

CIRCUMFERENTIAL ACOUSTIC SCANNING TOOL

CEMENT INSPECTION

Company		East Cheyenne Gas Storage, LLC.	
Well		DOROTHY STRANGE #1 WP-D011	
Field		West Peetz	
County		Logan	CO
Company East Cheyenne Gas Storage, LLC. Well DOROTHY STRANGE #1 WP-D011 Field West Peetz County Logan State CO		API No.: 05-075-07146-00 Serv #: 903182643 Location: 2304' FSL & 1639' FEL NWSE Gauge Ring/JB ACX RMTi Plug set	
Permanent Datum		G.L	Elevation 4547'
Log Measured From		K.B. , 13' Ft. above perm. datum	K.B. 4560' D.F. 4560' G.L. 4547'
Drilling Measured From		K.B.	G.L.
Date @ Time Logged		3/26/2016 @ 17:00	Type Fluid in Hole FRESH WATER
Run No.		ONE	Density of Fluid 8.4#
Depth - Driller		5220'	Fluid Level SURFACE
Depth - Logger		5137'	Cement Top Est. Logged N/A
Bottom - Logged Interval		5054'	Equipment / Location 11875120 / BRIGHTON
Top - Log Interval		SURFACE	Recorded by J. SCHMIDT & P. DIMPFL
Max. Recorded Temp.		167 F	Witnessed by G. FRANCIS / G. OHLMAN
CEMENTING DATA		Surface	Protection String
Date / Time Cemented		String	Production String
Primary / Squeeze			
Expected Compressive Strength		psi@ hrs	psi@ hrs
Cement Volume			
Cement Type / Weight		/	/
Formulation			
Mud Type / Mud Wgt.		/	/
Borehole Record		Casing & Tubing Record	
Run Number	Bit	From	To
		Size	Weight
		9-5/8"	25.4#
		5.5"	15.5#
			0'
			5298'

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HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

1. LOG WAS CORRELATED TO J-W WIRELINE CEMENT BOND LOG DATED 02/04/2011.
2. CAST CONFIG: 3 5/8" HEAD, BLACK 450KHz TRANSDUCER, CIM, 72 SHOTS, 12SPF
3. POOR DATA QUALITY IN MID WELL INTERVAL DUE TO WELLBORE FLUID CONDITIONS.

HALLIBURTON CREW: JASON WILKERSON & BRANDON SHUPE

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, BRIGHTON, CO

Service Ticket No.	903182643	API No.	05-075-07146-0000	PGM Ver	WARRIOR 8
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
TELEMETRY		CAST			
Run No.	ONE	Run No.	ONE	Run No.	
Serial No.	10010734	Serial No.	11501505	Serial No.	
Model No.	TTTC-U-002	Model No.	CAST-M	Model No.	
Diameter	1.688"	Diameter	2.125"	Diameter	
LOGGING DATA					
General Data					
Pass	Depths		Well Head	Speed	Logging Run Comments
No	From	To	Pressure	Ft/Min	

No.	FROM	TO	Pressure	Flow	Time
ONE	PLUG	SURFACE	0 PSI	15 FPM	MAIN LOG SECTION
	GAMMA RAY		IR		THICKNESS
Pass	Scale		Scale		Scale
No.	L	R	L	R	L
	0 API	150 API	2.6	3.6	0.26
					0.46
					0
					6.15
DIRECTIONAL INFORMATION					
Maximum Deviation		deg. @		KOP	

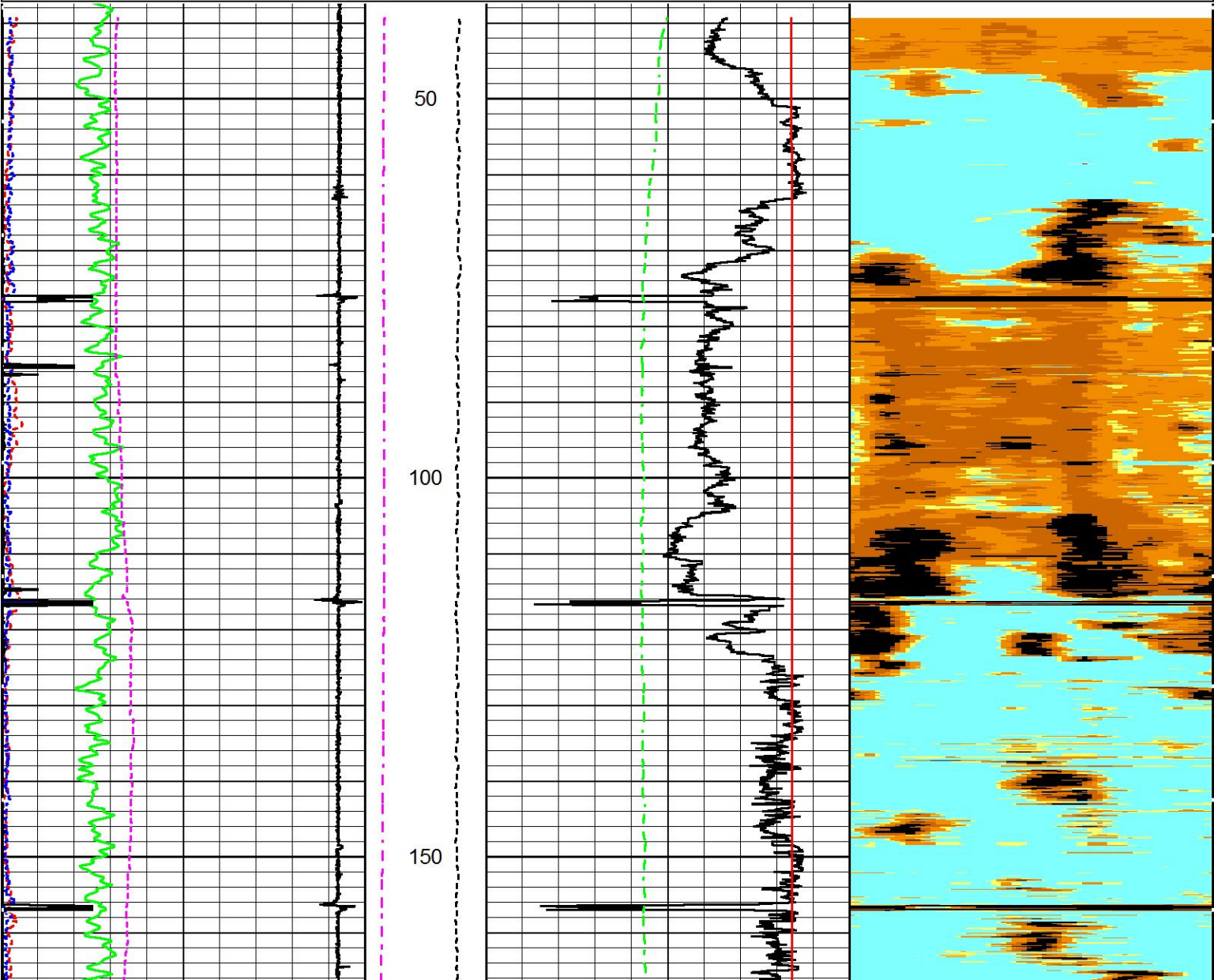
HALLIBURTON

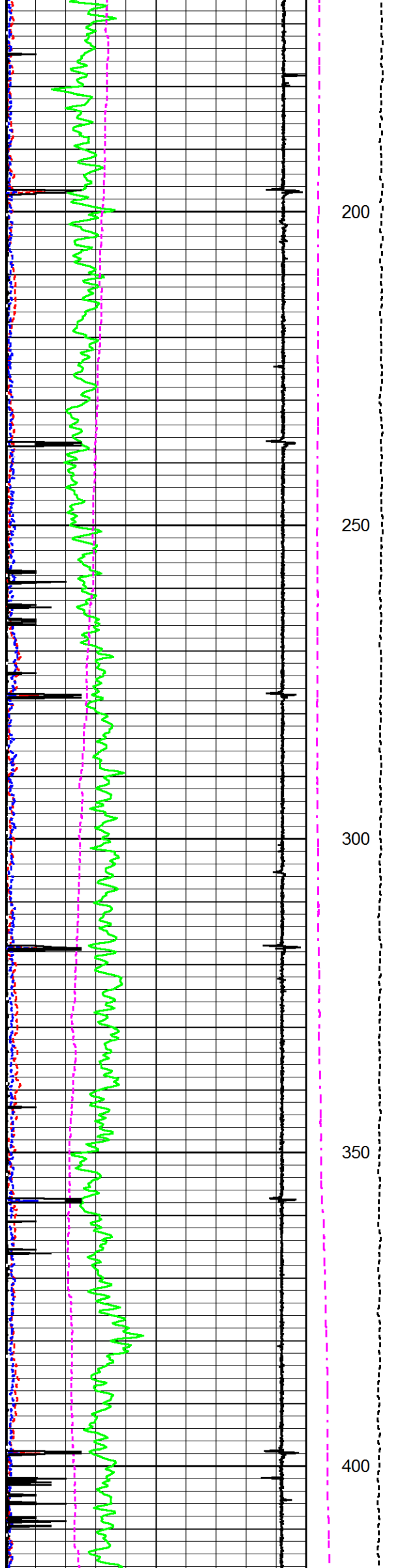
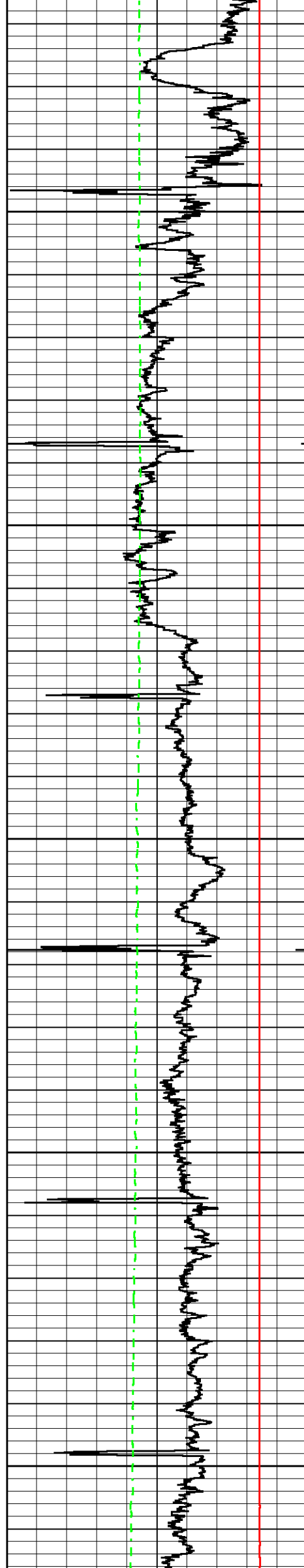
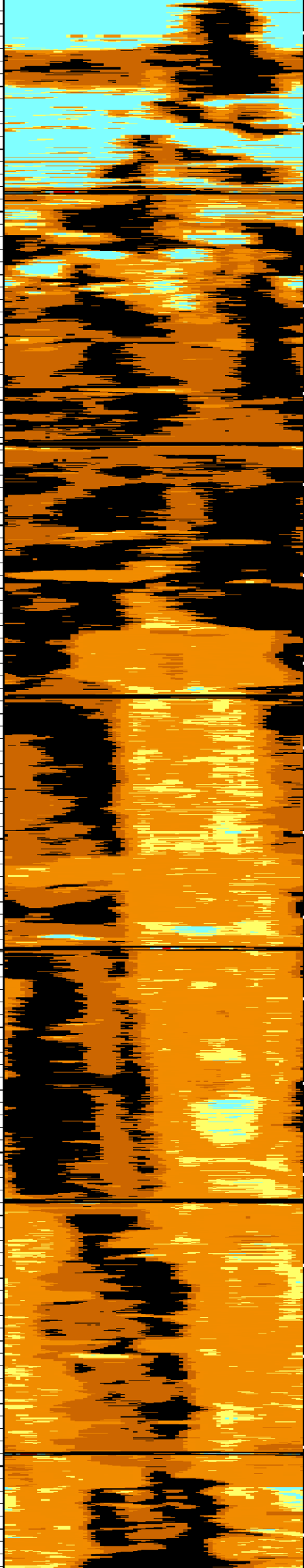
MAIN PASS TOP SECTION

