

Schlumberger

Company: **Kerr McGee Oil and Gas Onshore, LP**

Well: KCB 17-14

Field: **Wattenberg**

County: **Weld** State: **Colorado**

County: Weld			
Field: Wattenberg			
Location: NENE Sec. 14, T 5N , R 64W			
Well: KCB 17-14			
Company: Kerr McGee Oil and Gas Onshore			
LOCATION			
NENE Sec. 14, T 5N , R 64W SHL: 731 FNL / 779 FEL NENE BHL: 1256 FNL / 1411 FEL NWNE		Elev.: K.B. 4606.00 ft G.L. 4591.00 ft D.F. 4605.00 ft	
Permanent Datum: _____ Log Measured From: _____ Drilling Measured From: _____		Ground Level _____ Kelly Bushing _____ Kelly Bushing _____ Elev.: 4591.00 ft _____ 15.00 ft above Perm. Datum	
API Serial No. 05-123-30821-000C	Section 14	Township 5N	Range 64W

[illegible]

Logging Date	7-Apr-2010					
Run Number	1					
Depth Driller	7405 ft					
Schlumberger Depth	7385 ft					
Bottom Log Interval	7377 ft					
Top Log Interval	708 ft					
Casing Driller Size @ Depth	8,625 in @ 705 ft					
Casing Schlumberger	708 ft					
Bit Size	7.875 in					
Type Fluid In Hole	KCL Polymer					
Density	Viscosity	8.2 lbm/gal		34 s		
Fluid Loss	PH					
Source Of Sample	Flowline					
RM @ Measured Temperature	1.167 ohm.m @ 86 degF				@	
RMF @ Measured Temperature	0.875 ohm.m @ 86 degF				@	
RMC @ Measured Temperature	1.750 ohm.m @ 86 degF				@	
Source RMF	RMC	Calculated	Calculated			
RM @ MRT	RMF @ MRT	0.548 @ 191	0.411 @ 191		@	@
Maximum Recorded Temperatures	191 degF					
Circulation Stopped	Time	7-Apr-2010		9:30		
Logger On Bottom	Time	7-Apr-2010		17:04		
Unit Number	Location	3055 Fort Morgan, CO				
Recorded By	Jared R. Hoskins					
Witnessed By	Rick Masters & Marek Giesnik					

Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth		@		
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
Density	Viscosity			
Fluid Loss	PH			
Source Of Sample				
RM @ Measured Temperature		@		
RMF @ Measured Temperature		@		
RMC @ Measured Temperature		@		
Source RMF	RMC			
RM @ MRT	RMF @ MRT	@	@	@
Maximum Recorded Temperatures				
Circulation Stopped	Time			
Logger On Bottom	Time			
Unit Number	Location			
Recorded By				
Witnessed By				

DEPTH SUMMARY LISTING

Date Created: 7-APR-2010 18:04:03

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-39P LXS
Serial Number:	799	Serial Number:	1223	Serial Number:	708273
Calibration Date:	1-Oct-2009	Calibration Date:	27-Mar-10	Length:	16760 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100513	Conveyance Method: Wireline Rig Type: LAND	
Calibration Cable Type:	7-46P	Number of Calibration Points: 0			
Wheel Correction 1:	-4				
Wheel Correction 2:	-5				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	5.50 FT
Tool Zero Check At Surface:	0.00 FT

Depth Control Remarks

1. All Schlumberger depth policy procedures applied
2. This is the primary depth reference
- 3.
- 4.
- 5.
- 6.

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
1. This is the first run in hole.	
2. Tool run as per tool sketch.	
3. Matrix changes are as noted on porosity log.	
4. Toolstring run with minimum jewelry.	

Rig: Xtreme 11

Crew: Tim Ludgate & Jay Musgrave

RUN 1
SERVICE ORDER #: BCEK-00017
PROGRAM VERSION: 17C0-154
FLUID LEVEL:

RUN 2
SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

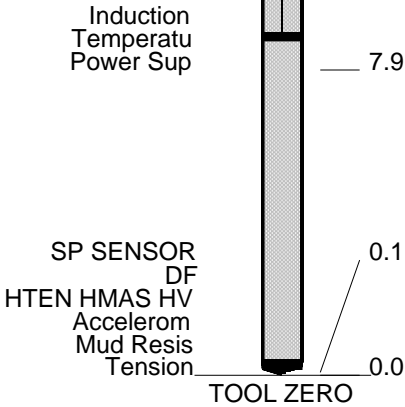
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1			RUN 2		
SURFACE EQUIPMENT GSR-U/Y NCT-B CNB-AB NCS-VB WITM (DTS)-A					
DOWNHOLE EQUIPMENT					
LEH-QT LEH-QT		43.6			
DTC-H ECH-KC DTCH0-A DTCH1-A	CTEM	39.7			
	TelStatus ToolStatu	37.6			
	HGNS HTEM HMCA	37.6			
HILTB-FTB HGNSD-B HMCA HGNH NLS-KL NSR-F 5068 HACCZ 452 HCNT HGR HRCC-B HRMS-B HRGD-B GLS-VJ 5416 MCFL Device HILT Nucl. LS 42767 HILT Nucl. SS 42767 HILT Nucl. BS 42767 NPV-N	HGNS Gamm	36.9			
		31.1			
	HGNS Neut HGNS Neut	30.6			
		28.2			
	HRCC cart	24.2			
	MCFL HILT cali HRDD-LS HRDD-SS HRDD-BS	18.8 18.3 17.9			

AIT-M
AMIS-A 1372
AMRM-A

16.0

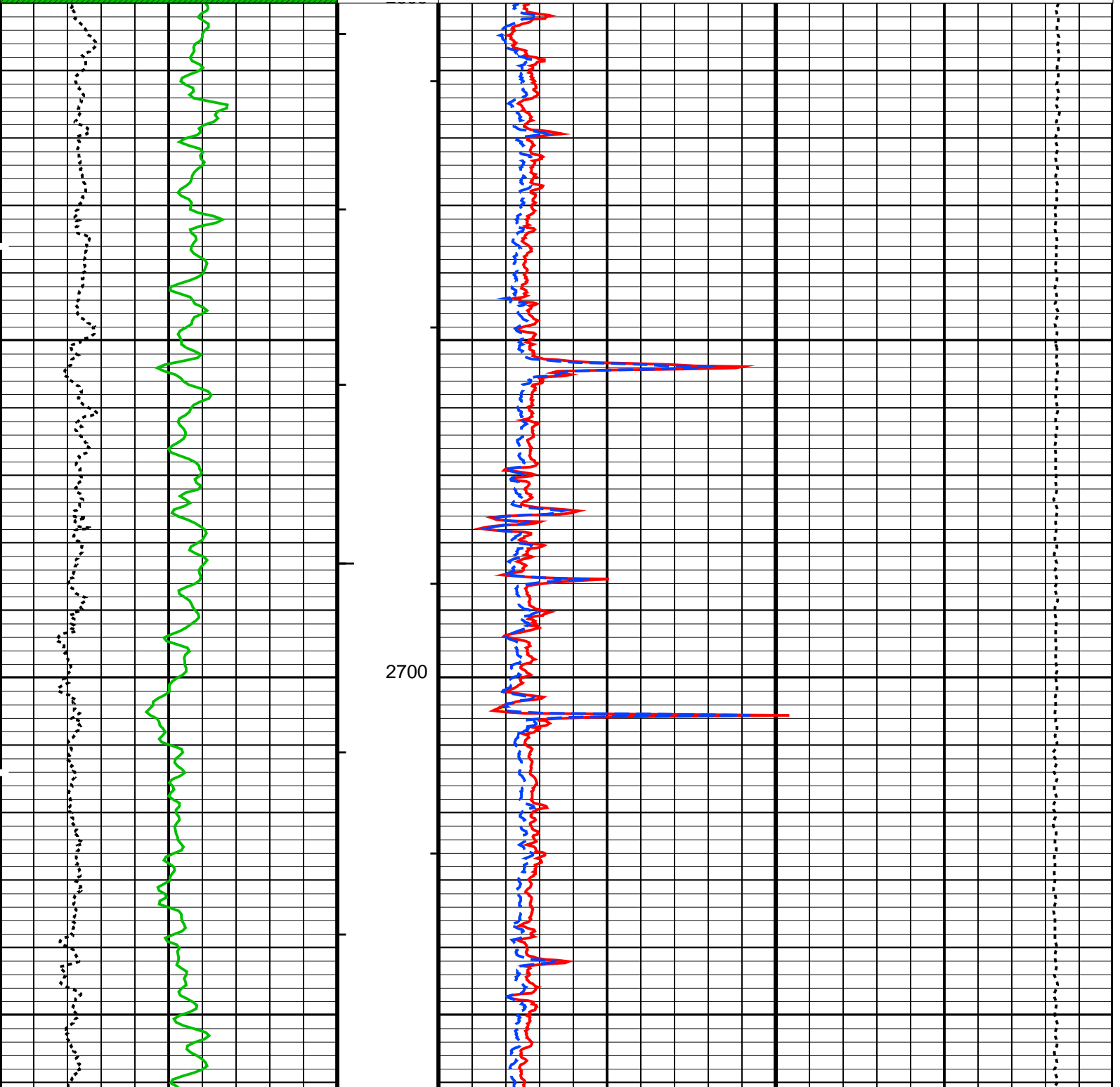


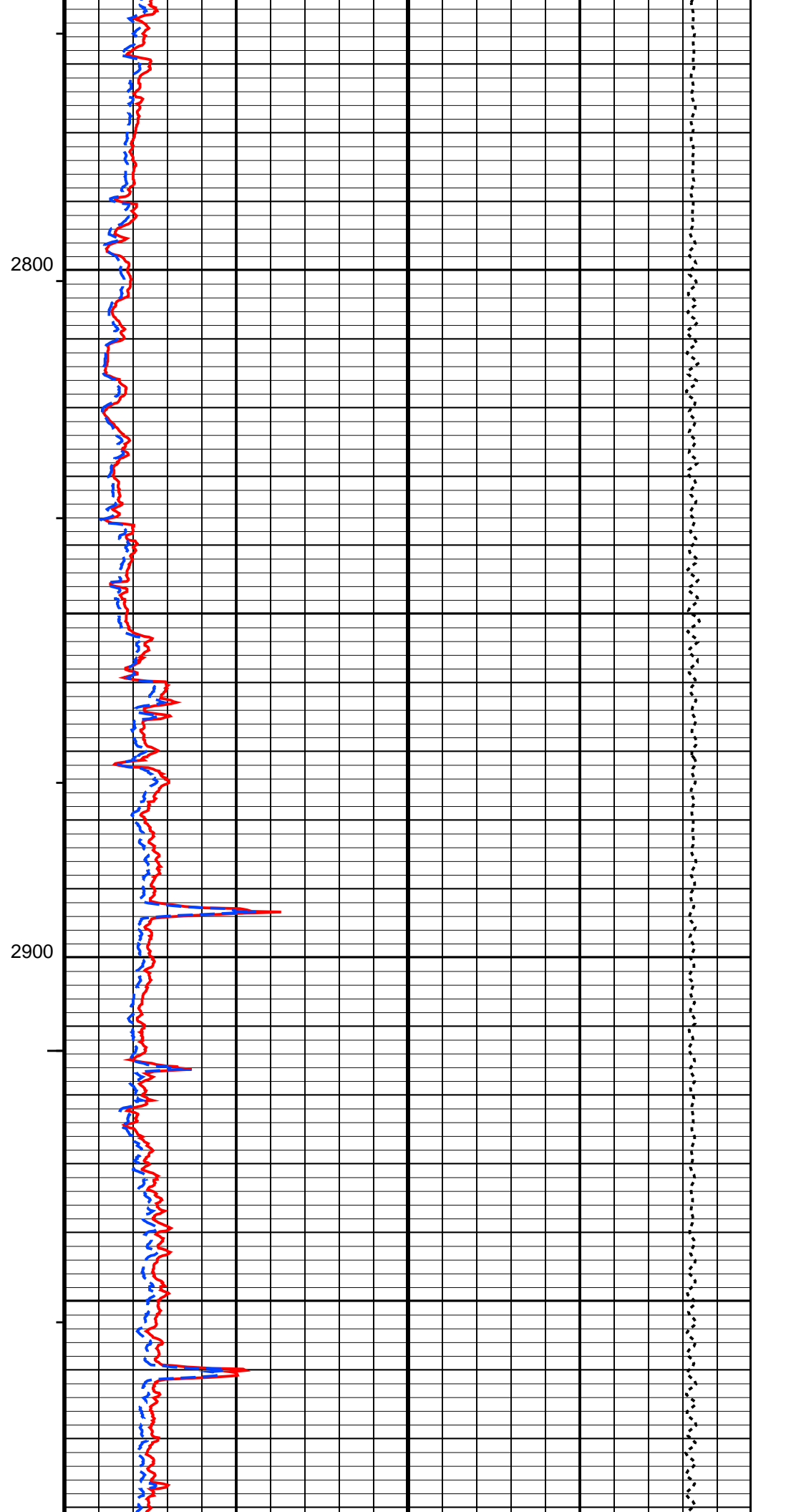
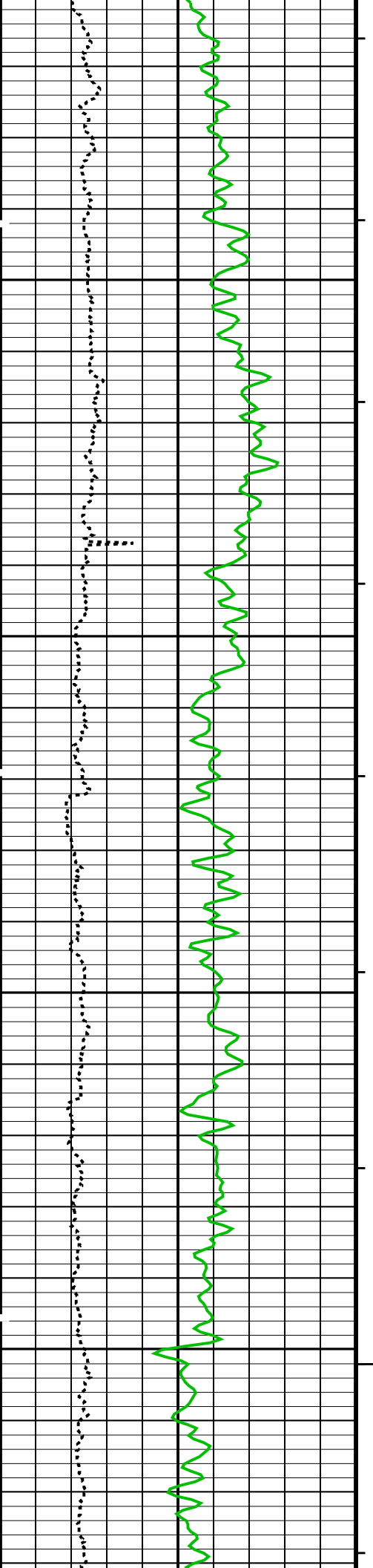
MAXIMUM STRING DIAMETER 4.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

