



# Composite Log

Company Pronghorn Operating, LLC.  
Well Harley #5  
Field Cheyenne Wells  
County Cheyenne State Colorado

Location: 1867 FSL & 737 FEL  
SEC 4 TWP 14S RGE 44W  
Permanent Datum G.L. Elevation 4307 ft.  
Log Measured From K.B. , 16 ft. above perm. datum  
Drilling Measured From K.B. G.L. Elevation 4323 ft.  
D.F. 4322 ft.  
G.L. 4307 ft.

Date	24-June-2013		
Run Number	One		
Depth Driller	5641'		
Depth Logger	5646'		
Bottom Logged Interval	5644'		
Top Log Interval	3900'		
Casing Driller	13.375" @ 426'	@	@
Casing Logger	426'		
Bit Size	7.875"	@	@
Type Fluid in Hole	WBM		
Density / Viscosity	8.8 / 47		
pH / Fluid Loss	9.5 / 7.3		
Source of Sample	Mud Pit		
Rm @ Meas. Temp	1.0 @ 75 °F	@	@
Rmf @ Meas. Temp	0.8 @ 75 °F	@	@
Rmc @ Meas. Temp	1.25 @ 75 °F	@	@
Source of Rmf / Rmc	Calculated		
Rm @ BHT	0.58 @ 130 °F	@	@
Time Circulation Stopped	14:30		
Time Logger on Bottom	19:00		
Maximum Recorded Temperature	130 °F		
Equipment Number	10002		
Location	Brighton		
Recorded By	B.Oetting		
Witnessed By	J. Flora		

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## Equipment and Log Data

Service Order: 23259

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.	5302	Serial No.	7939	Serial No.	10010072	Serial No.	10110
O.D.	3.375 in.	Source No.	50130B	Source No.	66010B	Centralizers	0	Standoffs	0 @ 0.5"
		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 CSG	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: 2300 ppm  
Sped up at 3900' per J.F.

YOUR CREW TODAY: A. Hughes



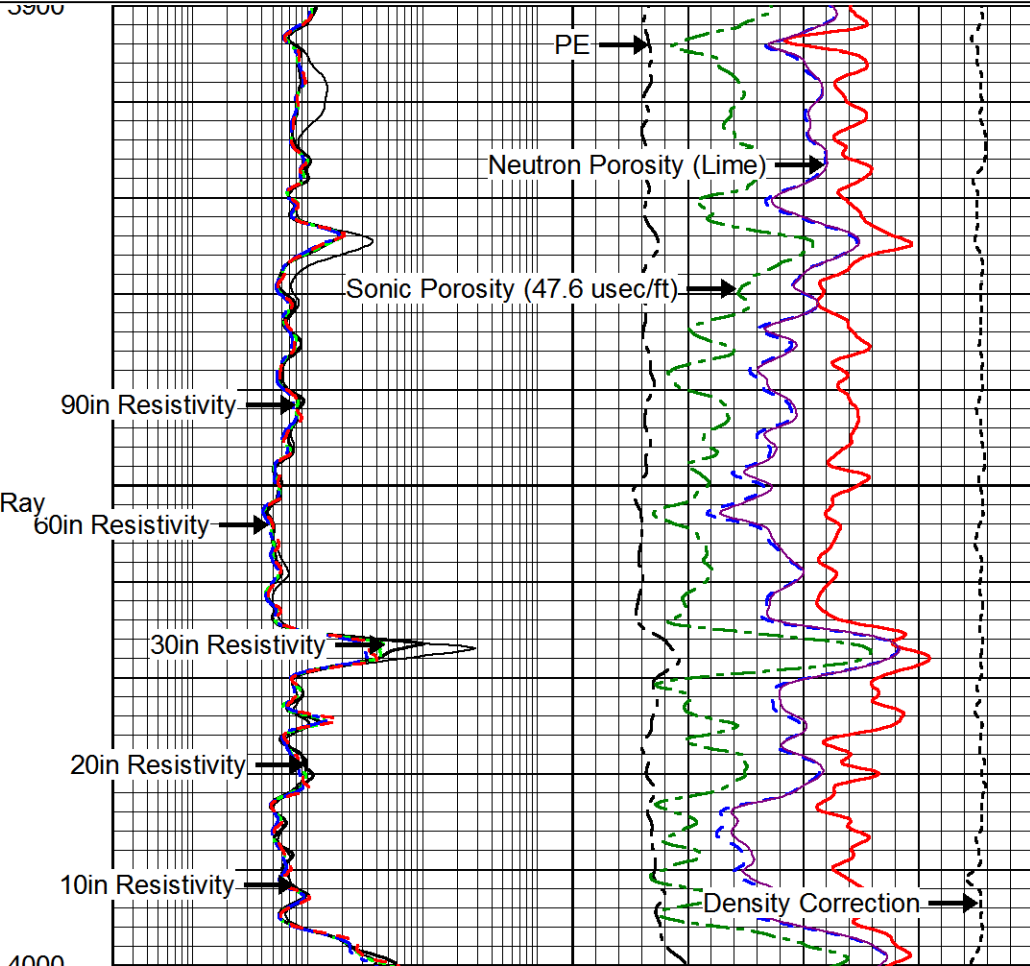
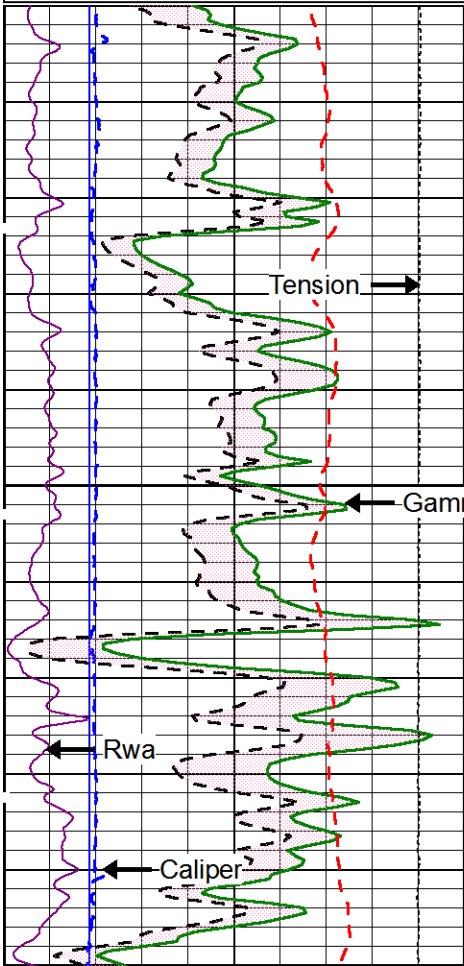
# Main Pass

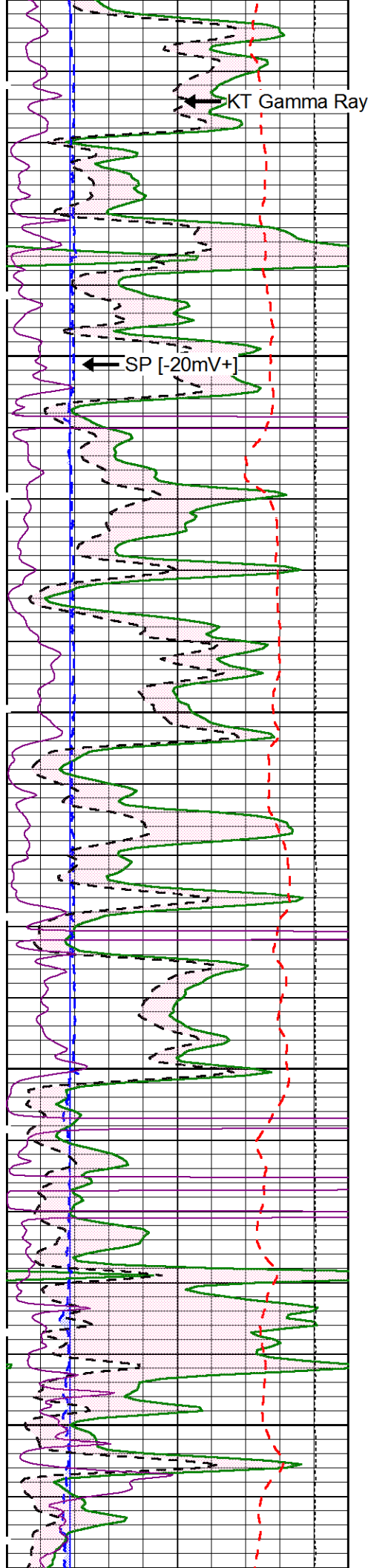
Database File: pronghorn\_harley\_5.db  
Dataset Pathname: F\_Main  
Presentation Format: a4pronl  
Dataset Creation: Tue Jun 25 19:52:10 2013  
Charted by: Depth in Feet scaled 1:240

6	Bitsize (in)	16
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 (2.71g/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

