

DIRECTIONAL INFORMATION

Maximum Deviation @ KOP @

VERTICAL WELL

Remarks:

1. CORRELATION LOG OR CASING TALLY WAS NOT PROVIDED BY CUSTOMER.
2. POSITIVE DEPTH CONTROL APPLIED
3. SCALES AND PRESENTATIONS AS CUSTOMER REQUESTED
4. ALL PROCEDURES WERE DONE IN AGREEMENT WITH CUSTOMER REPRESENTATIVE
5. GR-CCL-CBL RAN IN COMBINATION AS SHOWN IN THE TOOL DIAGRAM
6. DATA MISSING ON HEADER WAS NOT PROVIDED BY CUSTOMER
7. TRAVEL TIME SKIPS BELOW 4mV.

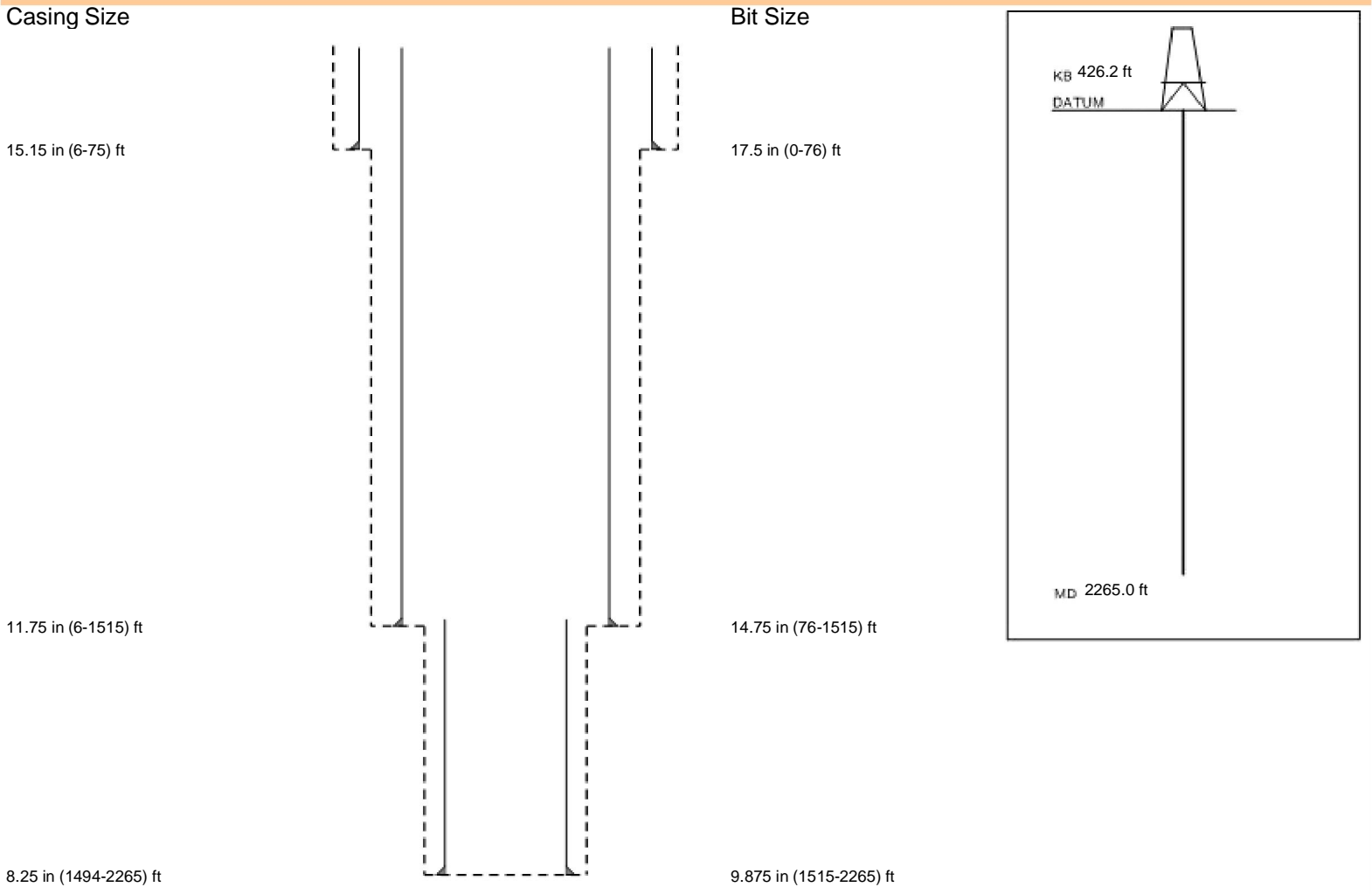
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WELL DIAGRAM REPORT

<p>Customer: ECOPETROL S.A. Well: INFANTAS 309 Field: LA CIRA INFANTAS Datum: G.L.E.</p>	<p>Location: SURFACE LOCATION: N: 1.250.805,5 m E: 1.034.901,5 m ORIGIN: BOGOTA RIG: RSU03</p>
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TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
		Ø 2.310 in →		← Fishing Neck @ 31.66 ft		32.55 ft
RWCH-12001602 135.00 lbs		Ø 3.625 in →		← Load Cell @ 28.86 ft ← BH Temperature @ 28.30 ft	6.25 ft	26.30 ft
	Weak Point 11000 lbs- 11356143 0.01 lbs	Ø 0.010 in* →				2.00 ft
CCL-D-11658795 60.00 lbs		Ø 3.625 in →		← CCL @ 25.59 ft ← Z-Accelerometer @ 23.84 ft		24.30 ft
		Ø 3.625 in →				8.52 ft
GTET-11512327 165.00 lbs		Ø 3.625 in →		← GammaRay @ 18.23 ft		15.77 ft
	Centralizer 25-00000001 8.00 lbs	Ø 16.000 in* →				
		Ø 3.625 in →		← Receiver Array @ 7.26 ft ← Sonic Receivers @ 7.26 ft	15.77 ft	0.00 ft
BSAT-10995703 300.00 lbs		Ø 3.625 in →				
	Centralizer 25-00000002 8.00 lbs	Ø 16.000 in* →				

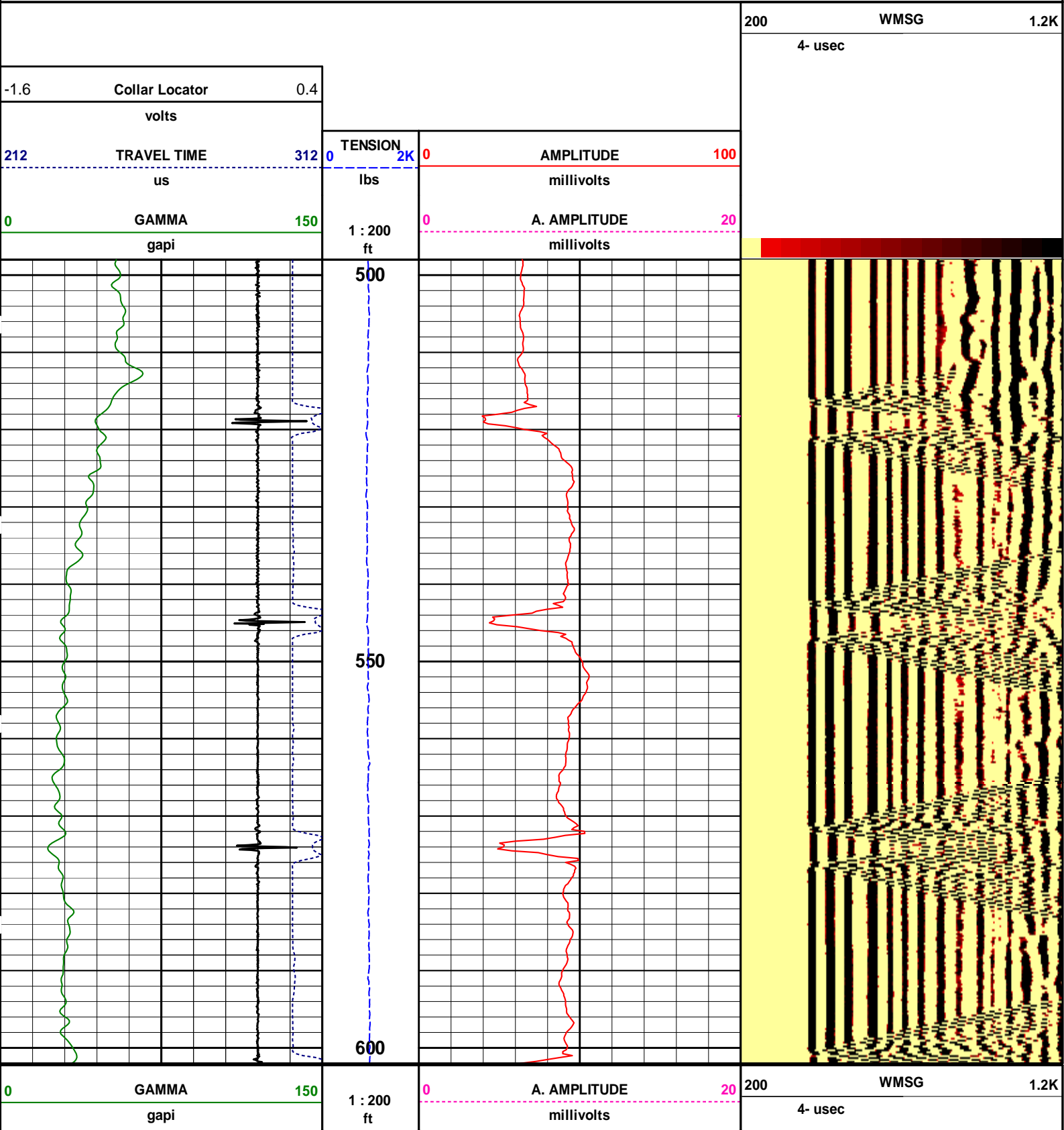
Mnemonic	Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head	12001602	135.00	6.25	26.30	300.00
WP11K	Weak Point 11000 lbs	11356143	0.01	0.01	*	27.10
CCL	Casing Collar Locator - Digital Source	11658795	60.00	2.00	24.30	300.00
GTET	Gamma Telemetry Tool	11512327	165.00	8.52	15.77	60.00
BSAT	Borehole Sonic Array Tool	10995703	300.00	15.77	0.00	60.00
OBCEN	Centralizer - 25 in. Overbody	00000002	8.00	2.08	*	0.21
OBCEN	Centralizer - 25 in. Overbody	00000001	8.00	2.08	*	12.91

