

HALLIBURTON

RESERVOIR MONITOR LOG
CCL-GR

Company	EAST CHEYENNE GAS		
Well	SCHWAKE 1 WP-M008		
Field	WEST PEETZ PROSPECT		
County	LOGAN	State	CO
Company EAST CHEYENNE GAS STORAGE LLC			
Well SCHWAKE 1 WP-M008			
Field WEST PEETZ PROSPECT			
County LOGAN State CO			
API No.:	05-075-087990000	Serv #:	90394701
Location: SURFACE HOLE LOCATION: 671' FSL & 667' FEL		Other Services	
Sec: 31 Twp: 12N Rge: 52W		CAST TEMP CBL	

Permanent Datum	G.L.	Elevation	4540'	Elevation	
Log Measured From	K.B.	16 Ft. above perm. datum	K.B. D.F. G.L.	4556'	4540'
Drilling Measured From	K.B.				
Date @ Time Logged	03-APRIL-2017	Type Fluid in Hole	FRESH WATER		
Run No.	ONE	Density of Fluid	8.5 PPG		
Depth - Driller	5334 FT	Fluid Level	SURFACE		
Depth - Logger	5312 FT	Cement Top Est. Logged	SURFACE		
Bottom - Logged Interval	5306 FT / 1600 FT	Equipment / Location	11808537 / RS		
Top - Log Interval	5000 FT / 200 FT	Recorded by	PEDRO GONZALEZ B.		
Max. Recorded Temp.	193° F	Witnessed by	G. OHLMAN		
CEMENTING DATA		Surface String	Protection 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 8.625"	Weight 24.4	From SURFACE	To 186'
		5.5"	15.5	SURFACE	5330'

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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

HES RESERVOIR MONITOR LOG CORRELATED BY JW CEMENT BOND LOG DATED JUNE-29-2017
LOG INTERVAL PER CUSTOMER REQUEST
FIRST LOG FROM TD TO 5000 FT
SECOND LOG FROM 1600 FT TO 200 FT

TOOLS RAN IN 5.5" 15.5 LB CASING

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES

MAIN PASS FROM TD TO 5000 FT

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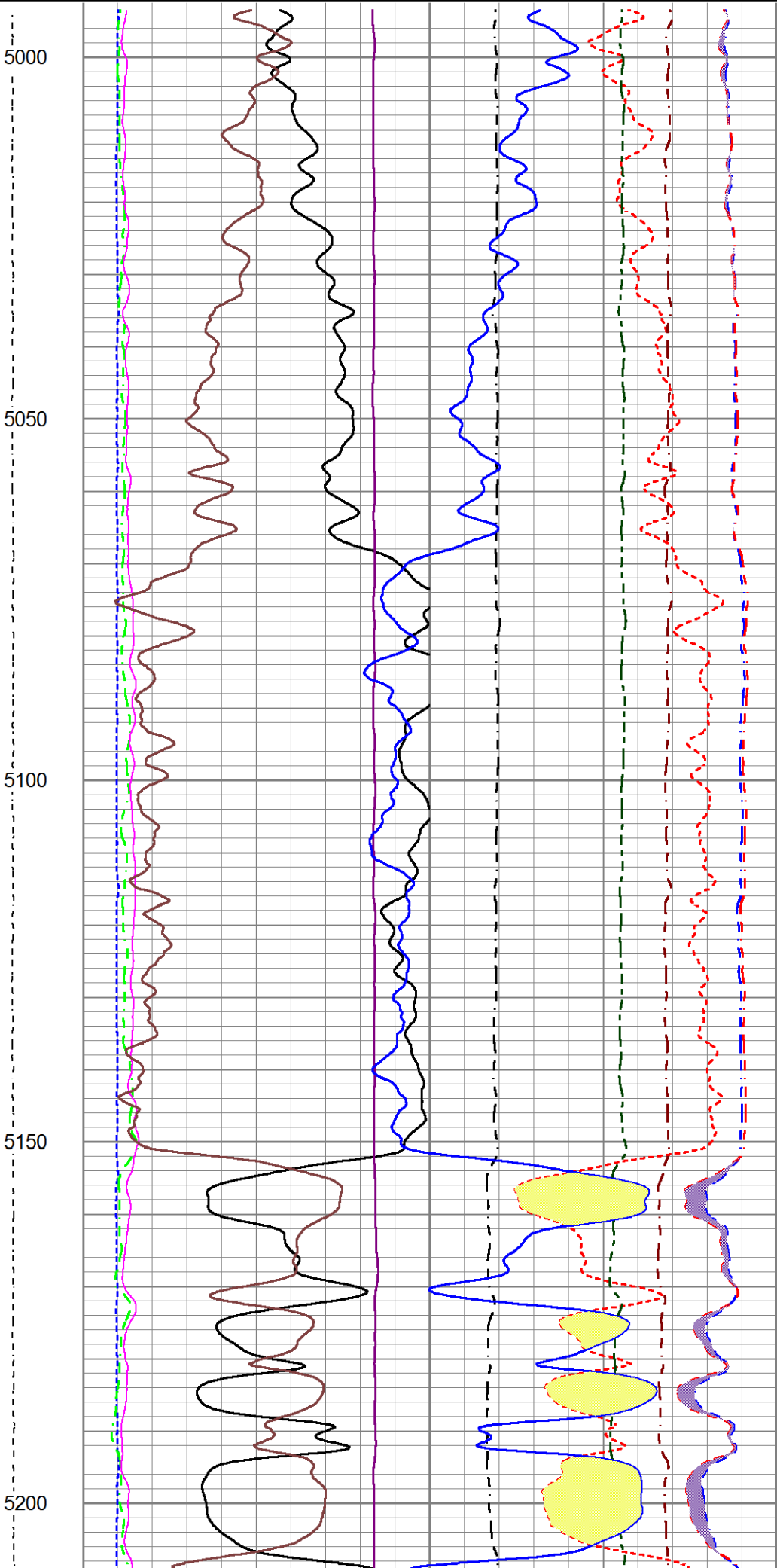
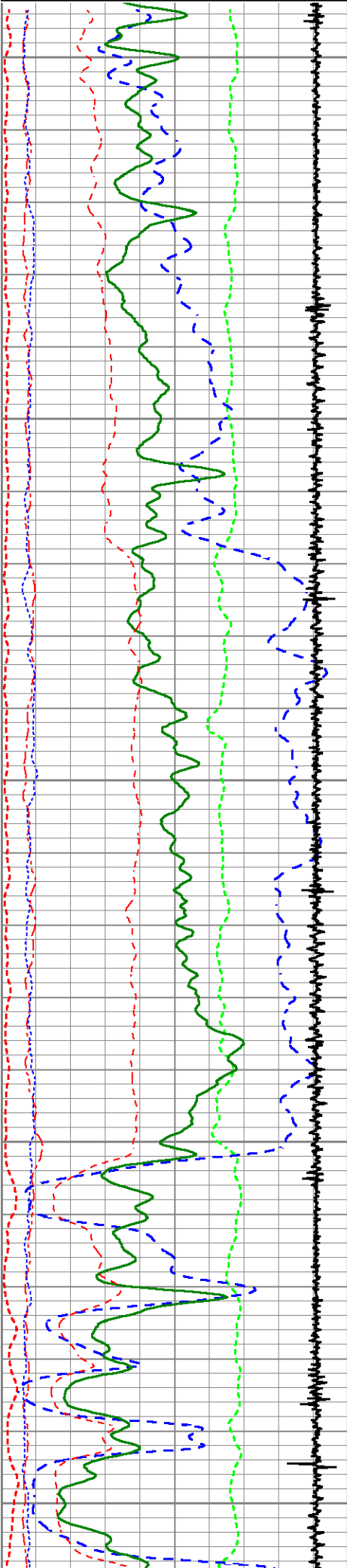
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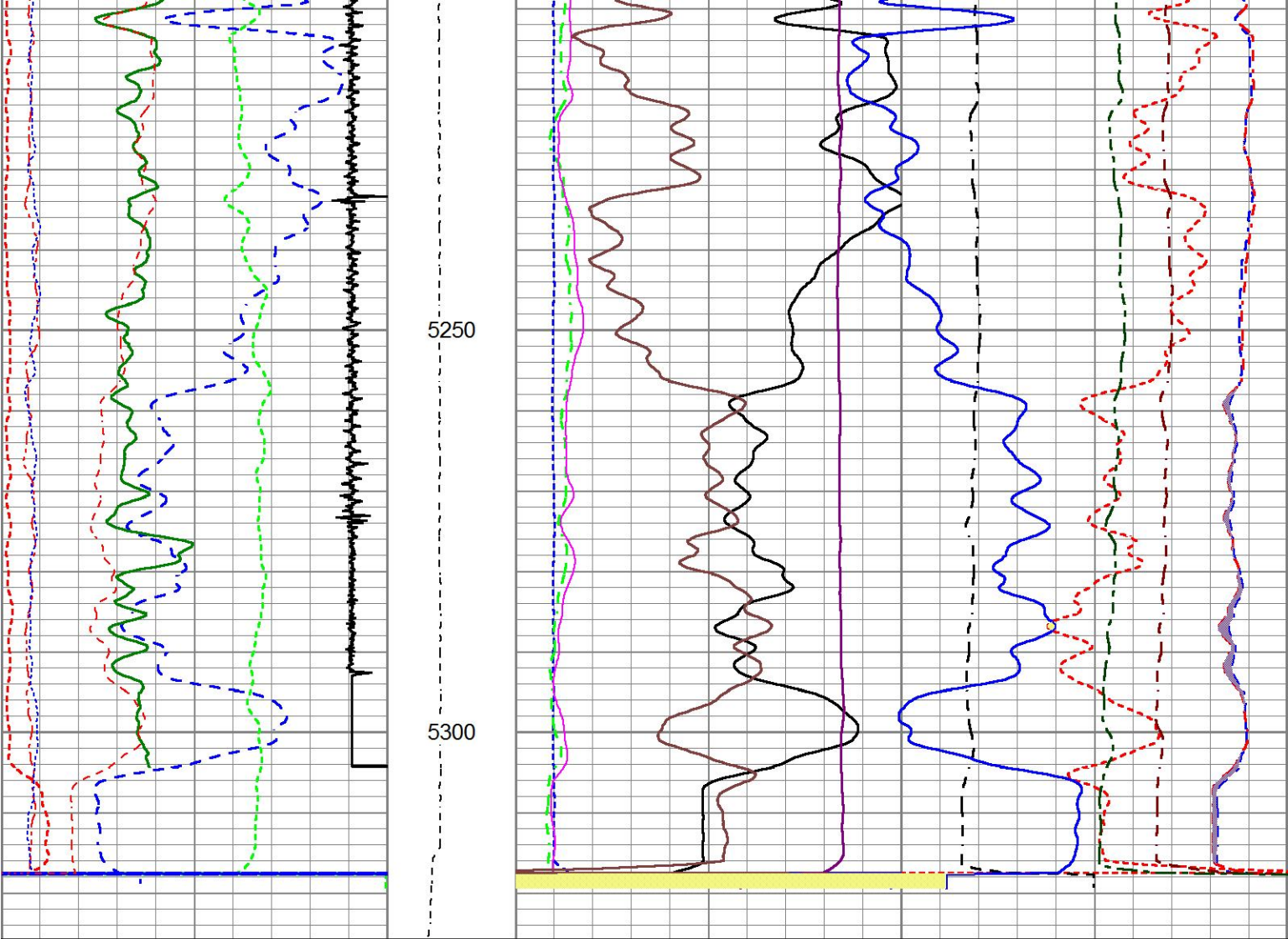
Database File schwake 1\schwake_1-rmt.db
Dataset Pathname SCHWAKE-1/run1/MAIN
Presentation Format RMTE_M~1
Dataset Creation Mon Apr 03 10:47:06 2017
Charted by Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.2
0	OAI	100	(lb/1800	60	SGIN	0
10	5.5" FSL FSL (CCL-GR)	10	5.5" FSL FSL (CCL-GR)	10	5.5" FSL FSL (CCL-GR)	10

