

Company: TEP Rocky Mountain LLC

Well: PA 434-24

Field: Parachute

County: Garfield State: Colorado

County: Garfield
Field: Parachute
Location: LOT 14
Well: PA 434-24
Company: TEP Rocky Mountain LLC

Platform Express
Triple Combo
Linear

LOT 14	Elev.:	K.B.	5756.00 ft
1391 FSL & 465 FWL		G.L.	5732.00 ft
Lat/Long: 39.506988/-107.936589		D.F.	5756.00 ft
Permanent Datum:	Ground Level	Elev.:	5732.00 f
Log Measured From:	Kelly Bushing	24.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
05-045-23764	19	6S	94W

Logging Date 05-Sep-2018

Run Number One

Depth Driller 1143.00 ft

Schlumberger Depth 1134.00 ft

Bottom Log Interval 1134.00 ft

Top Log Interval

Casing Driller Size @ Depth 16 in @ 104.00 ft

Casing Schlumberger 103 ft

Bit Size 13.5 in

Type Fluid In Hole Water

Density 9.3 lbm/gal 80 s

Fluid Loss PH 8

MUD Source of Sample Active Tank

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 0.14 @ 100 0.11 @ 100 Pressed

Max Recorded Temperatures 106 degF

Circulation Stopped 04-Sep-2018 20:00:00

Logger on Bottom 05-Sep-2018 11:01:00

Unit Number 9102 Location: Fort Morgan

Recorded By Evan Grzecki

Witnessed By Dalen

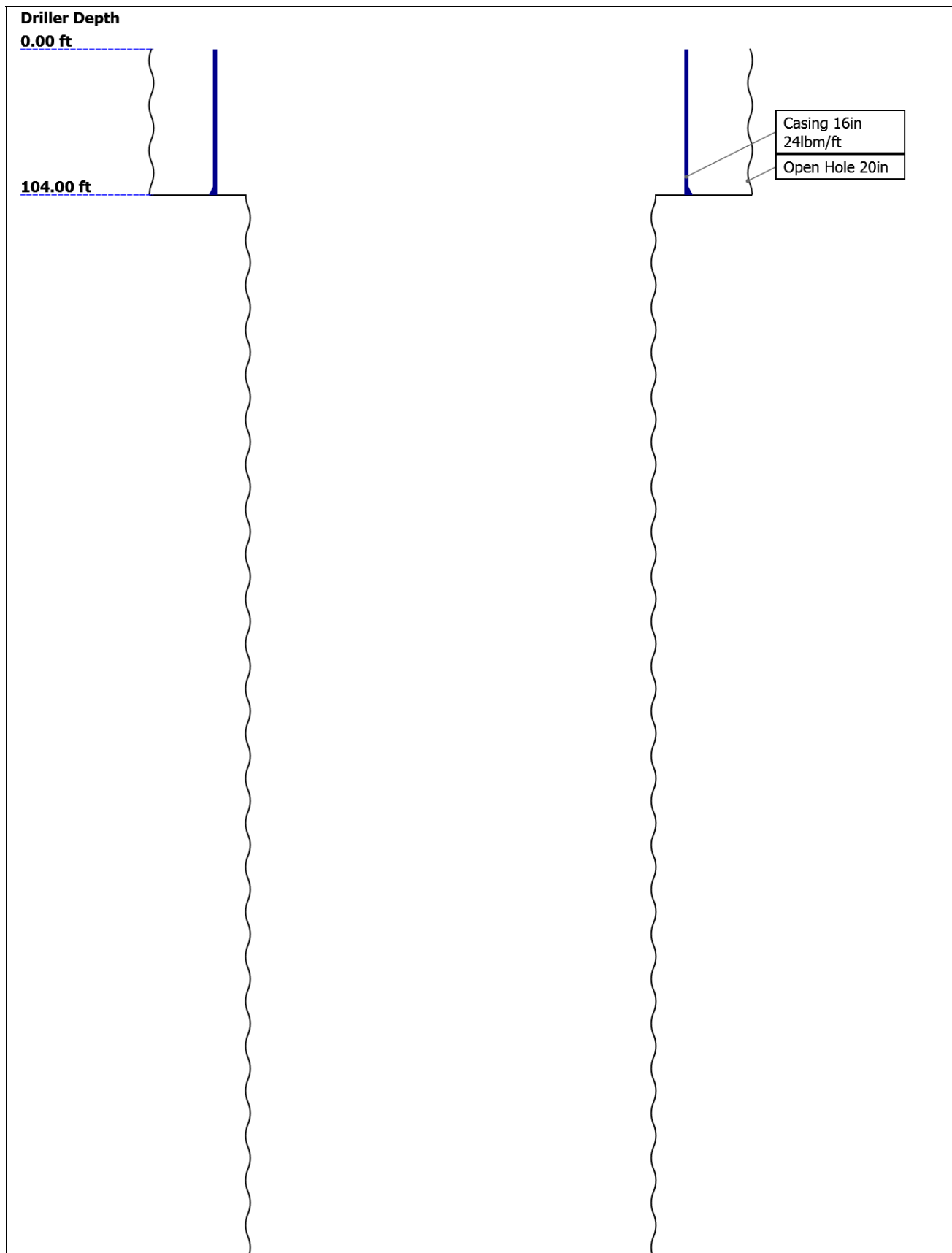
Disclaimer

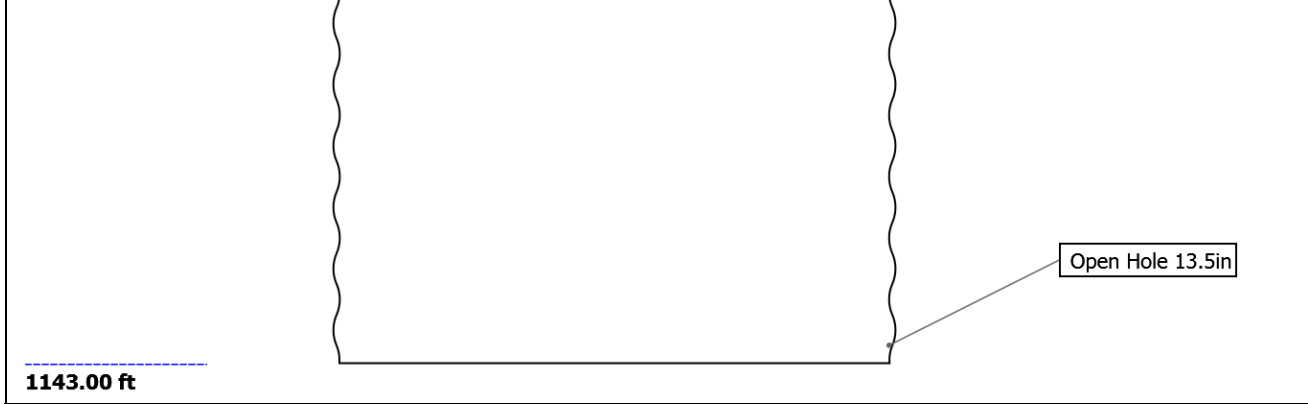
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Well Sketch



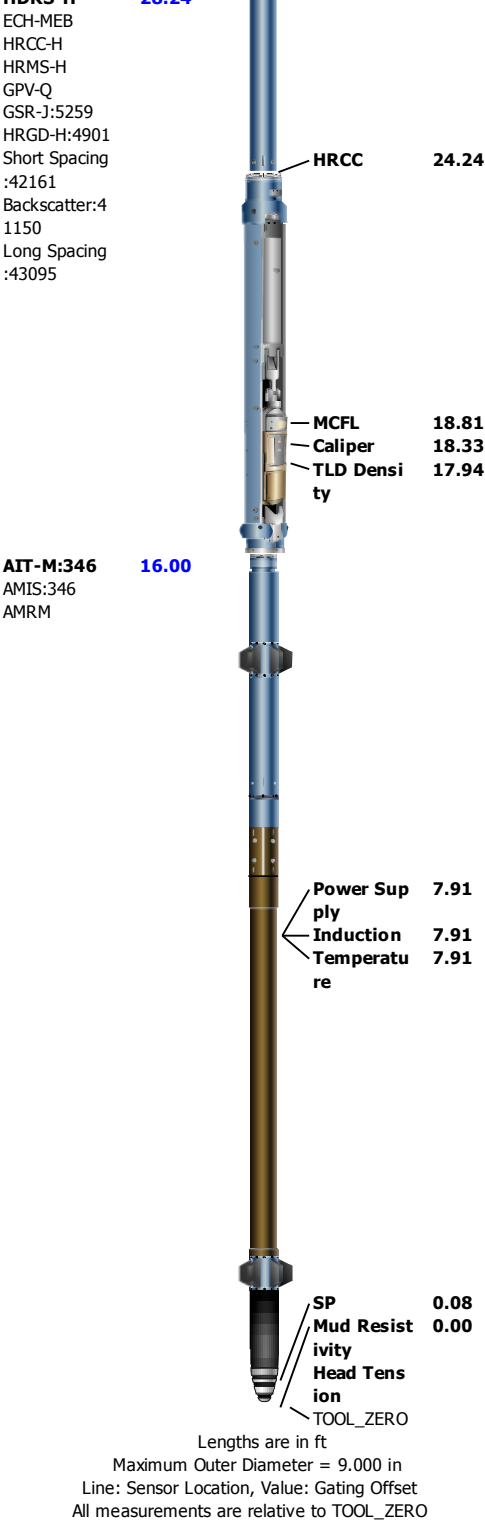


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	20	13.5				
Top Driller (ft)	0	104				
Top Logger (ft)	0	104				
Bottom Driller (ft)	104	1143				
Bottom Logger (ft)	104	1134				
Casing						
Size (in)	16					
Weight (lbm/ft)	24					
Inner Diameter (in)	15.723					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	104					
Bottom Logger (ft)	103					

