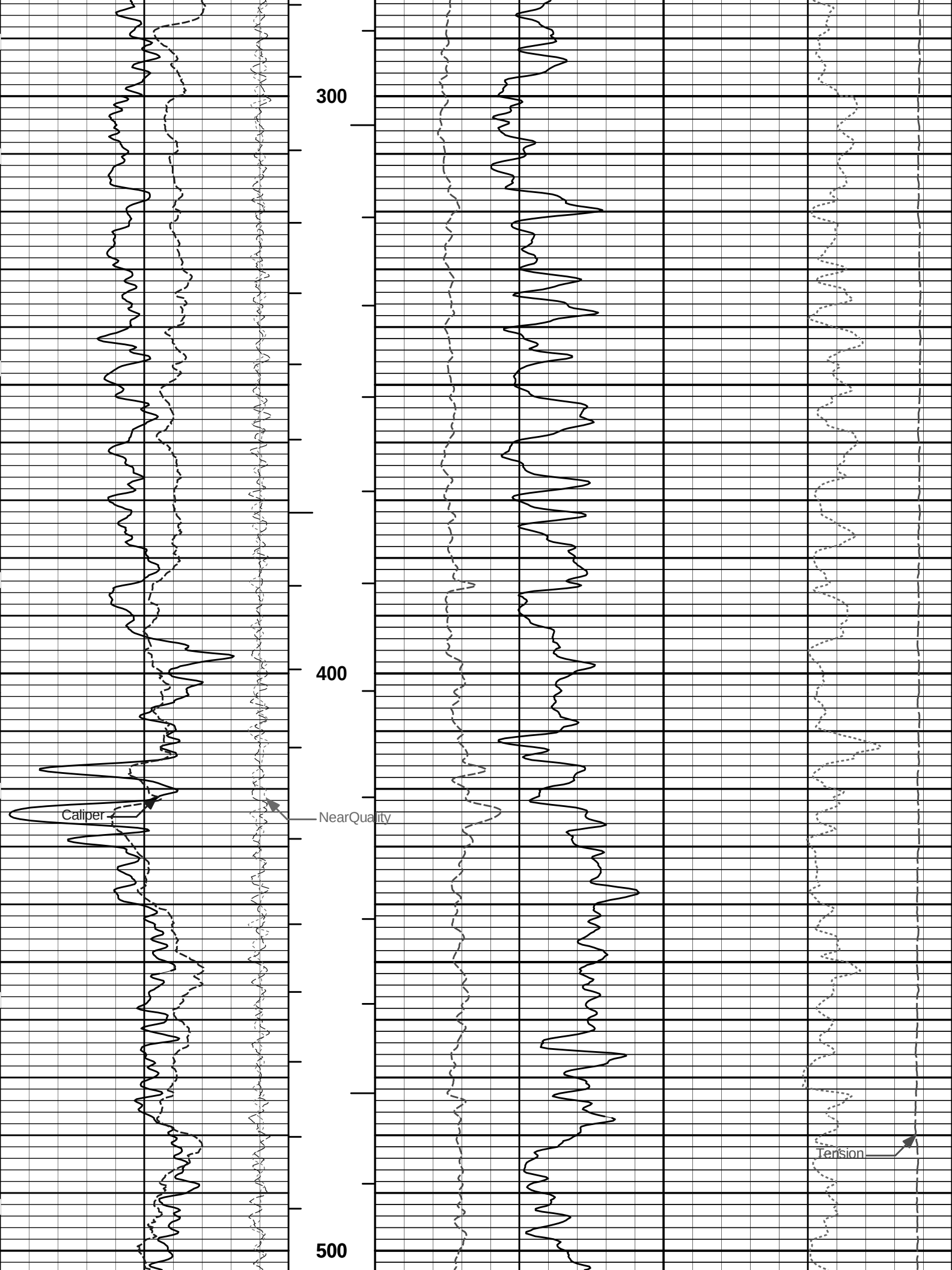
Gamma Ray

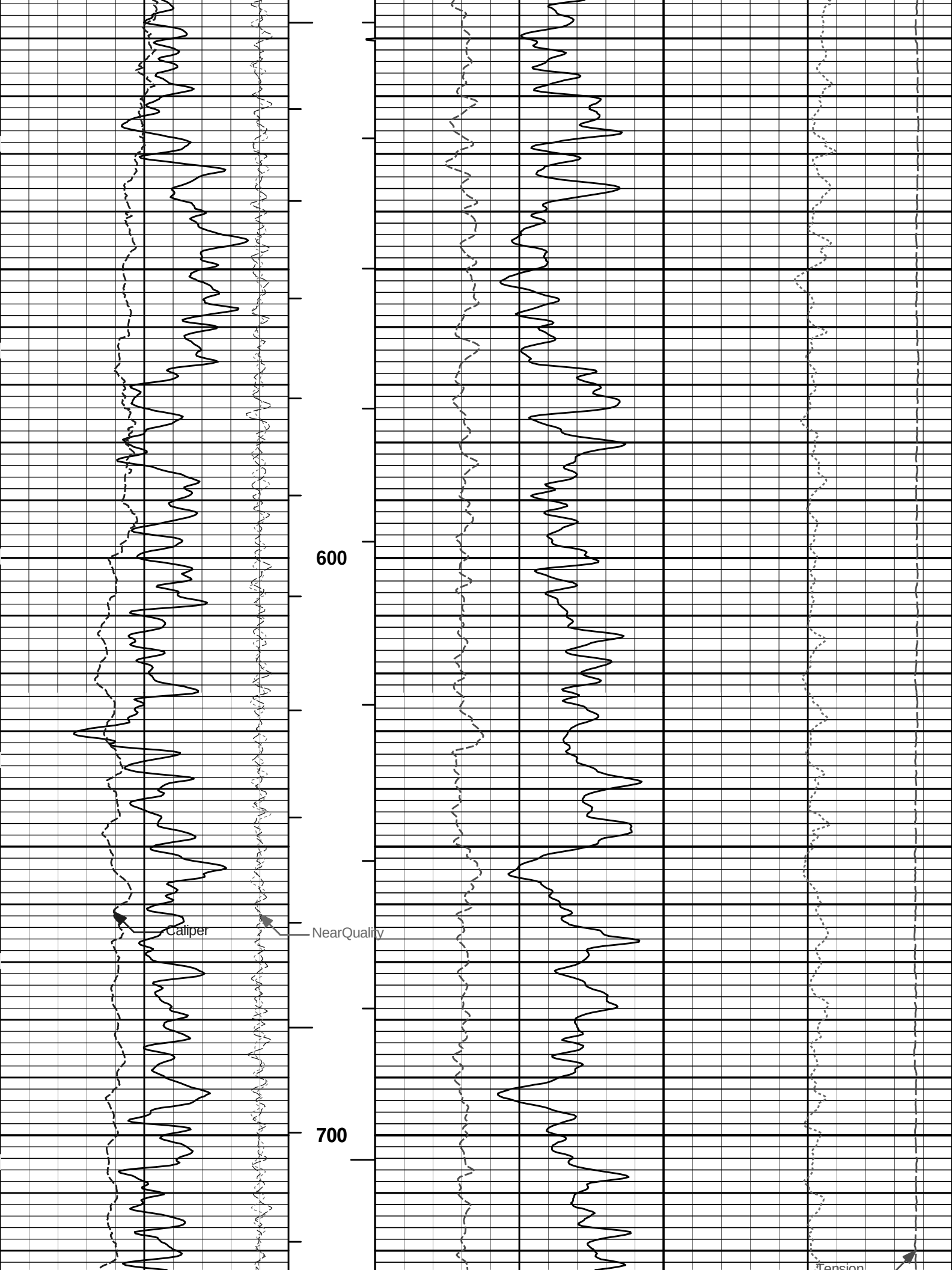
Pe

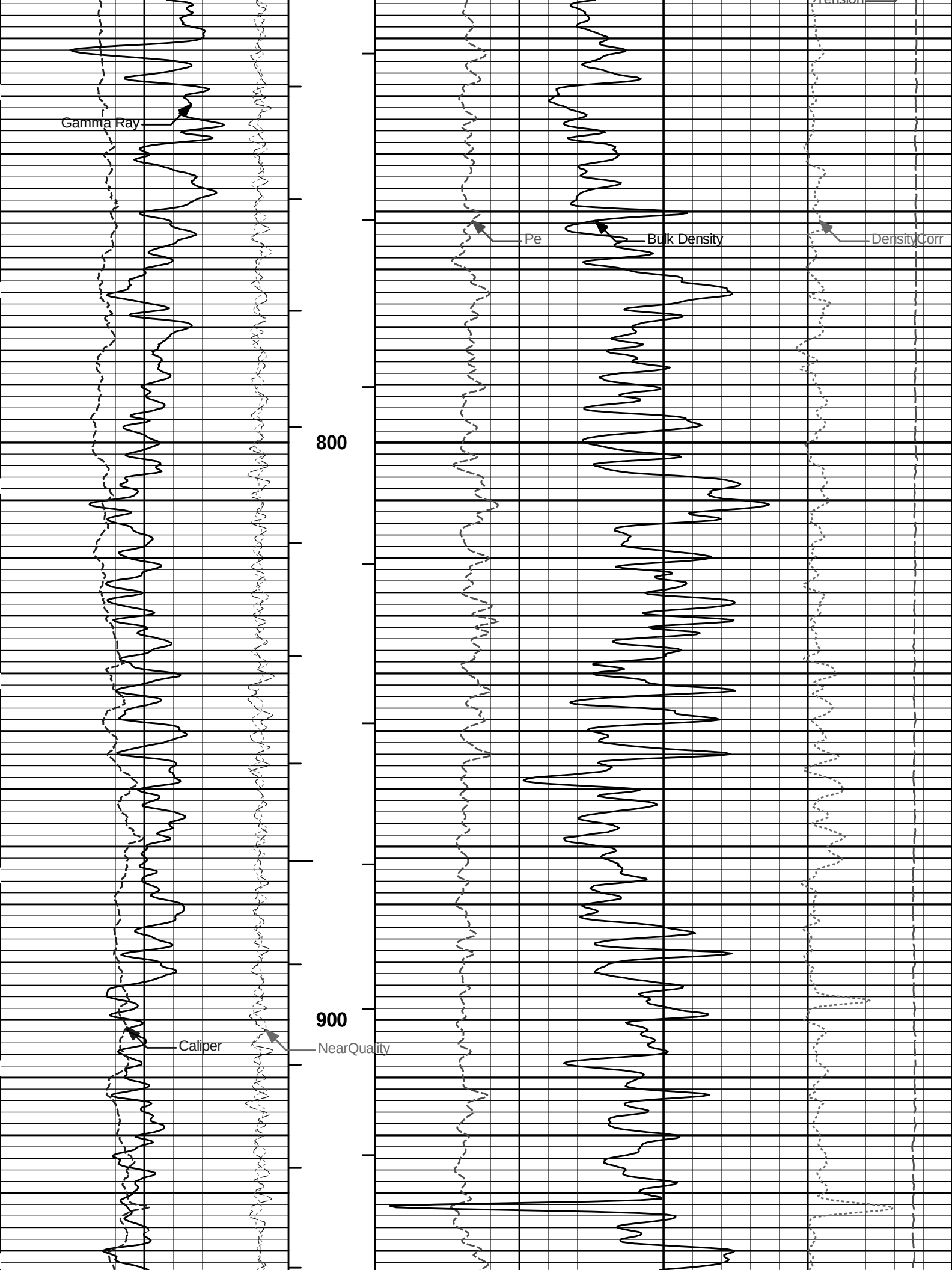
Bulk Density

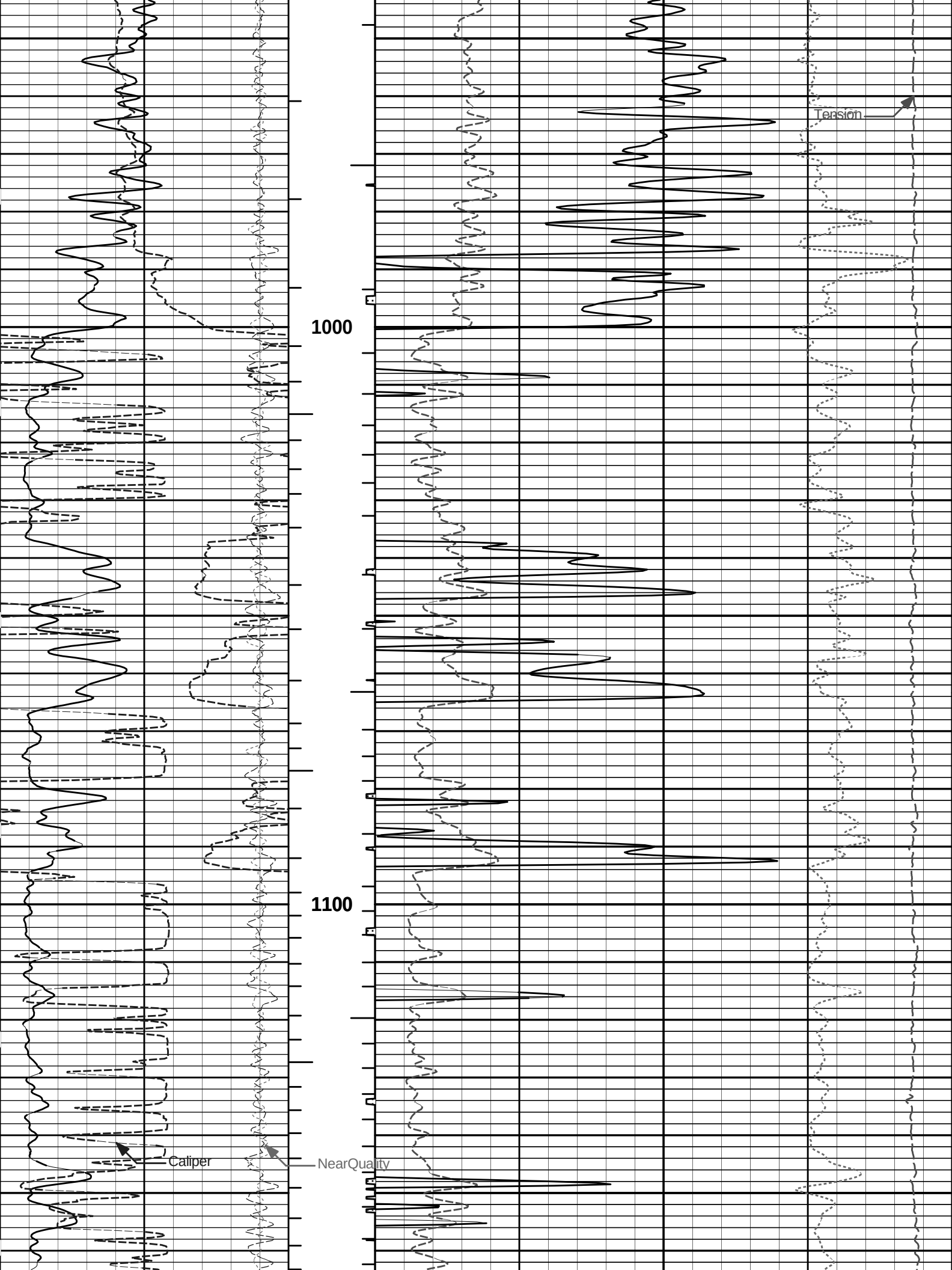
Tension

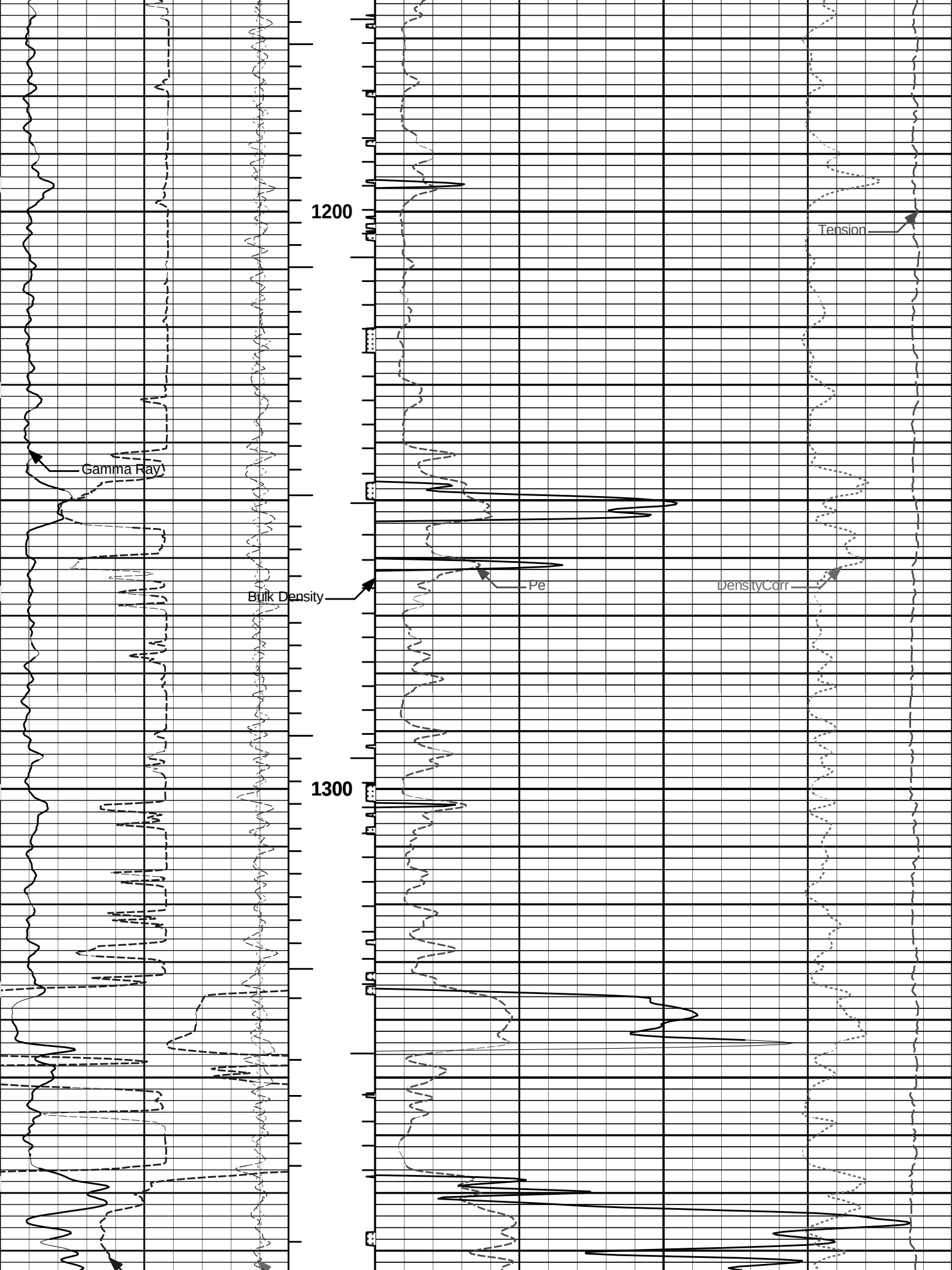
DensityCorr

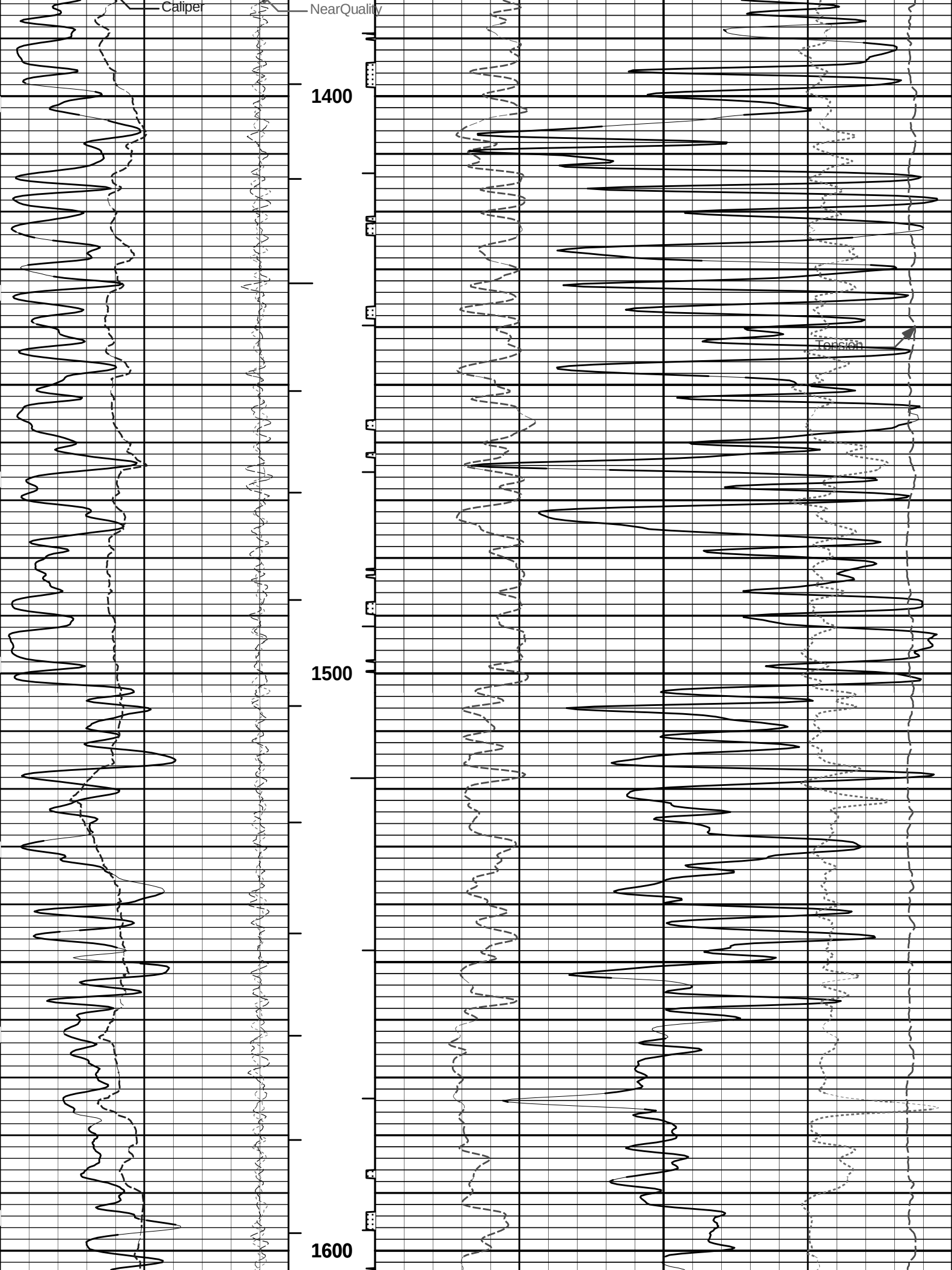

300
400
500
Caliper
NearQuality
Tension

