MUD

County: Adams

Schlumberger

Company: **Kerr−McGee Oil and Gas Onshore LP**

Well: **Parterre 12−16**

Field: **Spindle**

County: **Adams** State: **Colorado**

Field: Spindle
Location: Sec. 16, T1S, R67W
Well: Parterre 12−16
Company: Kerr−McGee Oil and Gas Onshor

Platform Express
Array Induction
Linear Correlation

LOCATION

Sec. 16, T1S, R67W
Surf: 1515' FSL X 1264' FWL NWSW
BHL: 2111' FSL X 519' FWL NWSW (est.)

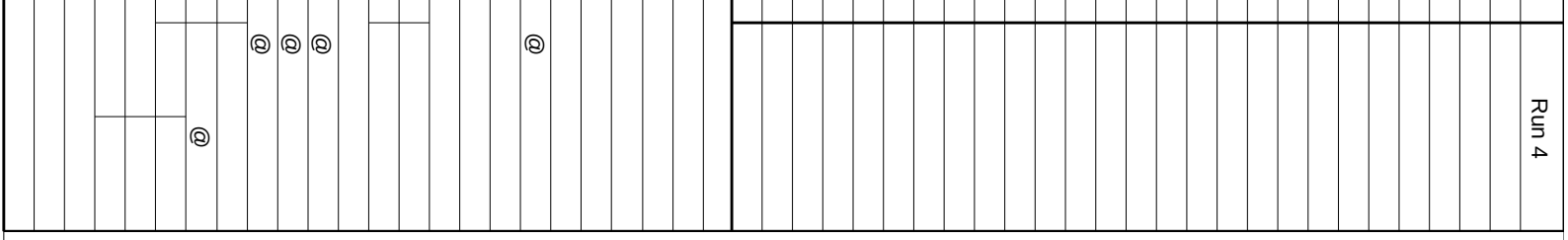
Elev.: K.B. 5175.00 ft
G.L. 5160.00 ft
D.F. 5174.00 ft

Permanent Datum: Ground Level Elev.: 5160.00 ft
Log Measured From: Kelly Bushing 15.00 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
05−001−09686−0000	16	1S	67W

	Run 1	Run 2	Run 3
Logging Date	27−Nov−2009		
Run Number	1		
Depth Driller	8628 ft		
Schlumberger Depth	8594 ft		
Bottom Log Interval	8586 ft		
Top Log Interval	1209 ft		
Casing Driller Size @ Depth	8.625 in @ 1220 ft	@	
Casing Schlumberger	1209 ft		
Bit Size	7.875 in		
Type Fluid In Hole	Water Based Mud		
MUD Density / Viscosity	8.3 lbm/gal / 26 s		
MUD Fluid Loss / PH	/		
MUD Source Of Sample	AIT Sensor		
RM @ Measured Temperature	0.970 ohm.m @ 79 degF	@	
RMF @ Measured Temperature	0.728 ohm.m @ 79 degF	@	
RMC @ Measured Temperature	1.455 ohm.m @ 79 degF	@	
Source RMF / RMC	Calculated / Calculated		
RM @ MRT / RMF @ MRT	0.394 @ 205 / 0.296 @ 205	@ / @	
Maximum Recorded Temperatures	205 degF		
Circulation Stopped Time	27−Nov−2009 13:00		
Logger On Bottom Time	27−Nov−2009 20:42		
Unit Number / Location	3055 Ft. Morgan, CO		
Recorded By	Tim Hoffman		
Witnessed By	Marvin Hackworth & Mark Scanniello		

	Run 1	Run 2	Run 3
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			
MUD Density / Viscosity	/		
MUD Fluid Loss / PH	/		
MUD 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			



DEPTH SUMMARY LISTING

Date Created: 27−NOV−2009 20:46:10

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−39P LXS
Serial Number:	799	Serial Number:	1223	Serial Number:	708273
Calibration Date:	1−Oct−2009	Calibration Date:	1−Oct−2009	Length:	15060 FT
Calibrator Serial Number:	33	Calibrator Serial Number:	100513		
Calibration Cable Type:	7−39P LXS	Number of Calibration Points:	0	Conveyance Method:	Wireline
Wheel Correction 1:	−4			Rig Type:	LAND
Wheel Correction 2:	−5				

Depth Control Parameters

Log Sequence:	First Log In the Well
Rig Up Length At Surface:	0.00 FT
Rig Up Length At Bottom:	0.00 FT
Rig Up Length Correction:	0.00 FT
Stretch Correction:	5.00 FT
Tool Zero Check At Surface:	0.00 FT

Depth Control Remarks

1. All Schlumberger depth policy procedures applied
2. This is the primary depth reference
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: None	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
This is the first run in hole.	
Toolstring run as per tool sketch	
Toolstring run without bowspring and standoffs as per client request on deviated wells	
Matrix changes are as noted on the porosity print	

Rig: Xtreme 11

Crew: Tim Ludgate and Roger Wiley

RUN 1		RUN 2	
SERVICE ORDER #:	B03C−00066	SERVICE ORDER #:	
PROGRAM VERSION:	17C0−154	PROGRAM VERSION:	
FLUID LEVEL:	10 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

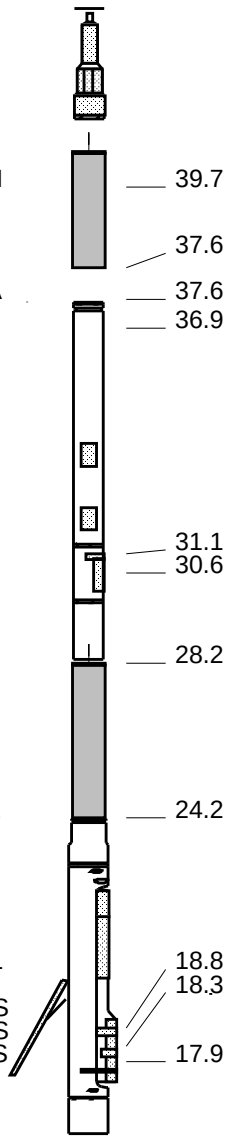
GSR−U/Y
NCT−B
CNB−AB
NCS−VB
WITM (DTS)−A

DOWNHOLE EQUIPMENT

LEH−QT
LEH−QT — 43.6

DTC−H
ECH−KC
DTCH0−A
DTCH1−A
CTEM — 39.7
TelStatus
ToolStatu
HGNS HTEM — 37.6
HMCA — 37.6
40.6

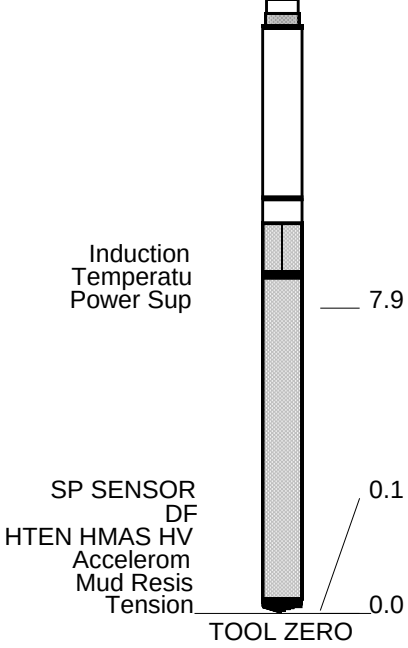
HILTB−FTB
HGNSD−B 1927
HMCA
HGNH
NLS−KL
NSR−F 5068
HACCZ 749
HCNT
HGR
HRCC−B
HRMS−B
HRGD−B 1732
GLS−VJ 5416
MCFL Device
HILT Nucl. LS 42767
HILT Nucl. SS 42767
HILT Nucl. BS 42767
NPV−N
HGNS Gamm — 36.9
HGNS Neut — 31.1
HGNS Neut — 30.6
HGNS sens — 28.2
HRCC cart — 24.2
MCFL — 18.8
HILT cali — 18.3
HRDD−LS
HRDD−SS
HRDD−BS — 17.9
37.6



RUN 2

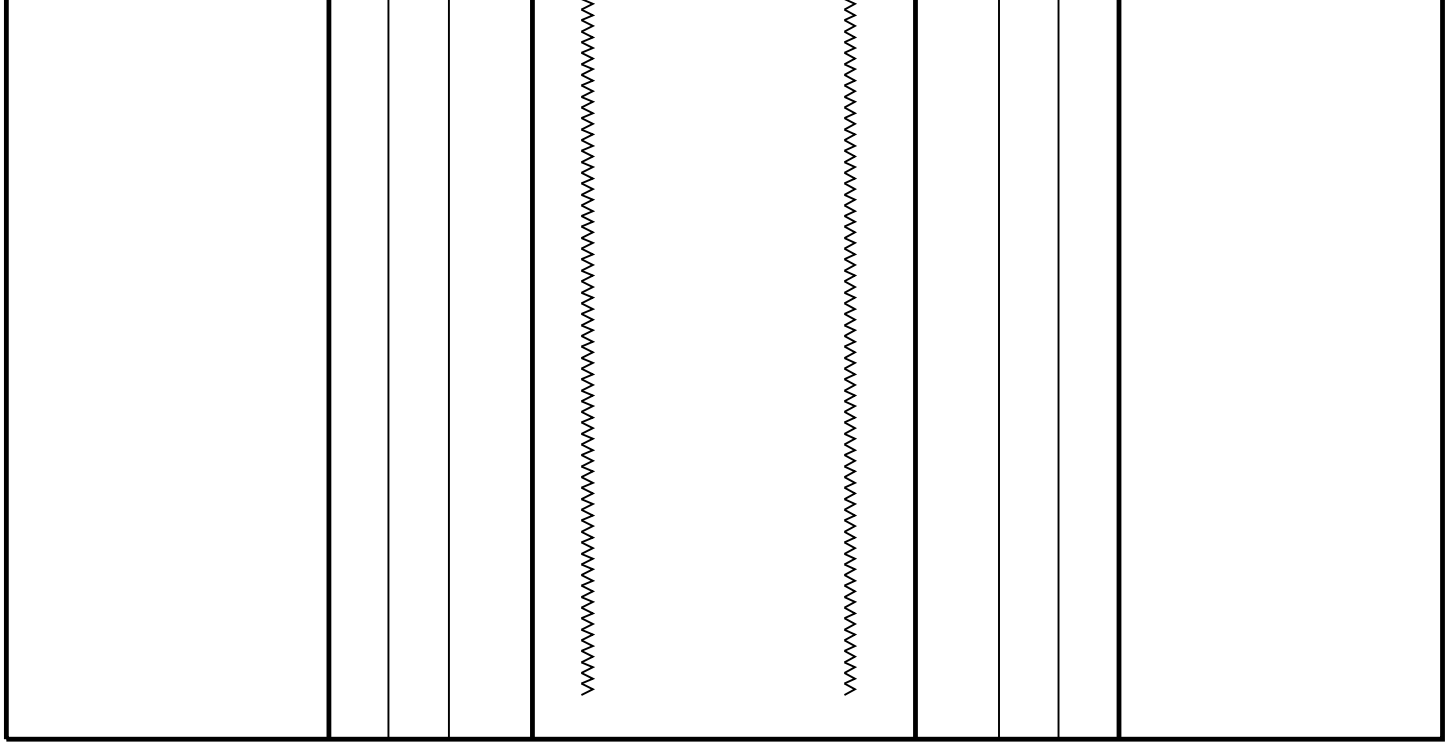
AIT−M
AMIS−A 1372
AMRM−A

16.0



MAXIMUM STRING DIAMETER 4.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Production String	(in) OD	(in) ID	(ft) MD	Well Schematic	(ft) MD	(in) OD	(in) ID	Casing String
					0.0	8.625		Casing String
					1220.0	8.625		Casing Shoe
					1220.0	7.875		Borehole Segment



All depths are driller’s depths

Schlumberger

RESISTIVITY LINEAR 2" = 100’

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39	8607.0 FT	888.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2595.31 F3

Cement Volume = 1779.61 F3 (assuming 4.50 IN casing O.D.)

Computed from 8594.0 FT to 1209.0 FT using data channel(s) HCAL

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

PIP SUMMARY

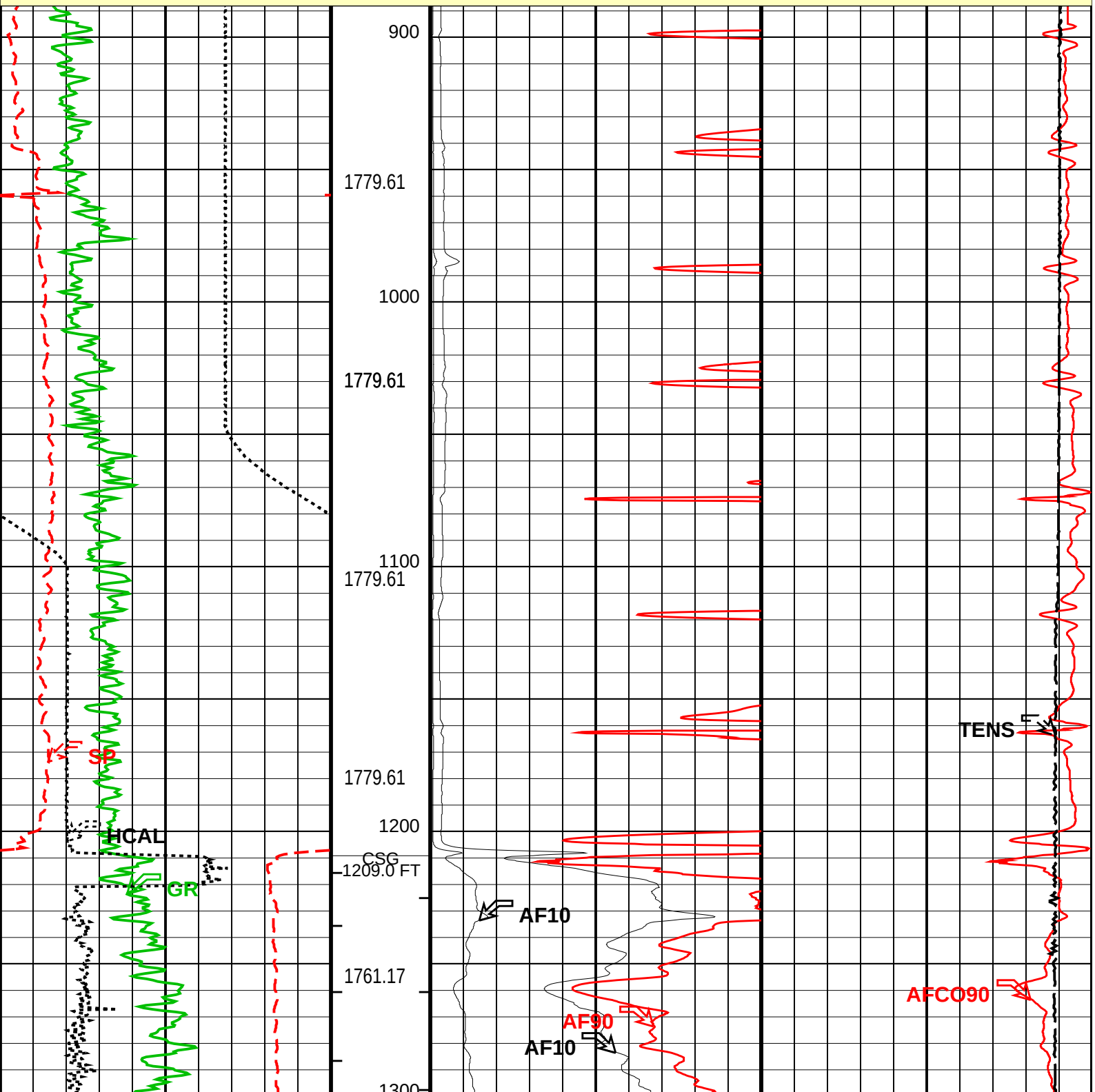
Integrated Cement Volume Major Pip Every 100 F3

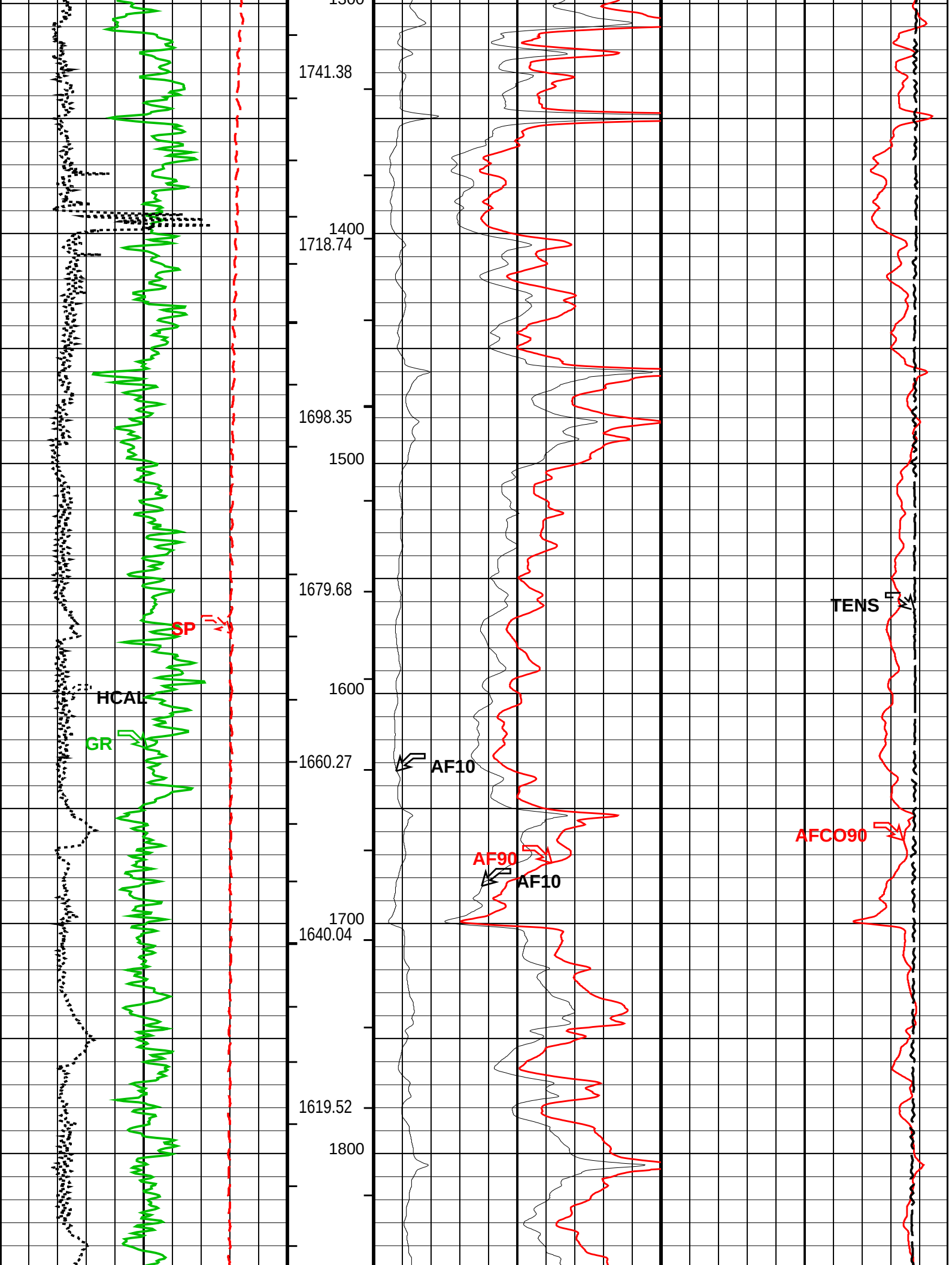
Integrated Cement Volume Minor Pip Every 10 F3

