HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY LOGS

COMPANY	TGT PETROLEUM CORPORATION
WELL	END WRENCH #5
FIELD	EINSEL
COUNTY	KIOWA
STATE	KANSAS

COMPANY **TGT PETROLEUM CORPORATION**

WELL **END WRENCH #5**

FIELD **EINSEL**

COUNTY **KIOWA** STATE **KANSAS**

API No. 15-097-21737

Location (SHL) 978' FSL & 1316' FEL
SW NW SE SE

Sect. 25 Twp. 27S Rge. 19W

Other Services:
DSN/SDL
MICROLOG
ACRT
BSAT
XRMI

Permanent Datum	GL	Elev. 2206.0 ft	Elev.: K.B.	2216.0 ft
Log measured from	KB	, 10.0 ft above perm. Datum	D.F.	2215.0 ft
Drilling measured from	KB		G.L.	2206.0 ft

Date		27-Nov-12				
Run No.		ONE				
Depth - Driller		4940.00 ft				
Depth - Logger		4930.0 ft				
Bottom - Logged Interval		4920				
Top - Logged Interval		479				
Casing - Driller		8.625 in @ 477.0 ft		@		@
Casing - Logger		479.0 ft				
Bit Size		7.875 in		@		@
Type Fluid in Hole		WATER BASED MUD				
Density	Viscosity	9.5 ppg	75.00 s/qt			
PH	Fluid Loss	10.50 pH	12.8 cptm			
Source of Sample		MUD PIT				
Rm @ Meas. Temperature		0.400 ohmm @ 82.00 degF		@		@
Rmf @ Meas. Temperature		0.34 ohmm @ 82.00 degF		@		@
Rmc @ Meas. Temperature		0.460 ohmm @ 82.00 degF		@		@
Source Rmf	Rmc	CALCULATED	CALCULATED			
Rm @ BHT		0.28 ohmm @ 120.0 degF		@		@
Time Since Circulation		5.5 hr				
Time on Bottom		27-Nov-12 17:52				
Max. Rec. Temperature		120.0 degF @ 4930.0 ft		@		@
Equipment	Location	10800785	LIBERAL			
Recorded By		S. INGERSOLL				
Witnessed By		J. CHRISTIAN				

Fold here

Service Ticket No.: 900033352 API Serial No.: 15-097-21737 PGM Version: WL INSITE R3.6.0 (Build 3)

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	ACRT	N/A	CENT.	
	10929775			

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	10811258	Serial No.	10747683	Serial No.	10950489	Serial No.	10755066
Model No.	GTET	Model No.	BSAT	Model No.	SDLT	Model No.	DSNT
Diameter	3.625"	No. of Cent.	2	Diameter	4.5"	Diameter	3.625"
Detector Model No.	GTET	Spacing	.5'	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT			Source Type	CS-137	Source Type	AM-241BE
Length	8"	LSA [Y/N]		Serial No.		Serial No.	
Distance to Source		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	4930	479	REC	0	150	30	-10	47.6 ft/us	30	-10	2.71 gm/cc	30	-10	LIME

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@

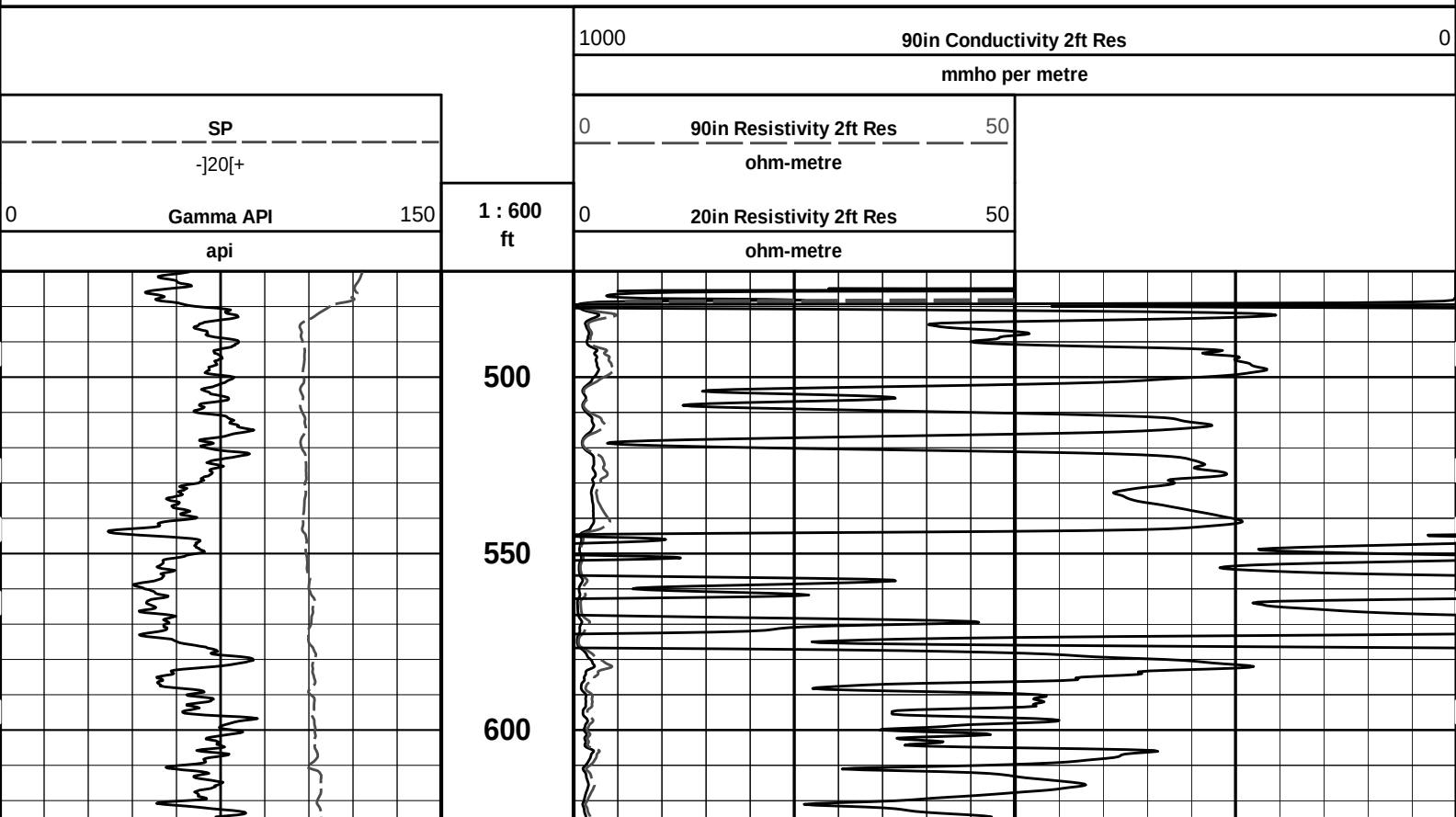
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.

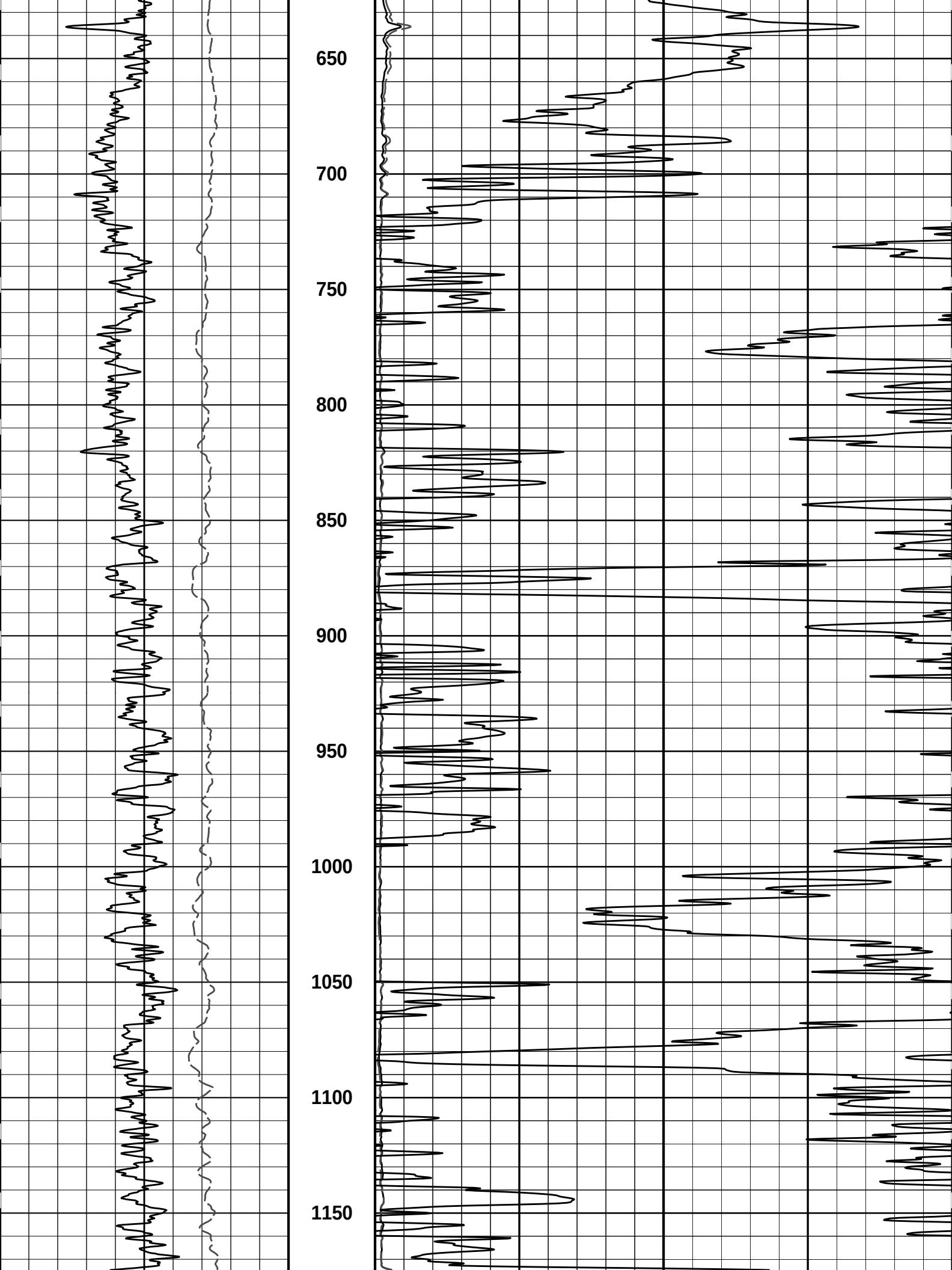
CHLORIDES REPORTED AT 12,000 ppm.

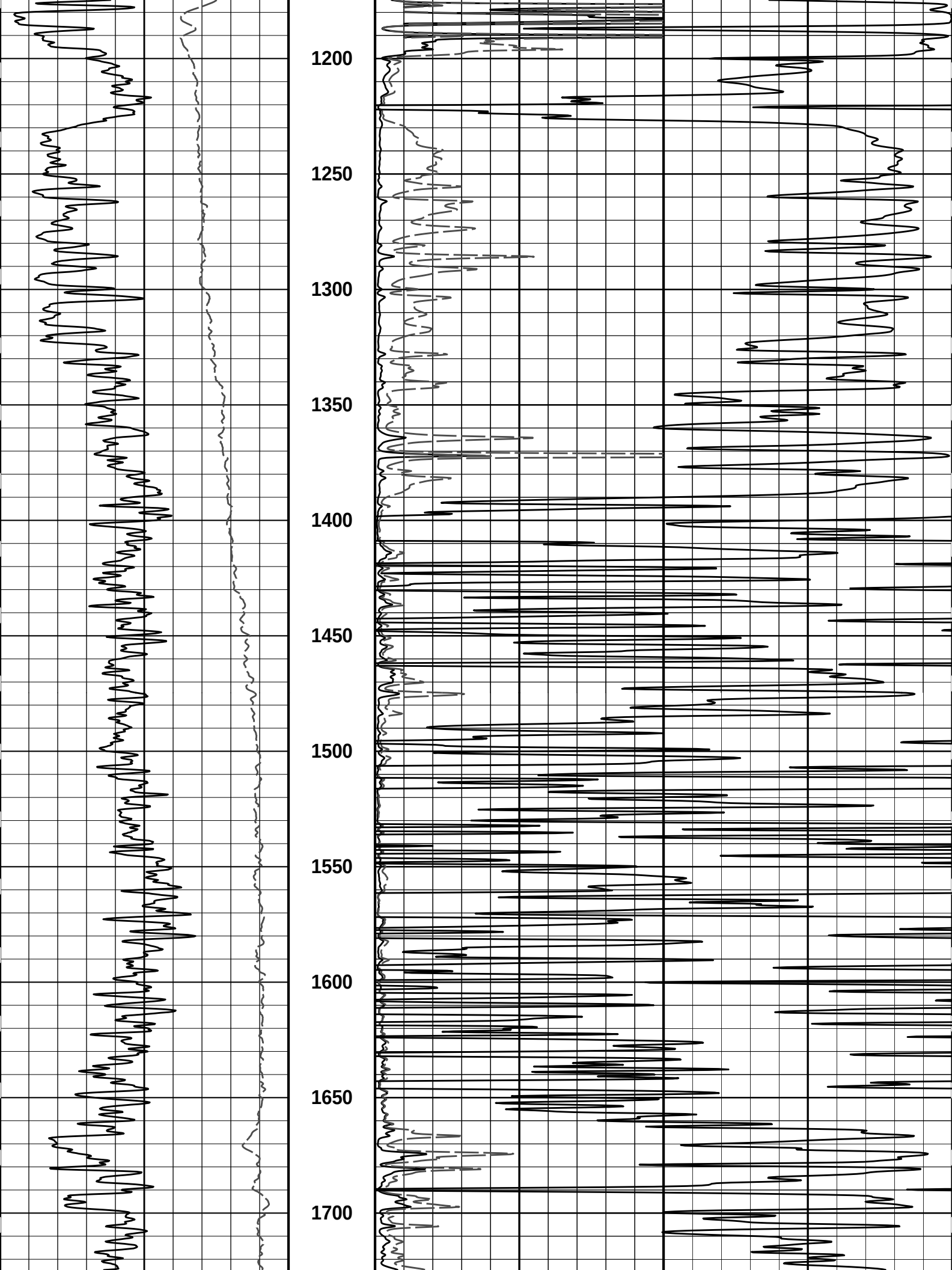
HALLIBURTON

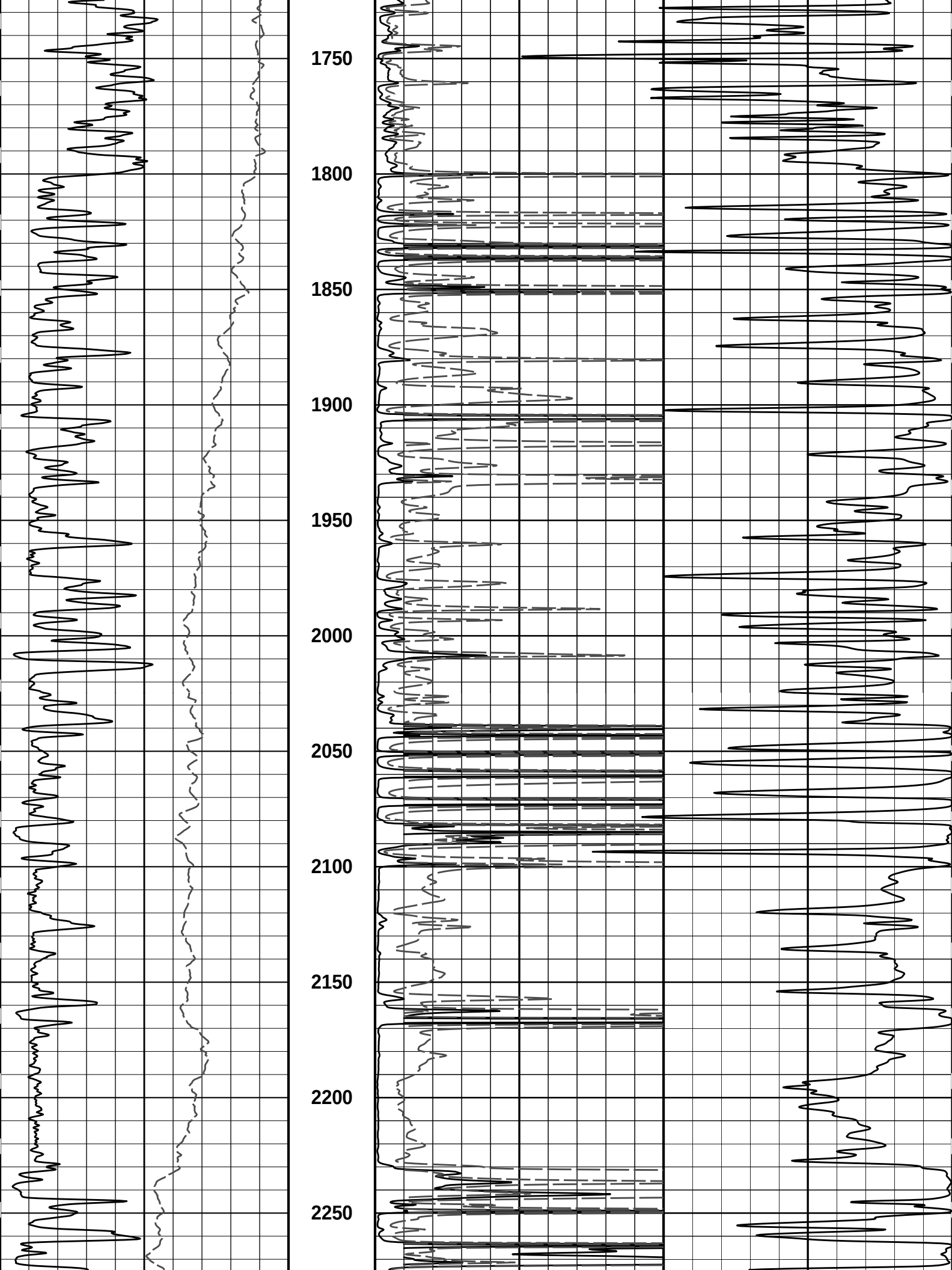
Plot Time: 27-Nov-12 22:08:02
Plot Range: 470 ft to 4930.91 ft
Data: END_WRENCH#5\Well Based\ACRT, BSAT
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_2_lib

