



ThruBit
A Schlumberger Company

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

Company SANDRIDGE ENERGY
Well RICHARD 3206 3-30H 3L
Field EASTHAM
County HARPER
State KANSAS

Company SANDRIDGE ENERGY
Well RICHARD 3206 3-30H 3L
Field EASTHAM
County HARPER State KANSAS

Location: API #: 15-077-21964-0300
SEC 25 TWP 32S RGE 7W
250' FWL & 790' FEL
Permanent Datum G.L. Elevation 1411'
Log Measured From D.F. 20.5' ABOVE PERM DATUM
Drilling Measured From D.F.
Other Services
THRUBIT
PORTAL BIT
Elevation
K.B. 1431.5'
D.F. 1431.5'
G.L. 1411'

Date	24 OCT 2013
Run Number	ONE
Depth Driller	9055'
Depth Logger	9016'
Bottom Logged Interval	8995'
Top Log Interval	5136'
Casing Driller	7.0" @ 5147'
Casing Logger	5136'
Bit Size	6.125"
Type Fluid in Hole	WBM
Density / Viscosity	8.4 / 28
pH / Fluid Loss	10.5 / 99
Source of Sample	MUD SENSOR
Rm @ Meas. Temp	0.23 OHM@65DEGF
Rmf @ Meas. Temp	0.19 OHM@65DEGF
Rmc @ Meas. Temp	0.26 OHM@65DEGF
Source of Rmf / Rmc	CALCULATED
Rm @ BHT	0.13 OHM@120DEGF
Time Circulation Stopped	21:00 23 OCT 2013
Time Logger on Bottom	21:48 23 OCT 2013
Maximum Recorded Temperature	120 DEGF
Equipment Number	T005
Location	OKC, OK
Recorded By	C.PARKER
Witnessed By	C.DAVIS

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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: 8927' LOGGED TO: 5136'
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 4.5" CSG., ft3
RIGMINDER USED TO ACQUIRE LOG DEPTH
LOG CORRELATED TO MWD GR
RIG: HORIZION 15

CREW: C.PARKER R.WILSON I.HERNDEZ

Service Ticket No. 2276 API No. 15-077-21964-0300 PGM Ver WARRIOR 7.0

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

EQUIPMENT DATA

GAMMA RAY	NEUTRON	DENSITY	INDUCTION
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Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	PS2T	Serial No.	ENP2N	Serial No.	PS44D	Serial No.	PS3R
Model No.	PS	Model No.	ENP	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	9016'	5136'	0 PSI	35 FPM	

	GAMMA RAY		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 OHM-M	2000 OHM-M

DIRECTIONAL INFORMATION

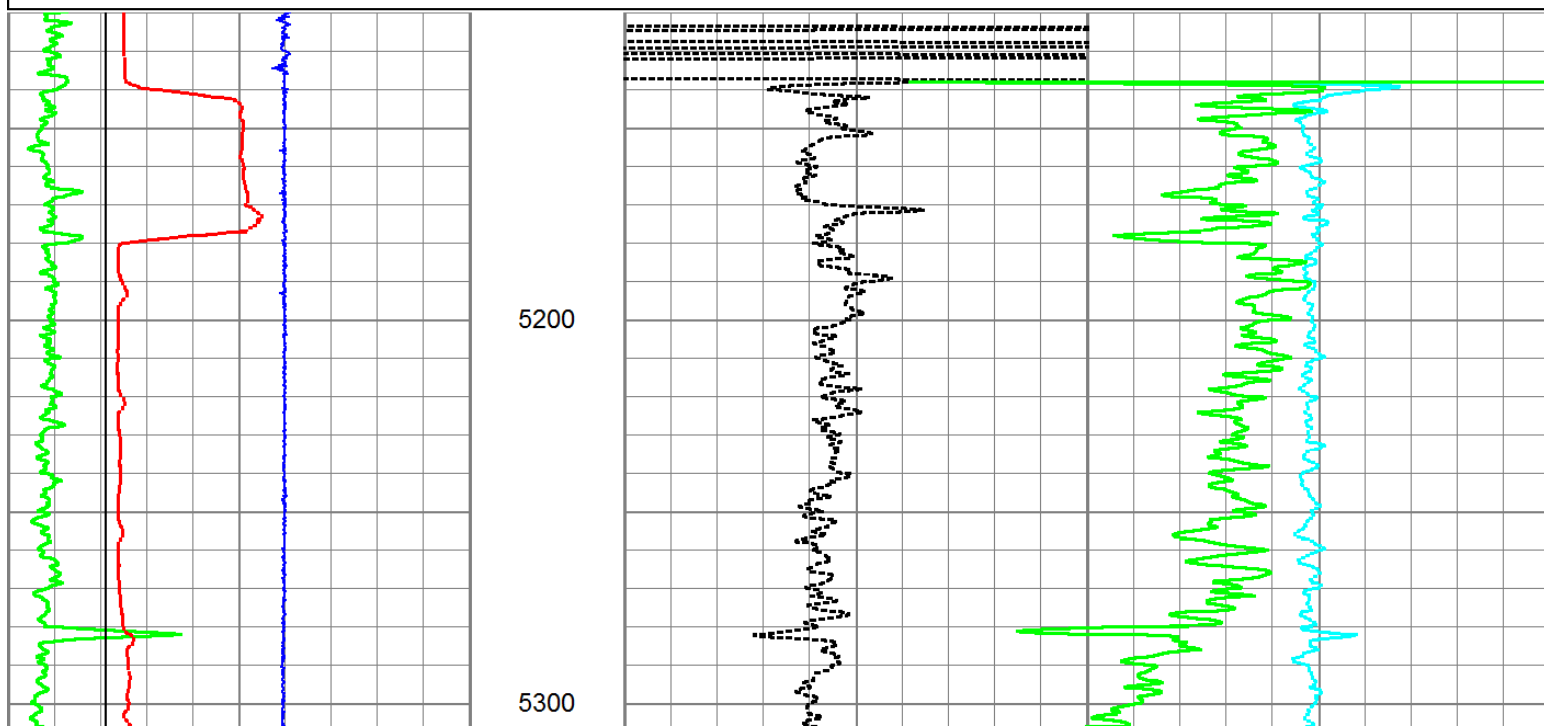
Maximum Deviation	93.86°	deg. @	9002'	KOP	3745'
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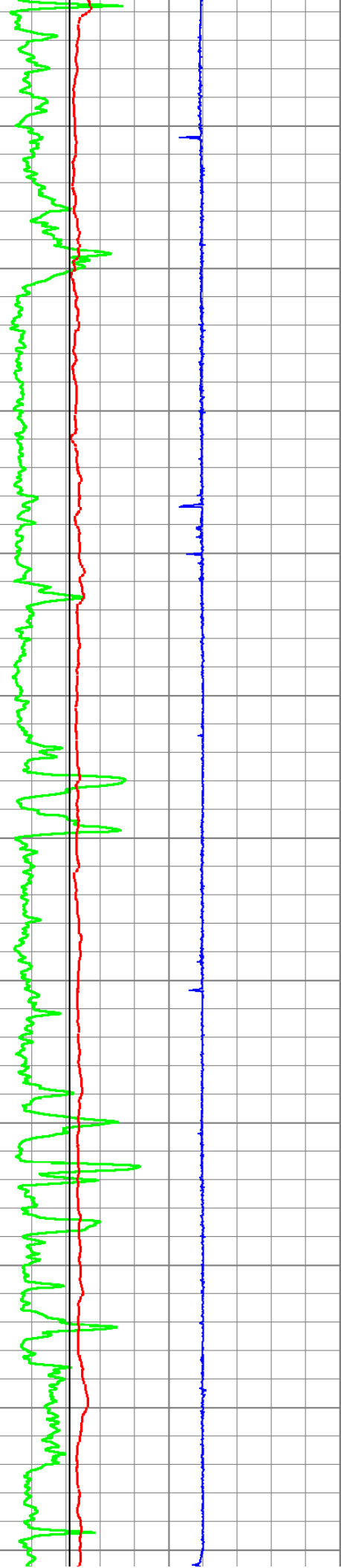


MAIN PASS

Database File: c:\users\kris.wetzel\desktop\richard 3206 l3\sandridge_richardl3_mem.db
 Dataset Pathname: proc1/pass1.2
 Presentation Format: 6_2n_chk
 Dataset Creation: Thu Oct 24 02:53:50 2013
 Charted by: Depth in Feet scaled 1:600

0	GR (GAPI)	150	0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
4	DCAL (in)	14	2	RHOB (g/cc)				3
4	BOREID (in)	14						
-5	ACCY	5						





