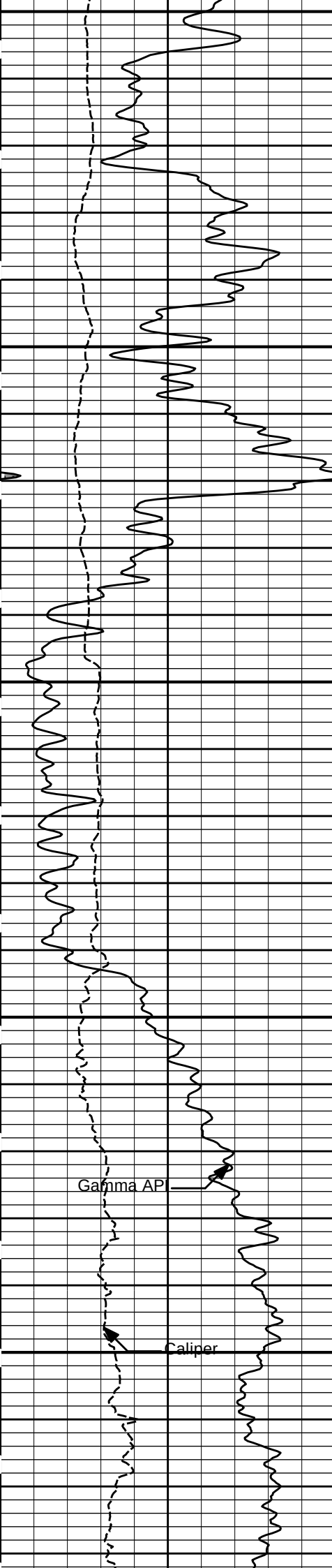


HALLIBURTON										MICRO LOG									
COMPANY					CULBREATH OIL & GAS					COMPANY					CULBREATH OIL & GAS				
WELL					MINIUM 1-19					WELL					MINIUM 1-19				
FIELD/BLOCK					KANACO-MORELAND					FIELD/BLOCK					KANACO-MORELAND				
COUNTY					SHERIDAN					COUNTY					SHERIDAN				
STATE					KANSAS					STATE					KANSAS				
Permanent Datum					GL					Other Services:					GTET				
Log measured from					KB					IDT					DSNT				
Drilling measured from					KB					SDLT					BSAT				
Date					18-Apr-18					Elev. 2654.0 ft					D.F.				
Run No.					ONE					G.L.					2654.0 ft				
Depth - Driller					4146.0 ft														
Depth - Logger					4145.0 ft														
Bottom - Logged Interval					4107.0 ft														
Top - Logged Interval					500.0 ft														
Casing - Driller					8.625 in					@					@				
Casing - Logger					265.0 ft														
Bit Size					7.875 in					@					@				
Type Fluid in Hole					Water Based Mud														
Density					9.2 ppg					53.00 s/qt									
PH					10.00 pH					7.2 cpm									
Source of Sample					MUD PIT														
Rm @ Meas. Temperature					1.18 ohmm					@ 75.00 degF					@				
Rmf @ Meas. Temperature					0.94 ohmm					@ 75.00 degF					@				
Rmc @ Meas. Temperature					1.42 ohmm					@ 75.00 degF					@				
Source Rmf					MEAS					MEAS									
Rm @ BHT					0.78 ohmm					@ 125.0 degF					@				
Time Since Circulation					05:25 hr														
Time on Bottom					18-Apr-18 03:55														
Max. Rec. Temperature					125.00 degF					@ 4145.0 ft					@				
Equipment					12147634					EL RENO									
Recorded By					SEAN WOLTEMATH														
Witnessed By					HAROLD BELLERIVE										LARRY NICHOLSON				

Service Ticket No.: 904783727						API No.: 15-179-21448-00-00						PGM Version: WL INSITE R5.0.5 (Build 8)							
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																		
Source of Sample						RESISTIVITY EQUIPMENT DATA													
Rm @ Meas. Temp		@		@		Run No.	Tool Type & No.	Pad Type		Tool Pos.		Other							
Rmf @ Meas. Temp.		@		@		ONE	ACRT	N/A		1.5 in S.O.		N/A							
Rmc @ Meas. Temp.		@		@			I-11026095												
Source Rmf	Rmc						S-11005908												
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.		11958947		Serial No.		10747683		Serial No.		10865873		Serial No.		11055304					
Model No.		GTET		Model No.		BSAT		Model No.		SDLT		Model No.		DSNT					
Diameter		3.625"		No. of Cent.		2		Diameter		5.5"		Diameter		3.625"					
Detector Model No.		GTET		Spacing		EVEN		Log Type		GAM-GAM		Log Type		NEU-NEU					
Type		SCINT						Source Type		Cs137		Source Type		Am241Be					
Length		8"		LSA [Y/N]				Serial No.		5168GW		Serial No.		DSN-424					
Distance to Source		10'		FWDA [Y/N]				Strength		1.5 Ci		Strength		15.0 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	Matrix		L	R	Matrix		L	R	Matrix		
ONE		TD	CSG	PEC	0	150	30	10			47.6 μsec/ft	30			10	2.71 g/cc			30

ONE	TD	CSG	REC	U	150	30	-10	47.0 usec/ft	30	-10	2.71 g/cc	30	-10	TIME		
DIRECTIONAL INFORMATION																
Maximum Deviation								@	KOP							@
Remarks: GTET-IDT-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION																
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING																
NO POST-CALS PERFORMED AS PER CLIENT REQUEST																
CHLORIDES REPORTED AT 2500 ppm																

