



ThruBit
A Schlumberger Company

**SPECTRAL DENSITY
DUAL SPACE NEUTRON
GAMMA RAY
MEMORY LOG**

Company	SANDRIDGE ENERGY	Company	SANDRIDGE ENERGY
Well	LuAnn 2925 2-36H	Well	LuAnn 2925 2-36H
Field	MINNEOLA	Field	MINNEOLA
County	FORD	County	FORD
State	KANSAS	State	KANSAS
Location:	API #: 15-057-208740000 240' FNL & 660' FWL	Other Services THRUBIT PORTAL BIT	
Permanent Datum	G.L.	Elevation	2587'
Log Measured From	K.B. 20' ABOVE PERM DATUM	D.F.	2607'
Drilling Measured From	K.B.	G.L.	2587'
SEC 36 TWP 29S RGE 25W			
Date	15 APR 2013		
Run Number	ONE		
Depth Driller	8422'		
Depth Logger	8373'		
Bottom Logged Interval	8355'		
Top Log Interval	4300'		
Casing Driller	9.625" @ 1048'		
Casing Logger	NA		
Bit Size	8.75"		
Type Fluid in Hole	WBM		
Density / Viscosity	9.2 / 40		
pH / Fluid Loss	10.1 / 8.0		
Source of Sample	MUD SENSOR		
Rm @ Meas. Temp	0.17 OHM@65DEGF		
Rmt @ Meas. Temp	0.13 OHM@65DEGF		
Rmc @ Meas. Temp	0.21 OHM@65DEGF		
Source of Rmt / Rmc	CALCULATED		
Rm @ BHT	0.10 OHM@131DEGF		
Time Circulation Stopped	05:00 15 APR 2013		
Time Logger on Bottom	07:05 15 APR 2013		
Maximum Recorded Temperature	114 DEGF		
Equipment Number	T005		
Location	OKC, OK		
Recorded By	S.JARSKI		
Witnessed By	JESSIE NEW		

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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

SERVICE: HORIZONTAL PUMP DOWN MEMORY BIT DEPTH: 8322' LOGGED TO: 4300'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 g/cc. USED FOR POROSITY MEASUREMENTS
TOOLSTING RAN WITH SWIVEL AND SMALL DE-CENTRALIZER
TBHV REPRESENTS TOTAL BOREHOLE VOLUME, ft3
ABHV REPRESENTS ANNULAR HOLE VOLUME, CALCULATED FOR 5.5" CSG., ft3
RIGMINDER USED TO ACQUIRE LOG DEPTH
LOG CORRELATED TO MWD GR
RIG: Lariat #3

CREW: S.JARSKI R.WILSON R.CRESTWELL

Service Ticket No.	1848	API No.	15-057-208740000	PGM Ver	WARRIOR 7.0
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
GAMMA	NEUTRON	DENSITY	INDUCTION		

Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS27T	Serial No.	PS14N	Serial No.	PS01D	Serial No.	PS38R
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"

LOGGING DATA

General Data

Pass	Depths		Well Head	Speed	Logging Run Comments
No.	From	To	Pressure	Ft/Min	
ONE	8363'	4300'	0 PSI	30 FPM	

	GAMMA		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	0 API	150 API	30%	-10%	30%	-10%	0.2 OHMM	2000 OHMM

DIRECTIONAL INFORMATION

Maximum Deviation	92.7	deg. @	5819'	KOP	4672'	

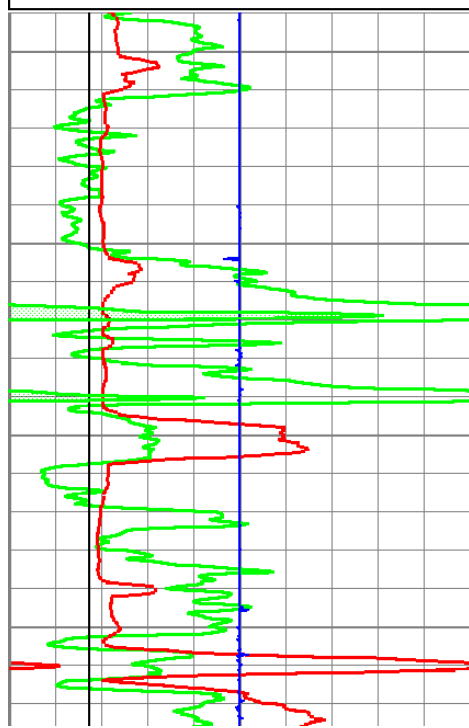


MAIN PASS

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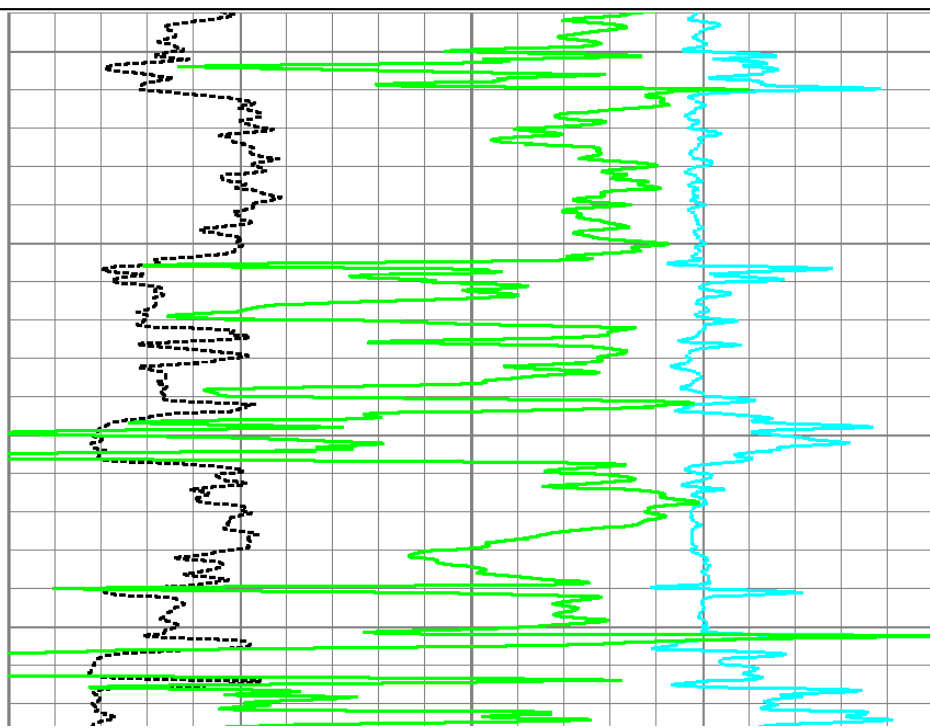
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7	DCAL (in)	17
7	BOREID (in)	17
-5	ACCY	5

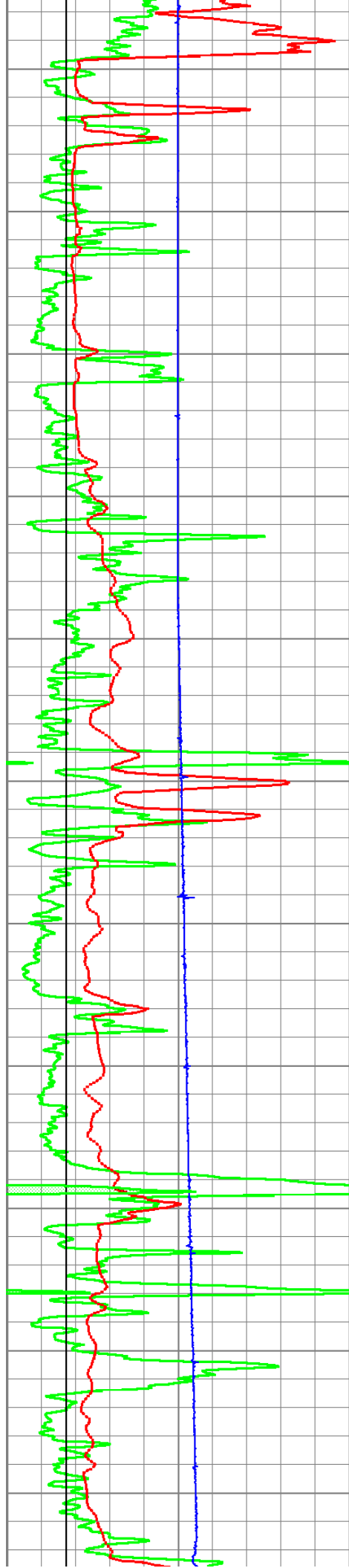
0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
2	RHOB (g/cc)				3