0	FAR FIT ERR (SGFF)	40
0	GR (GAPI)	200
0	NEAR FIT ERR (SGFN)	100
-10500	CCL	1050
0	IN FIT ERR (CFTR1) NEAR	1
0	IN FIT ERR CFTR2) FAR	1

0	RIN	9	60000	Near Counts (NCAP)	0
0	RICF	6	60000	Far Counts (FCAP)	0
0	H YIELD (YH2)	1	100000	FAR INTEL CT (FSIN)	0
0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN)	0
0.9	PHIT ()	-0.1	ET INL NEAR (NNII		
	INOX2	50000	-1000		
	-1500	1500			





200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.2
0	OAI	100	0 (lb 1800	60	SGIN	0
10	FAR FIT ERR (SGFF)	40		0	RIN	9 60000 Near Counts (NCAP)
0	GR (GAPI)	200		0	RICF	6 60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1 100000 FAR INTEL CT (FSIN)
-10500	CCL	1050		0	H YIELD (YH1)	1 10000(NEAR INTEL CT (NSIN)
0	IN FIT ERR (CFTR1) NEAR	1		0.9	PHIT ()	-0.1 ET INL NEAR (NNII
0	IN FIT ERR CFTR2) FAR	1			INOX2	50000 -1000
					-1500	1500

MAIN PASS FROM TD TO 5000 FT

HALLIBURTON

5"=100'