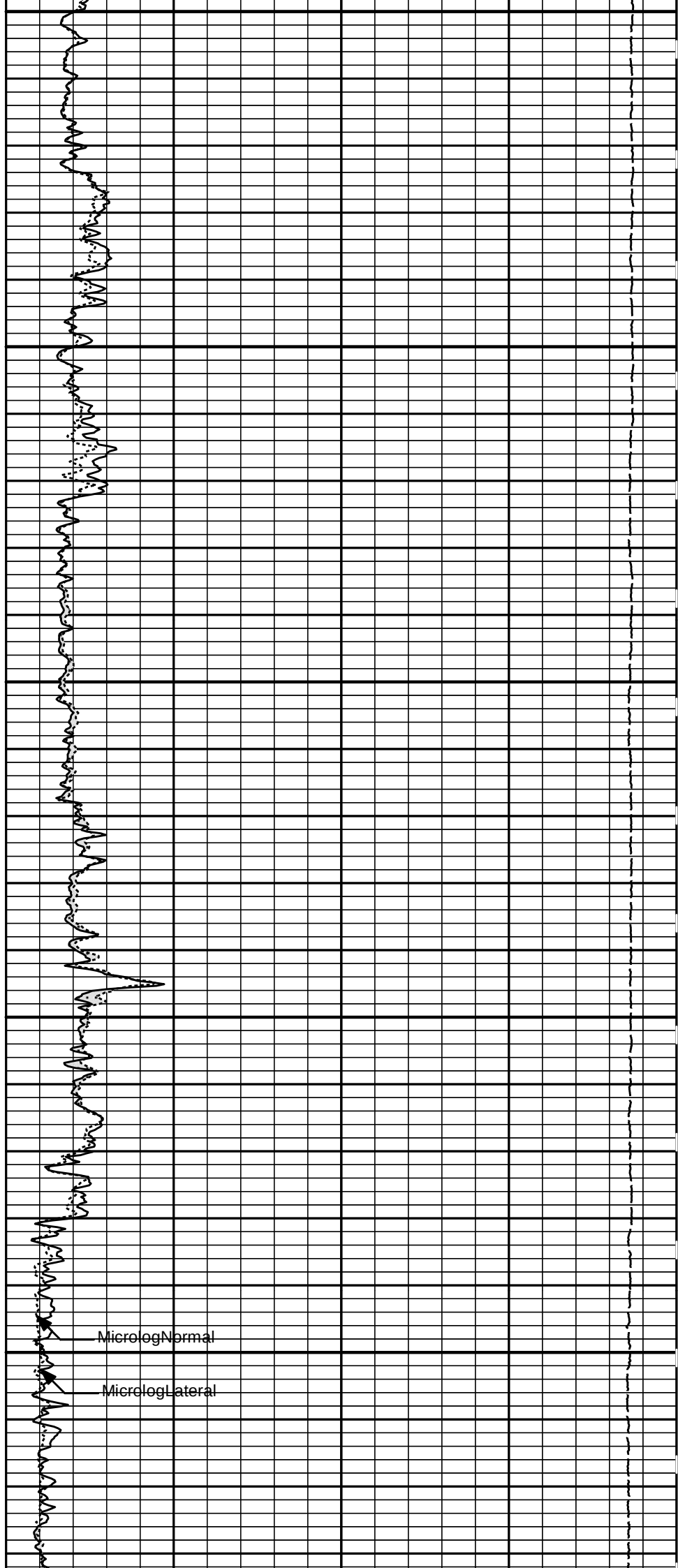


600

700

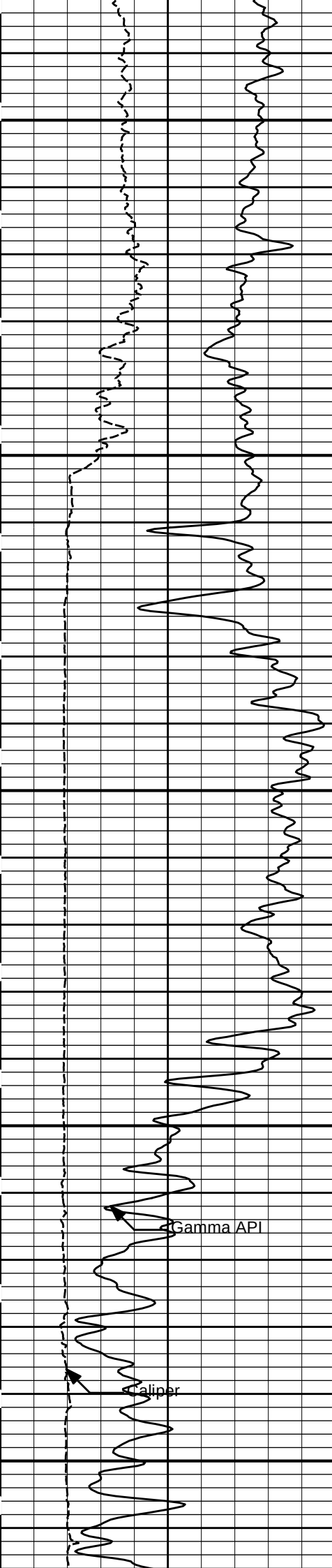
Gamma API

Caliper



MicrologNormal

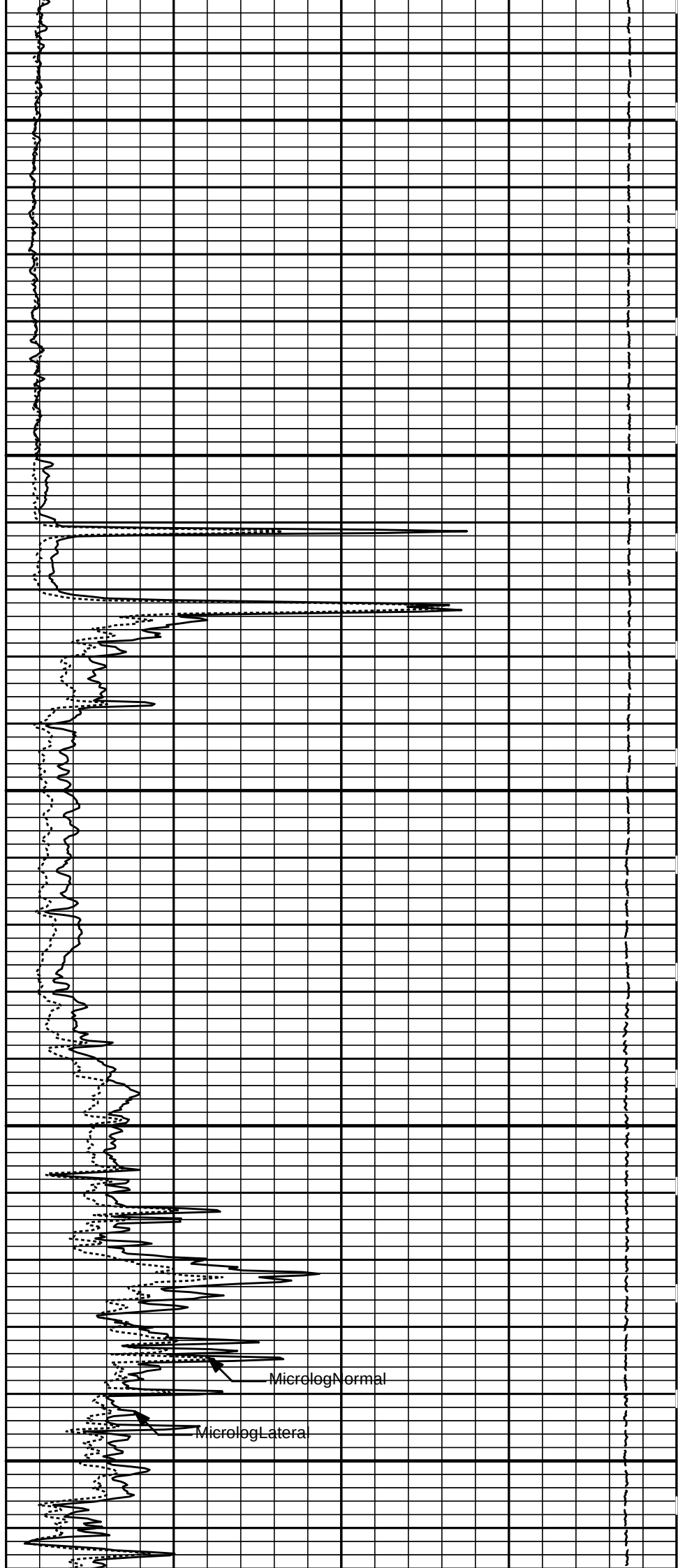
MicrologLateral

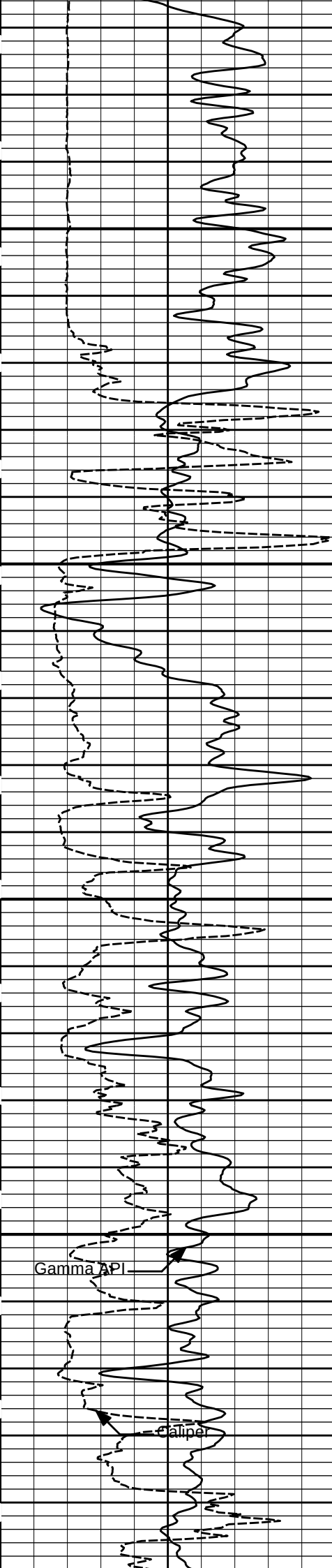


800

900

1000



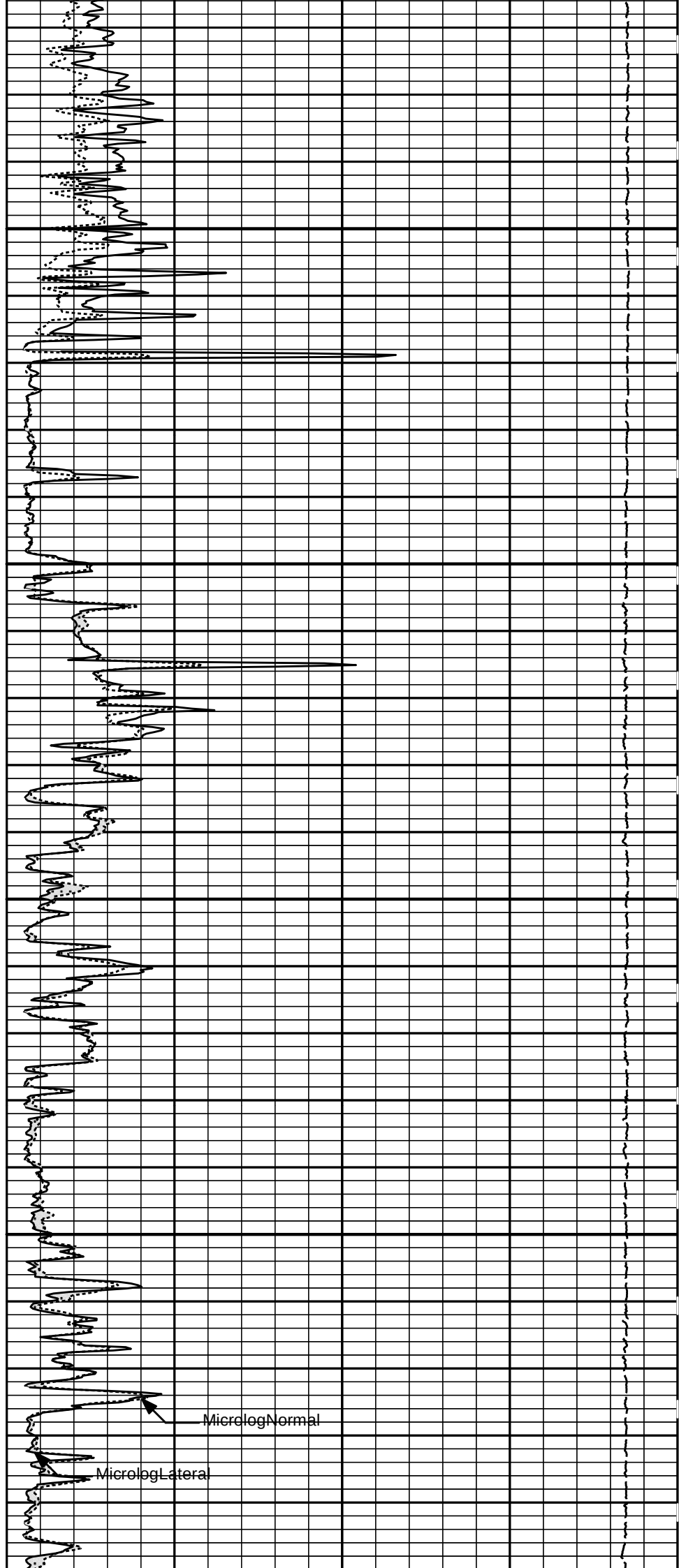


1100

1200

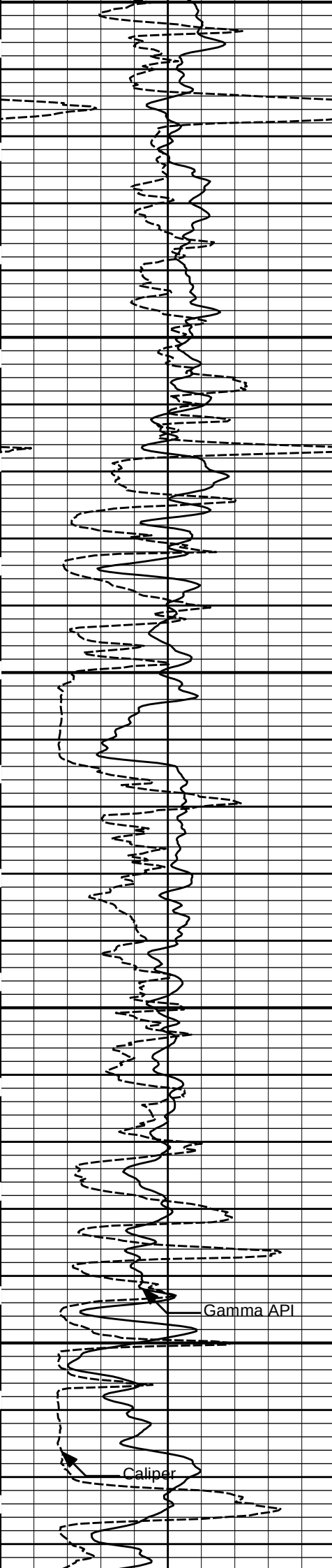
Gamma API

Caliper



MicrologNormal

MicrologLateral

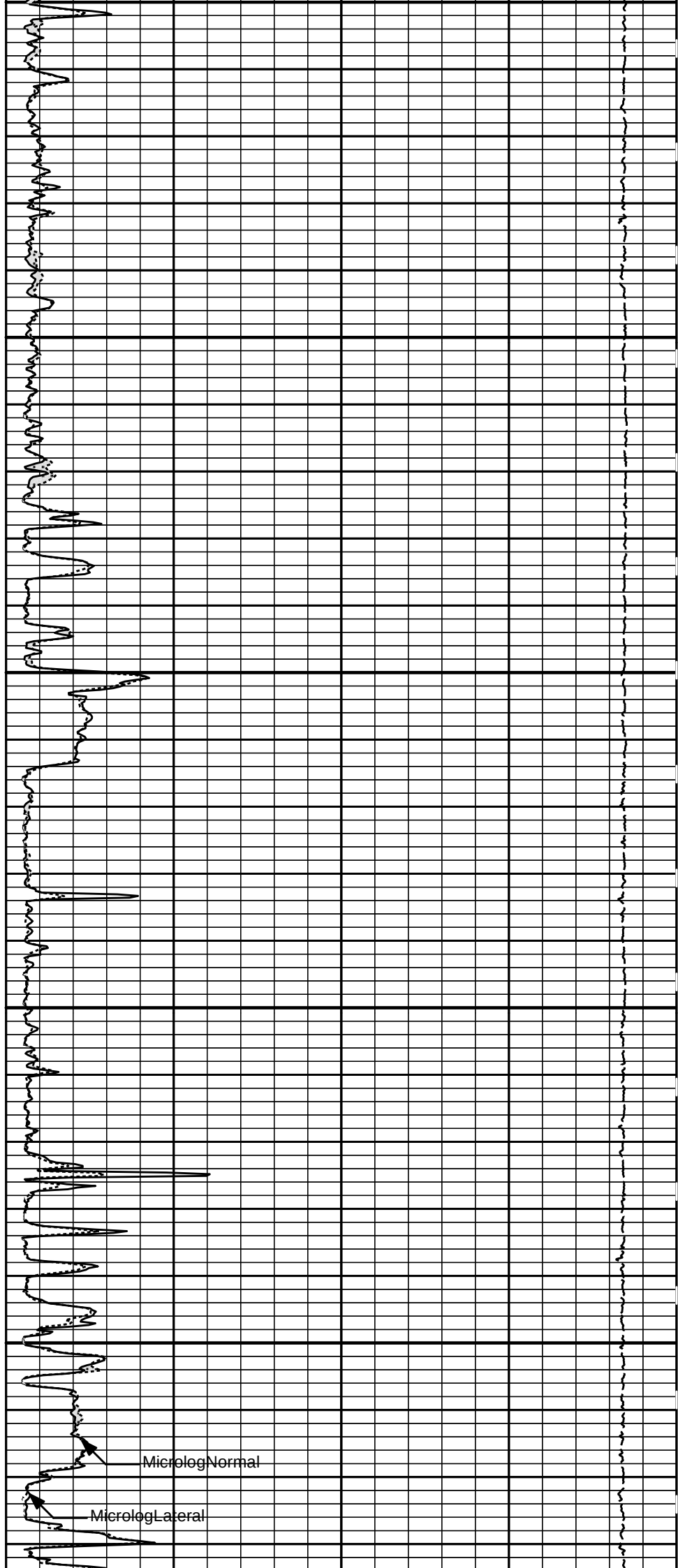


1300

1400

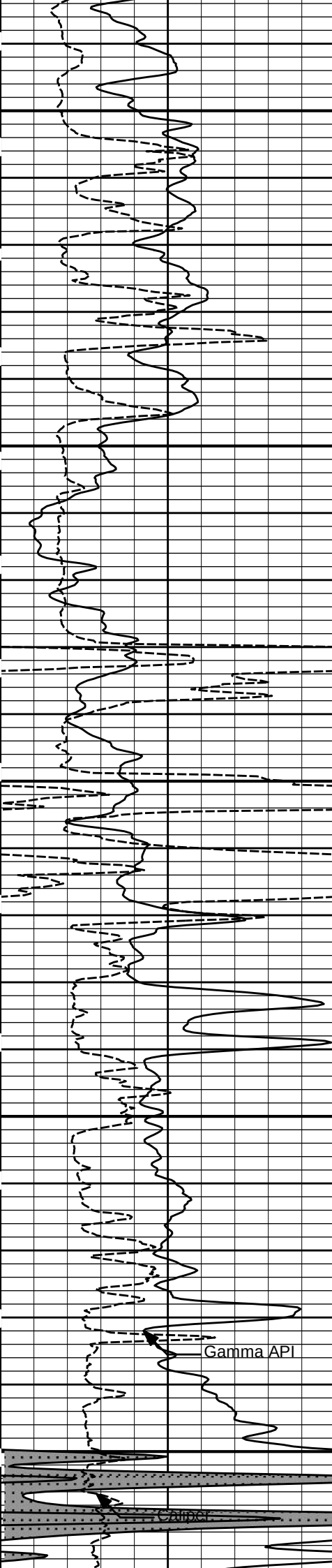
