

Company: SAVIA PERU S.A.

Well: LO16-31D

Field: LOBITOS

Rig Name: PEPESA 44 Country: PERU

NUCLEAR LOG

SP-HRLT-TLD-HGNS

SCALE 2"/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
		4594448.91			D.F. 50.00 ft
		Permanent Datum:	Mean Sea Level		Elev.:
		Log Measured From:	Drill Floor		50.00 ft
		Drilling Measured From:	Drill Floor		above Perm.Datum
		State:	Max.Hole Deviation	Longitude:	Latitude:
		PIURA	45.97 deg	81° 21' 55.85" W	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						
D M M	Density	Viscosity		11.6 lbm/gal		59 s	
	Fluid Loss	PH		5 cm3		10.4	
	Source of Sample						
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		Pressed			
RM @ BHT	RMF @ BHT	0.15 @ 150	0.1 @ 150				
Max Recorded Temperatures					150 degF		
Circulation Stopped		Time	27-Apr-2014		20:00:31		
Logger on Bottom		Time	28-Apr-2014		15:39:43		
Unit Number	Location:	826	PETA				
Recorded By	Naseem Mansoor						
Witnessed By	Jose Coronado						

Disclaimer

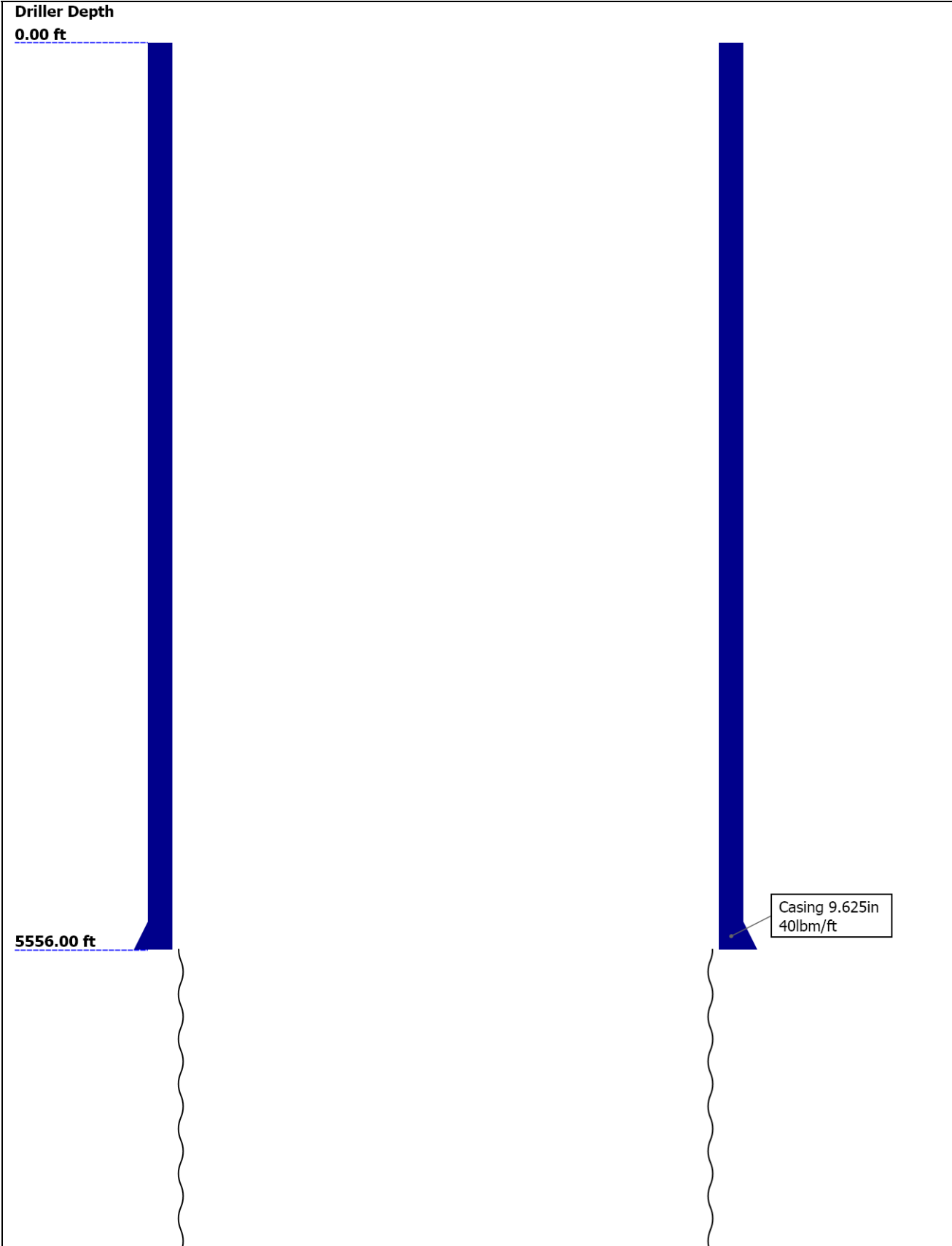
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Well Sketch



