

Company: SAVIA PERU S.A.

Well: LO16-31D

Field: LOBITOS

Rig Name: PEPESA 44 Country: PERU

NUCLEAR LOG

SP-HRLT-TLD-HGNS

SCALE 5"/100'

Rig Name:	PEPESA 44		
Field:	LOBITOS		
Location:	BLOCK - Z2B		
Well:	LO16-31D		
Company:	SAVIA PERU S.A.		
		Location:	
		BLOCK - Z2B	Elev.: K.B.
		9505993.11	G.L. -309.00 ft
		459448.91	D.F. 50.00 ft
		Permanent Datum:	Mean Sea Level
		Log Measured From:	Drill Floor 50.00 ft
		Drilling Measured From:	Drill Floor above Perm.Datum
		State: PIURA	Max.Hole Deviation 45.97 deg
			Longitude: 81° 21' 55.85" W
			Latitude: 4° 28' 9.17" S

Logging Date	28-Apr-2014		
Run Number	1		
Depth Driller	8865.00 ft		
Schlumberger Depth	6590.00 ft		
Bottom Log Interval	6590.00 ft		
Top Log Interval	5450.00 ft		
Casing Driller Size @ Depth	9.625 in @ 5556.00 ft		
Casing Schlumberger	5533 ft		
Bit Size	8.5 in		
Type Fluid In Hole	KLA-SHIELD		
Density	11.6 lbm/gal	Viscosity	59 s
Fluid Loss	5 cm3	PH	10.4
Source of Sample	Active Tank		
RM @ Meas Temp	0.29 ohm.m @ 73.2 degF		
RMF @ Meas Temp	0.2 ohm.m @ 74.1 degF		
RMC @ Meas Temp	0.91 ohm.m @ 73.8 degF		
Source RMF	RMC Pressed		
RM @ BHT	0.15 @ 150 0.1 @ 150		
Max Recorded Temperatures	150 degF		
Circulation Stopped	27-Apr-2014 20:00:31		
Logger on Bottom	28-Apr-2014 15:39:43		
Unit Number	826	Location:	PETA
Recorded By	Naseem Mansoor		
Witnessed By	Jose Coronado		

Disclaimer

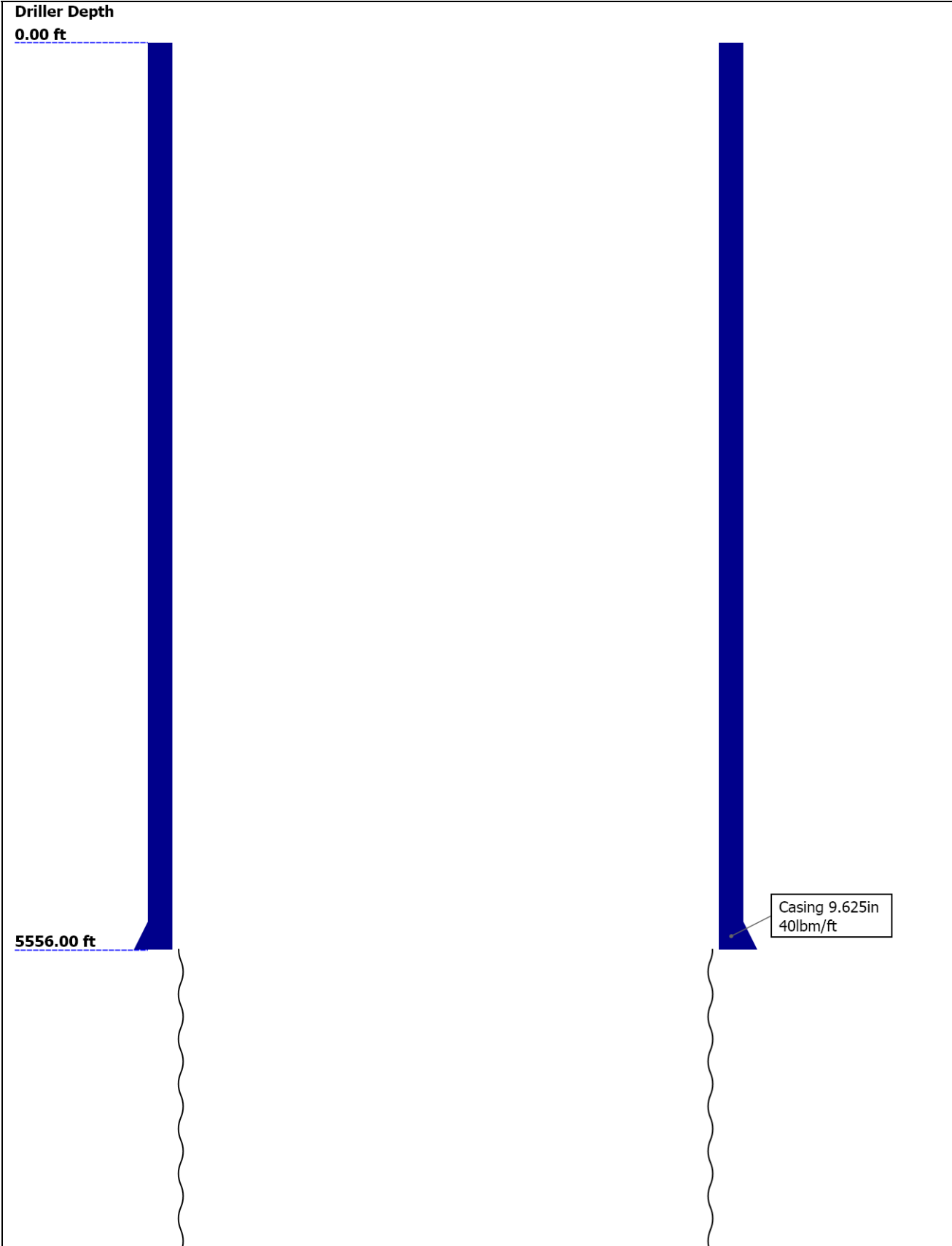
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Well Sketch



8865.00 ft

Open Hole 8.5in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.5					
Top Driller (ft)	5556					
Top Logger (ft)	5533					
Bottom Driller (ft)	8865					
Bottom Logger (ft)	6590					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	40					
Inner Diameter (in)	8.835					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	5556					
Bottom Logger (ft)	5533					

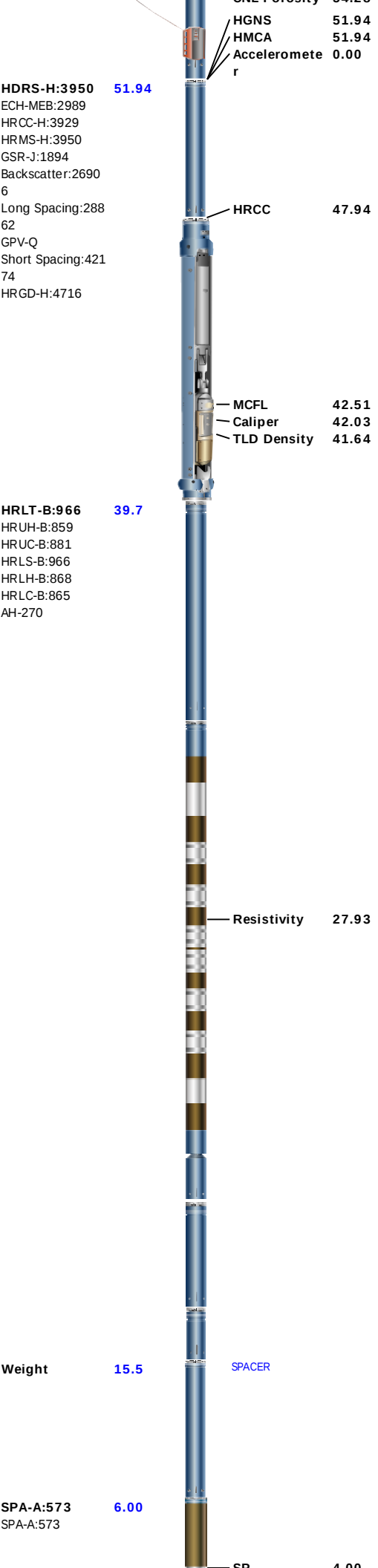
Operational Run Summary

Parameter (unit)	1					
Date Log Started	28-Apr-2014					
Time Log Started	12:14:06					
Date Log Finished	28-Apr-2014					
Time Log Finished	16:49:28					
Top Log Interval (ft)	5450.00					
Bottom Log Interval (ft)	6590.00					
Total Depth (ft)	8867.00					
Max Hole Deviation (deg)	45.97					
Azimuth of Max Deviation (deg)	287.78					
Bit Size (in)	8.500					
Logging Unit Number	826					
Logging Unit Location	PETA					
Recorded By	Naseem Mansoor					
Witnessed By	Jose Coronado					

Service Order Number							
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Borehole Fluids						
Parameter(unit)	1					
Fluid Type	Water					
Fluid Name	DFT_WATER_K LA - DFT_WATER_K LA_SHIELD					
Max Recorded Temperatures (degF)	150					
Source of Sample	Active Tank					
Salinity (ppm)	0					
Density (lbm/gal)	11.6					
Funnel Viscosity (s)	59					
Fluid Loss (cm3)	5					
PH	10.4					
Date/Time Circulation Stopped	27-Apr-2014 20:00:31					
Date Logger on Bottom	28-Apr-2014					
Time Logger on Bottom	15:39:43					
Source RMF	Pressed					
RMC	Pressed					
RM @ Meas Temp (ohm.m@degF)	0.29 @ 73.2					
RMF @ Meas Temp (ohm.m@degF)	0.2 @ 74.1					
RMC @ Meas Temp (ohm.m@degF)	0.91 @ 73.8					
RM @ BHT (ohm.m@degF)	0.15 @ 150					
RMF @ BHT (ohm.m@degF)	0.1 @ 150					
RMC @ BHT (ohm.m@degF)	0.47 @ 150					
Total Solid (%)	14					
High Gravity Solids (%)						

