WIRELINE LOGGING SOLUTIONS

Induction Array Log

Company O'Brien Energy Resources Corporation
Well Preedy East 1A-10
Field Borchers Northwest
County Meade State Kansas

Company	O'Brien Energy Resources Corporation
Well	Preedy East 1A-10
Field	Borchers Northwest
County	Meade
State	Kansas

Location: API #: 15-119-21452
1650' FNL & 968' FWL
W2 NE SW NW
SEC 10 TWP 33S RGE 29W

Permanent Datum G.L. Elevation 2635 ft.
Log Measured From K.B. , 12 ft. above perm. datum
Drilling Measured From K.B.

Other Services
CNL / LDT
MEL

Elevation
K.B. 2647 ft.
D.F. 2646 ft.
G.L. 2635 ft.

Date	12-Apr-2021		
Run Number	One		
Depth Driller	6320'		
Depth Logger	6320'		
Bottom Logged Interval	6312'		
Top Log Interval	1570'		
Casing Driller	8 5/8" @ 1572'	@	
Casing Logger	1572'		
Bit Size	7 7/8"	@	@
Type Fluid in Hole	WBM		
Density / Viscosity	9.1 / 70		
pH / Fluid Loss	11.0 / 6.4		
Source of Sample	Flowline		
Rm @ Meas. Temp	1.076 @ 75°F	@	@
Rmf @ Meas. Temp	0.807 @ 75°F	@	@
Rmc @ Meas. Temp	1.344 @ 75°F	@	@
Source of Rmf / Rmc	Calculated		
Rm @ BHT	0.699 @ 119°F	@	@
Time Circulation Stopped	16:30		
Time Logger on Bottom	21:00		
Maximum Recorded Temperature	119°F		
Equipment Number	11007		
Location	OKC, OK.		
Recorded By	H. Garcia		
Witnessed By	Mr. D. Greathouse	Mr. P. Debenham	

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Equipment and Log Data

Service Order: T7-210412

Gamma		Density		Neutron		Sonic		IAT	
Run No.	One	Run No.	One	Run No.	One	Run No.	One	Run No.	One
Serial No.	049	Serial No.	110	Serial No.	071	Serial No.	NA	Serial No.	110
O.D.	3.375 in.	Source No.	70997B	Source No.	1414NC	Centralizers	NA	Standoffs	2 @ 0.5"
		O.D.	4.5 in.	O.D.	3.375 in.	O.D.	3.375 in.	O.D	3.875 in.

Logging Pass Data

General			Gamma		Density			Neutron			Sonic			IAT	
			Scales		Scales			Scales			Scales			Scales	
Run	Depths		Left	Right	Left	Right	Matrix	Left	Right	Matrix	Left	Right	Matrix	Left	Right
One	SCG	TD	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime	NA	NA	NA	0.2	2000

Comments

Toolstring ran as per diagram.
Density is presented on a 2.71 g/cc Matrix, Neutron is presented on a Limestone Matrix.
Chlorides: 3000 mg/L
LCM: 6 lb/bbl
Annular Volume computed using 5.5" Casing.

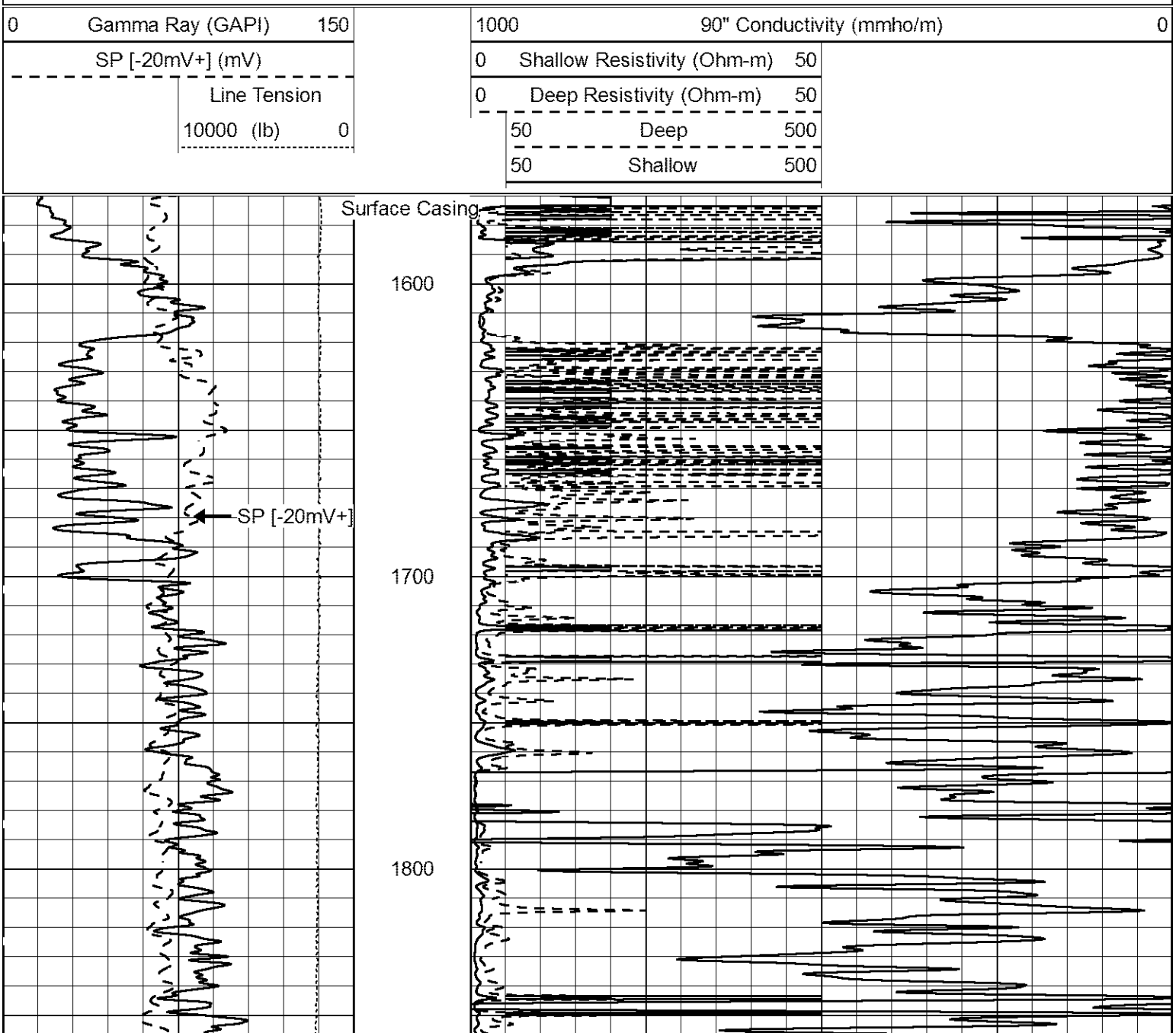
Washouts and borehole rugosity affect data quality and repeatability.
Duke Drlg. #1

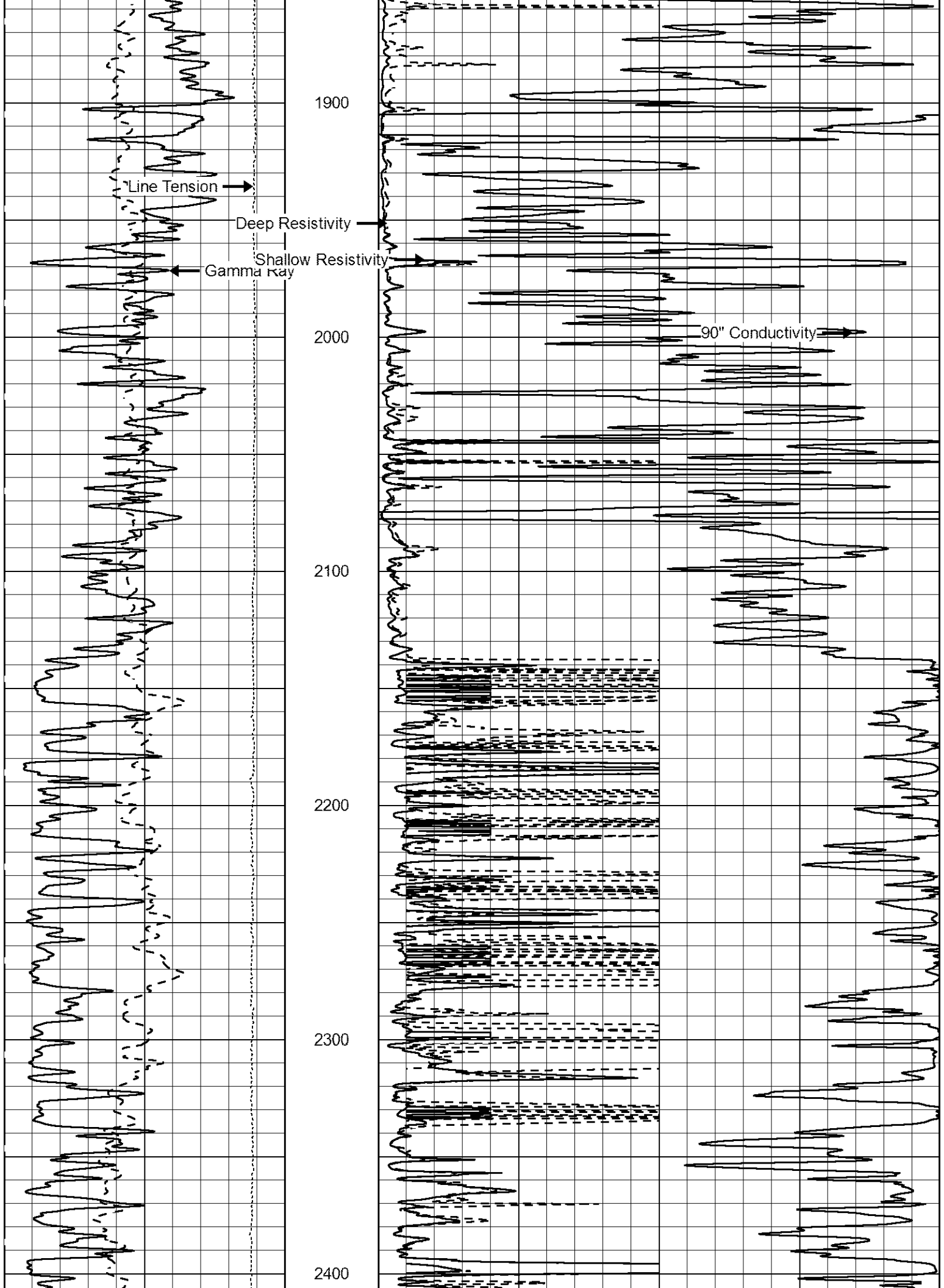
YOUR CREW TODAY: J. Bennett / M. Thomas
THANK YOU FOR CHOOSING WIRELINE LOGGING SOLUTIONS. OKLAHOMA CITY, OK. (405) 445-7135.

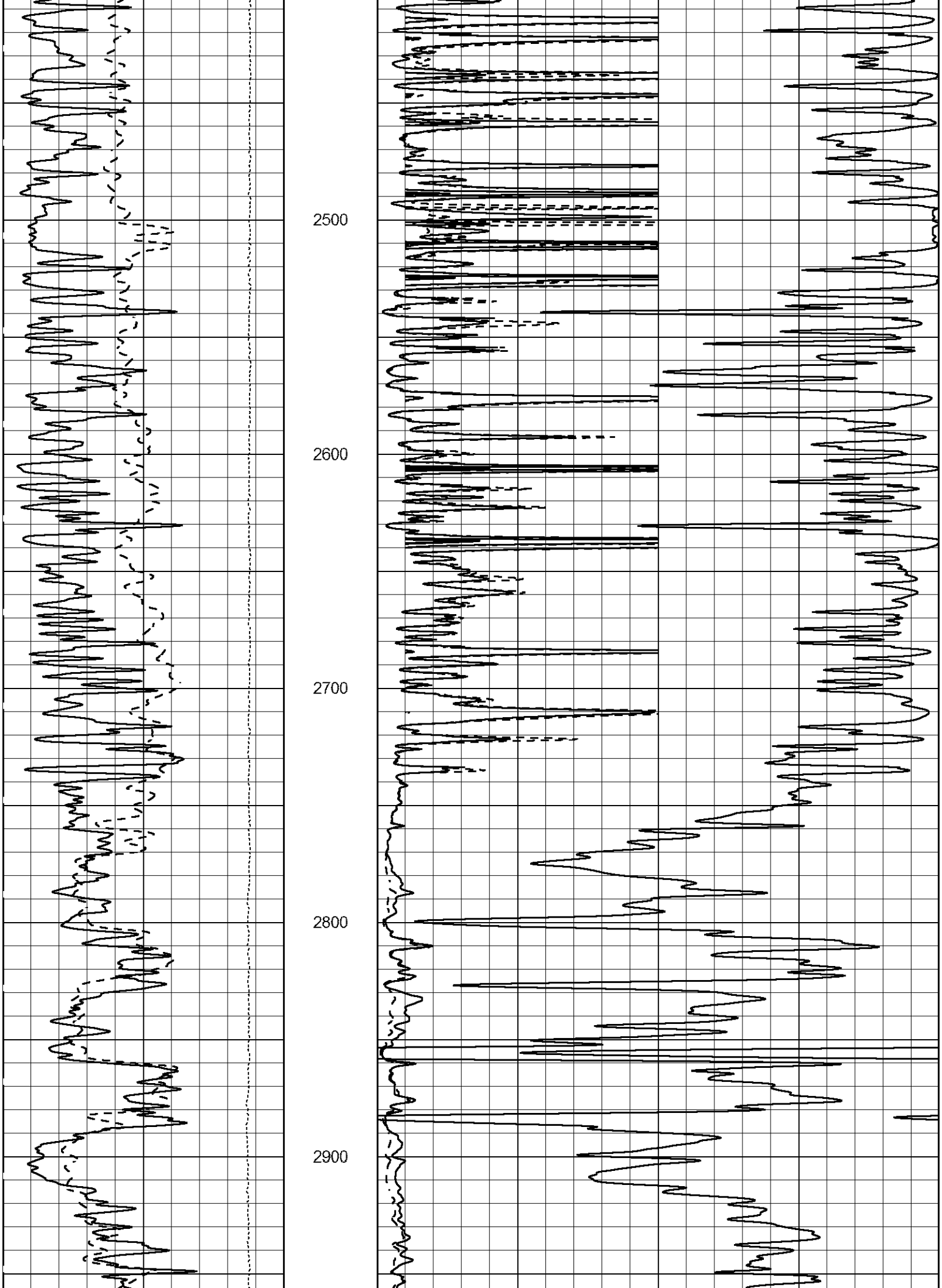
WIRELINE LOGGING SOLUTIONS

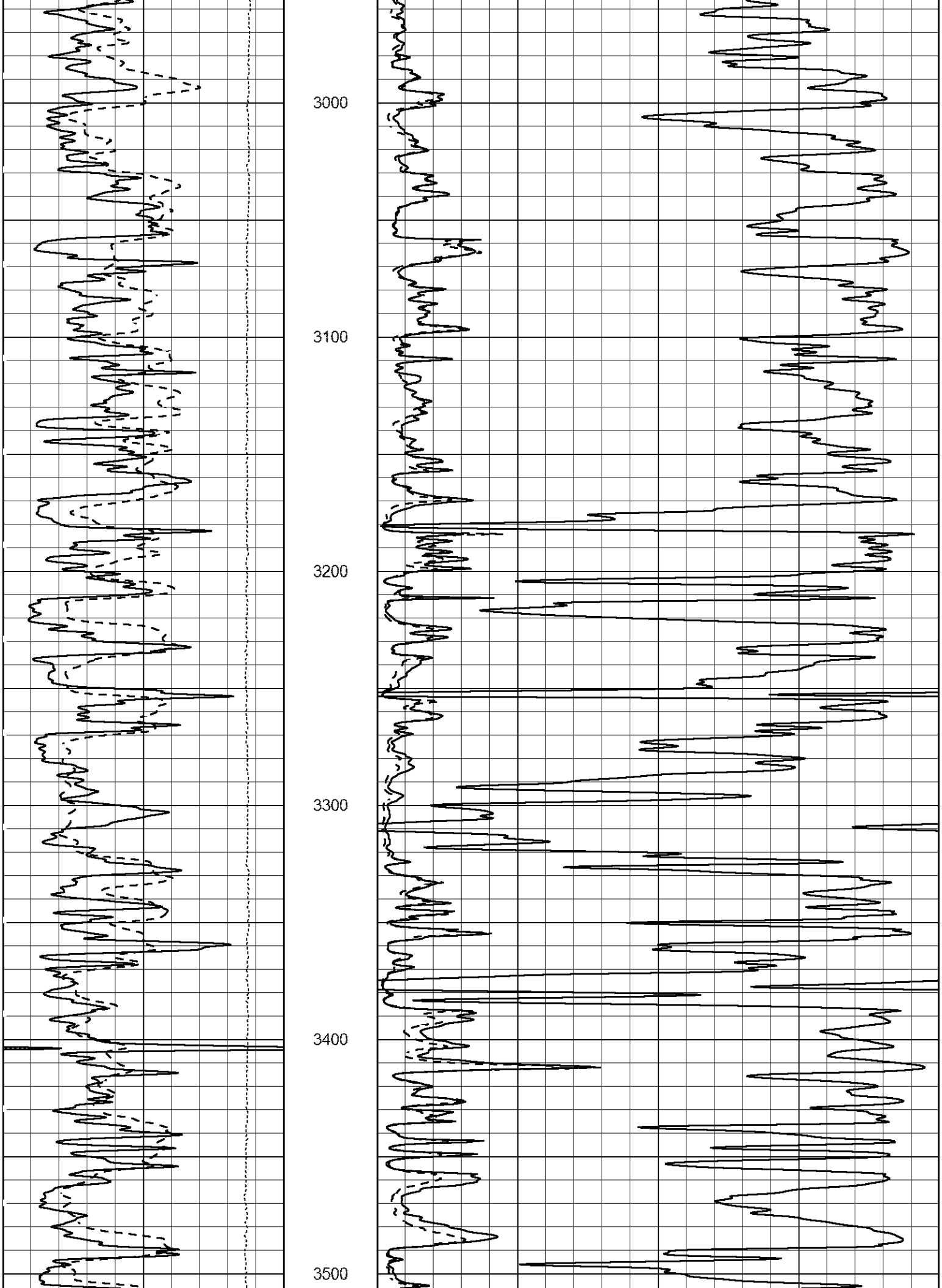
Main LS Pass

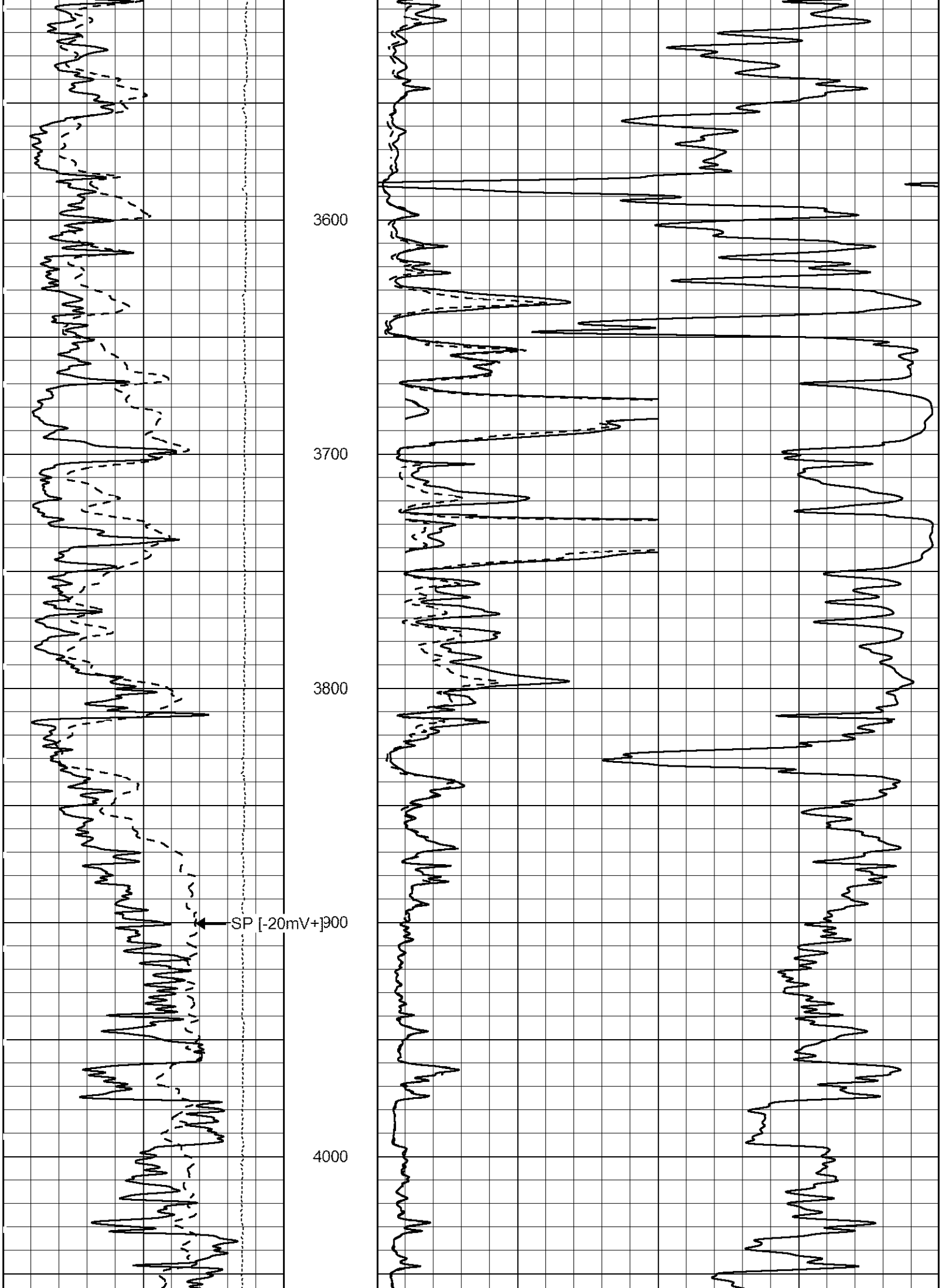
Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass5.1
Presentation Format	okc-acond2-base
Dataset Creation	Tue Apr 13 00:30:21 2021
Charted by	Depth in Feet scaled 1:600

