HALLIBURTON

RESERVOIR MONITORING TOOL ELITE

Company EAST CHEYENNE GAS
Well ECGS 6-18 WP-D011-2
Field WEST PEETZ
County LOGAN State CO

Company EAST CHEYENNE GAS STORAGE, LLC
Well ECGS 6-18 WP-D011-2
Field WEST PEETZ
County LOGAN State CO

API No.: 05-075-09406-00 Serv #: 903183196
Location: SURFACE HOLE LOCATION: 2320' FSL &1566' FEL NWSE

Other Services: GAUGE RING, JUNK BASKET, ACX, CAST-M, PRT #2, PLUG SET

Sec:6 Twp:11N Rge: 52W

Permanent Datum	G.L.	Elevation 4550 ft	Elevation: K.B. 4,564 ft
Log Measured From	K.B. , 14 Ft. above perm. datum		D.F. 4,563 ft
Drilling Measured From	K.B.		G.L. 4,550 ft

Date @ Time Logged	22-MAR 2016 @ 18:30	Type Fluid in Hole	WBM
Run No.	ONE	Density of Fluid	8.5 ppg
Depth - Driller	5,260 ft	Fluid Level	FULL
Depth - Logger	5,225 ft	Cement Top Est. Logged	LOGGED
Bottom - Logged Interval	5,223 ft	Equipment / Location	11875120 / Ft. LUPTON
Top - Log Interval	200 ft	Recorded by	DIMPFL/SCHMIDT
Max. Recorded Temp.	169 degF	Witnessed by	FRANCIS /OHLMAN

CEMENTING DATA	Surface String	Protection String	Production String	Liner
Date / Time Cemented				
Primary / Squeeze				
Expected Compressive Strength	psi@ hrs	psi@ hrs	psi@ hrs	psi@ hrs
Cement Volume				
Cement Type / Weight	/	/	/	/
Formulation				
Mud Type / Mud Wgt.	/	/	/	/

Borehole Record				Casing & Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				9.625 in	36 lb/ft	SURFACE	1,222 ft
				7.00 in	26 lb/ft	SURFACE	5,247 ft

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

1. LOG CORRELATED TO J-W WIRELINE CEMENT BOND LOG DATED OCTOBER 15, 2012
2. RMT-I LOGGED IN CAPTURE MODE
3. LOGGING INTERVALS PER CUSTOMER REQUEST
4. RMT-I GENERATOR VOLTAGE: 85V
5. SPLICE AT 4960' & 660.
6. MAIN PASS RAN WITH GAS IN ANNULAR. AN ADDITIONAL REPEAT PASS WAS PERFORMED WITH WATER IN THE ANNULAR .

HALLIBURTON CREW: J. WILKERSON, C. BUCANEK
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, FT. LUPTON, CO

Service Ticket No. 903183196 API No. 05-075-09406-0000 PGM Ver WARRIOR 8

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

TELEMETRY		RESERVOIR MONITORING TOOL					
Run No.	ONE	Run No.	ONE	Run No.		Run No.	
Serial No.	10010734	Serial No.	11917921	Serial No.		Serial No.	
Model No.	TTTC-U-002	Model No.	RMTI-A	Model No.		Model No.	
Diameter	1.688"	Diameter	2.125"	Diameter		Diameter	

LOGGING DATA

General Data

Pass No.	Depths From	To	Well Head Pressure	Speed Ft/Min	Logging Run Comments

ONE	5223'	200'	1200 PSI	15 FPM	MAIN LOG SECTION

	GAMMA RAY		NEAR BORE SI (SCBN)		RATIO (RNF)		SGIN	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	L
	0 API	150 API	200	0	2	0.5	60	0

DIRECTIONAL INFORMATION						
Maximum Deviation		deg. @		KOP		

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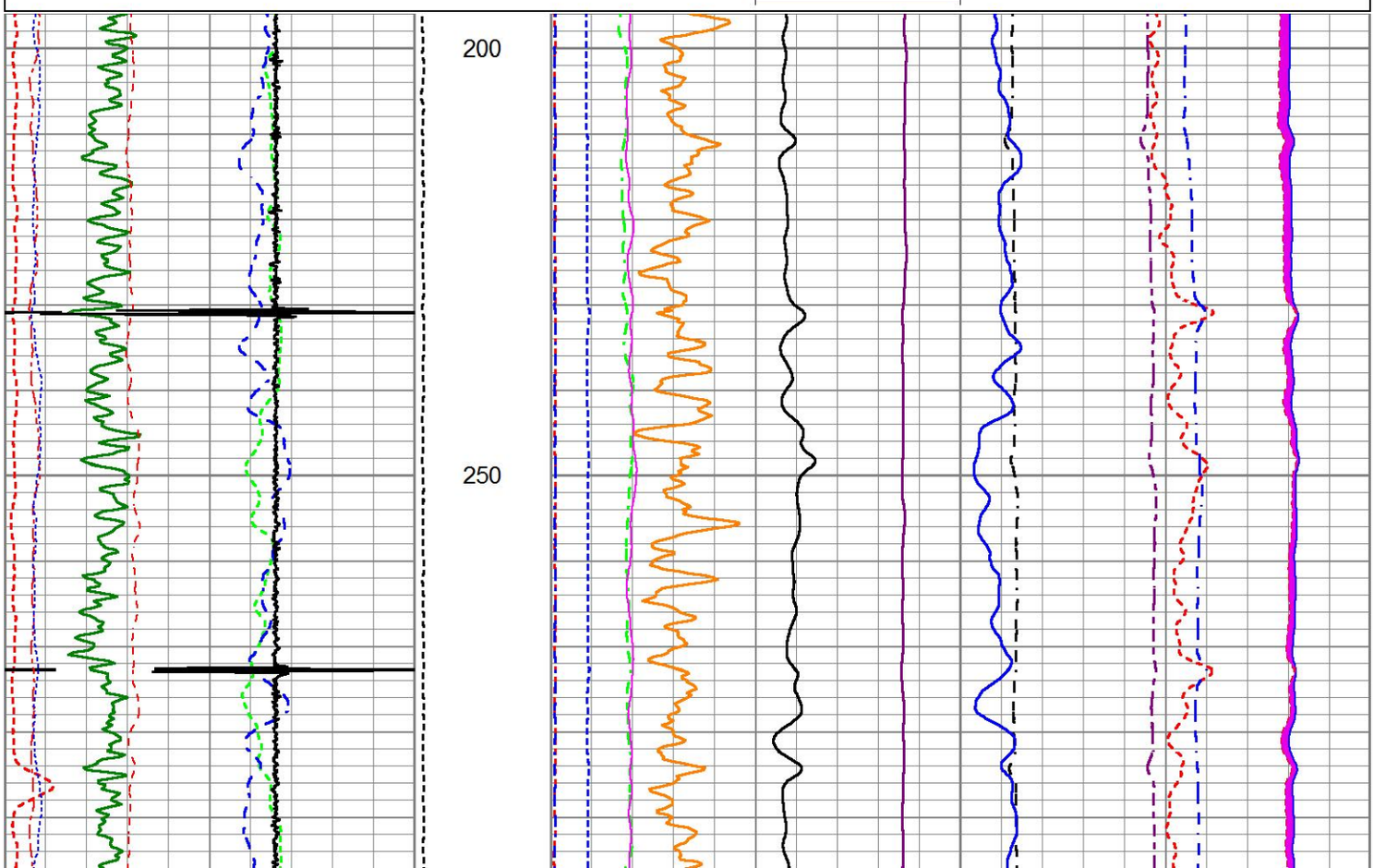
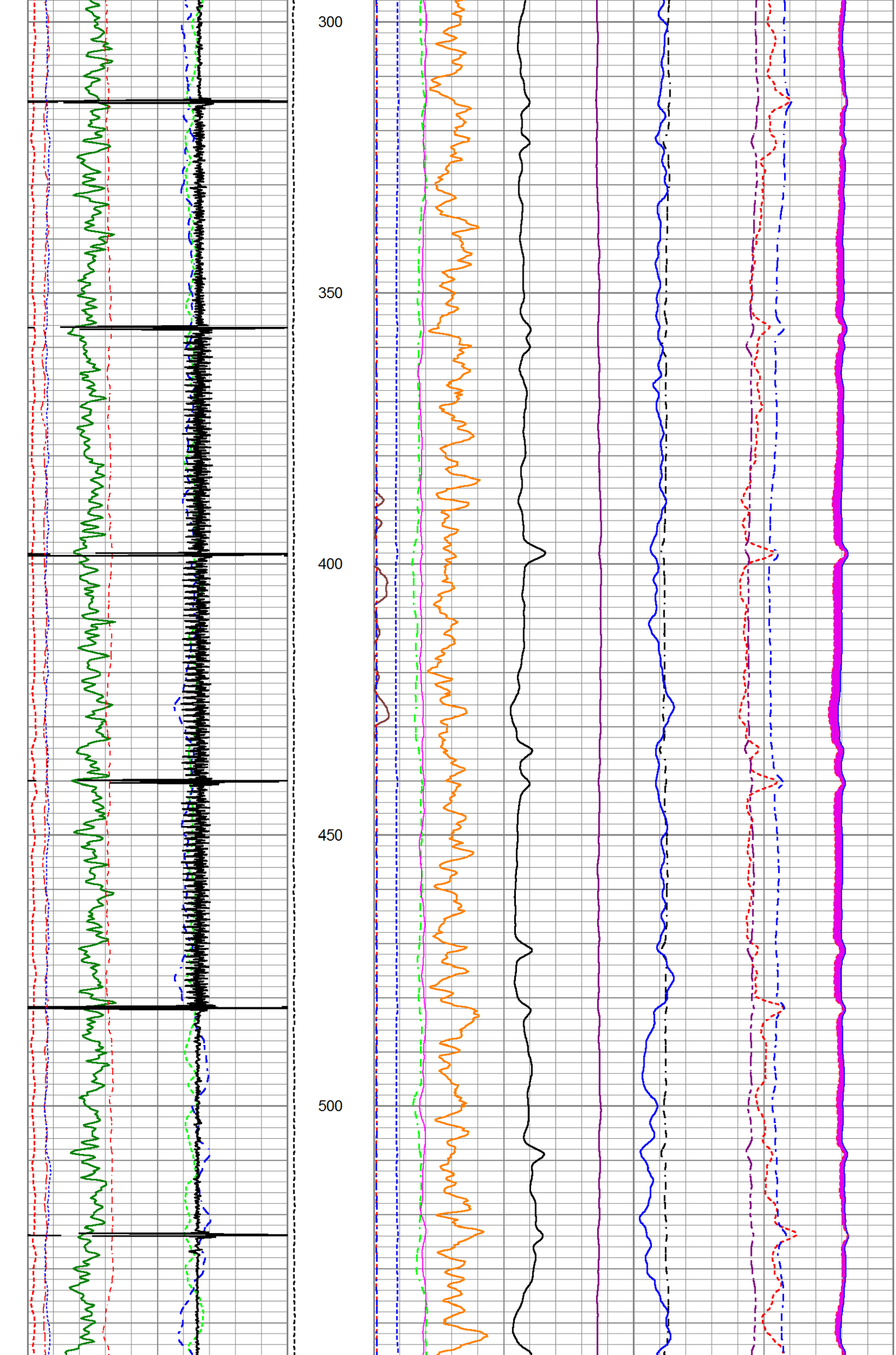
MAIN PASS

5" = 100'

Database File	egcs_6_18_wp_d011_2_rmt.db
Dataset Pathname	MAIN_FINAL
Presentation Format	1_rmte_main
Dataset Creation	Thu Mar 24 13:08:45 2016
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22			
0	OAI	100	0 (lb)	1750	60	SGIN	0		
10	FAR FIT ERR (SGFF)	40			0	RIN	9	60000	Near Counts (NCAP) 0
0	GR (GAPI)	150			0	RICF	6	60000	Far Counts (FCAP) 0
0	NEAR FIT ERR (SGFN)	100			0	H YIELD (YH2)	1	100000	FAR INTEL CT (FSIN) 0
17000	CCL	19000			0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN) 0
0	IN FIT ERR (CFTR1) NEAR	1			0.3	PHIT ( )	-0.1	ET INL NEAR (NNI	
0	IN FIT ERR CFTR2) FAR	1			0	STUN1	1	50000	-1000
					0	STUN2	1		
					0	NFTR	5		
						INOX2			
					-1500		1500		

