

Company: Kerr-Mcgee Oil and Gas Onshore LP

Well: Wilson Ranch 4C-27HZ

Field: Wattenberg

County: Weld Country: US

Ultrasonic Imager Tool

*** USI Multiple Pass Log ***

Weld		
Wattenberg		
NENE sec 26 T4N 68W		
Wilson Ranch 4C-27HZ		
Kerr-Mcgee Oil and Gas Onshore LP		
Location:	NENE sec 26 T4N 68W	Elev.: K.B. 4973.00 ft
	727 FNL 722 FEL	G.L. 4953.00 ft
	Latitude: 40.29000 Longitude: -104.96340	D.F. 4972.00 ft
	Permanent Datum:	Ground Level Elev.: 4953.00 f
	Log Measured From: Kelly Bushing	20.00 ft above Perm.Datum
Drilling Measured From:	Kelly Bushing	
	API Serial No. 0512341322	Max.Hole Deviation 0 deg Longitude: -104.96330 degrees Latitude: 40.289900 degrees

Logging Date	05-Aug-2016	
Run Number	One	
Depth Driller	1776.00 ft	
Schlumberger Depth	1776.00 ft	
Bottom Log Interval	1776.00 ft	
Top Log Interval	0.00 ft	
Casing Fluid Type	Water	
Salinity		
Density	9 lbm/gal	
Fluid Level	8.00 ft	
BIT/CASING/TUBING STRING		
Bit Size	13.50 in	
From	0.00 ft	
To	1776.00 ft	
Casing/Tubing Size	9.625 in	
Weight	36 lbm/ft	
Grade	N/A	
From	0.00 ft	
To	1776.00 ft	
Max Recorded Temperatures	80 degF	
Logger on Bottom	Time	
Unit Number	Location:	Fort Morgan
Recorded By	Ben Mammon / Stephen Tang	
Witnessed By	Jim Adams	

Disclaimer

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Well Sketch

Driller Depth

0.00 ft






Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	13.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	1776					
Bottom Logger (ft)	1776					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.921					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	1776					
Bottom Logger (ft)	1776					

Remarks and Equipment Summary

One: Toolstring			One: Remarks	
<div><div><div>Equip name</div><div>Length</div></div><div>LEH-QT</div><div>28.84</div><div>LEH-QT</div></div> <div><div><div>EDTC-B:9</div><div>25.92</div></div><div>254</div><div>EDTH-B:80</div><div>97</div><div>EDTG-B:79</div><div>417</div><div>EDTC-B:92</div><div>54</div></div> <div><div><div>AH-107[</div><div>2]</div></div><div>19.42</div></div> <div><div><div>AH-107[</div><div>1]</div></div><div>17.42</div></div> <div><div><div>USIT-E:93</div><div>15.42</div></div><div>0</div><div>ECH-MFA:</div><div>1924</div><div>USAC-A:9</div><div>30</div><div>USIT-A:75</div></div>		MP name	Offset	Toolstring ran as per tool sketch.
				CSG 9 5/8" 36 lb/ft
				Plug at 1776 ft
				Main pass logged at 0psi.
				Repeat pass logged at 500psi.

MP name

Offset

CTEM

22.42

ACCZ

0.00

HV

0.00

Gamma

20.55

Ray

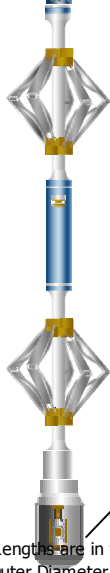
TelStatu

19.42

s



USIS-A:75
8
USSC-B:77
7
USRS-C
USI-SENS
OR



Lengths are in ft
Maximum Outer Diameter = 6.690 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary			
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-39P-LXS		
Serial Number			
Length	15000.00 ft		
Conveyance Type	Wireline		
Rig Type			
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth procedures followed.	
Rig Up Length At Surface		IDW used as primary depth device.	
Rig Up Length At Bottom		Z-chart used as secondary depth device.	
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
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Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 2	Log[2]:Up	1777.47	55.63

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "Theoretical".
CZMD uses theoretical results.
MUD_N_THE=1.00
DFD=1.08g/cm3(9.00lbm/gal)

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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Merge Composite

