



**Radial Cement Bond
Variable Density Log
w/ Gamma Ray/CCL**

Company	Noble Energy		
Well	Reliance E 23-63-1HNA		
Field	Wattenberg		
County	Weld		
State	Colorado		
Company	Noble Energy		
Well	Reliance E23-63-1HNA		
Field	Wattenberg		
County	Weld		
State	Colorado		
Location:	API # : 05-123-38221		
	BHL: 940' FSL & 535' FWL		
	SEC 23 TWP 6N RGE 65W		
Permanent Datum	Ground Level	Elevation	4724'
Log Measured From	Kelly Bushing	30' APD	
Drilling Measured From	Kelly Bushing		
		Other Services	None
		Elevation	K.B. 4754' D.F. 4753' G.L. 4724'

Date	March 20, 2015
Run Number	1
Depth Driller	11202'
Depth Logger	6598'
Bottom Logged Interval	6581'
Top Log Interval	Surface
Open Hole Size	8 3/4"
Type Fluid	Fresh Water
Density / Viscosity	8.33#
Max. Recorded Temp.	224 Deg F
Estimated Cement Top	966'
Time Well Ready	11:00
Time Logger on Bottom	11:45
E equipment Number	2366
Location	Brighton, Co
Recorded By	Jon Ostler
Witnessed By	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Conductor	26"	32'	132'				
Surface	13 1/2"	132'	855'				
Intermediate	8 3/4"	855'	7150'				
Production	6 1/8"	7150'	11202'				
Casing Record	Size		Wd/ft	Top		Bottom	
Surface String	9 5/8"		36#	32'		847'	
Prot. String							
Production String	7"		26#	32'		7141'	
Liner	4 1/2"		11.6#	6946'		11187'	
Short Joint				5874'		5894'	

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Primary Log on Well

Logged measured using 30' KB
Repeat Pass logged w/0 PSI
Main Pass logged w/2500 PSI
Estimated Top of Cement @ 966'
Short Joint @ 5874' to 5894'

Thank You for using Allied-Horizontal Wireline Services
(303) 659-4609



Repeat Pass (0 PSI)

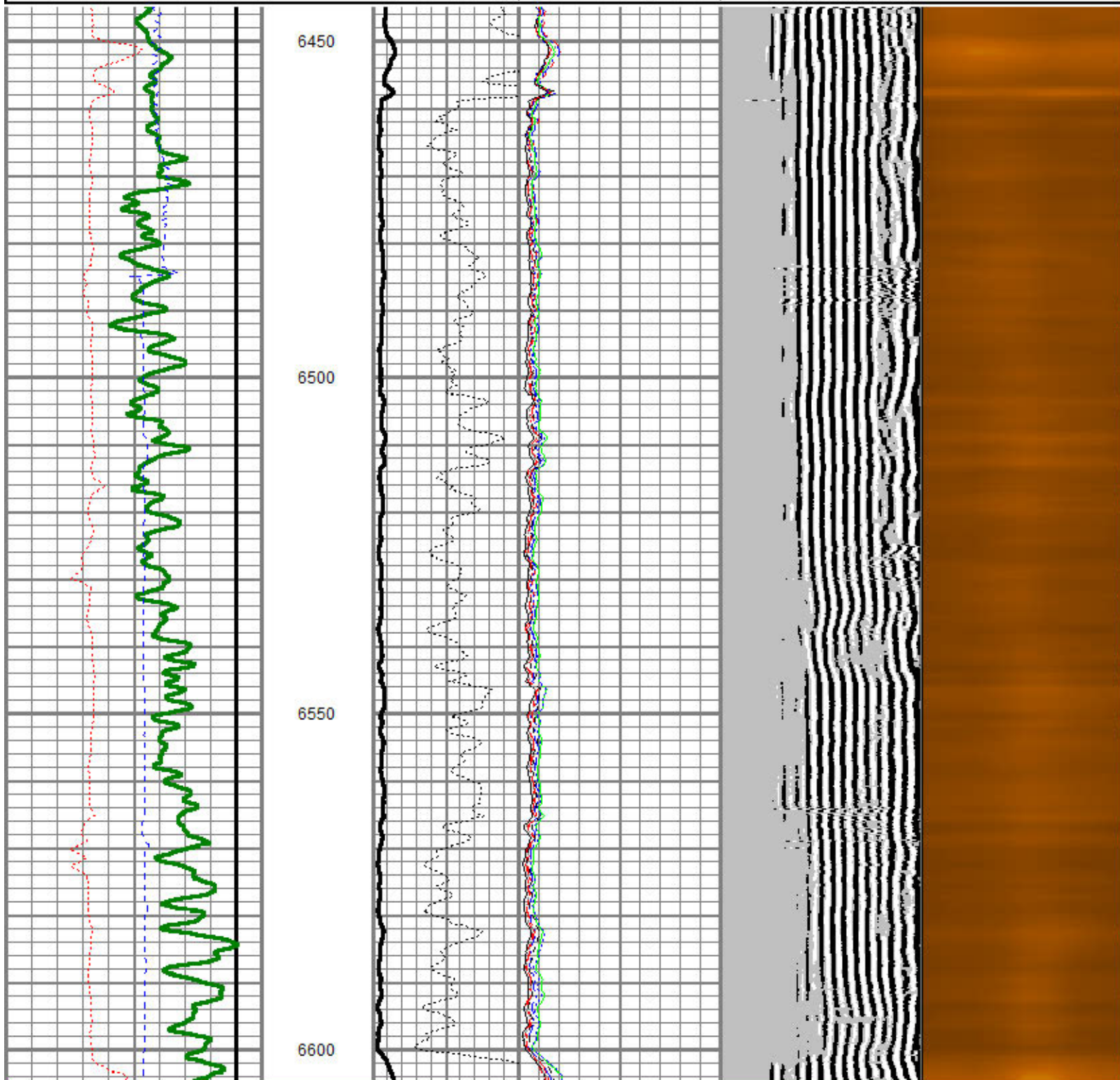
WIRELINE SERVICES

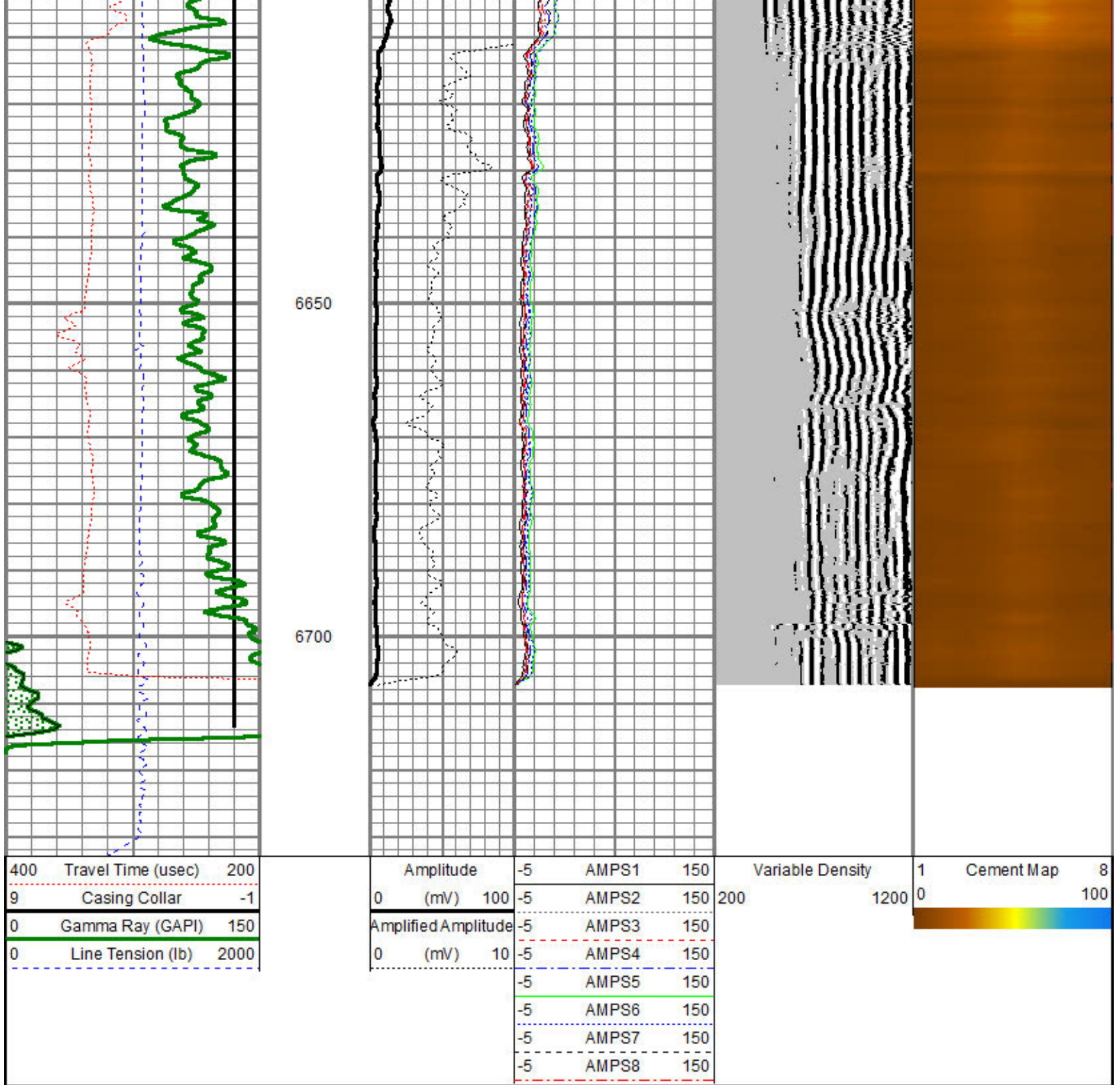
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 Dataset Pathname: pass15
 Presentation Format: scbl03
 Dataset Creation: Fri Mar 20 13:46:27 2015 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240

400	Travel Time (usec)	200
9	Casing Collar	-1
0	Gamma Ray (GAPI)	150
0	Line Tension (lb)	2000

Amplitude	-5	AMPS1	150
0 (mV) 100	-5	AMPS2	150
Amplified Amplitude	-5	AMPS3	150
0 (mV) 10	-5	AMPS4	150
	-5	AMPS5	150
	-5	AMPS6	150
	-5	AMPS7	150
	-5	AMPS8	150

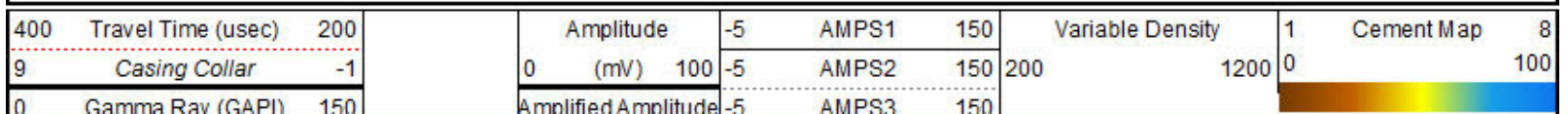
Variable Density	1	Cement Map	8
200	1200	0	100





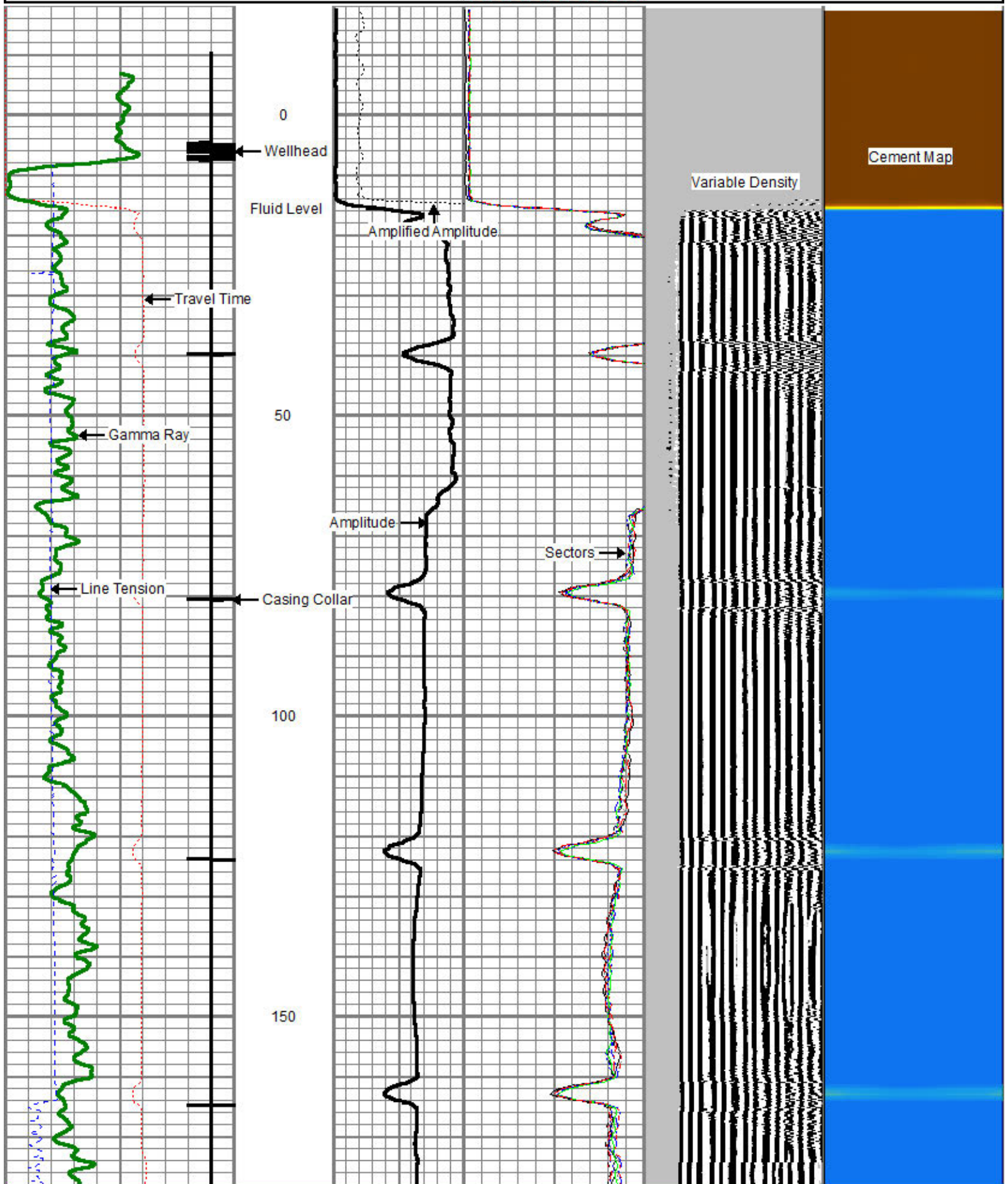
Main Pass (2500 PSI)

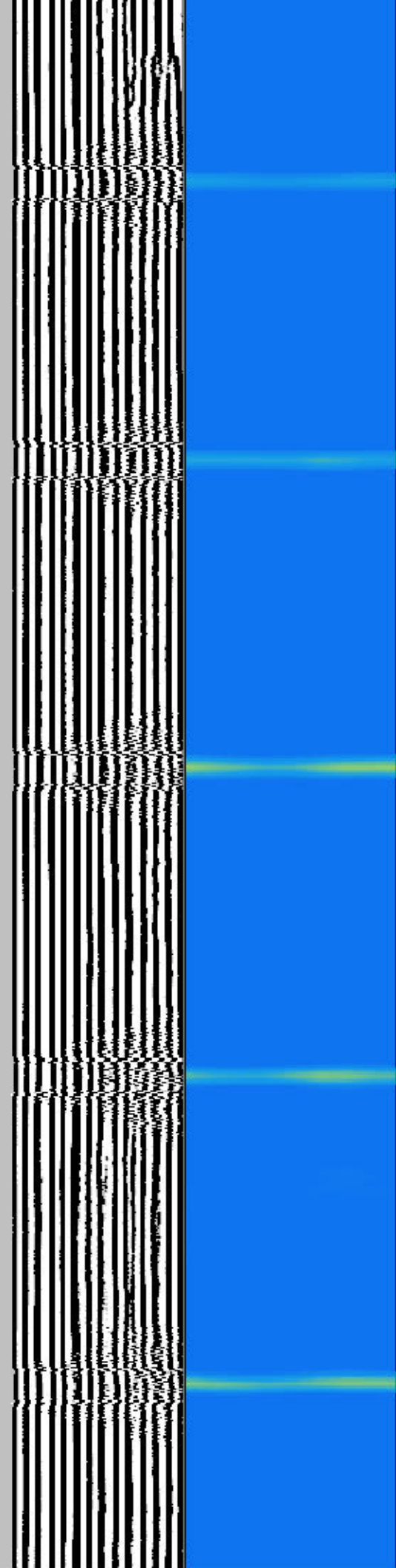
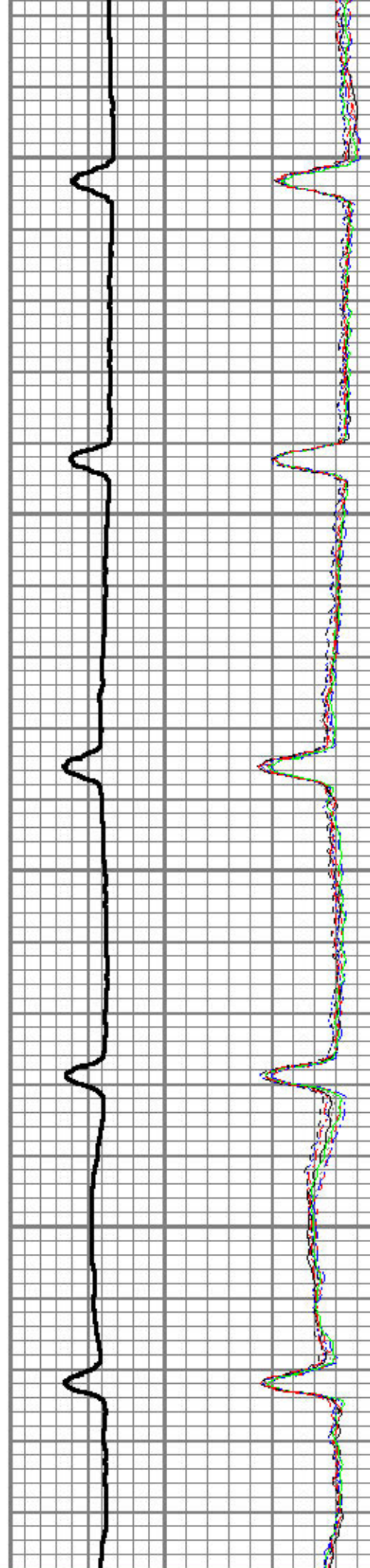
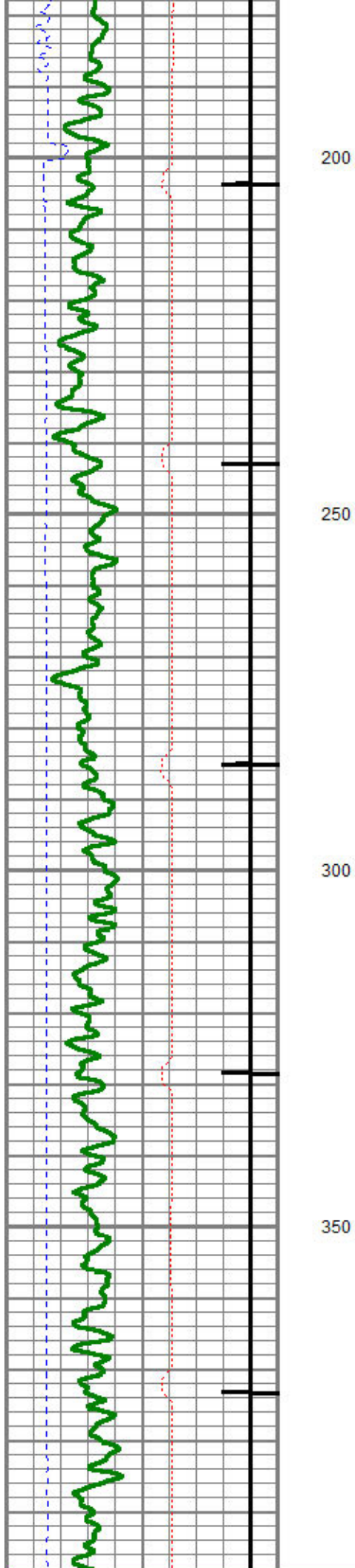
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 Charted by: Depth in Feet scaled 1:240

