Schlumberger

Company: **Orr Energy LLC**

Well: **South 6−22D**
Field: **Wattenburg**
County: **Weld** State: **Colorado**

County: Weld
Field: Wattenburg
Location: SENW Sec. 6 T5N, R66W
Well: South 6−22D
Company: Orr Energy LLC

Platform Express
Array Induction
with Linear Correlation

LOCATION

SENW Sec. 6 T5N, R66W
SHL: 2593' FNL X 2658' FWL
BHL: 2071' FNL X 2147' FWL (Proj.)

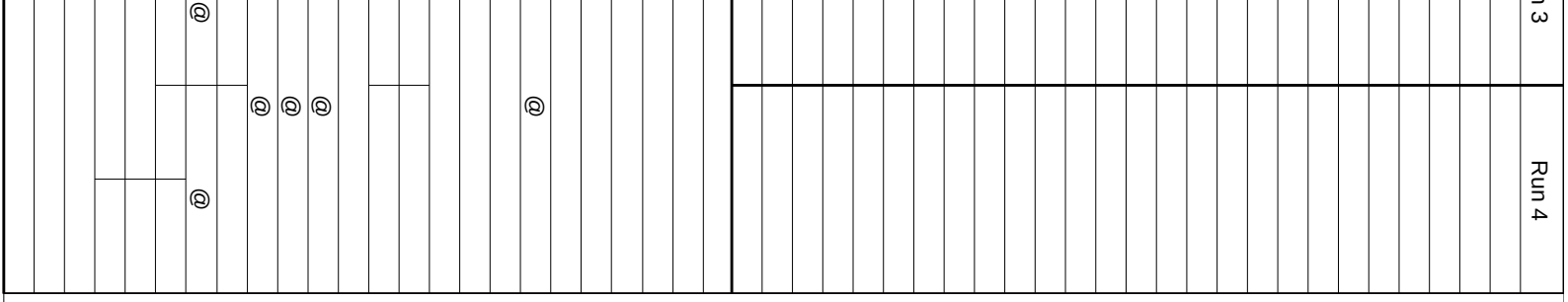
Elev.: K.B. 4806 ft
G.L. 4794 ft
D.F. 4807 ft

Permanent Datum: Ground Level Elev.: 4794 ft
Log Measured From: Kelly Bushing 12.0 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
05−123−25984−000C	6	5N	66W

Logging Date			5−Dec−2007					
Run Number			1					
Depth Driller			7769 ft					
Schlumberger Depth			7784 ft					
Bottom Log Interval			7774 ft					
Top Log Interval			841 ft					
Casing Driller Size @ Depth			8.625 in	@	838 ft		@	
Casing Schlumberger			841 ft					
Bit Size			7.875 in					
Type Fluid In Hole			Gel & Chemicals					
MUD Density		Viscosity	9.1 lbm/gal	49 s				
MUD Fluid Loss		PH						
MUD Source Of Sample			Flowline					
RM @ Measured Temperature			2.268 ohm.m	@	60 degF		@	
RMF @ Measured Temperature			1.701 ohm.m	@	60 degF		@	
RMC @ Measured Temperature			3.402 ohm.m	@	60 degF		@	
Source RMF	RMC		Calculated	Calculated				
RM @ MRT	RMF @ MRT		0.718 @ 205	0.539 @ 205		@		@
Maximum Recorded Temperatures			205 degF					
Circulation Stopped		Time	5−Dec−2007		14:00			
Logger On Bottom		Time	6−Dec−2007		0:20			
Unit Number	Location		3003	Fort Morgan, CO				
Recorded By			Krista Tagliaferri					
Witnessed By			Mark Scanniello					

	Run 1	Run 2	Run
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			
MUD Density / Viscosity			
MUD Fluid Loss / PH			
MUD 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: 6−DEC−2007 0:20:53

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−39P−LXS
Serial Number:	−999	Serial Number:	1937	Serial Number:	4142
Calibration Date:	6−Nov−2007	Calibration Date:	15−Nov−2007	Length:	14680.00 FT
Calibrator Serial Number:	1	Calibrator Serial Number:	100513		
Calibration Cable Type:	7−46P	Calibration Gain:	0.99	Conveyance Method:	Wireline
Wheel Correction 1:	−4	Calibration Offset:	261.00	Rig Type:	LAND
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:	8.00 FT
Tool Zero Check At Surface:	0.20 FT

Depth Control Remarks

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

OTHER SERVICES1	OTHER SERVICES2
OS1: GPIT	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole	
Tool run as per tool sketch	
Matrix changes shown on nuclear print	

Rig: Ensign 7

Crew: Ian Derry & David Marquez

RUN 1		RUN 2	
SERVICE ORDER #:		SERVICE ORDER #:	
PROGRAM VERSION:	15C0−309	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

RUN 1 LOGGED INTERVAL	START	STOP	RUN 2 LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

SURFACE EQUIPMENT

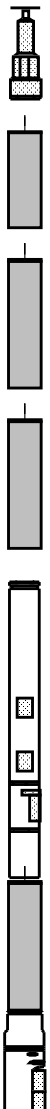
RUN 1

GSR−U/Y
NCT−B
CNB−AB
NCS−VB

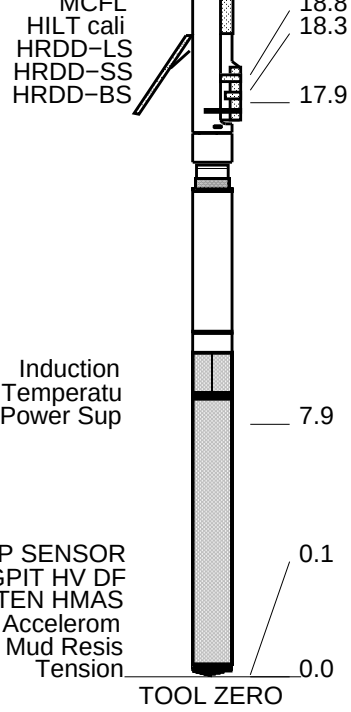
WITM (DTS)−A

RUN 2

DOWNHOLE EQUIPMENT

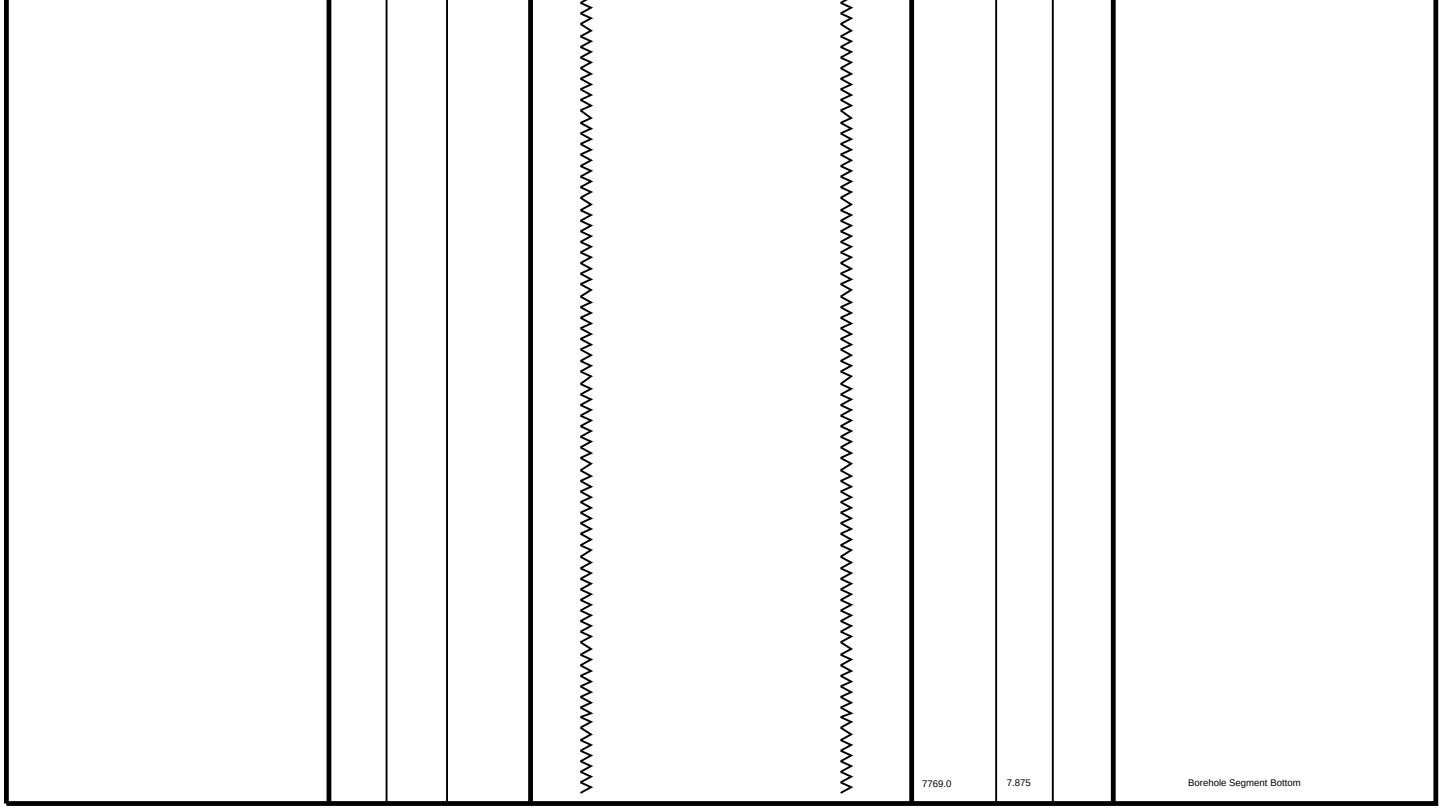


LEH−QT LEH−QT		51.6
DTC−H ECH−KC DTCH0−A DTCH1−A	CTEM TelStatus ToolStatu	48.6
AH−NM AH−NM		45.6
GPIT−C GPIC−C GPIH−B		41.6
HILTB−FTB HGNSD−B HMCA HGNH NLS−KL NSR−F 940 HACCZ HCNT HGR HRCC−B HRMS−B HRGD−B GLS−VJ 5094 MCFL Device HILT Nucl. LS 42767 HILT Nucl. SS 42767 HILT Nucl. BS 42767 AIT−H AHIS−BA 374 AHRM−A NPV−N	HGNS Gamm HGNS Neut HGNS Neut HGNS sens HRCC cart	37.6



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

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					0.0	8.625		Casing String
					838.0	8.625		Casing Shoe
					838.0	7.875		Borehole Segment



All depths are driller's depths

Schlumberger

RESISTIVITY LINEAR 2" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25	7788.0 FT	414.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2577.83 F3

Cement Volume = 1810.93 F3 (assuming 4.50 IN casing O.D.)

Computed from 7784.0 FT to 841.0 FT using data channel(s) HCAL

OP System Version: 15C0−309

MCM

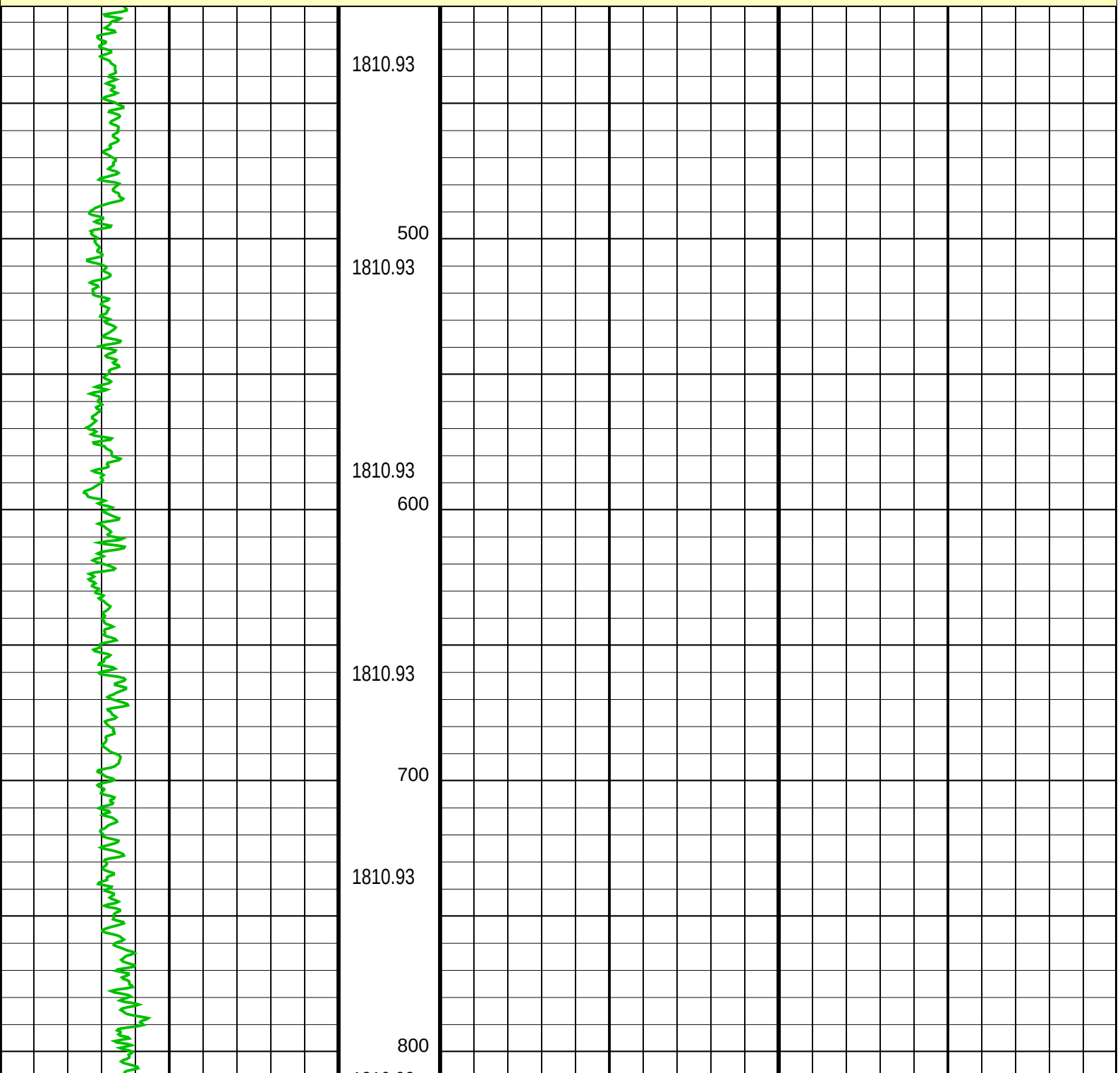
HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

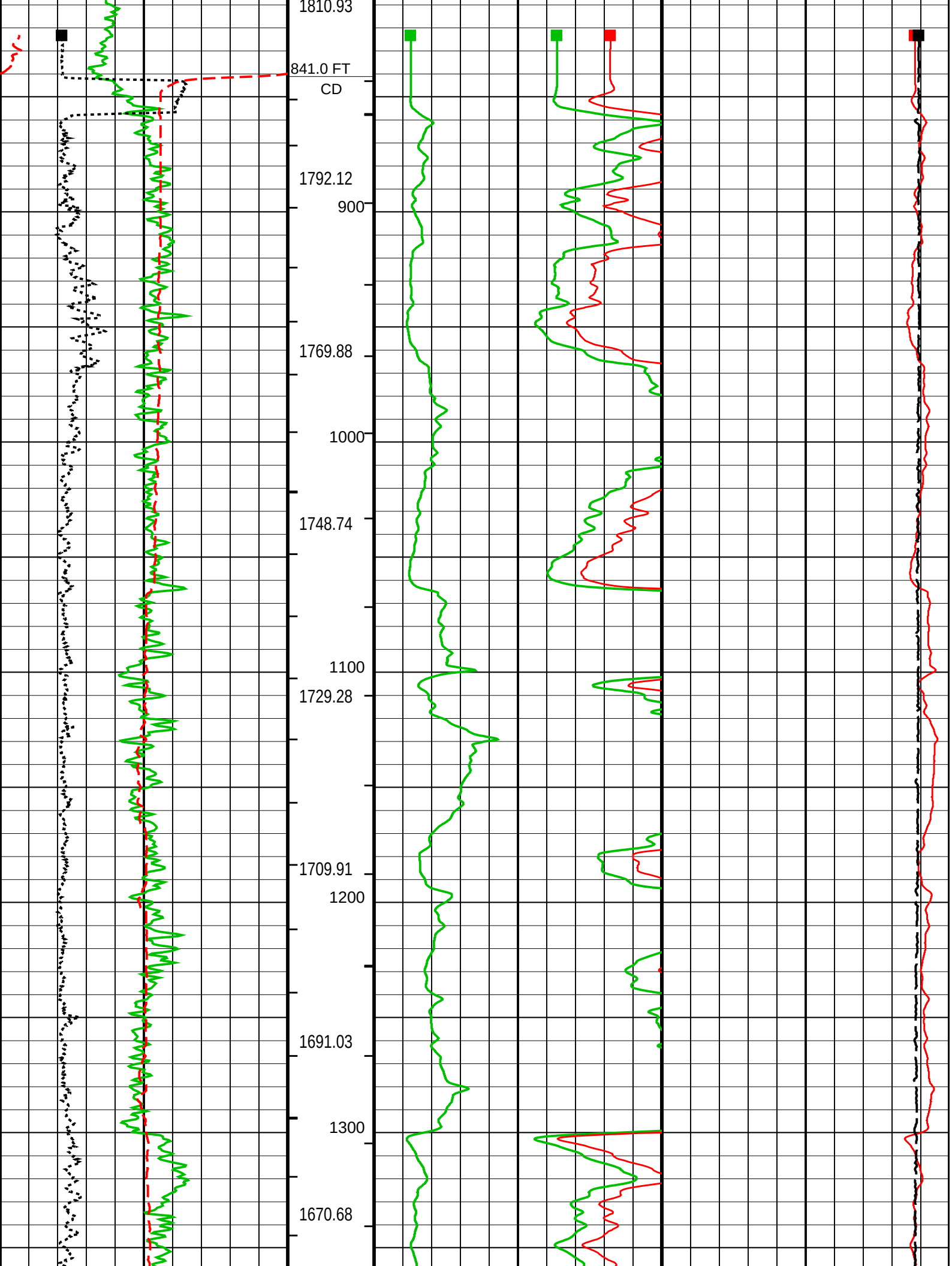
PIP SUMMARY

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

SP (SP) −160 (MV) 40		
Caliper (HCAL) 6 (IN) 16		AIT−H 90 Inch Investigation (AHF90) 0 (OHMM) 10
Gamma Ray (GR) 0 (GAPI) 200		AIT−H 10 Inch Investigation (AHF10) 0 (OHMM) 10
Gamma Ray Backup	Cement Volume (ICV) (F3)	AIT−H 10 Inch Investigation (AHF10) 0 (OHMM) 50
		Tension (TENS) 10000 (LBF) 0
		AIT−H 90 Inch Investigation Conductivity (AHFCO90) 1000 (MM/M) 0