Multiple Pass Cement

Software Version

Acquisition System	Version
Maxwell 2016 SP2	6.2.68624.3100

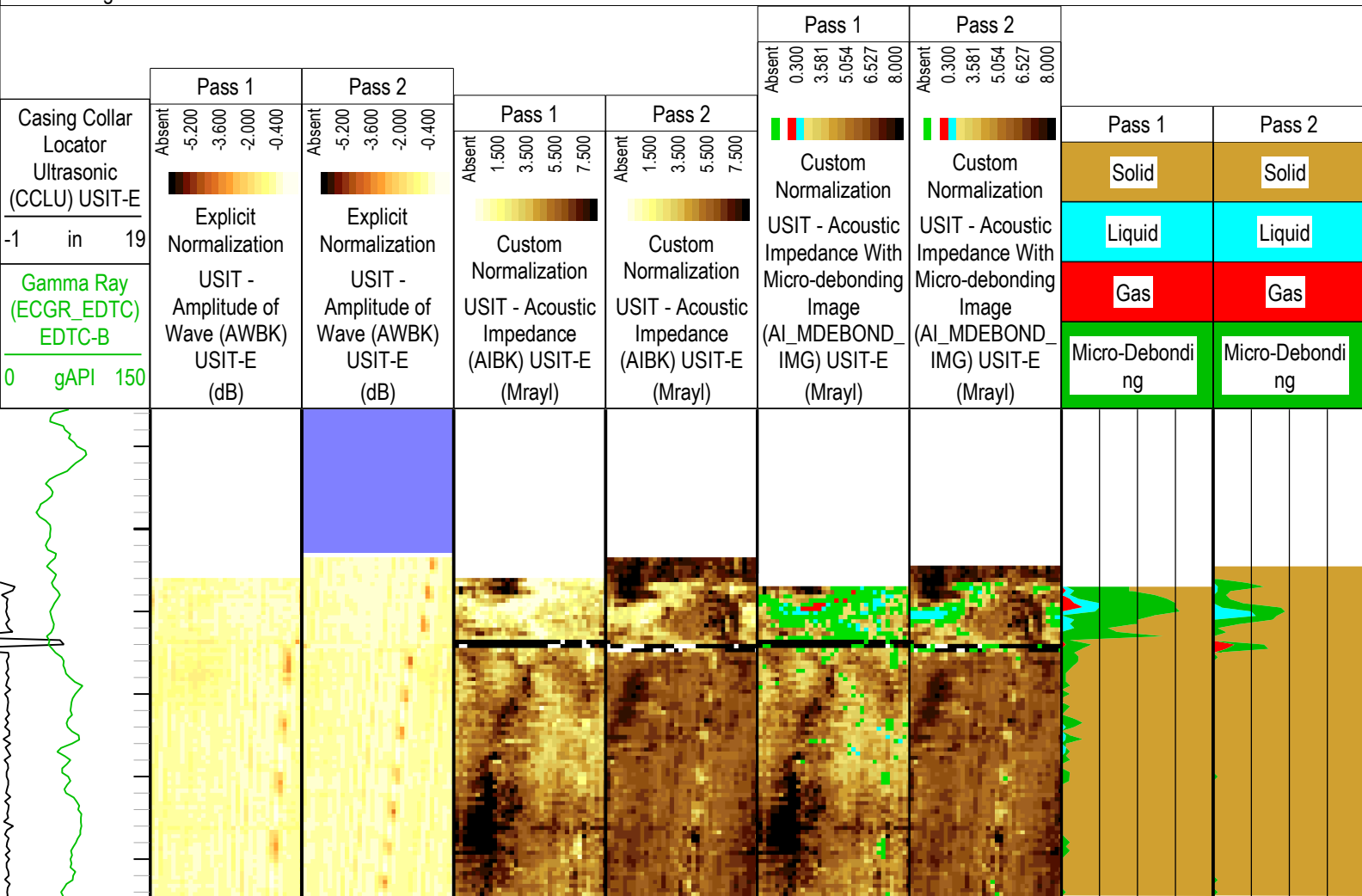
Composite Summary

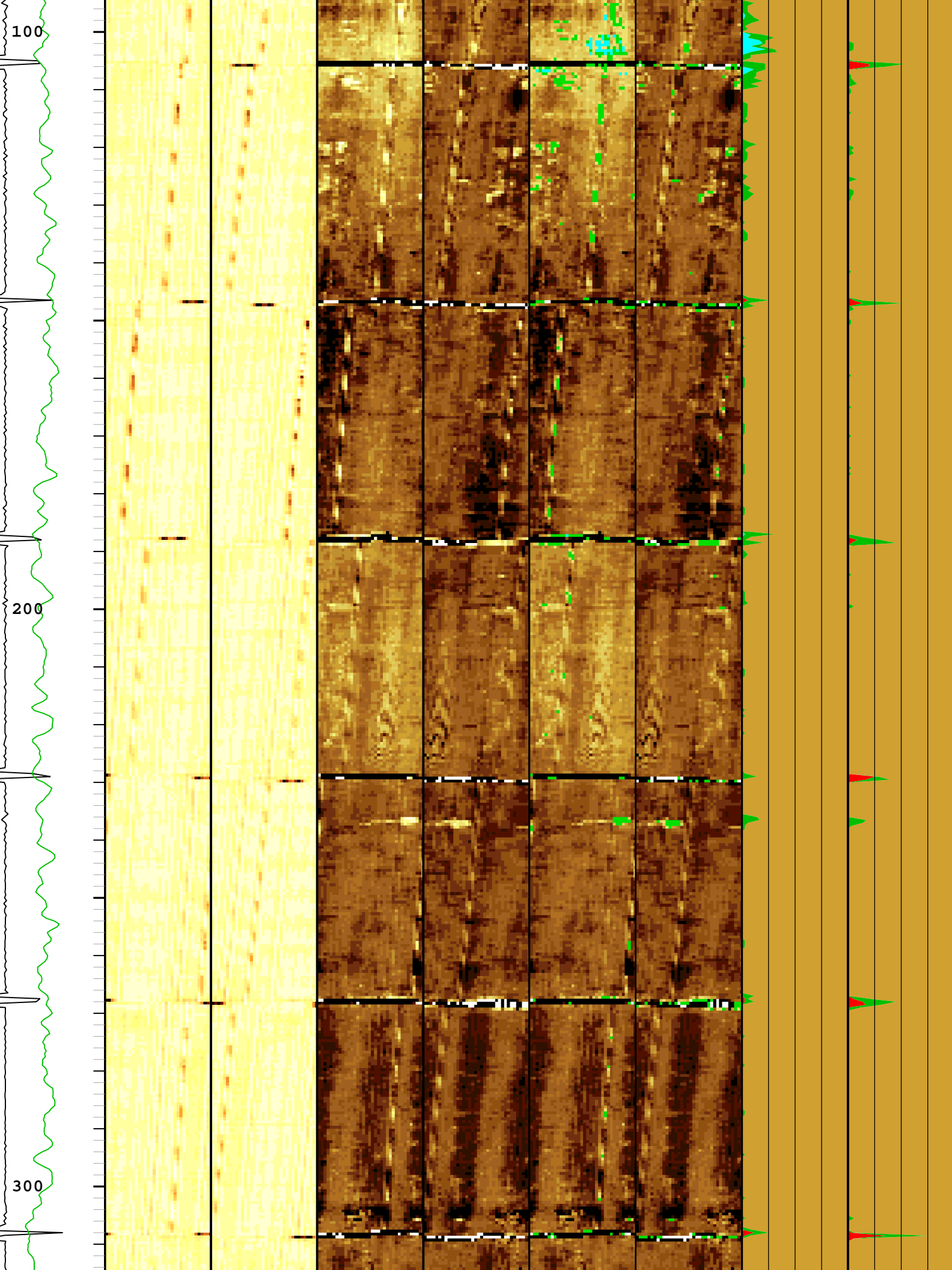
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[2]:Up	Up	55.63 ft	1777.47 ft	05-Aug-2016 10:23:49 AM	05-Aug-2016 10:32:52 AM	ON	4.17 ft	Yes
One	Log[3]:Up	Up	53.14 ft	1776.86 ft	05-Aug-2016 10:43:25 AM	05-Aug-2016 10:54:32 AM	ON	5.34 ft	Yes