4300

4400





4500

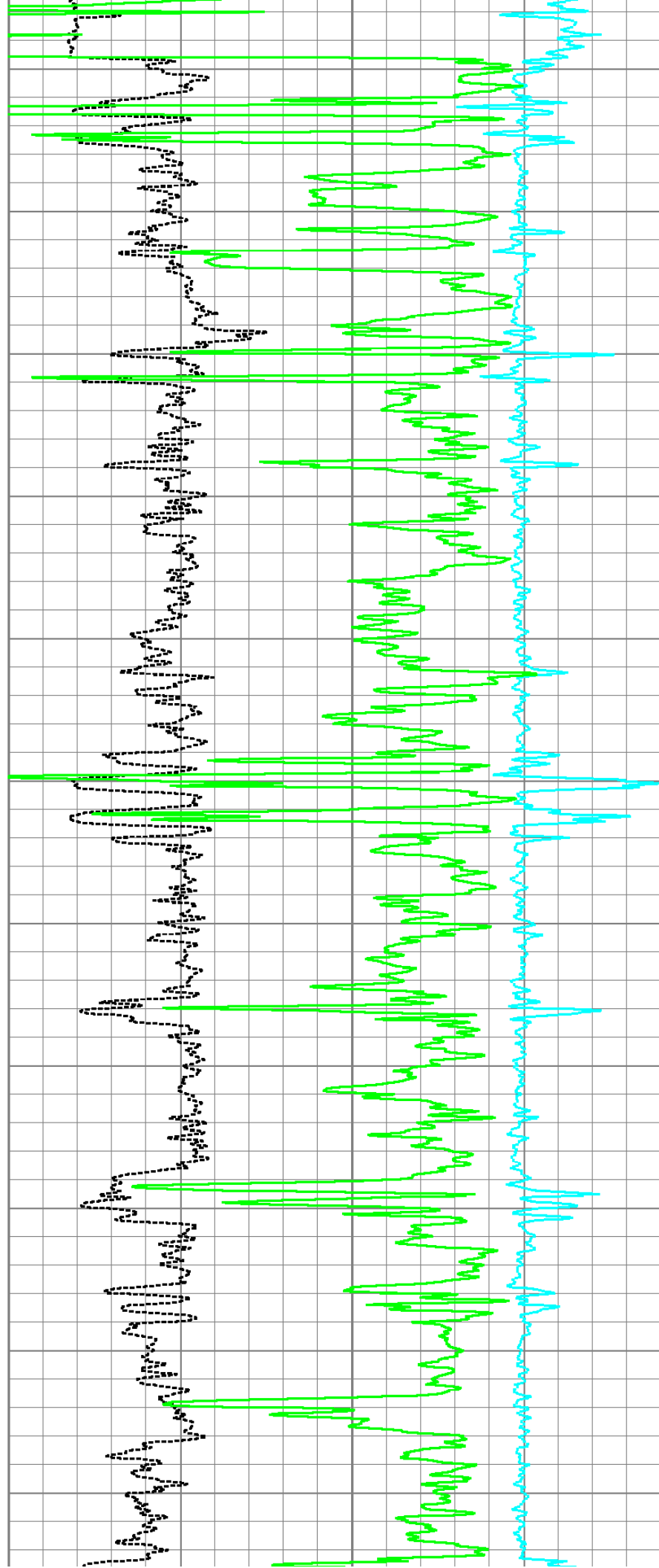
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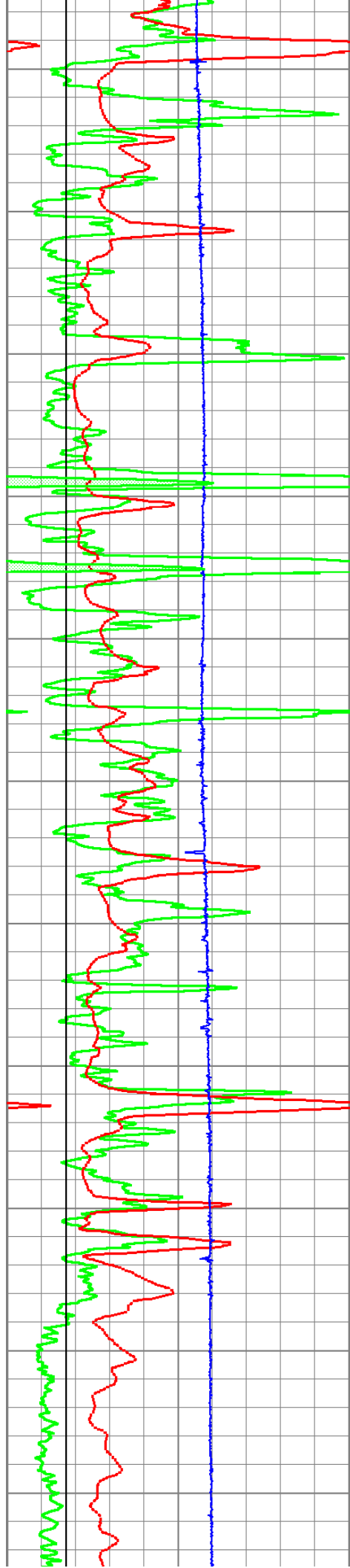
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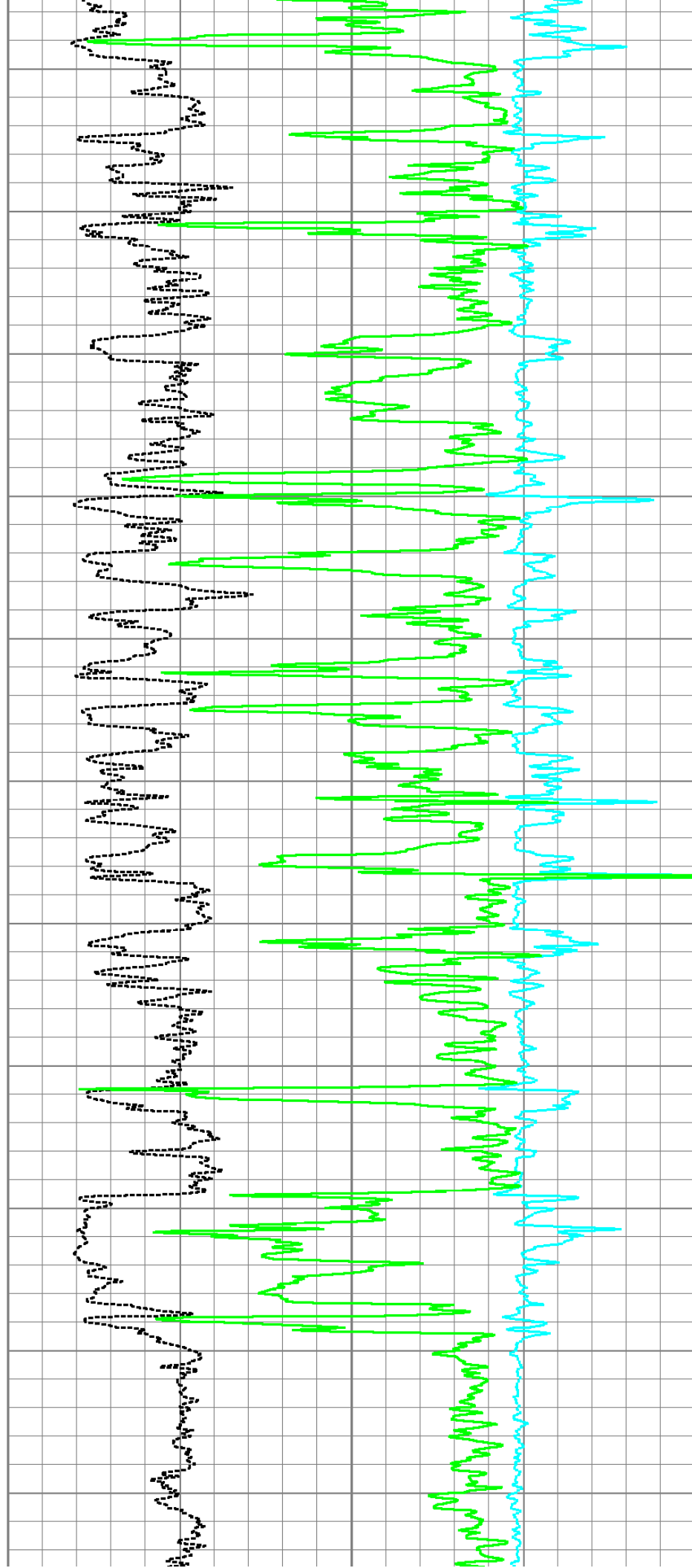
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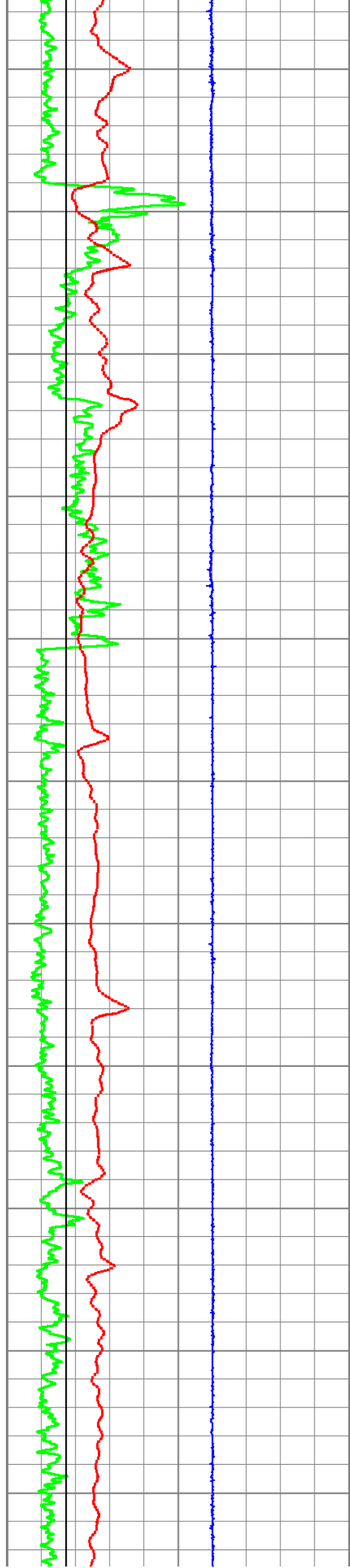
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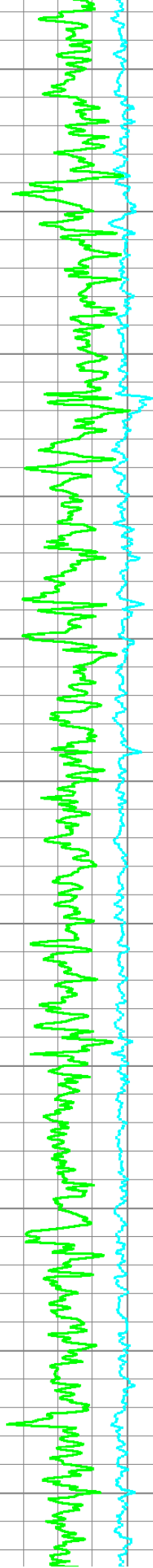
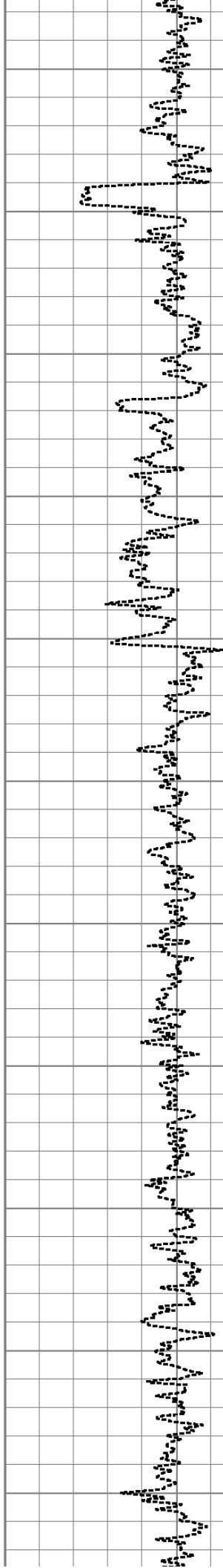
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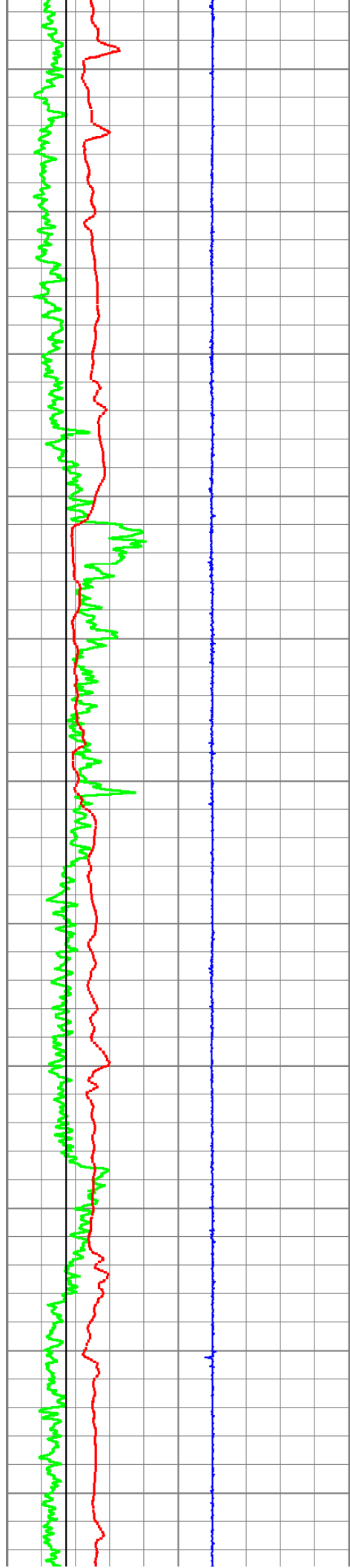
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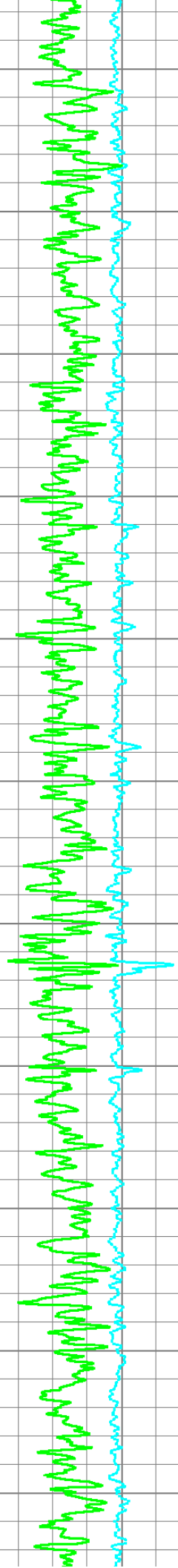
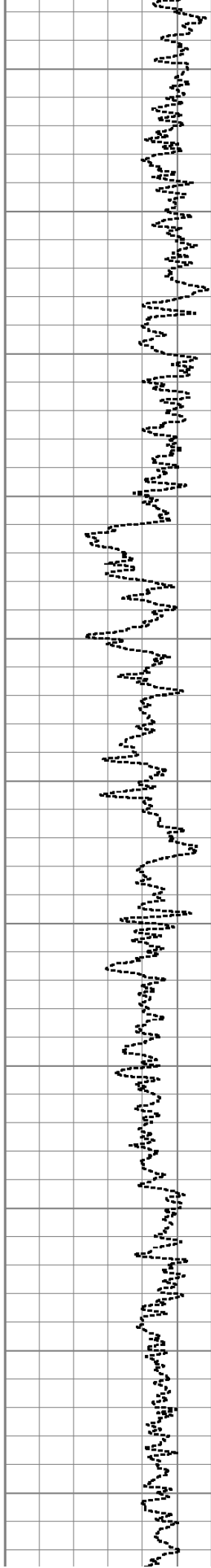
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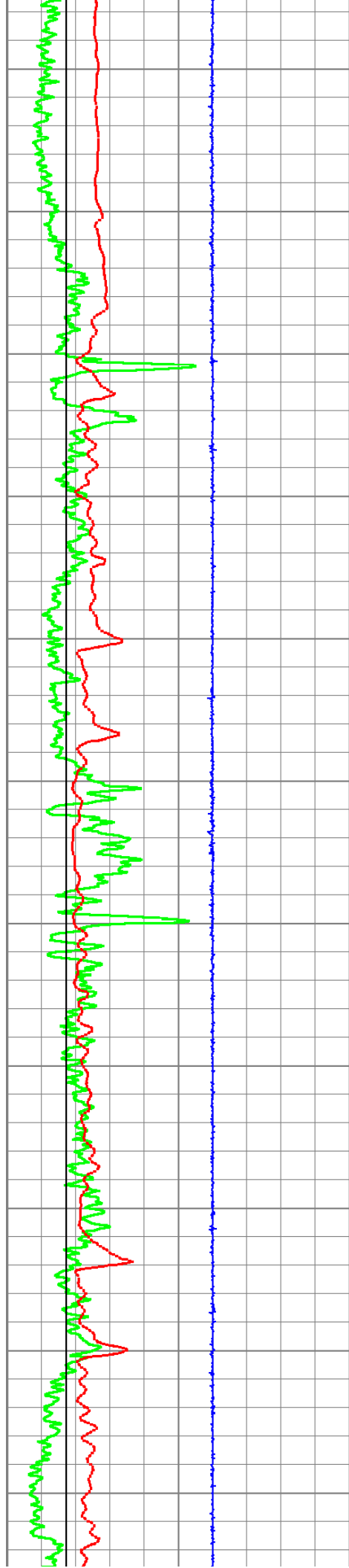
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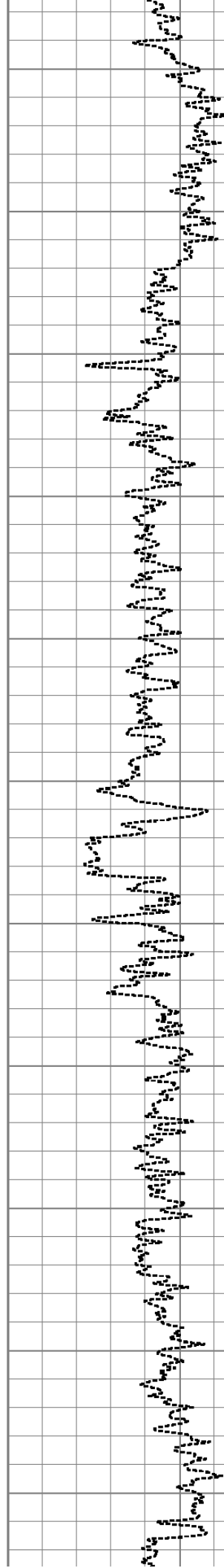
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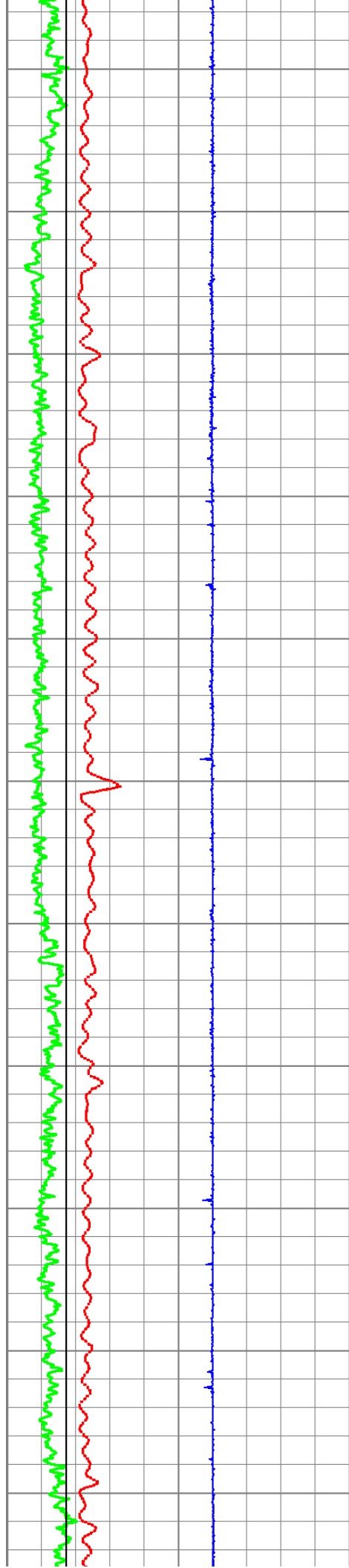
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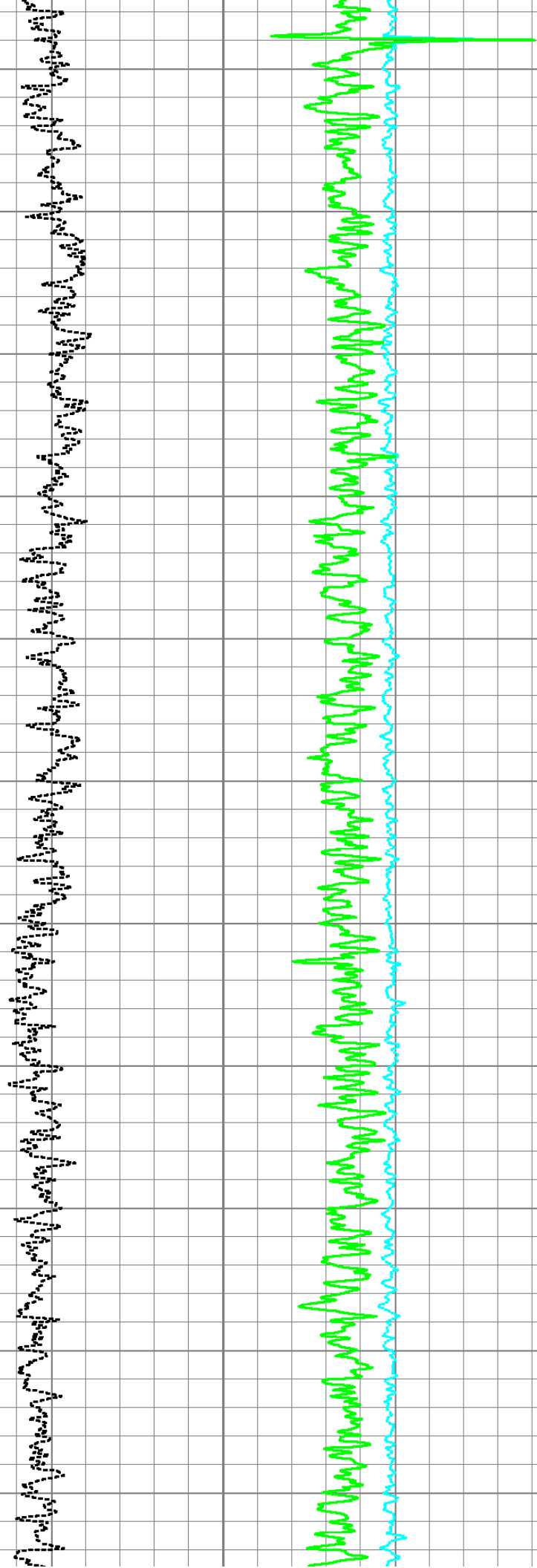
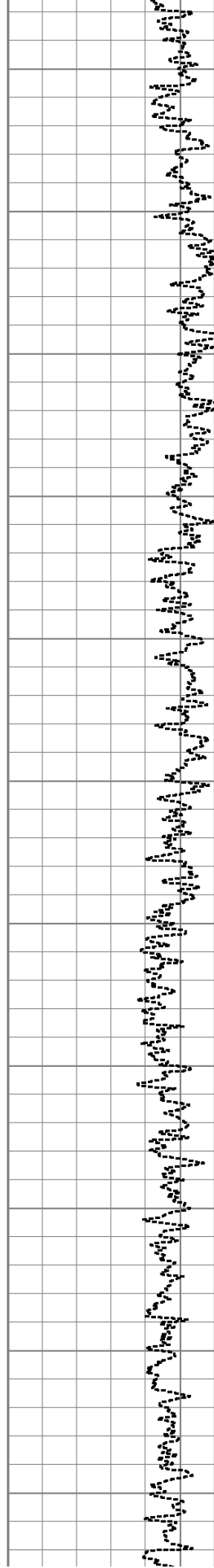
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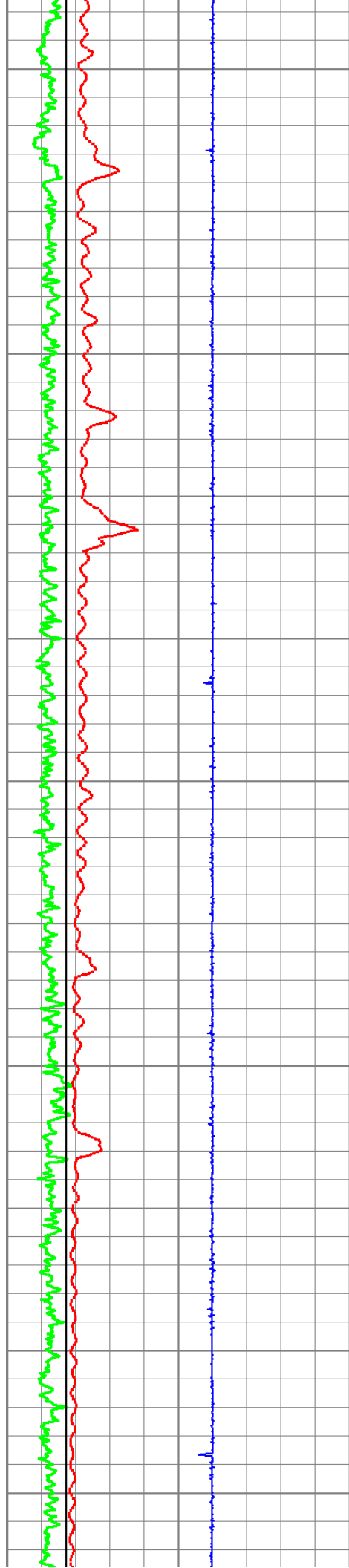
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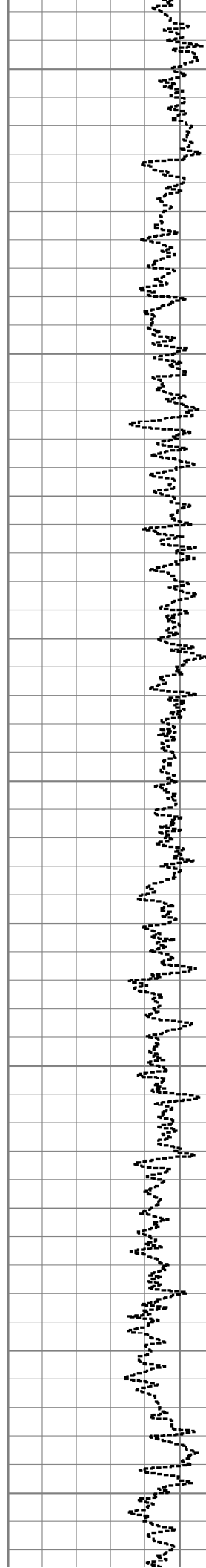
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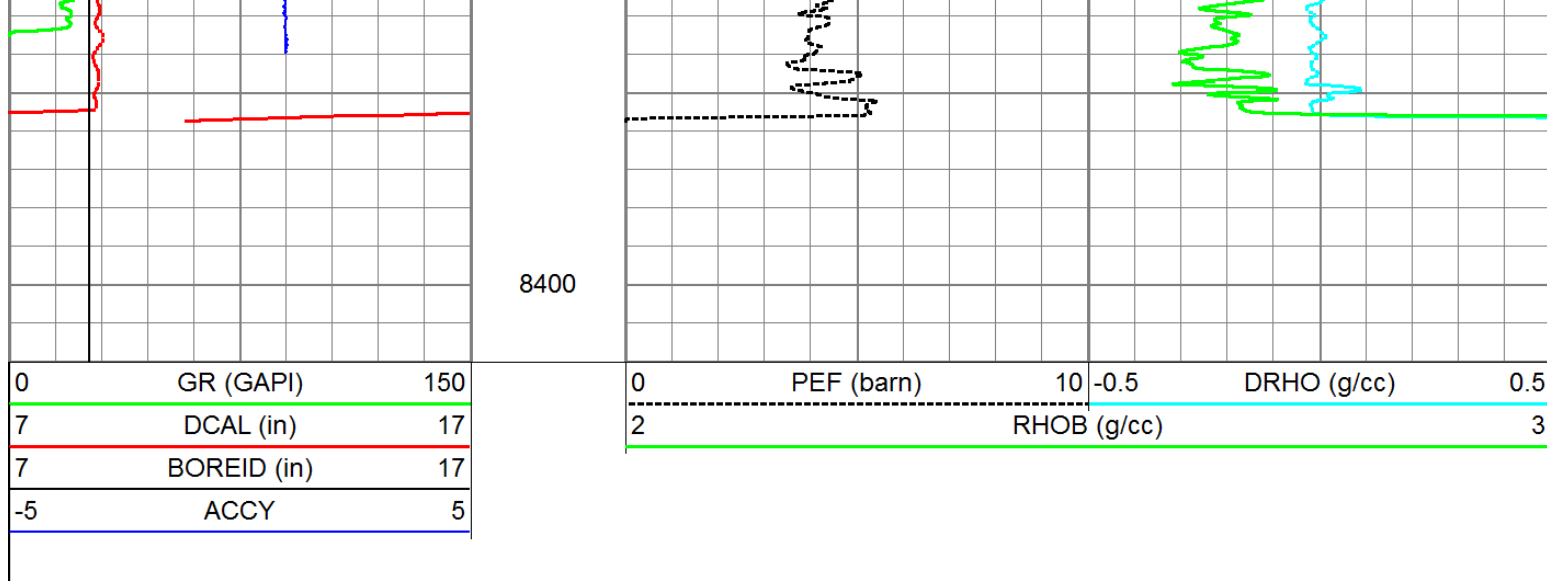
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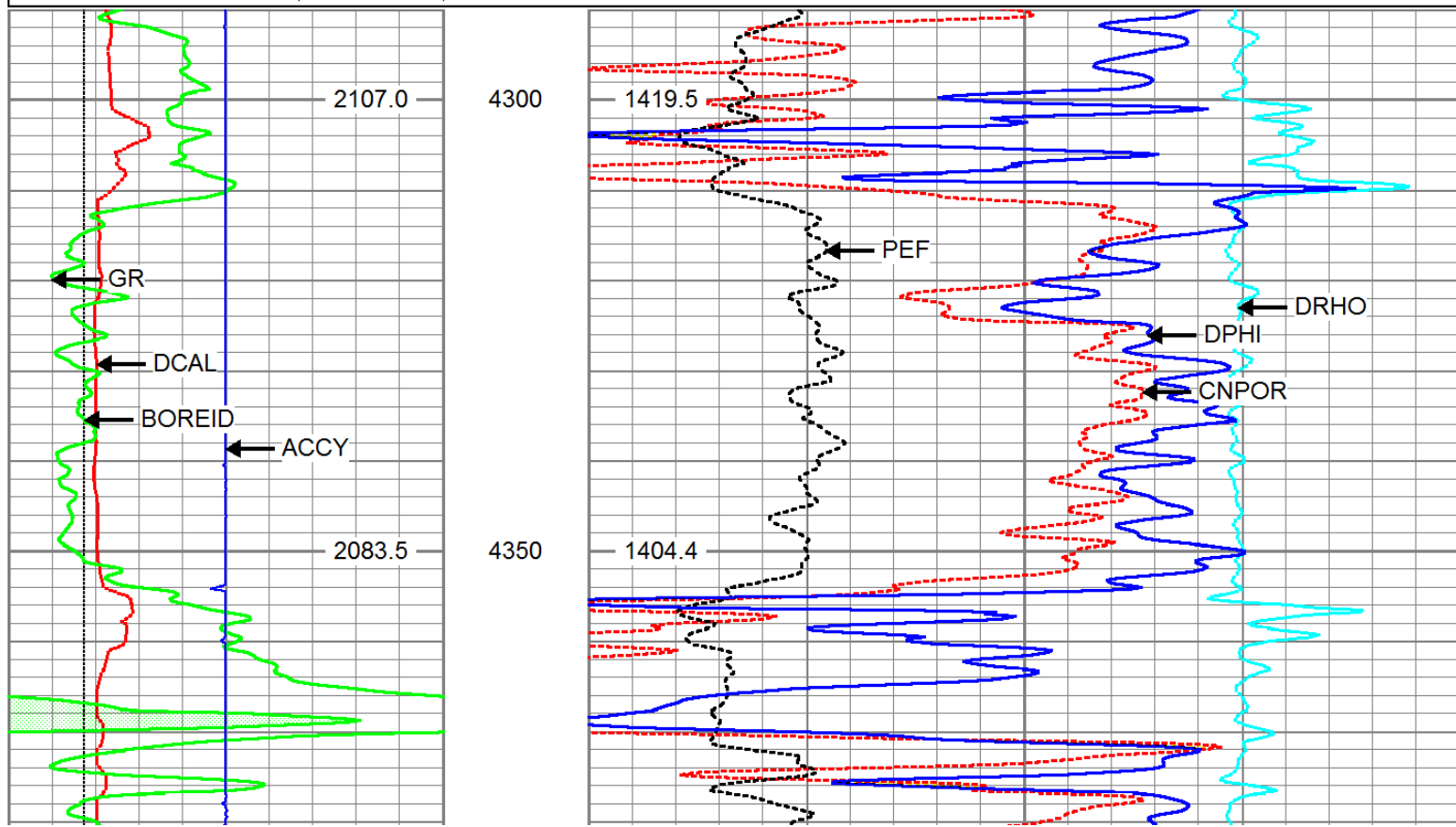