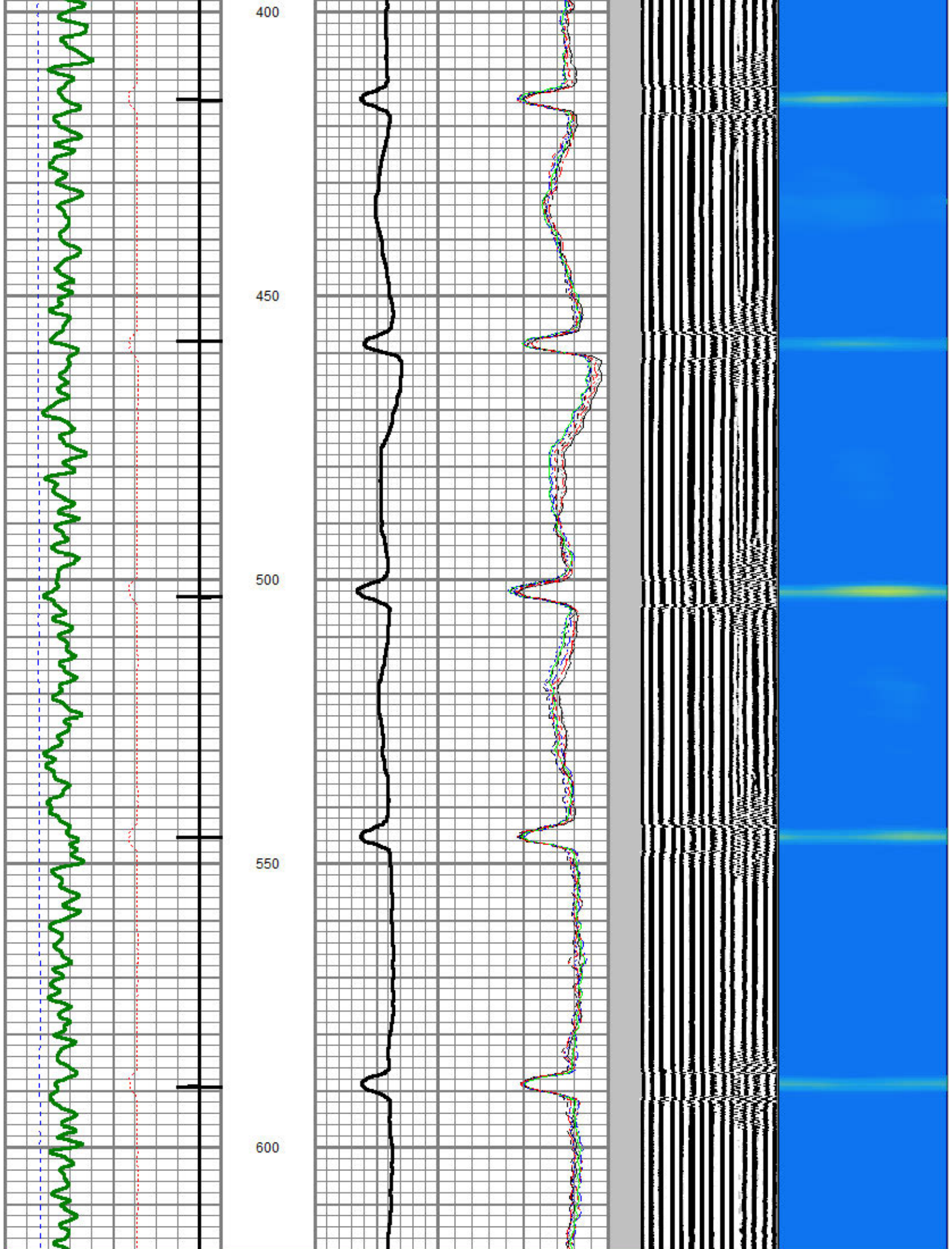


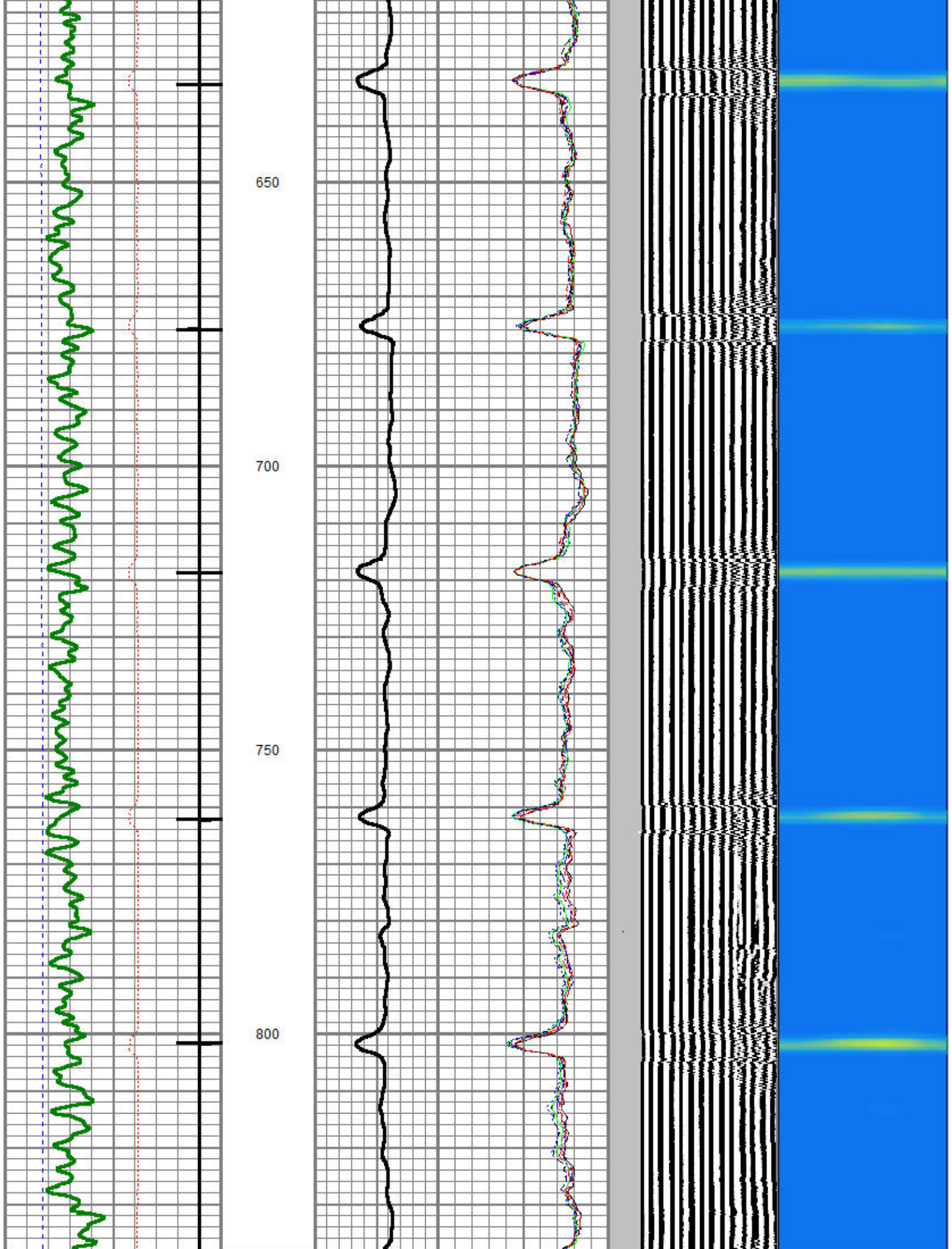
Line Tension (lb)	2000
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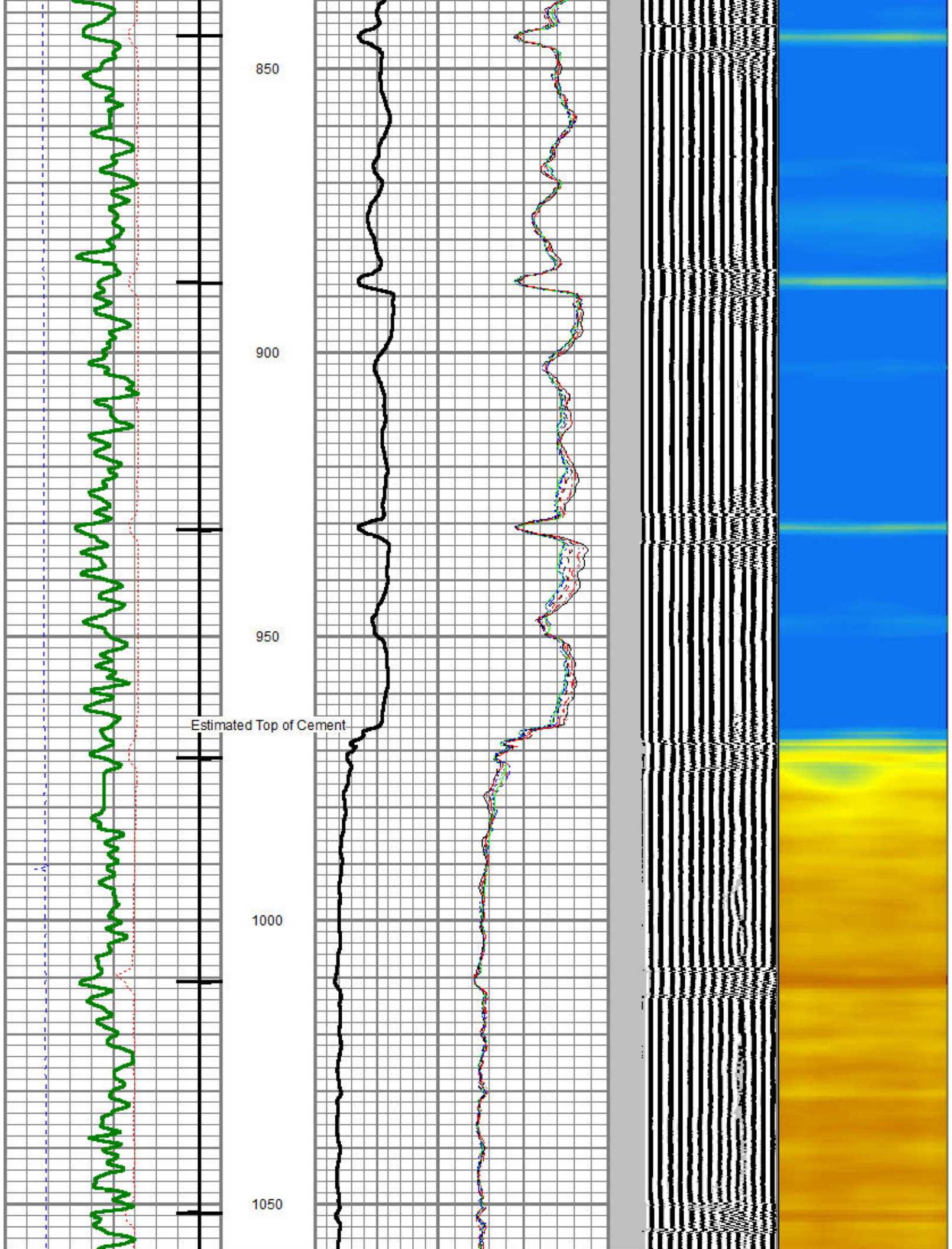
0	(mV)	10	-5	AMPS4	150
			-5	AMPS5	150
			-5	AMPS6	150
			-5	AMPS7	150
			-5	AMPS8	150

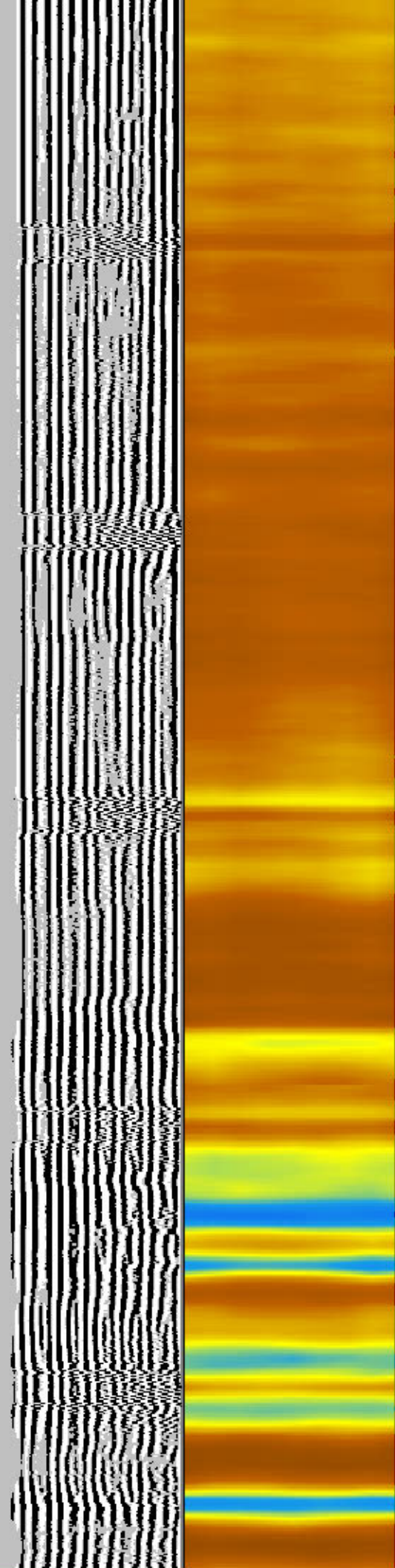
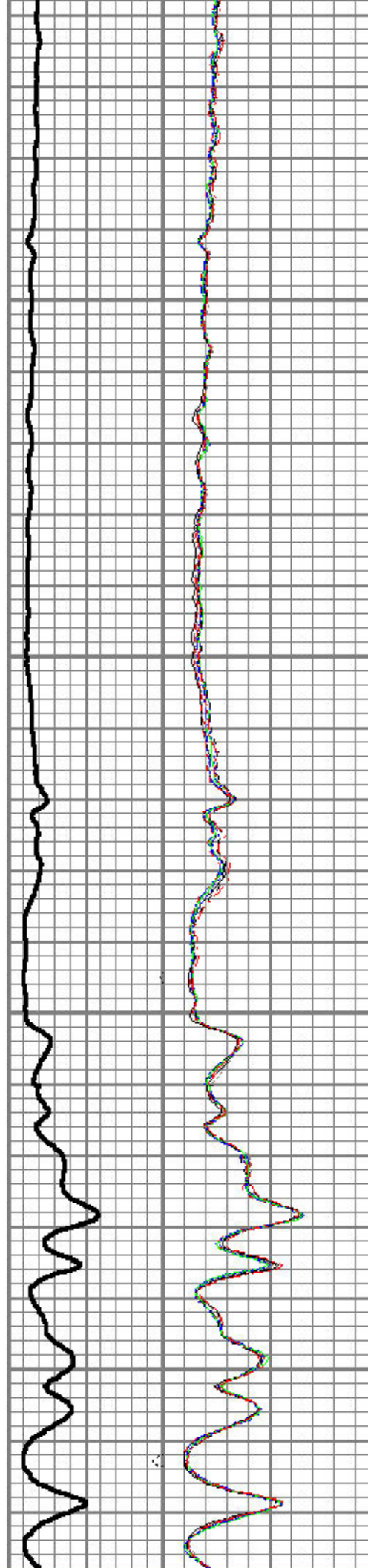
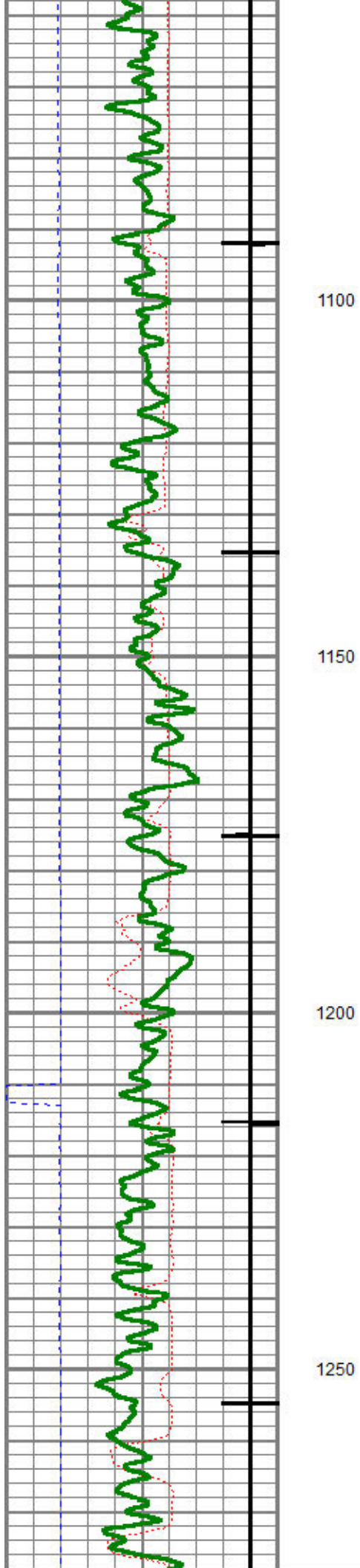