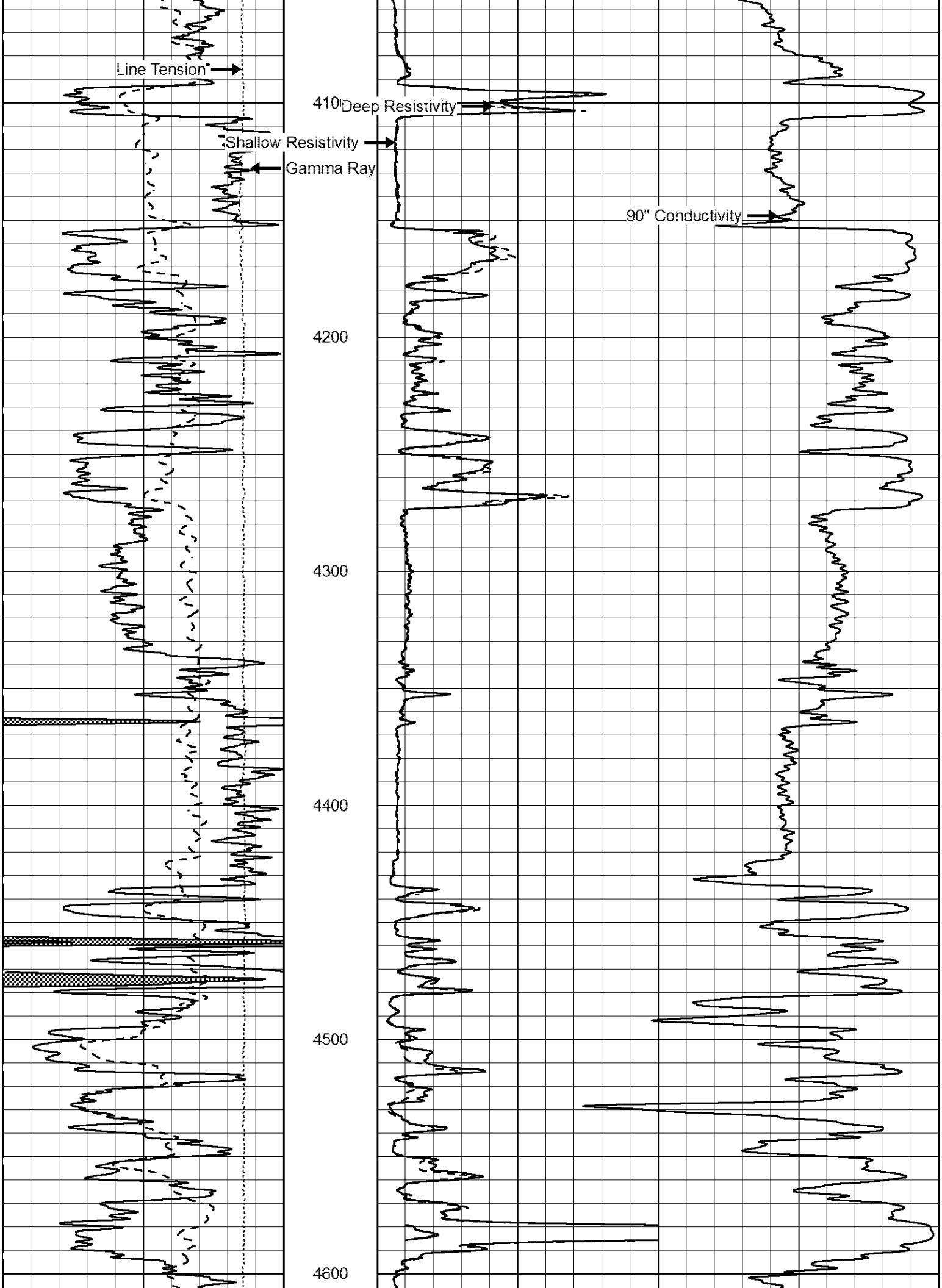


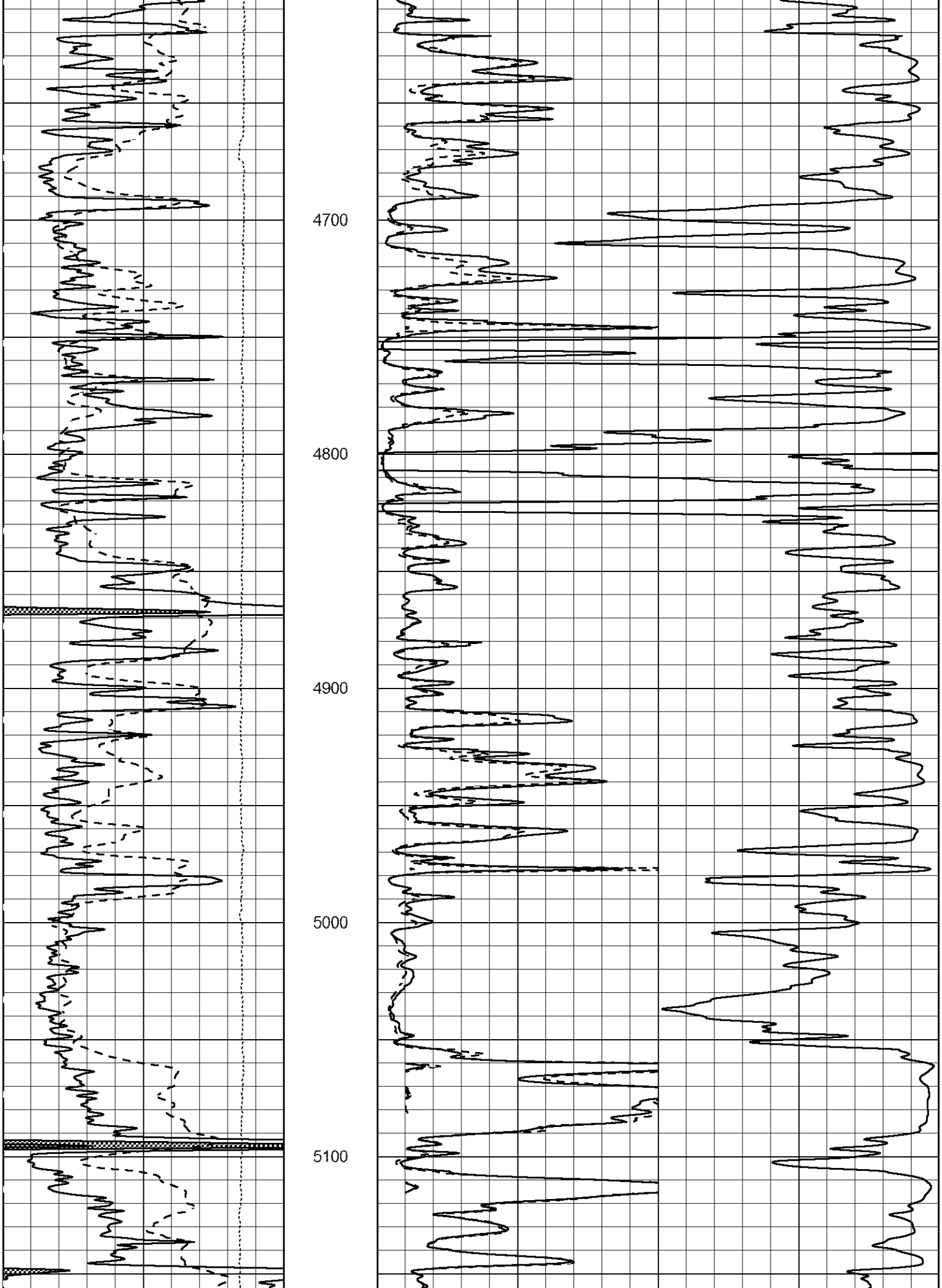

1900
Line Tension
Deep Resistivity
Shallow Resistivity
Gamma Ray
2000
90" Conductivity
2100
2200
2300
2400

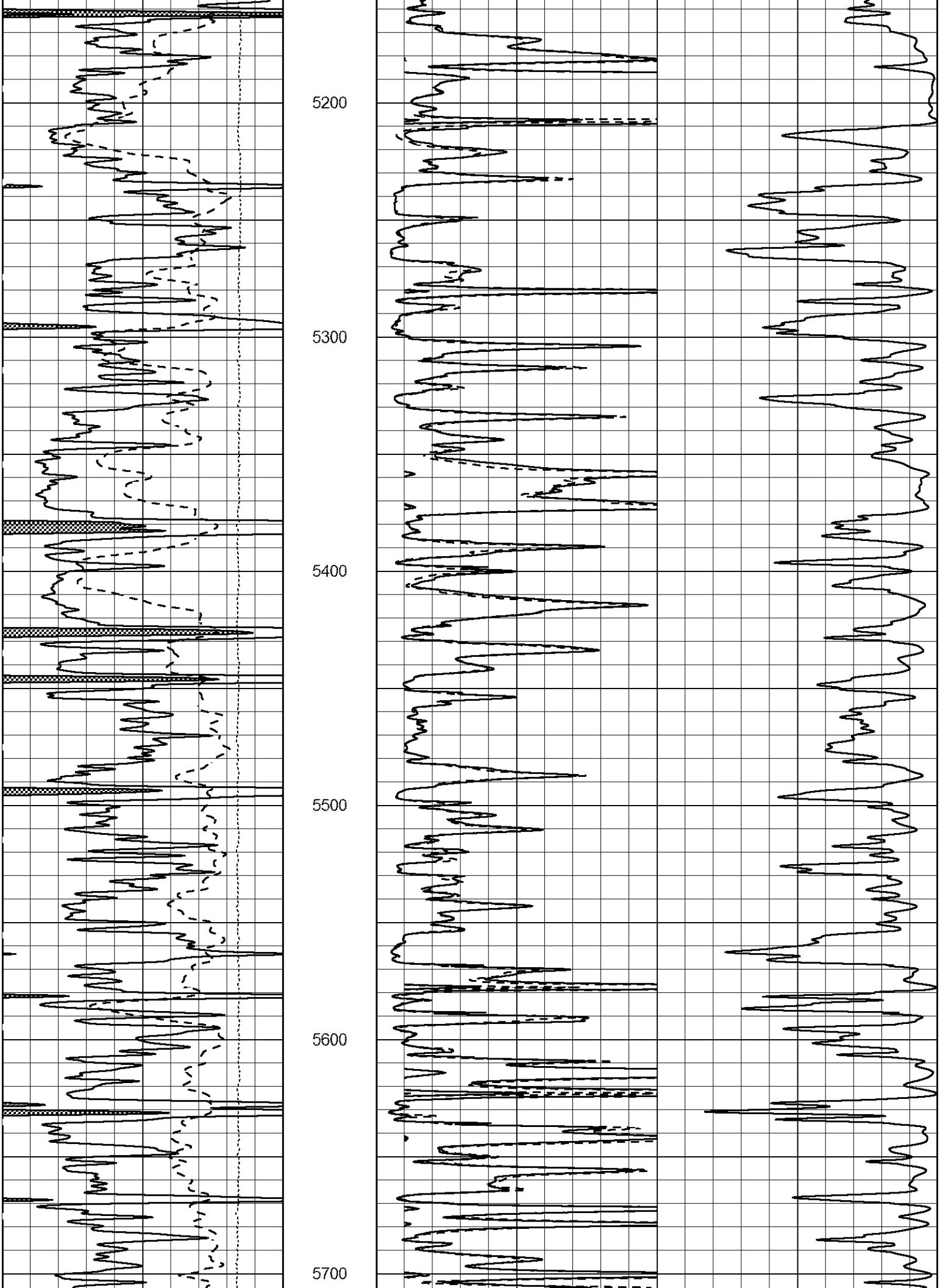

2500
2600
2700
2800
2900

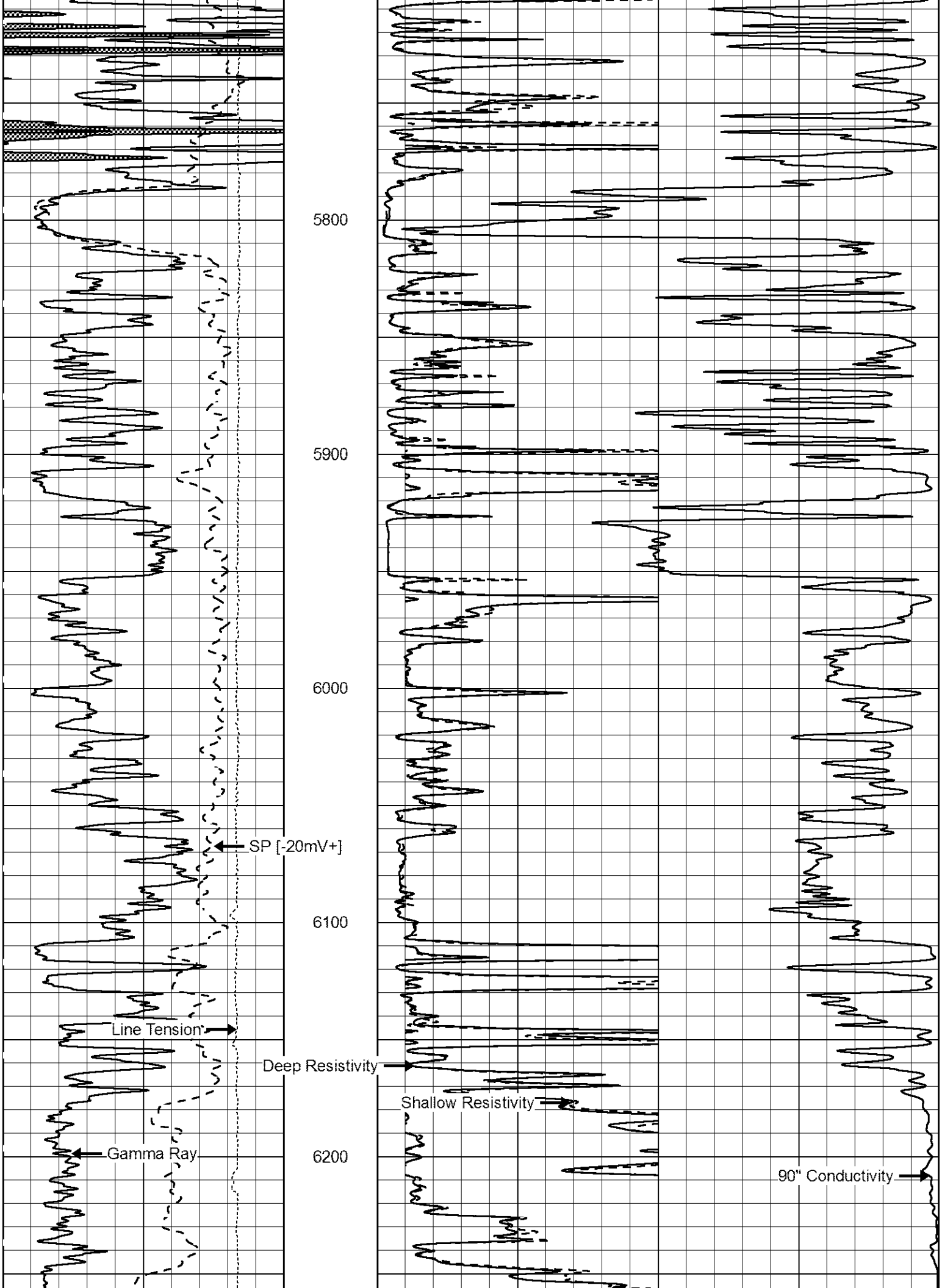

3000
3100
3200
3300
3400
3500

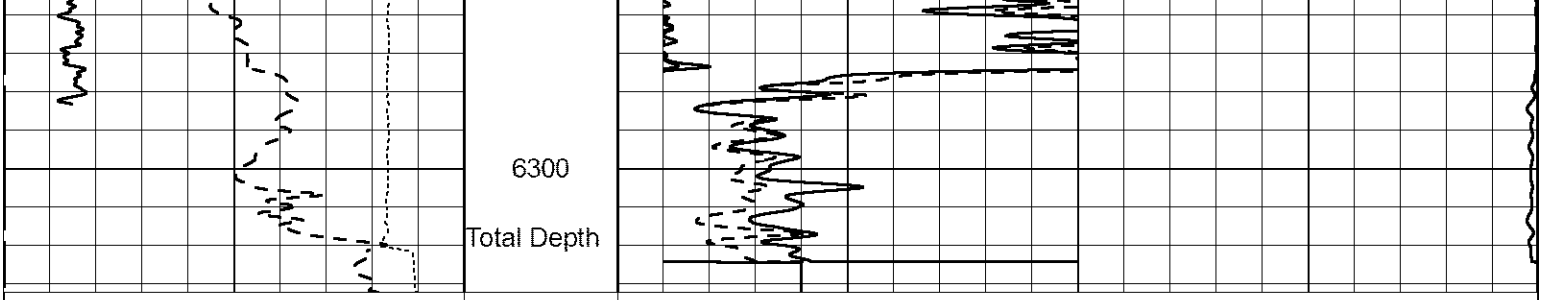

3600
3700
3800
SP [-20mV+]
900
4000


Line Tension
410
Deep Resistivity
Shallow Resistivity
Gamma Ray
90" Conductivity
4200
4300
4400
4500
4600


4700
4800
4900
5000
5100


5200
5300
5400
5500
5600
5700


5800
5900
6000
SP [-20mV+]
6100
Line Tension
Deep Resistivity
Shallow Resistivity
Gamma Ray
6200
90" Conductivity



0 Gamma Ray (GAPI) 150

SP [-20mV+] (mV)

Line Tension
10000 (lb) 0

1000 90" Conductivity (mmho/m) 0

0 Shallow Resistivity (Ohm-m) 50

0 Deep Resistivity (Ohm-m) 50

50 Deep 500

50 Shallow 500

WIRELINE LOGGING SOLUTIONS

High Resolution LS Pass

Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass4
Presentation Format	okc-aind2r10-base
Dataset Creation	Mon Apr 12 21:31:46 2021 by Log Sondex
Charted by	Depth in Feet scaled 1:120

0 Gamma Ray (GAPI) 150

SP [-20mV+]

