Schlumberger

Company: TUG HILL OPERATING, LLC

Well: DONOVAN 2-10 AH

Field: UNKNOWN

County: BARBER State: KANSAS

County: BARBER
Field: UNKNOWN
Location: SHL: 218' FNL, 1010' FEL
Well: DONOVAN 2-10 AH
Company: TUG HILL OPERATING, LLC

RESISTIVITY LOG

ARRAY INDUCTION/GAMMA RAY/SP

PLATFORM EXPRESS

Location:				
SHL: 218' FNL, 1010' FEL	Elev.	K.B.	1838.00	ft
LAT: 37.10803* NORTH		G.L.	1815.00	ft
LONG: 98.72796* WEST		D.F.	1838.00	ft

Permanent Datum:	Ground Level	Elev.:	1815.00 f
Log Measured From:	Kelly Bushing	23.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		

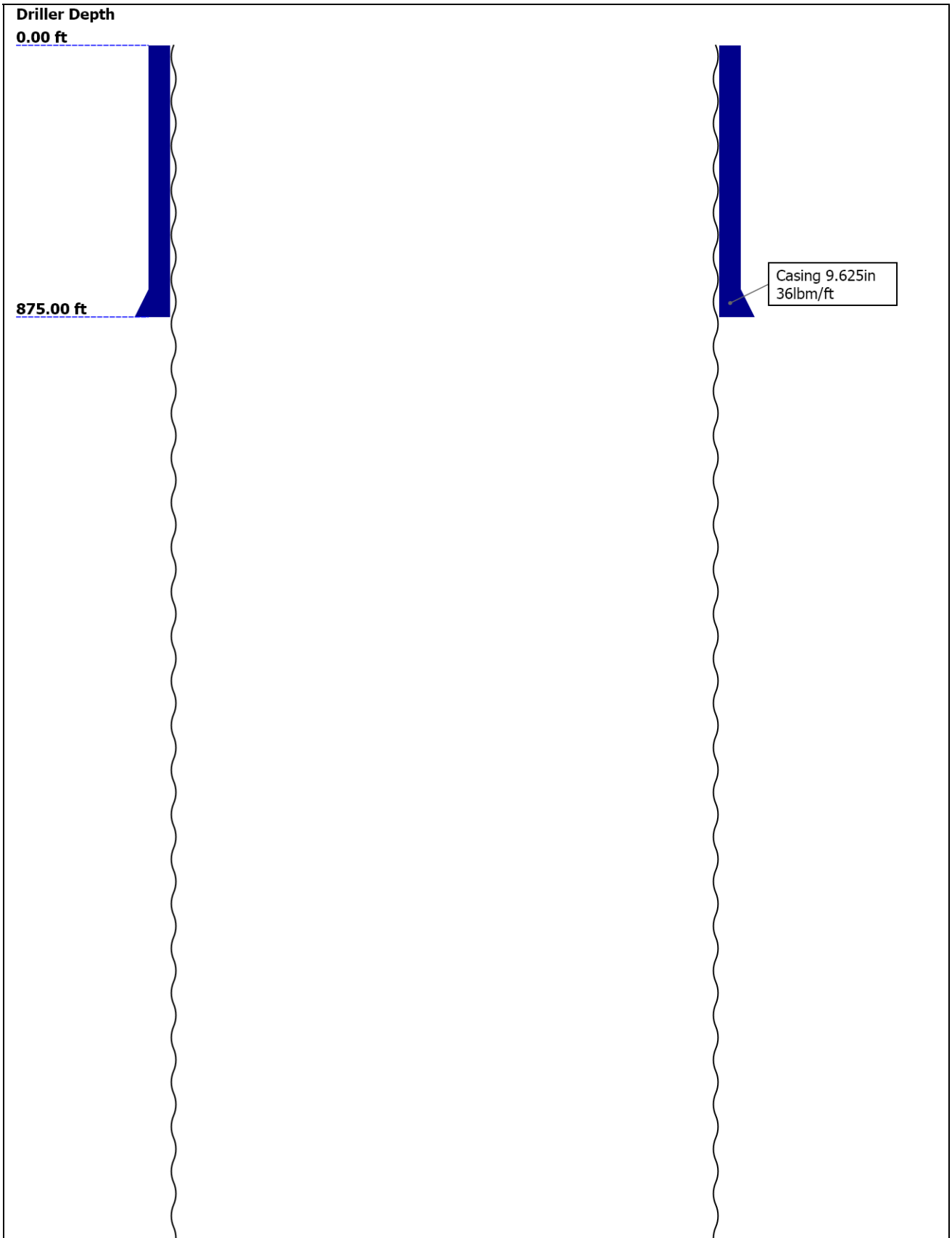
API Serial No.	Section:	Township:	Range:
15-007-23992-01-00	10	34	13W

Logging Date			04-Mar-2013			
Run Number			ONE			
Depth Driller			5450.00 ft			
Schlumberger Depth			5380.00 ft			
Bottom Log Interval			5380.00 ft			
Top Log Interval			863.00 ft			
Casing Driller Size @ Depth			9.625 in @ 875.00 ft			
Casing Schlumberger			863 ft			
Bit Size			8.75 in			
Type Fluid In Hole			Fresh Water			
MUD	Density	Viscosity	9.1 lbm/gal	47 s		
	Fluid Loss	PH	4 cm3	10		
	Source of Sample		Active Tank			
RM @ Meas Temp			0.61 ohm.m @ 55 degF			
RMF @ Meas Temp			0.52 ohm.m @ 55 degF			
RMC @ Meas Temp			0.85 ohm.m @ 55 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.24 @ 150	0.2 @ 150		
Max Recorded Temperatures			120 degF	120	120	
Circulation Stopped	Time		03-Mar-2013	23:40:00		
Logger on Bottom	Time		04-Mar-2013	07:45:00		
Unit Number	Location:		2281	ELK CITY OK		
Recorded By			DERYK REQUE			
Witnessed By			DAVID PATTERSON			

Disclaimer

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	8.75					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	5450					
Bottom Logger (ft)	5380					
Casing						
Size (in)	9.625					
Weight (lbm/ft)	36					
Inner Diameter (in)	8.914					
Grade	J55					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	875					
Bottom Logger (ft)	863					

Operational Run Summary

Parameter (unit)	ONE					
Date Log Started	04-Mar-2013					
Time Log Started	06:50:56					
Date Log Finished	04-Mar-2013					
Time Log Finished	11:40:41					
Top Log Interval (ft)	863.00					
Bottom Log Interval (ft)	5380.00					
Total Depth (ft)	5380.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.750					
Logging Unit Number	2281					
Logging Unit Location	ELK CITY OK					
Recorded By	DERYK REQUE					
Witnessed By	DAVID PATTERSON					

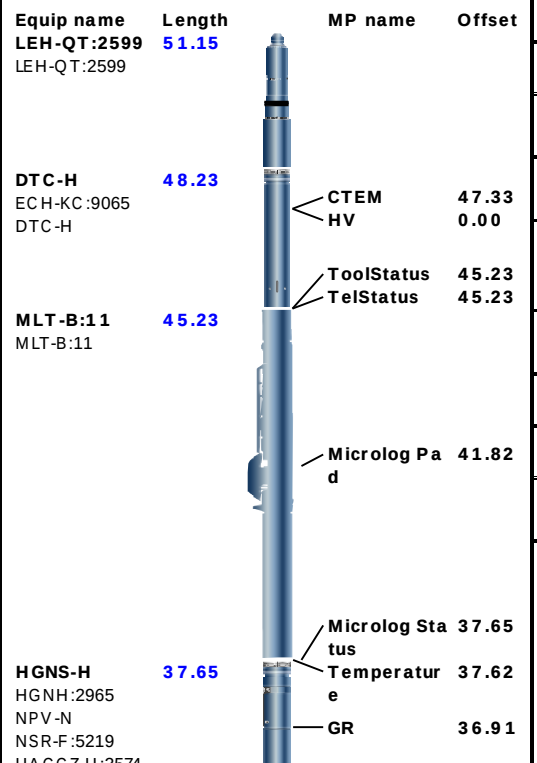
Service Order Number	C9O6-00036					

Borehole Fluids

Parameter(unit)	ONE					
Fluid Type	Water					
Fluid Name	Fresh Water					
Max Recorded Temperatures (degF)	120					
Source of Sample	Active Tank					
Salinity (ppm)	17000					
Density (lbm/gal)	9.1					
Funnel Viscosity (s)	47					
Fluid Loss (cm3)	4					
PH	10					
Date/Time Circulation Stopped	03-Mar-2013 23:40:00					
Date Logger on Bottom	04-Mar-2013					
Time Logger on Bottom	07:45:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	0.61 @ 55					
RMF @ Meas Temp (ohm.m@degF)	0.52 @ 55					
RMC @ Meas Temp (ohm.m@degF)	0.85 @ 55					
RM @ BHT (ohm.m@degF)	0.24 @ 150					
RMF @ BHT (ohm.m@degF)	0.2 @ 150					
RMC @ BHT (ohm.m@degF)	0.34 @ 150					
Total Solid (%)						
High Gravity Solids (%)						

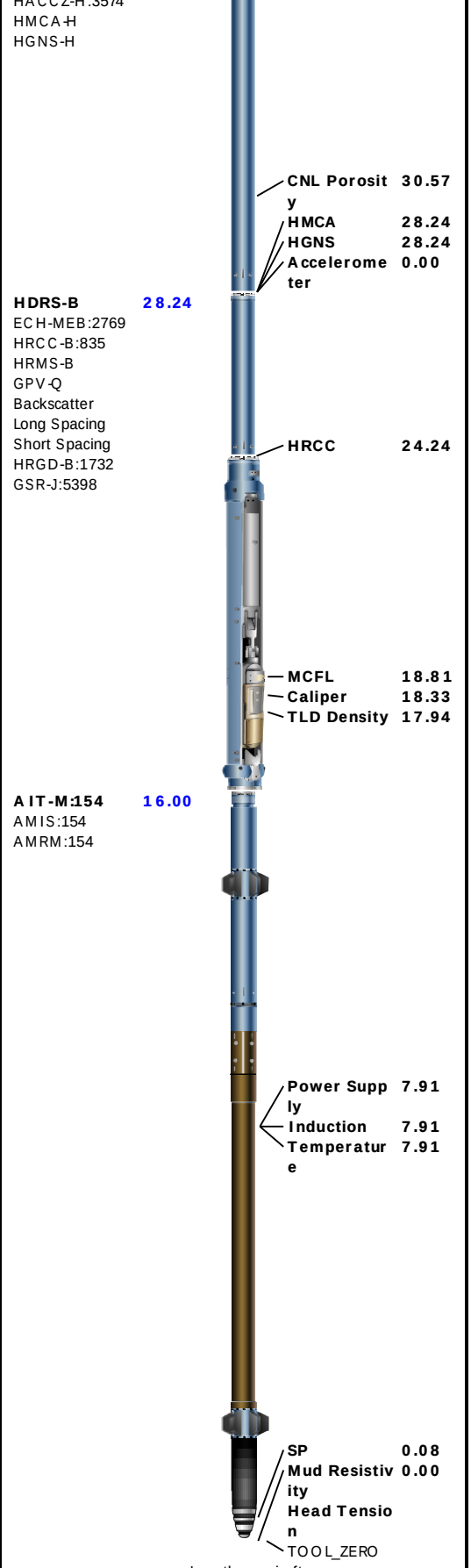
Remarks and Equipment Summary

ONE: Toolstring



ONE: Remarks

ONE: Remarks
Tool string ran as illustrated in toolsketch.
All data is presented following the Tug Hill SOP.
Logs were computed on a Limestone Matrix (MDEN = 2.71 g/cc, DTM = 47.6 us/ft)
Maximum temperature recorded by the HGNS was 120 degF.
Correlated Main pass to Down log using prominent GR deflection at 5325.0 ft. Repeat pass was logged from 5225 ft to 4025 ft.
Measurements are adversely affected by poor borehole conditions.
Caliper check in casing is within tolerance.
Main pass of PEX-MLT ran from TD to surface.
AIT FR = 5380', MLT FR = 5335', DENSITY FR = 5369', POROSITY FR = 5355', GR FR =



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		
Rig Type	LAND (triple)		
Depth Measuring Device	ONE		

Type	IDW-JA		
Serial Number	5904		
Calibration Date	13-NOV-2013		
Calibration Cable Type	7-46A-XS		
Wheel Correction 1	-8		
Wheel Correction 2	-6		
Tension Device	**ONE**		
Type	CMTD-B/A		
Serial Number	2576		
Calibration Date	08-FEB-2013		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	7		
Calibration Peak Error	14		
Logging Cable	**ONE**		
Type	7-46A-XS		
Serial Number	U711103		
Logging Cable Length (ft)	17500.00		

Survey Record

Survey Calculation

Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	True North	Total Correction Formula :	Magnetic Dec

Rig Location

Latitude :	37.108030 degrees	Longitude :	-98.727960 degrees

Tie In Point

Measured Depth:	0.00 ft	Inclination:	0.00 deg	Azimuth:	0.00 deg
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft	East Displacement:	0.00 ft

Survey Quality Index

28 : Tie-In Point

Survey Correction Index

0 : No correction

Survey Description Index

0 : Not Flagged Survey

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0

Composite 1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20120723-3.1.9755.1112
	EXP_APL-MAST-3.1.9755.1419
	EXP_APL-NEXTA-3.1.9755.1340

SoftwareVersion_Tool	SoftwareVersion_Run Version	SoftwareVersion_Build Version
WAFE-SEC	Synergy SV451EC version 8.10	Synergy SV451EC version 9.10
WAFE-FEC	Synergy SV451EC version 8.10	Synergy SV451EC version 9.10