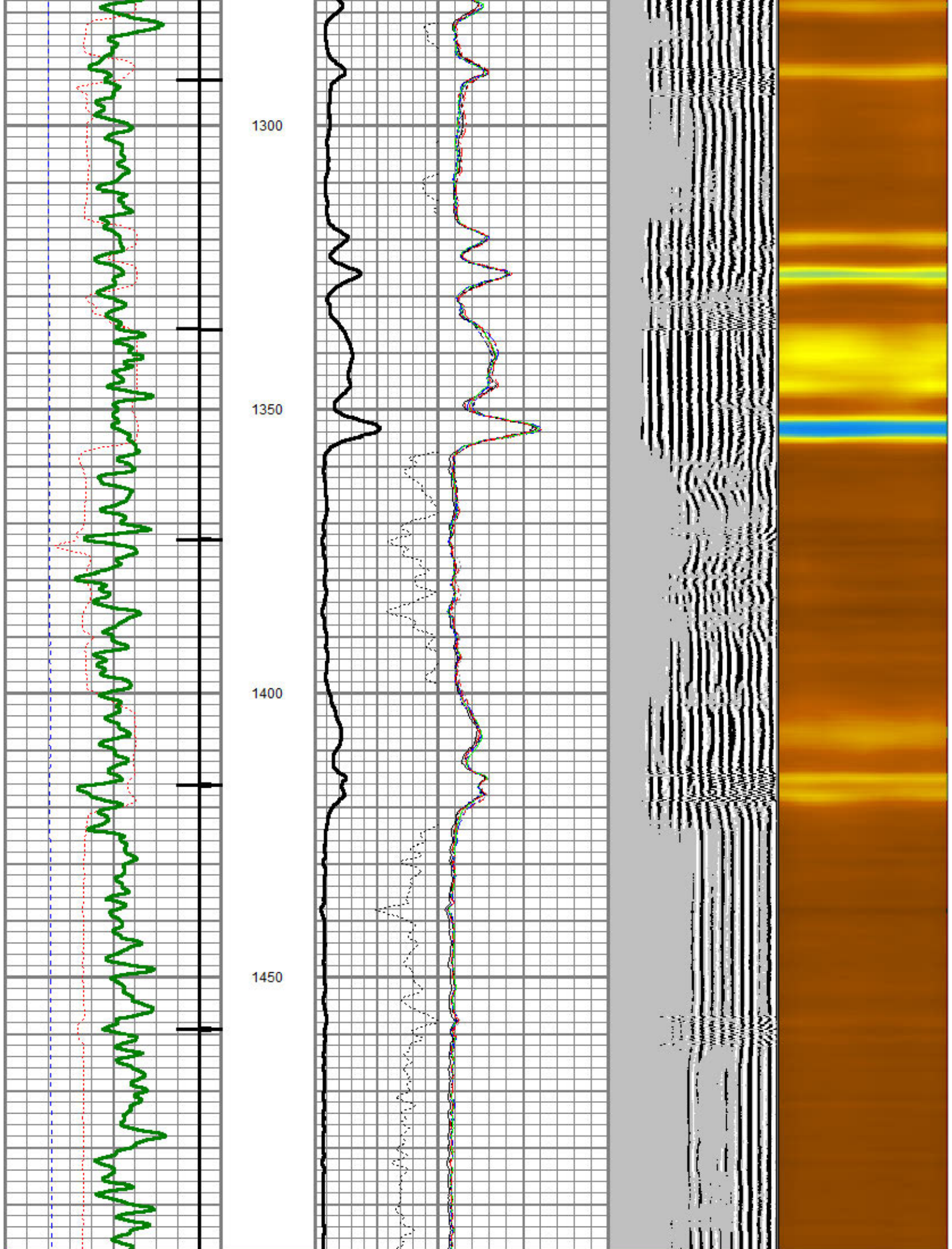


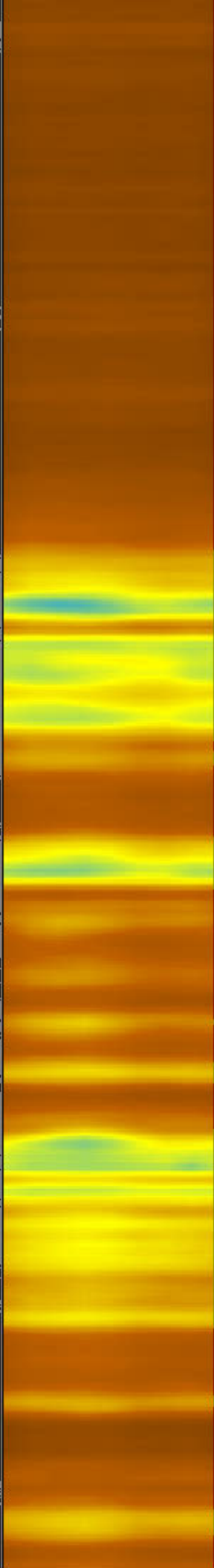
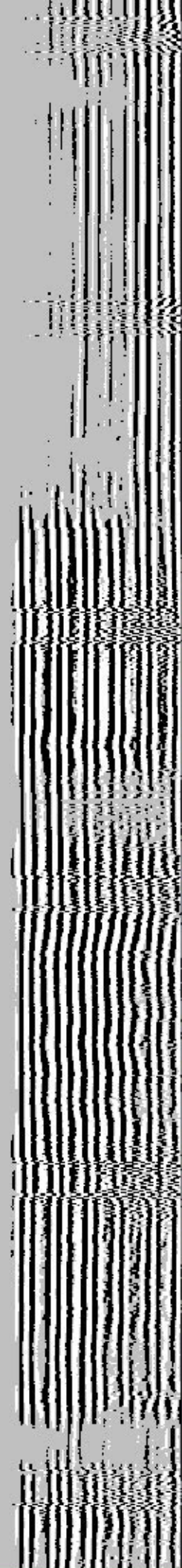
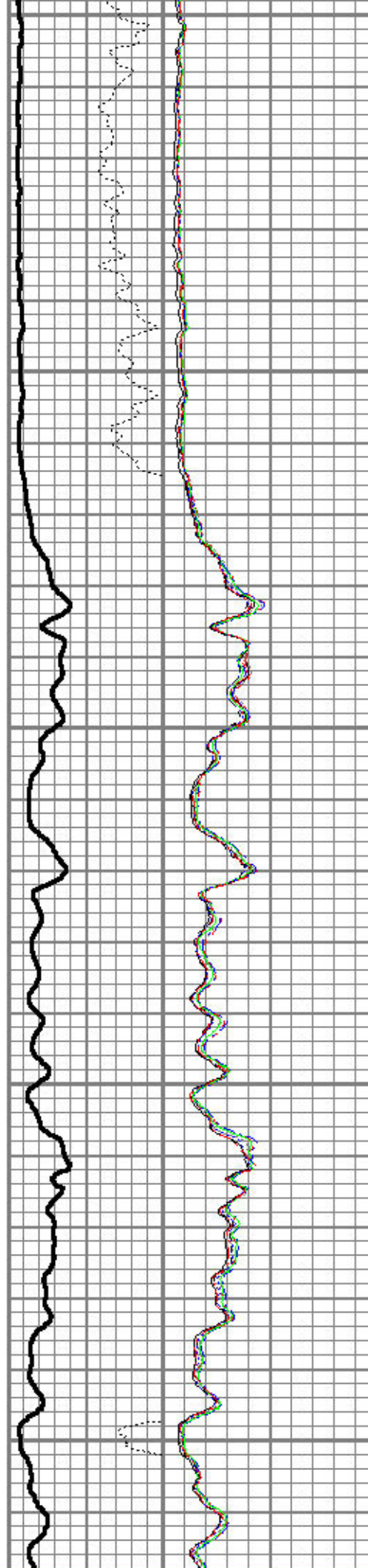
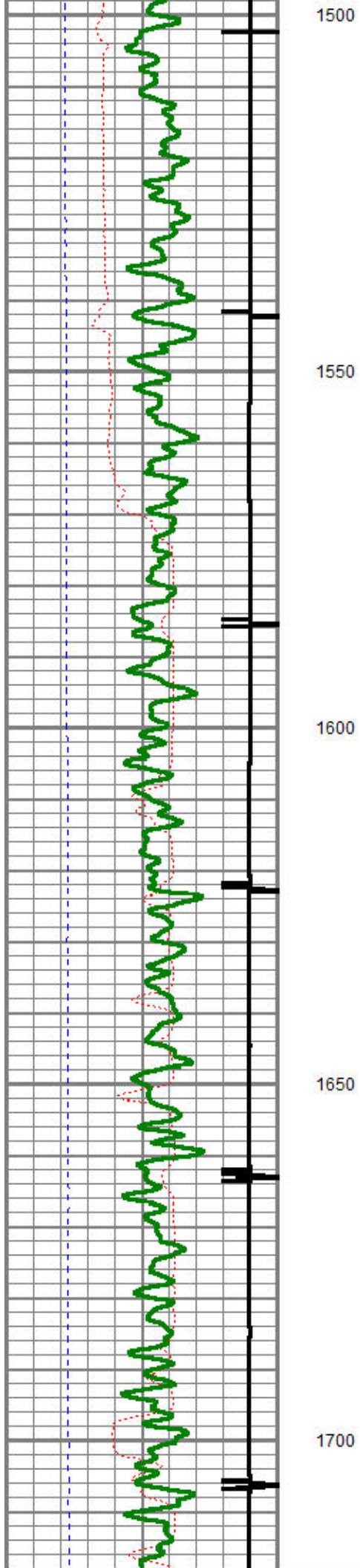


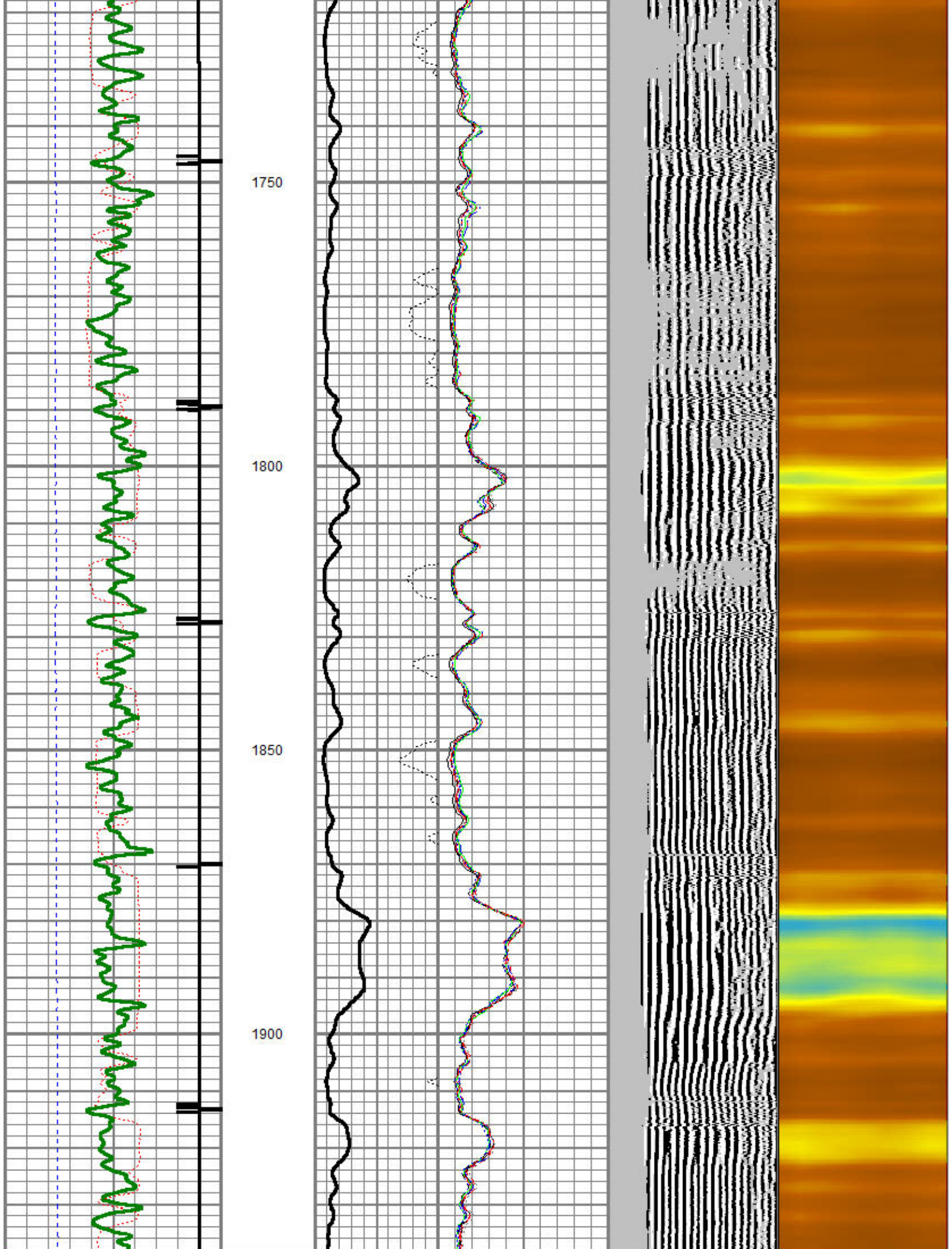


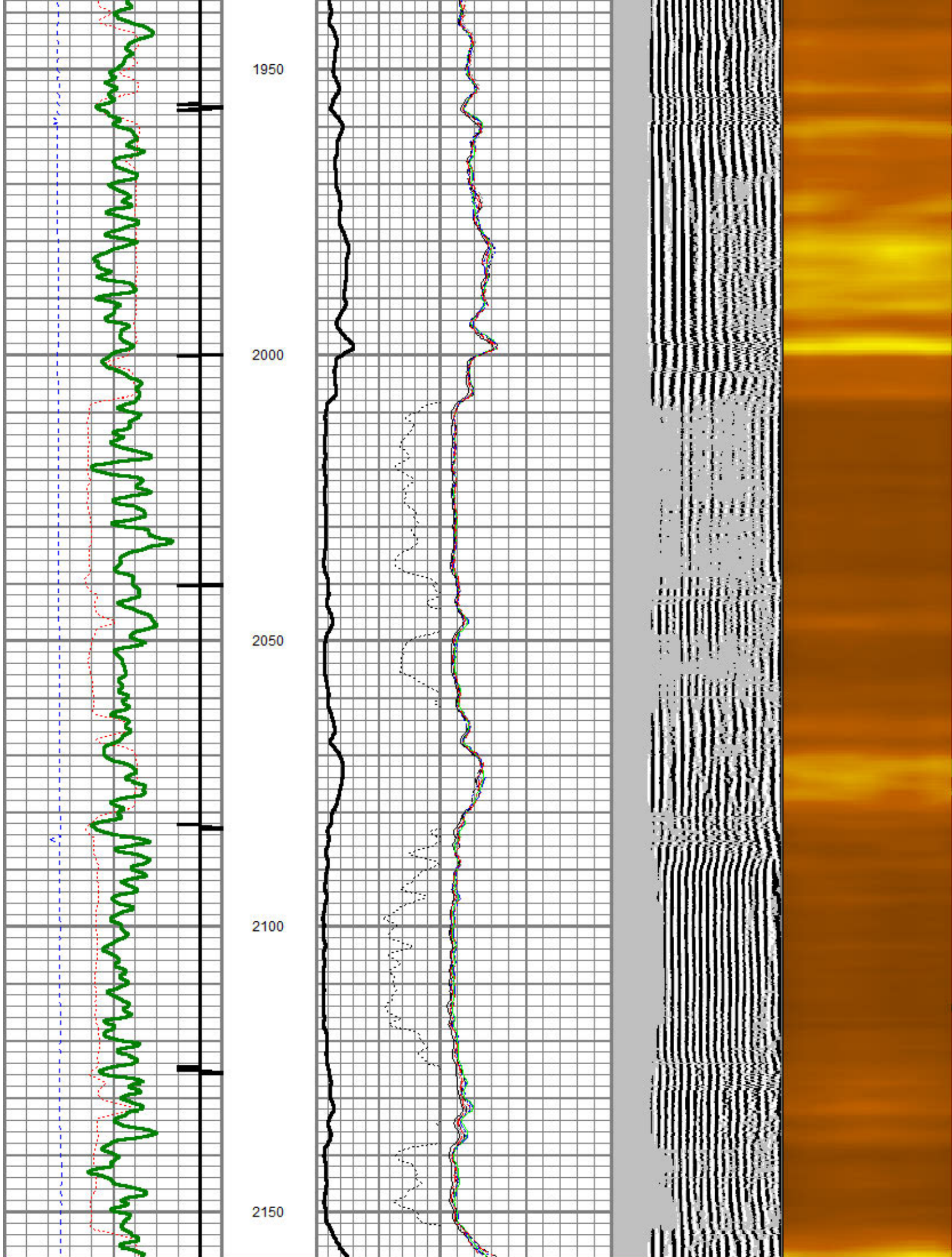


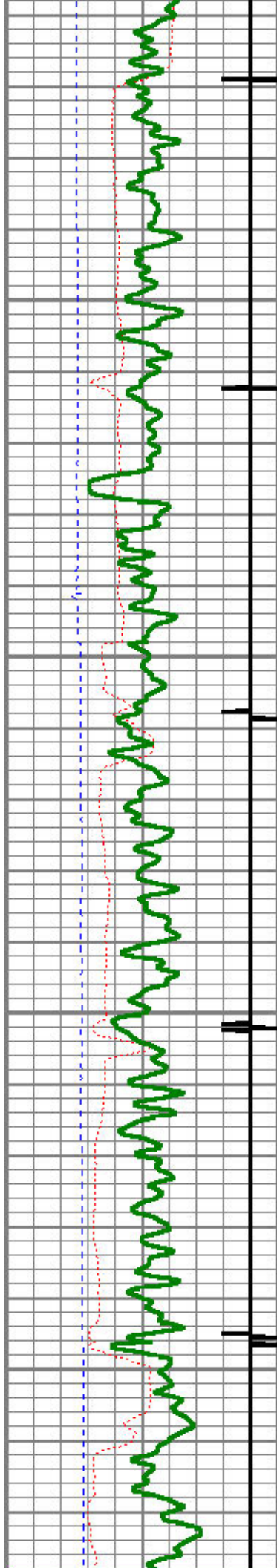










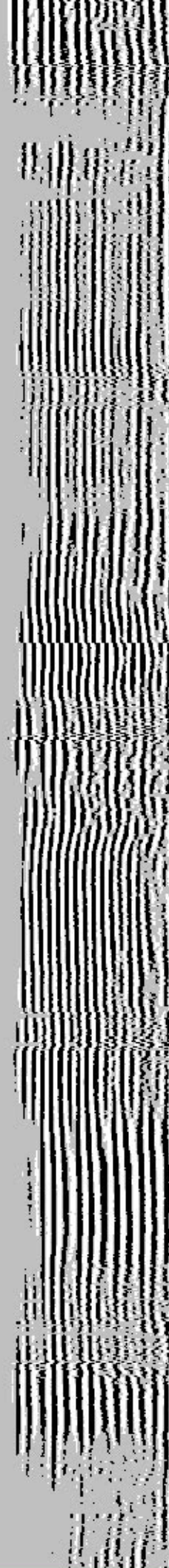
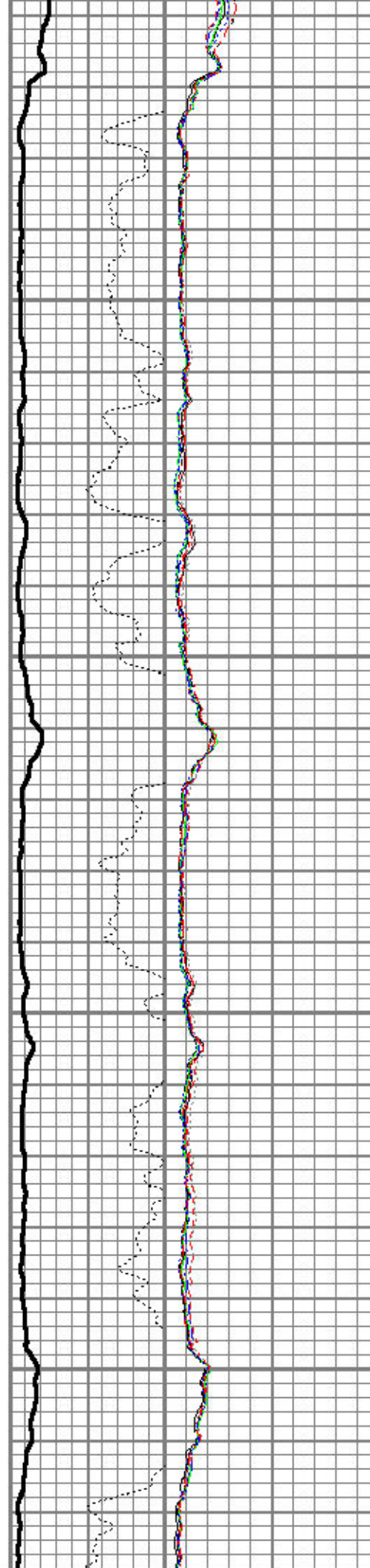