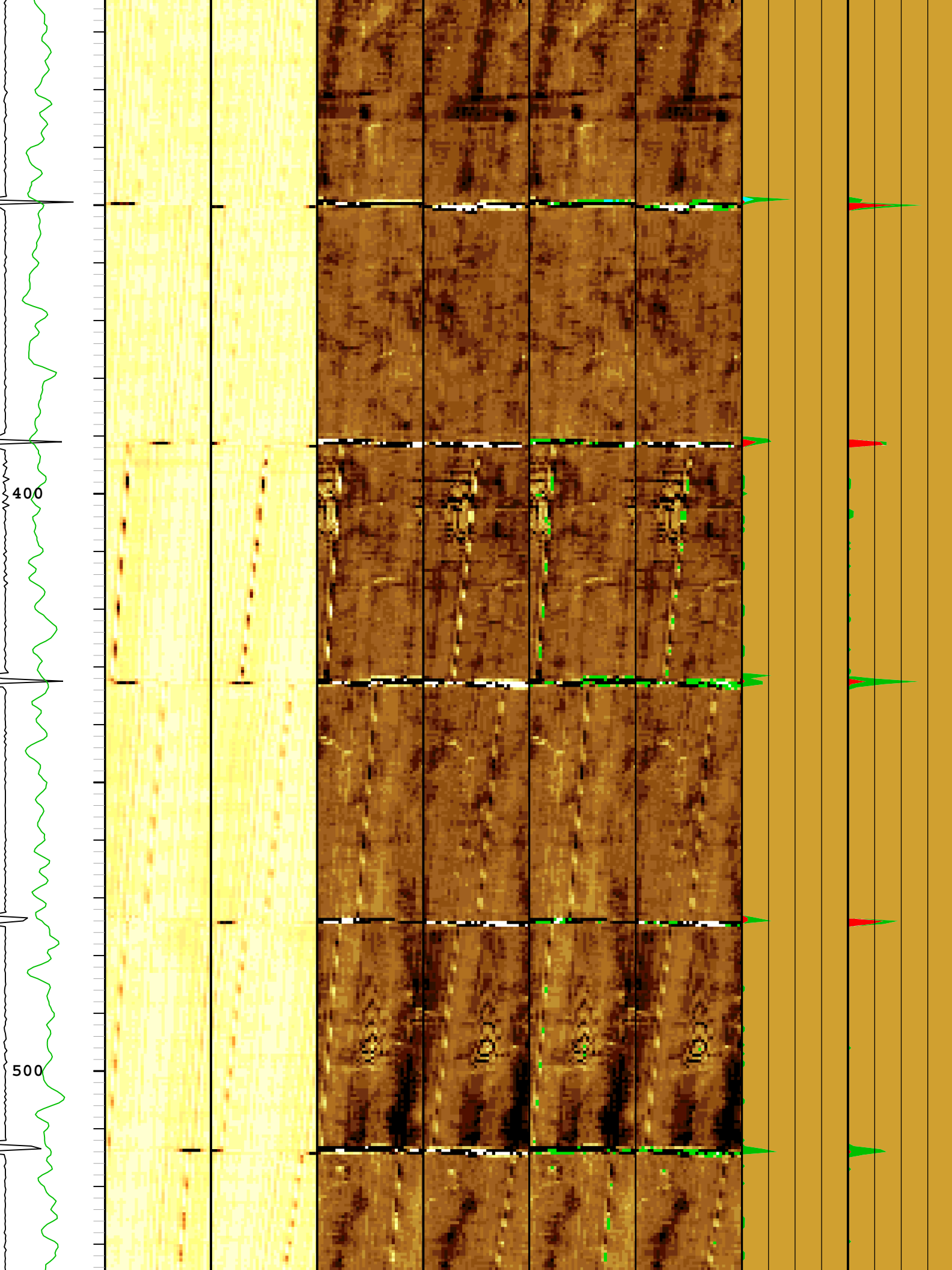
All depths are referenced to toolstring zero