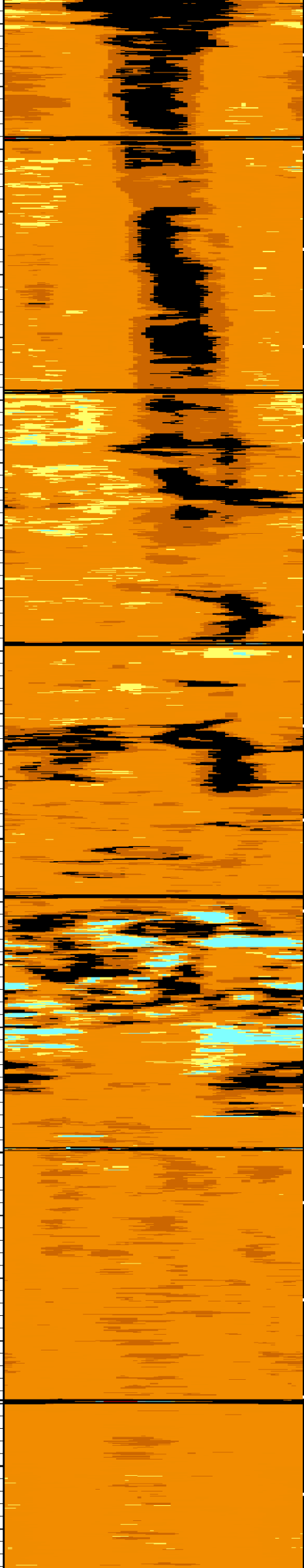
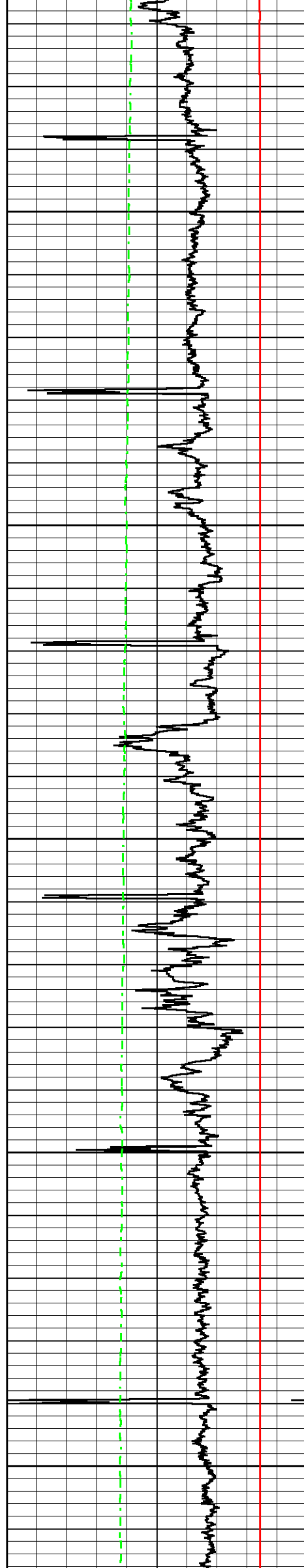
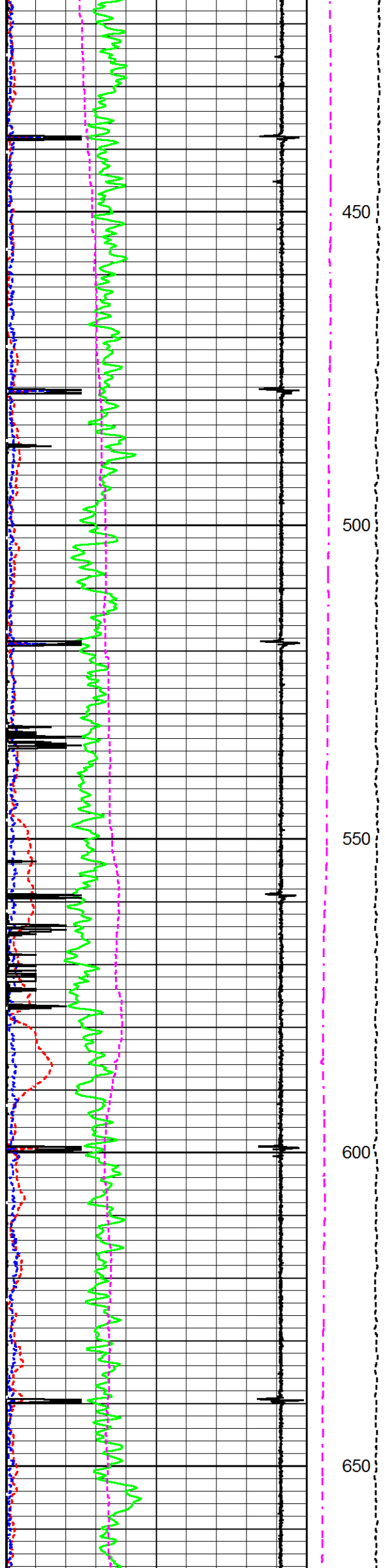
5" = 100'

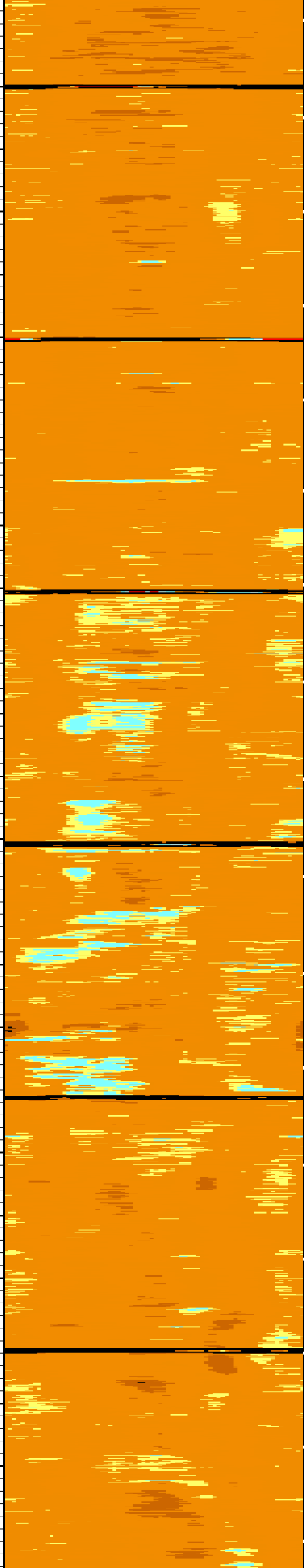
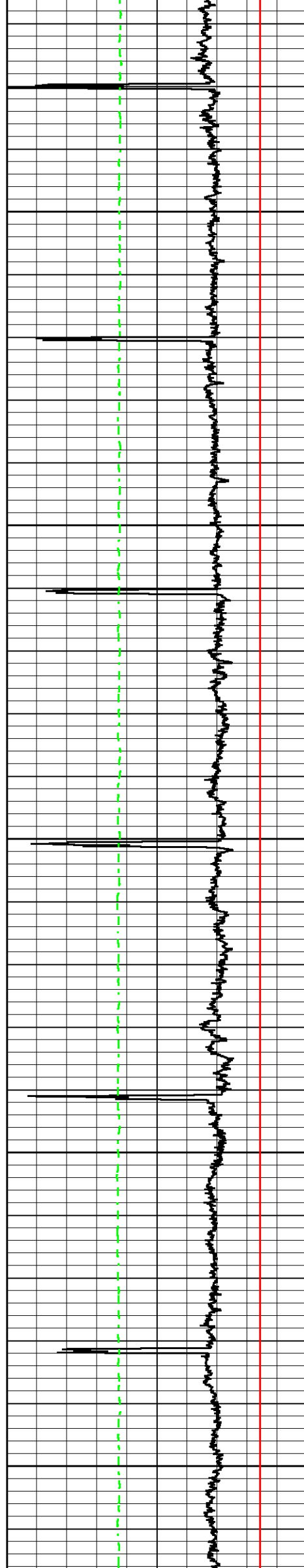
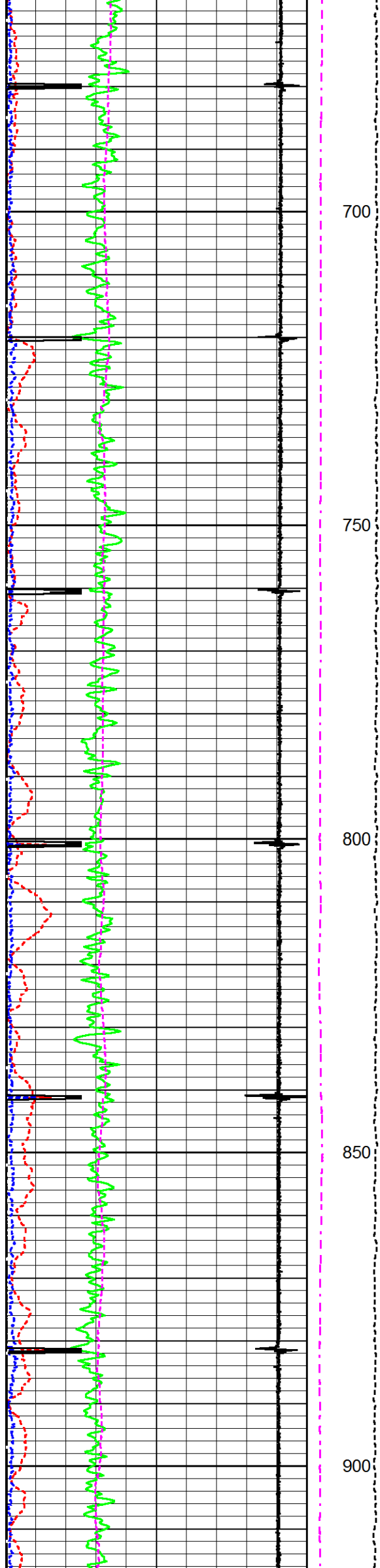
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Presentation Format	1CIM~1
Dataset Creation	Sat Mar 26 20:58:54 2016
Charted by	Depth in Feet scaled 1:240

