Schlumberger

Company: Tug Hill Operating, LLC

Well: Bearden Trust 1 SWD

Field: Unknown

County: Comanche State: Kansas

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP

County: Comanche
Field: Unknown
Location: 200' FSL & 635' FEL
Well: Bearden Trust 1 SWD
Company: Tug Hill Operating, LLC

Location:	200' FSL & 635' FEL	Elev.	K.B.	1992.00 ft
			G.L.	1969.00 ft
			D.F.	1992.00 ft
	Permanent Datum:	Ground Level	Elev.:	1969.00 f
	Log Measured From:	Kelly Bushing	23.00 ft	above Perm.Datum
	Drilling Measured From:	Kelly Bushing		

API Serial No.	Section:	Township:	Range:
15-033-21628	7	33	17

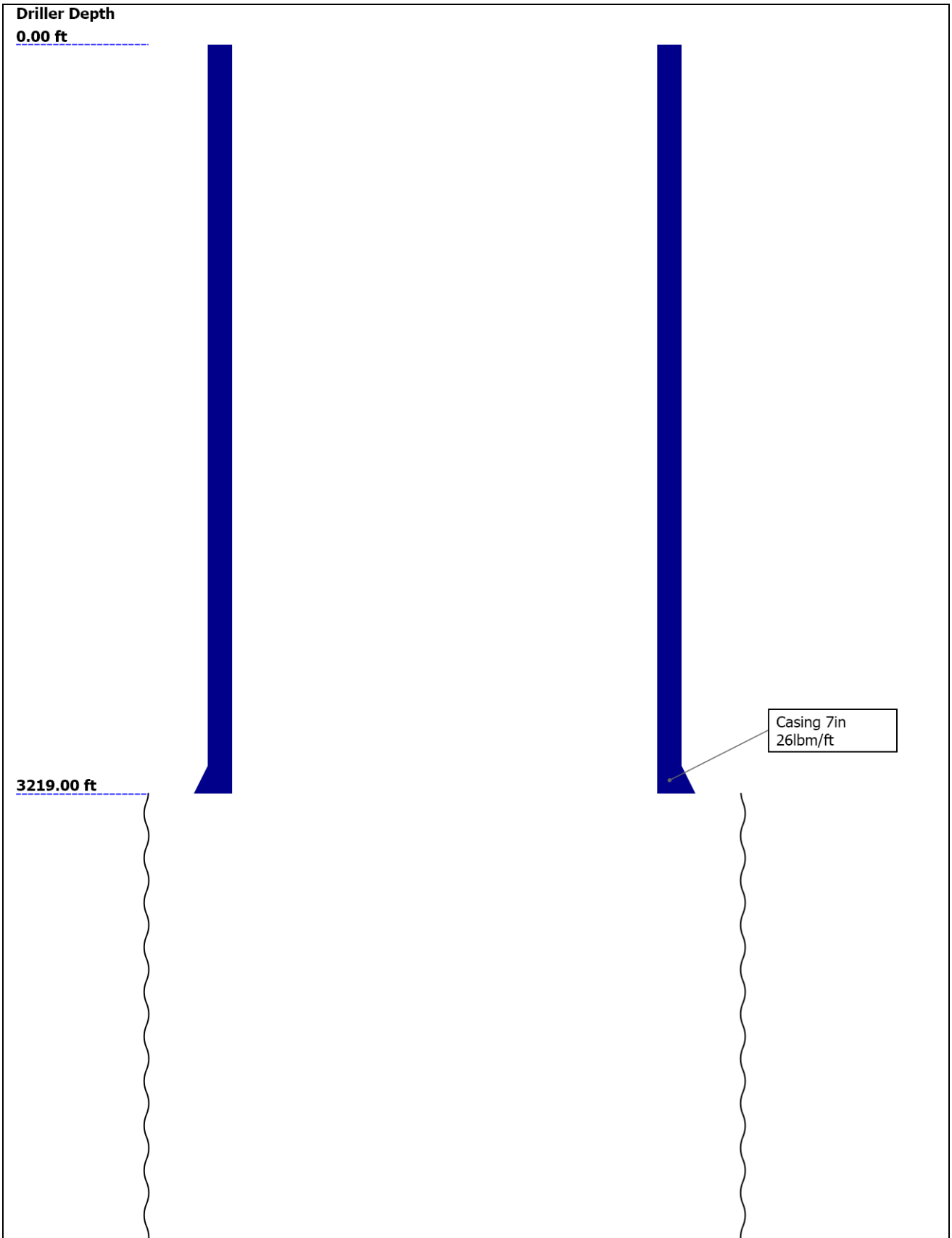
Logging Date			02-Jun-2012			
Run Number			One			
Depth Driller			6274.00 ft			
Schlumberger Depth			6260.00 ft			
Bottom Log Interval			6260.00 ft			
Top Log Interval			3215.00 ft			
Casing Driller Size @ Depth			7 in @ 3219.00 ft			
Casing Schlumberger			3215 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Water			
MUD	Density	Viscosity	9.3 lbm/gal	50 s		
	Fluid Loss	PH	5 cm3	8.8		
	Source of Sample		Flowline			
RM @ Meas Temp			0.16 ohm.m @ 76 degF			
RMF @ Meas Temp			0.14 ohm.m @ 76 degF			
RMC @ Meas Temp			0.22 ohm.m @ 76 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.09 @ 146	0.07 @ 146		
Max Recorded Temperatures			146 degF	146	146	
Circulation Stopped	Time		02-Jun-2012	11:00:00		
Logger on Bottom	Time		02-Jun-2012	14:34:30		
Unit Number	Location:		3082	Elk City, OK		
Recorded By			Abhinav Jain			
Witnessed By			Mr. Jim Quesenbury			

Disclaimer

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

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	3219					
Top Logger (ft)	3215					
Bottom Driller (ft)	6274					
Bottom Logger (ft)	6260					
Casing						
Size (in)	7					
Weight (lbm/ft)	26					
Inner Diameter (in)	6.283					
Grade	N/A					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	3219					
Bottom Logger (ft)	3215					

Remarks and Equipment Summary

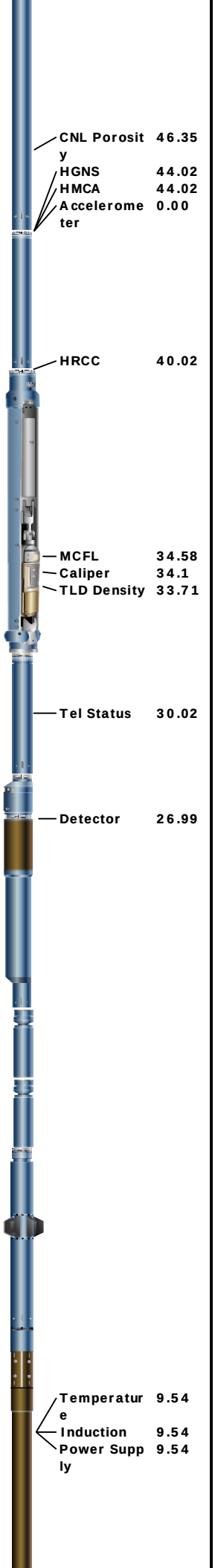
One: Toolstring

Equip name	Length	MP name	Offset
LEH-QT:2870	**66.93**		
LEH-QT:2870			
DTC-H:8187	**64.01**		
ECH-KC:10468		**CTEM**	**63.11**
DTC-H:8187		**HV**	**0.00**
		TelStatus	**61.01**
		ToolStatus	**61.01**
MLT-B:24	**61.01**		
MLT-B:24			
		Microlog Pad	**57.59**
		Microlog Status	**53.42**
HGNS-H:4759	**53.43**	**Temperature**	**53.4**
HGNH:3835			
NSR-F:5226		**GR**	**52.68**
NPV-N			
HMCA-H			

One: Remarks

Toolstring ran as per toolsketch. MLT used for eccentralization only. Hole finder used at the bottom of AIT as advised by client
All logs and formats as per clients request.
Logs computed on limestone matrix (MDEN = 2.71 g/cc)
Repeat Pass recorded from TD to 5900 ft.
Main Pass recorded from TD to CSG. ECS data recorded only till 4200 ft, as per client's r
Nuclear and Resistivity data affected by ruggose borehole.
Hole-Cement volume computed using future casing diameter of 7"
Max recorded temperature as obtained from the HGNS temp. sensor = 146 degF
Thank you for choosing Schlumberger Wireline, Elk City, 580-225-4300
Your crew today - Kenny, Nicky, Steve and AJ

HACCZ-H:5120
HGNS-H:4759



HDRS-H:4723 **44.02**
ECH-MEB:2972
HRCC-H:3965
HRMS-H:4723
Long Spacing:28941
GSR-J:5370
HRGD-H:4770
Backscatter
GPV-Q:5370
Short Spacing:27775

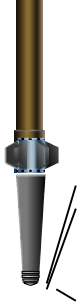
LDSC-B:475 **31.77**
LDSH-A:441
LDSC-B:475

ECS-A:99 **28.27**
ECSH-A:99
NSR-F:4022
ECS-A:99
ECSD-A:99

AH-184[2] **21.62**

AH-184[1] **19.62**

AIT-M:229 **17.62**
AMIS:229
AMHF:229



Lengths are in ft
Maximum Outer Diameter = 9.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	One		
Conveyance Type	Wireline		
Depth Measuring Device	**One**		
Type	IDW-B		
Serial Number	900		
Calibration Date	25-Mar-2012		
Calibration Cable Type	7-39 P-LXS		
Wheel Correction 1	-3		
Wheel Correction 2	-3		
Tension Device	**One**		
Type	CMTD-B/A		
Serial Number	2549		
Calibration Date	02-May-2012		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	6		
Calibration Peak Error	9		
Logging Cable	**One**		
Type	7-39P-LXS		
Serial Number	U712016		
Logging Cable Length (ft)	18320.00		

One

Main Pass 2" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	647.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1463.2	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0

AMIS	Array Induction Sonde - M	3.0.9609.1919	1

Pass Summary

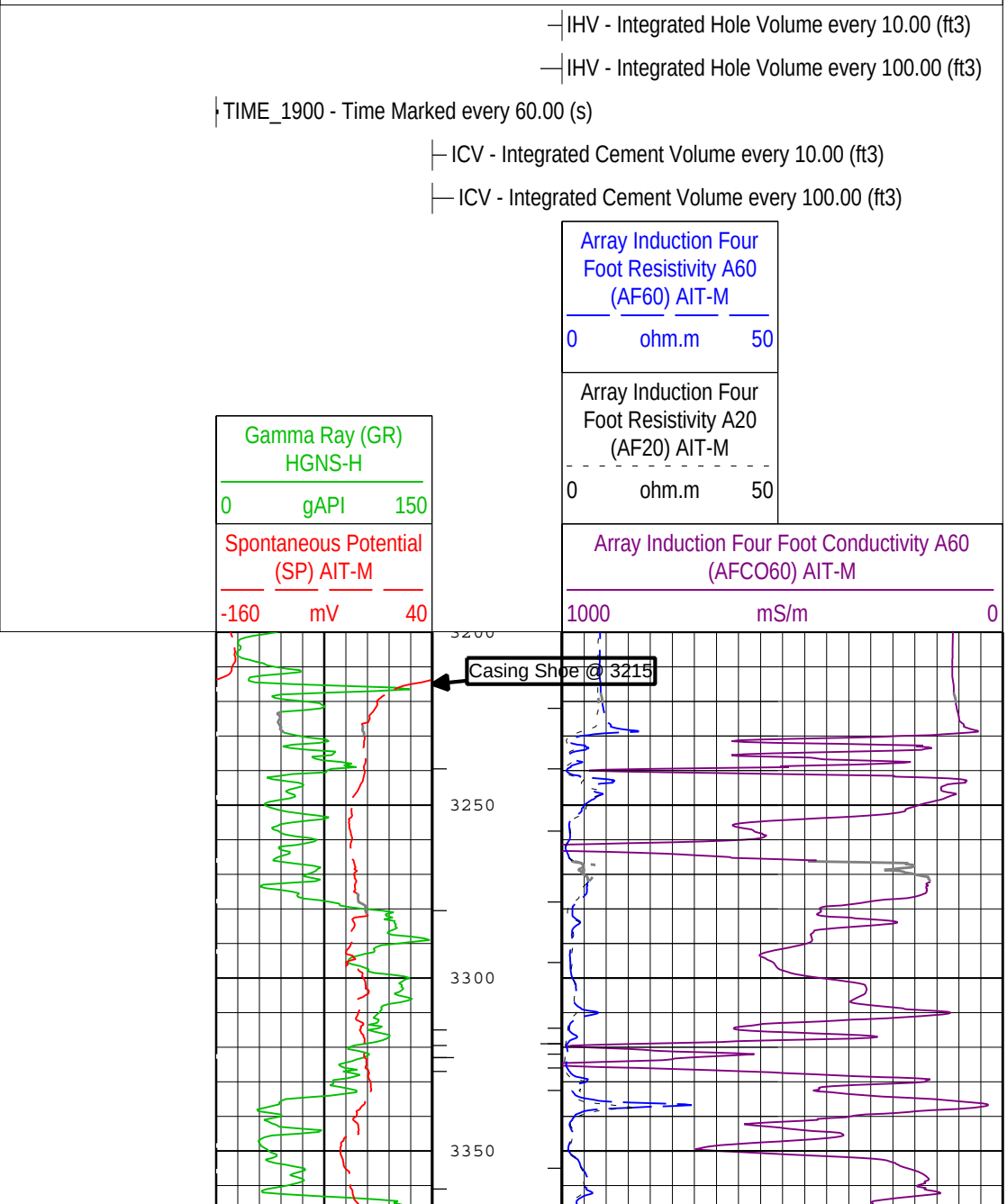
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Main[6]:Up	Up	3158.52 ft	6271.81 ft	02-Jun-2012 2:45:59 PM	02-Jun-2012 5:26:01 PM	0.00 ft	
All depths are referenced to toolstring zero								