Total			676.01	32.55		
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HALLIBURTON

Plot Time: 19-Jan-17 14:00:21
Plot Range: 498 ft to 602 ft
Data: INFA309_CH\Well Based\DAQ-0001-010\
Plot File: \\CBL\FREE_PIPE

FREE PIPE SECTION
SCALE 1:200



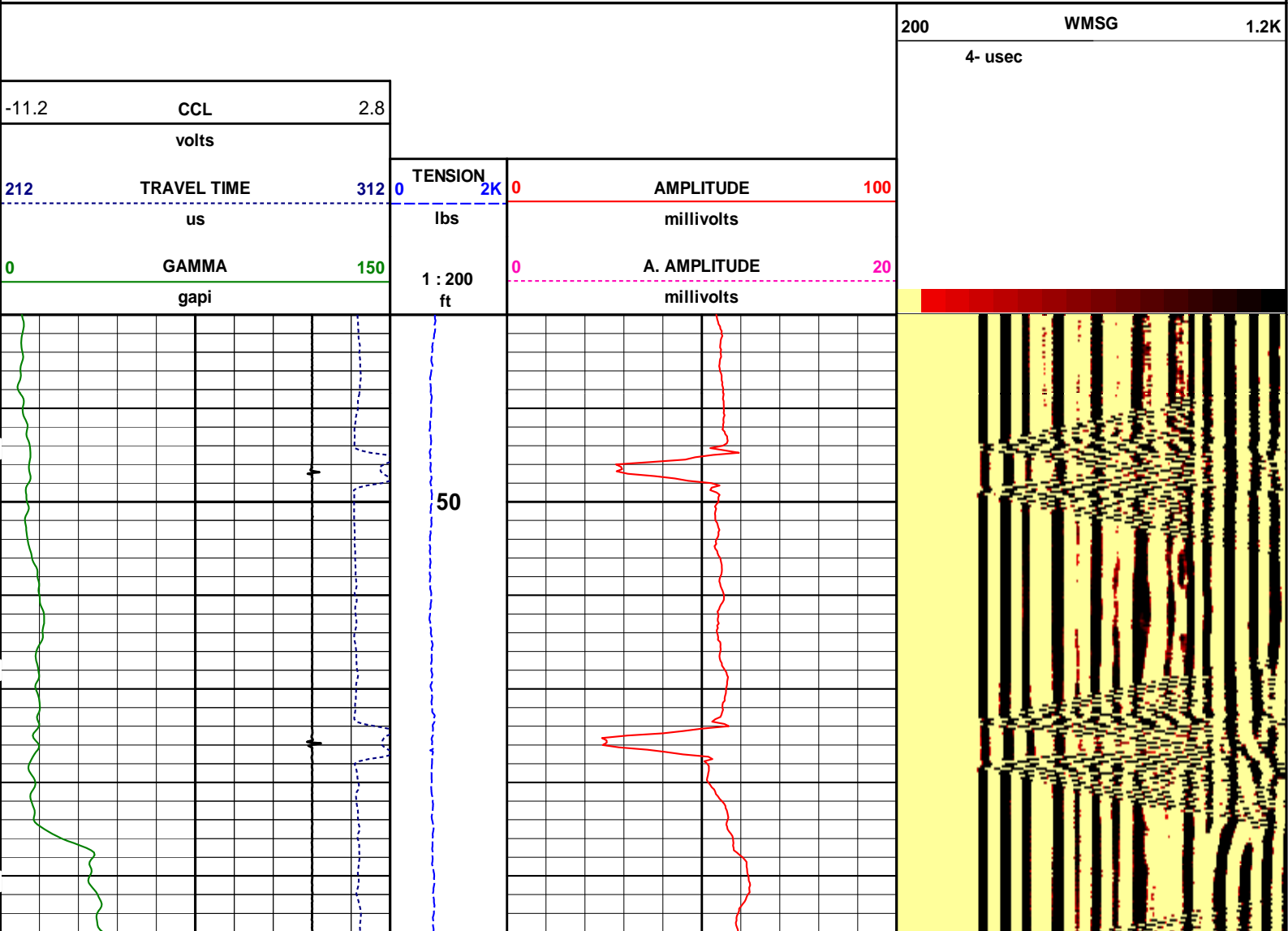
212	TRAVEL TIME	312 0	TENSION	2K 0	AMPLITUDE	100
	us		lbs		millivolts	
-1.6	Collar Locator	0.4				
	volts					