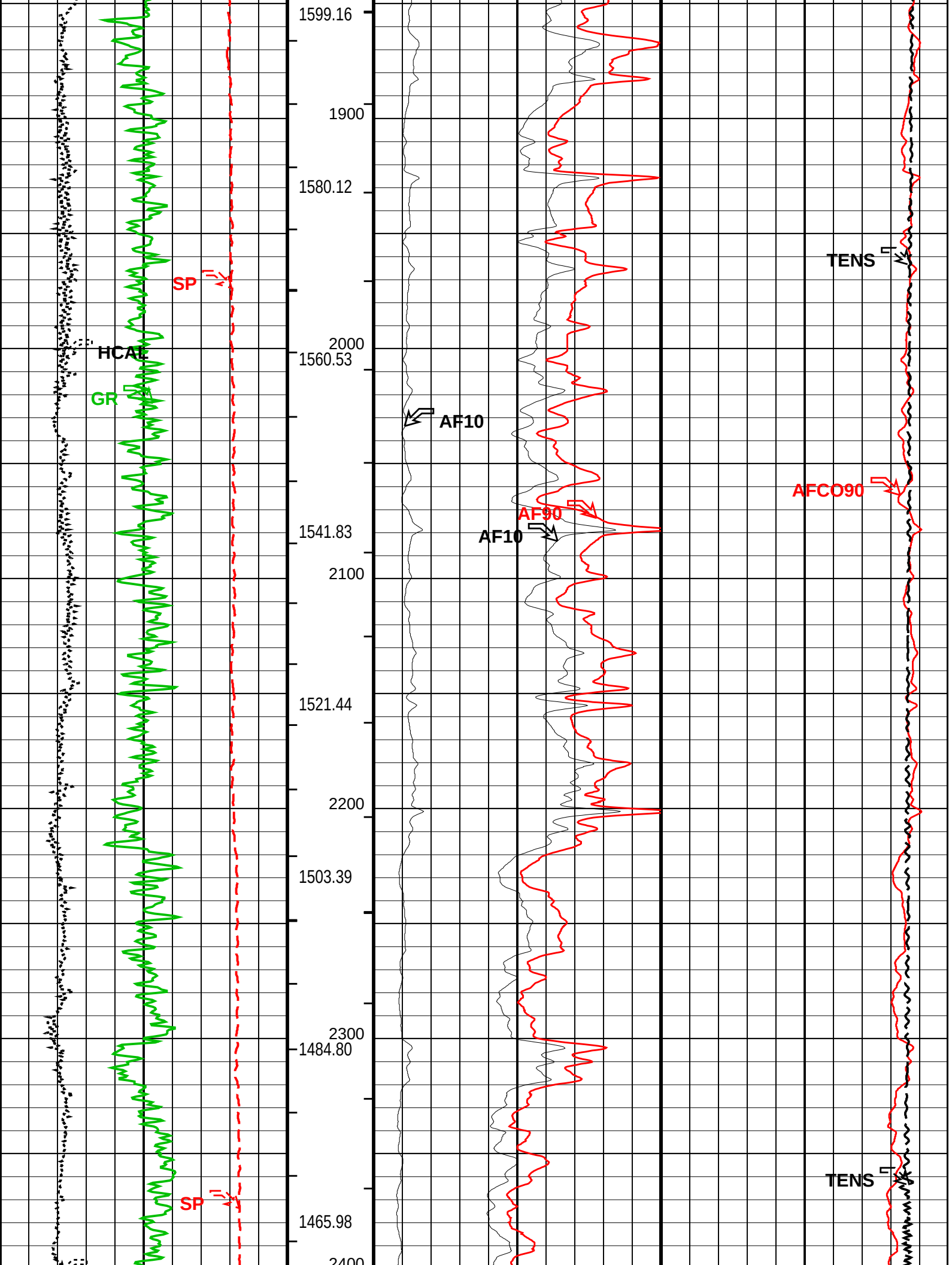
Integrated Hole Volume Major Pip Every 100 F3
Integrated Hole Volume Minor Pip Every 10 F3

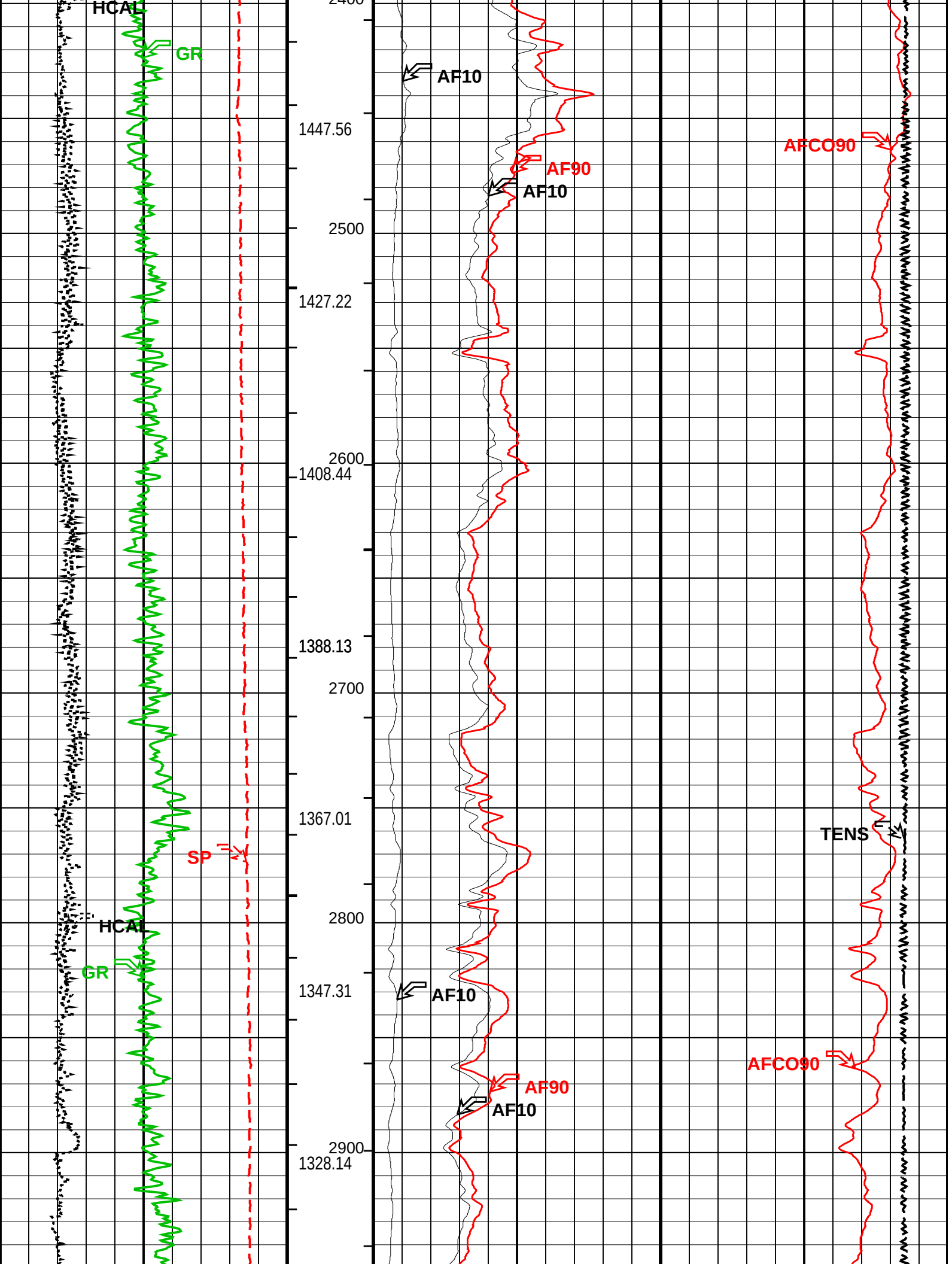
SP (SP) −160 (MV) 40			
Caliper (HCAL) 6 (IN) 16		AIT 10 Inch Investigation (AF10) 0 (OHMM) 50	
Gamma Ray (GR) 0 (GAPI) 200		AIT 90 Inch Investigation (AF90) 0 (OHMM) 10	Tension (TENS) 10000 (LBF) 0
Gamma Ray Backup	Cement Volume (ICV) (F3)	AIT 10 Inch Investigation (AF10) 0 (OHMM) 10	AIT 90 Inch Investigation Conductivity (AFCO90) 1000 (MM/M) 0

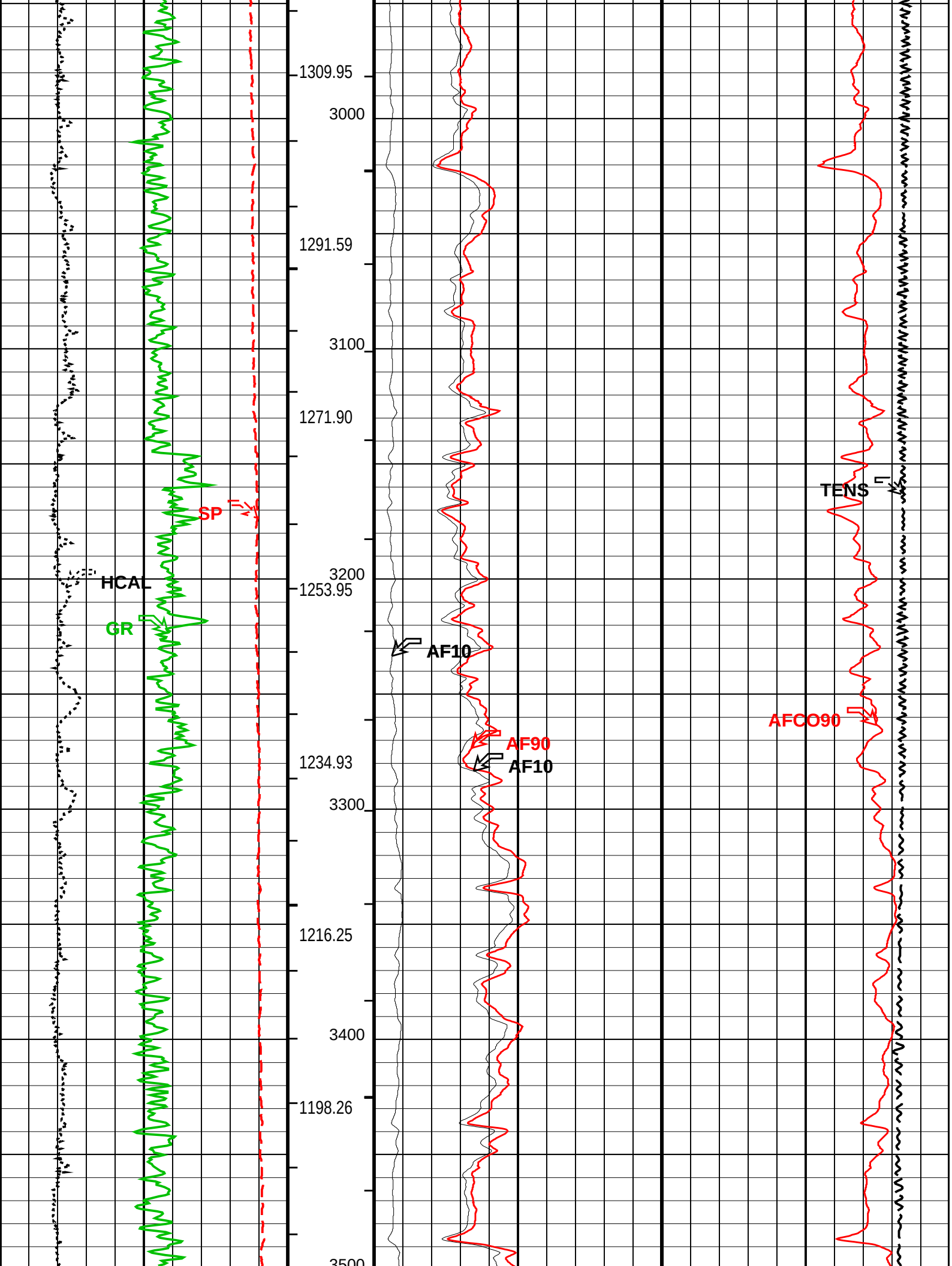
MAIN PASS: *** PLATFORM EXPRESS − ARRAY INDUCTION ***

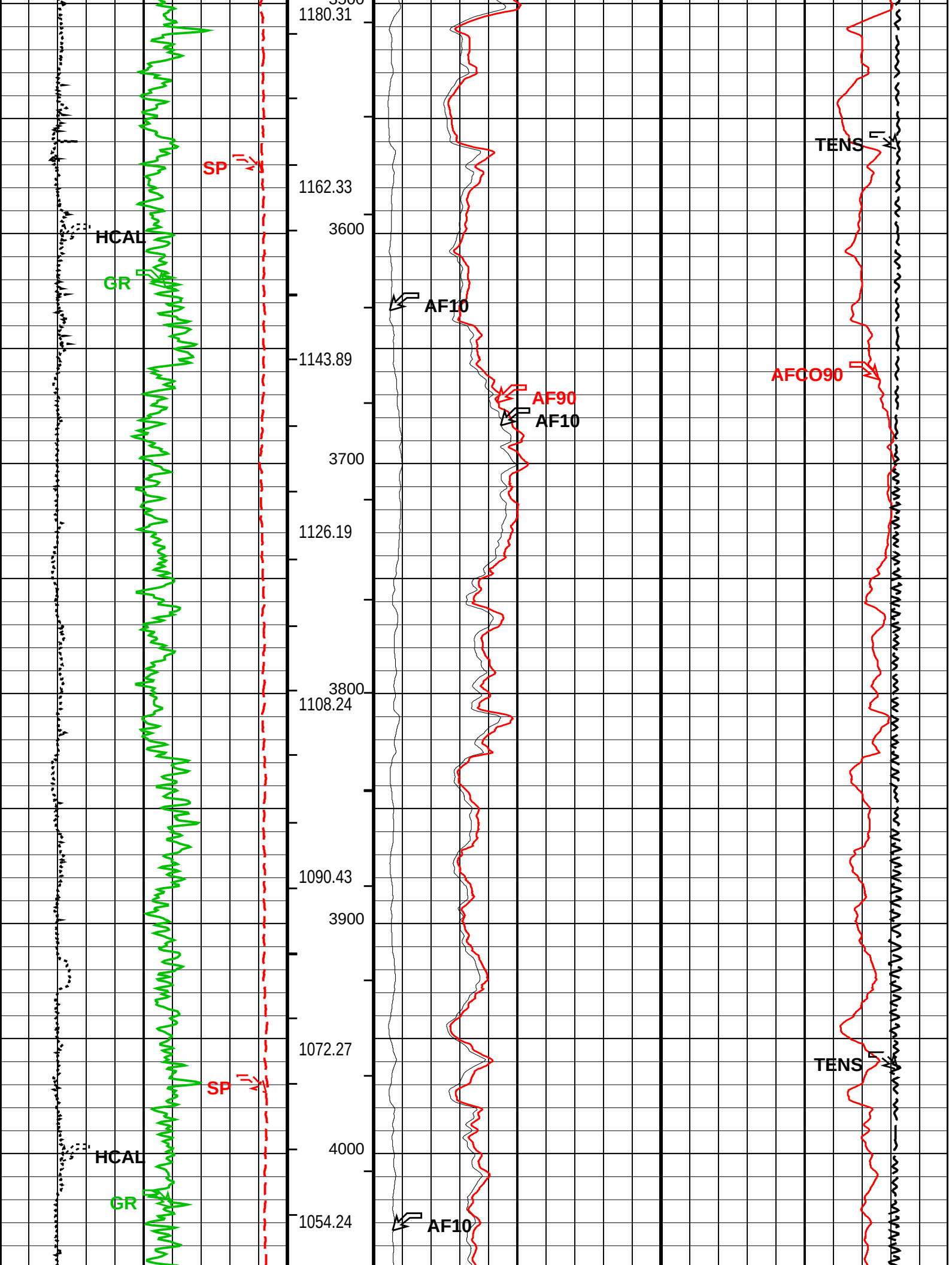


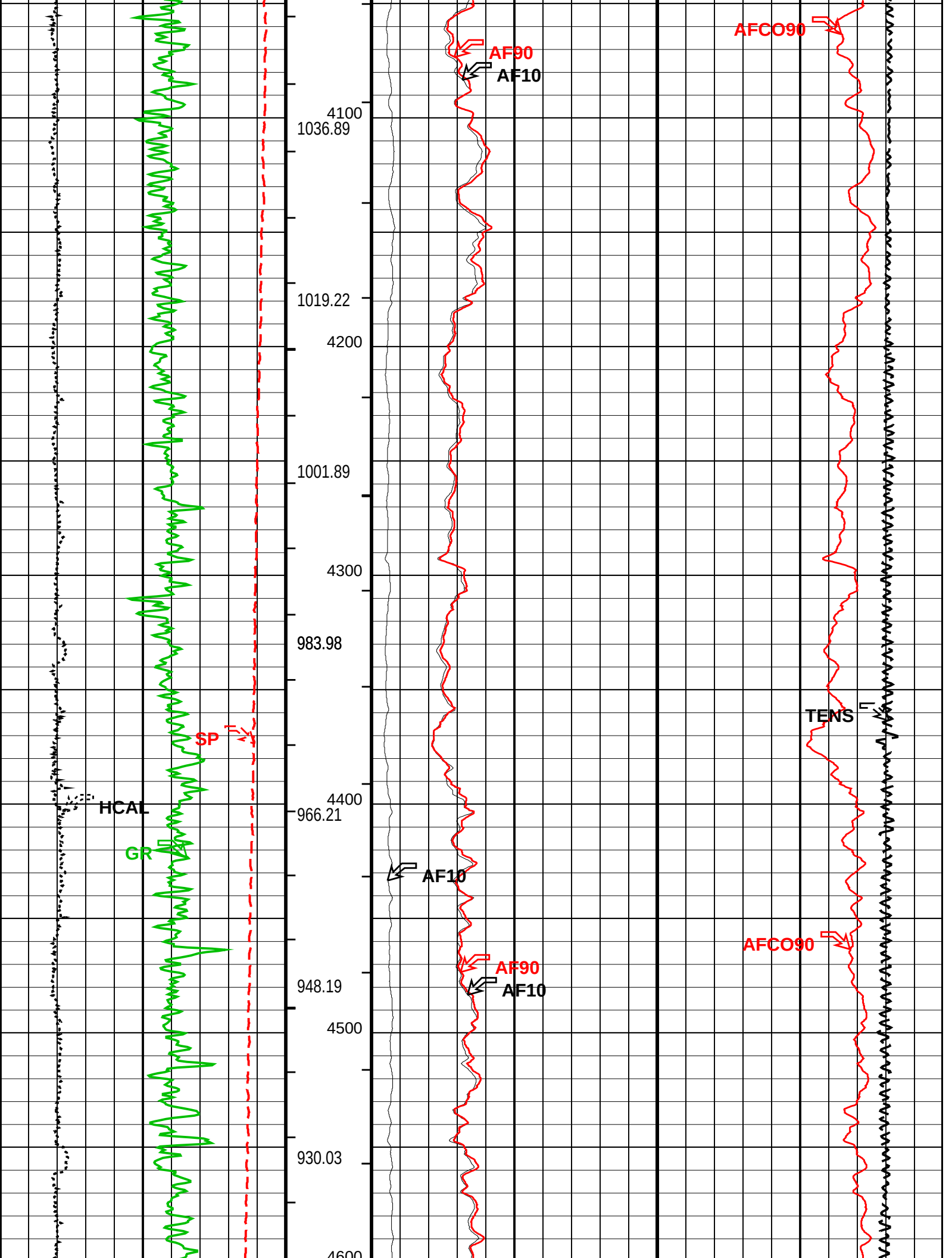

1741.38
1400
1718.74
1698.35
1500
1679.68
1600
1660.27
1700
1640.04
1619.52
1800
SP
HCAL
GR
AF10
AF90
AF10
TENS
AFCO90


1599.16
1900
1580.12
2000
1560.53
2100
1541.83
2200
1521.44
2300
1503.39
1484.80
2400
1465.98
SP
HCAL
GR
AF10
AF90
AF10
TENS
AFCO90
SP
TENS