REPEAT PASS FROM TD TO 5000 FT

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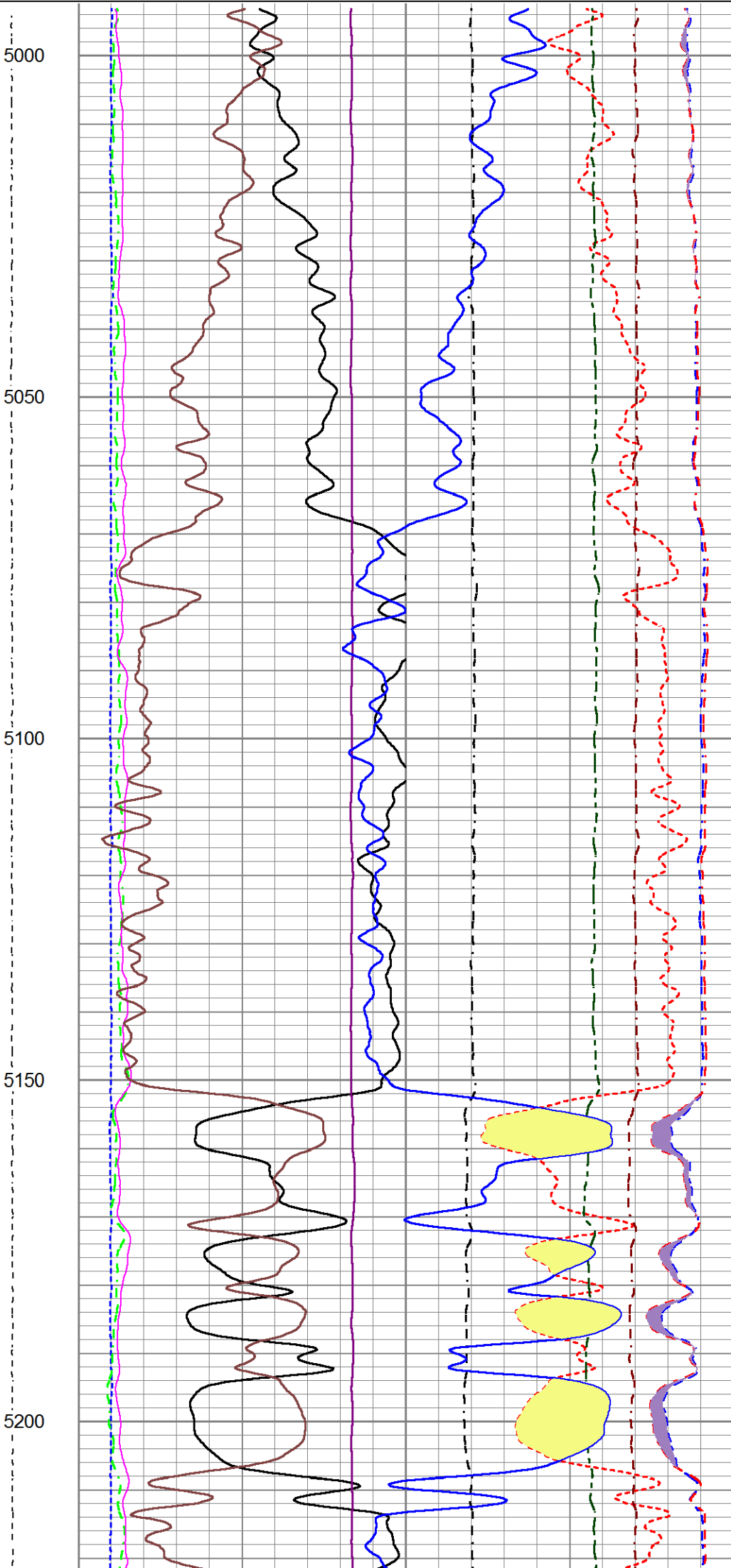
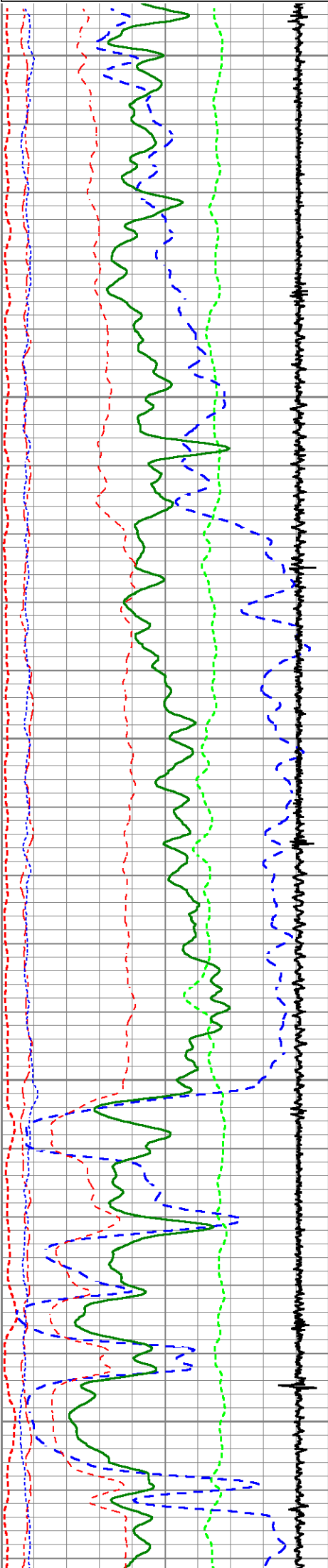
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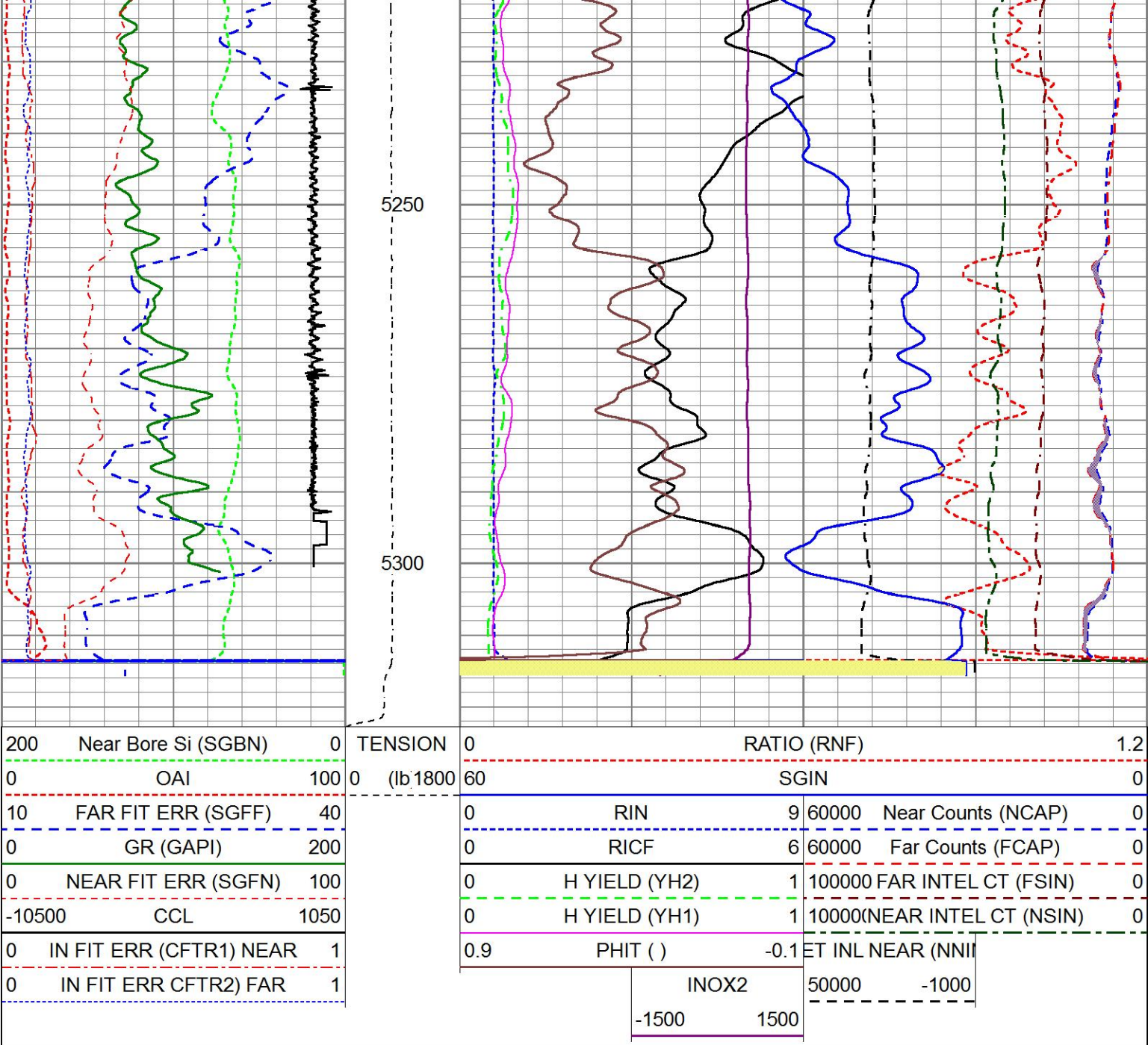
Database File	schwake 1\schwake_1-rmt.db
Dataset Pathname	SCHWAKE-1/run1/REPEAT
Presentation Format	RMTE_M~1
Dataset Creation	Mon Apr 03 11:06:22 2017
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.2
0	OAI	100	0 (lb 1800	60	SGIN	0
10	FAR FIT ERR (SGFF)	40		0	RIN	9 60000 Near Counts (NCAP)
0	GR (GAPI)	200		0	RICF	6 60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1 100000 FAR INTEL CT (FSIN)

-10500	CCL	1050
0	IN FIT ERR (CFTR1) NEAR	1
0	IN FIT ERR CFTR2) FAR	1

0	H YIELD (YH1)	1	10000(NEAR INTEL CT (NSIN)	0
0.9	PHIT ()	-0.1	ET INL NEAR (NNI	
	INOX2	50000	-1000	
	-1500	1500		





REPEAT PASS FROM TD TO 5000 FT

HALLIBURTON

5"=100'

