

Schlumberger

Company: **BLACK HILLS PLATUEA PRODUCTION**

Well: **HSC 4-28**

Field: **SHIRE GULCH**

County: **MESA**

State: **COLORADO**

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PLATFORM EXPRESS – AIT TRIPLE COMBO GAMMA RAY			
County:	MESA		
Field:	SHIRE GULCH		
Location:	SHL: 2,327' FSL & 967' FWL		
Well:	HSC 4–28		
Company:	BLACK HILLS PLATUEA PRODUCO		
LOCATION			
SHL: 2,327' FSL & 967' FWL	Elev.:		K.B. 5789.00 ft G.L. 5766.00 ft D.F. 5788.00 ft
Permanent Datum:	GROUND LEVEL		
Log Measured From:	KELLY BUSHING		
Drilling Measured From:	KELLY BUSHING		
API Serial No. 05-077-09401	Section 28	Township 9S	Range 97

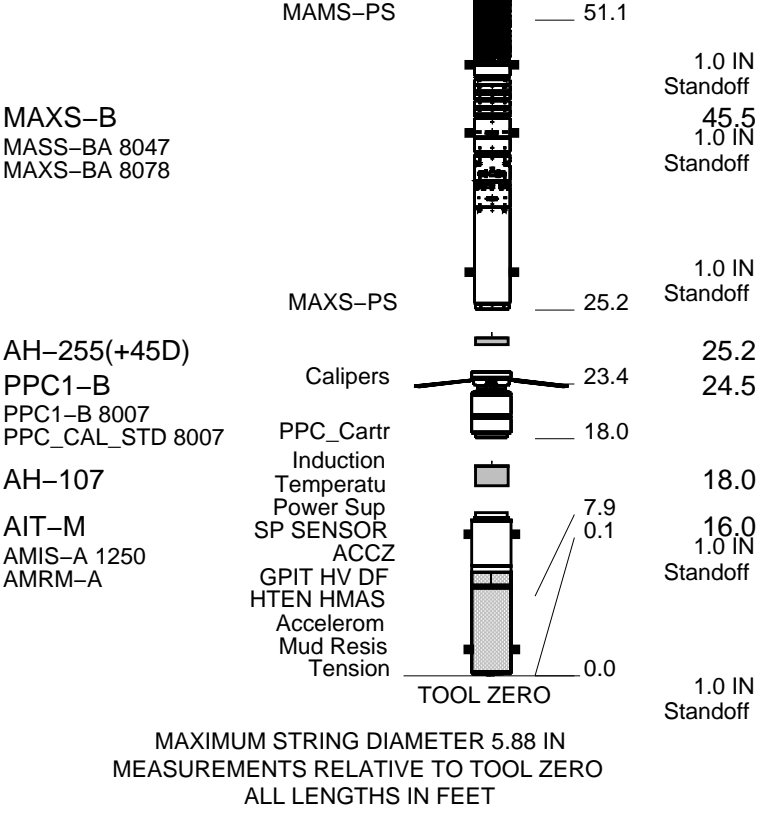
[illegible]

Logging Date	17-Jul-2011			
Run Number	1			
Depth Driller	11220 ft			
Schlumberger Depth	11200 ft			
Bottom Log Interval	11200 ft			
Top Log Interval	6863 ft			
Casing Driller Size @ Depth	7.000 in @ 6863 ft		@	
Casing Schlumberger	6863 ft			
Bit Size	6.125 in			
Type Fluid In Hole	OIL BASED MUD			
Density	Viscosity	30 s		
Fluid Loss	PH			
MUD				
Source Of Sample				
RM @ Measured Temperature	@		@	
RMF @ Measured Temperature	@		@	
RMC @ Measured Temperature	@		@	
Source RMF	RMC			
RM @ MRT	RMF @ MRT	@ 203	@ 203	@
Maximum Recorded Temperatures	203 degF			
Circulation Stopped	17-Jul-2011	4:00		
Logger On Bottom	18-Jul-2011	0:15		
Unit Number	Location	2379	VERNAL	
Recorded By	JOSH ROSNER/MIKE SEPTON			
Witnessed By	DARRELL BAXTER			

Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth		@		
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
Density	Viscosity			
Fluid Loss	PH			
Source Of Sample				
RM @ Measured Temperature		@		
RMF @ Measured Temperature		@		
RMC @ Measured Temperature		@		
Source RMF	RMC			
RM @ MRT	RMF @ MRT	@		@
Maximum Recorded Temperatures				
Circulation Stopped	Time			
Logger On Bottom	Time			
Unit Number	Location			
Recorded By				
Witnessed By				

TOOL RAN AS PER TOOL STRING
CORRECTED FOR HOLESIZE AND STANDOFF
MATRIX: SANDSTONE (2.68 G/CC)
LOG RAN OFF OF DRILL PIPE

CREW: ADAM MORRIL					
THANK YOU FOR CHOOSING SCHLUMBERGER!					
RUN 1 SERVICE ORDER #: BEHA-00072 PROGRAM VERSION: 18C0-147 FLUID LEVEL: 0 ft			RUN 2 SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP
EQUIPMENT DESCRIPTION					
RUN 1			RUN 2		
SURFACE EQUIPMENT WITM (EDTS)-A GSR-U/Y NCT-B CNB-AB NCS-VB					
DOWNHOLE EQUIPMENT					
DWCH-C					
DWCH-C		134.6			
AH-107		126.6			
SAH-E		124.6			
SAH-E					
HTCS-A	MDSB_EDTC				
HTCS-A	Mud Tempe	115.7			
	CTEM	112.2			
	Gamma Ray	110.3			
EDTC-B	EFTB DIAG	115.7			
EDTH-B	TelStatus				
EDTC-B	EDTCB Ele	109.2			
AH-NOMAG		109.2			
AH-NOMAG					
GPIT-C	HGNS HTEM				
GPIC-C	HMCA	98.7			
	HGNS Gamm	98.0			
HILTH-FTB	HGNS Neut	92.1			
HGNSD-H	HGNS Neut	91.6			
HMCA-H	HGNS sens	89.3			
HGNH	HRCC cart	83.3			
NLS-KL	MCFL	77.9			
NSR-F 5138	HILT cali	77.4			
HACCZ-H 3577	HRDD-LS				
HCNT-H	HRDD-SS				
HGR	HRDD-BS	77.0			
AH-107		75.0			
PPC2-B	Calipers	71.9			
PPC2-B 8352	PPC_Catr	66.5			
PPC_CAL_STD					
MAPC-B		66.5			
MAPC-BA 8023		1.0 IN			
ECH-SF 8023		Standoff			
MAMS-BA 8159		1.0 IN			
		Standoff			



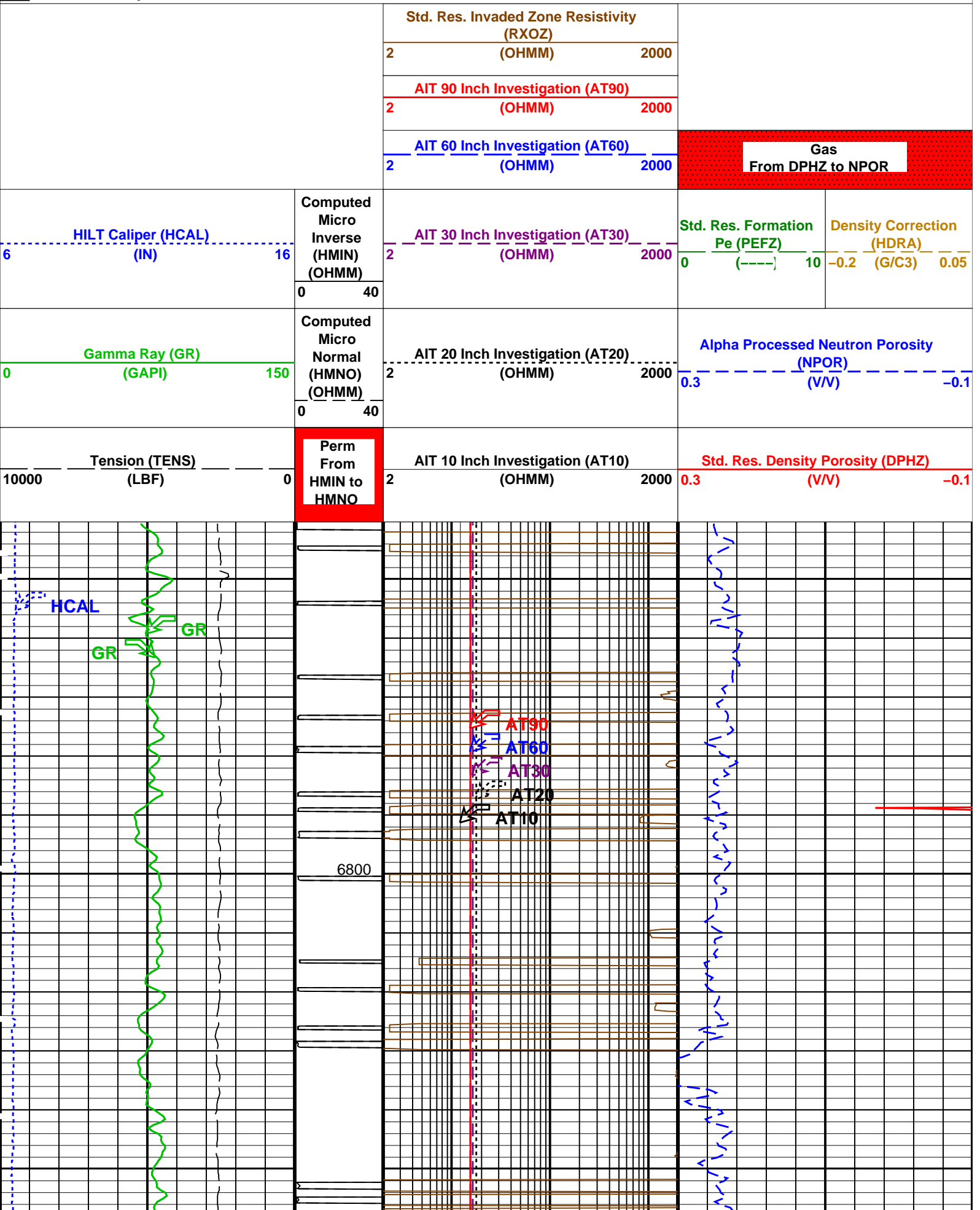
MAIN PASS
5" = 100'