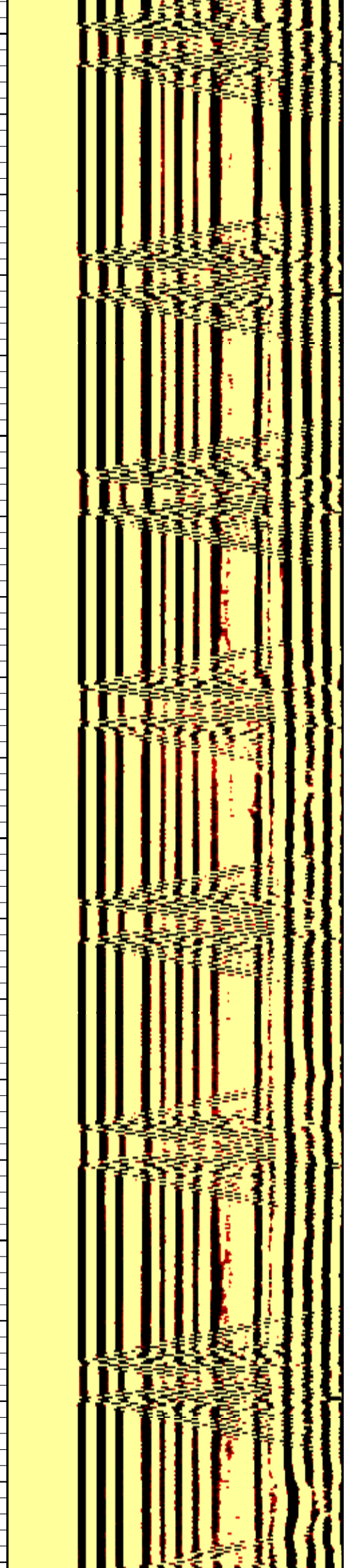
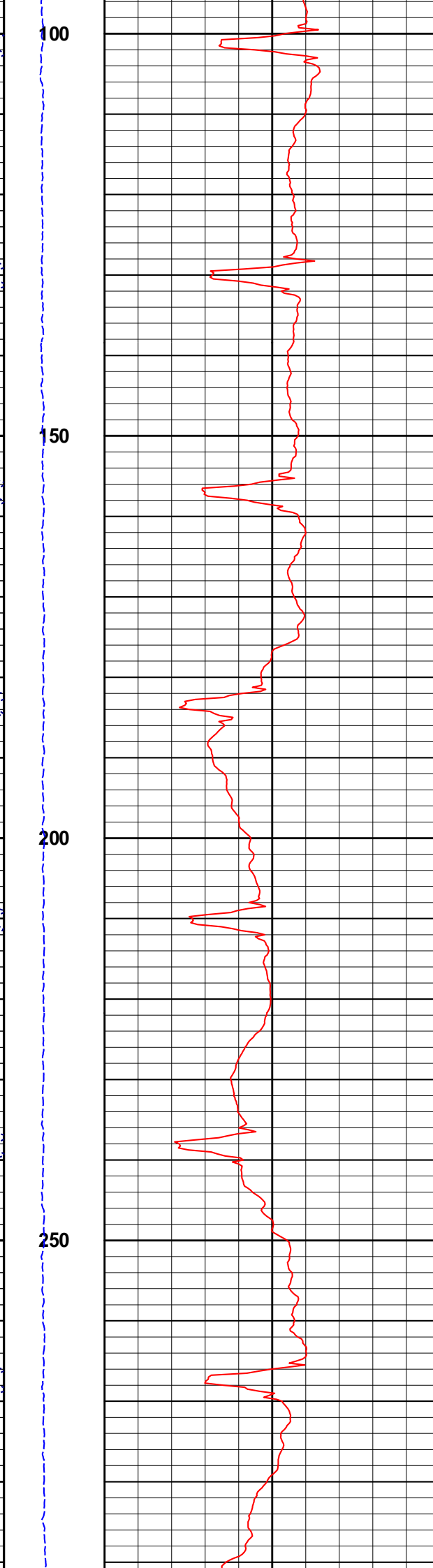
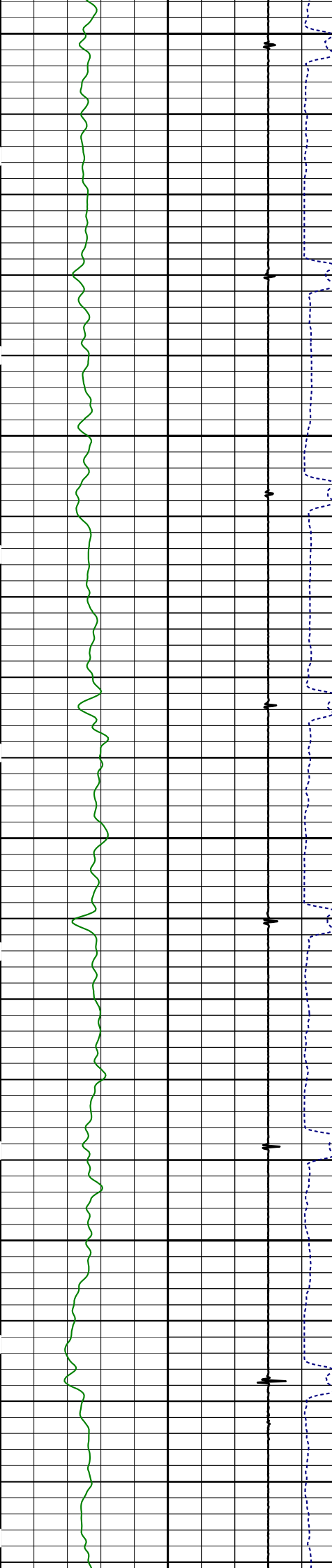
HALLIBURTON Plot Time: 19-Jan-17 14:00:22
 Plot Range: 498 ft to 602 ft
 Data: INFA309_CHWell Based\DAQ-0001-010\
 Plot File: \\CBL\FREE_PIPE