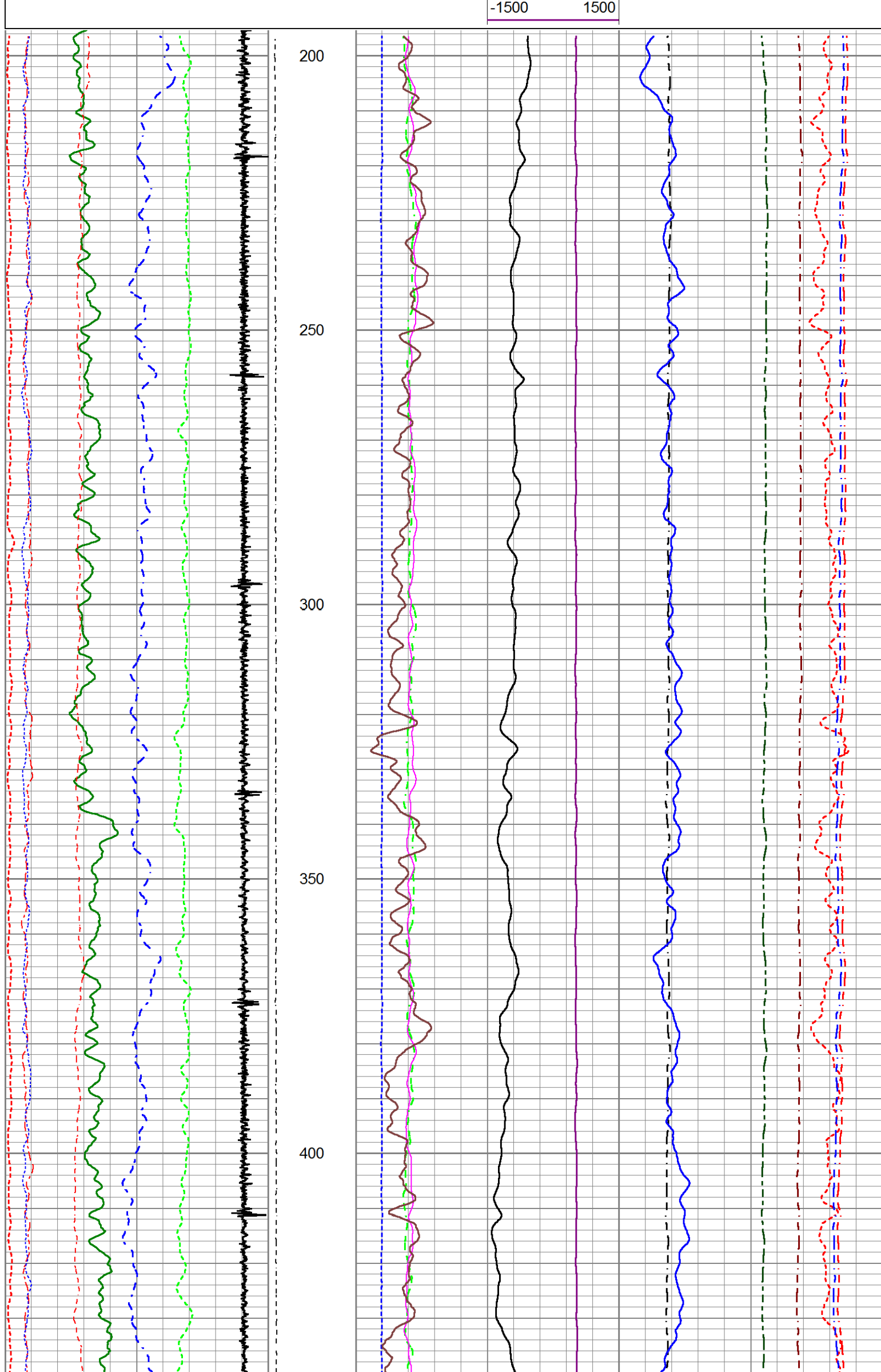
MAIN PASS FROM 1600 FT TO 200 FT

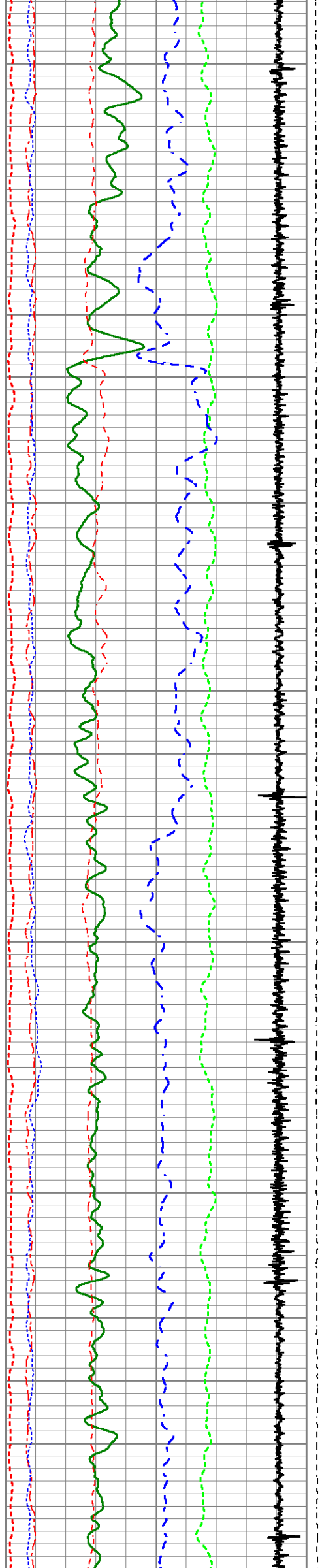
HALLIBURTON

5"=100'

Database File	schwake 1\schwake_1-rmt.db
Dataset Pathname	SCHWAKE-1/run1/MAIN1
Presentation Format	RMTE_M~1
Dataset Creation	Mon Apr 03 14:07:35 2017
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)		1.2
0	OAI	100	0 (lb 1800	60	SGIN		0
10	FAR FIT ERR (SGFF)	40		0	RIN	9 60000	Near Counts (NCAP) 0
0	GR (GAPI)	200		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
-10500	CCL	1050		0	H YIELD (YH1)	1 10000	(NEAR INTEL CT (NSIN) 0
0	IN FIT ERR (CFTR1) NEAR	1		0.9	PHIT ()	-0.1	ET INL NEAR (NNII
0	IN FIT ERR CFTR2) FAR	1			INOX2	50000	-1000
					-1500	1500	