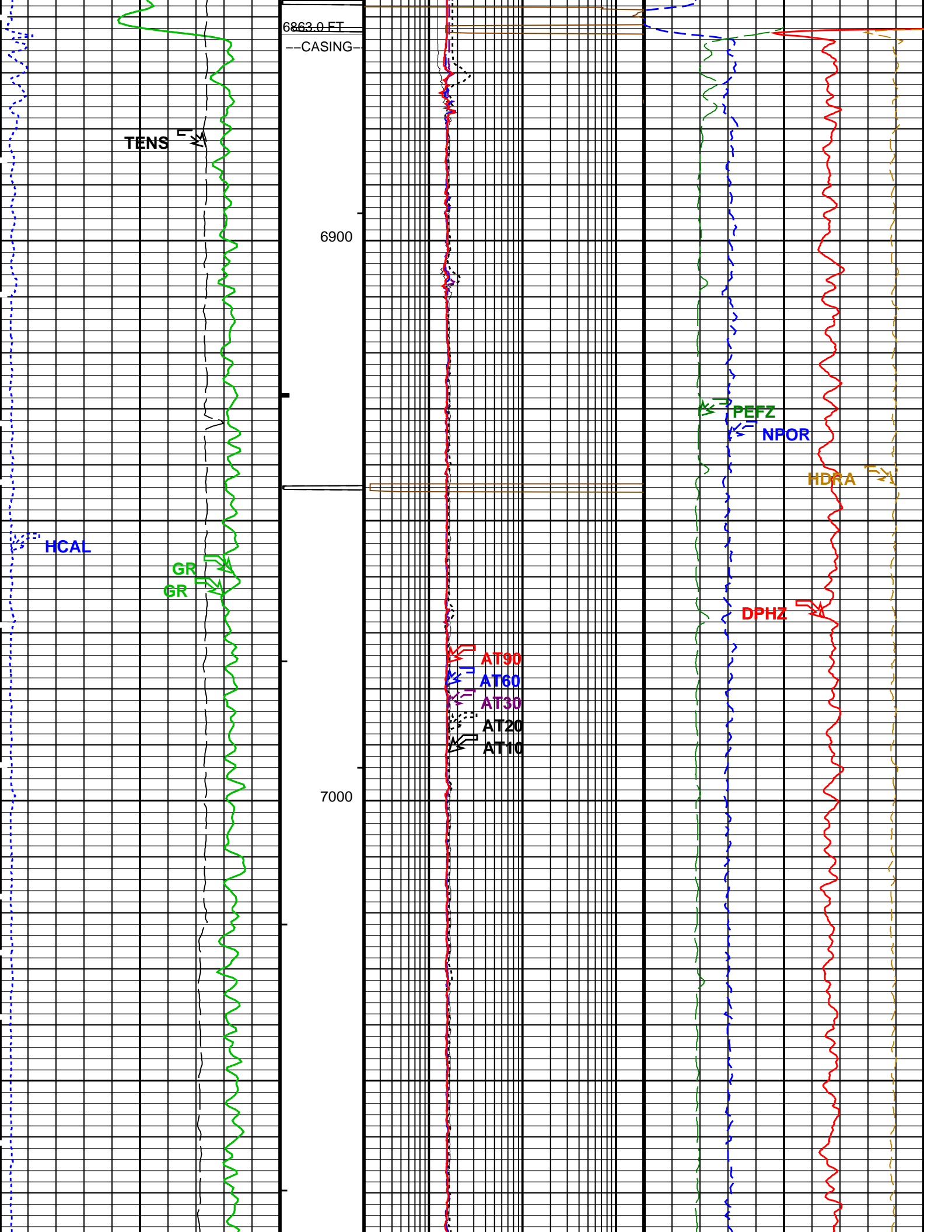
MAXIS Field Log

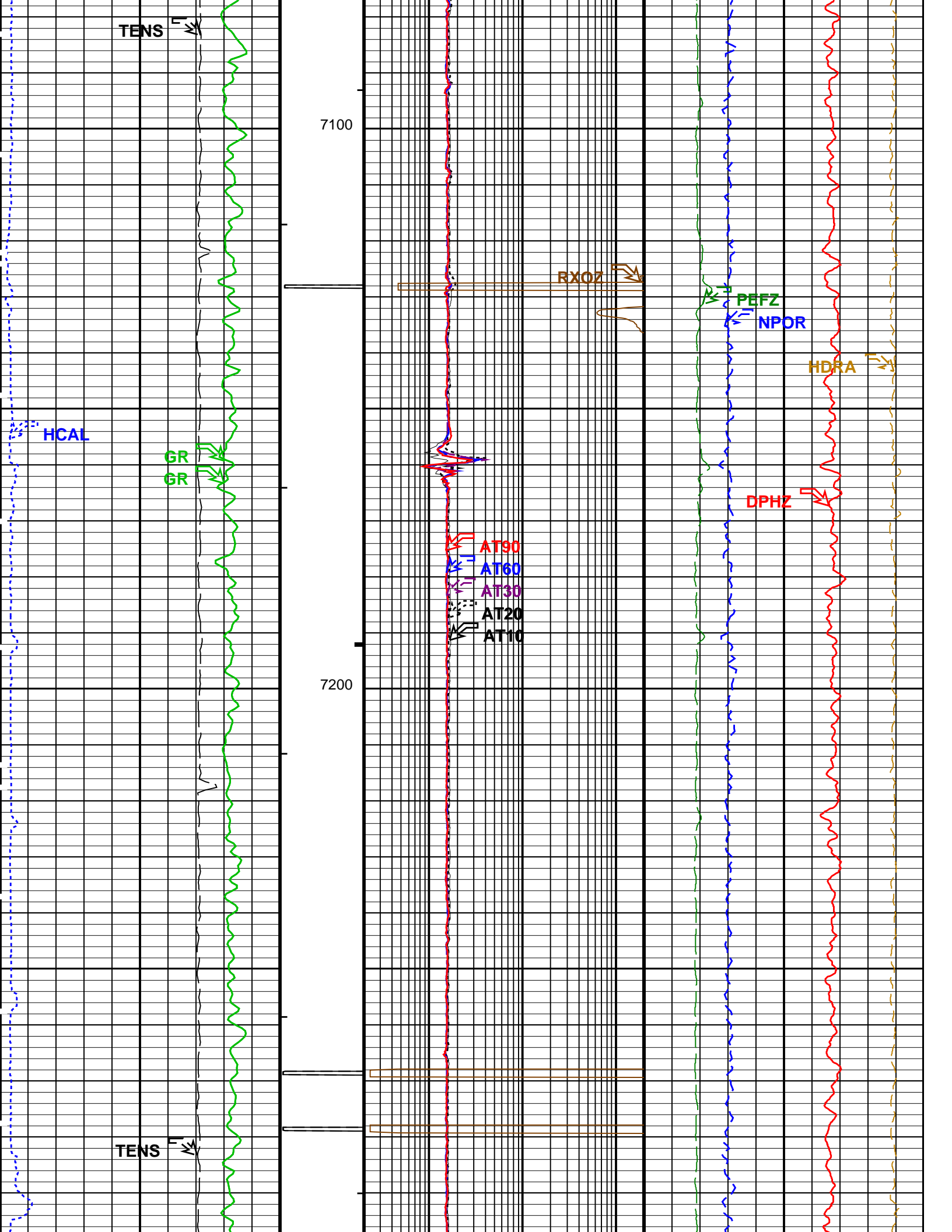
Company: BLACK HILLS PLATUEA PRODUCTION LLC				Well: HORSE SHOE CANYON 4-28		
Input DLIS Files						
DEFAULT	AIT_CAL_MAXS_MAPC_005LUP	FN:5	PRODUCER	18-Jul-2011 00:15	11202.0 FT	6729.0 FT
Output DLIS Files						
DEFAULT	AIT_CAL_MAXS_MAPC_007PUP	FN:8	PRODUCER	18-Jul-2011 07:11	11212.5 FT	6740.0 FT
RTB	AIT_CAL_MAXS_MAPC_007PUP	FN:9	PRODUCER	17-Jul-2011 07:11	11212.5 FT	6740.0 FT
Integrated Hole/Cement Volume Summary						
Hole Volume = 907.20 F3						
Cement Volume = 430.15 F3 (assuming 4.50 IN casing O.D.)						
Computed from 11202.0 FT to 6883.0 FT using data channel(s) CRD1_PPC1 CRD2_PPC1 CRD3_PPC1 CRD4_PPC1						
OP System Version: 18C0-147						
AIT-M	18C0-147		PPC1-B	18C0-147		
MAXS-B	18C0-147		MAPC-B	18C0-147		
PPC2-B	18C0-147		HILTH-FTB	18C0-147		
GPIT-C	18C0-147		EDTC-B	18C0-147		

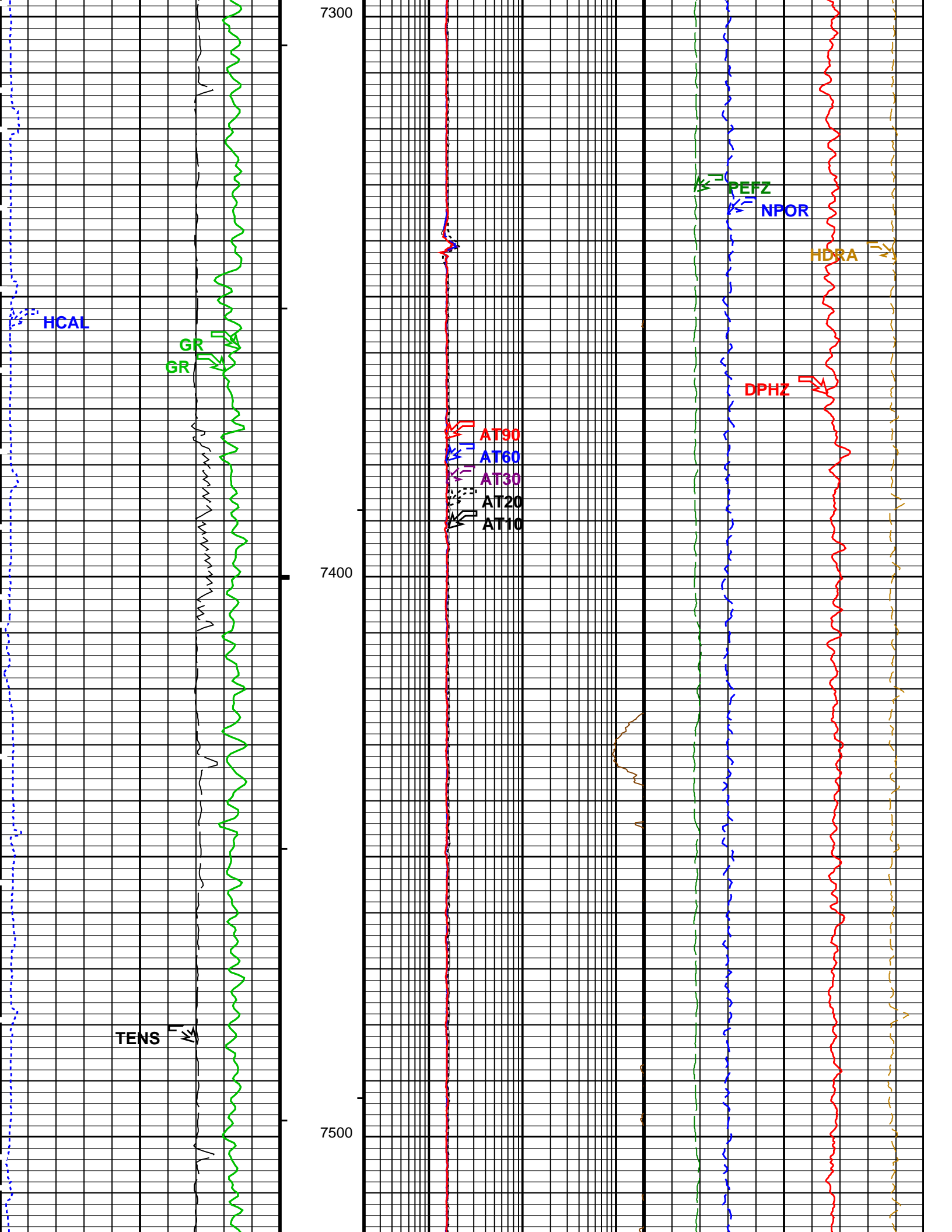
└ Integrated Hole Volume Minor Pip Every 10 F3
└ Integrated Hole Volume Major Pip Every 100 F3
└ Integrated Cement Volume Minor Pip Every 10 F3
└ Integrated Cement Volume Major Pip Every 100 F3