WAFE-TMDI	Synergy SV45TEC version 39.19	Synergy SV45TEC version 44.19	
Tool Elements	**Description**	**Software Version**	**Firmware Version**
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0
AMIS	Array Induction Sonde - M	3.1.9755.1112	1

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Main[6]:Up	Up	3913.48 ft	4412.61 ft	04-Mar-2013 9:45:05 AM	04-Mar-2013 9:55:09 AM	0.66 ft	
ONE	Main[7]:Up	Up	48.78 ft	5392.63 ft	04-Mar-2013 10:04:27 AM	04-Mar-2013 11:40:41 AM	1.44 ft	

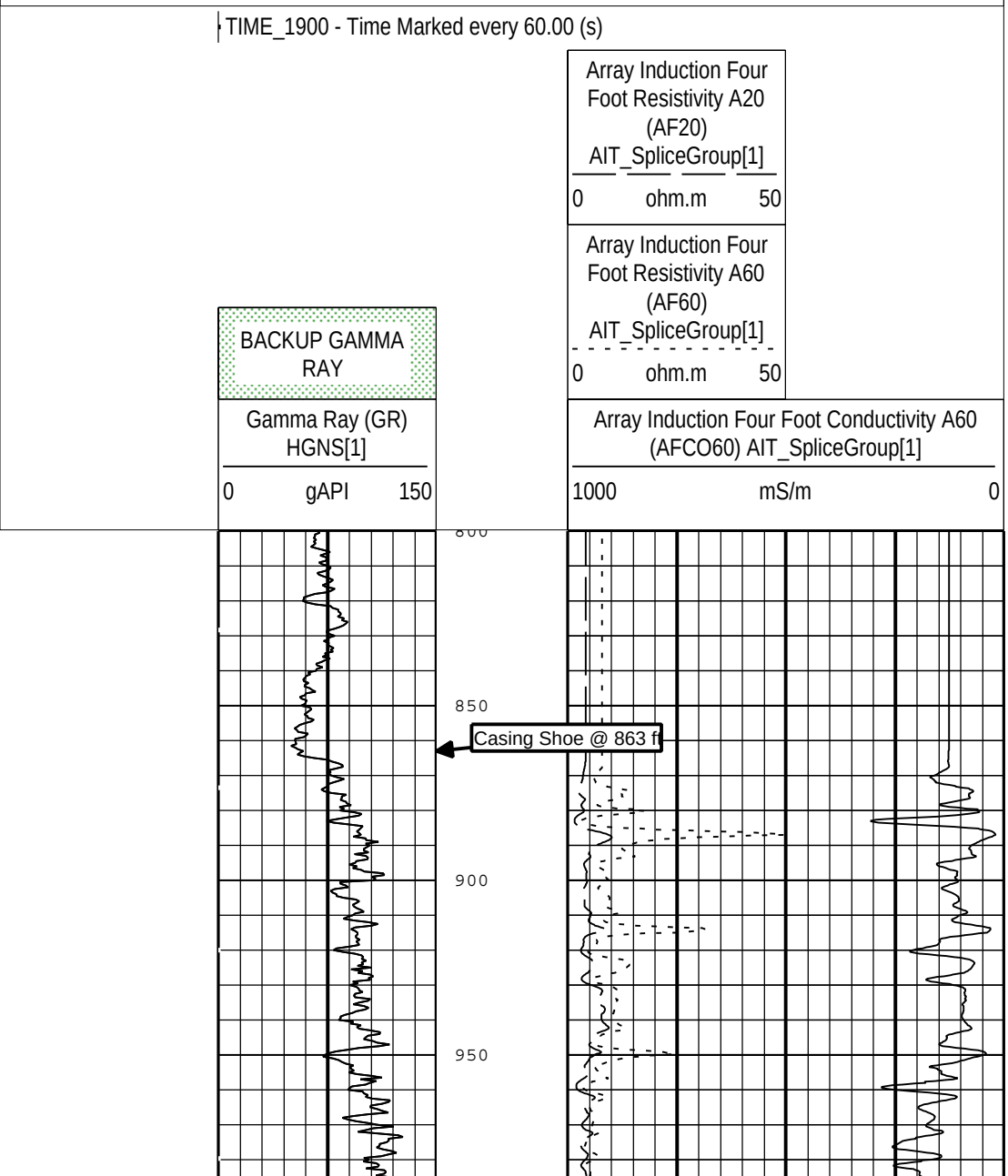
All depths are referenced to toolstring zero

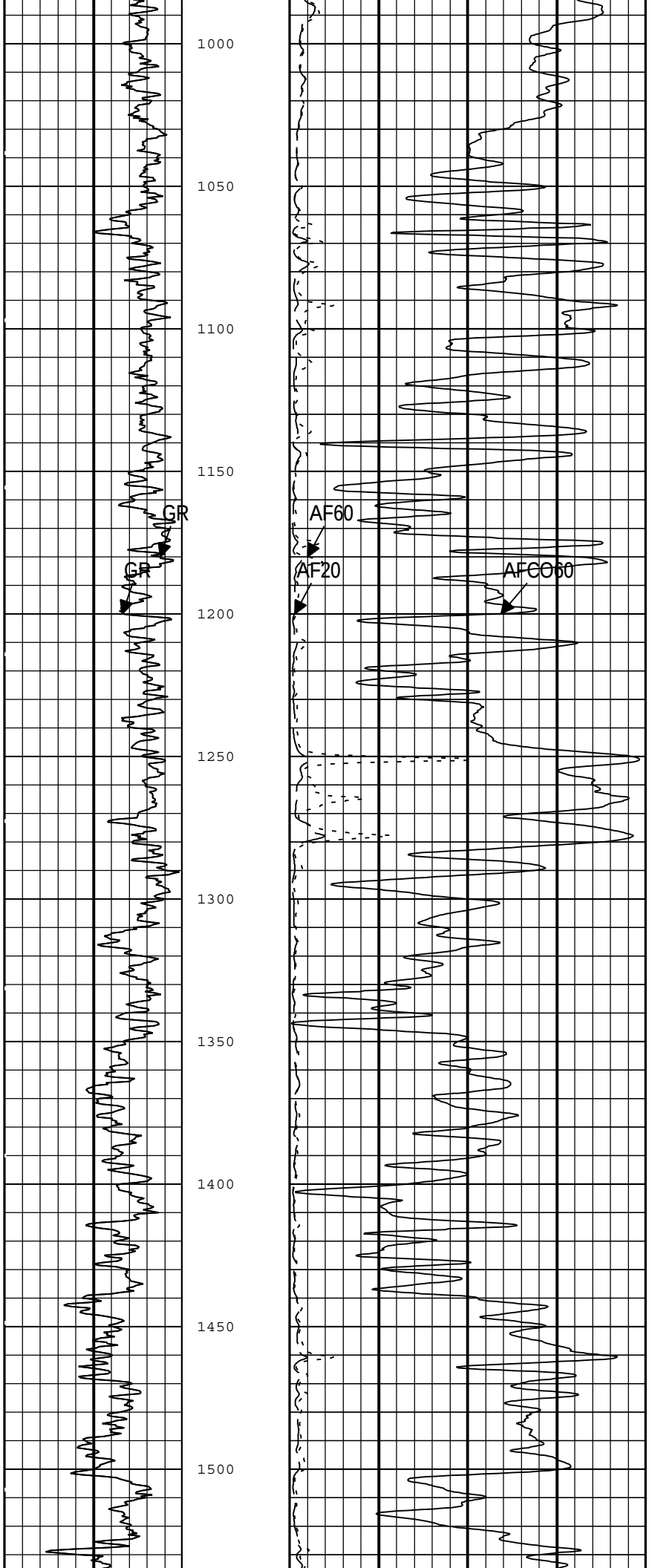
Log

Composite 1

Description: Format: Log (RILEY MUD) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:52

Channel	Source	Sampling
AF20	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AF60	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AFCO60	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
GR	HGNS[1]:HGNS-H[1]:HGNS-H[1]	6in
TIME_1900	WLWorkflow	0.1in