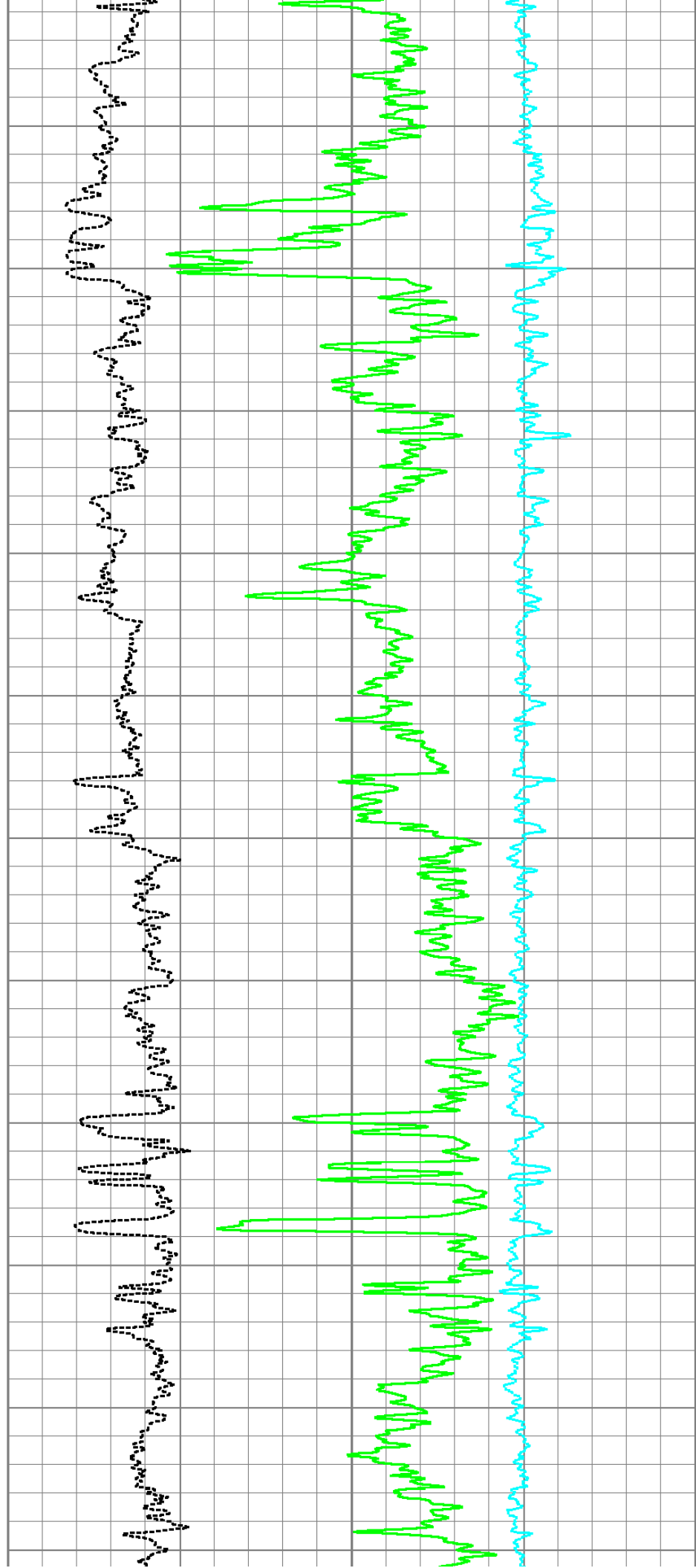
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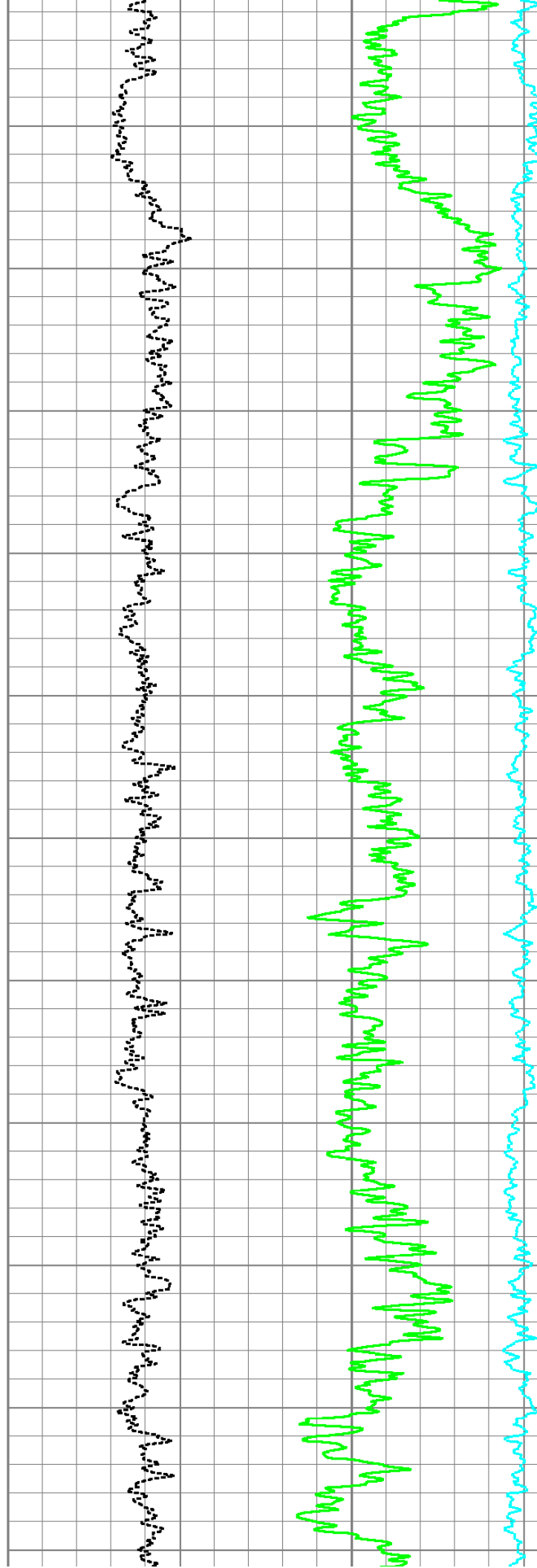
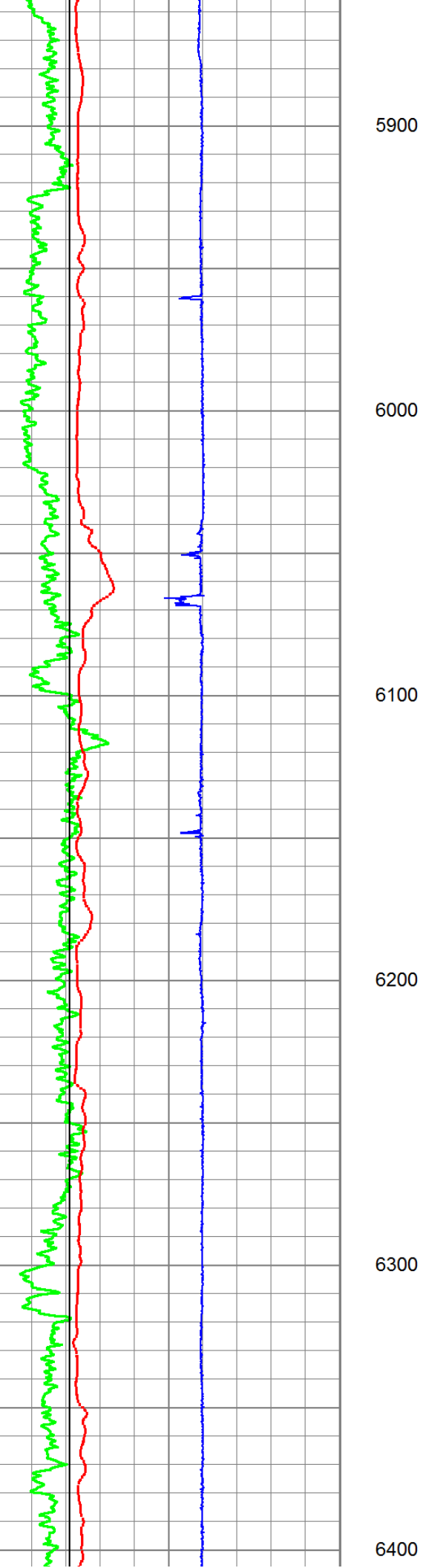
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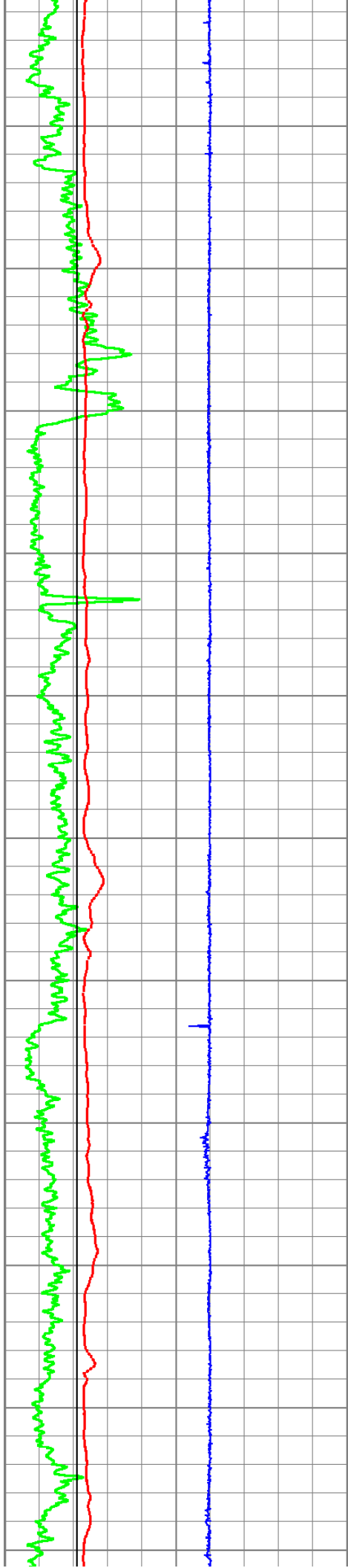
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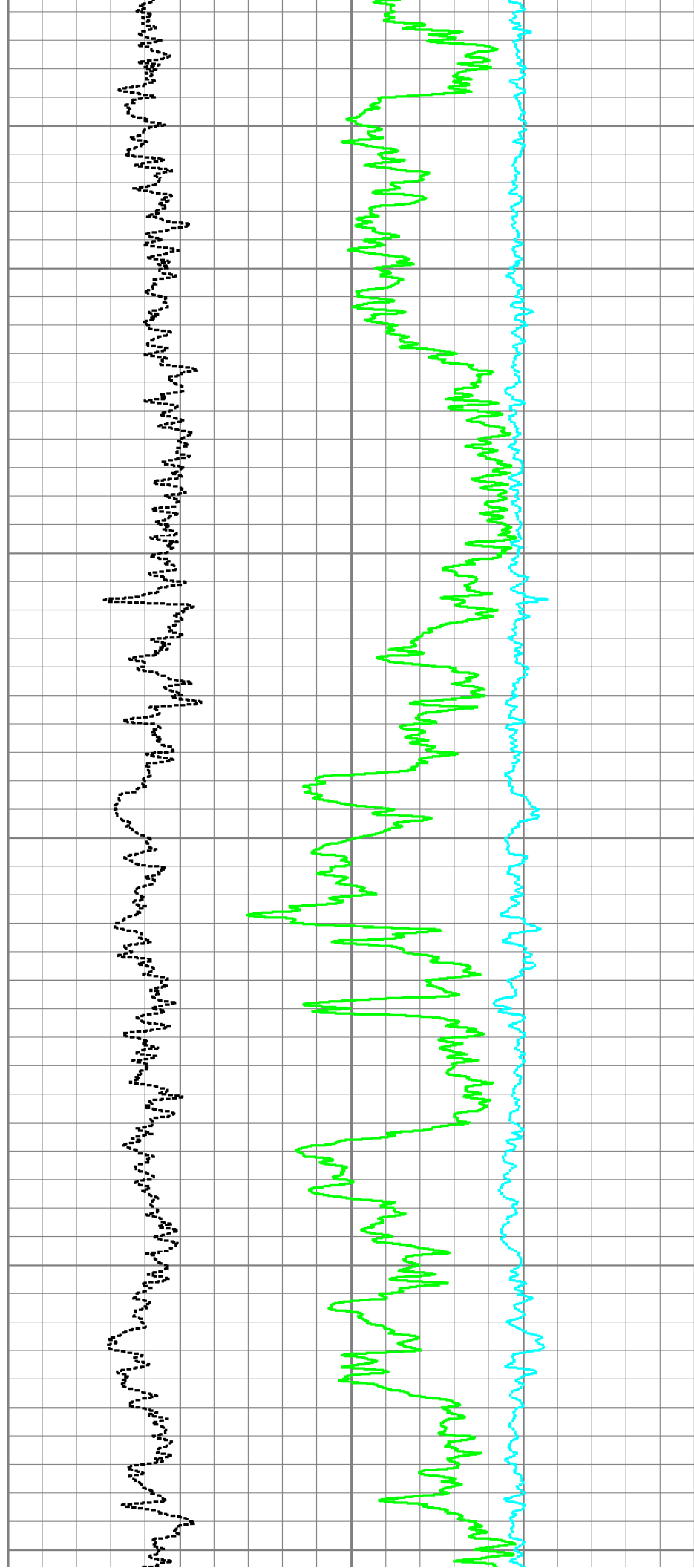
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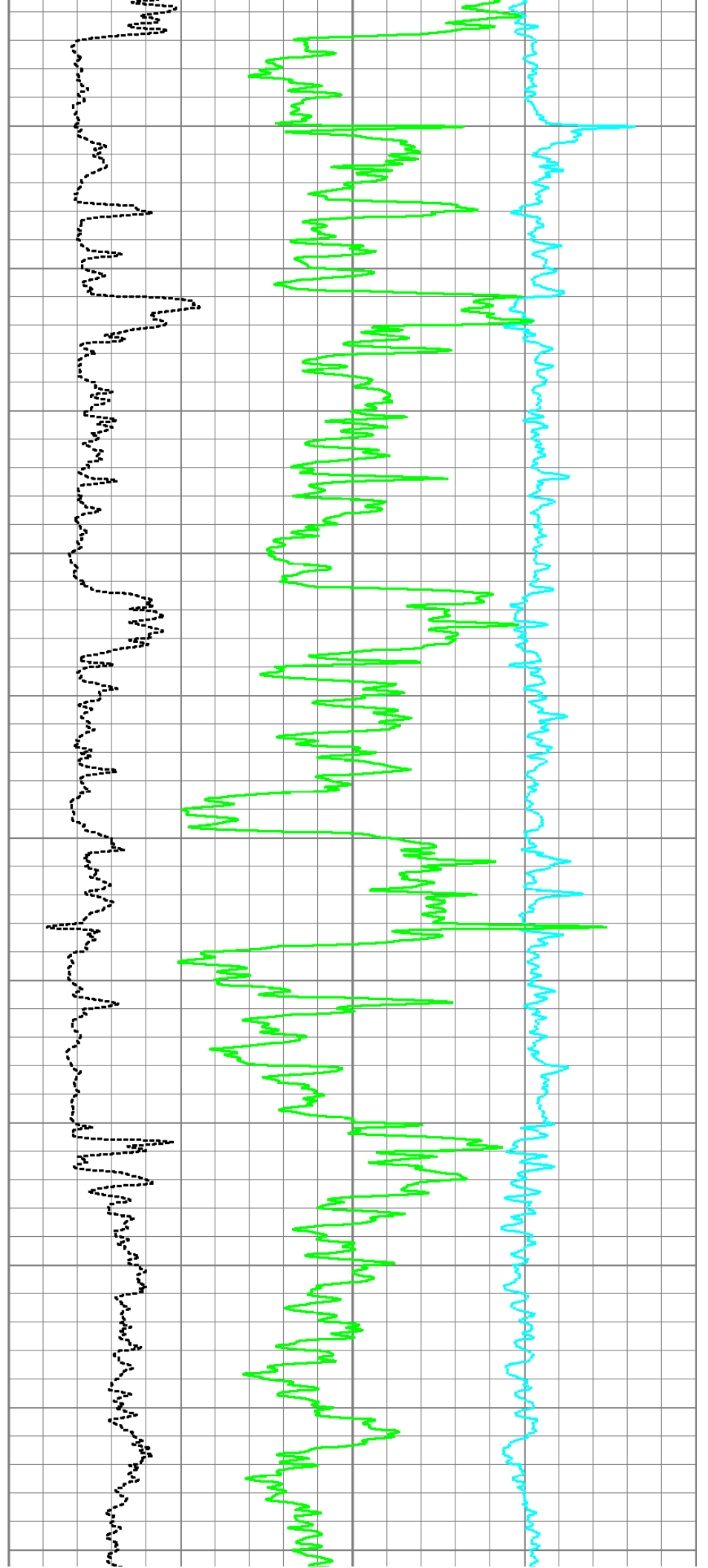
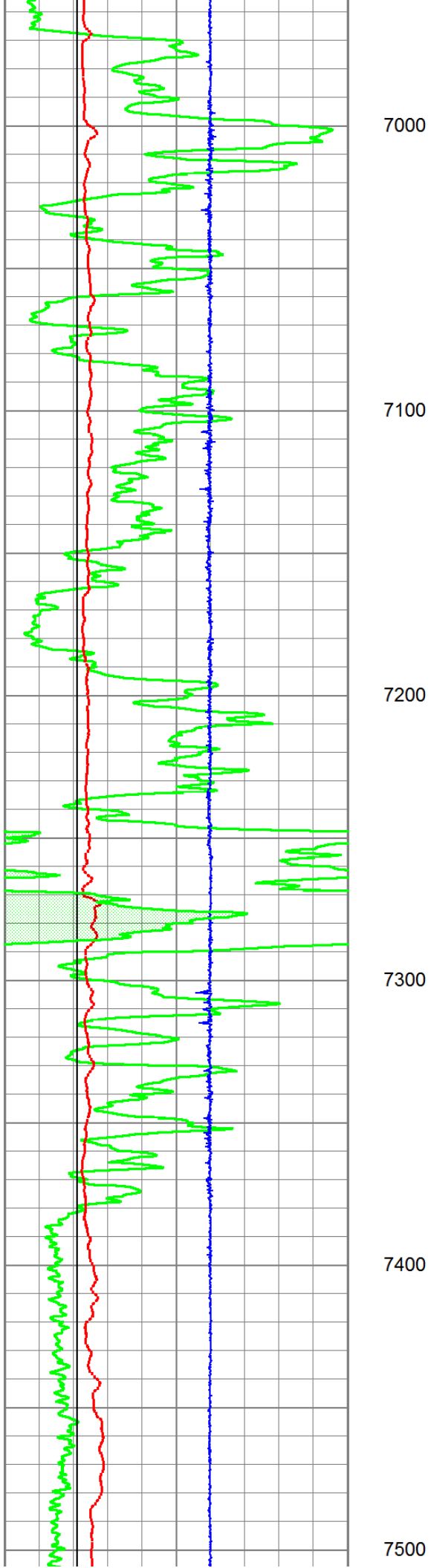
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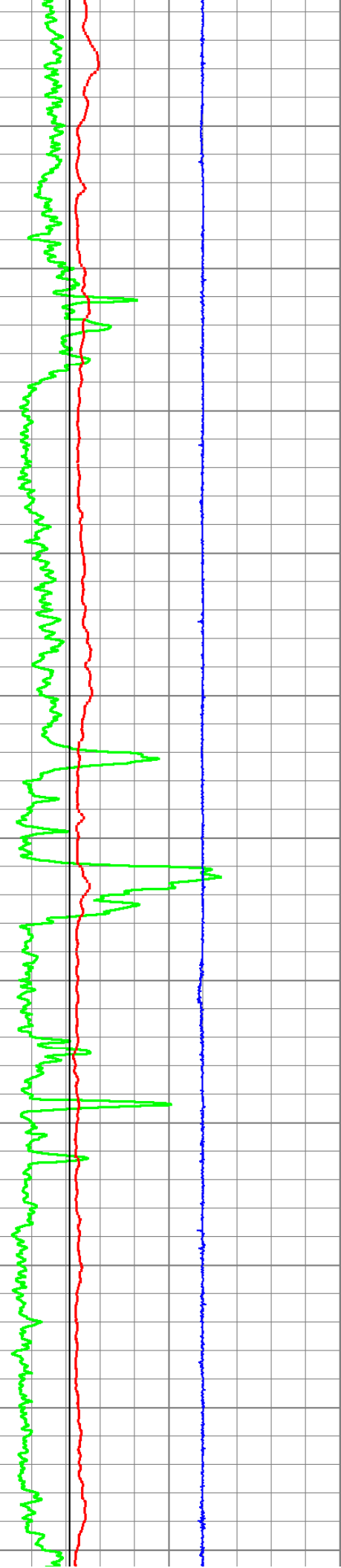
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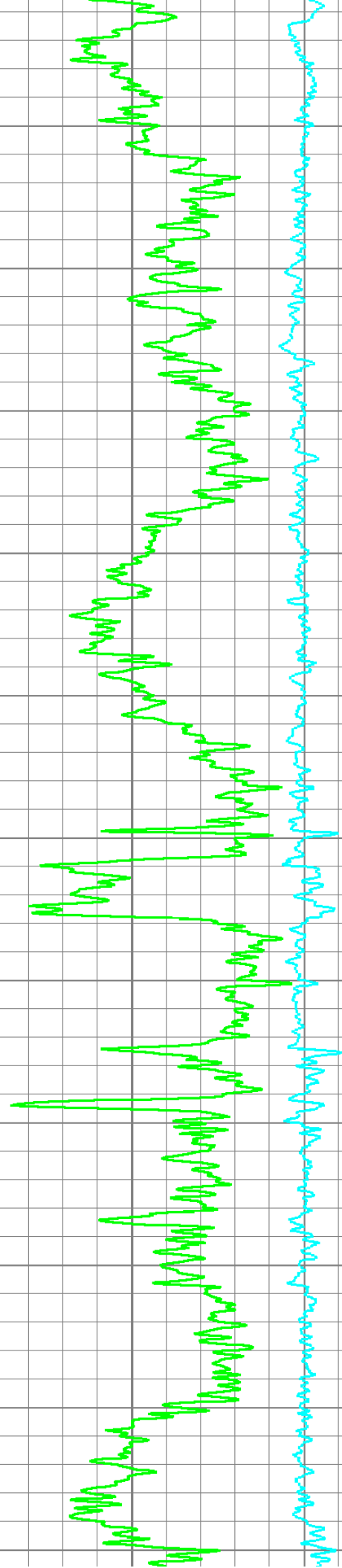
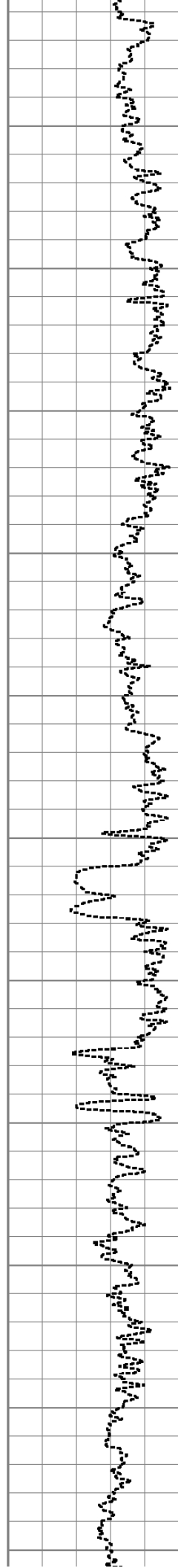
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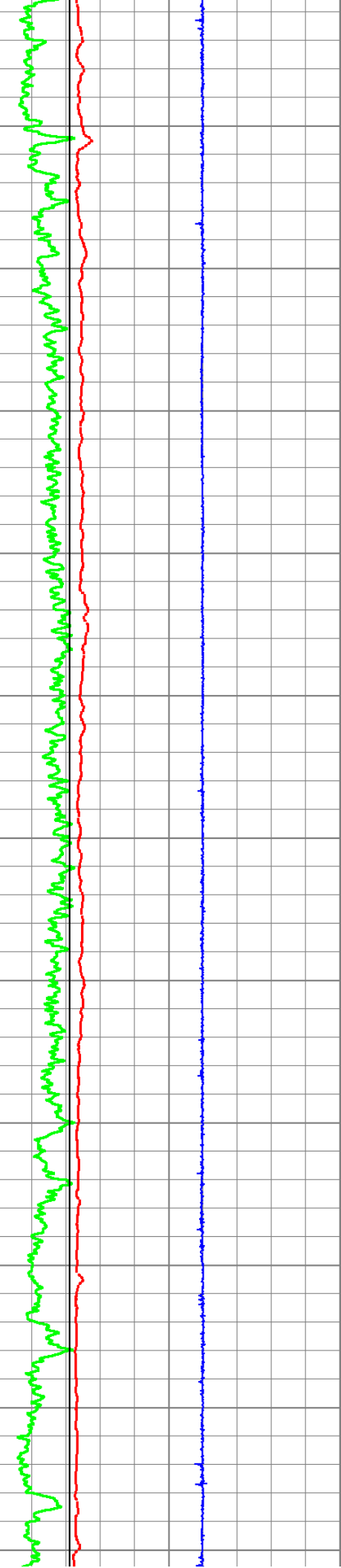
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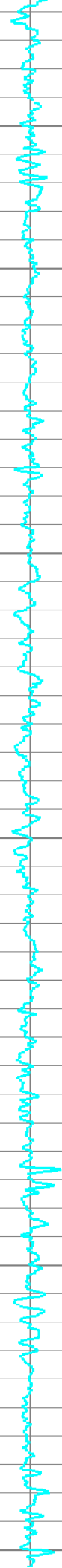
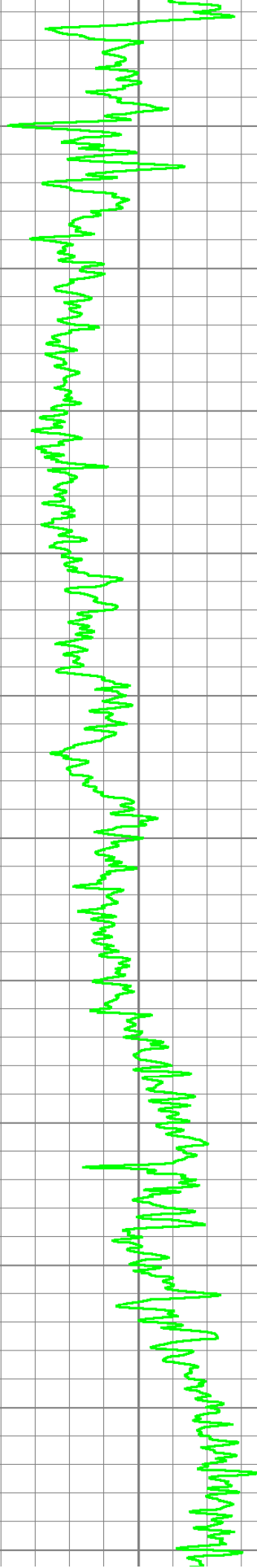
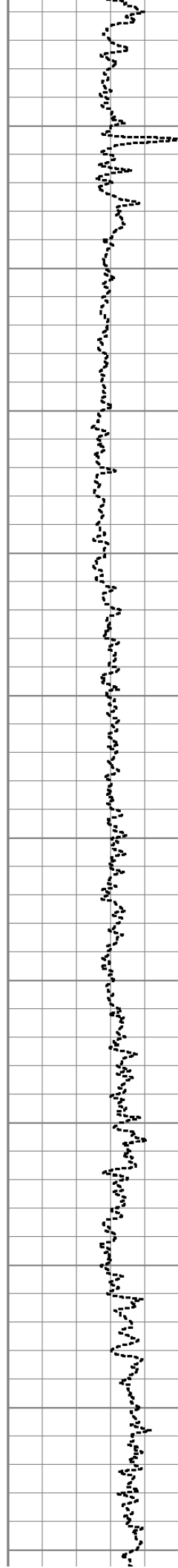
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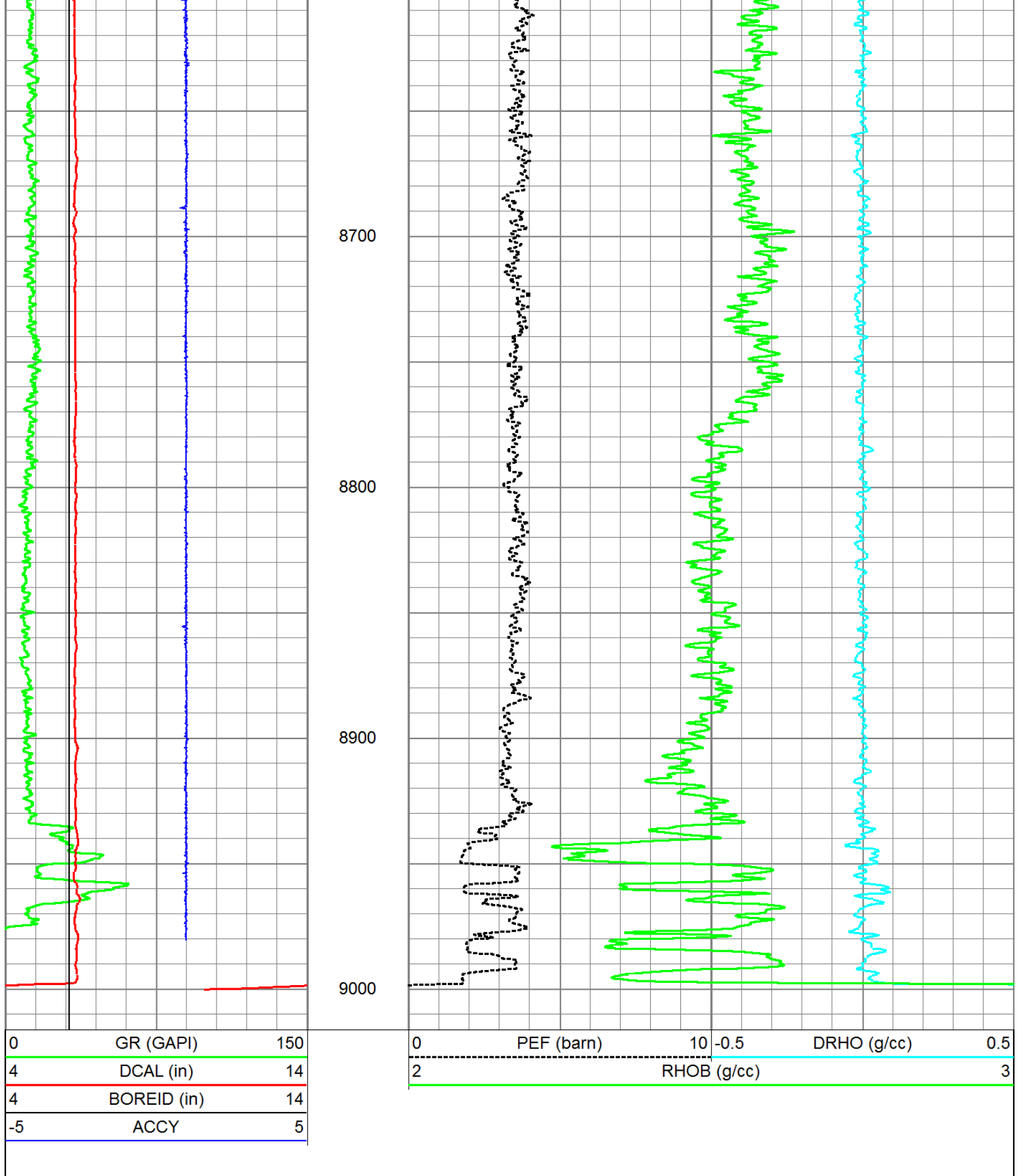
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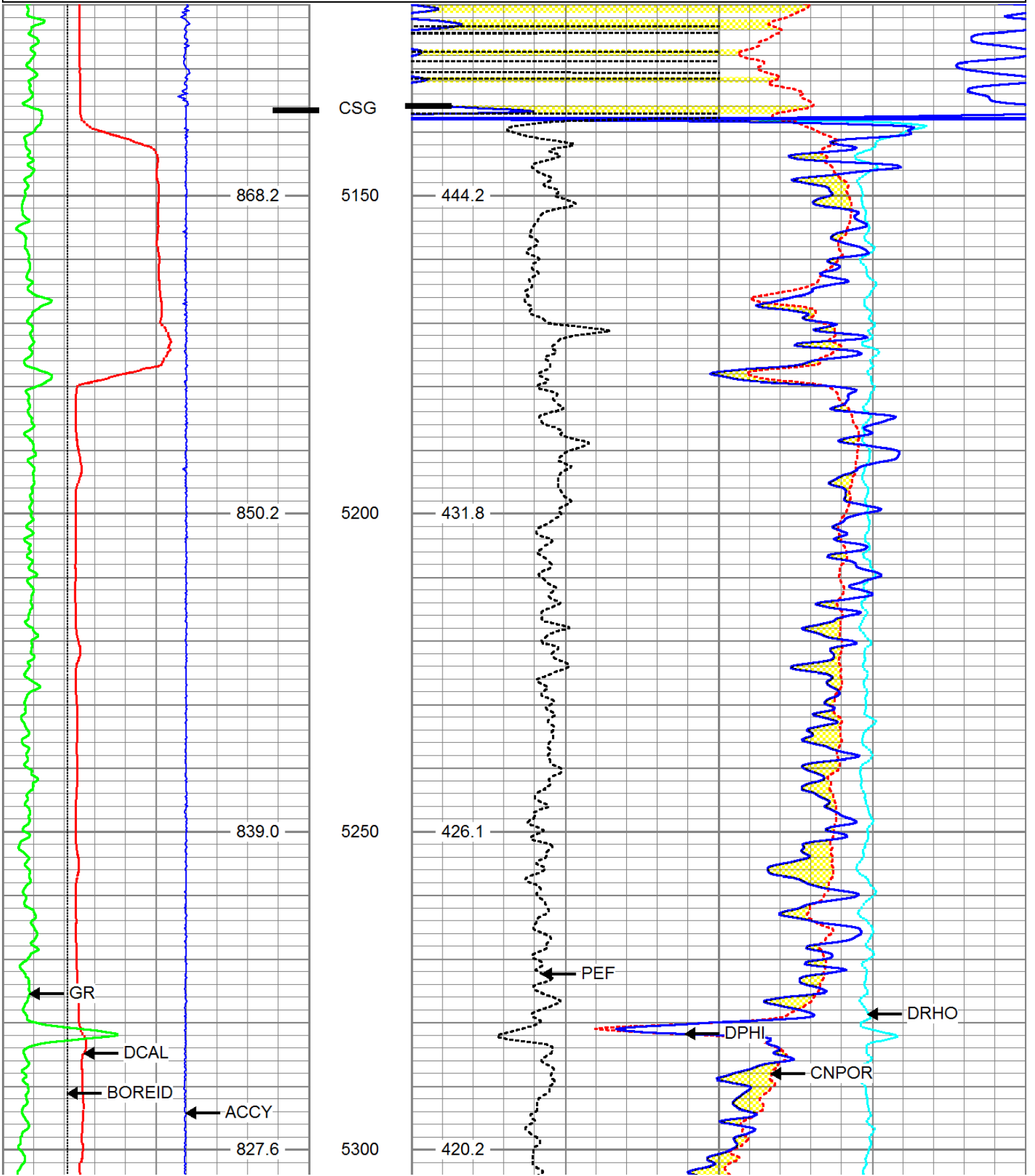