MAIN PASS: *** PLATFORM EXPRESS − ARRAY INDUCTION ***

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CD
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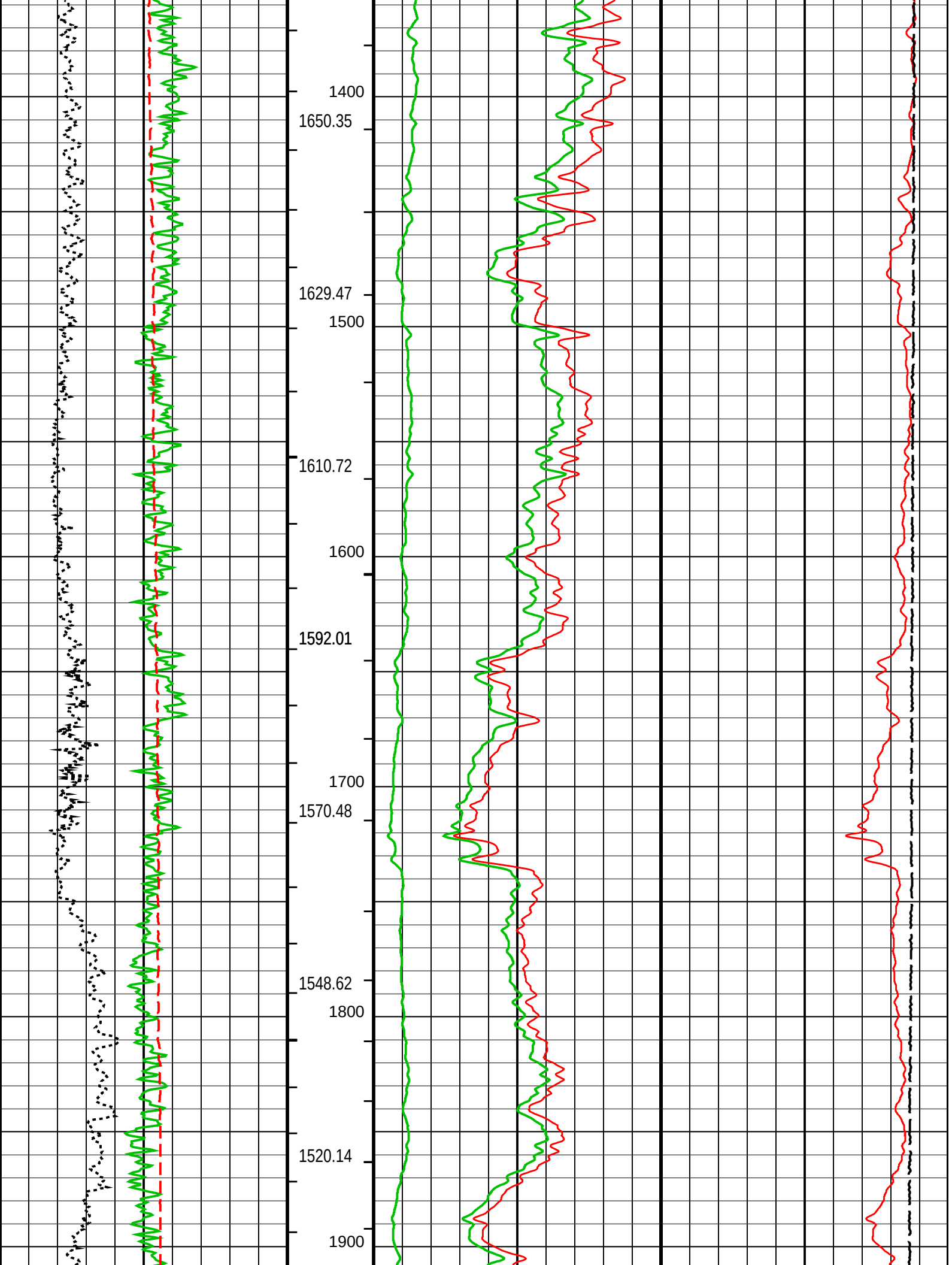
1300
1670.68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1548.62
1800
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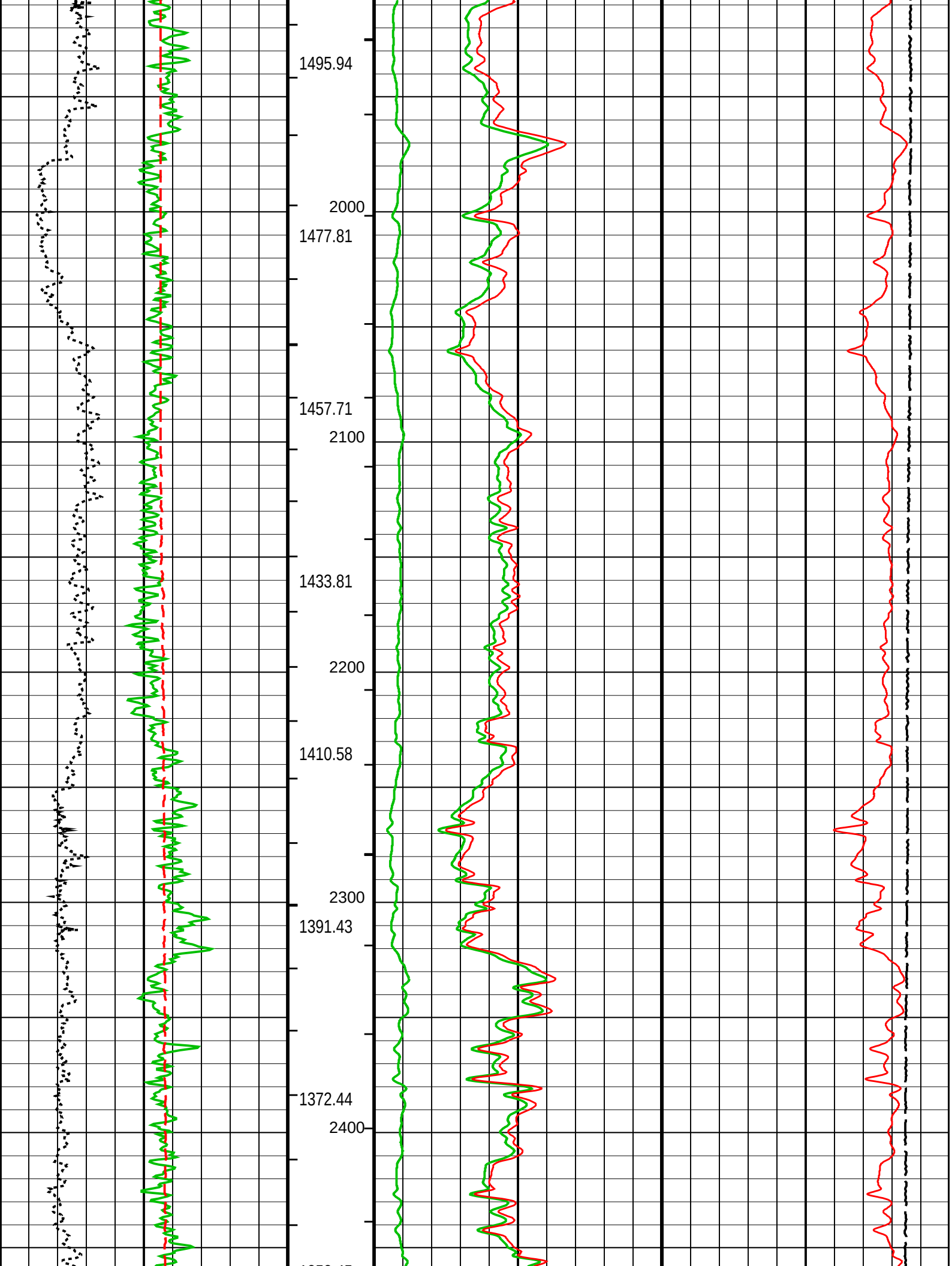
1900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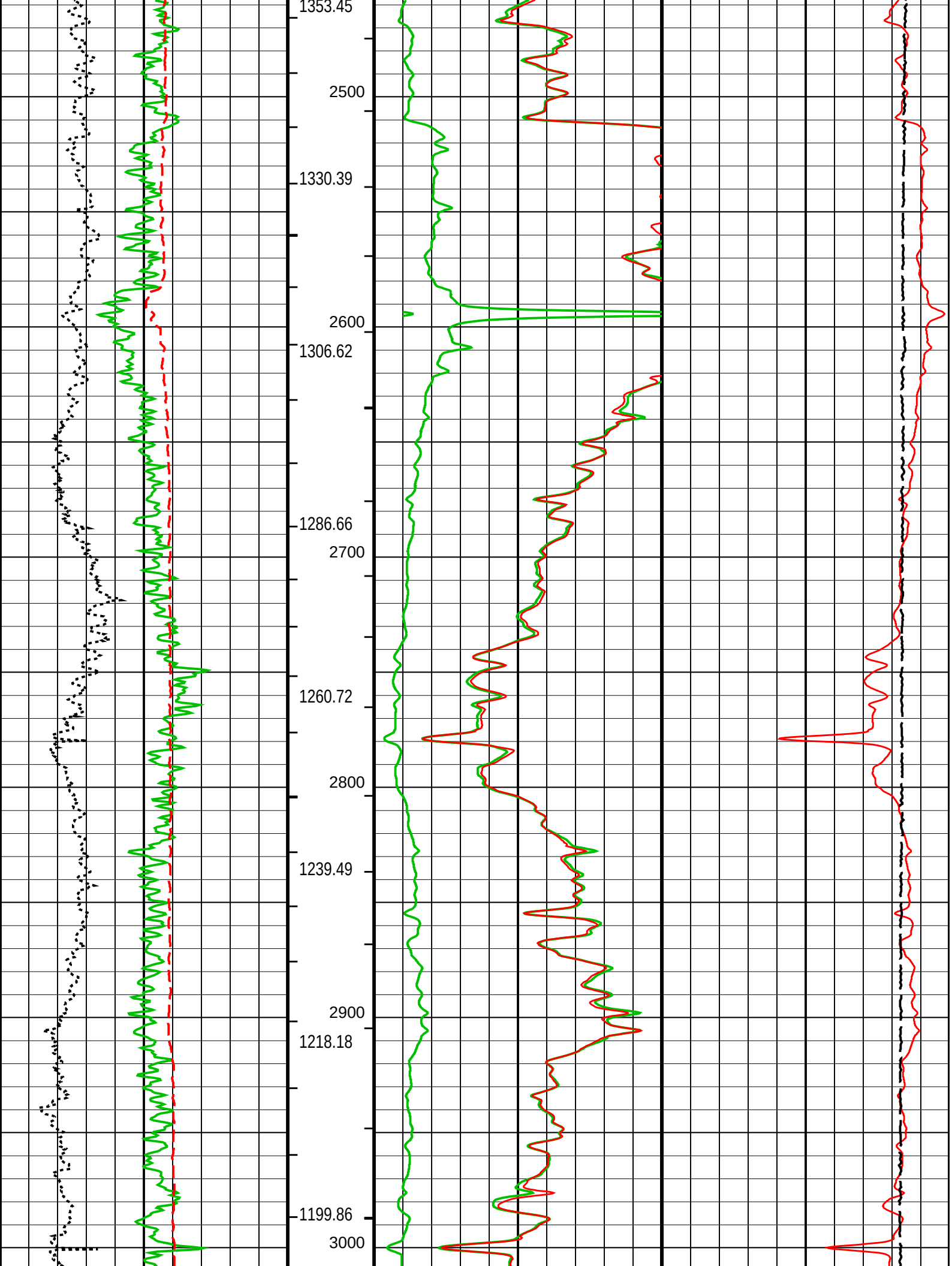
1477.81
1457.71
2100
1433.81
2200
1410.58
2300
1391.43
1372.44
2400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1306.62
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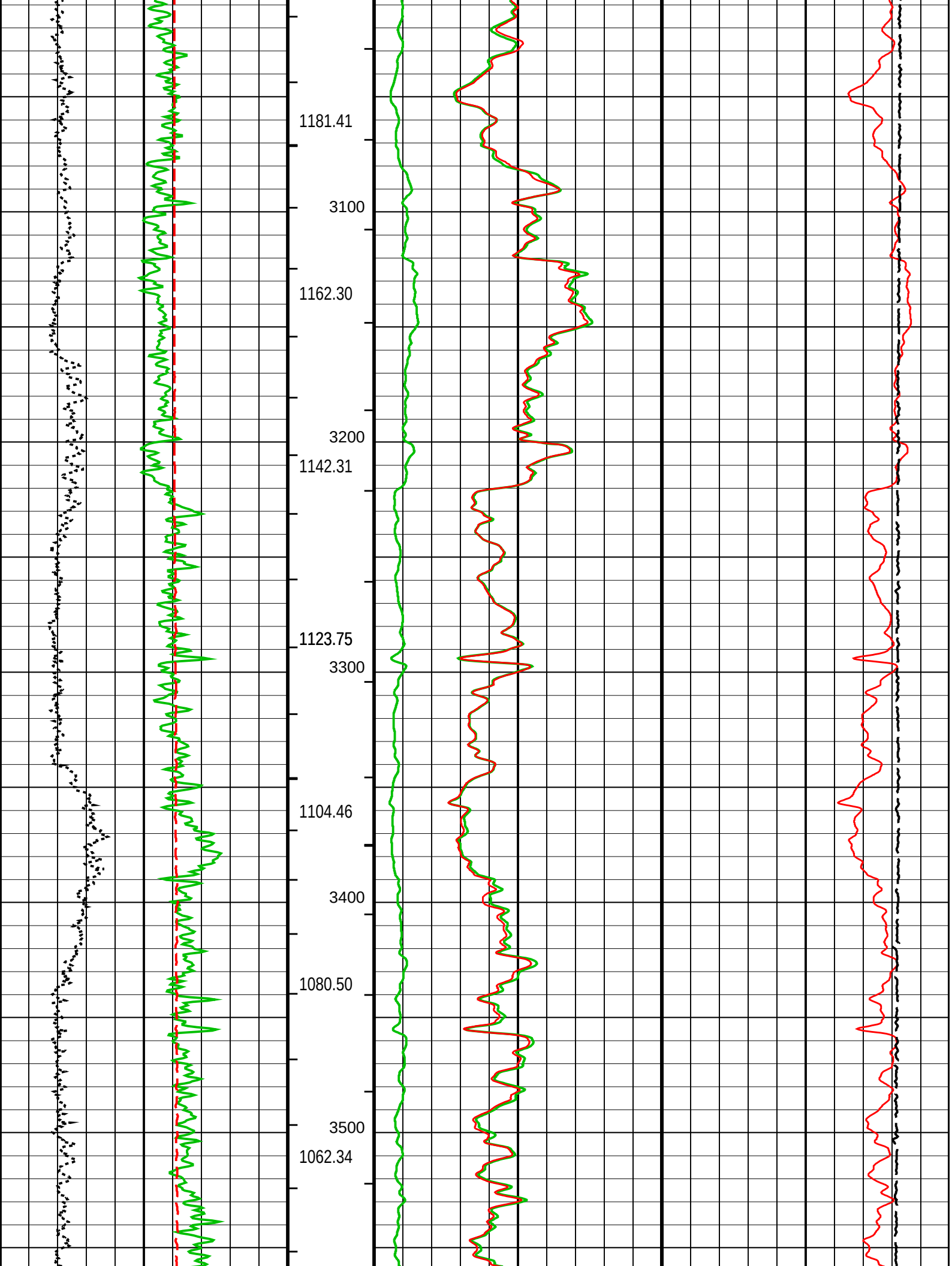
2700
1260.72
2800
1239.49
2900
1218.18
1199.86
3000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3300
1104.46
3400
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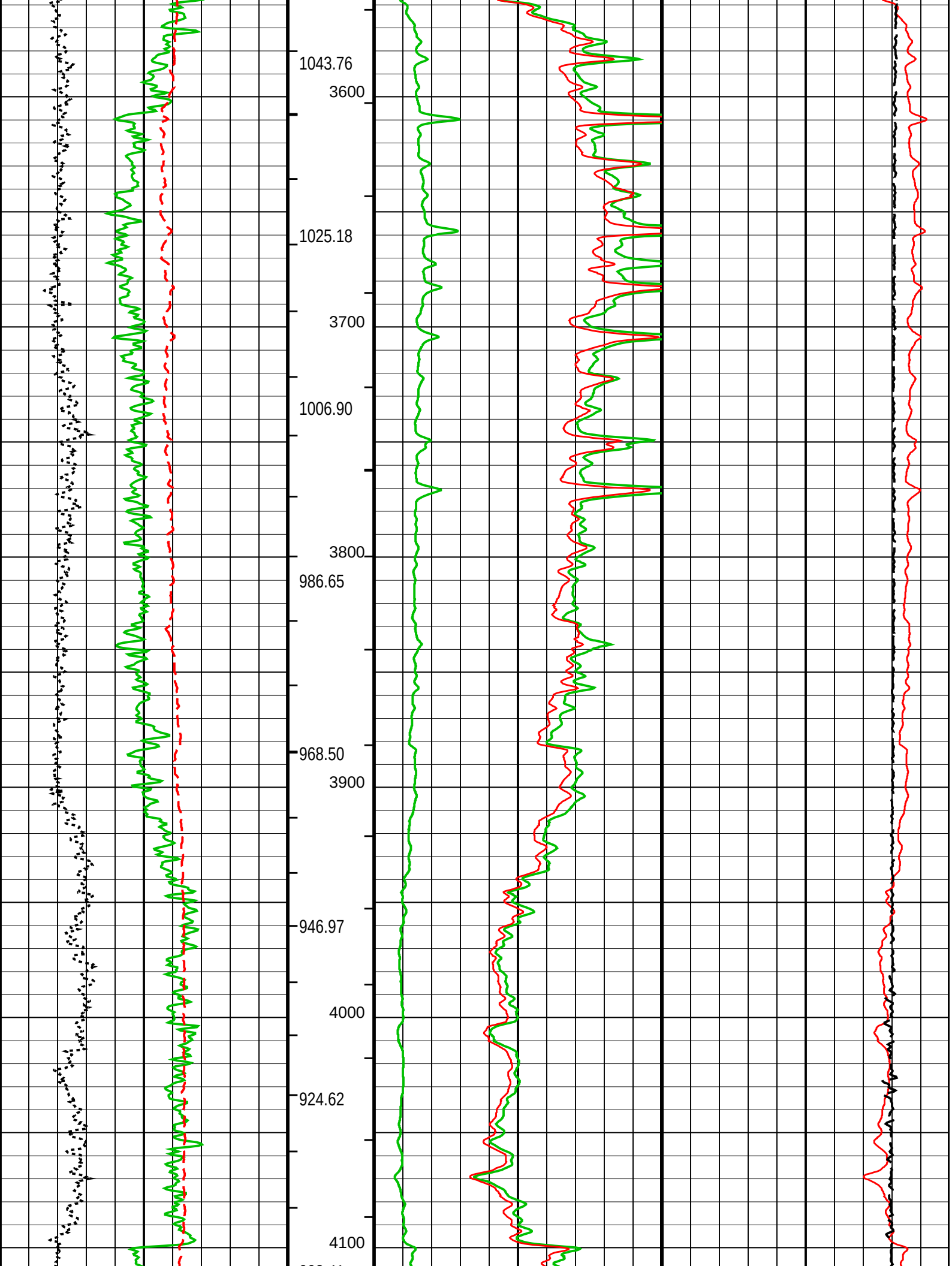