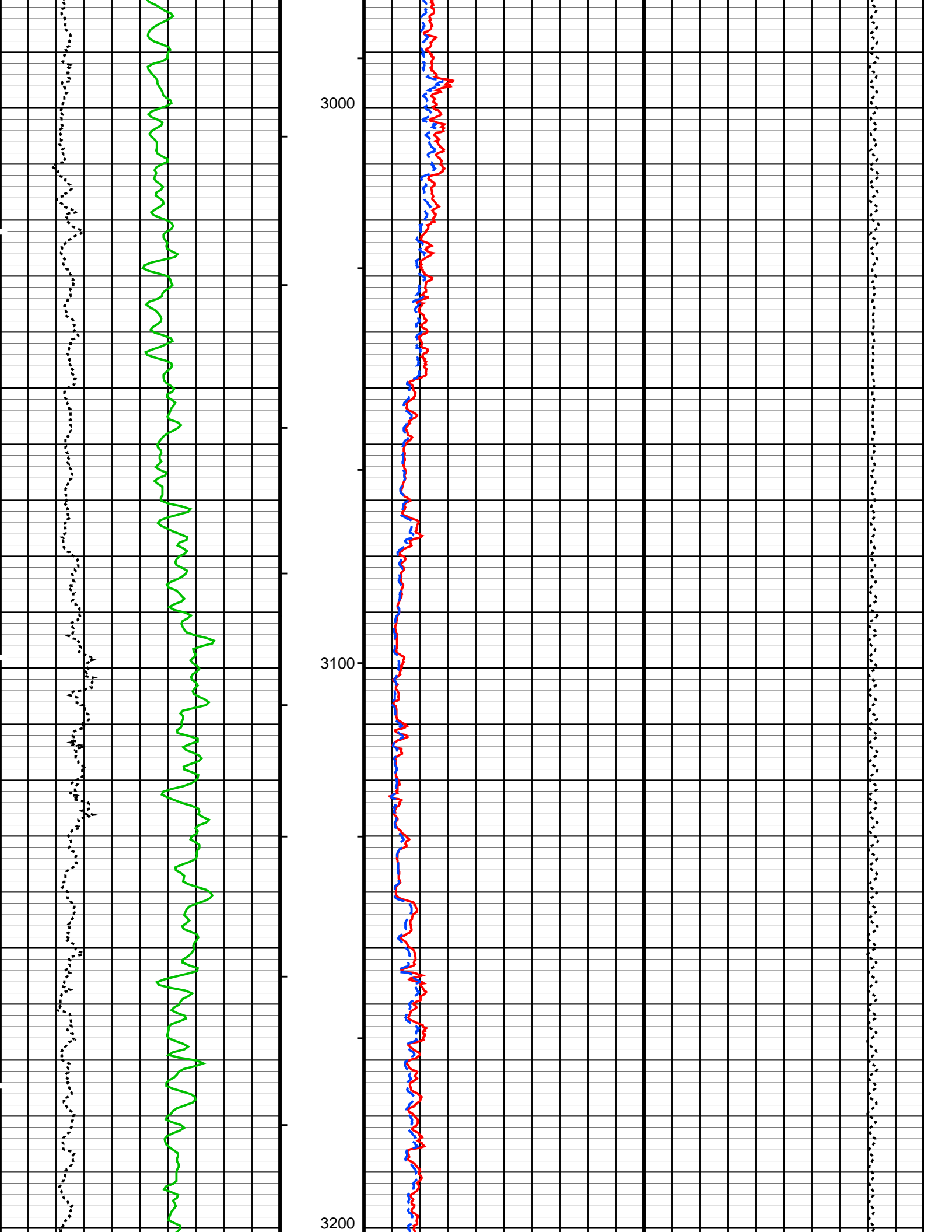
Production String	(in)		(ft)	Well Schematic	(ft)	(in)		Casing String
	OD	ID	MD		MD	OD	ID	
					0.0	8.625		Boresight String
					706.0	8.625		Casing Shoe

