

Company: SAVIA PERU S.A.
Well: LO6-27D
Field: LOBITOS
Rig Name: PEPESA-40 Country: PERU

SONIC LOG
SP-BHC-HRLT-TLD-HGNS-GR
SCALE 5"/100'

LOBITOS
N: 9508655.23
E: 459043.07

Elev. K.B. 50.00 ft
G.L. -335.00 ft
D.F. 50.00 ft

Location:
Permanent Datum:
Log Measured From:
Drilling Measured From:

Mean Sea Level
Drill Floor
Drill Floor

Elev.:
50.00 ft
above Perm. Datum

State:
PIURA

Max. Hole Deviation
49.5 deg

Longitude:
81° 22' 9.012" W

Latitude:
4° 26' 42.606" S

Rig Name: PEPESA-40
Field: LOBITOS
Location: LOBITOS
Well: LO6-27D
Company: SAVIA PERU S.A.

Logging Date	05-Mar-2013		
Run Number	1		
Depth Driller	11094.00 ft		
Schlumberger Depth	11094.00 ft		
Bottom Log Interval	9780.00 ft		
Top Log Interval	7918.25 ft		
Casing Driller Size @ Depth	7 in @ 7921.00 ft		
Casing Schlumberger	7918.25 ft		
Bit Size	6.125 in		
Type Fluid In Hole	BARADRL-N		
Density	Viscosity	64 s	
Fluid Loss	PH	5 cm3	9.8
Source of Sample	Flowline		
RM @ Meas Temp	0.6 ohm.m @ 73.5 degF		
RMF @ Meas Temp	0.44 ohm.m @ 73.5 degF		
RMC @ Meas Temp	0.85 ohm.m @ 71.9 degF		
Source RMF	RMC	Pressed	Pressed
RM @ BHT	RMF @ BHT	0.35 @ 132.97	0.25 @ 132.97
Max Recorded Temperatures			
Circulation Stopped		Time	04-Mar-2013 04:30:00
Logger on Bottom		Time	05-Mar-2013 20:16:36
Unit Number	Location:	826	PETA
Recorded By	S. Roman / C. Hidalgo		
Witnessed By	Augusto Ortega		

Disclaimer

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Operational Run Summary

Parameter (unit)	1					
Date Log Started	05-Mar-2013					
Time Log Started	15:34:17					
Date Log Finished	05-Mar-2013					
Time Log Finished	23:06:55					
Top Log Interval (ft)	7918.25					
Bottom Log Interval (ft)	9780.00					
Total Depth (ft)	9541.52					
Max Hole Deviation (deg)	49.50					
Azimuth of Max Deviation (deg)	NaN					
Bit Size (in)	6.125					
Logging Unit Number	826					
Logging Unit Location	PETA					
Recorded By	S. Roman / C. Hidalgo					
Witnessed By	Augusto Ortega					
Service Order Number	C3PZ-00033					

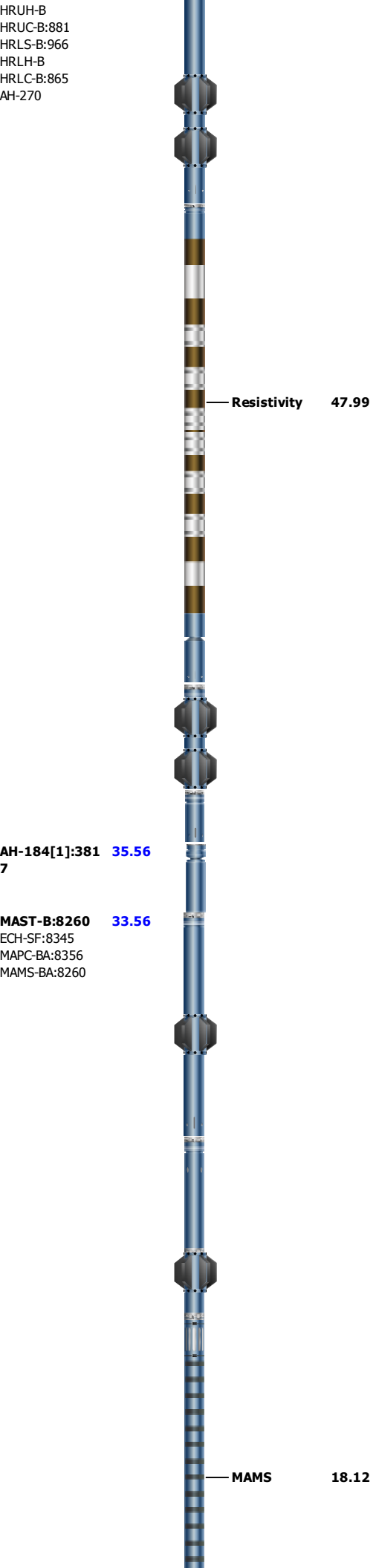
Borehole Fluids

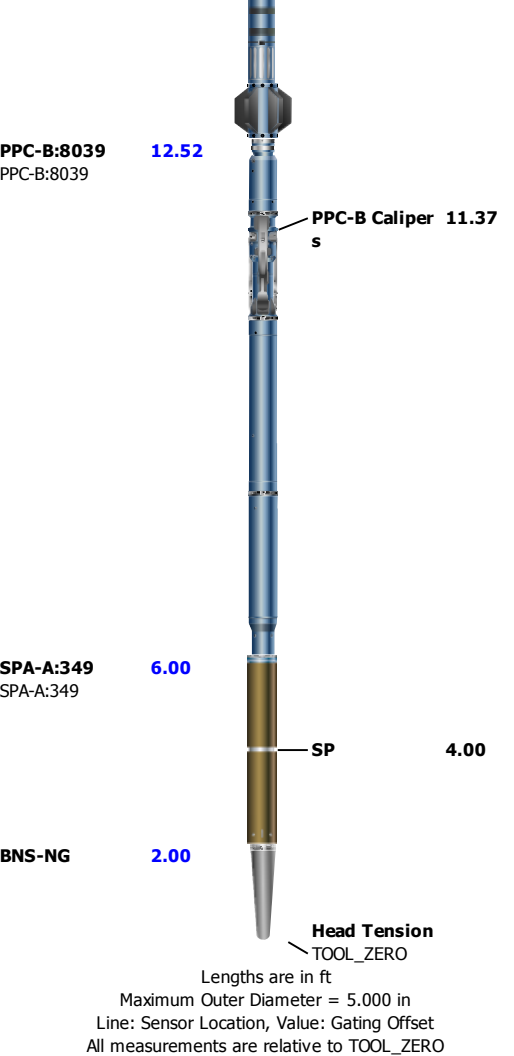
Parameter(unit)	1					
Fluid Type	Water					
Fluid Name	DFT_WATER_B ARADRIL - DFT_WATER_B ARADRIL_N					
Max Recorded Temperatures (degF)	132.97					
Source of Sample	Flowline					
Salinity (ppm)	1307					
Density (lbm/gal)	11.9					
Funnel Viscosity (s)	64					
Fluid Loss (cm3)	5					
PH	9.8					
Date/Time Circulation Stopped	04-Mar-2013 04:30:00					
Date Logger on Bottom	05-Mar-2013					
Time Logger on Bottom	20:16:36					
Source RMF	Pressed					
RMC	Pressed					
RM @ Meas Temp (degF)	0.6 @ 73.5					

ohm.m@degF)					
RMF @ Meas Temp (ohm.m@degF)	0.44 @ 73.5				
RMC @ Meas Temp (ohm.m@degF)	0.85 @ 71.9				
RM @ BHT (ohm.m@degF)	0.35 @ 132.97				
RMF @ BHT (ohm.m@degF)	0.25 @ 132.97				
RMC @ BHT (ohm.m@degF)	0.48 @ 132.97				
Total Solid (%)	19.8				
High Gravity Solids (%)					

Remarks and Equipment Summary

1: Toolstring				1: Remarks
Equip name LEH-QT LEH-QT	Length 93.62	MP name	Offset	Log objective: Nuclear, resistivity and sonic evaluation of 6.125" OH section.
				Open hole section started with a large washout below the 7in Casing shoe. Average diameter = 10.5 in until 8115 ft.
AH-369:938	90.71			Tool ran as per tool sketch. 4 x 0.5"standoffs used to eccentralize HRLA. HGNS without bowspring in agreement with client.
DTC-H:8280 ECH-KC:9357 DTC-H:8280	89.28	CTEM HV	88.38 0.00	Matrix = Limestone, Densty = 2.71 gr/cc as per client request.
		TelStatus ToolStatus	86.28 86.28	Neutron environmental corrections: Hole size, mud cake, mud weight, borehole salinity and pressure & temperature.
SAH-E:918	86.28			Maximum depth reached: 9780 ft. CSG Shoe found at 7918.25 ft. Max recorded temperature 132.97 degF (from HGNS sensor).
				Repeat section taken from 7950 ft to 8150 ft.
AH-184[2]:572 6	83.41			Drillers TD was not reached, due to operational difficulties.
HGNS-H:3969 HGNH:3719 NSR-F:331 NPV-N HACCZ-H:4171 HMCA-H HGNS-H:3969	81.41	Temperature GR	81.38 80.67	Tool sticks @ 9780, 9236, 9168, 8822, and 8720 ft, due to tough logging conditions.
				While POOH a consolidated piece of rock came out attached to the tool's head.
				SP data was affected by extrenal factors.
		CNL Porosity HMCA HGNS Acceleromete r	74.33 72.00 72.00 0.00	
HDRS-H:3950 ECH-MEB:2989 HRCC-H:3929 HRMS-H:3950 HRGD-H:4716 Short Spacing:421 74 Long Spacing:288 62 GPV-Q Backscatter:2690 6 GSR-J:3761	72.00	HRCC	68.00	
		MCFL Caliper TLD Density	62.57 62.08 61.69	
HRLT-B:966	59.76			

