



Schlumberger

Company: Kerr-McGee Oil and Gas Onshore LP

Well: Parterre 12-16

Field: Spindle

County: Adams

State: Colorado

Platform Express  
Compensated Neutron  
Litho Density

Field:	Spindle
Location:	Sec. 16, T1S, R67W
Well:	Parterre 12-16
Company:	Kerr-McGee Oil and Gas Onshore
LOCATION	
Sec. 16, T1S, R67W	Elev.: K.B. 5175.00 ft
Surf: 1515' FSL X 1264' FWL NWSW	G.L. 5160.00 ft
BHL: 2111' FSL X 519' FWL NWSW (est.)	D.F. 5174.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section 16
05-001-09686-000C	Township 1S
	Range 67W

Logging Date	27-Nov-2009
Run Number	1
Depth Driller	8628 ft
Schlumberger Depth	8594 ft
Bottom Log Interval	8586 ft
Top Log Interval	1209 ft
Casing Driller Size @ Depth	8.625 in @ 1220 ft
Casing Schlumberger	1209 ft
Bit Size	7.875 in
Type Fluid In Hole	Water Based Mud
Density	8.3 lbm/gal
Fluid Loss	PH
Source Of Sample	AIT Sensor
RM @ Measured Temperature	0.970 ohm.m @ 79 degF
RMF @ Measured Temperature	0.728 ohm.m @ 79 degF
RM @ Measured Temperature	1.455 ohm.m @ 79 degF
Source RMF	Calculated
RM @ MRT	0.394 @ 205
RMF @ MRT	205 degF
Maximum Recorded Temperatures	27-Nov-2009
Circulation Stopped	27-Nov-2009
Logger On Bottom	27-Nov-2009
Unit Number	3055
Location	Ft. Morgan, CO
Recorded By	Tim Hoffman
Witnessed By	Marvin Hackworth & Mark Scannell

	Run 1	Run 2	Run 3
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			
Fluid Loss			
Source Of Sample			
RM @ Measured Temperature			
RMF @ Measured Temperature			
RM @ Measured Temperature			
Source RMF			
RM @ MRT			
RMF @ MRT			
Maximum Recorded Temperatures			
Circulation Stopped			
Logger On Bottom			
Unit Number			
Location			
Recorded By			
Witnessed By			

DEPTH SUMMARY LISTING	
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Date Created: 27-NOV-2009 20:46:10

Depth System Equipment
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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:	1-Oct-2009	Length:	15060 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100513		
Calibration Cable Type:	7-39P LXS	Number of Calibration Points:	0	Conveyance Method:	Wireline
Wheel Correction 1:	-4			Rig Type:	LAND
Wheel Correction 2:	-5				

Depth Control Parameters	
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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:	5.00 FT
Tool Zero Check At Surface:	0.00 FT

Depth Control Remarks
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- |  |
|--|
| <ol style="list-style-type: none"><li>1. All Schlumberger depth policy procedures applied</li><li>2. This is the primary depth reference</li><li>3.</li><li>4.</li><li>5.</li><li>6.</li></ol> |
|--|

<p style="text-align: center;">DISCLAIMER</p> <p>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.</p>
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OTHER SERVICES1 OS1: None	OTHER SERVICES2 OS1:
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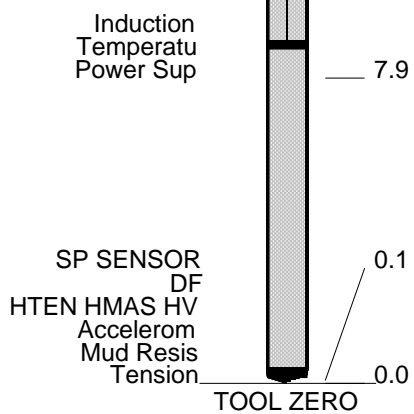
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole.	
Toolstring run as per tool sketch	
Toolstring run without bowspring and standoffs as per client request on deviated wells	
Matrix changes are as noted on the porosity print	

Rig: Xtreme 11					
Crew: Tim Ludgate and Roger Wiley					
<div> <div>RUN 1</div> <div> <div>SERVICE ORDER #:</div> <div>PROGRAM VERSION:</div> <div>FLUID LEVEL:</div> </div> <div> <div>B03C-00066</div> <div>17C0-154</div> <div>10 ft</div> </div> </div>			<div> <div>RUN 2</div> <div> <div>SERVICE ORDER #:</div> <div>PROGRAM VERSION:</div> <div>FLUID LEVEL:</div> </div> </div>		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION					
RUN 1					RUN 2

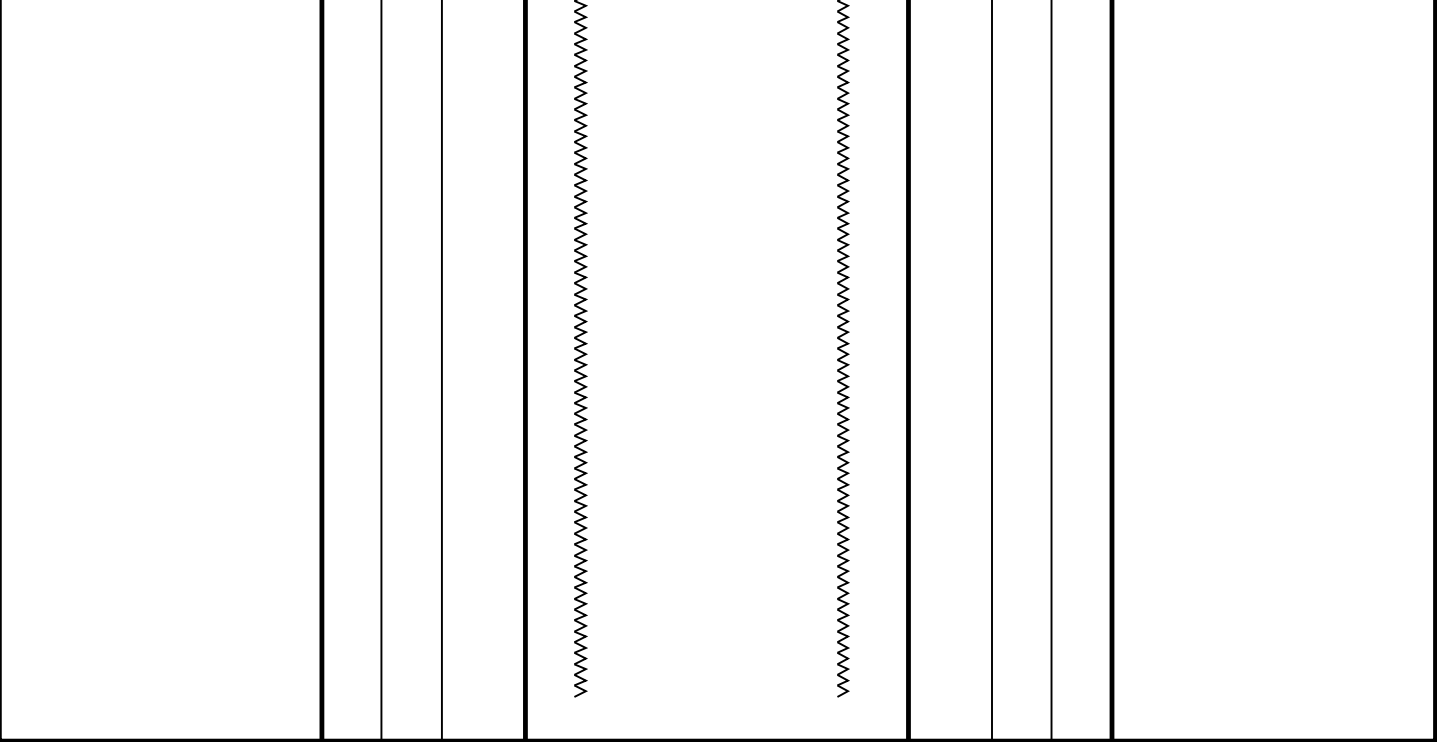
GSR-U/Y NCT-B CNB-AB NCS-VB	SURFACE EQUIPMENT WITM (DTS)-A	
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DOWNHOLE EQUIPMENT			
LEH-QT			43.6
LEH-QT			
DTC-H	CTEM	39.7	40.6
ECH-KC			
DTCH0-A	TelStatus		
DTCH1-A	ToolStatu	37.6	
	HGNS HTEM		
	HMCA	37.6	
HILTB-FTB	HGNS Gamm	36.9	37.6
HGNSD-B 1927			
HMCA			
HGNH			
NLS-KL			
NSR-F 5068			
HACCZ 749			
HCNT			
HGR			
HRCC-B	HGNS Neut	31.1	
HRMS-B	HGNS Neut	30.6	
HRGD-B 1732			
GLS-VJ 5416			
MCFL Device			
HILT Nucl. LS 42767	HGNS sens	28.2	
HILT Nucl. SS 42767			
HILT Nucl. BS 42767			
NPV-N			
	HRCC cart	24.2	
	MCFL	18.8	
	HILT cali	18.3	
	HRDD-LS		
	HRDD-SS		
	HRDD-BS	17.9	



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		Casing String
					1220.0	8.625		Casing Shoe
					1220.0	7.875		Borehole Segment



All depths are driller's depths

Schlumberger

UPPER POROSITY LOG 5" = 100'

MAXIS Field Log

Input DLIS Files

DEFAULT      AIT\_TLD\_MCFL\_CNL\_006LUP      FN:5      PRODUCER      27-Nov-2009 20:39      8607.0 FT      0.0 FT

Integrated Hole/Cement Volume Summary

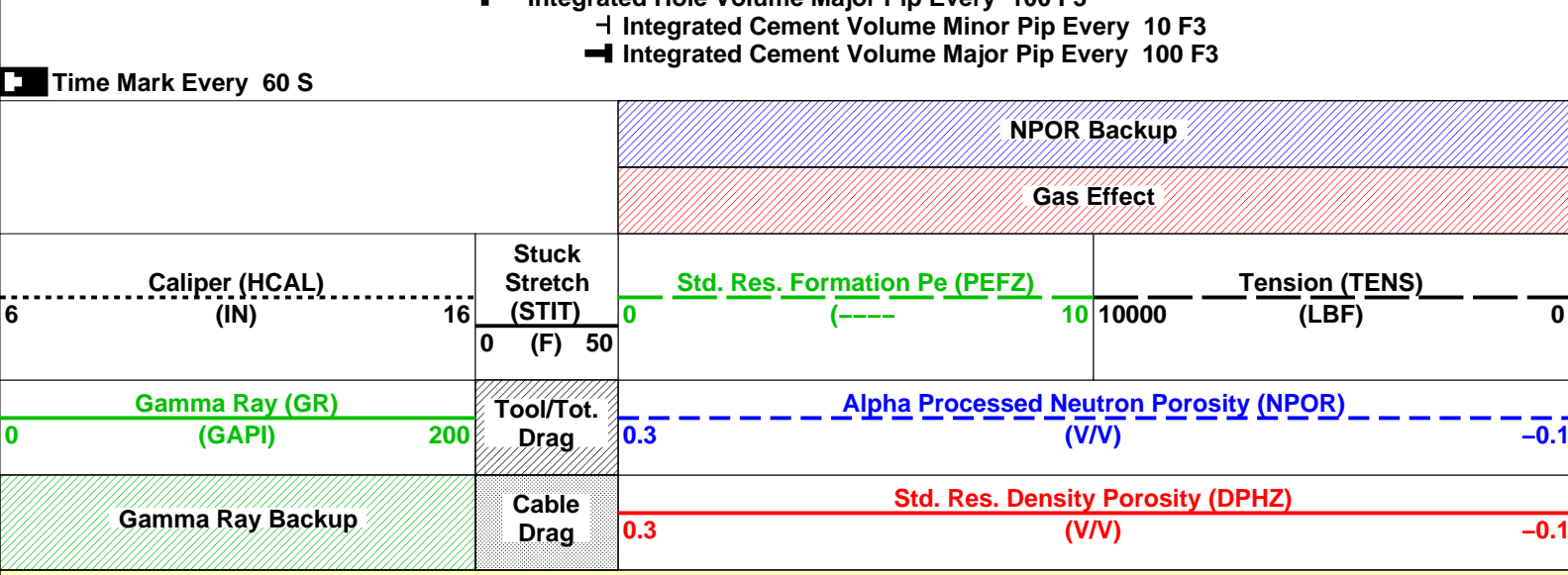
Hole Volume = 470.78 ft3  
Cement Volume = 321.17 ft3 (assuming 4.50 in casing O.D.)  
Computed from 5599.5 ft to 4245.5 ft

OP System Version: 17C0-154

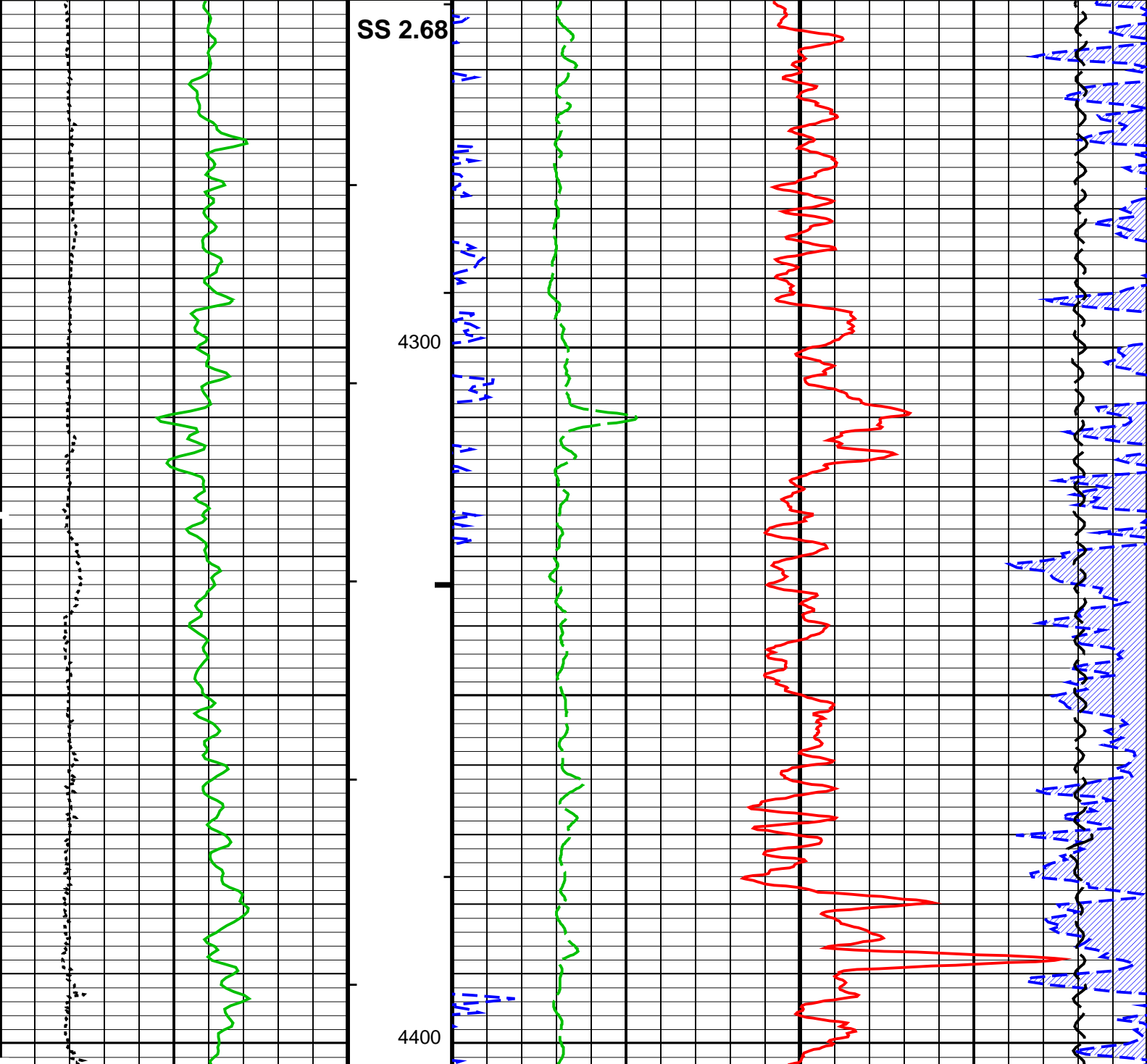
AITM      17C0-154      HILTD      17C0-154  
DTCH      17C0-154