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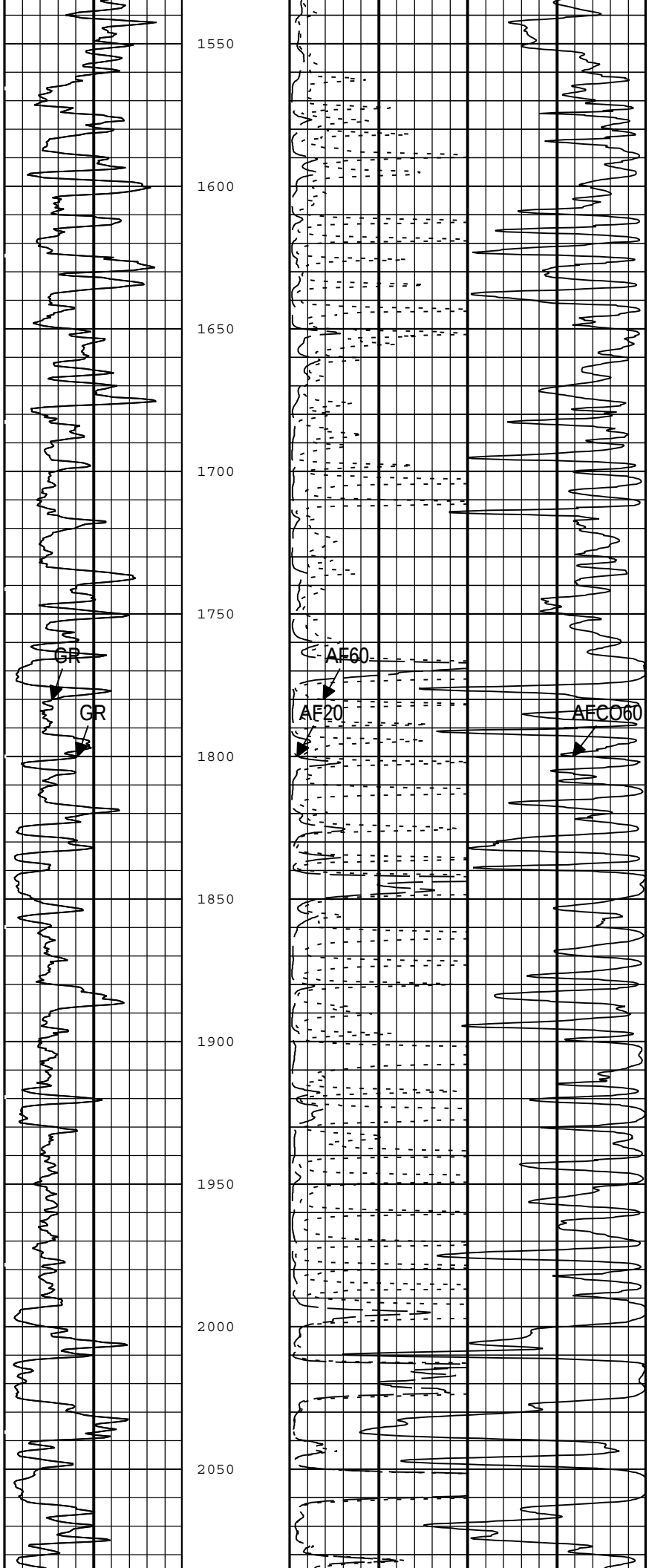
1450
1500
GR
GR
AF60
AF20
AFCO60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1700
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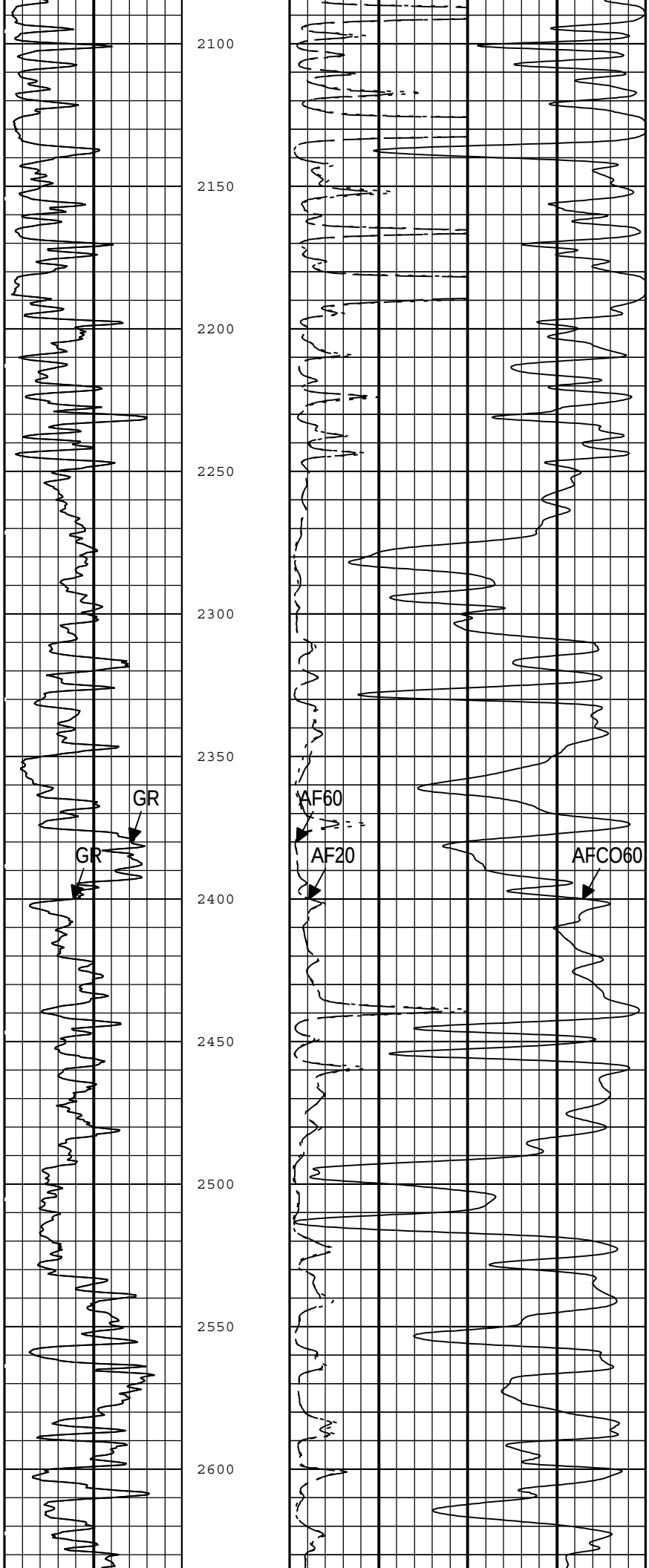
1800
1850
1900
1950
2000
2050
GR
GR
AF60
AF20
AFCO60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GR
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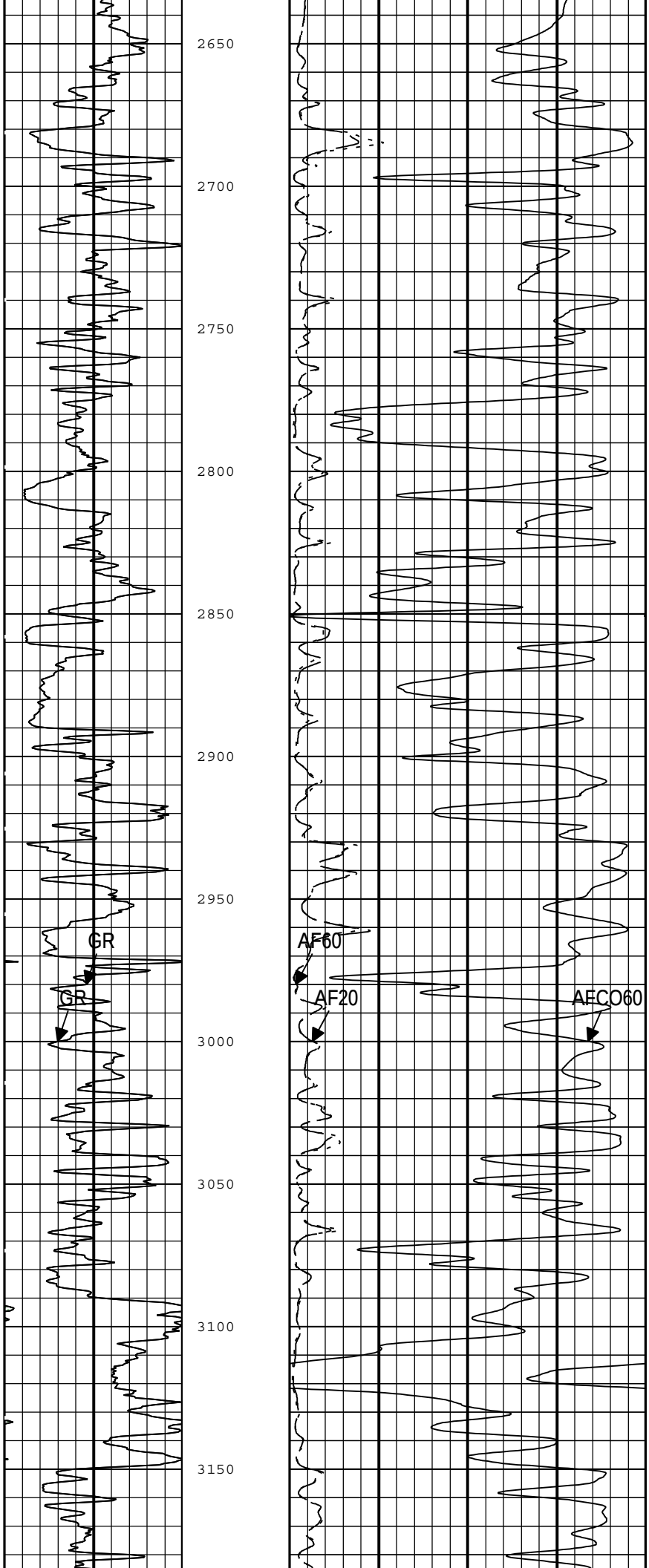
AFCO60
2400
2450
2500
2550
2600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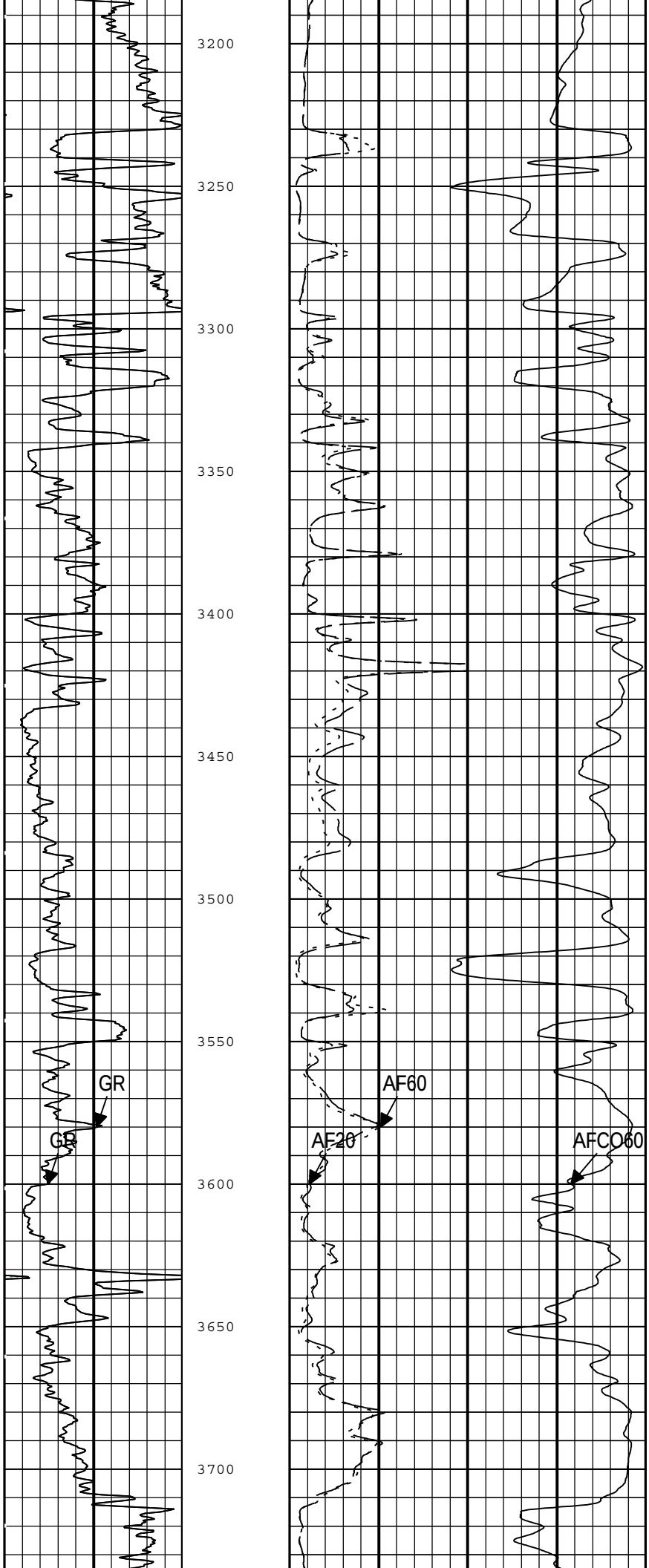
2750
2800
2850
2900
2950
3000
3050
3100
3150
GR
GR
AF60
AF20
AFCO60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3400
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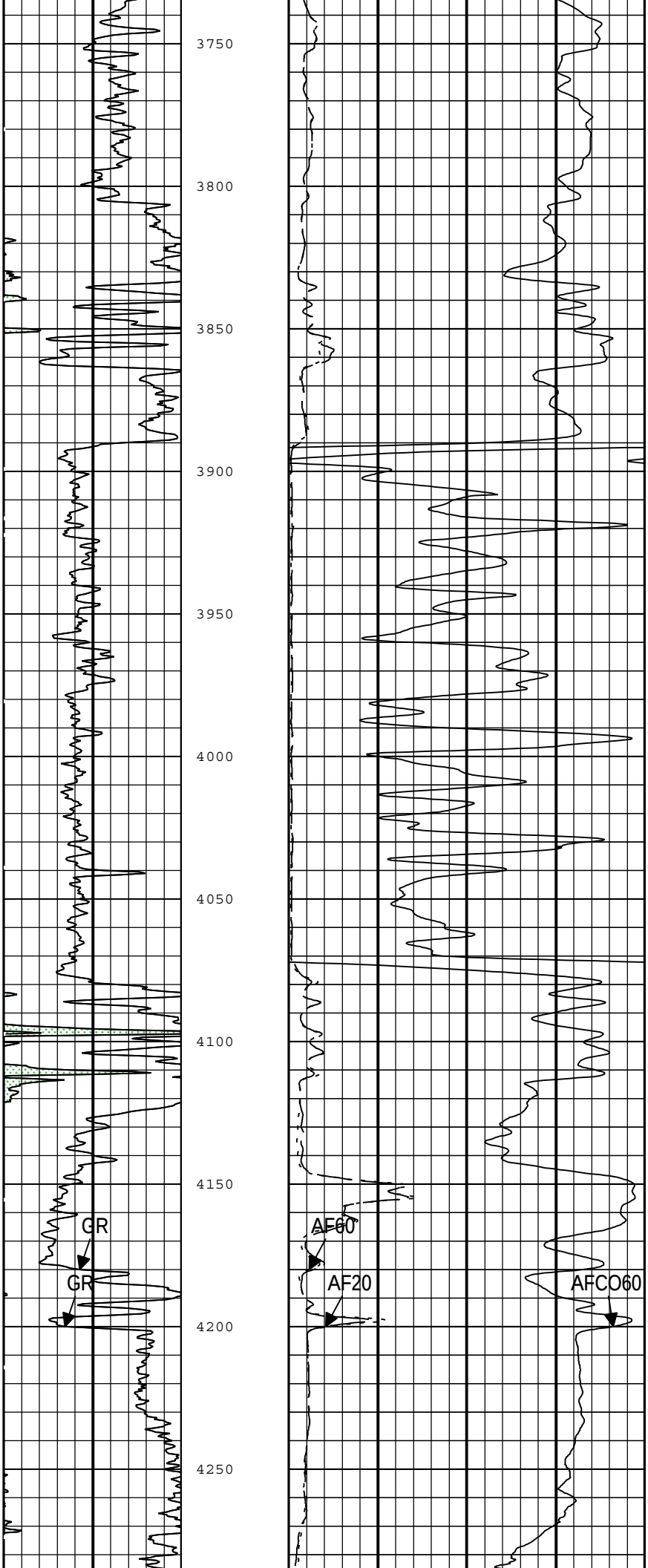
3550
3600
3650
3700
GR
GR
AF60
AF20
AFCO60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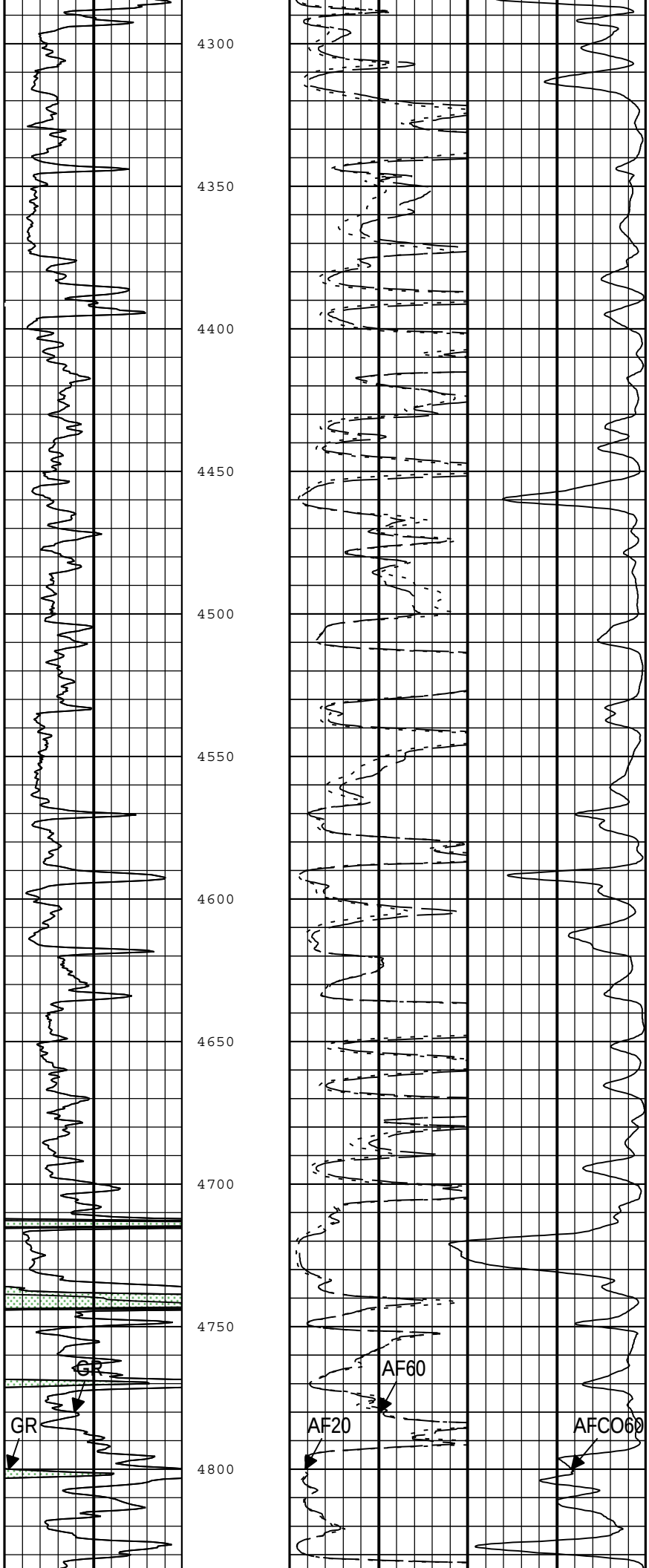
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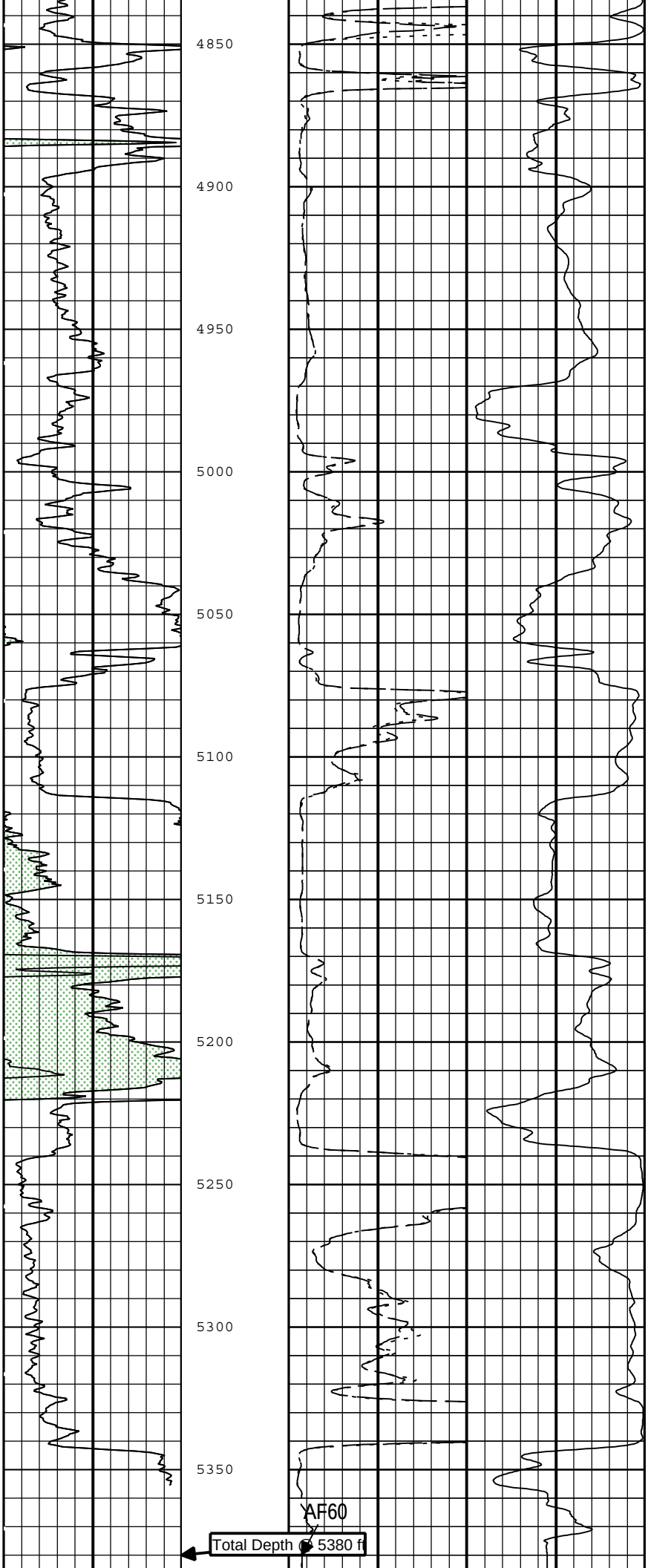
AF20
AFCO60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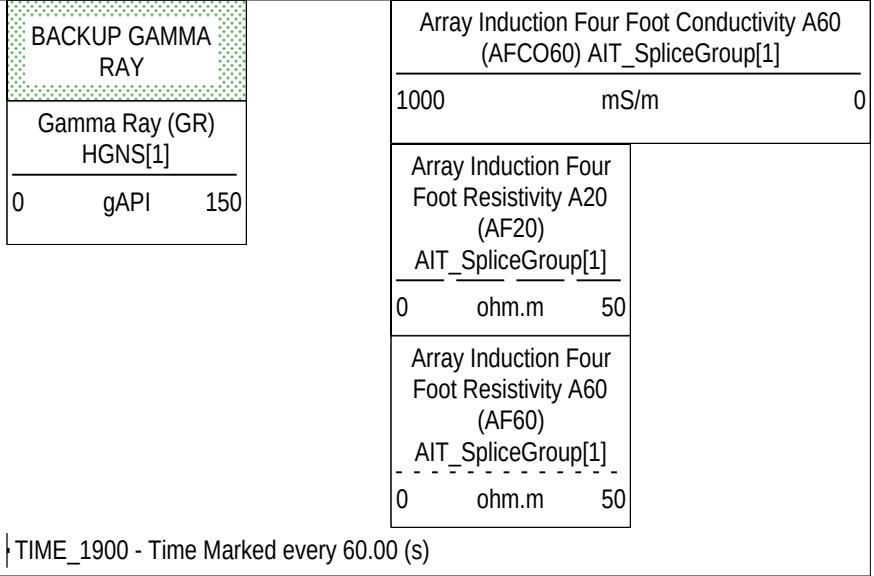
4900
4950
5000
5050
5100
5150
5200
5250
5300
5350
AF60
Total Depth @ 5380 ft