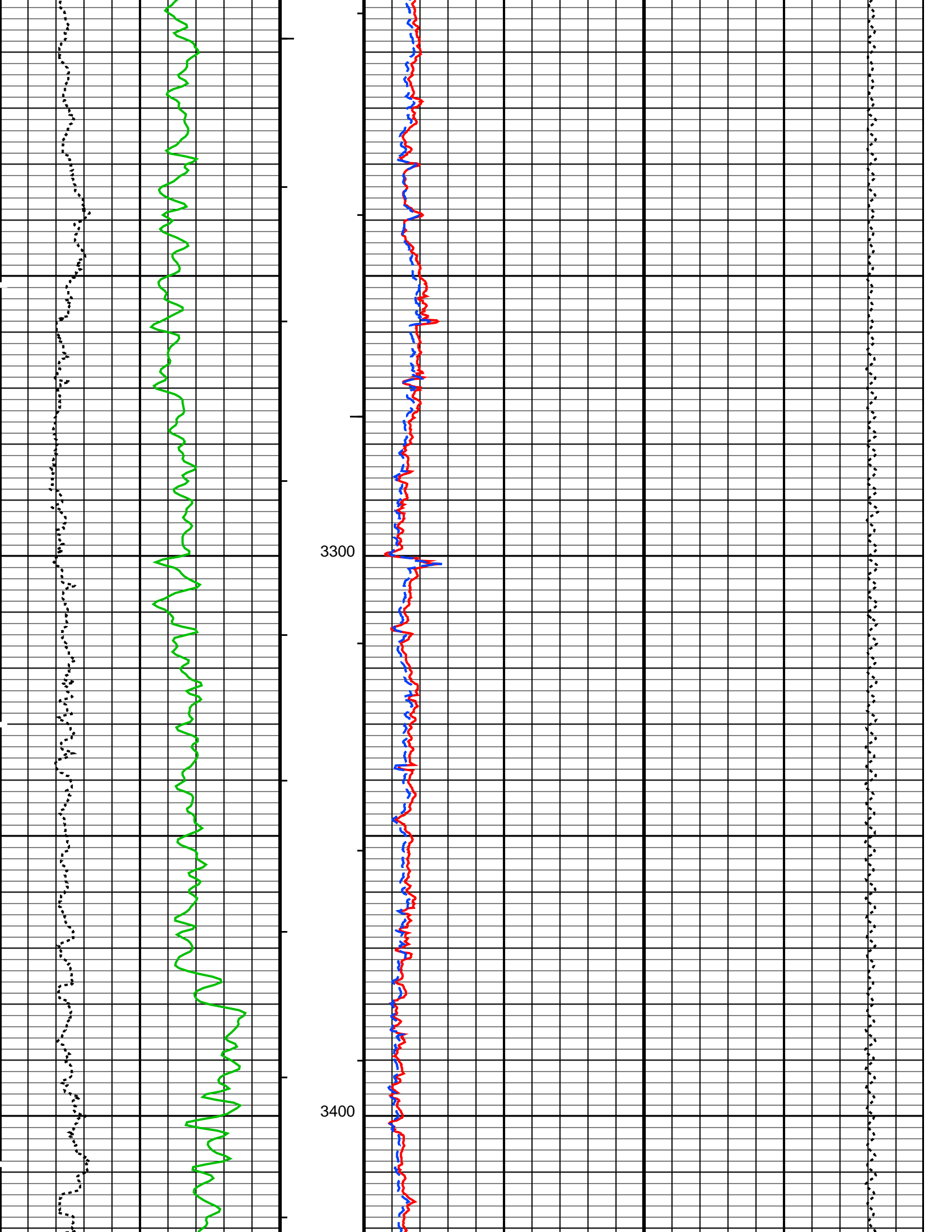
PIP SUMMARY

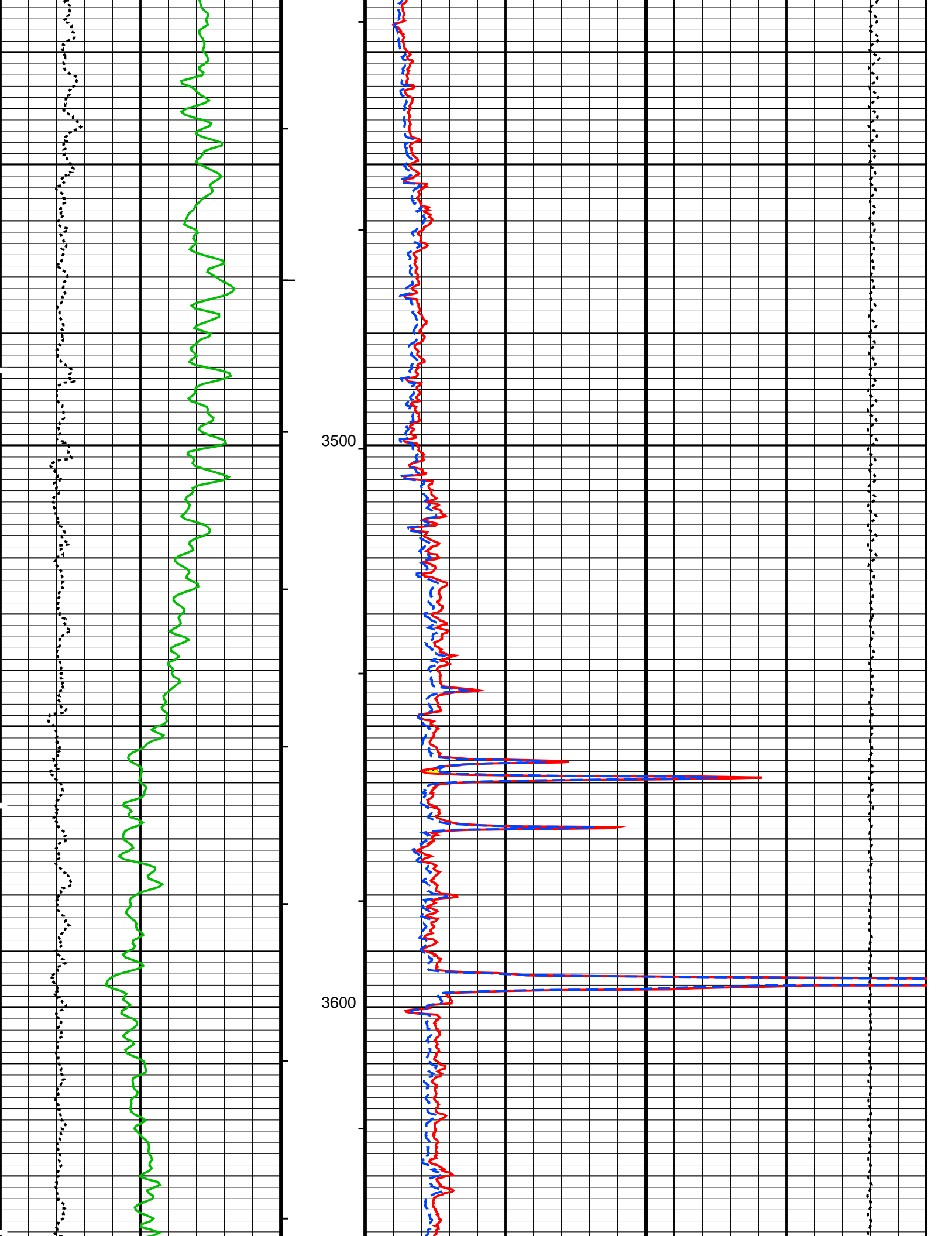
Time Mark Every 60 S

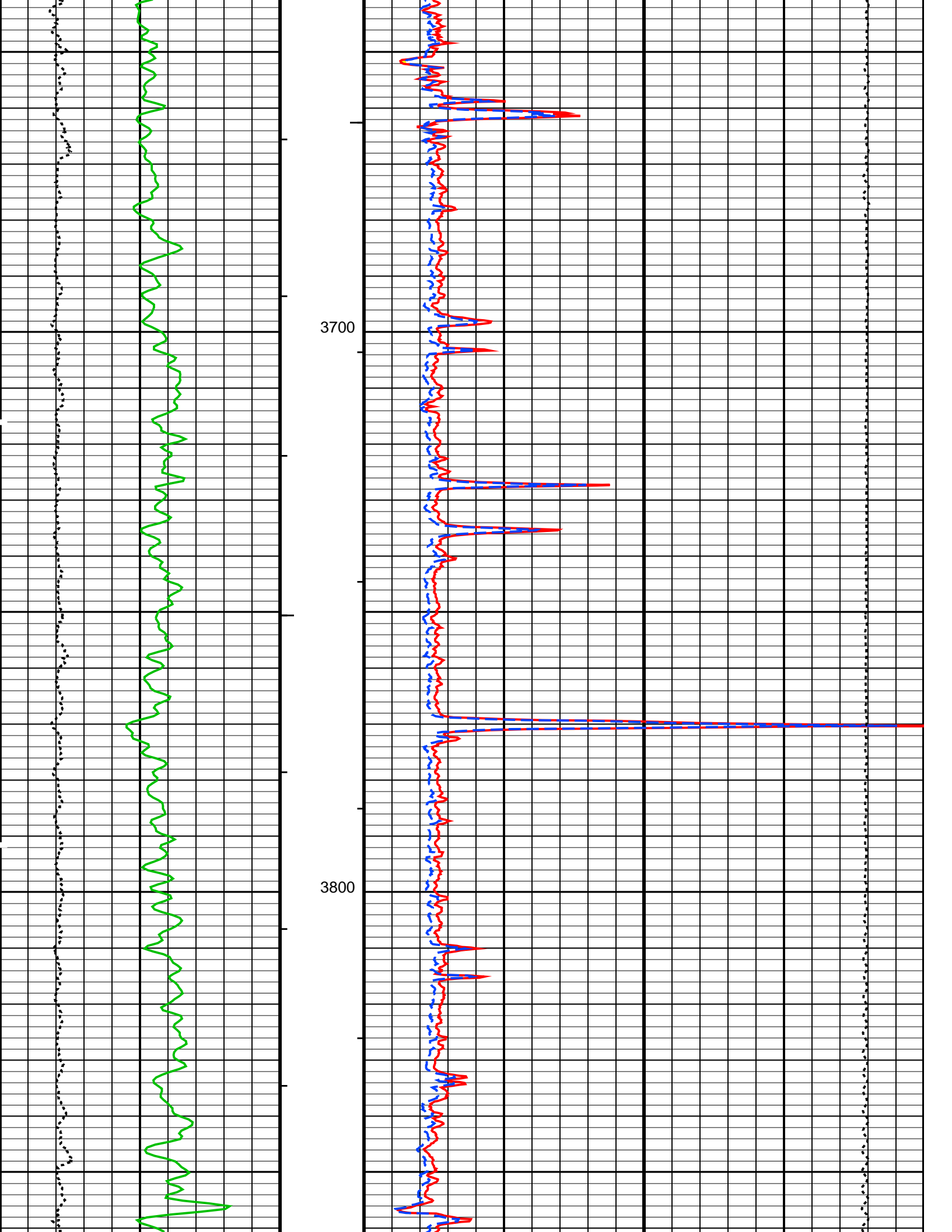


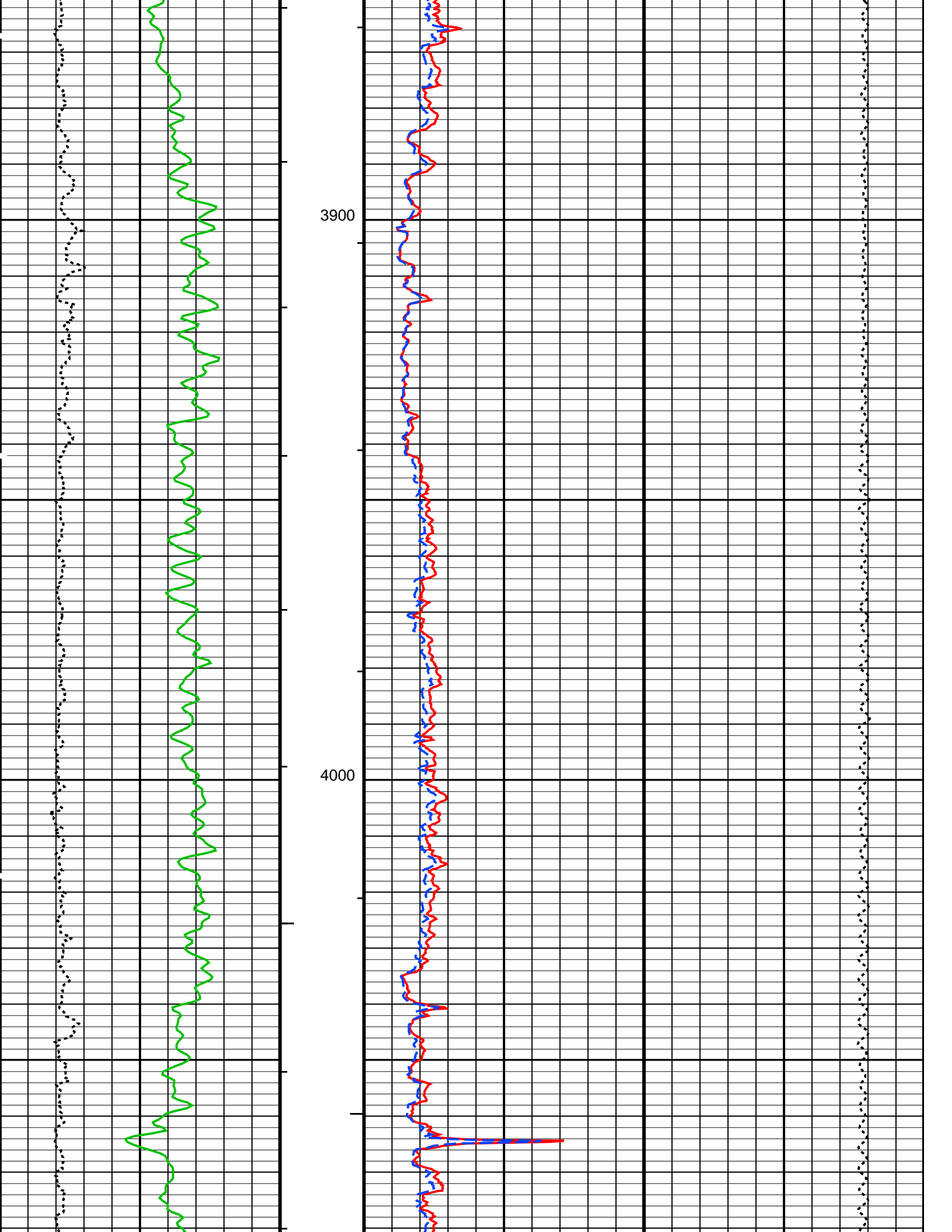


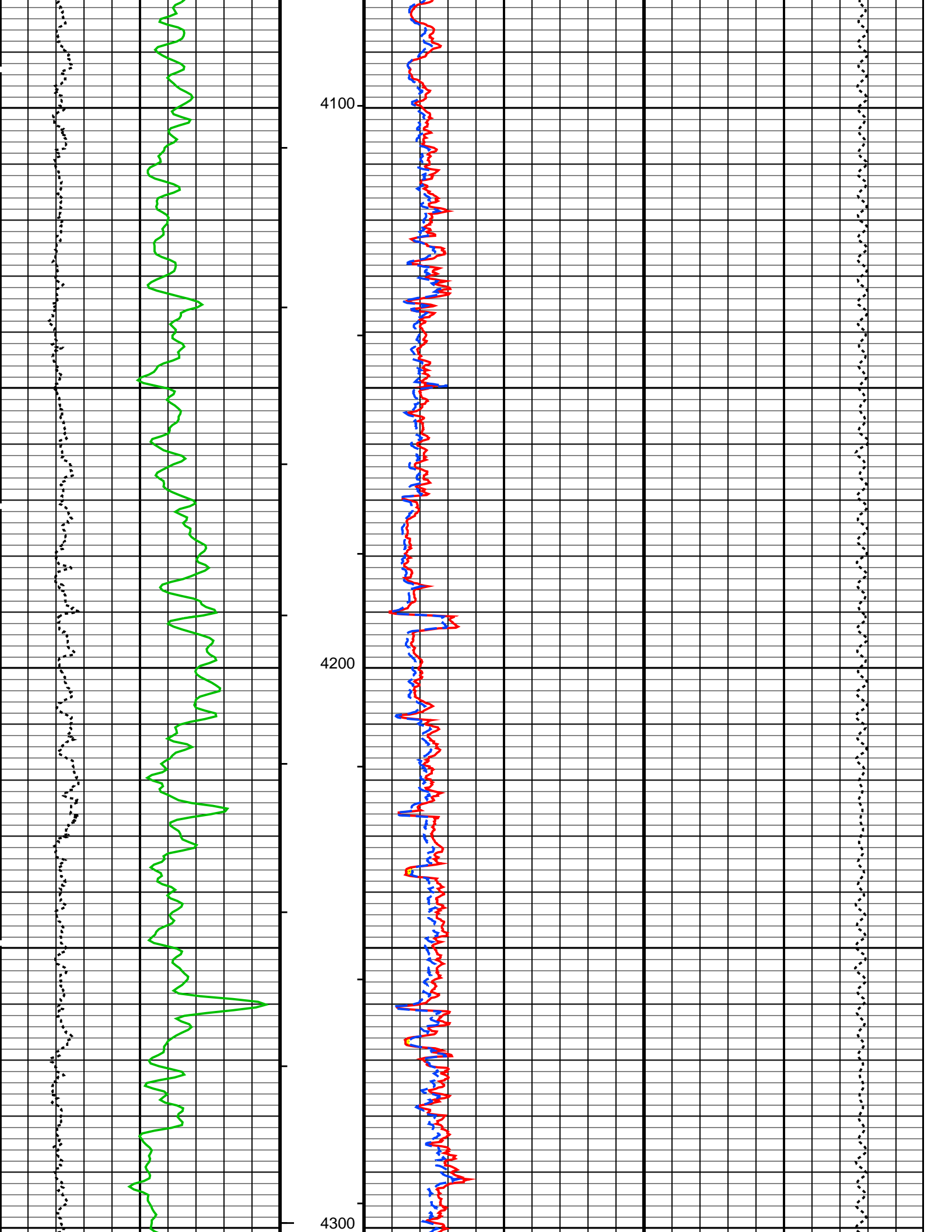


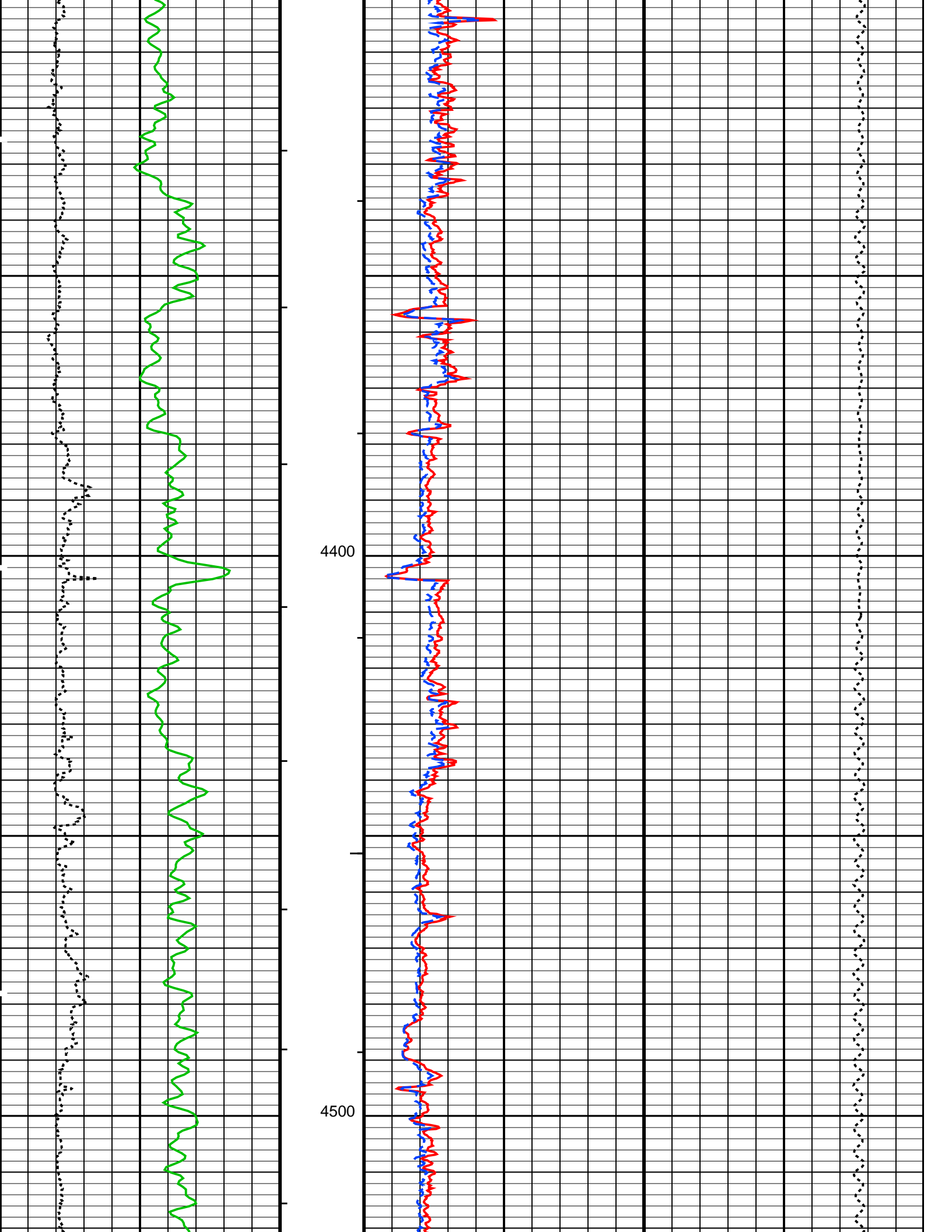


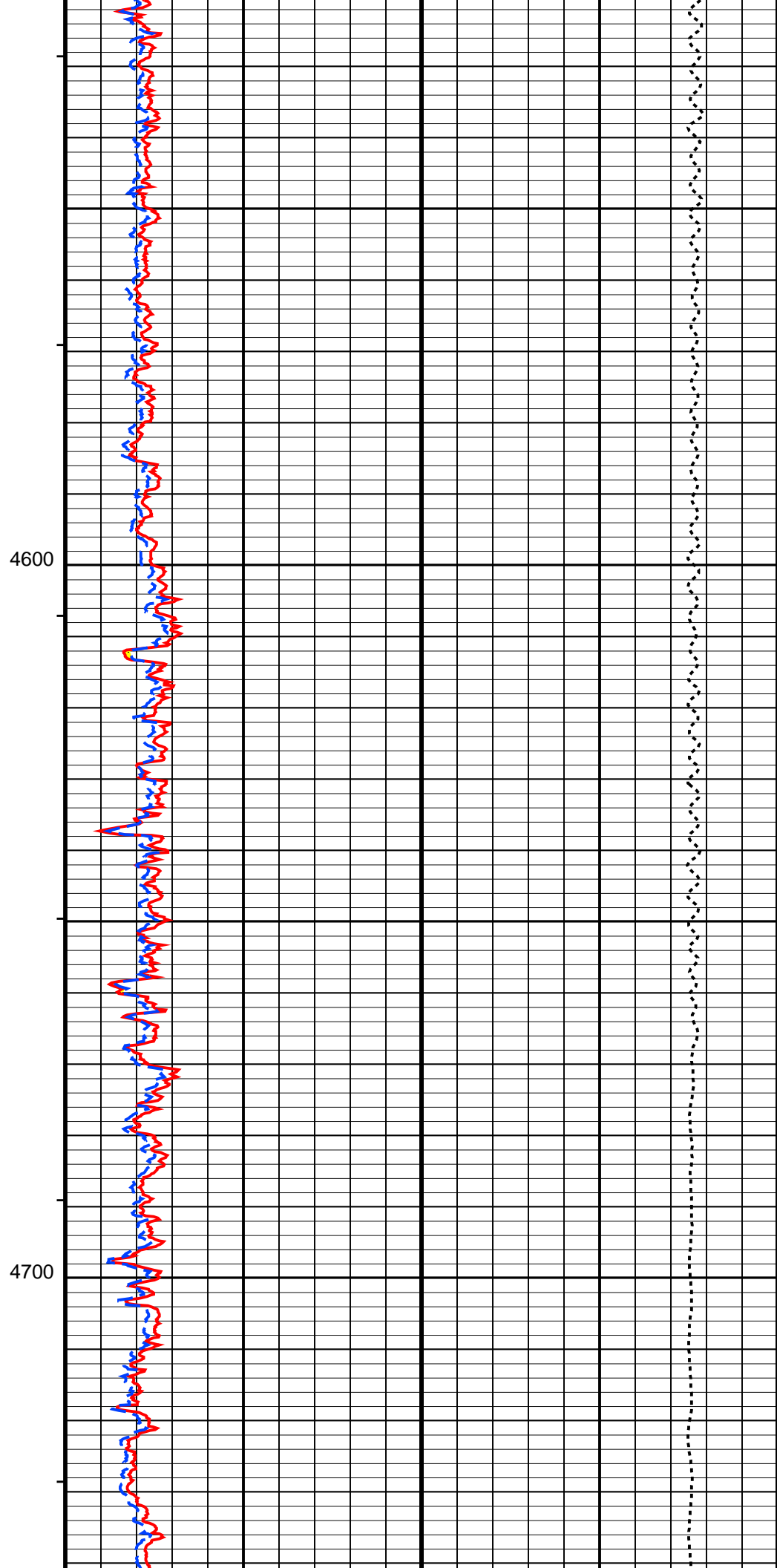
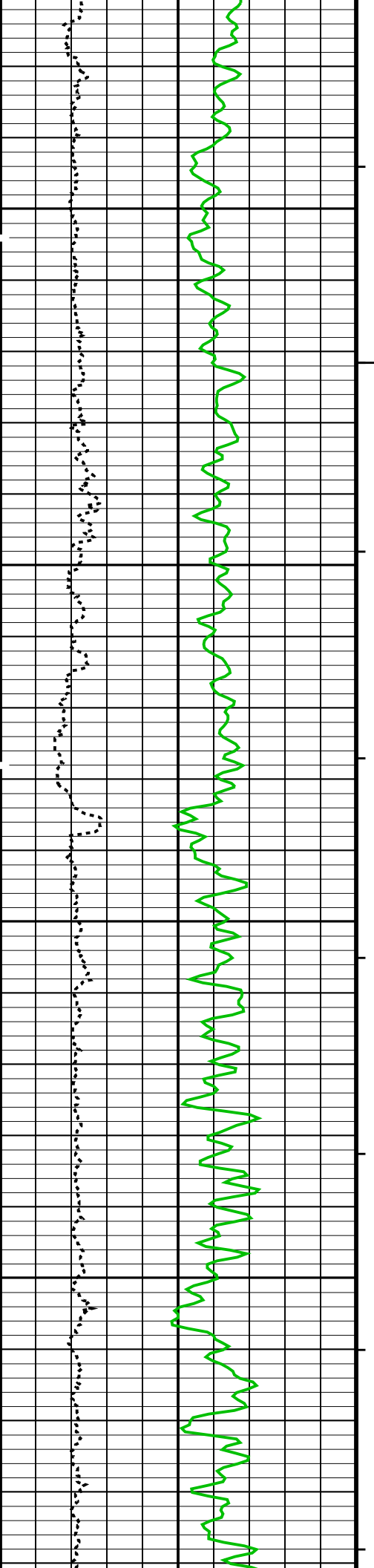


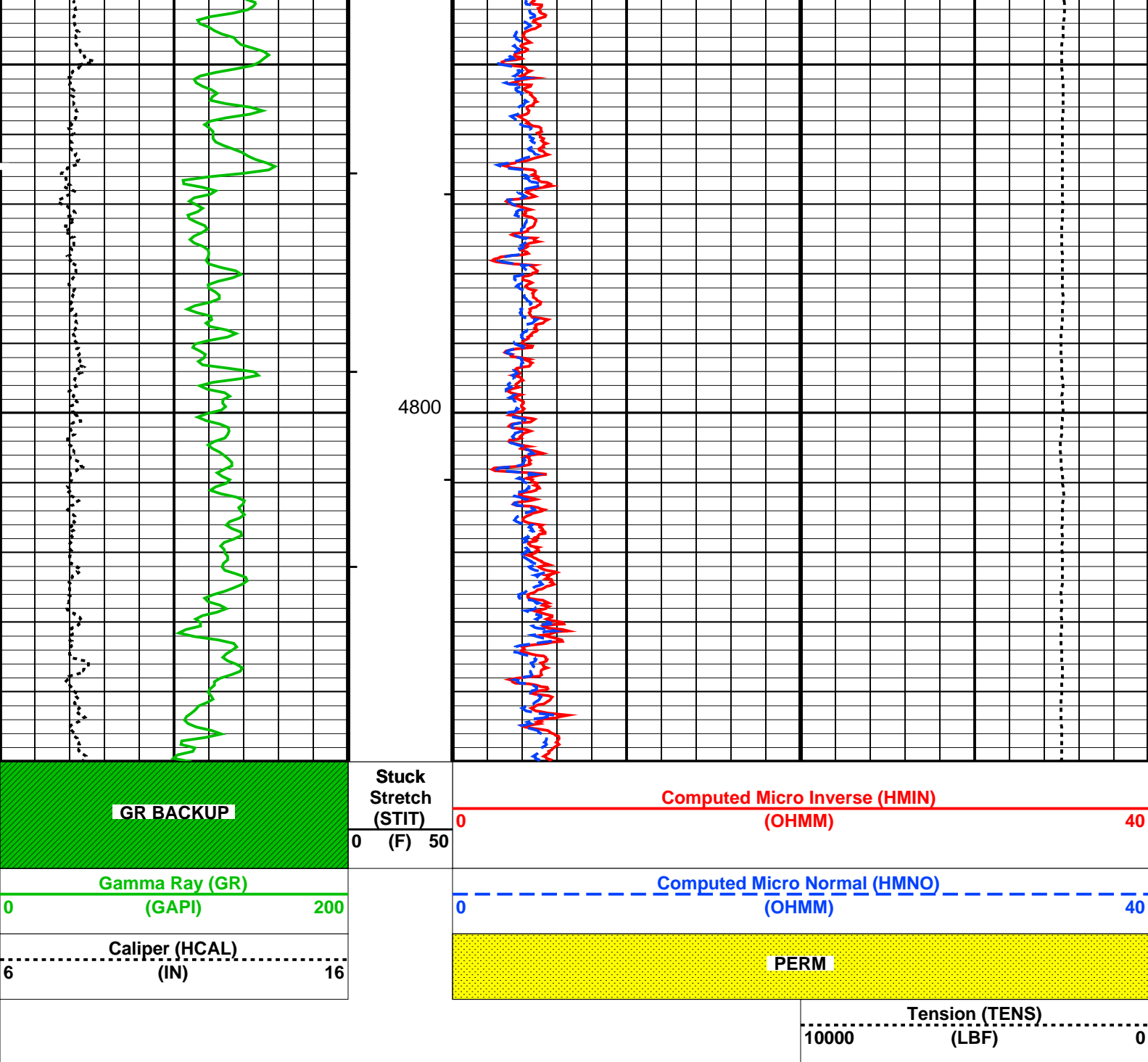












PIP SUMMARY		
└	Integrated Hole Volume Minor Pip Every 10 F3	
└	Integrated Hole Volume Major Pip Every 100 F3	
└	Integrated Cement Volume Minor Pip Every 10 F3	
└	Integrated Cement Volume Major Pip Every 100 F3	
■	Time Mark Every 60 S	

Parameters		
DLIS Name	Description	Value
MPOF	HILTB-FTB: High resolution Integrated Logging Tool-DTS MCFL Processing Operation Mode	ON
STKT	STI: Stuck Tool Indicator	
TDD	STI Stuck Threshold	2.500 ft
TDD	Total Depth - Driller	7405.0 ft
TDL	Total Depth - Logger	7385.0 ft
BS	System and Miscellaneous	
BS	Bit Size	7.875 in