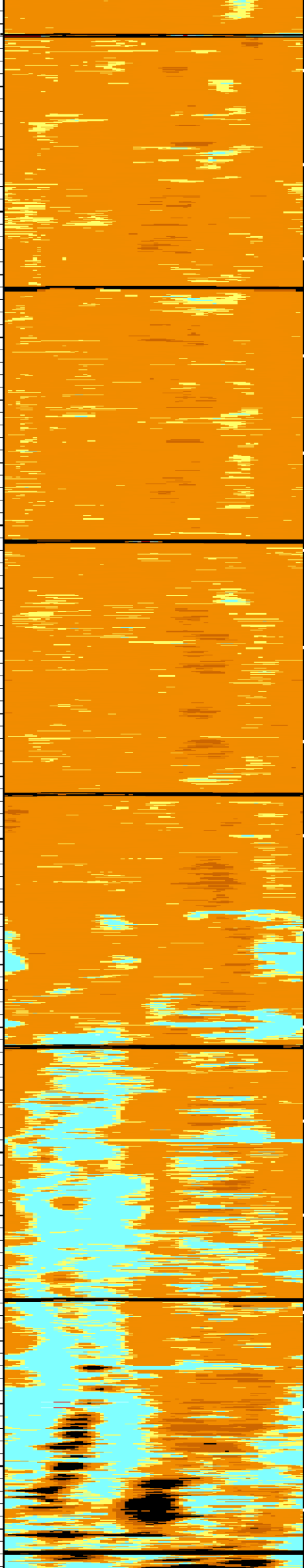
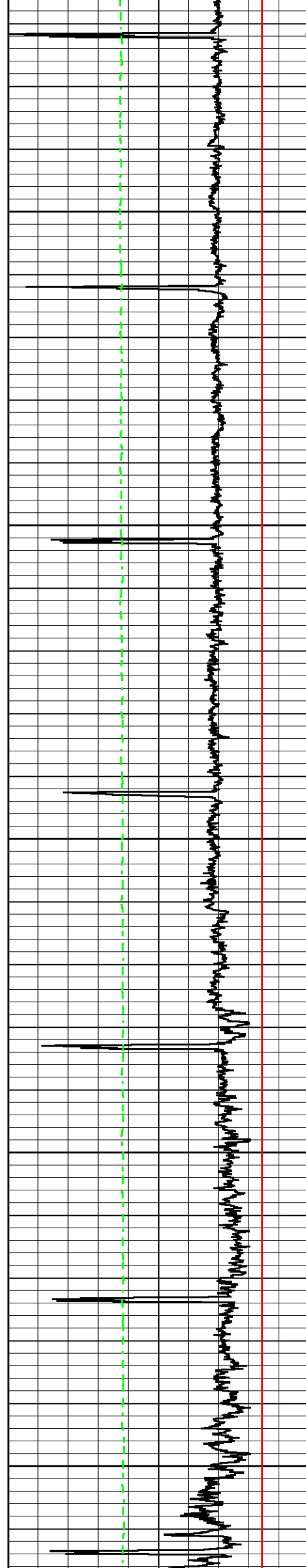
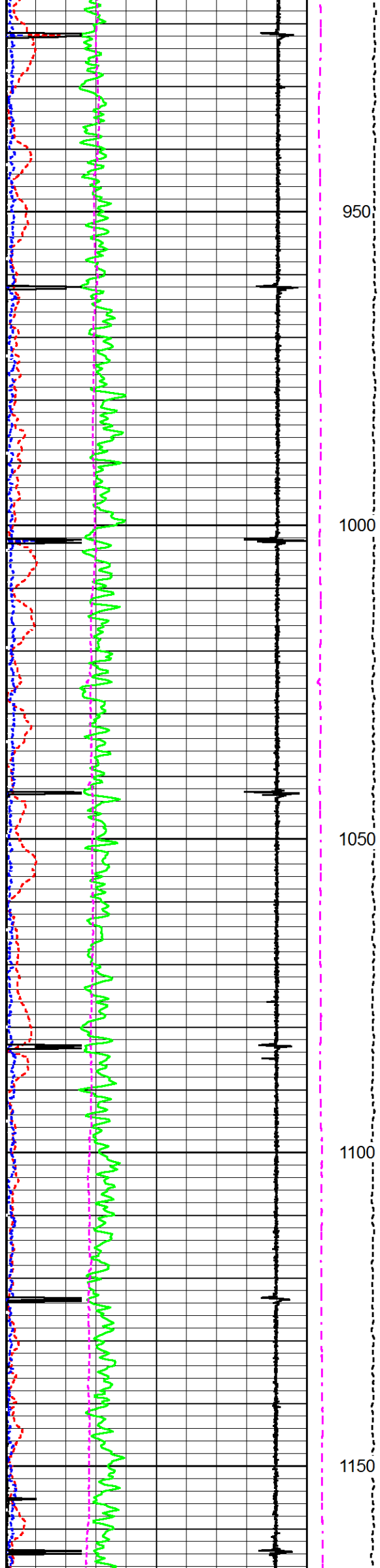
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0	ecen (in)	1	1000lb	0	220	Fluid Travel Time (usec/ft)	170	0	6.15
0	oval (in)	0.25	Rel Bearing	10	Z Mud (MRayl)	0			
-1	Instant Deviation (deg)	9	(deg)						
0	accl	4	-1	359					
17750	CCL	18350							

