



Composite Log

Company Pronghorn Operating
Well Harley #4
Field Cheyenne Wells
County Cheyenne State Colorado

Company Pronghorn Operating
Well Harley #4
Field Cheyenne Wells
County Cheyenne
State Colorado

Location: 620' FSL & 1943' FWL
SEC 5 TWP 14 S RGE 44 W
Permanent Datum GL Elevation 4293 ft.
Log Measured From KB , 17 ft. above perm. datum
Drilling Measured From KB
Other Services
K.B. 4310 ft.
D.F. 4309 ft.
G.L. 4293 ft.

Date July 6, 2013

Run Number	One		
Depth Driller	5570'		
Depth Logger	5586'		
Bottom Logged Interval	5584'		
Top Log Interval	3900'		
Casing Driller	13.375" @ 438'	@	@
Casing Logger	437'		
Bit Size	7.875 "	@	@
Type Fluid in Hole	WBM		
Density / Viscosity	8.8 / 48		
pH / Fluid Loss	10 / 7.6		
Source of Sample	Mud Pit		
Rm @ Meas. Temp	1.2 @ 75 °F	@	@
Rmf @ Meas. Temp	0.96 @ 75 °F	@	@
Rmc @ Meas. Temp	1.5 @ 75 °F	@	@
Source of Rmf / Rmc	Calculated		
Rm @ BHT	0.69 @ 130 °F	@	@
Time Circulation Stopped	12:15		
Time Logger on Bottom	8:15		
Maximum Recorded Temperature	130 °F		
Equipment Number	10002		
Location	Brighton		
Recorded By	B. Oetting/L. Schubert		
Witnessed By	Z. Kuenzler		

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Equipment and Log Data

Service Order: 23262

Gamma		Density		Neutron		Sonic		IAT	
Run No.	One	Run No.	One	Run No.	One	Run No.	One	Run No.	One
Serial No.	9990	Serial No.	0872	Serial No.	7939	Serial No.	10072	Serial No.	10110
O.D.	3.375 in.	Source No.	50130B	Source No.	66010B	Centralizers	0	Standoffs	0 @ 0
		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
One	TD 3900'	0	150	0.3	-0.1	2.71 g/cc	0.3	-0.1	Lime	0.3	-0.1

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

First run in hole
Tools ran slick due to hole conditions
5.5" production casing used to calculate annular hole volumes
Chlorides reported at: 3000 ppm

YOUR CREW TODAY: A. Hughes



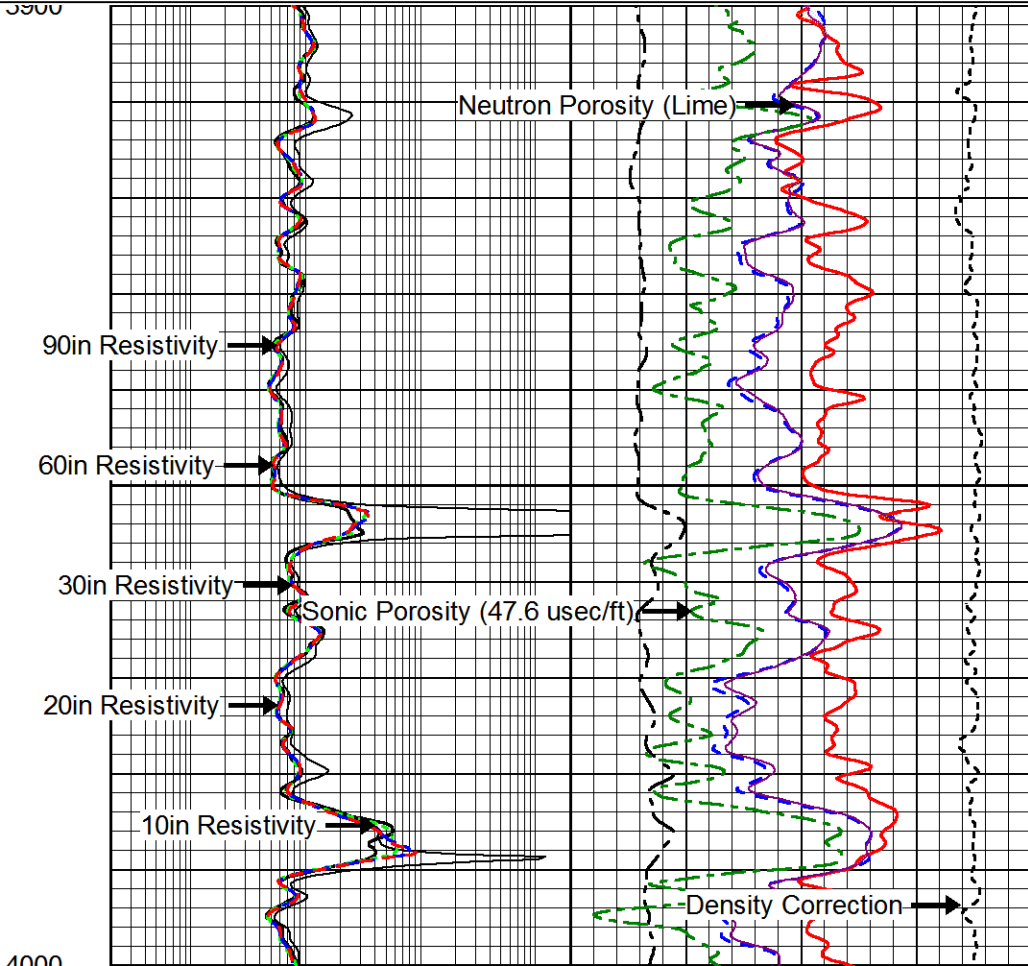
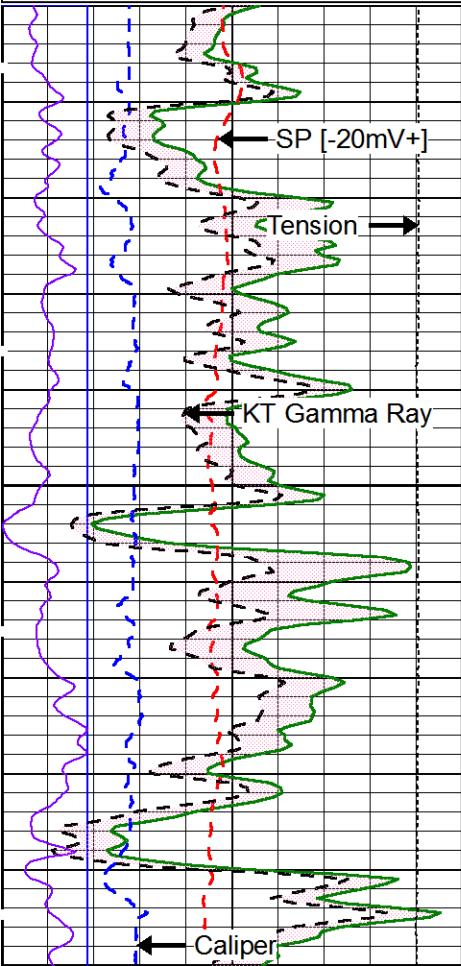
Main Pass

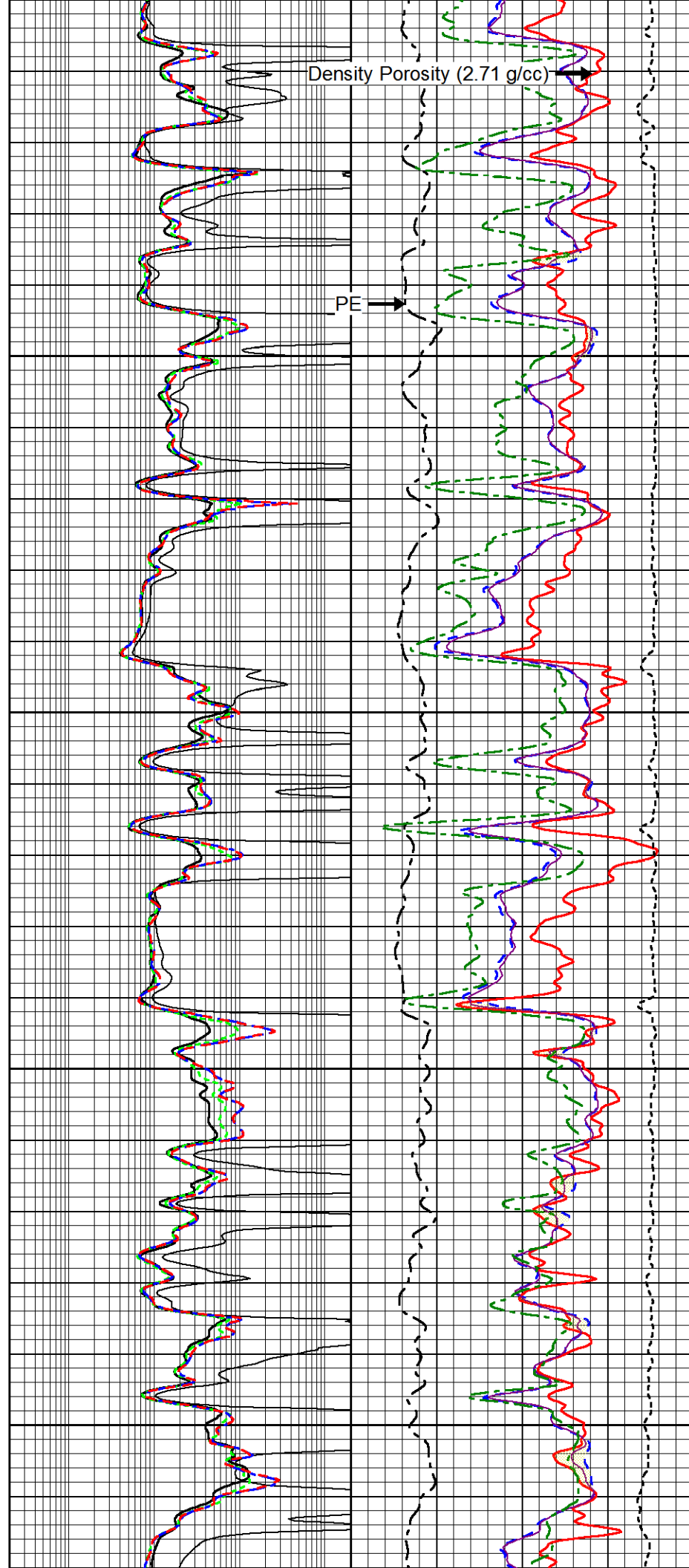
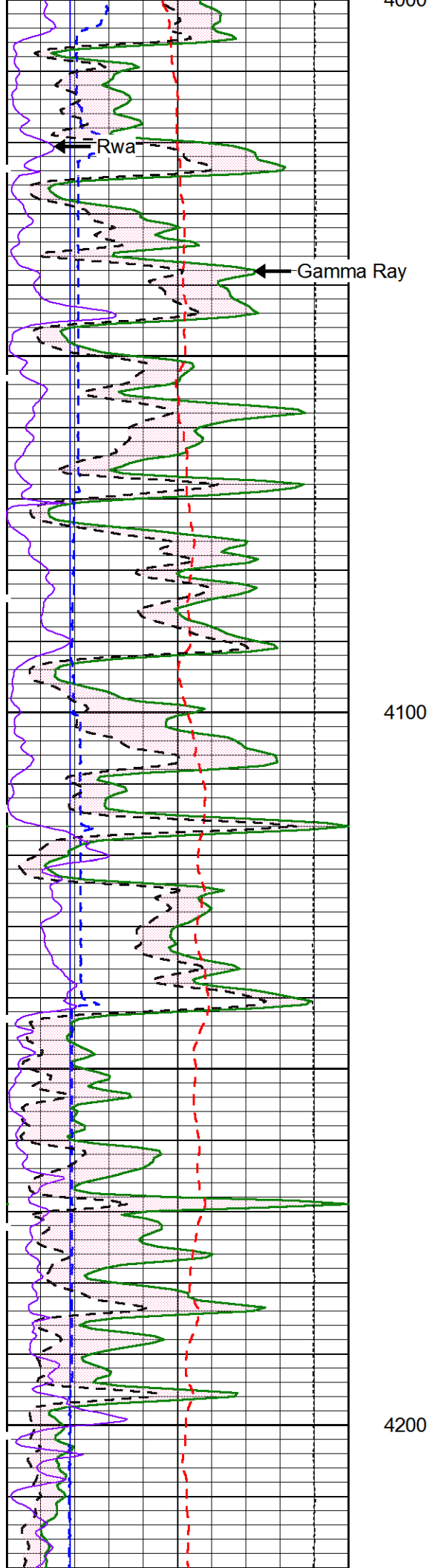
Database File: pronghorn_harley4.db
Dataset Pathname: L_main
Presentation Format: a4prnl
Dataset Creation: Sat Jul 06 17:39:11 2013
Charted by: Depth in Feet scaled 1:240

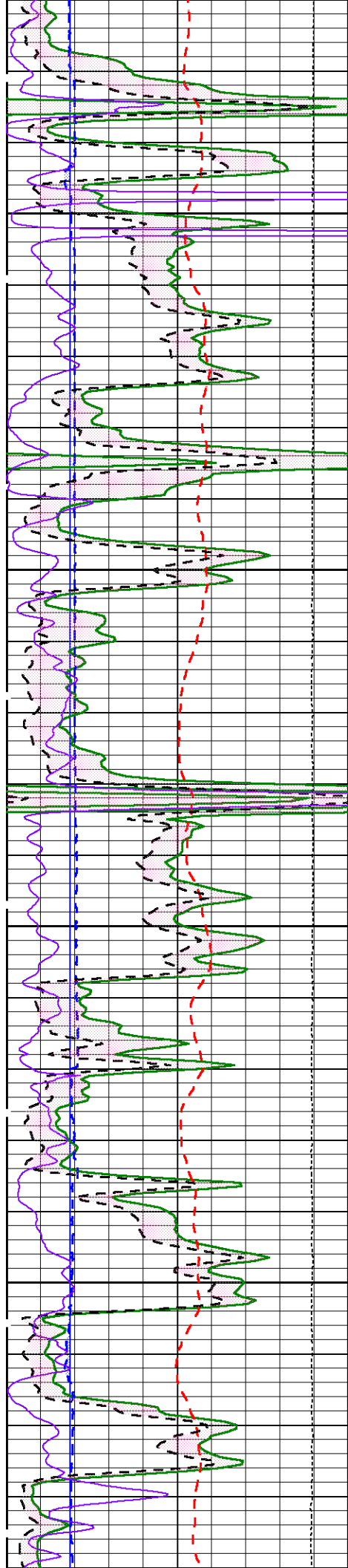
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0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
SP [-20mV+]		
0	KT Gamma Ray (GAPI)	150
0	Rwa (Ohm-m)	1
Tension		
	10000 (lb)	0

0.2	10in Resistivity (Ohm-m)	2000
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

0.3	Neutron Porosity (Lime)	-0.1
0.3	Density Porosity (2.71 g/cc)	-0.1
0	PE	10
Density Correction		
	0.8 (g/cc)	-0.2
0.3	Cross Plot Porosity	-0.1
0.3	Sonic Porosity (47.6 usec/ft)	-0.1