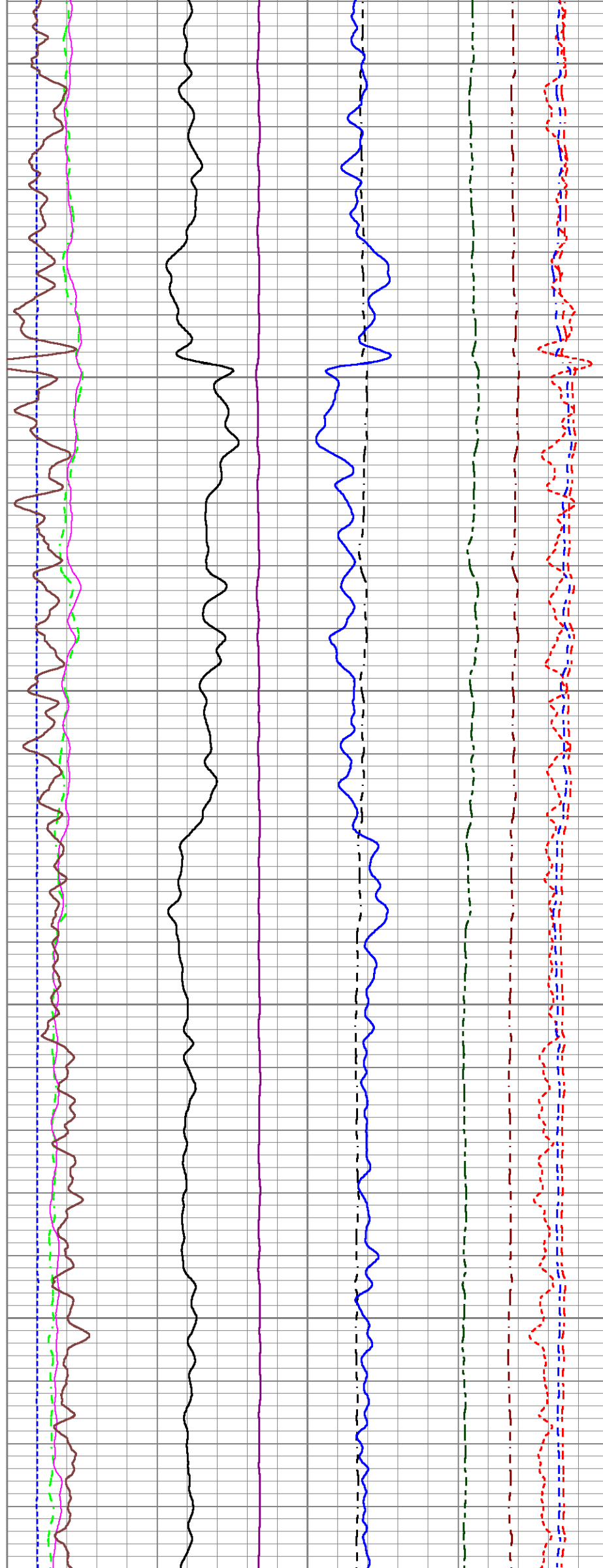
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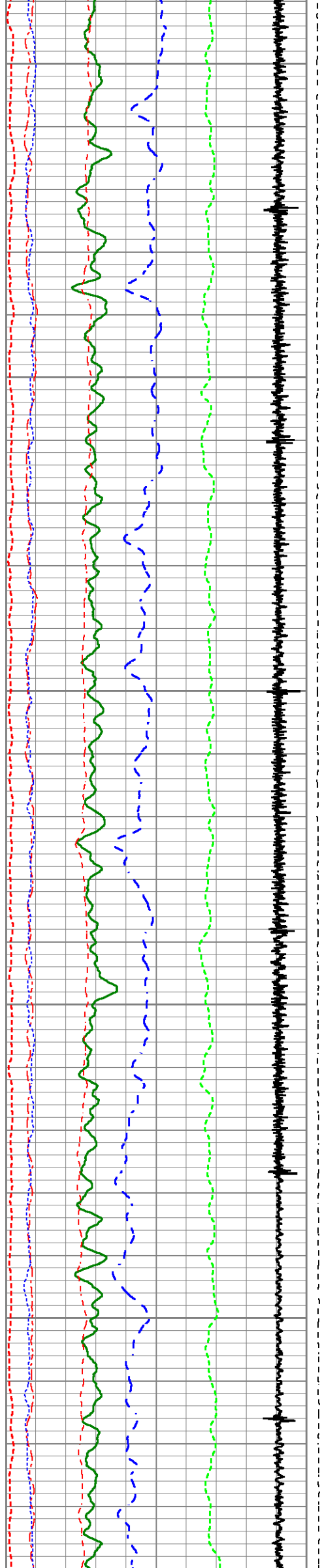
500