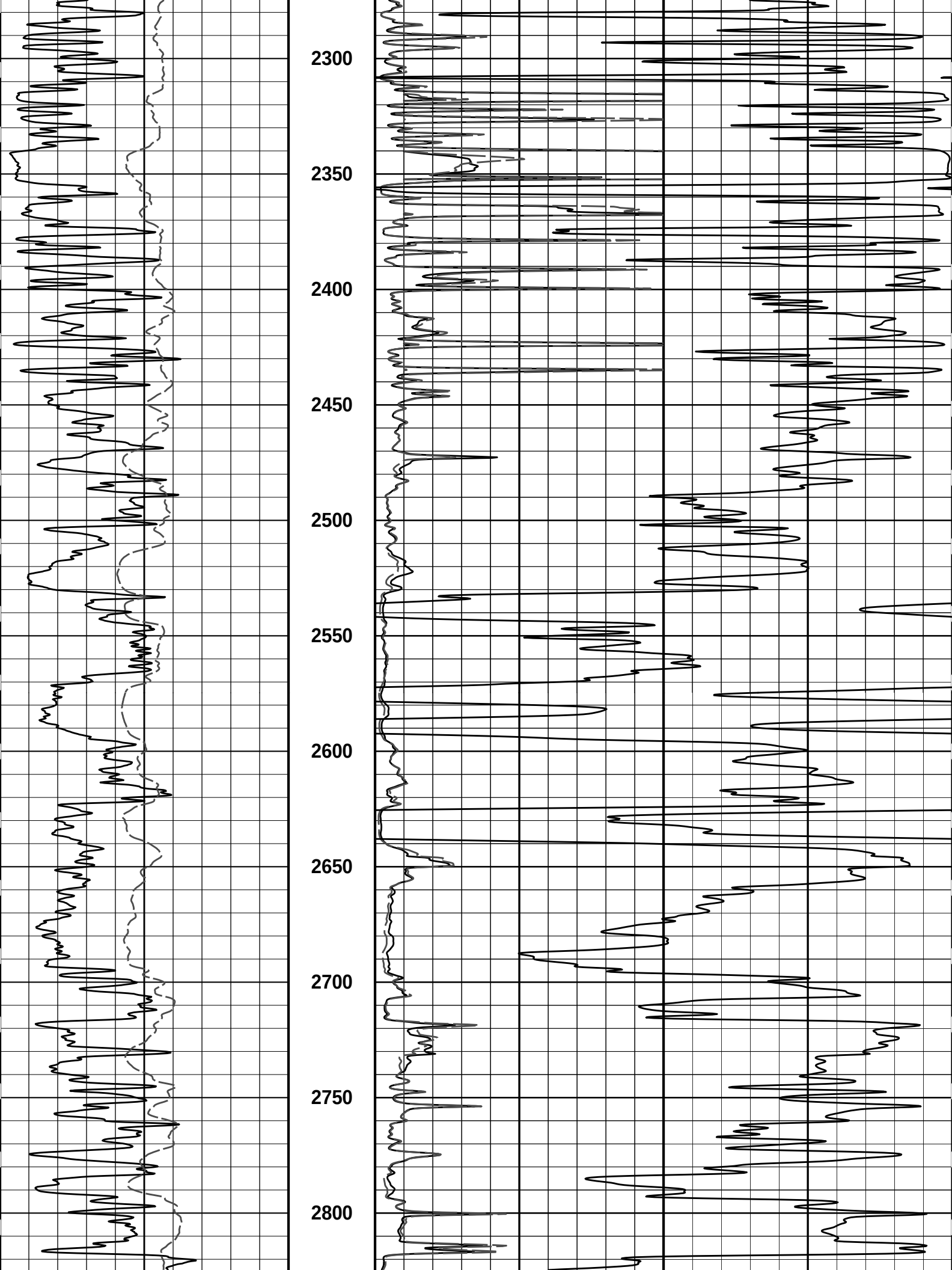
2 INCH MAIN LOG

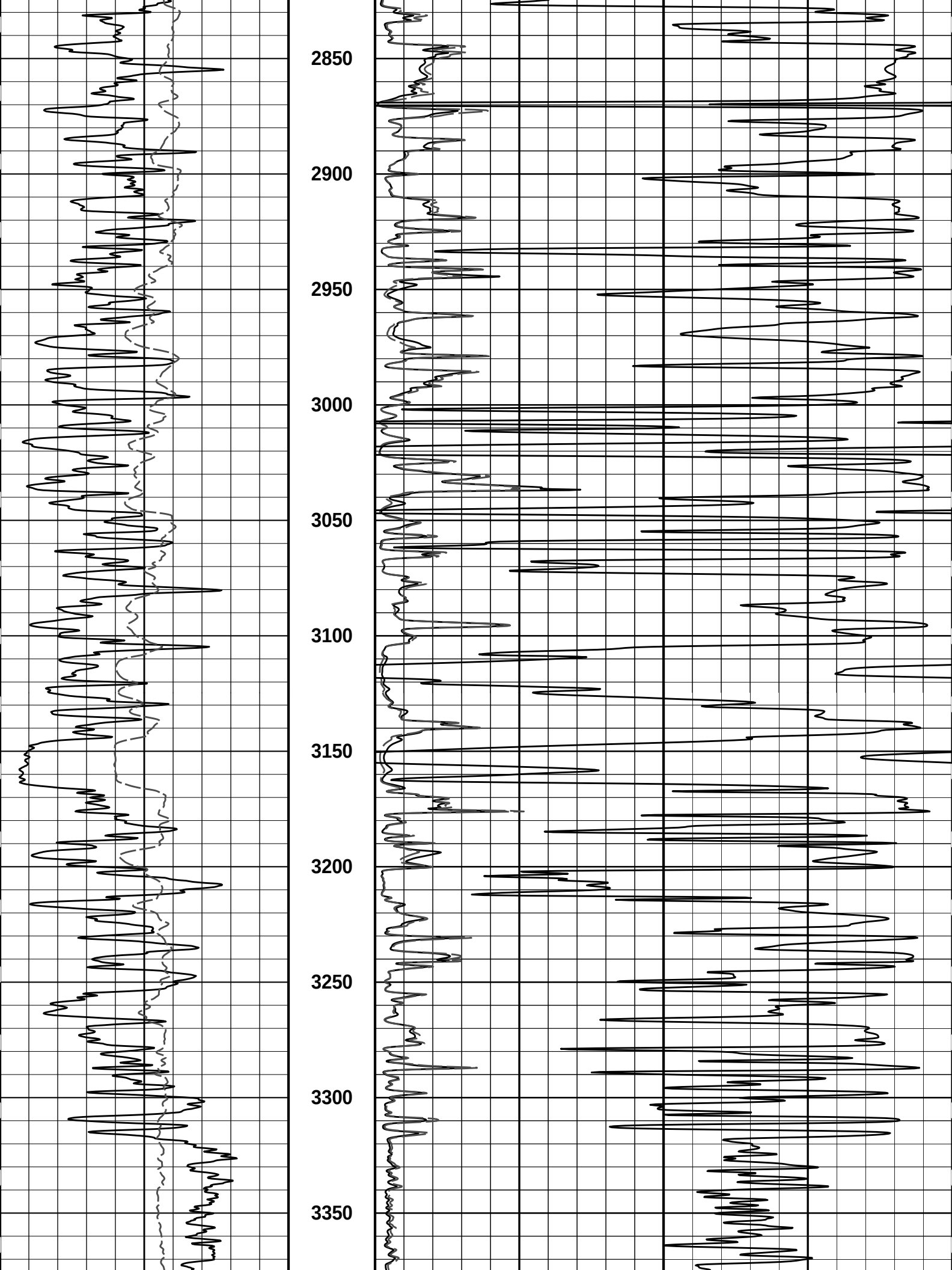


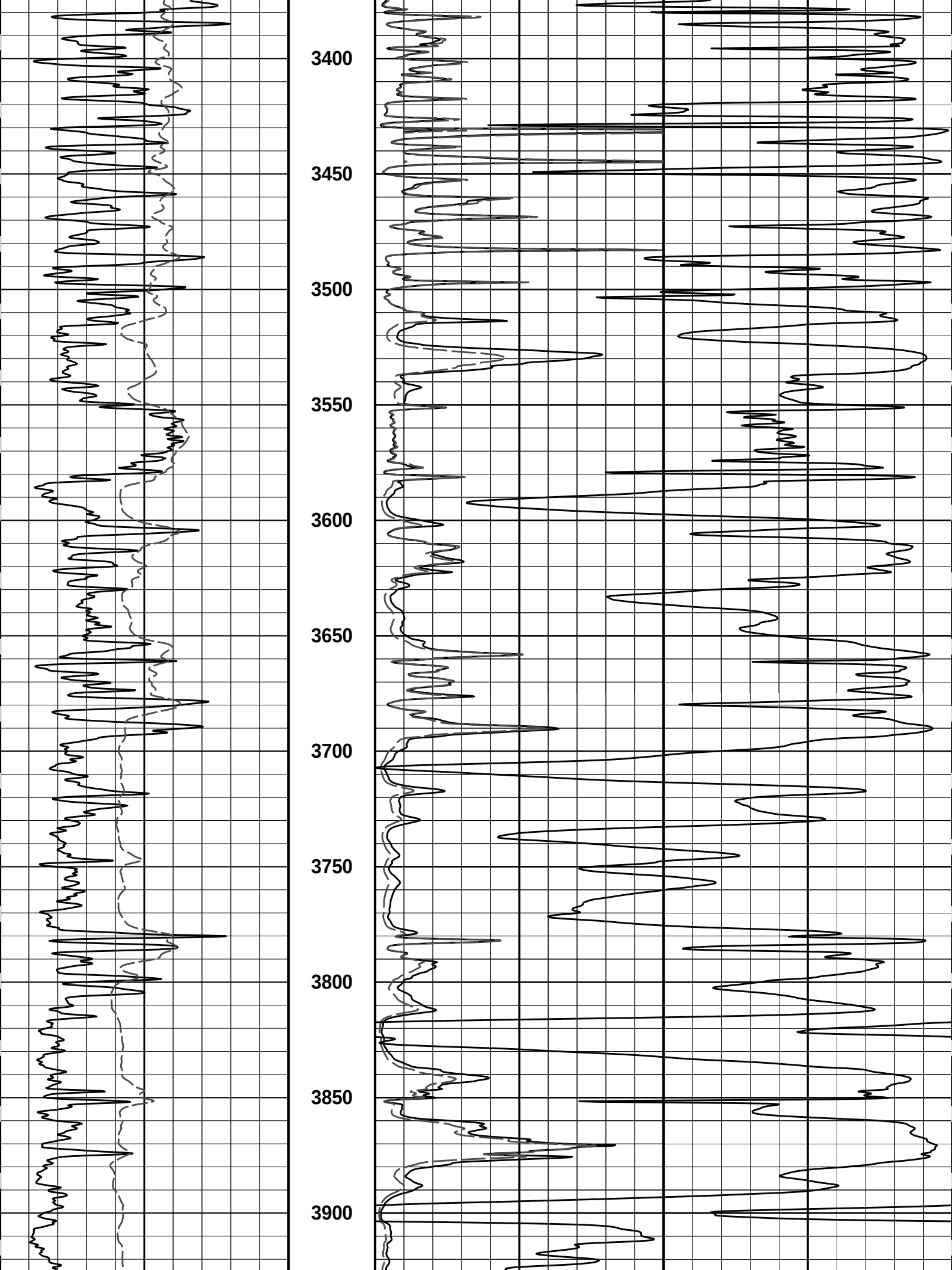

650
700
750
800
850
900
950
1000
1050
1100
1150

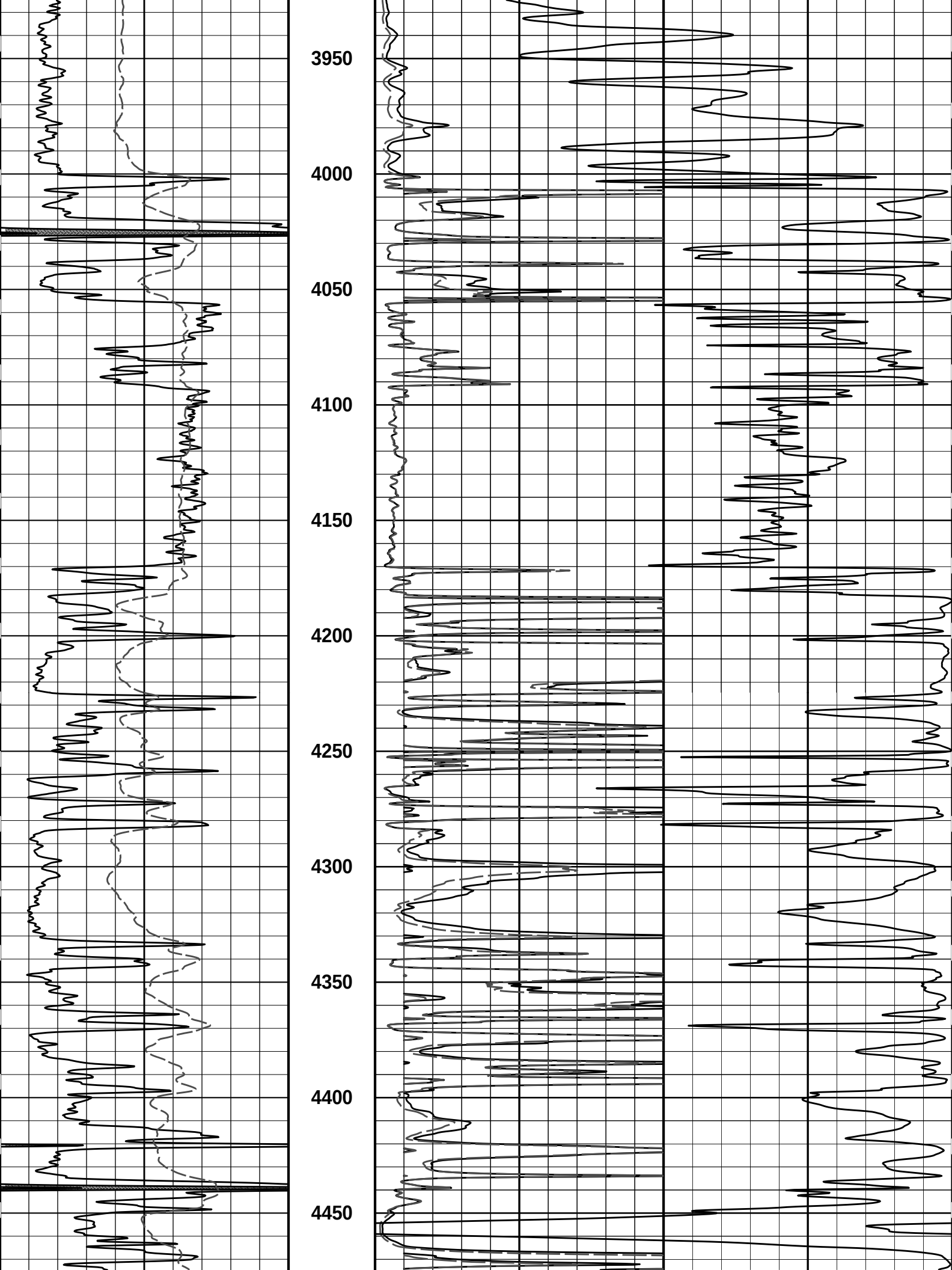

1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
1700

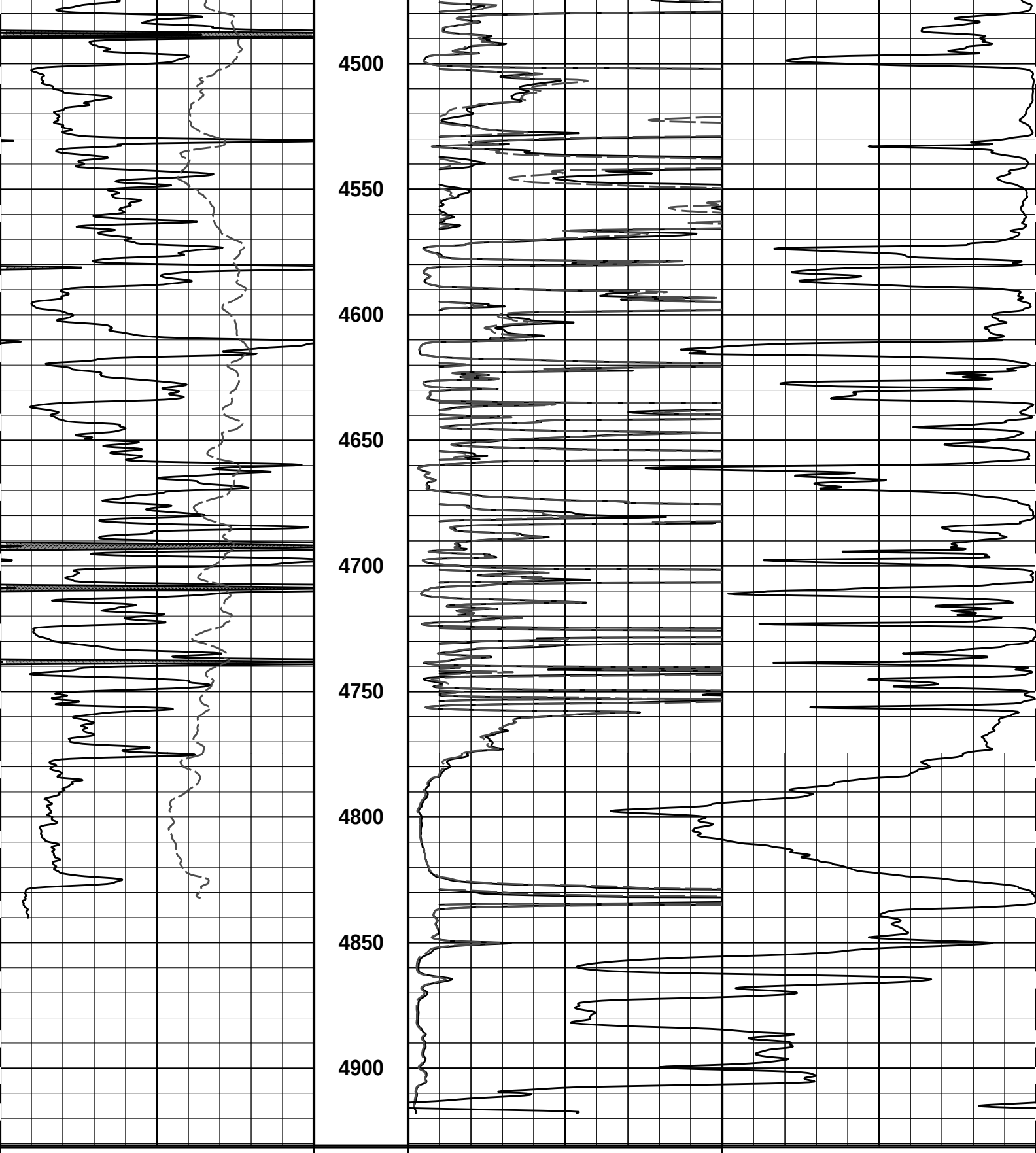

1750
1800
1850
1900
1950
2000
2050
2100
2150
2200
2250


2300
2350
2400
2450
2500
2550
2600
2650
2700
2750
2800


2850
2900
2950
3000
3050
3100
3150
3200
3250
3300
3350


3400
3450
3500
3550
3600
3650
3700
3750
3800
3850
3900


3950
4000
4050
4100
4150
4200
4250
4300
4350
4400
4450



0 Gamma API 150	1 : 600 ft	0 20in Resistivity 2ft Res 50
api		ohm-metre
SP		0 90in Resistivity 2ft Res 50
-]20[+		ohm-metre
		1000 90in Conductivity 2ft Res 0
		mmho per metre

HALLIBURTON

Plot Time: 27-Nov-12 22:08:24
Plot Range: 470 ft to 4930.91 ft

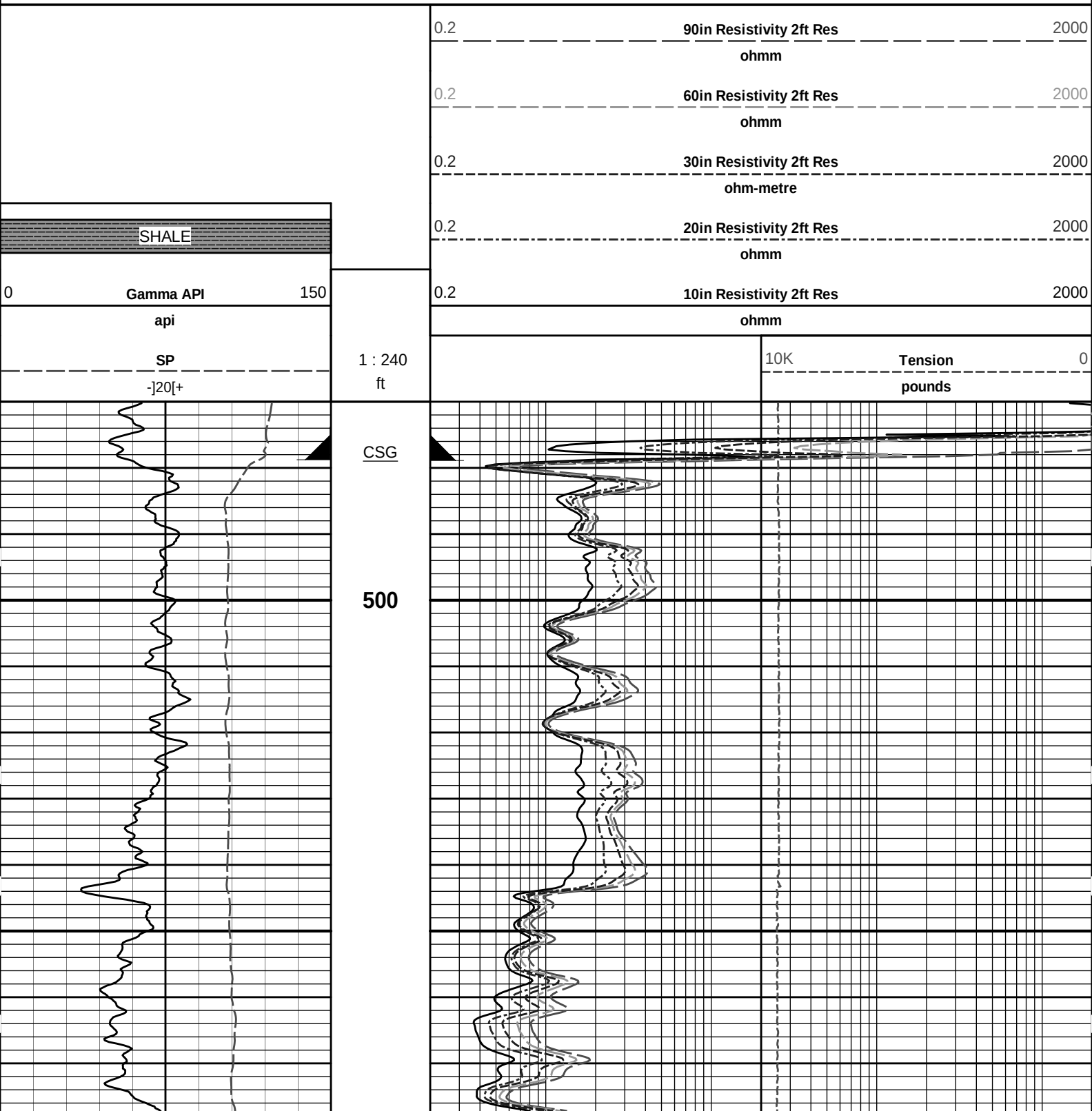
Data: END_WRENCH#5\Well Based\ACRT, BSAT\
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_2_lib

