

Company: St. Croix Operating, Inc.

Well: State 3-16

Field: Wildcat

County: Washington State: Colorado

Platform Express

Compensated Neutron

Litho-Density

County: Washington
Field: Wildcat
Location: NENW Sec. 16, T3S, R52W
Well: State 3-16
Company: St. Croix Operating, Inc.

Location:	NENW Sec. 16, T3S, R52W	Elev.:	K.B.	4827.00 ft
	SHL: 1100' FNL & 1700' FWL		G.L.	4821.00 ft
	Lat/Long: 39.796480 / -103.212730		D.F.	4827.00 ft
	Permanent Datum:	Ground Level	Elev.:	4821.00 f
Log Measured From:		Kelly Bushing	6.00 ft	above Perm.Datum
Drilling Measured From:		Kelly Bushing		
API Serial No.	Section:	Township:	Range:	
05-121-11073	16	3S	52W	

Logging Date 10-Jun-2018

Run Number ONE

Depth Driller 4500.00 ft

Schlumberger Depth 4504.00 ft

Bottom Log Interval 3500.00 ft

Top Log Interval 100.00 ft

Casing Driller Size @ Depth 8.625 in @ 325.00 ft

Casing Schlumberger 326.5 ft

Bit Size 7.875 in

Type Fluid In Hole WBM

Density Viscosity 9.1 lbm/gal 67 s

Fluid Loss PH 7.2 cm3 8.5

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 0.11 @ 125.11 0.09 @ 125.11

Max Recorded Temperatures

Circulation Stopped Time 09-Jun-2018 14:30:00

Logger on Bottom Time 10-Jun-2018 01:56:00

Unit Number Location: 9102 Fort Morgan

Recorded By Ashley Rosacker

Witnessed By Gary Duke

Disclaimer

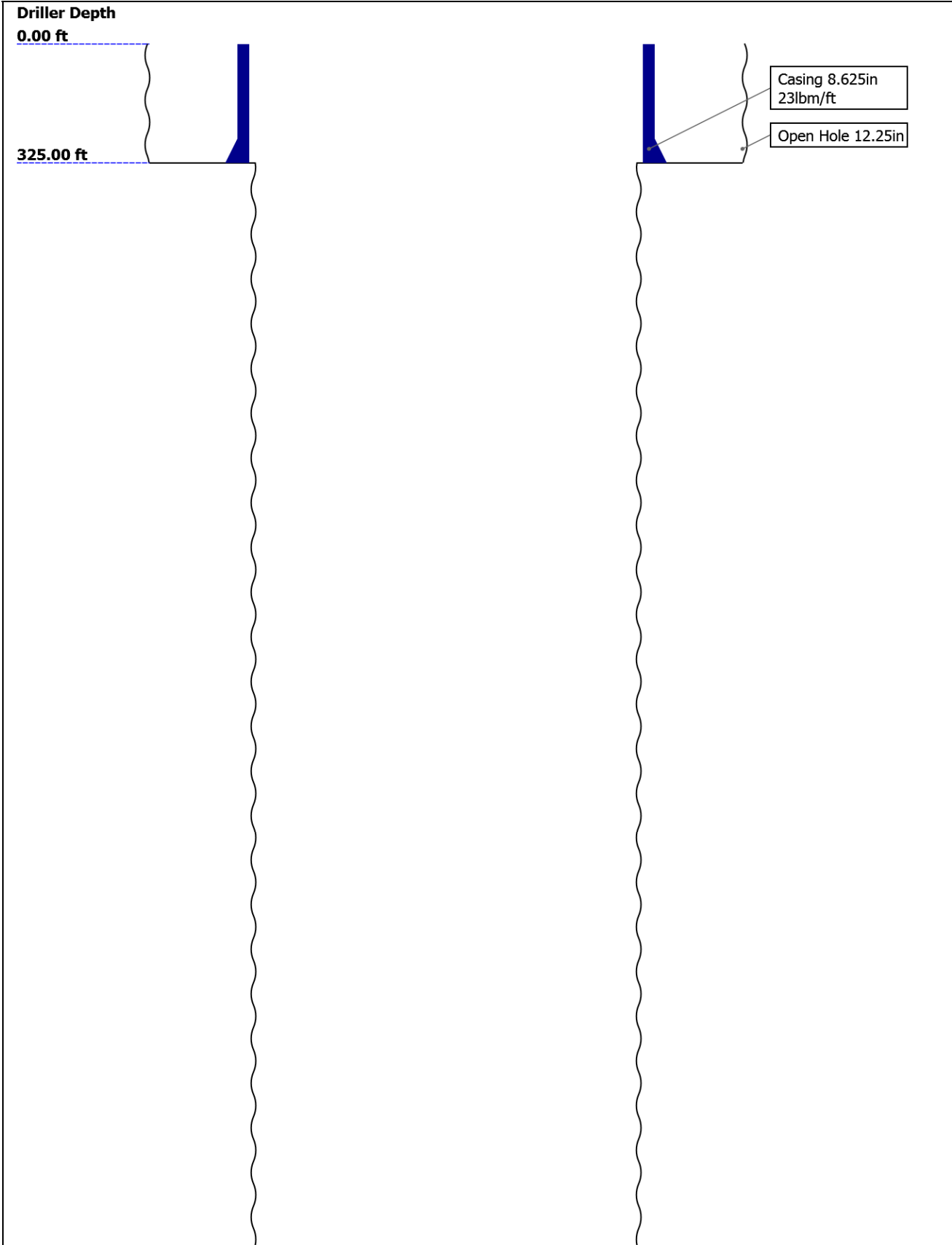
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

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Well Sketch




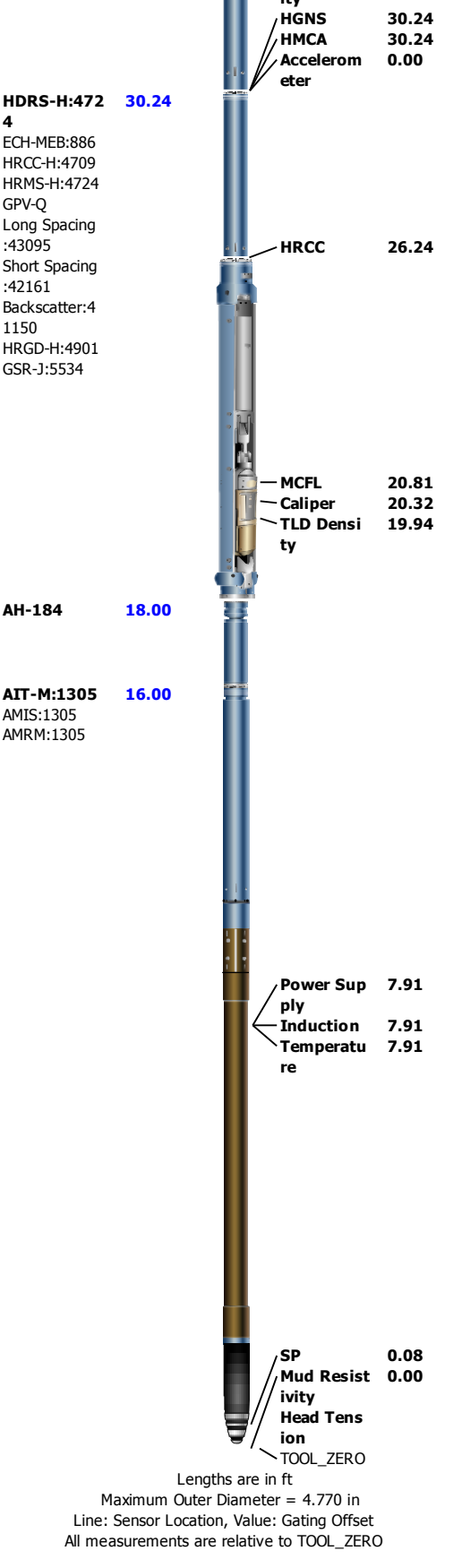


Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	12.25	7.875				
Top Driller (ft)	0	325				
Top Logger (ft)	0	325				
Bottom Driller (ft)	325	4500				
Bottom Logger (ft)	325	4504				
Casing						
Size (in)	8.625					
Weight (lbm/ft)	23					
Inner Diameter (in)	8.122					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	325					
Bottom Logger (ft)	326.5					