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1006.90
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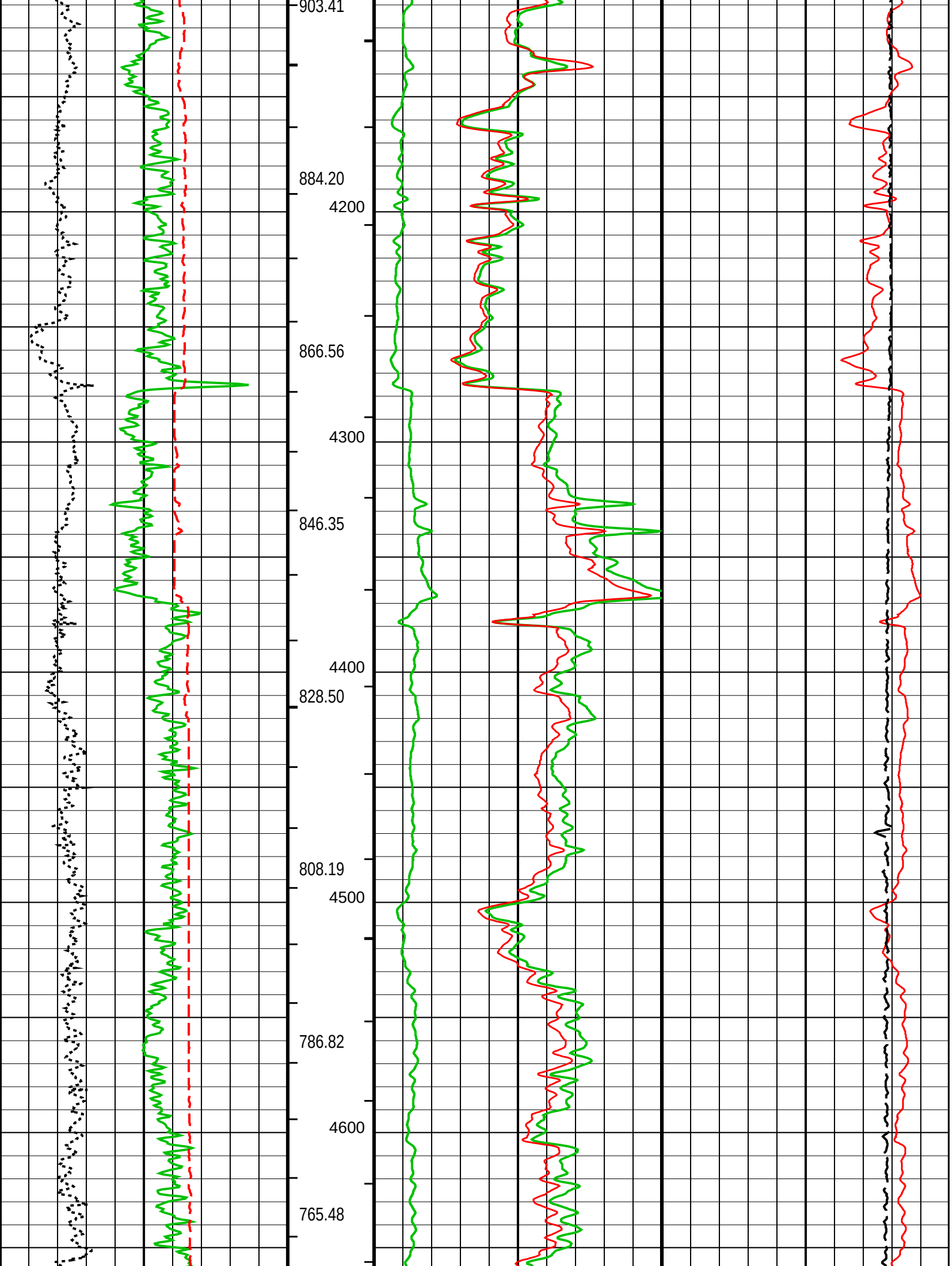
3900
946.97
4000
924.62
4100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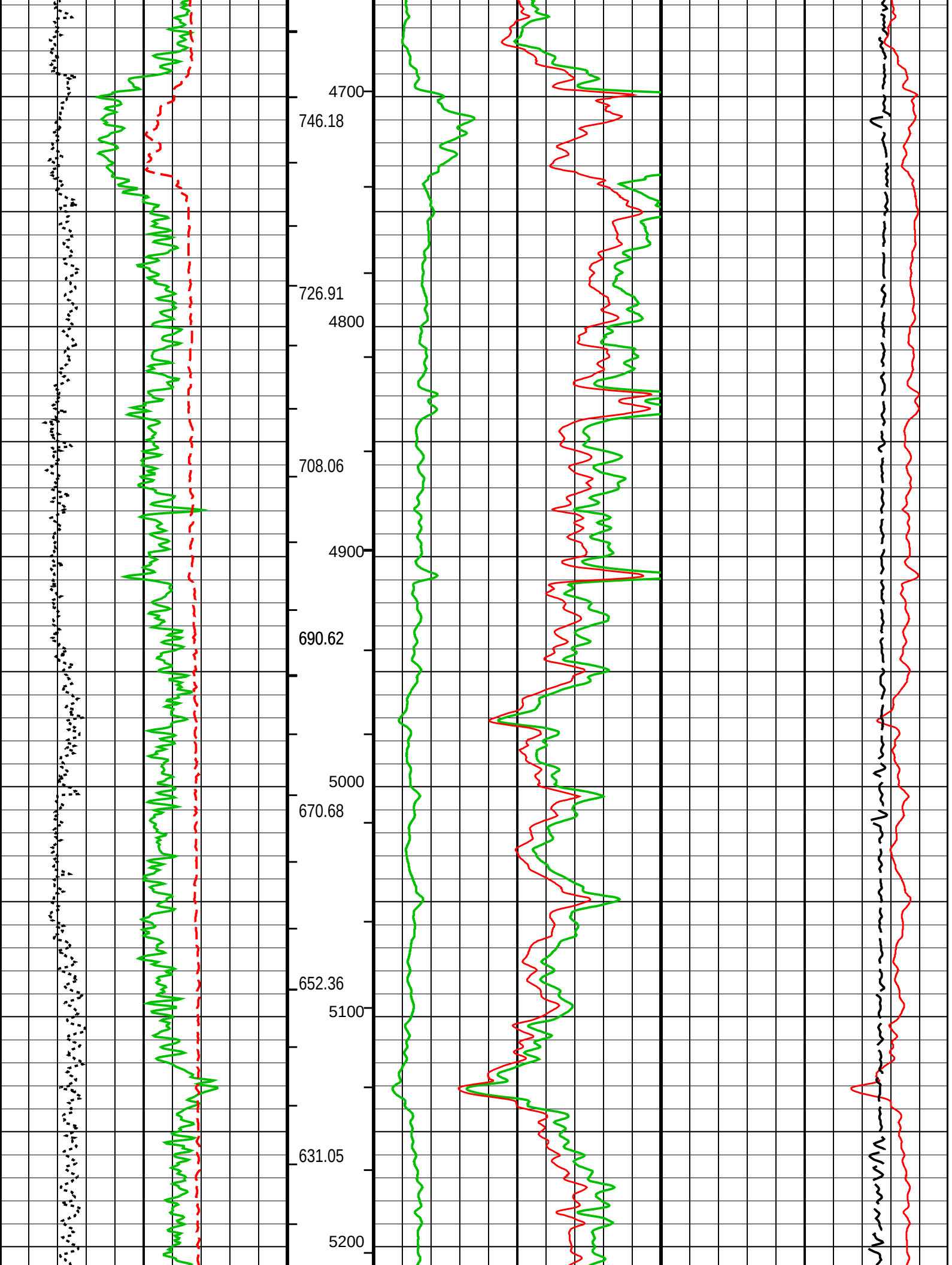
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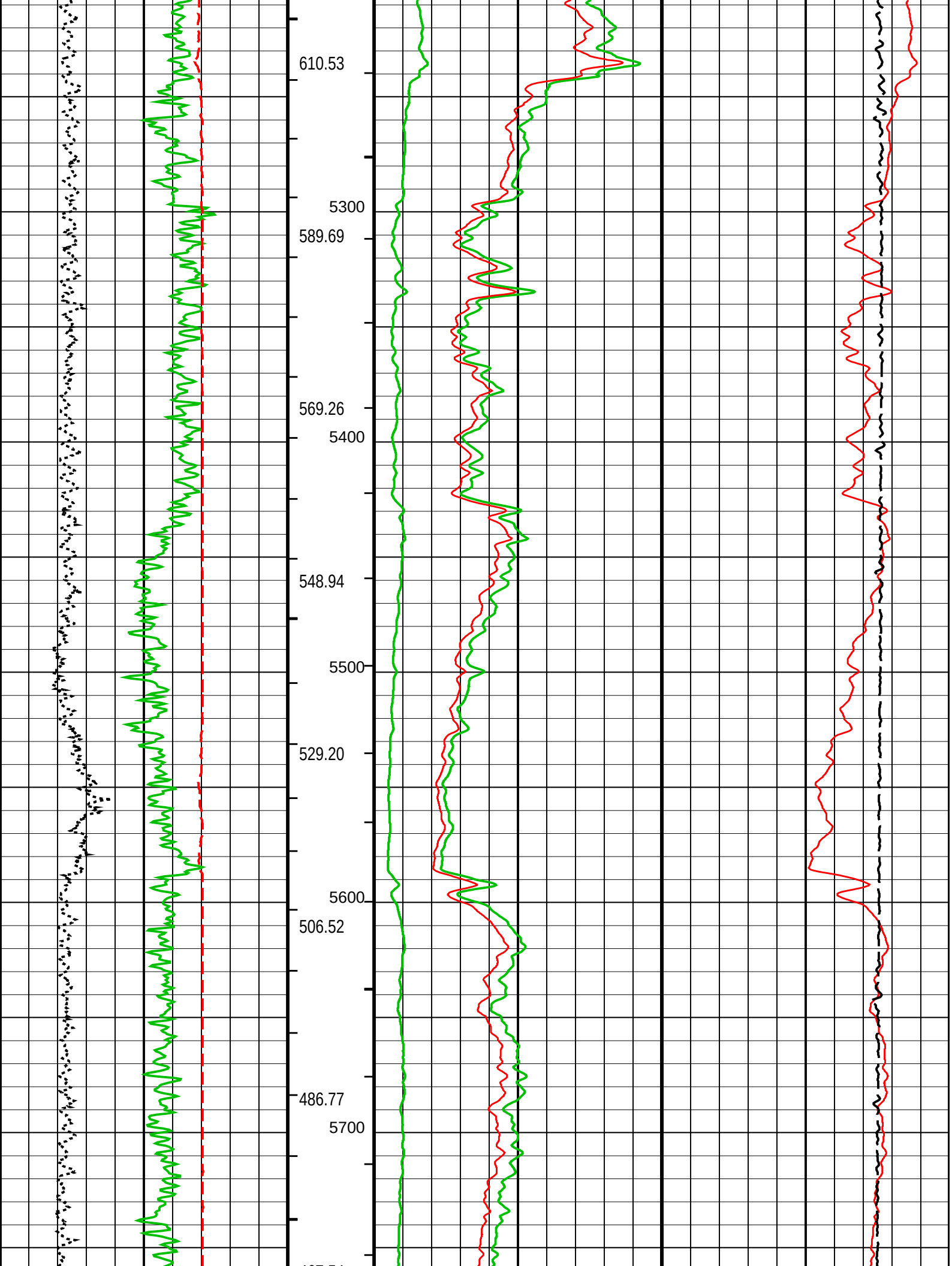
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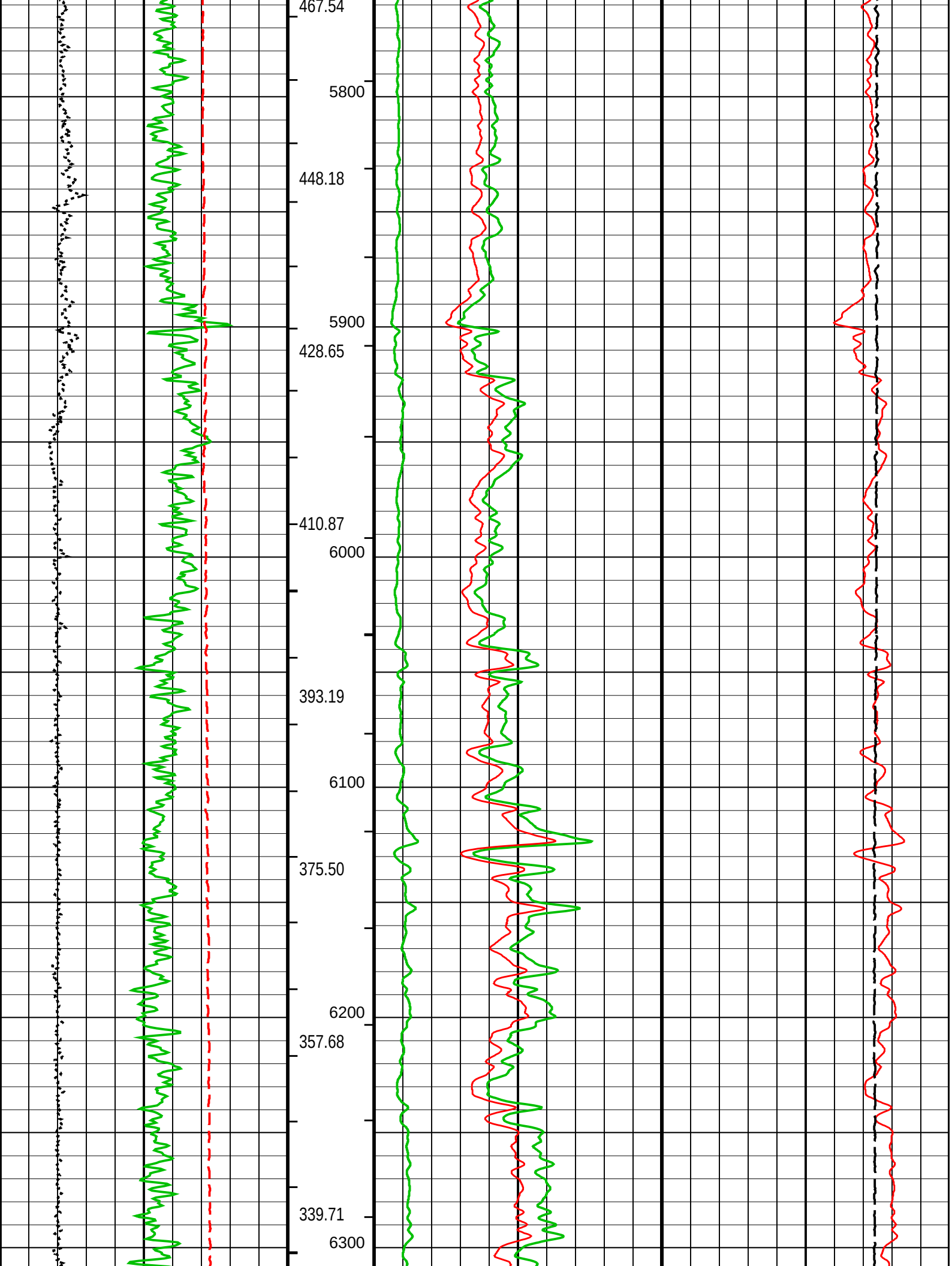
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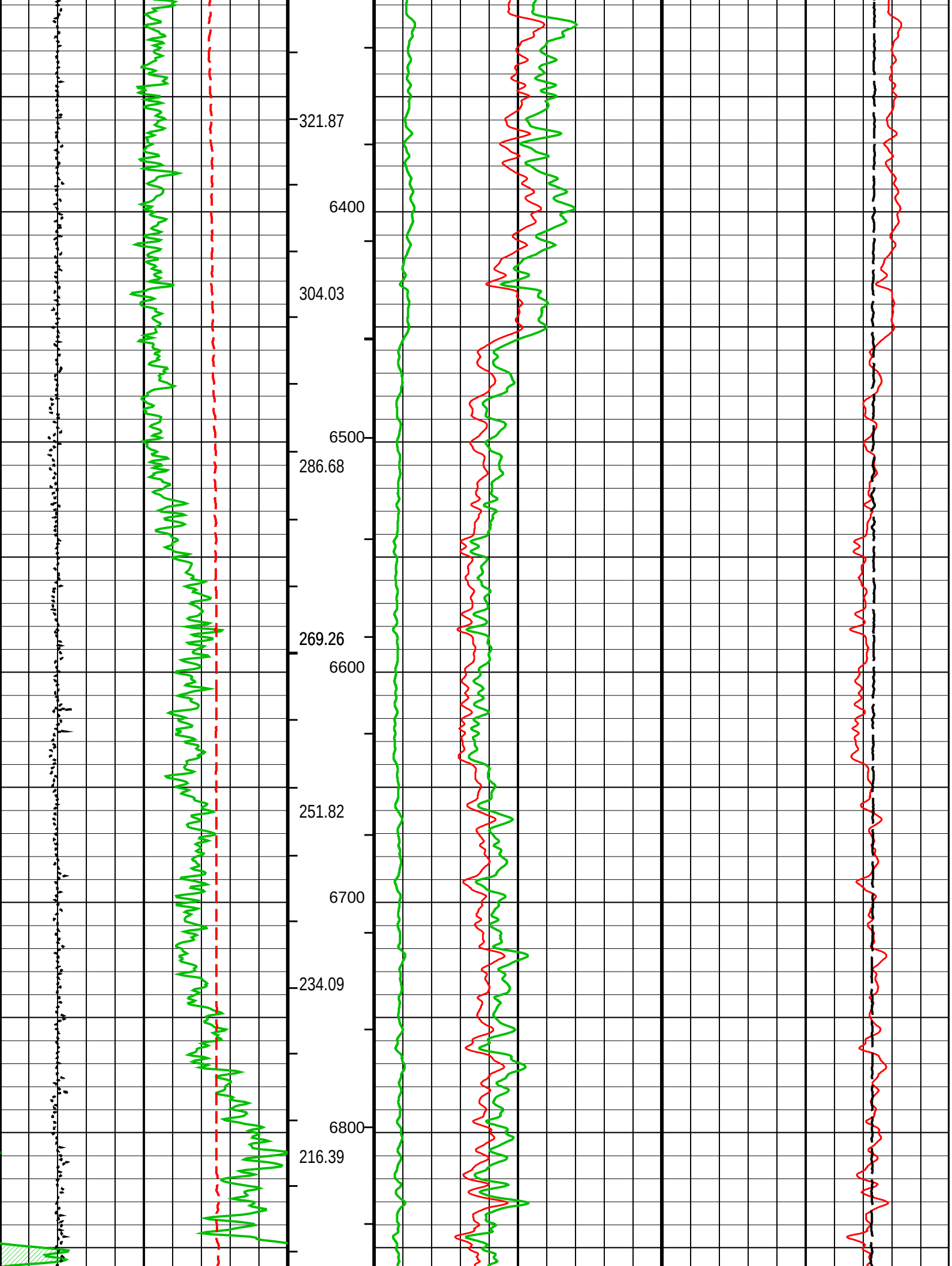
6300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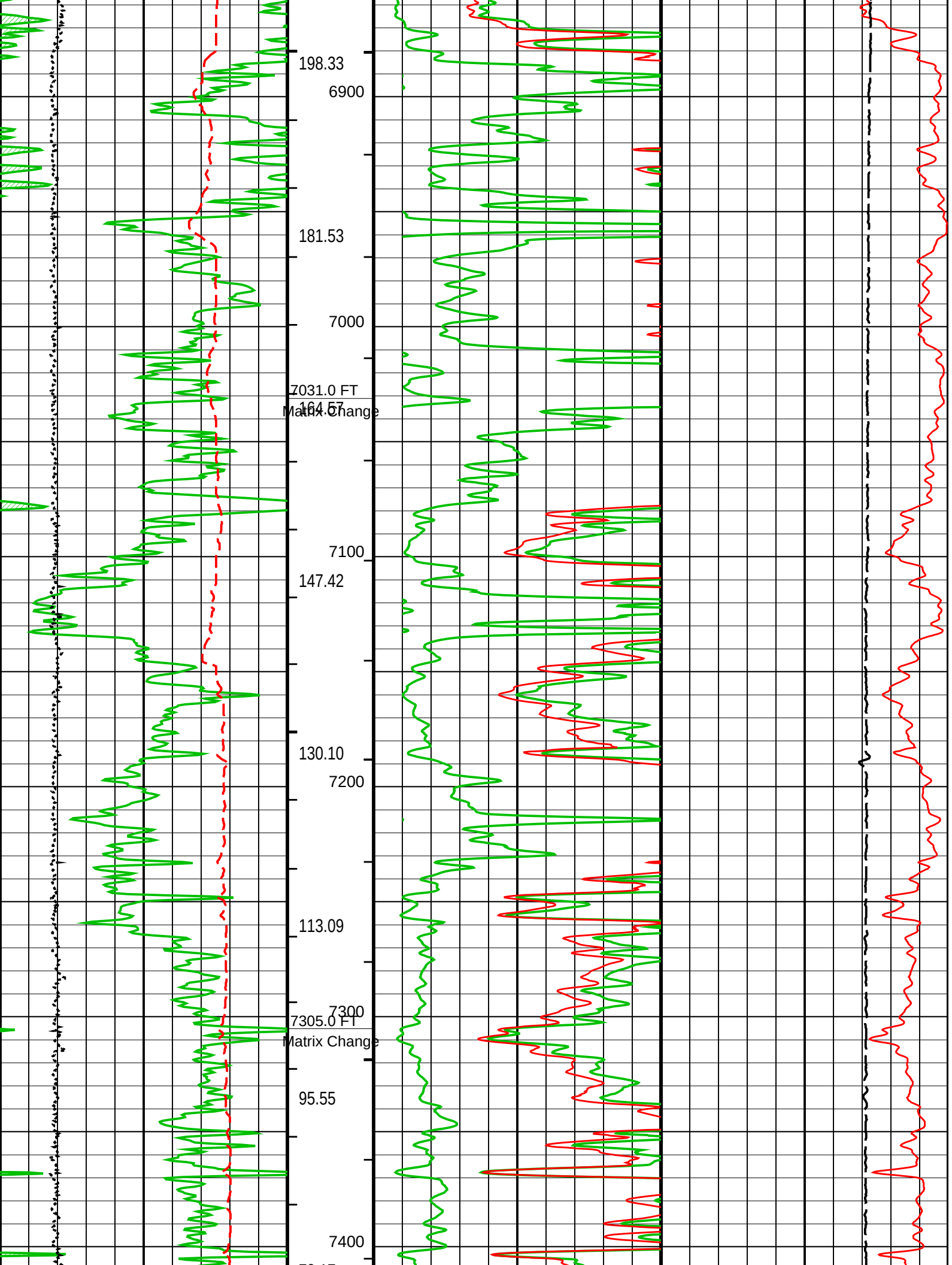
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Matrix Change
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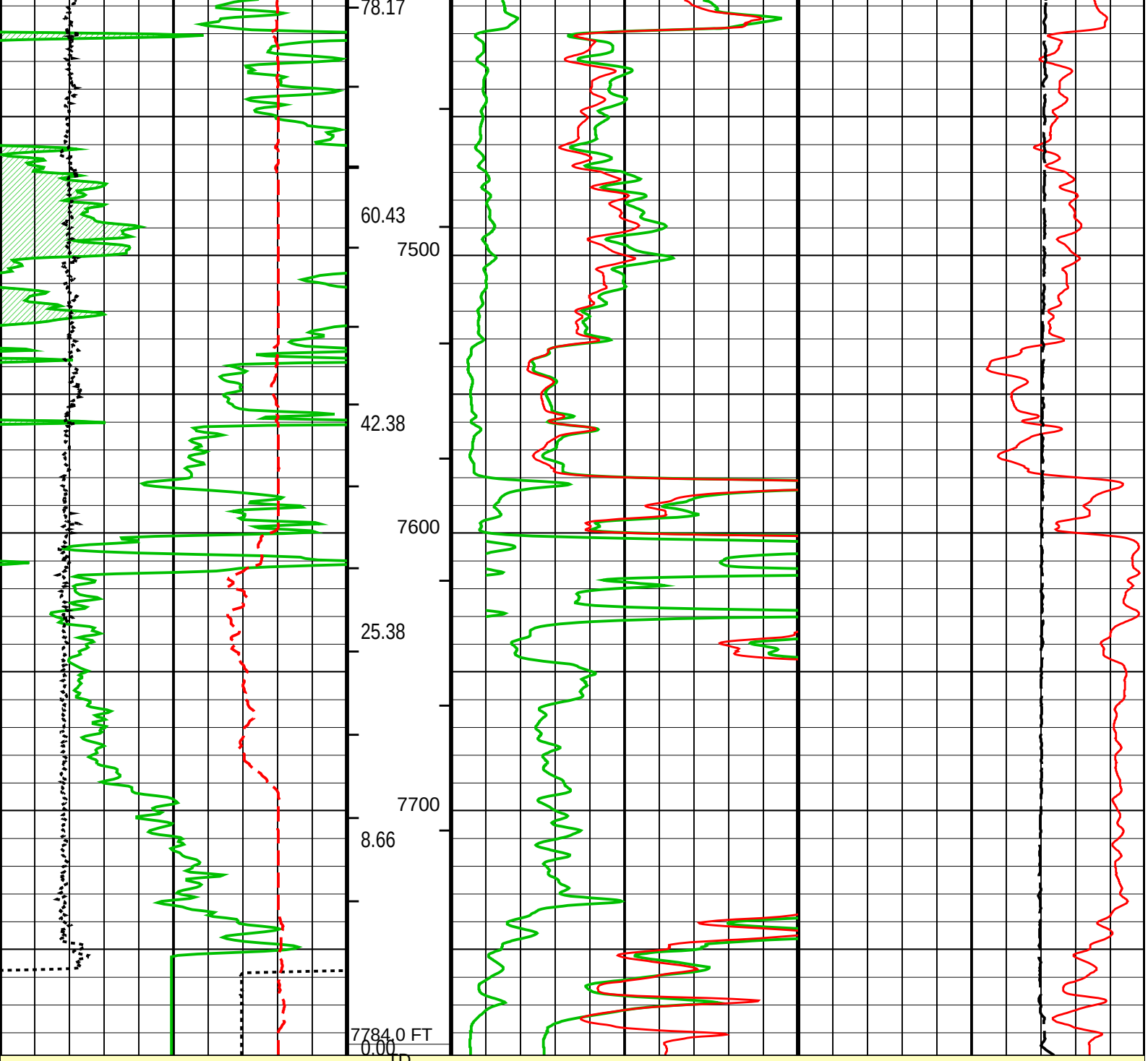


MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

Gamma Ray Backup	**Cement Volume (ICV) (F3)**	**AIT−H 10 Inch Investigation (AHF10)** 0 (OHMM) 50	**AIT−H 90 Inch Investigation Conductivity (AHFCO90)** 1000 (MM/M) 0
Gamma Ray (GR) 0 (GAPI) 200		**AIT−H 10 Inch Investigation (AHF10)** 0 (OHMM) 10	**Tension (TENS)** 10000 (LBF) 0
Caliper (HCAL) 6 (IN) 16		**AIT−H 90 Inch Investigation (AHF90)** 0 (OHMM) 10	
SP (SP) −160 (MV) 40			

PIP SUMMARY

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

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
SPNV	SP Next Value	0	MV
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	60	DEGF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
	System and Miscellaneous		
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	9.10	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	−50000.00	FT
MST	Mud Sample Temperature	60.29	DEGF
TD	Total Depth	7784	FT

Format: ERES_S2 **Vertical Scale: 2" per 100'** **Graphics File Created: 06−Dec−2007 00:25**

OP System Version: 15C0−309

MCM

HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25

Schlumberger

UPPER RESISTIVITY LOG 5" = 100'

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25 7788.0 FT	0.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 1540.83 ft3

Cement Volume = 1067.05 ft3 (assuming 4.50 in casing O.D.)

Computed from 5499.5 ft to 3494.5 ft

OP System Version: 15C0−309

MCM

HILTD	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTCH	SRPC−3497−NOV_2007		

PIP SUMMARY

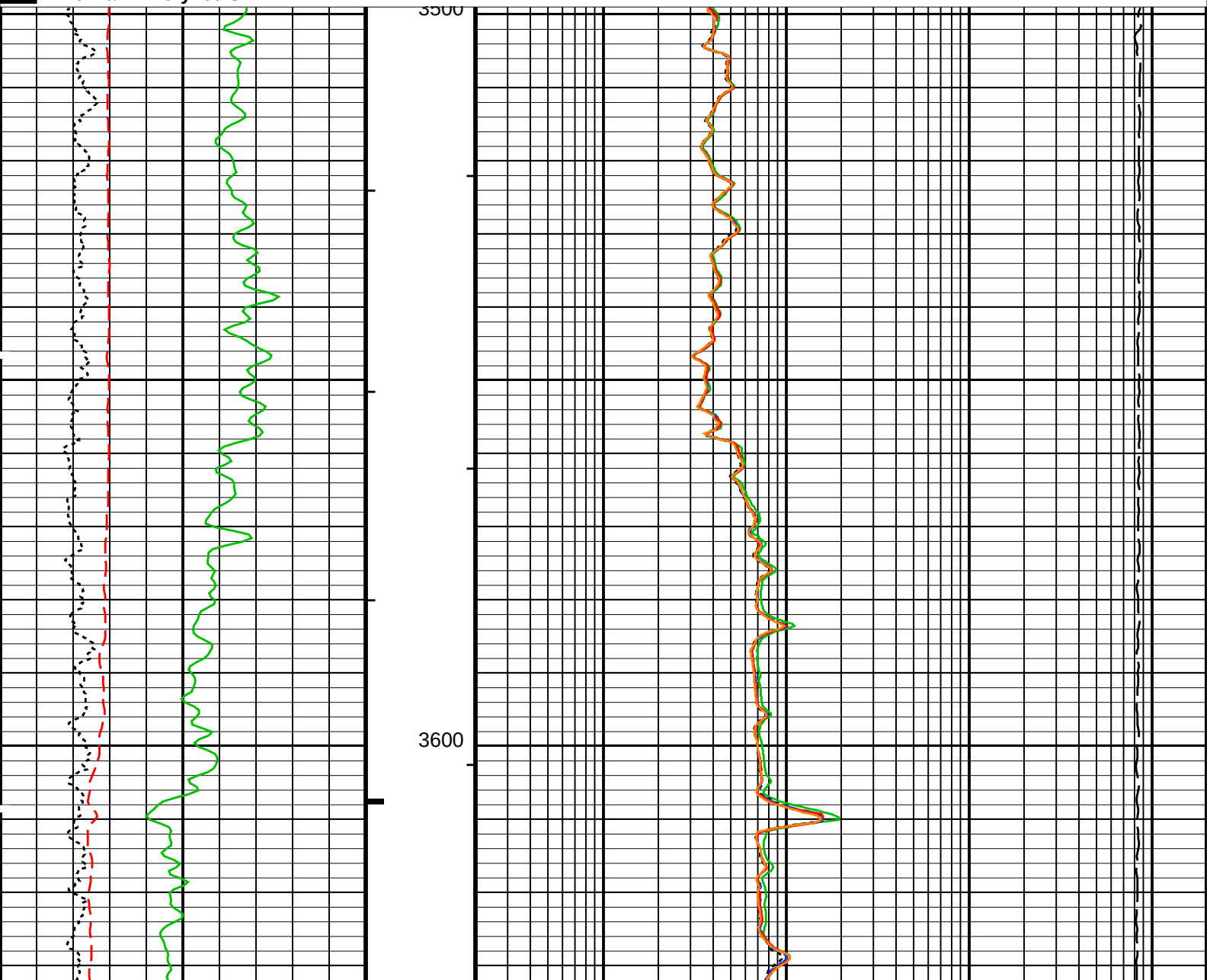
Integrated Hole Volume Minor Pip Every 10 F3

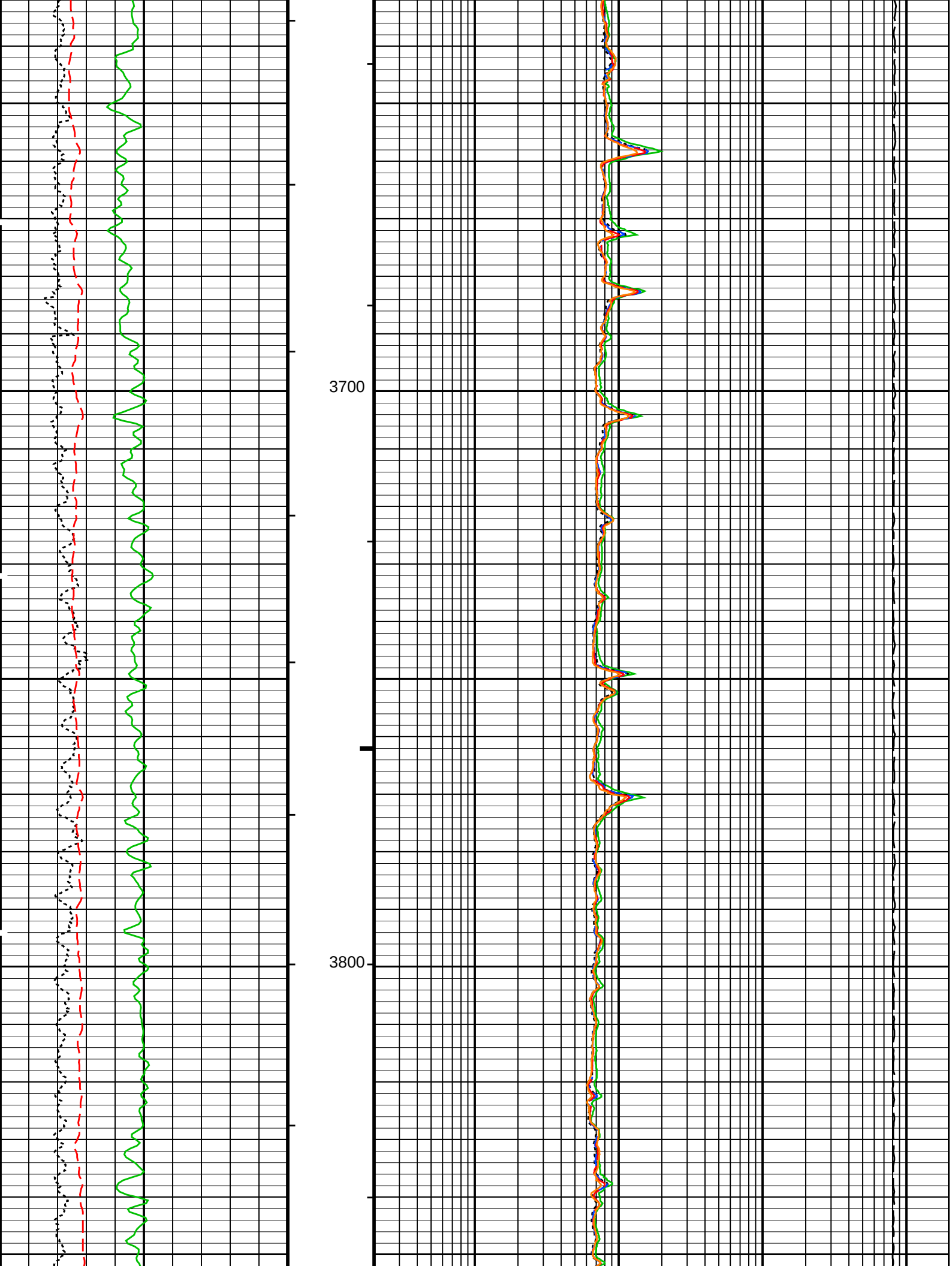
Integrated Hole Volume Major Pip Every 100 F3

