

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

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

Location:
LOBITOS
N: 9508655.23
E: 459043.07
Permanent Datum:
Log Measured From:
Drilling Measured From:

Elev.:
K.B.
G.L.
D.F.

50.00 ft
-335.00 ft
50.00 ft

Mean Sea Level
Drill Floor
Drill Floor

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

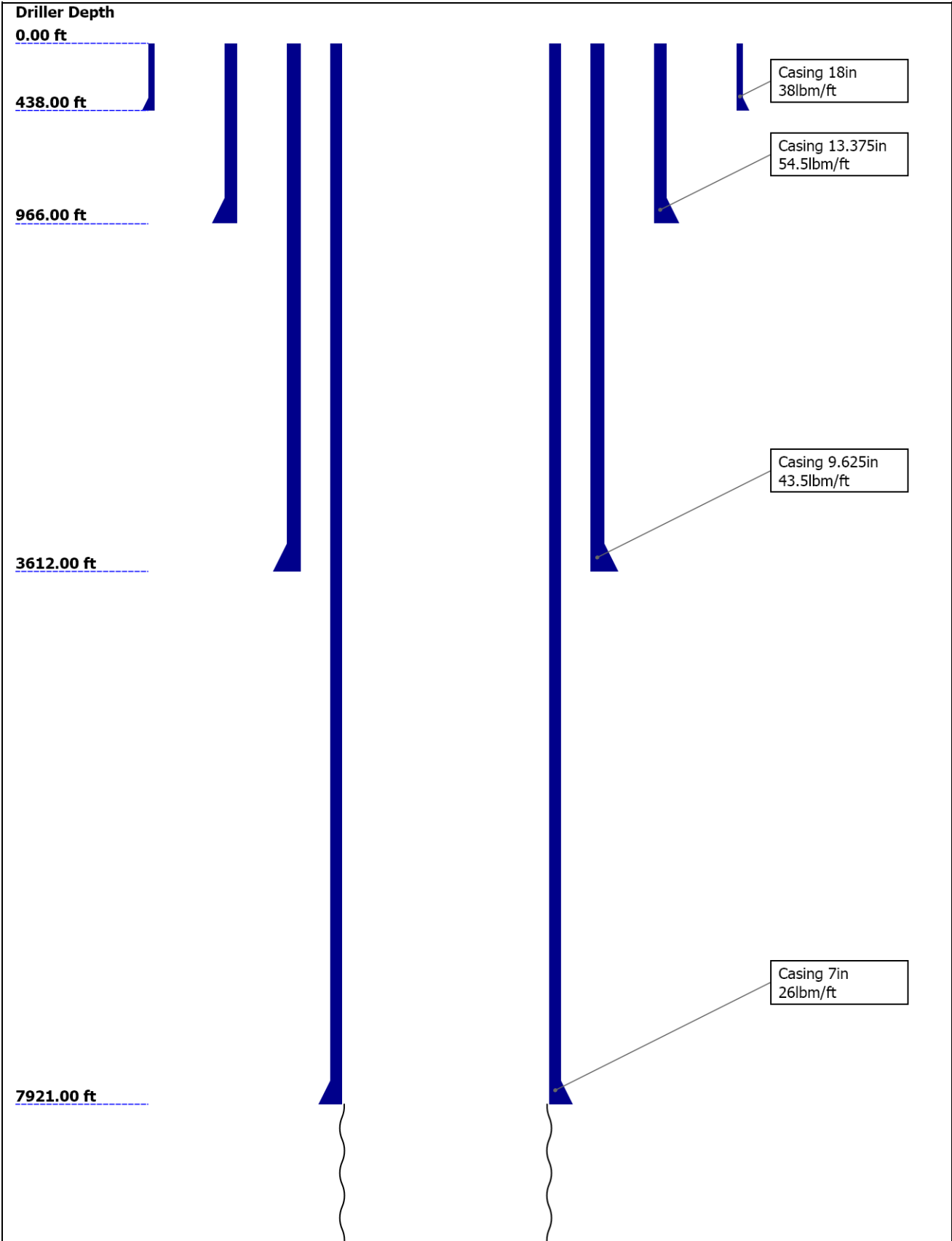
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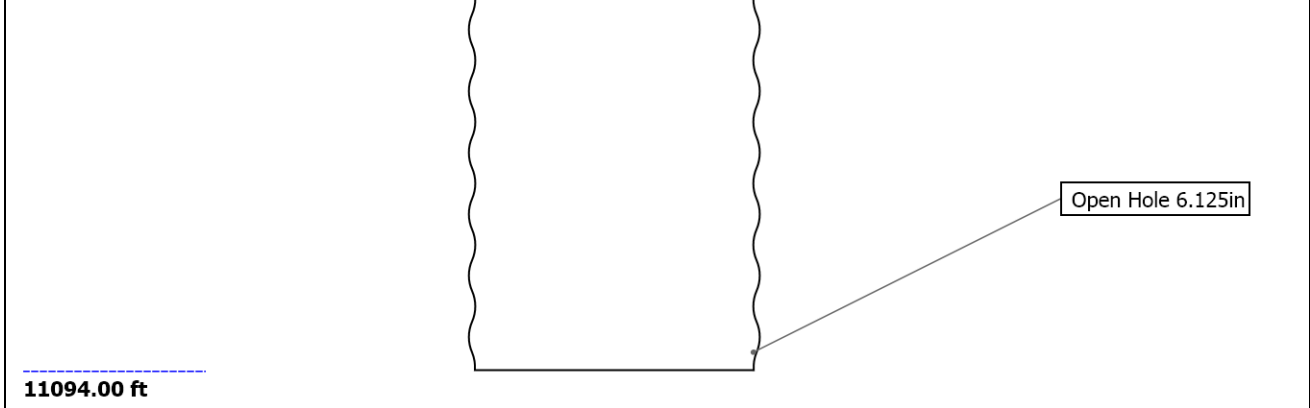
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Well Sketch





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		

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					

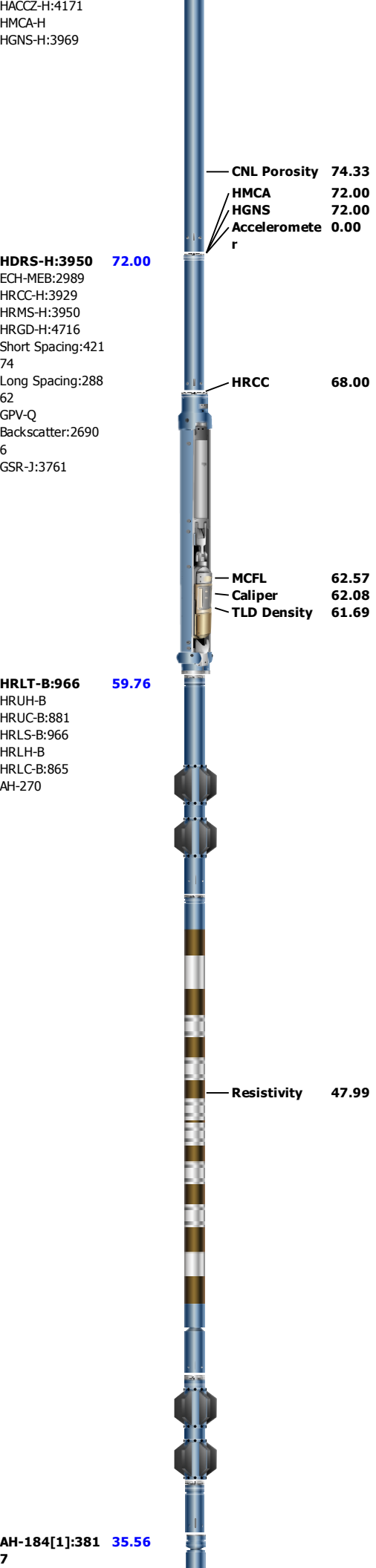
Service Order Number	C3PZ-00033					
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Borehole Fluids

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 (ohm.m@degF)	0.6 @ 73.5					
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.		
				Tool ran as per tool sketch. 4 x 0.5"standoffs used to eccentricize HRLA. HGNS without bowspring in agreement with client.		
				Matrix = Limestone, Densty = 2.71 gr/cc as per client request.		
				Neutron environmental corrections: Hole size, mud cake, mud weight, borehole salinity and pressure & temperature.		
				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.		
				Drillers TD was not reached, due to operational difficulties.		
				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 toolhead.		



came out attached to the tool's head.