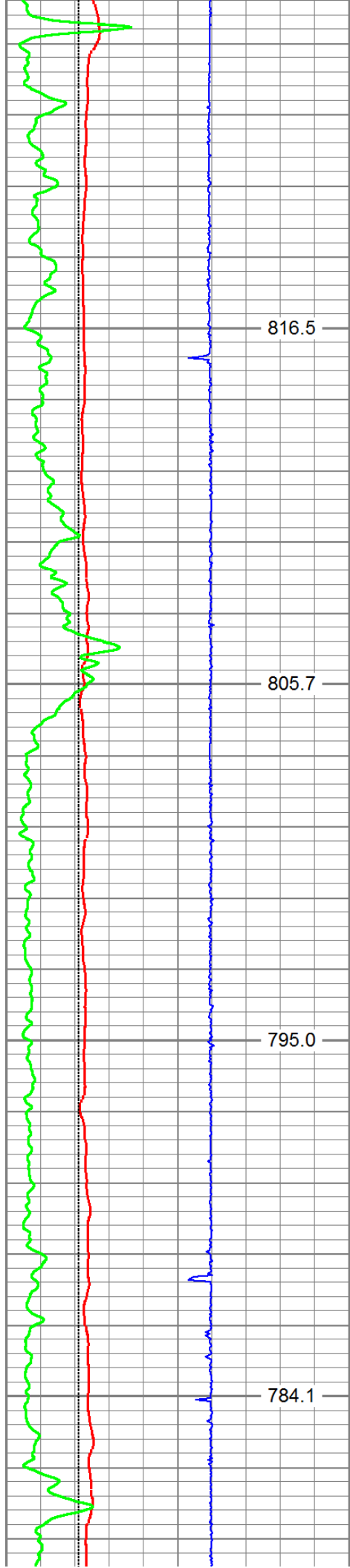


MAIN PASS

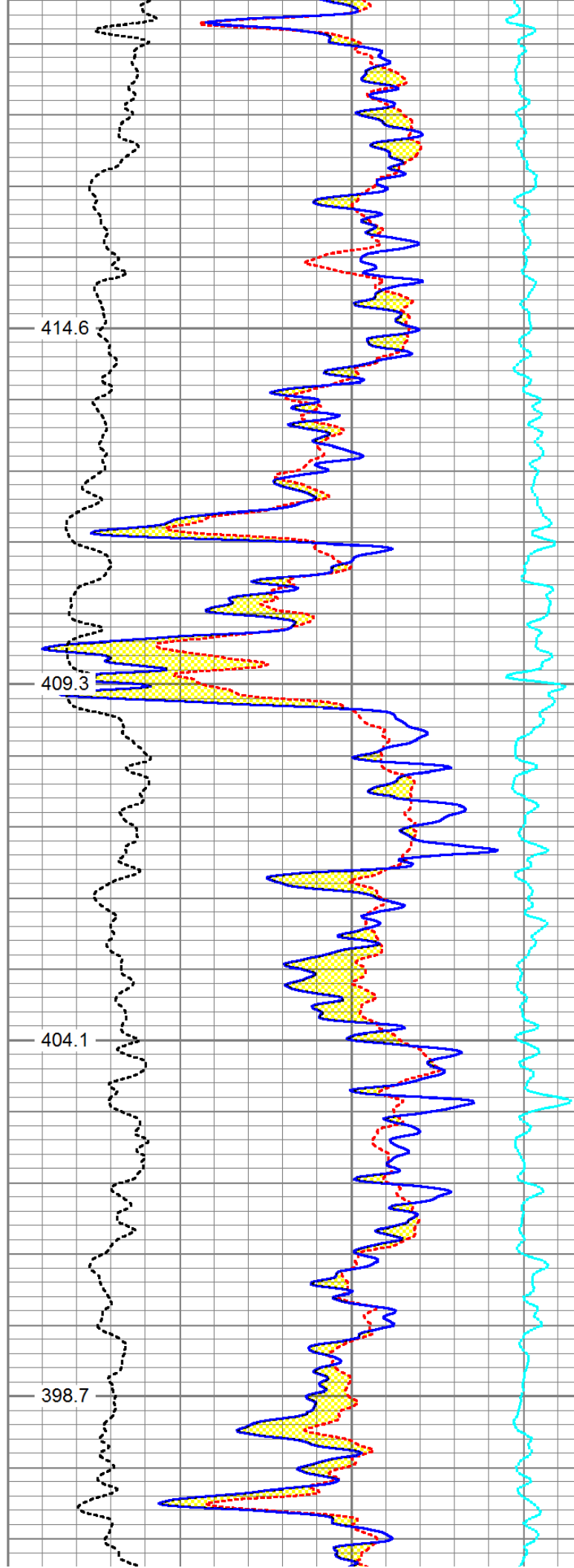
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4	BOREID (in)	14
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

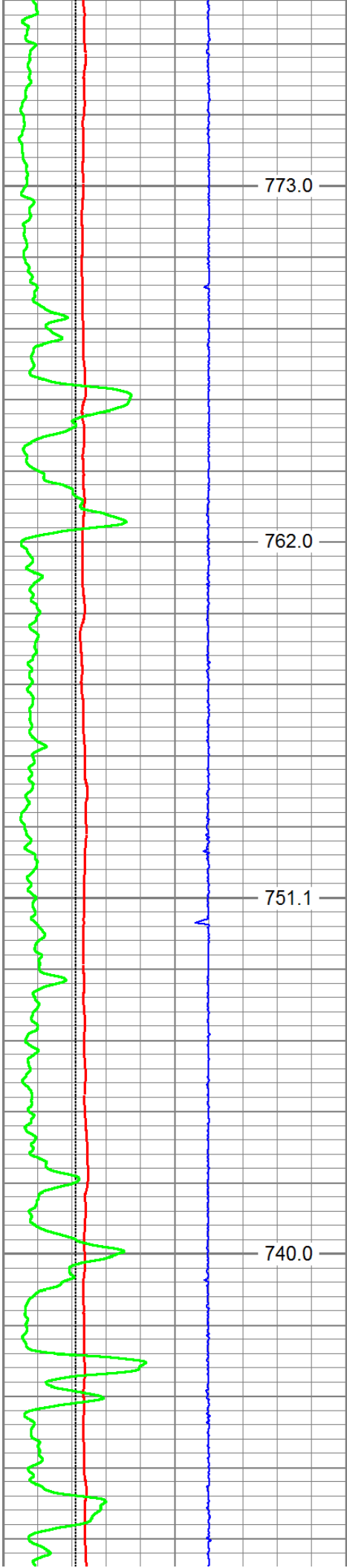
30	CNPOR (pu)	-10			
30	DPHI (pu)	-10			
0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5
	ABHV (ft3)				