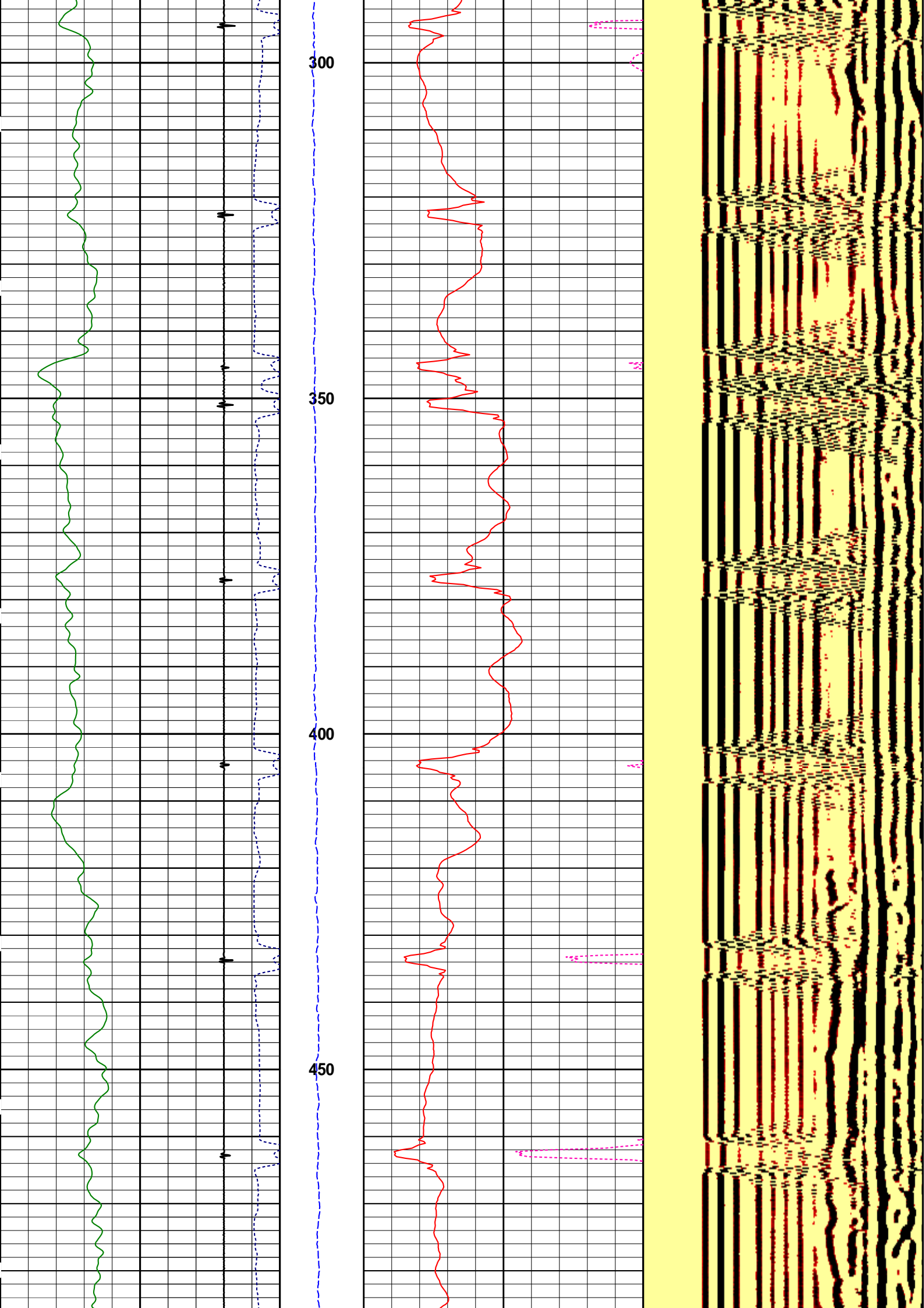
FREE PIPE SECTION
 SCALE 1:200

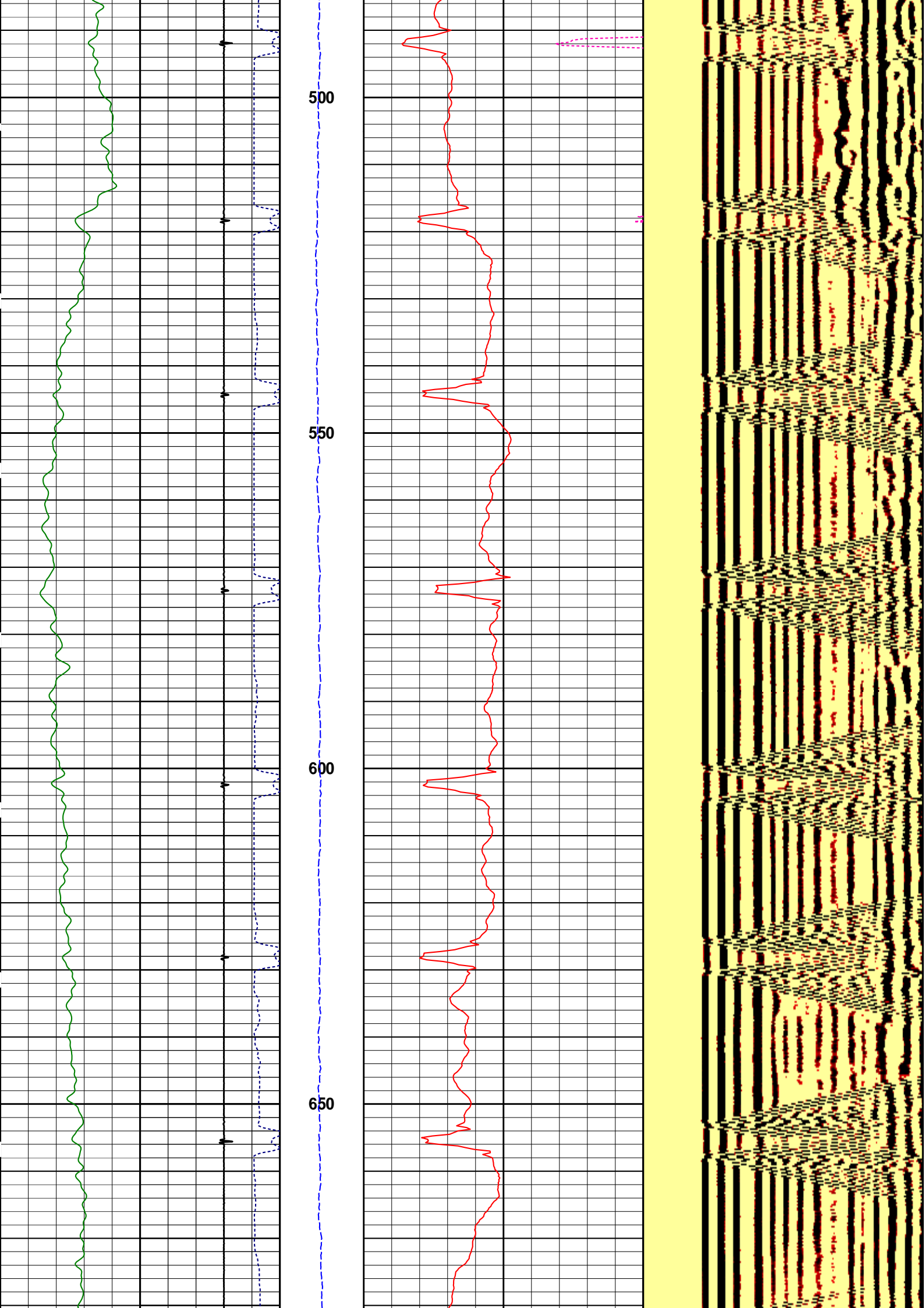
HALLIBURTON Plot Time: 19-Jan-17 14:00:22
 Plot Range: 30 ft to 1403.58 ft
 Data: INFA309_CHWell Based\DAQ-0001-013\
 Plot File: \\CBL\MAIN