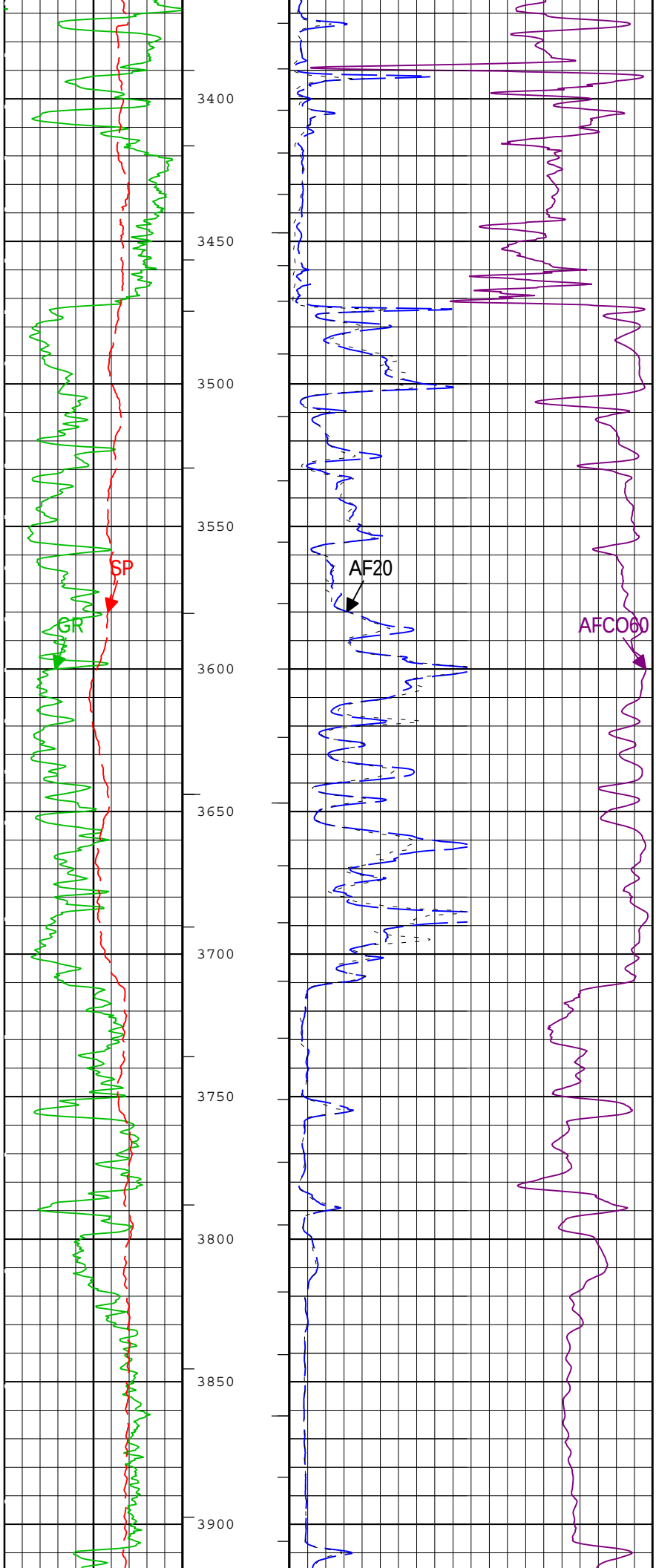
Log

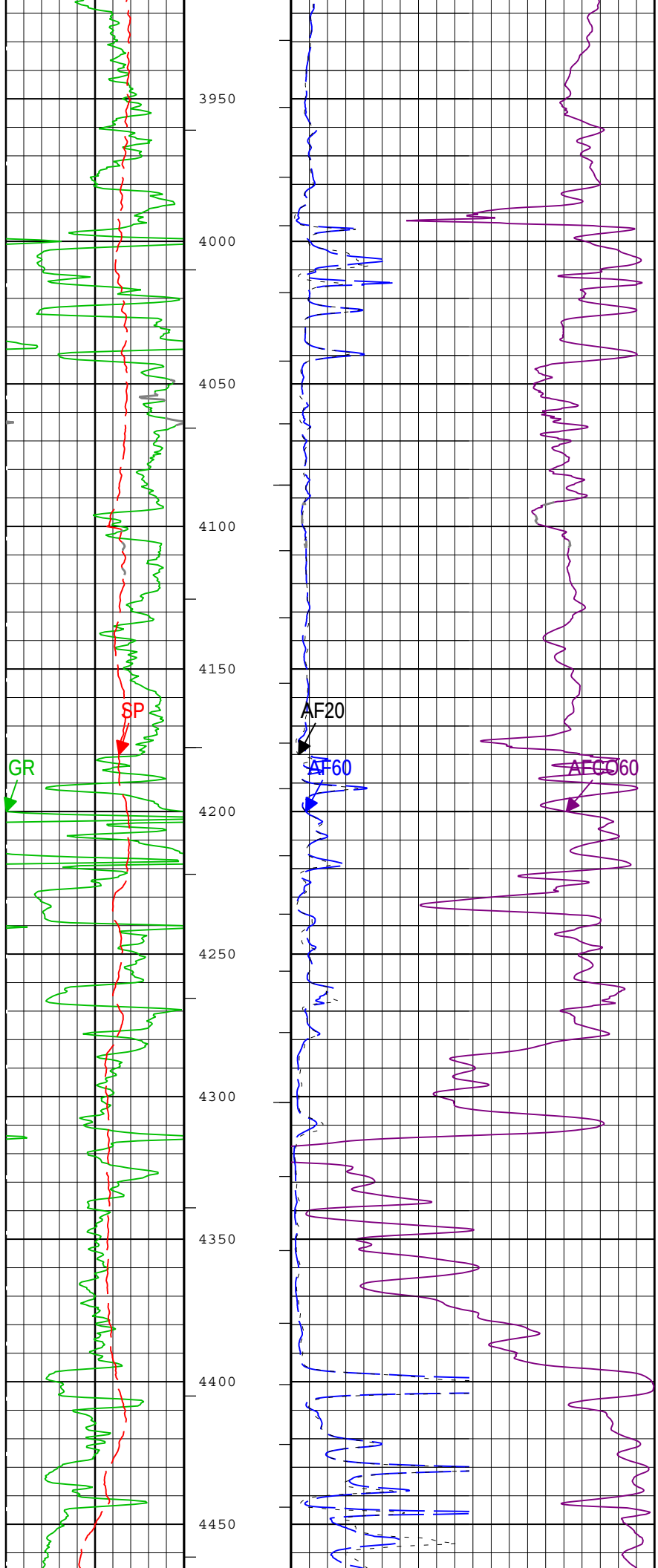
One: Main[6]:Up D9676CF6-3D54-48F2-AB6B-816D2E713451

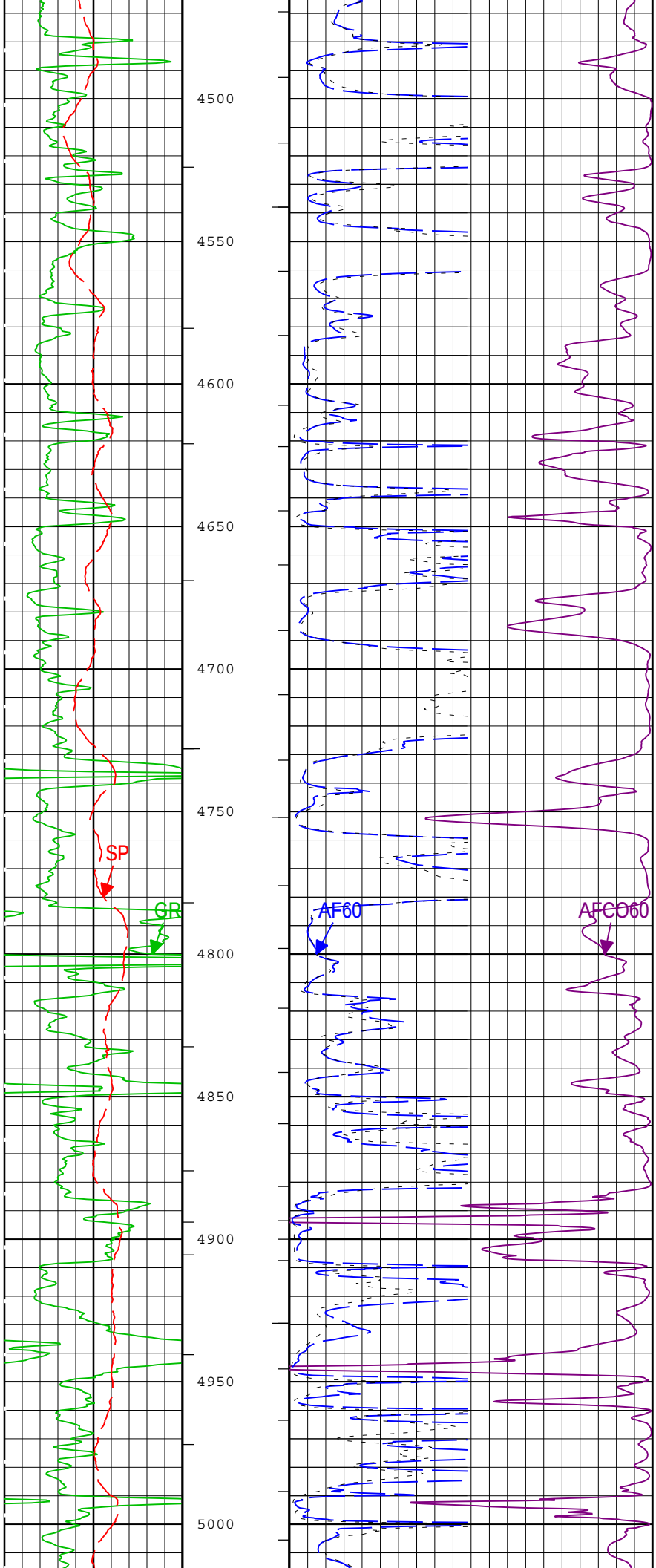
Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 2 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:21

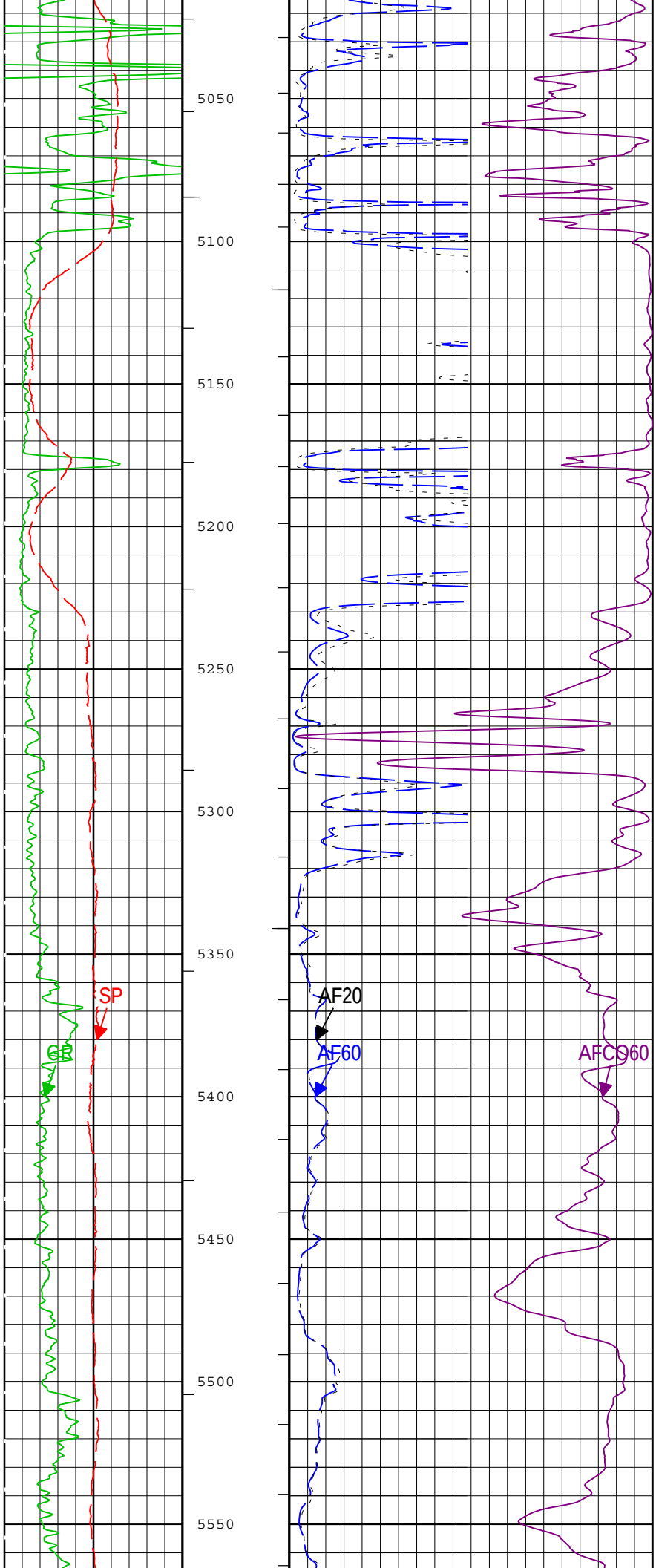
Channel	Source	Sampling
AF20	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AFCO60	AIT-M:AMIS:AMIS	3in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TIME_1900	WLWorkflow	0.1in

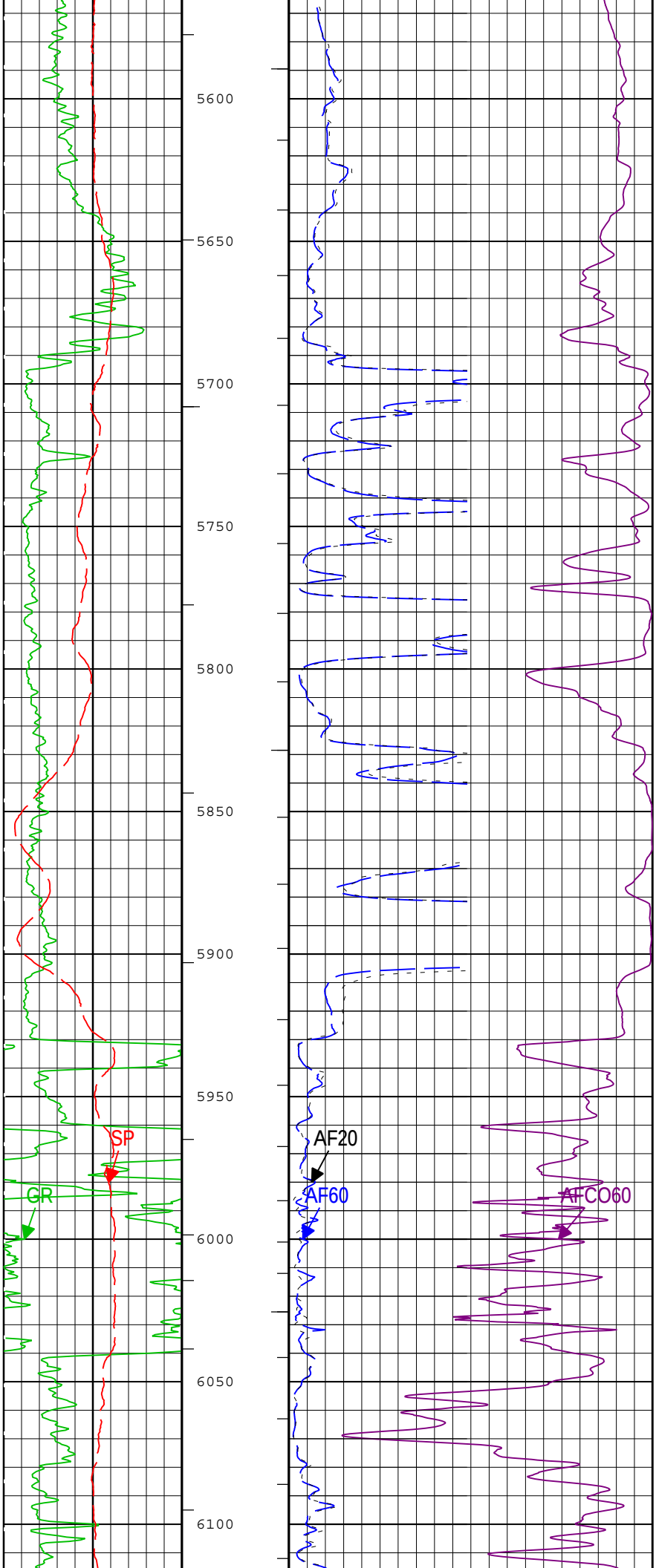


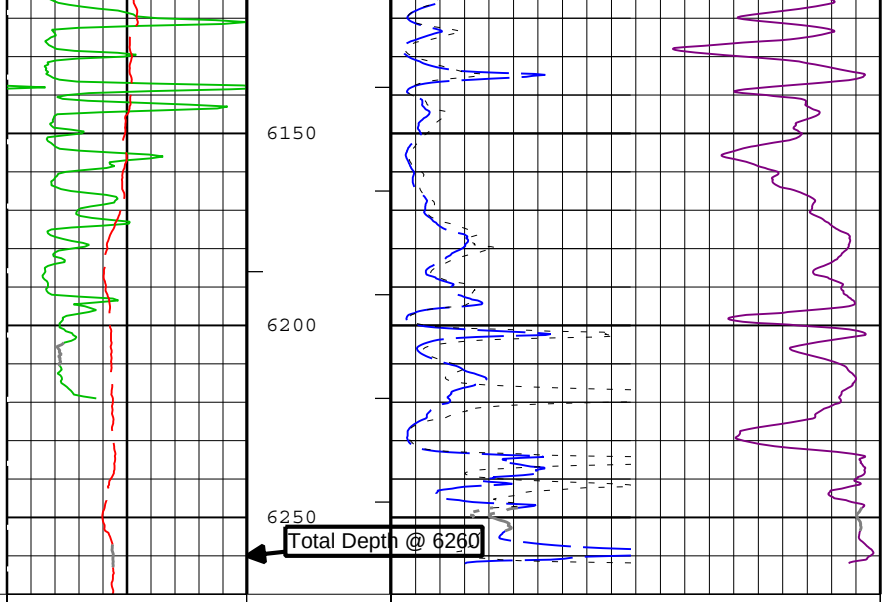

3400
3450
3500
3550
3600
3650
3700
3750
3800
3850
3900
SP
GR
AF20
AFCO60


3950
4000
4050
4100
4150
4200
4250
4300
4350
4400
4450
SP
GR
AF20
AF60
AFCO60


4500
4550
4600
4650
4700
4750
4800
4850
4900
4950
5000
SP
GR
AF60
AFCO60


5050
5100
5150
5200
5250
5300
5350
5400
5450
5500
5550
SP
GR
AF20
AF60
AFCO60


5600
5650
5700
5750
5800
5850
5900
5950
6000
6050
6100
SP
GR
AF20
AF60
AFCO60



Gamma Ray (GR) HGNS-H
0 gAPI 150

Spontaneous Potential (SP) AIT-M
-160 mV 40

Array Induction Four Foot Conductivity A60 (AFCO60) AIT-M
1000 mS/m 0

Array Induction Four Foot Resistivity A60 (AF60) AIT-M
0 ohm.m 50

Array Induction Four Foot Resistivity A20 (AF20) AIT-M
0 ohm.m 50

ICV - Integrated Cement Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 2 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:21

Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	-0.114	in
CBLO	Casing Bottom (Logger)	COMPLETION	3215	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	7	in
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	60	mV
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	3200	3215
BS	8.75	3215	6270

All depth are actual.