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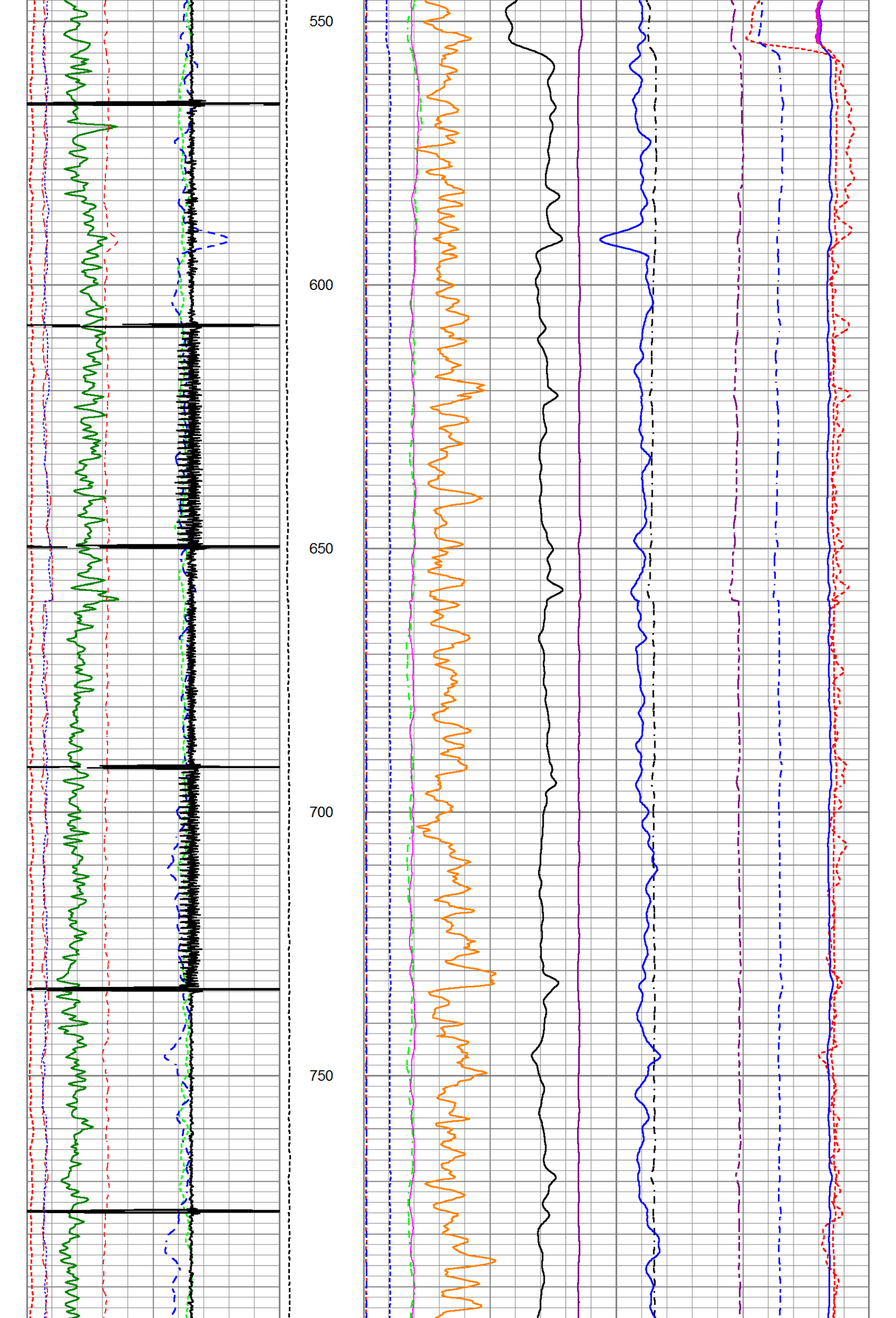
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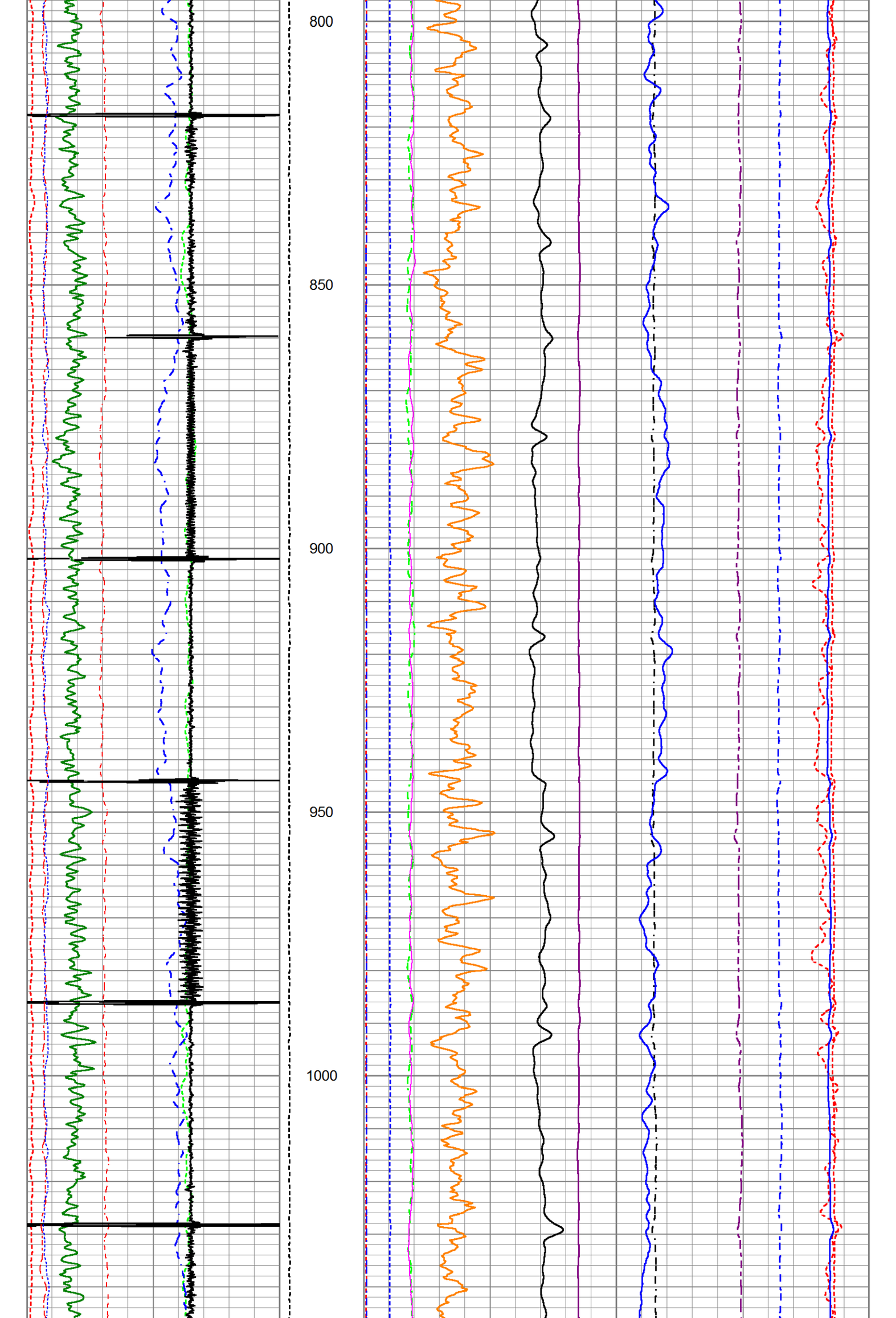
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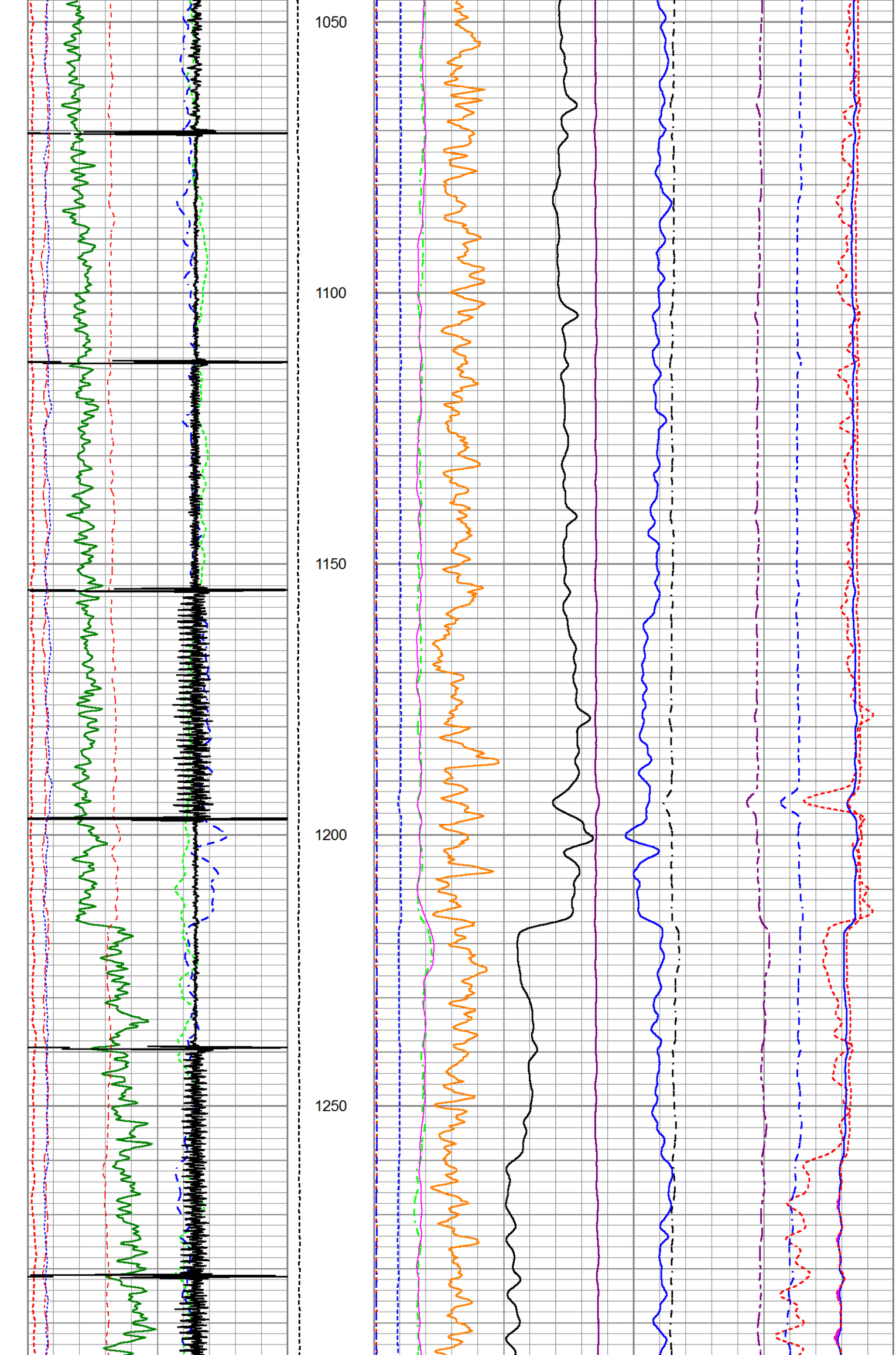
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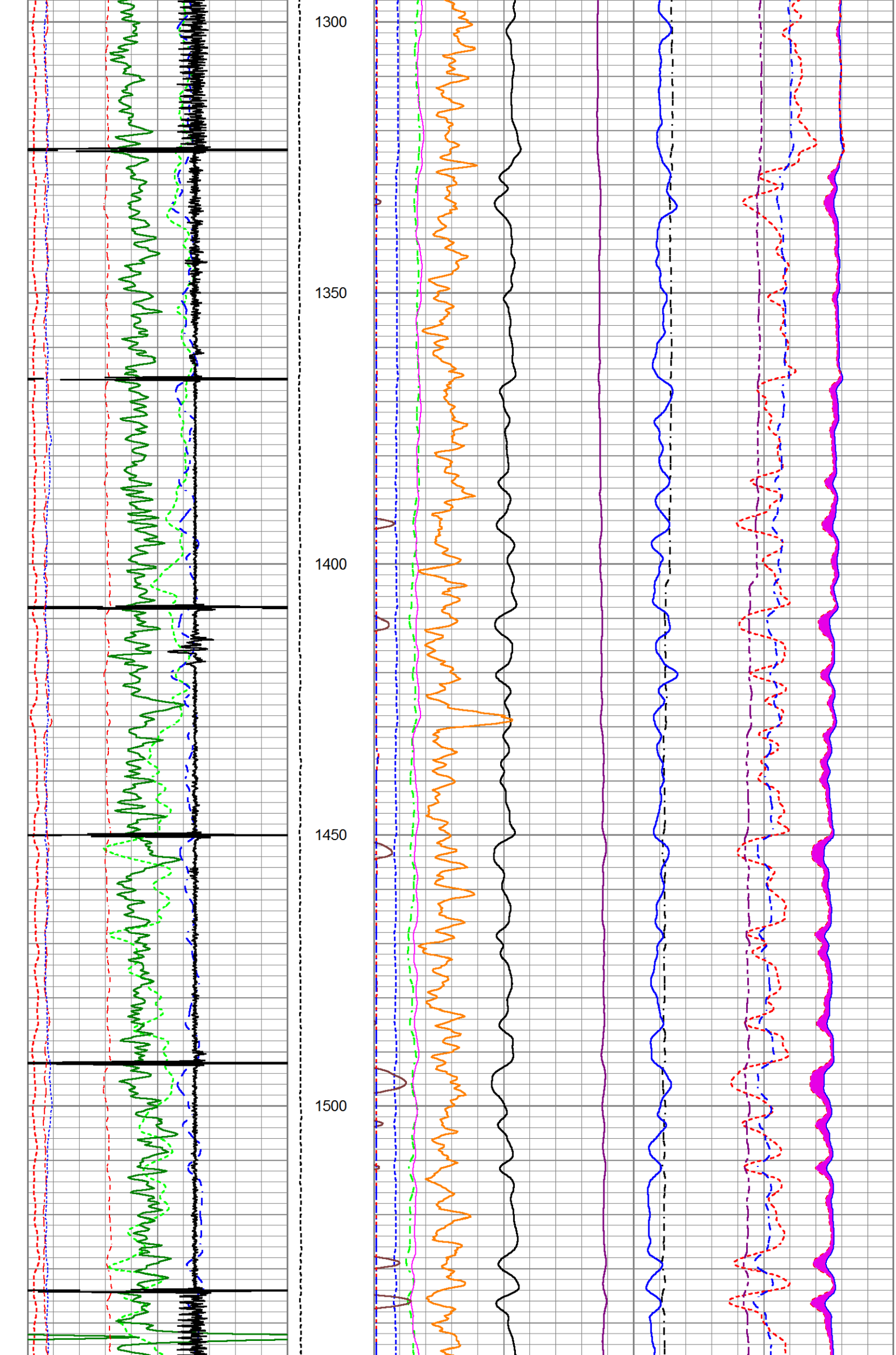
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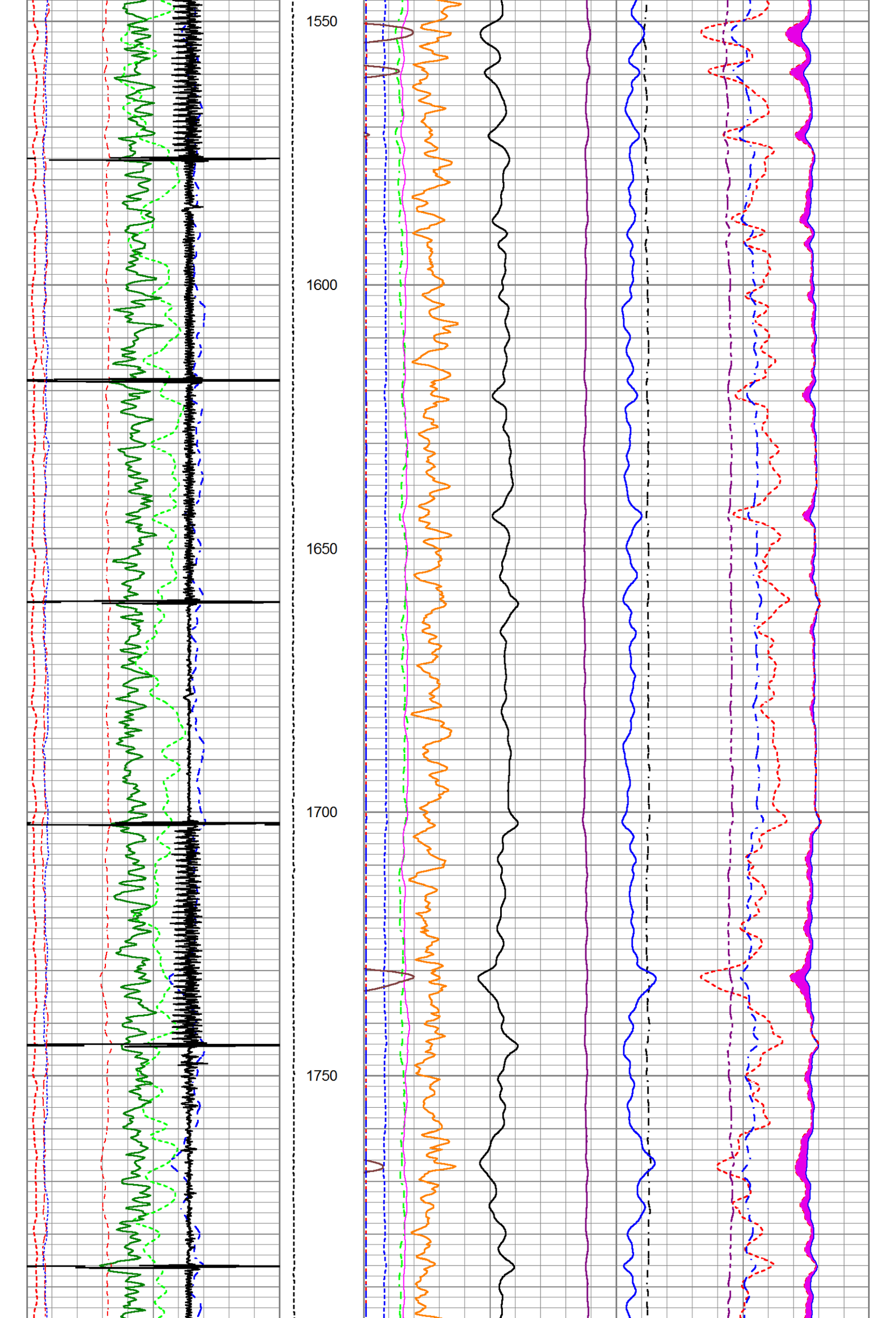