HCAL
GR
AF10
1447.56
AF90
AF10
AFCO90
2500
1427.22
2600
1408.44
1388.13
2700
1367.01
TENS
SP
2800
HCAL
GR
1347.31
AF10
AF90
AF10
AFCO90
2900
1328.14


1309.95
3000
1291.59
3100
1271.90
3200
1253.95
1234.93
3300
1216.25
3400
1198.26
3500
SP
HCAL
GR
AF10
AF90
AF10
TENS
AFCO90


1180.31
SP
TENS
1162.33
3600
HCAL
GR
AF10
1143.89
AFCO90
AF90
AF10
3700
1126.19
3800
1108.24
1090.43
3900
1072.27
SP
TENS
4000
HCAL
GR
1054.24
AF10


AF90
AF10
AFCO90
4100
1036.89
1019.22
4200
1001.89
4300
983.98
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966.21
GR
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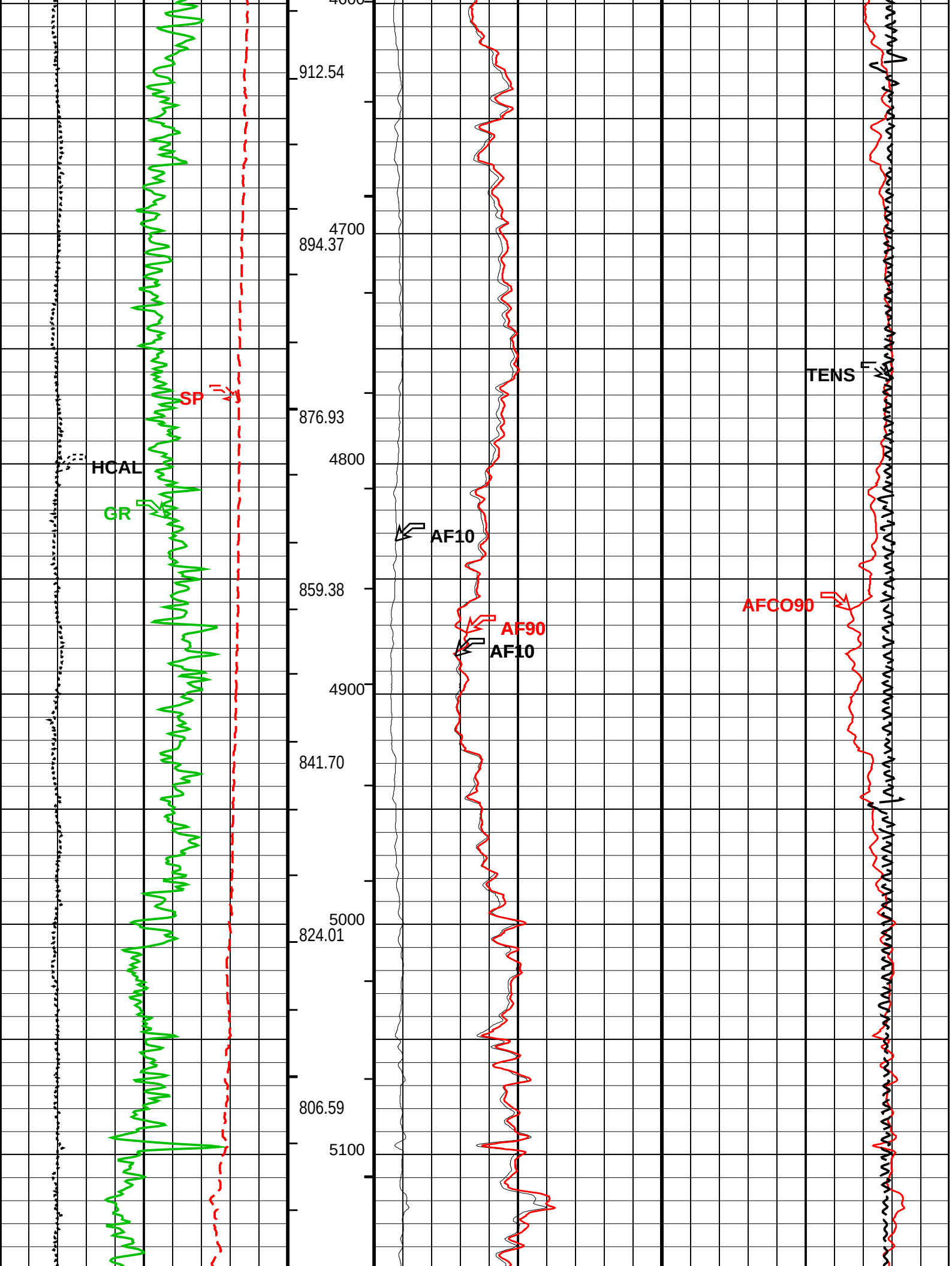
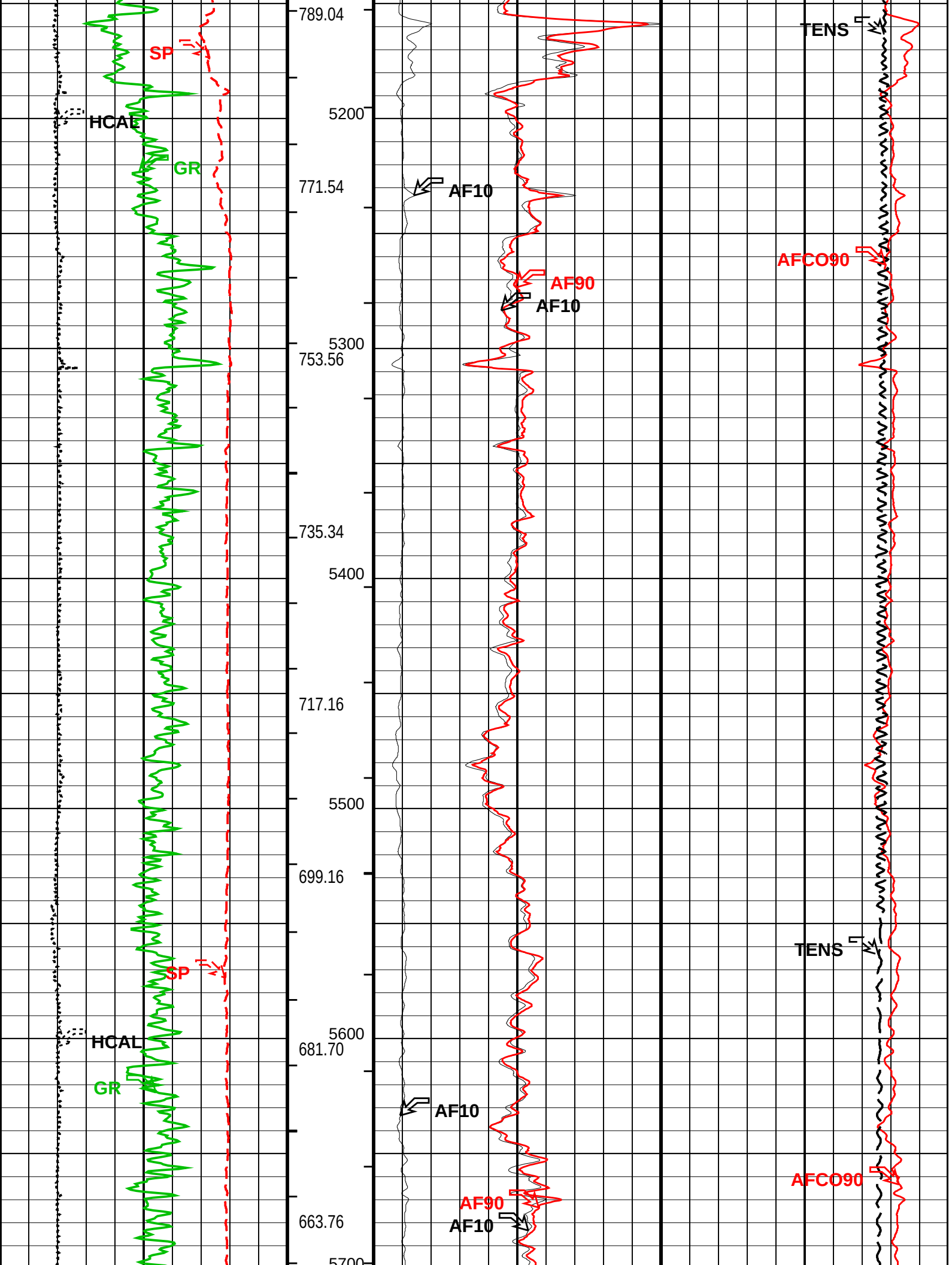
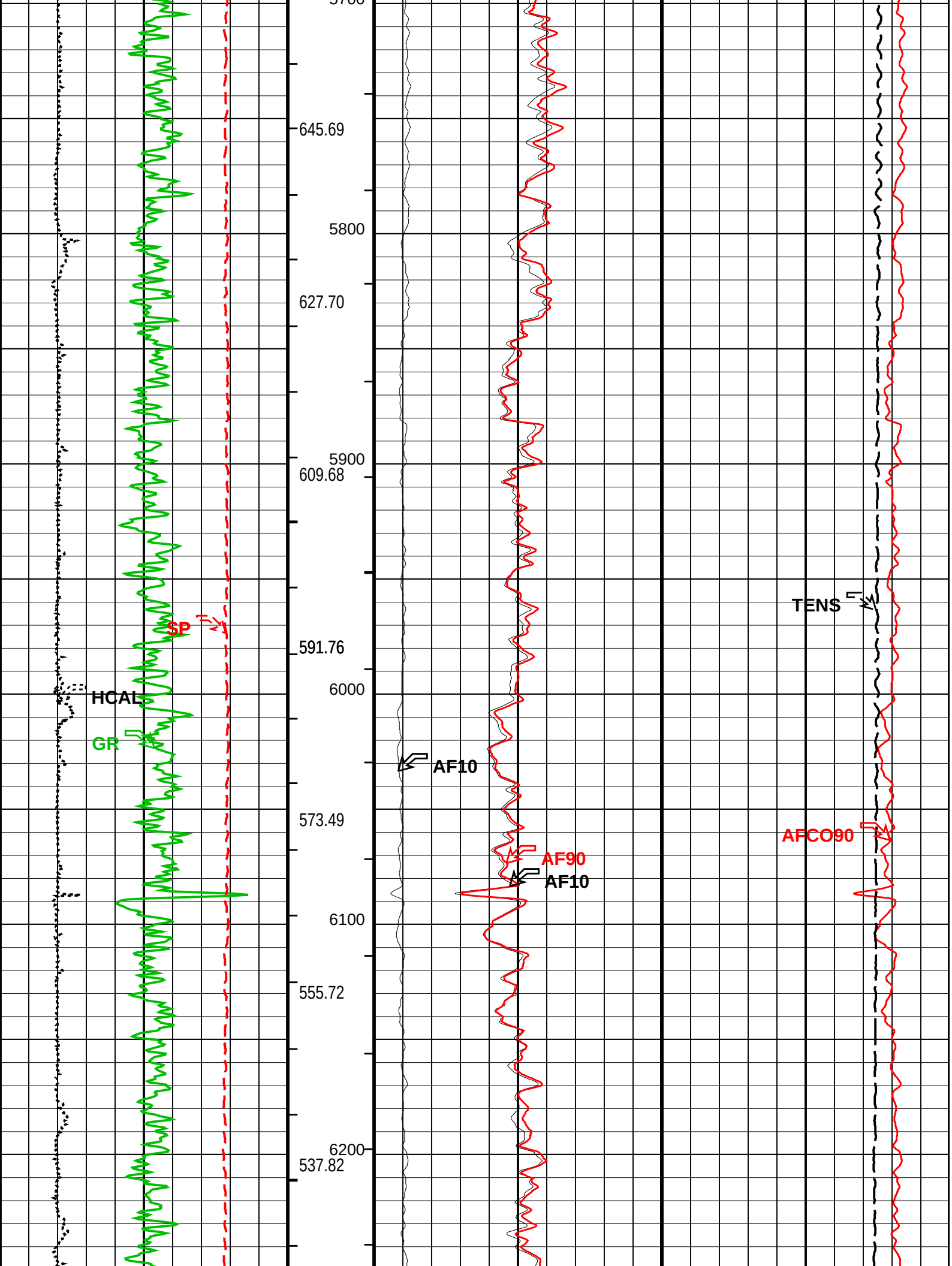
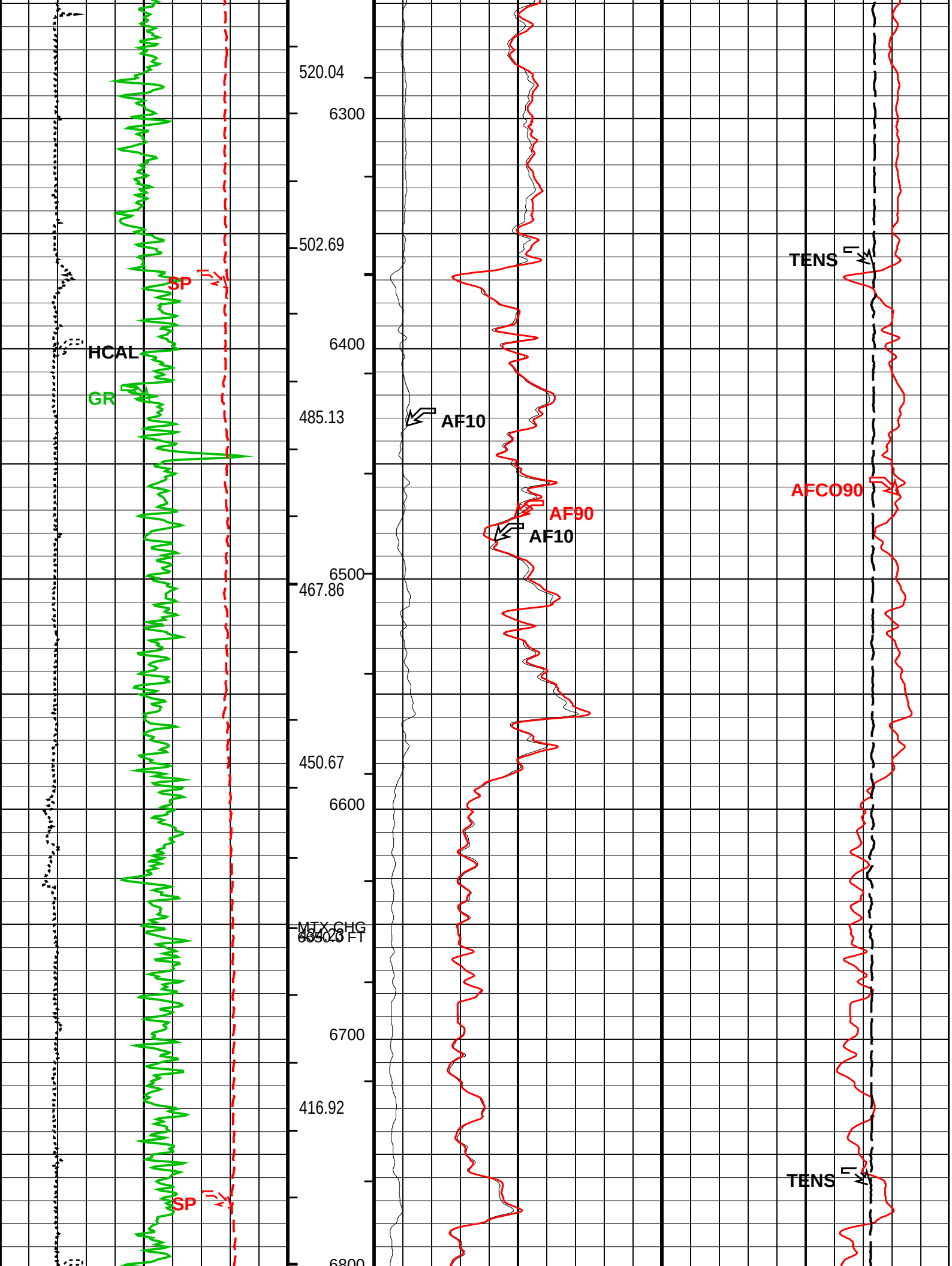
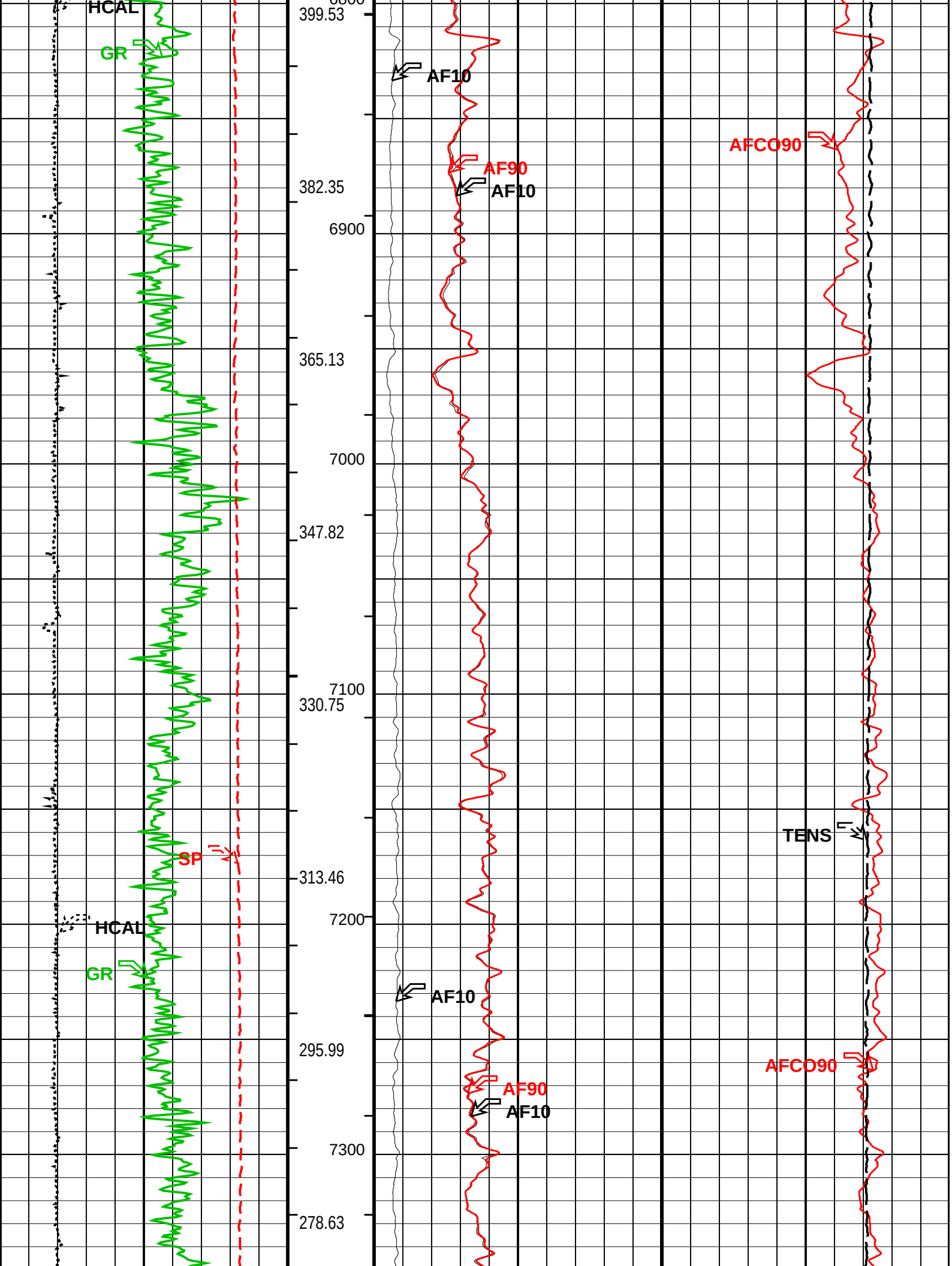
AF90
AF10
AFCO90
948.19
4500
930.03
4600