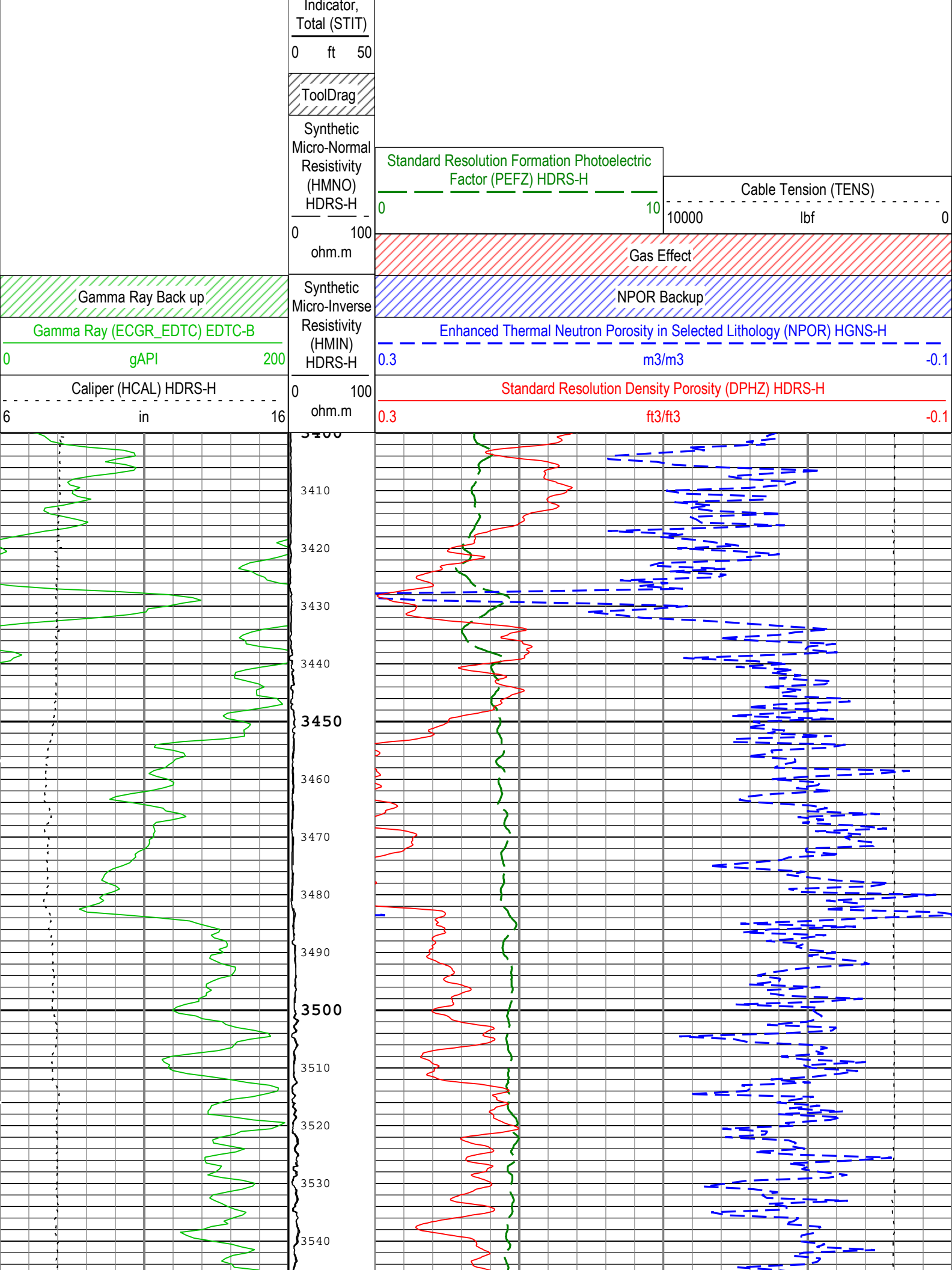
Remarks and Equipment Summary

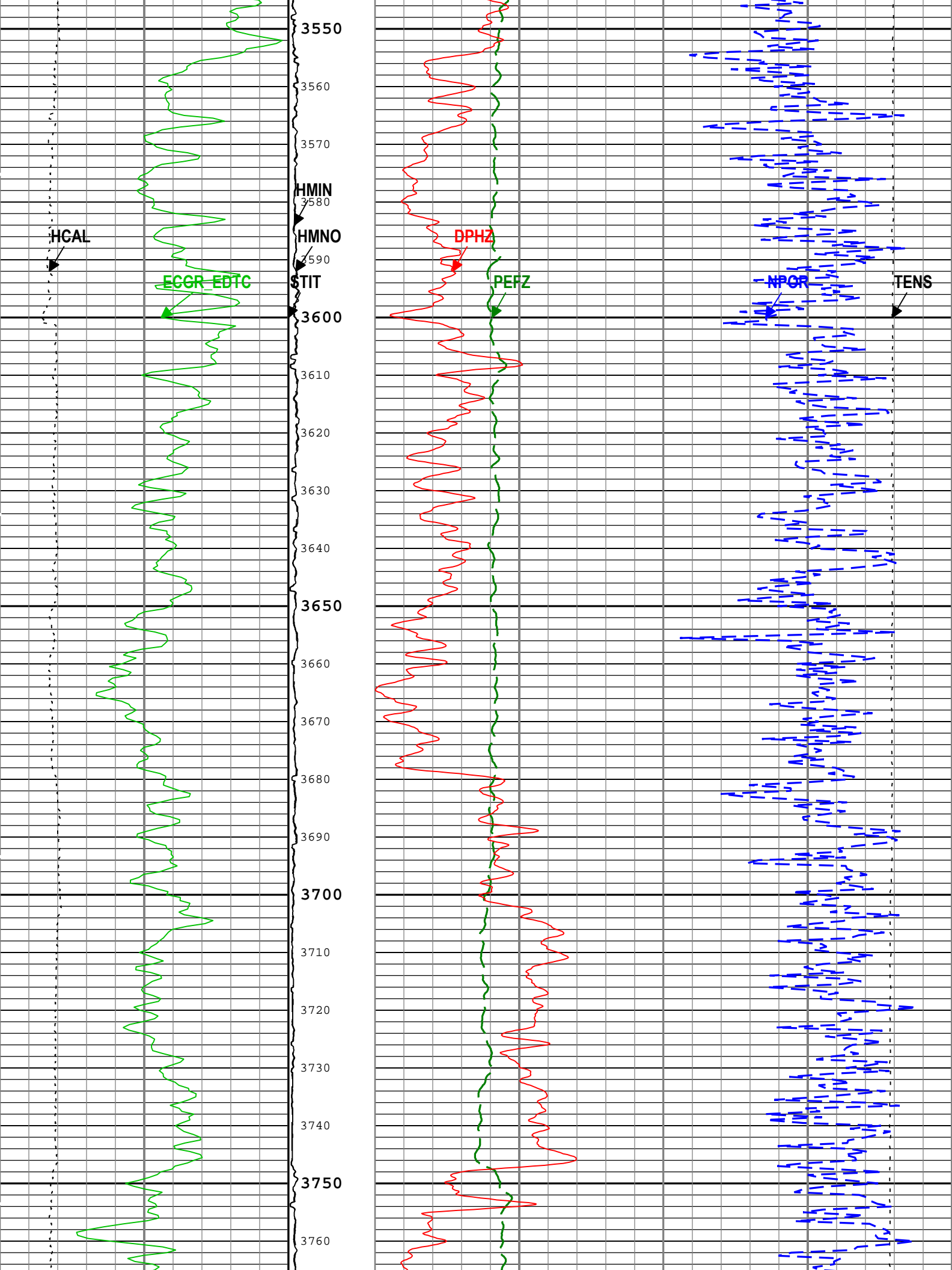
ONE: Toolstring				ONE: Remarks	
Equip name LEH-QT LEH-QT	Length 49.64	MP name	Offset	Thank you for choosing Schlumberger!	
				This is the first log in the well.	
				Toolstring run as per tool sketch and client logging program.	
				Requested to run the tool slick with no bowspring or standoffs.	
				Matrix: Sandstone, Density:2.65	
				BHT: 125 degF	
				TD: 4504, Casing Shoe: 326.5	
EDTC-B:847 3M EDTH-B:8624 EDTG-A:7743 4 EDTC-B:8473 M	46.15	CTEM ACCZ HV Gamma Ra y TelStatus Temperatu re GR	42.65 0.00 0.00 40.78 39.65 39.62 38.91		
HGNS-H:391 2 HGNH:3875 NPV-N NSR-F:5070 HMCA-H HACCZ-H:426 4 HGNS-H:3912	39.65				
		CNL Poros ity	32.58		

