

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

Company Noble Energy
Well Reliance E23-63-1HNC
Field Wattenberg
County Weld
State Colorado

Location: API #: 05-123-38222

BHL: 990' 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	11402'
Depth Logger	6839'
Bottom Logged Interval	6856'
Top Log Interval	Surface
Open Hole Size	8 3/4"
Type Fluid	Fresh Water
Density / Viscosity	8.33#
Max. Recorded Temp.	226 Deg F
Estimated Cement Top	570'
Time Well Ready	14:00
Time Logger on Bottom	14:45
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'	842'				
Intermediate	8 3/4"	842'	7285'				
Production	6 1/8"	7285'	11402'				
Casing Record	Size	Wd/ft	Top	Bottom			
Surface String	9 5/8"	36#	32'	832'			
Prot. String							
Production String	7"	26#	32'	7275'			
Liner	4 1/2"	11.6#	7159'	11392'			
Short Joint			6027'	6049'			

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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 @ 570'
Short Joint @ 6027' to 6049'

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

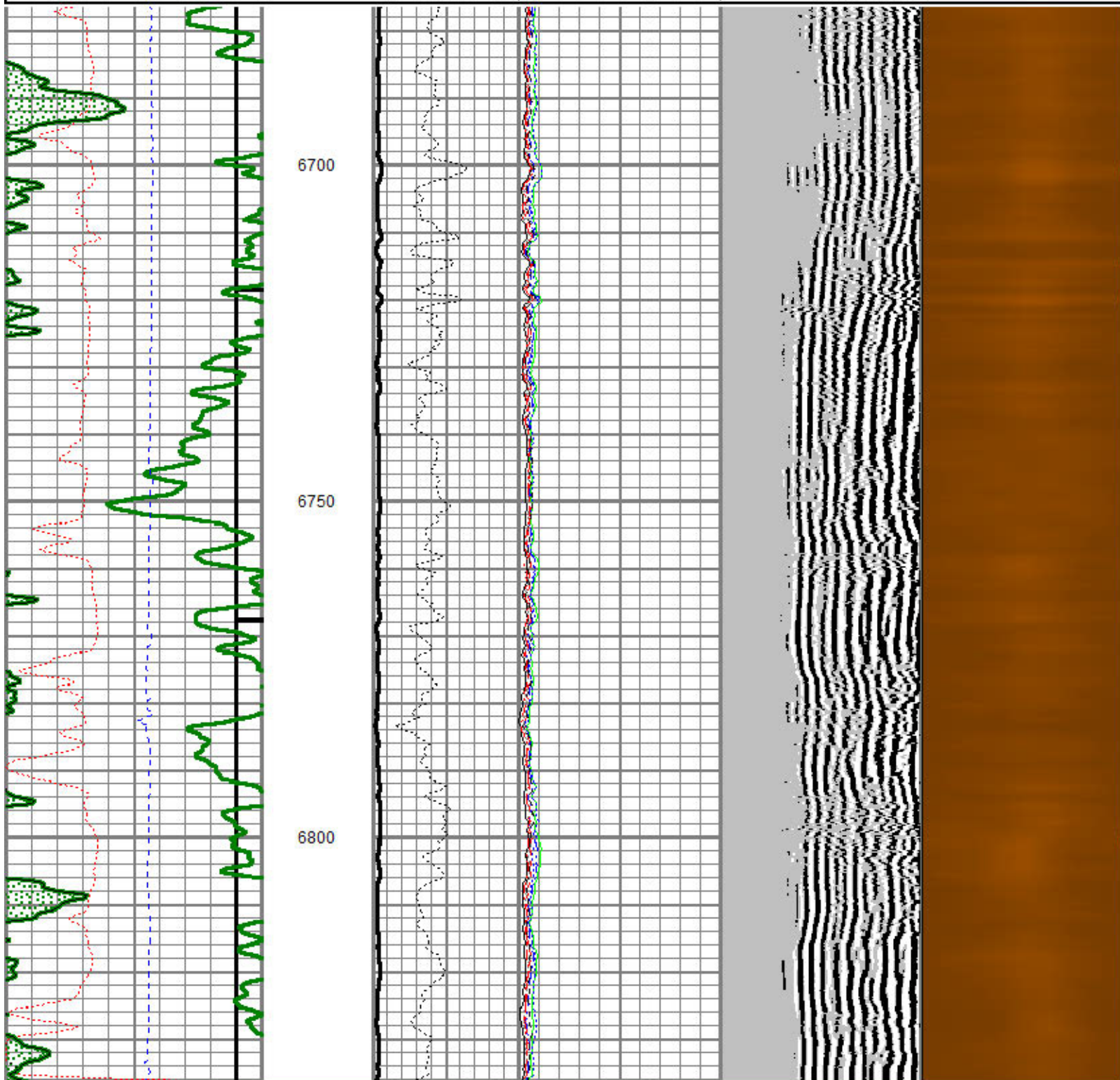
WIRELINE SERVICES

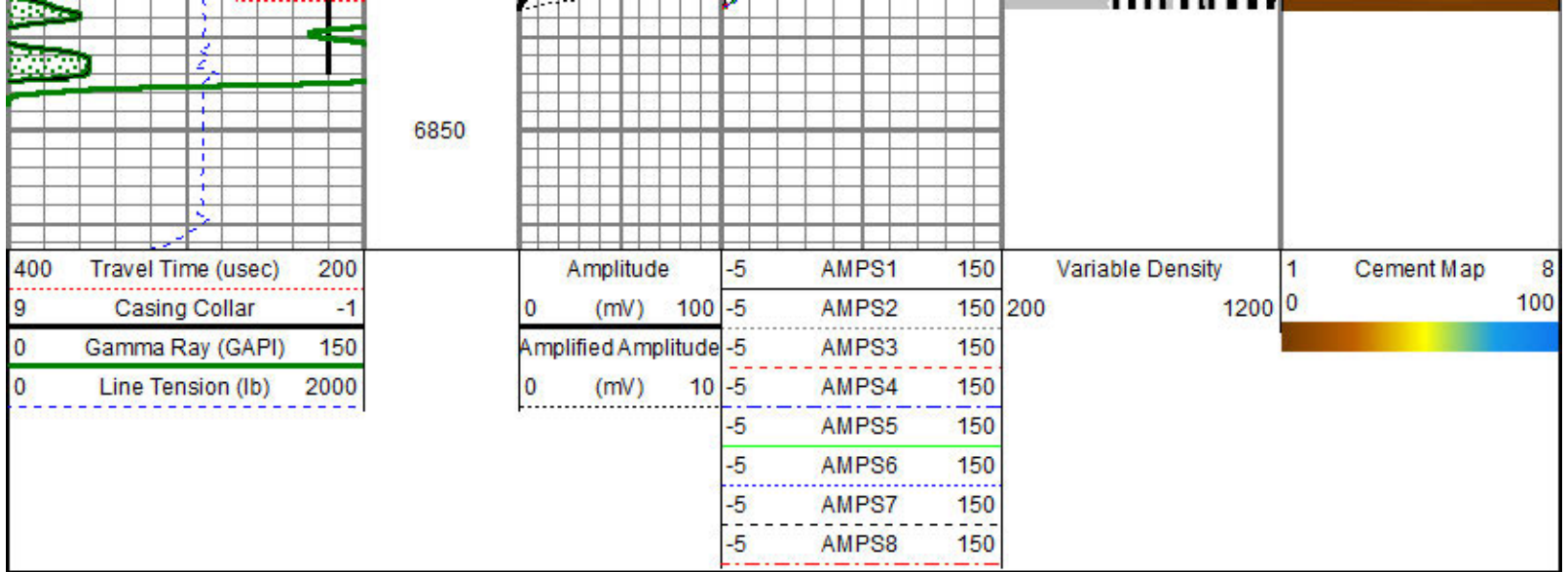
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 Presentation Format: scbl03
 Dataset Creation: Fri Mar 20 18:32:26 2015 by Log 7.0 B1
 Charted by: Depth in Feet scaled 1:240

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

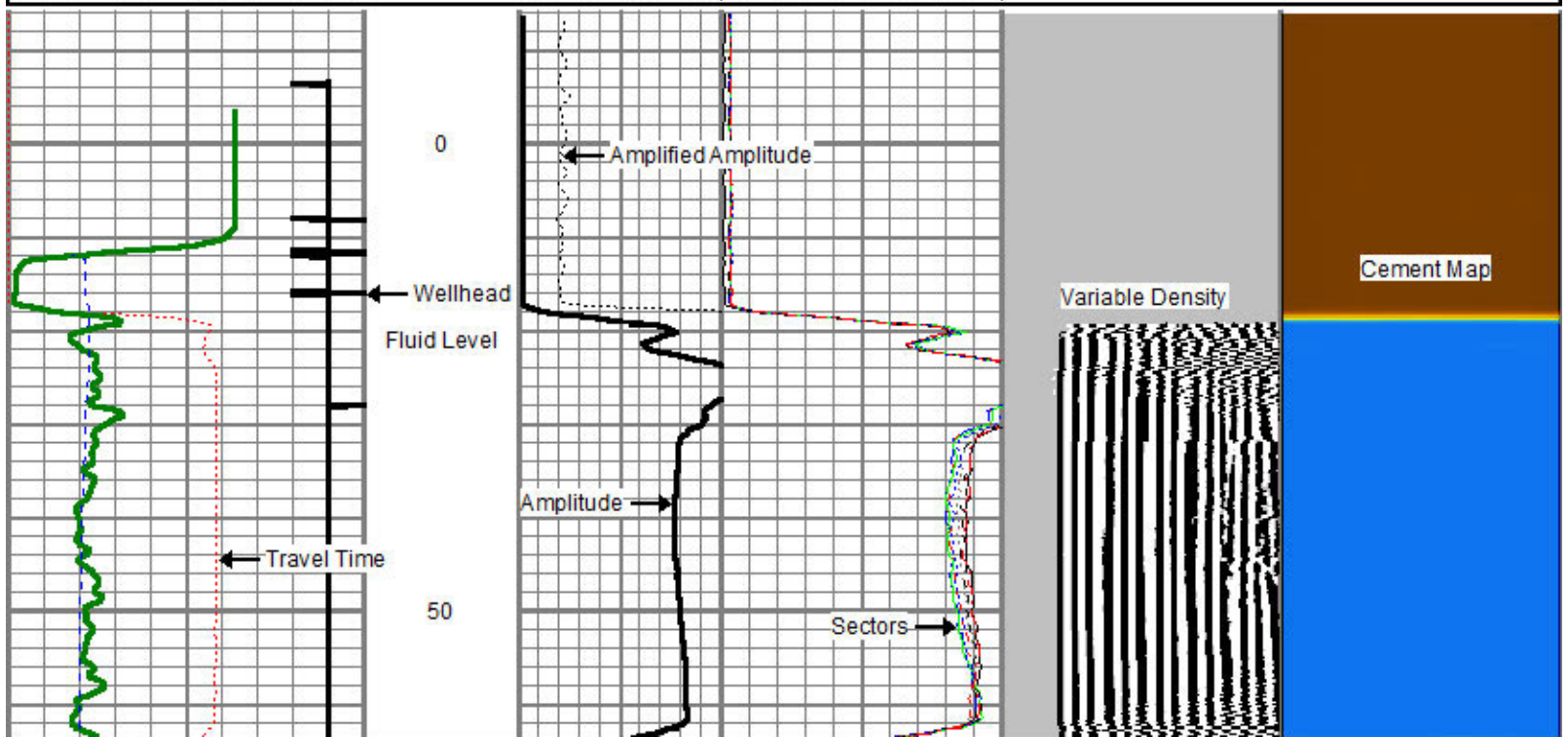
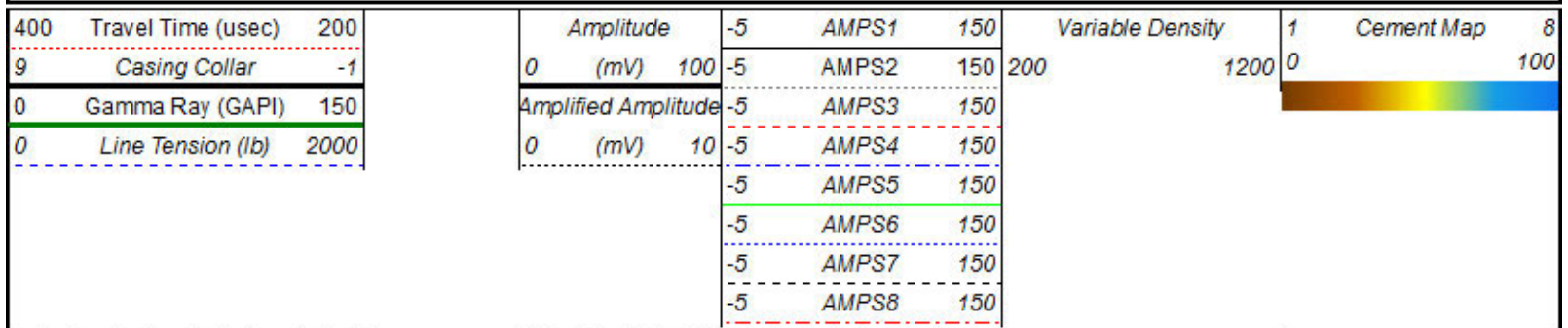
Variable Density	1	Cement Map	8
200	1200	0	100