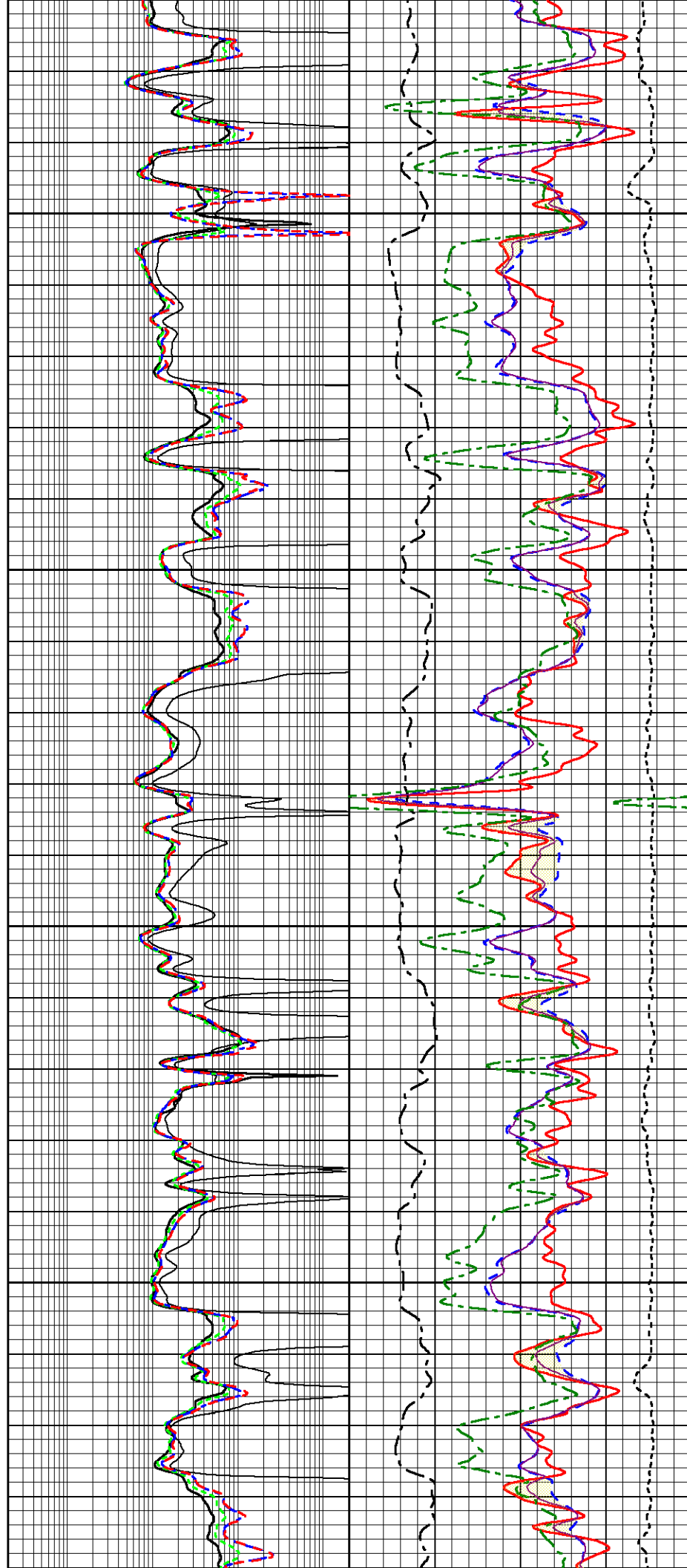


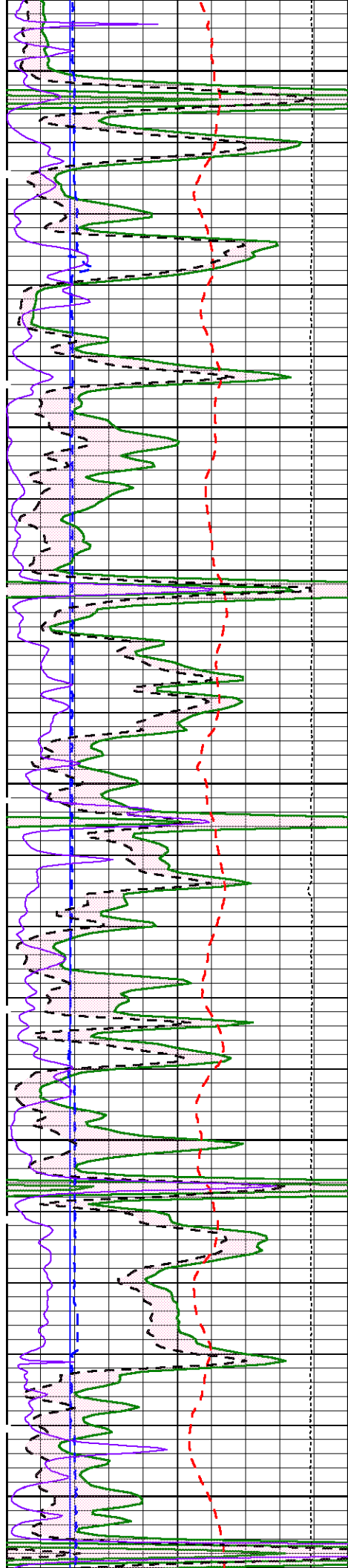




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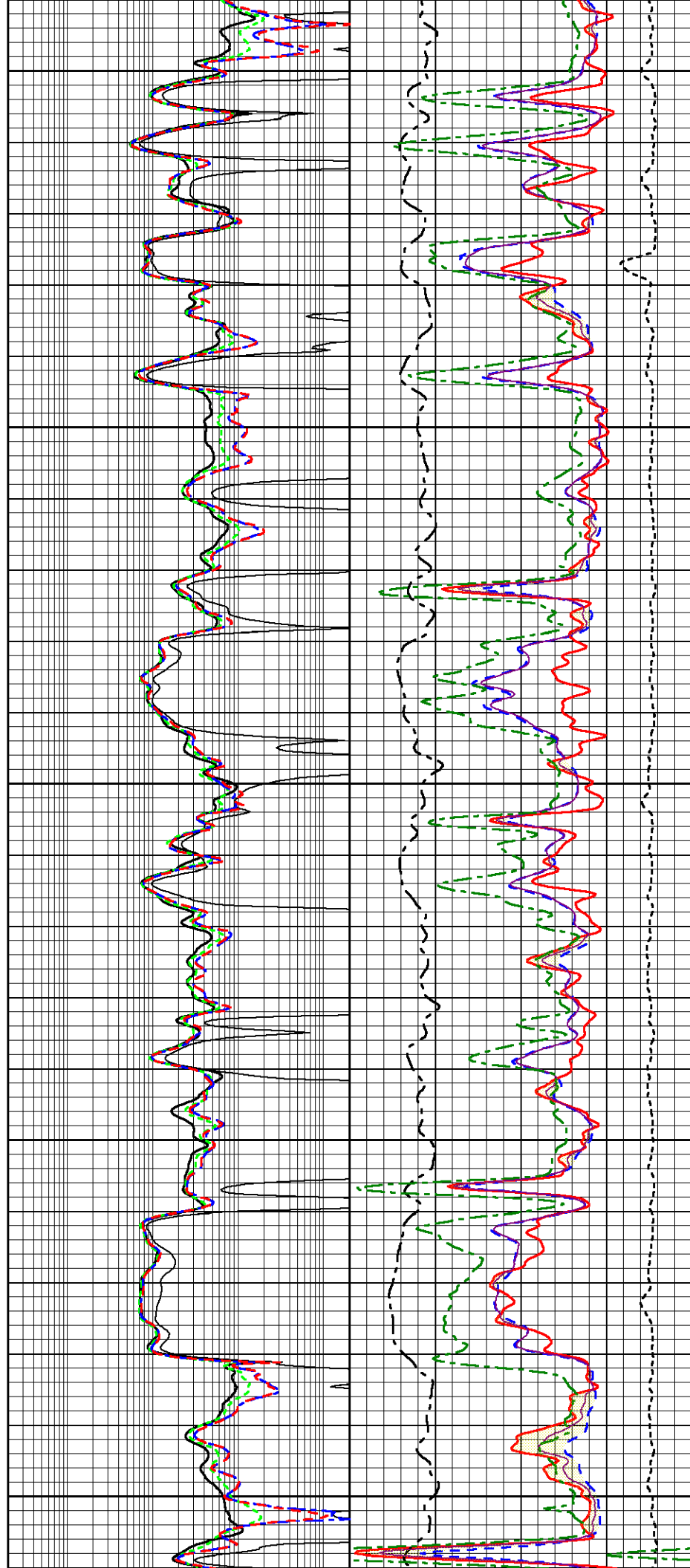
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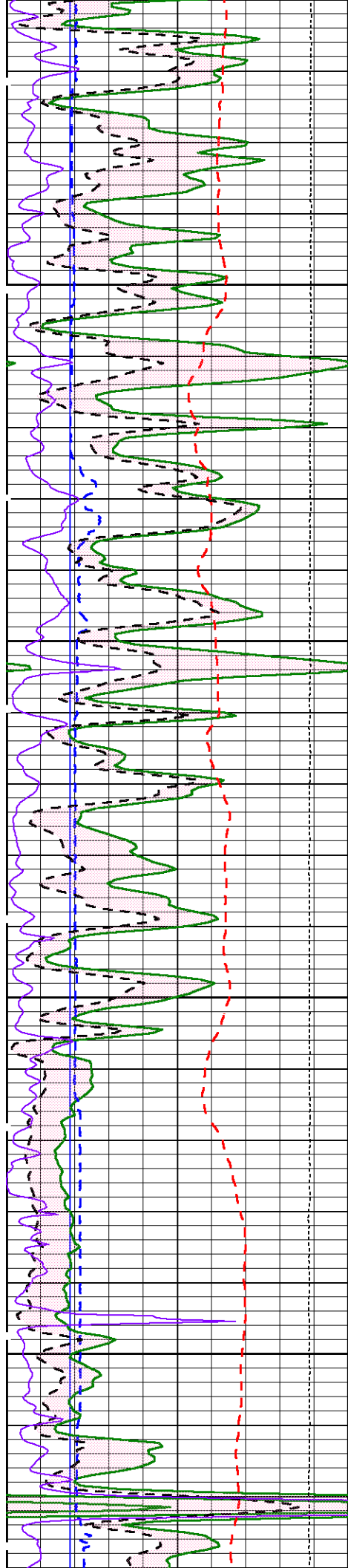




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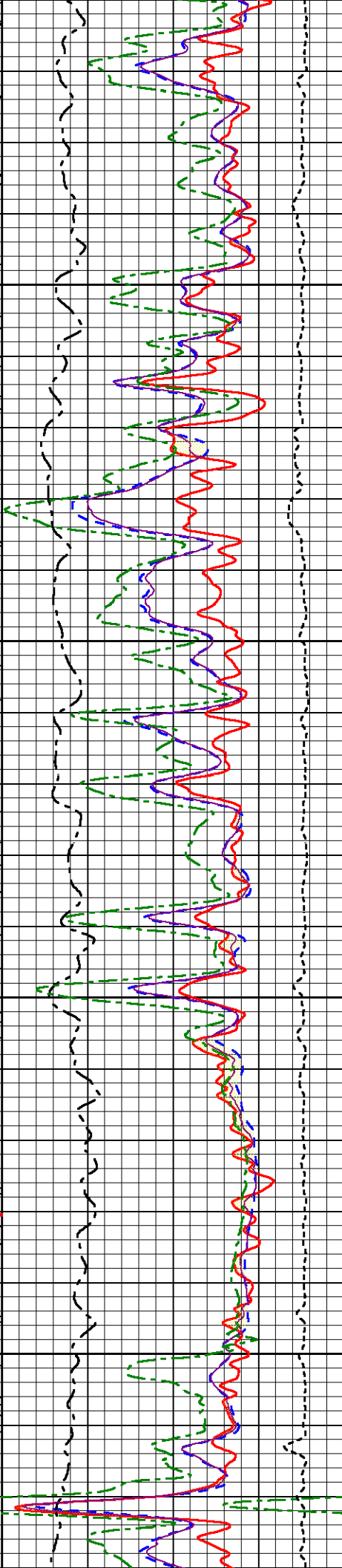
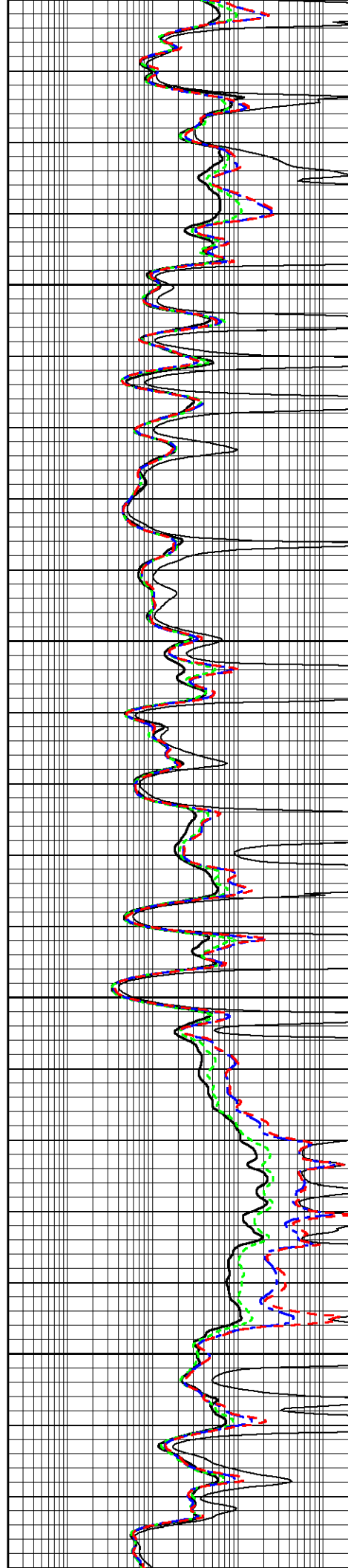
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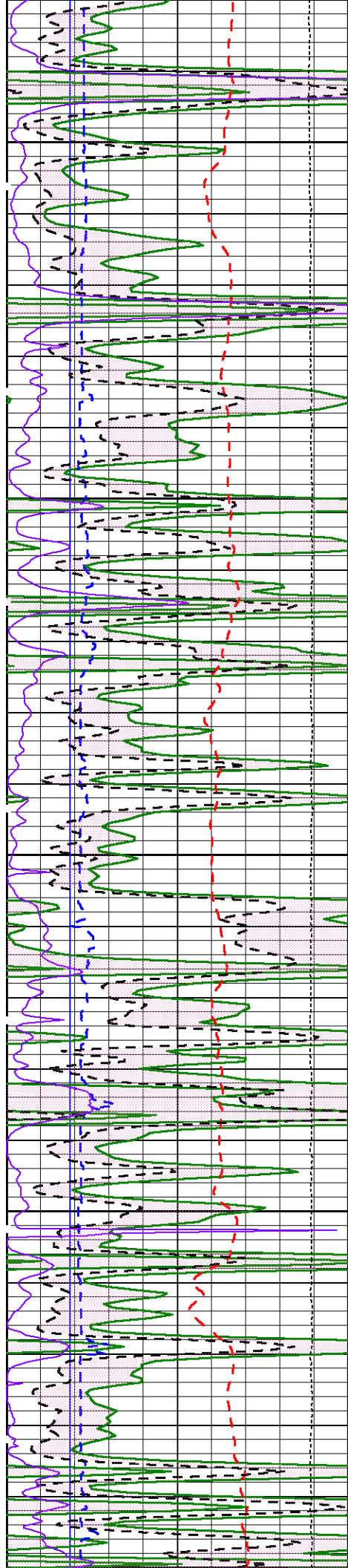