Description: Format: Log (RILEY MUD) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:52

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
AAPL	Array Induction Answer Product Level(Depth Log/View only)	AIT-M	Radial	
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ABLM	Array Induction Basic Logs Mode	AIT-M	Normal	
ACDE	Array Induction Casing Detection Enable	AIT-M	Yes	
ACEN	Array Induction Tool Centering Flag (in Borehole)	AIT-M	Eccentered	
AMRF	Array Induction Mud Resistivity Factor	AIT-M	1	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
ATSE	Array Induction Temperature Selection(Sonde Error Correction)	AIT-M	Internal	
BARI	Barite Mud Presence Flag	Borehole	Yes	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	8.75	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-B	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	863	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
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	
GR_MULTIPLIER	Gamma Ray Multiplier	HGNS-H	1	
GRSE	Generalized Mud Resistivity Selection, from Measured or Computed Mud Resistivity	Borehole	REMS	
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	CTEM	
MST	Mud Sample Temperature	Borehole	55	degF
RMS	Resistivity of Mud Sample	Borehole	0.61	ohm.m
SOCN	Standoff Distance	HGNS-H	0.125	in
SOCO	Standoff Correction Option	HGNS-H	Yes	
TPOS	Tool Position: Centered or Eccentered	HGNS-H	Eccentered	

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
HMCA_BRD_TYPE	HMCA Board Type	HGNS-H	1	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Composite 1

Resistivity Main Pass 5" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:ONE, FCD	1255.24	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS, GCSE_DOWN_PASS:ONE	2465.69	ft3

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Main[6]:Up	Up	3913.48 ft	4412.61 ft	04-Mar-2013 9:45:05 AM	04-Mar-2013 9:55:09 AM	0.66 ft	
ONE	Main[7]:Up	Up	48.78 ft	5392.63 ft	04-Mar-2013 10:04:27 AM	04-Mar-2013 11:40:41 AM	1.44 ft	
All depths are referenced to toolstring zero								

Log

Composite 1

Description: AIT Basic Log Two Format: Log (AIT 5 IN MUD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:55

Channel	Source	Sampling
AT10	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT20	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT30	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT60	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
AT90	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	3in
BS	Borehole	6in
CALI	HDRS[1]:HRCC-B[1]:HRCC-B[1]	1in
GR	HGNS[1]:HGNS-H[1]:HGNS-H[1]	6in
ICV	Borehole	6in
IHV	Borehole	6in
SP	AIT_SpliceGroup[1]:AMIS[1]:AMIS[1]	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)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

BACKUP GAMMA RAY

Mudcake

Gamma Ray (GR) HGNS[1]

0 gAPI 150

Spontaneous Potential (SP) AIT_SpliceGroup[1]

-160 mV 40

Caliper (CALI) HDRS[1]

6 in 16

Cable Tension (TENS)

Array Induction Two Foot Resistivity A10 (AT10) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A30 (AT30) AIT_SpliceGroup[1]

0.2 ohm.m 2000

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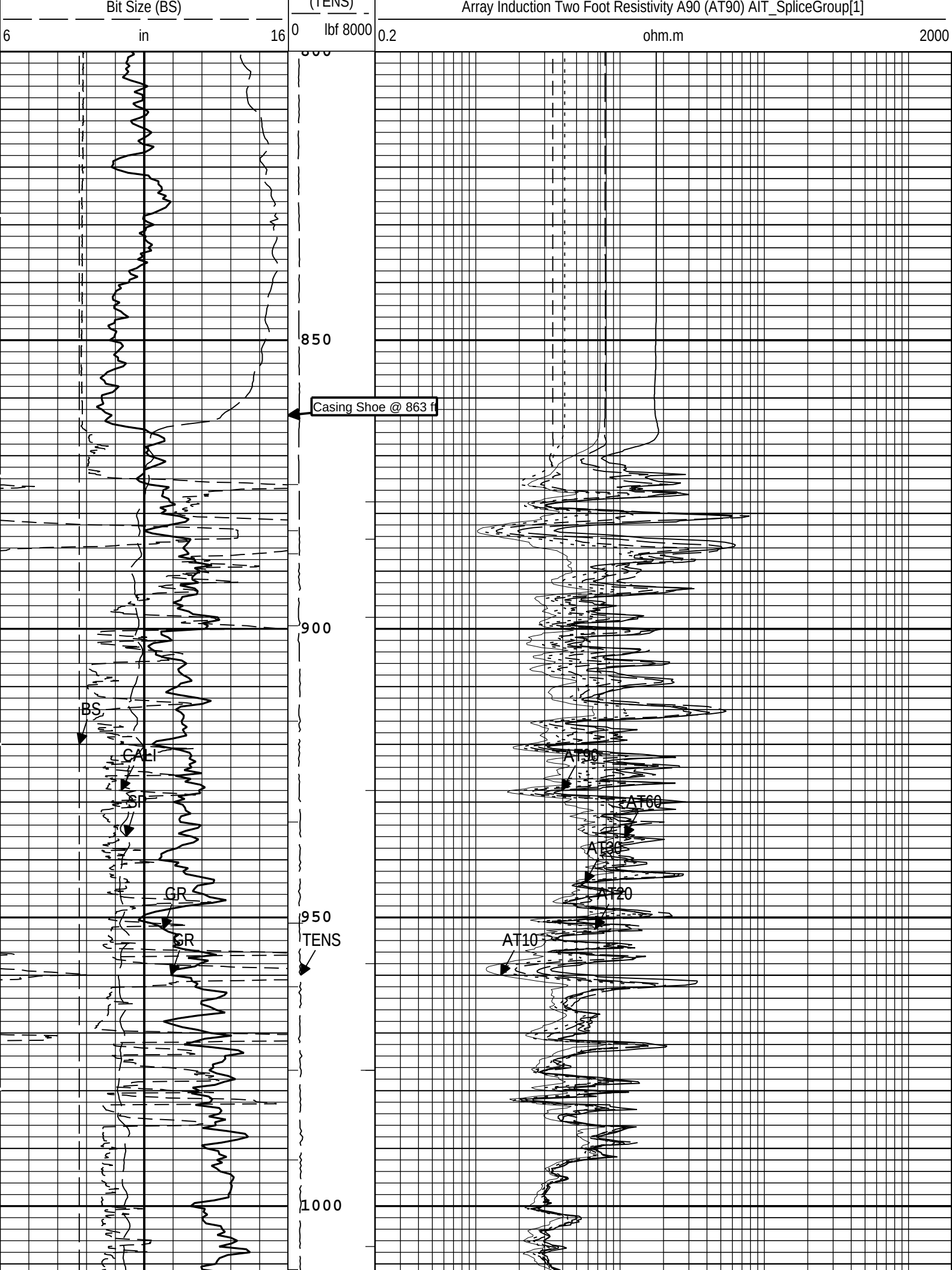
0.2 ohm.m 2000