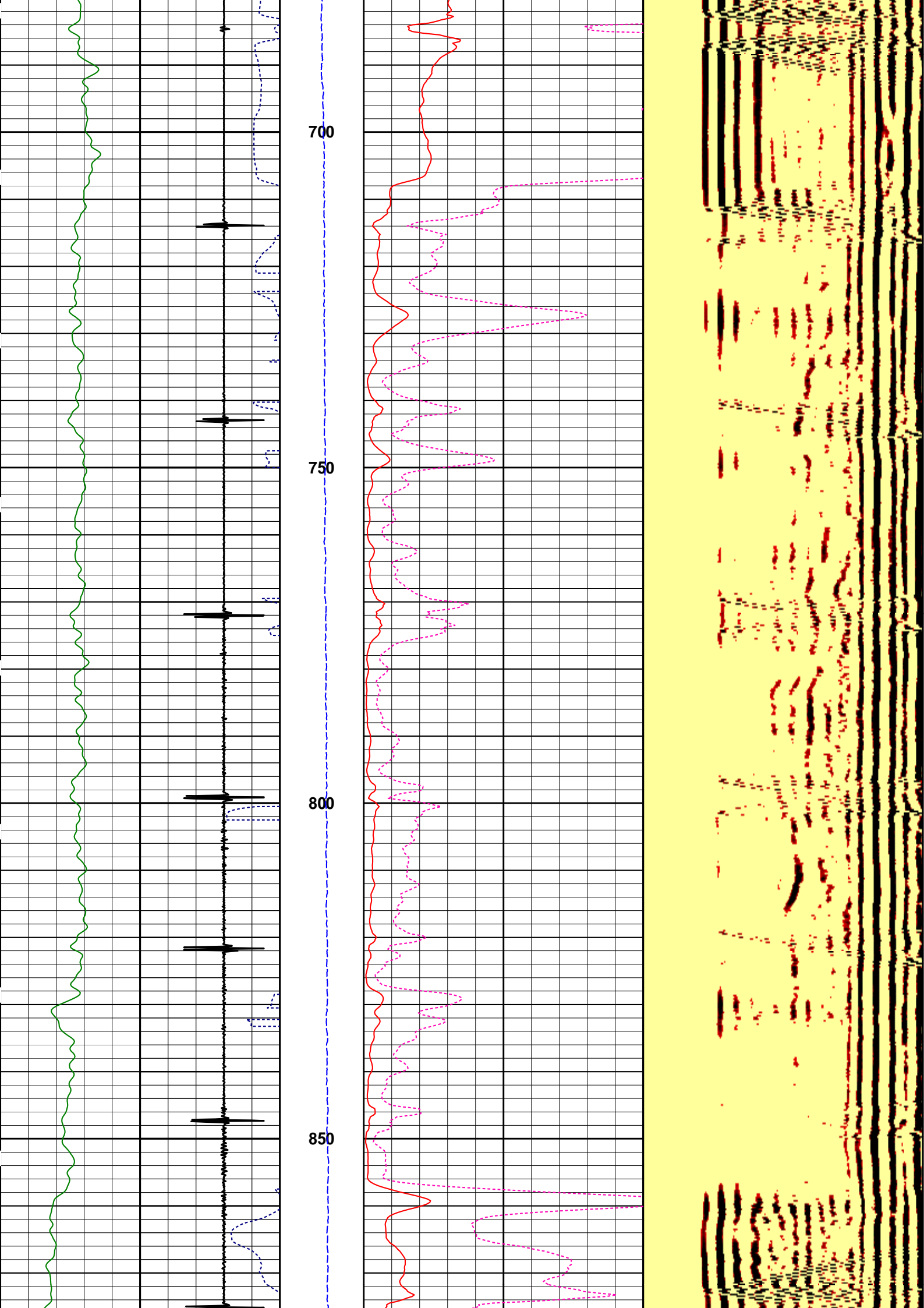
MAIN SECTION
 SCALE 1:200

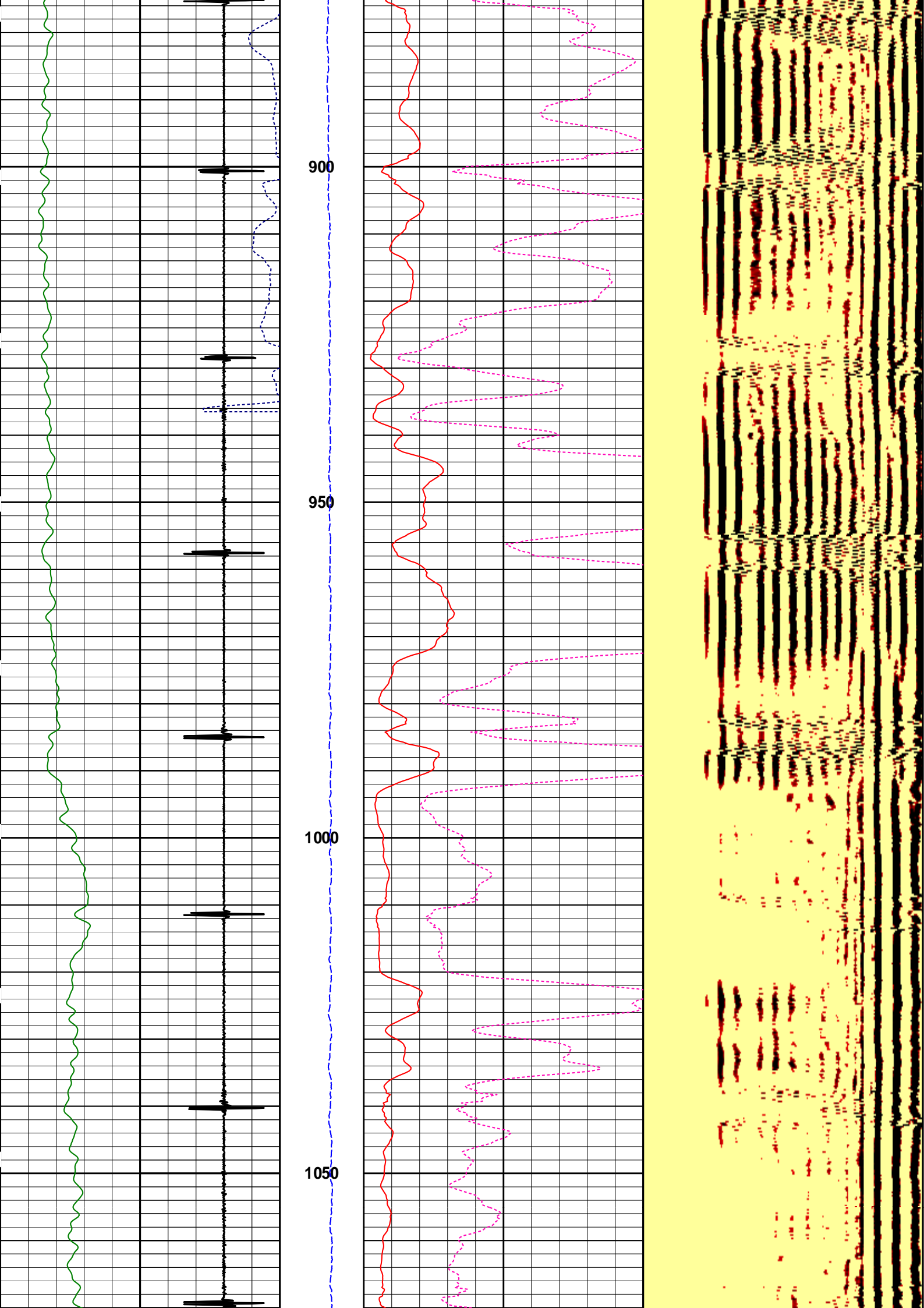


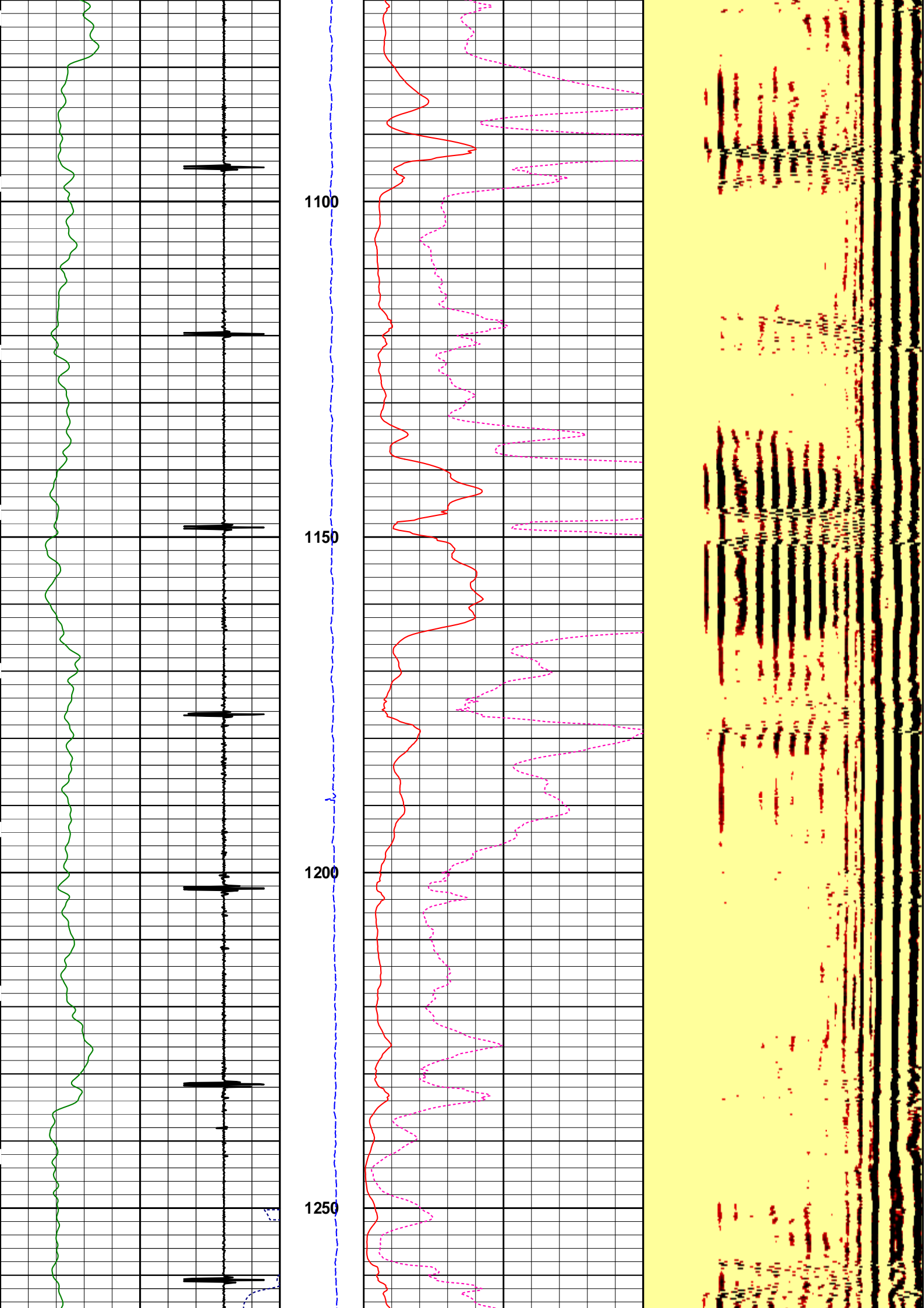


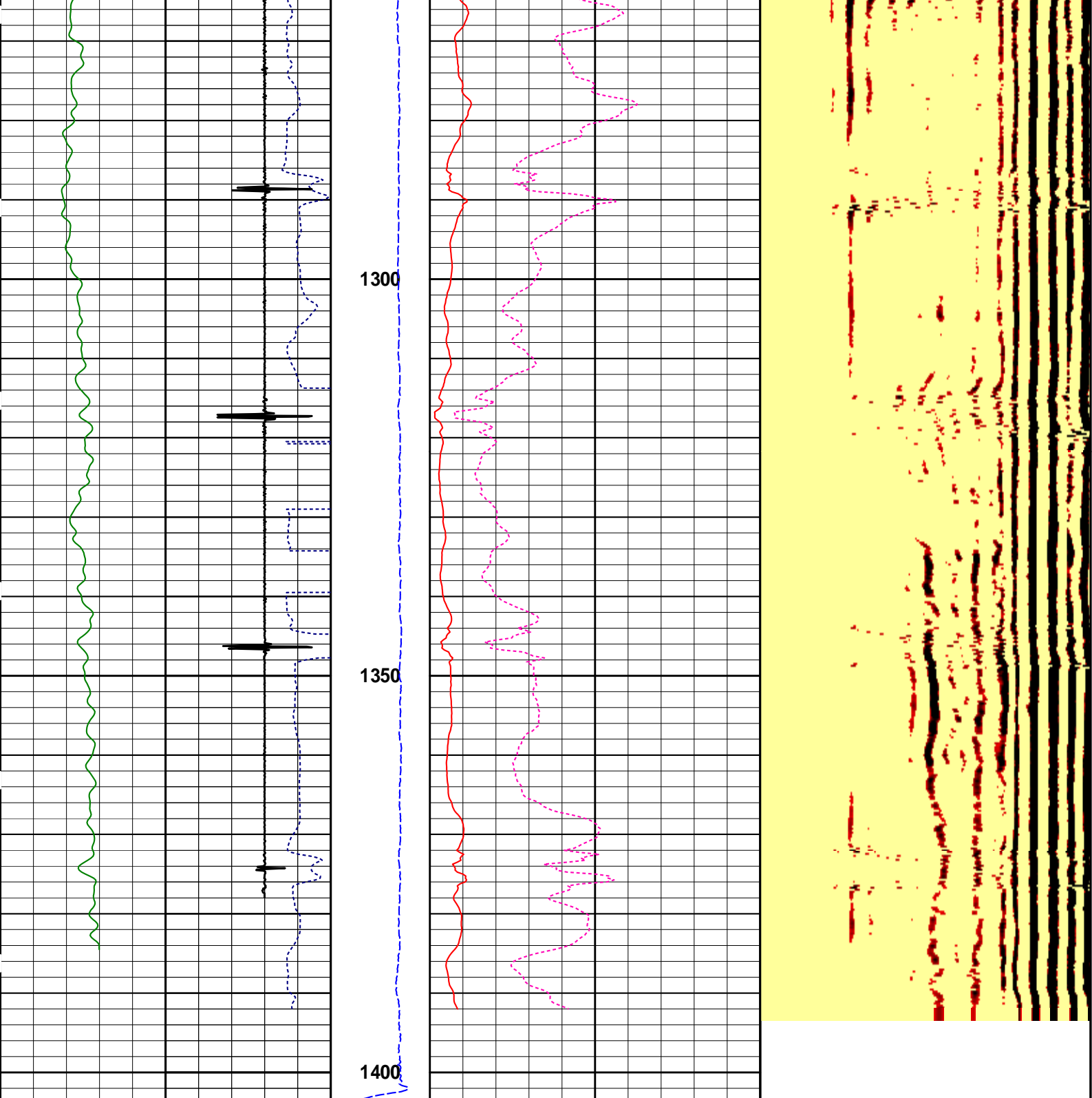












0	GAMMA	150
	gapi	
212	TRAVEL TIME	312
	us	
-11.2	CCL	2.8
	volts	

1 : 200
ft
TENSION
lbs

0	A. AMPLITUDE	20
	millivolts	
0	AMPLITUDE	100