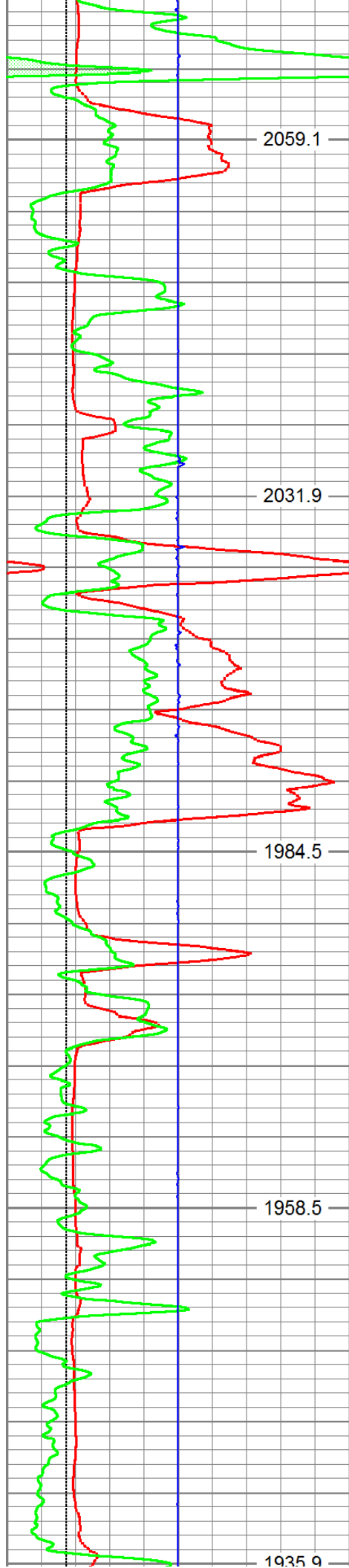


MAIN PASS

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 Presentation Format: 8_5n_chk
 Dataset Creation: Mon Apr 15 14:07:12 2013
 Charted by: Depth in Feet scaled 1:240

7	DCAL (in)	17	30	CNPOR (pu)	-10
7	BOREID (in)	17	0	PEF (barn)	10
0	GR (GAPI)	150	-0.5	DRHO (g/cc)	0.5
-5	ACCY	5	30	DPHI (pu)	-10
TBHV (ft3)		ABHV (ft3)			





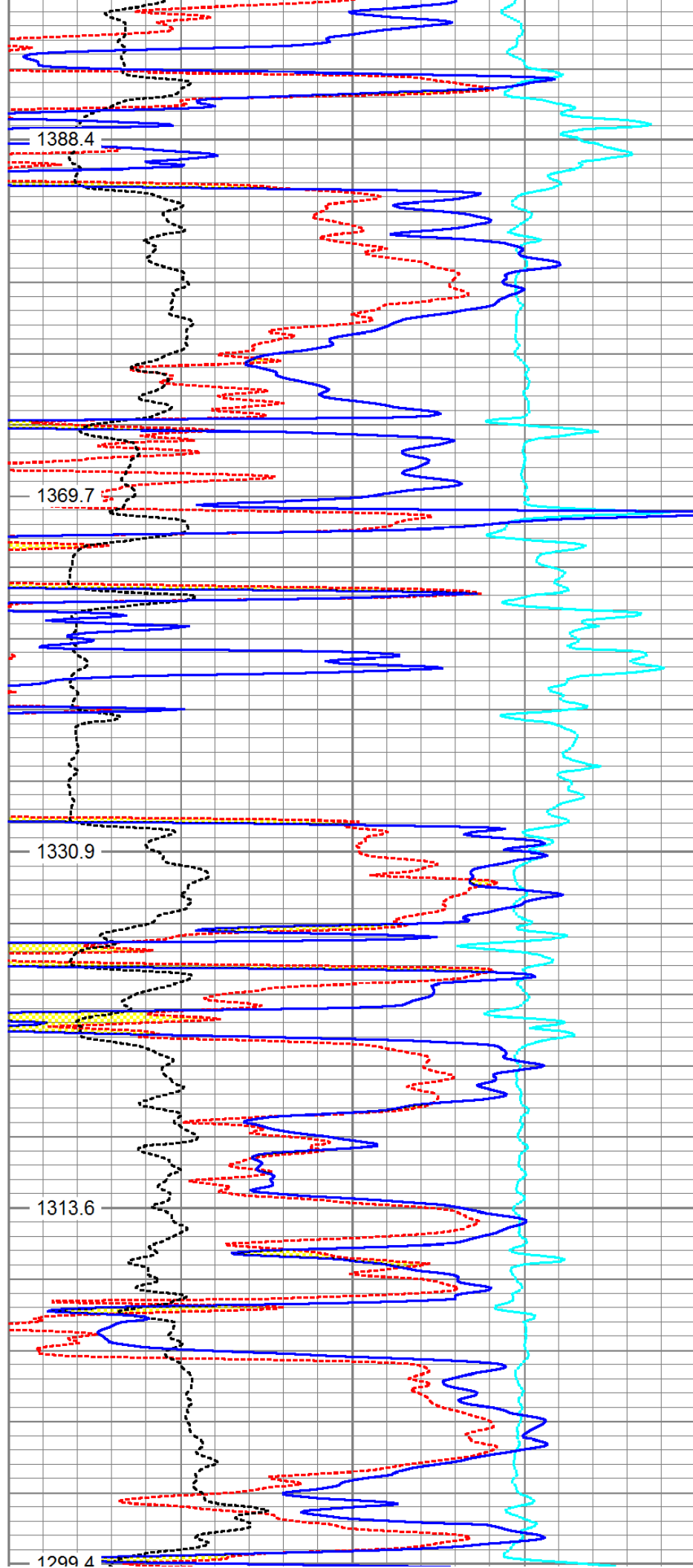
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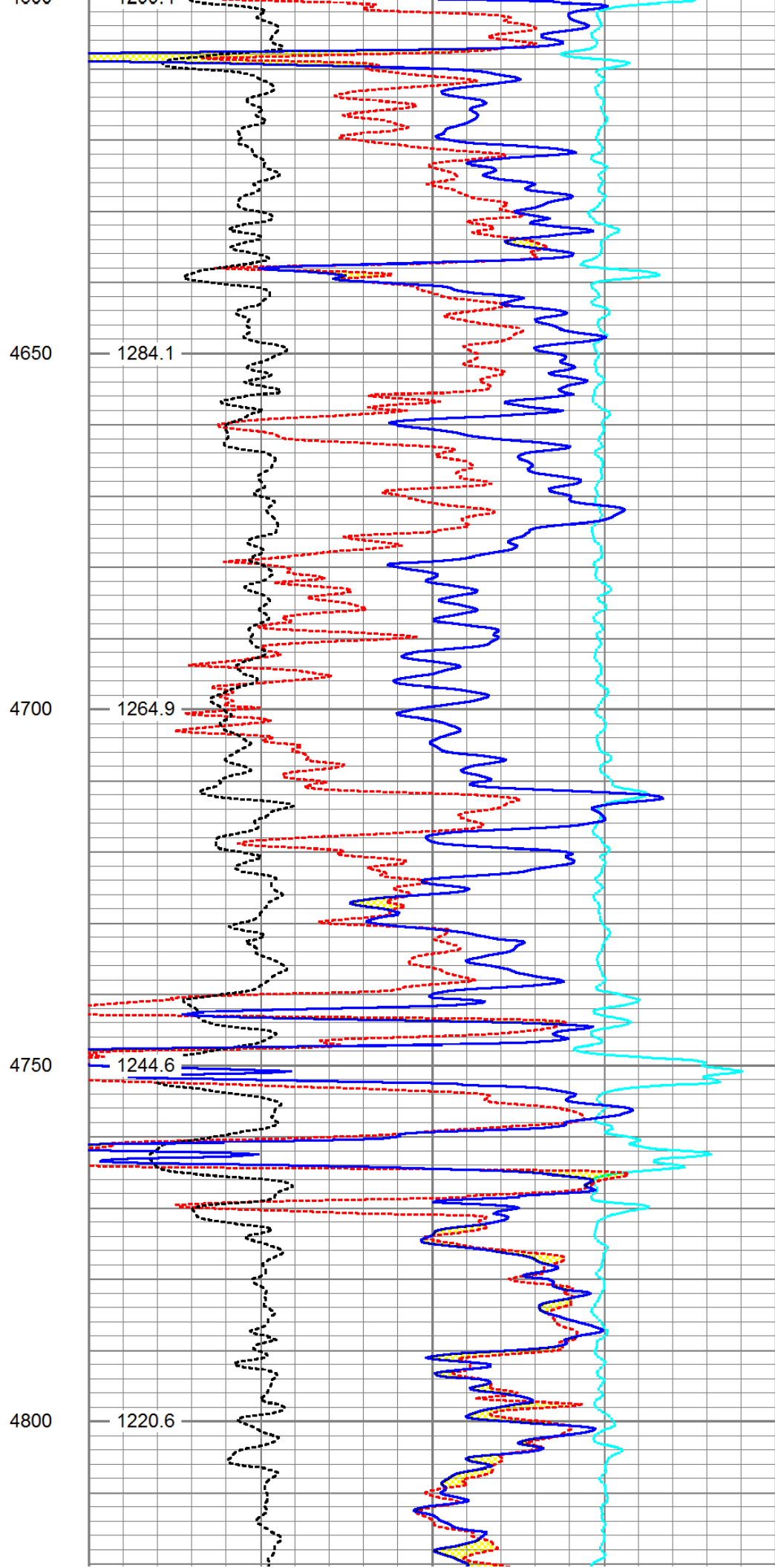
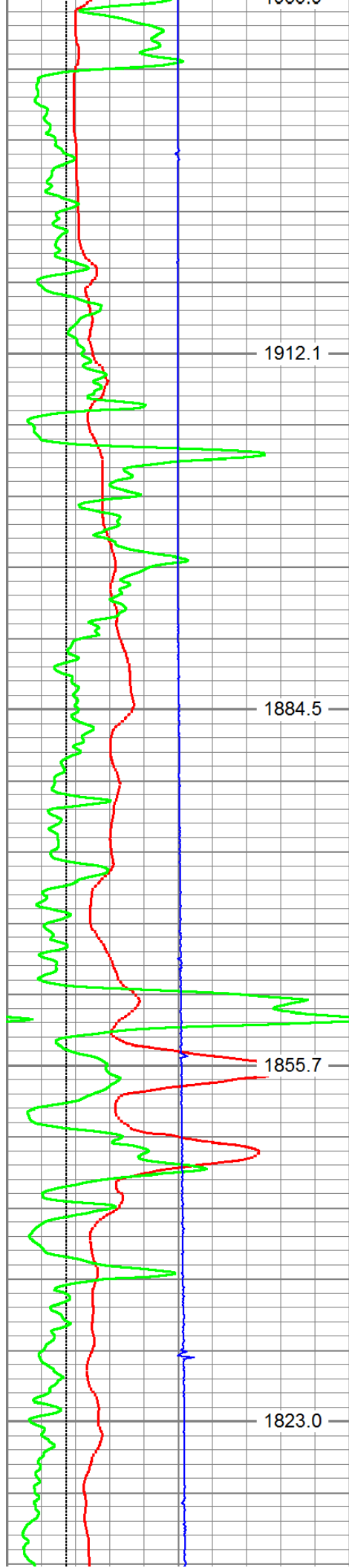
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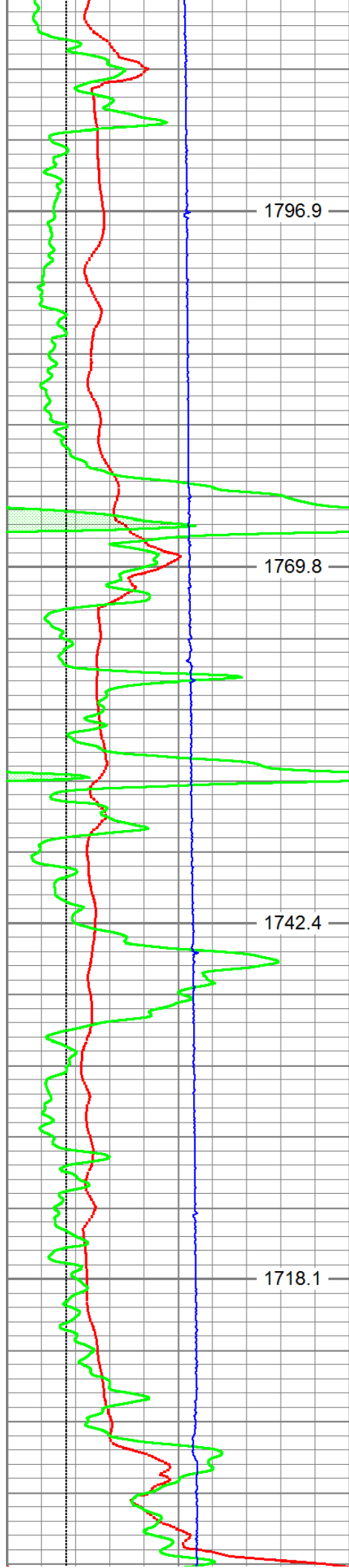
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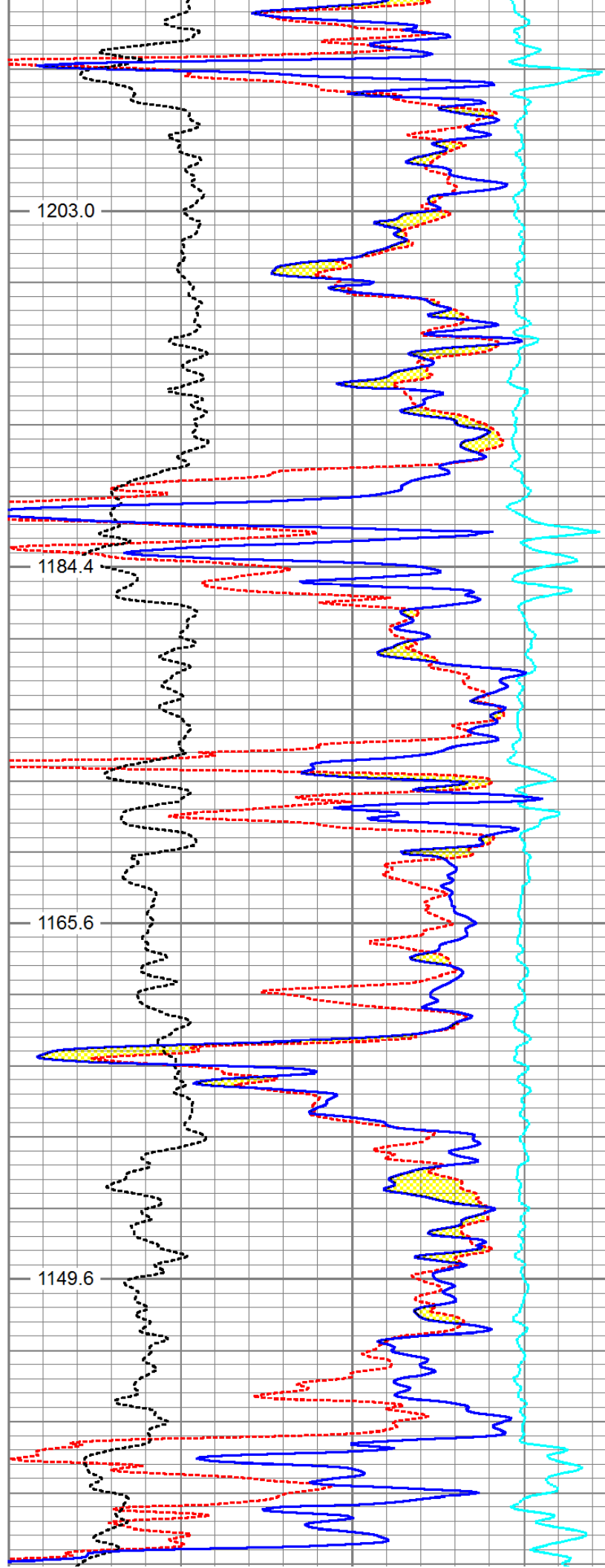


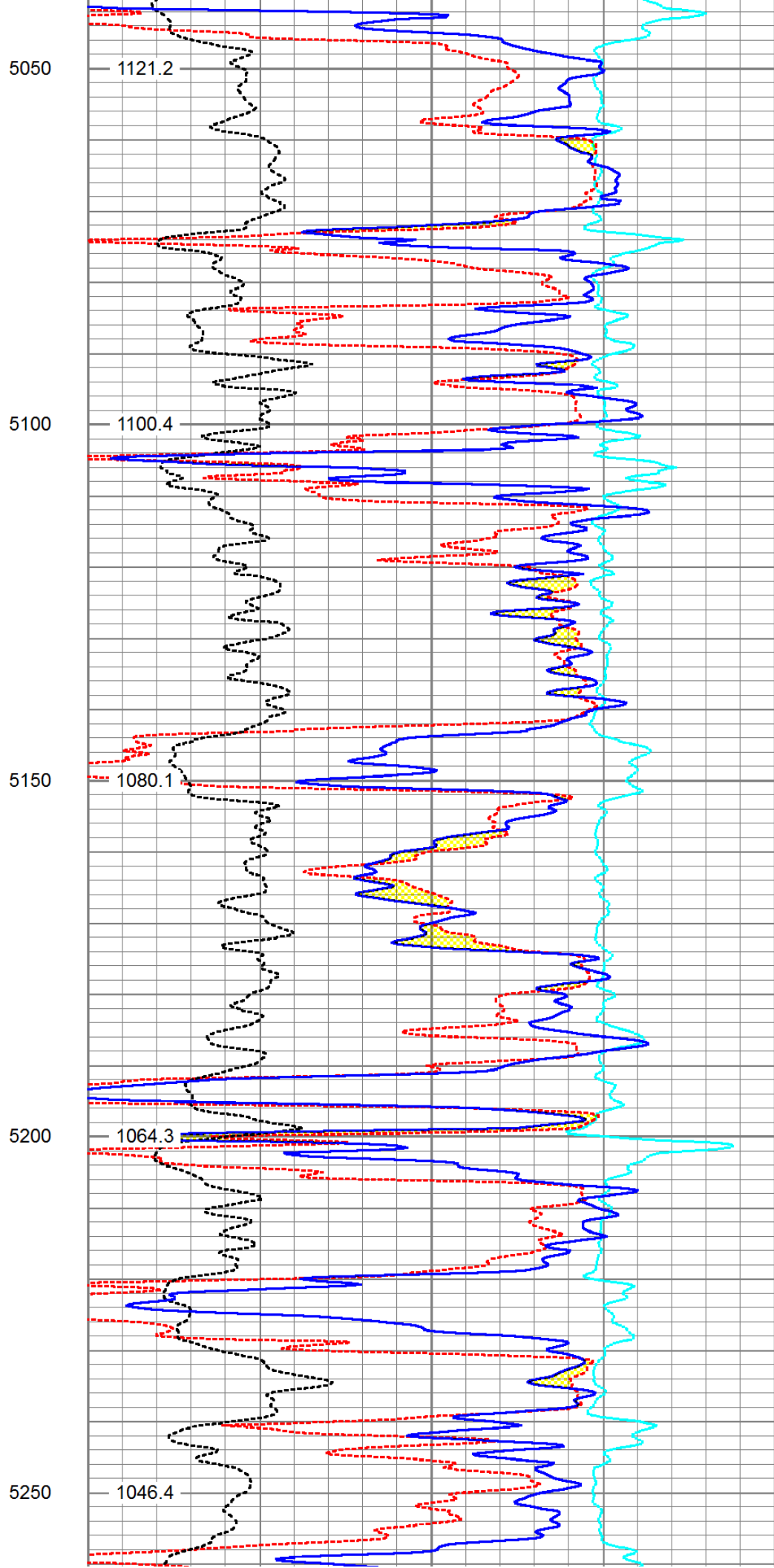
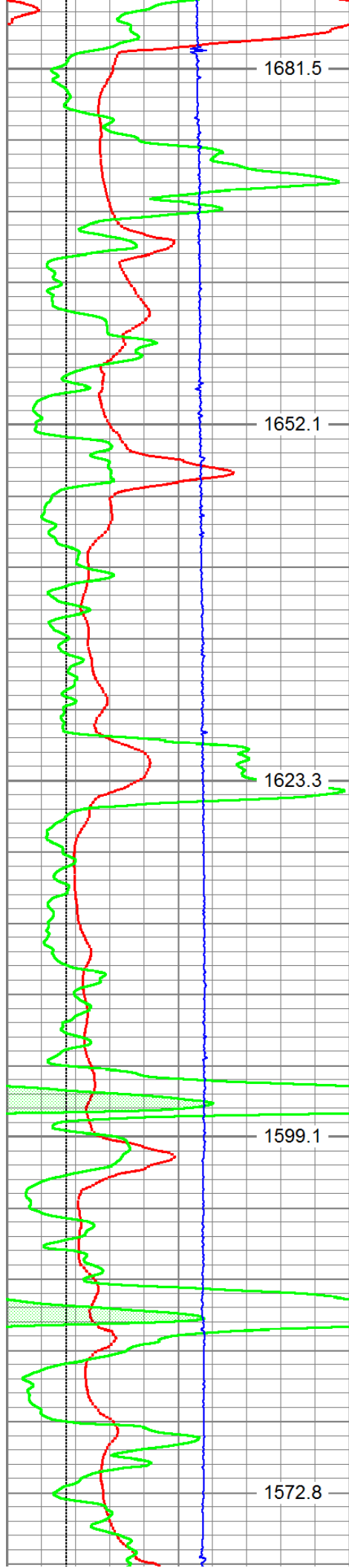
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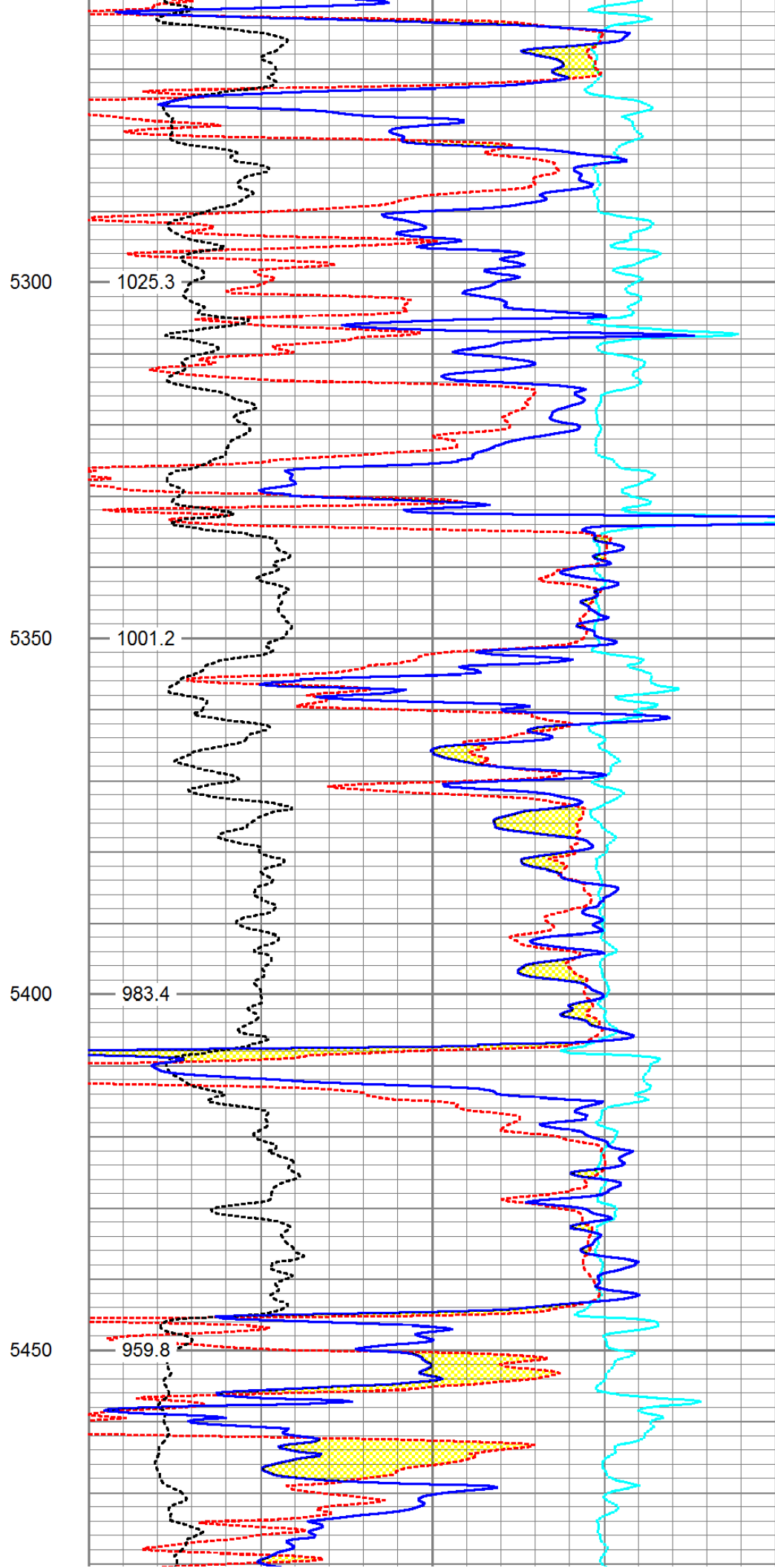
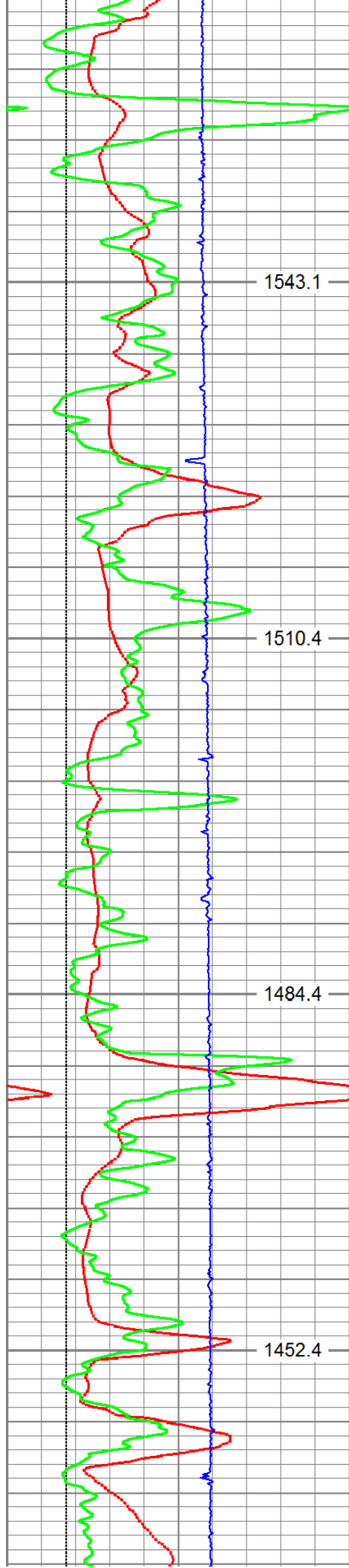
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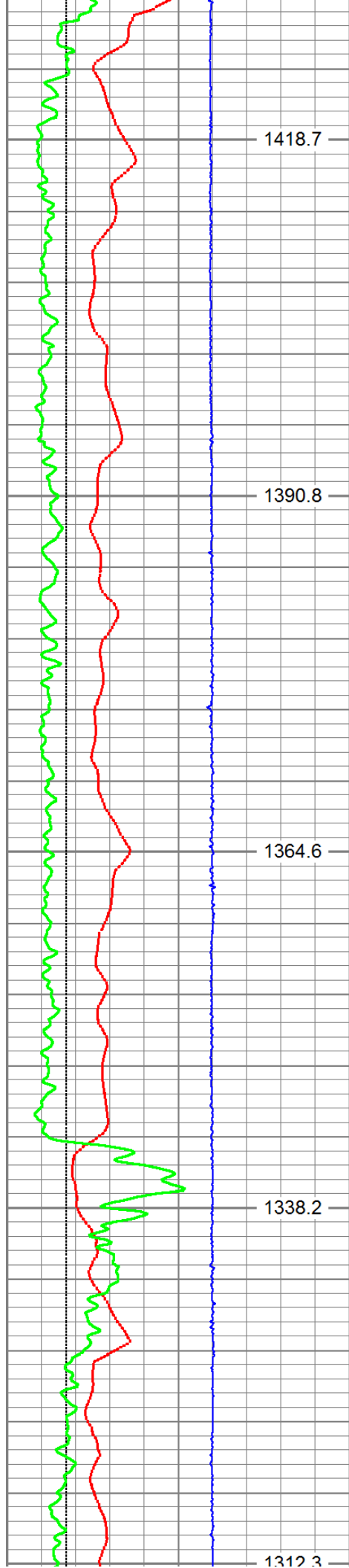
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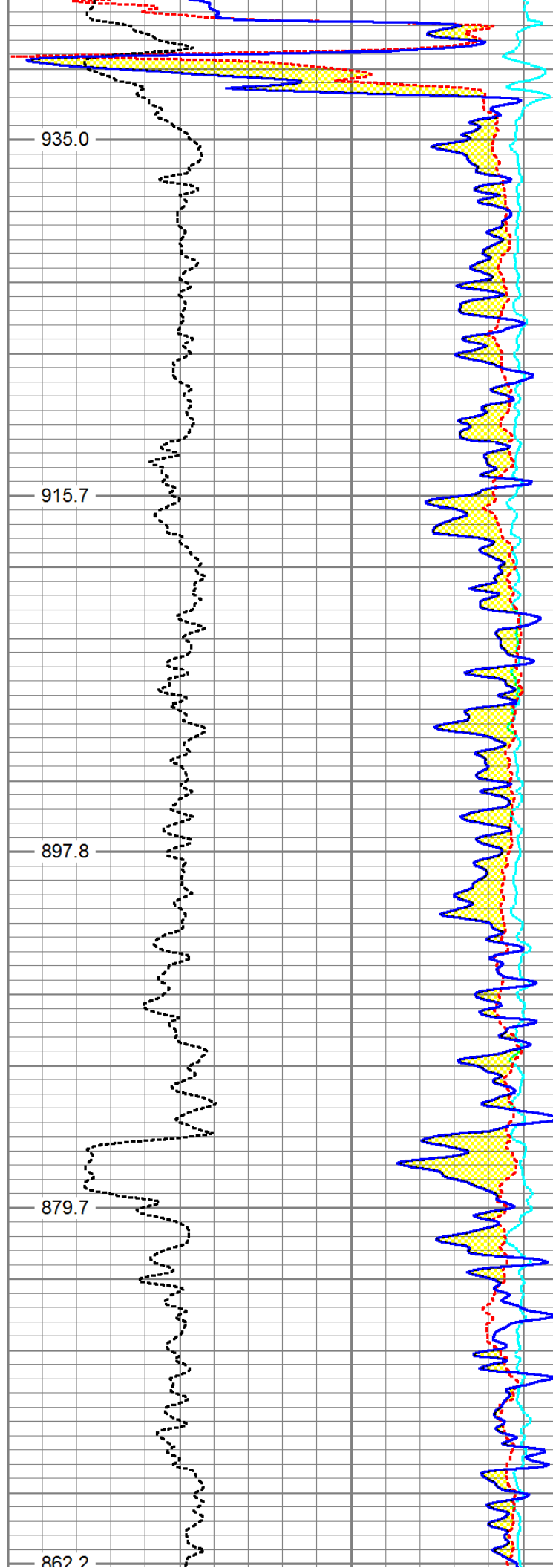


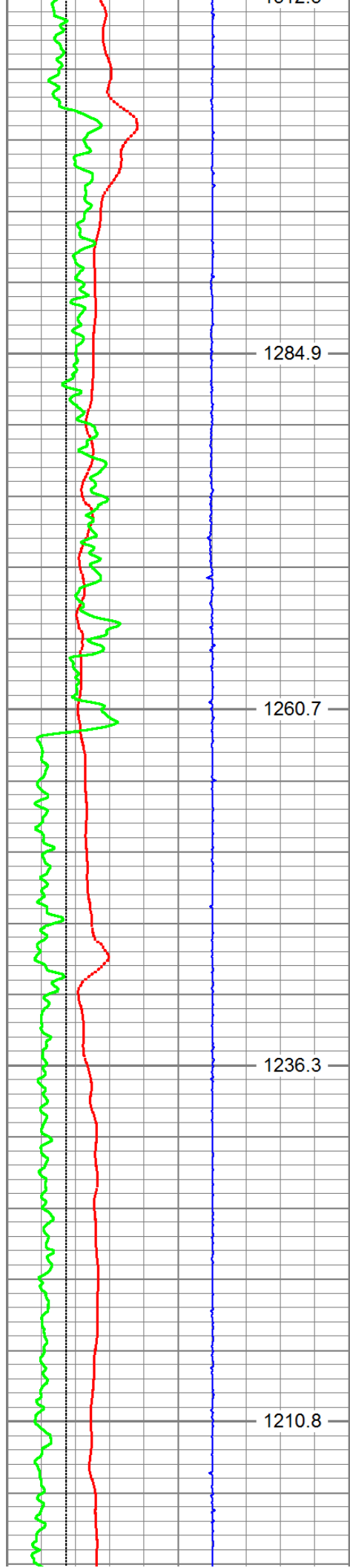




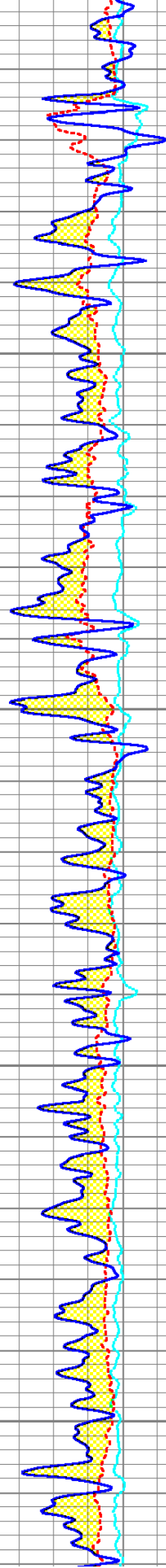
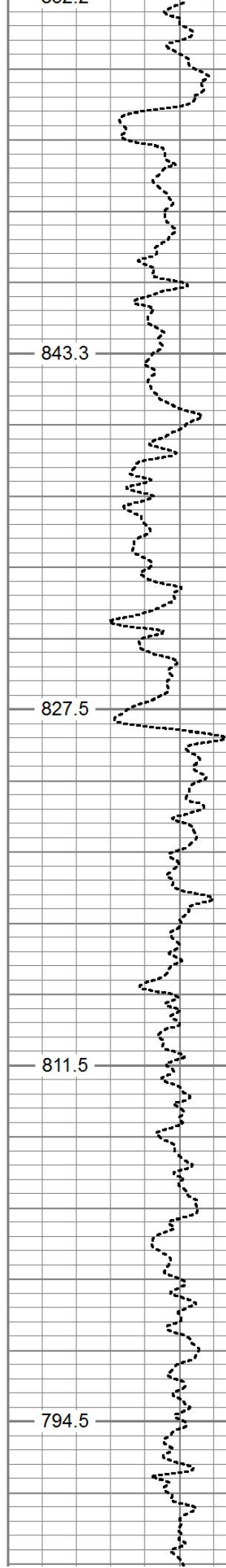


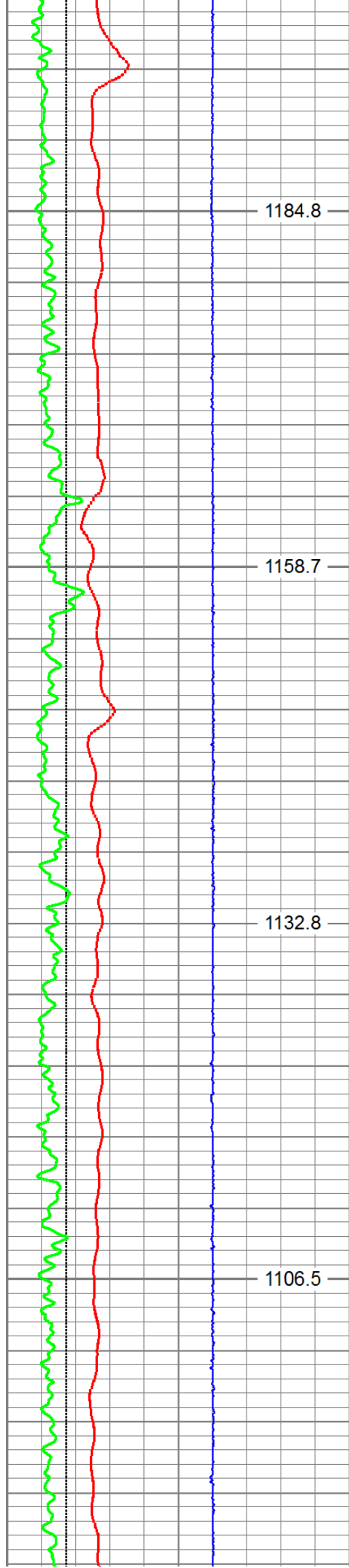
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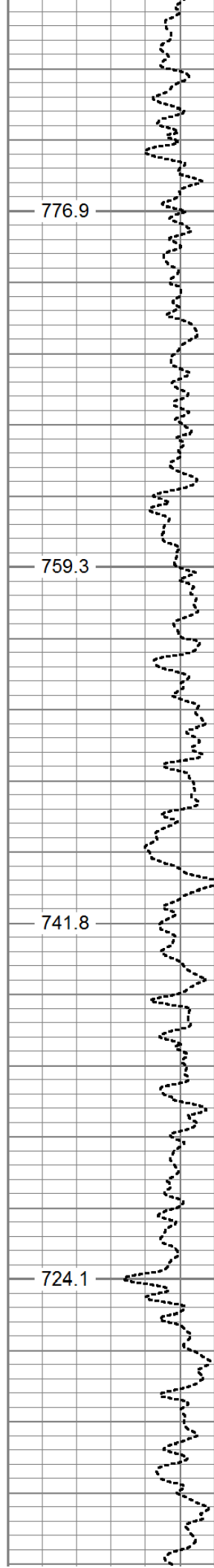
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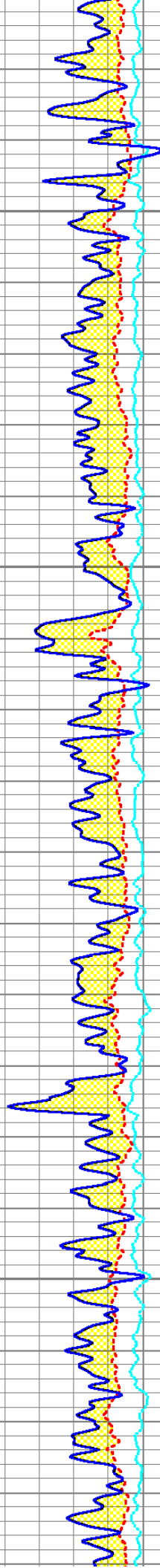


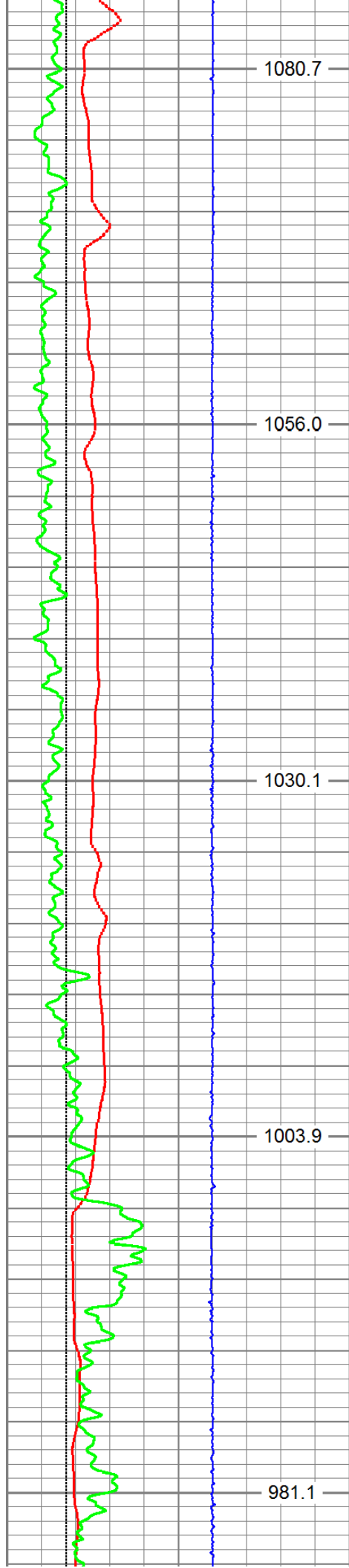
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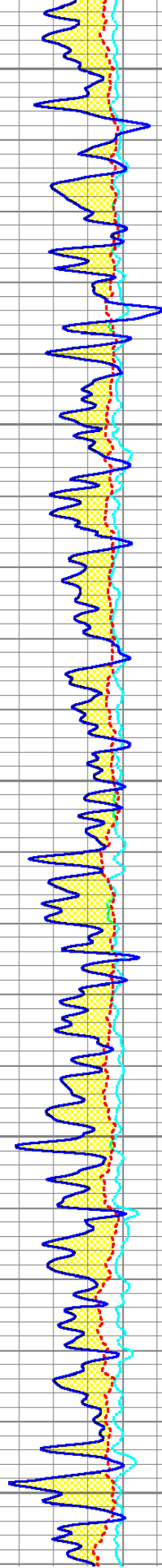
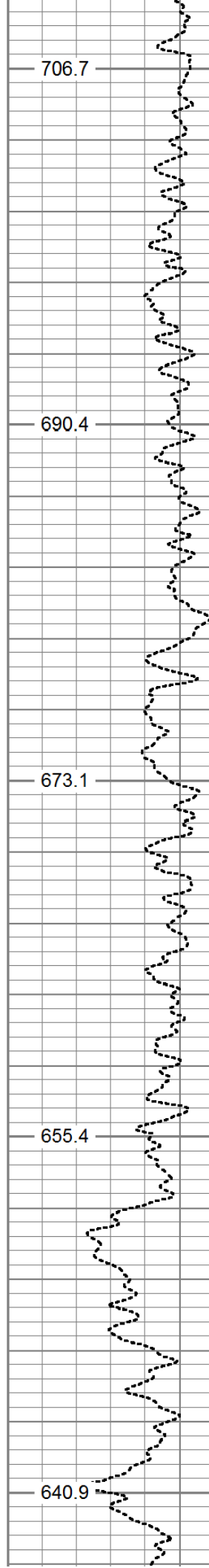
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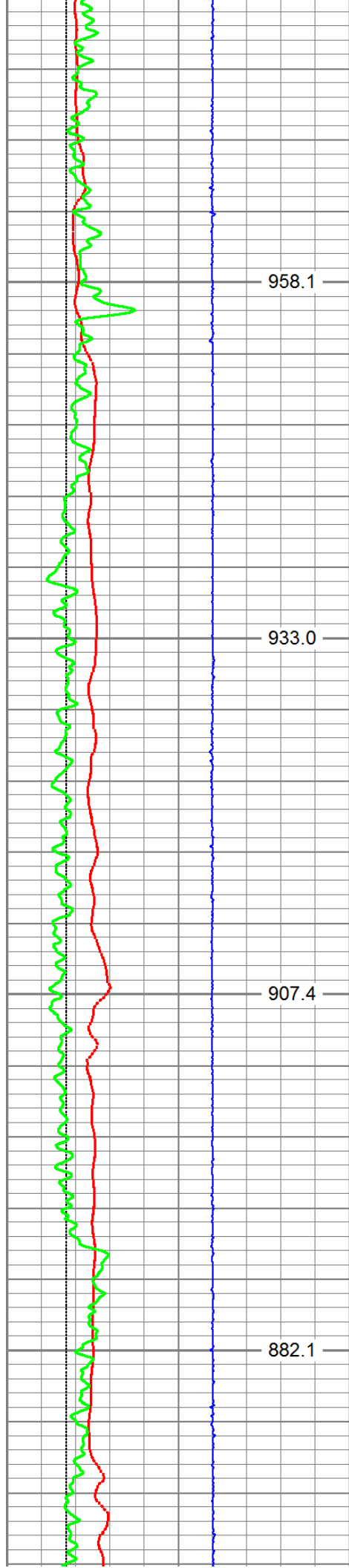
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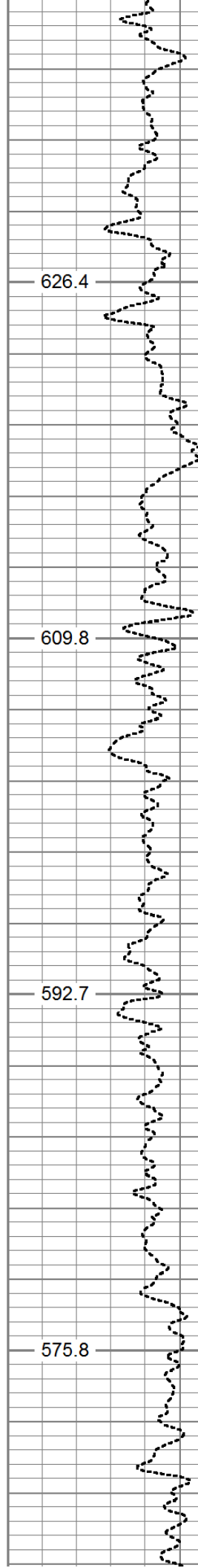


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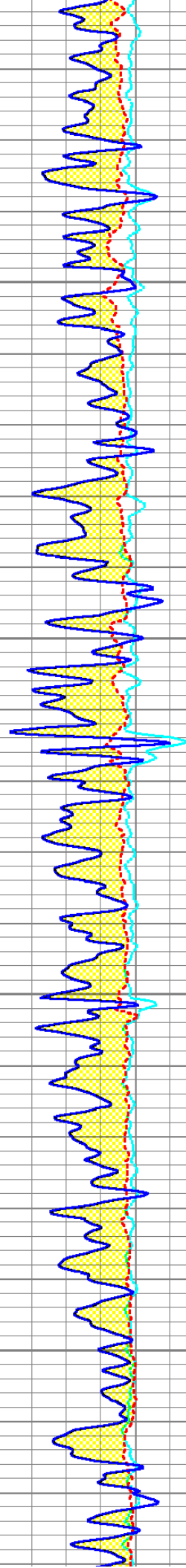


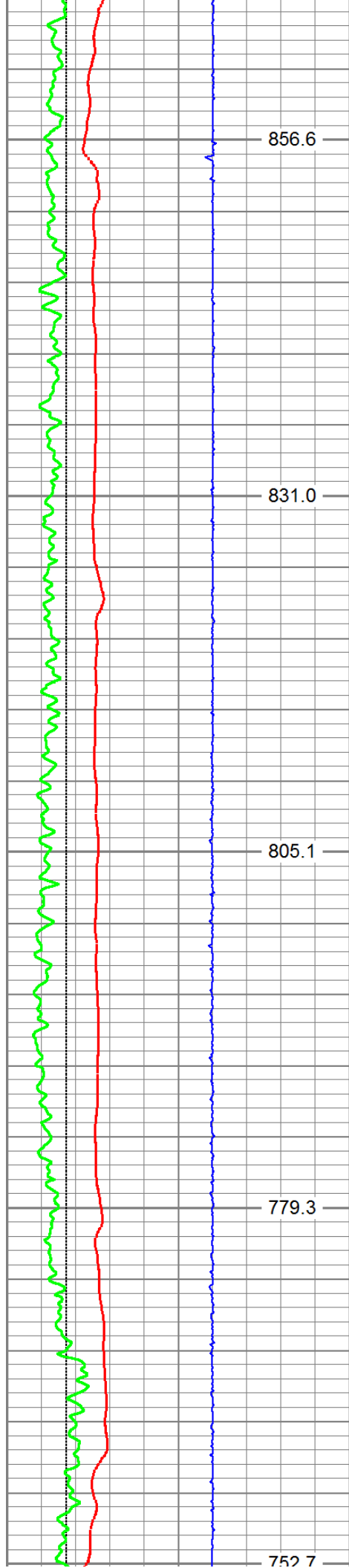
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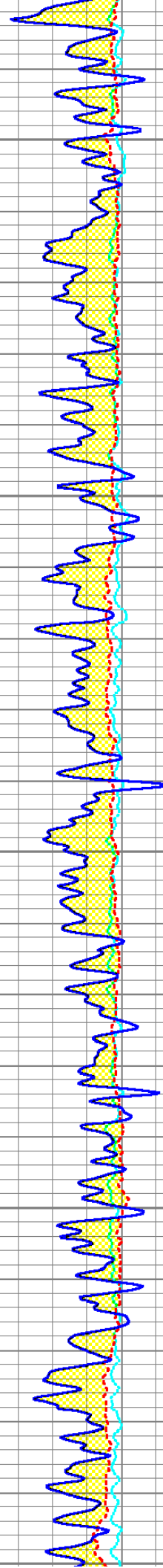
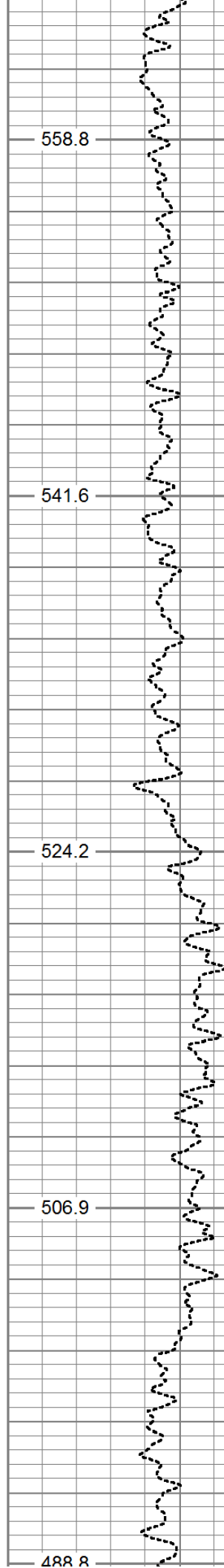
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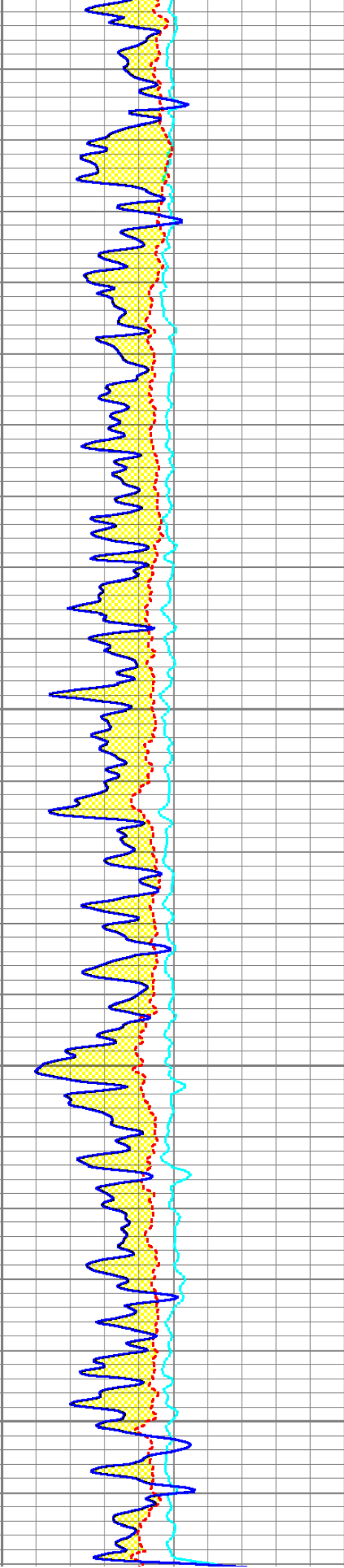
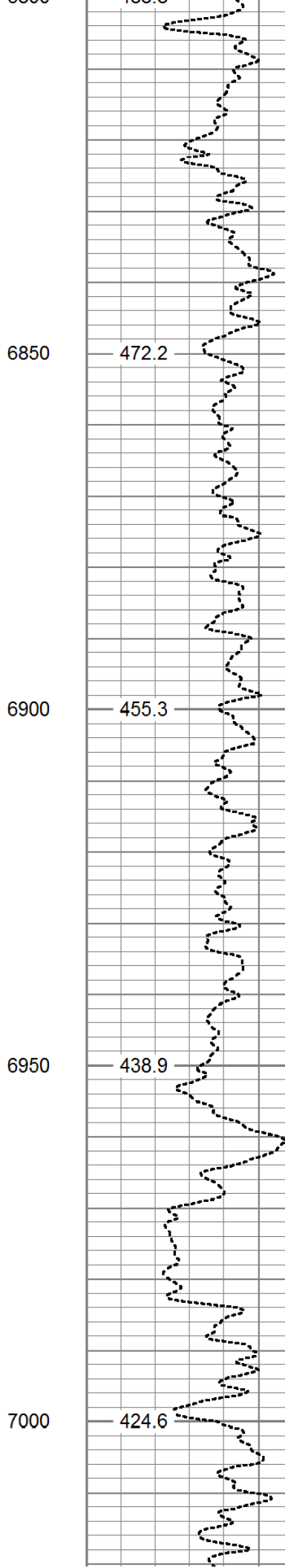
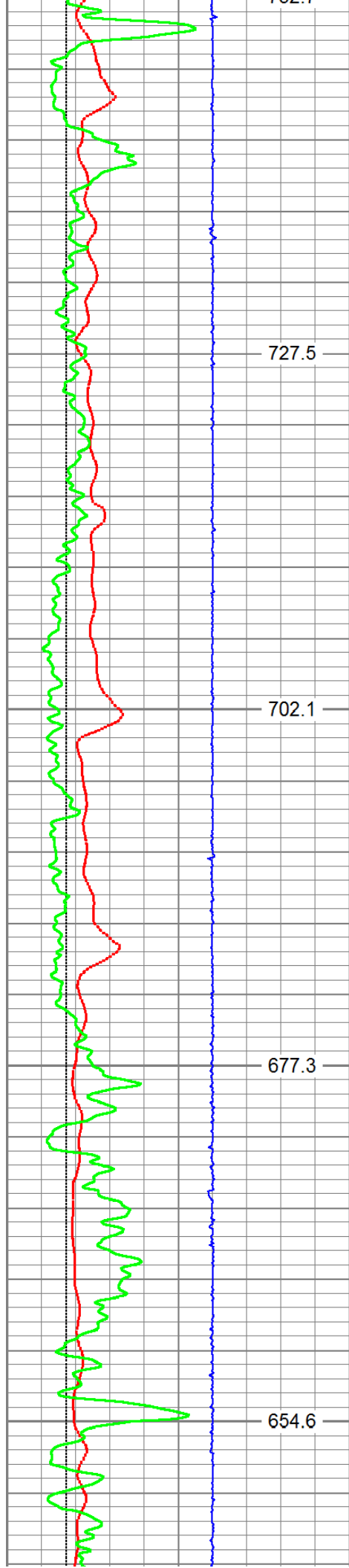
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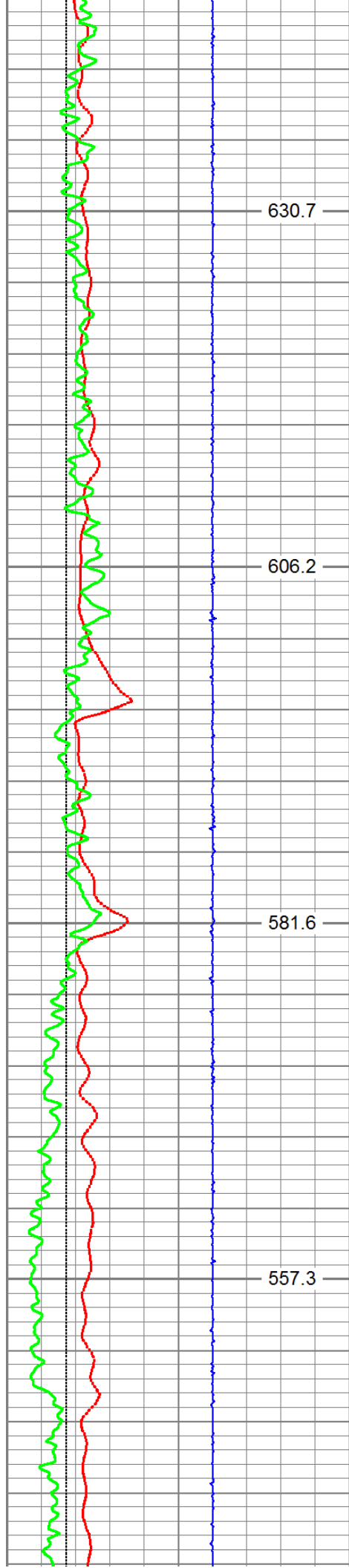




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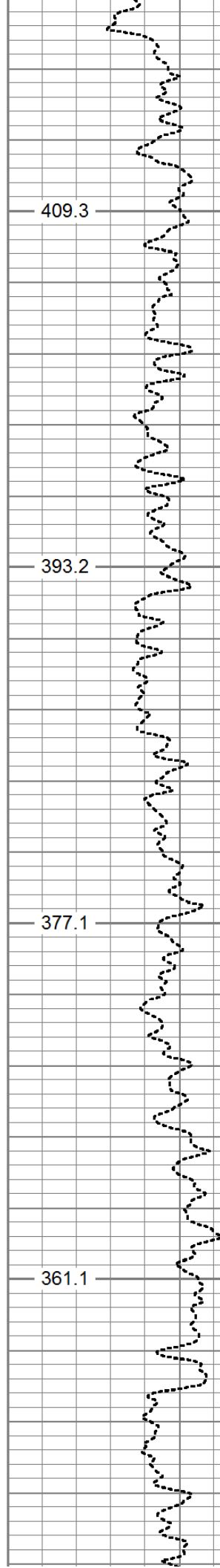


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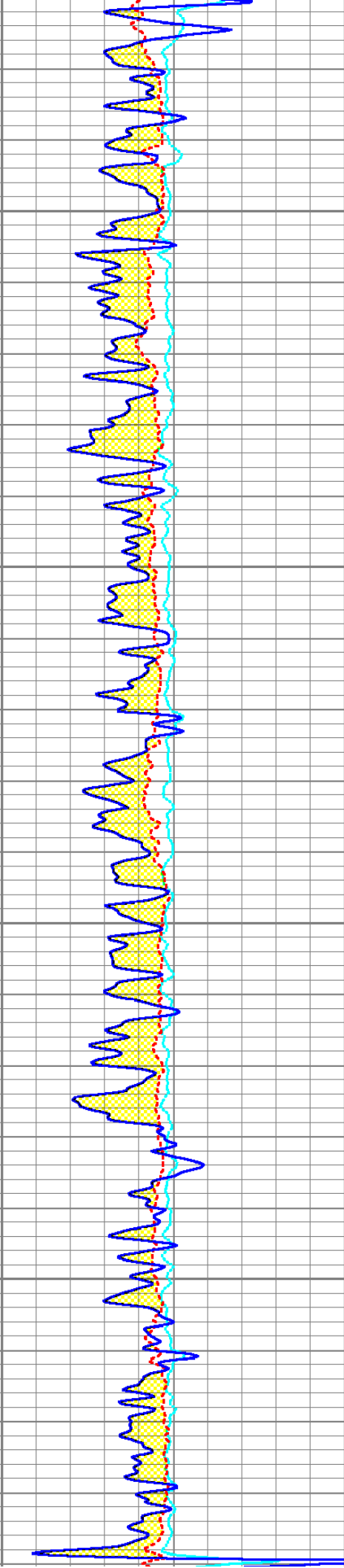


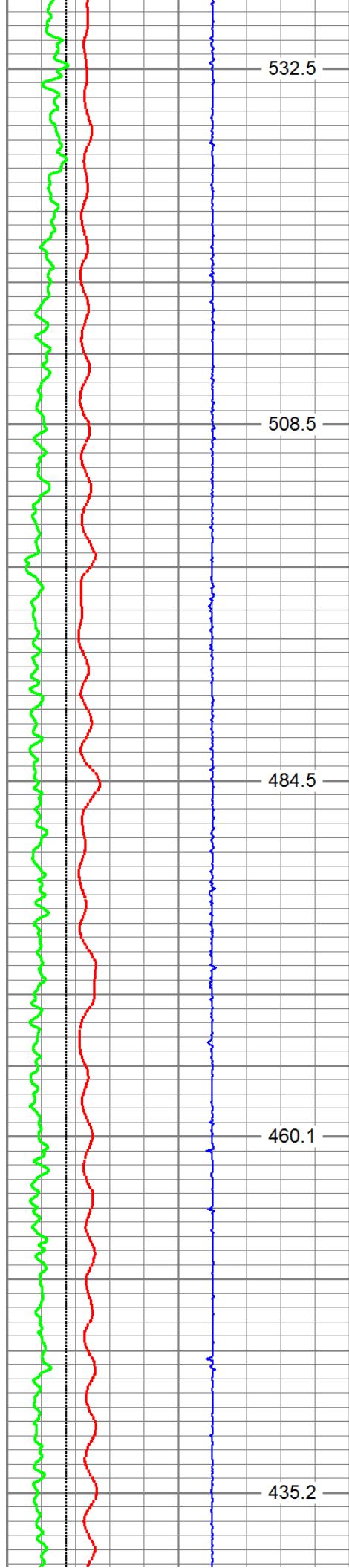
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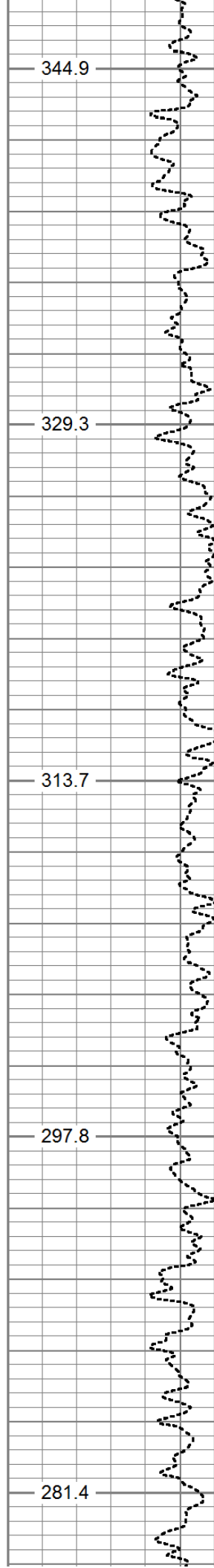
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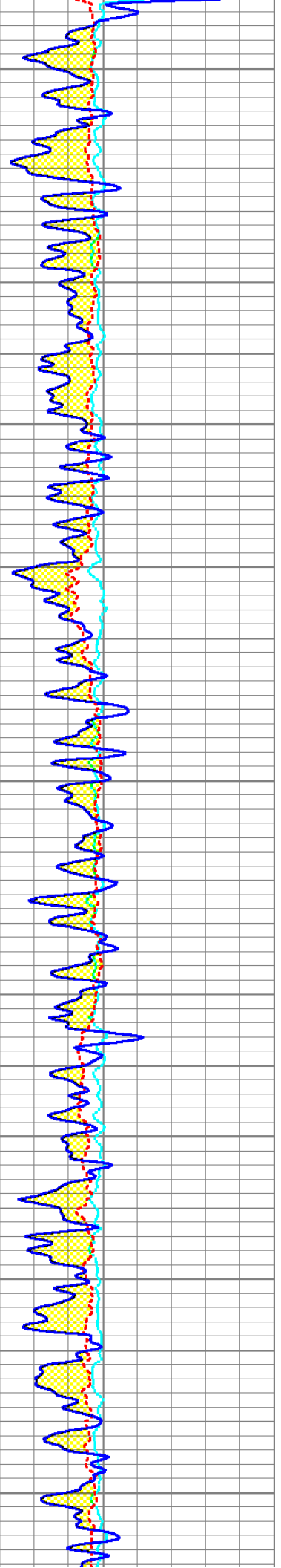
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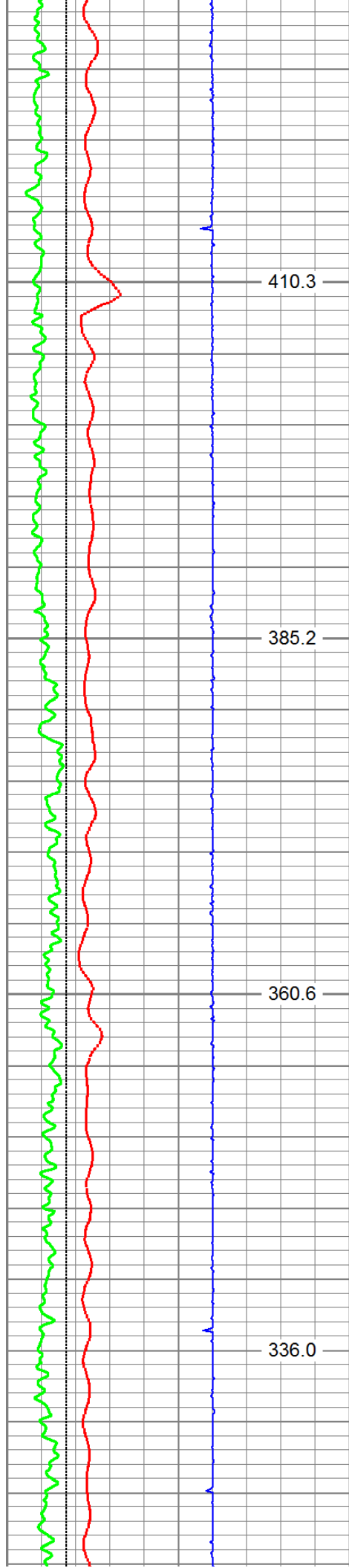
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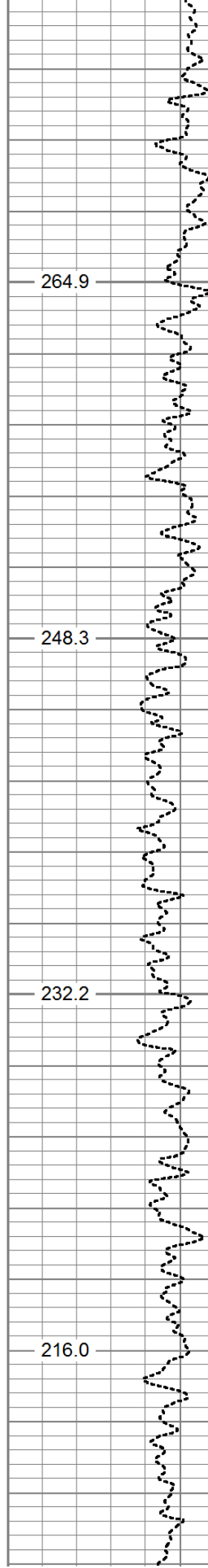


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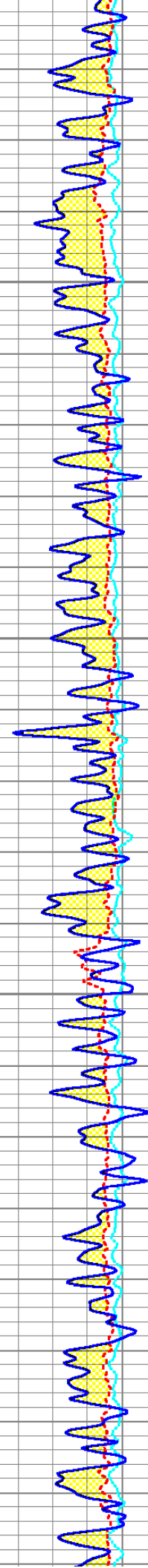


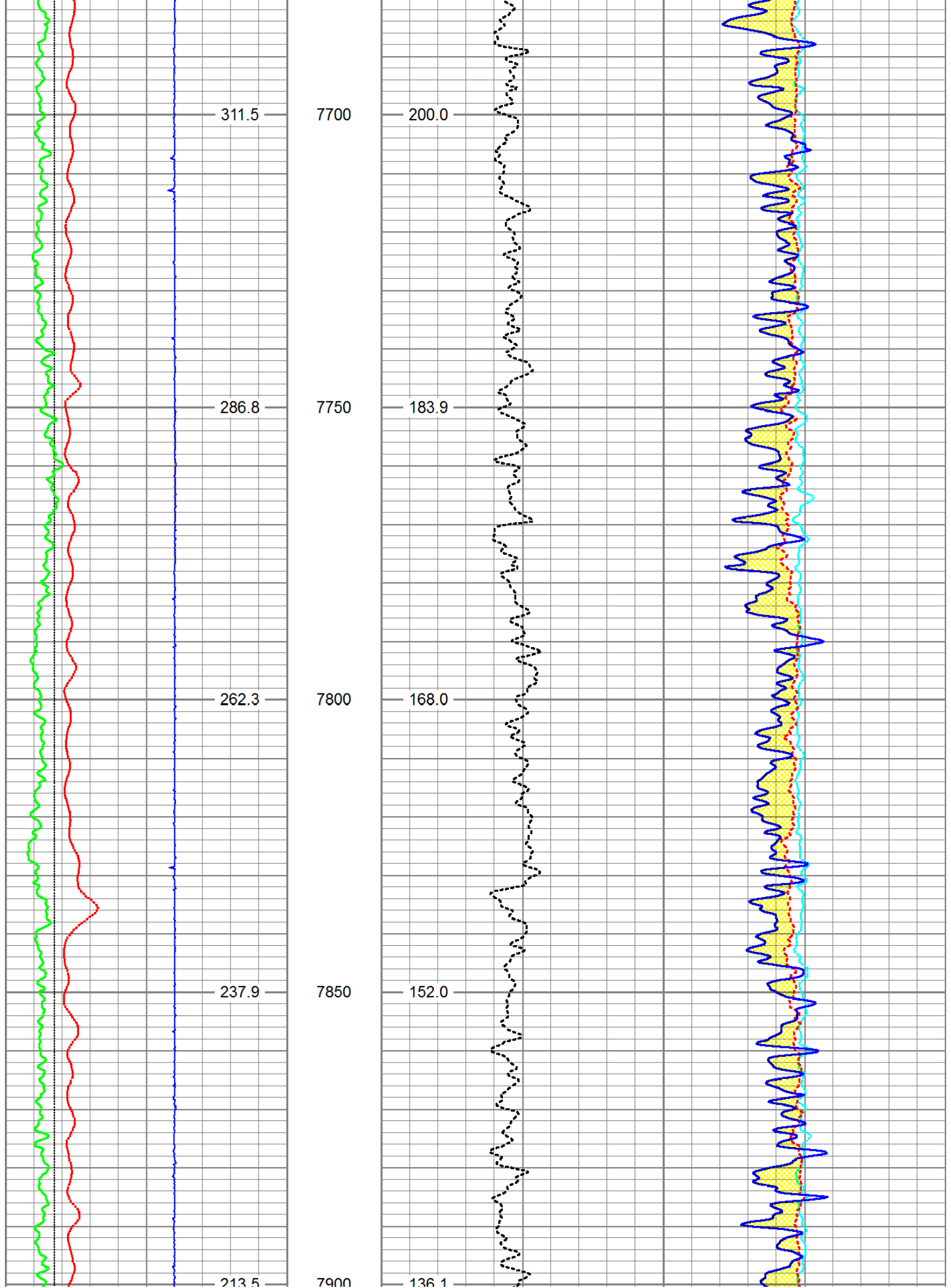
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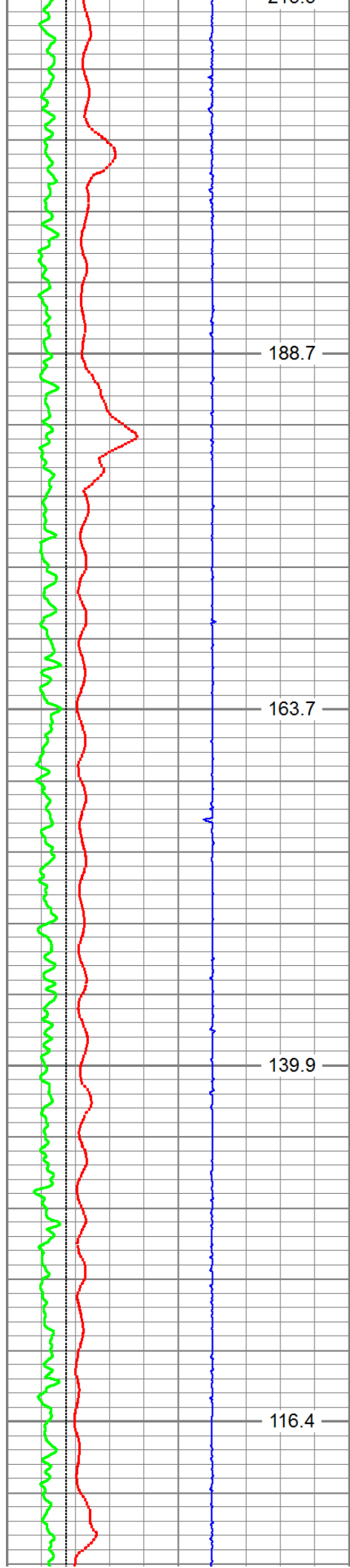
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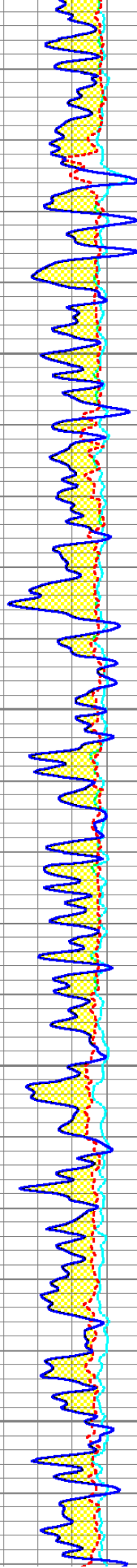
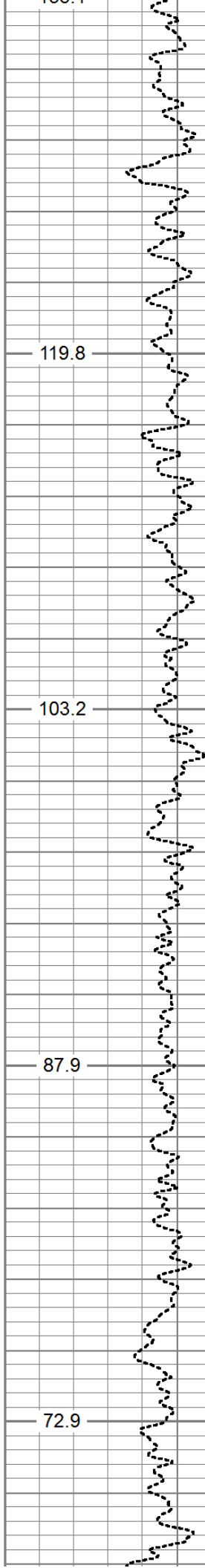
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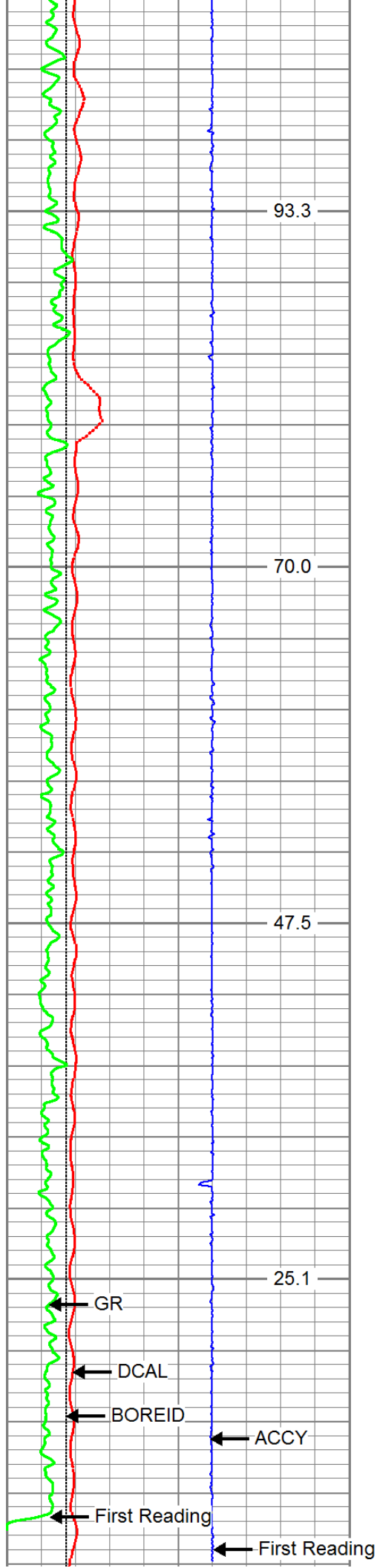






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8000
8050
8100





8150

8200

8250

8300

GR

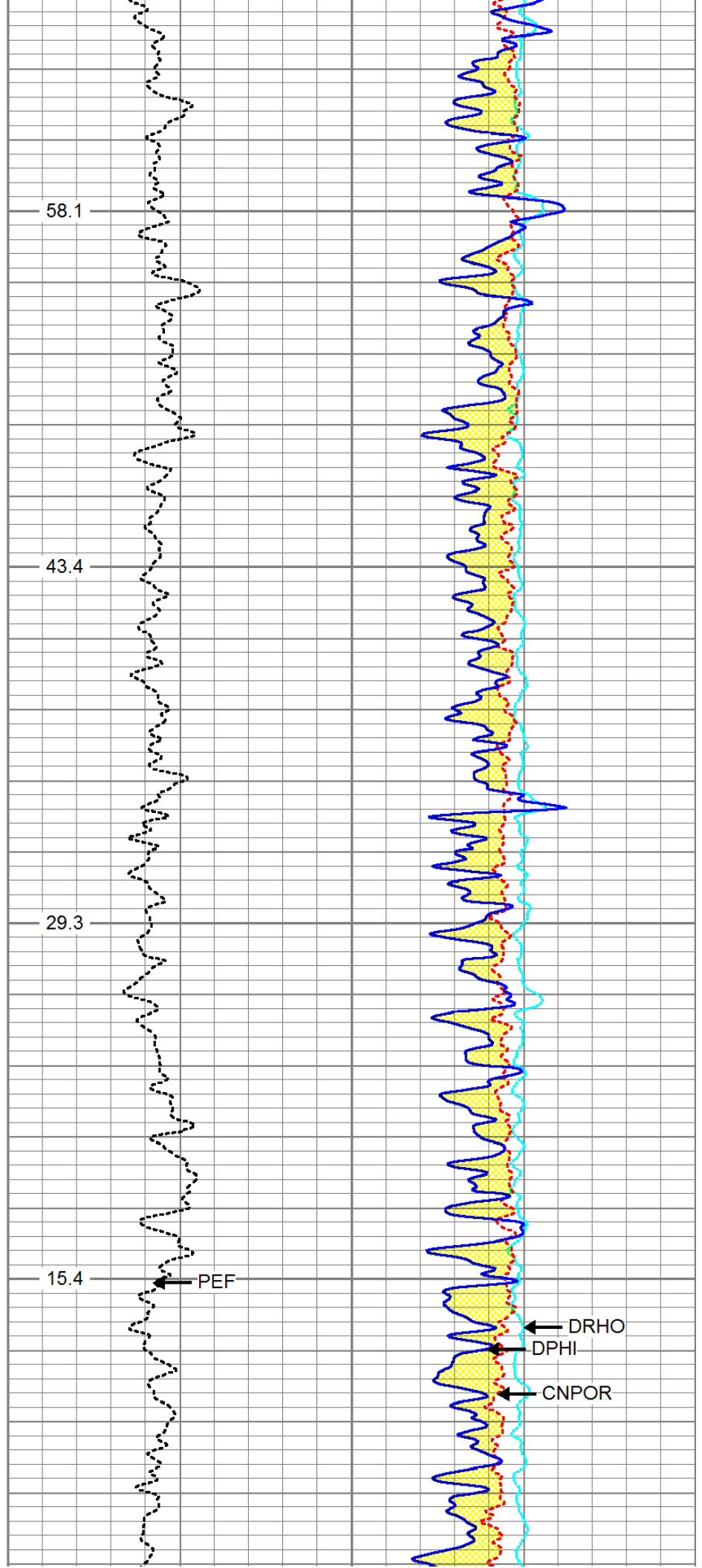
DCAL

BOREID

ACCY

First Reading

First Reading



58.1

43.4

29.3

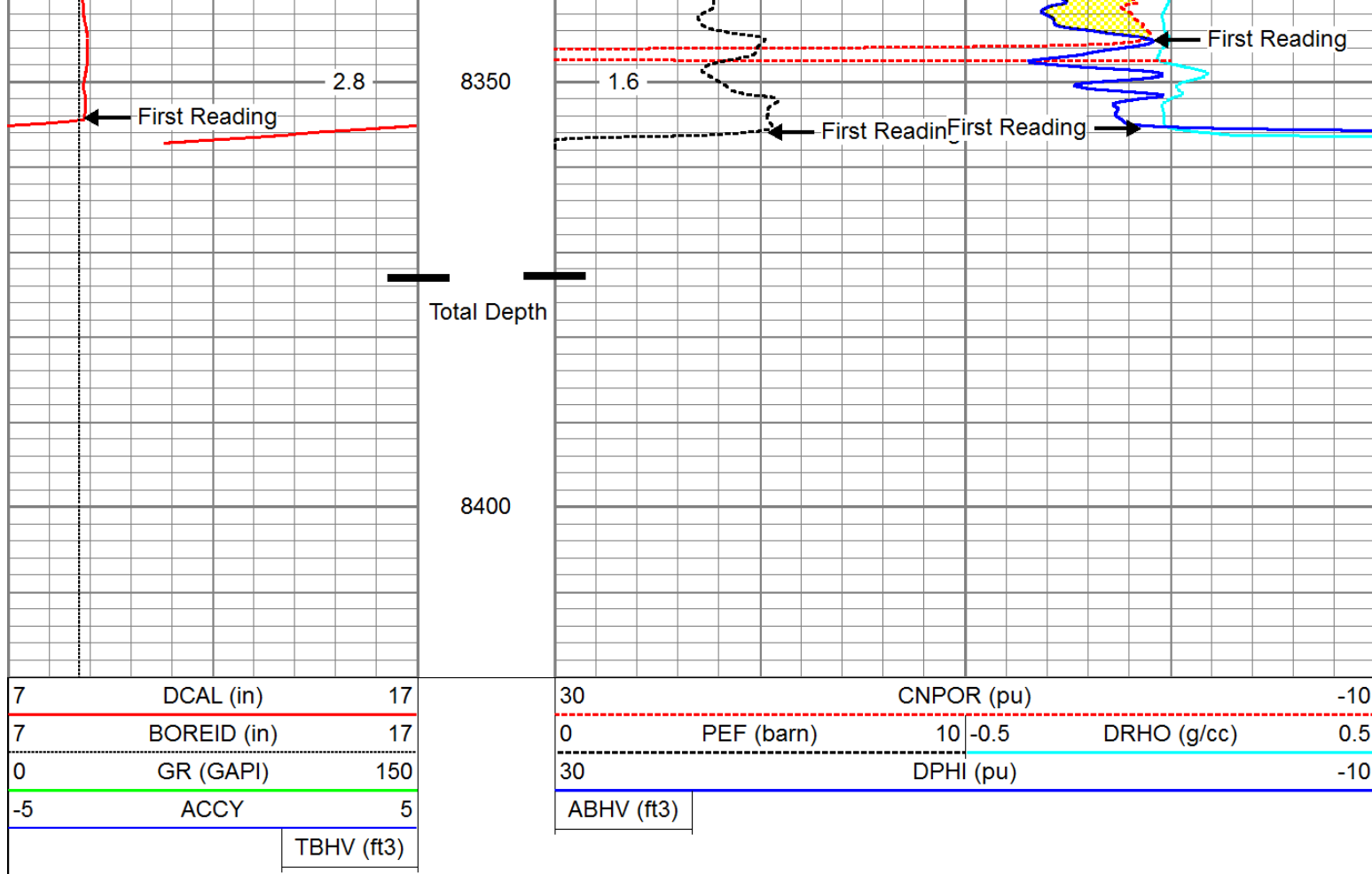
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PEF

DRHO

DPHI

CNPOR



Log Variables

Database: C:\Warrior\Data\luann_mem.db
Dataset: field/well/proc1/pass1.4

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in
1	On	WBM	1	MUDCELL	CURVE	8.75
BOTTEMP degF	CASED?	CASEOD in	CASETHCK in	CEMWATERSA kppm	CMNTTHCK in	DNBHC?
114	No	5.5	0	0	0	NO
DPORSEL	FLUIDDEN g/cc	FRMSALIN kppm	LATNOR	M	MATRXDEN g/cc	MUDSALIN kppm
RHOB	1	0	Off	2	2.71	34
MudWgt lb/gal	NPORSEL	PEBHC?	PERFS	RESTMP SRC	SO in	SRFTEMP degF
9.2	Limestone	YES	0	INTERNAL	0.5	65
SZCOR	TDEPTH ft	TMPCOR	TOOLPOS			
On	8422	On	Ec-centered			

Calibration Report

Database File: luann_mem.db
Dataset Pathname: proc1/pass1.4
Dataset Creation: Mon Apr 15 14:07:12 2013

Tool Model-Serial Number:

PS-PS38R

Shop Calibration Performed:

Fri Mar 01 12:30:29 2013

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-478.4900	[-500.00, -400.00]	175.3190	[-500.00, 500.00]
A2	-135.7360	[-180.00, -100.00]	302.3650	[-500.00, 500.00]
A3	-26.2781	[-50.00, -10.00]	-65.5454	[-500.00, 500.00]
A4	-16.7549	[-30.00, -10.00]	254.1780	[-500.00, 500.00]
A5	-14.3211	[-30.00, -10.00]	151.4720	[-500.00, 500.00]
Freq 2				
A1	-252.3300	[-280.00, -180.00]	90.6894	[-500.00, 500.00]
A2	-86.4805	[-130.00, -50.00]	170.3340	[-500.00, 500.00]
A3	-19.2593	[-50.00, -10.00]	-94.3423	[-500.00, 500.00]
A4	-19.7630	[-30.00, -10.00]	78.5474	[-500.00, 500.00]
A5	-19.2330	[-30.00, -10.00]	2.2441	[-500.00, 500.00]
Freq 3				
A1	-162.5760	[-180.00, -80.00]	-2.4436	[-500.00, 500.00]
A2	-65.8174	[-130.00, -30.00]	84.6667	[-500.00, 500.00]
A3	-15.1583	[-50.00, -10.00]	-126.5820	[-500.00, 500.00]
A4	-21.2009	[-30.00, -10.00]	-38.0339	[-500.00, 500.00]
A5	-21.8735	[-30.00, -10.00]	-105.2590	[-500.00, 500.00]
Freq 4				
A1	-89.4241	[-120.00, -40.00]	-152.8680	[-500.00, 500.00]
A2	-46.8994	[-110.00, -10.00]	-29.1757	[-500.00, 500.00]
A3	-12.3098	[-50.00, -10.00]	-189.9740	[-500.00, 500.00]
A4	-23.7794	[-30.00, -10.00]	-211.1800	[-500.00, 500.00]
A5	-26.9272	[-30.00, -10.00]	-283.6760	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9910	[0.95, 1.05]	0.0019	[-0.05, 0.05]
A2	0.9910	[0.95, 1.05]	0.0018	[-0.05, 0.05]
A3	1.0009	[0.95, 1.05]	-0.0054	[-0.05, 0.05]
A4	0.9885	[0.95, 1.05]	0.0047	[-0.05, 0.05]
A5	0.9939	[0.95, 1.05]	0.0015	[-0.05, 0.05]
Freq 2				
A1	0.9860	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A2	0.9858	[0.95, 1.05]	-0.0055	[-0.05, 0.05]
A3	0.9901	[0.95, 1.05]	-0.0051	[-0.05, 0.05]
A4	0.9836	[0.95, 1.05]	-0.0030	[-0.05, 0.05]
A5	0.9887	[0.95, 1.05]	-0.0069	[-0.05, 0.05]
Freq 3				
A1	0.9930	[0.95, 1.05]	-0.0045	[-0.05, 0.05]
A2	0.9931	[0.95, 1.05]	-0.0041	[-0.05, 0.05]
A3	0.9966	[0.95, 1.05]	-0.0041	[-0.05, 0.05]
A4	0.9891	[0.95, 1.05]	-0.0015	[-0.05, 0.05]
A5	0.9978	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
Freq 4				
A1	0.9848	[0.95, 1.05]	-0.0070	[-0.05, 0.05]
A2	0.9844	[0.95, 1.05]	-0.0066	[-0.05, 0.05]
A3	0.9901	[0.95, 1.05]	-0.0084	[-0.05, 0.05]
A4	0.9809	[0.95, 1.05]	-0.0036	[-0.05, 0.05]
A5	0.9865	[0.95, 1.05]	0.0100	[-0.05, 0.05]

AS	0.9963	[0.95, 1.05]	-0.0100	[-0.05, 0.05]
Temperature	34.5229 degC			

ThruBit Density Calibration Report				
Tool Model-Serial Number:		PS-PS01D		
Source Number:				
Shop Calibration Performed:		Fri Mar 15 09:23:41 2013		

REFERENCE			
	Density	Units	
Aluminium	2.607	g/cc	
Magnesium	1.752	g/cc	
READINGS			
Outputs	Counts	Units	Expected
SS1 Background	134.66	cps	[130.00, 170.00]
LS1 Background	144.00	cps	[130.00, 170.00]
LS4 Background	30.55	cps	[27.00, 35.00]
SS1 Aluminium	4854.37	cps	[4500.00, 5500.00]
LS1 Aluminium	895.24	cps	[750.00, 950.00]
LS4 Aluminium	1054.10	cps	[843.00, 1068.00]
SS1 Magnesium	7975.27	cps	[7000.00, 9000.00]
LS1 Magnesium	5799.57	cps	[5250.00, 6250.00]
LS1 Al + Fe	766.72	cps	[650.00, 800.00]
LS4 Al + Fe	476.15	cps	[382.00, 471.00]
RESULTS			
SS Slope	1.68		[1.52, 1.77]
LS Slope	0.42		[0.38, 0.45]
PEF K Factor	5.227		[3.510, 6.170]
PEF B Factor	-0.582		[-0.700, -0.410]

Caliper Shop Calibration performed:		Fri Mar 15 09:23:41 2013	
RESULTS			
Reference	Reading	Units	
12.00	1841.19	in	
9.00	2001.59	in	
6.00	2158.21	in	

DENSITY PRE-SURVEY CHECK Performed:		Mon Apr 08 09:30:56 2013		
Outputs	Counts	Units	Expected	
SS1 Background	134.25	cps	[130.62, 138.70]	
LS1 Background	143.04	cps	[139.68, 148.32]	
LS4 Background	31.47	cps	[28.71, 32.38]	

CALIPER PRE-SURVEY CHECK Performed:		Thu Apr 04 15:27:52 2013		
Reference	Readings	Units	Expected	
6.00	5.99	in	[5.80, 6.20]	

Compensated Neutron Calibration Report

Tool Model-Serial Number:
Source Number:

PS-PS14N

Calibration Tank Temperature:
Shop Calibration Performed:

63.7 degF
Mon Mar 18 10:54:09 2013

BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	786.5	cps	
LS Counts	26.1	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.1063	SS/LS	
Tank Ratio Gain	1.0283		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	8812.9	cps	
LS Counts	832.9	cps	
AI Ratio Ref	10.797	SS/LS	
AI Ratio	10.880	SS/LS	
AI Ratio Gain	0.99		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed:

Mon Apr 08 09:25:20 2013

Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

Gamma Ray Calibration Report

Tool Model-Serial Number:

PS-PS27T

Performed:

Mon Apr 08 09:54:28 2013

Calibrator Value:

165.0

GAPI

Background Reading:

47.8

cps

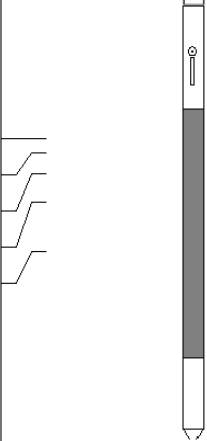
Calibrator Reading:

359 6

ops
rns

Calibrator Reading		000.0	cps
Sensitivity:		0.3750	GAPI/cps
Inclinometer Calibration Report			
Performed:	Sun Jun 13 14:33:21 1993		
	Low Read.	High Read.	Low Ref. High Ref.
X Accelerometer	0.00	1.00	0.00 1.00 gee
Y Accelerometer	0.00	1.00	0.00 1.00 gee
Z Accelerometer	0.00	1.00	0.00 1.00 gee

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
Thrubit	66.92		Cablehead-S Solid Weakpoint	2.31	2.13	5.00
Thrubit	64.61		PSBDOT	3.87	2.25	35.00
Thrubit	60.75		HangOff_Tool	5.00	2.38	60.00
Thrubit	55.75		10-1	0.88	2.13	3.95
Thrubit	54.87		Universal Joint	1.46	2.06	15.00
TBBAT	53.41		TBBAT-A (PS13B) Thrubit Battery	6.13	2.13	38.20
TBBAT2	47.29		TBBAT2-A (PS33B) Thrubit Battery	6.13	2.13	40.00
TMG GR GRTEMP	41.16 41.04 40.20		TMG-PS (PS27T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
Thrubit	35.04		Decentralizer Decentralizer (Small)	4.50	2.13	70.00
CNLSC	28.60		TBN-PS (PS14N) ThruBit Neutron	4.77	2.13	63.00
			TBD-PS (PS01D) Thrubit Density	10.48	2.13	91.00
LSW1 DCAL	18.04 17.13					

A1_P	10.60		TBI-PS (PS38R) ThruBit Induction	15.29	2.13	94.00				
A2_P	10.10									
A3_P	9.35									
A4_P	8.35									
A5_P	6.60									
Dataset:		luann_mem.db: field/well/proc1/pass1.4								
Total Length:		66.92 ft								
Total Weight:		560.15 lb								
O.D.		2.38 in								

 ThruBit A Schlumberger Company	Company	SANDRIDGE ENERGY
	Well	LuAnn 2925 2-36H
	Field	MINNEOLA
	County	HARPER
	State	KANSAS