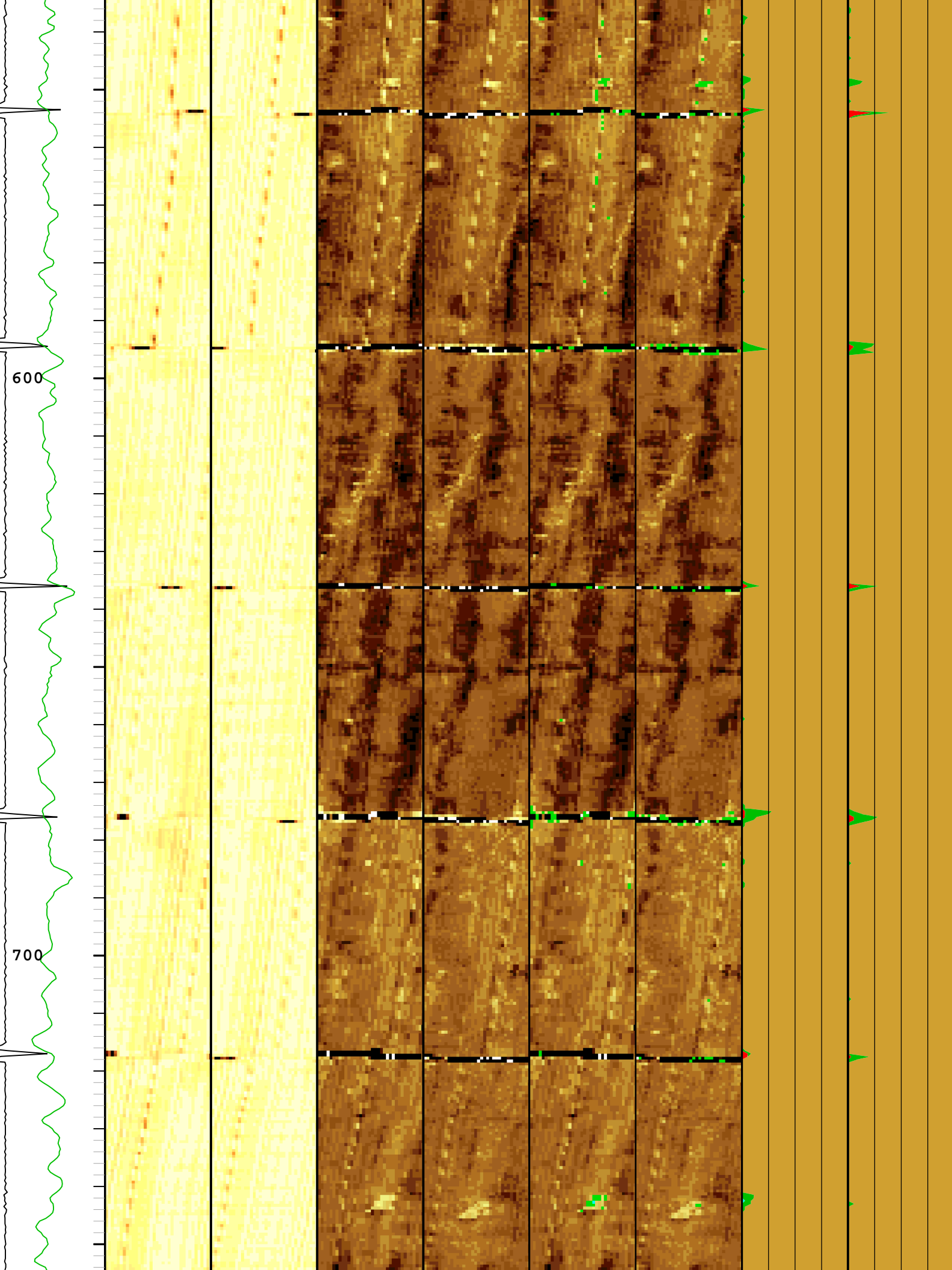
Log	Company:Kerr-Mcgee Oil and Gas Onshore LP Well:Wilson Ranch 4C-27HZ Merge Composite:S007
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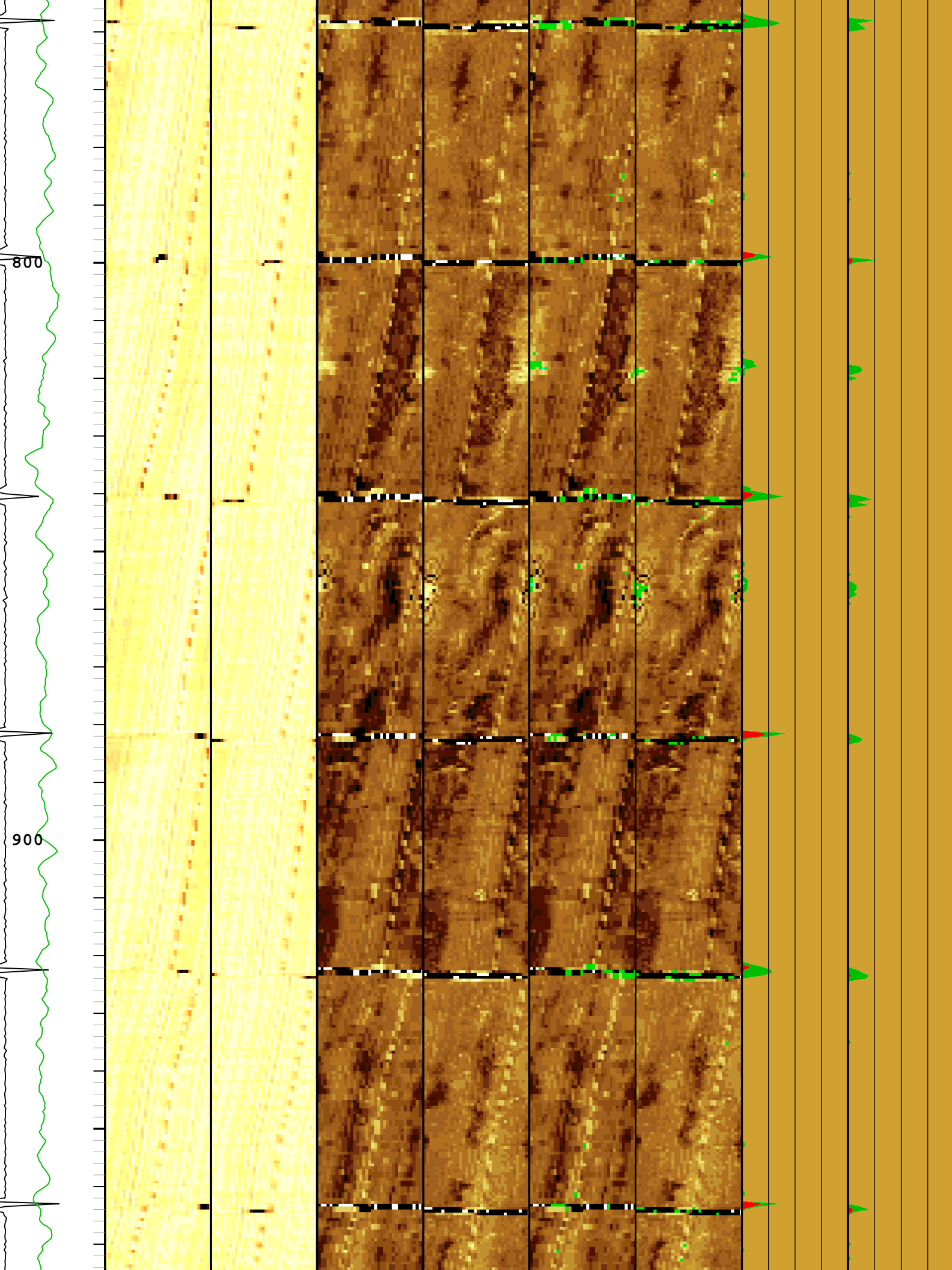
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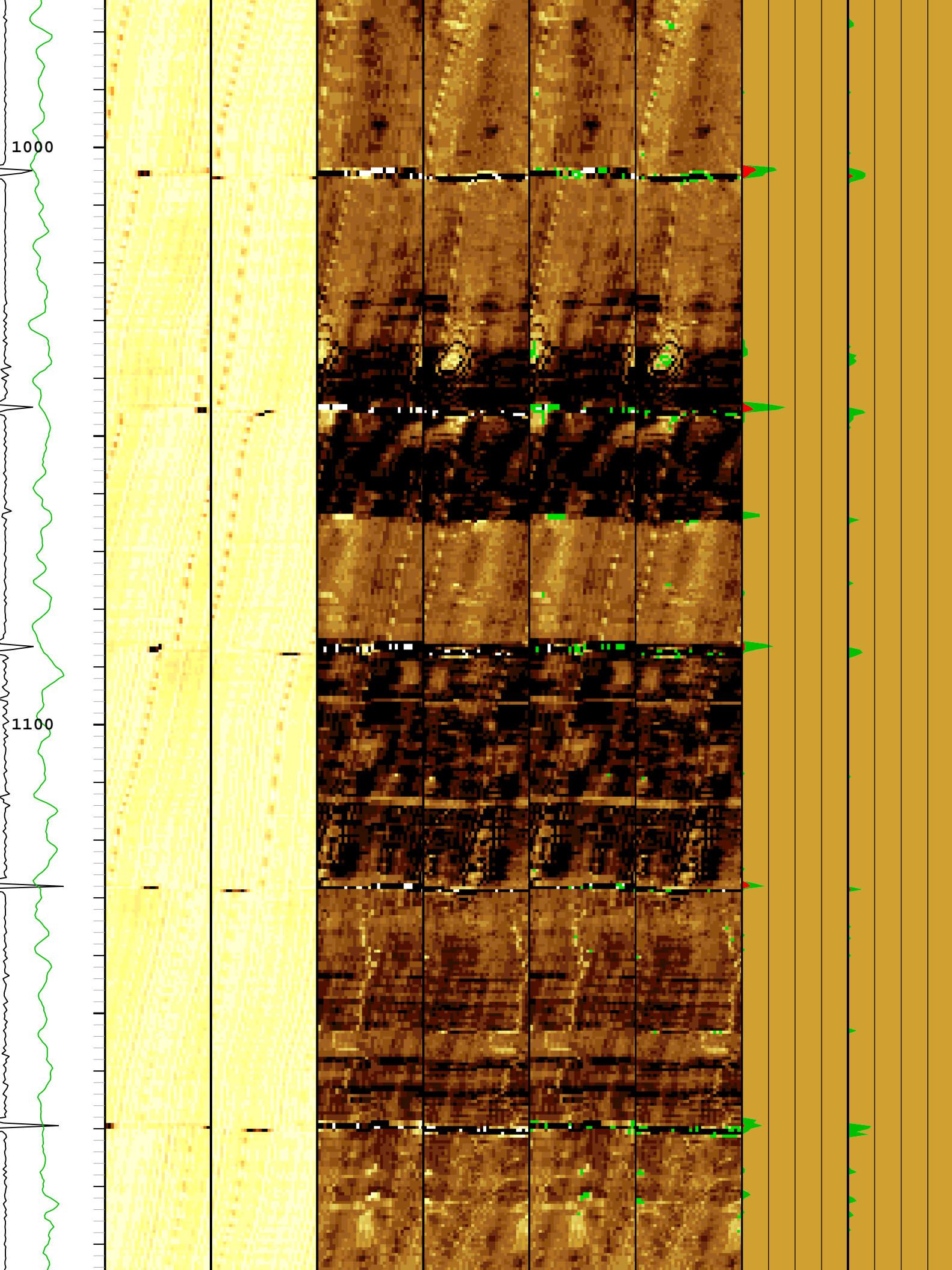