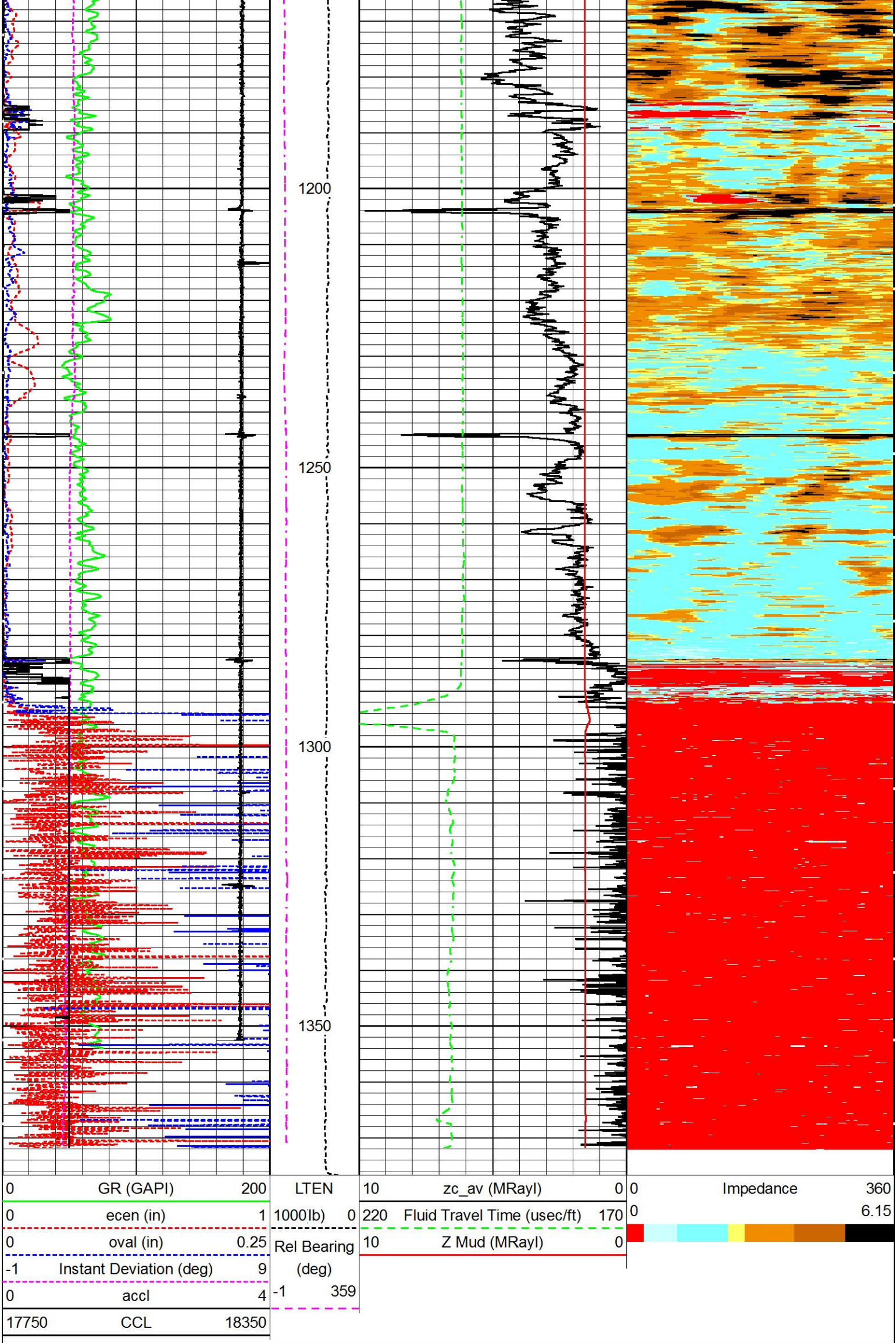












MAIN PASS TOP SECTION

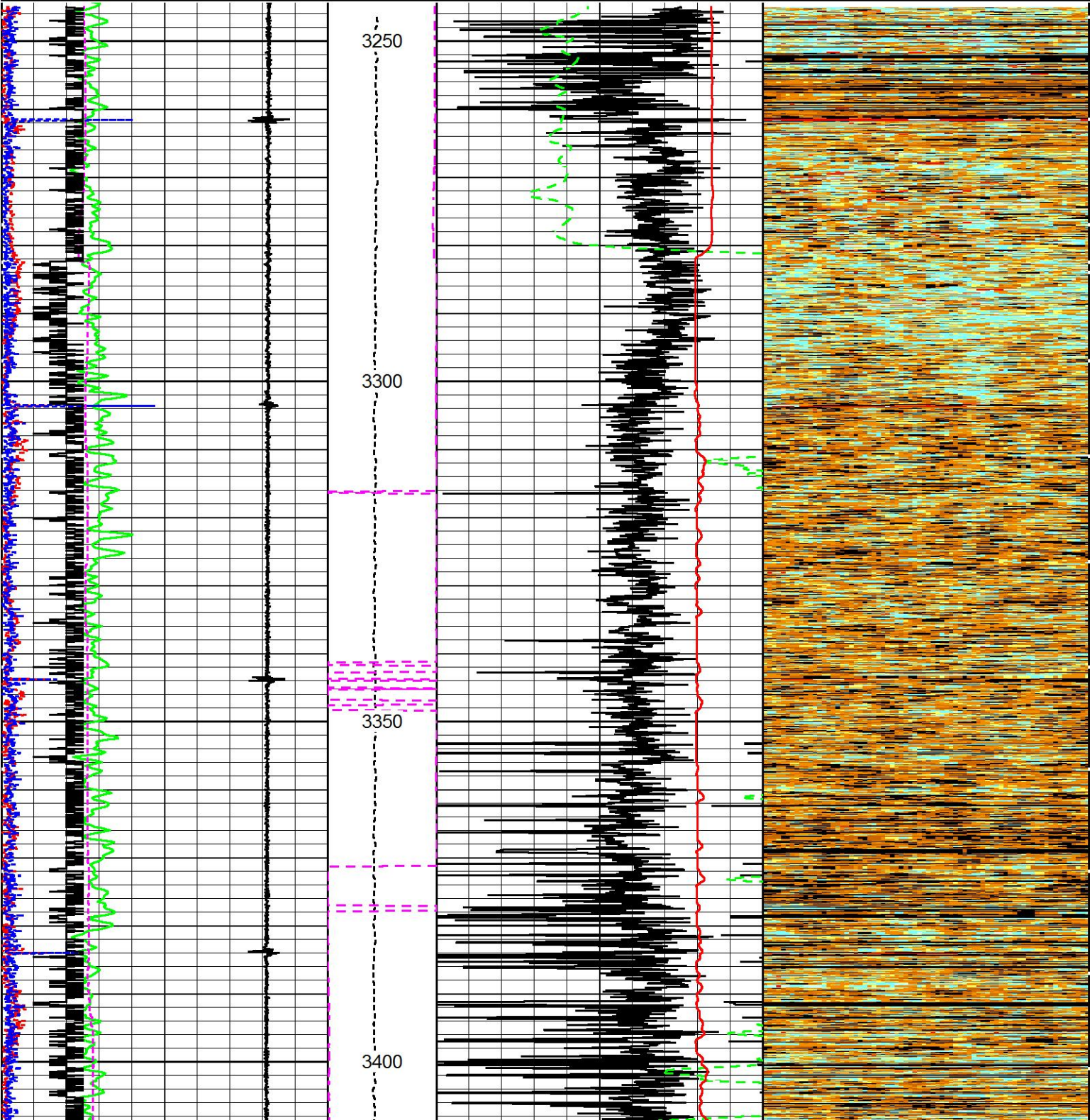
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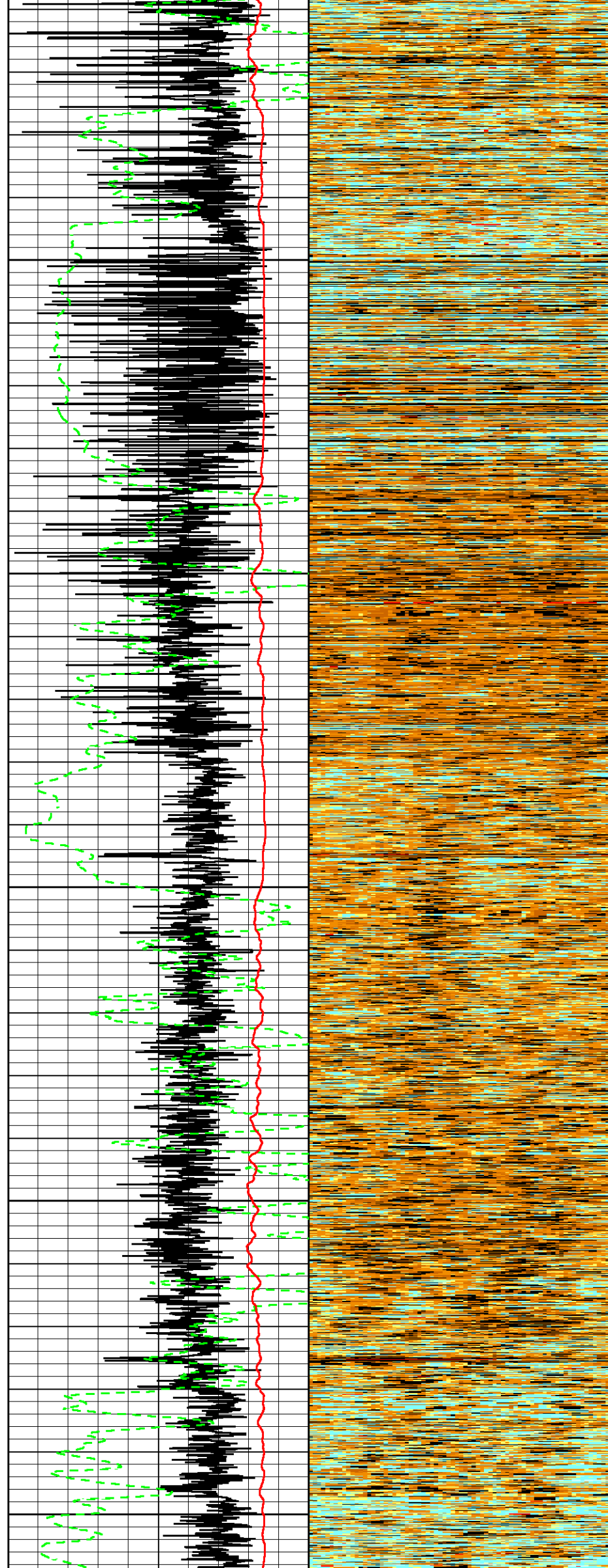
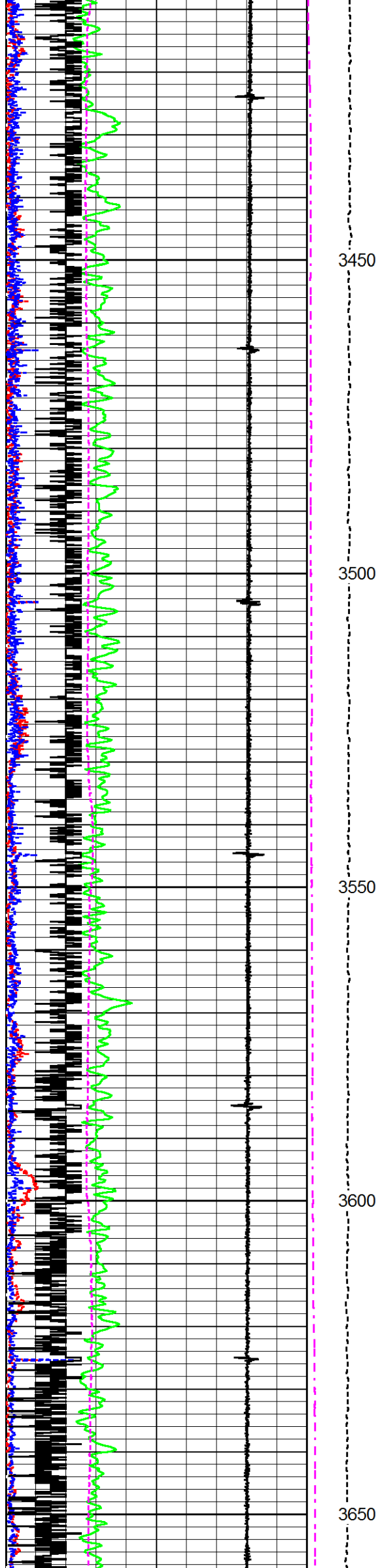
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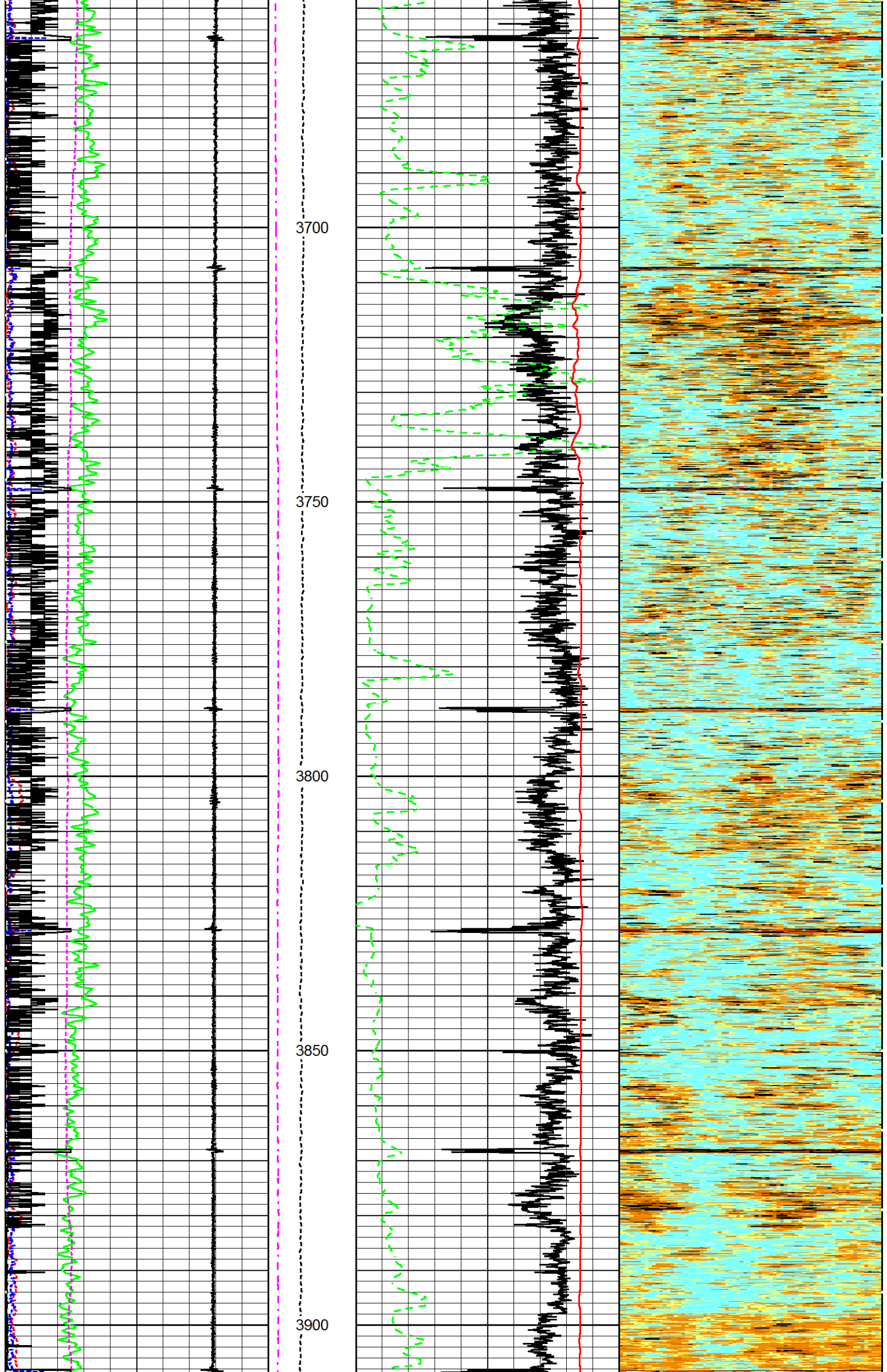