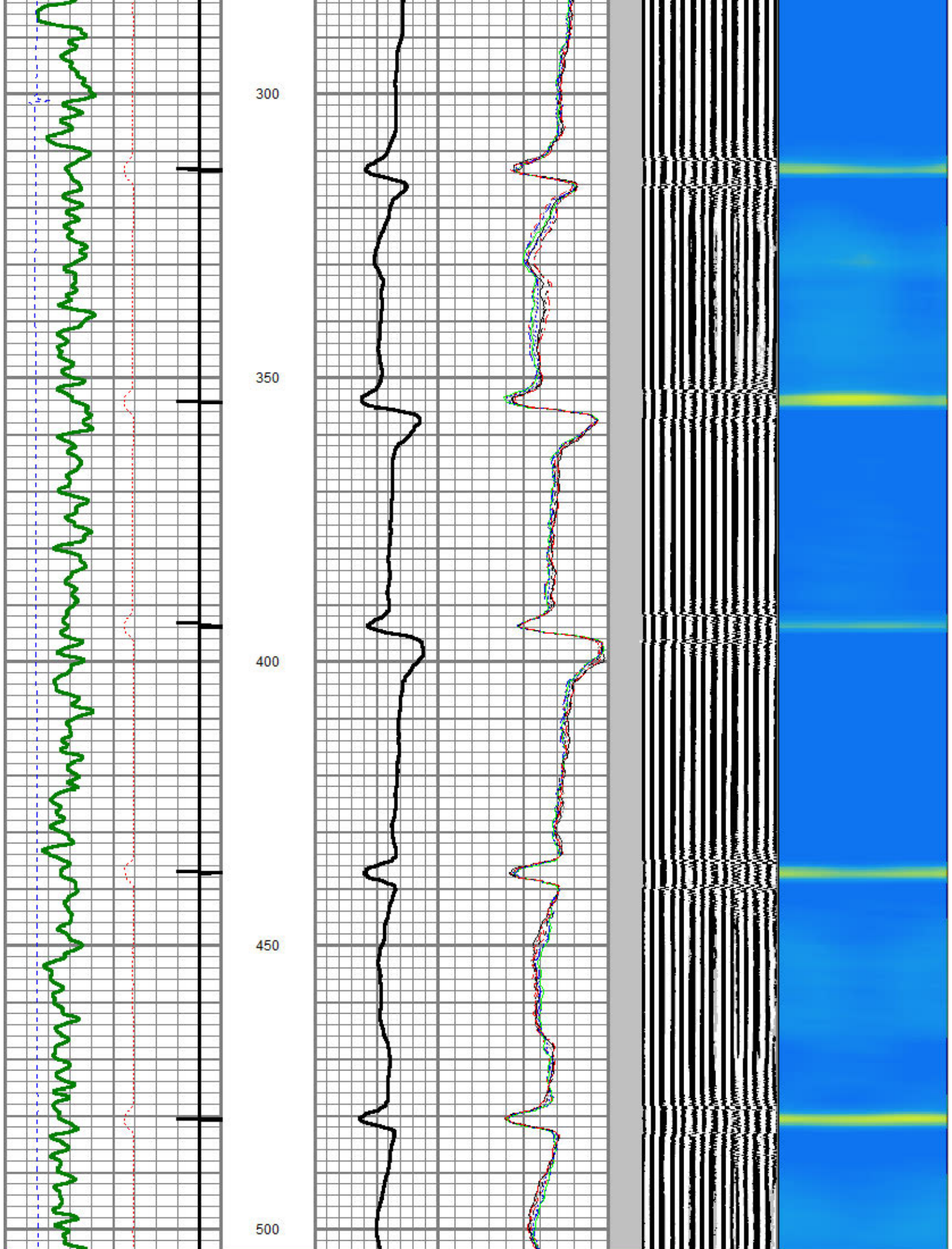


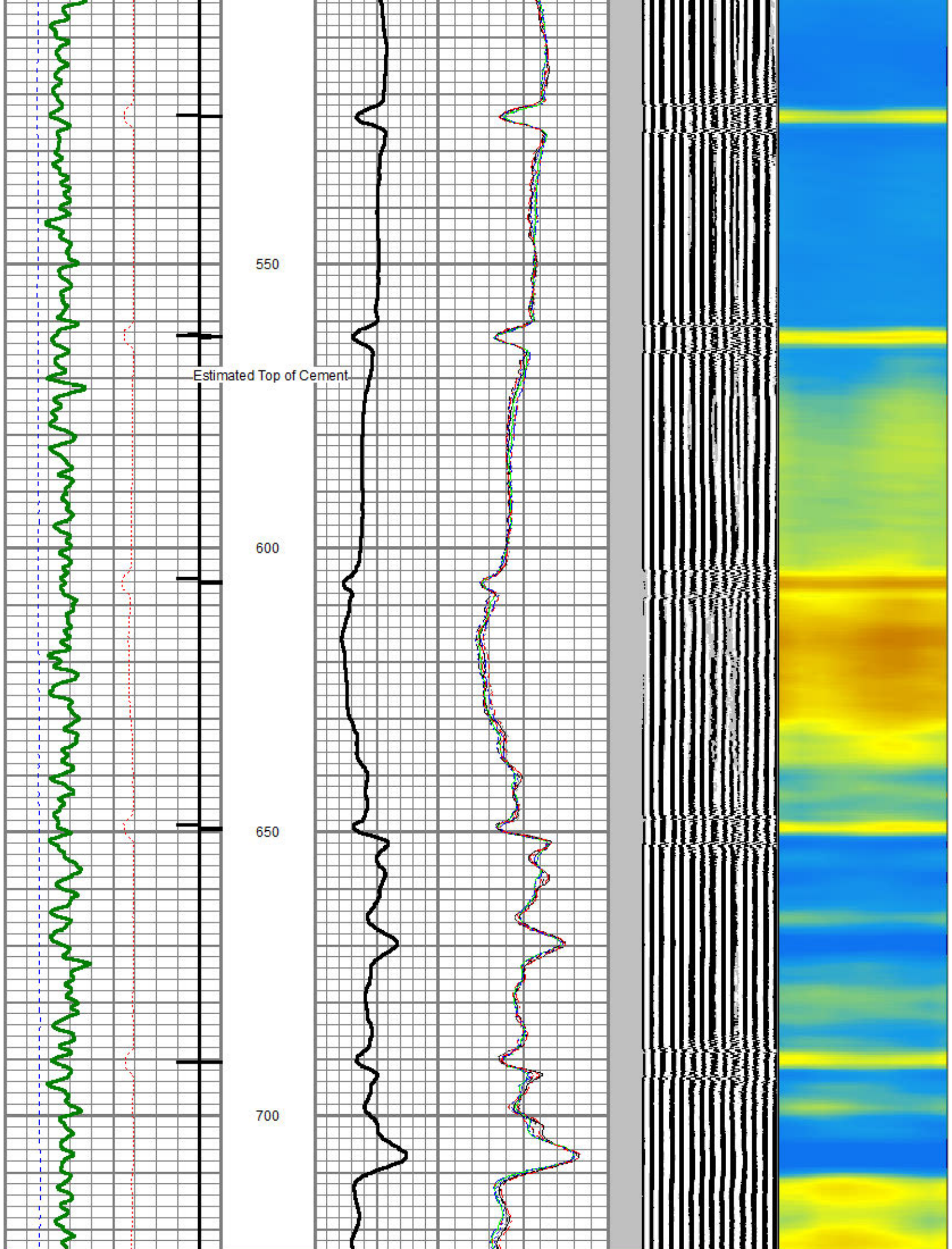
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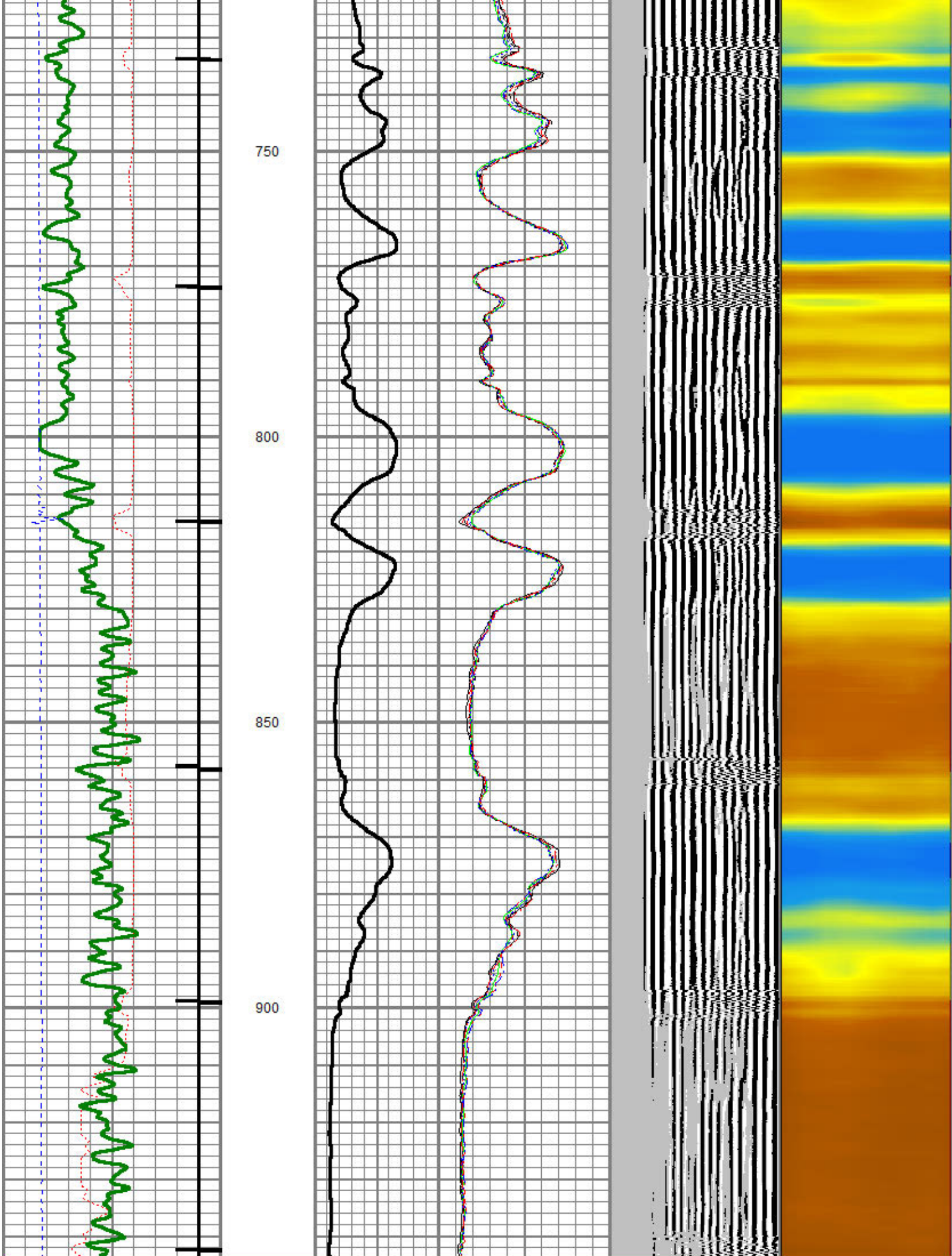
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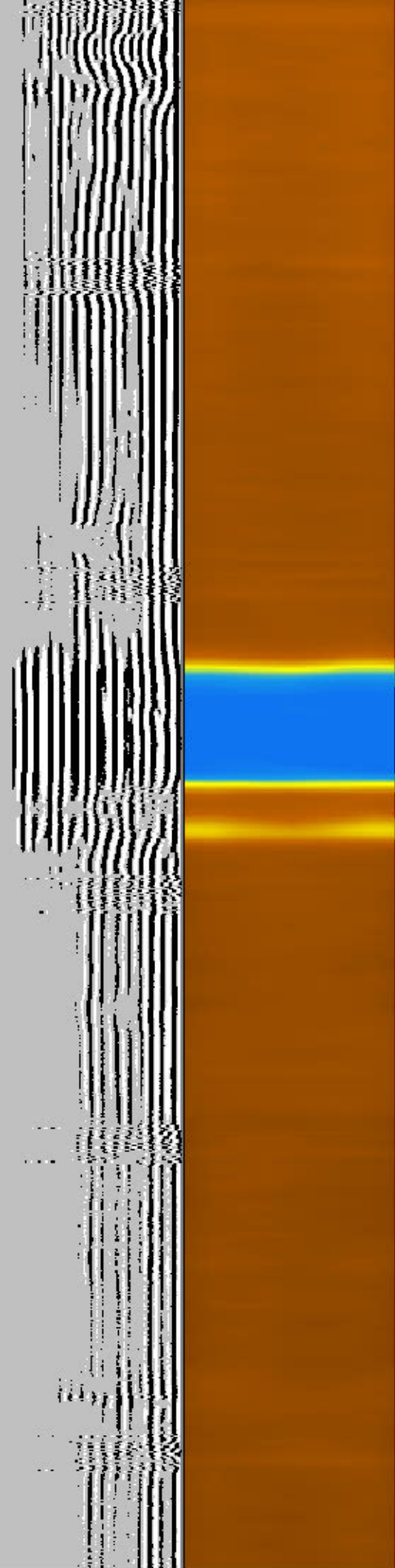
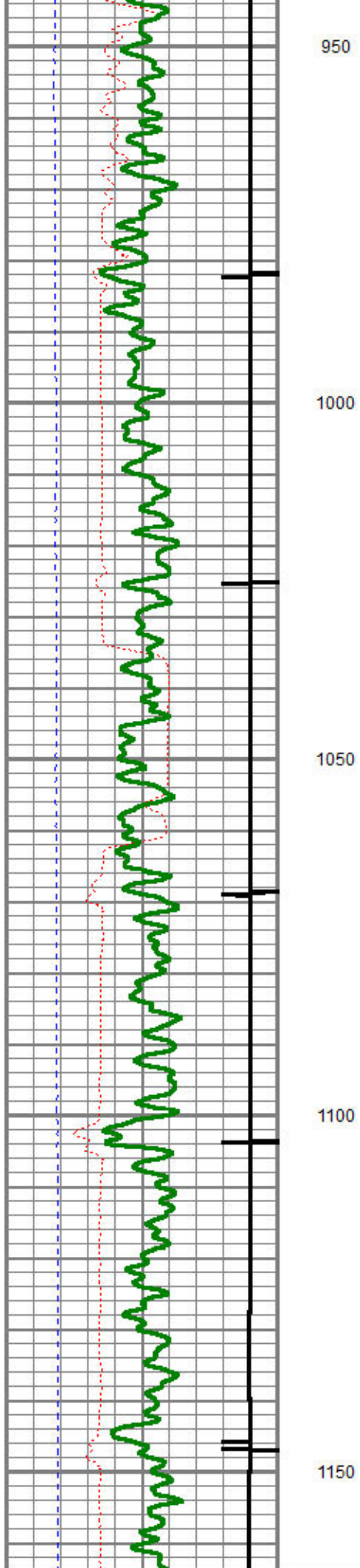


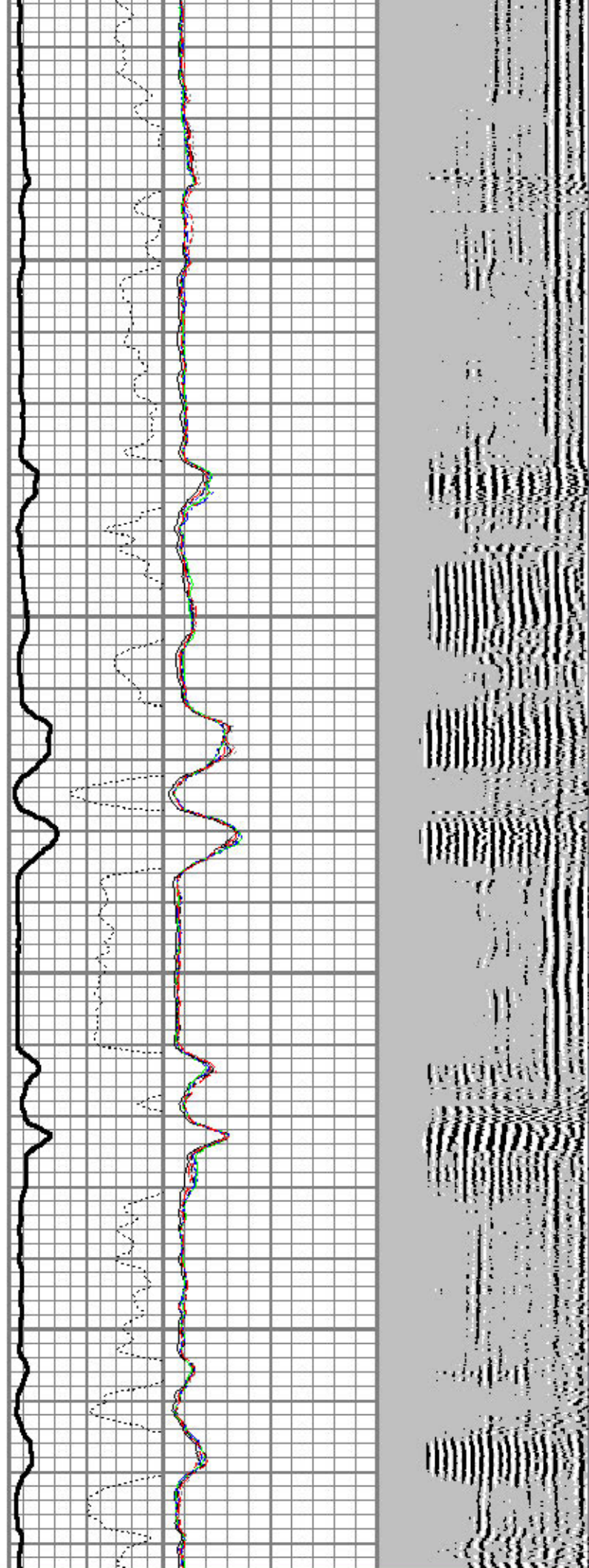
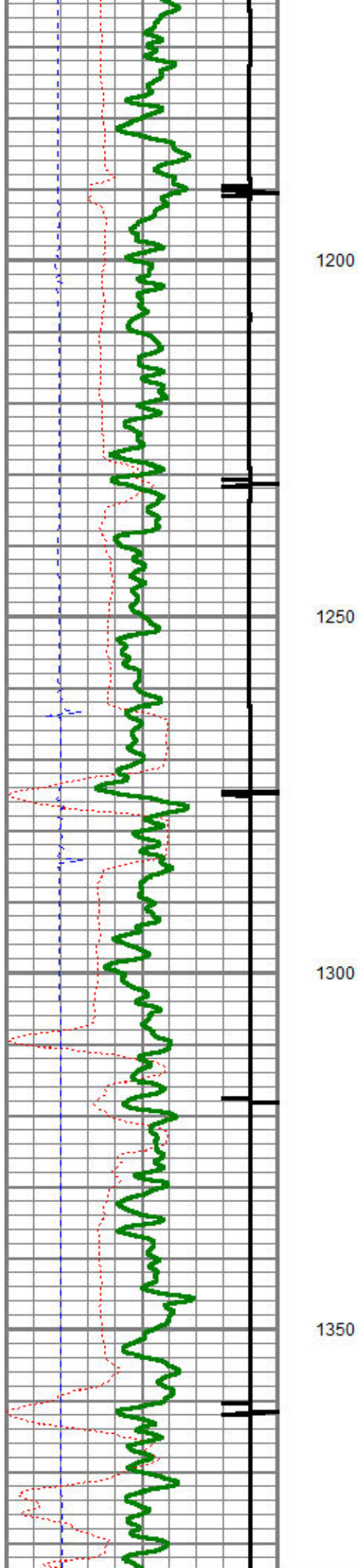