Gamma API

Caliper



MicrologNormal

MicrologLateral



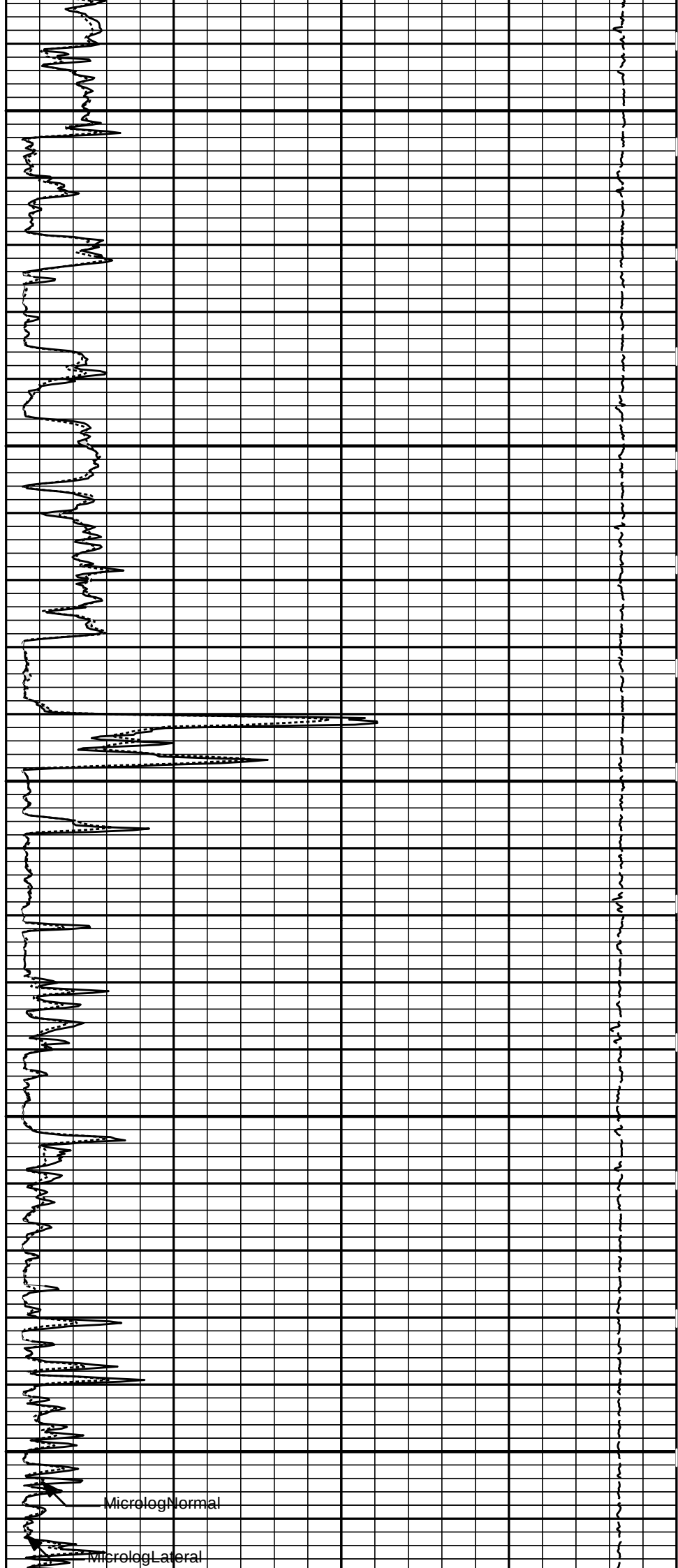
1500

1600

1700

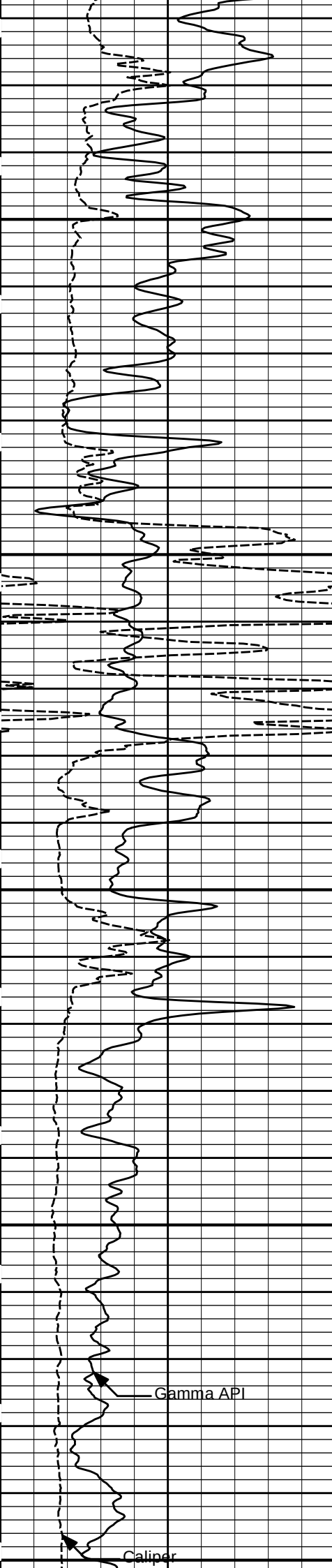
Gamma API

Caliper



MicrologNormal

MicrologLateral

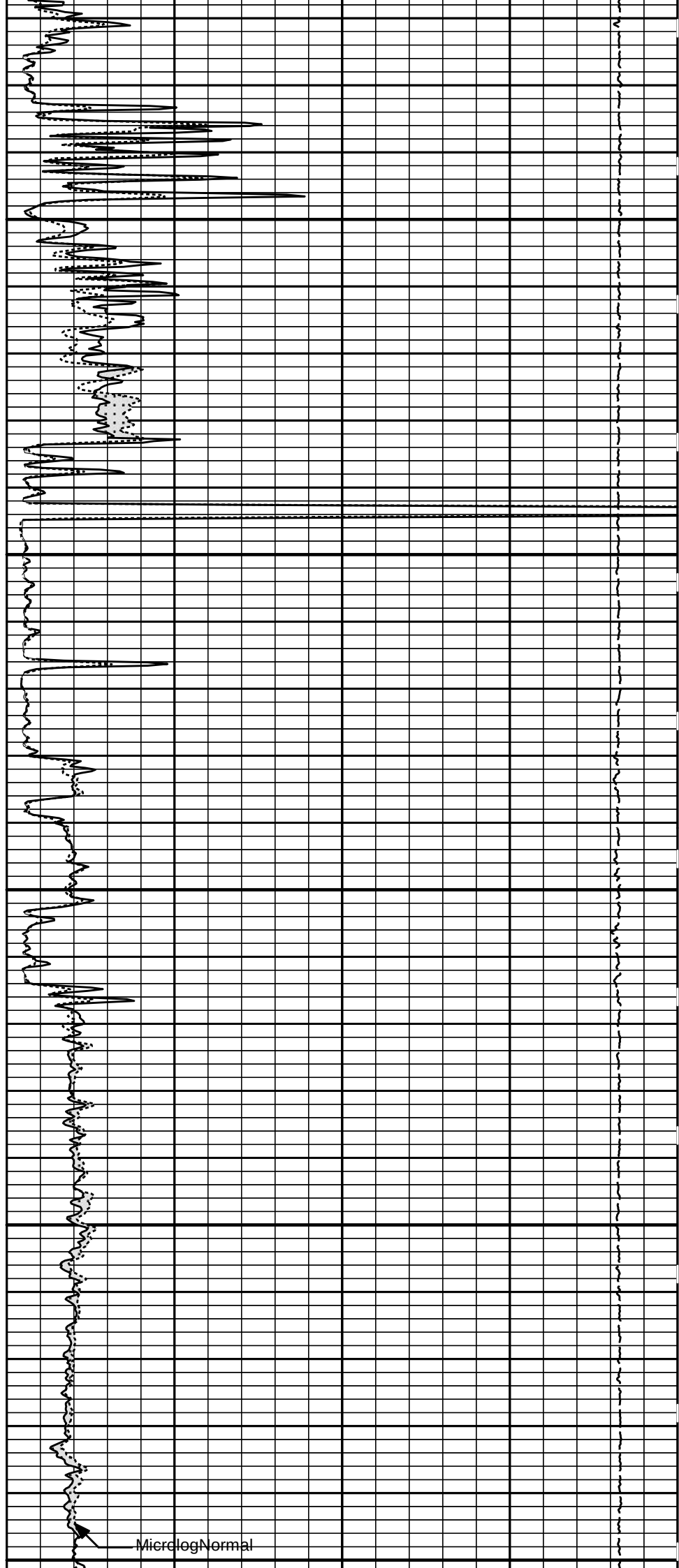


1800

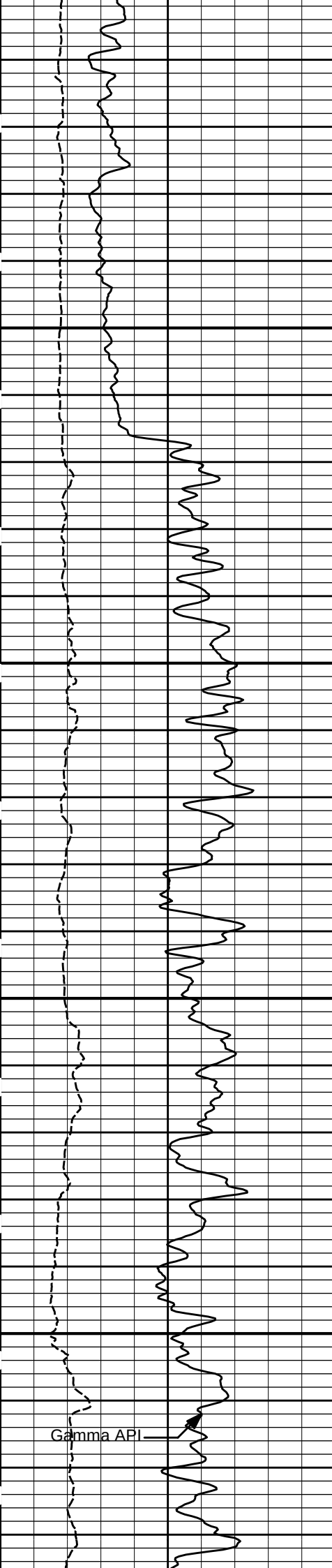
1900

Gamma API

Caliper

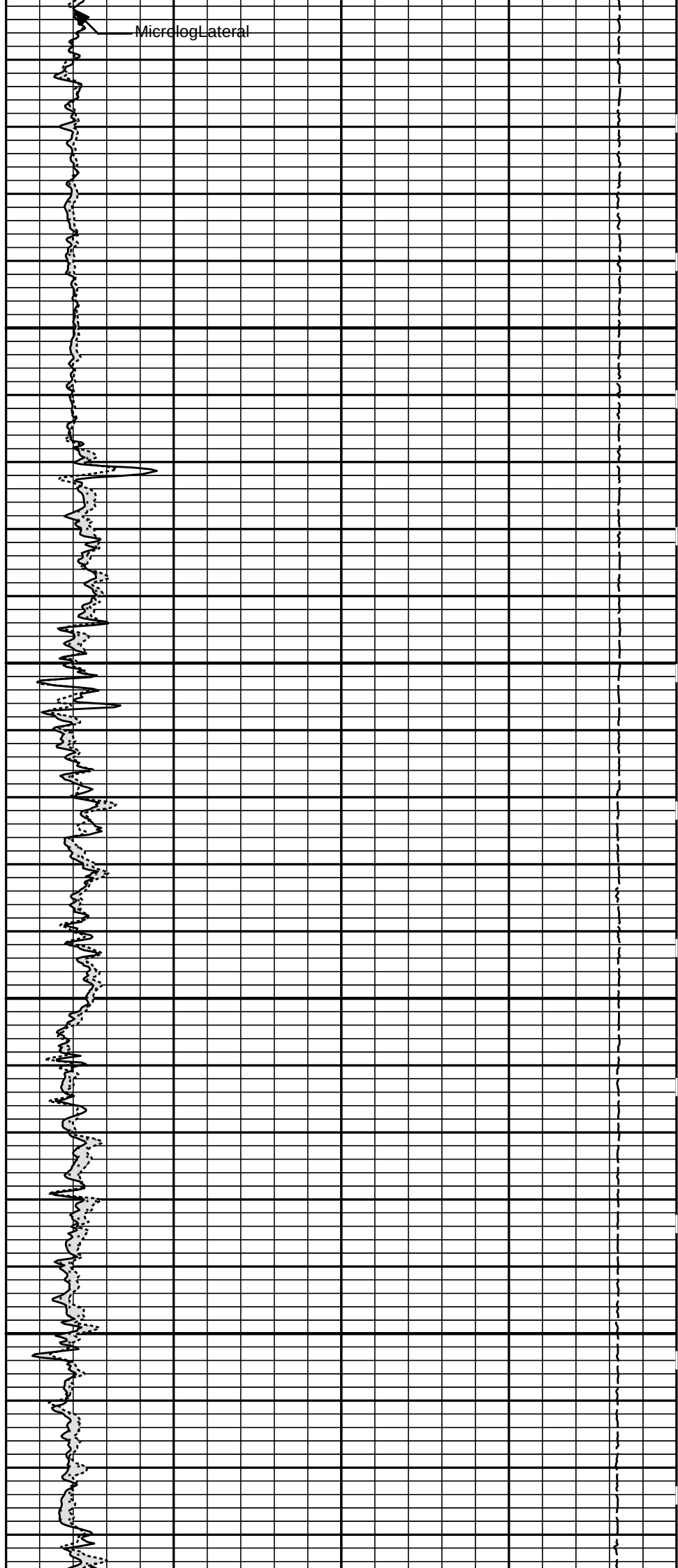


MicrologNormal



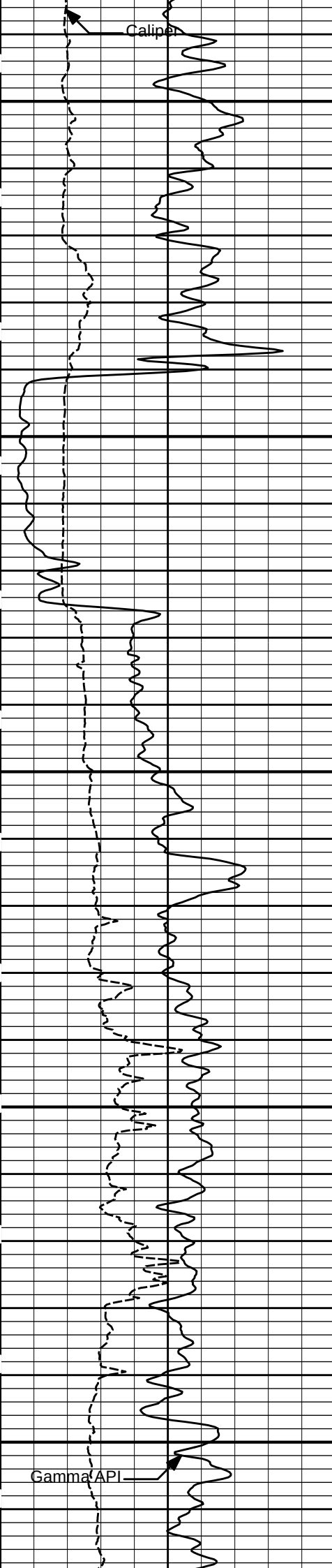
2000

2100



Microlog Lateral