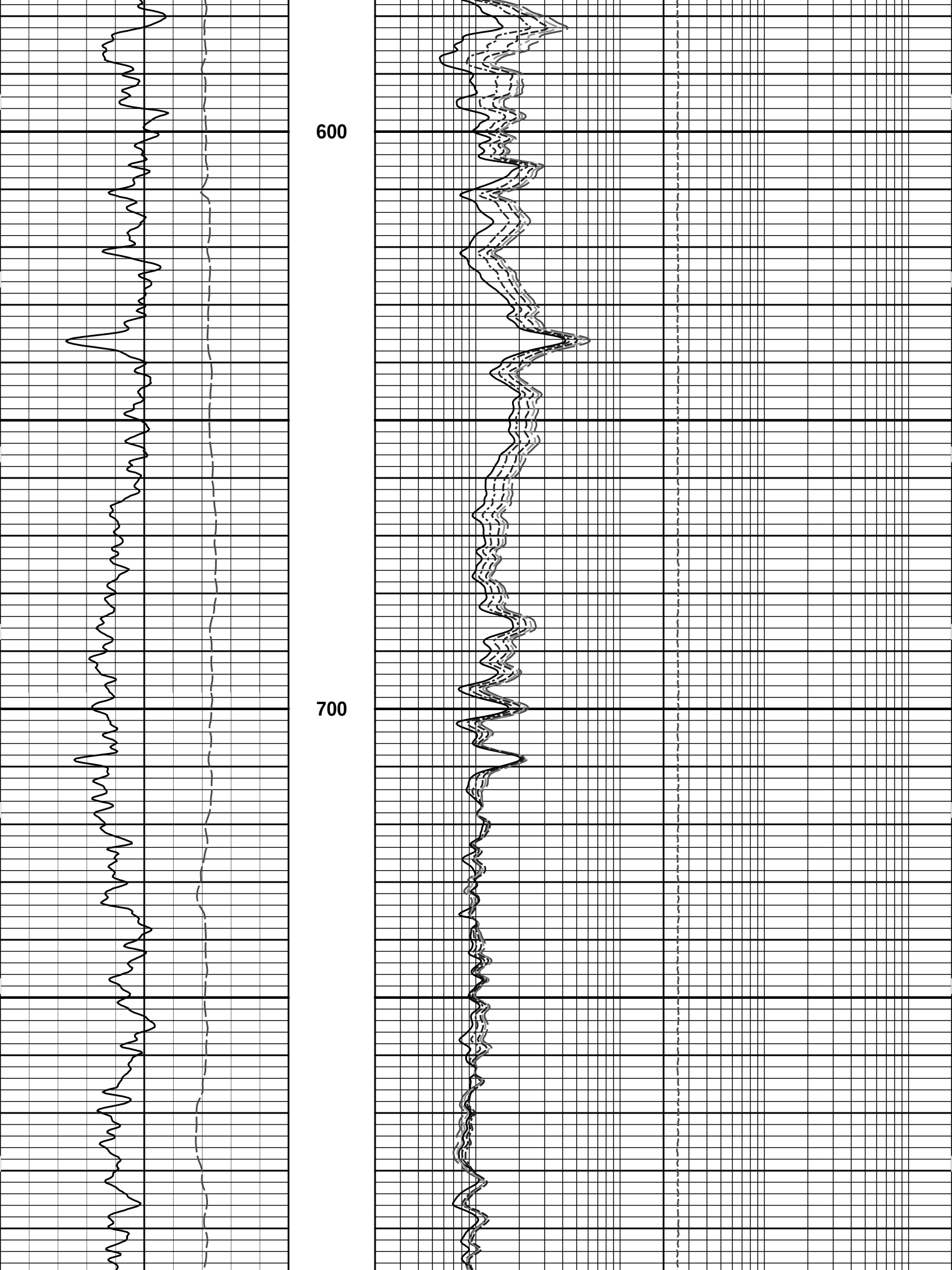
2 INCH MAIN LOG

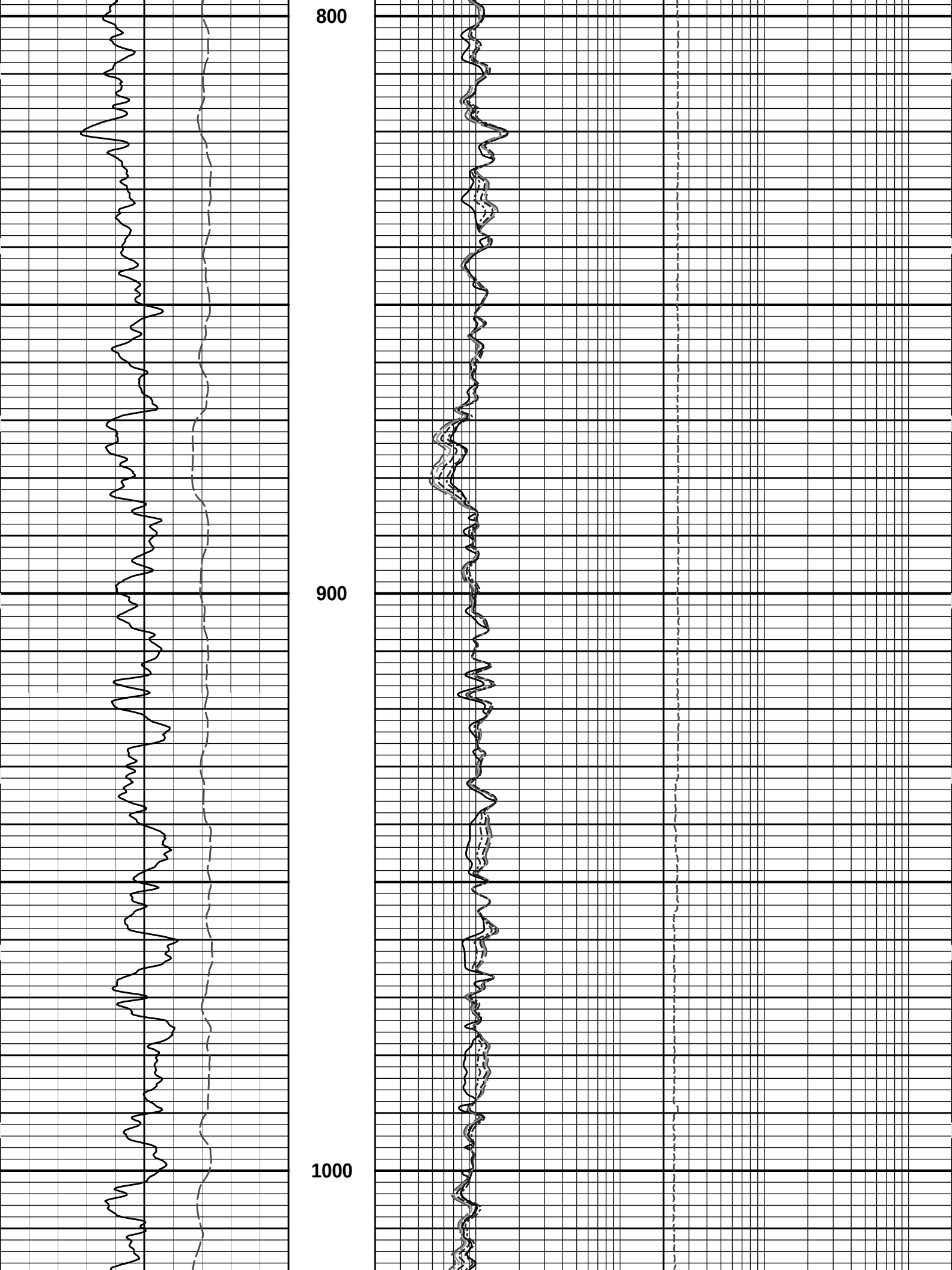
HALLIBURTON

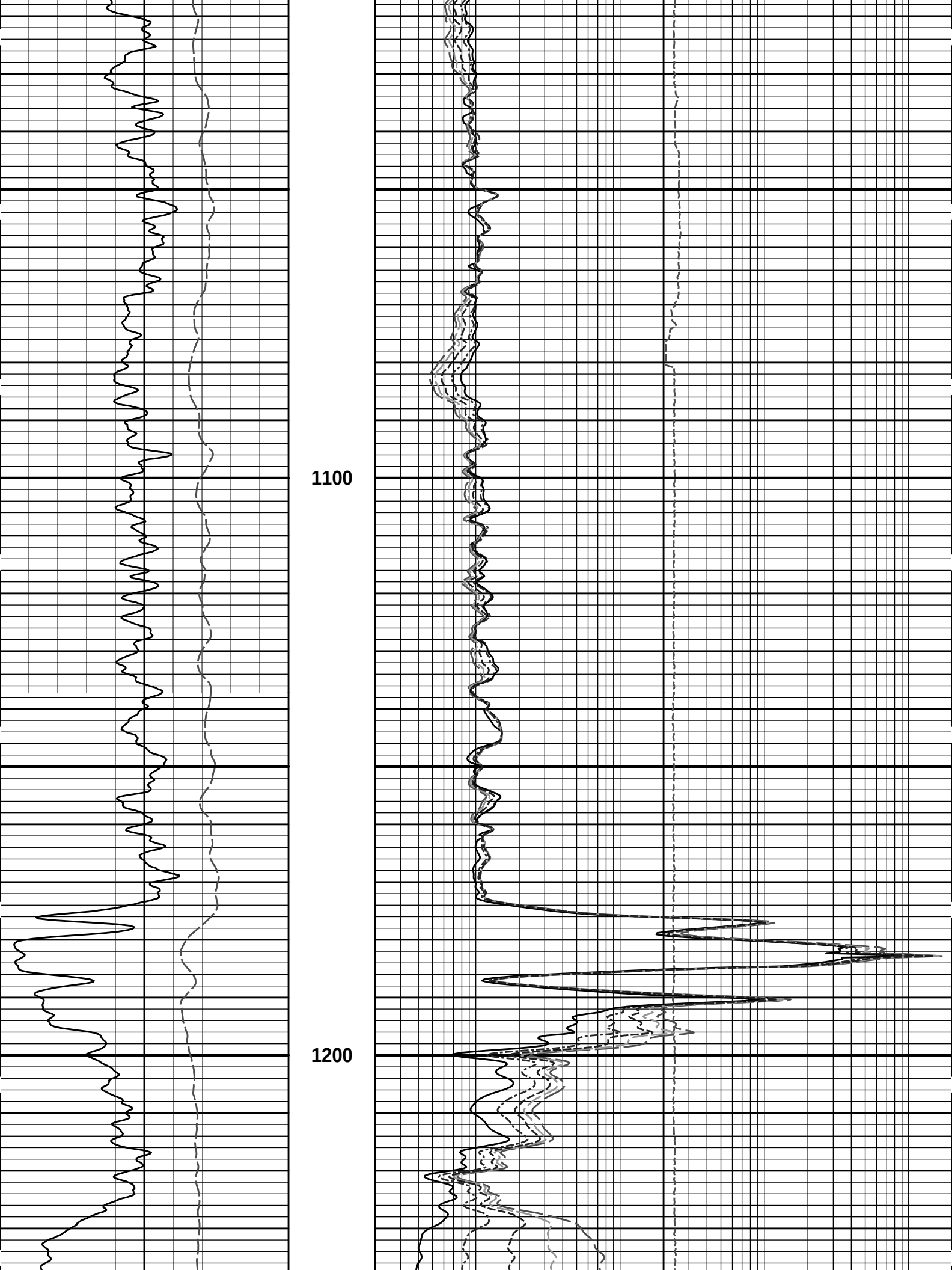
Plot Time: 27-Nov-12 22:08:24
Plot Range: 470 ft to 4930.91 ft
Data: END_WRENCH#5\Well Based\ACRT, BSAT\
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_5_main_lib