Remarks and Equipment Summary

One: Toolstring				One: Remarks	
<div><div><div>Equip name</div><div>Length</div><div>MP name</div><div>Offset</div></div><div><div>LEH-QT</div><div>44.14</div><div></div><div></div></div><div><div>DTC-H</div><div>40.65</div><div>CTEM</div><div>39.75</div></div><div><div>HGNS-H</div><div>37.65</div><div>HV</div><div>0.00</div></div><div><div>GR</div><div>36.91</div><div></div><div></div></div><div><div>CNL Porosity</div><div>30.57</div></div><div><div>HGNS</div><div>28.24</div></div><div><div>HMCA</div><div>28.24</div></div><div><div>Accelerometer</div><div>0.00</div></div></div> <div><div>Thank you for choosing Schlumberger!</div><div>Log run for formation evaluation</div><div>Toolstring run as per toolsketch</div><div>Matrix: Sandstone</div><div>MDEN: 2.65 g/cc</div><div>Log correlated to downlog</div><div>Crew: Gary Lapp, Michael Toups</div><div>Max Temp Recorded: 106 Deg F</div></div>					



Depth Summary

	One		
--	-----	--	--

Depth Measuring Device

Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

Tension Device

Type	CMTD-B/A		
------	----------	--	--

Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points	0								
Logging Cable									
Type	7-46NT-XS								
Serial Number									
Length	24000.00 ft								
Conveyance Type	Wireline								
Rig Type	Drilling								
One:Depth Control Parameters		Depth Control Remarks							
Log Sequence	First Log In the Well								
Rig Up Length At Surface									
Rig Up Length At Bottom									
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
One									
5" Triple Combo									
Integration Summary									
Output Channel(s)	Output Description	Input Parameter	Output Value	Unit					
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	553.76	ft3					
IHV	Integrated Hole Volume	GCSE_UP_PASS	1075.72	ft3					
Software Version									
Acquisition System			Version						
Maxwell 2018 SP2			8.2.104493.3100						
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[6]:Up	Up	14.86 ft	1136.15 ft	05-Sep-2018 11:21:40 AM	05-Sep-2018 11:58:38 AM	ON	1.95 ft	Yes
All depths are referenced to toolstring zero									
Log	Company:TEP Rocky Mountain LLC Well:PA 434-24 One: Log[6]:Up:S005								
Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Triple Combo Linear) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 05-Sep-2018 12:21:14									
Channel	Source	Sampling							
AT10	AIT-M:AMIS:AMIS	3in							
AT30	AIT-M:AMIS:AMIS	3in							
AT90	AIT-M:AMIS:AMIS	3in							
BS	Borehole	6in - RT							
CALI	HDRS-H:HRCC-H:HRCC-H	1in							
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in							
GR	HGNS-H:HGNS-H:HGNS-H	6in							
ICV	Borehole	6in - RT							
IHV	Borehole	6in - RT							
NDSP	HGNS-H:HGNS-H:HGNS-H	6in							