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

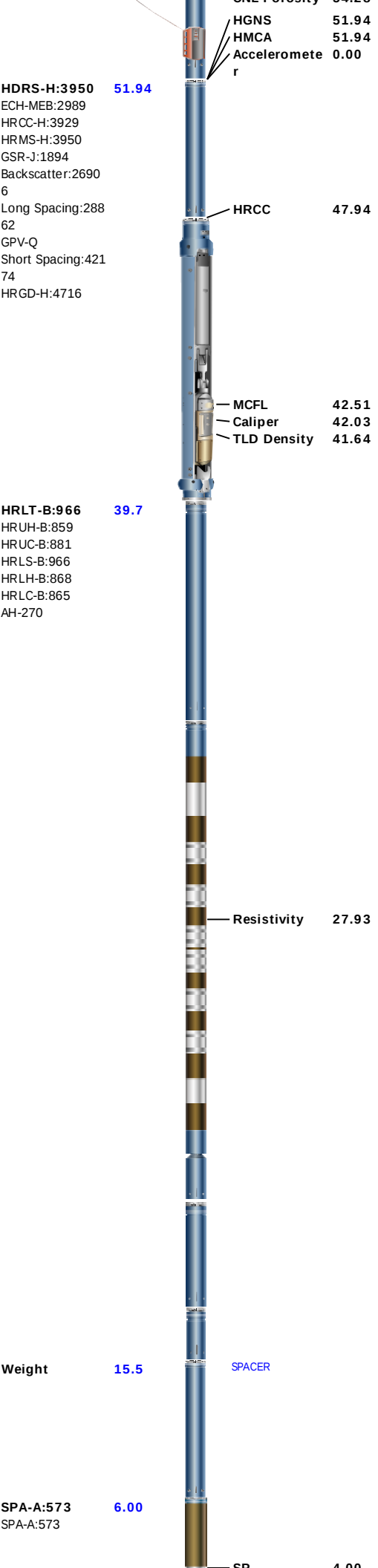
Parameter (unit)	1					
Date Log Started	28-Apr-2014					
Time Log Started	12:14:06					
Date Log Finished	28-Apr-2014					
Time Log Finished	16:49:28					
Top Log Interval (ft)	5450.00					
Bottom Log Interval (ft)	6590.00					
Total Depth (ft)	8867.00					
Max Hole Deviation (deg)	45.97					
Azimuth 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					

[illegible]