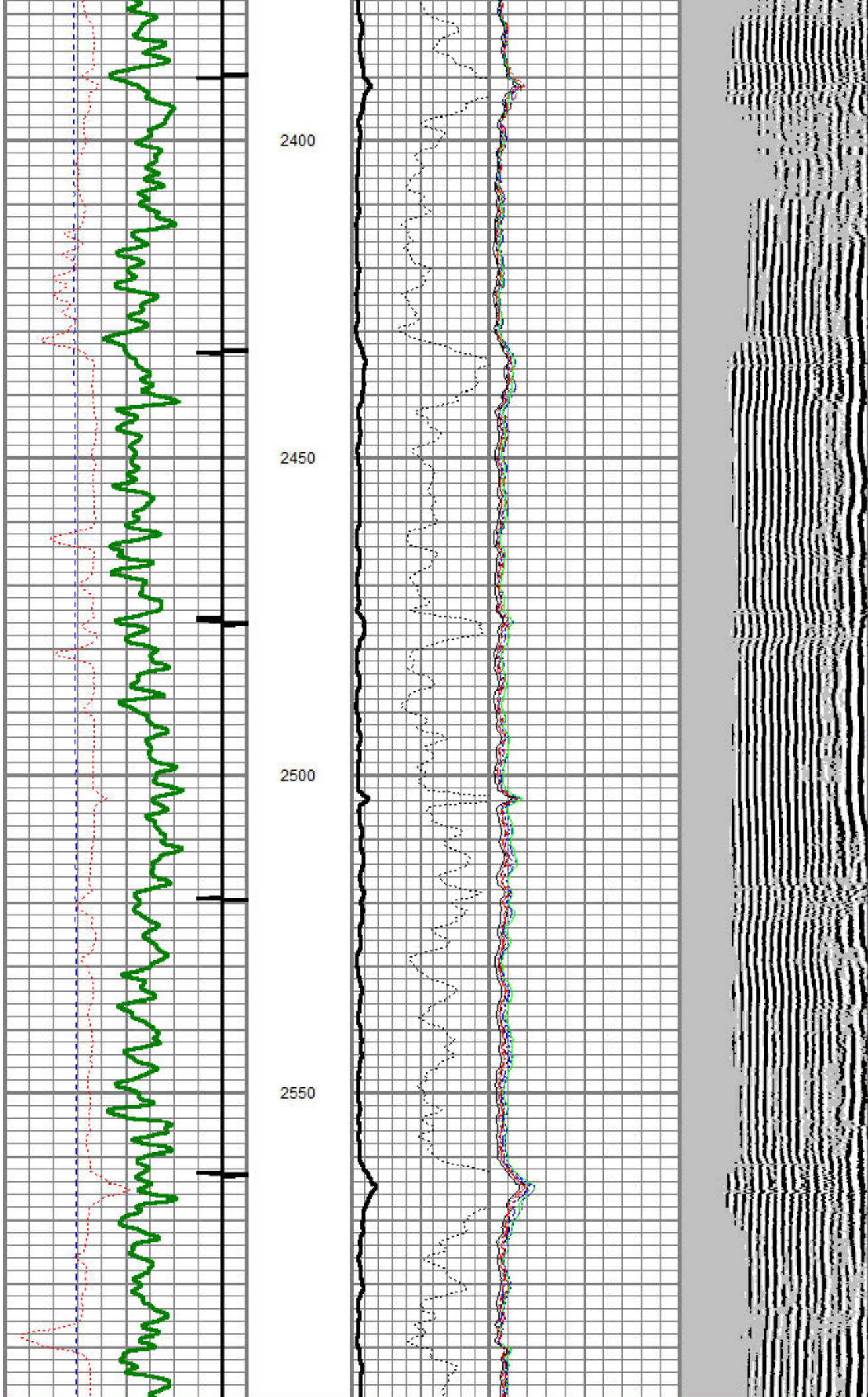
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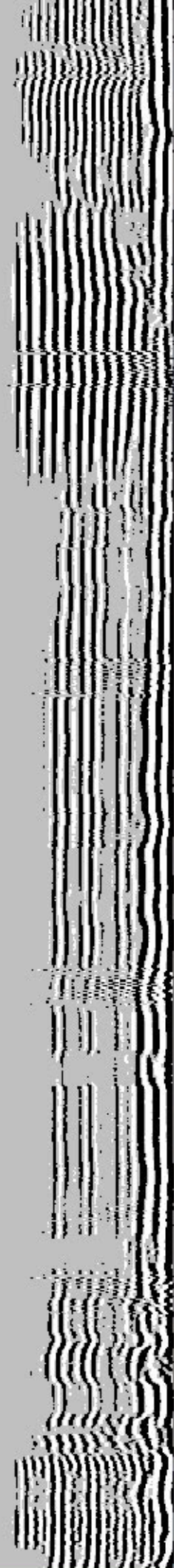
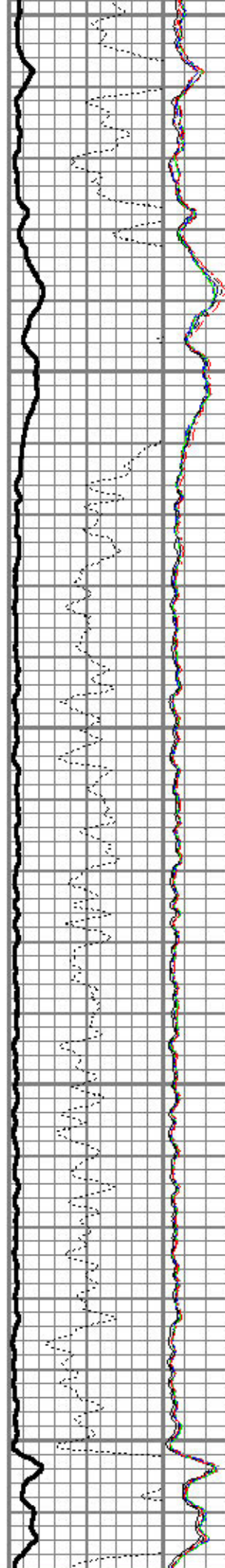
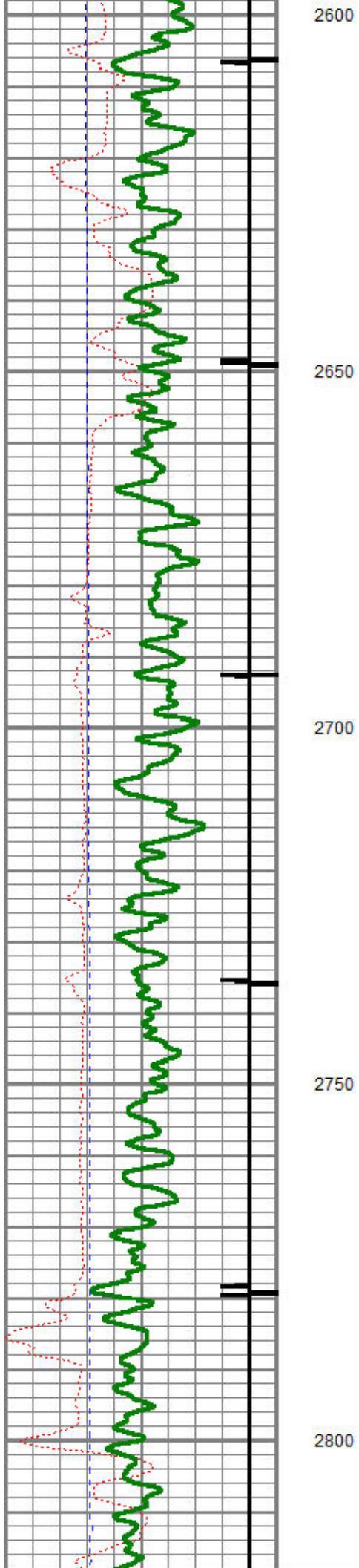
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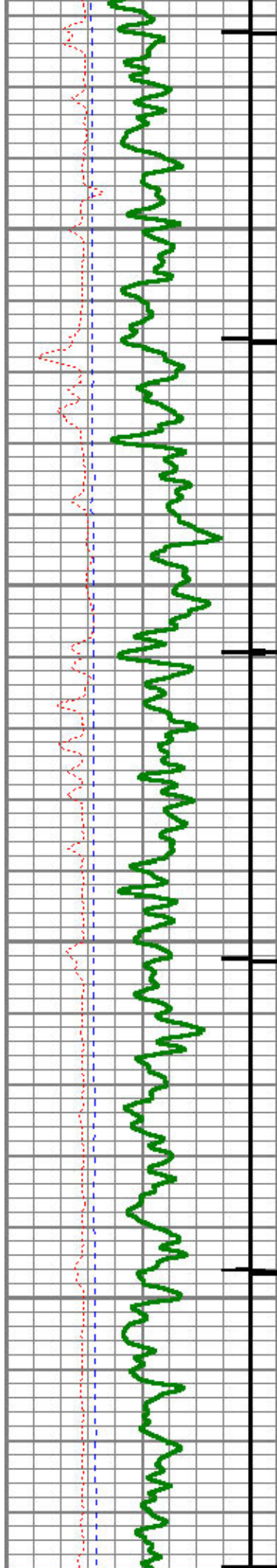
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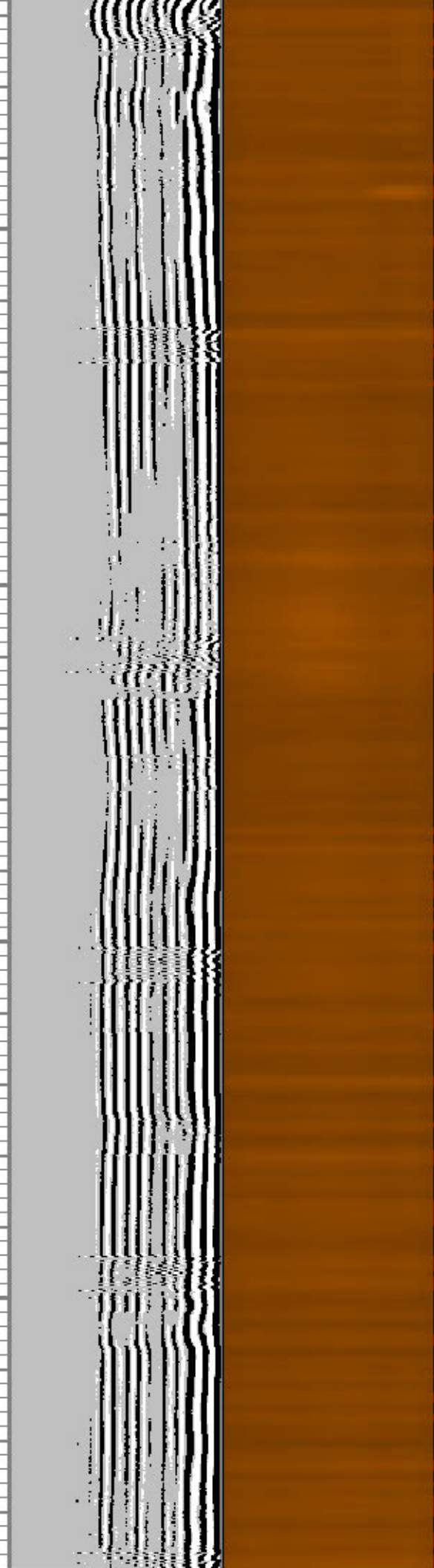
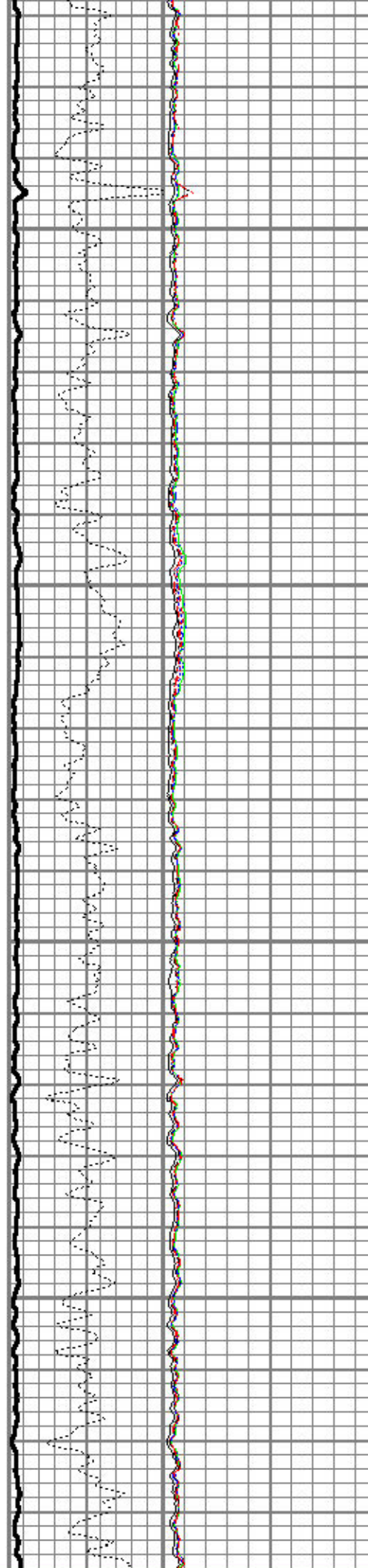