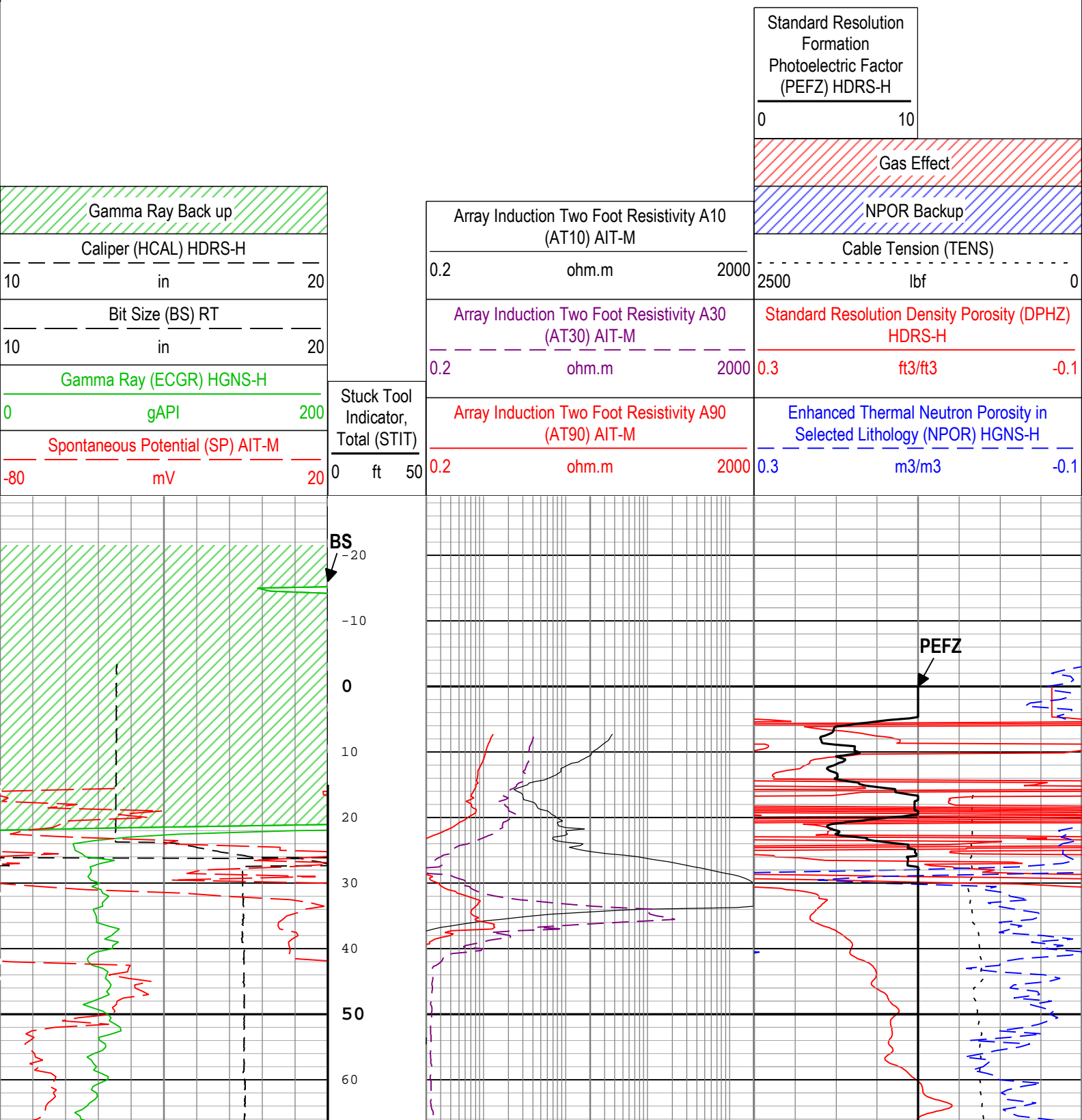
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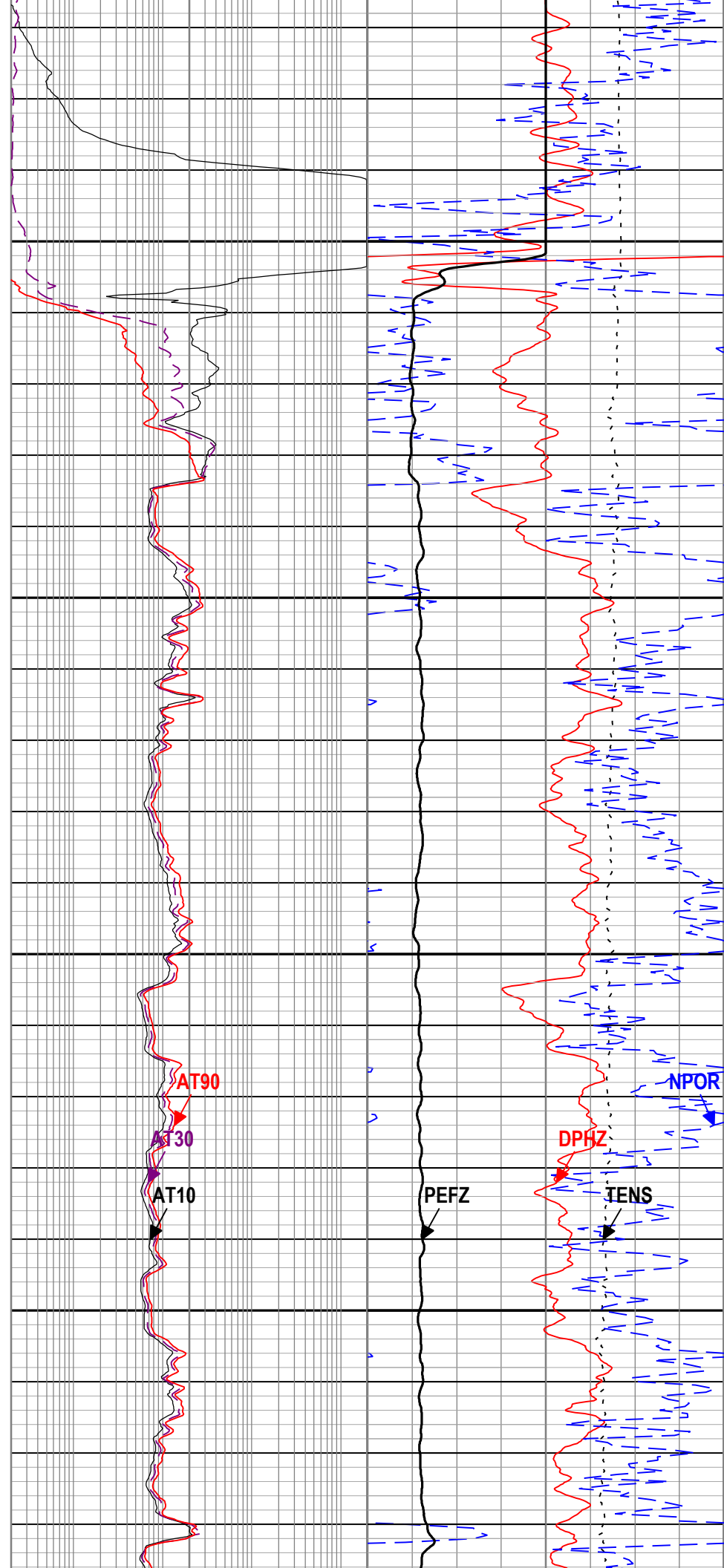
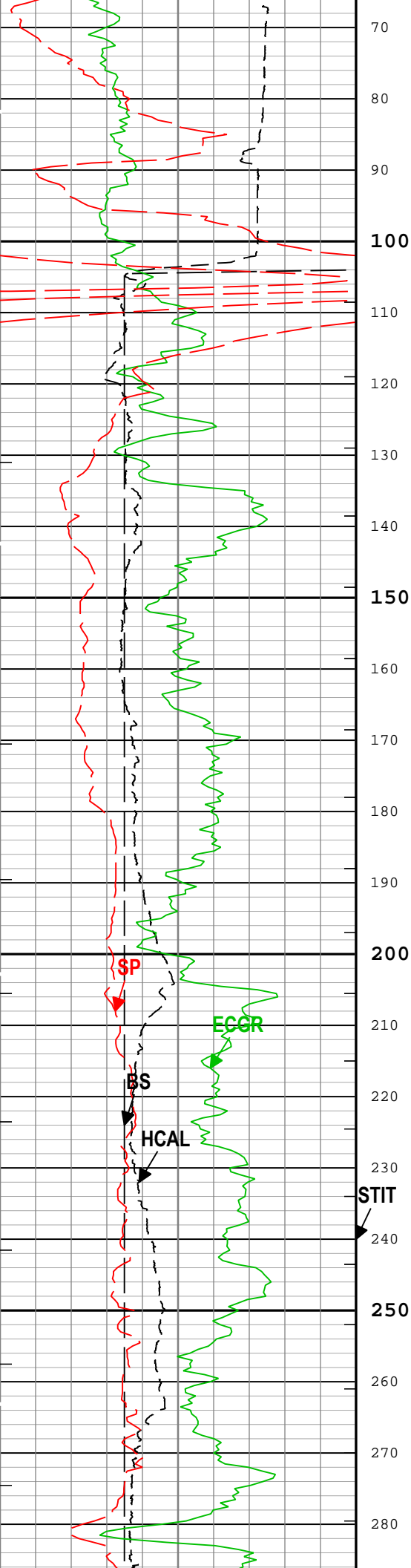
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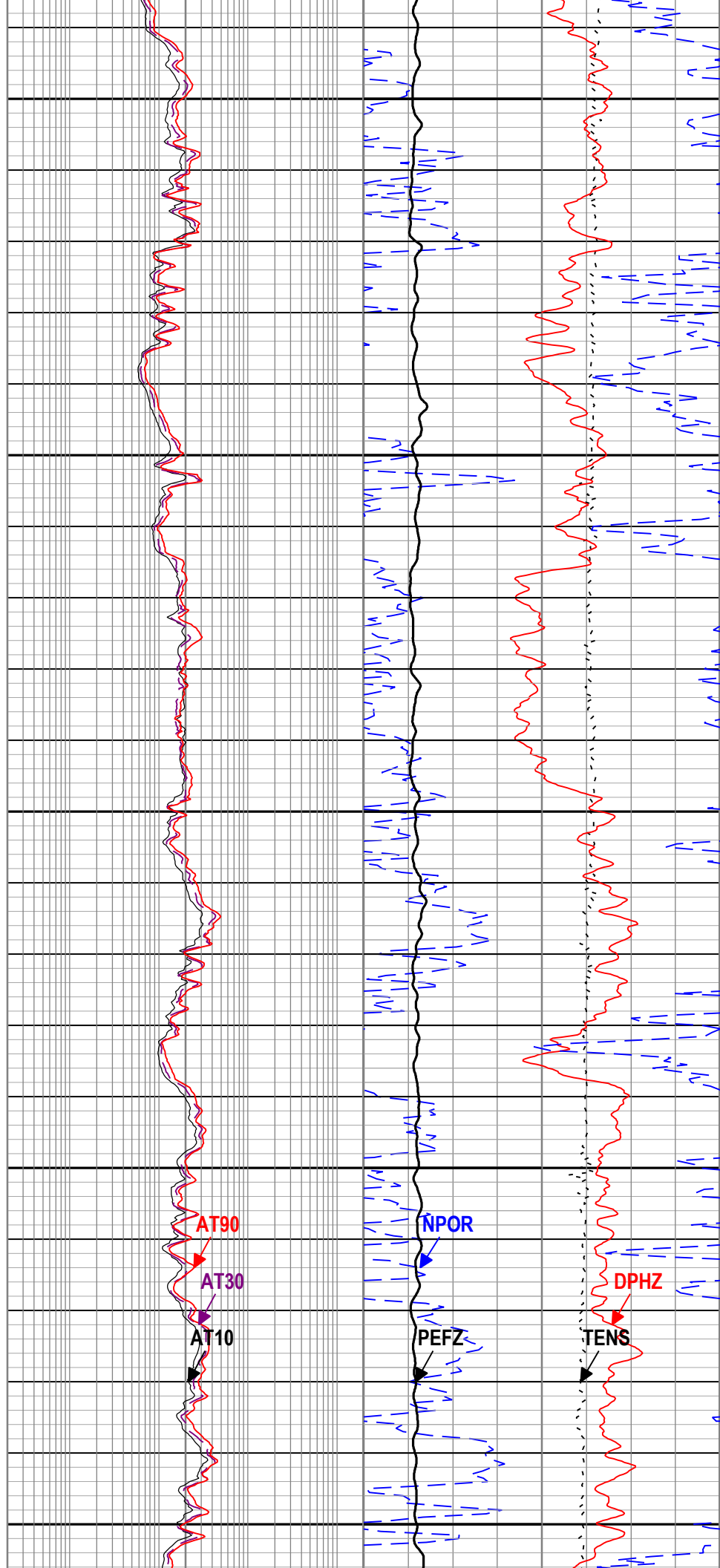