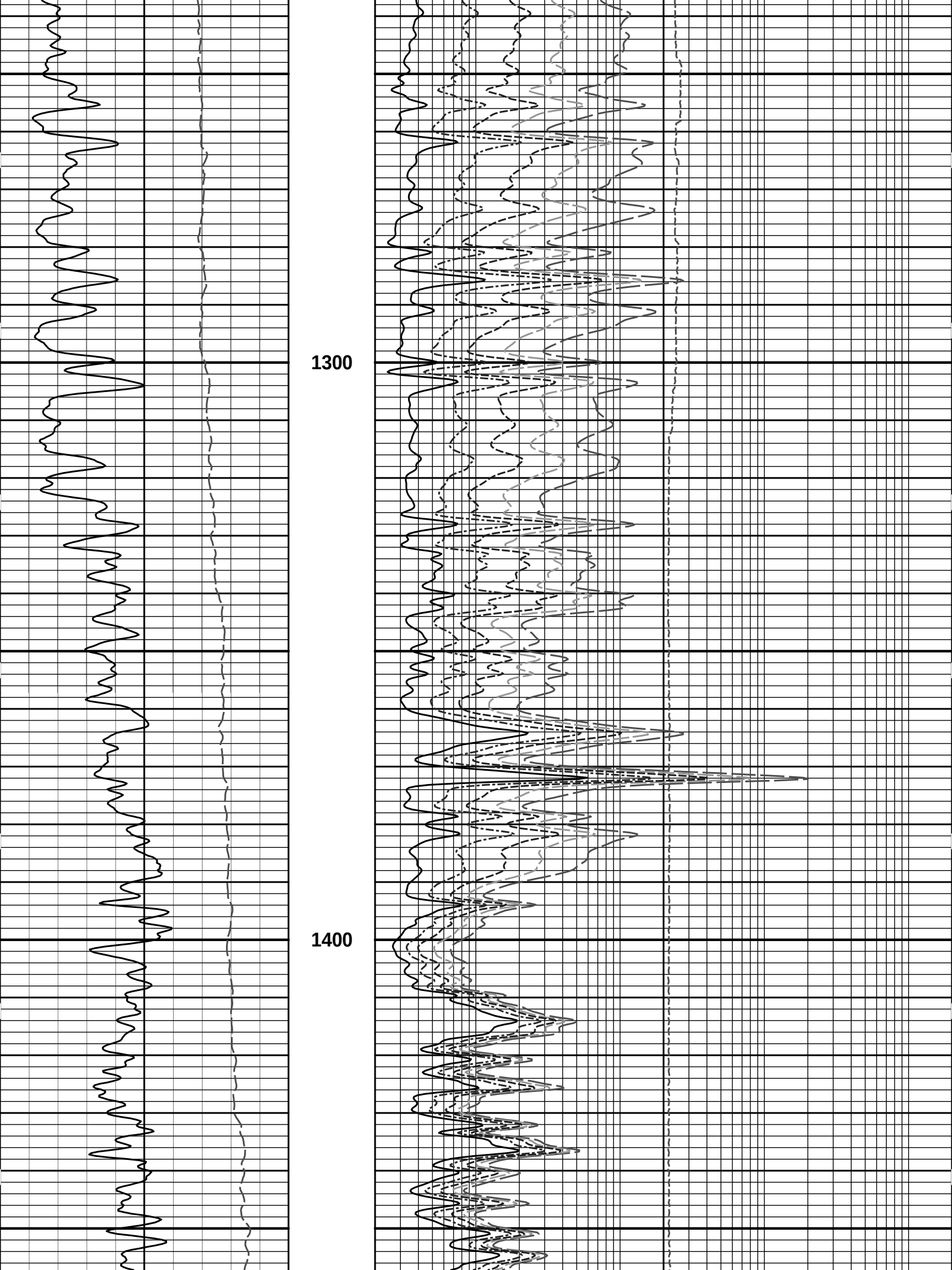
5 INCH MAIN LOG

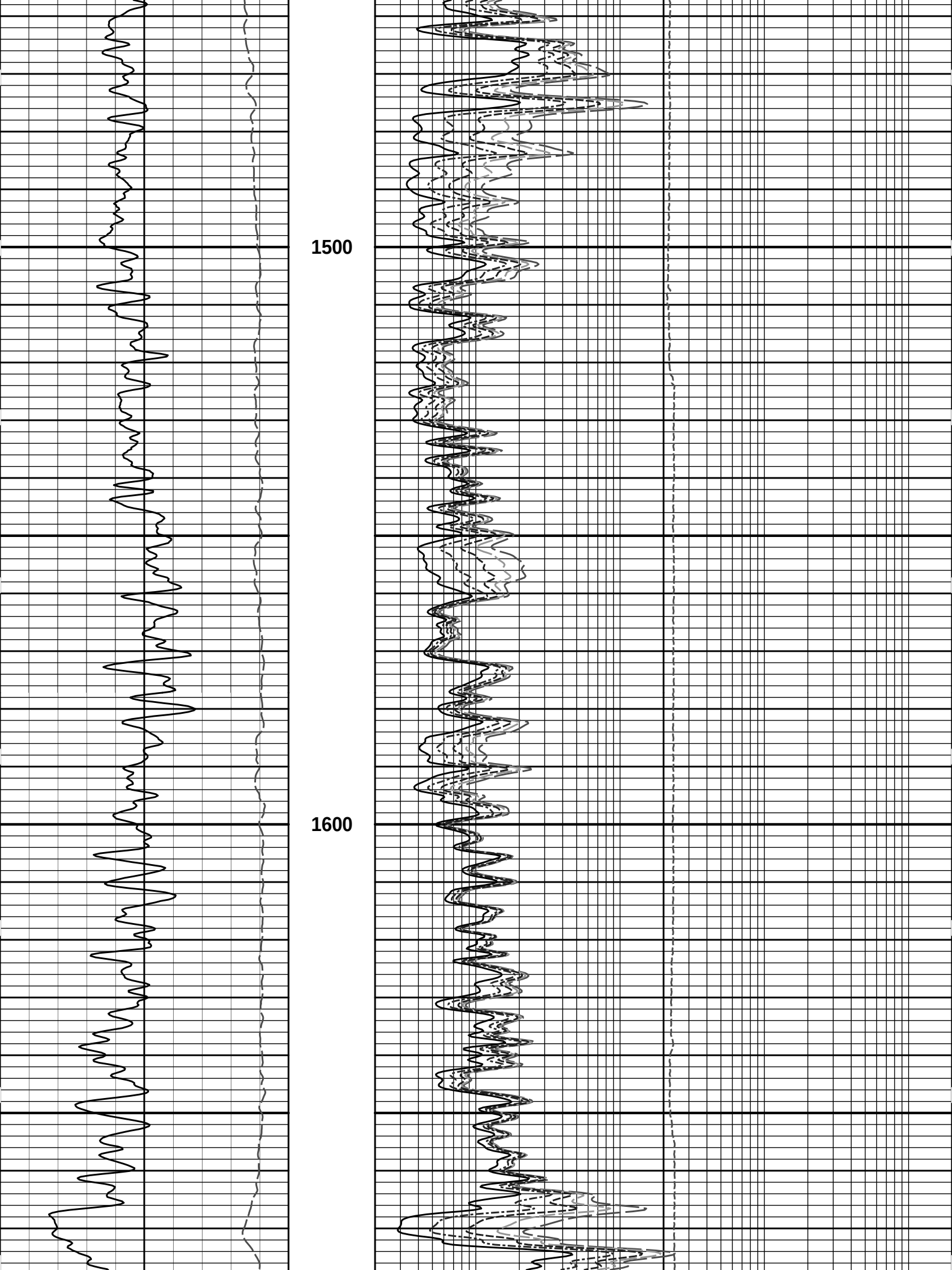


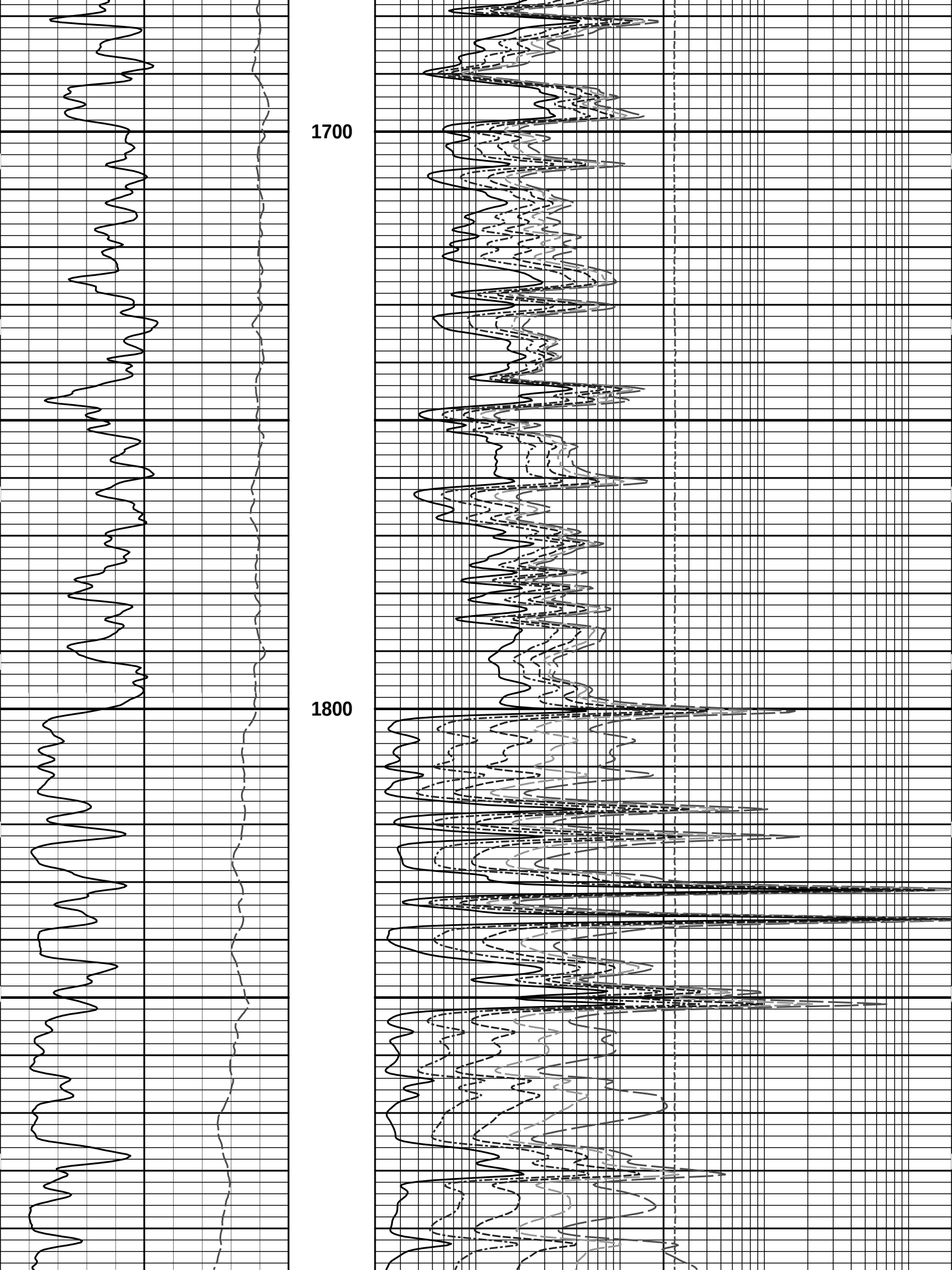

600
700

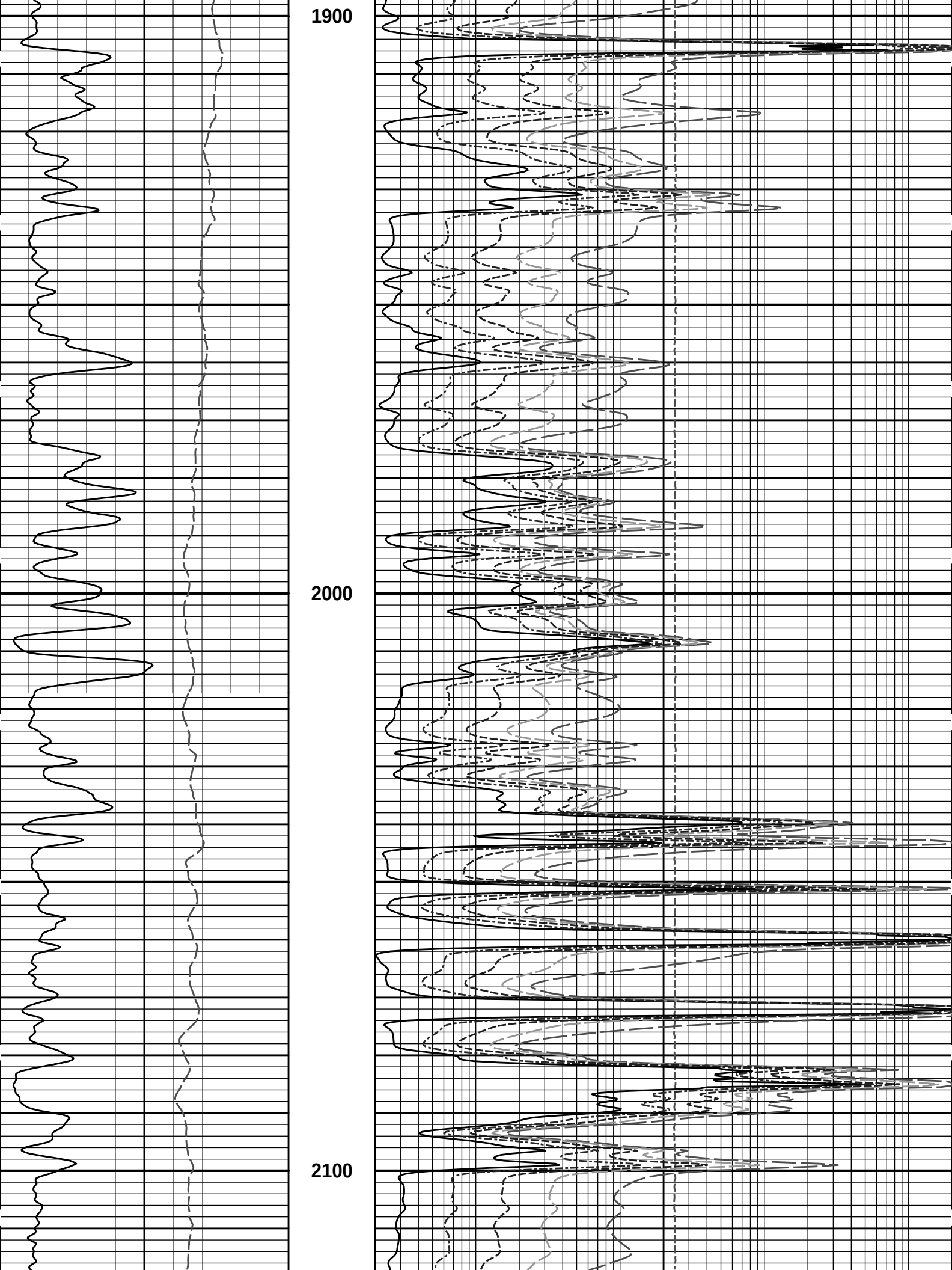

800
900
1000

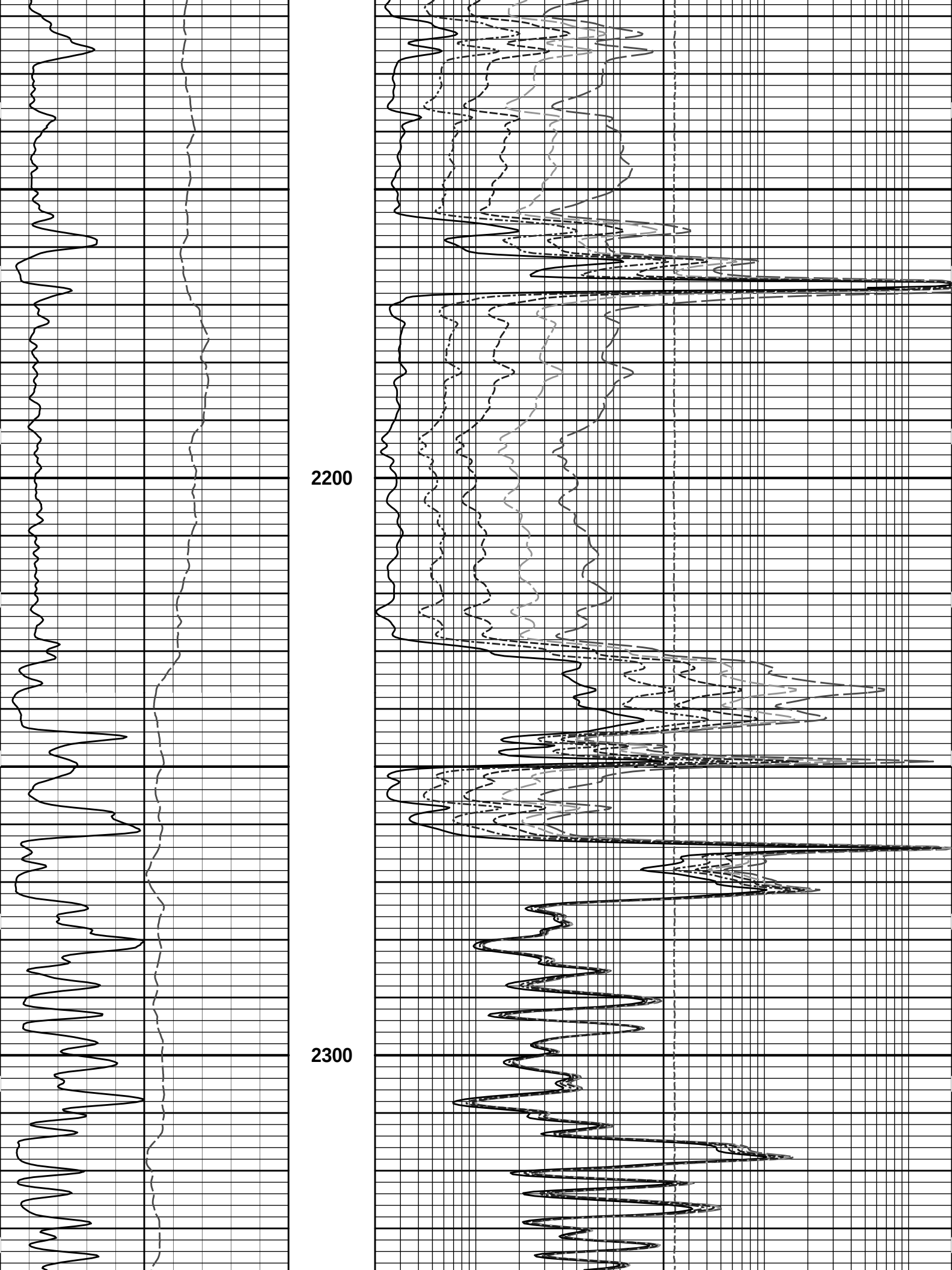

1100
1200

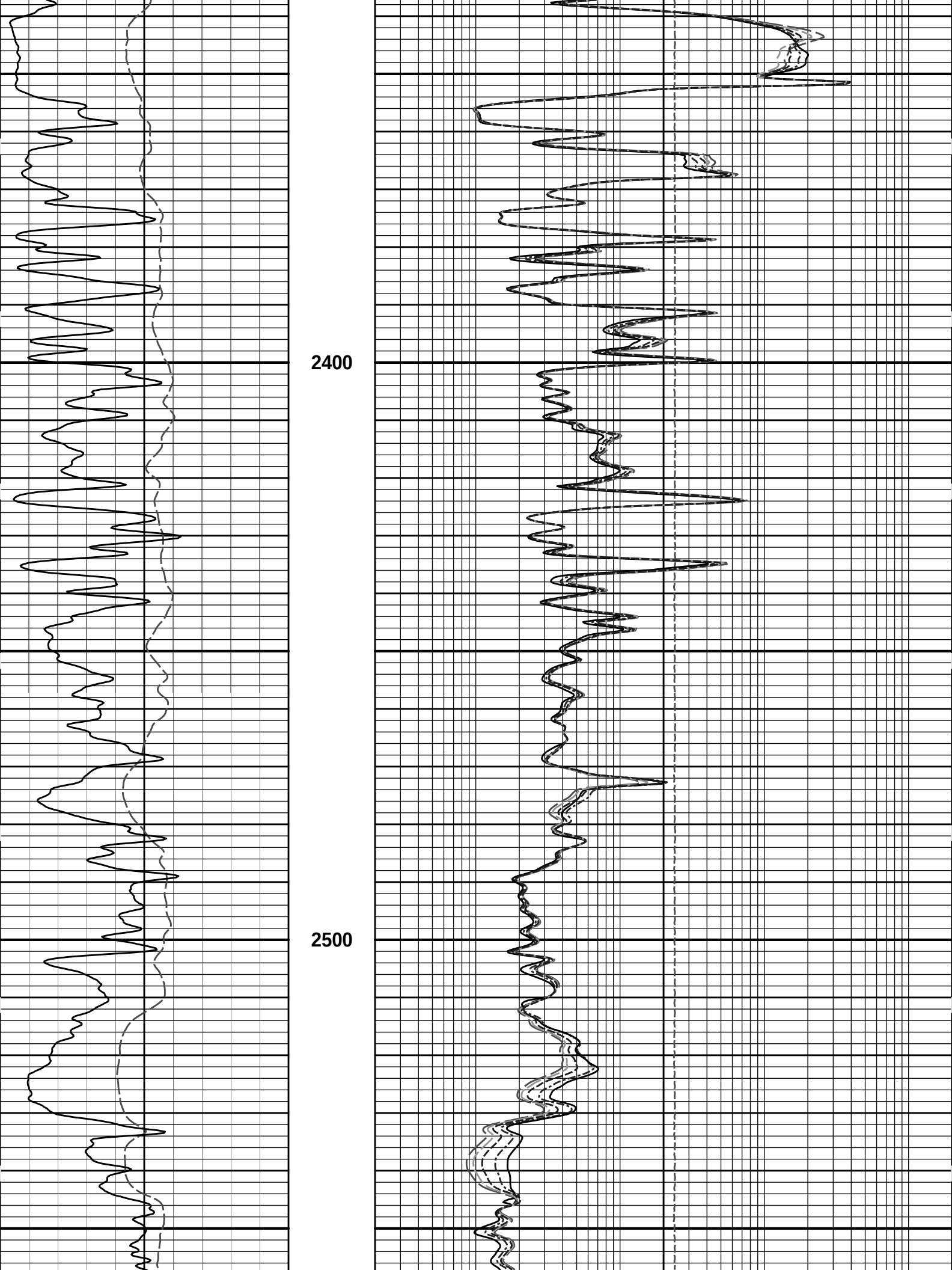

1300
1400

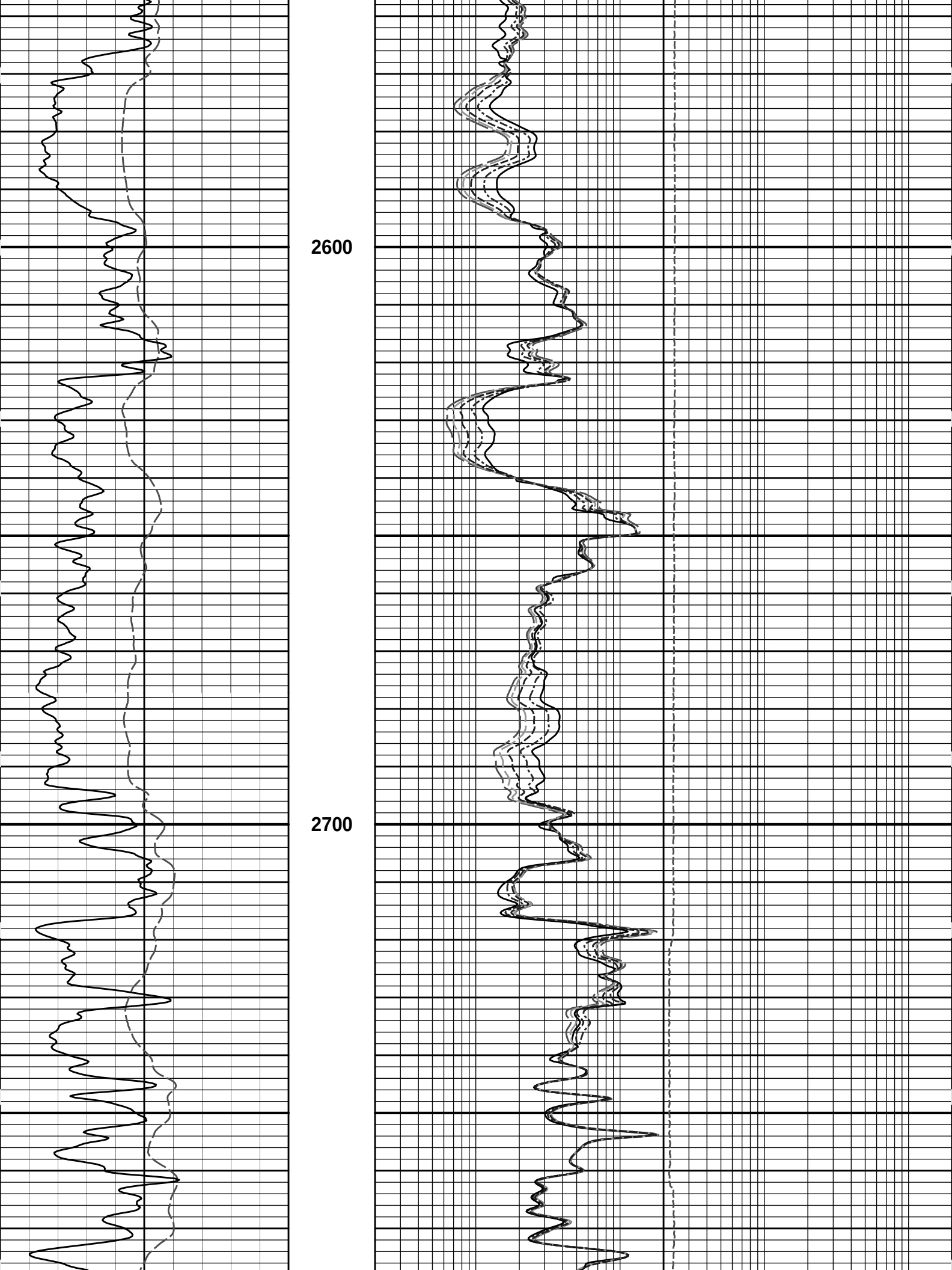

1500
1600

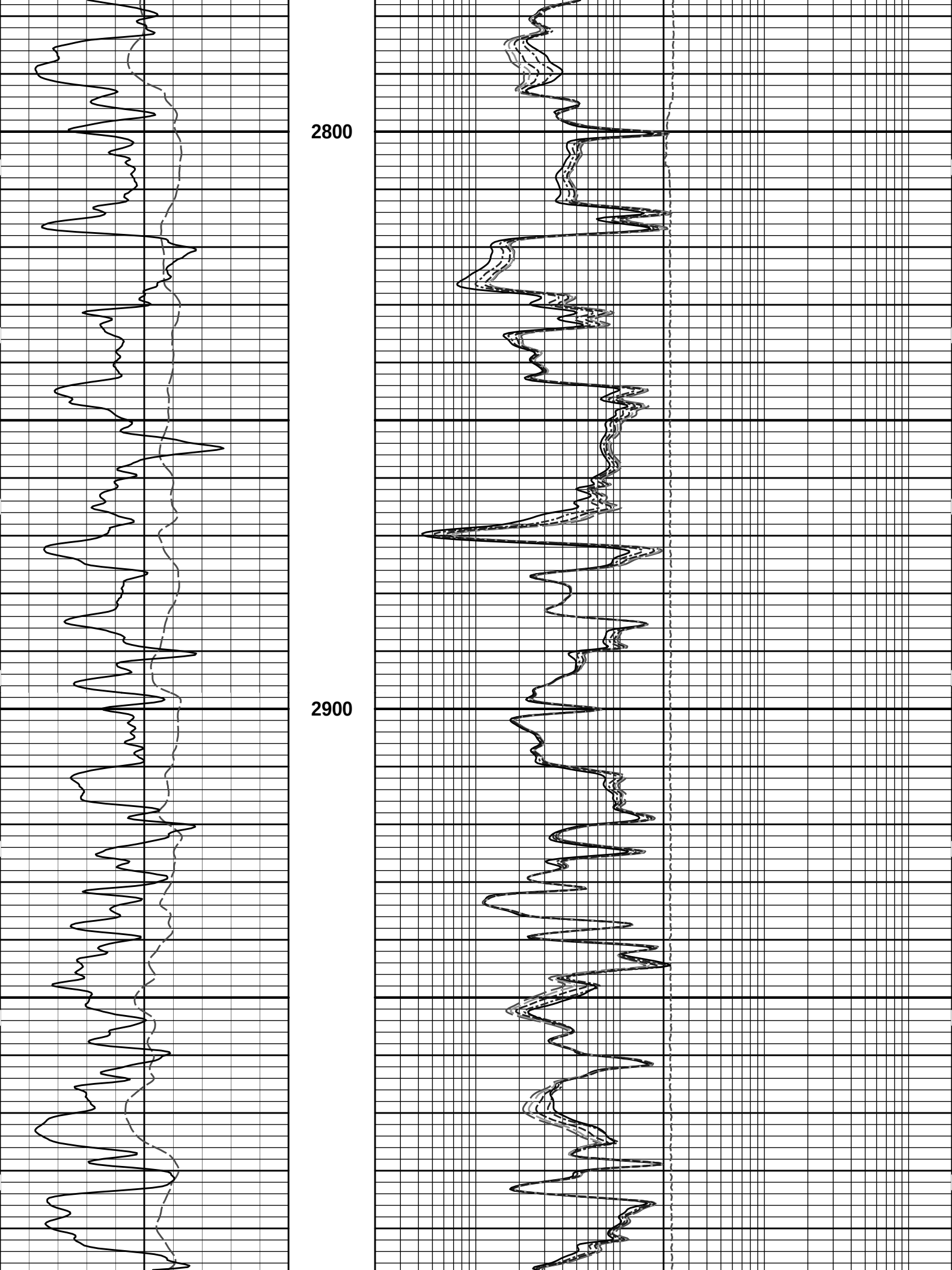

1700
1800

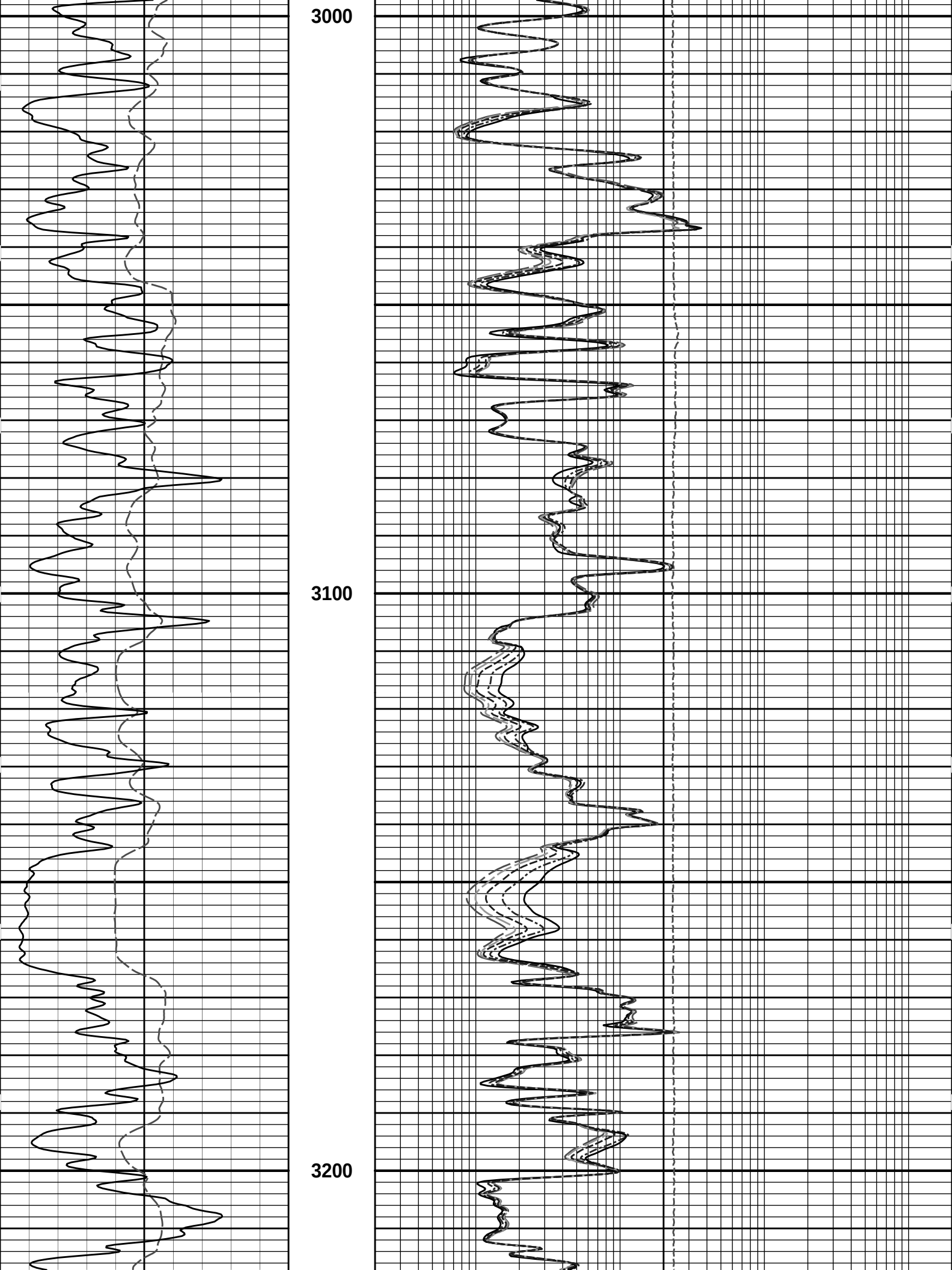

1900
2000
2100

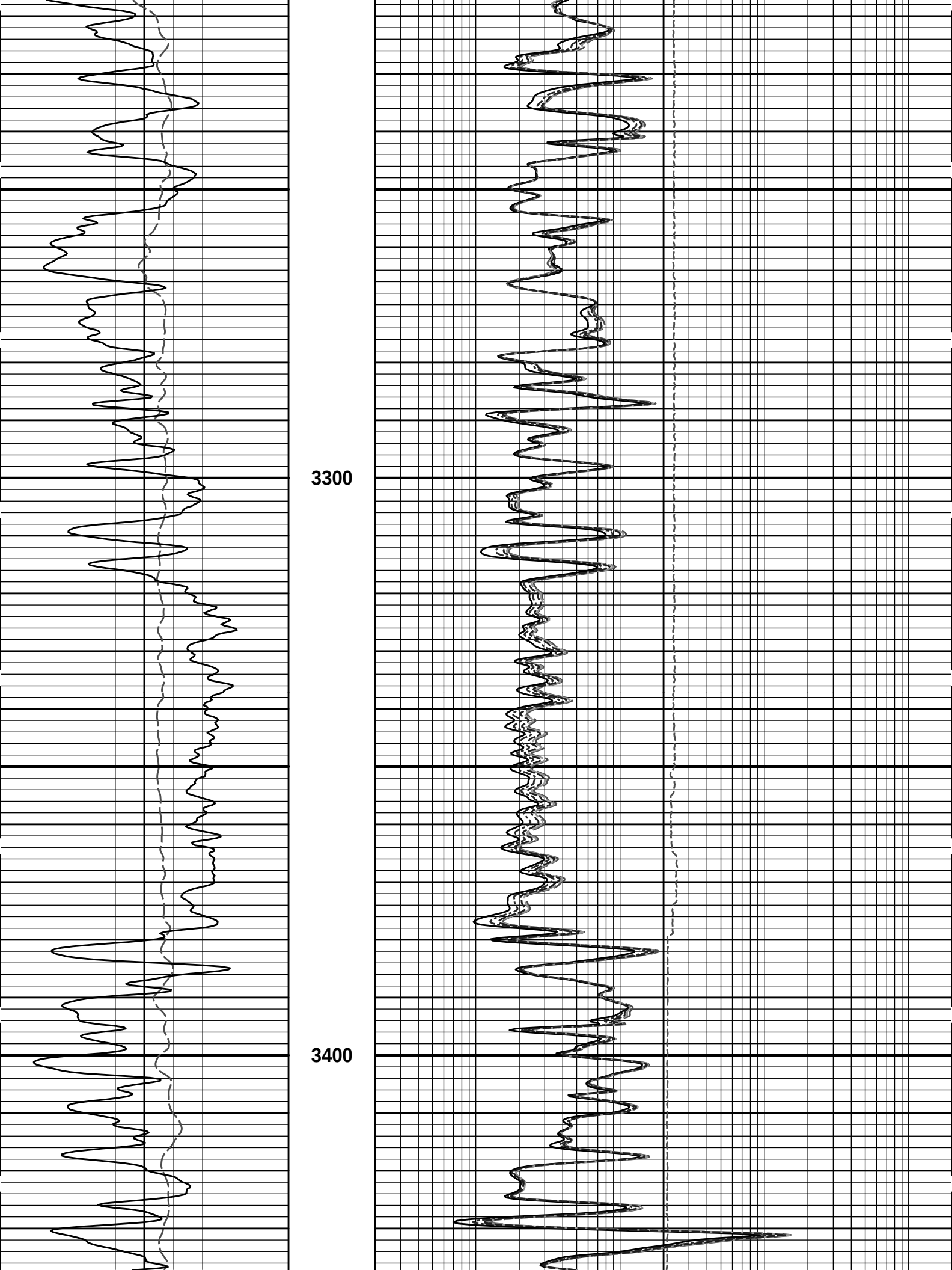

2200
2300

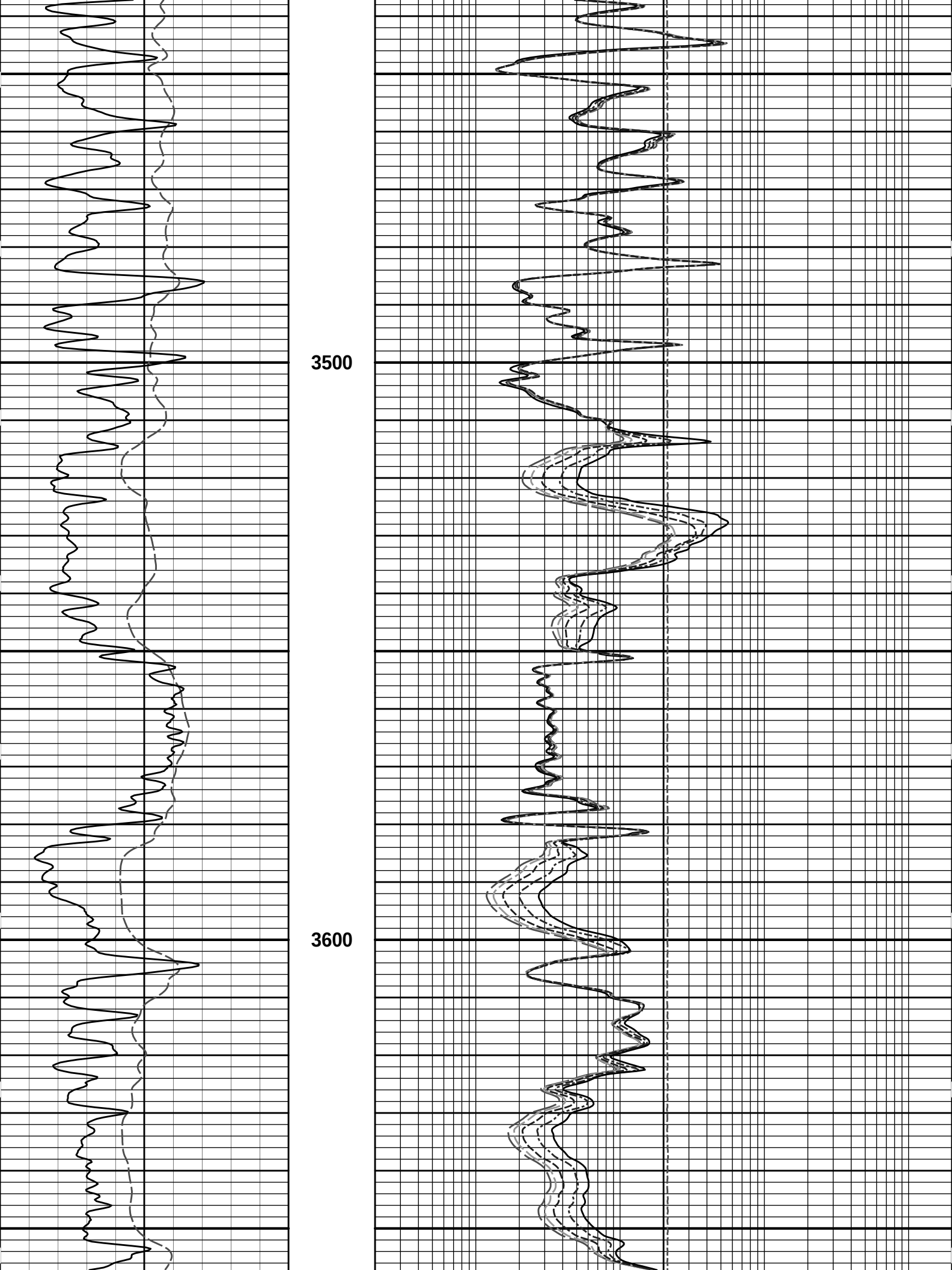

2400
2500

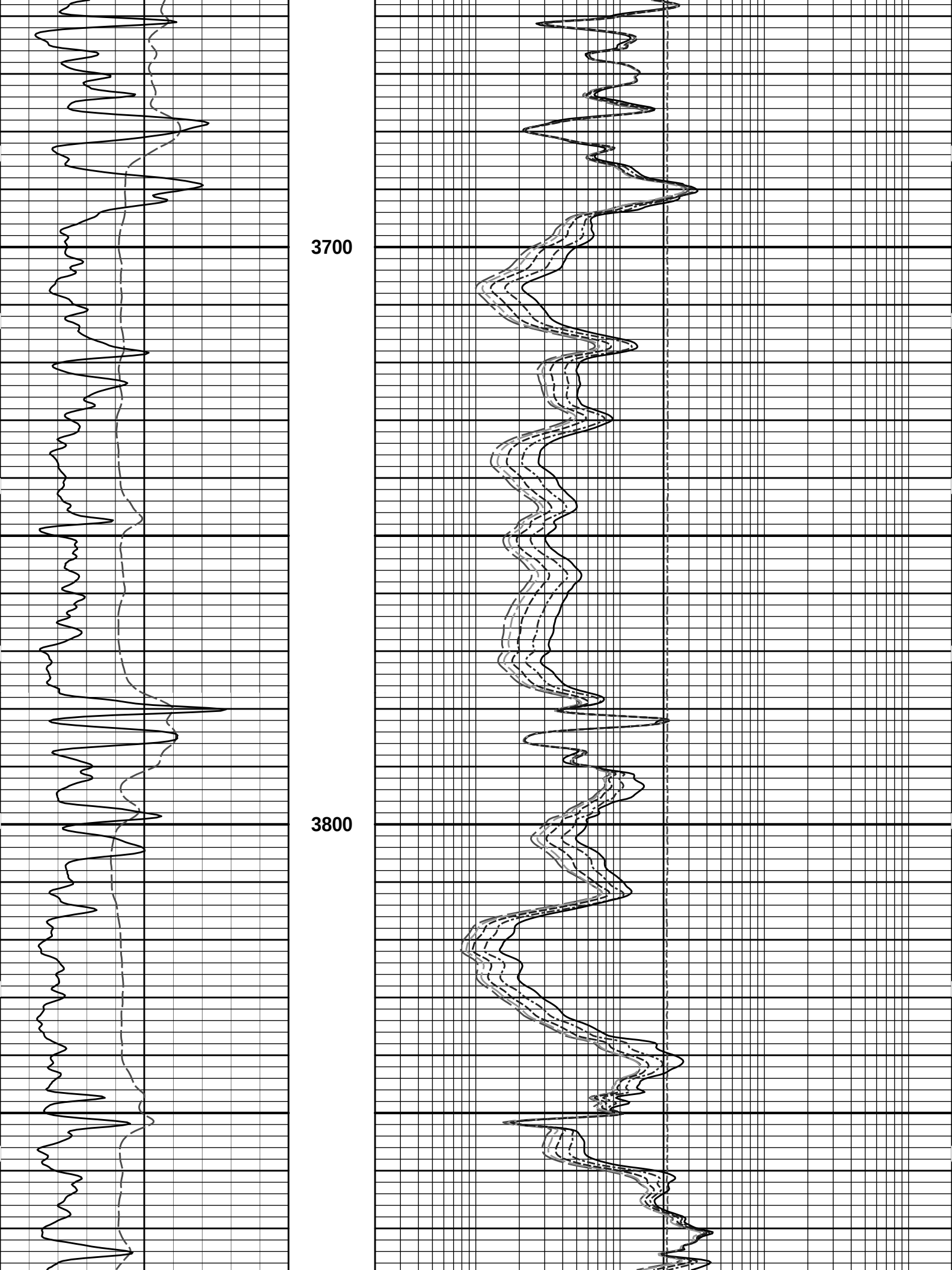

2600
2700

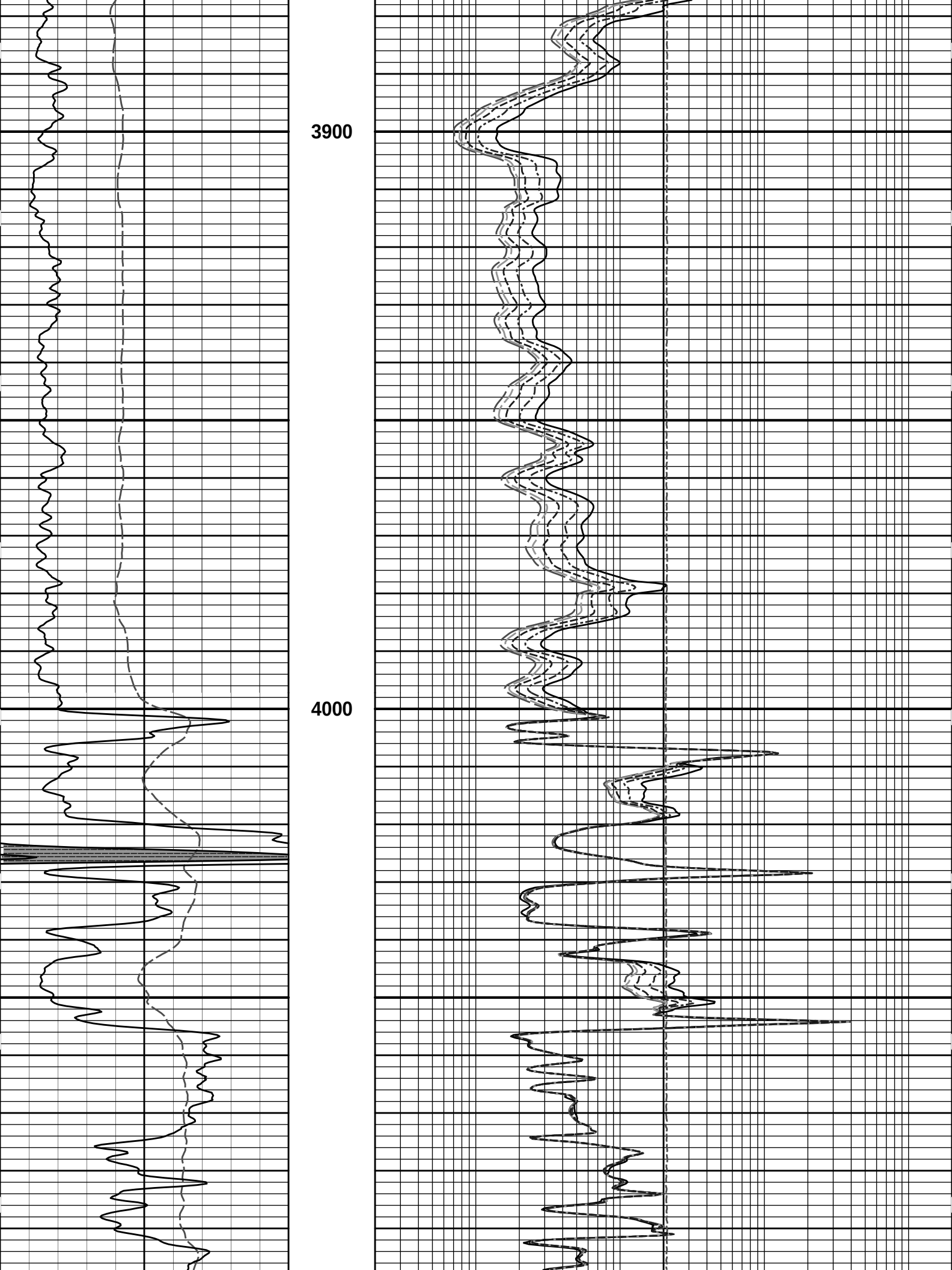

2800
2900

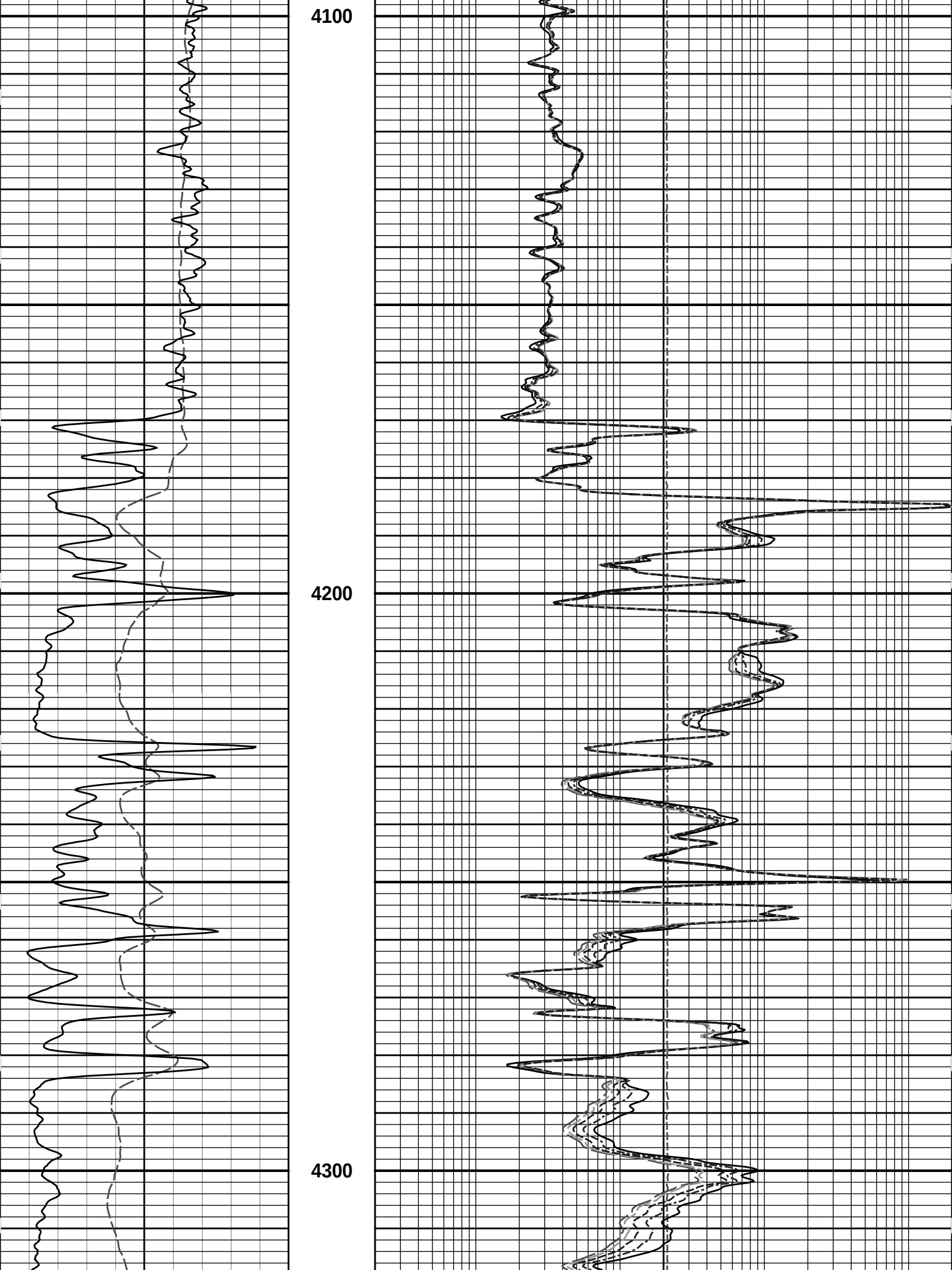

3000
3100
3200

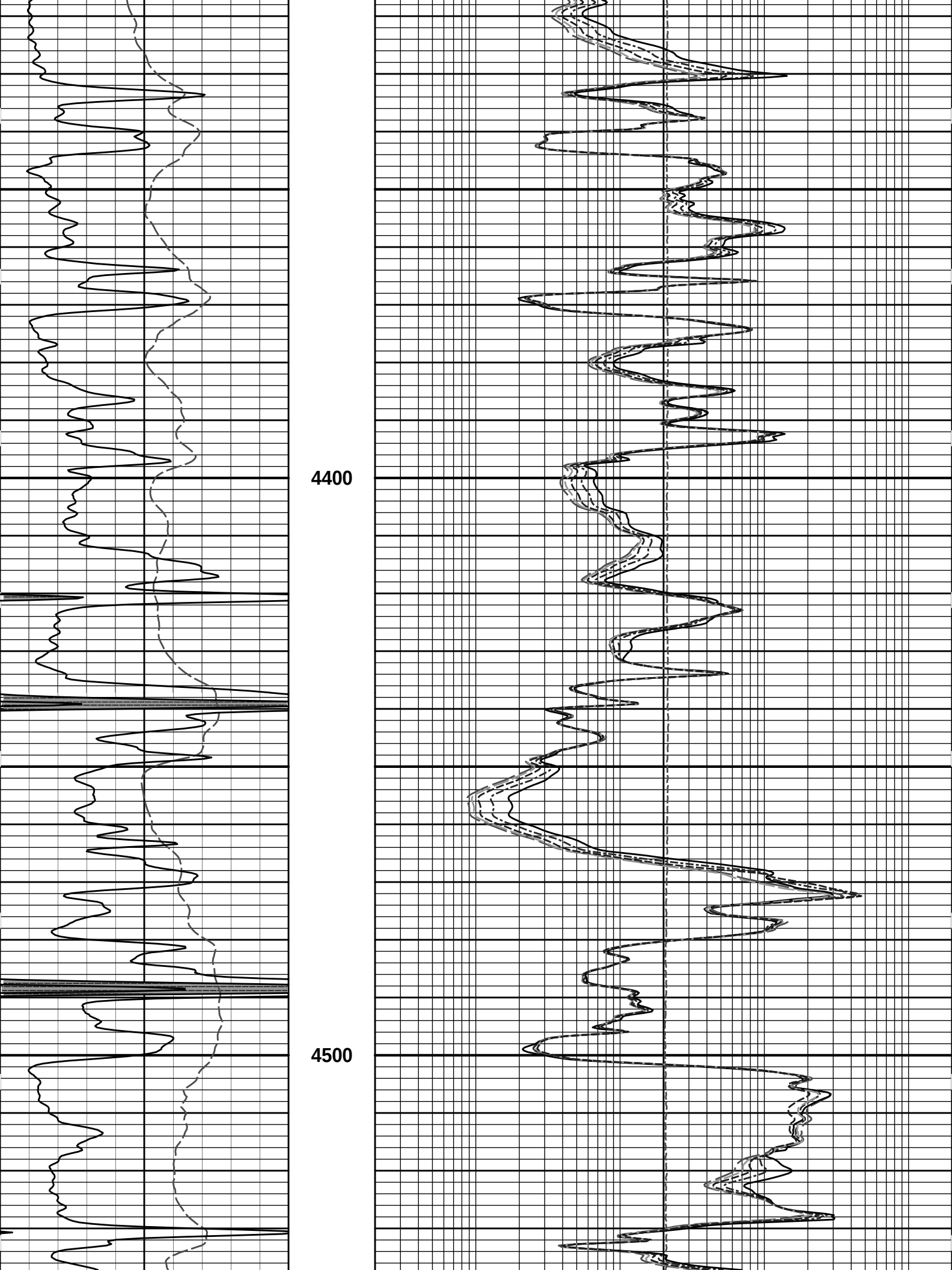

3300