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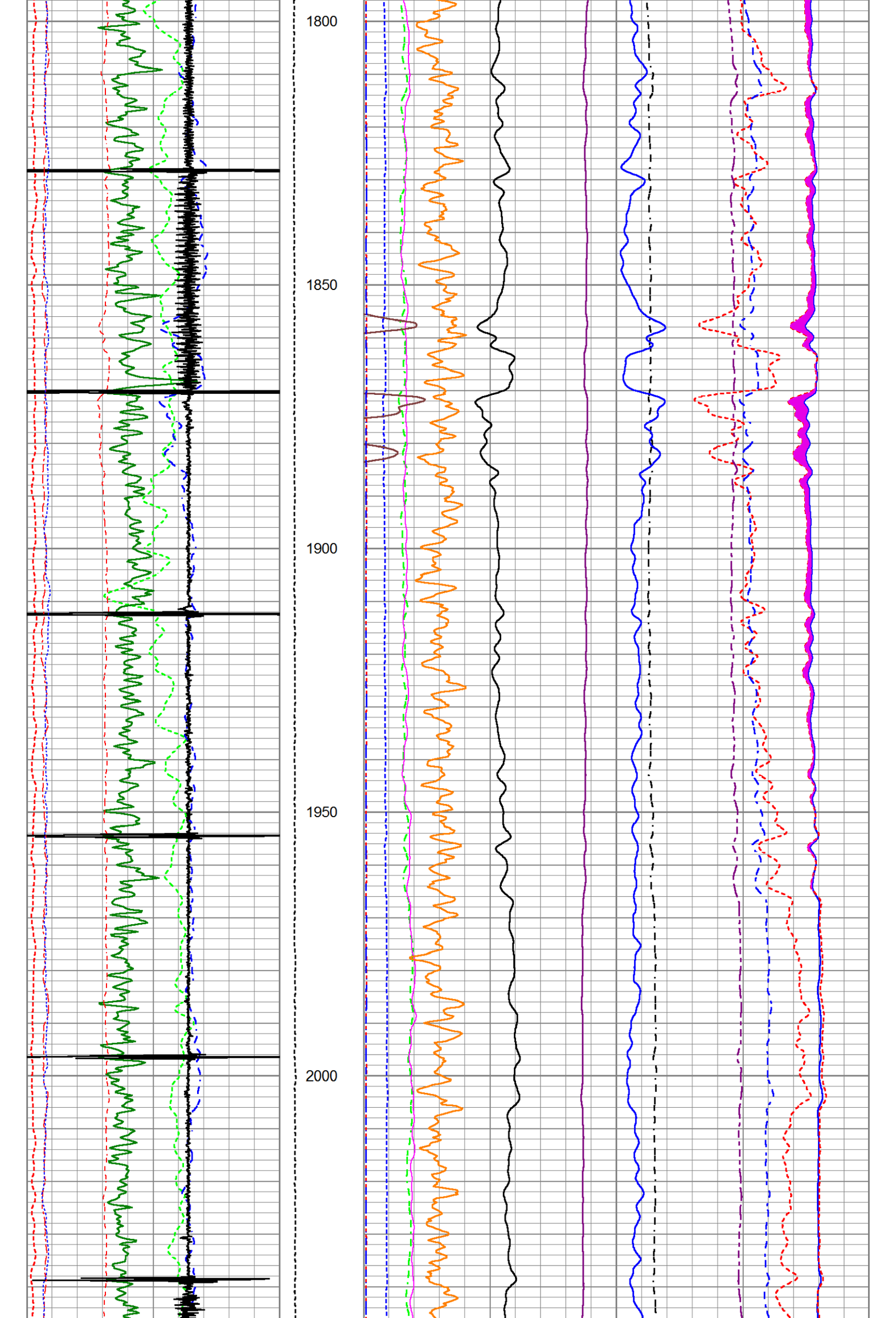
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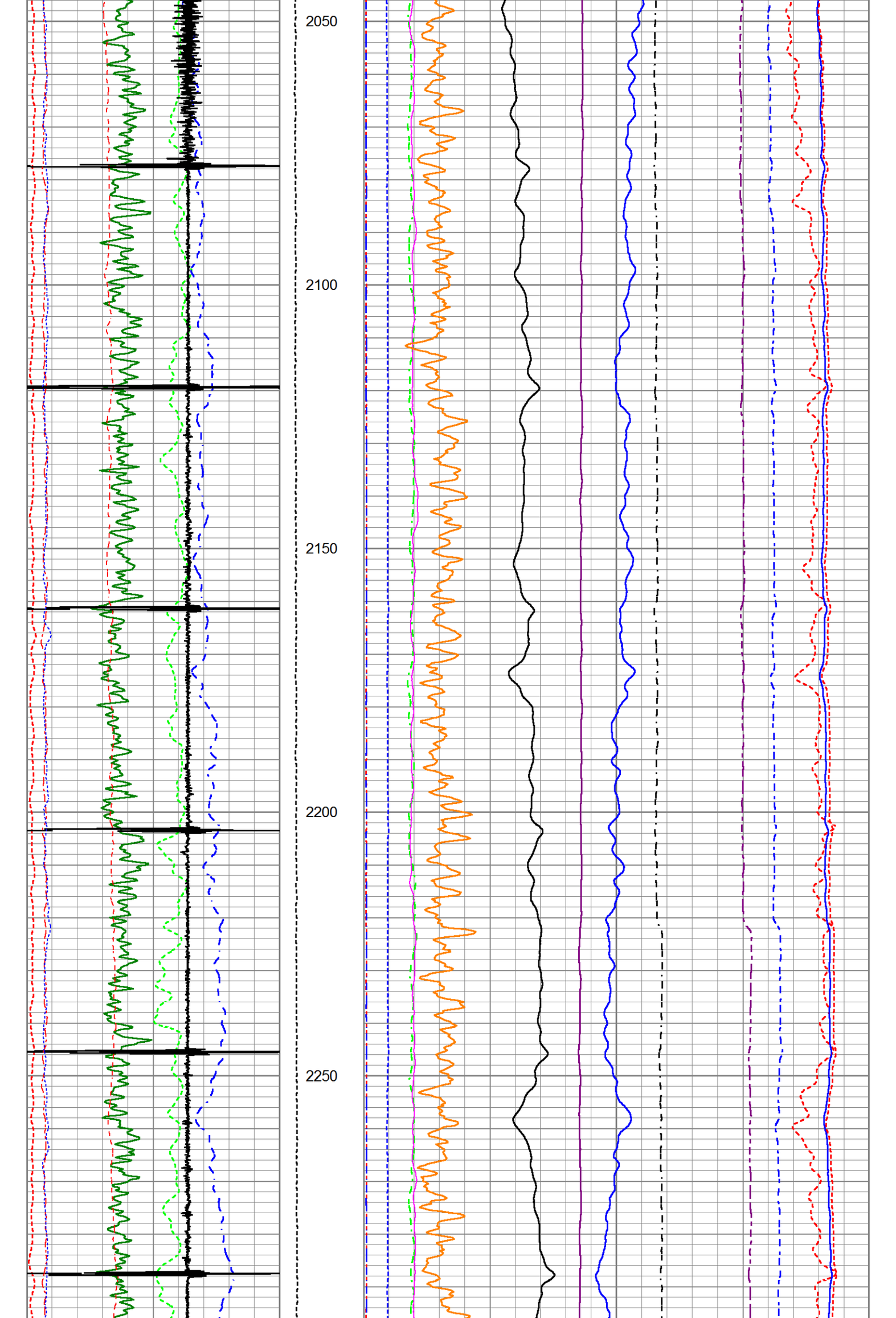
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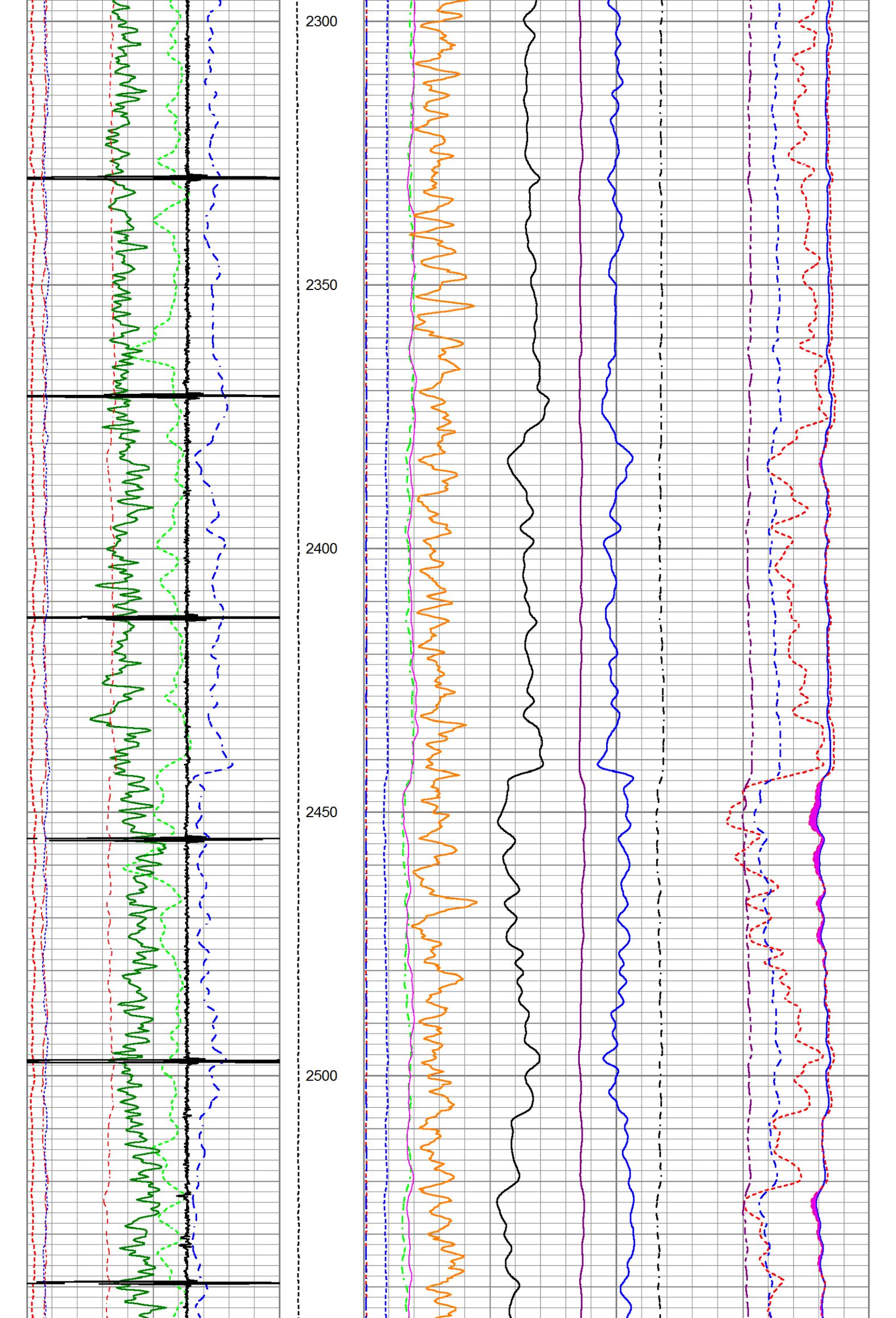
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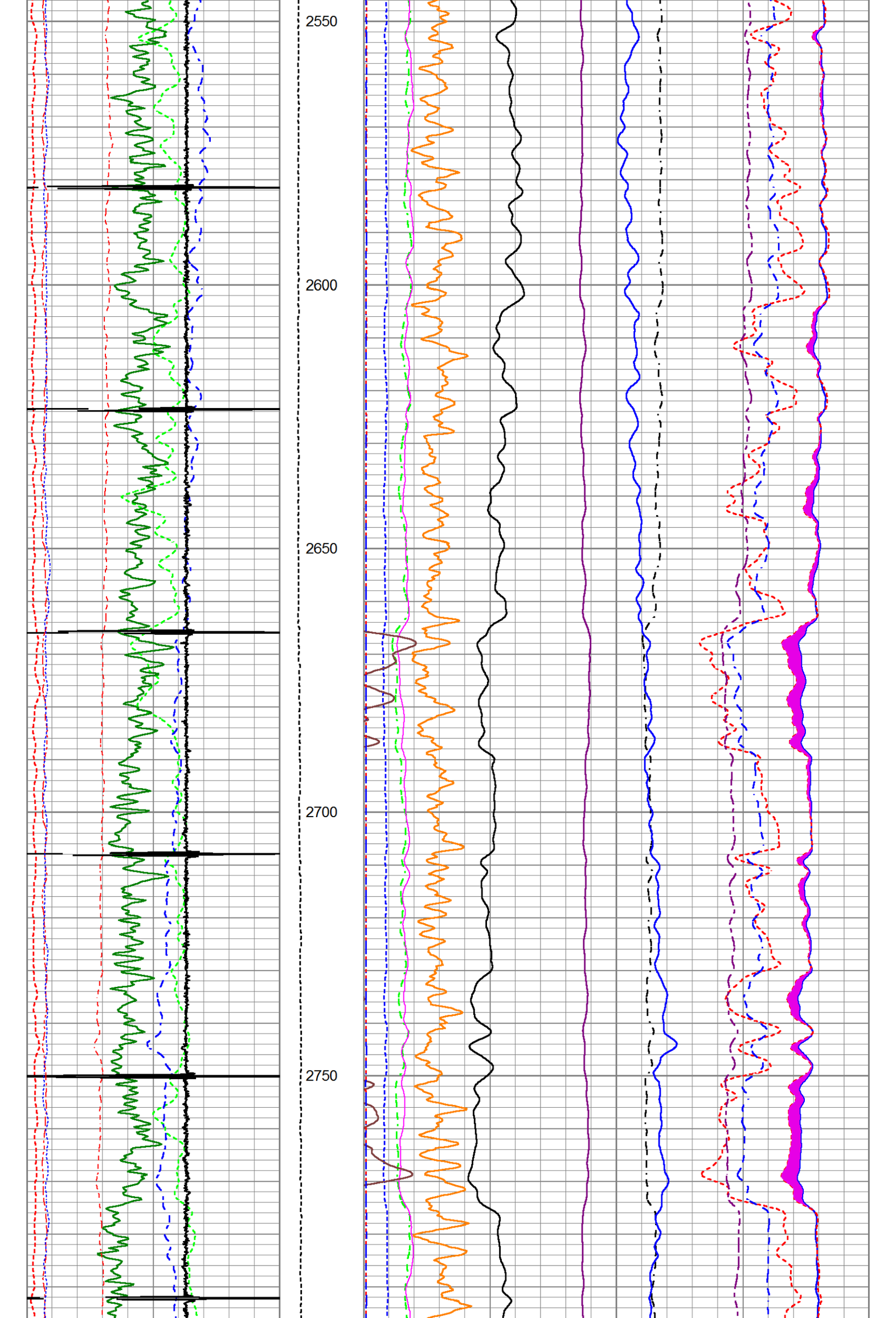
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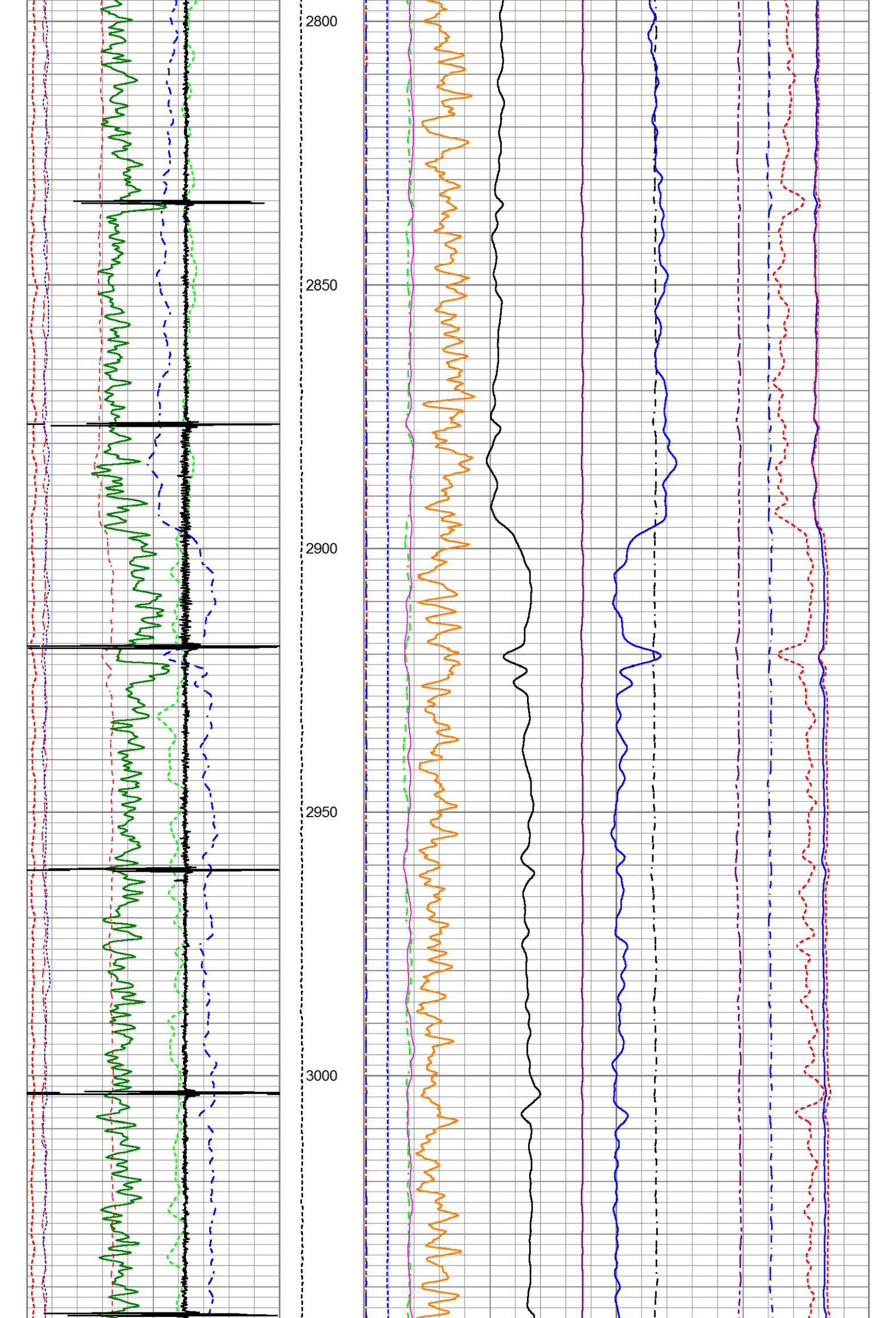