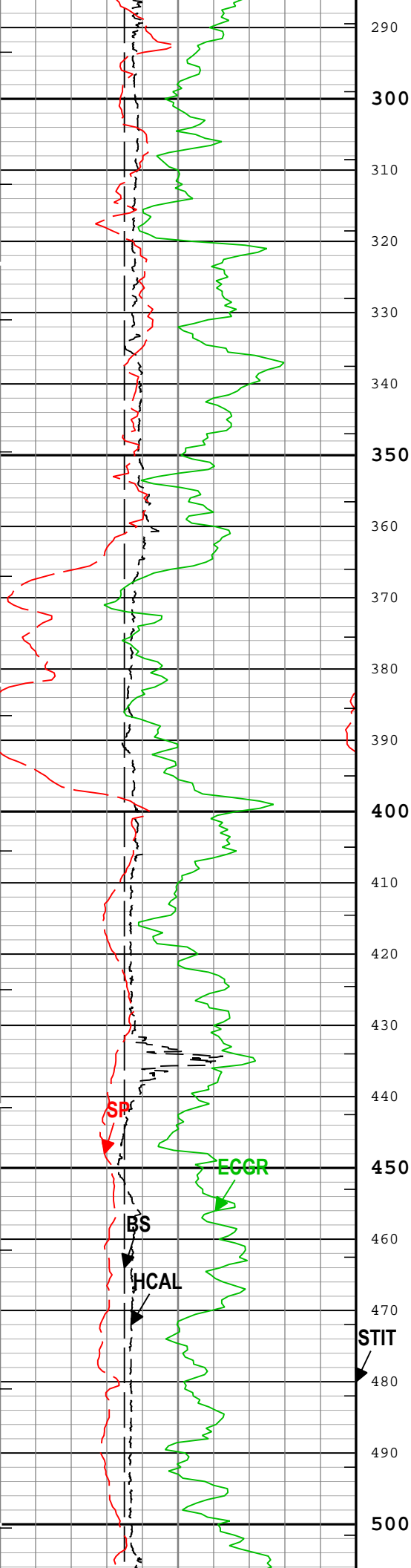
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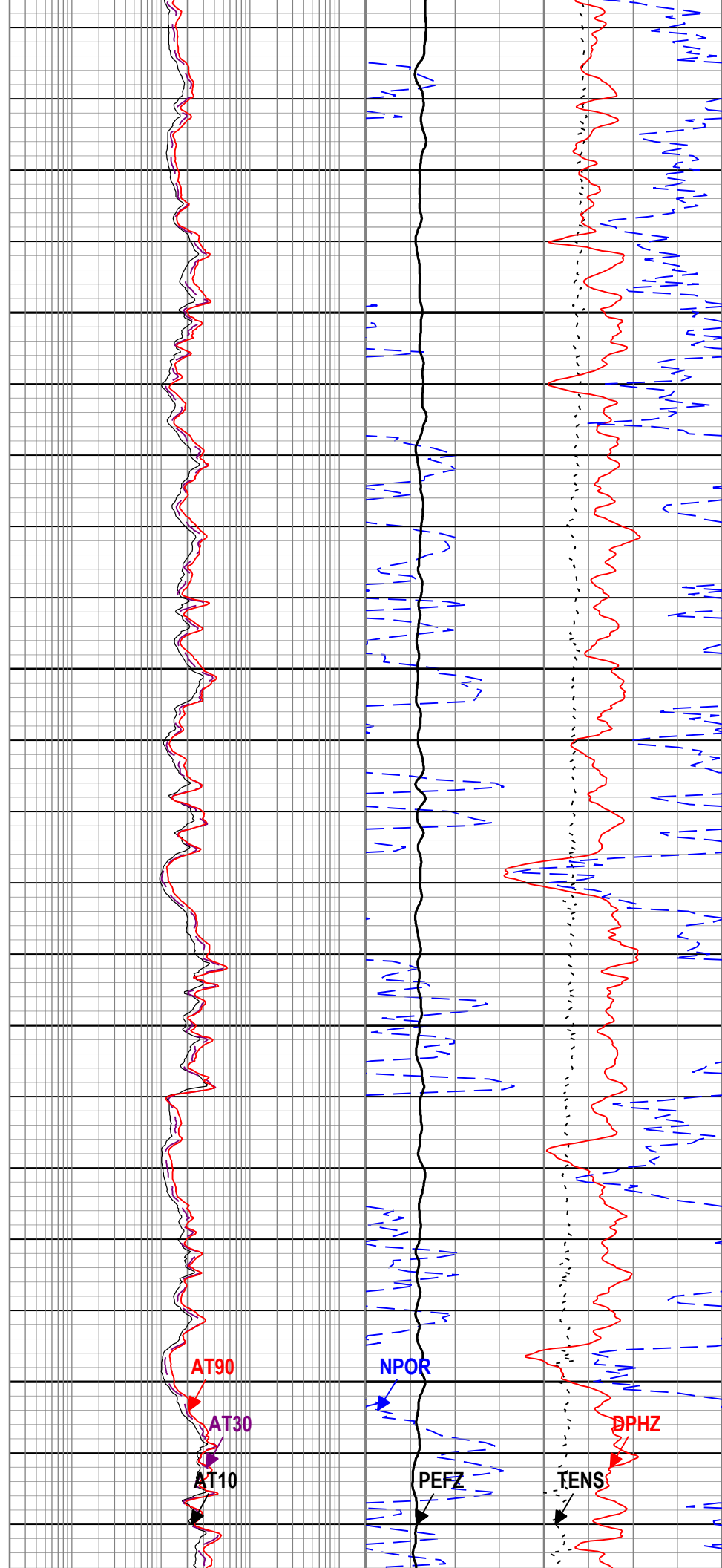
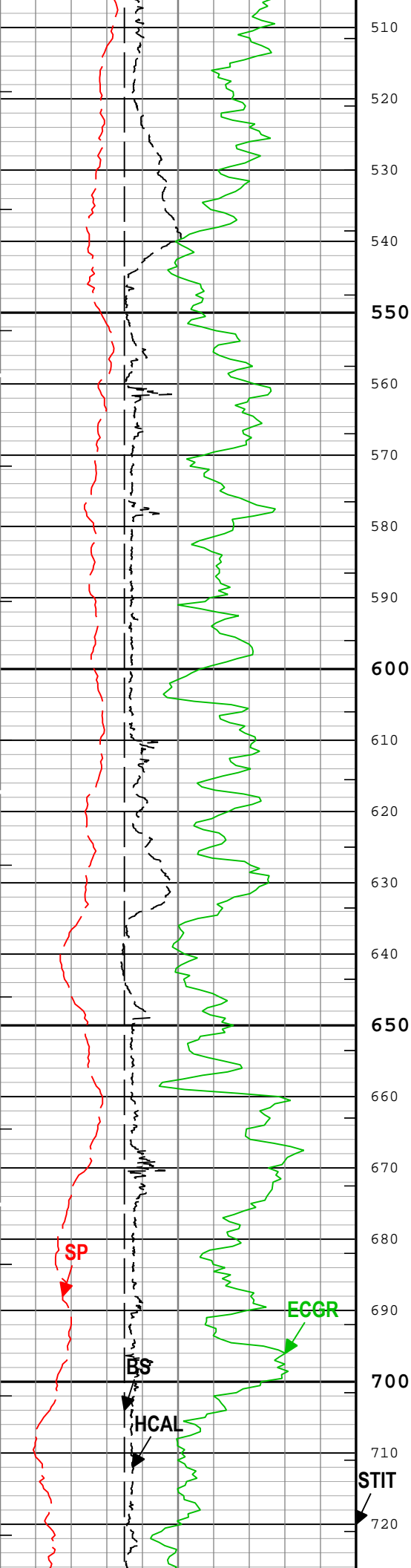
—ICV - Integrated Cement Volume every 10.00 (ft3)