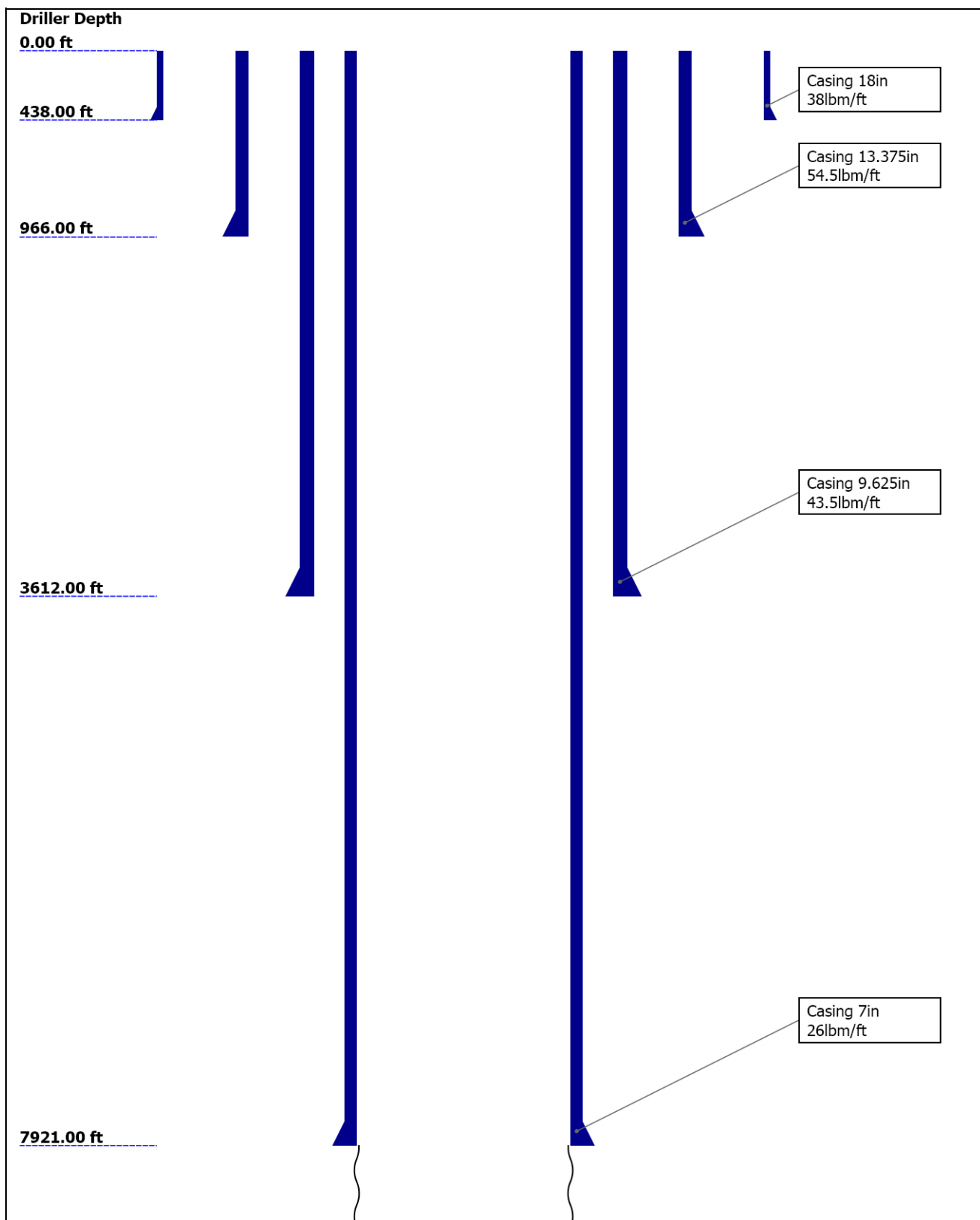


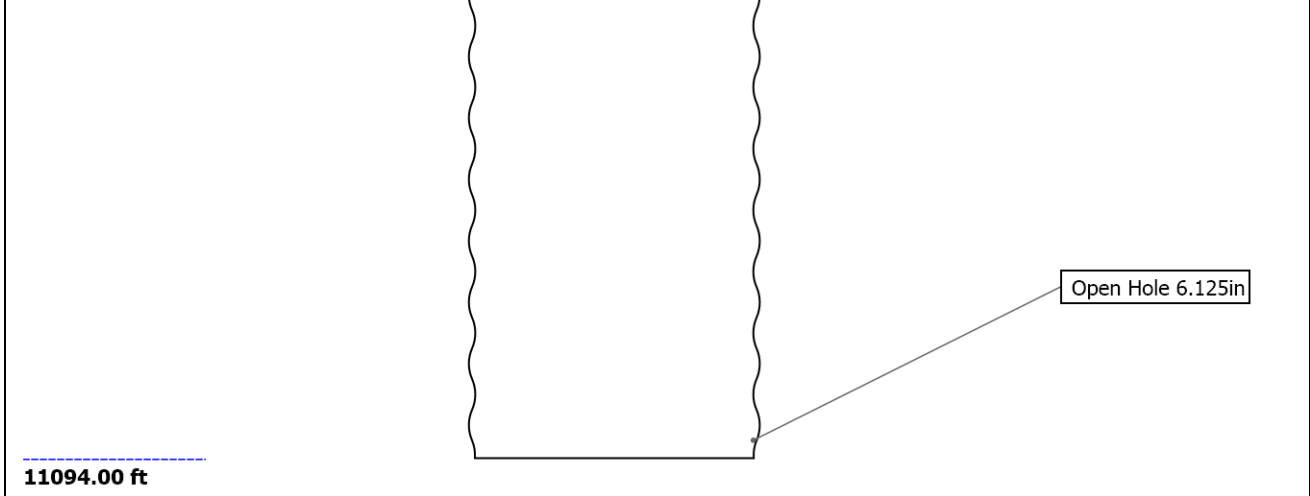


Depth Summary			
Depth Control Parameters	1		
Conveyance Type	Wireline		
Log Sequence	Subsequent Trip in Hole		
Rig Up Length at Surface (ft)	213.28		
Rig Up Length at Bottom (ft)	213.32		
Reference Log Date	10-Feb-2013		
Reference Log Name	SP-PPC-HRLT-TLD-HGNS-GR		
Reference Log Run Number	1		
Depth Remark Parameters	1		
Depth Remark 1	All Schlumberger depth control procedures followed.		
Depth Remark 2	IDW used as primary depth control; Z-Chart used as secondary.		
Depth Measuring Device	1		
Type	IDW-JA		
Serial Number	4889		
Calibration Date	04-FEB-2013		
Calibrator Serial Number	10		
Calibration Cable Type	7-46ZVXS		
Wheel Correction 1	3.8		
Wheel Correction 2	-3.14		
Tension Device	1		
Type	CMTD-B/A		
Serial Number	2087		
Calibration Date	07-FEB-2013		

Calibration Date	27-FEB-2013		
Calibrator Serial Number	1002		
Calibration Points	10		
Calibration RMS	22		
Calibration Peak Error	34		
Logging Cable	1		
Type	7-46ZV-XS		
Serial Number	U712148		
Logging Cable Length (ft)	24000.00		

Well Sketch





Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	6.125					
Top Driller (ft)	7921					
Top Logger (ft)	7921					
Bottom Driller (ft)	11094					
Bottom Logger (ft)	11094					
Casing						
Size (in)	18	13.375	9.625	7		
Weight (lbm/ft)	38	54.5	43.5	26		
Inner Diameter (in)	17.609	12.607	8.758	6.283		
Grade	J55	K55	N80	N80		
Top Driller (ft)	0	0	0	0		
Top Logger (ft)	0	0	0	0		
Bottom Driller (ft)	438	966	3612	7921		
Bottom Logger (ft)	438	966	3612	7918.25		

Composite 1

Main Pass

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
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Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
1	Log[4]:Up	Up	9525.96 ft	9835.83 ft	05-Mar-2013 7:59:41 PM	05-Mar-2013 8:12:24 PM	28.91 ft	false
1	Log[5]:Up	Up	7900.54 ft	9571.45 ft	05-Mar-2013 8:16:36 PM	05-Mar-2013 9:03:45 PM	29.93 ft	false

All depths are referenced to toolstring zero

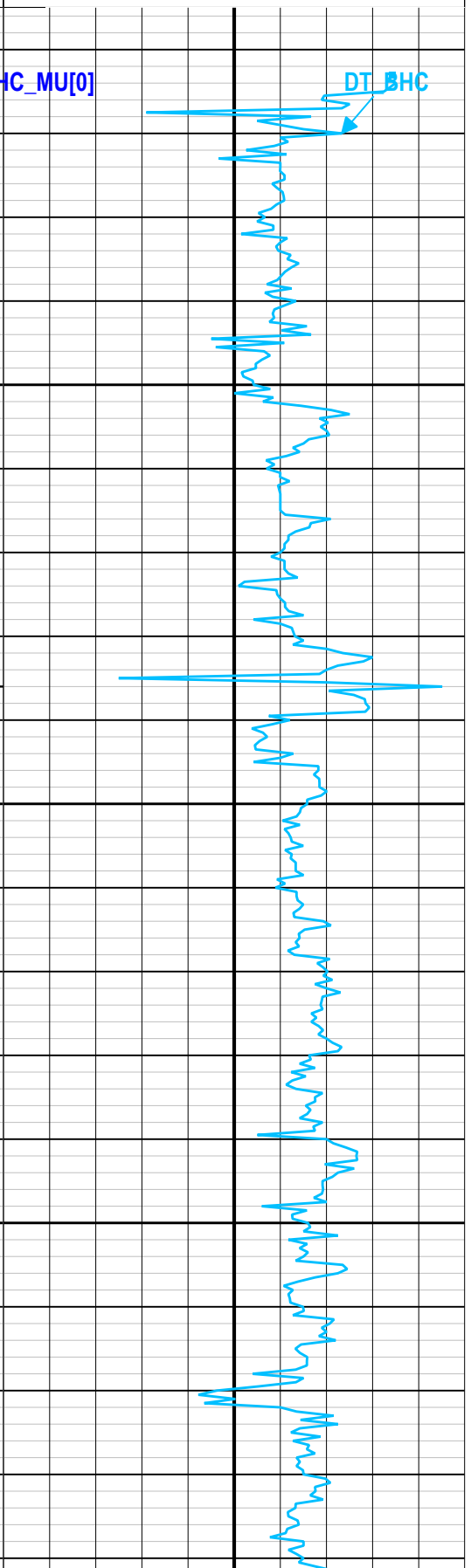
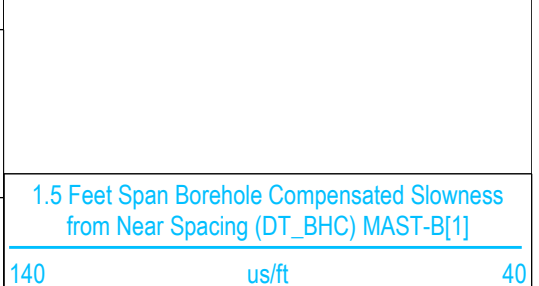
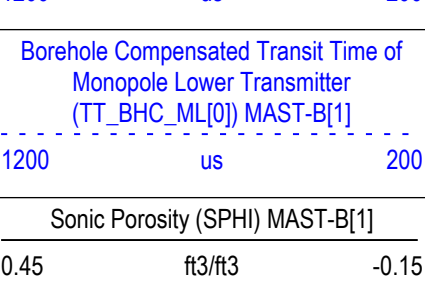
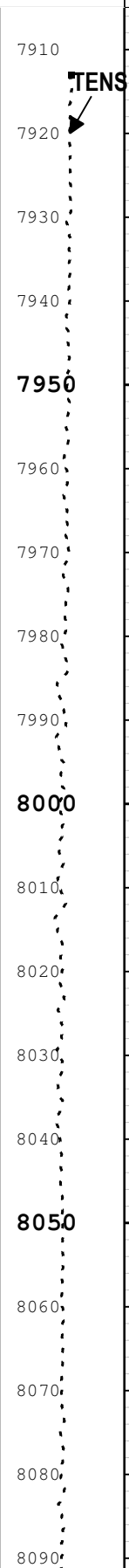
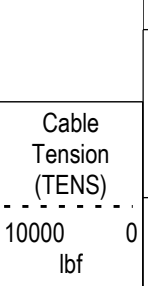
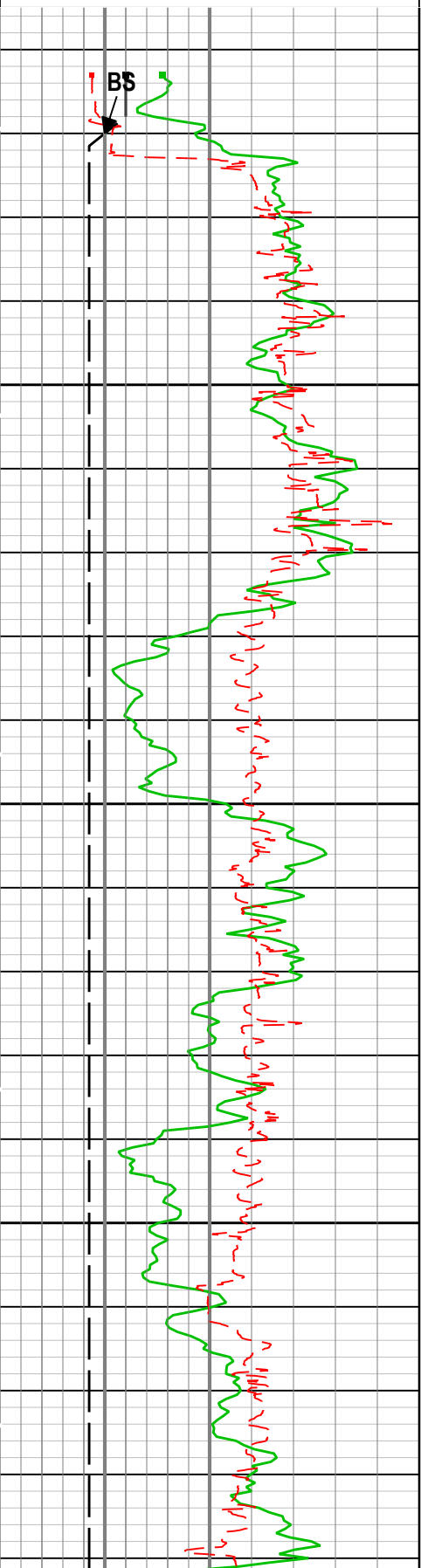
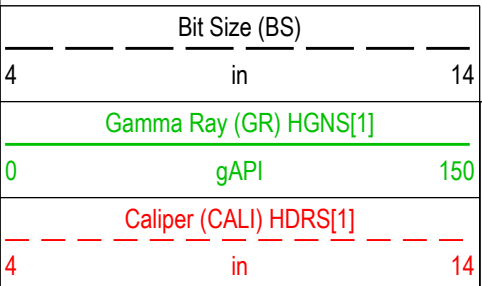
Log