0.2 20in Resistivity (Ohm-m) 2000

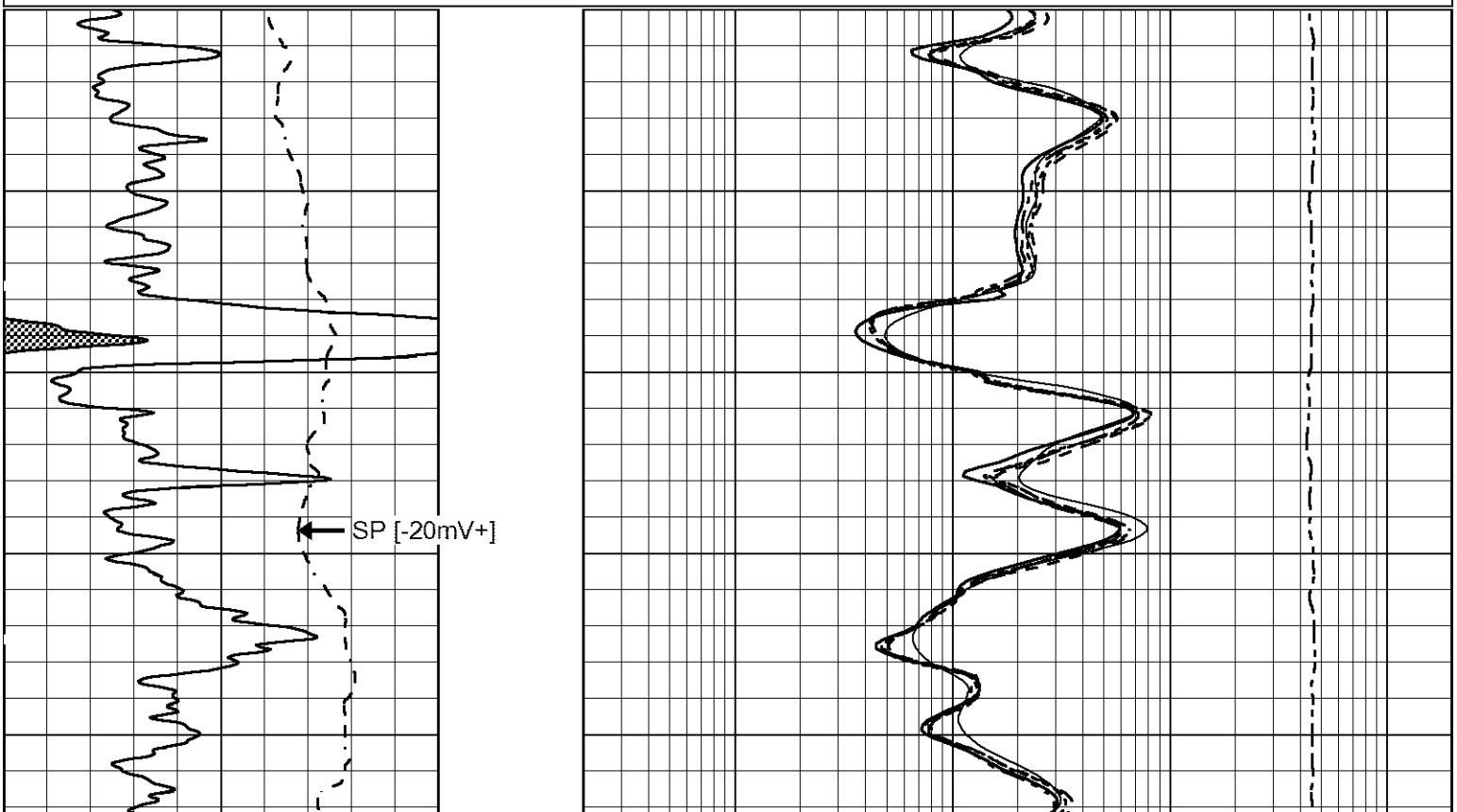
0.2 30in Resistivity (Ohm-m) 2000

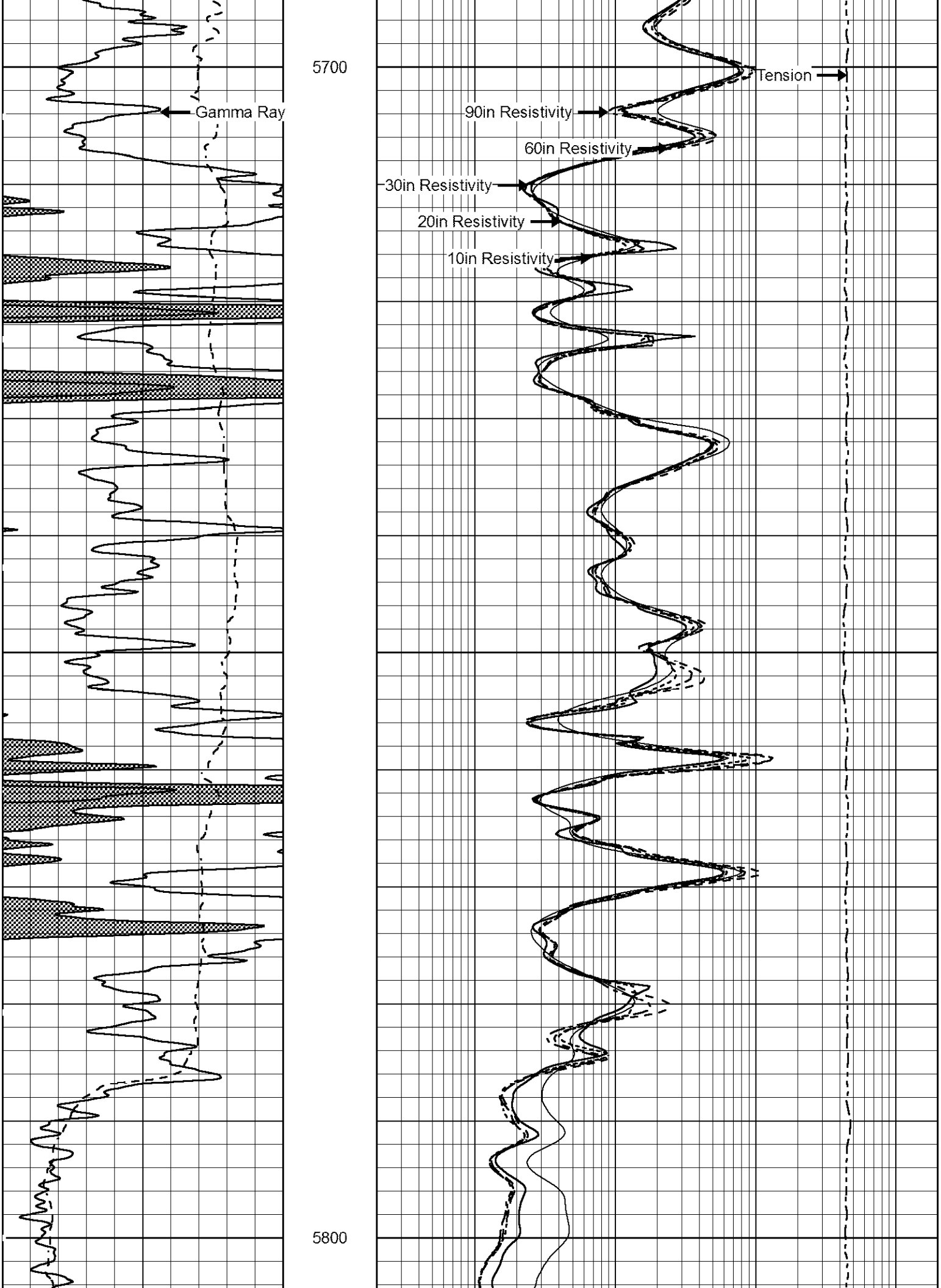
0.2 60in Resistivity (Ohm-m) 2000

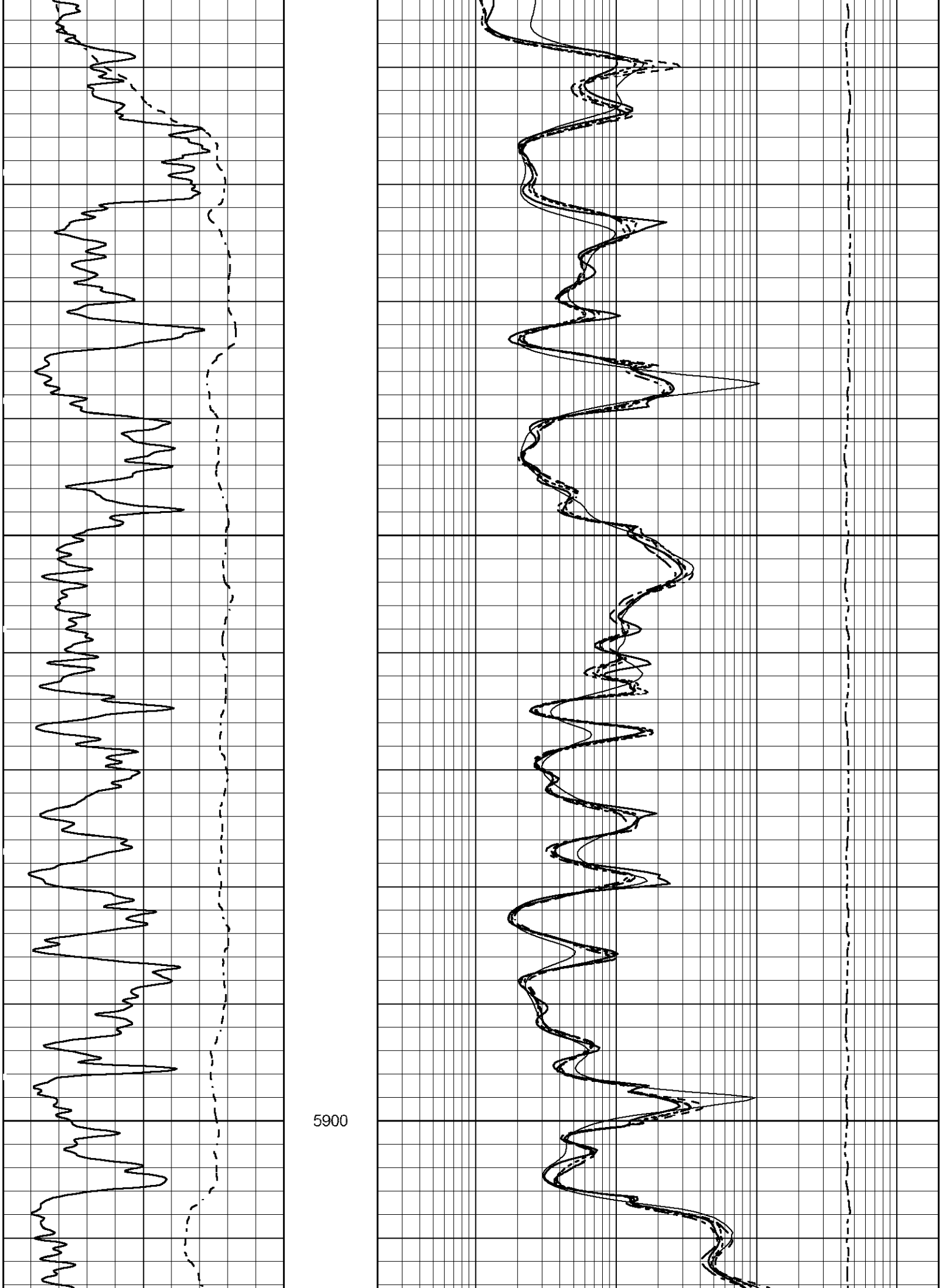
0.2 90in Resistivity (Ohm-m) 2000

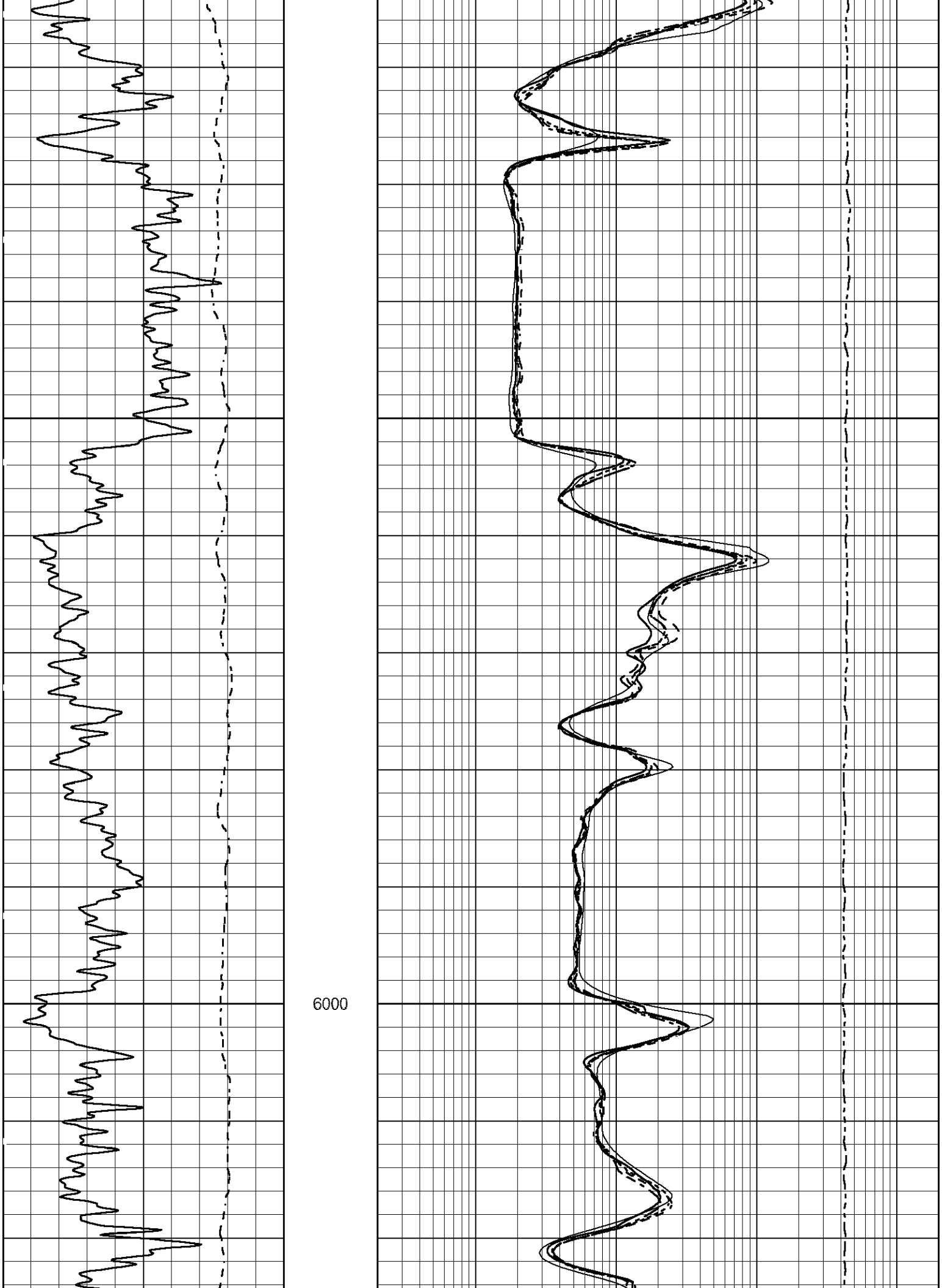
0.2 10in Resistivity (Ohm-m) 2000

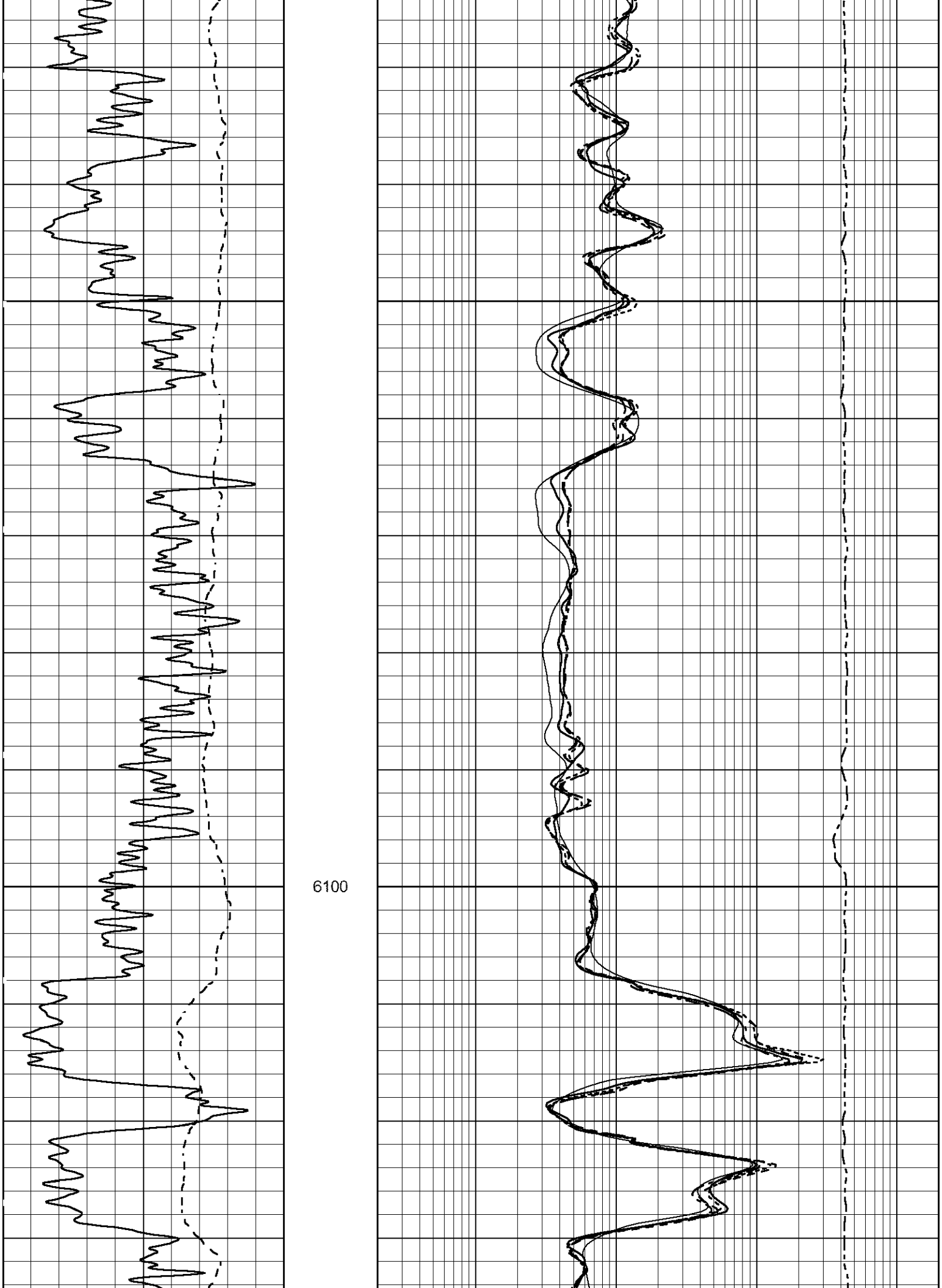
10000 Tension (lb) 0

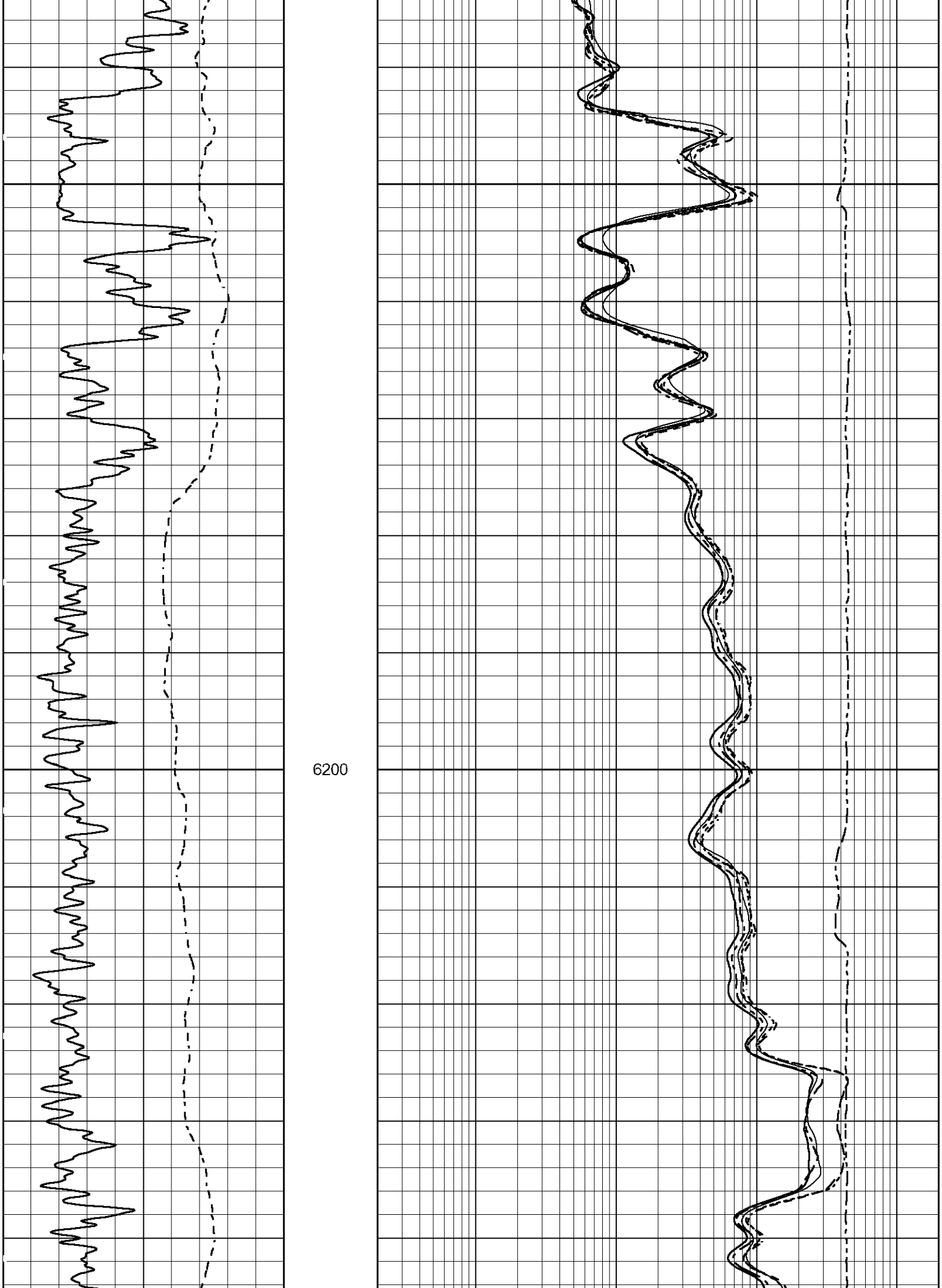


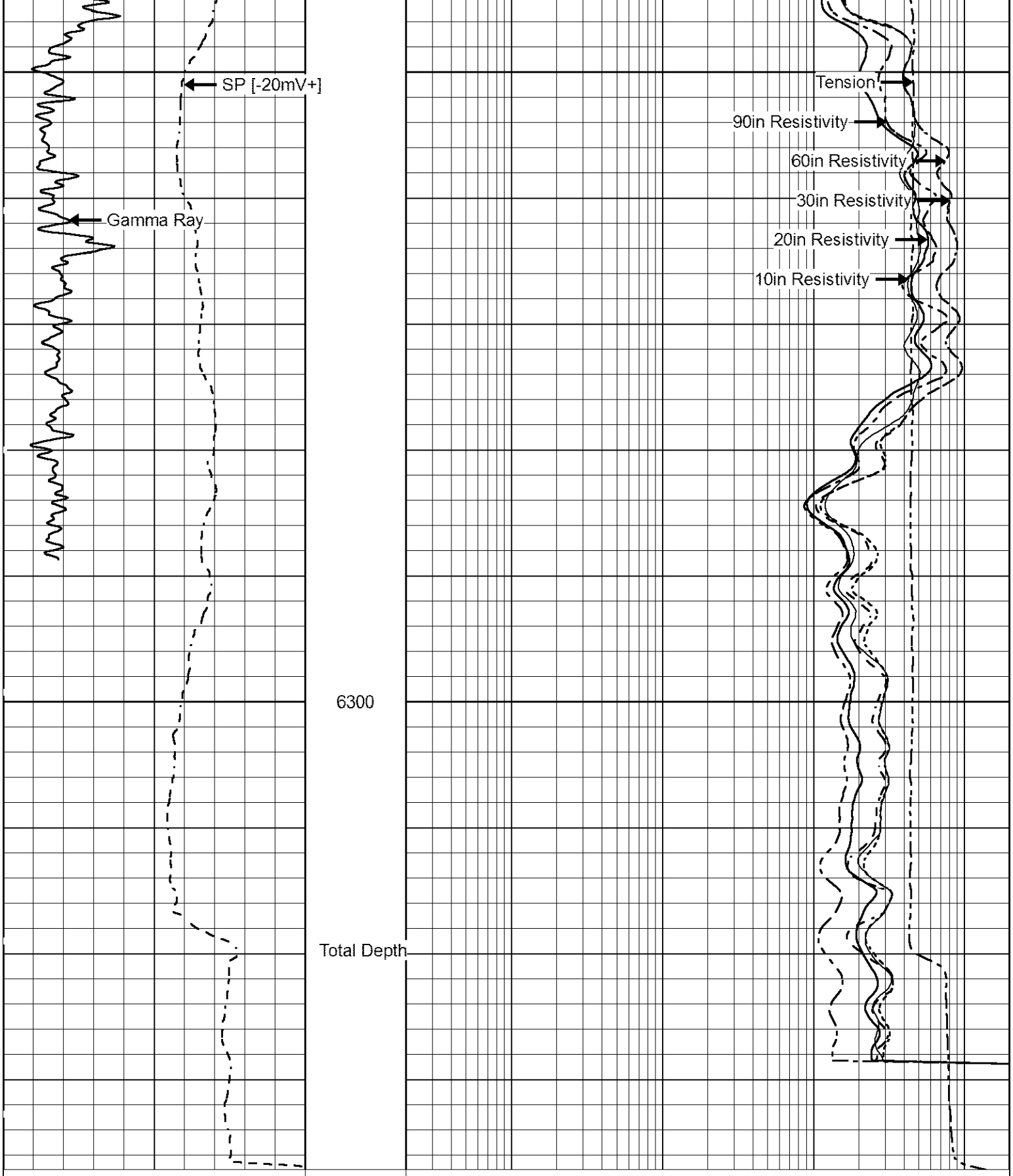

5700
Gamma Ray
Tension
90in Resistivity
60in Resistivity
30in Resistivity
20in Resistivity
10in Resistivity
5800


5900


6000


6100


6200


SP [-20mV+]
Gamma Ray
Tension
90in Resistivity
60in Resistivity
30in Resistivity
20in Resistivity
10in Resistivity
6300
Total Depth
0
Gamma Ray (GAPI)
150
SP [-20mV+]
0.2
20in Resistivity (Ohm-m)
2000
0.2
30in Resistivity (Ohm-m)
2000
0.2
60in Resistivity (Ohm-m)
2000
0.2
90in Resistivity (Ohm-m)
2000
0.2
10in Resistivity (Ohm-m)
2000
10000
Tension (lb)
0