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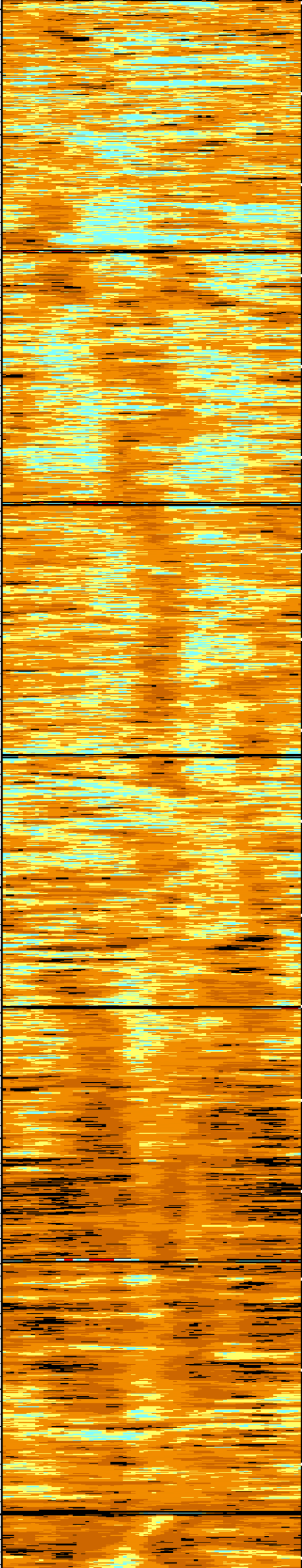
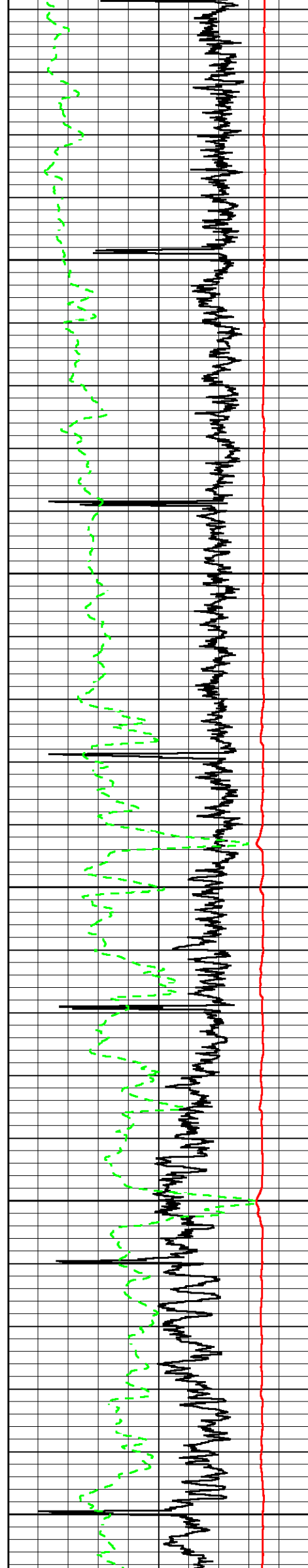
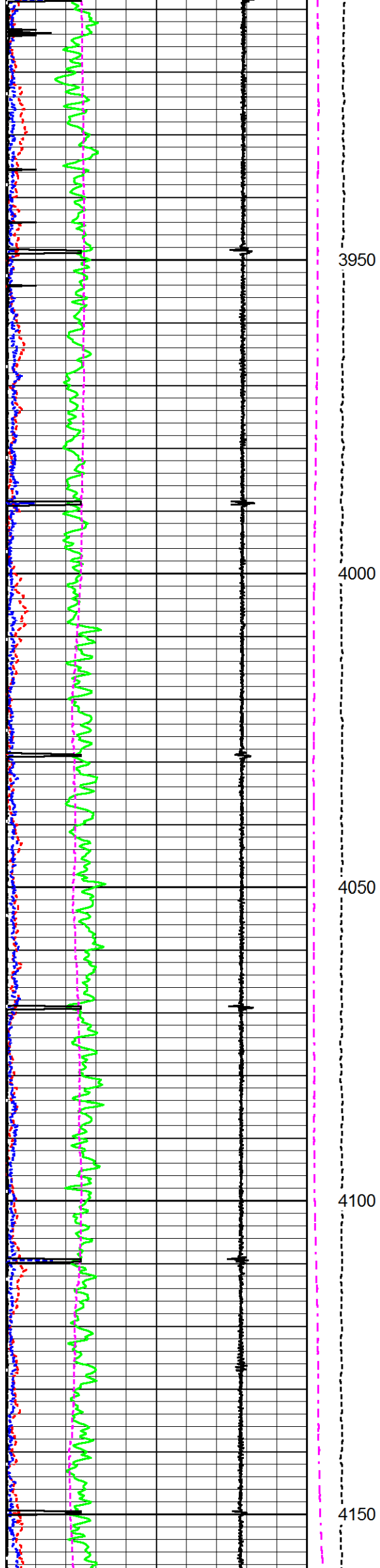
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Charted by Depth in Feet scaled 1:240