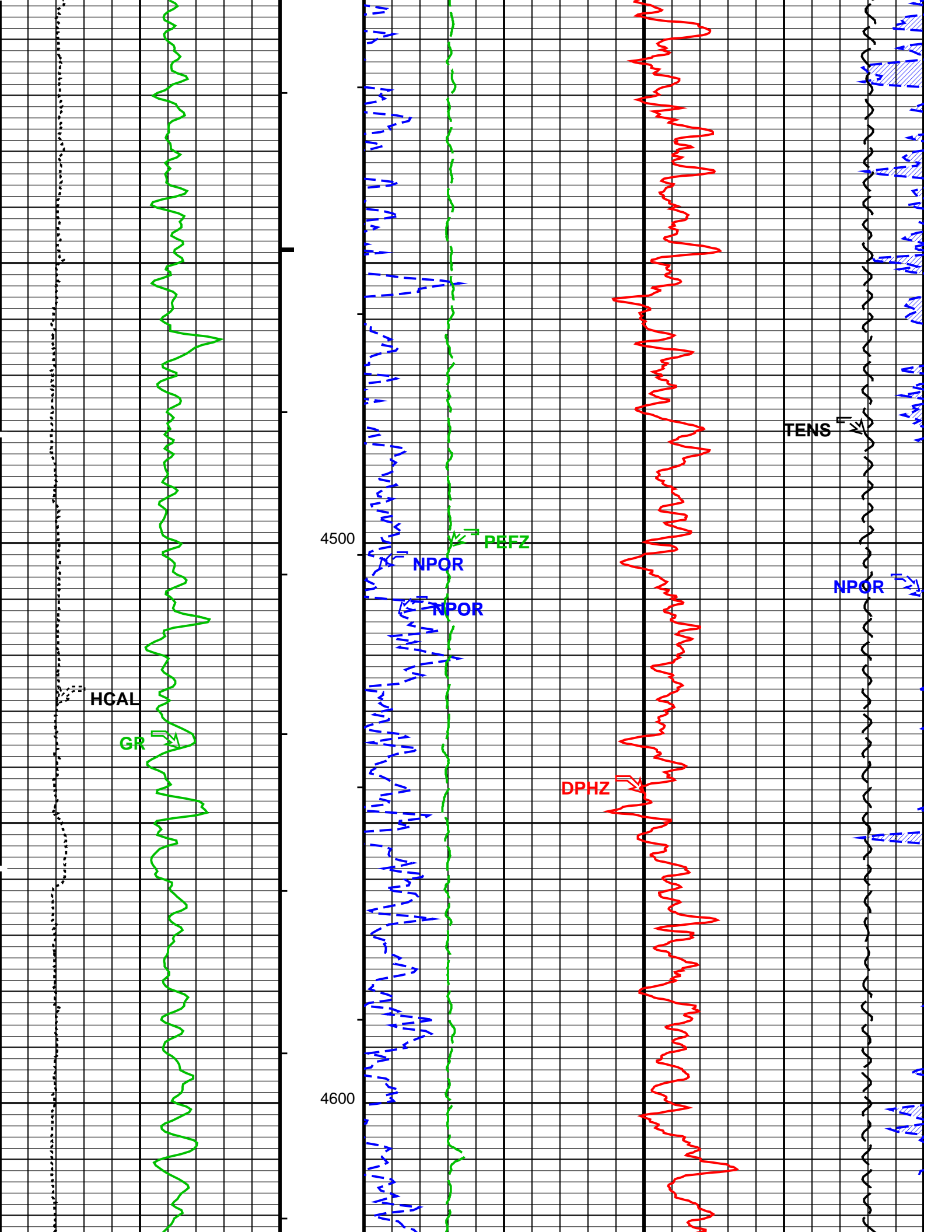
PIP SUMMARY

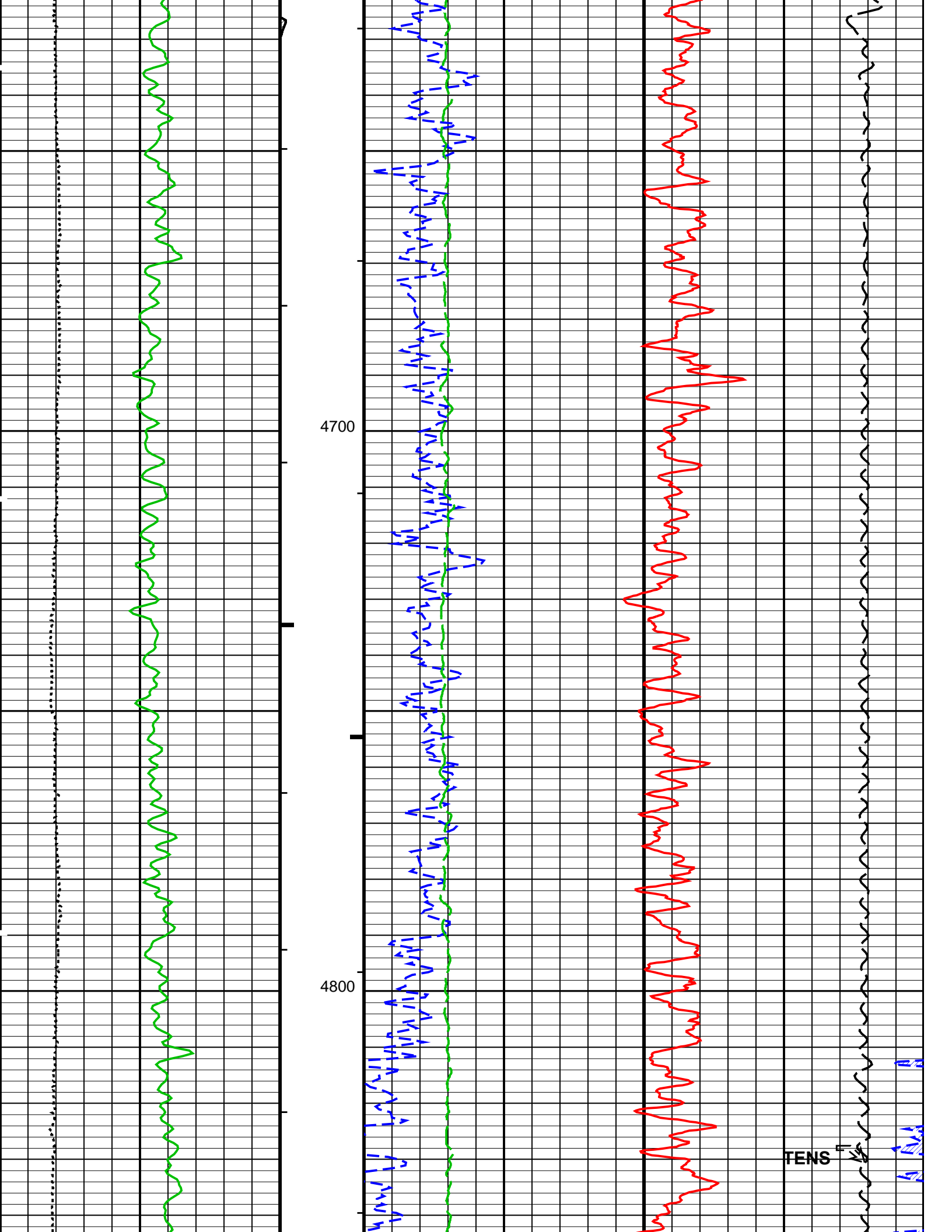
└ Integrated Hole Volume Minor Pip Every 10 F3  
■ Integrated Hole Volume Major Pip Every 100 F3

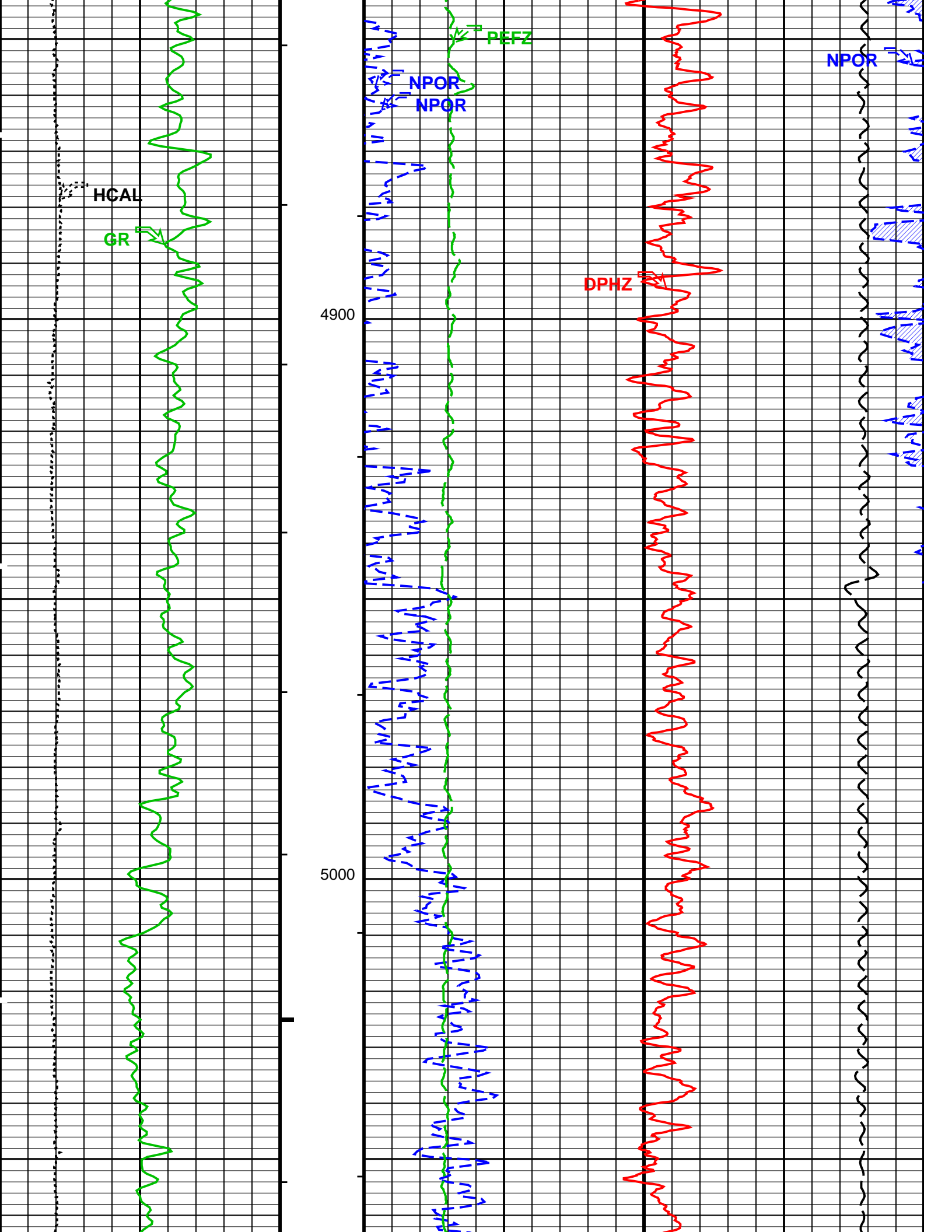


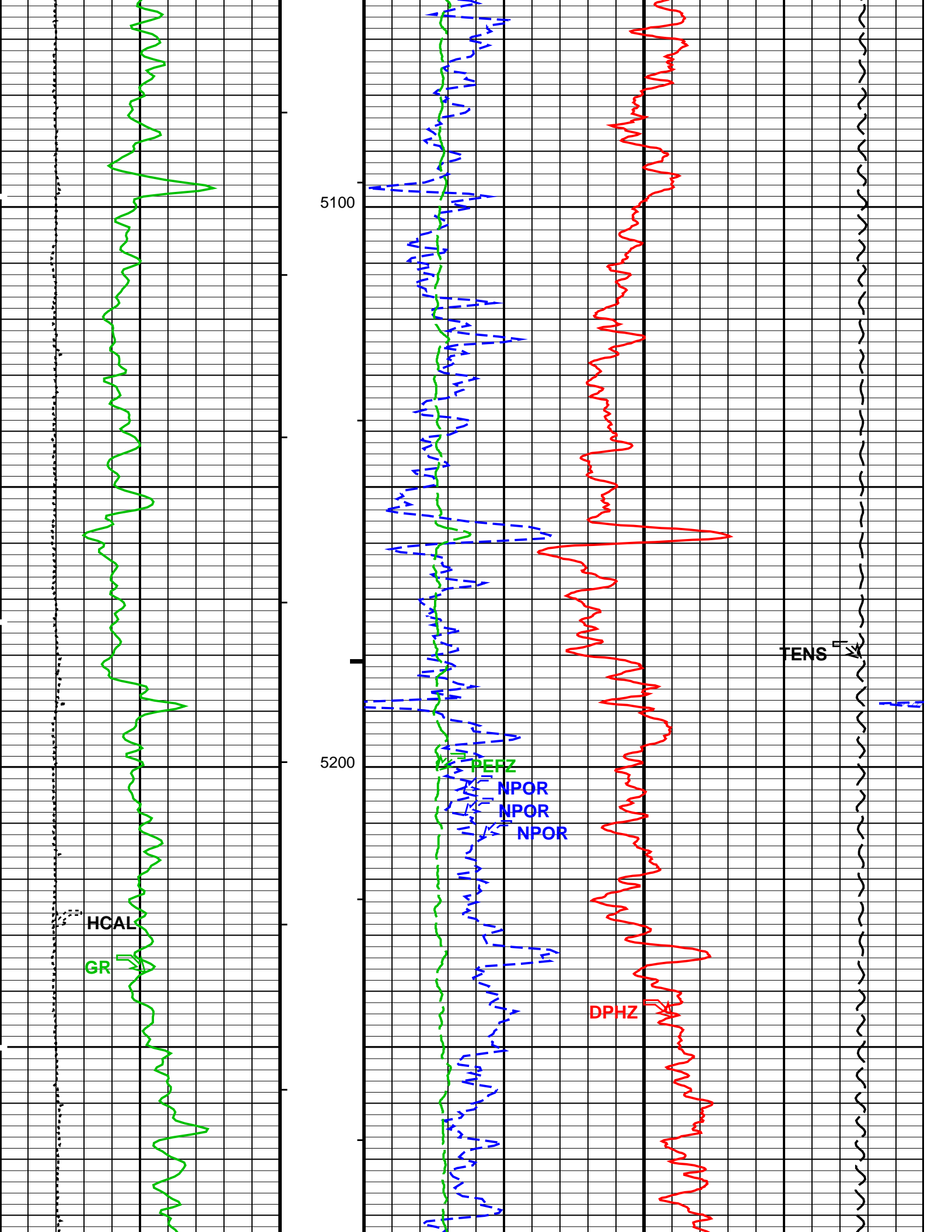
MAIN PASS: \*\*\* PLATFORM EXPRESS – NUCLEAR POROSITY \*\*\*

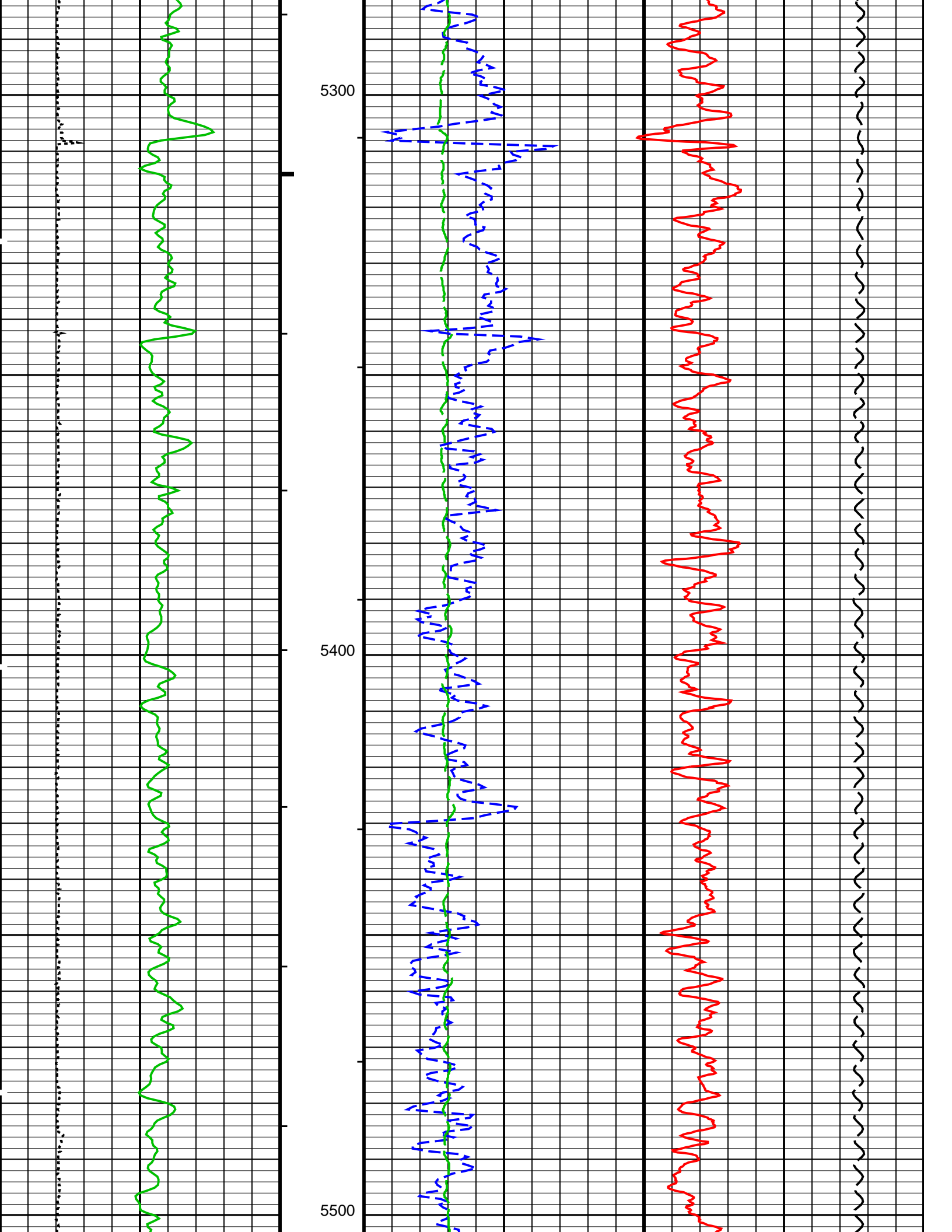


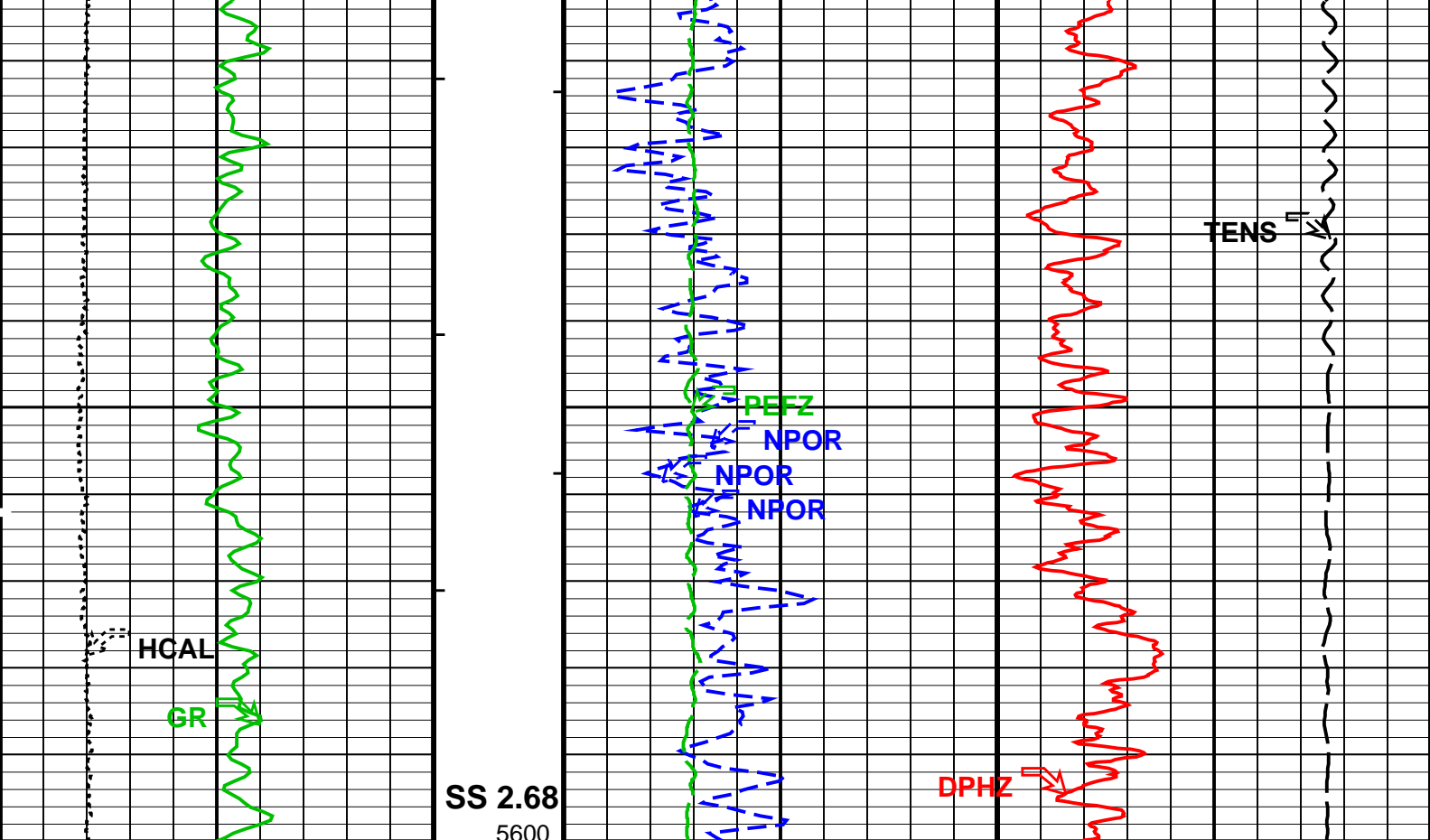












MAIN PASS: \*\*\* PLATFORM EXPRESS – NUCLEAR POROSITY \*\*\*

Gamma Ray Backup	Cable Drag	Std. Res. Density Porosity (DPHZ)	
		0.3	(V/V) -0.1
Gamma Ray (GR) (GAPI)	Tool/Tot. Drag	Alpha Processed Neutron Porosity (NPOR)	
0 200		0.3	(V/V) -0.1
Caliper (HCAL) (IN)	Stuck Stretch (STIT)	Std. Res. Formation Pe (PEFZ)	Tension (TENS)
6 16	0 (F) 50	0 10 10000	(LBF) 0
		Gas Effect	
		NPOR Backup	