912.54
4700
894.37
SP
876.93
HCAL
4800
GR
AF10
859.38
AF90
AF10
4900
841.70
5000
824.01
806.59
5100
TENS
AFCO90


789.04
5200
771.54
5300
753.56
735.34
5400
717.16
5500
699.16
5600
681.70
663.76
5700
SP
HCAL
GR
AF10
AF90
AF10
AFCO90
TENS
SP
HCAL
GR
AF10
AF90
AF10
TENS
AFCO90


645.69
5800
627.70
5900
609.68
SP
591.76
6000
HCAL
GR
AF10
573.49
AF90
AF10
6100
555.72
TENS
AFCO90
6200
537.82


520.04
6300
502.69
6400
485.13
6500
467.86
450.67
6600
MTX GHG
6690.3 FT
6700
416.92
6800
SP
HCAL
GR
AF10
AF90
AF10
TENS
AFCO90
SP
TENS


HCAL
GR
399.53
AF10
AF90
AF10
AFCO90
382.35
6900
365.13
7000
347.82
7100
330.75
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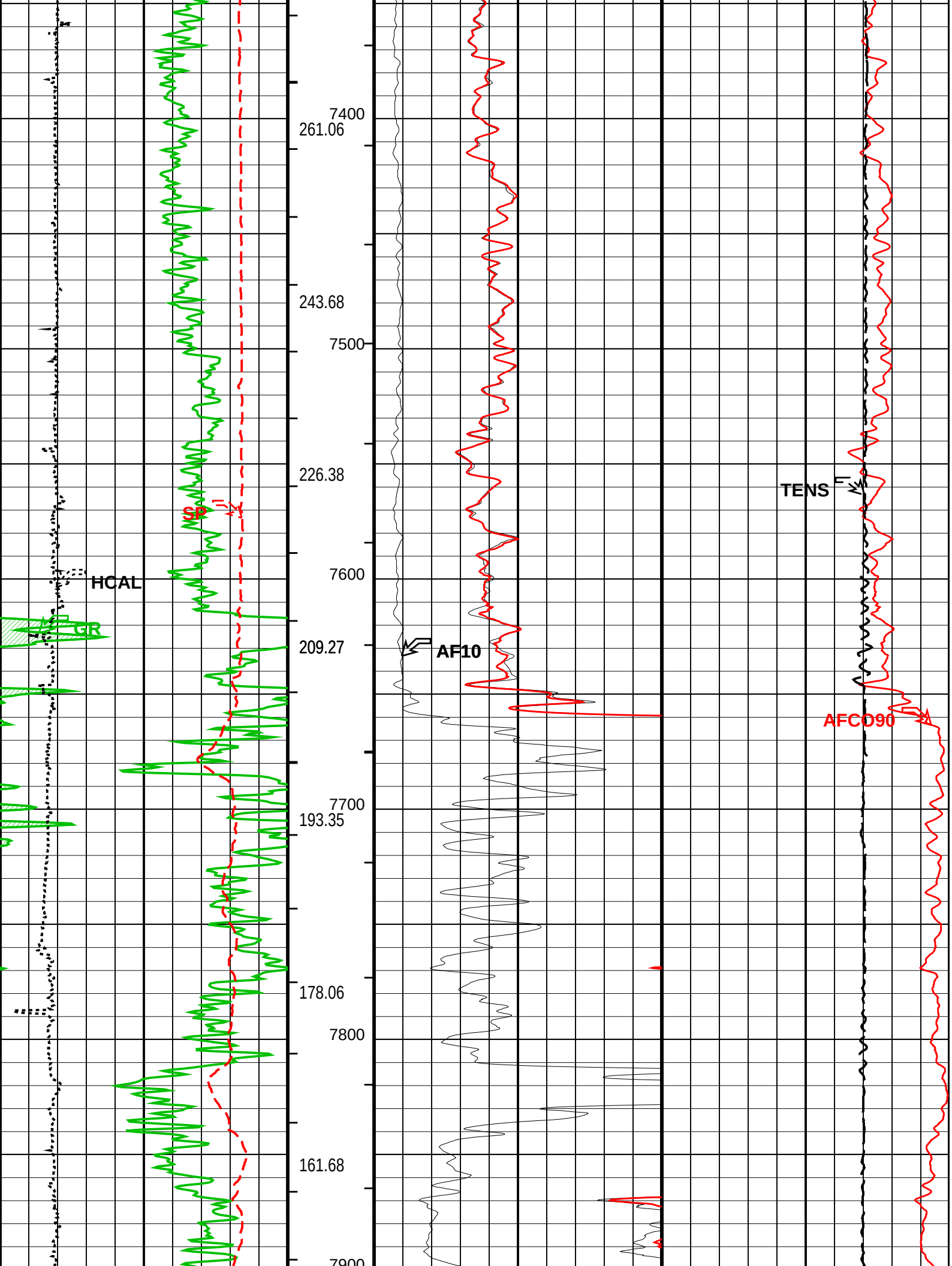
SP
313.46
7200
HCAL
GR
AF10
295.99
AFCO90
AF90
AF10
7300
278.63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243.68
7500
226.38
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193.35
178.06
7800
161.68
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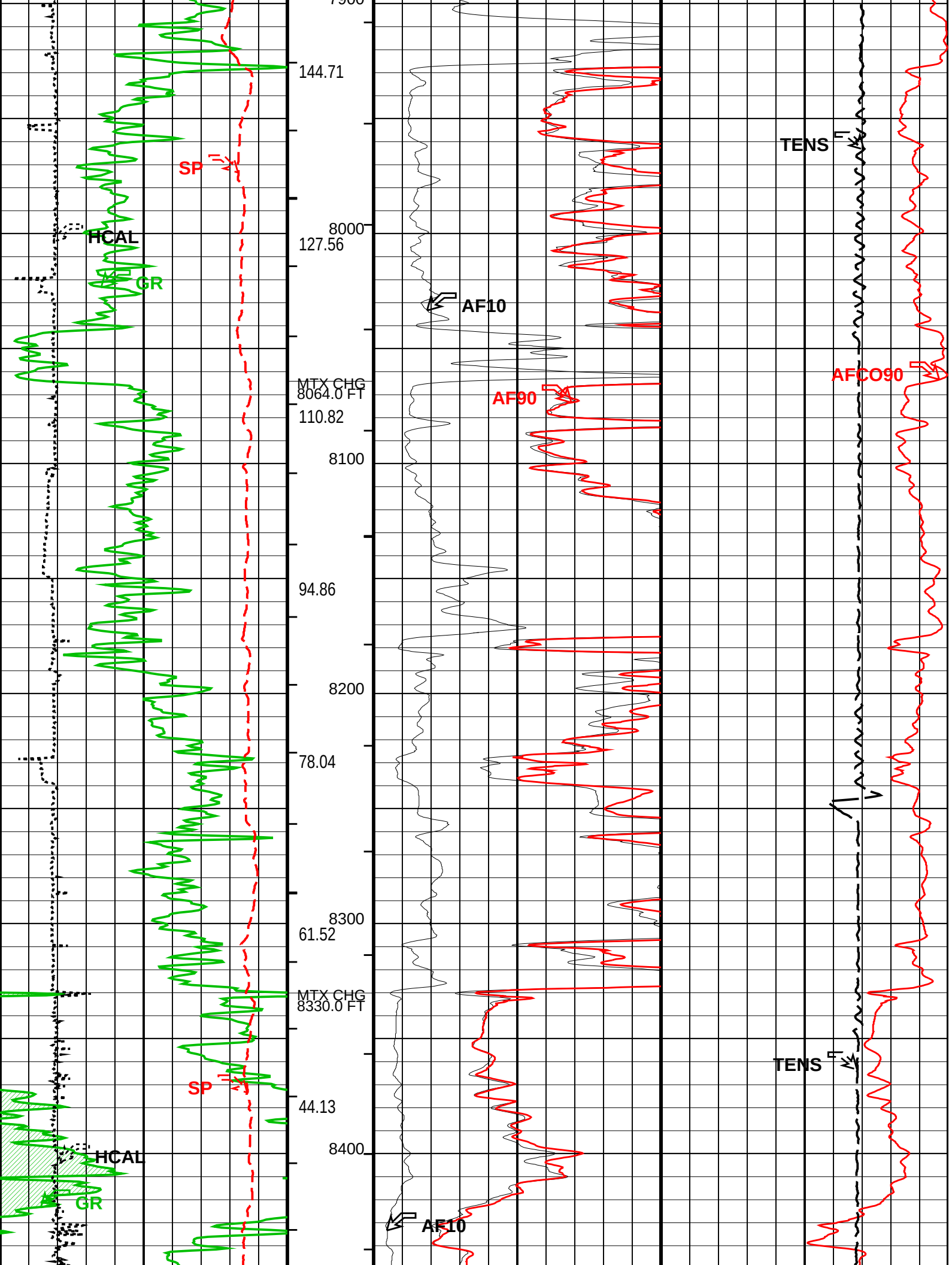
HCAL
GR
SP
AF10
TENS
AFCO90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SP
TENS
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GR
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MTX CHG
8064.0 FT
AF90
AFCO90
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8100
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GR
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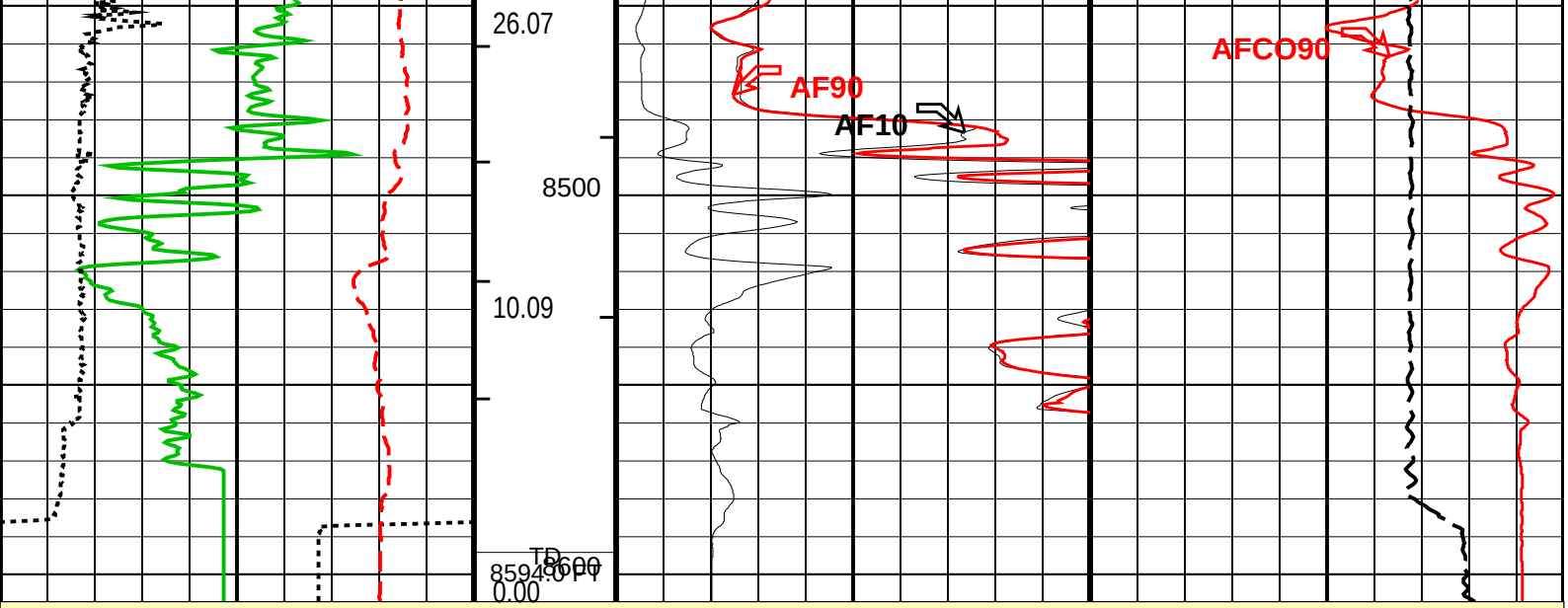


MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

Gamma Ray Backup	Cement Volume (ICV) (F3)	AIT 10 Inch Investigation (AF10)	AIT 90 Inch Investigation Conductivity (AFCO90)
		0 (OHMM) 10	1000 (MM/M) 0
Gamma Ray (GR)		AIT 90 Inch Investigation (AF90)	Tension (TENS)
0 (GAPI) 200		0 (OHMM) 10	10000 (LBF) 0
Caliper (HCAL)		AIT 10 Inch Investigation (AF10)	
6 (IN) 16		0 (OHMM) 50	
SP (SP)			
−160 (MV) 40			

PIP SUMMARY

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

Parameters

DLIS Name	Description	Value	
	AIT−M: Array Induction Tool − M		
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
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	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	On	
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 Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASAP	Array Induction Suspend Answer Product Processing	0_NoSuspension	
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	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	

SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	205	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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	68	DEGF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
	System and Miscellaneous		
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	79.26	DEGF
TD	Total Depth	8594	FT

Format: ERES_S2 **Vertical Scale: 2" per 100'** **Graphics File Created: 27−Nov−2009 20:39**

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39

Schlumberger

UPPER RESISTIVITY LOG 5" = 100'

MAXIS Field Log

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39	8607.0 FT	0.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 470.78 ft3

Cement Volume = 321.17 ft3 (assuming 4.50 in casing O.D.)

Computed from 5599.5 ft to 4245.5 ft

OP System Version: 17C0−154

AITM	17C0−154	HILTD	17C0−154
DTCH	17C0−154		

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

Tension (TENS)
10000 (LBF) 0

AIT 90 Inch Investigation (AT90)
0.2 (OHMM) 2000

SP (SP)
−160 (MV) 40

AIT 60 Inch Investigation (AT60)
0.2 (OHMM) 2000

Caliper (HCAL)
6 (IN) 16

Stuck Stretch (STIT)
0 (F) 50

AIT 30 Inch Investigation (AT30)
0.2 (OHMM) 2000

Gamma Ray (GR)
0 (GAPI) 200

Tool/Tot. Drag

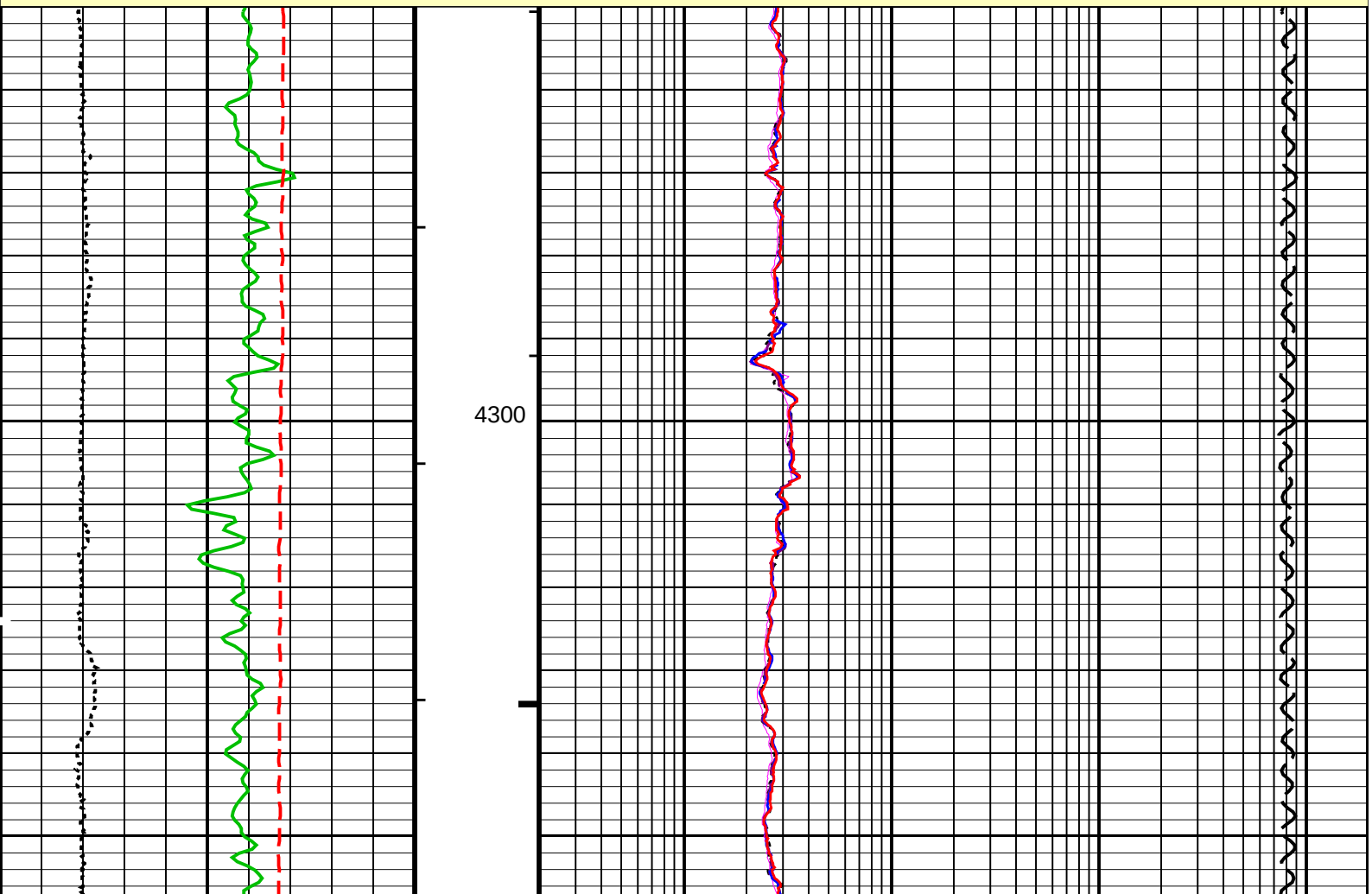
AIT 20 Inch Investigation (AT20)
0.2 (OHMM) 2000