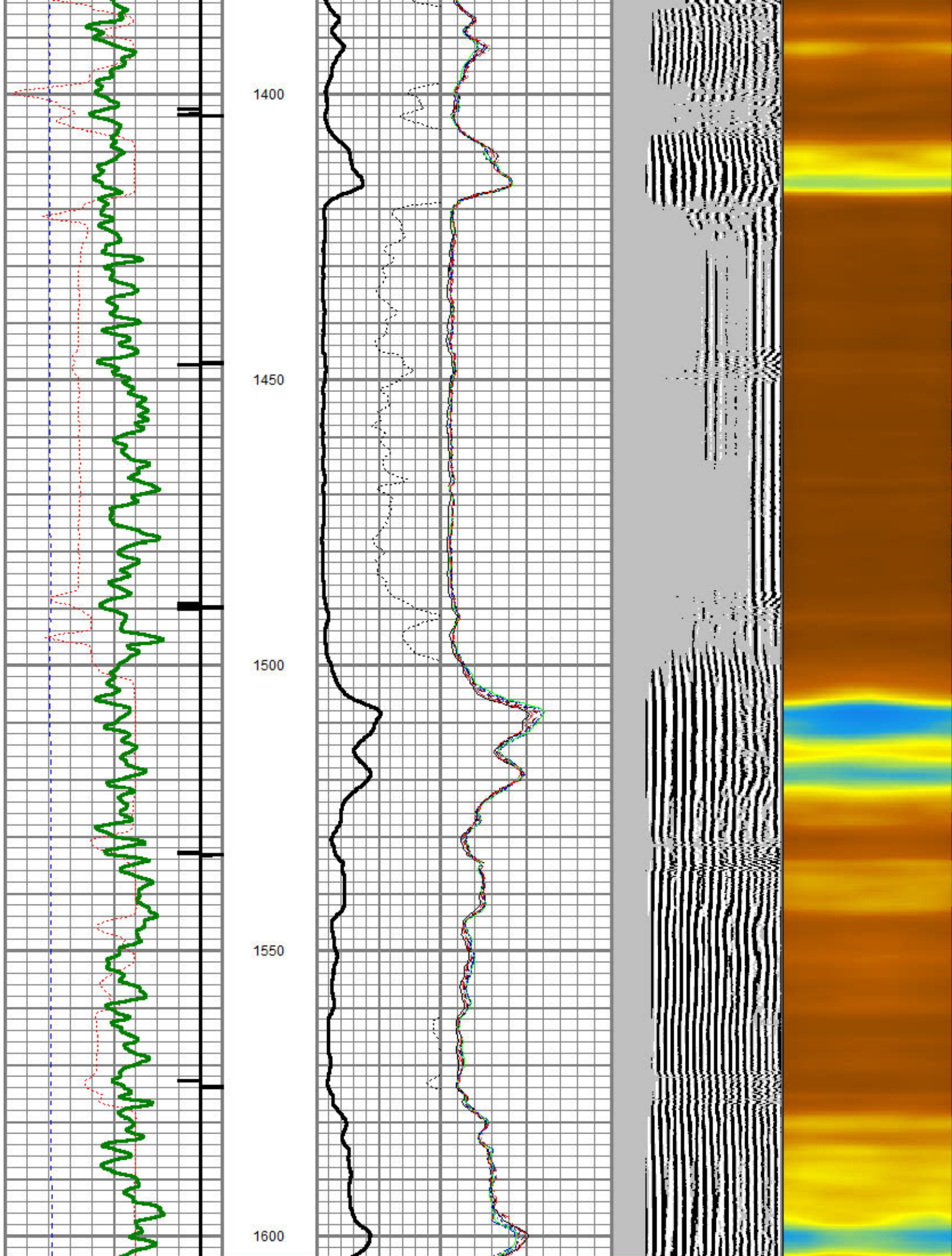


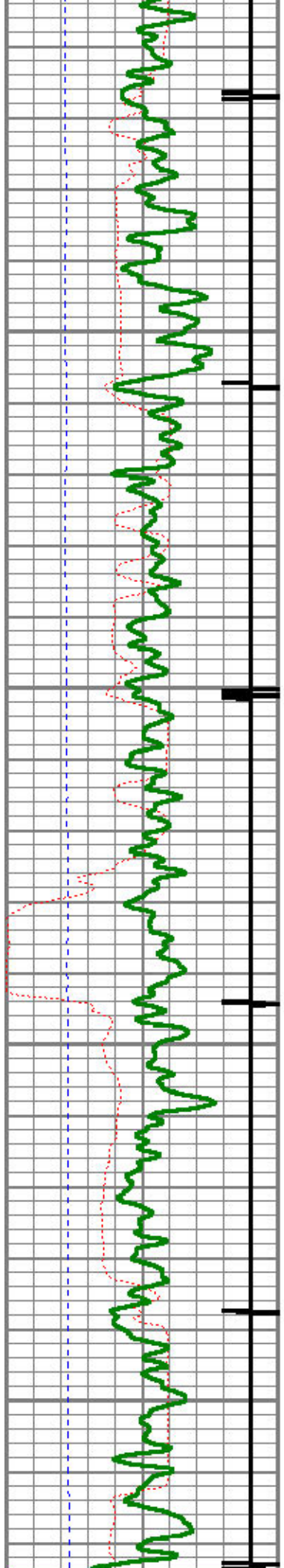










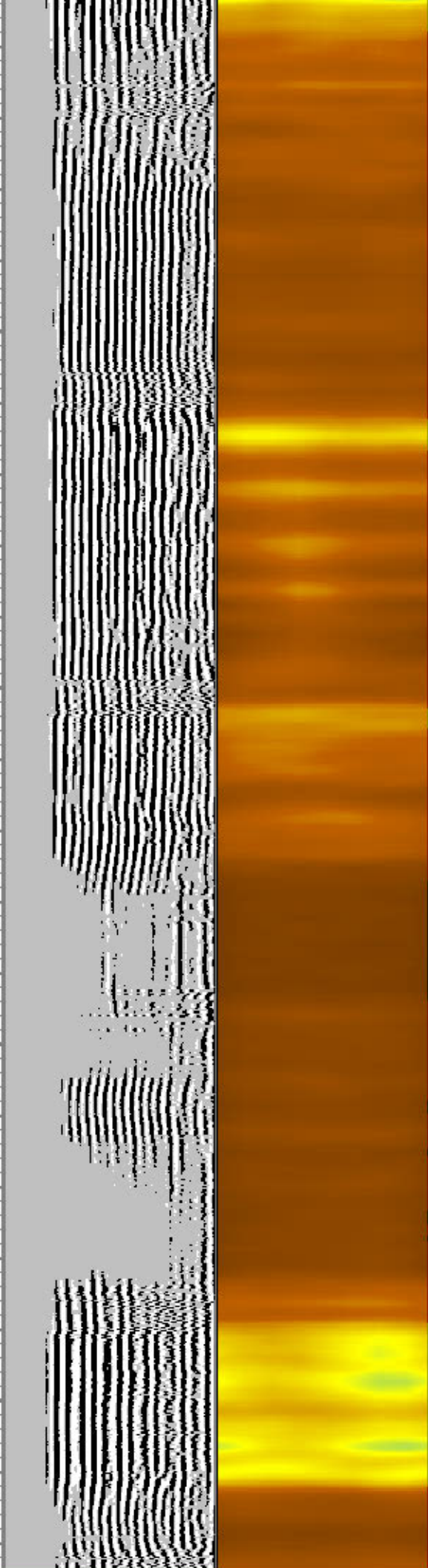
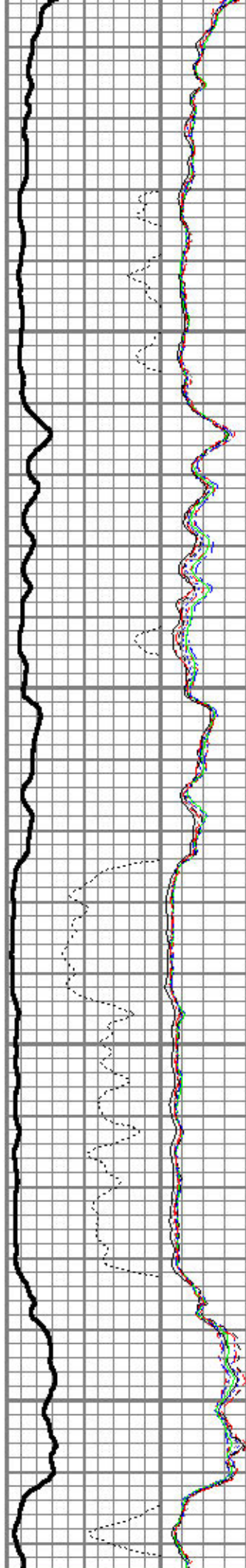


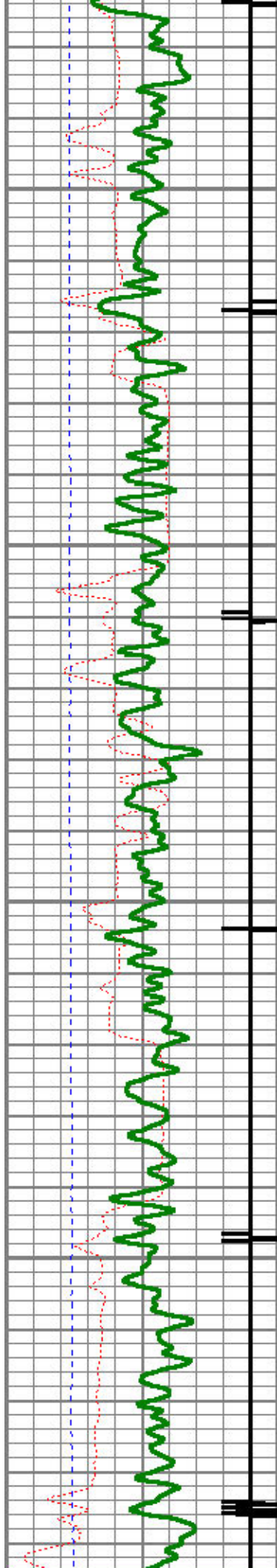
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1700

1750

1800



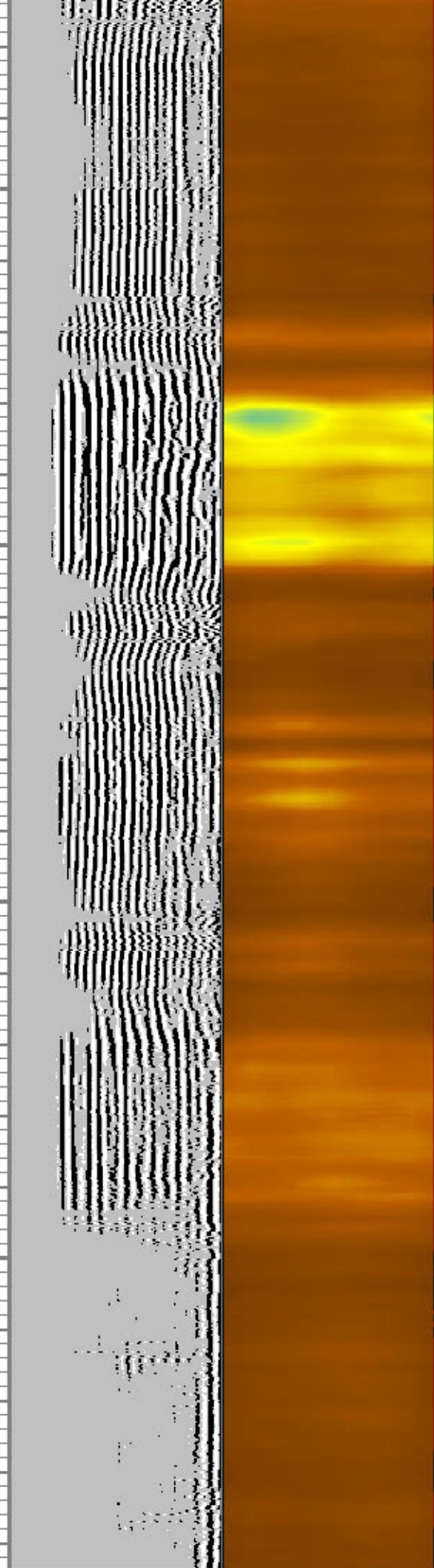
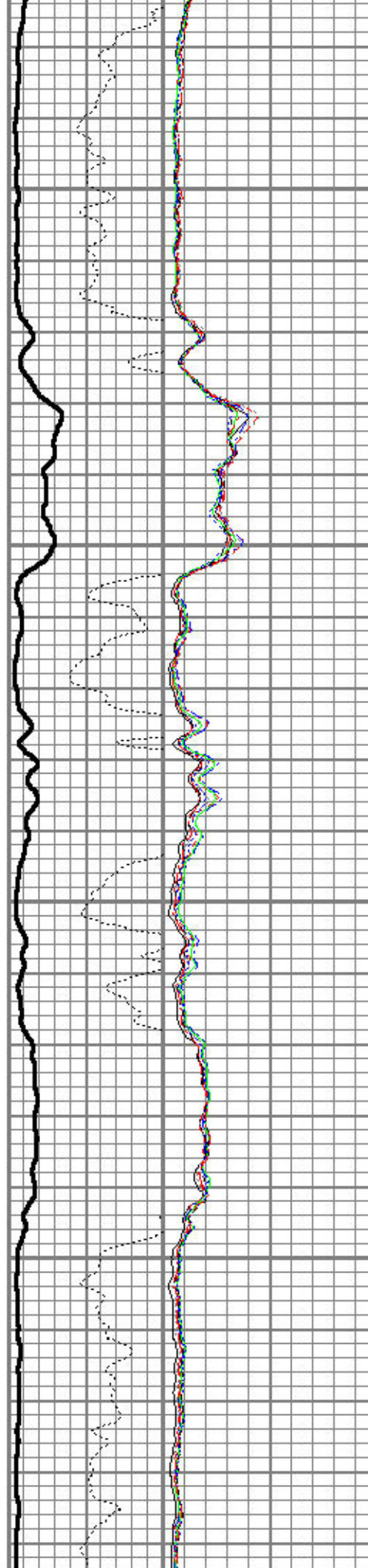


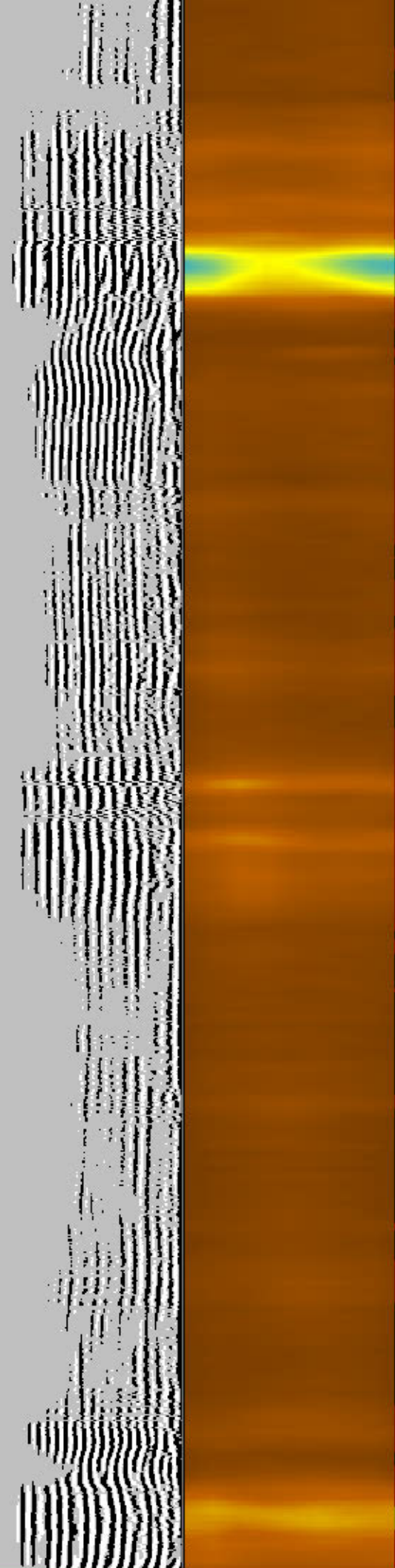
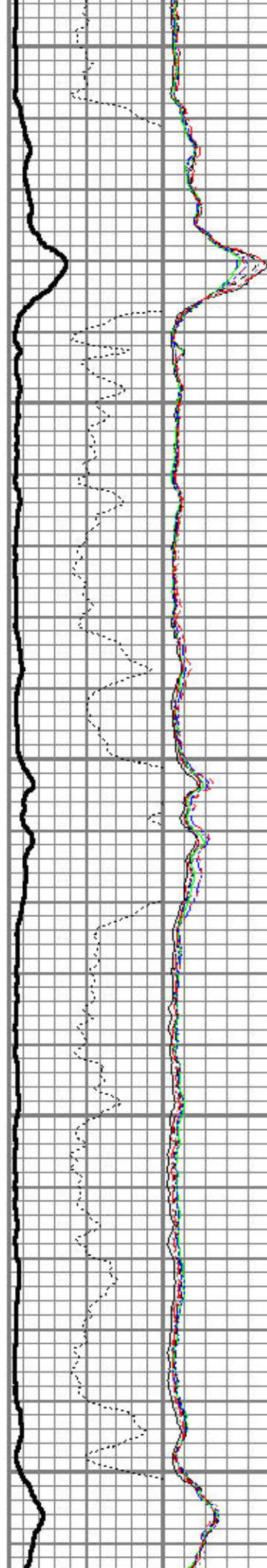
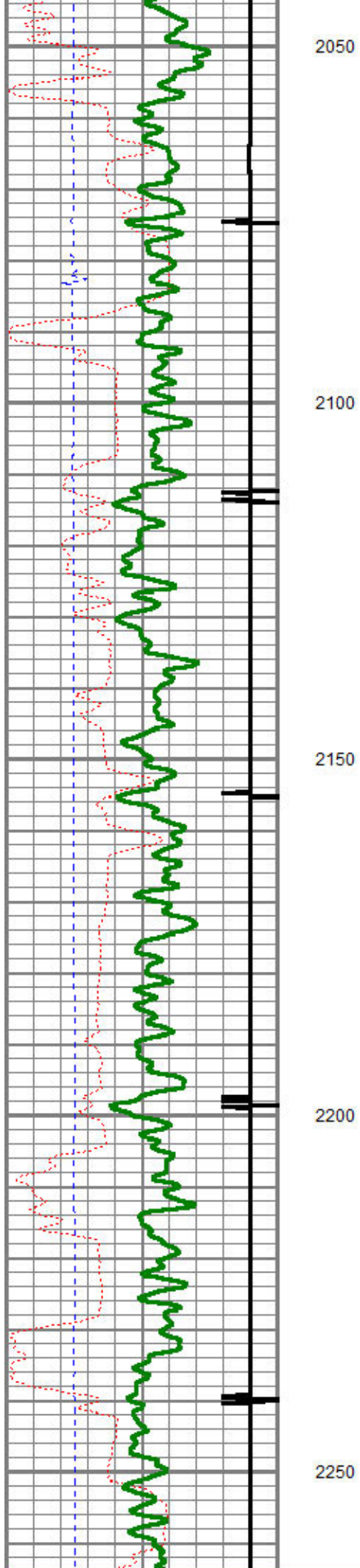
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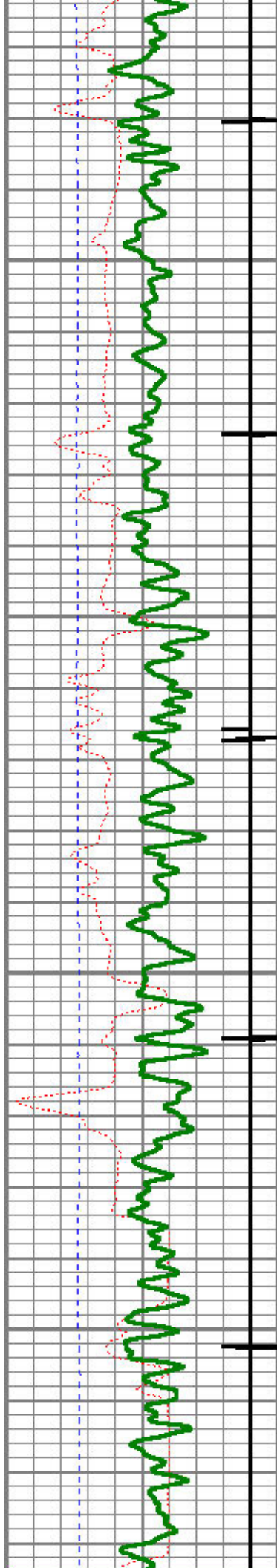
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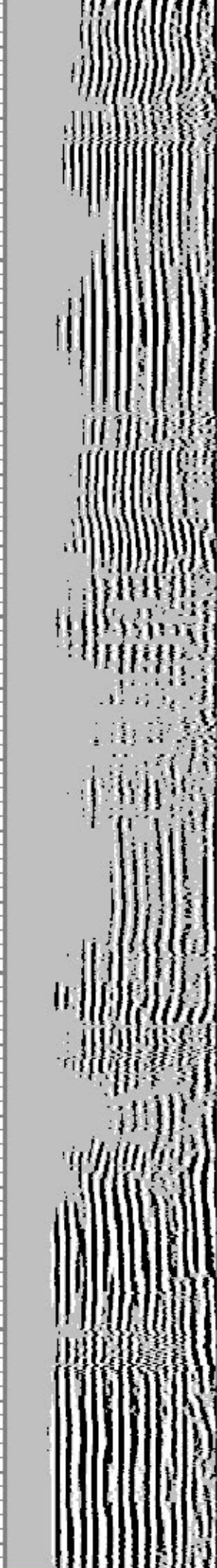
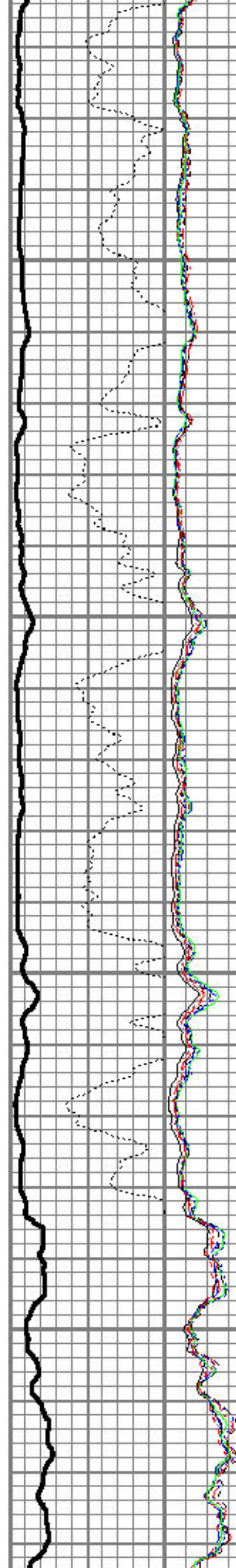