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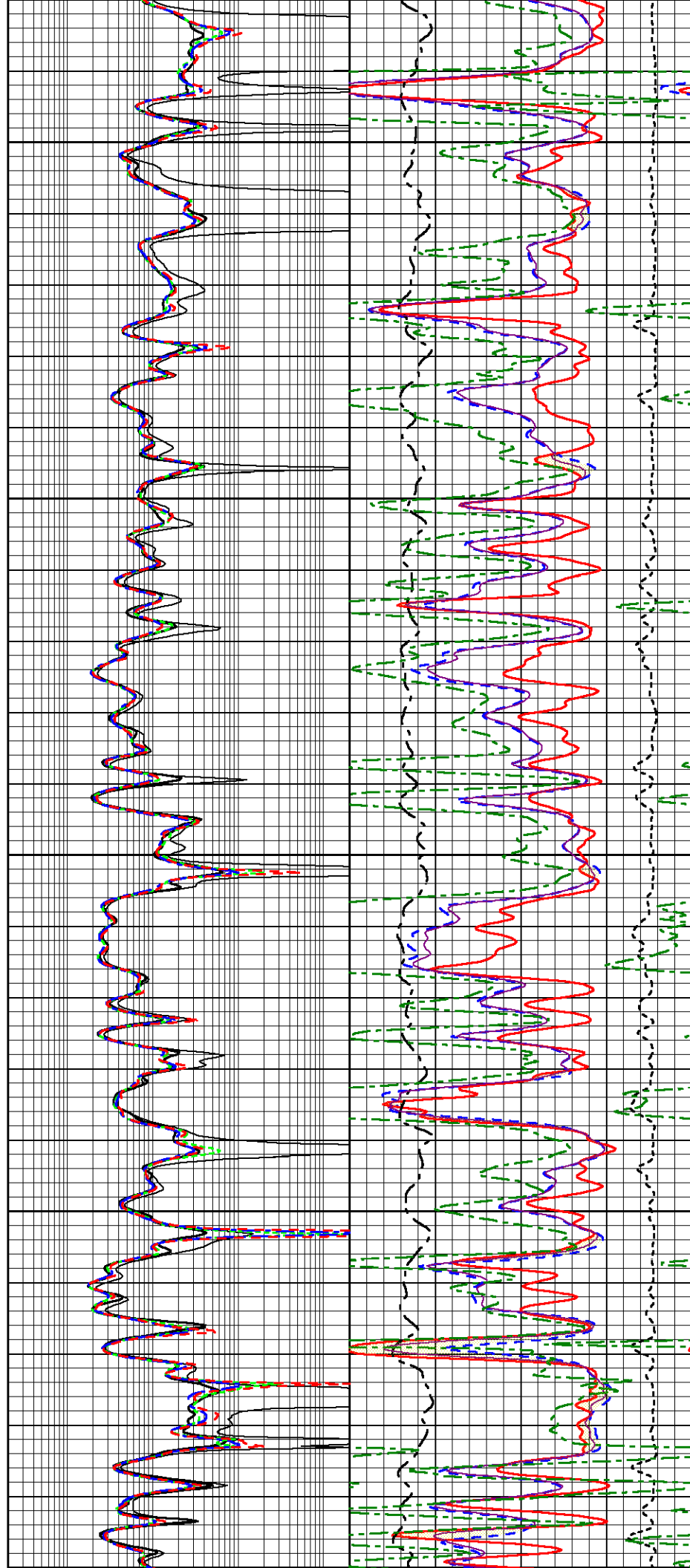




4900

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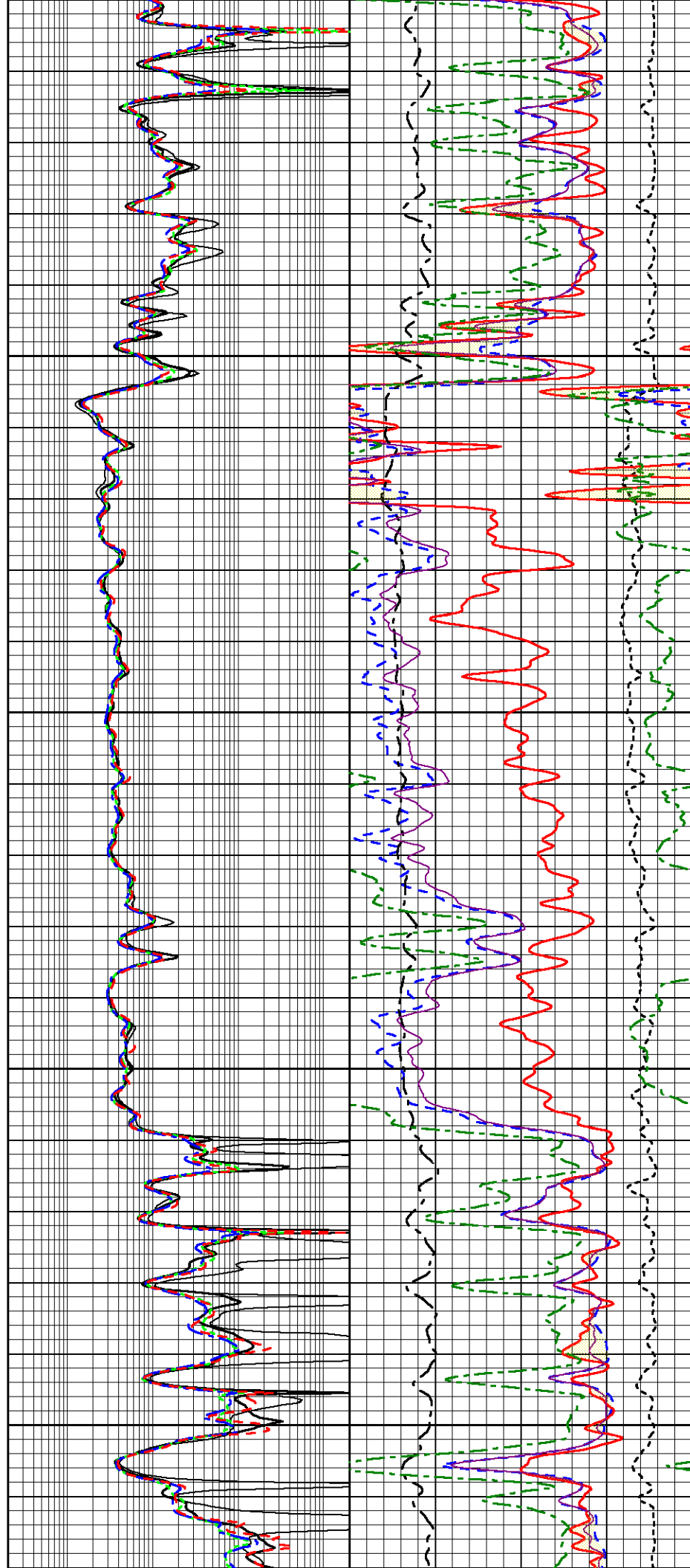
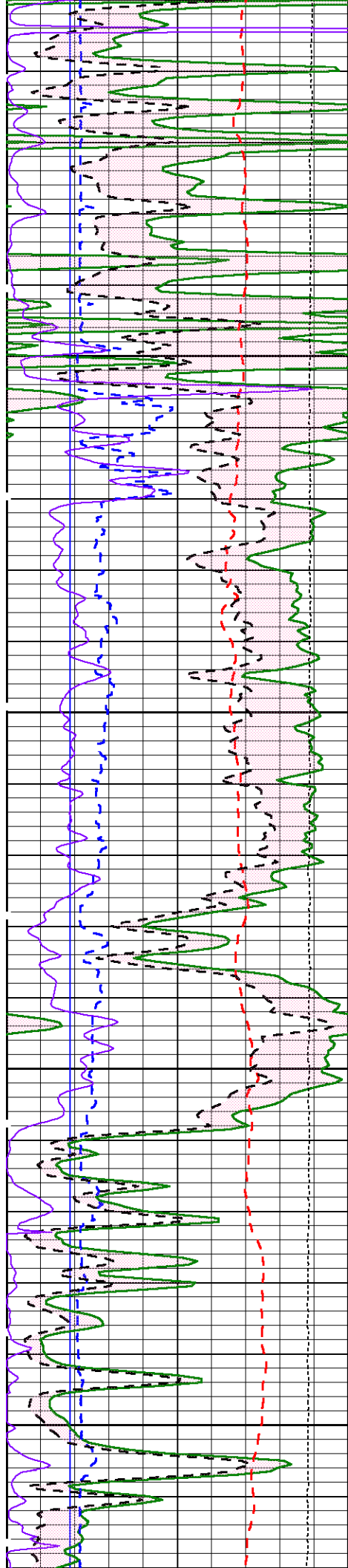
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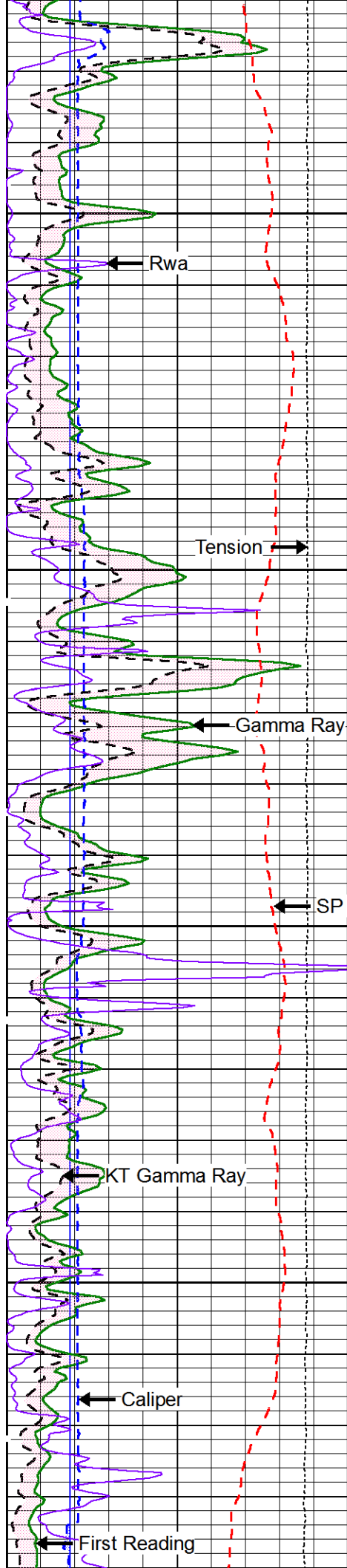


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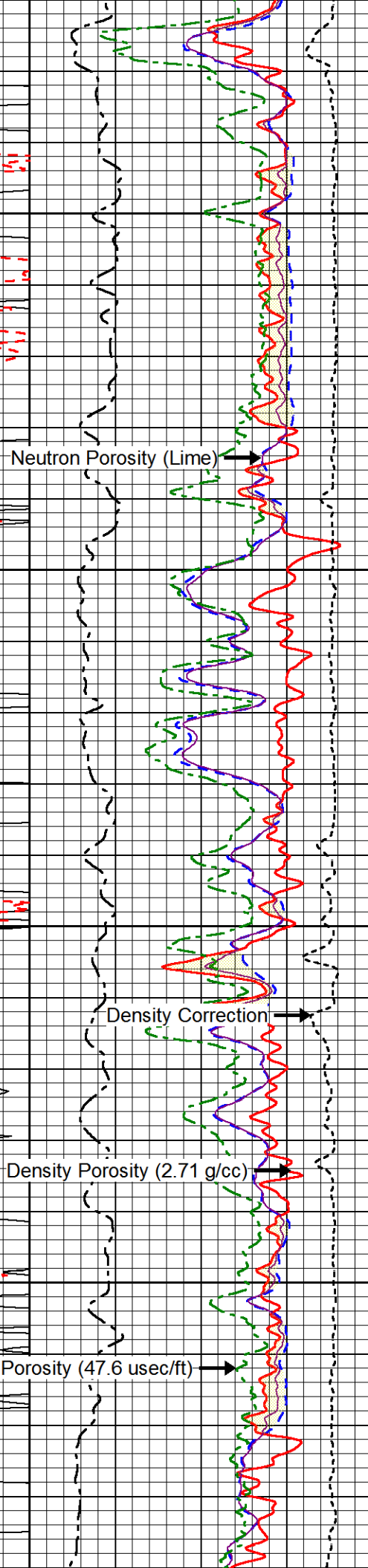
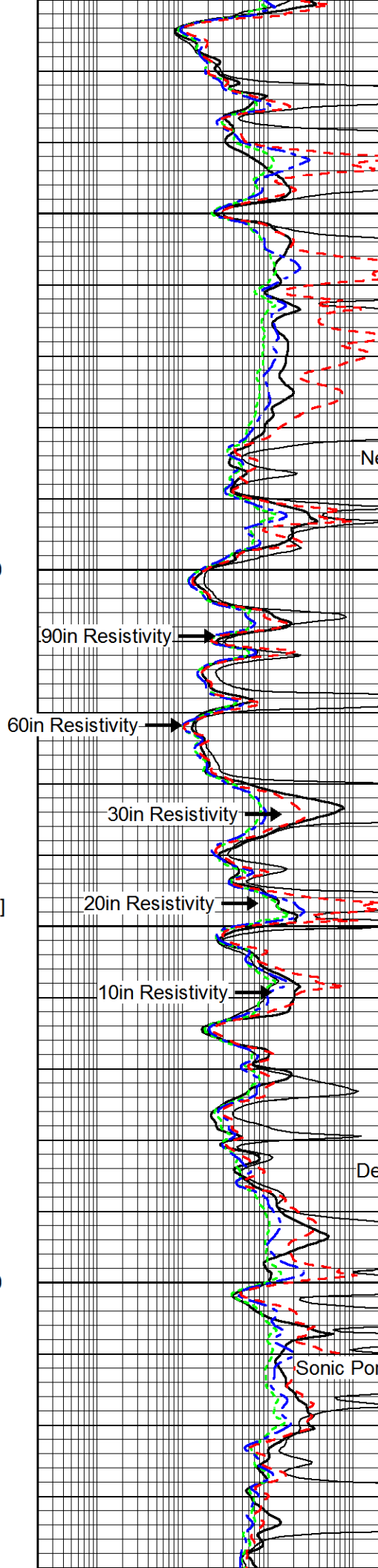
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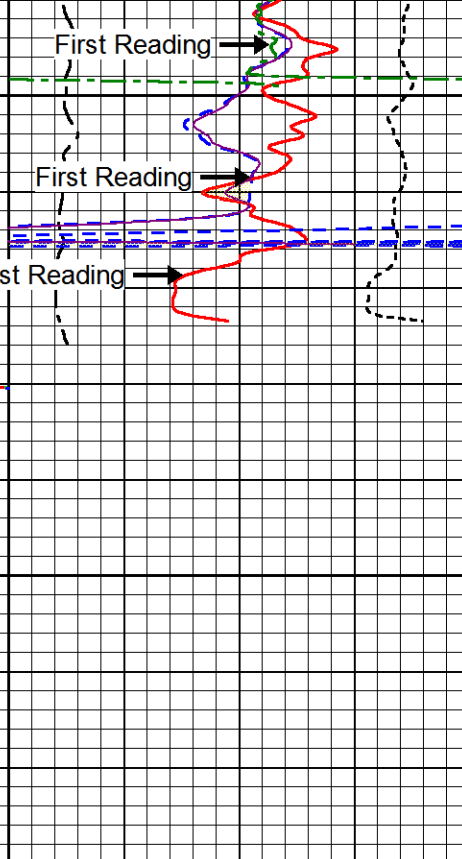




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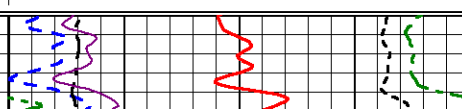