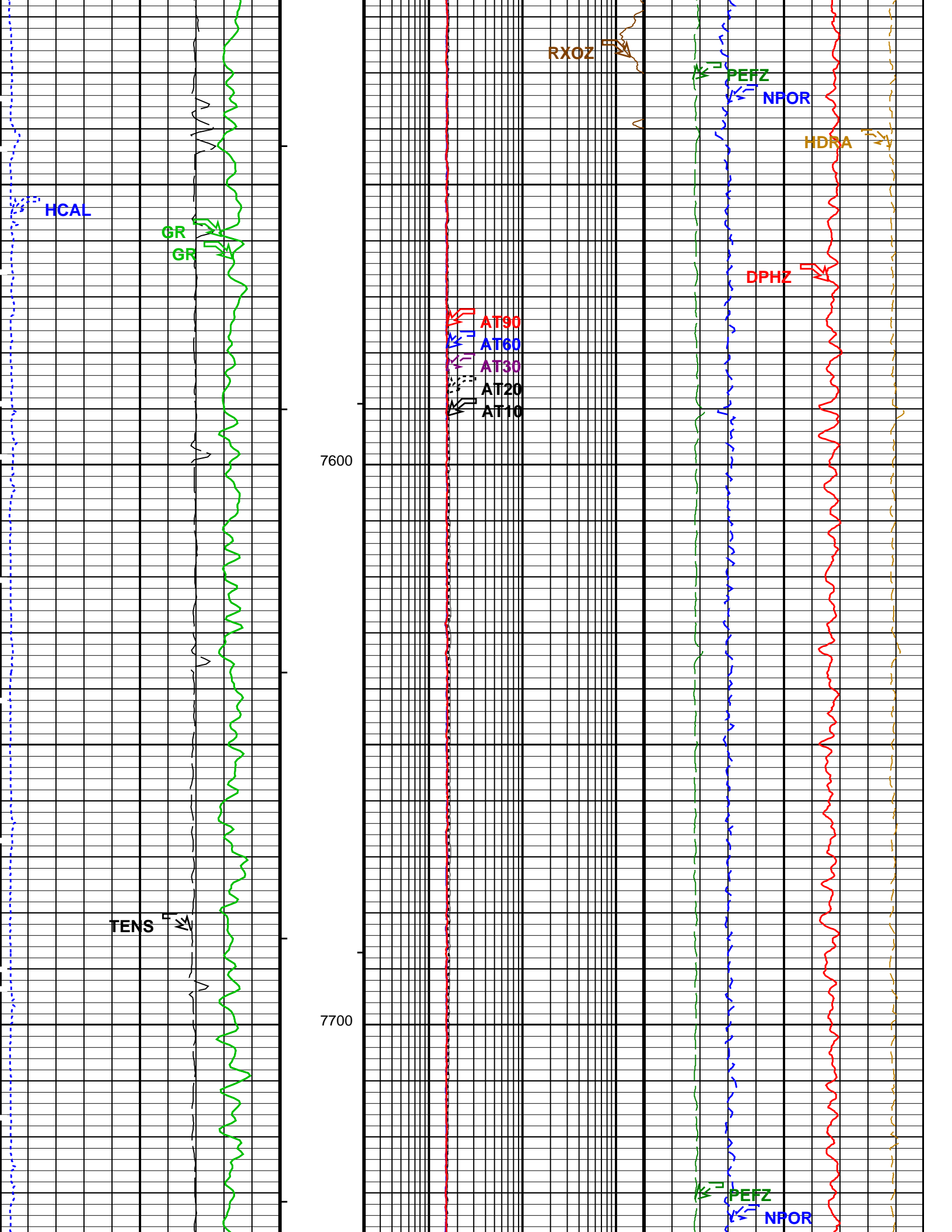
Time Mark Every 60 S

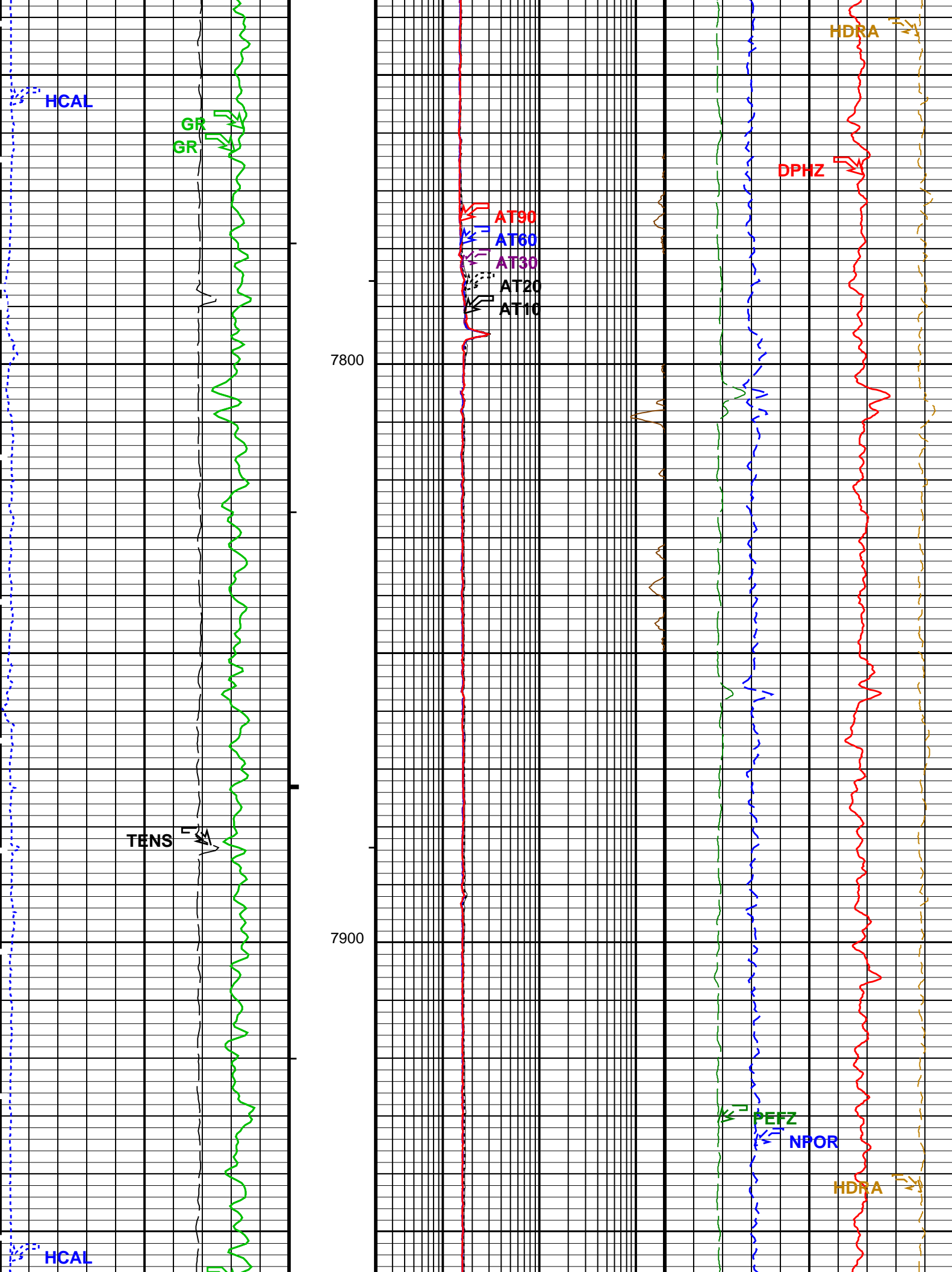


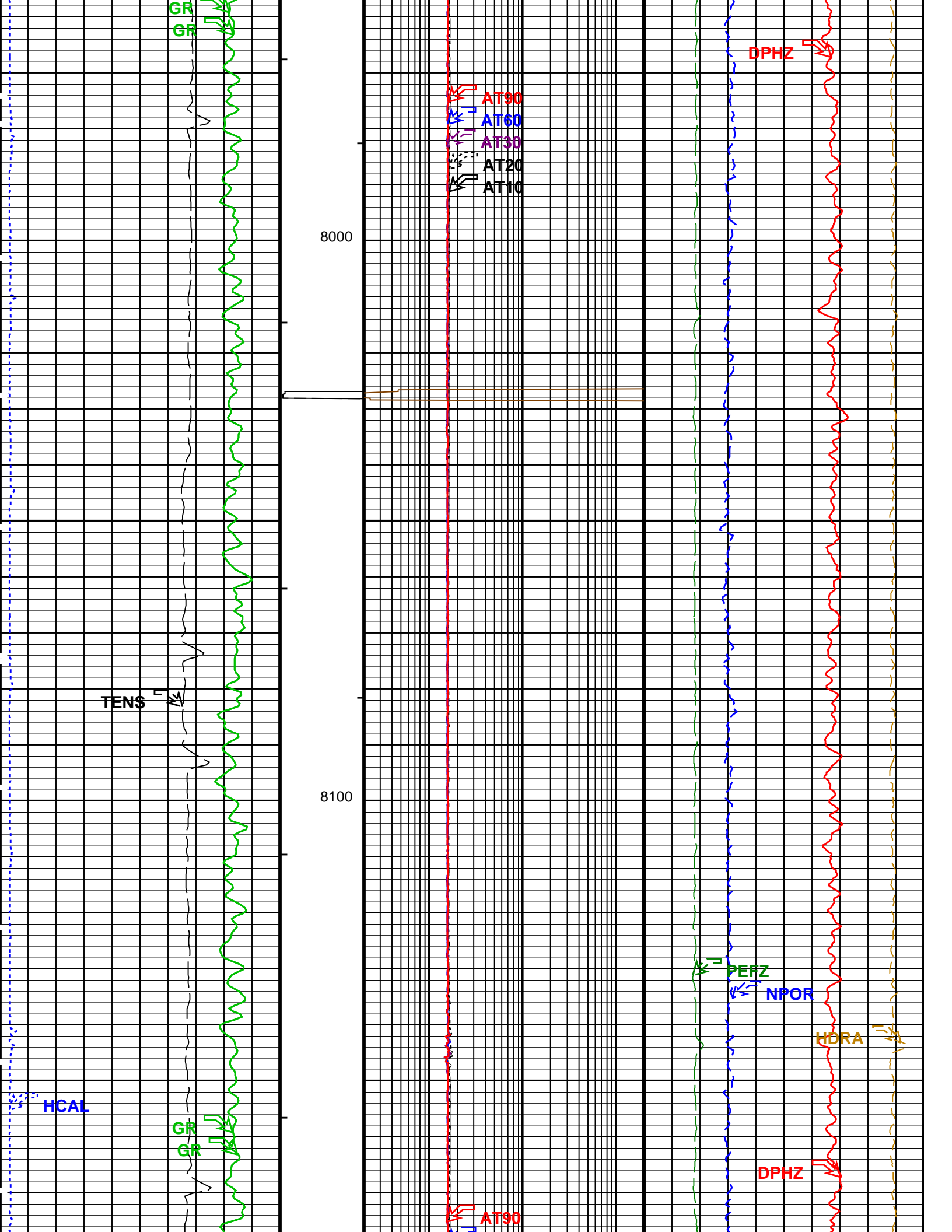


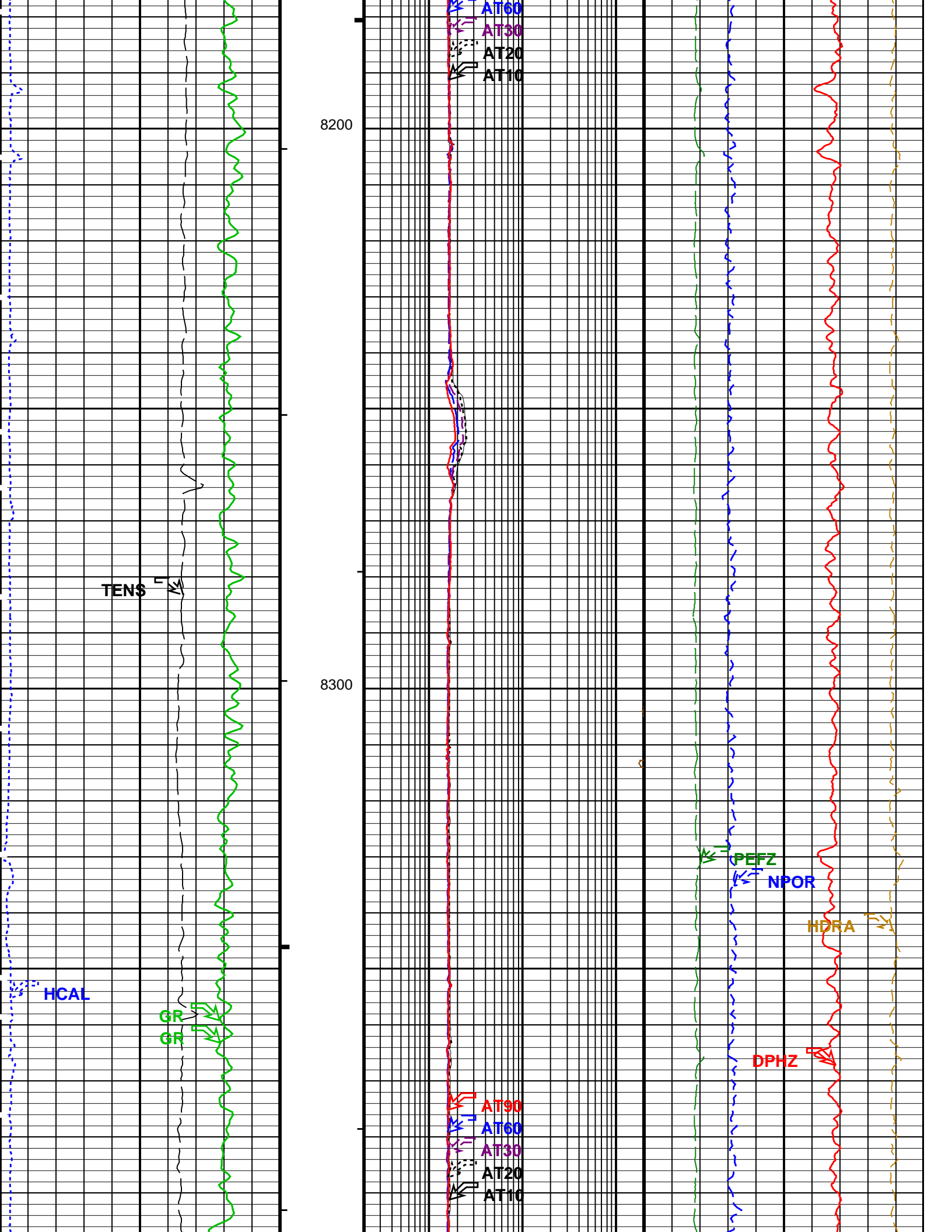


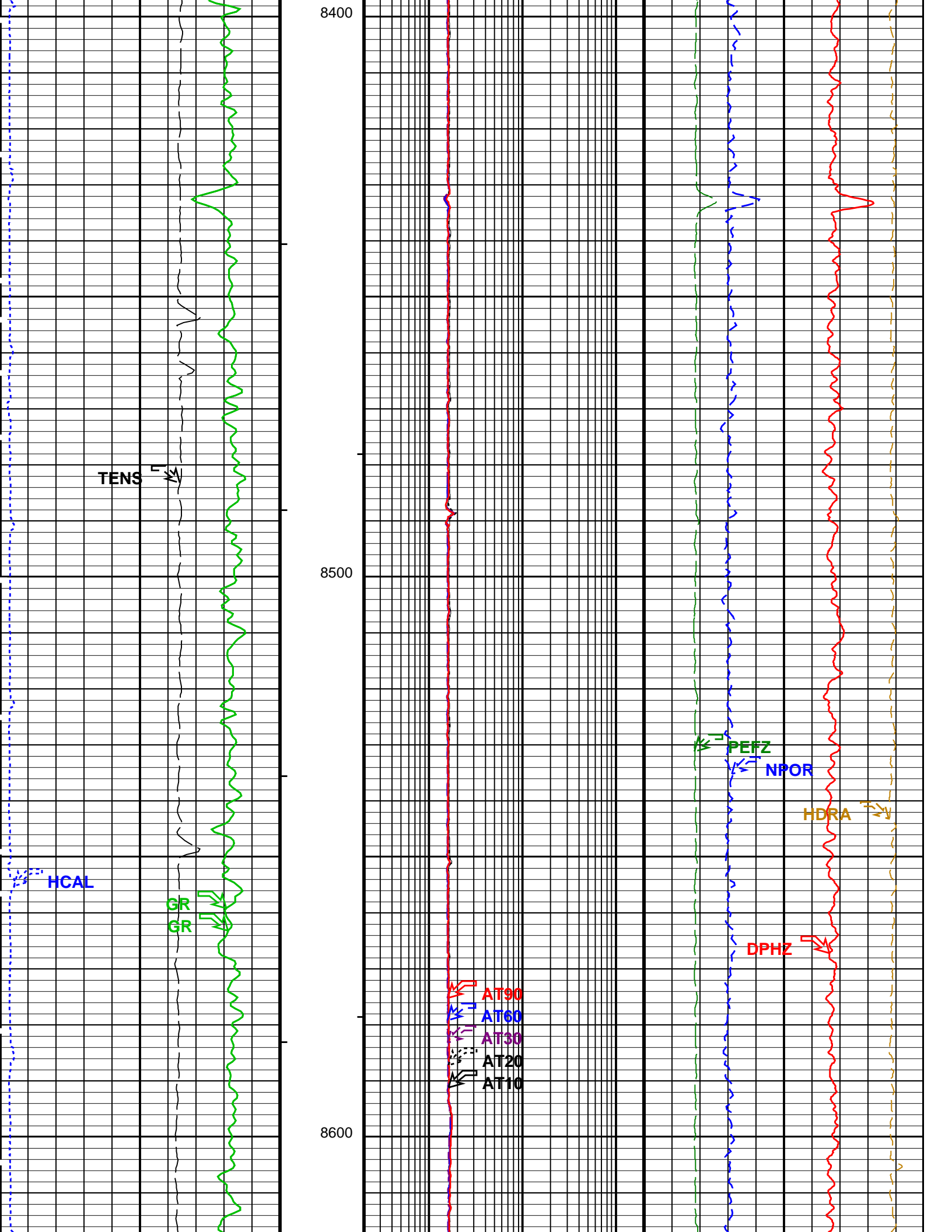


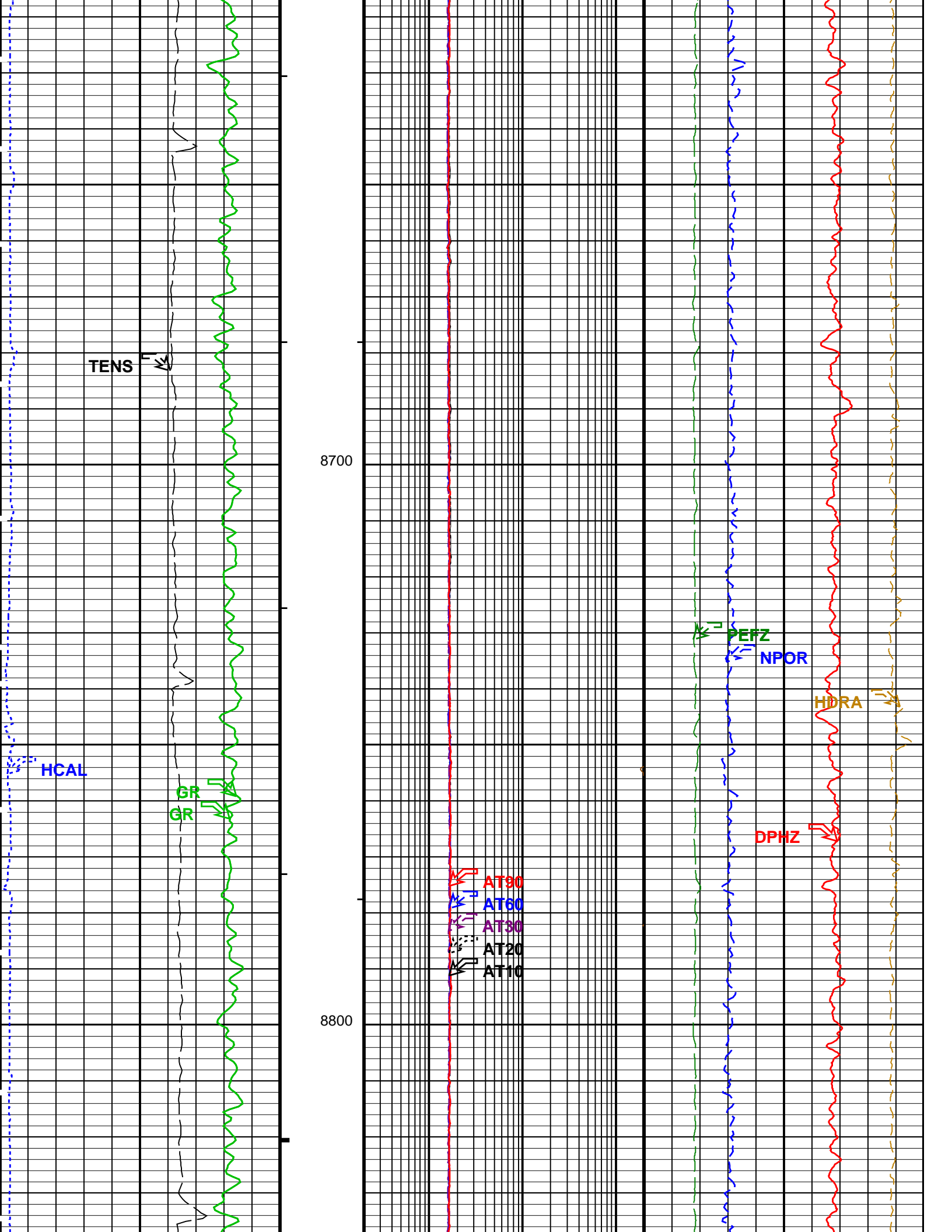


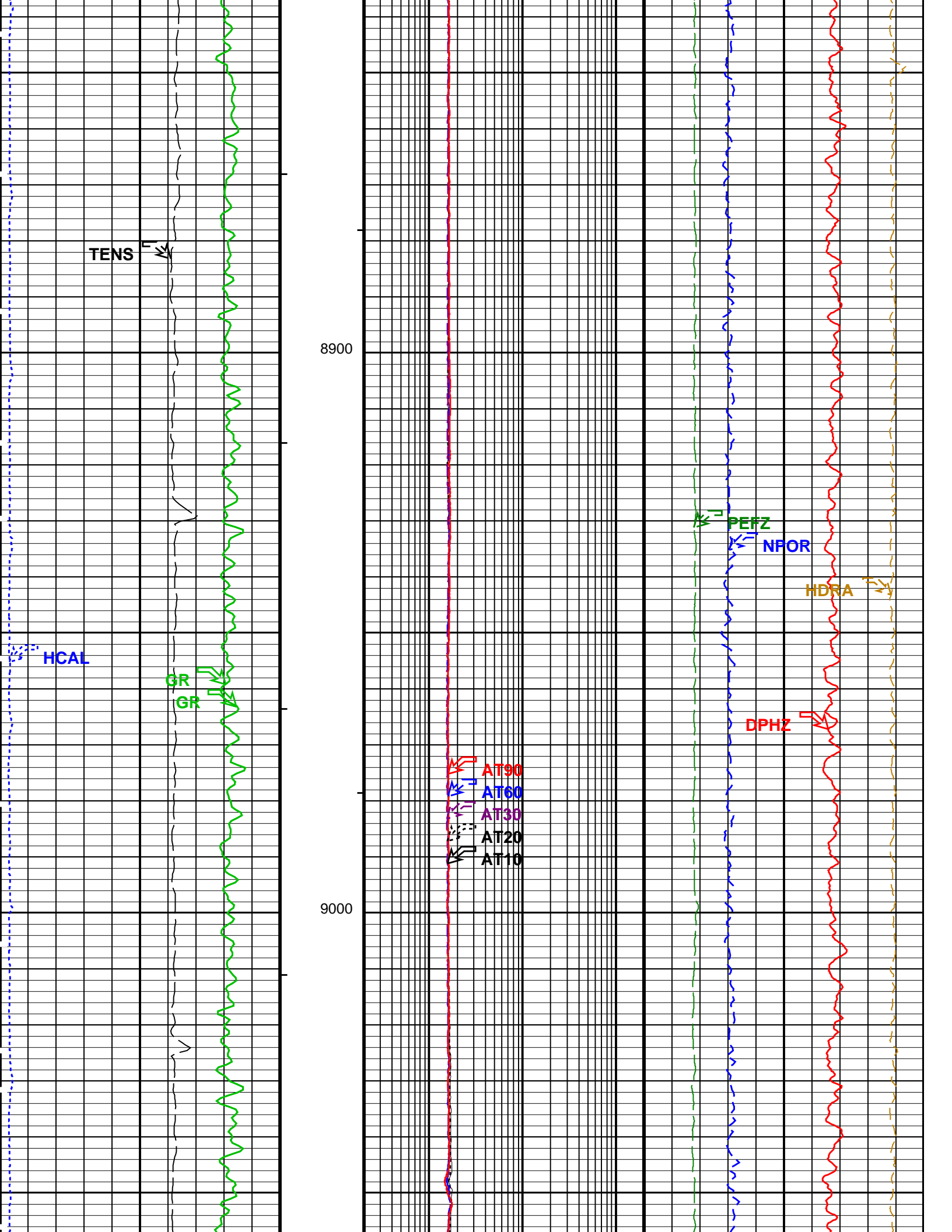


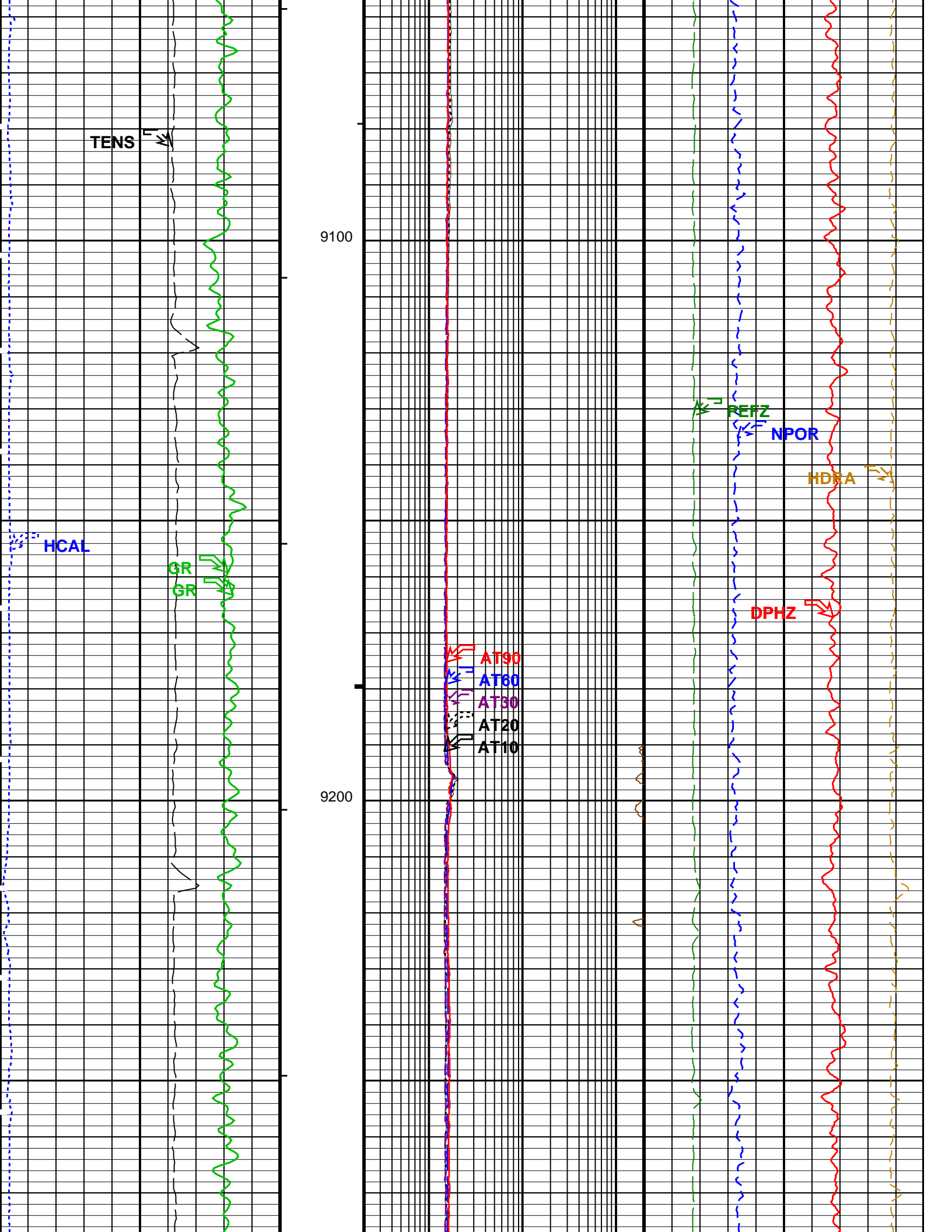


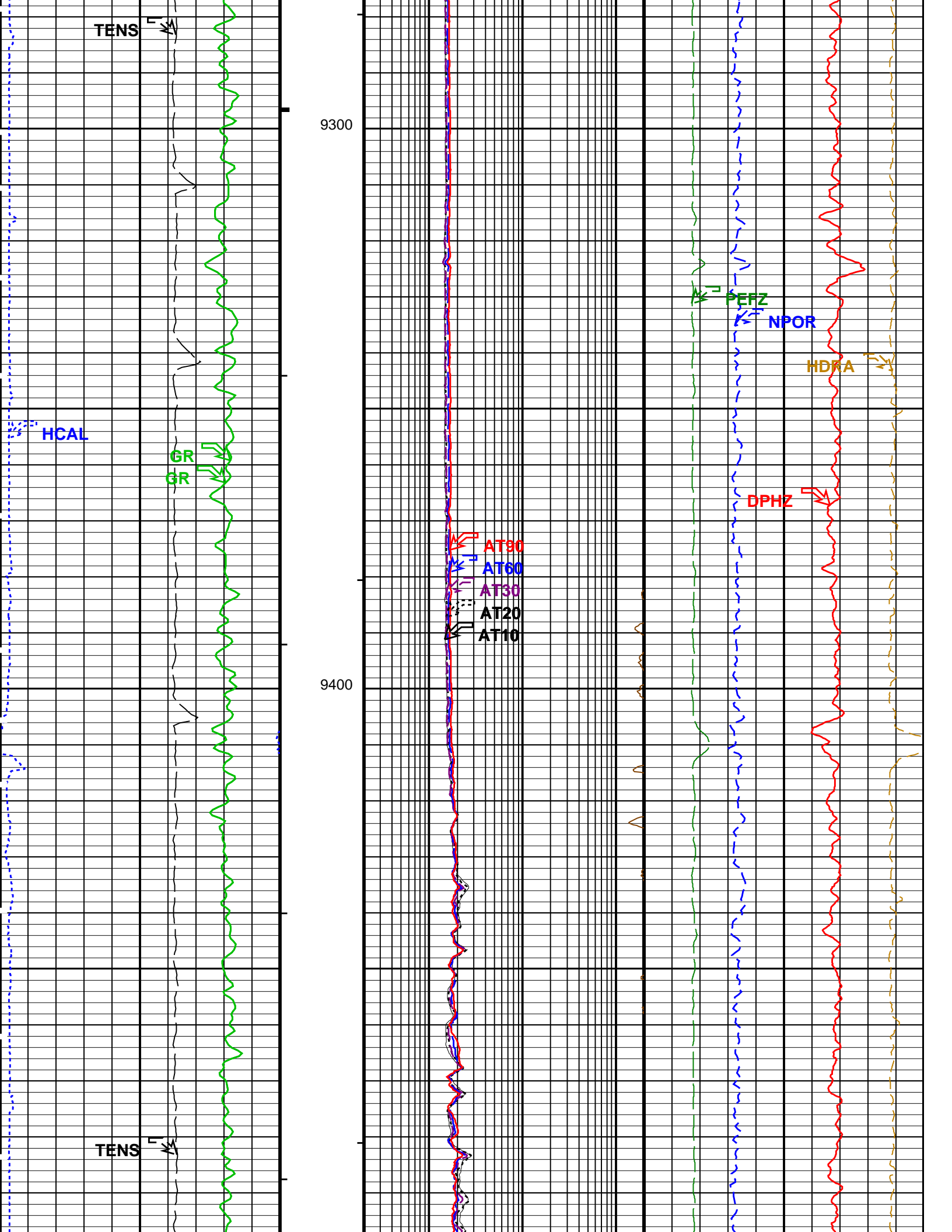


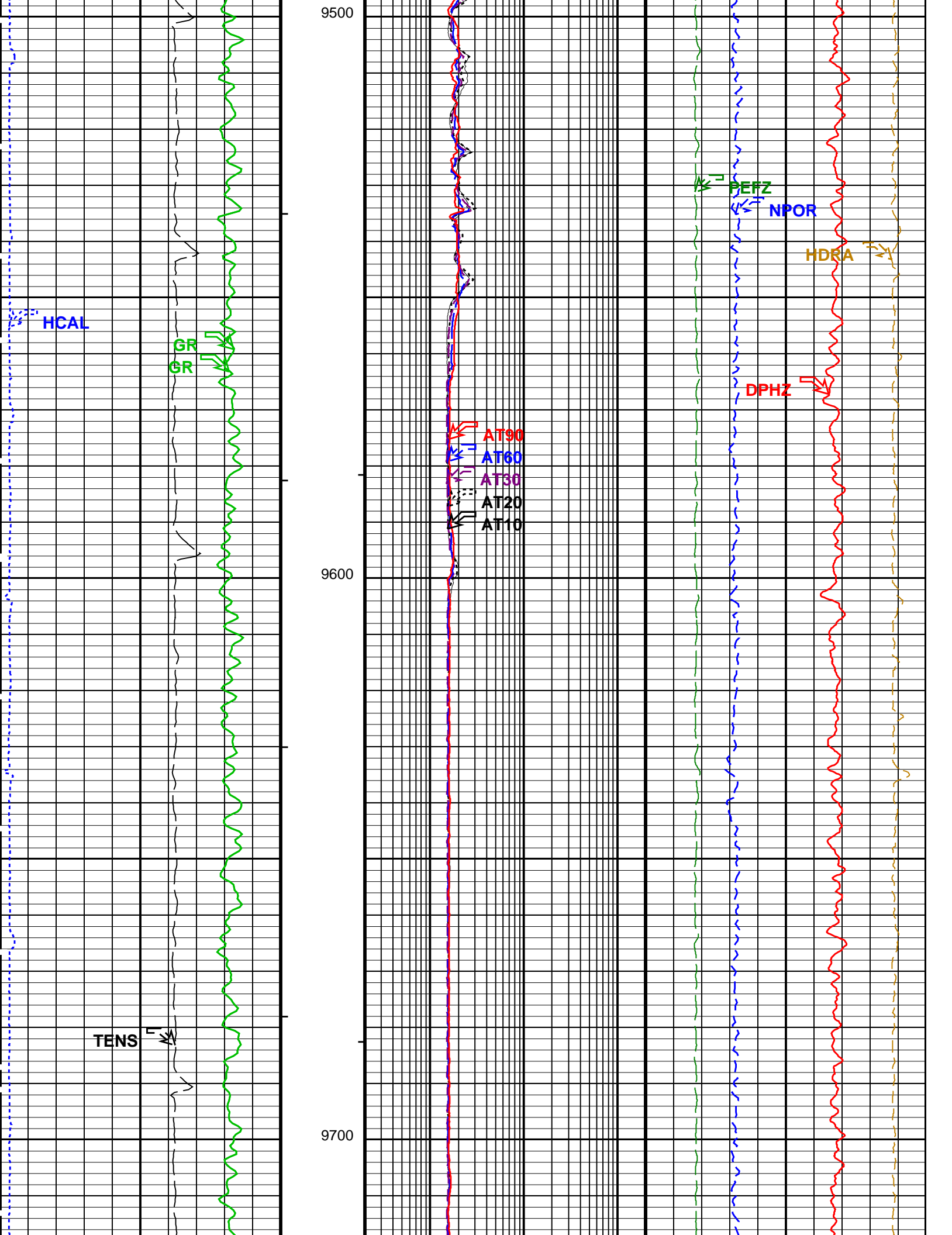


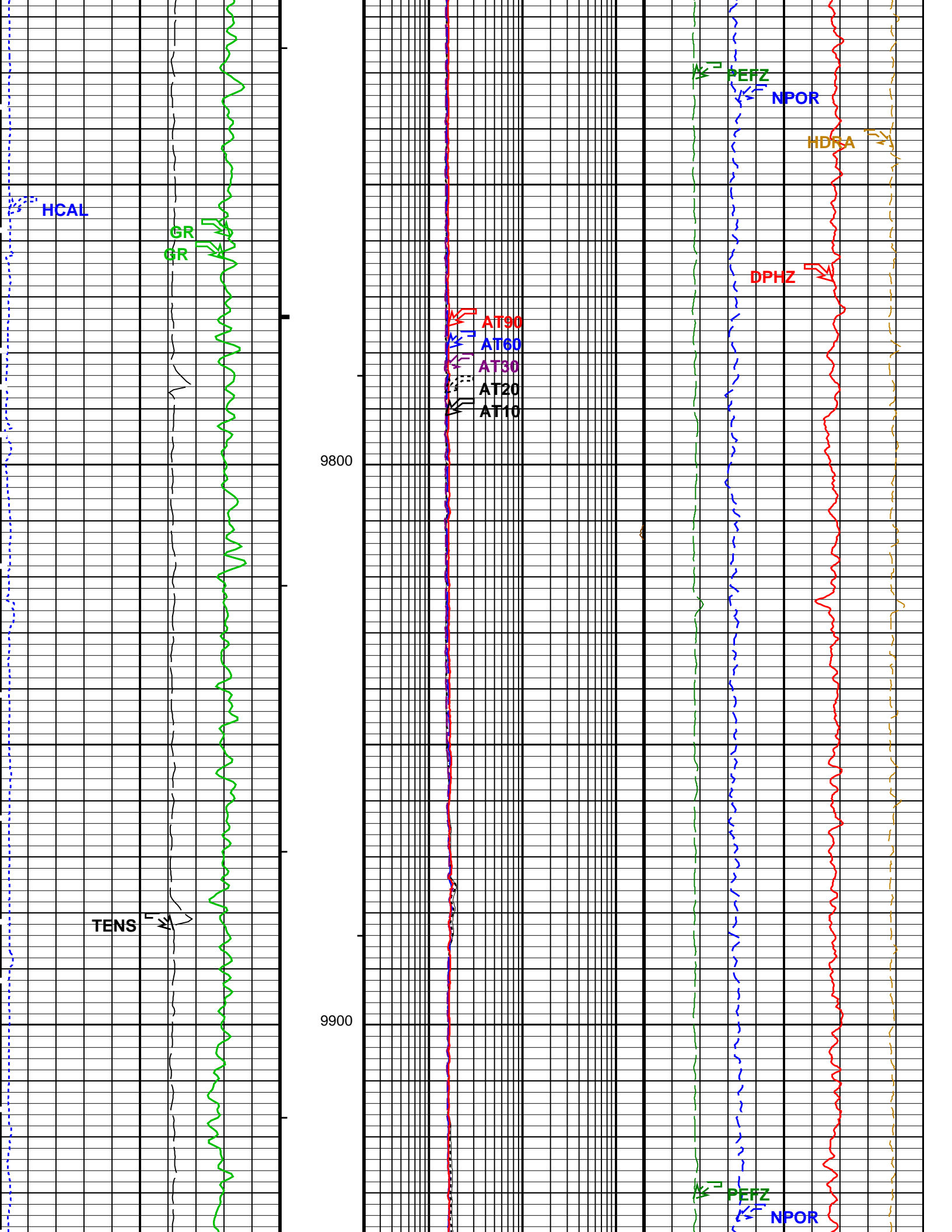


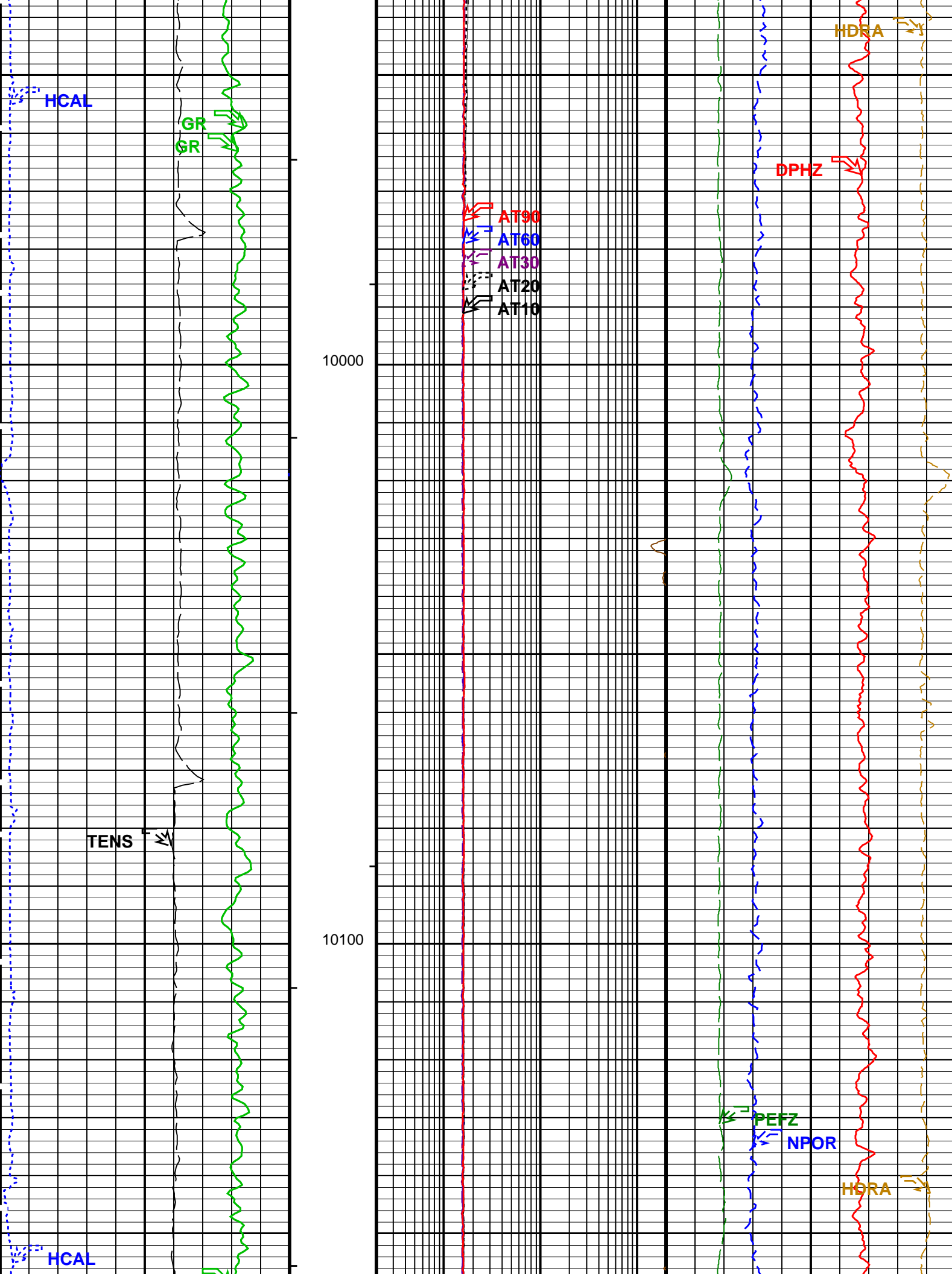


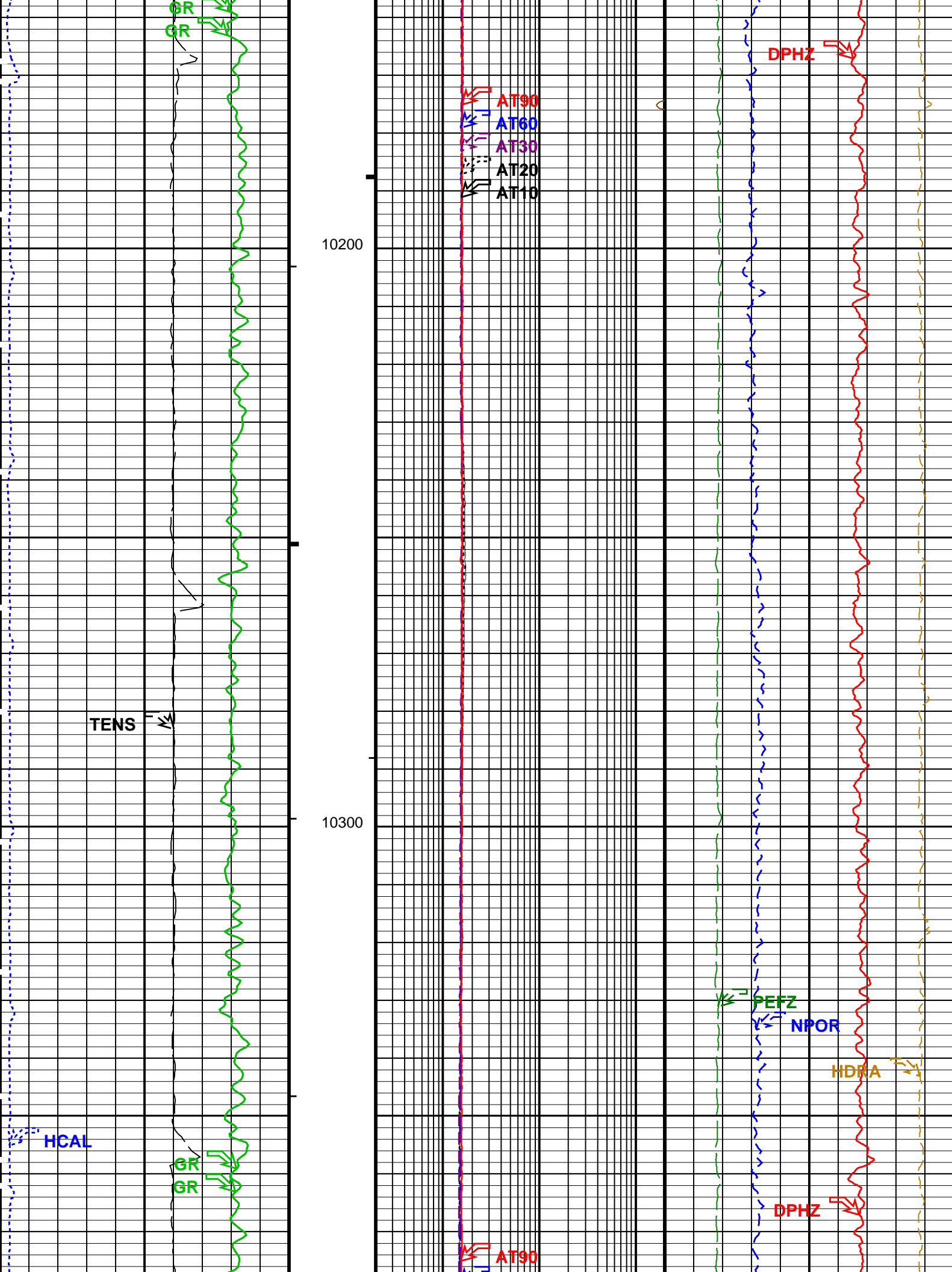


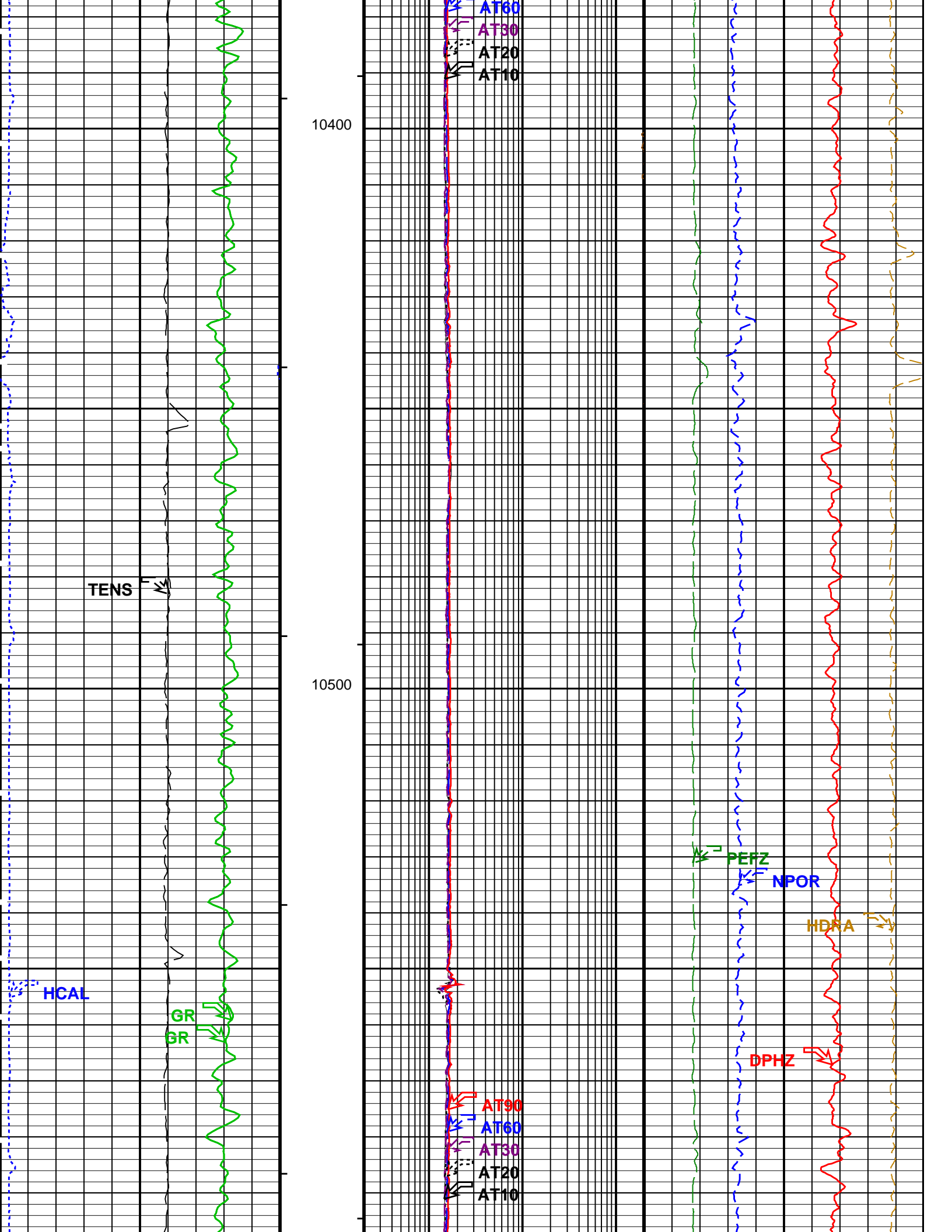


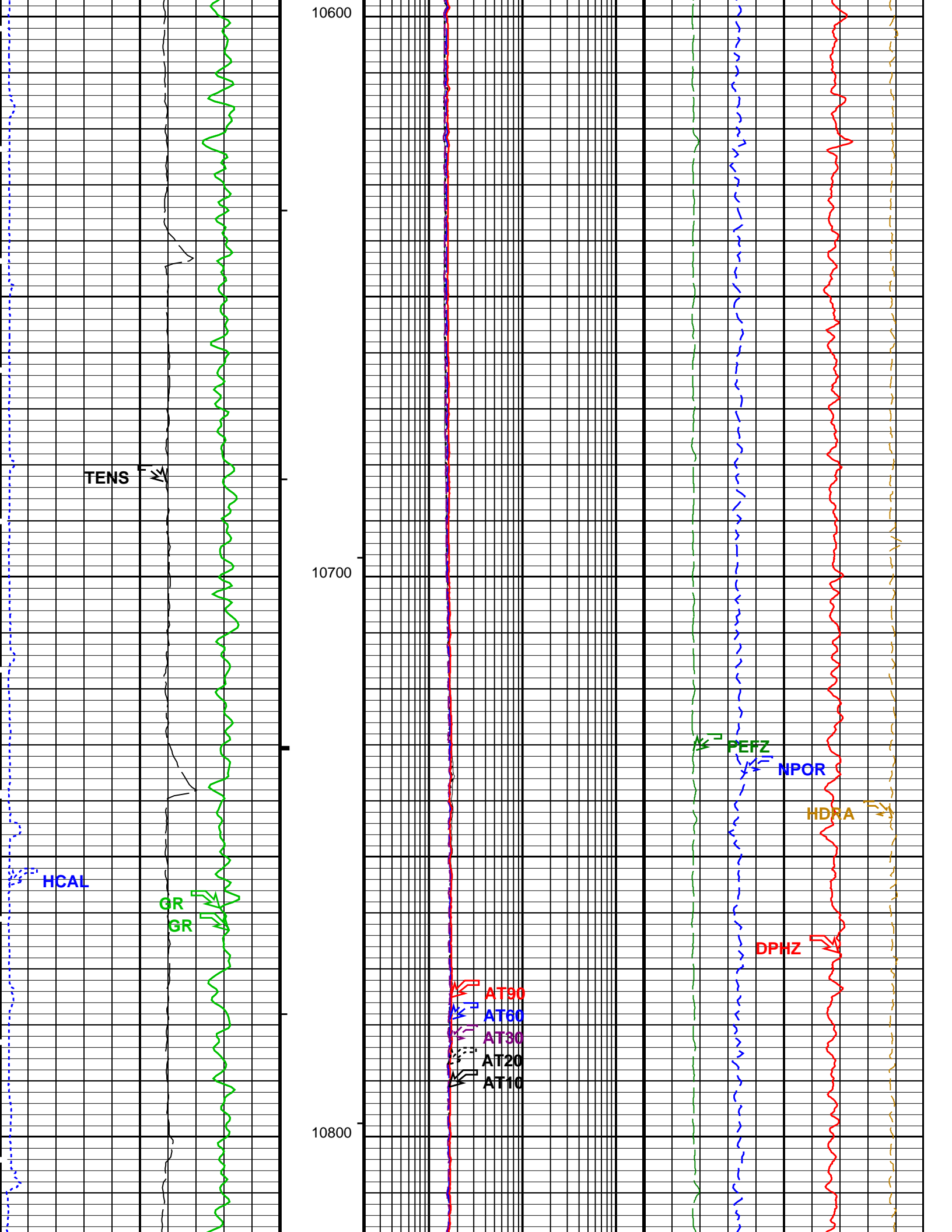


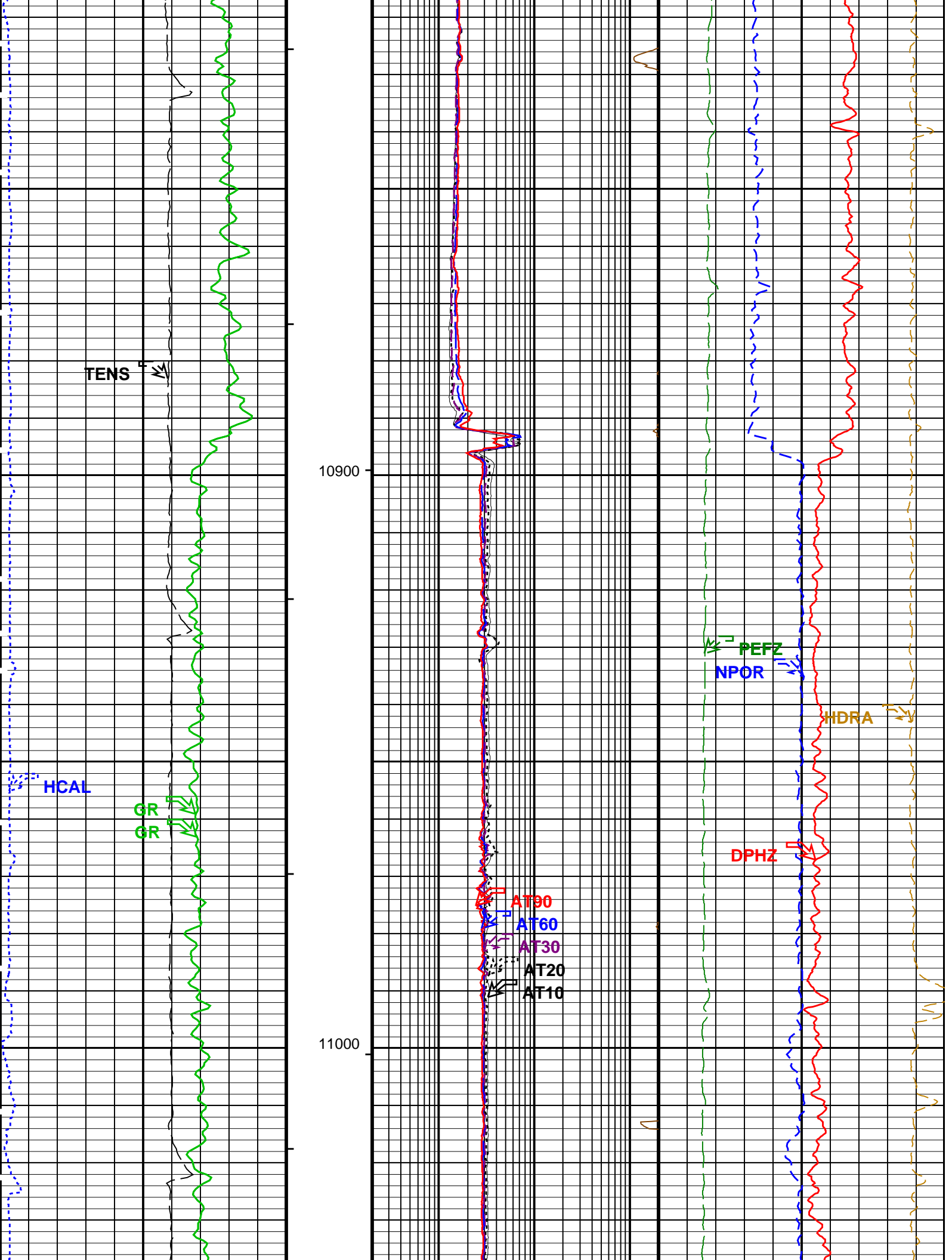


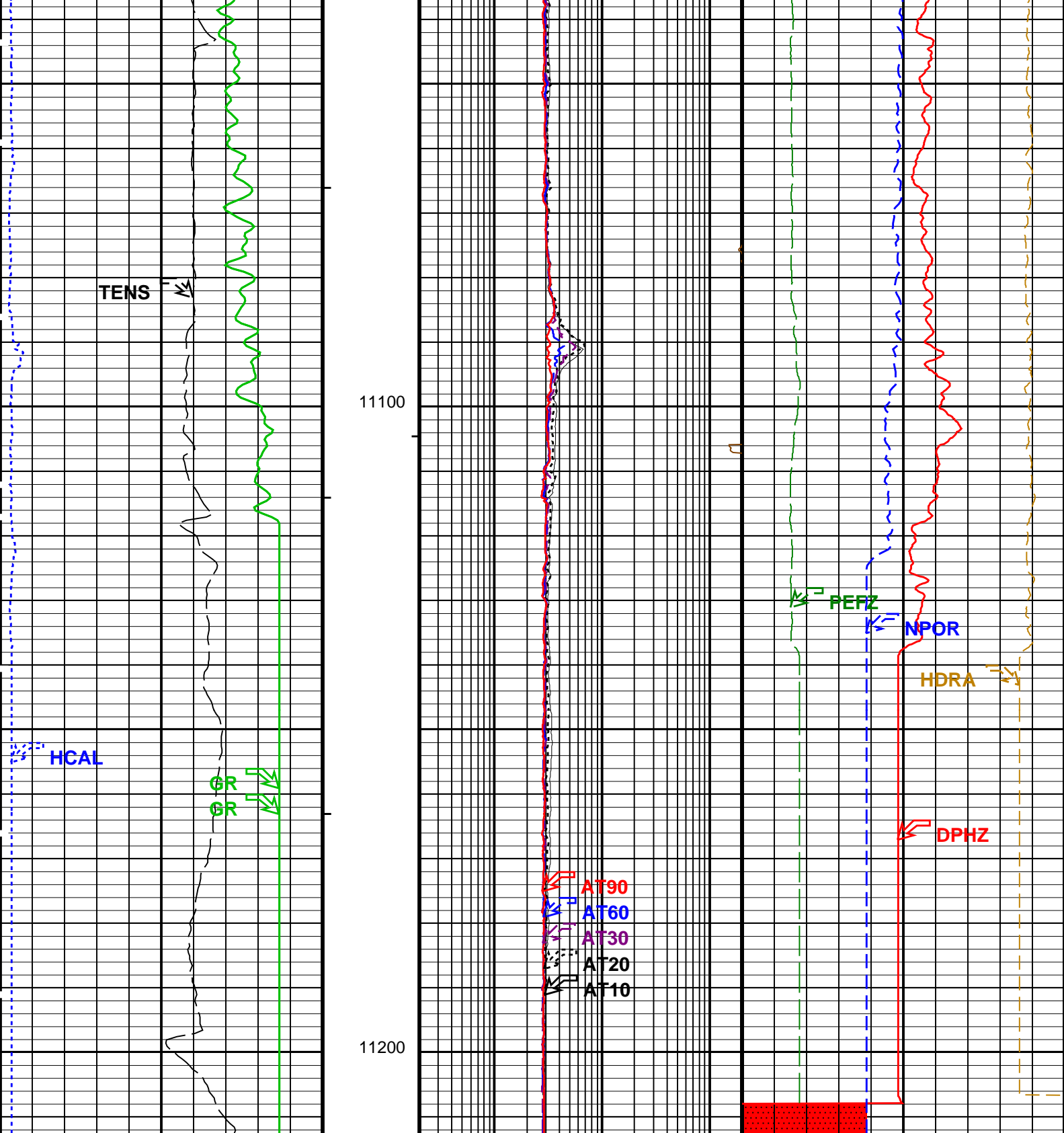












<p>Tension (TENS) (LBF)</p> <p>10000 0</p>	<p>Perm From HMIN to HMNO</p>	<p>AIT 10 Inch Investigation (AT10) (OHMM)</p> <p>2 2000</p>	<p>Std. Res. Density Porosity (DPHZ) (V/V)</p> <p>0.3 -0.1</p>	
<p>Gamma Ray (GR) (GAPI)</p> <p>0 150</p>	<p>Computed Micro Normal (HMNO) (OHMM)</p> <p>0 40</p>	<p>AIT 20 Inch Investigation (AT20) (OHMM)</p> <p>2 2000</p>	<p>Alpha Processed Neutron Porosity (NPOR) (V/V)</p> <p>0.3 -0.1</p>	
<p>HCT Caliper (HCT)</p>	<p>Computed Micro Inverse</p>	<p>AIT 30 Inch Investigation (AT30)</p>	<p>Std. Res. Formation</p>	<p>Density Correction</p>

6	(IN)	16	Inverse (HMIN) (OHMM)	2	(OHMM)	2000	0	Pe (PEFZ) (-----)	10	-0.2	(HDRA) (G/C3)	0.05
		0	40									
				2	<u>AIT 60 Inch Investigation (AT60)</u> (OHMM)	2000	<div>Gas From DPHZ to NPOR</div>					
				2	<u>AIT 90 Inch Investigation (AT90)</u> (OHMM)	2000						
				2	Std. Res. Invaded Zone Resistivity (RXOZ) (OHMM)	2000						
PIP SUMMARY												
└ Integrated Hole Volume Minor Pip Every 10 F3												
└ Integrated Hole Volume Major Pip Every 100 F3												
└ Integrated Cement Volume Minor Pip Every 10 F3												
└ Integrated Cement Volume Major Pip Every 100 F3												
Time Mark Every 60 S												

Parameters

DLIS Name	Description	Value	
AIT-M: Array Induction Tool – M			
AAPL	Array Induction Answer Product Level(Depth Log/View only)		