3400

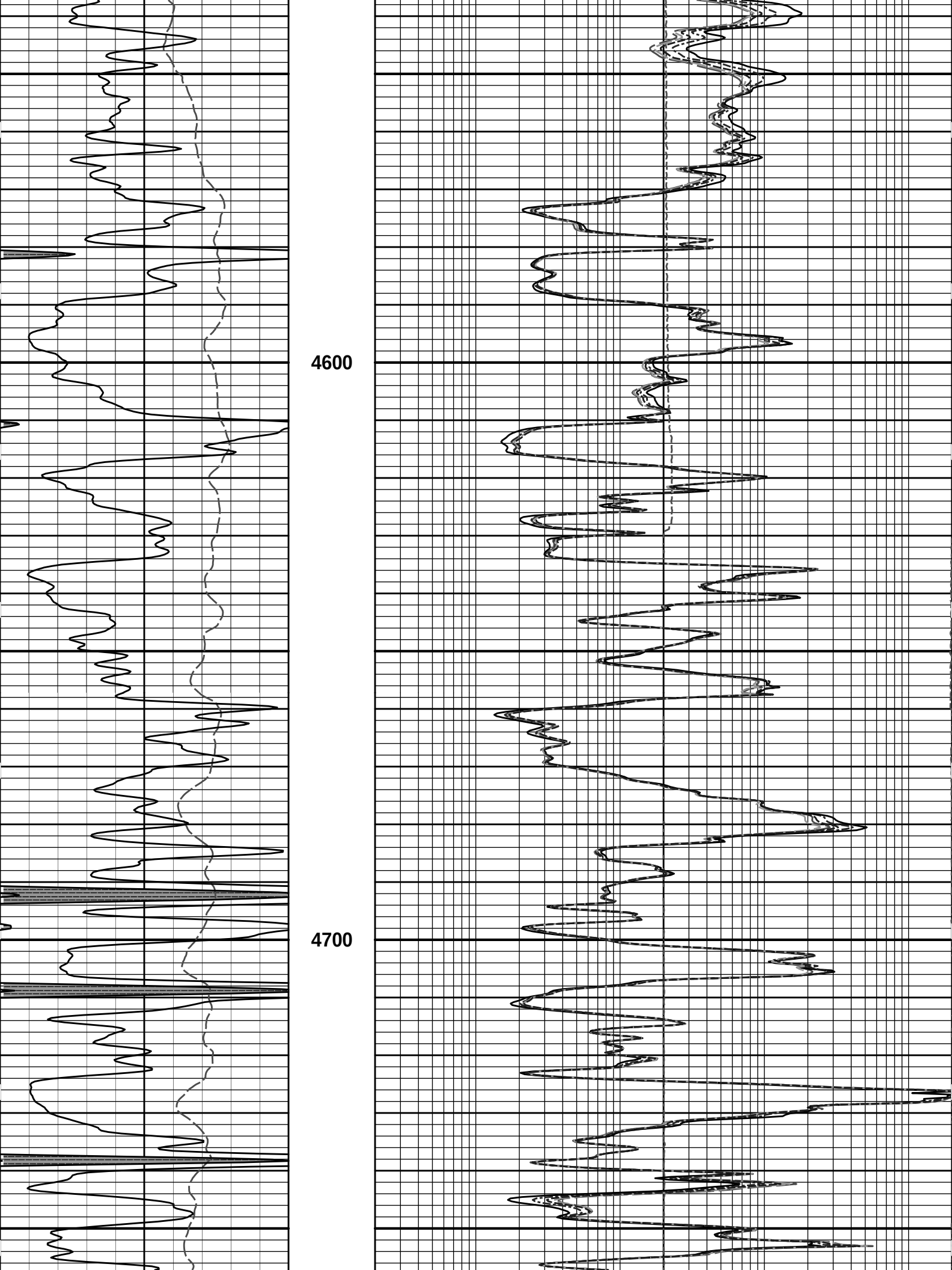

3500
3600

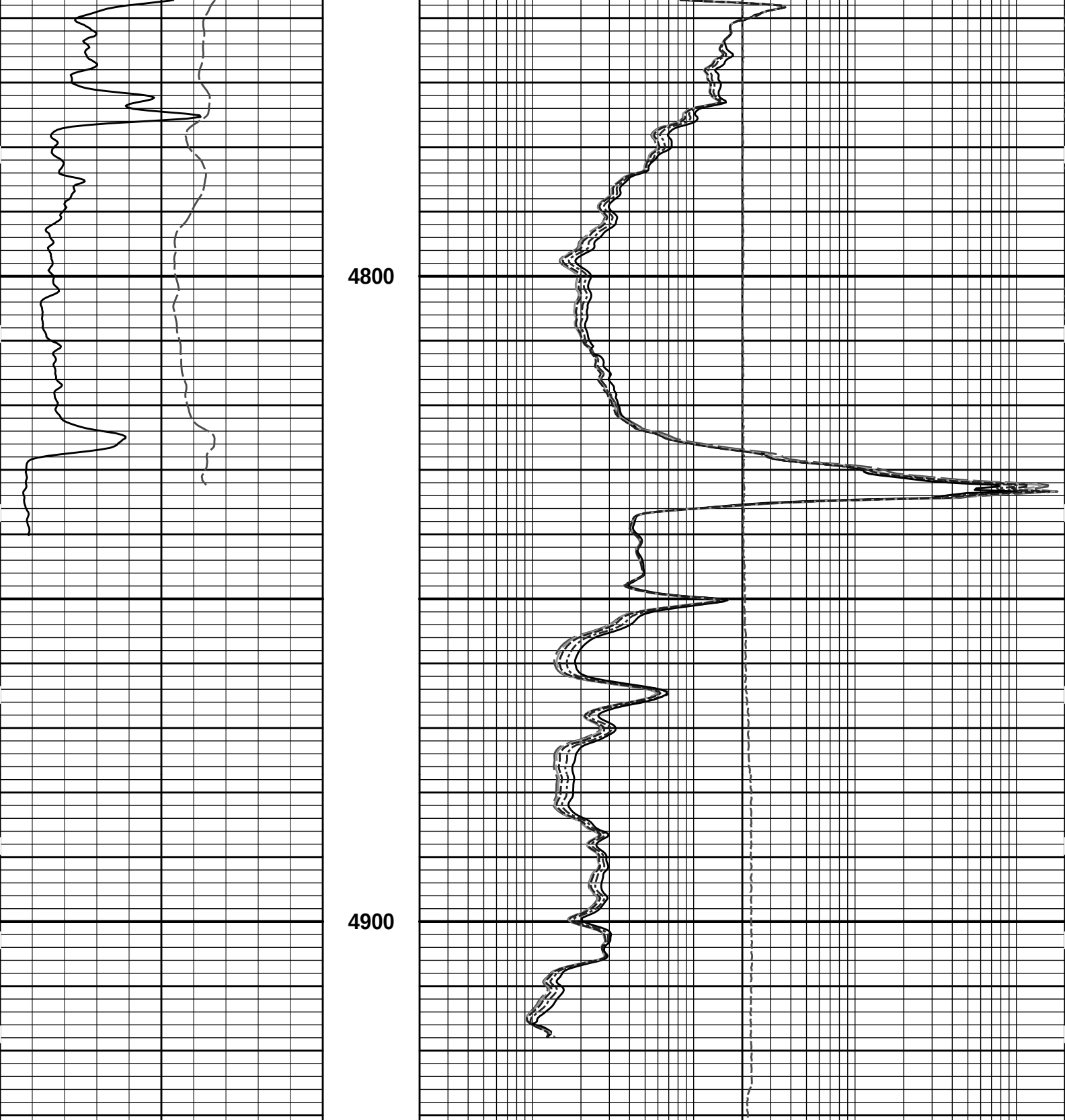

3700
3800


3900
4000


4100
4200
4300


4400
4500


4600
4700



SP

-]20[+

0 Gamma API 150

api

SHALE

1 : 240
ft

10K Tension 0

pounds

0.2 10in Resistivity 2ft Res 2000

ohmm

0.2 20in Resistivity 2ft Res 2000

ohmm

0.2 30in Resistivity 2ft Res 2000

ohm-metre

0.2 60in Resistivity 2ft Res 2000

ohmm

0.2 90in Resistivity 2ft Res 2000

ohmm

HALLIBURTON

Plot Time: 27-Nov-12 22:08:39
Plot Range: 470 ft to 4930.91 ft
Data: END_WRENCH#5\Well Based\ACRT, BSAT\
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_5_main_lib

5 INCH MAIN LOG

HALLIBURTON

Plot Time: 27-Nov-12 22:08:40
Plot Range: 4600 ft to 4929.5 ft
Data: END_WRENCH#5\Well Based\REPEAT\