5350
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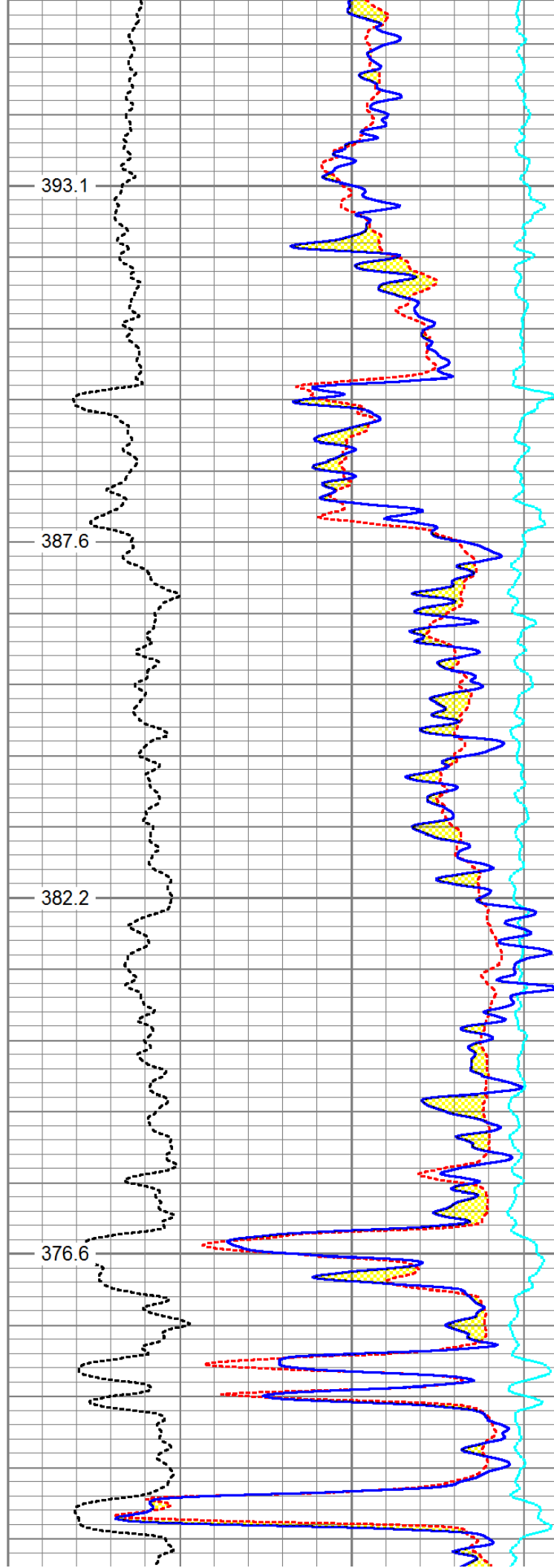


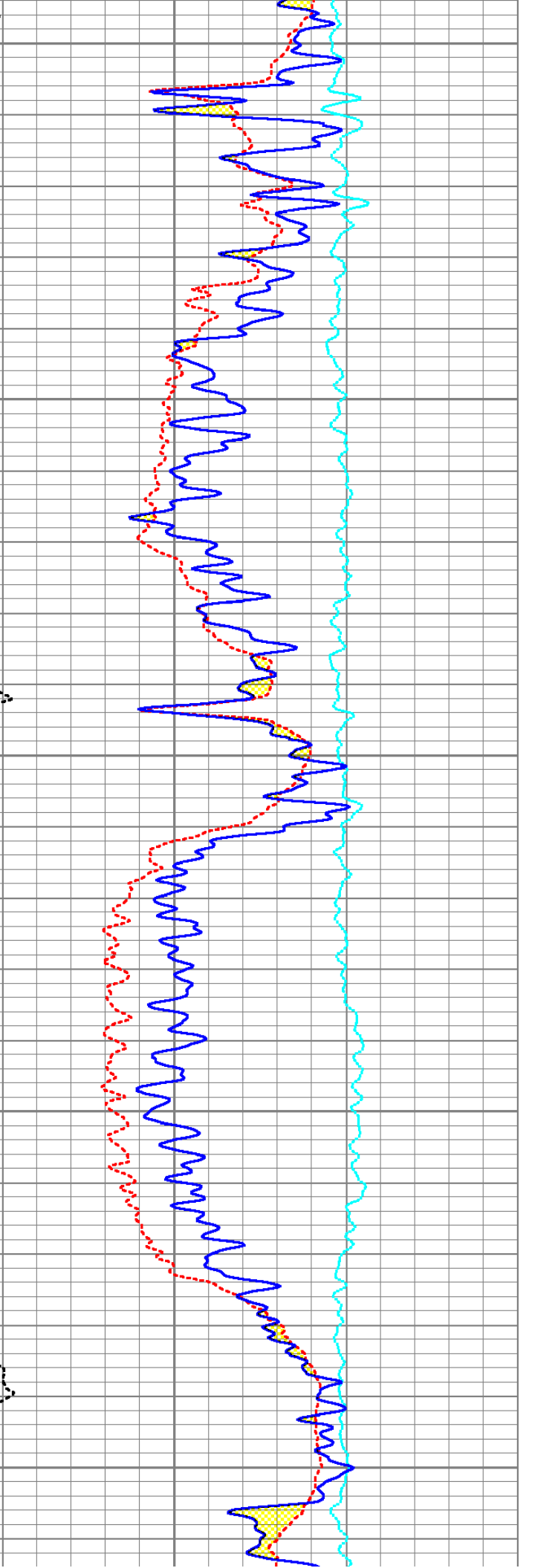
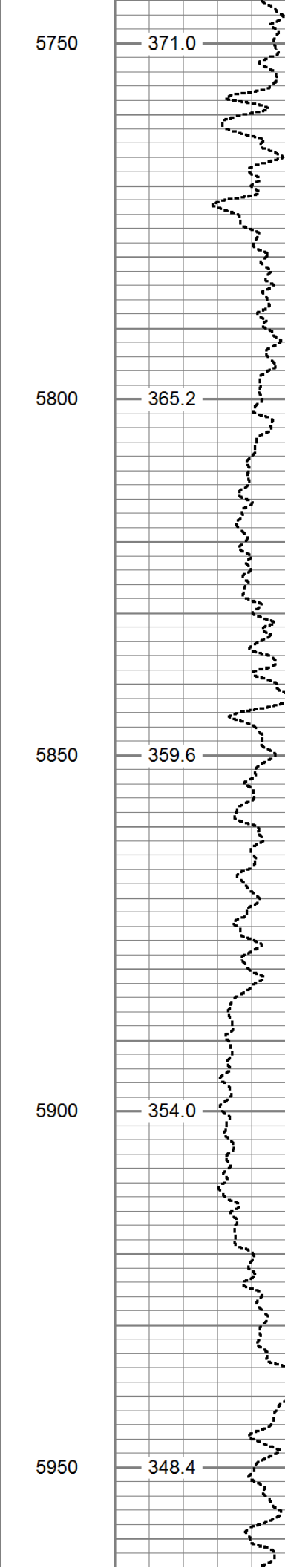
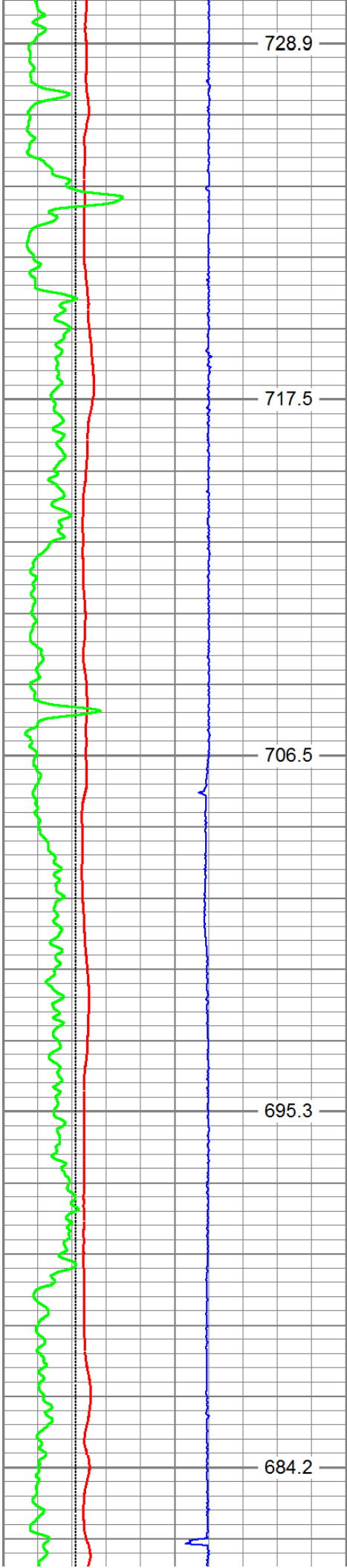
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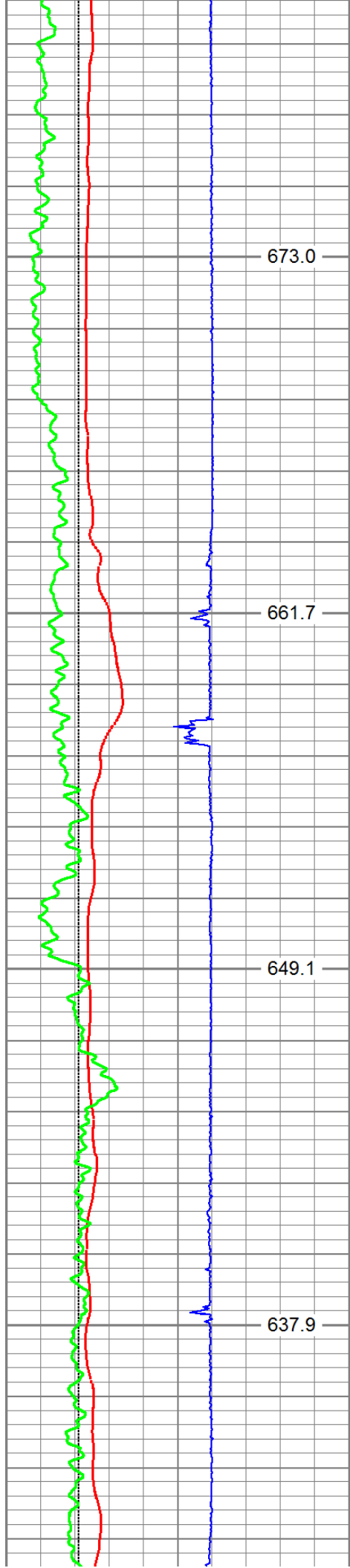
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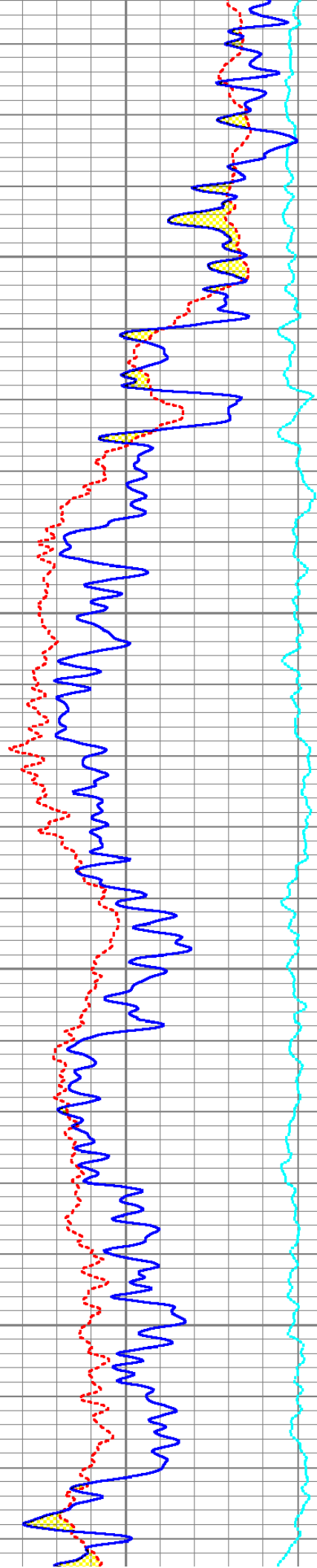
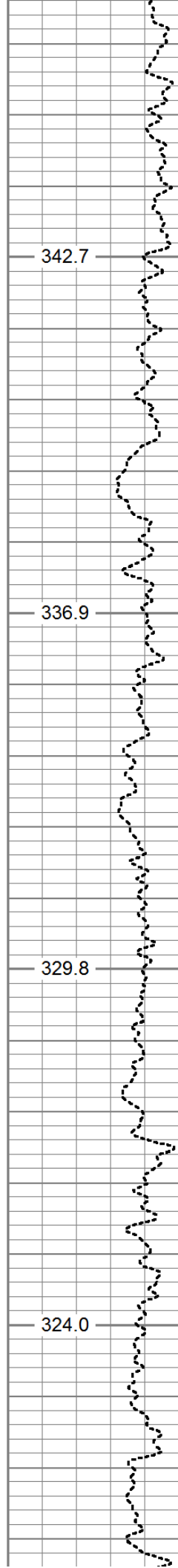