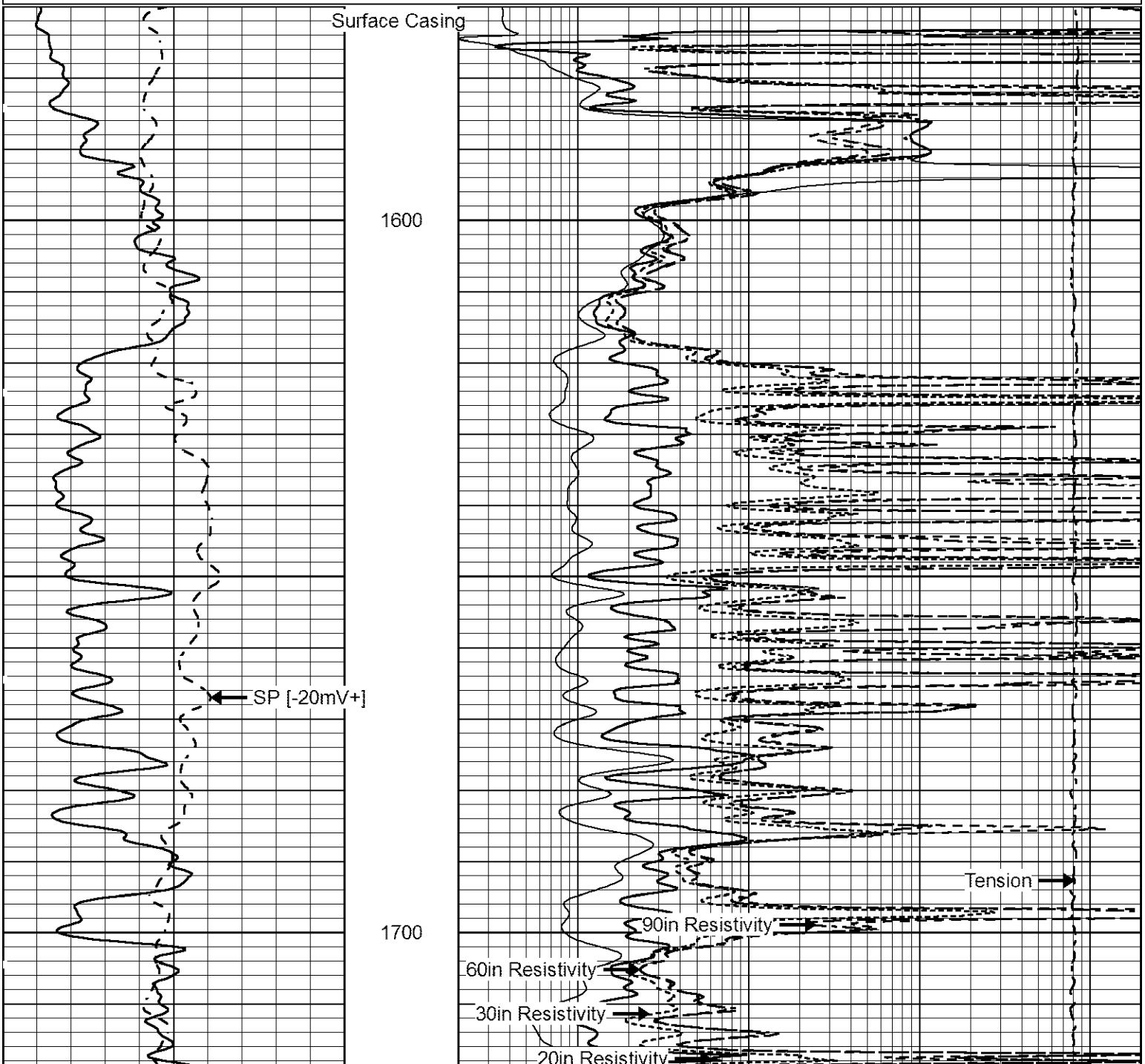
WIRELINE LOGGING SOLUTIONS

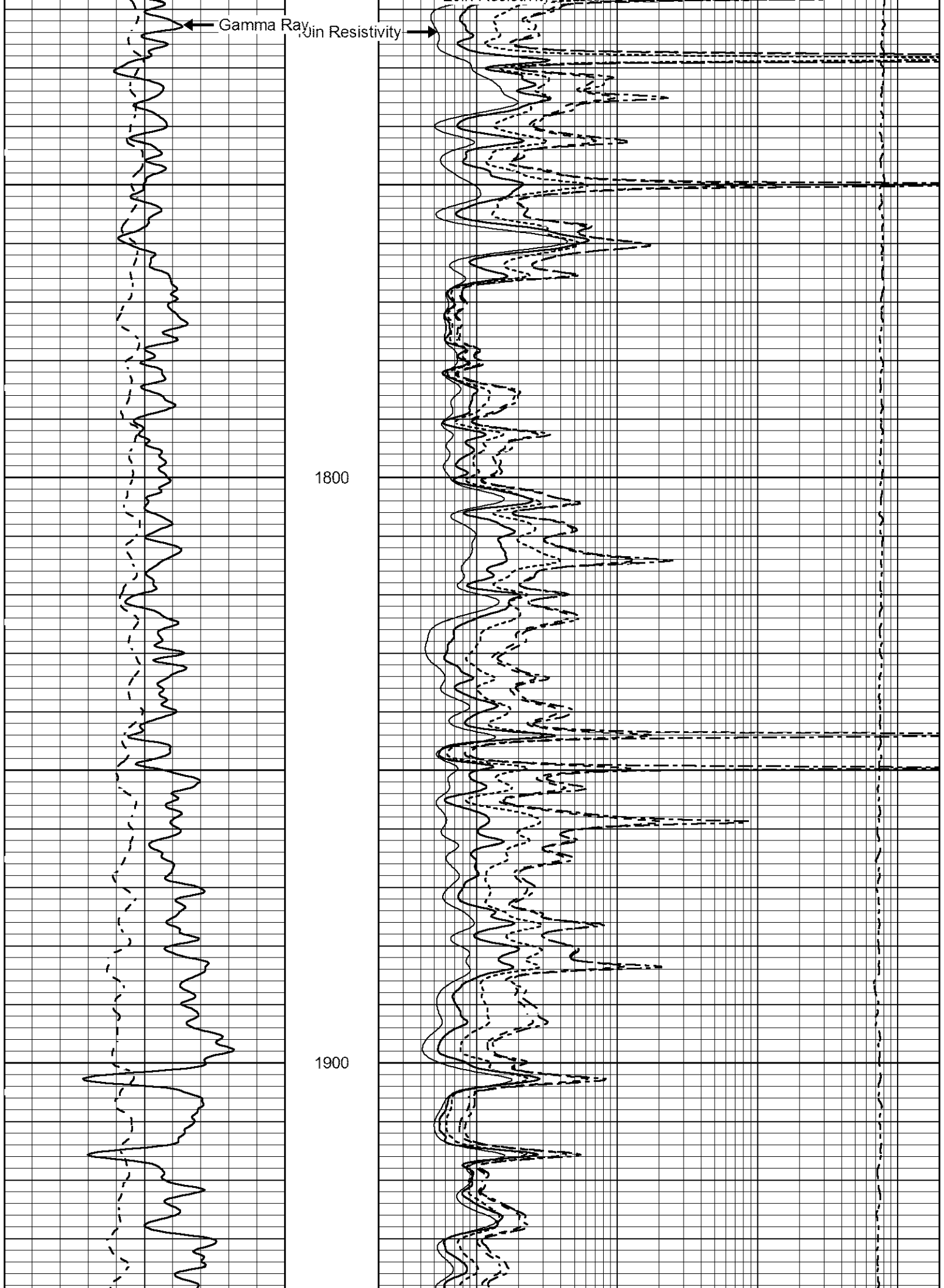
Main LS Pass

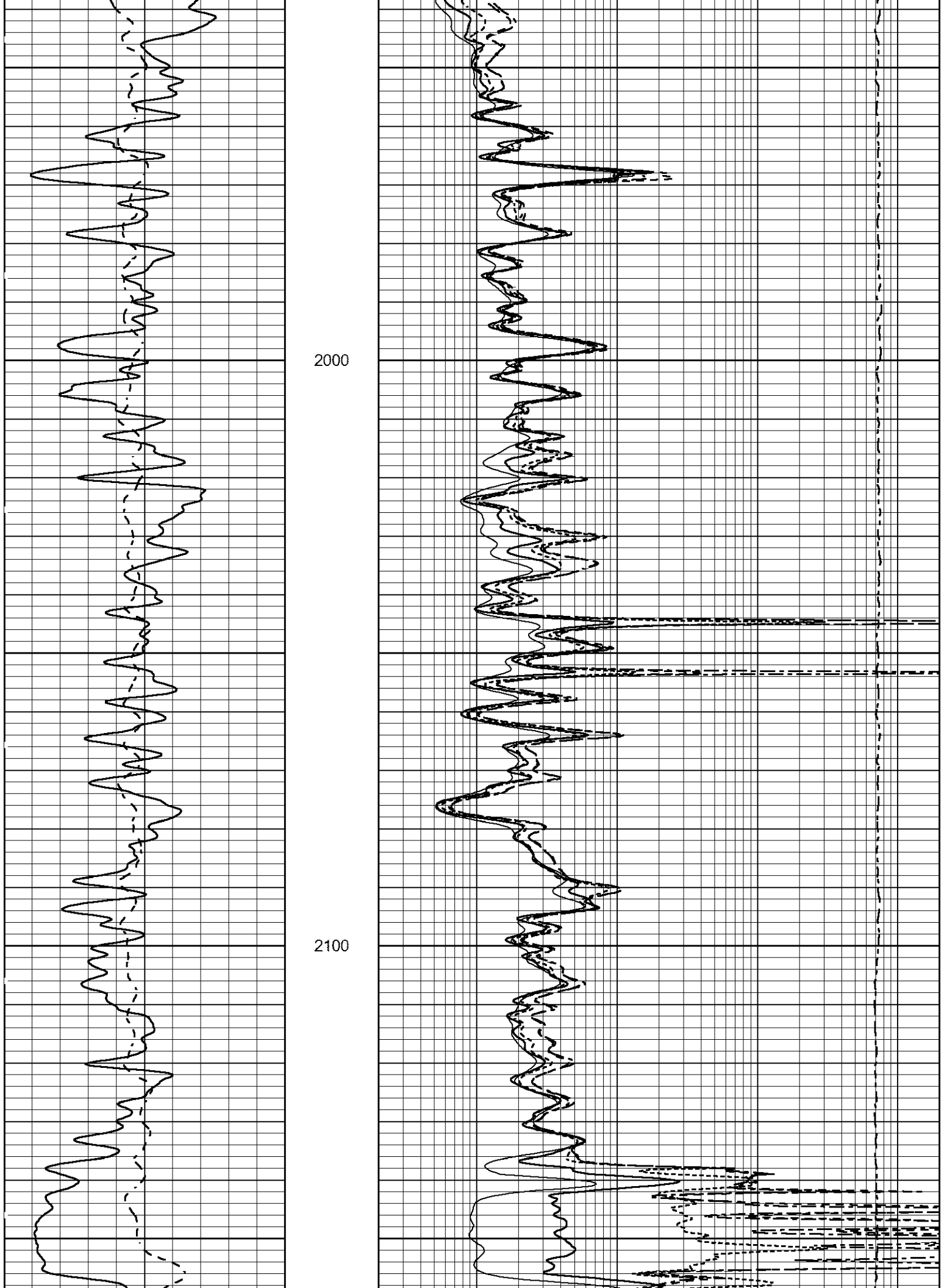
Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass5.1
Presentation Format	okc-aind2r10-base
Dataset Creation	Tue Apr 13 00:30:21 2021
Charted by	Depth in Feet scaled 1:240

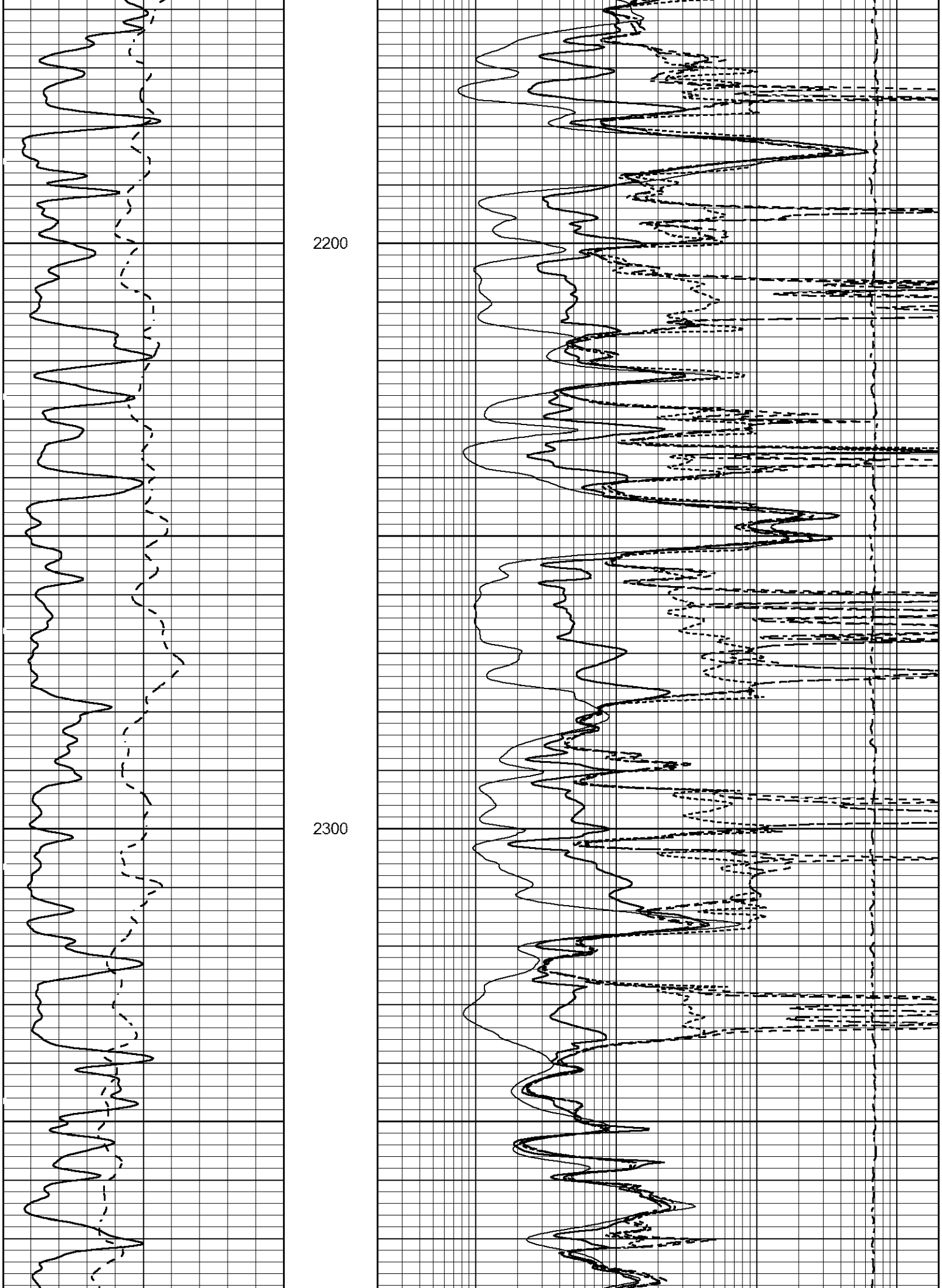
0	Gamma Ray (GAPI)	150
	SP [-20mV+]	

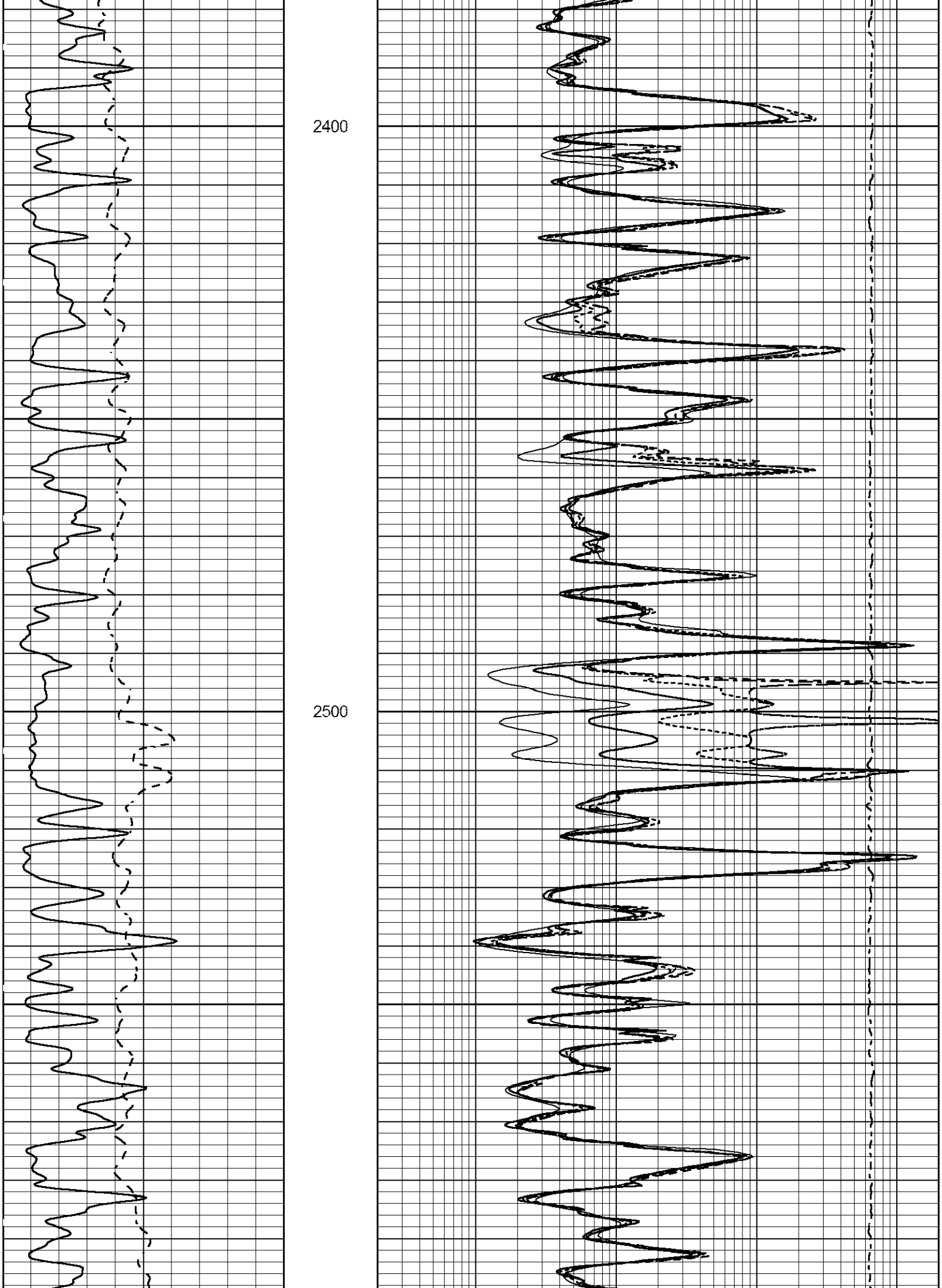
0.2	20in Resistivity (Ohm-m)	2000
0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000
0.2	10in Resistivity (Ohm-m)	2000
10000	Tension (lb)	0