Bit Size (BS)
6
in
16
(TENS)
0
lbf
8000
Array Induction Two Foot Resistivity A90 (AT90) AIT_SpliceGroup[1]
0.2
ohm.m
2000
850
Casing Shoe @ 863 ft
900
950
1000
BS
CALI
SP
GR
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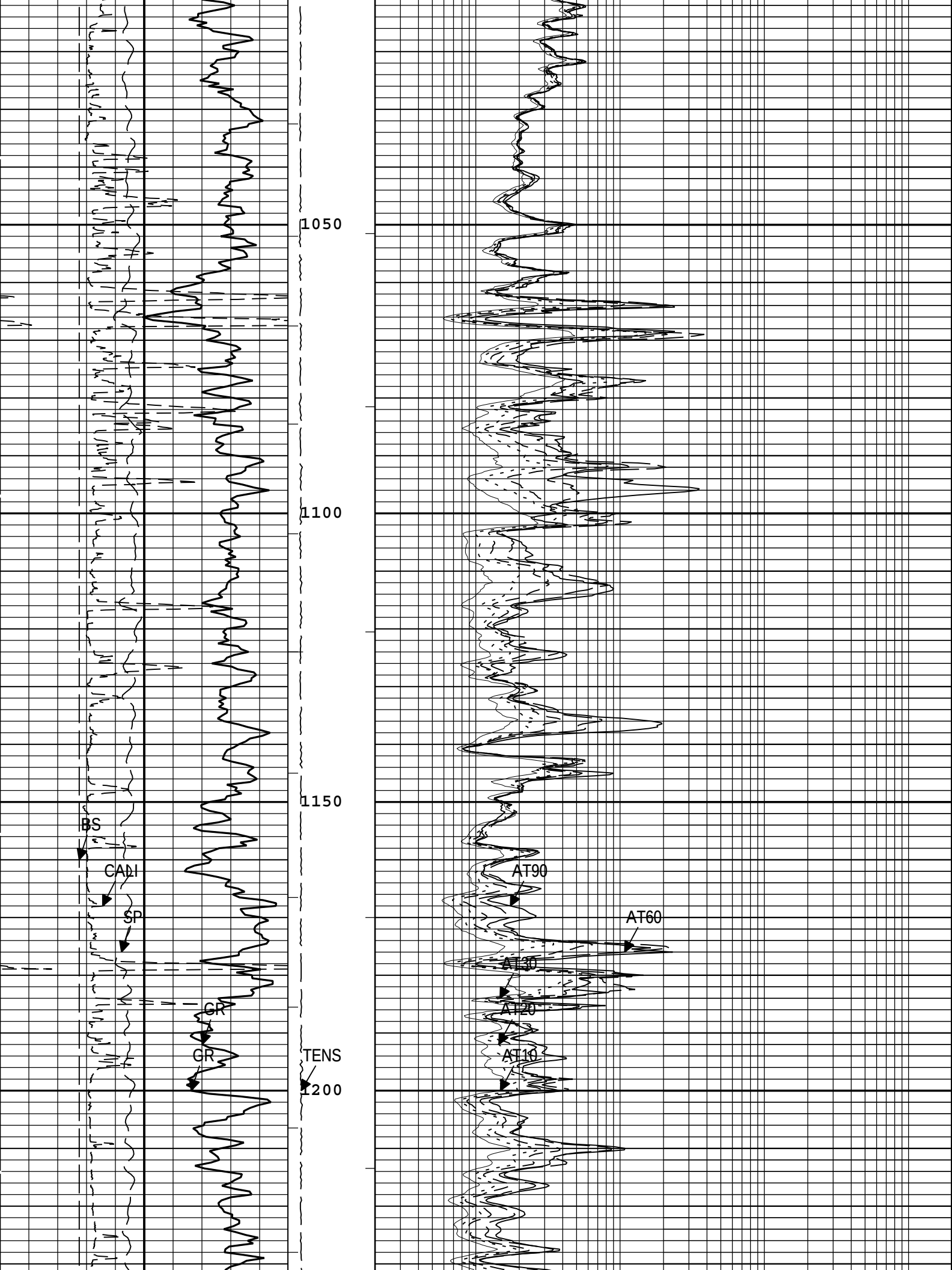
TENS
AT90
AT60
AT30
AT20
AT10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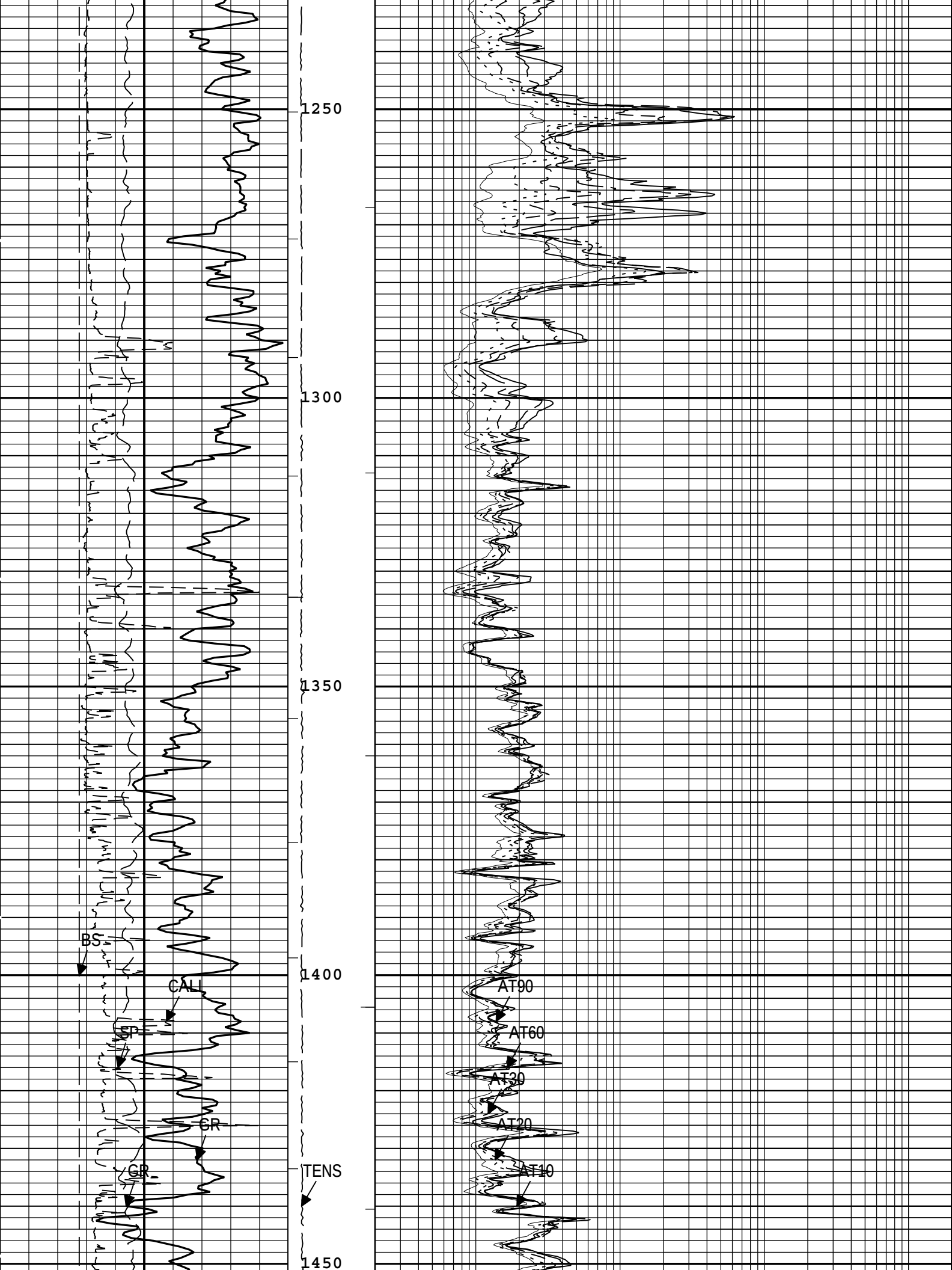
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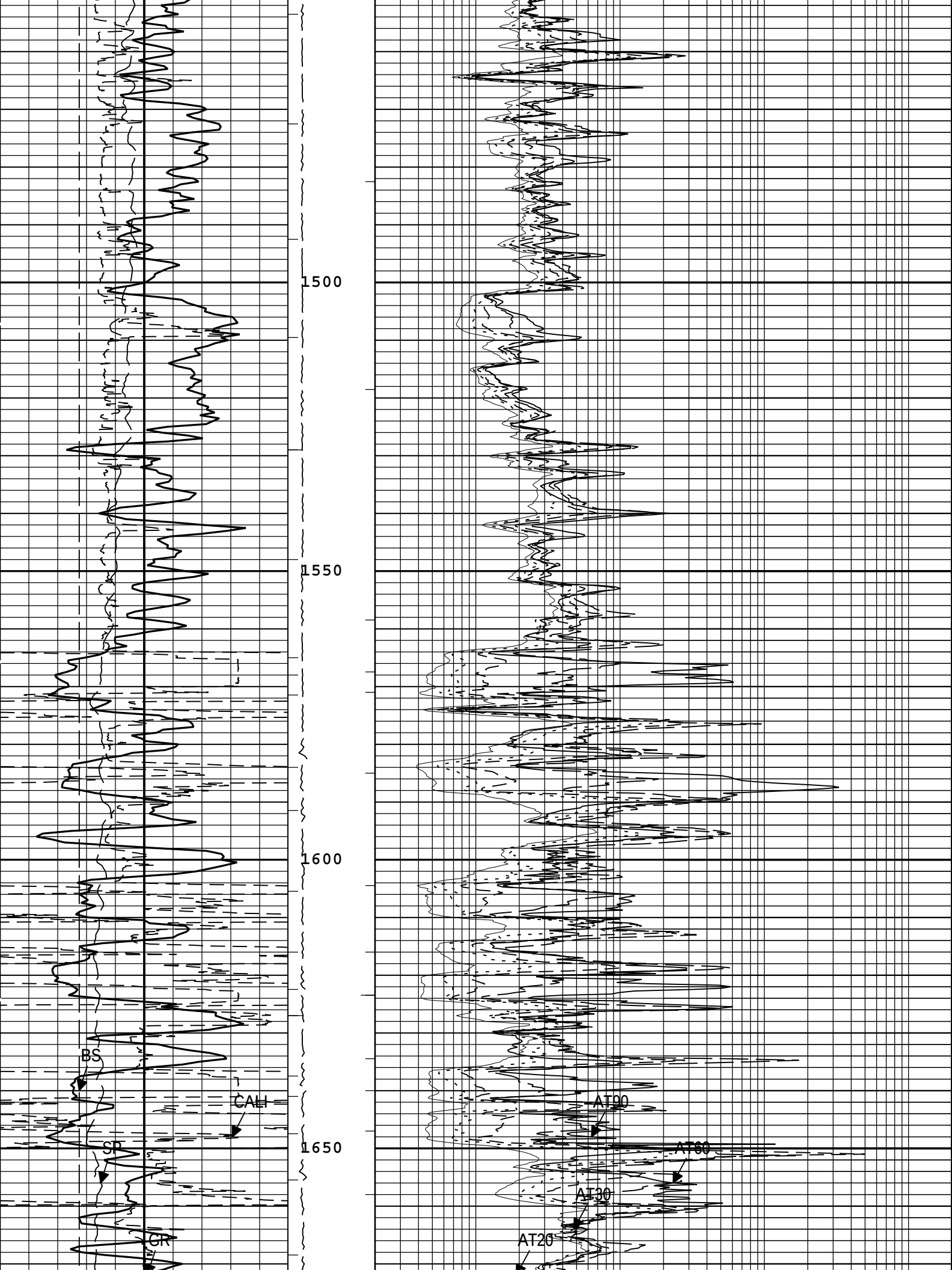
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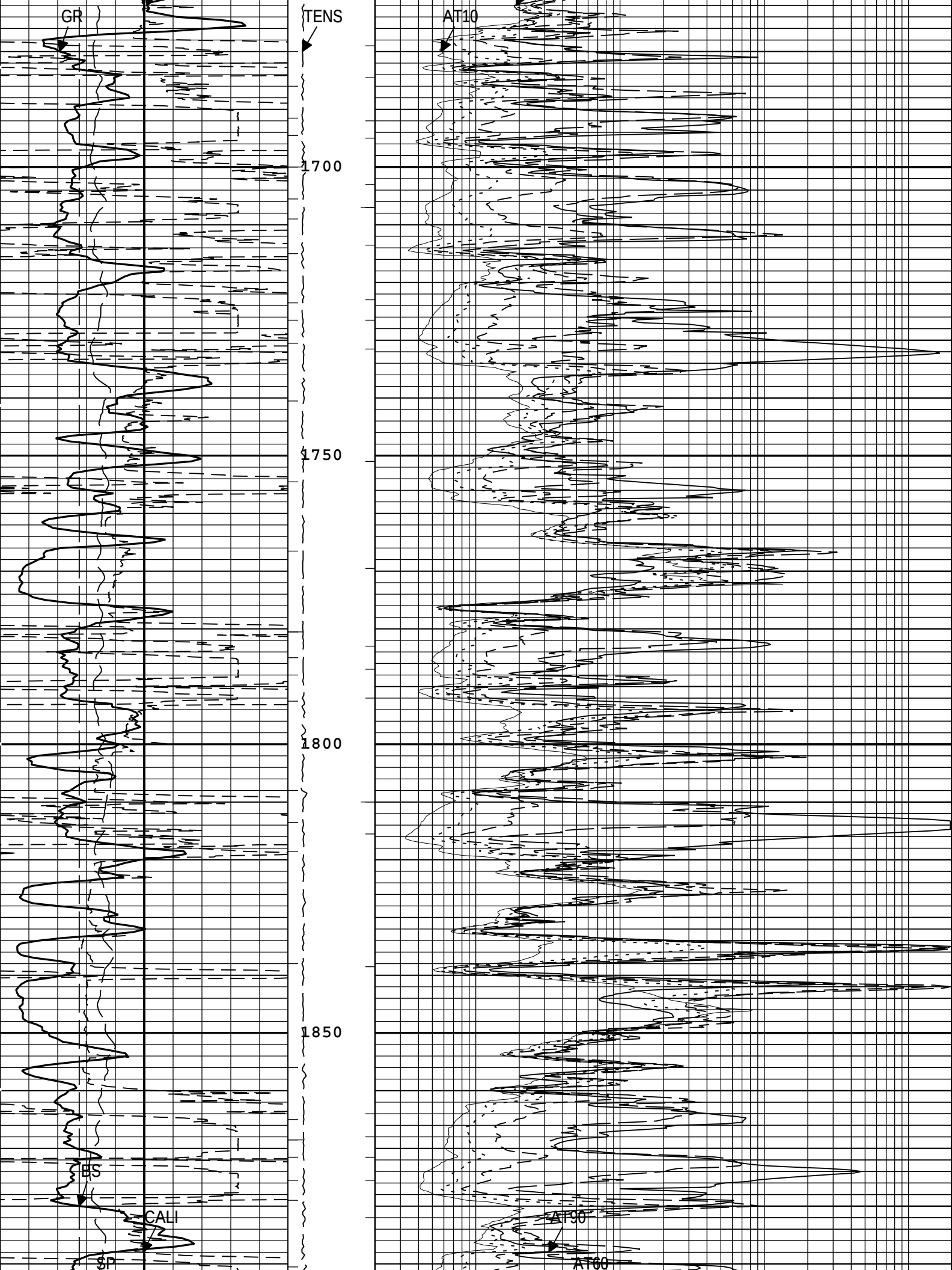