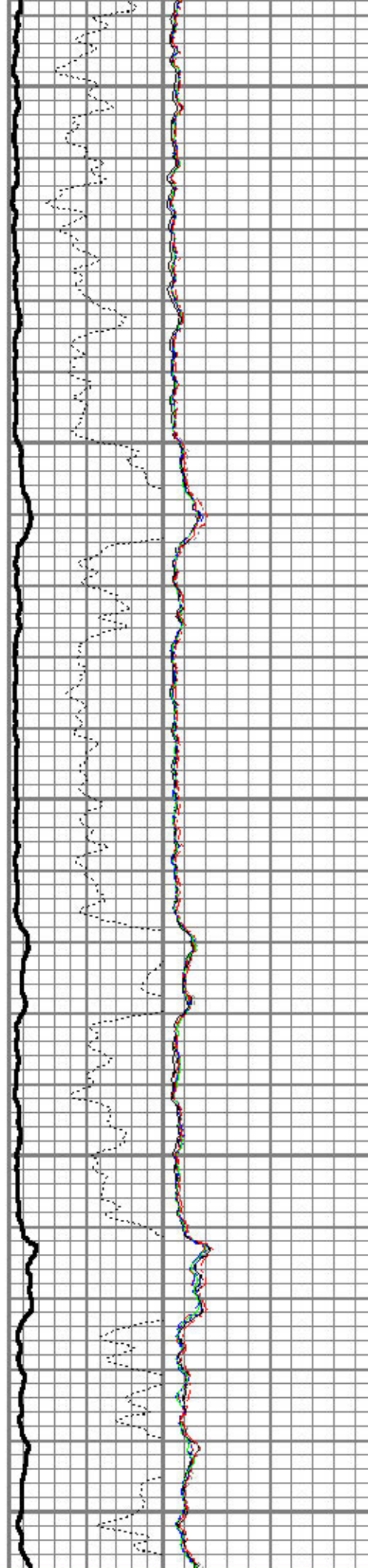
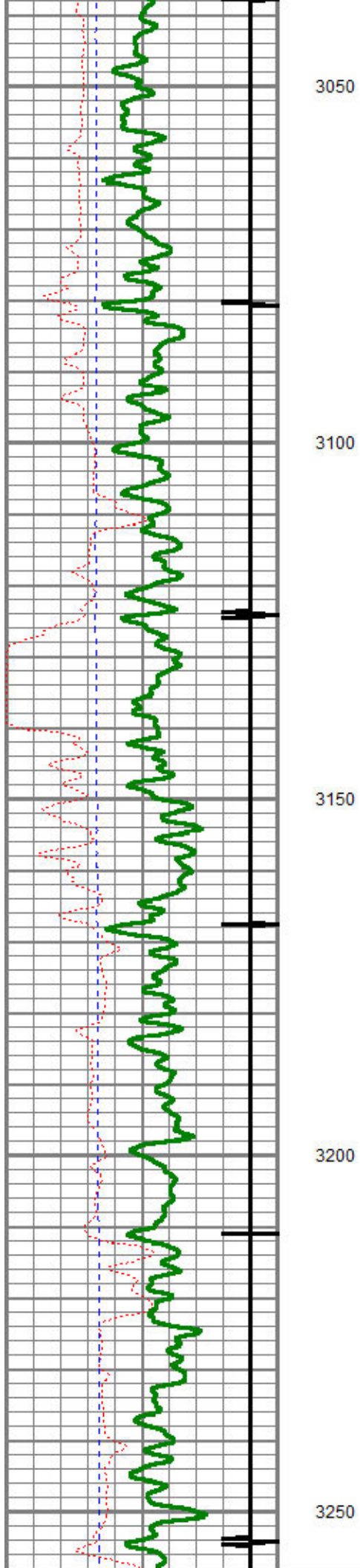
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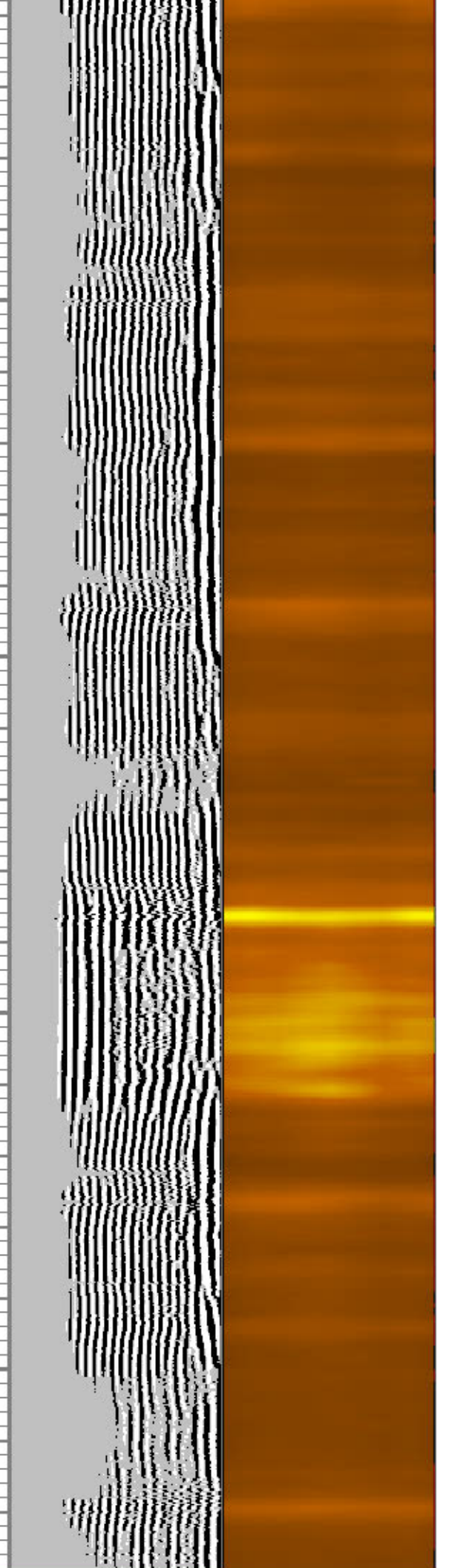
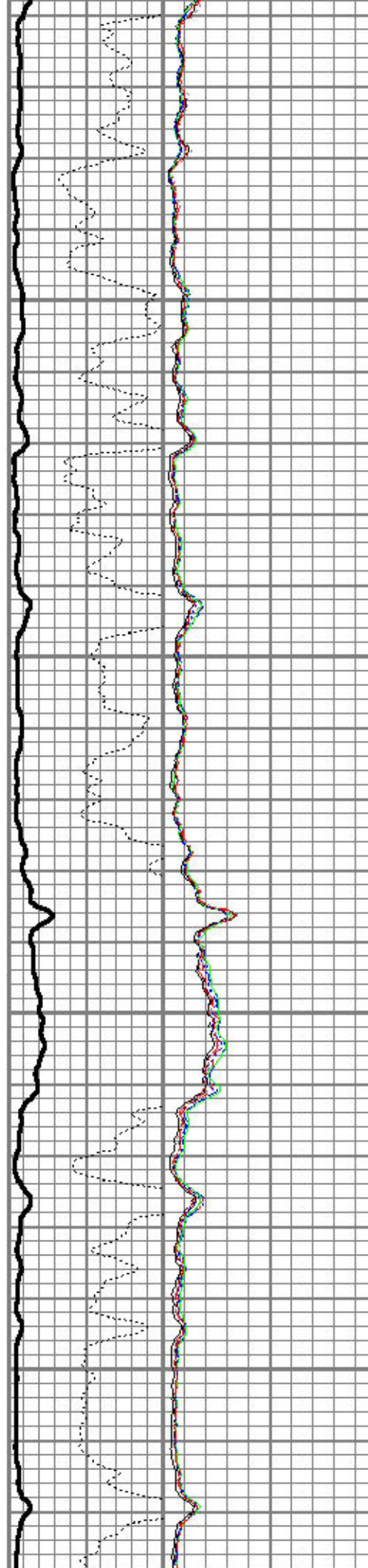
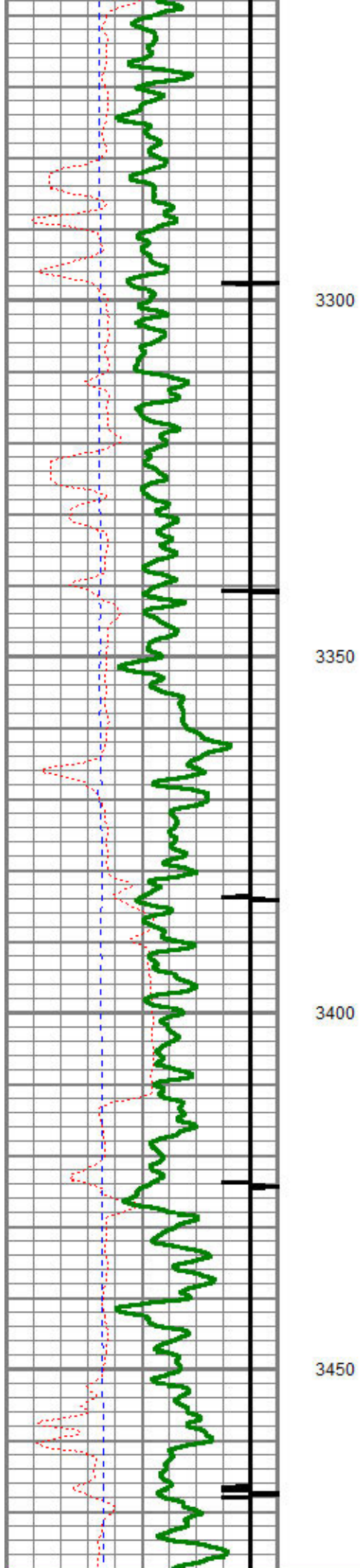
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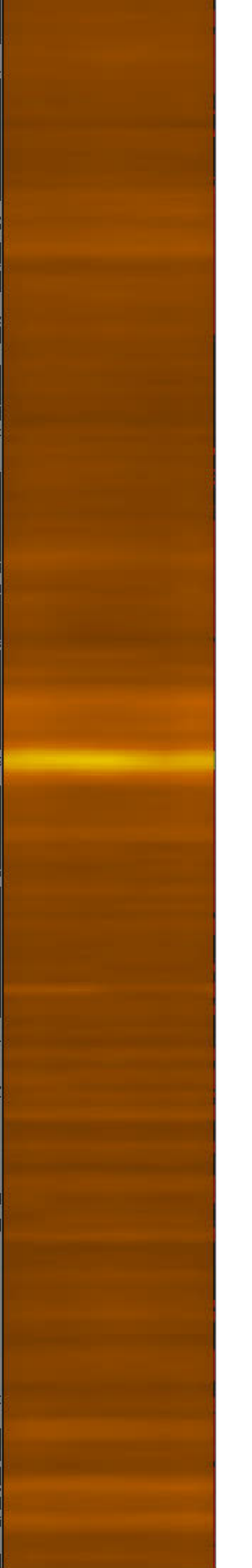
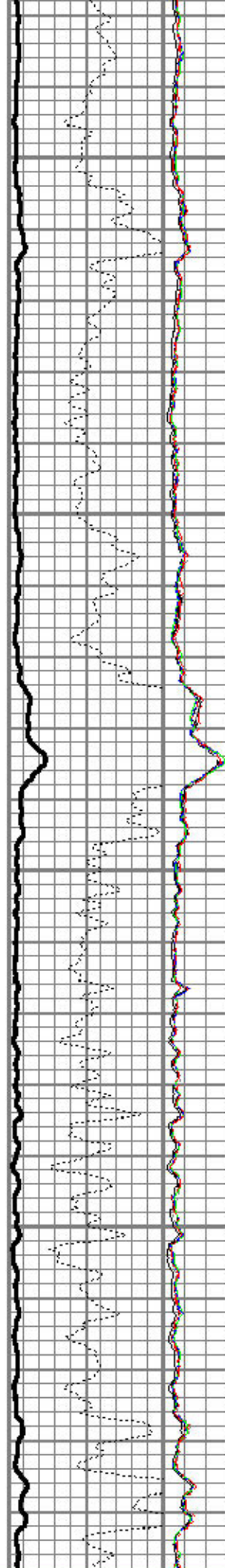
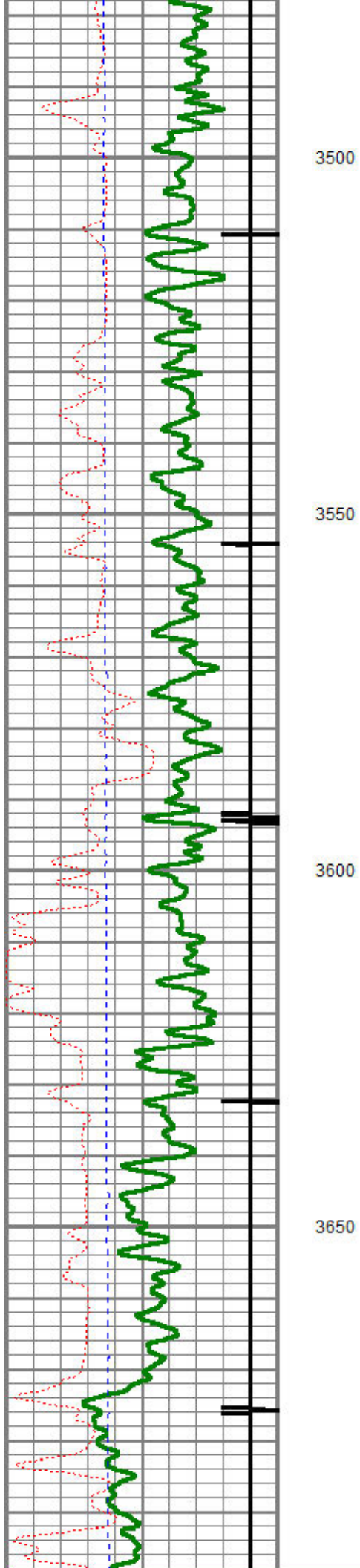
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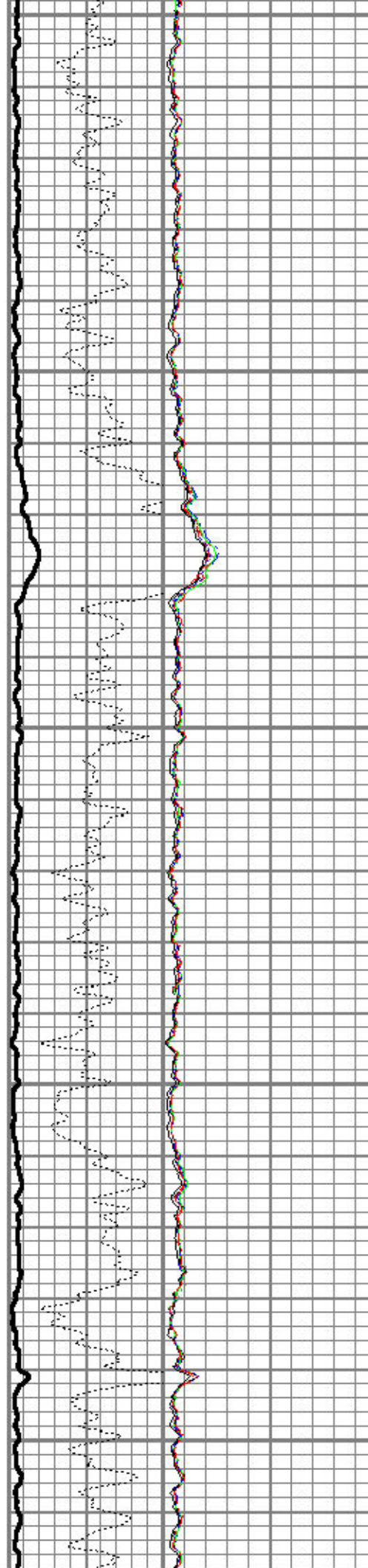
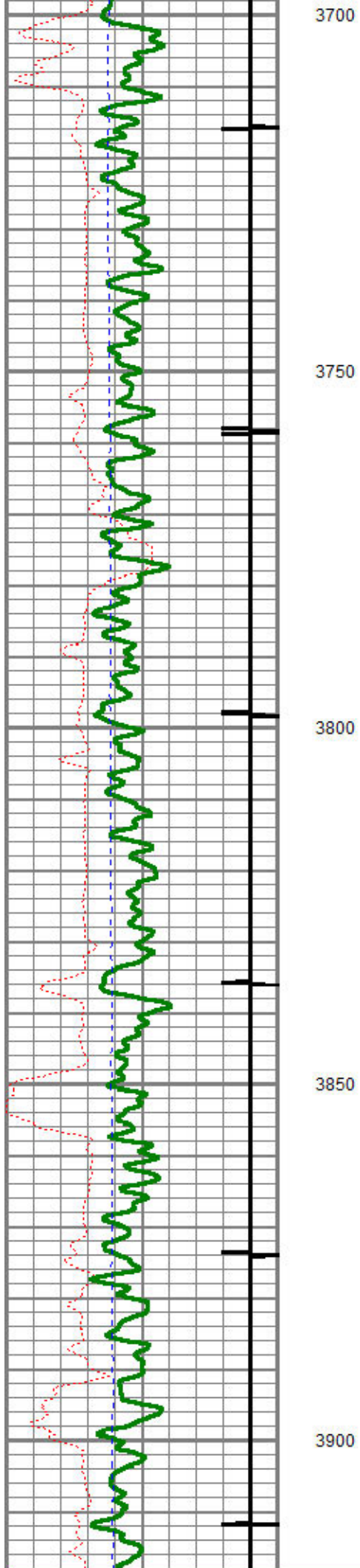
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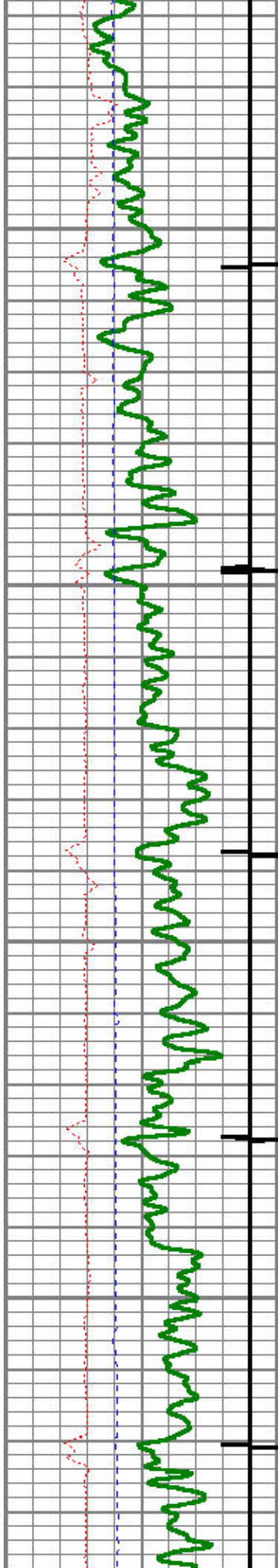