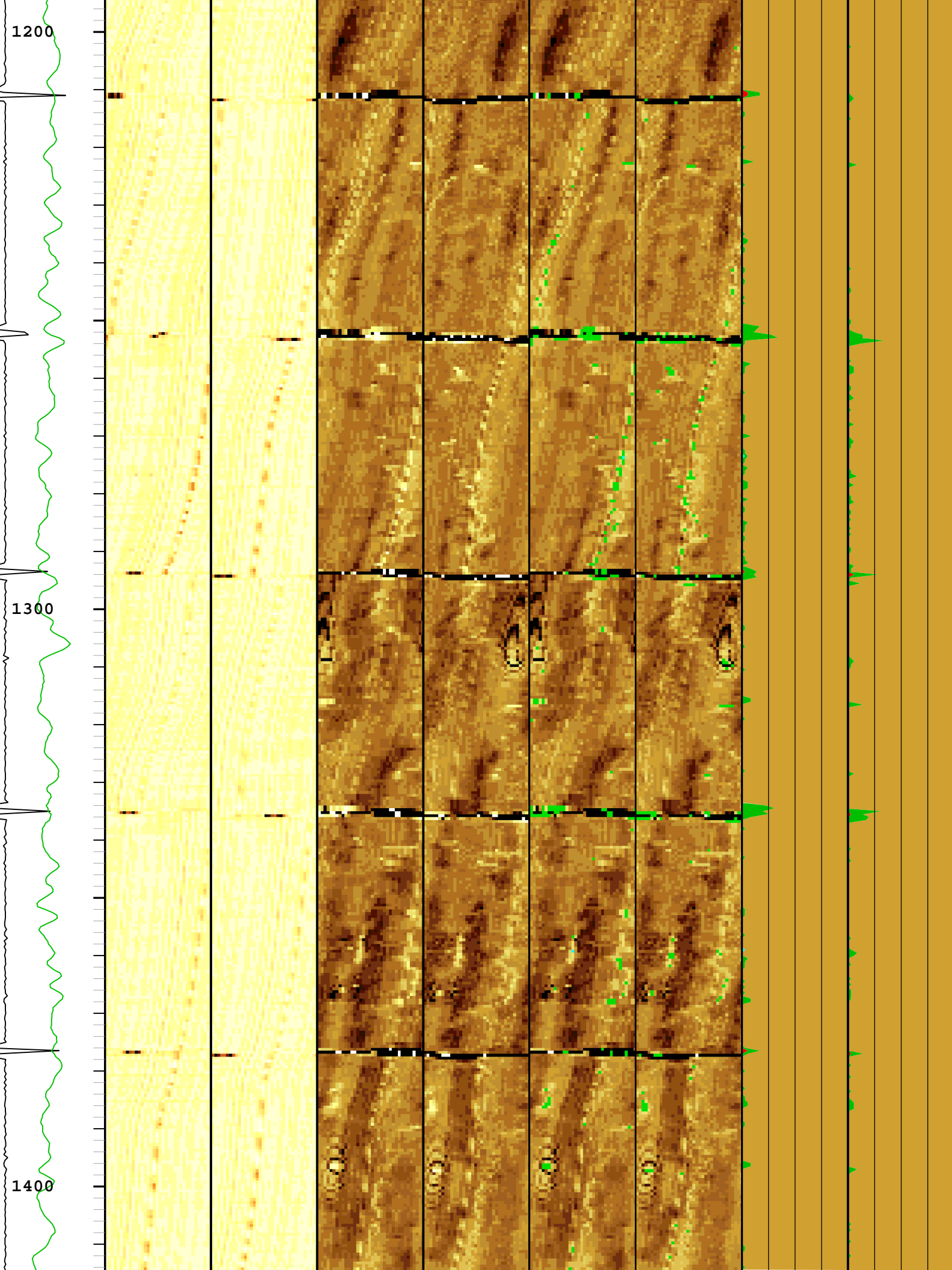


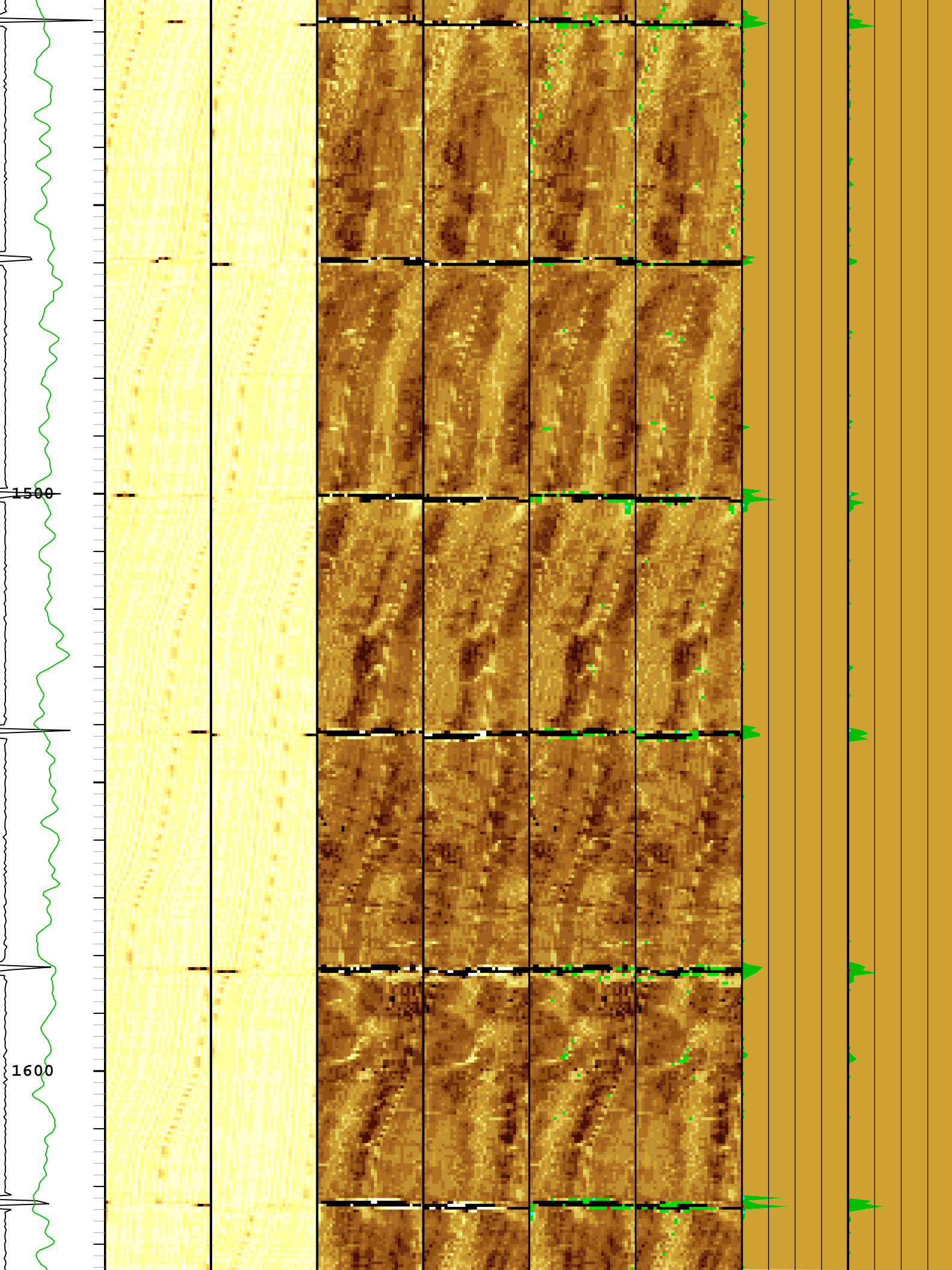


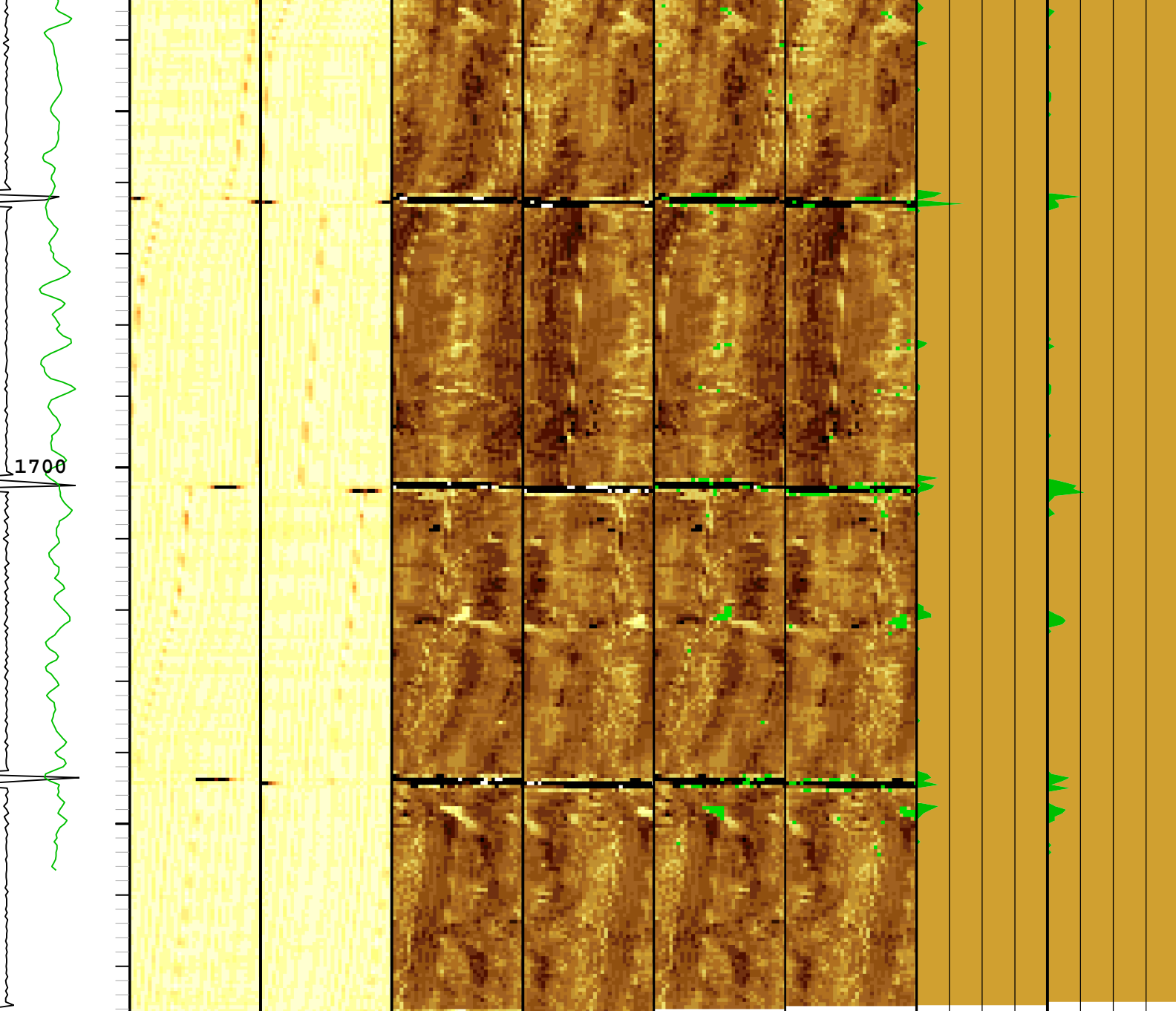












Casing Collar Locator Ultrasonic (CCLU) USIT-E	 Explicit Normalization USIT - Amplitude of Wave (AWBK) USIT-E (dB) Pass 1	 Explicit Normalization USIT - Amplitude of Wave (AWBK) USIT-E (dB) Pass 2	 Custom Normalization USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl) Pass 1	 Custom Normalization USIT - Acoustic Impedance (AIBK) USIT-E (Mrayl) Pass 2	 Custom Normalization USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl) Pass 1	 Custom Normalization USIT - Acoustic Impedance With Micro-debonding Image (AI_MDEBOND_IMG) USIT-E (Mrayl) Pass 2	Solid	Liquid	Gas	Micro-Debonding	Pass 1	Pass 2

Description: USI Corrosion Format: Log (Multiple Pass USI (3 inch)) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 05-Aug-2016 20:00:58