SP data was affected by extrernal factors.

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	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		

Composite 1

Main Pass

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1	583.86	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:1, FCD	0	ft3

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

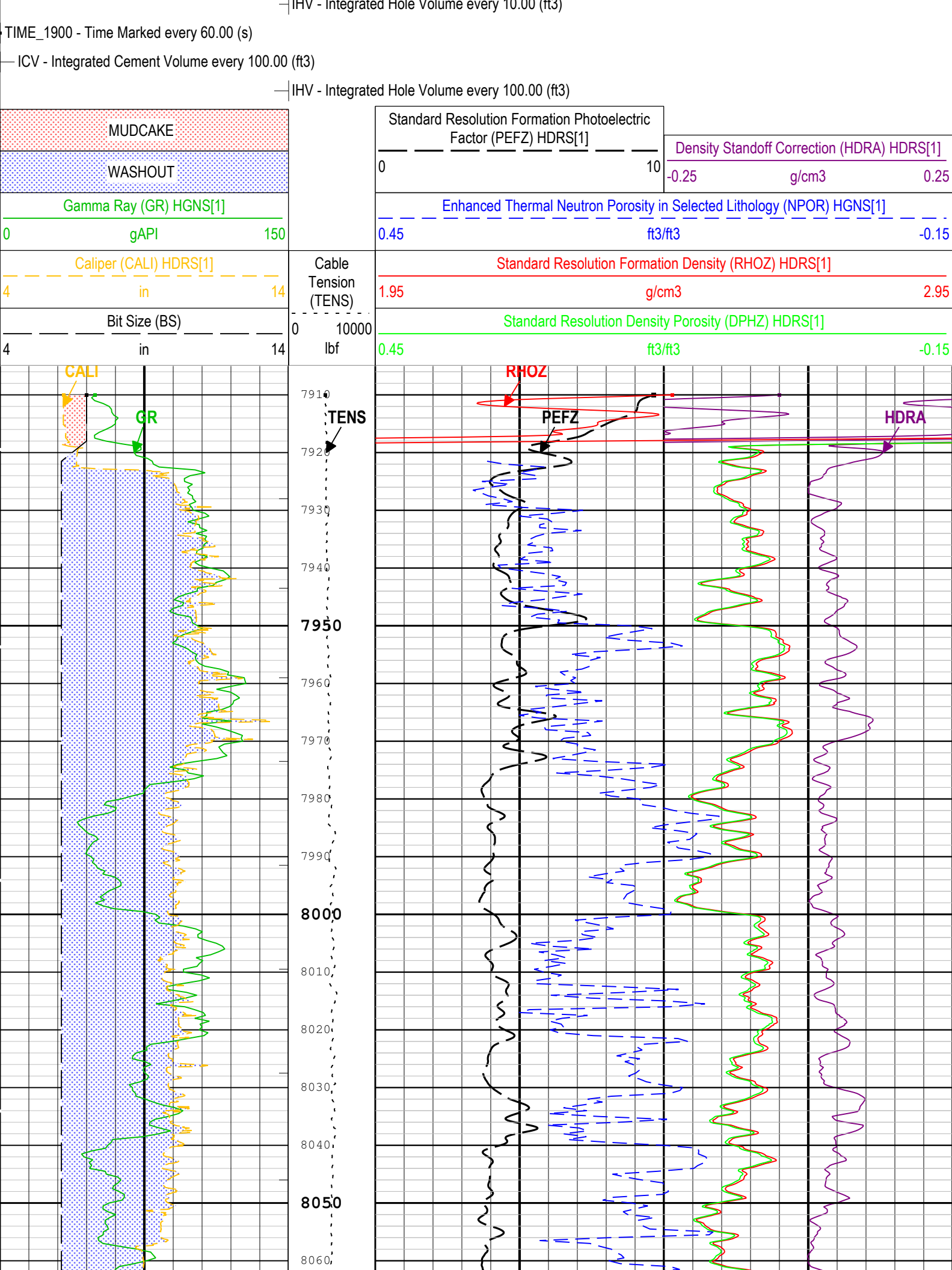
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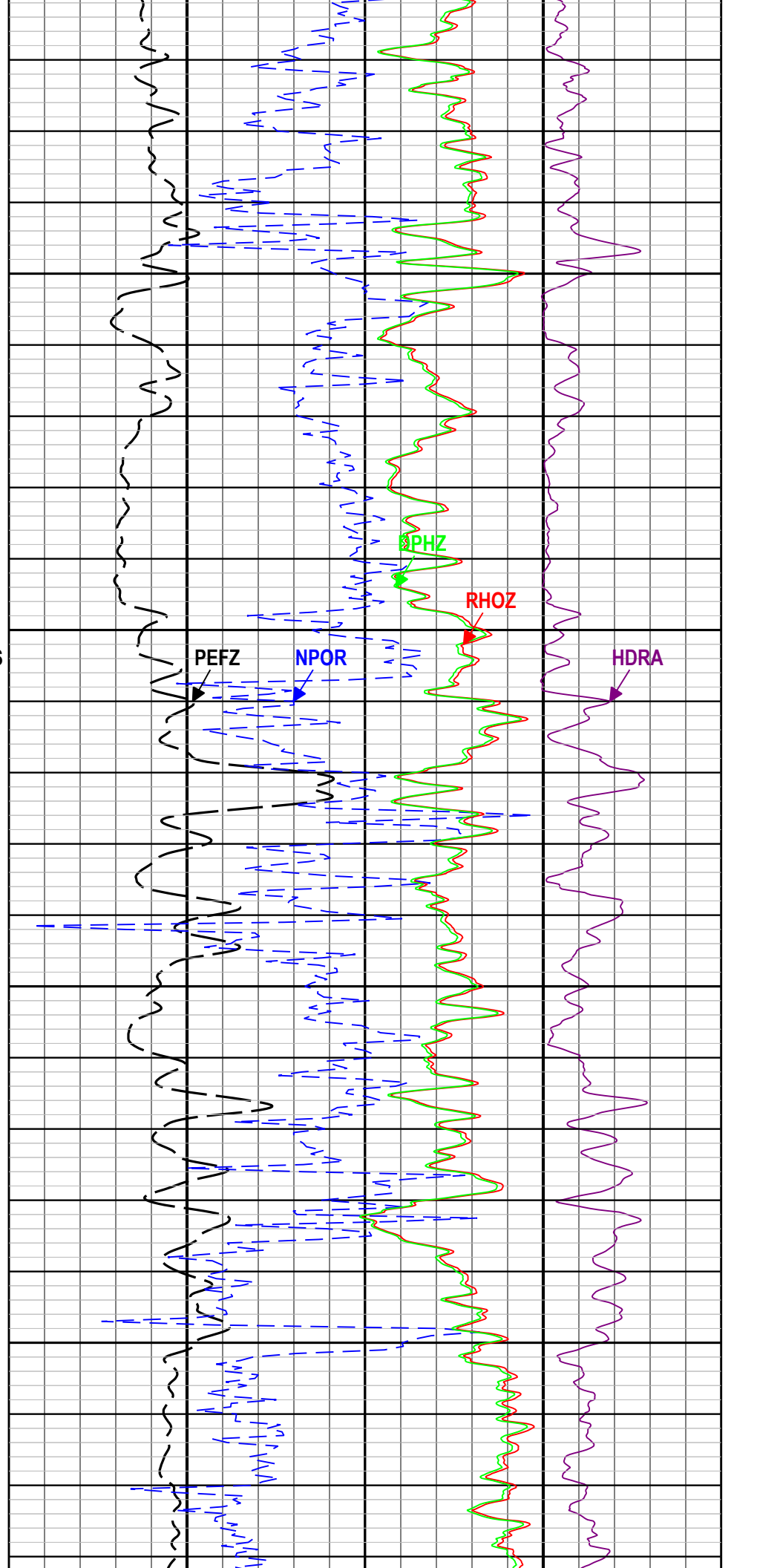
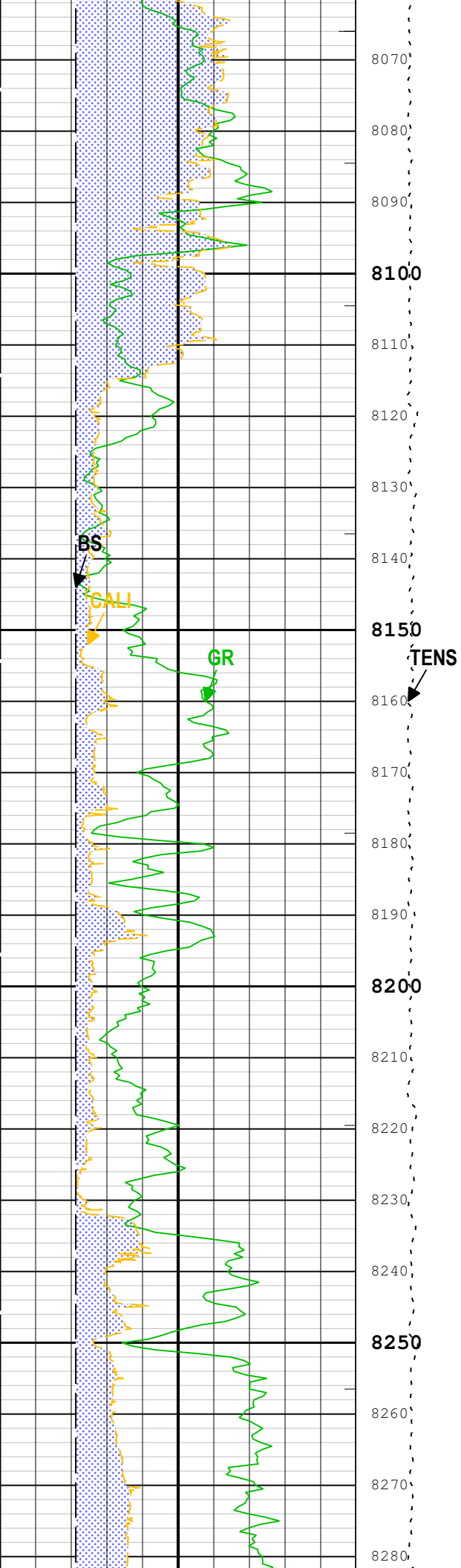
Composite 1

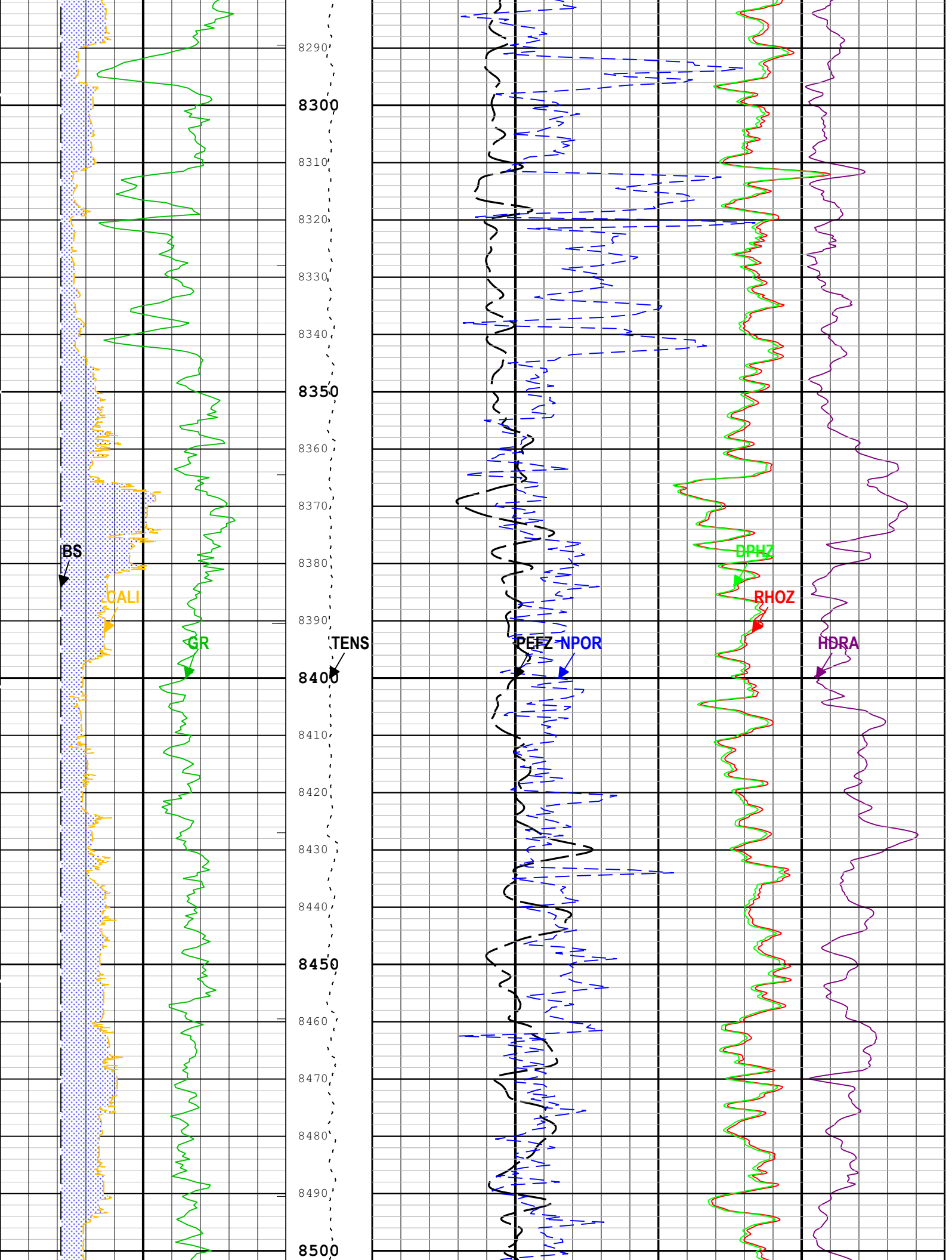
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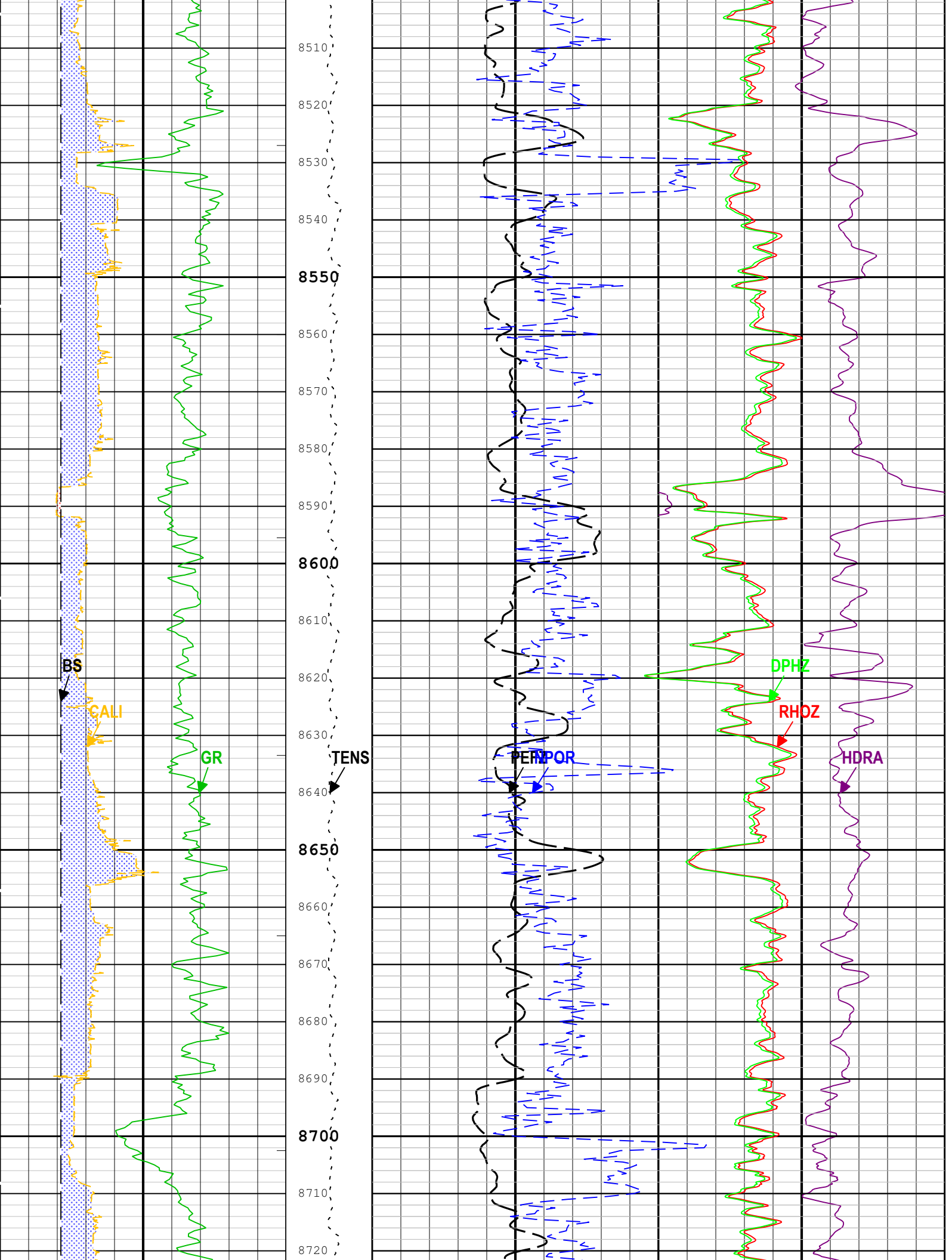
ICV - Integrated Cement Volume every 10.00 (ft3)

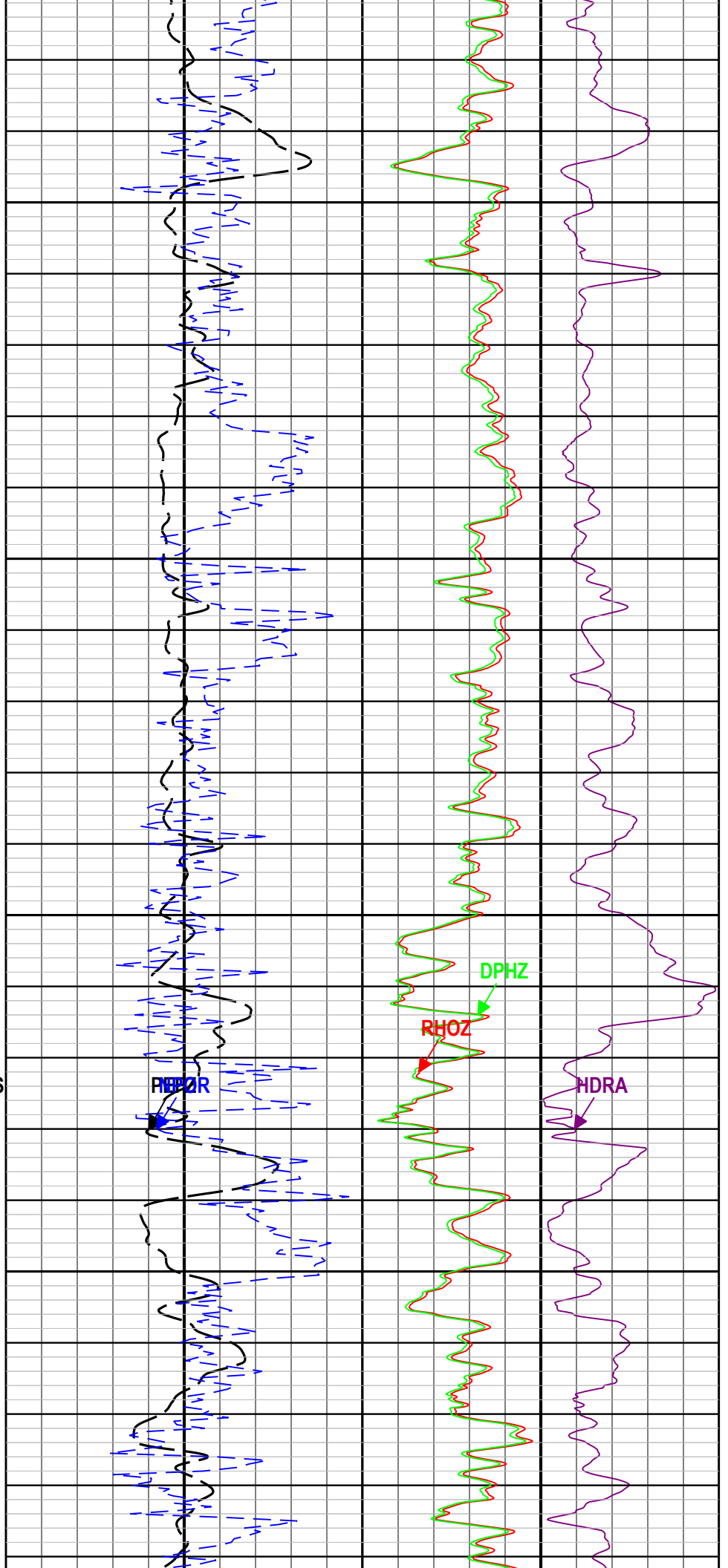
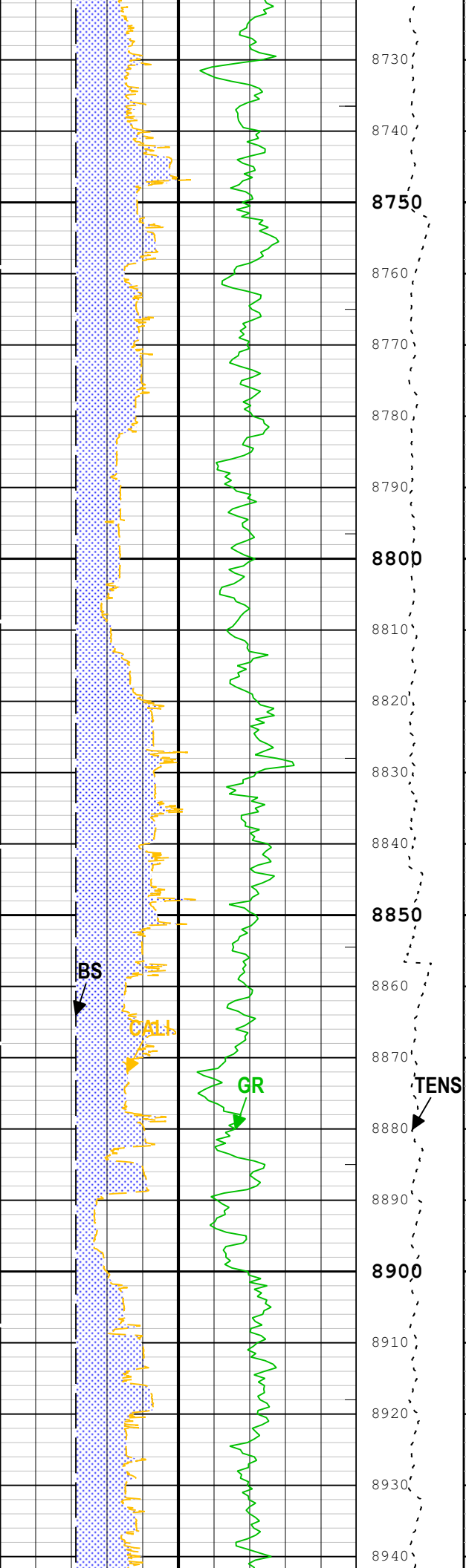
IHV - Integrated Hole Volume every 10.00 (ft3)

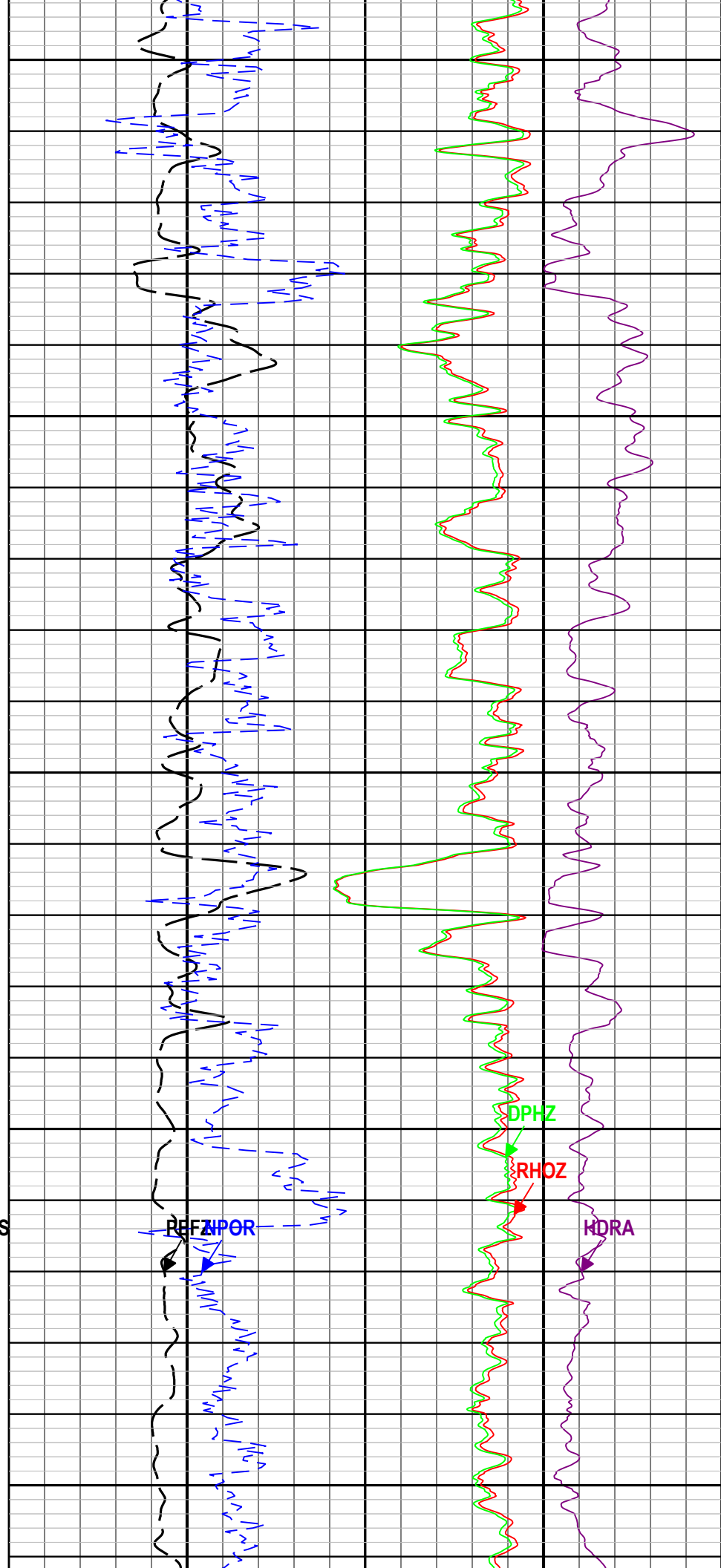
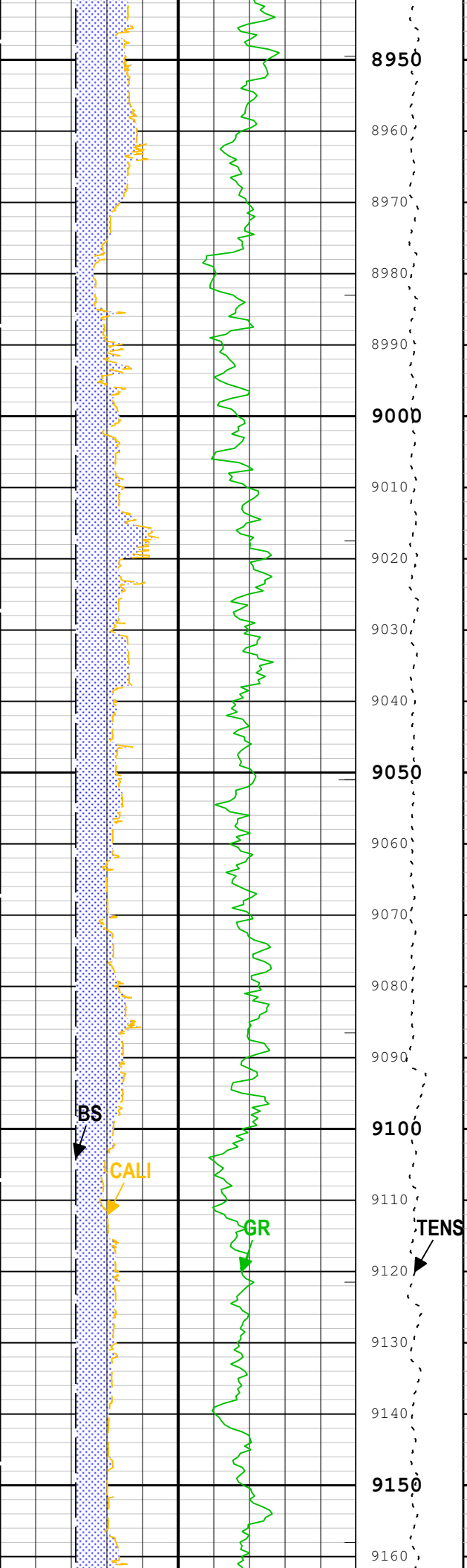


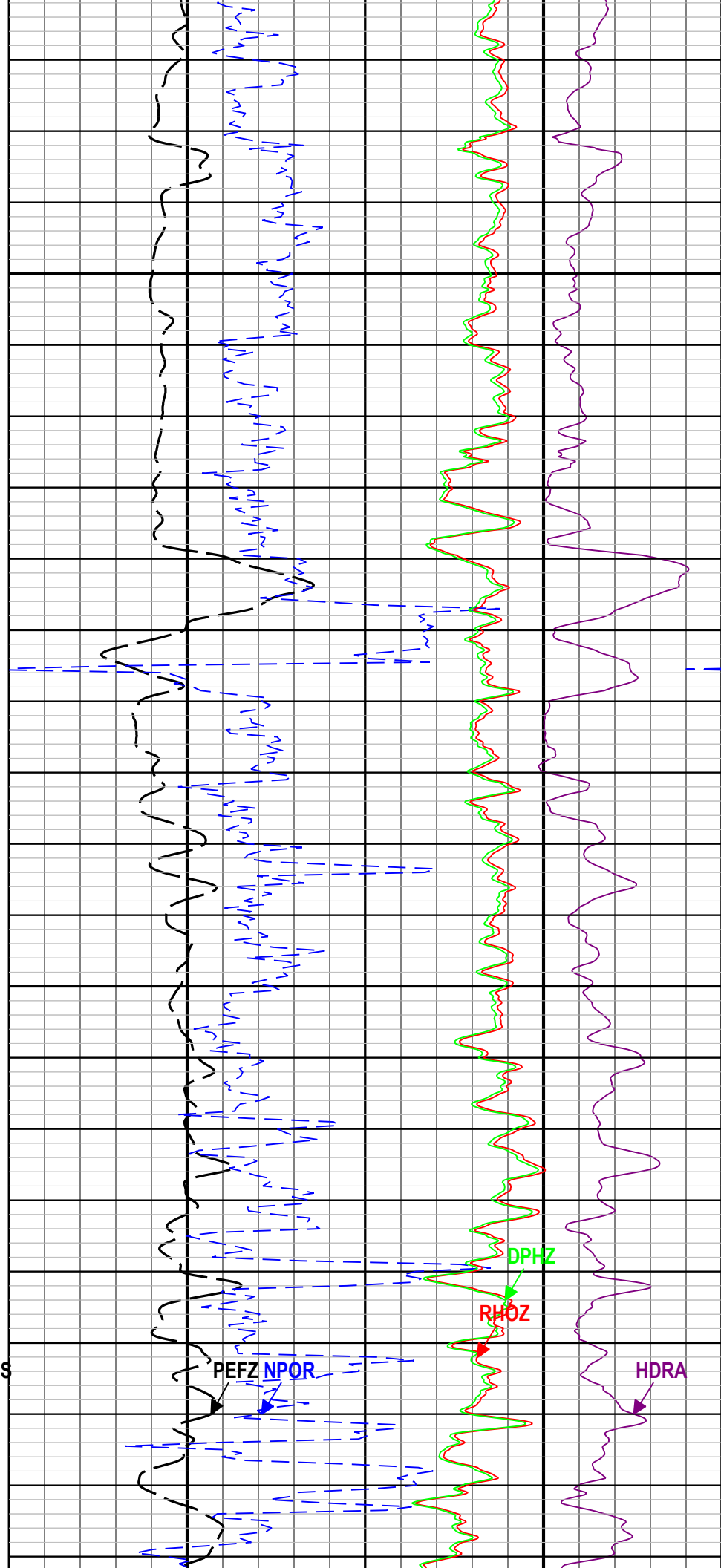
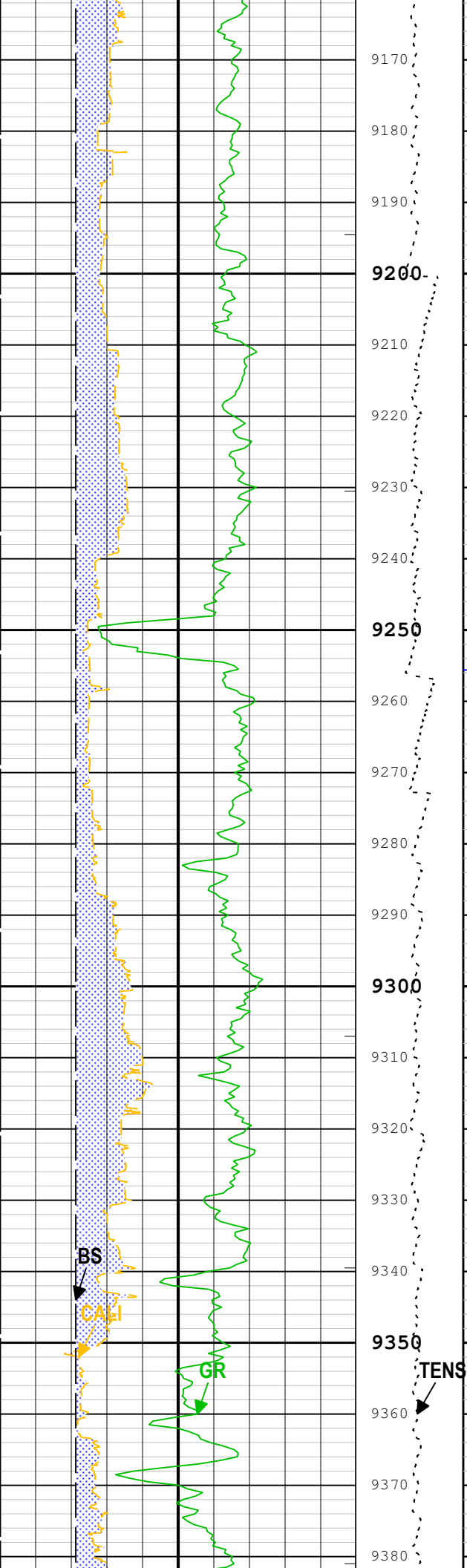


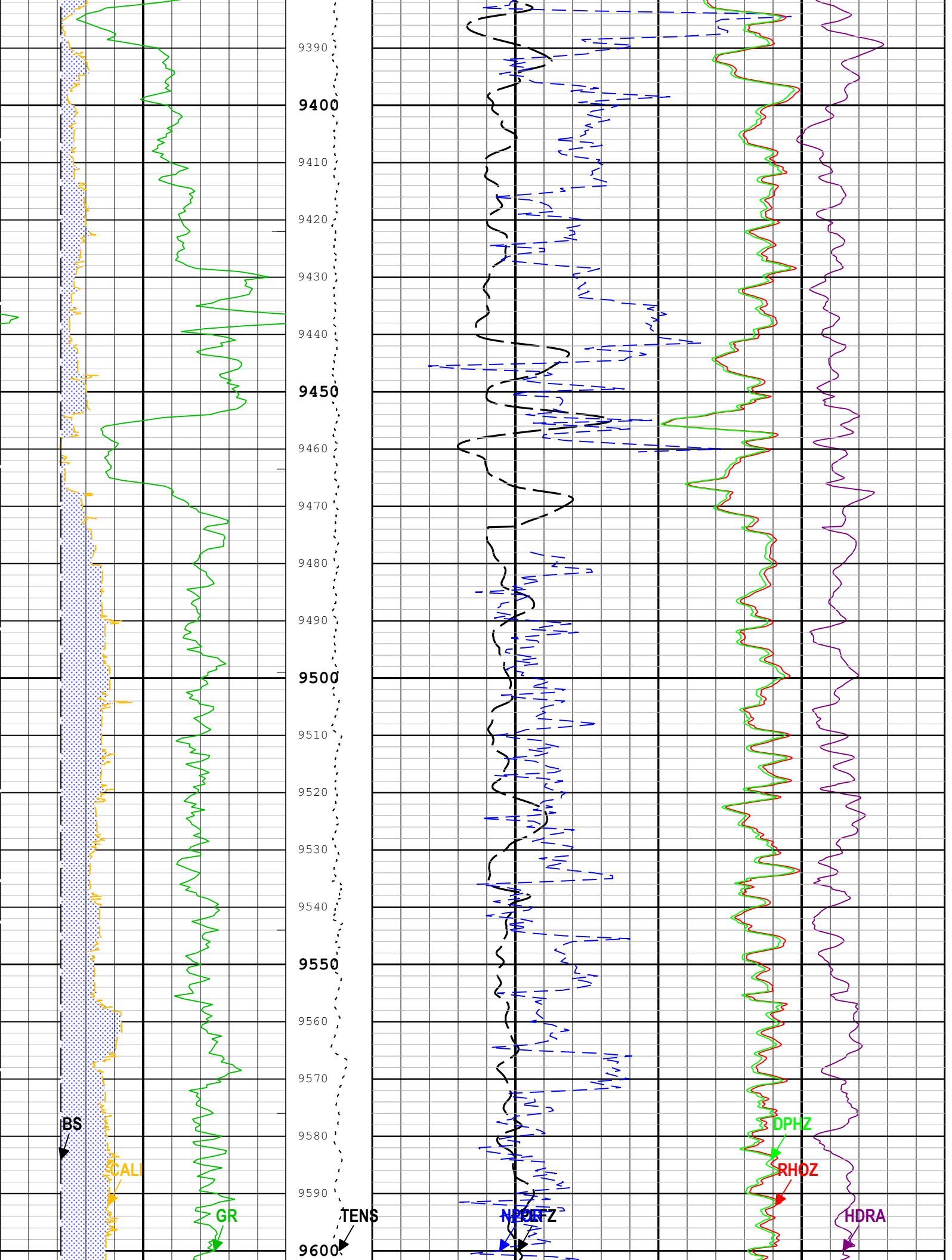


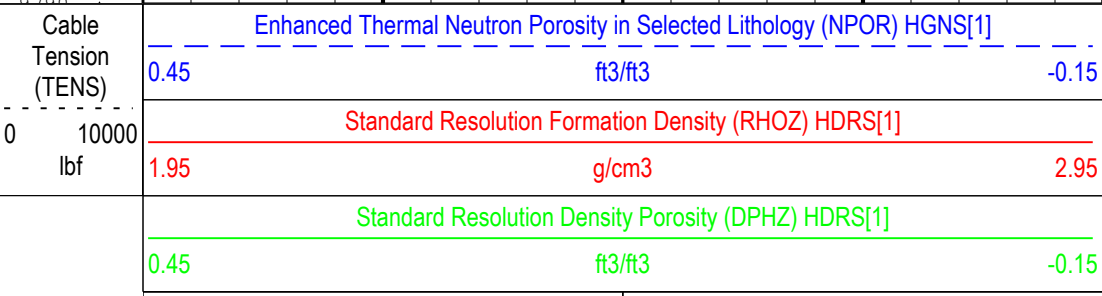
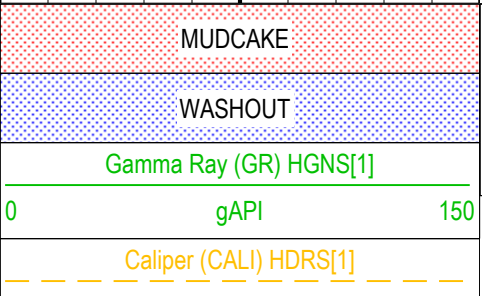
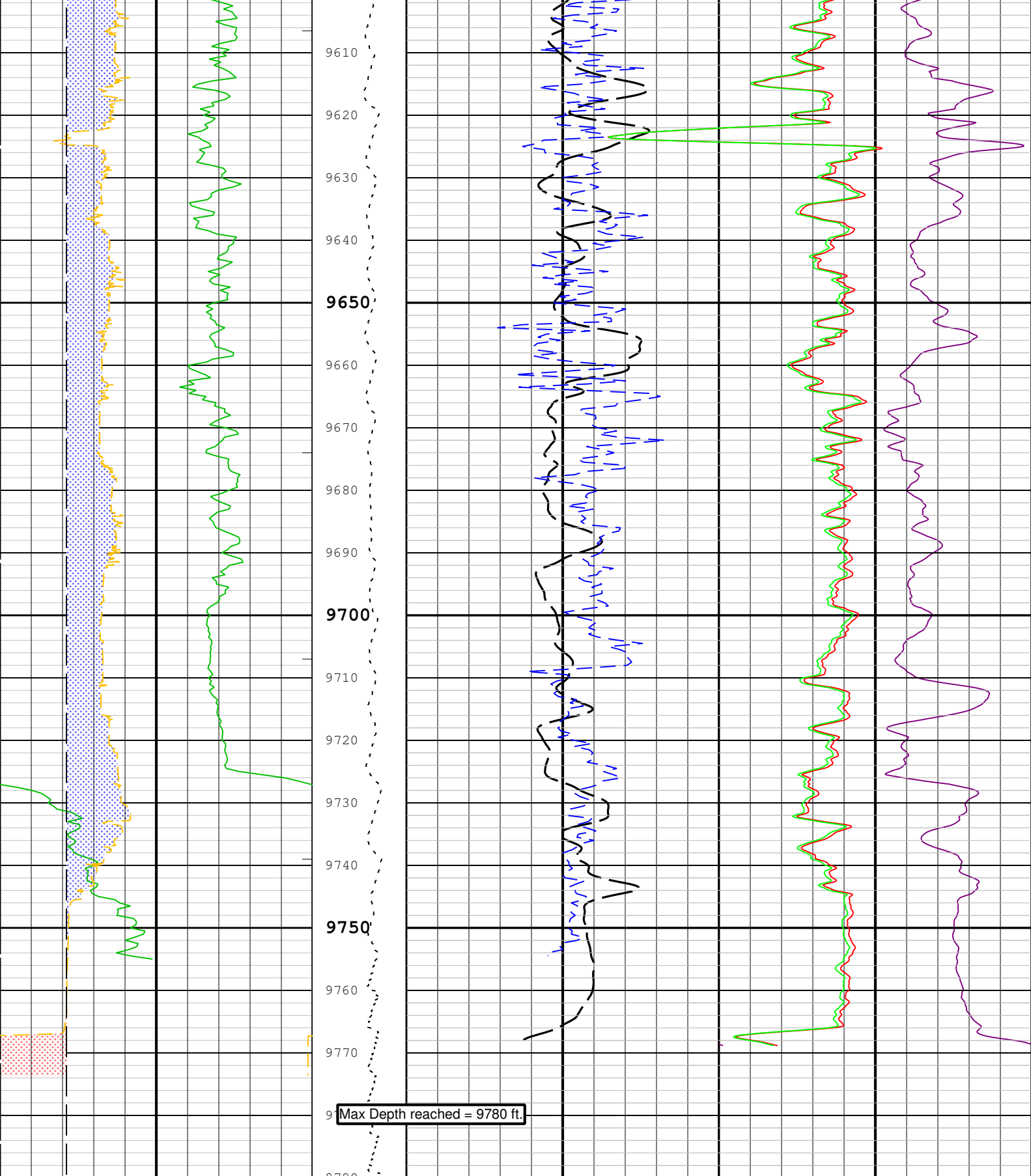