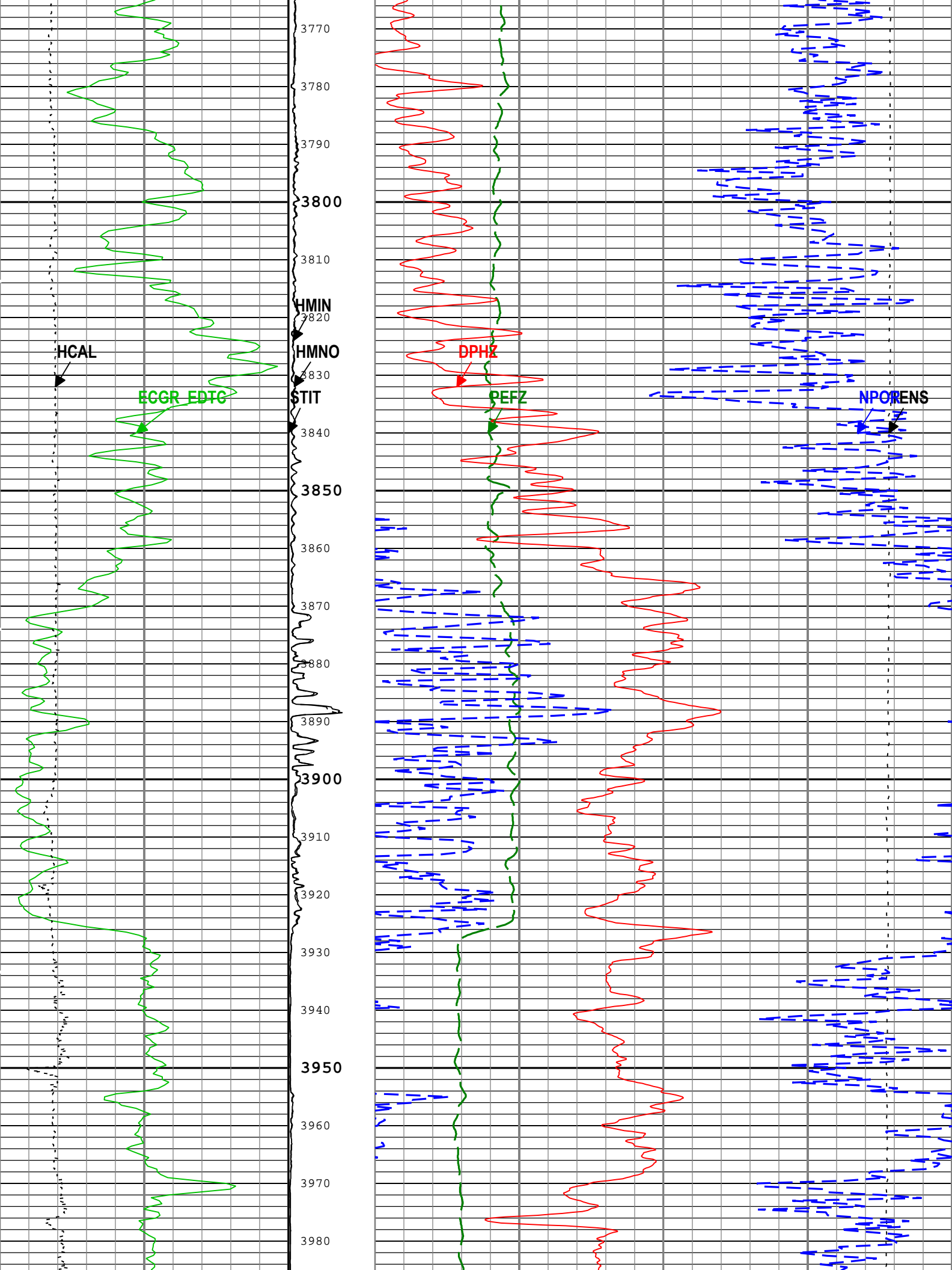


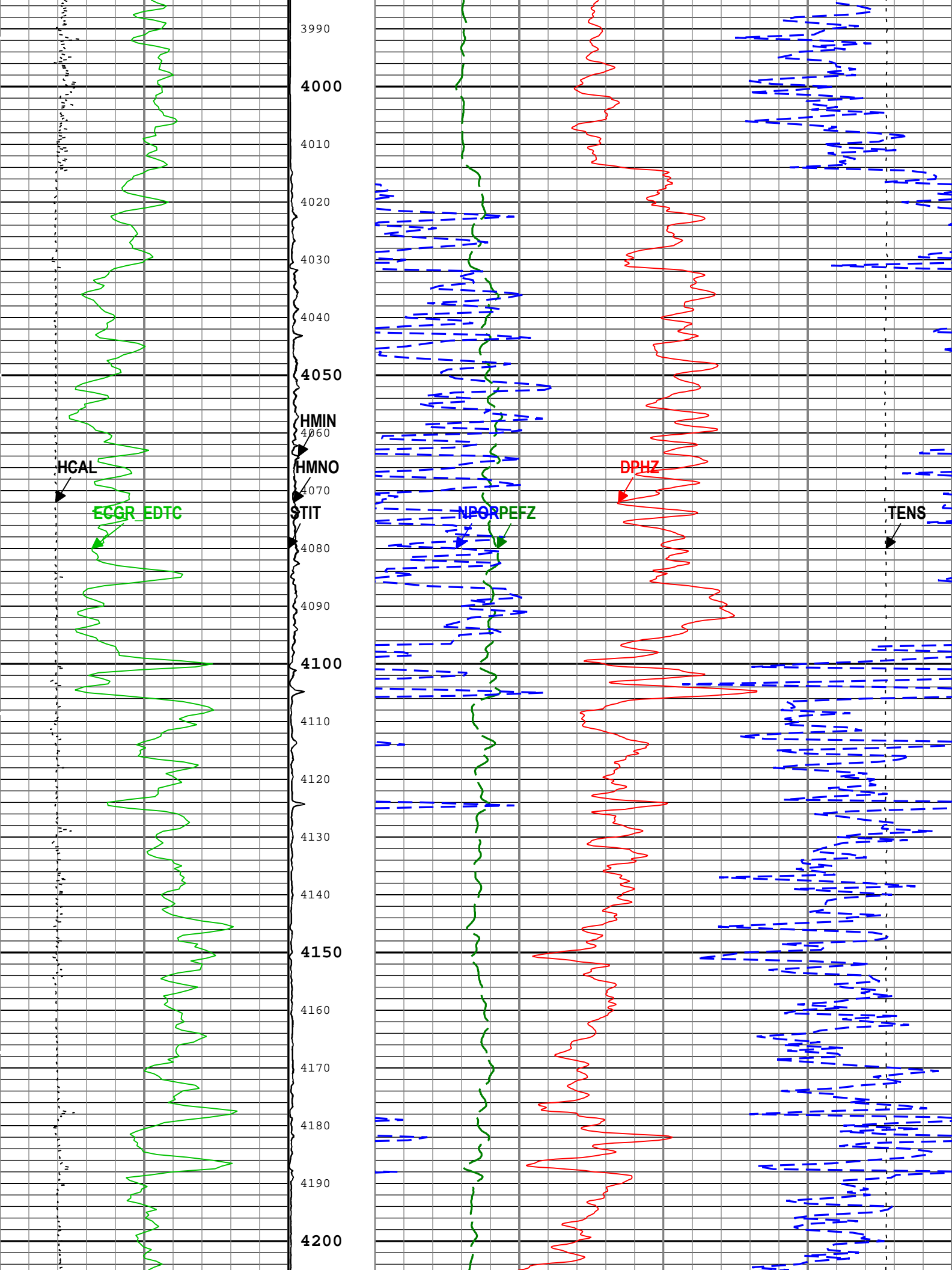
Depth Summary			
	ONE		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Quality			

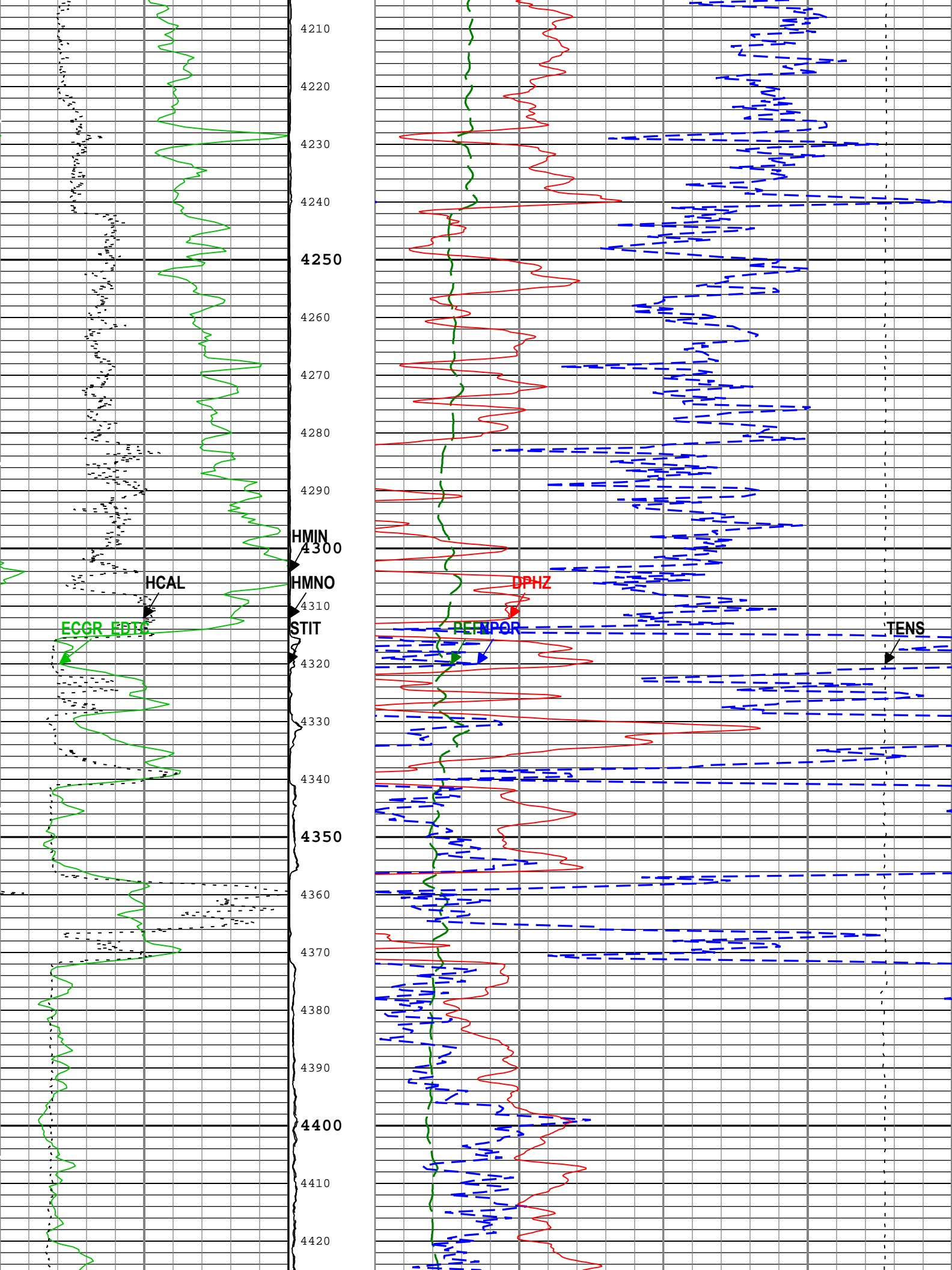
Calibration Cable Type									
Wheel Correction 1	0								
Wheel Correction 2	0								
Tension Device									
Type	CMTD-B/A								
Serial Number									
Calibration Date									
Calibrator Serial Number									
Number of Calibration Points	0								
Logging Cable									
Type	7-46A-XS								
Serial Number									
Length	24000.00 ft								
Conveyance Type	Wireline								
Rig Type	Land								
ONE:Depth Control Parameters				Depth Control Remarks					
Log Sequence	First Log In the Well			All Schlumberger depth control policies followed.					
Rig Up Length At Surface				IDW used as primary depth reference.					
Rig Up Length At Bottom				Z-Chart used as secondary depth reference.					
Rig Up Length Correction									
Stretch Correction									
Tool Zero Check At Surface									
ONE									
5" Porosity									
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	78.30 ft	4514.15 ft	10-Jun-2018 2:09:34 AM	10-Jun-2018 3:27:37 AM	ON	2.93 ft	No
All depths are referenced to toolstring zero									
Log	Company:St. Croix Operating, Inc. Well:State 3-16							ONE: Log[3]:Up:S004	
Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type:									
Measured Depth Creation Date: 10-Jun-2018 04:04:31									
Channel	Source	Sampling							
CALI	HDRS-H:HRCC-H:HRCC-H	1in							
DPHZ	HDRS-H:HRMS-H:HRGD-H	2in							
GR	EDTC-B:EDTC-B:EDTC-B	6in							
NPOR	HGNS-H:HGNS-H:HGNS-H	6in							
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in							
SMIN	HDRS-H:HRMS-H:HRGD-H	2in							
SMNO	HDRS-H:HRMS-H:HRGD-H	2in							
STIT	DepthCorrection	6in							
TENS	WLWorkflow	6in							
TIME_1900	WLWorkflow	0.1in							
TIME_1900 - Time Marked every 60.00 (s)									
Stuck Tool									

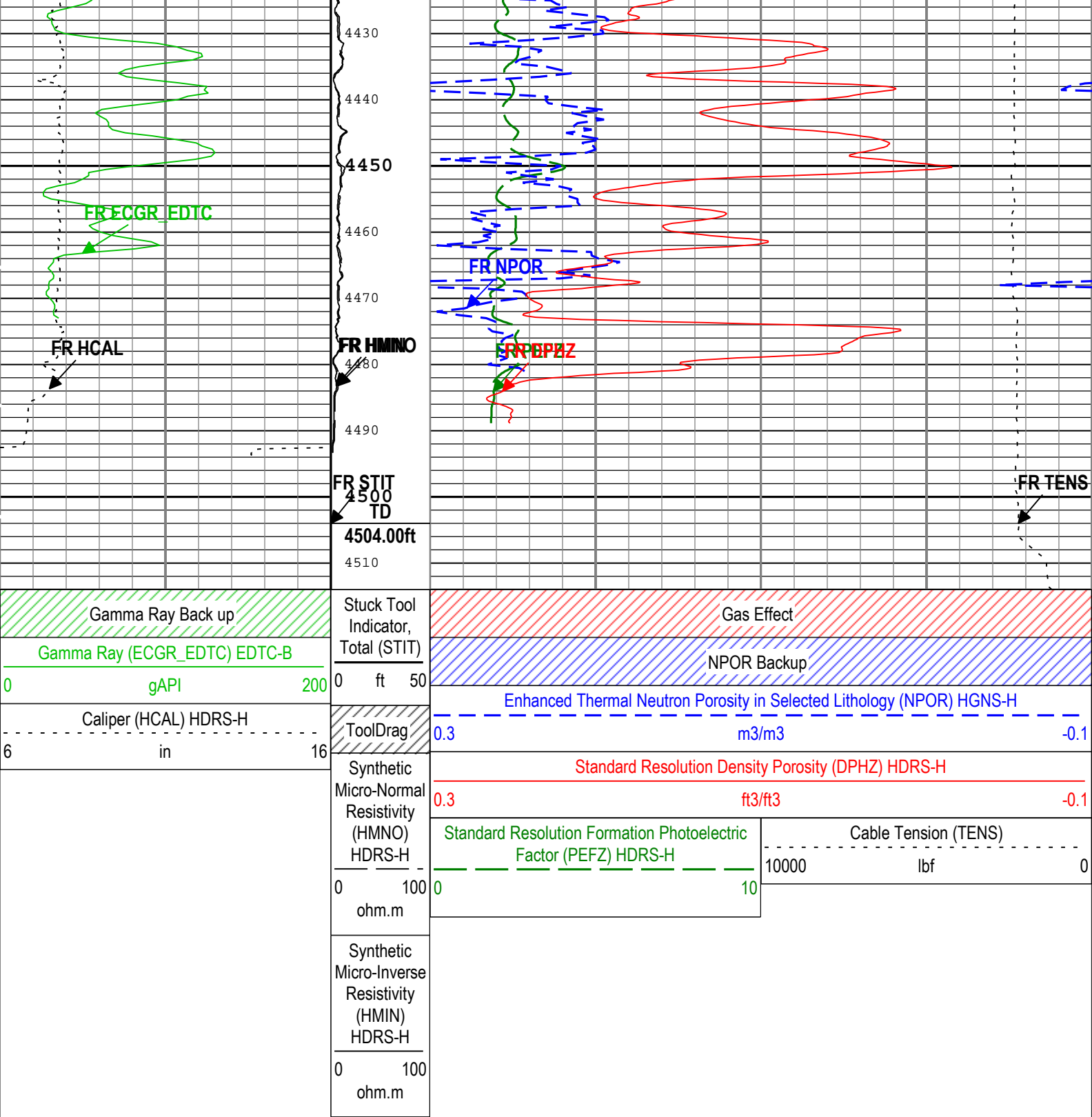












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Jun-2018 04:04:31

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	125.11	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	600	ppm

BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.153	in
CBLO	Casing Bottom (Logger)	WLSESSION	326.5	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DFT_WATER	Drilling Fluid Water Type	Borehole	WBM	
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
PTCO	Pressure Temperature Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
TD	Total Measured Depth	Borehole	4504	ft

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
NPUC	Nuclear Pile-Up Correction	HDRS-H	On	

ONE

5" Density

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	78.30 ft	4514.15 ft	10-Jun-2018 2:09:34 AM	10-Jun-2018 3:27:37 AM	ON	2.93 ft	No

All depths are referenced to toolstring zero

Log

Company:St. Croix Operating, Inc.

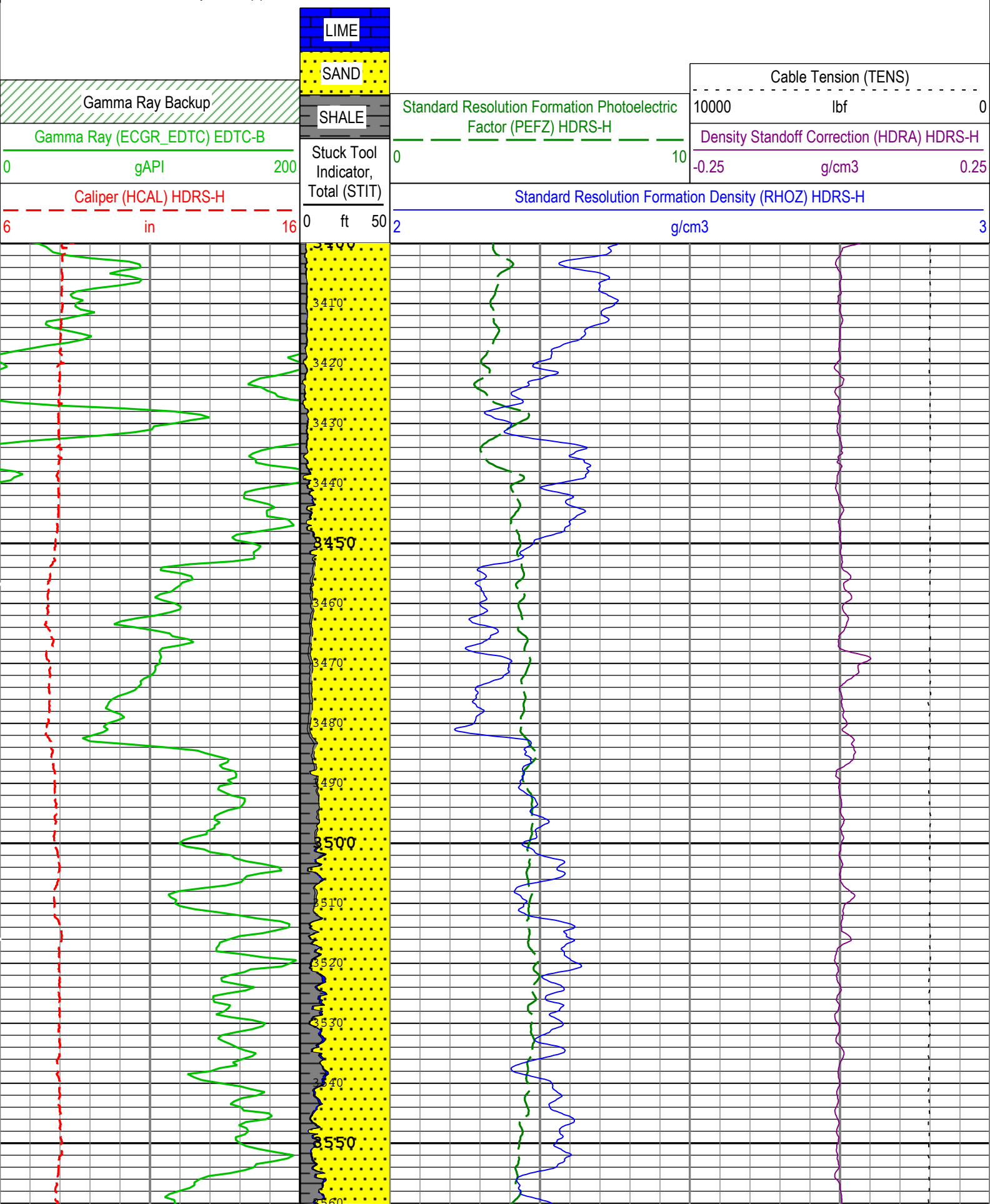
Well:State 3-16

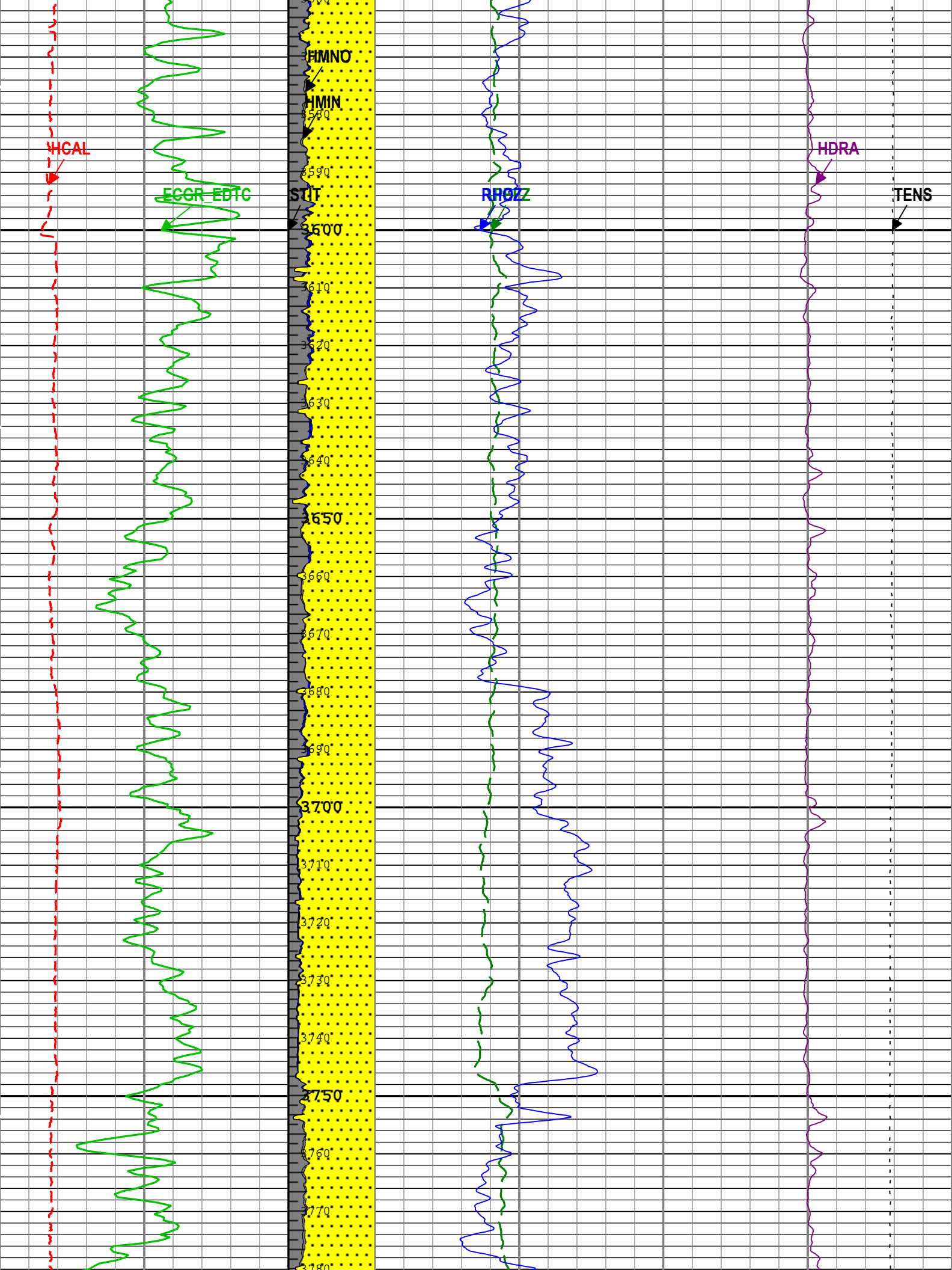
ONE: Log[3]:Up:S004

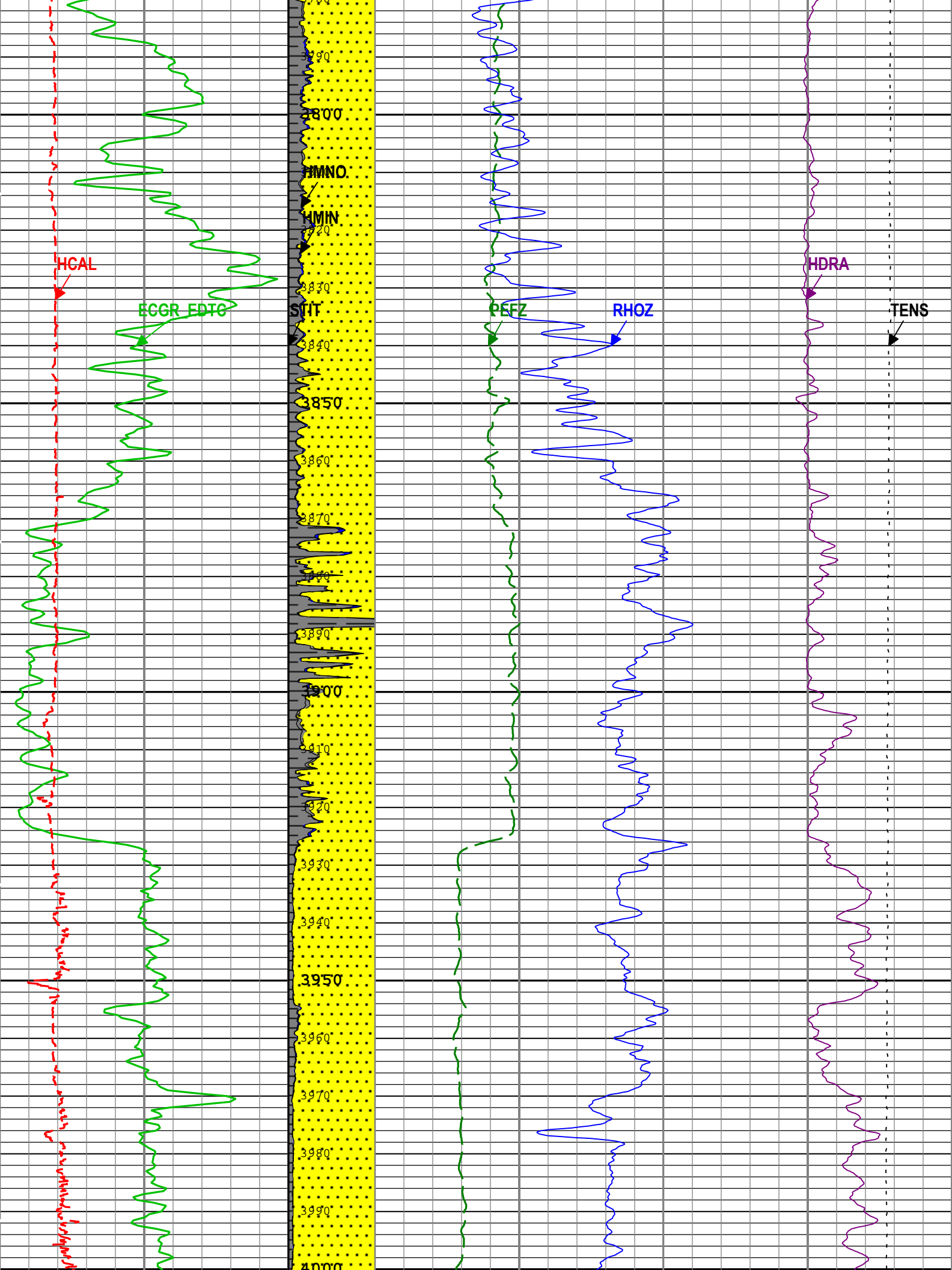
Description: HGNS standard resolution porosities for Platform Express
Format: Log (Density-5)
Index Scale: 5 in per 100 ft
Index Unit: ft
Index Type: Measured Depth
Creation Date: 10-Jun-2018 04:04:33

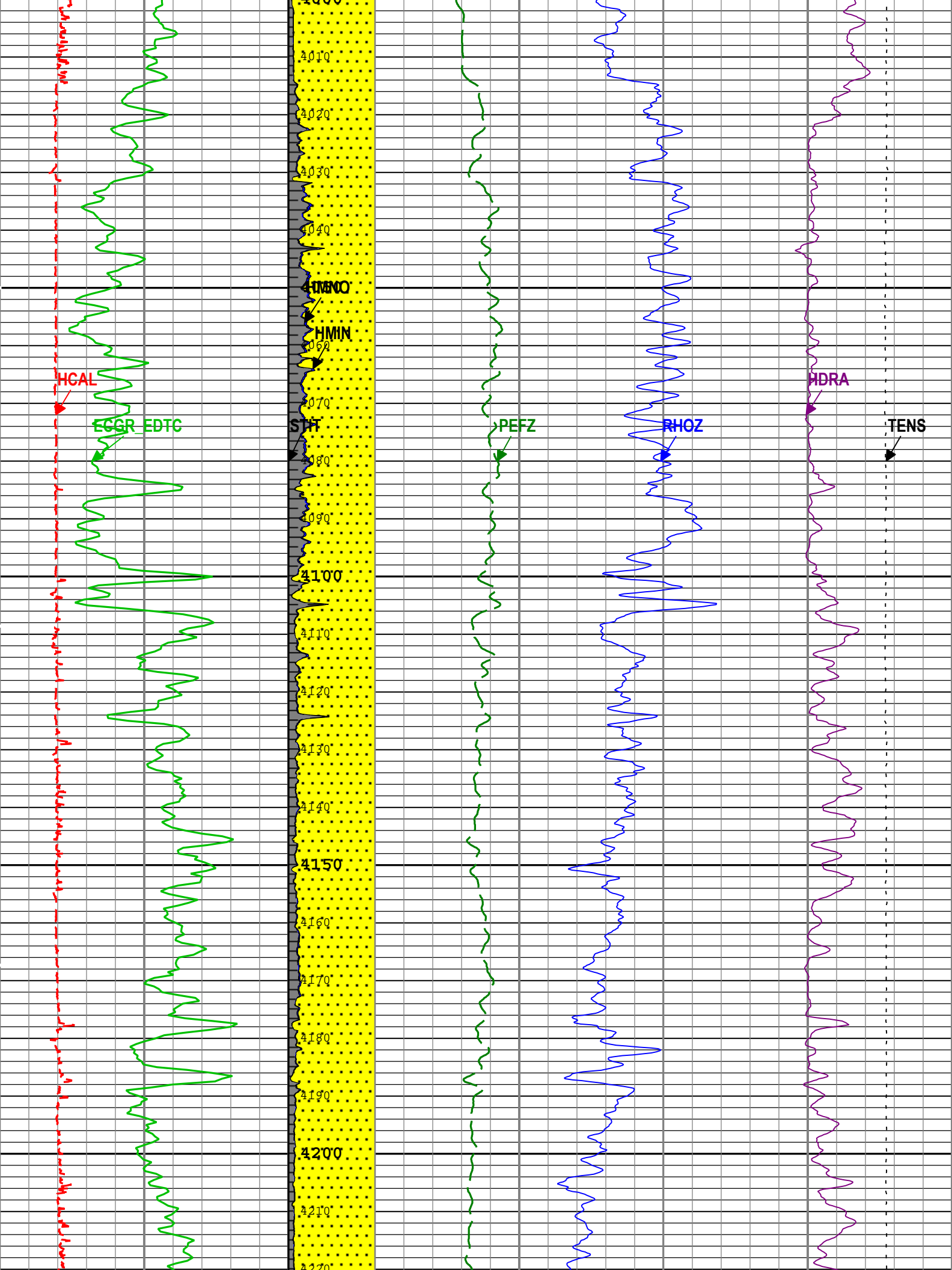
Channel	Source	Sampling
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	EDTC-B:EDTC-B:EDTC-B	6in
HDRA	HDRS-H:HRMS-H:HRGD-H	2in
PEFZ	HDRS-H:HRMS-H:HRGD-H	2in
RHOZ	HDRS-H:HRMS-H:HRGD-H	2in
SMIN	HDRS-H:HRMS-H:HRGD-H	2in
SMNO	HDRS-H:HRMS-H:HRGD-H	2in

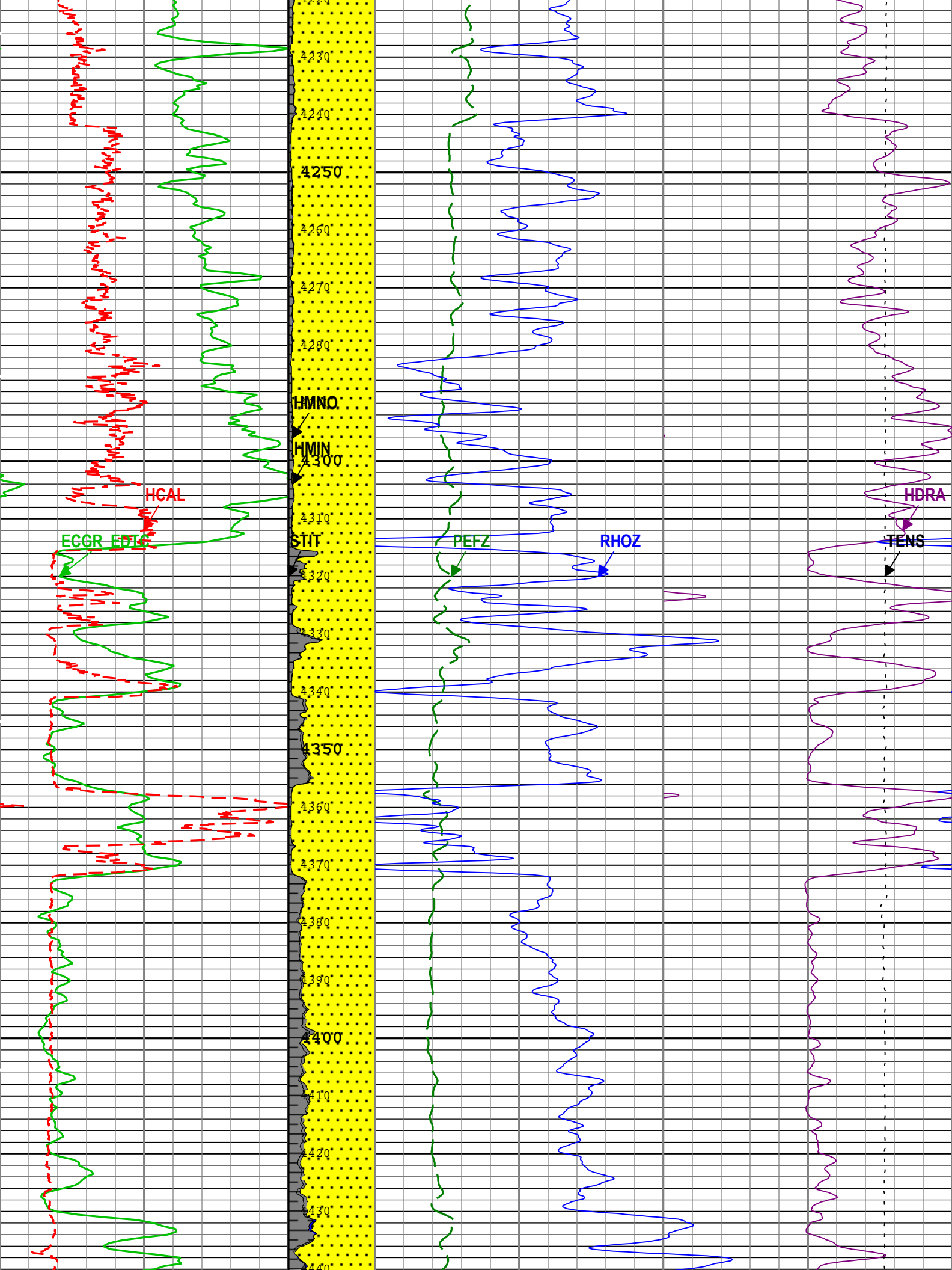
TIME_1900 - Time Marked every 60.00 (s)