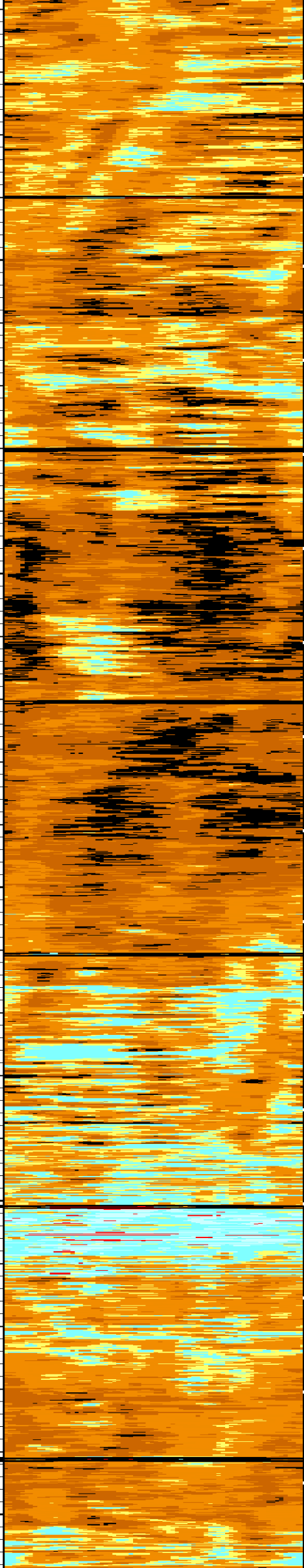
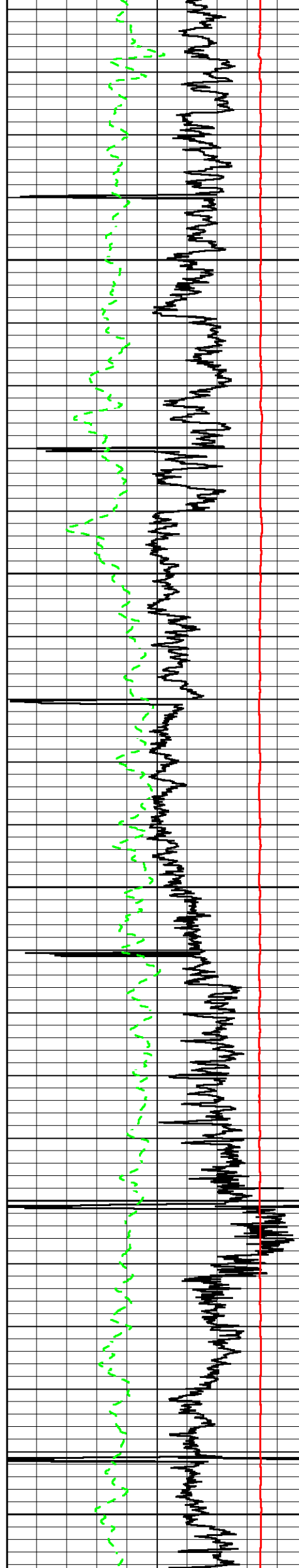
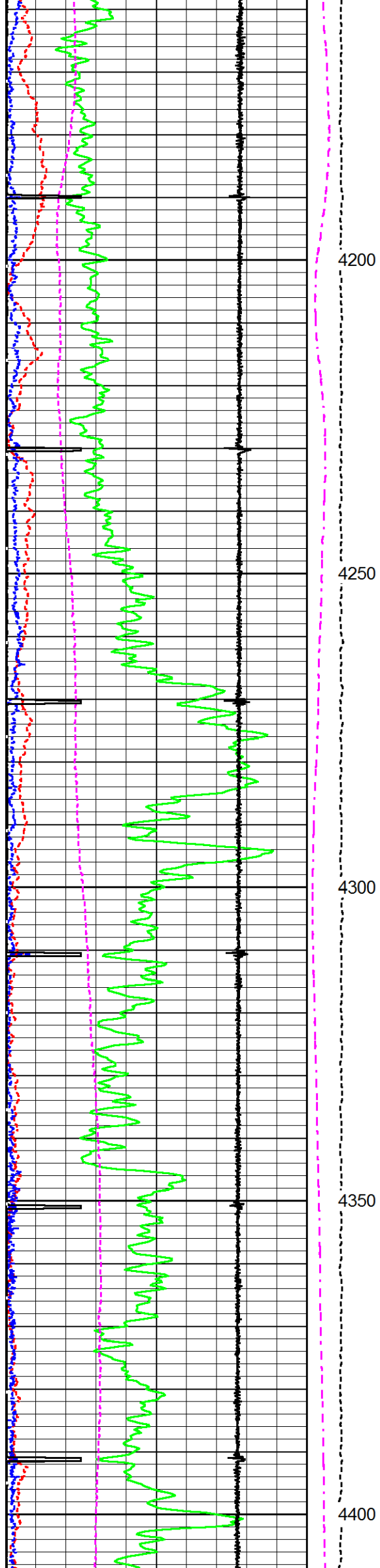
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0	ecen (in)	1	1000lb	0	220	Fluid Travel Time (usec/ft)	170	0	6.15
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17750	CCL	18350							

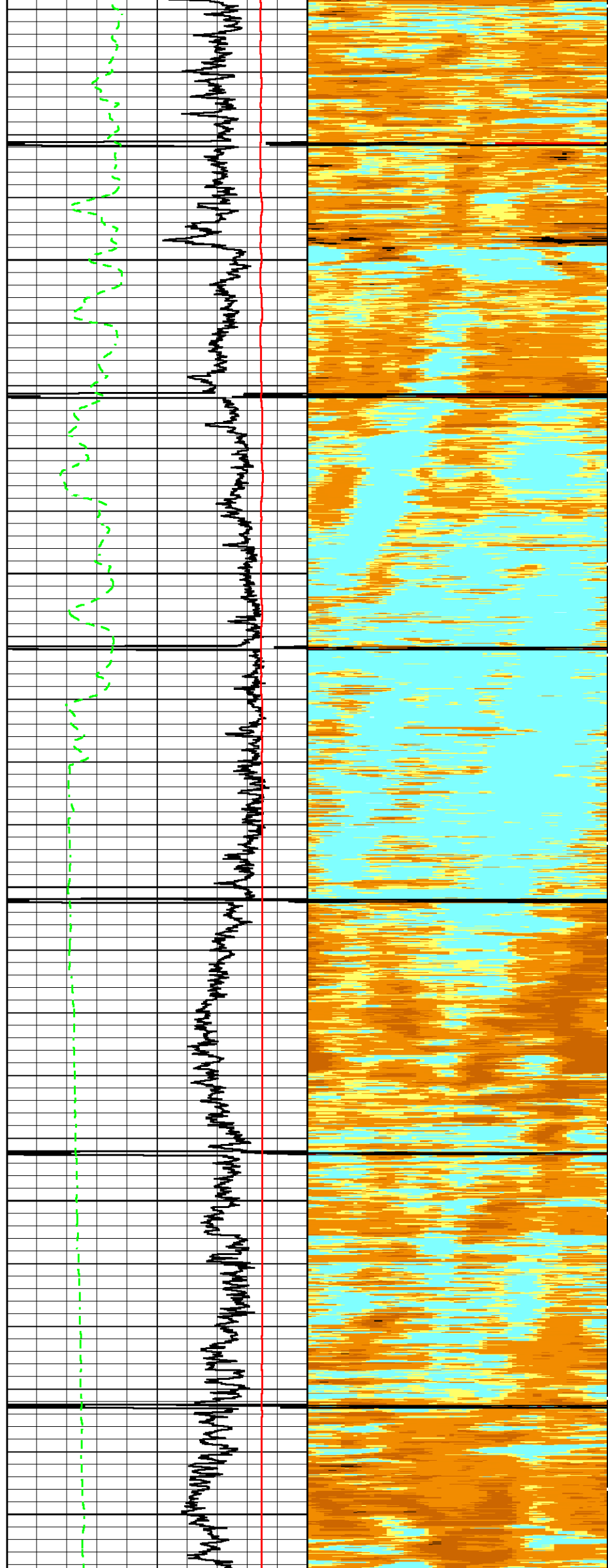
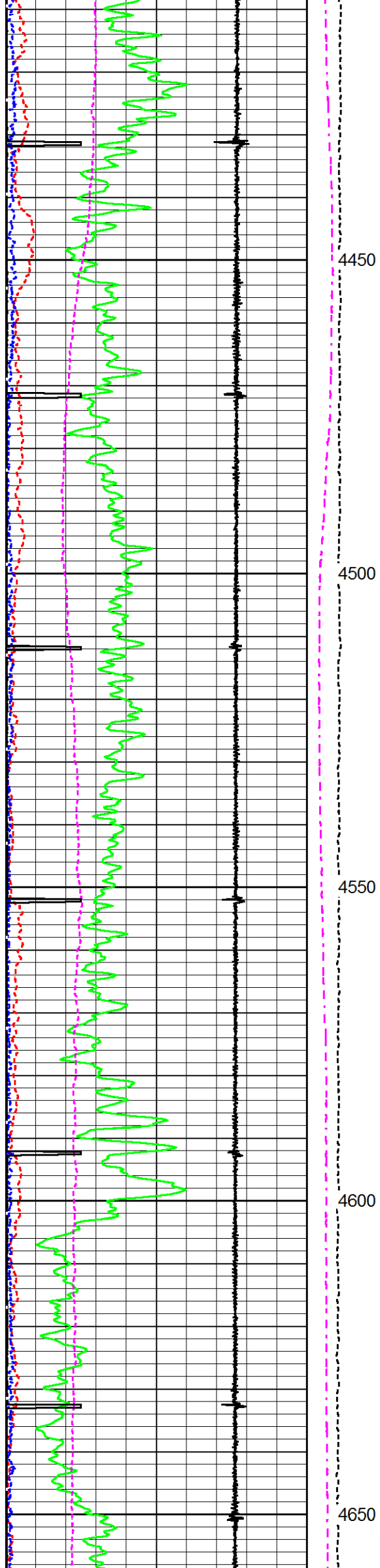