Tool Control Parameters

One

Main Pass 5" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	647.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1463.2	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.1919	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Main[6]:Up	Up	3158.52 ft	6271.81 ft	02-Jun-2012 2:45:59 PM	02-Jun-2012 5:26:01 PM	0.00 ft	

All depths are referenced to toolstring zero

Log

One: Main[6]:Up D9676CF6-3D54-48F2-AB6B-816D2E713451

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:24

Channel	Source	Sampling
AT20	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 100.00 (ft3)

Cable Tension (TENS)

10000 lbf 0

Mudcake

Caliper (CALI) HDRS-H

6 in 16

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-160 mV 40

Bit Size (BS)

6 in 16

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

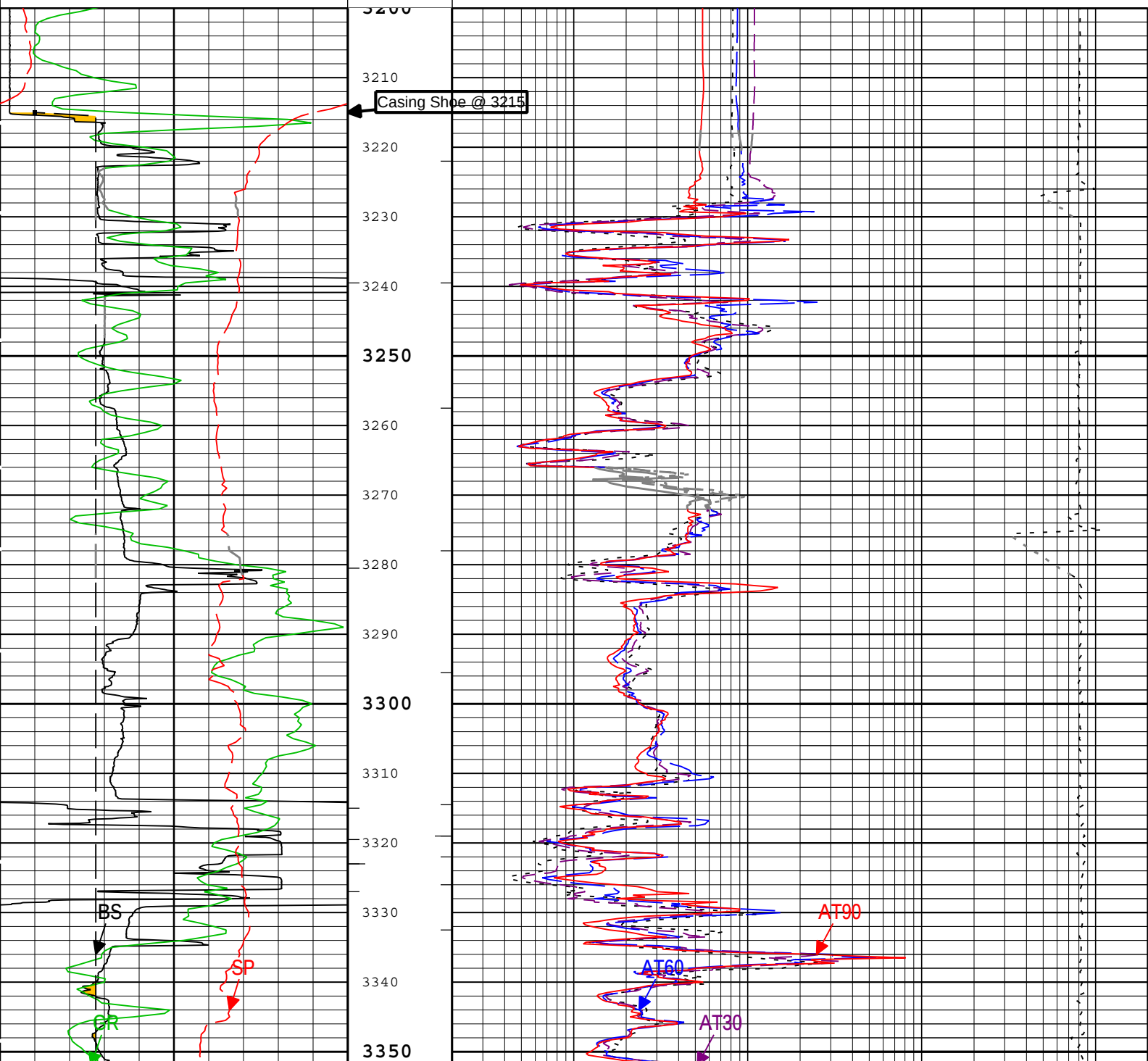
0.2 ohm.m 2000

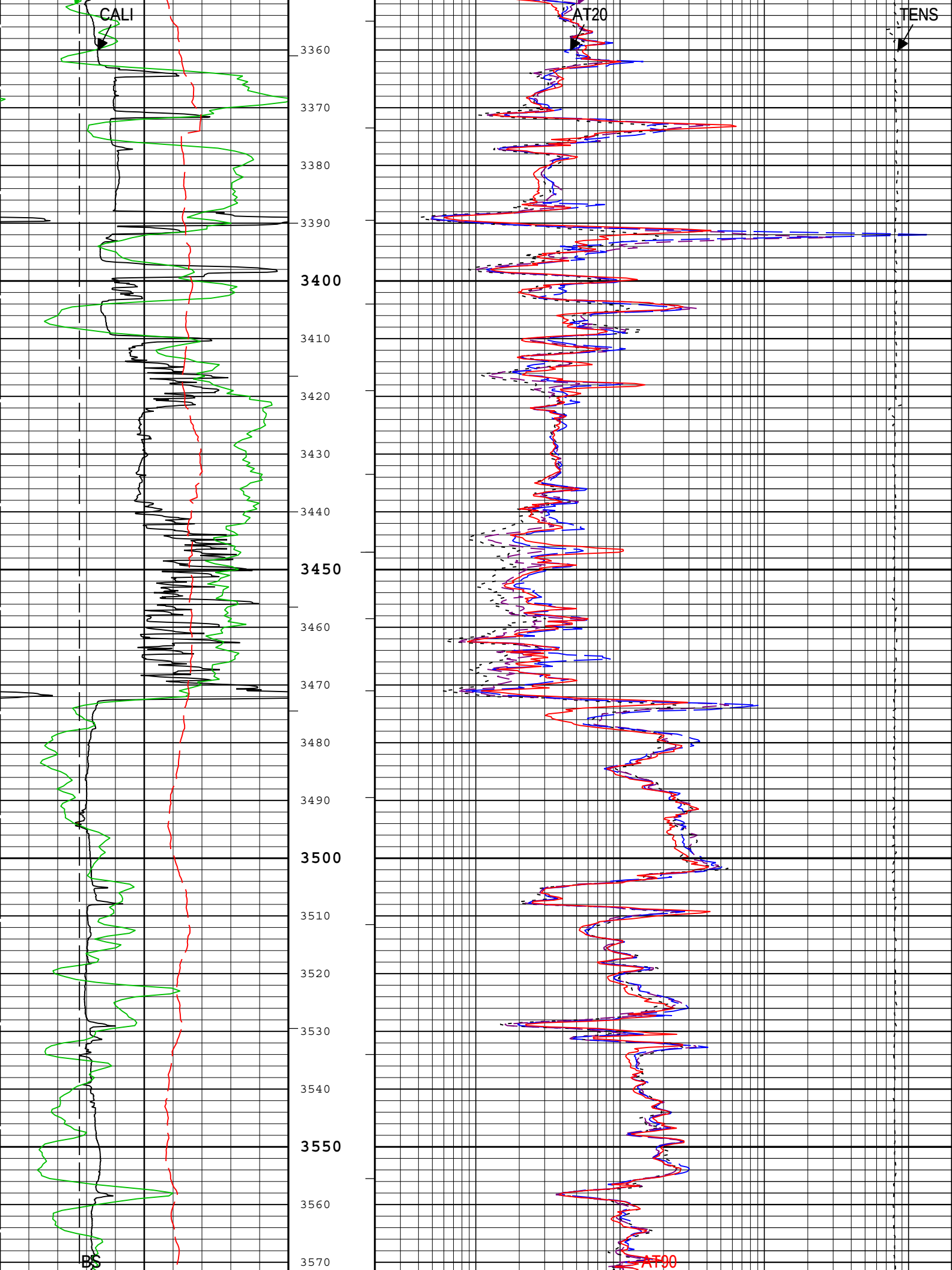
Array Induction Two Foot Resistivity A60 (AT60) AIT-M

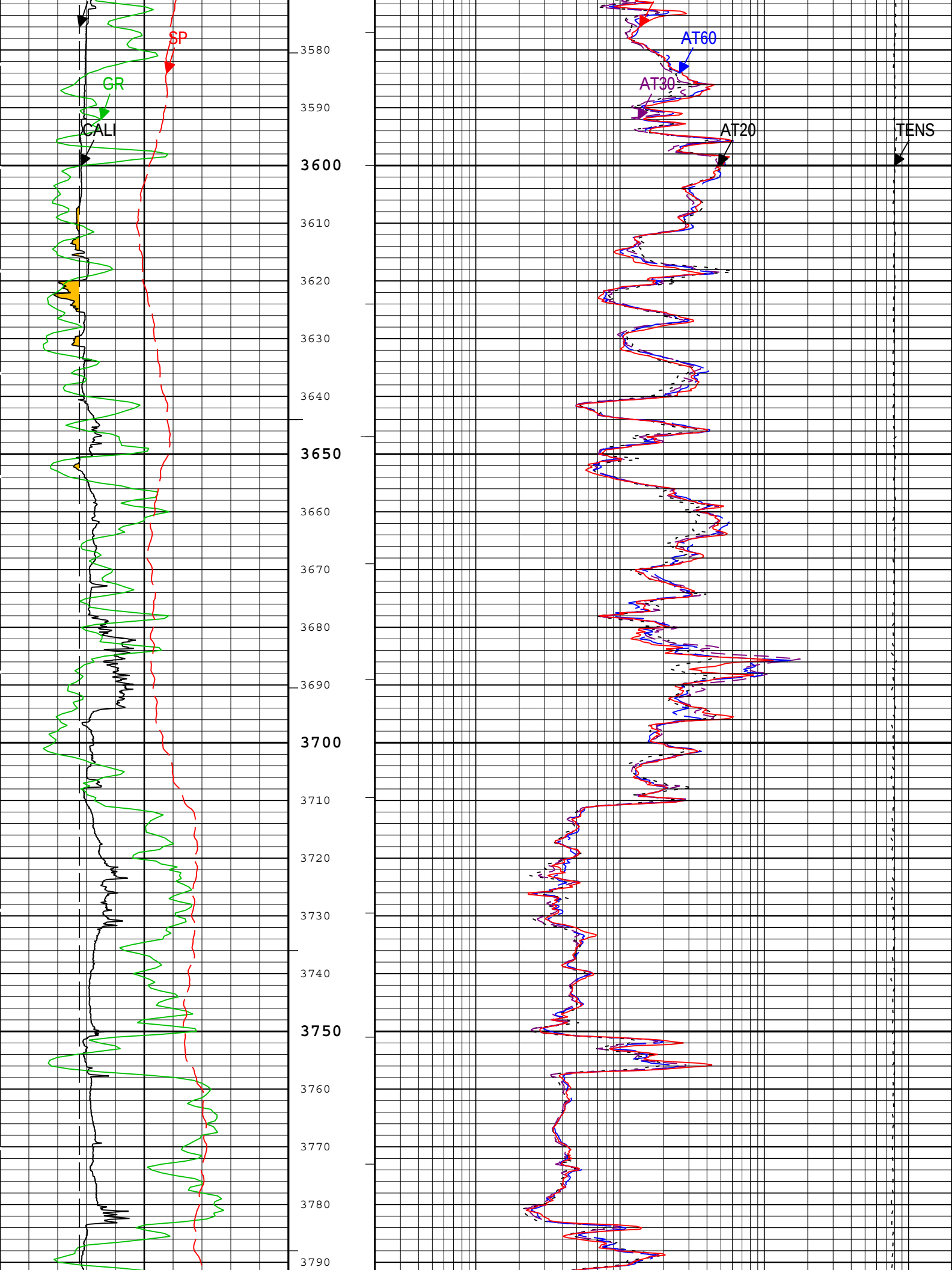
0.2 ohm.m 2000

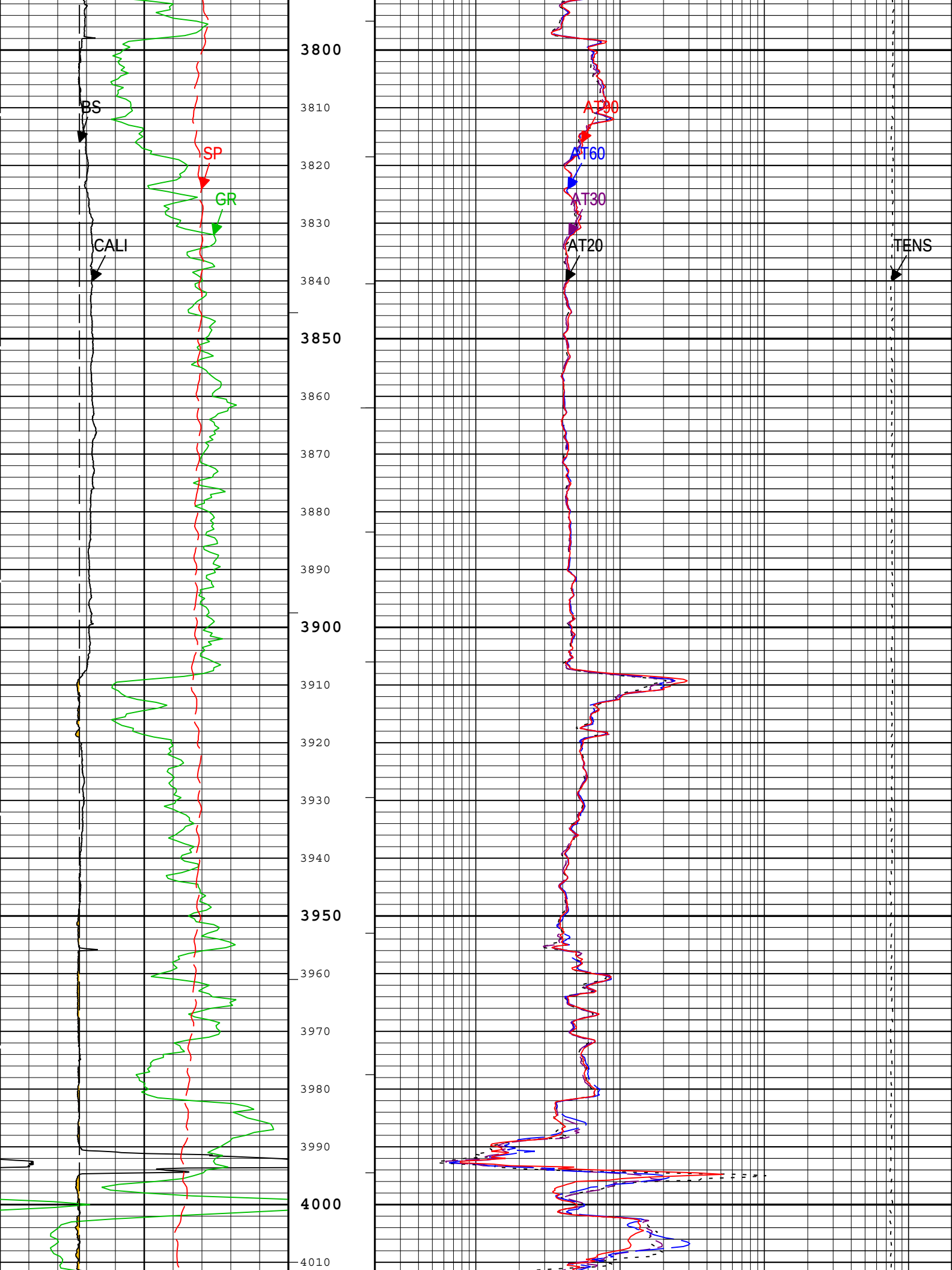
Array Induction Two Foot Resistivity A90 (AT90) AIT-M