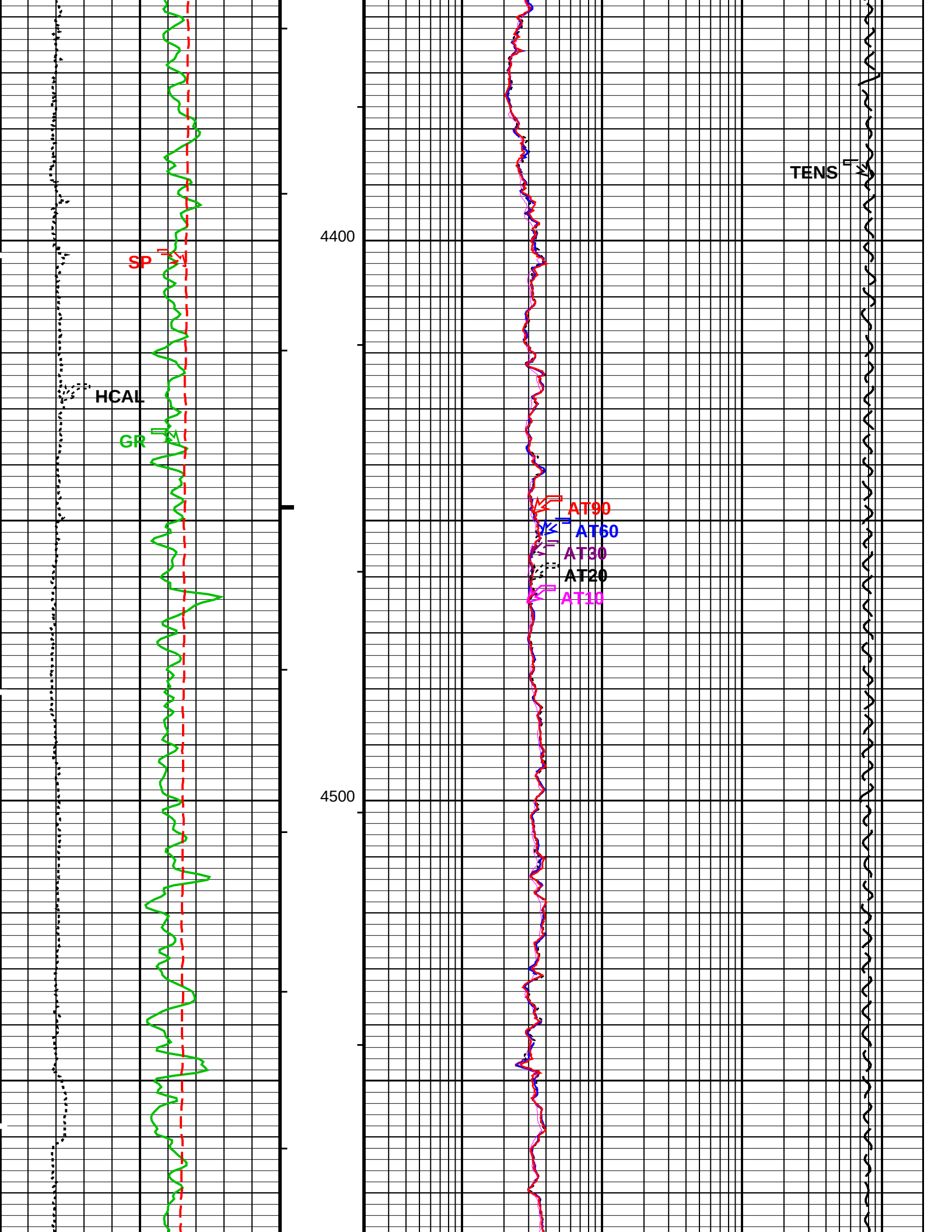
Gamma Ray Backup

Cable Drag

AIT 10 Inch Investigation (AT10)
0.2 (OHMM) 2000

MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

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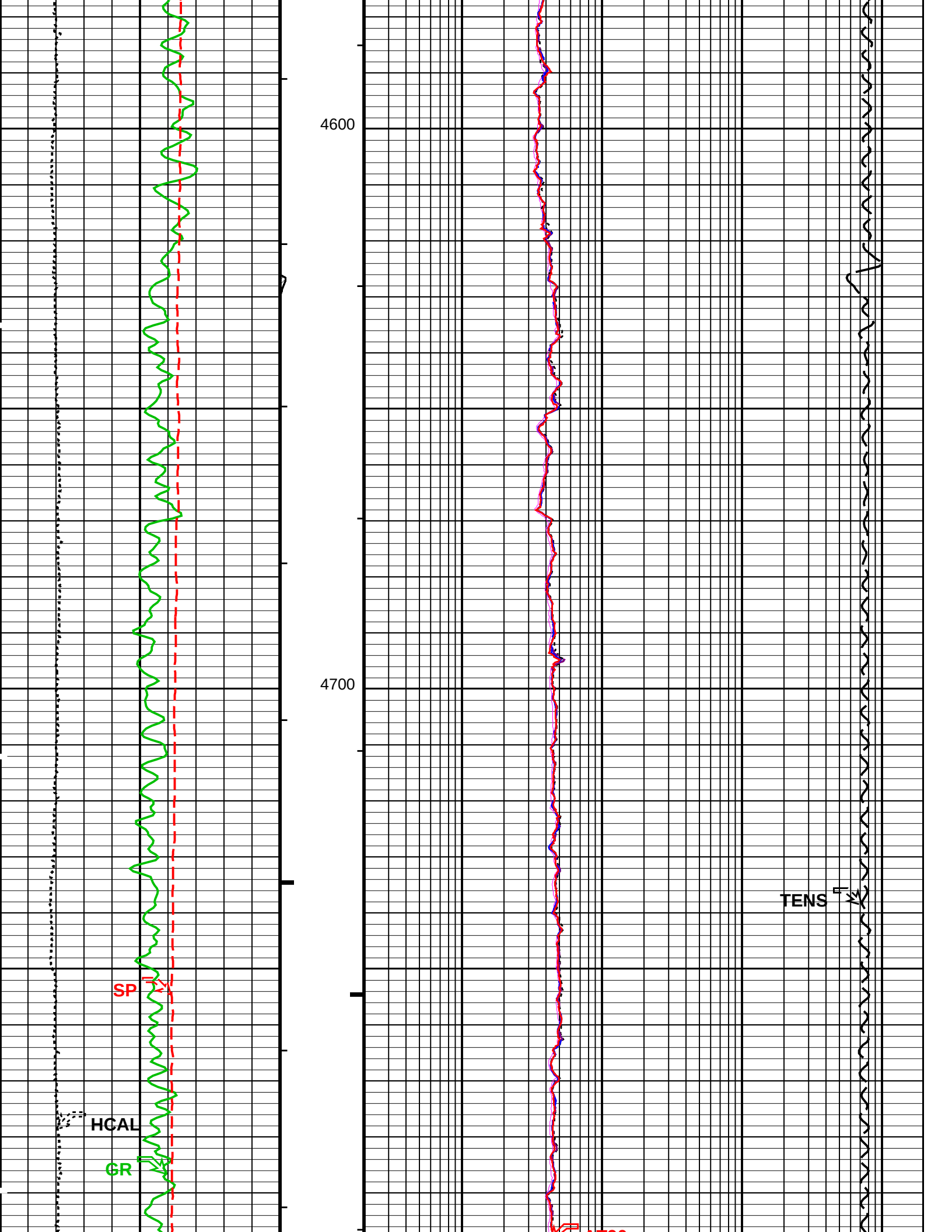
HCAL
GR
4400
4500
AT90
AT60
AT30
AT20
AT10
TENS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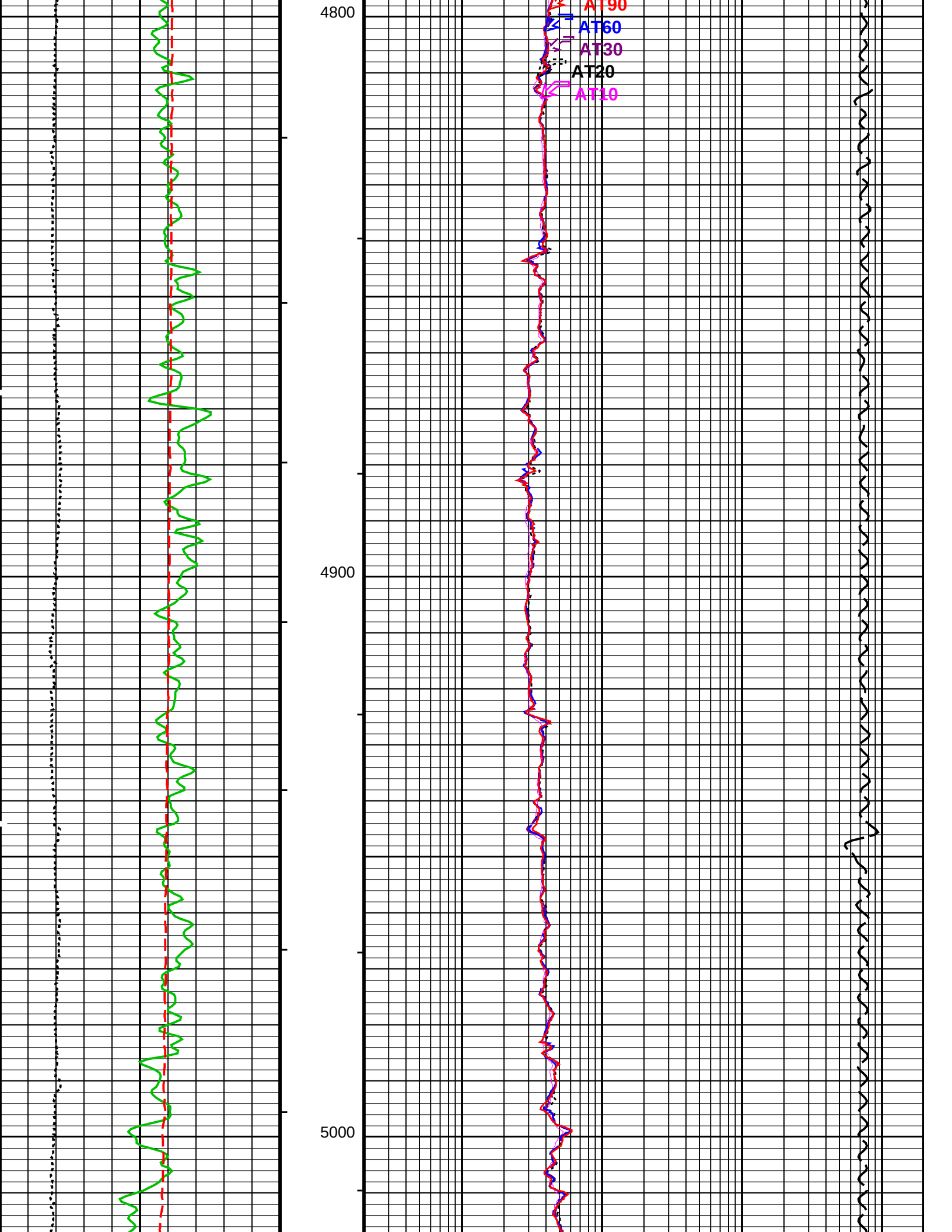
4700
SP
HCAL
GR
TENS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4900
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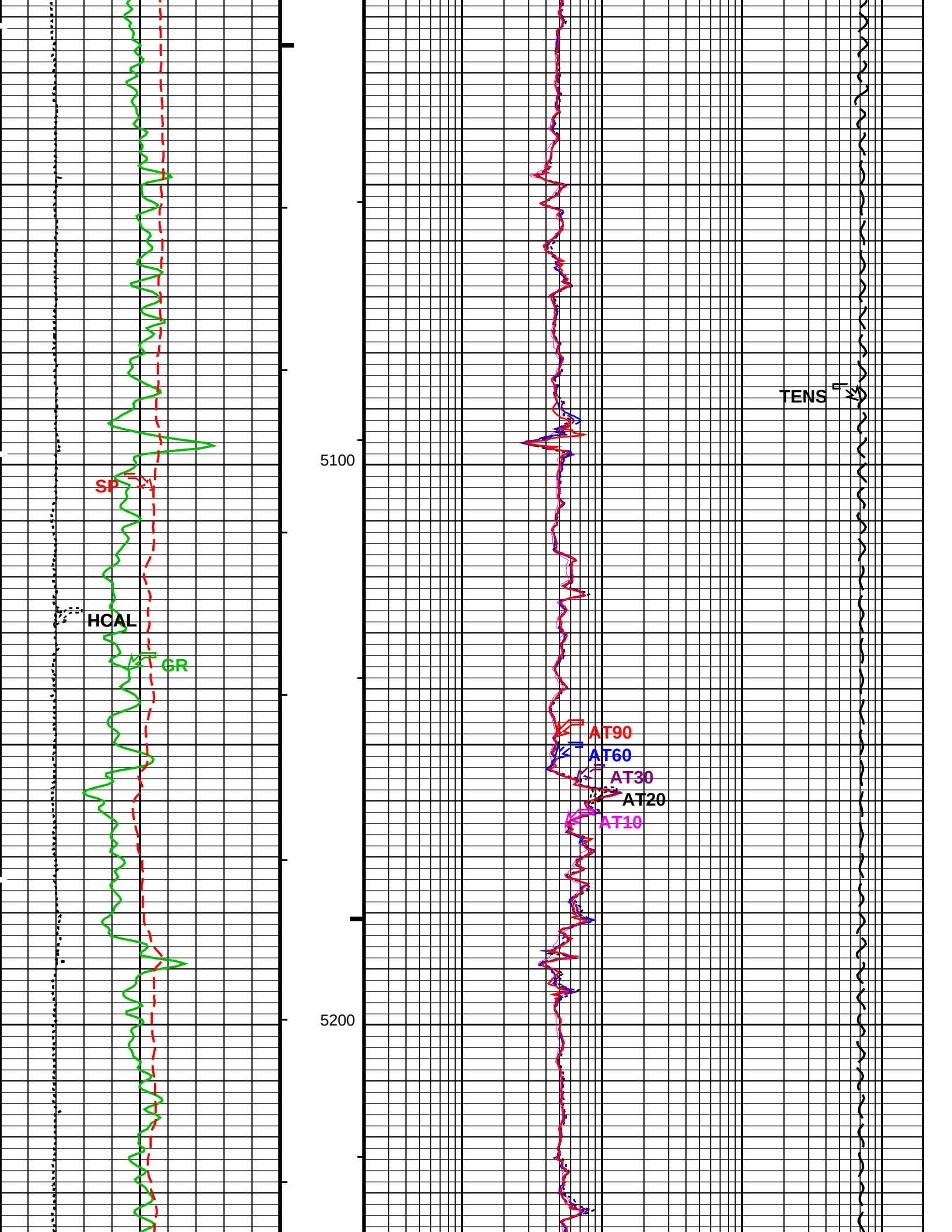
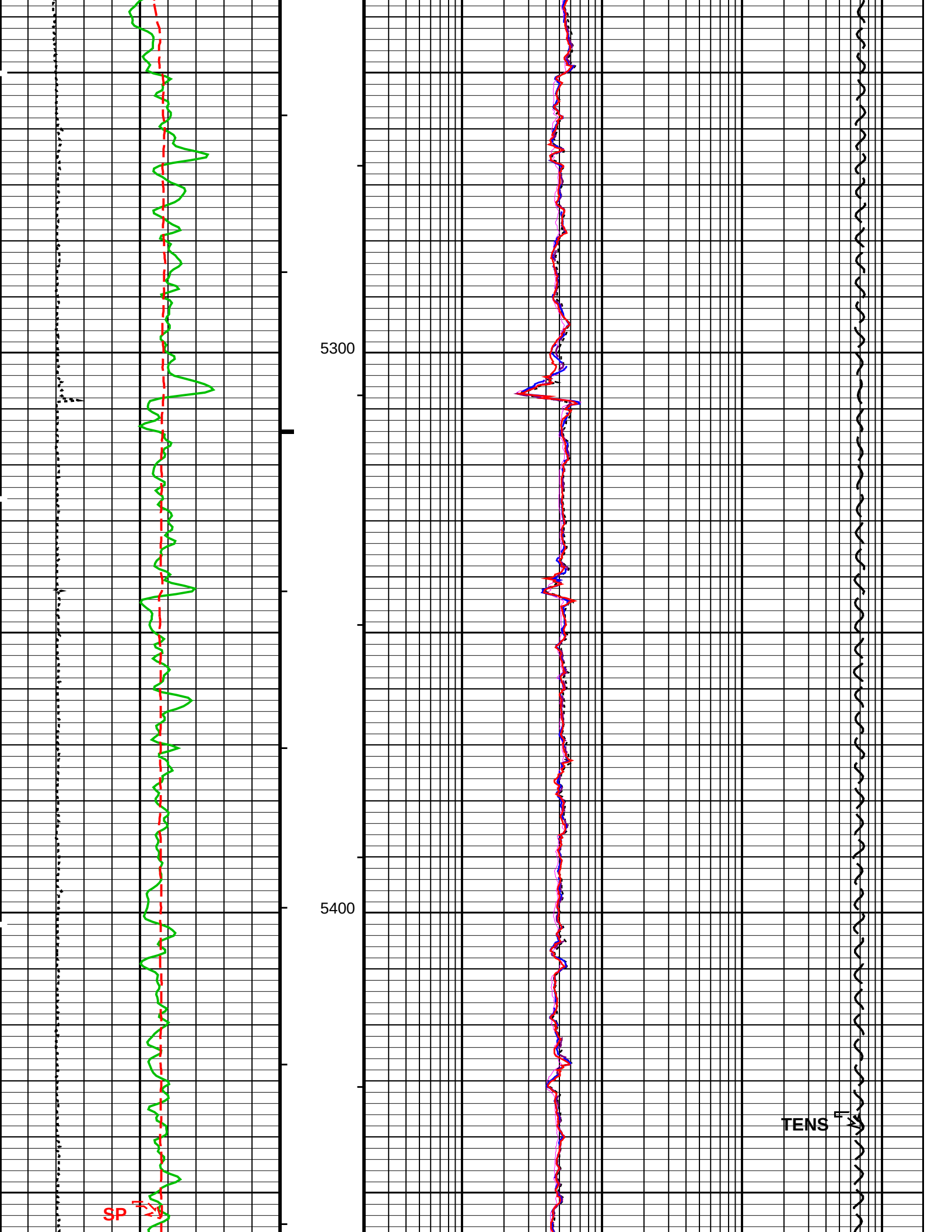
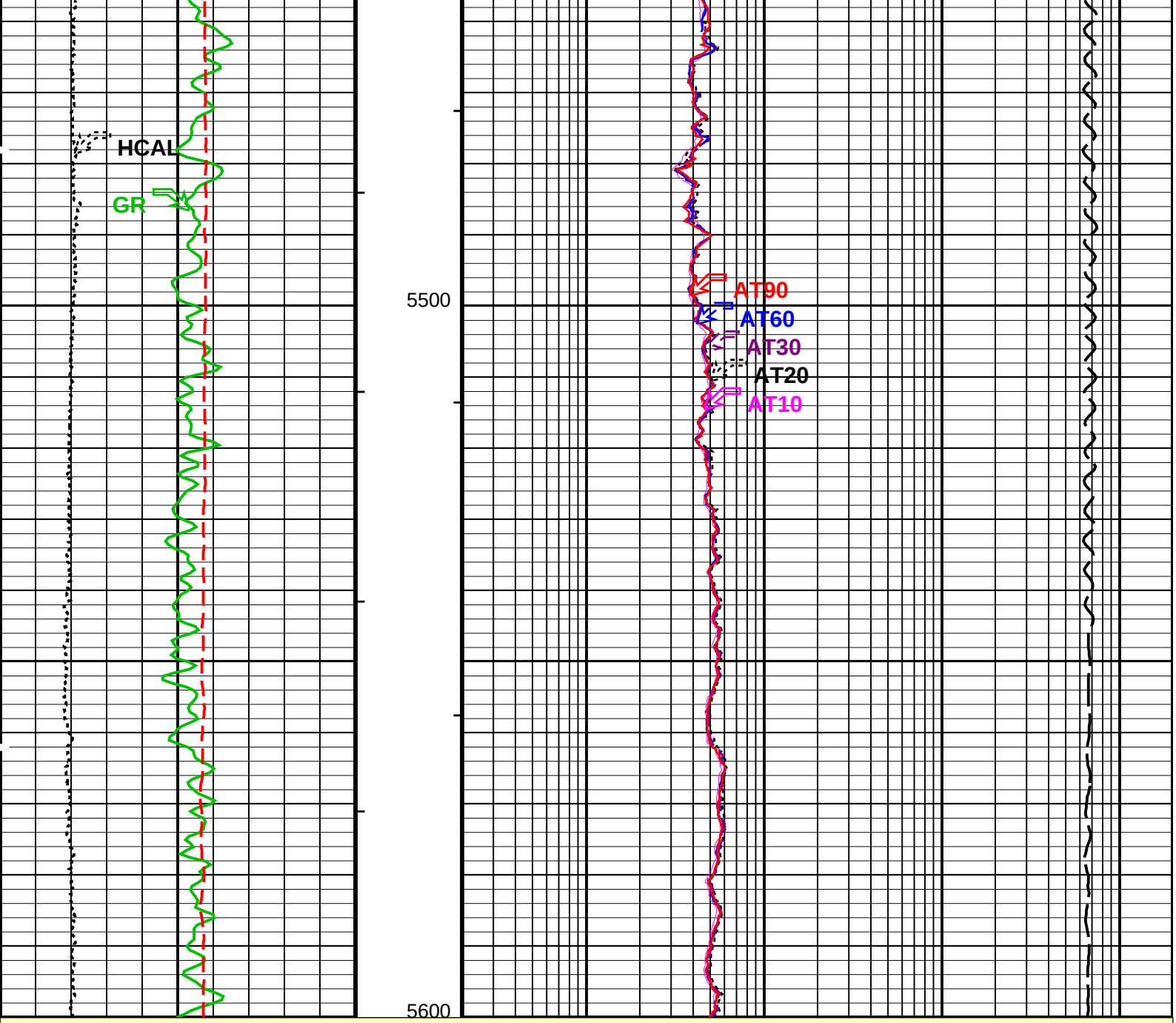
AT90
AT60
AT30
AT20
AT10