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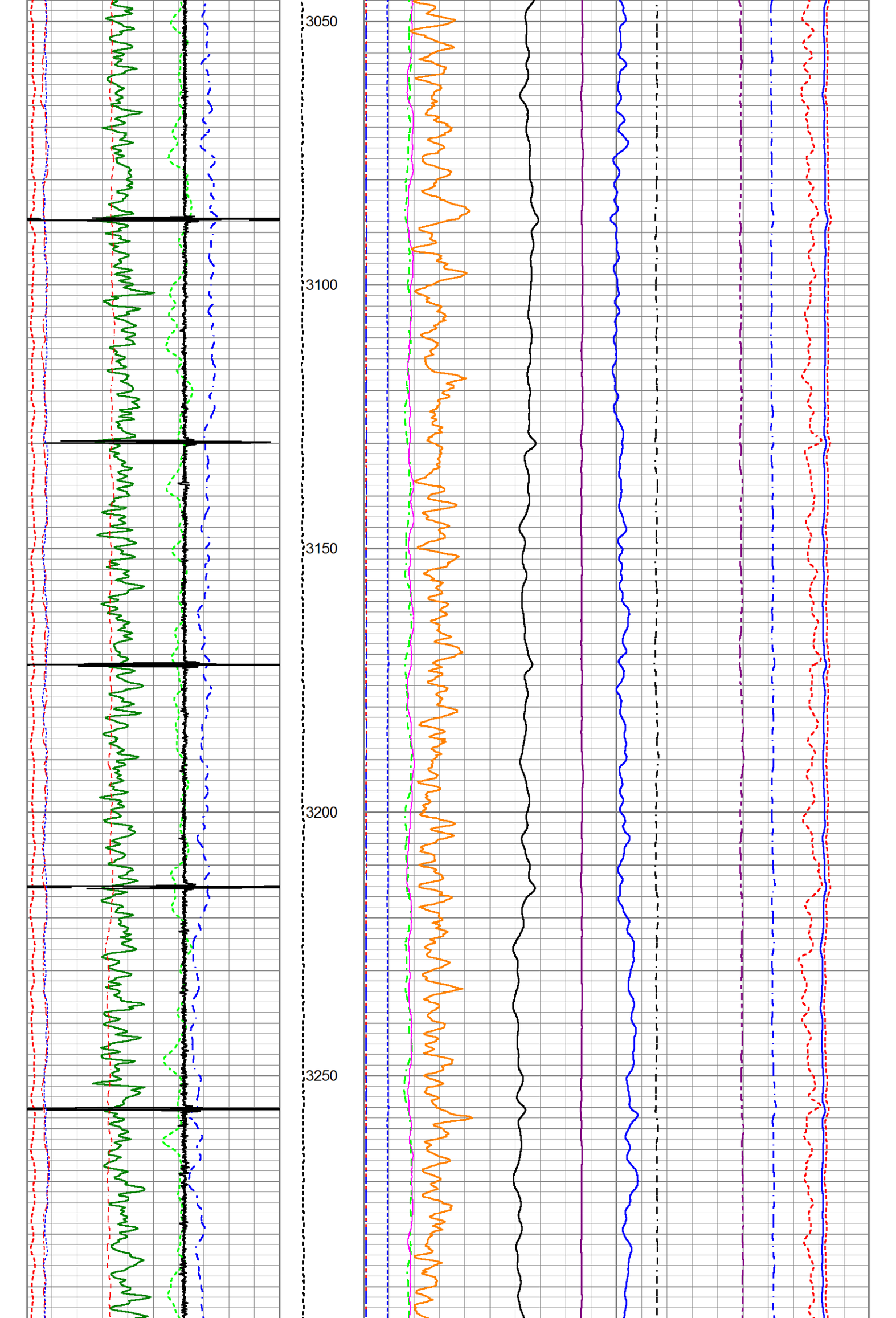
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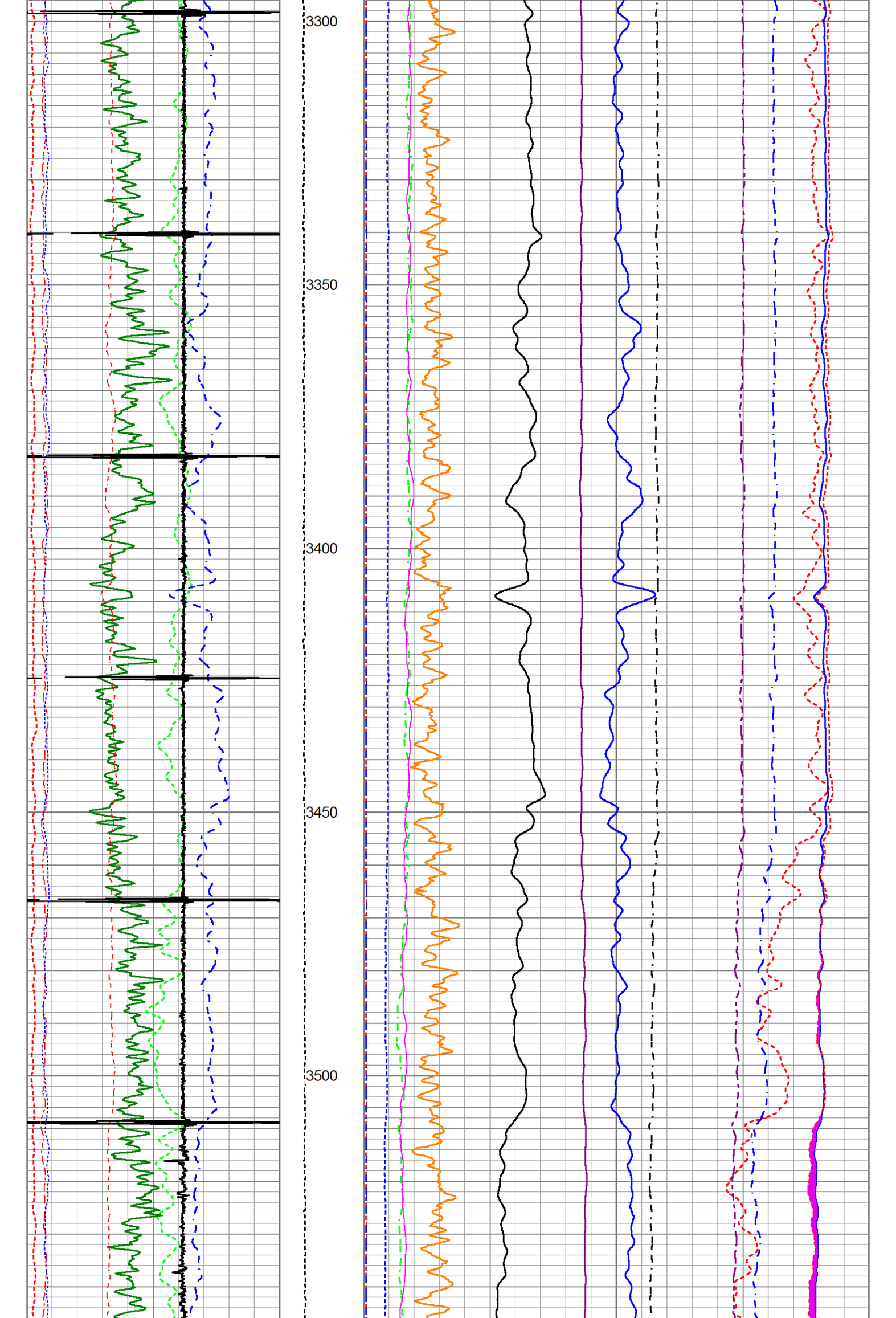
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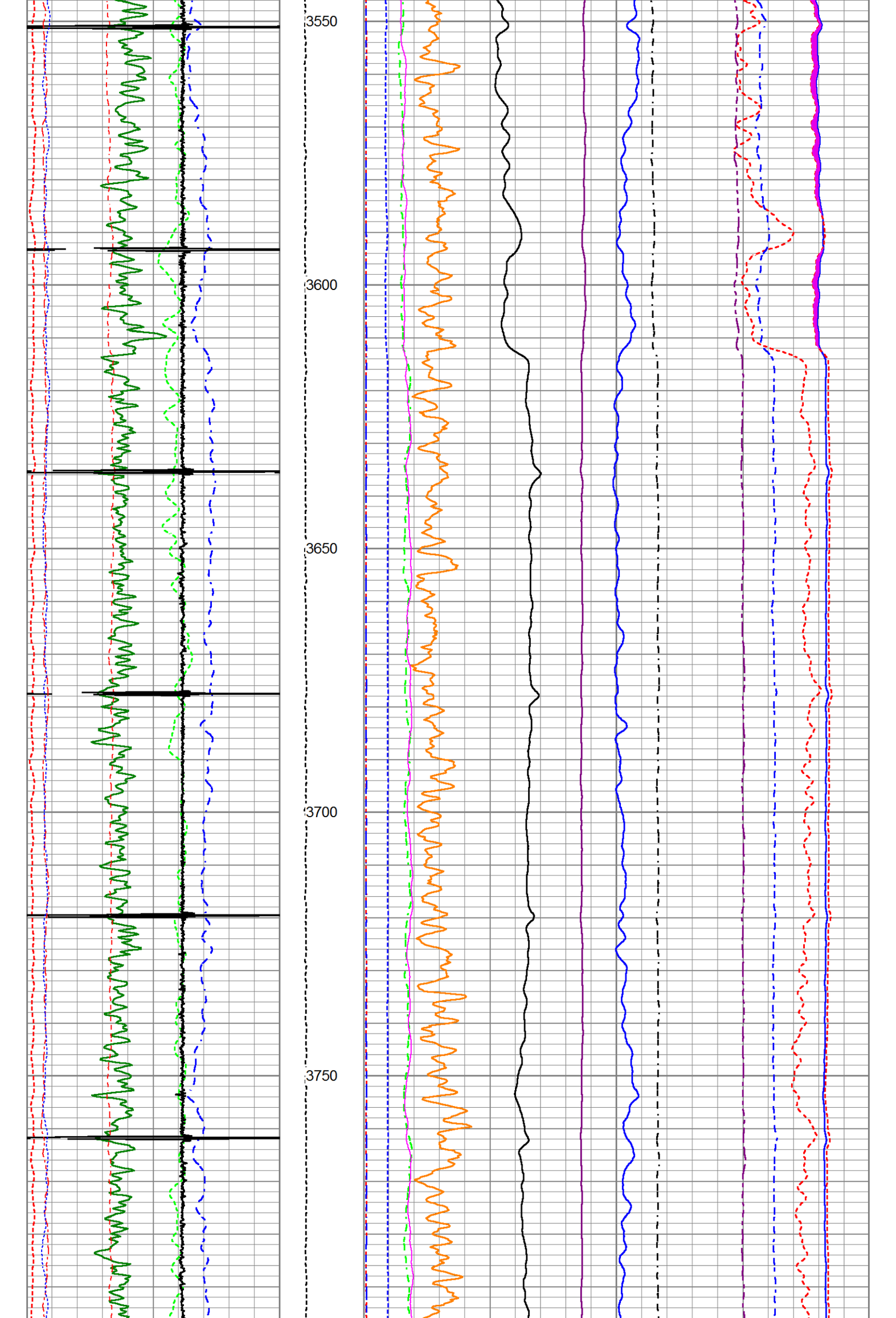
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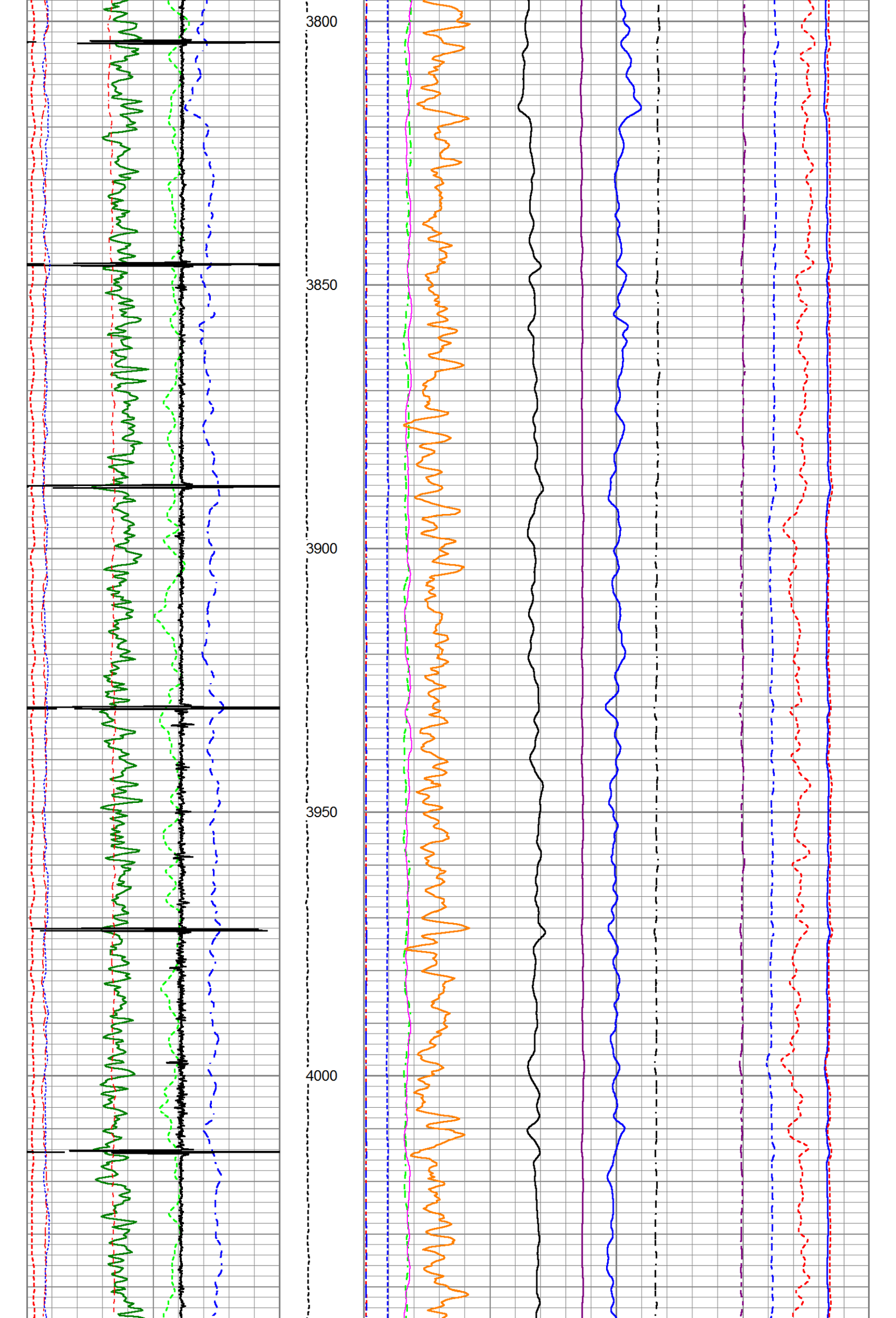