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	

BERJ	Bad Echo Rejection	USIT-E	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	13.5	in
CASING_PRATIO	Casing Poisson Ratio	USIT-E	Standard Poisson Ratio	
CBLO	Casing Bottom (Logger)	WLSESSION	1776	ft
CDEN	Cement Density	EDTC-B	16.69	lbm/gal
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FDII	FPM Data Interpolation Interval	USIT-E	0	ft
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GR_MULTIPLIER	Gamma Ray Multiplier	EDTC-B	1	
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	Depth Zoned	us
MUD_N_THE	Theoretical Mud Normalization Factor	USIT-E	1	
RCOD	Reference Calibrator Outer Diameter	USIT-E	7	in
RCSO	Reference Calibrator Standoff	USIT-E	1.378	in
RCTH	Reference Calibrator Thickness	USIT-E	0.295	in
SDNV	Number of Vertical Samples used for Micro-debonding Computation	USIT-E	5	
SDTHOR	Acoustic Impedance STD Horizontal Threshold for Micro-debonding	USIT-E	0.5	Mrayl
SDTVER	Acoustic Impedance STD Vertical Threshold for Micro-debonding	USIT-E	0.3	Mrayl
SOCN	Standoff Distance	EDTC-B	0.125	in
SOCO	Standoff Correction Option	EDTC-B	No	
TCUB	T^3 Processing Level	USIT-E	Loop	
THDH	Maximum Search Thickness (percentage of nominal)	USIT-E	130	%
THDL	Minimum Search Thickness (percentage of nominal)	USIT-E	70	%
TPOS_EDTC	Tool Position: Centered or Eccentered	EDTC-B	Eccentered	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0	Mrayl
UFGDE	Fiberglass Density	USIT-E	16.27	lbm/gal
UFGPS	Fiberglass Processing Selection	USIT-E	No	
UFGVL	Fiberglass Velocity	USIT-E	9678.48	ft/s
USI_FSOD	USIT USI Fluid Slowness Fits Casing Outer Diameter	USIT-E	0_OFF	
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	Theoretical	
THDP	Thickness Detection Policy	USIT-E	Fundamental	
VCAS	Ultrasonic Transversal Velocity in Casing	USIT-E	51.4	us/ft
ZCAS	Acoustic Impedance of Casing	USIT-E	46.25	Mrayl
ZINI	Initial Estimate of Cement Impedance	USIT-E	-1	Mrayl
ZMUD	Acoustic Impedance of Mud	Borehole	1.78	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.6	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

OneDepth Zoned Parameters			
Parameter	Value	Start (ft)	Stop (ft)
MEAS_WLEN	21.86	35.5	1776
MEAS_WLEN	20	1776	1777

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
U-USIT_DDT5	USIC Downhole Decimation for T5 only	USIT-E	0_NONE	
DOT(DOS)	Distance between Opposite Transducer Faces	USIT-E	4.874	in
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
MOTOR_PROTECT	Motor Protection	USIT-E	On	
TMUC	Type of Mud	USIT-E	BRI	
UACLV_PERM	Ultrasonic ACLV Permanent	USIT-E	No	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
UMFR	Modulation Frequency	USIT-E	333333	Hz
USFR	Ultrasonic Sampling Frequency	USIT-E	500000	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in LF	
USIT_DEPTHLOG	Starting Depth Log for Ultrasonics	USIT-E	500	ft
USSP	Ultrasonic Service	USIT-E	USI	
VRES	Vertical Resolution	USIT-E	6.0 in	
WINB	Window Begin Time	USIT-E	49.47	us
WINE	Window End Time	USIT-E	89.47	us

OneTime Zoned Parameters

Pass Log[2]:Up

Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	40	05-Aug-2016 10:23:49	05-Aug-2016 10:24:27	1777.47	1760.33
EMXV	50	05-Aug-2016 10:24:27	05-Aug-2016 10:32:52	1760.33	55.63

Pass Log[3]:Up

EMXV	50	05-Aug-2016 10:43:25	05-Aug-2016 10:47:31	1776.86	1368.68
EMXV	55	05-Aug-2016 10:47:31	05-Aug-2016 10:47:45	1368.68	1322.12
EMXV	60	05-Aug-2016 10:47:45	05-Aug-2016 10:47:56	1322.12	1285.4
EMXV	65	05-Aug-2016 10:47:56	05-Aug-2016 10:48:21	1285.4	1202.99
EMXV	70	05-Aug-2016 10:48:21	05-Aug-2016 10:48:29	1202.99	1175.65
EMXV	75	05-Aug-2016 10:48:29	05-Aug-2016 10:48:40	1175.65	1139.42
EMXV	80	05-Aug-2016 10:48:40	05-Aug-2016 10:48:58	1139.42	1081.98
EMXV	85	05-Aug-2016 10:48:58	05-Aug-2016 10:49:05	1081.98	1056.9
EMXV	90	05-Aug-2016 10:49:05	05-Aug-2016 10:51:52	1056.9	481.78
EMXV	95	05-Aug-2016 10:51:52	05-Aug-2016 10:52:18	481.78	392.24
EMXV	100	05-Aug-2016 10:52:18	05-Aug-2016 10:54:32	392.24	53.14

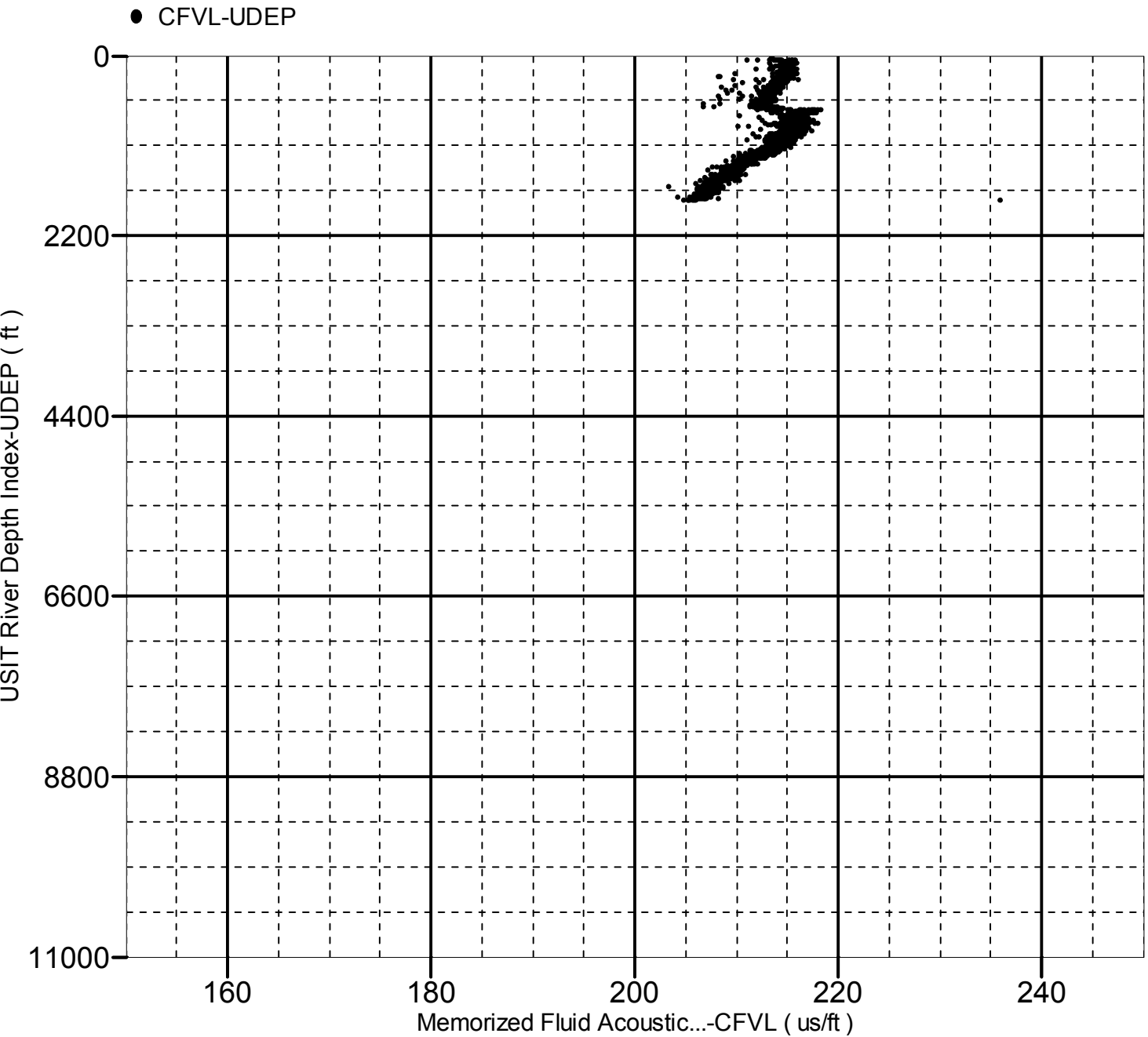
All depth are at tool zero.