	millivolts	

200	WMSG	1.2K
	4- usec	

HALLIBURTON

Plot Time: 19-Jan-17 14:00:24
 Plot Range: 30 ft to 1403.58 ft
 Data: INFA309_CHWell Based\DAQ-0001-013\
 Plot File: \\CBL\MAIN

MAIN SECTION
SCALE 1:200

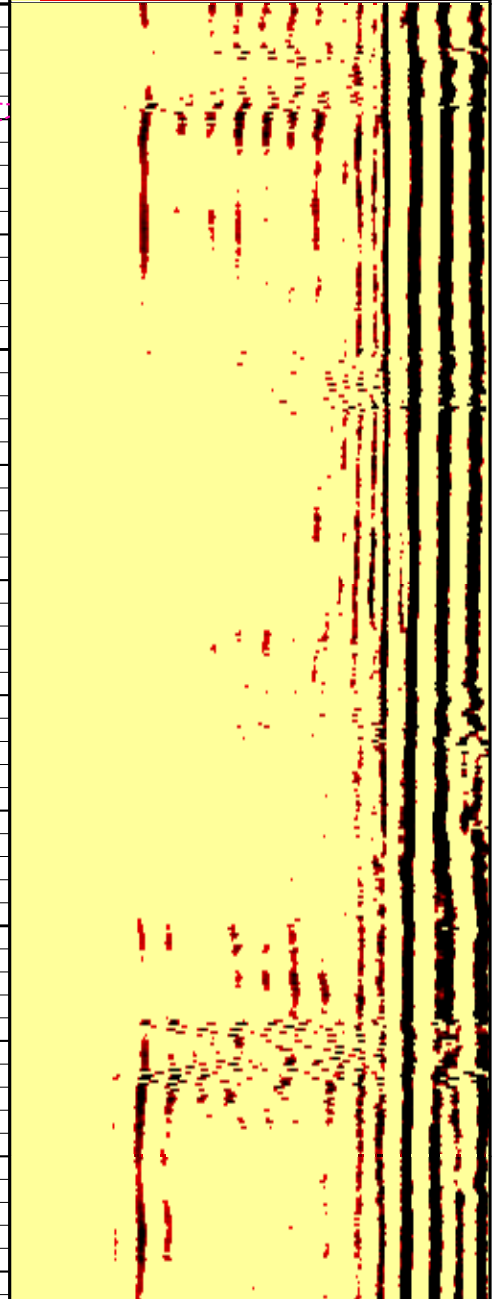
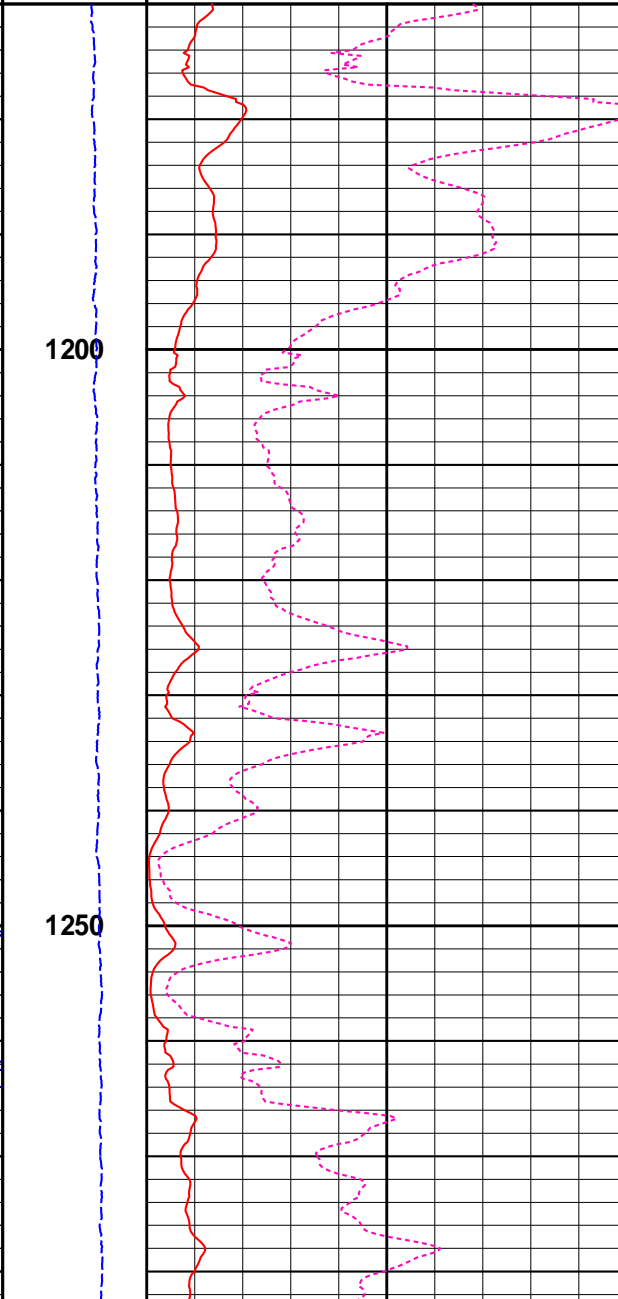
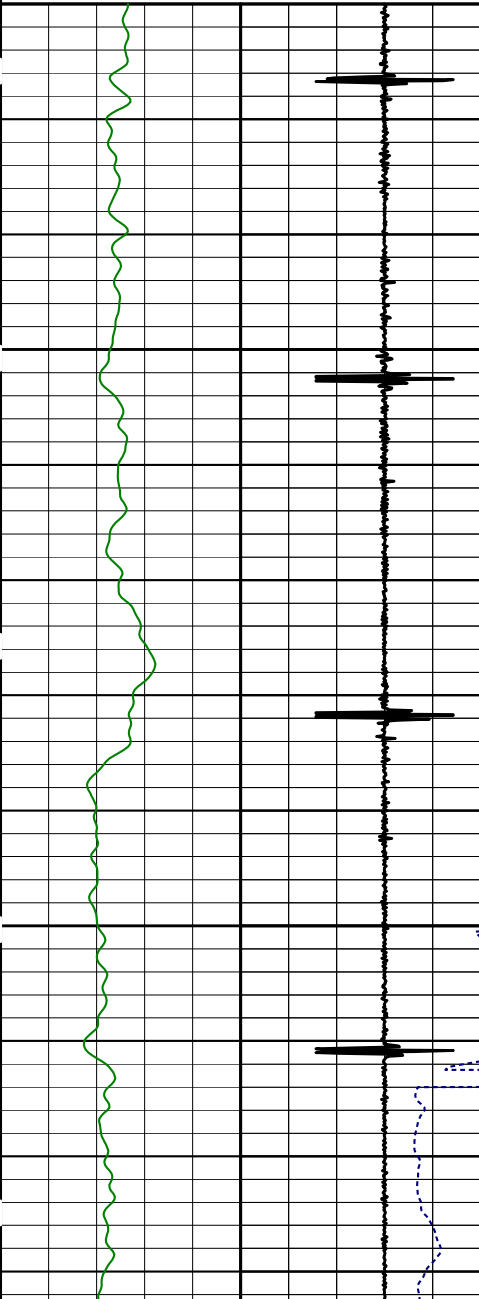
REPEAT SECTION
SCALE 1:200

