



Company: **BATTELLE MEMORIAL INSTITUTE**

Well: **AEP #1**

Field: **APPALACHIAN POWER CO.**

County: **MASON** STATE: **WEST VIRGINIA**

**PLATFORM EXPRESS
ARRAY INDUCTION
LITHO-DENSITY / COMPENSATED NEUTRON**

COUNTY: MASON
Field: APPALACHIAN POWER CO.
Location: 6044 FEET W OF LONG 81 DEG 55"
Well: AEP #1
Company: BATTELLE MEMORIAL INSTITUTE

LOCATION		6044 FEET W OF LONG 81 DEG 55"	Elev.: K.B. 608 ft
		8118 FEET S OF LAT 39 DEG 00"	G.L. 590 ft
			D.F. 603 ft
Permanent Datum:	GROUND LEVEL	Elev.: 590 ft	
Log Measured From:	KELLY BUSHING	18.0 ft above Perm. Datum	
Drilling Measured From:	KELLY BUSHING		
API Serial No.	WATERSHED	QUADRANGLE	DISTRICT
47-053-0423	MIDDLE OHIO #2	NEW HAVEN WV-OH	GRAHAM

Logging Date	Run 1	Run 2	Run
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			
PH			
Source Of Sample			
RM @ Measured Temperature	@	@	
RMF @ Measured Temperature	@	@	
RMC @ Measured Temperature	@	@	
Source RMF			
RMC			
RM @ MRT	@	@	
RMF @ MRT			
Maximum Recorded Temperatures			
Circulation Stopped			
Time			
Logger On Bottom			
Time			
Unit Number			
Location			
Recorded By			
JAMES NOEL			
Witnessed By			
BILL RIKE			

Logging Date	10-Jun-2003
Run Number	ONE
Depth Driller	1816 ft
Schlumberger Depth	1802 ft
Bottom Log Interval	1816 ft
Top Log Interval	0 ft
Casing Driller Size @ Depth	20,000 in @ 235 ft
Casing Schlumberger	224 ft
Bit Size	17,500 in
Type Fluid In Hole	FRESH MUD
Density	8.9 lbm/gal
Fluid Loss	
PH	
Source Of Sample	BOREHOLE
RM @ Measured Temperature	0.023 ohm.m @ 78 degF
RMF @ Measured Temperature	0.023 ohm.m @ 78 degF
RMC @ Measured Temperature	0.023 ohm.m @ 78 degF
Source RMF	
RMC	
RM @ MRT	0.023 @ 78
RMF @ MRT	0.023 @ 78
Maximum Recorded Temperatures	78 degF
Circulation Stopped	10-Jun-2003
Time	6:00
Logger On Bottom	10-Jun-2003
Time	9:30
Unit Number	3046
Location	CHARLESTON, WV
Recorded By	JAMES NOEL
Witnessed By	BILL RIKE

Logging Date	Run 1	Run 2	Run
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			
PH			
Source Of Sample			
RM @ Measured Temperature	@	@	
RMF @ Measured Temperature	@	@	
RMC @ Measured Temperature	@	@	
Source RMF			
RMC			
RM @ MRT	@	@	
RMF @ MRT			
Maximum Recorded Temperatures			
Circulation Stopped			
Time			
Logger On Bottom			
Time			
Unit Number			
Location			
Recorded By			
JAMES NOEL			
Witnessed By			
BILL RIKE			

DEPTH SUMMARY LISTING

Date Created: 10-JUN-2003 8:48:24

Depth System Equipment

Depth Measuring Device	Tension Device	Logging Cable
Type: IDW-B	Type: CMTD-B/A	Type: 7-39P
Serial Number: 1755	Serial Number: 1374	Serial Number: 2138
Calibration Date: 15-APR-2003	Calibration Date: 12-MAY-2003	Length: 16300.00 FT
Calibrator Serial Number: 1	Calibrator Serial Number: -999	Conveyance Method: Wireline
Calibration Cable Type: 7-39P	Calibration Gain: 0.93	Rig Type: LAND
Wheel Correction 1: -5	Calibration Offset: -2959.00	
Wheel Correction 2: -3		

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	230.00 FT
Rig Up Length At Bottom:	230.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	0.30 FT
Tool Zero Check At Surface:	0.20 FT

Depth Control Remarks

<ol style="list-style-type: none"> 1. THIS IS THE FIRST RUN IN HOLE 2. IDW USED AS PRIMARY DEPTH CONTROL 3. 4. 5. 6.
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DISCLAIMER

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OTHER SERVICES1	OTHER SERVICES2
OS1: CALIPER	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
IDW USED AS PRIMARY DEPTH CONTROL	
FIRST RUN IN HOLE	
MATRIX DENSITY AS NOTED ON LOG	

MUD RESISTIVITY FOUND FROM AHMFC IN BOREHOLE
 BOREHOLE TEMPERATURE FOUND FROM AHTCA

THANK YOU FOR CHOOSING SCHLUMBERGER!!
 YOUR CREW TODAY: L. SMITH

RUN 1		
SERVICE ORDER #:	10613743	
PROGRAM VERSION:	10C0-306	
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

RUN 2		
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

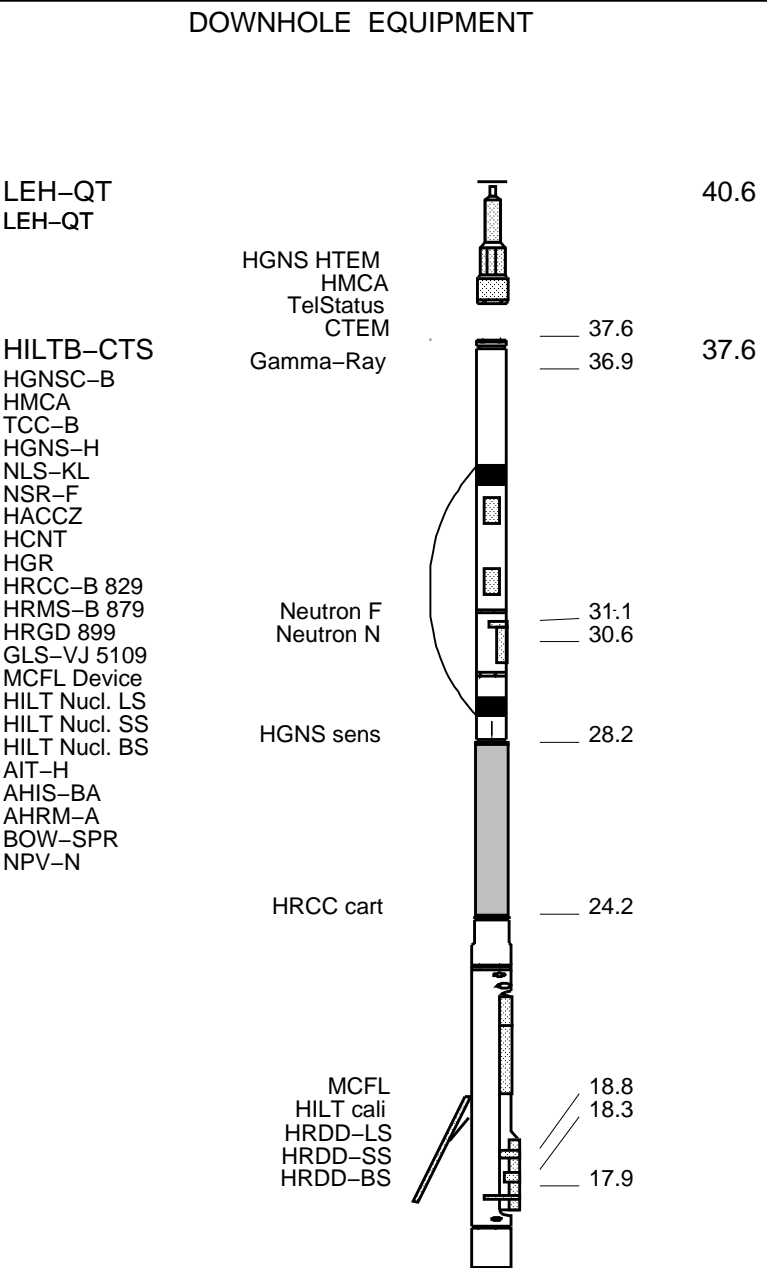
EQUIPMENT DESCRIPTION

RUN 1

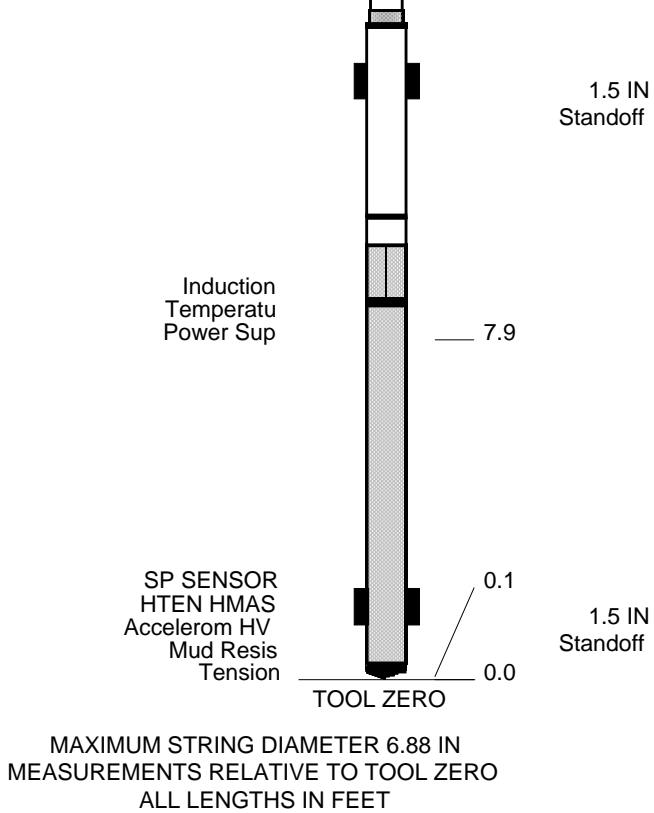
SURFACE EQUIPMENT

WITM (CTS)-A
 GSR-U/Y
 NCT-B
 CNB-AB

NCS-VB



RUN 2



Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_006LUP FN:9 PRODUCER 10-Jun-2003 09:45

OP System Version: 10C0-306

MCM

HILTB-CTS OP10-KP1

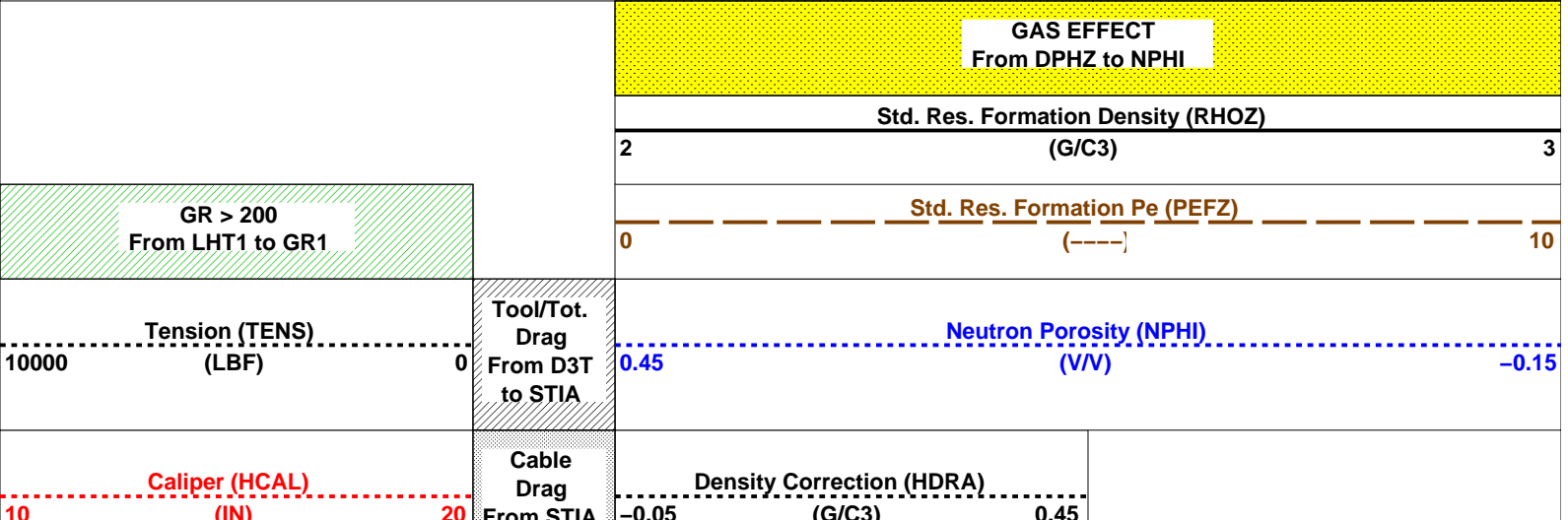
Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
LBFR	TDL	STI	1735.3 09:49:17
TD	1802 FT	1816 FT	1809.8 09:47:56
TDL	1802.00 FT	1816.00 FT	1811.1 09:47:54

PIP SUMMARY

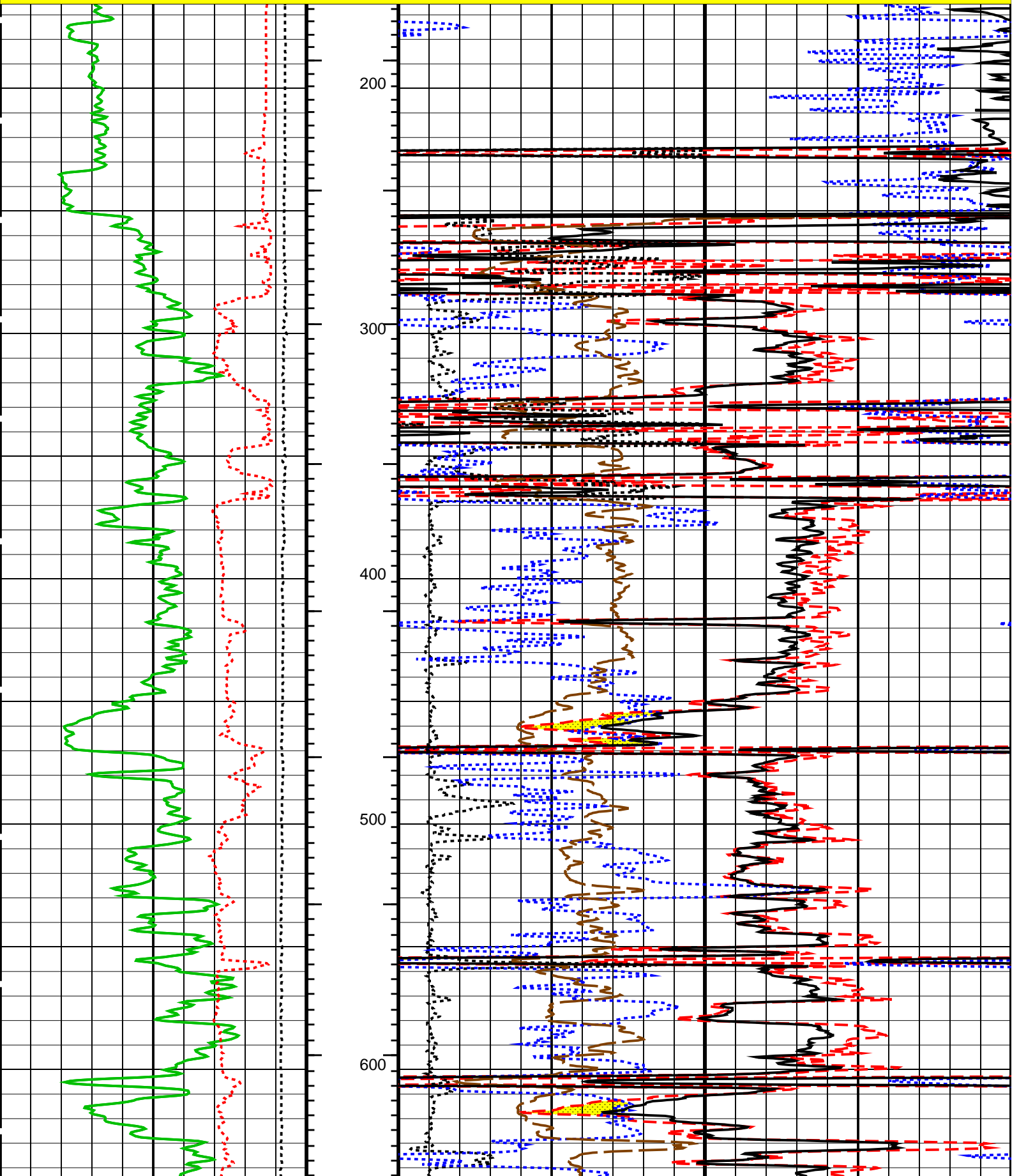
- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

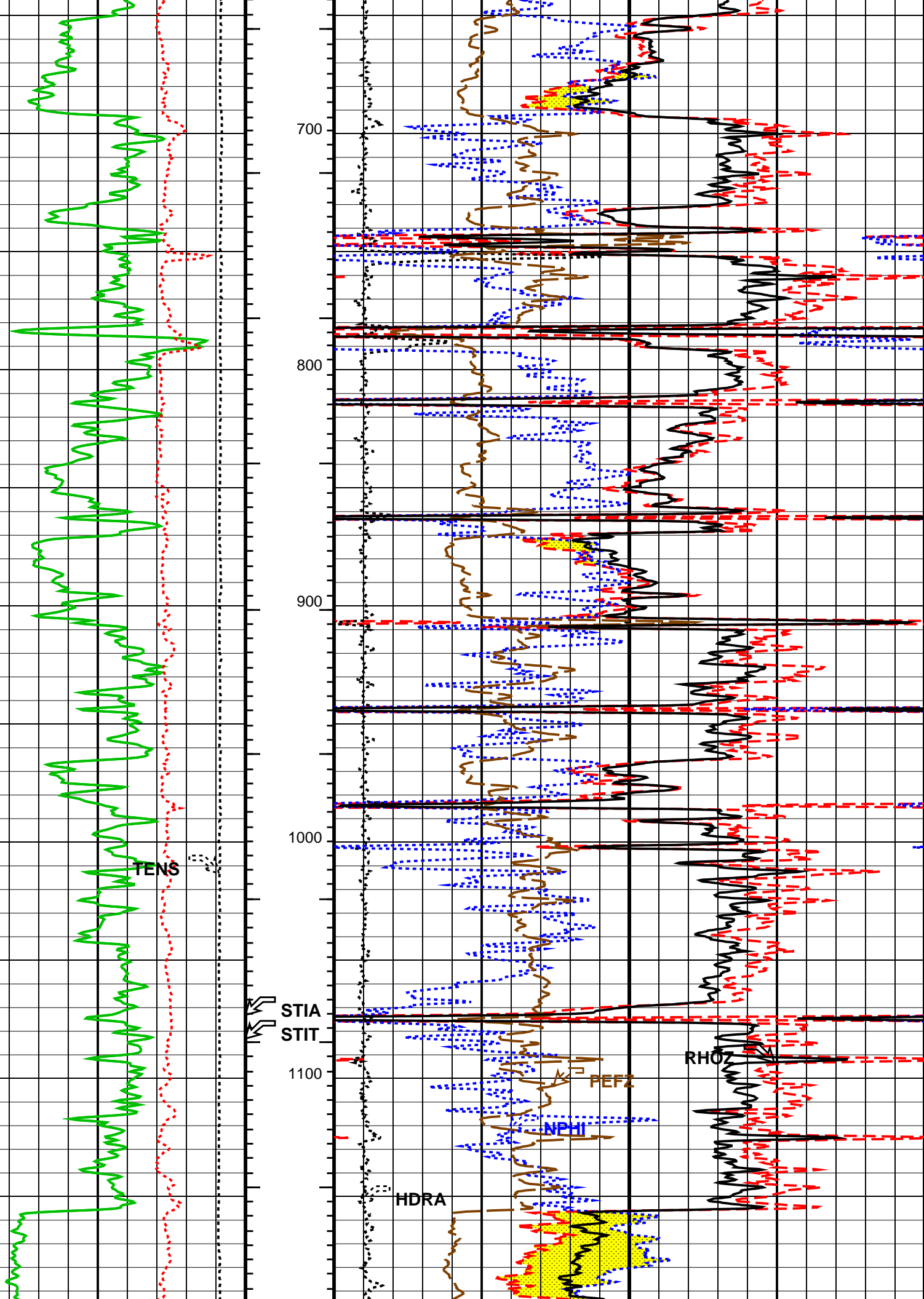
Time Mark Every 60 S

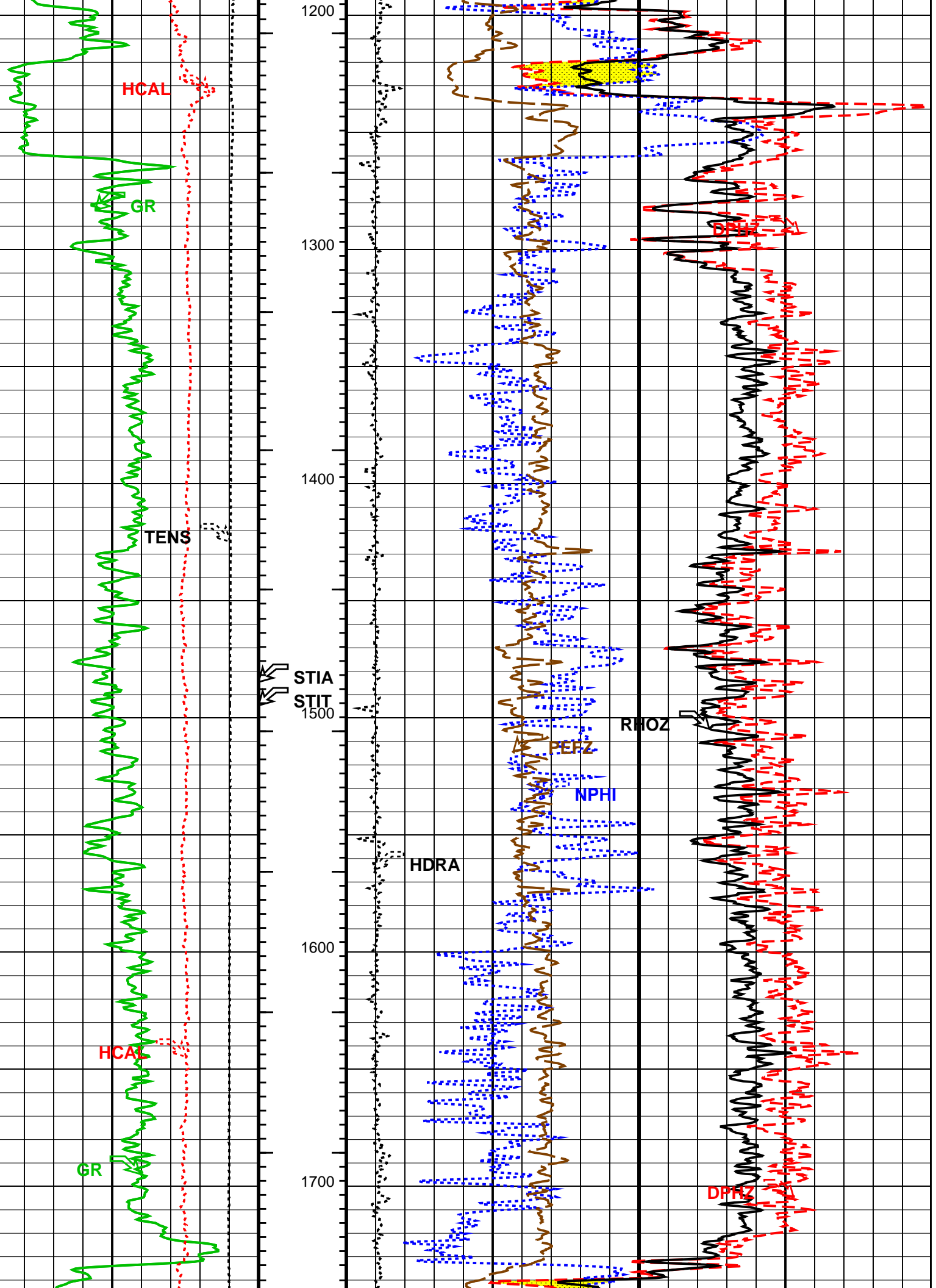


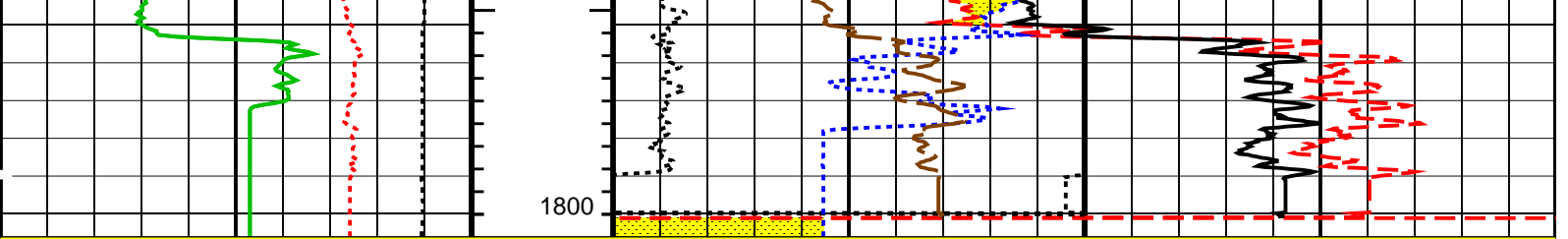
	From CHA to STIT		
Gamma Ray (GR) (GAPI)	Stuck Stretch (STIT) (F)	Std. Res. Density Porosity (DPHZ) (VV)	
0 200	0 50	0.3 -0.1	

MANI PASS 2 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE









MANI PASS 2 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

Gamma Ray (GR) (GAPI)	0	200	Stuck Stretch (STIT) (F)	0	50	Std. Res. Density Porosity (DPHZ) (V/V)	0.3	-0.1
Caliper (HCAL) (IN)	10	20	Cable Drag From STIA to STIT	-0.05	0.45	Density Correction (HDRA) (G/C3)		
Tension (TENS) (LBF)	10000	0	Tool/Tot. Drag From D3T to STIA	0.45		Neutron Porosity (NPHI) (V/V)		-0.15
GR > 200 From LHT1 to GR1						Std. Res. Formation Pe (PEFZ) (-----)	0	10
						Std. Res. Formation Density (RHOZ) (G/C3)	2	3
						GAS EFFECT From DPHZ to NPHI		

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-CTS: High resolution Integrated Logging Tool-CTS		
BHS	Borehole Status	OPEN
DHC	Density Hole Correction	BS
FD	Fluid Density	1.1 G/C3
GCSE	Generalized Caliper Selection	HCAL
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE
MDEN	Matrix Density	2.68 G/C3
NAAC	HRDD APS Activation Correction	OFF
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	HiRes
NSAR	HRDD Depth Sampling Rate	1 IN
HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN
FCD	Future Casing (Outer) Diameter	0 IN
GCSE	Generalized Caliper Selection	HCAL
HVCS	Integrated Hole Volume Caliper Selection	HCAL
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE
STI: Stuck Tool Indicator		
LBFR	Trigger for MAXIS First Reading Label	STI
STKT	STI Stuck Threshold	1.1 FT
TDD	Total Depth - Driller	1816.00 FT
TDL	Total Depth - Logger	1816.00 FT
PERT: Preliminary Evaluation - Real Time		
BHS	Borehole Status	OPEN
GCSE	Generalized Caliper Selection	HCAL
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE
System and Miscellaneous		
BS	Bit Size	17.500 IN
DFD	Drilling Fluid Density	8.90 LB/G
ED	Total Depth	1816.00 FT

OP System Version: 10C0-306
 MCM

HILTB-CTS OP10-KP1

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_006LUP FN:9 PRODUCER 10-Jun-2003 09:45

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_006LUP FN:9 PRODUCER 10-Jun-2003 09:45 1806.0 FT -2.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2976.99 F3
 Cement Volume = 2976.99 F3 (assuming 0.00 IN casing O.D.)
 Computed from 1806.0 FT to 17.5 FT using data channel(s) HCAL

OP System Version: 10C0-306
 MCM

HILTB-CTS OP10-KP1

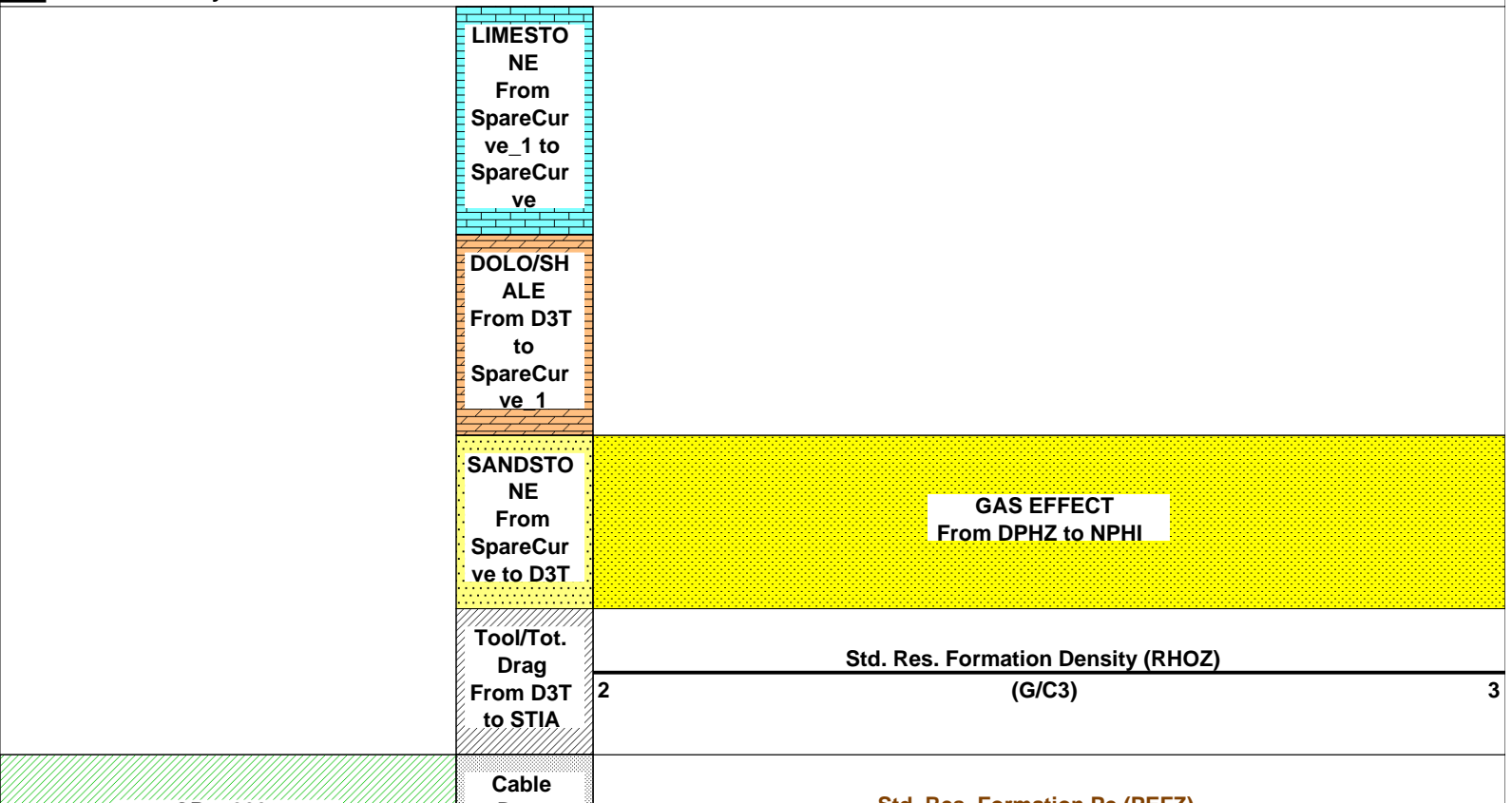
Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
LBFR	TDL	STI	1735.3 09:49:17
TD	1802 FT	1816 FT	1809.8 09:47:56
TDL	1802.00 FT	1816.00 FT	1811.1 09:47:54

PIP SUMMARY

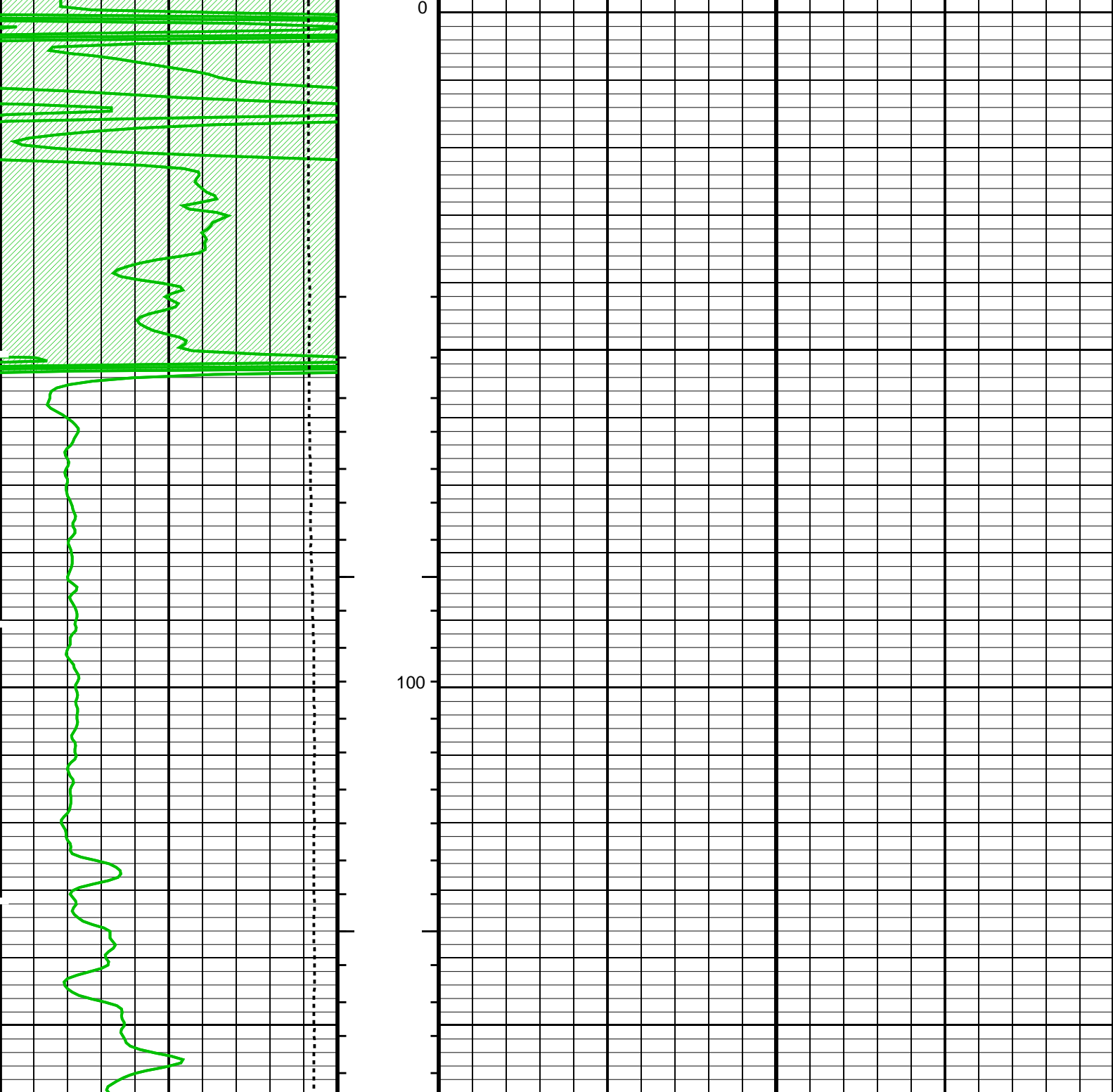
- ┆ Integrated Hole Volume Minor Pip Every 10 F3
- ┆ Integrated Hole Volume Major Pip Every 100 F3
 - ┆ Integrated Cement Volume Minor Pip Every 10 F3
 - ┆ Integrated Cement Volume Major Pip Every 100 F3

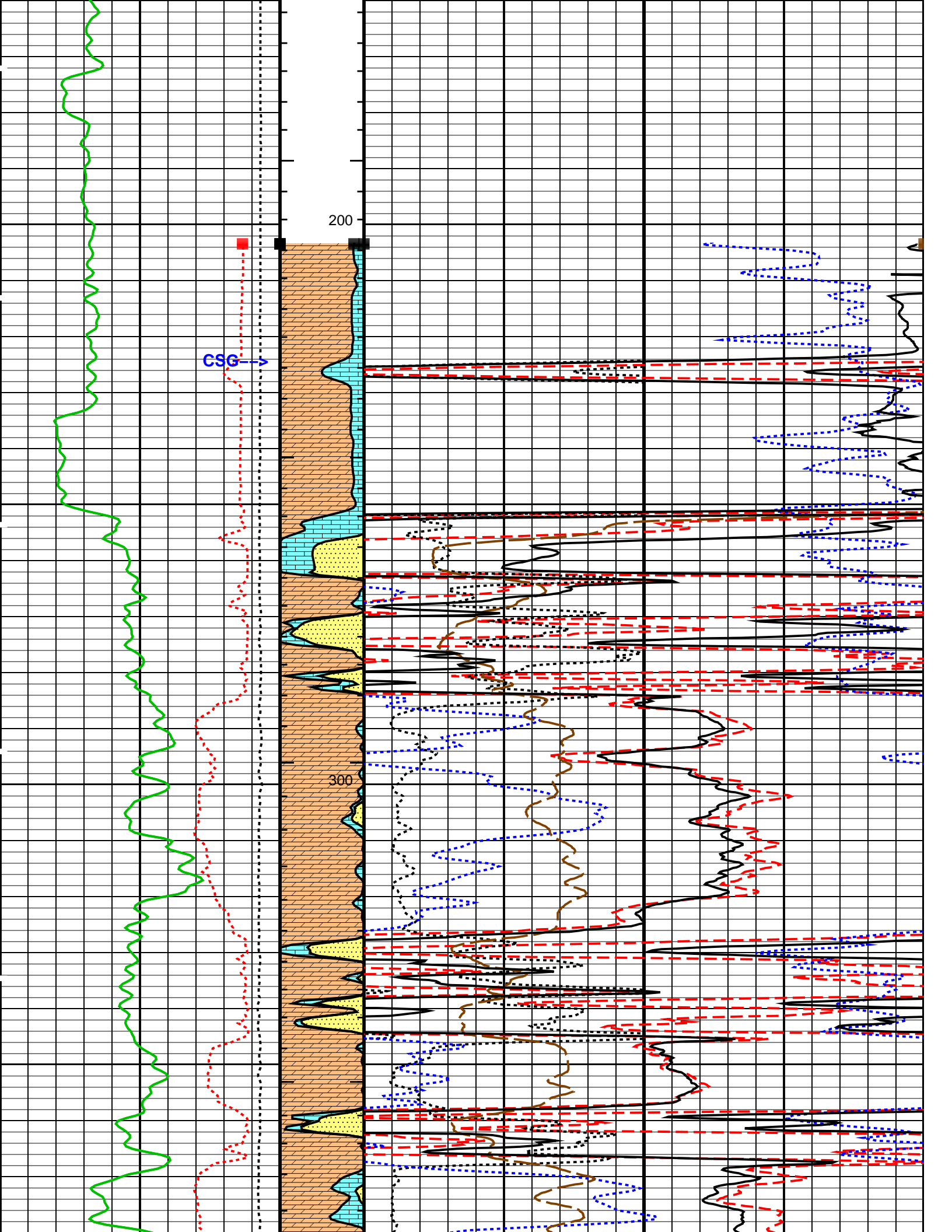
Time Mark Every 60 S

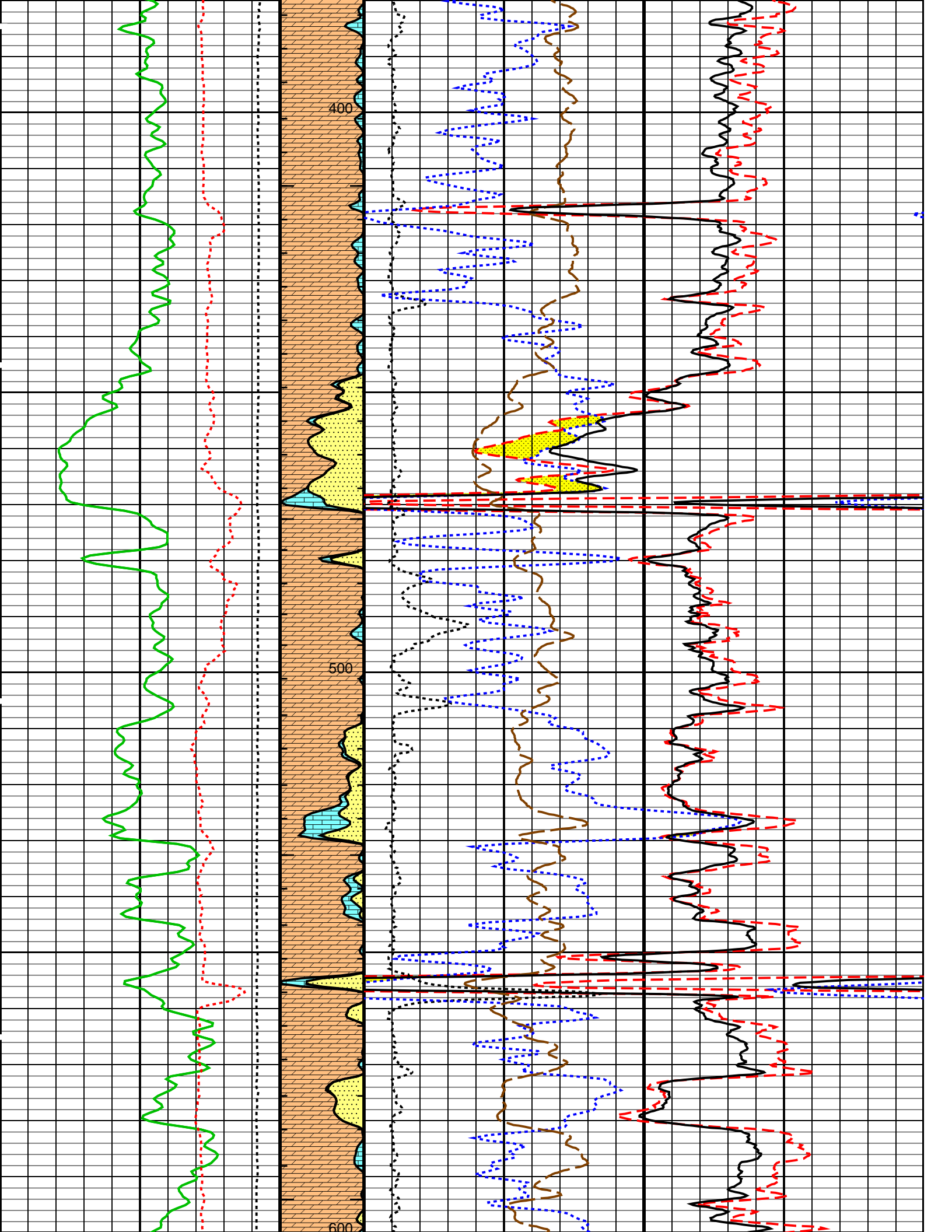


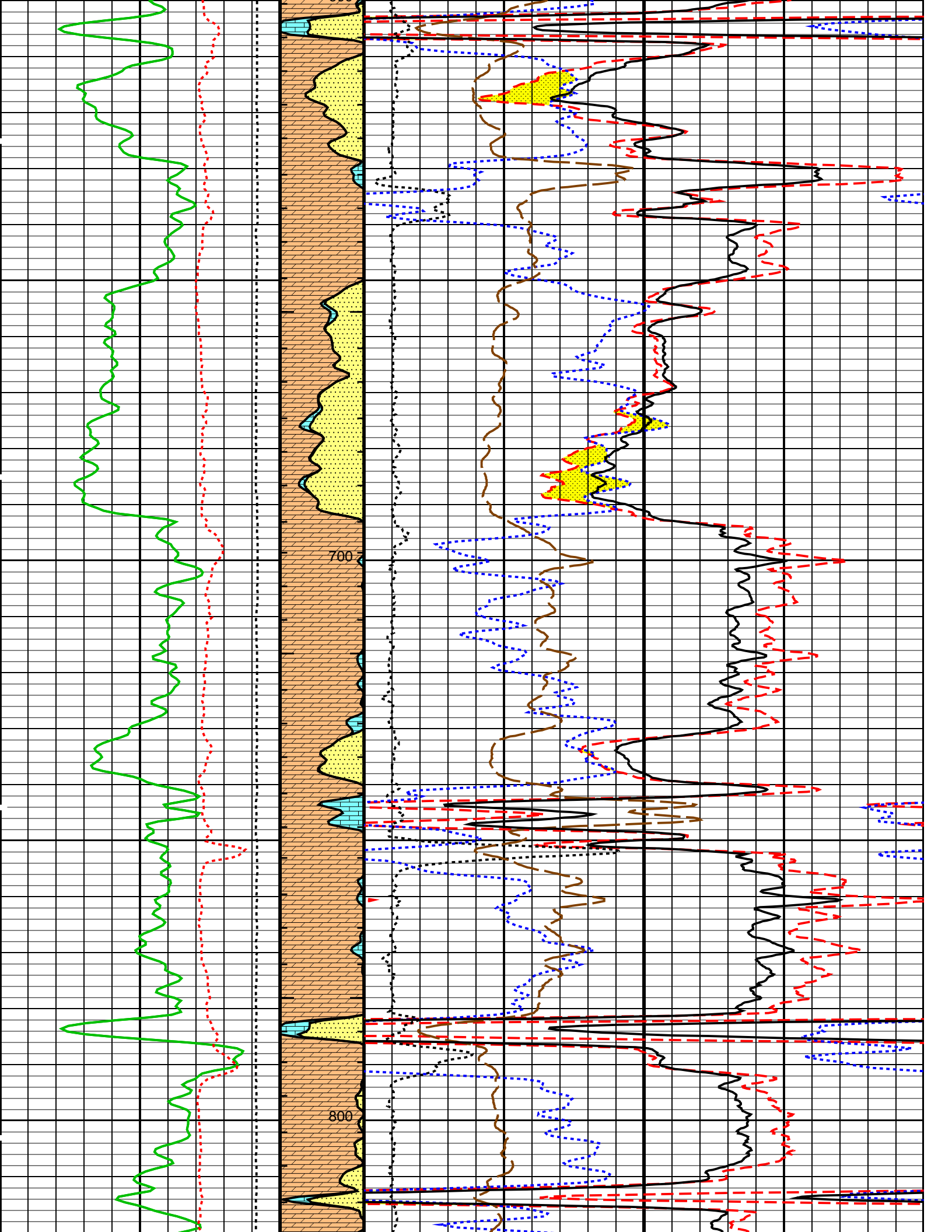
GR > 200 From LHT1 to GR1		Drag From STIA to STIT	0	Std. Res. Formation Pz (PERZ) (-----)	10
Tension (TENS) (LBF)		Stuck Stretch (STIT)	0	Neutron Porosity (NPHI) (V/V)	-0.15
10000	0	0 (F) 50	0.45		
Caliper (HCAL) (IN)		MINERAL #3 (MP3)	Density Correction (HDRA) (G/C3)		0.45
10	20	0 (-----) 1	-0.05		
Gamma Ray (GR) (GAPI)		MINERAL #2 (MP2)	Std. Res. Density Porosity (DPHZ) (V/V)		-0.1
0	200	1 (-----) 0	0.3		

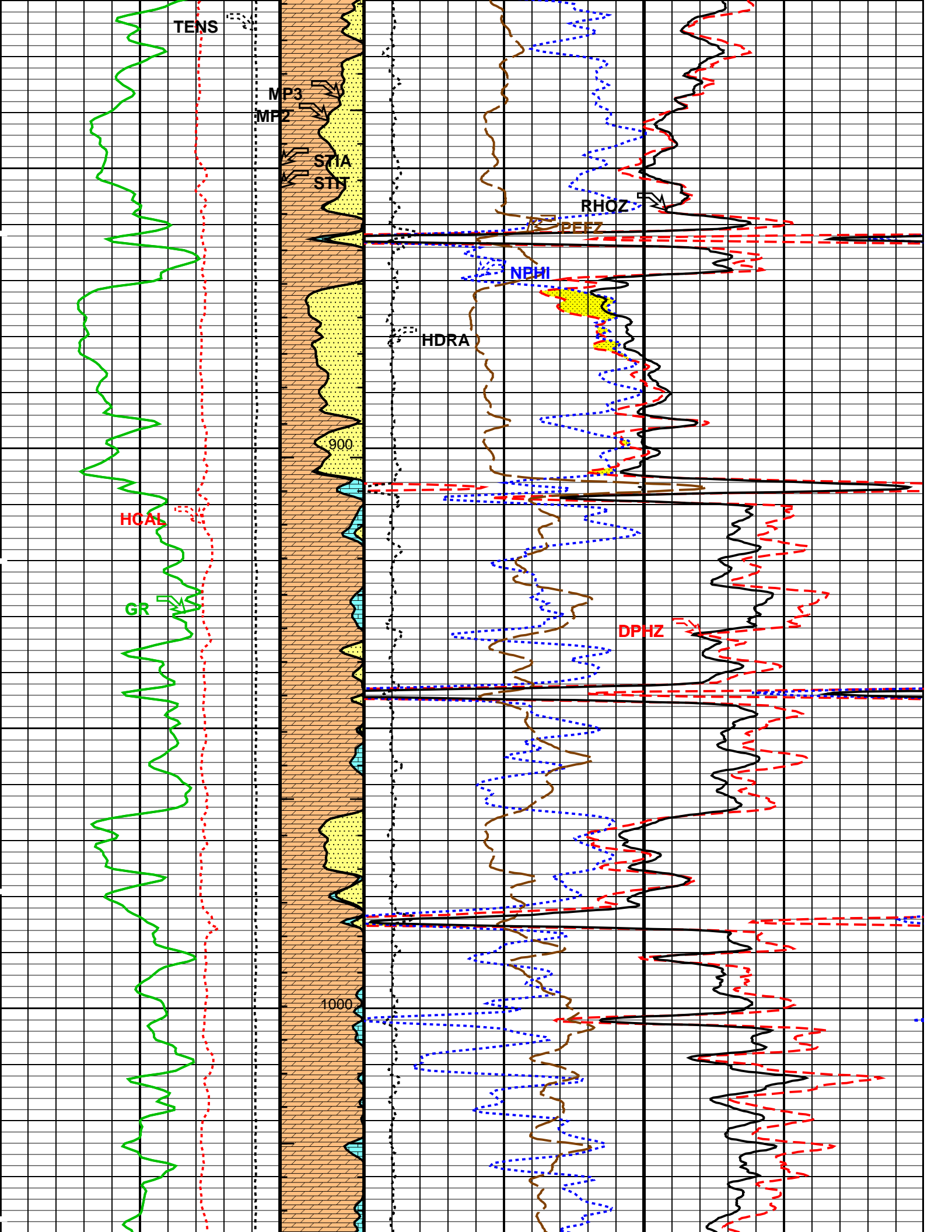
MAIN PASS 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

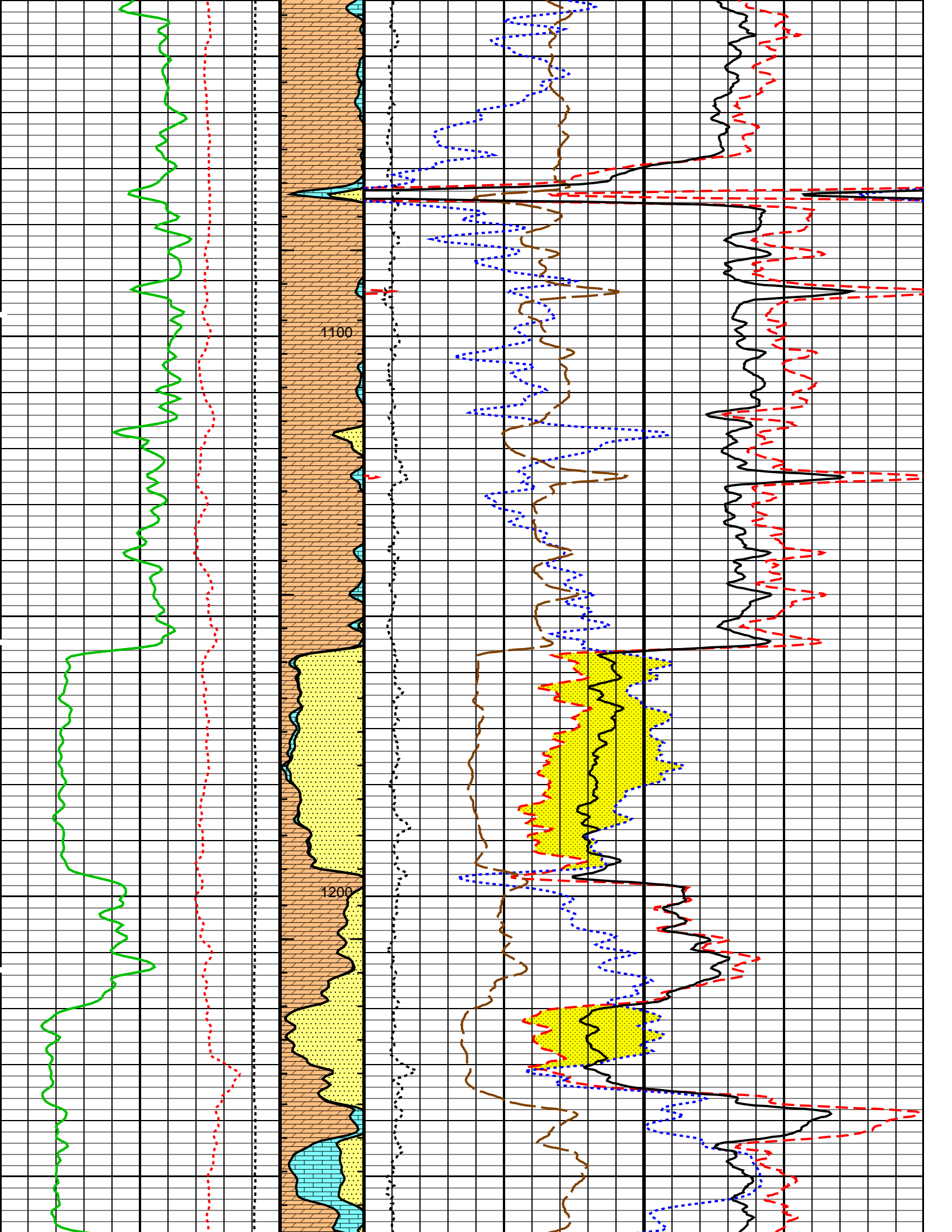


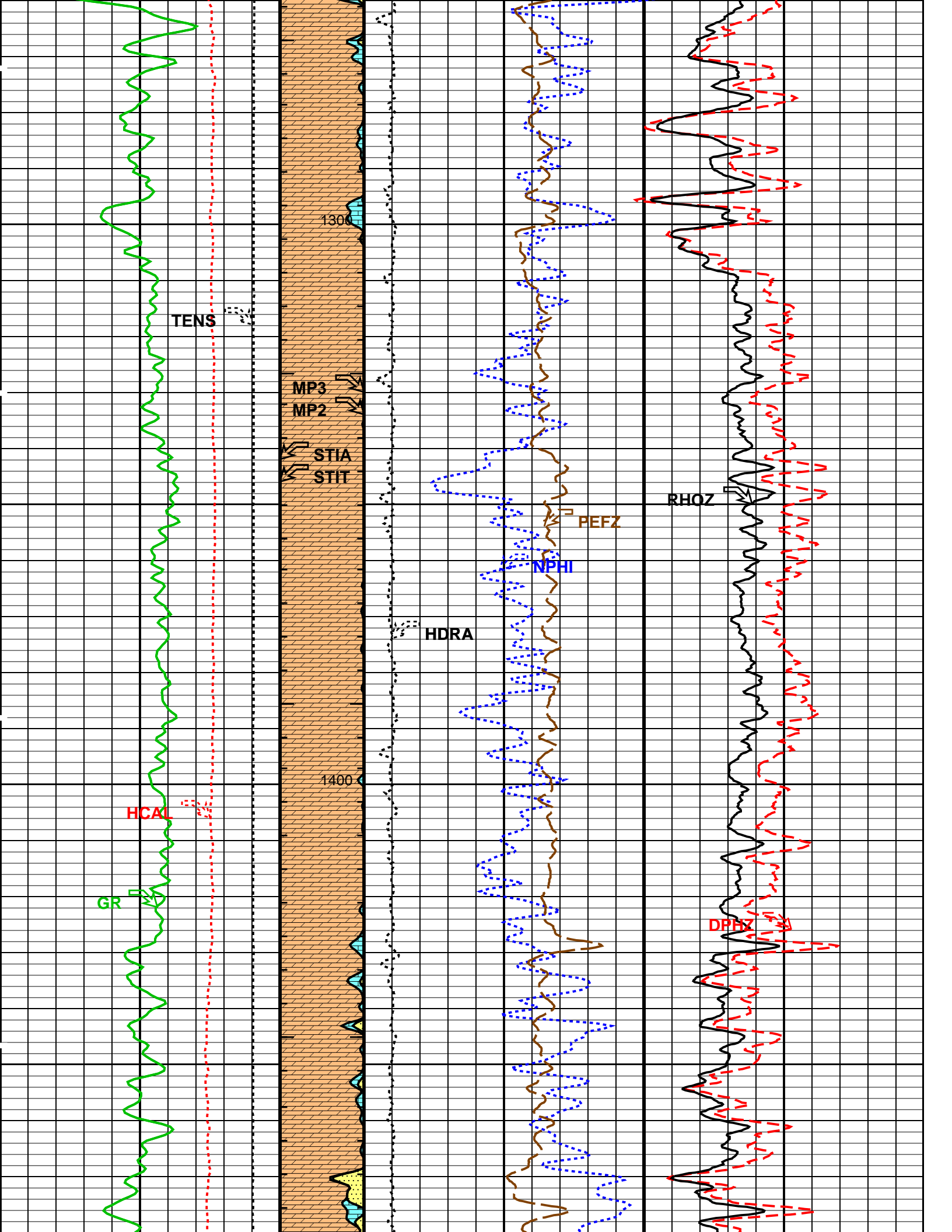


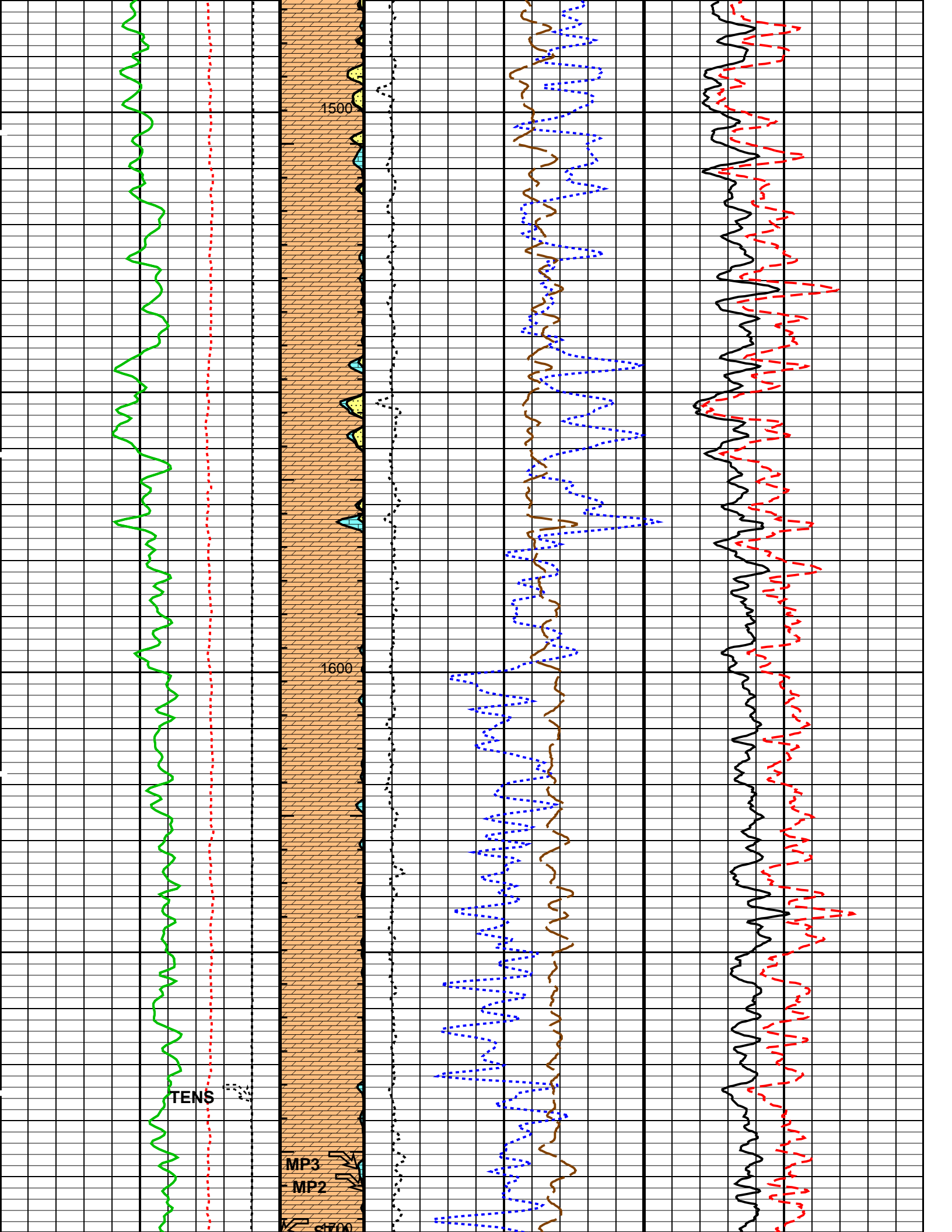


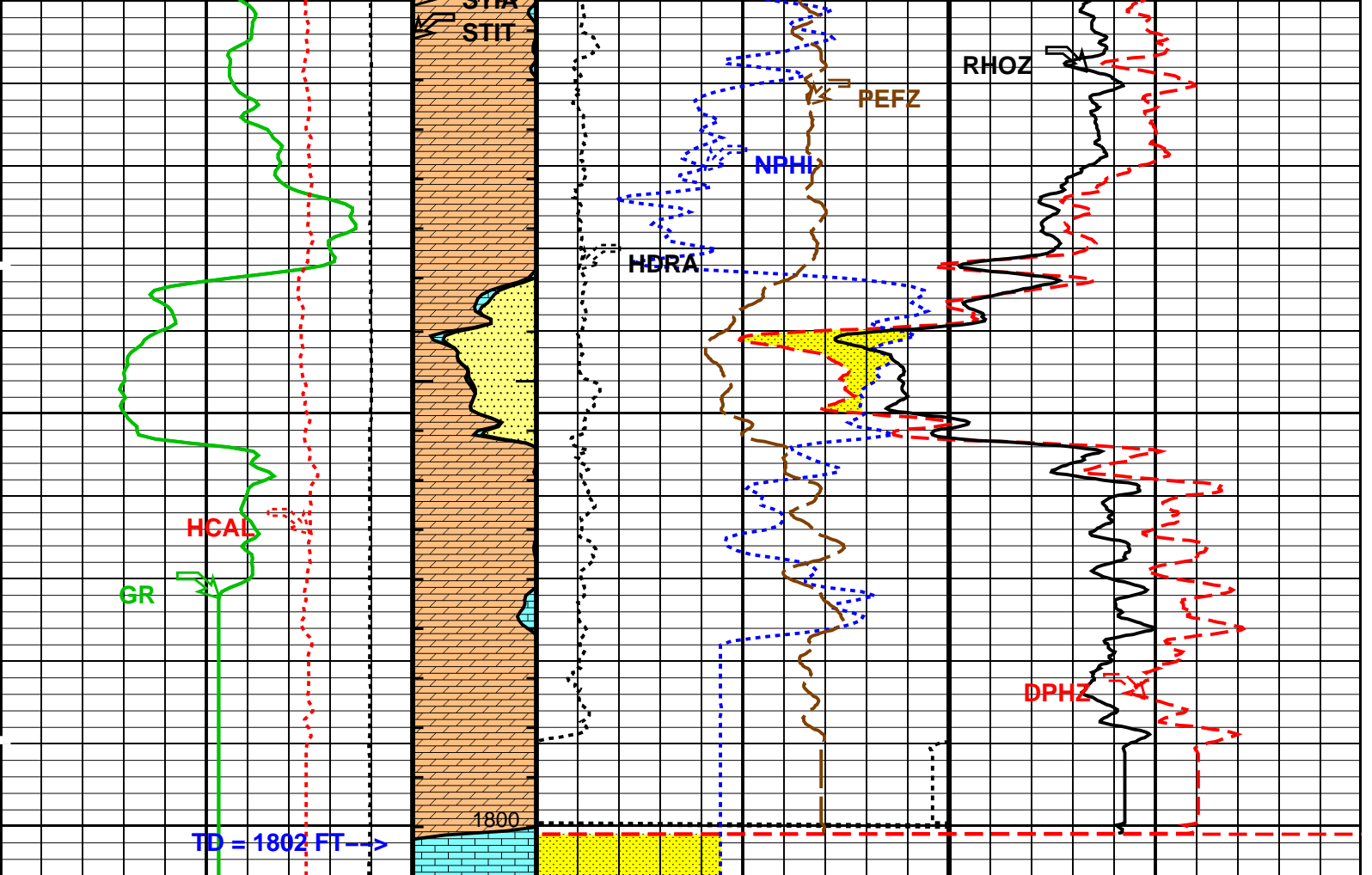












MAIN PASS 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

Gamma Ray (GR) (GAPI)	MINERAL #2 (MP2)	Std. Res. Density Porosity (DPHZ)
0 200	1 (----) 0	0.3 (VV) -0.1
Caliper (HCAL) (IN)	MINERAL #3 (MP3)	Density Correction (HDRA)
10 20	0 (----) 1	-0.05 (G/C3) 0.45
Tension (TENS) (LBF)	Stuck Stretch (STIT)	Neutron Porosity (NPHI)
10000 0	0 (F) 50	0.45 (VV) -0.15
GR > 200 From LHT1 to GR1	Cable Drag From STIA to STIT	Std. Res. Formation Pe (PEFZ)
		0 (----) 10
	Tool/Tot. Drag From D3T to STIA	Std. Res. Formation Density (RHOZ)
		2 (G/C3) 3
	SANDSTONE From SpareCurve to D3T	GAS EFFECT From DPHZ to NPHI
	DOLO/SHALLE From D3T to SpareCurve	



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-CTS: High resolution Integrated Logging Tool-CTS			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	78	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.68	G/C3
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	55	DEGF
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	78	DEGF
FCD	Future Casing (Outer) Diameter	0	IN
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	55	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	1.1	FT
TDD	Total Depth - Driller	1816.00	FT
TDL	Total Depth - Logger	1816.00	FT
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
PERT: Preliminary Evaluation - Real Time			
BDPS	Bulk Density Processing Selector	Standard	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	78	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	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PMAX	PHI Maximum	0.5	CFCF
POUT	Porosity Output Lithology	LIMESTONE	
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	55	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	
System and Miscellaneous			
BS	Bit Size	17.500	IN
DFD	Drilling Fluid Density	8.90	LB/G
RMFS	Resistivity of Mud Filtrate Sample	0.0230	OHMM
TD	Total Depth	1816	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: PEX_NUC5_MAIN Vertical Scale: 5" per 100' Graphics File Created: 10-Jun-2003 09:45

OP System Version: 10C0-306
MCM

HILTB-CTS OP10-KP1

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:9	PRODUCER	10-Jun-2003 09:45
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Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_004LUP	FN:5	PRODUCER	10-Jun-2003 09:34	1812.0 FT	1366.0 FT
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Integrated Hole/Cement Volume Summary

Hole Volume = 694.15 F3
 Cement Volume = 694.15 F3 (assuming 0.00 IN casing O.D.)
 Computed from 1812.0 FT to 1386.0 FT using data channel(s) HCAL

OP System Version: 10C0-306
MCM

HILTB-CTS OP10-KP1

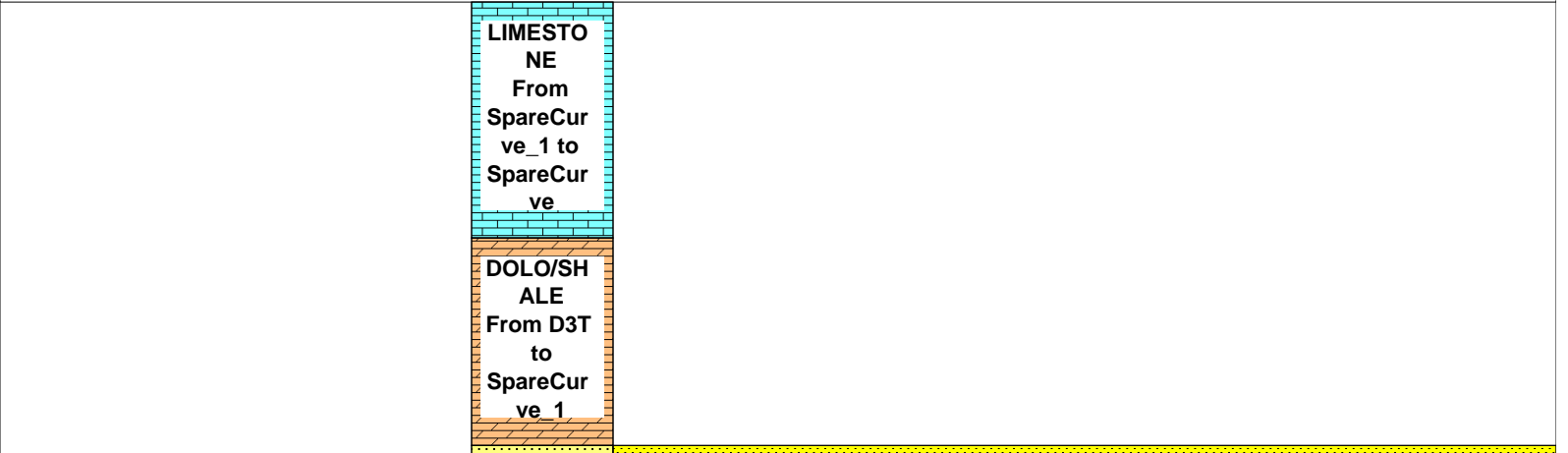
Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	78 DEGF	75 DEGF	1723.6 09:36:32
RMFS	0.0230 OHMM	-50000.0000 OHMM	1688.8 09:37:09

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



SANDSTONE
From
SpareCurve
to D3T

GAS EFFECT
From DPHZ to NPHI

Tool/Tot.
Drag
From D3T
to STIA

Std. Res. Formation Density (RHOZ)
(G/C3)

2

3

GR > 200
From LHT1 to GR1

Cable
Drag
From STIA
to STIT

Std. Res. Formation Pe (PEFZ)
(----)

0

10

Tension (TENS)
(LBF)

10000

0

Stuck
Stretch
(STIT)
(F) 50

0.45

Neutron Porosity (NPHI)
(V/V)

-0.15

Caliper (HCAL)
(IN)

10

20

MINERAL
#3 (MP3)
0 (----) 1

Density Correction (HDRA)
(G/C3)

-0.05

0.45

Gamma Ray (GR)
(GAPI)

0

200

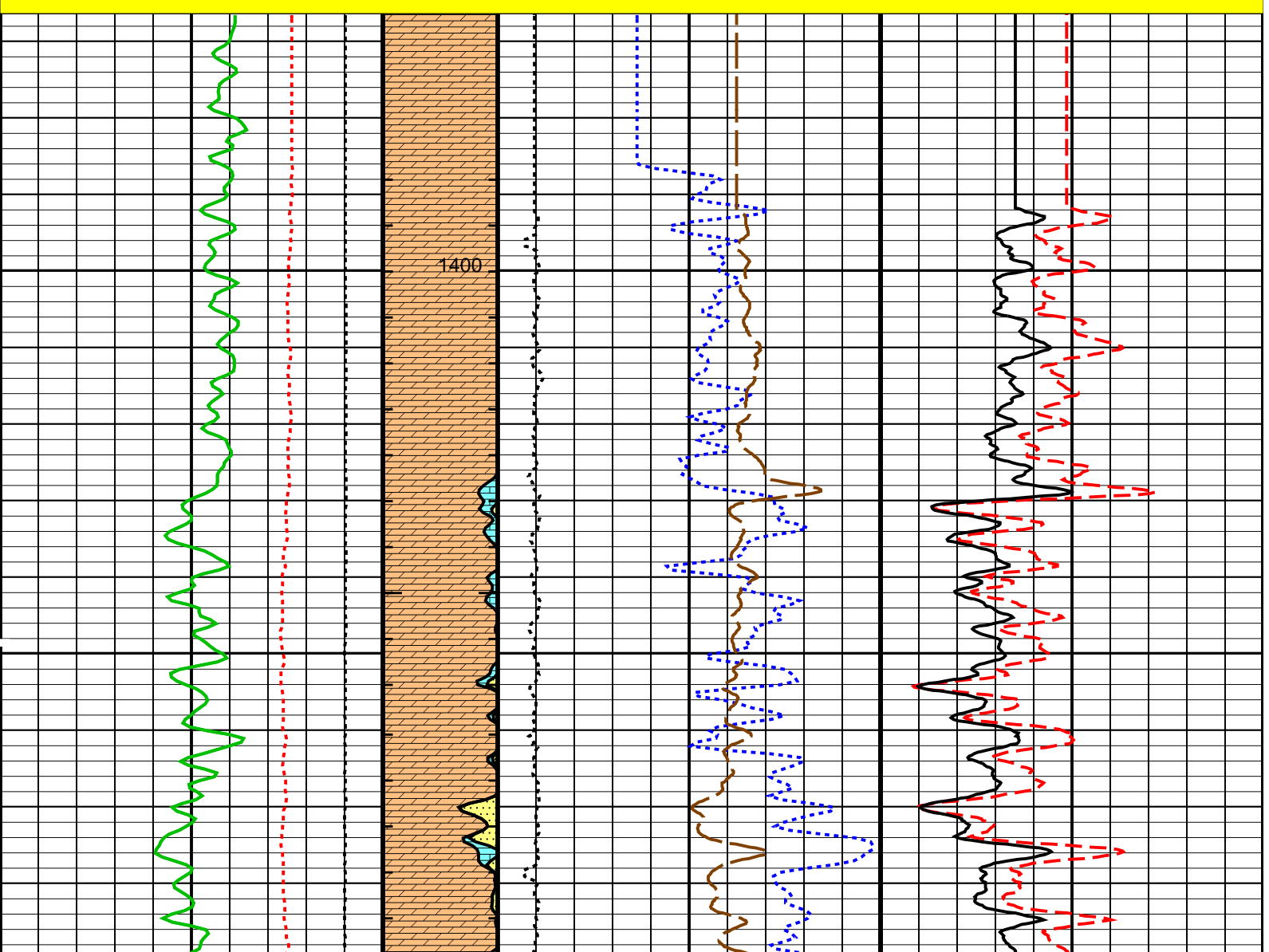
MINERAL
#2 (MP2)
1 (----) 0

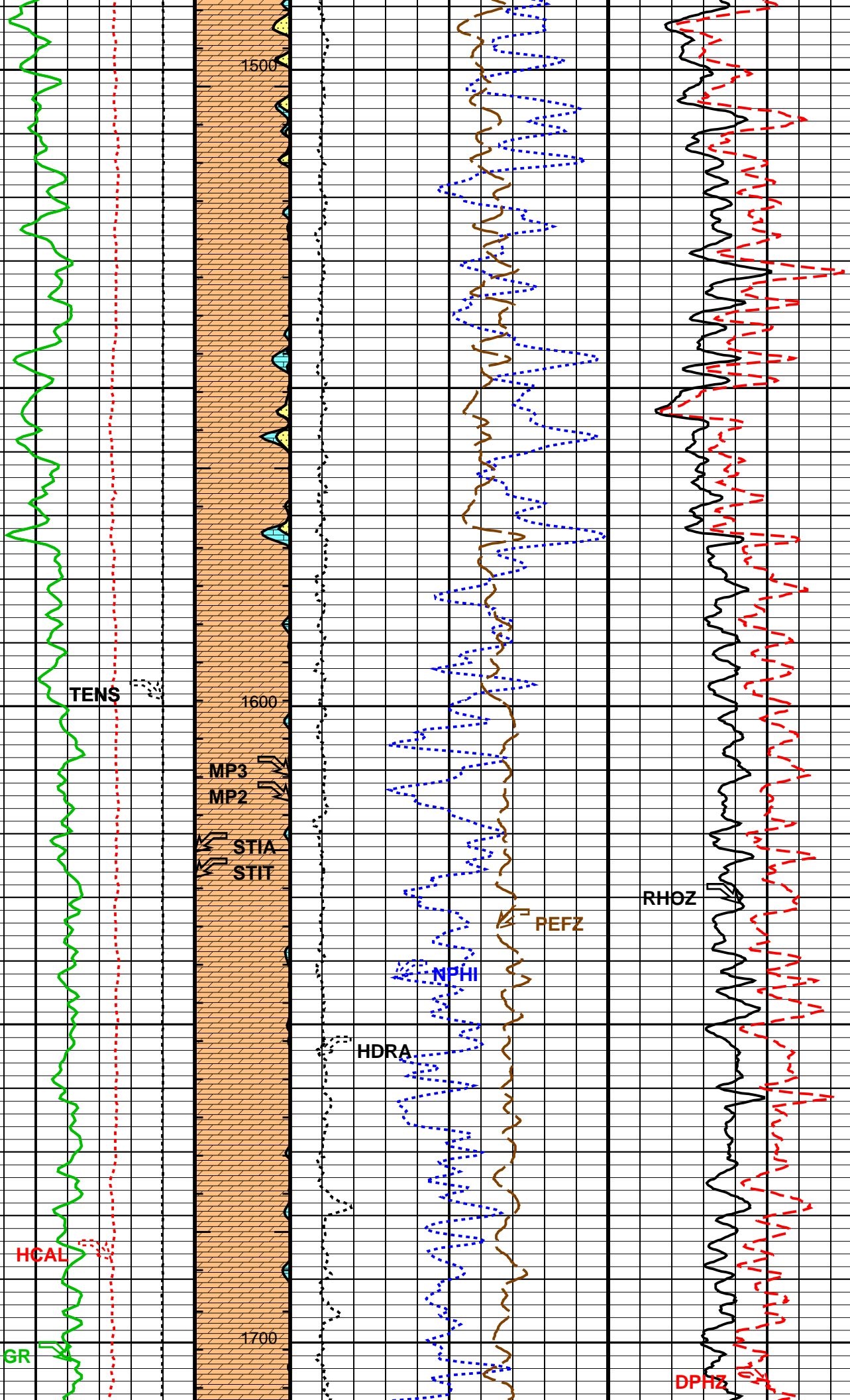
Std. Res. Density Porosity (DPHZ)
(V/V)

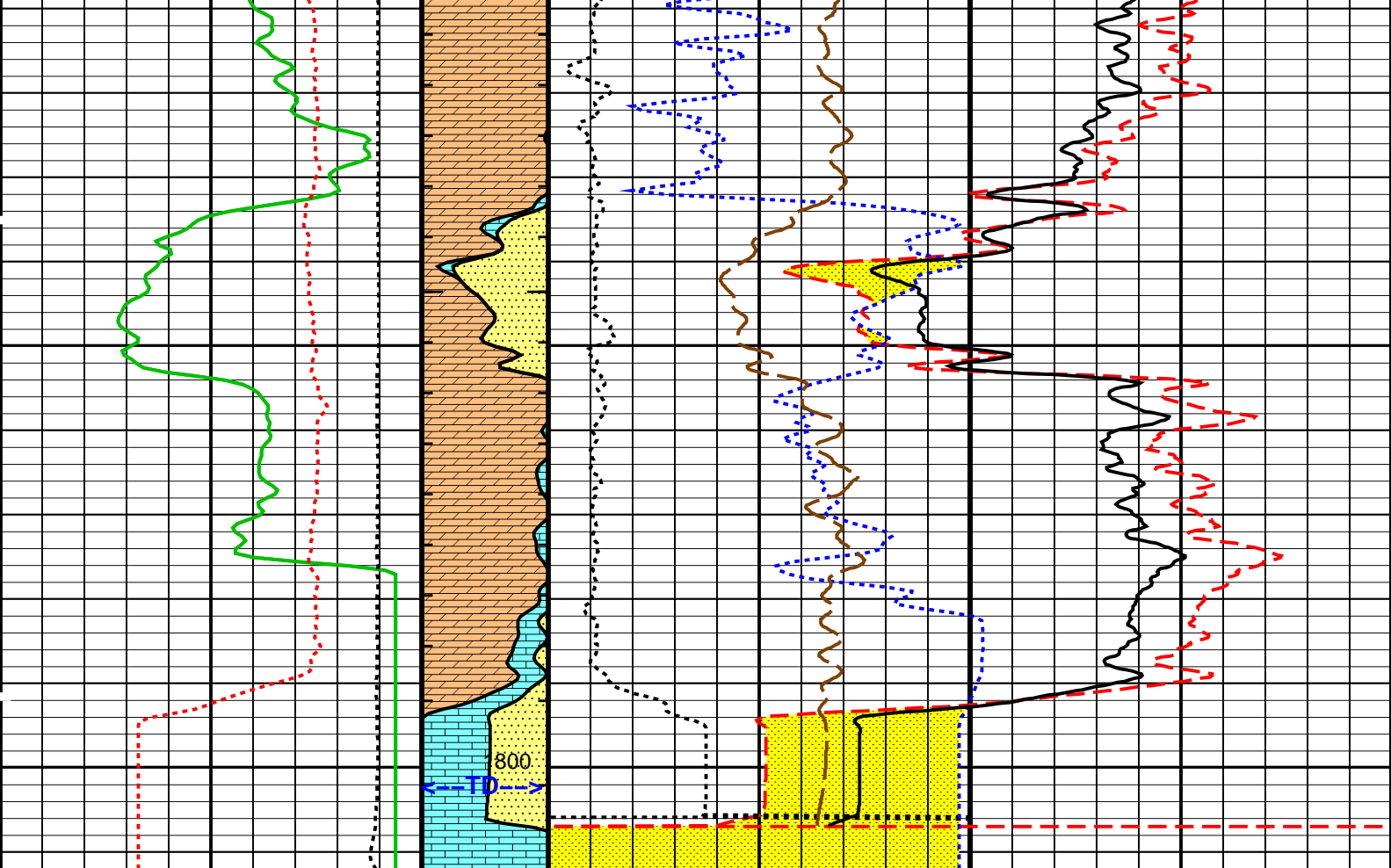
0.3

-0.1

REPEAT SECTION 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE







REPEAT SECTION 5 INCH = 100 FEET NEUTRON MATRIX = LIMESTONE

Gamma Ray (GR) (GAPI)	0	200	MINERAL #2 (MP2) 1 (----) 0	0.3	Std. Res. Density Porosity (DPHZ) (V/V)	-0.1
Caliper (HCAL) (IN)	10	20	MINERAL #3 (MP3) 0 (----) 1	-0.05	Density Correction (HDRA) (G/C3)	0.45
Tension (TENS) (LBF)	10000	0	Stuck Stretch (STIT) 0 (F) 50	0.45	Neutron Porosity (NPHI) (V/V)	-0.15
GR > 200 From LHT1 to GR1			Cable Drag From STIA to STIT	0	Std. Res. Formation Pe (PEFZ) (----)	10
			Tool/Tot. Drag From D3T to STIA	2	Std. Res. Formation Density (RHOZ) (G/C3)	3
			SANDSTONE From SpareCurve to D3T		GAS EFFECT From DPHZ to NPHI	
			DOLO/SHALE From D3T to SpareCurve 1			

LIMESTONE
NE
From
SpareCurve_1 to
SpareCurve

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-CTS: High resolution Integrated Logging Tool-CTS			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	75	DEGF
DHC	Density Hole Correction	BS	
FD	Fluid Density	1.1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.68	G/C3
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	HiRes	
NSAR	HRDD Depth Sampling Rate	1	IN
SHT	Surface Hole Temperature	55	DEGF
HOLEV: Integrated Hole/Cement Volume			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	75	DEGF
FCD	Future Casing (Outer) Diameter	0	IN
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
SHT	Surface Hole Temperature	55	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	1.1	FT
TDD	Total Depth - Driller	1816.00	FT
TDL	Total Depth - Logger	1816.00	FT
FEQL: Formation Evaluation Quick Look			
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
PERT: Preliminary Evaluation - Real Time			
BDPS	Bulk Density Processing Selector	Standard	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	75	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	
GCSE	Generalized Caliper Selection	HCAL	
GGRD	Geothermal Gradient	0.01	DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
PMAX	PHI Maximum	0.5	CFCF
POUT	Porosity Output Lithology	LIMESTONE	
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

RTLF	RT Limit Flag	NO_LIMIT	
RWF	Resistivity of Free Water	0.02	OHMM
SHT	Surface Hole Temperature	55	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	
System and Miscellaneous			
BS	Bit Size	17.500	IN
DFD	Drilling Fluid Density	8.90	LB/G
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
TD	Total Depth	1816	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

Format: PEX_NUC5_REP Vertical Scale: 5" per 100' Graphics File Created: 10-Jun-2003 09:34

OP System Version: 10C0-306
MCM

HILTB-CTS OP10-KP1

Output DLIS Files

DEFAULT AIT_TLD_MCFL_CNL_004LUP FN:5 PRODUCER 10-Jun-2003 09:34

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Calibration out of date 14-Jan-2003 16:15 Before: 10-Jun-2003 9:22							
Thru Cal Magnitude - 0	0	0.6222	0.6232	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.278	1.280	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6344	0.6355	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7161	0.7172	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.343	1.345	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.942	1.945	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.950	1.952	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.391	1.392	N/A	N/A	N/A	V
Phase - 0	0	65.90	66.25	N/A	N/A	N/A	DEG
Phase - 1	0	64.78	65.12	N/A	N/A	N/A	DEG
Phase - 2	0	61.00	61.33	N/A	N/A	N/A	DEG
Phase - 3	0	60.23	60.56	N/A	N/A	N/A	DEG
Phase - 4	0	53.86	54.18	N/A	N/A	N/A	DEG
Phase - 5	0	51.98	52.29	N/A	N/A	N/A	DEG
Phase - 6	0	51.94	52.25	N/A	N/A	N/A	DEG
Phase - 7	0	48.12	48.35	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary							
Master: Calibration out of date 14-Jan-2003 16:15 Before: 10-Jun-2003 9:22							
Array Induction SPA Plus	990.5	995.7	995.5	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	-0.3430	-0.3479	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9150	0.9224	0.9222	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	-0.0003400	-0.0003455	N/A	N/A	N/A	V
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction							
Master: Calibration out of date 14-Jan-2003 16:15							
Test Loop Gain Magnitude - 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.021	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.016	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9955	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9839	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	0.9947	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.004	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.4311	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.3746	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.08173	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.05669	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.09994	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.1026	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.3512	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	0.08647	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Sonde Error Correction

Master: Calibration out of date 14-Jan-2003 16:15

R Sonde Error Correction – 0	0	-62.62	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	156.0	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	57.25	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	13.13	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	9.567	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	-0.6655	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	-140.9	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	165.2	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	-78.69	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	-94.79	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	0.2783	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	-2.716	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	-2.277	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	4.946	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Mud Gain Correction

Master: 10-Jun-2003 9:24

Coarse – Mag, Real, Imag – 0	0	0.9495	N/A	N/A	N/A	N/A	
Coarse – Mag, Real, Imag – 1	0	0.9495	N/A	N/A	N/A	N/A	
Coarse – Mag, Real, Imag – 2	0	0.9495	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 0	0	0.9447	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 1	0	0.9447	N/A	N/A	N/A	N/A	
Fine – Mag, Real, Imag – 2	0	0.9447	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Stab Measurement Summary

Before: 6-Jun-2003 12:49

BS Window Ratio	0.7492	N/A	0.7493	N/A	N/A	N/A	
BS Window Sum	12180	N/A	12180	N/A	N/A	N/A	CPS
SS Window Ratio	0.4855	N/A	0.4845	N/A	N/A	N/A	
SS Window Sum	11940	N/A	11950	N/A	N/A	N/A	CPS
LS Window Ratio	0.2971	N/A	0.2958	N/A	N/A	N/A	
LS Window Sum	1313	N/A	1309	N/A	N/A	N/A	CPS

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

Before: 6-Jun-2003 12:49

BS PM High Voltage (Command)	1504	N/A	1507	N/A	N/A	N/A	V
SS PM High Voltage (Command)	2271	N/A	2270	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1846	N/A	1840	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Crystal Quality Resolutions Calibration

Before: 6-Jun-2003 12:49

BS Crystal Resolution	12.65	N/A	12.68	N/A	N/A	N/A	%
SS Crystal Resolution	10.94	N/A	10.93	N/A	N/A	N/A	%
LS Crystal Resolution	9.801	N/A	9.761	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration – MCFL Calibration

Before: 29-May-2003 12:56

Raw B0 Resistivity	3875	N/A	3896	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3851	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3859	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration – HILT Caliper Calibration

Before: 6-Jun-2003 12:47

HILT Caliper Zero Measurement	5.000	N/A	5.340	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	8.000	N/A	8.648	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Detector Calibration

Before: 6-Jun-2003 12:46

Gamma Ray Background	30.00	N/A	34.84	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkg)	179.8	N/A	179.8	N/A	N/A	0.09091	GAPI
Gamma Ray (Calibrated)	168.0	N/A	168.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Zero Measurement

Master: 5-Apr-2003 16:09 Before: 6-Jun-2003 12:46

CNTC Background	30.56	30.56	30.38	N/A	N/A	0.1500	CPS
CFTC Background	29.97	29.97	30.43	N/A	N/A	0.1500	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration – Accelerometer Calibration

Before: Calibration not done

Z-Axis Acceleration	32.19	N/A	32.19	N/A	N/A	N/A	F/S2
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High resolution Integrated Logging Tool-CTS Master Calibration – Inversion results

Master: 28-May-2003 19:10

Rho Aluminum	2.596	2.598	--	--	--	--	G/C3
Rho Magnesium	1.686	1.687	--	--	--	--	G/C3
Pe Aluminum	2.570	2.579	--	--	--	--	
Pe Magnesium	2.650	2.639	--	--	--	--	

High resolution Integrated Logging Tool-CTS Master Calibration – Deviation Summary

Master: 28-May-2003 19:10

BS Average Deviation	0	0.2344	--	--	--	--	%
BS Max Deviation	0	0.5193	--	--	--	--	%
SS Average Deviation	0	0.1991	--	--	--	--	%
SS Max Deviation	0	0.8259	--	--	--	--	%
LS Average Deviation	0	0.5482	--	--	--	--	%
LS Max Deviation	0	1.187	--	--	--	--	%

High resolution Integrated Logging Tool-CTS Master Calibration – Tank Measurement

Master: 5-Apr-2003 16:09

Thermal Near Corr. (Tank)	6031	5587	--	--	--	--	CPS
Thermal Far Corr. (Tank)	2793	2328	--	--	--	--	CPS
CNTC/CFTC (Tank)	2.159	2.400	--	--	--	--	

The GLS-VJ source activity is acceptable.

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

NCT-B Water Temperature 70.0 DEGF.
 Thermal Housing Size 3.340 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool – H	AIT – H	
Rm/SP Bottom Nose	AHRM – A	
Array Induction Sonde	AHIS – BA	216
HILT high-Resolution Mechanical Sonde	HRMS – B	879
HILT Rxo Gamma-ray Device	HRGD –	899
HILT Nuclear Back-Scatter Detector	HILT –	
HILT Nuclear Short-Spacing Detector	HILT –	
HILT Nuclear Long-Spacing Detector	HILT –	

Auxiliary Equipment:

Company: **BATTELLE MEMORIAL INSTITUTE**



Well: **AEP #1**

Field: **APPALACHIAN POWER CO.**

COUNTY: **MASON**

STATE: **WEST VIRGINIA**

PLATFORM EXPRESS

ARRAY INDUCTION

LITHO-DENSITY / COMPENSATED NEUTRON