Integrated Cement Volume Minor Pip Every 10 F3

Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

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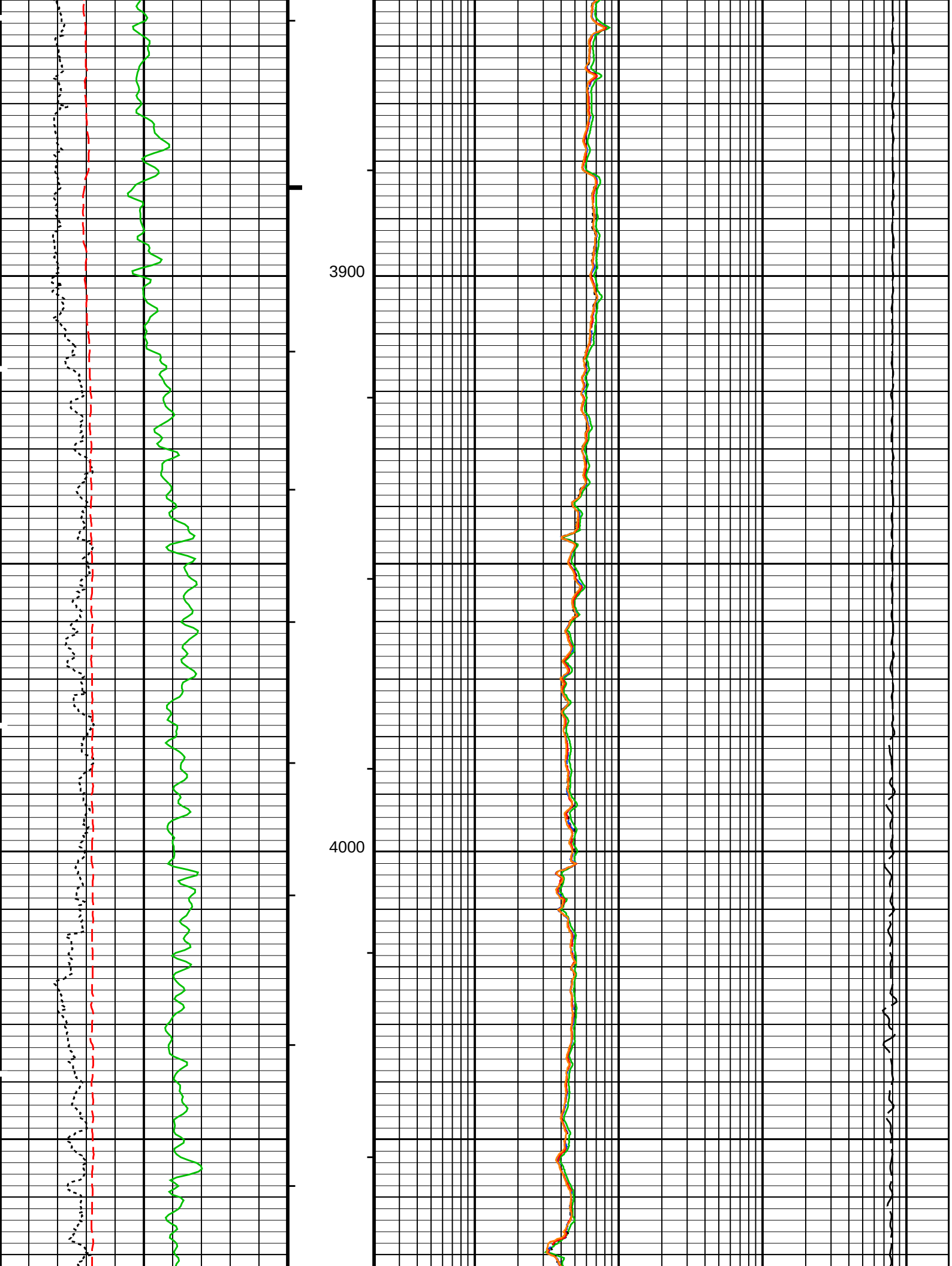
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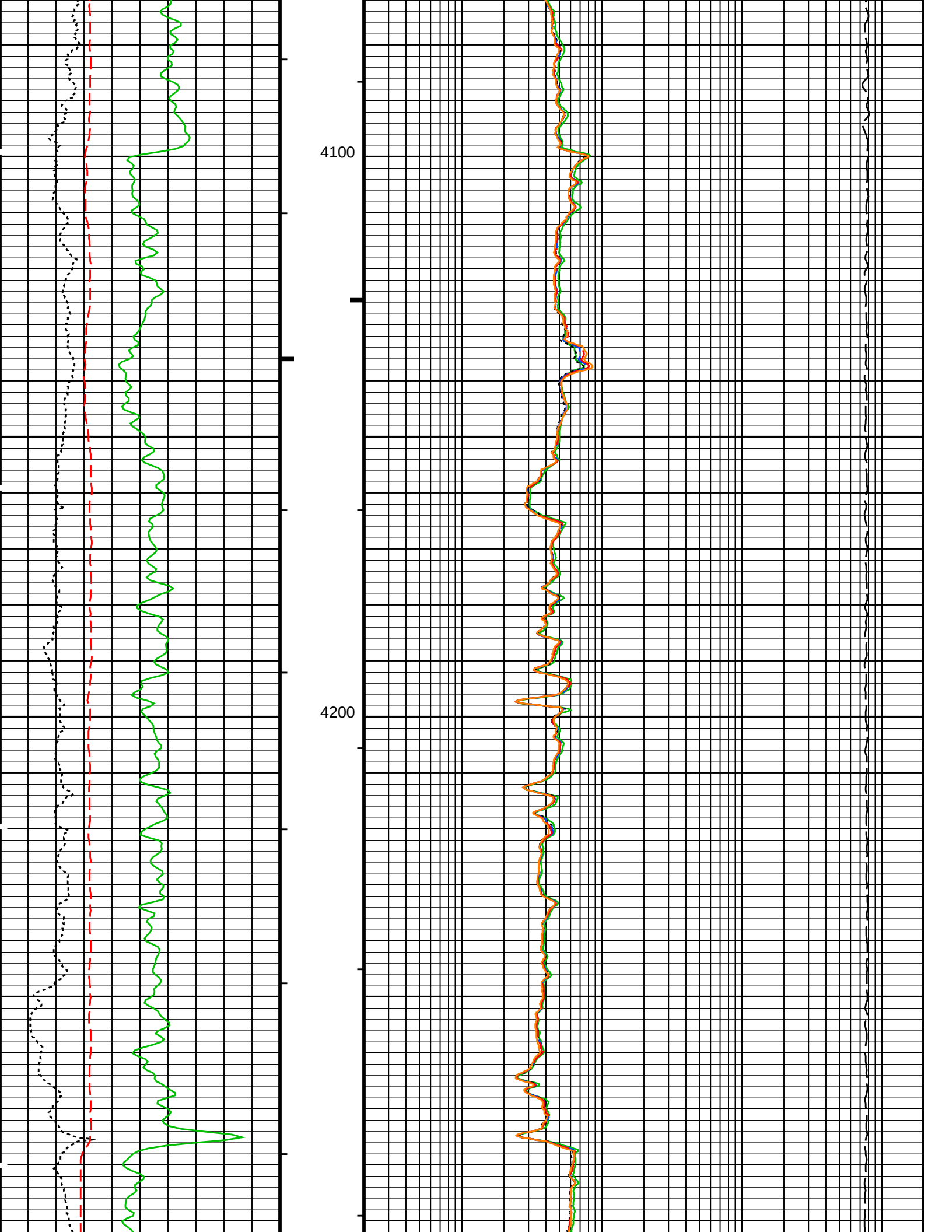
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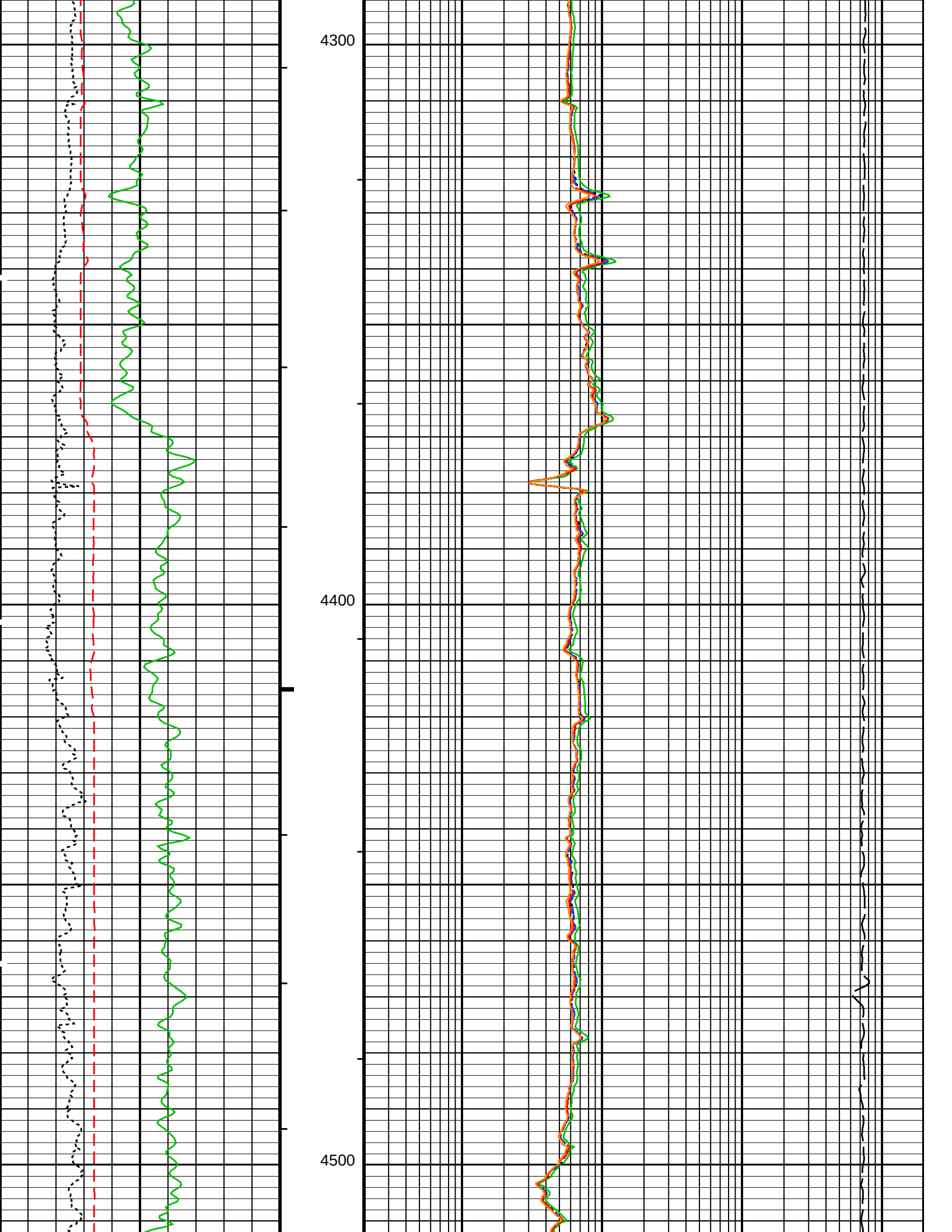
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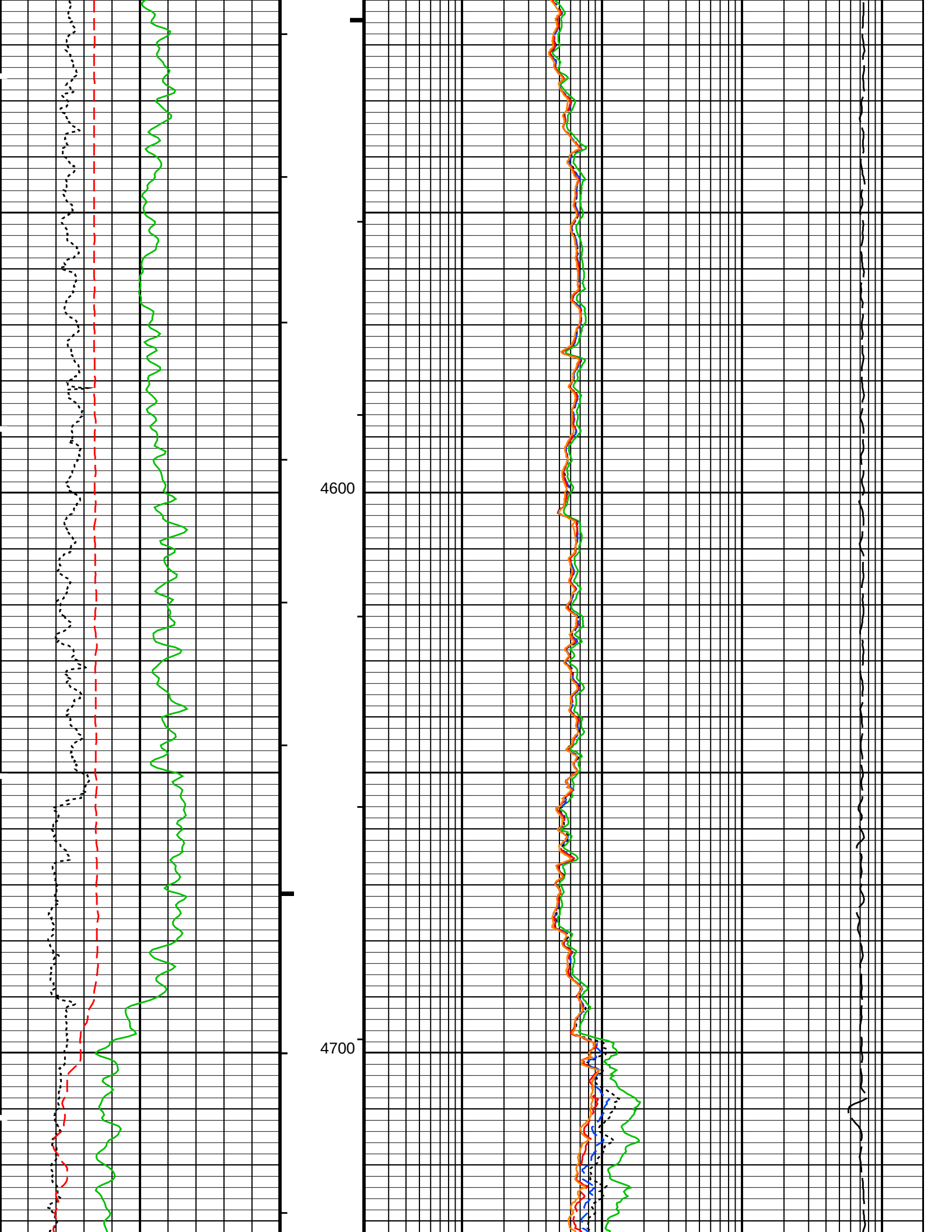
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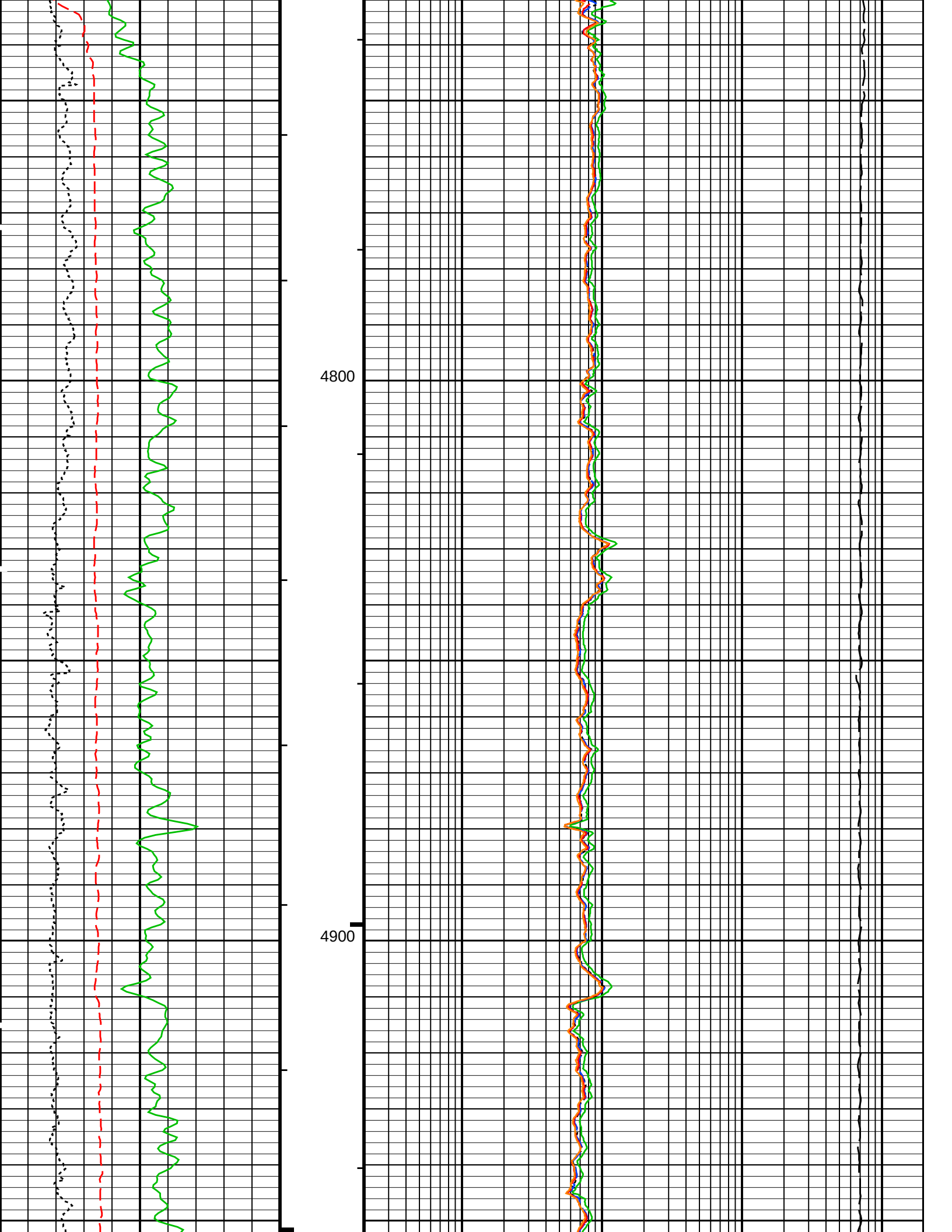
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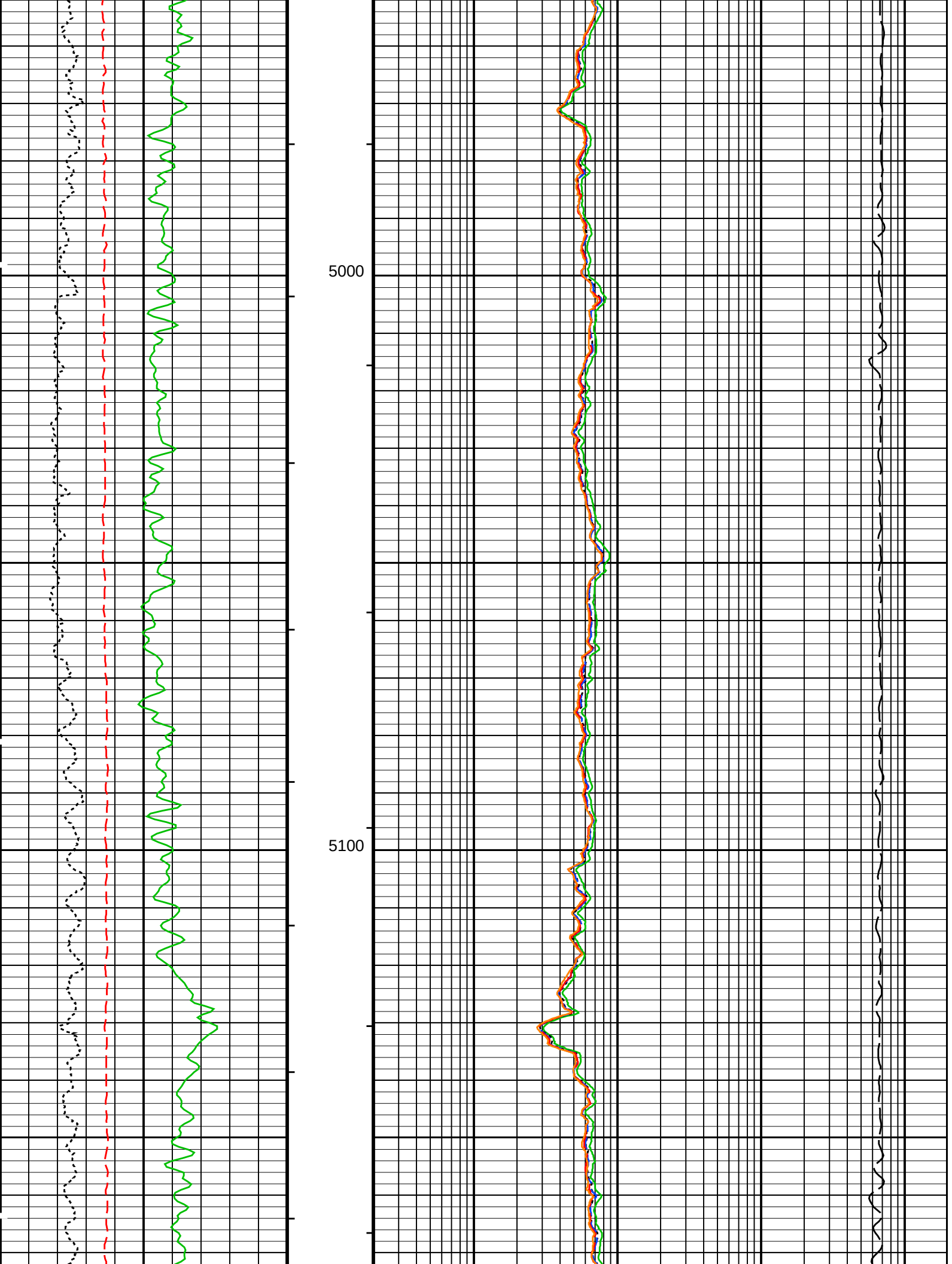
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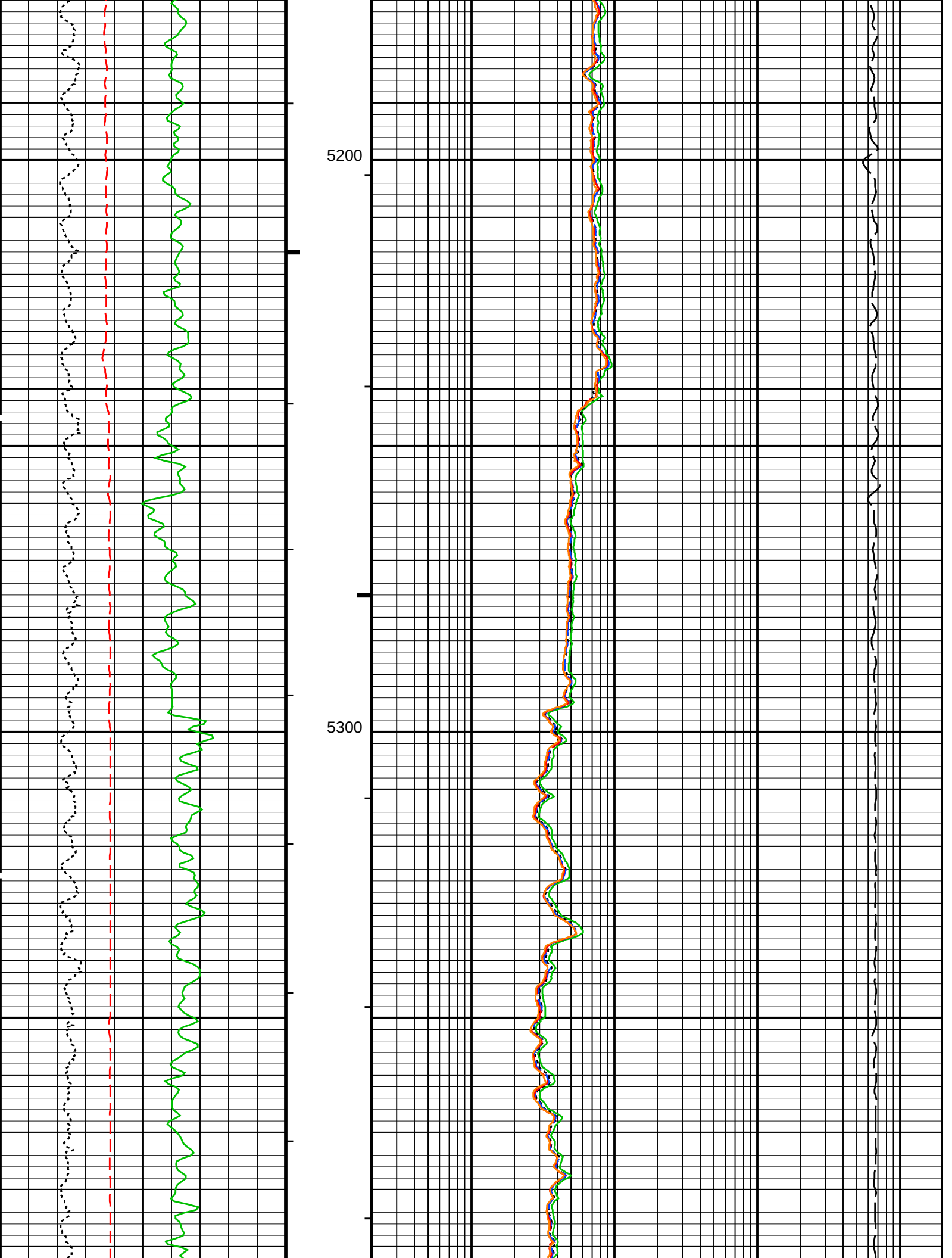
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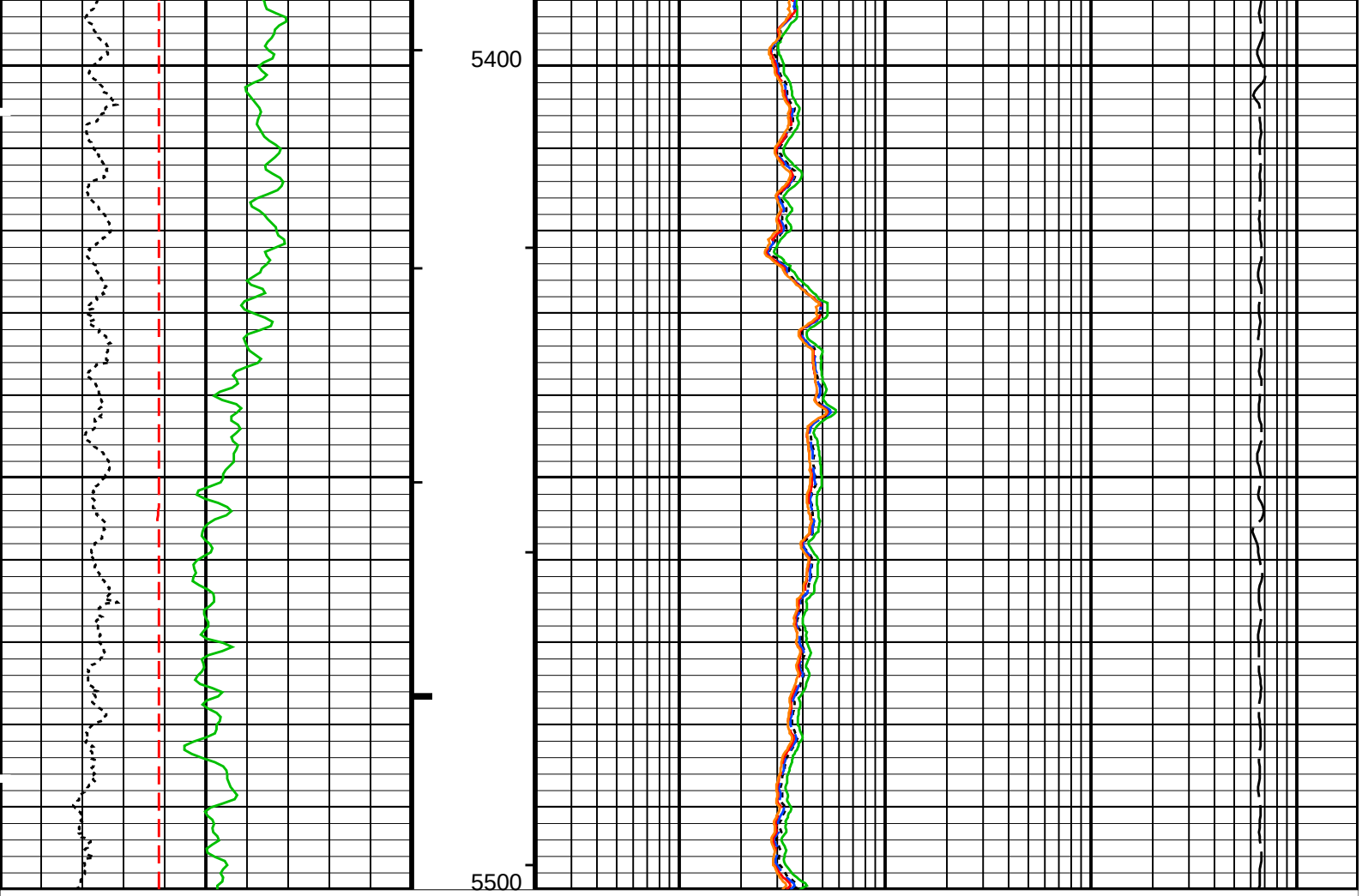