	3_BholeCorr_BasicLogs_RadialProcessing		
ABHM	Array Induction Borehole Correction Mode	0_ComputeMudResistivity	
ABHV	Array Induction Borehole Correction Code Version Number	900	
ABLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
ABLV	Array Induction Basic Logs Code Version Number	223	
ACDE	Array Induction Casing Detection Enable	Yes	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	6852	FT
ADITM	Array Induction Desired Tool Mode	0x00_Log_000	
AEBC	Array Induction Enable Borehole Correction	Yes	
AEBL	Array Induction Enable Basic Logs	Yes	
AERP	Array Induction Enable Radial Processing	Yes	
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AFVN	Array Induction Firmware Code Version Number	1	
AIGS	Array Induction Select Akima Interpolation Gating	On	
ALNV	Array Induction Log Not Valid Flag	Log_Valid-No_Default_Parameters	
AMRD	Array Induction Mud Resistivity Calibration Depth	0	FT
AMRF	Array Induction Mud Resistivity Factor	1	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Processing Code Version Number	701	
ARPM	Array Induction Radial Profiling Mode	6_One_Two_and_Four	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ARTS	AIT Rt Selection (for ALLRES computation)	AITM_FourResA90	
ASTA	Array Induction Tool Standoff	0.125	IN
ATRSV	Array Induction Response Set Version for Two ft Resolution	41.70.24.20	
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	Internal	
ATTY	Array Induction Tool Type (of acquired data)	AITM	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
RTCO	RTCO – Rt Invasion Correction	YES	
SHT	Surface Hole Temperature	76	DEGF
SPNV	SP Next Value	0	MV
PPC1-B: Powered Positioning Device/Caliper 1			
	PPC1 Caliper Type	CAL_STD	
CLBD_PPC	PPC Calibration data selection	ROM	
PWEL_PPC	PPC Primary Tool for WellCAD	NONE	
SWEL_PPC	PPC Secondary Tool for WellCAD (45 Degrees Rotation PPC Tool)	NONE	
WRDR_PPC	PPC Rotation Direction for Secondary Tool	NONE	
MAXS-B: Multimode Array Sonic Xmitter Sonde			
FIRING TABLE	MAST Firing Table	** V **	

FIRING_TABLE	MAST Firing Table	** V **	