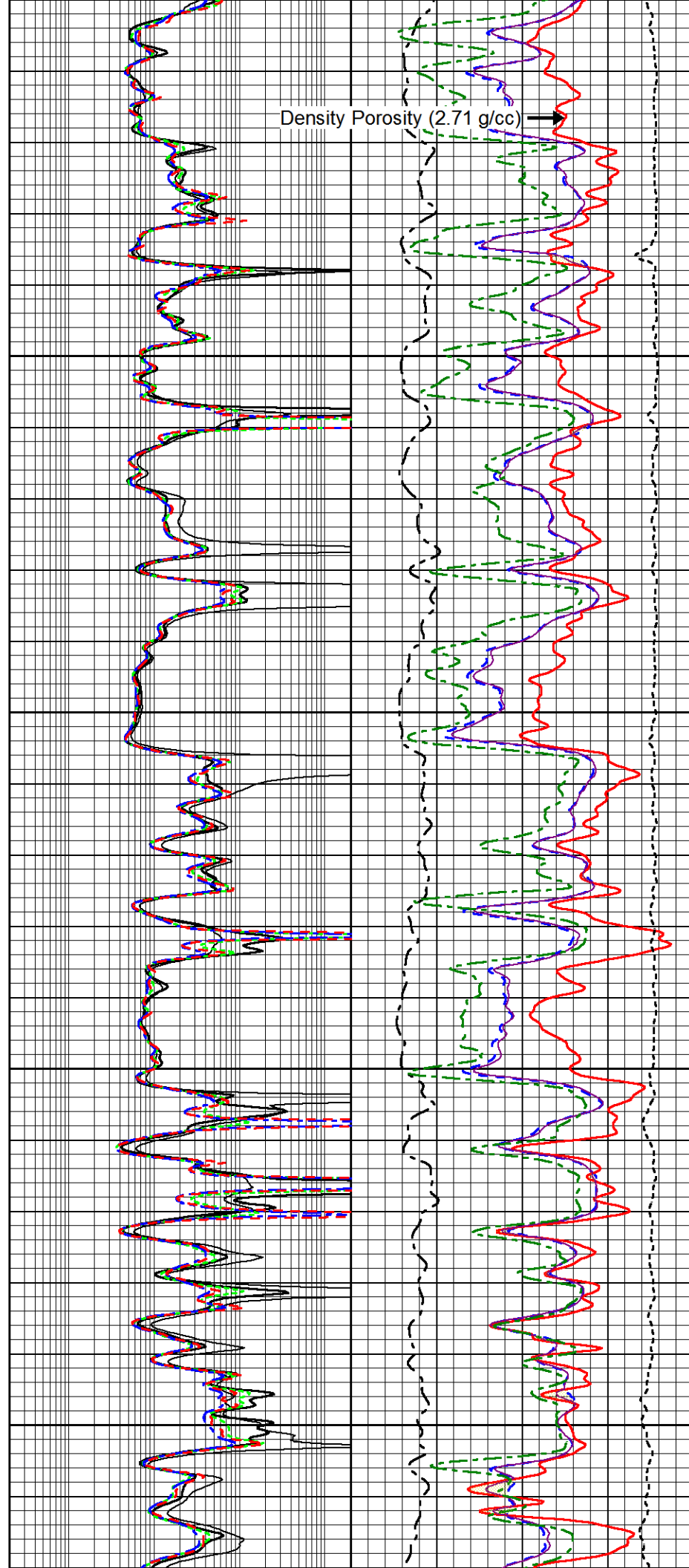


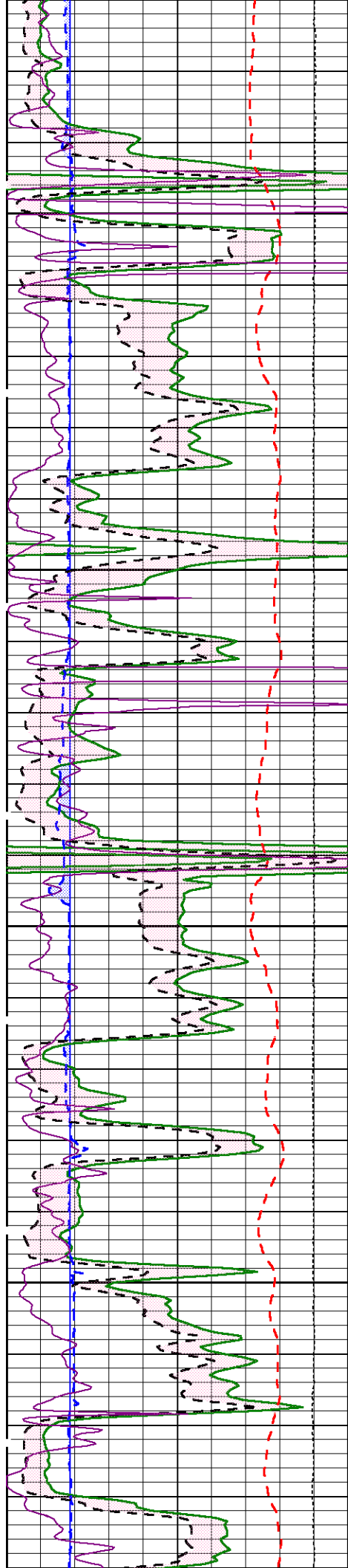


4000

4100

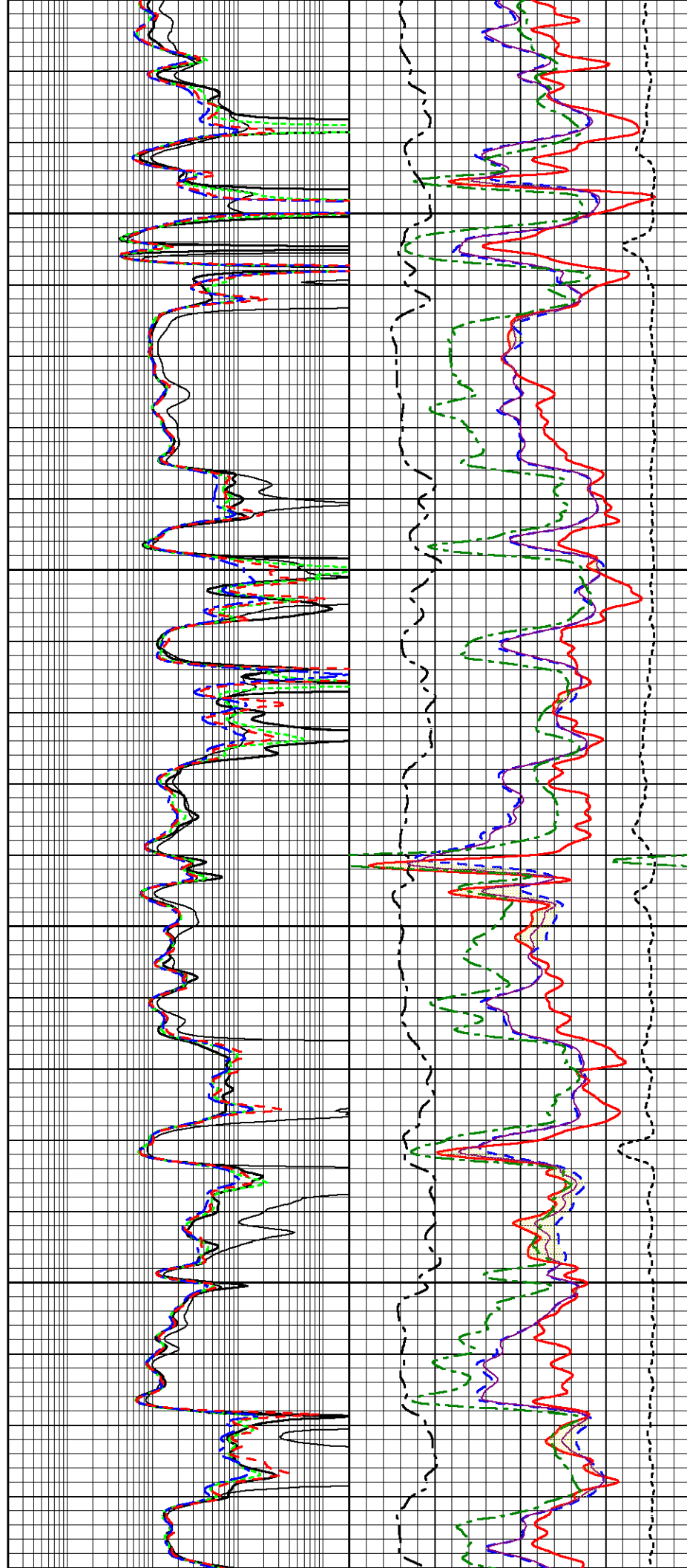
4200



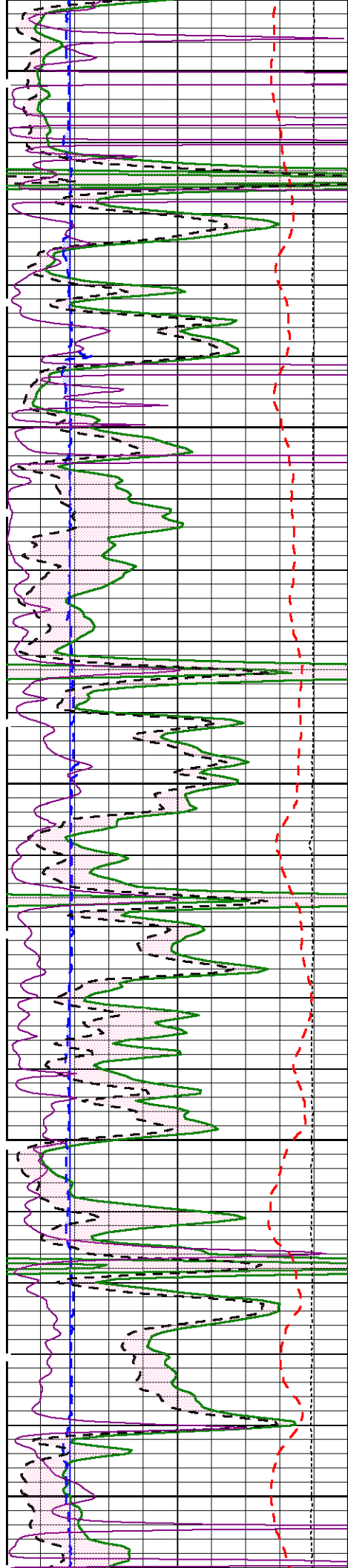


4300

4400

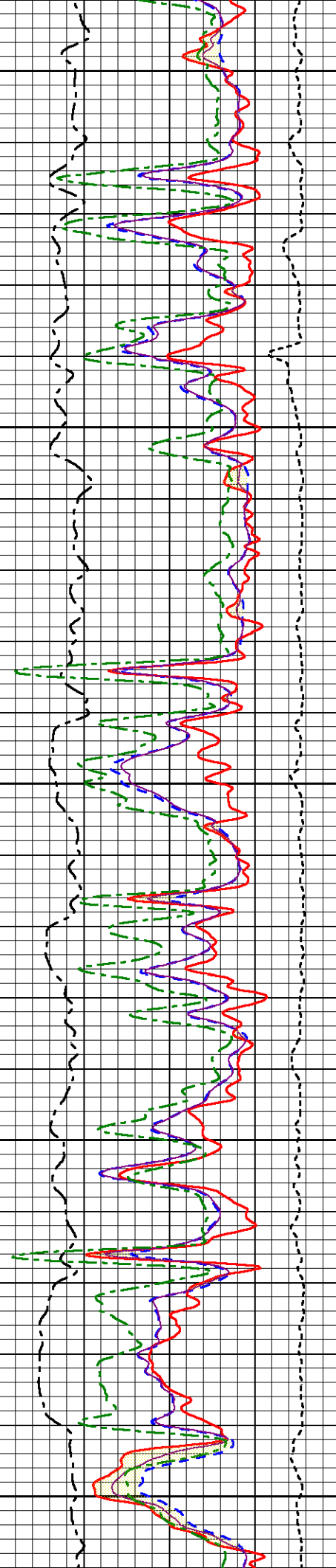
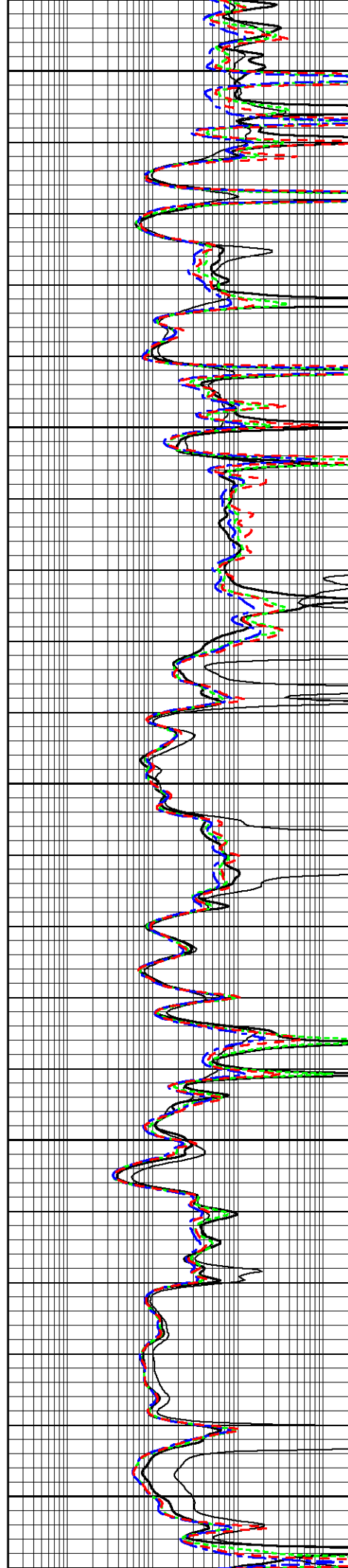


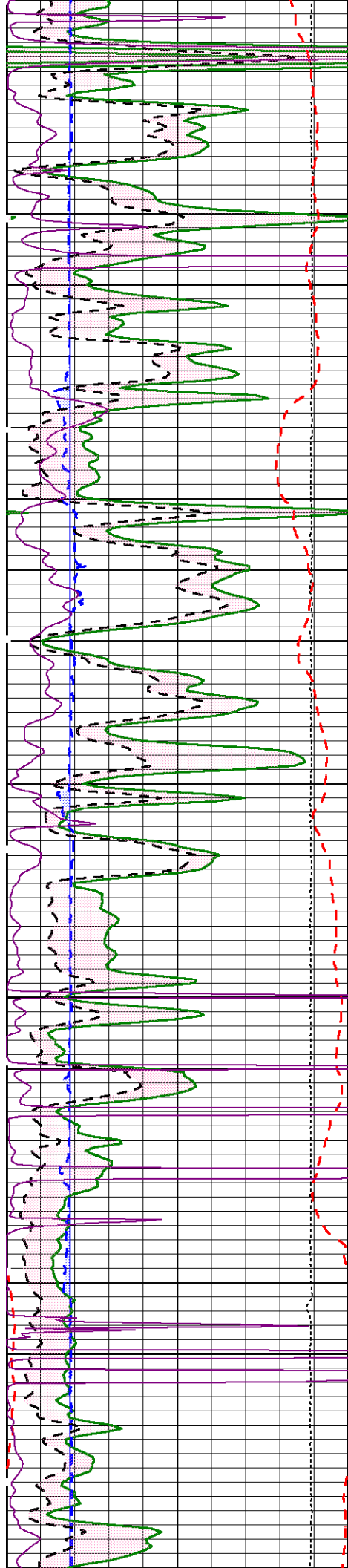




4500

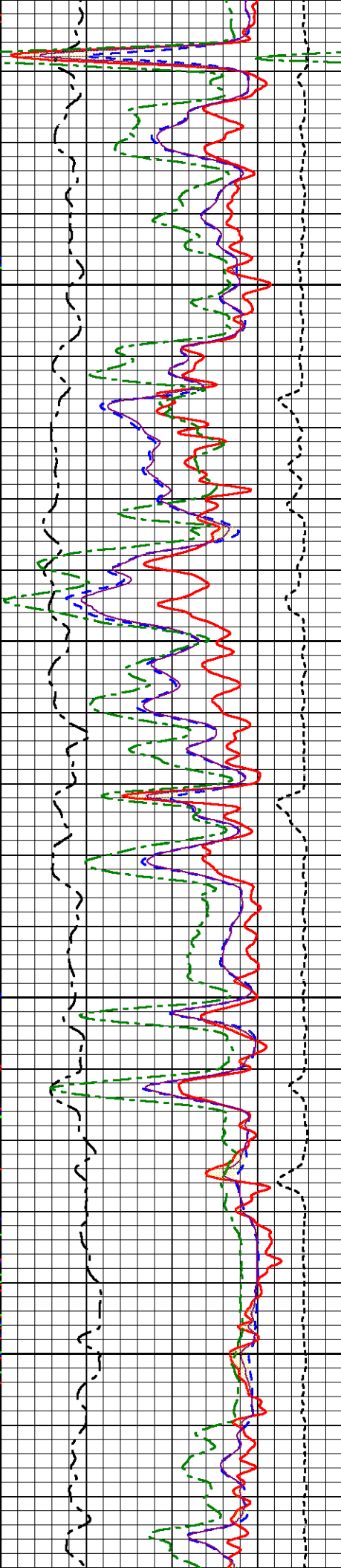
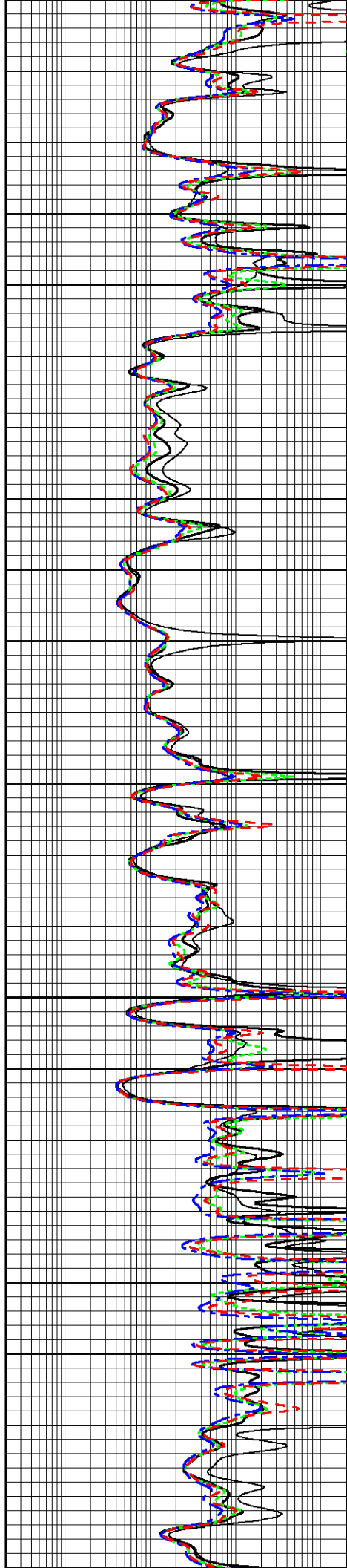
4600