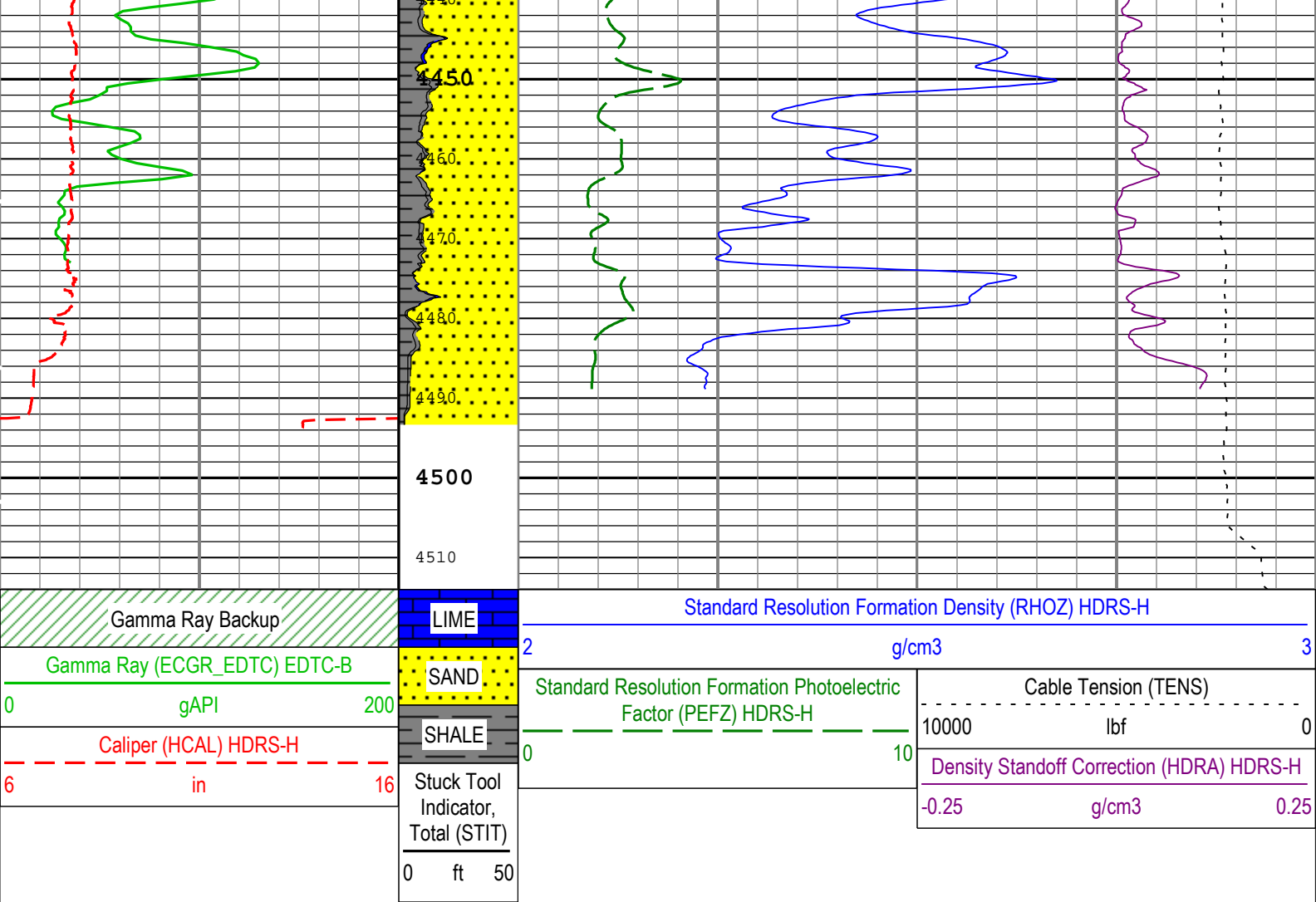












TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Density-5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Jun-2018 04:04:33

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.153	in
CBLO	Casing Bottom (Logger)	WLSESSION	326.5	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DHC	Density Hole Correction	HDRS-H	Bit Size	
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	
TD	Total Measured Depth	Borehole	4504	ft

Tool Control Parameters				
ONE: 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
NPUC	Nuclear Pile-Up Correction	HDRS-H	On	

ONE

5" Porosity

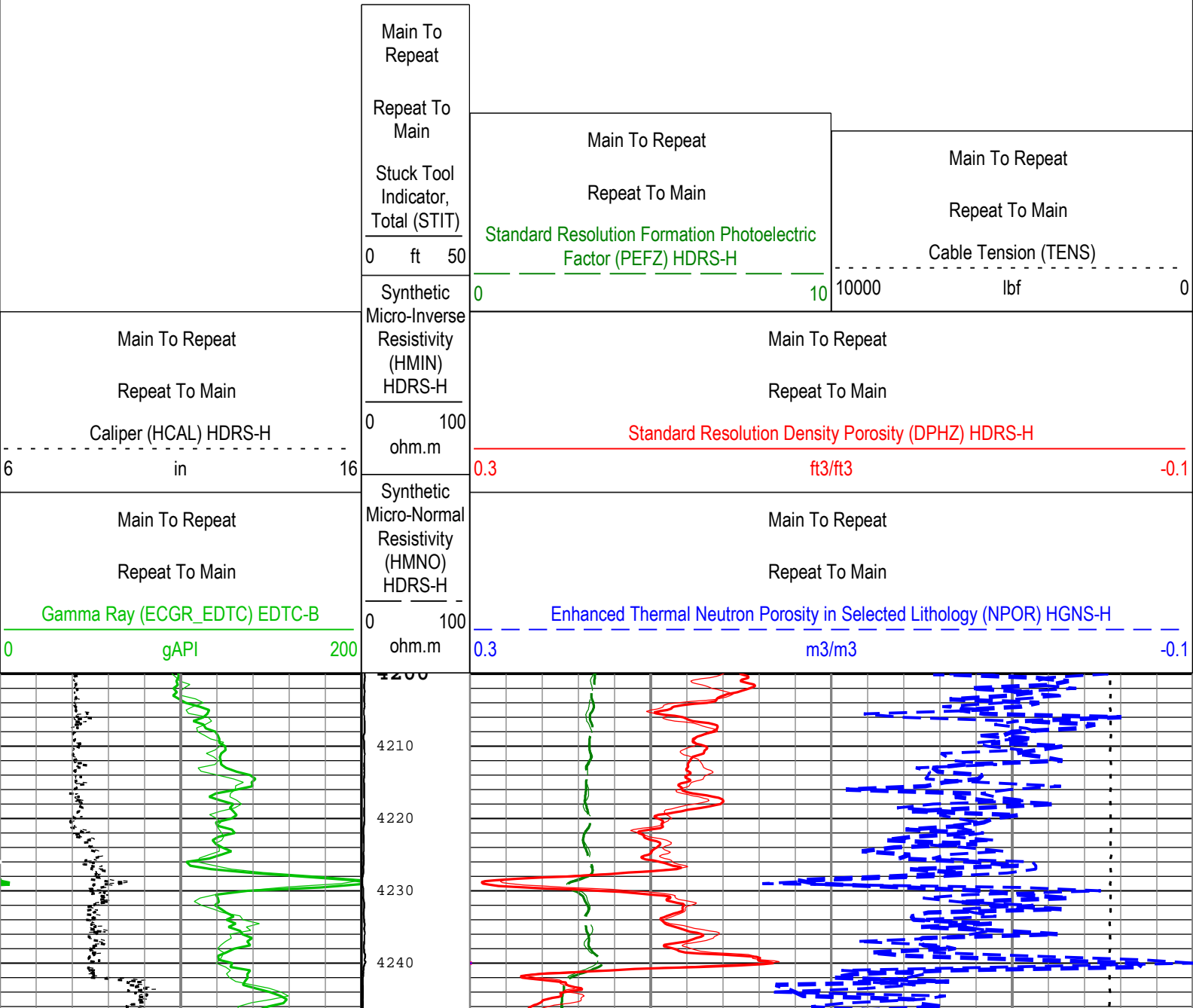
Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[2]:Up	Up	4186.13 ft	4513.38 ft	10-Jun-2018 1:56:57 AM	10-Jun-2018 2:04:41 AM	ON	2.99 ft	No
ONE	Log[3]:Up	Up	78.30 ft	4514.15 ft	10-Jun-2018 2:09:34 AM	10-Jun-2018 3:27:37 AM	ON	2.93 ft	No