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_5_repeat_lib

REPEAT SECTION

0.2 90in Resistivity 2ft Res 2000

ohmm

0.2 60in Resistivity 2ft Res 2000

ohmm

0.2 30in Resistivity 2ft Res 2000

ohm-metre

0.2 20in Resistivity 2ft Res 2000

ohmm

0.2 10in Resistivity 2ft Res 2000

ohmm

SHALE

0 Gamma API 150

api

SP

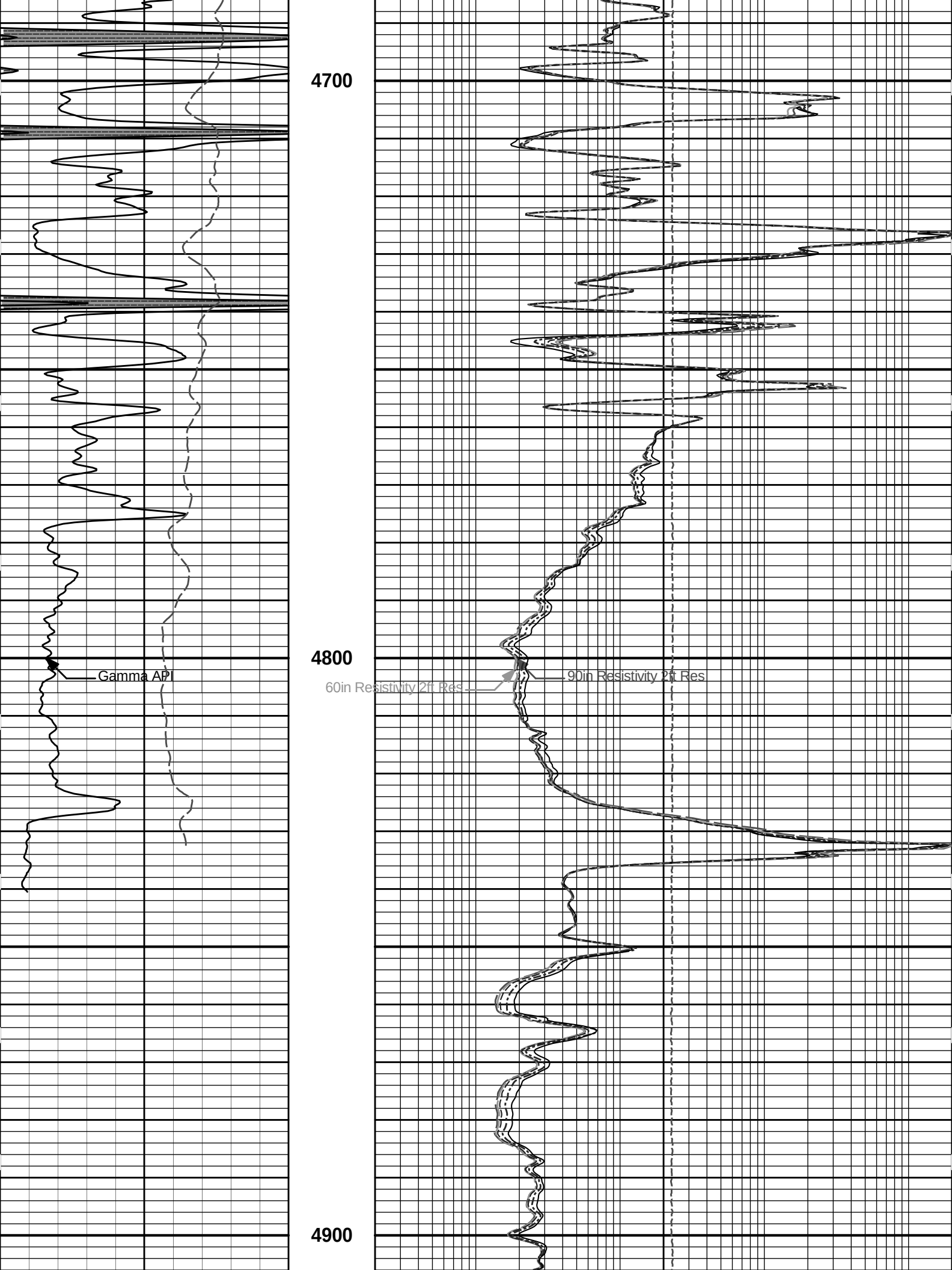
-]20[+

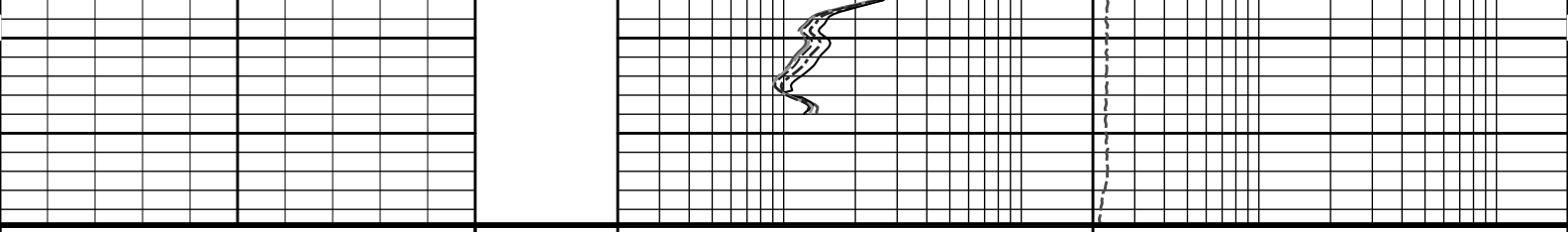
1 : 240
ft

10K Tension 0

pounds

4600


4700
4800
4900
Gamma API
60in Resistivity 2ft Res
90in Resistivity 2ft Res



SP	1 : 240 ft	10K Tension 0
-]20[+		pounds
0 Gamma API 150		0.2 10in Resistivity 2ft Res 2000
api		ohmm
SHALE		0.2 20in Resistivity 2ft Res 2000
		ohmm
		0.2 30in Resistivity 2ft Res 2000
		ohm-metre
		0.2 60in Resistivity 2ft Res 2000
		ohmm
		0.2 90in Resistivity 2ft Res 2000
		ohmm