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	07-Apr-2010 17:12	7405.5 FT	0.0 FT
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MAIN MICROLOG 5" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_009LUP	FN:8	PRODUCER	07-Apr-2010 17:12
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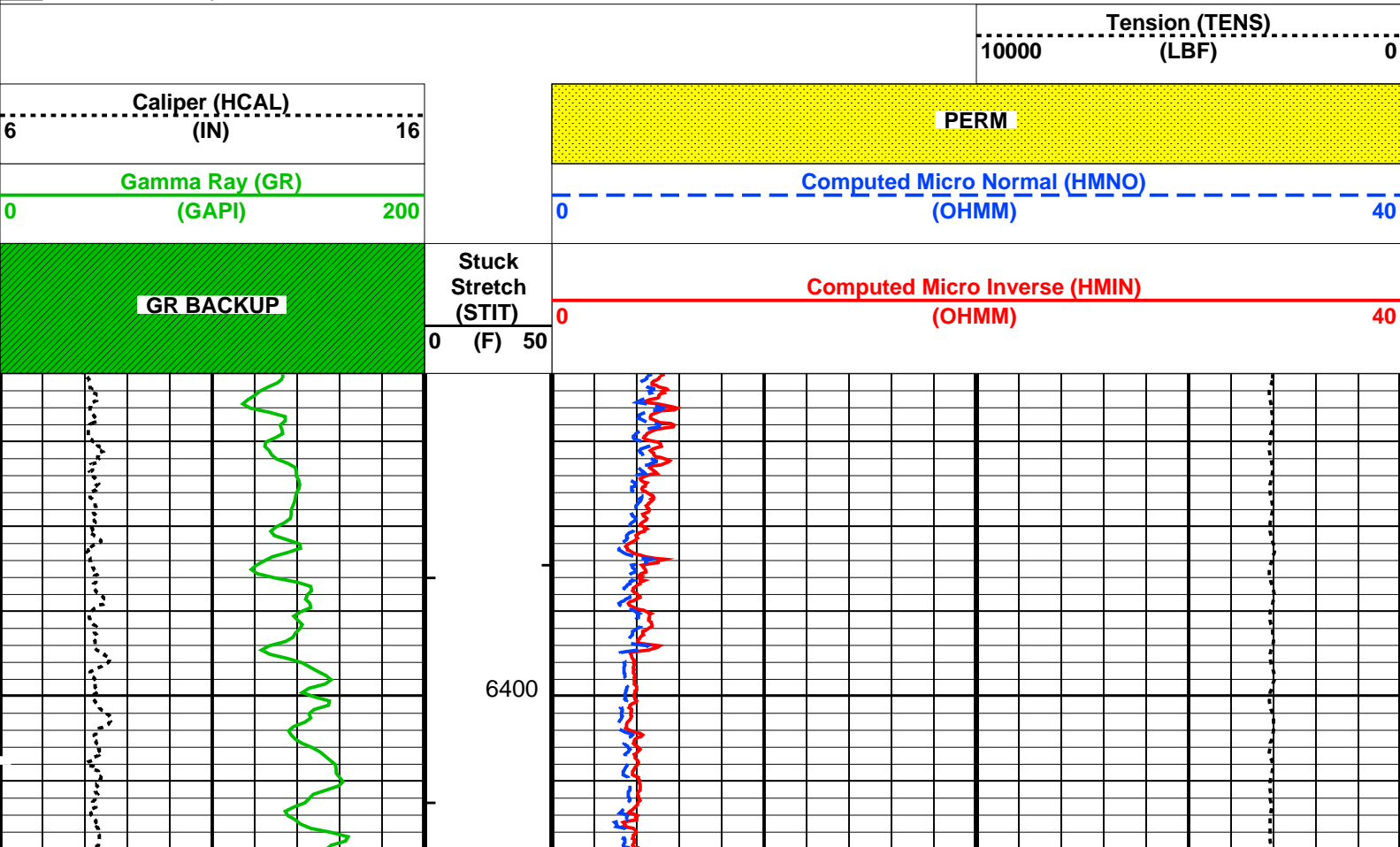
OP System Version: 17C0-154

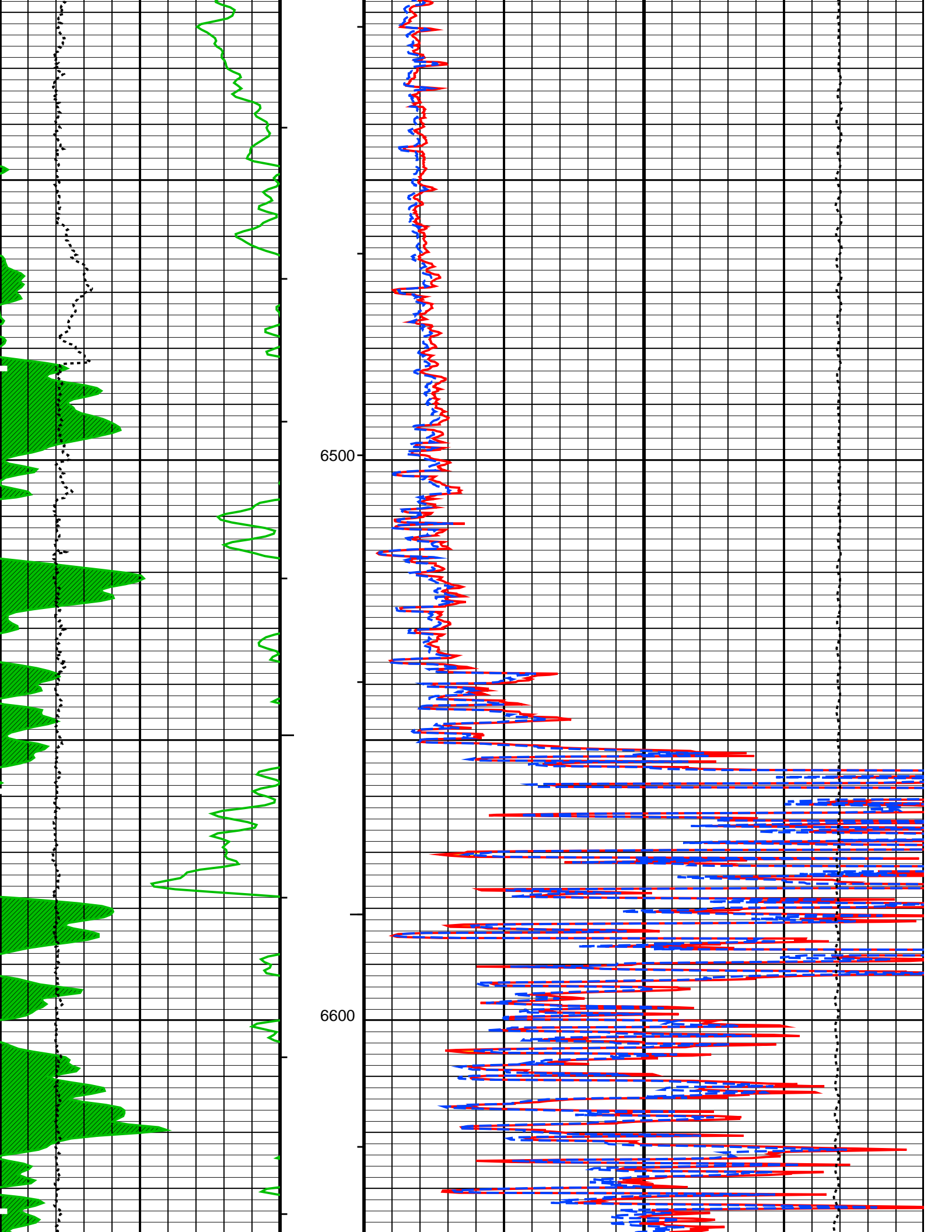
AIT-M	17C0-154	HILTB-FTB	17C0-154
DTC-H	17C0-154		