PIP SUMMARY

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	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
AHBHM	Array Induction Borehole Correction Mode	2_COMPUTESTANDOFF	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_ONE_TWO_AND_FOUR	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	YES	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	ECCENTERED	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1.000	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSAP	Array Induction Suspend Answer Product Processing	0_NOSUSPENSION	
AHSTA	Array Induction Tool Standoff	0.125	in
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHT	Bottom Hole Temperature (used in calculations)	202.0	degF
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AHMF	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60.000	degF
SPDR	SP Drift	0.000	mV/ft
SPNV	SP Next Value	0.000	mV
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
	HQLEV: Integrated Hole/Cement Volume		

	HCLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	202.0	degF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AHMF	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60.000	degF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	202.0	degF
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AHMF	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60.000	degF
	System and Miscellaneous		
BS	Bit Size	7.875	in
DFD	Drilling Fluid Density	9.100	lbm/gal
FLEV	Fluid Level		
MST	Mud Sample Temperature	60.295	degF
TD	Total Depth	7784.0	ft

Format: GRES_REP Vertical Scale: 5" per 100' Graphics File Created: 06−Dec−2007 01:30

OP System Version: 15C0−309

MCM

HILTD	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTCH	SRPC−3497−NOV_2007		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25	7788.0 FT	0.0 FT

Schlumberger

MAIN RESISTIVITY LOG 5" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25

OP System Version: 15C0−309

MCM

HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

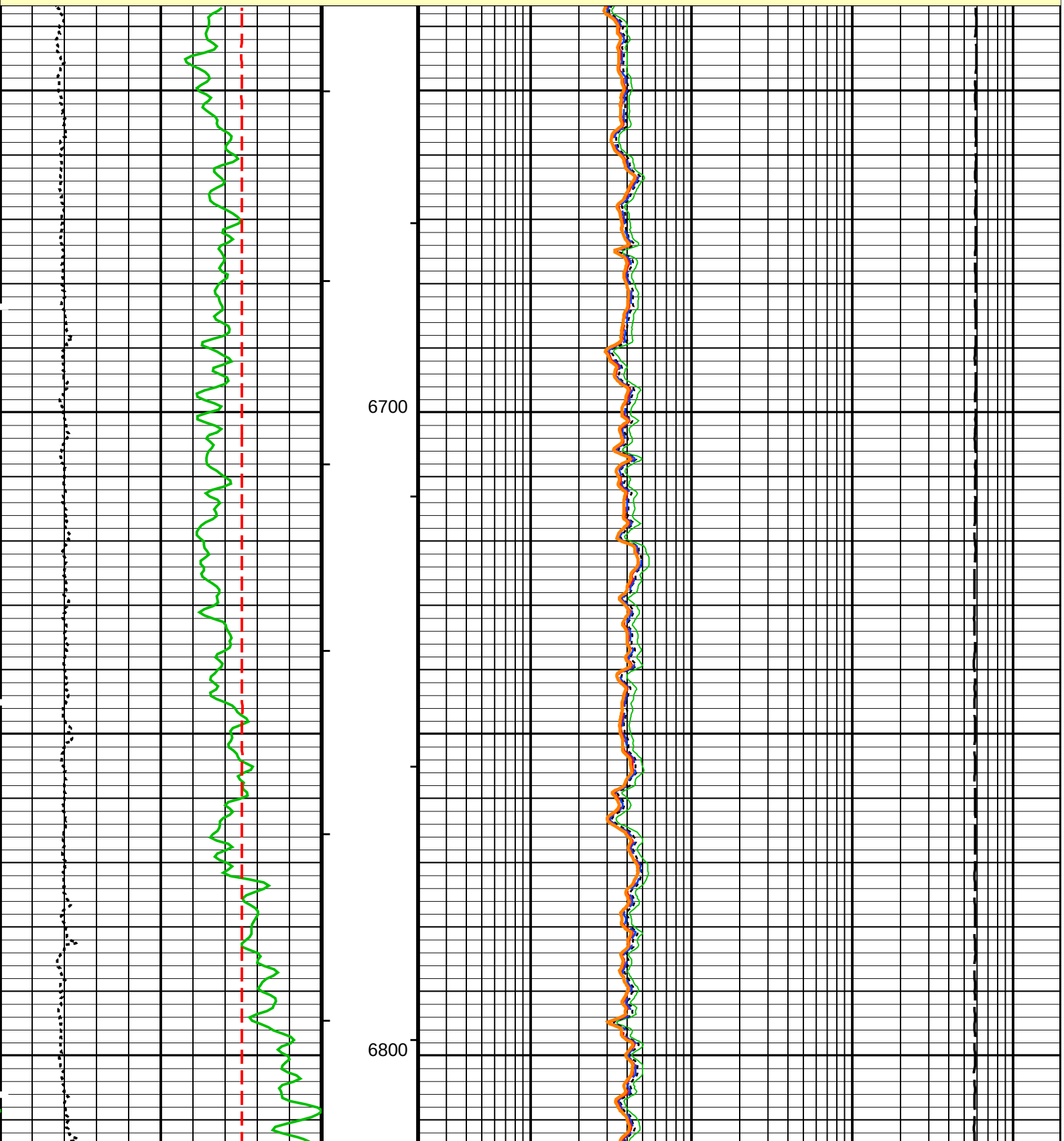
PIP SUMMARY

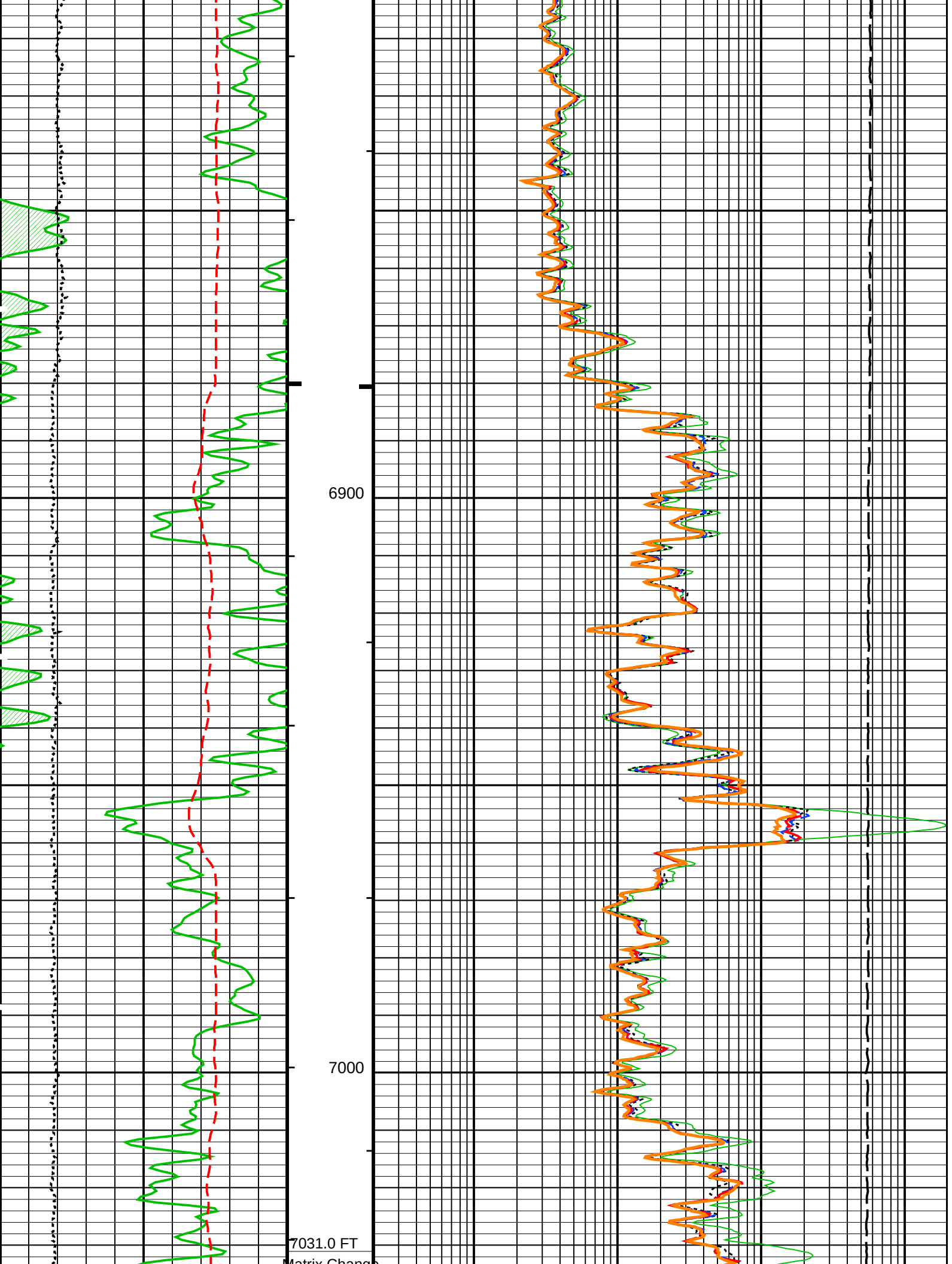
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3
- Time Mark Every 60 S

	Tension (TENS)	
10000	(LBF)	0
	AIT−H 90 Inch Investigation (AHT90)	
0.2	(OHMM)	2000
SP (SP)		
−160	(MV)	40
	AIT−H 60 Inch Investigation (AHT60)	
0.2	(OHMM)	2000

Caliper (HCAL)	Stuck Stretch (STIT)	AIT−H 30 Inch Investigation (AHT30)
6 (IN) 16	0 (F) 50	0.2 (OHMM) 2000
Gamma Ray (GR)	**Tool/Tot. Drag**	**AIT−H 20 Inch Investigation (AHT20)**
0 (GAPI) 200		0.2 (OHMM) 2000
Gamma Ray Backup	**Cable Drag**	**AIT−H 10 Inch Investigation (AHT10)**
		0.2 (OHMM) 2000

MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

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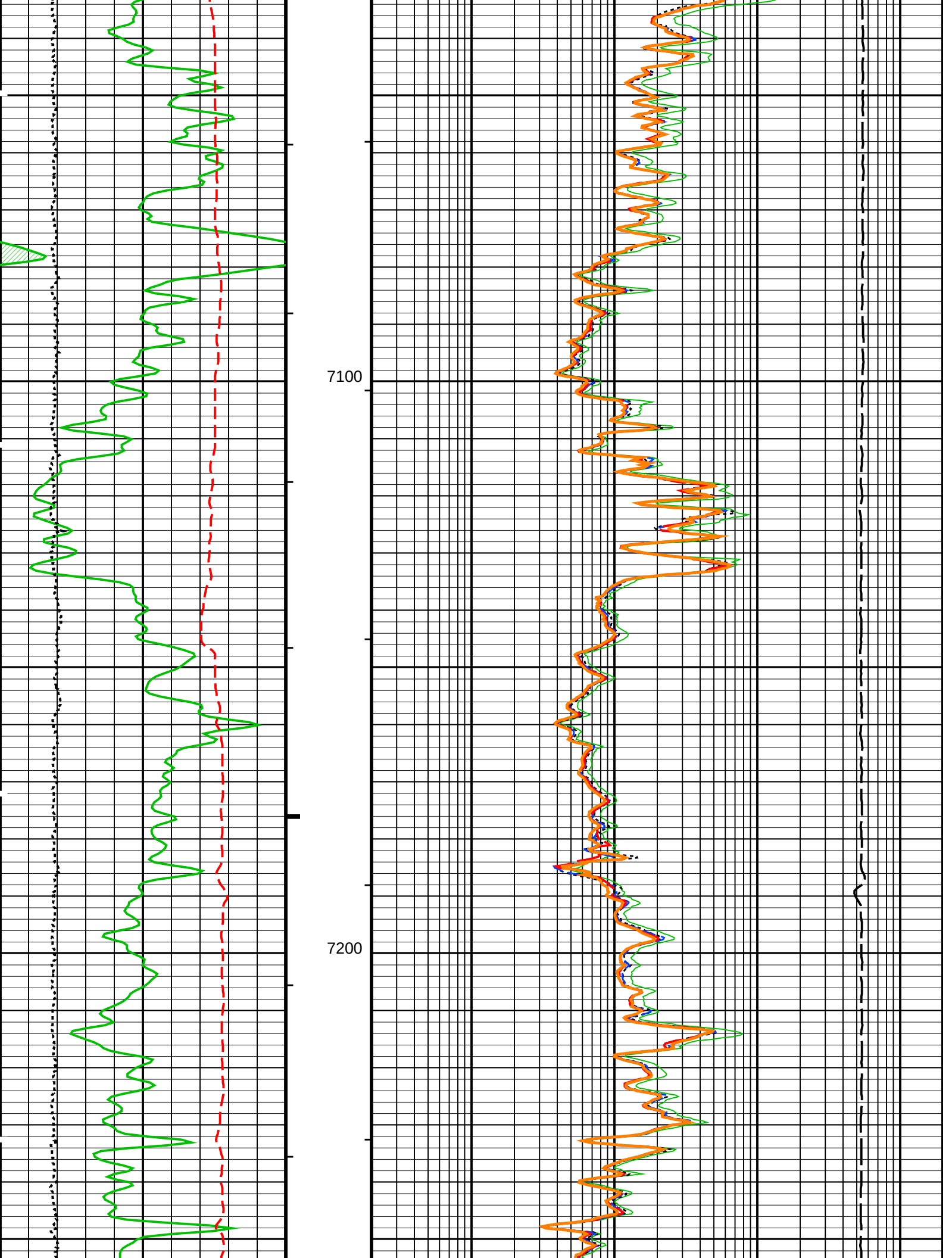
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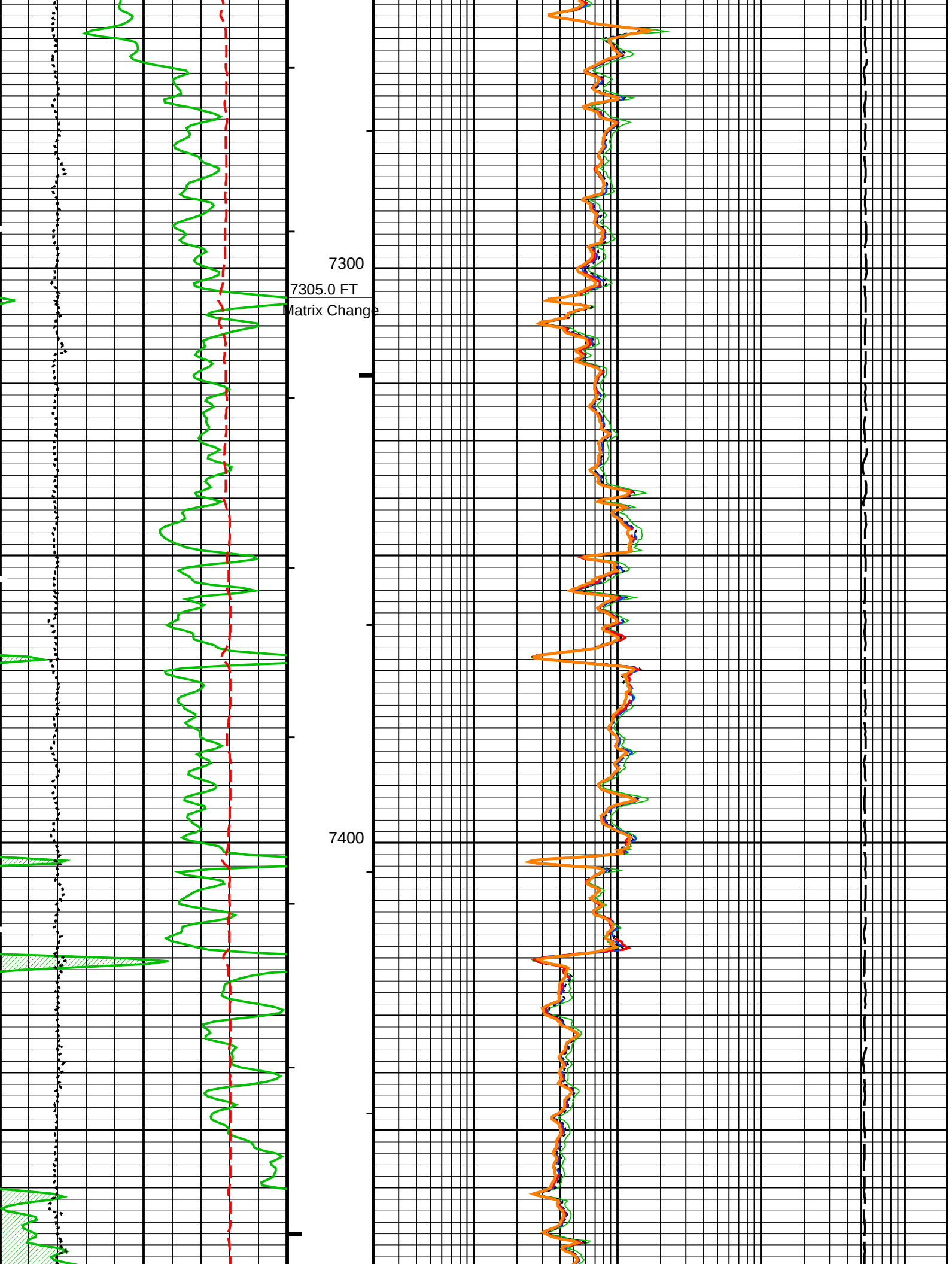
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Matrix Change
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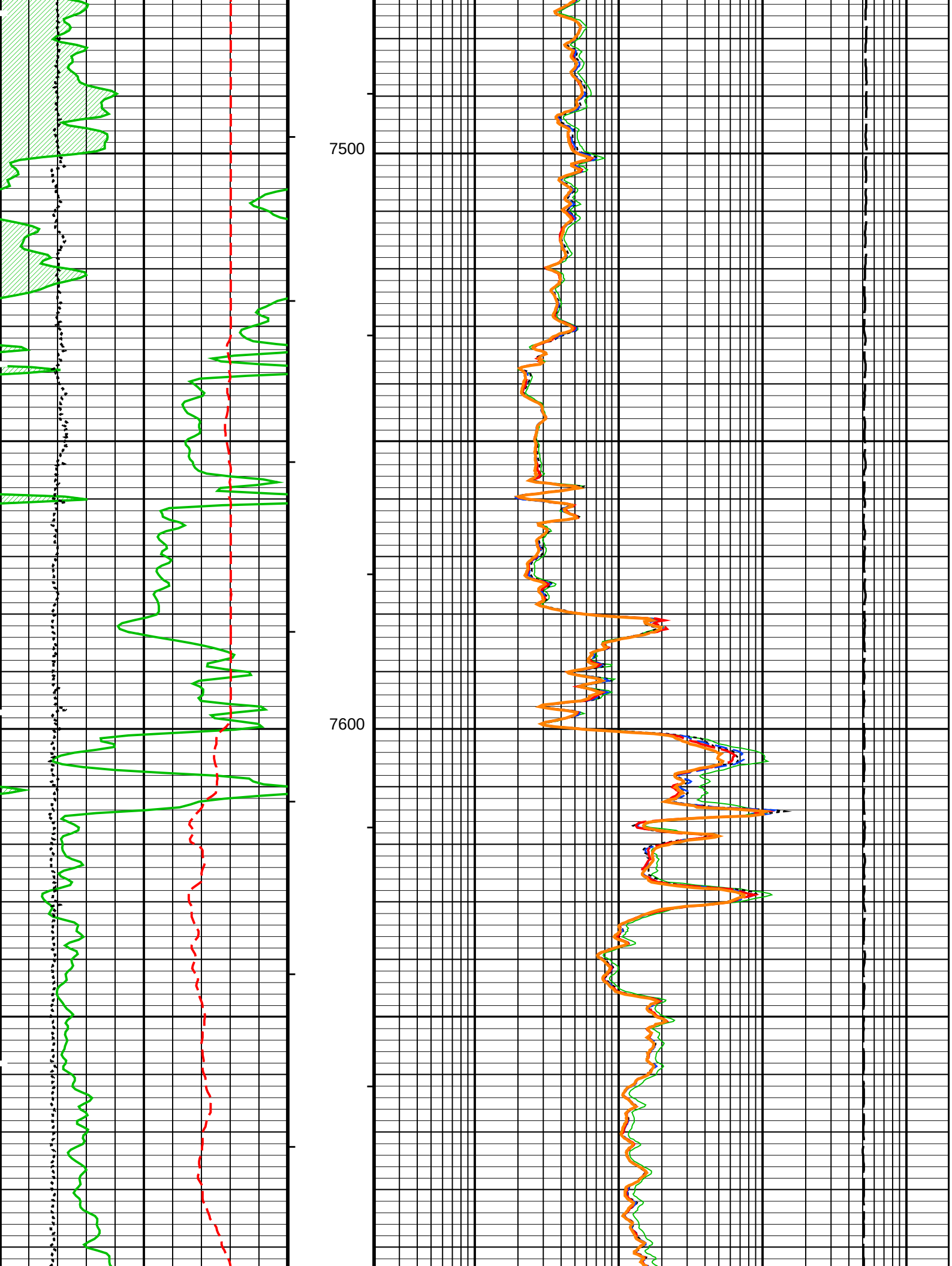
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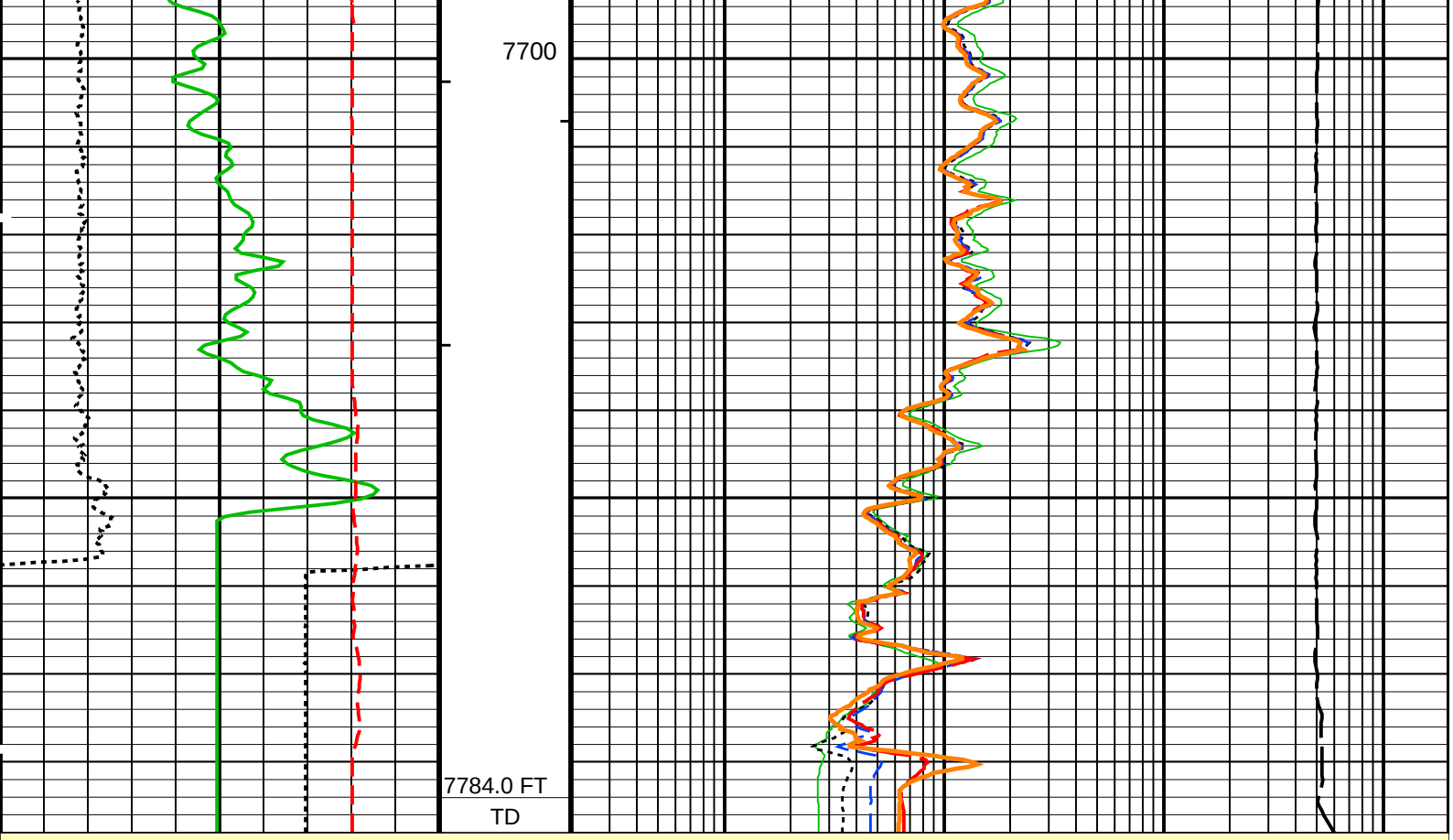


MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

Gamma Ray Backup	Cable Drag	AIT−H 10 Inch Investigation (AHT10) 0.2 (OHMM) 2000
Gamma Ray (GR) 0 (GAPI) 200	Tool/Tot. Drag	AIT−H 20 Inch Investigation (AHT20) 0.2 (OHMM) 2000
Caliper (HCAL) 6 (IN) 16	Stuck Stretch (STIT) 0 (F) 50	AIT−H 30 Inch Investigation (AHT30) 0.2 (OHMM) 2000
SP (SP) −160 (MV) 40		AIT−H 60 Inch Investigation (AHT60) 0.2 (OHMM) 2000
		AIT−H 90 Inch Investigation (AHT90) 0.2 (OHMM) 2000
		Tension (TENS) 10000 (LBF) 0

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

AIT−H Answer Product Processing Summary. Data taken with Tool # 374 (AHTNO)

...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand−off of 0.13 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT−H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): HTEM Porosity (FPHI): DPHZ

***** Other Parameters used by AIT−H Answer Product Processing *****

Form Factor Exponent (FEXP) 2.000 Form Factor Numerator (FNUM) 1.000

Form Factor Exponent (FEXP)	2.000		Form Factor Numerator (FNUM)	1.000	
Mud Filtrate Sample Resistivity (RMFS)	1.701	OHMM	Mud Filtrate Sample Temperature (MFST)	60.295	DEGF
Resitivity Connate Water (RW)	1.000	OHMM			

***** AIT−H Answer Product Processing Control Parameters *****

(AHAPL): 3_BholeCorr_BasicLogs_Radial_Processing

(AHBHM): 2_ComputeStandoff (AHBLM): 6_One_Two_and_Four (AHRPM): 6_One_Two_and_Four

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
SPNV	SP Next Value	0	MV
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	60	DEGF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
	STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	7769.00	FT
TDL	Total Depth − Logger	7784.00	FT
	System and Miscellaneous		
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	9.10	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	−50000.00	FT
MST	Mud Sample Temperature	60.29	DEGF
TD	Total Depth	7784	FT

Format: LOWER_GRES Vertical Scale: 5" per 100' Graphics File Created: 06−Dec−2007 00:25

OP System Version: 15C0−309

MCM

HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

Output DLIS File

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25

Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	06−Dec−2007 00:18	7802.0 FT	7434.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25

OP System Version: 15C0−309

MCM

HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

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

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

AHT90_REP Curve (AHT90_REP)
0.2 (OHMM) 2000

SP_REP Curve (SP_REP)
−160 (MV) 40

AHT60_REP Curve (AHT60_REP)
0.2 (OHMM) 2000

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

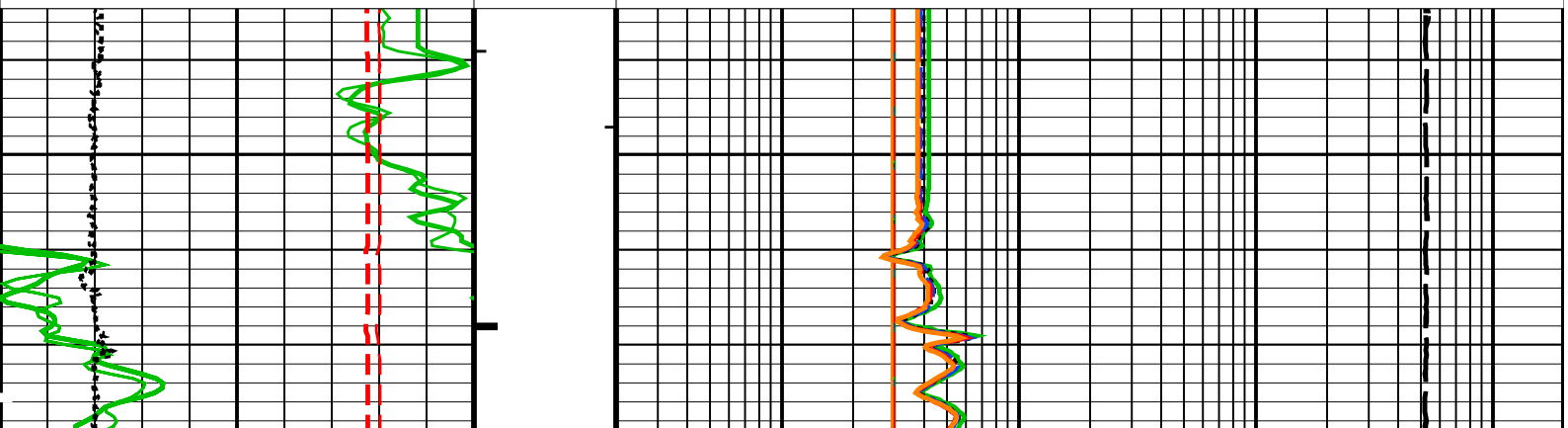
AHT30_REP Curve (AHT30_REP)
0.2 (OHMM) 2000

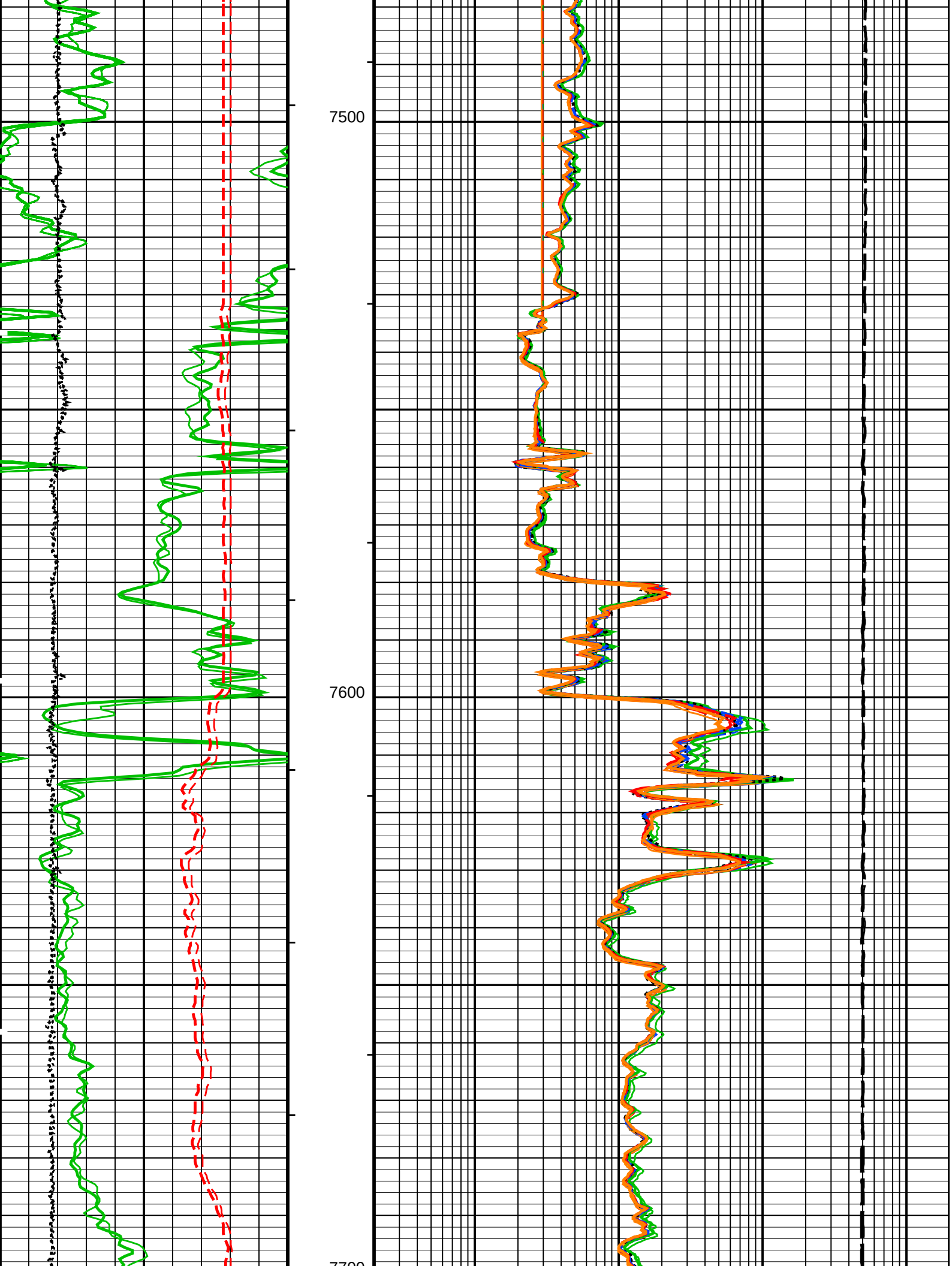
GR1_REP Curve (GR_REP)
200 (GAPI) 400

AHT20_REP Curve (AHT20_REP)
0.2 (OHMM) 2000

GR_REP Curve (GR_REP)
0 (GAPI) 200

AHT10_REP Curve (AHT10_REP)
0.2 (OHMM) 2000

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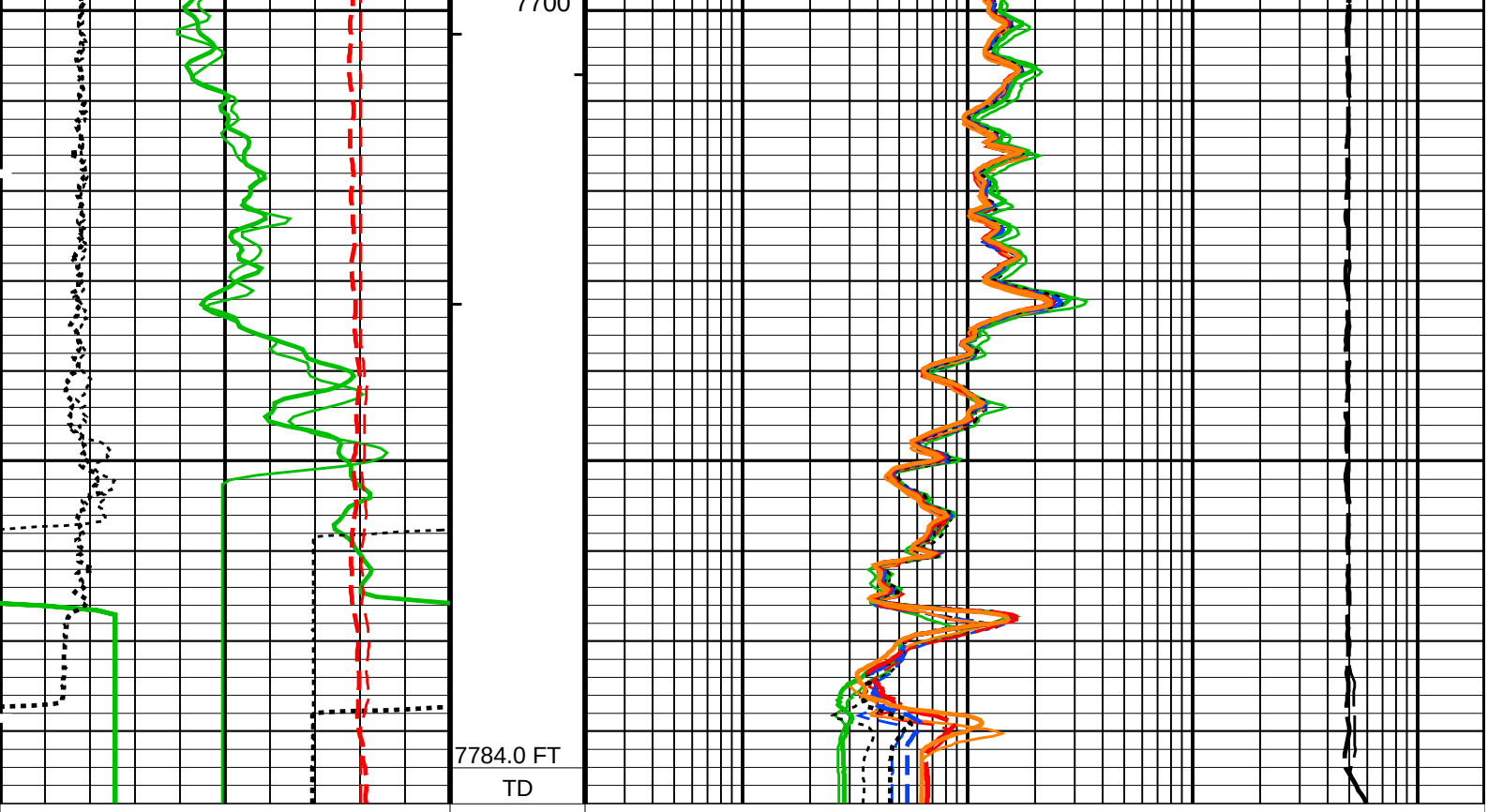

GR_REP Curve (GR_REP)
0 (GAPI) 200

GR1_REP Curve (GR_REP)
200 (GAPI) 400

HCAL_REP Curve (HCAL_REP)
6 (IN) 16

SP_REP Curve (SP_REP)
−160 (MV) 40

AHT10_REP Curve (AHT10_REP)
0.2 (OHMM) 2000

AHT20_REP Curve (AHT20_REP)
0.2 (OHMM) 2000

AHT30_REP Curve (AHT30_REP)
0.2 (OHMM) 2000

AHT60_REP Curve (AHT60_REP)
0.2 (OHMM) 2000

AHT90_REP Curve (AHT90_REP)
0.2 (OHMM) 2000

TENS_REP Curve (TENS_REP)
10000 (LBF) 0

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

AIT−H Answer Product Processing Summary. Data taken with Tool # 374 (AHTNO)
...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)
Tool is run in ECCENTERED mode with a tool stand−off of 0.13 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT−H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): HTEM Porosity (FPHI): DPHZ

***** Other Parameters used by AIT−H Answer Product Processing *****

Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	1.701 OHMM	Mud Filtrate Sample Temperature (MFST)	60.295 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT−H Answer Product Processing Control Parameters *****

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value	
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	900	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	223	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
AHRFV	Array Induction Radial Profiling Code Version Number	701	
AHRPV	Array Induction Radial Parametrization Code Version Number	232	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
SPNV	SP Next Value	0	MV
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	60	DEGF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	202	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	60	DEGF
	System and Miscellaneous		
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	9.10	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	−50000.00	FT
MST	Mud Sample Temperature	60.29	DEGF
TD	Total Depth	7784	FT

Format: GRES_REP **Vertical Scale: 5" per 100'** **Graphics File Created: 06−Dec−2007 00:25**

OP System Version: 15C0−309

MCM

HILTB−FTB	SRPC−3497−NOV_2007	GPIT−C	SRPC−3497−NOV_2007
DTC−H	SRPC−3497−NOV_2007		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	06−Dec−2007 00:18	7802.0 FT	7434.5 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_010LUP	FN:9	PRODUCER	06−Dec−2007 00:25

Schlumberger

BEFORE CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Electronics Calibration Check − Thru Cal Mag. & Phase							
Master: 27−Sep−2007 11:01 Before: 5−Dec−2007 16:32							
Thru Cal Magnitude − 0	0	0.6092	0.6109	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.249	1.253	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6210	0.6226	N/A	N/A	N/A	V
Thru Cal Magnitude − 3	0	0.7034	0.7054	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.311	1.315	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.894	1.900	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.898	1.904	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.335	1.341	N/A	N/A	N/A	V
Phase − 0	0	49.73	50.38	N/A	N/A	N/A	DEG
Phase − 1	0	48.71	49.38	N/A	N/A	N/A	DEG
Phase − 2	0	44.61	45.30	N/A	N/A	N/A	DEG
Phase − 3	0	43.74	44.43	N/A	N/A	N/A	DEG
Phase − 4	0	36.98	37.70	N/A	N/A	N/A	DEG
Phase − 5	0	34.80	35.56	N/A	N/A	N/A	DEG
Phase − 6	0	34.77	35.53	N/A	N/A	N/A	DEG
Phase − 7	0	28.85	29.83	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Electronics Calibration Check − Auxilliary							
Master: 27−Sep−2007 11:01 Before: 5−Dec−2007 16:32							
Array Induction SPA Plus	990.5	990.0	990.1	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.1585	0.1458	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9167	0.9168	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0001591	0.0001658	N/A	N/A	N/A	V
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Test Loop Gain Correction							
Master: 27−Sep−2007 11:01							
Test Loop Gain Magnitude − 0	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 1	0	1.020	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 2	0	1.024	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 3	0	1.021	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 4	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 5	0	0.9951	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 6	0	1.005	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude − 7	0	1.012	N/A	N/A	N/A	N/A	V
Phase − 0	0	0.5429	N/A	N/A	N/A	N/A	DEG
Phase − 1	0	0.5581	N/A	N/A	N/A	N/A	DEG
Phase − 2	0	−0.03639	N/A	N/A	N/A	N/A	DEG
Phase − 3	0	−0.005282	N/A	N/A	N/A	N/A	DEG
Phase − 4	0	−0.03332	N/A	N/A	N/A	N/A	DEG
Phase − 5	0	−0.08879	N/A	N/A	N/A	N/A	DEG
Phase − 6	0	0.1686	N/A	N/A	N/A	N/A	DEG
Phase − 7	0	−0.4128	N/A	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool−DTS Wellsite Calibration − Sonde Error Correction							
Master: 27−Sep−2007 11:01							
R Sonde Error Correction − 0	0	−110.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	161.5	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	116.0	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	59.72	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	23.64	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	12.92	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	9.047	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−0.7151	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	−219.3	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	−205.6	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	−40.24	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	34.19	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	20.51	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 5	0	11.70	N/A	N/A	N/A	N/A	MM/M

X Sonde Error Correction − 5	0	11.70	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	5.787	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	0.9127	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Mud Gain Correction
Master: 27−Sep−2007 11:01

Coarse − Mag, Real, Imag − 0	0	0.8865	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	0.8865	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	0.8865	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	0.8929	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	0.8929	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	0.8929	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 5−Dec−2007 16:37

BS Window Ratio	0.7104	N/A	0.7097	N/A	N/A	N/A	
BS Window Sum	8992	N/A	8978	N/A	N/A	N/A	CPS
SS Window Ratio	0.4968	N/A	0.4940	N/A	N/A	N/A	
SS Window Sum	10290	N/A	10290	N/A	N/A	N/A	CPS
LS Window Ratio	0.2932	N/A	0.2879	N/A	N/A	N/A	
LS Window Sum	1080	N/A	1068	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 5−Dec−2007 16:37

BS PM High Voltage (Command)	1446	N/A	1439	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1580	N/A	1574	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1411	N/A	1431	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 5−Dec−2007 16:37

BS Crystal Resolution	10.31	N/A	10.37	N/A	N/A	N/A	%
SS Crystal Resolution	9.688	N/A	9.729	N/A	N/A	N/A	%
LS Crystal Resolution	8.772	N/A	8.719	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 5−Dec−2007 16:45

Raw B0 Resistivity	3875	N/A	3852	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3793	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3789	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 5−Dec−2007 16:31

HILT Caliper Zero Measurement	8.000	N/A	8.246	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.39	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 5−Dec−2007 16:31

Gamma Ray Background	30.00	N/A	75.45	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	170.9	N/A	170.9	N/A	N/A	15.54	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: 14−Sep−2007 17:57 Before: 5−Dec−2007 16:32

CNTC Background	27.59	27.59	27.68	N/A	N/A	4.139	CPS
CFTC Background	29.13	29.13	28.93	N/A	N/A	4.370	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 14−Sep−2007 17:57

Thermal Near Corr. (Tank)	5800	5348	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2176	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.458	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 5−Dec−2007 23:37

Z−Axis Acceleration	32.19	N/A	32.19	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 25−Nov−2007 15:21

Rho Aluminum	2.596	2.600	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.687	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.555	−−	−−	−−	−−	
Pe Magnesium	2.650	2.631	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 25−Nov−2007 15:21

BS Average Deviation	0	0.3446	−−	−−	−−	−−	%
BS Max Deviation	0	1.006	−−	−−	−−	−−	%
SS Average Deviation	0	0.2535	−−	−−	−−	−−	%
SS Max Deviation	0	0.8238	−−	−−	−−	−−	%
LS Average Deviation	0	0.4908	−−	−−	−−	−−	%
LS Max Deviation	0	0.9686	−−	−−	−−	−−	%

General Purpose Inclinometer Wellsite Calibration − CROUZET ACCELEROMETER PROM HAS BEEN READ CORRECTLY
Before: 5−Dec−2007 23:37

TEMPERATURE REFERENCE :	N/A	N/A	68	N/A	N/A	N/A	DEGF
YEAR OF CALIBRATION :	N/A	N/A	5	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	5	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	905	N/A	N/A	N/A	

General Purpose Inclinometer Wellsite Calibration − CROUZET MAGNETOMETER PROM HAS BEEN READ CORRECTLY
Before: 5−Dec−2007 23:37

TEMPERATURE REFERENCE :	N/A	N/A	72	N/A	N/A	N/A	DEGF
YEAR OF CALIBRATION :	N/A	N/A	1	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	6	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	449	N/A	N/A	N/A	

The GLS−VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature 71.0 DEGF.
Thermal Housing Size 3.363 IN.
NSR−F serial number 940

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:

Array Induction Tool − H	AIT − H	
Rm/SP Bottom Nose	AHRM − A	
Array Induction Sonde	AHIS − BA	374
HILT high−Resolution Mechanical Sonde	HRMS − B	
HILT Rxo Gamma−ray Device	HRGD − B	
HILT Micro Cylindrically Focused Log Dev	MCFL −	
GR Logging Source	GLS − VJ	5094
HILT High Res. Control Cartridge	HRCC − B	

Auxiliary Equipment:

High resolution Integrated Logging Tool−DTS Wellsite Calibration
Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6092		0.6050	49.73		71.00
	Before	0.6109			50.38		
1	Master	1.249		1.270	48.71		70.00
	Before	1.253			49.38		
2	Master	0.6210		0.6230	44.61		66.00
	Before	0.6226			45.30		
3	Master	0.7034		0.7040	43.74		65.00
	Before	0.7054			44.43		
4	Master	1.311		1.337	36.98		59.00
	Before	1.315			37.70		
5	Master	1.894		1.955	34.80		57.00
	Before	1.900			35.56		
6	Master	1.898		1.955	34.77		57.00
	Before	1.904			35.53		
7	Master	1.335		1.415	28.85		53.00
	Before	1.341			29.83		
		60.00 % (Minimum)	140.0 % (Maximum) (Nominal)		Nom −60.00 (Minimum)	Nom + 60.00 (Maximum) (Nominal)	

Master: 27−Sep−2007 11:01 Before: 5−Dec−2007 16:32

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Electronics Calibration Check − Auxilliary

Phase	Array Induction SPA Plus MV	Value
Master		990.0
Before		990.1
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		0.1585
Before		0.1458
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9167
Before		0.9168
	0.8700 (Minimum) 0.9150 (Nominal) 0.9600 (Maximum)	

Phase	Array Induction Temperature Zero V	Value
Master		0.0001591
Before		0.0001658
	−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
0	1.019		0.5429	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
1	1.020		0.5581	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
2	1.024		−0.03639	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
3	1.021		−0.005282	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
4	1.004		−0.03332	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
5	0.9951		−0.08879	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
6	1.005		0.1686	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
7	1.012		−0.4128	
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	−110.7		−219.3	
	−231.0 (Minimum) −56.00 (Nominal) 119.0 (Maximum)		−2250 (Minimum) 0 (Nominal) 2250 (Maximum)	
1	161.5		−205.6	
	114.0 (Minimum) 159.0 (Nominal) 204.0 (Maximum)		−625.0 (Minimum) 0 (Nominal) 625.0 (Maximum)	
2	116.0		−40.24	
	66.00 (Minimum) 111.0 (Nominal) 156.0 (Maximum)		−350.0 (Minimum) 0 (Nominal) 350.0 (Maximum)	
3	59.72		34.19	
	39.00 (Minimum) 64.00 (Nominal) 89.00 (Maximum)		−250.0 (Minimum) 0 (Nominal) 250.0 (Maximum)	
4	23.64		20.51	
	15.00 (Minimum) 25.00 (Nominal) 35.00 (Maximum)		−63.00 (Minimum) 0 (Nominal) 63.00 (Maximum)	
5	12.92		11.70	
	4.000 (Minimum) 14.00 (Nominal) 24.00 (Maximum)		−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

6	9.047				5.787				
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	
7	−0.7151				0.9127				
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)	

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	0.8865				0.8929			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	0.8865				0.8929			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	0.8865				0.8929			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value
Before				0.7097	Before				0.4940	Before				0.2879
	0.6749 (Minimum)	0.7104 (Nominal)	0.7459 (Maximum)			0.4719 (Minimum)	0.4968 (Nominal)	0.5216 (Maximum)			0.2786 (Minimum)	0.2932 (Nominal)	0.3079 (Maximum)	
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				8978	Before				10290	Before				1068
	8542 (Minimum)	8992 (Nominal)	9442 (Maximum)			9773 (Minimum)	10290 (Nominal)	10800 (Maximum)			1026 (Minimum)	1080 (Nominal)	1134 (Maximum)	

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Photo−multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before				1439	Before				1574	Before				1431
	1346 (Minimum)	1446 (Nominal)	1546 (Maximum)			1480 (Minimum)	1580 (Nominal)	1680 (Maximum)			1311 (Minimum)	1411 (Nominal)	1511 (Maximum)	

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
Before				10.37	Before				9.729	Before				8.719
	9.315 (Minimum)	10.31 (Nominal)	11.31 (Maximum)			8.688 (Minimum)	9.688 (Nominal)	10.69 (Maximum)			7.772 (Minimum)	8.772 (Nominal)	9.772 (Maximum)	

Before: 5−Dec−2007 16:37

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
Before				3852	Before				3793	Before				3789
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	

Before: 5−Dec−2007 16:45

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				8.246	Before				12.39
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)			9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	

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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		75.45	Before		170.9	Before		165.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	155.4 (Minimum)	170.9 (Nominal)	186.5 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.59	Master		29.13
Before		27.68	Before		28.93
5.000 (Minimum)	27.59 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	29.13 (Nominal)	40.00 (Maximum)

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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		5348	Master		2176	Master		2.458
4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	1900 (Minimum)	2400 (Nominal)	2900 (Maximum)	2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)

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High resolution Integrated Logging Tool−DTS Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.19
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)

Before: 5−Dec−2007 23:37

High resolution Integrated Logging Tool−DTS Master Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6092		0.6050	49.73		71.00
1	Master	1.249		1.270	48.71		70.00
2	Master	0.6210		0.6230	44.61		66.00
3	Master	0.7034		0.7040	43.74		65.00
4	Master	1.311		1.337	36.98		59.00
5	Master	1.894		1.955	34.80		57.00
6	Master	1.898		1.955	34.77		57.00
7	Master	1.335		1.415	28.85		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom −60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)

Master: 27−Sep−2007 11:01

High resolution Integrated Logging Tool−DTS Master Calibration

Electronics Calibration Check − Auxilliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		990.0	Master		0.1585
941.0 (Minimum)	990.5 (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		0.9167	Master		0.0001591
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	−0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

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High resolution Integrated Logging Tool−DTS Master Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG		
0	1.019				0.5429			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.020				0.5581			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.024				−0.03639			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.021				−0.005282			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	1.004				−0.03332			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9951				−0.08879			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.005				0.1686			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.012				−0.4128			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 27−Sep−2007 11:01

High resolution Integrated Logging Tool−DTS Master Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	**−110.7**				**−219.3**			
		−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	161.5				−205.6			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	116.0				−40.24			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	59.72				34.19			
		39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	23.64				20.51			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	12.92				11.70			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.047				5.787			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−0.7151				0.9127			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

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High resolution Integrated Logging Tool−DTS Master Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	0.8865				0.8929			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	0.8865				0.8929			

		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	0.8865				0.8929			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

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High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value
Master		2.600	Master		1.687
	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		2.555	Master		2.631
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)			2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

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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		0.3446	Master		0.2535	Master		0.4908
	−0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)			−1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)			−1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	
Phase	BS Max Deviation %	Value	Phase	SS Max Deviation %	Value	Phase	LS Max Deviation %	Value
Master		1.006	Master		0.8238	Master		0.9686
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)			−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)			−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

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High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.59	Master		29.13
	5.000 (Minimum) 27.59 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 29.13 (Nominal) 40.00 (Maximum)	

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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		5348	Master		2176	Master		2.458
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

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General Purpose Inclinometer / Equipment Identification

Primary Equipment:

GPIT Cartridge − C	GPIC − C

Auxiliary Equipment:

GPIT Housing	GPIH − B

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH − KC

Company:	**Orr Energy LLC**
Well:	**South 6−22D**
Field:	**Wattenburg**
County:	**Weld**
State:	**Colorado**

Schlumberger

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