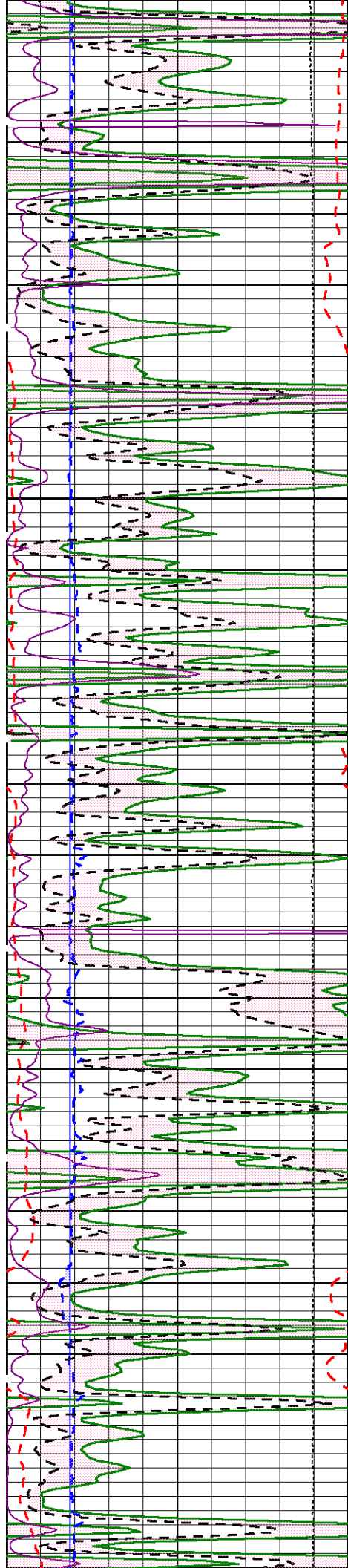




4700

4800

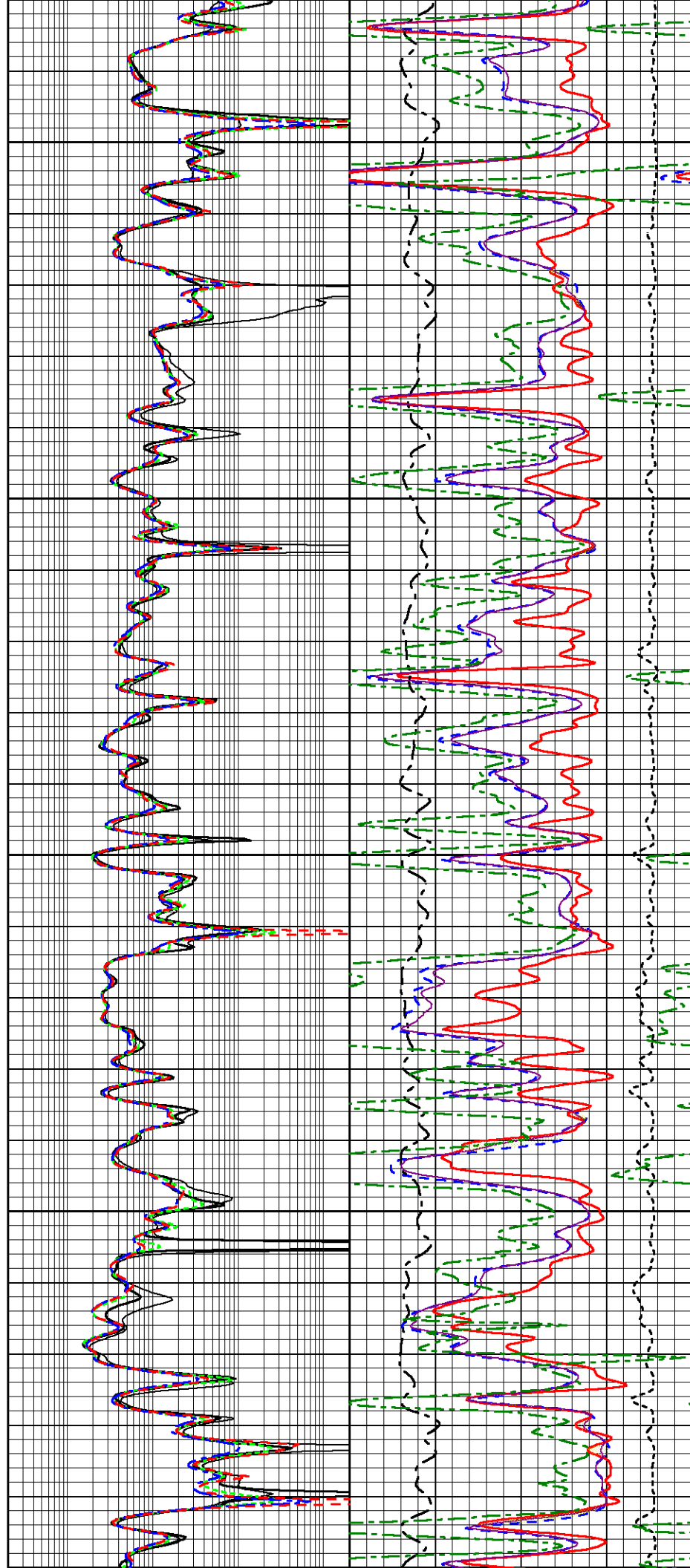




4900

5000

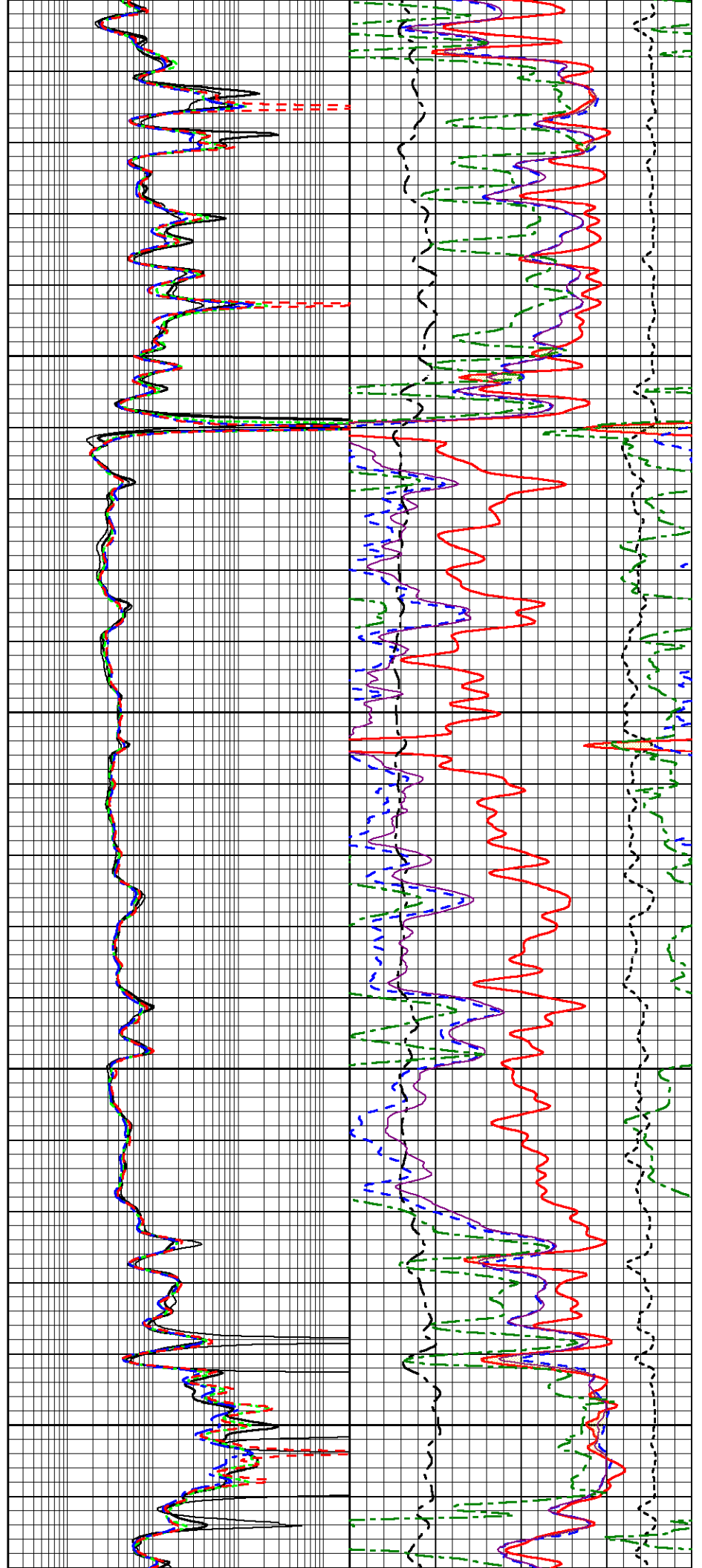
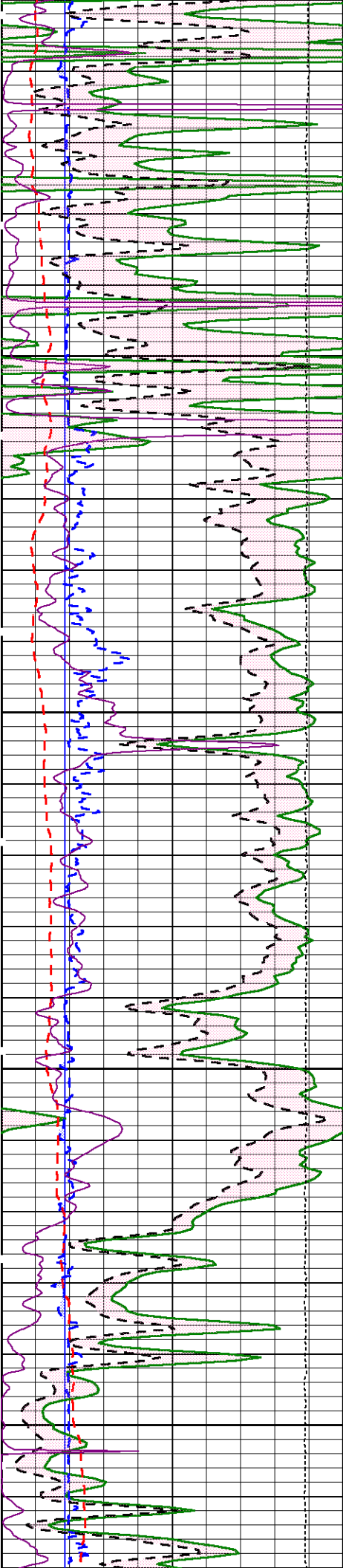
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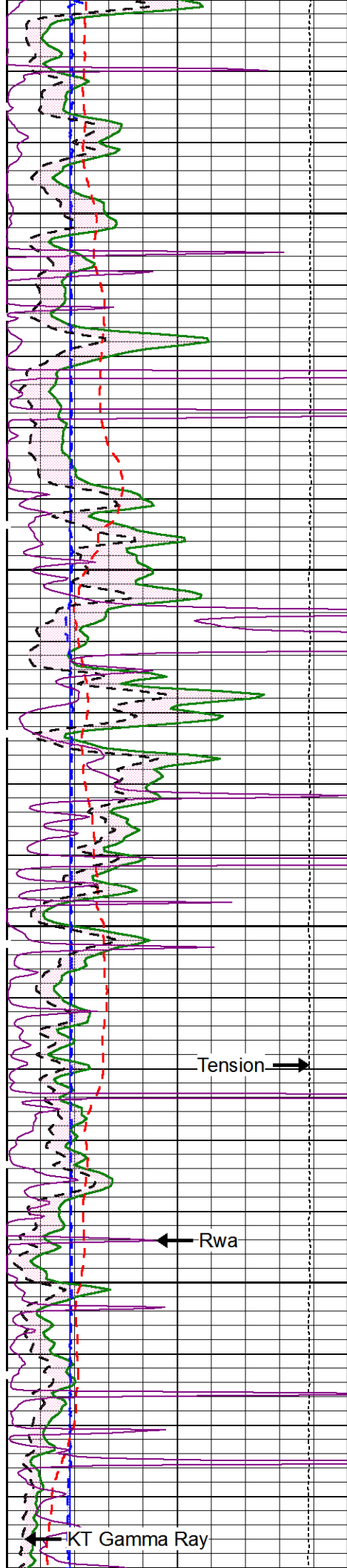
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5200

5300

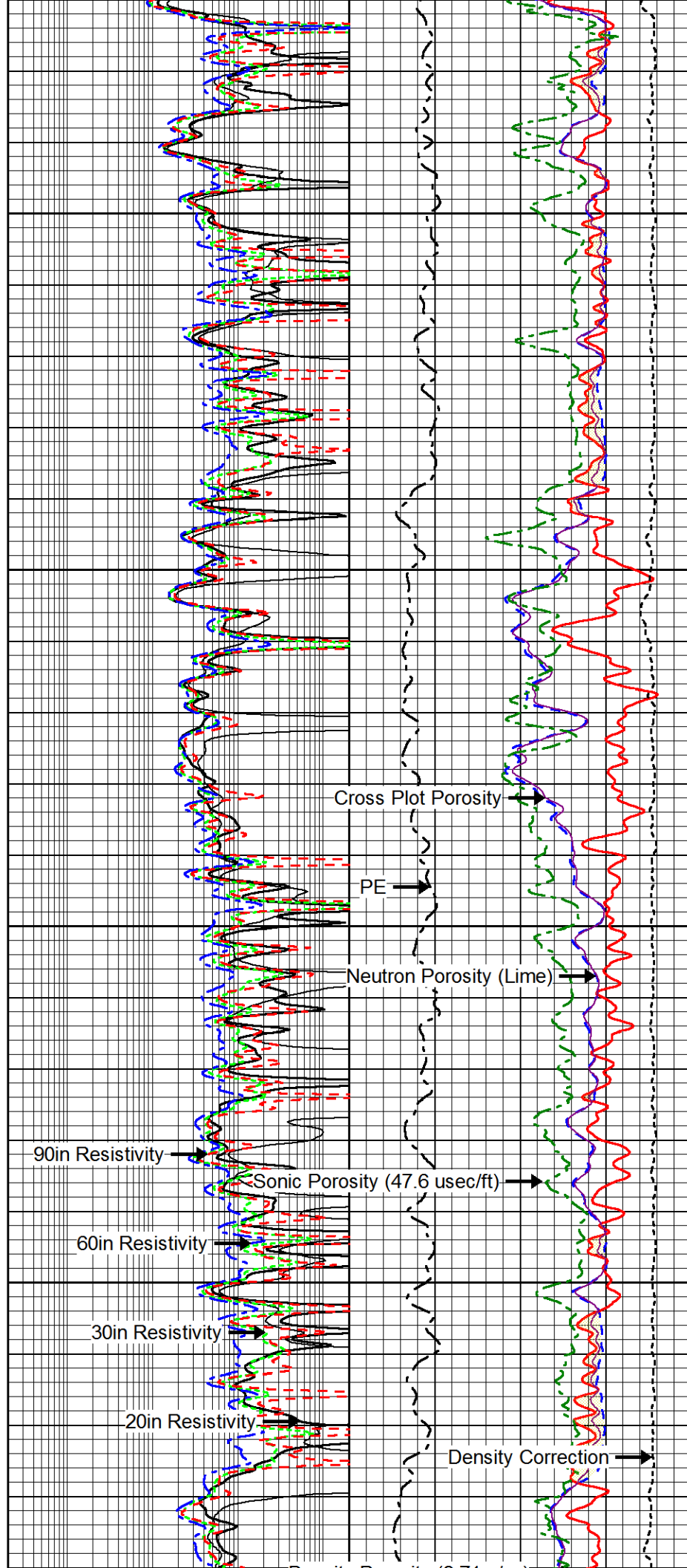






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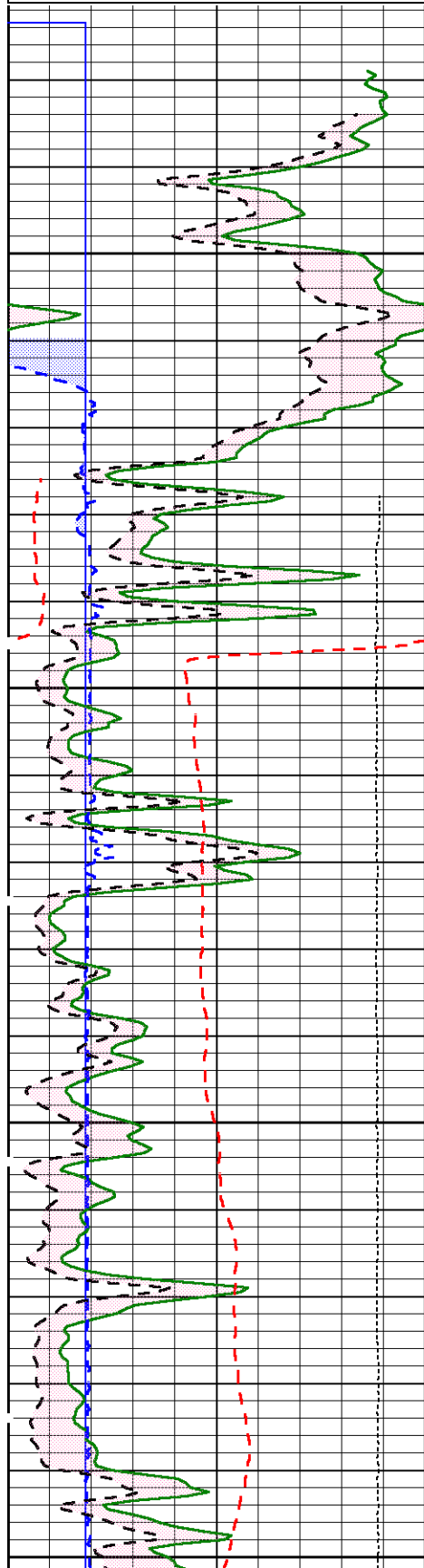