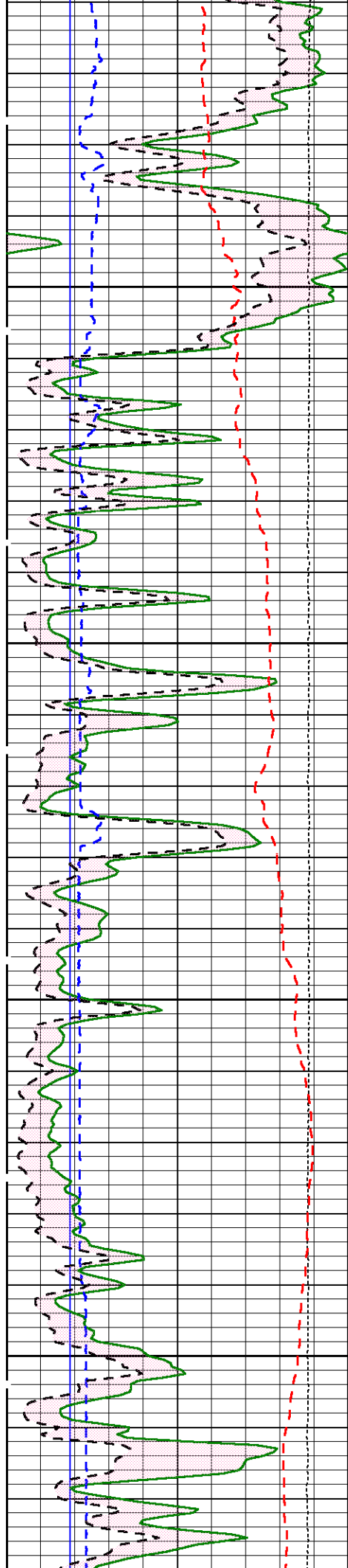


0.3	Neutron Porosity (Lime)	-0.1
0.3	Density Porosity (2.71 g/cc)	-0.1
0	PE	10
		Density Correction
		0.8 (g/cc) -0.2
0.3	Cross Plot Porosity	-0.1
0.3	Sonic Porosity (47.6 usec/ft)	-0.1



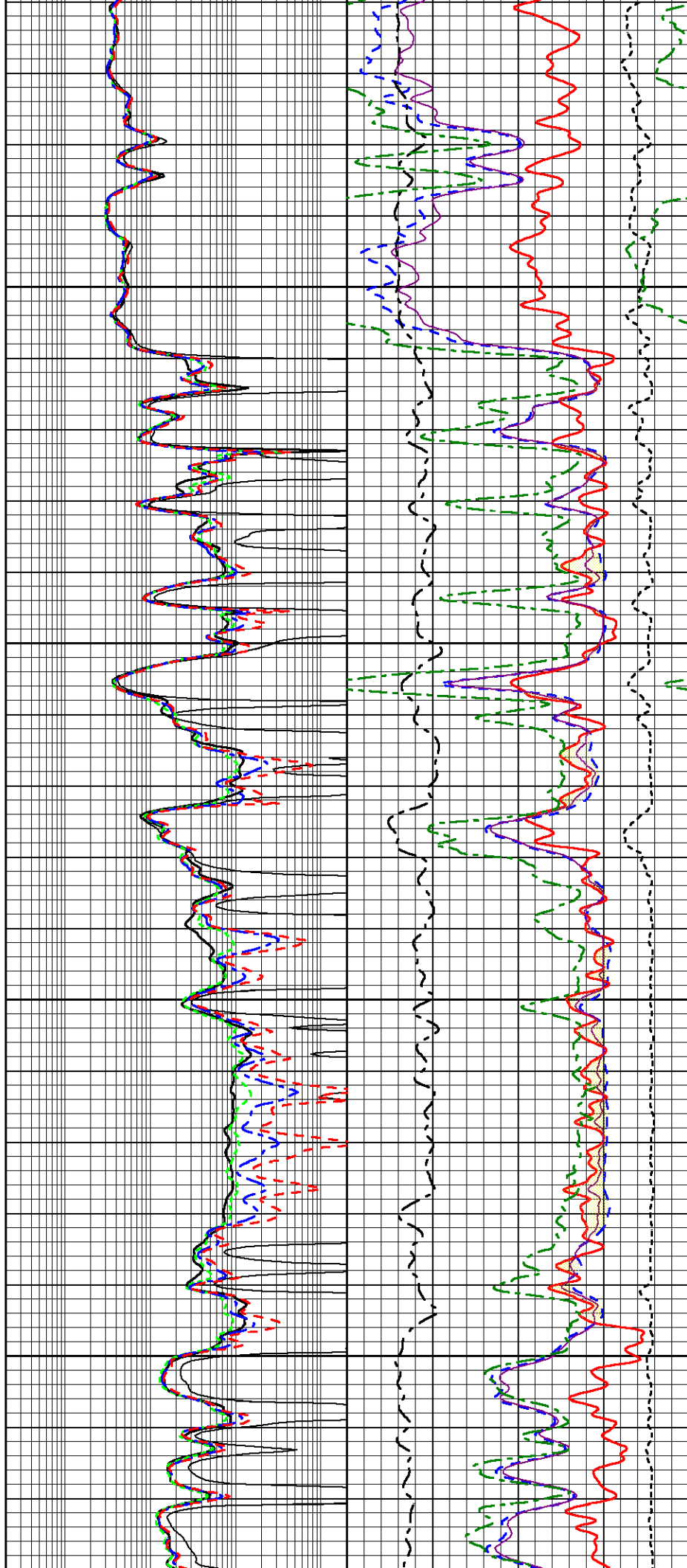
0.3	Neutron Porosity (Lime)	-0.1
0.3	Density Porosity (2.71 g/cc)	-0.1
0	PE	10
		Density Correction
		0.8 (g/cc) -0.2
0.3	Cross Plot Porosity	-0.1
0.3	Sonic Porosity (47.6 usec/ft)	-0.1

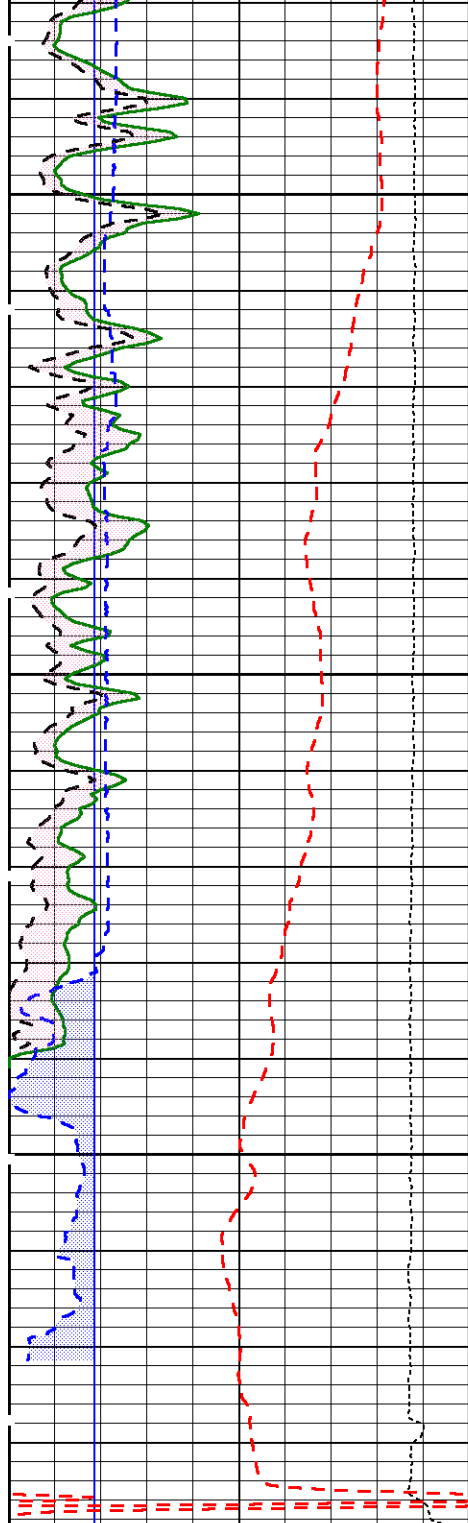




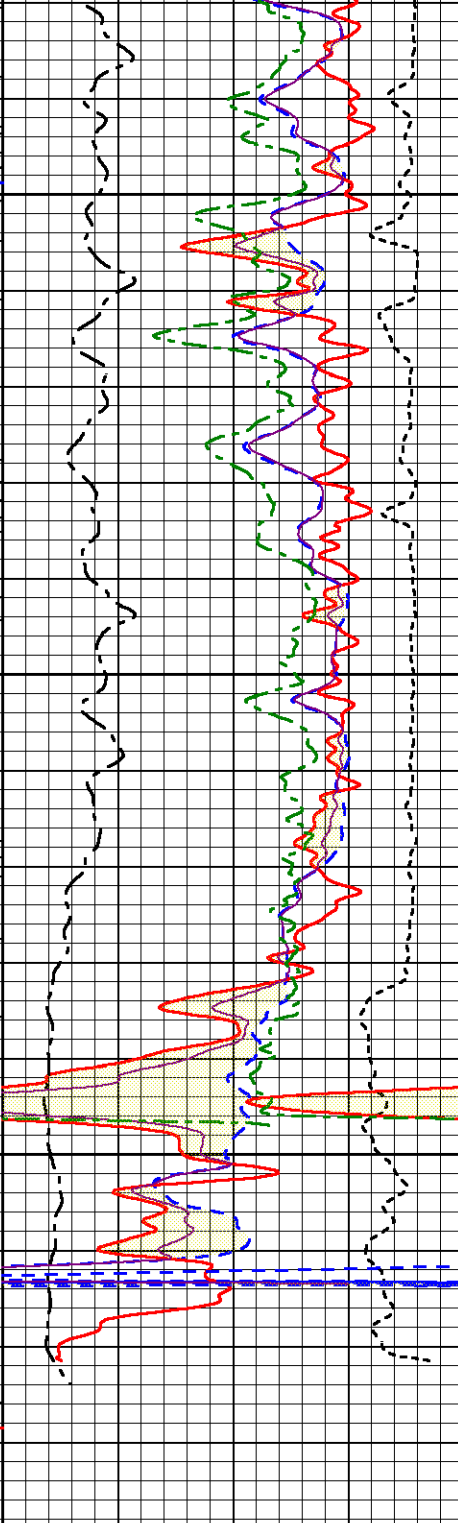
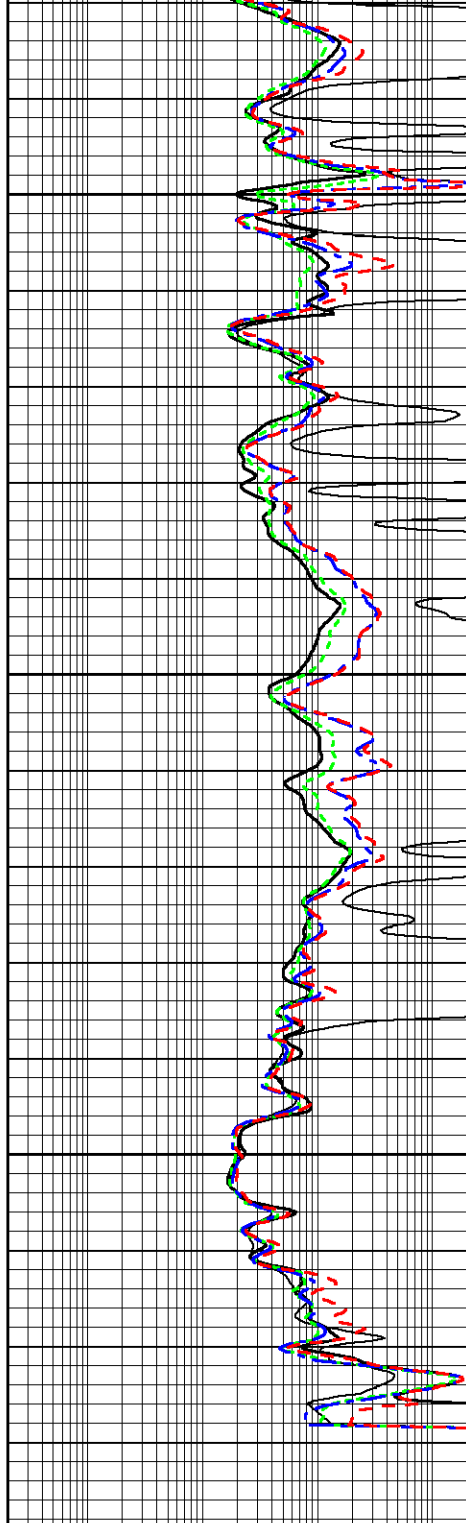
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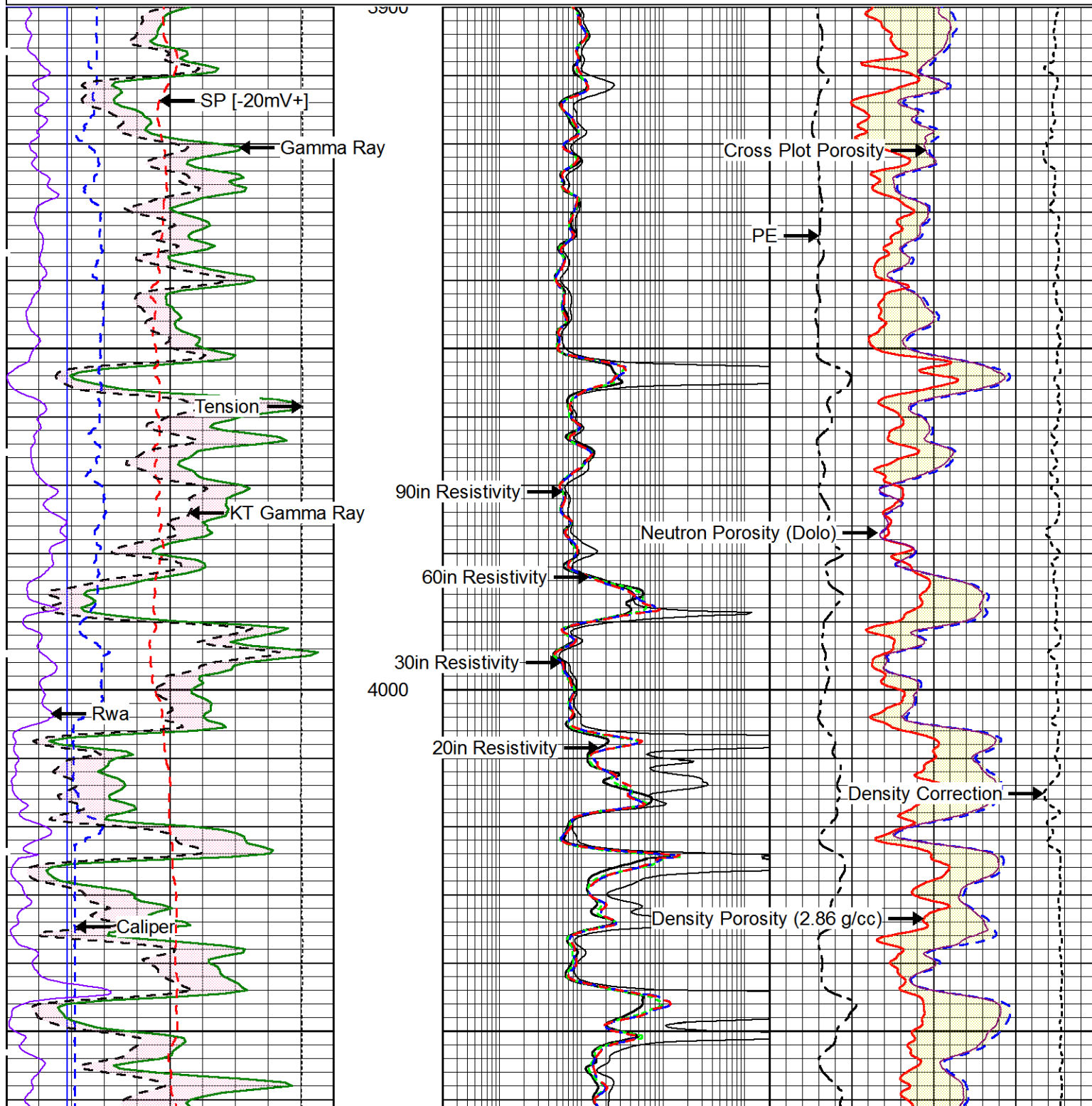
6	Bit-size (in)	16
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
SP [-20mV+]		
0	KT Gamma Ray (GAPI)	150
Tension		
10000	(lb)	0