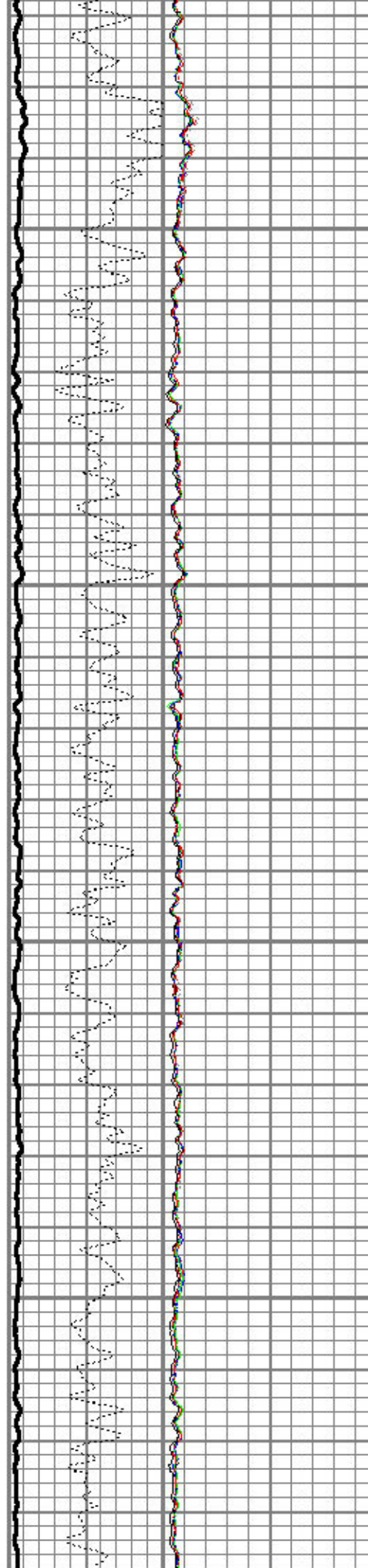


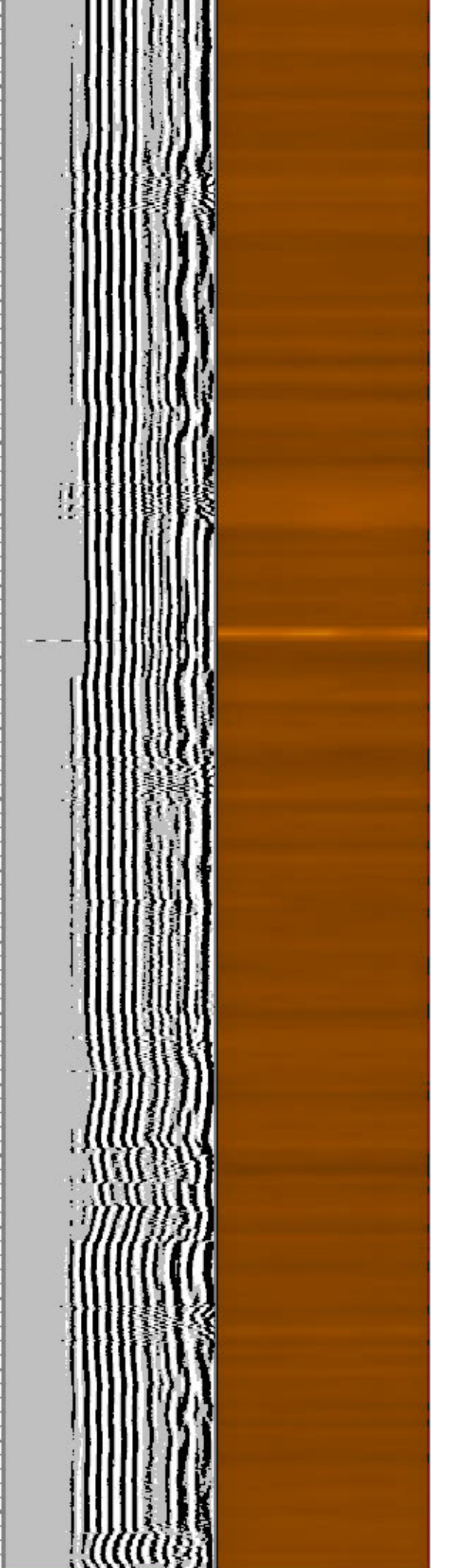
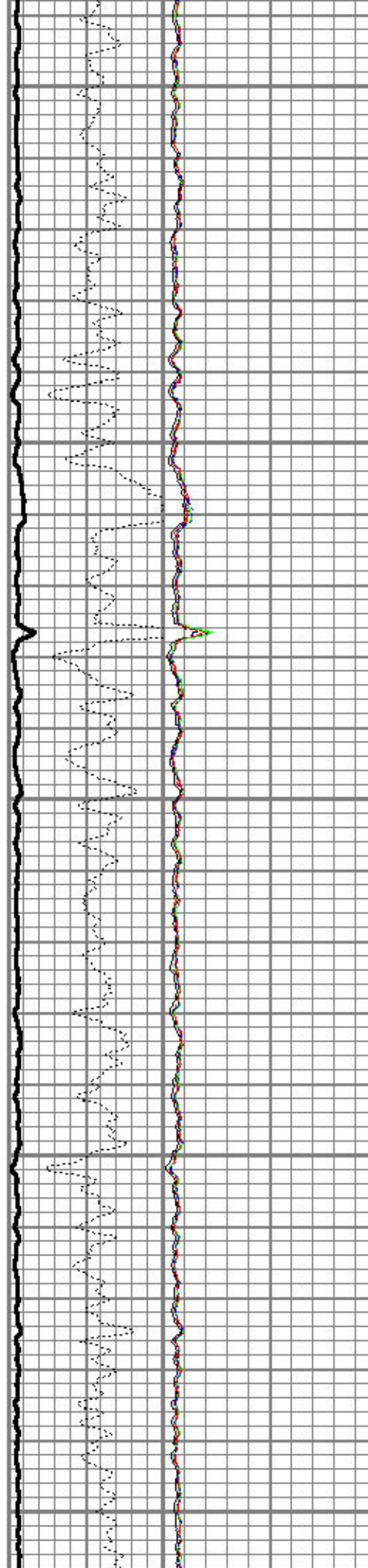
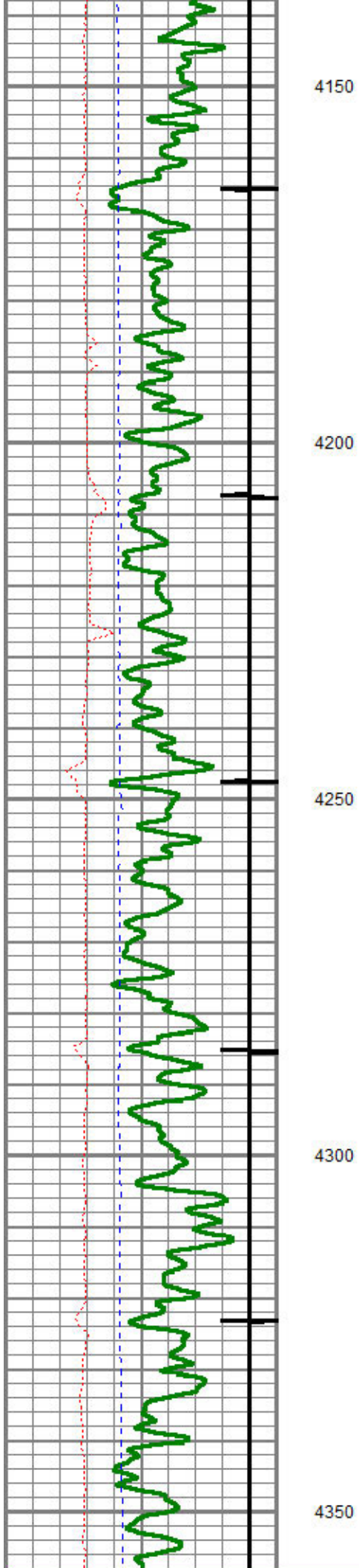
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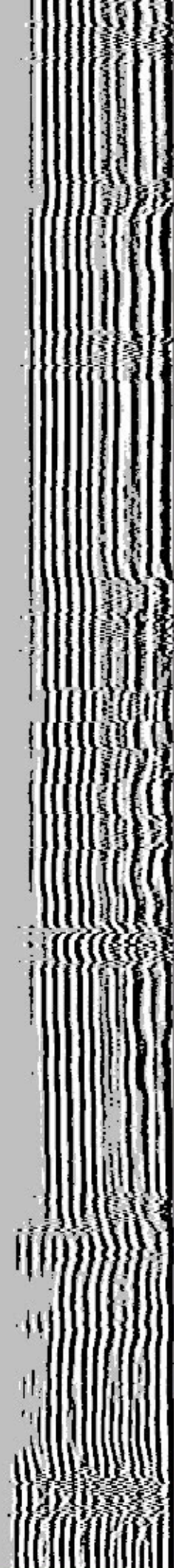
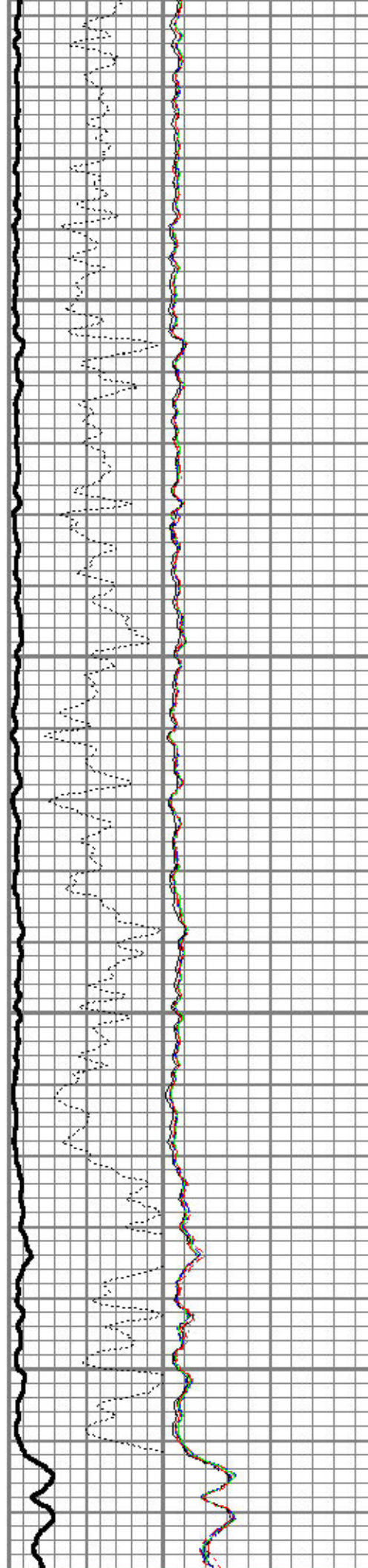
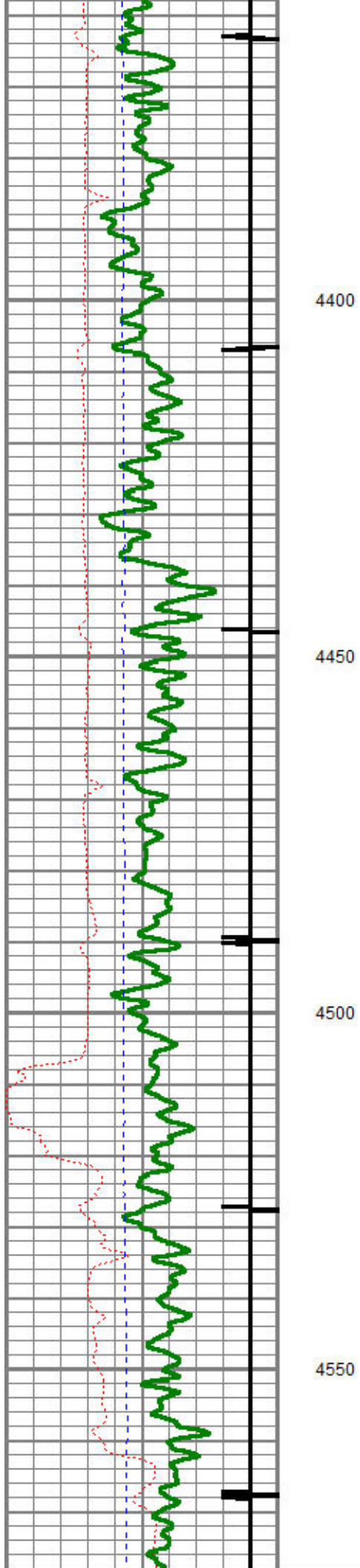
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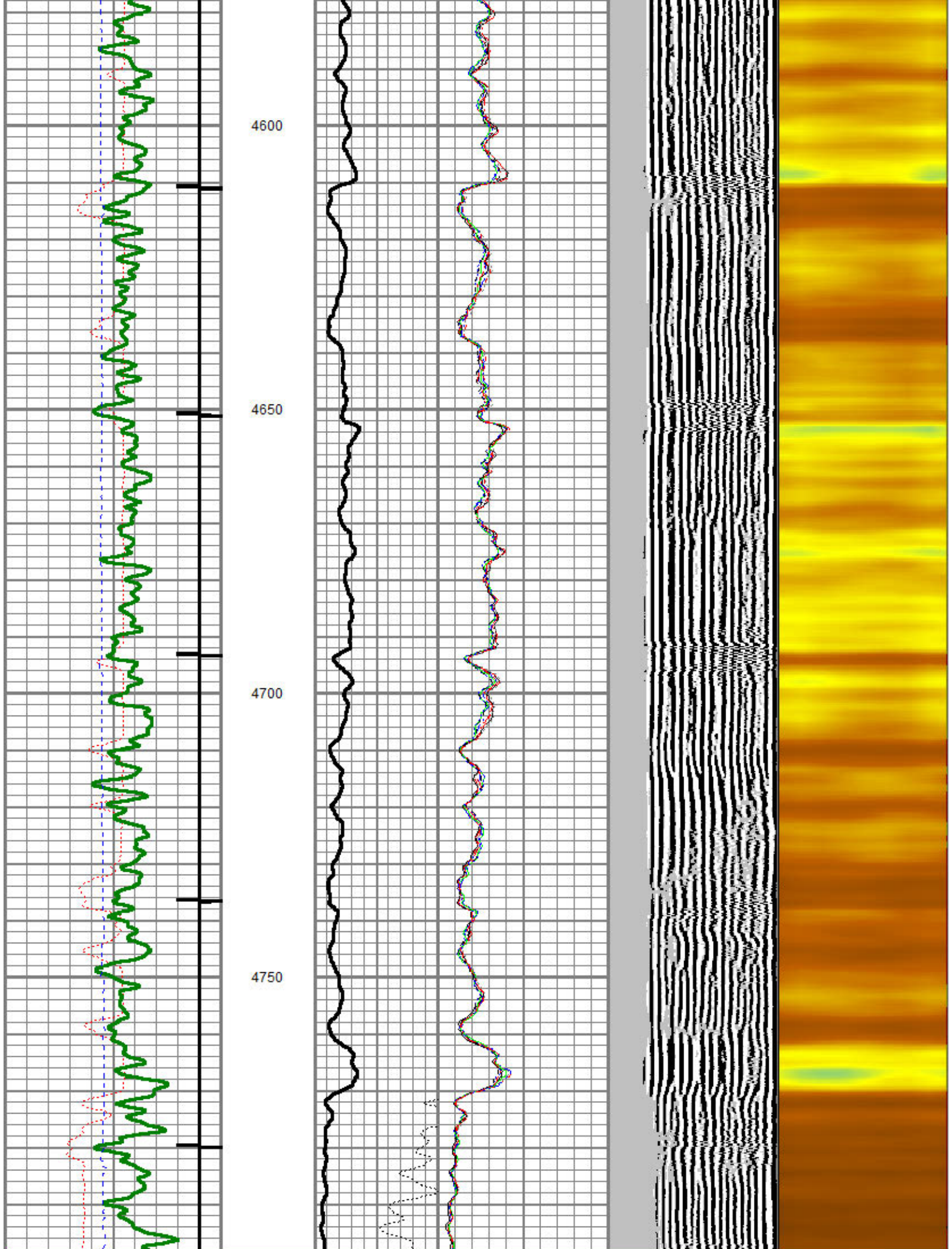
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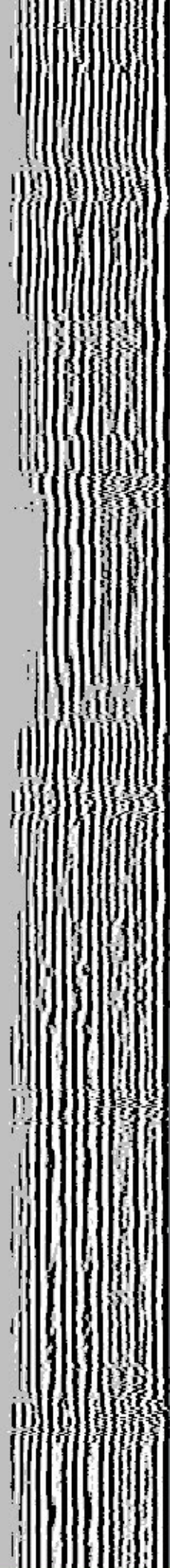
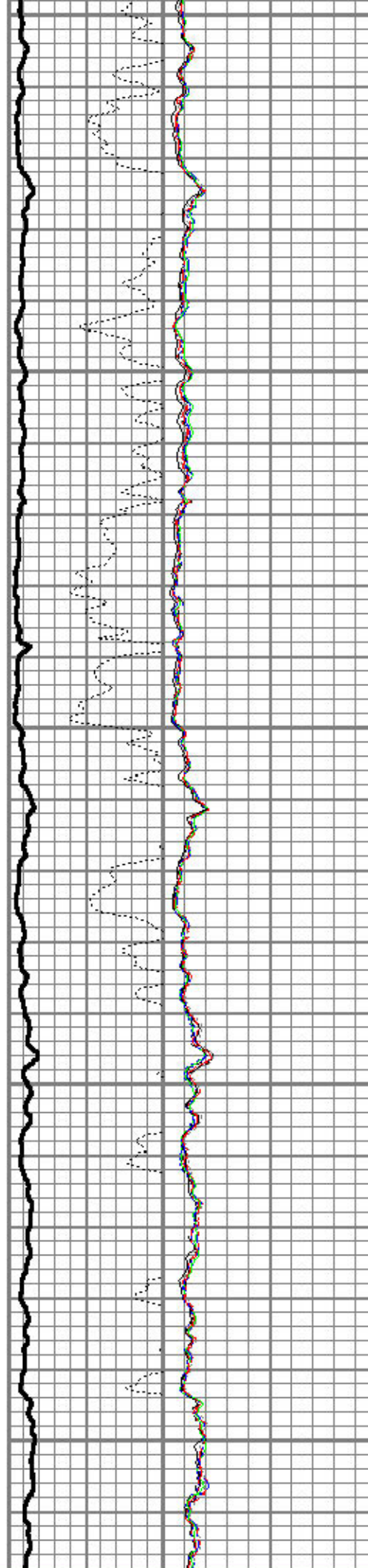
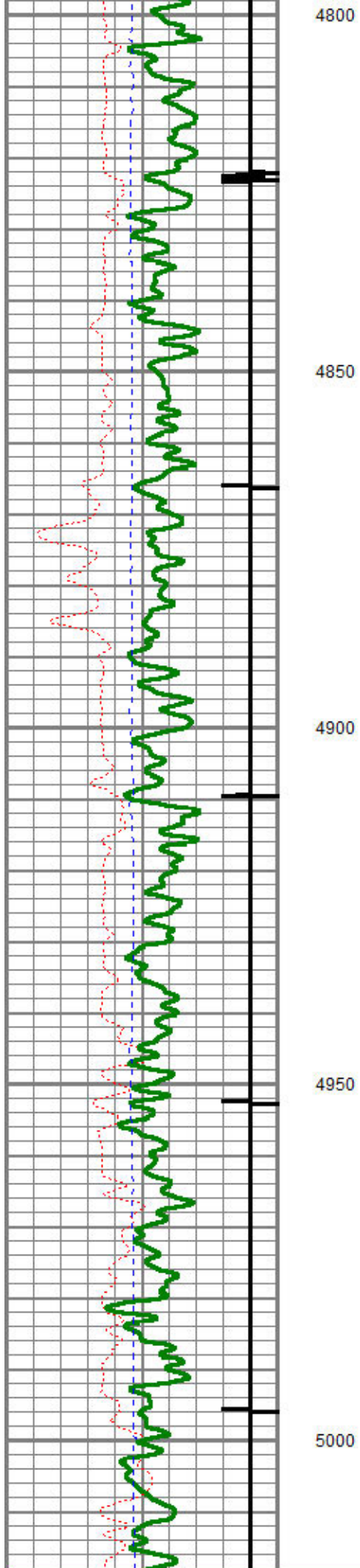
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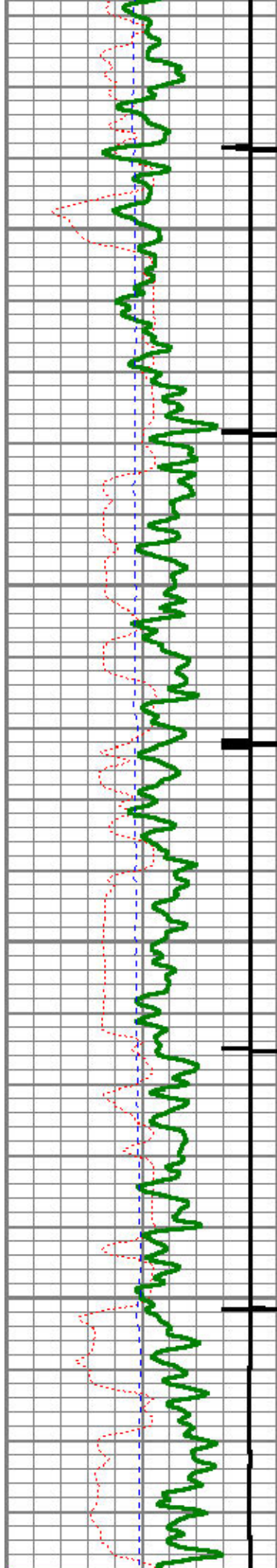










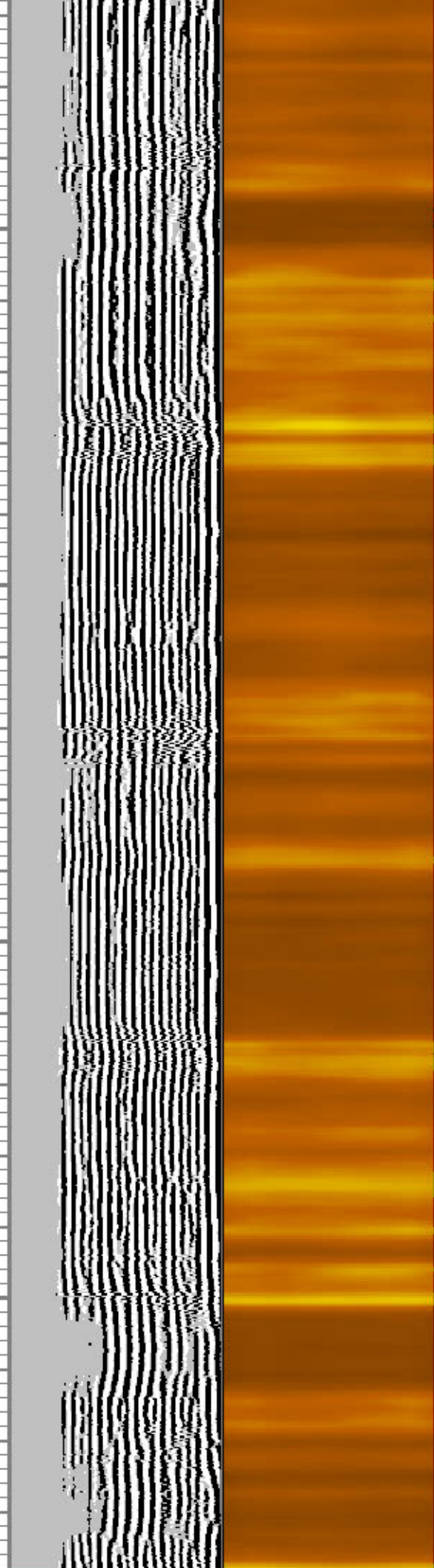
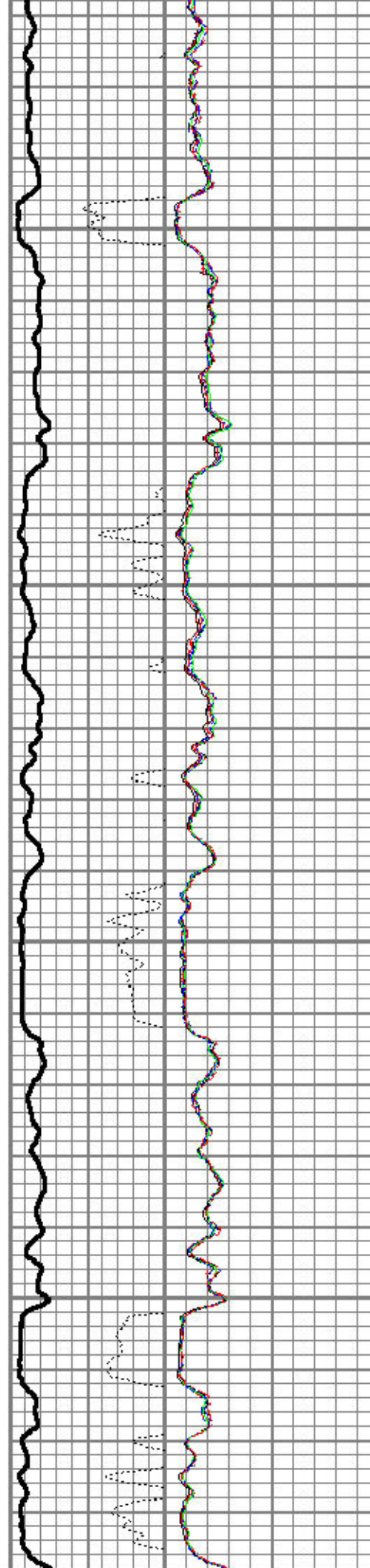