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Database File:      pronghorn_harley_5.db
Dataset Pathname:  rpt
Presentation Format: a4prnl
Dataset Creation:   Tue Jun 25 19:56:47 2013
```

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

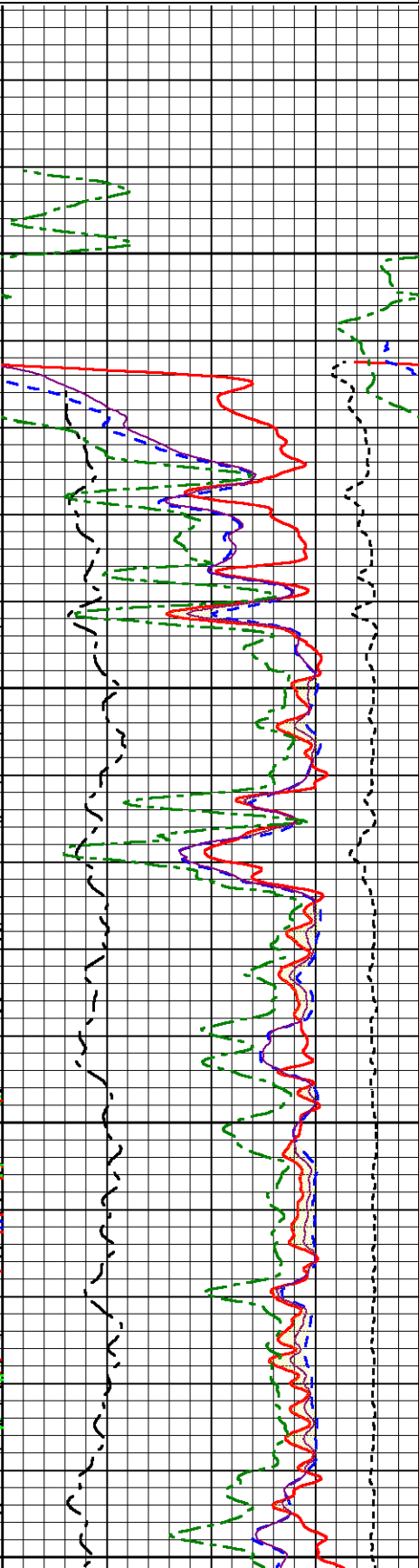
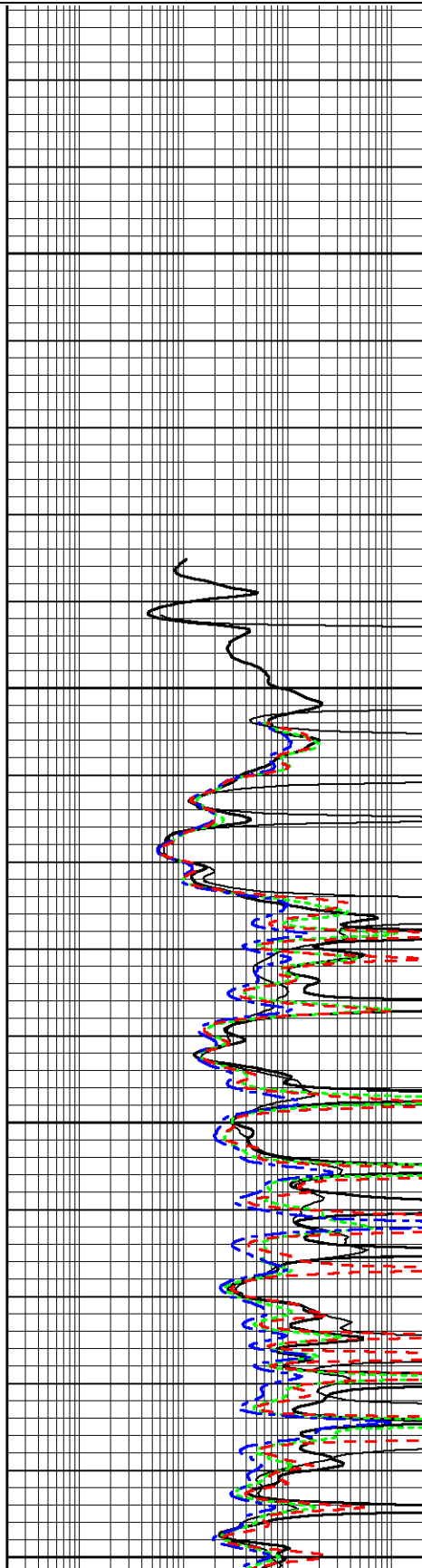
0.2	10in Resistivity (Ohm-m)	2000
0.2	20in Resistivity (Ohm-m)	2000
0.2	30in Resistivity (Ohm-m)	2000
0.2	60in Resistivity (Ohm-m)	2000
0.2	90in Resistivity (Ohm-m)	2000

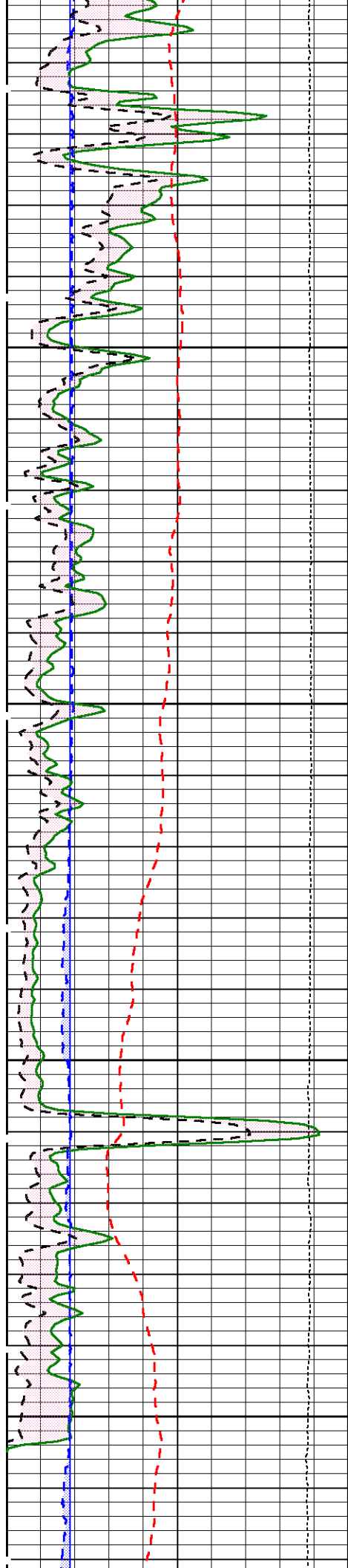
0.3	Neutron Porosity (Lime)	-0.1
0.3	Density Porosity (2.71g/cc)	-0.1
0	PE	10
Density Correction		
	0.8 (g/cc)	-0.2
0.3	Cross-Plot Porosity	-0.1
0.3	Sonic Porosity (47.6 usec/ft)	-0.1



5300

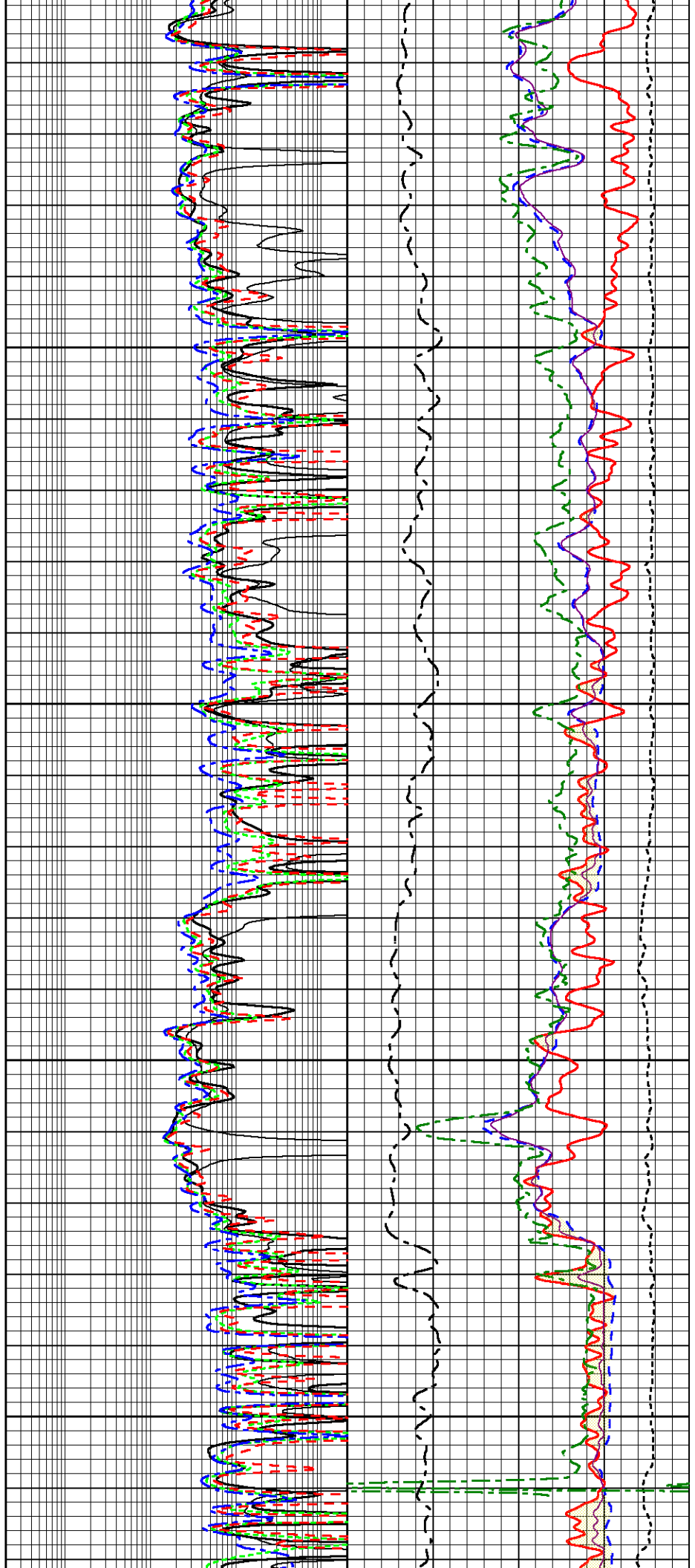
5400



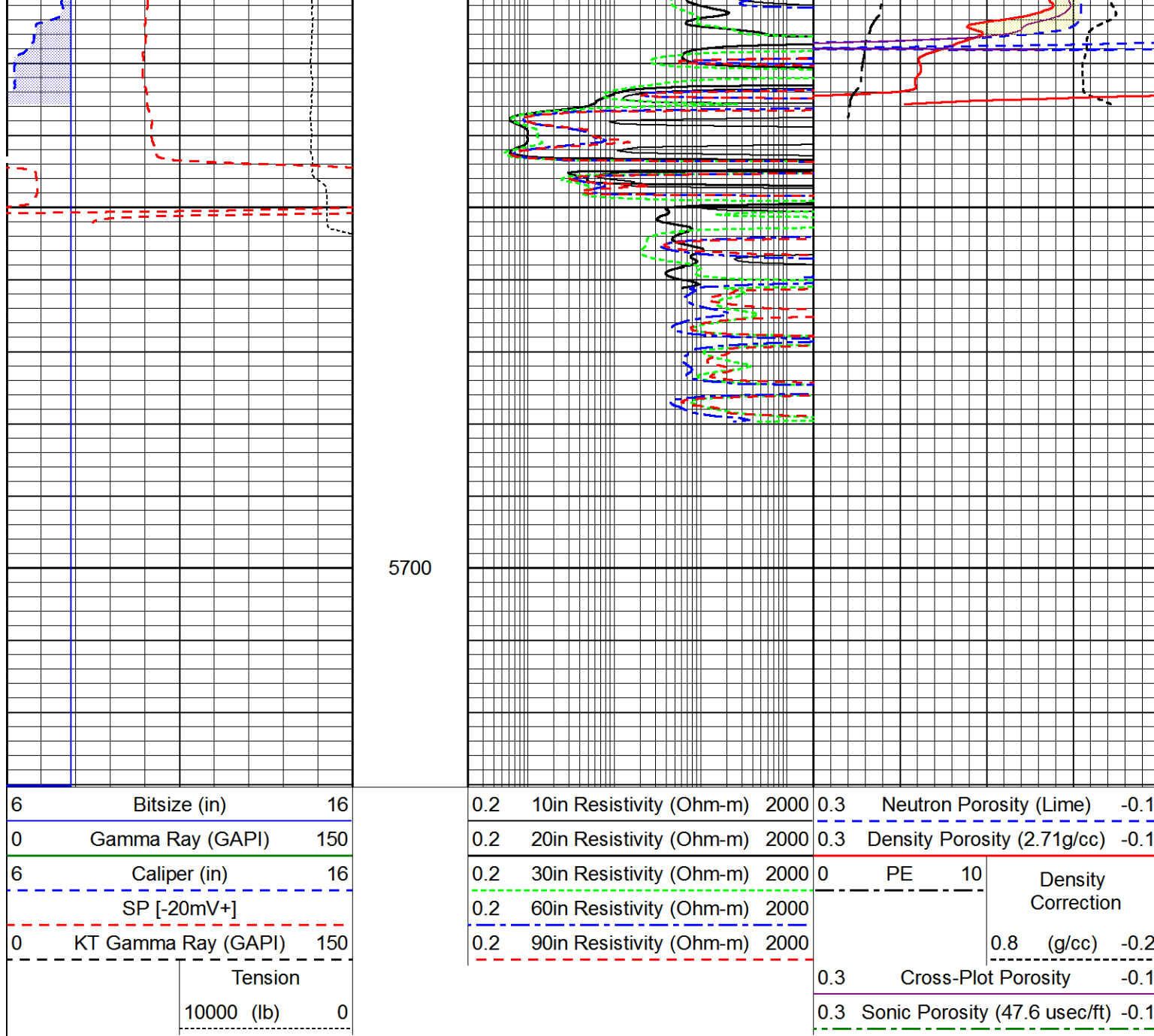


5500

5600



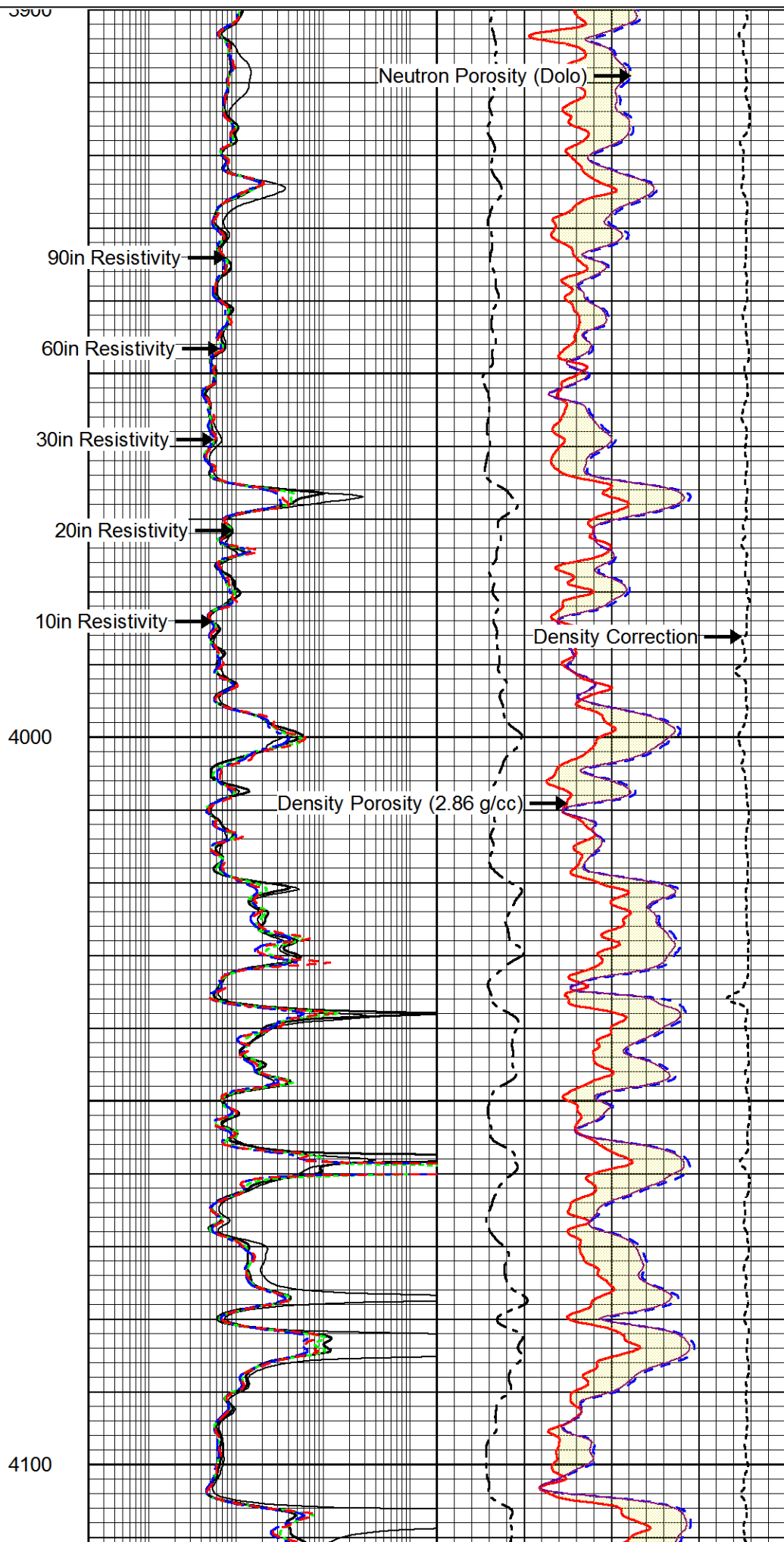
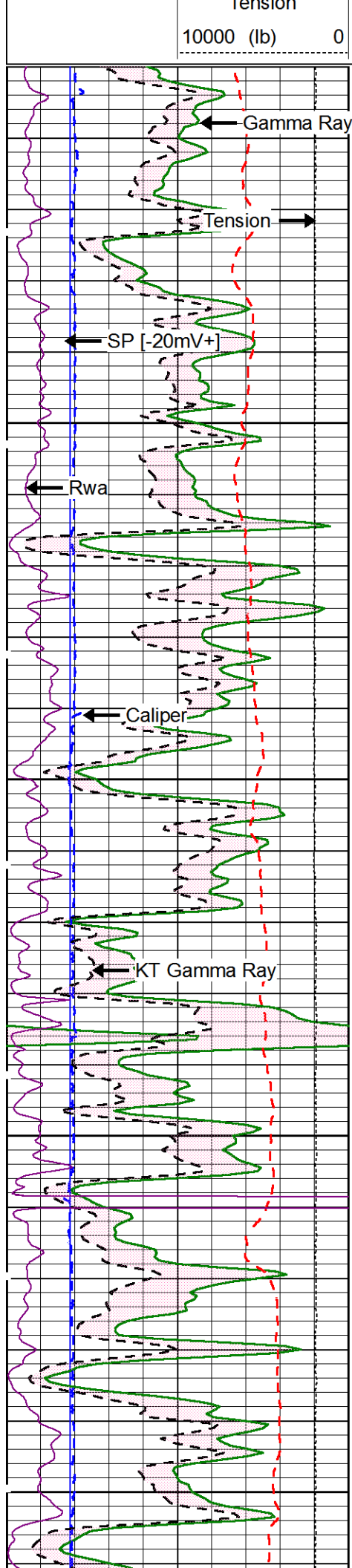


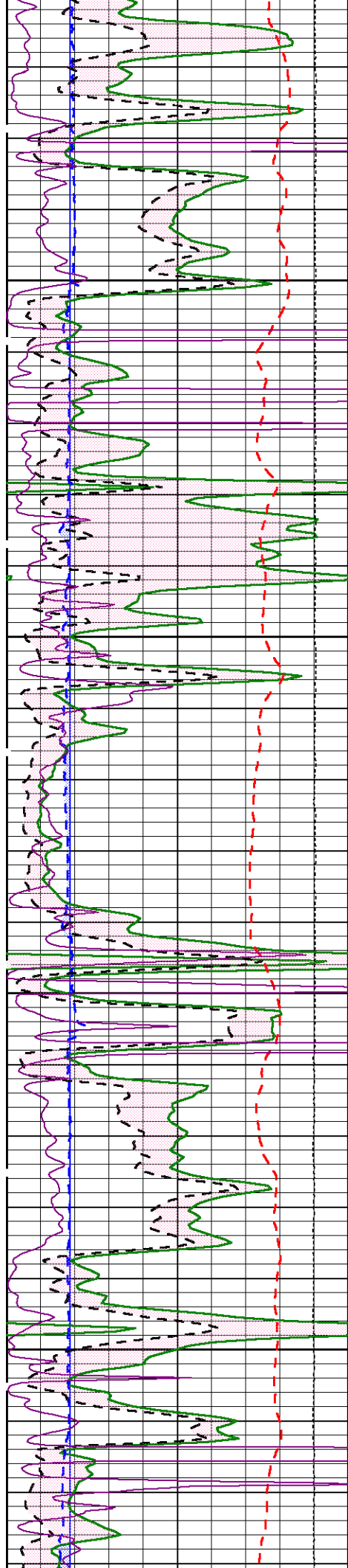


# Main Pass

Database File: pronghorn\_harley\_5.db  
 Dataset Pathname: Main  
 Presentation Format: a3prond  
 Dataset Creation: Mon Jun 24 22:41:47 2013  
 Charted by: Depth in Feet scaled 1:240

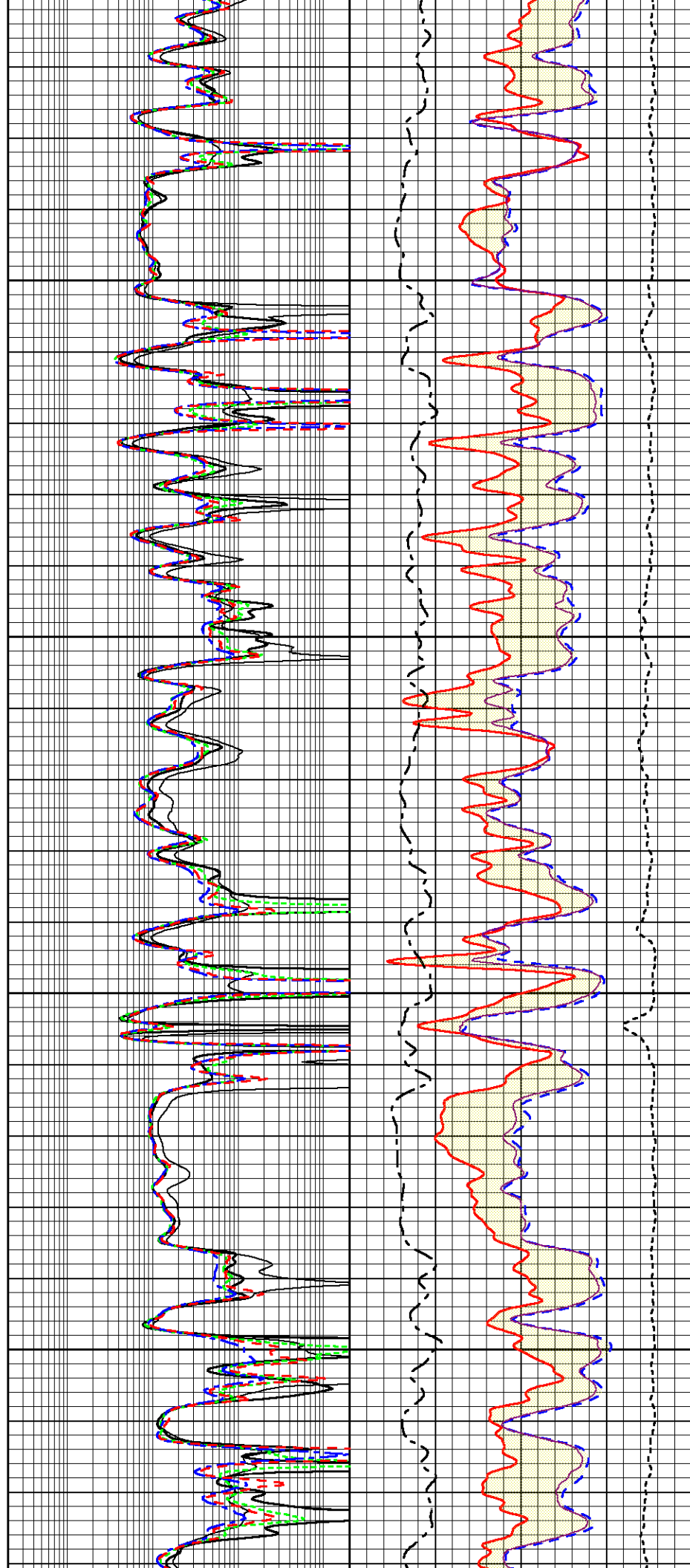
6	Bitsize (in)	16	0.2	10in Resistivity (Ohm-m)	2000	0.3	Neutron Porosity (Dolo)	-0.1
0	Gamma Ray (GAPI)	150	0.2	20in Resistivity (Ohm-m)	2000	0.3	Density Porosity (2.87g/cc)	-0.1
6	Caliper (in)	16	0.2	30in Resistivity (Ohm-m)	2000	0	PE	10