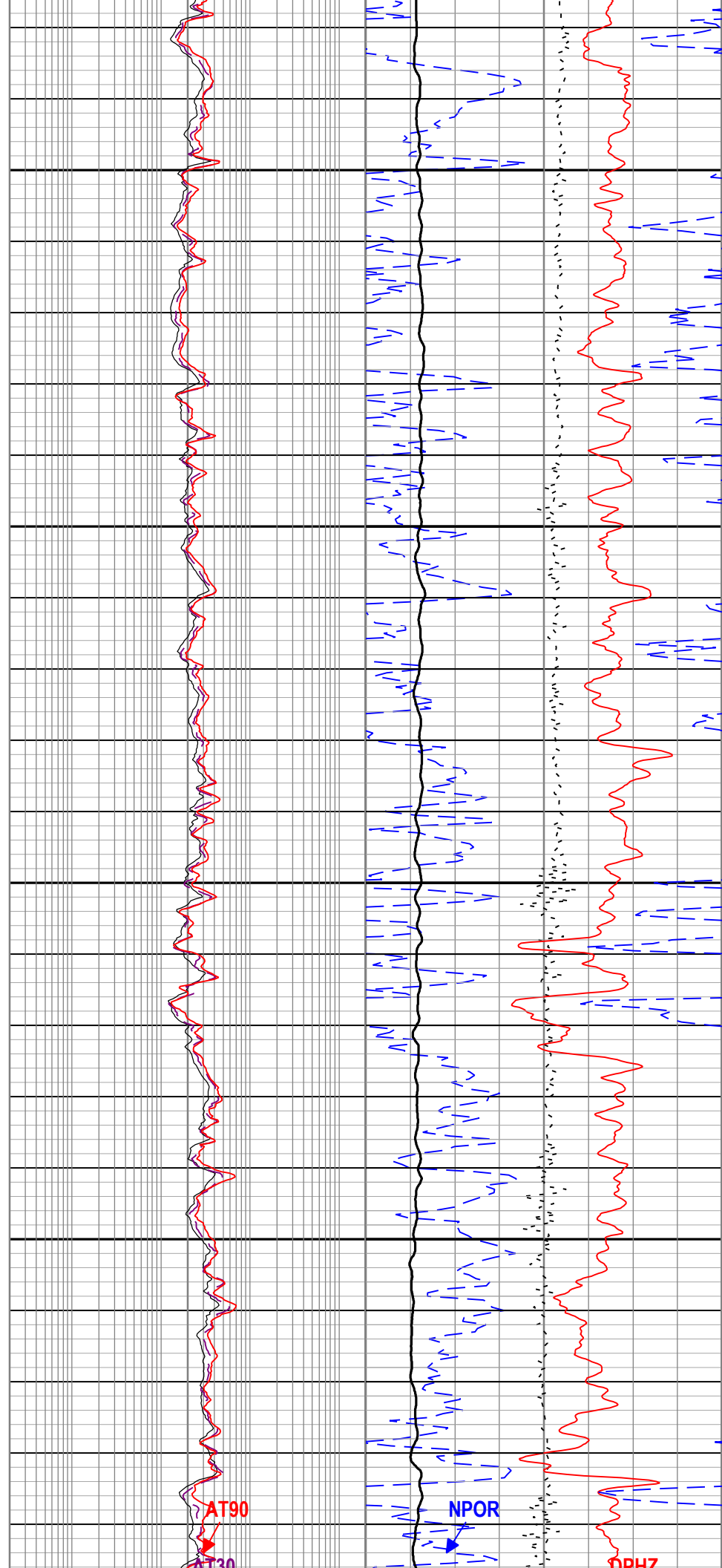
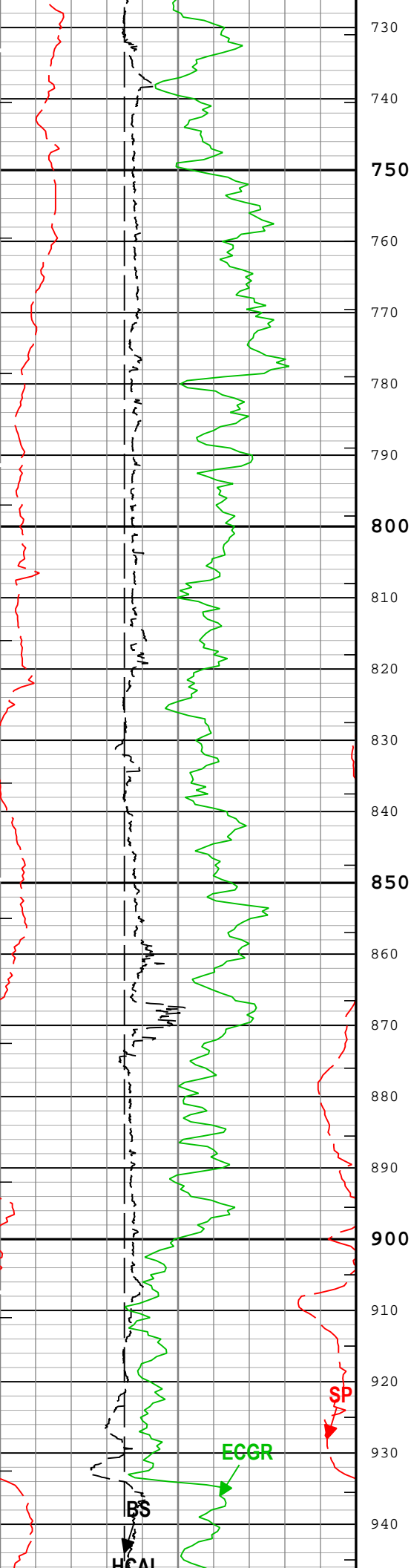
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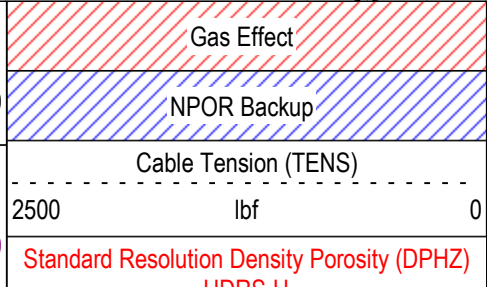
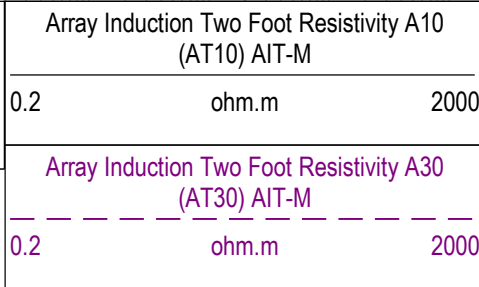
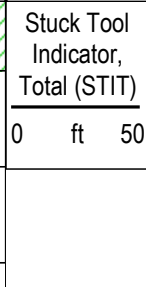
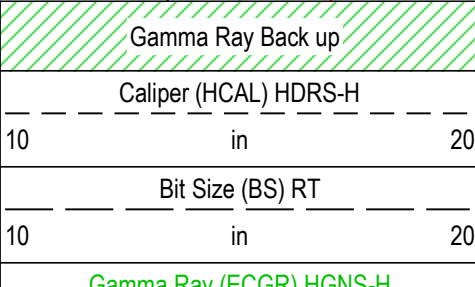