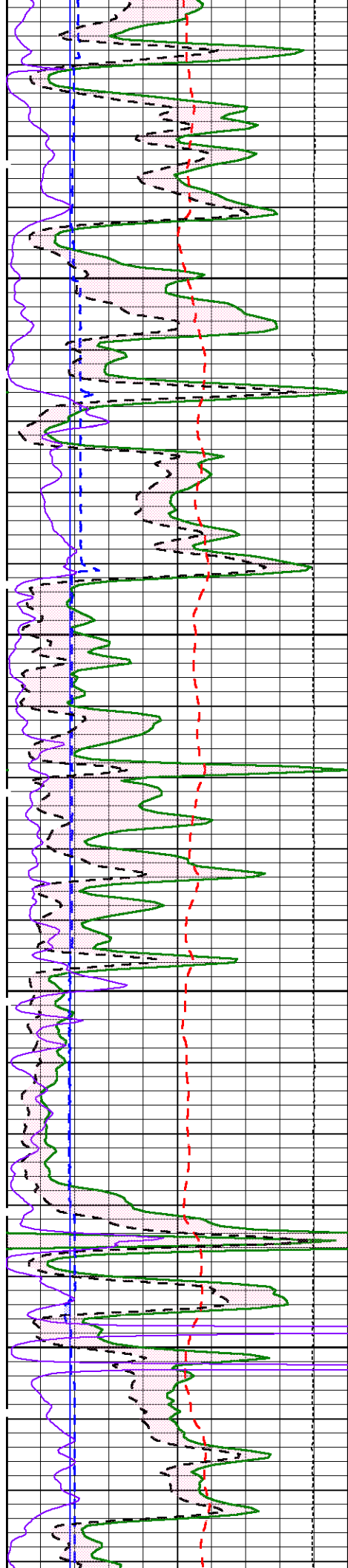
0.2	10in Resistivity (Ohm-m)	2000
0.2	20in Resistivity (Ohm-m)	2000
0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000

0.3	Neutron Porosity (Lime)	-0.1
0.3	Density Porosity (2.71 g/cc)	-0.1
0	PE	10
Density Correction		
0.8	(g/cc)	-0.2
0.3	Cross Plot Porosity	-0.1
0.3	Sonic Porosity (47.6 usec/ft)	-0.1

Database File: pronghorn_harley4.db
Dataset Pathname: D_main
Presentation Format: a3prond
Dataset Creation: Sat Jul 06 17:37:01 2013
Charted by: Depth in Feet scaled 1:240

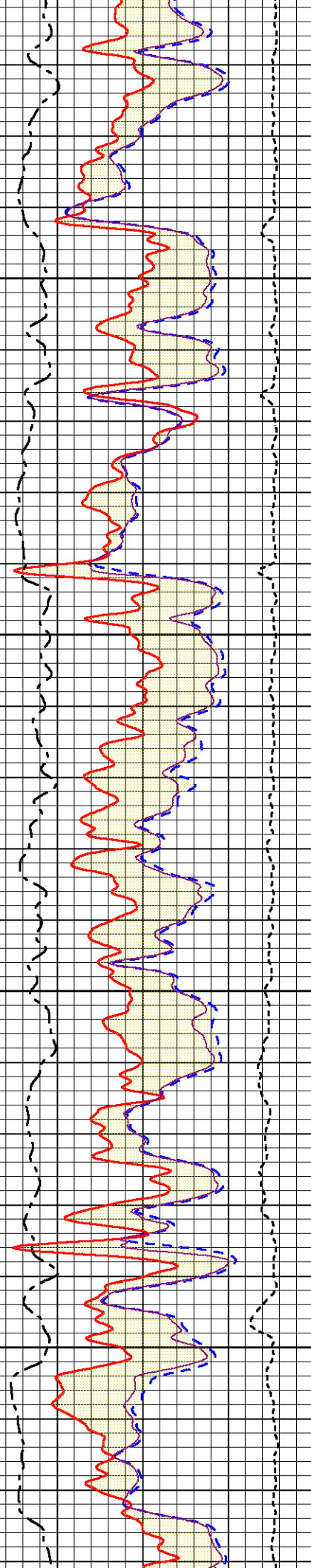
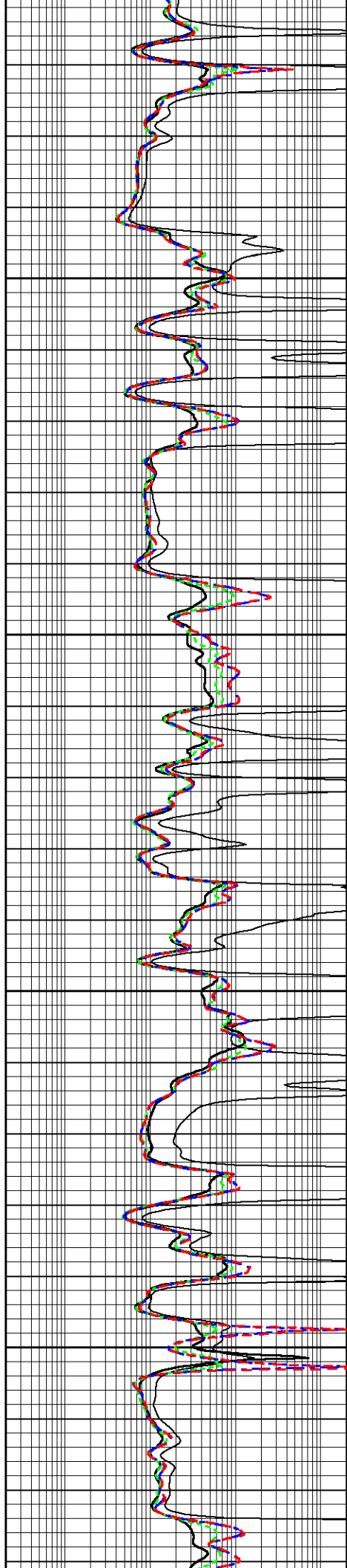
6	Bitsize (in)	16	0.2	10in Resistivity (Ohm-m)	2000	0.3	Neutron Porosity (Dolo)	-0.1
0	Gamma Ray (GAPI)	150	0.2	20in Resistivity (Ohm-m)	2000	0.3	Density Porosity (2.86 g/cc)	-0.1
6	Caliper (in)	16	0.2	30in Resistivity (Ohm-m)	2000	0	PE	10
	SP [-20mV+]		0.2	60in Resistivity (Ohm-m)	2000		Density Correction	
0	KT Gamma Ray (GAPI)	150	0.2	90in Resistivity (Ohm-m)	2000		0.8 (g/cc)	-0.2
0	Rwa (Ohm-m)	1				0.3	Cross Plot Porosity	-0.1
	Tension							
	10000 (lb)	0						