Fluid Acoustic Slowness vs Depth

2D Cross Plot

2D Cross Plot

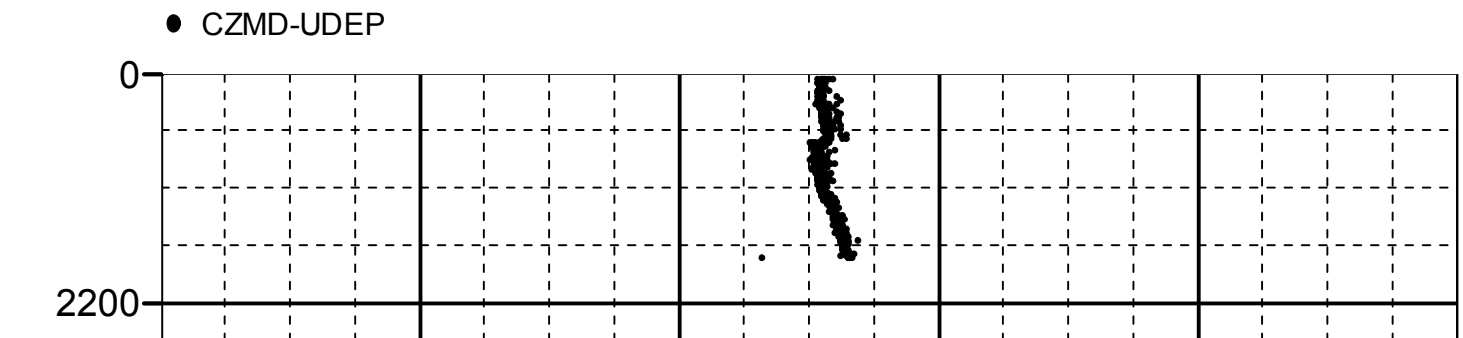
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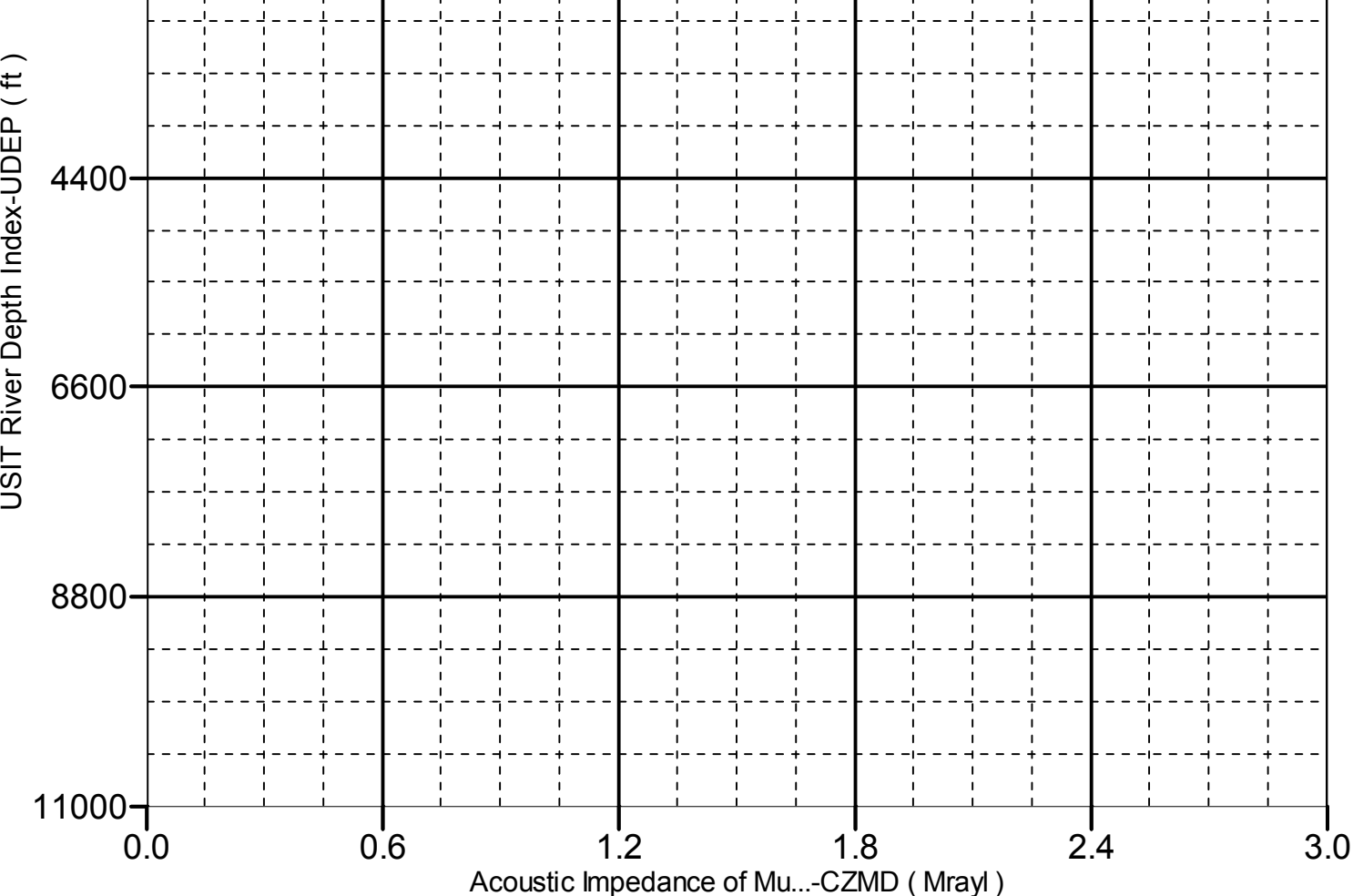


Acoustic Impedance of M ud vs Depth

2D Cross Plot

Index Range: From 1777.00 to 55.50 ft





Company: Kerr-Mcgee Oil and Gas Onshore LP

Schlumberger

Well: Wilson Ranch 4C-27HZ

Field: Wattenberg

County: Weld

Country: US

Ultrasonic Imager Tool

*** USI Multiple Pass Log ***