TX_AMP	Transmitter Amplitude Factor		
U_CE_CBLG7	CBL Gate Width 7 for Cement Evaluation	80	US
U_CE_CBLG8	CBL Gate Width 8 for Cement Evaluation	80	US
U_CE_NMSG7	Near Minimum Sliding Gate 7 for Cement Evaluation	220	US
U_CE_NMSG8	Near Minimum Sliding Gate 8 for Cement Evaluation	220	US
U_CE_SGDT7	Sliding Gate Delta-T 7 for Cement Evaluation	57	US/F
U_CE_SGDT8	Sliding Gate Delta-T 8 for Cement Evaluation	57	US/F
MAPC-B: Multimode Array Sonic Power Cartridge			
AZIM_SELECT	Azimuth Reference Selection	P1AZ	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BS	Bit Size	6.125	IN
CDTS	C-Delta-T Shale	100	US/F
CE_DCBLSEL	DCBL Selection for Cement Evaluation	3_5FT	
CE_VDLGRA	VDL Manual Gain Rate Array for Cement Evaluation	** V **	
CE_VDLSEL	VDL Selection for Cement Evaluation	MU_5FT	
CE_VDL_MODE	DCBL/VDL Mode for Cement Evaluation	STANDARD	
CE_VFILSWA	VDL Filter Switch Array for Cement Evaluation	** V **	
CLASSAL	Classification Algorithm	** V **	
CRVIN_MF	Alteration Detection Input Number for Monopole Far	ID3	
CRVIN_ML	Alteration Detection Input Number for Monopole Lower	ID2	
CRVIN_MU	Alteration Detection Input Number for Monopole Upper	ID1	
DCRMVL	DC Offset Removal Option	DC_MULTIPLE	
DLHS	Hole Diameter Source for SOBS Channel	AUTO	
DTCO_SELECT	Delta-T Compressional Selection for Finalization	MF	
DTF	Delta-T Fluid	221.6	US/F
DTM	Delta-T Matrix	56	US/F
DTSH_SELECT	Delta-T Shear Selection for Finalization	XD	
DWF7_SPEC	Channel/Station/Azimuth for VDL (DWF7) of Measurement 7		
DWF8_SPEC	Channel/Station/Azimuth for VDL (DWF8) of Measurement 8		
FIRING_TABLE	MAST Firing Table	** V **	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
IMG_DTCO_SEL_MAST	Imaging Input DT Compressional Selection	CONSTANT_DTCO	
IMG_EST_DTCO_MAST	Imaging Estimated DT Compressional	120	US/F
IMG_RBS	Imaging Relative Bearing Selection	RB1	
ISSBAR	Barite Mud Switch	NOBARITE	
ITTS	Integrated Transit Time Source	DTCO	
MAST_AZIM_PROC_SWITCH	MAST Azimuth Process Switch	ON	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NFPI_ML	Free Pipe Amplitude for ML	0	
NFPI_MU	Free Pipe Amplitude for MU	0	