SP [-20mV+]			0.2	60in Resistivity (Ohm-m)	2000	Density Correction		
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								

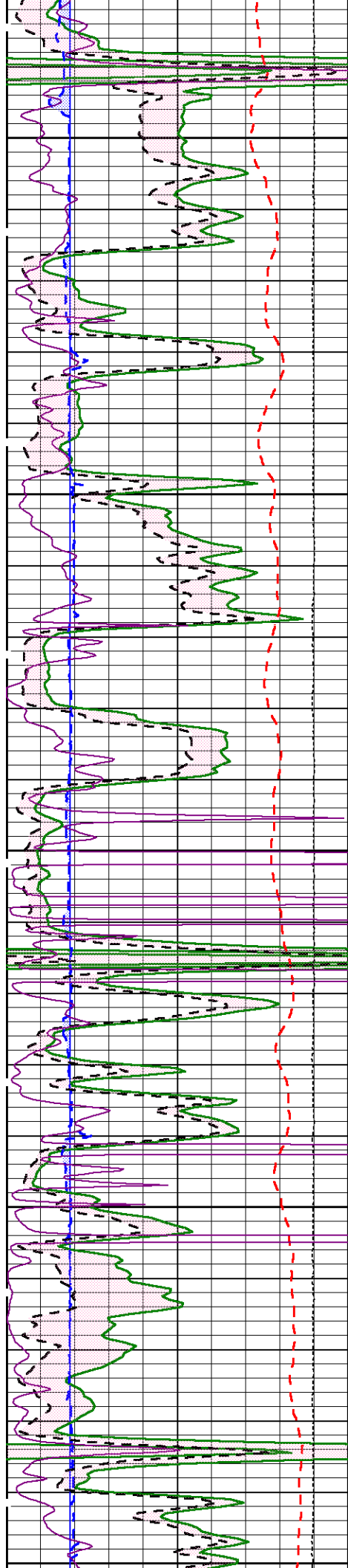




4200

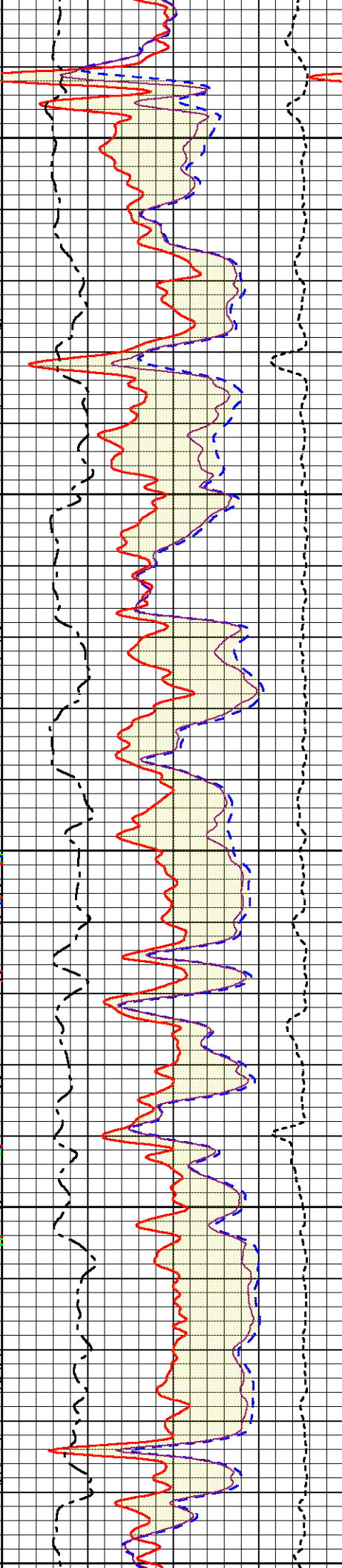
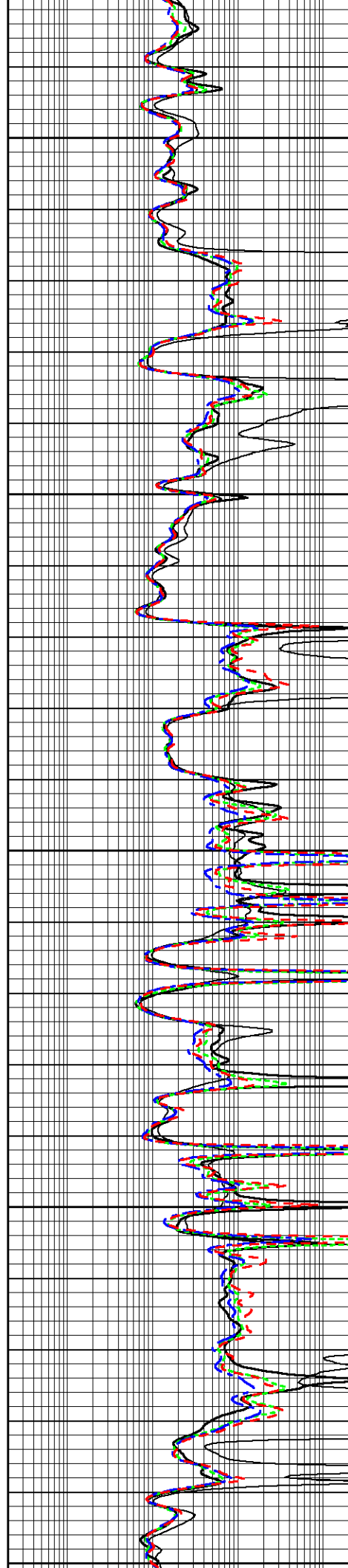
4300



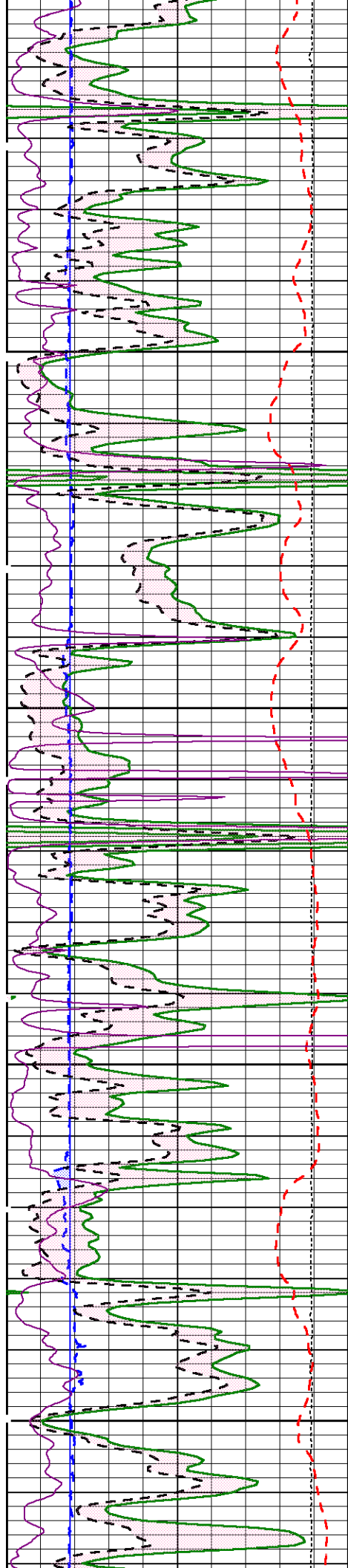


4400

4500

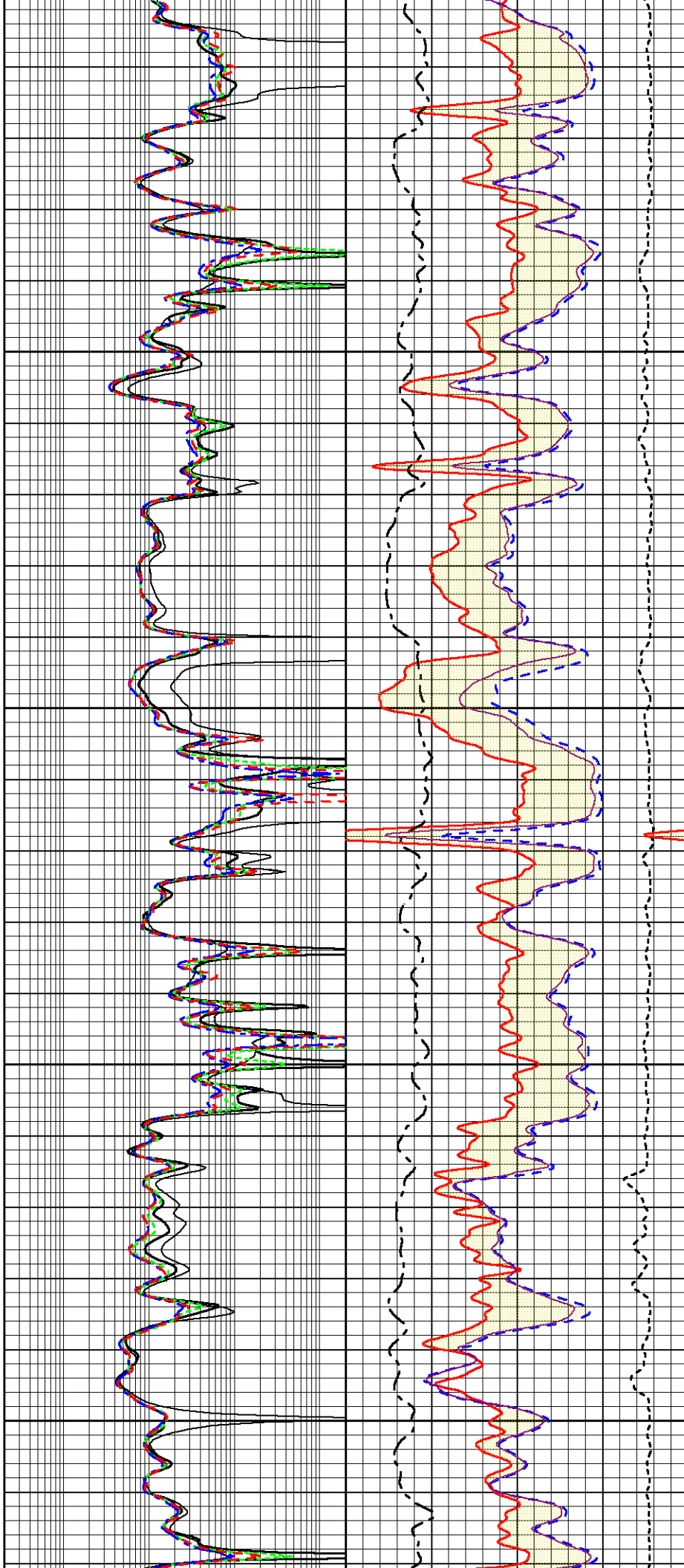


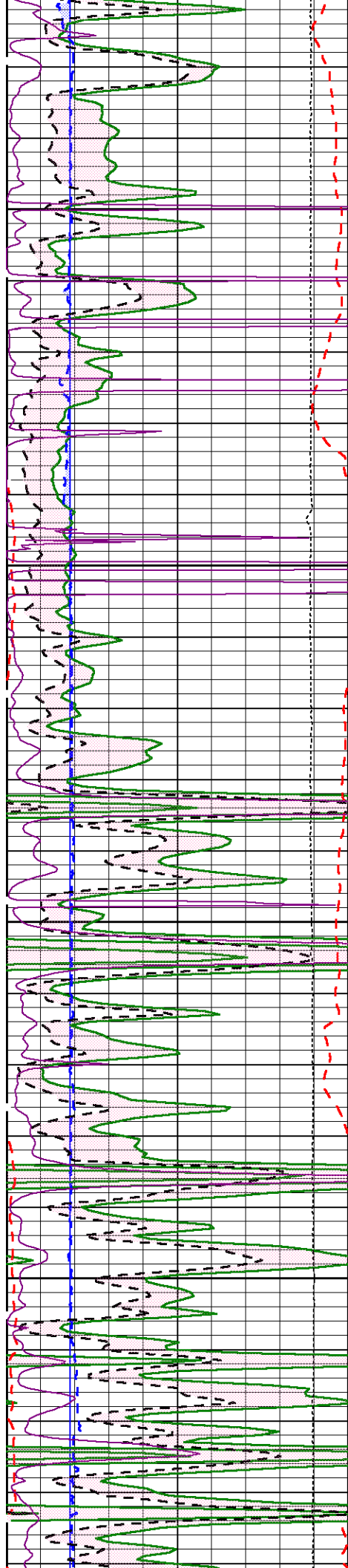




4600

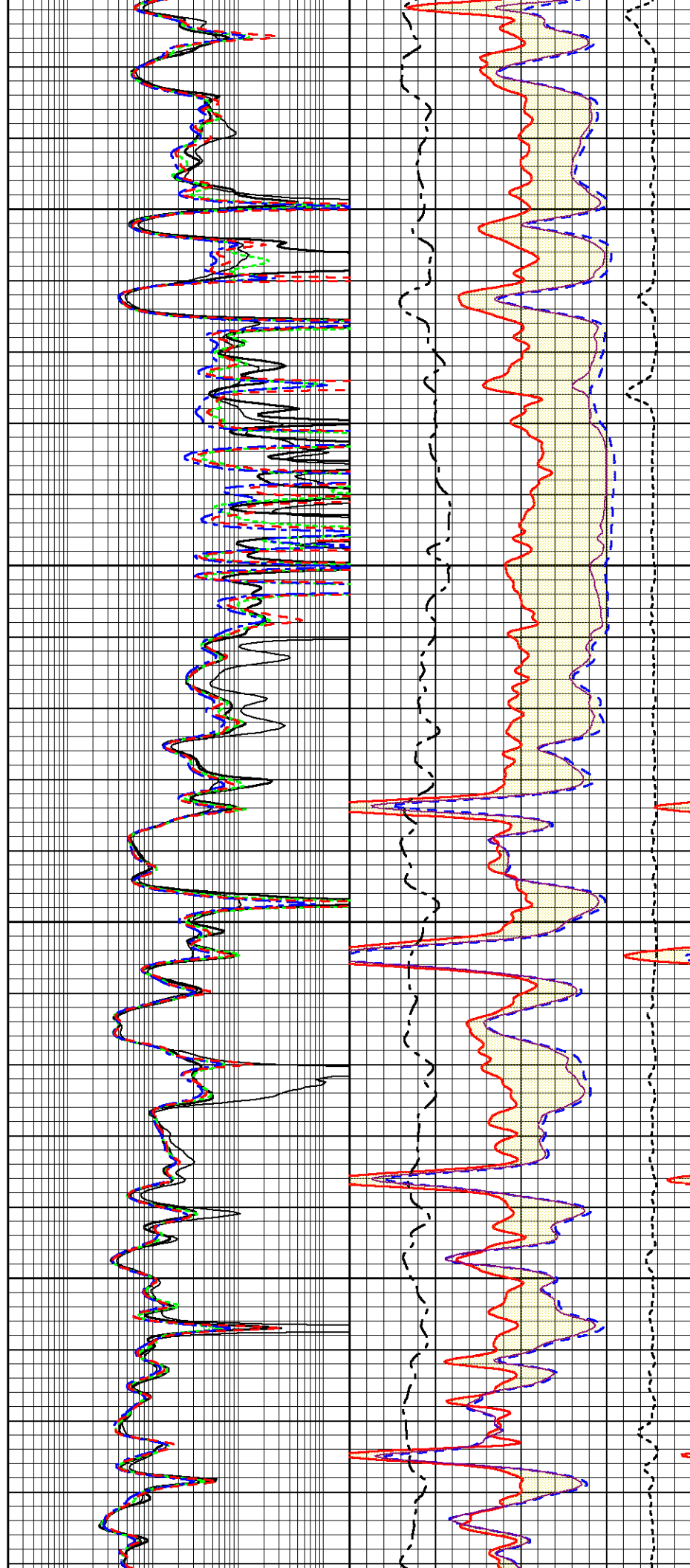
4700

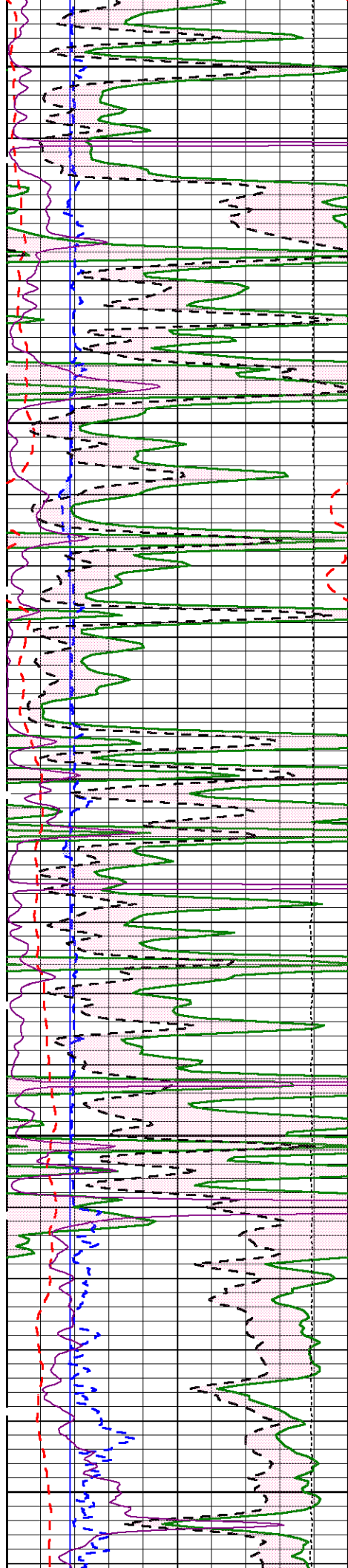




4800

4900

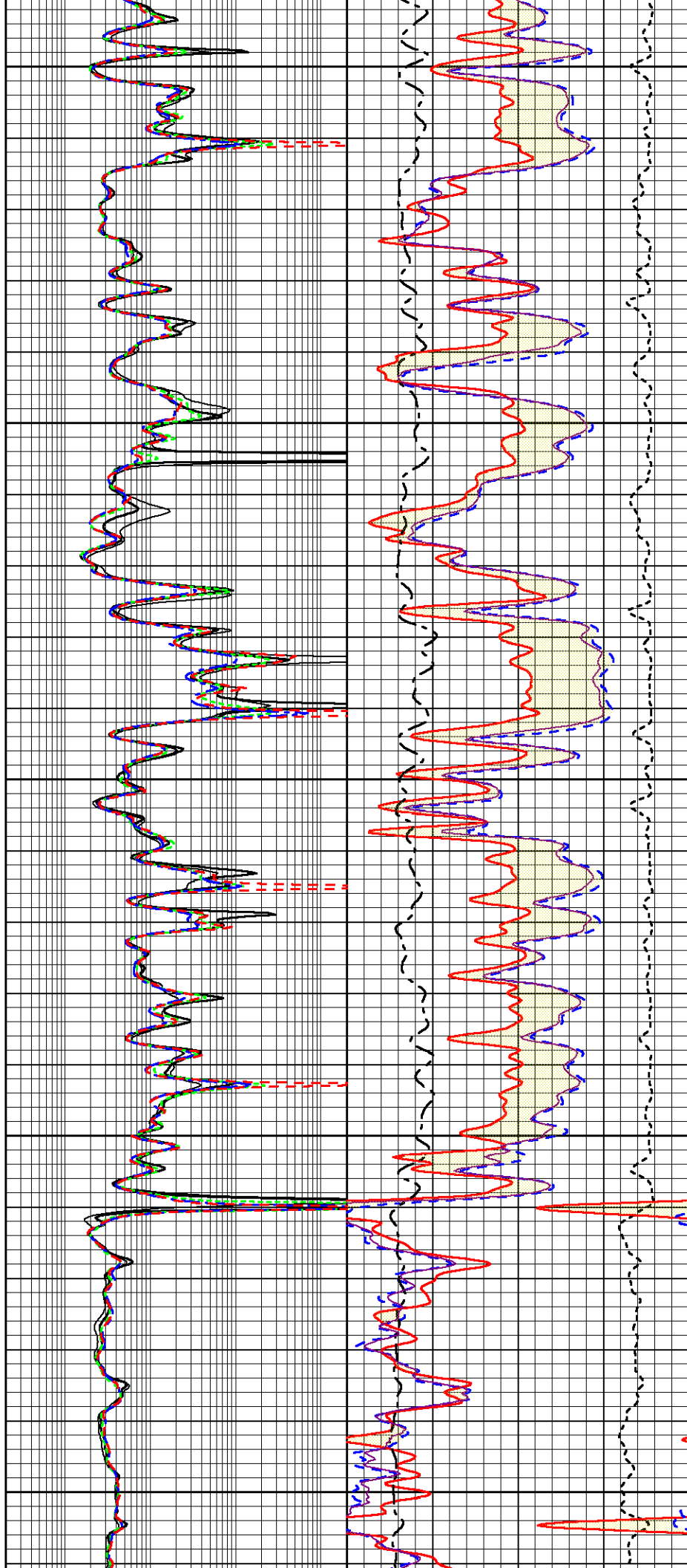




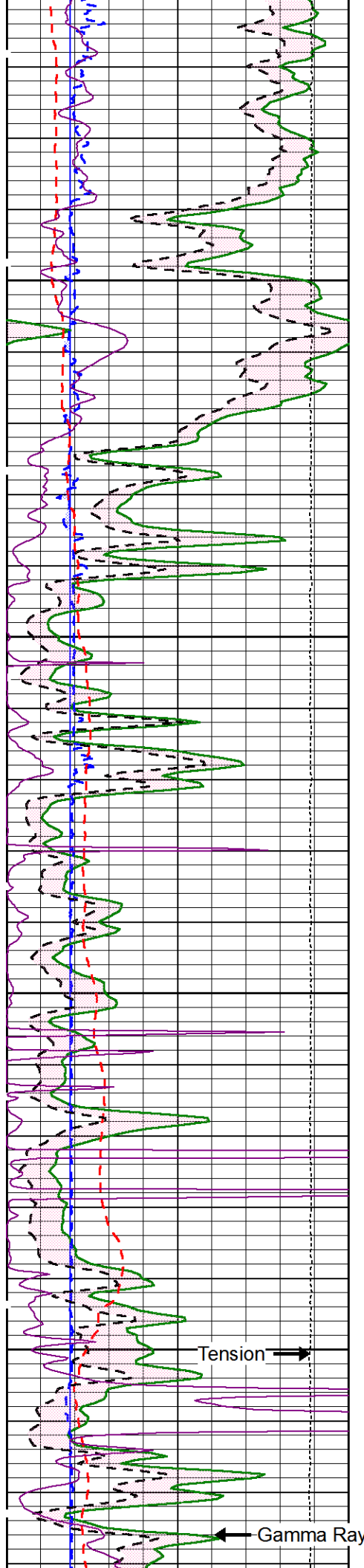
5000

5100

5200

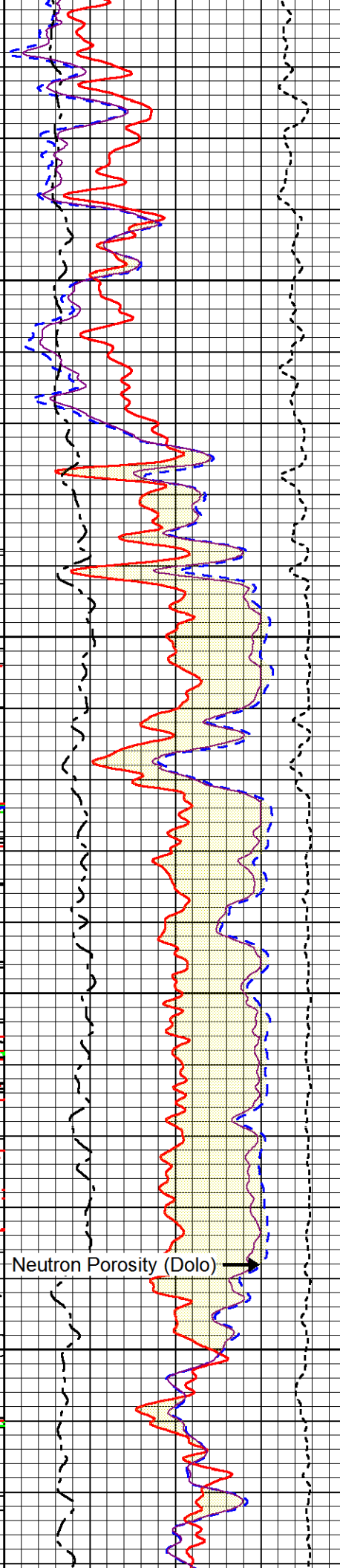
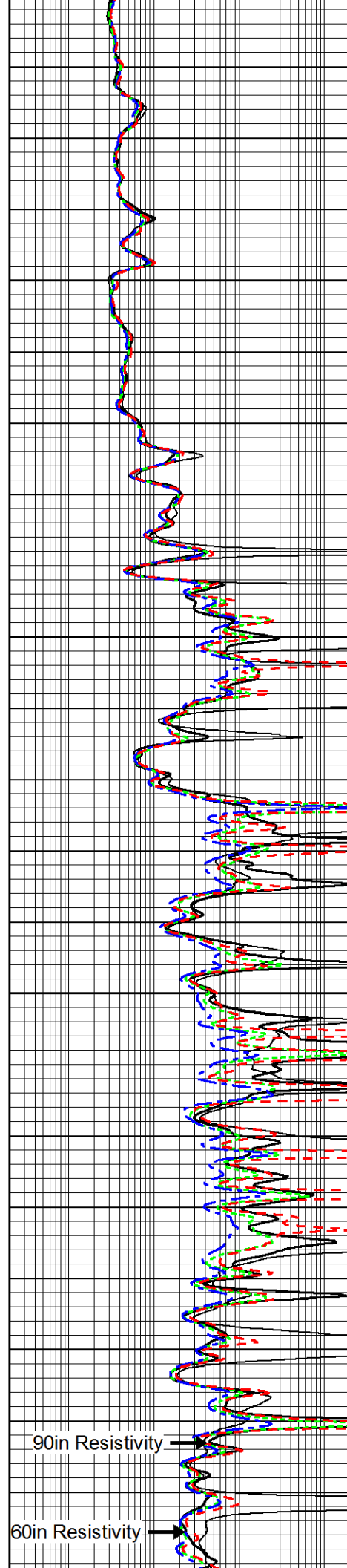






5300

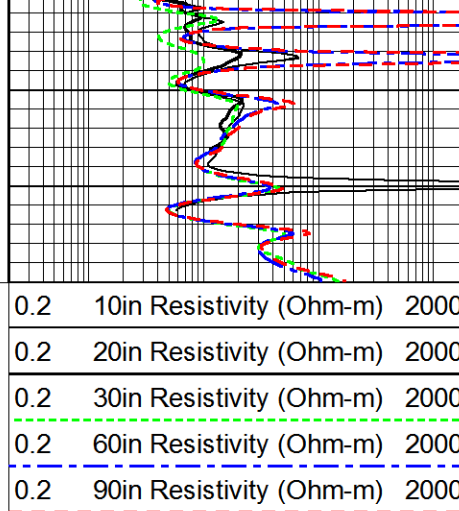
5400







6	Bitsize (in)	16
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



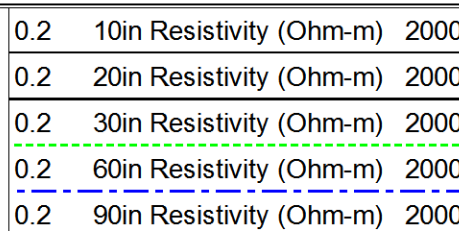
0.3	Neutron Porosity (Dolo)	-0.1
0.3	Density Porosity (2.87g/cc)	-0.1
0	PE	10
Density Correction		
0.8	(g/cc)	-0.2
0.3	Cross-Plot Porosity	-0.1



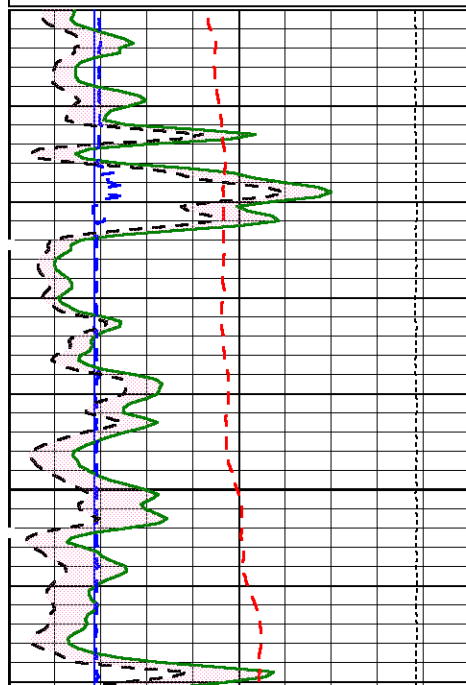
# Repeat Pass

Database File: pronghorn\_harley\_5.db  
Dataset Pathname: pass3dt  
Presentation Format: a3prond  
Dataset Creation: Mon Jun 24 22:07:48 2013  
Charted by: Depth in Feet scaled 1:240

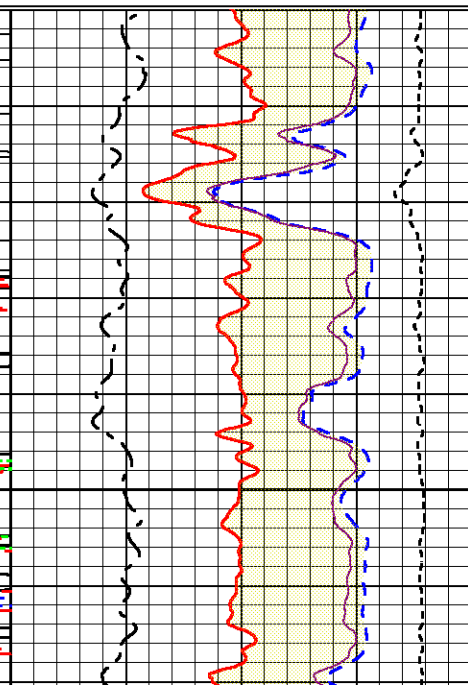
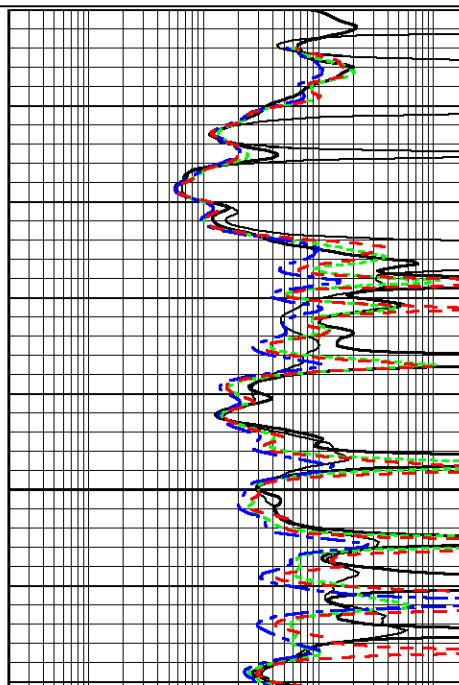
6	Bitsize (in)	16
0	Gamma Ray (GAPI)	150
6	Caliper (in)	16