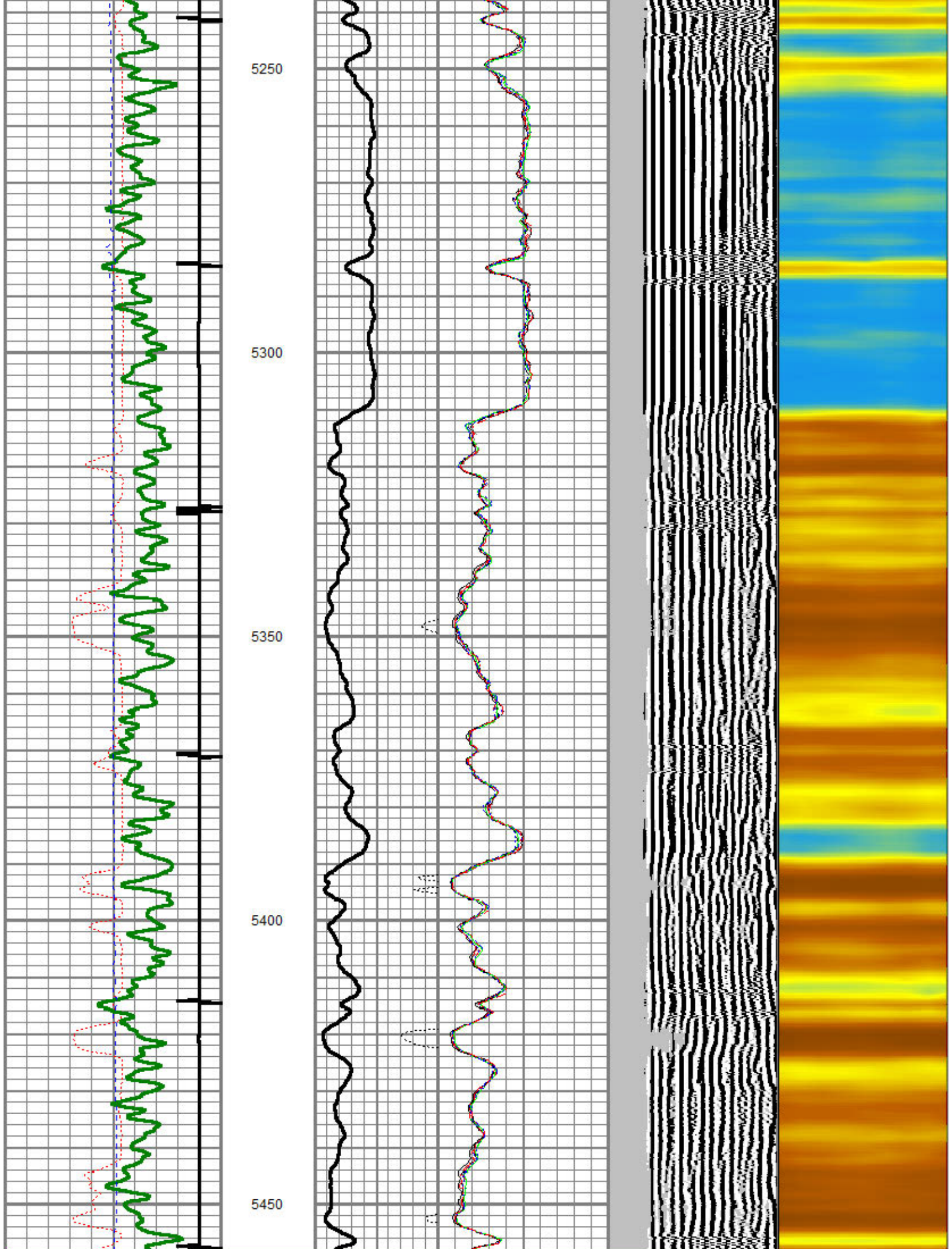
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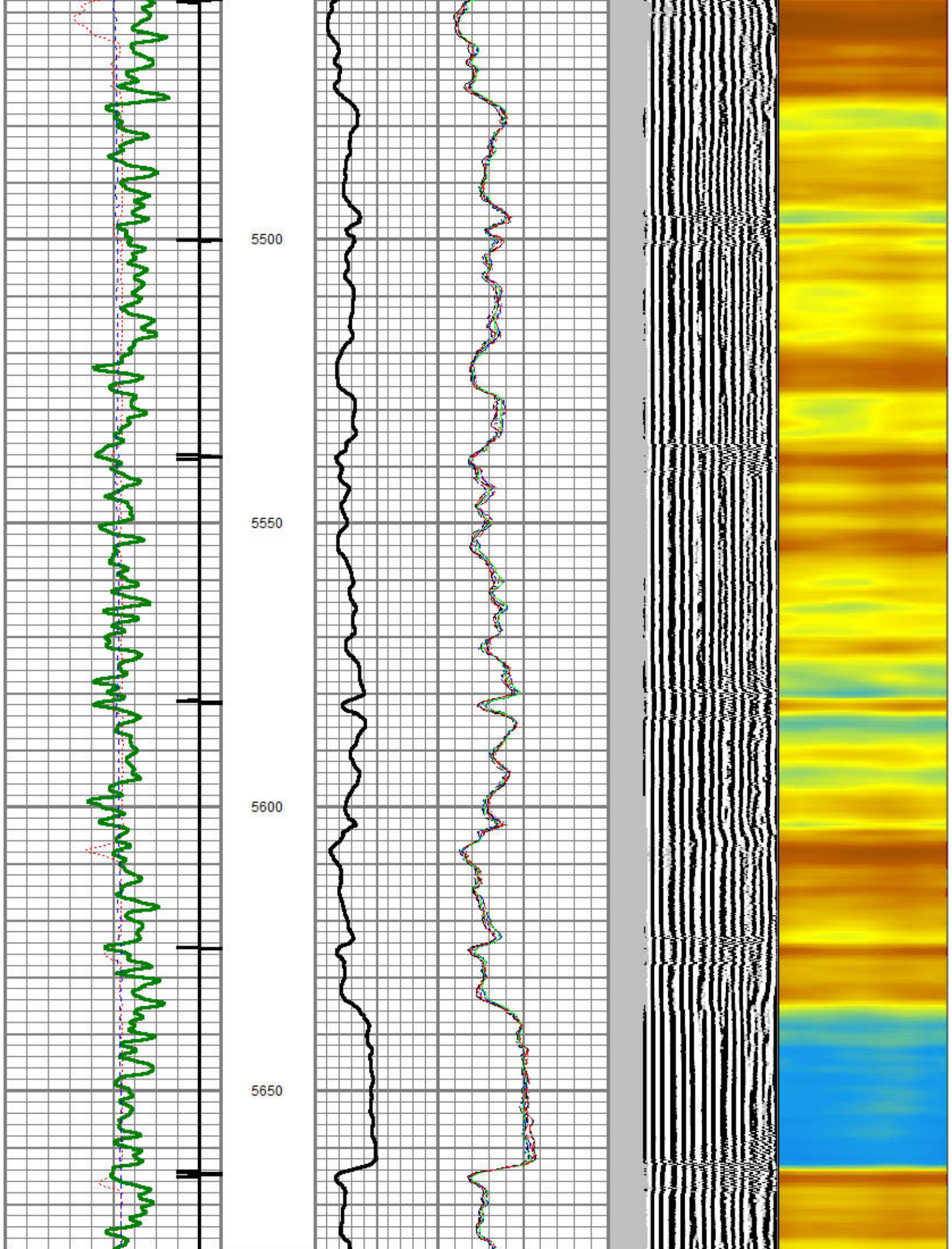
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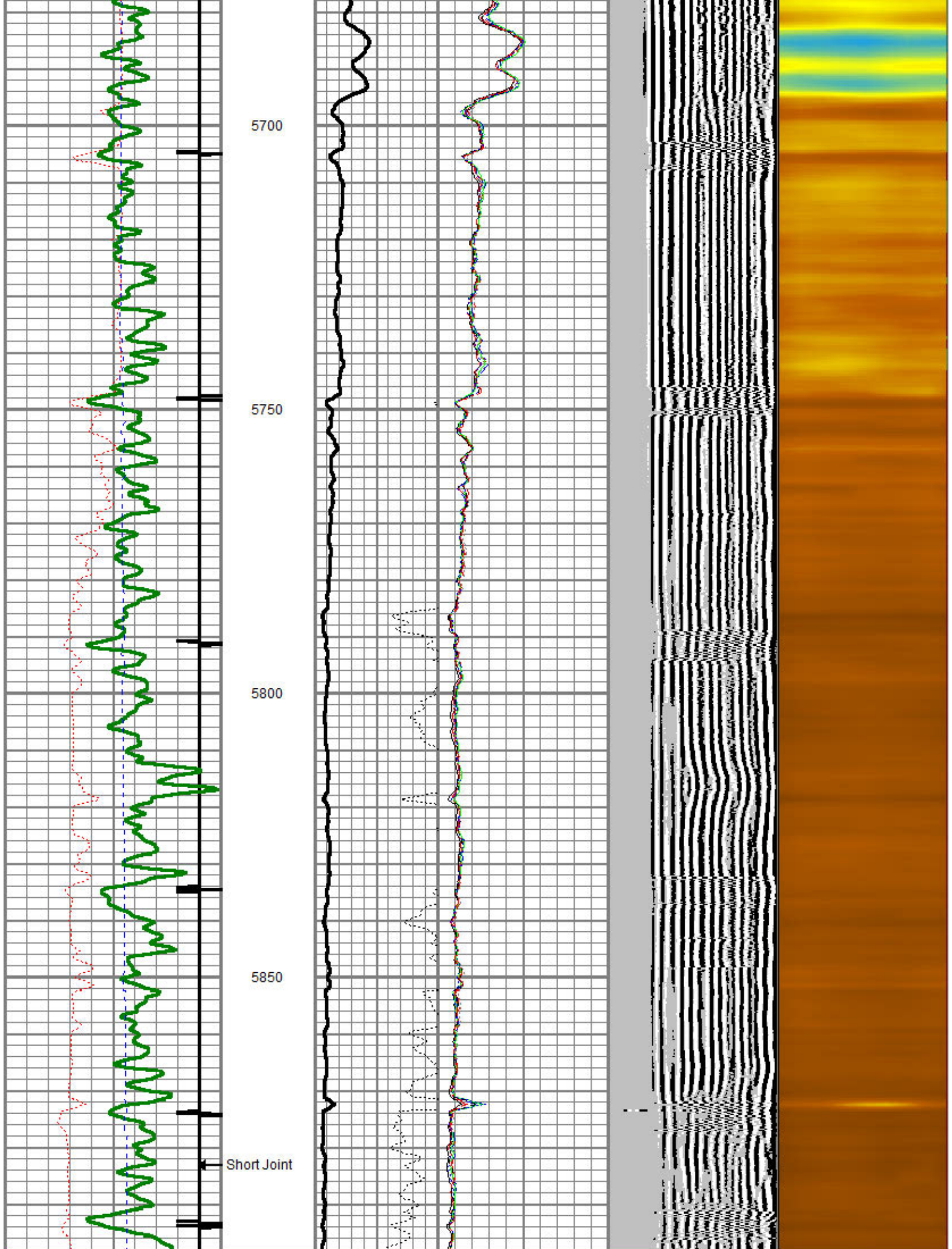
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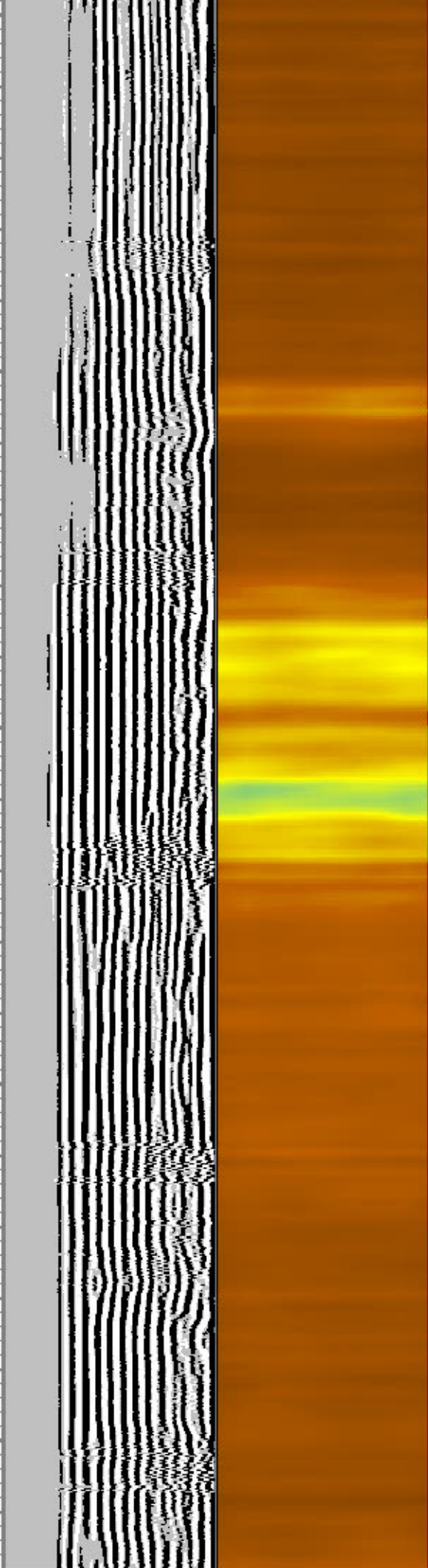
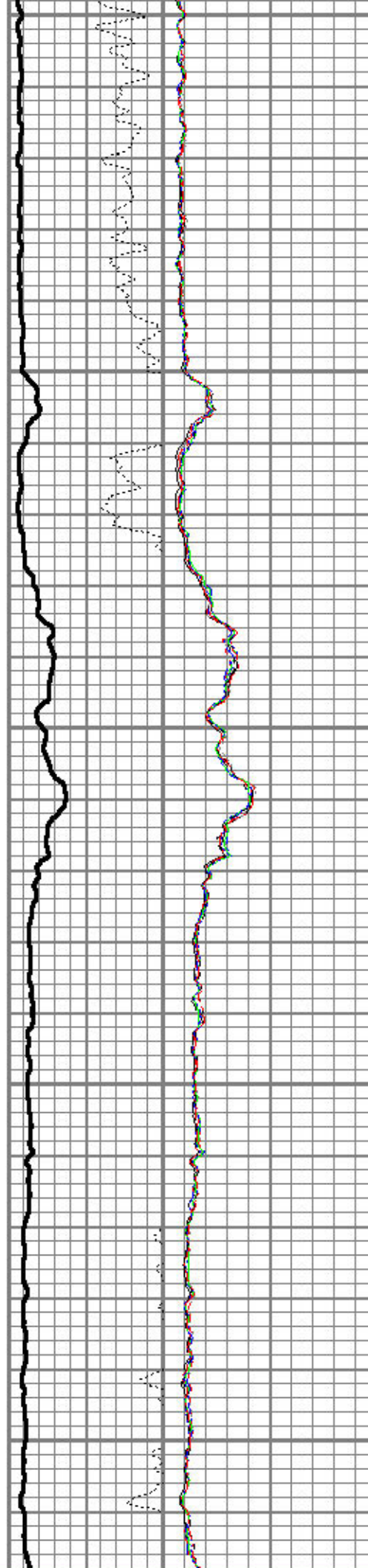
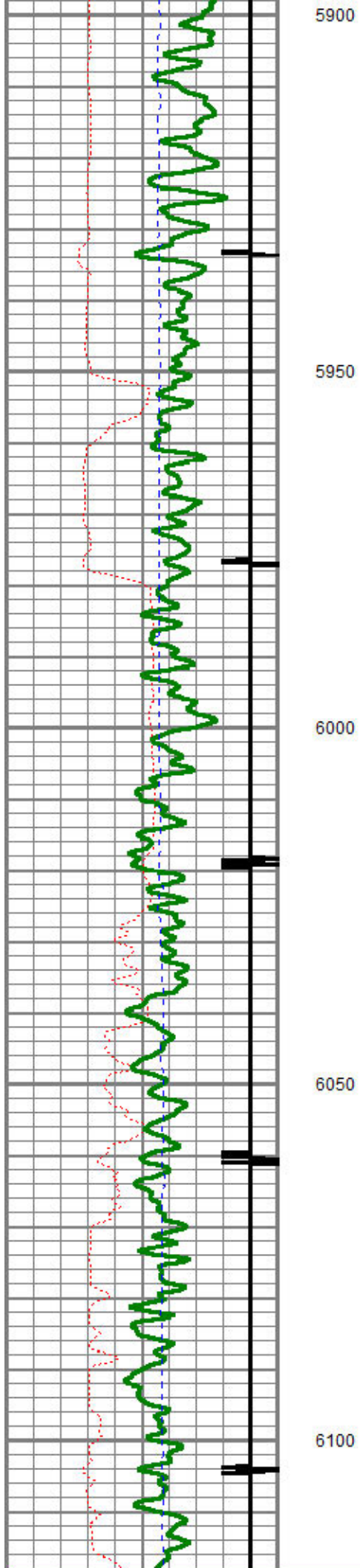
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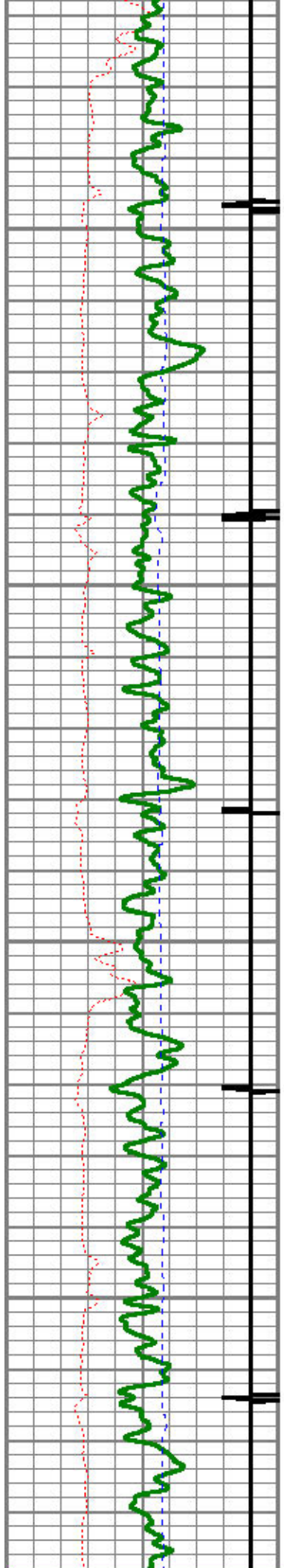