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
AIT–M: Array Induction Tool – M		
BHS	Borehole Status	OPEN
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0.000 deg
GGRD	Geothermal Gradient	0.010 degF/ft
MATR	Rock Matrix for Neutron Porosity Corrections	SAND
SHT	Surface Hole Temperature	68.000 degF
HILTB–FTB: High resolution Integrated Logging Tool–DTS		
BHFL	Borehole Fluid Type	WATER
BHFL_TLD	HILT Nuclear Mud Base	WATER
BHS	Borehole Status	OPEN
BSCO	Borehole Salinity Correction Option	NO

CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.000	g/cm3
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SAND	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.680	g/cm3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	STDRES	
NSAR	HRDD Depth Sampling Rate	1.000	in
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68.000	degF
SOCN	Standoff Distance	0.125	in
SOCO	Standoff Correction Option	YES	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
MATR	Rock Matrix for Neutron Porosity Corrections	SAND	
SHT	Surface Hole Temperature	68.000	degF
PERT: Preliminary Evaluation – Real Time			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
MATR	Rock Matrix for Neutron Porosity Corrections	SAND	
SHT	Surface Hole Temperature	68.000	degF
STI: Stuck Tool Indicator			
STKT	STI Stuck Threshold	2.500	ft
TDD	Total Depth – Driller	8628.0	ft
TDL	Total Depth – Logger	8594.0	ft
System and Miscellaneous			
BS	Bit Size	7.875	in
BSAL	Borehole Salinity		
CSIZ	Current Casing Size	8.625	in
CWEI	Casing Weight	24.000	lbm/ft
DFD	Drilling Fluid Density	8.300	lbm/gal
FSAL	Formation Salinity		
MST	Mud Sample Temperature	79.260	degF
RMFS	Resistivity of Mud Filtrate Sample	0.728	ohm.m

Format: UPPER\_PORO      Vertical Scale: 5" per 100'      Graphics File Created: 27-Nov-2009 21:38

## OP System Version: 17C0-154

AITM	17C0-154	HILTD	17C0-154
DTCH	17C0-154		

## Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27-Nov-2009 20:39	8607.0 FT	0.0 FT
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**Schlumberger**

**LOWER POROSITY LOG 5" = 100'**

MAXIS Field Log

## Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27-Nov-2009 20:39
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# OP System Version: 17C0-154

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

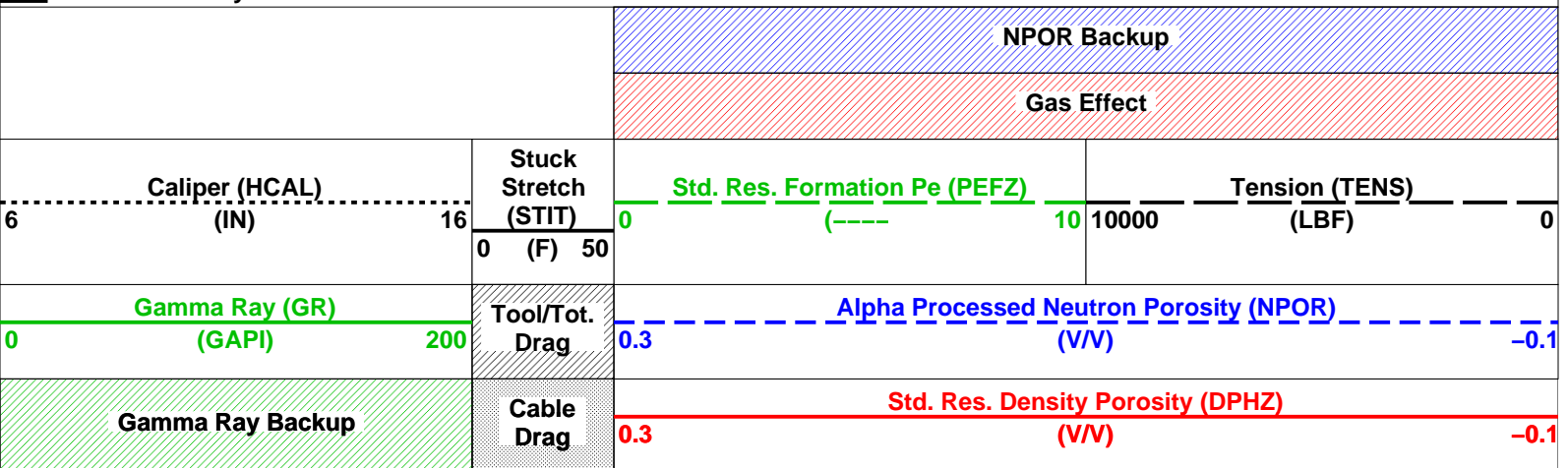
## Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	SANDSTONE	8607.0 20:41:37
MDEN	SANDSTONE	SANDSTONE	8330.0 20:45:15
	2.65 G/C3	2.68 G/C3	8607.0 20:41:37
	2.68 G/C3	2.65 G/C3	8330.0 20:45:15

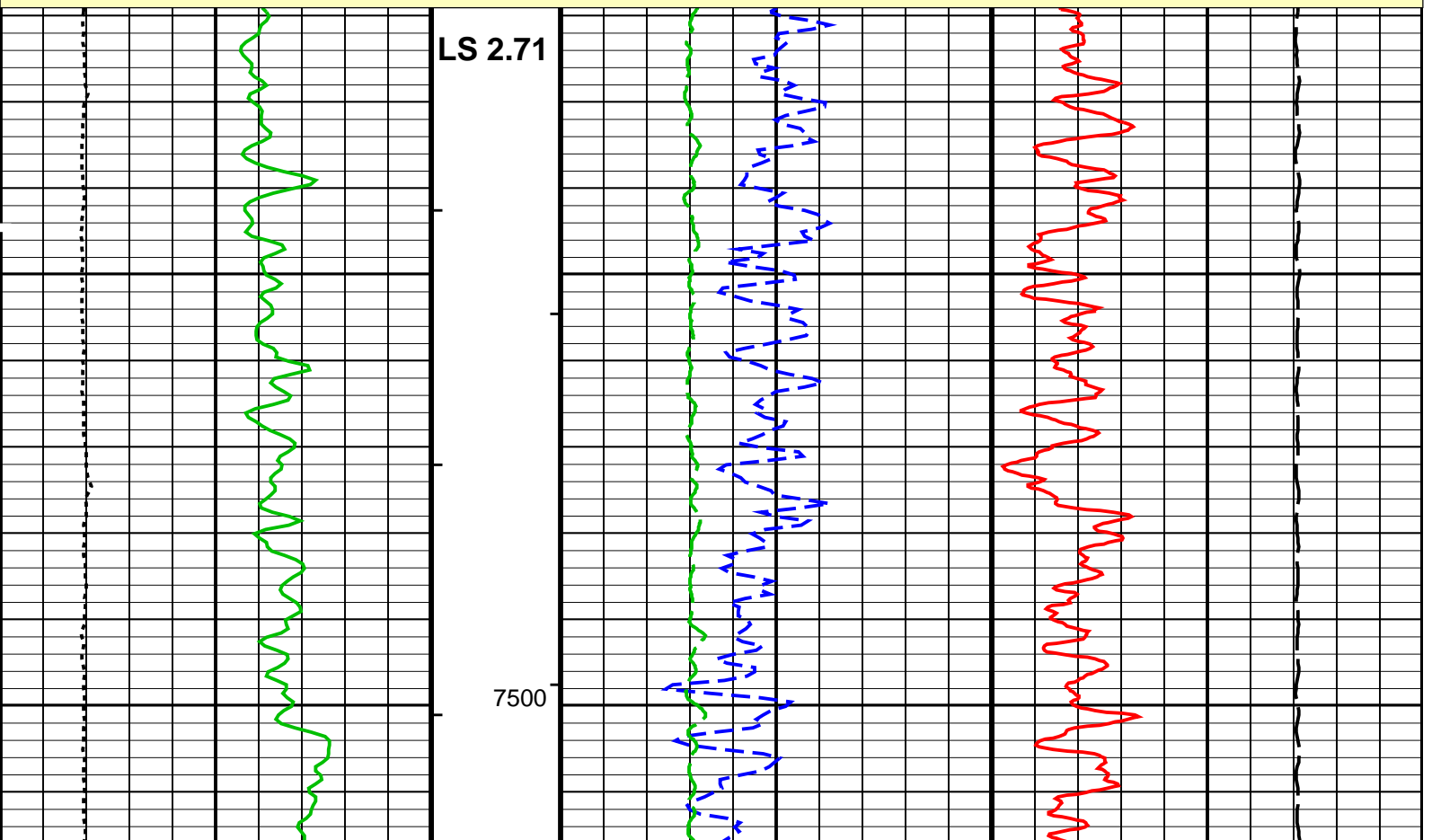
### PIP SUMMARY

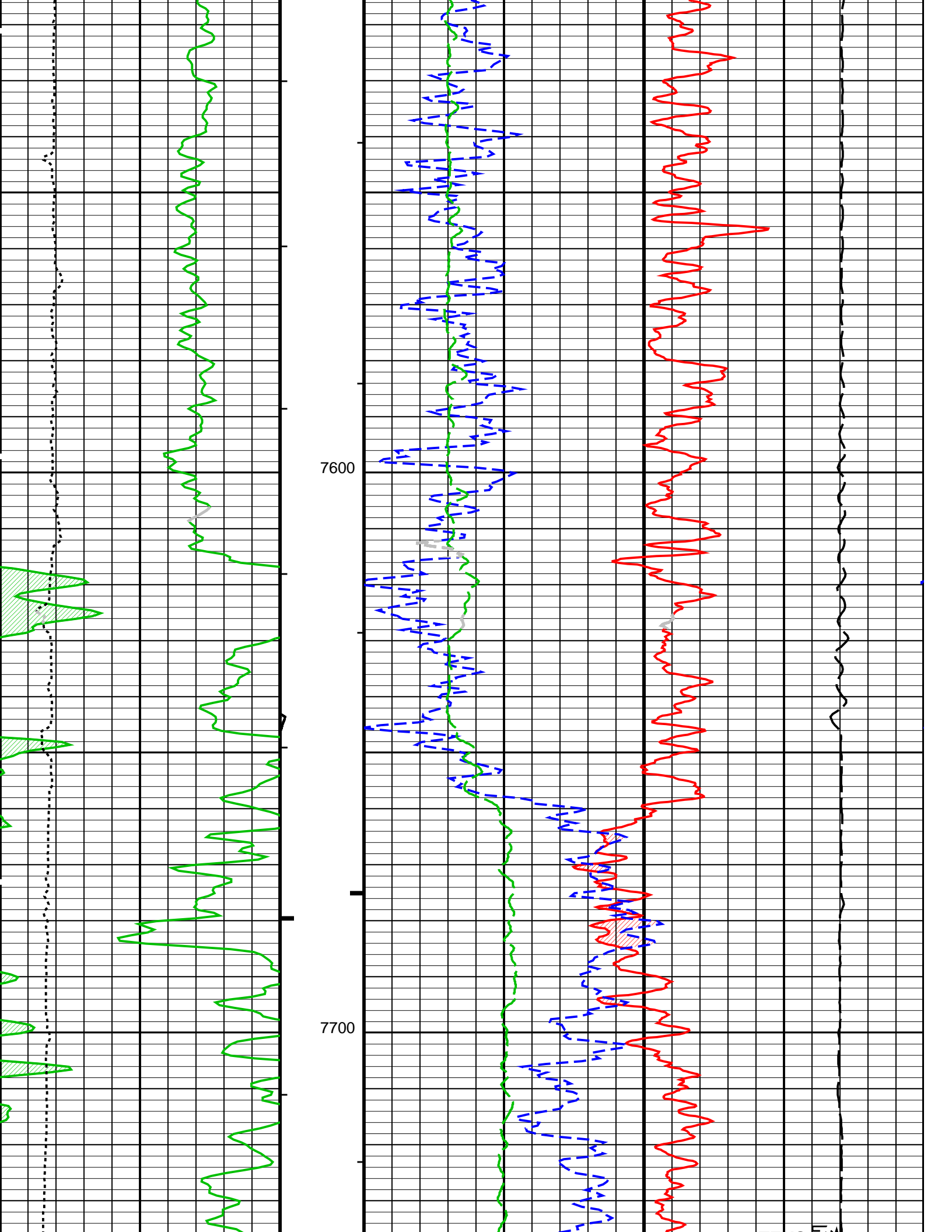
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
  - Integrated Cement Volume Minor Pip Every 10 F3
  - Integrated Cement Volume Major Pip Every 100 F3