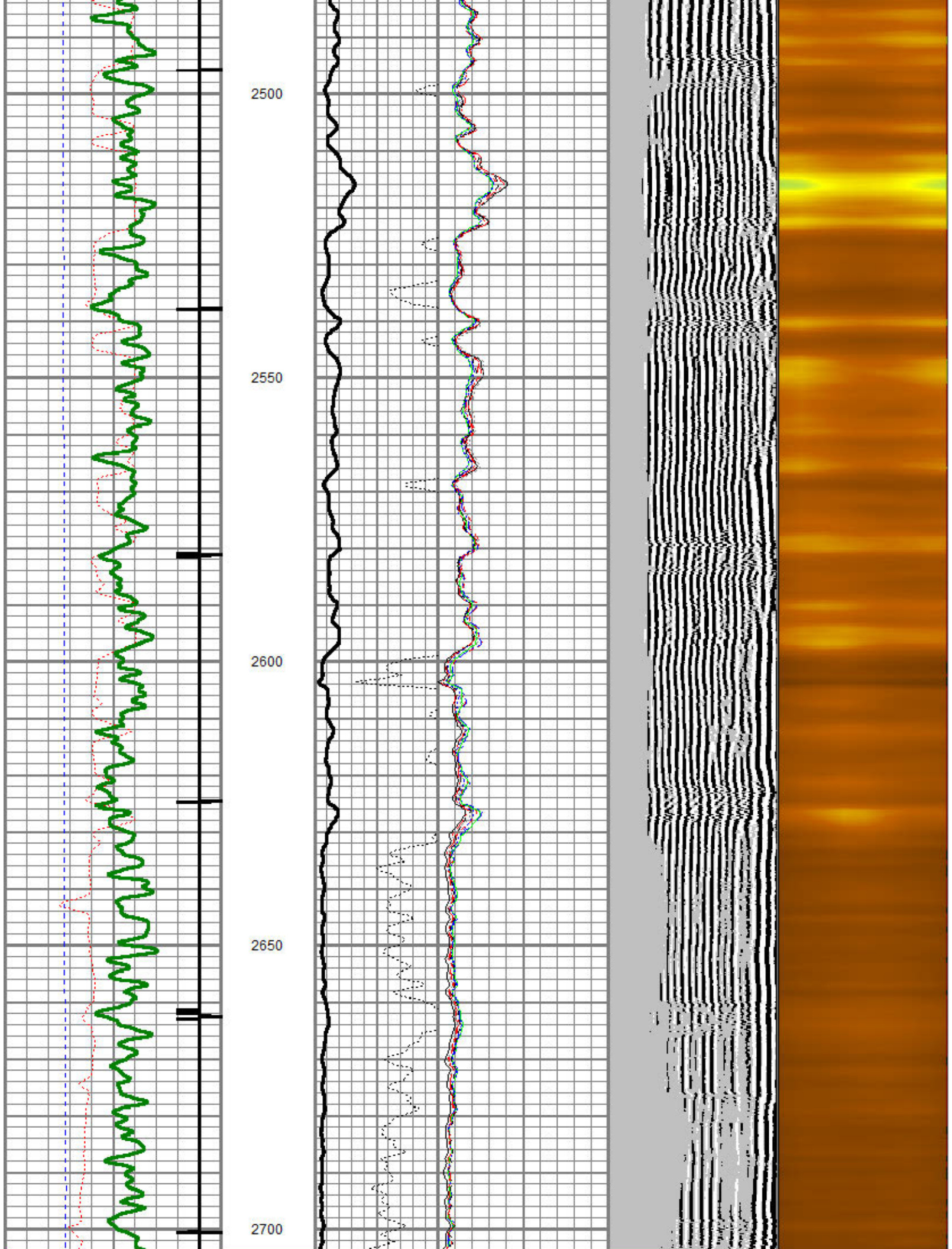
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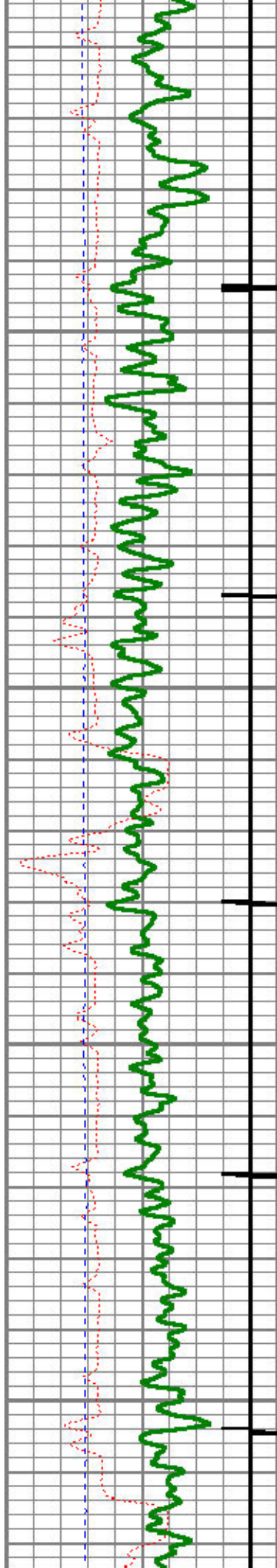
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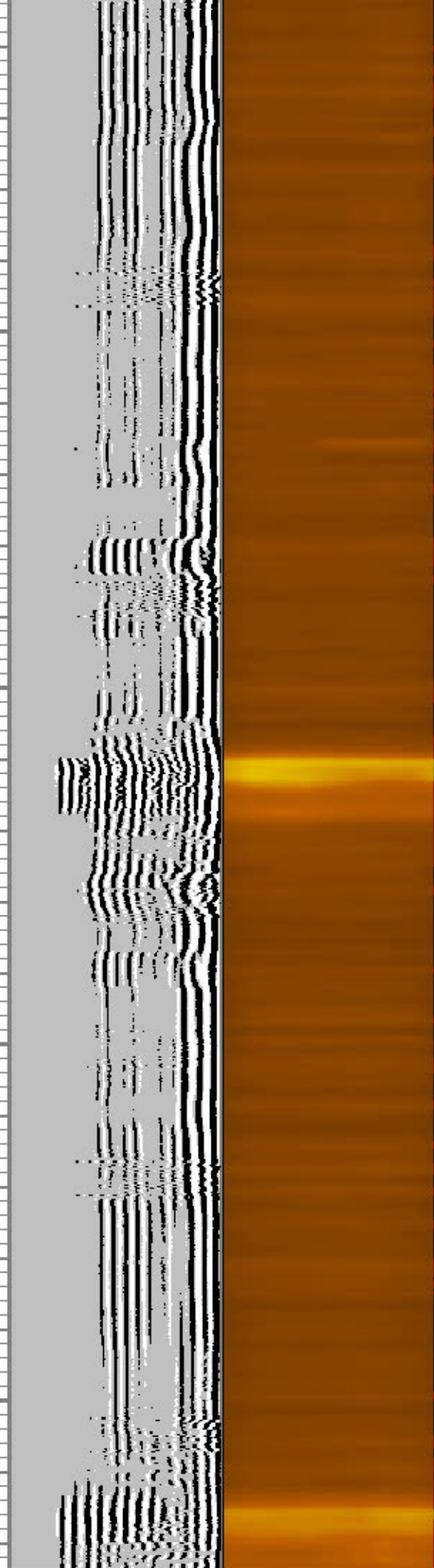
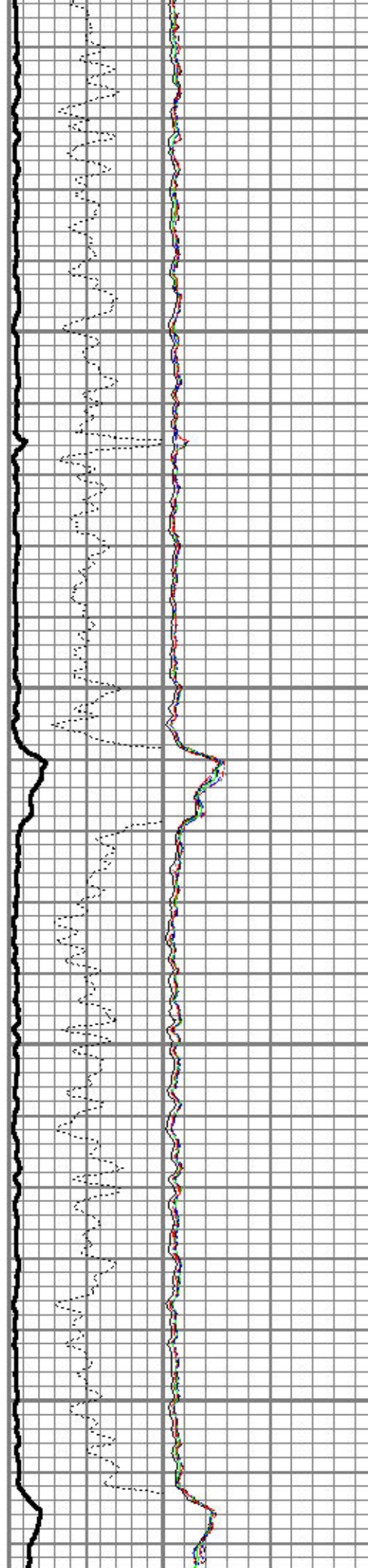


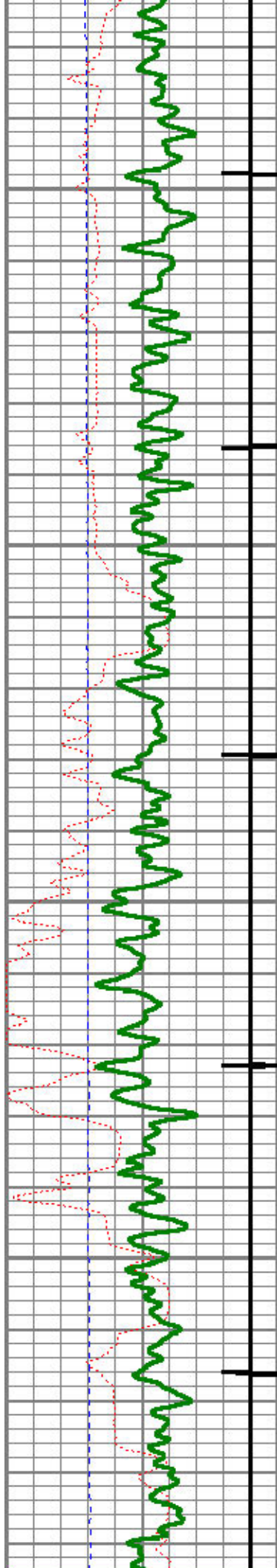
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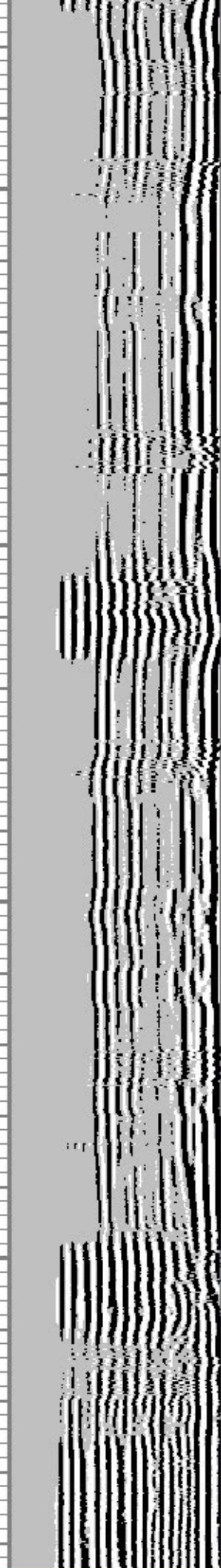
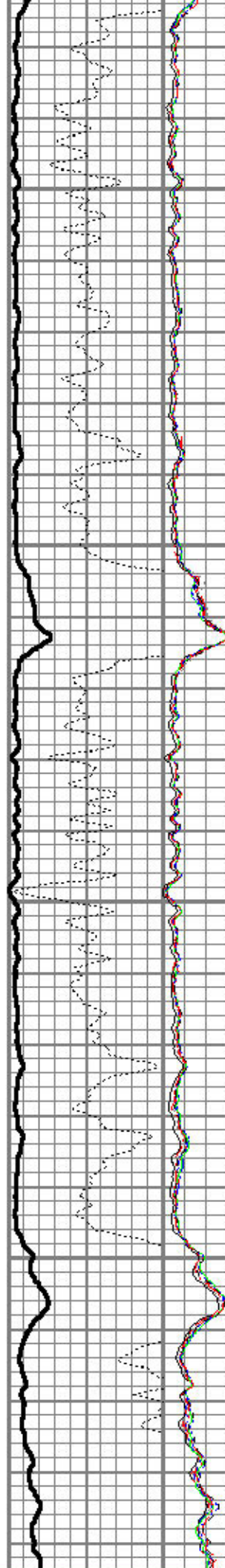