550

600

650





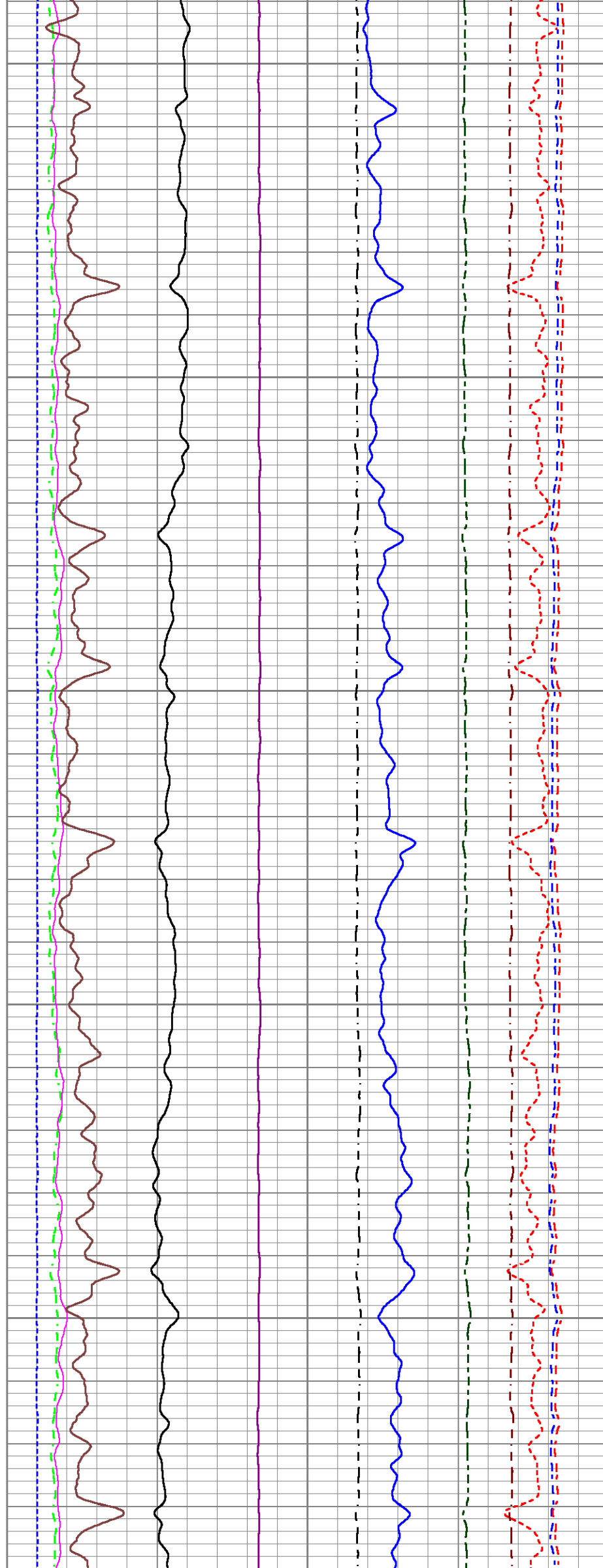
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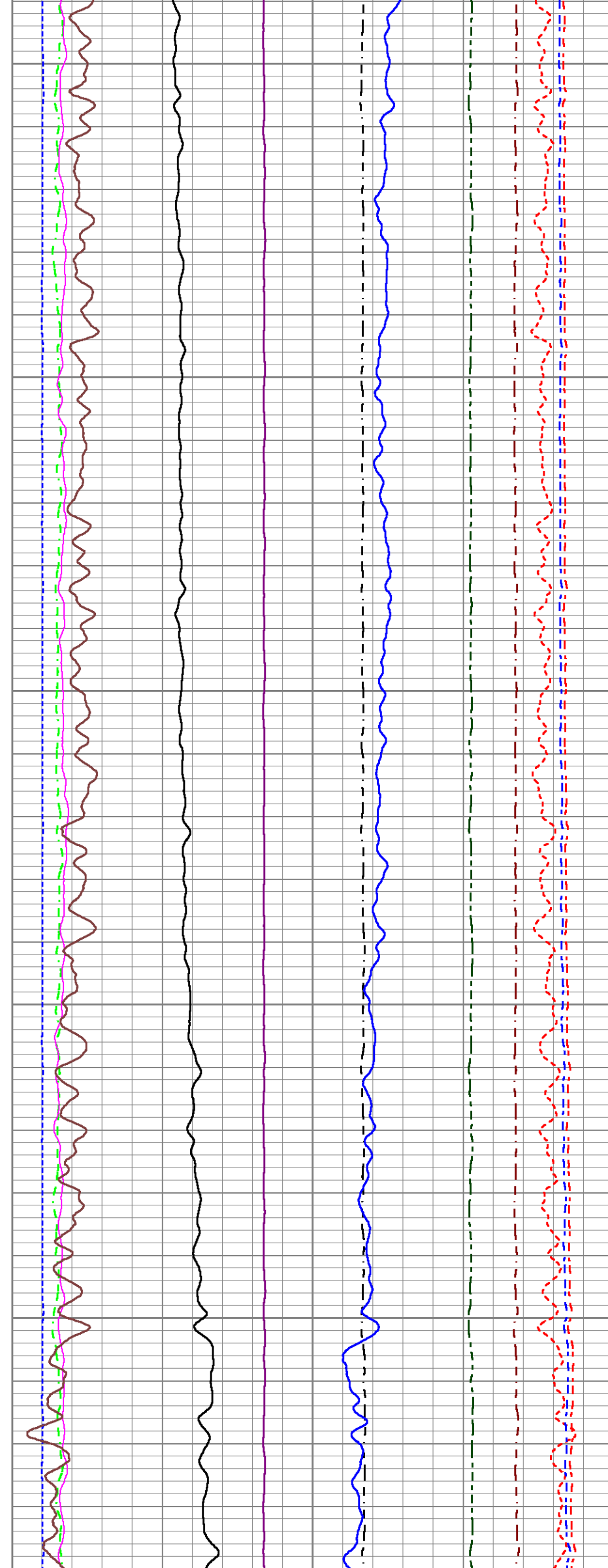
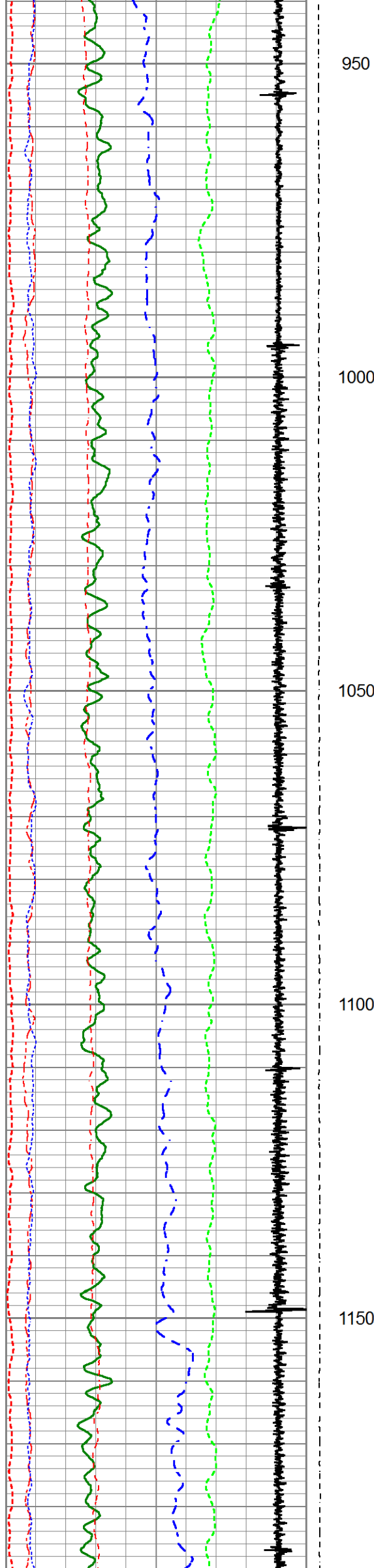
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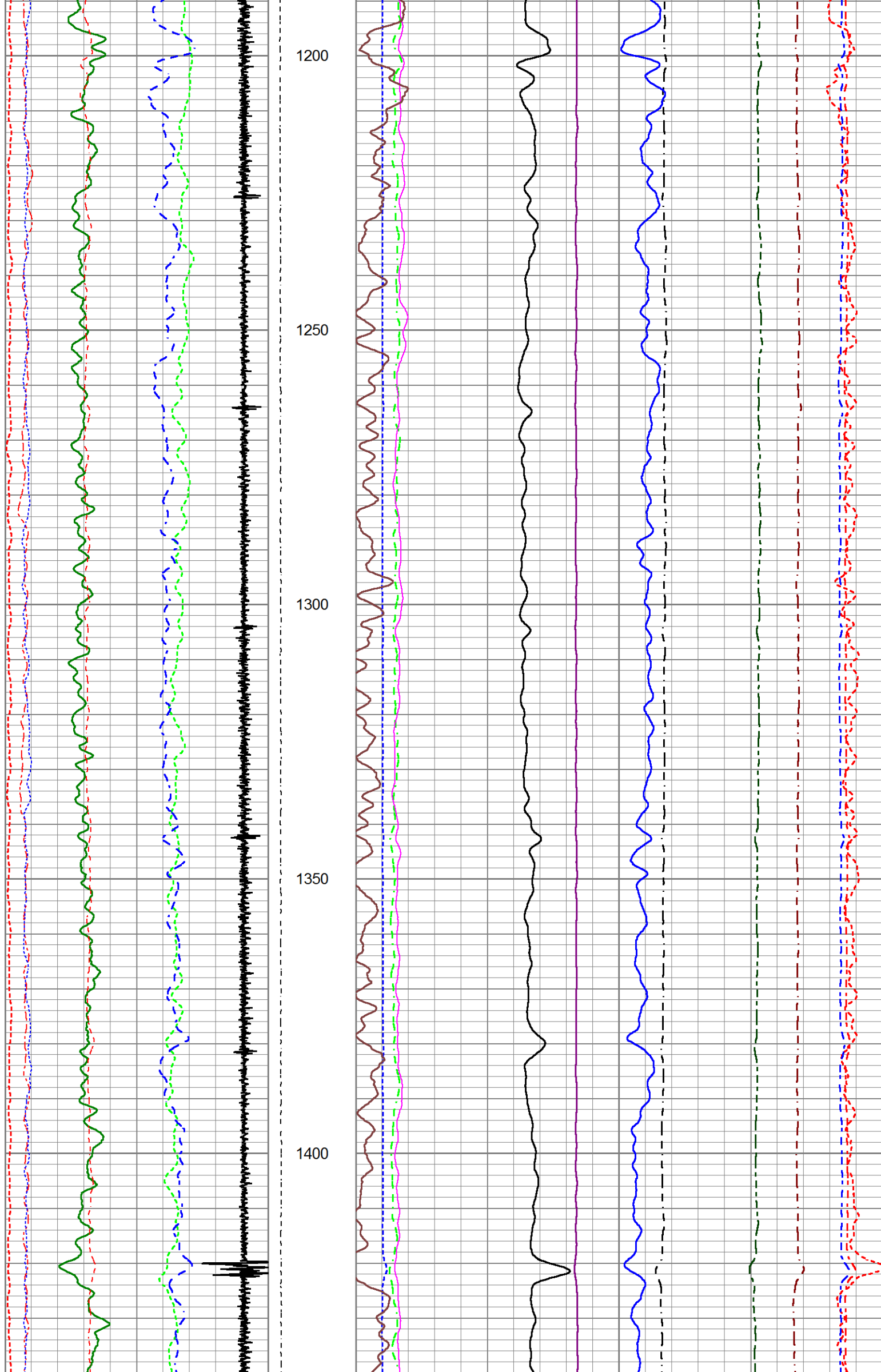
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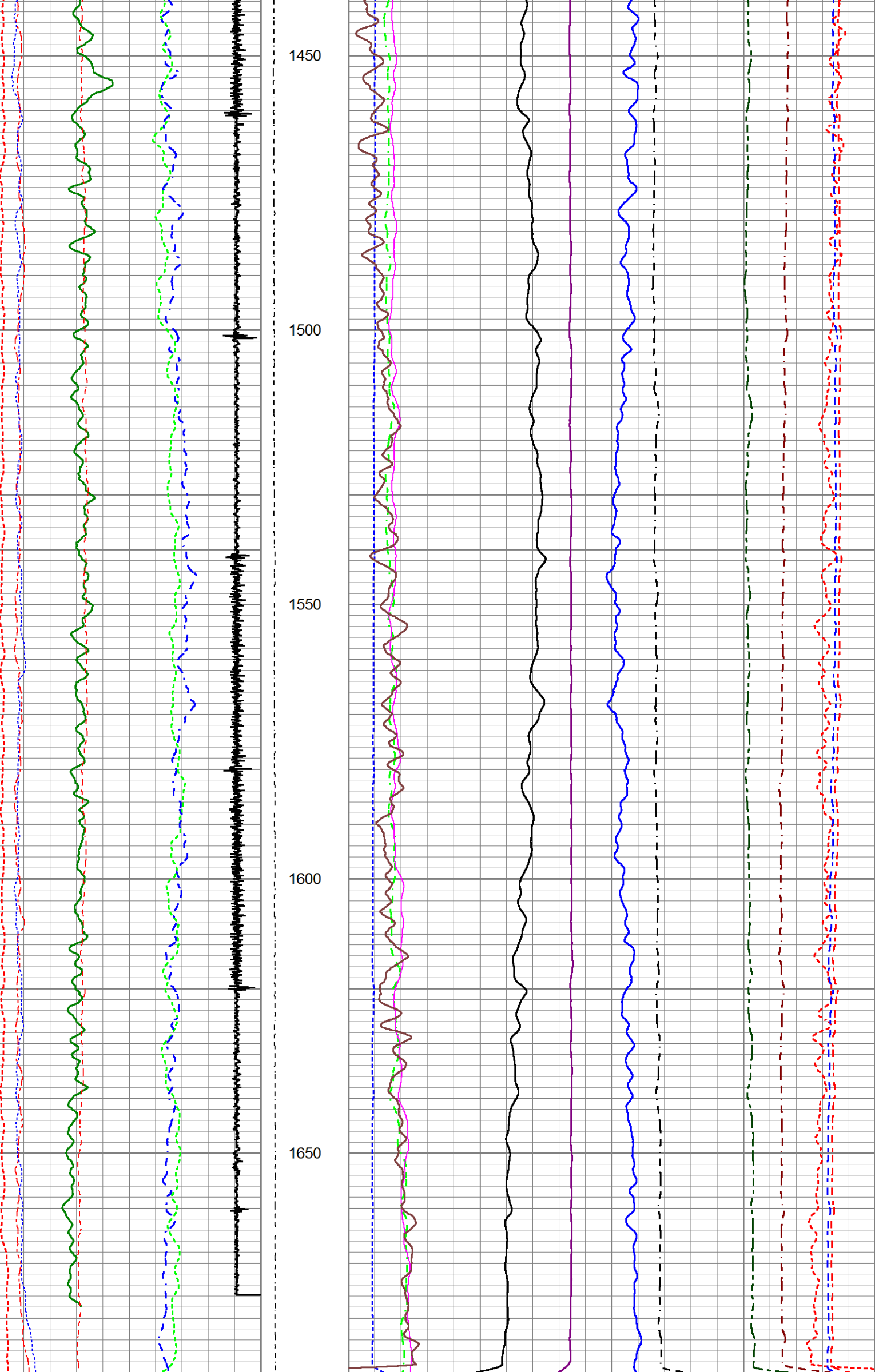
850