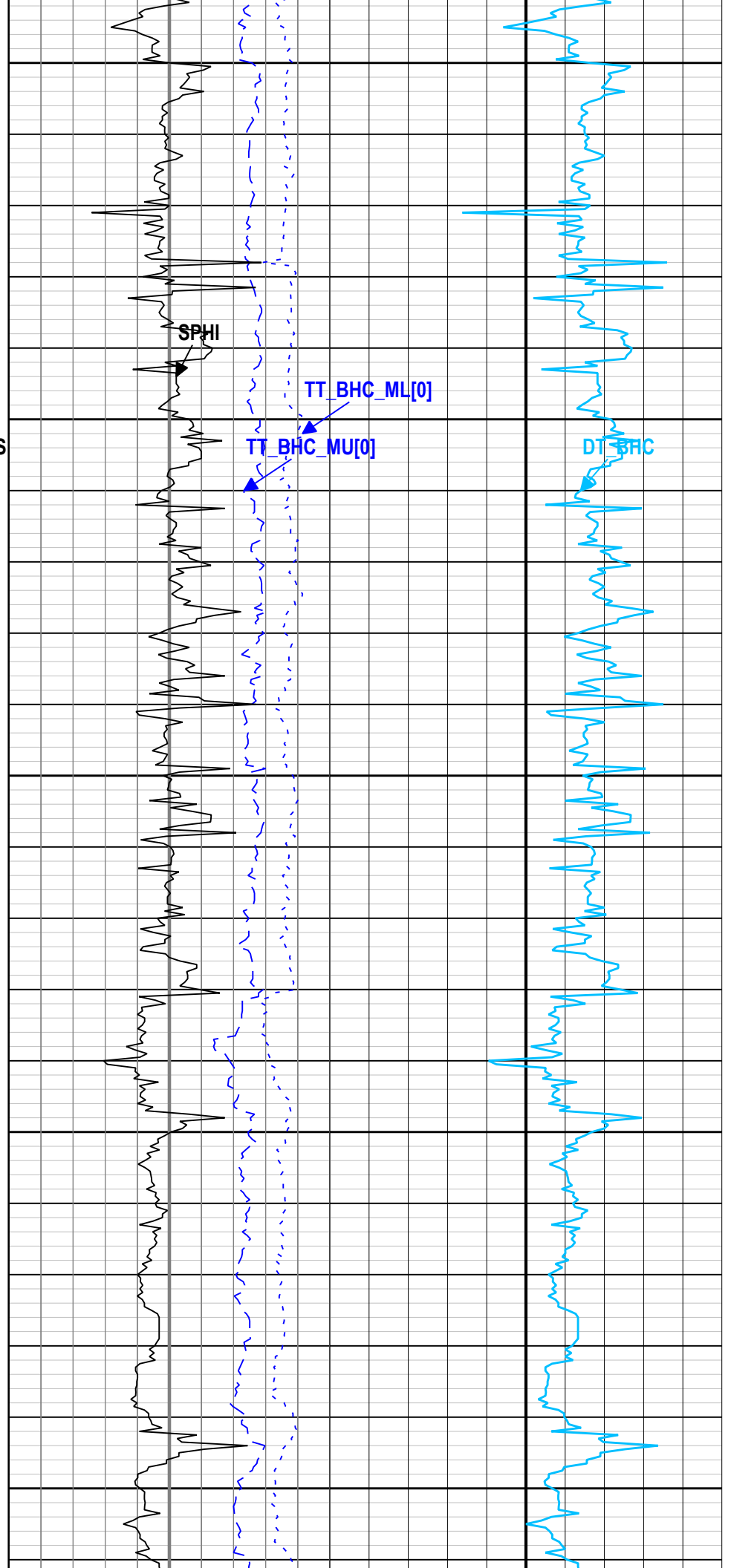
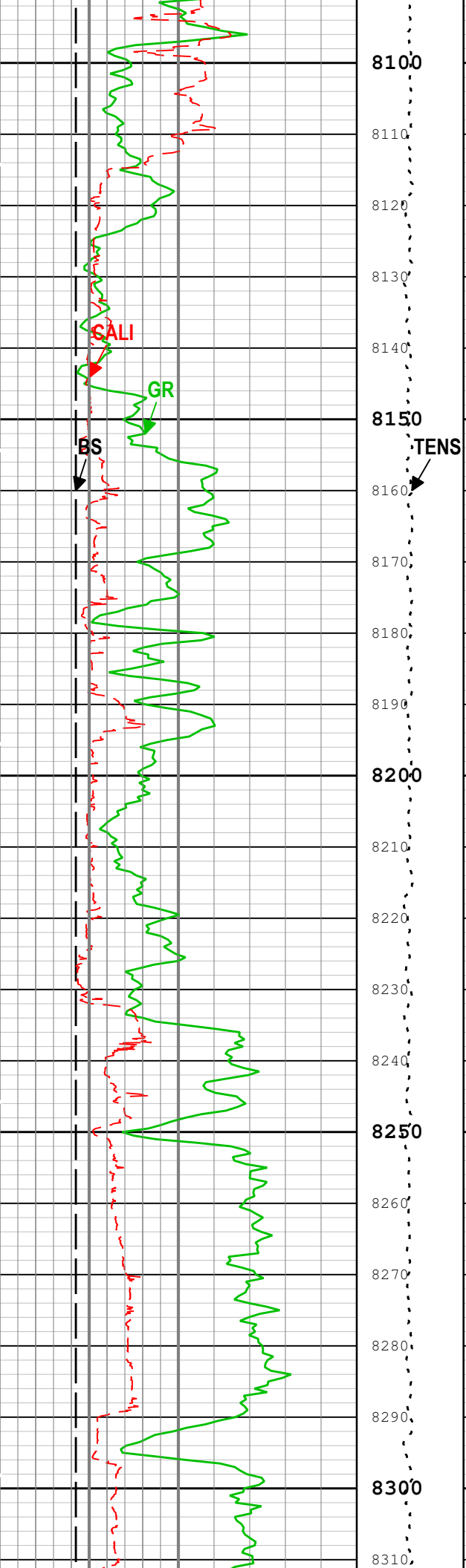
Composite 1

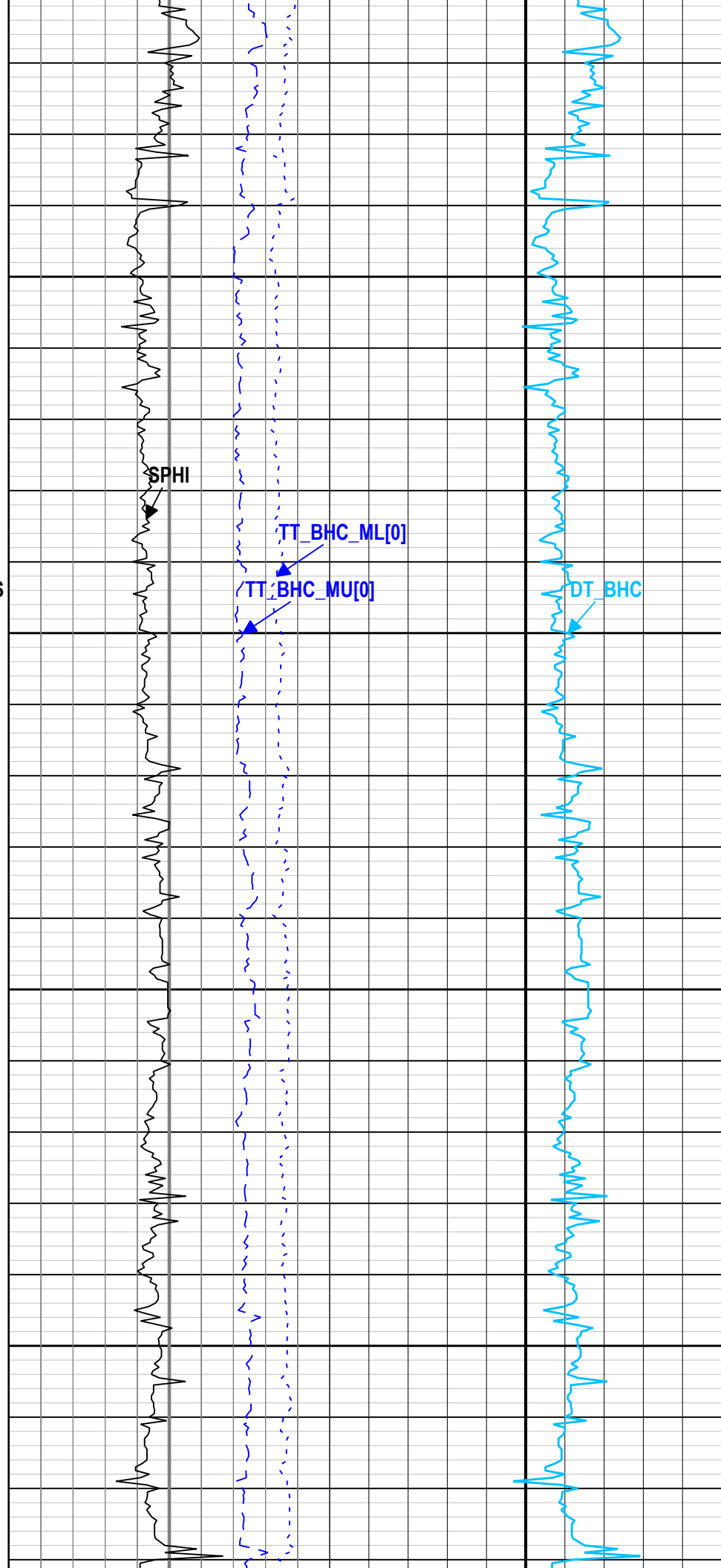
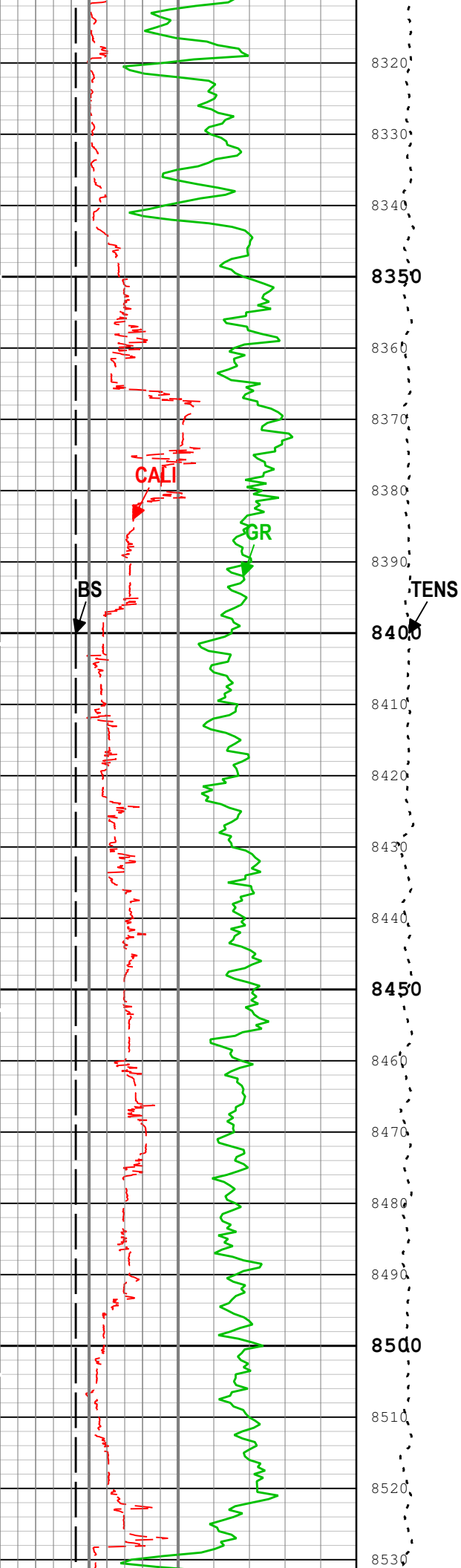
Description: MAST_SONI_BHC Format: Log (MAST_SONI_BHC) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2013 02:42:53