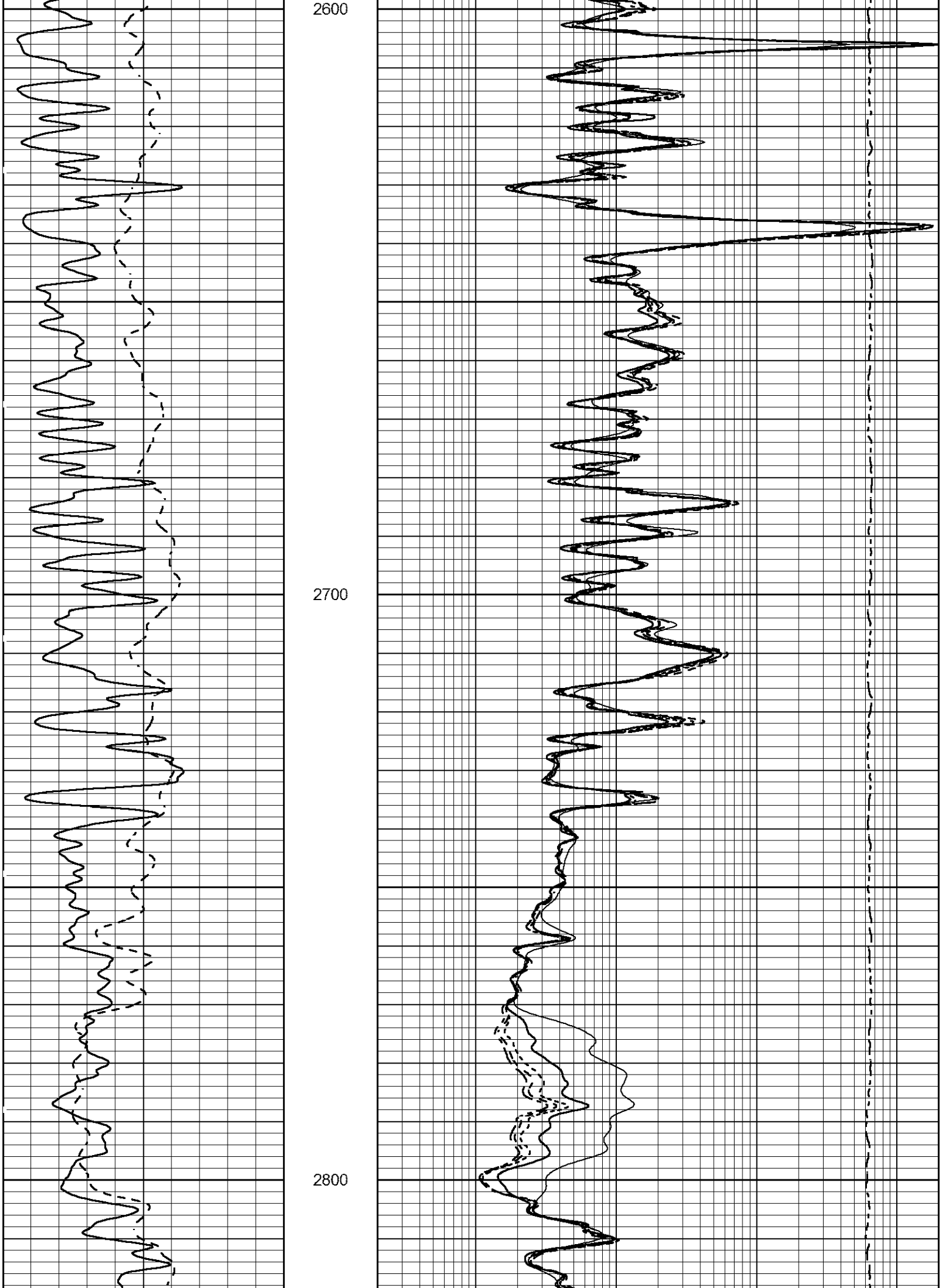


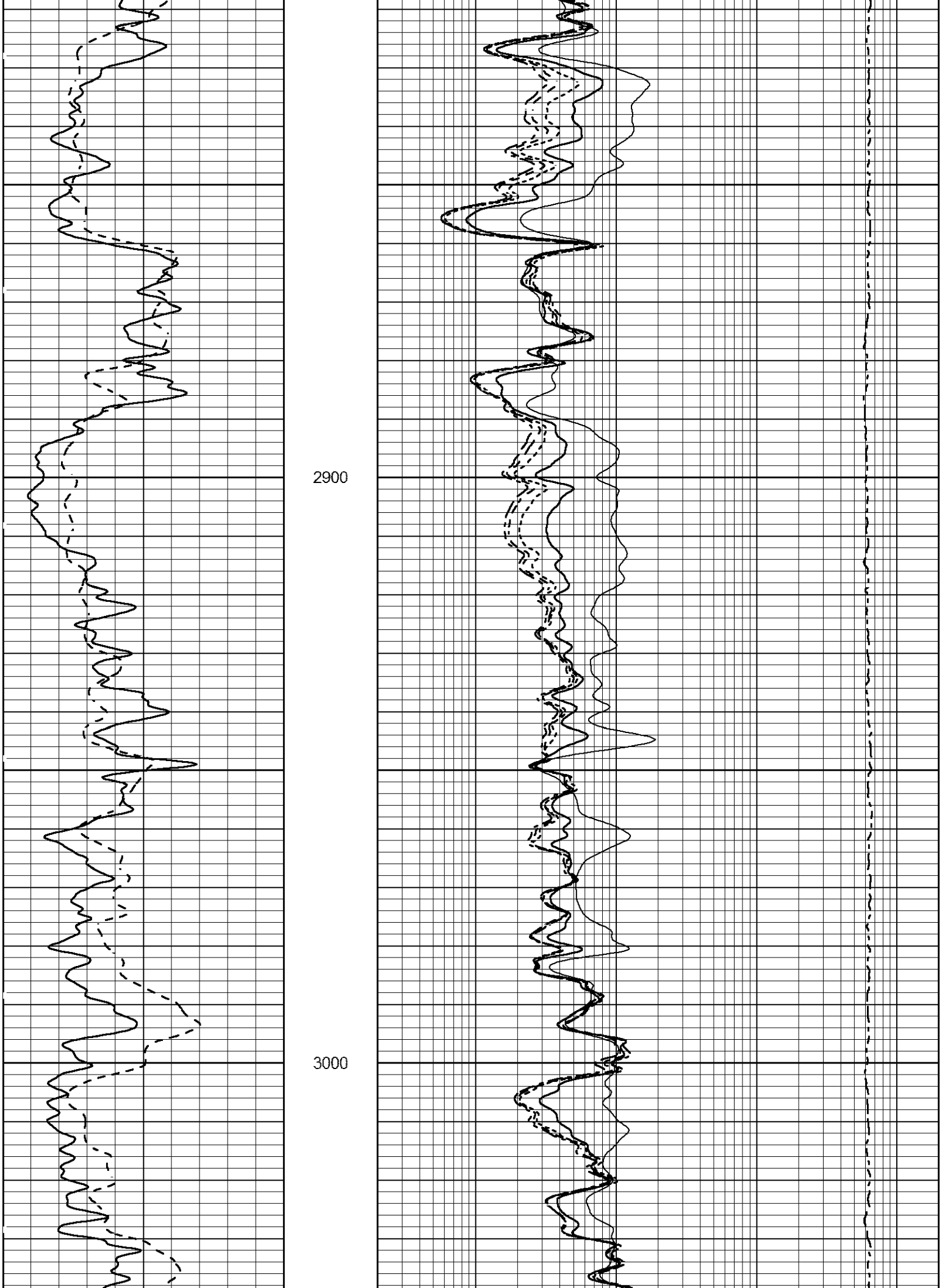

Gamma Ray
Resistivity
1800
1900

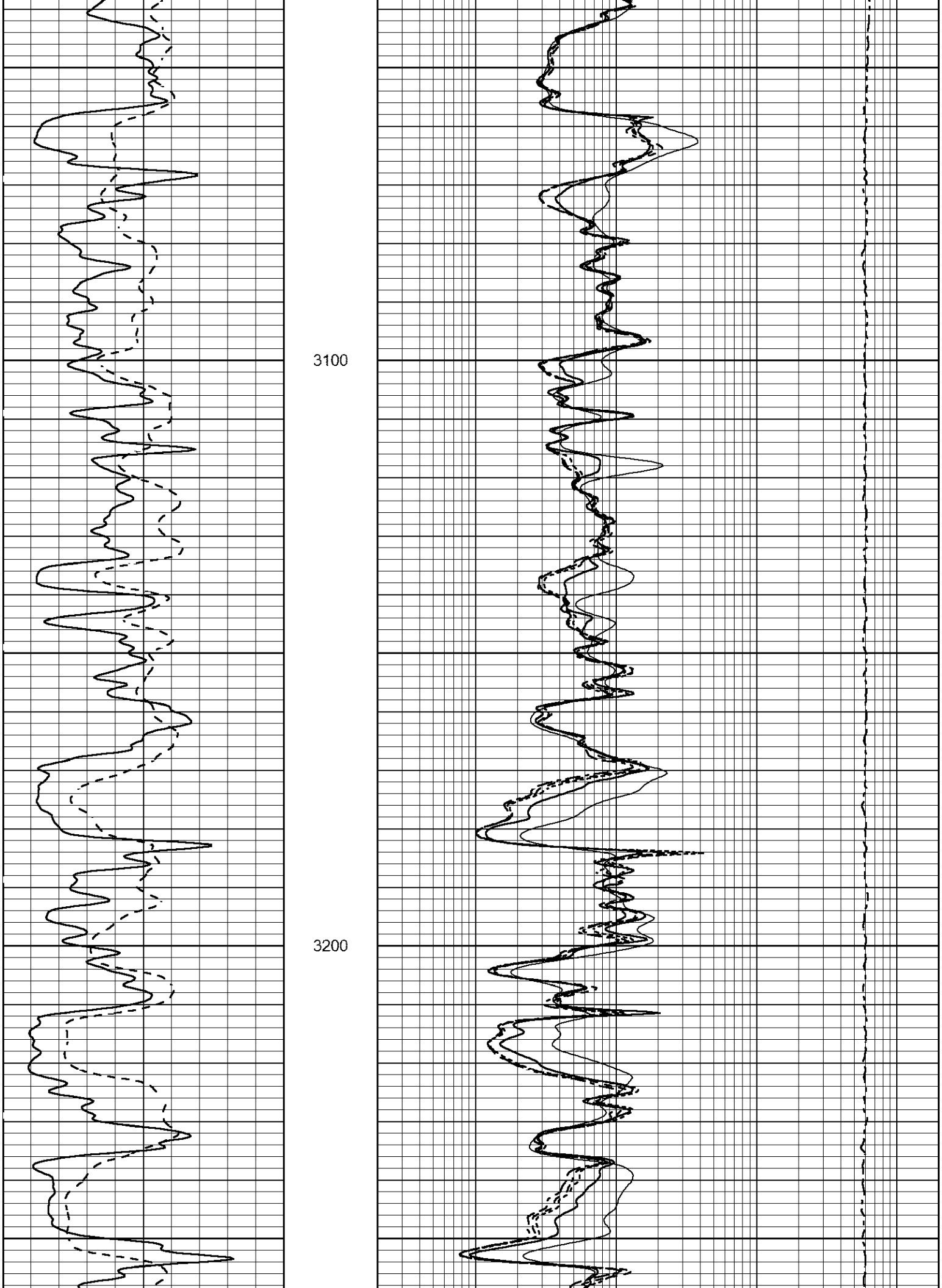

2000
2100

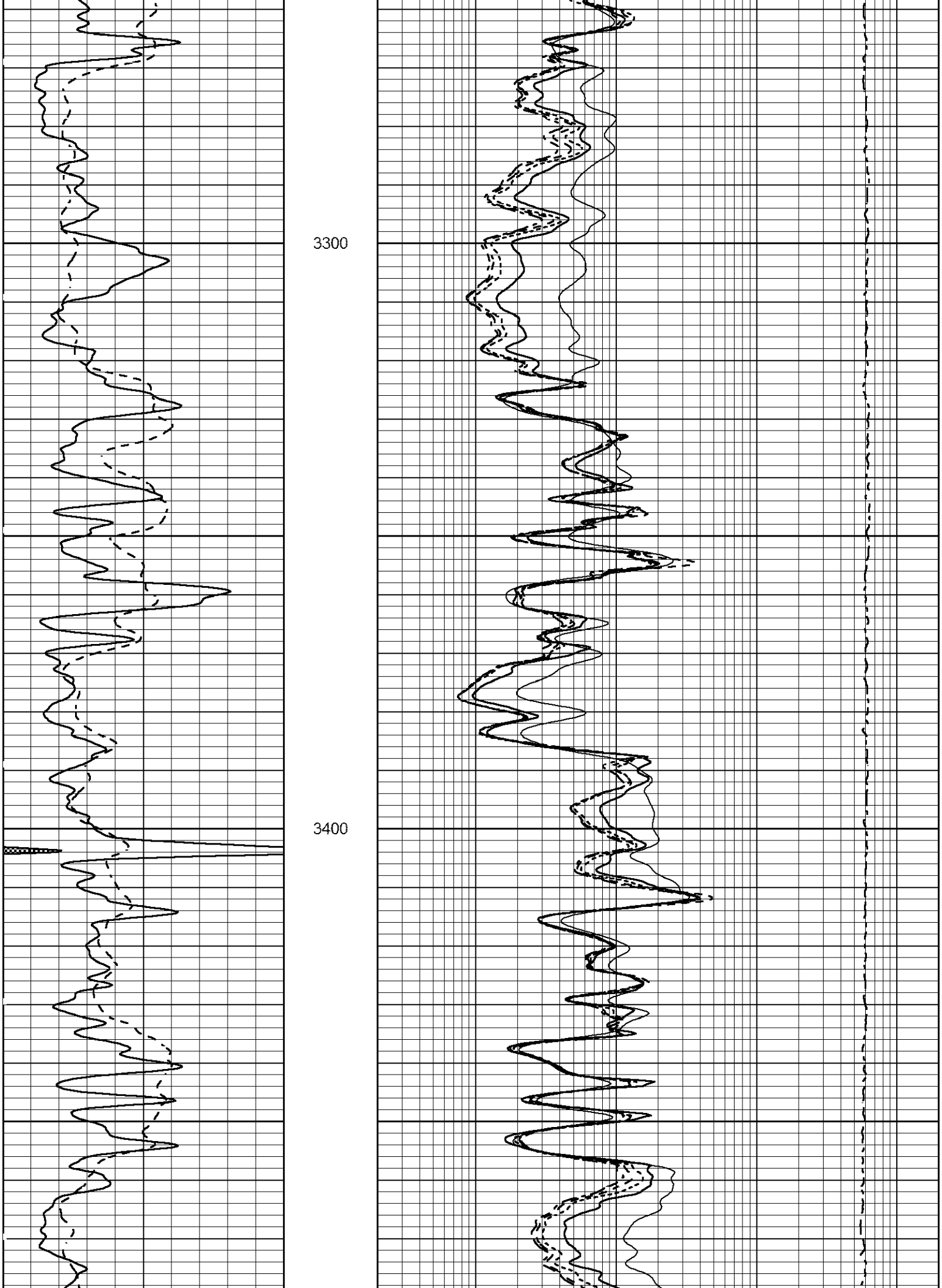

2200
2300

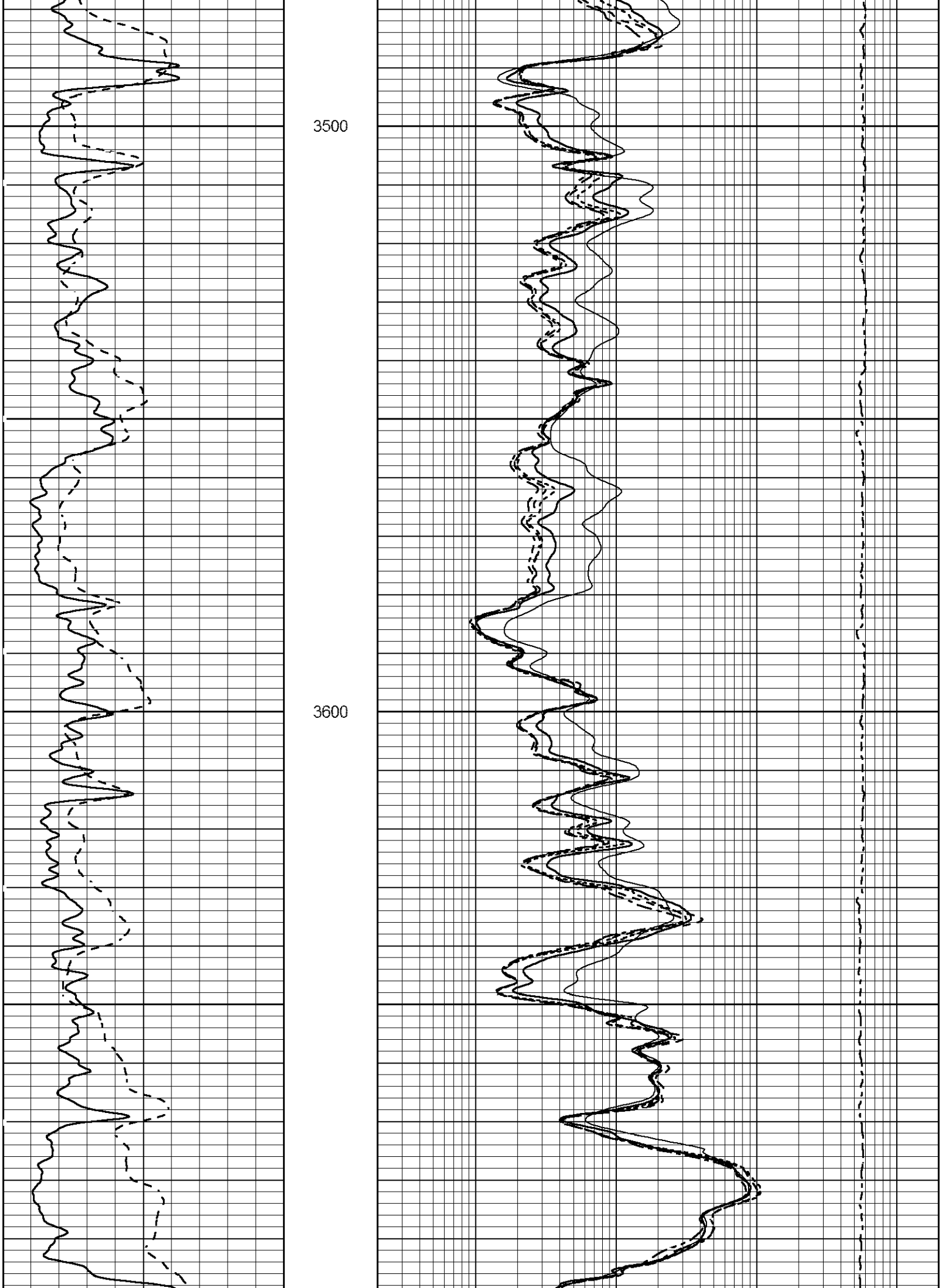

2400
2500

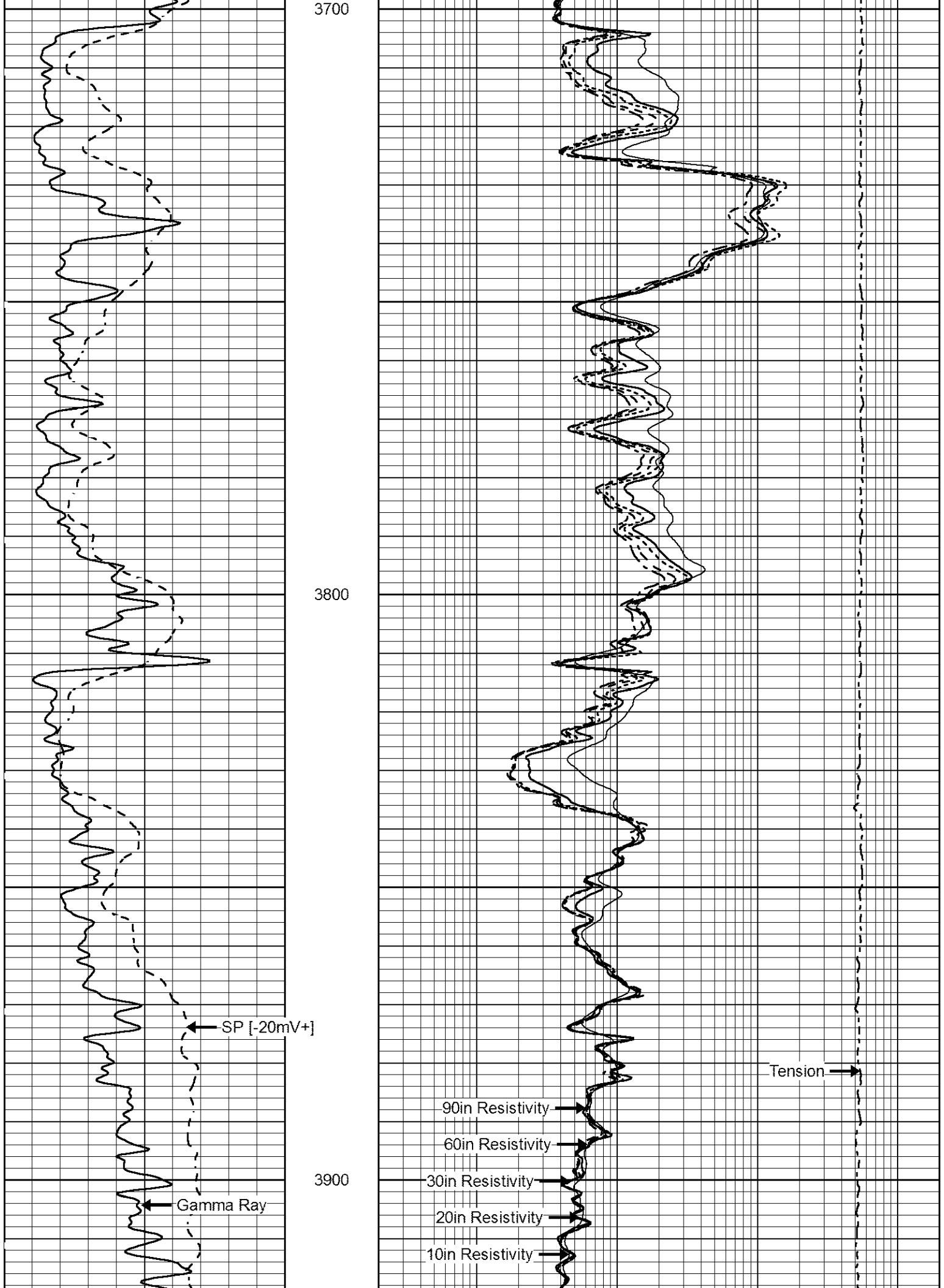

2600
2700
2800

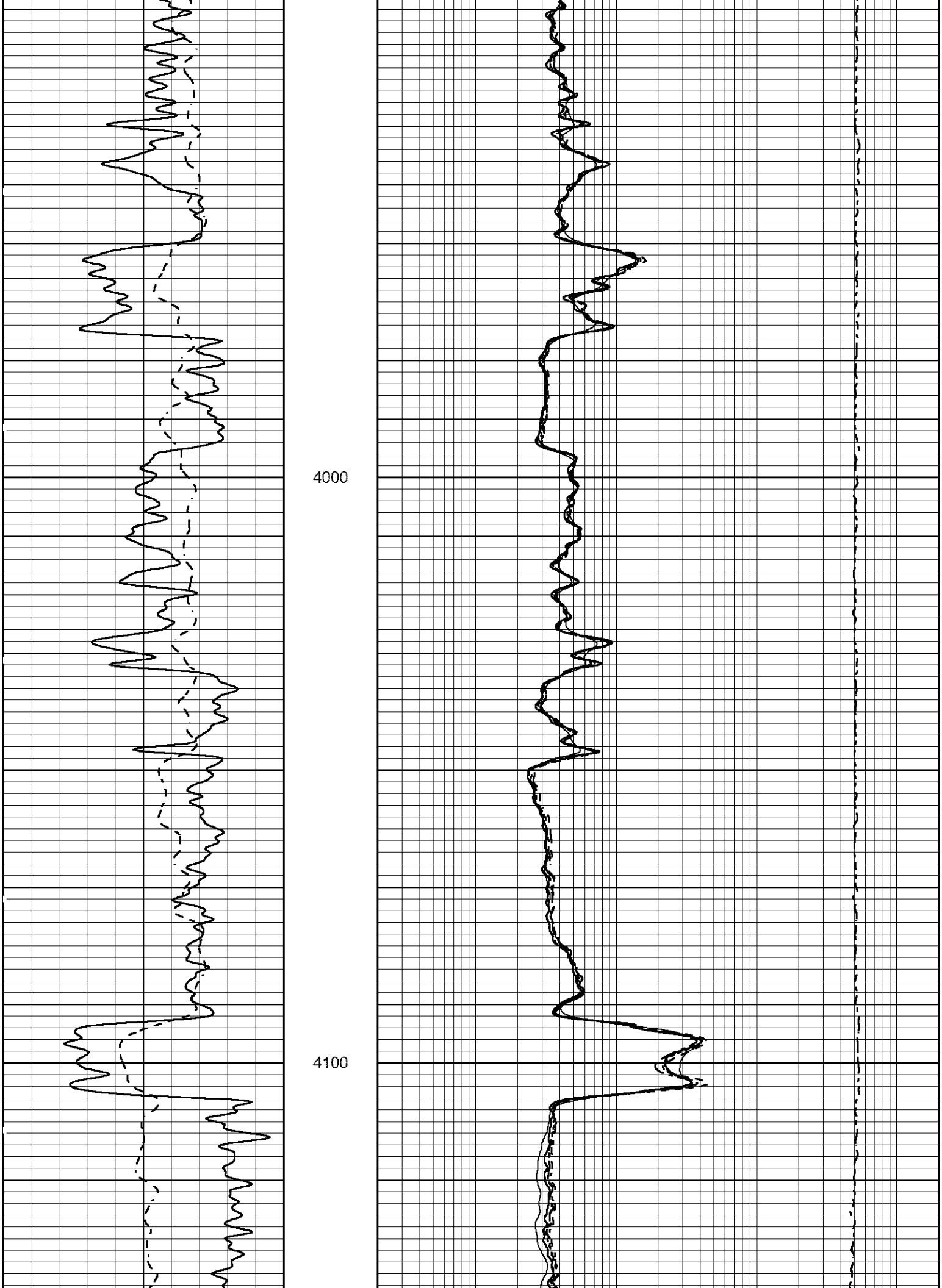

2900
3000

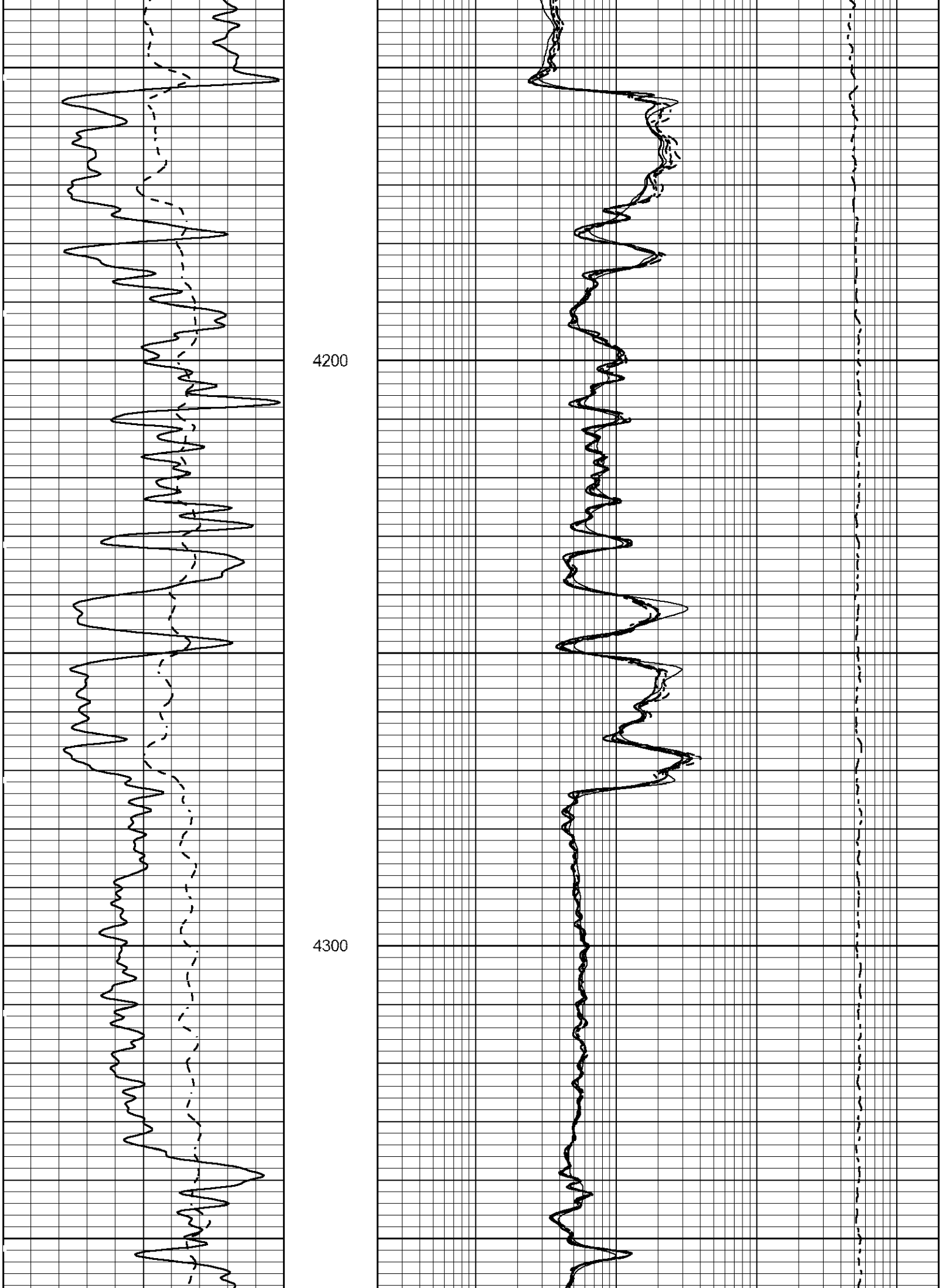

3100
3200

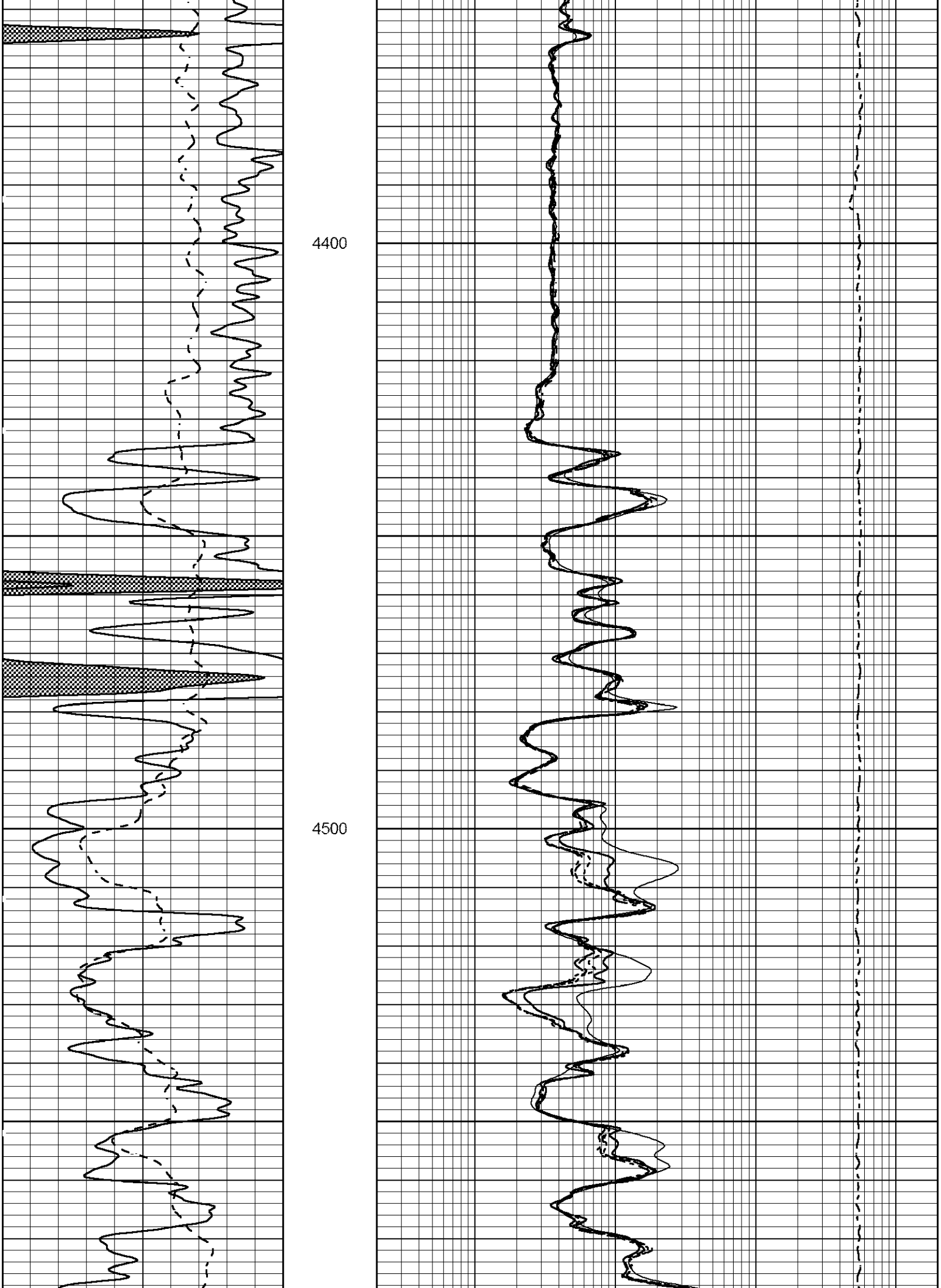

3300
3400

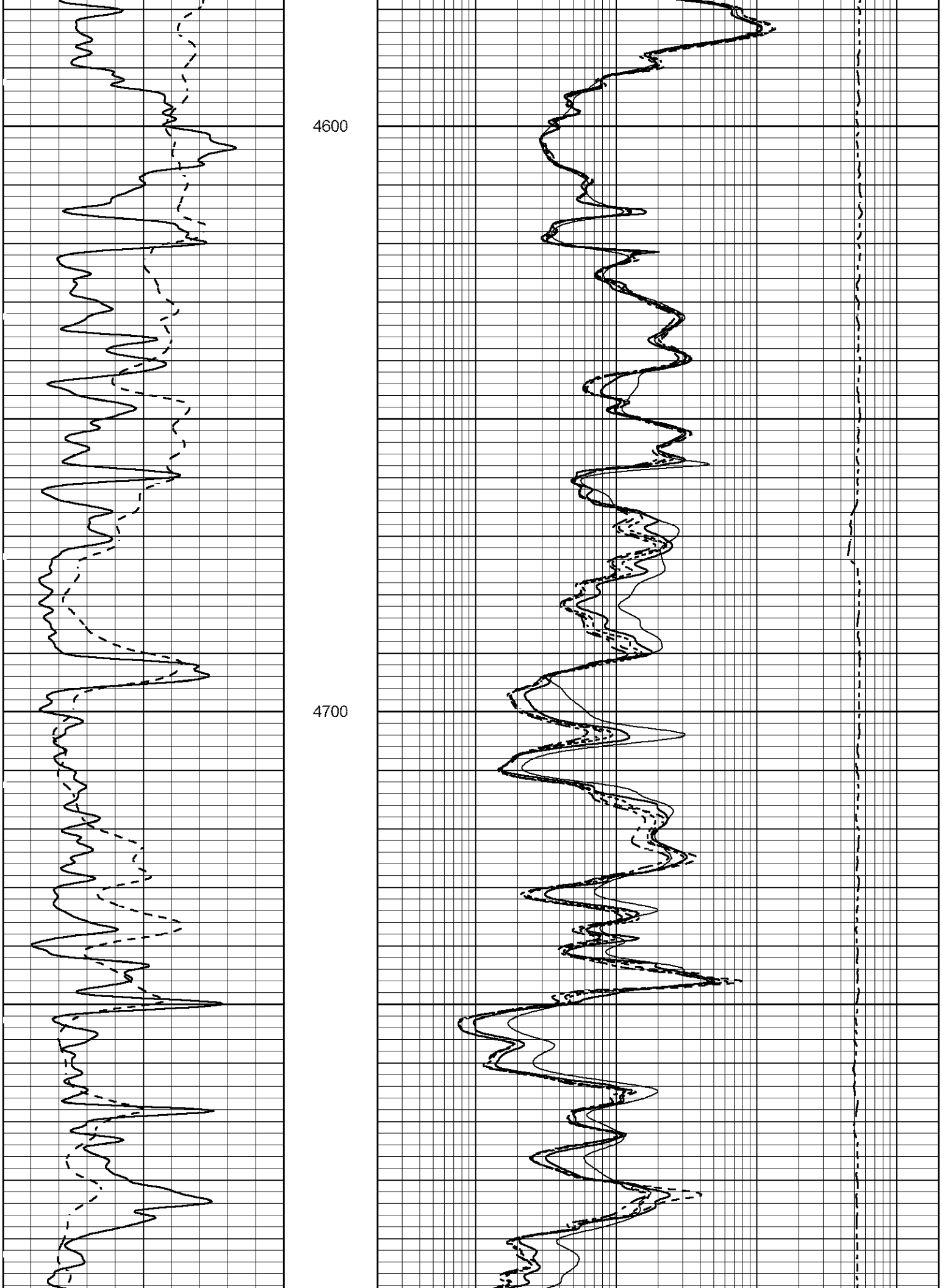