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	
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1: Toolstring				1: Remarks
Equip name	Length	MP name	Offset	Logging objective: formation resistivity, nuclear and caliper evaluation.
LEH-QT:2708 LEH-QT:2708	68.69			Toolstring ran as per toolsketch.
AH-369:938	65.78			Matrix was set to Limestone with density 2.71 g/cc, as per client request.
DTC-H:8280 ECH-KC:9357 DTC-H:8280	64.35			Neutron corrections: Hole Size, mud weight, mud cake, pressure and temperature.
		CTEM HV	63.45 0.00	Main log correlated to downlog.
HGNS-H:4740 HGNH:2750 NPV-N NSR-F:2254 HMCA-H HACCZ-H:4651 HGNS-H:4740	61.35	TelStatus ToolStatus Temperature	61.35 61.35 61.32	TD wasn't tagged. Maximum depth reached 6590 ft. Casing Shoe found @ 5533 ft.
		GR	60.61	Tool String run with 1.5: Standoffs
		CNL Porosity	54.28	Repeat section was made close to casing shoe to avoid going down to the sticky zones.



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

HRGD-H	HILT High Resolution Control Cartridge, 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

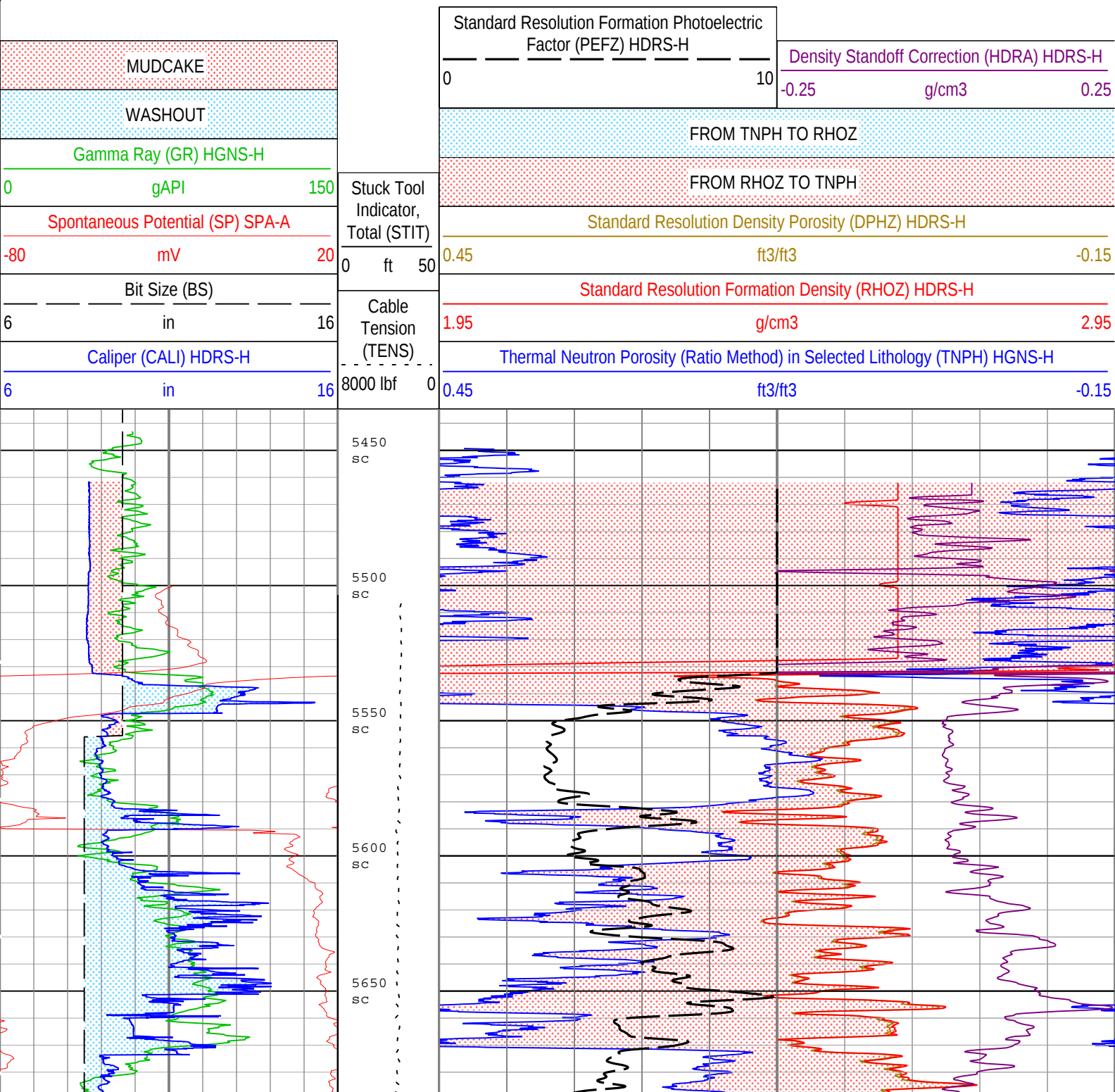
All depths are referenced to toolstring zero

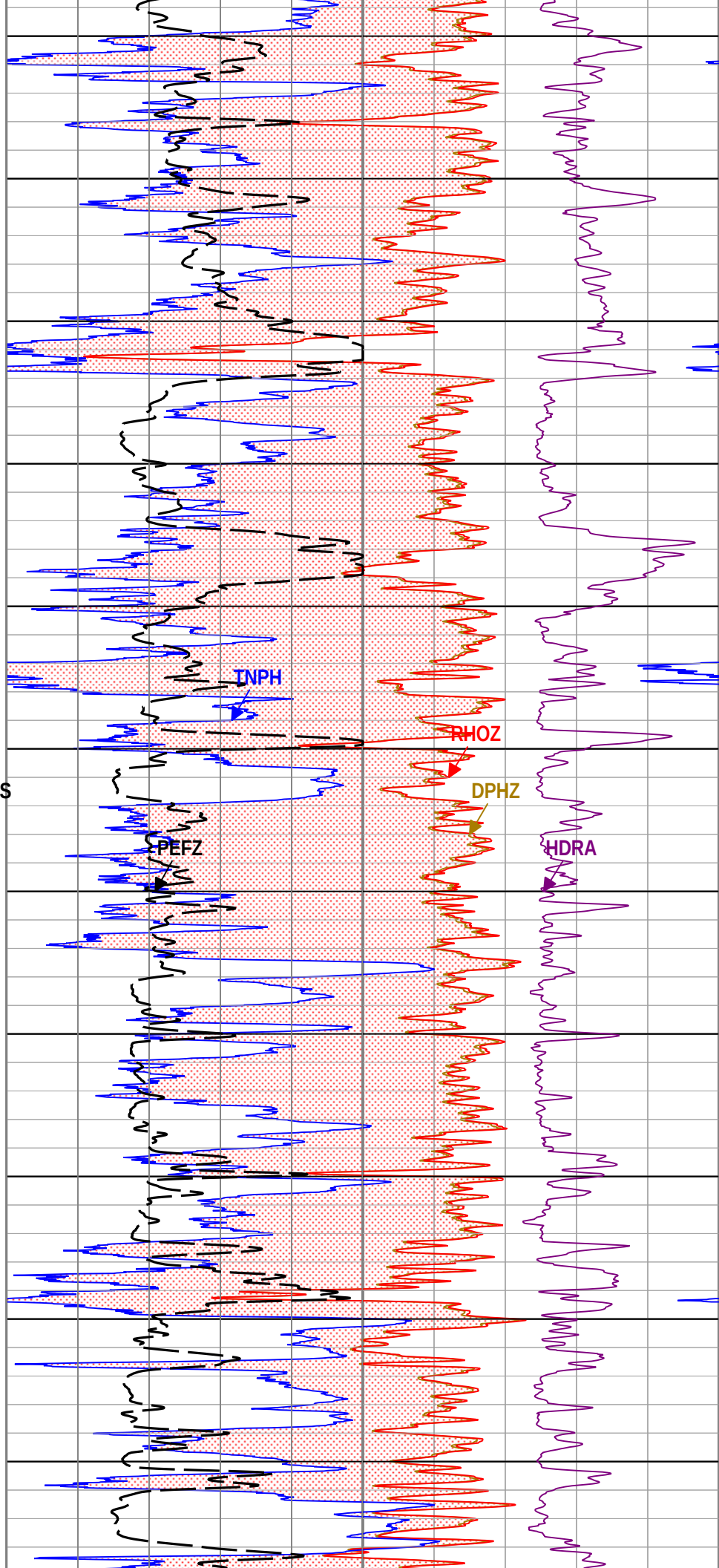
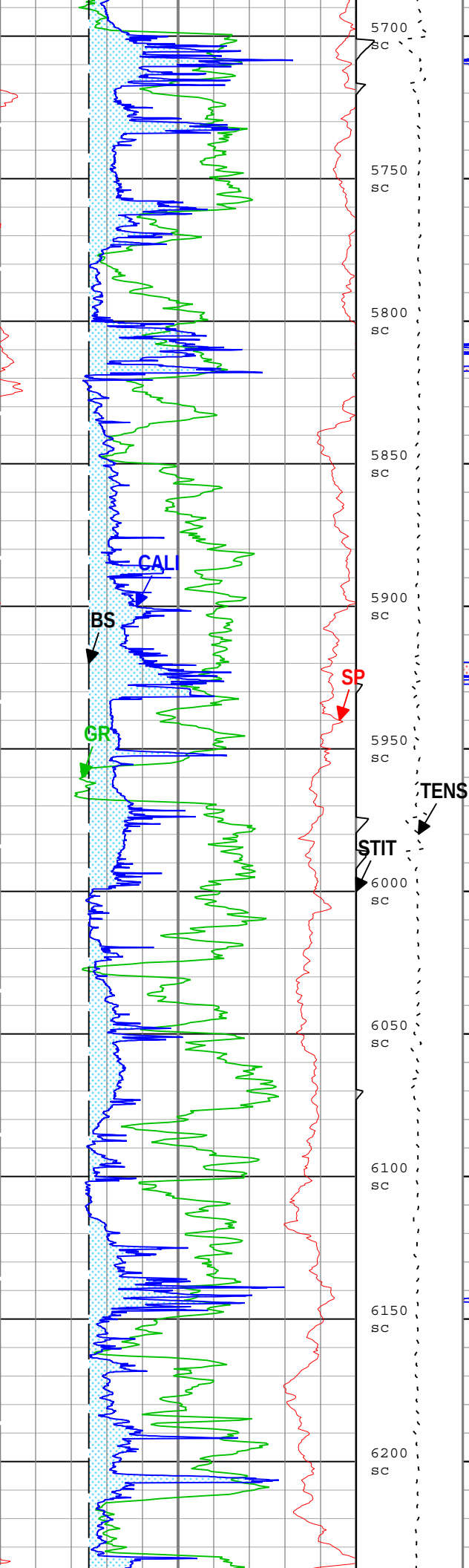
Log

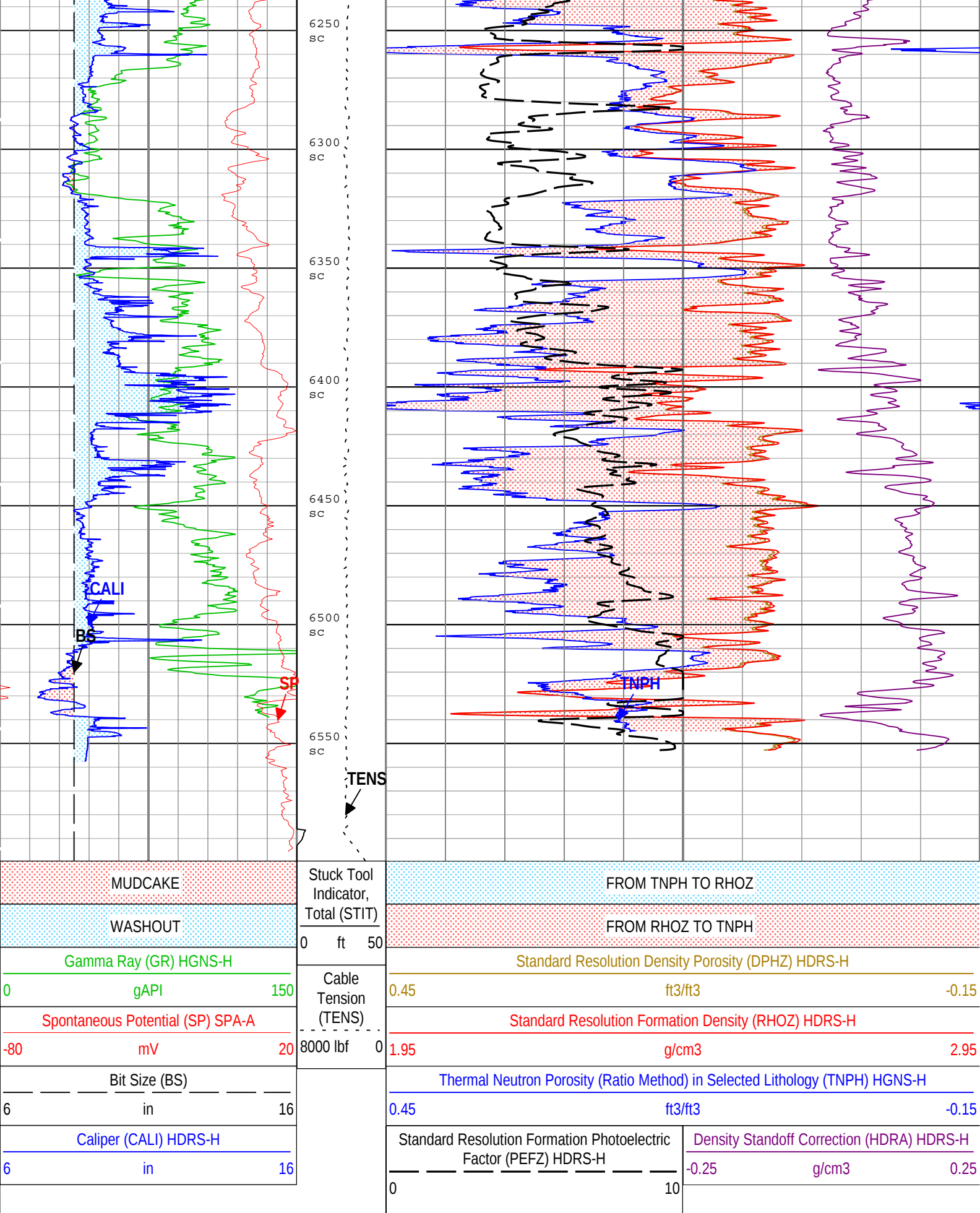
Company:SAVIA PERU S.A. Well:LO16-31D
1: Log[7]:Up:S005

Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:40:26

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: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:40:26

Channel Processing Parameters

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

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	

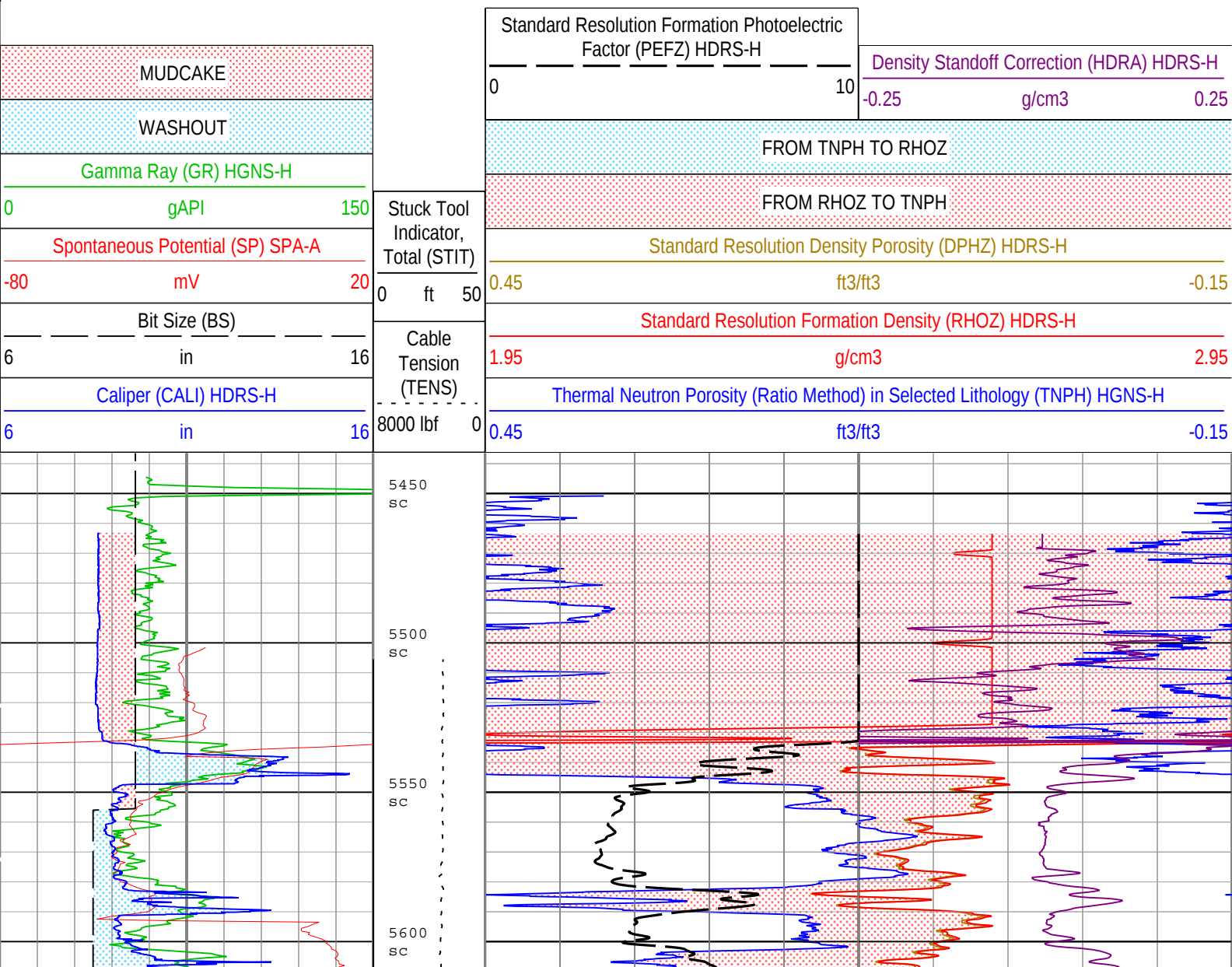
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[9]:Up	Up	5505.00 ft	5711.43 ft	28-Apr-2014 3:32:10 PM	28-Apr-2014 3:37:28 PM	ON	3.00 ft	No

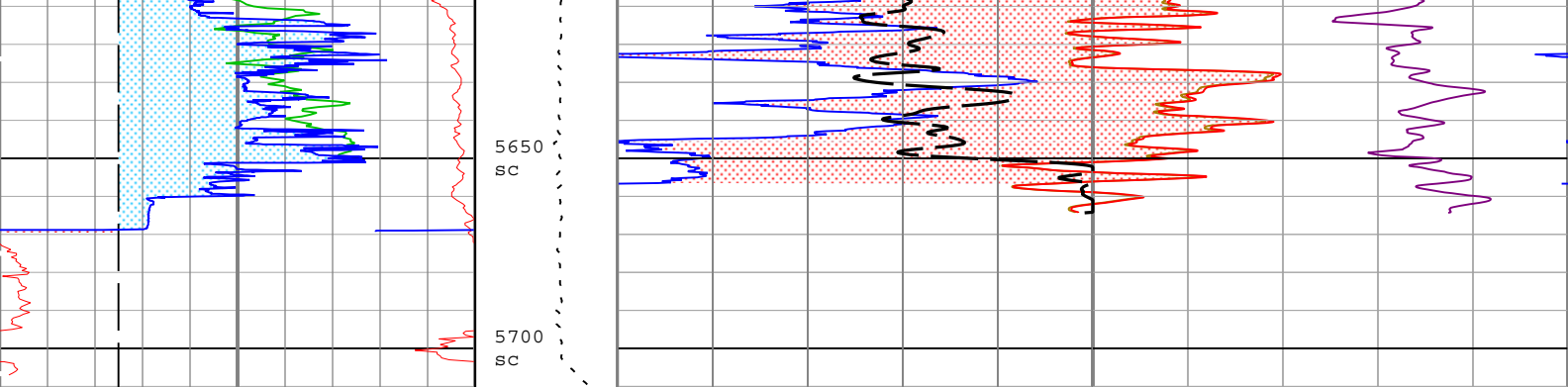
All depths are referenced to toolstring zero

Log	Company:SAVIA PERU S.A.	Well:LO16-31D
		1: Log[9]:Up:S005

Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:40:27

TIME_1900 - Time Marked every 60.00 (s)





MUDCAKE	Stuck Tool Indicator, Total (STIT)	FROM TNPH TO RHOZ		
WASHOUT		FROM RHOZ TO TNPH		
Gamma Ray (GR) HGNS-H	Cable Tension (TENS)	Standard Resolution Density Porosity (DPHZ) HDRS-H		
0 gAPI 150		0.45	ft3/ft3	-0.15
Spontaneous Potential (SP) SPA-A	8000 lbf 0	Standard Resolution Formation Density (RHOZ) HDRS-H		
-80 mV 20		1.95	g/cm3	2.95
Bit Size (BS)		Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
6 in 16		0.45	ft3/ft3	-0.15
Caliper (CALI) HDRS-H		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
6 in 16		0		10
		Density Standoff Correction (HDRA) HDRS-H		
		-0.25	g/cm3	0.25

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (Nuc) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 28-Apr-2014 22:40:27

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	Borehole	GTEM LINEST	

	Computed Temperature	Borehole	274.1	
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	

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	

		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	-320.9	-280.6	
		After	-322.7	-379.6	-320.3	-280.6	
		After-Before	-----	-9.7	0.6	9.7	
HRLT MV - 6	uV	Before	322.7	280.6	323.9	379.6	
		After	322.7	280.6	323.1	379.6	
		After-Before	-----	-9.7	-0.8	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	Before-Master	-----	-----	-0.0001	-----	
		Master	1		23468		
		Before	23468	22295	23941	24642	
SS Window Ratio		Before-Master	-----	-----	473	-----	
		Master	1.0000		0.4770		
		Before	0.4770	0.4531	0.4784	0.5008	
SS Window Sum	1/s	Before-Master	-----	-----	0.0014	-----	
		Master	1		11122		
		Before	11122	10566	11110	11678	
LS Window Ratio		Before-Master	-----	-----	-12	-----	
		Master	1.0000		0.2991		
		Before	0.2991	0.2842	0.3007	0.3141	
LS Window Sum	1/s	Before-Master	-----	-----	0.0016	-----	
		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	

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
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AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.0	32.8	
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HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):	00:00:00 15-Dec-2005
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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
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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
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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

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 2"/100'