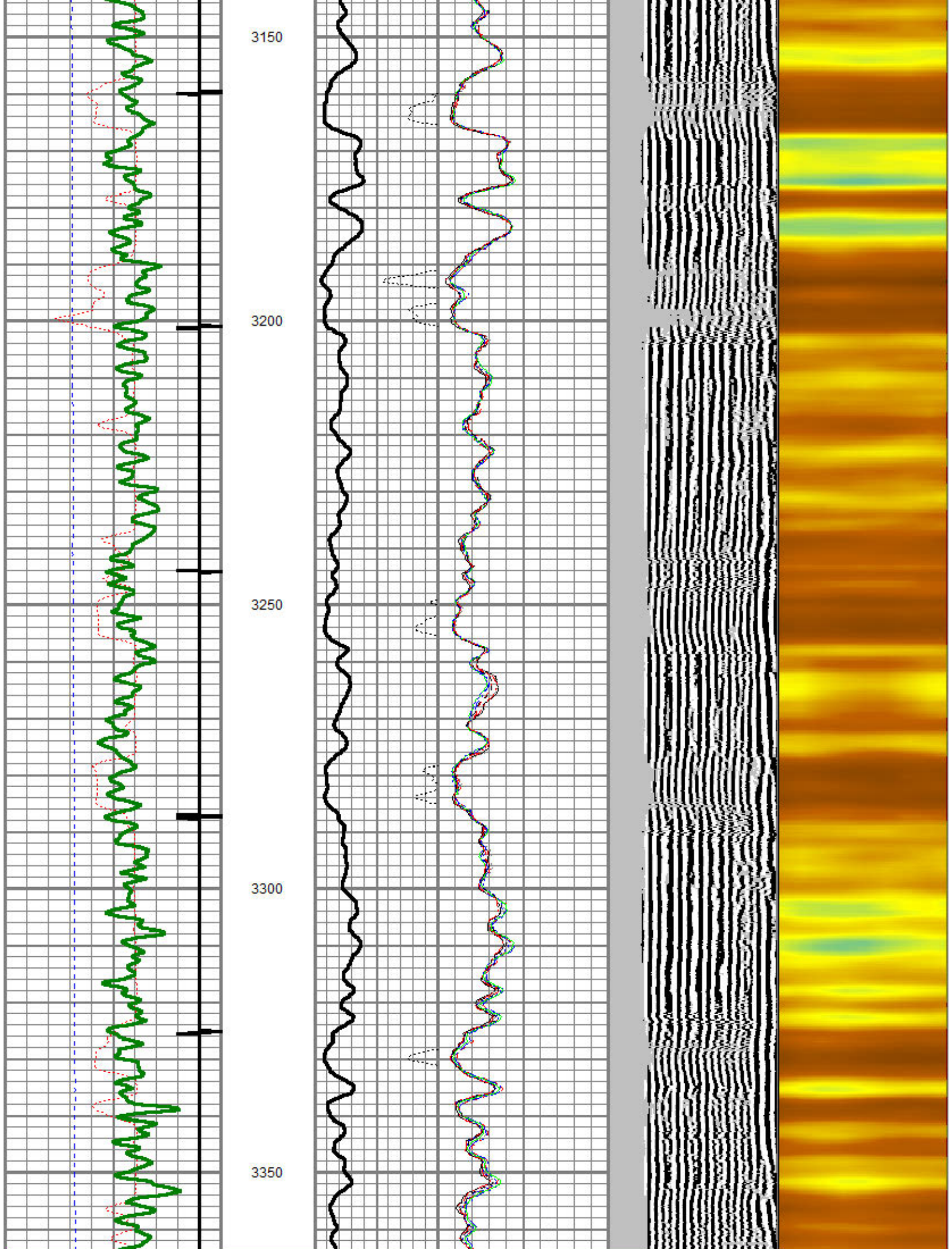
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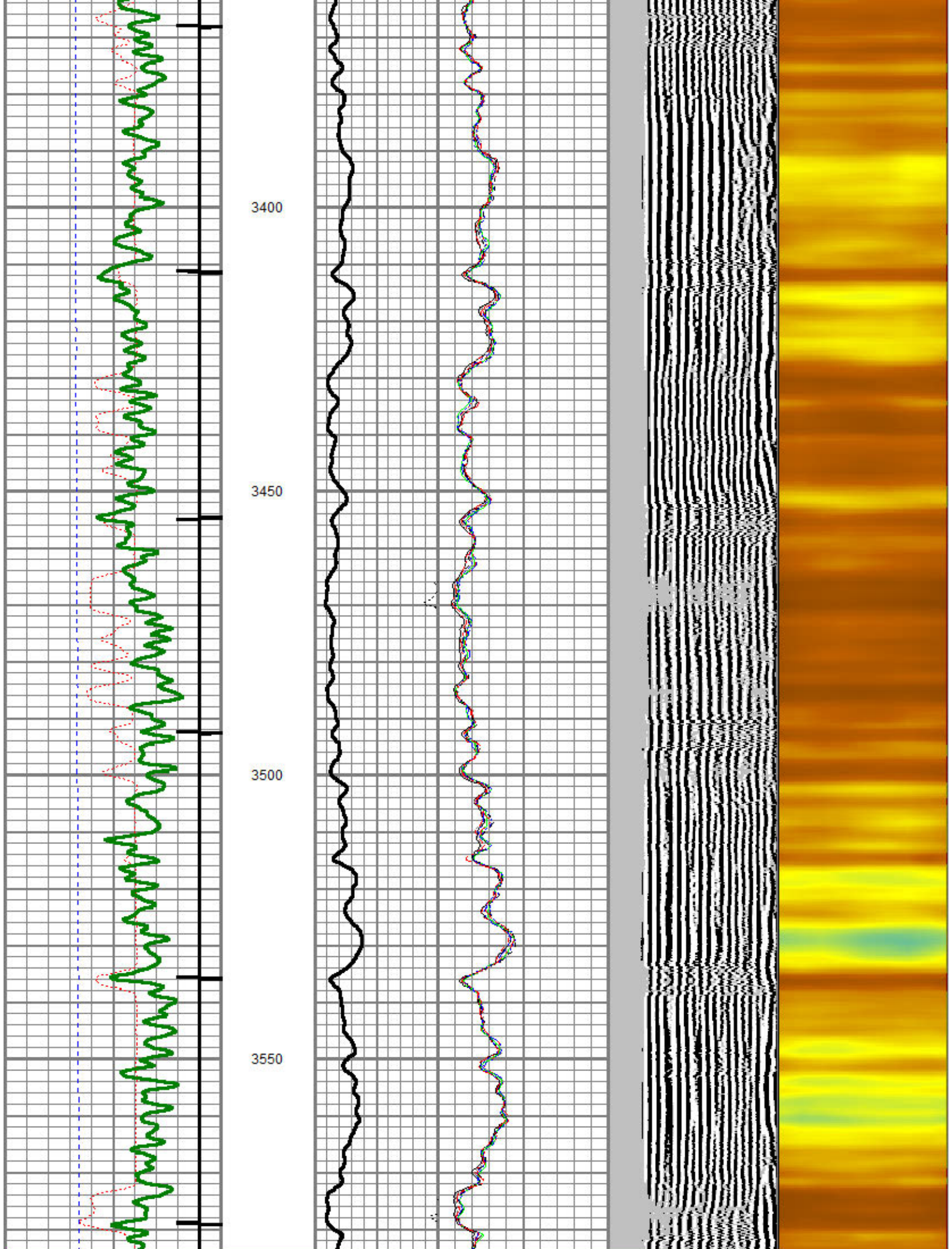
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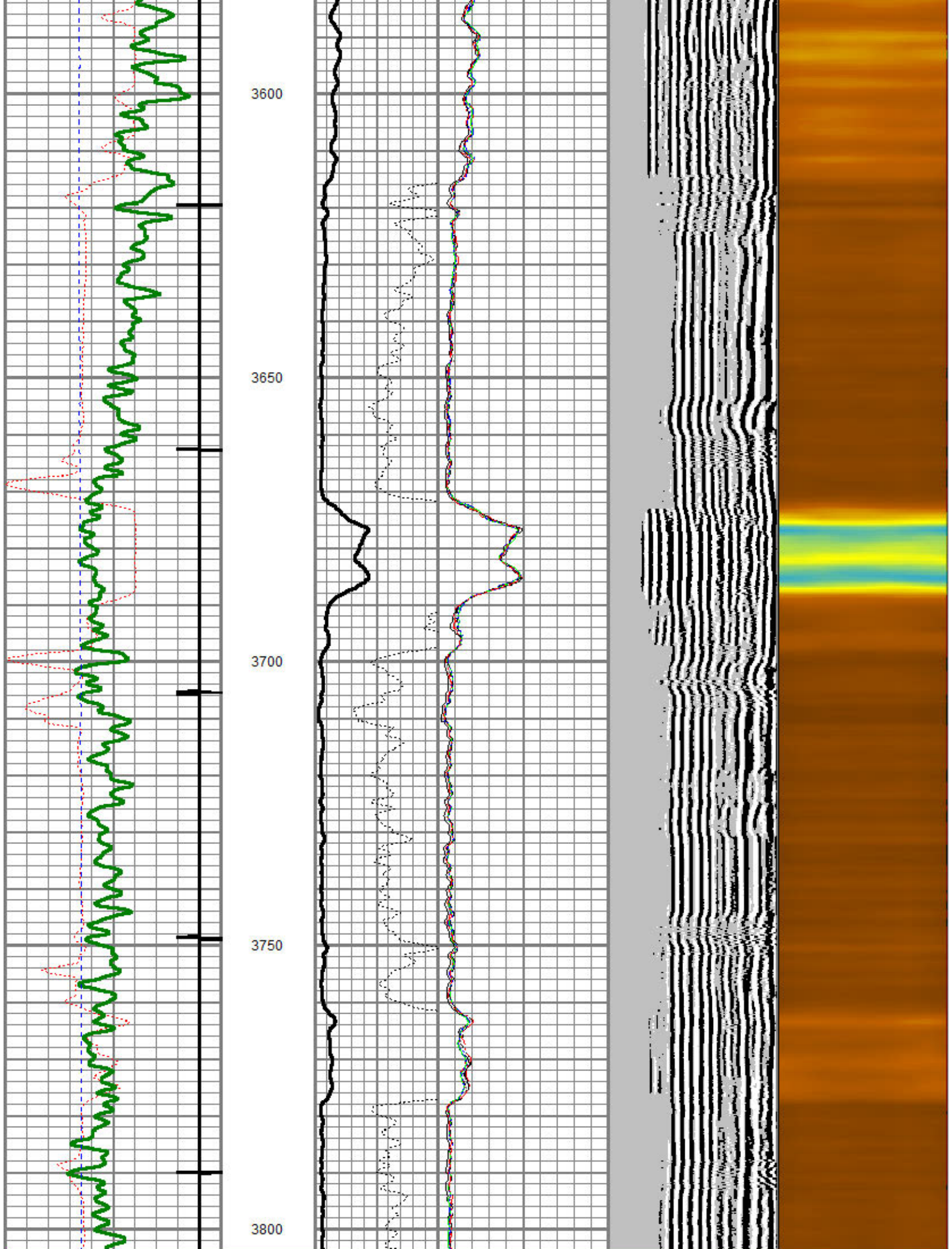
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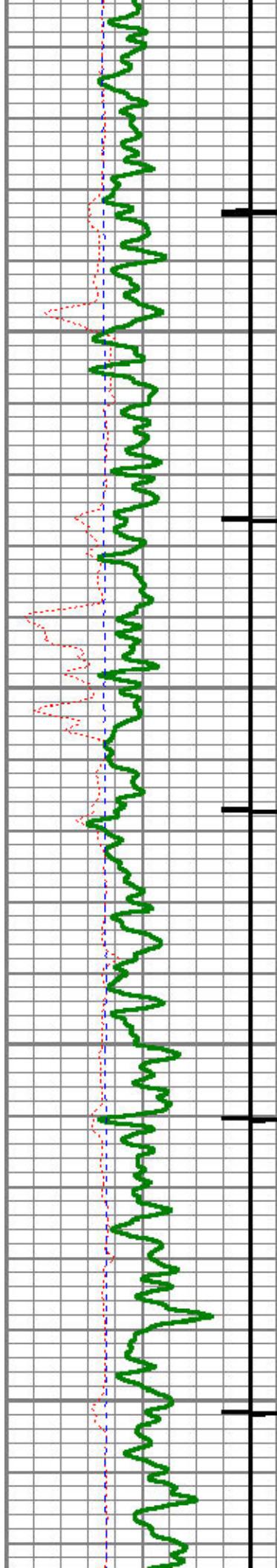
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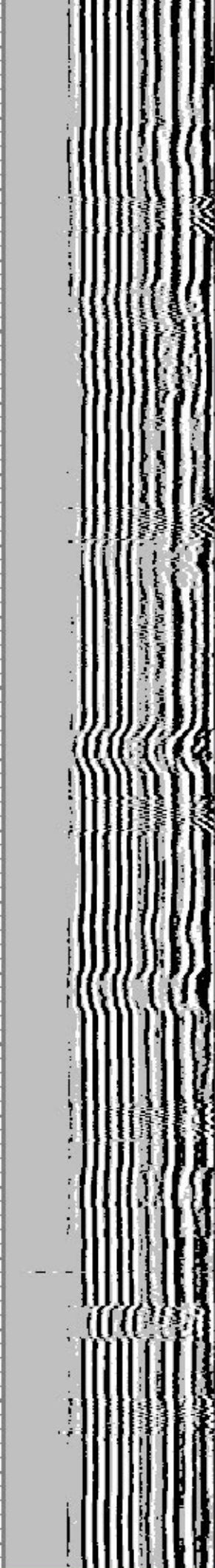
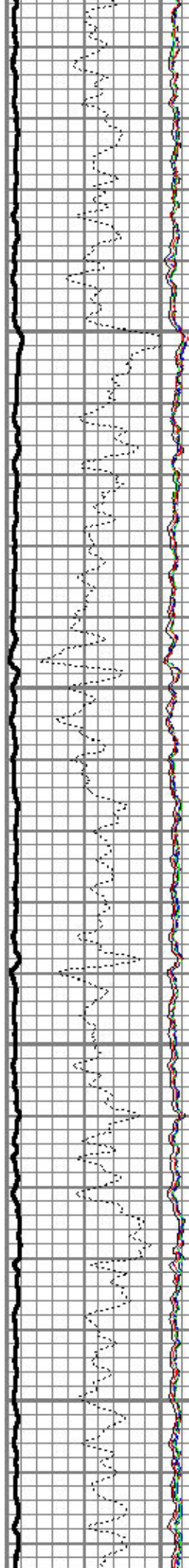