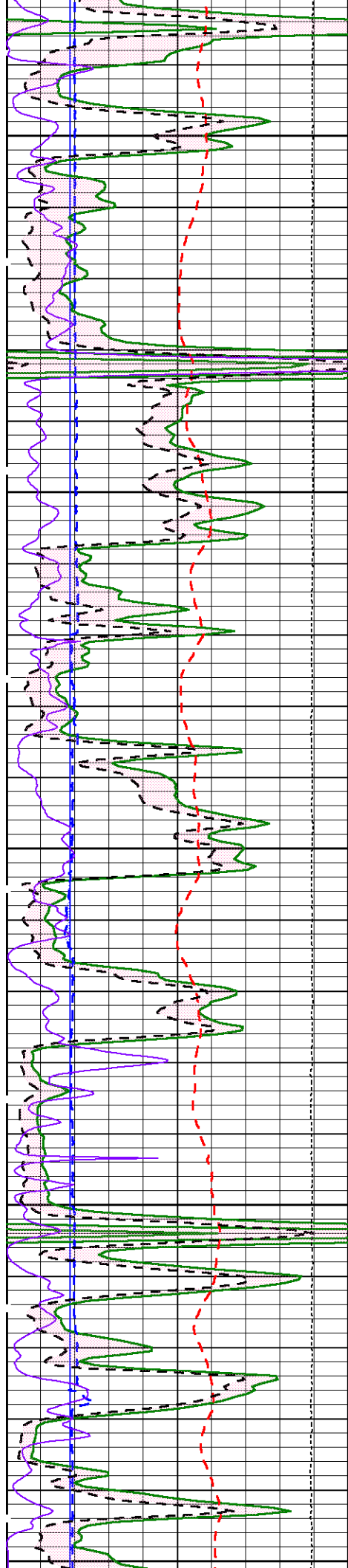




4100

4200

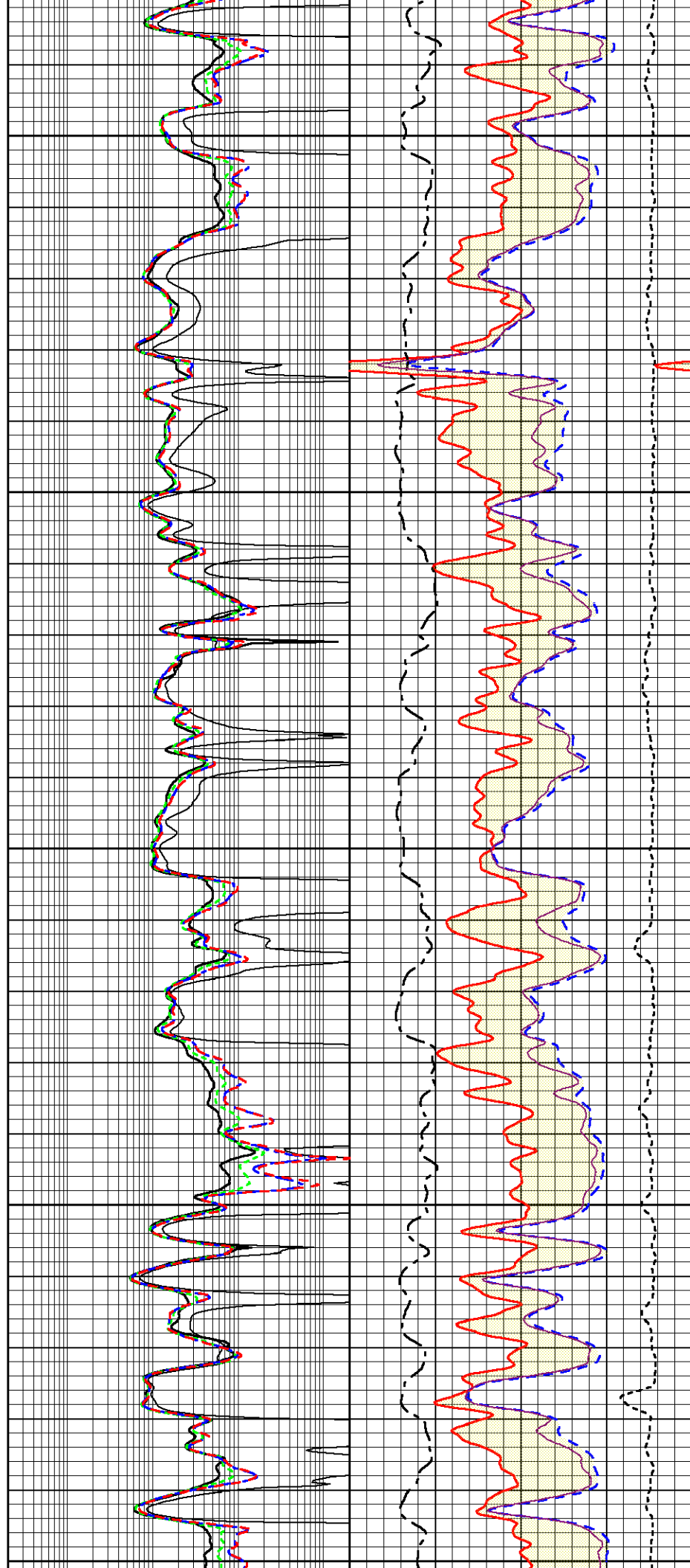


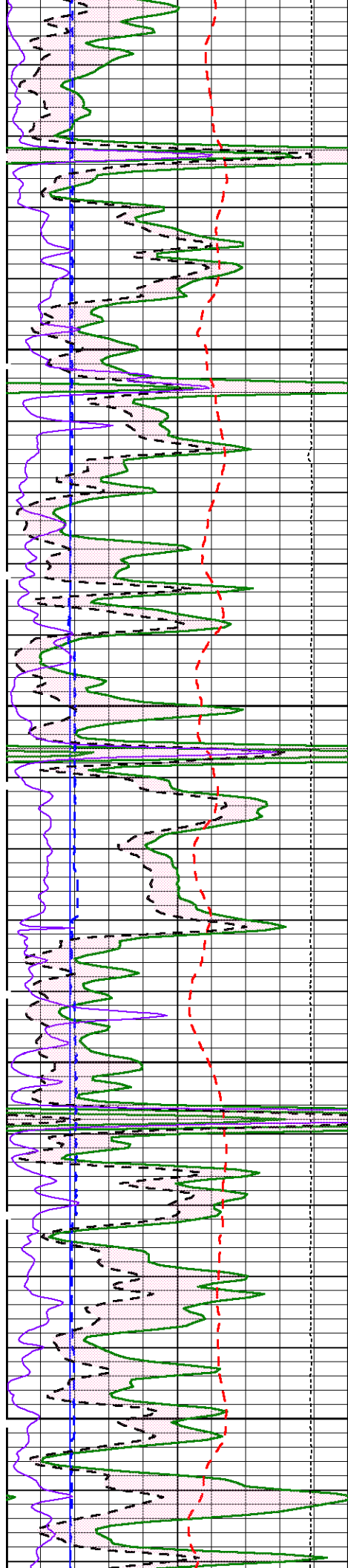


4300

4400

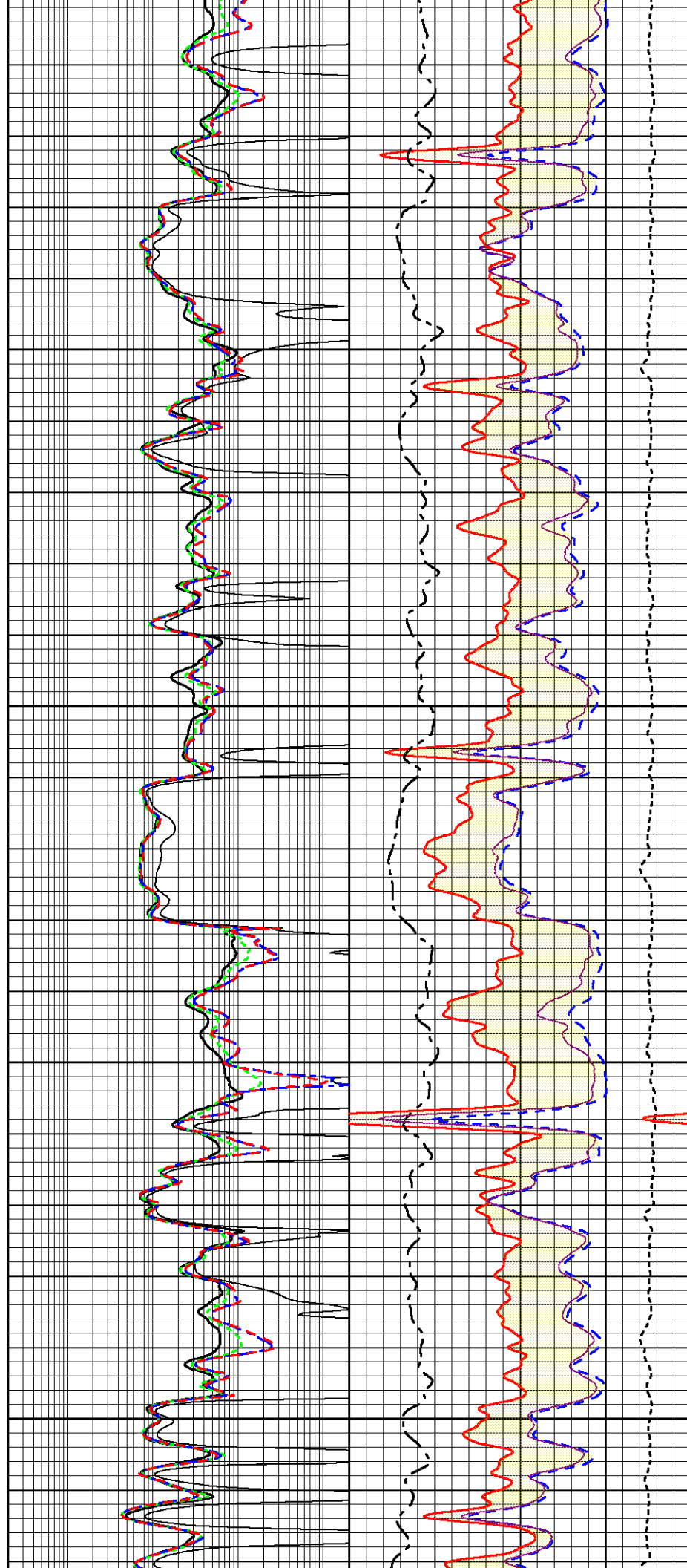
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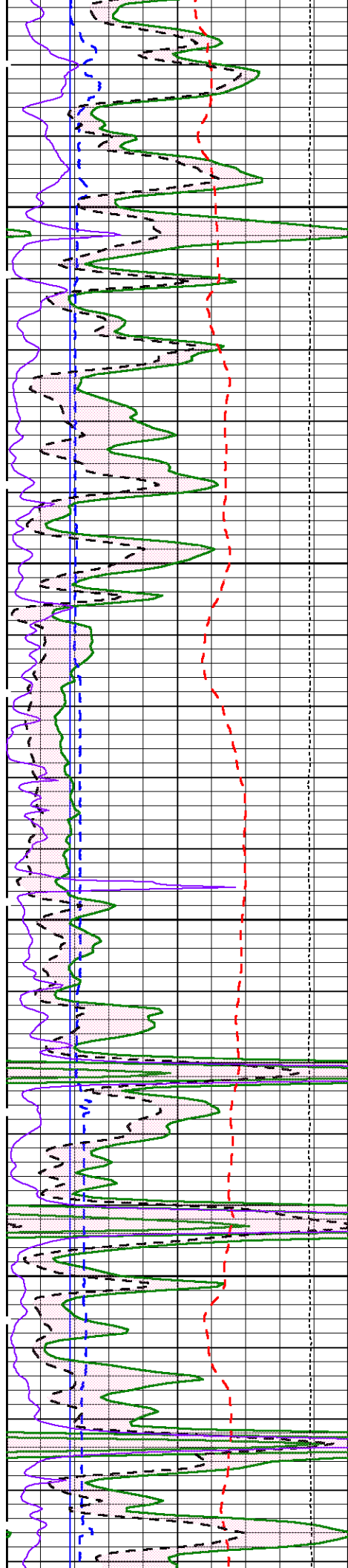




4600

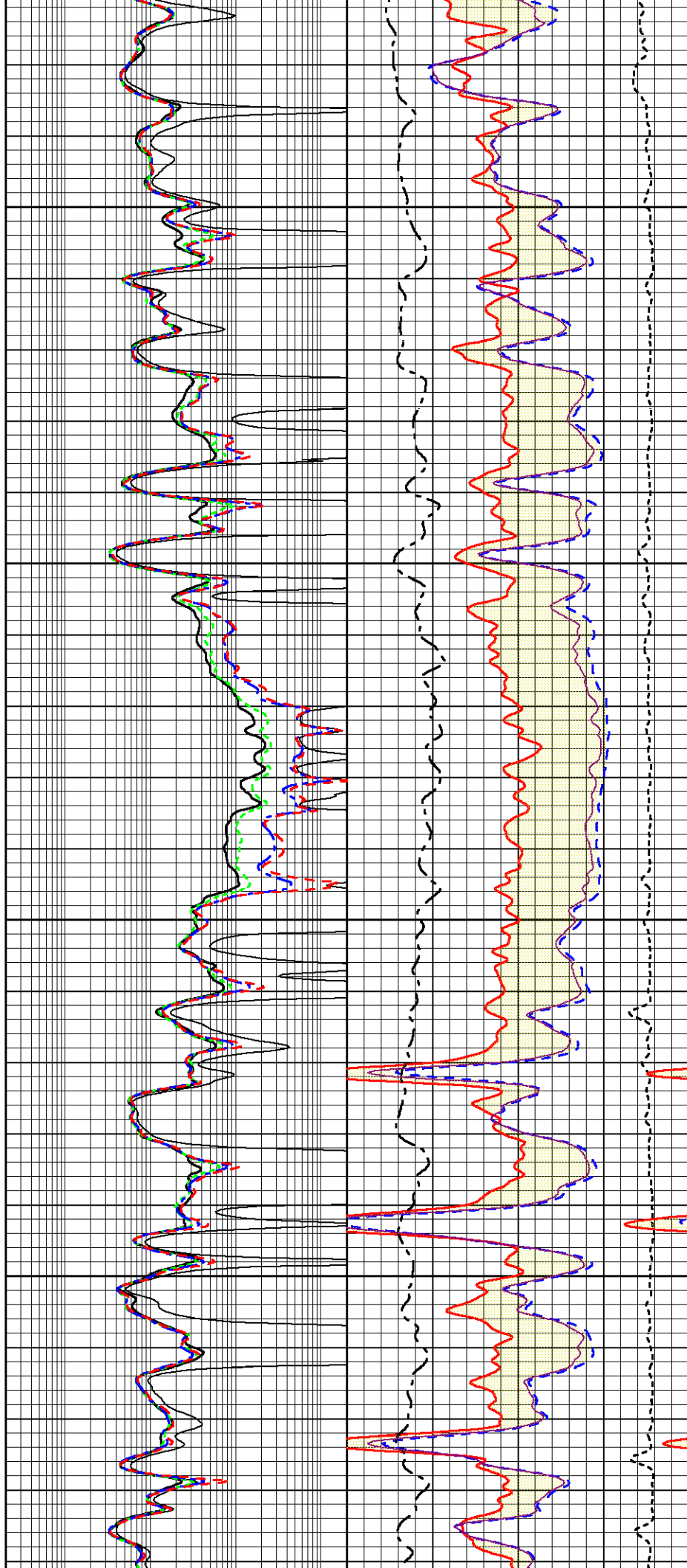
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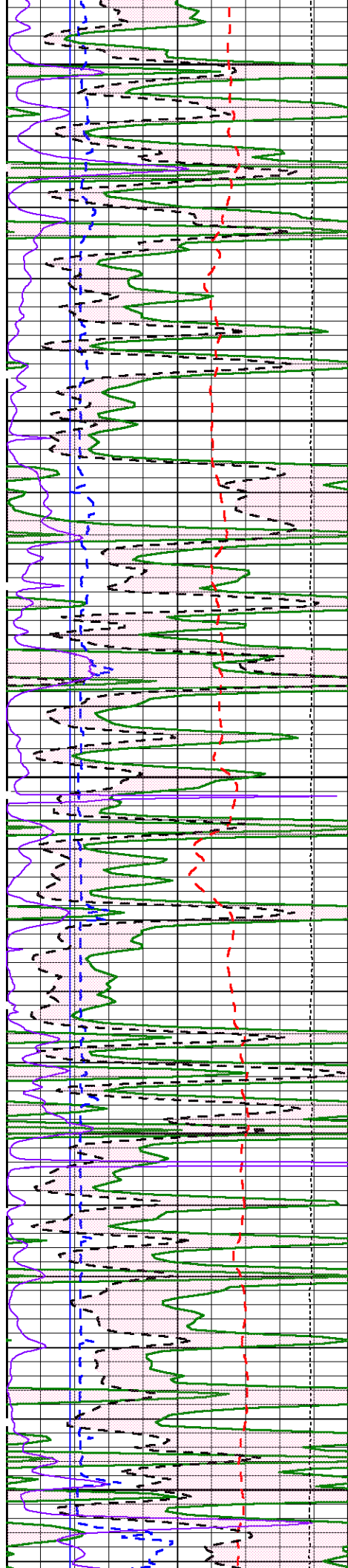




4800

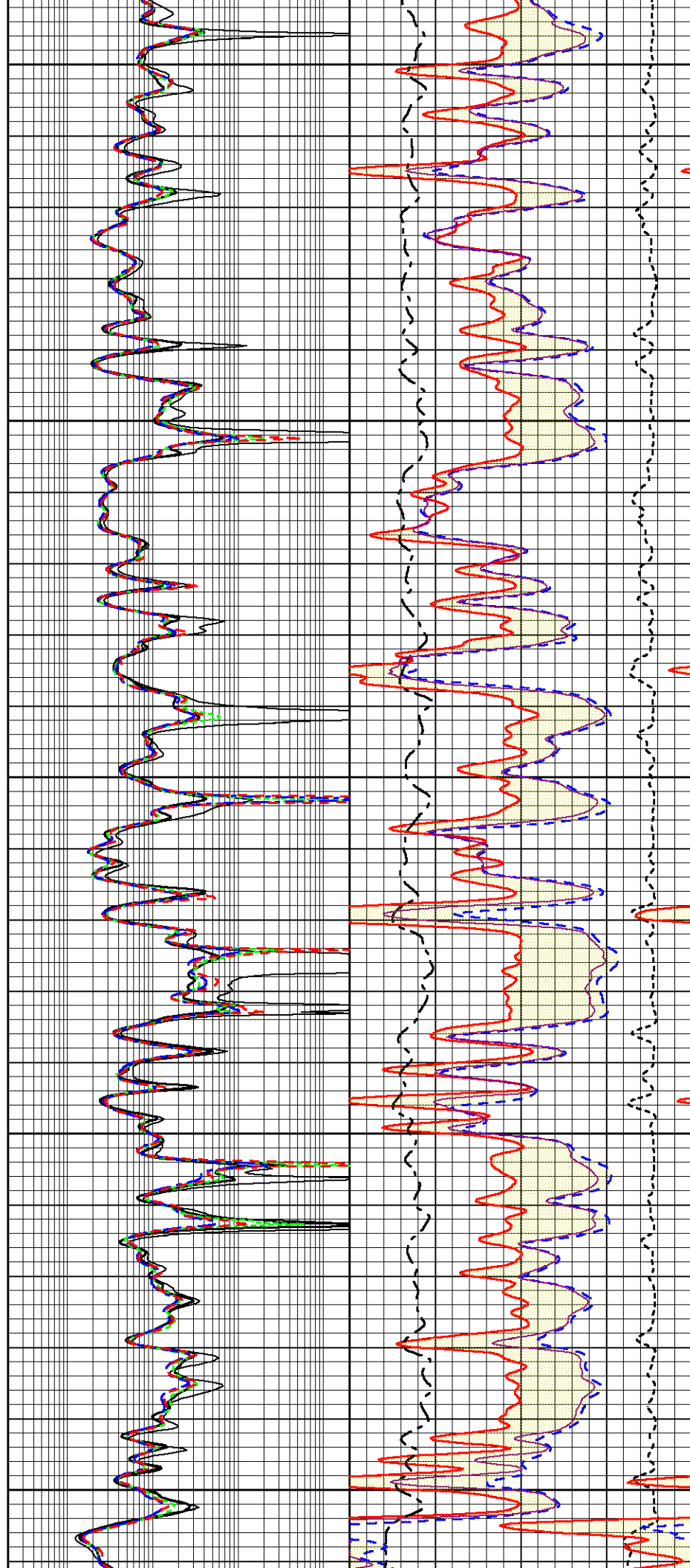
4900

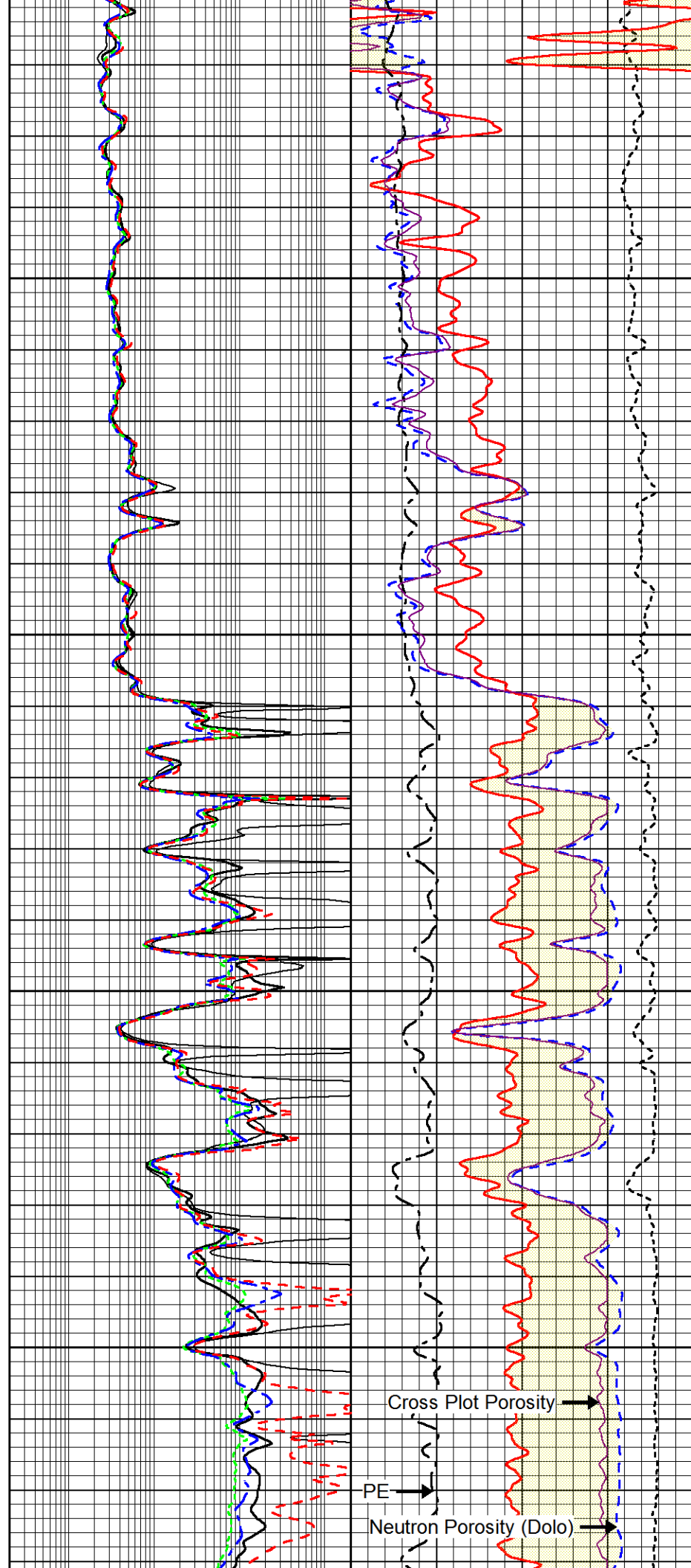
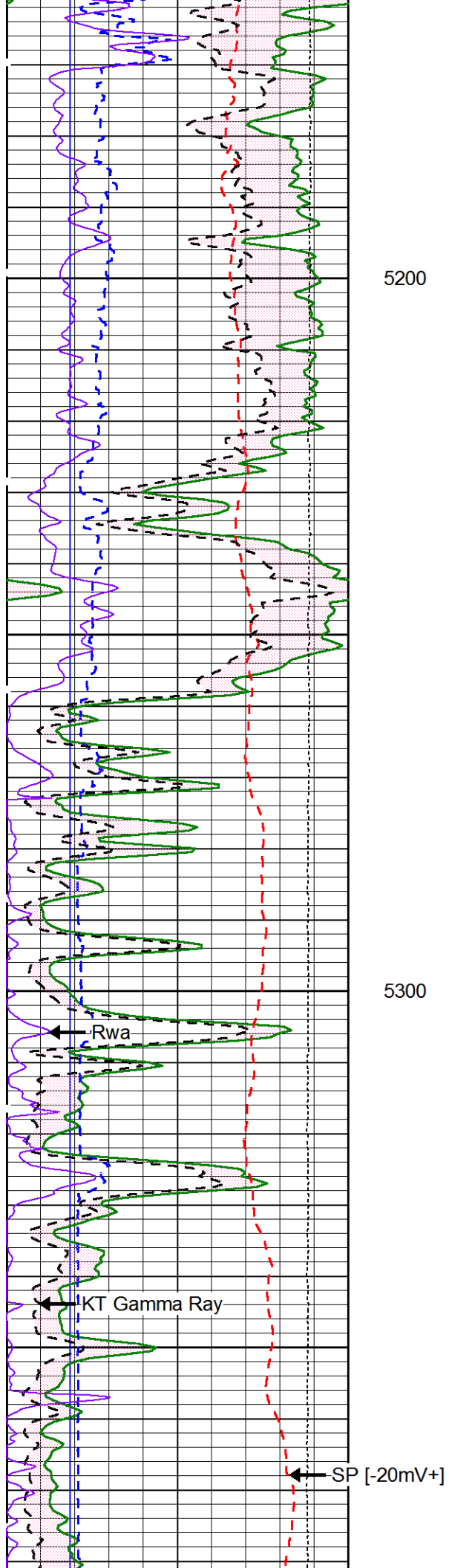