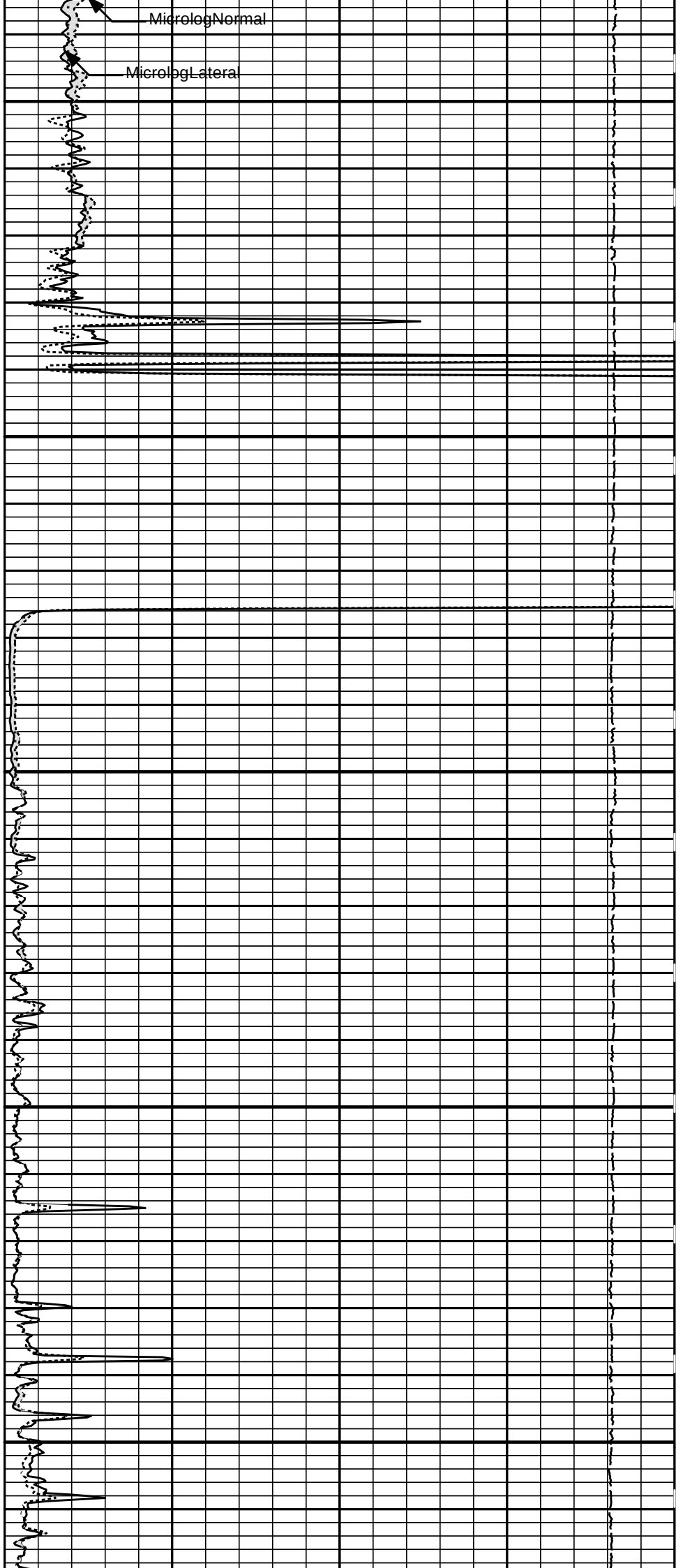
Gamma API



2200

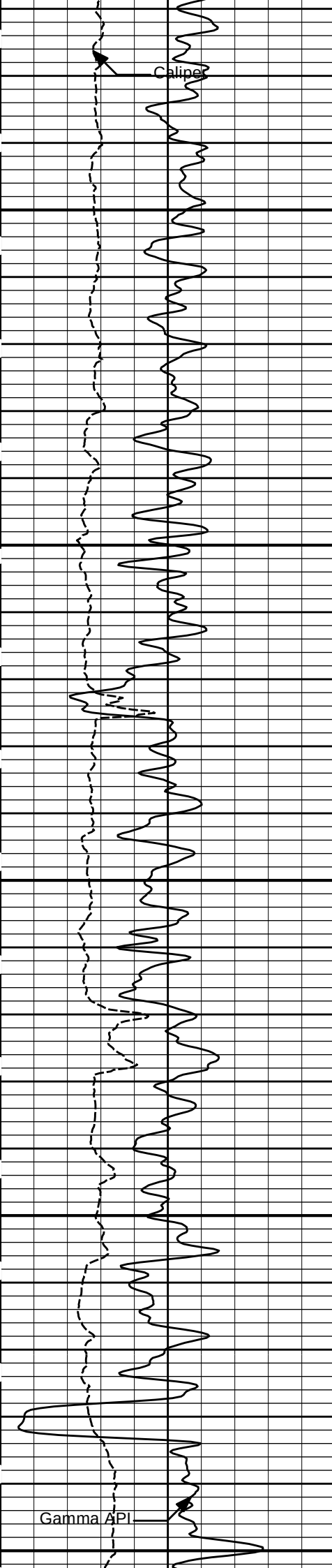
2300

2400



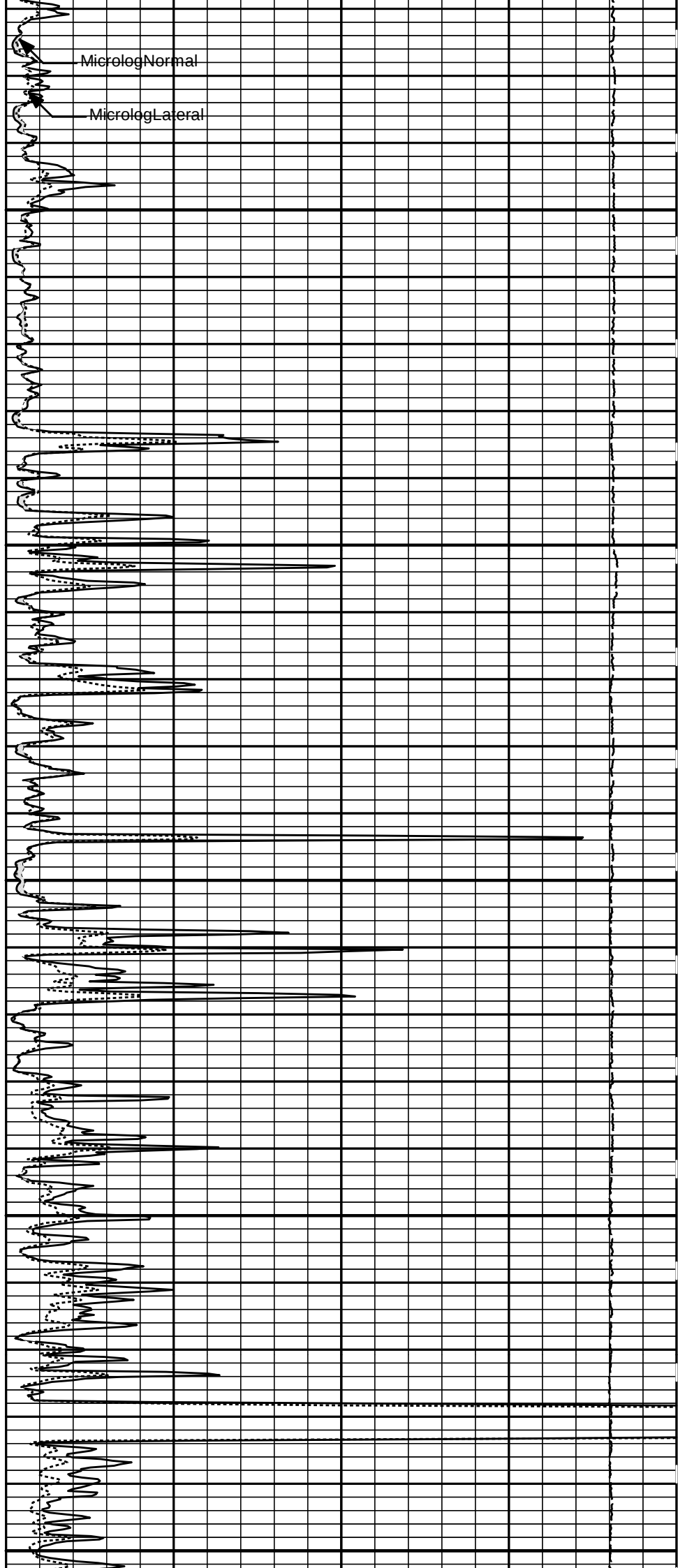
MicrologNormal

MicrologLateral



2500

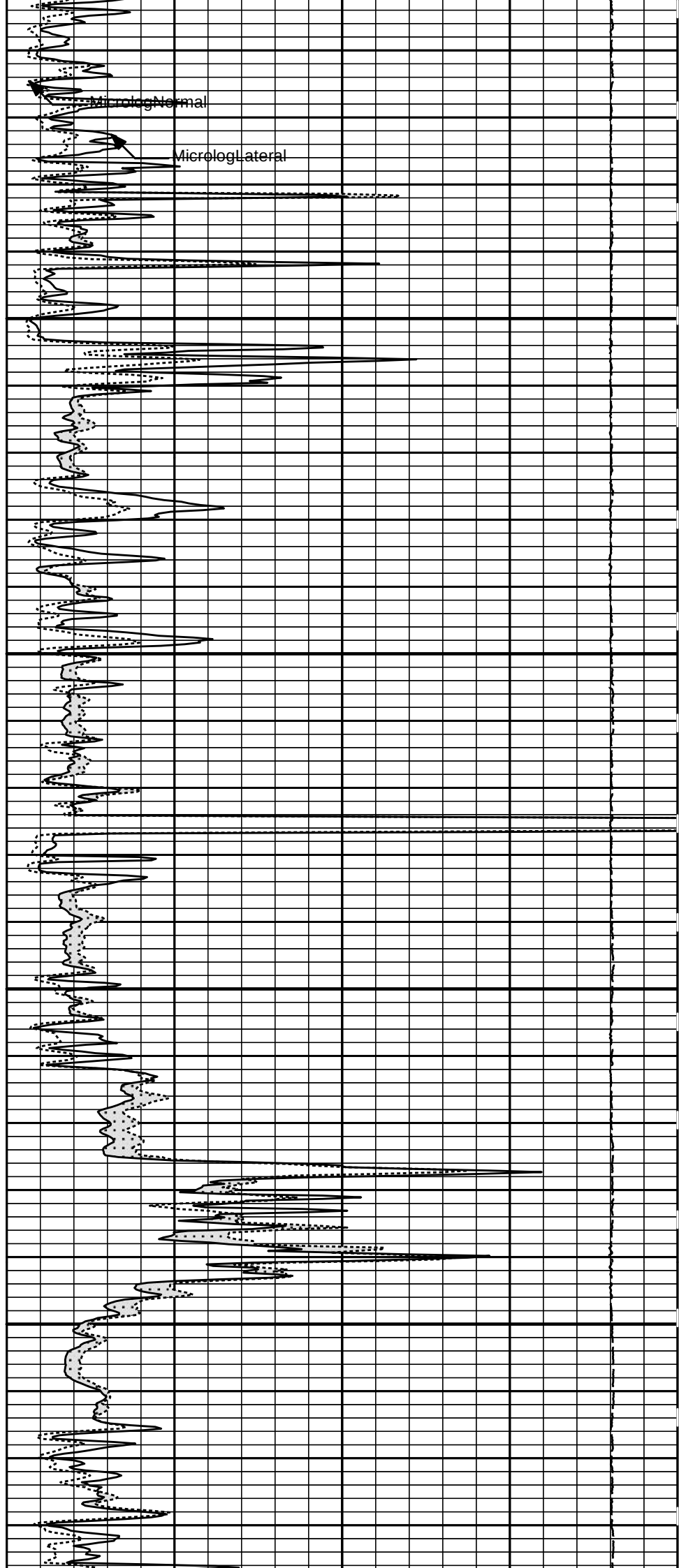
2600

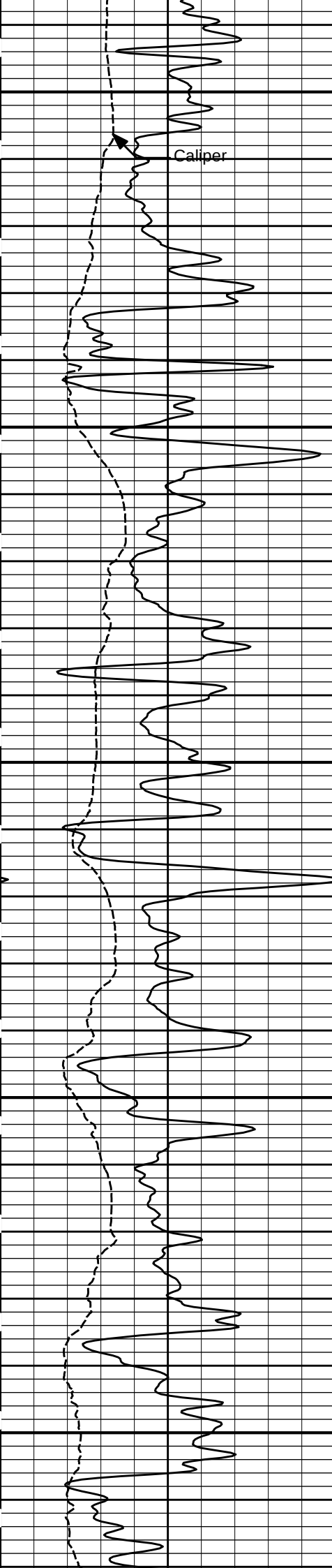




2700

2800



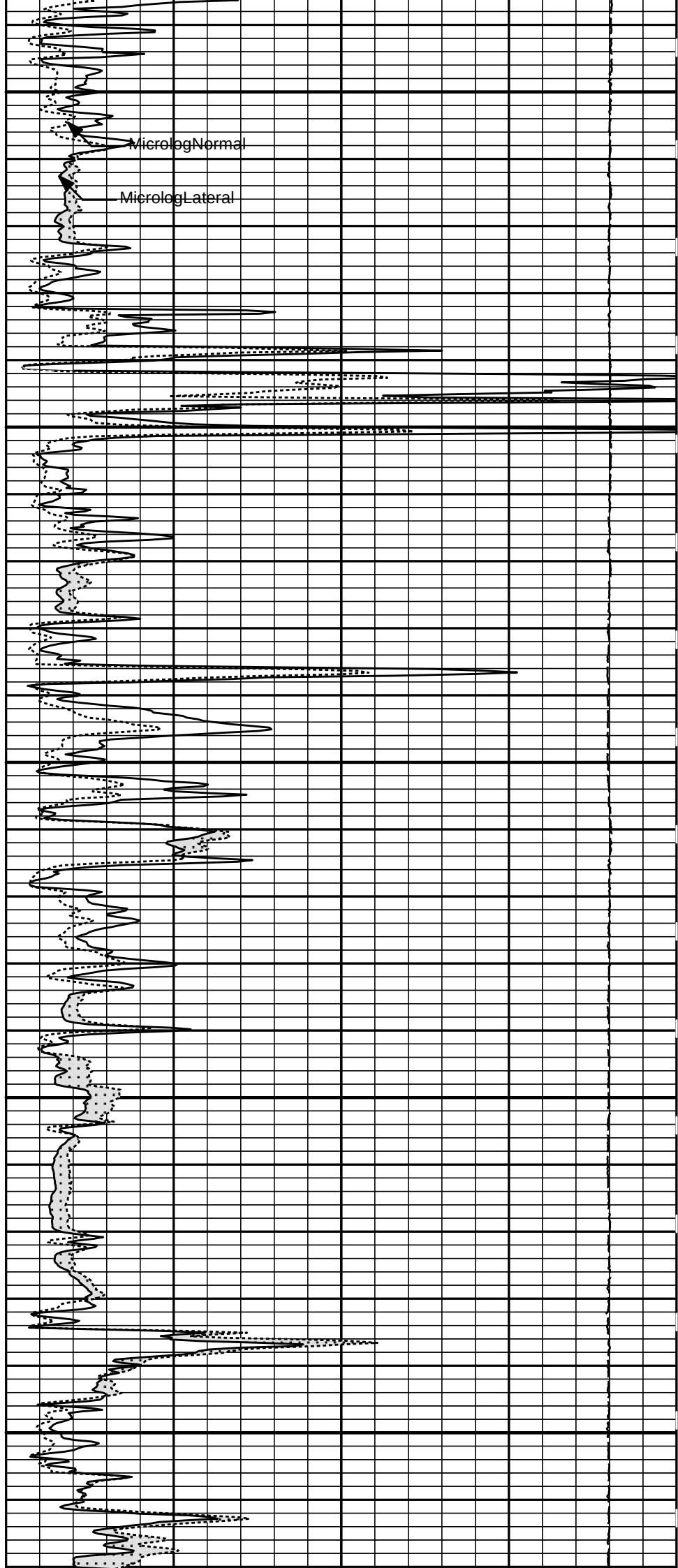


2900

Caliper

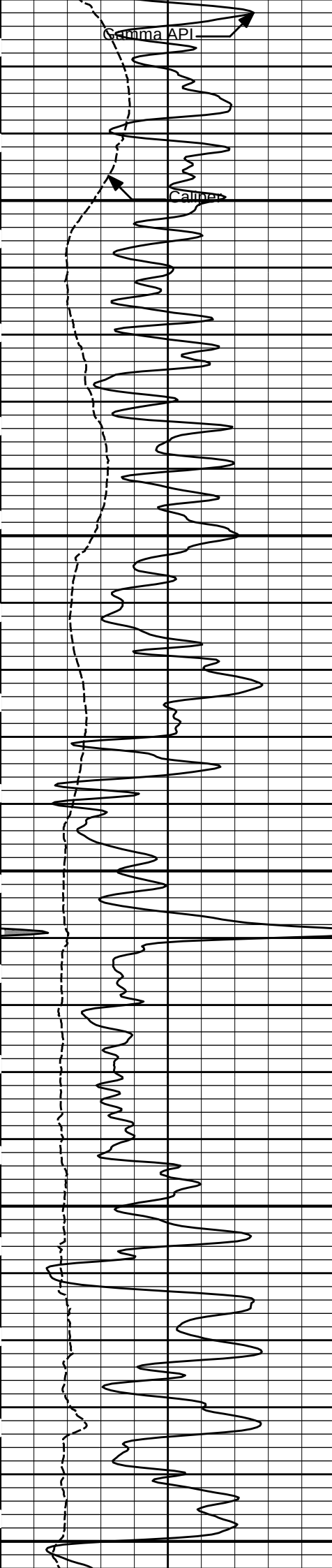
3000

3100



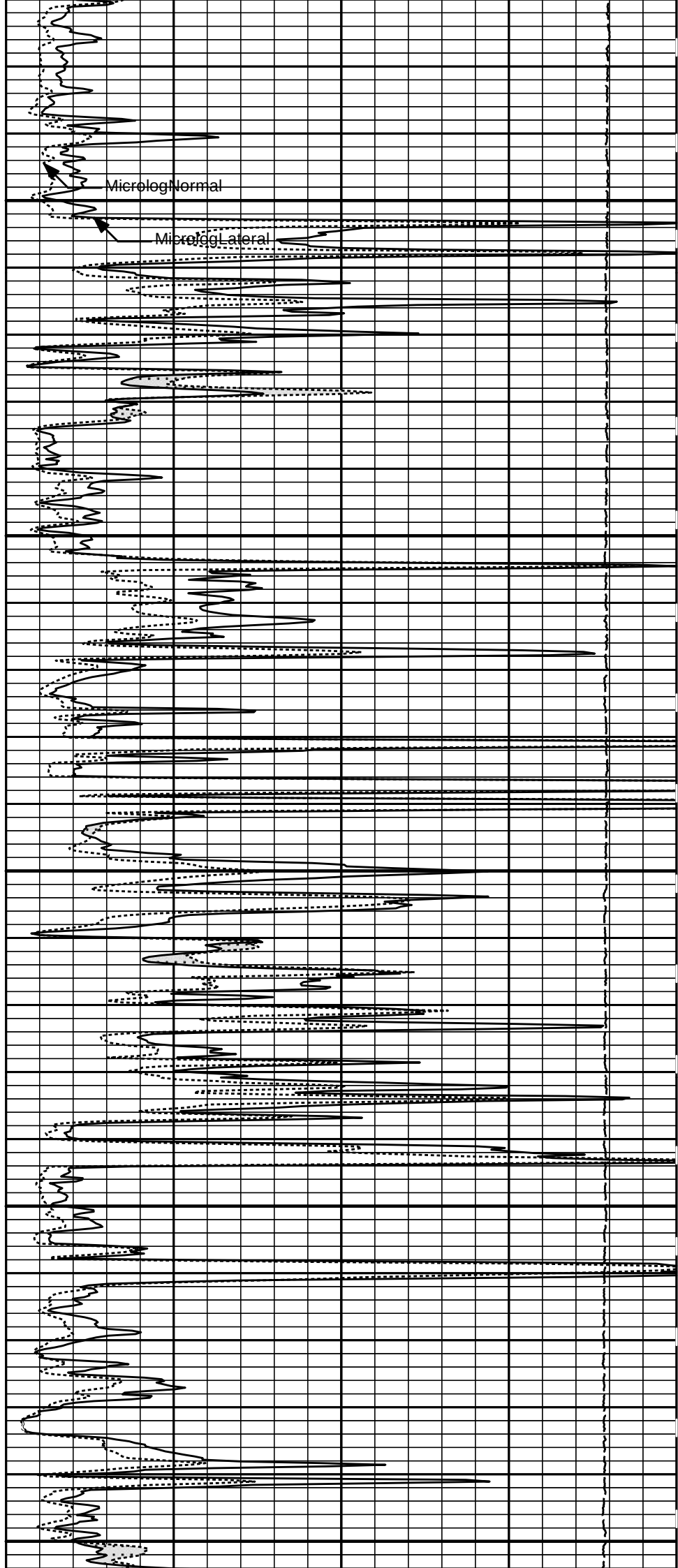
MicrologNormal