SP
HCAL
GR
5100
5200
TENS
AT90
AT60
AT30
AT20
AT10


5300
5400
SP
TENS



MAIN PASS: * PLATFORM EXPRESS − ARRAY INDUCTION ***

Gamma Ray Backup	Cable Drag	AIT 10 Inch Investigation (AT10): 0.2 (OHMM) 2000
Gamma Ray (GR): 0 (GAPI) 200	Tool/Tot. Drag	AIT 20 Inch Investigation (AT20): 0.2 (OHMM) 2000
Caliper (HCAL): 6 (IN) 16	Stuck Stretch (STIT): 0 (F) 50	AIT 30 Inch Investigation (AT30): 0.2 (OHMM) 2000
SP (SP): −160 (MV) 40		AIT 60 Inch Investigation (AT60): 0.2 (OHMM) 2000
		AIT 90 Inch Investigation (AT90): 0.2 (OHMM) 2000
		Tension (TENS): 10000 (LBF) 0

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		
ABHM	Array Induction Borehole Correction Mode	2_COMPUTESTANDOFF	
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	NO	
ACEN	Array Induction Tool Centering Flag (in Borehole)	ECCENTERED	
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	YES	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	ON	
AMRF	Array Induction Mud Resistivity Factor	1.000	
AORSV	Array Induction Response Set Version for One ft Resolution	41.70.24.20	
ARFV	Array Induction Radial Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASAP	Array Induction Suspend Answer Product Processing	0_NOSUSPENSION	
ASPC	Array Induction Sonde Characterization Pressure Coefficients	0.000	
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	
AULV	Array Induction User Level Control	NORMAL	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHT	Bottom Hole Temperature (used in calculations)	205.0	degF
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AMF_AITM	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68.000	degF
SPDR	SP Drift	0.000	mV/ft
SPNV	SP Next Value	0.000	mV
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHT	Bottom Hole Temperature (used in calculations)	205.0	degF
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AMF_AITM	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68.000	degF
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	205.0	degF
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AMF_AITM	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68.000	degF
	PERT: Preliminary Evaluation − Real Time		
BHT	Bottom Hole Temperature (used in calculations)	205.0	degF
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AMF_AITM	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68.000	degF
	STI: Stuck Tool Indicator		
STKT	STI Stuck Threshold	2.500	ft
TDD	Total Depth − Driller	8628.0	ft
TDL	Total Depth − Logger	8594.0	ft
	System and Miscellaneous		
ACSED	Array Induction Casing Shoe Estimated Depth		
BS	Bit Size	7.875	in
DFD	Drilling Fluid Density	8.300	lbm/gal
FLEV	Fluid Level	10.000	ft
MST	Mud Sample Temperature	79.260	degF

TD	Total Depth	8594.0	ft

Format: UPPER_GRES Vertical Scale: 5" per 100' Graphics File Created: 27−Nov−2009 21:38

OP System Version: 17C0−154

AITM	17C0−154	HILTD	17C0−154
DTCH	17C0−154		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39	8607.0 FT	0.0 FT

Schlumberger

LOWER RESISTIVITY LOG 5" = 100'

MAXIS Field Log

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

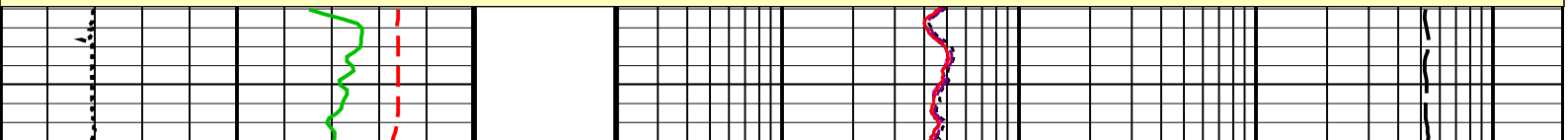
PIP SUMMARY

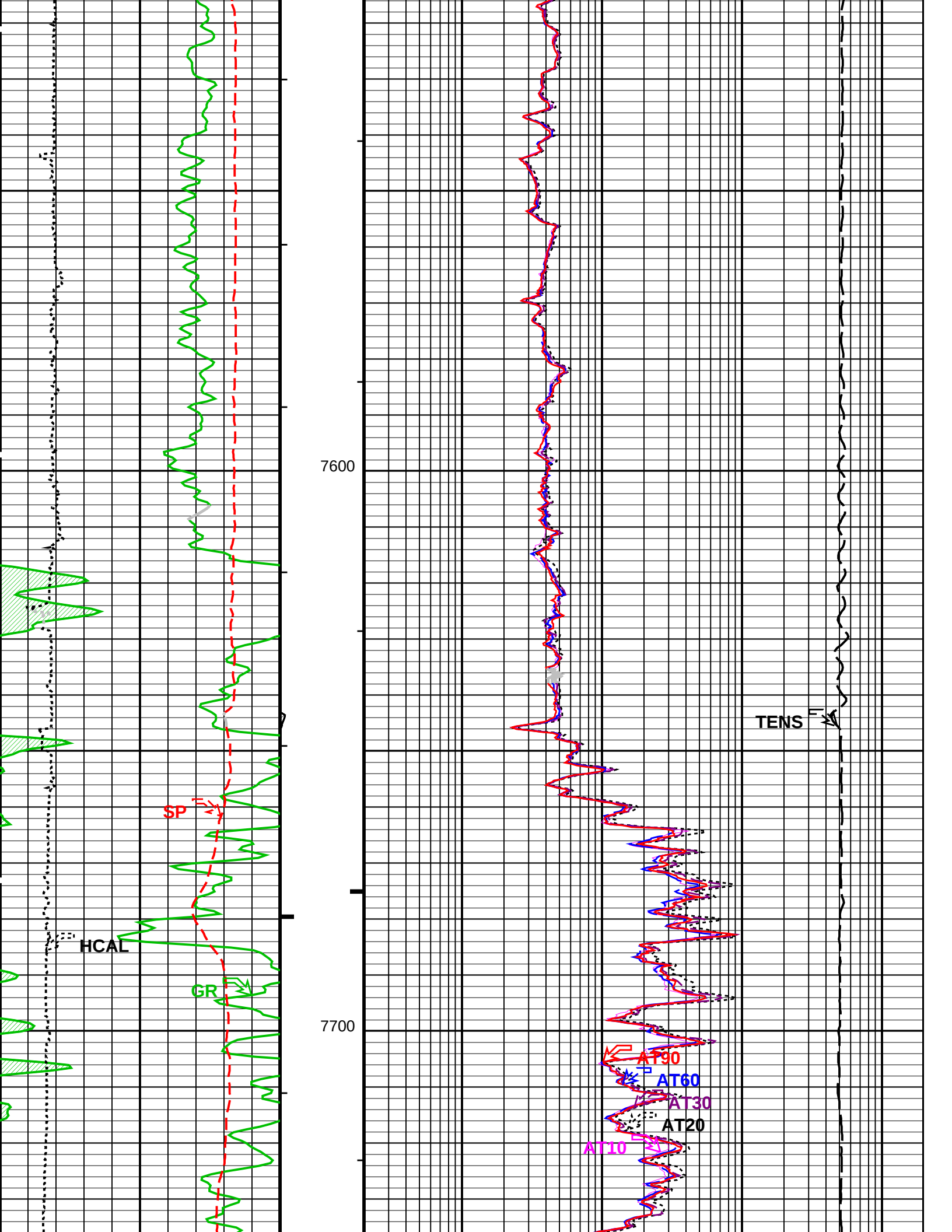
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

		Tension (TENS) 10000 (LBF) 0
		AIT 90 Inch Investigation (AT90) 0.2 (OHMM) 2000
SP (SP) −160 (MV) 40		AIT 60 Inch Investigation (AT60) 0.2 (OHMM) 2000
Caliper (HCAL) 6 (IN) 16	Stuck Stretch (STIT) 0 (F) 50	AIT 30 Inch Investigation (AT30) 0.2 (OHMM) 2000
Gamma Ray (GR) 0 (GAPI) 200	Tool/Tot. Drag	AIT 20 Inch Investigation (AT20) 0.2 (OHMM) 2000
Gamma Ray Backup	Cable Drag	AIT 10 Inch Investigation (AT10) 0.2 (OHMM) 2000