NRSA	Number of Receivers in Sub-Array	** V **	
RBC	Relative Bearing Correction Allow/Disallow	DISALLOW	
ROTIN_XD	Alford Rotation X Dipole Measurement Number	ID5	
ROTIN_YD	Alford Rotation Y Dipole Measurement Number	ID6	
ROTWINDOW_CTRL	Alford Rotation Window Control	ON	
ROT_AI	Dipole Waveform Rotation Averaging Depth Interval	5	FT
ROT_FIL LENG	Alford Rotation Filter Length	101	
ROT_TWD	Alford Rotation Window Time Width	1000	US
ROT_TWO	Alford Rotation Window Time Offset	1080	US
ROT_XFH	Alford Rotation Filter High Cutoff	2500	HZ
ROT_XFL	Alford Rotation Filter Low Cutoff	1000	HZ
SHT	Surface Hole Temperature	76	DEGF
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DTCO	
STCAL	STC Algorithm	** V **	
STCSEL1	Station Selection for STC for Measurement 1	** V **	
STCSEL2	Station Selection for STC for Measurement 2	** V **	
STCSEL3	Station Selection for STC for Measurement 3	** V **	
STCSEL4	Station Selection for STC for Measurement 4	** V **	
STCSEL5	Station Selection for STC for Measurement 5	** V **	
STCSEL6	Station Selection for STC for Measurement 6	** V **	
STCSEL_FAST	Station Selection for STC for DT_FAST	** V **	
STCSEL_SLOW	Station Selection for STC for DT_SLOW	** V **	
TRMIN	Alteration Detection Minimum Transmitter Receiver Spacing for Processing	3.0	FT
TX_AMP	Transmitter Amplitude Factor	** V **	
U_CE_CBLG7	CBL Gate Width 7 for Cement Evaluation	80	US
U_CE_CBLG8	CBL Gate Width 8 for Cement Evaluation	80	US
U_CE_NMSG7	Near Minimum Sliding Gate 7 for Cement Evaluation	220	US
U_CE_NMSG8	Near Minimum Sliding Gate 8 for Cement Evaluation	220	US
U_CE_SGDT7	Sliding Gate Delta-T 7 for Cement Evaluation	57	US/F
U_CE_SGDT8	Sliding Gate Delta-T 8 for Cement Evaluation	57	US/F
U_SLL1_MAST	MAST DSTC Slowness Lower Limit 1	0	US/F
U_SLL2_MAST	MAST DSTC Slowness Lower Limit 2	0	US/F
U_SLL3_MAST	MAST DSTC Slowness Lower Limit 3	40	US/F
U_SLL4_MAST	MAST DSTC Slowness Lower Limit 4	180	US/F
U_SLL5_MAST	MAST DSTC Slowness Lower Limit 5	80	US/F
U_SLL6_MAST	MAST DSTC Slowness Lower Limit 6	80	US/F
U_SLL_FAST_MAST	MAST DSTC Slowness Lower Limit Fast	0	US/F