MicrologLateral



3200

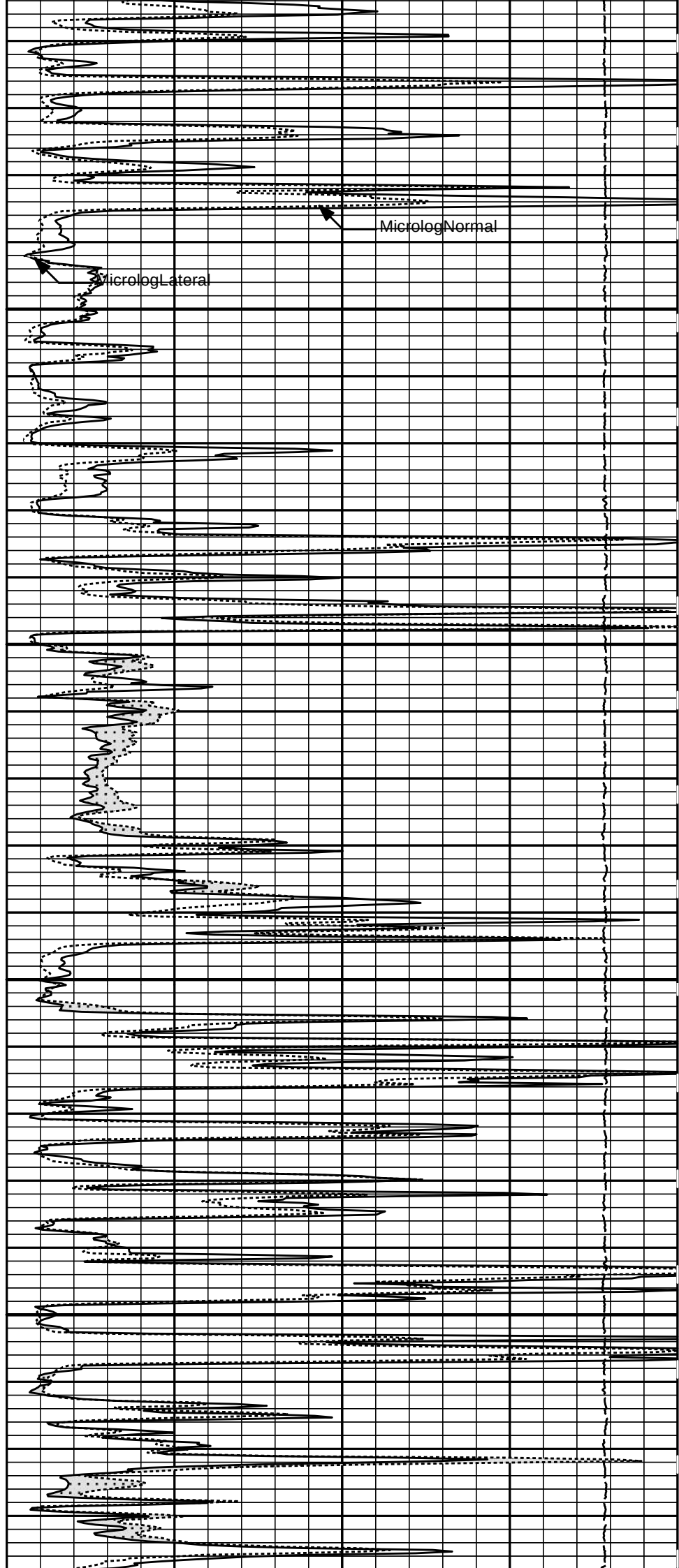
3300

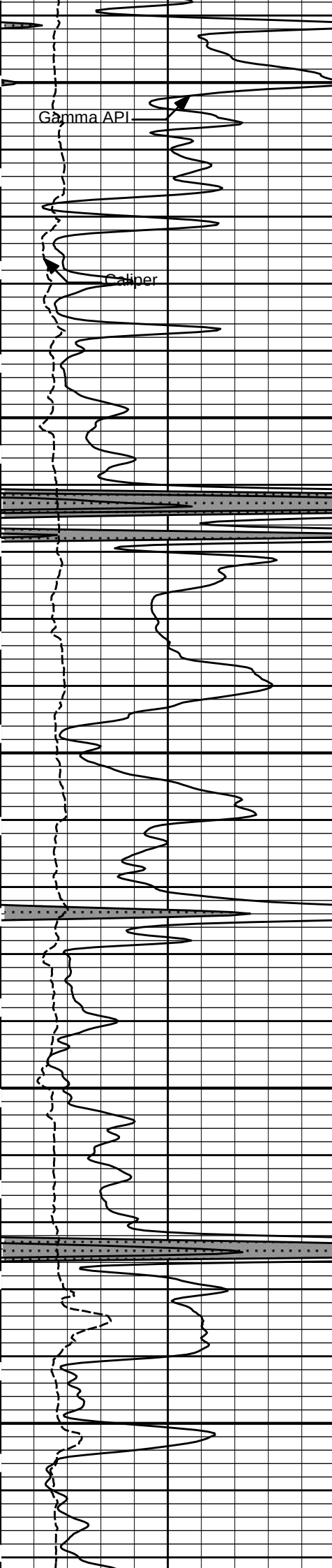




3400

3500

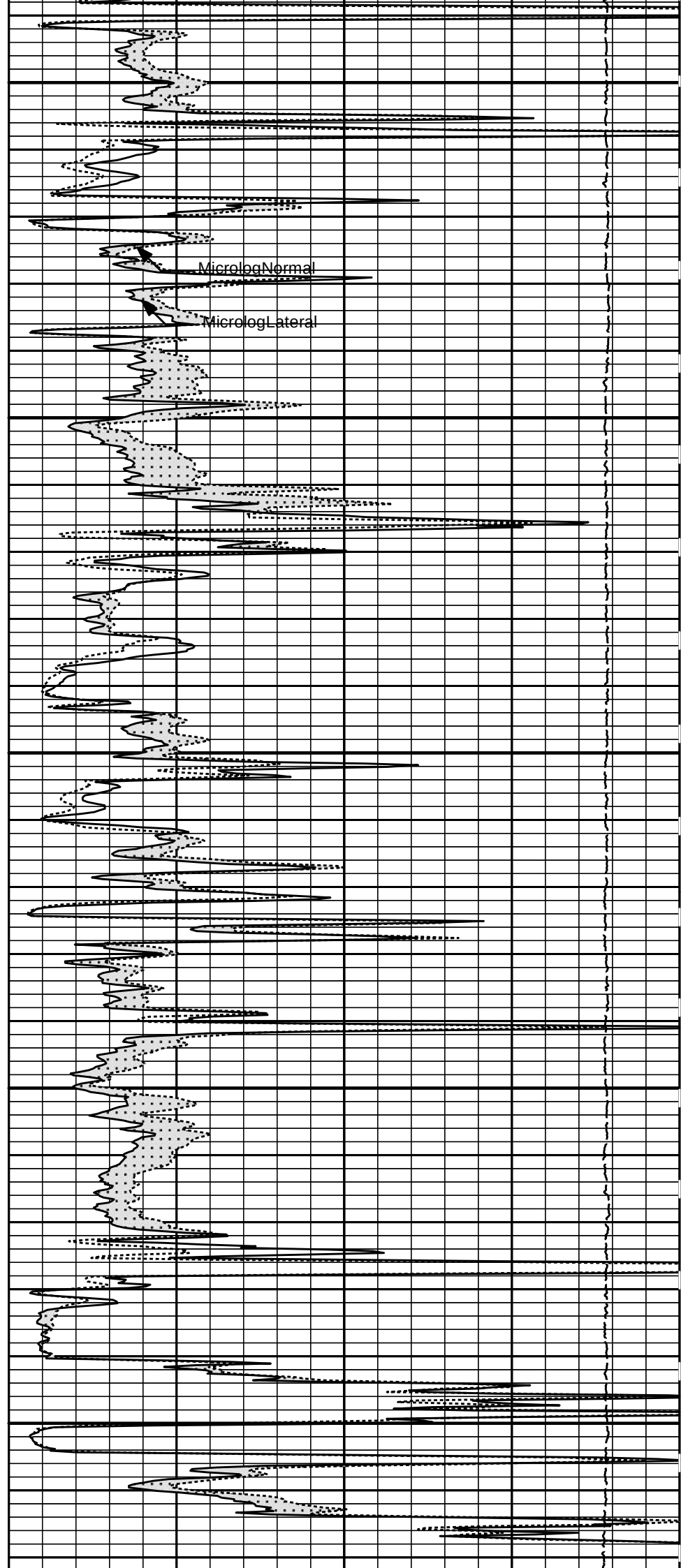


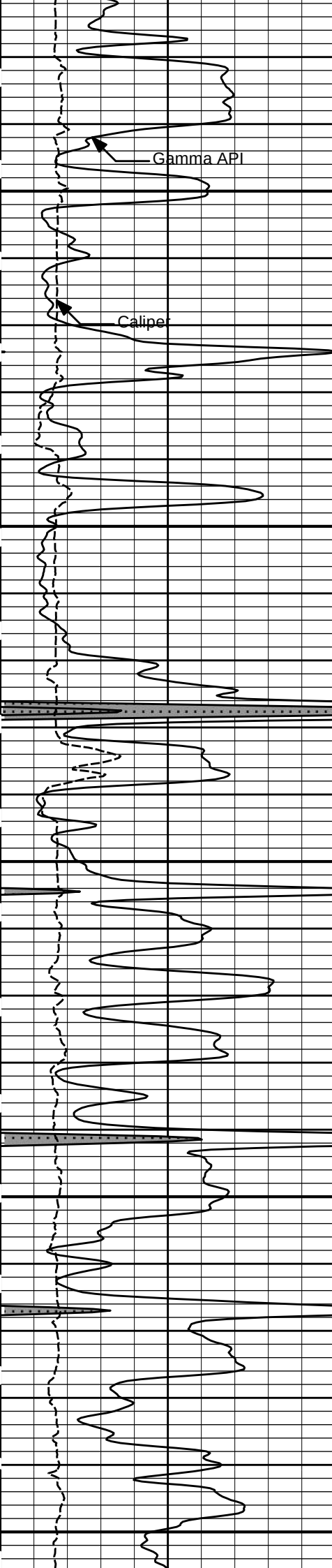


3600

3700

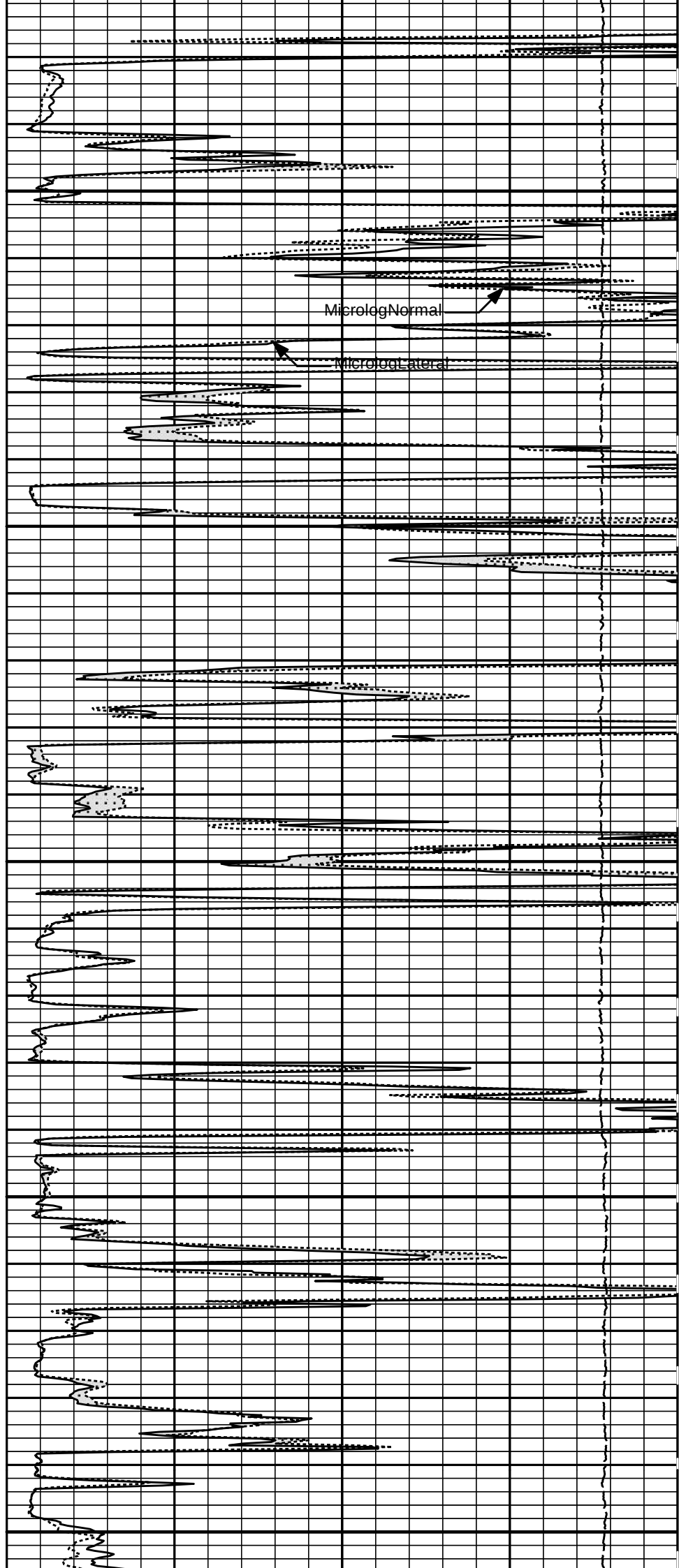
3800

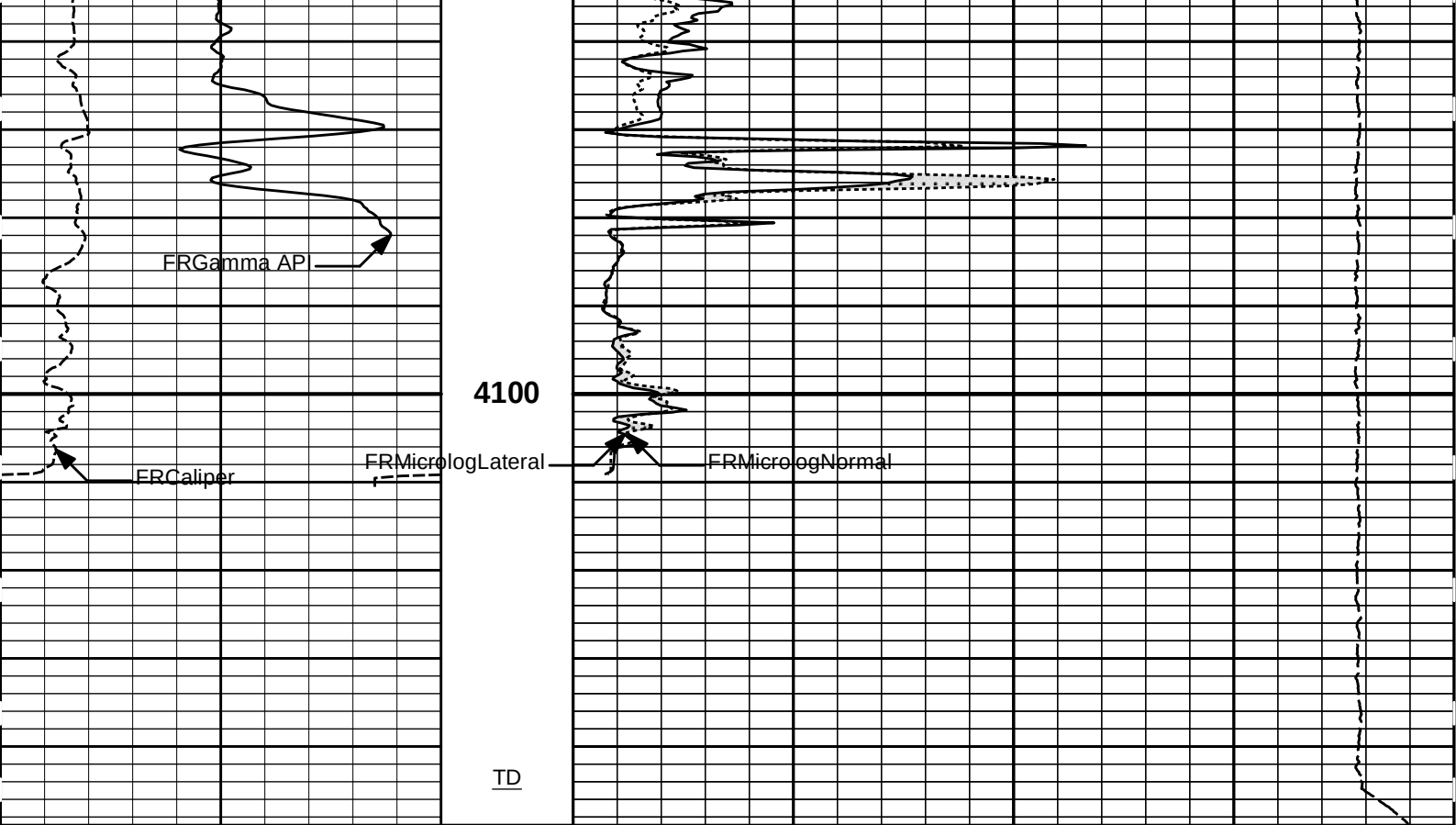




3900

4000





6	Caliper	16	1 : 240	15K	Tension	0
	inches		ft		pounds	
0	Gamma API	150		0	MicrologLateral	40
	api				ohm-metre	
				0	MicrologNormal	40
					ohm-metre	