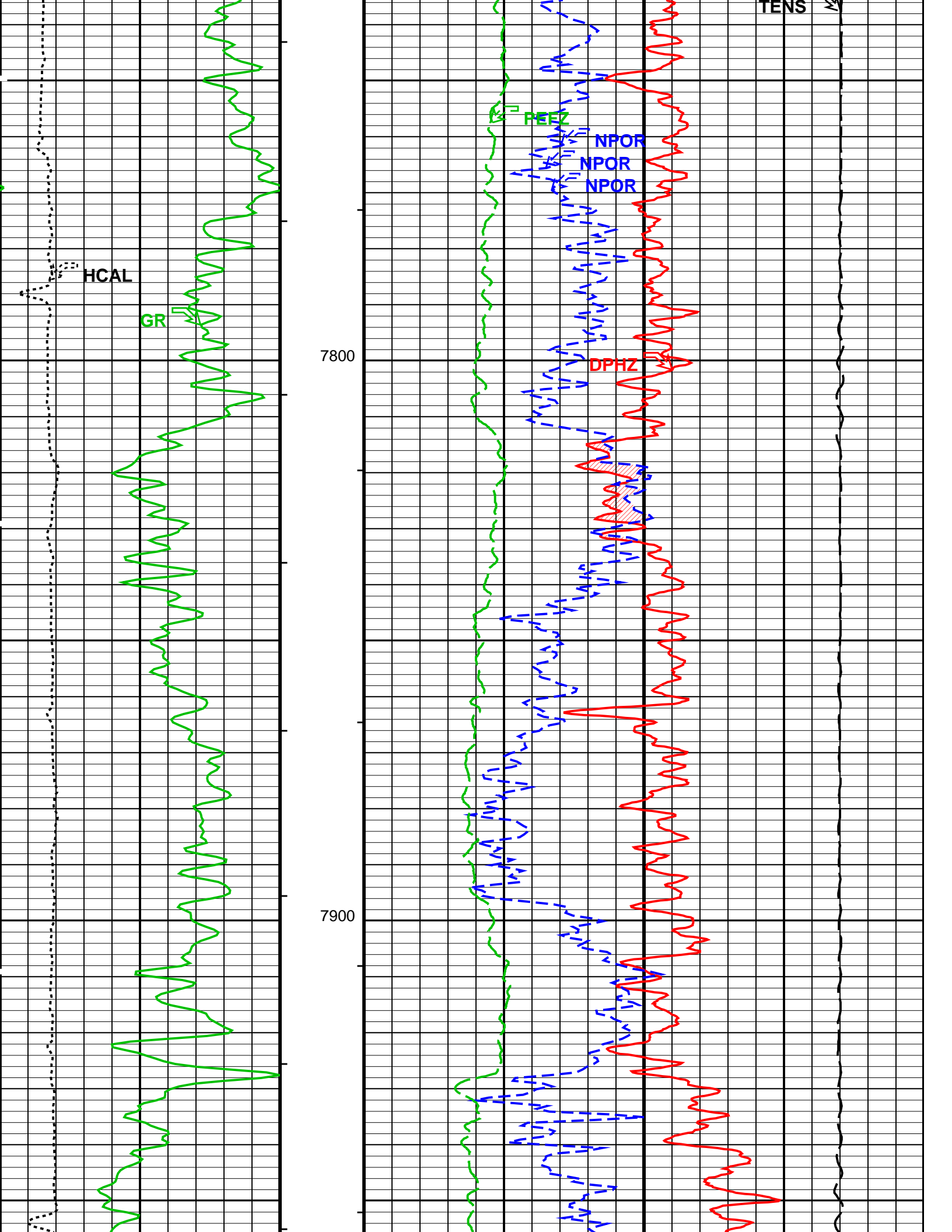
Time Mark Every 60 S

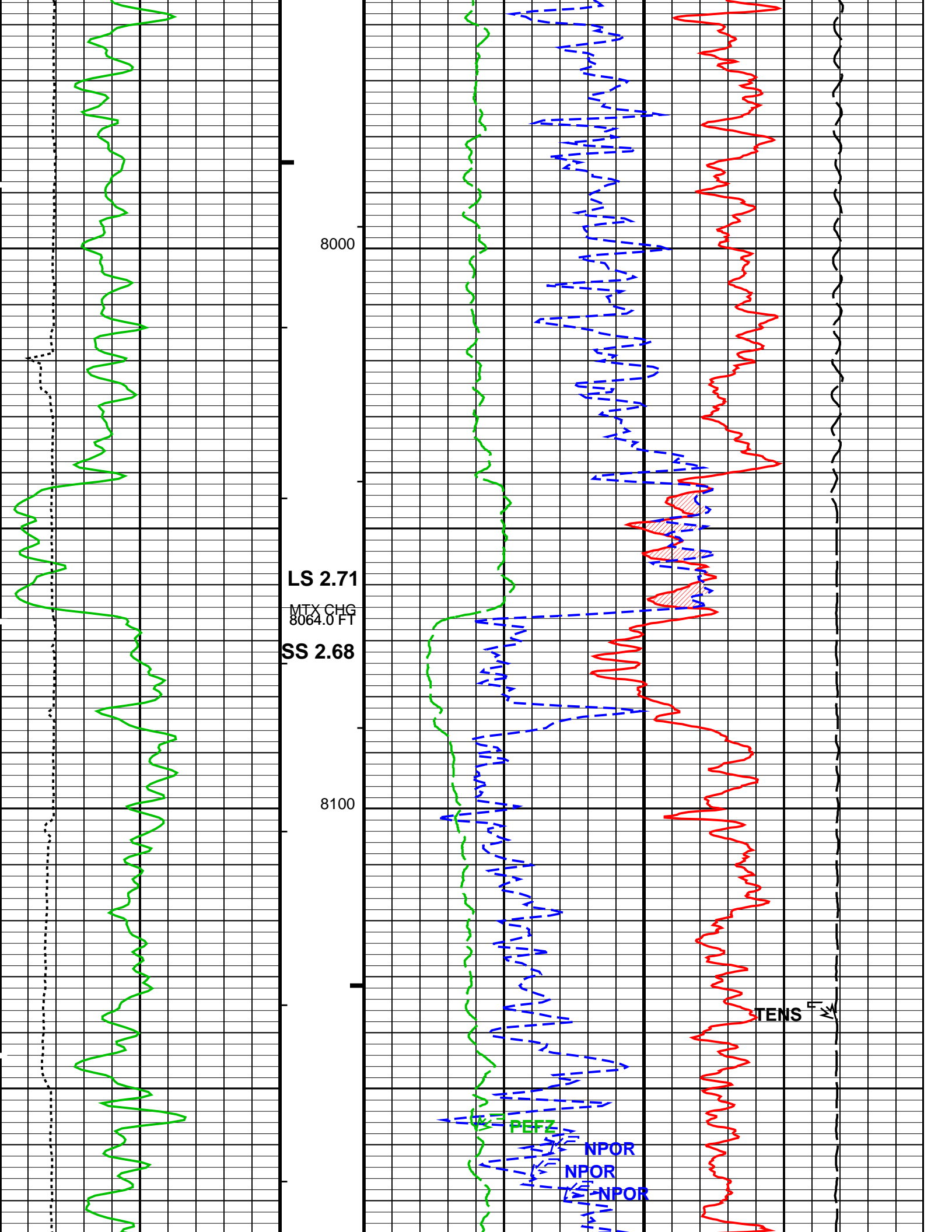


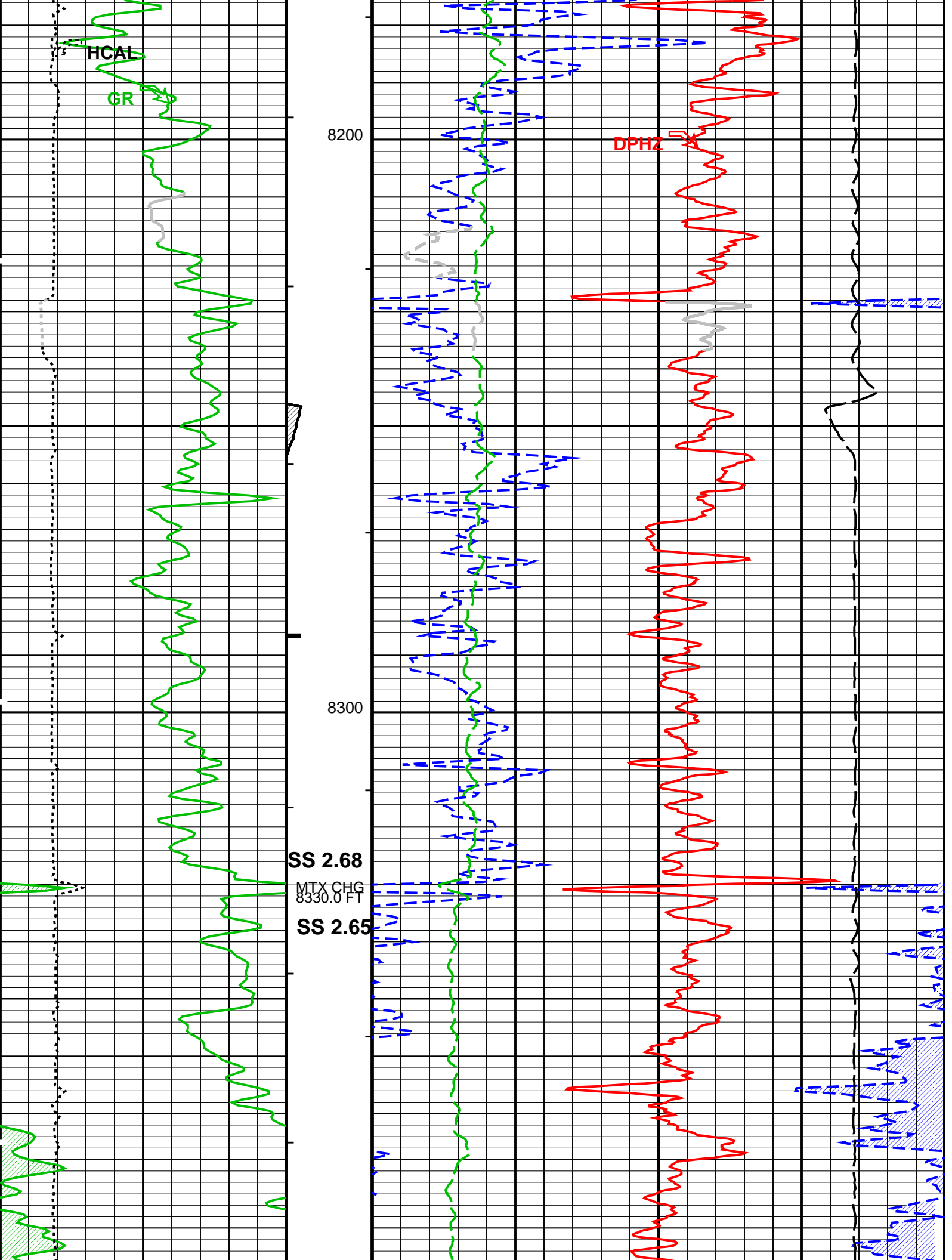
MAIN PASS: \*\*\* PLATFORM EXPRESS - NUCLEAR POROSITY \*\*\*

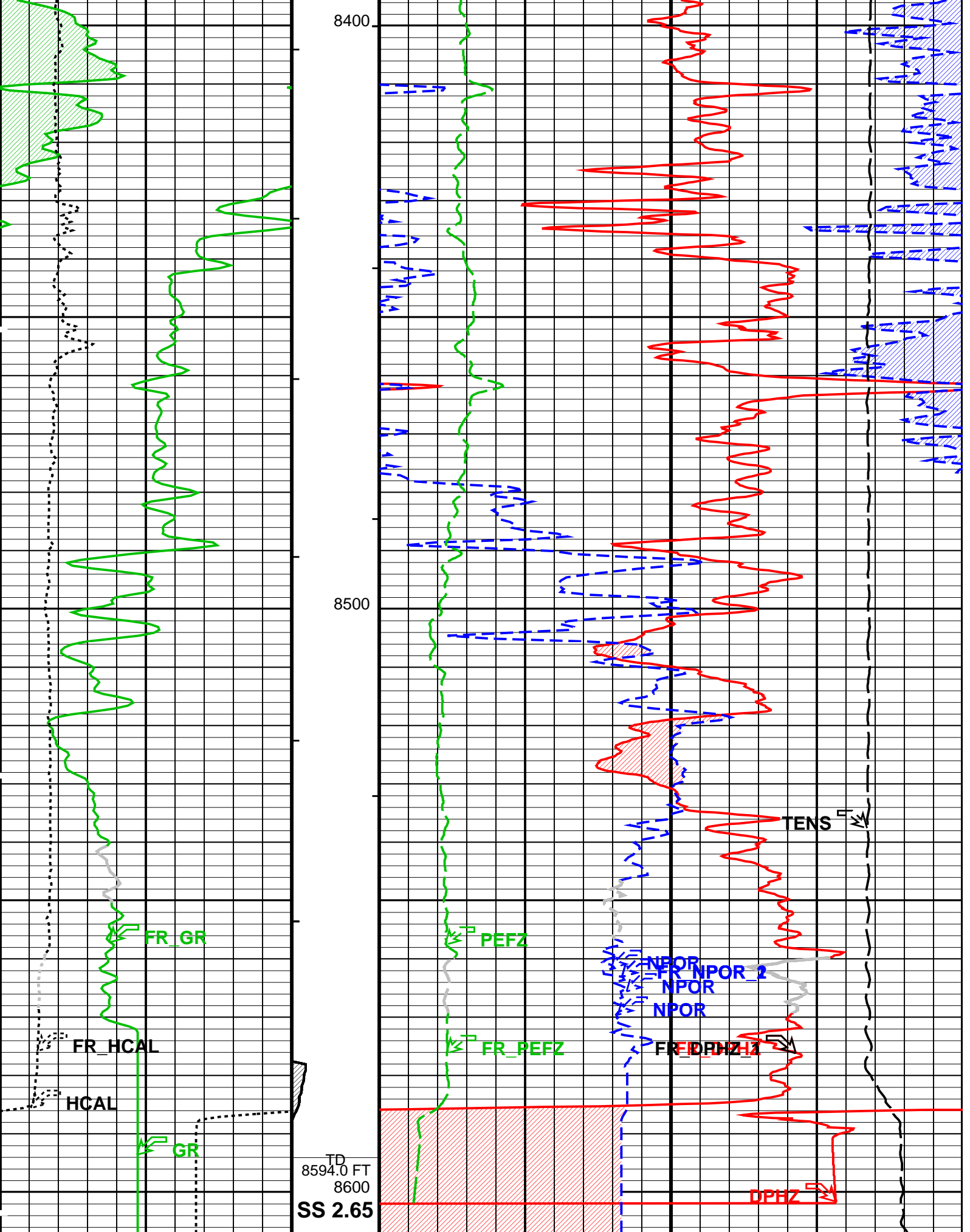




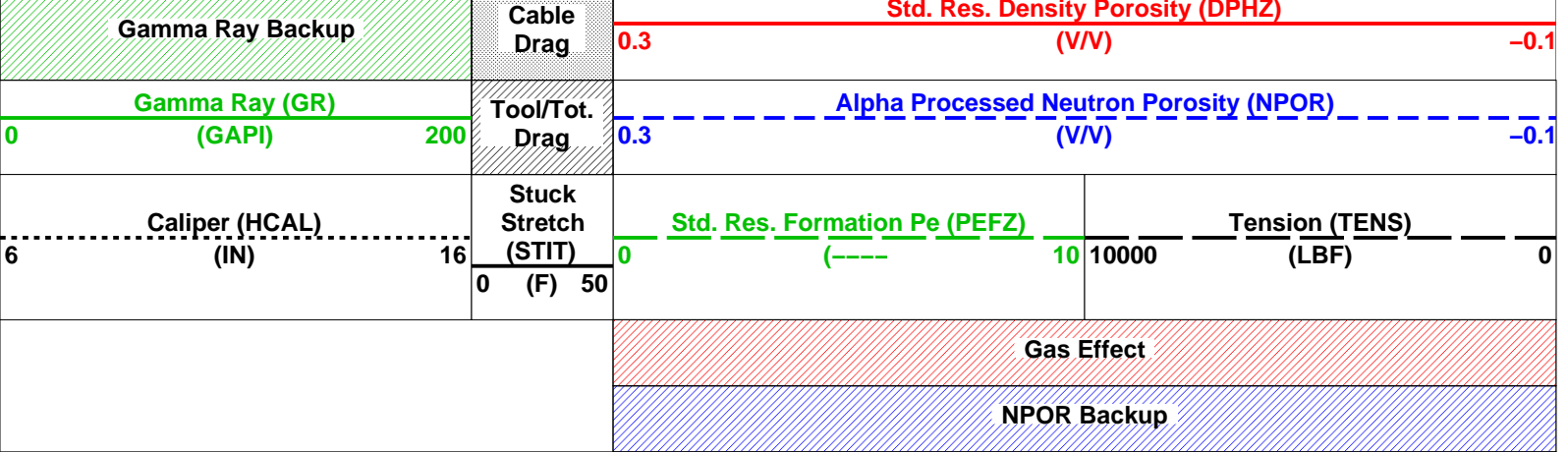








MAIN PASS: \*\*\* PLATFORM EXPRESS - NUCLEAR POROSITY \*\*\*



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		
AIT-M: Array Induction Tool – M				
BHS	Borehole Status	OPEN		
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GGRD	Geothermal Gradient	0.01	DF/F	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
SHT	Surface Hole Temperature	68	DEGF	
HILTB-FTB: High resolution Integrated Logging Tool-DTS				
BHFL	Borehole Fluid Type	WATER		
BHFL_TLD	HILT Nuclear Mud Base	WATER		
BHS	Borehole Status	OPEN		
BSCO	Borehole Salinity Correction Option	NO		
CCCO	Casing & Cement Thickness Correction Option	NO		
DHC	Density Hole Correction	BS		
FD	Fluid Density	1	G/C3	
FSAL	Formation Salinity	-50000	PPM	
FSCO	Formation Salinity Correction Option	NO		
GCLF	Germany Coal-like Formation Option	NO		
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GGRD	Geothermal Gradient	0.01	DF/F	
HSCO	Hole Size Correction Option	YES		
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
MCCO	Mud Cake Correction Option	NO		
MCOR	Mud Correction	NATU		
MDEN	Matrix Density	2.68	G/C3	
MWCO	Mud Weight Correction Option	NO		
NAAC	HRDD APS Activation Correction	OFF		
NMT	HILT Nuclear Mud Type	NOBARITE		
NPRM	HRDD Processing Mode	StdRes		
NSAR	HRDD Depth Sampling Rate	1	IN	
PTCO	Pressure/Temperature Correction Option	NO		
SDAT	Standoff Data Source	SOCN		
SHT	Surface Hole Temperature	68	DEGF	
SOCN	Standoff Distance	0.125	IN	
SOCO	Standoff Correction Option	YES		
HOLEV: Integrated Hole/Cement Volume				
BHS	Borehole Status	OPEN		
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	
HVCS	Integrated Hole Volume Caliper Selection	HCAL		
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
SHT	Surface Hole Temperature	68	DEGF	
PERT: Preliminary Evaluation – Real Time				
BHS	Borehole Status	OPEN		
GCSE	Generalized Caliper Selection	HCAL		
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG	
GGRD	Geothermal Gradient	0.01	DF/F	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
SHT	Surface Hole Temperature	68	DEGF	
STI: Stuck Tool Indicator				

LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth – Driller	8628.00	FT
TDL	Total Depth – Logger	8594.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	79.26	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.7275	OHMM
TD	Total Depth	8594	FT

Format: LOWER\_PORO

Vertical Scale: 5" per 100'

Graphics File Created: 27-Nov-2009 20:39

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_006LUP	FN:5	PRODUCER 27-Nov-2009 20:39

Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Input DLIS Files			
DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER 27-Nov-2009 20:38 8625.0 FT 8229.0 FT
Output DLIS Files			
DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER 27-Nov-2009 20:39

OP System Version: 17C0-154			
AIT-M	17C0-154	HILTB-FTB	17C0-154
DTC-H	17C0-154		

Changed Parameter Summary			
DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	SANDSTONE	8607.0 20:41:37
MDEN	SANDSTONE	SANDSTONE	8330.0 20:45:15
	2.65 G/C3	2.68 G/C3	8607.0 20:41:37
	2.68 G/C3	2.65 G/C3	8330.0 20:45:15

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

HCAL\_REP Curve (HCAL\_REP)

(IN)

616

PEFZ\_REP Curve (PEFZ\_REP)

(----

01010000

TENS\_REP Curve (TENS\_REP)

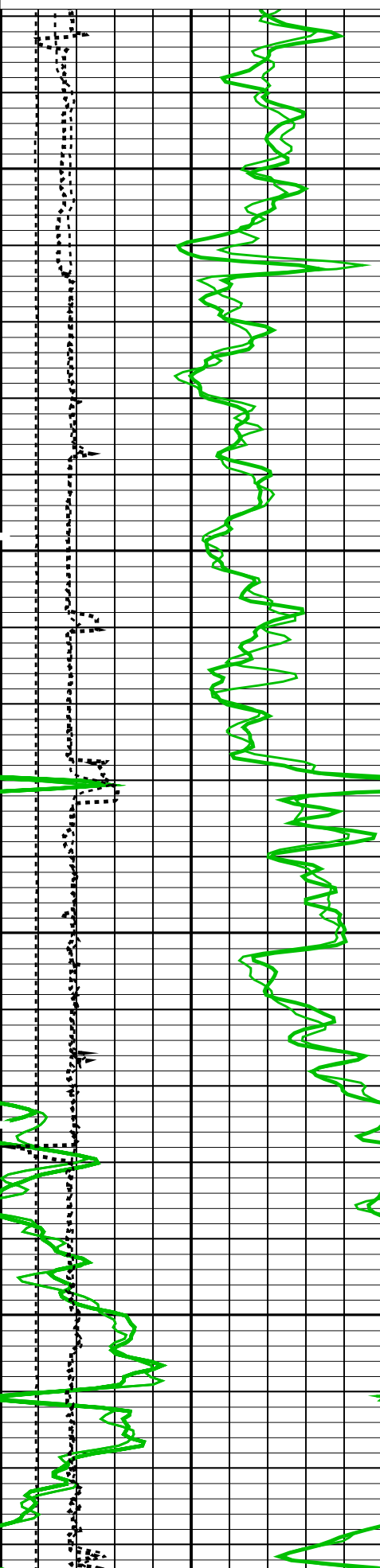
(LBF)