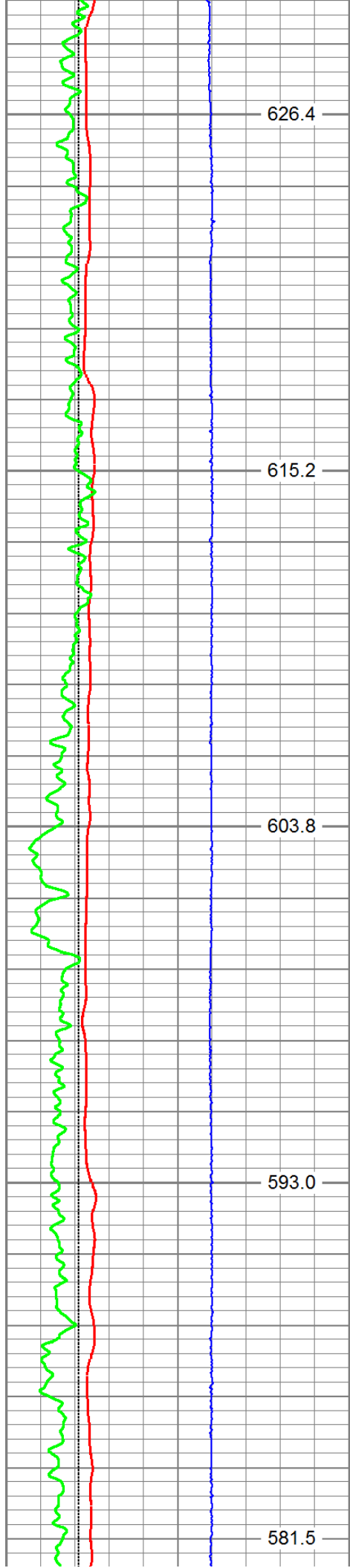
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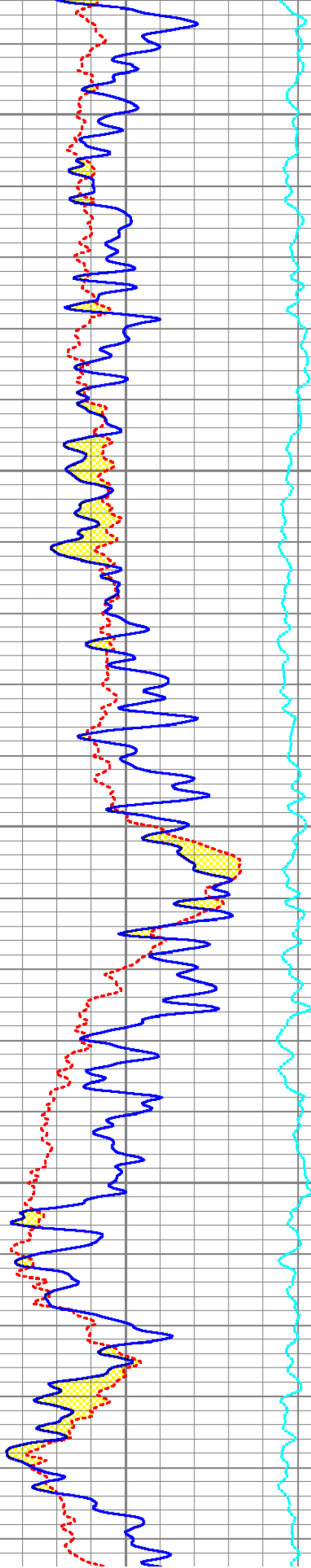
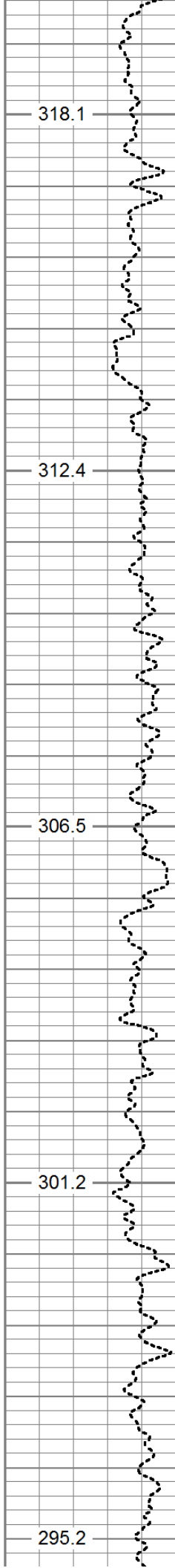
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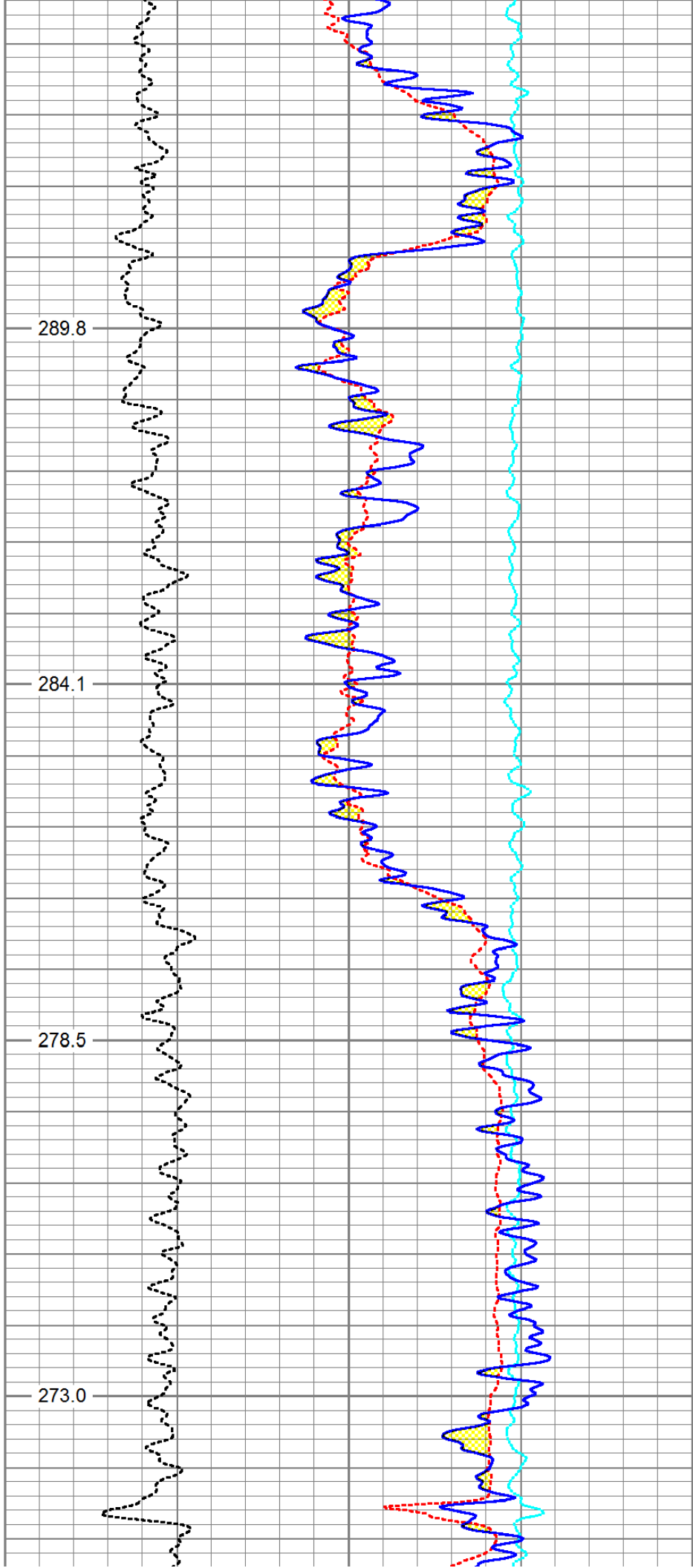
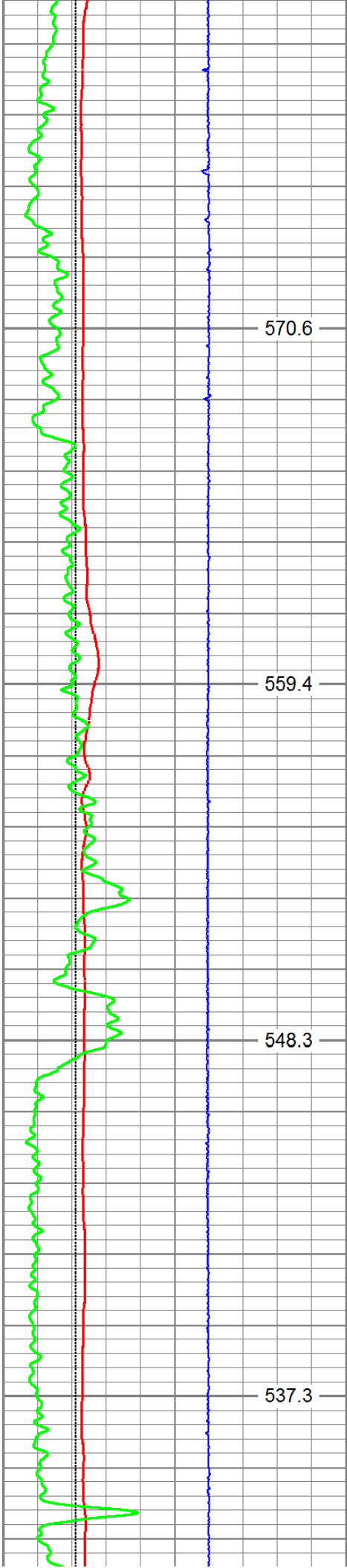
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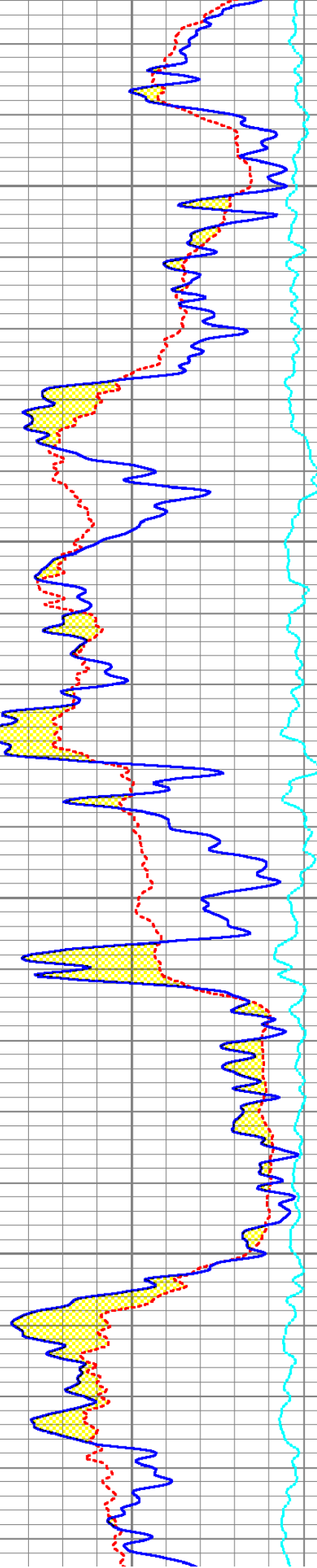
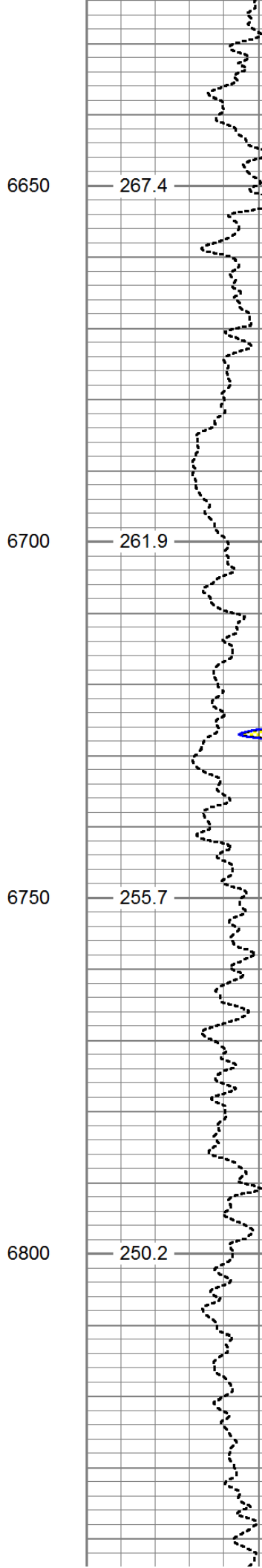
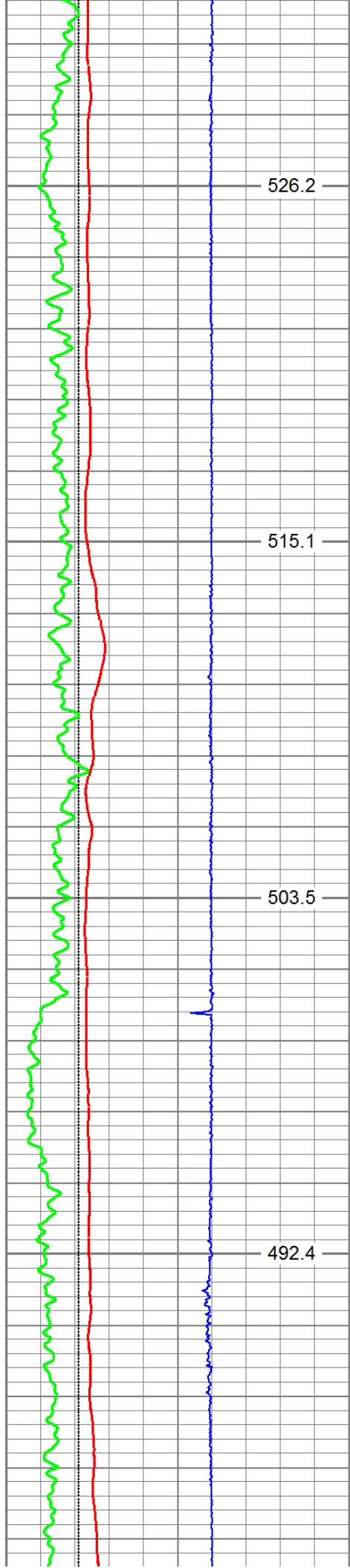


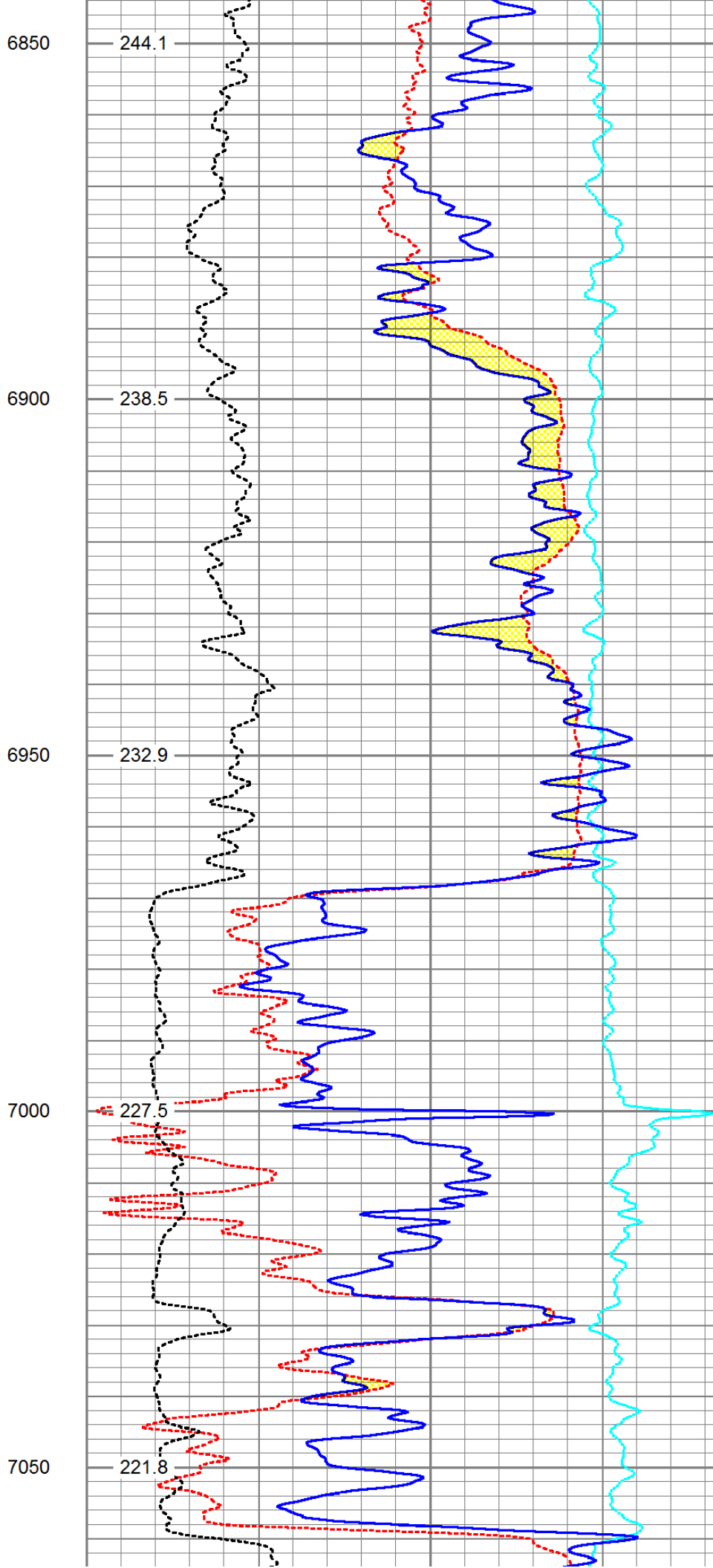
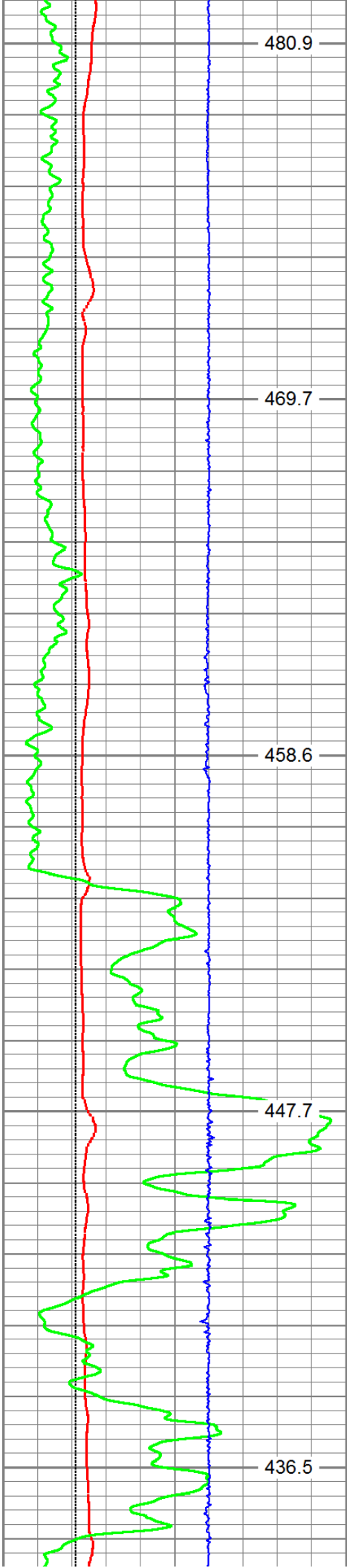