HALLIBURTON

Plot Time: 18-Apr-18 09:59:29
Plot Range: 490 ft to 4148.92 ft
Data: MINIMUM_1-19\Well Based\MAIN\
Plot File: \\LOCAL-MINIMUM_1-19\Well Based\ML\Microlog_IQ_5_main

5 INCH MAIN LOG

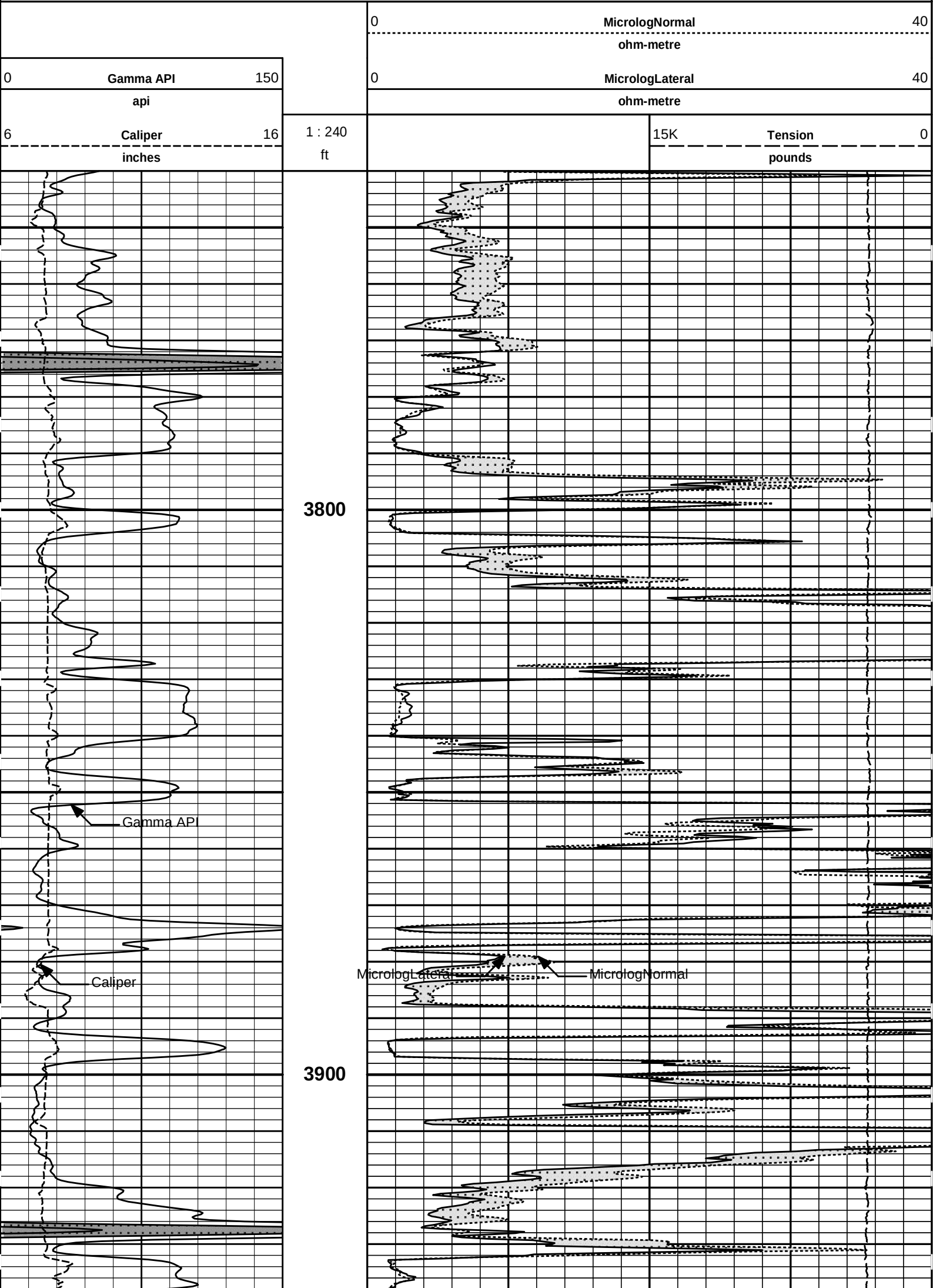
MAIN LOG 5" PER 100'

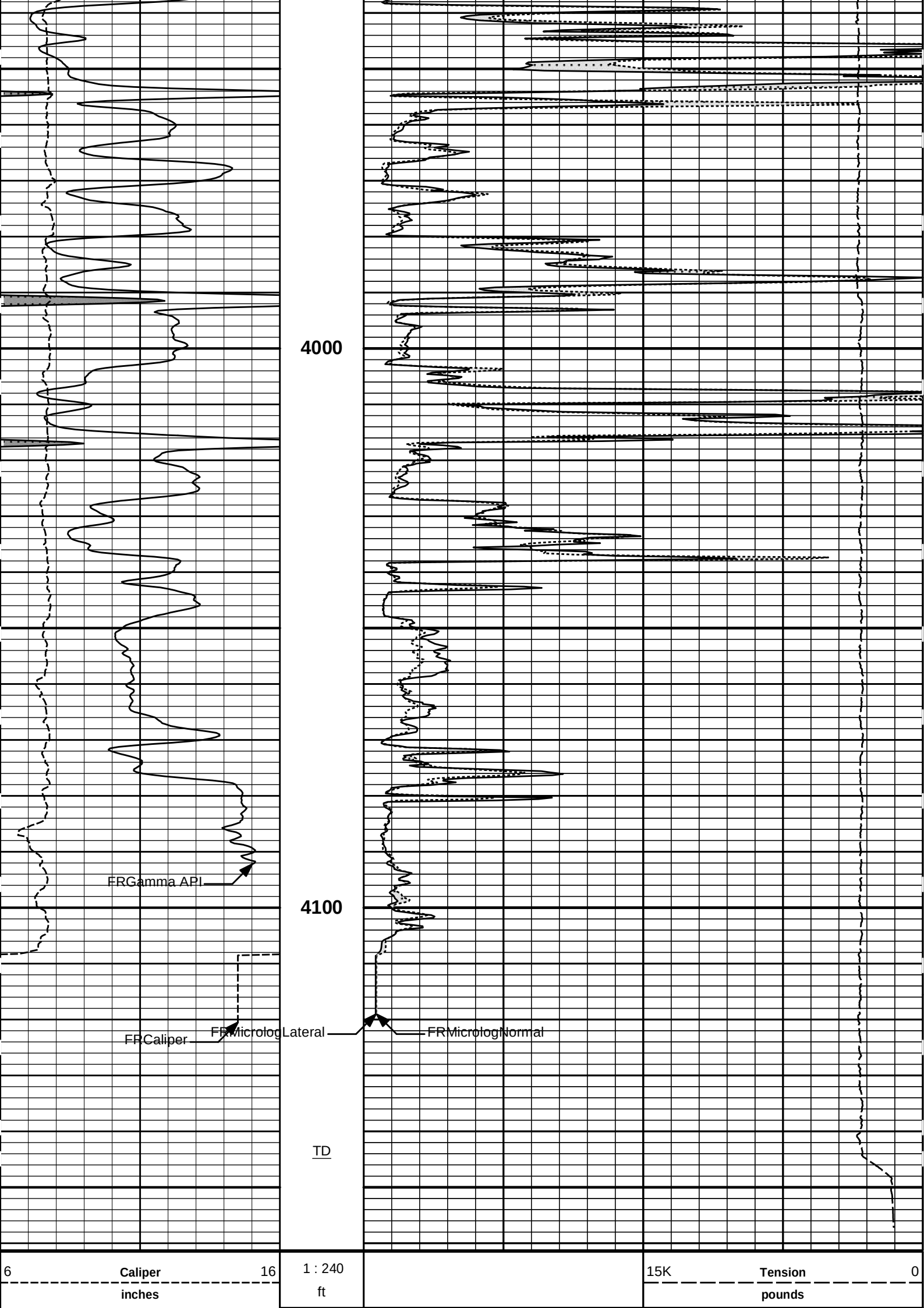
HALLIBURTON

Plot Time: 18-Apr-18 09:59:30
Plot Range: 3740 ft to 4161.25 ft
Data: MINIMUM_1-19\Well Based\REPEAT\
Plot File: \\LOCAL-MINIMUM_1-19\Well Based\ML\Microlog_IQ_5_rpt