Remarks and Equipment Summary						
1: Toolstring				1: Remarks		
Equip name LEH-QT:2708 LEH-QT:2708 </						



SP 4.00 BNS-NG 2.00 Head Tension TOOL_ZERO Lengths are in ft Maximum Outer Diameter = 4.700 in Line: Sensor Location, Value: Gating Offset All measurements are relative to TOOL_ZERO		
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Depth Summary			
	1		
Depth Measuring Device			
Type	IDW-JA		
Serial Number	7029		
Calibration Date	24-SEP-2013		
Calibrator Serial Number	3421		
Calibration Cable Type	7-46P-XS		
Wheel Correction 1	-7		
Wheel Correction 2	-6		
Tension Device			
Type	CMTD-B/A		
Serial Number	2924		
Calibration Date	25-APR-2014		
Calibrator Serial Number	921		
Number of Calibration Points	10		
Calibration Root Mean Square Error	11		
Calibration Peak Error	24		
Logging Cable			
Type	7-46P-XS		
Serial Number	U713055		
Length	30000.00 ft		
Conveyance Type	Wireline		
Rig Type	OFFSHORE		
1:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	IDW used as primary depth reference	
Rig Up Length At Surface	191.60 ft	Z-Chart used as secondary depth reference	
Rig Up Length At Bottom	190.30 ft	All Schlumberger depth control policies were followed	
Rig Up Length Correction	1.30 ft		
Stretch Correction	2.00 ft		
Tool Zero Check At Surface	2.00 ft		

1

MAIN LOG

Software Version			
Acquisition System		Version	
MaxWell		4.0.9163.3000	
Application Patch		Patch-SP-10767_13393-4.0.9163.3001	
Computation	Description	Version	
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	4.0.9213.3000	
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	4.0.9033.3000	
DepthCorrection	DepthCorrection	4.0.9213.3000	
Tool Elements	Description	Software Version	Firmware Version
HRCC-H	Hill T High-Resolution Control Cartridge, 150 degC	4.0.9231.3000	2.0

HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	4.0.9231.3000	2.0
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	4.0.9231.3000	3.0
SPA-A	SP Adaptor	4.0.9033.3000	

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[7]:Up	Up	5503.48 ft	6599.73 ft	28-Apr-2014 3:03:41 PM	28-Apr-2014 3:25:32 PM	ON	2.00 ft	No

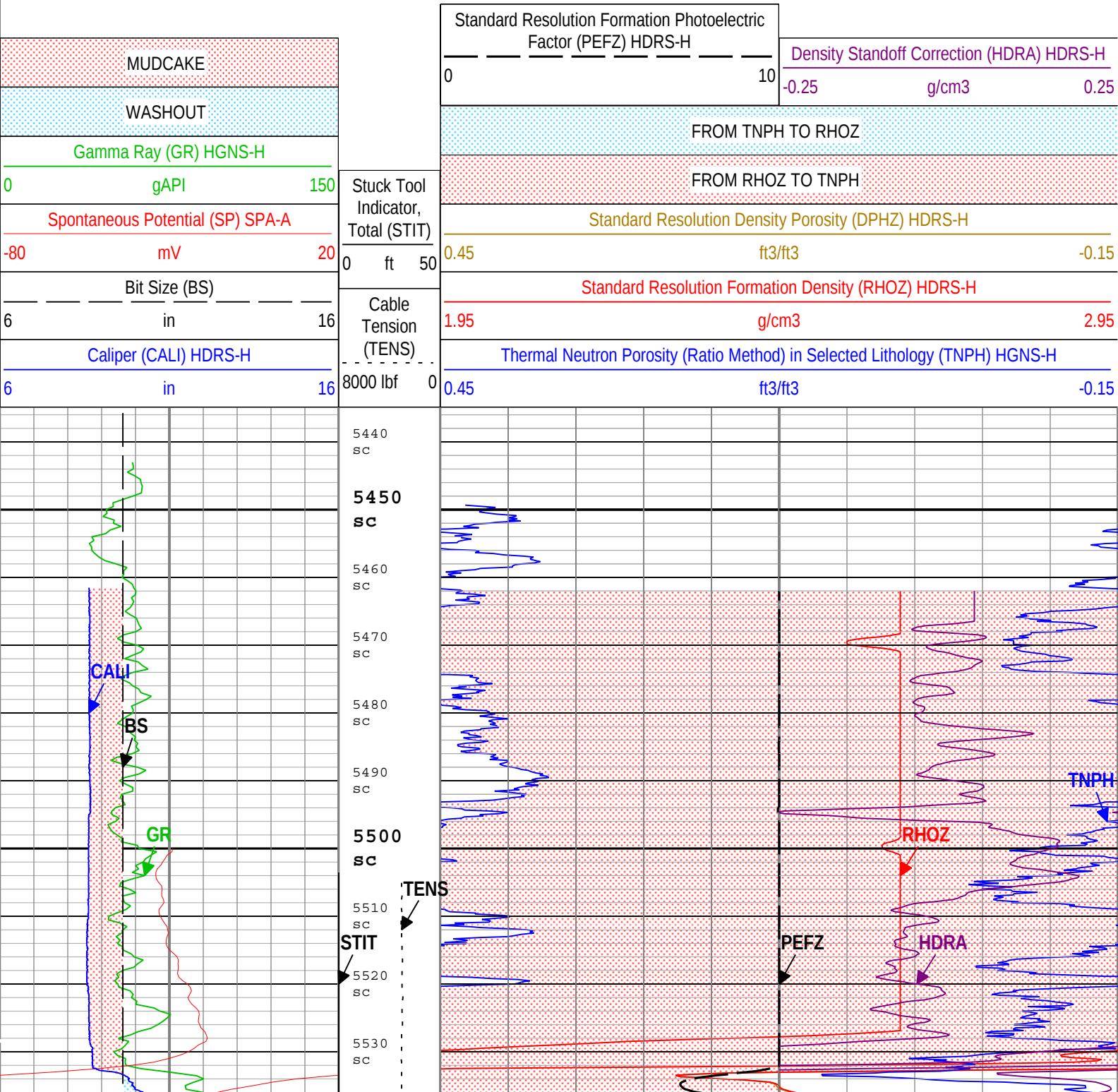
All depths are referenced to toolstring zero

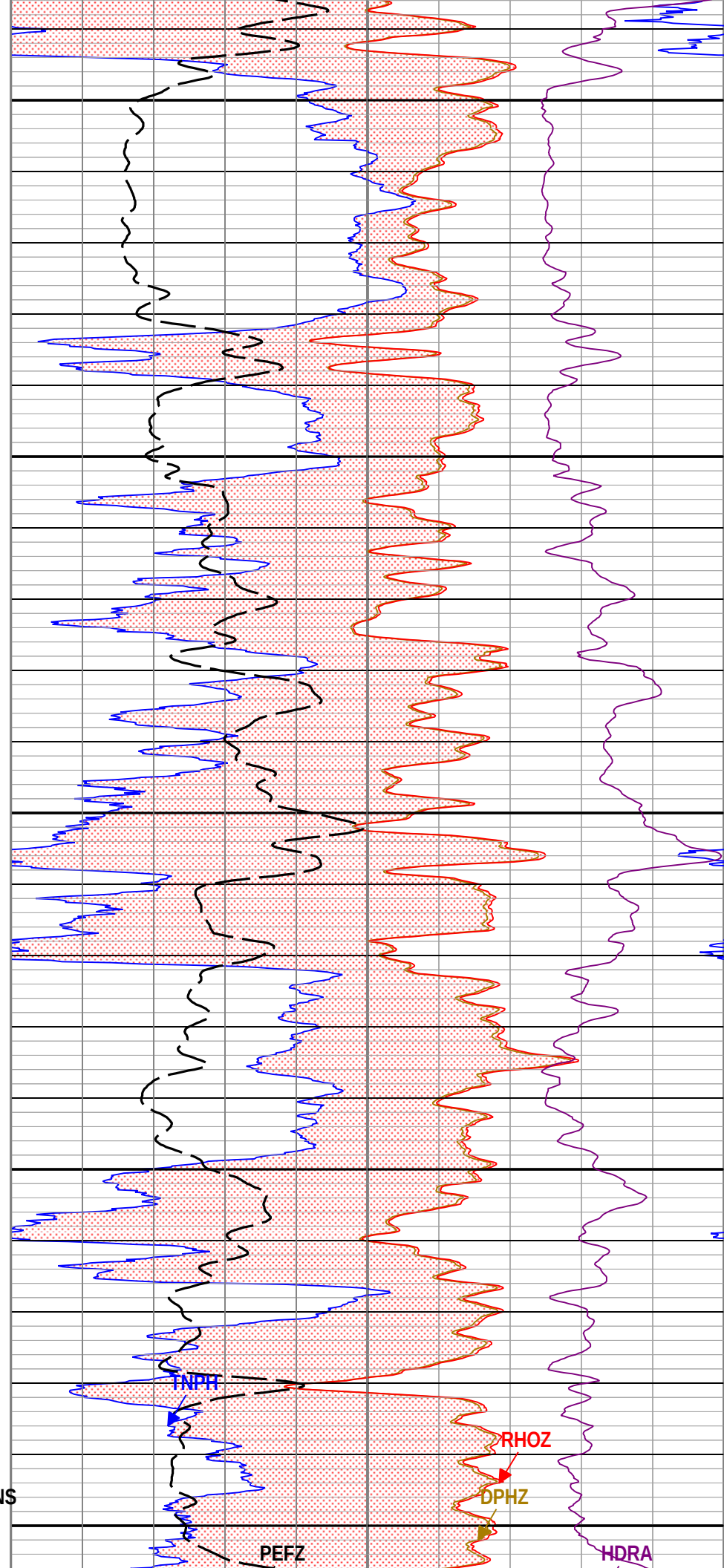
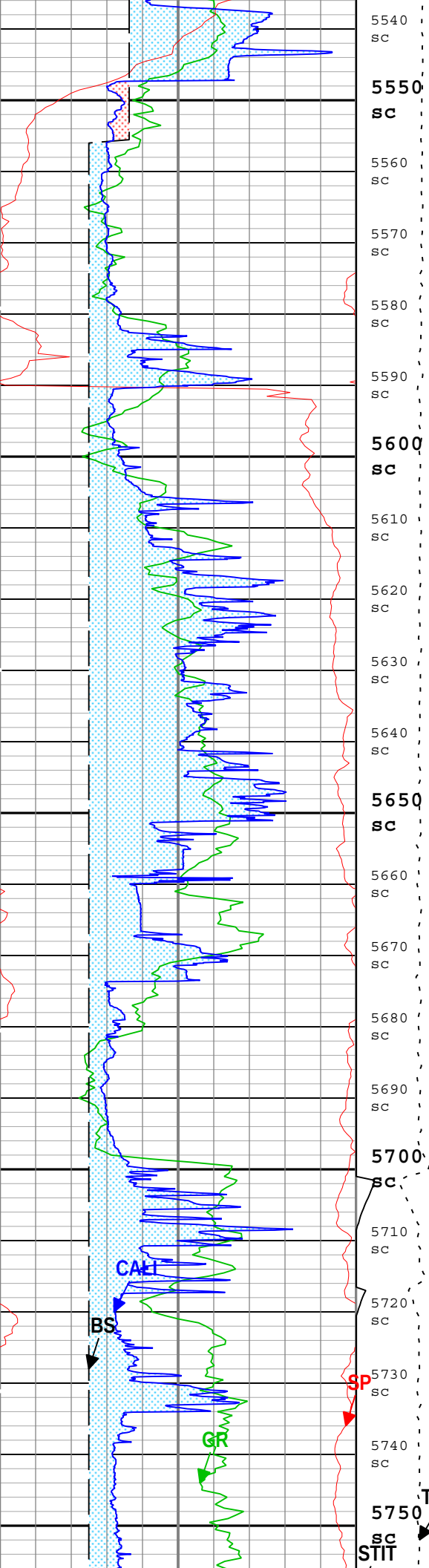
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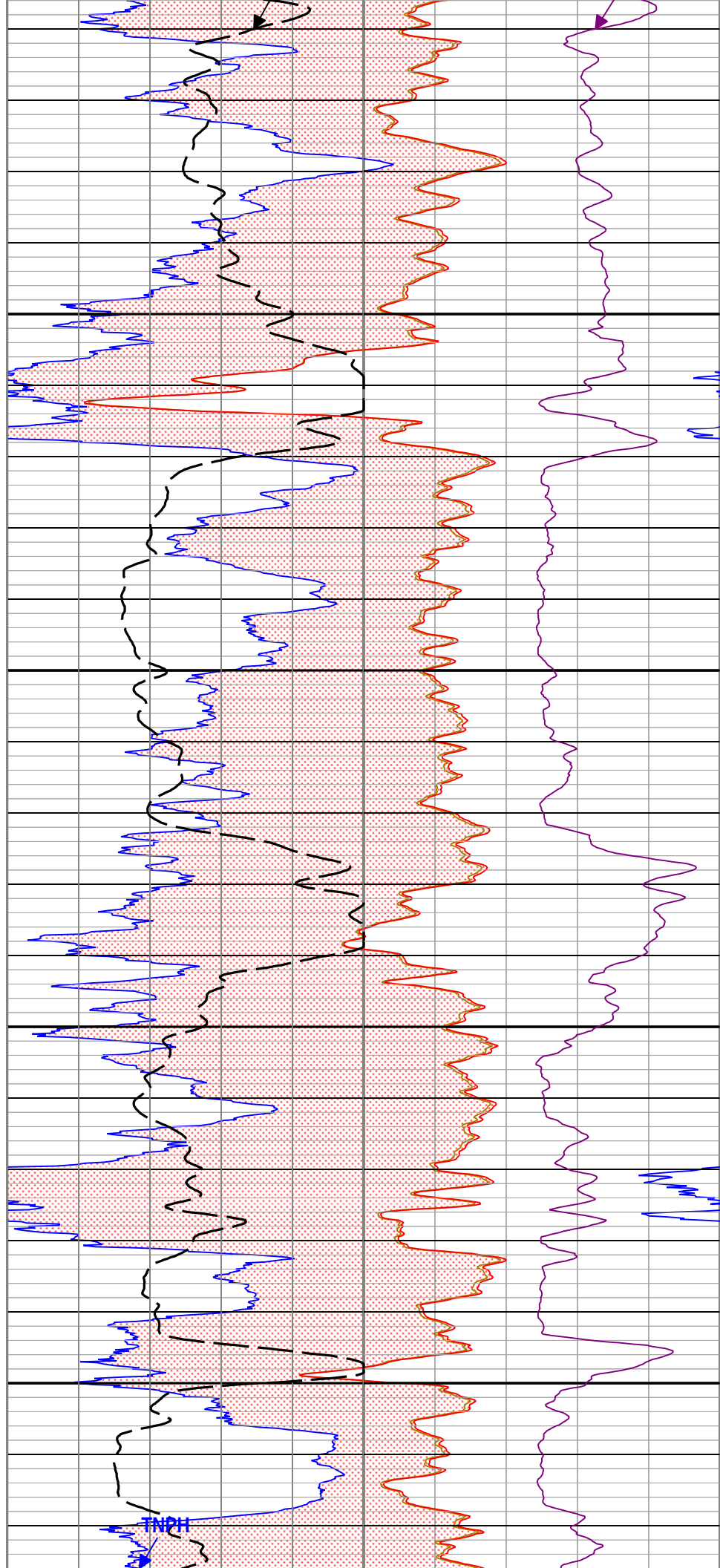
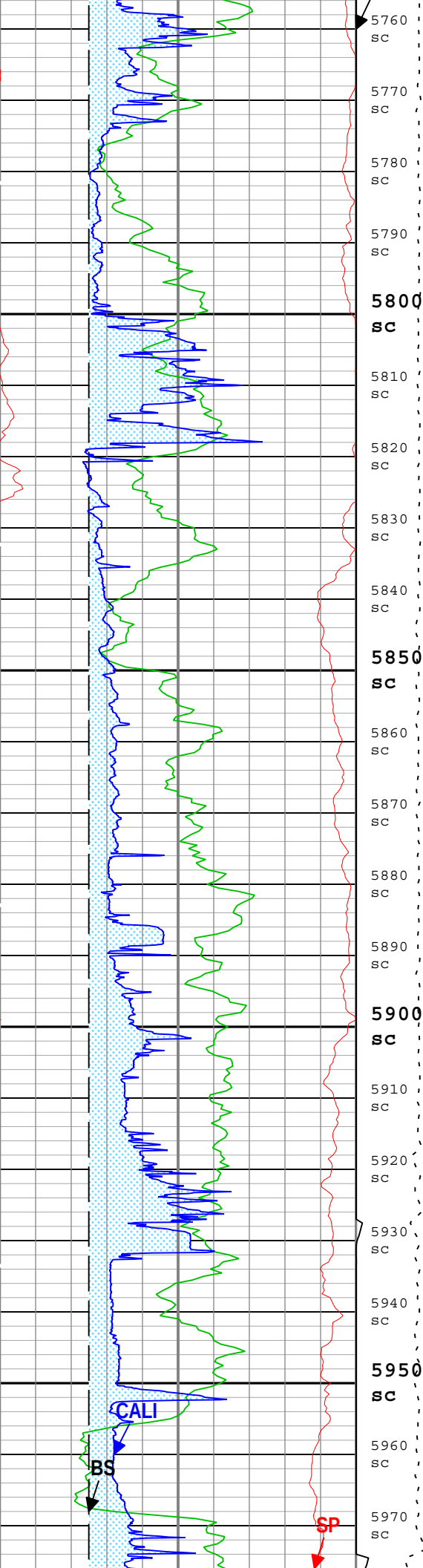
Company:SAVIA PERU S.A. Well:LO16-31D
1: Log[7]:Up:S005

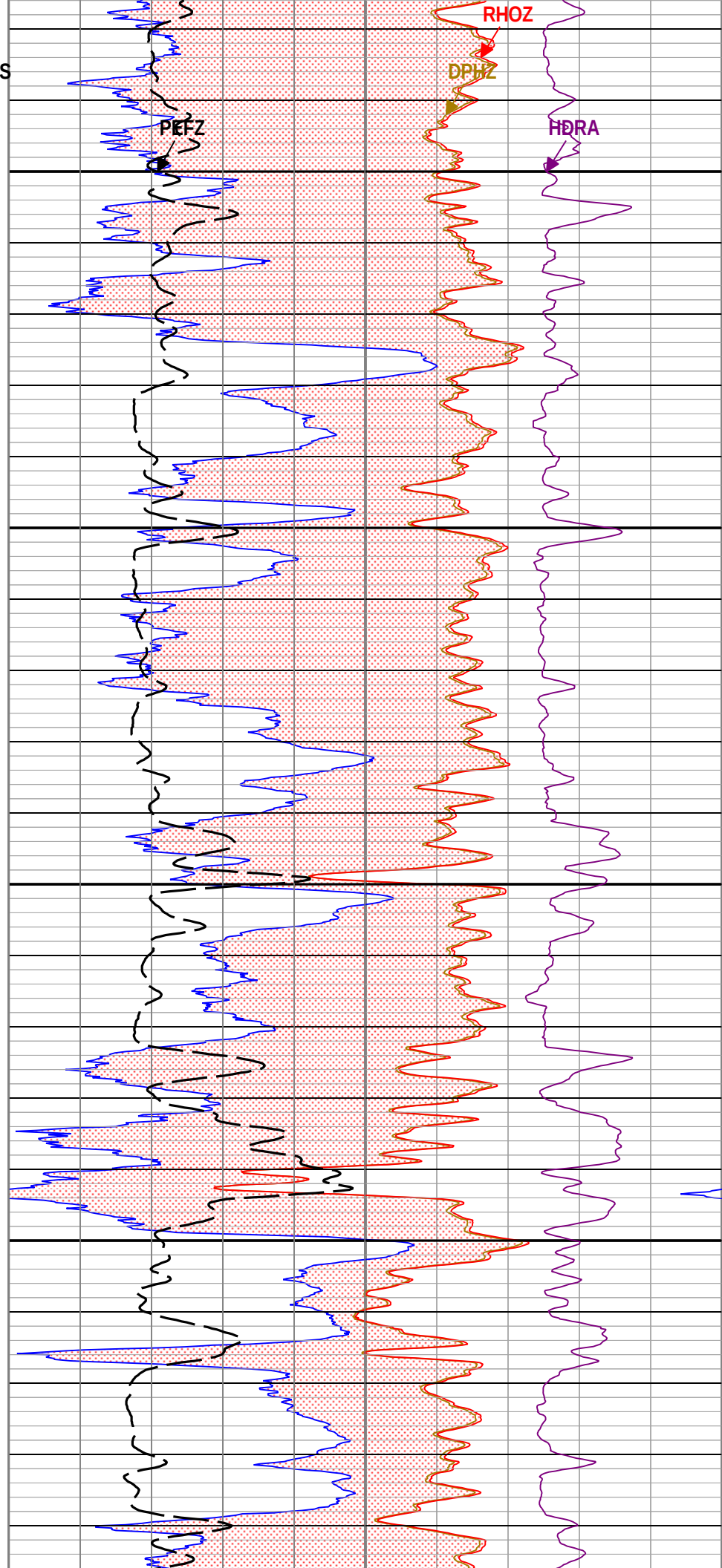
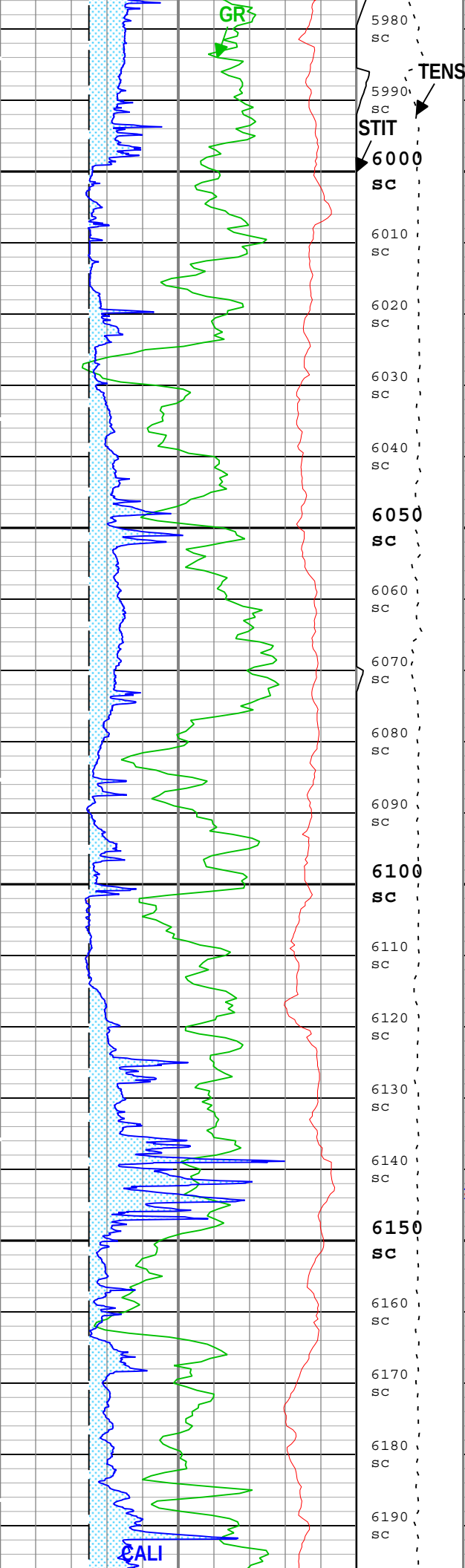
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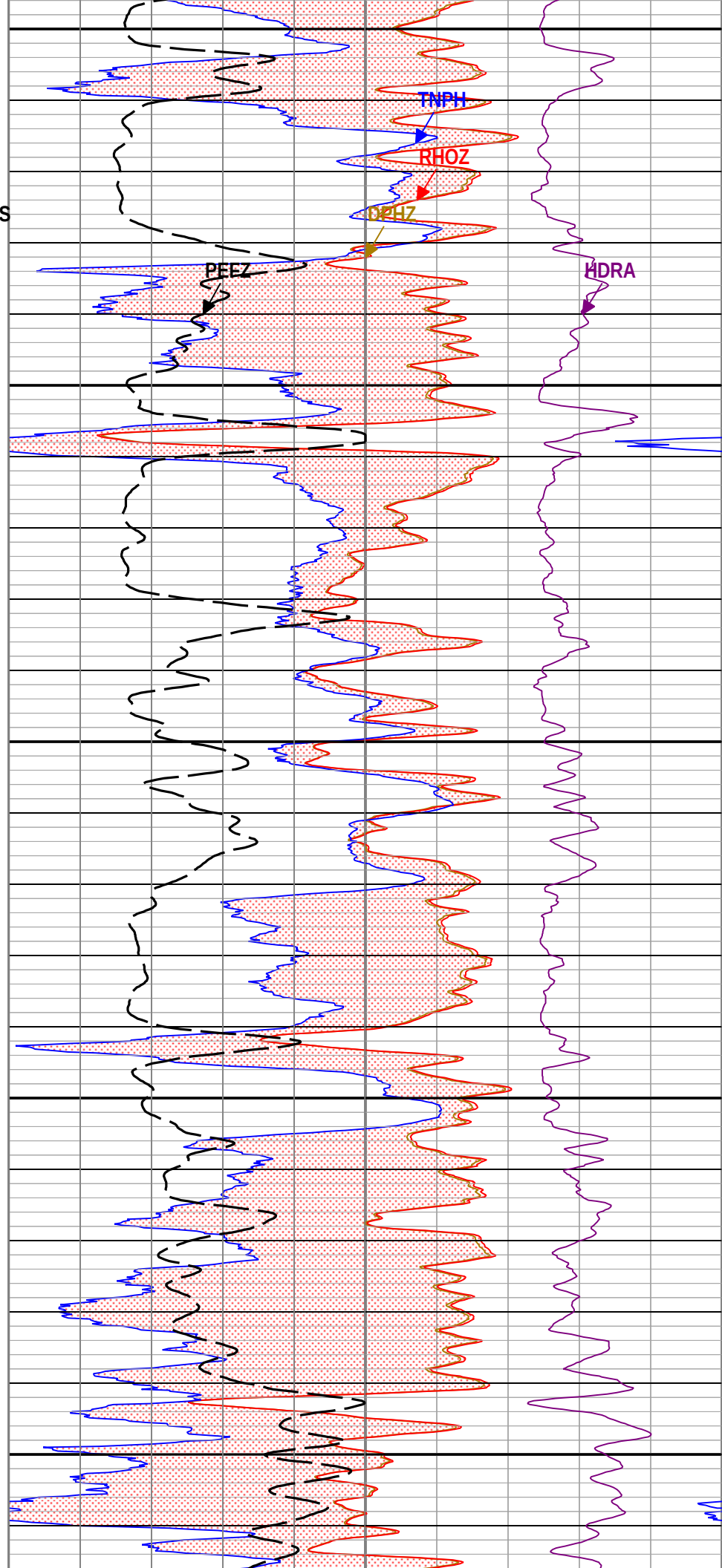
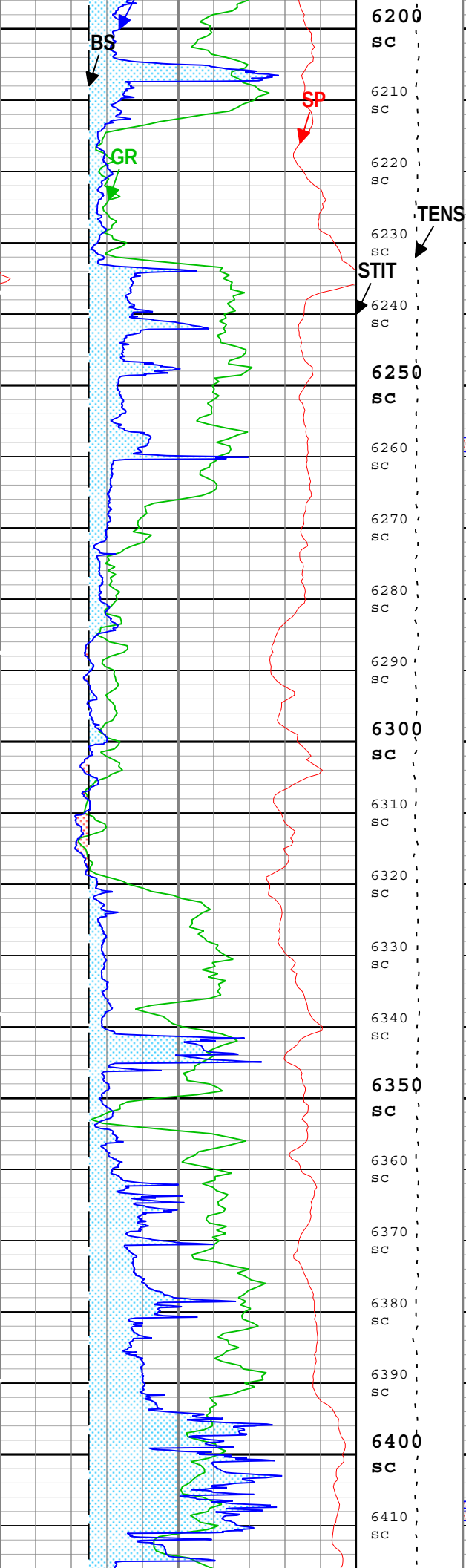
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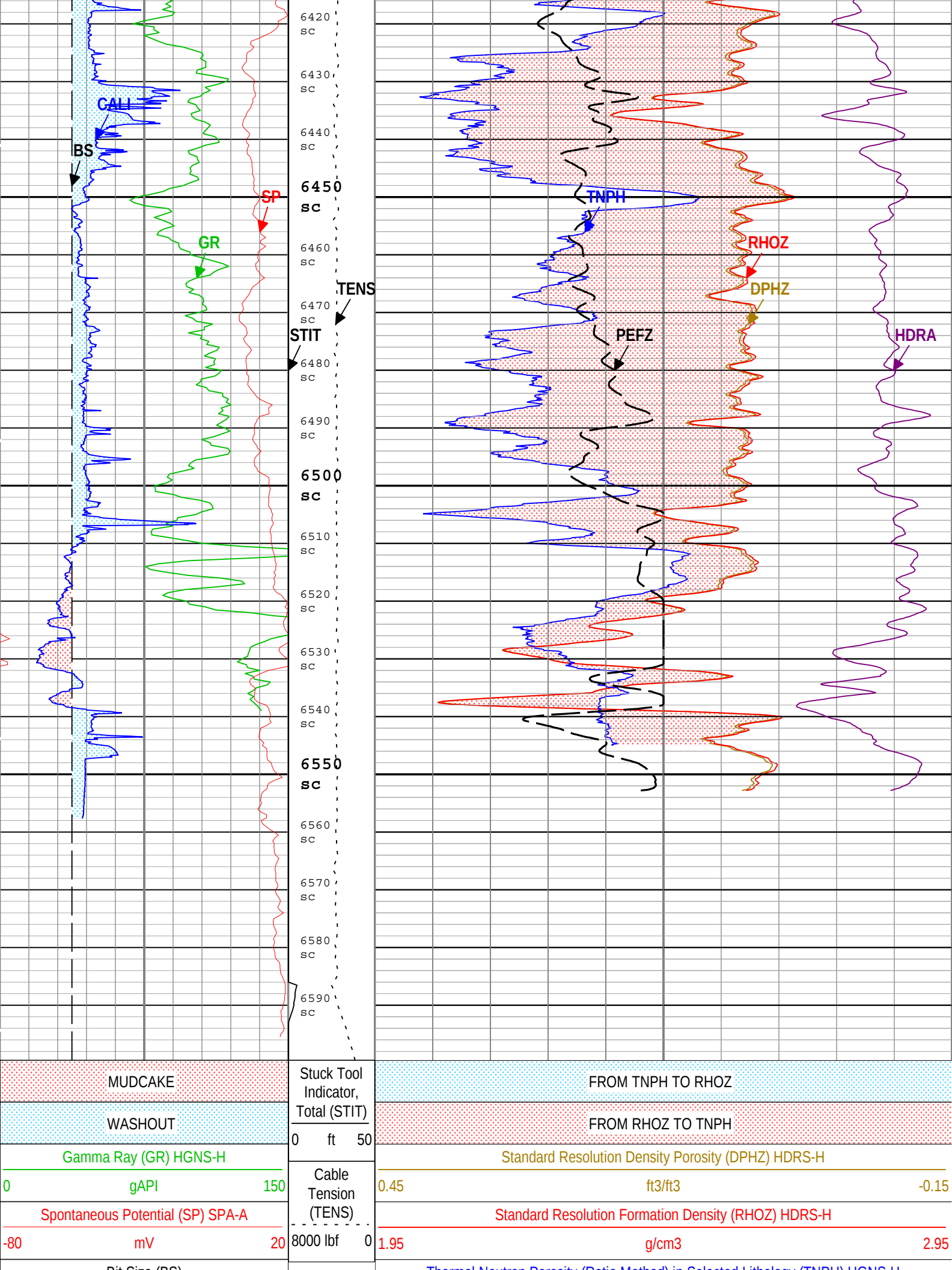












Bit Size (BS)		Thermal Neutron Porosity (Ratio Method) in Selected Lithology (INPH) HGNS-H								
6	in	16	0.45	ft3/ft3	-0.15					
Caliper (CALI) HDRS-H			Density Standoff Correction (HDRA) HDRS-H							
6	in	16	-0.25		g/cm3	0.25				
			0		10					
TIME_1900 - Time Marked every 60.00 (s)										
Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:41:36										
Channel Processing Parameters										
Parameter	Description		Tool	Value	Unit					
BARI	Barite Mud Presence Flag		Borehole	No						
BHS	Borehole Status (Open or Cased Hole)		Borehole	Open						
BHT	Bottom Hole Temperature		Borehole	150	degF					
BS	Bit Size		WLSESSION	8.5	in					
BSAL	Borehole Salinity		Borehole	0	ppm					
CALI_SHIFT	CALI Supplementary Offset		HDRS-H	0	in					
CBLO	Casing Bottom (Logger)		WLSESSION	5533	ft					
CDEN	Cement Density		HGNS-H	2	g/cm3					
DC_MODE	Depth Correction Mode		DepthCorrection	Post-processed Depth						
DFD	Drilling Fluid Density		Borehole	11.6	lbm/gal					
DFT	Drilling Fluid Type		Borehole	Water						
DFT_WATER	Drilling Fluid Water Type		Borehole	KLA-SHIELD						
DHC	Density Hole Correction		HDRS-H	Bit Size						
EDF	Elevation of Derrick Floor Above Permanent Datum		WLSESSION	50	ft					
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level		WLSESSION	0	ft					
FD	Fluid Density		Borehole	1	g/cm3					
FSAL	Formation Salinity		Borehole	0	ppm					
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						
GGRD	Geothermal Gradient		Borehole	1	0.01 degF/ft					
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity		Borehole	REMS						
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature		Borehole	GTEM_LINEST						
HSCO	Hole Size Correction Option		HGNS-H	Yes						
MATR	Rock Matrix for Neutron Porosity Corrections		Borehole	LIMESTONE						
MCCO	Mud Cake Correction Option		HGNS-H	Yes						
MDEN	Matrix Density for Density Porosity		Borehole	2.71	g/cm3					
MFST	Mud Filtrate Sample Temperature		Borehole	74.1	degF					
MST	Mud Sample Temperature		Borehole	73.2	degF					
MWCO	Mud Weight Correction Option		HGNS-H	Yes						
PDAT	Permanent Datum		WLSESSION	MSL						
PTCO	Pressure Temperature Correction Option		HGNS-H	Yes						
RMFS	Resistivity of Mud Filtrate Sample		Borehole	0.2	ohm.m					
RMS	Resistivity of Mud Sample		Borehole	0.29	ohm.m					
SHT	Surface Hole Temperature		Borehole	85	degF					
SPDR	SP Drift Per Foot		SPA-A	0	mV/ft					
TD	Total Measured Depth		Borehole	8867	ft					
WDMS	Water Depth to Mean Sea Level		WLSESSION	309	ft					
Tool Control Parameters										
Parameter	Description		Tool	Value	Unit					

HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

1

REPEAT SECTION

Software Version

Acquisition System	Version
MaxWell	4.0.9163.3000
Application Patch	Patch-SP-10767_13393-4.0.9163.3001

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	4.0.9213.3000
HENVIR	Computation Ensemble for the HGNS Neutron environmental corrections	4.0.9033.3000
DepthCorrection	DepthCorrection	4.0.9213.3000

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	4.0.9231.3000	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	4.0.9231.3000	2.0
HRGD-H	HILT Resistivity Gamma-Ray Density Device, 150 degC	4.0.9231.3000	3.0
SPA-A	SP Adaptor	4.0.9033.3000	

Pass Summary

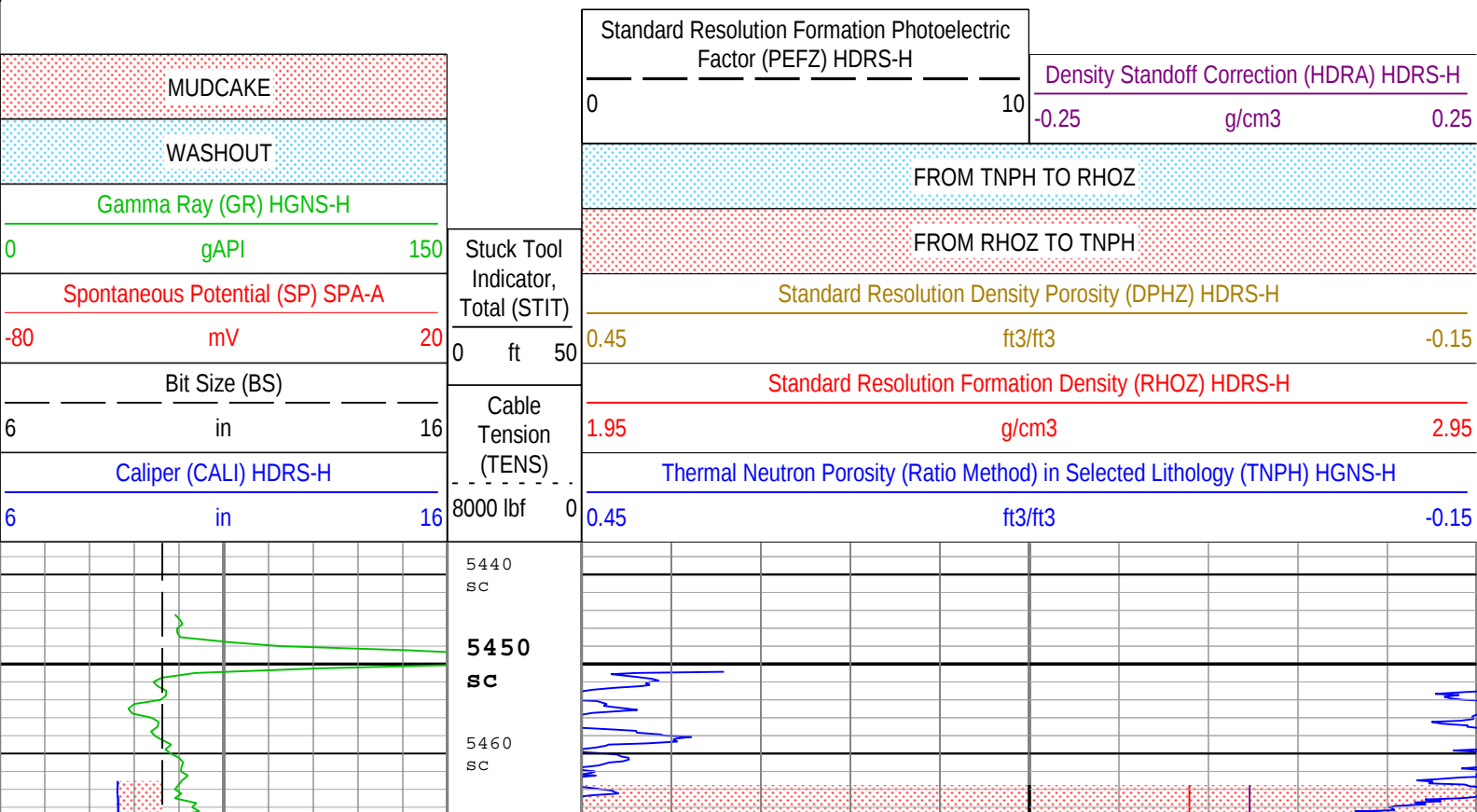
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[9]:Up	Up	5505.00 ft	5711.43 ft	28-Apr-2014 3:32:10 PM	28-Apr-2014 3:37:28 PM	ON	3.00 ft	No

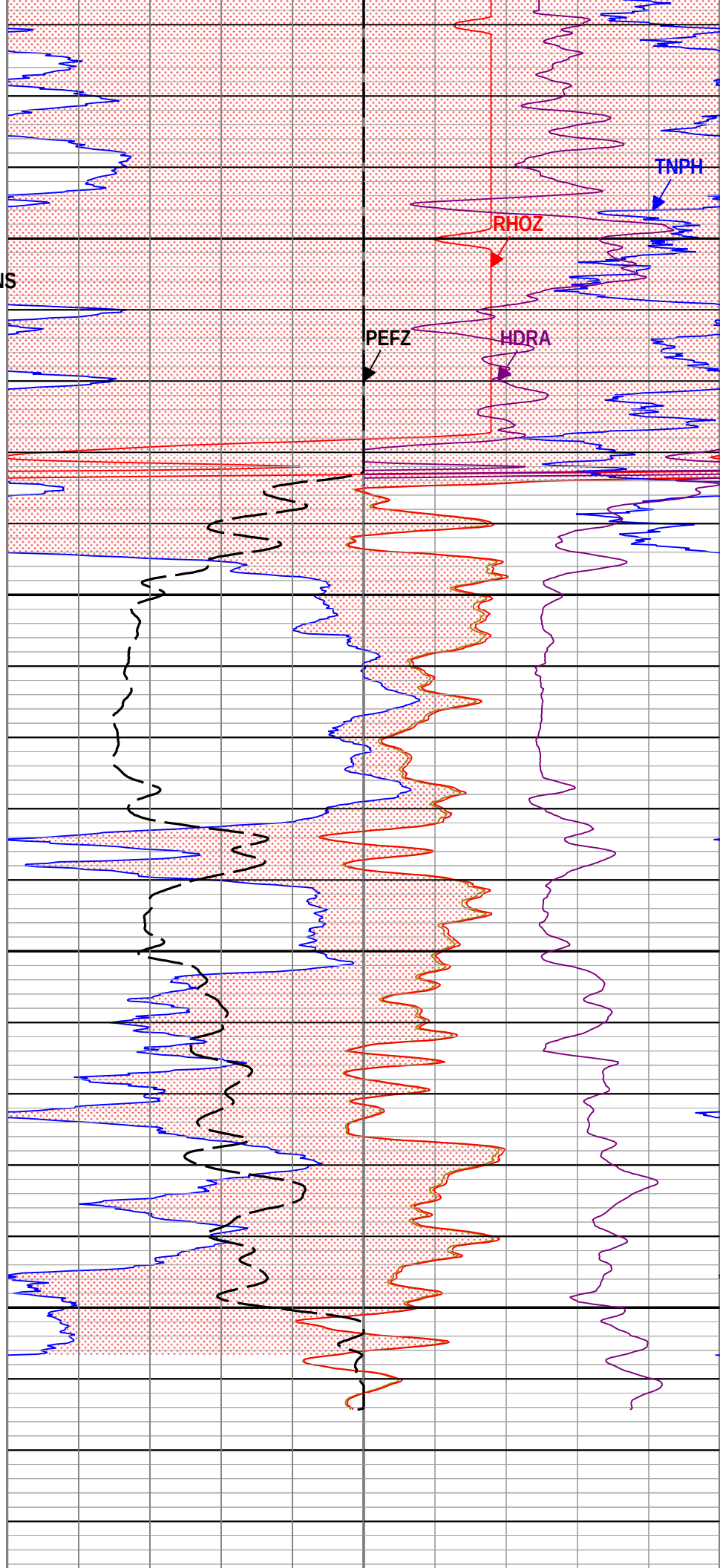
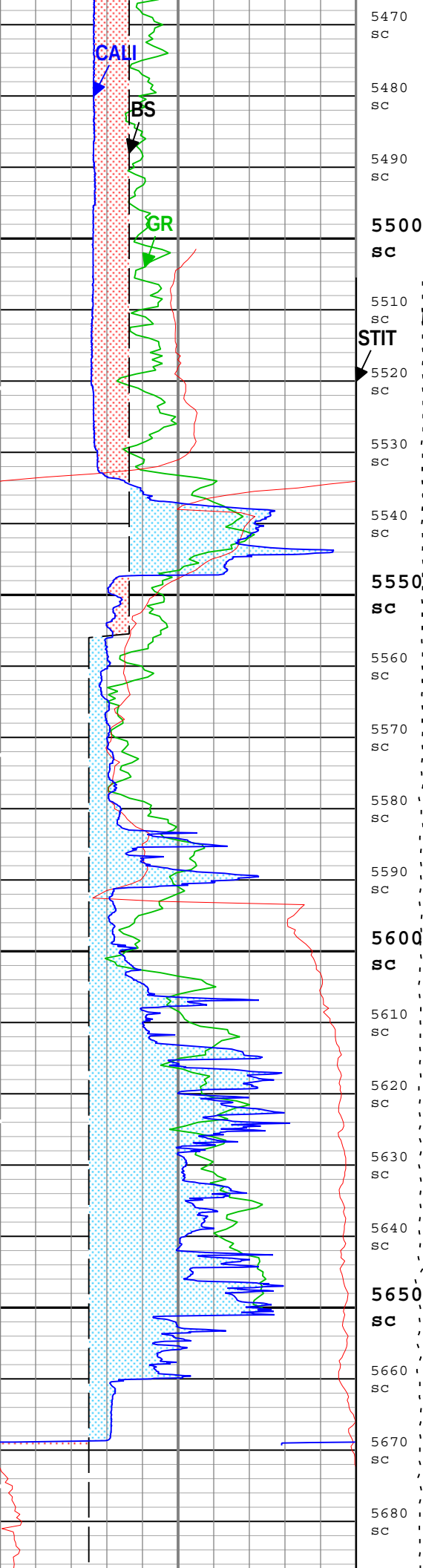
All depths are referenced to toolstring zero

Log	Company:SAVIA PERU S.A. Well:LO16-31D 1: Log[9]:Up:S005
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Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:41:37

TIME_1900 - Time Marked every 60.00 (s)





TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:41:37

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	150	degF
BS	Bit Size	WLSESSION	8.5	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	5533	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Post-processed Depth	
DFD	Drilling Fluid Density	Borehole	11.6	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	KLA-SHIELD	
DHC	Density Hole Correction	HDRS-H	Bit Size	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	50	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	0	ft
FD	Fluid Density	Borehole	1	g/cm3
FSAL	Formation Salinity	Borehole	0	ppm
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	
GGRD	Geothermal Gradient	Borehole	1	0.01 degF/ft
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	REMS	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	GTEM_LINEST	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	LIMESTONE	
MCCO	Mud Cake Correction Option	HGNS-H	Yes	

MDEN	Matrix Density for Density Porosity	Borehole	2.71	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	74.1	degF
MST	Mud Sample Temperature	Borehole	73.2	degF
MWCO	Mud Weight Correction Option	HGNS-H	Yes	
PDAT	Permanent Datum	WLSESSION	MSL	
PTCO	Pressure Temperature Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.2	ohm.m
RMS	Resistivity of Mud Sample	Borehole	0.29	ohm.m
SHT	Surface Hole Temperature	Borehole	85	degF
SPDR	SP Drift Per Foot	SPA-A	0	mV/ft
TD	Total Measured Depth	Borehole	8867	ft
WDMS	Water Depth to Mean Sea Level	WLSESSION	309	ft

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

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):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
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	-315.2	-280.6	
		After-Before	-----	-9.7	0.9	9.7	
HRLT M01 - 1	uV	Before	-322.7	-379.6	-315.5	-280.6	
		After	-322.7	-379.6	-313.4	-280.6	
		After-Before	-----	-9.7	2.1	9.7	
HRLT M01 - 2	uV	Before	-322.7	-379.6	-317.7	-280.6	
		After	-322.7	-379.6	-315.4	-280.6	
		After-Before	-----	-9.7	2.3	9.7	
HRLT M01 - 3	uV	Before	-322.7	-379.6	-316.2	-280.6	
		After	-322.7	-379.6	-315.0	-280.6	
		After-Before	-----	-9.7	1.2	9.7	
HRLT M01 - 4	uV	Before	-322.7	-379.6	-312.7	-280.6	
		After	-322.7	-379.6	-311.6	-280.6	
		After-Before	-----	-9.7	1.1	9.7	
HRLT M01 - 5	uV	Before	-322.7	-379.6	-317.0	-280.6	
		After	-322.7	-379.6	-316.1	-280.6	
		After-Before	-----	-9.7	0.9	9.7	
HRLT M01 - 6	uV	Before	322.7	280.6	314.6	379.6	
		After	322.7	280.6	313.5	379.6	
		After-Before	-----	-9.7	-1.1	9.7	