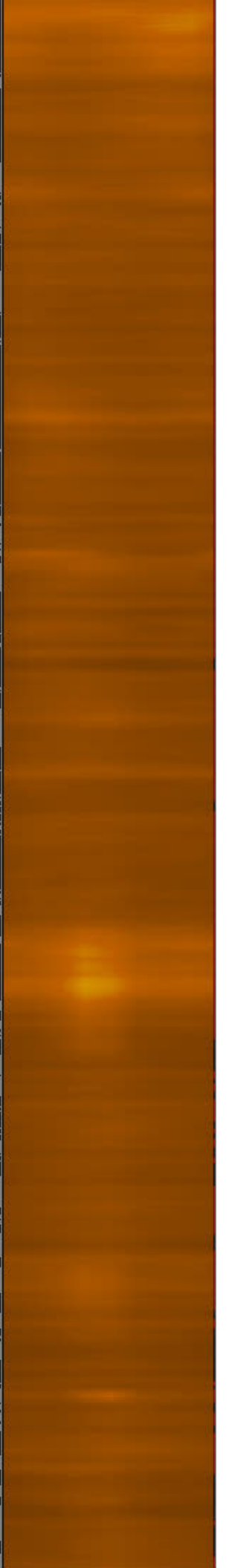
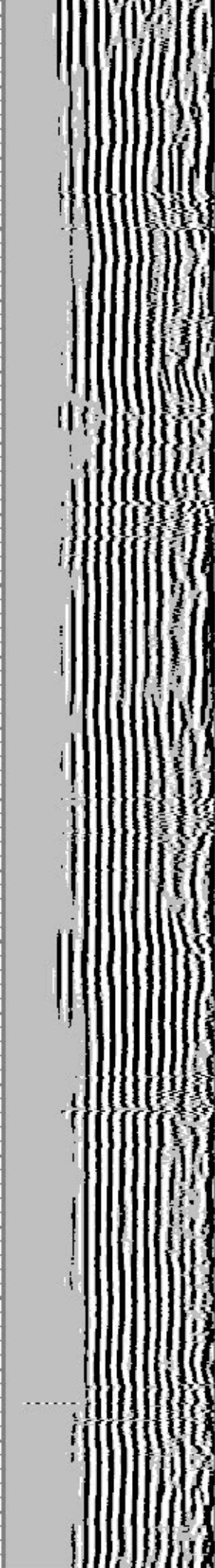
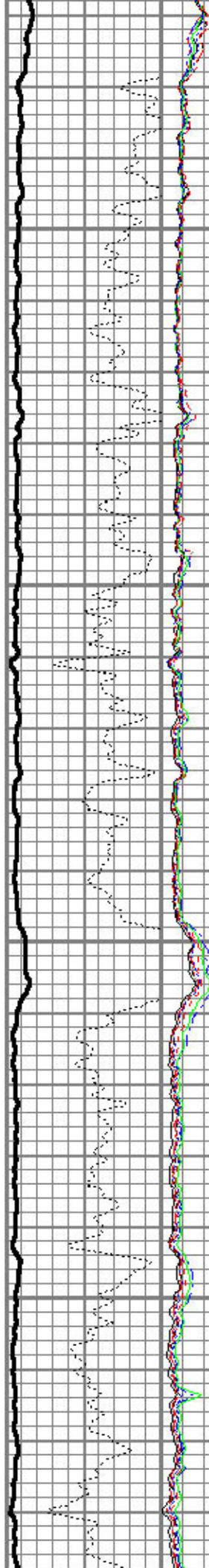


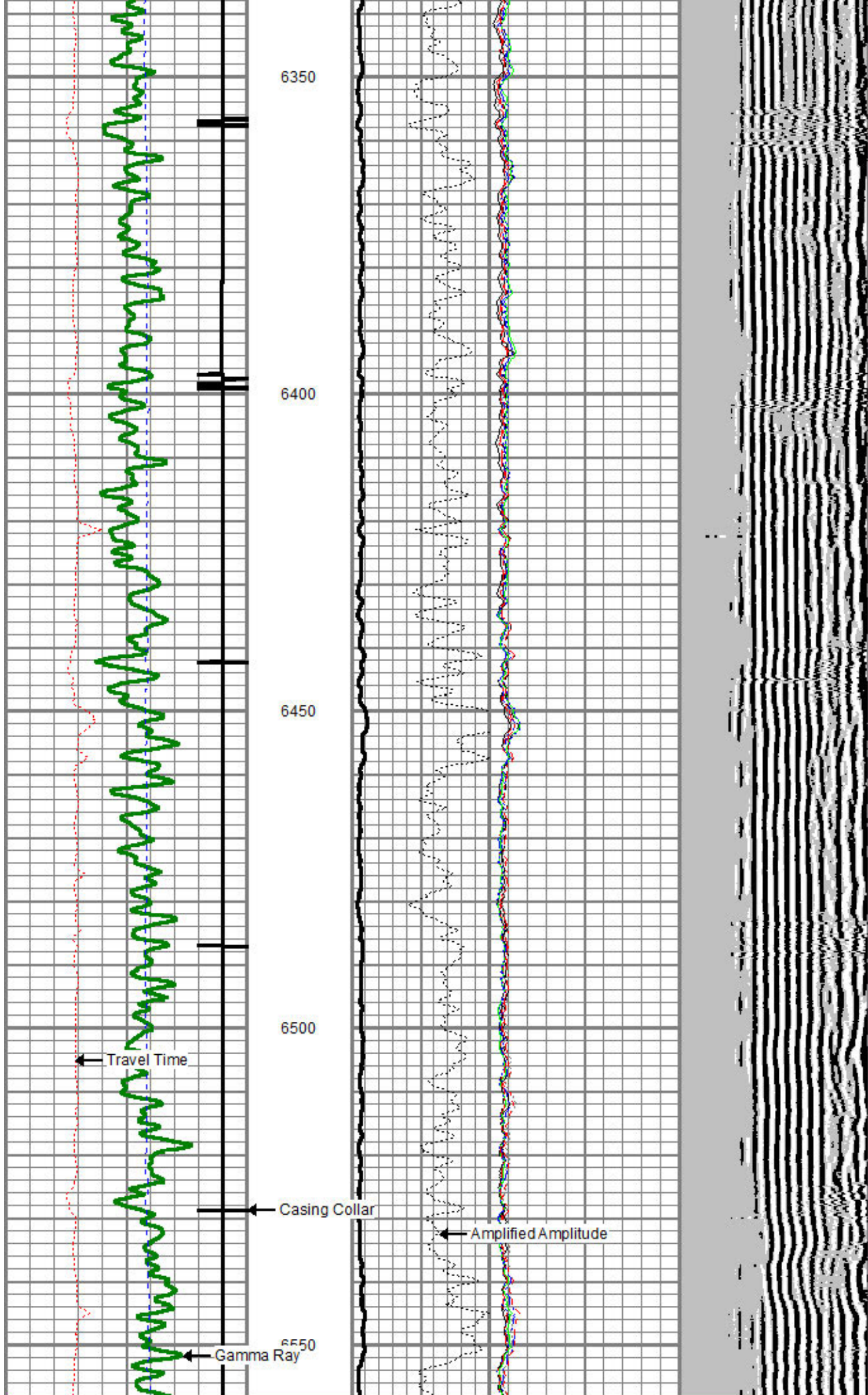
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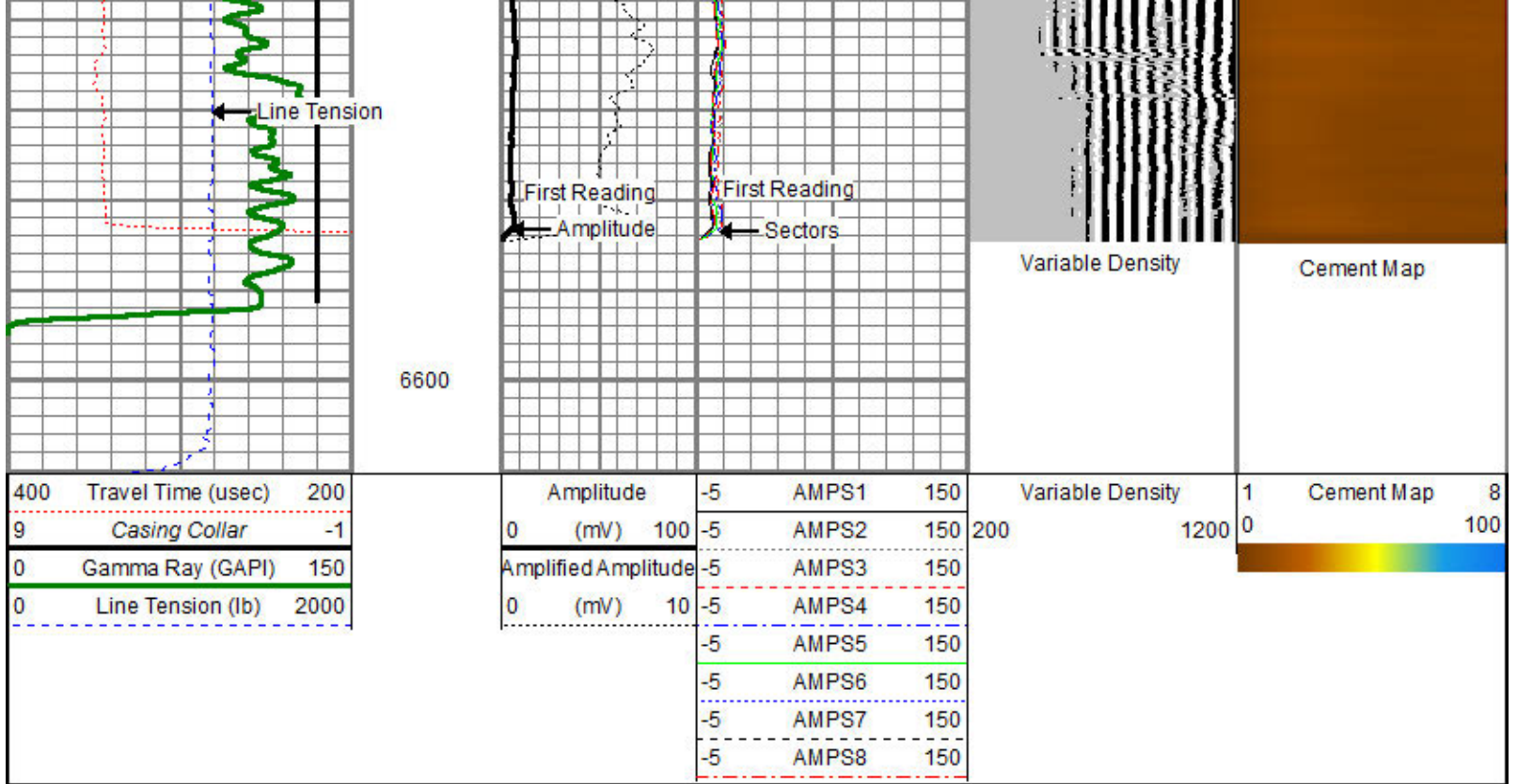
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6250

6300







Calibration Report

Database File: noble reliance e23-63-1hna.db
 Dataset Pathname: merge3
 Dataset Creation: Fri Mar 20 20:11:14 2015

60 Arm Multi Sensor Caliper Calibration Report

Serial Number: FW1408-57
 Tool Model: 60_INCL
 Performed: Fri Mar 20 12:23:58 2015

Ref ID:	5.00	6.00	7.00	8.00	9.00	in
Arm1	2.54	3.00	3.49	3.97	4.48	
Arm2	2.57	3.04	3.51	3.97	4.47	
Arm3	2.53	3.00	3.49	3.99	4.50	
Arm4	2.58	3.05	3.52	4.01	4.52	
Arm5	2.52	3.01	3.54	4.08	4.59	
Arm6	2.55	3.02	3.51	4.01	4.52	
Arm7	2.55	3.02	3.50	3.99	4.50	
Arm8	2.56	3.04	3.54	4.06	4.57	
Arm9	2.49	2.96	3.48	4.03	4.58	
Arm10	2.56	3.05	3.53	4.02	4.53	
Arm11	2.53	3.02	3.53	4.05	4.56	
Arm12	2.56	3.05	3.53	4.02	4.54	
Arm13	2.49	2.99	3.51	4.04	4.55	
Arm14	2.57	3.07	3.56	4.05	4.56	
Arm15	2.53	3.02	3.50	4.00	4.52	
Arm16	2.52	3.02	3.56	4.13	4.65	
Arm17	2.55	3.04	3.50	3.99	4.51	
Arm18	2.52	3.02	3.50	3.99	4.49	
Arm19	2.56	3.06	3.54	4.05	4.56	
Arm20	2.56	3.06	3.55	4.08	4.60	
Arm21	2.52	3.04	3.55	4.06	4.55	
Arm22	2.58	3.09	3.57	4.08	4.58	
Arm23	2.49	3.00	3.49	3.99	4.50	
Arm24	2.47	2.99	3.51	4.05	4.56	
Arm25	2.50	3.01	3.50	4.00	4.51	
Arm26	2.45	2.97	3.47	3.99	4.50	
Arm27	2.48	2.99	3.48	3.99	4.49	
Arm28	2.55	3.07	3.57	4.08	4.57	
Arm29	2.53	3.05	3.55	4.06	4.56	

Arm30	2.48	3.00	3.49	4.01	4.51	
* Bad						
Ref ID:	5.00	6.00	7.00	8.00	9.00	in
Arm31	2.43	2.95	3.44	3.97	4.47	
Arm32	2.49	3.00	3.50	4.03	4.52	
Arm33	2.44	2.95	3.45	3.96	4.45	
Arm34	2.45	2.96	3.47	4.00	4.49	
Arm35	2.43	2.94	3.45	3.99	4.47	
Arm36	2.50	3.01	3.49	3.99	4.46	
Arm37	2.39	2.89	3.43	4.00	4.51	
Arm38	2.45	2.96	3.45	3.97	4.46	
Arm39	2.45	2.96	3.47	3.99	4.46	
Arm40	2.45	2.97	3.51	4.06	4.54	
Arm41	2.45	2.94	3.45	3.97	4.47	
Arm42	2.41	2.90	3.42	3.99	4.48	
Arm43	2.43	2.92	3.43	3.96	4.45	
Arm44	2.46	2.97	3.48	4.02	4.50	
Arm45	2.43	2.91	3.43	3.98	4.48	
Arm46	2.46	2.95	3.45	3.98	4.47	
Arm47	2.44	2.93	3.44	3.95	4.43	
Arm48	2.48	2.97	3.47	3.97	4.45	
Arm49	2.45	2.93	3.43	3.94	4.42	
Arm50	2.45	2.96	3.48	4.02	4.52	
Arm51	2.39	2.87	3.41	3.97	4.47	
Arm52	2.46	2.93	3.45	3.98	4.48	
Arm53	2.49	2.96	3.47	3.98	4.46	
Arm54	2.52	3.00	3.51	4.02	4.51	
Arm55	2.47	2.93	3.43	3.95	4.46	
Arm56	2.54	3.00	3.50	4.00	4.49	
Arm57	2.46	2.93	3.44	3.97	4.48	
Arm58	2.57	3.02	3.50	4.00	4.51	
Arm59	2.51	2.97	3.47	3.98	4.49	
Arm60	2.53	3.00	3.51	4.02	4.53	
* Bad						

PROBE verifications Calibration Report						
Performed:	Pre Verification Fri Mar 20 12:26:46 2015		Post Verification Fri Mar 20 12:17:38 2015		Casing Check	
Ref ID:	7.00		7.00		0.00	in
Min.	6.97		7.08		0.00	in
Max.	7.00		7.15		0.00	in
Avg.	6.98		7.12		0.00	in
Dia1	6.98		7.09		0.00	in
Dia2	6.98		7.13		0.00	in
Dia3	6.98		7.08		0.00	in
Dia4	6.98		7.14		0.00	in
Dia5	6.99		7.09		0.00	in
Dia6	6.98		7.15		0.00	in
Dia7	6.99		7.08		0.00	in
Dia8	6.99		7.12		0.00	in
Dia9	6.98		7.11		0.00	in
Dia10	6.98		7.13		0.00	in
Dia11	6.98		7.11		0.00	in
Dia12	6.99		7.12		0.00	in
Dia13	6.98		7.10		0.00	in
Dia14	6.99		7.11		0.00	in
Dia15	6.98		7.08		0.00	in
Dia16	7.00		7.15		0.00	in
Dia17	6.98		7.10		0.00	in
Dia18	6.99		7.14		0.00	in
Dia19	6.99		7.12		0.00	in
Dia20	6.98		7.15		0.00	in
Dia21	6.98		7.10		0.00	in
Dia22	6.97		7.15		0.00	in

Dia23	6.98	7.11	0.00	in
Dia24	6.98	7.11	0.00	in
Dia25	6.99	7.11	0.00	in
Dia26	6.99	7.13	0.00	in
Dia27	6.99	7.08	0.00	in
Dia28	6.99	7.14	0.00	in
Dia29	6.98	7.11	0.00	in
Dia30	6.99	7.14	0.00	in

Inclinometer Calibration Report

Performed:	Fri Mar 20 08:12:34 2015				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	-3696.00	3852.00	-1.00	1.00	gee
Y Accelerometer	-4404.00	3672.00	-1.00	1.00	gee
Z Accelerometer	17.27	3651.70	0.00	1.00	gee

Gamma Ray Calibration Report

Serial Number:	FW1408-35	
Tool Model:	Probe275	
Performed:	Fri Mar 20 07:45:03 2015	
Calibrator Value:	1022.0	GAPI
Background Reading:	109.6	cps
Calibrator Reading:	1299.5	cps
Sensitivity:	0.8589	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	FW1406-126	
Tool Model:	RBTC3	
Calibration Casing Diameter:	7.000	in
Calibration Depth:	987.633	ft

Master Calibration, performed Fri Mar 20 08:51:32 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.014	0.499	2.000	62.165	104.052	0.209
CAL	0.015	1.008				
5'	0.014	0.589	2.000	62.165	104.615	0.519
SUM						
S1	0.018	0.484	0.000	100.000	214.495	-3.828
S2	0.014	0.525	0.000	100.000	195.897	-2.817
S3	0.014	0.531	0.000	100.000	193.490	-2.797
S4	0.016	0.520	0.000	100.000	198.305	-3.142
S5	0.014	0.498	0.000	100.000	206.493	-2.884
S6	0.014	0.481	0.000	100.000	214.198	-3.051
S7	0.014	0.472	0.000	100.000	218.652	-3.120
S8	0.014	0.477	0.000	100.000	216.005	-3.109

Internal Reference Calibration, performed Wed Dec 31 17:00:00 1969:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset

CAL	0.000	0.000	0.015	1.008	1.000	0.000
Air Zero Calibration, performed Wed Dec 31 17:00:00 1969:						
	Raw (v)		Calibrated (v)		Results	
	Zero		Zero		Offset	
3'	0.000		0.000		0.000	
5'	0.000		0.000		0.000	
SUM						
S1	0.000		0.000		0.000	
S2	0.000		0.000		0.000	
S3	0.000		0.000		0.000	
S4	0.000		0.000		0.000	
S5	0.000		0.000		0.000	
S6	0.000		0.000		0.000	
S7	0.000		0.000		0.000	
S8	0.000		0.000		0.000	
Temperature Calibration Report						
Serial Number:		FW1406-126				
Tool Model:		RBTC3				
Performed:		Sun Jun 13 13:33:21 1993				
		Reference		Reading		
Low Reference:		0.00	degF	0.00		
High Reference:		1.00	degF	1.00		
Gain:		1.00				
Offset:		0.00				
Delta Spacing		1				

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			PTS275	2.83	2.75	
WVF3FT	26.53		RBT-RBTC3 (FW1406-126)	8.92	2.75	90.00
WVFCAL	26.53					
WVFS1	26.53					
WVFS2	26.53					
WVFS3	26.53					
WVFS4	26.53					
WVFS5	26.53					
WVFS6	26.53					
WVFS7	26.53		PTS275	2.83	2.75	
WVFS8	26.53					
WVF5FT	25.53					
TEMP	22.91					
CCL	18.54					
GR	17.21		GR-Probe275 (FW1408-35)	4.78	2.75	57.00

			Probe 2 3/4" Logging Gamma Ray			
			PTS275	2.83	2.75	
			Probe_MFCAL-60_INCL (FW1408-57)	9.00	3.62	85.00
			PTS275	2.83	2.75	
ACCX	7.83					
ACCY	7.83					
ACCZ	7.83					
ETEMP	5.33					
Meas	4.50					
Dataset:		noble reliance e23-63-1hna.db: field/well/run1/merge3				
Total Length:		34.03 ft				
Total Weight:		232.00 lb				
O.D.		3.62 in				