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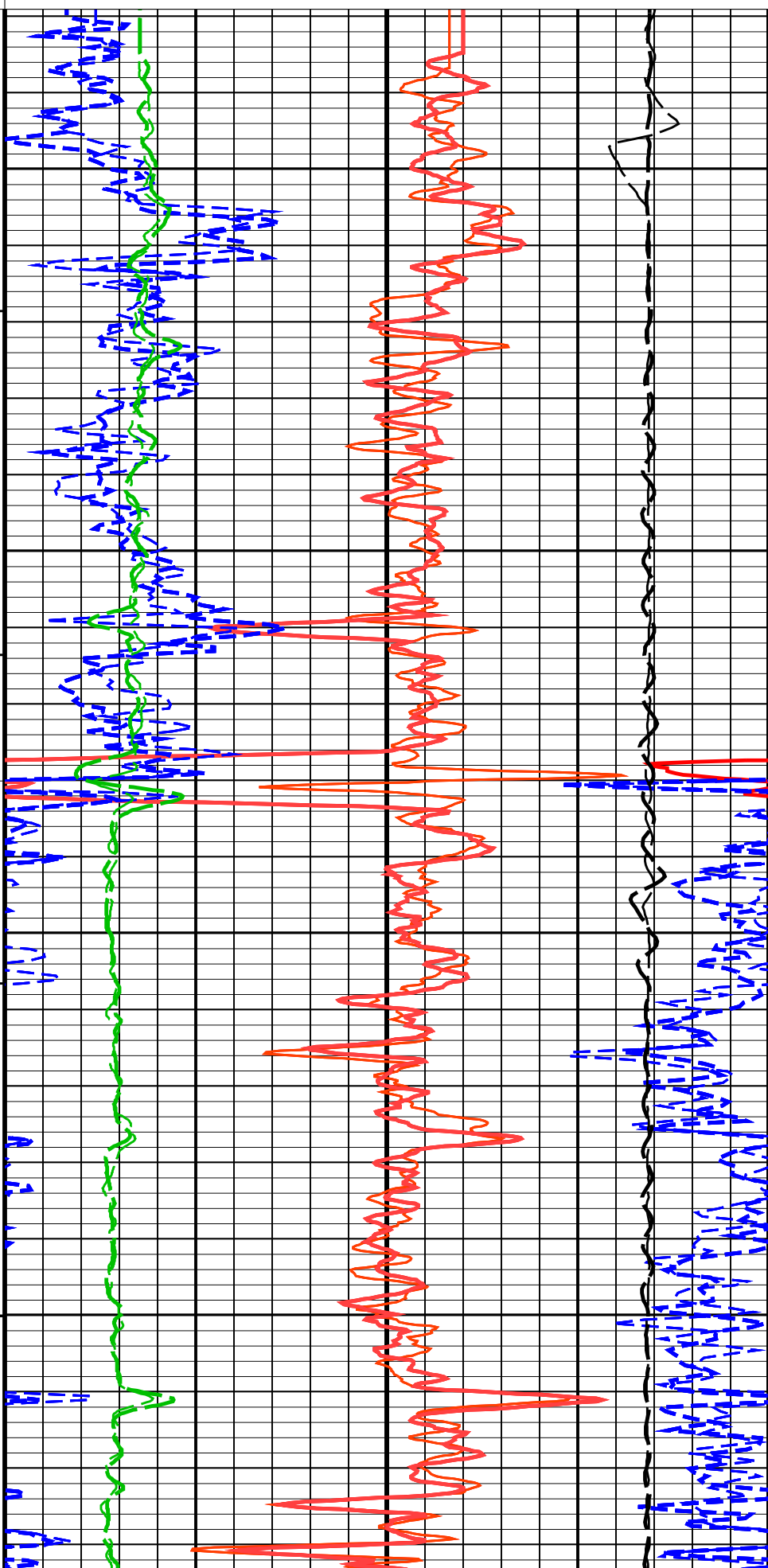
GR\_REP Curve (GR\_REP)

NPOR\_REP Curve (NPOR\_REP)

0 (GAPI) 200  
Cable Speed (CS)  
(F/HR) 50000



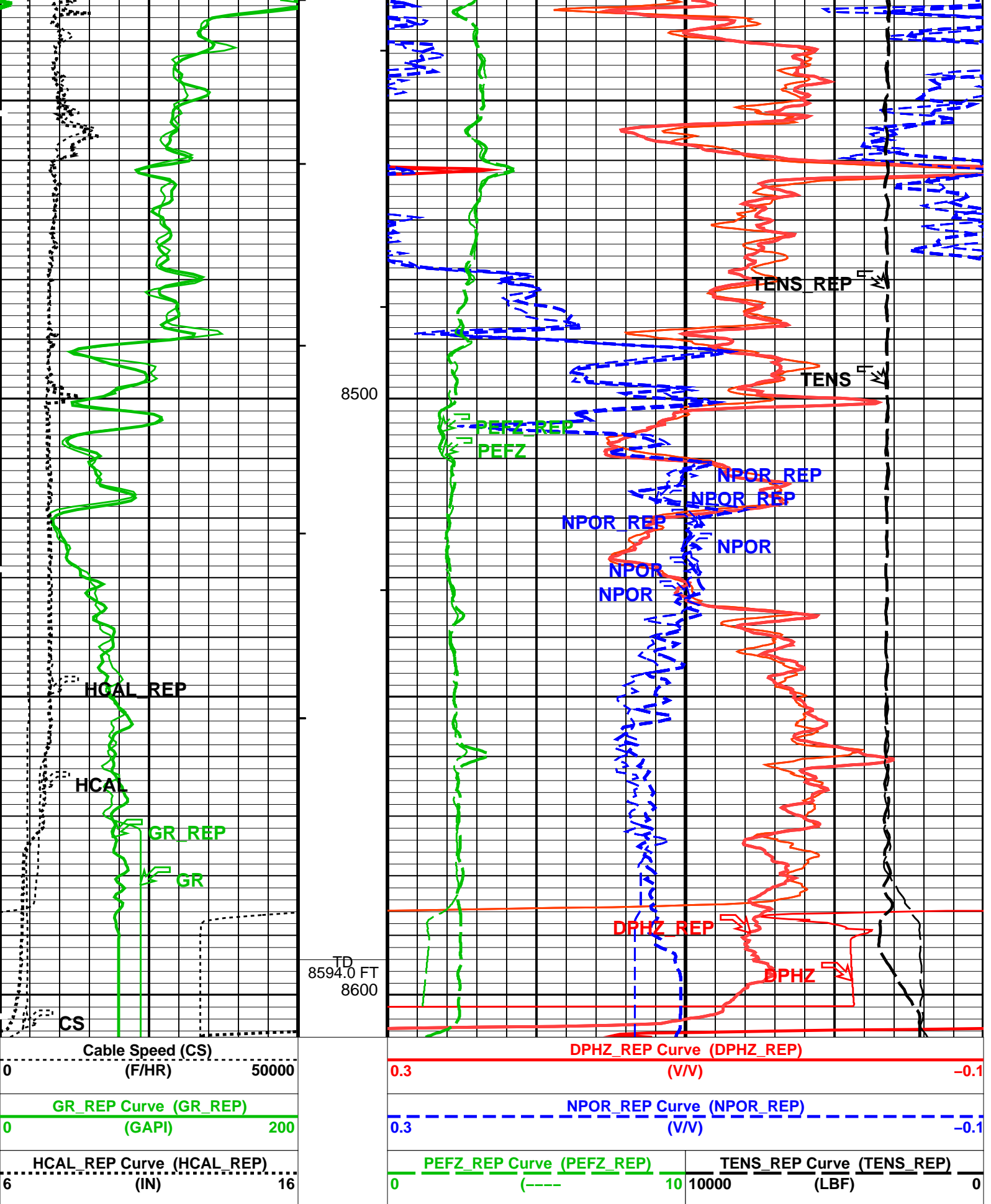
0.3 (V/V) -0.1  
DPHZ\_REP Curve (DPHZ\_REP)  
0.3 (V/V) -0.1



8300

MTX CHG  
8330.0 FT

8400



### 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

## Parameters

DLIS Name	Description	Value	
AIT-M: Array Induction Tool – M			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
HILTB-FTB: High resolution Integrated Logging Tool-DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCO	Hole Size Correction Option	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
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
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation – Real Time			
BHS	Borehole Status	OPEN	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
TDL	Total Depth – Logger	8594.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	8.625	IN
CWEI	Casing Weight	24.00	LB/F
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
MST	Mud Sample Temperature	79.26	DEGF
RMFS	Resistivity of Mud Filtrate Sample	0.7275	OHMM
TD	Total Depth	8594	FT

Format: PORO\_REP

Vertical Scale: 5" per 100'

Graphics File Created: 27-Nov-2009 20:39

## OP System Version: 17C0-154

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

## Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	27-Nov-2009 20:38	8625.0 FT	8229.0 FT
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# Output DLIS Files