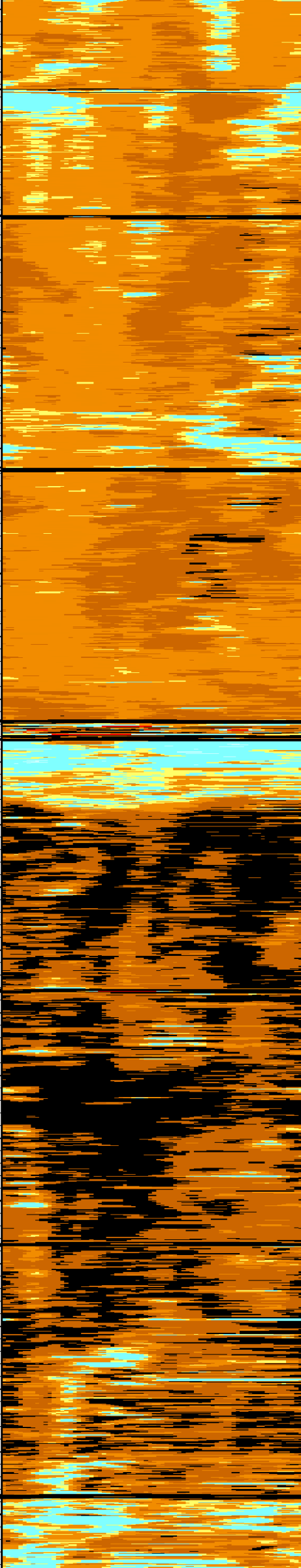
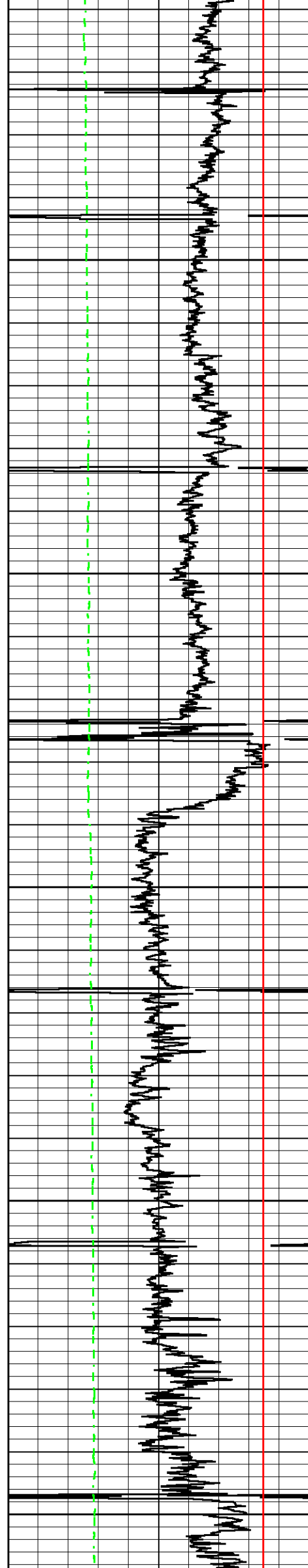
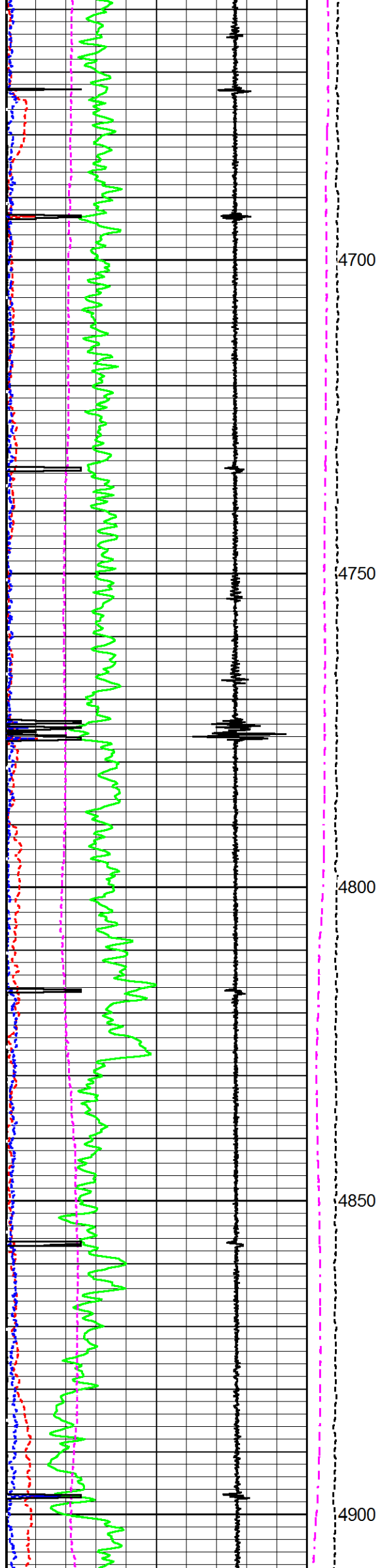


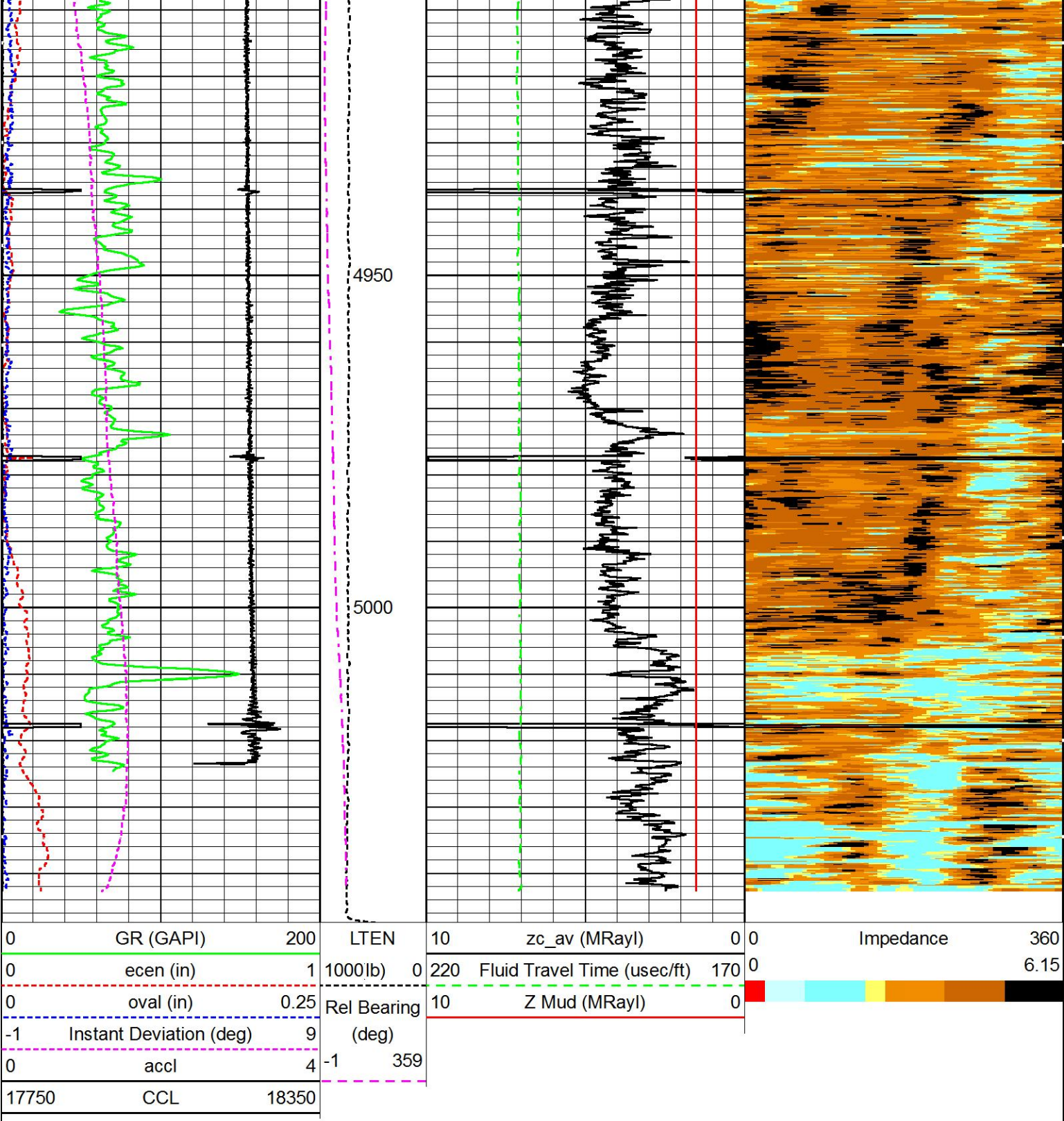












MAIN PASS BOTTOM SECTION

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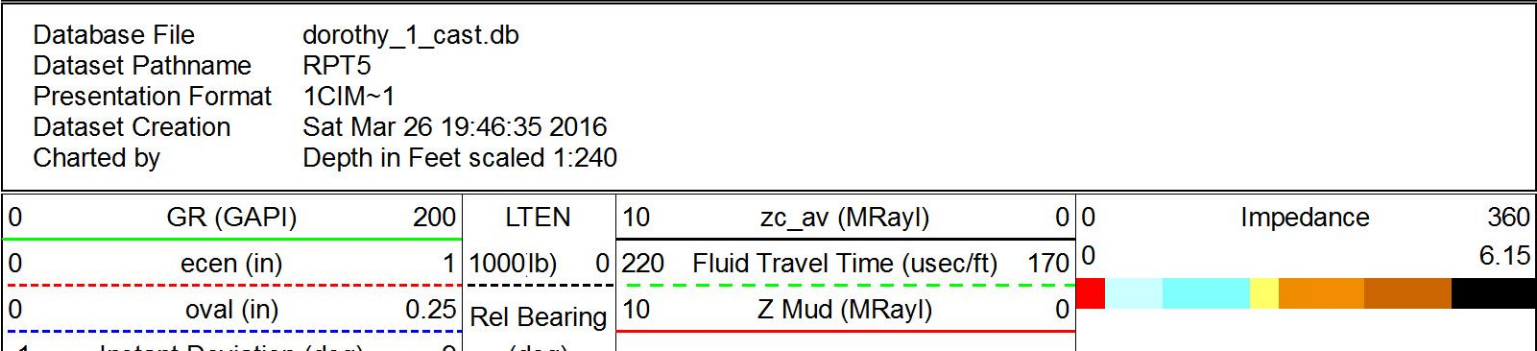
5" = 100'