MAIN PASS: *** PLATFORM EXPRESS − ARRAY INDUCTION ***

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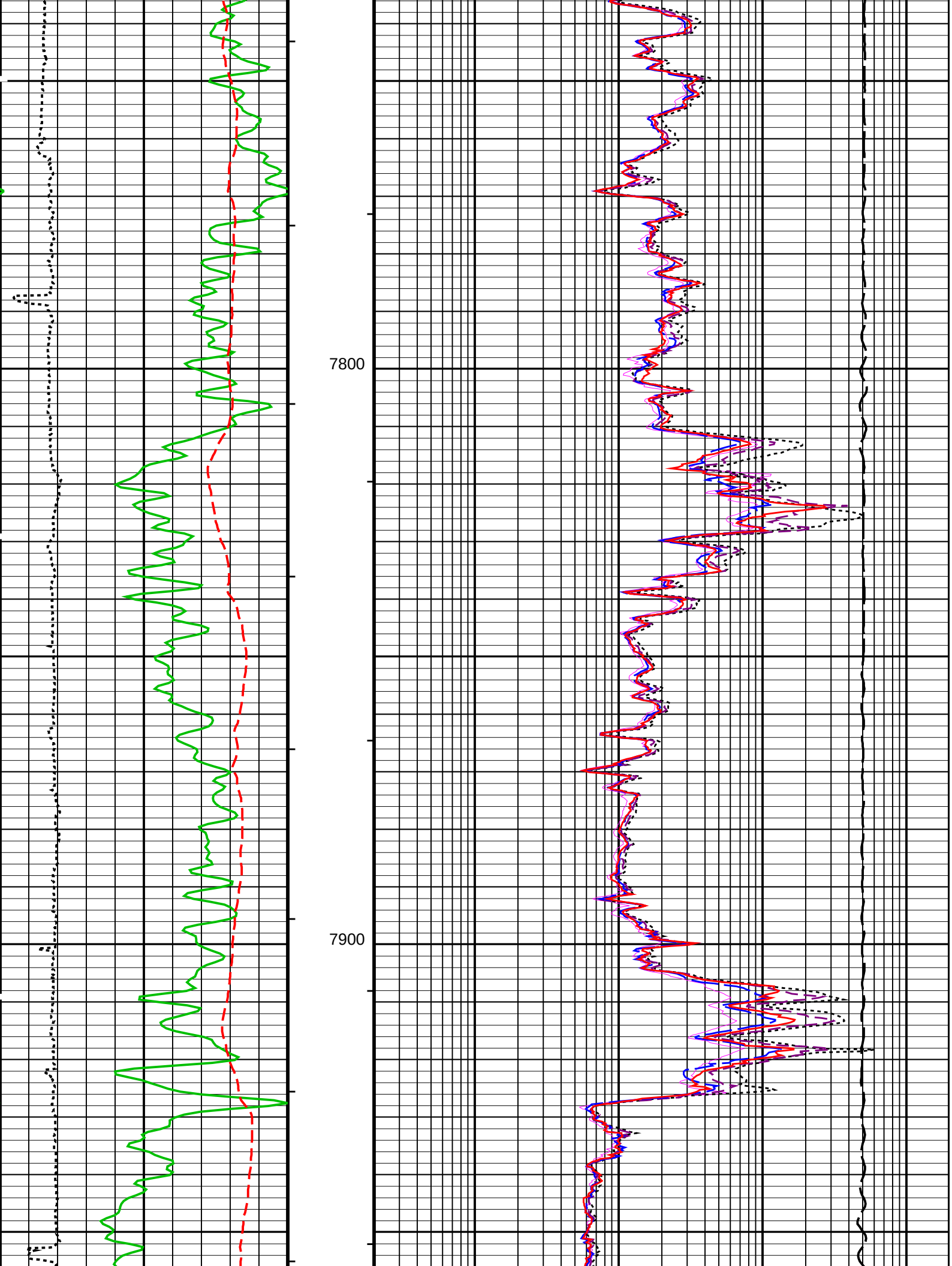
SP
GR
HCAL
TENS
AT90
AT60
AT30
AT20
AT10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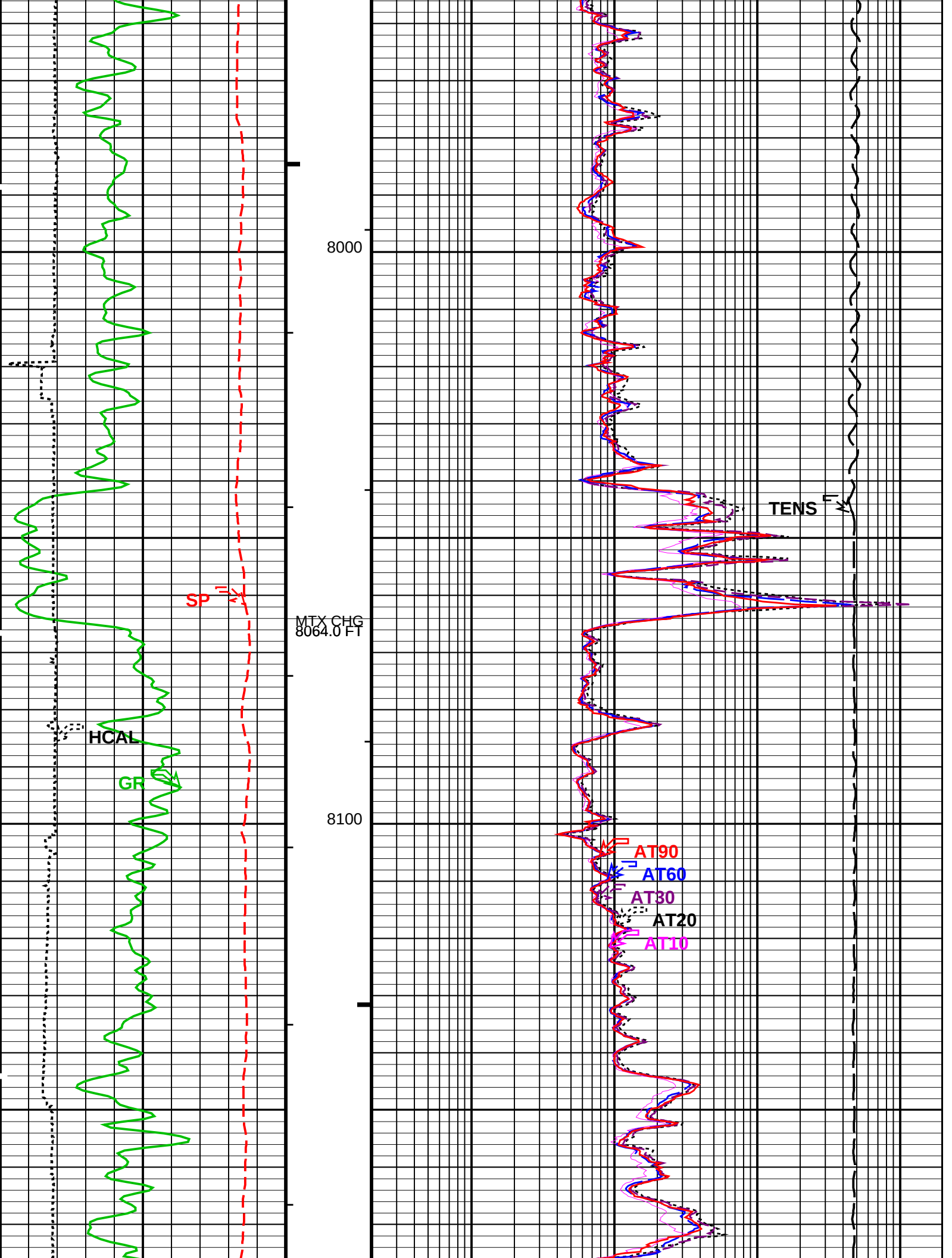
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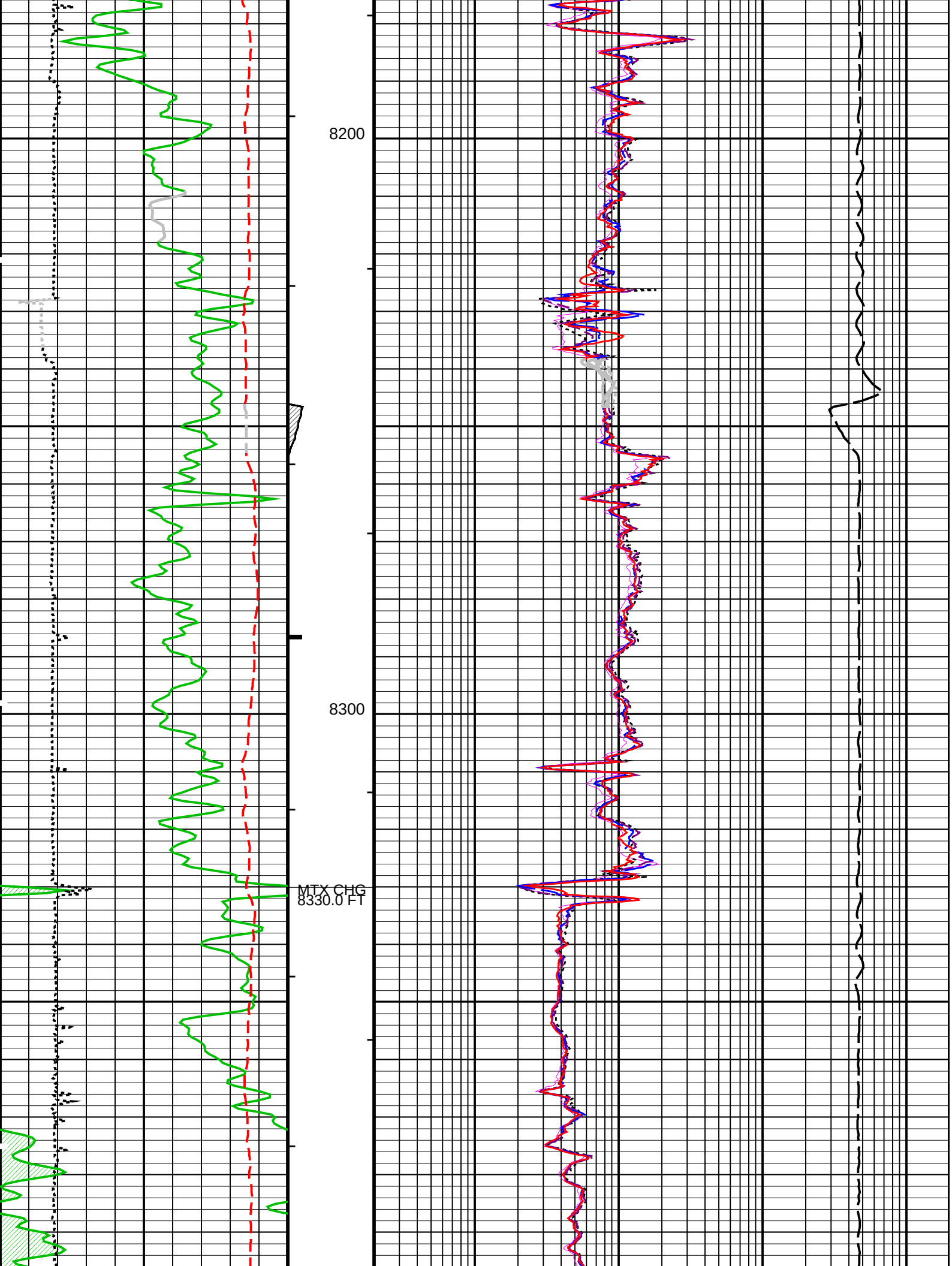
8100
SP
HCAL
GR
TENS
AT90
AT60
AT30
AT20
AT10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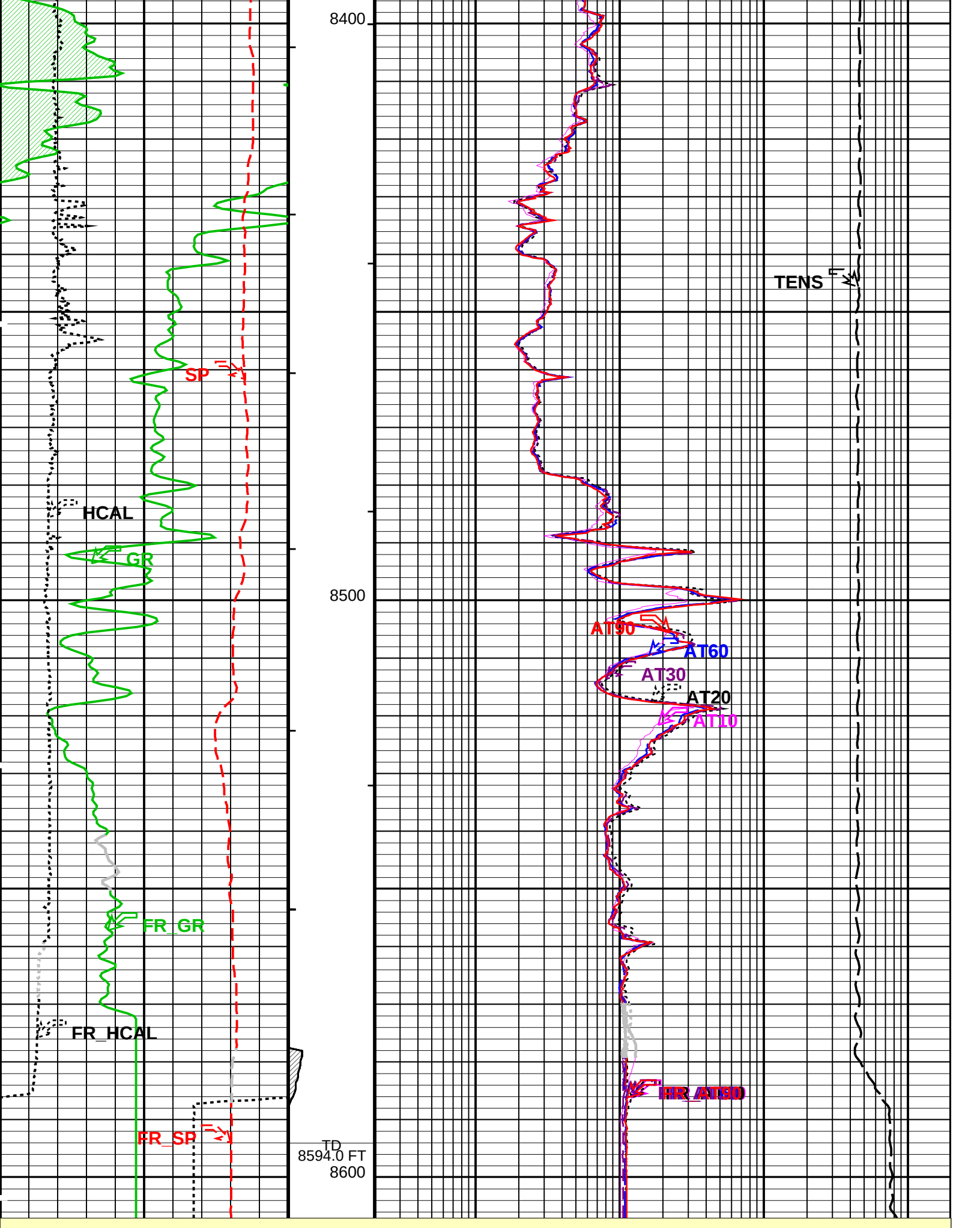
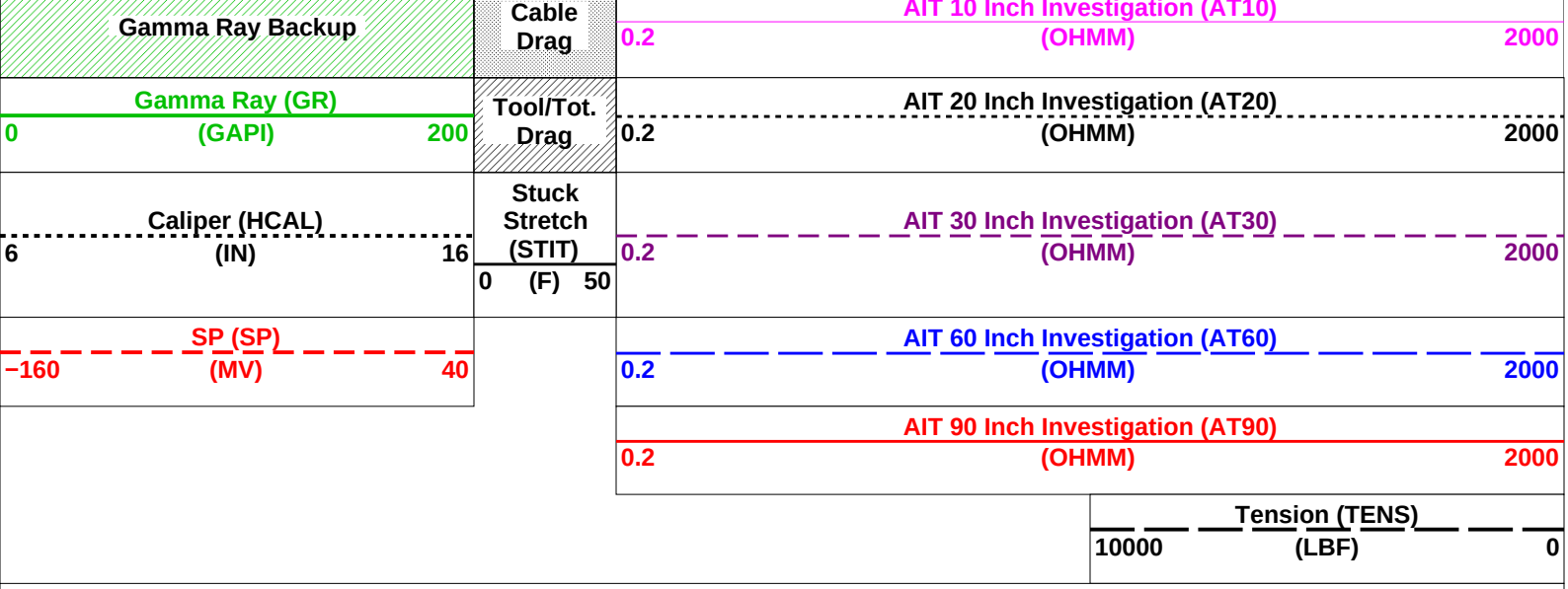
8300
MTX CHG
8330.0 FT



MAIN PASS: *** PLATFORM EXPRESS − ARRAY INDUCTION ***



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		
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
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	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	On	
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 Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASAP	Array Induction Suspend Answer Product Processing	0_NoSuspension	
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	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FCD	Future Casing (Outer) Diameter	4.5	IN
GCSE	Generalized Caliper Selection	HCAL	

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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation − Real Time			
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	TDL	
STKT	STI Stuck Threshold	2.5	FT
TDD	Total Depth − Driller	8628.00	FT
TDL	Total Depth − Logger	8594.00	FT
System and Miscellaneous			
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	79.26	DEGF
TD	Total Depth	8594	FT

Format: LOWER_GRES **Vertical Scale: 5" per 100'** **Graphics File Created: 27−Nov−2009 20:39**

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39	

Schlumberger

REPEAT ANALYSIS

MAXIS Field Log

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	27−Nov−2009 20:38	8625.0 FT	8229.0 FT

Output DLIS Files

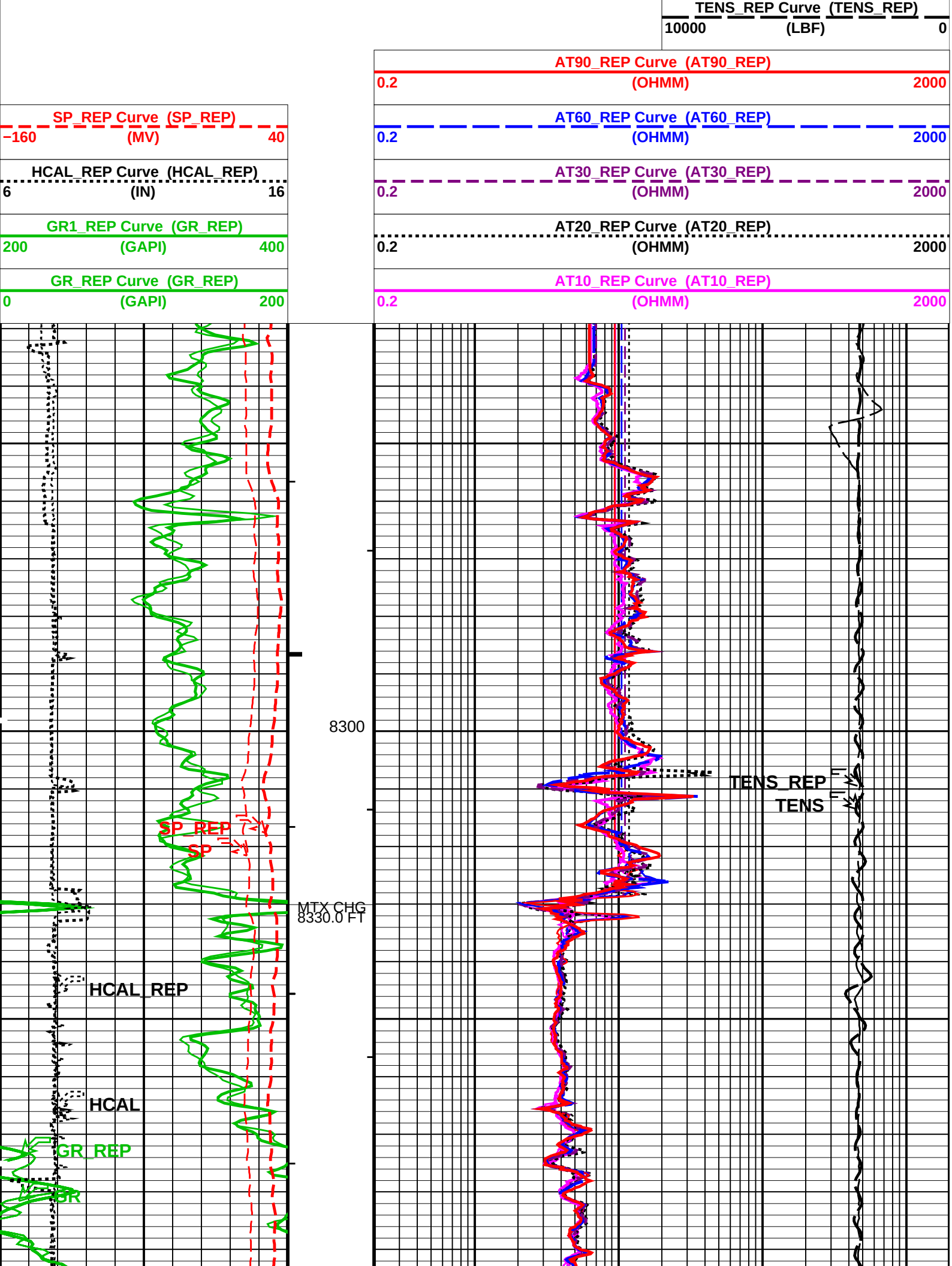
DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

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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10000 (LBF) 0
AT90_REP Curve (AT90_REP)
0.2 (OHMM) 2000
SP_REP Curve (SP_REP)
−160 (MV) 40
AT60_REP Curve (AT60_REP)
0.2 (OHMM) 2000
HCAL_REP Curve (HCAL_REP)
6 (IN) 16
AT30_REP Curve (AT30_REP)
0.2 (OHMM) 2000
GR1_REP Curve (GR_REP)
200 (GAPI) 400
AT20_REP Curve (AT20_REP)
0.2 (OHMM) 2000
GR_REP Curve (GR_REP)
0 (GAPI) 200
AT10_REP Curve (AT10_REP)
0.2 (OHMM) 2000
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TENS
SP_REP
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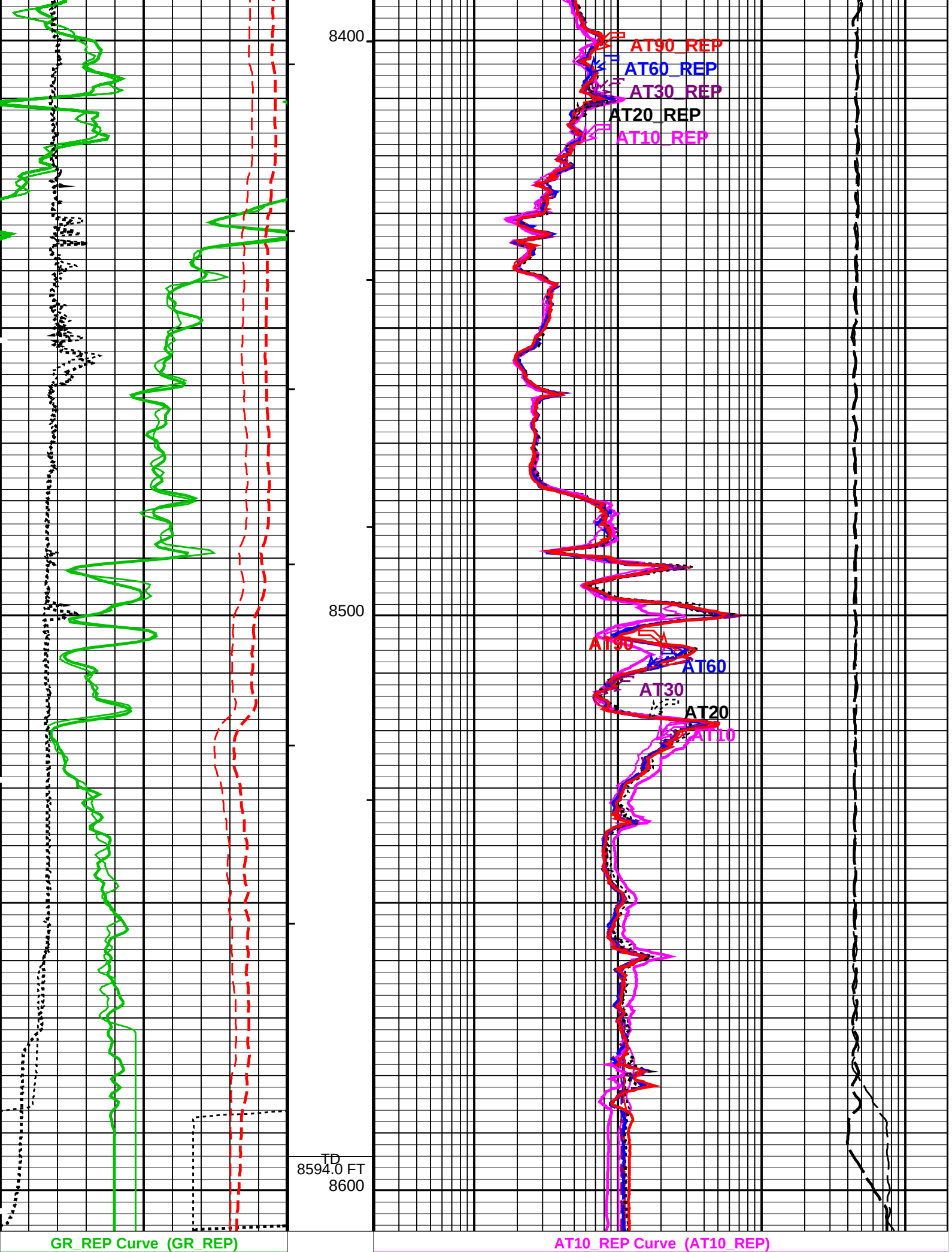
GR_REP
GR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8500
TD
8594.0 FT
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AT90_REP
AT60_REP
AT30_REP
AT20_REP
AT10_REP
AT90
AT60
AT30
AT20
AT10
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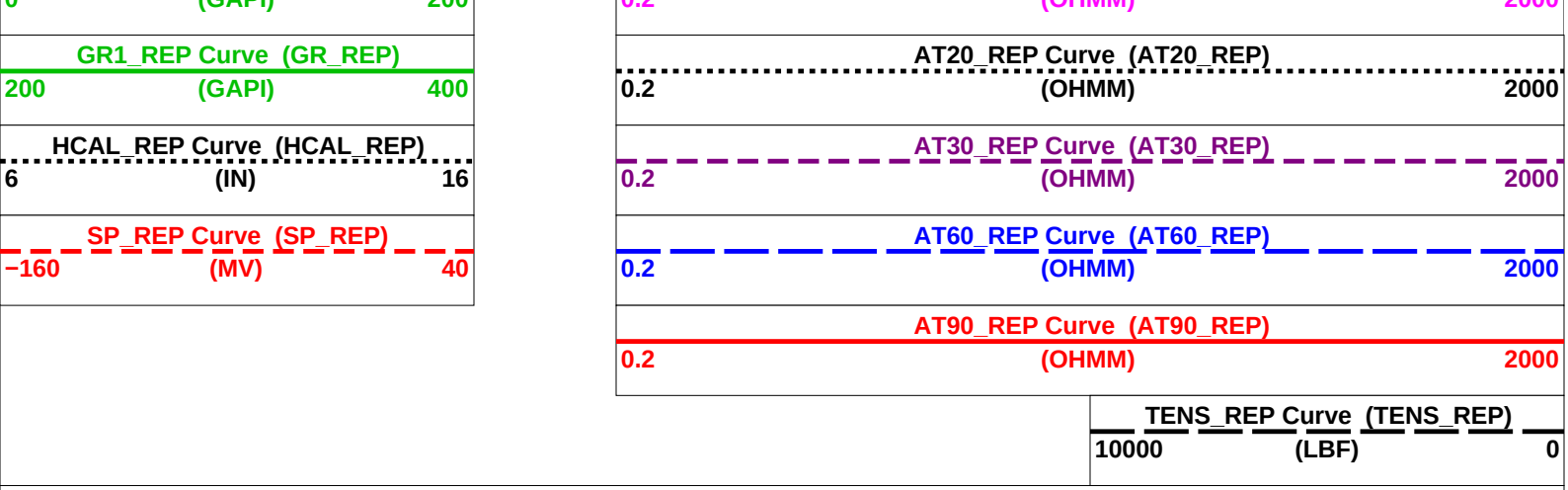
0
(GAPI)
200
AT10_REP Curve (AT10_REP)
0.2
(OHMM)
2000