3500
3600

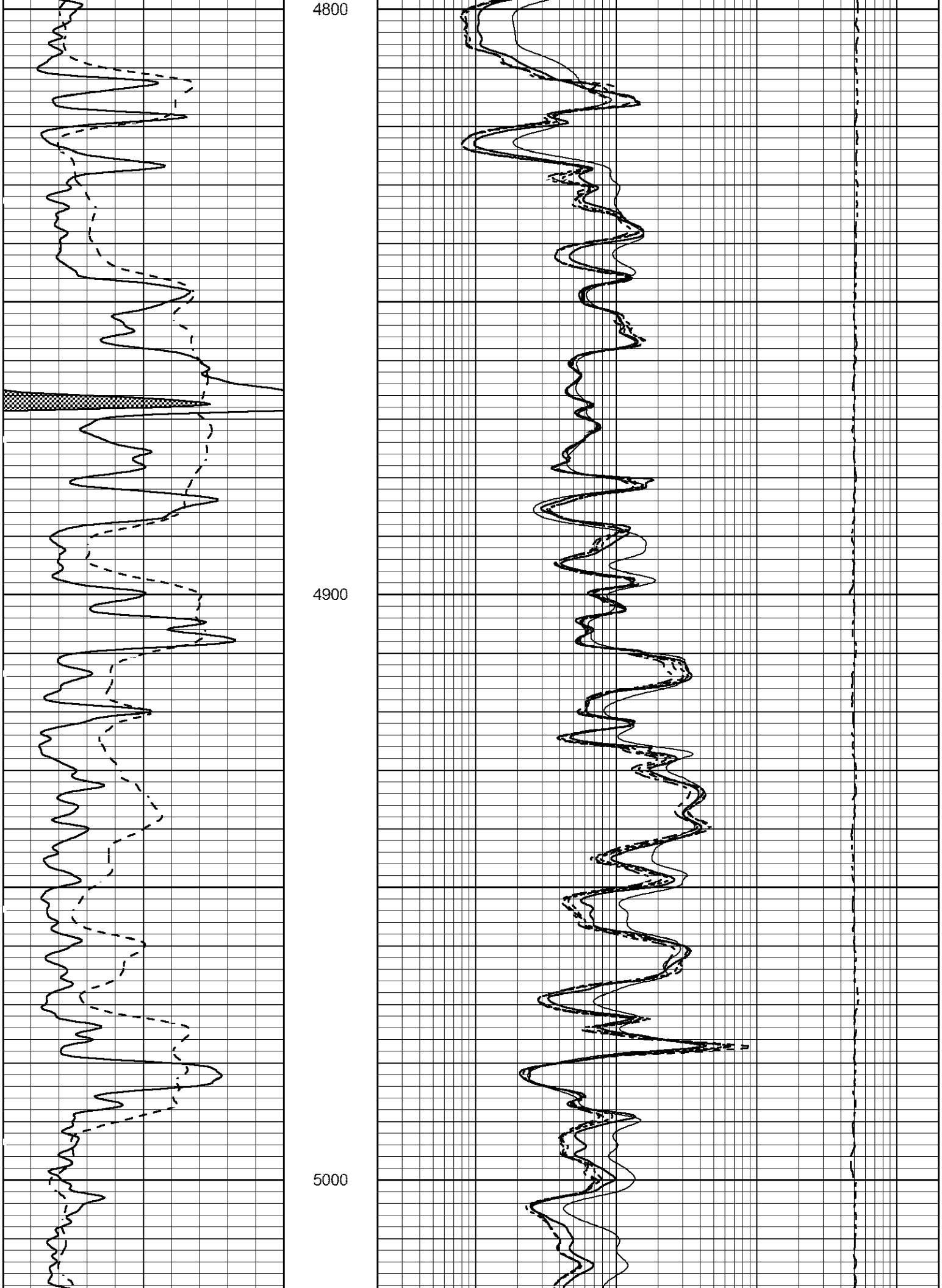

3700
3800
3900
SP [-20mV+]
Gamma Ray
Tension
90in Resistivity
60in Resistivity
30in Resistivity
20in Resistivity
10in Resistivity

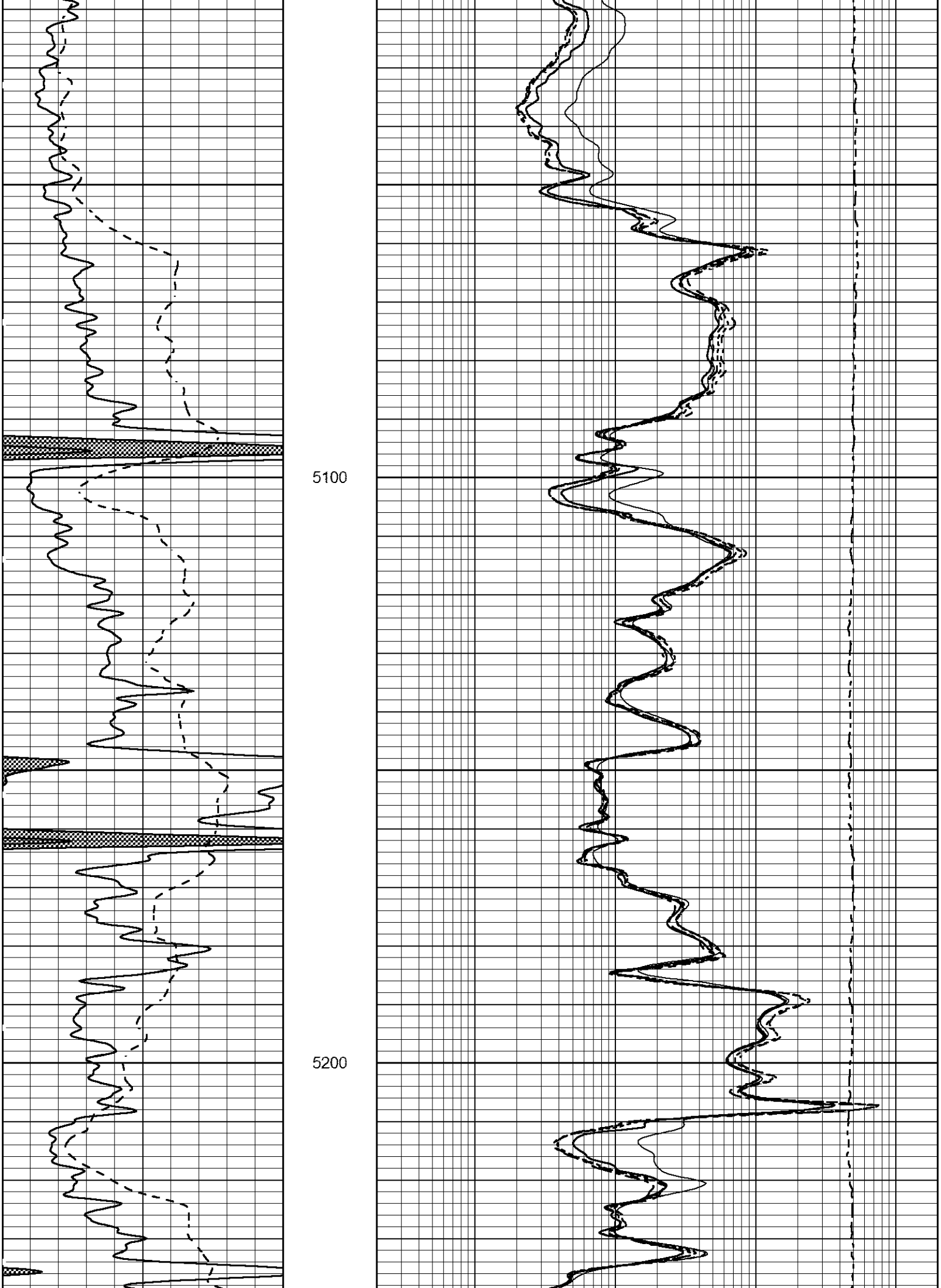

4000
4100

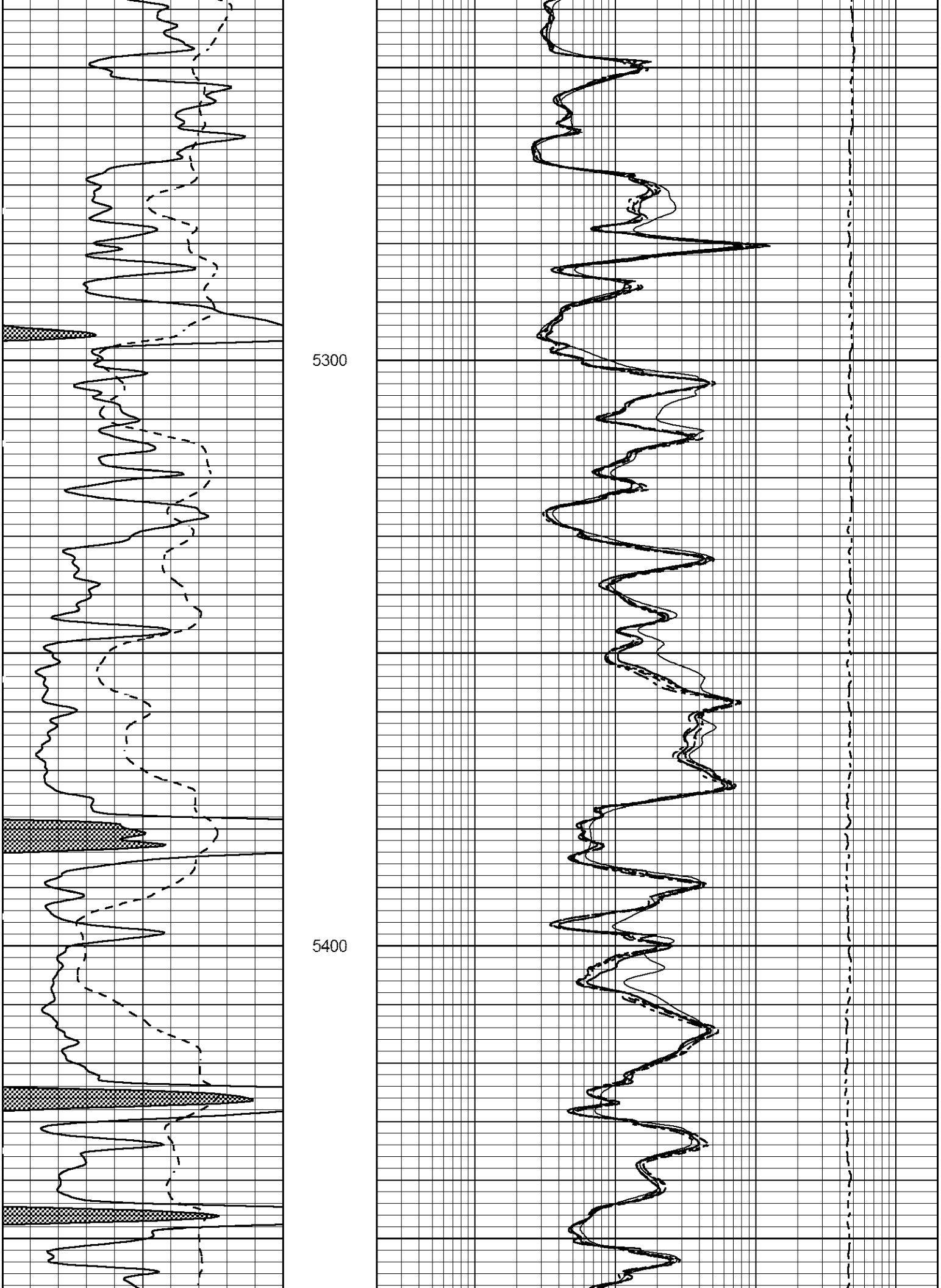

4200
4300

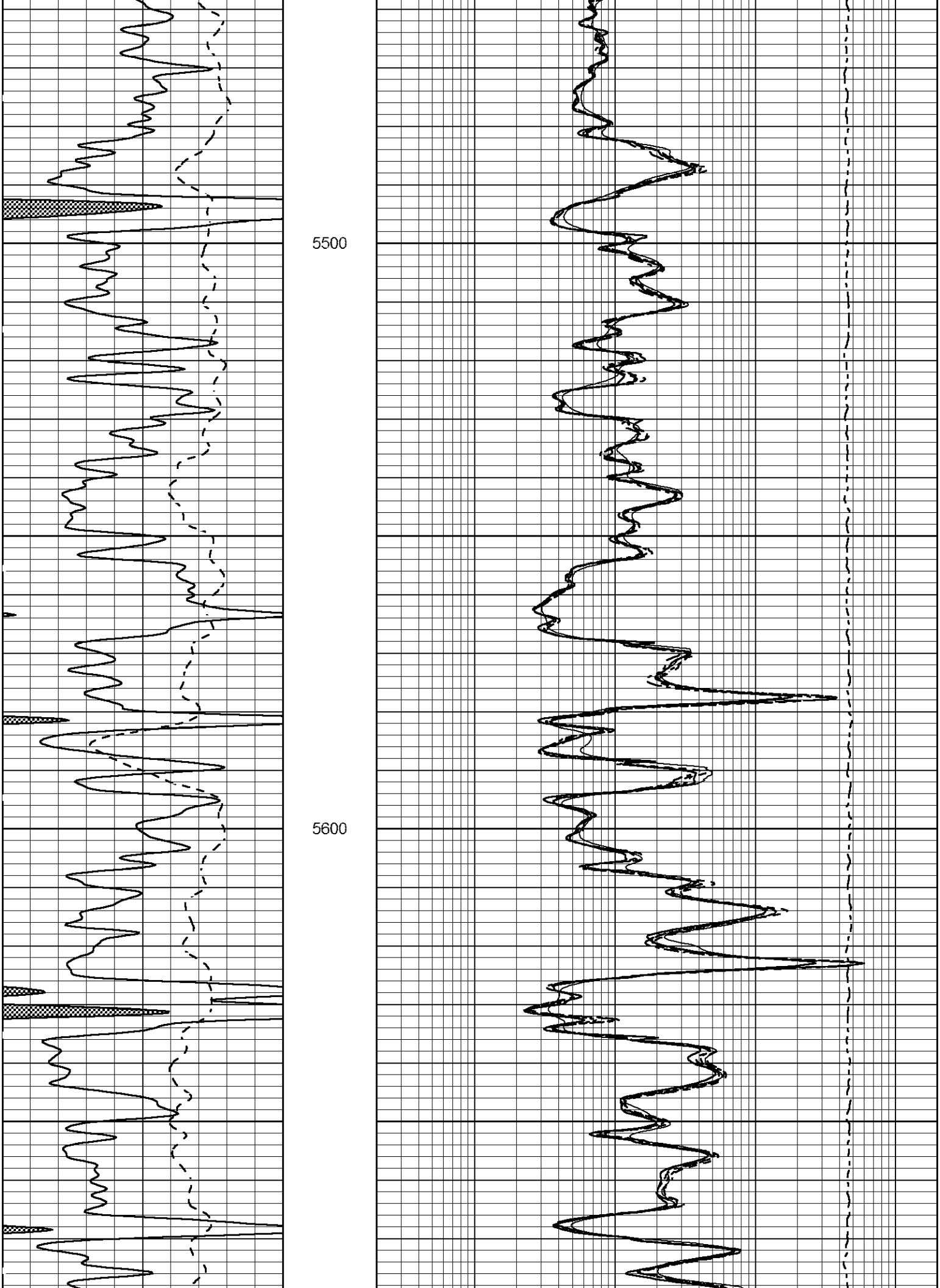

4400
4500


4600
4700


4800
4900
5000


5100
5200


5300
5400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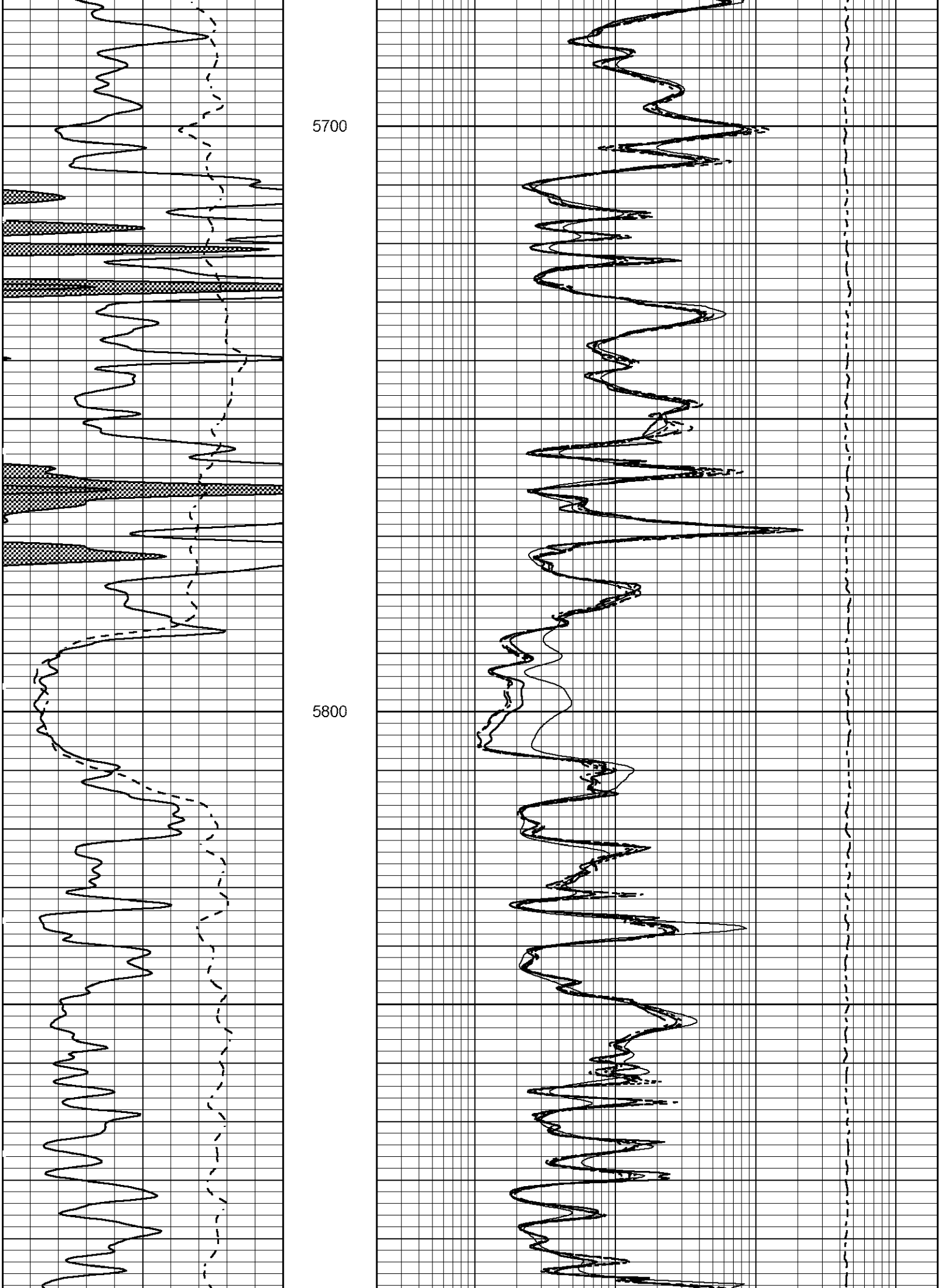
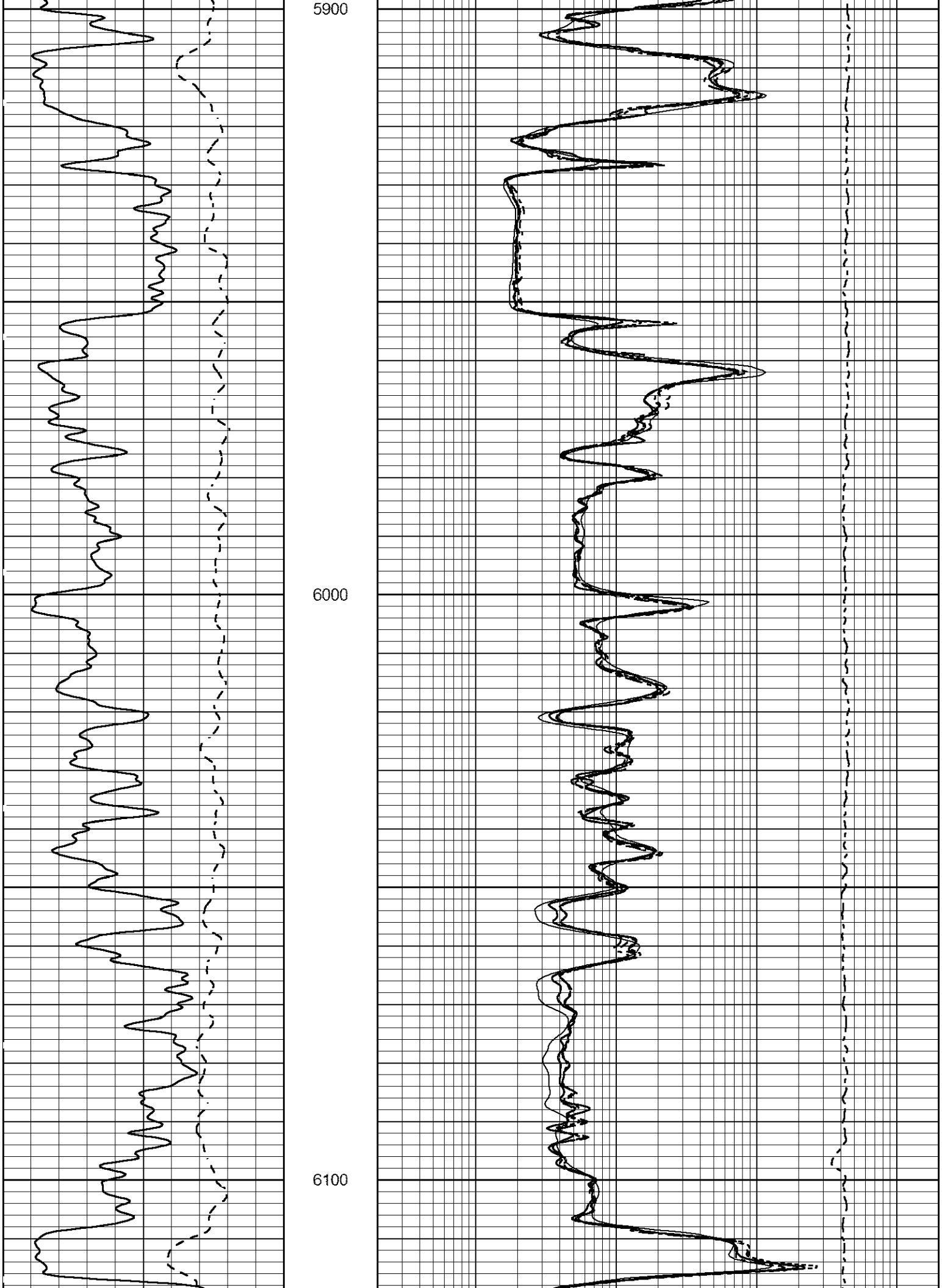
5600