SP [-20mV+]		
0	KT Gamma Ray (GAPI)	150
Tension		
10000	(lb)	0

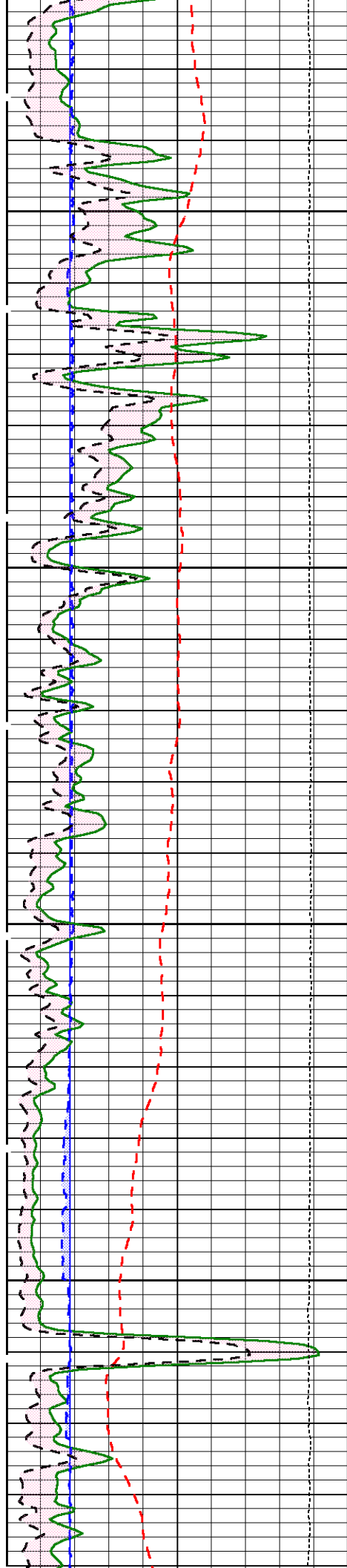


0.3	Neutron Porosity (Dolo)	-0.1
0.3	Density Porosity (2.87g/cc)	-0.1
0	PE	10
Density Correction		
0.8	(g/cc)	-0.2
0.3	Cross-Plot Porosity	-0.1



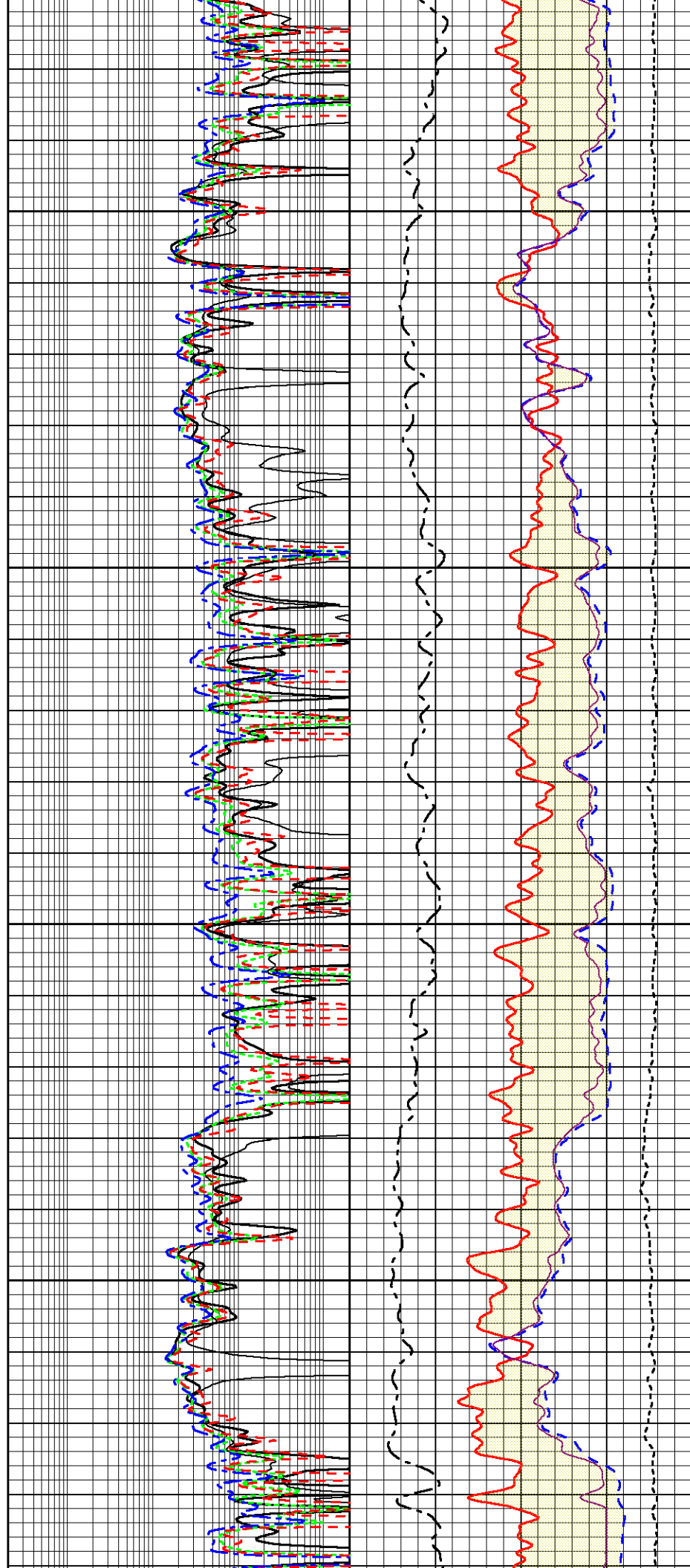
5500

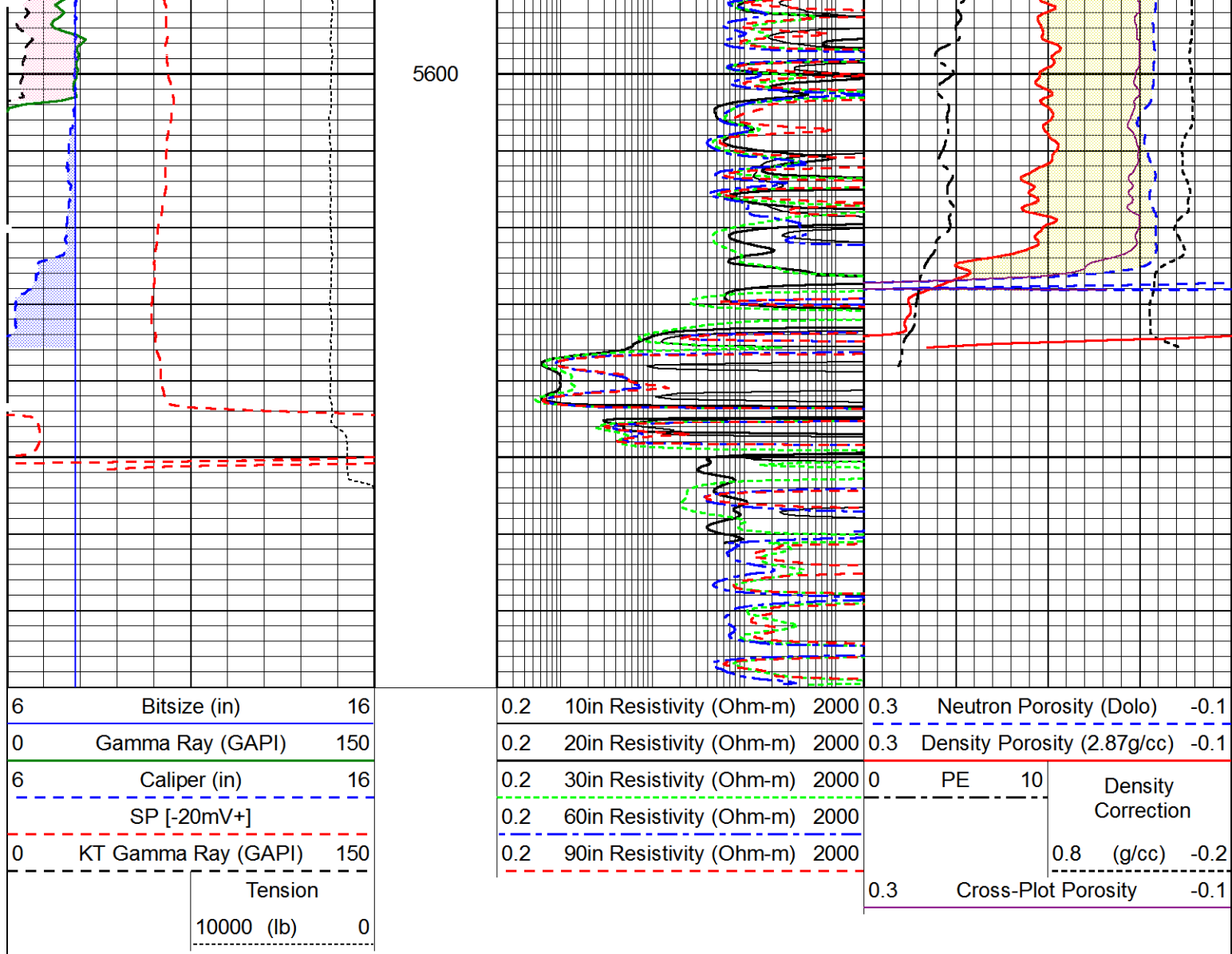




5400

5500





## Log Variables

Database: C:\Warrior\Data\pronghorn\_harley\_5.db  
Dataset: field/well/run1/pass3.1

### Top - 426.00 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	<b>CASED?</b>  Yes	<b>CASEWGHT</b> lb/ft 40	NPORSEL  Limestone	AIR_HOLE?  No
MudWgt lb/gal 8.8	FLUIDDEN g/cc 1	MATRXDEN g/cc 2.71	SPSHIFT mV 0	<b>CASEOD</b> in 13.375	PERFS  0	TDEPTH ft 5641	BOTTEMP degF 124
BOREID in 7.875							

### 426.00 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
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0	1	0.8	1	189	47.0	0	0
DEVI ° 0	SRFTEMP degF 68	SO in 1.5	DE-CENT  Yes	CASED?  No	CASEWGHT lb/ft 14.5	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 5641	BOTTEMP degF 124
BOREID in 7.875							

Calibration Report								
Database File:	pronghorn_harley_5.db							
Dataset Pathname:	pass3.1							
Dataset Creation:	Mon Jun 24 20:51:10 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:				1.00 Ohm-m			
Mud Resistivity Surface Temperature:				75.0 degF			
Borehole Corrections:				Automatic			

Minimum Standoff:

0.4 in