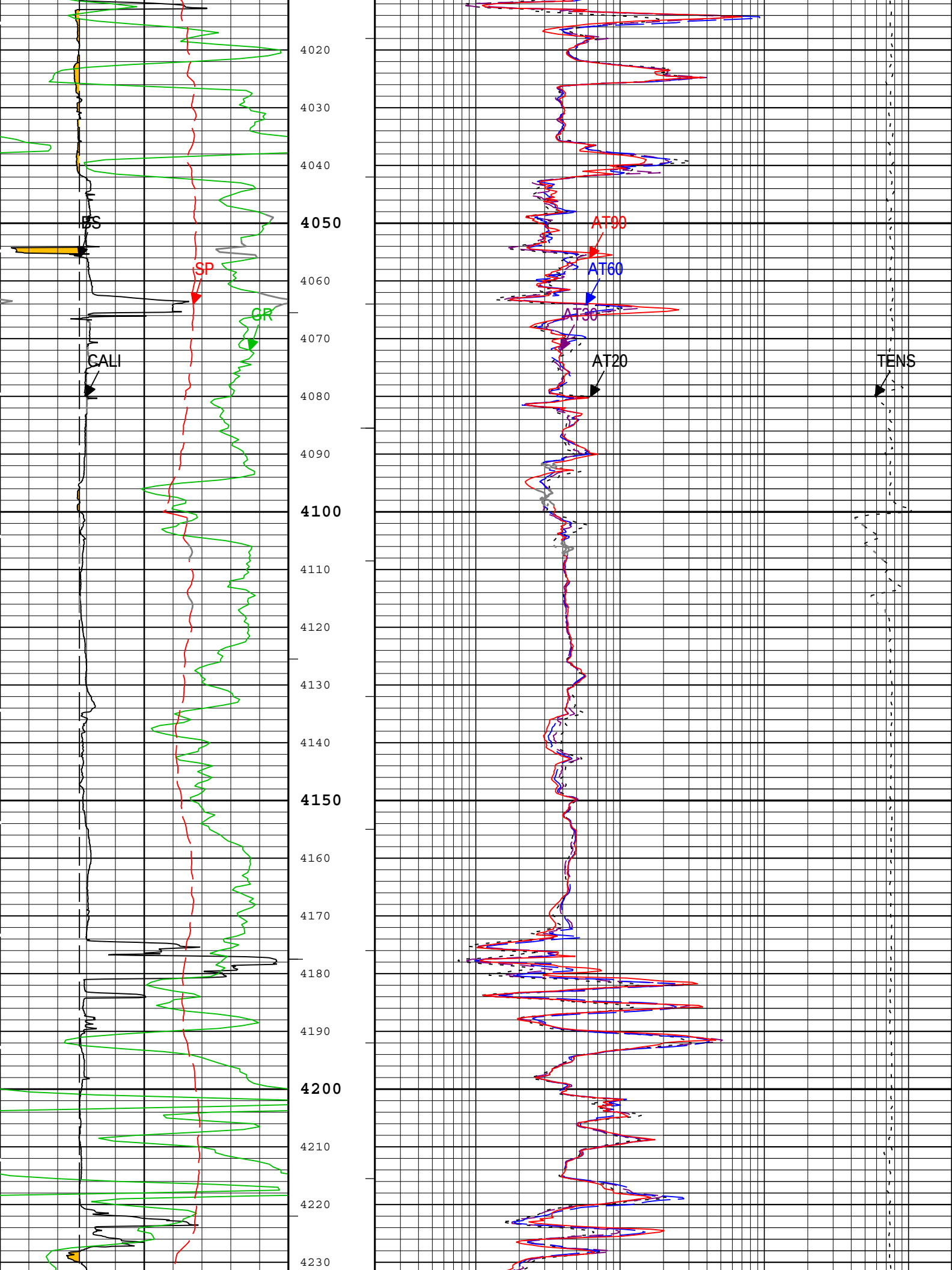
0.2 ohm.m 2000

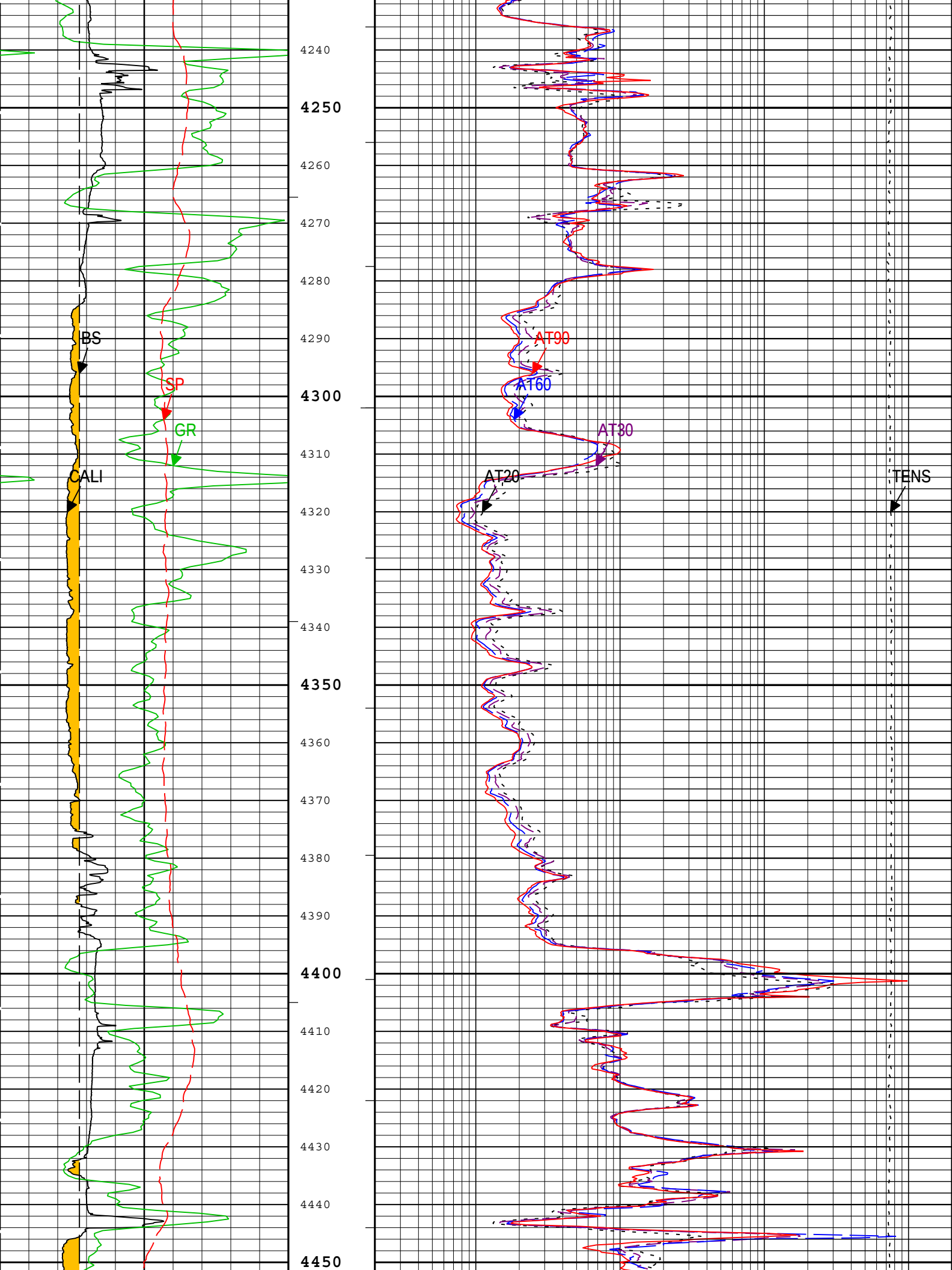


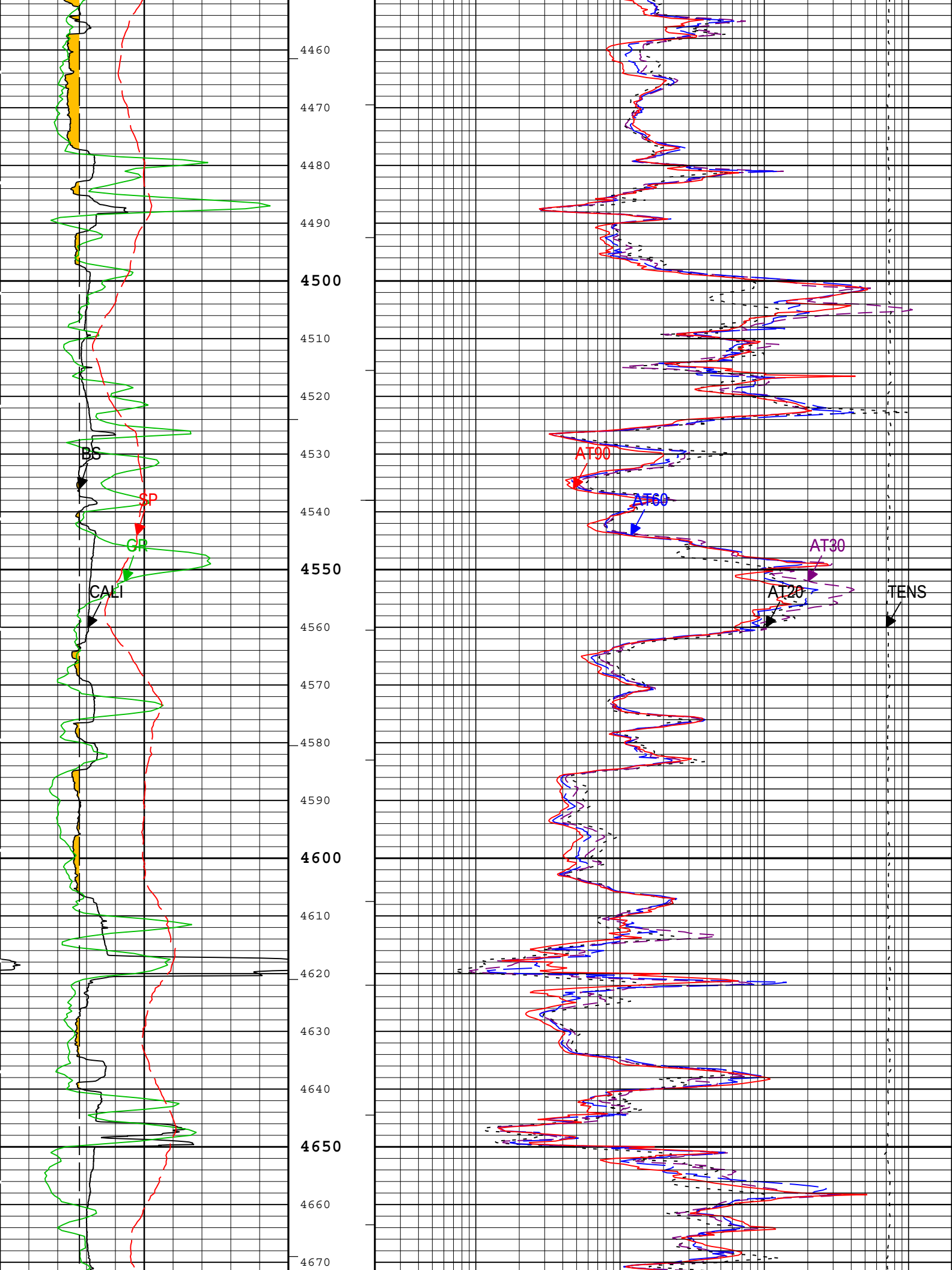

CALI
AT20
TENS
3360
3370
3380
3390
3400
3410
3420
3430
3440
3450
3460
3470
3480
3490
3500
3510
3520
3530
3540
3550
3560
3570
BS
AT90

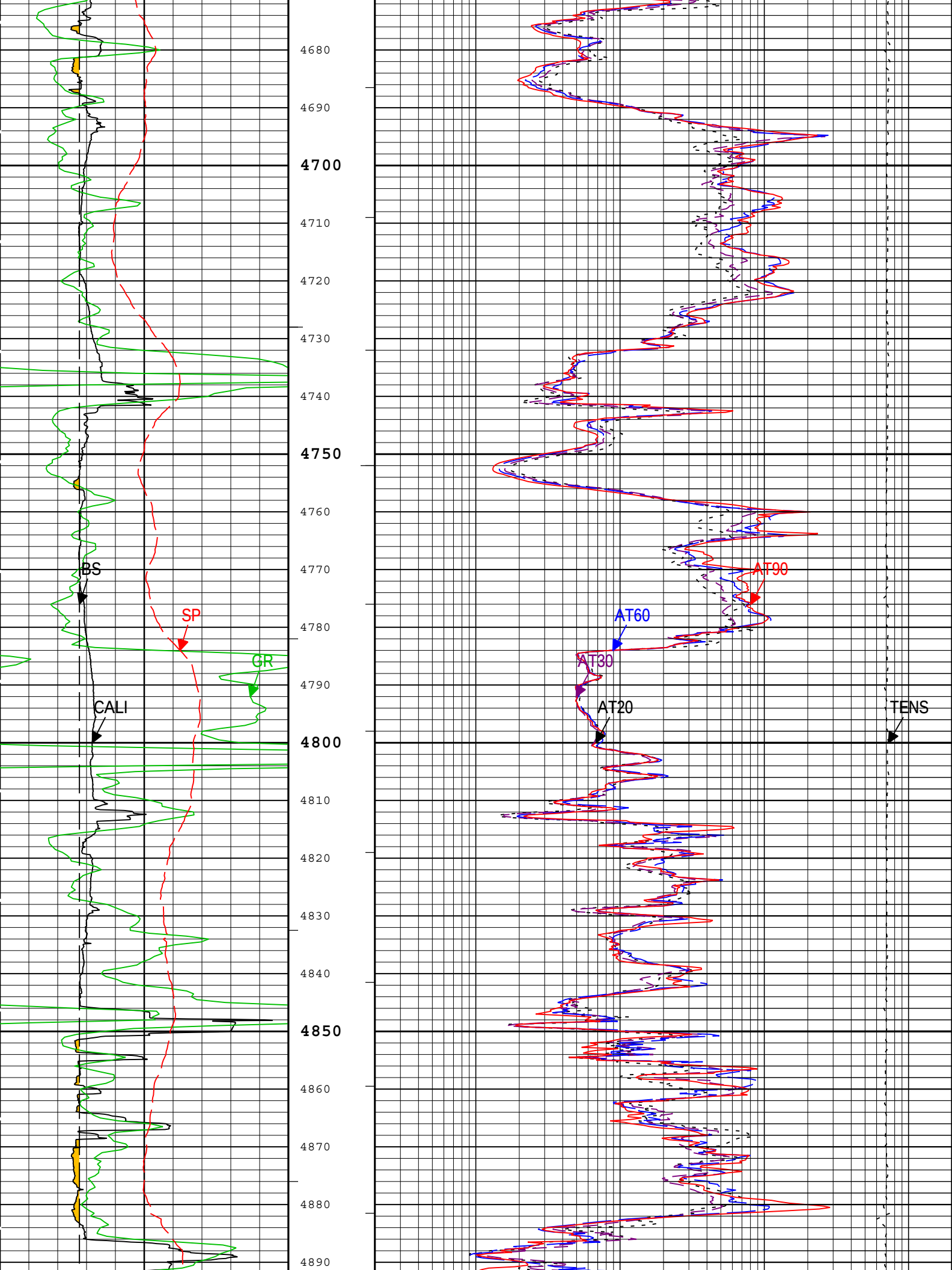

SP
GR
CALI
AT60
AT30
AT20
TENS
3580
3590
3600
3610
3620
3630
3640
3650
3660
3670
3680
3690
3700
3710
3720
3730
3740
3750
3760
3770
3780
3790

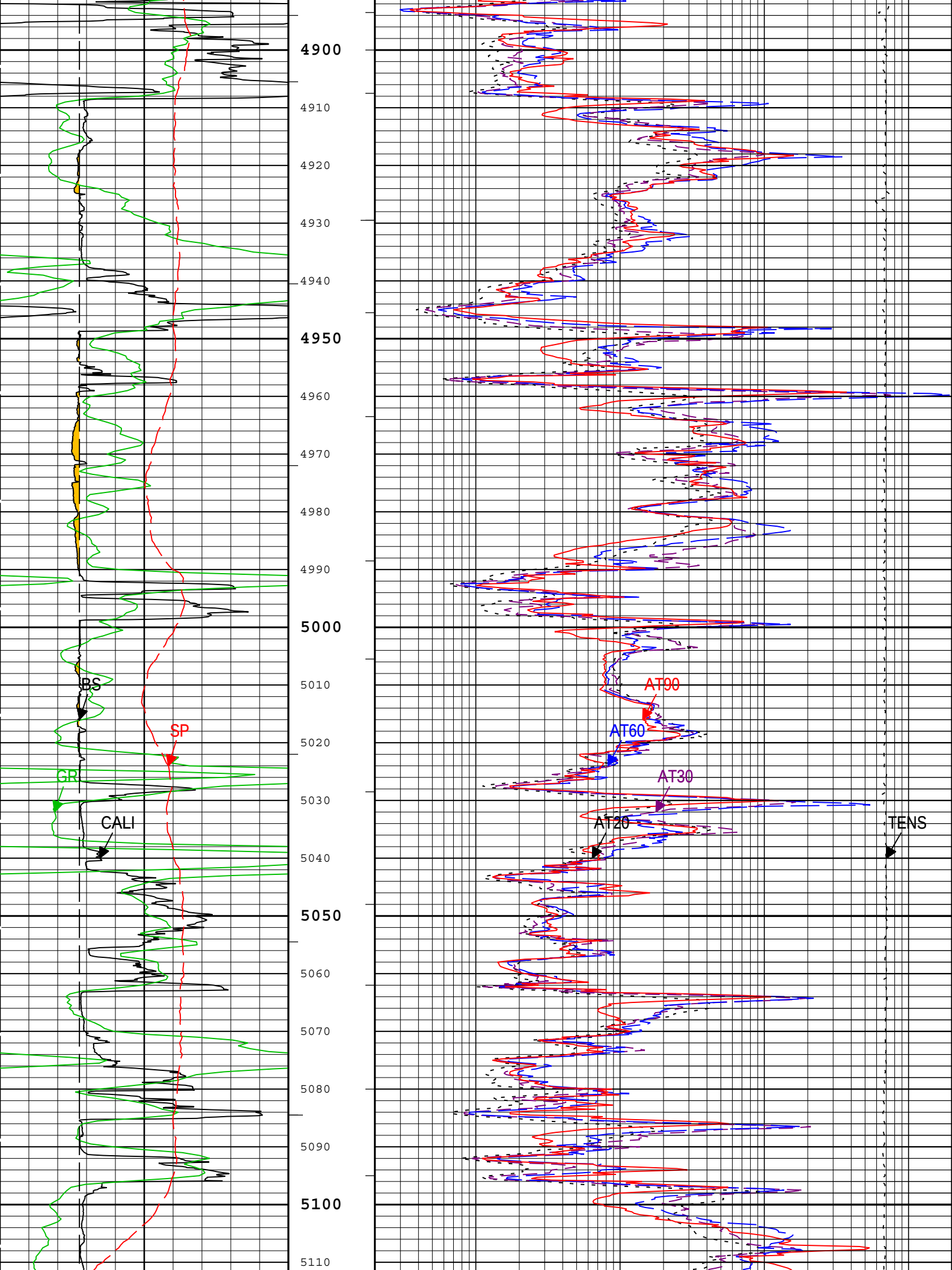

BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS
3800
3810
3820
3830
3840
3850
3860
3870
3880
3890
3900
3910
3920
3930
3940
3950
3960
3970
3980
3990
4000
4010