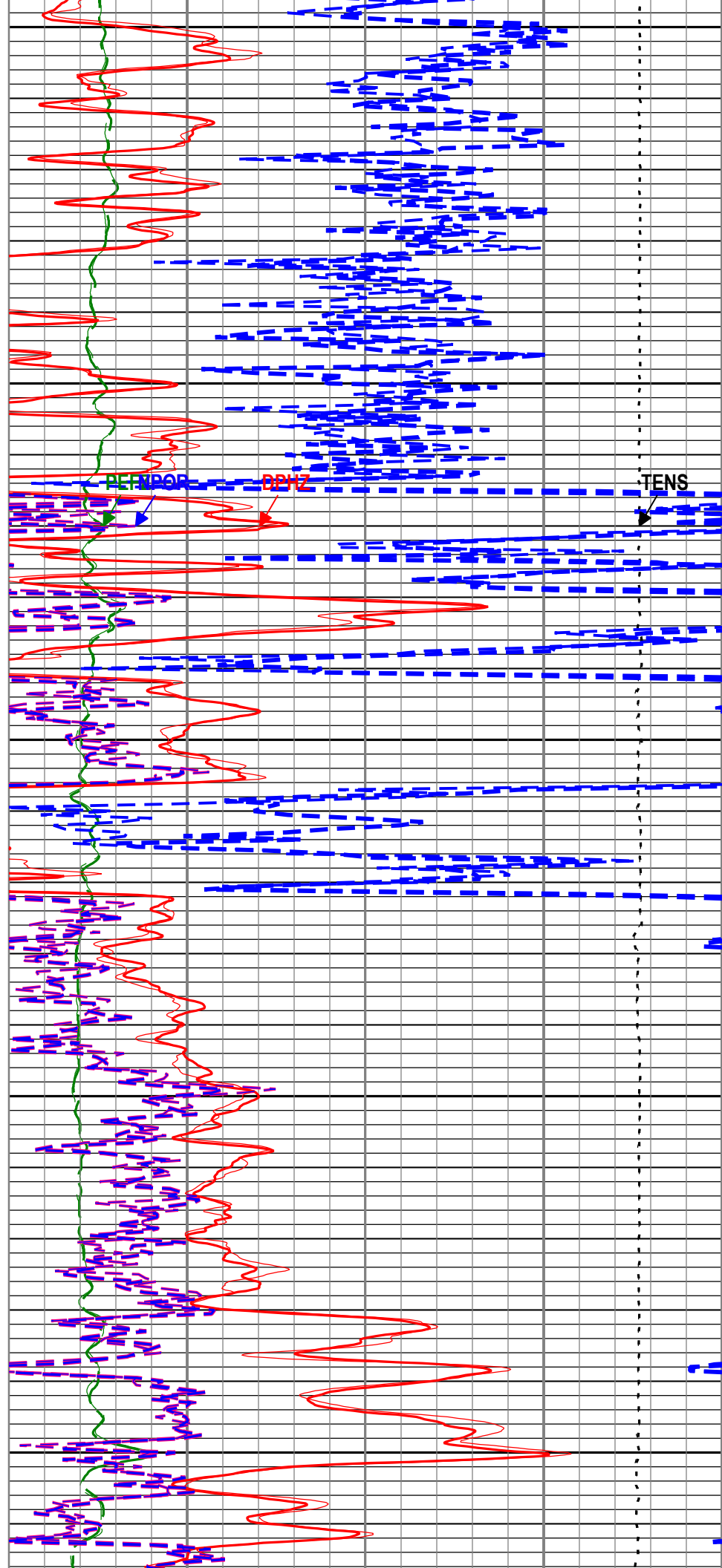
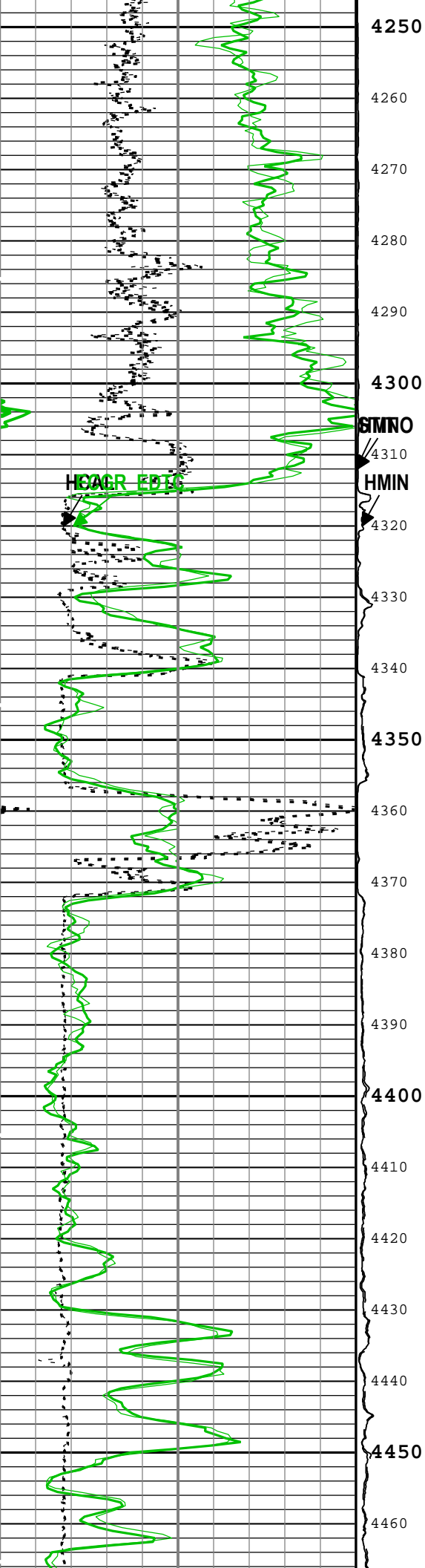
All depths are referenced to toolstring zero

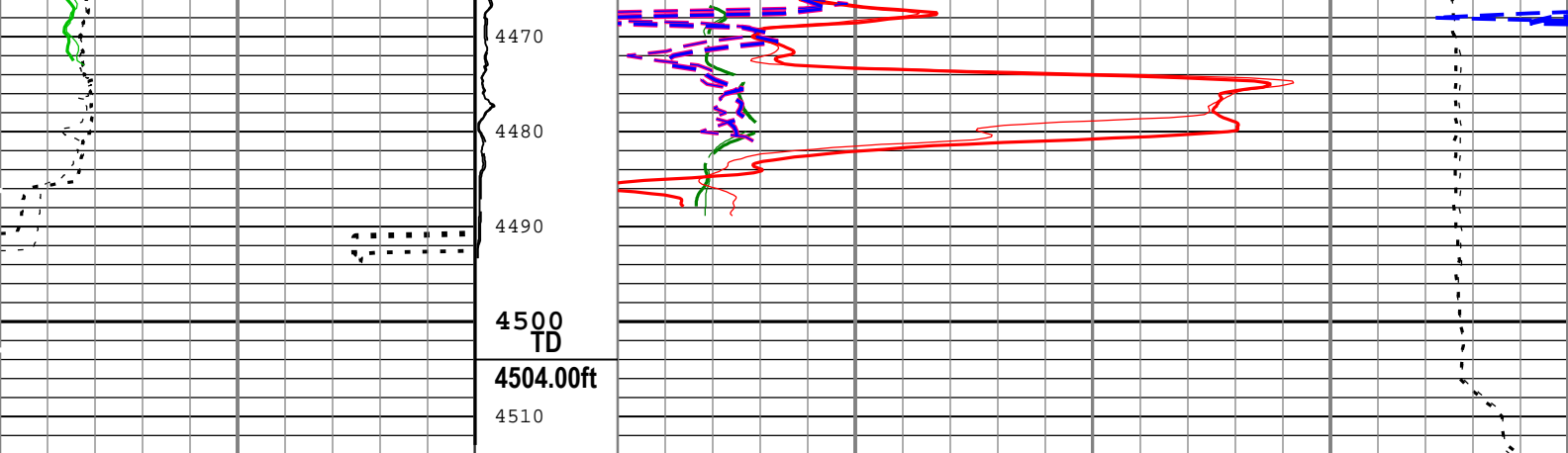
Log	Company:St. Croix Operating, Inc. Well:State 3-16 ONE: Log[3]:Up:S004
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Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Jun-2018 04:04:35

TIME_1900 - Time Marked every 60.00 (s)







Main To Repeat Repeat To Main Caliper (HCAL) HDRS-H 6 in 16	Main To Repeat Repeat To Main Stuck Tool Indicator, Total (STIT) 0 ft 50	Main To Repeat Repeat To Main Standard Resolution Density Porosity (DPHZ) HDRS-H 0.3 ft3/ft3 -0.1	
	Synthetic Micro-Inverse Resistivity (HMIN) HDRS-H 0 100 ohm.m	Main To Repeat Repeat To Main Enhanced Thermal Neutron Porosity in Selected Lithology (NPOR) HGNS-H 0.3 m3/m3 -0.1	
Main To Repeat Repeat To Main Gamma Ray (ECGR_EDTC) EDTC-B 0 gAPI 200	Synthetic Micro-Normal Resistivity (HMNO) HDRS-H 0 100 ohm.m	Main To Repeat Repeat To Main Standard Resolution Formation Photoelectric Factor (PEFZ) HDRS-H 0 10	Main To Repeat Repeat To Main Cable Tension (TENS) 10000 lbf 0

TIME_1900 - Time Marked every 60.00 (s)

Description: HGNS standard resolution porosities for Platform Express Format: Log (Porosity-5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Jun-2018 04:04:35

Channel Processing Parameters				
ONE: Parameters				
Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BHT	Bottom Hole Temperature	Borehole	125.11	degF
BS	Bit Size	WLSESSION	7.875	in
BSAL	Borehole Salinity	Borehole	600	ppm
BSCO	Borehole Salinity Correction Option	HGNS-H	Yes	
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0.153	in
CBLO	Casing Bottom (Logger)	WLSESSION	326.5	ft
CDEN	Cement Density	EDTC-B	2	g/cm3
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	

DFT_WATER	Drilling Fluid Water Type	Borehole	WBM	
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
PTCO	Pressure Temperature Correction Option	HGNS-H	Yes	
RMFS	Resistivity of Mud Filtrate Sample	Borehole	0.15	ohm.m
TD	Total Measured Depth	Borehole	4504	ft

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
NPUC	Nuclear Pile-Up Correction	HDRS-H	On	

Calibration Report

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

Primary Equipment :

File code for AIT-MA Sonde Tool Element

AMIS

1305

Auxiliary Equipment :

AITM Rm/SP Bottom Nose

AMRM

1305

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 19:47:51 02-Jan-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.018	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 0	deg	Master	0	-3.000	0.466	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 1		Master	1.000	0.950	1.016	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 1	deg	Master	0	-3.000	0.592	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 2		Master	1.000	0.950	1.018	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 2	deg	Master	0	-3.000	-0.168	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 3		Master	1.000	0.950	1.014	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 3	deg	Master	0	-3.000	-0.081	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 4		Master	1.000	0.950	1.000	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 4	deg	Master	0	-3.000	0.271	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 5		Master	1.000	0.950	0.986	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 5	deg	Master	0	-3.000	0.500	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 6		Master	1.000	0.950	0.999	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 6	deg	Master	0	-3.000	0.312	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Gain - 7		Master	1.000	0.950	1.015	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 7	deg	Master	0	-3.000	-0.002	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 19:47:51 02-Jan-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-84.140	119.000	<div><div></div><div></div><div></div><div></div><div></div></div>

Sonde Error Correction Quad - 0		Master	-----	-2250.000	-111.537	2250.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	189.149	204.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 1		Master	-----	-625.000	-132.092	625.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	96.476	156.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 2		Master	-----	-350.000	-197.375	350.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	56.388	89.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 3		Master	-----	-250.000	-3.688	250.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.947	35.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 4		Master	-----	-63.000	-16.050	63.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	11.514	24.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 5		Master	-----	-50.000	23.280	50.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	10.454	15.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 6		Master	-----	-30.000	-5.840	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.634	5.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 7		Master	-----	-30.000	3.752	30.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 19:47:51 02-Jan-2018							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Coarse Gain		Master	1.000	0.800	0.872	1.200	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Fine Gain		Master	1.000	0.800	0.863	1.200	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 19:47:51 02-Jan-2018 Before (Measured): 01:21:46 10-Jun-2018 After:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 0	V	Master	-----	0.366	0.607	0.854	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.366	0.607	0.854	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	0.000	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master	-----	137.000	-172.033	-103.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	137.000	-173.892	-103.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-1.859	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master	-----	0.762	1.245	1.778	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.762	1.244	1.778	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master	-----	136.000	-172.976	-104.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	136.000	-174.837	-104.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-1.861	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master	-----	0.372	0.617	0.868	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.372	0.616	0.868	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master	-----	132.000	-176.357	-108.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	132.000	-178.218	-108.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-1.861	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master	-----	0.420	0.699	0.980	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	0.420	0.698	0.980	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-0.001	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After-Before	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master	-----	131.000	-177.087	-109.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before	-----	131.000	-178.952	-109.000	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		After	-----	-----	-----	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
		Before-Master	-----	-----	-1.865	-----	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>