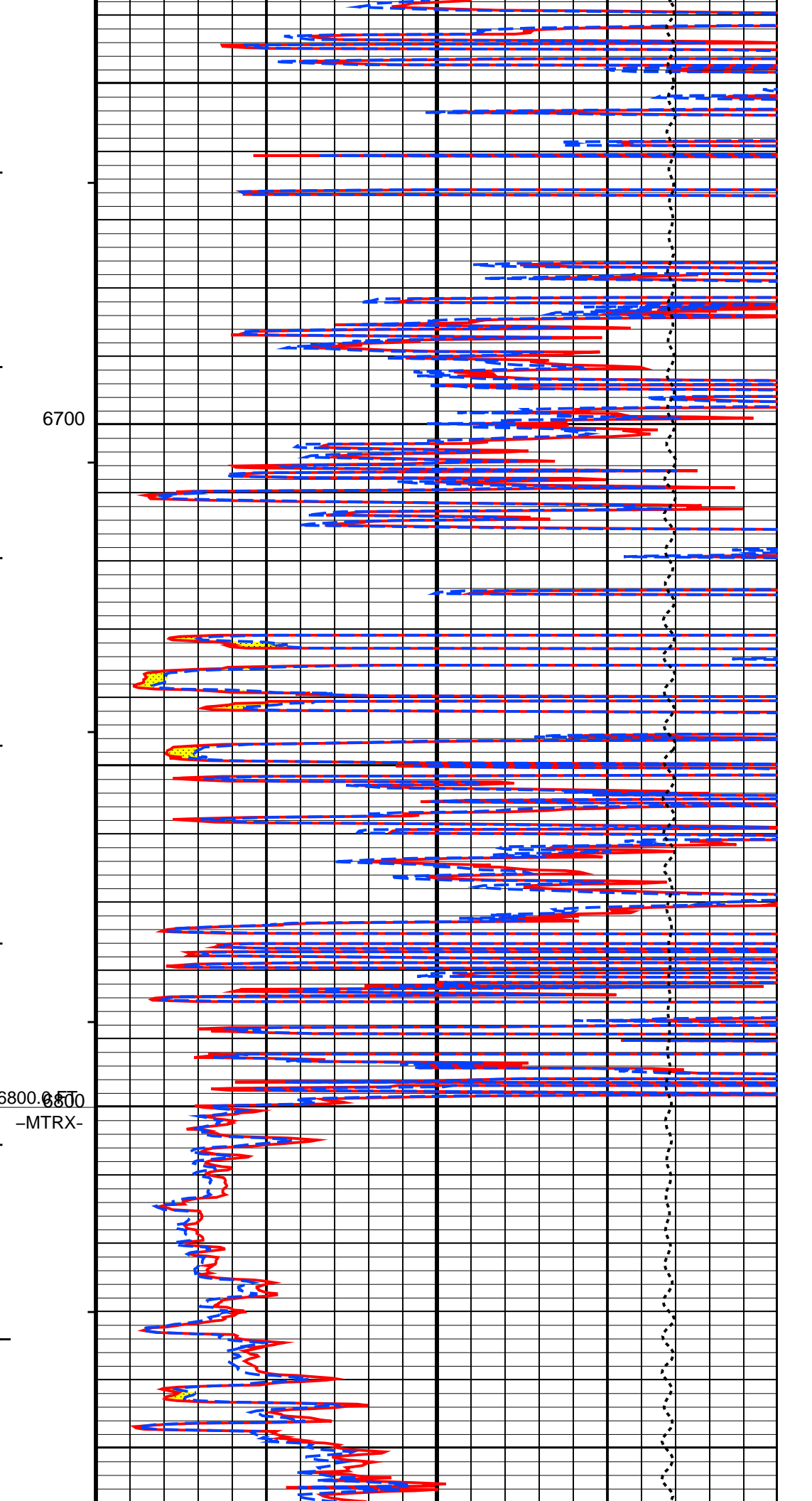
PIP SUMMARY

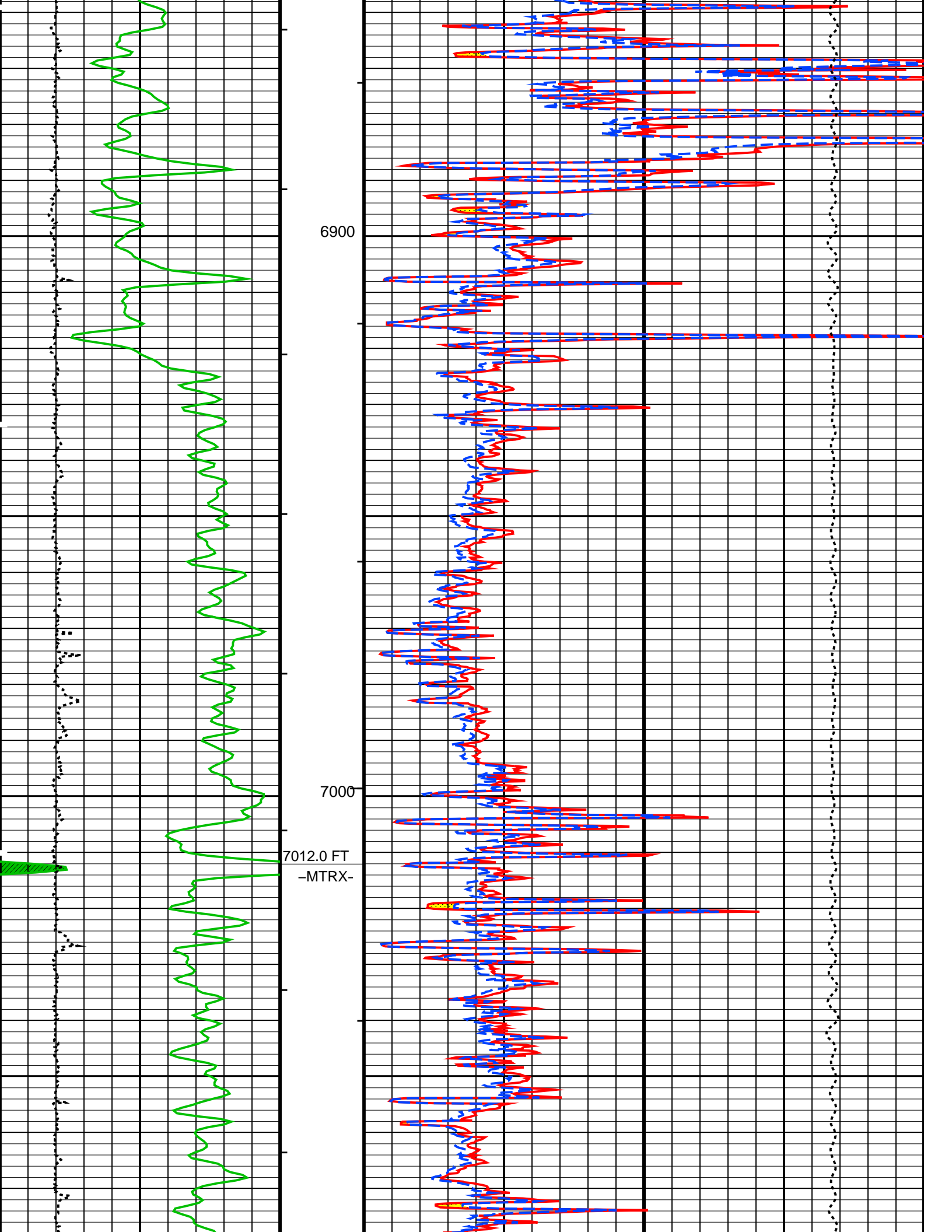
- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

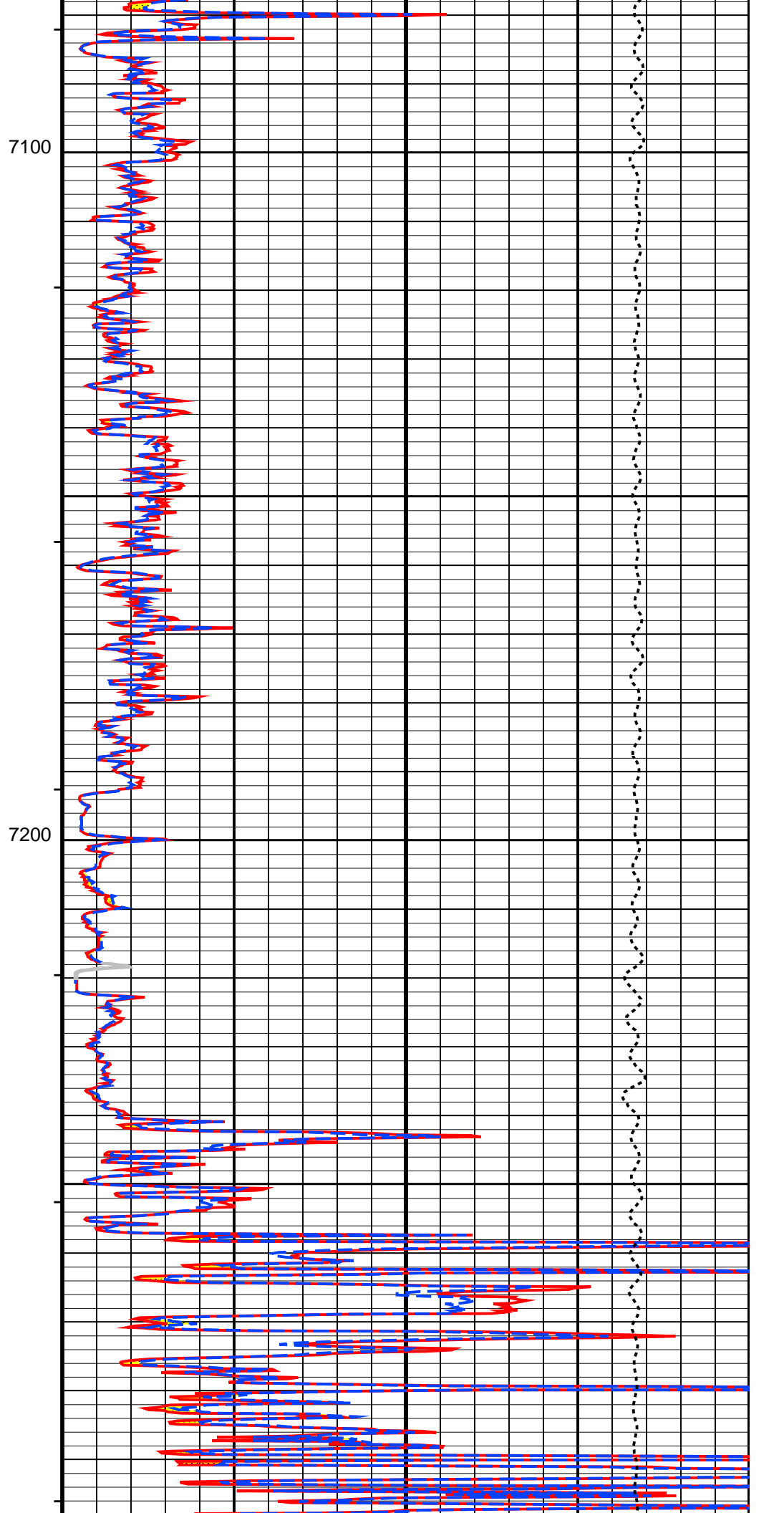
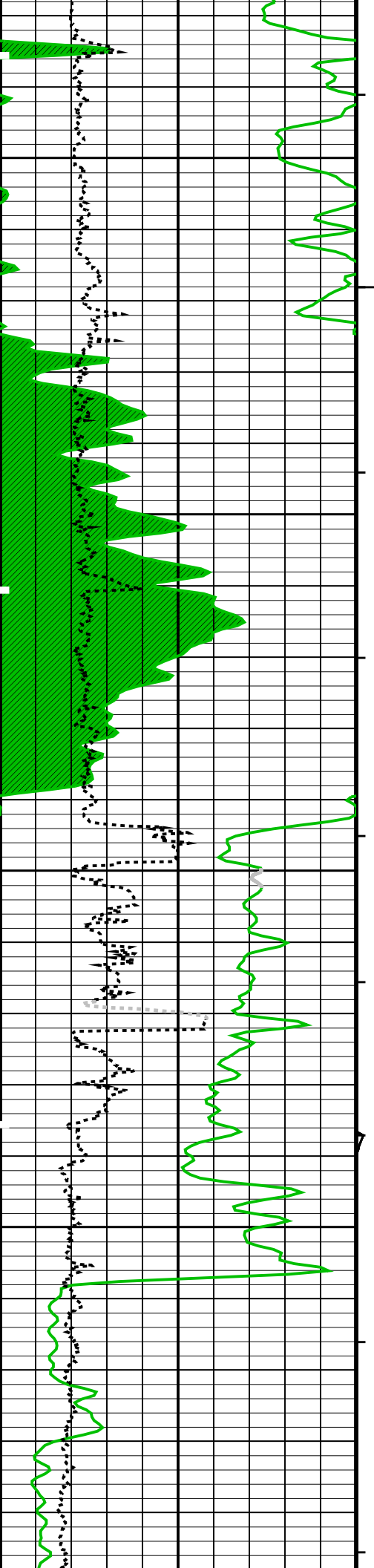
Time Mark Every 60 S

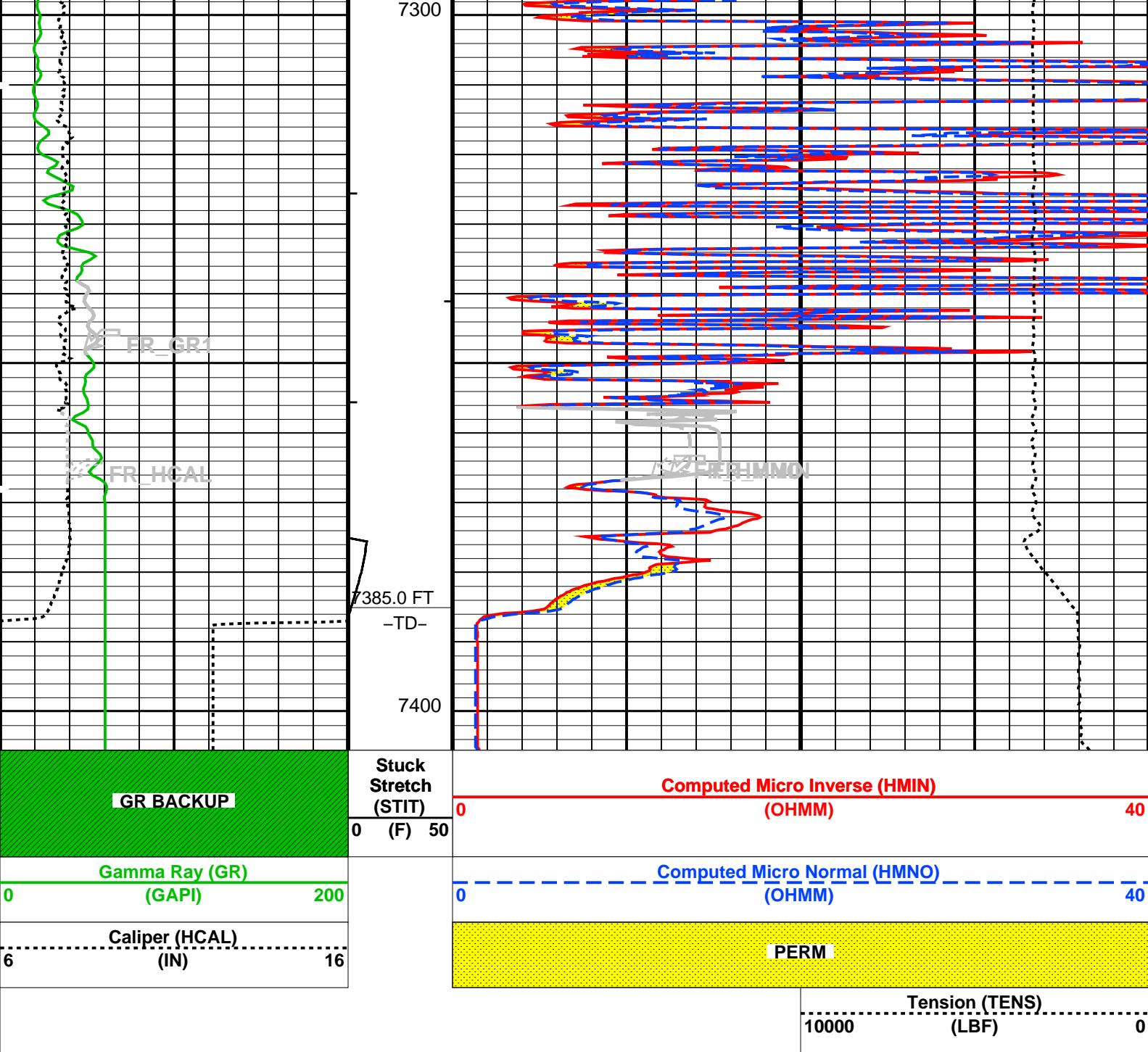












PIP SUMMARY		
└ Integrated Hole Volume Minor Pip Every 10 F3		
└ Integrated Hole Volume Major Pip Every 100 F3		
└ Integrated Cement Volume Minor Pip Every 10 F3		
└ Integrated Cement Volume Major Pip Every 100 F3		
Time Mark Every 60 S		

Parameters		
DLIS Name	Description	Value
MPOF	HILTB-FTB: High resolution Integrated Logging Tool-DTS MCFL Processing Operation Mode	ON
FCD	HOLEV: Integrated Hole/Cement Volume	4.5 IN
HVCS	Future Casing (Outer) Diameter	HCAL
STI	Integrated Hole Volume Caliper Selection	STI: Stuck Tool Indicator
LBFR	Trigger for MAXIS First Reading Label	TDL
STKT	STI Stuck Threshold	2.5 FT
TDD	Total Depth - Driller	7405.00 FT
TDL	Total Depth - Logger	7385.00 FT
BS	System and Miscellaneous	
DORL	Bit Size	7.875 IN
	Depth Offset for Repeat Analysis	0.0 FT

TD

Total Depth

7385 FT

Format: LOWER_MLT Vertical Scale: 5" per 100' Graphics File Created: 07-Apr-2010 17:12