900









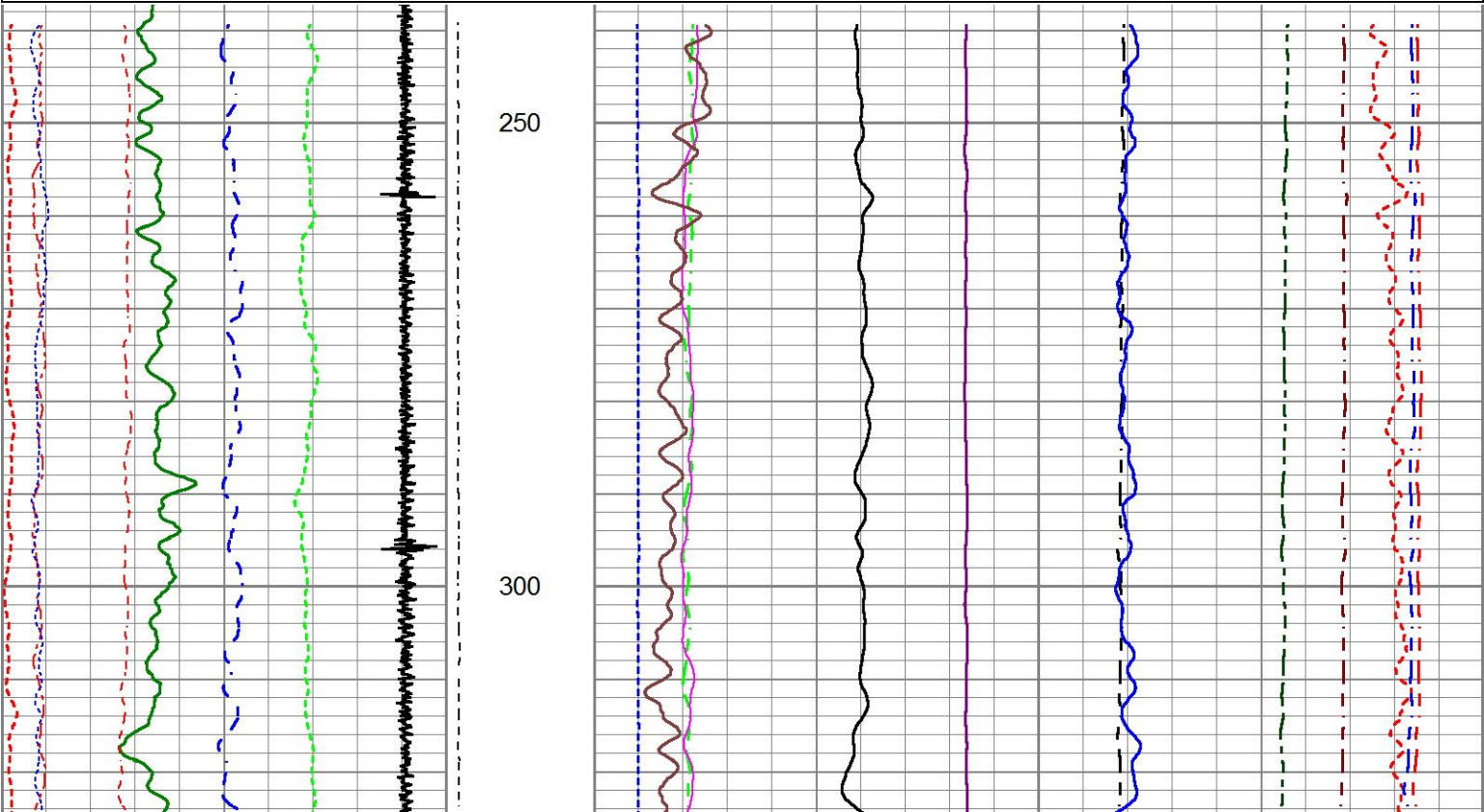
200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)				1.2
0	OAI	100	0 (lb 1800	60	SGIN				0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000	Near Counts (NCAP)	0
0	GR (GAPI)	200		0	RICF	6	60000	Far Counts (FCAP)	0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000	FAR INTEL CT (FSIN)	0
-10500	CCL	1050		0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN)	0
0	IN FIT ERR (CFTR1) NEAR	1		0.9	PHIT ()	-0.1	ET INL NEAR (NNII		
0	IN FIT ERR CFTR2) FAR	1			INOX2		50000	-1000	
					-1500	1500			