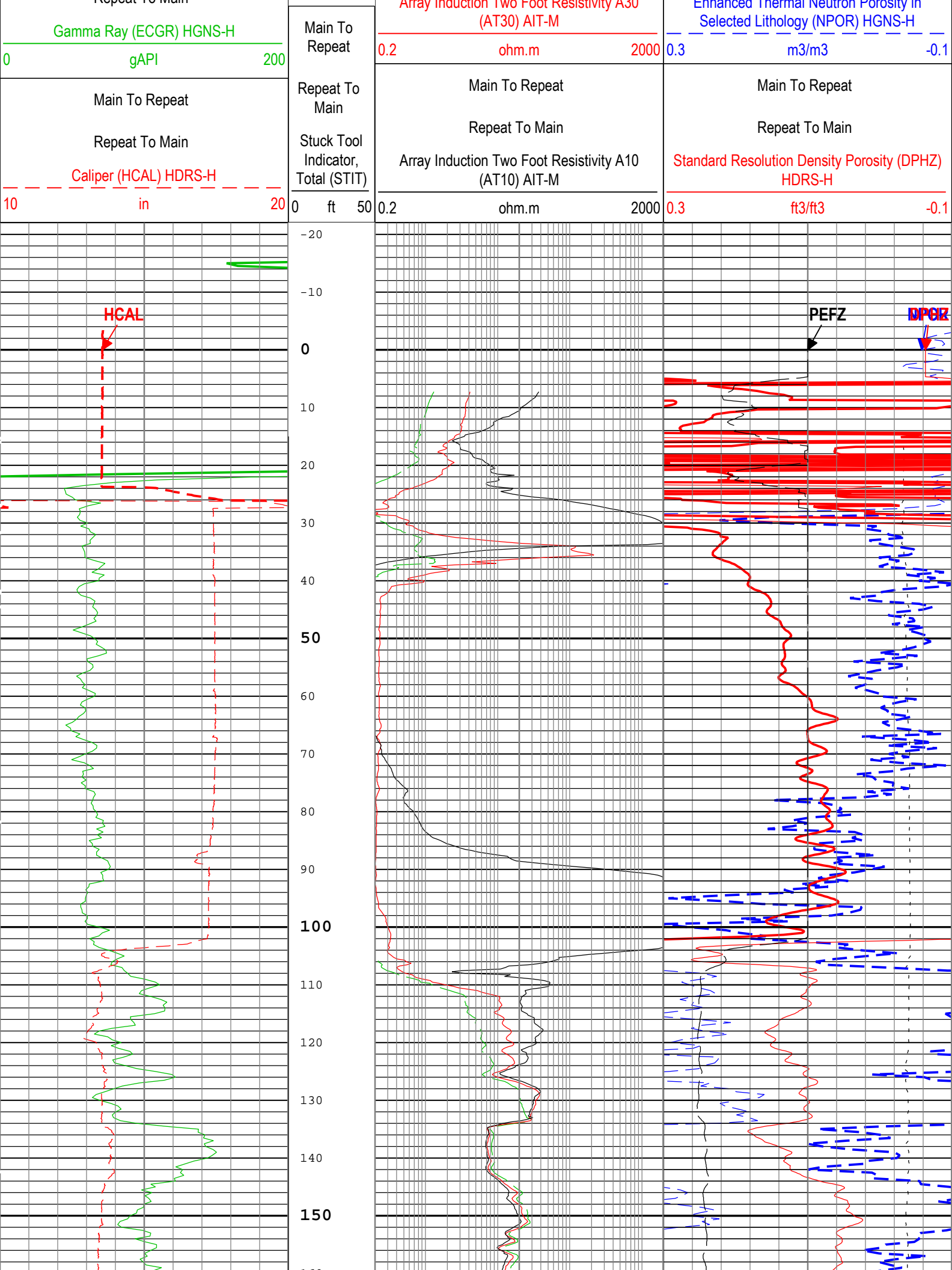


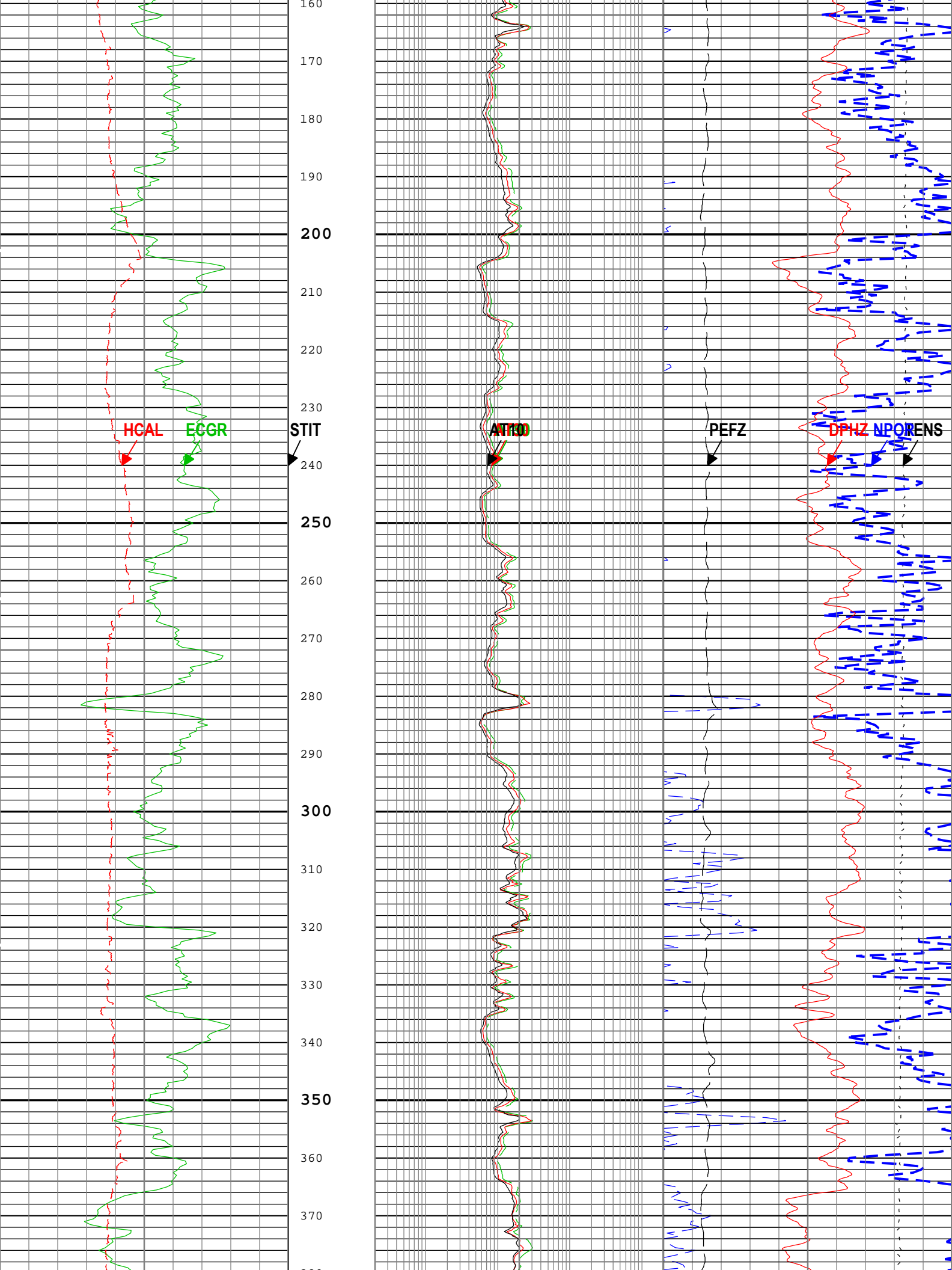


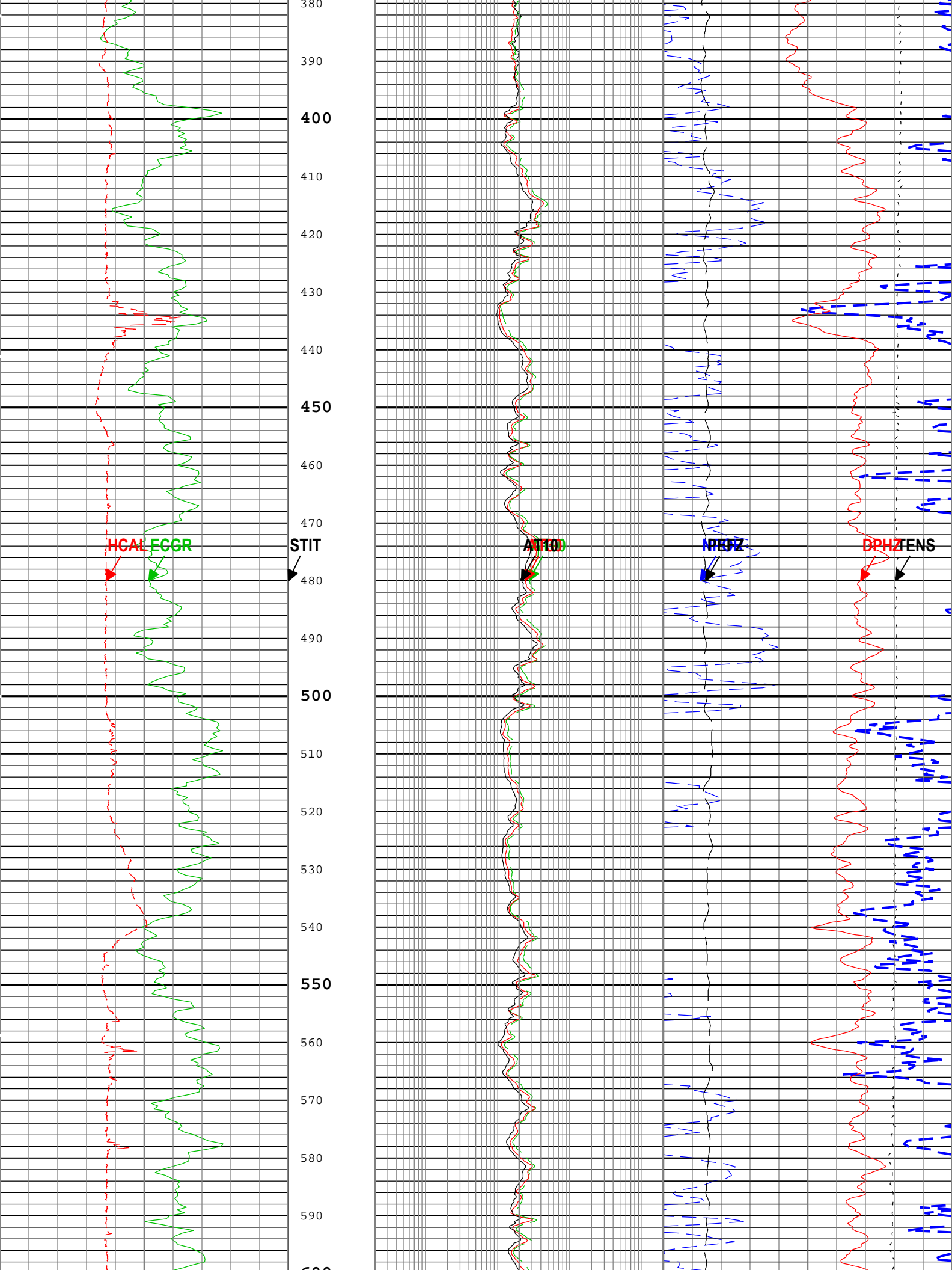
Gamma Ray (LOG) HGNS-H			Array Induction Two Foot Resistivity A90 (AT90) AIT-M			HDRS-H		
0	gAPI	200	0.2	ohm.m	2000	0.3	ft3/ft3	-0.1
Spontaneous Potential (SP) AIT-M						Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H		
-80	mV	20				0.3	m3/m3	-0.1
						Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H		
						0	10	
ICV - Integrated Cement Volume every 10.00 (ft3)								
ICV - Integrated Cement Volume every 10.00 (ft3)								
IHV - Integrated Hole Volume every 10.00 (ft3)								
IHV - Integrated Hole Volume every 10.00 (ft3)								
TIME_1900 - Time Marked every 60.00 (s)								
Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Triple Combo Linear) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 05-Sep-2018 12:21:14								

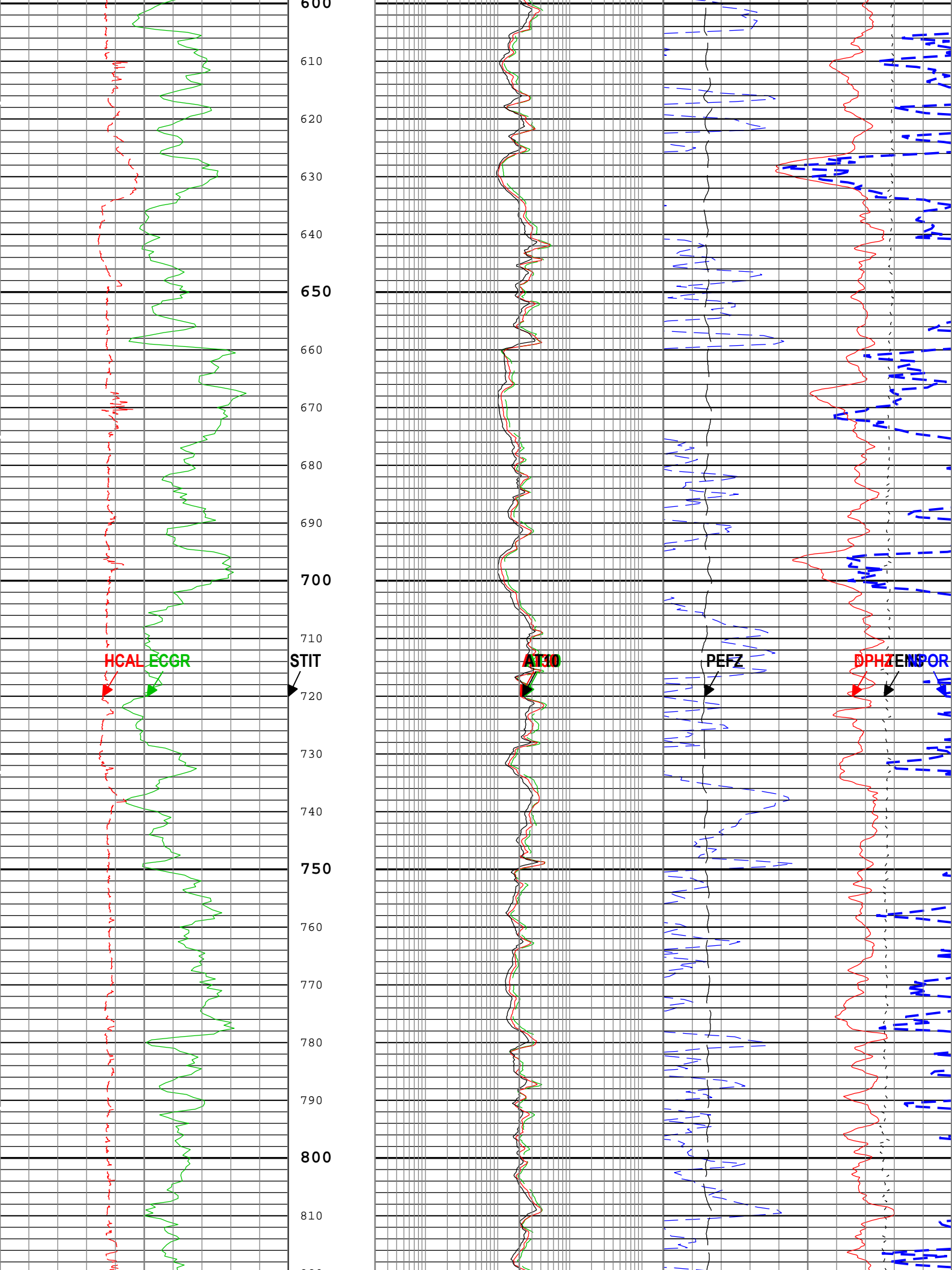
Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ASTA	Array Induction Tool Standoff	AIT-M	0.125	in
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	100	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	103	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	16	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
FCD	Future Casing (Outer) Diameter	WLSESSION	9.625	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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
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
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
SDPR	SDPR in Depth	AIT-M	0	in