HALLIBURTON

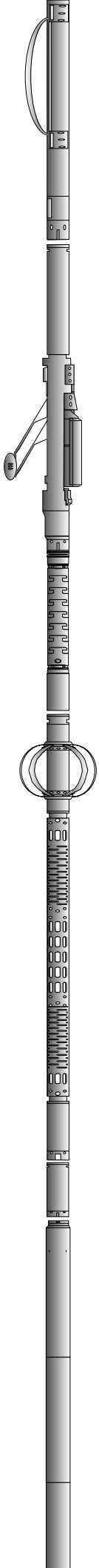
Plot Time: 27-Nov-12 22:08:43
Plot Range: 4600 ft to 4929.5 ft
Data: END_WRENCH#5\Well Based\REPEAT
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_5_repeat_lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
						105.50 ft
RWCH-B097 135.00 lbs		Ø 3.625 in		Load Cell @ 101.82 ft BH Temperature @ 101.25 ft	6.25 ft	
						99.25 ft
SP Sub-PROT01 60.00 lbs		Ø 3.625 in		SP @ 97.47 ft	3.74 ft	
						95.51 ft
GTET-10811258 165.00 lbs		Ø 3.625 in		GammaRay @ 89.45 ft	8.52 ft	
						86.99 ft



DSN Decentralizer-PROT01
6.60 lbs

Ø 5.000 in*

DSNT-10755066
174.00 lbs

Ø 3.625 in

9.69 ft

DSN Far @ 80.05 ft

DSN Near @ 79.30 ft

77.30 ft

SDLT-10950489
360.00 lbs

Ø 4.500 in

10.81 ft

SDLT Pad-10844781
65.00 lbs

Microlog Pad-10950489
8.00 lbs

Ø 4.750 in*

Ø 4.750 in*

Microlog @ 69.49 ft

SDL Caliper @ 69.31 ft

SDL @ 69.30 ft

66.49 ft

IQ Flex-954
140.00 lbs

Ø 3.625 in

5.67 ft

60.82 ft

Centralizer 25-1
8.00 lbs

Ø 4.000 in*

BSAT-10747683
300.00 lbs

Ø 3.625 in

15.77 ft

Sonic Receivers @ 52.30 ft

45.05 ft

XRMI Isolator-10967395
32.50 lbs

Ø 4.500 in

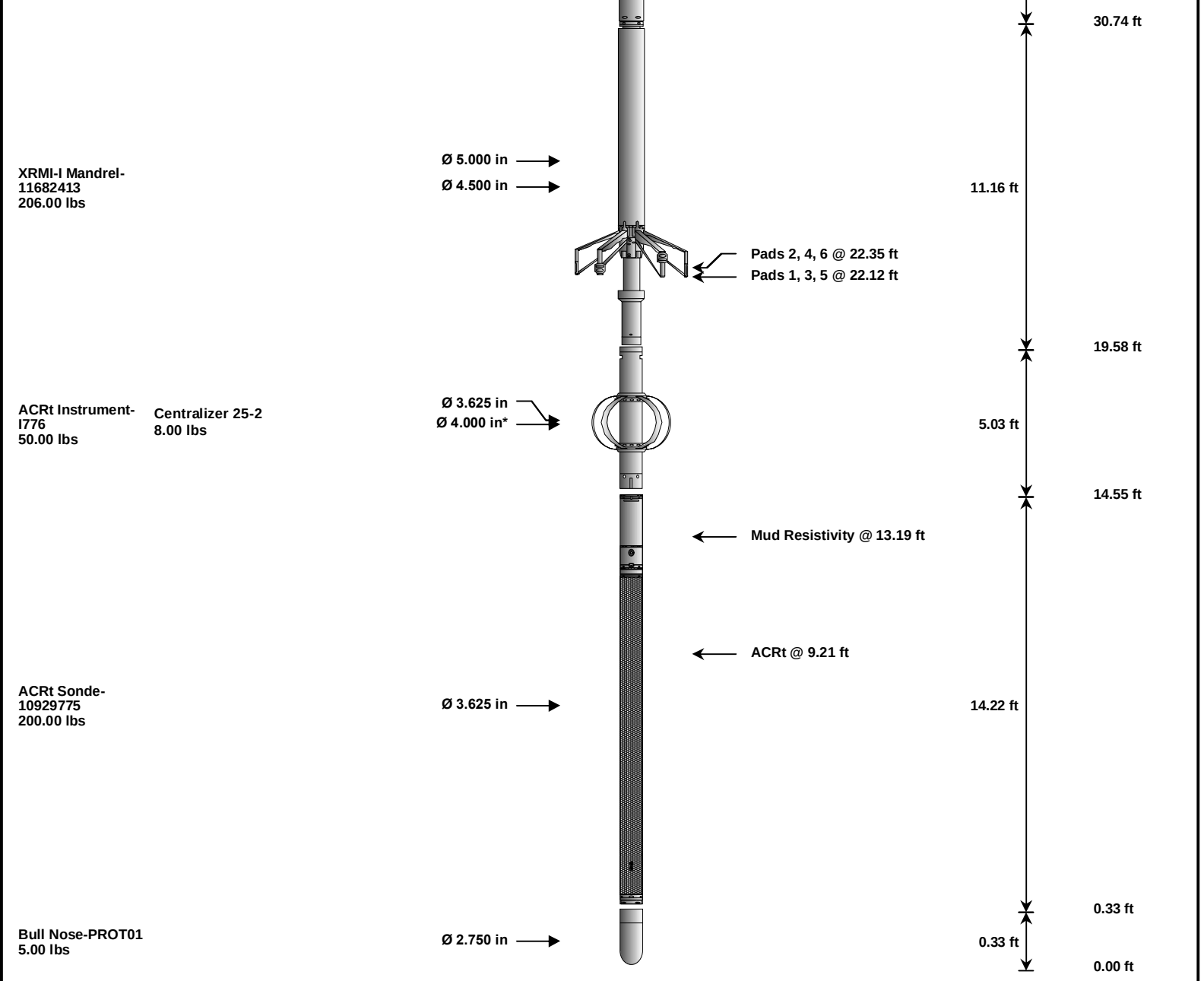
1.30 ft

43.74 ft

XRMI-I Instrument-11682412
290.00 lbs

Ø 4.500 in

13.00 ft



Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)		Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	B097	135.00	6.25		99.25	300.00
SP	SP Sub	PROT01	60.00	3.74		95.51	300.00
GTET	Gamma Telemetry Tool	10811258	165.00	8.52		86.99	60.00
DSNT	Dual Spaced Neutron	10755066	174.00	9.69		77.30	60.00
DCNT	DSN Decentralizer	PROT01	6.60	5.13	*	80.63	300.00
SDLT	Spectral Density Tool	10950489	360.00	10.81		66.49	60.00
MICP	Microlog Pad	10950489	8.00	1.00	*	68.99	60.00
SDLP	Density Insite Pad	10844781	65.00	2.55	*	68.70	60.00
IQF	IQ Flex tool	954	140.00	5.67		60.82	300.00
BSAT	Borehole Sonic Array Tool	10747683	300.00	15.77		45.05	60.00
OBCEN	Centralizer - 25 in. Overbody	1	8.00	2.08	*	57.73	300.00
	Isolator for the XRMI tool	10967395	32.50	1.30		43.74	300.00
XRMI	XRMI Navigation - Insite	11682412	290.00	13.00		30.74	30.00
XRMI-I	XRMI Imager - Insite	11682413	206.00	11.16		19.58	30.00
ACRt	Array Compensated True Resistivity Instrument Section	I776	50.00	5.03		14.55	300.00
OBCEN	Centralizer - 25 in. Overbody	2	8.00	2.08	*	15.98	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22		0.33	300.00
BLNS	Bull Nose	PROT01	5.00	0.33		0.00	300.00
Total			**2,213.10**	**105.50**			

* Not included in Total Length and Length Accumulation.

Data: END_WRENCH#5\0001 SP-GTET-DSN-SDL-BSAT-XRMI-ACRT-BN\005 27-Nov-12 17:52 Up @4930.5f **Date: 27-Nov-12 18:44:52**

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**30-Sep-12 14:49:28**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**27-Nov-12 15:00:28**
Software Version:	**WL INSITE R3.6.0 (Build 3)**	**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	37.3	37.1	api
Background + Calibrator	270.7	269.1	api
Calibrator	233.3	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	**GTET - 10811258**	**Reference Calibration Date:**	**27-Nov-12 15:00:28**
Engineer:	**S. INGERSOLL**	**Calibration Date:**	**27-Nov-12 15:04:17**
Software Version:	**WL INSITE R3.6.0 (Build 3)**	**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	37.1	36.3	api
Background + Calibrator	269.1	264.7	api
Calibrator	232.0	228.4	api

Shop	Field	Difference	Tolerance
232.0	228.4	3.6	+/- 9.00

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION

Tool Name:	**ACRt Sonde - 10929775**	**Reference Calibration Date:**	**28-Oct-12 14:24:44**
Engineer:	**T. HYDE**	**Calibration Date:**	**21-Nov-12 11:21:31**
Software Version:	**WL INSITE R3.6.0 (Build 3)**	**Calibration Version:**	**1**
Host Tool Name:	**ACRt Instrument - I776**		

TYPICAL GAIN RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A2 (50")	0.95	1.01	1.05	0.95	1.02	1.05	0.95	1.02	1.05
A3 (29")	0.95	1.01	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A4 (17")	0.95	1.00	1.05	0.95	1.01	1.05	0.95	1.01	1.05
A5 (10")	N/A	N/A	N/A	0.95	1.01	1.05	0.95	1.01	1.05
A6 (6")	N/A	N/A	N/A	0.95	1.00	1.05	0.95	1.00	1.05

TYPICAL SONDE OFFSET RANGE

Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper

A1 (80")	-5	-2.01	2	-6	-4.61	-2	-8	-4.72	-2
A2 (50")	-7	-2.91	0	-7	-4.25	0	-7	-4.37	0
A3 (29")	-27	-14.96	-9	-9	-4.74	-3	-7	-2.90	-1
A4 (17")	-180	-102.93	-60	-45	-32.43	-15	-39	-25.50	-13
A5 (10")	N/A	N/A	N/A	-150	-117.18	-50	-80	-54.93	-10
A6 (6")	N/A	N/A	N/A	175	274.80	525	90	137.56	270

TRANSMITTER CURRENT GAIN

Signal	Lower	R	Upper
12K	0.6	0.85	1.3
36K	1.0	1.18	2.0
72K	1.0	1.47	2.0

R-MUD VERIFICATION

Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)
Mud Cell	0.95	0.99	1.05

PASS/FAIL SUMMARY

GAIN RANGE CHK	PASS
SONDE OFFSET RANGE CHK	PASS
Tx CURRENT GAIN	PASS
Rmud VERIFICATION	PASS

TOOL OK TO LOG

CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-10811258						
Gamma Ray Calibrator	232.0	228.4	----------	3.6	+/- 9.00	api
ACRt Sonde-10929775						
Mud Cell	0.99	----------	----------	0.00	----------	ohm-m

Data: END_WRENCH#5\0001 SP-GTET-DSN-SDL-BSAT-XRMI-ACRT-BN\005 27-Nov-12 17:52 Up @4930.5f **Date: 27-Nov-12 18:48:43**

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	9.500	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	1.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4940.00	ft
	SHARED	BHT	Bottom Hole Temperature	130.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	XRMI-Instrument	

SHARED	AZTM	High Res Z Accelerometer Master Tool	XRMI-I Instrument	
SHARED	TEMM	Temperature Master Tool	NONE	
SHARED	BHSM	Borehole Size Master Tool	NONE	
Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.000	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
XRMI-I Instrument	WRTI	Survey Writing Interval	30	ft
XRMI-I Instrument	SOPT	Smoothing Option	None	
XRMI-I Mandrel	DIMG	Process XRMI?	Yes	
XRMI-I Mandrel	ROTI	Rotate Image (N-E-S-W-N)?	Yes	
XRMI-I Mandrel	AGN	Use Button Auto Gain?	Yes	
XRMI-I Mandrel	BCLR	Button Auto Gain Color	127	
XRMI-I Mandrel	BFIL	Button Auto Gain Filter	0.020	

	Mandrel				
	XRMI-I Mandrel	BGAN	Button Gain Value	0.001	
	XRMI-I Mandrel	BOFF	Button Offset	0	
	XRMI-I Mandrel	DIPE	Process Dipmeter Calculations?	Yes	
	XRMI-I Mandrel	BHCS	Process Borehole Corrections?	Yes	
	XRMI-I Mandrel	CLOK	Process Caliper Outputs?	Yes	
	XRMI-I Mandrel	CMAX	Caliper Maximum Limit	100.0	in
	XRMI-I Mandrel	CMIN	Caliper Mimimum Limit	3.5	in
	XRMI-I Mandrel	NAVS	Navigation Source Tool	XRMI-I Instrument	
	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

INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
	Depth Panel			
TENS	Tension	0.00	NO	
	RWCH			
DHTN	DownholeTension	0.00	BLK	0.000
	SP Sub			
PLTC	Plot Control Mask	97.47	NO	
SP	Spontaneous Potential	97.47	BLK	1.250
SPR	Raw Spontaneous Potential	97.47	NO	
SPO	Spontaneous Potential Offset	97.47	NO	
	GTET			
TPUL	Tension Pull	89.45	NO	
GR	Natural Gamma Ray API	89.45	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	89.45	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	89.45	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
	DSNT			
TPUL	Tension Pull	79.20	NO	
RNDS	Near Detector Telemetry Counts	79.30	BLK	1.417
RFDS	Far Detector Telemetry Counts	80.05	TRI	0.583
DNTT	DSN Tool Temperature	79.30	NO	
DSNS	DSN Tool Status	79.20	NO	
ERND	Near Detector Telemetry Counts EVR	79.30	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	80.05	BLK	0.000
ENTM	DSN Tool Temperature EVR	79.30	NO	
	SDLT			

TPUL	Tension Pull	69.31	NO	
PCAL	Pad Caliper	69.31	TRI	0.250
ACAL	Arm Caliper	69.31	TRI	0.250
	BSAT			
TPUL	Tension Pull	52.30	NO	
STAT	Status	52.30	NO	
DLYT	Delay Time	52.30	NO	
SI	Sample Interval	52.30	NO	
TXRX	Raw Telemetry 10 Receivers	52.30	NO	
FRMC	Tool Frame Count	52.30	NO	
GMOD	Gain processing mode	45.05	NO	
	XRMI-I Mandrel			
TPUL	Tension Pull	22.35	NO	
PAD1	XRMI Pad 1 values	22.12	NO	
PAD2	XRMI Pad 2 values	22.12	NO	
PAD3	XRMI Pad 3 values	22.12	NO	
PAD4	XRMI Pad 4 values	22.12	NO	
PAD5	XRMI Pad 5 values	22.12	NO	
PAD6	XRMI Pad 6 values	22.12	NO	
OD1	EMI Odd Button Values Pad 1	22.12	NO	
OD2	EMI Odd Button Values Pad 2	22.35	NO	
OD3	EMI Odd Button Values Pad 3	22.12	NO	
OD4	EMI Odd Button Values Pad 4	22.35	NO	
OD5	EMI Odd Button Values Pad 5	22.12	NO	
OD6	EMI Odd Button Values Pad 6	22.35	NO	
EV1	EMI Even Button Values Pad 1	22.14	NO	
EV2	EMI Even Button Values Pad 2	22.32	NO	
EV3	EMI Even Button Values Pad 3	22.14	NO	
EV4	EMI Even Button Values Pad 4	22.32	NO	
EV5	EMI Even Button Values Pad 5	22.14	NO	
EV6	EMI Even Button Values Pad 6	22.32	NO	
ITMP	Instrument Temperature	19.58	NO	
EMIM	Tool Mode	19.58	NO	
HAZI	Hole Azimuth	21.87	NO	
HAZI	Hole Azimuth - Down Delay	22.37	NO	
ZACC	Accelerometer Z	22.12	NO	
TPUL	Tension Pull	22.35	NO	
FIR1	Current Button R - Pad 1	22.12	NO	
FIR2	Current Button R - Pad 2	22.35	NO	
FIR3	Current Button R - Pad 3	22.12	NO	
FIR4	Current Button R - Pad 4	22.35	NO	
FIR5	Current Button R - Pad 5	22.12	NO	
FIR6	Current Button R - Pad 6	22.35	NO	
FIX1	Current Button X - Pad 1	22.12	NO	
FIX2	Current Button X - Pad 2	22.35	NO	
FIX3	Current Button X - Pad 3	22.12	NO	
FIX4	Current Button X - Pad 4	22.35	NO	
FIX5	Current Button X - Pad 5	22.12	NO	
FIX6	Current Button X - Pad 6	22.35	NO	
SIR1	Current Slow Button R - Pad 1	22.12	BLK	3.000
SIR2	Current Slow Button R - Pad 2	22.35	BLK	3.000
SIR3	Current Slow Button R - Pad 3	22.12	BLK	3.000
SIR4	Current Slow Button R - Pad 4	22.35	BLK	3.000
SIR5	Current Slow Button R - Pad 5	22.12	BLK	3.000