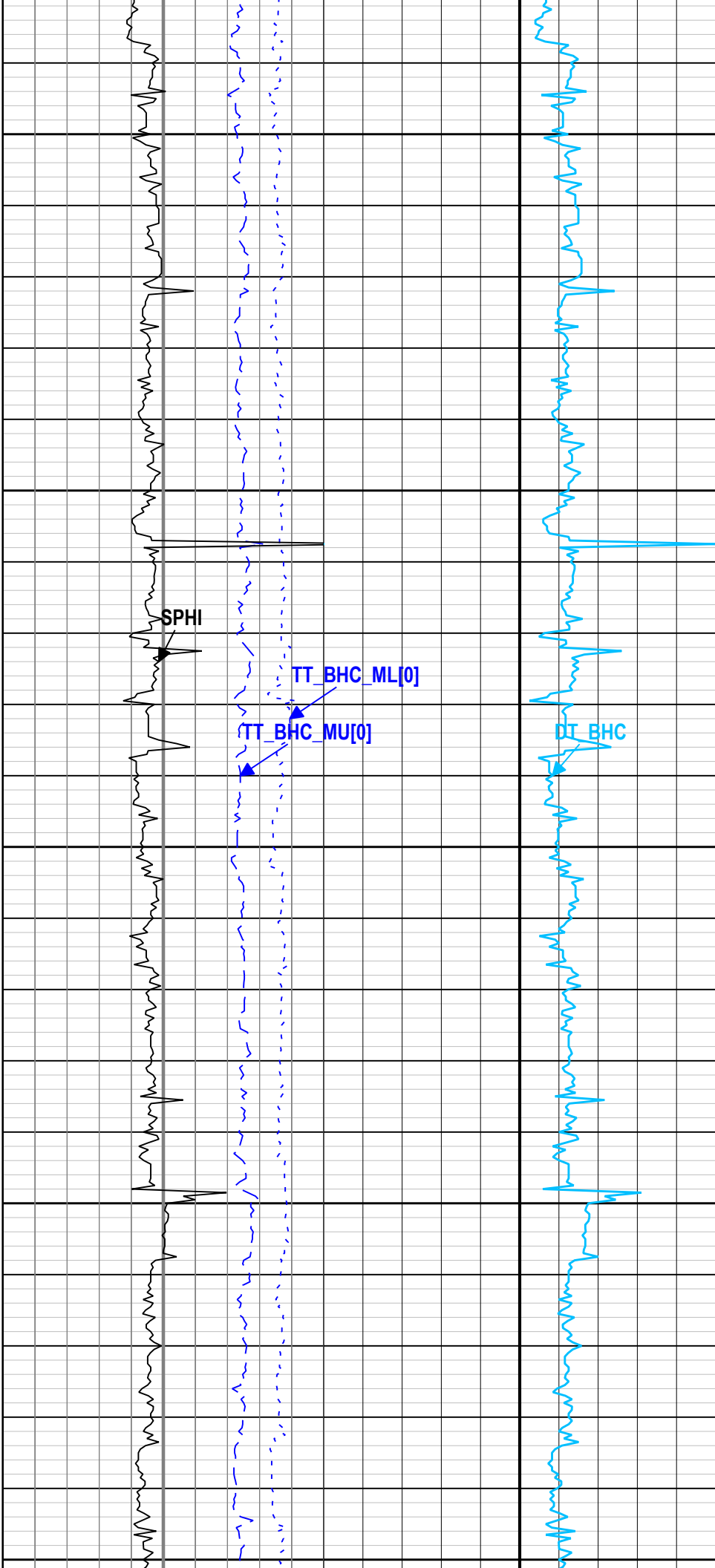
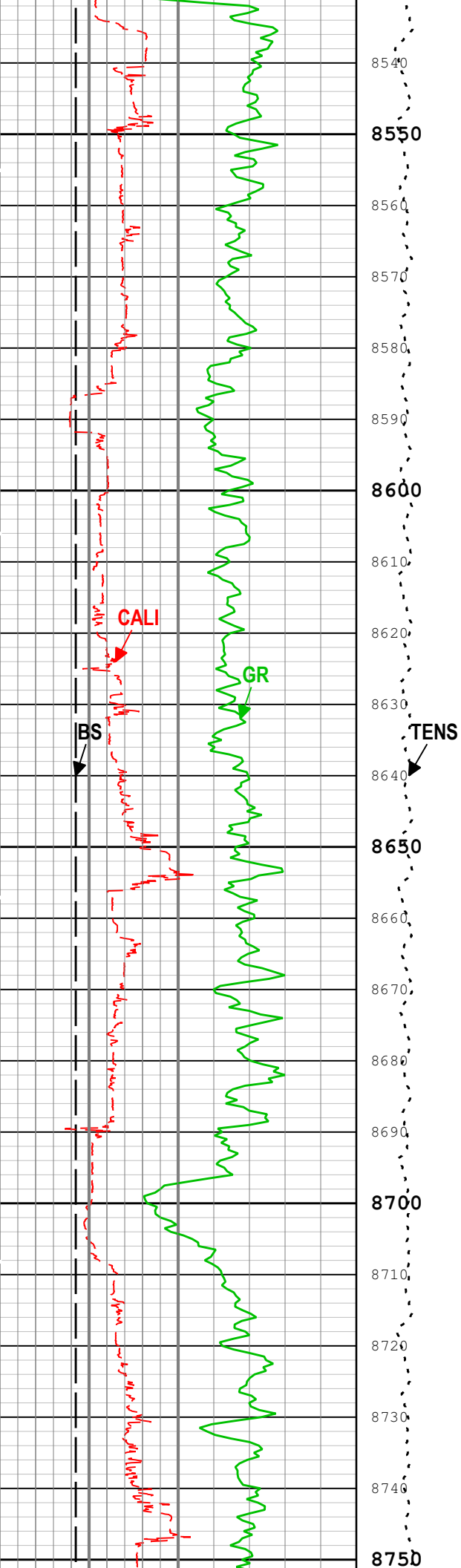
TIME_1900 - Time Marked every 60.00 (s)

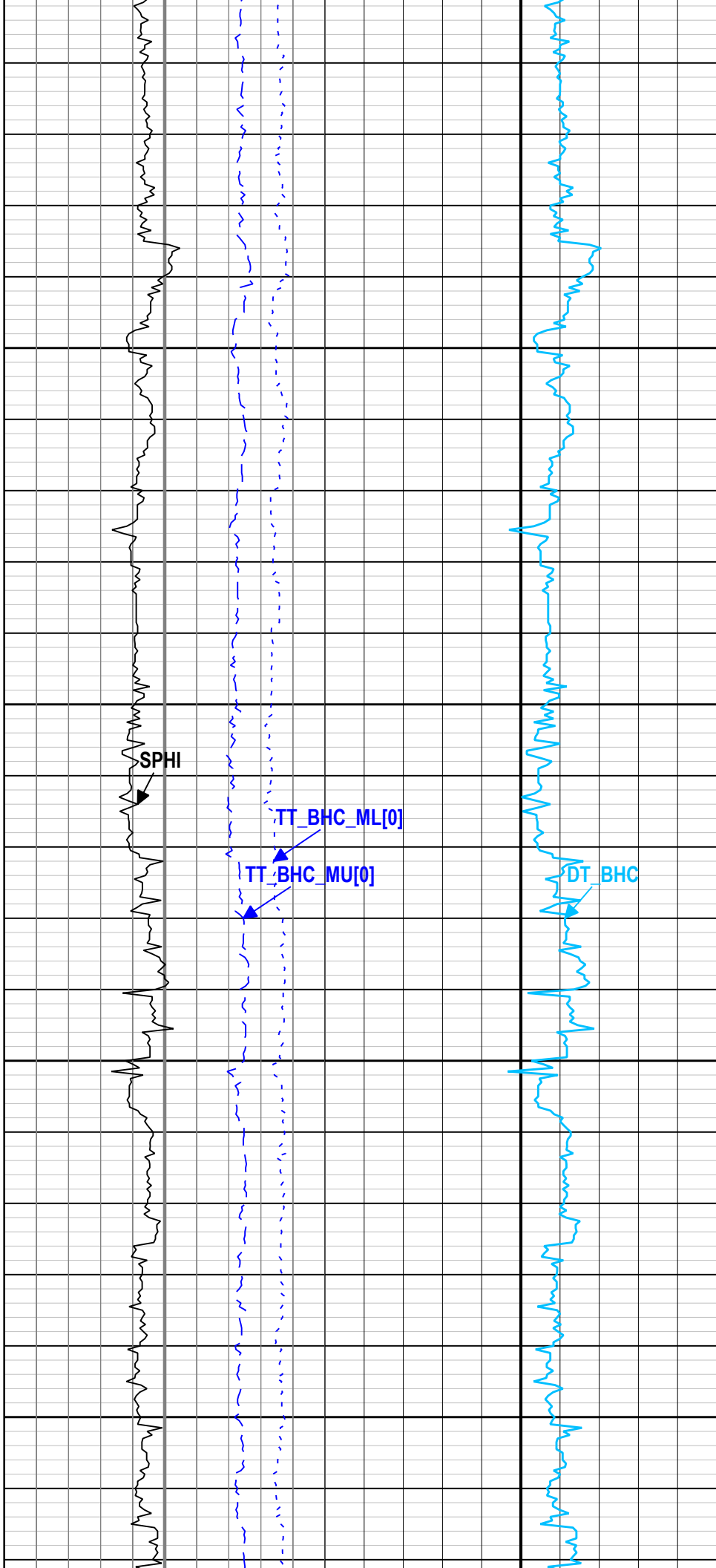
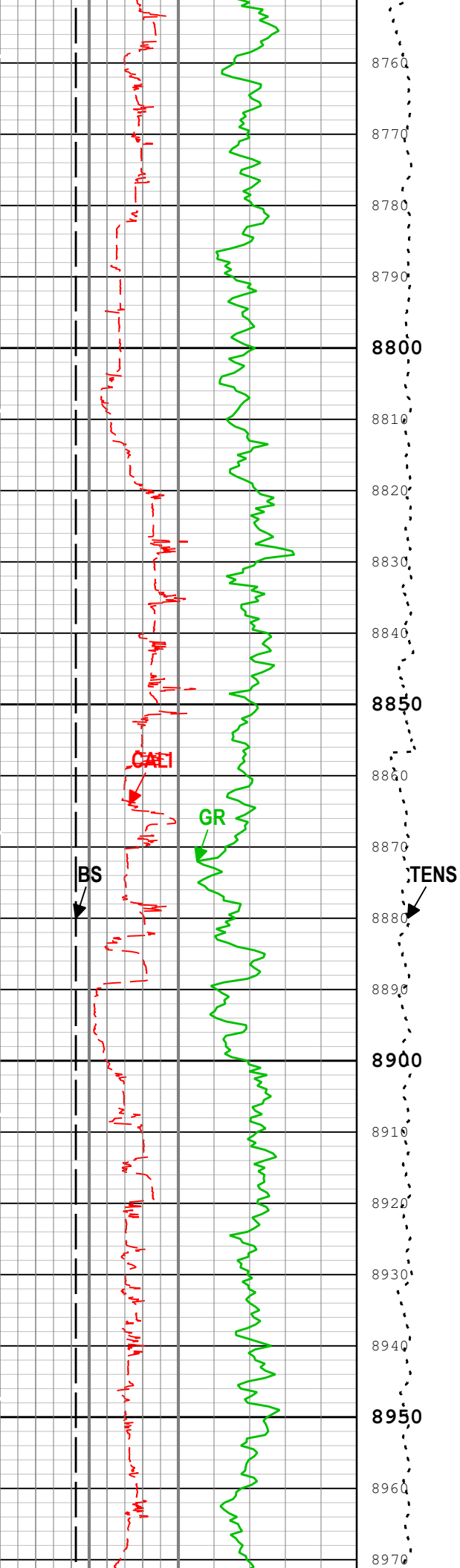
Borehole Compensated Transit Time of
Monpole Upper Transmitter
(TT_BHC_MU[0]) MAST-B[1]

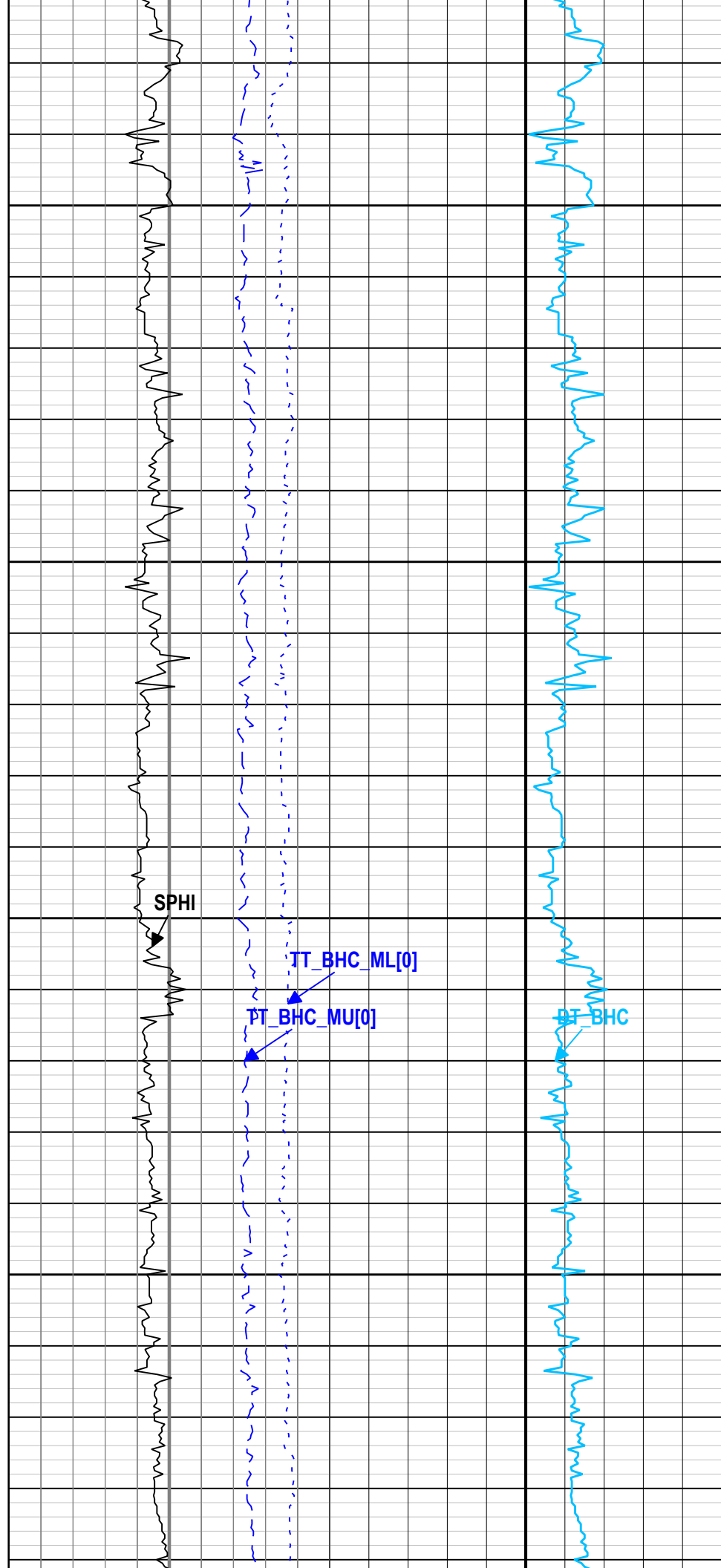
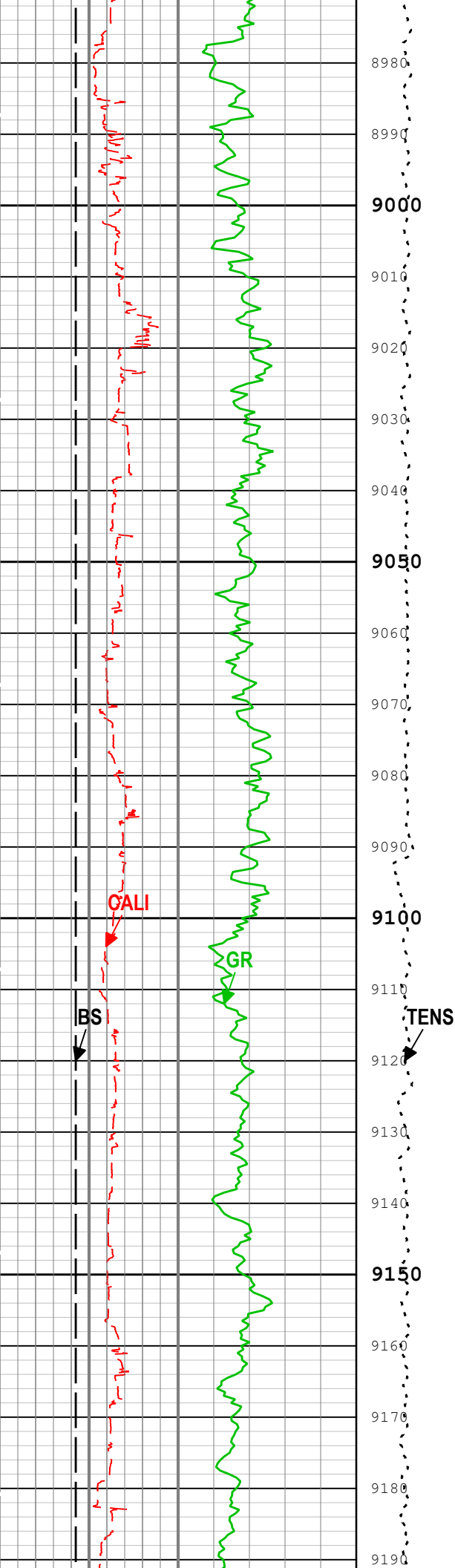


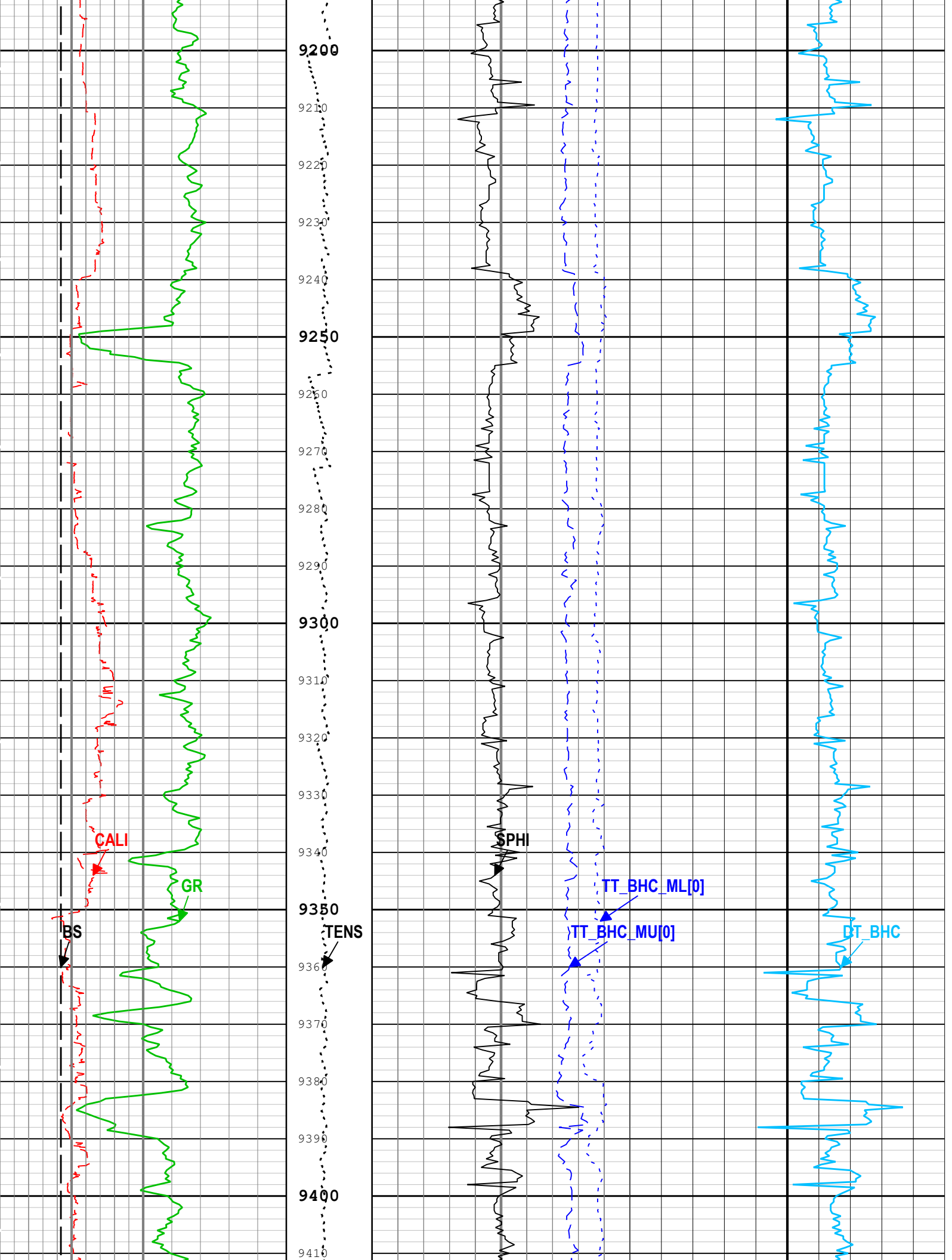


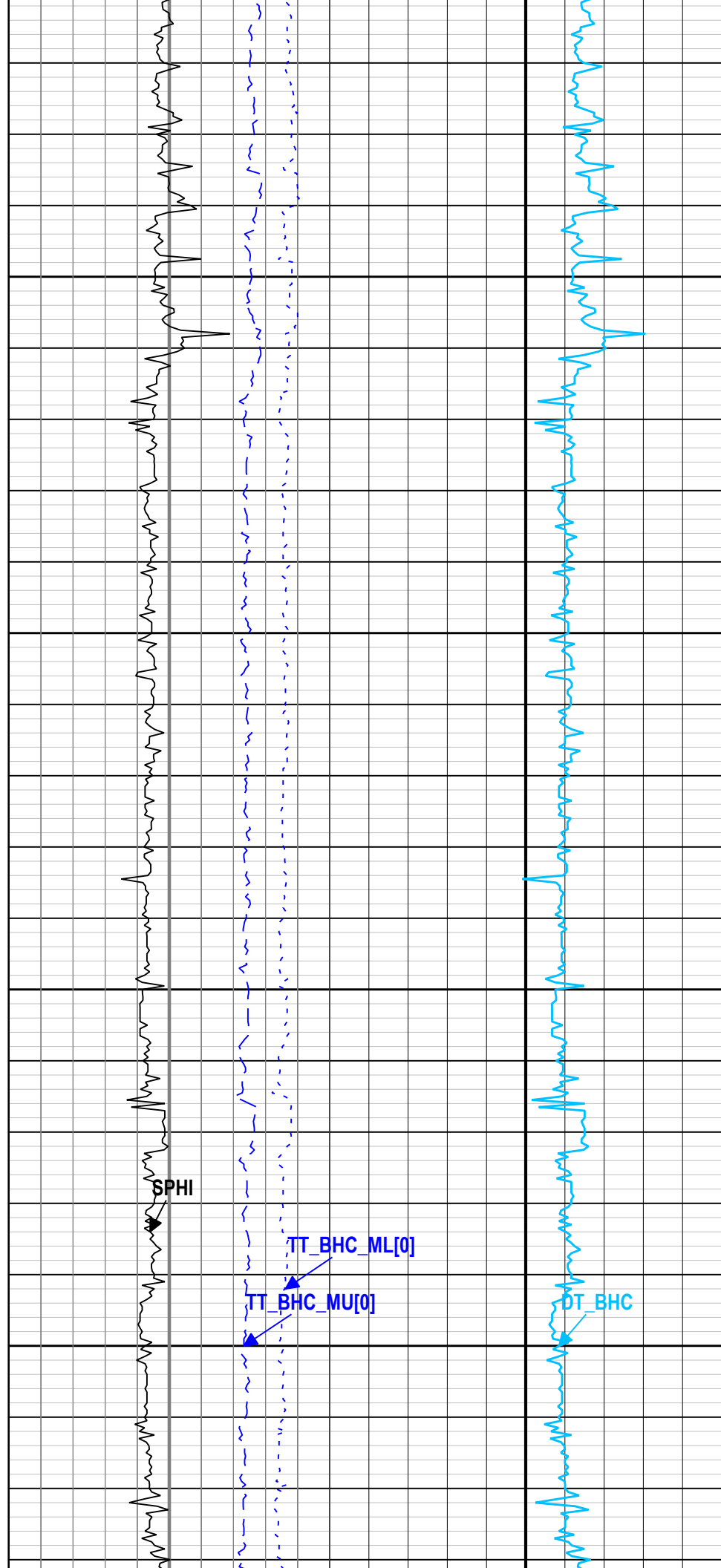
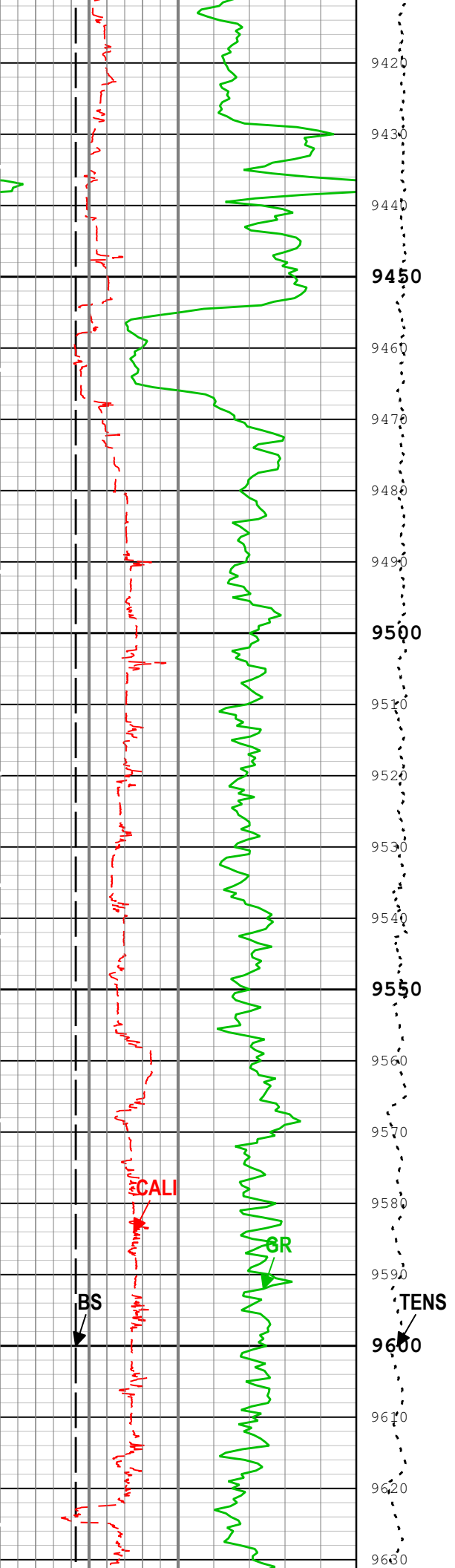


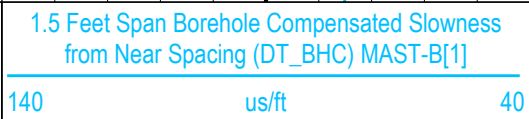
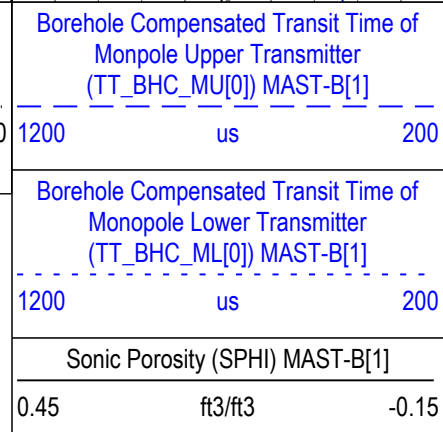
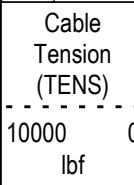
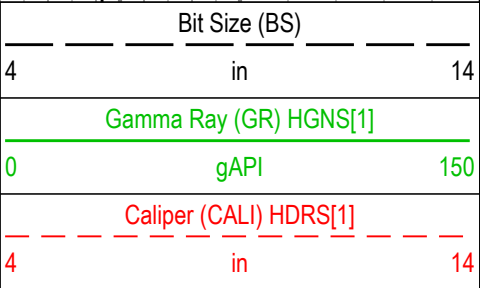
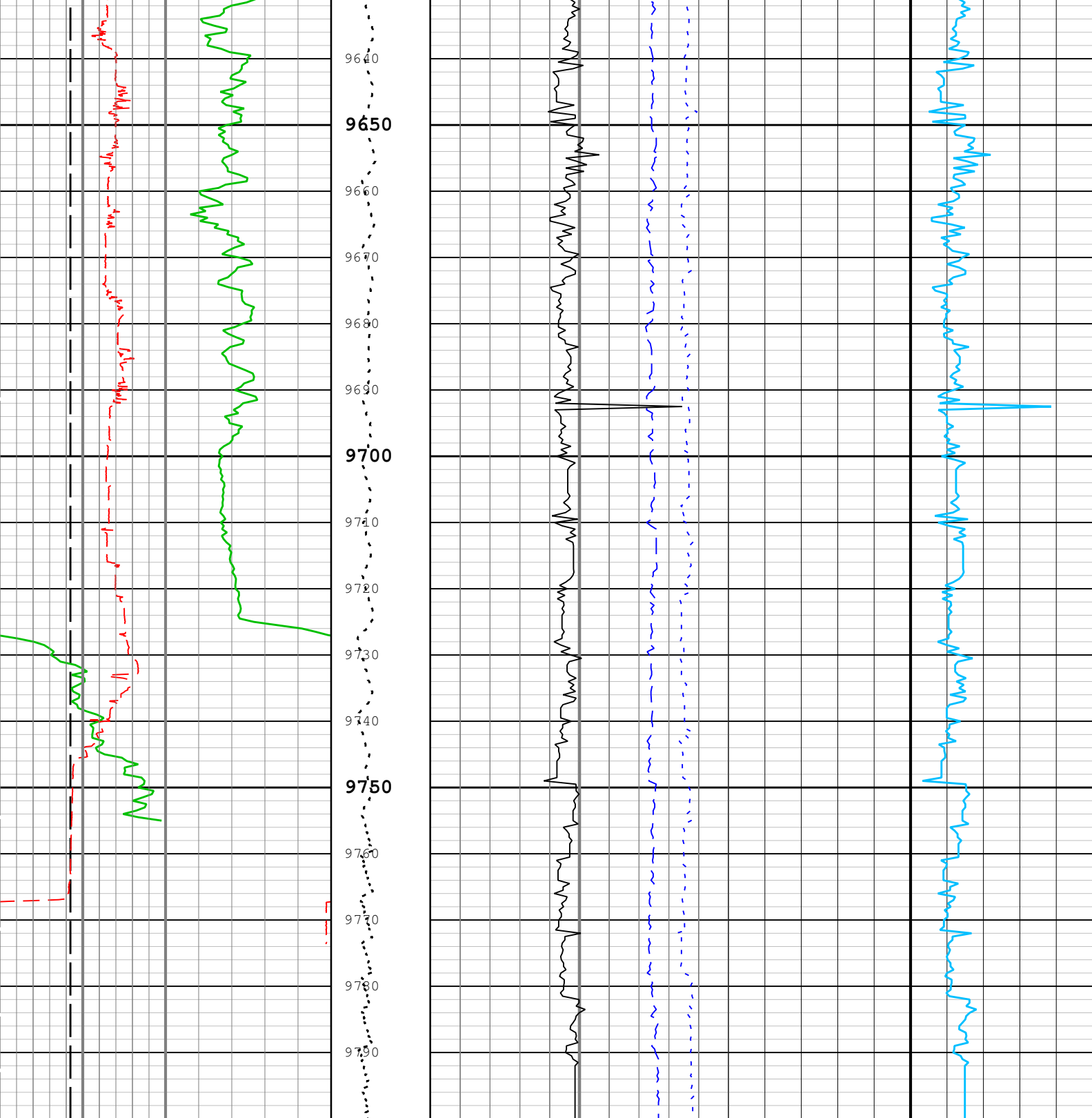












TIME_1900 - Time Marked every 60.00 (s)

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	Yes	
BHCCTL	Borehole Compensated Processing Control Flag	MAST-B	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	7918.25	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CDTS	Correction for Delta-T Shale, Empirical	Borehole	100	us/ft
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DET_STOP_MLM_M	Detection Stop Time for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	583.33	us
DET_STOP_MUM_M	Detection Stop Time for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	583.33	us
DET_STRT_MLM_M	Detection Start Time for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	106.67	us
DET_STRT_MUM_M	Detection Start Time for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	106.67	us
DFD	Drilling Fluid Density	Borehole	11.9	lbm/gal
DTF	Delta-T Fluid	Borehole	189	us/ft
DTM	Delta-T Matrix	Borehole	56	us/ft
FMDCTL_MLM_M	First Motion Detection Processing Control Flag for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	On	
FMDCTL_MUM_M	First Motion Detection Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	On	
FMDRS_MLM_M	First Motion Detection Receiver Selection for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	[1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0]	
FMDRS_MUM_M	First Motion Detection Receiver Selection for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	[0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1]	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
MODALCTL_MUM	Modal Decomposition Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing	MAST-B	On	
SFTY	Slowness Formation Type (Fast, Intermediate, Slow, etc.)	Borehole	Intermediate	
SOCN	Standoff Distance	HGNS-H	0	in
SPFS	Sonic Porosity Formula	Borehole	Raymer-Hunt	
SSCCTL_MUM	Sensor Sensitivity Correction Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing	MAST-B	On	

1Depth Zoned Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	7905	7921
BS	6.125	7921	9800

All depth are actual.

Tool Control Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
ACQ_DOMAIN	Custom Acquisition Domain Name	MAST-B	[UMMF, LMMF]	
CBOOTSTA_MAPC	MAMS Controller Boot Status	MAST-B	1	
CFWREV_MAPC	MAPC Firmware Revision of Controller Electronics	MAST-B	1840	
COMPCTL	Data Compression Control	MAST-B	[MZIPA, MZIPA]	
DHMODALCTL	Downhole/Surface Modal Computation Control	MAST-B	[OFF, OFF]	

DIGDEL	Waveform Digitizing Delay	MAST-B	[0, 0]	us
DIGDT	Sonic Waveform Digitizing Slowness	MAST-B	[0, 0]	us/ft
DIGTIME	Digitizing Time	MAST-B	[2550, 2550]	us
DIIN_WF_CHN	Dipole Inline Component Waveform Data Channel Name	MAST-B	[,]	
DIIN_WFN_CHN	Dipole Inline Component Waveform Normalization Data Channel Name	MAST-B	[,]	
DIOF_WF_CHN	Dipole Offline Component Waveform Data Channel Name	MAST-B	[,]	
DIOF_WFN_CHN	Dipole Offline Component Waveform Normalization Data Channel Name	MAST-B	[,]	
GNINT	Automatic Gain Selection Time Interval	MAST-B	[2550, 2550]	us
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3590	ft/h
MAX_TOOL_SPEED	Maximum service speed allowed for, or attained by, a logging tool.	MAST-B	3590	ft/h
MONO_WF_CHN	Monopole Component Waveform Data Channel Name	MAST-B	[RSWMUM_M, RSWMLM_M]	
MONO_WFN_CHN	Monopole Component Waveform Normalization Data Channel Name	MAST-B	[RSWMUMN_M, RSWMLMN_M]	
MSMT_LIST	Measurement List	MAST-B	[MUM, MLM]	
NUMMSMT	Number of active measurements	MAST-B	2	
PROD_CLASS	MAST Product Class Selection	MAST-B	BHC	
R10FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #10	MAST-B	1057	
R11FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #11	MAST-B	1057	
R12FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #12	MAST-B	1057	
R13FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #13	MAST-B	1057	
R1FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #1	MAST-B	1057	
R2FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #2	MAST-B	1057	
R3FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #3	MAST-B	1057	
R4FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #4	MAST-B	1057	
R5FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #5	MAST-B	1057	
R6FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #6	MAST-B	1057	
R7FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #7	MAST-B	1057	
R8FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #8	MAST-B	1057	
R9FWREV_MAPC	MAPC Firmware Revision of Sensor Electronics Station #9	MAST-B	1057	
RBOOTSTA_MAPC	MAMS Receiver Boot Status	MAST-B	1	
RXSEL	Receiver Station Select	MAST-B	[[Off, On], [Off, On], [Off, On], [Off, On], [On, On], [On, On], [On, On], [On, On], [On, Off], [On, Off], [On, Off], [On, Off]]	
SAMINT	Sonic Waveform Sampling Interval	MAST-B	[10, 10]	
SERVICE_LIST	Service Selection List	MAST-B	[NMSTC, NMATD, BHC]	
SNSR_WF_CHN	Sensor Waveforms Data Channel Name	MAST-B	[RSWMUM, RSWMLM]	
SNSR_WFN_CHN	Sensor Waveforms Normalization Factor Channel Name	MAST-B	[SWMUMN, SWMLMN]	
SNSRSEL	Sensor Element Select	MAST-B	[[On, On], [Off, Off], [On, On], [Off, Off], [On, On], [Off, Off], [On, On], [Off, Off]]	
TX_AMP	Transmitter Amplitude Factor	MAST-B	[THREEQUARTER, THREEQUARTER]	
TXSEL	Transmitter Drive Selection	MAST-B	[UM, LM]	
WF_CR_CHN	Waveform Compression Rate Channel Name	MAST-B	[WCRMUM, WCRMLM]	
WF_DEPTH_CHN	Waveform Depth Channel Name	MAST-B	[WDMUM, WDMLM]	
WF_QI_CHN	Waveform Quality Indicator Channel Name	MAST-B	[WQMUM, WQMLM]	
WFSEL	Transmitter Drive Waveform Selection	MAST-B	[mp_mf_d, mp_mf_d]	

1

Repeat Analysis

Pass Summary									
Run	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth	Include	

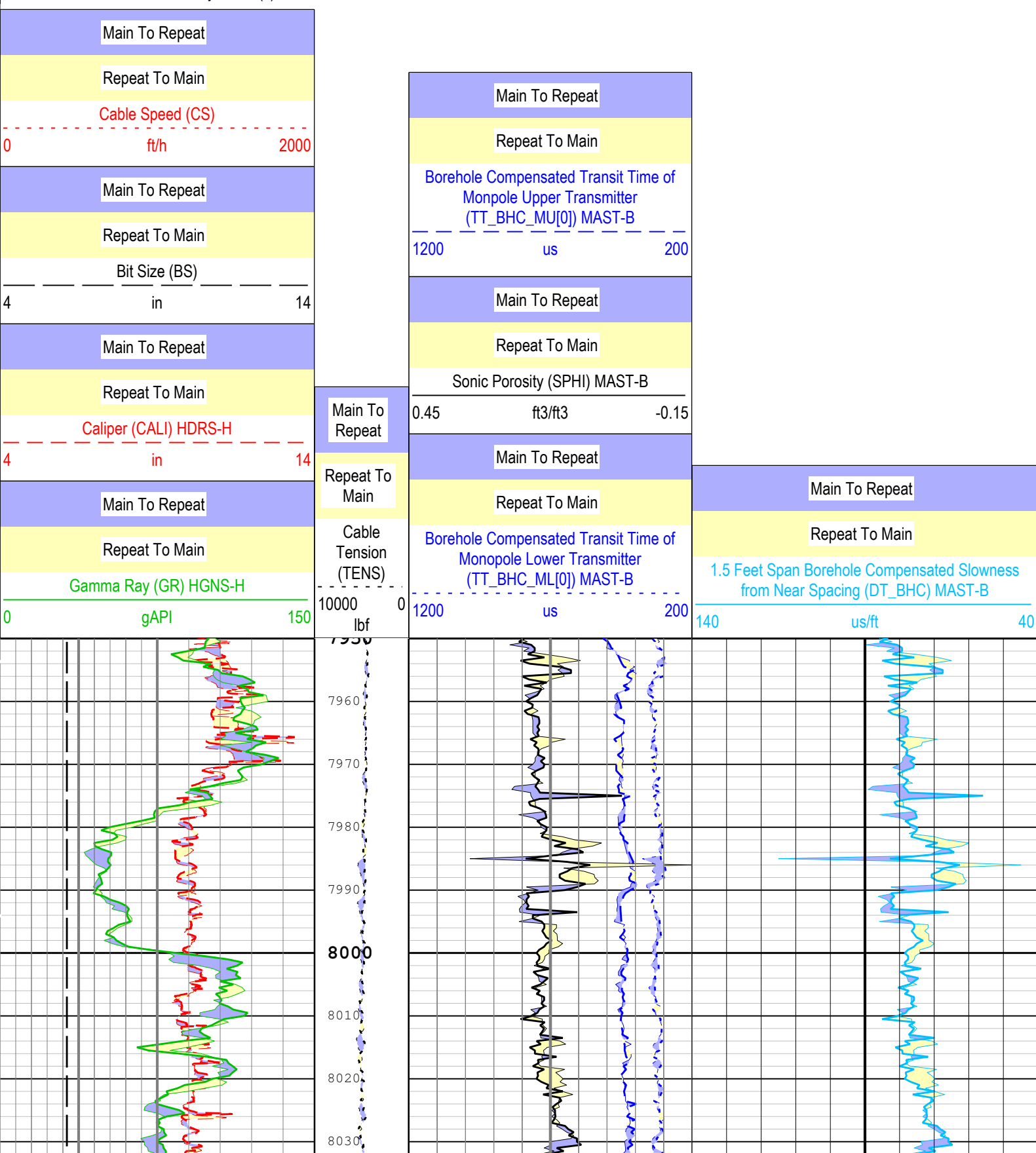
Name							Shift	Parallel Data
1	Log[5]:Up	Up	7900.54 ft	9571.45 ft	05-Mar-2013 8:16:36 PM	05-Mar-2013 9:03:45 PM	29.93 ft	false
1	Log[6]:Up	Up	7502.78 ft	8289.62 ft	05-Mar-2013 9:09:50 PM	05-Mar-2013 9:25:44 PM	29.96 ft	false

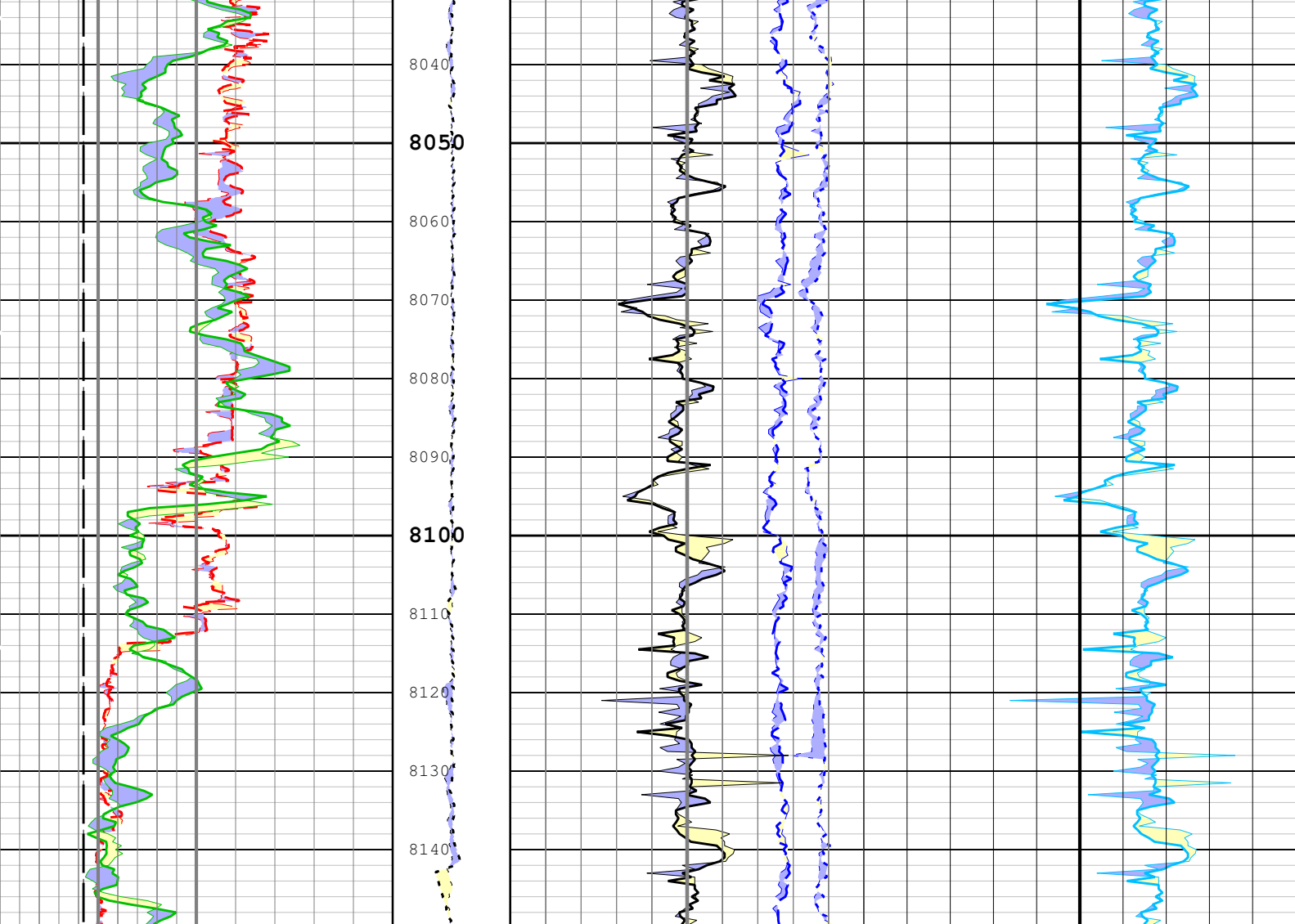
All depths are referenced to toolstring zero

Log	1: Log[5]:Up
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Description: MAST_SONI_BHC Format: Log (MAST_SONI_BHC RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2013 02:42:56

TIME_1900 - Time Marked every 60.00 (s)





Main To Repeat	Main To Repeat	Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main	Repeat To Main	Repeat To Main
Cable Speed (CS)	Cable Tension (TENS)	Borehole Compensated Transit Time of Monopole Upper Transmitter (TT_BHC_MU[0]) MAST-B	1.5 Feet Span Borehole Compensated Slowness from Near Spacing (DT_BHC) MAST-B
0 ft/h 2000	10000 lbf 0	1200 us 200	140 us/ft 40
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Bit Size (BS)		Sonic Porosity (SPHI) MAST-B	
4 in 14		0.45 ft3/ft3 -0.15	
Main To Repeat		Main To Repeat	
Repeat To Main		Repeat To Main	
Caliper (CALI) HDRS-H		Borehole Compensated Transit Time of Monopole Lower Transmitter (TT_BHC_ML[0]) MAST-B	
4 in 14		1200 us 200	
Main To Repeat			
Repeat To Main			
Gamma Ray (GR) HGNS-H			
0 gAPI 150			

Calibration Report**HRLT-B (High Resolution Laterolog Array) Calibration - Run 1**

Primary Equipment :

HRLT-B Sonde

HRLS-B

966

HRLT-B Calibration - HRLT M0-M1 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M01 - 0	uV	Before	-322.7	-379.6	-316.1	-280.6	
		After	-322.7	-379.6	-315.4	-280.6	
		After-Before	-----	-----	0.7	-----	
HRLT M01 - 1	uV	Before	-322.7	-379.6	-318.1	-280.6	
		After	-322.7	-379.6	-313.7	-280.6	
		After-Before	-----	-----	4.4	-----	
HRLT M01 - 2	uV	Before	-322.7	-379.6	-319.0	-280.6	
		After	-322.7	-379.6	-316.4	-280.6	
		After-Before	-----	-----	2.6	-----	
HRLT M01 - 3	uV	Before	-322.7	-379.6	-318.0	-280.6	
		After	-322.7	-379.6	-315.4	-280.6	
		After-Before	-----	-----	2.6	-----	
HRLT M01 - 4	uV	Before	-322.7	-379.6	-313.4	-280.6	
		After	-322.7	-379.6	-311.9	-280.6	
		After-Before	-----	-----	1.5	-----	
HRLT M01 - 5	uV	Before	-322.7	-379.6	-317.5	-280.6	
		After	-322.7	-379.6	-316.4	-280.6	
		After-Before	-----	-----	1.1	-----	
HRLT M01 - 6	uV	Before	322.7	280.6	318.0	379.6	
		After	322.7	280.6	316.1	379.6	
		After-Before	-----	-----	-1.9	-----	

HRLT-B Calibration - HRLT M1-M2 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M12 - 0	uV	Before	1781.0	1548.7	1734.6	2095.3	
		After	1781.0	1548.7	1729.2	2095.3	
		After-Before	-----	-----	-5.4	-----	
HRLT M12 - 1	uV	Before	1781.0	1548.7	1753.2	2095.3	
		After	1781.0	1548.7	1726.8	2095.3	
		After-Before	-----	-----	-26.4	-----	
HRLT M12 - 2	uV	Before	1781.0	1548.7	1750.6	2095.3	
		After	1781.0	1548.7	1734.8	2095.3	
		After-Before	-----	-----	-15.8	-----	
HRLT M12 - 3	uV	Before	1781.0	1548.7	1744.0	2095.3	
		After	1781.0	1548.7	1727.4	2095.3	
		After-Before	-----	-----	-16.6	-----	
HRLT M12 - 4	uV	Before	1781.0	1548.7	1717.3	2095.3	
		After	1781.0	1548.7	1706.7	2095.3	
		After-Before	-----	-----	-10.6	-----	
HRLT M12 - 5	uV	Before	1781.0	1548.7	1740.1	2095.3	
		After	1781.0	1548.7	1731.9	2095.3	
		After-Before	-----	-----	-8.2	-----	
HRLT M12 - 6	uV	Before	-1781.0	-2095.3	-1760.9	-1548.7	
		After	-1781.0	-2095.3	-1748.6	-1548.7	
		After-Before	-----	-----	12.3	-----	

HRLT-B Calibration - HRLT M2-M3 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M23 - 0	uV	Before	1781.0	1548.7	1731.7	2095.3	
		After	1781.0	1548.7	1727.9	2095.3	
		After-Before	-----	-----	-3.8	-----	
HRLT M23 - 1	uV	Before	1781.0	1548.7	1754.1	2095.3	
		After	1781.0	1548.7	1729.1	2095.3	

		After-Before	-----	-----	-25.0	-----			
HRLT M23 - 2	uV	Before	1781.0	1548.7	1755.2	2095.3			
		After	1781.0	1548.7	1740.6	2095.3			
		After-Before	-----	-----	-14.6	-----			
HRLT M23 - 3	uV	Before	1781.0	1548.7	1753.8	2095.3			
		After	1781.0	1548.7	1739.0	2095.3			
		After-Before	-----	-----	-14.8	-----			
HRLT M23 - 4	uV	Before	1781.0	1548.7	1723.8	2095.3			
		After	1781.0	1548.7	1714.7	2095.3			
		After-Before	-----	-----	-9.1	-----			
HRLT M23 - 5	uV	Before	1781.0	1548.7	1748.8	2095.3			
		After	1781.0	1548.7	1742.0	2095.3			
		After-Before	-----	-----	-6.8	-----			
HRLT M23 - 6	uV	Before	-1781.0	-2095.3	-1750.1	-1548.7			
		After	-1781.0	-2095.3	-1738.9	-1548.7			
		After-Before	-----	-----	11.2	-----			

HRLT-B Calibration - HRLT A3-A4 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V34 - 0	uV	Before	70000.0	60869.6	67710.7	82352.9	
		After	70000.0	60869.6	67591.3	82352.9	
		After-Before	----	----	-119.4	----	
HRLT V34 - 1	uV	Before	70000.0	60869.6	68537.4	82352.9	
		After	70000.0	60869.6	67604.9	82352.9	
		After-Before	----	----	-932.5	----	
HRLT V34 - 2	uV	Before	70000.0	60869.6	68883.5	82352.9	
		After	70000.0	60869.6	68345.2	82352.9	
		After-Before	----	----	-538.3	----	
HRLT V34 - 3	uV	Before	70000.0	60869.6	69021.6	82352.9	
		After	70000.0	60869.6	68459.1	82352.9	
		After-Before	----	----	-562.5	----	
HRLT V34 - 4	uV	Before	70000.0	60869.6	67735.1	82352.9	
		After	70000.0	60869.6	67413.8	82352.9	
		After-Before	----	----	-321.3	----	
HRLT V34 - 5	uV	Before	70000.0	60869.6	68699.9	82352.9	
		After	70000.0	60869.6	68468.7	82352.9	
		After-Before	----	----	-231.2	----	
HRLT V34 - 6	uV	Before	-70000.0	-82352.9	-67433.3	-60869.6	
		After	-70000.0	-82352.9	-67025.3	-60869.6	
		After-Before	----	----	408.0	----	

HRLT-B Calibration - HRLT A4-A5 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V45 - 0	uV	Before	70000.0	60869.6	67795.6	82352.9	
		After	70000.0	60869.6	67679.2	82352.9	
		After-Before	----	----	-116.4	----	
HRLT V45 - 1	uV	Before	70000.0	60869.6	68829.8	82352.9	
		After	70000.0	60869.6	67904.9	82352.9	
		After-Before	----	----	-924.9	----	
HRLT V45 - 2	uV	Before	70000.0	60869.6	69124.3	82352.9	
		After	70000.0	60869.6	68583.5	82352.9	
		After-Before	----	----	-540.8	----	
HRLT V45 - 3	uV	Before	70000.0	60869.6	69223.8	82352.9	
		After	70000.0	60869.6	68653.1	82352.9	
		After-Before	----	----	-570.7	----	
HRLT V45 - 4	uV	Before	70000.0	60869.6	67851.2	82352.9	
		After	70000.0	60869.6	67533.2	82352.9	
		After-Before	----	----	-318.0	----	
HRLT V45 - 5	uV	Before	70000.0	60869.6	68791.9	82352.9	
		After	70000.0	60869.6	68556.8	82352.9	
		After-Before	----	----	-235.1	----	
HRLT V45 - 6	uV	Before	-70000.0	-82352.9	-67733.6	-60869.6	
		After	-70000.0	-82352.9	-67341.0	-60869.6	
		After-Before	----	----	392.6	----	

HRLT-B Calibration - HRLT A5-A6 Voltage Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
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Before (Measured):		After (Measured):		Before (Measured):		After (Measured):	
15:42:50 05-Mar-2013		15:42:50 05-Mar-2013		22:43:13 05-Mar-2013		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V56 - 0	uV	Before	70000.0	60869.6	67746.0	82352.9	
		After	70000.0	60869.6	67626.6	82352.9	
		After-Before	-----	-----	-119.4	-----	
HRLT V56 - 1	uV	Before	70000.0	60869.6	68801.4	82352.9	
		After	70000.0	60869.6	67880.1	82352.9	
		After-Before	-----	-----	-921.3	-----	
HRLT V56 - 2	uV	Before	70000.0	60869.6	69085.4	82352.9	
		After	70000.0	60869.6	68577.8	82352.9	
		After-Before	-----	-----	-507.6	-----	
HRLT V56 - 3	uV	Before	70000.0	60869.6	69171.4	82352.9	
		After	70000.0	60869.6	68603.6	82352.9	
		After-Before	-----	-----	-567.8	-----	
HRLT V56 - 4	uV	Before	70000.0	60869.6	67797.1	82352.9	
		After	70000.0	60869.6	67479.8	82352.9	
		After-Before	-----	-----	-317.3	-----	
HRLT V56 - 5	uV	Before	70000.0	60869.6	68737.0	82352.9	
		After	70000.0	60869.6	68507.7	82352.9	
		After-Before	-----	-----	-229.3	-----	
HRLT V56 - 6	uV	Before	-70000.0	-82352.9	-67701.1	-60869.6	
		After	-70000.0	-82352.9	-67305.9	-60869.6	
		After-Before	-----	-----	395.2	-----	

HRLT-B Calibration - HRLT Torpedo-M0 Voltage

Before (Measured):		After (Measured):		Before (Measured):		After (Measured):	
15:42:50 05-Mar-2013		15:42:50 05-Mar-2013		22:43:13 05-Mar-2013		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VTP - 0	uV	Before	-70000.0	-82352.9	-67620.8	-60869.6	
		After	-70000.0	-82352.9	-67516.8	-60869.6	
		After-Before	-----	-----	104.0	-----	
HRLT VTP - 1	uV	Before	-70000.0	-82352.9	-69116.6	-60869.6	
		After	-70000.0	-82352.9	-68206.4	-60869.6	
		After-Before	-----	-----	910.2	-----	
HRLT VTP - 2	uV	Before	-70000.0	-82352.9	-69395.8	-60869.6	
		After	-70000.0	-82352.9	-68863.2	-60869.6	
		After-Before	-----	-----	532.6	-----	
HRLT VTP - 3	uV	Before	-70000.0	-82352.9	-69497.3	-60869.6	
		After	-70000.0	-82352.9	-68946.3	-60869.6	
		After-Before	-----	-----	551.0	-----	
HRLT VTP - 4	uV	Before	-70000.0	-82352.9	-68122.5	-60869.6	
		After	-70000.0	-82352.9	-67810.7	-60869.6	
		After-Before	-----	-----	311.8	-----	
HRLT VTP - 5	uV	Before	-70000.0	-82352.9	-69053.3	-60869.6	
		After	-70000.0	-82352.9	-68825.8	-60869.6	
		After-Before	-----	-----	227.5	-----	
HRLT VTP - 6	uV	Before	70000.0	60869.6	67971.6	82352.9	
		After	70000.0	60869.6	67559.1	82352.9	
		After-Before	-----	-----	-412.5	-----	

HRLT-B Calibration - HRLT Bridle#9-M0 Voltage

Before (Measured):		After (Measured):		Before (Measured):		After (Measured):	
15:42:50 05-Mar-2013		15:42:50 05-Mar-2013		22:43:13 05-Mar-2013		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VBD - 0	uV	Before	-70000.0	-82352.9	-67585.4	-60869.6	
		After	-70000.0	-82352.9	-67479.0	-60869.6	
		After-Before	-----	-----	106.4	-----	
HRLT VBD - 1	uV	Before	-70000.0	-82352.9	-69035.1	-60869.6	
		After	-70000.0	-82352.9	-68088.9	-60869.6	
		After-Before	-----	-----	946.2	-----	
HRLT VBD - 2	uV	Before	-70000.0	-82352.9	-69287.0	-60869.6	
		After	-70000.0	-82352.9	-68781.4	-60869.6	
		After-Before	-----	-----	505.6	-----	
HRLT VBD - 3	uV	Before	-70000.0	-82352.9	-69423.1	-60869.6	
		After	-70000.0	-82352.9	-68844.9	-60869.6	
		After-Before	-----	-----	578.2	-----	
HRLT VBD - 4	uV	Before	-70000.0	-82352.9	-68073.4	-60869.6	
		After	-70000.0	-82352.9	-67757.2	-60869.6	
		After-Before	-----	-----	316.2	-----	
HRLT VBD - 5	uV	Before	-70000.0	-82352.9	-69024.7	-60869.6	
		After	-70000.0	-82352.9	-68781.0	-60869.6	
		After-Before	-----	-----	243.7	-----	

		After	-70000.0	-62352.9	-68781.9	-60869.6	
		After-Before	-----	-----	242.8	-----	
HRLT VBD - 6	uV	Before	70000.0	60869.6	67865.0	82352.9	
		After	70000.0	60869.6	67471.2	82352.9	
		After-Before	-----	-----	-393.8	-----	

HRLT-B Calibration - HRLT Source Current Plus

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT ISO - 0	uA	Before	284.0	247.0	282.4	334.1	
		After	284.0	247.0	281.9	334.1	
		After-Before	-----	-----	-0.5	-----	
HRLT ISO - 1	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	
HRLT ISO - 2	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	
HRLT ISO - 3	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	
HRLT ISO - 4	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	
HRLT ISO - 5	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	
HRLT ISO - 6	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-----	0.0	-----	

HRLT-B Calibration - HRLT Vertical Voltage PI

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT MV - 0	uV	Before	-322.7	-379.6	-317.8	-280.6	
		After	-322.7	-379.6	-317.2	-280.6	
		After-Before	-----	-----	0.6	-----	
HRLT MV - 1	uV	Before	-322.7	-379.6	-314.6	-280.6	
		After	-322.7	-379.6	-310.4	-280.6	
		After-Before	-----	-----	4.2	-----	
HRLT MV - 2	uV	Before	-322.7	-379.6	-313.6	-280.6	
		After	-322.7	-379.6	-311.2	-280.6	
		After-Before	-----	-----	2.4	-----	
HRLT MV - 3	uV	Before	-322.7	-379.6	-310.7	-280.6	
		After	-322.7	-379.6	-308.1	-280.6	
		After-Before	-----	-----	2.6	-----	
HRLT MV - 4	uV	Before	-322.7	-379.6	-302.9	-280.6	
		After	-322.7	-379.6	-301.4	-280.6	
		After-Before	-----	-----	1.5	-----	
HRLT MV - 5	uV	Before	-322.7	-379.6	-321.4	-280.6	
		After	-322.7	-379.6	-320.4	-280.6	
		After-Before	-----	-----	1.0	-----	
HRLT MV - 6	uV	Before	322.7	280.6	327.3	379.6	
		After	322.7	280.6	325.6	379.6	
		After-Before	-----	-----	-1.7	-----	

HRLT-B Calibration - HRLT Calibration Temperature

Before (Measured):		15:42:50 05-Mar-2013		After (Measured):		22:43:13 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CTEM_HRLT	degF	Before			104.9		
		After			98.4		
		After-Before	-----	-----	-6.5	-----	

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1

Primary Equipment :			
HILT High-Resolution Control Cartridge, 150 degC		HRCC-H	3929
HILT Resistivity Gamma-Ray Density Device, 150 degC		HRGD-H	4716

Auxiliary Equipment :		
HRDD Backscatter Detector	Backscatter	26906
HRDD Long Spacing Detector	Long Spacing	28862
HRDD Short Spacing Detector	Short Spacing	42174
Cesium 137 Gamma-Ray Logging Source	GSR-J	3761
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3929
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3950
Calibration Parameter :		
Small Ring Size (Caliper Calibration Small Ring)	8.00	
Large Ring Size (Caliper Calibration Large Ring)	12.00	

HDRS Caliper Calibration - Caliper Accumulations							
Before (Measured):		07:43:40 05-Mar-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.71	10.00	
Large Ring	in	Before	12.00	9.00	11.65	15.00	

HDRS Density Calibration - Inversion Results							
Master (EEPROM):		19:06:40 12-Feb-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.601	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.685	1.696	
Pe Aluminum		Master	2.570	2.470	2.537	2.670	
Pe Magnesium		Master	2.650	2.550	2.652	2.750	

HDRS Density Calibration - Deviation Summary							
Master (EEPROM):		19:06:40 12-Feb-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.1605	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.4988	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.3565	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.3729	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.4916	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.1809	3.5000	

HDRS Density Calibration - Background Summary							
Master (EEPROM):		19:06:40 12-Feb-2013		Before (Measured):		15:45:15 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7424		
		Before	0.7424	0.7052	0.7394	0.7795	
		Before-Master	-----	-----	-0.0030	-----	
BS Window Sum	1/s	Master	1		24269		
		Before	24269	23056	23862	25483	
		Before-Master	-----	-----	-407	-----	
SS Window Ratio		Master	1.0000		0.4796		
		Before	0.4796	0.4557	0.4766	0.5036	
		Before-Master	-----	-----	-0.0030	-----	
SS Window Sum	1/s	Master	1		11439		
		Before	11439	10867	11406	12011	
		Before-Master	-----	-----	-33	-----	
LS Window Ratio		Master	1.0000		0.3031		
		Before	0.3031	0.2879	0.3011	0.3182	
		Before-Master	-----	-----	-0.0020	-----	
LS Window Sum	1/s	Master	1		1318		
		Before	1318	1252	1306	1384	
		Before-Master	-----	-----	-12	-----	

HDRS Density Calibration - Photo-multiplier High Voltages							
Master (EEPROM):		19:06:40 12-Feb-2013		Before (Measured):		15:45:15 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1475	2400	
		Before		1000	1491	2400	
		Before-Master	-----	-100	16	100	
SS PM High Voltage	V	Master		1000	1551	2400	
		Before		1000	1560	2400	

		Before-Master	-----	-100	9	100	
LS PM High Voltage	V	Master		1000	1357	2400	
		Before		1000	1350	2400	
		Before-Master	-----	-100	-7	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		19:06:40 12-Feb-2013		Before (Measured):		15:45:15 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master		5.00	10.72	25.00	
		Before		5.00	10.85	25.00	
		Before-Master	-----	-1.00	0.13	1.00	
SS Crystal Resolution	%	Master		5.00	9.29	20.00	
		Before		5.00	9.27	20.00	
		Before-Master	-----	-1.00	-0.02	1.00	
LS Crystal Resolution	%	Master		5.00	8.84	20.00	
		Before		5.00	8.80	20.00	
		Before-Master	-----	-1.00	-0.04	1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		15:45:34 05-Mar-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3862	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3815	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3827	4136	

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run 1

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	3969	
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC	HACCZ-H	4171	
AmBe Neutron Logging Source	NSR-F	331	
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG (Jig minus background reference)	165		

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		15:40:49 05-Mar-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.0	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		00:00:00 15-Jul-2005					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Accelerometer Manufacturer		Master			QAT_160		
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0	
Accelerometer Coefficients - 0		Master	-----	-----	13743.000	-----	
Accelerometer Coefficients - 1		Master	-----	-----	1.783	-----	
Accelerometer Coefficients - 2		Master	-----	-----	-0.001	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.720	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	298.400	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.989	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		20:37:24 11-Feb-2013		Before (Measured):		15:43:30 05-Mar-2013		After (Measured):		22:57:07 05-Mar-2013	
Measurement		Unit	Phase	Nominal	Low Limit	Actual	High Limit				
Near Zero Measurement		1/s	Master	0	5.0	26.3	40.0				
			Before	0	5.0	26.6	40.0				
			After	0	5.0	27.2	40.0				

		After	0	0.0	27.2	40.0	
		Before-Master	----	-3.9	0.3	3.9	
		After-Before	----	-4.0	0.6	4.0	
Far Zero Measurement	1/s	Master	0	5.0	28.1	40.0	
		Before	0	5.0	28.3	40.0	
		After	0	5.0	29.8	40.0	
		Before-Master	----	-4.2	0.2	4.2	
		After-Before	----	-4.2	1.5	4.2	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5052.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2167.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	4936.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2079.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		15:46:36 05-Mar-2013		After (Measured):		22:51:07 05-Mar-2013	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	5.2	120.0	
		After	30.0	0	22.5	120.0	
		After-Before	----	----	17.3	----	
RGR Plus Measurement	gAPI	Before	185.4	157.1	168.0	206.3	
		After	185.4	157.1	164.5	206.3	
		After-Before	----	----	-3.5	----	
GR Calibration Gain		Before	0.89	0.80	0.98	1.05	
		After	----	----	----	----	
		After-Before	----	----	----	----	

Company:	SAVIA PERU S.A.	
Well:	LO6-27D	
Field:	LOBITOS	
Rig Name:	PEPESA-40	
Country:	PERU	

SONIC LOG
SP-BHC-HRLT-TLD-HGNS-GR
SCALE 5"/100'