DEFAULT

AIT\_TLD\_MCFL\_CNL\_006LUP

FN:5

PRODUCER

27-Nov-2009 20:39

**Schlumberger**

**UPPER DENSITY LOG 5" = 100'**

MAXIS Field Log

## Input DLIS Files

DEFAULT

AIT\_TLD\_MCFL\_CNL\_006LUP

FN:5

PRODUCER

27-Nov-2009 20:39

8607.0 FT

0.0 FT

**OP System Version: 17C0-154**

AITM  
DTCH

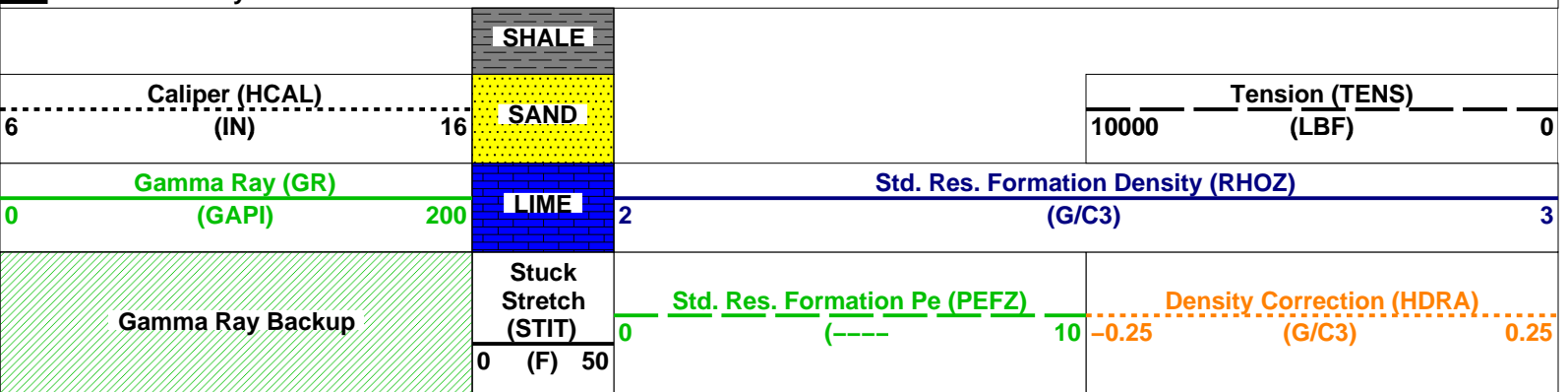
17C0-154  
17C0-154

HILTD

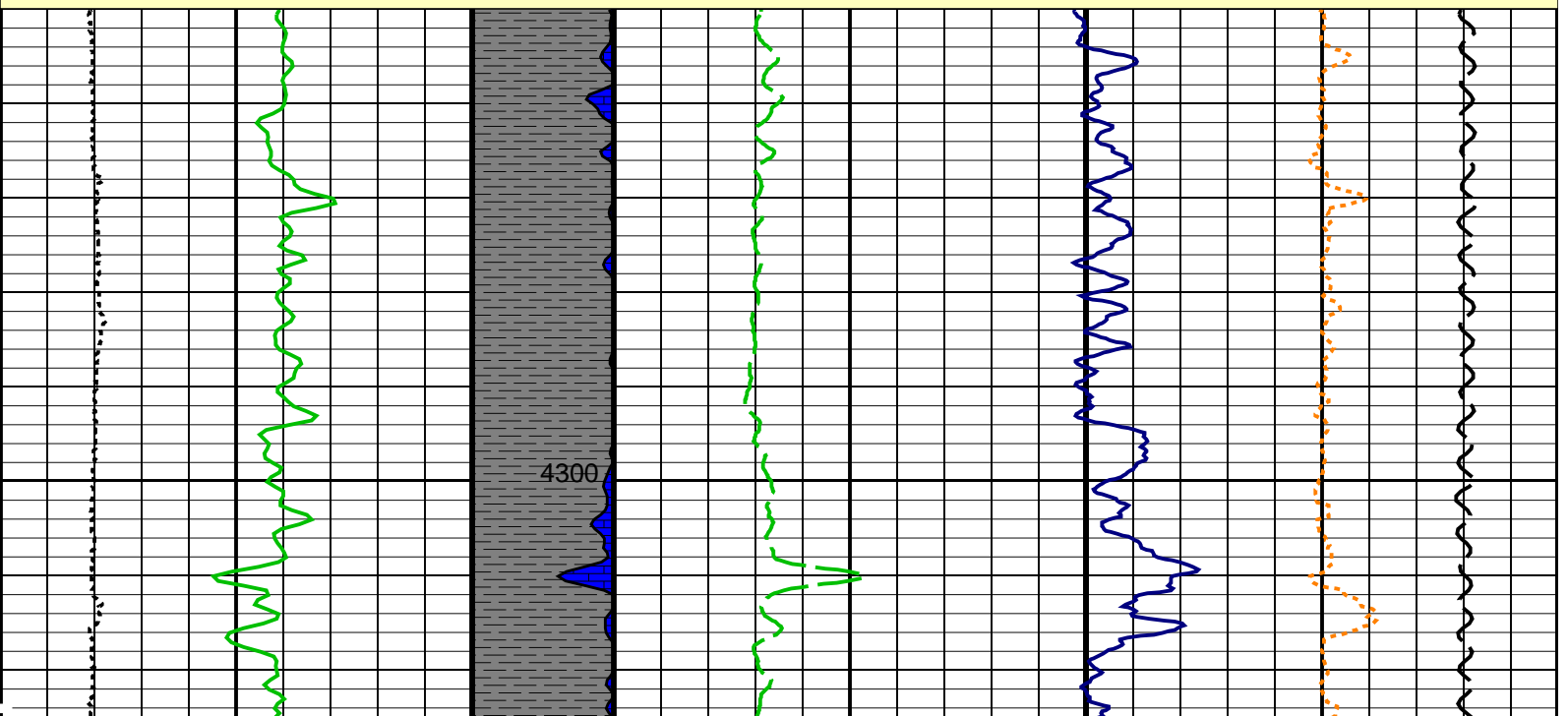
17C0-154

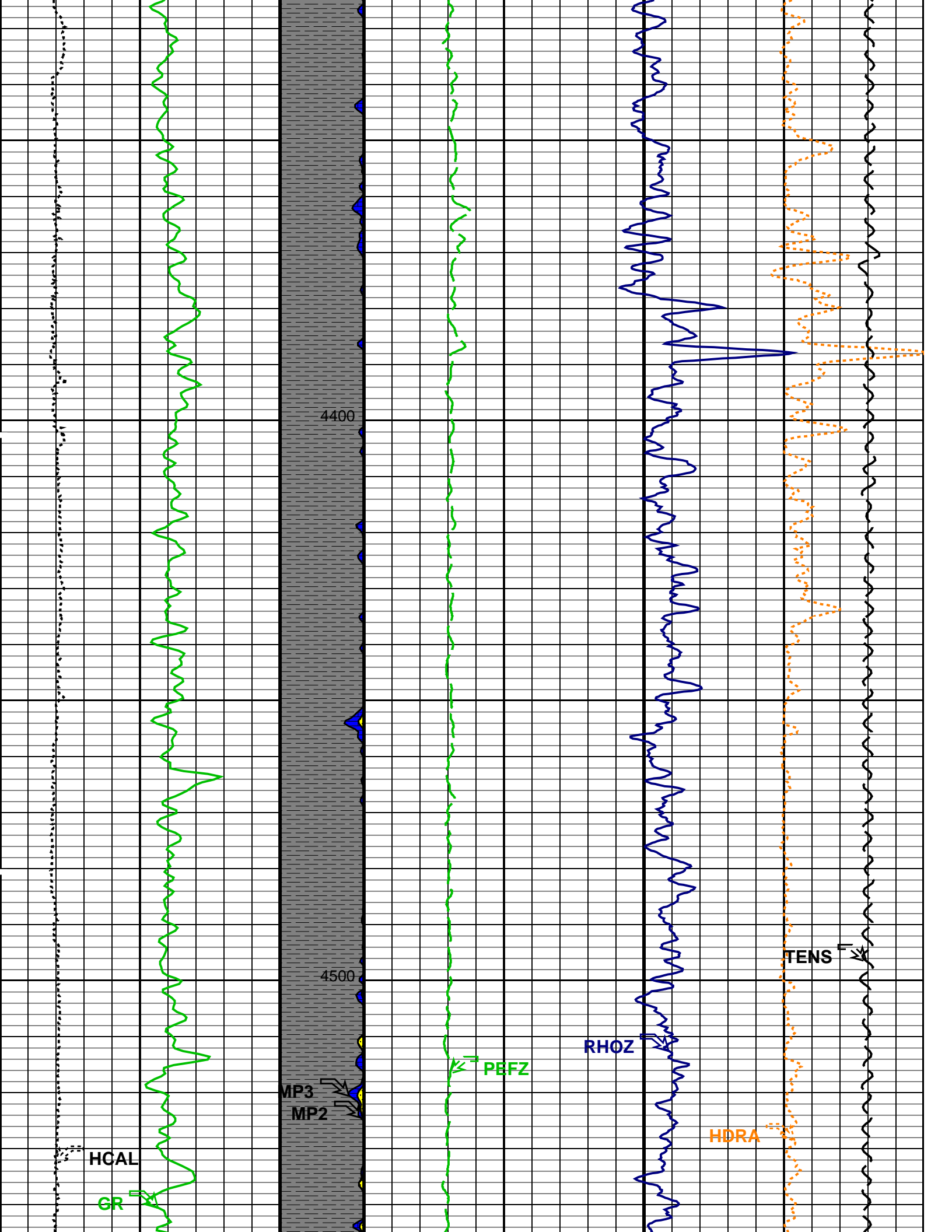
## PIP SUMMARY

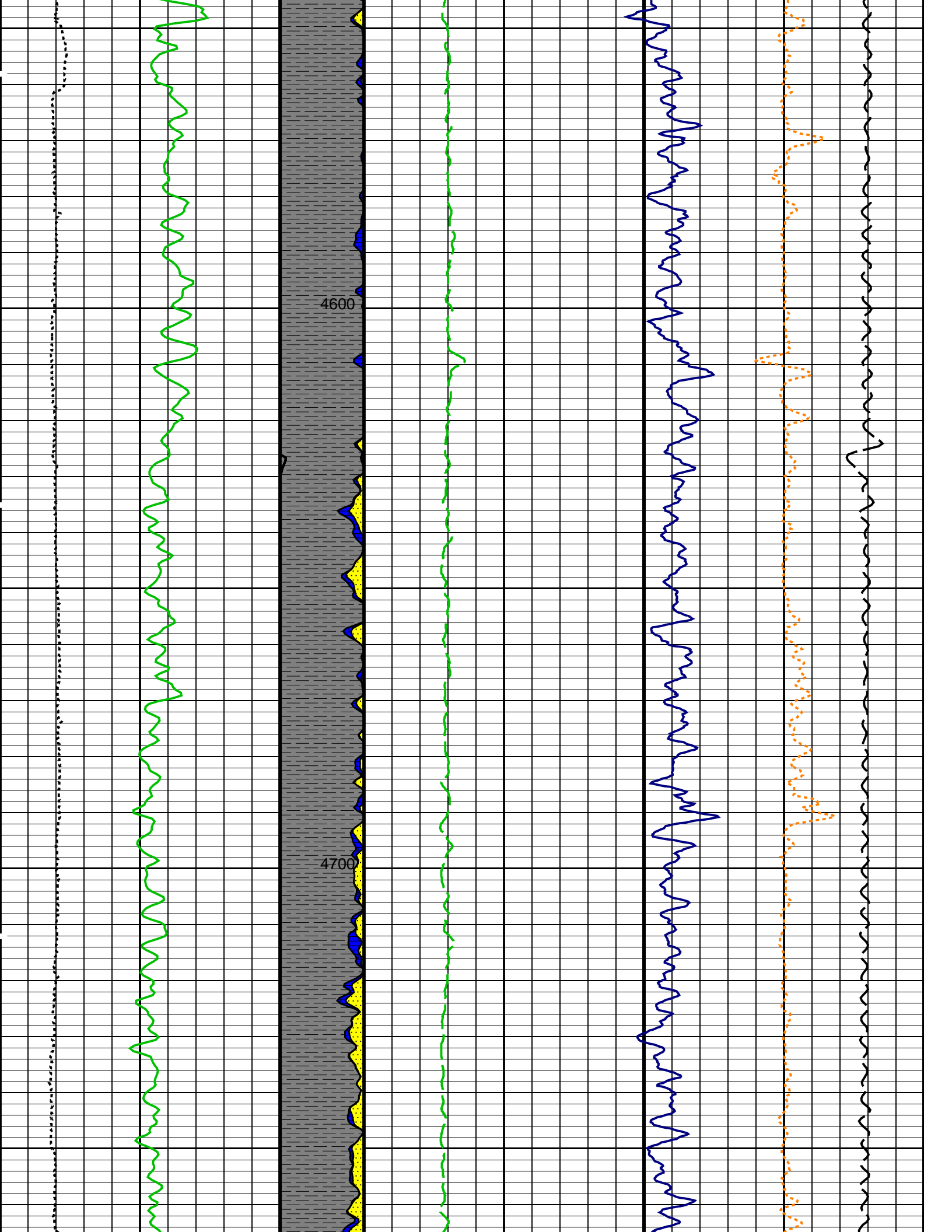
Time Mark Every 60 S

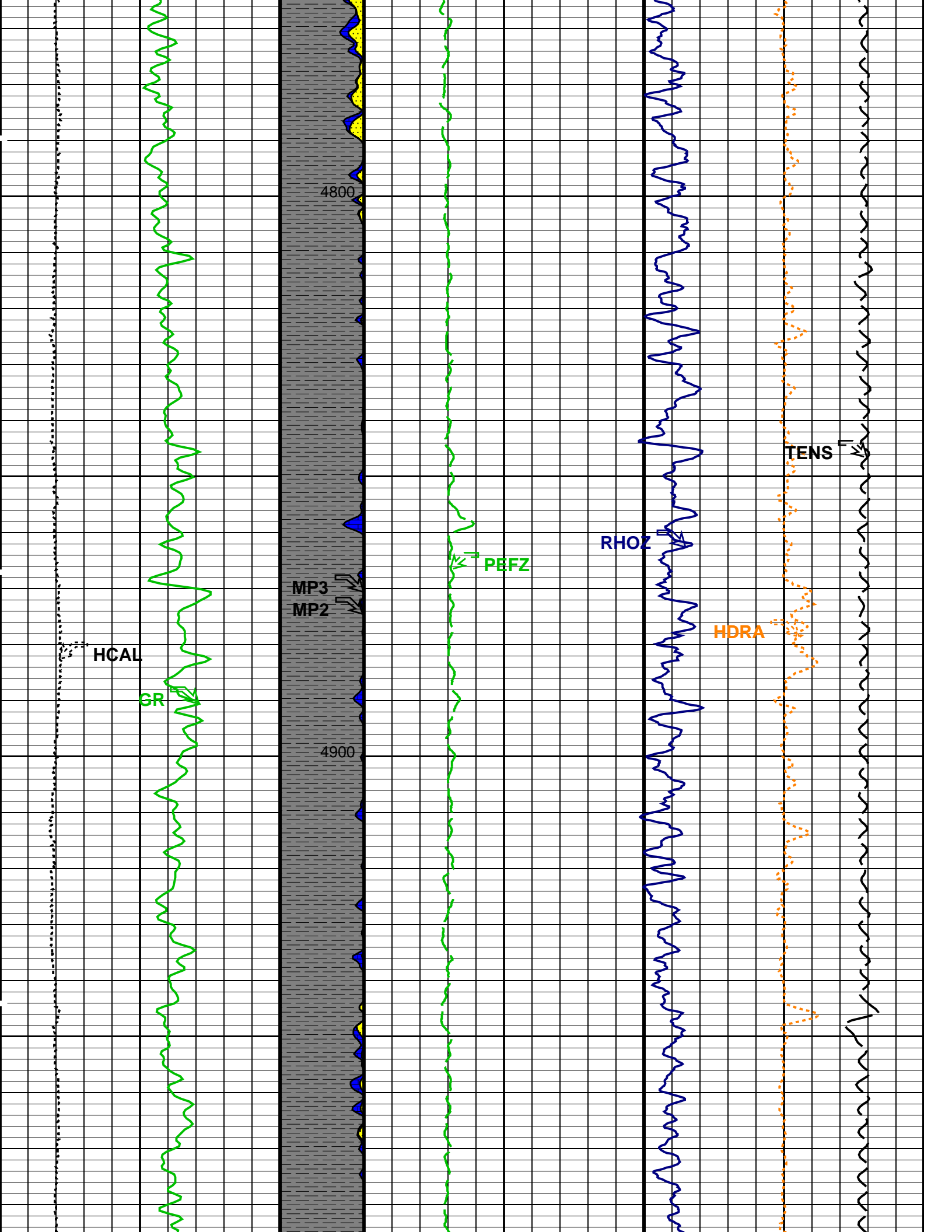


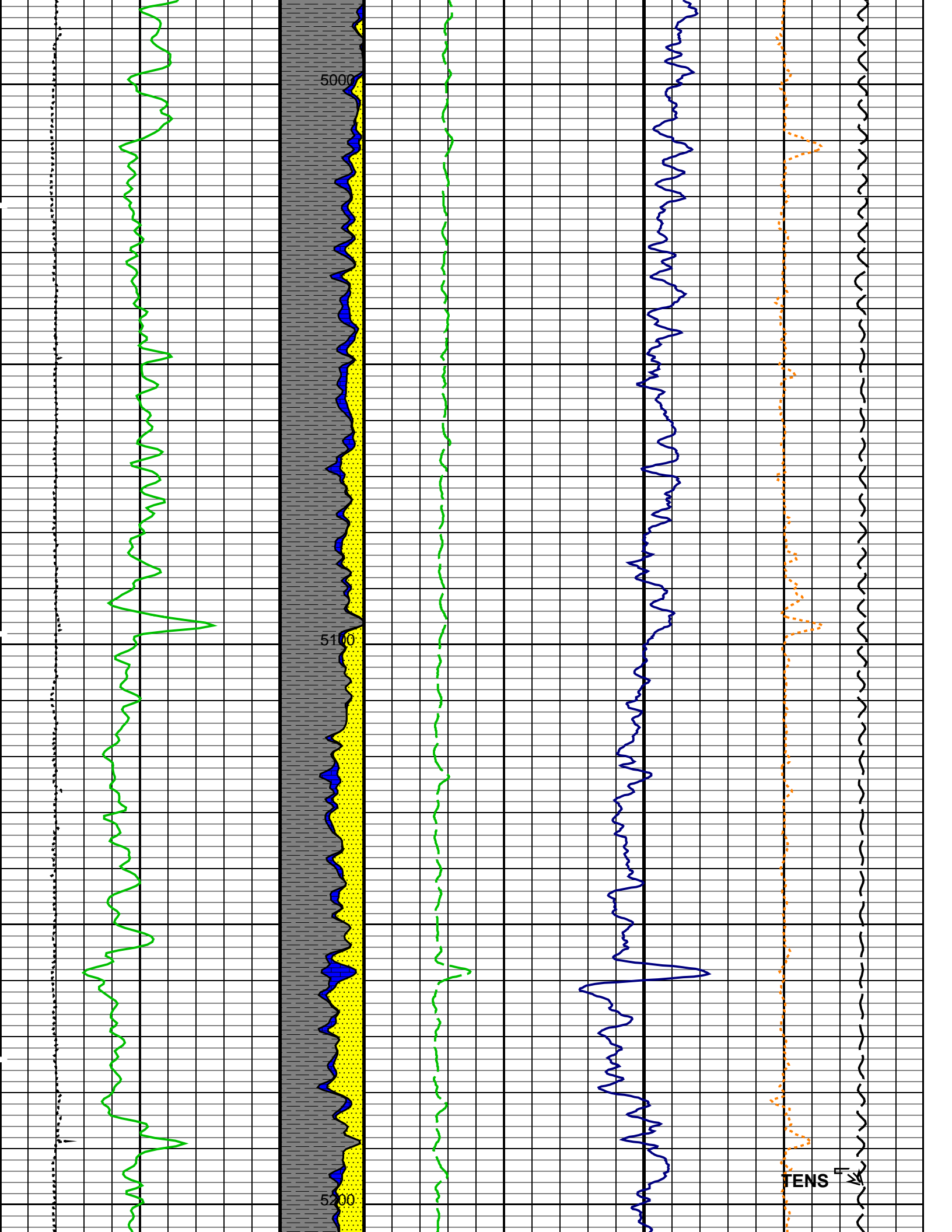
MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*

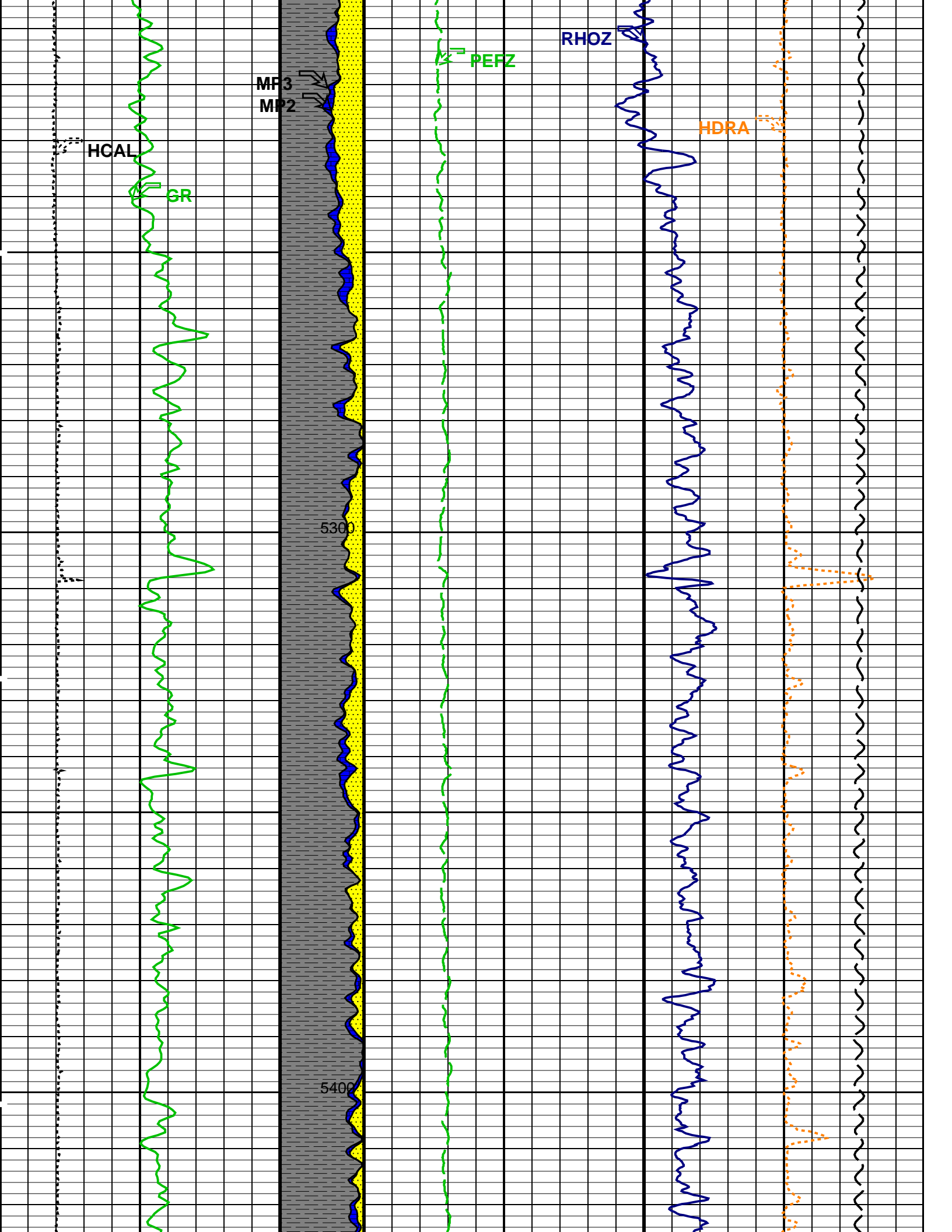


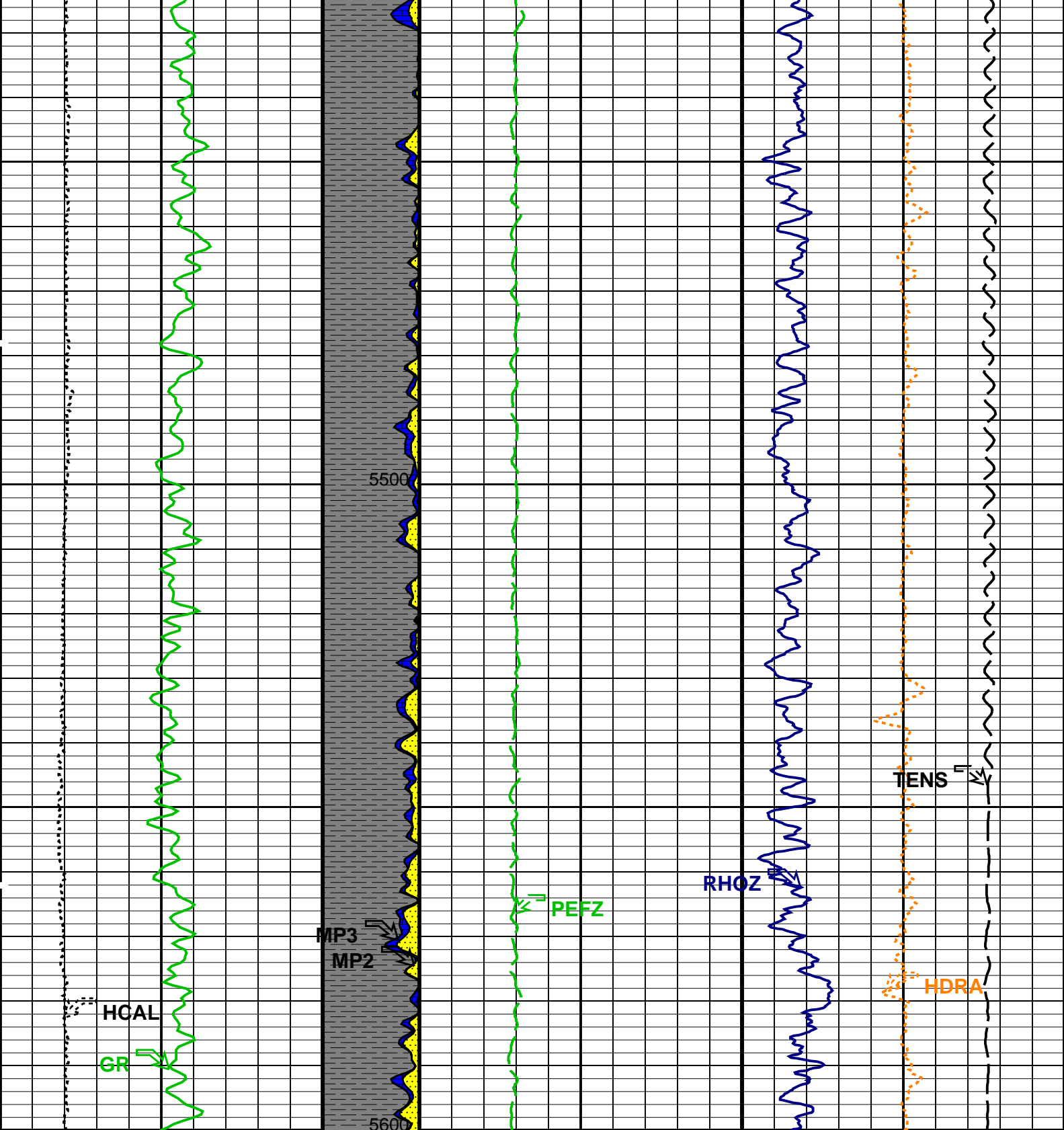












MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*

Gamma Ray Backup	Stuck Stretch (STIT)	0	Std. Res. Formation Pe (PEFZ)	10	Density Correction (HDRA)	0.25
	(F) 50	0	(----		(G/C3)	
Gamma Ray (GR)	LIME	2	Std. Res. Formation Density (RHOZ)			
(GAPI) 200			(G/C3)			
0			3			
Caliper (HCAL)	SAND		Tension (TENS)			
(IN) 16			(LBF)			
6			10000			
	SHALE		0			

Time Mark Every 60 S

SHALE

PIP SUMMARY

Parameters

DLIS Name	Description	Value
HILTB-FTB: High resolution Integrated Logging Tool-DTS		
BHFL_TLD	HILT Nuclear Mud Base	WATER
DHC	Density Hole Correction	BS
GCLF	Germany Coal-like Formation Option	NO
NAAC	HRDD APS Activation Correction	OFF
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	STDRES
NSAR	HRDD Depth Sampling Rate	1.000 in
STI: Stuck Tool Indicator		
STKT	STI Stuck Threshold	2.500 ft
TDD	Total Depth - Driller	8628.0 ft
TDL	Total Depth - Logger	8594.0 ft
System and Miscellaneous		
BS	Bit Size	7.875 in
DFD	Drilling Fluid Density	8.300 lbm/gal

Format: UPPER\_DENS    Vertical Scale: 5" per 100'    Graphics File Created: 27-Nov-2009 21:38

OP System Version: 17C0-154

AITM	17C0-154	HILTD	17C0-154
DTCH	17C0-154		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27-Nov-2009 20:39	8607.0 FT	0.0 FT
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Schlumberger

LOWER DENSITY LOG 5" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27-Nov-2009 20:39
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OP System Version: 17C0-154

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

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
MATR	SANDSTONE	SANDSTONE	8607.0 20:41:37
	SANDSTONE	SANDSTONE	8330.0 20:45:15
POUT	SANDSTONE	SANDSTONE	8607.0 20:41:37
	SANDSTONE	SANDSTONE	8330.0 20:45:15

PIP SUMMARY

Time Mark Every 60 S

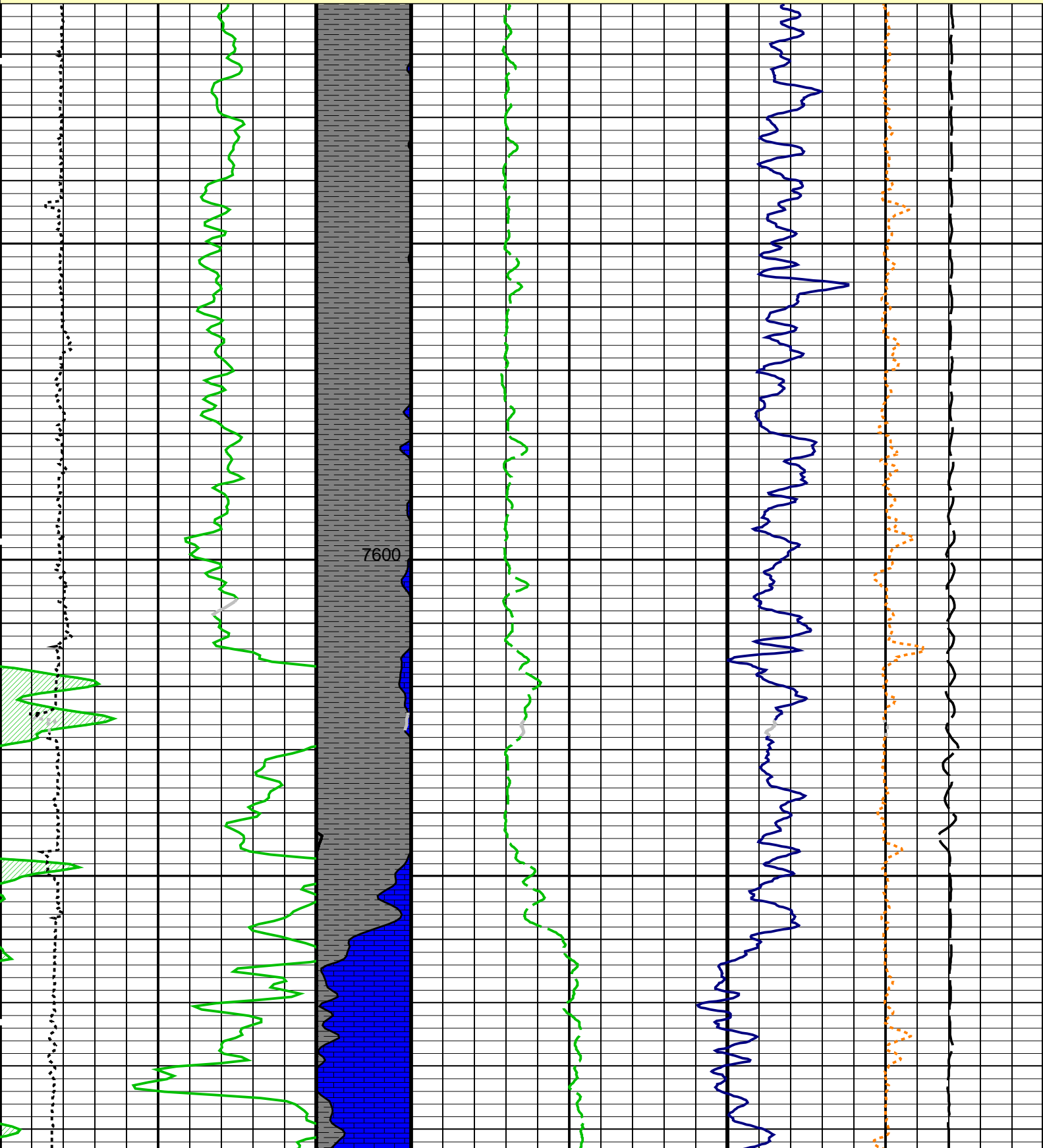
SHALE

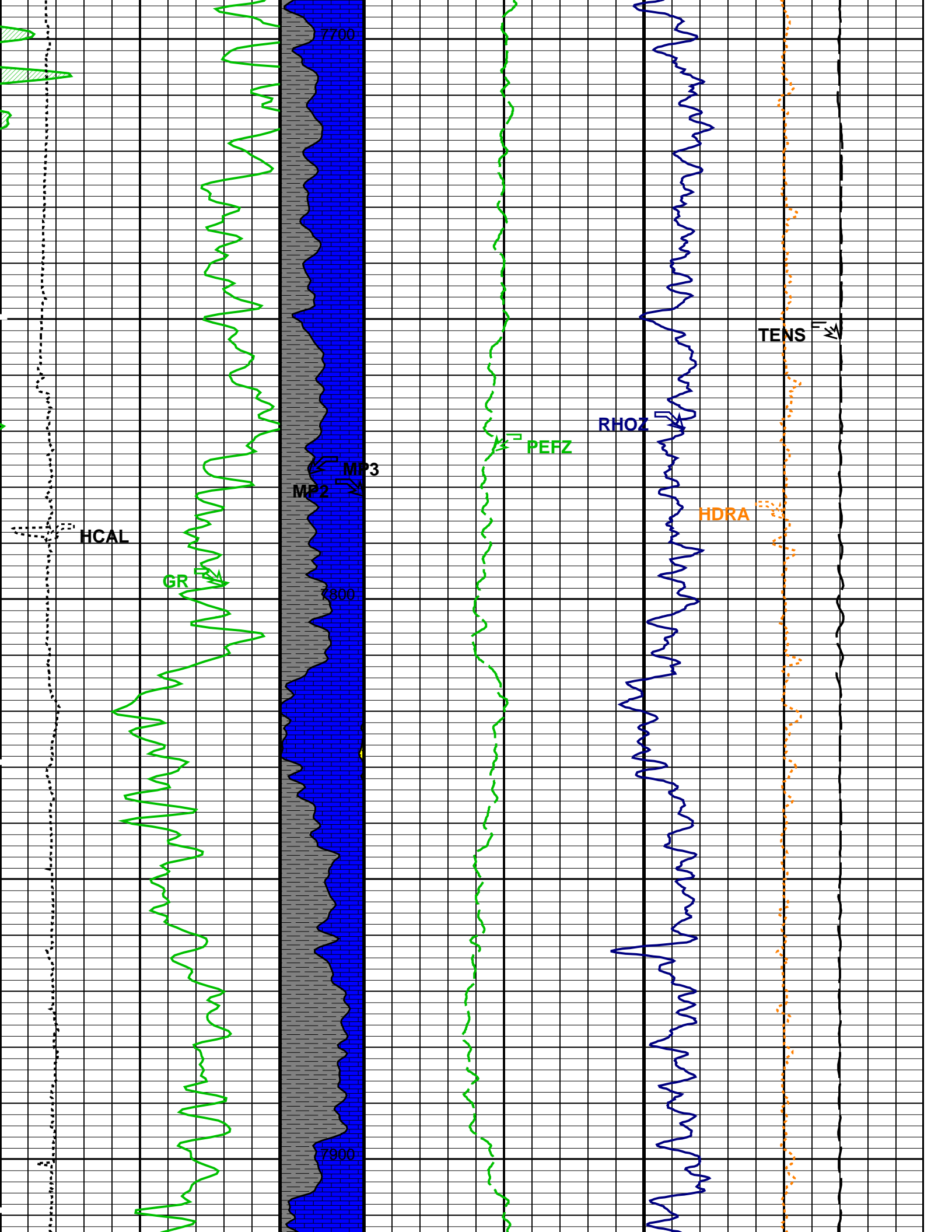
Caliper (HCAL)

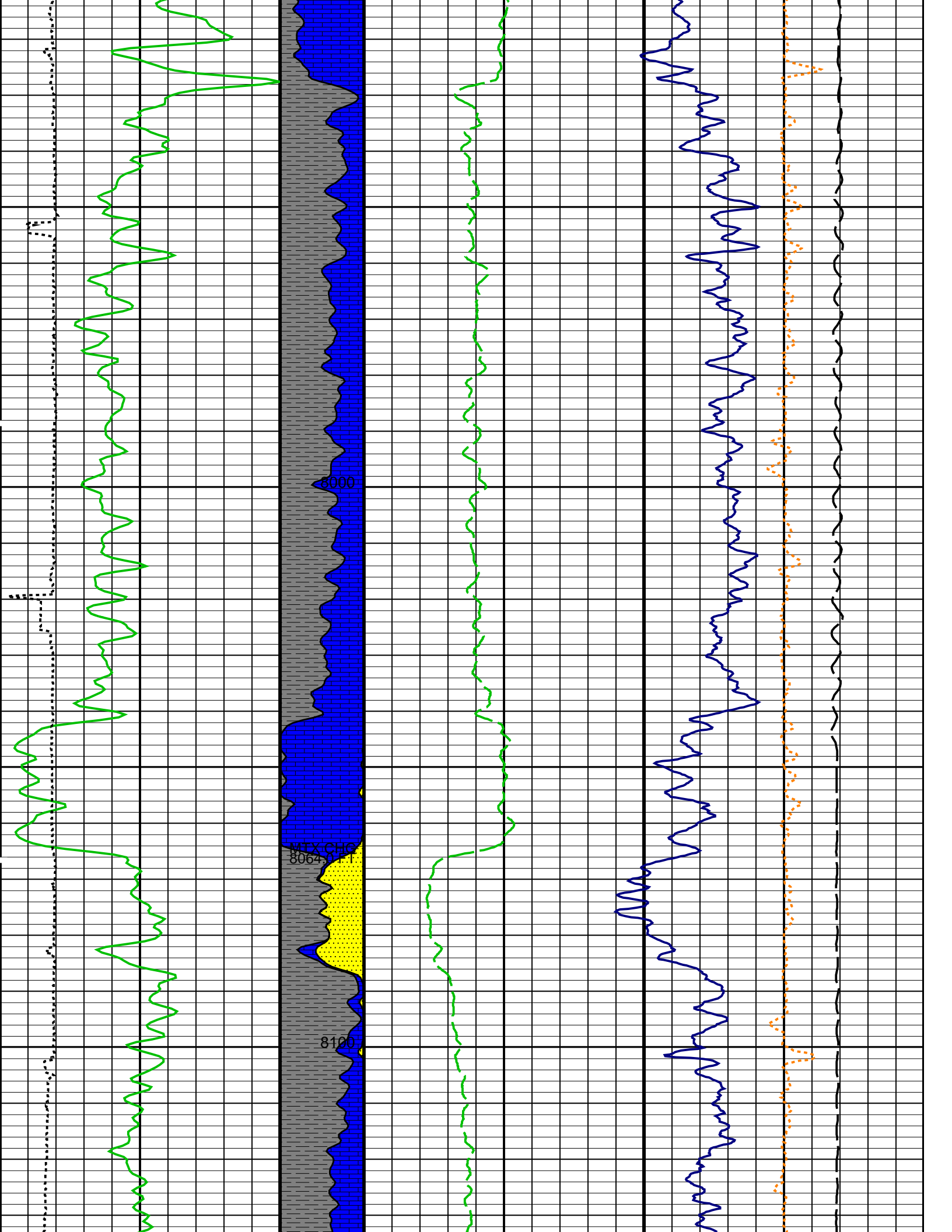
Tension (TENS)

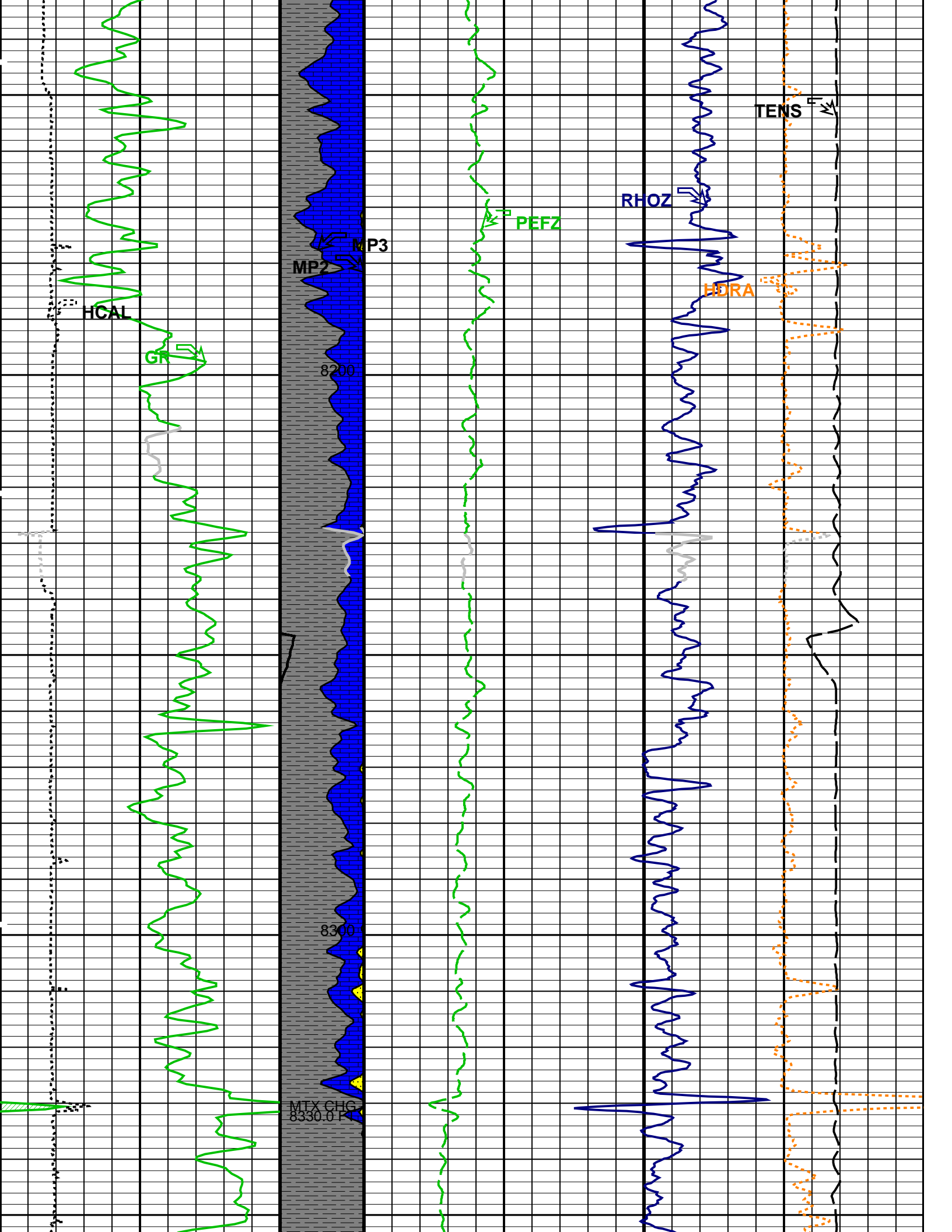
6	Caliper (IN)	16	SAND	10000	Tension (LBF)	0
Gamma Ray (GR) (GAPI)		200	LIME	Std. Res. Formation Density (RHOZ) (G/C3)		
Gamma Ray Backup			Stuck Stretch (STIT)	Std. Res. Formation Pe (PEFZ) (-----)	Density Correction (HDRA) (G/C3)	
		0 (F) 50		0 10	-0.25 0.25	

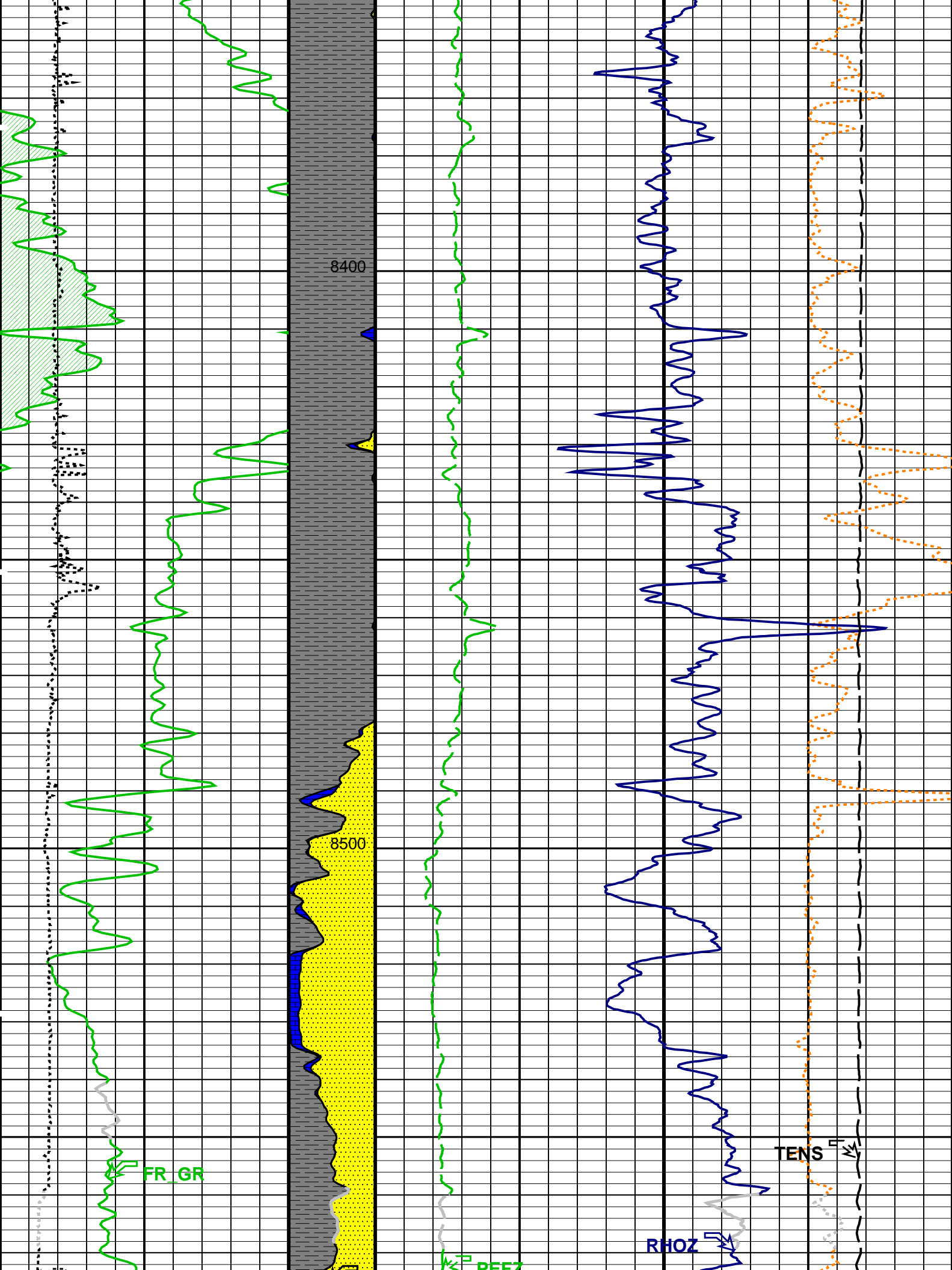
MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*