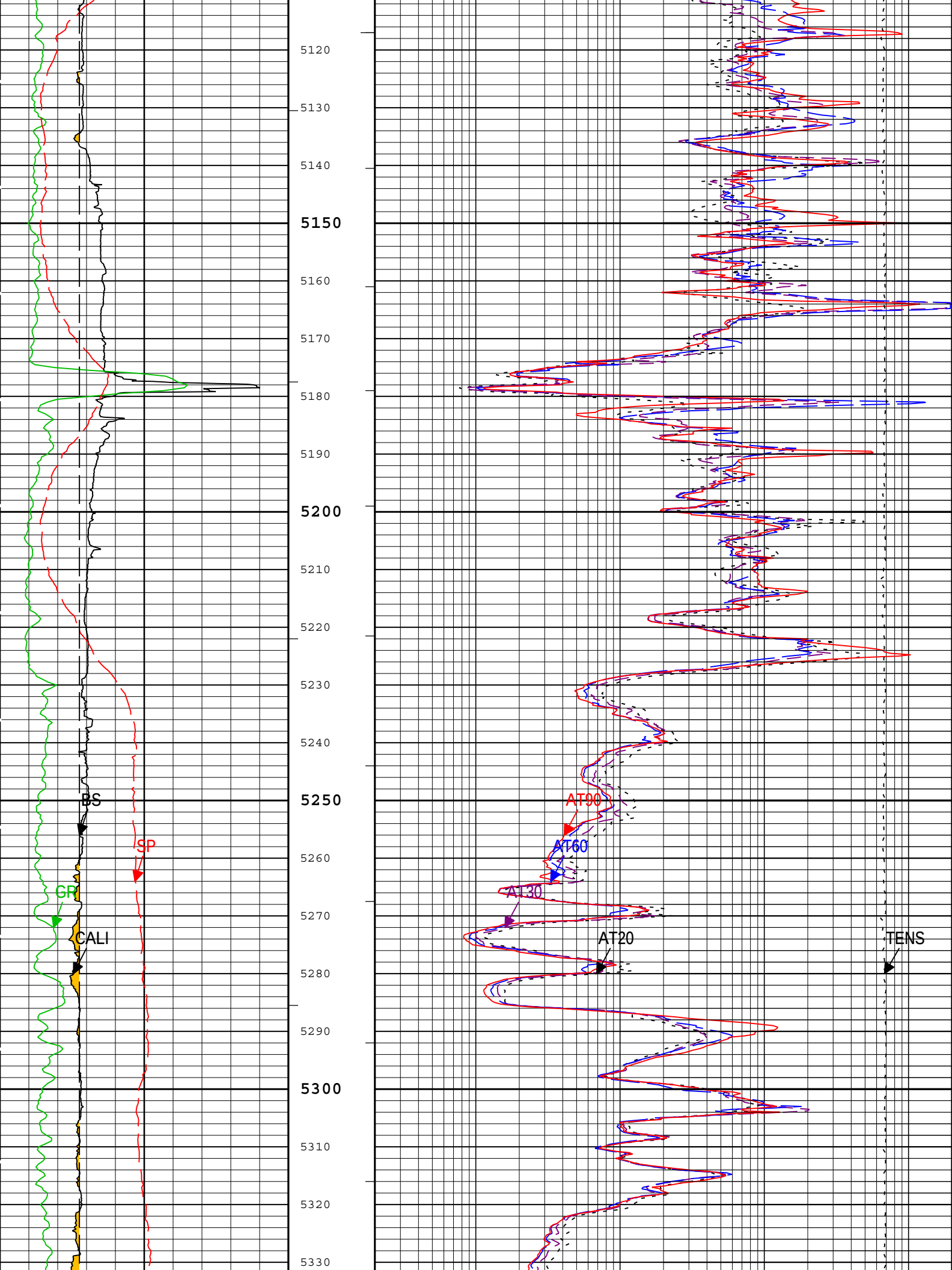

BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS
4020
4030
4040
4050
4060
4070
4080
4090
4100
4110
4120
4130
4140
4150
4160
4170
4180
4190
4200
4210
4220
4230

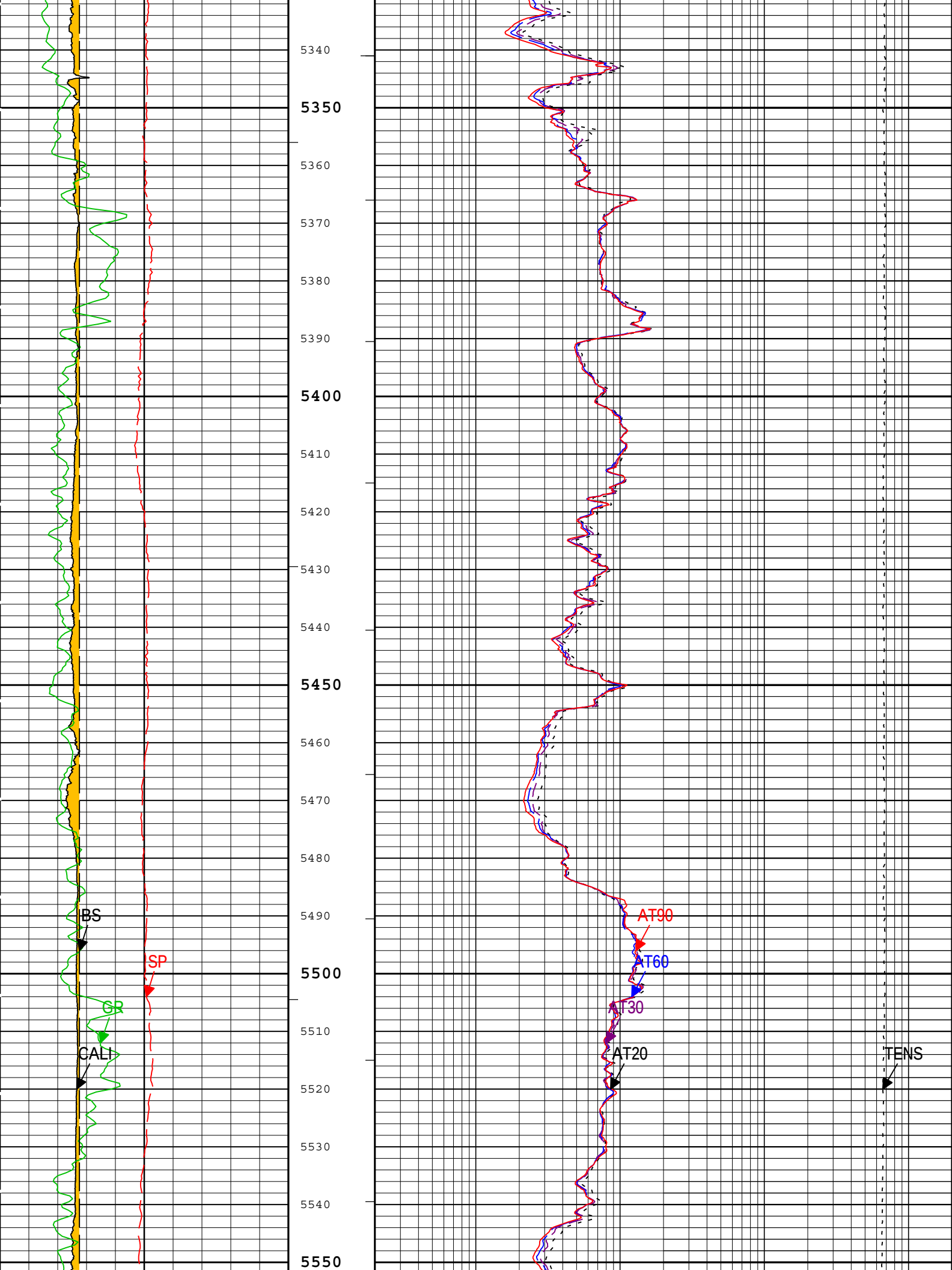

BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS
4240
4250
4260
4270
4280
4290
4300
4310
4320
4330
4340
4350
4360
4370
4380
4390
4400
4410
4420
4430
4440
4450

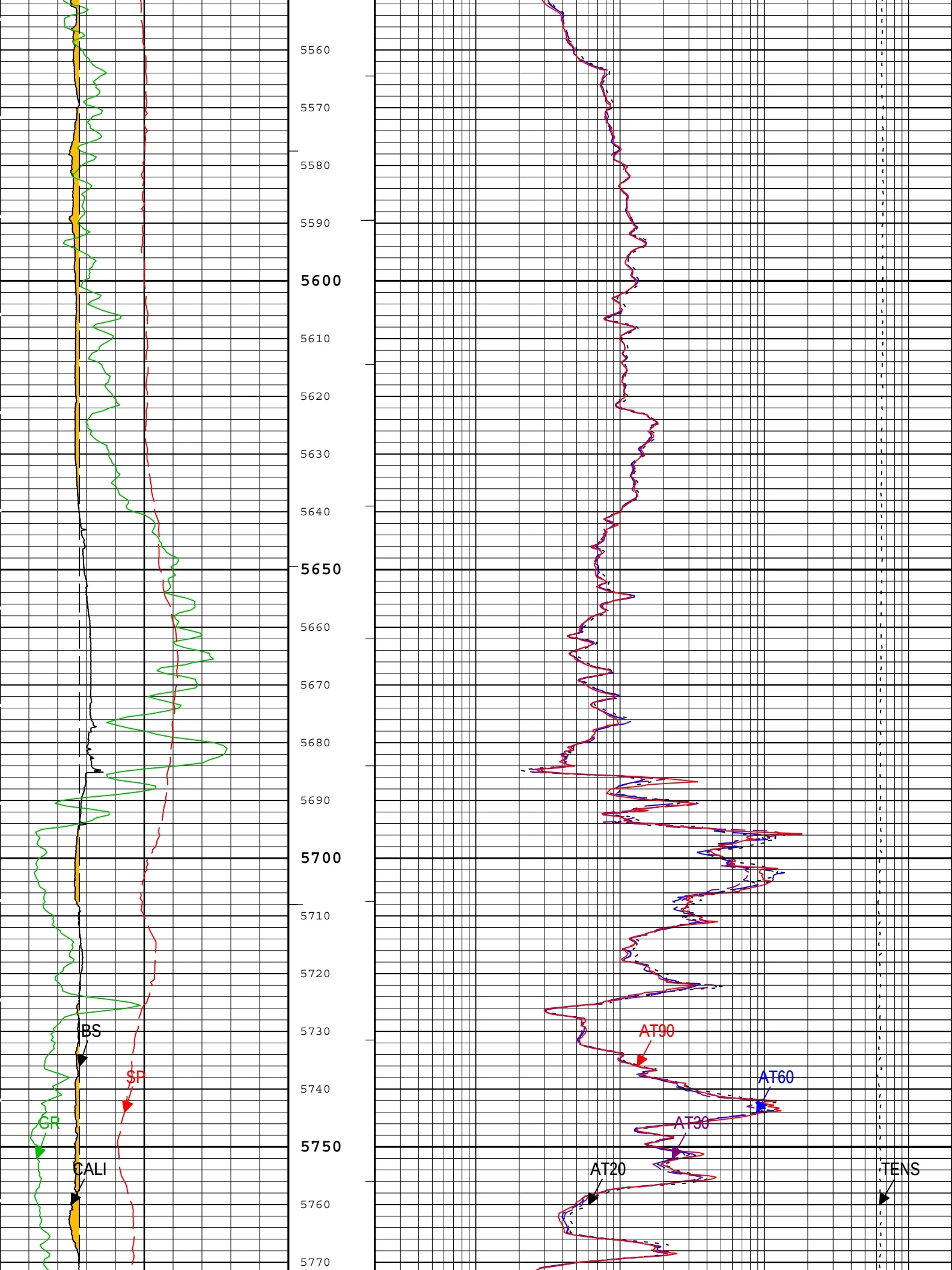

4460
4470
4480
4490
4500
4510
4520
4530
4540
4550
4560
4570
4580
4590
4600
4610
4620
4630
4640
4650
4660
4670
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS

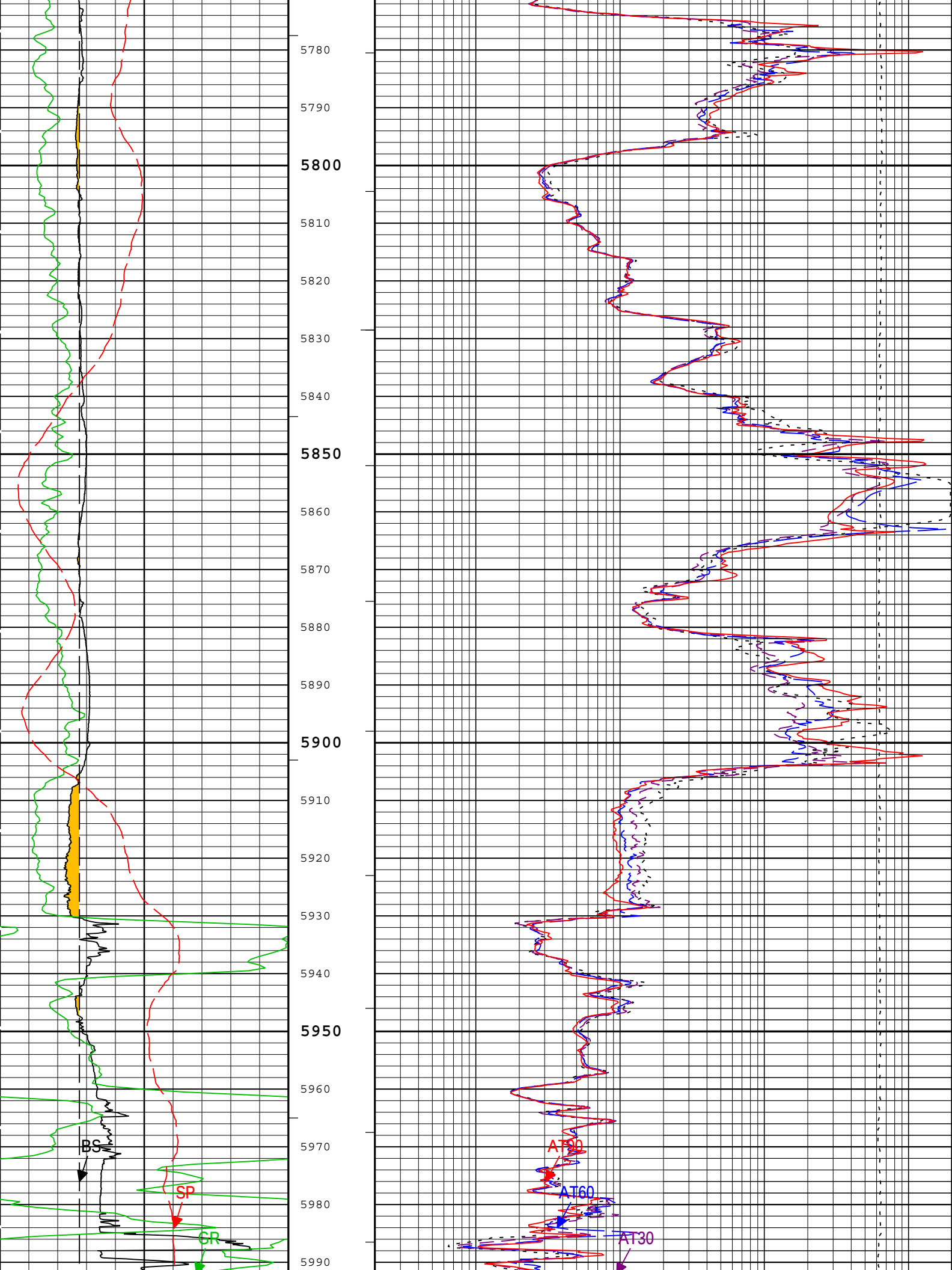

4680
4690
4700
4710
4720
4730
4740
4750
4760
4770
4780
4790
4800
4810
4820
4830
4840
4850
4860
4870
4880
4890
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS

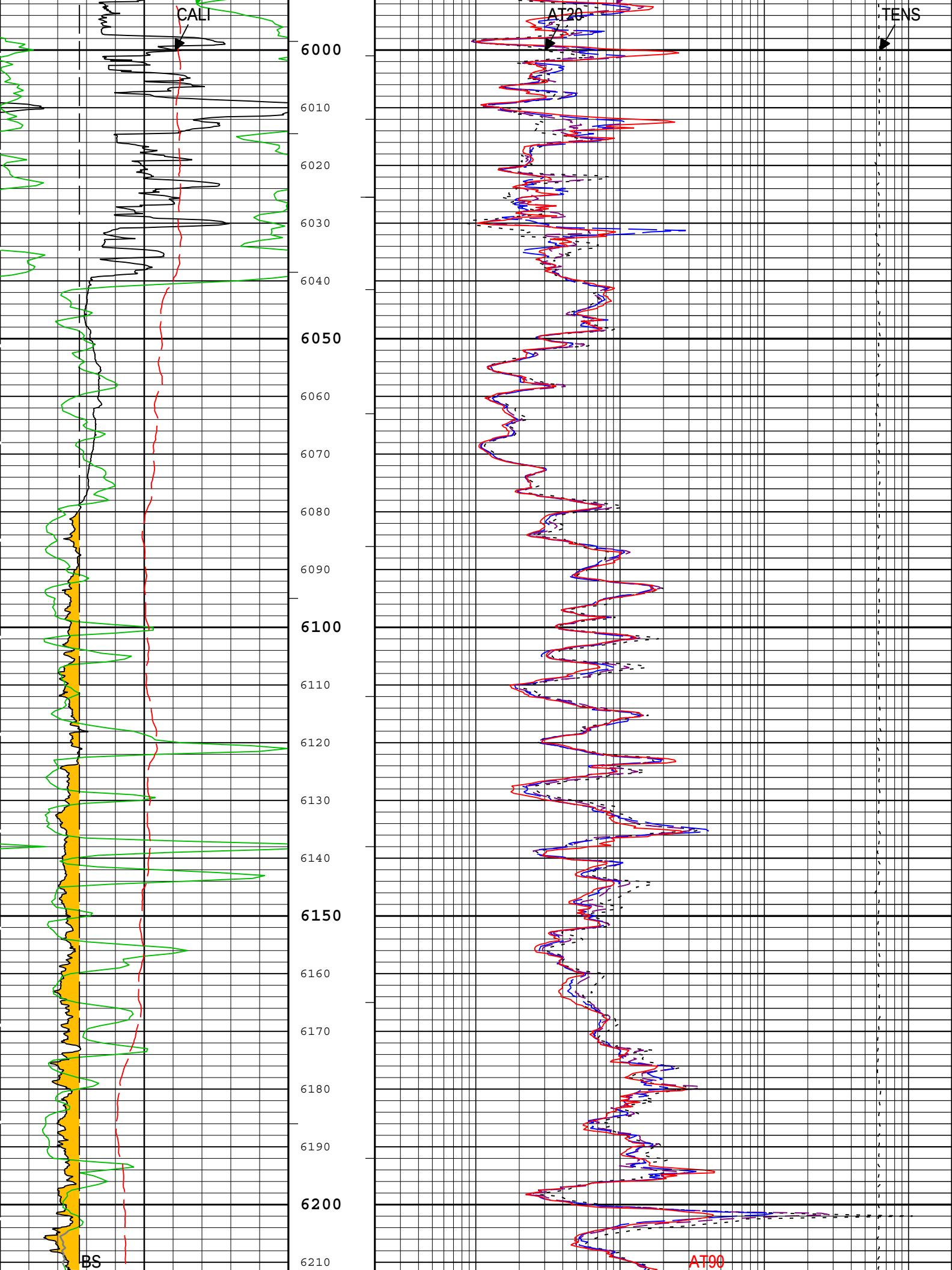

4900
4910
4920
4930
4940
4950
4960
4970
4980
4990
5000
5010
5020
5030
5040
5050
5060
5070
5080
5090
5100
5110
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS

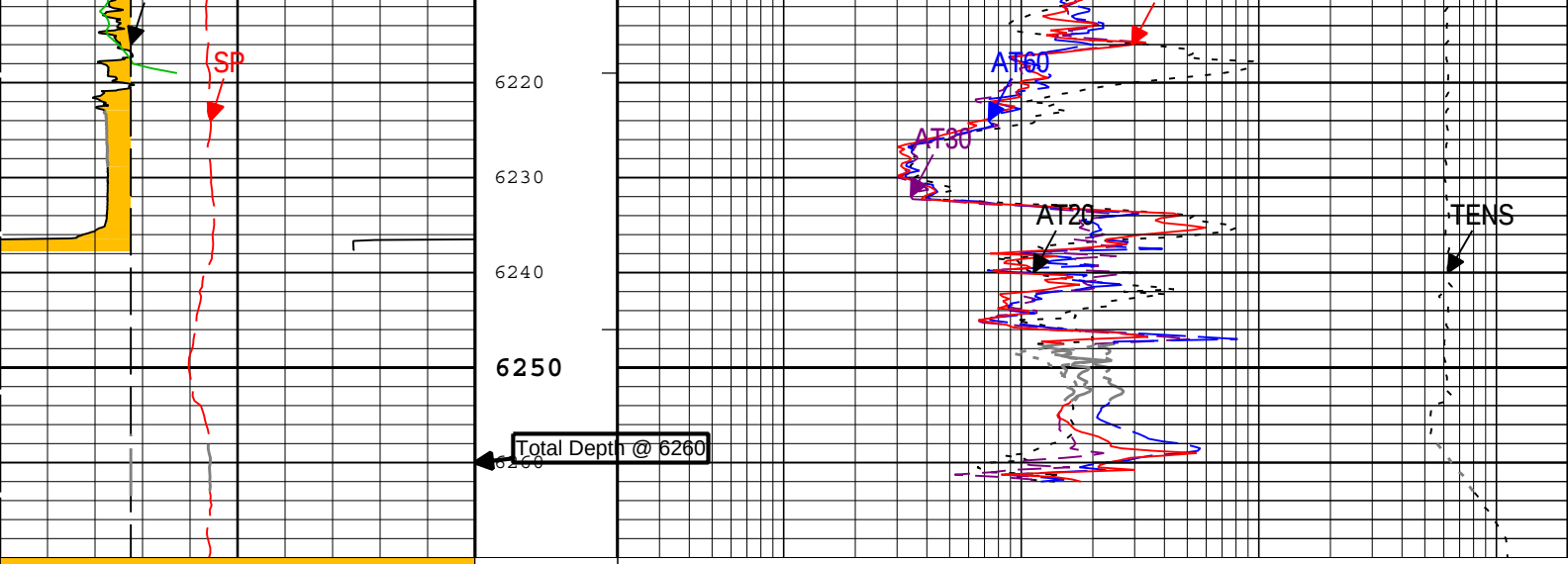

5120
5130
5140
5150
5160
5170
5180
5190
5200
5210
5220
5230
5240
5250
5260
5270
5280
5290
5300
5310
5320
5330
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS


5340
5350
5360
5370
5380
5390
5400
5410
5420
5430
5440
5450
5460
5470
5480
5490
5500
5510
5520
5530
5540
5550
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS


5560
5570
5580
5590
5600
5610
5620
5630
5640
5650
5660
5670
5680
5690
5700
5710
5720
5730
5740
5750
5760
5770
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS


5780
5790
5800
5810
5820
5830
5840
5850
5860
5870
5880
5890
5900
5910
5920
5930
5940
5950
5960
5970
5980
5990
BS
SP
GR
AT90
AT60
AT30


CALI
AT20
TENS
6000
6010
6020
6030
6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140
6150
6160
6170
6180
6190
6200
6210
BS
ATI90



Mudcake

Caliper (CALI) HDRS-H

6 in 16

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-160 mV 40

Bit Size (BS)

6 in 16

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000

Cable Tension (TENS)

10000 lbf 0

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:24

Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	-0.114	in
CBLO	Casing Bottom (Logger)	COMPLETION	3215	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	7	in
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	60	mV

SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	3200	3215
BS	8.75	3215	6270

All depth are actual.

Tool Control Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		1800	ft/h

One

Repeat Pass 5" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	68.84	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	167.72	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.0.9609.1919	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Repeat[5]:Up	Up	5862.93 ft	6271.31 ft	02-Jun-2012 2:09:26 PM	02-Jun-2012 2:34:30 PM	2.60 ft	

All depths are referenced to toolstring zero

Log

One: Repeat[5]:Up C93EBC78-4E01-421C-A678-0B0A2832D483

Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:28

Channel	Source	Sampling
AT20	AIT-M:AMIS:AMIS	3in
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TENS	WL Workflow	6in

TENS WLWorkflow 0in

TIME_1900 WLWorkflow 0.1in

IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Cable Tension (TENS)

10000 lbf 0

Mudcake

Caliper (CALI) HDRS-H

6 in 16

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-160 mV 40

Bit Size (BS)

6 in 16

Array Induction Two Foot Resistivity A20 (AT20) AIT-M

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT-M

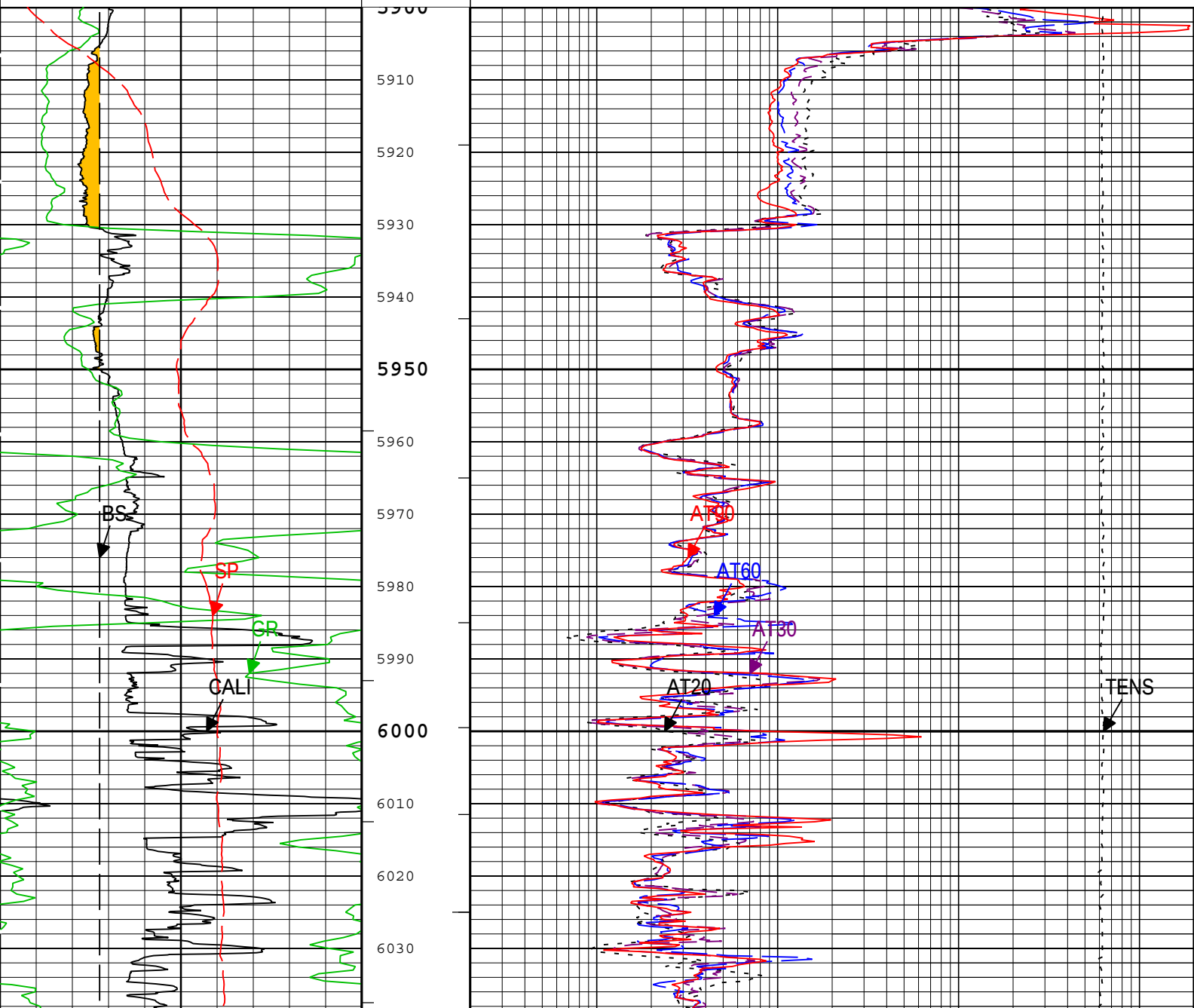
0.2 ohm.m 2000

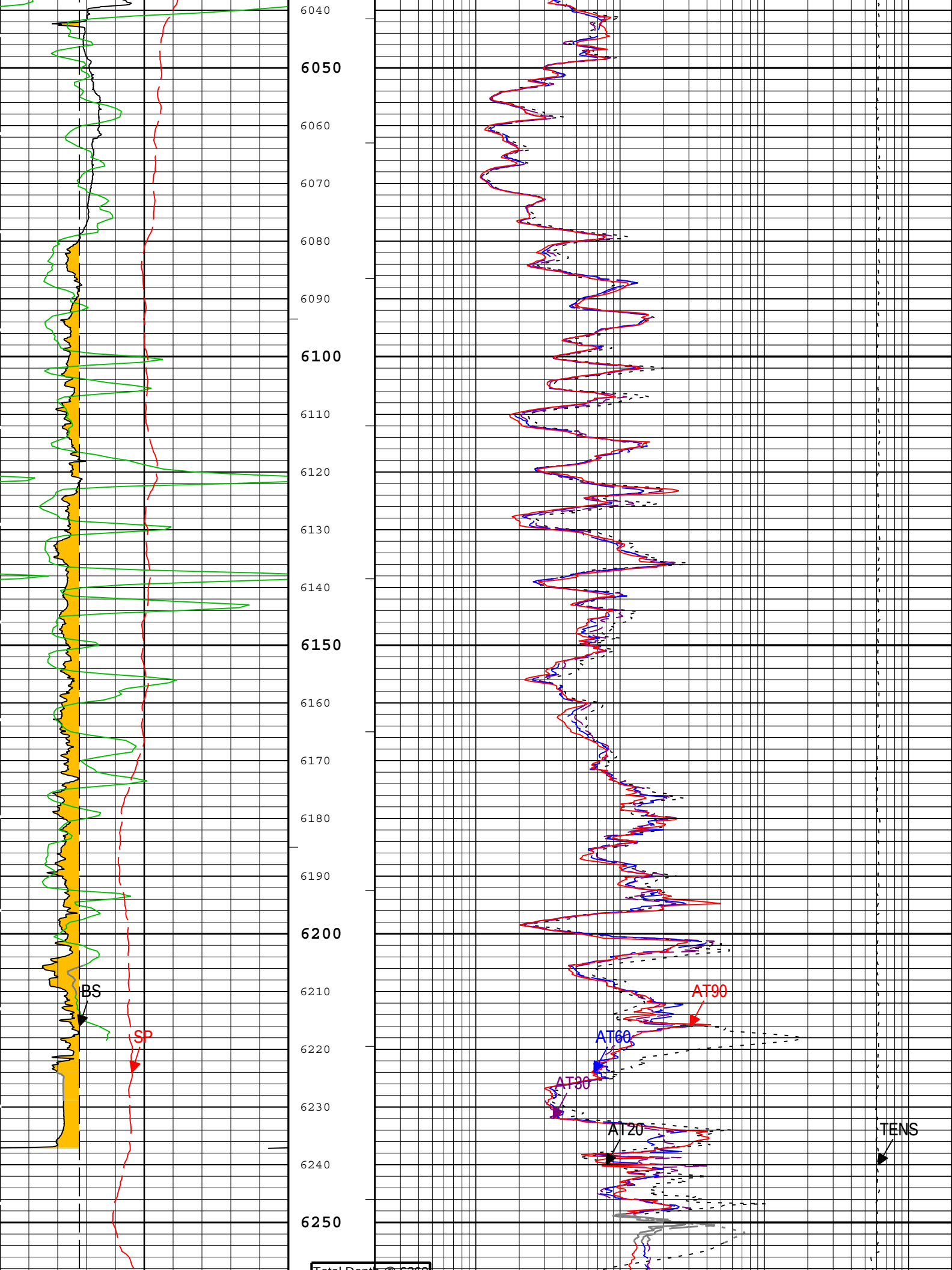
Array Induction Two Foot Resistivity A60 (AT60) AIT-M

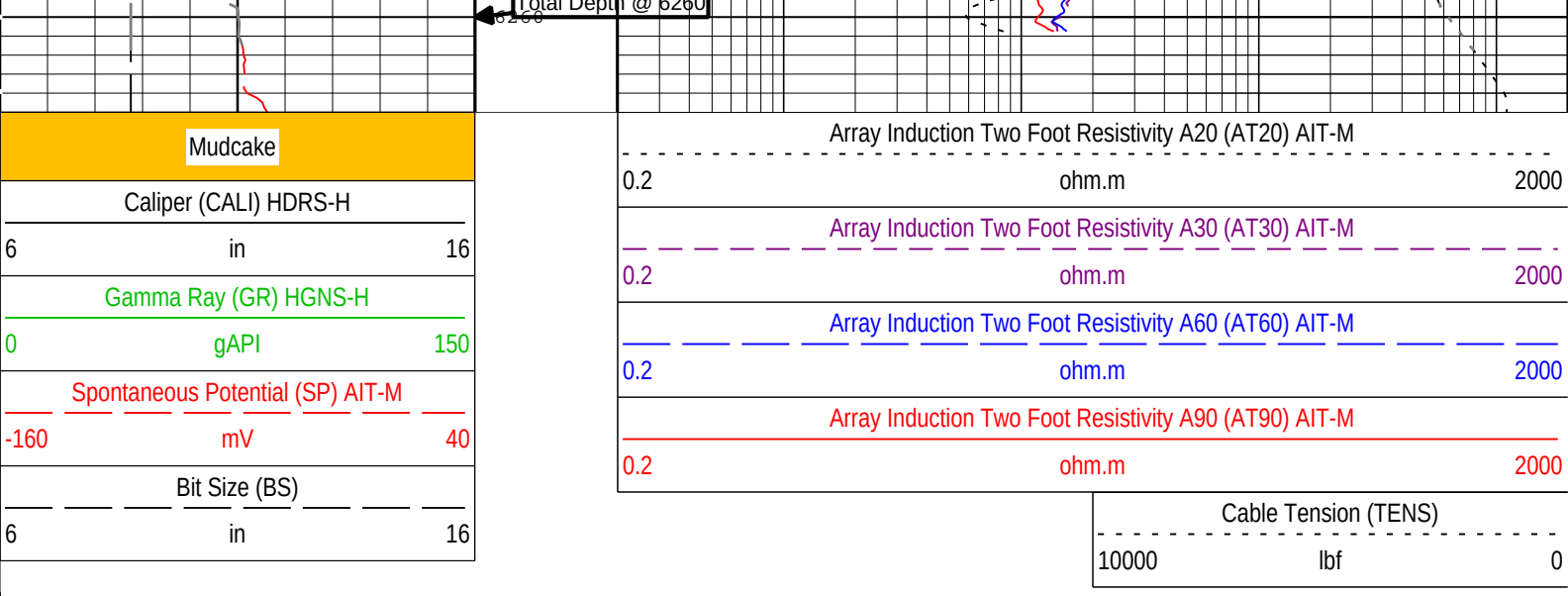
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M