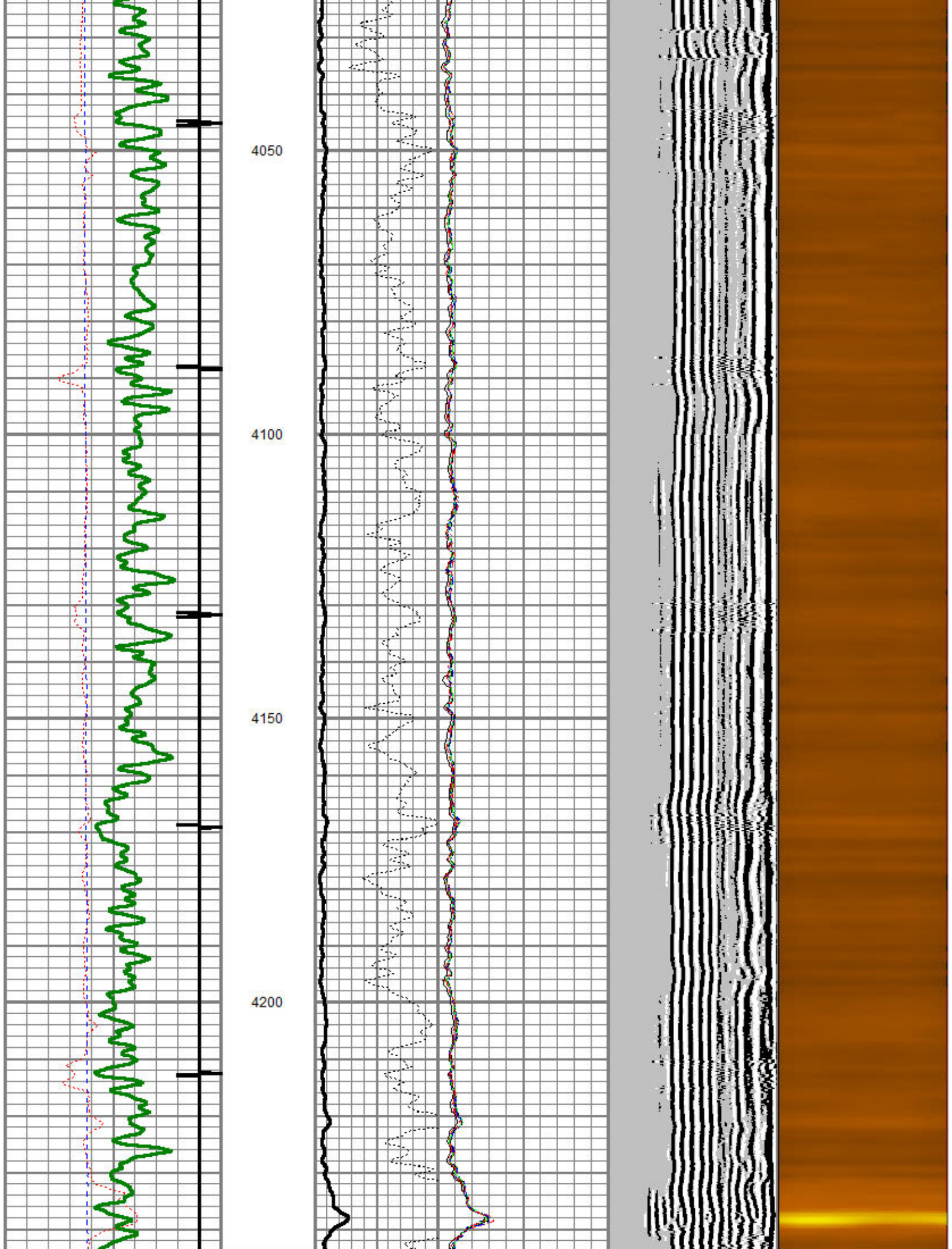
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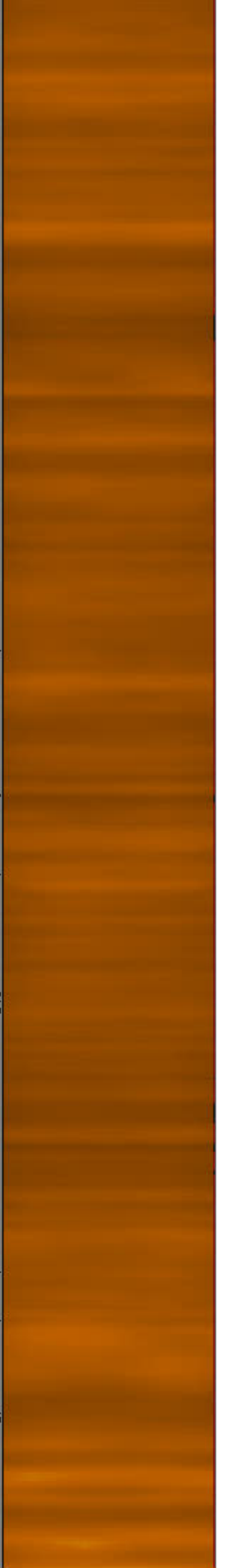
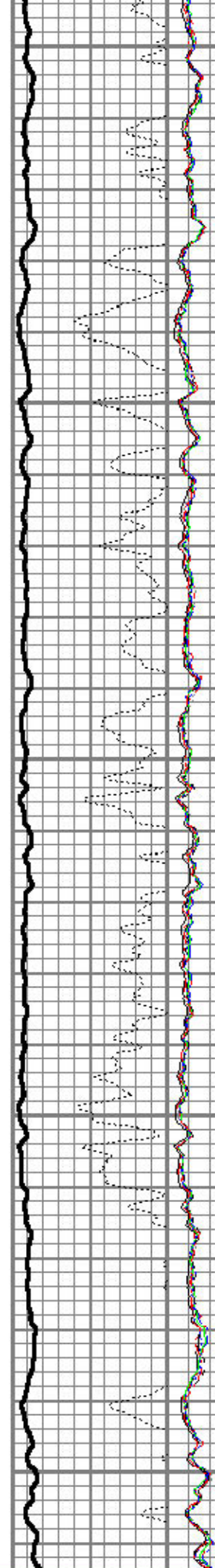
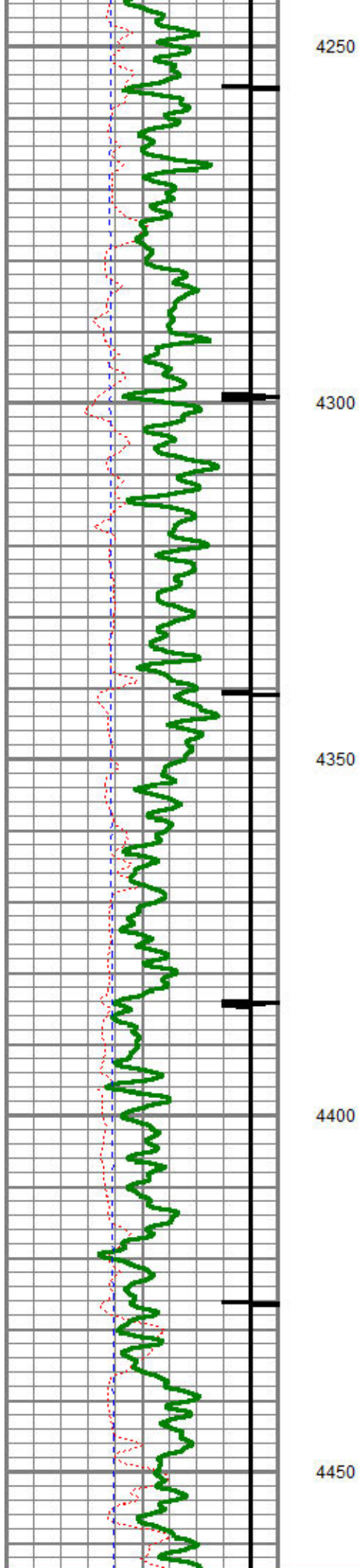
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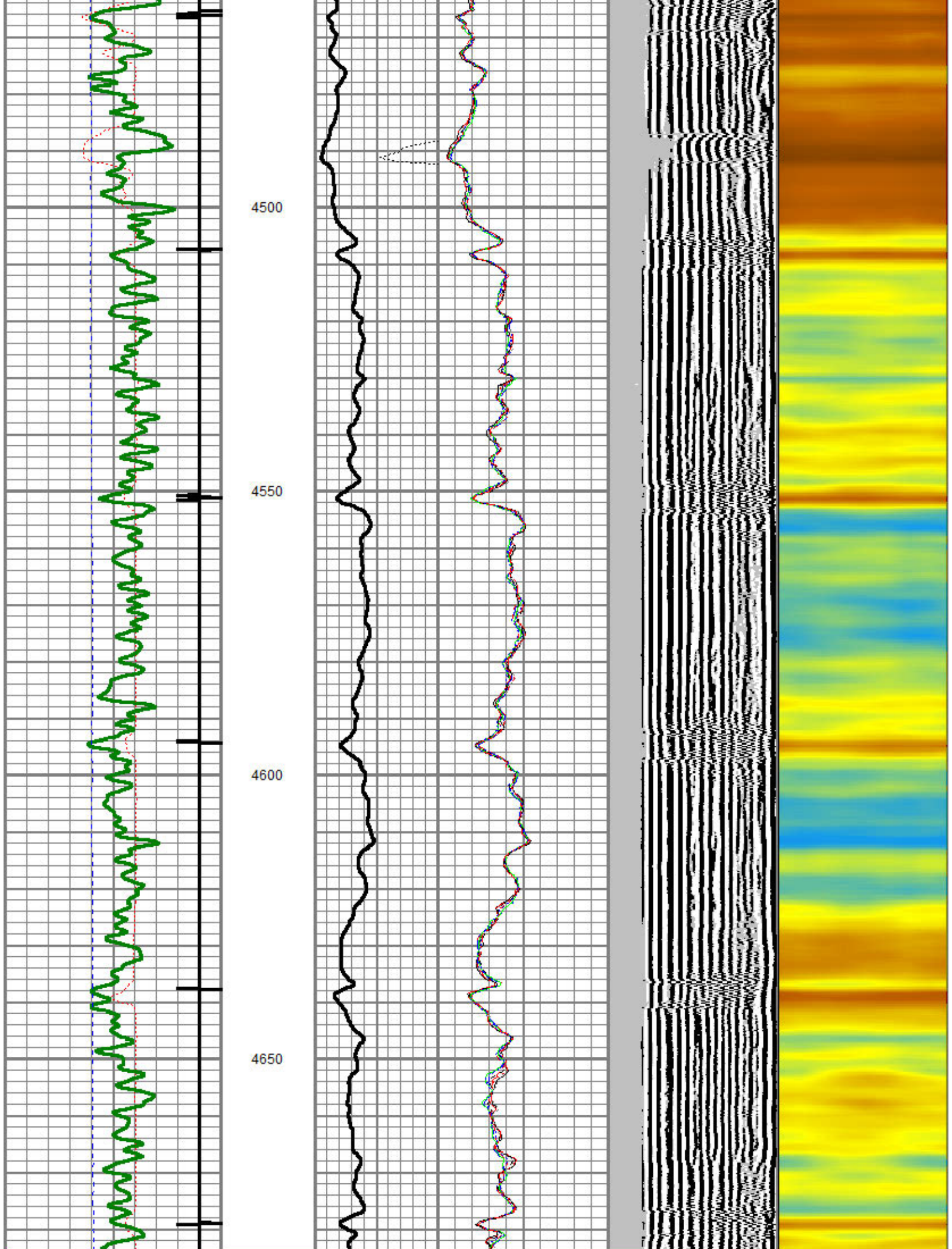
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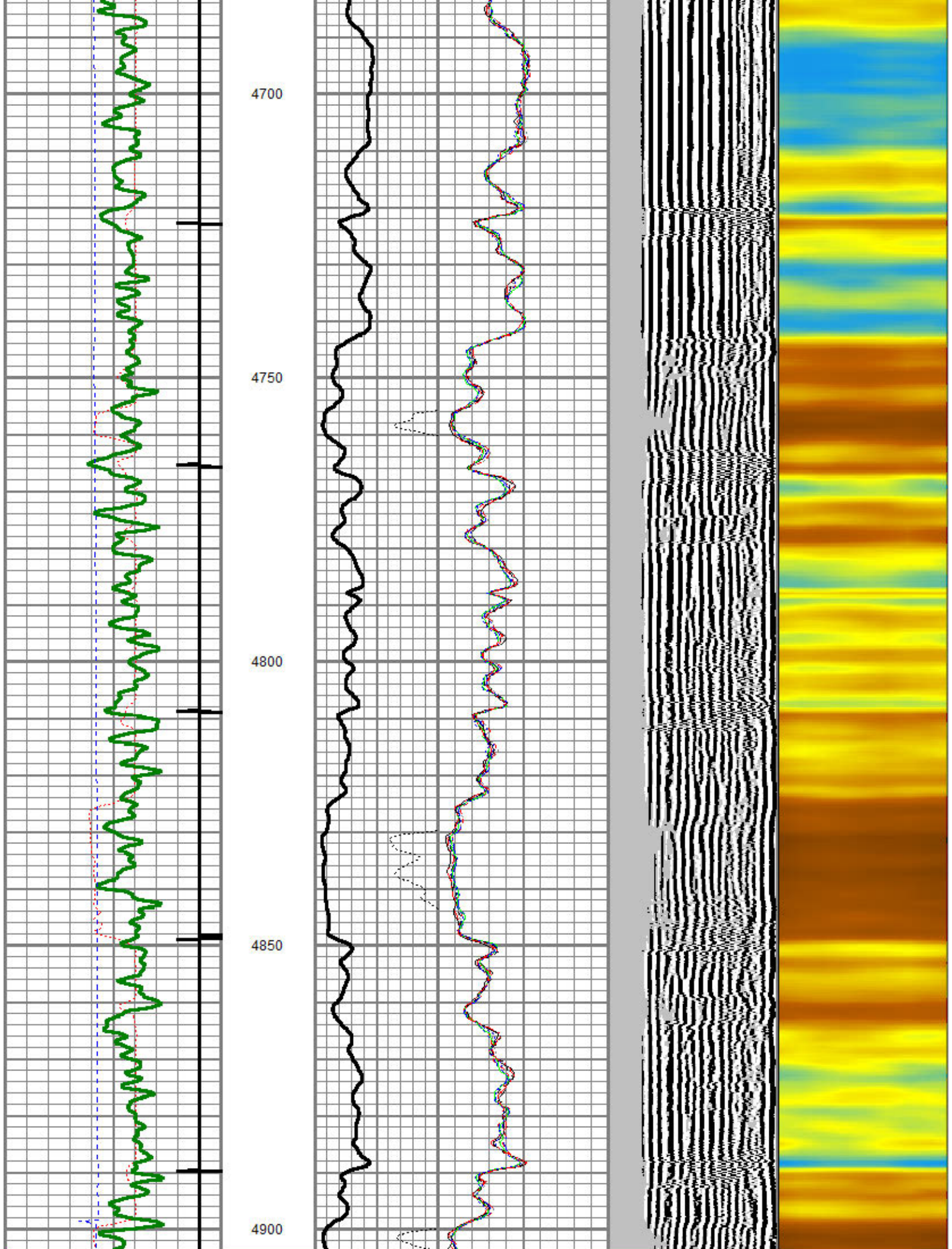
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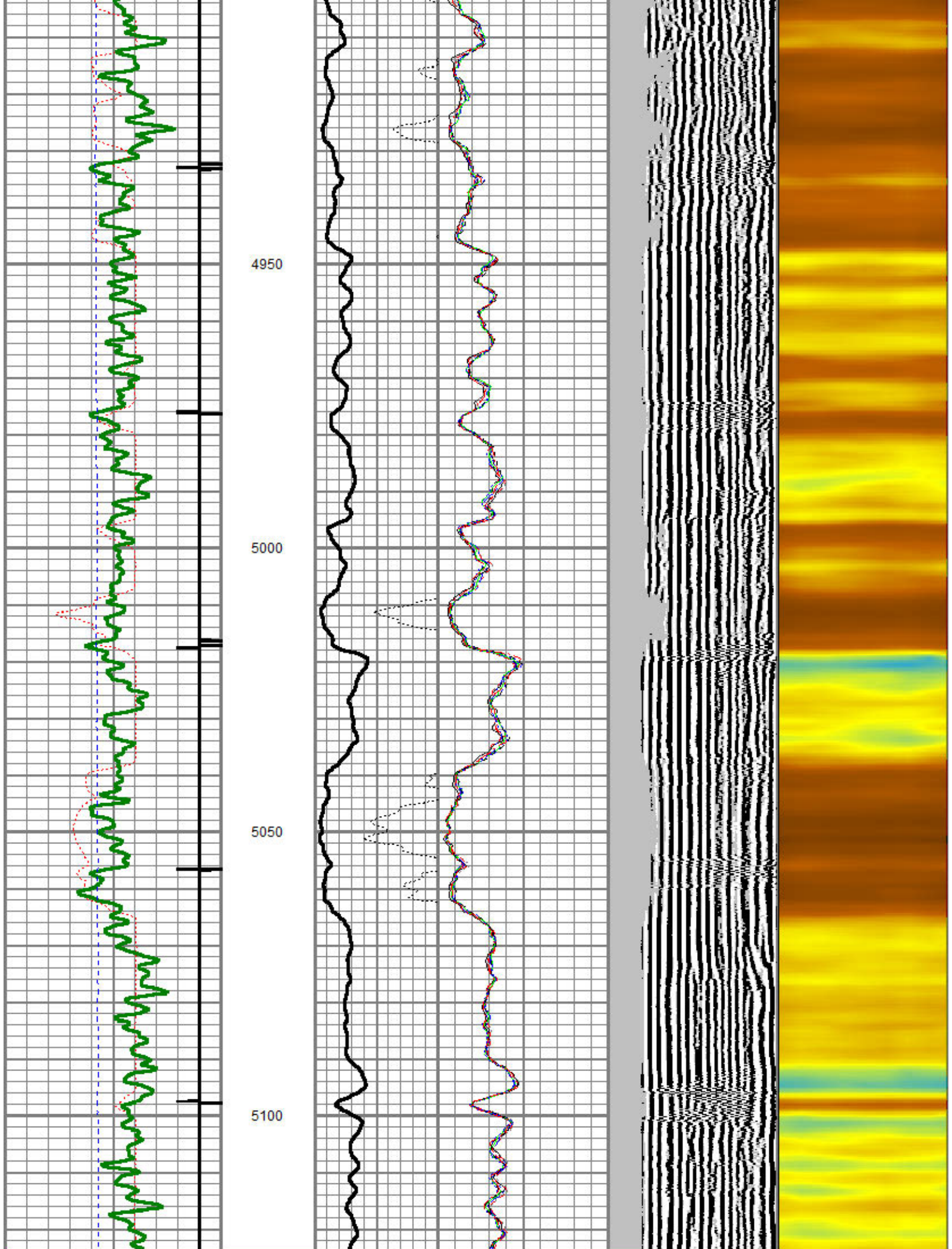