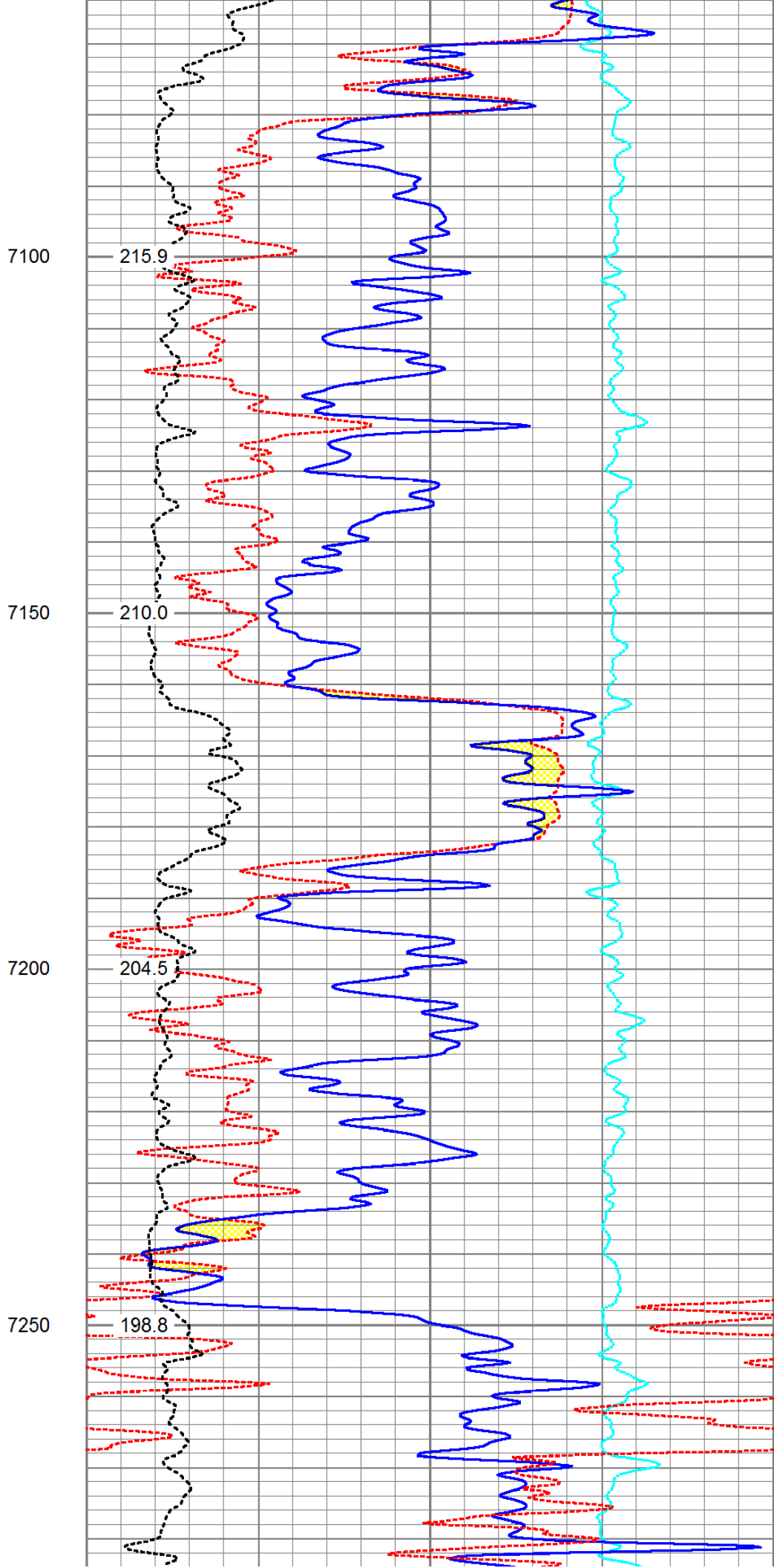
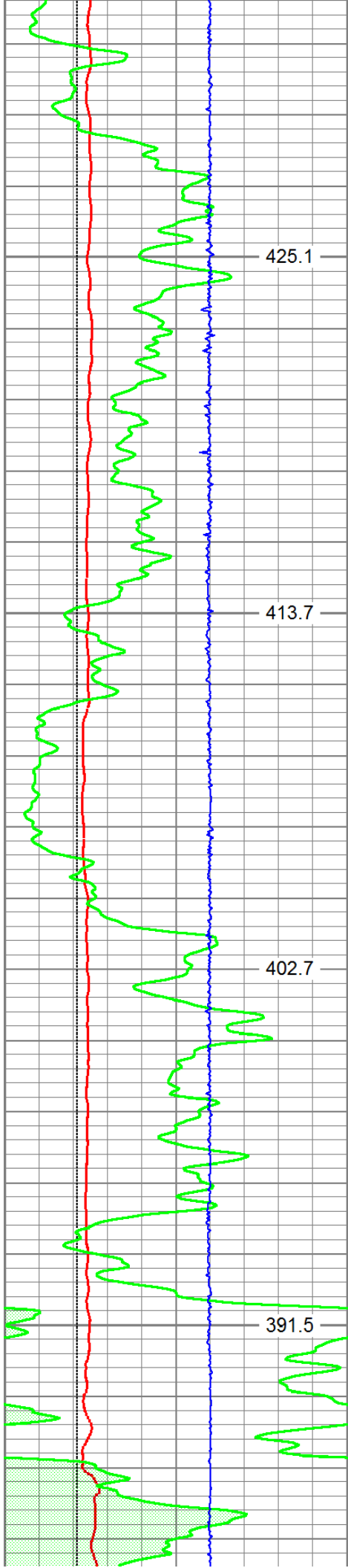
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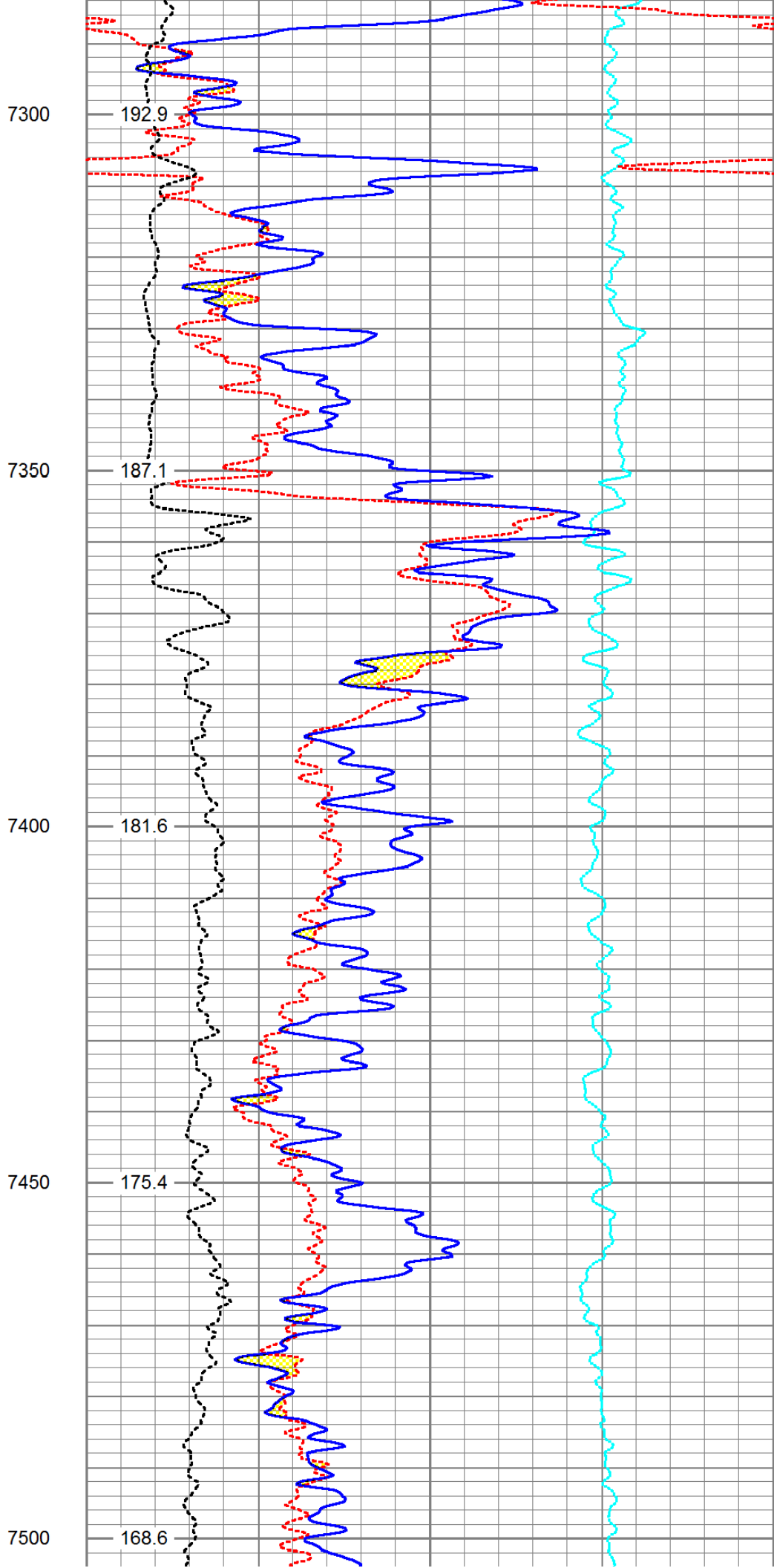
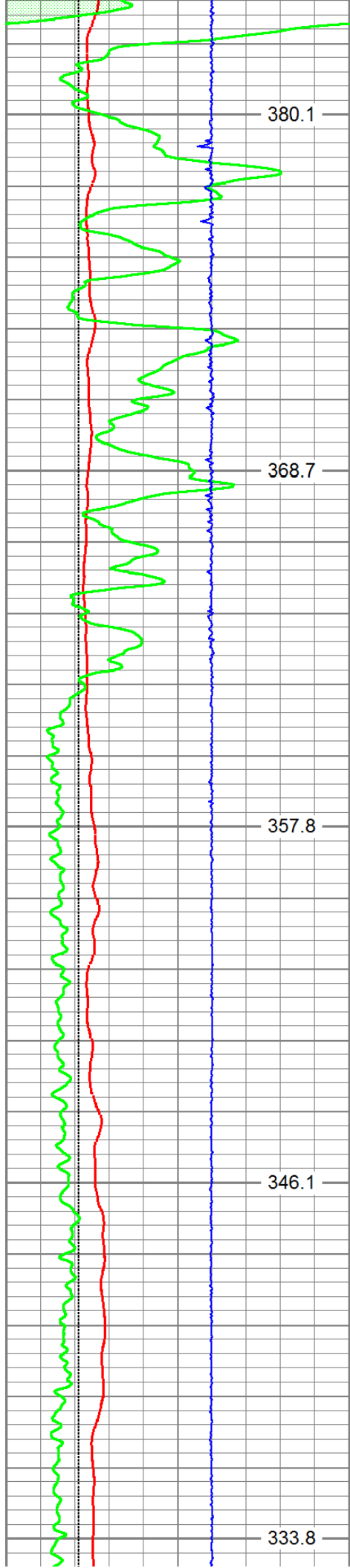