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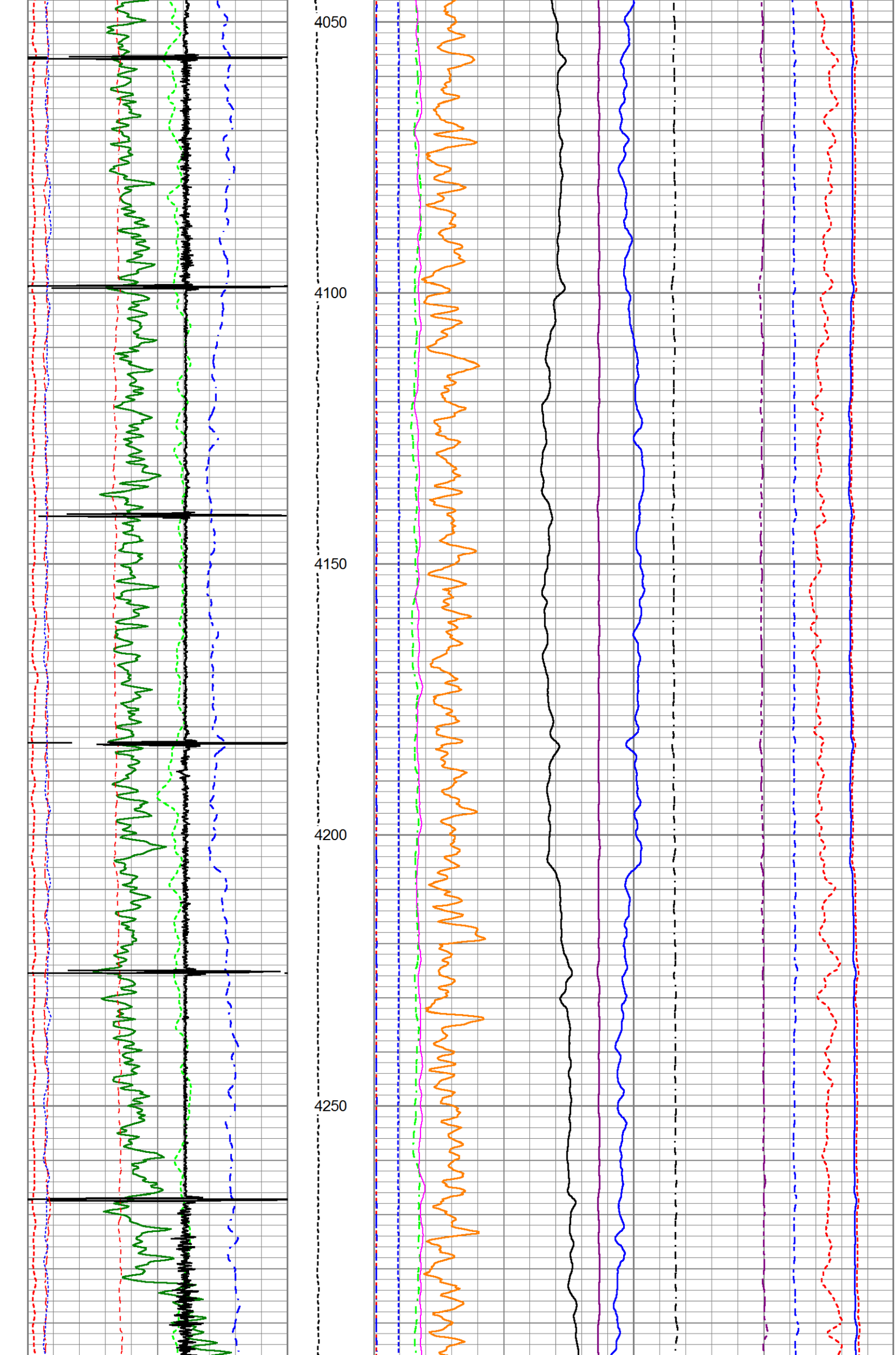
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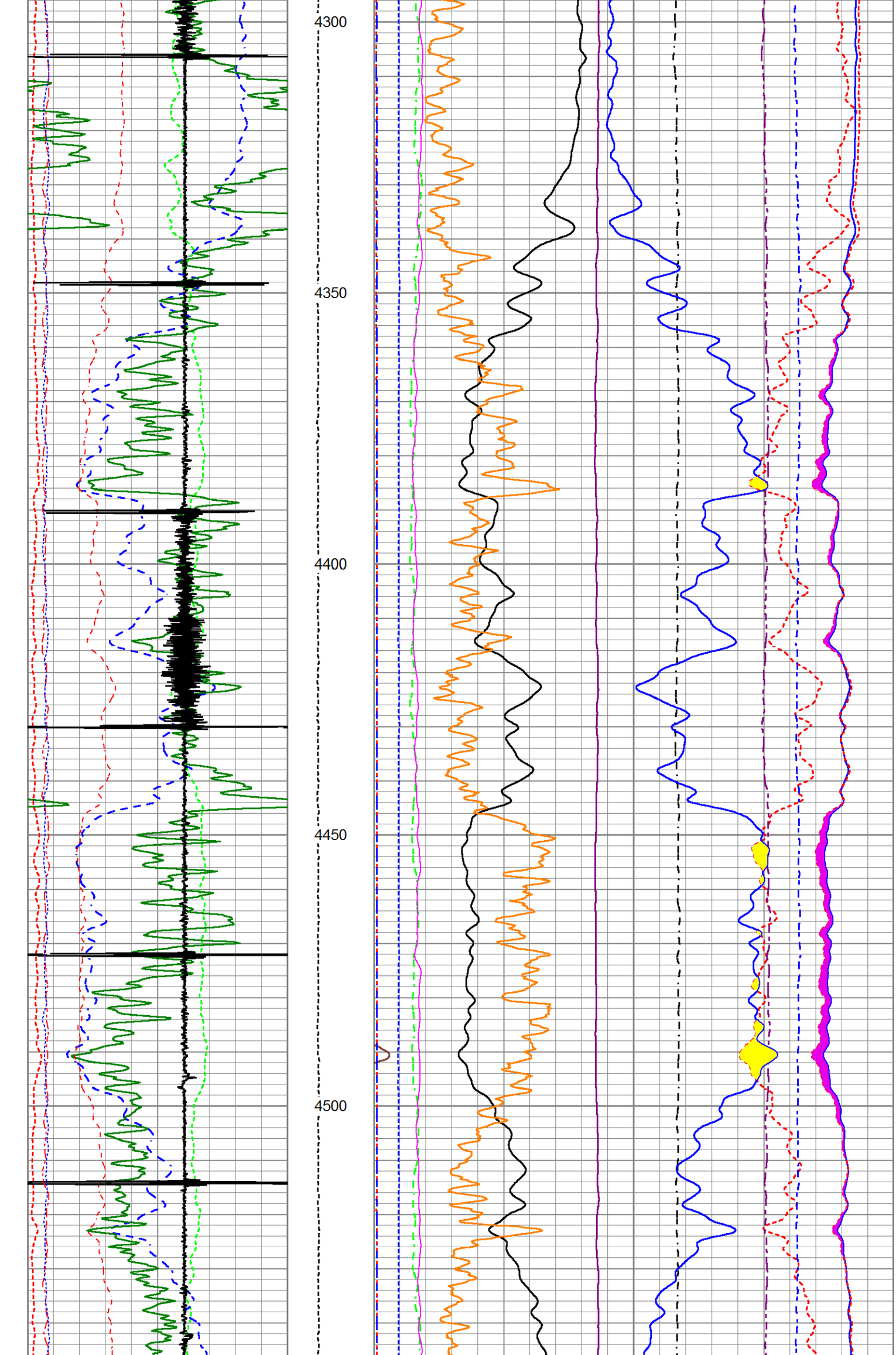
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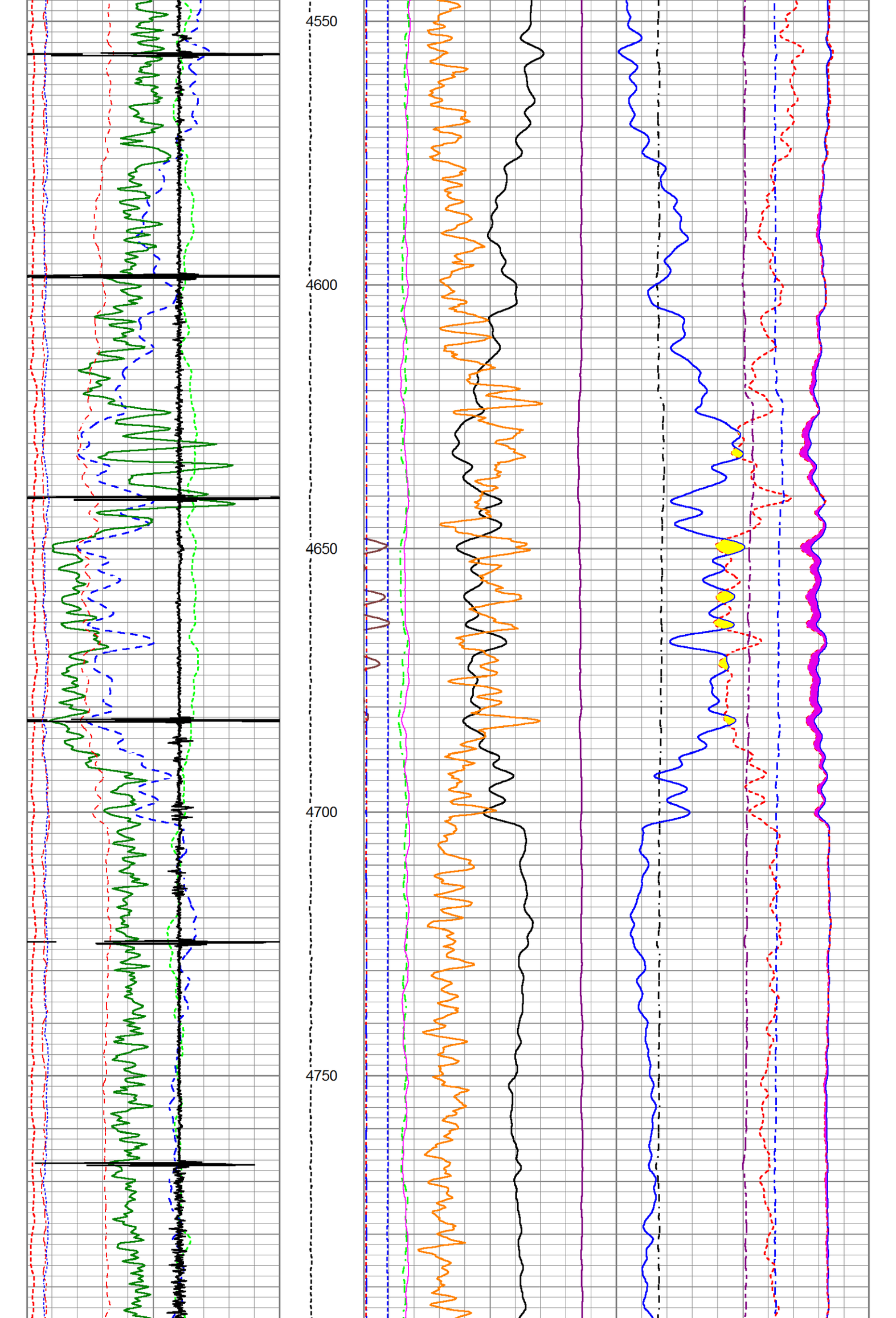
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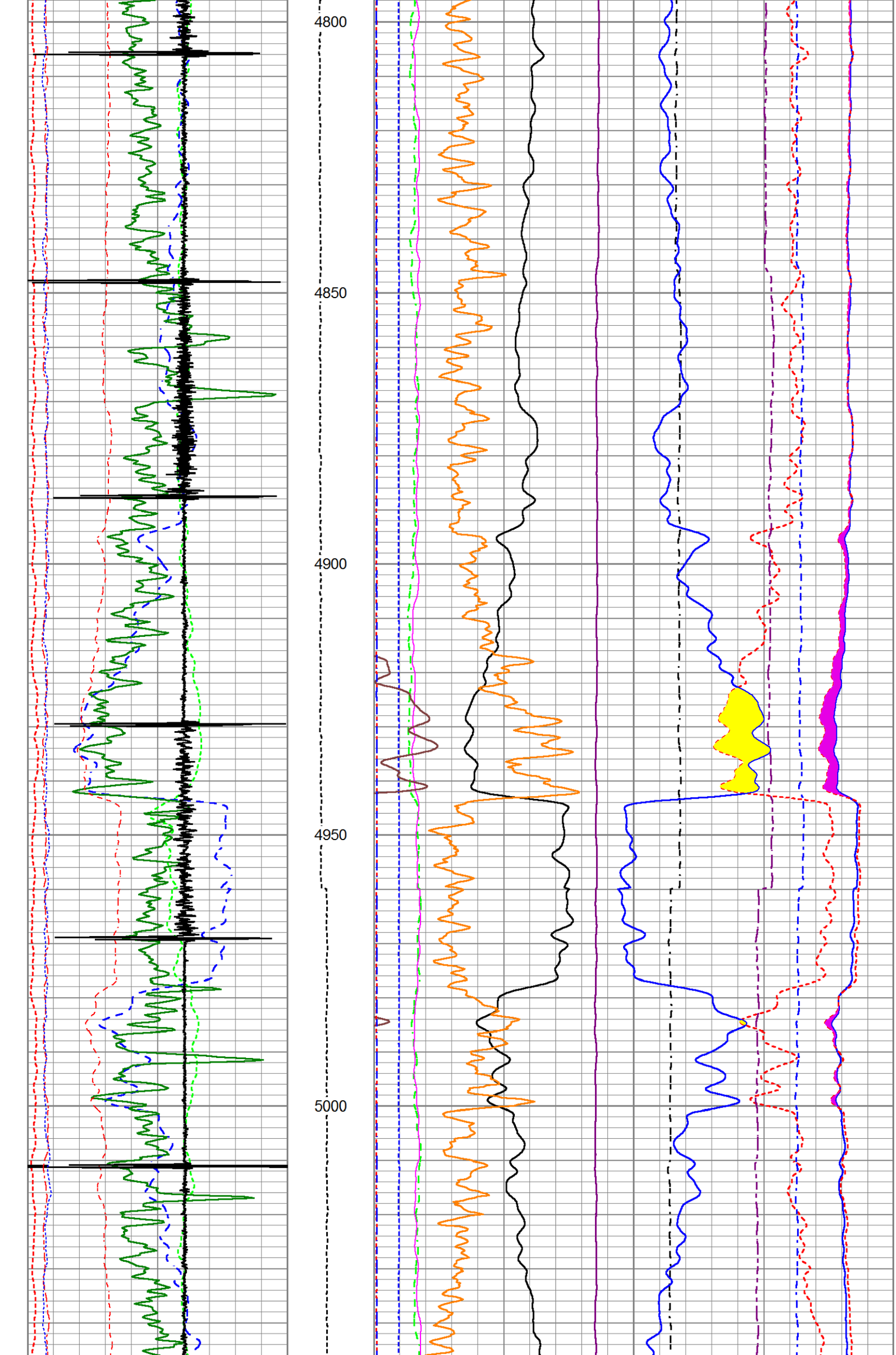
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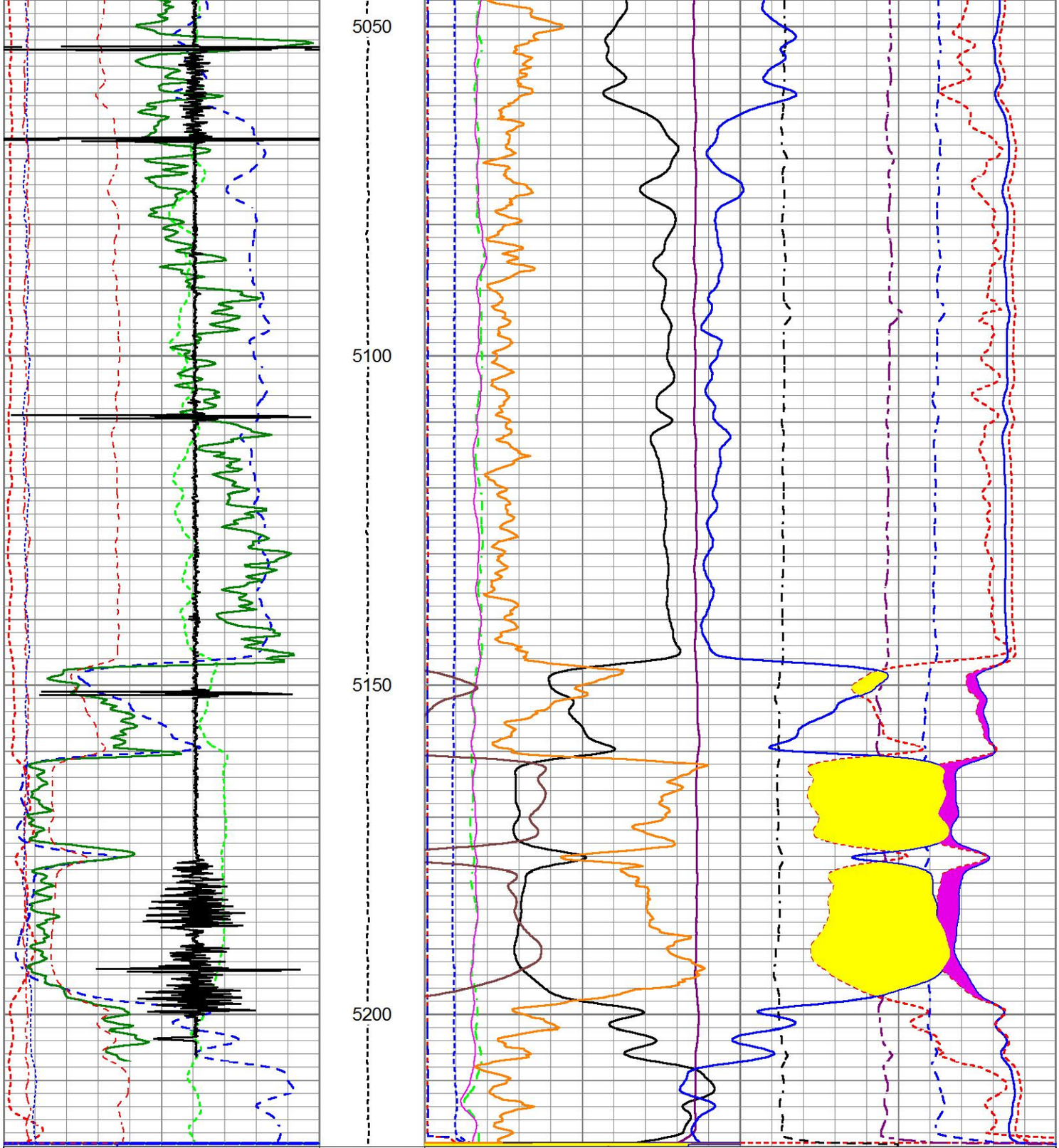