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		
ABHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
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	No	
ACEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
ACSED	Array Induction Casing Shoe Estimated Depth	−50000	FT
AETP	Array Induction Enable Sonde Error Temp&Pres Corr	Yes	
AFRSV	Array Induction Response Set Version for Four ft Resolution	41.70.24.20	
AIGS	Array Induction Select Akima Interpolation Gating	On	
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 Profiling Code Version Number	701	
ARPV	Array Induction Radial Parametrization Code Version Number	232	
ASAP	Array Induction Suspend Answer Product Processing	0_NoSuspension	
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	
AULV	Array Induction User Level Control	Normal	
AZRSV	Array Induction Response Set Version for Z Resolution	00.10.25.00	
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
	HILTB−FTB: High resolution Integrated Logging Tool−DTS		
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
	FEQL: Formation Evaluation Quick Look		
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
	HOLEV: Integrated Hole/Cement Volume		
BHT	Bottom Hole Temperature (used in calculations)	205	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	AITM_RESIST	

GTSE	Generalized Temperature Selection	HSTS_HTEM	
HVCS	Integrated Hole Volume Caliper Selection	HCAL	
SHT	Surface Hole Temperature	68	DEGF
PERT: Preliminary Evaluation − Real Time			
BHT	Bottom Hole Temperature (used in calculations)	205	DEGF
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
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	AITM_RESIST	
GTSE	Generalized Temperature Selection	HSTS_HTEM	
SHT	Surface Hole Temperature	68	DEGF
System and Miscellaneous			
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.30	LB/G
DORL	Depth Offset for Repeat Analysis	0.0	FT
FLEV	Fluid Level	10.00	FT
MST	Mud Sample Temperature	79.26	DEGF
TD	Total Depth	8594	FT

Format: GRES_REP **Vertical Scale: 5" per 100'** **Graphics File Created: 27−Nov−2009 20:39**

OP System Version: 17C0−154

AIT−M	17C0−154	HILTB−FTB	17C0−154
DTC−H	17C0−154		

Input DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_005PUP	FN:4	PRODUCER	27−Nov−2009 20:38	8625.0 FT	8229.0 FT

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_006LUP	FN:5	PRODUCER	27−Nov−2009 20:39

Schlumberger

BEFORE 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: 14−Oct−2009 17:03 Before: 27−Nov−2009 15:06							
Thru Cal Magnitude − 0	0	0.6205	0.6204	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.271	1.271	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6318	0.6317	N/A	N/A	N/A	V
Thru Cal Magnitude − 3	0	0.7131	0.7130	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.334	1.334	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.953	1.953	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.949	1.949	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.419	1.419	N/A	N/A	N/A	V
Thru Cal Phase − 0	0	180.2	180.2	N/A	N/A	N/A	DEG
Thru Cal Phase − 1	0	179.2	179.1	N/A	N/A	N/A	DEG
Thru Cal Phase − 2	0	175.6	175.6	N/A	N/A	N/A	DEG
Thru Cal Phase − 3	0	174.9	174.8	N/A	N/A	N/A	DEG
Thru Cal Phase − 4	0	168.7	168.7	N/A	N/A	N/A	DEG
Thru Cal Phase − 5	0	167.0	167.0	N/A	N/A	N/A	DEG
Thru Cal Phase − 6	0	167.0	167.0	N/A	N/A	N/A	DEG
Thru Cal Phase − 7	0	166.2	166.2	N/A	N/A	N/A	DEG
Array Induction Tool − M Wellsite Calibration − Electronics Calibration Check − Auxiliary							

Master: 14−Oct−2009 17:03 Before: 27−Nov−2009 15:06

Array Induction SPA Plus	991.0	992.7	992.7	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.6638	0.6620	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9170	0.9196	0.9196	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0006632	0.0006718	N/A	N/A	N/A	V

Array Induction Tool − M Wellsite Calibration − Test Loop Gain Correction
Master: 14−Oct−2009 17:03

Test Loop Gain Correctio − 0	0	1.017	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 1	0	1.014	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 2	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 3	0	1.011	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 4	0	0.9935	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 5	0	0.9888	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 6	0	0.9937	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 7	0	1.007	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 0	0	0.7201	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 1	0	0.7620	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 2	0	0.2948	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 3	0	0.2209	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 4	0	0.1146	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 5	0	−0.009143	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 6	0	0.2984	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 7	0	−0.05307	N/A	N/A	N/A	N/A	DEG

Array Induction Tool − M Wellsite Calibration − Sonde Error Correction
Master: 14−Oct−2009 17:03

R Sonde Error Correction − 0	0	−69.04	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	172.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	116.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	64.65	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	26.78	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	12.75	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	11.98	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−2.480	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	−259.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	103.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	63.05	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	−22.90	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	21.47	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 5	0	−15.50	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	−4.060	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	−4.950	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool − M Wellsite Calibration − Mud Gain Correction
Master: 14−Oct−2009 17:03

Coarse − Mag, Real, Imag − 0	0	0.8551	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	0.8551	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	0.8551	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	0.8573	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	0.8573	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	0.8573	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 27−Nov−2009 15:10

BS Window Ratio	0.7143	N/A	0.7123	N/A	N/A	N/A	
BS Window Sum	8626	N/A	8634	N/A	N/A	N/A	CPS
SS Window Ratio	0.4904	N/A	0.4907	N/A	N/A	N/A	
SS Window Sum	9782	N/A	9761	N/A	N/A	N/A	CPS
LS Window Ratio	0.2965	N/A	0.2929	N/A	N/A	N/A	
LS Window Sum	1030	N/A	1027	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 27−Nov−2009 15:10

BS PM High Voltage (Command)	1475	N/A	1475	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1678	N/A	1679	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1475	N/A	1481	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 27−Nov−2009 15:10

BS Crystal Resolution	10.42	N/A	10.53	N/A	N/A	N/A	%
SS Crystal Resolution	9.900	N/A	9.800	N/A	N/A	N/A	%
LS Crystal Resolution	10.04	N/A	10.02	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 27−Nov−2009 15:06

Raw B0 Resistivity	3875	N/A	3854	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3794	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3790	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 27−Nov−2009 15:02

HILT Caliper Zero Measurement	8.000	N/A	8.581	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.74	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 27−Nov−2009 15:01

Gamma Ray Background	30.00	N/A	83.51	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	178.8	N/A	178.8	N/A	N/A	16.26	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 8−Oct−2009 13:16 Before: 27−Nov−2009 15:03

CNTC Background	26.34	26.34	26.72	N/A	N/A	3.951	CPS
CFTC Background	27.85	27.85	27.82	N/A	N/A	4.178	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 8−Oct−2009 13:16

Thermal Near Corr. (Tank)	5800	5423	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2400	2272	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.387	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 27−Nov−2009 19:59

Z−Axis Acceleration	32.19	N/A	32.07	N/A	N/A	N/A	F/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 21−Nov−2009 12:11

Rho Aluminum	2.596	2.605	−−	−−	−−	−−	G/C3
Rho Magnesium	1.686	1.687	−−	−−	−−	−−	G/C3
Pe Aluminum	2.570	2.559	−−	−−	−−	−−	
Pe Magnesium	2.650	2.626	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 21−Nov−2009 12:11

BS Average Deviation	0	0.2944	−−	−−	−−	−−	%
BS Max Deviation	0	0.7618	−−	−−	−−	−−	%
SS Average Deviation	0	0.4807	−−	−−	−−	−−	%
SS Max Deviation	0	2.268	−−	−−	−−	−−	%
LS Average Deviation	0	1.301	−−	−−	−−	−−	%
LS Max Deviation	0	2.265	−−	−−	−−	−−	%

The GLS−VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT−B Water Temperature 57.0 DEGF.
Thermal Housing Size 3.365 IN.
NSR−F serial number 5068

Array Induction Tool − M / Equipment Identification

Primary Equipment:

Rm/SP Bottom Nose	AMRM − A	
Array Induction Sonde	AMIS − A	1372

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	0.6205		0.6100	180.2		197.0
	Before	0.6204			180.2		
1	Master	1.271		1.270	179.2		196.0
	Before	1.271			179.1		
2	Master	0.6318		0.6200	175.6		192.0
	Before	0.6317			175.6		
	Master	0.7131			174.9		

3	Before	0.7130	0.7000	174.8	191.0
4	Master	1.334	1.340	168.7	185.0
	Before	1.334		168.7	
5	Master	1.953	1.960	167.0	182.0
	Before	1.953		167.0	
6	Master	1.949	1.960	167.0	181.0
	Before	1.949		167.0	
7	Master	1.419	1.410	166.2	175.0
	Before	1.419		166.2	
		60.00 % (Minimum)	(Nominal) 140.0 % (Maximum)	Nom −60.00 (Minimum)	(Nominal) Nom + 60.00 (Maximum)

Master: 14−Oct−2009 17:03 Before: 27−Nov−2009 15:06

Array Induction Tool − M Wellsite Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV	Value
Master		992.7
Before		992.7
	941.0 (Minimum) 991.0 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		0.6638
Before		0.6620
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9196
Before		0.9196
	0.8710 (Minimum) 0.9170 (Nominal) 0.9630 (Maximum)	

Phase	Array Induction Temperature Zero V	Value
Master		0.0006632
Before		0.0006718
	−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 14−Oct−2009 17:03 Before: 27−Nov−2009 15:06

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	1.017		0.7201	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.014		0.7620	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.015		0.2948	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.011		0.2209	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	0.9935		0.1146	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9888		−0.009143	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	0.9937		0.2984	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.007		−0.05307	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: 14−Oct−2009 17:03

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	−69.04		−259.4	

	−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	172.8				103.1		
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	116.8				63.05		
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	64.65				−22.90		
	39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	26.78				21.47		
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	12.75				−15.50		
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	11.98				−4.060		
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−2.480				−4.950		
	−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 14−Oct−2009 17:03

Array Induction Tool − M Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	0.8551				0.8573			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
1	0.8551				0.8573			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
2	0.8551				0.8573			
	0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	

Master: 14−Oct−2009 17:03

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	0.6205		0.6100	180.2		197.0
1	Master	1.271		1.270	179.2		196.0
2	Master	0.6318		0.6200	175.6		192.0
3	Master	0.7131		0.7000	174.9		191.0
4	Master	1.334		1.340	168.7		185.0
5	Master	1.953		1.960	167.0		182.0
6	Master	1.949		1.960	167.0		181.0
7	Master	1.419		1.410	166.2		175.0
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)		Nom −60.00 (Minimum) (Nominal)	Nom + 60.00 (Maximum)

Master: 14−Oct−2009 17:03

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		992.7	Master		0.6638
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		0.9196	Master		0.0006632

0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)		−0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)

Master: 14−Oct−2009 17:03

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	1.017				0.7201			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.014				0.7620			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.015				0.2948			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.011				0.2209			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	0.9935				0.1146			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9888				−0.009143			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	0.9937				0.2984			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.007				−0.05307			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 14−Oct−2009 17:03

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	−69.04				−259.4			
		−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	172.8				103.1			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	116.8				63.05			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	64.65				−22.90			
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	26.78				21.47			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	12.75				−15.50			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	11.98				−4.060			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−2.480				−4.950			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 14−Oct−2009 17:03

Array Induction Tool − M Master Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag	Value	Fine − Mag, Real, Imag
0	0.8551		0.8573	

		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
1	0.8551				0.8573				
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	
2	0.8551				0.8573				
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)	

Master: 14−Oct−2009 17:03

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:		
HILT high−Resolution Mechanical Sonde	HRMS − B	
HILT Rxo Gamma−ray Device	HRGD − B	1732
HILT Micro Cylindrically Focused Log Dev	MCFL −	
GR Logging Source	GLS − VJ	5416
HILT High Res. Control Cartridge	HRCC − B	
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − B	1927
HGNS Gamma−Ray Device	HGR −	
HGNS Neutron Detector with Alpha Source	HCNT −	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	
HGNS Housing	HGNH −	

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

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.7123	Before		0.4907	Before		0.2929
	0.6786 (Minimum) 0.7143 (Nominal) 0.7500 (Maximum)			0.4659 (Minimum) 0.4904 (Nominal) 0.5150 (Maximum)			0.2817 (Minimum) 0.2965 (Nominal) 0.3114 (Maximum)	
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		8634	Before		9761	Before		1027
	8194 (Minimum) 8626 (Nominal) 9057 (Maximum)			9293 (Minimum) 9782 (Nominal) 10270 (Maximum)			978.4 (Minimum) 1030 (Nominal) 1081 (Maximum)	

Before: 27−Nov−2009 15:10

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		1475	Before		1679	Before		1481
	1375 (Minimum) 1475 (Nominal) 1575 (Maximum)			1578 (Minimum) 1678 (Nominal) 1778 (Maximum)			1375 (Minimum) 1475 (Nominal) 1575 (Maximum)	

Before: 27−Nov−2009 15:10

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		10.53	Before		9.800	Before		10.02
	9.417 (Minimum) 10.42 (Nominal) 11.42 (Maximum)			8.900 (Minimum) 9.900 (Nominal) 10.90 (Maximum)			9.045 (Minimum) 10.04 (Nominal) 11.04 (Maximum)	

Before: 27−Nov−2009 15:10

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		3854	Before		3794	Before		3790
	3565 (Minimum) 3875 (Nominal) 4185 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)	

Before: 27−Nov−2009 15:06

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

Phase		Value
Before		8.581
	6.000 (Minimum) 8.000 (Nominal) 10.00 (Maximum)	

Phase		Value
Before		12.74
	9.000 (Minimum) 12.00 (Nominal) 15.00 (Maximum)	

Before: 27−Nov−2009 15:02

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value
Before		83.51
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)	

Phase	Gamma Ray (Jig − Bkg) GAPI	Value
Before		178.8
	162.6 (Minimum) 178.8 (Nominal) 195.1 (Maximum)	

Phase	Gamma Ray (Calibrated) GAPI	Value
Before		165.0
	150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 27−Nov−2009 15:01

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value
Master		26.34
Before		26.72
	5.000 (Minimum) 26.34 (Nominal) 40.00 (Maximum)	

Phase	CFTC Background CPS	Value
Master		27.85
Before		27.82
	5.000 (Minimum) 27.85 (Nominal) 40.00 (Maximum)	

Master: 8−Oct−2009 13:16 Before: 27−Nov−2009 15:03

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value
Master		5423
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)	

Phase	Thermal Far Corr. (Tank) CPS	Value
Master		2272
	1900 (Minimum) 2400 (Nominal) 2900 (Maximum)	

Phase	CNTC/CFTC (Tank)	Value
Master		2.387
	2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 8−Oct−2009 13:16

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration F/S2	Value
Before		32.07
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

Before: 27−Nov−2009 19:59

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum G/C3	Value
Master		2.605
	2.586 (Minimum) 2.596 (Nominal) 2.606 (Maximum)	

Phase	Rho Magnesium G/C3	Value
Master		1.687
	1.676 (Minimum) 1.686 (Nominal) 1.696 (Maximum)	

Phase	Pe Aluminum	Value
Master		2.559
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)	

Phase	Pe Magnesium	Value
Master		2.626
	2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

Master: 21−Nov−2009 12:11

High resolution Integrated Logging Tool−DTS Master Calibration

Deviation Summary

Phase	BS Average Deviation %	Value
Master		0.2944
	−0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)	

Phase	SS Average Deviation %	Value
Master		0.4807
	−1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)	

Phase	LS Average Deviation %	Value
Master		1.301
	−1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	

Phase	BS Max Deviation %	Value
Master		0.7618
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)	

Phase	SS Max Deviation %	Value
Master		2.268
	−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)	

Phase	LS Max Deviation %	Value
Master		2.265
	−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

Master: 21−Nov−2009 12:11

High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value
Master		26.34
	5.000 (Minimum) 26.34 (Nominal) 40.00 (Maximum)	

Phase	CFTC Background CPS	Value
Master		27.85
	5.000 (Minimum) 27.85 (Nominal) 40.00 (Maximum)	

Master: 8−Oct−2009 13:16

High resolution Integrated Logging Tool−DTS Master Calibration

Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value
Master		5423
	4700 (Minimum) 5800 (Nominal) 6900 (Maximum)	

Phase	Thermal Far Corr. (Tank) CPS	Value
Master		2272
	1900 (Minimum) 2400 (Nominal) 2900 (Maximum)	

Phase	CNTC/CFTC (Tank)	Value
Master		2.387
	2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 8−Oct−2009 13:16

DTS Telemetry Tool / Equipment Identification

Primary Equipment:

DTC−H Auxiliary Cartridge	DTCH − A
DTC−H Telemetry Cartridge	DTCH − A

Auxiliary Equipment:

DTCH Telemetry Cartridge Housing	ECH − KC

Company: **Kerr−McGee Oil and Gas Onshore LP**

Schlumberger

Well: **Parterre 12−16**
Field: **Spindle**
County: **Adams**
State: **Colorado**

Platform Express
Array Induction
Linear Correlation