		After-Before	----	----	----	----		
Thru Cal Mag - 4	V	Master	----	0.804	1.309	1.876		
		Before	----	0.804	1.307	1.876		
		After	----	----	----	----		
		Before-Master	----	----	-0.002	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 4	deg	Master	----	125.000	177.118	-115.000		
		Before	----	125.000	175.239	-115.000		
		After	----	----	----	----		
		Before-Master	----	----	-1.879	----		
		After-Before	----	----	----	----		
Thru Cal Mag - 5	V	Master	----	1.176	1.905	2.744		
		Before	----	1.176	1.904	2.744		
		After	----	----	----	----		
		Before-Master	----	----	-0.001	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 5	deg	Master	----	122.000	175.565	-118.000		
		Before	----	122.000	173.679	-118.000		
		After	----	----	----	----		
		Before-Master	----	----	-1.886	----		
		After-Before	----	----	----	----		
Thru Cal Mag - 6	V	Master	----	1.176	1.903	2.744		
		Before	----	1.176	1.901	2.744		
		After	----	----	----	----		
		Before-Master	----	----	-0.002	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 6	deg	Master	----	121.000	175.599	-119.000		
		Before	----	121.000	173.713	-119.000		
		After	----	----	----	----		
		Before-Master	----	----	-1.886	----		
		After-Before	----	----	----	----		
Thru Cal Mag - 7	V	Master	----	0.846	1.375	1.974		
		Before	----	0.846	1.373	1.974		
		After	----	----	----	----		
		Before-Master	----	----	-0.002	----		
		After-Before	----	----	----	----		
Thru Cal Phase - 7	deg	Master	----	115.000	174.690	-125.000		
		Before	----	115.000	172.726	-125.000		
		After	----	----	----	----		
		Before-Master	----	----	-1.964	----		
		After-Before	----	----	----	----		
SPA Zero	mV	Master		-50.000	-0.123	50.000		
		Before		-50.000	-0.119	50.000		
		After	----	----	----	----		
		Before-Master	----	----	0.004	----		
		After-Before	----	----	----	----		
SPA Plus	mV	Master		941.000	1002.225	1040.000		
		Before		941.000	1003.250	1040.000		
		After	----	----	----	----		
		Before-Master	----	----	1.025	----		
		After-Before	----	----	----	----		
Temperature Zero	V	Master		-0.050	0.000	0.050		
		Before		-0.050	0.000	0.050		
		After	----	----	----	----		
		Before-Master	----	----	0.000	----		
		After-Before	----	----	----	----		
Temperature Plus	V	Master		0.870	0.929	0.960		
		Before		0.870	0.929	0.960		
		After	----	----	----	----		
		Before-Master	----	----	0.000	----		
		After-Before	----	----	----	----		

Primary Equipment :			
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4709
	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	5534
	HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4709
	HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4724
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):		12:55:32 09-Jun-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Small Ring	in	Before	8.00	6.00	8.42	10.00	
Large Ring	in	Before	12.00	9.00	12.41	15.00	

HDRS Density Calibration - Inversion Results

Master (EEPROM):		14:17:48 22-May-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.598	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.686	1.696	
Pe Aluminum		Master	2.570	2.470	2.526	2.670	
Pe Magnesium		Master	2.650	2.550	2.632	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM):		14:17:48 22-May-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.3972	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.8287	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.2853	1.0000	
SS Max Deviation	%	Master	0	-2.5000	0.6042	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.6423	1.5000	
LS Max Deviation	%	Master	0	-3.5000	2.6194	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM):		14:17:48 22-May-2018		Before (Measured):		12:52:21 09-Jun-2018	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7383		
		Before	0.7383	0.7014	0.7379	0.7752	
		Before-Master	----	----	-0.0004	----	
BS Window Sum	1/s	Master	1		23373		
		Before	23373	22205	23316	24542	
		Before-Master	----	----	-57	----	
SS Window Ratio		Master	1.0000		0.4852		
		Before	0.4852	0.4610	0.4855	0.5095	
		Before-Master	----	----	0.0003	----	
SS Window Sum	1/s	Master	1		10478		
		Before	10478	9954	10460	11002	
		Before-Master	----	----	-18	----	
LS Window Ratio		Master	1.0000		0.2972		
		Before	0.2972	0.2824	0.2990	0.3121	
		Before-Master	----	----	0.0018	----	
LS Window Sum	1/s	Master	1		1178		
		Before	1178	1119	1173	1237	
		Before-Master	----	----	-5	----	

HDRS Density Calibration - Photo-multiplier High Voltages

Secondary Calibration - Master High Voltage

Master (EEPROM):		14:17:48 22-May-2018		Before (Measured):		12:52:21 09-Jun-2018	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
BS PM High Voltage	V	Master		1000	1564	2400	<div></div>
		Before		1000	1592	2400	<div></div>
		Before-Master	----	-100	28	100	<div></div>
SS PM High Voltage	V	Master		1000	1653	2400	<div></div>
		Before		1000	1651	2400	<div></div>
		Before-Master	----	-100	-2	100	<div></div>
LS PM High Voltage	V	Master		1000	1570	2400	<div></div>
		Before		1000	1570	2400	<div></div>
		Before-Master	----	-100	0	100	<div></div>

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		14:17:48 22-May-2018		Before (Measured):		12:52:21 09-Jun-2018	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
BS Crystal Resolution	%	Master		5.00	12.12	25.00	<div></div>
		Before		5.00	12.31	25.00	<div></div>
		Before-Master	----	-1.00	0.19	1.00	<div></div>
SS Crystal Resolution	%	Master		5.00	8.92	20.00	<div></div>
		Before		5.00	8.83	20.00	<div></div>
		Before-Master	----	-1.00	-0.09	1.00	<div></div>
LS Crystal Resolution	%	Master		5.00	8.88	20.00	<div></div>
		Before		5.00	9.08	20.00	<div></div>
		Before-Master	----	-1.00	0.20	1.00	<div></div>

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		01:21:05 10-Jun-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
Main Resistivity	ohm.m	Before	3875	3565	3850	4185	<div></div>
Deep Resistivity	ohm.m	Before	3830	3524	3798	4136	<div></div>
Shallow Resistivity	ohm.m	Before	3830	3524	3798	4136	<div></div>

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

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	3912
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HAC CZ-H	4264
AmBe Neutron Logging Source		NSR-F	5070
Calibration Parameter :			
Water Temperature			
Housing Size			
JIG-BKG			

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		01:21:40 10-Jun-2018					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	31.7	32.8	<div></div>

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		18:00:00 14-Jun-2005					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div></div>
Accelerometer Manufacturer		Master			QAT_160		<div></div>
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0	<div></div>
Accelerometer Coefficients - 0		Master	----	----	5359.000	----	<div></div>
Accelerometer Coefficients - 1		Master	----	----	-15.426	----	<div></div>
Accelerometer Coefficients - 2		Master	----	----	0.015	----	<div></div>
Accelerometer Coefficients - 3		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 4		Master	----	----	2.742	----	<div></div>
Accelerometer Coefficients - 5		Master	----	----	0.000	----	<div></div>
Accelerometer Coefficients - 6		Master	----	----	0.000	----	<div></div>

Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	299.400	-----	
Accelerometer Coefficients - 9		Master	-----	-----	1.009	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 13:07:56 06-Apr-2018		Before (Measured): 12:46:54 09-Jun-2018		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.7	40.0	
		Before	0	5.0	26.4	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.2	-1.3	4.2	
		After-Before	----	----	----	----	
Far Zero Measurement	1/s	Master	0	5.0	28.4	40.0	
		Before	0	5.0	29.9	40.0	
		After	----	----	----	----	
		Before-Master	----	-4.3	1.5	4.3	
		After-Before	----	----	----	----	
Near Plus Measurement	1/s	Master	6031.0	4700.0	4972.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Plus Measurement	1/s	Master	2793.0	1900.0	2078.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Near Corrected Plus Measurement	1/s	Master		4700.0	5044.0	6900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	
Far Corrected Plus Measurement	1/s	Master		1900.0	2114.0	2900.0	
		Before	----	----	----	----	
		After	----	----	----	----	
		Before-Master	----	----	----	----	
		After-Before	----	----	----	----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before:		After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement - 0	gAPI	Before	----	----	----	----	
		After	----	----	----	----	
		After-Before	----	----	----	----	
RGR Plus Measurement	gAPI	Before			NOT DONE		
		After			NOT DONE		
		After-Before	----	----	----	----	
GR Calibration Gain		Before			NOT DONE		
		After	----	----	----	----	
		After-Before	----	----	----	----	

EDTC-B (Enhanced Digital Telemetry Cartridge - Version B) Calibration - Run ONE

Primary Equipment :			
EDTC-B		EDTC-B	8473M
Calibration Parameter :			
Plus Reference			

EDTC-B Accelerometer Calibration - EDTC-B Accelerometer Calibration

Before (Measured): 01:21:00 10-Jun-2018							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.19	31.53	32.37	32.84	

EDTC-B Memory Data - EDTC-B Memory Data

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Initial PMT HV	V	Master			1596.000			
Accelerometer Serial Number		Master			539			
Accelerometer Coefficients - 0		Master	----	----	3.014E+000	----		
Accelerometer Coefficients - 1		Master	----	----	2.800E-004	----		
Accelerometer Coefficients - 2		Master	----	----	3.524E-007	----		
Accelerometer Coefficients - 3		Master	----	----	-5.257E-008	----		
Accelerometer Coefficients - 4		Master	----	----	1.263E-009	----		
Accelerometer Coefficients - 5		Master	----	----	-9.535E-012	----		
Accelerometer Coefficients - 6		Master	----	----	2.442E-014	----		
Accelerometer Coefficients - 7		Master	----	----	-3.396E-003	----		
Accelerometer Coefficients - 8		Master	----	----	3.712E-005	----		
Accelerometer Coefficients - 9		Master	----	----	-5.869E-009	----		
Accelerometer Coefficients - 10		Master	----	----	1.195E-009	----		
Accelerometer Coefficients - 11		Master	----	----	-4.589E-012	----		
Gamma-Ray Detector Serial Number		Master			7434			

EDTC-B Gamma-Ray Calibration - Gamma Ray Coefficients

Before:			After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Gamma Ray Gain		Before	1.000	0.900	NOT DONE	1.100		
		After	----	----	----	----		
		After-Before	----	----	----	----		

EDTC-B Gamma-Ray Calibration - Gamma Ray Accumulations

Before:			After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RGR Zero Measurement - 0	gAPI	Before	----	----	----	----		
		After	----	----	----	----		
		After-Before	----	----	----	----		
RGR Plus Measurement	gAPI	Before			NOT DONE			
		After			NOT DONE			
		After-Before	----	----	----	----		

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

Primary Equipment :

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

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:								
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
RHTE Zero Measurement - 0	lbf	Before	----	----	----	----		
RHTE Plus Measurement - 0	lbf	Before	----	----	----	----		
HTEN Gain - 0		Before	----	----	----	----		
HTEN Offset - 0	lbf	Before	----	----	----	----		

Company:	St. Croix Operating, Inc.	Schlumberger
Well:	State 3-16	
Field:	Wildcat	
County:	Washington	
State:	Colorado	
Platform Express		
Compensated Neutron		
Litho-Density		