Schlumberger

Company: TUG HILL OPERATING LLC

Well: HOFFMAN FAMILY TRUST #1

Field: WILDCAT

County: COMANCHE State: KANSAS

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP

County: COMANCHE
Field: WILDCAT
Location: 330' FSL & 510' FEL
Well: HOFFMAN FAMILY TRUST #1
Company: TUG HILL OPERATING LLC

Location:			
330' FSL & 510' FEL	Elev.	K.B.	1959.00 ft
		G.L.	1936.00 ft
		D.F.	1959.00 ft

Permanent Datum:	Ground Level	Elev.:	1936.00 f
Log Measured From:	Kelly Bushing	23.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

API Serial No.	Section:	Township:	Range:
15-033-21620	18	34	18W

Logging Date			19-Jul-2012			
Run Number			ONE			
Depth Driller			6781.00 ft			
Schlumberger Depth			6770.00 ft			
Bottom Log Interval			6770.00 ft			
Top Log Interval			3021.00 ft			
Casing Driller Size @ Depth			7 in @ 3000.00 ft			
Casing Schlumberger			3021 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Fresh WBM			
MUD	Density	Viscosity	9.2 lbm/gal	51 s		
	Fluid Loss	PH	12 cm3	9.2		
	Source of Sample		Active Tank			
RM @ Meas Temp			0.17 ohm.m @ 93 degF			
RMF @ Meas Temp			0.14 ohm.m @ 93 degF			
RMC @ Meas Temp			0.23 ohm.m @ 93 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.11 @ 148	0.09 @ 148		
Max Recorded Temperatures			148 degF			
Circulation Stopped	Time		19-Jul-2012	12:00:00		
Logger on Bottom	Time		20-Jul-2012	10:00:00		
Unit Number	Location:		2367	ELK CITY, OK		
Recorded By			ARONA NDIAYE			
Witnessed By			JAY LEWIS			

Disclaimer

Contents

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	19-Jul-2012					
Time Log Started	19:34:42					
Date Log Finished	20-Jul-2012					
Time Log Finished	11:55:04					
Top Log Interval (ft)	3021.00					
Bottom Log Interval (ft)	6770.00					
Total Depth (ft)	6770.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	2367					
Logging Unit Location	ELK CITY, OK					
Recorded By	ARONA NDIAYE					
Witnessed By	JAY LEWIS					
Service Order Number	BVWA-00058					

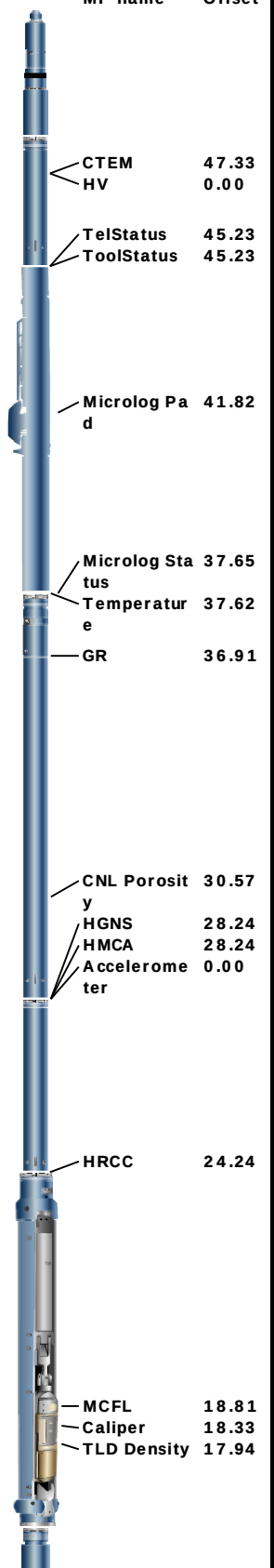
Borehole Fluids

Parameter(unit)	ONE					
Fluid Type	Water					
Fluid Name	Fresh WBM					
Max Recorded Temperatures (degF)	148					
Source of Sample	Active Tank					
Salinity (ppm)	28000					
Density (lbm/gal)	9.2					
Funnel Viscosity (s)	51					
Fluid Loss (cm3)	12					
PH	9.2					
Date/Time Circulation Stopped	19-Jul-2012 12:00:00					
Date Logger on Bottom	20-Jul-2012					
Time Logger on Bottom	10:00:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	0.17 @ 93					
RMF @ Meas Temp (ohm.m@degF)	0.14 @ 93					

RMC @ Meas Temp (ohm.m@degF)	0.23 @ 93					
RM @ BHT (ohm.m@degF)	0.11 @ 148					
RMF @ BHT (ohm.m@degF)	0.09 @ 148					
RMC @ BHT (ohm.m@degF)	0.15 @ 148					
Total Solid (%)						
High Gravity Solids (%)						

Remarks and Equipment Summary

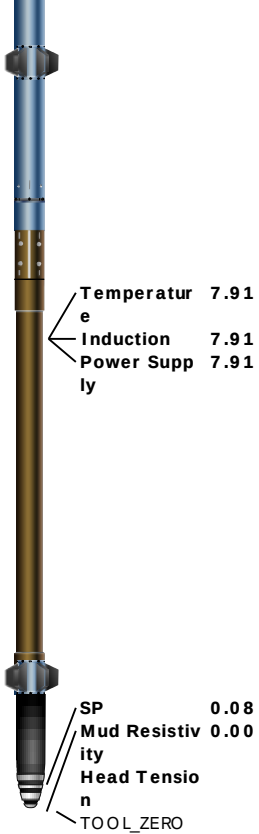
ONE: Toolstring



ONE: Remarks

Toolstring ran as per tool sketch
All presentations are as per client's request
Maximum recorded temperature is 148 degF, obtained from HGNS.
Hole cement volume computed given a future casing diameter of 7 inches.
Logs computed on a Limestone matrix (MDEN = 2.71 g/cc)
Main Pass logged from SLB TD to CSG. Repeat Pass logged 300ft from SLB TD.
HGNS ran without a bowspring per client's request.
Your crew today: Arona, Steve and Ryan
Thank you for choosing Schlumberger of Elk City, OK.
580-225-4300

AMRM:154



Lengths are in ft
Maximum Outer Diameter = 5.875 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	**ONE**		
Conveyance Type	Wireline		
Log Sequence	First Trip to Wellsite		
Rig Up Length at Surface (ft)	208.50		
Rig Up Length at Bottom (ft)	208.20		
Rig Up Length Correction (ft)	0.30		
Stretch Correction (ft)	2.50		
Tool Zero Reference Check at Surface (ft)	0.30		
Rig Type	DEVELOPMENT		
Depth Remark Parameters	**ONE**		
Depth Remark 1	All Schlumberger depth control procedures were followed		
Depth Remark 2	IDW used as primary depth control		
Depth Remark 3	Z-Chart used as secondary depth control		
Depth Remark 4	First run in hole. Main Pass correlated to Down Pass near TD.		
Depth Measuring Device	**ONE**		
Type	IDW-B		
Serial Number	5806		
Calibration Date	08-MAR-2012		
Calibrator Serial Number	33		
Calibration Cable Type	7-46A-XS		
Wheel Correction 1	-4		
Wheel Correction 2	-4		
Tension Device	**ONE**		
Type	CMTD-B/A		
Serial Number	2576		

Calibration Date	03-JUL-2012			
Calibrator Serial Number	1018			
Calibration Points	10			
Calibration RMS	45			
Calibration Peak Error	85			
Logging Cable	ONE			
Type	7-46A-XS			
Serial Number	U711103			
Logging Cable Length (ft)	25000.00			

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	648.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1652.31	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[5]:Up	Up	2921.22 ft	6779.70 ft	20-Jul-2012 10:18:12 AM	20-Jul-2012 11:30:49 AM	0.00 ft	

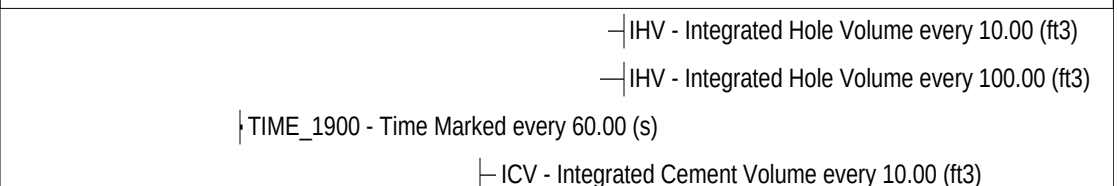
All depths are referenced to toolstring zero

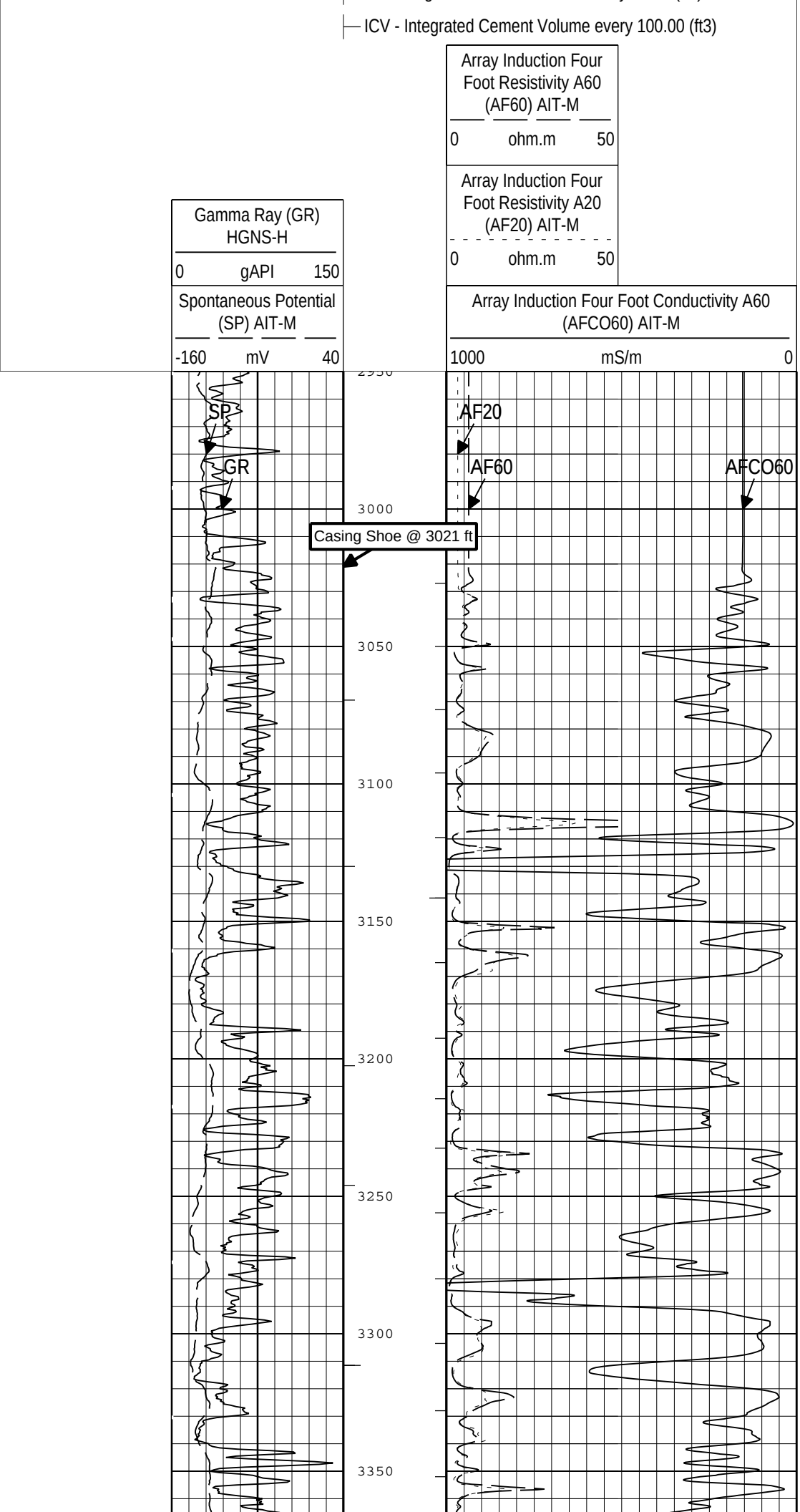
Log

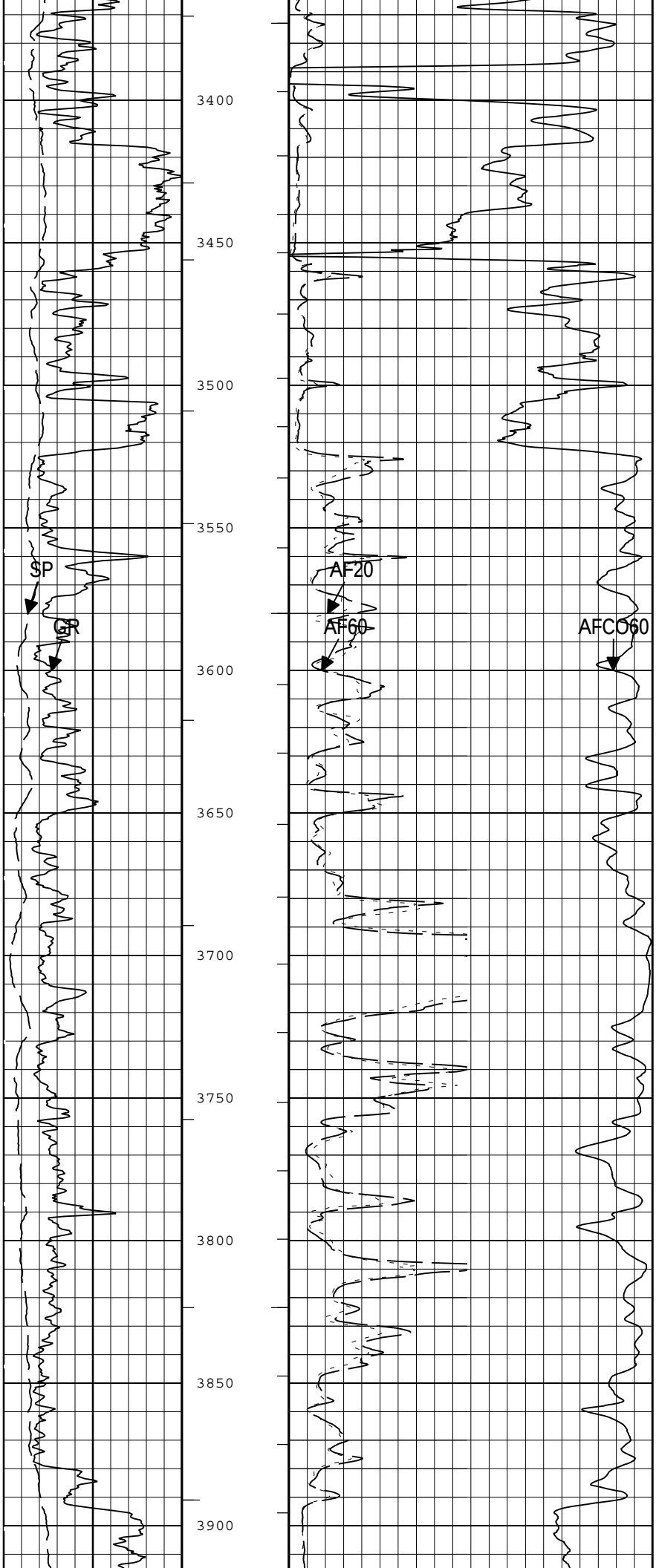
ONE: Main[5]:Up 0848A71E-31E5-4201-A295-69098F1E9101