REPEAT SECTION

REPEAT SECTION





0	Gamma API	150		0	MicrologLateral	40
api				ohm-metre		
				0	MicrologNormal	40
				ohm-metre		

HALLIBURTON

Plot Time: 18-Apr-18 09:59:31
Plot Range: 3740 ft to 4161.25 ft
Data: MINIMUM_1-19\Well Based\REPEAT\
Plot File: \\LOCAL\MINIMUM_1-19\Well Based\ML\Microlog_IQ_5_rpt

REPEAT SECTION

REPEAT SECTION

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	GTET - 11958947	Reference Calibration Date:	20-Feb-18 09:19:12
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	20-Feb-18 09:23:22
Firmware Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Calibrator Source S/N: TB-146
Calibrator API Reference:225.00 api
Equivalent Calibrator API Reference:228.9 api

Measurement	Measured	Calibrated	Units
Background	29.2	29.5	api
Background + Calibrator	256.0	258.4	api
Calibrator	226.8	228.9	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	GTET - 11958947	Reference Calibration Date:	20-Feb-18 09:23:22
Engineer:	SEAN WOLTEMATH	Calibration Date:	16-Apr-18 14:43:49
ware Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Calibrator Source S/N: TB-146
Calibrator API Reference:225.00 api
Equivalent Calibrator API Reference:228.9 api

Field Verification	Shop	Field	Units
Background	29.5	33.3	api
Background + Calibrator	258.4	260.7	api
Calibrator	228.9	227.5	api

Shop	Field	Difference	Tolerance
228.9	227.5	1.4	+/- 9.00

ACCELEROMETER AND MAGNETOMETER SHOP CALIBRATION

Tool Name:	IDT - 10967514	Reference Calibration Date:	10-Jun-15 12:26:23
Engineer:	T. HYDE	Calibration Date:	29-Oct-17 13:11:14
ware Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

Reference Gravity Field: 1.0000 g

* QF : value of 0 is shown for bad quality if | data - reference | > (2 * standard deviation) and > (0.5% of reference value)

ACCELEROMETER CALIBRATION RAW DATA VALUE

Raw Acc X	Raw Acc Y	Raw Acc Z	Quality(Gravity)	Quality Error(%)	QF
0.4483	-0.5559	-0.0095	0.9981	99.8100	1
-0.5039	-0.5331	-0.0099	1.0031	99.6915	1
-0.5654	0.4850	-0.0091	0.9981	99.8106	1
0.4775	0.5551	-0.0083	1.0016	99.8382	1
-0.0462	0.7421	-0.0092	0.9990	99.9012	1
0.0175	0.6700	0.1486	1.0019	99.8056	1
-0.0354	0.7429	-0.0080	0.9995	99.9454	1
0.7161	-0.0146	-0.0080	1.0001	99.9879	1
-0.1158	-0.7139	-0.0106	0.9983	99.8349	1
-0.7361	0.0867	-0.0094	0.9996	99.9608	1
0.0201	0.0033	0.3515	0.9995	99.9502	1
-0.0882	-0.6750	-0.1350	1.0010	99.8970	1

ACCELEROMETER QUALITY SUMMARY

Average Calculated Gravity Field	1.0000	g
Standard Deviation Calculated Gravity Field	0.0016	g

ACCELEROMETER GAIN AND OFFSET

	GAIN	OFFSET
ACC X	1.3729314804	0.0163711496
ACC Y	1.3640266657	-0.0144008221
ACC Z	2.7541277409	0.0303100925

* QF : value of 0 is shown for bad quality if | data - reference | > (3 * standard deviation) and > (1% of reference value)

MAGNETOMETER CALIBRATION RAW DATA VALUE

Raw Mag X	Raw Mag Y	Raw Mag Z	Quality(Magnetic)	Quality Error(%)	QF
-0.2521	1.2321	-0.0673	50269.6523	99.9258	1
1.1777	0.4363	-0.0659	50414.2500	99.7868	1
0.4808	-1.1763	-0.0661	50405.3398	99.8045	1
-1.1602	-0.4497	-0.0670	50424.7813	99.7659	1
-0.0176	-1.1284	0.5517	49826.3203	99.0445	1
0.0313	-1.2770	-0.0348	50608.3594	99.4010	1
0.0788	-1.1358	-0.5676	50331.3359	99.9516	1
-1.1041	0.0010	-0.5685	50178.7305	99.7450	1
0.1428	1.1184	-0.5672	50183.2461	99.7540	1
1.1165	-0.0921	-0.5669	50159.5469	99.7069	1
-0.2703	0.5710	1.0944	50460.0742	99.6957	1
0.1696	0.8462	-0.9311	50400.3164	99.8145	1

MAGNETOMETER QUALITY SUMMARY

Average Calculated Magnetic Field	50305.1641	nT
Standard Deviation Calculated Magnetic Field	201.0230	nT

MAGNETOMETER GAIN AND OFFSET

	GAIN	OFFSET
MAG X	40363.0234375000	-313.7065734863
MAG Y	39727.5820312500	148.1569976807
MAG Z	39703.6484375000	123.7606582642

Noise Level Value: 0.000229 cnts

Noise Level Cal Value: 0.0006 g

Tool Name: DSNT - 11055304		Reference Calibration Date: 13-Mar-18 15:42:08		
Engineer: JORGE ORLANDO PEREZ		Calibration Date: 13-Mar-18 16:05:22		
Software Version: WL INSITE R5.0.5 (Build 8)		Calibration Version: 1		
Logging Source S/N: DSN-424 Tank Serial Number: 12345678 Reference value assigned to Tank: 56.100 Snow Block S/N: 12345678 Calibration Tank Water Temperature: 68 degF Min. Tool Housing Outside Diameter: 3.625 in				
CALIBRATION CONSTANTS				
Measurement	Prev. Value	New Value	Control Limit On New Value	
Gain:	1.04035	1.03906	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):	0.2362	0.2358	0.0004	+/- 0.0020
Calibrated Ratio:	10.5726	10.5595	0.013	+/- 0.050
VERIFIER				
Measurement	Value	Control Limit		
Snow-Block Porosity (decp):	0.0642	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 - 11055304		Reference Calibration Date: 13-Mar-18 16:05:22		
Engineer: SEAN WOLTEMATH		Calibration Date: 16-Apr-18 15:07:38		
Software Version: WL INSITE R5.0.5 (Build 8)		Calibration Version: 1		
Logging Source S/N: DSN-424 Snow Block S/N: 12345678				
NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0642	0.0509	-0.0133	+/- 0.0150
PASS/FAIL SUMMARY				
Block Change Check:		Passed		
Snow Block Stat Check:		Passed		
Temperature Check:		Passed		

DENSITY CALIPER SHOP CALIBRATION			
Tool Name: SDLT - 10951315		Reference Calibration Date: 07-Mar-18 09:39:58	
Engineer: JORGE ORLANDO PEREZ		Calibration Date: 07-Mar-18 09:48:53	
Software Version: WL INSITE R5.0.5 (Build 8)		Calibration Version: 1	
Host Tool Name: DSNT - 11055304			
CALIBRATION COEFFICIENTS			
Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-3522.85	-3549.59	-7000.00 - -1000.00
Pad Gain	0.0003722	0.0003749	0.0002000 - 0.0006000

Arm Offset	-3023.66	-2454.88	-5000.00 - 3000.00
Arm Gain	0.0005295	0.0004796	0.000300 - 0.000700
Arm Power	-0.000006101	-0.000003067	-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)	3.73	3.75	0.02	+/- 0.20	
RING DIAMETER:					
Small Ring (in)	6.40	6.50	0.10	+/- 0.20	
Medium Ring (in)	8.27	8.25	-0.02	+/- 0.20	
Large Ring (in)	15.00	15.00	0.00	+/- 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 - 10951315	Reference Calibration Date:	07-Mar-18 09:48:53
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	07-Mar-18 09:51:03
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Pad Extension	3.75	3.75	0.00	+/- 0.10
Ring Diameter	8.25	8.25	0.00	+/- 0.15
PASS/FAIL SUMMARY				
Pad Extension Check:			Passed	
Diameter Check:			Passed	

MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - 10951315	Reference Calibration Date:	13-Mar-18 17:22:52
Engineer:	JORGE ORLANDO PEREZ	Calibration Date:	21-Mar-18 12:30:09
Software Version:	WL INSITE R5.0.5 (Build 8)	Calibration Version:	1
Host Tool Name:	DSNT - 11055304		

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.11	-0.12	-0.00	-0.00	ohmm
Calibration Point #1	0.00	0.00	0.00	0.00	ohmm
Calibration Point #2	19.76	20.00	19.93	20.00	ohmm
Internal Reference	19.83	20.07	19.91	19.98	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	-2.57		0.53		V
Calibration Point #1	27.78		2.13		V
Calibration Point #2	5286.93		6884.80		V
Internal Reference	5306.57		6879.42		V

MICRO LOG FIELD CHECK

MICRO LOG FIELD CHECK					
Tool Name:	Microlog Pad - 10951315			Reference Calibration Date:	21-Mar-18 12:30:09
Engineer:	SEAN WOLTEMATH			Calibration Date:	16-Apr-18 14:34:38
Software Version:	WL INSITE R5.0.5 (Build 8)			Calibration Version:	1
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.12	-0.10	-0.00	-0.01	ohmm
Internal Reference	20.07	20.10	19.98	20.01	ohmm
Summary					
Signal	Shop	Field	Difference	Tolerance	
Microlog Normal	20.07	20.10	-0.03	+/- 0.80	
Microlog Lateral	19.98	20.01	-0.03	+/- 0.80	

SPECTRAL DENSITY SHOP CALIBRATION				
Tool Name:	SDLT Pad - 10865873		Reference Calibration Date:	13-Mar-18 10:51:36
Engineer:	JORGE ORLANDO PEREZ		Calibration Date:	13-Mar-18 11:16:20
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Logging Source S/N: 5168GW				
Aluminum Block S/N: EL RENO STD ALUMINUM		Density: 2.581g/cc	Pe: 3.170	
Magnesium Block S/N: EL RENO		Density: 1.687g/cc	Pe: 2.594	
DENSITY CALIBRATION SUMMARY				
Measurement	Previous Value	New Value	Control Limit	
Near Bar Gain	1.0157	1.0357	0.90 - 1.10	
Near Dens Gain	1.0196	1.0142	0.90 - 1.10	
Near Peak Gain	1.0395	1.0317	0.90 - 1.10	
Near Lith Gain	1.0541	1.0327	0.90 - 1.10	
Far Bar Gain	1.0110	1.0122	0.90 - 1.10	
Far Dens Gain	1.0025	1.0022	0.90 - 1.10	
Far Peak Gain	0.9984	0.9998	0.90 - 1.10	
Far Lith Gain	0.9749	0.9761	0.90 - 1.10	
Near Bar Offset	0.1609	-0.0201	NONE	
Near Dens Offset	0.1178	0.1665	NONE	
Near Peak Offset	-0.0532	0.0109	NONE	
Near Lith Offset	-0.1910	-0.0138	NONE	
Far Bar Offset	0.1786	0.1672	NONE	
Far Dens Offset	0.2184	0.2226	NONE	
Far Peak Offset	0.2132	0.2040	NONE	
Far Lith Offset	0.3427	0.3343	NONE	
Near Bar Background	823.98	821.51	700 - 1450	
Near Dens Background	269.05	269.15	230 - 480	
Near Peak Background	119.85	118.90	100 - 210	
Near Lith Background	144.86	144.31	125 - 260	
Far Bar Background	600.14	599.08	450 - 900	
Far Dens Background	236.51	236.11	175 - 345	
Far Peak Background	92.88	92.59	70 - 140	
Far Lith Background	96.04	96.48	75 - 145	
CALIBRATION BLOCK SUMMARY				
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change
MAGNESIUM				
Density (g/cc)	1.687	1.687	0.000	+/- 0.015
Pe	2.525	2.551	0.026	+/- 0.150

Pe	2.523	2.551	0.026	+/- 0.150
ALUMINUM				
Density (g/cc)	2.580	2.581	0.001	+/- 0.01500
Pe	3.157	3.123	-0.034	+/- 0.150
TOOL SUMMARY				
Measurement	Near Detector		Far Detector	
	Value	Control Limits	Value	Control Limits
QUALITY				
Background	0.0003	+/- 0.0110	-0.0014	+/- 0.0140
Magnesium Block	-0.0011	+/- 0.0110	-0.0013	+/- 0.0140
Aluminum Block	-0.0011	+/- 0.0110	-0.0008	+/- 0.0140
Resolution	10.05	6.00 - 11.50	9.01	6.00 - 11.50
Internal Verifier(B+D+P+L)	1354	1200 - 2700	1024	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 - 10865873		Reference Calibration Date:	13-Mar-18 11:16:20
Engineer:	SEAN WOLTEMATH		Calibration Date:	16-Apr-18 14:33:22
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Pad Temperature: 64.7 degF				
DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1353.863	1352.738	-1.125	14.876
Far (B+D+P+L) cps	1024.257	1025.271	1.014	17.069
Near Resolution	10.05	9.91	-0.140	0.50
Far Resolution	9.01	9.03	0.020	1.00
PASS/FAIL SUMMARY				
	Bkg Quality Check:		Passed	
	Bkg Resolution Check:		Passed	
	Bkg Verification Check:		Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION				
Tool Name:	ACRt Sonde - 11005908		Reference Calibration Date:	24-Jan-18 11:50:13
Engineer:	JORGE ORLANDO PEREZ		Calibration Date:	16-Mar-18 10:34:00
Software Version:	WL INSITE R5.0.5 (Build 8)		Calibration Version:	1
Host Tool Name:	ACRt Instrument - 11026095			