U_SLL_SLOW_MAST	MAST DSTC Slowness Lower Limit Slow	0	US/F
U_SUL1_MAST	MAST DSTC Slowness Upper Limit 1	0	US/F
U_SUL2_MAST	MAST DSTC Slowness Upper Limit 2	0	US/F
U_SUL3_MAST	MAST DSTC Slowness Upper Limit 3	280	US/F
U_SUL4_MAST	MAST DSTC Slowness Upper Limit 4	680	US/F
U_SUL5_MAST	MAST DSTC Slowness Upper Limit 5	540	US/F
U_SUL6_MAST	MAST DSTC Slowness Upper Limit 6	540	US/F
U_SUL_FAST_MAST	MAST DSTC Slowness Upper Limit Fast	0	US/F
U_SUL_SLOW_MAST	MAST DSTC Slowness Upper Limit Slow	0	US/F
PPC2-B: Powered Positioning Device/Caliper 2			
	PPC2 Caliper Type	CAL_STD	
CLBD_PPC	PPC Calibration data selection	ROM	
PWEL_PPC	PPC Primary Tool for WellCAD	NONE	
SWEL_PPC	PPC Secondary Tool for WellCAD (45 Degrees Rotation PPC Tool)	NONE	
WRDR_PPC	PPC Rotation Direction for Secondary Tool	NONE	
HILTH-FTB: High resolution Integrated Logging Tool-DTS			
BHFL	Borehole Fluid Type	WATER	
BHFL_TLD	HILT Nuclear Mud Base	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
EXSICL	External Shale Indicator Clean Value	20	
EXSISH	External Shale Indicator Shale Value	150	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
FPHI	Form Factor Porosity Source	DPHZ	
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCLF	Germany Coal-like Formation Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HACPP	Accelerometer PROM Presence	PRESENT_FILE	
HART	Accelerometer Reference Temperature	77	DEGF
HDCOD	HILT Density Coal detection	2	G/C3
HDSAD	HILT Density Salt detection	2.1	G/C3
HILT_GAS_DENSITY	HILT Gas Downhole Density	0	G/C3
HILT_GAS_OPTION	HILT Gas Computation Option	OFF	
HNCOD	HILT Neutron Coal detection	45	PU
HNSAD	HILT Neutron Salt detection	5	PU
HPHIECUT	HILT effective Porosity Cutoff	5	PU
HSCO	Hole Size Correction Option	YES	
HSIS	HILT Shale Indicator Selection	GR	
HSSO	HRDD Nuclear Source Strength Option	NORMAL	
HSWCUT	HILT Water Saturation from AITH cutoff	50	%
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.68	G/C3
MHC0	MCFL B0 Contrast Correction Coefficient	2.2e-005	OHMS
MHC1	MCFL B1 Contrast Correction Coefficient	3.2e-005	OHMS
MHCC	MCFL High Contrast Correction Switch	NO	
MPOF	MCFL Processing Operation Mode	ON	
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PEA_FILTER	PEA Filter	NO_FILTER	
PEFC_FILTER	PEFC Filter	NO_FILTER	
PHIMAX	HILT max porosity	35	PU
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SEXP_HILT	HILT Saturation Exponent	2	
SHT	Surface Hole Temperature	76	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
GPIT-C: General Purpose Inclinometer			
ACPP	Accelerometer PROM Presence	PRESENT	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
ART	Accelerometer Reference Temperature	68	DEGF
GLM	GPIT Logging Mode	DIPM	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MAPP	Magnetometer PROM Presence	PRESENT	
MDEC	Magnetic Field Declination	10.3989	DEG
MRTE	Magneto Reference Temperature	68	DEGF
TEMS	GPIT Temperature Sensor Used	BOTH	
U-GPOF	Playback OLD VERSION GPIT FILE (BEFORE OP14 + SRPC-3098-FEB 2006 C) ?		

	EDTC-B: Enhanced DTS Cartridge		
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
DPPM	Density Porosity Processing Mode	HIRS	
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HSCO	Hole Size Correction Option	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
ISSBAR_EDTC	Nuclear Mud Type	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MWCO	Mud Weight Correction Option	NO	
PTCO	Pressure/Temperature Correction Option	NO	
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	76	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	YES	
TPOS_EDTC	EDTC Tool Centered/Eccentered	Eccentered	
U-ETELM_EDTS	Telemetry Mode for eWAFE	Standard_EDTS	
U-TELM_EDTS	Telemetry Mode for WAFE	Standard_EDTS	
	DIR: Directional Survey Computation		
SPED	East Departure of Starting Point	0	FT
SPND	North Departure of Starting Point	0	FT
SPVD	TVD of Starting Point	0	FT
TAZI	Vertical Section Azimuth	0	DEG
TIED	East Departure of Tie-in Point	0	FT
TIMD	Along-hole depth of Tie-in Point	0	FT
TIND	North Departure of Tie-in Point	0	FT
TIVD	TVD of Tie-in Point	0	FT
	DIRPLOT: Enhanced Directional Plots		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	76	DEGF
	HOLEV: Integrated Hole/Cement Volume		
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	AUTOMATIC	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	76	DEGF
	System and Miscellaneous		
ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	23.00	LB/F
DFD	Drilling Fluid Density	9.20	LB/G
DO	Depth Offset for Playback	11.0	FT
FLEV	Fluid Level	0.00	FT
MST	Mud Sample Temperature	-50000.00	DEGF
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	OFF	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	11220	FT
TDD	Total Depth - Driller	11220.00	FT
TDL	Total Depth - Logger	11200.00	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF

AIT-M	18C0-147	PPC1-B	18C0-147
MAXS-B	18C0-147	MAPC-B	18C0-147
PPC2-B	18C0-147	HILTH-FTB	18C0-147
GPIT-C	18C0-147	EDTC-B	18C0-147

Input DLIS Files						
DEFAULT	AIT_CAL_MAXS_MAPC_005LUP	FN:5	PRODUCER	18-Jul-2011 00:15	11202.0 FT	6729.0 FT
Output DLIS Files						
DEFAULT	AIT_CAL_MAXS_MAPC_007PUP	FN:8	PRODUCER	18-Jul-2011 07:11		
RTB	AIT_CAL_MAXS_MAPC_007PUP	FN:9	PRODUCER	17-Jul-2011 07:11		



CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary							
Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool – M Wellsite Calibration – Electronics Calibration Check – Thru Cal Mag. & Phase							
Master: 10–Jun–2011 12:28 Before: 16–Jul–2011 18:11							
Thru Cal Magnitude – 0	0	0.6137	0.6136	N/A	N/A	N/A	V
Thru Cal Magnitude – 1	0	1.259	1.258	N/A	N/A	N/A	V
Thru Cal Magnitude – 2	0	0.6235	0.6233	N/A	N/A	N/A	V
Thru Cal Magnitude – 3	0	0.7055	0.7052	N/A	N/A	N/A	V
Thru Cal Magnitude – 4	0	1.316	1.316	N/A	N/A	N/A	V
Thru Cal Magnitude – 5	0	1.914	1.914	N/A	N/A	N/A	V
Thru Cal Magnitude – 6	0	1.915	1.915	N/A	N/A	N/A	V
Thru Cal Magnitude – 7	0	1.376	1.376	N/A	N/A	N/A	V
Thru Cal Phase – 0	0	194.8	197.5	N/A	N/A	N/A	DEG
Thru Cal Phase – 1	0	193.6	196.4	N/A	N/A	N/A	DEG
Thru Cal Phase – 2	0	190.0	192.8	N/A	N/A	N/A	DEG
Thru Cal Phase – 3	0	189.3	192.0	N/A	N/A	N/A	DEG
Thru Cal Phase – 4	0	183.0	185.7	N/A	N/A	N/A	DEG
Thru Cal Phase – 5	0	181.3	184.0	N/A	N/A	N/A	DEG
Thru Cal Phase – 6	0	181.3	184.0	N/A	N/A	N/A	DEG
Thru Cal Phase – 7	0	180.7	183.3	N/A	N/A	N/A	DEG
Array Induction Tool – M Wellsite Calibration – Electronics Calibration Check – Auxiliary							
Master: 10–Jun–2011 12:28 Before: 16–Jul–2011 18:11							
Array Induction SPA Plus	991.0	991.9	992.0	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.3646	0.3504	N/A	N/A	N/A	MV
Array Induction Temperature PI	0.9170	0.9193	0.9193	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0003578	0.0003492	N/A	N/A	N/A	V
Array Induction Tool – M Wellsite Calibration – Test Loop Gain Correction							
Master: 10–Jun–2011 12:28							
Test Loop Gain Correctio – 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 1	0	1.013	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 2	0	1.013	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 3	0	1.007	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 4	0	0.9957	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 5	0	0.9879	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 6	0	0.9973	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 7	0	1.002	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio – 0	0	0.5567	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 1	0	0.8161	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 2	0	–0.3277	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 3	0	–0.03665	N/A	N/A	N/A	N/A	DEG

Test Loop Gain Correctio – 4	0	–0.2165	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 5	0	–0.2176	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 6	0	0.1276	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio – 7	0	–0.1224	N/A	N/A	N/A	N/A	DEG

Array Induction Tool – M Wellsite Calibration – Sonde Error Correction

Master: 10–Jun–2011 12:28

R Sonde Error Correction – 0	0	–32.91	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 1	0	176.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 2	0	110.0	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 3	0	62.08	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 4	0	21.96	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 5	0	14.99	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 6	0	10.33	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction – 7	0	–1.527	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 0	0	250.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 1	0	44.04	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 2	0	–84.37	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 3	0	–33.34	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 4	0	2.683	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 5	0	–1.196	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 6	0	–3.437	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction – 7	0	6.226	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool – M Wellsite Calibration – Mud Gain Correction

Master: 10–Jun–2011 12:28

Coarse – Mag, Real, Imag – 0	0	1.042	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 1	0	1.042	N/A	N/A	N/A	N/A
Coarse – Mag, Real, Imag – 2	0	1.042	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 0	0	1.064	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 1	0	1.064	N/A	N/A	N/A	N/A
Fine – Mag, Real, Imag – 2	0	1.064	N/A	N/A	N/A	N/A

Powered Positioning Device/Caliper 1 Wellsite Calibration – PPC1 Caliper Calibration

Before: 8–Jul–2011 17:30

PPC1 Radius 1 Raw Small Radius	3.500	N/A	4.288	N/A	N/A	0.5000	IN
PPC1 Radius 1 Raw Large Radius	8.000	N/A	8.521	N/A	N/A	0.5000	IN
PPC1 Radius 2 Raw Small Radius	3.500	N/A	3.776	N/A	N/A	0.5000	IN
PPC1 Radius 2 Raw Large Radius	8.000	N/A	7.999	N/A	N/A	0.5000	IN
PPC1 Radius 3 Raw Small Radius	3.500	N/A	4.092	N/A	N/A	0.5000	IN
PPC1 Radius 3 Raw Large Radius	8.000	N/A	8.167	N/A	N/A	0.5000	IN
PPC1 Radius 4 Raw Small Radius	3.500	N/A	3.503	N/A	N/A	0.5000	IN
PPC1 Radius 4 Raw Large Radius	8.000	N/A	7.748	N/A	N/A	0.5000	IN

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Stab Measurement Summary

Before: 16–Jul–2011 17:58

BS Window Ratio	0.7376	N/A	0.7401	N/A	N/A	N/A	
BS Window Sum	27040	N/A	26910	N/A	N/A	N/A	CPS
SS Window Ratio	0.4743	N/A	0.4718	N/A	N/A	N/A	
SS Window Sum	11710	N/A	11690	N/A	N/A	N/A	CPS
LS Window Ratio	0.2985	N/A	0.2999	N/A	N/A	N/A	
LS Window Sum	1332	N/A	1329	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Photo–multiplier High Voltages Calibrations

Before: 16–Jul–2011 17:58

BS PM High Voltage (Command)	1454	N/A	1471	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1371	N/A	1369	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1483	N/A	1482	N/A	N/A	N/A	V

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Crystal Quality Resolutions Calibration

Before: 16–Jul–2011 17:58

BS Crystal Resolution	11.57	N/A	11.54	N/A	N/A	N/A	%
SS Crystal Resolution	9.659	N/A	9.582	N/A	N/A	N/A	%
LS Crystal Resolution	7.878	N/A	7.812	N/A	N/A	N/A	%

High resolution Integrated Logging Tool–DTS Wellsite Calibration – MCFL Calibration

Before: 16–Jul–2011 18:03

Raw B0 Resistivity	3875	N/A	3878	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3808	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3824	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool–DTS Wellsite Calibration – HILT Caliper Calibration

Before: 16–Jul–2011 17:58

HILT Caliper Zero Measurement	8.000	N/A	6.811	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	10.33	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Detector Calibration

Before: 16–Jul–2011 17:54

Gamma Ray Background	30.00	N/A	36.09	N/A	N/A	N/A	GAPI
Gamma Ray (Jig – Bkgd)	165.0	N/A	164.2	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool–DTS Wellsite Calibration – Zero Measurement							
Master: 30–May–2011 15:29	Before: 16–Jul–2011 17:55						
CNTC Background	27.98	27.98	27.70	N/A	N/A	4.197	CPS
CFTC Background	29.12	29.12	28.79	N/A	N/A	4.368	CPS
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Ratio Measurement							
Master: 30–May–2011 15:29							
Thermal Near Corr. (Tank)	5800	5225	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2166	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.412	N/A	N/A	N/A	N/A	
High resolution Integrated Logging Tool–DTS Wellsite Calibration – Accelerometer Calibration							
Before: Calibration not done							
Z–Axis Acceleration	32.19	N/A	32.19	N/A	N/A	N/A	F/S2
High resolution Integrated Logging Tool–DTS Master Calibration – Inversion results							
Master: 5–Jul–2011 0:26							
Rho Aluminum	2.596	2.599	--	--	--	--	G/C3
Rho Magnesium	1.686	1.691	--	--	--	--	G/C3
Pe Aluminum	2.570	2.495	--	--	--	--	
Pe Magnesium	2.650	2.633	--	--	--	--	
High resolution Integrated Logging Tool–DTS Master Calibration – Deviation Summary							
Master: 5–Jul–2011 0:26							
BS Average Deviation	0	0.1852	--	--	--	--	%
BS Max Deviation	0	0.4671	--	--	--	--	%
SS Average Deviation	0	0.3413	--	--	--	--	%
SS Max Deviation	0	1.053	--	--	--	--	%
LS Average Deviation	0	0.8554	--	--	--	--	%
LS Max Deviation	0	2.334	--	--	--	--	%
General Purpose Inclinomater Wellsite Calibration – CROUZET ACCELEROMETER PROM HAS BEEN READ CORRECTLY							
Before: 17–Jul–2011 12:11							
TEMPERATURE REFERENCE :	N/A	N/A	68	N/A	N/A	N/A	DEGF
YEAR OF CALIBRATION :	N/A	N/A	7	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	2	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	1081	N/A	N/A	N/A	
General Purpose Inclinomater Wellsite Calibration – CROUZET MAGNETOMETER PROM HAS BEEN READ CORRECTLY							
Before: 17–Jul–2011 12:11							
TEMPERATURE REFERENCE :	N/A	N/A	68	N/A	N/A	N/A	DEGF
YEAR OF CALIBRATION :	N/A	N/A	91	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	4	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	87	N/A	N/A	N/A	
<p>The GLS–VJ source activity is acceptable.</p> <p>The HGNS Neutron Master Calibration was done with the following parameters :</p> <p>NCT–B Water Temperature 64.4 DEGF. Thermal Housing Size 3.375 IN. NSR–F serial number 5138</p>							