5700
5800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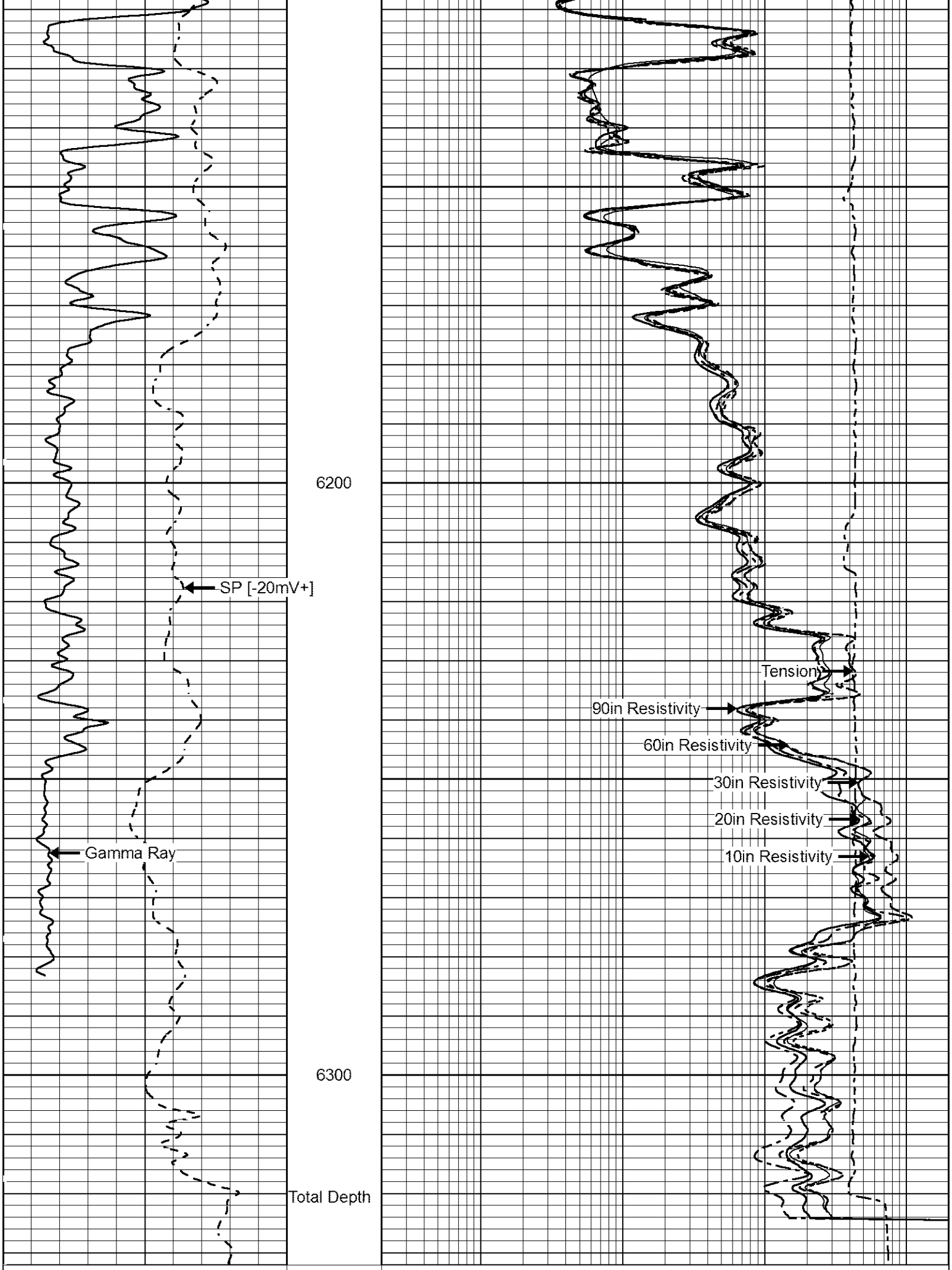
6000
6100


6200
SP [-20mV+]
Tension
90in Resistivity
60in Resistivity
30in Resistivity
20in Resistivity
10in Resistivity
Gamma Ray
6300
Total Depth
0
Gamma Ray (GAPI)
150
0.2
20in Resistivity (Ohm-m)
2000

SP [-20mV+]

0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000
0.2	10in Resistivity (Ohm-m)	2000
10000	Tension (lb)	0

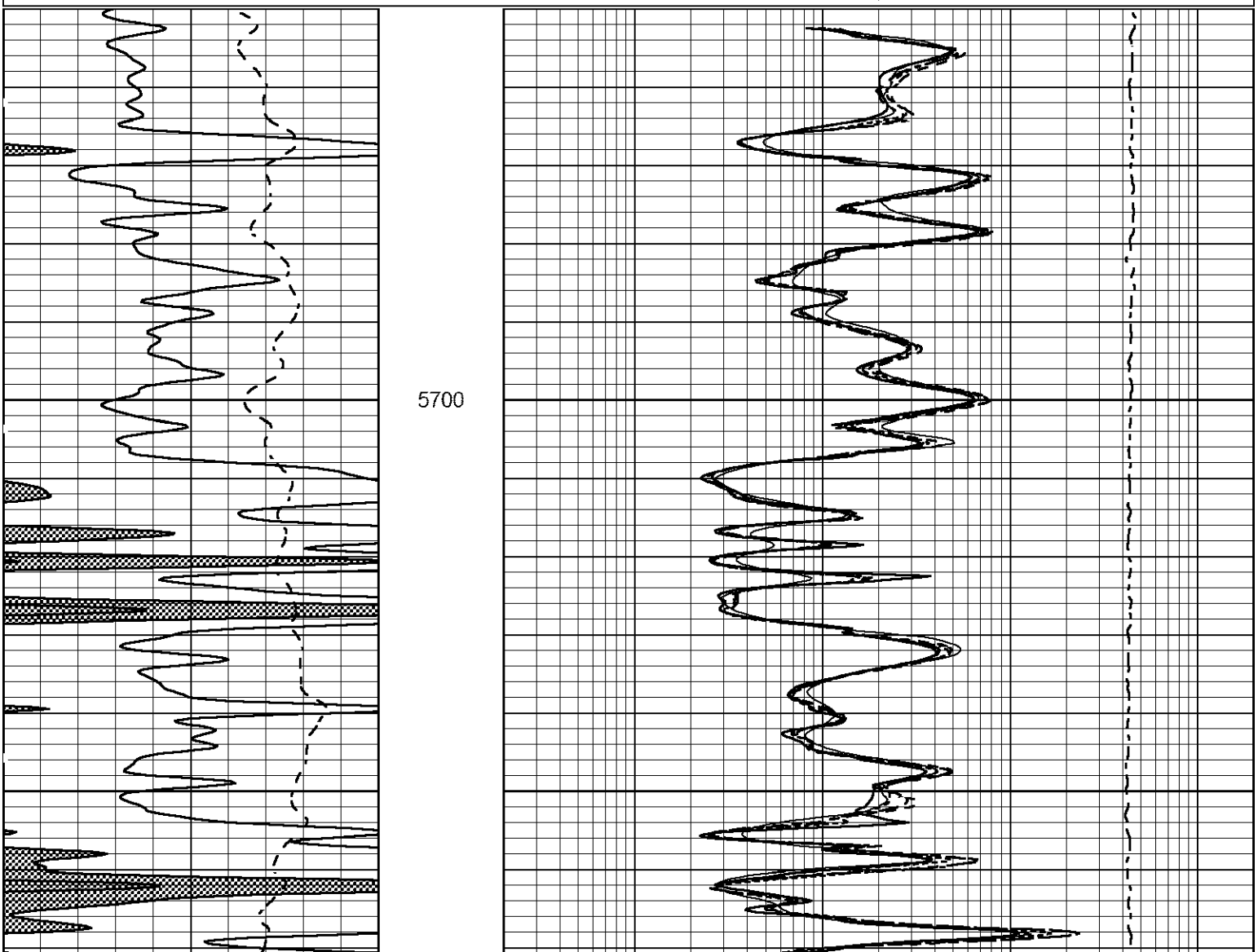
WIRELINE LOGGING SOLUTIONS

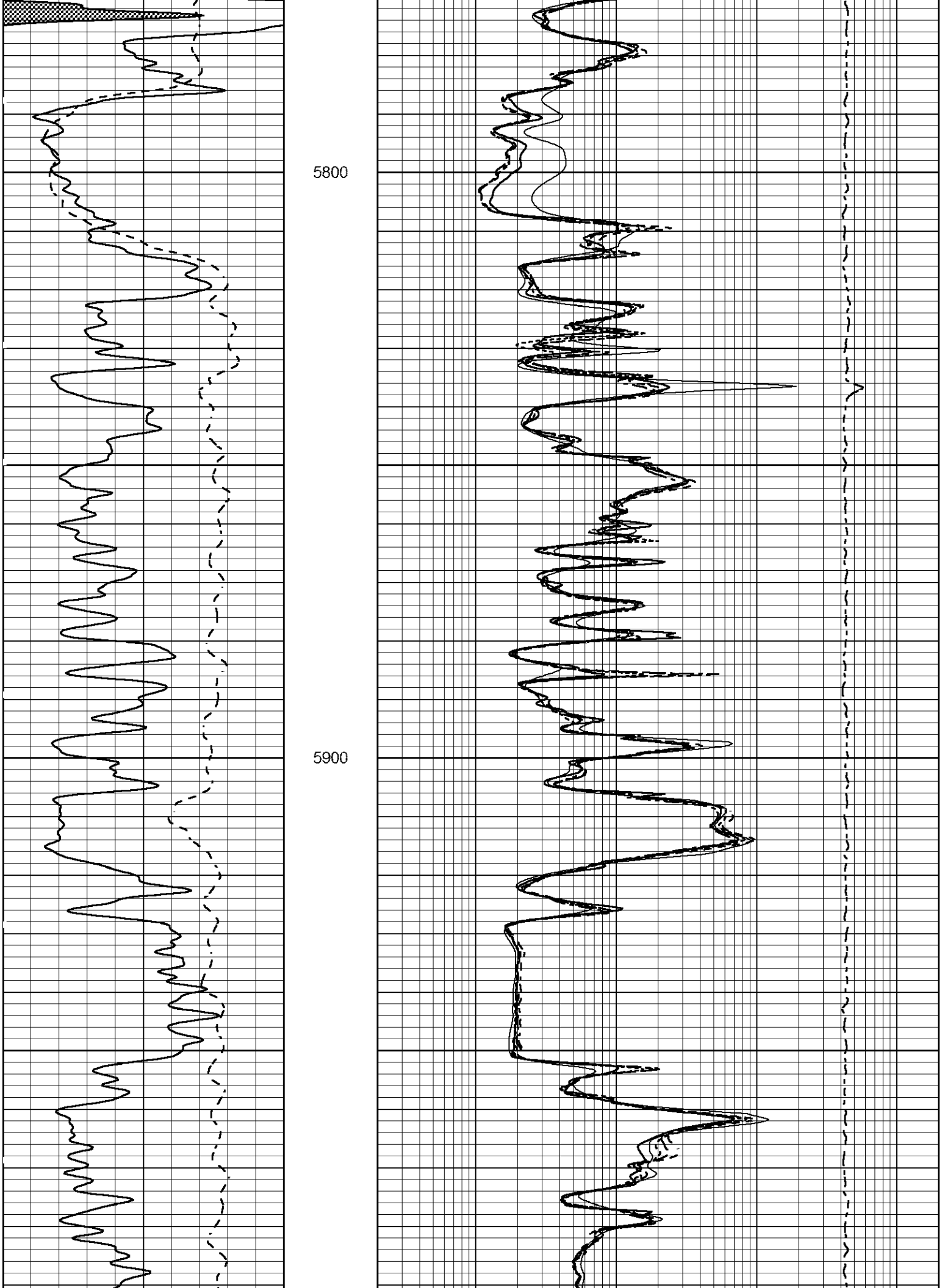
Repeat LS Pass

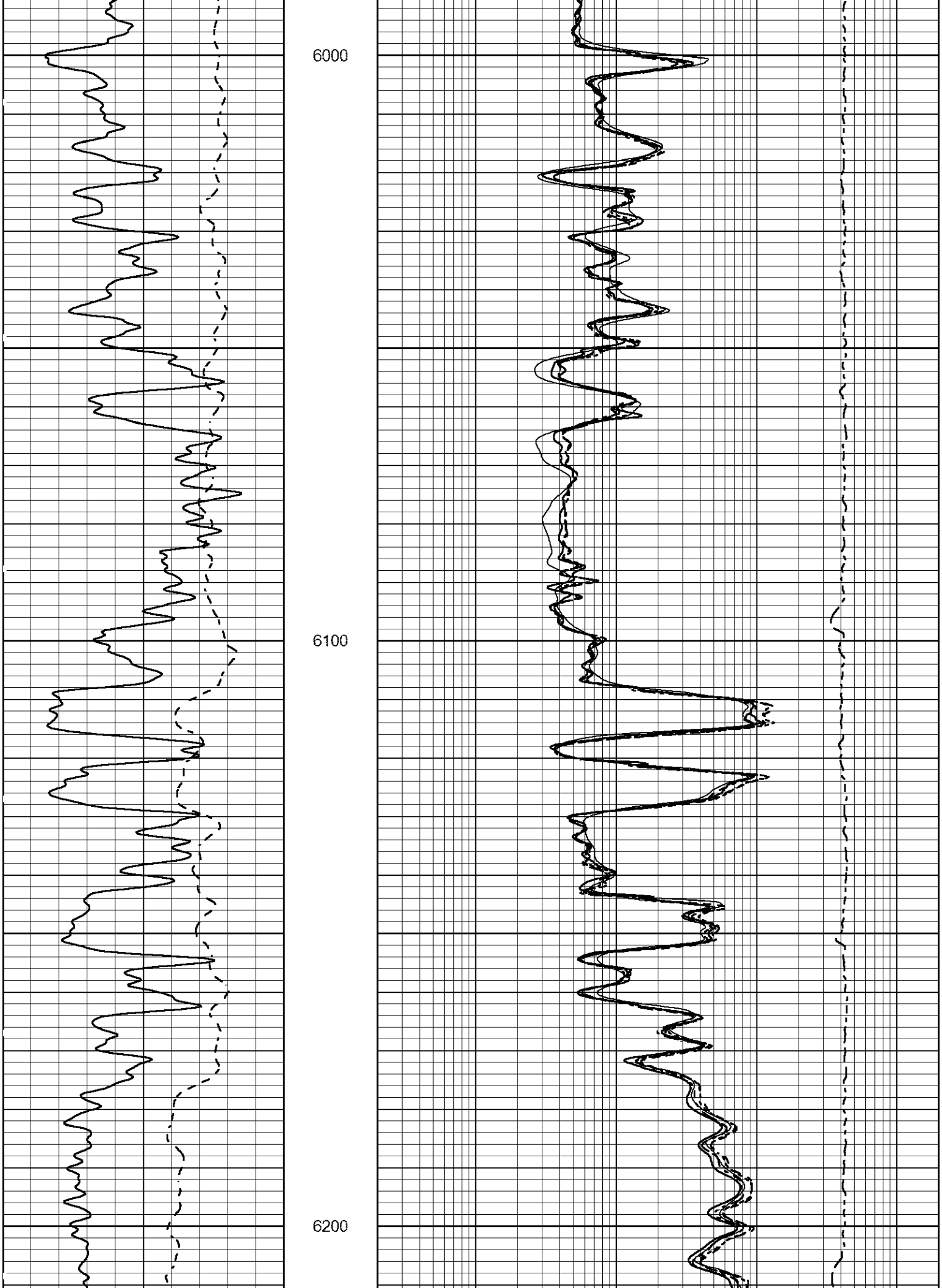
Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass3
Presentation Format	okc-aind2r10-base
Dataset Creation	Mon Apr 12 21:00:31 2021 by Log Sondex
Charted by	Depth in Feet scaled 1:240

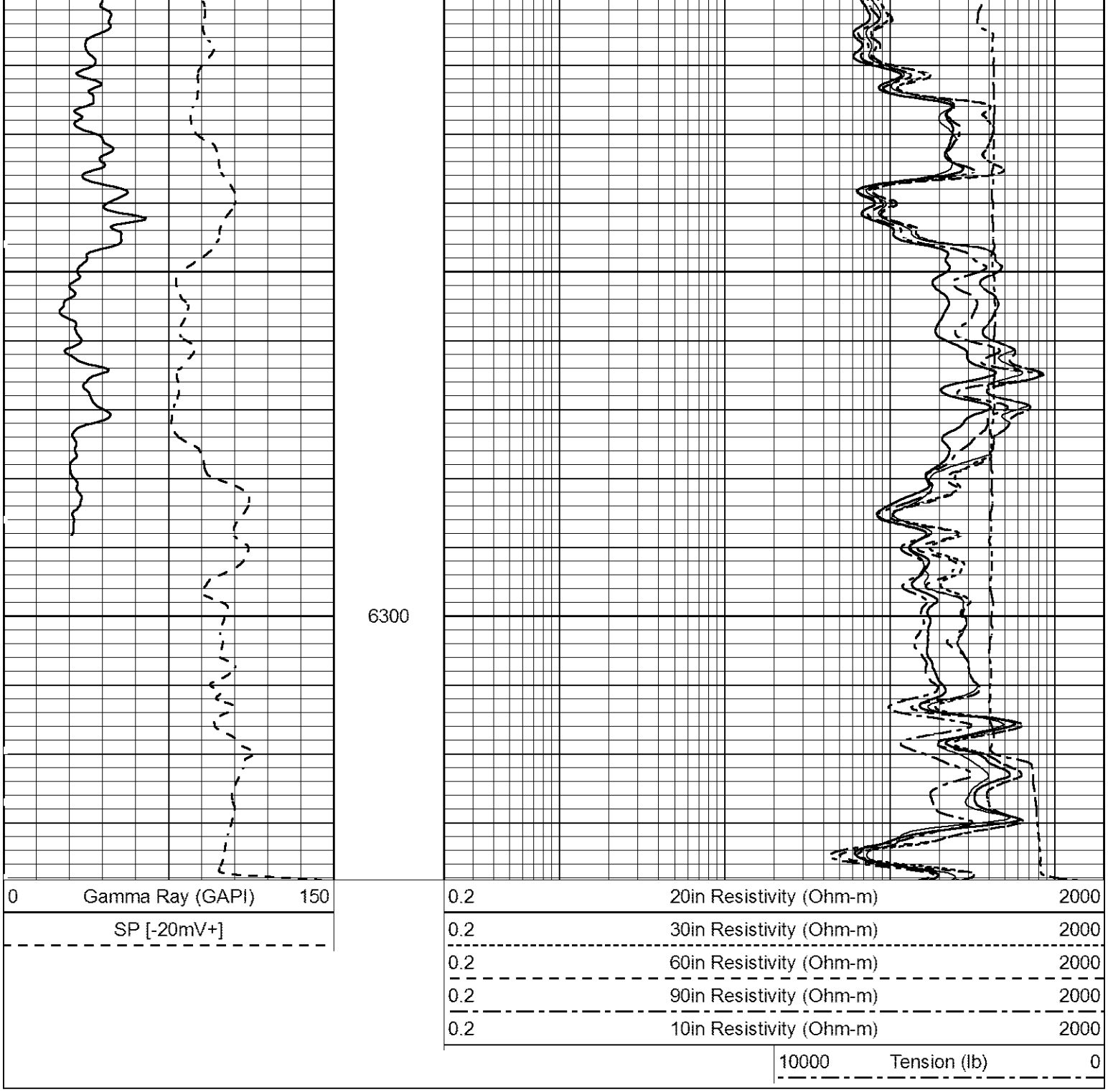
0	Gamma Ray (GAPI)	150
	SP [-20mV+]	

0.2	20in Resistivity (Ohm-m)	2000
0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000
0.2	10in Resistivity (Ohm-m)	2000
10000	Tension (lb)	0




5800
5900


6000
6100
6200



Log Variables

Database C:\Sondex\Sondex Warrior\Data\obrien-preedy east 1a-10.db
Dataset field/well/run1/pass5/_vars_

Top - 1572.00 ft

MAGDEC deg 0	FRMSALIN kppm 75	MUDSALIN kppm 0	DEVI deg 0	SRFTEMP degF 55	SO in 0.25	DE-CENT Yes	CASED? Yes
CASEWGHT lb/ft 24	NPORSEL Limestone	AIR_HOLE? No	MudWgt lb/gal 9.1	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASETHCK in 0.264
CASEOD in 8.625	PERFS 0	TDEPTH ft 1572	BOTTEMP degF 125	BOREID in 12.25			

1572.00 ft - Bottom

MAGDEC deg	FRMSALIN kppm	MUDSALIN kppm	DEVI deg	SRFTEMP degF	SO in	DE-CENT	**CASED?**
0	75	0	0	55	0.25	Yes	**No**
CASEWGHT lb/ft	NPORSEL	AIR_HOLE?	MudWgt lb/gal	FLUIDDEN g/cc	MATRXDEN g/cc	SPSHIFT mV	**CASETHCK in**
17	Limestone	No	9.1	1	2.71	0	**0.304**
CASEOD in	PERFS	**TDEPTH ft**	BOTTEMP degF	**BOREID in**			
5.5	0	**6320**	125	**7.875**			

Calibration Report

Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass5
Dataset Creation	Mon Apr 12 22:21:50 2021 by Log Sondex

Induction Array Tool Calibration Report

Serial Number:	B10110
Tool Model:	002

Master Calibration Performed:	Fri Jun 19 15:42:19 2020
Temperature:	106.4 degF

Sonde Error:

Array	1	2	3	4	5	6	7	
Real	192.3	-12.8	-40.5	-15.8	-2.7	3.4	1.1	mmho/m
Imaginary	37.3	-19.3	-5.4	-21.0	-27.8	3.2	-1.2	mmho/m

Loop Gain:

Array	1	2	3	4	5	6	7	
Loop (real)	537.7	678.5	1295.3	1394.1	1144.8	712.8	404.8	mmho/m
Loop (imaginary)	73.3	92.5	389.8	419.5	344.5	214.5	121.8	mmho/m
Real	754.7	724.6	1228.1	1358.7	1147.9	734.9	415.9	mmho/m
Imaginary	105.1	80.9	380.2	394.1	318.0	223.9	123.9	mmho/m
Gain (real)	0.956	0.920	1.021	1.014	0.995	0.974	0.976	
Gain (imaginary)	1.081	0.923	1.011	1.011	0.996	0.972	0.974	

Before Survey Verification Performed:	Fri Jun 19 15:59:35 2020
Sonde 1 Temperature:	109.7 degF
Sonde 2 Temperature:	106.7 degF
Array 1 Temperature:	111.1 degF

Array	1	2	3	4	5	6	7
TxIR	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
TxIX	0.0	0.0	0.2	0.2	0.2	0.2	0.2
Tx Magnitude	0.0	0.0	0.2	0.2	0.2	0.2	0.2
Gain	122.5	170.7	190.0	190.0	183.8	185.8	190.0
RxCR	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
RxCX	0.2	0.1	0.2	0.2	0.2	0.2	0.2
RxC Magnitude	0.2	0.1	0.2	0.2	0.2	0.2	0.2

Tool Module Parameters

Software Version:	8.0.0.4
Borehole Size Source:	CALI
Mud Resistivity Source:	MUDRES
Mud Resistivity At Surface:	N/A
Mud Resistivity Surface Temperature:	N/A

Borehole Corrections:	Automatic
Minimum Standoff:	0.4 in

Litho Density Tool Calibration Report

Serial Number:	B10110S70997B
Tool Model:	B10110

Caliper Calibration Performed: Mon Apr 12 10:43:16 2021

	Diameter		Reading	
Small Ring:	9.000	in	1745.500	cps
Large Ring:	13.000	in	2090.600	cps
Gain:	0.0116			
Offset:	-11.2318			

Master Calibration Performed: Mon Apr 12 10:03:46 2021

Source Number:	S70997B
Medium:	Water
Al Block Density:	2.6018 g/cc

	Background	Al Block	Al Block + Fe	
SS1	704.6	4177.6	3606.5	cps
SS2	1986.7	28467.4	24577.7	cps
SSTOTAL	4654.7	45568.2	39008.7	cps
LITH	88.3	486.4	298.1	cps
LL	175.8	806.8	724.2	cps
LU	496.0	1036.1	973.2	cps
LS	671.8	1842.9	1697.4	cps
LSTOTAL	1263.5	4518.5	3736.7	cps
SSHV	1464.1	1466.3	1468.1	V
LSHV	1311.8	1313.9	1314.8	V
SSFF	-0.001	0.009	0.003	
LSFF	0.004	-0.002	0.005	

Before Survey Verification Performed: Mon Apr 12 10:20:57 2021
After Survey Verification Performed: Mon Apr 12 10:27:19 2021

	Master Background	Before Survey Background	After Survey Background	
SS1	704.6	706.3	700.5	cps
SS2	1986.7	1986.9	1985.8	cps
SSTOTAL	4654.7	4662.7	4651.8	cps
LITH	88.3	87.7	86.1	cps
LL	175.8	173.3	174.9	cps
LU	496.0	497.0	491.0	cps
LS	671.8	670.3	665.9	cps
LSTOTAL	1263.5	1259.3	1254.1	cps
SSHV	1464.1	1470.0	1469.7	V
LSHV	1311.8	1315.8	1315.8	V
SSFF	-0.001	-0.006	-0.007	
LSFF	0.004	0.003	-0.006	

Tool Module Parameters

Software Version:	8.0.0.6
Borehole Size Source:	CALI
Pad Type:	2

Compensated Neutron Tool Calibration Report

Serial Number:	C10071S1414NC
Tool Model:	009

Master Calibration Performed:	Mon Apr 12 11:06:22 2021	
Source Number:	1414NC	
Short Spacing Counts:	5574.20	cps
Long Spacing Counts:	200.36	cps
High Voltage:	1363.95	V
Target Ratio:	27.2000	
Ratio:	27.8204	
K-Factor:	0.9777	

Before Survey Verification Performed:	Mon Apr 12 11:24:08 2021	
After Survey Verification Performed:	Mon Apr 12 11:25:20 2021	
Verifier Number:	6489	

Verifier Values	Master Cal	Before Survey	After Survey	
Short Spacing Counts:	251.96	249.10	251.53	cps
Long Spacing Counts:	238.16	236.70	236.61	cps
High Voltage:	1363.94	1363.94	1363.94	V
Ratio:	1.0579	1.0524	1.0631	

Tool Module Parameters

Software Version:	8.0.0.5	
Borehole Size Source:	CALI	
Clip Crossplot Porosity:	YES	
Lithology Identification Parameters:		

	Calcite	Quartz	Dolomite	
Uma:	13.77	4.79	9.03	barns/cc
RHOma:	2.71	2.65	2.88	g/cc

Micro Electric Log Calibration Report

Serial Number:	10020666
Tool Model:	001

Caliper Calibration Performed:	Wed Mar 27 13:54:25 2019

	Pad Arm			Backup Arm		
	Radius		Reading	Radius		Reading
Small Jig:	4.000	in	1079.500	4.000	in	1216.600
Large Jig:	6.000	in	1483.400	6.000	in	1590.500
Gain:			0.0050			0.0053
Offset:			-1.3454			-2.5076

Pad Calibration

	Inverse	Normal
Gain:	1.0000	1.0000
Offset:	0.0000	0.0000

Tool Module Parameters

Software Version:	8.0.0.4

Gamma Ray Calibration Report

Serial Number:	C10049
Tool Model:	001
Performed:	Mon Apr 12 11:47:33 2021

Calibrator Value:	156.0	GAPI
Background Reading:	70.5	cps
Calibrator Reading:	494.1	cps
Sensitivity:	0.3683	GAPI/cps

Borehole Fluid Resistivity Calibration Report

Serial Number:	P004
Tool Model:	002

Master Calibration Performed: Wed May 25 15:17:37 2016

Resistivity Polynomial Equation:

$$0.1429x^3 - 0.4495x^2 + 1.2097x - 0.2854$$

Temperature Calibration:

Reference		Reading	
71.60	degF	559.80	bits
167.00	degF	659.50	bits

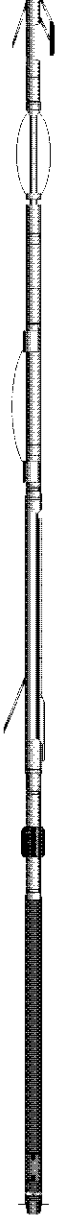
Head Tension Unit Calibration Report

Serial Number:	00001
Tool Model:	011

Performed: Mon Mar 04 10:52:43 2013

Point #	Reference		Reading	
1	-19894.000	lb	8957.860	cps
2	-15010.000	lb	13965.100	cps
3	-9998.000	lb	19079.100	cps
4	-5007.000	lb	24133.000	cps
5	-1009.000	lb	28232.100	cps
6	1017.000	lb	30185.400	cps
7	5040.000	lb	34439.700	cps
8	9970.000	lb	39346.900	cps
9	14955.000	lb	44466.000	cps
10	19770.000	lb	49397.800	cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			CHD-WFT (WFT01) Weatherford Cable Head	2.67	2.25	15.00
			X-Over-WFT (0001) Weatherford X-Over	1.13	3.38	5.00
HTEN	53.95		XTU-008 (C10068) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00
			HTU-011 (00001) Head Tension Unit	2.18	3.38	55.00
BFR	50.31		BFR-002 (P004) Borehole Fluid Resistivity Tool	4.39	3.38	94.00
GR	47.54		GRT-001 (C10049) Gamma Ray Tool	3.22	3.38	69.00
			Overbody-Over-cen Overbody Centralizer	3.00	3.38	10.00
			MEL-001 (10020666) Micro Electric Log	9.17	3.38	190.00



MEL	37.55				
		CEN-001 (000029) Inline OH Springbow Centraliser	4.27	3.38	66.00
		KJT-001 (10010515) Knuckle Joint	2.86	3.38	72.00
CNLSC	25.59	CNL-009 (C10071S1414NC) Compensated Neutron Logging Tool	5.28	3.38	100.00
CNSSC	25.09				
		LDT-B10110 (B10110S70997B) Litho Density Tool	9.75	4.50	310.00
LDT	15.44				
		Overbody-Standoff Standoff (Rubber)	1.00	4.50	4.00
IAT	8.44				
		IAT-002 (B10110) Induction Array Tool	13.22	3.88	196.00
SP	0.43	Shorty-Short Short Hole Finder	0.38	3.88	6.00

Dataset:	obrien-preedy east 1a-10.db: field/well/run1/pass5
Total length:	60.59 ft
Total weight:	1239.00 lb
O.D.:	4.50 in

WIRELINE LOGGING SOLUTIONS

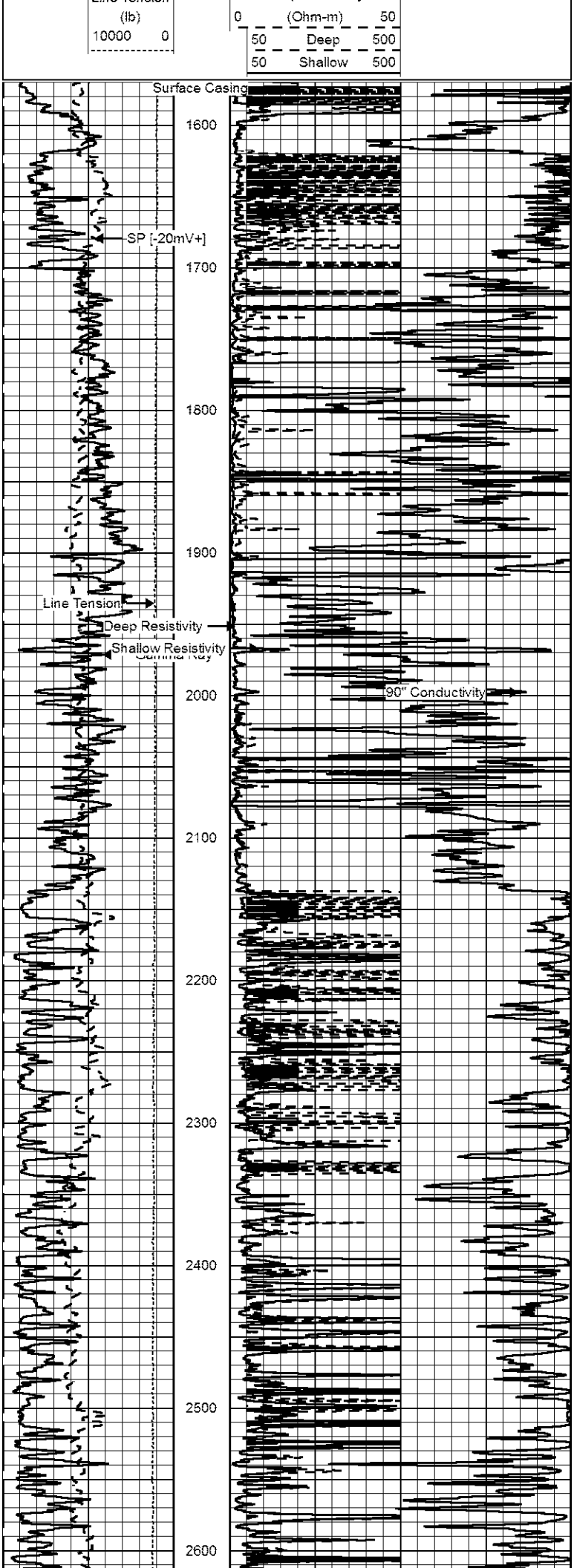
Company	O'Brien Energy Resources Corporation
Well	Preedy East 1A-10
Field	Borchers Northwest
County	Meade
State	Kansas

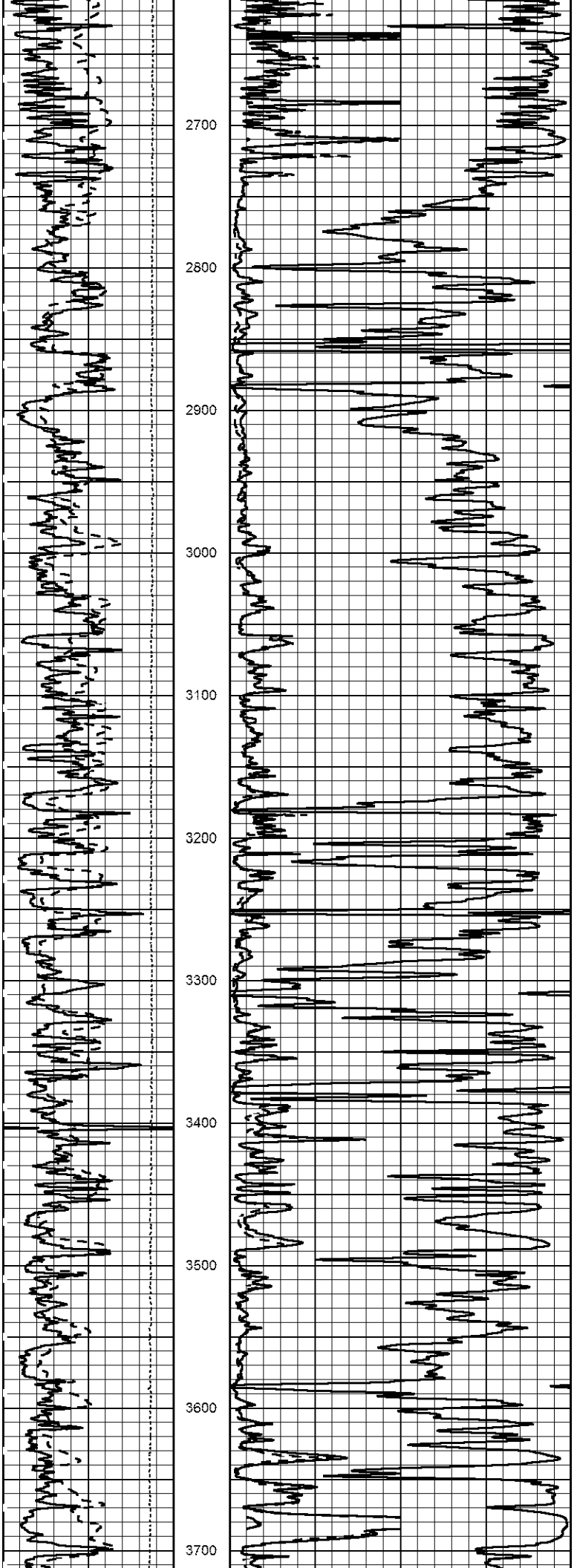
WIRELINE LOGGING SOLUTIONS

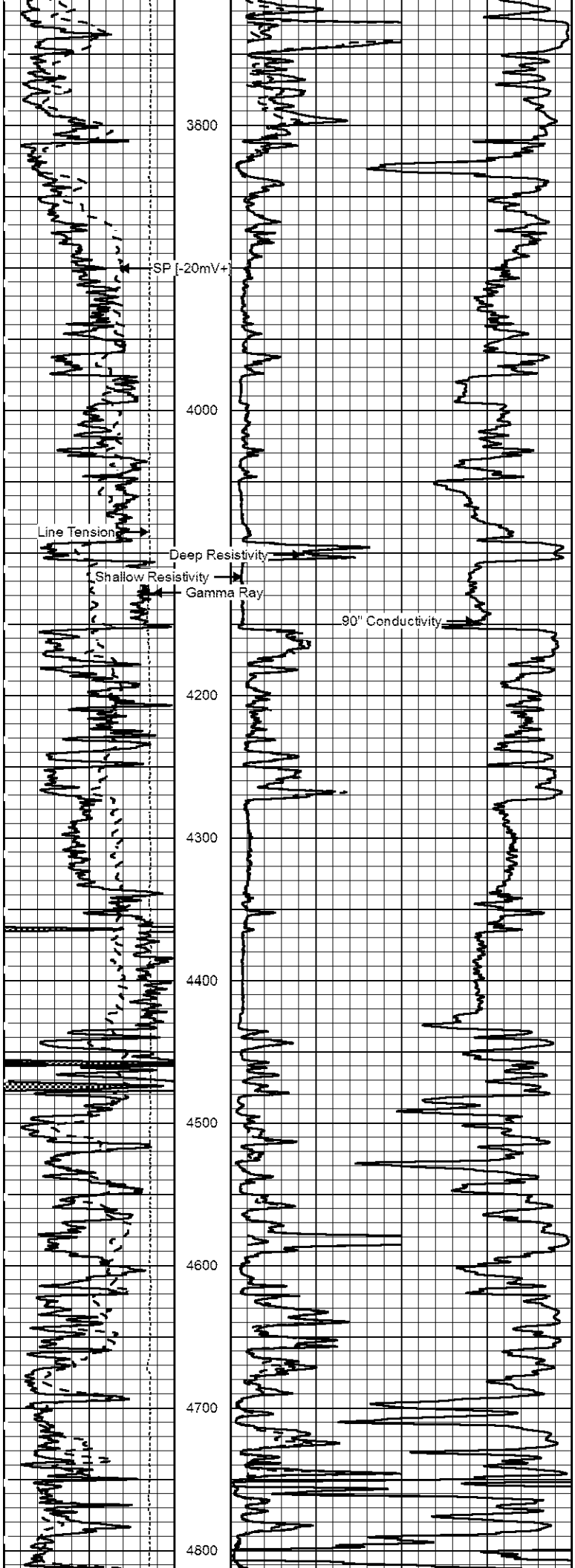
Main LS Pass

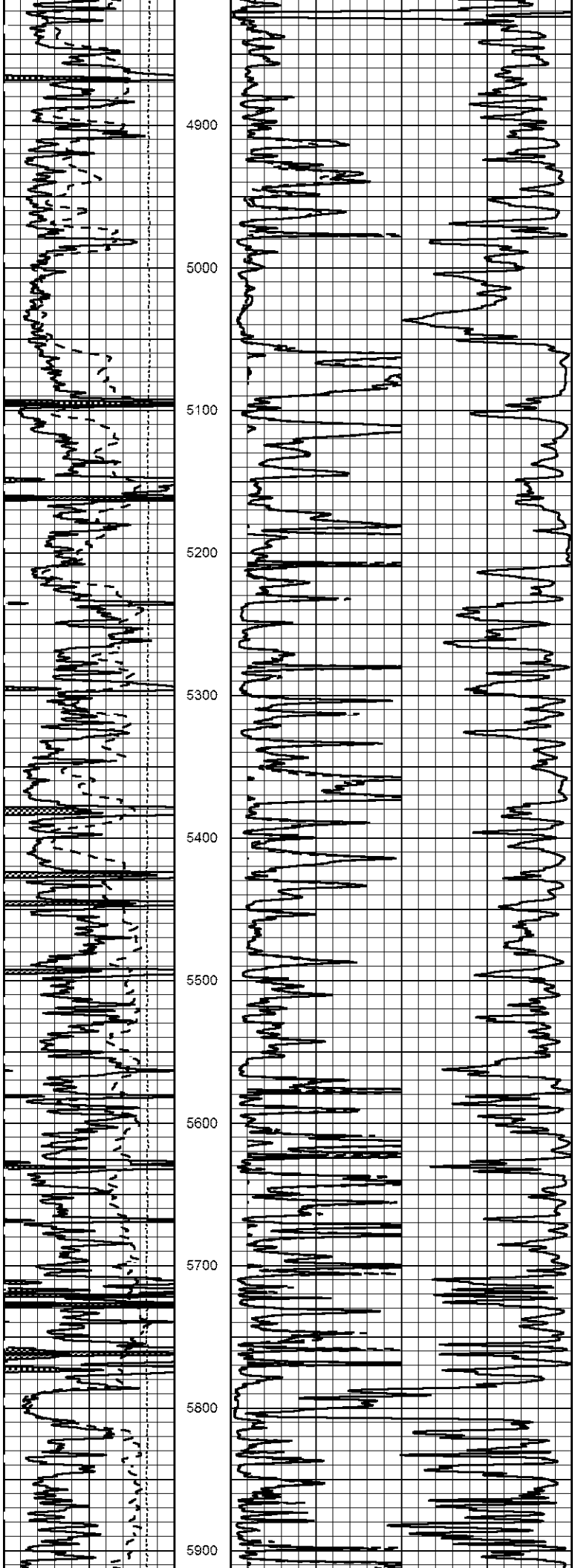
Database File	obrien-preedy east 1a-10.db
Dataset Pathname	pass5.1
Presentation Format	okc-acond2-base
Dataset Creation	Tue Apr 13 00:30:21 2021
Charted by	Depth in Feet scaled 1:1200

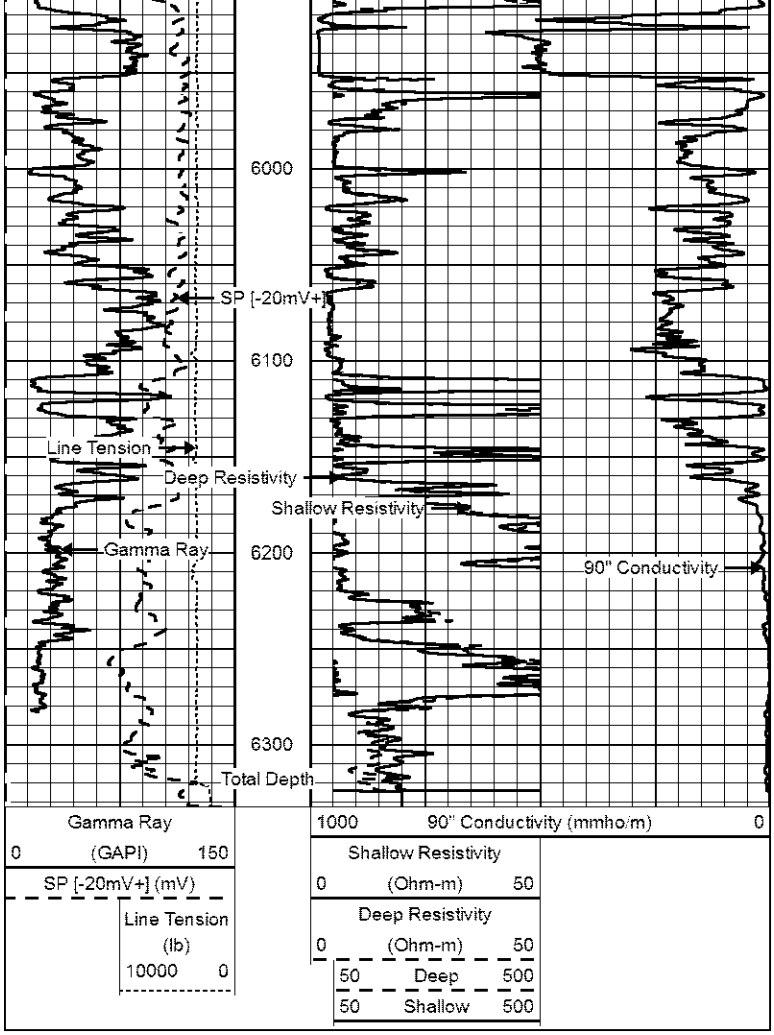
Gamma Ray 0 (GAPI) 150	1000 90" Conductivity (mmho/m) 0	
SP [-20mV+] (mV)	Shallow Resistivity 0 (Ohm-m) 50	
Line Tension	Deep Resistivity	


(lb)
10000 0
0 (Ohm-m) 50
50 Deep 500
50 Shallow 500
Surface Casing
1600
SP [-20mV+]
1700
1800
1900
Line Tension
Deep Resistivity
Shallow Resistivity
2000
90" Conductivity
2100
2200
2300
2400
2500
2600


2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700


3800
SP [-20mV+]
4000
Line Tension
Deep Resistivity
Shallow Resistivity
Gamma Ray
90" Conductivity
4200
4300
4400
4500
4600
4700
4800


4900
5000
5100
5200
5300
5400
5500
5600
5700
5800
5900


6000
SP [-20mV+]
6100
Line Tension
Deep Resistivity
Shallow Resistivity
Gamma Ray
6200
90" Conductivity
6300
Total Depth
Gamma Ray
0 (GAPI) 150
SP [-20mV+] (mV)
Line Tension
(lb)
10000 0
1000 90" Conductivity (mmho/m) 0
Shallow Resistivity
0 (Ohm-m) 50
Deep Resistivity
0 (Ohm-m) 50
50 Deep 500
50 Shallow 500