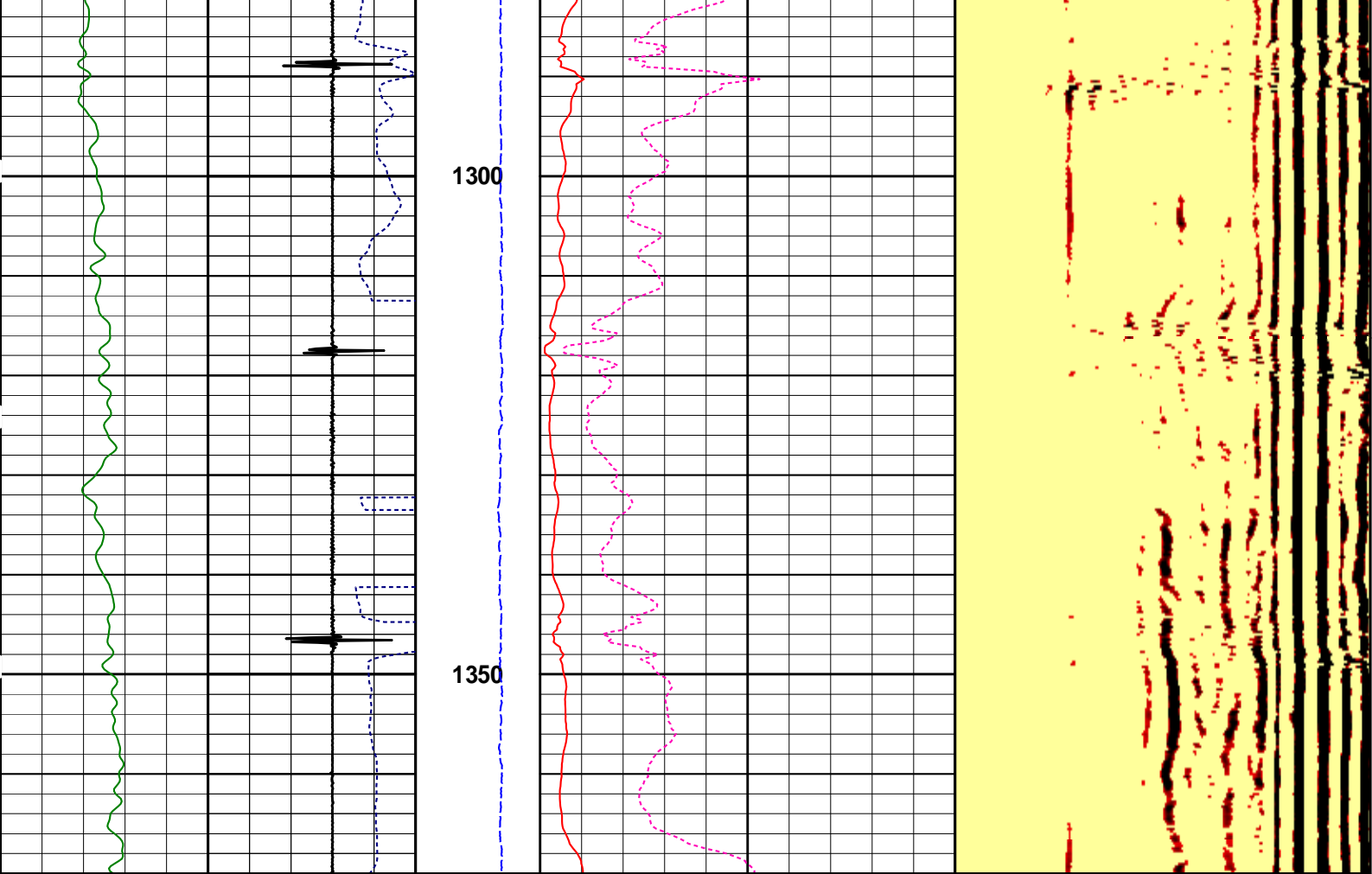
200 WMSG 1.2K

4- usec

-11.2	Collar Locator	2.8
	volts	
212	TRAVEL TIME	312
	us	
0	GAMMA	150
	gapi	

TENSION	2K	0	AMPLITUDE	100
lbs			millivolts	
1 : 200		0	A. AMPLITUDE	20
ft			millivolts	





0	GAMMA	150	1 : 200	0	A. AMPLITUDE	20	200	WMSG	1.2K
	gapi		ft		millivolts			4- usec	
212	TRAVEL TIME	312	TENSION	0	AMPLITUDE	100			
	us		lbs		millivolts				
-11.2	Collar Locator	2.8							
	volts								

HALLIBURTON Plot Time: 19-Jan-17 14:00:25
 Plot Range: 1170 ft to 1370 ft
 Data: INFA309_CHWell Based\DAQ-0001-012*
 Plot File: \CBL\REPEAT

REPEAT SECTION
 SCALE 1:200

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	14.750	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.330	ppg

SHARED	WAGT	Weighting Agent	Natural	
SHARED	BSAL	Borehole salinity	0.00	ppm
SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
SHARED	RMUD	Mud Resistivity	2.000	ohmm
SHARED	TRM	Temperature of Mud	75.0	degF
SHARED	CSD	Logging Interval is Cased?	Yes	
SHARED	CSOD	Outer Casing Diameter	11.750	in
SHARED	CSWT	Casing Weight	60.00	lbpf
SHARED	ISOC	Is Outer Casing Present?	No	
SHARED	CSCM	Casing Cemented	Yes	
SHARED	CMTY	API Cement Class	H	
SHARED	CMWT	Cement Weight	16.500	ppg
SHARED	CSTR	Compressive Strength	1000.00	psia
SHARED	ST	Surface Temperature	80.0	degF
SHARED	TD	Total Well Depth	1413.00	ft
SHARED	BHT	Bottom Hole Temperature	110.0	degF
SHARED	SVTM	Navigation and Survey Master Tool	NONE	
SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
SHARED	TEMM	CBM Temperature Master Tool	GTET	
CCL-D	CLOK	Process CCL?	Yes	
CCL-D	CCLS	CCL Processing Selection	Raw	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	Bit Size	
BSAT	TTLV	Travel Time threshold.	4.0	mV
BSAT	TTOF	CBL Travel Time Offset from Calibration.	0	us
BSAT	ISFM	Is foam cement type?	No	
BSAT	BIOK	Calculate Bond Index?	Yes	
BSAT	ISMD	Is borehole fluid Mud?	No	
BSAT	AMFW	Amplitude Correction from Fluid Weight	No	

BOTTOM

Data: INFA309_CHI0001 CBL_OXYIDLE

Date: 19-Jan-17 13:51:50

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	GTET - 11512327	Reference Calibration Date:	16-Jan-17 13:43:01
Engineer:	YEFERSON SANCHEZ	Calibration Date:	16-Jan-17 13:45:46
Software Version:	WL INSITE R5.2.3 (Build 2)	Calibration Version:	1

Calibrator Source S/N: 12071565

Calibrator API Reference:227.00 api

Equivalent Calibrator API Reference:231.0 api

Measurement	Measured	Calibrated	Units
Background	35.3	35.3	api
Background + Calibrator	266.3	266.3	api
Calibrator	231.0	231.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	GTET - 11512327	Reference Calibration Date:	16-Jan-17 13:45:46
Engineer:	YEFERSON SANCHEZ	Calibration Date:	19-Jan-17 09:50:36
Software Version:	WL INSITE R5.2.3 (Build 2)	Calibration Version:	1

Calibrator Source S/N: 12071565

Calibrator API Reference:227.00 api

Equivalent Calibrator API Reference:231.0 api

Field Verification	Shop	Field	Units
Background	35.3	34.4	api
Background + Calibrator	266.3	257.8	api
Calibrator	231.0	223.4	api

Shop	Field	Difference	Tolerance
231.0	223.4	7.6	+/- 9.00

NATURAL GAMMA RAY TOOL POST CALIBRATION

Tool Name: GTET - 11512327 **Reference Calibration Date:** 19-Jan-17 09:50:36
Engineer: YEFERSON SANCHEZ **Calibration Date:** 19-Jan-17 13:53:44
Software Version: WL INSITE R5.2.3 (Build 2) **Calibration Version:** 1

Calibrator Source S/N: 12071565
 Calibrator API Reference:227.00 api
 Equivalent Calibrator API Reference:231.0 api

Post Verification	Field	Post	Units
Background	34.4	35.2	api
Background + Calibrator	257.8	259.1	api
Calibrator	223.4	223.9	api