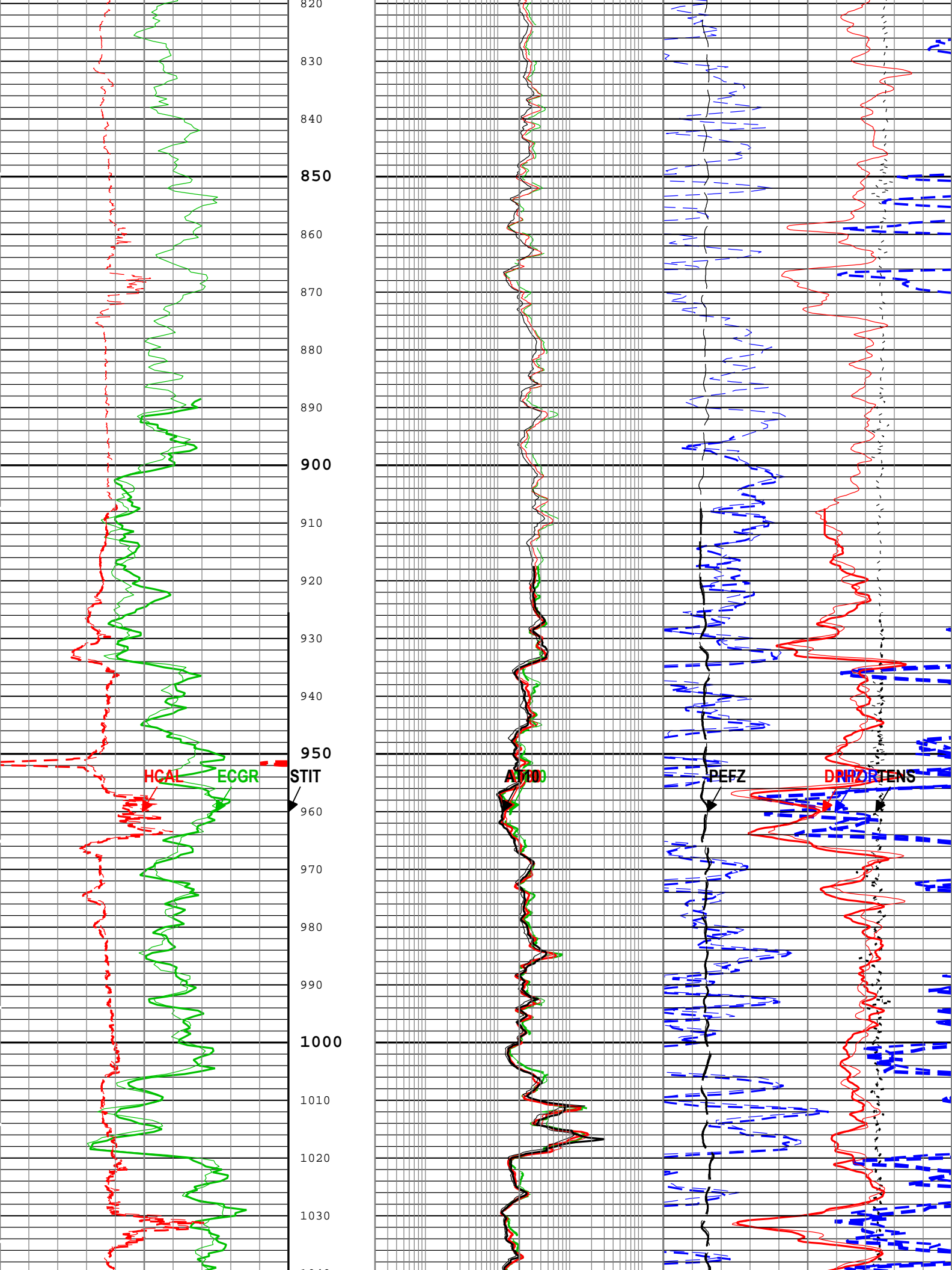
Main To Repeat
Repeat To Main

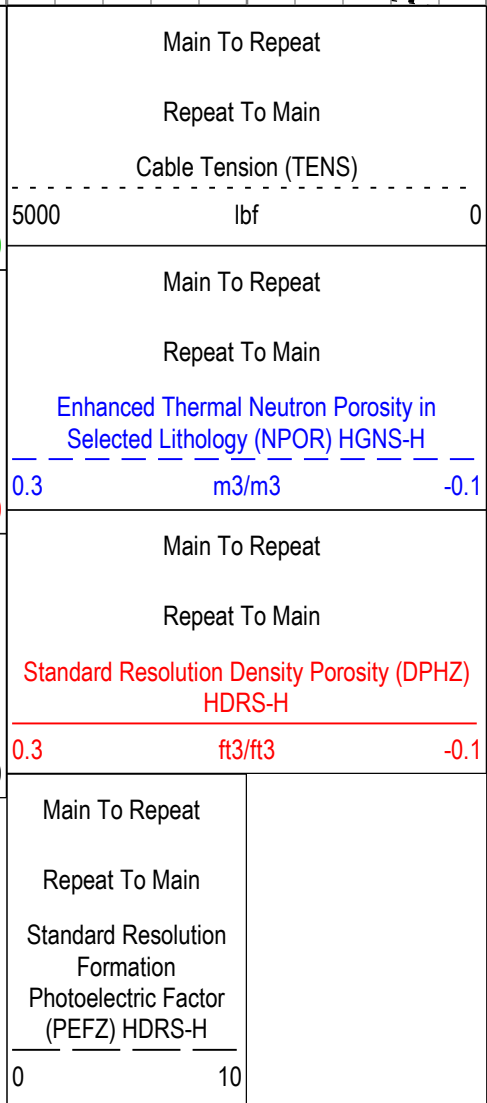
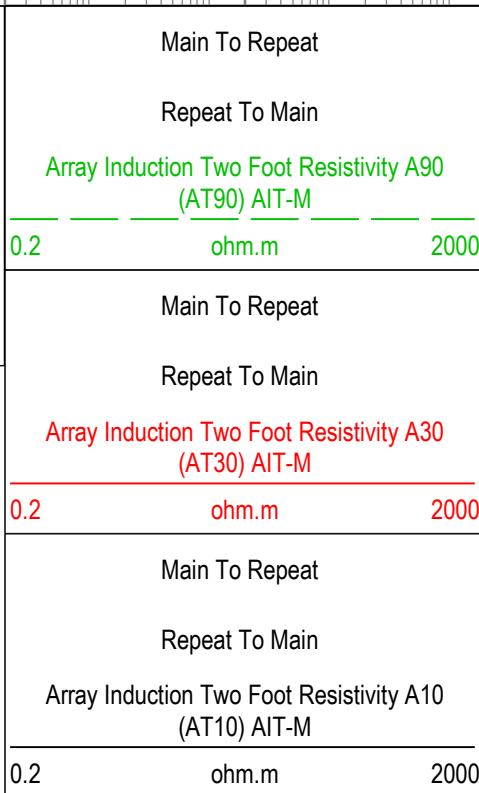
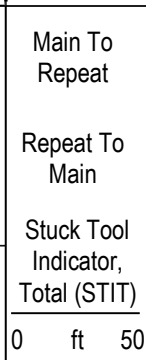
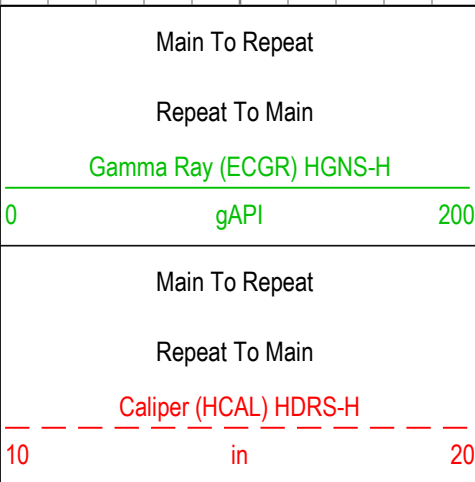
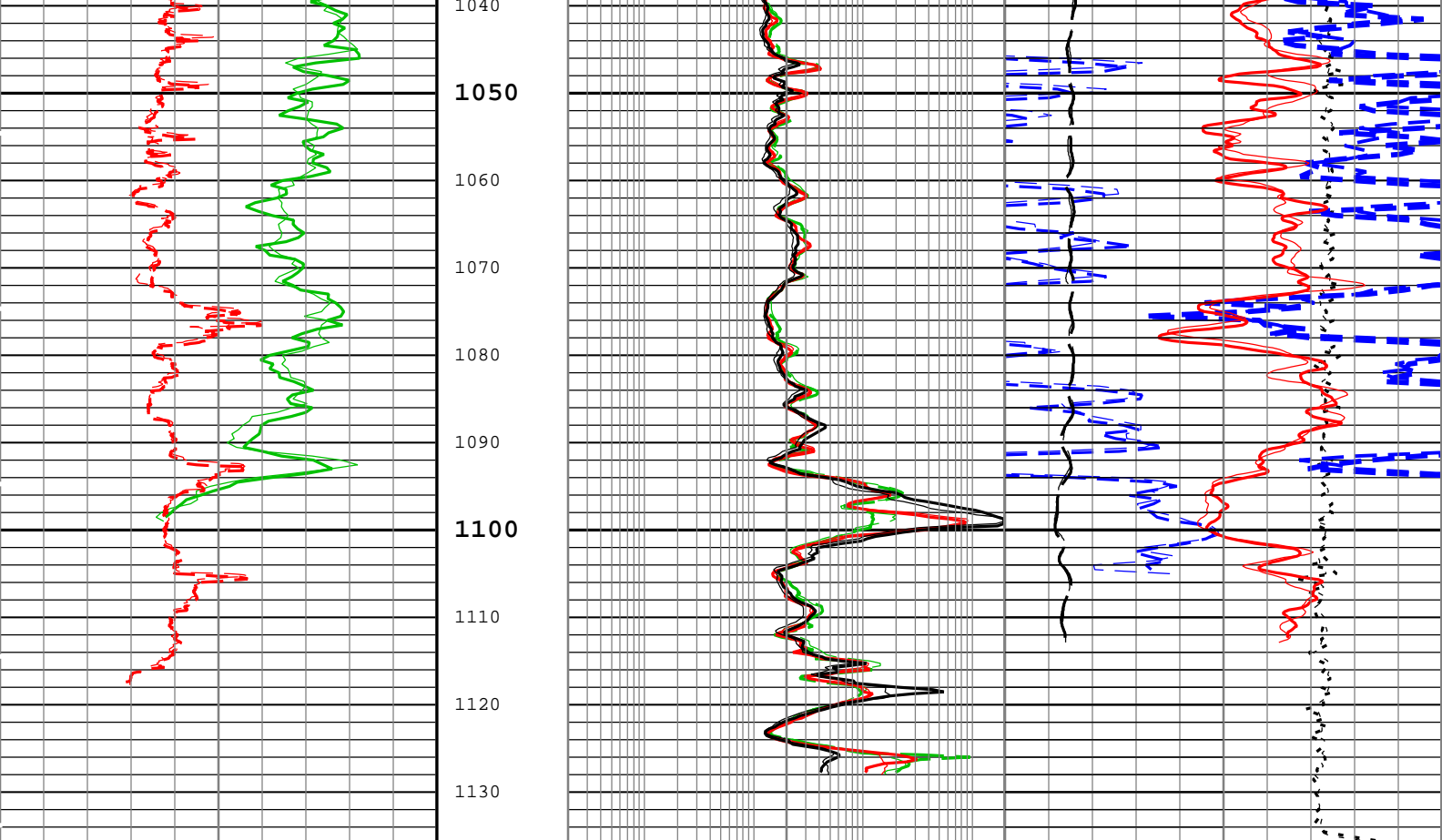