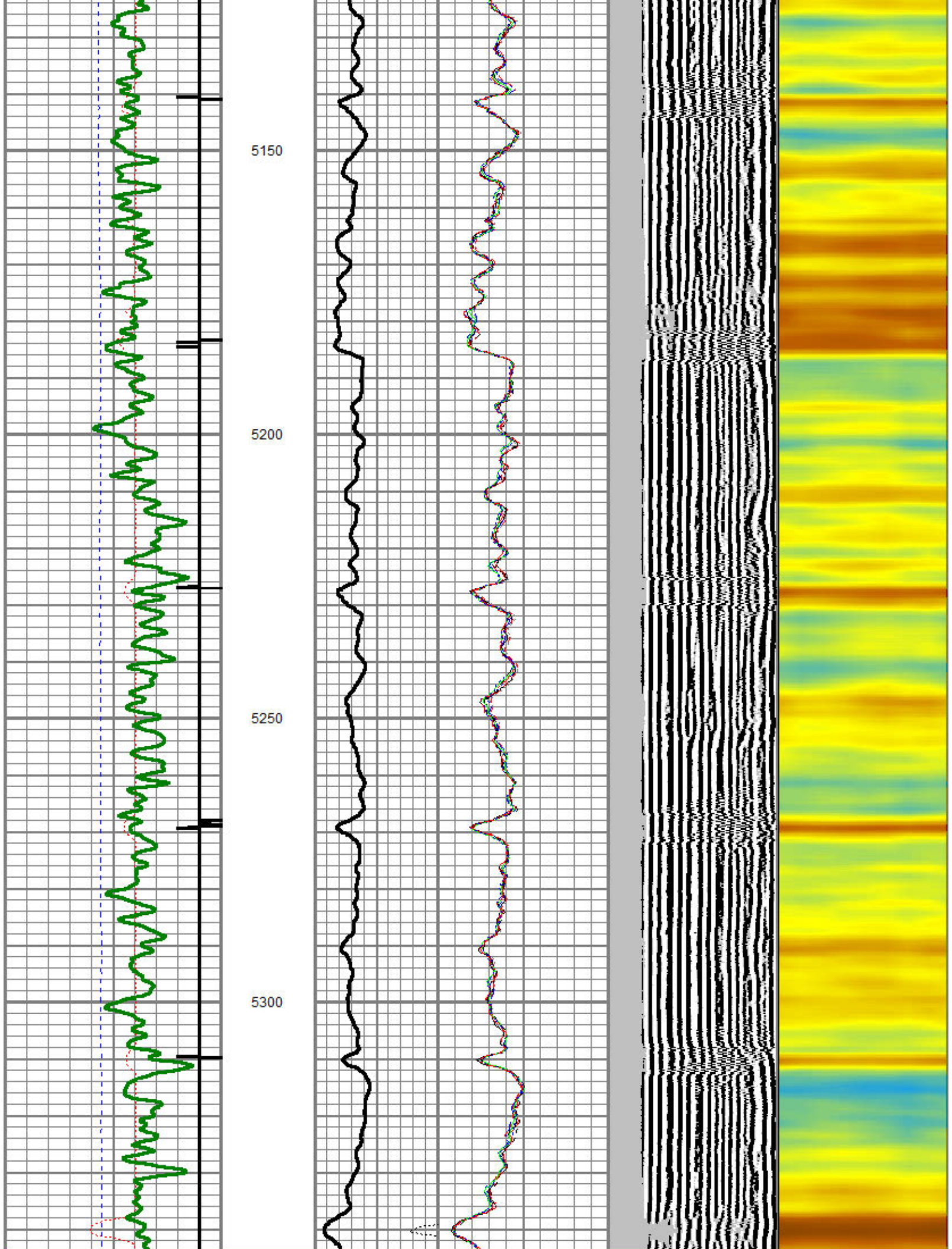


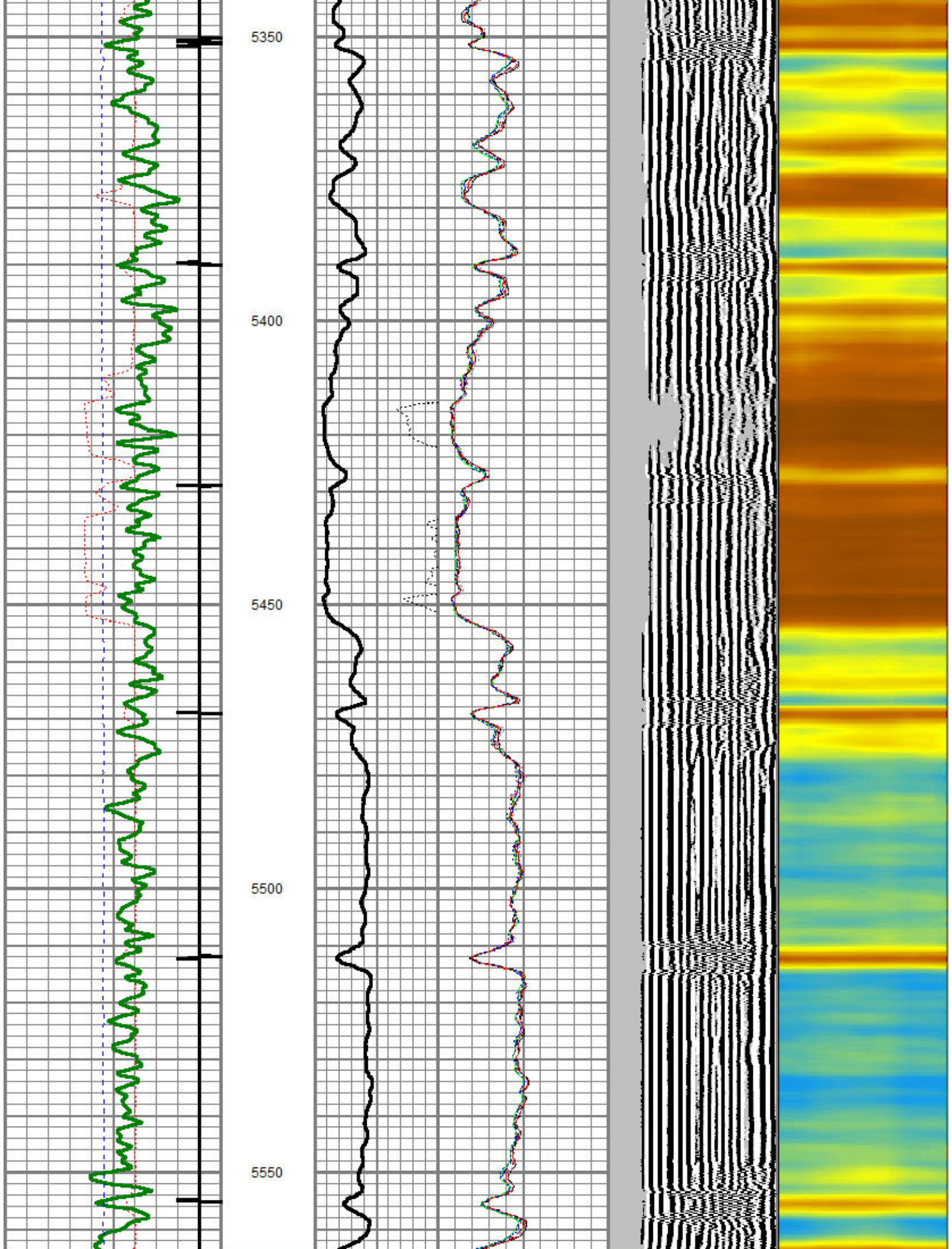


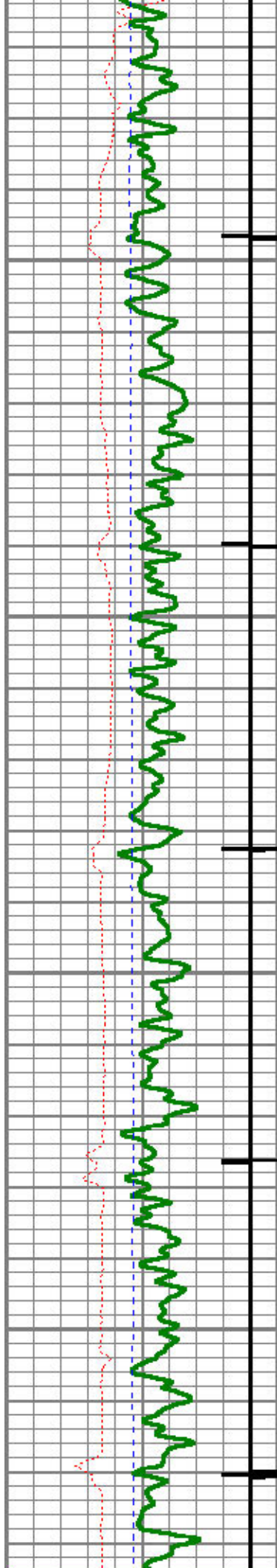










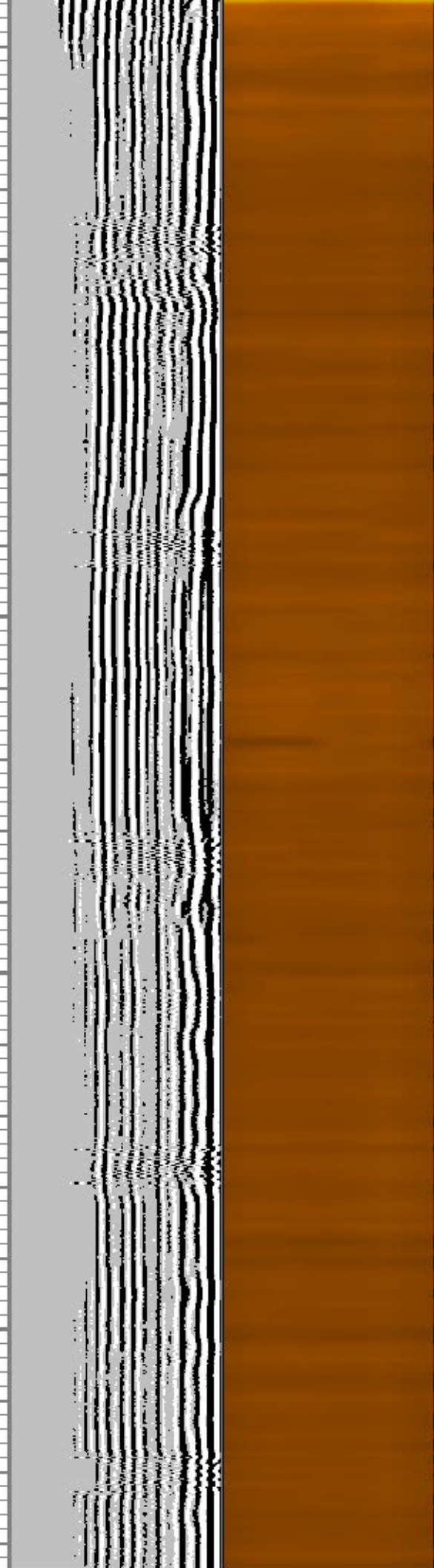
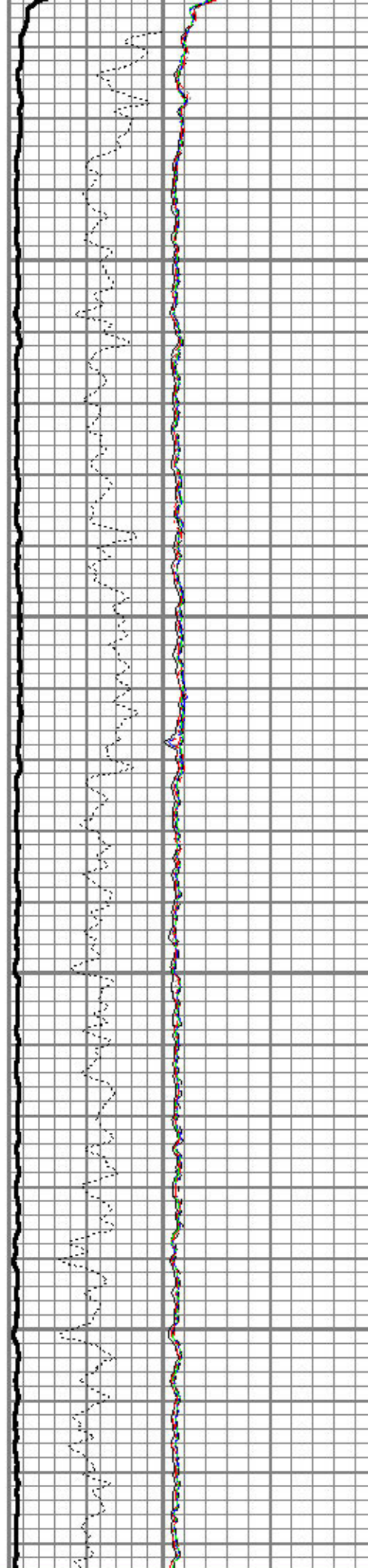


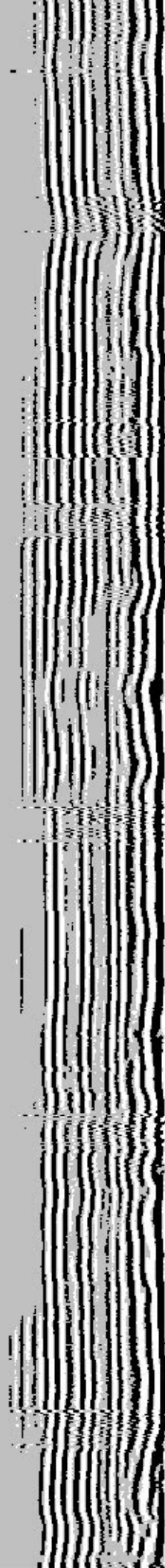
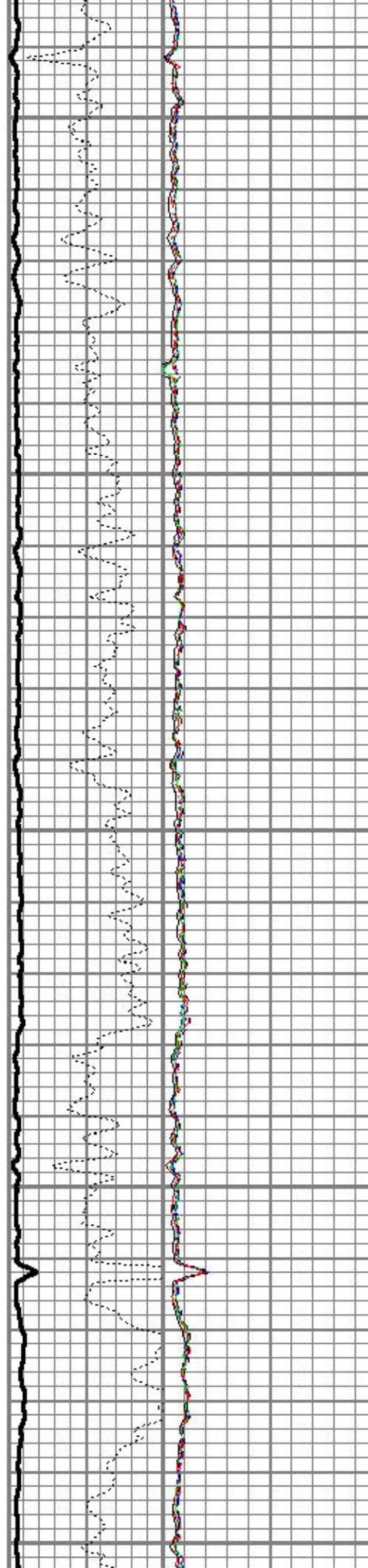
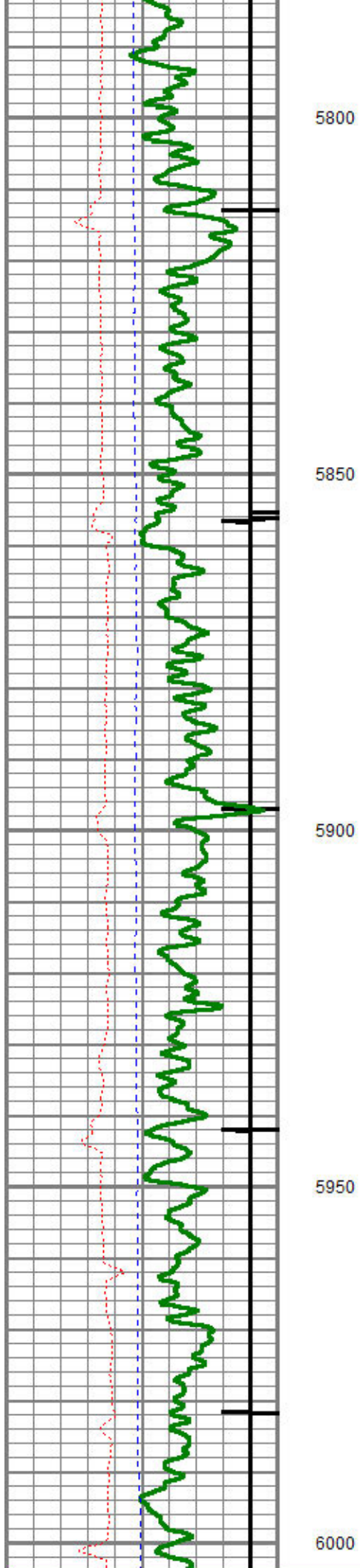
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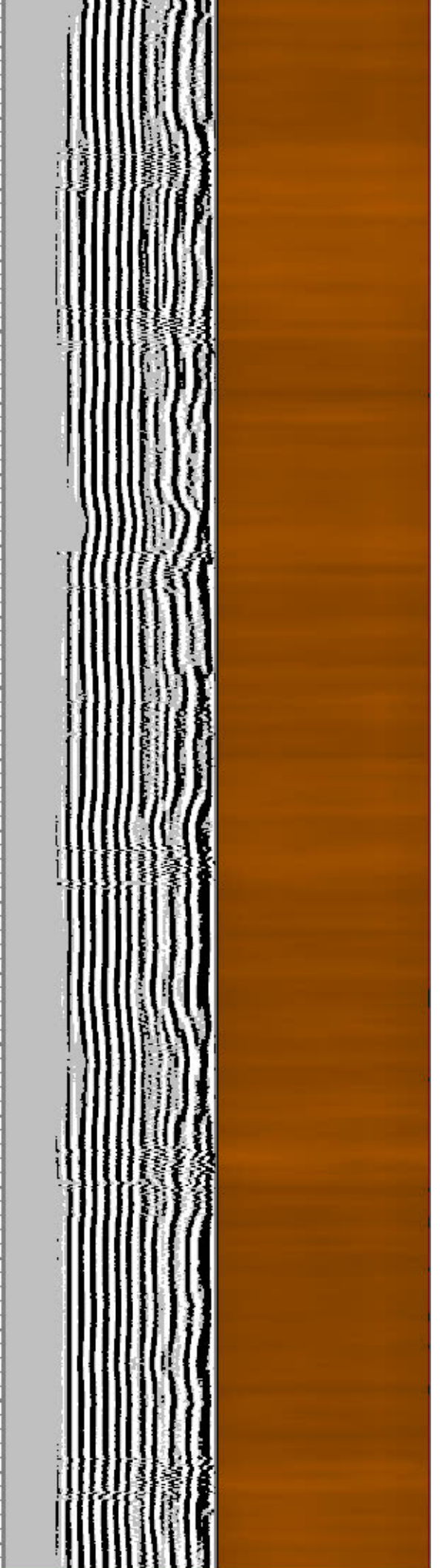
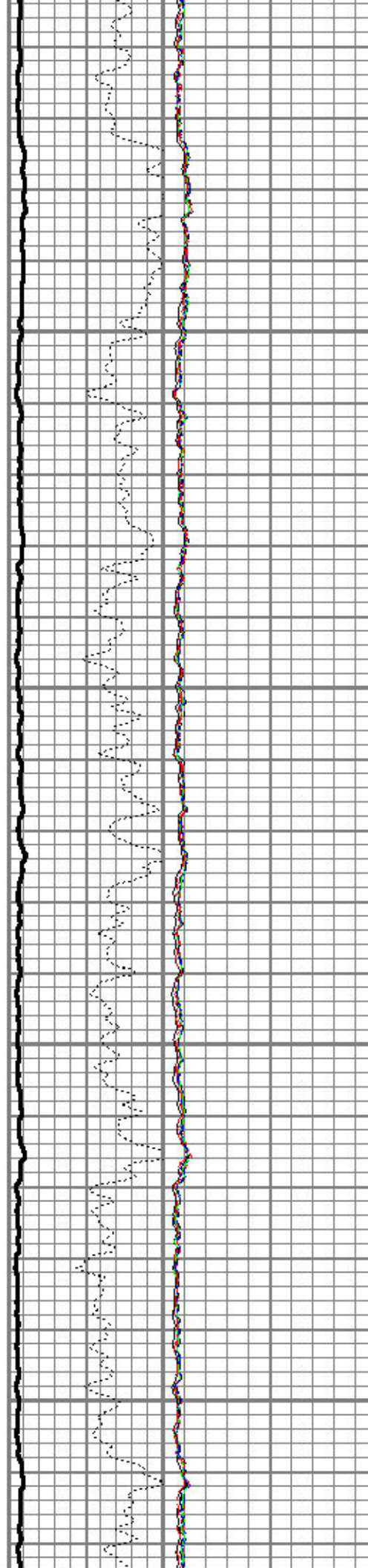
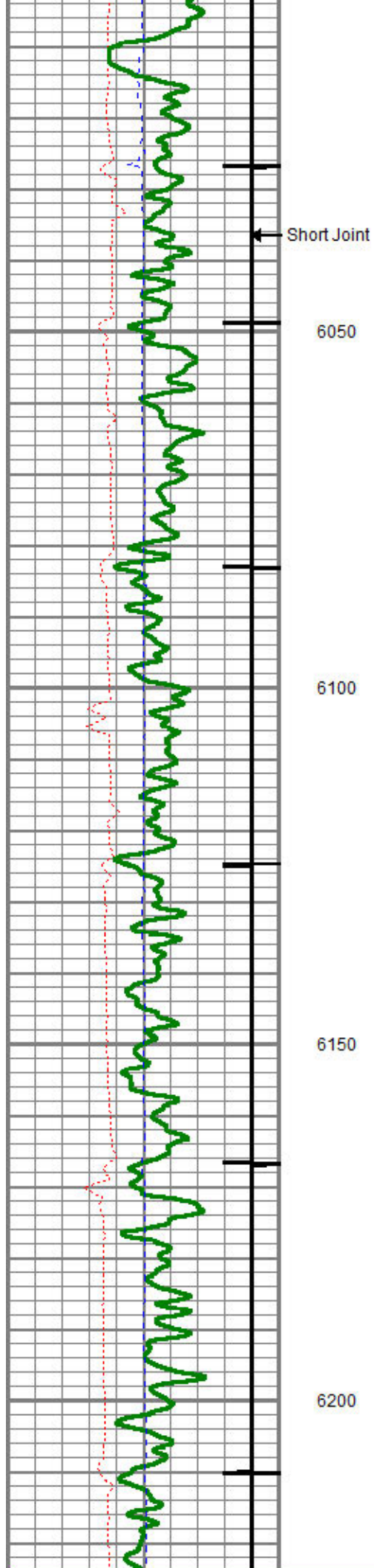
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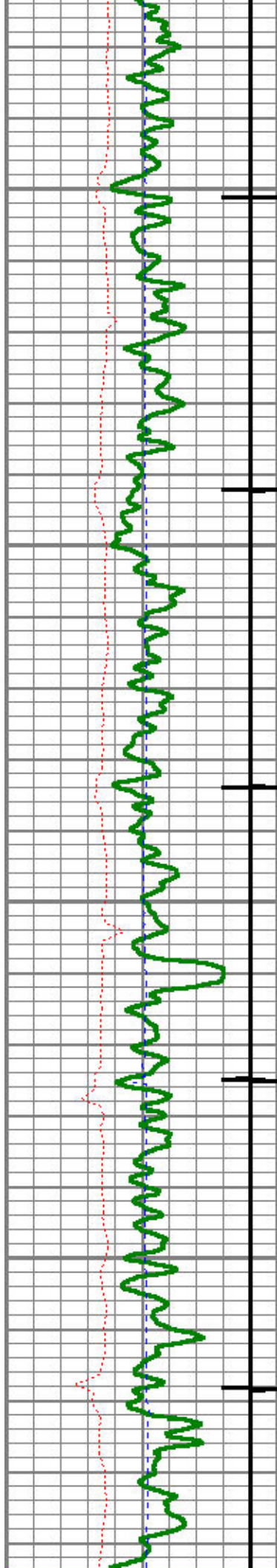
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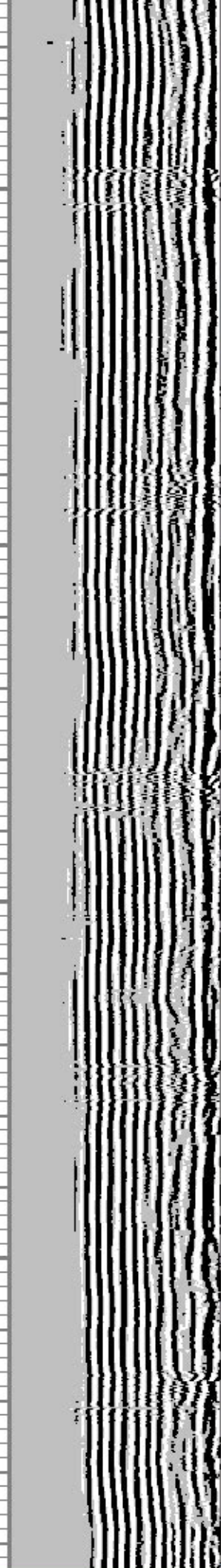
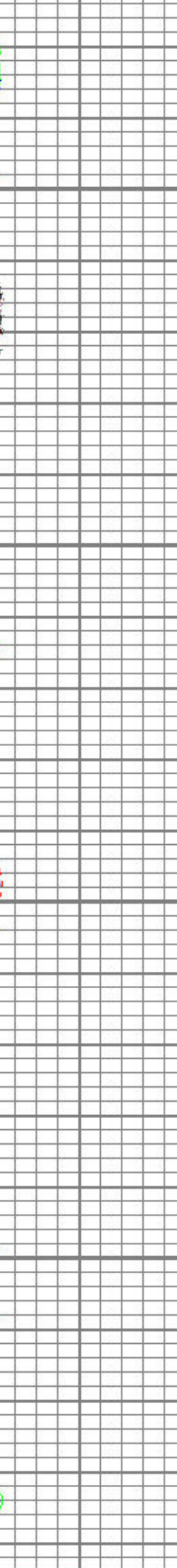
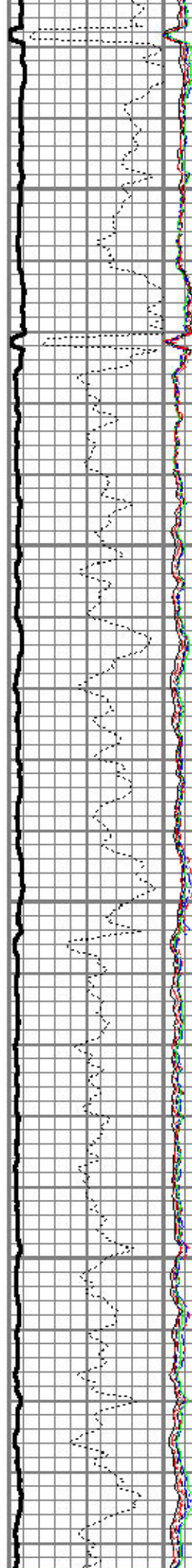


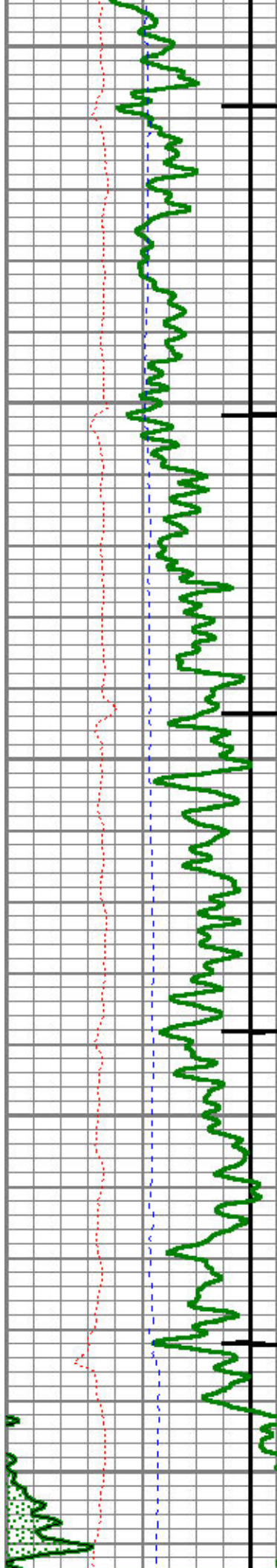
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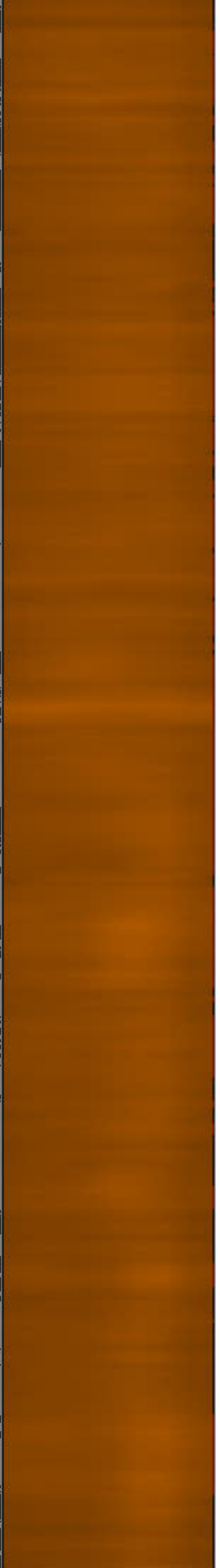
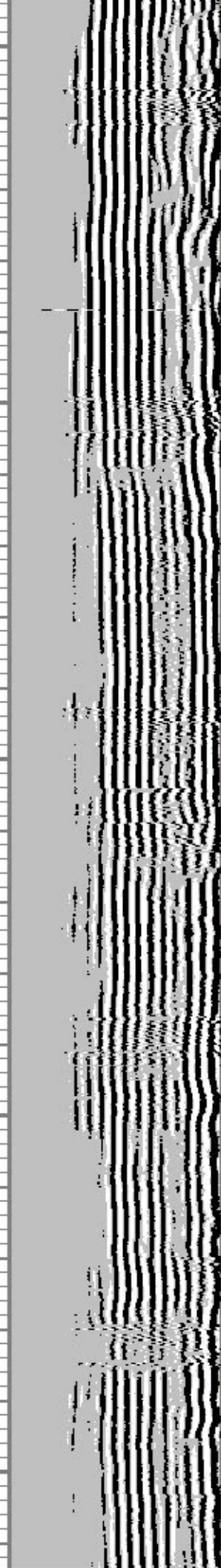
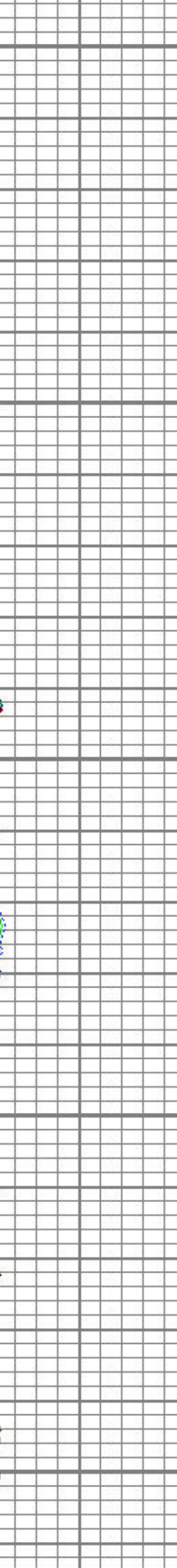
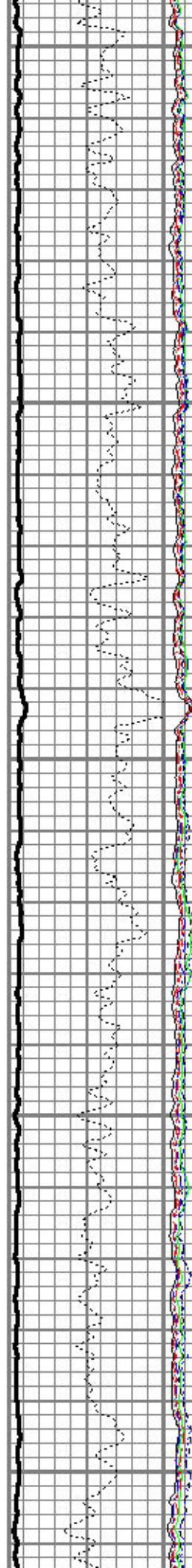
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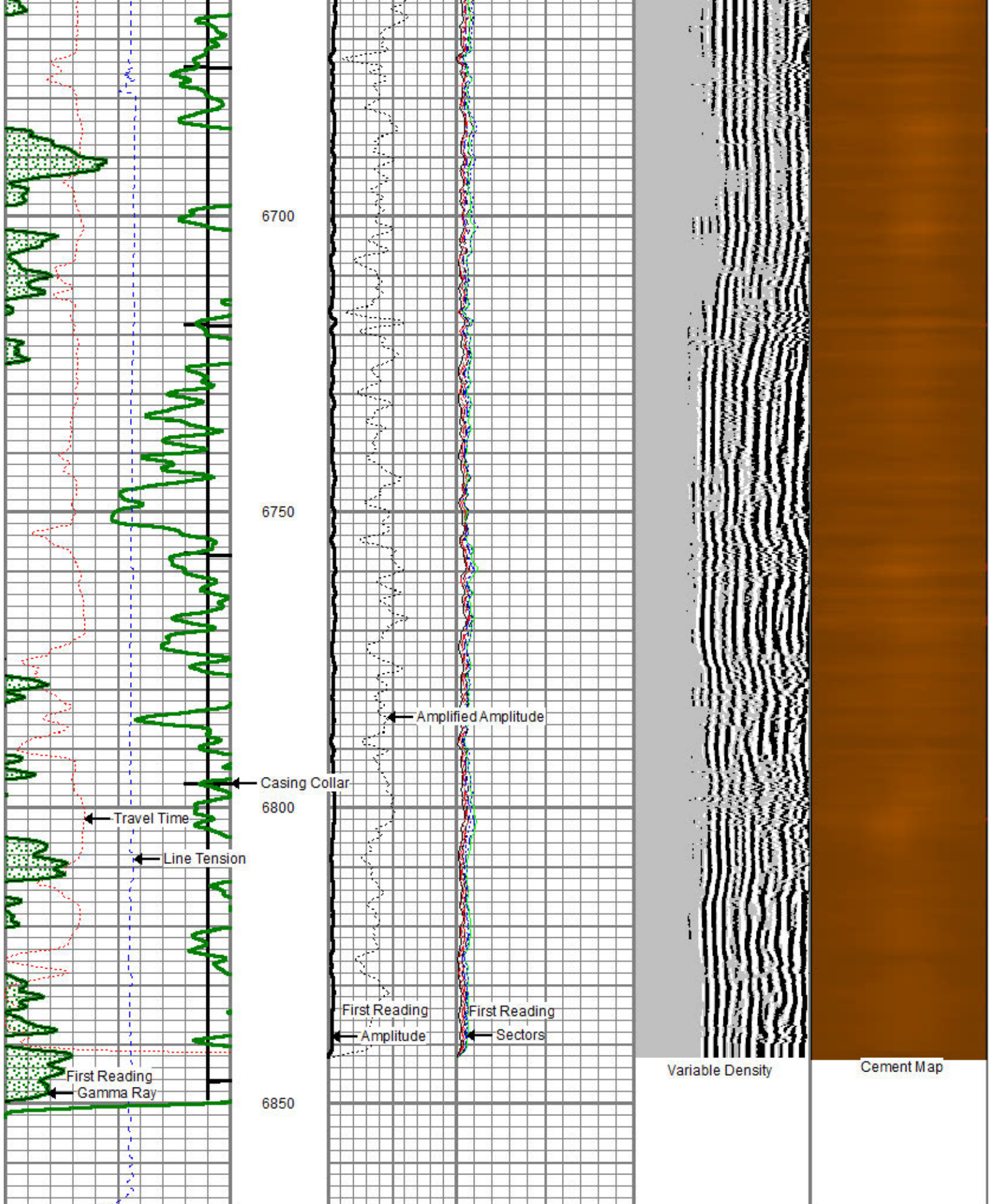
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6600

6650





400	Travel Time (usec)	200	Amplitude	-5	AMPS1	150	Variable Density	1	Cement Map	8
9	Casing Collar	-1	0 (mV)	100	-5	AMPS2	150	200	1200	0
0	Gamma Ray (GAPI)	150	Amplified Amplitude	-5	AMPS3	150				
0	Line Tension (lb)	2000	0 (mV)	10	-5	AMPS4	150			

-5	AMPS5	150
-5	AMPS6	150
-5	AMPS7	150
-5	AMPS8	150

Calibration Report

Database File: noble reliance e23-63-1hnc.db
Dataset Pathname: merge1
Dataset Creation: Fri Mar 20 21:41:06 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
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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

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: 1008.875 ft

Master Calibration, performed Fri Mar 20 18:07:07 2015:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.015	0.488	2.000	62.165	127.397	0.033
CAL	0.015	1.003				
5'	0.013	0.565	2.000	62.165	108.994	0.578
SUM						
S1	0.018	0.469	0.000	100.000	221.753	-3.928
S2	0.015	0.516	0.000	100.000	199.537	-2.935
S3	0.012	0.529	0.000	100.000	193.454	-2.413
S4	0.014	0.520	0.000	100.000	197.679	-2.804
S5	0.015	0.494	0.000	100.000	208.697	-3.060
S6	0.012	0.467	0.000	100.000	220.026	-2.705
S7	0.014	0.450	0.000	100.000	229.134	-3.194
S8	0.015	0.461	0.000	100.000	224.389	-3.372

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	1.003	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	

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					
WVFCAL	26.53					
WVFS1	26.53					
WVFS2	26.53					
WVFS3	26.53					
WVFS4	26.53					
WVFS5	26.53					
WVFS6	26.53					
WVFS7	26.53					
WVFS8	26.53					
WVF5FT	25.53					
TEMP	22.91					
CCL	18.54					
GR	17.21					
			GR-Probe275 (FW1408-35) Probe 2 3/4" Logging Gamma Ray	4.78	2.75	57.00
			PTS275	2.83	2.75	
			PTS275	2.83	2.75	
ACCX	7.83					
ACCY	7.83					
ACCZ	7.83					
ETEMP	5.33					
			Probe_MFCAL-60_INCL (FW1408-57)	9.00	3.62	85.00