Shop	Field	Post	Difference	Tolerance
231.0	223.4	223.9	-0.5	+/- 9.00

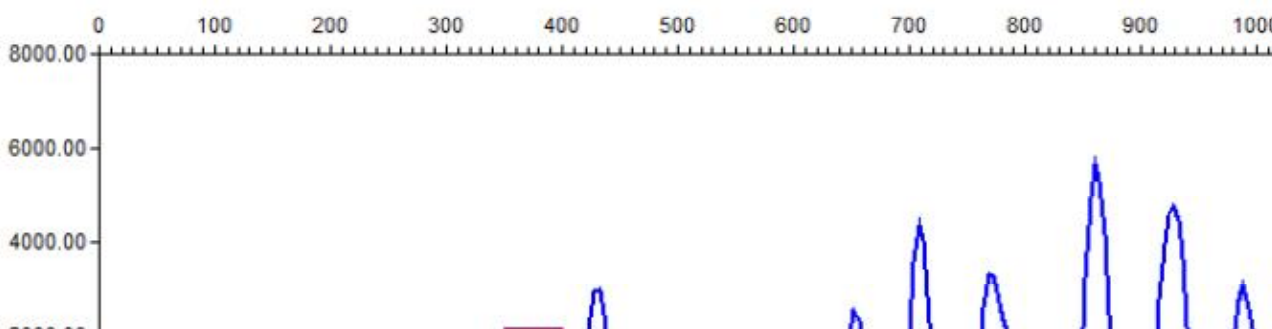
BSAT SHOP CALIBRATION

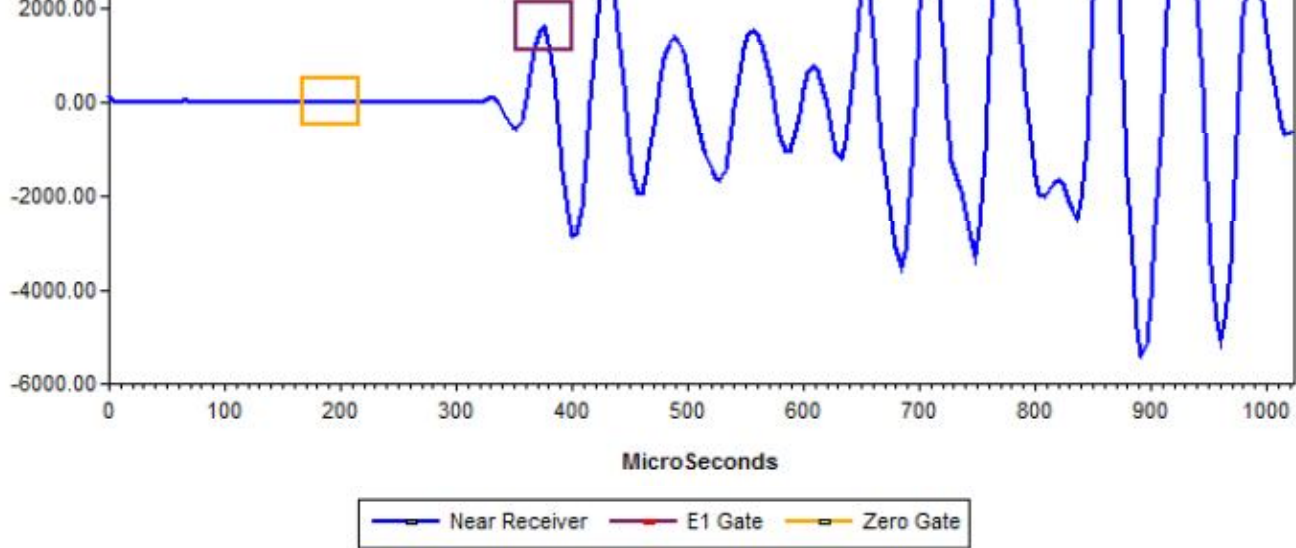
Tool Name: BSAT - 10995703 **Reference Calibration Date:** 19-Jan-17 11:56:38
Engineer: YEFERSON SANCHEZ **Calibration Date:** 19-Jan-17 11:57:23
Software Version: WL INSITE R5.2.3 (Build 2) **Calibration Version:** 1
Calibration Type: Well @ 630.36 ft **Calibration Depth:** 630.36 ft
Casing Weight: 60.00 lbpf **Casing OD:** 11.750 in

Sensor	Measured	Calibrated	Difference	Units
Amplitude Tx1	45.60	45.50	-0.10	mV
Amplitude Tx2	45.40	45.50	-0.10	mV
Pipe Reference TT	----	303.00	----	us

Sensor	Raw Value	Tolerance	Units
Amplitude Tx1	1,620.90	----	mV
Amplitude Tx2	2,335.80	----	mV
Pipe TT from Tx1	374.00	----	us
Pipe TT from Tx2	374.00	----	us
Noise Amplitude Tx1	10.80	<200	cps
Noise Amplitude Tx2	26.55	<200	cps

Calibration - CBL Waveform





CALIBRATION SUMMARY

Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11512327						
Gamma Ray Calibrator	231.0	223.4	223.9	-0.5	+/- 9.00	api

Data: INFA309_CH0001 CBL_OXYIDLE

Date: 19-Jan-17 13:54:44

HALLIBURTON

CUSTOMER EVENT LOG

Event Type	Time & Date	Depth (ft)	Event Description
	19-Jan-17 10:51:38.108	-7.75	Logging 001 19-Jan-17 10:51 Dn @-7.8f
	19-Jan-17 10:59:05.589	504.57	Halting 001 19-Jan-17 10:51 Dn @-7.8f
	19-Jan-17 11:04:16.790	504.75	Logging 002 19-Jan-17 11:04 Up @504.8f
	19-Jan-17 11:10:03.504	387.19	Halting 002 19-Jan-17 11:04 Up @504.8f
	19-Jan-17 11:13:33.339	501.25	Logging 003 19-Jan-17 11:13 Up @501.3f
	19-Jan-17 11:21:07.410	348.93	Halting 003 19-Jan-17 11:13 Up @501.3f
	19-Jan-17 11:27:24.095	500.75	Logging 004 19-Jan-17 11:27 Up @500.8f
	19-Jan-17 11:30:32.021	428.24	Halting 004 19-Jan-17 11:27 Up @500.8f
	19-Jan-17 11:36:36.562	500.75	Logging 005 19-Jan-17 11:36 Up @500.8f
	19-Jan-17 11:37:54.170	469.99	Halting 005 19-Jan-17 11:36 Up @500.8f
	19-Jan-17 11:40:01.177	418.50	Logging 006 19-Jan-17 11:39 Up @418.5f
	19-Jan-17 11:41:10.526	388.77	Halting 006 19-Jan-17 11:39 Up @418.5f
	19-Jan-17 11:42:59.930	346.25	Logging 007 19-Jan-17 11:42 Up @346.3f
	19-Jan-17 11:44:12.736	313.18	Halting 007 19-Jan-17 11:42 Up @346.3f
	19-Jan-17 11:46:59.964	255.00	Logging 008 19-Jan-17 11:46 Up @255.0f
	19-Jan-17 11:48:45.149	211.21	Halting 008 19-Jan-17 11:46 Up @255.0f
	19-Jan-17 11:49:05.316	203.25	Logging 009 19-Jan-17 11:49 Dn @203.3f
	19-Jan-17 11:53:33.948	630.36	Halting 009 19-Jan-17 11:49 Dn @203.3f
	19-Jan-17 11:57:32.706	630.50	Logging 010 19-Jan-17 11:57 Up @630.5f
	19-Jan-17 12:02:51.938	498.17	Halting 010 19-Jan-17 11:57 Up @630.5f
	19-Jan-17 12:04:27.838	593.50	Logging 011 19-Jan-17 12:04 Dn @593.5f
	19-Jan-17 12:11:23.658	1403.54	Halting 011 19-Jan-17 12:04 Dn @593.5f
	19-Jan-17 12:12:04.426	1403.75	Logging 012 19-Jan-17 12:11 Up @1403.8f
	19-Jan-17 12:21:44.592	1159.25	Halting 012 19-Jan-17 12:11 Up @1403.8f
	19-Jan-17 12:25:40.077	1403.75	Logging 013 19-Jan-17 12:25 Up @1403.8f
	19-Jan-17 13:23:48.380	23.97	Halting 013 19-Jan-17 12:25 Up @1403.8f

Data: INFA309_CH0001 CBL_OXYHW11839

Date: 19-Jan-17 13:52:38

COMPANY **ECOPETROL S.A.**

WELL	INFANTAS 309		
FIELD	LA CIRA INFANTAS		
COUNTY	B/MEJA	STATE	SANTANDER
HALLIBURTON		CEMENT BOND LOG GAMMA RAY - CCL SCALE 1:200	