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22	
0	OAI	100	0 (lb 1750	60	SGIN	0	
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP) 0
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP) 0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN) 0
17000	CCL	19000		0	H YIELD (YH1)	1	10000 NEAR INTEL CT (NSIN) 0
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1	ET INL NEAR (NNI
0	IN FIT ERR CFTR2) FAR	1		0	STUN1	1	50000 -1000
				0	STUN2	1	
				0	NFTR	5	
					INOX2		
				-1500		1500	

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MAIN PASS

5" = 100'

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REPEAT PASS

5" = 100'

Database File	egcs_6_18_wp_d011_2_rmt.db
Dataset Pathname	RPT
Presentation Format	1_RMTE~1
Dataset Creation	Thu Mar 24 03:15:07 2016
Charted by	Depth in Feet scaled 1:240

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0	OAI	100	0 (lb 1750	60	SGIN	0	
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP) 0
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP) 0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN) 0
20000	CCL	18000		0	H YIELD (YH1)	1	10000 NEAR INTEL CT (NSIN) 0
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1	ET INL NEAR (NNI
0	IN FIT ERR CFTR2) FAR	1		0	STUN1	1	50000 -1000
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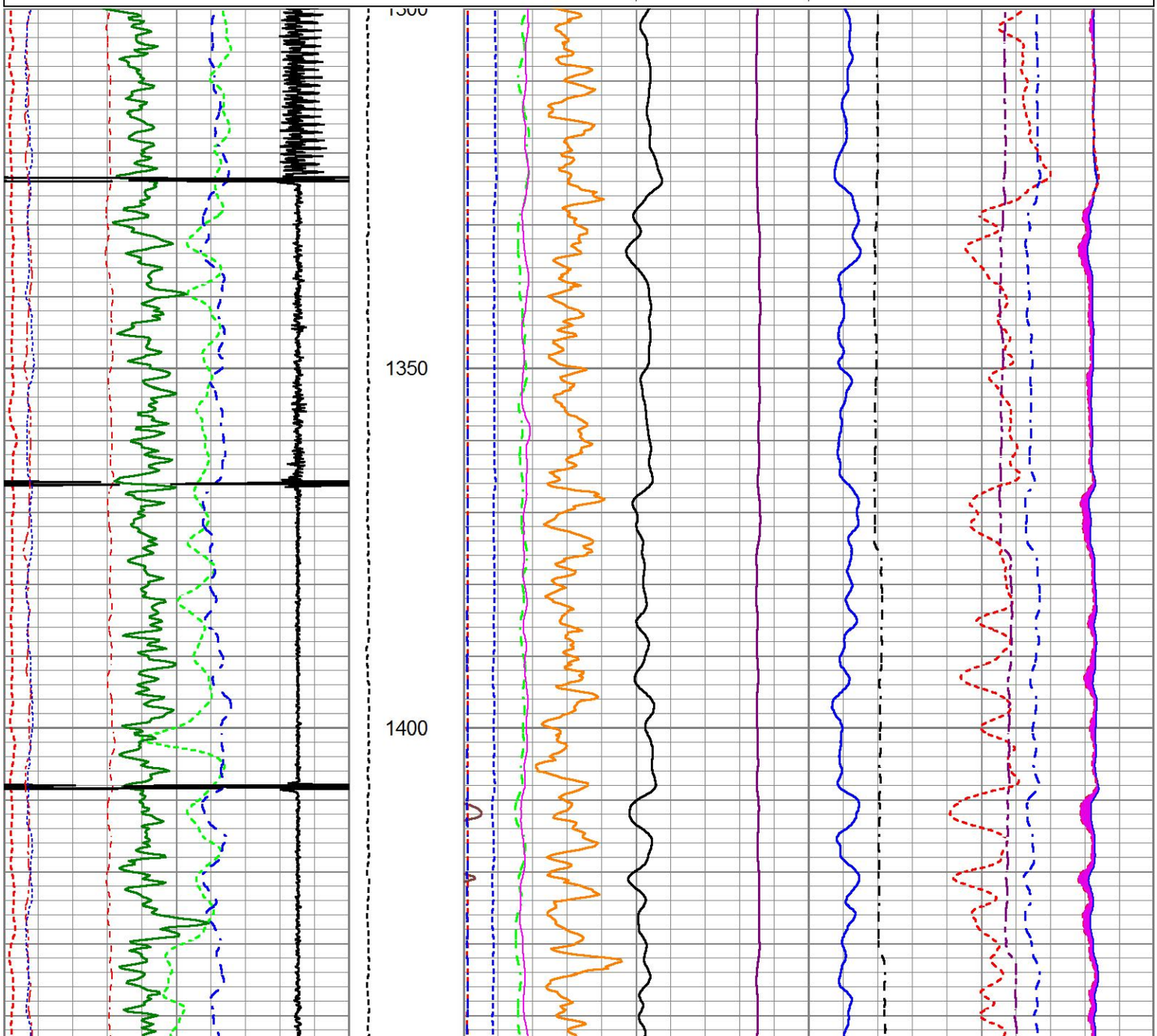