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: 20-Jul-2012 13:34:32

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




ICV - Integrated Cement Volume every 100.00 (ft3)
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
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
SP
GR
AF20
AF60
AFCO60
Casing Shoe @ 3021 ft
3000
3050
3100
3150
3200
3250
3300
3350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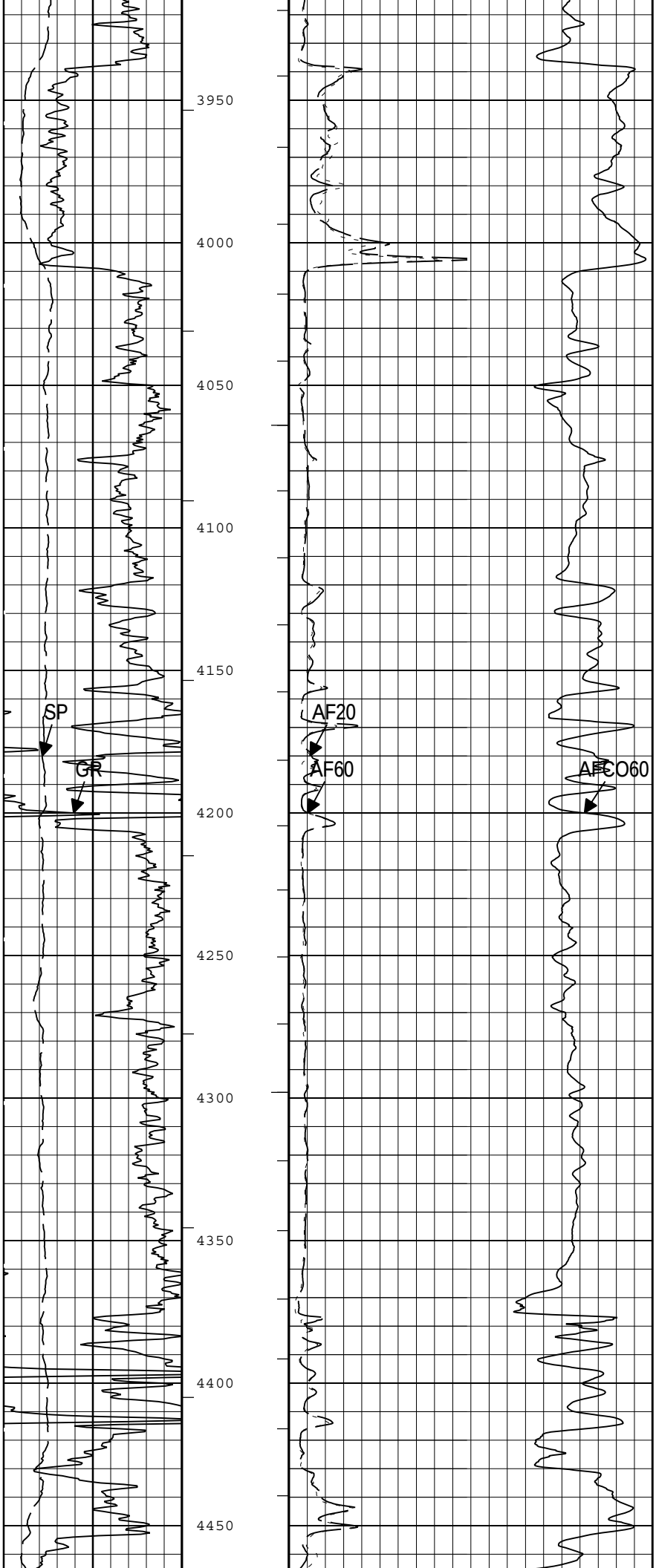
3550
3600
3650
3700
3750
3800
3850
3900
SP
GR
AF20
AF60
AFCO60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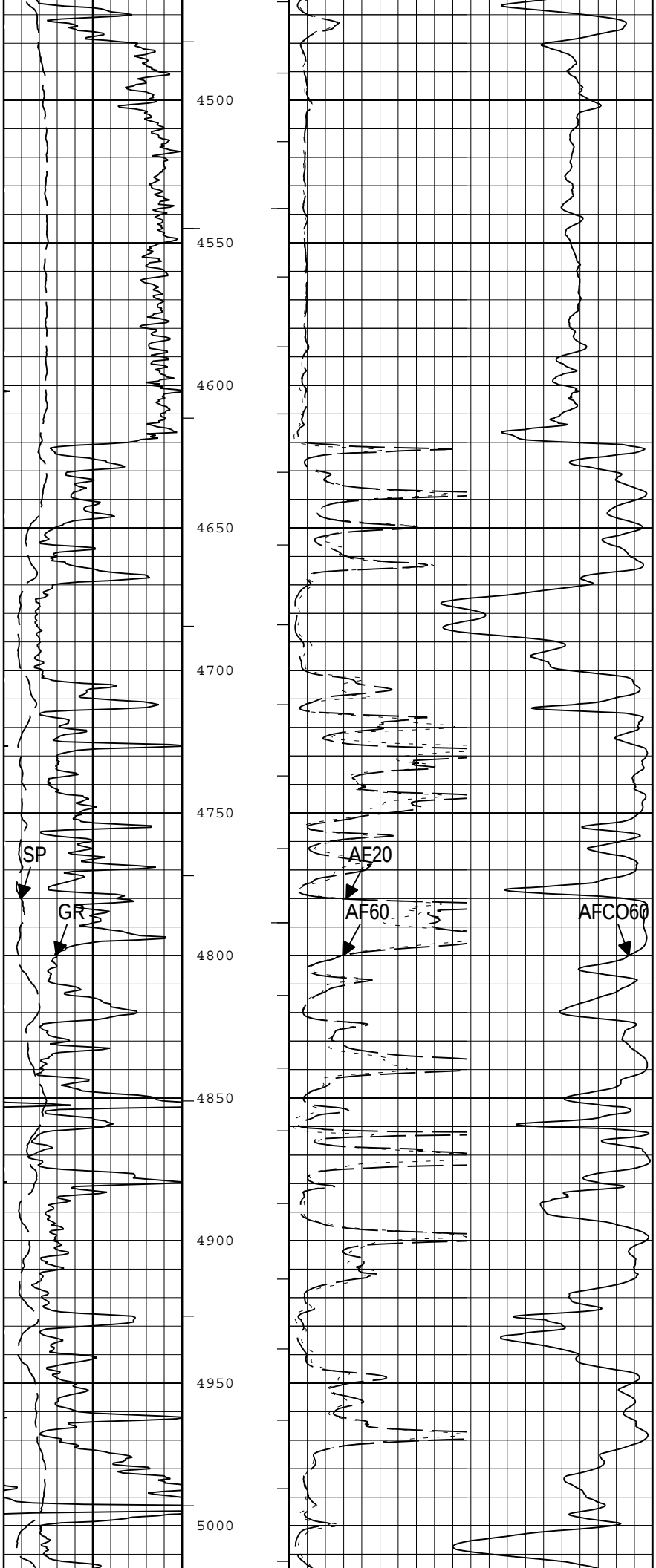
4000
4050
4100
4150
4200
4250
4300
4350
4400
4450
SP
GR
AF20
AF60
AFCO60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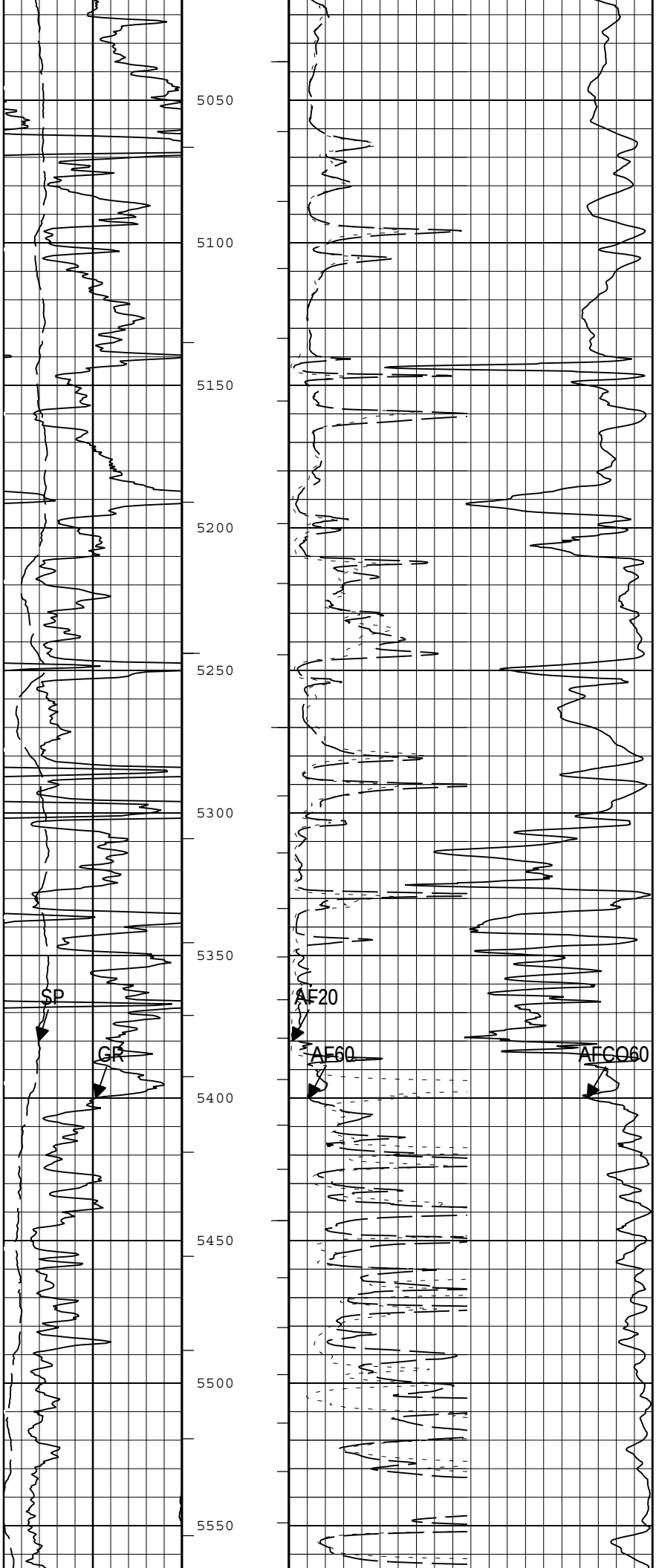
4650
4700
4750
4800
4850
4900
4950
5000
SP
GR
AE20
AF60
AFCO60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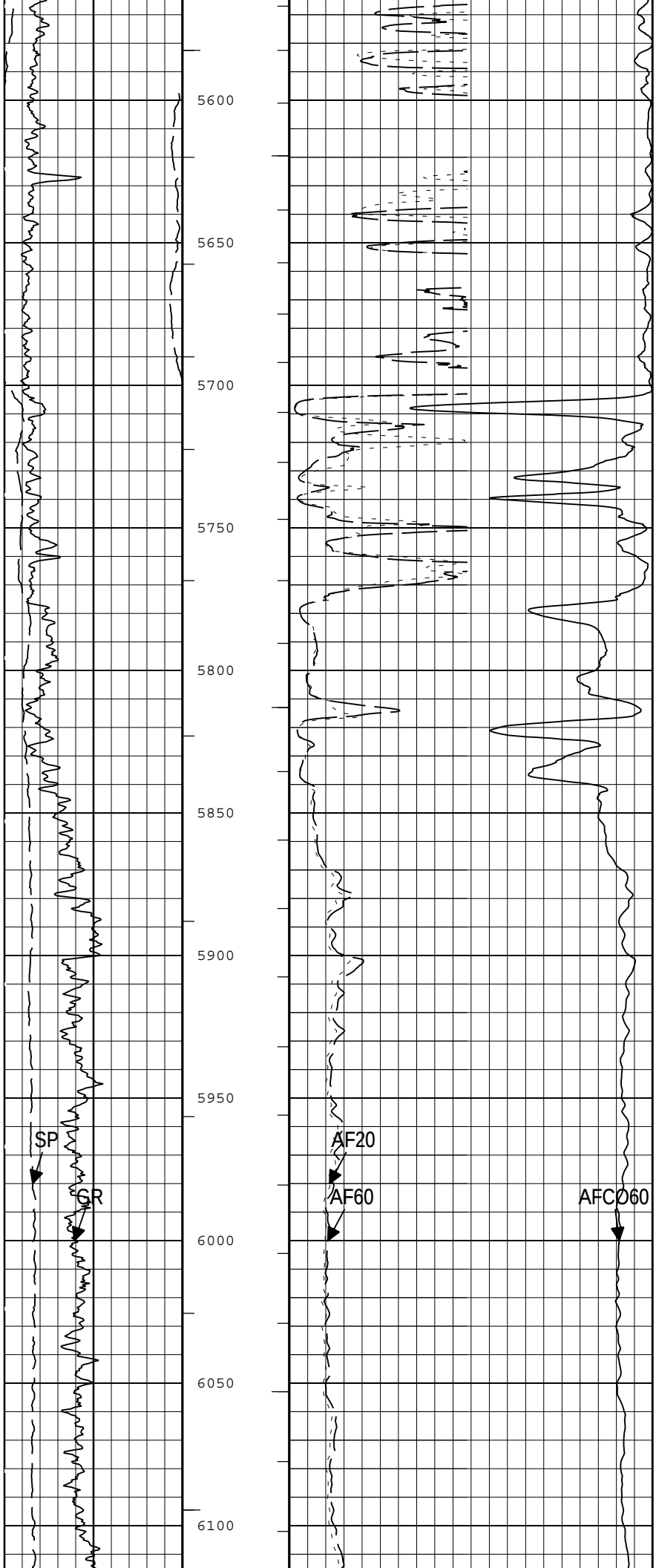
SP
AF20
GR
AF60
AFCO60
5400
5450
5500
5550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6000
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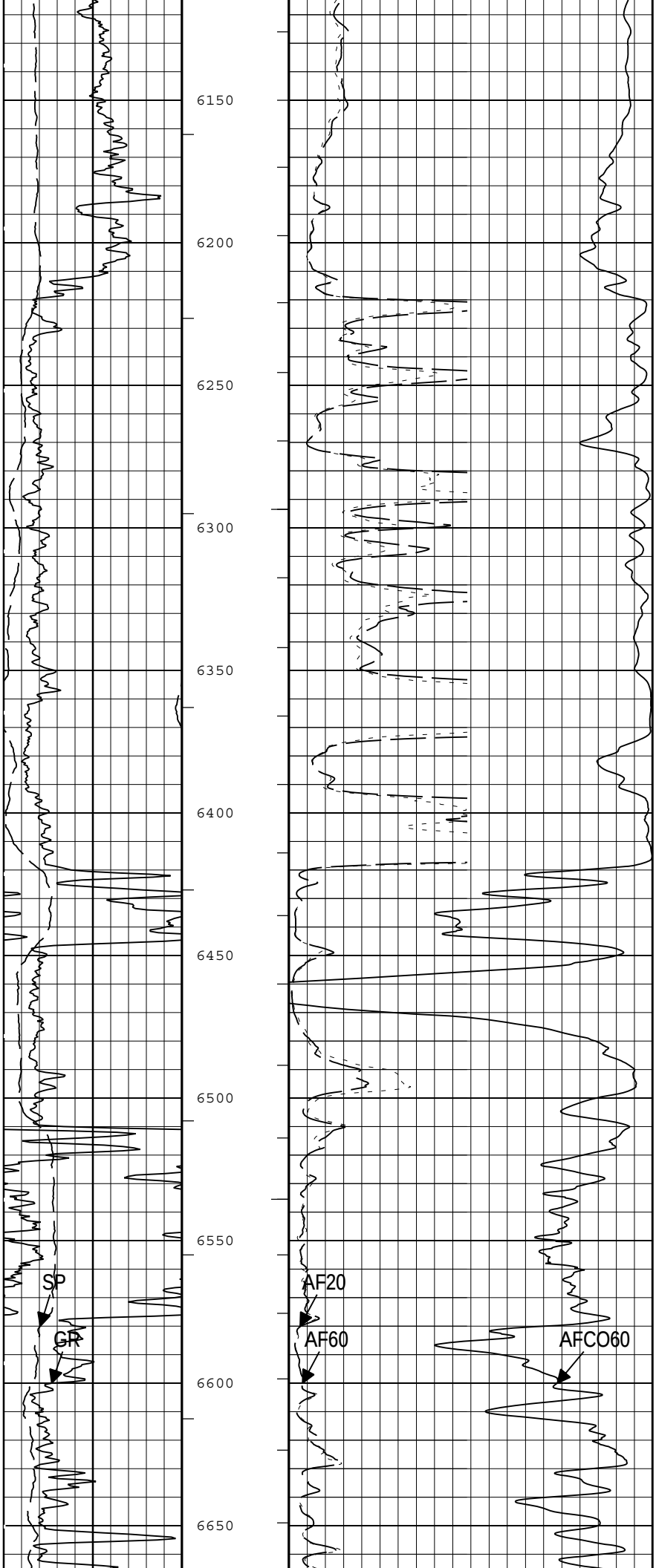
6100
SP
GR
AF20
AF60
AFCO60


6150
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6300
6350
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6500
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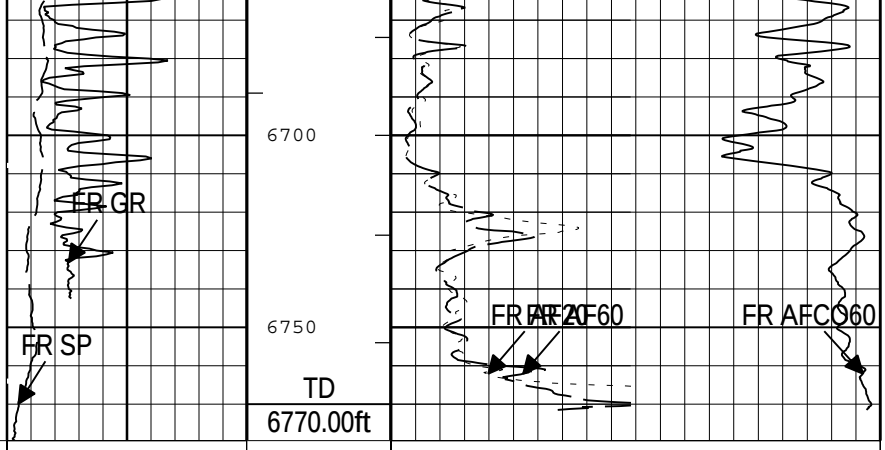
6600
6650
SP
GR
AF20
AF60
AFCO60



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: 20-Jul-2012 13:34:32

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	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.125	in
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	in
CBLO	Casing Bottom (Logger)	COMPLETION	3021	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	9.2	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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	0	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	WLWorkflow	1800	ft/h

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	648.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1652.31	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[5]:Up	Up	2921.22 ft	6779.70 ft	20-Jul-2012 10:18:12 AM	20-Jul-2012 11:30:49 AM	0.00 ft	

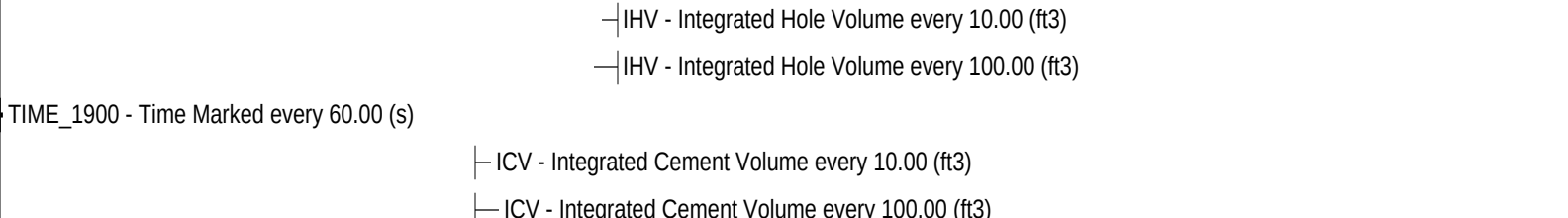
All depths are referenced to toolstring zero

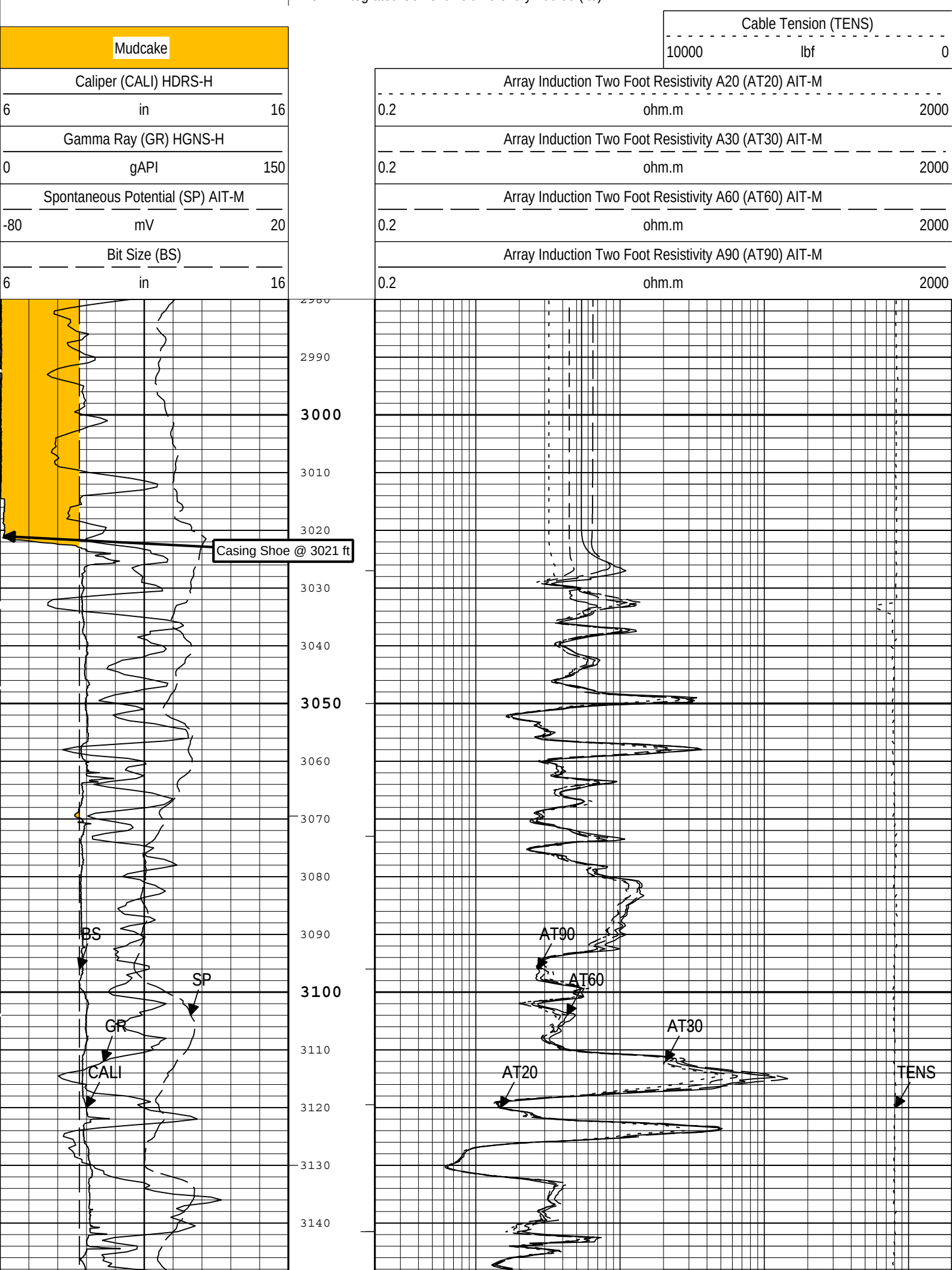
Log

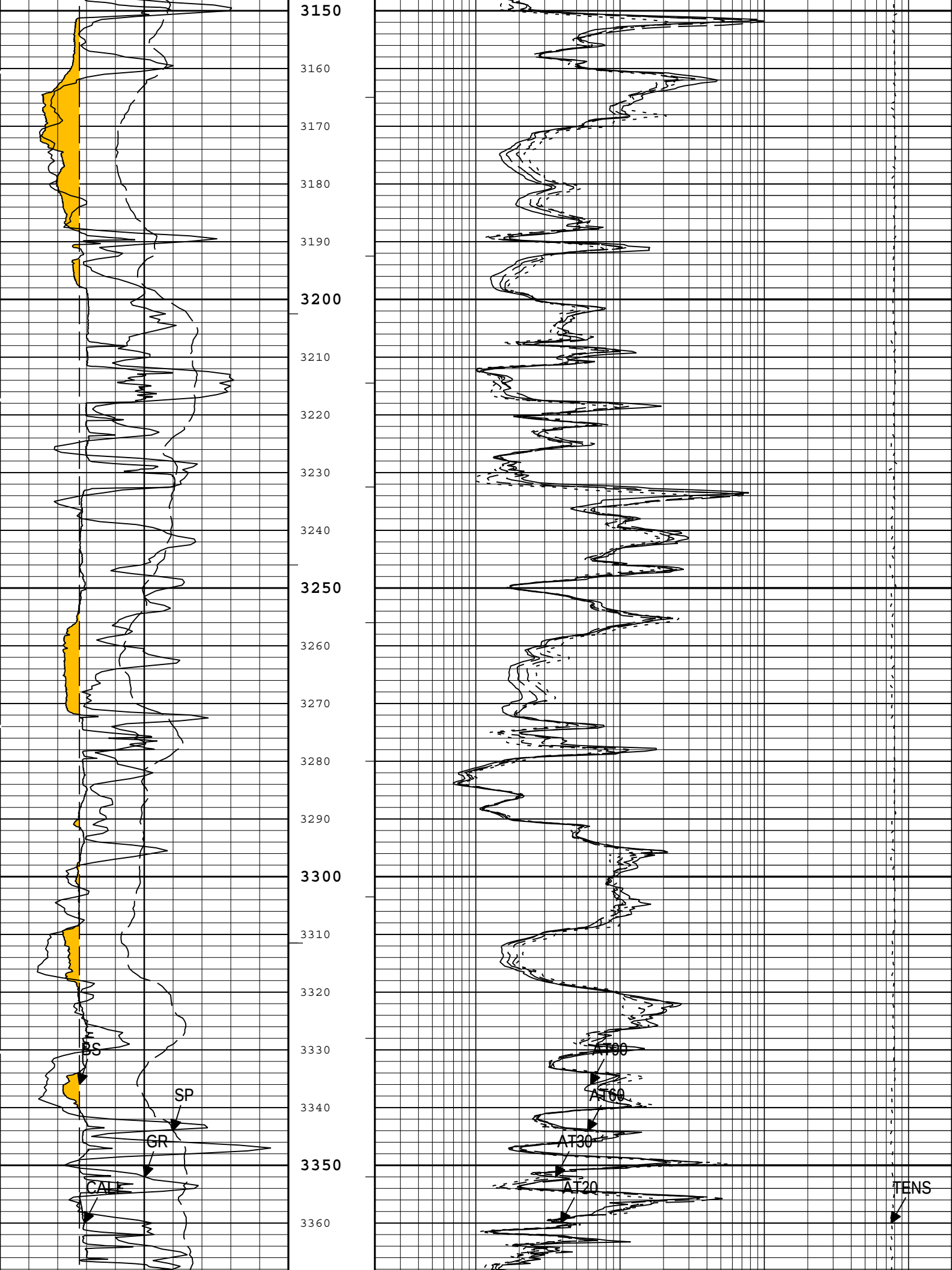
ONE: Main[5]:Up 0848A71E-31E5-4201-A295-69098F1E9101

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: 20-Jul-2012 13:34:35

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




Mudcake
Caliper (CALI) HDRS-H
6
in
16
Gamma Ray (GR) HGNS-H
0
gAPI
150
Spontaneous Potential (SP) AIT-M
-80
mV
20
Bit Size (BS)
6
in
16
Cable Tension (TENS)
10000
lbf
0
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
2980
2990
3000
3010
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
3120
3130
3140
Casing Shoe @ 3021 ft
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS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BS
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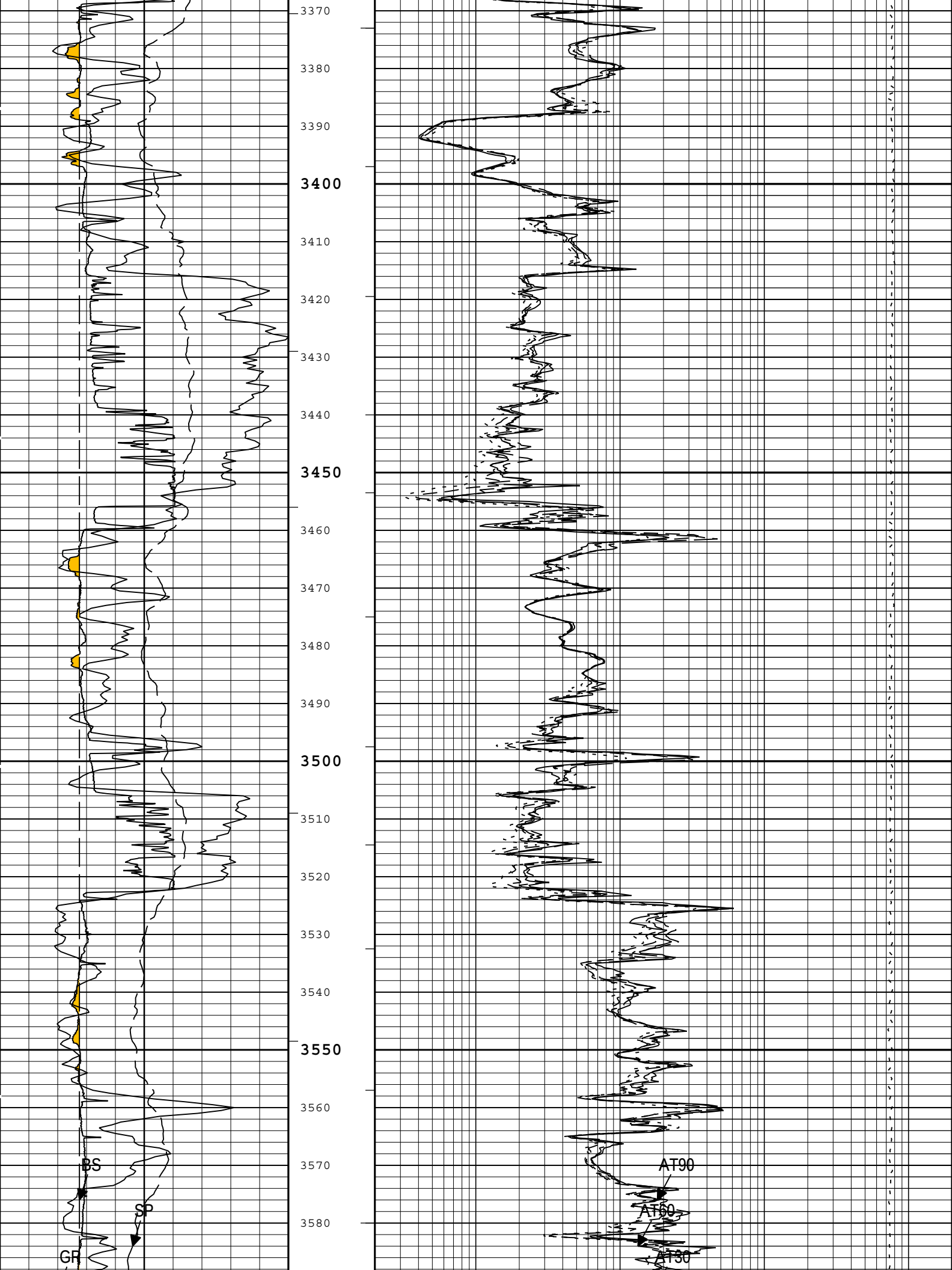
AT20
TENS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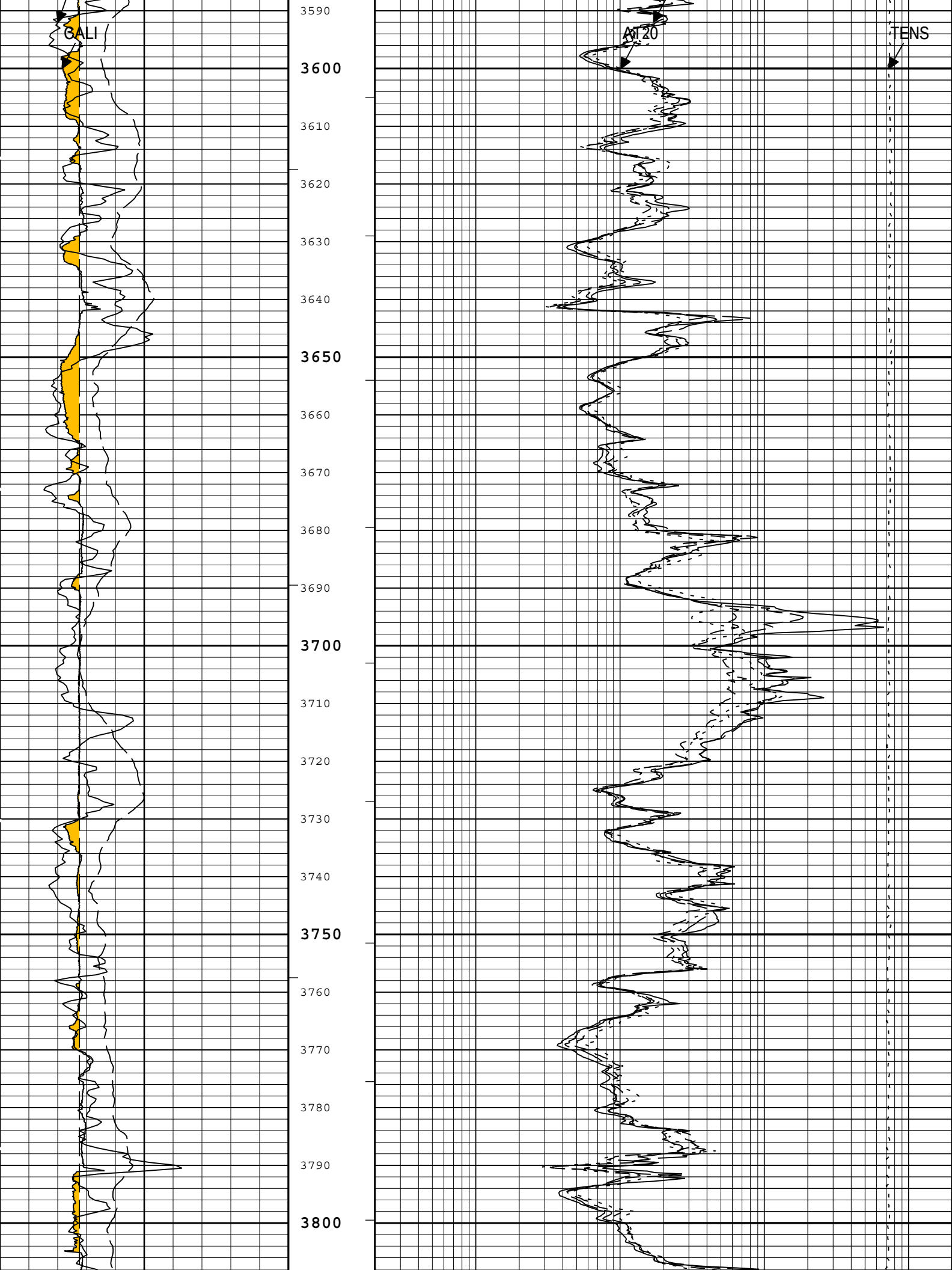
AT90
AT50
AT30


CALI
AT20
TENS
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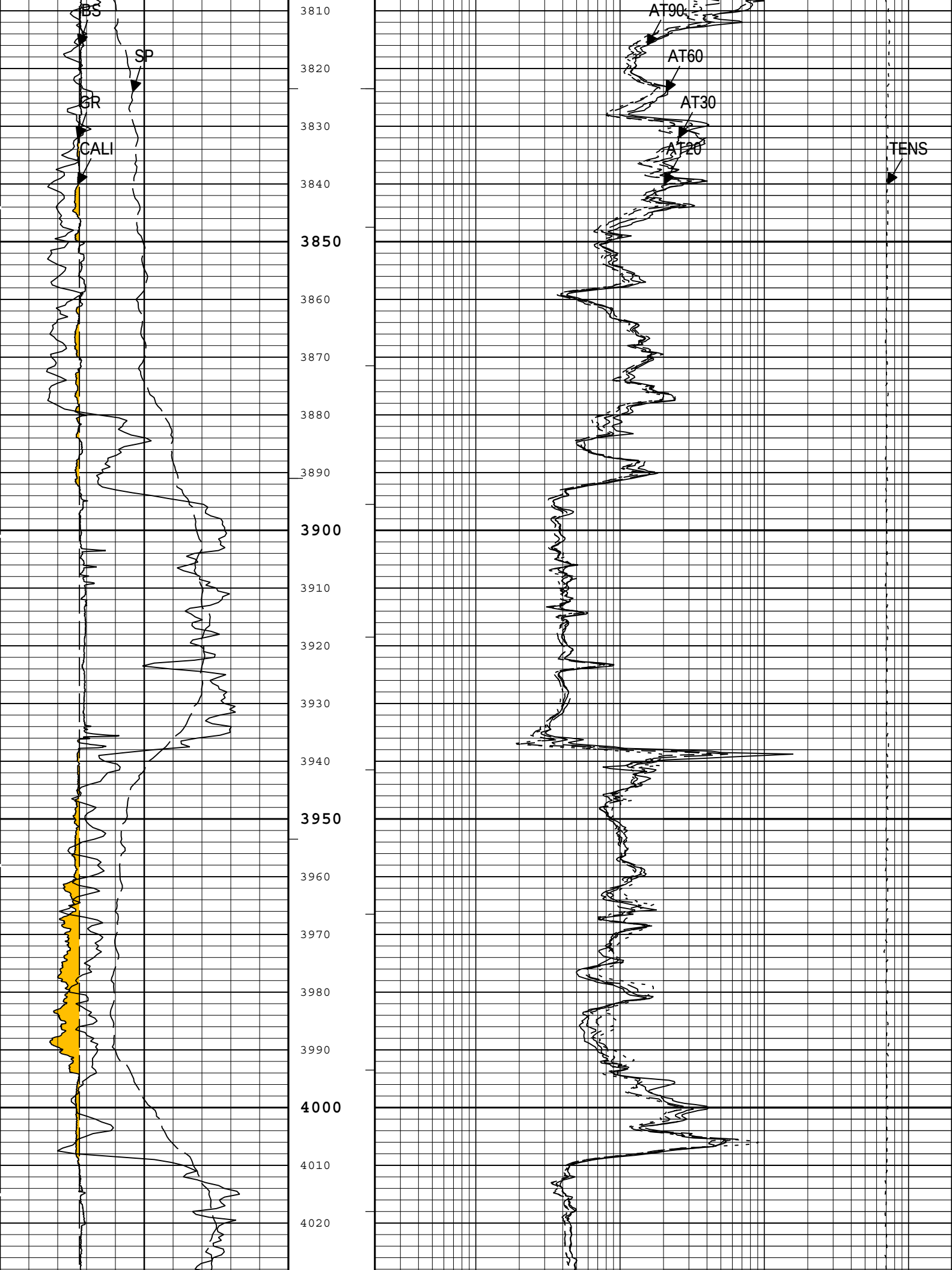
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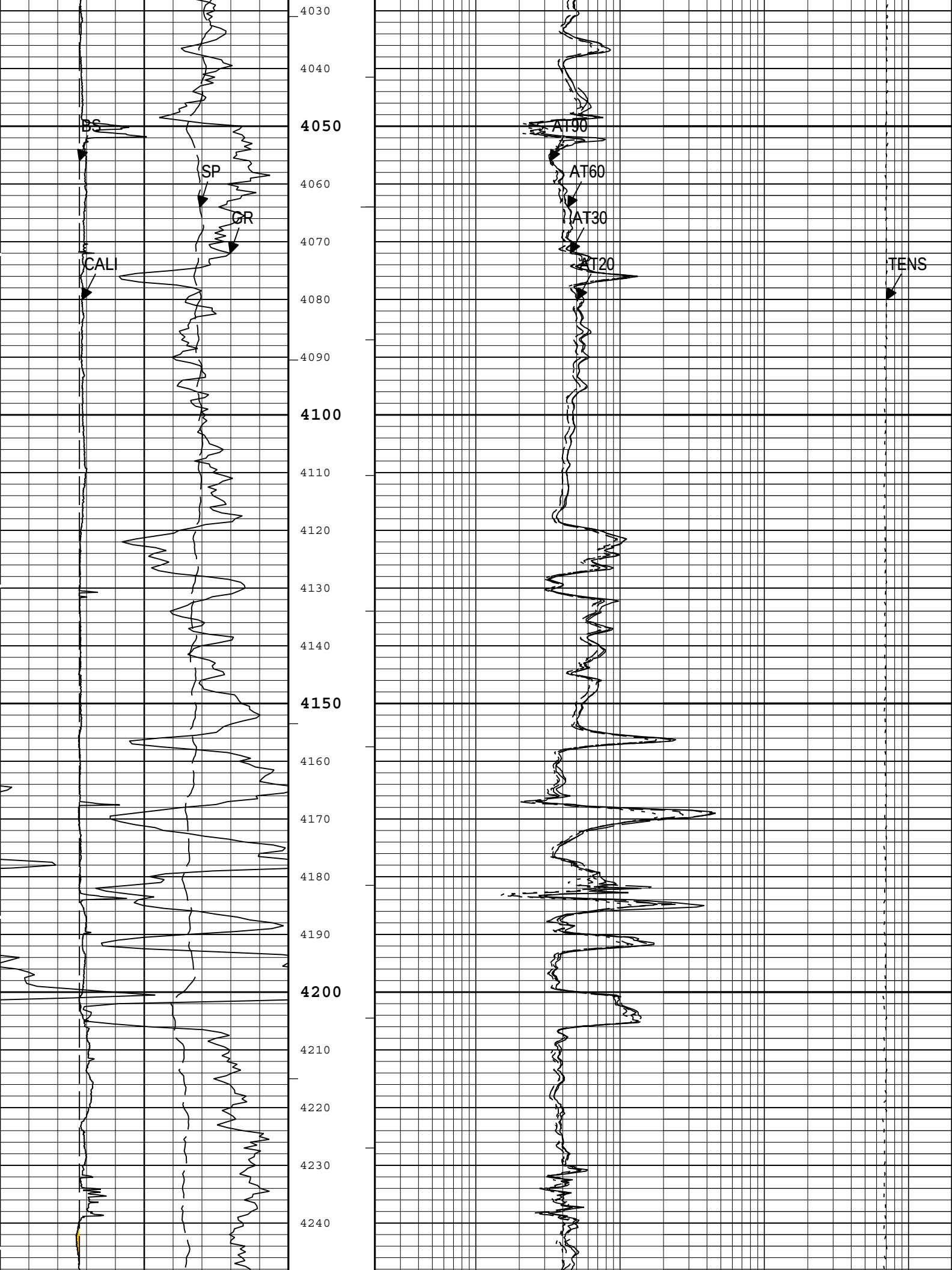
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4210
4220
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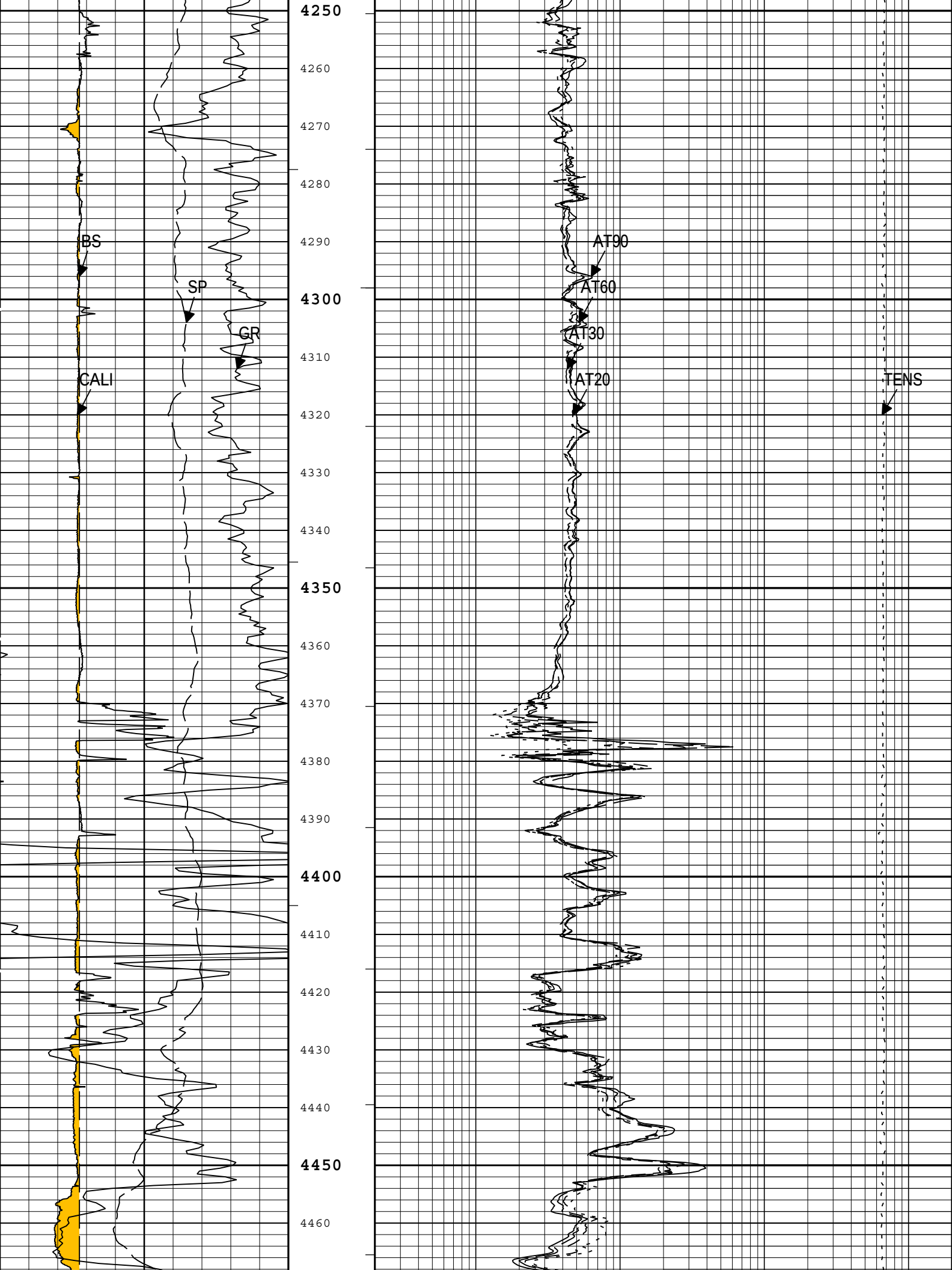
4240
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS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4400
4410
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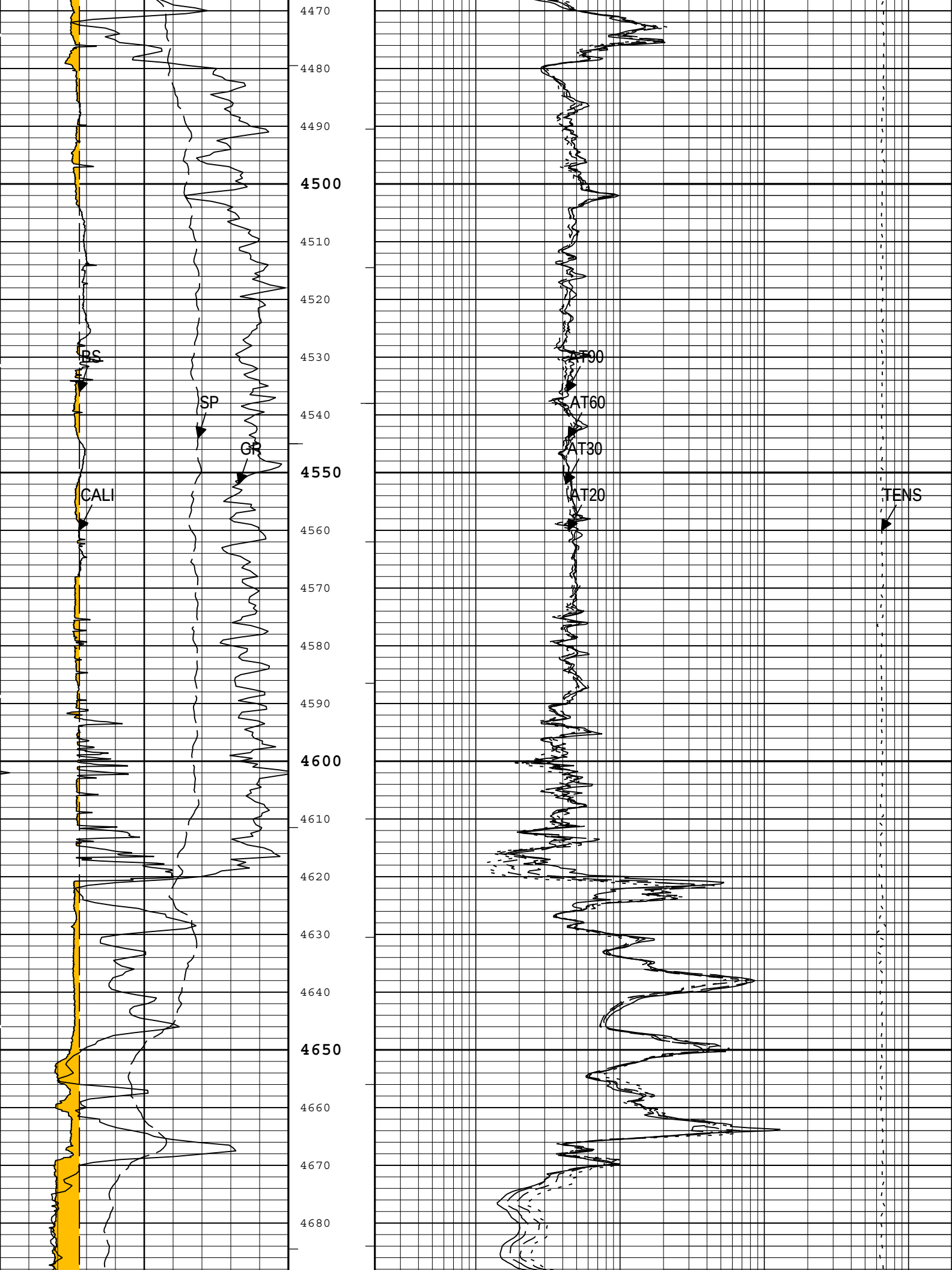
4440
4450
4460
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS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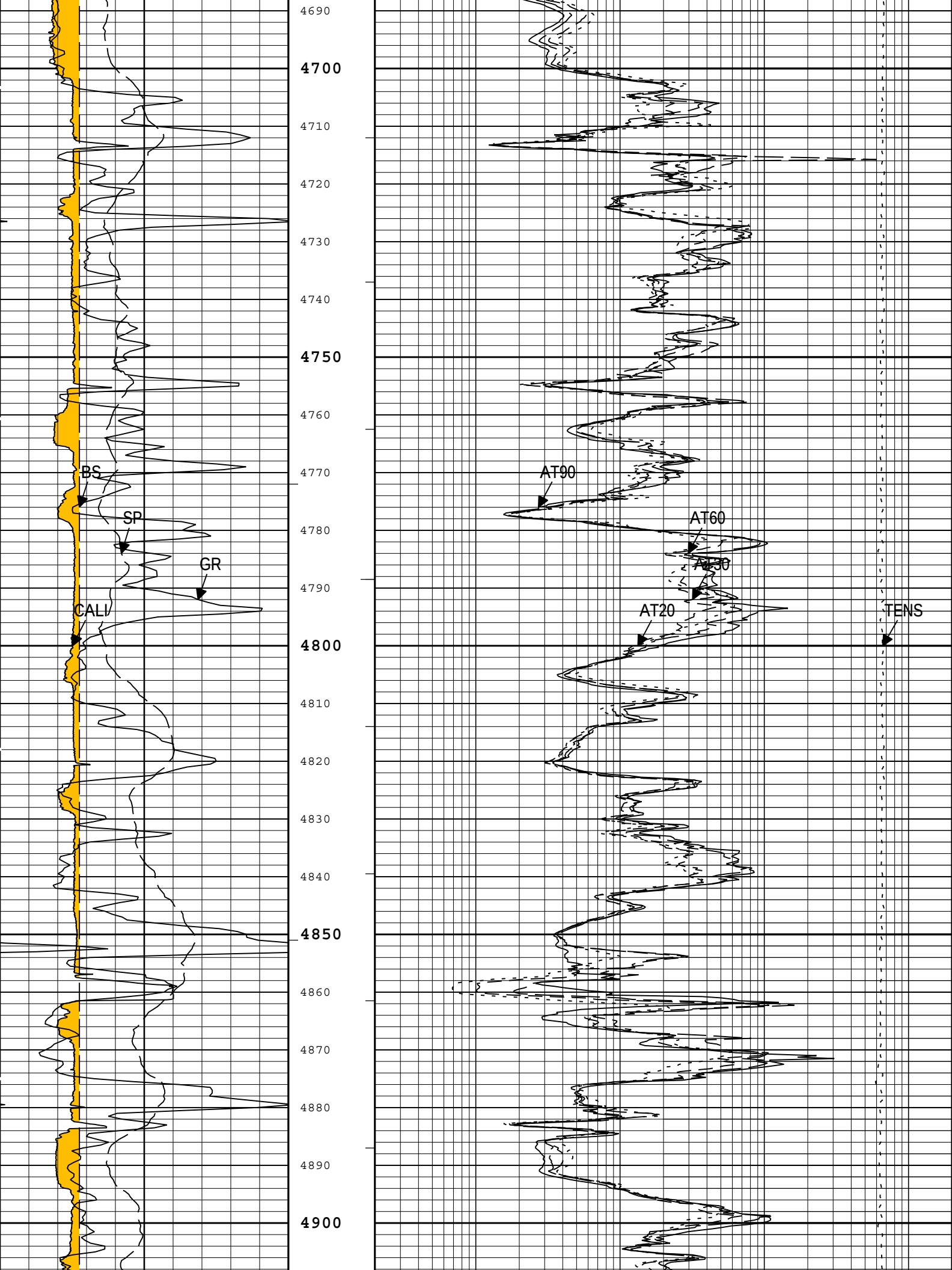
4630
4640
4650
4660
4670
4680
BS
SP
GR
CALI
AT90
AT60
AT30
AT20
TENS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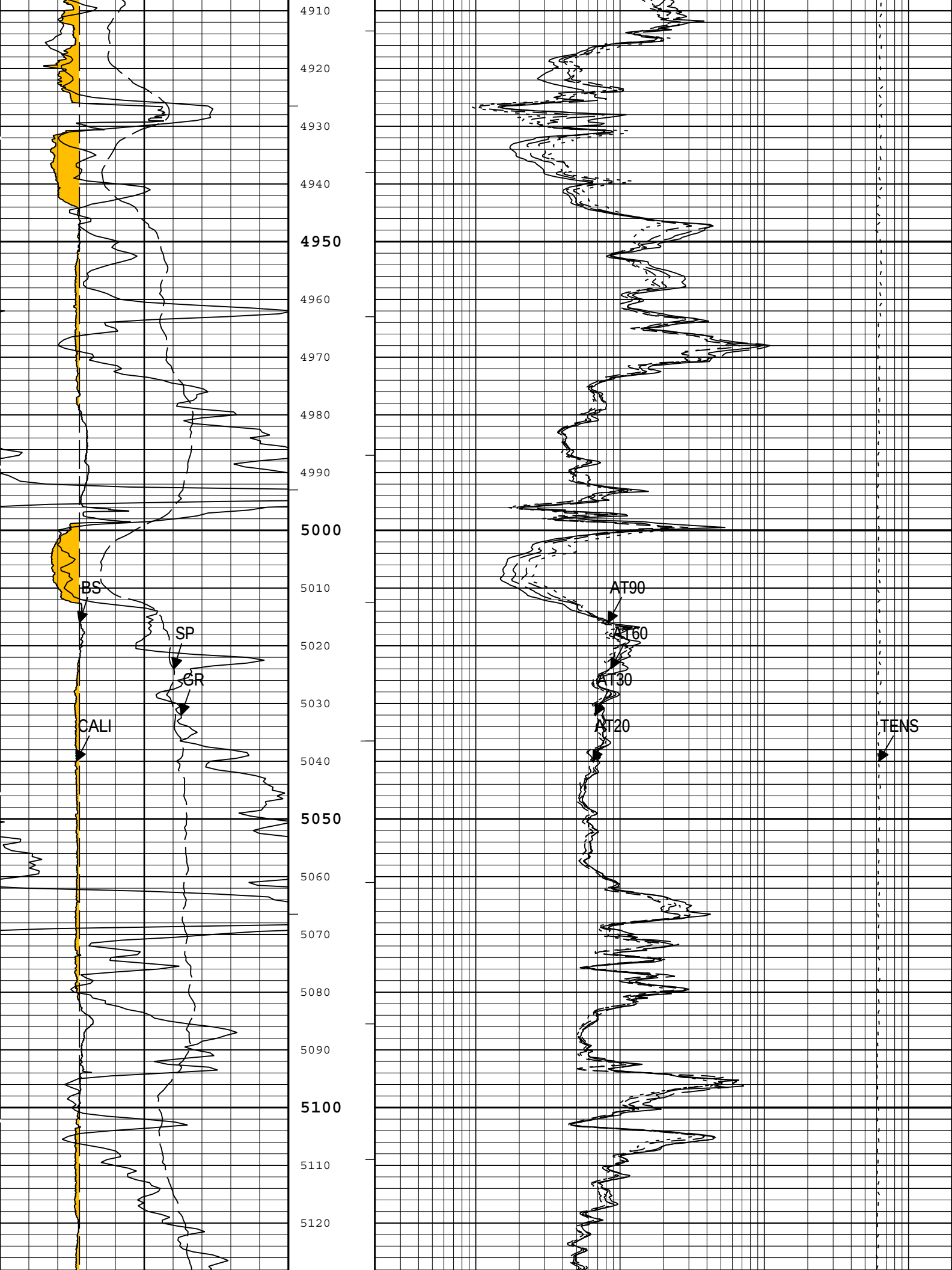
TENS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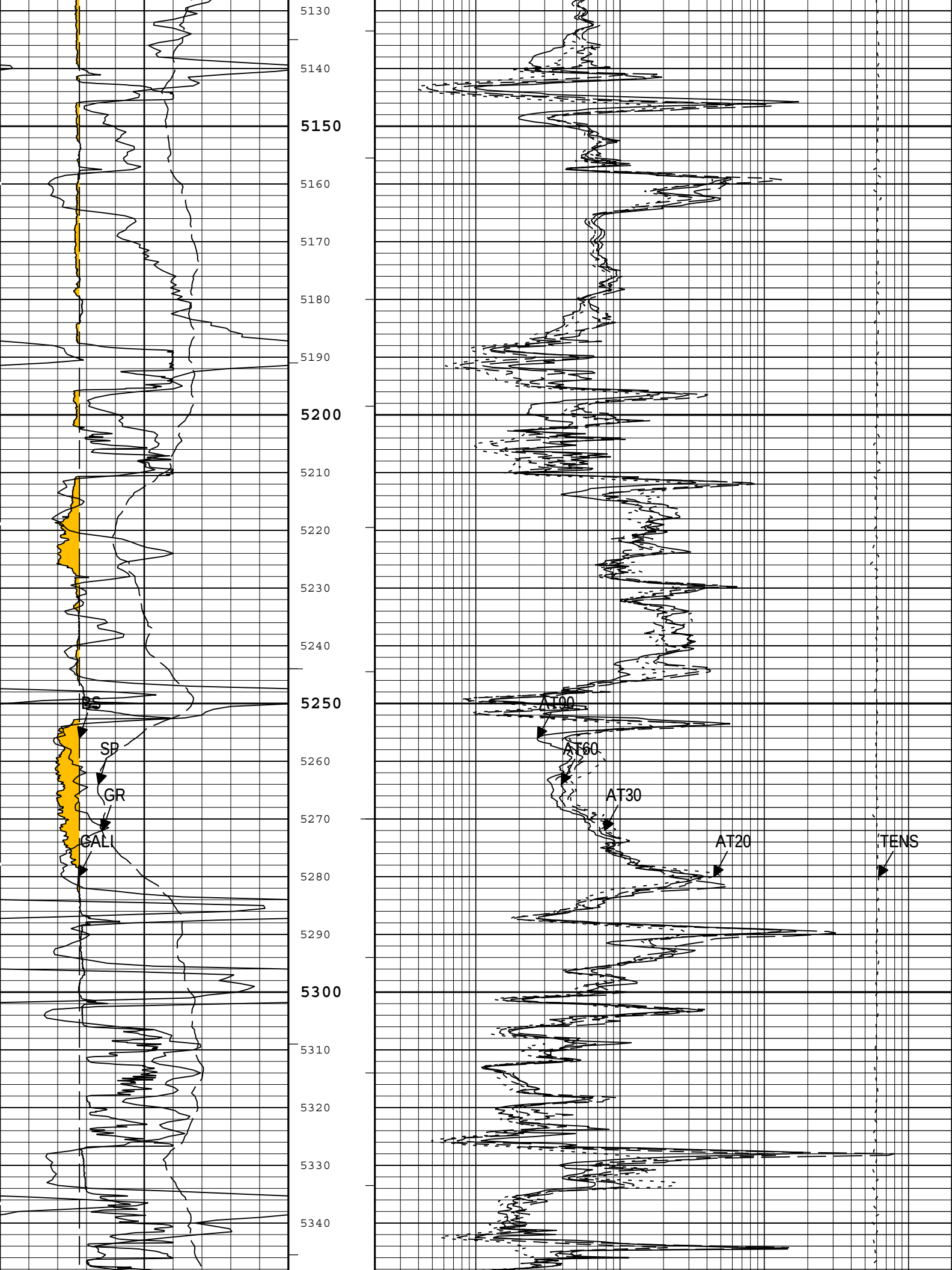
TENS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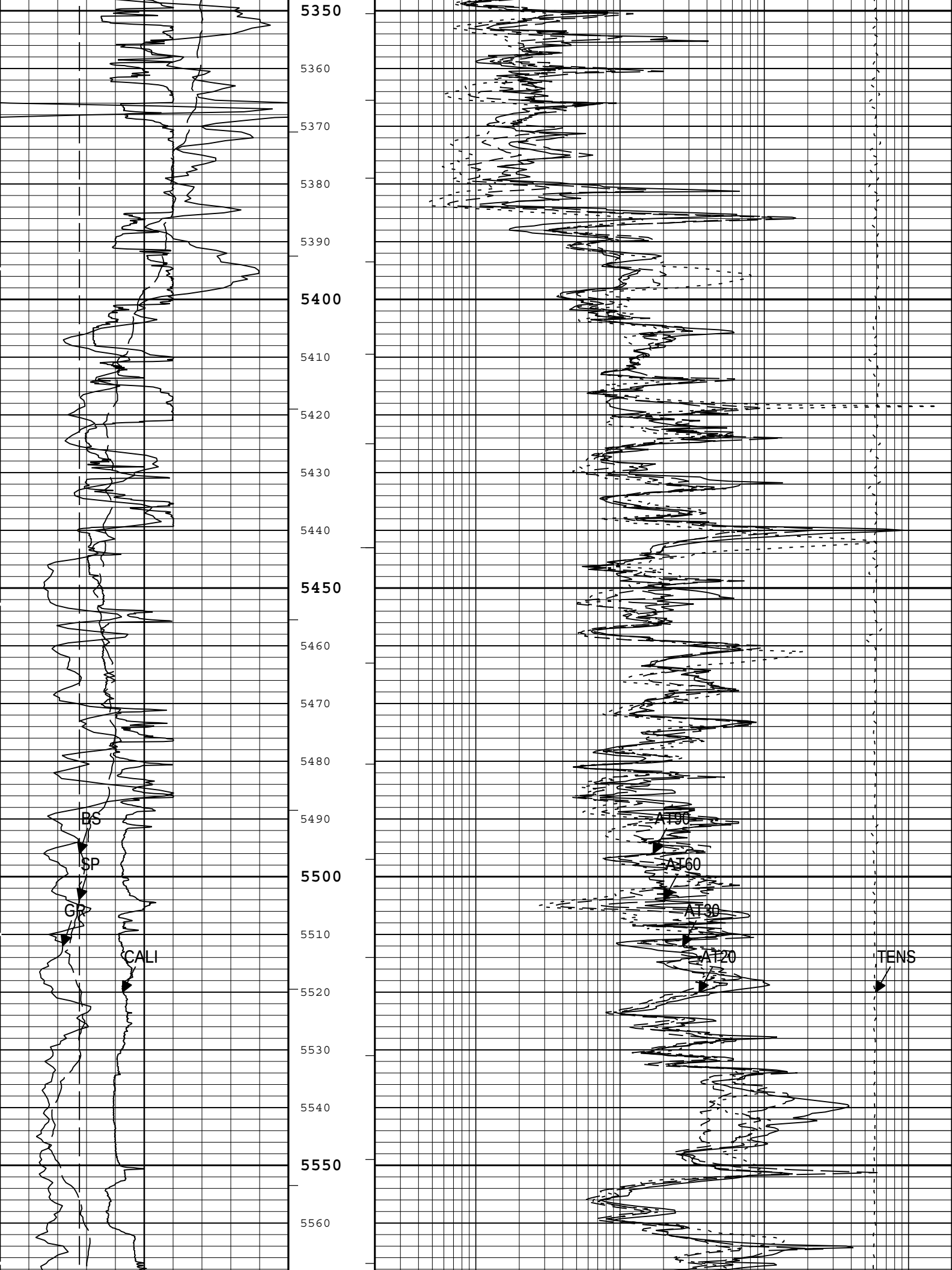
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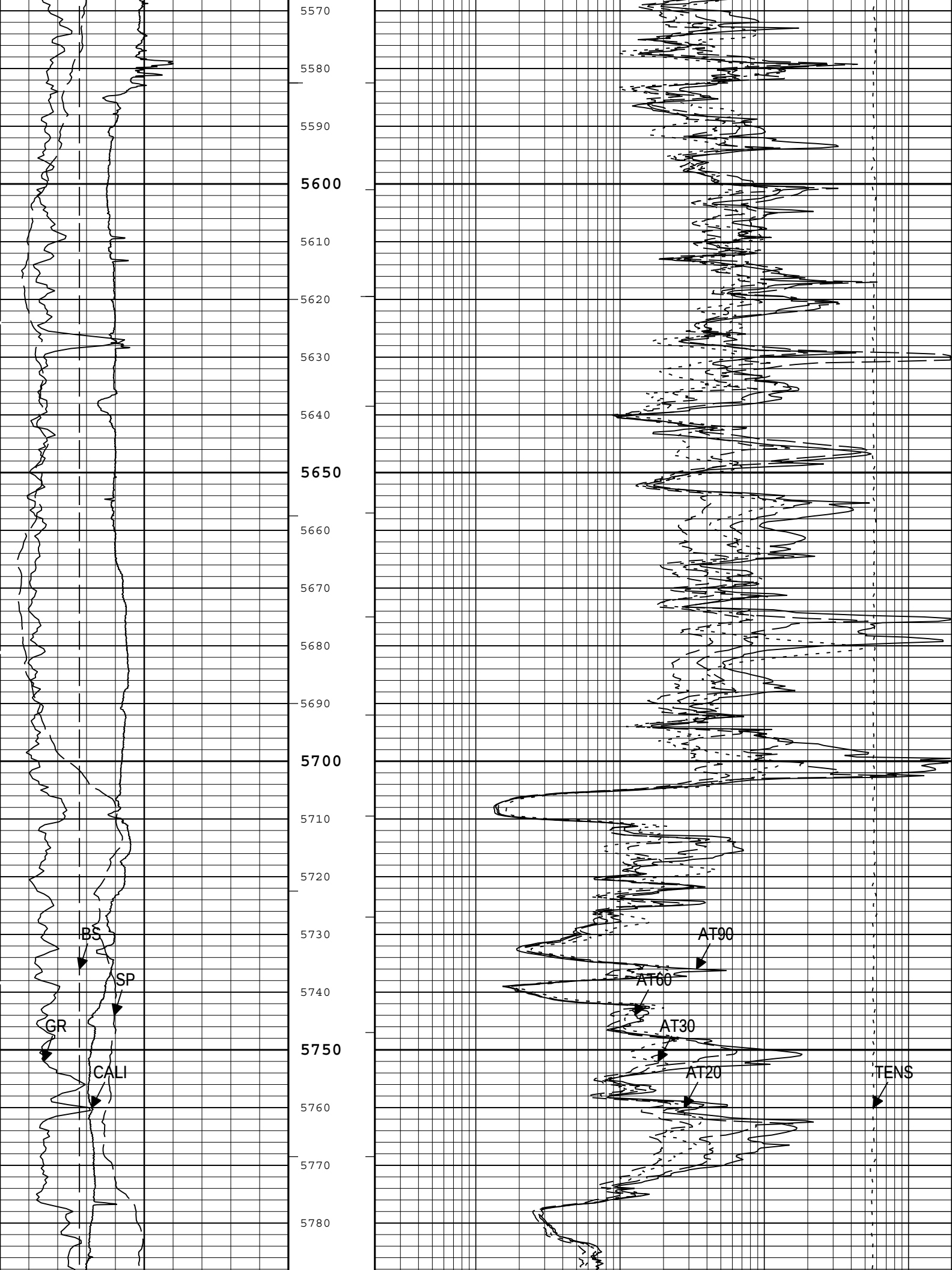
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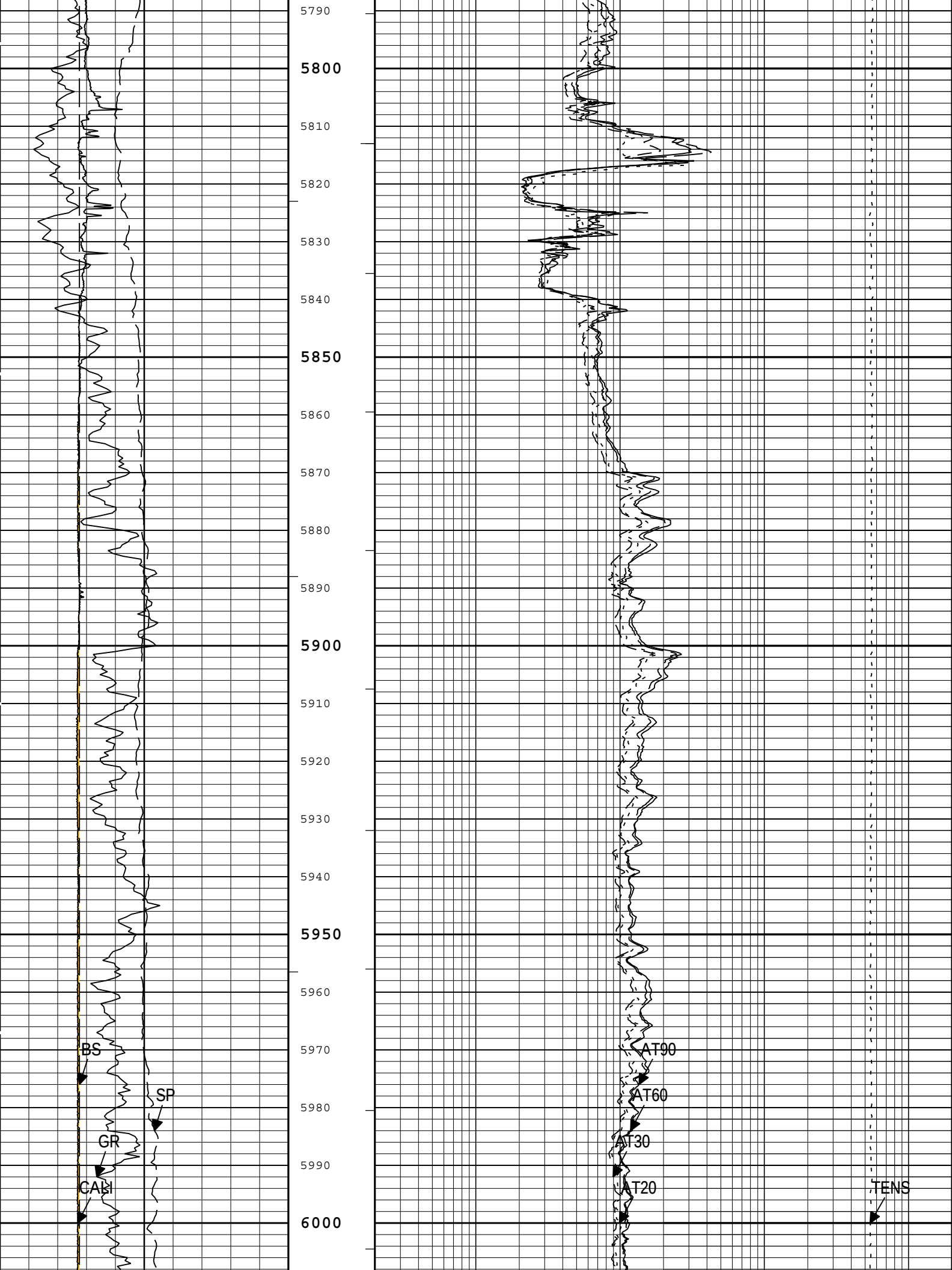
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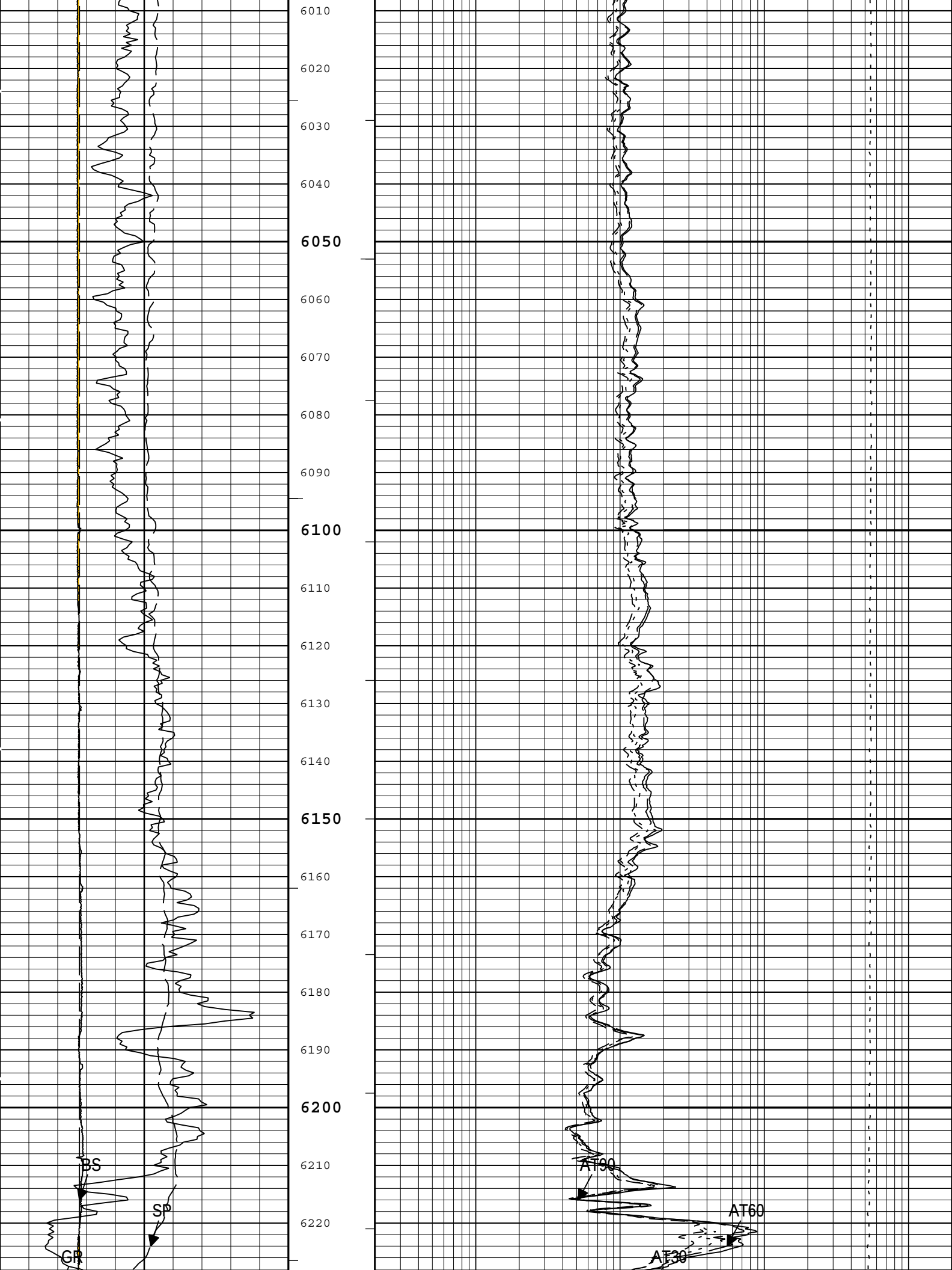
TENS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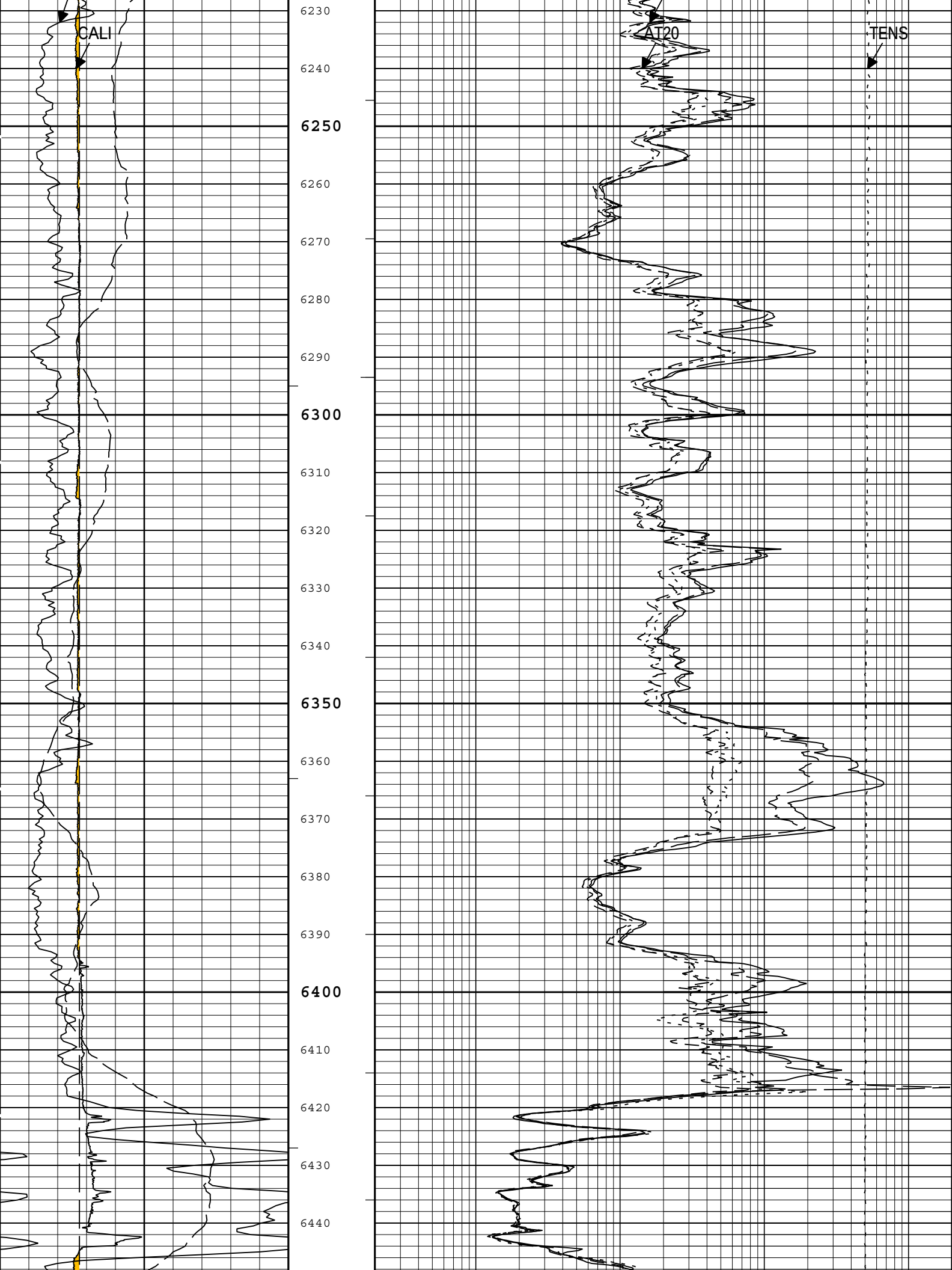
CALI
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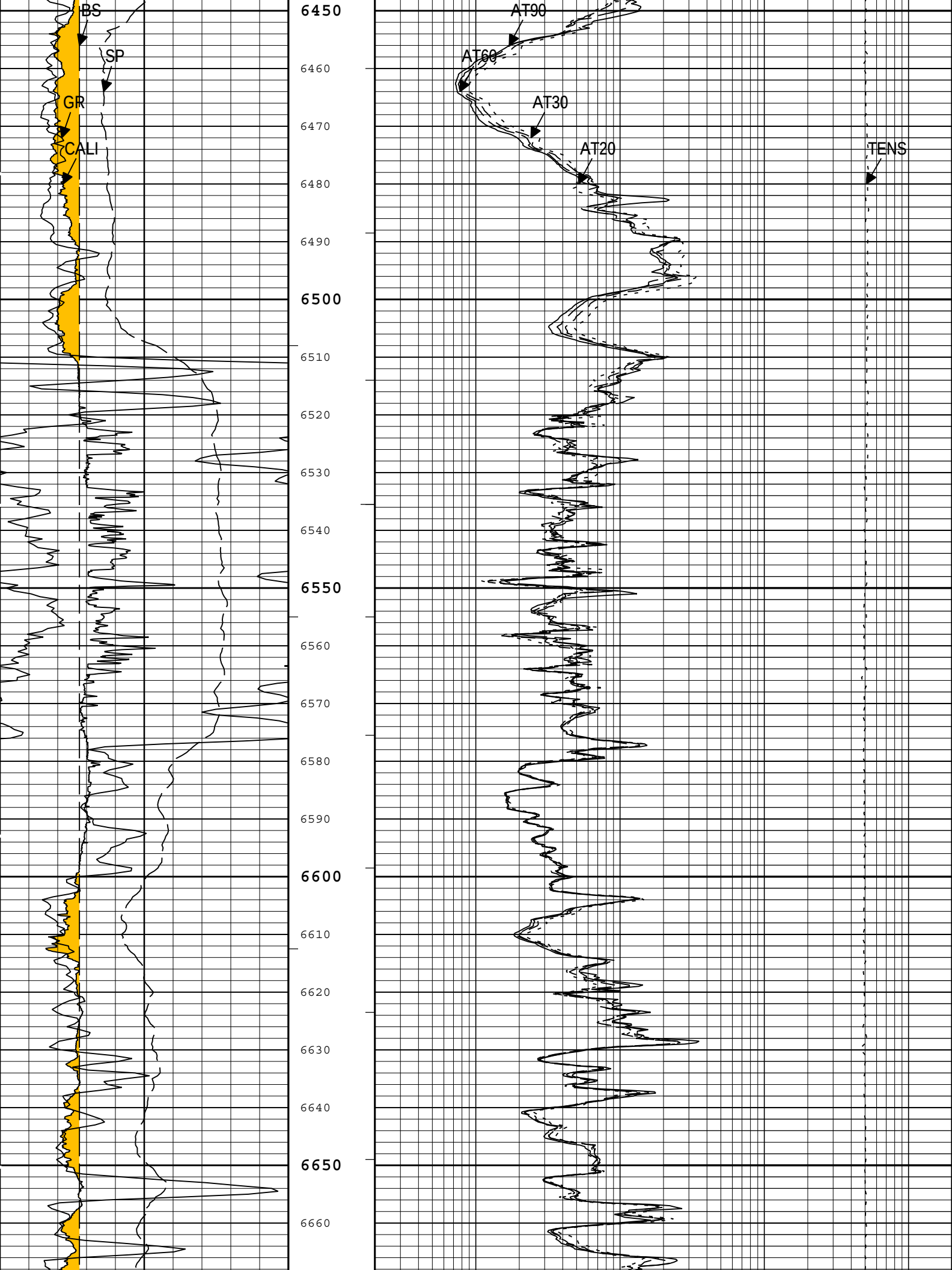
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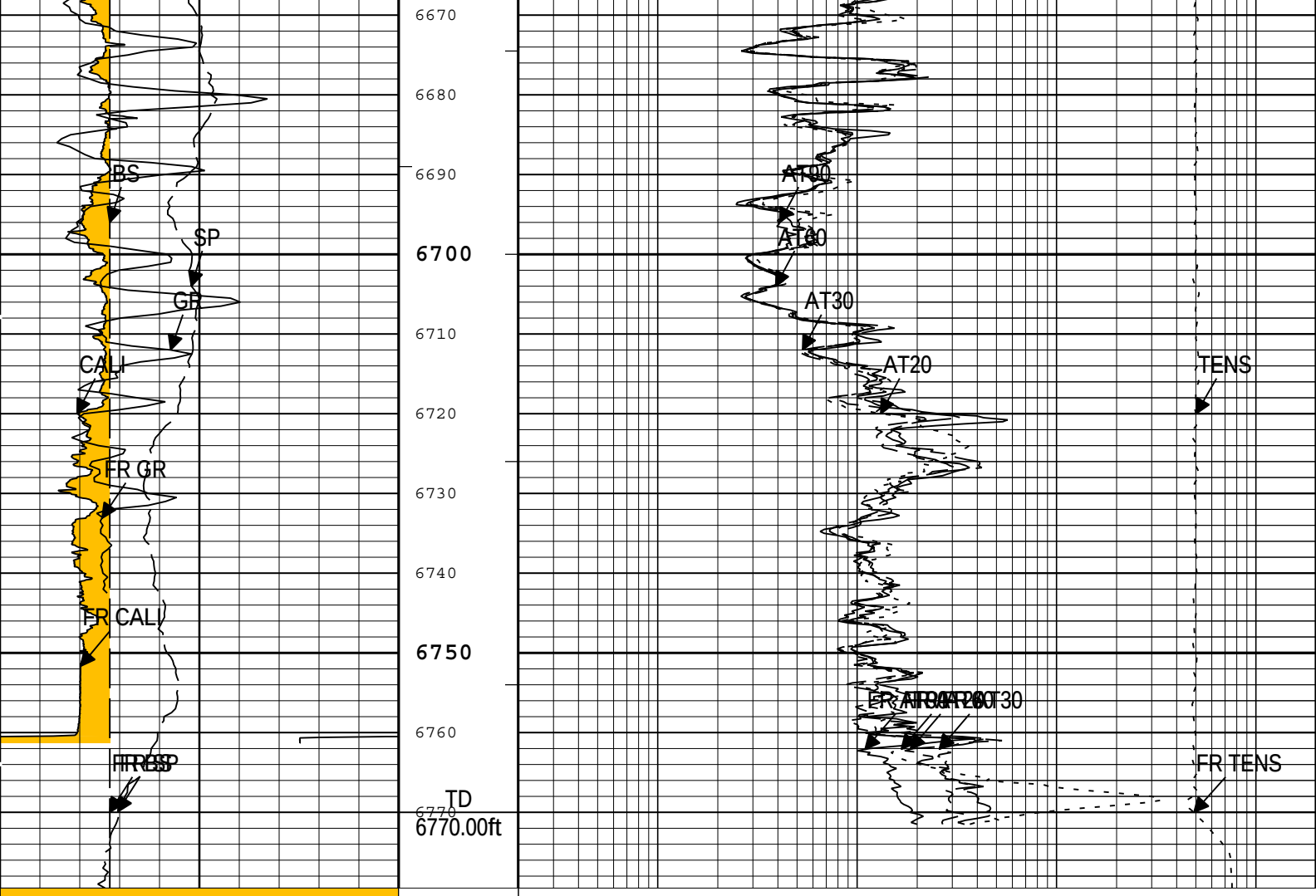


Mudcake

Caliper (CALI) HDRS-H

6	in	16

Gamma Ray (GR) HGNS-H

0	gAPI	150

Spontaneous Potential (SP) AIT-M

-80	mV	20

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)

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) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Jul-2012 13:34:35

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	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.125	in

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	in
CBLO	Casing Bottom (Logger)	COMPLETION	3021	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	9.2	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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	0	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	WLWorkflow	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	53.73	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	155.72	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[4]:Up	Up	6151.71 ft	6782.22 ft	20-Jul-2012 9:57:58 AM	20-Jul-2012 10:10:12 AM	2.02 ft	

All depths are referenced to toolstring zero

Log

ONE: Repeat[4]:Up 2ACAC1E2-4BA7-420F-ADDE-12A243E1C7F4

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: 20-Jul-2012 13:34:39

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)

TIME_1900 - Time Marked every 60.00 (s)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

Mudcake

Caliper (CALI) HDRS-H

6 in 16

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-80 mV 20

Bit Size (BS)

6 in 16

Cable Tension (TENS)

10000 lbf 0

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

0.2 ohm.m 2000

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

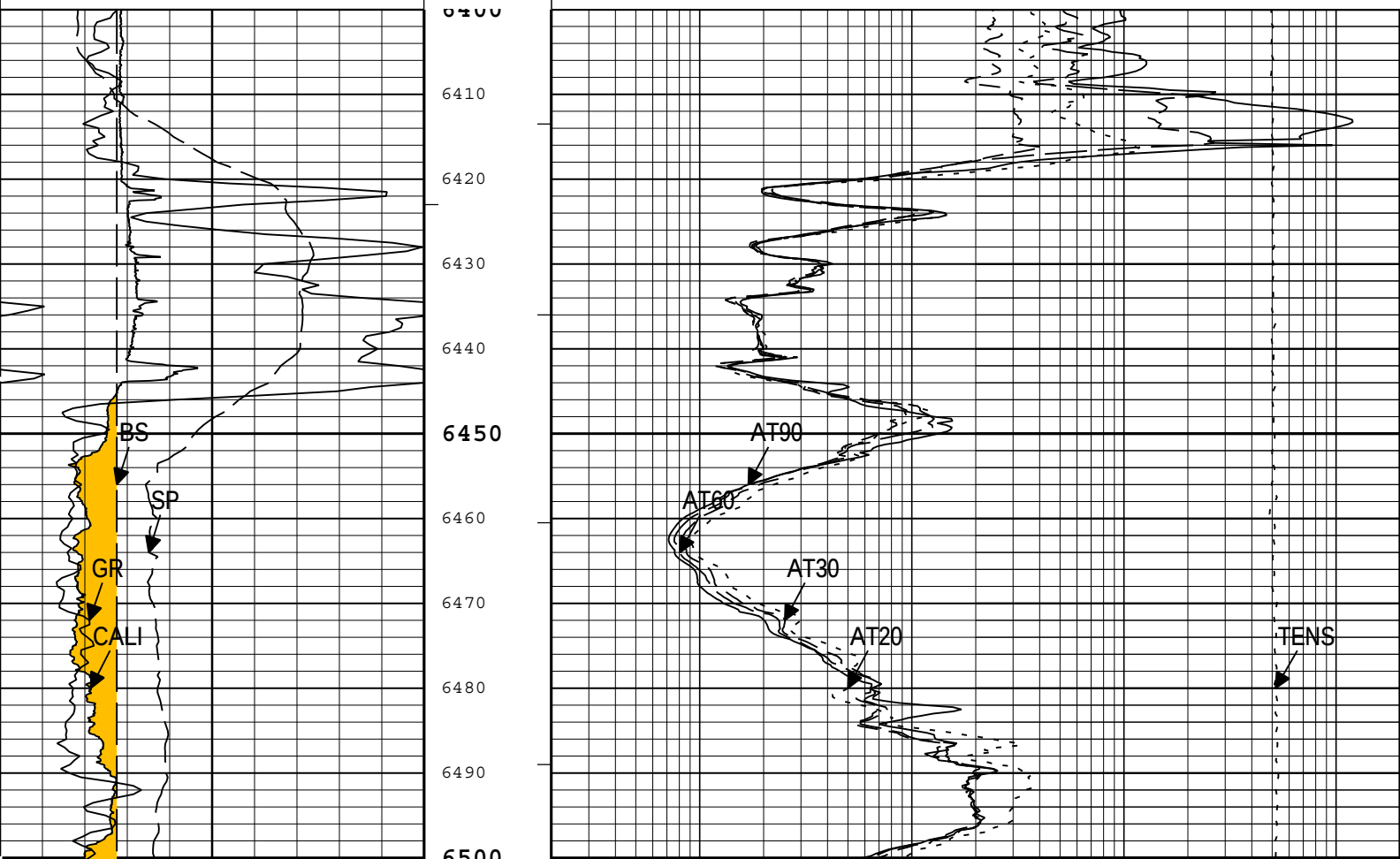
0.2 ohm.m 2000

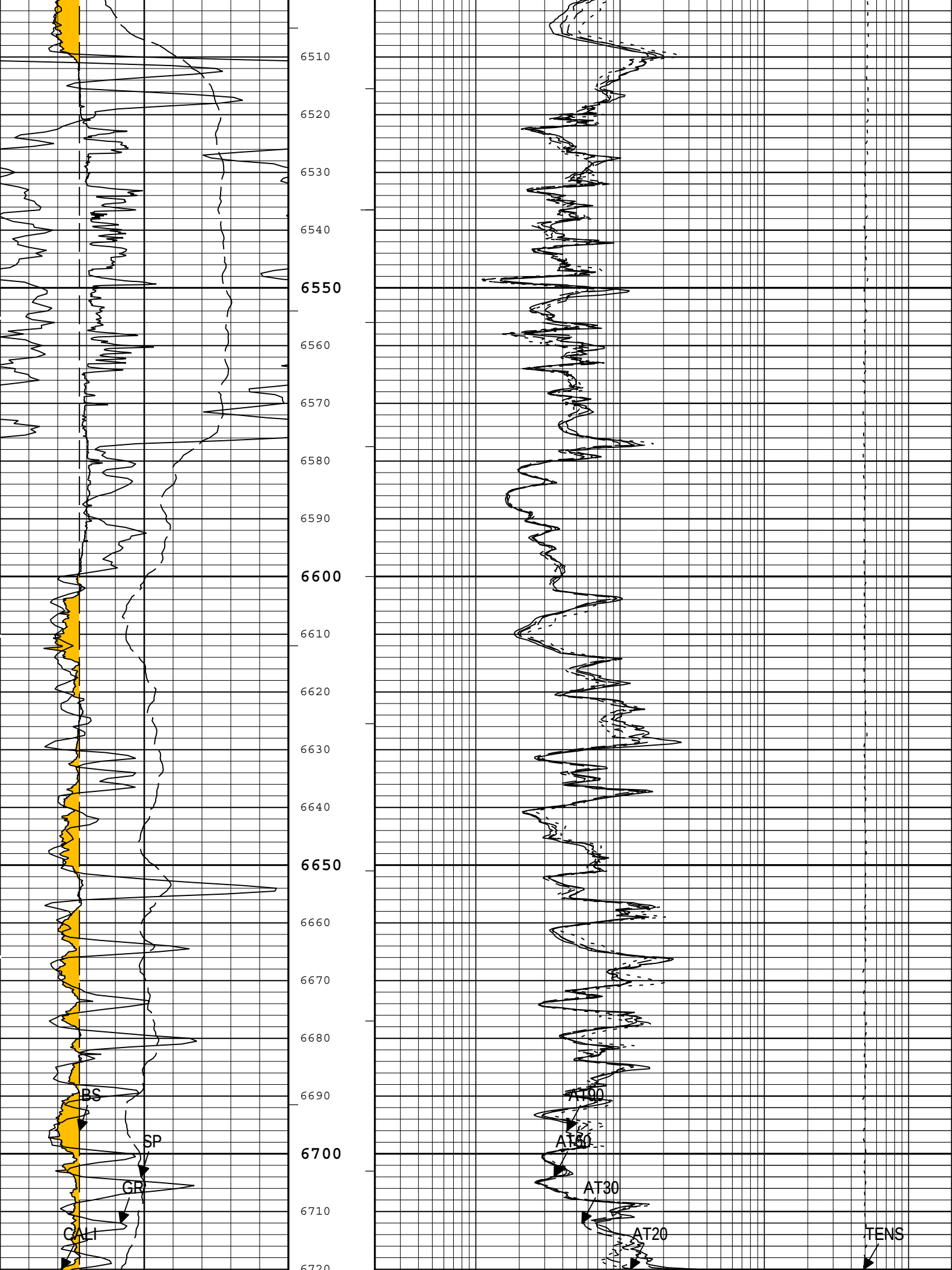
Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

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

0.2 ohm.m 2000

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6720
BS
SP
GR
CALI
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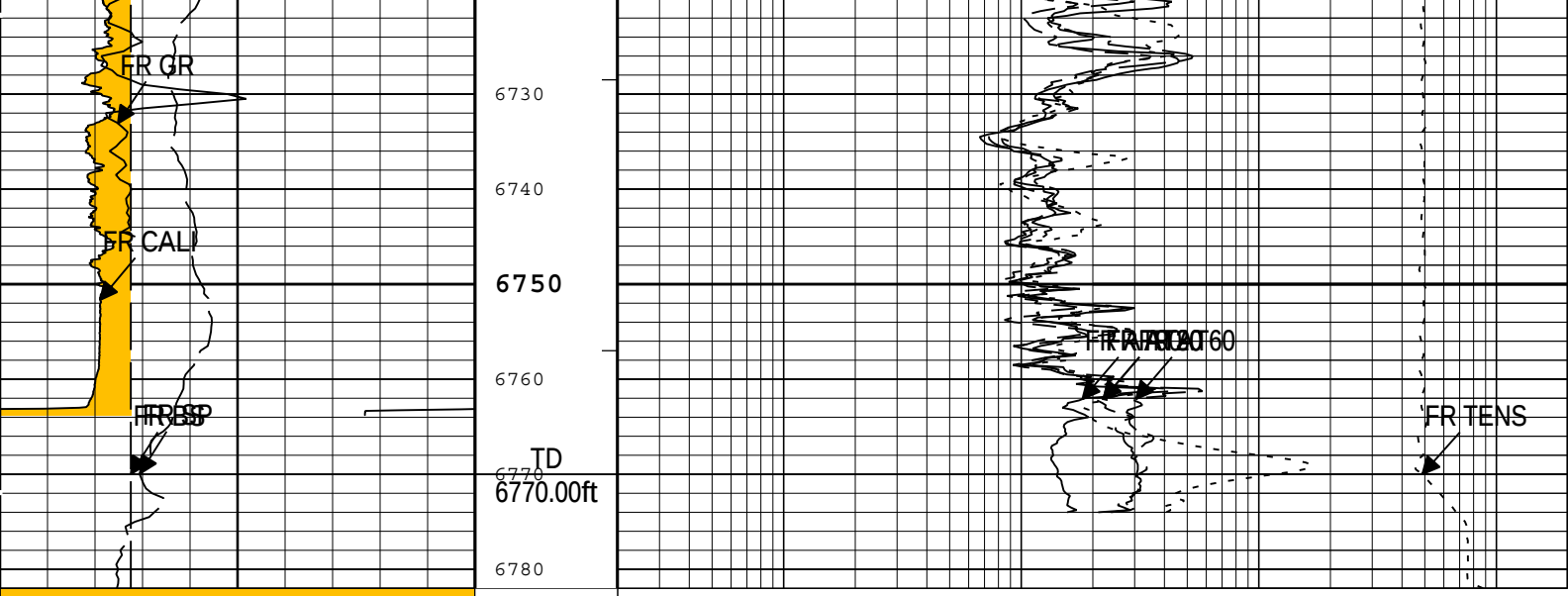
AT30
AT20
TENS



Mudcake

Caliper (CALI) HDRS-H
6 in 16

Gamma Ray (GR) HGNS-H
0 gAPI 150

Spontaneous Potential (SP) AIT-M
-80 mV 20

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)
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) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Jul-2012 13:34:39

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	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.125	in
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	in
CBLO	Casing Bottom (Logger)	COMPLETION	3021	ft
CDEN	Cement Density	HGNS-H:HGNS-H:HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.2	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	
GRSE	Generalized Mud Resistivity Selection, from Measured or	Borehole	AMF	

	Computed Mud Resistivity			
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	0	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	WLWorkflow	1800	ft/h

ONE

Repeat Analysis

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Repeat[4]:Up	Up	6151.71 ft	6782.22 ft	20-Jul-2012 9:57:58 AM	20-Jul-2012 10:10:12 AM	2.02 ft	
ONE	Main[5]:Up	Up	2921.22 ft	6779.70 ft	20-Jul-2012 10:18:12 AM	20-Jul-2012 11:30:49 AM	0.00 ft	

All depths are referenced to toolstring zero

Log

ONE: Main[5]:Up 0848A71E-31E5-4201-A295-69098F1E9101

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: 20-Jul-2012 13:34:40

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

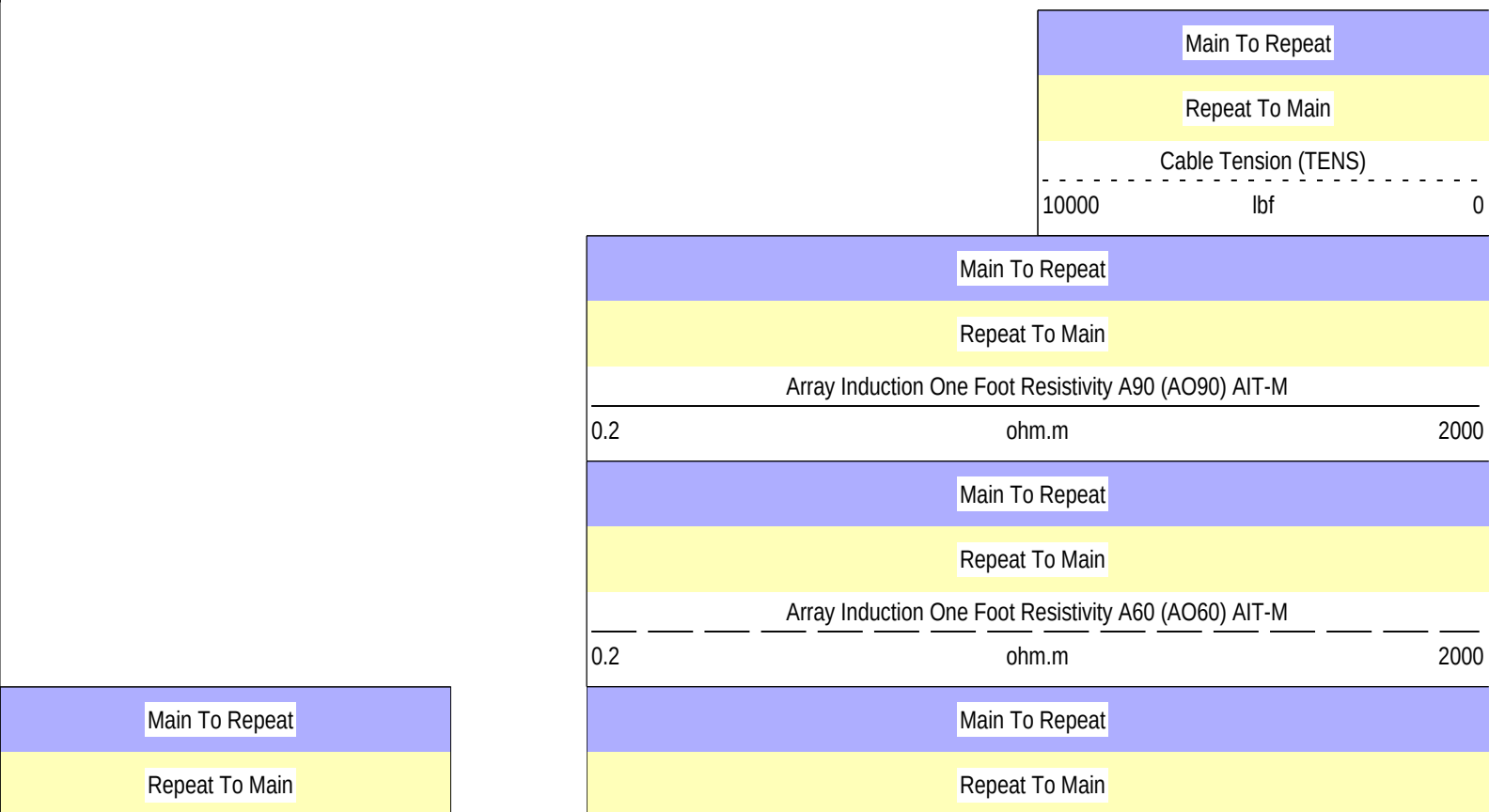
IHV - Integrated Hole Volume every 10.00 (ft3)

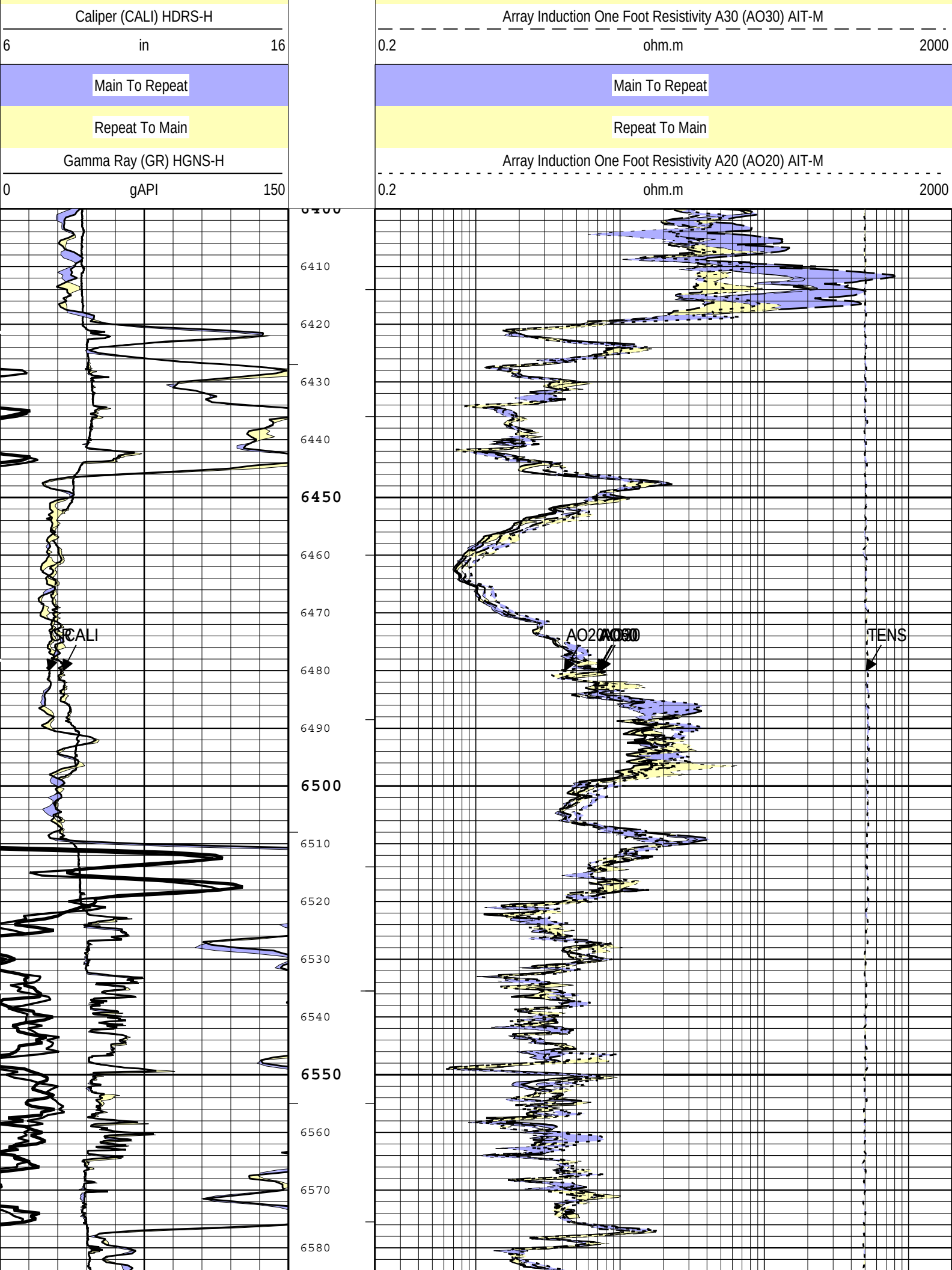
IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)




Caliper (CALI) HDRS-H
6
in
16
Main To Repeat
Repeat To Main
Gamma Ray (GR) HGNS-H
0
gAPI
150
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
6400
6410
6420
6430
6440
6450
6460
6470
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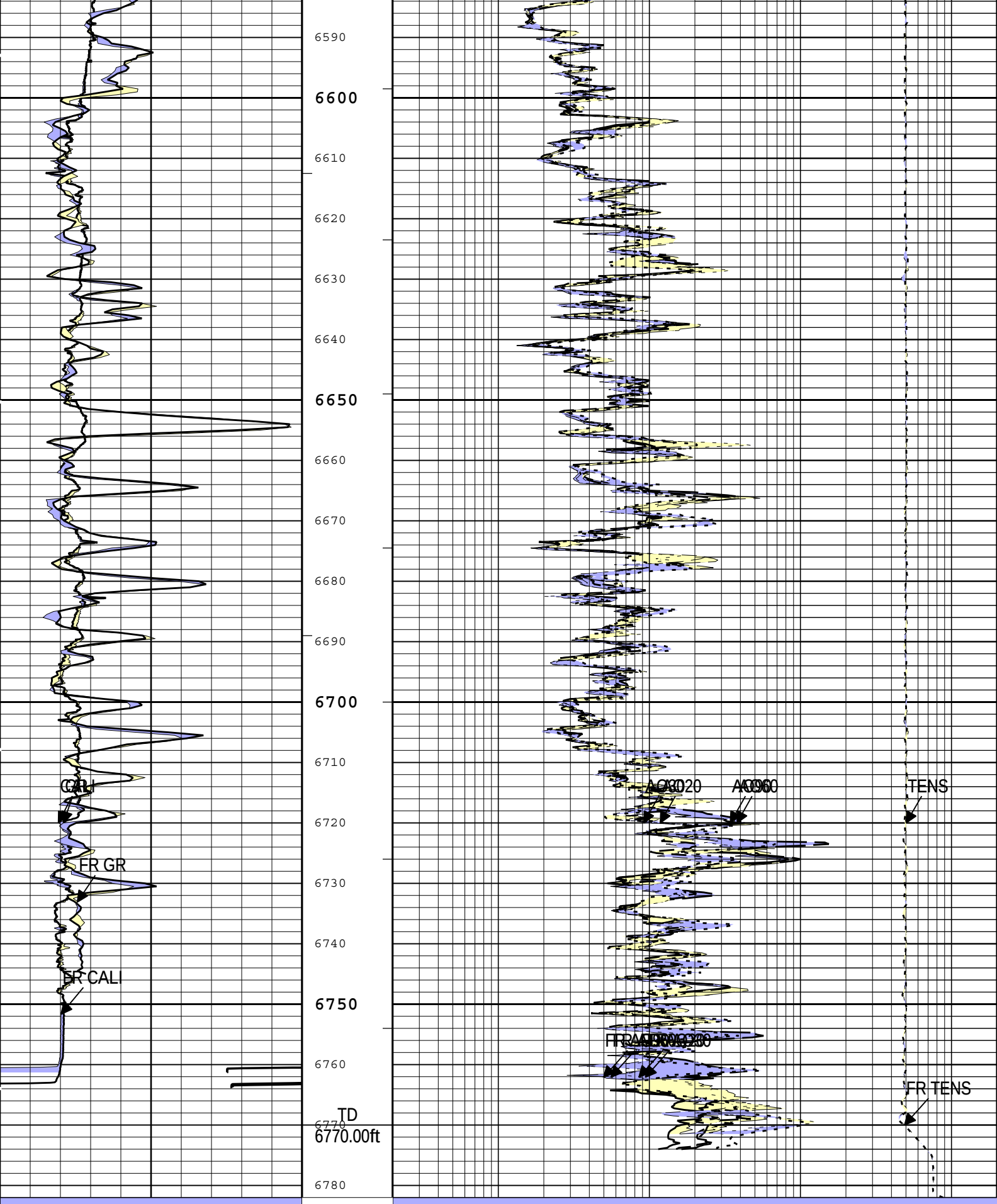
6580
GR
CALI
TENS



Main To Repeat

Repeat To Main

Caliper (CALI) HDRS-H

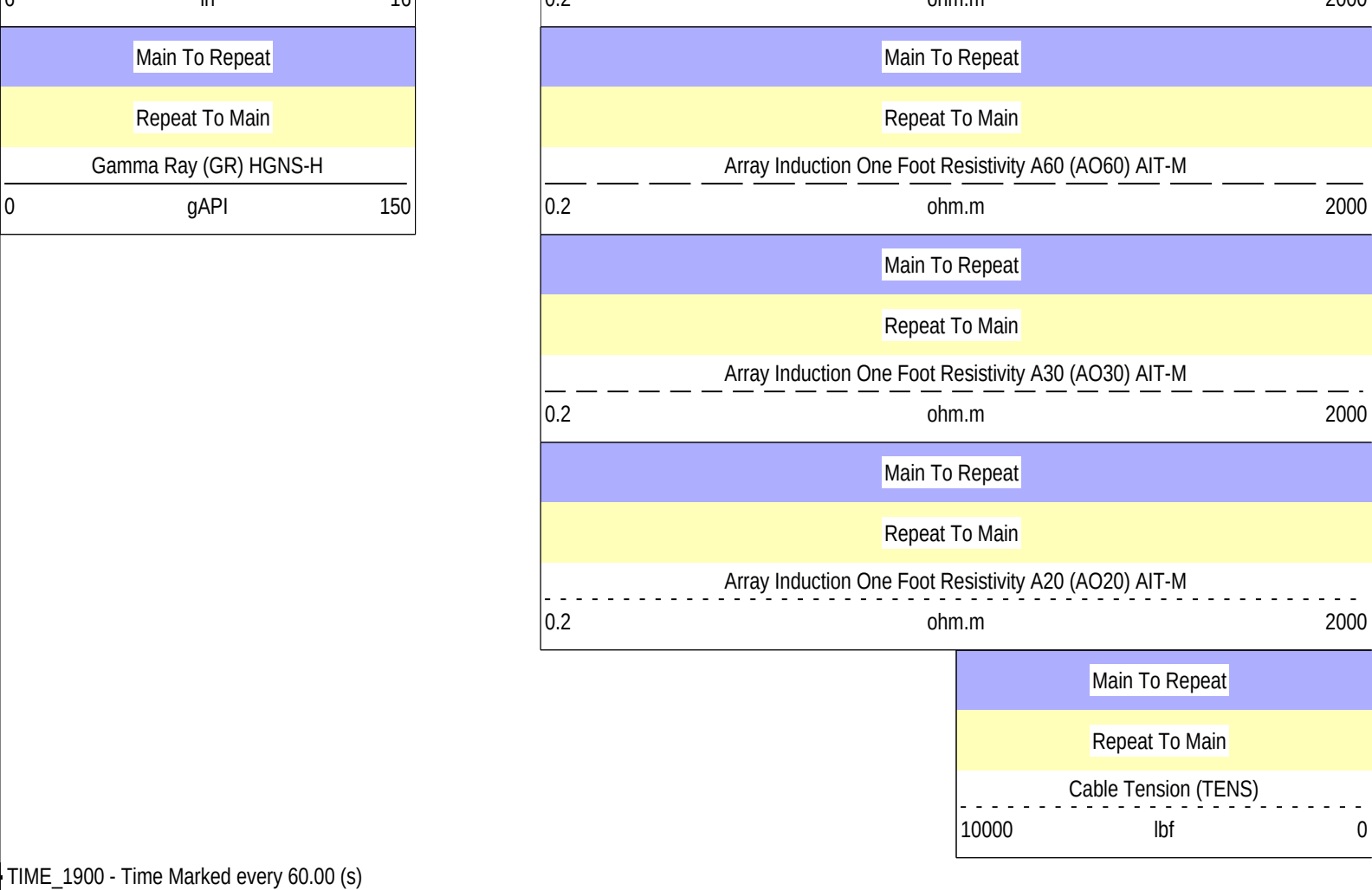
6 in 16

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000



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: 20-Jul-2012 13:34:40

Calibration Report

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

Primary Equipment :

Array Induction Sonde - M	AMIS	154

Auxiliary Equipment :

AITM Rm/SP Bottom Nose	AMRM	154

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 11:39:54 15-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.013	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.548	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.628	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.014	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	-0.022	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.009	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.128	3.000
Test Loop Gain - 4		Master	1.000	0.950	0.994	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.023	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.985	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.217	3.000
Test Loop Gain - 6		Master	1.000	0.950	0.995	1.050

Test Loop Phase - 6	deg	Master	0	-3.000	0.188	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.009	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	-0.113	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 11:39:54 15-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-103.946	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-92.173	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	151.063	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	160.241	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	104.135	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-60.037	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	58.490	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	80.576	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	24.786	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	53.297	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	13.054	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-24.618	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.846	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	0.063	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-2.056	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	0.084	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 11:39:54 15-May-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Coarse Gain		Master	1.000	0.800	1.078	1.200
Fine Gain		Master	1.000	0.800	1.078	1.200

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 11:39:54 15-May-2012 Before (Measured): 09:45:34 19-Jul-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.598	0.854
		Before	-----	0.366	0.598	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-169.765	-103.000
		Before	-----	137.000	-165.904	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	3.861	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.224	1.778
		Before	-----	0.762	1.224	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-170.840	-104.000
		Before	-----	136.000	-166.980	-104.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	3.860	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.607	0.868
		Before	-----	0.372	0.608	0.868
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	-174.377	-108.000
		Before	-----	132.000	-170.520	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	3.857	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 3	V	Master	-----	0.420	0.685	0.980
		Before	-----	0.420	0.685	0.980
		After	-----	-----	-----	-----
		Before-Master	-----	-----	0.000	-----
		After-Before	-----	-----	-----	-----

Thru Cal Phase - 3	deg	Master	-----	131.000	-175.133	-109.000	
		Before	-----	131.000	-171.275	-109.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	3.858	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Mag - 4	V	Master	-----	0.804	1.282	1.876	
		Before	-----	0.804	1.282	1.876	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.000	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 4	deg	Master	-----	125.000	178.757	-115.000	
		Before	-----	125.000	-177.391	-115.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-356.148	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Mag - 5	V	Master	-----	1.176	1.866	2.744	
		Before	-----	1.176	1.867	2.744	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.001	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 5	deg	Master	-----	122.000	177.157	-118.000	
		Before	-----	122.000	-178.994	-118.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-356.151	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Mag - 6	V	Master	-----	1.176	1.868	2.744	
		Before	-----	1.176	1.868	2.744	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.000	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 6	deg	Master	-----	121.000	177.140	-119.000	
		Before	-----	121.000	-179.011	-119.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-356.151	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Mag - 7	V	Master	-----	0.846	1.342	1.974	
		Before	-----	0.846	1.342	1.974	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.000	-----	
		After-Before	-----	-----	-----	-----	
Thru Cal Phase - 7	deg	Master	-----	115.000	176.433	-125.000	
		Before	-----	115.000	-179.738	-125.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-356.171	-----	
		After-Before	-----	-----	-----	-----	
SPA Zero	mV	Master	-----	-50.000	-0.420	50.000	
		Before	-----	-50.000	-0.426	50.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.006	-----	
		After-Before	-----	-----	-----	-----	
SPA Plus	mV	Master	-----	941.000	991.385	1040.000	
		Before	-----	941.000	991.475	1040.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	0.090	-----	
		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	0.918	0.960	
		Before	-----	0.870	0.918	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	4709
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	4700

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	26832
HRDD Long Spacing Detector	Long Spacing	28548
HRDD Short Spacing Detector	Short Spacing	27727
Cesium 137 Gamma-Ray Logging Source	GSR-J	5347
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	4709
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3964

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): 09:45:37 19-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.08	10.00
Large Ring	in	Before	12.00	9.00	12.24	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 22:41:48 03-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.592	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.693	1.696
Pe Aluminum		Master	2.570	2.470	2.559	2.670
Pe Magnesium		Master	2.650	2.550	2.602	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 22:41:48 03-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.3308	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.7154	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.8226	1.0000
SS Max Deviation	%	Master	0	-2.5000	1.8450	2.5000
LS Average Deviation	%	Master	0	-1.5000	1.2011	1.5000
LS Max Deviation	%	Master	0	-3.5000	2.9927	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 22:41:48 03-Jul-2012 Before (Measured): 09:46:43 19-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000	-----	0.7403	-----
		Before	0.7403	0.7033	0.7398	0.7773
		Before-Master	-----	-----	-0.0005	-----
BS Window Sum	1/s	Master	1	-----	24930	-----
		Before	24930	23683	24889	26176
		Before-Master	-----	-----	-41	-----
SS Window Ratio		Master	1.0000	-----	0.4795	-----
		Before	0.4795	0.4555	0.4783	0.5035
		Before-Master	-----	-----	-0.0012	-----
SS Window Sum	1/s	Master	1	-----	10822	-----
		Before	10822	10281	10817	11364
		Before-Master	-----	-----	-5	-----
LS Window Ratio		Master	1.0000	-----	0.3003	-----
		Before	0.3003	0.2853	0.3022	0.3153
		Before-Master	-----	-----	0.0019	-----
LS Window Sum	1/s	Master	1	-----	1346	-----
		Before	1346	1278	1339	1413
		Before-Master	-----	-----	-7	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 22:41:48 03-Jul-2012 Before (Measured): 09:46:43 19-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master	-----	1000	1265	2400

		Before	-----	1000	1285	2400
		Before-Master	-----	-100	20	100
SS PM High Voltage	V	Master	-----	1000	1646	2400
		Before	-----	1000	1645	2400
		Before-Master	-----	-100	-1	100
LS PM High Voltage	V	Master	-----	1000	1523	2400
		Before	-----	1000	1542	2400
		Before-Master	-----	-100	19	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 22:41:48 03-Jul-2012 Before (Measured): 09:46:43 19-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master	-----	5.00	10.42	25.00
		Before	-----	5.00	10.53	25.00
		Before-Master	-----	-1.00	0.11	1.00
SS Crystal Resolution	%	Master	-----	5.00	10.61	20.00
		Before	-----	5.00	10.69	20.00
		Before-Master	-----	-1.00	0.08	1.00
LS Crystal Resolution	%	Master	-----	5.00	9.69	20.00
		Before	-----	5.00	9.89	20.00
		Before-Master	-----	-1.00	0.20	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 09:46:59 19-Jul-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	3808	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3826	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)	165

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 19:35:55 19-Jul-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): 09:28:00 17-Jul-2012 Before (Measured): 09:44:04 19-Jul-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	26.9	40.0
		Before	0	5.0	26.2	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.0	-0.7	4.0
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	26.9	40.0
		Before	0	5.0	29.9	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.0	3.0	4.0
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4903.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2058.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master	-----	4700.0	4871.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master	-----	1900.0	2028.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 09:45:24 19-Jul-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	28.7	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	185.4	157.1	176.5	206.3
		After	-----	-----	NOT DONE	-----
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	0.93	1.05
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

MLT-B (Microlog Tool) Calibration - Run ONE

Primary Equipment :

Microlog Tool	MLT-B	11

Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.000
Large Ring Size (Caliper Calibration Large Ring)	12.000
Micro Normal Plus Reference (Micro Normal Plus Reference)	6.72
Micro Inverse Plus Reference (Micro Inverse Plus Reference)	5

Caliper Calibration - Caliper Calibration

Before (Measured): 09:53:34 19-Jul-2012

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Caliper Small Ring Measurement	in	Before	8.000	4.000	6.258	12.000
Caliper Large Ring Measurement	in	Before	12.000	6.000	9.914	18.000
Caliper Gain		Before	-----	-----	1.094	-----
Caliper Offset	in	Before	-----	-----	1.152	-----

Electrical Calibration - Microlog Calibration

Before (Measured): 09:43:46 19-Jul-2012 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Micro Normal Zero Measurement	ohm.m	Before	0	-2.000	0.000	2.000	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Micro Normal Plus Measurement	ohm.m	Before	6.720	2.720	6.519	10.720	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
Micro Normal Gain		Before	-----	-----	1.031	-----	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
Micro Normal Offset	ohm.m	Before	-----	-----	0.000	-----	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
Micro Inverse Zero Measurement	ohm.m	Before	0	-2.000	0.000	2.000	
		After	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Micro Inverse Plus Measurement	ohm.m	Before	5.000	1.000	4.866	9.000	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
Micro Inverse Gain		Before	-----	-----	1.028	-----	
		After	-----	-----	NOT DONE	-----	
		After-Before	-----	-----	-----	-----	
Micro Inverse Offset	ohm.m	Before	-----	-----	0.000	-----	
		After	-----	-----	NOT DONE	-----	
		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	648.05	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	1652.31	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[5]:Up	Up	2921.22 ft	6779.70 ft	20-Jul-2012 10:18:12 AM	20-Jul-2012 11:30:49 AM	0.00 ft	

All depths are referenced to toolstring zero

Log

ONE: Main[5]:Up 0848A71E-31E5-4201-A295-69098F1E9101

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: 20-Jul-2012 13:34:52

Channel	Source	Sampling
AF20	AIT-M:AMIS:AMIS	3in
AF60	AIT-M:AMIS:AMIS	3in
AFCO60	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

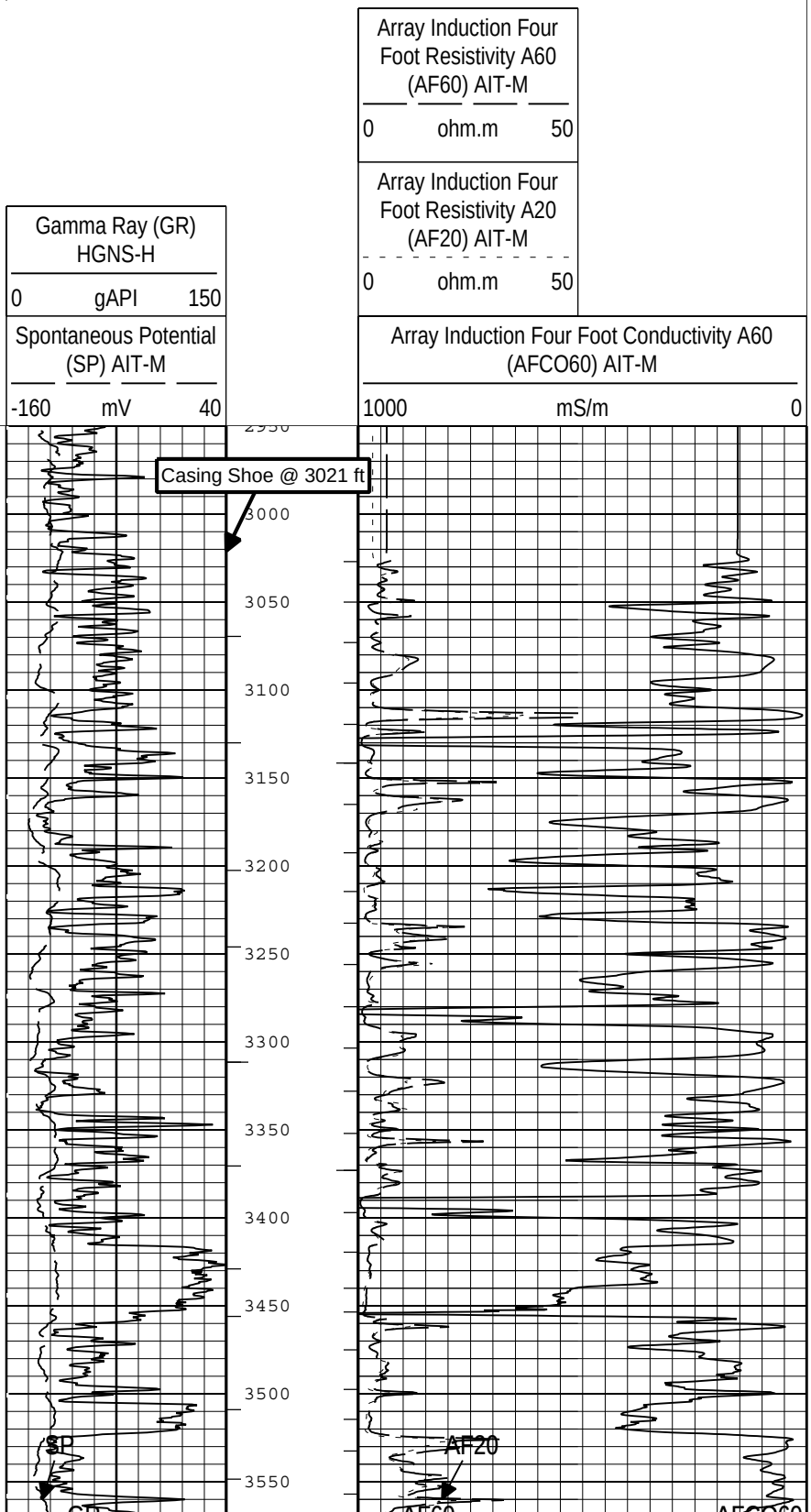
IHV - Integrated Hole Volume every 10.00 (ft3)

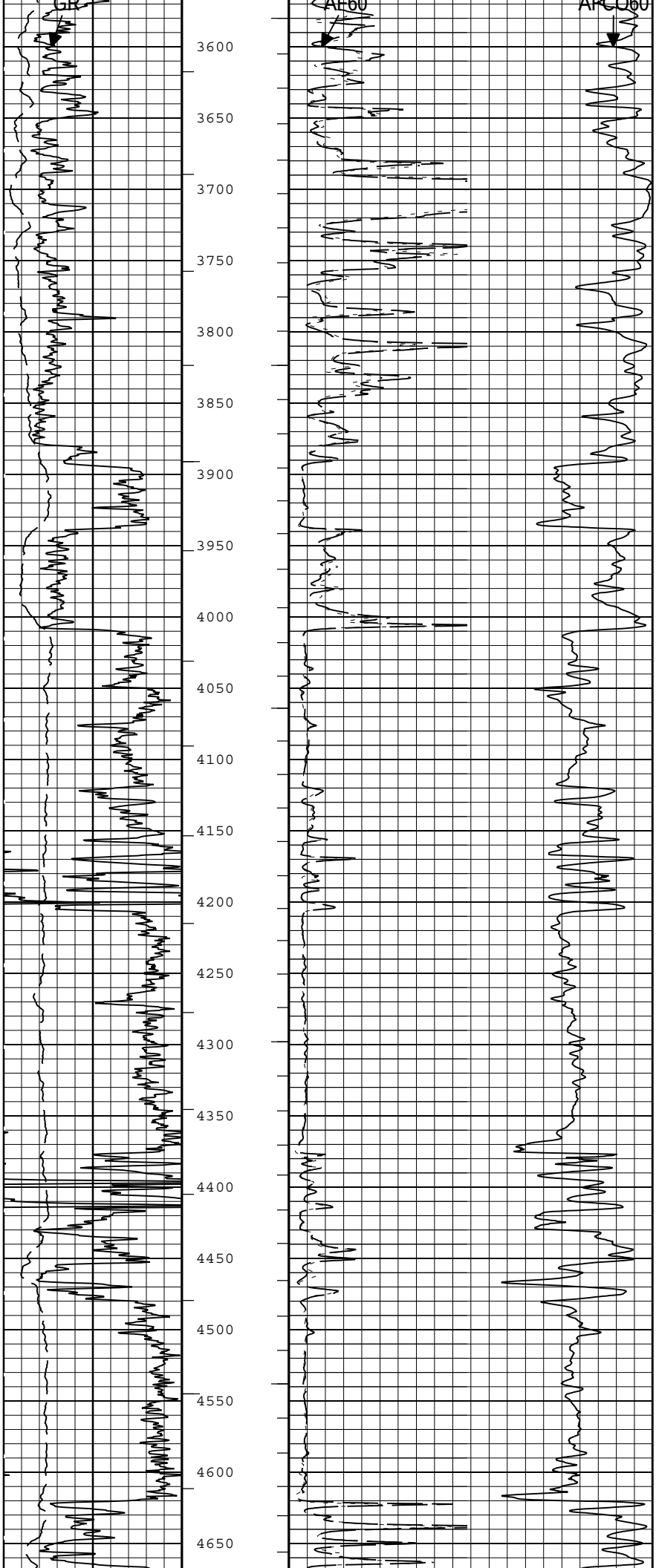
IHV - Integrated Hole Volume every 100.00 (ft3)

ICV - Integrated Cement Volume every 10.00 (ft3)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

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APCO60
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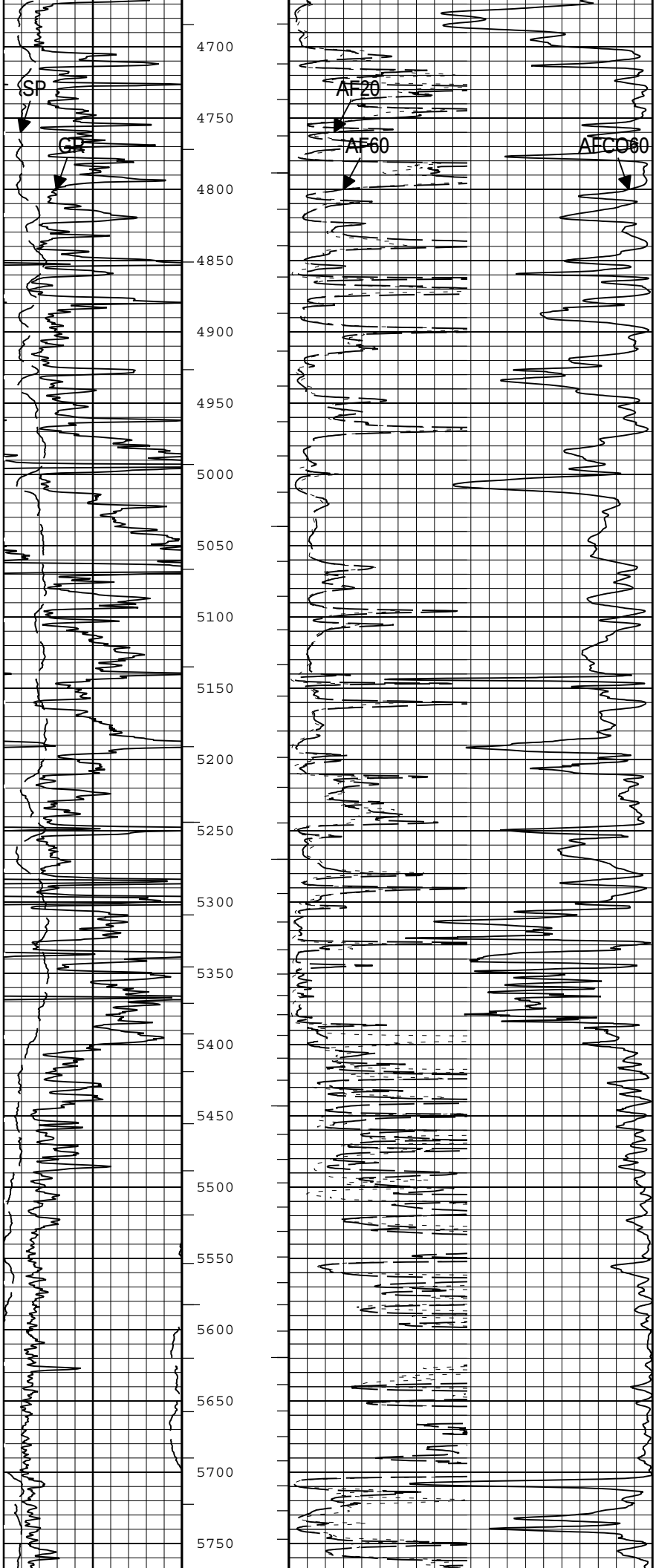
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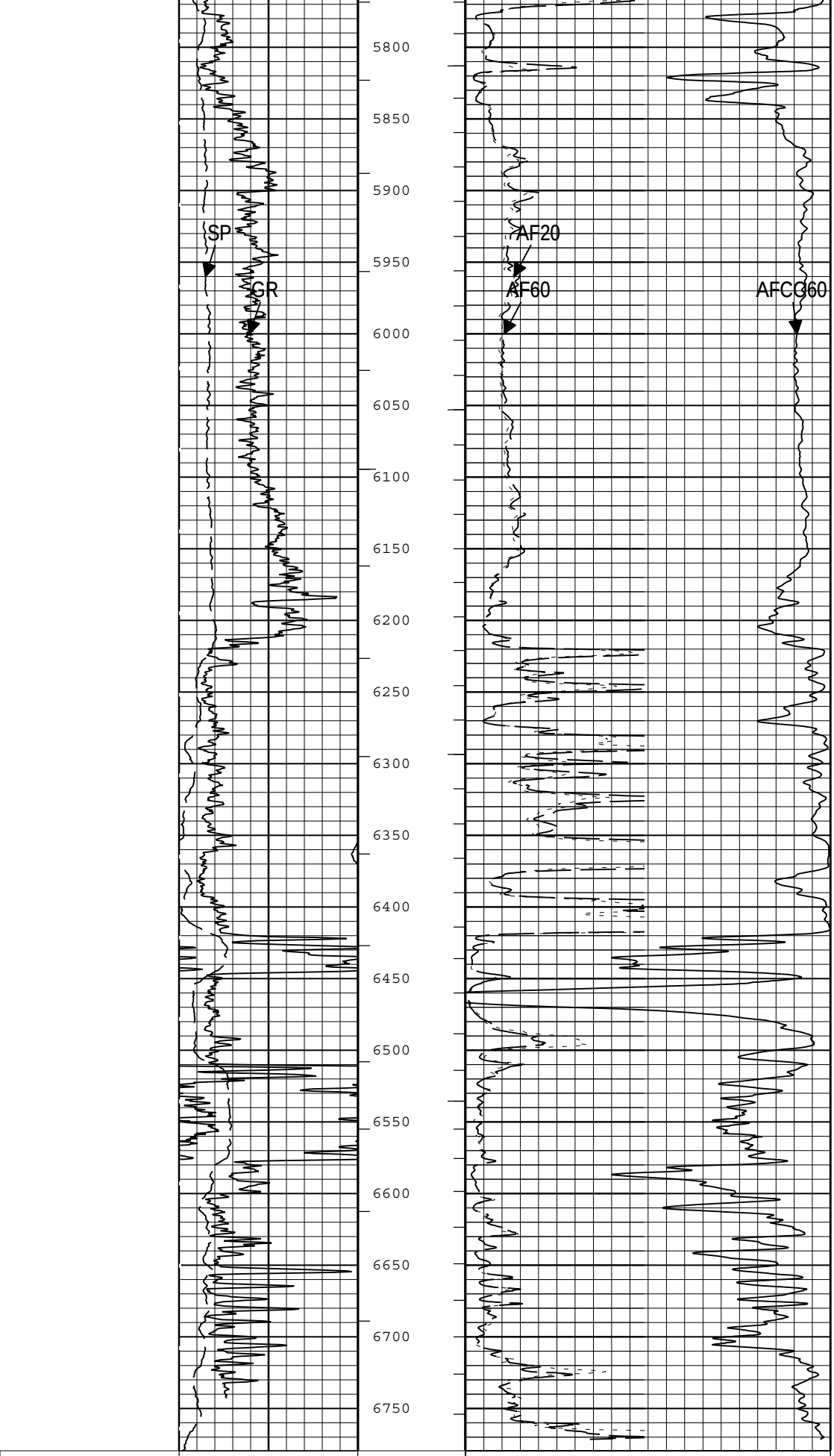


Gamma Ray (GR)
HGNS-H

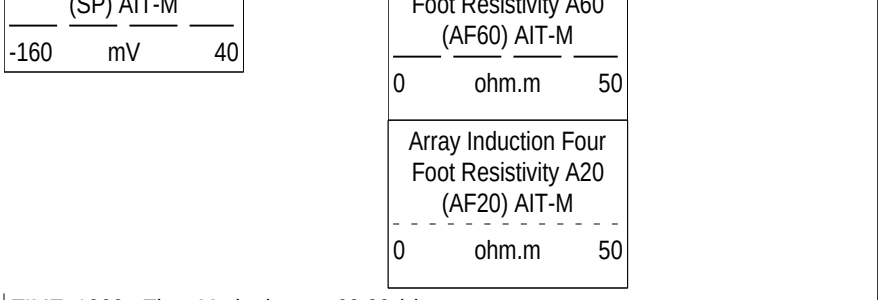
0 gAPI 150

Spontaneous Potential

Array Induction Four Foot Conductivity A60
(AFCO60) AIT-M

1000 mS/m 0

Array Induction Four



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: 20-Jul-2012 13:34:52

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	
ASTA	Array Induction Tool Standoff	AIT-M:AMIS:AMIS	1.125	in
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	in
CBLO	Casing Bottom (Logger)	COMPLETION	3021	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	9.2	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	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	AMF	
SOCO	Standoff Correction Option	HGNS-H:HGNS-H:HGNS-H	Yes	
SP_SHIFT	SP Shift	AIT-M:AMIS:AMIS	0	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	WLWorkflow	1800	ft/h

Company: TUG HILL OPERATING LLC

Schlumberger

Well: HOFFMAN FAMILY TRUST #1

Field: WILDCAT

County: COMANCHE

State: KANSAS

PLATFORM EXPRESS

ARRAY INDUCTION

GAMMA RAY - SP