Array Induction Tool – M / Equipment Identification

Primary Equipment:
Rm/SP Bottom Nose
Array Induction Sonde

AMRM – A
AMIS – A 1250

Auxiliary Equipment:

Array Induction Tool – M Wellsite Calibration							
Electronics Calibration Check – Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
0	Master	0.6137		0.6100	194.8		197.0
	Before	0.6136			197.5		
1	Master	1.259		1.270	193.6		196.0
	Before	1.258			196.4		

2	Master	0.6235		0.6200	190.0		192.0
	Before	0.6233			192.8		
3	Master	0.7055		0.7000	189.3		191.0
	Before	0.7052			192.0		
4	Master	1.316		1.340	183.0		185.0
	Before	1.316			185.7		
5	Master	1.914		1.960	181.3		182.0
	Before	1.914			184.0		
6	Master	1.915		1.960	181.3		181.0
	Before	1.915			184.0		
7	Master	1.376		1.410	180.7		175.0
	Before	1.376			183.3		
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)
Master: 10-Jun-2011 12:28				Before: 16-Jul-2011 18:11			

Array Induction Tool – M Wellsite Calibration							
Electronics Calibration Check – Auxiliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			991.9	Master			0.3646
Before			992.0	Before			0.3504
	941.0 (Minimum)	991.0 (Nominal)	1040 (Maximum)		-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
Phase	Array Induction Temperature Plus V		Value	Phase	Array Induction Temperature Zero V		Value
Master			0.9193	Master			0.0003578
Before			0.9193	Before			0.0003492
	0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)		-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)
Master: 10-Jun-2011 12:28				Before: 16-Jul-2011 18:11			

Array Induction Tool – M Wellsite Calibration								
Test Loop Gain Correction								
Idx	Value	Test Loop Gain Correction Magnitude V			Value	Test Loop Gain Correction Phase DEG		
0	1.015				0.5567			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.013				0.8161			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.013				-0.3277			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.007				-0.03665			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9957				-0.2165			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9879				-0.2176			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9973				0.1276			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.002				-0.1224			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
Master: 10-Jun-2011 12:28								

Array Induction Tool – M Wellsite Calibration					
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Array Induction Tool – M Wellsite Calibration

Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-32.91				250.1		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	176.7				44.04		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	110.0				-84.37		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)
3	62.08				-33.34		
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		-250.0 (Minimum)	0 (Nominal) 250.0 (Maximum)
4	21.96				2.683		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal) 63.00 (Maximum)
5	14.99				-1.196		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal) 50.00 (Maximum)
6	10.33				-3.437		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)
7	-1.527				6.226		
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)
Master: 10-Jun-2011 12:28							

Master: 10-Jun-2011 12:28

Array Induction Tool – M Wellsite Calibration							
Mud Gain Correction							
Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag	
0	1.042				1.064		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
1	1.042				1.064		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
2	1.042				1.064		
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal) 1.200 (Maximum)
Master: 10–Jun–2011 12:28							

Master: 10-Jun-2011 12:28

Array Induction Tool – M Master Calibration									
Electronics Calibration Check – Thru Cal Mag. & Phase									
Idx	Phase	Value	Thru Cal Magnitude V		Nominal	Value	Thru Cal Phase DEG		Nominal
0	Master	0.6137			0.6100	194.8			197.0
1	Master	1.259			1.270	193.6			196.0
2	Master	0.6235			0.6200	190.0			192.0
3	Master	0.7055			0.7000	189.3			191.0
4	Master	1.316			1.340	183.0			185.0
5	Master	1.914			1.960	181.3			182.0
6	Master	1.915			1.960	181.3			181.0
7	Master	1.376			1.410	180.7			175.0
		60.00 % (Minimum)	(Nominal)		140.0 % (Maximum)	Nom -60.00 (Minimum)	(Nominal)		Nom + 60.00 (Maximum)
Master: 10–Jun–2011 12:28									

Master: 10-Jun-2011 12:28

Array Induction Tool – M Master Calibration							
Electronics Calibration Check – Auxiliary							
Phase	Array Induction SPA Plus MV		Value	Phase	Array Induction SPA Zero MV		Value
Master			991.9	Master			0.3646

Array Induction Tool – M Master Calibration									
Test Loop Gain Correction									
Idx	Value	Test Loop Gain	Correction Magnitude	V	Value	Test Loop Gain	Correction Phase	DEG	
0	1.015				0.5567				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
1	1.013				0.8161				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
2	1.013				-0.3277				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
3	1.007				-0.03665				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
4	0.9957				-0.2165				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
5	0.9879				-0.2176				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
6	0.9973				0.1276				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
7	1.002				-0.1224				
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	

Array Induction Tool – M Master Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M	
0	-32.91				250.1		
		-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)		-2250 (Minimum)	0 (Nominal) 2250 (Maximum)
1	176.7				44.04		
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		-625.0 (Minimum)	0 (Nominal) 625.0 (Maximum)
2	110.0				-84.37		
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		-350.0 (Minimum)	0 (Nominal) 350.0 (Maximum)
3	62.08				-33.34		
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		-250.0 (Minimum)	0 (Nominal) 250.0 (Maximum)
4	21.96				2.683		
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		-63.00 (Minimum)	0 (Nominal) 63.00 (Maximum)
5	14.99				-1.196		
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		-50.00 (Minimum)	0 (Nominal) 50.00 (Maximum)
6	10.33				-3.437		
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)
7	-1.527				6.226		
		-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		-30.00 (Minimum)	0 (Nominal) 30.00 (Maximum)

Master: 10-Jun-2011 12:28

Mud Gain Correction

Idx	Value	Coarse – Mag, Real, Imag			Value	Fine – Mag, Real, Imag		
0	1.042				1.064			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.042				1.064			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.042				1.064			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 10-Jun-2011 12:28

Powered Positioning Device/Caliper 1 / Equipment Identification

Primary Equipment:

PPC Powered Positioning Device/Caliper
PPC1 Caliper Standard

PPC1 – B

8007



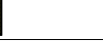
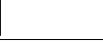


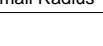
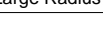
PPC_ –

8007

Auxiliary Equipment:

Powered Positioning Device/Caliper 1 Wellsite Calibration

PPC1 Caliper Calibration

PPC1 Sample Calculator						
Phase	PPC1 Radius 1 Raw Small Radius IN	Value	Phase	PPC1 Radius 1 Raw Large Radius IN	Value	
Before		4.288	Before		8.521	
	1.200 (Minimum)	3.500 (Nominal)	5.600 (Maximum)	6.100 (Minimum)	8.000 (Nominal)	9.700 (Maximum)
Phase	PPC1 Radius 2 Raw Small Radius IN	Value	Phase	PPC1 Radius 2 Raw Large Radius IN	Value	
Before		3.776	Before		7.999	
	1.200 (Minimum)	3.500 (Nominal)	5.600 (Maximum)	6.100 (Minimum)	8.000 (Nominal)	9.700 (Maximum)
Phase	PPC1 Radius 3 Raw Small Radius IN	Value	Phase	PPC1 Radius 3 Raw Large Radius IN	Value	
Before		4.092	Before		8.167	
	1.200 (Minimum)	3.500 (Nominal)	5.600 (Maximum)	6.100 (Minimum)	8.000 (Nominal)	9.700 (Maximum)
Phase	PPC1 Radius 4 Raw Small Radius IN	Value	Phase	PPC1 Radius 4 Raw Large Radius IN	Value	
Before		3.503	Before		7.748	
	1.200 (Minimum)	3.500 (Nominal)	5.600 (Maximum)	6.100 (Minimum)	8.000 (Nominal)	9.700 (Maximum)

Before: 8-Jul-2011 17:30

High resolution Integrated Logging Tool-DTS / Equipment Identification

Primary Equipment:

HILT high-Resolution Mechanical Sonde
HILT Rxo Gamma-ray Device
HILT Micro Cylindrically Focused Log Dev
GR Logging Source
HILT High Res. Control Cartridge
HILT Gamma-Ray Neutron Sonde-DTS
HGNS Gamma-Ray Device
HGNS Neutron Detector with Alpha Source

HRMS – H

3969

HRGD – H

3995

MCFL – H

GLS – VJ

5234

HRCC – H

4863

HGNS – H

HGR –

HCNT – H

Auxiliary Equipment:

Neutron Calibration Tank
Gamma Source Radioactive
HGNS Housing




NCT – B

GSR – U/Y

HGNS –




High resolution Integrated Logging Tool-DTS Wellsite Calibration

Stab Measurement Summary




Star Measurement Summary											
Phase	BS Window Ratio		Value	Phase	SS Window Ratio		Value	Phase	LS Window Ratio		Value
Before			0.7401	Before			0.4718	Before			0.2999
	0.7008 (Minimum)	0.7376 (Nominal)	0.7745 (Maximum)		0.4505 (Minimum)	0.4743 (Nominal)	0.4980 (Maximum)		0.2836 (Minimum)	0.2985 (Nominal)	0.3135 (Maximum)
Phase	BS Window Sum CPS		Value	Phase	SS Window Sum CPS		Value	Phase	LS Window Sum CPS		Value

Before		26910	Before		11690	Before		1329
25690 (Minimum)	27040 (Nominal)	28390 (Maximum)	11130 (Minimum)	11710 (Nominal)	12300 (Maximum)	1265 (Minimum)	1332 (Nominal)	1399 (Maximum)

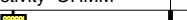
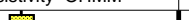
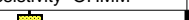
Before: 16-Jul-2011 17:58

High resolution Integrated Logging Tool—DTS Wellsite Calibration														
Photo-multiplier High Voltages Calibrations														
Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
Before				1471	Before				1369	Before				1482
	1354 (Minimum)	1454 (Nominal)	1554 (Maximum)			1271 (Minimum)	1371 (Nominal)	1471 (Maximum)			1383 (Minimum)	1483 (Nominal)	1583 (Maximum)	
Before: 16-Jul-2011 17:58														


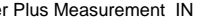
Before: 16-Jul-2011 17:58

High resolution Integrated Logging Tool–DTS Wellsite Calibration											
Crystal Quality Resolutions Calibration											
Phase	BS Crystal Resolution %		Value	Phase	SS Crystal Resolution %		Value	Phase	LS Crystal Resolution %		Value
Before			11.54	Before			9.582	Before			7.812
	10.57 (Minimum)	11.57 (Nominal)	12.57 (Maximum)		8.659 (Minimum)	9.659 (Nominal)	10.66 (Maximum)		6.878 (Minimum)	7.878 (Nominal)	8.878 (Maximum)
Before: 16–Jul–2011 17:58											

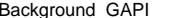

Before: 16-Jul-2011 17:58

High resolution Integrated Logging Tool-DTS Wellsite Calibration														
MCFL Calibration														
Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
Before				3878	Before				3808	Before				3824
	3565 (Minimum)	3875 (Nominal)	4185 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)			3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	
Before: 16-Jul-2011 18:03														





Before: 16-Jul-2011 18:03

High resolution Integrated Logging Tool–DTS Wellsite Calibration							
HILT Caliper Calibration							
Phase	HILT Caliper Zero Measurement IN		Value	Phase	HILT Caliper Plus Measurement IN		Value
Before			6.811	Before			10.33
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)		9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)
Before: 16-Jul-2011 17:58							

Before: 16-Jul-2011 17:58

High resolution Integrated Logging Tool–DTS Wellsite Calibration							
Detector Calibration							
Phase	Gamma Ray Background GAPI		Value	Phase	Gamma Ray (Jig – Bkgd) GAPI		Value
Before			36.09	Before			164.2
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		157.1 (Minimum)	165.0 (Nominal)	206.3 (Maximum)
Before: 16–Jul–2011 17:54							

Before: 16-Jul-2011 17:54

High resolution Integrated Logging Tool-DTS Wellsite Calibration								
Zero Measurement								
Phase	CNTC Background CPS		Value	Phase	CFTC Background CPS		Value	
Master			27.98	Master			29.12	
Before			27.70	Before			28.79	
5.000 (Minimum)			27.98 (Nominal)	5.000 (Minimum)			29.12 (Nominal)	40.00 (Maximum)
Master: 30-May-2011 15:29				Before: 16-Jul-2011 17:55				


Master: 30-May-2011 15:29





Before: 16-Jul-2011 17:55







High resolution Integrated Logging Tool-DTS Wellsite Calibration														
Ratio Measurement														
Phase	Thermal Near Corr. (Tank) CPS			Value	Phase	Thermal Far Corr. (Tank) CPS			Value	Phase	CNTC/CFTC (Tank)			Value
Master	<div><div></div></div>			5225	Master	<div><div></div></div>			2166	Master	<div><div></div></div>			2.412
	4700 (Minimum)	5800 (Nominal)	6900 (Maximum)			1900 (Minimum)	2400 (Nominal)	2900 (Maximum)			2.120 (Minimum)	2.159 (Nominal)	2.540 (Maximum)	
Master: 30-May-2011 15:29														



Master: 30-May-2011 15:29




High resolution Integrated Logging Tool-DTS Wellsite Calibration
Accelerometer Calibration

Accelerometer Calibration		
Phase	Z-Axis Acceleration F/S2	Value
Before		32.19
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	
Before: Calibration not done		

High resolution Integrated Logging Tool-DTS Master Calibration					
Inversion results					
Phase	Rho Aluminum G/C3	Value	Phase	Rho Magnesium G/C3	Value
Master		2.599	Master		1.691
	2.586 (Minimum) 2.596 (Nominal) 2.606 (Maximum)			1.676 (Minimum) 1.686 (Nominal) 1.696 (Maximum)	
Phase	Pe Aluminum	Value	Phase	Pe Magnesium	Value
Master		2.495	Master		2.633
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)			2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	
Master: 5-Jul-2011 0:26					

High resolution Integrated Logging Tool-DTS Master Calibration								
Deviation Summary								
Phase	BS Average Deviation %	Value	Phase	SS Average Deviation %	Value	Phase	LS Average Deviation %	Value
Master		0.1852	Master		0.3413	Master		0.8554
	-0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)			-1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)			-1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	
Phase	BS Max Deviation %	Value	Phase	SS Max Deviation %	Value	Phase	LS Max Deviation %	Value
Master		0.4671	Master		1.053	Master		2.334
	-1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)			-2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)			-3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	
Master: 5-Jul-2011 0:26								

High resolution Integrated Logging Tool-DTS Master Calibration					
Zero Measurement					
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.98	Master		29.12
	5.000 (Minimum) 27.98 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 29.12 (Nominal) 40.00 (Maximum)	
Master: 30-May-2011 15:29					

High resolution Integrated Logging Tool-DTS Master Calibration								
Tank Measurement								
Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		5225	Master		2166	Master		2.412
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)			1900 (Minimum) 2400 (Nominal) 2900 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	
Master: 30-May-2011 15:29								

General Purpose Inclinometer / Equipment Identification	
Primary Equipment: GPIT Cartridge - C	GPIC - C
Auxiliary Equipment: GPIT Housing	GPIH - B

Well: **HSC 4-28**
Field: **SHIRE GULCH**
County: **MESA**
State: **COLORADO**

PLATFORM EXPRESS – AIT
TRIPLE COMBO
GAMMA RAY