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0415	1.05	0.95	1.0202	1.05	0.95	1.0109	1.05
A2 (50")	0.95	1.0485	1.05	0.95	1.0233	1.05	0.95	1.0144	1.05
A3 (29")	0.95	1.0353	1.05	0.95	1.0139	1.05	0.95	1.0048	1.05
A4 (17")	0.95	1.0423	1.05	0.95	1.0194	1.05	0.95	1.0121	1.05

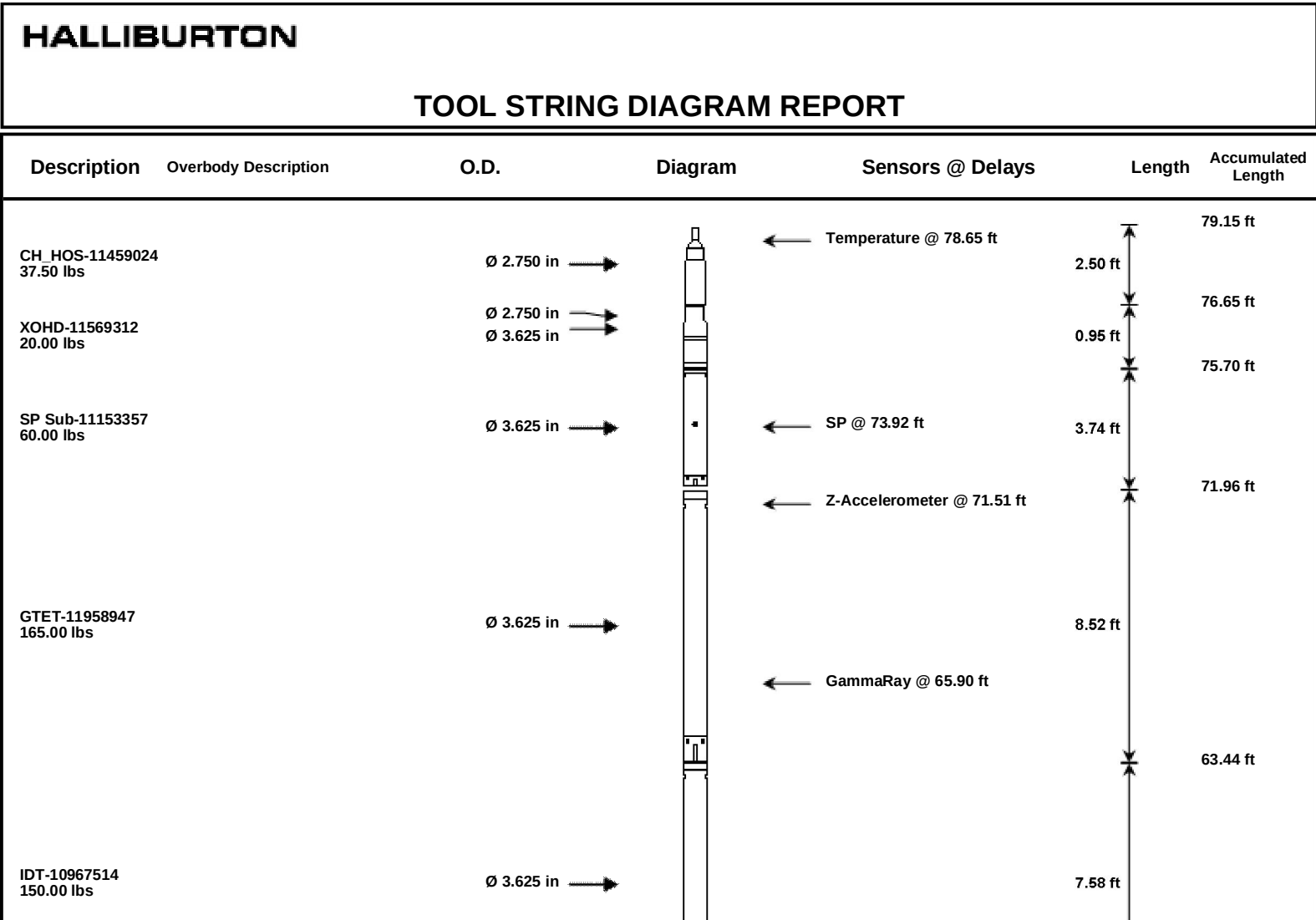
R12KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-212634064.000	-212633888.000	176.000	10631694.400	Pass
A2 (50")	-209134528.000	-209132944.000	1584.000	10456647.200	Pass
A3 (29")	-209198784.000	-209198864.000	80.000	10459943.200	Pass
A4 (17")	-212472320.000	-212469504.000	2816.000	10623475.200	Pass
A5 (10")	-215806928.000	-215805120.000	1808.000	10790256.000	Pass
A6 (6")	-216964560.000	-217024160.000	59600.000	10851208.000	Pass
R36KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	45945148.000	45942224.000	2924.000	2297111.200	Pass
A2 (50")	42617908.000	42614540.000	3368.000	2130727.000	Pass
A3 (29")	35212352.000	35209964.000	2388.000	1760498.200	Pass
A4 (17")	36200304.000	36198396.000	1908.000	1809919.800	Pass
A5 (10")	42031348.000	42028092.000	3256.000	2101404.600	Pass
A6 (6")	42711908.000	42592740.000	119168.000	2129637.000	Pass
R72KHz					
	Measured (mmho/m)	Last Month (mmho/m)	Difference (mmho/m)	Tolerance (mmho/m)	Pass/Fail
A1 (80")	-93057816.000	-93058472.000	656.000	4652923.600	Pass
A2 (50")	-87051256.000	-87047392.000	3864.000	4352369.600	Pass
A3 (29")	-89096656.000	-89095584.000	1072.000	4454779.200	Pass
A4 (17")	-87151120.000	-87148272.000	2848.000	4357413.600	Pass
A5 (10")	-86683120.000	-86681608.000	1512.000	4334080.400	Pass
A6 (6")	-87306328.000	-87322176.000	15848.000	4366108.800	Pass
PASS/FAIL SUMMARY					
	Std Deviation Verification			Pass	
	Average Verification			Pass	
	Gain Tolerance Verification			Pass	

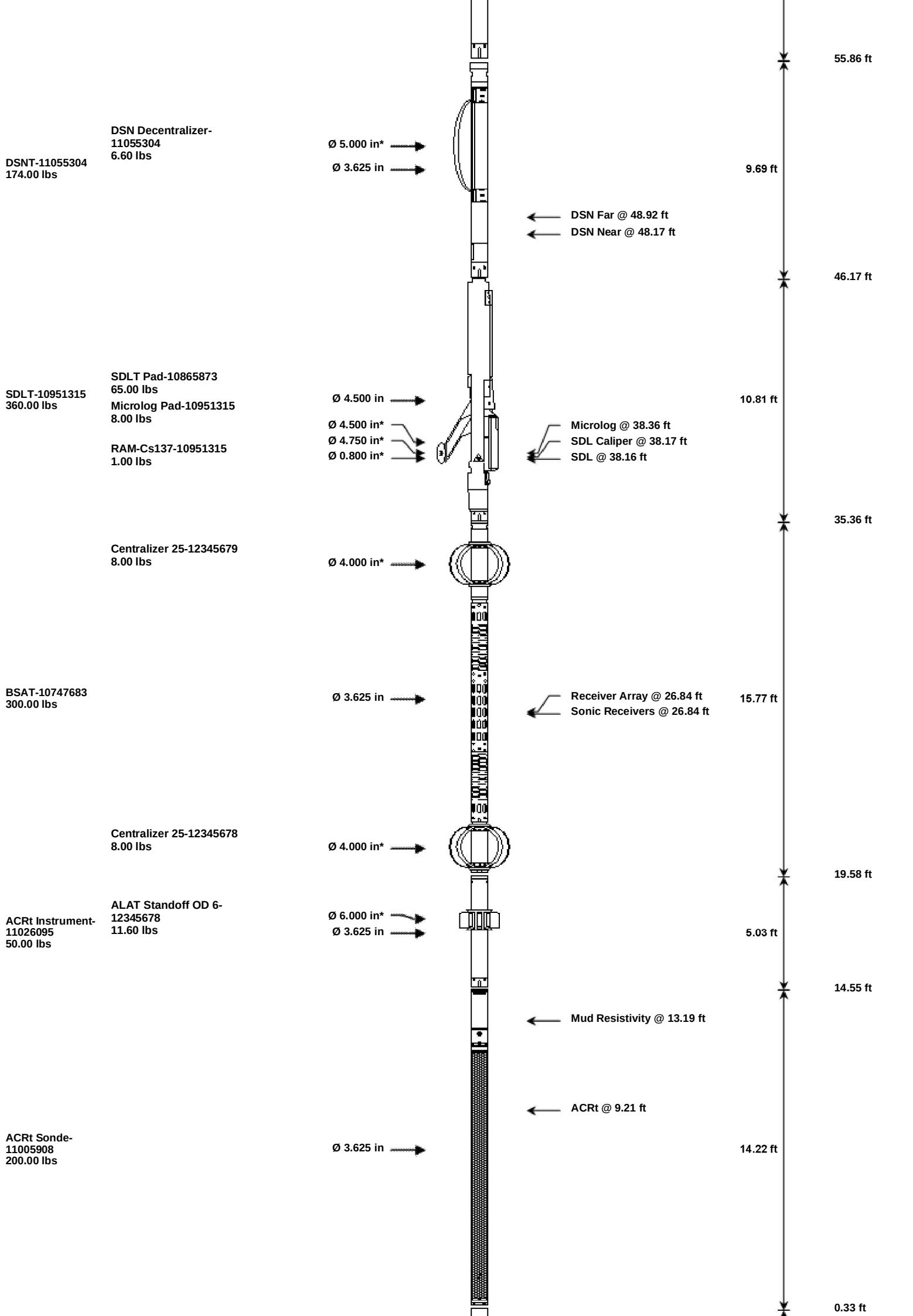
CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11958947						
Gamma Ray Calibrator	228.9	227.5	-----	1.4	+/- 9.00	api
DSNT-11055304						
Snow-Block Porosity	0.0642	0.0509	-----	0.0133	+/- 0.0150	decp
SDLT-10951315						
Pad Extension	3.75	3.75	-----	0.00	+/-0.10	in
Ring Diameter	8.25	8.25	-----	0.00	+/-0.15	in
Microlog Pad-10951315						
MicroLog Normal	20.07	20.10	-----	-0.03	+/-0.80	ohmm
MicroLog Lateral	19.98	20.01	-----	-0.03	+/-0.80	ohmm
SDLT Pad-10865873						
Near(B+D+P+L)	1353.863	1352.738	-----	1.125	+/-14.876	cps
Far(B+D+P+L)	1024.257	1025.271	-----	-1.014	+/-17.069	cps
ACRt Sonde-11005908						
Mud Cell	1.00	-----	-----	0	-----	ohm-m

Data: MINIUUM_1-19\0001 GTET-IDT-DSN-SDL-BSAT-ACRT\IDLE	Date: 18-Apr-18 05:08:05
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PARAMETERS REPORT					
Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	TD	Total Well Depth	4146.00	ft
0.00					
	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	1.180	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	CSTR	Compressive Strength	1000.00	psia
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4438.00	ft
	SHARED	BHT	Bottom Hole Temperature	140.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	IDT	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	IDT	
	SHARED	TEMM	CBM Temperature Master Tool	GTET	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
	Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
	Rwa / CrossPlot	BHSM	Borehole Size Source Tool	SDLT	
	Rwa / CrossPlot	ROIN	Input for RO Calculation	Rwa	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GEOK	Process Gamma Ray EVR?	Yes	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	GTET	BHSM	Borehole Size Source Tool	SDLT	
	IDT	WRTI	Survey Writing Interval	30	ft
	IDT	SOPT	Smoothing Option	None	
	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	DNTT	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	
	DSNT	BHSM	Borehole Size Source Tool	SDLT	
	SDLT	CLOK	Process Caliper Outputs?	Yes	
	Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
	CDLT 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
SDLT Pad	BHSM	Borehole Size Source Tool	SDLT	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Pore Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	Limestone 47.6	
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 Up	
ACRt Sonde	TPOS	Tool Position	Eccentered	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMAX	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
ACRt Sonde	BHSM	Borehole Size Source Tool	SDLT	
ACRt Sonde	MBFL	Apply Corkscrew Effect?	No	
BOTTOM				
Data: MINIU1-1910001 GTET-IDT-DSN-SDL-BSAT-ACRT1005 18-Apr-18 04:55 Up @4153.0f				Date: 18-Apr-18 08:02:17





Bull Nose-12345678

5.00 lbs

Ø 2.750 in

→



0.33 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	11459024	37.50	2.50	76.65	300.00
XOHD	Hostile to Dits Cross Over	11569312	20.00	0.95	75.70	300.00
SP	SP Sub	11153357	60.00	3.74	71.96	300.00
GTET	Gamma Telemetry Tool	11958947	165.00	8.52	63.44	60.00
IDT	Insite Directional Tool	10967514	150.00	7.58	55.86	60.00
DSNT	Dual Spaced Neutron	11055304	174.00	9.69	46.17	60.00
DCNT	DSN Decentralizer	11055304	6.60	5.13	* 49.50	300.00
SDLT	Spectral Density Tool	10951315	360.00	10.81	35.36	60.00
SDLP	Density Insite Pad	10865873	65.00	2.55	* 37.57	60.00
Cs137	Logging Source, SDLT-I, 1.78 Ci - Cs137	10951315	1.00	0.80	* 37.80	300.00
MICP	Microlog Pad	10951315	8.00	1.00	* 37.86	60.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77	19.58	60.00
OBCEN	Centralizer - 25 in. Overbody	12345678	8.00	2.08	* 19.79	300.00
OBCEN	Centralizer - 25 in. Overbody	12345679	8.00	2.08	* 32.41	300.00
ACRt	Array Compensated True Resistivity Instrument Section	11026095	50.00	5.03	14.55	120.00
ALATS	Array Laterolog Tool OD 6 Standoff	12345678	11.60	1.00	* 17.12	60.00
ACRt	Array Compensated True Resistivity Sonde Section	11005908	200.00	14.22	0.33	120.00
BLNS	Bull Nose	12345678	5.00	0.33	0.00	300.00
Total			1,629.70	79.15		

* Not included in Total Length and Length Accumulation.

Data: MINIMUM_1-19\0001 GTET-IDT-DSN-SDL-BSAT-ACRT\005 18-Apr-18 04:55 Up @4153.0f

Date: 18-Apr-18 05:13:44

COMPANY	CULBREATH OIL & GAS		
WELL	MINIUM 1-19		
FIELD	KANACO-MORELAND		
COUNTY	SHERIDAN	STATE	KANSAS
HALLIBURTON		MICRO LOG	