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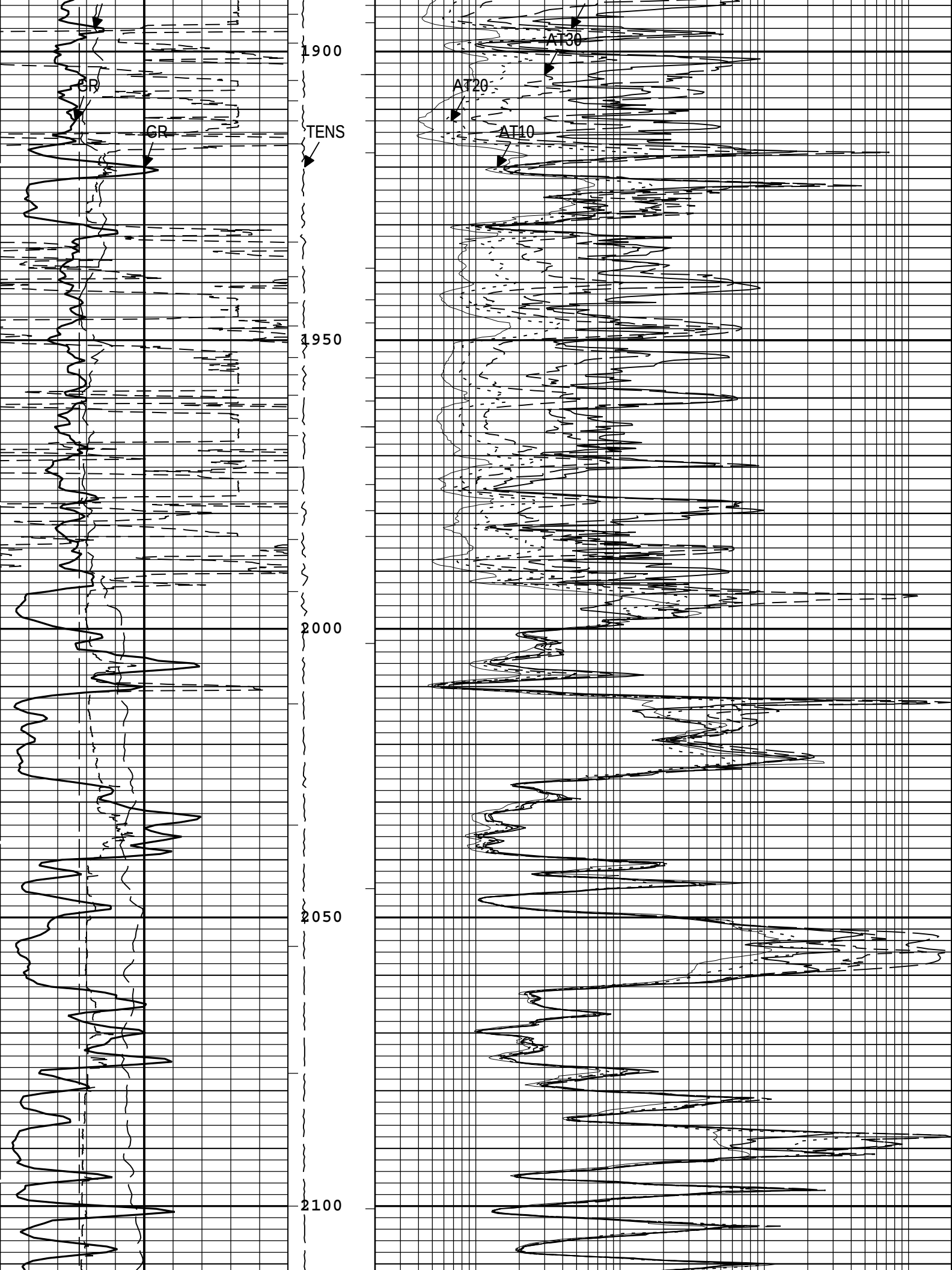
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AT20
AT10
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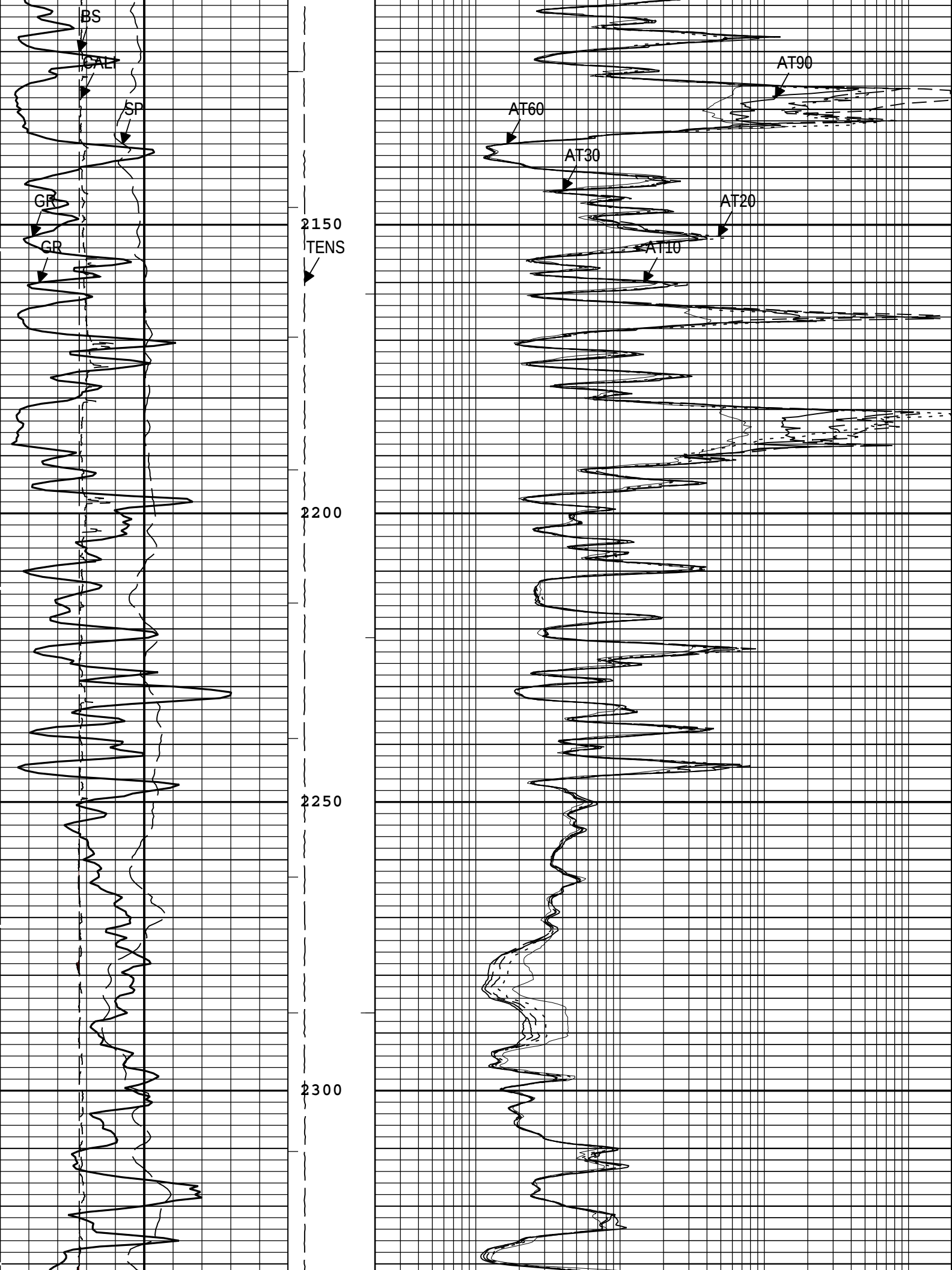
GR
TENS
1900
1950
2000
2050
2100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AT20
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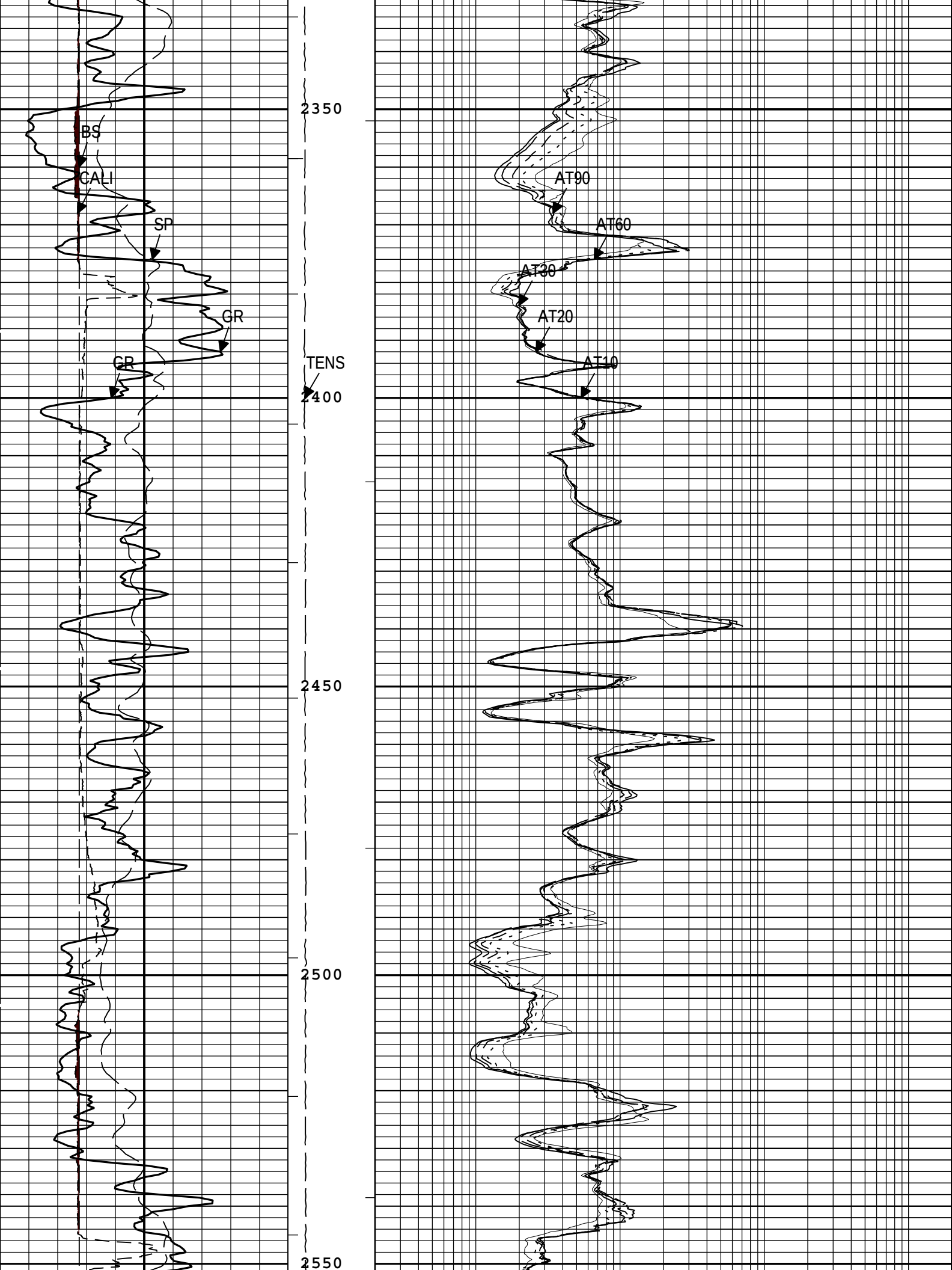
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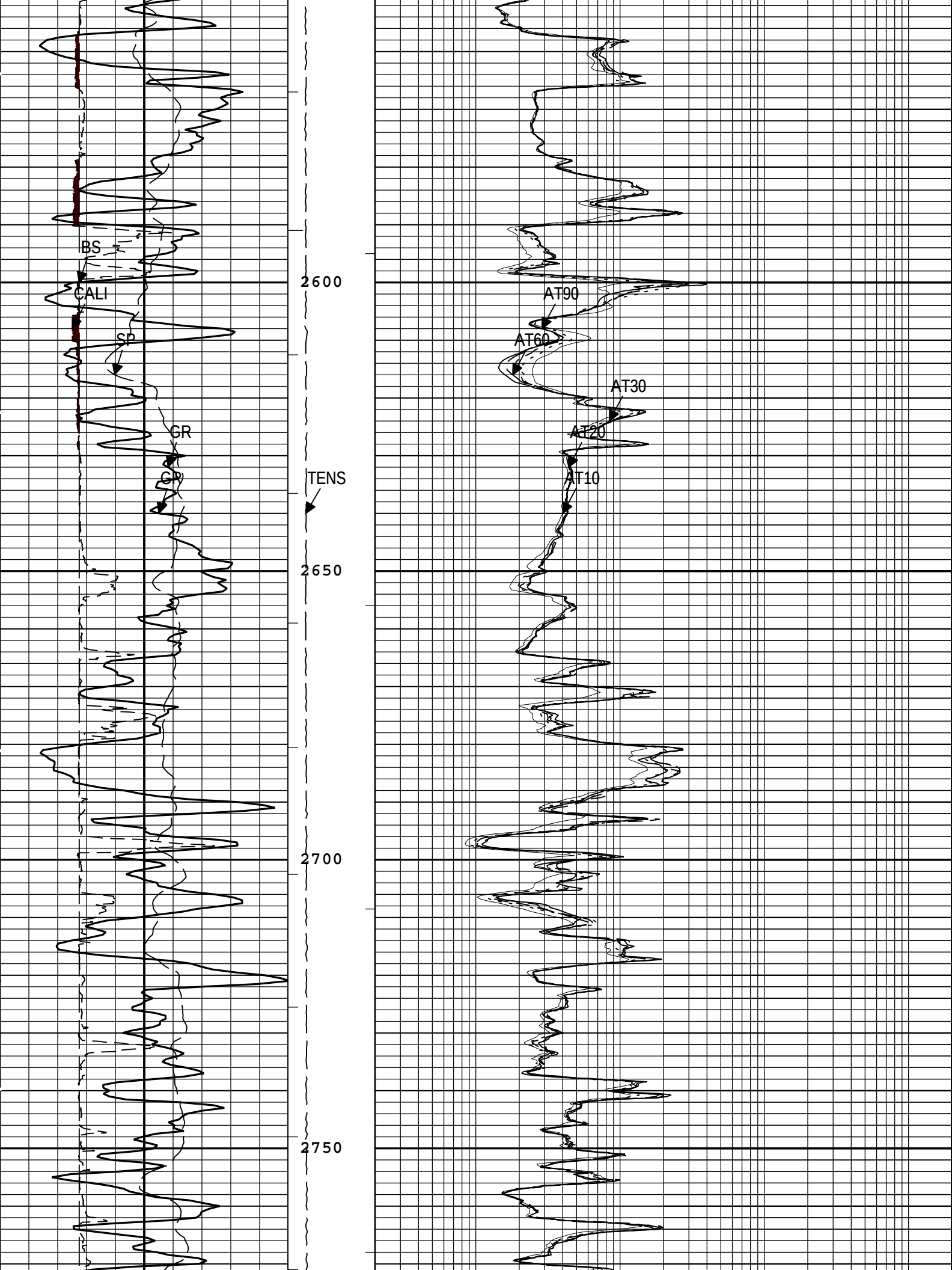