SIR6	Current Slow Button R - Pad 6	22.35	BLK	3.000
SIX1	Current Slow Button X - Pad 1	22.12	BLK	3.000
SIX2	Current Slow Button X - Pad 2	22.35	BLK	3.000
SIX3	Current Slow Button X - Pad 3	22.12	BLK	3.000
SIX4	Current Slow Button X - Pad 4	22.35	BLK	3.000
SIX5	Current Slow Button X - Pad 5	22.12	BLK	3.000
SIX6	Current Slow Button X - Pad 6	22.35	BLK	3.000
EMMR	Phasor Voltage - Real Part	22.12	NO	
EMMX	Phasor Voltage - Imaginary Part	22.12	NO	
PADV	Pad Voltage	19.58	BLK	0.250
ITMP	Instrument Temperature	19.58	BLK	0.000
CON1	Conductivity Pad 1	22.12	BLK	3.000
CON2	Conductivity Pad 2	22.35	BLK	3.000
CON3	Conductivity Pad 3	22.12	BLK	3.000
CON4	Conductivity Pad 4	22.35	BLK	3.000
CON5	Conductivity Pad 5	22.12	BLK	3.000
CON6	Conductivity Pad 6	22.35	BLK	3.000
UIR2	Current Button R No Delay - Pad 2	22.12	NO	
UIR4	Current Button R No Delay - Pad 4	22.12	NO	
UIR6	Current Button R No Delay - Pad 6	22.12	NO	
UIX2	Current Button X No Delay - Pad 2	22.12	NO	
UIX4	Current Button X No Delay - Pad 4	22.12	NO	
UIX6	Current Button X No Delay - Pad 6	22.12	NO	
TPUL	Tension Pull	22.35	NO	
ARM1	Caliper 1 measurement	22.12	BLK	0.000
ARM2	Caliper 2 measurement	22.12	BLK	0.000
ARM3	Caliper 3 measurement	22.12	BLK	0.000
ARM4	Caliper 4 measurement	22.12	BLK	0.000
ARM5	Caliper 5 measurement	22.12	BLK	0.000
ARM6	Caliper 6 measurement	22.12	BLK	0.000
MOTV	Motor Voltage Monitor 1	22.12	BLK	0.000
PRES	Caliper percentage of total compression of the spring	19.58	BLK	0.000
HAZI	Hole Azimuth	22.12	NO	
RB	Relative Bearing	22.12	NO	
AZI1	PAD1 Azimuth	22.12	NO	
DEVI	Inclination	22.12	NO	

ACRt Sonde				
TPUL	Tension Pull	2.73	NO	
F1R1	ACRT 12KHz - 80in R value	8.98	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	8.98	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.48	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.48	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	4.98	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	4.98	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	3.98	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	3.98	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.48	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.48	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.23	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.23	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	8.98	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	8.98	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.48	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.48	BLK	0.000

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

	SDLT Pad			
TPUL	Tension Pull	69.30	NO	
NAB	Near Above	69.12	BLK	0.920
NHI	Near Cesium High	69.12	BLK	0.920
NLO	Near Cesium Low	69.12	BLK	0.920
NVA	Near Valley	69.12	BLK	0.920
NBA	Near Barite	69.12	BLK	0.920
NDE	Near Density	69.12	BLK	0.920
NPK	Near Peak	69.12	BLK	0.920
NLI	Near Lithology	69.12	BLK	0.920
NBAU	Near Barite Unfiltered	69.12	BLK	0.250
NLIU	Near Lithology Unfiltered	69.12	BLK	0.250
FAB	Far Above	69.47	BLK	0.250
FHI	Far Cesium High	69.47	BLK	0.250
FLO	Far Cesium Low	69.47	BLK	0.250
FVA	Far Valley	69.47	BLK	0.250
FBA	Far Barite	69.47	BLK	0.250
FDE	Far Density	69.47	BLK	0.250
FPK	Far Peak	69.47	BLK	0.250
FLI	Far Lithology	69.47	BLK	0.250

PTMP	Pad Temperature	69.31	BLK	0.920
NHV	Near Detector High Voltage	68.70	NO	
FHV	Far Detector High Voltage	68.70	NO	
ITMP	Instrument Temperature	68.70	NO	
DDHV	Detector High Voltage	68.70	NO	

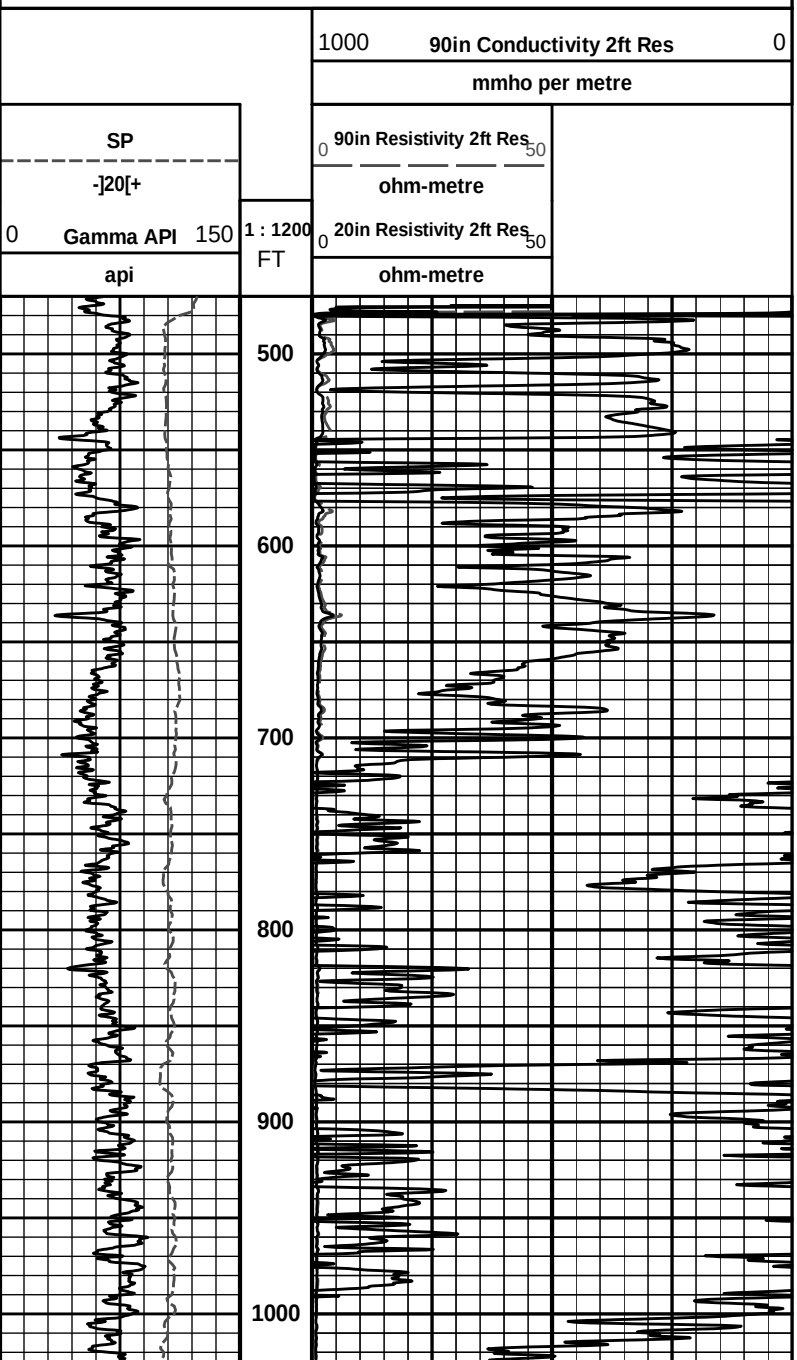
Microlog Pad				
TPUL	Tension Pull	69.49	NO	
MINV	Microlog Lateral	69.49	BLK	0.750
MNOR	Microlog Normal	69.49	BLK	0.750

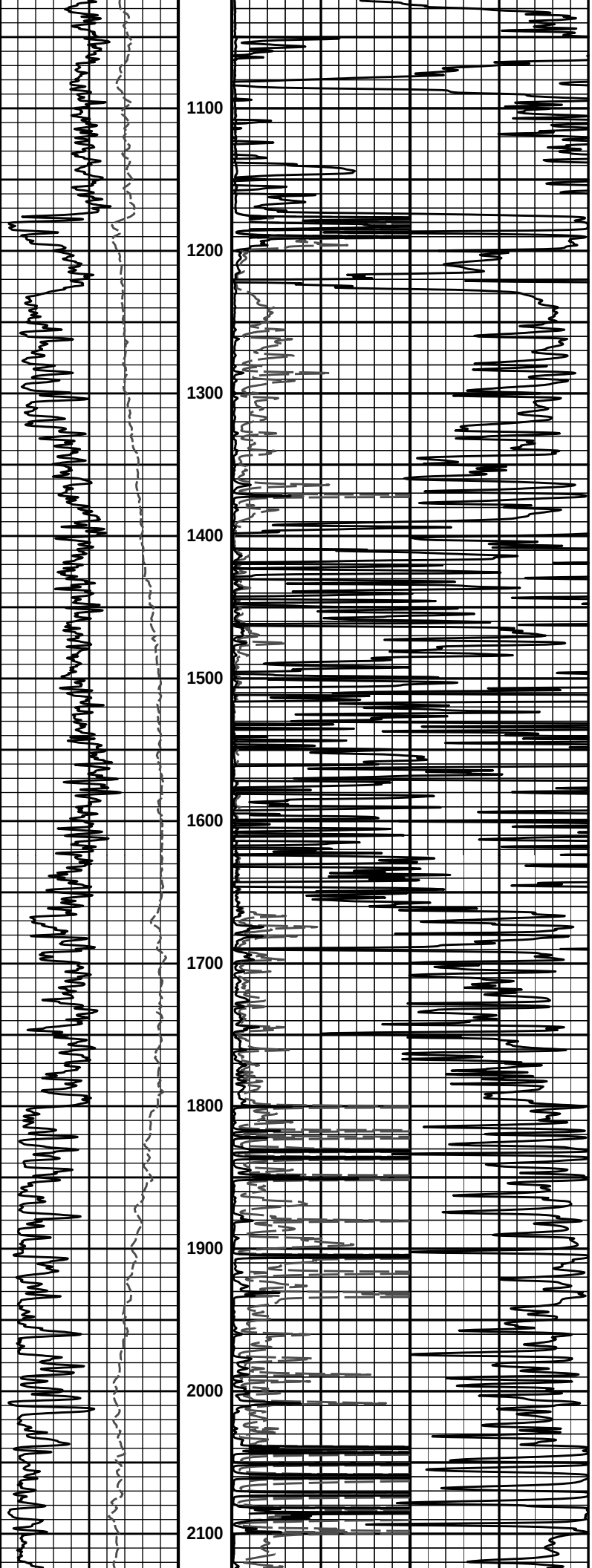
Data: END_WRENCH#5\0001 SP-GTET-DSN-SDL-BSAT-XRMI-ACRT-BN\005 27-Nov-12 17:52 Up @4930.5f **Date: 27-Nov-12 20:03:52**

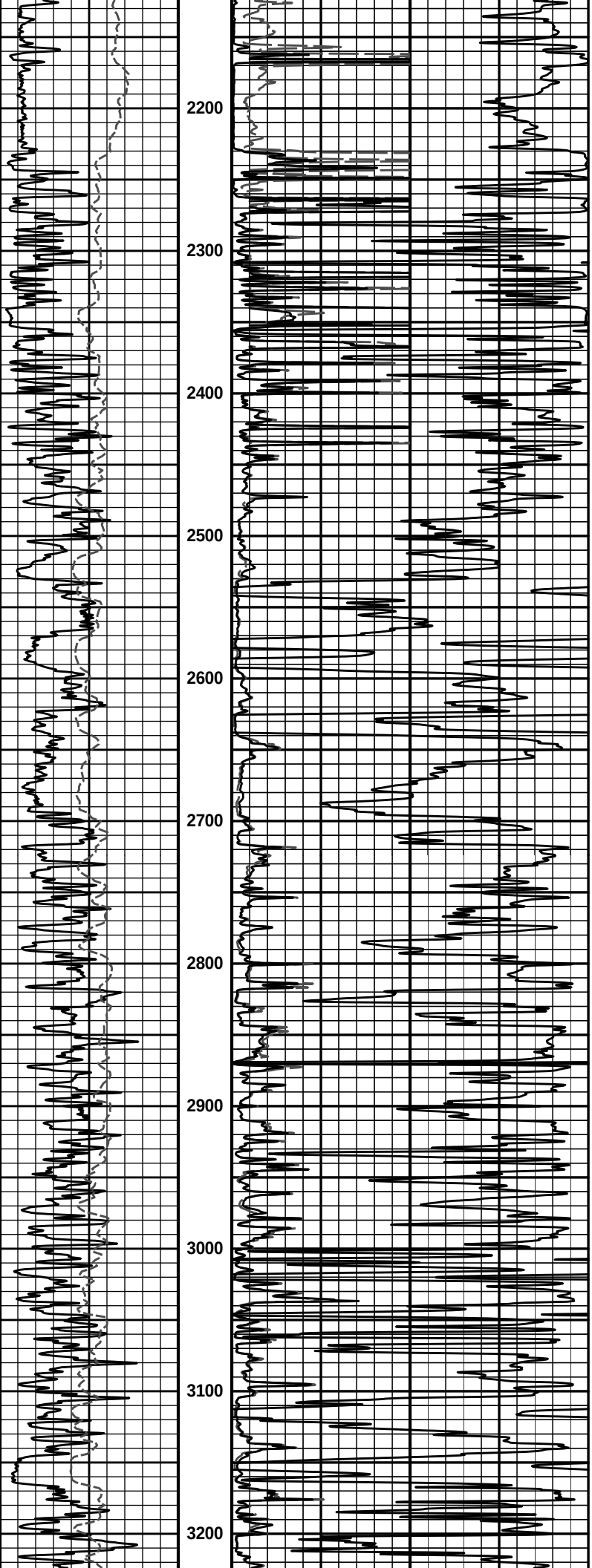
HALLIBURTON

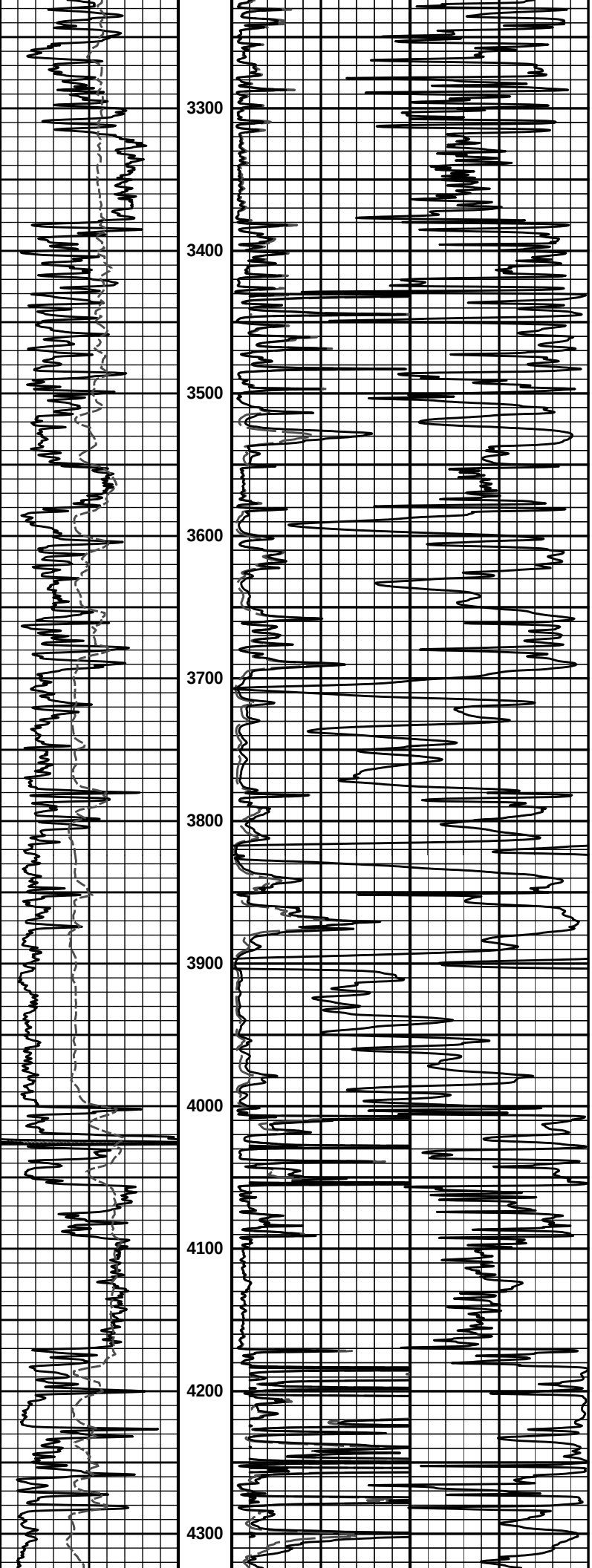
Plot Time: 27-Nov-12 22:10:06
Plot Range: 470 ft to 4917.9 ft
Data: END_WRENCH#5\Well Based\ACRT, BSAT
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_1_lib

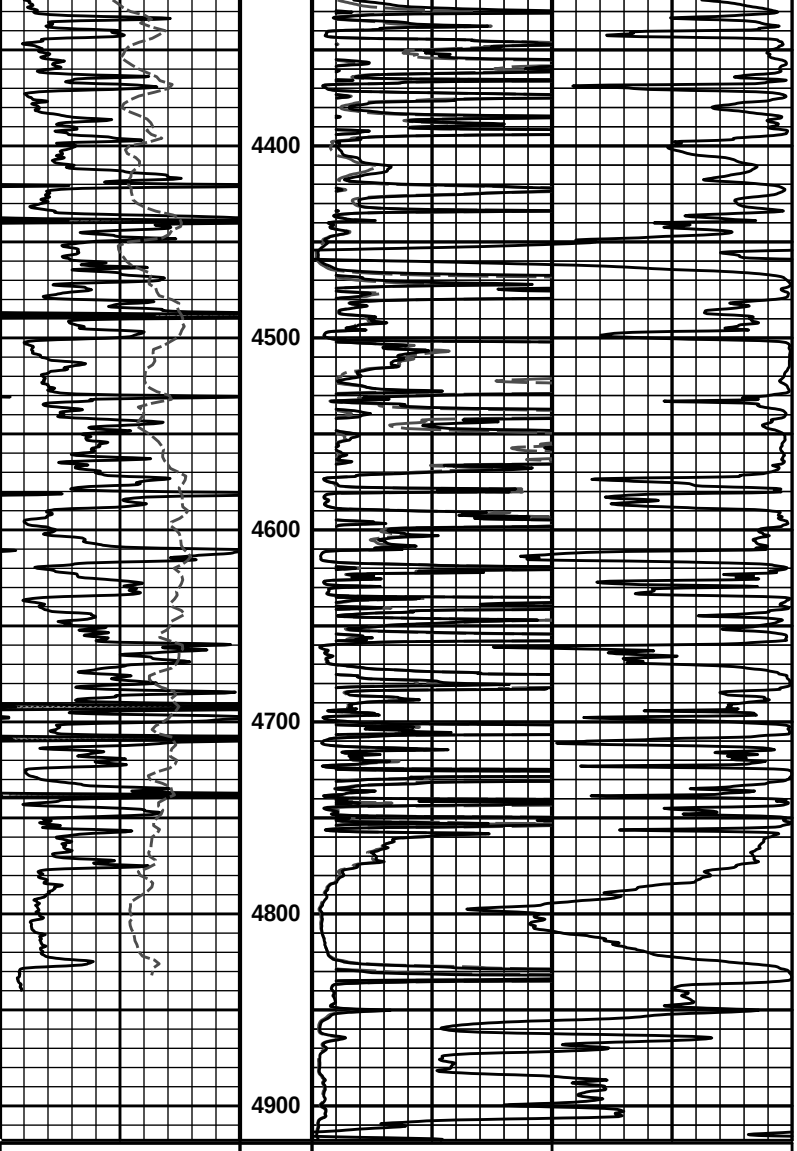
1 INCH MAIN LOG




1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100


2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200


3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300



0 Gamma API 150	1 : 1200 FT	0 20in Resistivity 2ft Res 50	
api		ohm-metre	
SP		0 90in Resistivity 2ft Res 50	
-]20[+		ohm-metre	
		1000 90in Conductivity 2ft Res 0	
		mmho per metre	

HALLIBURTON

Plot Time: 27-Nov-12 22:10:11
Plot Range: 470 ft to 4917.9 ft
Data: END_WRENCH#5\Well Based\ACRT, BSAT
Plot File: \\-LOCAL-\END_WRENCH#5\Well Based\ACRT\ACRT_1_lib

1 INCH MAIN LOG

COMPANY	**TGT PETROLEUM CORPORATION**		
WELL	**END WRENCH #5**		
FIELD	**EINSEL**		
COUNTY	**KIOWA**	STATE	**KANSAS**

HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY

	LOGS