## Litho Density Tool Calibration Report

Serial Number:

B5302S50130B

Tool Model:

002

Caliper Calibration Performed:

Sun Jun 09 18:52:24 2013

	Diameter		Reading	
Small Ring:	6.000	in	1487.600	cps
Large Ring:	13.000	in	2139.900	cps
Gain:	0.0107			
Offset:	-10.1038			

Master Calibration Performed:

Thu May 23 13:30:58 2013

Source Number:

50130B

Medium:

Water

Al Block Density:

2.6002 g/cc

	Background	Al Block	Al Block + Fe	
SS1	777.7	4414.3	3726.8	cps
SS2	2193.2	29273.9	24800.1	cps
SSTOTAL	5197.8	47130.7	39704.8	cps
LITH	85.4	479.7	281.7	cps
LL	169.3	804.1	705.3	cps
LU	481.5	1021.4	941.7	cps
LS	650.9	1825.5	1647.0	cps
LSTOTAL	1242.8	4531.1	3640.8	cps
SSHV	1446.2	1446.5	1447.4	V
LSHV	1470.0	1466.4	1468.0	V
SSFF	-0.002	0.008	0.006	
LSFF	-0.004	0.009	0.006	

Before Survey Verification Performed:

After Survey Verification Performed:

	Master Background	Before Survey Background	After Survey Background	
SS1	777.7			cps
SS2	2193.2			cps
SSTOTAL	5197.8			cps
LITH	85.4			cps
LL	169.3			cps
LU	481.5			cps
LS	650.9			cps
LSTOTAL	1242.8			cps
SSHV	1446.2			V
LSHV	1470.0			V
SSFF	-0.002			
LSFF	-0.004			

## Tool Module Parameters

Software Version:

2.5.1.0

Borehole Size Source:

CALI

Pad Type:

2

## Compensated Neutron Tool Calibration Report

Serial Number:

C7939S66010B

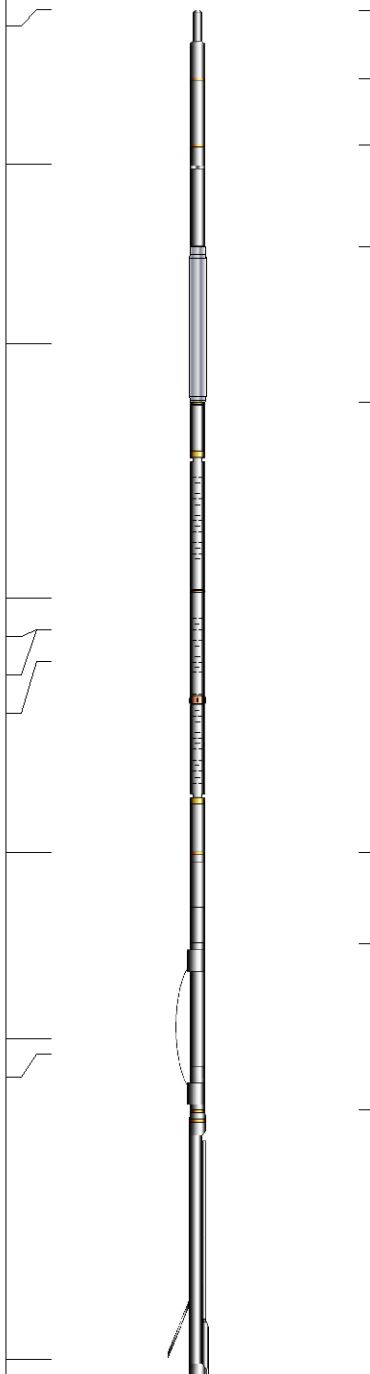
Serial Number: 07000000102		Tool Model: 009	
Master Calibration Performed:		Thu May 23 13:53:23 2013	
Source Number:		66010B	