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (EMD 5in Triple Combo Linear RA) Index Scale: 5 in per 100 ft Index

Channel Processing Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ASTA	Array Induction Tool Standoff	AIT-M	0.125	in
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	100	degF
BS	Bit Size	WLSESSION	Depth Zoned	in
BSAL	Borehole Salinity	Borehole	0	ppm
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	103	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
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(RT)	
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	AMF	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
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
NPRM	HRDD Nuclear Processing Mode	HDRS-H	Standard Resolution	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
TD	Total Measured Depth	Borehole	1134	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	20	0	104
BS	13.5	104	1134

All depth are actual.

Tool Control Parameters

One: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BOARD_TYPE	HMCA Board Type	HGNS-H	1	
HRGD_BOARD_TYPE	HRGD Board Type	HDRS-H	WITH_HET	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run One

Primary Equipment :	File code for AIT-MA Sonde Tool Element	AMIS	346
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AIT Electronics Check - Thru Calibration Check

Before (Measured):		15:20:17 04-Sep-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Before	-----	0.366	0.623	0.854	
Thru Cal Phase - 0	deg	Before	-----	137.000	-164.433	-103.000	
Thru Cal Mag - 1	V	Before	-----	0.762	1.276	1.778	
Thru Cal Phase - 1	deg	Before	-----	136.000	-165.508	-104.000	
Thru Cal Mag - 2	V	Before	-----	0.372	0.634	0.868	
Thru Cal Phase - 2	deg	Before	-----	132.000	-169.041	-108.000	
Thru Cal Mag - 3	V	Before	-----	0.420	0.714	0.980	
Thru Cal Phase - 3	deg	Before	-----	131.000	-169.795	-109.000	
Thru Cal Mag - 4	V	Before	-----	0.804	1.338	1.876	
Thru Cal Phase - 4	deg	Before	-----	125.000	-175.887	-115.000	
Thru Cal Mag - 5	V	Before	-----	1.176	1.950	2.744	
Thru Cal Phase - 5	deg	Before	-----	122.000	-177.534	-118.000	
Thru Cal Mag - 6	V	Before	-----	1.176	1.950	2.744	
Thru Cal Phase - 6	deg	Before	-----	121.000	-177.510	-119.000	
Thru Cal Mag - 7	V	Before	-----	0.846	1.403	1.974	
Thru Cal Phase - 7	deg	Before	-----	115.000	-178.237	-125.000	
SPA Zero	mV	Before		-50.000	0.097	50.000	
SPA Plus	mV	Before		941.000	991.005	1040.000	
Temperature Zero	V	Before		-0.050	0.000	0.050	
Temperature Plus	V	Before		0.870	0.918	0.960	

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run One			
Primary Equipment :			
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H		
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H		4901
Auxiliary Equipment :			
HRDD Backscatter Detector	Backscatter		41150
HRDD Long Spacing Detector	Long Spacing		43095
HRDD Short Spacing Detector	Short Spacing		42161
Cesium 137 Gamma-Ray Logging Source	GSR-J		5259
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):		15:23:55 04-Sep-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	8.41	10.00	
Large Ring	in	Before	12.00	9.00	12.60	15.00	

HDRS Density Calibration - Inversion Results							
Master (EEPROM):		19:57:56 14-Aug-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.594	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.690	1.696	
Pe Aluminum		Master	2.570	2.470	2.515	2.670	
Pe Magnesium		Master	2.650	2.550	2.633	2.750	

HDRS Density Calibration - Deviation Summary							
Master (EEPROM):		19:57:56 14-Aug-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.1763	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.6135	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.6594	1.0000	

HGNS Accelerometer, 150 degC

HACCZ-H

4168

AmBe Neutron Logging Source

NSR-F

5070

Calibration Parameter :

Water Temperature

Housing Size

JIG-BKG (Jig minus background reference)

165

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): 18:00:00 14-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	-----	-----	1582.500	-----		
Accelerometer Coefficients - 1		Master	-----	-----	35.100	-----		
Accelerometer Coefficients - 2		Master	-----	-----	-0.047	-----		
Accelerometer Coefficients - 3		Master	-----	-----	-0.001	-----		
Accelerometer Coefficients - 4		Master	-----	-----	2.739	-----		
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	-----	-----	0.991	-----		

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 14:54:40 15-Jul-2018

Before (Measured):

15:20:01 04-Sep-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Near Zero Measurement	1/s	Master	0	5.0	25.3	40.0		
		Before	0	5.0	26.3	40.0		
		Before-Master	-----	-3.8	1.0	3.8		
Far Zero Measurement	1/s	Master	0	5.0	28.3	40.0		
		Before	0	5.0	28.1	40.0		
		Before-Master	-----	-4.2	-0.2	4.2		
Near Plus Measurement	1/s	Master	6031.0	4700.0	5016.0	6900.0		
		Before	-----	-----	-----	-----		
		Before-Master	-----	-----	-----	-----		
Far Plus Measurement	1/s	Master	2793.0	1900.0	2126.0	2900.0		
		Before	-----	-----	-----	-----		
		Before-Master	-----	-----	-----	-----		
Near Corrected Plus Measurement	1/s	Master		4700.0	5016.0	6900.0		
		Before	-----	-----	-----	-----		
		Before-Master	-----	-----	-----	-----		
Far Corrected Plus Measurement	1/s	Master		1900.0	2114.0	2900.0		
		Before	-----	-----	-----	-----		
		Before-Master	-----	-----	-----	-----		

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 15:23:04 04-Sep-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Zero Measurement	gAPI	Before	30.0	0	61.3	120.0		
RGR Plus Measurement	gAPI	Before	185.4	157.1	173.1	206.3		
GR Calibration Gain		Before	0.89	0.80	0.95	1.05		

Company:	TEP Rocky Mountain LLC	Schlumberger
Well:	PA 434-24	
Field:	Parachute	
County:	Garfield	
State:	Colorado	
Platform Express		
Triple Combo		
Linear		