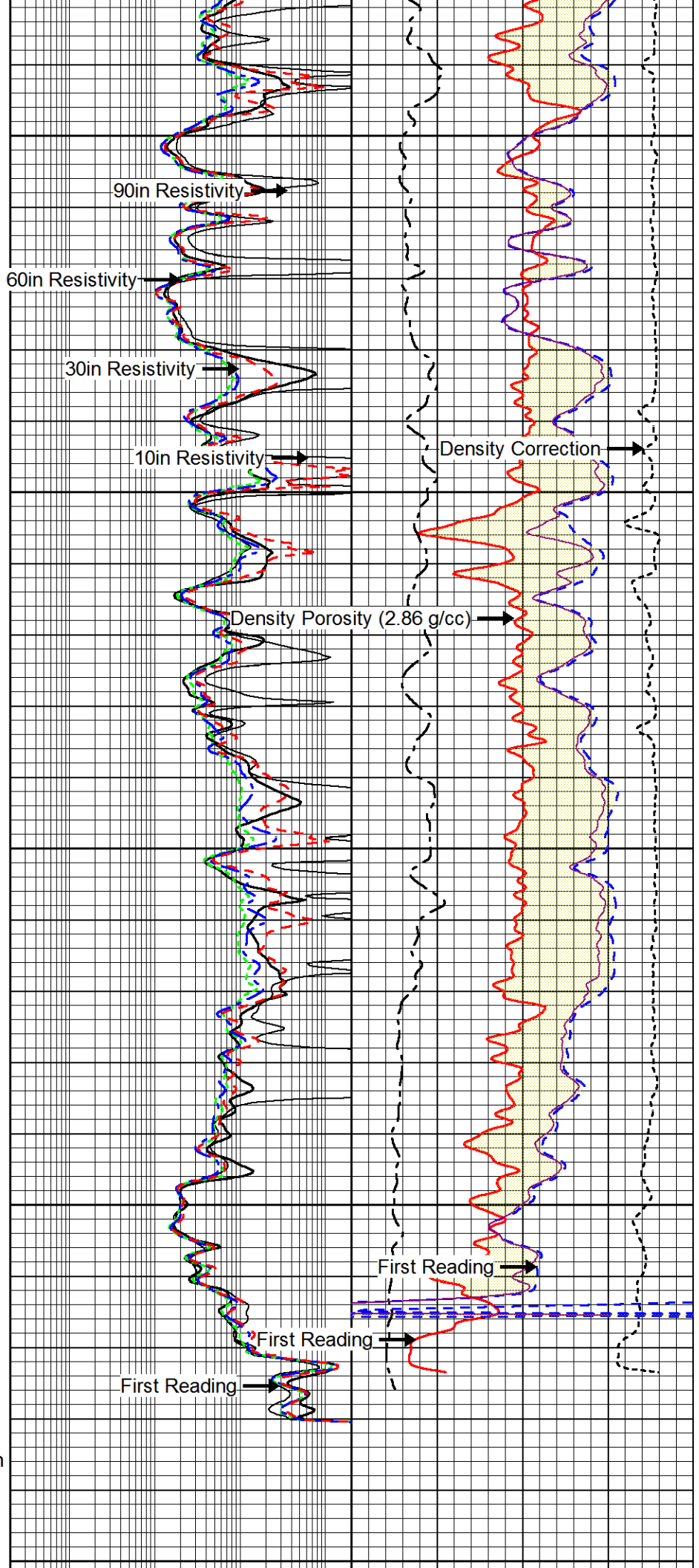
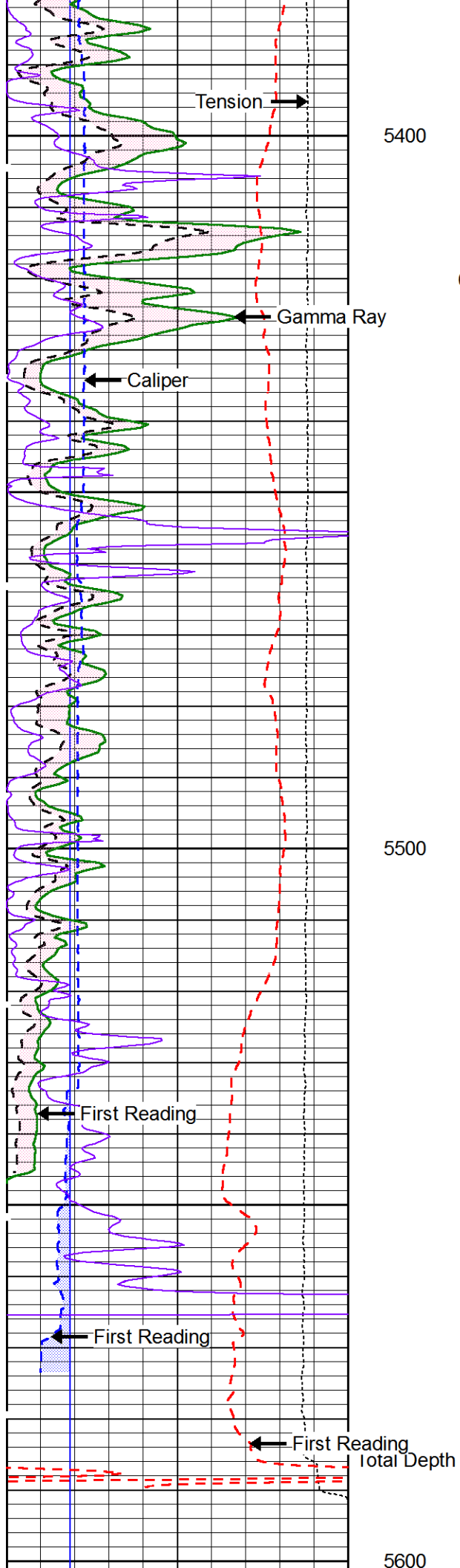


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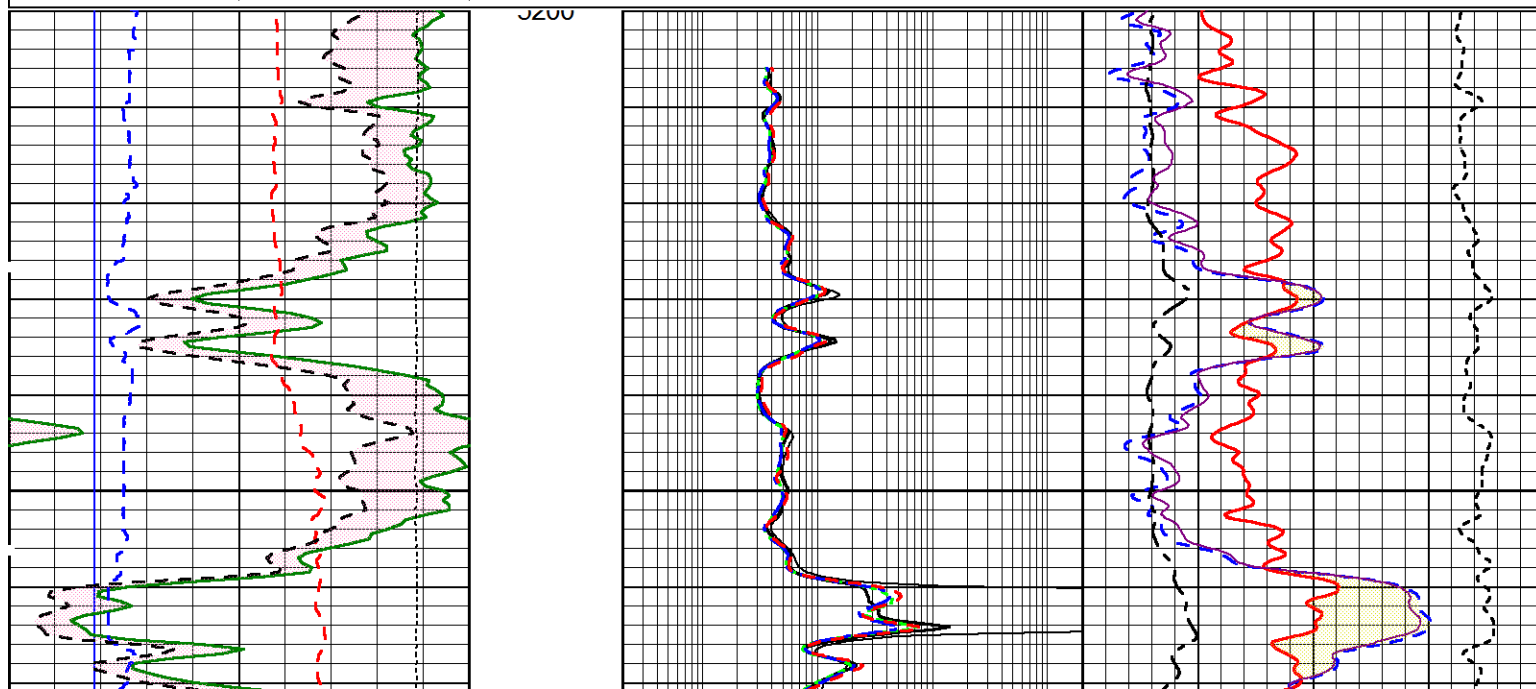
6	Bitsize (in)	16	0.2	10in Resistivity (Ohm-m)	2000	0.3	Neutron Porosity (Dolo)	-0.1
0	Gamma Ray (GAPI)	150	0.2	20in Resistivity (Ohm-m)	2000	0.3	Density Porosity (2.86 g/cc)	-0.1
6	Caliper (in)	16	0.2	30in Resistivity (Ohm-m)	2000	0	PE	10
	SP [-20mV+]		0.2	60in Resistivity (Ohm-m)	2000		Density Correction	
0	KT Gamma Ray (GAPI)	150	0.2	90in Resistivity (Ohm-m)	2000		0.8 (g/cc)	-0.2
0	Rwa (Ohm-m)	1				0.3	Cross Plot Porosity	-0.1
	Tension							
	10000 (lb)	0						

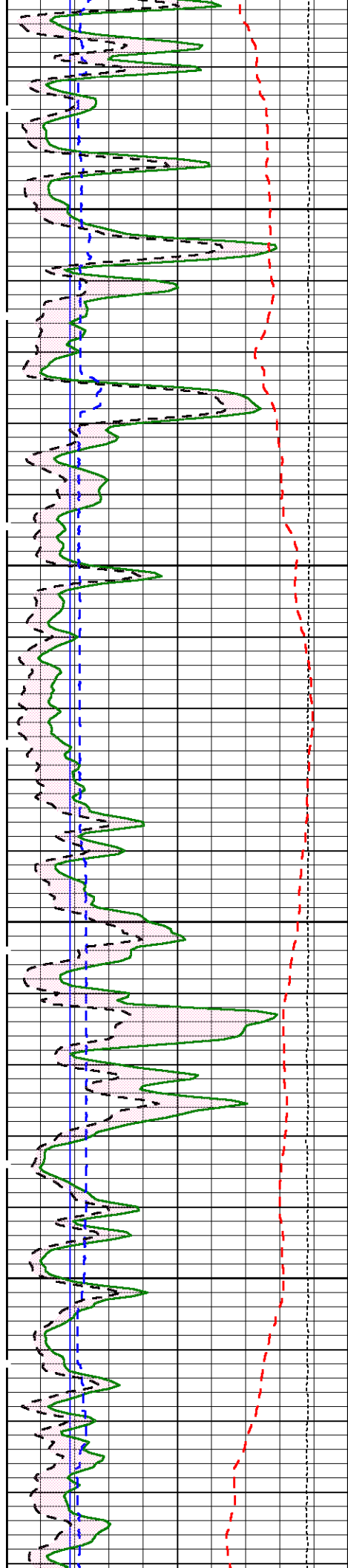


Repeat Pass

Database File: pronghorn_harley4.db
 Dataset Pathname: pass2.2
 Presentation Format: a3prond
 Dataset Creation: Sat Jul 06 17:29:42 2013 by Calc Sondex V7.03
 Charted by: Depth in Feet scaled 1:240