HRLT-B Calibration - HRLT M1-M2 Voltage Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M12 - 0	uV	Before	1781.0	1548.7	1732.4	2095.3	
		After	1781.0	1548.7	1727.8	2095.3	
		After-Before	-----	-53.4	-4.6	53.4	
HRLT M12 - 1	uV	Before	1781.0	1548.7	1736.0	2095.3	
		After	1781.0	1548.7	1724.8	2095.3	
		After-Before	-----	-53.4	-11.2	53.4	
HRLT M12 - 2	uV	Before	1781.0	1548.7	1740.9	2095.3	
		After	1781.0	1548.7	1729.2	2095.3	
		After-Before	-----	-53.4	-11.7	53.4	
HRLT M12 - 3	uV	Before	1781.0	1548.7	1732.1	2095.3	
		After	1781.0	1548.7	1725.4	2095.3	

		After-Before	-----	-53.4	-6.7	53.4	
HRLT M12 - 4	uV	Before	1781.0	1548.7	1711.3	2095.3	
		After	1781.0	1548.7	1705.7	2095.3	
		After-Before	-----	-53.4	-5.6	53.4	
HRLT M12 - 5	uV	Before	1781.0	1548.7	1735.4	2095.3	
		After	1781.0	1548.7	1731.2	2095.3	
		After-Before	-----	-53.4	-4.2	53.4	
HRLT M12 - 6	uV	Before	-1781.0	-2095.3	-1739.4	-1548.7	
		After	-1781.0	-2095.3	-1734.2	-1548.7	
		After-Before	-----	-53.4	5.2	53.4	

HRLT-B Calibration - HRLT M2-M3 Voltage Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT M23 - 0	uV	Before	1781.0	1548.7	1732.3	2095.3	
		After	1781.0	1548.7	1726.5	2095.3	
		After-Before	-----	-53.4	-5.8	53.4	
HRLT M23 - 1	uV	Before	1781.0	1548.7	1739.0	2095.3	
		After	1781.0	1548.7	1726.8	2095.3	
		After-Before	-----	-53.4	-12.2	53.4	
HRLT M23 - 2	uV	Before	1781.0	1548.7	1747.6	2095.3	
		After	1781.0	1548.7	1735.3	2095.3	
		After-Before	-----	-53.4	-12.3	53.4	
HRLT M23 - 3	uV	Before	1781.0	1548.7	1744.1	2095.3	
		After	1781.0	1548.7	1736.6	2095.3	
		After-Before	-----	-53.4	-7.5	53.4	
HRLT M23 - 4	uV	Before	1781.0	1548.7	1720.2	2095.3	
		After	1781.0	1548.7	1713.5	2095.3	
		After-Before	-----	-53.4	-6.7	53.4	
HRLT M23 - 5	uV	Before	1781.0	1548.7	1746.6	2095.3	
		After	1781.0	1548.7	1741.2	2095.3	
		After-Before	-----	-53.4	-5.4	53.4	
HRLT M23 - 6	uV	Before	-1781.0	-2095.3	-1730.7	-1548.7	
		After	-1781.0	-2095.3	-1724.4	-1548.7	
		After-Before	-----	-53.4	6.3	53.4	

HRLT-B Calibration - HRLT A3-A4 Voltage Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V34 - 0	uV	Before	70000.0	60869.6	67627.5	82352.9	
		After	70000.0	60869.6	67545.5	82352.9	
		After-Before	-----	-2100.0	-82.0	2100.0	
HRLT V34 - 1	uV	Before	70000.0	60869.6	67851.6	82352.9	
		After	70000.0	60869.6	67516.5	82352.9	
		After-Before	-----	-2100.0	-335.1	2100.0	
HRLT V34 - 2	uV	Before	70000.0	60869.6	68466.9	82352.9	
		After	70000.0	60869.6	68100.3	82352.9	
		After-Before	-----	-2100.0	-366.6	2100.0	
HRLT V34 - 3	uV	Before	70000.0	60869.6	68545.3	82352.9	
		After	70000.0	60869.6	68368.4	82352.9	
		After-Before	-----	-2100.0	-176.9	2100.0	
HRLT V34 - 4	uV	Before	70000.0	60869.6	67486.4	82352.9	
		After	70000.0	60869.6	67367.0	82352.9	
		After-Before	-----	-2100.0	-119.4	2100.0	
HRLT V34 - 5	uV	Before	70000.0	60869.6	68515.0	82352.9	
		After	70000.0	60869.6	68439.3	82352.9	
		After-Before	-----	-2100.0	-75.7	2100.0	
HRLT V34 - 6	uV	Before	-70000.0	-82352.9	-66529.9	-60869.6	
		After	-70000.0	-82352.9	-66438.1	-60869.6	
		After-Before	-----	-2100.0	91.8	2100.0	

HRLT-B Calibration - HRLT A4-A5 Voltage Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V45 - 0	uV	Before	70000.0	60869.6	67715.9	82352.9	
		After	70000.0	60869.6	67636.5	82352.9	
		After-Before	-----	-2100.0	-79.4	2100.0	
HRLT V45 - 1	uV	Before	70000.0	60869.6	68148.3	82352.9	

		After	70000.0	60869.6	67807.9	82352.9	
		After-Before	-----	-2100.0	-340.4	2100.0	
HRLT V45 - 2	uV	Before	70000.0	60869.6	68705.2	82352.9	
		After	70000.0	60869.6	68346.0	82352.9	
		After-Before	-----	-2100.0	-359.2	2100.0	
HRLT V45 - 3	uV	Before	70000.0	60869.6	68741.1	82352.9	
		After	70000.0	60869.6	68559.4	82352.9	
		After-Before	-----	-2100.0	-181.7	2100.0	
HRLT V45 - 4	uV	Before	70000.0	60869.6	67612.1	82352.9	
		After	70000.0	60869.6	67487.1	82352.9	
		After-Before	-----	-2100.0	-125.0	2100.0	
HRLT V45 - 5	uV	Before	70000.0	60869.6	68603.0	82352.9	
		After	70000.0	60869.6	68537.0	82352.9	
		After-Before	-----	-2100.0	-66.0	2100.0	
HRLT V45 - 6	uV	Before	-70000.0	-82352.9	-66865.0	-60869.6	
		After	-70000.0	-82352.9	-66765.3	-60869.6	
		After-Before	-----	-2100.0	99.7	2100.0	

HRLT-B Calibration - HRLT A5-A6 Voltage Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT V56 - 0	uV	Before	70000.0	60869.6	67662.0	82352.9	
		After	70000.0	60869.6	67577.0	82352.9	
		After-Before	-----	-2100.0	-85.0	2100.0	
HRLT V56 - 1	uV	Before	70000.0	60869.6	68116.8	82352.9	
		After	70000.0	60869.6	67787.2	82352.9	
		After-Before	-----	-2100.0	-329.6	2100.0	
HRLT V56 - 2	uV	Before	70000.0	60869.6	68701.1	82352.9	
		After	70000.0	60869.6	68333.0	82352.9	
		After-Before	-----	-2100.0	-368.1	2100.0	
HRLT V56 - 3	uV	Before	70000.0	60869.6	68694.0	82352.9	
		After	70000.0	60869.6	68534.0	82352.9	
		After-Before	-----	-2100.0	-160.0	2100.0	
HRLT V56 - 4	uV	Before	70000.0	60869.6	67560.6	82352.9	
		After	70000.0	60869.6	67436.9	82352.9	
		After-Before	-----	-2100.0	-123.7	2100.0	
HRLT V56 - 5	uV	Before	70000.0	60869.6	68545.4	82352.9	
		After	70000.0	60869.6	68482.8	82352.9	
		After-Before	-----	-2100.0	-62.6	2100.0	
HRLT V56 - 6	uV	Before	-70000.0	-82352.9	-66817.3	-60869.6	
		After	-70000.0	-82352.9	-66748.2	-60869.6	
		After-Before	-----	-2100.0	69.1	2100.0	

HRLT-B Calibration - HRLT Torpedo-M0 Voltage

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VTP - 0	uV	Before	-70000.0	-82352.9	-67555.0	-60869.6	
		After	-70000.0	-82352.9	-67471.9	-60869.6	
		After-Before	-----	-2100.0	83.1	2100.0	
HRLT VTP - 1	uV	Before	-70000.0	-82352.9	-68445.6	-60869.6	
		After	-70000.0	-82352.9	-68101.7	-60869.6	
		After-Before	-----	-2100.0	343.9	2100.0	
HRLT VTP - 2	uV	Before	-70000.0	-82352.9	-68996.2	-60869.6	
		After	-70000.0	-82352.9	-68627.1	-60869.6	
		After-Before	-----	-2100.0	369.1	2100.0	
HRLT VTP - 3	uV	Before	-70000.0	-82352.9	-69023.6	-60869.6	
		After	-70000.0	-82352.9	-68852.8	-60869.6	
		After-Before	-----	-2100.0	170.8	2100.0	
HRLT VTP - 4	uV	Before	-70000.0	-82352.9	-67894.7	-60869.6	
		After	-70000.0	-82352.9	-67759.1	-60869.6	
		After-Before	-----	-2100.0	135.6	2100.0	
HRLT VTP - 5	uV	Before	-70000.0	-82352.9	-68878.6	-60869.6	
		After	-70000.0	-82352.9	-68799.6	-60869.6	
		After-Before	-----	-2100.0	79.0	2100.0	
HRLT VTP - 6	uV	Before	70000.0	60869.6	67091.9	82352.9	
		After	70000.0	60869.6	66985.4	82352.9	
		After-Before	-----	-2100.0	-106.5	2100.0	

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

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT VBD - 0	uV	Before	-70000.0	-82352.9	-67502.9	-60869.6	
		After	-70000.0	-82352.9	-67429.3	-60869.6	
		After-Before	-----	-2100.0	73.6	2100.0	
HRLT VBD - 1	uV	Before	-70000.0	-82352.9	-68343.9	-60869.6	
		After	-70000.0	-82352.9	-68011.7	-60869.6	
		After-Before	-----	-2100.0	332.2	2100.0	
HRLT VBD - 2	uV	Before	-70000.0	-82352.9	-68892.2	-60869.6	
		After	-70000.0	-82352.9	-68524.4	-60869.6	
		After-Before	-----	-2100.0	367.8	2100.0	
HRLT VBD - 3	uV	Before	-70000.0	-82352.9	-68923.8	-60869.6	
		After	-70000.0	-82352.9	-68773.5	-60869.6	
		After-Before	-----	-2100.0	150.3	2100.0	
HRLT VBD - 4	uV	Before	-70000.0	-82352.9	-67832.1	-60869.6	
		After	-70000.0	-82352.9	-67706.2	-60869.6	
		After-Before	-----	-2100.0	125.9	2100.0	
HRLT VBD - 5	uV	Before	-70000.0	-82352.9	-68820.5	-60869.6	
		After	-70000.0	-82352.9	-68753.2	-60869.6	
		After-Before	-----	-2100.0	67.3	2100.0	
HRLT VBD - 6	uV	Before	70000.0	60869.6	66977.3	82352.9	
		After	70000.0	60869.6	66898.3	82352.9	
		After-Before	-----	-2100.0	-79.0	2100.0	

HRLT-B Calibration - HRLT Source Current Plus

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT ISO - 0	uA	Before	284.0	247.0	282.1	334.1	
		After	284.0	247.0	281.7	334.1	
		After-Before	-----	-8.5	-0.4	8.5	
HRLT ISO - 1	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	
HRLT ISO - 2	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	
HRLT ISO - 3	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	
HRLT ISO - 4	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	
HRLT ISO - 5	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	
HRLT ISO - 6	uA	Before	281.1	244.4	281.1	330.7	
		After	281.1	244.4	281.1	330.7	
		After-Before	-----	-8.5	0.0	8.5	

HRLT-B Calibration - HRLT Vertical Voltage PI

Before (Measured):		12:22:37 28-Apr-2014		After (Measured):		16:48:19 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HRLT MV - 0	uV	Before	-322.7	-379.6	-317.7	-280.6	
		After	-322.7	-379.6	-317.0	-280.6	
		After-Before	-----	-9.7	0.7	9.7	
HRLT MV - 1	uV	Before	-322.7	-379.6	-311.8	-280.6	
		After	-322.7	-379.6	-310.0	-280.6	
		After-Before	-----	-9.7	1.8	9.7	
HRLT MV - 2	uV	Before	-322.7	-379.6	-312.1	-280.6	
		After	-322.7	-379.6	-310.3	-280.6	
		After-Before	-----	-9.7	1.8	9.7	
HRLT MV - 3	uV	Before	-322.7	-379.6	-308.8	-280.6	
		After	-322.7	-379.6	-307.9	-280.6	
		After-Before	-----	-9.7	0.9	9.7	
HRLT MV - 4	uV	Before	-322.7	-379.6	-302.1	-280.6	
		After	-322.7	-379.6	-301.3	-280.6	
		After-Before	-----	-9.7	0.8	9.7	
HRLT MV - 5	uV	Before	-322.7	-379.6	-320.0	-280.6	
		After	-322.7	-379.6	-319.2	-280.6	
		After-Before	-----	-9.7	0.8	9.7	

HRLT MV - 6	uV	Before After After-Before	-322.7 -322.7 -----	-379.6 -379.6 -9.7	-320.9 -320.3 0.6	-280.6 -280.6 9.7	
HRLT MV - 6	uV	Before After After-Before	322.7 322.7 -----	280.6 280.6 -9.7	323.9 323.1 -0.8	379.6 379.6 9.7	

HRLT-B Calibration - HRLT Calibration Temperature

Before (Measured): 12:22:37 28-Apr-2014		After (Measured): 16:48:19 28-Apr-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
CTEM_HRLT	degF	Before			90.8		
		After			95.0		
		After-Before	-----	-----	4.2	-----	

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		1894		
	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): 12:27:24 28-Apr-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.80	10.00	
Large Ring	in	Before	12.00	9.00	11.86	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM): 18:14:00 25-Apr-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.597	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696	
Pe Aluminum		Master	2.570	2.470	2.509	2.670	
Pe Magnesium		Master	2.650	2.550	2.651	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 18:14:00 25-Apr-2014							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2156	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.3916	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.7811	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.3717	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.5557	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.3841	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM): 18:14:00 25-Apr-2014		Before (Measured): 12:33:11 28-Apr-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7403		
		Before	0.7403	0.7033	0.7402	0.7773	
		Before-Master	-----	-----	-0.0001	-----	
BS Window Sum	1/s	Master	1		23468		
		Before	23468	22295	23941	24642	
		Before-Master	-----	-----	473	-----	
SS Window Ratio		Master	1.0000		0.4770		
		Before	0.4770	0.4581	0.4784	0.5000	
		Before-Master	-----	-----	0.0014	-----	

		Before	0.4770	0.4531	0.4784	0.5008	
		Before-Master	-----	-----	0.0014	-----	
SS Window Sum	1/s	Master	1		11122		
		Before	11122	10566	11110	11678	
		Before-Master	-----	-----	-12	-----	
LS Window Ratio		Master	1.0000		0.2991		
		Before	0.2991	0.2842	0.3007	0.3141	
		Before-Master	-----	-----	0.0016	-----	
LS Window Sum	1/s	Master	1		1277		
		Before	1277	1213	1269	1341	
		Before-Master	-----	-----	-8	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM):		18:14:00 25-Apr-2014		Before (Measured):		12:33:11 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1511	2400	
		Before		1000	1501	2400	
		Before-Master	-----	-100	-10	100	
SS PM High Voltage	V	Master		1000	1582	2400	
		Before		1000	1586	2400	
		Before-Master	-----	-100	4	100	
LS PM High Voltage	V	Master		1000	1361	2400	
		Before		1000	1362	2400	
		Before-Master	-----	-100	1	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		18:14:00 25-Apr-2014		Before (Measured):		12:33:11 28-Apr-2014	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master		5.00	10.80	25.00	
		Before		5.00	10.74	25.00	
		Before-Master	-----	-1.00	-0.06	1.00	
SS Crystal Resolution	%	Master		5.00	9.42	20.00	
		Before		5.00	9.53	20.00	
		Before-Master	-----	-1.00	0.11	1.00	
LS Crystal Resolution	%	Master		5.00	8.85	20.00	
		Before		5.00	8.98	20.00	
		Before-Master	-----	-1.00	0.13	1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		12:33:30 28-Apr-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3860	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3815	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3826	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		4740	
Auxiliary Equipment :						
	HGNS Accelerometer, 150 degC		HACCZ-H		4651	
	AmBe Neutron Logging Source		NSR-F		2254	
Calibration Parameter :						
	Water Temperature					
	Housing Size					
	JIG-BKG (Jig minus background reference)		160			

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		12:19:06 28-Apr-2014					
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-Dec-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	-----	-----	-6900.000	-----	
Accelerometer Coefficients - 1		Master	-----	-----	26.920	-----	
Accelerometer Coefficients - 2		Master	-----	-----	0.006	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.733	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	298.600	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.998	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 20:34:56 25-Apr-2014		Before (Measured): 12:35:51 28-Apr-2014		After (Measured): 16:45:12 28-Apr-2014			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.8	40.0	
		Before	0	5.0	28.0	40.0	
		After	0	5.0	27.7	40.0	
		Before-Master	-----	-4.2	0.2	4.2	
		After-Before	-----	-4.2	-0.3	4.2	
Far Zero Measurement	1/s	Master	0	5.0	27.4	40.0	
		Before	0	5.0	29.0	40.0	
		After	0	5.0	31.3	40.0	
		Before-Master	-----	-4.1	1.6	4.1	
		After-Before	-----	-4.4	2.3	4.4	
Near Plus Measurement	1/s	Master	6031.0	4700.0	5842.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2441.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Near Corrected Plus Measurement	1/s	Master		4700.0	5754.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Corrected Plus Measurement	1/s	Master		1900.0	2375.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 12:51:47 28-Apr-2014		After (Measured): 16:42:59 28-Apr-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	15.3	120.0	
		After	30.0	0	19.8	120.0	
		After-Before	-----	-----	4.5	-----	
RGR Plus Measurement	gAPI	Before	179.8	152.4	159.2	200.0	
		After	179.8	152.4	156.7	200.0	
		After-Before	-----	-----	-2.5	-----	
GR Calibration Gain		Before	0.89	0.80	1.01	1.05	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

LEH-QT (Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with Tension Sensor) Calibration - Run 1

Primary Equipment :

Logging Equipment Head - QT, 3-3/8 inch 31 pin HPHT with
Tension Sensor

LEH-QT

2708

HTEN Master Calibration - HTEN Master Calibration

Master:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
HTEN Shop Gain		Master	1.000	0.800	NOT DONE	4.500	
HTEN Shop Offset	lbf	Master	0	-1000.000	NOT DONE	1000.000	
HTEN Before Calibration - HTEN Before Calibration							
Before (Measured):		12:54:36 28-Apr-2014					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RHTE Zero Measurement	lbf	Before	0	-300.000	-113.685	300.000	
RHTE Plus Measurement	lbf	Before	1107.020	940.967	1124.068	1273.073	
HTEN Gain		Before	2.650	0.800	0.894	4.500	
HTEN Offset	lbf	Before	0	-1000.000	101.678	1000.000	

Company:	SAVIA PERU S.A.	Schlumberger
Well:	LO16-31D	
Field:	LOBITOS	
Rig Name:	PEPESA 44	
Country:	PERU	
NUCLEAR LOG		
SP-HRLT-TLD-HGNS		
SCALE 5"/100'		