0.2 ohm.m 2000




6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140
6150
6160
6170
6180
6190
6200
6210
6220
6230
6240
6250
BS
SP
AT90
AT60
AT30
AT20
TENS



Description: AIT Basic Log One Format: Log (AIT 5) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:28

Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M:AMIS:AMIS	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	-0.114	in
CBLO	Casing Bottom (Logger)	COMPLETION	3215	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	60	mV
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

Tool Control Parameters

Parameter	Description	ToolPath	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed		1800	ft/h

One

Repeat Analysis

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data

One	Repeat[5]:Up	Up	5862.93 ft	6271.31 ft	02-Jun-2012 2:09:26 PM	02-Jun-2012 2:34:30 PM	2.60 ft	
One	Main[6]:Up	Up	3158.52 ft	6271.81 ft	02-Jun-2012 2:45:59 PM	02-Jun-2012 5:26:01 PM	0.00 ft	

All depths are referenced to toolstring zero

Log

One: Main[6]:Up D9676CF6-3D54-48F2-AB6B-816D2E713451

Description: AIT Basic Log One Format: Log (AIT 5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:29

Channel	Source	Sampling
ICV	Borehole	6in
IHV	Borehole	6in
TIME_1900	WLWorkflow	0.1in

IHV - Integrated Hole Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

Main To Repeat

Repeat To Main

Cable Tension (TENS)

10000 lbf 0

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A90 (AO90) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A60 (AO60) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

6 in 16

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A30 (AO30) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

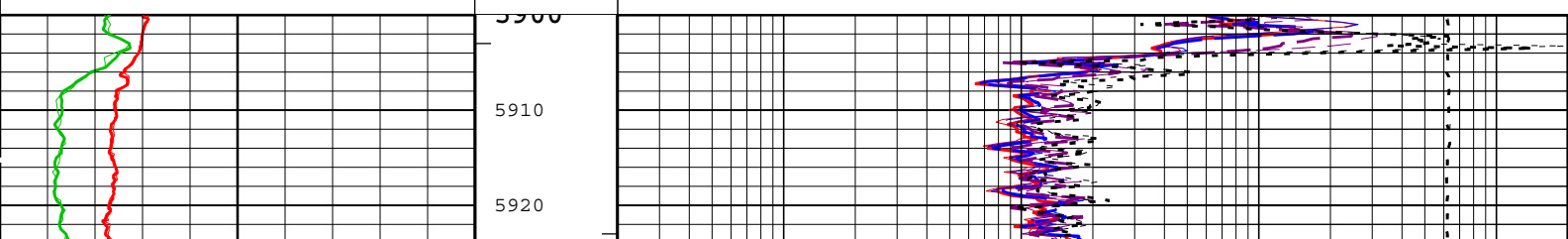
0 gAPI 150

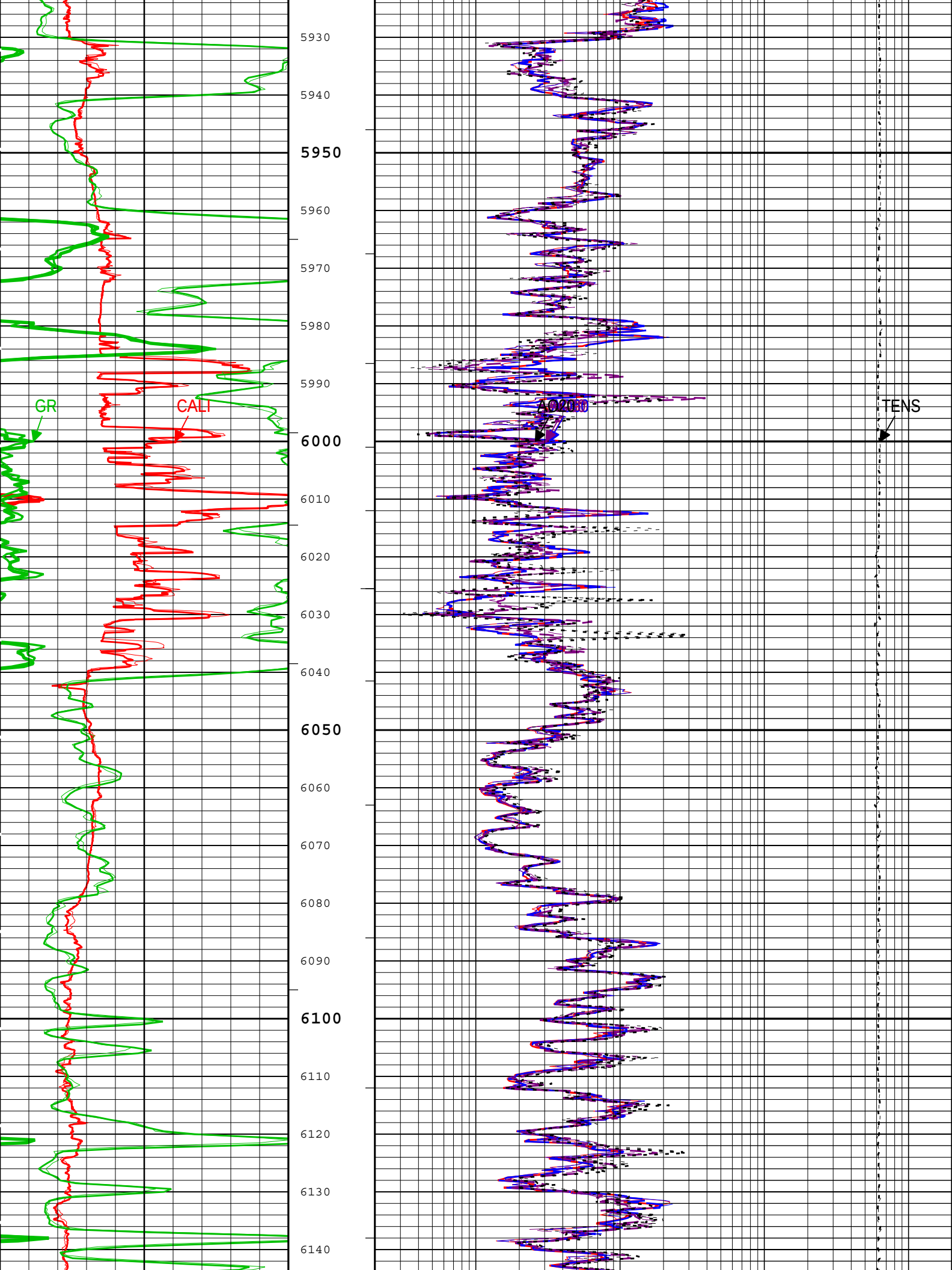
Main To Repeat

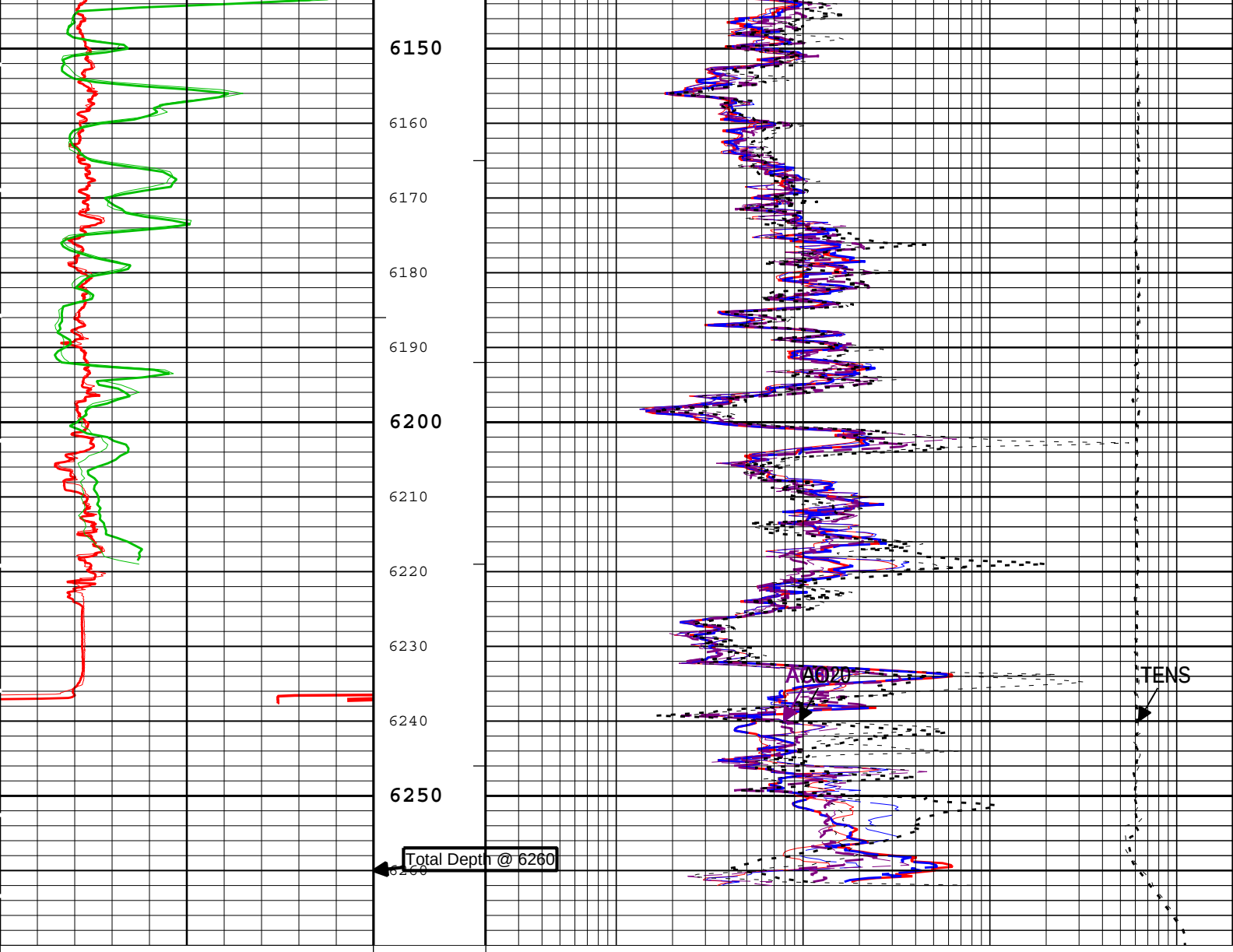
Repeat To Main

Array Induction One Foot Resistivity A20 (AO20) AIT-M

0.2 ohm.m 2000




GR
CALI
TENS
5930
5940
5950
5960
5970
5980
5990
6000
6010
6020
6030
6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140



Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

6 in 16

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

0 gAPI 150

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A90 (AO90) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A60 (AO60) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A30 (AO30) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Array Induction One Foot Resistivity A20 (AO20) AIT-M

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Cable Tension (TENS)

10000 lbf 0

ICV - Integrated Cement Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log One Format: Log (AIT 5 RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:29

Calibration Report

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

Primary Equipment :

Array Induction Sonde - M	AMIS	229

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 15:11:35 05-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.018	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.555	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.593	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.018	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.020	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.056	3.000
Test Loop Gain - 4		Master	1.000	0.950	0.995	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.078	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.992	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	1.072	3.000
Test Loop Gain - 6		Master	1.000	0.950	0.996	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	0.257	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	0.263	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 15:11:35 05-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-89.643	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-1205.814	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	160.789	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	183.606	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	108.133	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-137.337	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	49.453	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	-16.995	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	26.216	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	1.594	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	12.908	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-4.294	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.625	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	5.777	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-0.676	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	-2.997	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 15:11:35 05-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	0.650	0.500	1.166	0.800
Fine Gain		Master	0.650	0.500	1.177	0.800

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 15:11:35 05-May-2012 Before (Measured): 21:43:50 01-Jun-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.613	0.854
		Before	-----	0.366	0.613	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-176.494	-103.000
		Before	-----	137.000	-170.782	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.712	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.257	1.778
		Before	-----	0.762	1.257	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-177.562	-104.000
		Before	-----	136.000	-171.853	-104.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.709	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.623	0.868
		Before	-----	0.372	0.622	0.868
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	178.884	-108.000
		Before	-----	132.000	-175.407	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.291	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 3	V	Master	-----	0.420	0.704	0.980
		Before	-----	0.420	0.703	0.980
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 3	deg	Master	-----	131.000	178.122	-109.000
		Before	-----	131.000	-176.170	-109.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.292	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 4	V	Master	-----	0.804	1.315	1.876
		Before	-----	0.804	1.315	1.876
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 4	deg	Master	-----	125.000	172.006	-115.000
		Before	-----	125.000	177.707	-115.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.701	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 5	V	Master	-----	1.176	1.916	2.744
		Before	-----	1.176	1.916	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 5	deg	Master	-----	122.000	170.360	-118.000
		Before	-----	122.000	176.058	-118.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.698	-----
		After-Before	-----	-----	-----	-----

Thru Cal Mag - 6	V	Master	-----	1.176	1.913	2.744
		Before	-----	1.176	1.913	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 6	deg	Master	-----	121.000	170.403	-119.000
		Before	-----	121.000	176.098	-119.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.695	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 7	V	Master	-----	0.846	1.379	1.974
		Before	-----	0.846	1.379	1.974
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 7	deg	Master	-----	115.000	169.622	-125.000
		Before	-----	115.000	175.281	-125.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.659	-----
		After-Before	-----	-----	-----	-----
SPA Zero	mV	Master	-----	-50.000	-0.075	50.000
		Before	-----	-50.000	-0.065	50.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.010	-----
		After-Before	-----	-----	-----	-----
SPA Plus	mV	Master	-----	941.000	994.818	1040.000
		Before	-----	941.000	994.801	1040.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.017	-----
		After-Before	-----	-----	-----	-----
Temperature Zero	V	Master	-----	-0.050	0.000	0.050
		Before	-----	-0.050	0.000	0.050
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Temperature Plus	V	Master	-----	0.870	0.922	0.960
		Before	-----	0.870	0.922	0.960
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run One

Primary Equipment :

HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3965
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4770

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	28941
HRDD Short Spacing Detector	Short Spacing	27775
Cesium 137 Gamma-Ray Logging Source	GSR-J	5370
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3965
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	4723

Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.00
Large Ring Size (Caliper Calibration Large Ring)	12.00

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 14:12:17 30-May-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	7.61	10.00
Large Ring	in	Before	12.00	9.00	12.06	15.00

HDRS Density Calibration - Inversion Results

HDRS Density Calibration - Inversion Results

Master (EEPROM): 14:33:08 20-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.596	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.687	1.696
Pe Aluminum		Master	2.570	2.470	2.570	2.670
Pe Magnesium		Master	2.650	2.550	2.623	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 14:33:08 20-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.2320	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.5702	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.4147	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.0787	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.8020	1.5000
LS Max Deviation	%	Master	0	-3.5000	1.7712	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 14:33:08 20-May-2012 Before (Measured): 14:05:18 30-May-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000	-----	0.7394	-----
		Before	0.7394	0.7025	0.7398	0.7764
		Before-Master	-----	-----	0.0004	-----
BS Window Sum	1/s	Master	1	-----	29051	-----
		Before	29051	27598	29024	30503
		Before-Master	-----	-----	-27	-----
SS Window Ratio		Master	1.0000	-----	0.4842	-----
		Before	0.4842	0.4600	0.4855	0.5084
		Before-Master	-----	-----	0.0013	-----
SS Window Sum	1/s	Master	1	-----	11466	-----
		Before	11466	10893	11444	12040
		Before-Master	-----	-----	-22	-----
LS Window Ratio		Master	1.0000	-----	0.2981	-----
		Before	0.2981	0.2832	0.2988	0.3130
		Before-Master	-----	-----	0.0007	-----
LS Window Sum	1/s	Master	1	-----	1357	-----
		Before	1357	1289	1352	1425
		Before-Master	-----	-----	-5	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 14:33:08 20-May-2012 Before (Measured): 14:05:18 30-May-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master	-----	1000	1462	2400
		Before	-----	1000	1475	2400
		Before-Master	-----	-100	13	100
SS PM High Voltage	V	Master	-----	1000	1419	2400
		Before	-----	1000	1410	2400
		Before-Master	-----	-100	-9	100
LS PM High Voltage	V	Master	-----	1000	1600	2400
		Before	-----	1000	1599	2400
		Before-Master	-----	-100	-1	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 14:33:08 20-May-2012 Before (Measured): 14:05:18 30-May-2012 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master	-----	5.00	10.77	25.00
		Before	-----	5.00	10.91	25.00
		Before-Master	-----	-1.00	0.14	1.00
SS Crystal Resolution	%	Master	-----	5.00	9.31	20.00
		Before	-----	5.00	9.12	20.00
		Before-Master	-----	-1.00	-0.19	1.00
LS Crystal Resolution	%	Master	-----	5.00	8.64	20.00
		Before	-----	5.00	8.80	20.00
		Before-Master	-----	-1.00	0.16	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 21:47:45 01-Jun-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit

Main Resistivity	ohm.m	Before	3875	3565	3830	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3793	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3805	4136	

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

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 150 degC	HGNS-H	4759

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	5120
AmBe Neutron Logging Source	NSR-F	5226

Calibration Parameter :

Water Temperature	
Housing Size	
JIG-BKG (Jig minus background reference)	160

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 21:46:28 01-Jun-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.2	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-May-2006

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Accelerometer Manufacturer		Master	-----	-----	QAT_160	-----	
Accelerometer Reference Temperature	degF	Master	-----	30.2	77.0	122.0	
Accelerometer Coefficients - 0		Master	-----	-----	519.600	-----	
Accelerometer Coefficients - 1		Master	-----	-----	33.370	-----	
Accelerometer Coefficients - 2		Master	-----	-----	-0.009	-----	
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 4		Master	-----	-----	2.719	-----	
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----	
Accelerometer Coefficients - 8		Master	-----	-----	298.600	-----	
Accelerometer Coefficients - 9		Master	-----	-----	0.997	-----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 16:29:00 19-Apr-2012 Before (Measured): 14:11:47 30-May-2012 Expired by 1 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Near Zero Measurement	1/s	Master	0	5.0	27.2	40.0	
		Before	0	5.0	26.9	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.1	-0.3	4.1	
		After-Before	-----	-----	-----	-----	
Far Zero Measurement	1/s	Master	0	5.0	28.0	40.0	
		Before	0	5.0	27.5	40.0	
		After	-----	-----	-----	-----	
		Before-Master	-----	-4.2	-0.5	4.2	
		After-Before	-----	-----	-----	-----	
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4851.0	6900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2019.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Near Corrected Plus Measurement - 0	1/s	Master	-----	4700.0	4936.0	6900.0	
		Before	-----	-----	-----	-----	

		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Far Corrected Plus Measurement - 0	1/s	Master	-----	1900.0	2063.0	2900.0	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 14:02:30 30-May-2012 Expired by 1 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	27.8	120.0	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
RGR Plus Measurement	gAPI	Before	179.8	152.4	178.1	200.0	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
GR Calibration Gain		Before	0.89	0.80	0.90	1.05	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

One

Main Pass 1" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	647.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1463.2	ft3

Software Version

Acquisition System	Version
MaxWell	3.0.9609.0
Application Patch	SP-20120409-3.0.9609.1919
	EXP_APL-OPElevation-3.0.9609.1966

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.0.9609.1919

Tool Elements	Description	Software Version	Firmware Version
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.0.9609.1919	2.0
AMIS	Array Induction Sonde - M	3.0.9609.1919	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Main[6]:Up	Up	3158.52 ft	6271.81 ft	02-Jun-2012 2:45:59 PM	02-Jun-2012 5:26:01 PM	0.00 ft	

All depths are referenced to toolstring zero

Log

One: Main[6]:Up D9676CF6-3D54-48F2-AB6B-816D2E713451

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 1 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:44

Channel	Source	Sampling
AF20	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AFCO60	AIT-M:AMIS:AMIS	3in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in

IHV	Borehole	6in
SP	AIT-M:AMIS:AMIS	6in
TIME_1900	WLWorkflow	0.1in

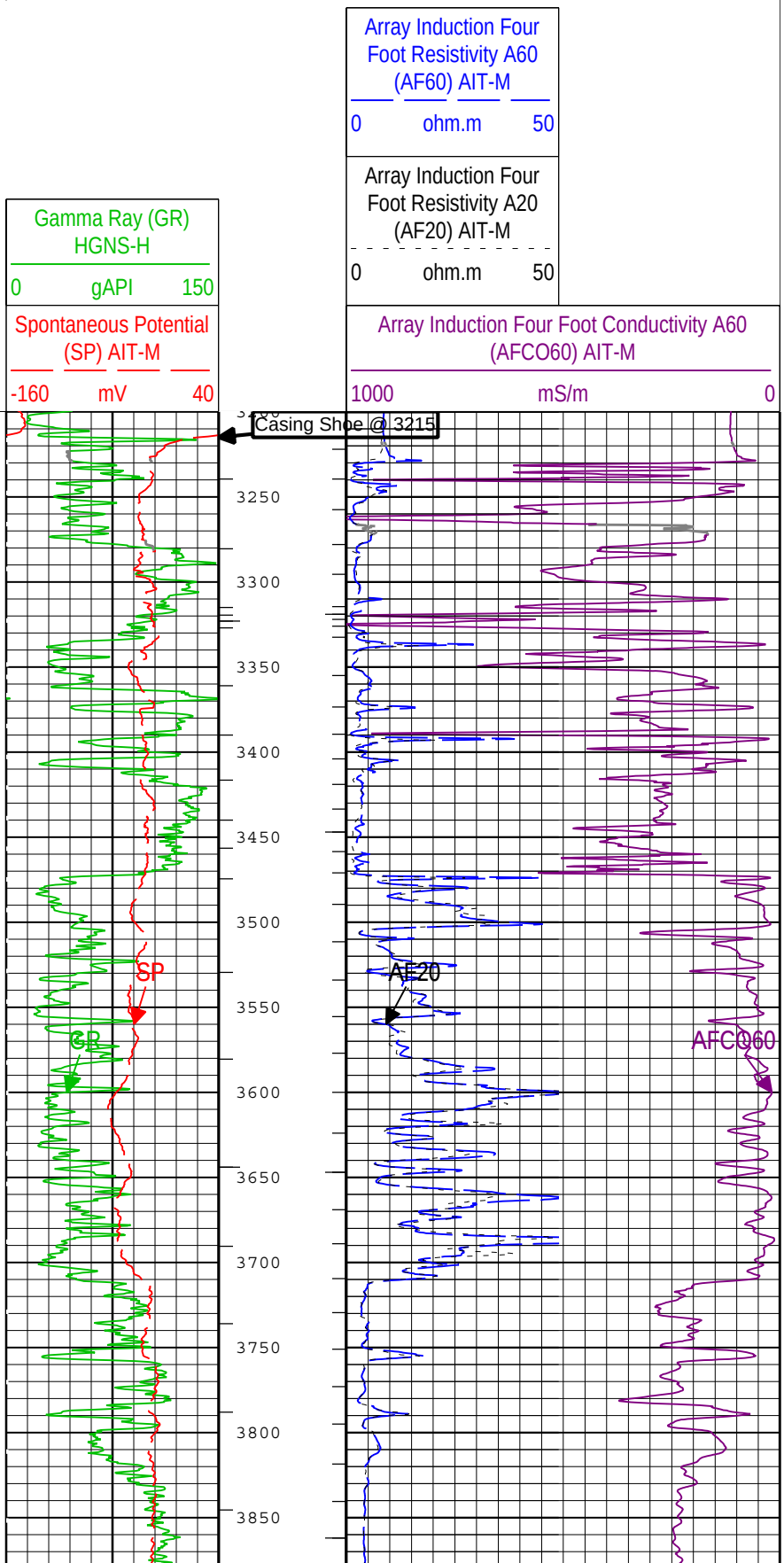
IHV - Integrated Hole Volume every 10.00 (ft3)

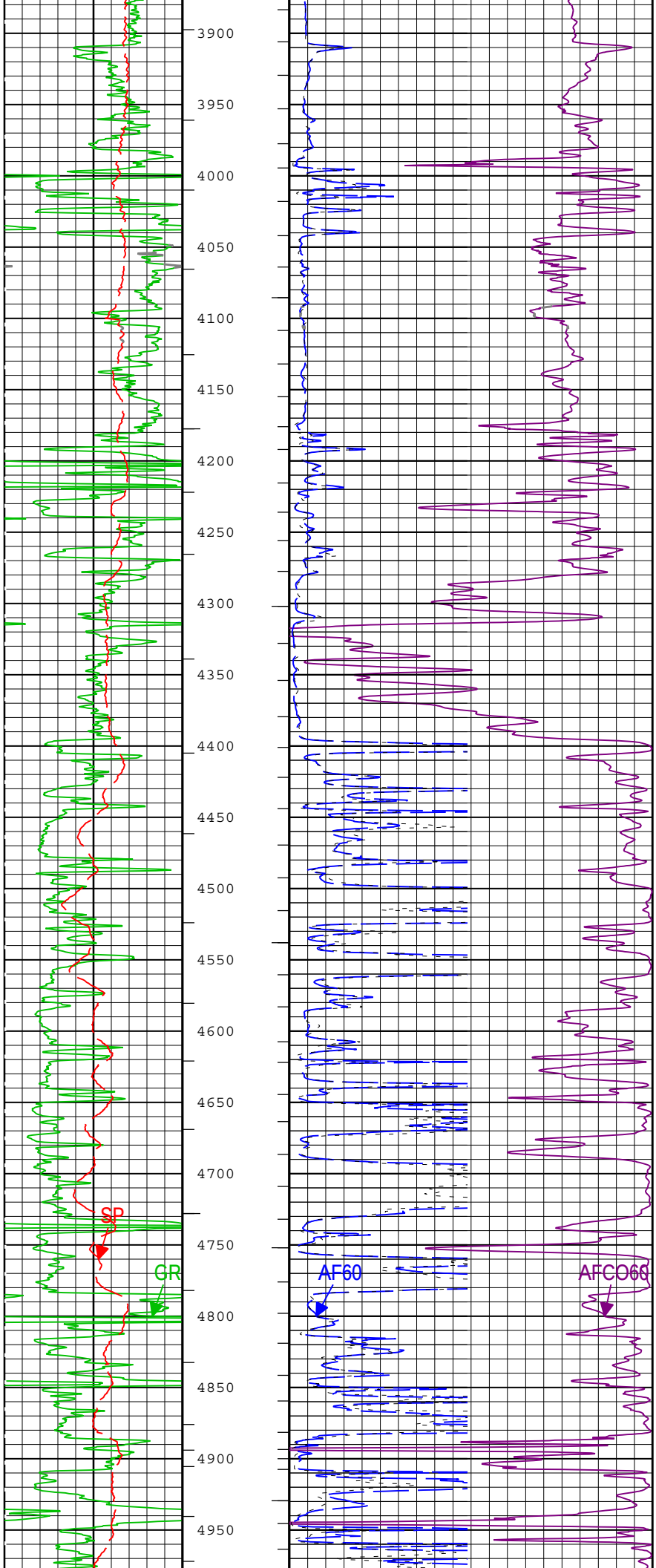
IHV - Integrated Hole Volume every 100.00 (ft3)

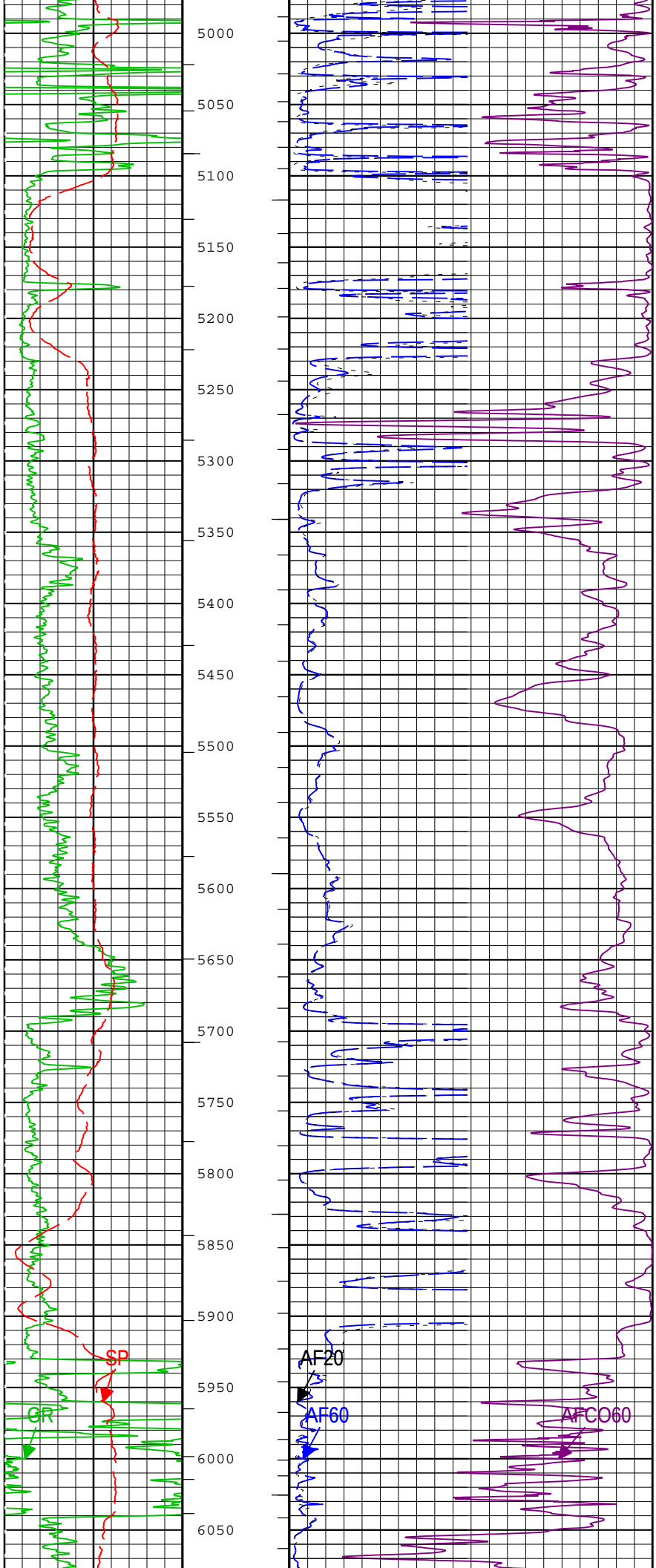
ICV - Integrated Cement Volume every 10.00 (ft3)

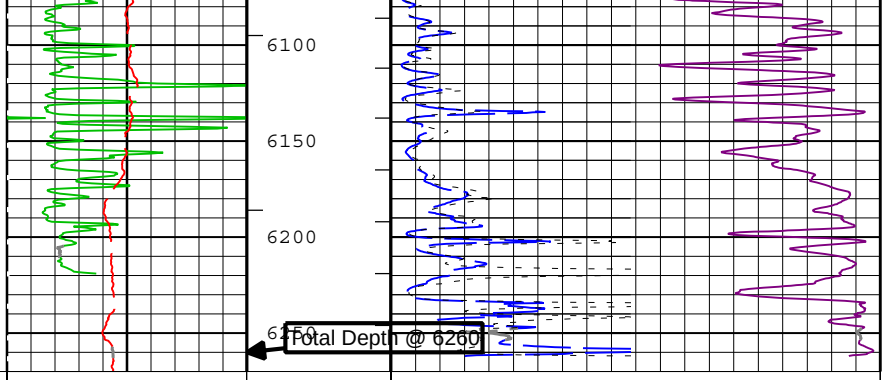
ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)




3900
3950
4000
4050
4100
4150
4200
4250
4300
4350
4400
4450
4500
4550
4600
4650
4700
4750
4800
4850
4900
4950
SP
GR
AF60
AFCO60


5000
5050
5100
5150
5200
5250
5300
5350
5400
5450
5500
5550
5600
5650
5700
5750
5800
5850
5900
5950
6000
6050
SP
GR
AF20
AF60
AFCO60



Gamma Ray (GR) HGNS-H
0 gAPI 150

Spontaneous Potential (SP) AIT-M
-160 mV 40

Array Induction Four Foot Conductivity A60 (AFCO60) AIT-M
1000 mS/m 0

Array Induction Four Foot Resistivity A60 (AF60) AIT-M
0 ohm.m 50

Array Induction Four Foot Resistivity A20 (AF20) AIT-M
0 ohm.m 50

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

IHV - Integrated Hole Volume every 100.00 (ft3)

IHV - Integrated Hole Volume every 10.00 (ft3)

Description: AIT Basic Log Two Format: Log (AIT Basic Log Two) Index Scale: 1 in per 100 ft Index Unit: ft
Index Type: Measured Depth Creation Date: 02-Jun-2012 18:25:44

Channel Processing Parameters

Parameter	Description	ToolPath	Value	Unit
ABLM	Array Induction Basic Logs Mode	AIT-M:AMIS:AMIS	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M:AMIS:AMIS	Yes	
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	COMPLETION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H:HRCC-H:HRCC-H	-0.114	in
CBLO	Casing Bottom (Logger)	COMPLETION	3215	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	COMPLETION	7	in
DFD	Drilling Fluid Density	Borehole	9.3	lbm/gal
FCD	Future Casing (Outer) Diameter	COMPLETION	7	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	60	mV
SPDR	SP Drift Per Foot	AIT-M:AMIS:AMIS	0	mV/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	3200	3215
BS	8.75	3215	6270

All depth are actual.

Tool Control Parameters

Company: Tug Hill Operating, LLC

Schlumberger

Well: Bearden Trust 1 SWD

Field: Unknown

County: Comanche

State: Kansas

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP