

Company: Gulf Exploration LLC

Well: Black Powder #2

Field: Wattenberg

County: Weld State: Colorado

Platform Express			
Compensated Neutron Log			
Three Detector Litho-Density			
Location:		Elev.: K.B. 4861.00 ft	
600' FSL & 1900' FWL		G.L. 4838.00 ft	
Section 10, Township 7N, Range 63W		D.F. 4860.00 ft	
Permanent Datum:	Ground Level	Elev.:	4838.00 f
Log Measured From:	Kelly Bushing	23.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
05-123-47681	10	7N	63W
Logging Date	21-Aug-2020		

Logging Date		21-Aug-2020		
Run Number		1A		
Depth Driller		8900.00 ft		
Schlumberger Depth		8890.00 ft		
Bottom Log Interval		8890.00 ft		
Top Log Interval		7300.00 ft		
Casing Driller Size @ Depth		9.625 in @ 878.00 ft		
Casing Schlumberger		878 ft		
Bit Size		8.75 in		
Type Fluid In Hole		Water		
MUD	Density	9 lbm/gal	37 s	
	Fluid Loss	0 cm3	8.5	
	Source of Sample			
RM @ Meas Temp		0.2 ohm.m @ 68 degF		
RMF @ Meas Temp		0.15 ohm.m @ 68 degF		
RMC @ Meas Temp				
Source RMF		RMC		
RM @ BHT		RMF @ BHT	0.07 @ 209	0.05 @ 209
Max Recorded Temperatures		209 degF		
Circulation Stopped		Time	20-Aug-2020	22:00:00
Logger on Bottom		Time	21-Aug-2020	04:30:00
Unit Number		Location:	9108	Fort Morgan
Recorded By		Caroline Ibrahim		
Witnessed By		Jeff Petty		

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents

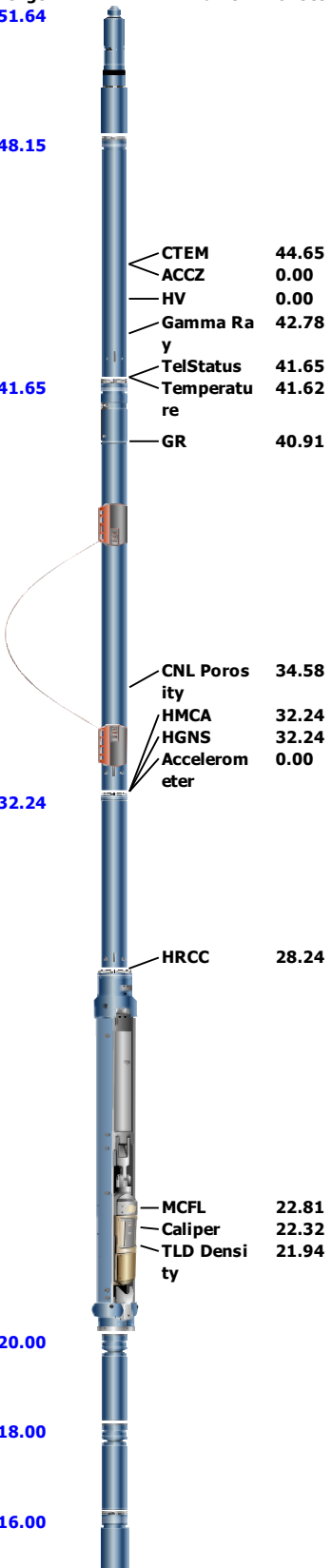
- 1. Header
- 2. Disclaimer
- 3. Contents
- 4. Remarks and Equipment Summary
- 5. Depth Summary
- 6. 1A Main Pass 2" = 100'
  - 6.1 Integration Summary
  - 6.2 Software Version
  - 6.3 Composite Summary
  - 6.4 Log ( Porosity 2 inch General )
- 7. 1A Main Pass 5" = 100'
  - 7.1 Integration Summary
  - 7.2 Composite Summary
  - 7.3 Log ( Porosity\_5\_Inch )
  - 7.4 Parameter Listing
- 8. 1A Repeat Pass 5" = 100'
  - 8.1 Composite Summary

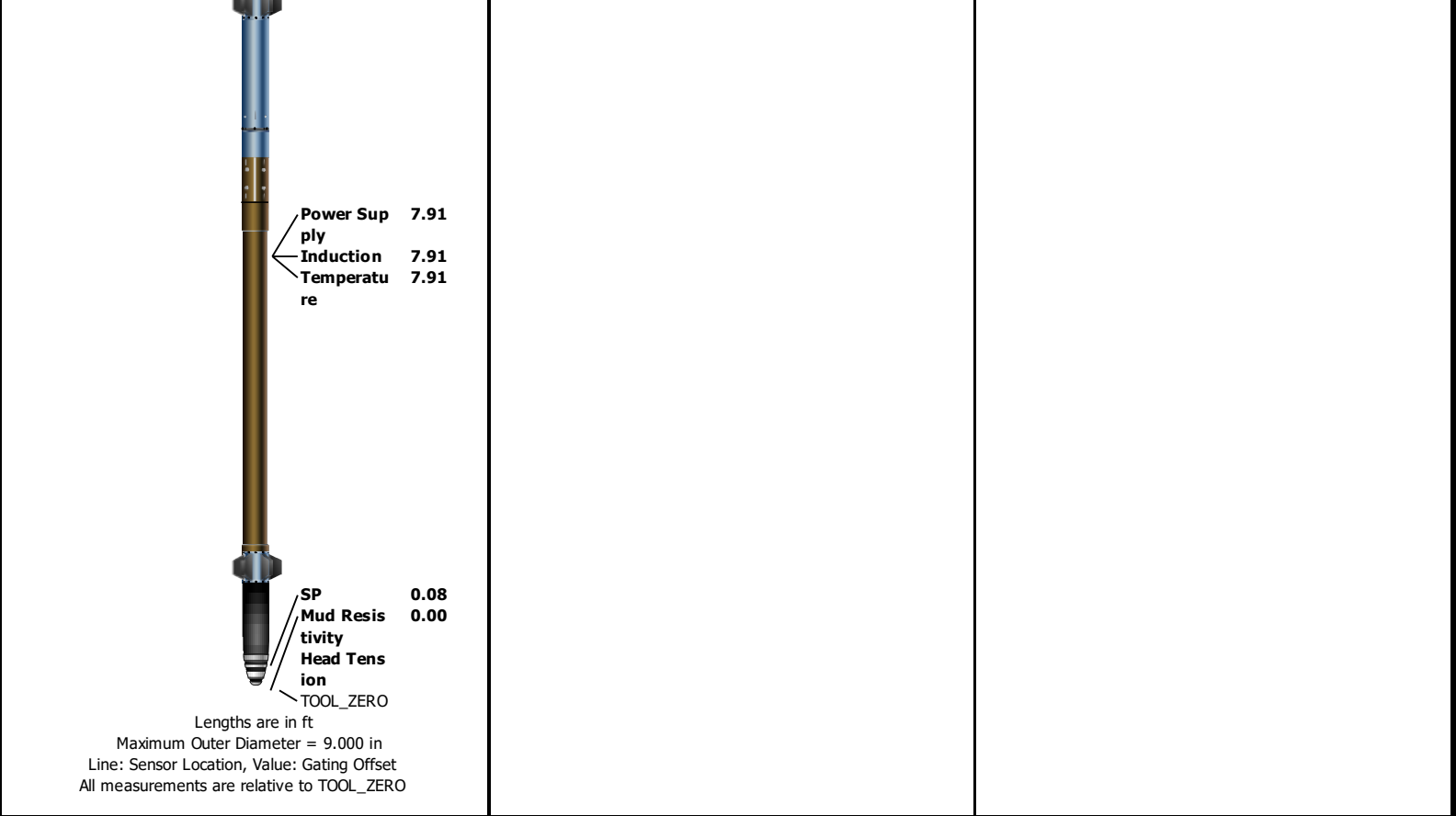
8.2 Log ( Porosity\_5\_Inch RA )

9. Calibration Report

10. Tail

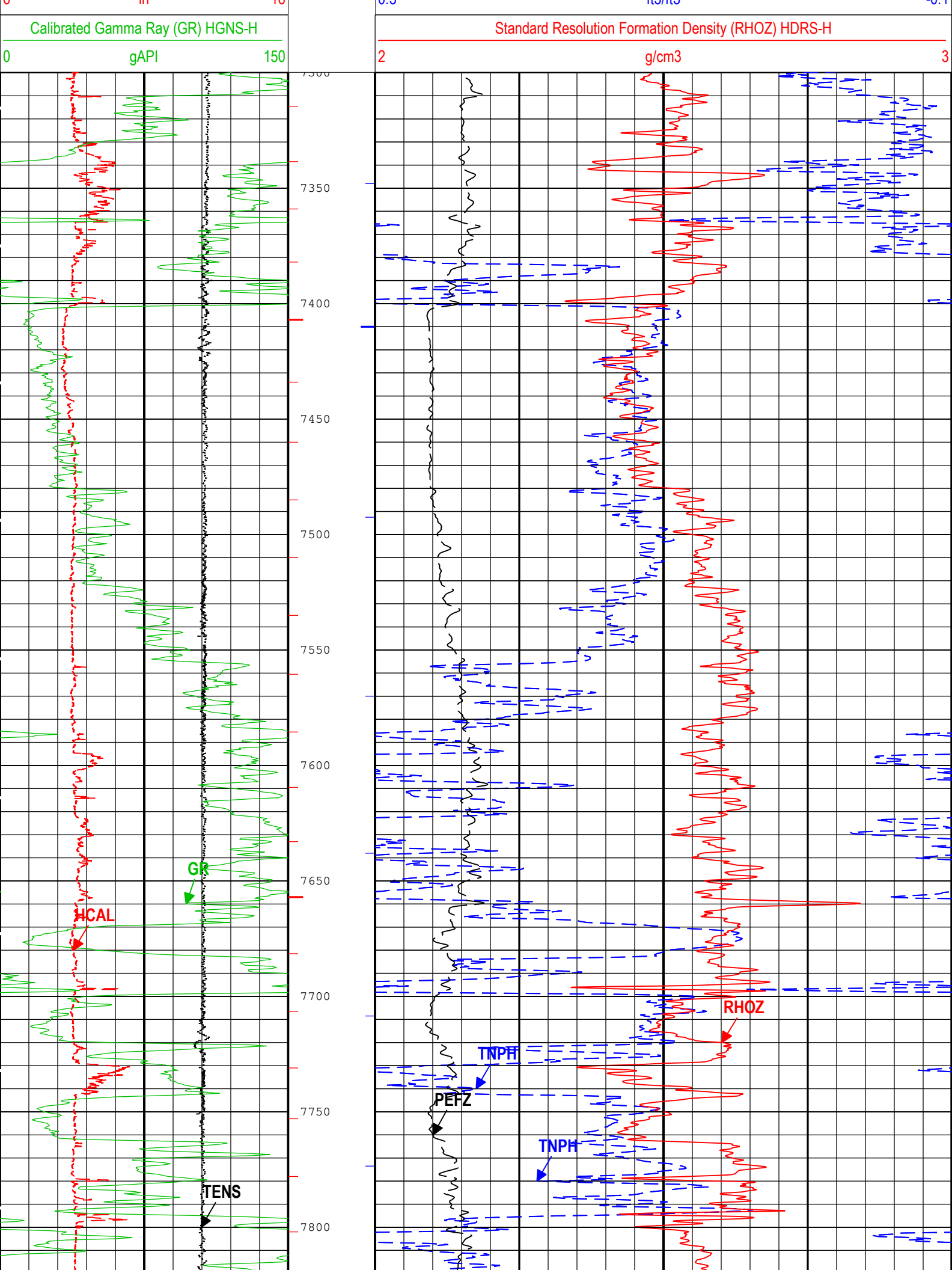
Remarks and Equipment Summary

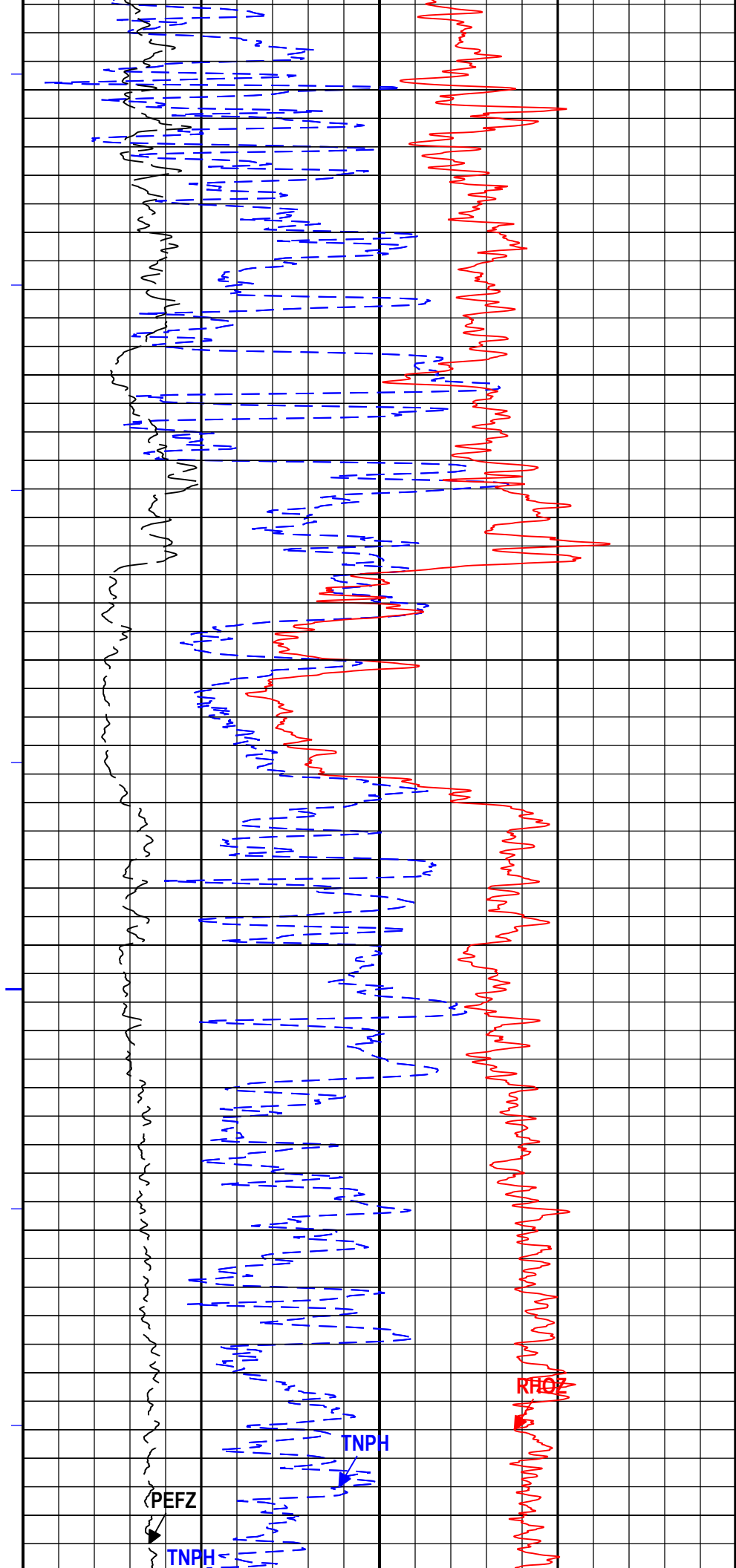
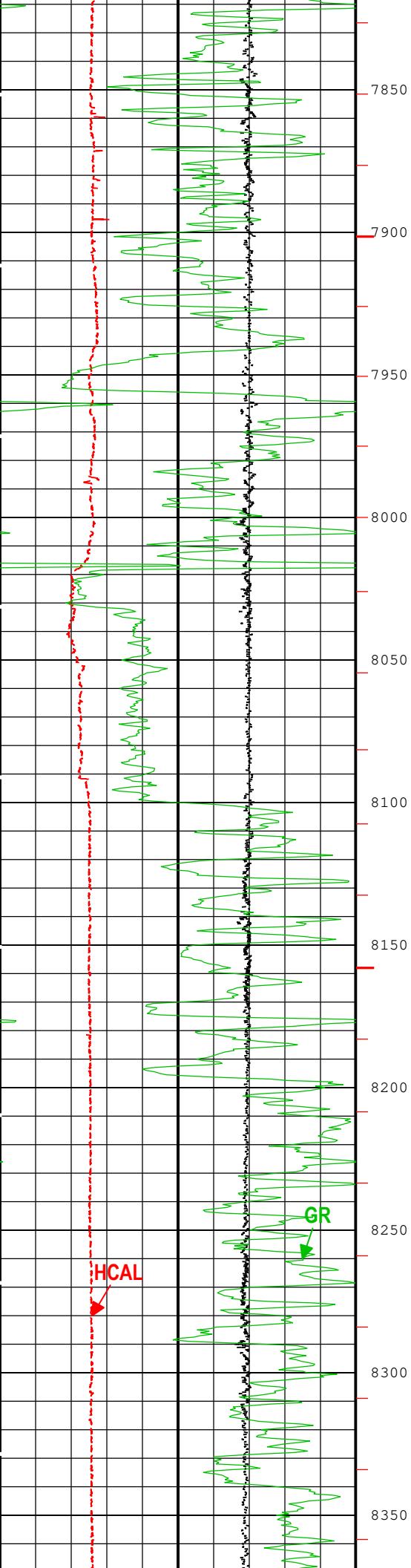
1A: Toolstring				1A: Remarks
<b>Equip name</b> <b>LEH-QT</b> LEH-QT	<b>Length</b> <b>51.64</b>	<b>MP name</b>	<b>Offset</b>	Tool was run as per tool sketch
				All logging intervals as per client request. Repeat TD-8550'. Main Pass TCOM TD-7300', Induction/ GR TD-surface
				Thank you for choosing Schlumberger
				Sandstone matrix used, 2.65 g/cc
<b>EDTC-B</b> EDTH-B EDTG-A EDTC-B	<b>48.15</b>			
<b>HGNS-H</b> HGNH NSR-F:5203 NPV-N HACCZ-H:153 7 HMCA-H HGNS-H	<b>41.65</b>	CTEM ACCZ HV Gamma Ra y TelStatus Temperatu re GR	44.65 0.00 0.00 42.78  41.65 41.62  40.91	
<b>HDRS-H</b> ECH-MEB HRCC-H HRMS-H GPV-Q Short Spacing HRGD-H:3967 Long Spacing GSR-J:5534 Backscatter	<b>32.24</b>	CNL Porosity HMCA HGNS Accelerometer  HRCC	34.58 32.24 32.24 0.00  28.24	
<b>AH-184[2]</b>	<b>20.00</b>	MCFL Caliper TLD Density	22.81 22.32 21.94	
<b>AH-184[1]</b>	<b>18.00</b>			
<b>AIT-M:138</b> AMIS:138 AMRM:138	<b>16.00</b>			

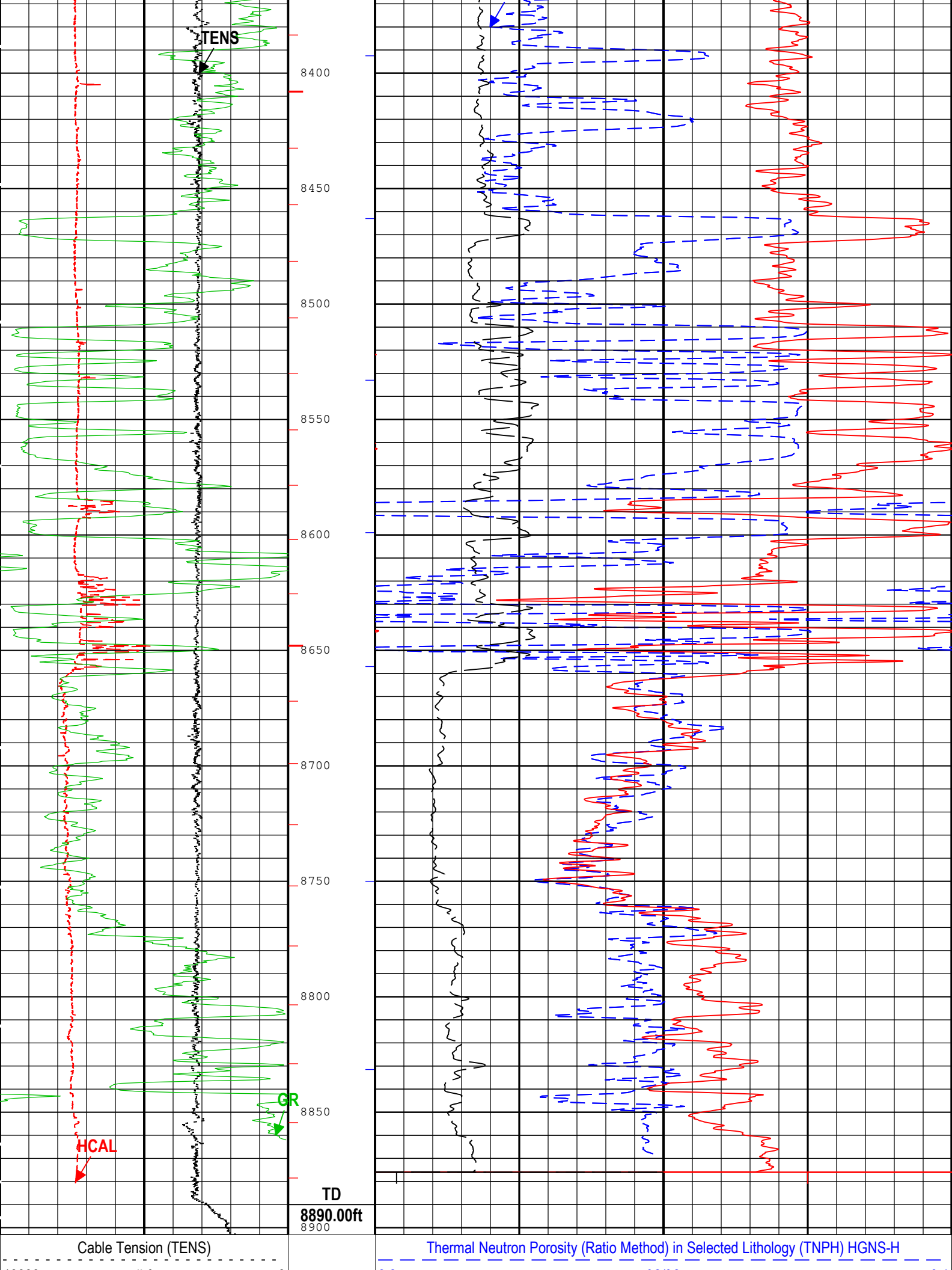


Depth Summary			
	1A		
Depth Measuring Device			
Type	IDW-B		
Serial Number	7234		
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type	7-39PI-XS		
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number	1703		
Calibration Date	20-Aug-2020		
Calibrator Serial Number	78135A		
Number of Calibration Points	10		
Calibration Root Mean Square Error	11		
Calibration Peak Error	20		
Logging Cable			
Type	7-39PI-XS		
Serial Number	F719131		
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type			
1A:Depth Control Parameters		Depth Control Remarks	

Caliper (HCAL) HDRS-H			Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
6	in	16	0.3	f3/f3	0







10000	lb	0
Caliper (HCAL) HDRS-H		
6	in	16
Calibrated Gamma Ray (GR) HGNS-H		
0	gAPI	150

TIME\_1900 - Time Marked every 60.00 (s)

0.3	ft3/ft3	-0.1
Thermal Neutron Porosity (Ratio Method) in Selected Lithology (TNPH) HGNS-H		
0.3	ft3/ft3	-0.1
Standard Resolution Formation Density (RHOZ) HDRS-H		
2	g/cm3	3
Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
0		10

—|ICV - Integrated Cement Volume every 10.00 (ft3)  
—|ICV - Integrated Cement Volume every 100.00 (ft3)  
—|IHV - Integrated Hole Volume every 10.00 (ft3)  
—|IHV - Integrated Hole Volume every 100.00 (ft3)

Description: HRLT BASIC LOG    Format: Log ( Porosity 2 inch General )    Index Scale: 2 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 21-Aug-2020 09:13:47

1A
Main Pass 5" = 100'

Integration Summary				
Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	70.7	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	212.63	ft3

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1A	Log[2]:Up	Up	8383.71 ft	8901.40 ft	21-Aug-2020 6:01:58 AM	21-Aug-2020 6:12:39 AM	ON	4.00 ft	No

All depths are referenced to toolstring zero

Log	Company:Gulf Exploration LLC      Well:Black Powder #2 1A: Log[2]:Up:S003
-----	--

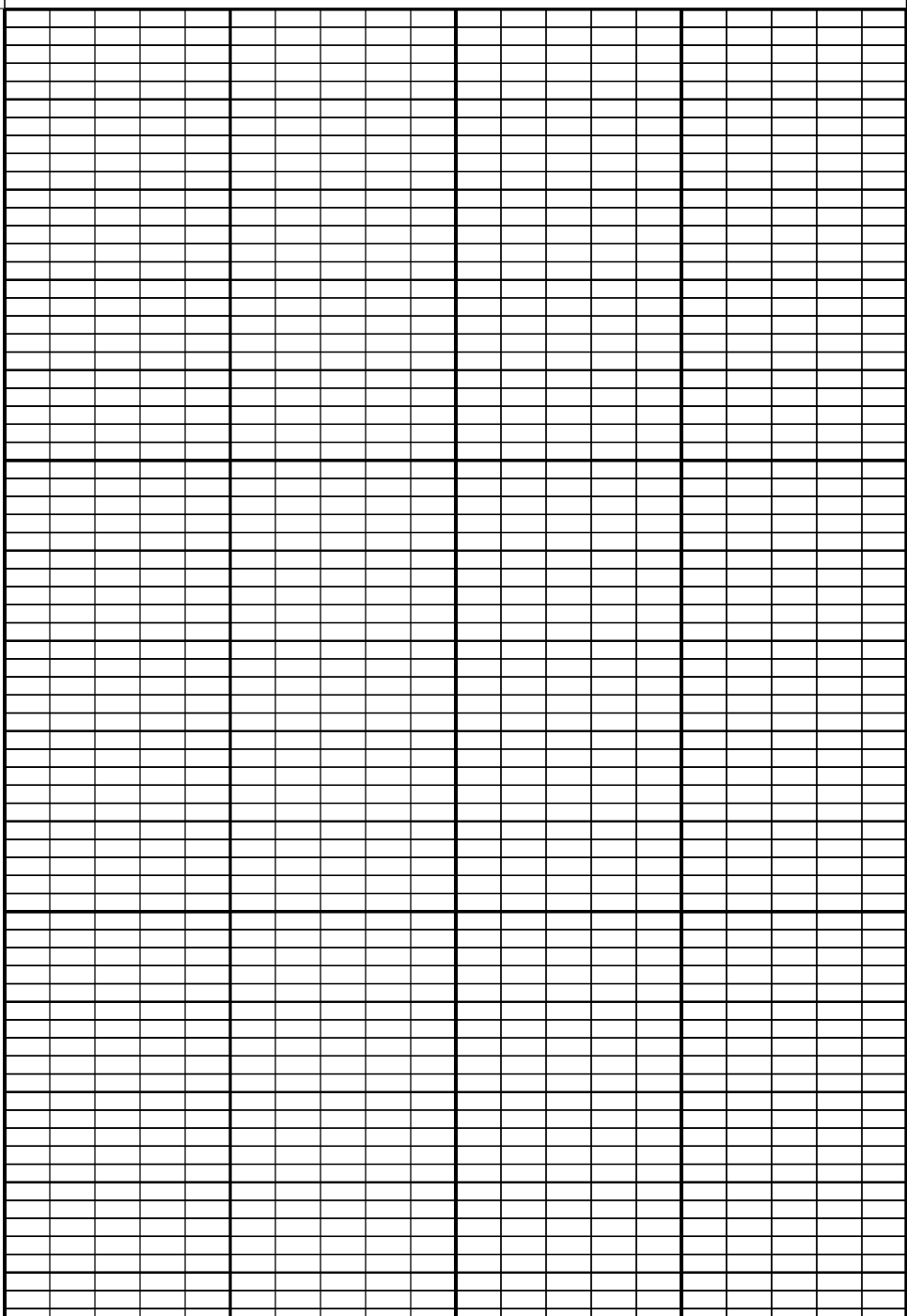
Description: HRLT BASIC LOG    Format: Log ( Porosity\_5\_Inch )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 21-Aug-2020 09:13:52

Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in
GR_CAL	HGNS-H:HGNS-H:HGNS-H	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
ICV	Borehole	6in - RT
IHV	Borehole	6in - RT
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
PXND	PEQL	6in
TENS	WLWorkflow	1in
TIME_1900	WLWorkflow	0.1in
TNPH	HGNS-H:HGNS-H:HGNS-H	6in

—|IHV - Integrated Hole Volume every 100.00 (ft3)  
—|IHV - Integrated Hole Volume every 10.00 (ft3)  
—|ICV - Integrated Cement Volume every 100.00 (ft3)  
—|ICV - Integrated Cement Volume every 10.00 (ft3)

TIME\_1900 - Time Marked every 60.00 (s)





[illegible]

7670

7680

7690

**7700**

7710

7720

7730

7740

7750

7760

7770

7780

7790

7800

7810

7820

7830

7840

7850

7860

7870

7880

7890

7900

7910

7920

7930

7940

7950

7960

7970

7980

7990

8000

8010

8020

8030

8040

**8050**

8060

8070

8080

8090

8100

[illegible]

8110

8120

8130

8140

8150

8160

8170

8180

8190

**8200**

8210

8220

8230

8240

8250

8260

8270

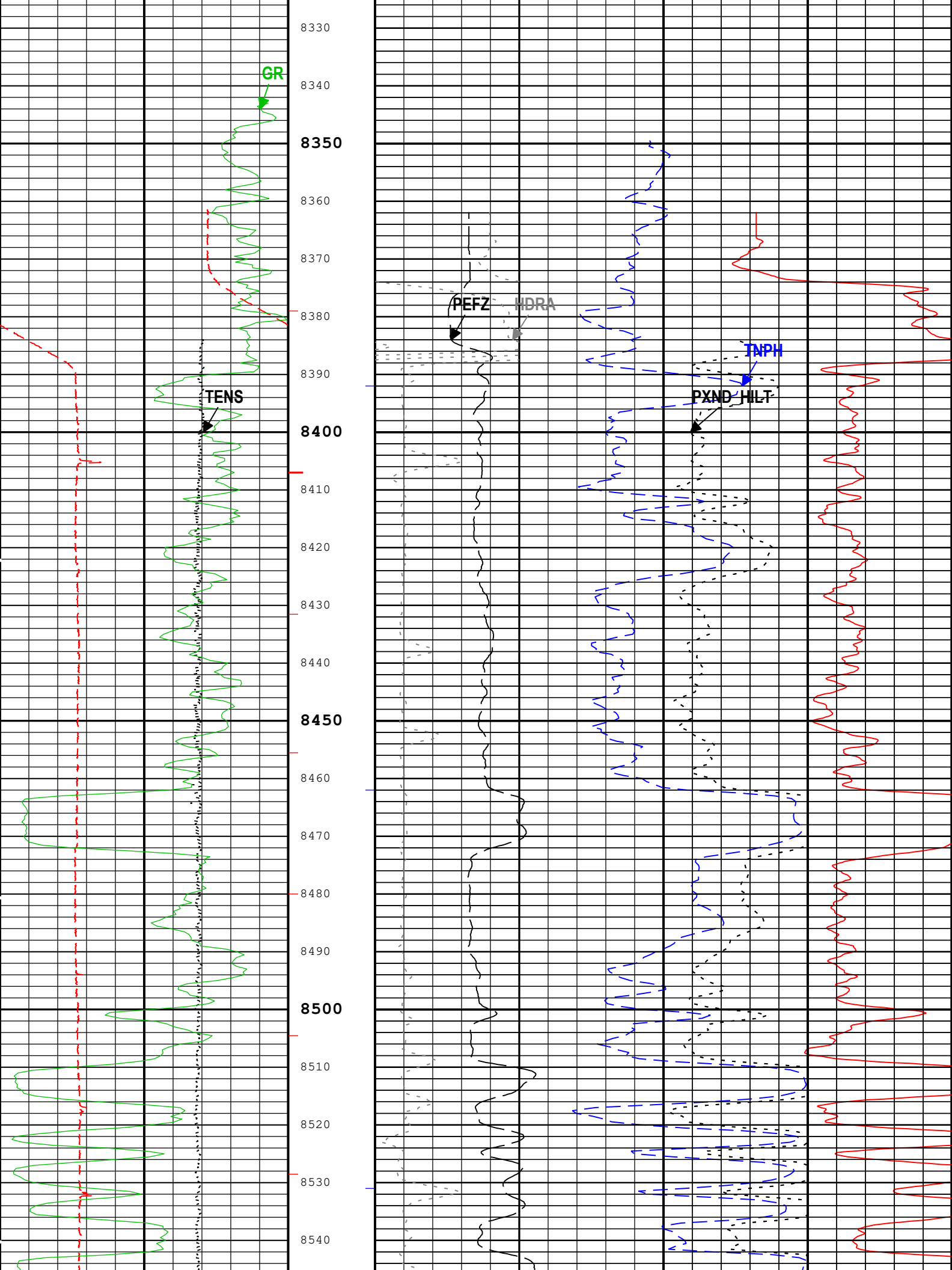
8280

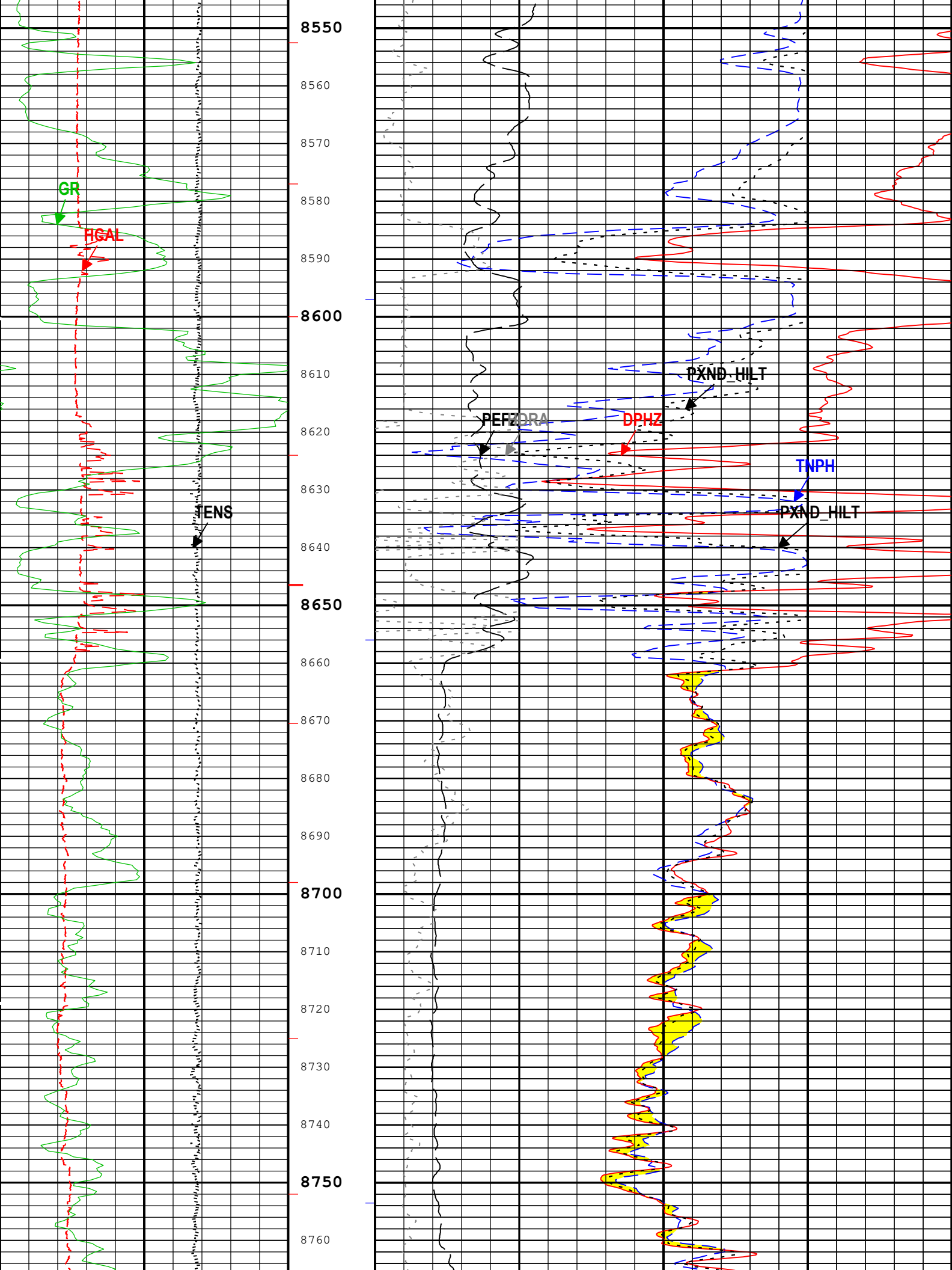
8290

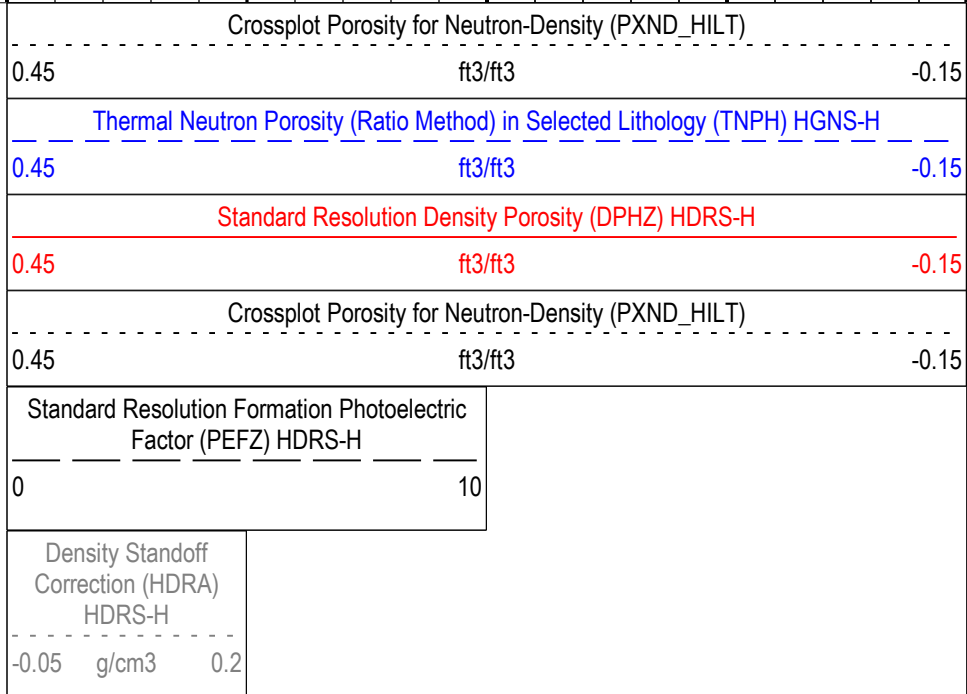
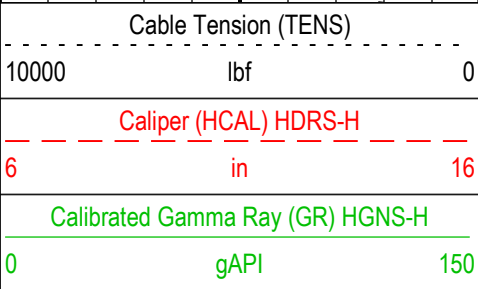
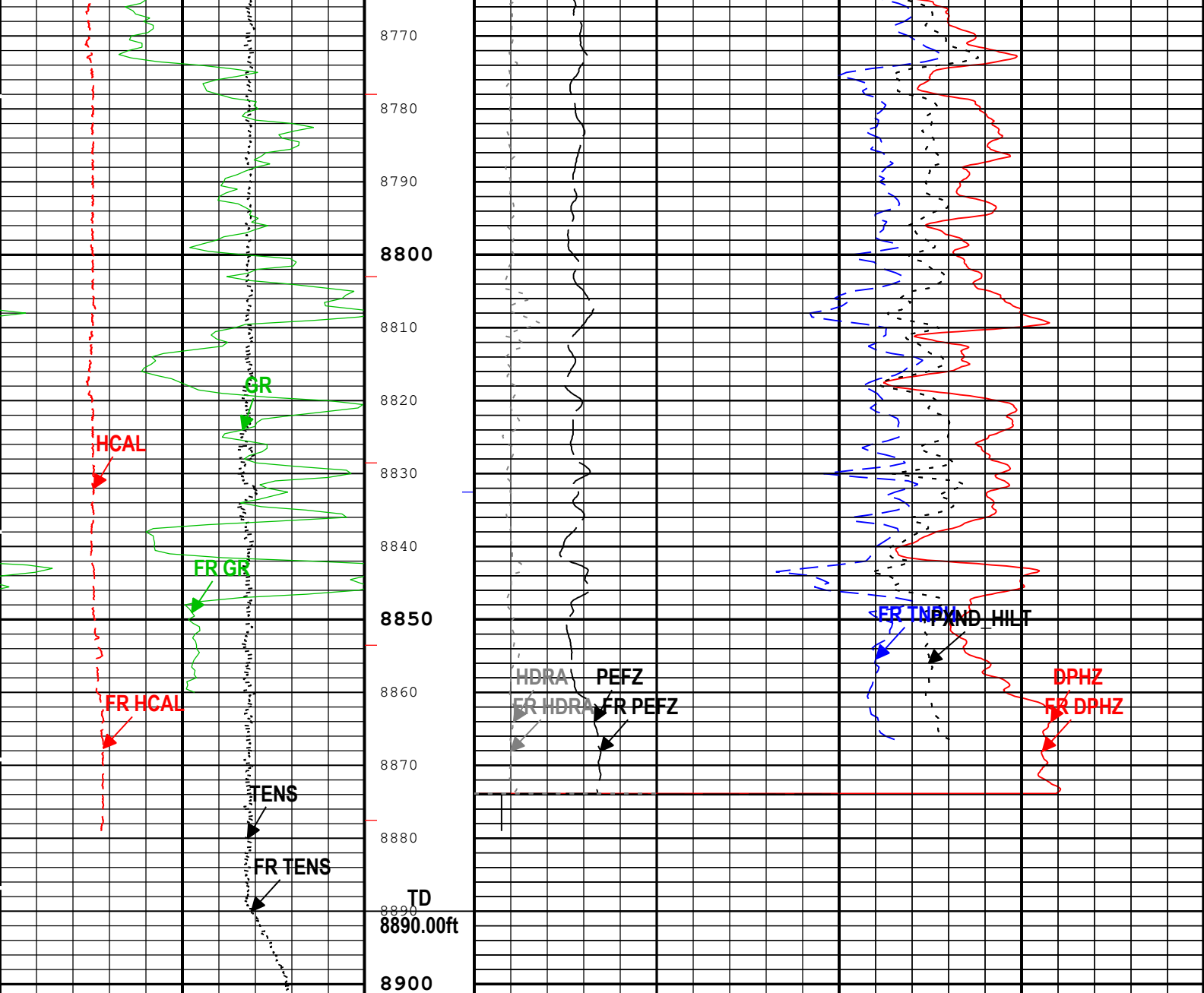
8300

8310

8320







TIME\_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 10.00 (ft3)



→ICV - Integrated Cement Volume every 100.00 (ft3)

└ IHV - Integrated Hole Volume every 10.00 (ft3)

└ IHV - Integrated Hole Volume every 100.00 (ft3)

Description: HRLT BASIC LOG   Format: Log ( Porosity\_5\_Inch )   Index Scale: 5 in per 100 ft   Index Unit: ft   Index Type: Measured Depth   Creation Date: 21-Aug-2020 09:13:52

## Channel Processing Parameters

### 1A: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	209	degF
BS	Bit Size	WLSESSION	8.75	in
BSAL	Borehole Salinity	Borehole	1200	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	878	ft
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
EDF	Elevation of Derrick Floor Above Permanent Datum	WLSESSION	22	ft
EPD	Elevation of Permanent Datum (PDAT) above Mean Sea Level	WLSESSION	4838	ft
FCD	Future Casing (Outer) Diameter	WLSESSION	7	in
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(RT)	
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	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	GTEM_LINEST(RT)	
HSCO	Hole Size Correction Option	HGNS-H	Yes	
MATR	Rock Matrix for Neutron Porosity Corrections	Borehole	SANDSTONE	
MDEN	Matrix Density for Density Porosity	Borehole	2.65	g/cm3
MFST	Mud Filtrate Sample Temperature	Borehole	68	degF
MST	Mud Sample Temperature	Borehole	68	degF
PDAT	Permanent Datum	WLSESSION	GL	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
RMS	Resistivity of Mud Sample	Borehole	0.2	ohm.m
SHT	Surface Hole Temperature	Borehole	68	degF
TD	Total Measured Depth	Borehole	8890	ft

## Tool Control Parameters

### 1A: Parameters

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

## 1A

## Repeat Pass 5" = 100'

## Pass Summary

All depths are referenced to toolstring zero

Description: HRT BASIC LOG    Format: Log ( Porosity 5 Inch RA )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation:

— IHV - Integrated Hole Volume every 100.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

—ICV - Integrated Cement Volume every 10.00 (ft3)

[illegible]

Density Standoff

	HDRS-H
--	--------

[illegible]

[Report To Main](#)

Standard Resolution Formation Photoelectric  
Factor (RFF) MPPC II

0	10

Crossplot Porosity for Neutron-Density (PXND\_HILT)


	Maint To Repeat
--	-----------------

	Repeat To Main
--	----------------

Standard Resolution Density Porosity (DPHZ) HDRS-H


Main To Repeat		Main To Repeat
----------------	--	----------------

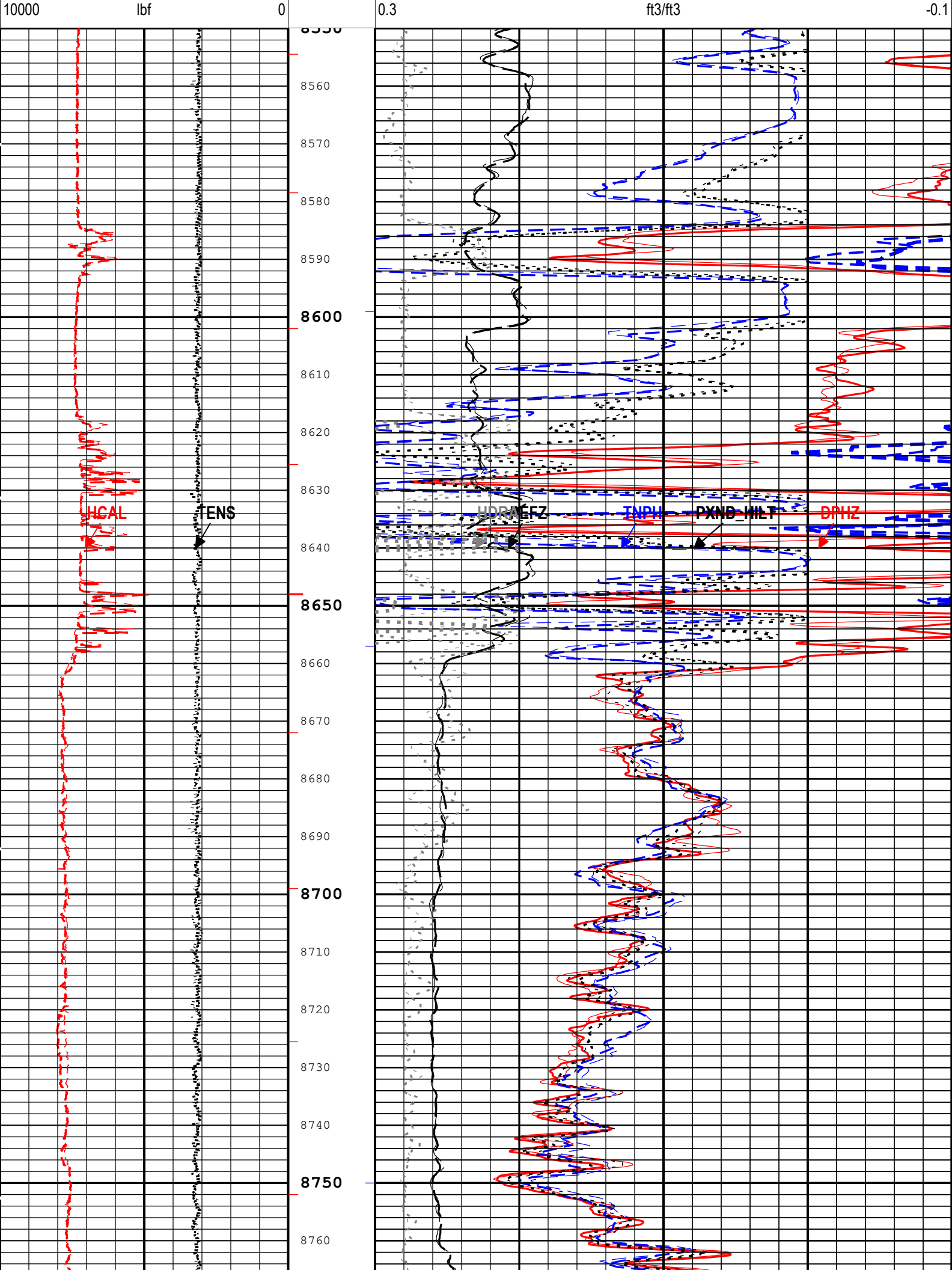
Repeat To Main		Repeat To Main
----------------	--	----------------

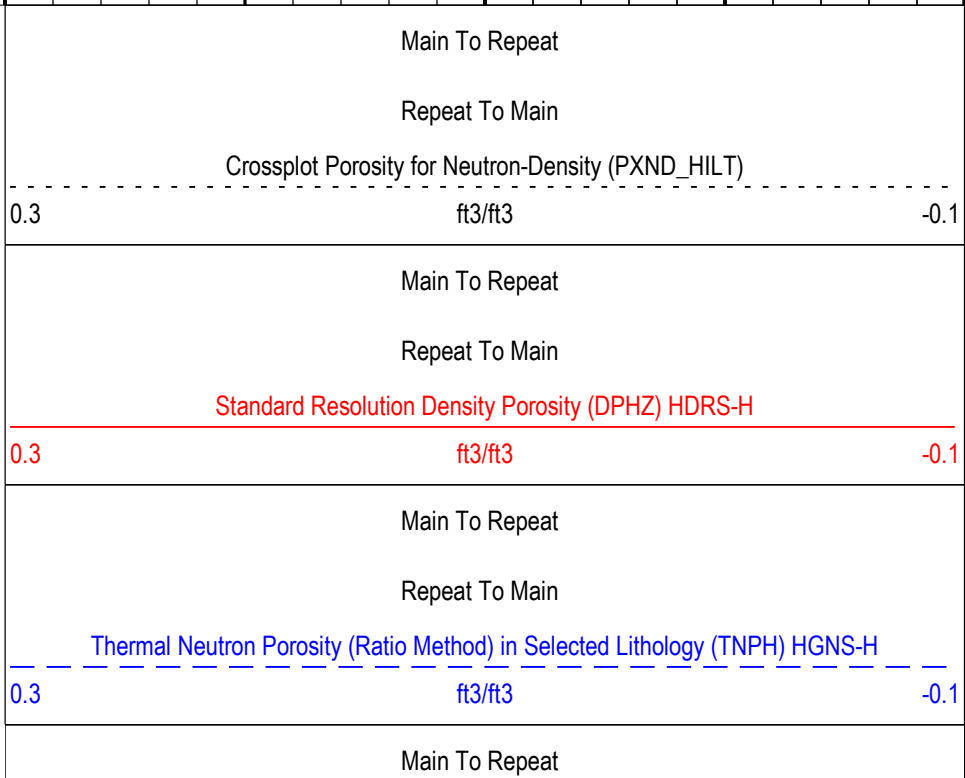
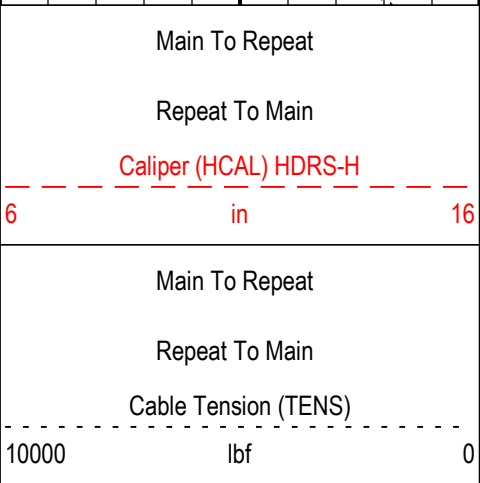
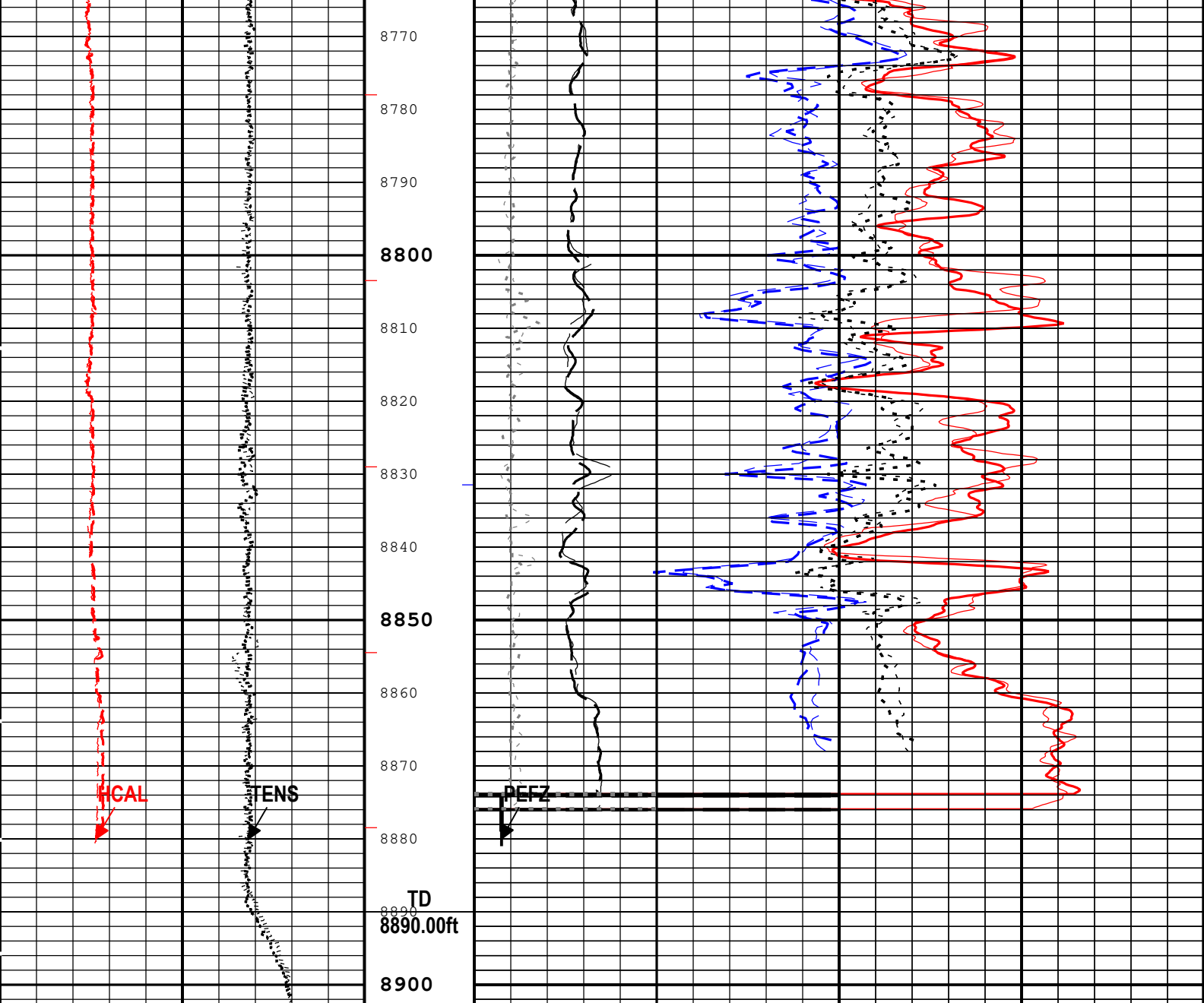
Sample (10, 12, 15, 18, 21)	Normal distribution (green) (false method) in selected kinology (10, 11, 15, 18, 21)
0	0.0
10	0.0
12	0.0
15	0.0
18	0.0
21	0.0


<p>Main To Repeat</p>		<p>Main To Repeat</p>
-----------------------	--	-----------------------

Repeat To Main		Repeat To Main
----------------	--	----------------

Cable Tension (TENS)		Crossplot Porosity for Neutron-Density (PXND_HILT)
----------------------	--	--





Repeat To Main

Crossplot Porosity for Neutron-Density (PXND\_HILT)

0.3ft3/ft3-0.1

Main To Repeat

Repeat To Main

Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H

010

Main To Repeat

Repeat To Main

Density Standoff Correction (HDRA) HDRS-H

-0.05g/cm30.2

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

TIME\_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG    Format: Log ( Porosity\_5\_Inch RA )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 21-Aug-2020 09:13:57

Calibration Report			
HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run 1A			
Primary Equipment :			
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H		
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3967	
Auxiliary Equipment :			
HRDD Backscatter Detector	Backscatter		
HRDD Long Spacing Detector	Long Spacing		
HRDD Short Spacing Detector	Short Spacing		
Cesium 137 Gamma-Ray Logging Source	GSR-J	5534	
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H		
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H		
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):		18:19:45 20-Aug-2020					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	7.62	10.00	
Large Ring	in	Before	12.00	9.00	11.93	15.00	

HDRS Density Calibration - Inversion Results							
Master (EEPROM):		10:03:48 28-Jul-2020					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.600	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.685	1.696	

Pe Aluminum		Master	2.570	2.470	2.552	2.670	<div><div></div><div></div><div></div><div></div><div></div></div>
Pe Magnesium		Master	2.650	2.550	2.623	2.750	<div><div></div><div></div><div></div><div></div><div></div></div>
HDRS Density Calibration - Deviation Summary							
Master (EEPROM):		10:03:48 28-Jul-2020					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Average Deviation	%	Master	0	-0.6000	0.2348	0.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Max Deviation	%	Master	0	-1.6000	0.7487	1.6000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Average Deviation	%	Master	0	-1.0000	0.3750	1.0000	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Max Deviation	%	Master	0	-2.5000	1.2926	2.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Average Deviation	%	Master	0	-1.5000	0.5925	1.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Max Deviation	%	Master	0	-3.5000	1.5286	3.5000	<div><div></div><div></div><div></div><div></div><div></div></div>
HDRS Density Calibration - Background Summary							
Master (EEPROM):		10:03:48 28-Jul-2020		Before (Measured):		18:17:29 20-Aug-2020	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Ratio		Master	1.0000		0.7432		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	0.7432	0.7060	0.7414	0.7803	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.0018	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Window Sum	1/s	Master	1		21857		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	21857	20764	21819	22950	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-38	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Ratio		Master	1.0000		0.4936		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	0.4936	0.4690	0.4936	0.5183	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.0000	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Window Sum	1/s	Master	1		9679		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	9679	9195	9655	10163	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-24	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Ratio		Master	1.0000		0.2972		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	0.2972	0.2824	0.3027	0.3121	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.0055	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Window Sum	1/s	Master	1		1019		<div><div></div><div></div><div></div><div></div><div></div></div>
		Before	1019	968	1016	1070	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-3	-----	<div><div></div><div></div><div></div><div></div><div></div></div>
HDRS Density Calibration - Photo-multiplier High Voltages							
Master (EEPROM):		10:03:48 28-Jul-2020		Before (Measured):		18:17:29 20-Aug-2020	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS PM High Voltage	V	Master		1000.0	1520.8	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		1000.0	1496.8	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100.0	-24.0	100.0	<div><div></div><div></div><div></div><div></div><div></div></div>
SS PM High Voltage	V	Master		1000.0	1404.5	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		1000.0	1405.0	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100.0	0.5	100.0	<div><div></div><div></div><div></div><div></div><div></div></div>
LS PM High Voltage	V	Master		1000.0	1639.4	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		1000.0	1619.3	2400.0	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-100.0	-20.1	100.0	<div><div></div><div></div><div></div><div></div><div></div></div>
HDRS Density Calibration - Crystal Quality Resolutions							
Master (EEPROM):		10:03:48 28-Jul-2020		Before (Measured):		18:17:29 20-Aug-2020	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
BS Crystal Resolution	%	Master		5.00	10.66	25.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		5.00	10.60	25.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	-0.06	1.00	<div><div></div><div></div><div></div><div></div><div></div></div>
SS Crystal Resolution	%	Master		5.00	9.42	20.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		5.00	9.39	20.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	-0.03	1.00	<div><div></div><div></div><div></div><div></div><div></div></div>
LS Crystal Resolution	%	Master		5.00	9.81	20.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before		5.00	9.87	20.00	<div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-1.00	0.06	1.00	<div><div></div><div></div><div></div><div></div><div></div></div>
HDRS MCFL Calibration - MCFL Accumulations							
Before (Measured):		05:01:45 21-Aug-2020					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Main Resistivity	ohm.m	Before	3875	3565	3900	4185	<div><div></div><div></div><div></div><div></div><div></div></div>

Deep Resistivity	ohm.m	Before	3830	3524	3834	4136	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Shallow Resistivity	ohm.m	Before	3830	3524	3846	4136	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>

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

### Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC

HGNS-H

### Auxiliary Equipment :

HGNS Accelerometer, 150 degC

HACCZ-H

1537

AmBe Neutron Logging Source

NSR-F

5203

### Calibration Parameter :

Water Temperature

Housing Size

JIG-BKG (Jig minus background reference)

145

## HGNS Accelerometer Calibration - Accelerometer Accumulations

Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
AZ Vertical Measurement - 0	ft/s2	Before	----	----	----	----		

## HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 19:00:00 14-Mar-2002

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	----	----	-530.200	----		
Accelerometer Coefficients - 1		Master	----	----	-13.059	----		
Accelerometer Coefficients - 2		Master	----	----	-0.001	----		
Accelerometer Coefficients - 3		Master	----	----	0.000	----		
Accelerometer Coefficients - 4		Master	----	----	2.721	----		
Accelerometer Coefficients - 5		Master	----	----	0.000	----		
Accelerometer Coefficients - 6		Master	----	----	0.000	----		
Accelerometer Coefficients - 7		Master	----	----	0.000	----		
Accelerometer Coefficients - 8		Master	----	----	298.900	----		
Accelerometer Coefficients - 9		Master	----	----	1.007	----		

## HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 15:11:08 18-Aug-2020 Before (Measured): 18:14:52 20-Aug-2020

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Near Zero Measurement	1/s	Master	0	5.0	26.7	40.0		
		Before	0	5.0	26.7	40.0		
		Before-Master	----	-4.0	0.0	4.0		
Far Zero Measurement	1/s	Master	0	5.0	27.7	40.0		
		Before	0	5.0	27.6	40.0		
		Before-Master	----	-4.2	-0.1	4.2		
Near Plus Measurement	1/s	Master	6031.0	4700.0	5168.0	6900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Far Plus Measurement	1/s	Master	2793.0	1900.0	2215.0	2900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Near Corrected Plus Measurement	1/s	Master		4700.0	5137.0	6900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
Far Corrected Plus Measurement	1/s	Master		1900.0	2184.0	2900.0		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		

## HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 18:20:40 20-Aug-2020

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Zero Measurement	gAPI	Before	30.0	0	106.2	120.0		
RGR Plus Measurement	gAPI	Before	162.9	138.1	141.5	181.3		
GR Calibration Gain		Before	0.89	0.80	1.02	1.05		

Company: Gulf Exploration LLC

**Schlumberger**

Well: Black Powder #2

Field: Wattenberg

County: Weld

State: Colorado

Platform Express

Compensated Neutron Log

Three Detector Litho-Density