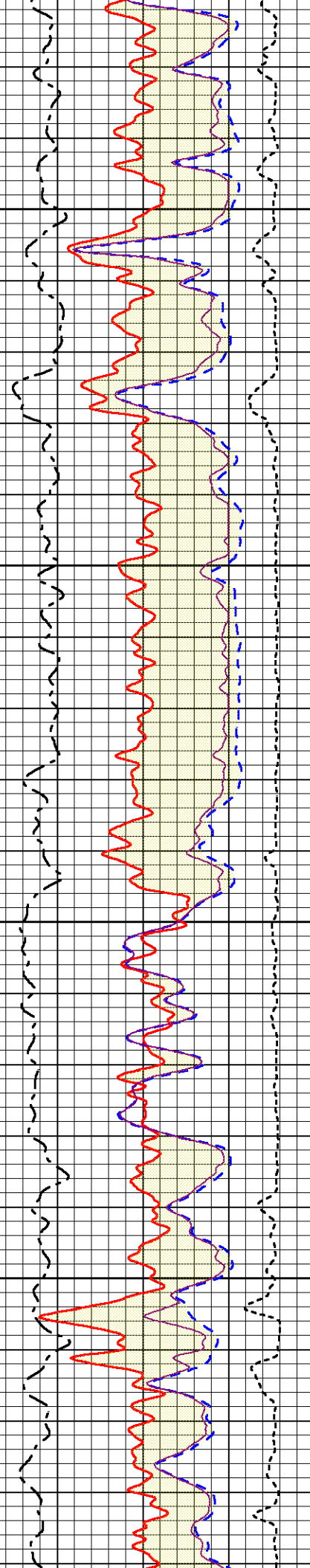
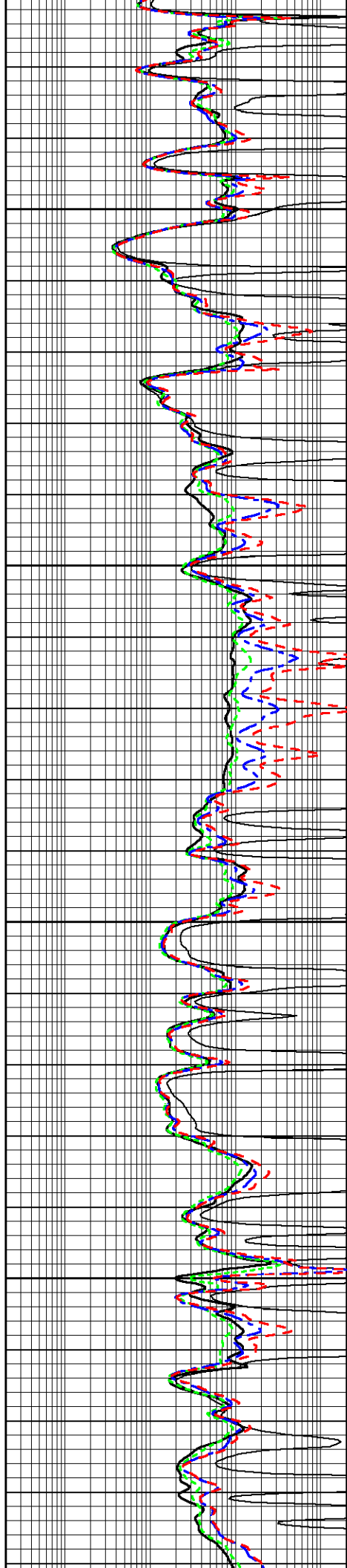
6	Bitsize (in)	16	0.2	10in Resistivity (Ohm-m)	2000	0.3	Neutron Porosity (Dolo)	-0.1
0	Gamma Ray (GAPI)	150	0.2	20in Resistivity (Ohm-m)	2000	0.3	Density Porosity (2.86 g/cc)	-0.1
6	Caliper (in)	16	0.2	30in Resistivity (Ohm-m)	2000	0	PE	10
	SP [-20mV+]		0.2	60in Resistivity (Ohm-m)	2000		Density Correction	
0	KT Gamma Ray (GAPI)	150	0.2	90in Resistivity (Ohm-m)	2000		0.8 (g/cc)	-0.2
	Tension					0.3	Cross Plot Porosity	-0.1
	10000 (lb)	0						

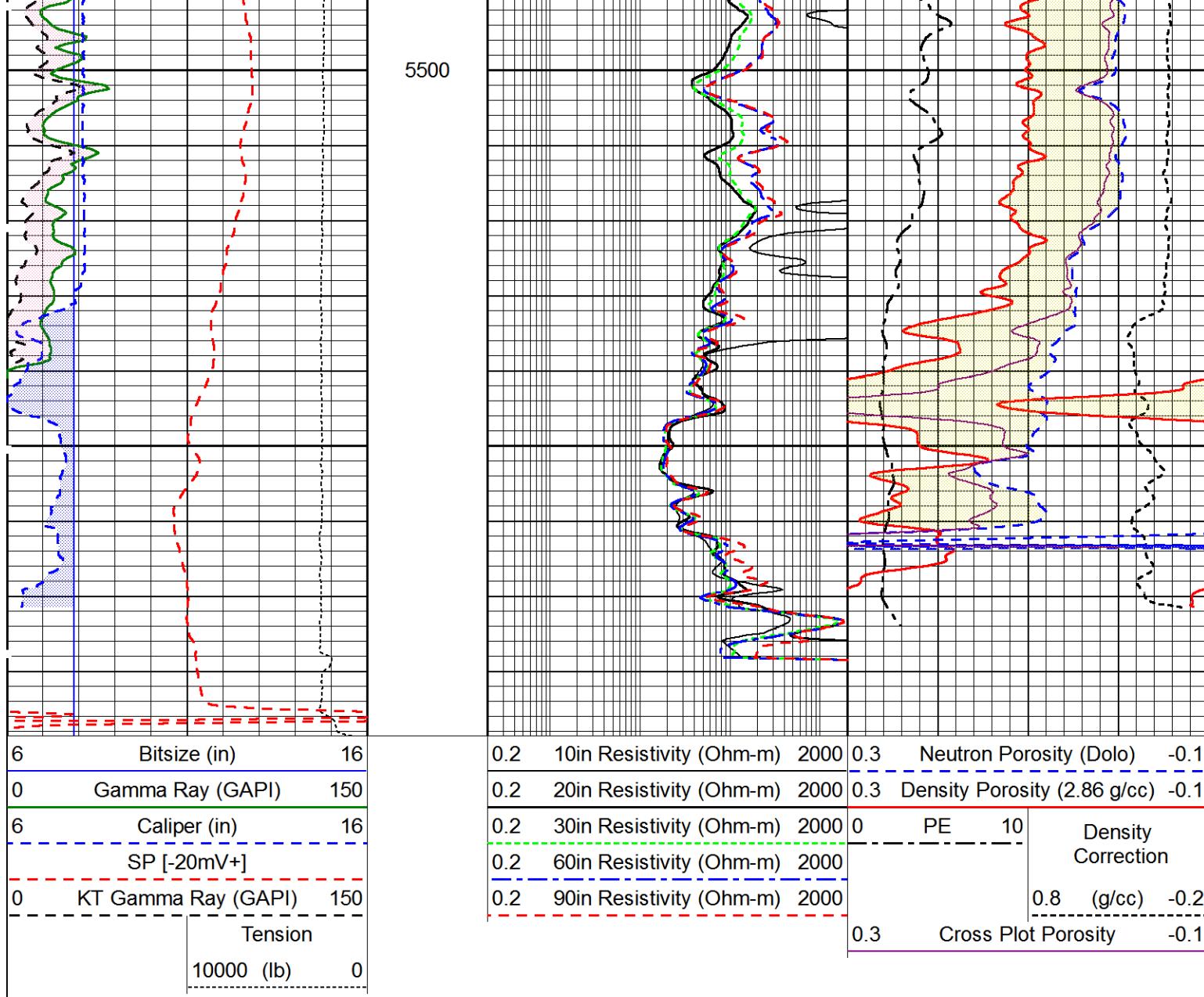




5300

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Log Variables

Database: C:\Warrior\Data\pronghorn_harley4.db
Dataset: field/well/run1/pass3.1

Top - 428.00 ft

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI ° 0	SRFTEMP degF 68	SO in 1.5	DE-CENT Yes	CASED? Yes	CASEWGHT lb/ft 54	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 8.8	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASEOD in 13.375	PERFS 0	TDEPTH ft 5570	BOTTEMP degF 130
BOREID in 7.875	A 1	M 2					

428.00 ft - Bottom

MAXAMPL mV 0	MINAMPL mV 1	MINATTN db/ft 0.8	COMPACT 1	SVFLUID usec/ft 189	SVMATRIX usec/ft 47.6	FRMSALIN kppm 0	MUDSALIN kppm 0
DEVI ° 0	SRFTEMP degF 68	SO in 1.5	DE-CENT Yes	CASED? No	CASEWGHT lb/ft 11.5	NPORSEL Limestone	AIR_HOLE? No
MudWgt lb/gal 8.8	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	CASEOD in 5.5	PERFS 0	TDEPTH ft 5570	BOTTEMP degF 130
BOREID in 7.875	A 1	M 2					

Calibration Report								
Database File:	pronghorn_harley4.db							
Dataset Pathname:	pass3.1							
Dataset Creation:	Sat Jul 06 10:42:59 2013 by Calc Sondex V7.03							
Induction Array Tool Calibration Report								
Serial Number:				B10110				
Tool Model:				002				
Master Calibration Performed:				Wed Aug 24 08:34:17 2011				
Temperature:				74.0 degF				
Sonde Error:								
Array	1	2	3	4	5	6	7	
Real	191.9	-13.8	-40.9	-15.9	-3.1	0.7	3.4	mmho/m
Imaginary	33.1	-17.8	-19.8	-16.7	-24.3	-1.9	5.8	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	762.6	736.2	1247.9	1380.3	1164.3	741.8	425.4	mmho/m
Imaginary	109.3	84.7	369.6	408.4	328.0	221.5	135.1	mmho/m
Gain (real)	0.942	0.905	1.005	0.999	0.981	0.962	0.959	
Gain (imaginary)	0.961	0.902	1.001	0.987	0.978	0.960	0.942	
Before Survey Verification Performed:				Thu Oct 04 13:29:32 2012				
Sonde 1 Temperature:				83.1 degF				
Sonde 2 Temperature:				86.7 degF				
Array 1 Temperature:				83.1 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	121.5	180.0	190.0	190.0	190.0	190.0	190.0	
RxCR	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	
RxCX	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
RxC Magnitude	0.2	0.2	0.2	0.2	0.2	0.2	0.2	

Tool Module Parameters	
Software Version:	1.9.1.0
Borehole Size Source:	CALI
Mud Resistivity Source:	Hilchie
Mud Resistivity At Surface:	1.20 Ohm m

Mud Resistivity At Surface:	1.20 Ohm-Fm
Mud Resistivity Surface Temperature:	75.0 degF
Borehole Corrections:	Automatic
Minimum Standoff:	0.4 in

Litho Density Tool Calibration Report

Serial Number:	B0872S50130B
Tool Model:	002

Caliper Calibration Performed:	Wed Jun 26 11:30:27 2013
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	Diameter		Reading	
Small Ring:	6.000	in	1355.300	cps
Large Ring:	13.000	in	2004.700	cps
Gain:	0.0108			
Offset:	-8.6090			

Master Calibration Performed:	Wed Jun 26 11:01:57 2013
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Source Number:	50103
Medium:	Water
Al Block Density:	2.5982 g/cc

	Background	Al Block	Al Block + Fe	
SS1	822.8	4393.2	3697.5	cps
SS2	2307.7	29712.2	25027.5	cps
SSTOTAL	5405.6	47464.6	39740.1	cps
LITH	95.7	489.9	293.8	cps
LL	188.5	811.2	710.8	cps
LU	538.1	1063.3	983.9	cps
LS	726.6	1874.5	1694.7	cps
LSTOTAL	1375.4	4558.6	3691.5	cps
SSHV	1470.6	1473.6	1474.1	V
LSHV	1403.7	1405.6	1406.1	V
SSFF	0.010	0.007	0.002	
LSFF	0.010	0.002	-0.002	

Before Survey Verification Performed:
After Survey Verification Performed:

	Master Background	Before Survey Background	After Survey Background	
SS1	822.8			cps
SS2	2307.7			cps
SSTOTAL	5405.6			cps
LITH	95.7			cps
LL	188.5			cps
LU	538.1			cps
LS	726.6			cps
LSTOTAL	1375.4			cps
SSHV	1470.6			V
LSHV	1403.7			V
SSFF	0.010			
LSFF	0.010			

Tool Module Parameters

Software Version:	2.5.1.0
Borehole Size Source:	CALI
Pad Type:	2

Compensated Neutron Tool Calibration Report

Serial Number:		C7939S66010B	
Tool Model:		009	
Master Calibration Performed:		Wed Jun 26 13:44:35 2013	
Source Number:		66010B	
Short Spacing Counts:		6788.82	cps
Long Spacing Counts:		267.57	cps
High Voltage:		1336.27	V
Target Ratio:		23.9200	
Ratio:		25.3720	
K-Factor:		0.9428	
Before Survey Verification Performed:			
After Survey Verification Performed:			
Verifier Number:		6494	
Verifier Values	Master Cal	Before Survey	After Survey
Short Spacing Counts:	257.10		cps
Long Spacing Counts:	258.50		cps
High Voltage:	1336.30		V
Ratio:	0.9946		
Tool Module Parameters			
Software Version:		1.5.0.0	
Borehole Size Source:		CALI	
Clip Crossplot Porosity:		YES	

Spectral Gamma Ray Tool Calibration Report

Serial Number:		220344	
Tool Model:		002	
Performed:		Wed Jun 26 13:25:33 2013	
Source Number:		Th Blanket #12	
Calibrator Value:		217.0	API
Background Reading:		477.0	cps
Calibrator Reading:		2090.4	cps
Sensitivity:		0.135	API / cps
Perfomed:			
Verifier Number:			
Concentrations		K %	U ppm T ppm
K Peak:			
U Peak:			
T Peak:			

Before Survey Verification Performed:

After Survey Verification Performed:

	Before Survey	After Survey	
Background Reading:			cps
Verifier Reading:			cps

K Peak:
U Peak:
T Peak:

Tool Module Parameters

Software Version: 1.8.9.5

Gamma Ray Calibration Report

Serial Number: 10009990
Tool Model: 001

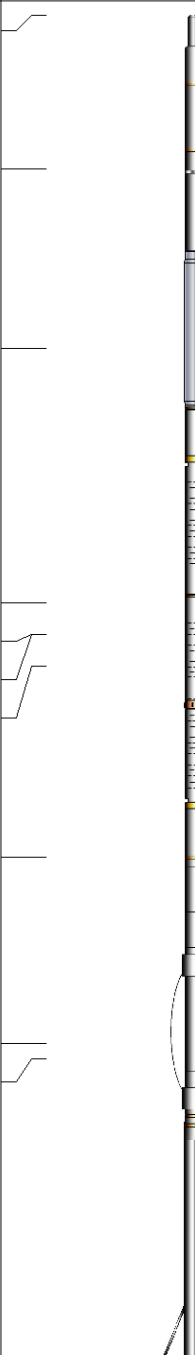
Performed: Wed Mar 27 09:56:46 2013

Calibrator Value: 236.0 GAPI

Background Reading: 205.7 cps

Calibrator Reading: 961.5 cps

Sensitivity: 0.3122 GAPI/cps

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)	
CHD	59.75		CHD-001 (000004) Cable Head	2.19	3.38	35.00	
GR	54.88		XTU-008 (10007730) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00	
			GRT-001 (10009990) Gamma Ray Tool	3.22	3.38	69.00	
SGR	49.19		SGR-002 (220344) Spectral Gamma Ray Tool	4.94	3.88	120.00	
WVFUTRF	41.12		MAS-001SS (10010072SS) Multi Array Sonic Tool (SS)	14.28	3.38	242.00	
WVFUTRN	40.12						
WVFLTRF	40.12						
WVFLTRN	39.12						
KJT	33.04		KJT-001 (000002) Knuckle Joint	2.86	3.38	72.00	
CNLSC	27.16		CNL-009 (C7939S66010B) Compensated Neutron Logging Tool	5.27	3.38	125.00	
CNSSC	26.66						
			LDT-002 (B0872S50130B) Litho Density Tool	9.75	4.50	310.00	