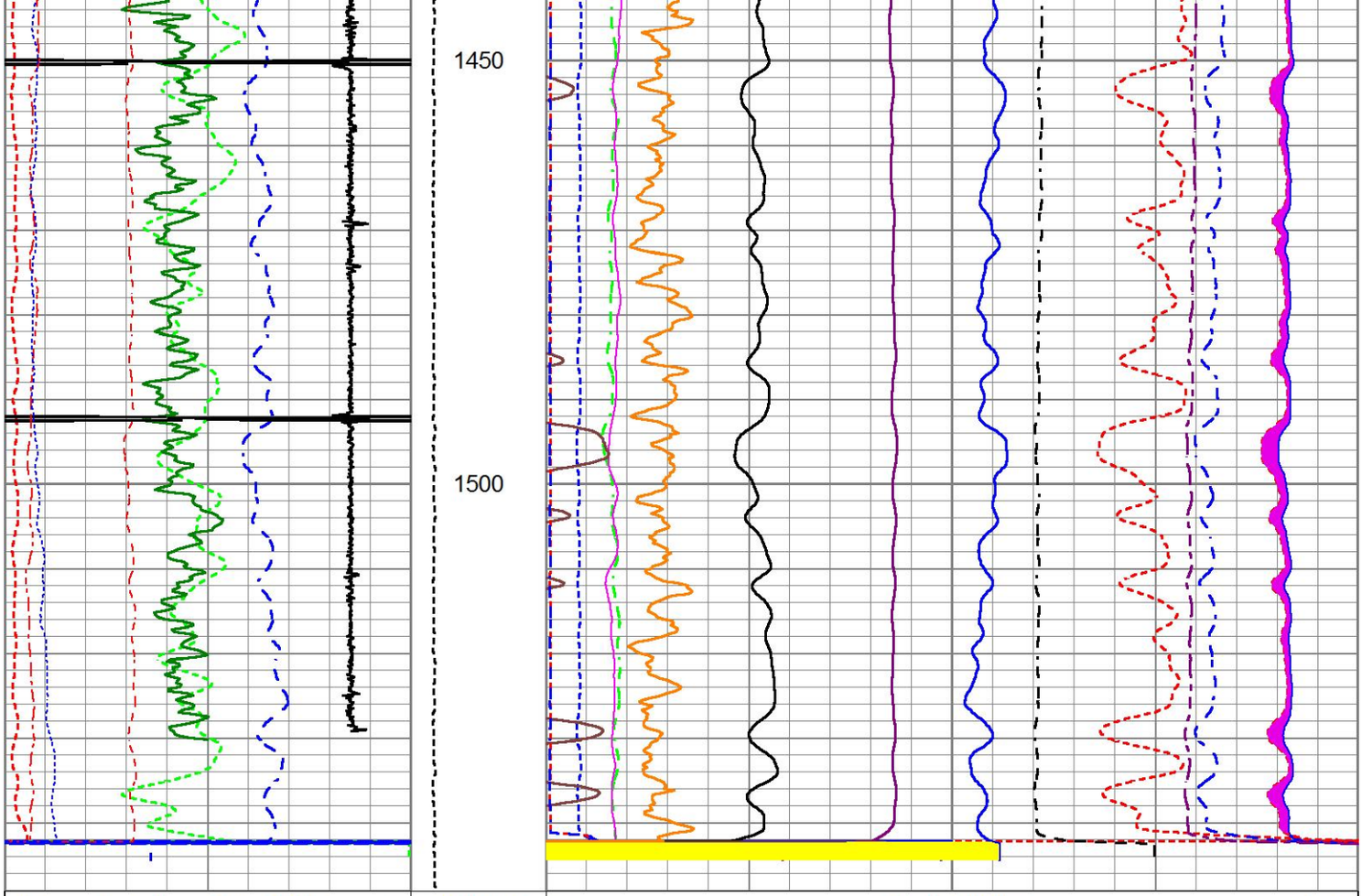

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22		
0	OAI	100	0 (lb 1750	60	SGIN	0		
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)	0
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP)	0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN)	0
20000	CCL	18000		0	H YIELD (YH1)	1	10000 NEAR INTEL CT (NSIN)	0
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1	ET INL NEAR (NNI	
0	IN FIT ERR CFTR2) FAR	1		0	STUN1	1	50000 -1000	
				0	STUN2	1		
				0	NFTR	5		
					INOX2			
				-1500		1500		

HALLIBURTON

REPEAT PASS

5" = 100'

HALLIBURTON

REPEAT PASS WITH FLUID IN ANNULAR

5" = 100'

Database File	egcs_6_18_wp_d011_2_rmt.db
Dataset Pathname	repeat_annular
Presentation Format	1_rmte_main
Dataset Creation	Thu Mar 24 11:19:55 2016
Charted by	Depth in Feet scaled 1:240

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10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)	0
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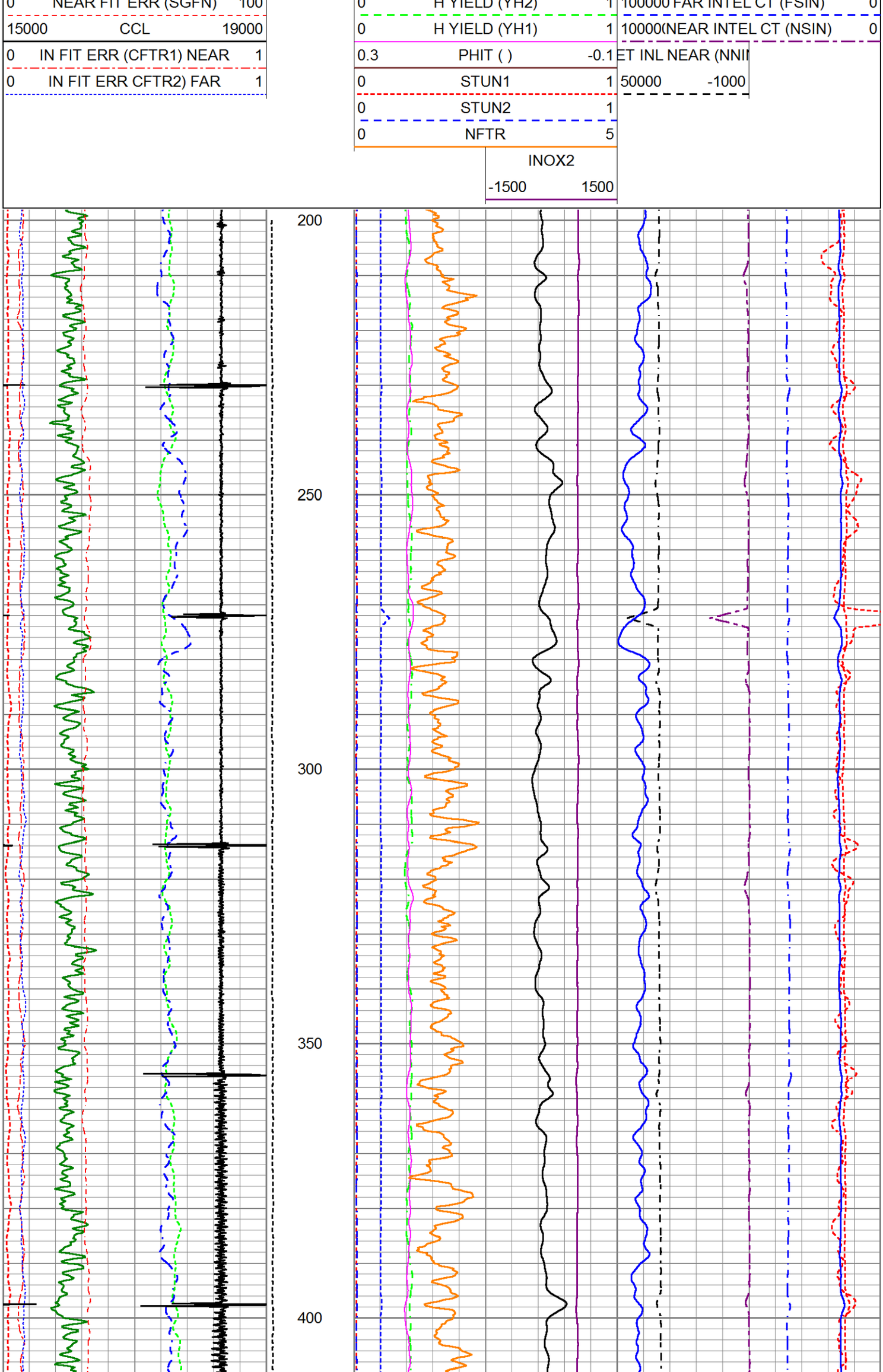
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0.3 PHIT ( ) -0.1
0 STUN1 1
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0 NFTR 5
INOX2
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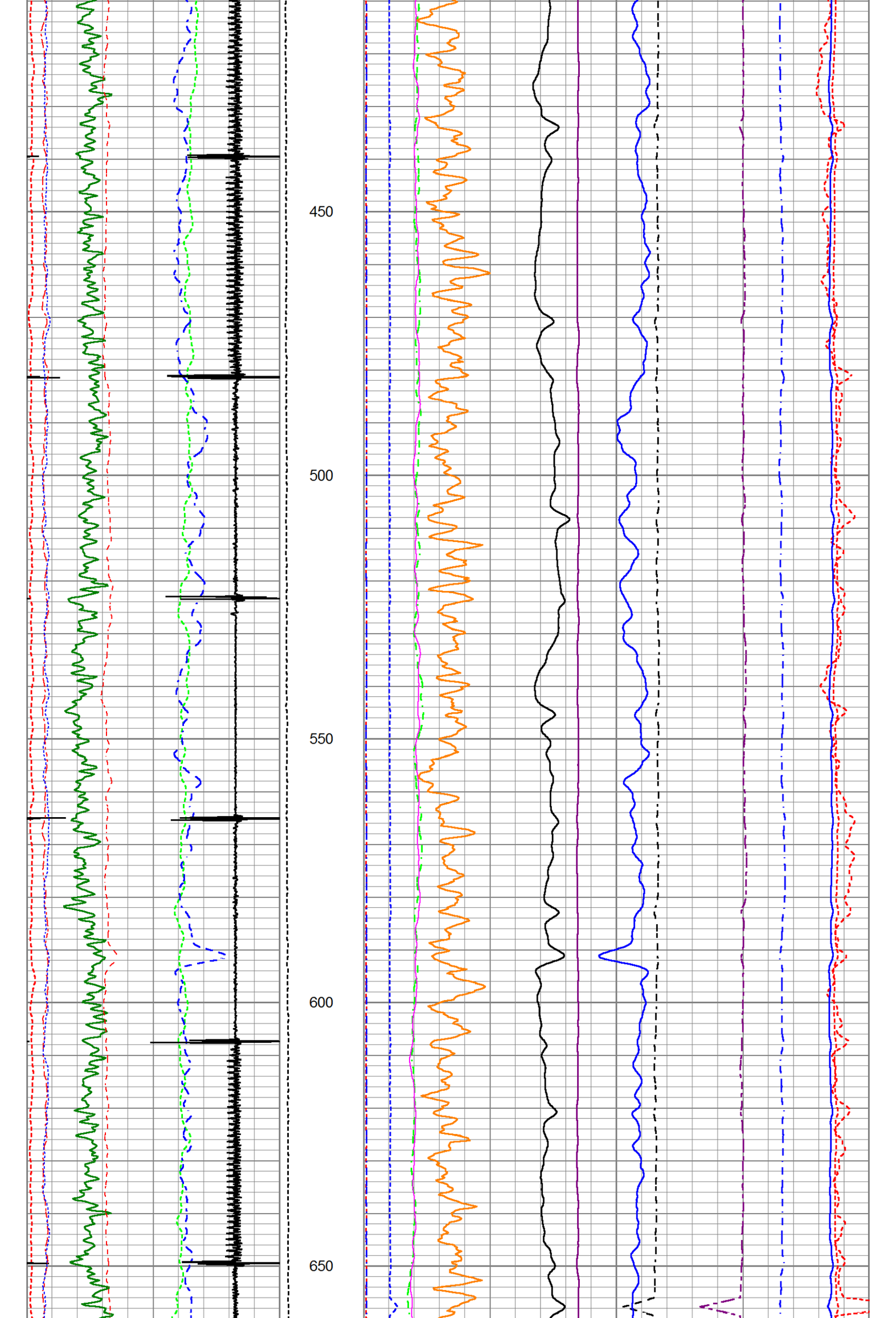
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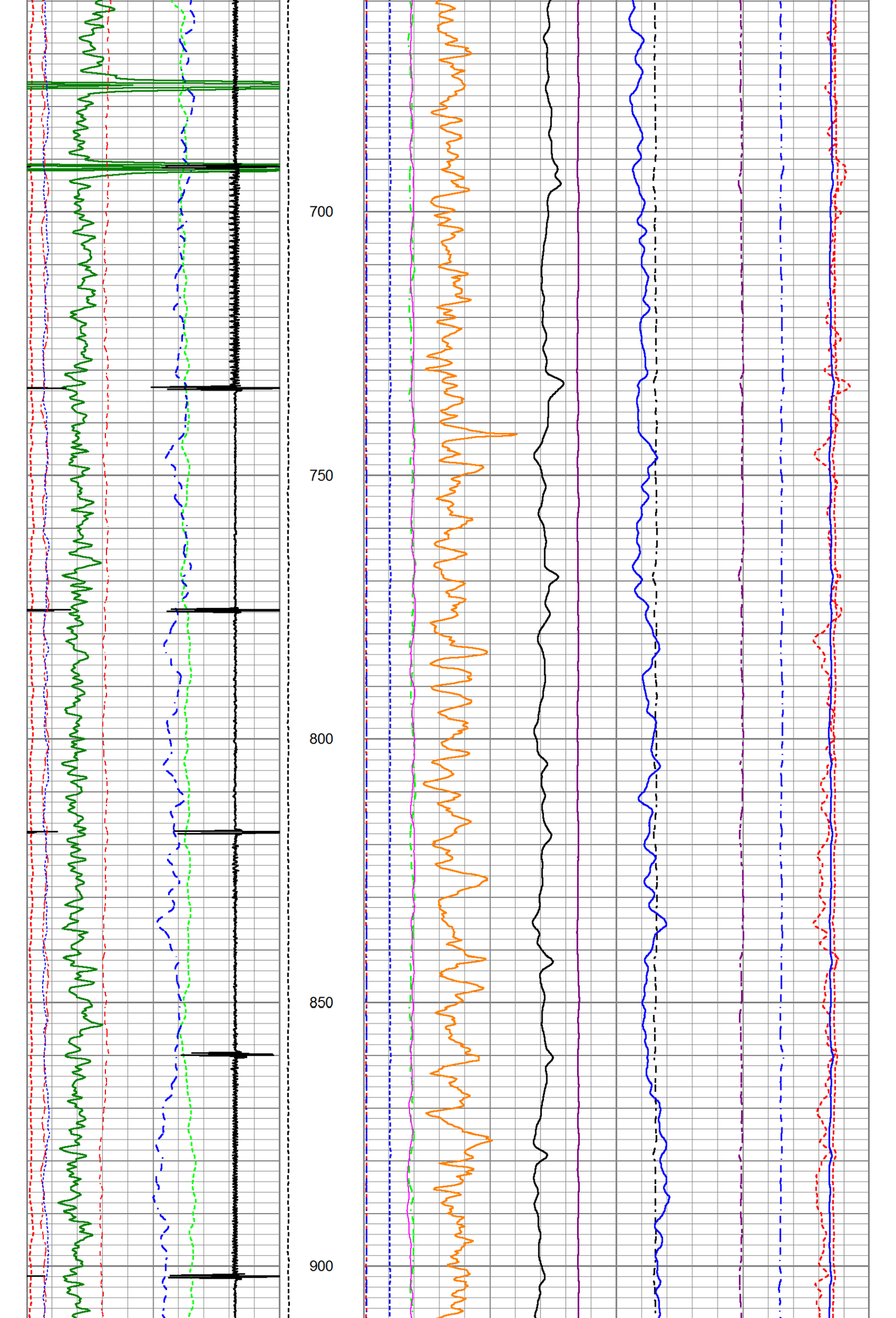
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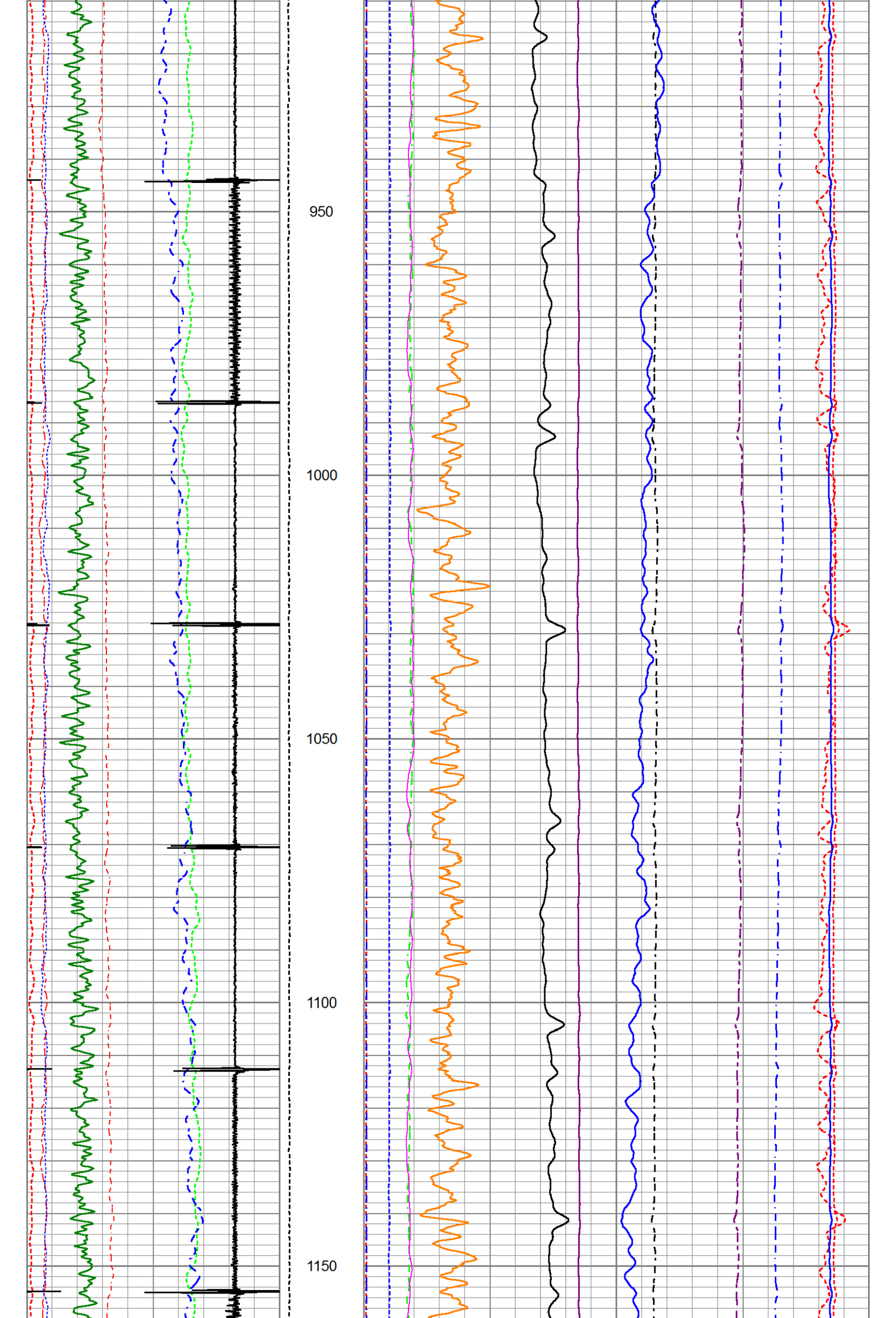
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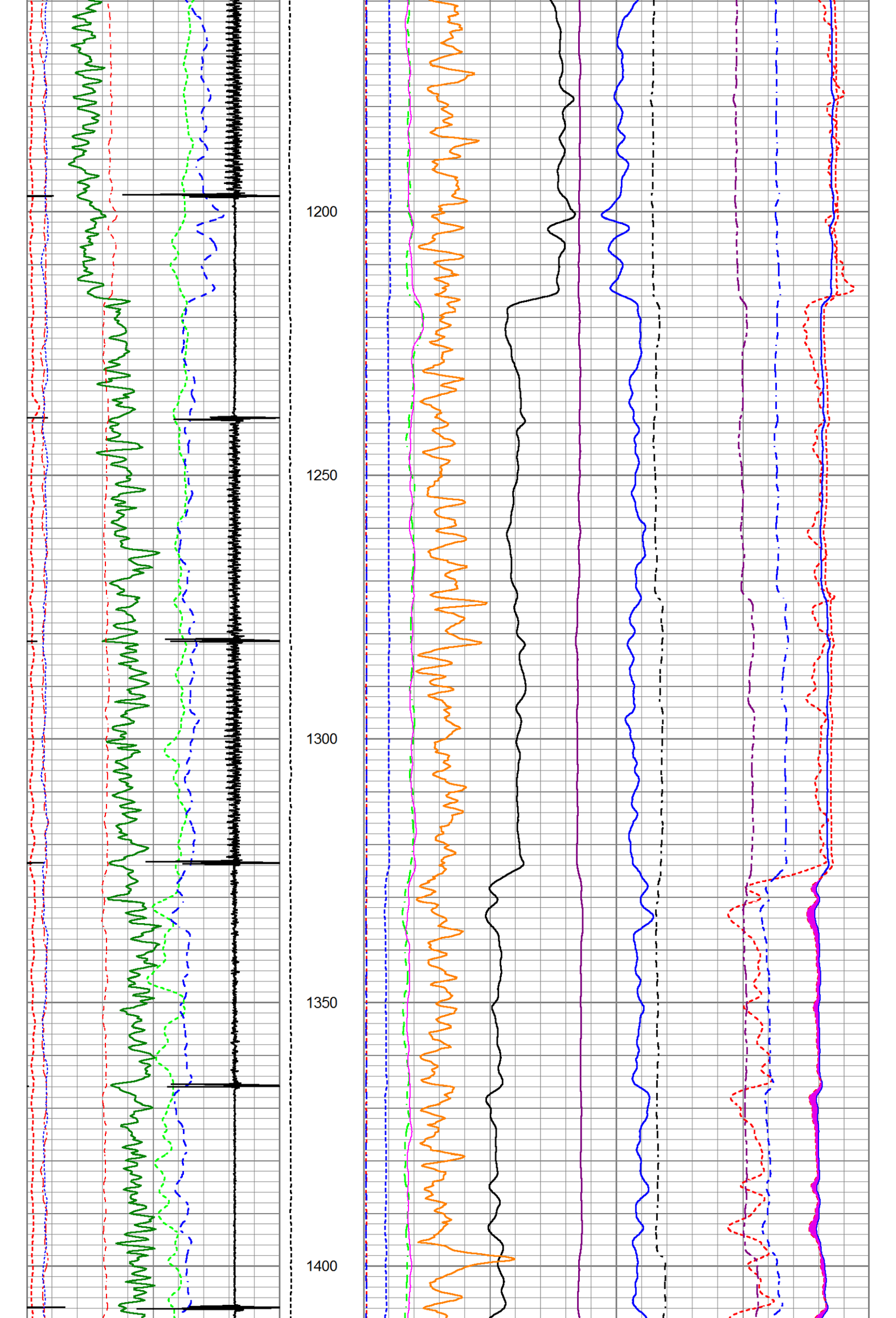
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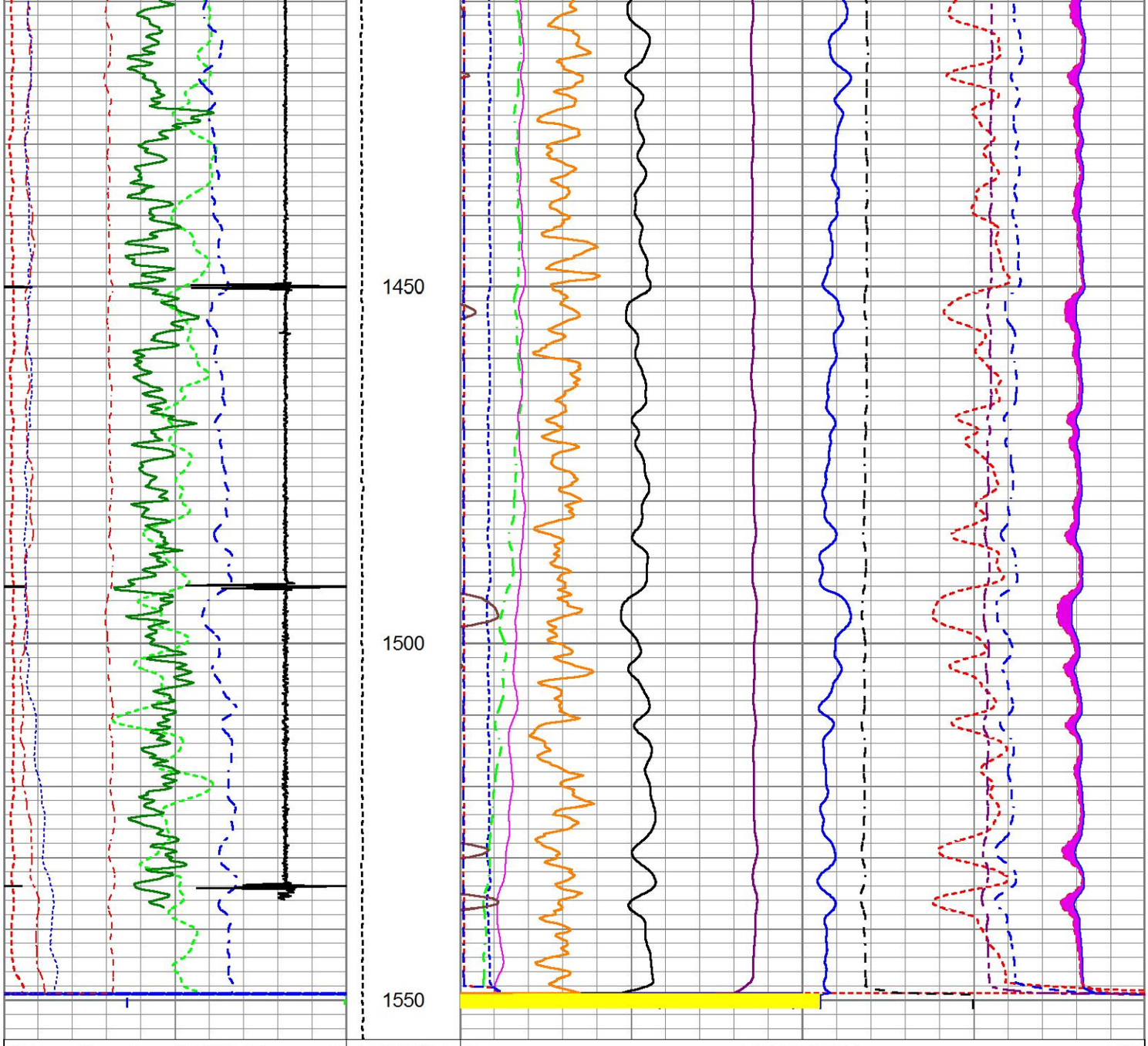