Bit Size (BS)		Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS[1]		Density Standoff Correction (HDRA) HDRS[1]	
4	14	0	10	-0.25	0.25
in				g/cm3	
IHV - Integrated Hole Volume every 100.00 (ft3)					
ICV - Integrated Cement Volume every 100.00 (ft3)					
TIME_1900 - Time Marked every 60.00 (s)					
IHV - Integrated Hole Volume every 10.00 (ft3)					
ICV - Integrated Cement Volume every 10.00 (ft3)					

Description:	Format: Log (NUCLEAR)	Index Scale: 5 in per 100 ft	Index Unit: ft	Index Type: Measured Depth	Creation Date: 10-Apr-2013 02:53:30
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Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	Yes	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	1307	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
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
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	7	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	11.9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	BARADRIL-N	
DHC	Density Hole Correction	HDRS-H	Bit Size	
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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	MRES	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
HRLT_PROCRM	Mud Resistivity Select	HRLT-B	HRLT Compute	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
KFAC_HRLT	HRLT Geometrical Factor Option	HRLT-B	Sonde	
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	73.5	degF
MWCO	Mud Weight Correction Option	HGNS-H	Yes	
PROCMSO	Mechanical Standoff Size	HRLT-B	0.5	in
PROCSP0	Sonde Position	HRLT-B	Eccentered	
PTCO	Pressure Temperature Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.44	ohm.m
SOCN	Standoff Distance	HGNS-H	0	in

1Depth Zoned Parameters

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

BS	6.125	7921	9790
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All depth are actual.

Tool Control Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BRD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3590	ft/h

1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include 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

Description: Format: Log (NUCLEAR RA_1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Apr-2013 02:53:32

ICV - Integrated Cement Volume every 10.00 (ft3)

—| IHV - Integrated Hole Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

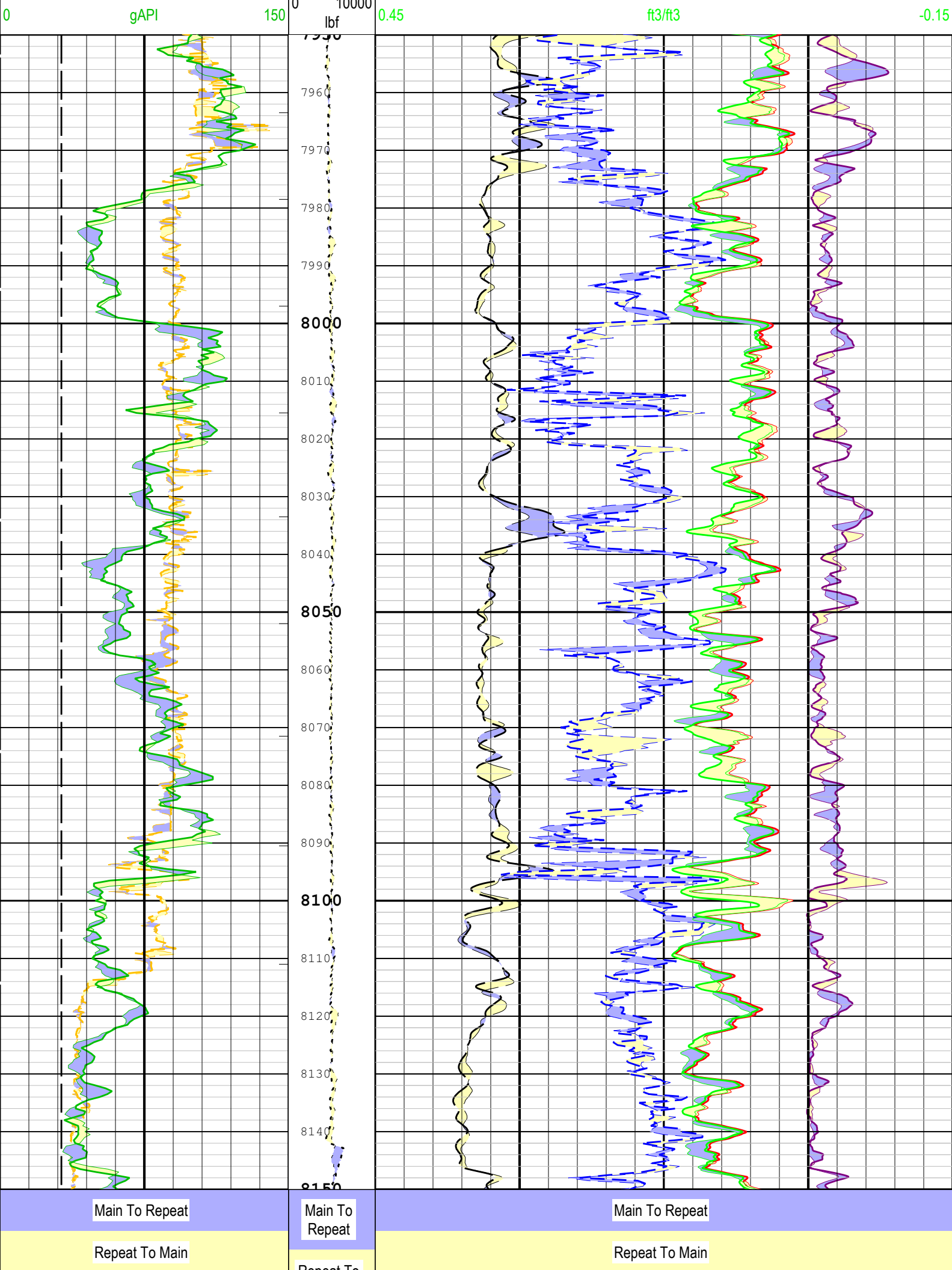
—| IHV - Integrated Hole Volume every 100.00 (ft3)

Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H	Density Standoff Correction (HDRA) HDRS-H
010	-0.25g/cm30.25

Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Caliper (CALI) HDRS-H	Standard Resolution Formation Density (RHOZ) HDRS-H
4in14	1.95g/cm32.95

Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Bit Size (BS)	Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H
4in14	0.45ft3/ft3-0.15

Main To Repeat	Main To Repeat
Repeat To Main	Repeat To Main
Gamma Ray (GR) HGNS-H	Standard Resolution Density Porosity (DPHZ) HDRS-H
010000	



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	
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):		15:42:50 05-Mar-2013		After (Measured):		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	-68888.6	-60869.6	
		After-Before	-----	-----	507.2	-----	

		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):		15:42:50 05-Mar-2013		After (Measured):		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	-68781.9	-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	

		Before	-322.7	-379.6	-317.2	-280.6	
		After	-322.7	-379.6	-310.4	-280.6	
		After-Before	-----	-----	4.2	-----	
HRLT MV - 1	uV	Before	-322.7	-379.6	-314.6	-280.6	
		After	-322.7	-379.6	-311.2	-280.6	
		After-Before	-----	-----	2.4	-----	
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	
		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.

Schlumberger

Well:

LO6-27D

Field:

LOBITOS

Rig Name:

PEPESA-40

Country:

PERU

NUCLEAR LOG

SP-BHC-HRLT-TLD-HGNS-GR

SCALE 5"/100'