REPEAT PASS

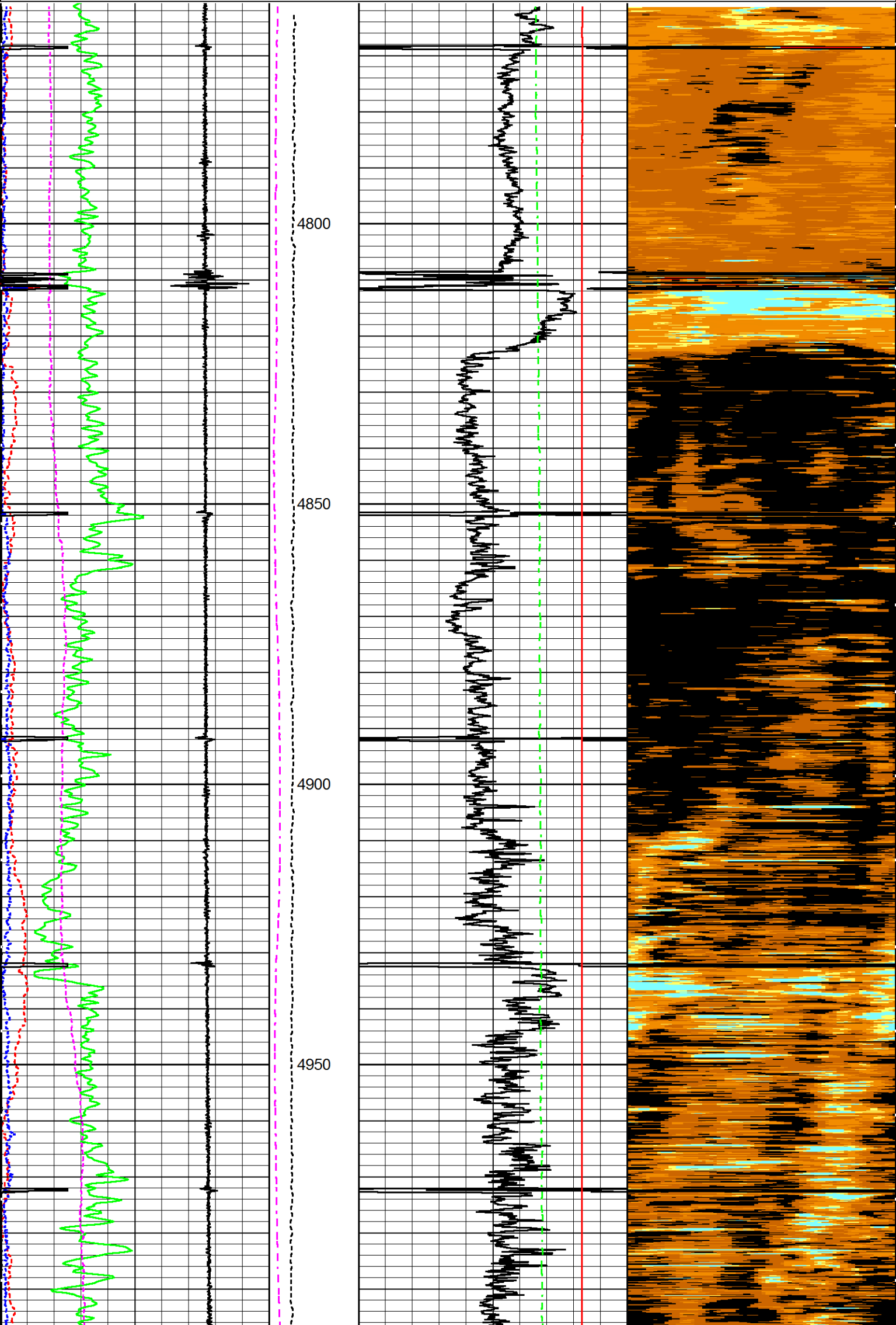
HALLIBURTON

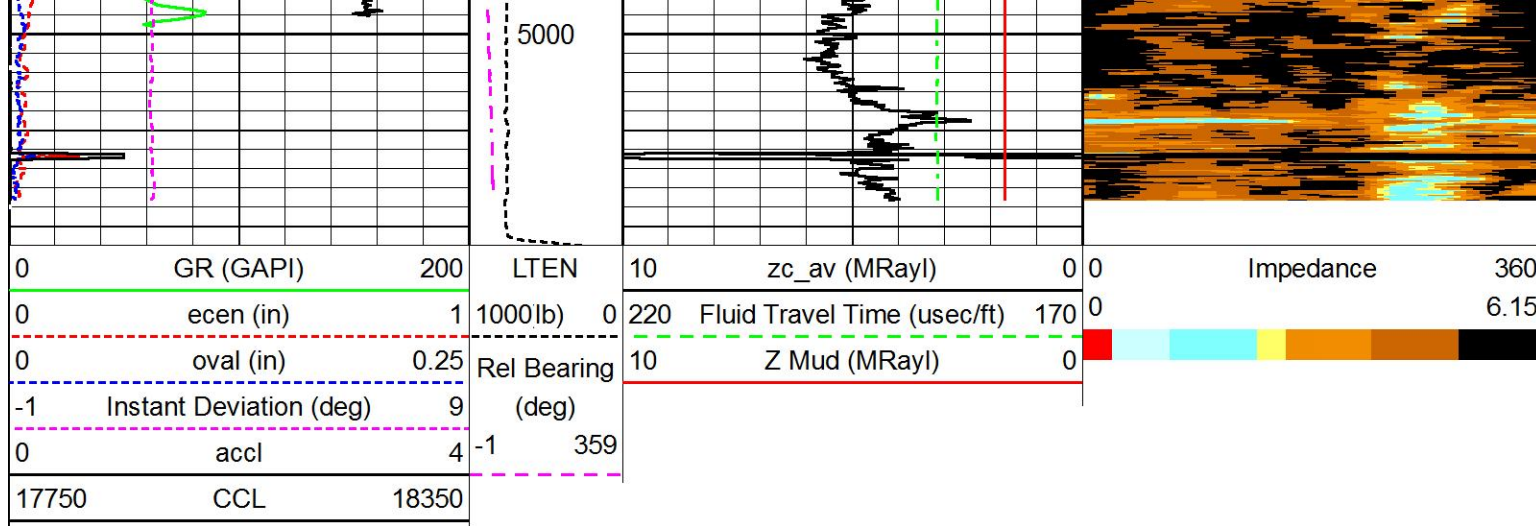
5" = 100'

(PULLED AFTER MAIN PASS)



0	accl	4	-1	359
17750	CCL	18350		





REPEAT PASS

HALLIBURTON

5" = 100'
(PULLED AFTER MAIN PASS)

Log Variables

DatabaseC:\ProgramData\Warrior\Data\dorothy_1_cast.db
Dataset field/well/run1/MAIN TOP/ vars

Top - Bottom

BHSAL1 1	BHSAL2 0	BHTEMP_Src ITEMPX	BITSIZE in 7.875	BORSAL kppm 150	BOTTEMP degF 169	CASED? Yes	CASEOD in 5.5
CASETHCK in 0.275	CASEWGHT lb/ft 15.5	LTH Sandstone	MudWgt lb/gal 8.5	PERFS 0	POROS1 1	POROS2 0	RHO�F 0.25
SO in 0	SRFTEMP degF 0	TDEPTH ft 0	UHSGC NONE	USERFTT usec/ft 0	ZREF MRayl 1.7		

Calibration Report

```
Database File      dorothy_1_cast.db
Dataset Pathname  MAIN_TOP_LAST
Dataset Creation   Sat Mar 26 20:58:54 2016
```

Circumferential Acoustic Scanning Tool Downhole Calibration Report

Serial-Model: 11501505-3 5/8 EXT SCAN

Calibration Performed: Sat Mar 26 20:29:30 2016

Averaged Results


Name	Value	Units
TT-Main	43.9	usec
Amp-Main	92.4	
Frq-Main	344.2	khz
TT-Mud	45.4	usec
Amp-Mud	83.6	
TT-LWw1	44.0	usec
TT-LWw2	84.2	usec
Amp-LWw1	93.2	
Amp-LWw2	45.6	
Frq-LWw	372.6	khz
TT-MWw1	46.0	usec
TT-MWw2	87.2	usec
Amp-MWw1	87.4	
Amp-MWw2	25.3	
Frq-MWw	273.4	khz


Calibrated Offsets

Name	Value
TCAL	3.7
MCAL	4.2

XY Accelerometers Calibration Report						
Performed:	(Not Performed)					
	Low Read.	High Read.		Low Ref.	High Ref.	
X Accelerometer	0.000	1.000	gee	0.000	1.000	gee
Y Accelerometer	0.000	1.000	gee	0.000	1.000	gee

Gamma Ray Calibration Report		
Serial Number:	10010734	
Tool Model:	002	
Performed:	Tue Mar 08 14:57:04 2016	
Calibrator Value:	190.0	GAPI
Background Reading:	42.0	cps
Calibrator Reading:	184.4	cps
Sensitivity:	1.3349	GAPI/cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
CCL	23.55		STNDCH-STND_CH Fishing Neck	1.50	2.00	1.00
			TTTCU-002 (10010734) Through Tubing Telemetry Cartridge - Ultrawire	7.65	1.69	100.00
GR	21.30		XHU-003 (11899561) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00
			CENT-CASTM-CENT CAST M INLINE CENTRALIZER	2.16	3.13	25.00
			HAL CAST M ELECT CAST M Elect (12037571)	2.75	3.00	30.00

			HAL-CAST-M-ELECT-CAST-M-Elect (12037.374) CAST M ELECTRONIC	2.75	30.00
AccY2	0.00		HAL-CAST-M-3 5/8 EXT SCAN (115015056.65 3 5/8 EXT SCAN CASTM	3.13	276.00
AccX2	0.00				
AccY1	0.00				
AccX1	0.00				
SCAN	0.00				
LOCTIM	0.00				
UTCTIM	0.00				
LLMTEN	0.00				
Dataset: dorothy_1_cast.db: field/well/run1/MAIN_TOP_LAST Total length: 27.12 ft Total weight: 439.00 lb O.D.: 3.13 in					

Company	East Cheyenne Gas Storage, LLC.			
Well	DOROTHY STRANGE #1 WP-D011			
Field	West Peetz			
County	Logan	State	CO	
HALLIBURTON	CIRCUMFERENTIAL ACOUSTIC SCANNING TOOL CEMENT INSPECTION			