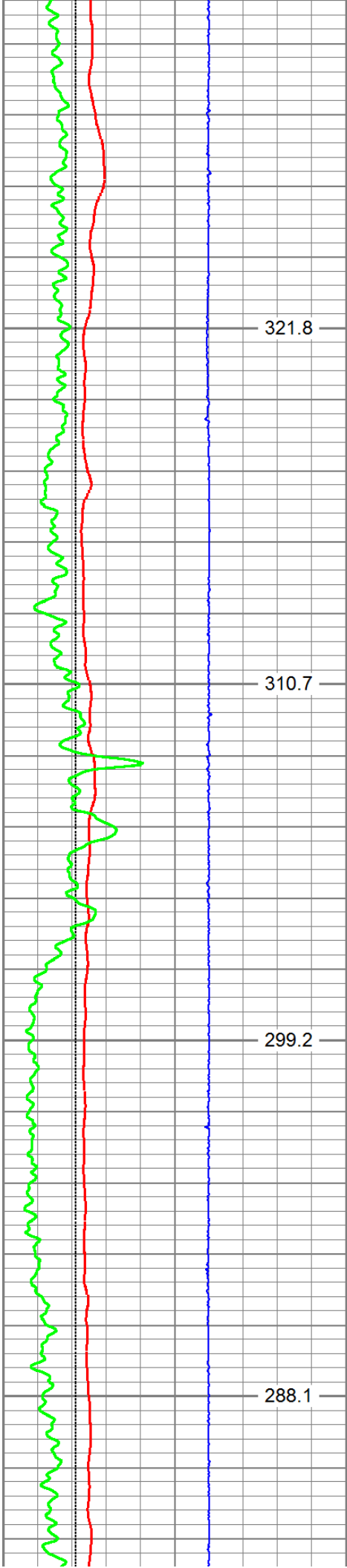




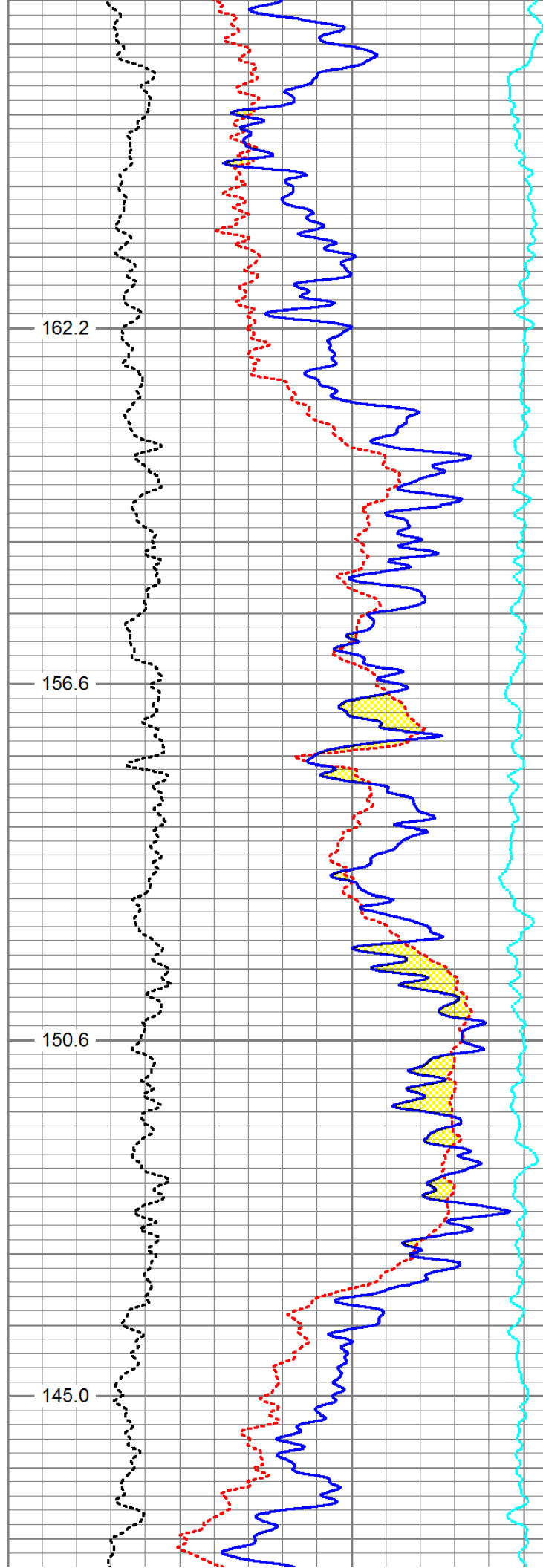


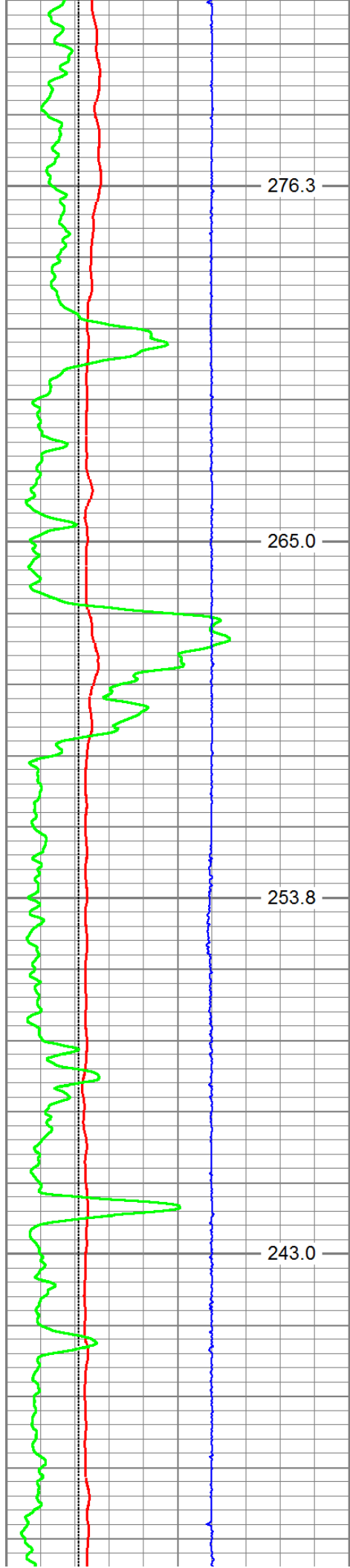






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7700



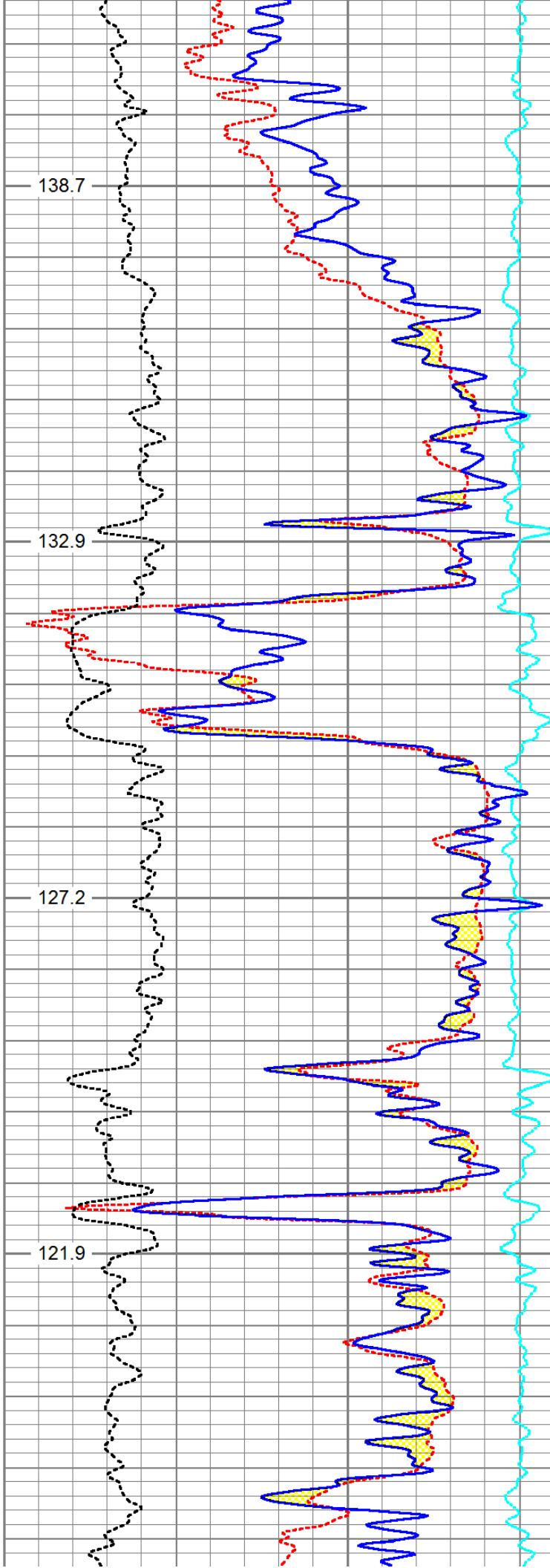


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7900

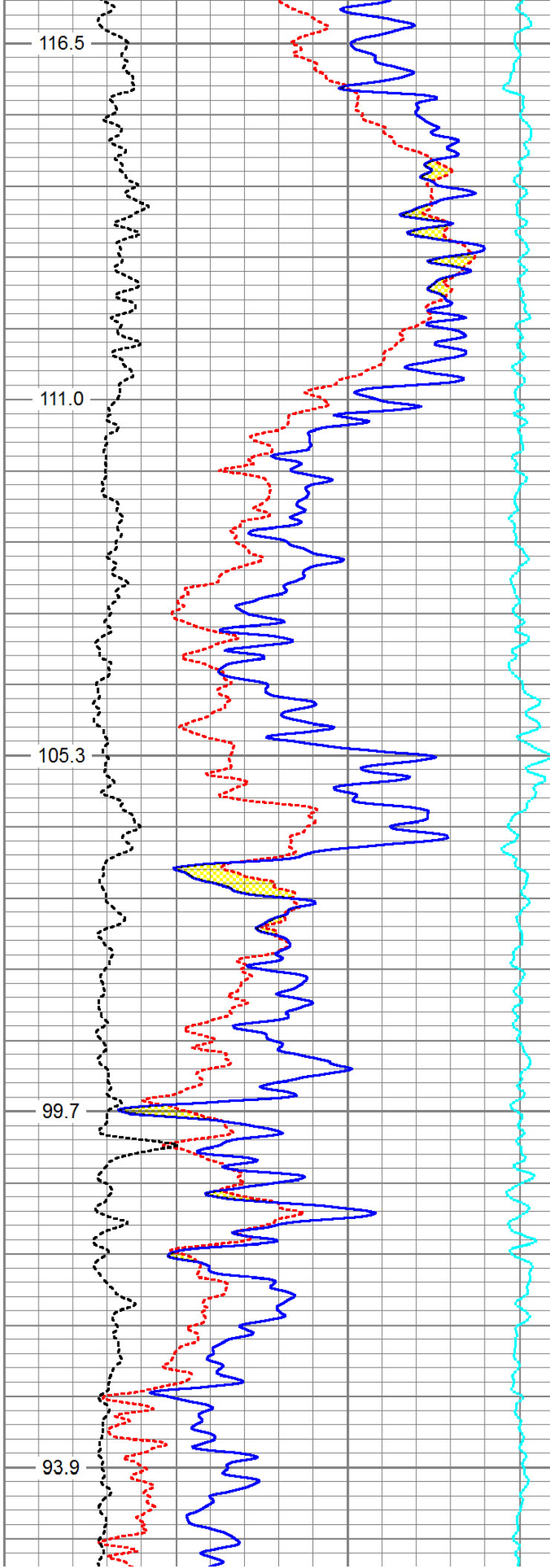
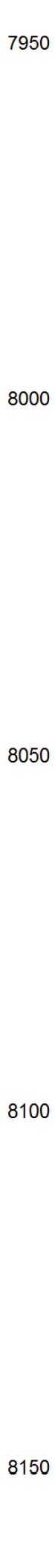
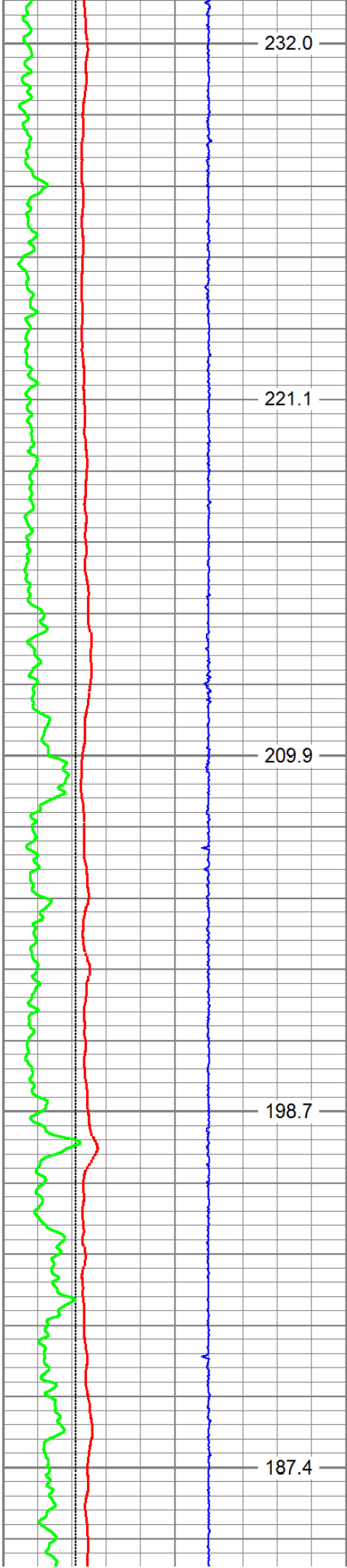


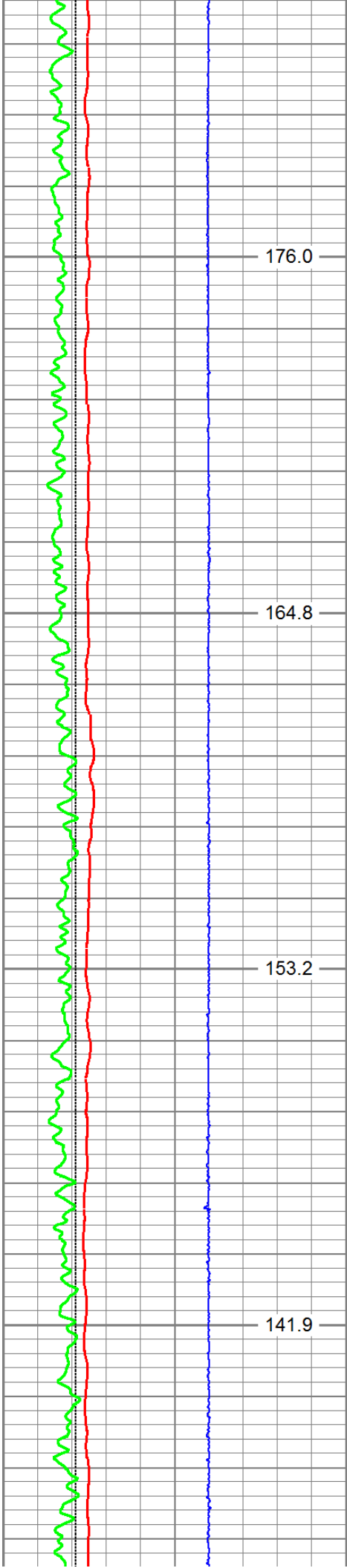
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127.2

121.9



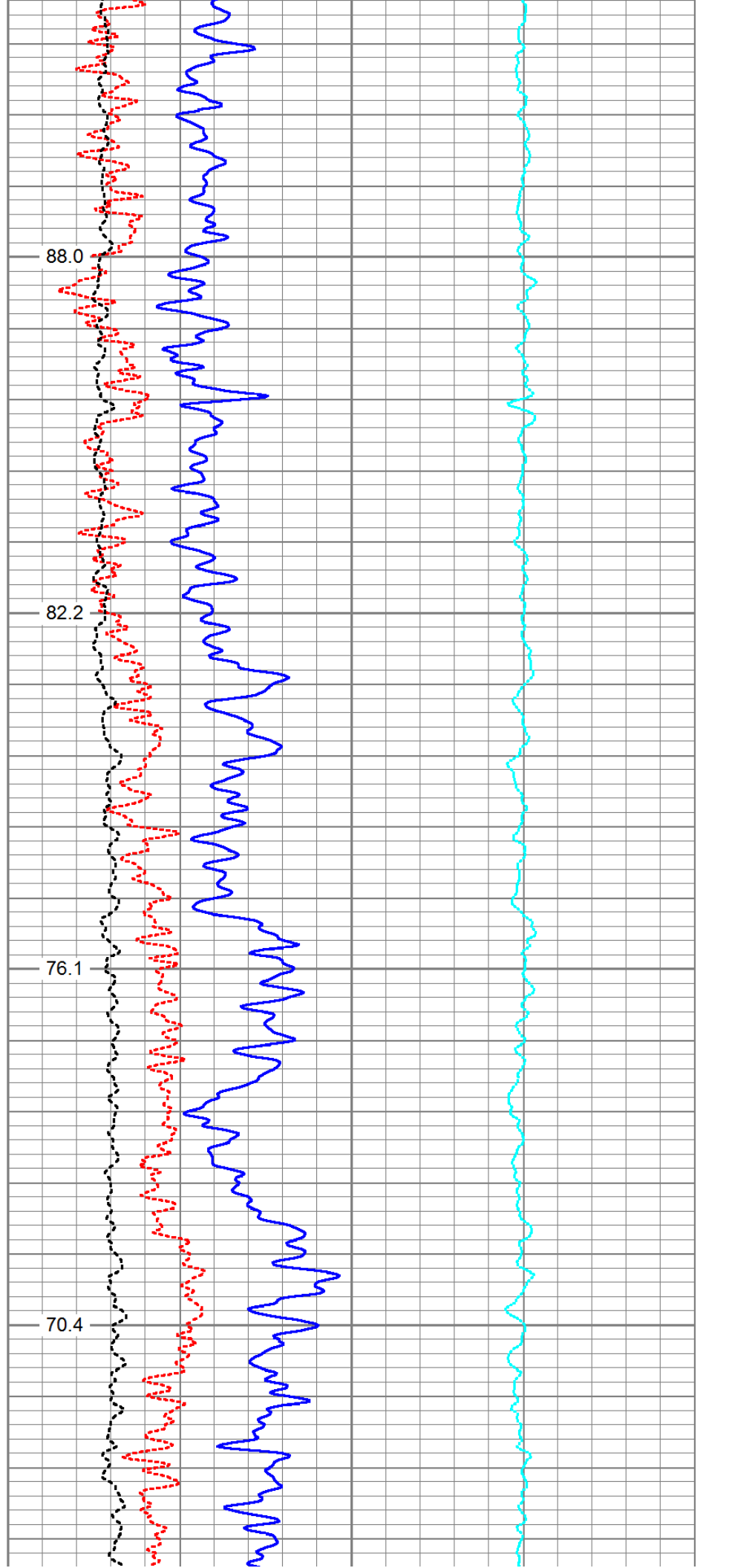


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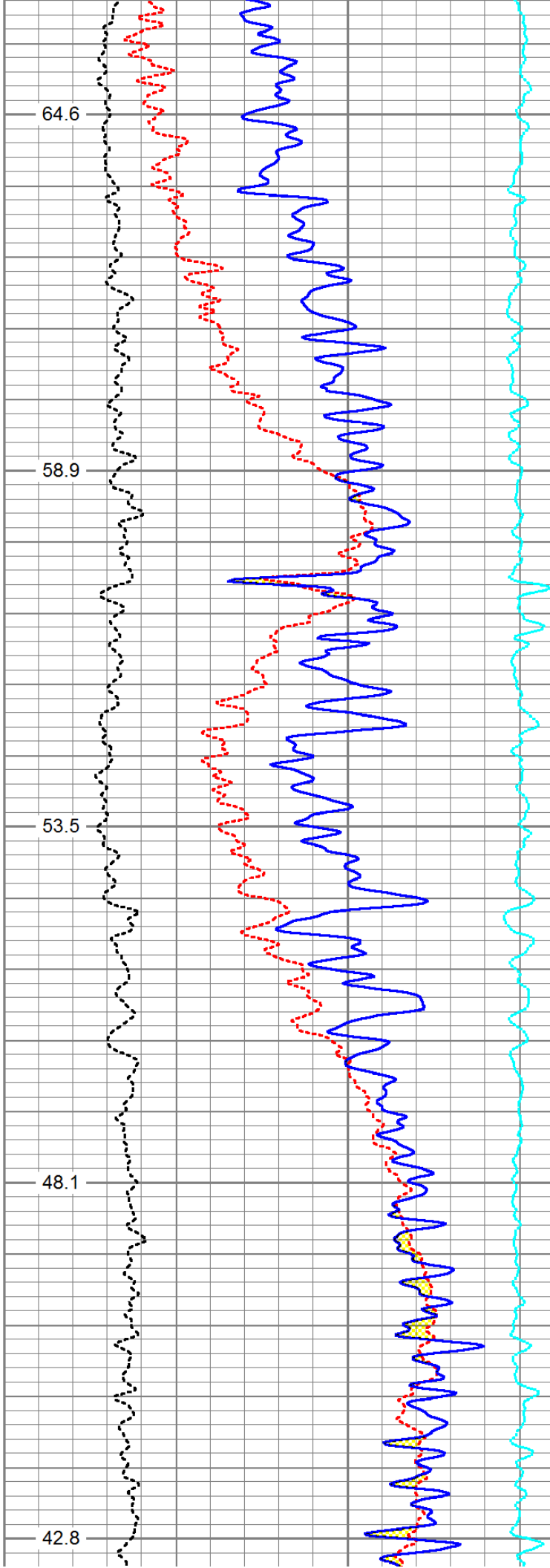
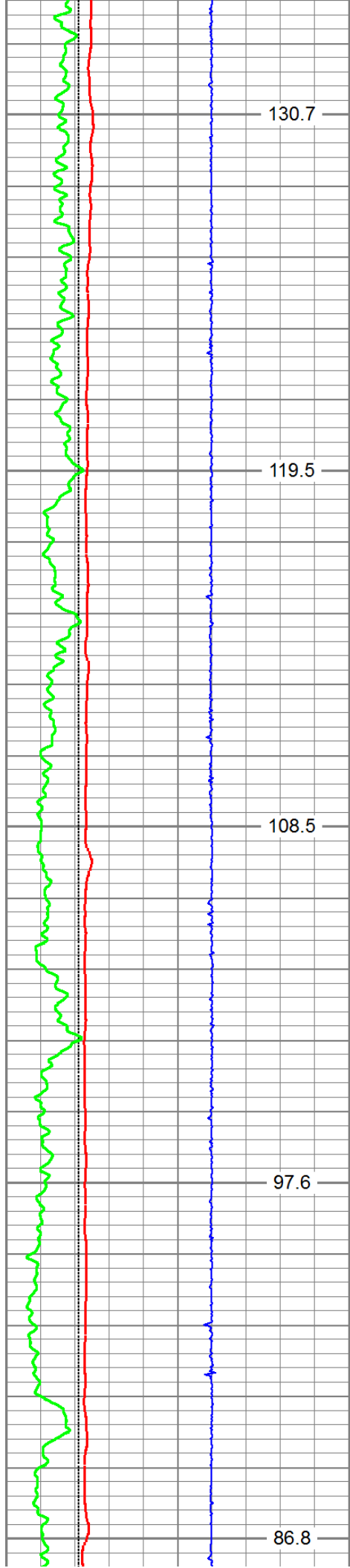