Short Spacing Counts:	6649.41	cps	
Long Spacing Counts:	260.18	cps	
High Voltage:	1335.88	V	
Target Ratio:	23.9200		
Ratio:	25.5572		
K-Factor:	0.9359		
Before Survey Verification Performed:			
After Survey Verification Performed:			
Verifier Number:		6494	
Verifier Values	Master Cal	Before Survey	After Survey
Short Spacing Counts:	251.77		cps
Long Spacing Counts:	262.36		cps
High Voltage:	1335.93		V
Ratio:	0.9596		
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 Mar 27 10:17:59 2013	
Source Number:	Th Blanket #14		
Calibrator Value:	217.0	API	
Background Reading:	476.3	cps	
Calibrator Reading:	2122.6	cps	
Sensitivity:	0.132	API / cps	
Performed:			
Verifier Number:			
	K %	U ppm	T ppm
Concentrations			
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:			

### 1.8.9.1

# Gamma Ray Calibration Report

001

GAPI/cps

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
CHD	59.76		CHD-001 (000004) Cable Head	2.19	3.38	35.00
			XTU-008 (10007730) Crossover Ultrawire Toolbus to Ultralink	2.08	3.38	47.00
GR	54.88		GRT-001 (10009990) Gamma Ray Tool	3.22	3.38	69.00
SGR	49.20		SGR-002 (220344) Spectral Gamma Ray Tool	4.94	3.88	120.00
WVFUTRF	41.13		MAS-001SS (10010072SS) Multi Array Sonic Tool (SS)	14.28	3.38	242.00
WVFUTRN	40.13					
WVFLTRF	40.13					
WVFLTRN	39.13					
KJT	33.05	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 (B5302S50130B) Litho Density Tool	9.75	4.50	310.00	
LDT	17.00					