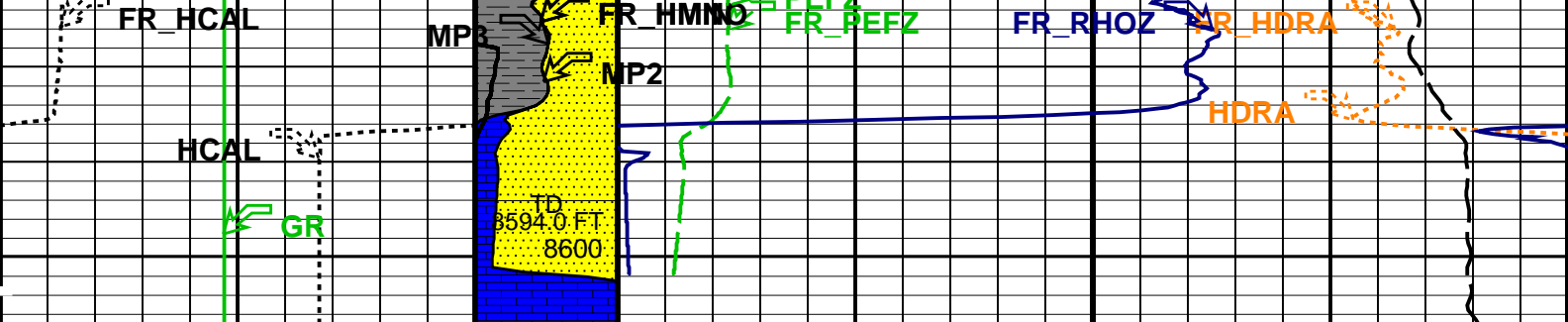




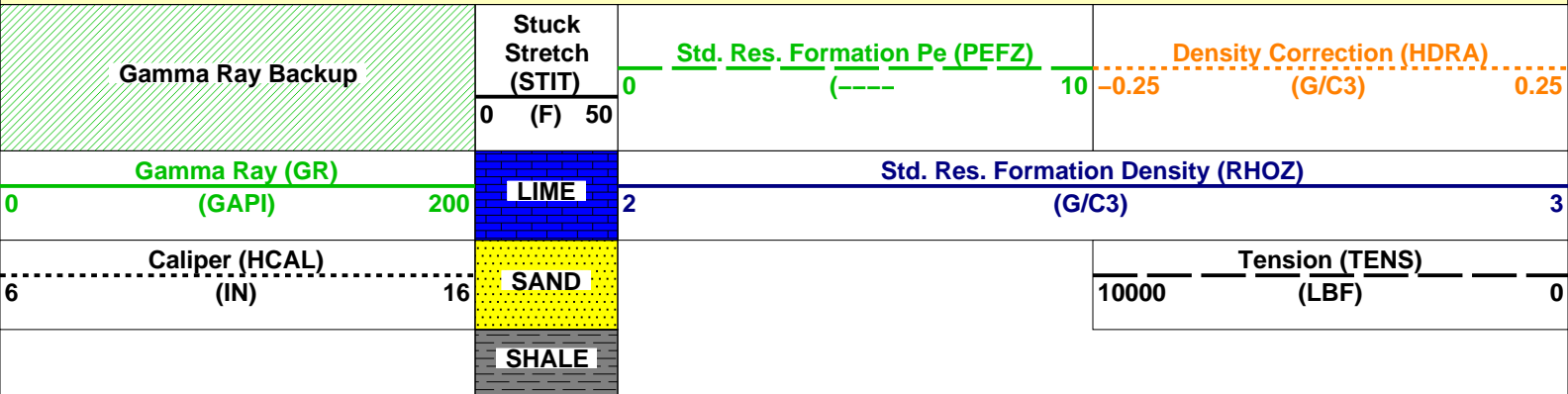








### MAIN PASS: \*\*\* PLATFORM EXPRESS - LITHOLOGY DENSITY \*\*\*



### PIP SUMMARY

Time Mark Every 60 S

## Parameters

DLIS Name	Description	Value	
AIT-M: Array Induction Tool - M			
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
HILTB-FTB: High resolution Integrated Logging Tool-DTS			
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCLF	Germany Coal-like Formation Option	NO	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	68	DEGF
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)	205	DEGF
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	HSTS_HTEM	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation - Real Time			
BDPS	Bulk Density Processing Selector	Standard	
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
CLIM	Caliper Limit for Bad Hole	999	IN
CNPS	Corrected Neutron Porosity Selector	NPHI	
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	PRESENT	
FEXP	Form Factor Exponent	2	
FLDT	Bulk Density Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	

FSON	Sonic Presence Flag	ABSENT	0.01	DF/F
GGRD	Geothermal Gradient			
GTSE	Generalized Temperature Selection	HSTS_HTEM		
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE		
PMAX	PHI Maximum	0.5		CFCF
POUT	Porosity Output Lithology	SANDSTONE		
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71		G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.644		G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877		G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71		G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.644		G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877		G/C3
RTLFL	RT Limit Flag	NO_LIMIT		
RWF	Resistivity of Free Water	0.02		OHMM
SHT	Surface Hole Temperature	68		DEGF
UF	U Fluid	0.398		
UM21	U Matrix (2-Mineral Model, Min-1)	13.77		
UM22	U Matrix (2-Mineral Model, Min-2)	4.779		
UM23	U Matrix (2-Mineral Model, Min-3)	8.997		
UM31	U Matrix (3-Mineral Model, Min-1)	13.77		
UM32	U Matrix (3-Mineral Model, Min-2)	4.779		
UM33	U Matrix (3-Mineral Model, Min-3)	8.997		
STI: Stuck Tool Indicator				
LBFR	Trigger for MAXIS First Reading Label	TDL		
STKT	STI Stuck Threshold	2.5		FT
TDD	Total Depth - Driller	8628.00		FT
TDL	Total Depth - Logger	8594.00		FT
System and Miscellaneous				
BS	Bit Size	7.875		IN
DFD	Drilling Fluid Density	8.30		LB/G
DORL	Depth Offset for Repeat Analysis	0.0		FT
RMFS	Resistivity of Mud Filtrate Sample	0.7275		OHMM
TD	Total Depth	8594		FT
TWS	Temperature of Connate Water Sample	100.00		DEGF

Format: LOWER_DENS		Vertical Scale: 5" per 100'		Graphics File Created: 27-Nov-2009 20:39	
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_006LUP	FN:5	PRODUCER	27-Nov-2009 20:39	



# 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: 14-Oct-2009 17:03 Before: 27-Nov-2009 15:06							
Thru Cal Magnitude - 0	0	0.6205	0.6204	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.271	1.271	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6318	0.6317	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7131	0.7130	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.334	1.334	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.953	1.953	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.949	1.949	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.419	1.419	N/A	N/A	N/A	V
Thru Cal Phase - 0	0	180.2	180.2	N/A	N/A	N/A	DEG

Thru Cal Phase – 1	0	179.2	179.1	N/A	N/A	N/A	DEG
Thru Cal Phase – 2	0	175.6	175.6	N/A	N/A	N/A	DEG
Thru Cal Phase – 3	0	174.9	174.8	N/A	N/A	N/A	DEG
Thru Cal Phase – 4	0	168.7	168.7	N/A	N/A	N/A	DEG
Thru Cal Phase – 5	0	167.0	167.0	N/A	N/A	N/A	DEG
Thru Cal Phase – 6	0	167.0	167.0	N/A	N/A	N/A	DEG
Thru Cal Phase – 7	0	166.2	166.2	N/A	N/A	N/A	DEG

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

Master: 14–Oct–2009 17:03 Before: 27–Nov–2009 15:06

Array Induction SPA Plus	991.0	992.7	992.7	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.6638	0.6620	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9170	0.9196	0.9196	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0006632	0.0006718	N/A	N/A	N/A	V

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

Master: 14–Oct–2009 17:03

Test Loop Gain Correctio – 0	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 1	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 2	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 3	0	1.011	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 4	0	0.9935	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 5	0	0.9888	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	1.007	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 0	0	0.7201	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 1	0	0.7620	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 2	0	0.2948	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 3	0	0.2209	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 4	0	0.1146	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 5	0	–0.009143	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 6	0	0.2984	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 7	0	–0.05307	N/A	N/A	N/A	N/A	DEG

#### Array Induction Tool – M Wellsite Calibration – Sonde Error Correction

Master: 14–Oct–2009 17:03

R Sonde Error Correction – 0	0	–69.04	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	172.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 2	0	116.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 3	0	64.65	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	26.78	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	12.75	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	11.98	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	–2.480	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	–259.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	103.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	63.05	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	–22.90	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	21.47	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	–15.50	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	–4.060	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	–4.950	N/A	N/A	N/A	N/A	MM/M

#### Array Induction Tool – M Wellsite Calibration – Mud Gain Correction

Master: 14–Oct–2009 17:03

Coarse – Mag, Real, Imag – 0	0	0.8551	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 1	0	0.8551	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 2	0	0.8551	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 0	0	0.8573	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 1	0	0.8573	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 2	0	0.8573	N/A	N/A	N/A	N/A

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

Before: 27–Nov–2009 15:10

BS Window Ratio	0.7143	N/A	0.7123	N/A	N/A	N/A	
BS Window Sum	8626	N/A	8634	N/A	N/A	N/A	CPS
SS Window Ratio	0.4904	N/A	0.4907	N/A	N/A	N/A	
SS Window Sum	9782	N/A	9761	N/A	N/A	N/A	CPS
LS Window Ratio	0.2965	N/A	0.2929	N/A	N/A	N/A	
LS Window Sum	1030	N/A	1027	N/A	N/A	N/A	CPS

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

Before: 27–Nov–2009 15:10

BS PM High Voltage (Command)	1475	N/A	1475	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1678	N/A	1679	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1475	N/A	1481	N/A	N/A	N/A	V

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

Before: 27–Nov–2009 15:10

BS Crystal Resolution	10.42	N/A	10.53	N/A	N/A	N/A	%
SS Crystal Resolution	9.900	N/A	9.800	N/A	N/A	N/A	%
LS Crystal Resolution	10.04	N/A	10.02	N/A	N/A	N/A	%

High resolution Integrated Logging Tool–DTS Wellsite Calibration – MCFL Calibration							
Before: 27–Nov–2009 15:06							
Raw B0 Resistivity	3875	N/A	3854	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3794	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3790	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool–DTS Wellsite Calibration – HILT Caliper Calibration							
Before: 27–Nov–2009 15:02							
HILT Caliper Zero Measurement	8.000	N/A	8.581	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.74	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Detector Calibration							
Before: 27–Nov–2009 15:01							
Gamma Ray Background	30.00	N/A	83.51	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	178.8	N/A	178.8	N/A	N/A	16.26	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: 8–Oct–2009 13:16 Before: 27–Nov–2009 15:03							
CNTC Background	26.34	26.34	26.72	N/A	N/A	3.951	CPS
CFTC Background	27.85	27.85	27.82	N/A	N/A	4.178	CPS
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement							
Master: 8–Oct–2009 13:16							
Thermal Near Corr. (Tank)	5800	5423	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2272	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.387	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration							
Before: 27–Nov–2009 19:59							
Z–Axis Acceleration	32.19	N/A	32.07	N/A	N/A	N/A	F/S2
High resolution Integrated Logging Tool–DTS Master Calibration – Inversion results							
Master: 21–Nov–2009 12:11							
Rho Aluminum	2.596	2.605	--	--	--	--	G/C3
Rho Magnesium	1.686	1.687	--	--	--	--	G/C3
Pe Aluminum	2.570	2.559	--	--	--	--	
Pe Magnesium	2.650	2.626	--	--	--	--	
High resolution Integrated Logging Tool–DTS Master Calibration – Deviation Summary							
Master: 21–Nov–2009 12:11							
BS Average Deviation	0	0.2944	--	--	--	--	%
BS Max Deviation	0	0.7618	--	--	--	--	%
SS Average Deviation	0	0.4807	--	--	--	--	%
SS Max Deviation	0	2.268	--	--	--	--	%
LS Average Deviation	0	1.301	--	--	--	--	%
LS Max Deviation	0	2.265	--	--	--	--	%
The GLS–VJ source activity is acceptable.							
The HGNS Neutron Master Calibration was done with the following parameters :							
NCT–B Water Temperature	57.0	DEGF.					
Thermal Housing Size	3.365	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
0	Master	0.6205		0.6100	180.2		197.0
	Before	0.6204			180.2		





1	Master	1.271		1.270	179.2		196.0
	Before	1.271			179.1		
2	Master	0.6318		0.6200	175.6		192.0
	Before	0.6317			175.6		
3	Master	0.7131		0.7000	174.9		191.0
	Before	0.7130			174.8		
4	Master	1.334		1.340	168.7		185.0
	Before	1.334			168.7		
5	Master	1.953		1.960	167.0		182.0
	Before	1.953			167.0		
6	Master	1.949		1.960	167.0		181.0
	Before	1.949			167.0		
7	Master	1.419		1.410	166.2		175.0
	Before	1.419			166.2		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 14-Oct-2009 17:03				Before: 27-Nov-2009 15:06			

















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			992.7	Master			0.6638
Before			992.7	Before			0.6620
	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			0.9196	Master			0.0006632
Before			0.9196	Before			0.0006718
	0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 14-Oct-2009 17:03				Before: 27-Nov-2009 15:06			

















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	1.017				0.7201		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.014				0.7620		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.015				0.2948		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.011				0.2209		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9935				0.1146		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9888				-0.009143		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9937				0.2984		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.007				-0.05307		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)




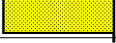


Array Induction Tool – M Master Calibration
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## Electronics Calibration Check – Auxiliary







Phase	Array Induction SPA Plus MV			Value	Phase	Array Induction SPA Zero MV			Value
Master				992.7	Master				0.6638
	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				0.9196	Master				0.0006632
	0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)			-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)	
Master: 14-Oct-2009 17:03									




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	1.017				0.7201		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
1	1.014				0.7620		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
2	1.015				0.2948		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
3	1.011				0.2209		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
4	0.9935				0.1146		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
5	0.9888				-0.009143		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
6	0.9937				0.2984		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
7	1.007				-0.05307		
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal) 3.000 (Maximum)
Master: 14-Oct-2009 17:03							




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	-69.04				-259.4		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	172.8				103.1		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	116.8				63.05		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)
3	64.65				-22.90		
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		-250.0 (Minimum)	0 (Nominal) 250.0 (Maximum)
4	26.78				21.47		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal) 63.00 (Maximum)
5	12.75				-15.50		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal) 50.00 (Maximum)
6	11.98				-4.060		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)
7	-2.480				-4.950		
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)




	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
Master: 14-Oct-2009 17:03							
Array Induction Tool – M Master Calibration							
Mud Gain Correction							
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag	
0	0.8551				0.8573		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
1	0.8551				0.8573		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
2	0.8551				0.8573		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
Master: 14-Oct-2009 17:03							

High resolution Integrated Logging Tool–DTS / Equipment Identification			
Primary Equipment:			
HILT high-Resolution Mechanical Sonde	HRMS – B		
HILT Rxo Gamma-ray Device	HRGD – B	1732	
HILT Micro Cylindrically Focused Log Dev	MCFL –		
GR Logging Source	GLS – VJ	5416	
HILT High Res. Control Cartridge	HRCC – B		
HILT Gamma-Ray Neutron Sonde–DTS	HGNS – B	1927	
HGNS Gamma-Ray Device	HGR –		
HGNS Neutron Detector with Alpha Source	HCNT –		
Auxiliary Equipment:			
Neutron Calibration Tank	NCT – B		
Gamma Source Radioactive	GSR – U/Y		
HGNS Housing	HGNH –		

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				0.7123	Before				0.4907	Before				0.2929
	0.6786 (Minimum)	0.7143 (Nominal)	0.7500 (Maximum)		0.4659 (Minimum)	0.4904 (Nominal)	0.5150 (Maximum)			0.2817 (Minimum)	0.2965 (Nominal)	0.3114 (Maximum)		
Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
Before				8634	Before				9761	Before				1027
	8194 (Minimum)	8626 (Nominal)	9057 (Maximum)		9293 (Minimum)	9782 (Nominal)	10270 (Maximum)			978.4 (Minimum)	1030 (Nominal)	1081 (Maximum)		
Before: 27–Nov–2009 15:10														



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				1475	Before				1679	Before				1481
	1375 (Minimum)	1475 (Nominal)	1575 (Maximum)		1578 (Minimum)	1678 (Nominal)	1778 (Maximum)			1375 (Minimum)	1475 (Nominal)	1575 (Maximum)		
Before: 27–Nov–2009 15:10														




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			10.53	Before			9.800	Before			10.02
	9.417 (Minimum)	10.42 (Nominal)	11.42 (Maximum)		8.900 (Minimum)	9.900 (Nominal)	10.90 (Maximum)		9.045 (Minimum)	10.04 (Nominal)	11.04 (Maximum)
Before: 27–Nov–2009 15:10											

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			3854	Before			3794	Before			3790





3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)
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

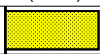
Before: 27–Nov–2009 15:06

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			8.581	Before			12.74
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)		9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)
Before: 27–Nov–2009 15:02							


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		83.51	Before		178.8	Before		165.0	
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	162.6 (Minimum)	178.8 (Nominal)	195.1 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: 27–Nov–2009 15:01





High resolution Integrated Logging Tool–DTS Wellsite Calibration							
Zero Measurement							
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value
Master			26.34	Master			27.85
Before			26.72	Before			27.82
5.000 (Minimum)			26.34 (Nominal)	40.00 (Maximum)			
5.000 (Minimum)			27.85 (Nominal)	40.00 (Maximum)			
Master: 8–Oct–2009 13:16				Before: 27–Nov–2009 15:03			



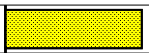
High resolution Integrated Logging Tool–DTS Wellsite Calibration									
Ratio Measurement									
Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value	
Master		5423	Master		2272	Master		2.387	
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)	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		32.07	
	31.53 (Minimum)	32.19 (Nominal)	32.84 (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			2.605	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			2.559	Master			2.626
	2.470 (Minimum)	2.570 (Nominal)	2.670 (Maximum)		2.550 (Minimum)	2.650 (Nominal)	2.750 (Maximum)
Master: 21–Nov–2009 12:11							

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		0.2944	Master		0.4807	Master		1.301	
	-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	

Value	ES Min (Minimum)	ES Max (Maximum)	Value	ES Min (Minimum)	ES Max (Maximum)	Value	ES Min (Minimum)	ES Max (Maximum)	Value	ES Min (Minimum)	ES Max (Maximum)						
Master			0.7618	Master			2.268	Master			2.265						
-1.600 (Minimum)			0 (Nominal)			1.600 (Maximum)			-3.500 (Minimum)			0 (Nominal)			3.500 (Maximum)		
Master: 21-Nov-2009 12:11																	