OP System Version: 17C0-154

AIT-M

17C0-154

HILTB-FTB

17C0-154

DTC-H

17C0-154

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_009LUP FN:8 PRODUCER 07-Apr-2010 17:12

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REPEAT ANALYSIS

MAXIS Field Log

Input DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_008PUP FN:7 PRODUCER 07-Apr-2010 17:10 7419.0 FT 7147.0 FT

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_009LUP FN:8 PRODUCER 07-Apr-2010 17:12

OP System Version: 17C0-154

AIT-M

17C0-154

HILTB-FTB

17C0-154

DTC-H

17C0-154

PIP SUMMARY

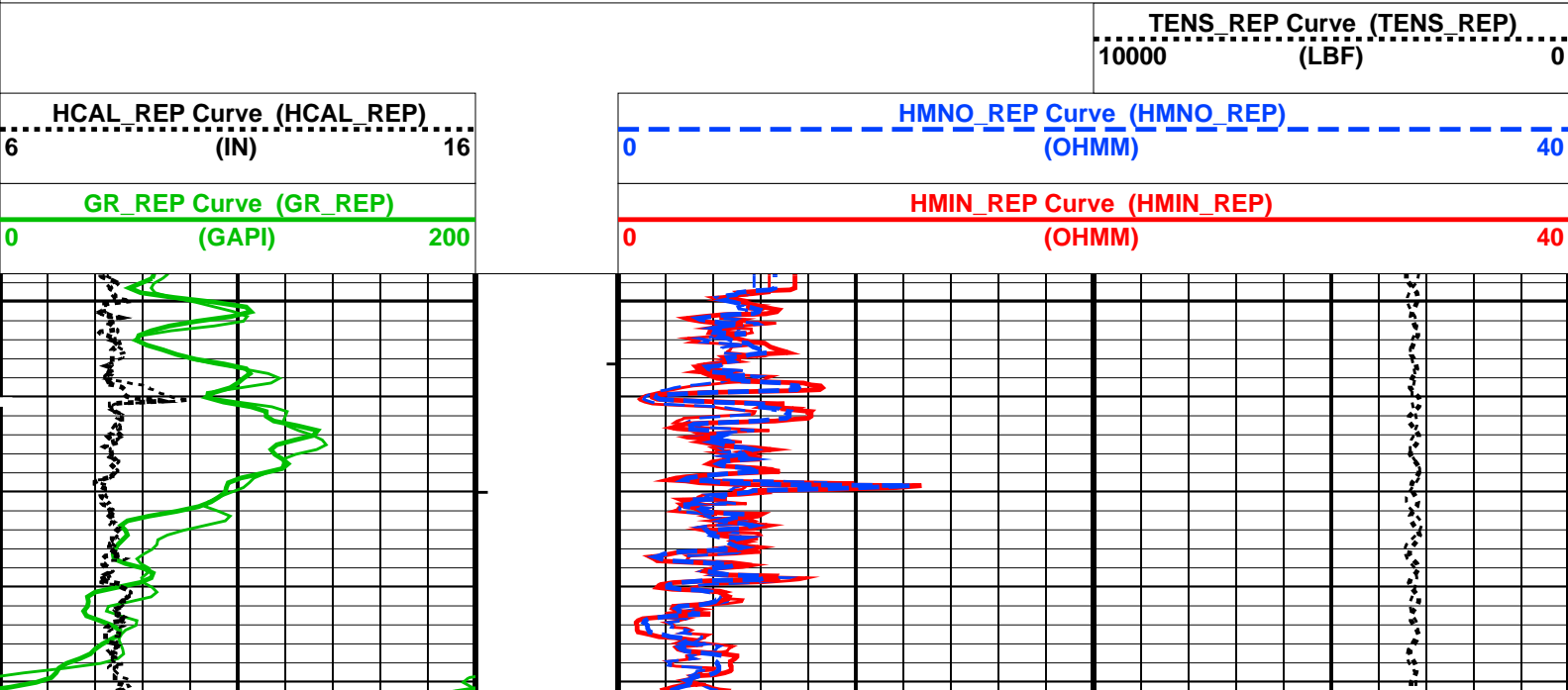
└ Integrated Hole Volume Minor Pip Every 10 F3

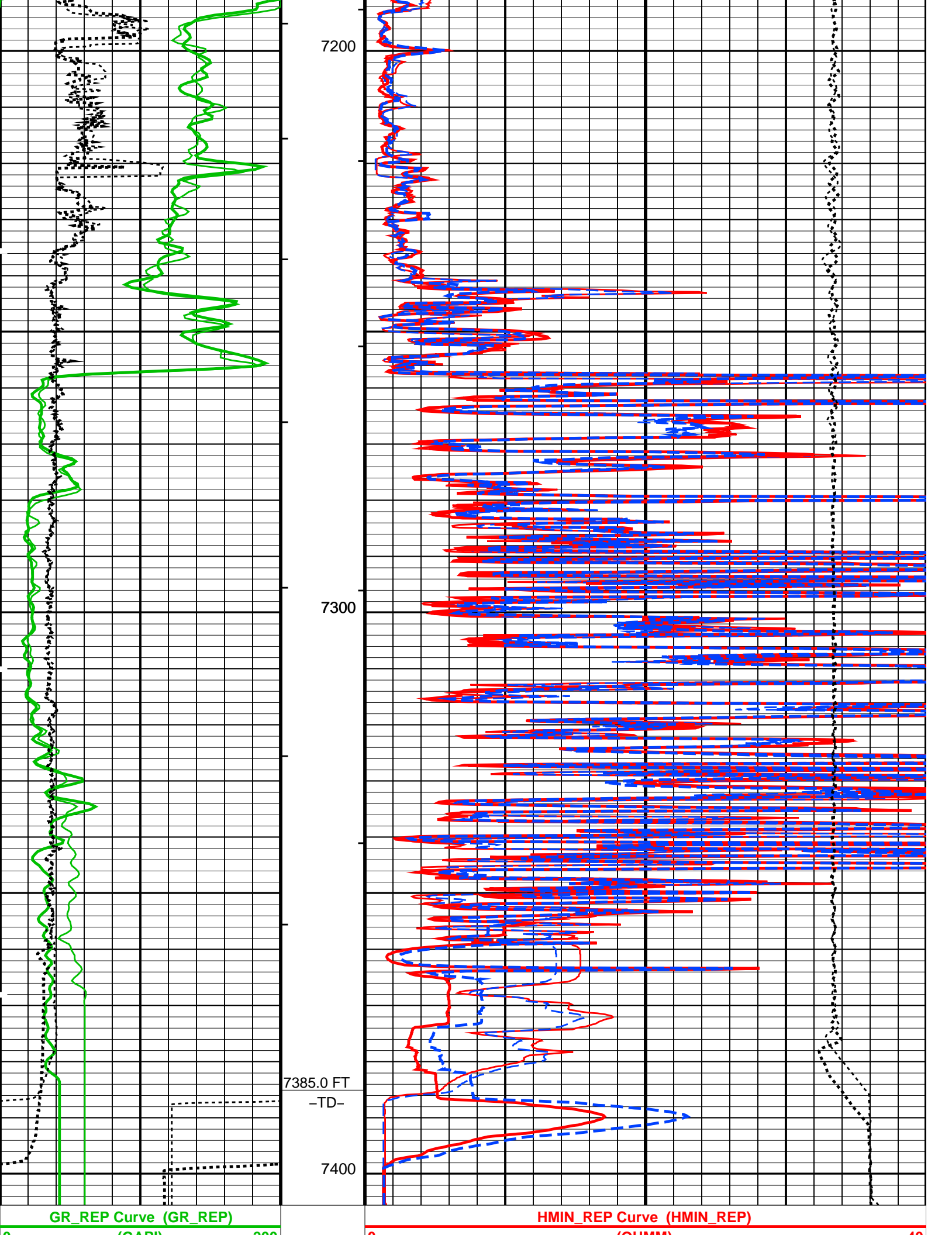
└ Integrated Hole Volume Major Pip Every 100 F3

└ Integrated Cement Volume Minor Pip Every 10 F3

└ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S





<div>(GAPI) 200</div> <div>HCAL_REP Curve (HCAL_REP)</div> <div>6 (IN) 16</div>		<div>(OHMM) 40</div> <div>HMNO_REP Curve (HMNO_REP)</div> <div>0 (OHMM) 40</div>																																					
		<div>TENS_REP Curve (TENS_REP)</div> <div>10000 (LBF) 0</div>																																					
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Format: MLT_REP		Vertical Scale: 5" per 100'																																					
Graphics File Created: 07-Apr-2010 17:12																																							
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Schlumberger

BEFORE CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary							
Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool – M Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase							
Master: 17-Mar-2010 8:50 Before: 7-Apr-2010 9:08							
Thru Cal Magnitude – 0	0	0.6194	0.6193	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.269	1.269	N/A	N/A	N/A	V
Thru Cal Magnitude – 2	0	0.6307	0.6306	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7118	0.7118	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.332	1.332	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.950	1.950	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.946	1.946	N/A	N/A	N/A	V

Thru Cal Magnitude – 7	0	1.418	1.417	N/A	N/A	N/A	V
Thru Cal Phase – 0	0	180.0	179.9	N/A	N/A	N/A	DEG
Thru Cal Phase – 1	0	178.9	178.8	N/A	N/A	N/A	DEG
Thru Cal Phase – 2	0	175.3	175.2	N/A	N/A	N/A	DEG
Thru Cal Phase – 3	0	174.6	174.5	N/A	N/A	N/A	DEG
Thru Cal Phase – 4	0	168.4	168.3	N/A	N/A	N/A	DEG
Thru Cal Phase – 5	0	166.7	166.6	N/A	N/A	N/A	DEG
Thru Cal Phase – 6	0	166.8	166.7	N/A	N/A	N/A	DEG
Thru Cal Phase – 7	0	165.9	165.8	N/A	N/A	N/A	DEG

Array Induction Tool – M Wellsite Calibration – Electronics Calibration Check – Auxiliary

Master: 17–Mar–2010 8:50 Before: 7–Apr–2010 9:08

Array Induction SPA Plus	991.0	983.6	983.5	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	–0.2001	–0.1952	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9170	0.9114	0.9113	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	–0.0002014	–0.0001927	N/A	N/A	N/A	V

Array Induction Tool – M Wellsite Calibration – Test Loop Gain Correction

Master: 17–Mar–2010 8:50

Test Loop Gain Correctio – 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 1	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 2	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 3	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 4	0	0.9937	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 5	0	0.9890	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 6	0	0.9937	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 7	0	1.006	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 0	0	0.3332	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 1	0	0.6161	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 2	0	0.1287	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 3	0	0.1700	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 4	0	0.1124	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 5	0	–0.06042	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 6	0	0.2973	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 7	0	–0.06541	N/A	N/A	N/A	N/A	DEG

Array Induction Tool – M Wellsite Calibration – Sonde Error Correction

Master: 17–Mar–2010 8:50

R Sonde Error Correction – 0	0	–65.75	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	176.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 2	0	119.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 3	0	66.51	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	27.71	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	12.62	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	9.430	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	–1.425	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	–316.9	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	108.6	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	44.39	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	–31.03	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	20.82	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	–16.06	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	–4.953	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	–11.76	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool – M Wellsite Calibration – Mud Gain Correction

Master: 17–Mar–2010 8:50

Coarse – Mag, Real, Imag – 0	0	0.8486	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 1	0	0.8487	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 2	0	0.8487	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 0	0	0.8511	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 1	0	0.8512	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 2	0	0.8512	N/A	N/A	N/A	N/A

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Stab Measurement Summary

Before: 7–Apr–2010 9:03

BS Window Ratio	0.7392	N/A	0.7359	N/A	N/A	N/A
BS Window Sum	10690	N/A	10680	N/A	N/A	CPS
SS Window Ratio	0.4732	N/A	0.4728	N/A	N/A	N/A
SS Window Sum	10190	N/A	10170	N/A	N/A	CPS
LS Window Ratio	0.2975	N/A	0.3001	N/A	N/A	N/A
LS Window Sum	1166	N/A	1162	N/A	N/A	CPS

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Photo–multiplier High Voltages Calibrations

Before: 7–Apr–2010 9:03

BS PM High Voltage (Command)	1509	N/A	1515	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1777	N/A	1780	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1896	N/A	1900	N/A	N/A	N/A	V

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Crystal Quality Resolutions Calibration

Before: 7–Apr–2010 9:03

BS PM High Voltage (Command)	1509	N/A	1515	N/A	N/A	N/A	V
------------------------------	------	-----	------	-----	-----	-----	---

BS Crystal Resolution	11.23	N/A	11.17	N/A	N/A	N/A	%
SS Crystal Resolution	11.03	N/A	11.14	N/A	N/A	N/A	%
LS Crystal Resolution	9.873	N/A	9.879	N/A	N/A	N/A	%
High resolution Integrated Logging Tool–DTS Wellsite Calibration – MCFL Calibration							
Before: 7–Apr–2010 9:08							
Raw B0 Resistivity	3875	N/A	3857	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3810	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3826	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool–DTS Wellsite Calibration – HILT Caliper Calibration							
Before: 7–Apr–2010 8:57							
HILT Caliper Zero Measurement	8.000	N/A	9.771	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	13.89	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Detector Calibration							
Before: 7–Apr–2010 8:54							
Gamma Ray Background	30.00	N/A	79.26	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	148.5	N/A	148.5	N/A	N/A	13.50	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Zero Measurement							
Master: 20–Mar–2010 17:38 Before: 7–Apr–2010 9:12							
CNTC Background	28.30	28.30	28.36	N/A	N/A	4.245	CPS
CFTC Background	26.92	26.92	28.76	N/A	N/A	4.038	CPS
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement							
Master: 20–Mar–2010 17:38							
Thermal Near Corr. (Tank)	5800	5716	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2390	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.392	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration							
Before: 7–Apr–2010 16:38							
Z–Axis Acceleration	32.19	N/A	31.77	N/A	N/A	N/A	F/S2
High resolution Integrated Logging Tool–DTS Master Calibration – Inversion results							
Master: 22–Mar–2010 21:20							
Rho Aluminum	2.596	2.602	--	--	--	--	G/C3
Rho Magnesium	1.686	1.688	--	--	--	--	G/C3
Pe Aluminum	2.570	2.565	--	--	--	--	
Pe Magnesium	2.650	2.609	--	--	--	--	
High resolution Integrated Logging Tool–DTS Master Calibration – Deviation Summary							
Master: 22–Mar–2010 21:20							
BS Average Deviation	0	0.3292	--	--	--	--	%
BS Max Deviation	0	0.6568	--	--	--	--	%
SS Average Deviation	0	0.4057	--	--	--	--	%
SS Max Deviation	0	1.954	--	--	--	--	%
LS Average Deviation	0	0.8119	--	--	--	--	%
LS Max Deviation	0	1.606	--	--	--	--	%
The GLS–VJ source activity is acceptable.							
The HGNS Neutron Master Calibration was done with the following parameters :							
NCT–B Water Temperature	61.6	DEGF.					
Thermal Housing Size	3.380	IN.					
NSR–F serial number	5068						

Array Induction Tool – M / Equipment Identification

Primary Equipment:
Rm/SP Bottom Nose
Array Induction Sonde

AMRM – A
AMIS – A 1372









Auxiliary Equipment:

Array Induction Tool – M Wellsite Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
	Master	0.6194			180.0		

0	Before	0.6193		0.6100	179.9		197.0
1	Master	1.269		1.270	178.9		196.0
	Before	1.269			178.8		
2	Master	0.6307		0.6200	175.3		192.0
	Before	0.6306			175.2		
3	Master	0.7118		0.7000	174.6		191.0
	Before	0.7118			174.5		
4	Master	1.332		1.340	168.4		185.0
	Before	1.332			168.3		
5	Master	1.950		1.960	166.7		182.0
	Before	1.950			166.6		
6	Master	1.946		1.960	166.8		181.0
	Before	1.946			166.7		
7	Master	1.418		1.410	165.9		175.0
	Before	1.417			165.8		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)

Master: 17-Mar-2010 8:50



Before: 7-Apr-2010 9:08

Array Induction Tool – M Wellsite Calibration							
Electronics Calibration Check – Auxiliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			983.6	Master			-0.2001
Before			983.5	Before			-0.1952
941.0 (Minimum)		991.0 (Nominal)	1040 (Maximum)	-50.00 (Minimum)		0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V		Value	Phase	Array Induction Temperature Zero V		Value
Master			0.9114	Master			-0.0002014
Before			0.9113	Before			-0.0001927
0.8710 (Minimum)		0.9170 (Nominal)	0.9630 (Maximum)	-0.05000 (Minimum)		0 (Nominal)	0.05000 (Maximum)
Master: 17-Mar-2010 8:50				Before: 7-Apr-2010 9:08			

Master: 17-Mar-2010 8:50

Before: 7-Apr-2010 9:08



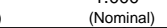



Array Induction Tool – M Wellsite Calibration							
Test Loop Gain Correction							
Idx	Value	Test Loop Gain Correction Magnitude V			Value	Test Loop Gain Correction Phase DEG	
0	1.015				0.3332		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
1	1.012				0.6161		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
2	1.016				0.1287		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
3	1.012				0.1700		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
4	0.9937				0.1124		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
5	0.9890				-0.06042		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
6	0.9937				0.2973		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)

7	1.006		-0.06541			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

















Master: 17-Mar-2010 8:50

Array Induction Tool – M Wellsite Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-65.75				-316.9		
	-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	176.6				108.6		
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	119.4				44.39		
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	66.51				-31.03		
	39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	27.71				20.82		
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	12.62				-16.06		
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.430				-4.953		
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-1.425				-11.76		
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)



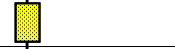
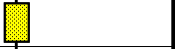
Master: 17-Mar-2010 8:50

















Array Induction Tool – M Wellsite Calibration							
Mud Gain Correction							
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag	
0	0.8486				0.8511		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
1	0.8487				0.8512		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
2	0.8487				0.8512		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)

Master: 17-Mar-2010 8:50

Array Induction Tool – M Master Calibration									
Electronics Calibration Check – Thru Cal Mag. & Phase									
Idx	Phase	Value	Thru Cal Magnitude V		Nominal	Value	Thru Cal Phase DEG		Nominal
0	Master	0.6194			0.6100	180.0			197.0
1	Master	1.269			1.270	178.9			196.0
2	Master	0.6307			0.6200	175.3			192.0
3	Master	0.7118			0.7000	174.6			191.0
4	Master	1.332			1.340	168.4			185.0
5	Master	1.950			1.960	166.7			182.0
6	Master	1.946			1.960	166.8			181.0
7	Master	1.418			1.410	165.9			175.0
		60.00 % (Minimum)	(Nominal)		140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)		Nom + 60.00 (Maximum)

Master: 17-Mar-2010 8:50

Array Induction Tool – M Master Calibration							
Electronics Calibration Check – Auxiliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			983.6	Master			-0.2001
	941.0 (Minimum)	991.0 (Nominal)	1040 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V		Value	Phase	Array Induction Temperature Zero V		Value
Master			0.9114	Master			-0.0002014
	0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 17–Mar–2010 8:50							

Array Induction Tool – M Master Calibration								
Test Loop Gain Correction								
Idx	Value	Test Loop Gain Correction Magnitude V			Value	Test Loop Gain Correction Phase DEG		
0	1.015				0.3332			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.012				0.6161			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.016				0.1287			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.012				0.1700			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9937				0.1124			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9890				-0.06042			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9937				0.2973			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.006				-0.06541			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Master: 17–Mar–2010 8:50								

Array Induction Tool – M Master Calibration								
Sonde Error Correction								
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	-65.75	<div><div></div><div></div><div></div></div>			-316.9	<div><div></div><div></div><div></div></div>		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	176.6	<div><div></div><div></div><div></div></div>			108.6	<div><div></div><div></div><div></div></div>		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	119.4	<div><div></div><div></div><div></div></div>			44.39	<div><div></div><div></div><div></div></div>		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	66.51	<div><div></div><div></div><div></div></div>			-31.03	<div><div></div><div></div><div></div></div>		
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	27.71	<div><div></div><div></div><div></div></div>			20.82	<div><div></div><div></div><div></div></div>		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	12.62	<div><div></div><div></div><div></div></div>			-16.06	<div><div></div><div></div><div></div></div>		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.430	<div><div></div><div></div><div></div></div>			-4.953	<div><div></div><div></div><div></div></div>		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)




Master: 17-Mar-2010 8:50



Master: 17-Mar-2010 8:50




Before: 7-Apr-2010 9:03





Before: 7-Apr-2010 9:03




Before: 7-Apr-2010 9:03

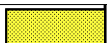
Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3857	Before		3810	Before		3826
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)		3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	
Before: 7-Apr-2010 9:08								





High resolution Integrated Logging Tool–DTS Wellsite Calibration							
HILT Caliper Calibration							
Phase	HILT Caliper Zero Measurement IN		Value	Phase	HILT Caliper Plus Measurement IN		Value
Before			9.771	Before			13.89
6.000 (Minimum)		8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)		12.00 (Nominal)	15.00 (Maximum)
Before: 7-Apr-2010 8:57							




High resolution Integrated Logging Tool–DTS Wellsite Calibration											
Detector Calibration											
Phase	Gamma Ray Background GAPI		Value	Phase	Gamma Ray (Jig – Bkg) GAPI		Value	Phase	Gamma Ray (Calibrated) GAPI		Value
Before			79.26	Before			148.5	Before			165.0
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		135.0 (Minimum)	148.5 (Nominal)	162.0 (Maximum)		150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)
Before: 7-Apr-2010 8:54											

High resolution Integrated Logging Tool–DTS Wellsite Calibration							
Zero Measurement							
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value
Master			28.30	Master			26.92
Before			28.36	Before			28.76
5.000 (Minimum)			28.30 (Nominal)	40.00 (Maximum)			
5.000 (Minimum)			26.92 (Nominal)	40.00 (Maximum)			
Master: 20–Mar–2010 17:38				Before: 7–Apr–2010 9:12			



High resolution Integrated Logging Tool–DTS Wellsite Calibration											
Ratio Measurement											
Phase	Thermal Near Corr. (Tank) CPS		Value	Phase	Thermal Far Corr. (Tank) CPS		Value	Phase	CNTC/CFTC (Tank)		Value
Master			5716	Master			2390	Master			2.392
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)		2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)
Master: 20–Mar–2010 17:38											




High resolution Integrated Logging Tool–DTS		
Wellsite Calibration		
Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		31.77
	31.53 (Minimum)	32.19 (Nominal)
		32.84 (Maximum)
Before: 7-Apr-2010 16:38		

High resolution Integrated Logging Tool–DTS Master Calibration							
Inversion results							
Phase	Rho Aluminum G/C3		Value	Phase	Rho Magnesium G/C3		Value
Master			2.602	Master			1.688
	2.586 (Minimum)	2.596 (Nominal)	2.606 (Maximum)		1.676 (Minimum)	1.686 (Nominal)	1.696 (Maximum)
Phase	Pe Aluminum		Value	Phase	Pe Magnesium		Value
Master			2.565	Master			2.609
	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)		2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)
Master: 22–Mar–2010 21:20							

High resolution Integrated Logging Tool–DTS Master Calibration								
Deviation Summary								
Phase	BS Average Deviation %	Value	Phase	SS Average Deviation %	Value	Phase	LS Average Deviation %	Value
Master		0.3292	Master		0.4057	Master		0.8119

<div><div>-0.60000</div><div>0</div><div>0.60000</div></div> <div>(Minimum)(Nominal)(Maximum)</div>			<div><div>-1.000</div><div>0</div><div>1.000</div></div> <div>(Minimum)(Nominal)(Maximum)</div>			<div><div>-1.500</div><div>0</div><div>1.500</div></div> <div>(Minimum)(Nominal)(Maximum)</div>					
Phase	BS Max Deviation %		Value	Phase	SS Max Deviation %		Value	Phase	LS Max Deviation %		Value
Master	<div><div></div></div>		0.6568	Master	<div><div></div></div>		1.954	Master	<div><div></div></div>		1.606
<div><div>-1.600</div><div>0</div><div>1.600</div></div> <div>(Minimum)(Nominal)(Maximum)</div>			<div><div>-2.500</div><div>0</div><div>2.500</div></div> <div>(Minimum)(Nominal)(Maximum)</div>			<div><div>-3.500</div><div>0</div><div>3.500</div></div> <div>(Minimum)(Nominal)(Maximum)</div>					
Master: 22-Mar-2010 21:20											

High resolution Integrated Logging Tool—DTS Master Calibration									
Zero Measurement									
Phase	CNTC Background CPS			Value	Phase	CFTC Background CPS			Value
Master				28.30	Master				26.92
	5.000 (Minimum)	28.30 (Nominal)	40.00 (Maximum)			5.000 (Minimum)	26.92 (Nominal)	40.00 (Maximum)	
Master: 20–Mar–2010 17:38									

High resolution Integrated Logging Tool-DTS Master Calibration											
Tank Measurement											
Phase	Thermal Near Corr. (Tank) CPS		Value	Phase	Thermal Far Corr. (Tank) CPS		Value	Phase	CNTC/CFTC (Tank)		Value
Master			5716	Master			2390	Master			2.392
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)		1900 (Minimum)	2400 (Nominal)	2900 (Maximum)		2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)
Master: 20-Mar-2010 17:38											

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC-H Auxiliary Cartridge
DTC-H Telemetry Cartridge

DTCH - A
DTCH - A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing

ECH - KC

Company: **Kerr McGee Oil and Gas Onshore, LP**

Schlumberger

Well: **KCB 17-14**

Field: **Wattenberg**

County: **Weld**

State: **Colorado**

Platform Express
Micro Log