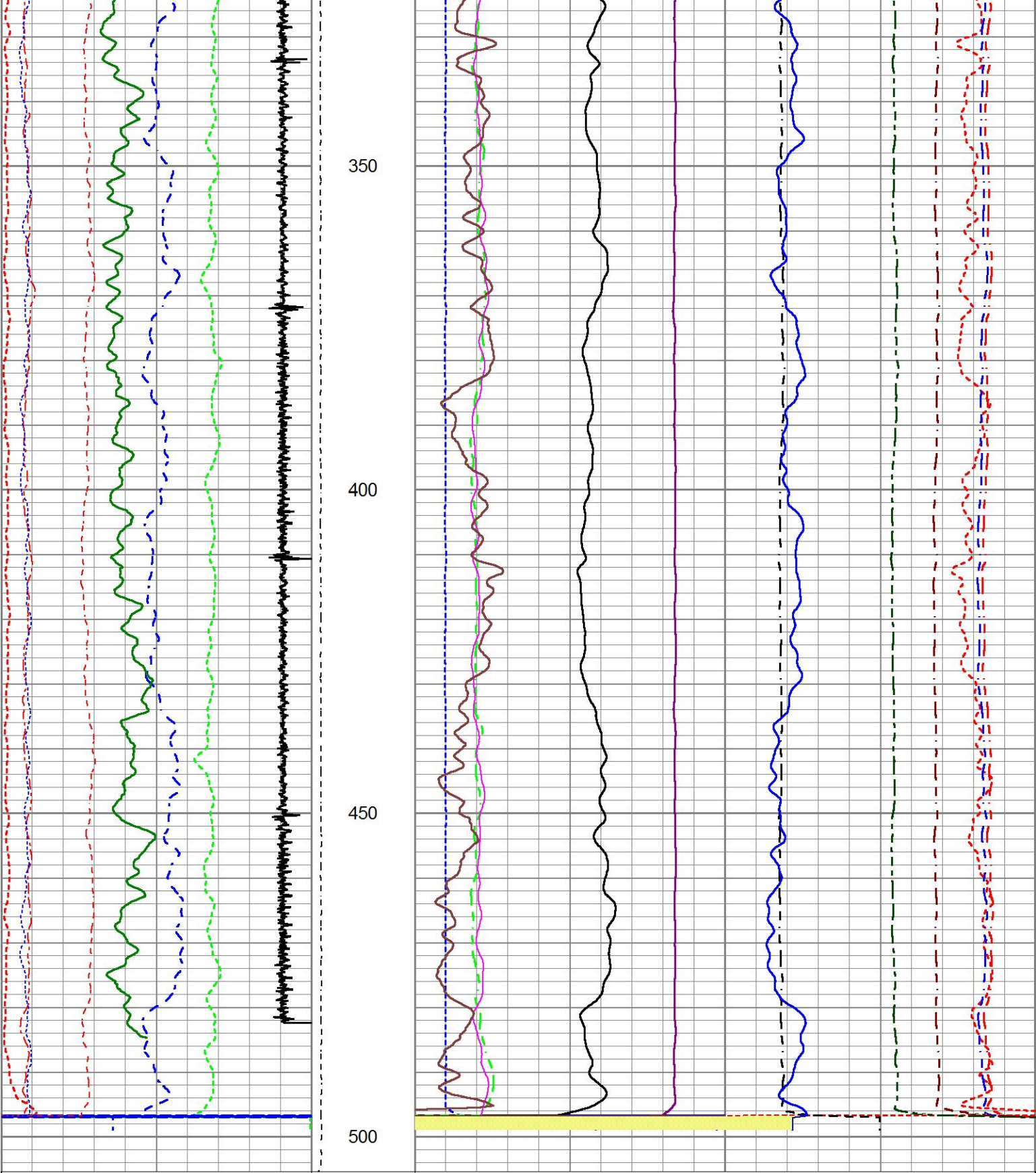
MAIN PASS FROM 1600 FT TO 200 FT

HALLIBURTON

5"=100'

REPEAT PASS TOP LOG									
5"=100'									
Database File		schwake 1\schwake_1-rmt.db							
Dataset Pathname		SCHWAKE-1/run1/REPEAT1							
Presentation Format		RMTE_M~1							
Dataset Creation		Mon Apr 03 15:17:56 2017							
Charted by		Depth in Feet scaled 1:240							
200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)				1.2
0	OAI	100	0 (lb 1800	60	SGIN				0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000	Near Counts (NCAP)	0
0	GR (GAPI)	200		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
-10500	CCL	1050		0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN)	0
0	IN FIT ERR (CFTR1) NEAR	1		0.9	PHIT ()	-0.1	ET INL NEAR (NNII		
0	IN FIT ERR CFTR2) FAR	1			INOX2		50000	-1000	
					-1500	1500			





200	Near Bore Si (SGBN)	0
0	OAI	100
10	FAR FIT ERR (SGFF)	40
0	GR (GAPI)	200
0	NEAR FIT ERR (SGFN)	100
-10500	CCL	1050
0	IN FIT ERR (CFTR1) NEAR	1
0	IN FIT ERR CFTR2) FAR	1

TENSION	0	RATIO (RNF)				1.2
0 (lb.1800	60	SGIN				0
	0	RIN	9	60000	Near Counts (NCAP)	0
	0	RICF	6	60000	Far Counts (FCAP)	0
	0	H YIELD (YH2)	1	100000	FAR INTEL CT (FSIN)	0
	0	H YIELD (YH1)	1	10000	(NEAR INTEL CT (NSIN)	0
	0.9	PHIT ()	-0.1	ET INL NEAR (NNII		
		INOX2		50000	-1000	
		-1500	1500			

REPEAT PASS TOP LOG

HALLIBURTON

5"=100'

Calibration Report	
Database File	d:\warrior_data\schwake 1\schwake_1-rmt.db
Dataset Pathname	SCHWAKE-1/run1/MAIN1
Dataset Creation	Mon Apr 03 14:07:35 2017

Reservoir Monitor Tool I Calibration Report

Serial-Model:	11917405-A
Shop Calibration Performed:	Fri Mar 24 10:17:01 2017

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Carbon/Oxygen Mode					
Stabilization					
Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	88.00	80.00	8.00	+/-15.00	V
ITCR2	3163	3250	-87	+/-250	cps
Near Detector					
	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0297	5.29	<6.00
Fe	207	206 +/-2	0.0995	-----	-----
NGAIN = 0.995	NZOFF = 0.6				
Far Detector					
	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0370	5.94	<6.50
Fe	209	208 +/-2	0.0924	-----	-----
FGAIN = 0.993	FZOFF = 0.9				
Flask Temperature	47.5 degF				
Result	Logged	Expected Value	Diff.	Tol.	Units
COIR2	0.44	0.45	-0.01	+/-0.02	
LIRI2	1.37	1.36	0.01	+/-0.05	
TCCR2	3829	4000	-171	+/-1000	cps
ITCR2	3094	3200	-106	+/-250	cps




Sigma Mode					
Stabilization					
Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	88.00	80.00	8.00	+/-15.00	V
FCAP	9770	10000	-230	+/-500	cps
Horizontal Water Tank					
Result	Logged	Expected Value	Diff.	Tol.	Units
N/F Normalizer	0.97	0.95	0.02		
N/F Inel Norm	0.62	0.61	0.01		
RNF	1.03	1.07	-0.04	+/-0.12	
RINC	1.60	1.64	-0.04	+/-0.18	
SGFN	24.07	24.00	0.07	+/-0.50	cu
SGFF	22.88	22.85	0.03	+/-0.50	cu
FSIN	23768	24000	-232	+/-2000	cps
FCAP	10015	10000	15	+/-1000	cps
NFTR	0.82			<5.00	
FFTR	0.88			<5.00	
NBKG	183			<500	cps
FBKG	96			<500	cps
RTN	0.42	0.40	0.02	+/-0.10	usec
RTF	0.47	0.40	0.07	+/-0.10	usec


Calibration Software Modules	
HRMTI Module	2015.5.4.0
RMTI Module	2015.10.16.1
Log Data Acquisition Software Modules	
HRMTI Module	2015.5.4.0
RMTI Module	2015.10.16.1

Gamma Ray Calibration Report

Type / Serial: 002 / 11224502

SHOP CALIBRATION		Mon Feb 27 11:33:38 2017			
Background Calibrator	Counts/Sec.	Gain	Offset	Jig	Units
	29.0				cps
	296.5	1.3758			cps GAPI/cps
PRIMARY VERIFICATION					
Background Calibrator Difference	39.1				cps
	412.9				cps
				373.7	GAPI
BEFORE SURVEY VERIFICATION					
Background Calibrator Difference	0.0				cps
	0.0				cps
				0.0	GAPI
AFTER SURVEY VERIFICATION					
Background Calibrator Difference	0.0				cps
	0.0				cps
				0.0	GAPI

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
CCL	21.46		STNDCH-STND_CH 1.4375 IN CABLE HEAD	1.50	1.44	1.00
GR	19.21		TTTCU-002 (11224502) Through Tubing Telemetry Cartridge - Ultrawire	7.65	1.69	37.00
			XHU-003 (11899561) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00

RmtTFGT	8.55		14.00	2.13	77.00
RmtTNGT	8.05				
RmtFP5V	0.30				
RmtNFwvMcsPh	0.30				
RmtCommFWar	0.30				
LLMTEN	0.00				