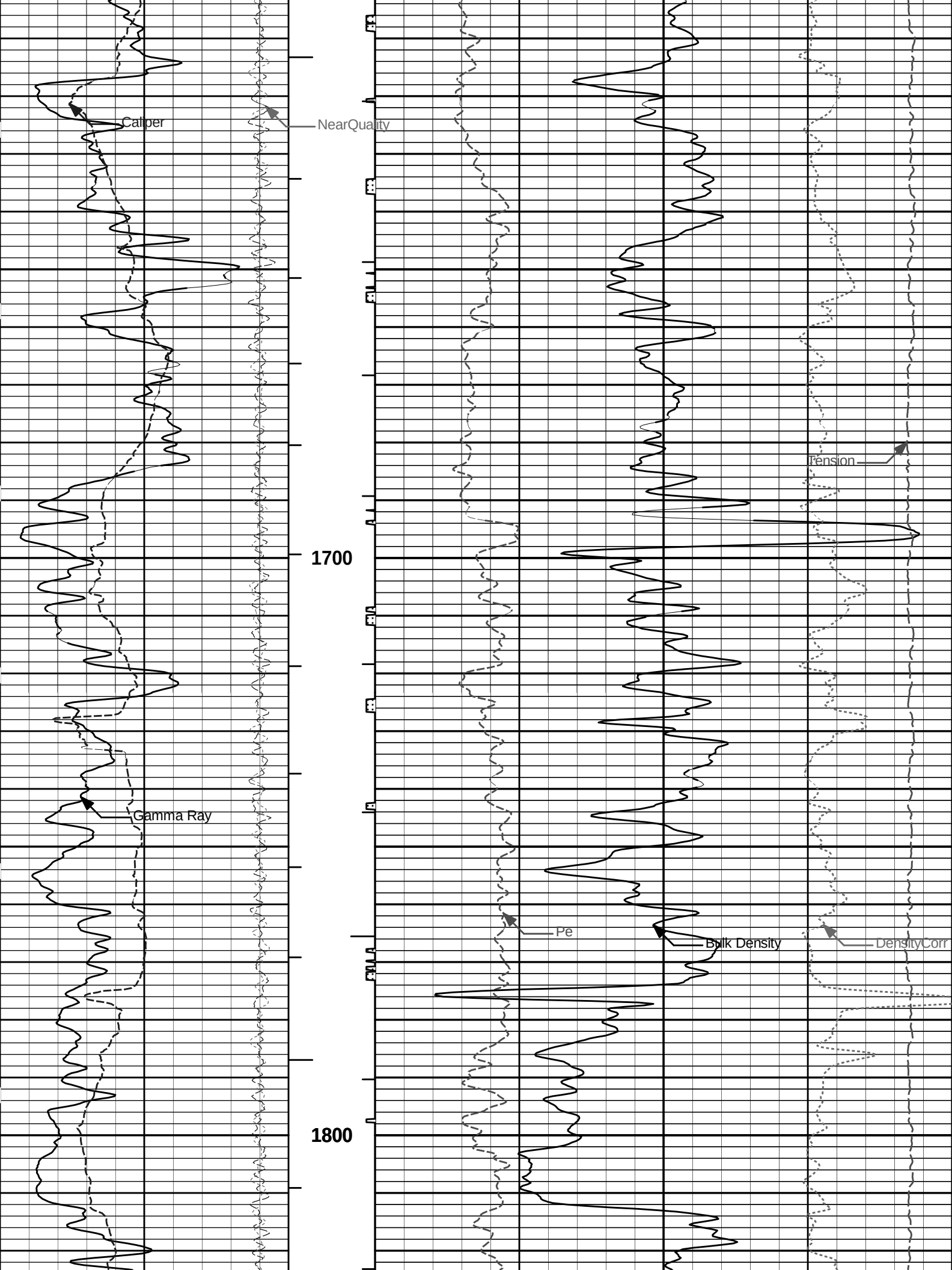

600
700
Caliper
NearQuality
Tension

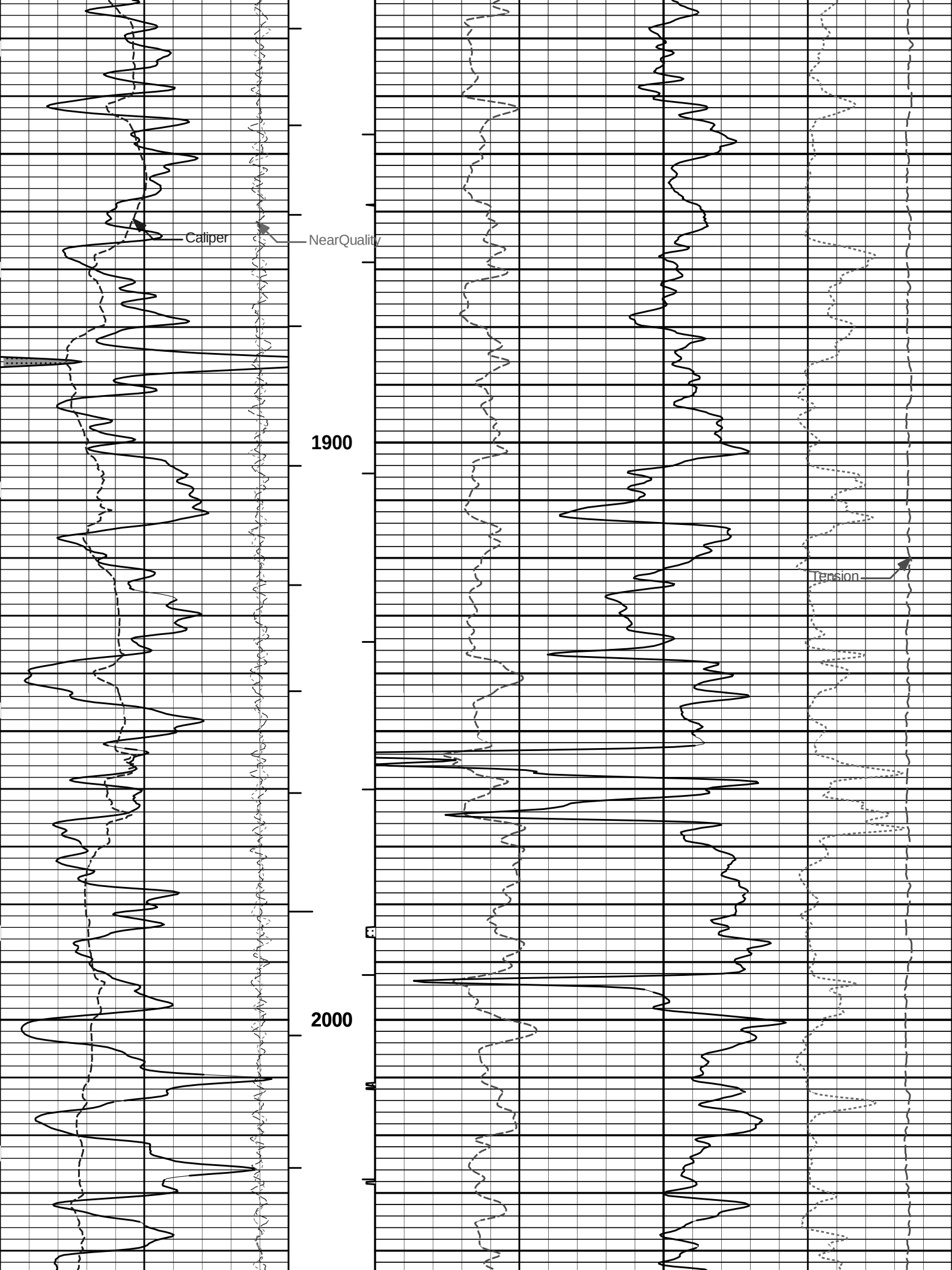

Gamma Ray
Pe
Bulk Density
DensityCorr
800
900
Caliper
NearQuality


1000
1100
Tension
Caliper
NearQuality


1200
1300
Gamma Ray
Bulk Density
Pe
DensityCorr
Tension


Caliper
NearQuality
1400
Tension
1500
1600


Caliper
NearQuality
1700
Tension
Gamma Ray
Pe
Bulk Density
DensityCorr
1800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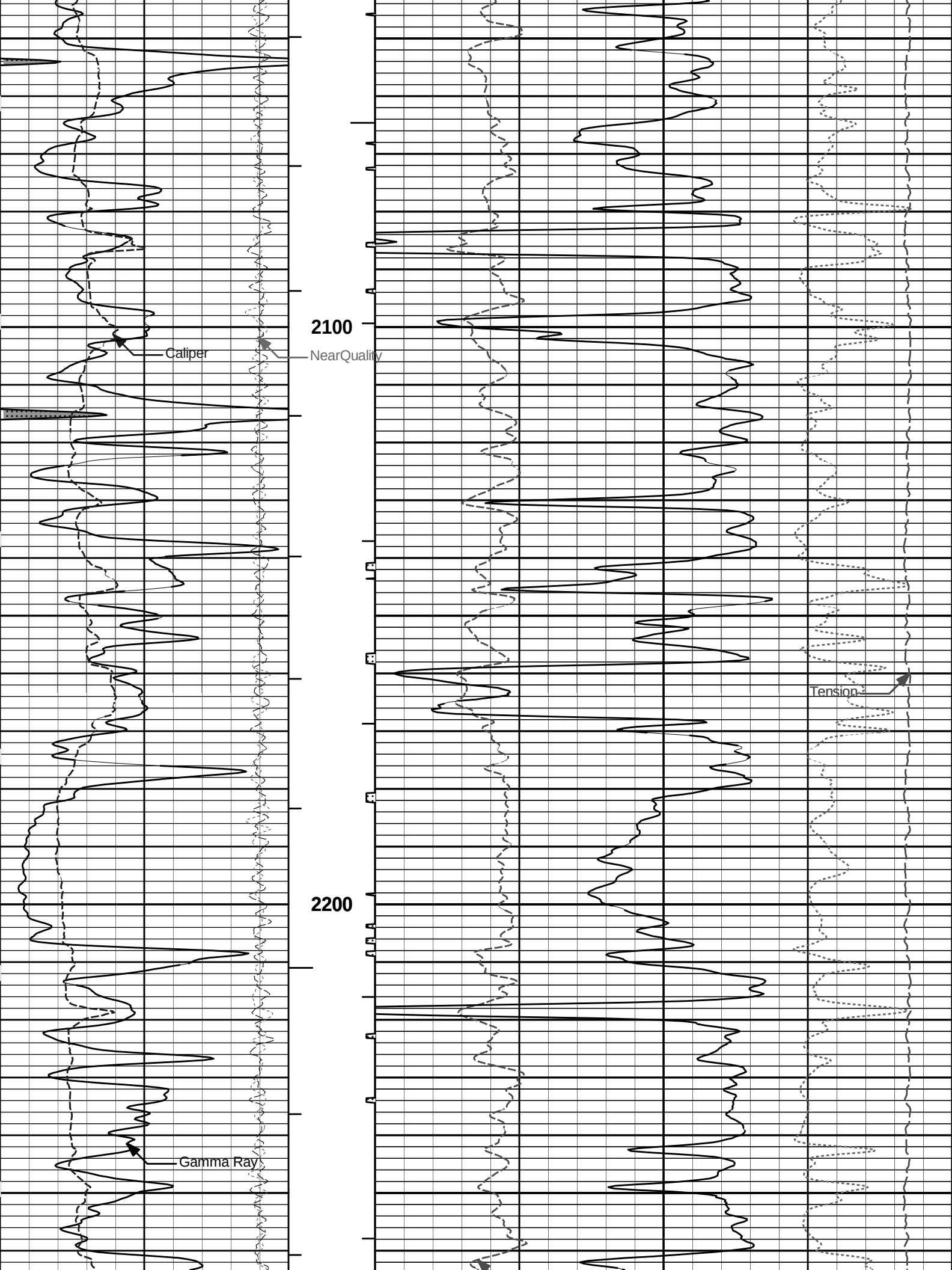
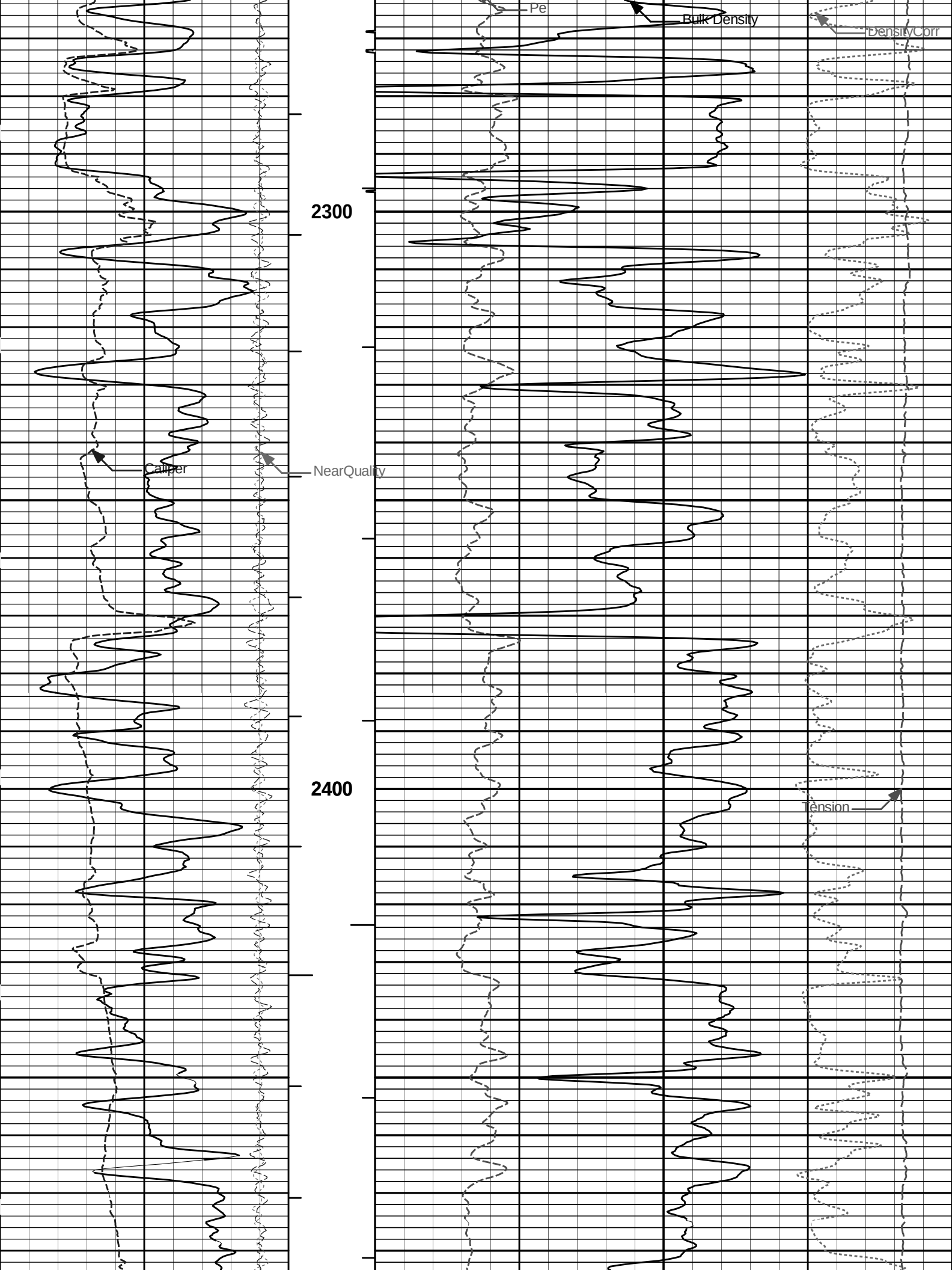
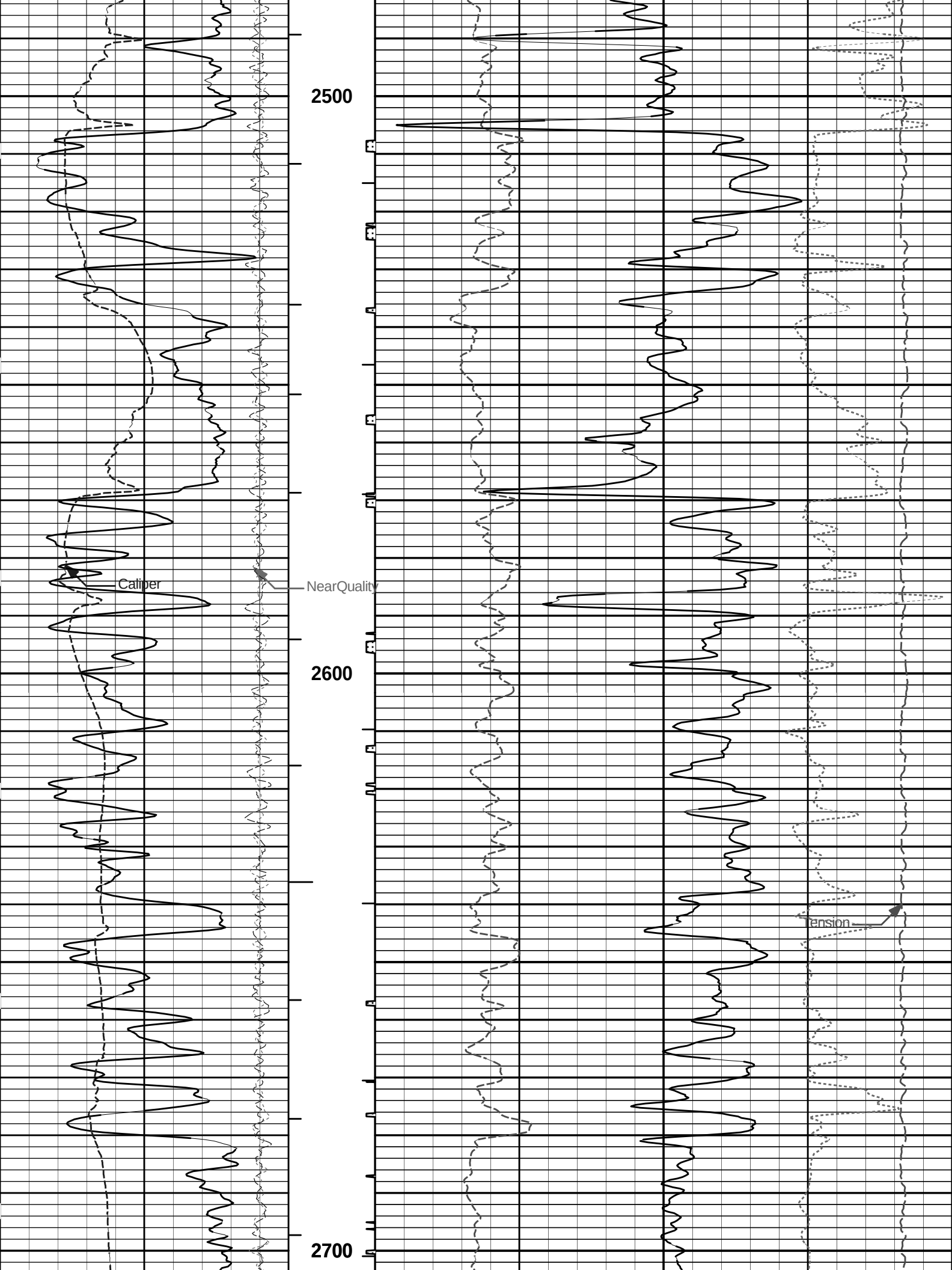
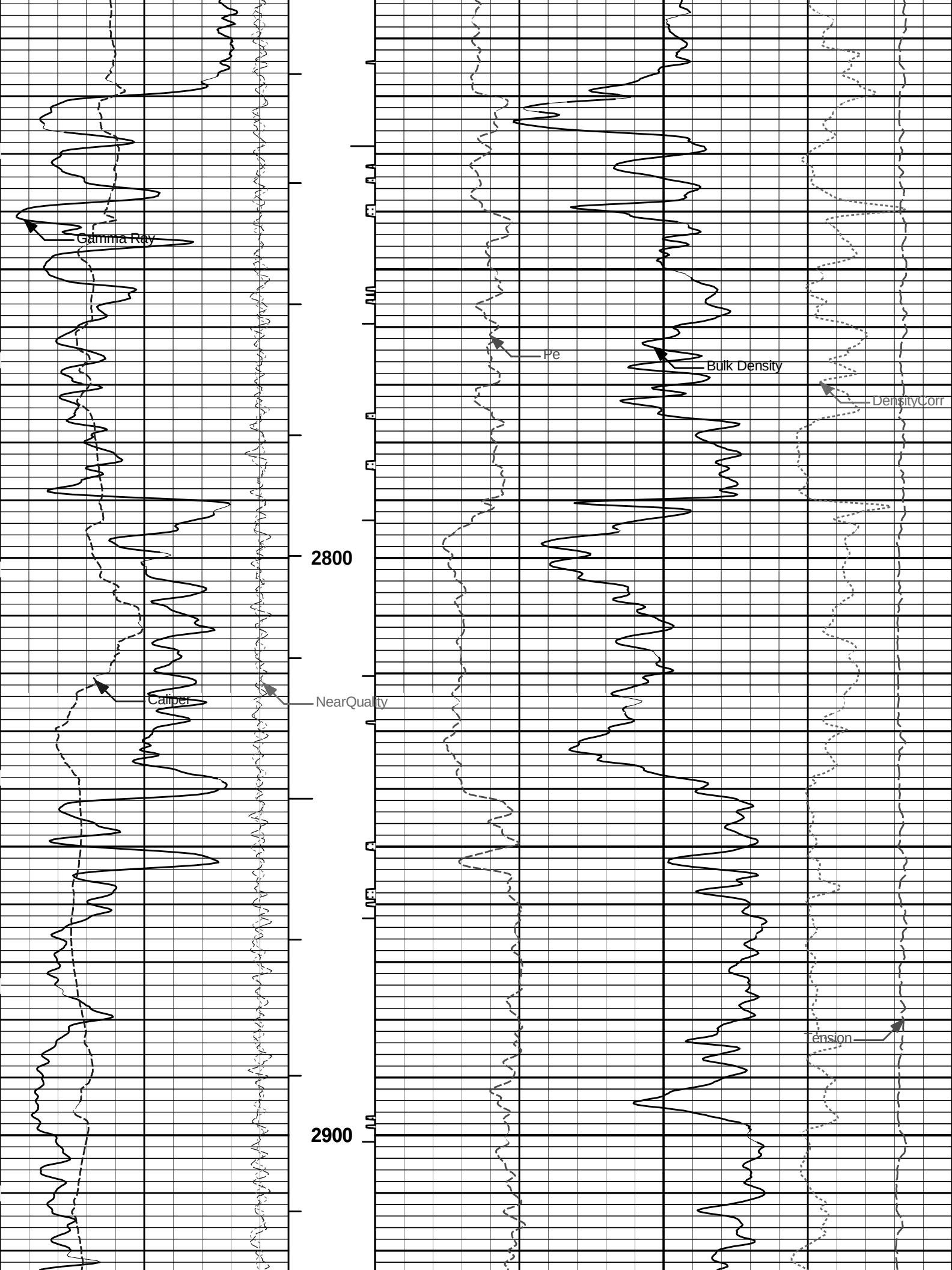
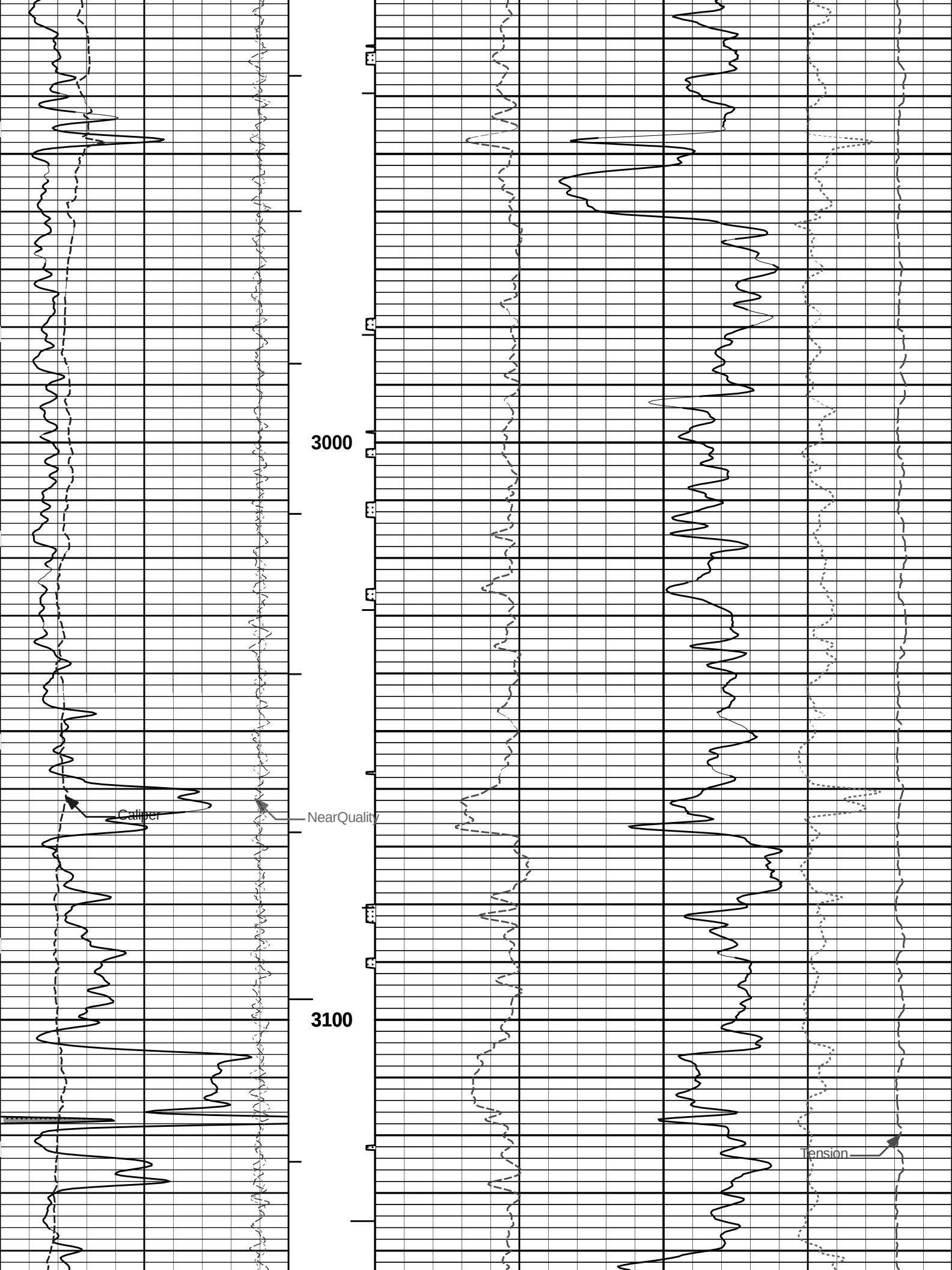
NearQuality
1900
Tension
2000

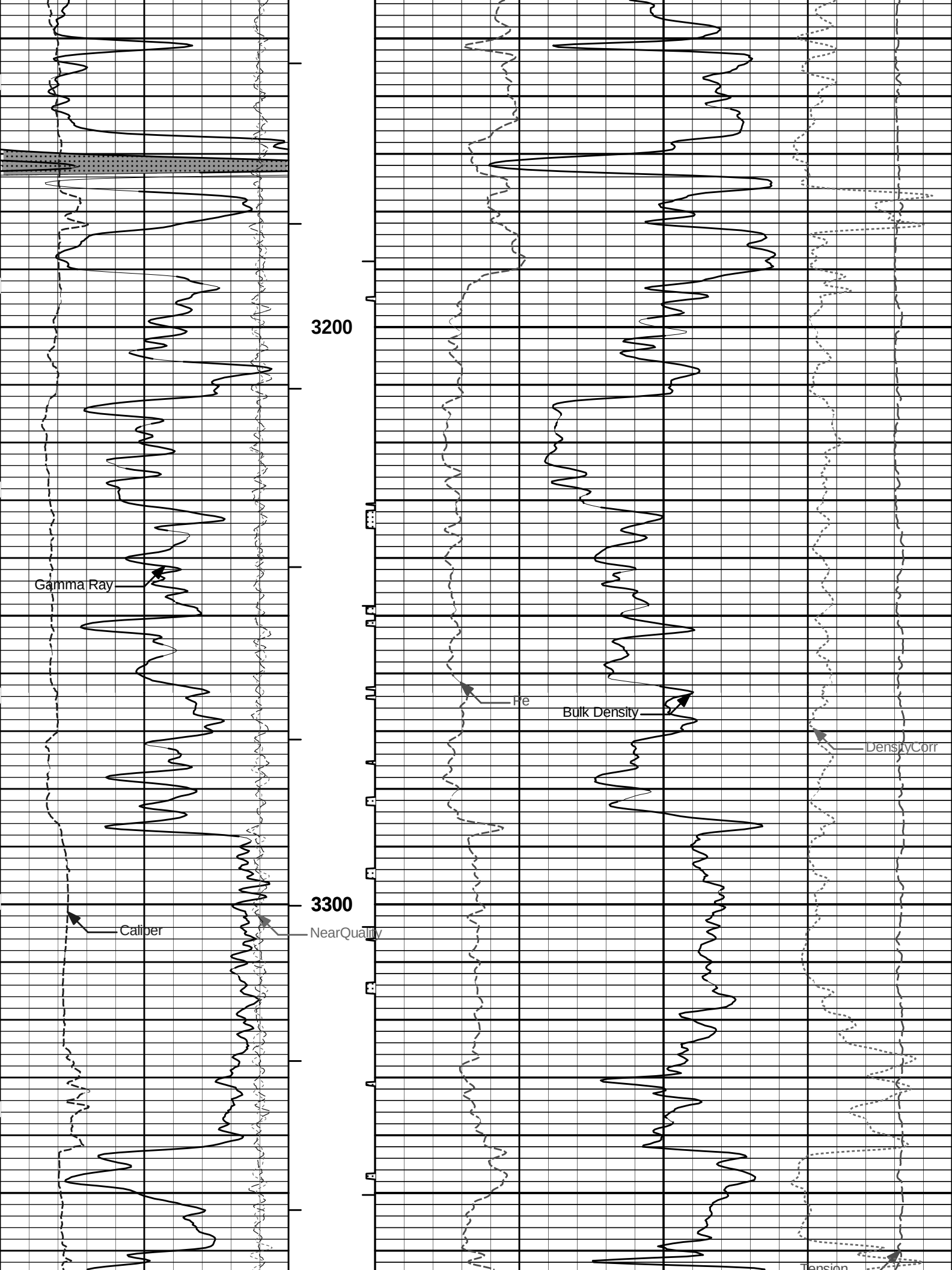

2100
2200
Caliper
NearQuality
Tension
Gamma Ray

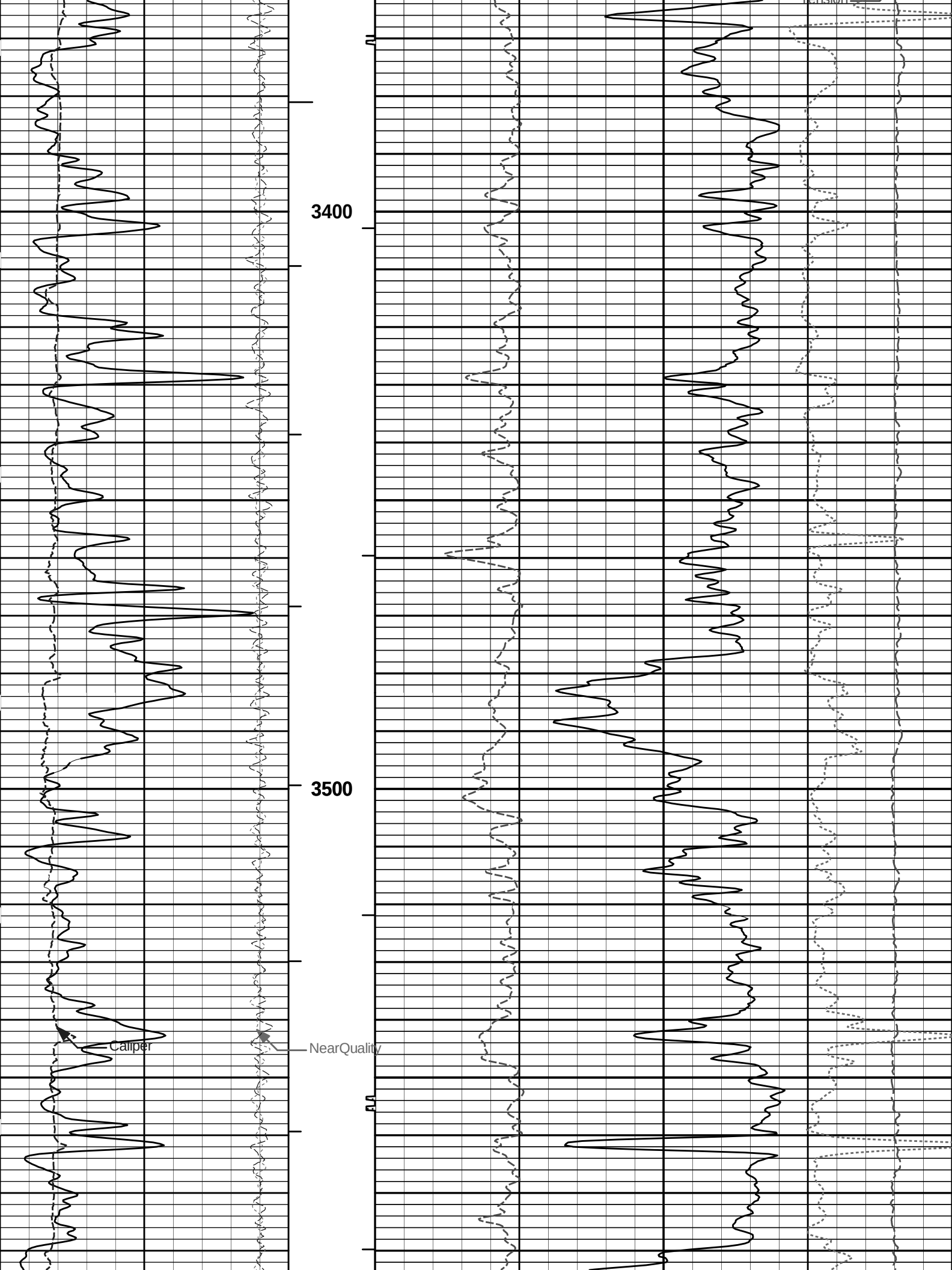

Pe
Bulk Density
DensityCorr
2300
Caliper
NearQuality
2400
Tension

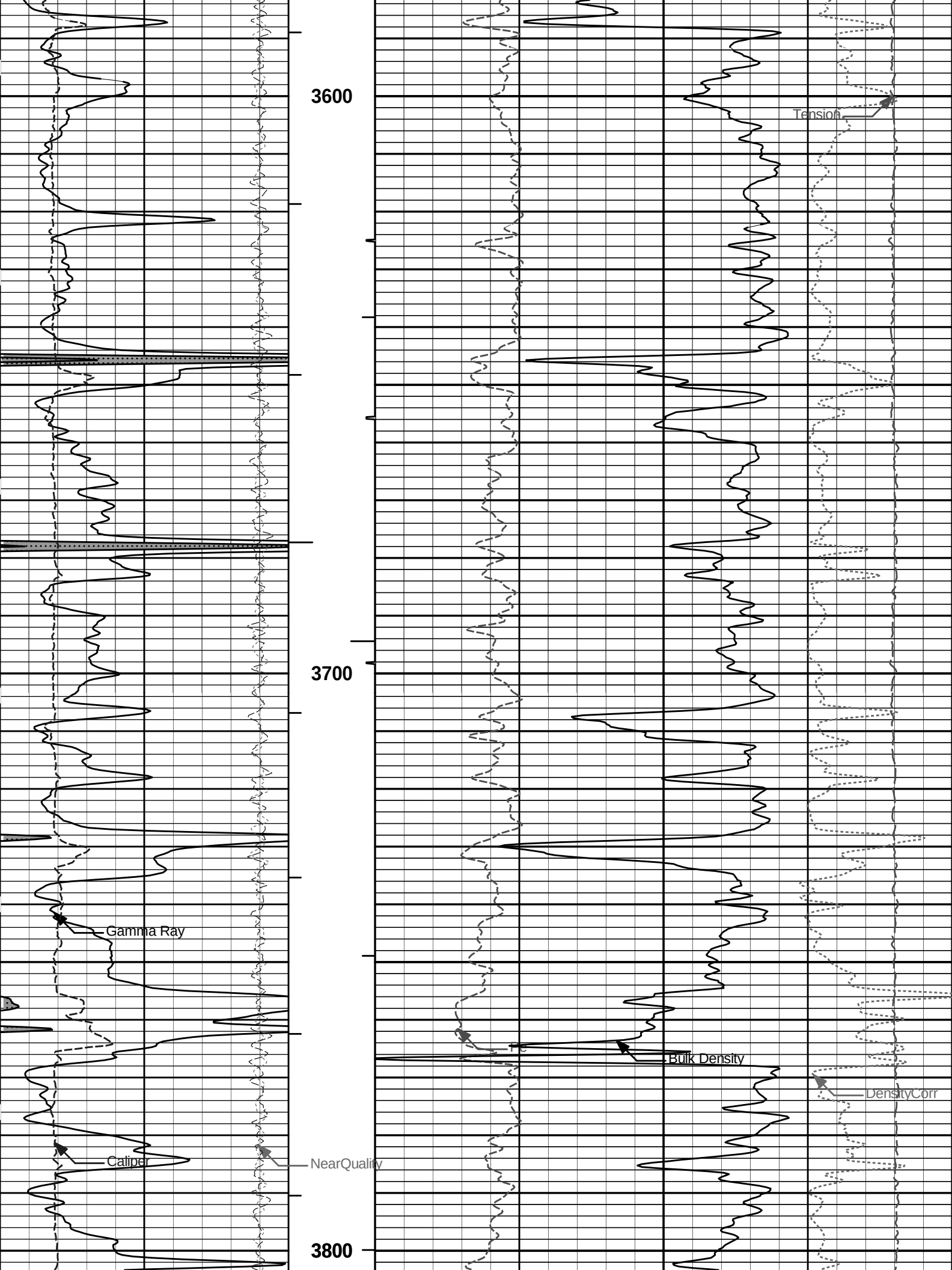

2500
2600
2700
Caliper
NearQuality
ension

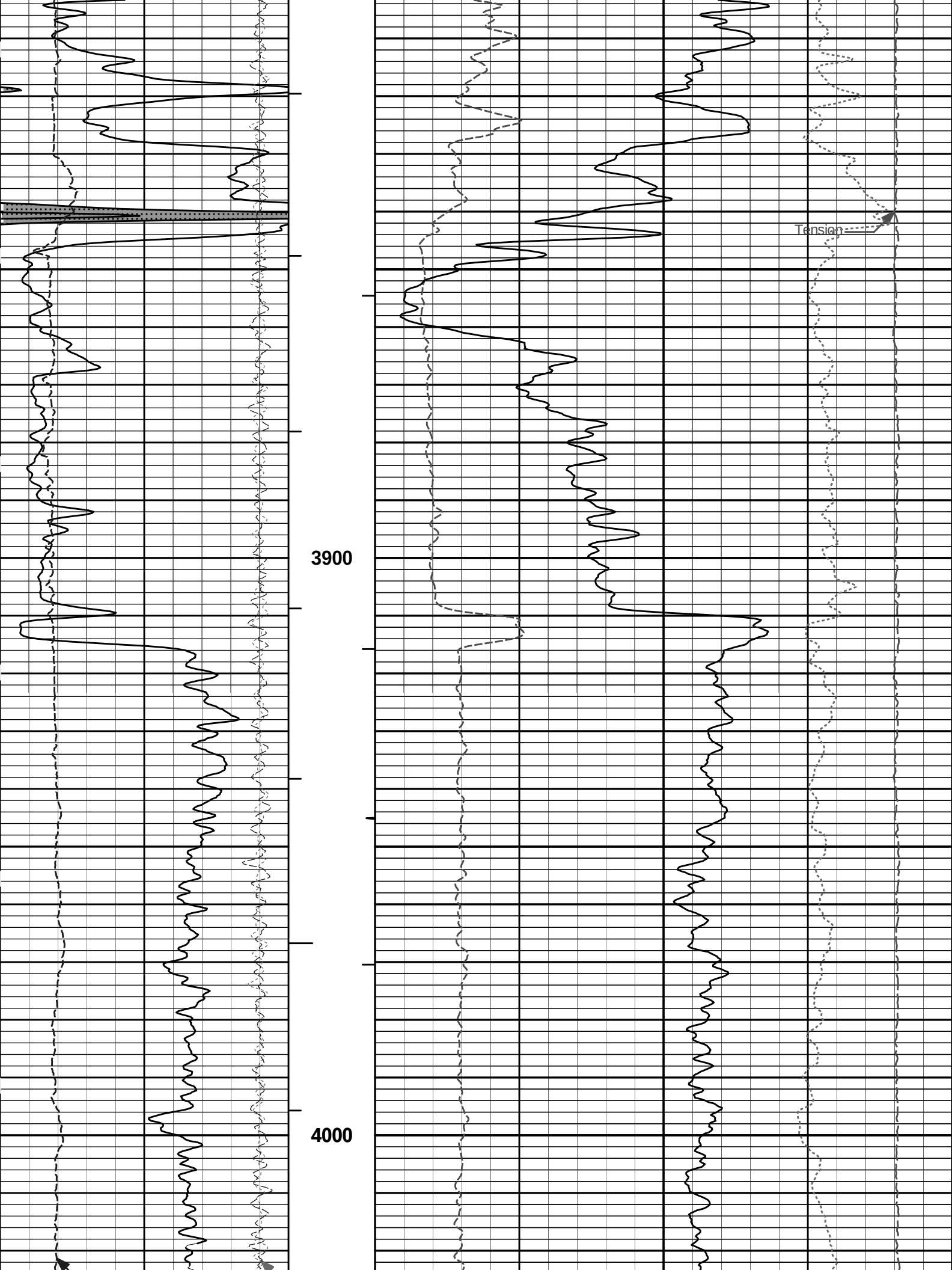

Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
DensityCorr
ension
2800
2900

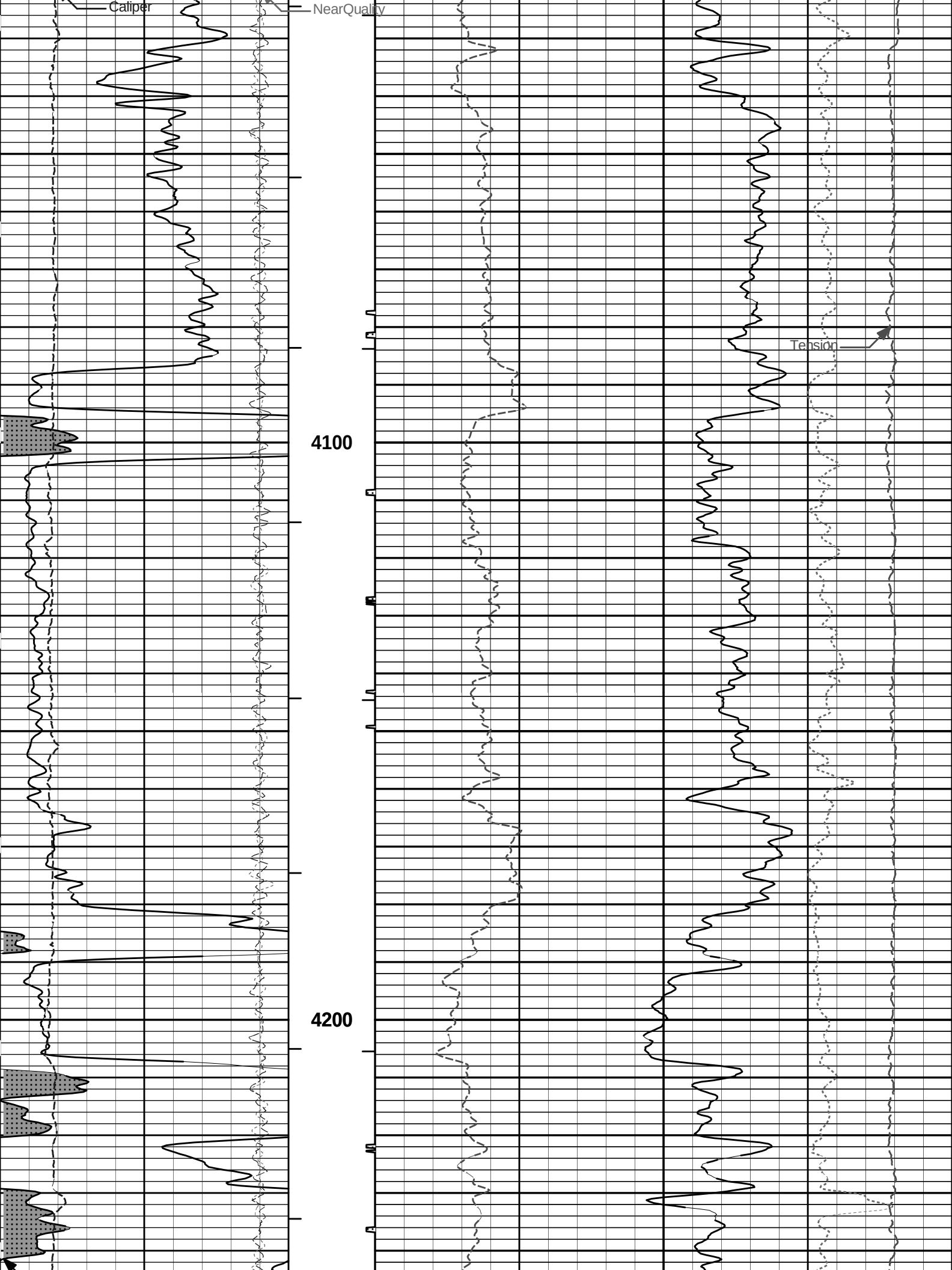

3000
3100
Caliper
NearQuality
Tension

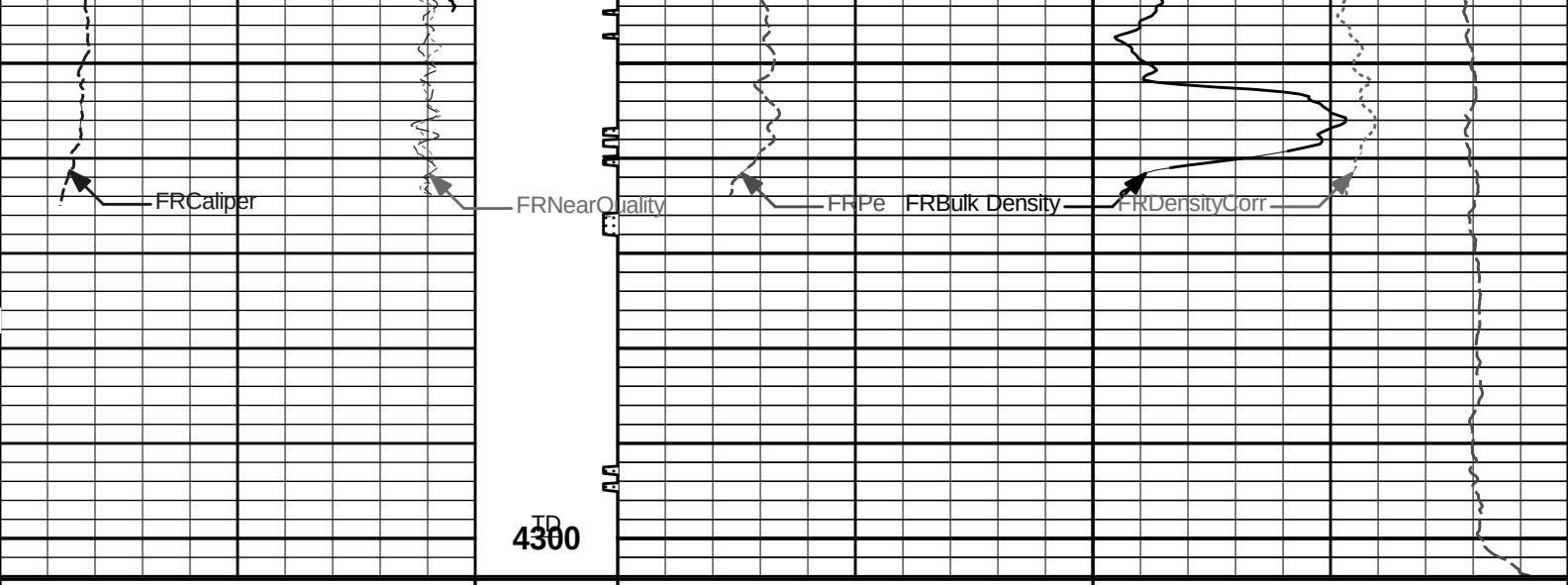

3200
3300
Gamma Ray
Caliper
NearQuality
Pe
Bulk Density
DensityCorr
Tension


3400
3500
Caliper
NearQuality


3600
3700
3800
Tension
Gamma Ray
Bulk Density
DensityCorr
Caliper
NearQuality


Tension
3900
4000


Caliper
NearQuality
Tension
4100
4200



6 Caliper 16 inches		1 : 240 ft	0 Pe 10	-0.25 DensityCorr 0.25 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 api		Tension Pull 10 0		
SHALE		Tension Pull		

HALLIBURTON

Plot Time: 24-Jun-11 10:22:50
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\BULKD_5_MAIN_LIB

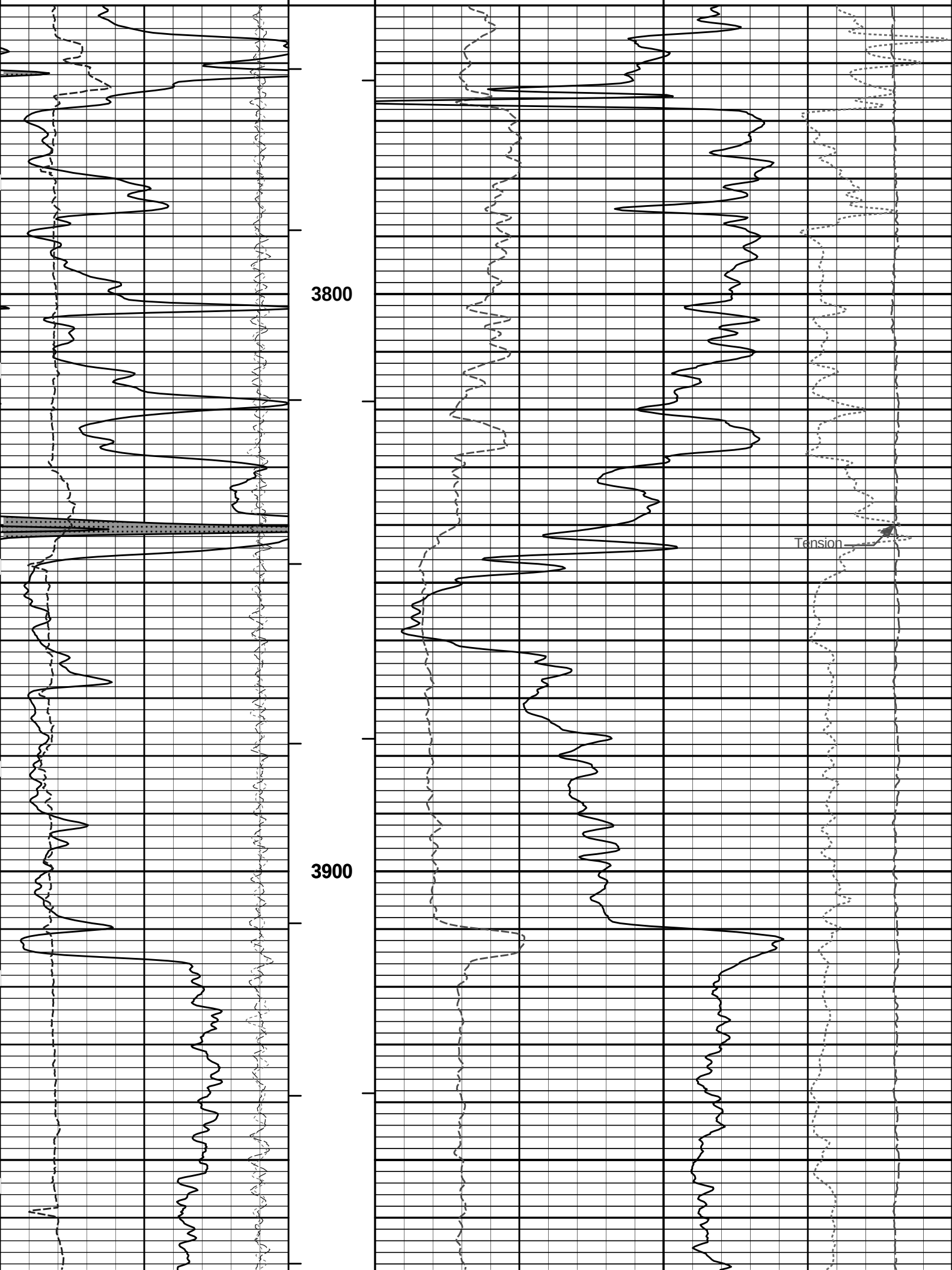
5 INCH MAIN LOG

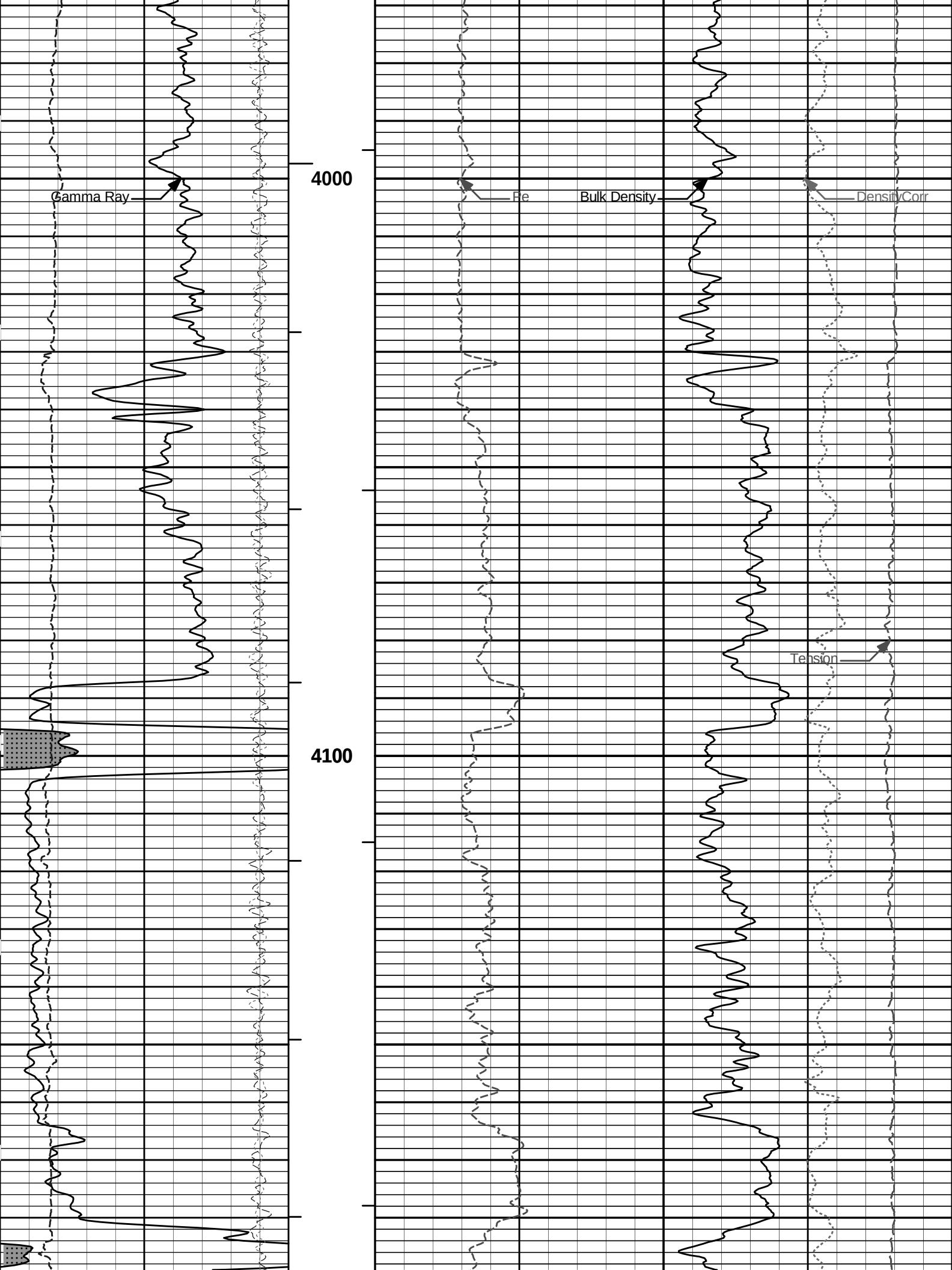
HALLIBURTON

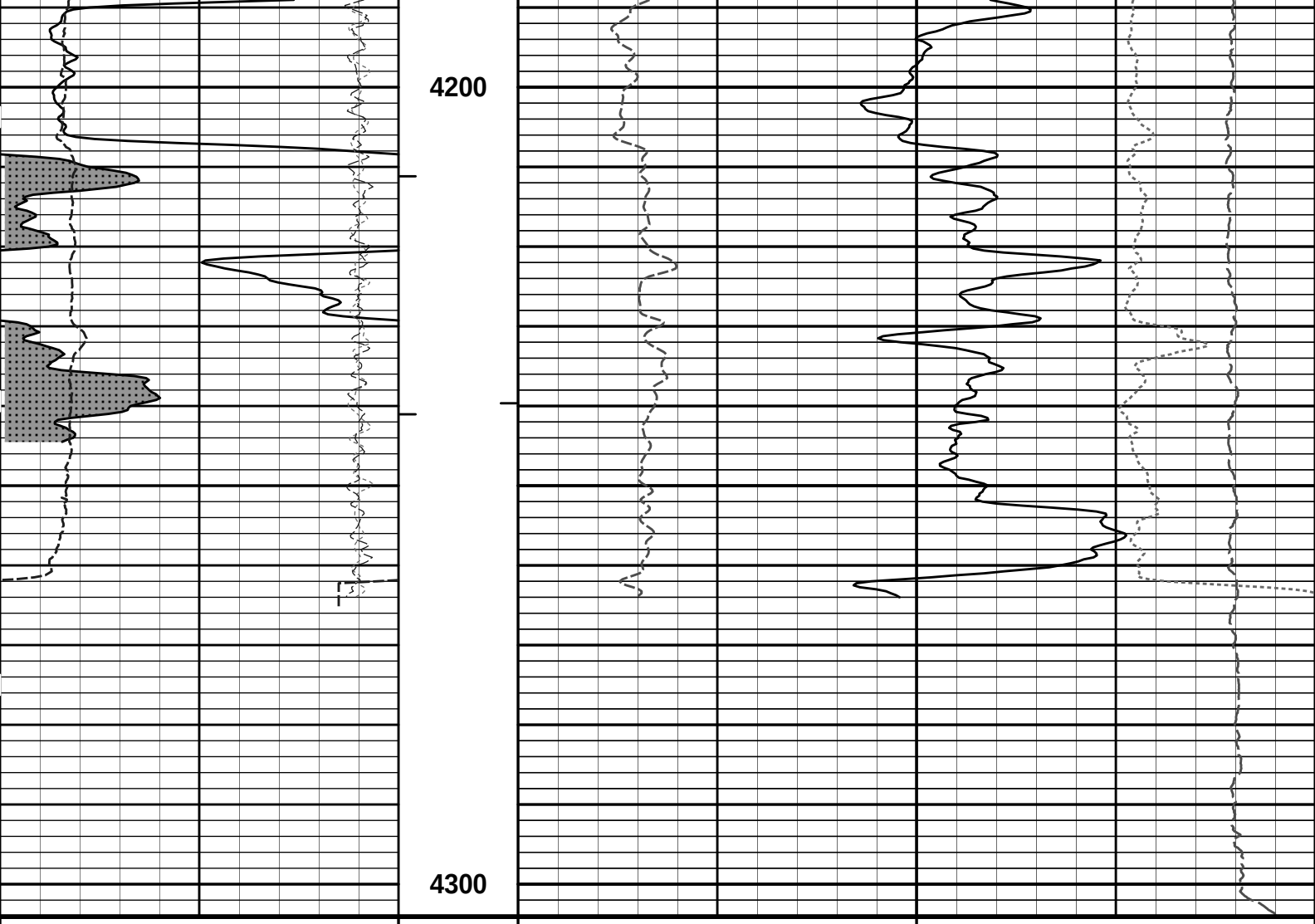
Plot Time: 24-Jun-11 10:22:51
Plot Range: 3750 ft to 4303.92 ft
Data: HORTON_1\Well Based\DAQ-0001-REPEAT
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\BULKD_5_REP_LIB

REPEAT SECTION

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


3800
3900
Tension


Gamma Ray
4000
Pe
Bulk Density
DensityCorr
Tension
4100



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				
api				
SHALE				

HALLIBURTON

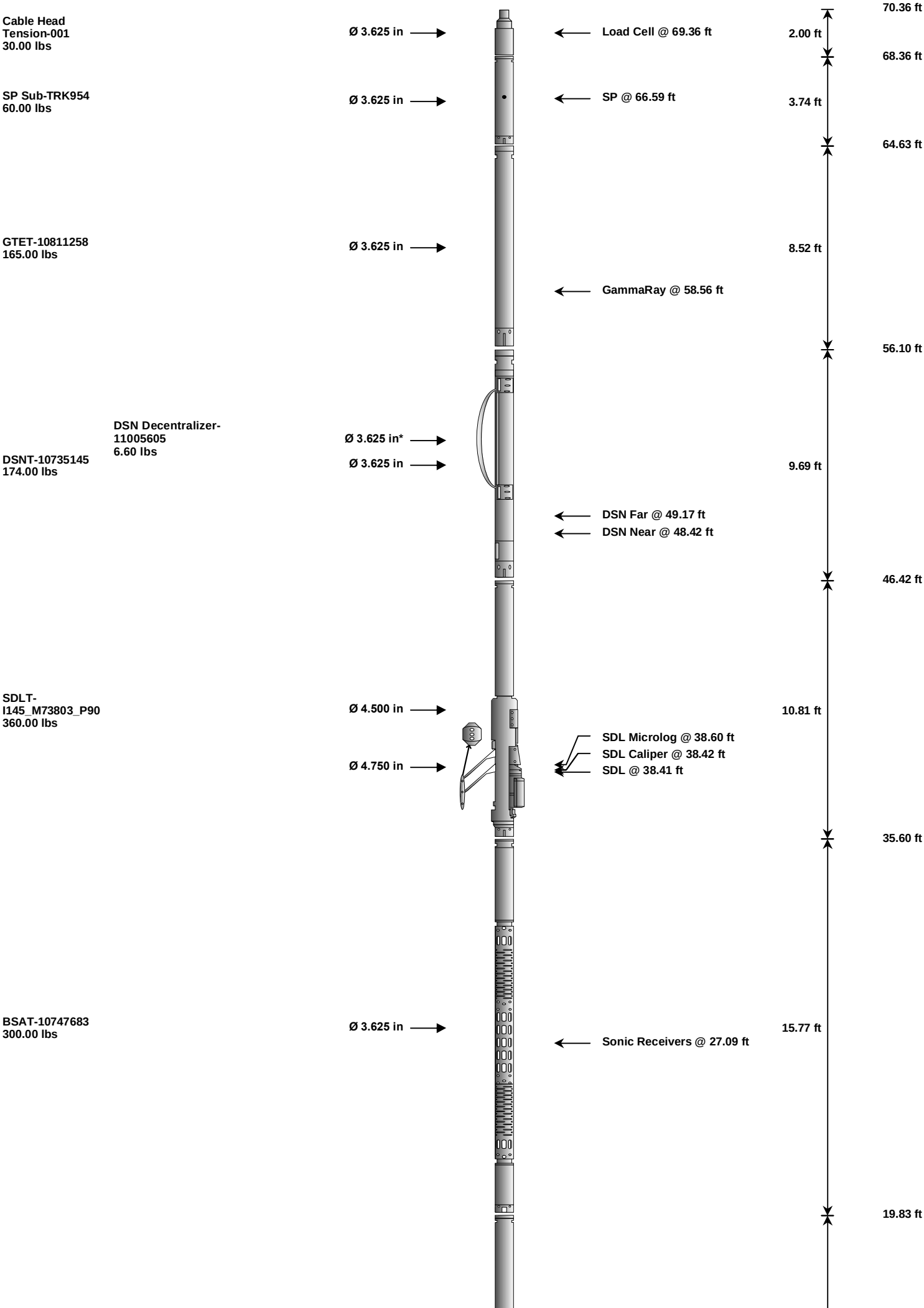
Plot Time: 24-Jun-11 10:22:52
Plot Range: 3750 ft to 4303.92 ft
Data: HORTON_1\Well Based\DAQ-0001-REPEAT\
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\BULKD_5_REP_LIB

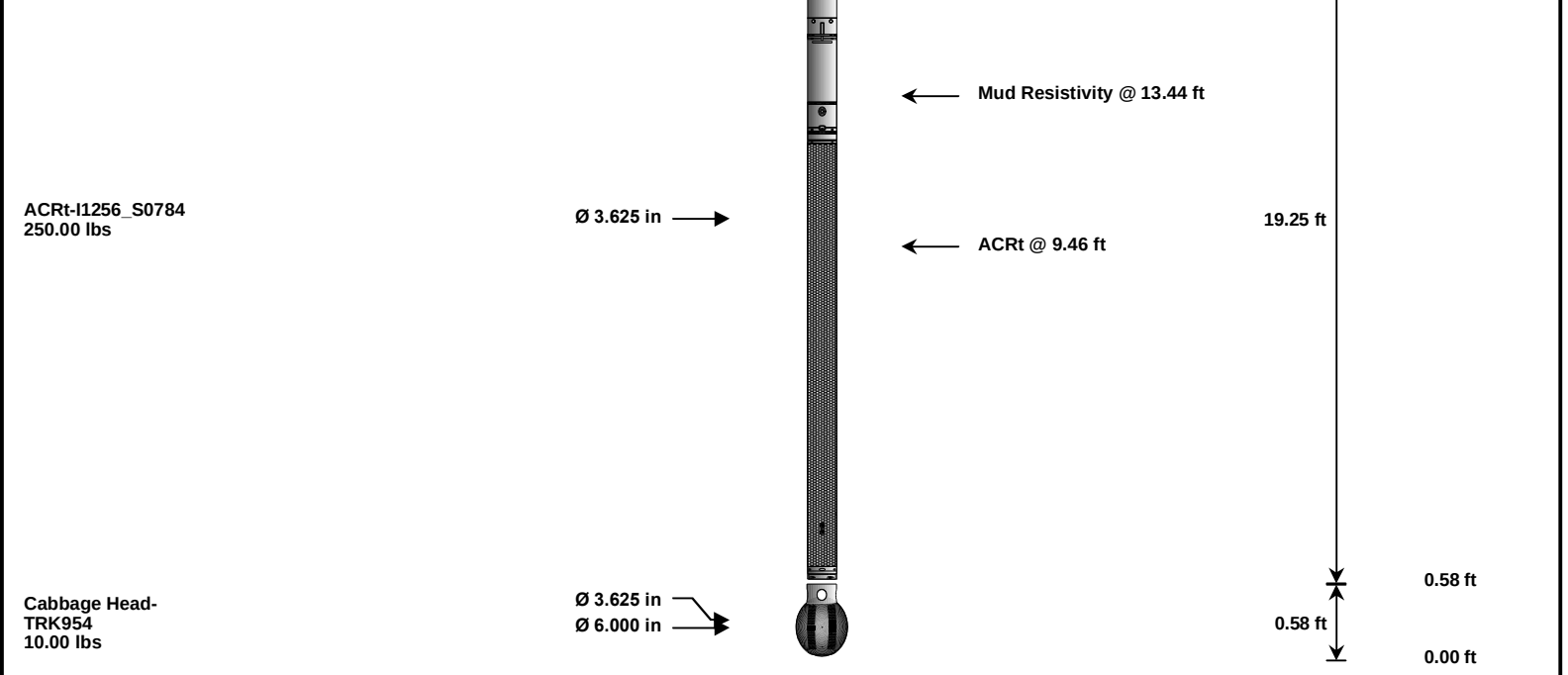
REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length


Cable Head Tension-001
30.00 lbs
Ø 3.625 in
Load Cell @ 69.36 ft
70.36 ft
2.00 ft
68.36 ft
SP Sub-TRK954
60.00 lbs
Ø 3.625 in
SP @ 66.59 ft
3.74 ft
64.63 ft
GTET-10811258
165.00 lbs
Ø 3.625 in
8.52 ft
GammaRay @ 58.56 ft
56.10 ft
DSN Decentralizer-11005605
6.60 lbs
Ø 3.625 in*
DSNT-10735145
174.00 lbs
Ø 3.625 in
9.69 ft
DSN Far @ 49.17 ft
DSN Near @ 48.42 ft
46.42 ft
SDLT-I145_M73803_P90
360.00 lbs
Ø 4.500 in
10.81 ft
SDL Microlog @ 38.60 ft
SDL Caliper @ 38.42 ft
Ø 4.750 in
SDL @ 38.41 ft
35.60 ft
BSAT-10747683
300.00 lbs
Ø 3.625 in
15.77 ft
Sonic Receivers @ 27.09 ft
19.83 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
CHT	Cable Head with Load Cell	001	30.00	2.00		68.36	300.00
SP	SP Sub	TRK954	60.00	3.74		64.63	300.00
GTET	Gamma Telemetry Tool	10811258	165.00	8.52		56.10	60.00
DSNT	Dual Spaced Neutron	10735145	174.00	9.69		46.42	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13	*	49.75	300.00
SDLT	Spectral Density Tool	I145_M73803_P90	360.00	10.81		35.60	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77		19.83	60.00
ACRt	Array Compensated True Resistivity	I1256_S0784	250.00	19.25		0.58	300.00
CBHD	Cabbage Head	TRK954	10.00	0.58		0.00	300.00
Total			**1,355.60**	**70.36**			

* Not included in Total Length and Length Accumulation.

Data: HORTON_1\0001 QUAD_COMBO\IDLE **Date: 23-Jun-11 22:15:02**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**20-May-11 16:40:55**
Engineer:	**C. MARLOWE**	**Calibration Date:**	**15-Jun-11 10:17:57**
Software Version:	**WL INSITE R3.2.5 (Build 2)**	**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	55.8	56.4	api
Background + Calibrator	285.5	288.4	api
Calibrator	232.5	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**15-Jun-11 10:17:57**
Engineer:	**S. JUNG**	**Calibration Date:**	**23-Jun-11 19:30:27**
Software Version:	**WL INSITE R3.2.5 (Build 2)**	**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	56.4	40.5	api
Background + Calibrator	288.4	273.5	api
Calibrator	232.0	233.0	api

Shop	Field	Difference	Tolerance
232.0	233.0	-1.0	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name: DSNT - 10735145 **Reference Calibration Date:** 18-May-11 21:10:57

Engineer: C. HAVERKAMP **Calibration Date:** 18-Jun-11 10:39:27

Software Version: WL INSITE R3.2.5 (Build 2) **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_10782954

Calibration Tank Water Temperature: 81 degF

Min. Tool Housing Outside Diameter: 3.615 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.938	0.939	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):	0.2098	0.2103	0.0005	+/- 0.0020
Calibrated Ratio:	9.69	9.70	0.016	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0706	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 - 10735145 **Reference Calibration Date:** 18-Jun-11 10:39:27

Engineer: S. JUNG **Calibration Date:** 23-Jun-11 19:40:27

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

Logging Source S/N: DSN-436

Snow Block S/N: TRK_10782954

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0706	0.0706	0.0001	+/- 0.0150

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

SPECTRAL DENSITY SHOP CALIBRATION

Tool Name:	**SDLT - I145_M73803_P90**	**Reference Calibration Date:**	**18-May-11 17:44:44**
Engineer:	**C. MARLOWE**	**Calibration Date:**	**15-Jun-11 10:34:46**
Software Version:	**WL INSITE R3.2.5 (Build 2)**	**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	1.0080	1.0023	0.90 - 1.10
Near Dens Gain	1.0081	0.9875	0.90 - 1.10
Near Peak Gain	1.0056	0.9973	0.90 - 1.10
Near Lith Gain	0.9844	0.9632	0.90 - 1.10
Far Bar Gain	0.9923	0.9925	0.90 - 1.10
Far Dens Gain	0.9826	0.9820	0.90 - 1.10
Far Peak Gain	0.9743	0.9736	0.90 - 1.10
Far Lith Gain	0.9481	0.9394	0.90 - 1.10
Near Bar Offset	0.0954	0.1527	NONE
Near Dens Offset	0.0893	0.2754	NONE
Near Peak Offset	0.1119	0.1868	NONE
Near Lith Offset	0.2668	0.4501	NONE
Far Bar Offset	0.1571	0.1560	NONE
Far Dens Offset	0.2226	0.2246	NONE
Far Peak Offset	0.2358	0.2385	NONE
Far Lith Offset	0.3443	0.4060	NONE
Near Bar Background	902.15	900.23	700 - 1450
Near Dens Background	299.70	298.99	230 - 480
Near Peak Background	131.63	131.80	100 - 210
Near Lith Background	160.75	160.57	125 - 260
Far Bar Background	604.55	602.78	450 - 900
Far Dens Background	237.94	236.92	175 - 345
Far Peak Background	94.36	94.07	70 - 140
Far Lith Background	98.09	99.15	75 - 145

CALIBRATION BLOCK SUMMARY

Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.685	1.690	0.005	+/- 0.015
Pe	2.567	2.560	-0.007	+/- 0.150
ALUMINUM				
Density (g/cc)	2.581	2.591	0.010	+/- 0.01500
Pe	3.154	3.134	-0.020	+/- 0.150

TOOL SUMMARY

Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0014	+/- 0.0110	-0.0025	+/- 0.0140
Magnesium Block	-0.0008	+/- 0.0110	-0.0013	+/- 0.0140
Aluminum Block	-0.0007	+/- 0.0110	0.0000	+/- 0.0140
Resolution	8.85	6.00 - 11.50	9.01	6.00 - 11.50
Internal Verifier(B+D+P+L)	1492	1200 - 2700	1033	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 - I145_M73803_P90 **Reference Calibration Date:** 15-Jun-11 10:34:46

Engineer: S. JUNG **Calibration Date:** 23-Jun-11 19:31:21

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

Pad Temperature: 73.4 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1491.582	1499.654	8.072	15.565
Far (B+D+P+L) cps	1032.924	1036.240	3.316	17.120
Near Resolution	8.85	9.03	0.180	0.50
Far Resolution	9.01	9.25	0.240	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

MICRO LOG SHOP CALIBRATION

Tool Name: SDLT - I145_M73803_P90 **Reference Calibration Date:** 15-Jun-11 11:53:22

Engineer: S. JUNG **Calibration Date:** 23-Jun-11 19:50:35

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		
	Measured	Calibrated	Measured	Calibrated	Units
Tool Zero	-0.07	-0.07	-0.01	-0.01	ohmm
Calibration Point #1	0.00	0.00	-0.00	0.00	ohmm
Calibration Point #2	20.05	20.00	20.04	20.00	ohmm
Internal Reference	19.97	19.93	20.04	19.99	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-0.03	0.01	V

Calibration Point #1	19.89	2.53	V
Calibration Point #2	5421.64	7046.62	V
Internal Reference	5402.18	7044.74	V

MICRO LOG FIELD CHECK

Tool Name: SDLT - I145_M73803_P90 **Reference Calibration Date:** 23-Jun-11 19:50:35

Engineer: S. JUNG **Calibration Date:** 23-Jun-11 19:51:02

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

Measurement	Micro Log Normal		Micro Log Lateral		
	Shop	Field	Shop	Field	Units
Tool Zero	-0.07	-0.07	-0.01	-0.01	ohmm
Internal Reference	19.93	19.93	19.99	20.00	ohmm

Summary

Signal	Shop	Field	Difference	Tolerence
Microlog Normal	19.93	19.93	0.00	+/- 0.80
Microlog Lateral	19.99	20.00	-0.01	+/- 0.80

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - I145_M73803_P90 **Reference Calibration Date:** 20-May-11 16:52:52

Engineer: C. MARLOWE **Calibration Date:** 15-Jun-11 11:43:08

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-2676.44	-2594.17	-7000.00 - -1000.00
Pad Gain	0.0003965	0.0003994	0.000200 - 0.000600
Arm Offset	-1687.08	-1863.07	-5000.00 - 3000.00
Arm Gain	0.0005317	0.0005373	0.000300 - 0.000700
Arm Power	-0.000006112	-0.000006132	-0.000010 - 0.000010

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)	1.95	2.00	0.05	+/- 0.20
Medium Ring (in)	3.69	3.75	0.06	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.54	6.50	-0.04	+/- 0.20
Medium Ring (in)	8.26	8.25	-0.01	+/- 0.20
Large Ring (in)	14.93	15.00	0.07	+/- 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 - I145_M73803_P90 **Reference Calibration Date:** 15-Jun-11 11:43:08

Engineer: S. JUNG **Calibration Date:** 23-Jun-11 19:43:57

Software Version: WL INSITE R3.2.5 (Build 2) **Calibration Version:** 1

MEASURED CALIPER VALUES

Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.79	0.04	+/- 0.10
Ring Diameter	8.25	8.19	-0.06	+/- 0.15

PASS/FAIL SUMMARY

Pad Extension Check:	Passed
Diameter Check:	Passed

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10811258						
Gamma Ray Calibrator	232.0	233.0	----------	-1.0	+/- 9.00	api
DSNT-10735145						
Snow-Block Porosity	0.0706	0.0706	----------	0.0000	+/- 0.0150	decp
SDLT-I145_M73803_P90						
Near(B+D+P+L)	1491.582	1499.654	----------	-8.072	+/-15.565	cps
Far(B+D+P+L)	1032.924	1036.240	----------	-3.316	+/-17.120	cps
MicroLog Normal	19.93	19.93	----------	0.00	+/-0.80	ohmm
MicroLog Lateral	19.99	20.00	----------	-0.01	+/-0.80	ohmm
Pad Extension	3.75	3.79	----------	-0.04	+/-0.10	in
Ring Diameter	8.25	8.19	----------	0.060	+/-0.15	in

Data: HORTON_1\0001 QUAD_COMBO\IDLE **Date: 24-Jun-11 00:19:28**

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	9.000	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.320	ohmm
	SHARED	TRM	Temperature of Mud	74.0	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	4320.00	ft
	SHARED	BHT	Bottom Hole Temperature	120.0	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	0.27	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	73.00	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

INPUTS, DELAYS AND FILTERS TABLE

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

PHV	Pad 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

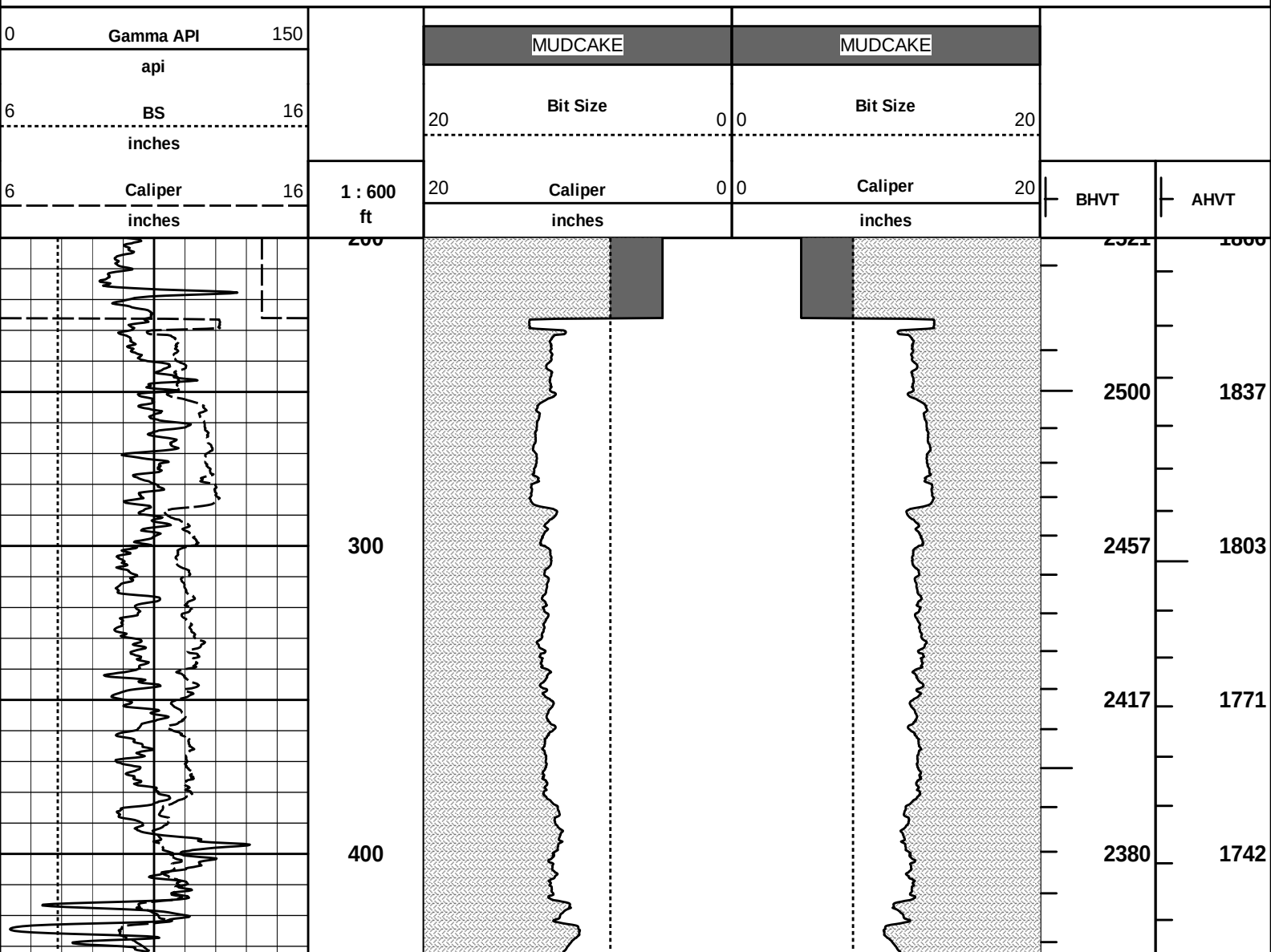
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter 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	

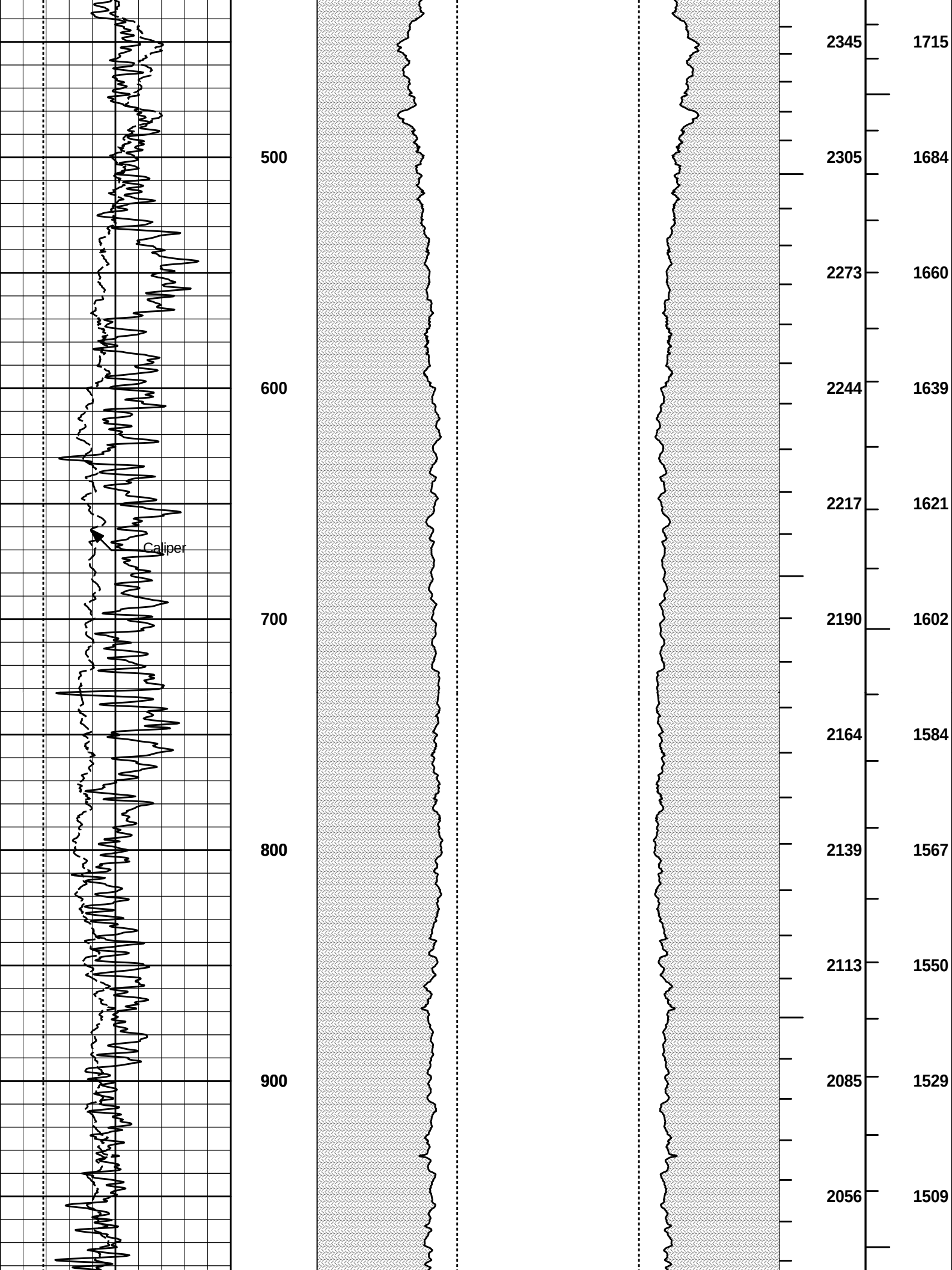
Data: HORTON_1\0001 QUAD_COMBO\IDLE **Date: 23-Jun-11 22:15:57**

HALLIBURTON

Plot Time: 24-Jun-11 10:22:53
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\AHV_5_5_INCH_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT (5.5 INCH)




500
600
700
800
900
Caliper
2345
2305
2273
2244
2217
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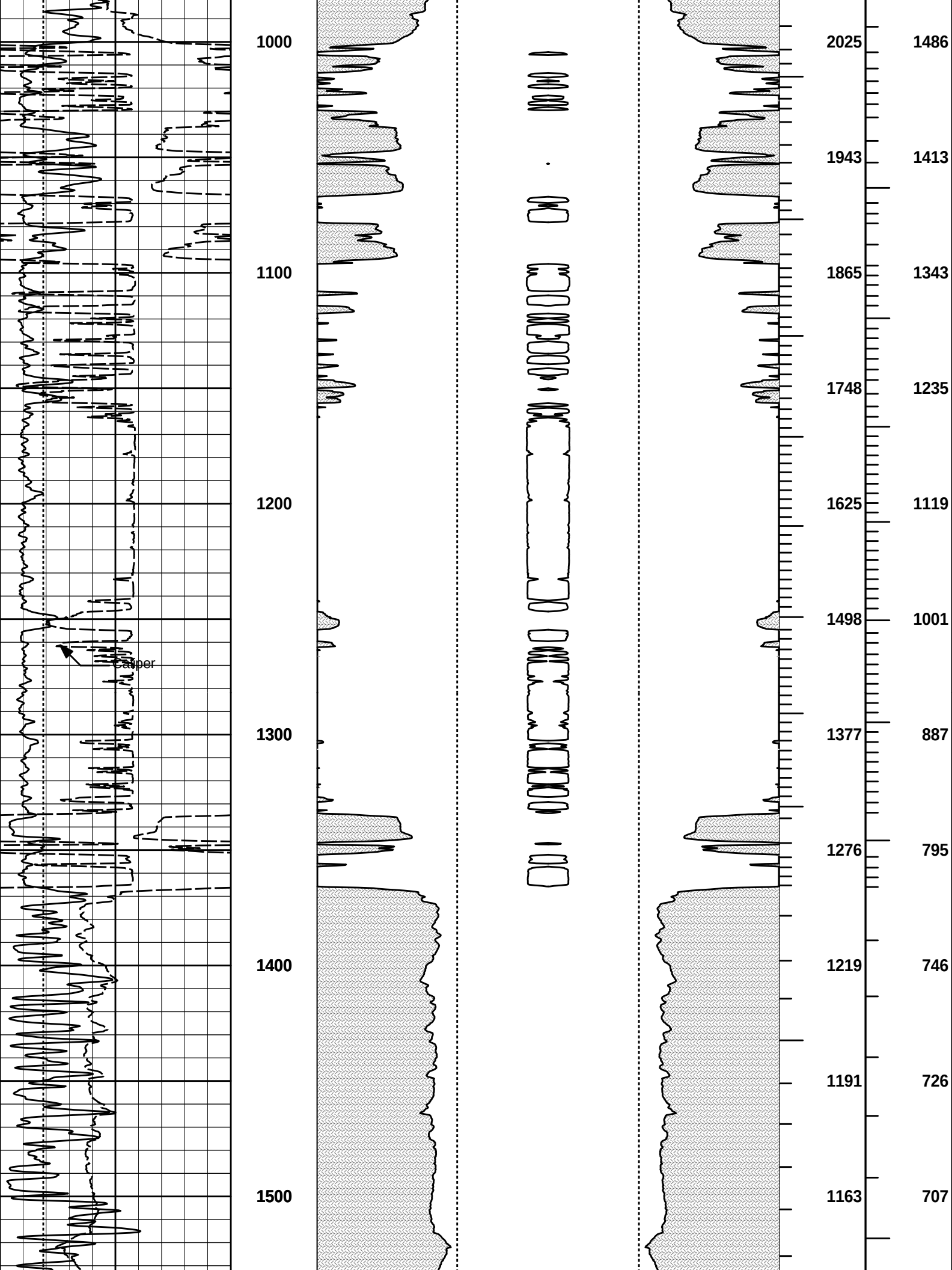
1715
1684
1660
1639
1621
1602
1584
1567
1550
1529
1509


1000
1100
1200
1300
1400
1500
Caliper
2025
1943
1865
1748
1625
1498
1377
1276
1219
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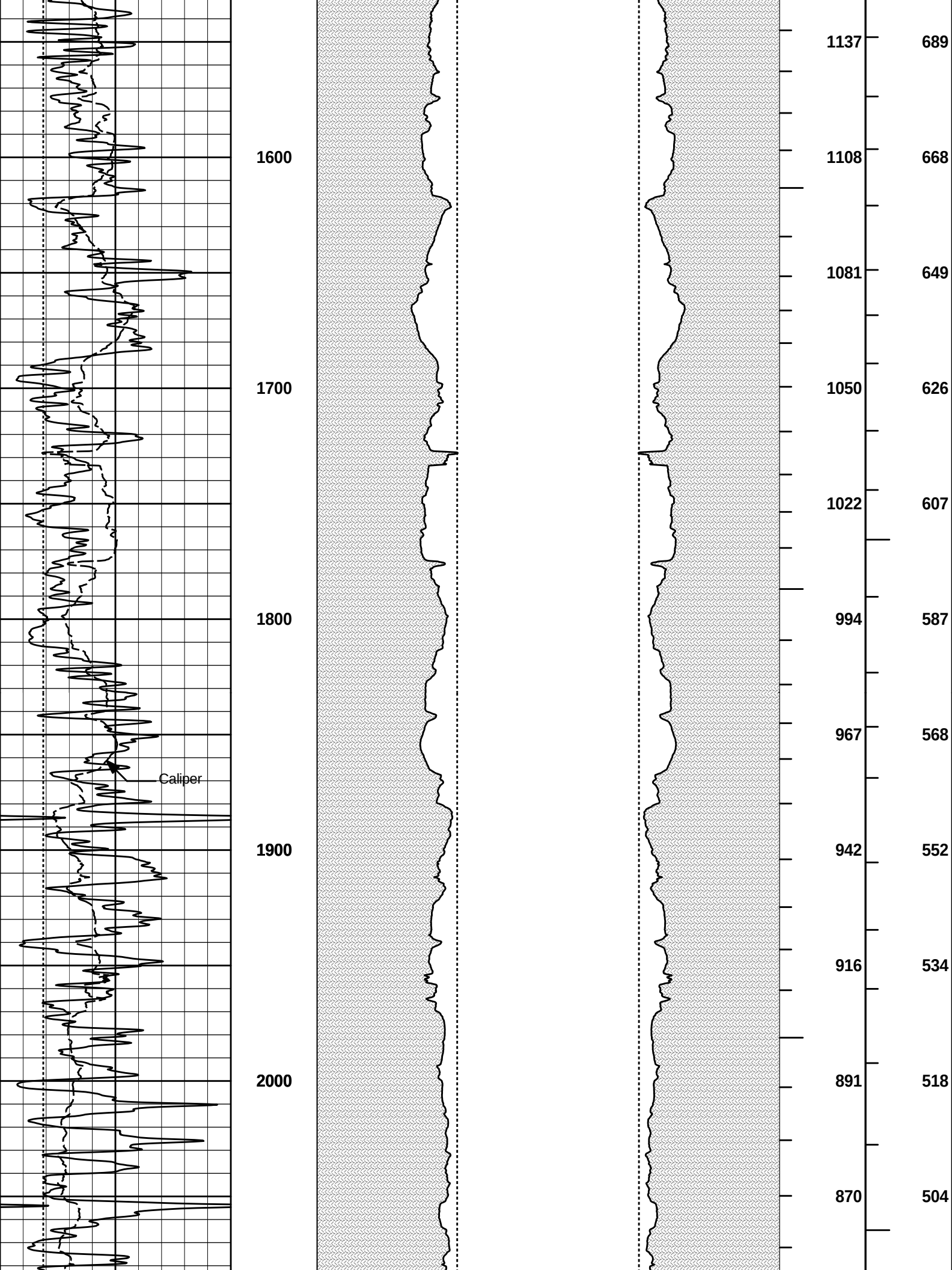
1235
1119
1001
887
795
746
726
707


1600
1700
1800
1900
2000
Caliper
1137
1108
1081
1050
1022
994
967
942
916
891
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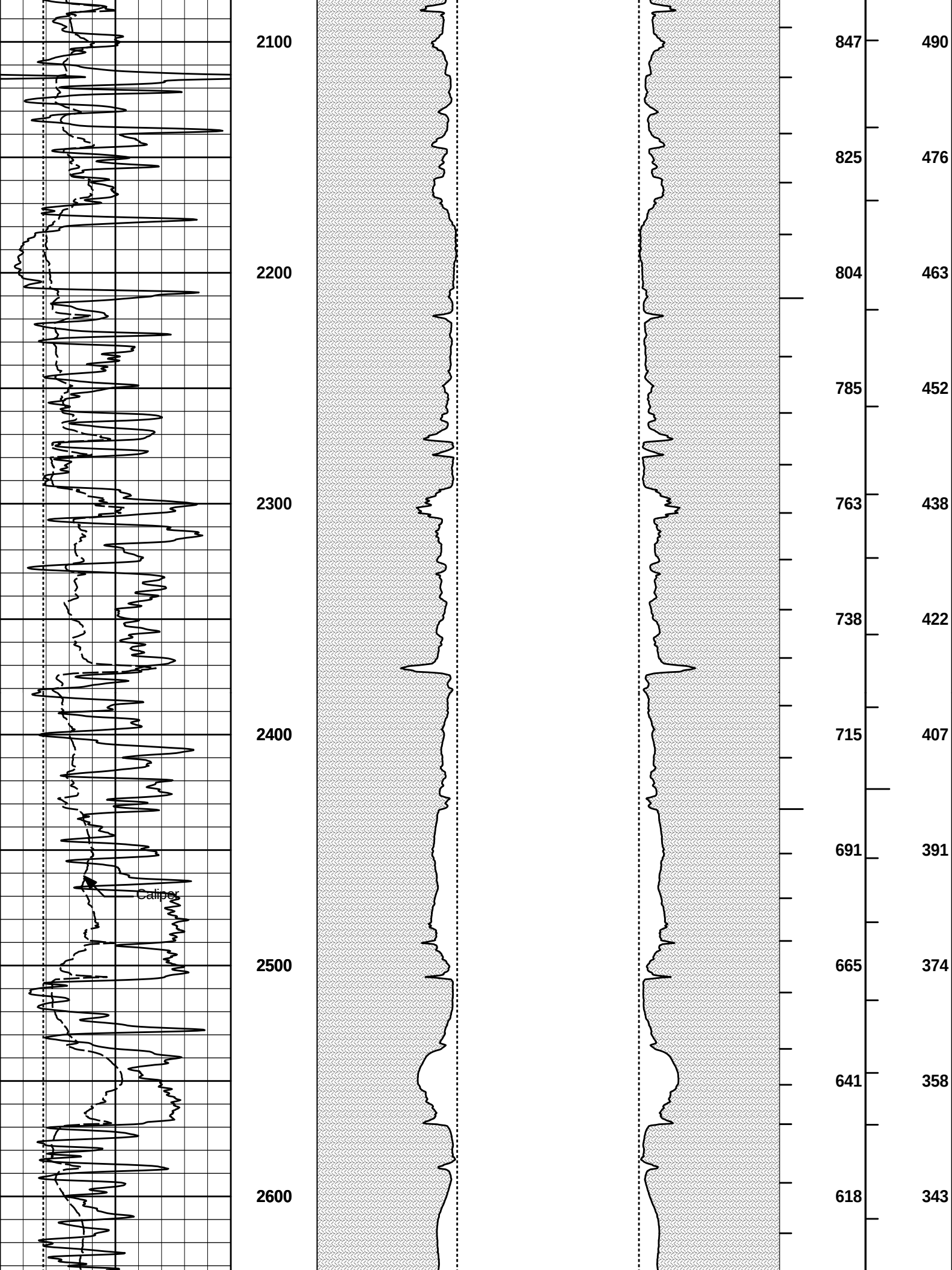
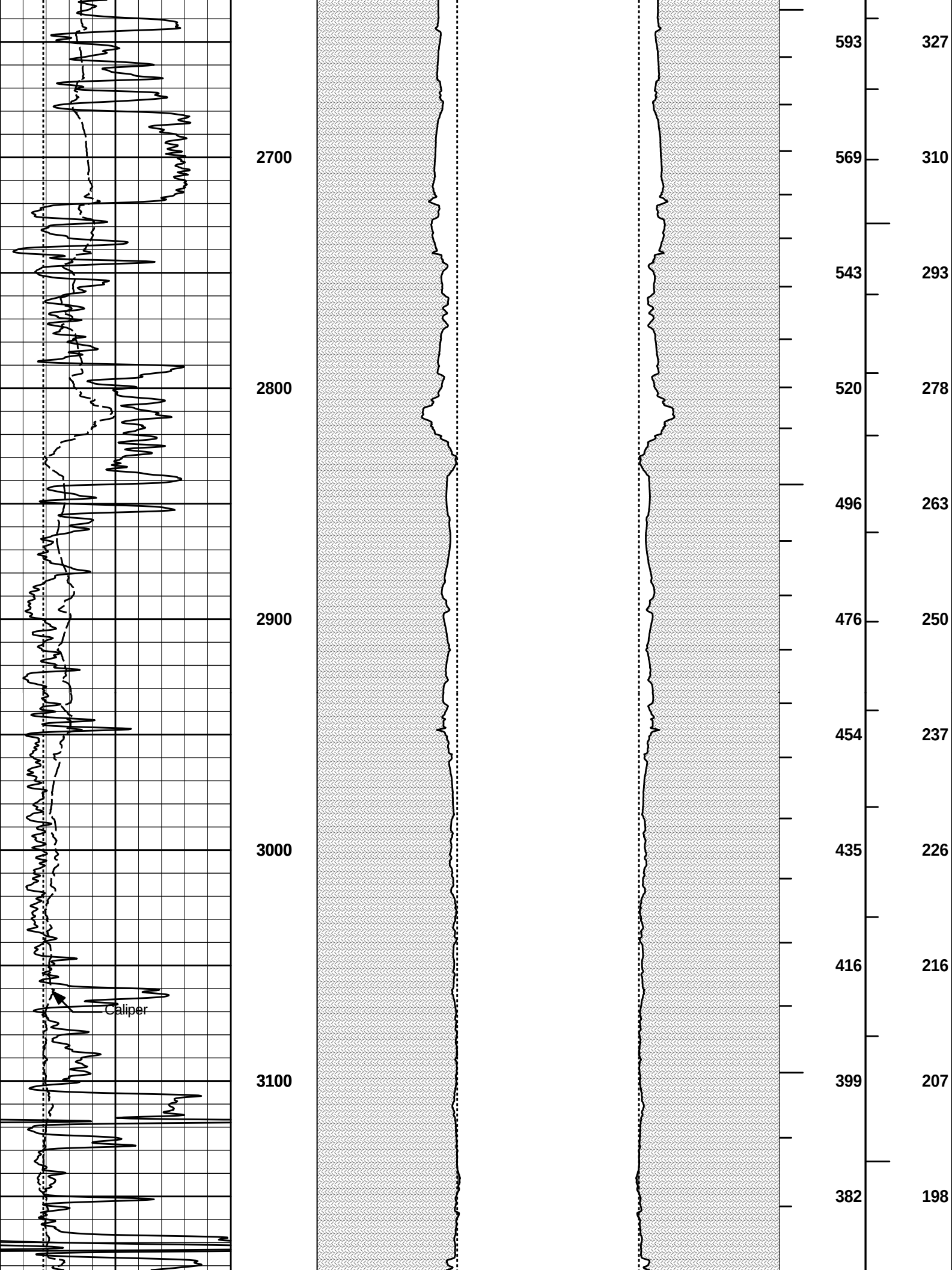
668
649
626
607
587
568
552
534
518
504


2100
2200
2300
2400
2500
2600
Caliper
847
825
804
785
763
738
715
691
665
641
618
490
476
463
452
438
422
407
391
374
358
343


2700
2800
2900
3000
3100
Caliper
593
569
543
520
496
476
454
435
416
399
382
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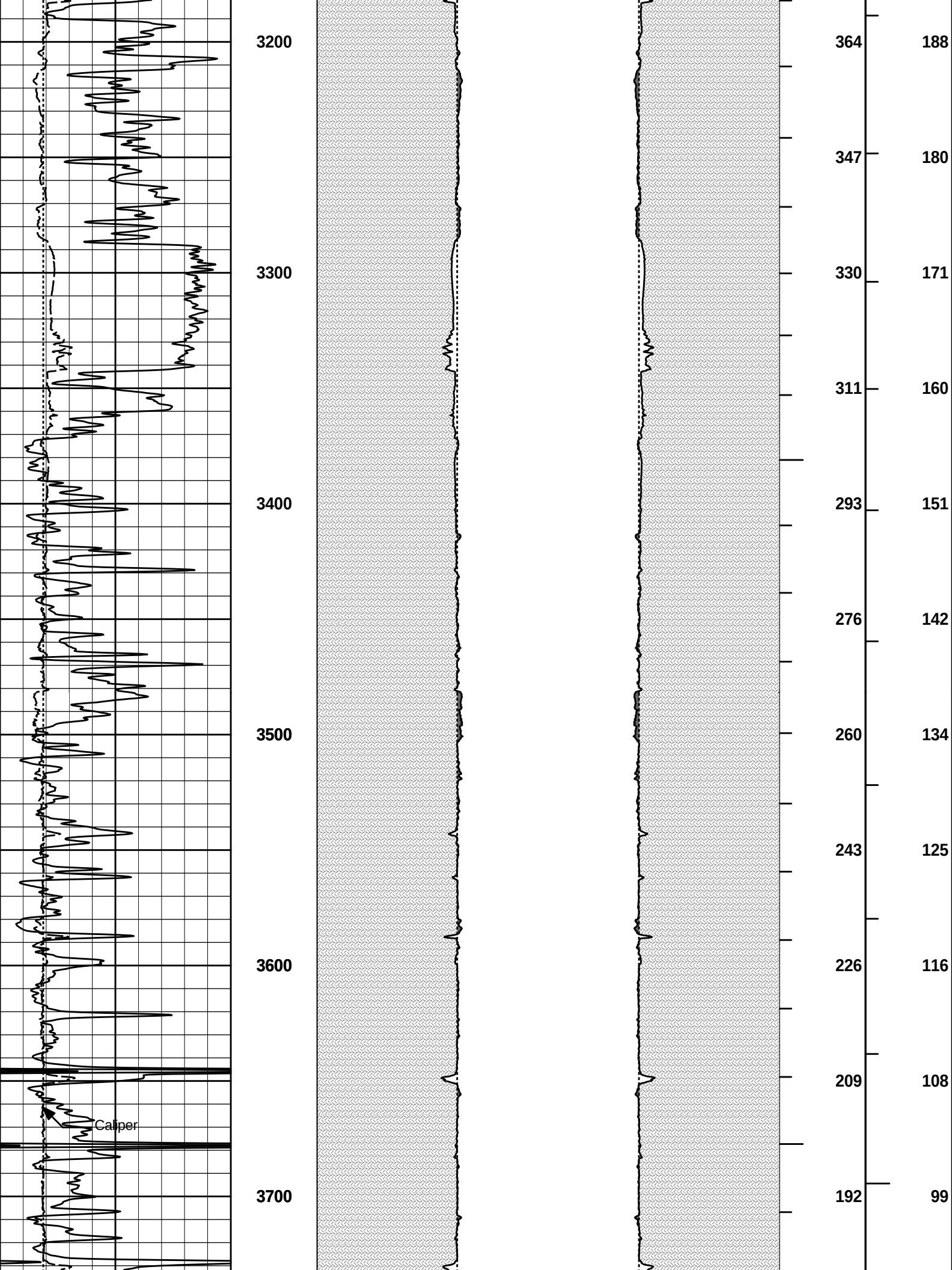
310
293
278
263
250
237
226
216
207
198


3200
3300
3400
3500
3600
3700
Caliper
364
347
330
311
293
276
260
243
226
209
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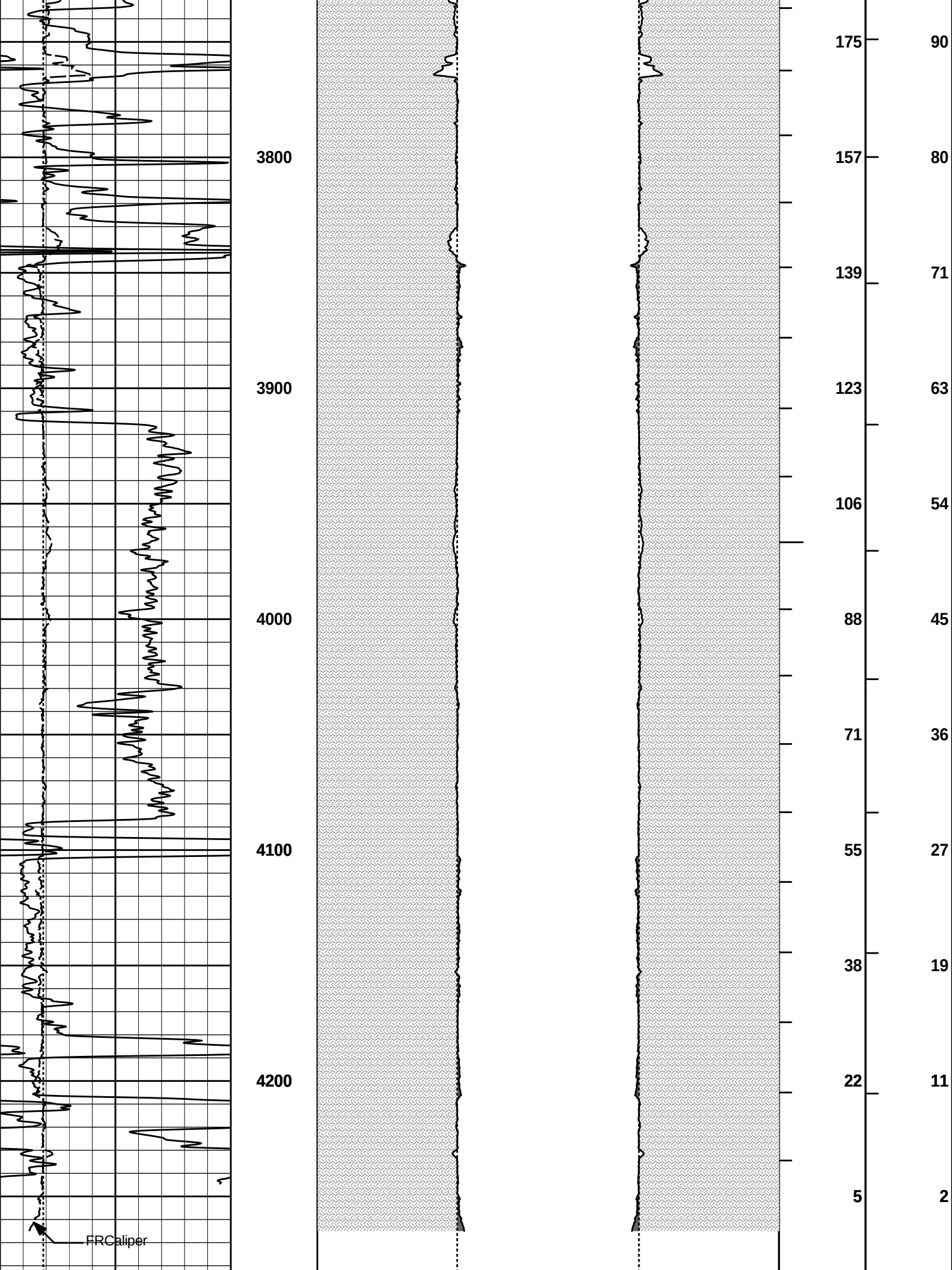
180
171
160
151
142
134
125
116
108
99


3800
3900
4000
4100
4200
175
157
139
123
106
88
71
55
38
22
5
90
80
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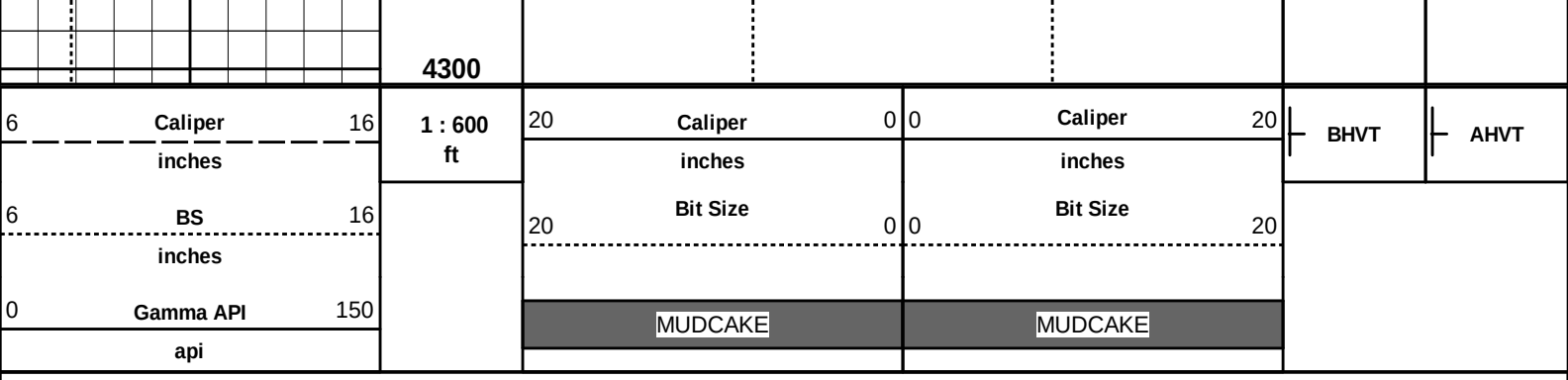
63
54
45
36
27
19
11
2
FRCaliper



HALLIBURTON

Plot Time: 24-Jun-11 10:22:57
Plot Range: 200 ft to 4304 ft
Data: HORTON_1\Well Based\DAQ-0001-CSG
Plot File: \\-LOCAL-\HORTON_1\0001 QUAD_COMBO\POROML\AHV_5_5_INCH_2_IQ_LIB

ANNULAR HOLE VOLUME PLOT (5.5 INCH)

COMPANY	**NEW GULF OPERATING, LLC**		
WELL	**HORTON #1**		
FIELD	**LANGDON**		
COUNTY	**RENO**	STATE	**KANSAS**

HALLIBURTON

SPECTRAL DENSITY
DUAL SPACED NEUTRON
MICROLOG