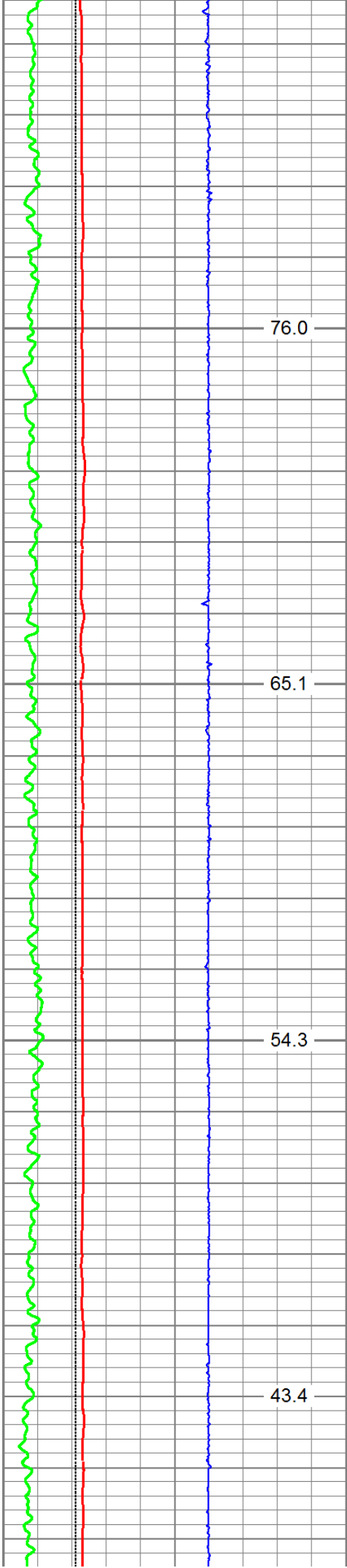
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76.1

70.4





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65.1

54.3

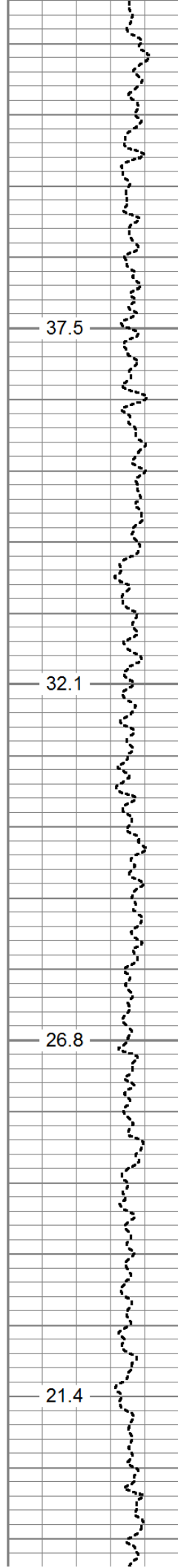
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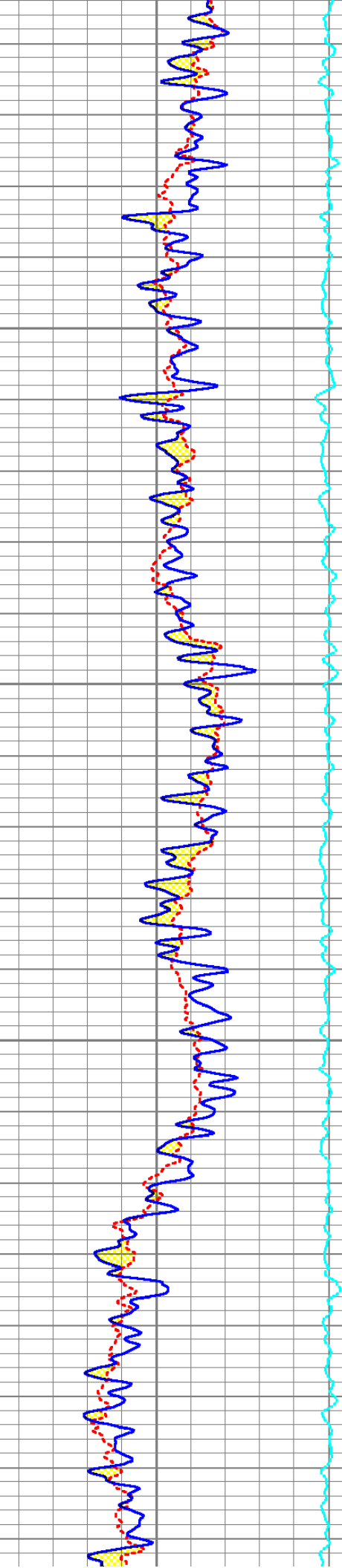


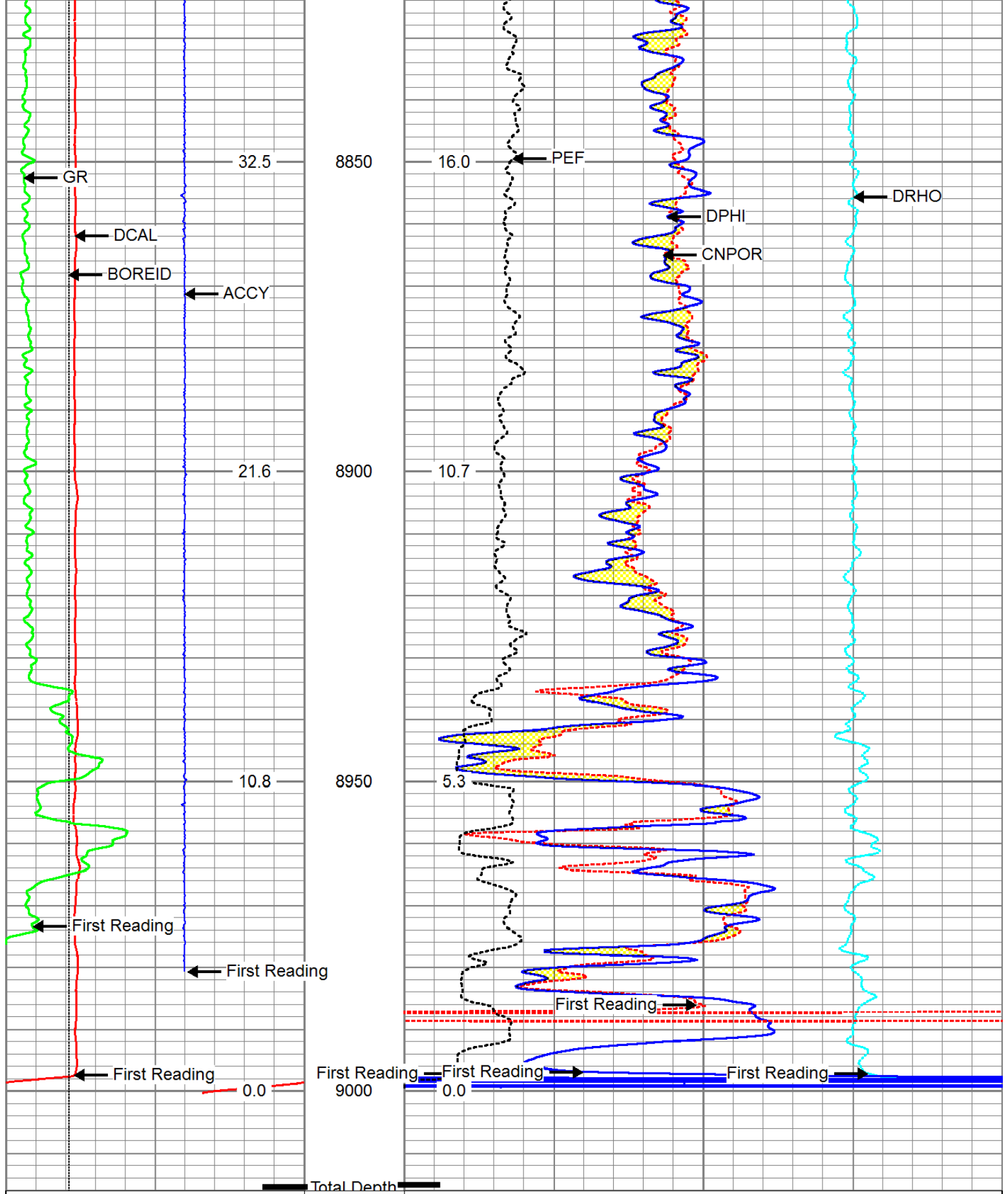
37.5

32.1

26.8

21.4





4	DCAL (in)	14
4	BOREID (in)	14
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

Total Depth

30	CNPOR (pu)	-10
30	DPHI (pu)	-10
0	PEF (barn)	10 -0.5
	DRHO (g/cc)	0.5
	ABHV (ft3)	

Log Variables

Database: c:\users\kris.wetzel\desktop\richard 3206 l3\sandridge_richardl3_mem.db
 Dataset: field/well/proc1/pass1.2

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in
1	On	WBM	1	MUDCELL	CURVE	6.125
BOTTEMP degF	CASED?	CASEOD in	CASETHCK in	CEMWATERSA kppm	CMNTTHCK in	DNBHC?
120	No	4.5	0	0	0	NO
DPORSEL	FLUIDDEN g/cc	FRMSALIN kppm	LATNOR	M	MATRXDEN g/cc	MUDSALIN kppm
RHOB	1	0	Off	2	2.71	2.5
MudWgt lb/gal	NPORSEL	PEBHC?	PERFS	RESTMPSRC	SO in	SRFTEMP degF
8.4	Limestone	YES	0	INTERNAL	0.5	65
SZCOR	TDEPTH ft	TMPCOR	TOOLPOS			
On	9055	On	Ec-centered			

Calibration Report

Database File: c:\users\kris.wetzel\desktop\richard 3206 l3\sandridge_richardl3_mem.db
 Dataset Pathname: proc1/pass1.2
 Dataset Creation: Thu Oct 24 02:53:50 2013

ThruBit Induction Calibration Report

Tool Model-Serial Number: PS-PS03R
 Shop Calibration Performed: Mon Aug 05 09:40:03 2013

BASELINE

	R	Expected	X	Expected
Freq 1				
A1	-468.0840	[-500.00, -400.00]	72.8838	[-500.00, 500.00]
A2	-145.2750	[-180.00, -100.00]	10.7250	[-500.00, 500.00]
A3	-29.6967	[-50.00, -10.00]	-117.5550	[-500.00, 500.00]
A4	-18.5257	[-30.00, -10.00]	207.5980	[-500.00, 500.00]
A5	-15.3741	[-30.00, -10.00]	134.9460	[-500.00, 500.00]
Freq 2				
A1	-241.6600	[-280.00, -180.00]	17.0635	[-500.00, 500.00]
A2	-93.7452	[-130.00, -50.00]	-21.3022	[-500.00, 500.00]
A3	-21.5530	[-50.00, -10.00]	-130.8850	[-500.00, 500.00]
A4	-21.6062	[-30.00, -10.00]	47.1430	[-500.00, 500.00]
A5	-20.7412	[-30.00, -10.00]	-10.3315	[-500.00, 500.00]
Freq 3				
A1	-150.4620	[-180.00, -80.00]	-59.4470	[-500.00, 500.00]
A2	-70.8153	[-130.00, -30.00]	-57.0476	[-500.00, 500.00]
A3	-17.3957	[-50.00, -10.00]	-156.7580	[-500.00, 500.00]
A4	-23.3347	[-30.00, -10.00]	-61.6453	[-500.00, 500.00]
A5	-23.8551	[-30.00, -10.00]	-115.8030	[-500.00, 500.00]
Freq 4				
A1	-80.0508	[-120.00, -40.00]	-199.5280	[-500.00, 500.00]
A2	-50.7274	[-110.00, -10.00]	-121.1000	[-500.00, 500.00]
A3	-13.8356	[-50.00, -10.00]	-214.7800	[-500.00, 500.00]

A4	-26.9167	[-30.00, -10.00]	-226.6750	[-500.00, 500.00]
A5	-30.7104	[-30.00, -10.00]	-292.2140	[-500.00, 500.00]

CALIBRATION COEFFICIENTS

	R	Expected	X	Expected
Freq 1				
A1	0.9970	[0.95, 1.05]	0.0029	[-0.05, 0.05]
A2	0.9980	[0.95, 1.05]	0.0029	[-0.05, 0.05]
A3	1.0025	[0.95, 1.05]	-0.0044	[-0.05, 0.05]
A4	0.9951	[0.95, 1.05]	0.0050	[-0.05, 0.05]
A5	0.9991	[0.95, 1.05]	0.0028	[-0.05, 0.05]
Freq 2				
A1	0.9908	[0.95, 1.05]	-0.0059	[-0.05, 0.05]
A2	0.9914	[0.95, 1.05]	-0.0055	[-0.05, 0.05]
A3	0.9900	[0.95, 1.05]	-0.0057	[-0.05, 0.05]
A4	0.9899	[0.95, 1.05]	-0.0040	[-0.05, 0.05]
A5	0.9946	[0.95, 1.05]	-0.0062	[-0.05, 0.05]
Freq 3				
A1	1.0044	[0.95, 1.05]	-0.0046	[-0.05, 0.05]
A2	1.0053	[0.95, 1.05]	-0.0039	[-0.05, 0.05]
A3	1.0038	[0.95, 1.05]	-0.0043	[-0.05, 0.05]
A4	1.0033	[0.95, 1.05]	-0.0027	[-0.05, 0.05]
A5	1.0090	[0.95, 1.05]	-0.0043	[-0.05, 0.05]
Freq 4				
A1	0.9927	[0.95, 1.05]	-0.0052	[-0.05, 0.05]
A2	0.9939	[0.95, 1.05]	-0.0047	[-0.05, 0.05]
A3	0.9940	[0.95, 1.05]	-0.0079	[-0.05, 0.05]
A4	0.9930	[0.95, 1.05]	-0.0039	[-0.05, 0.05]
A5	1.0024	[0.95, 1.05]	-0.0074	[-0.05, 0.05]
Temperature	34.4131 degC			

ThruBit Density Calibration Report

Tool Model-Serial Number: PS-PS44D
Source Number:
Shop Calibration Performed: Mon Oct 14 10:29:11 2013

REFERENCE

	Density	Units
Aluminium	2.607	g/cc
Magnesium	1.752	g/cc

READINGS

Outputs	Counts	Units	Expected
SS1 Background	127.25	cps	[130.00, 170.00]
LS1 Background	142.61	cps	[130.00, 170.00]
LS4 Background	29.14	cps	[27.00, 35.00]
SS1 Aluminium	5605.85	cps	[4500.00, 5500.00]
LS1 Aluminium	938.46	cps	[750.00, 950.00]
LS4 Aluminium	1046.36	cps	[843.00, 1068.00]
SS1 Magnesium	9060.90	cps	[7000.00, 9000.00]
LS1 Magnesium	6042.34	cps	[5250.00, 6250.00]

LS1 Al + Fe	828.49	cps	[650.00, 800.00]
LS4 Al + Fe	492.86	cps	[382.00, 471.00]

RESULTS

SS Slope	1.75	[1.52, 1.77]
LS Slope	0.43	[0.38, 0.45]
PEF K Factor	4.874	[3.510, 6.170]
PEF B Factor	-0.572	[-0.700, -0.410]

RESULTS

Caliper Shop Calibration performed: Mon Oct 14 10:29:11 2013

Reference	Reading	Units
12.00	1914.19	in
9.00	2054.06	in
6.00	2215.24	in

DENSITY PRE-SURVEY CHECK Performed: Tue Oct 22 14:20:44 2013

Outputs	Counts	Units	Expected
SS1 Background	124.81	cps	[123.43, 131.06]
LS1 Background	142.17	cps	[138.33, 146.89]
LS4 Background	29.31	cps	[27.39, 30.89]

CALIPER PRE-SURVEY CHECK Performed: Tue Oct 22 14:18:16 2013

Reference	Readings	Units	Expected
6.00	6.00	in	[5.80, 6.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number:	ENP-ENP2N
Source Number:	
Calibration Tank Temperature:	70.3 degF
Shop Calibration Performed:	Mon Oct 14 13:08:56 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	3357.7	cps	
LS Counts	108.5	cps	
Tank Ratio Ref	30.9580	SS/LS	
Tank Ratio	30.9475	SS/LS	
Tank Ratio Gain	1.0003		[0.85, 1.15]

ALUMINUM SLEEVE REFERENCE

ALUMINUM SLEEVE REFERENCE

Outputs	Measured	Units	Expected
SS Counts	39149.4	cps	
LS Counts	3578.9	cps	
AI Ratio Ref	10.797	SS/LS	
AI Ratio	10.943	SS/LS	
AI Ratio Gain	0.99		[0.90, 1.10]
Sleeve Porosity	14.46	pu	

PRE-SURVEY BACKGROUND CHECK Performed: Tue Oct 22 14:25:31 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-PS02T		
Performed:	Mon Jul 15 14:19:43 2013		
Calibrator Value:	165.0	GAPI	
Background Reading:	61.6	cps	
Calibrator Reading:	455.7	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	2.31	2.13	5.00
Thrubit	64.61		Solid Weakpoint			
			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 (PS02T) 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-ENP (ENP2N) ThruBit Neutron	4.77	2.13	63.00
LSW1 DCAL	18.04 17.13			TBD-PS (PS44D) ThruBit Density	10.48	2.13	91.00
A1_P A2_P A3_P A4_P A5_P	10.60 10.10 9.35 8.35 6.60			TBI-PS (PS03R) ThruBit Induction	15.29	2.13	94.00

Dataset: sandridge_richardl3_mem.db: field/well/proc1/pass1.2
Total Length: 66.92 ft
Total Weight: 560.15 lb
O.D.: 2.38 in



Company SANDRIDGE ENERGY
Well RICHARD 3206 3-30H 3L
Field EASTHAM
County HARPER
State KANSAS