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)		1.22
0	OAI	100	0 (lb 1750	60	SGIN		0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP) 0
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP) 0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN) 0
15000	CCL	19000		0	H YIELD (YH1)	1	10000 NEAR INTEL CT (NSIN) 0
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1	ET INL NEAR (NNI
0	IN FIT ERR CFTR2) FAR	1		0	STUN1	1	50000 -1000
				0	STUN2	1	
				0	NFTR	5	
					INOX2		
				-1500		1500	

HALLIBURTON

REPEAT PASS WITH FLUID IN ANNULAR

5" = 100'

Log Variables

DatabaseC:\ProgramData\Warrior\Data\egcs_6_18_wp_d011_2_rmt.db
Dataset field/well/run1/MAIN_TOP/_vars_

Top - Bottom

BHTEMP_Src	BHSAL2	BHSAL1	POROS2	POROS1	LTH	UHSGC	RHOCF

ITEMPX	0	1	0	1	Sandstone	NONE	0.25

SO in	BORSAL kppm	CASED?	USERFTT usec/ft	ZREF MRayl	CASEWGHT lb/ft	SRFTEMP degF	MudWgt lb/gal
0	150	Yes	0	1.7	17	40	8.5

CASETHCK in	CASEOD in	PERFS	TDEPTH ft	BOTTEMP degF	BITSIZE in
0.362	7	0	5215	155	10

Calibration Report

Database File egcs_6_18_wp_d011_2_rmt.db
Dataset Pathname RPT
Dataset Creation Thu Mar 24 03:15:07 2016

Reservoir Monitor Tool I Calibration Report

Serial-Model: 12270693-A

Shop Calibration Performed: Mon Mar 14 12:51:46 2016

Carbon/Oxygen Mode

Stabilization

Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	94.00	80.00	14.00	+/-15.00	V
ITCR2	3158	3250	-92	+/-250	cps

Near Detector

	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0275	5.28	<6.00
Fe	207	206 +/-2	0.0937	-----	-----
NGAIN = 0.996	NZOFF = 0.1				

Far Detector

	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0352	5.86	<6.50
Fe	210	208 +/-2	0.0894	-----	-----
FGAIN = 0.990	FZOFF = 0.4				

Flask Temperature 57.9 degF

Result	Logged	Expected Value	Diff.	Tol.	Units
COIR2	0.45	0.45	-0.00	+/-0.02	
LIRI2	1.64	1.64	0.00	+/-0.05	
TCCR2	5015	5000	15	+/-1000	cps
ITCR2	3114	3200	-86	+/-250	cps

Sigma Mode

Stabilization

Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	95.00	80.00	15.00	+/-15.00	V
FCAP	9771	10000	-229	+/-500	cps

Horizontal Water Tank

Result	Logged	Expected Value	Diff.	Tol.	Units
N/F Normalizer	1.00	0.95	0.05		
N/F Inel Norm	0.65	0.61	0.04		

RNF	1.00	1.07	-0.07	+/-0.12	
RINC	1.55	1.64	-0.09	+/-0.18	
SGFN	24.10	24.00	0.10	+/-0.50	cu
SGFF	22.92	22.85	0.07	+/-0.50	cu
FSIN	23156	24000	-844	+/-2000	cps
FCAP	9774	10000	-226	+/-1000	cps
NFTR	0.84			<5.00	
FFTR	0.89			<5.00	
NBKG	166			<500	cps
FBKG	94			<500	cps
RTN	0.40	0.40	-0.00	+/-0.10	usec
RTF	0.42	0.40	0.02	+/-0.10	usec

Calibration Software Modules

HRMTI Module	2013.11.14.0
RMTI Module	2014.8.28.1

Log Data Acquisition Software Modules

HRMTI Module	2013.11.14.0
RMTI Module	2014.8.28.1

Gamma Ray Calibration Report

Serial Number:	10010734	
Tool Model:	002	
Performed:	Tue Mar 08 14:57:04 2016	
Calibrator Value:	190.0	GAPI
Background Reading:	42.0	cps
Calibrator Reading:	184.4	cps
Sensitivity:	1.3349	GAPI/cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			STNDCH-STND_CH Fishing Neck	1.50	2.00	1.00
CCL	21.46					
			TTTCU-002 (10010734) Through Tubing Telemetry Cartridge - Ultrawire	7.65	1.69	100.00
GR	19.21					
			XHU-003 (11870311) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00

RmtTFGT	8.55				
RmtTNGT	8.05				
		RMTI-A (12270693) Halliburton RMTI Tool	14.00	2.13	77.00
RmtFP5V	0.30				
RmtCommFWar	0.30				
LLMTEN	0.00	BUL-001 (000001) Bullnose	0.30	1.69	1.50

Dataset: egcs_6_18_wp_d011_2_rmt.db: field/well/run1/MAIN_TOP
Total length: 25.03 ft
Total weight: 186.50 lb
O.D.: 2.13 in

Company	EAST CHEYENNE GAS STORAGE, LLC.
Well	ECGS 6-18 WP-D011-2
Field	WEST PEETZ
County	LOGAN State CO

HALLIBURTON

RESERVOIR
MONITORING TOOL
ELITE