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CALI
SP
GR
GR
TENS
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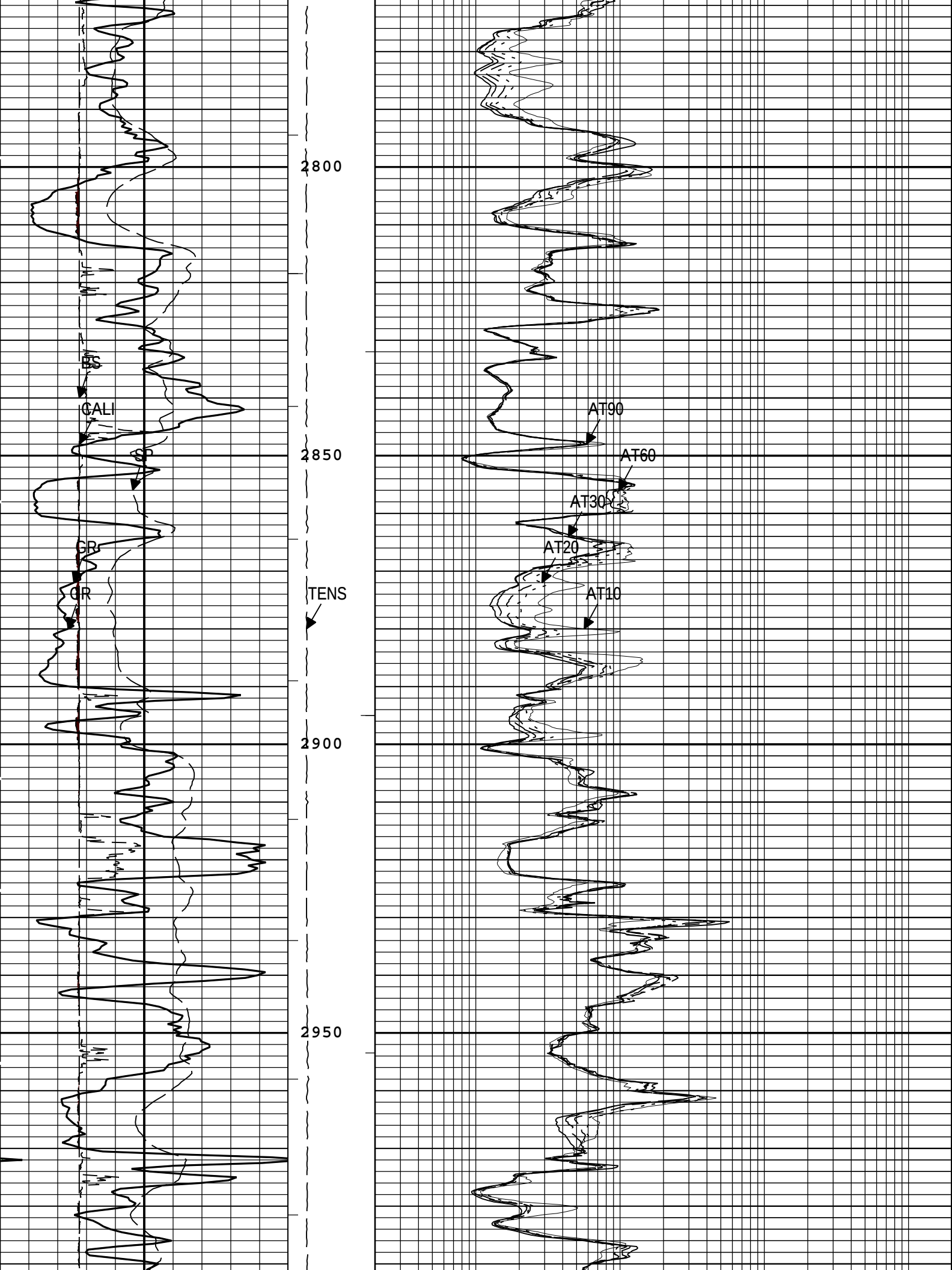
2650
2700
2750
AT90
AT60
AT30
AT20
AT10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AT30
AT20
AT10
GR
GR
TENS
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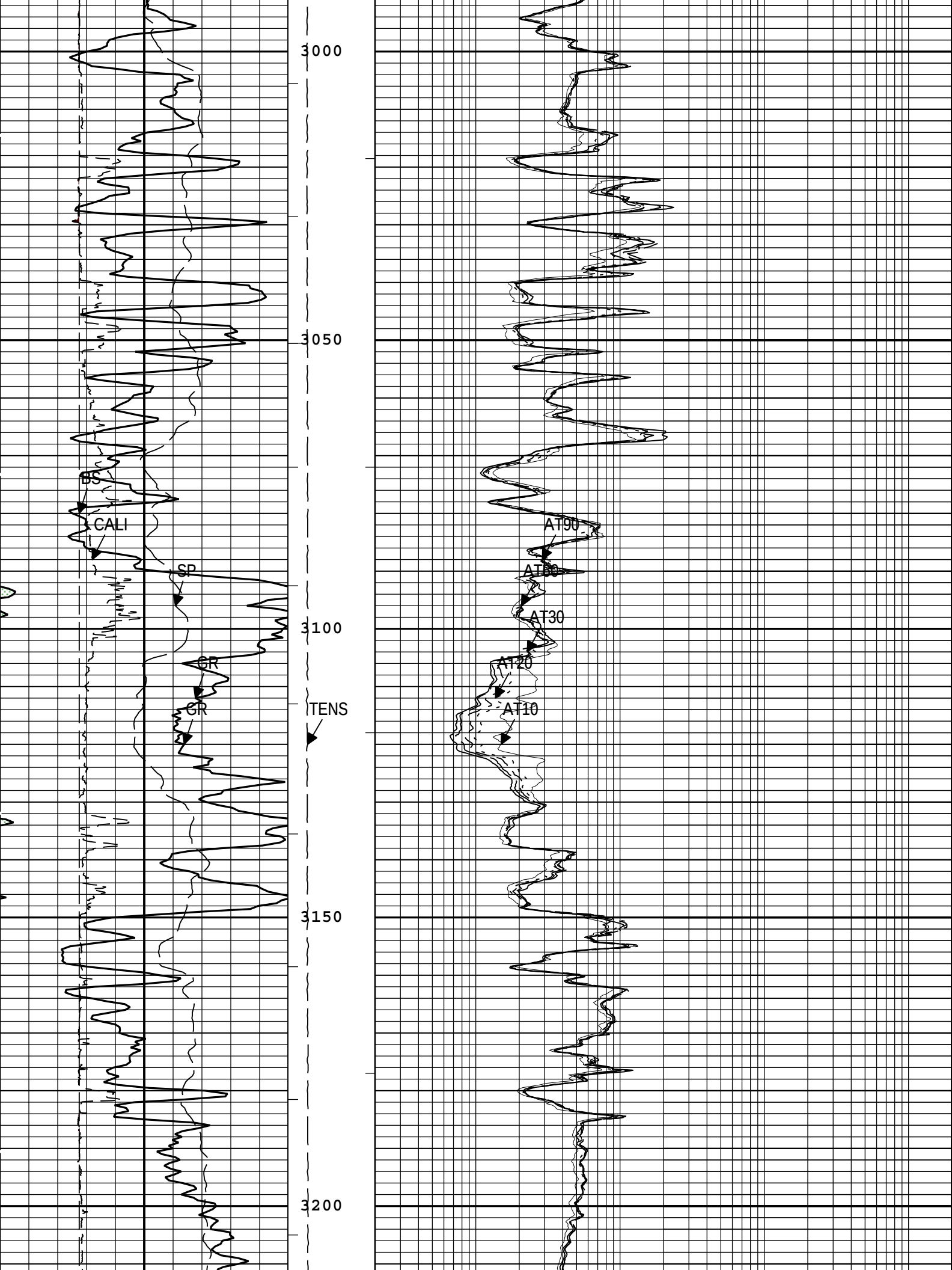
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SP
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GR
GR
TENS
AT90
AT60
AT30
AT20
AT10
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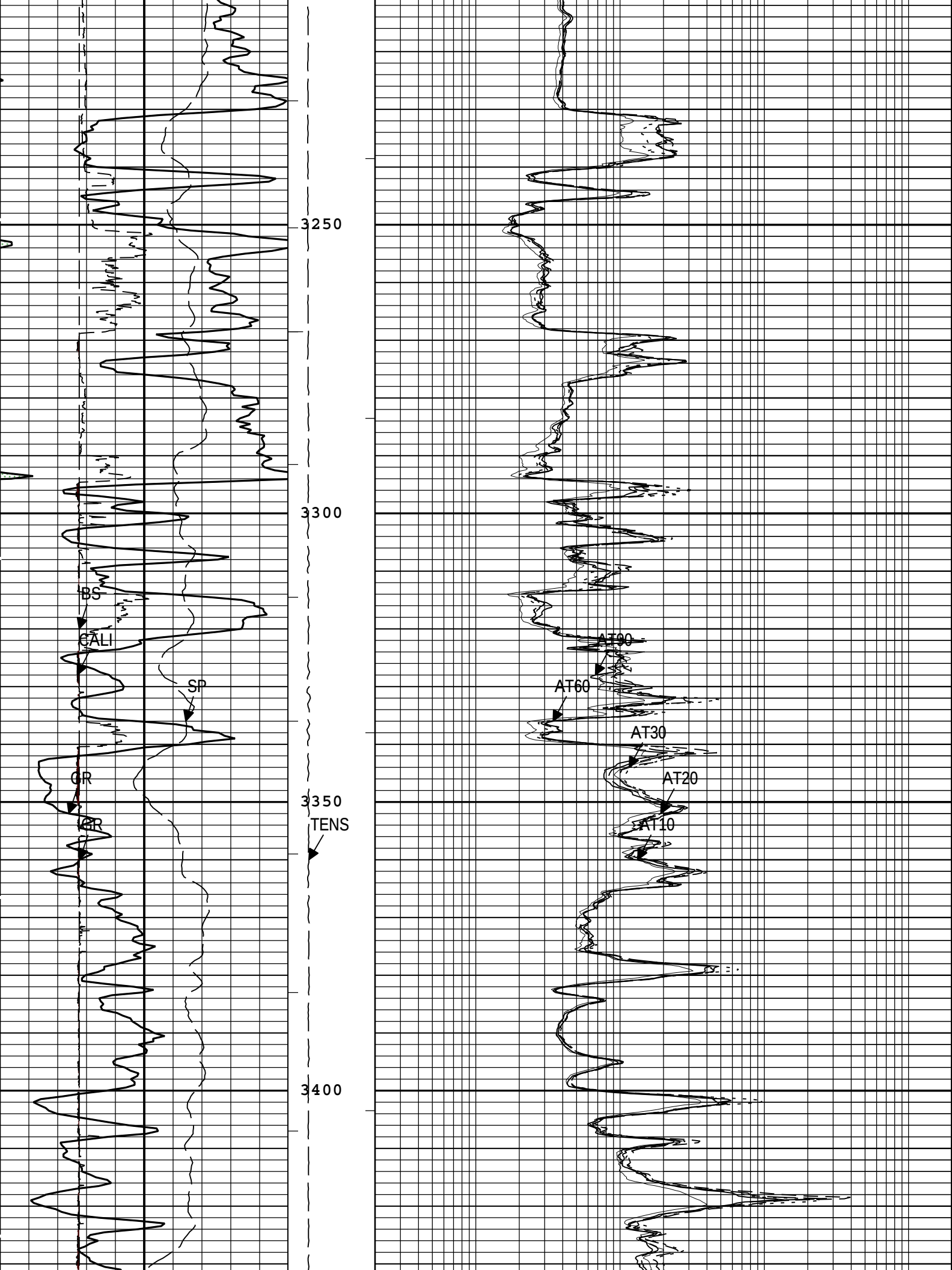
3200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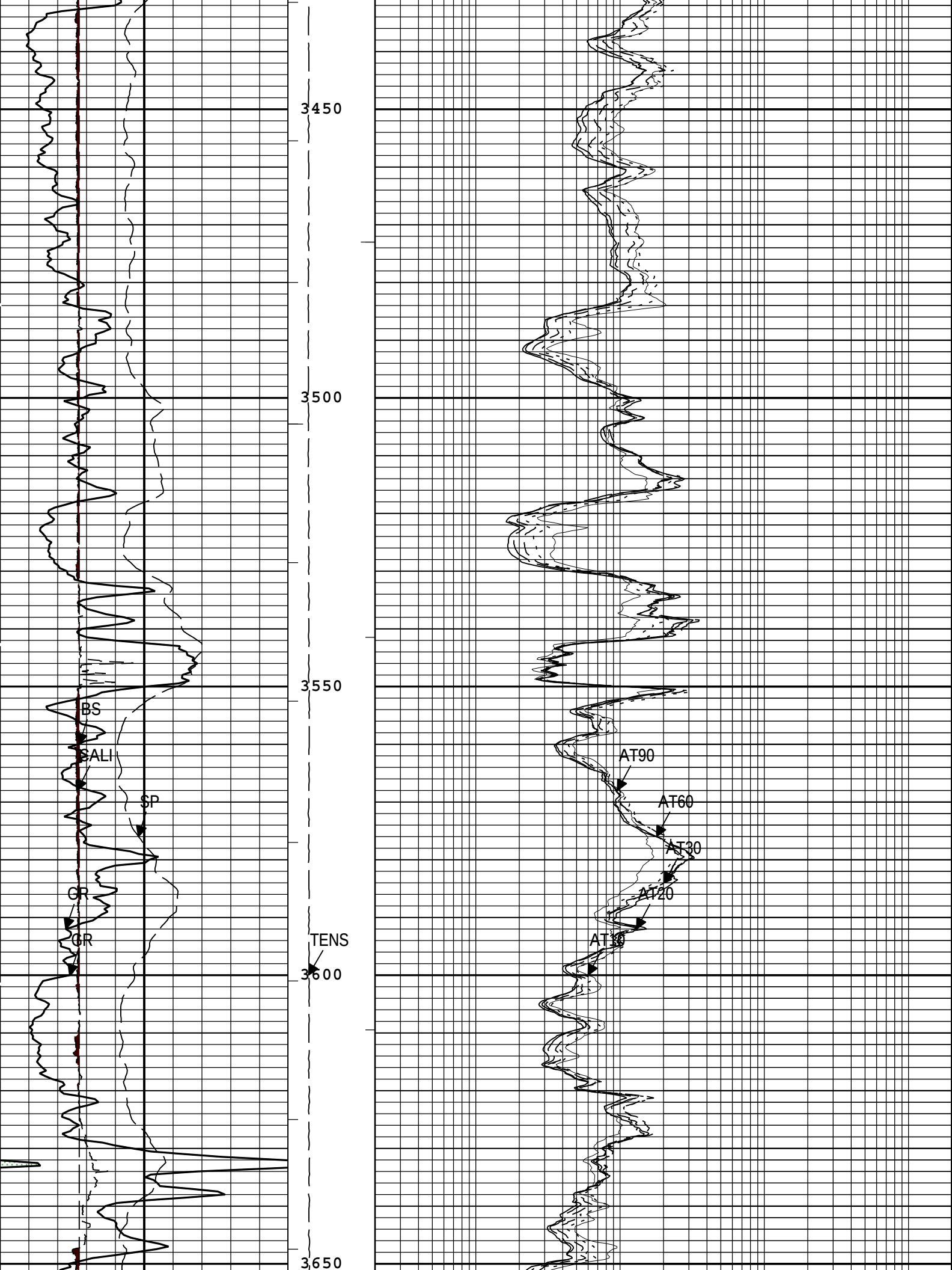
CALI
SP
GR
GR
TENS
3350
3400
AT90
AT60
AT30
AT20
AT10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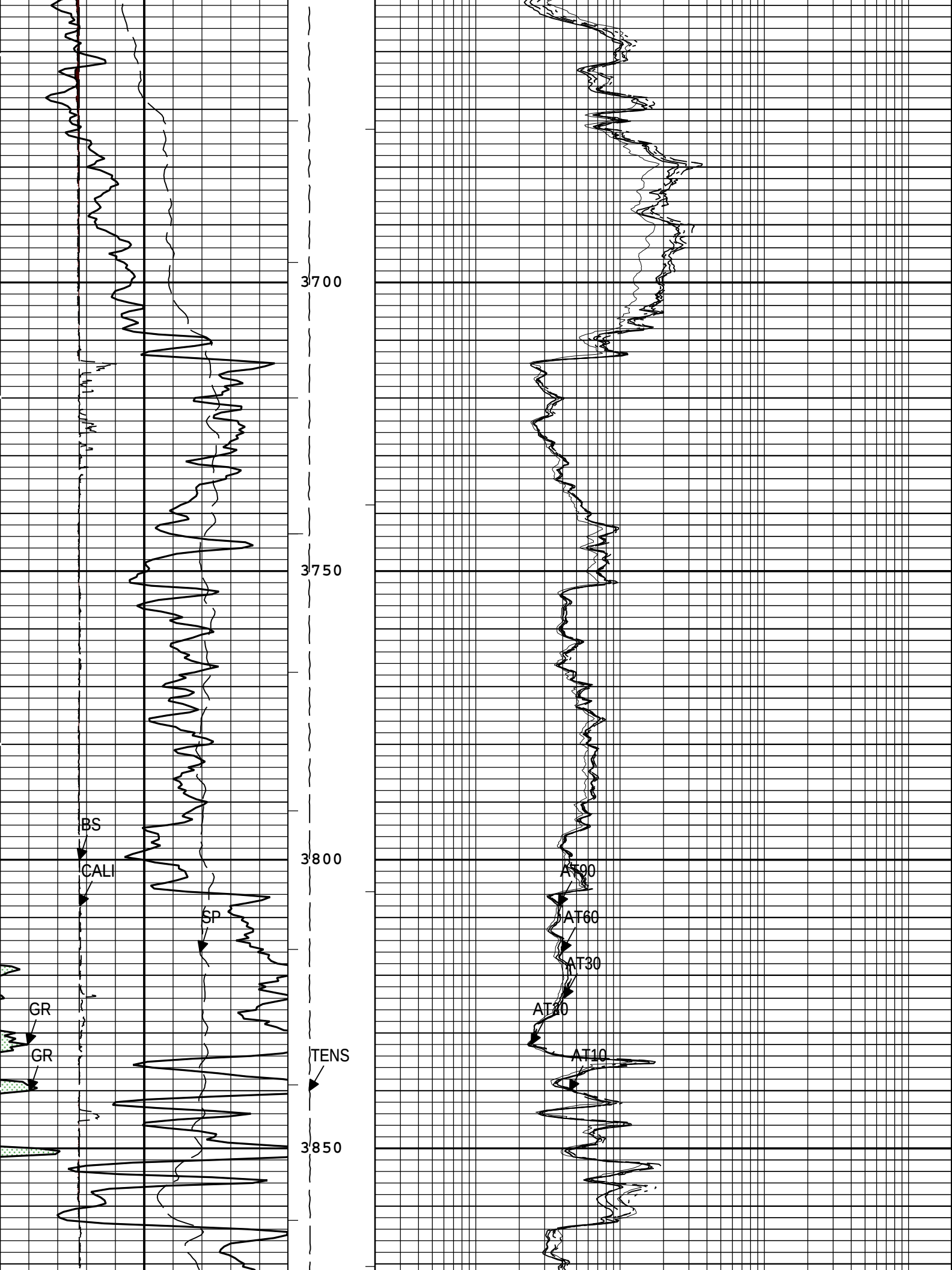
BS
SALI
SP
GR
GR
TENS
AT90
AT60
AT30
AT20
AT10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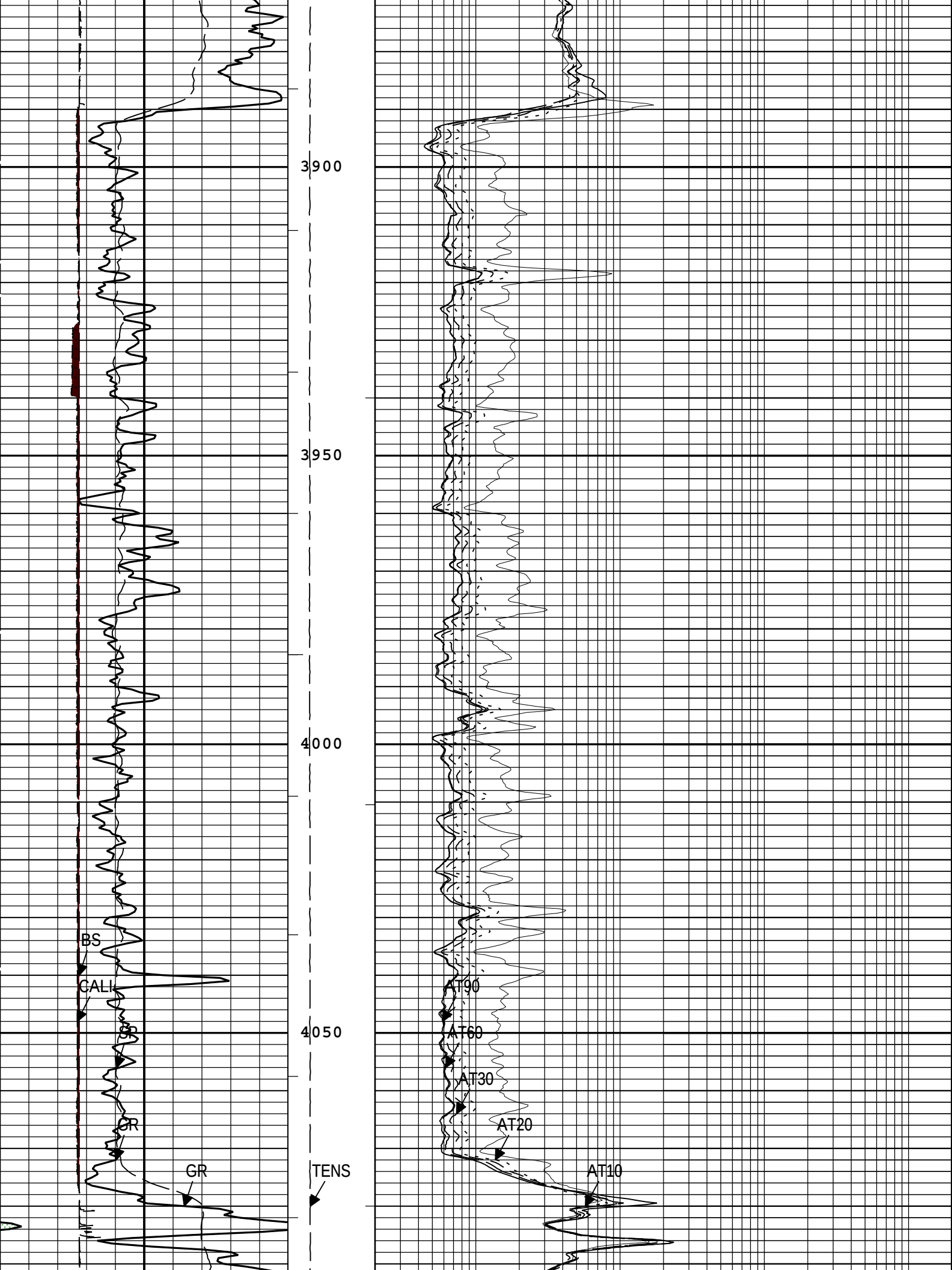
3800
3850
BS
CALI
SP
GR
GR
TENS
AT90
AT60
AT30
AT20
AT10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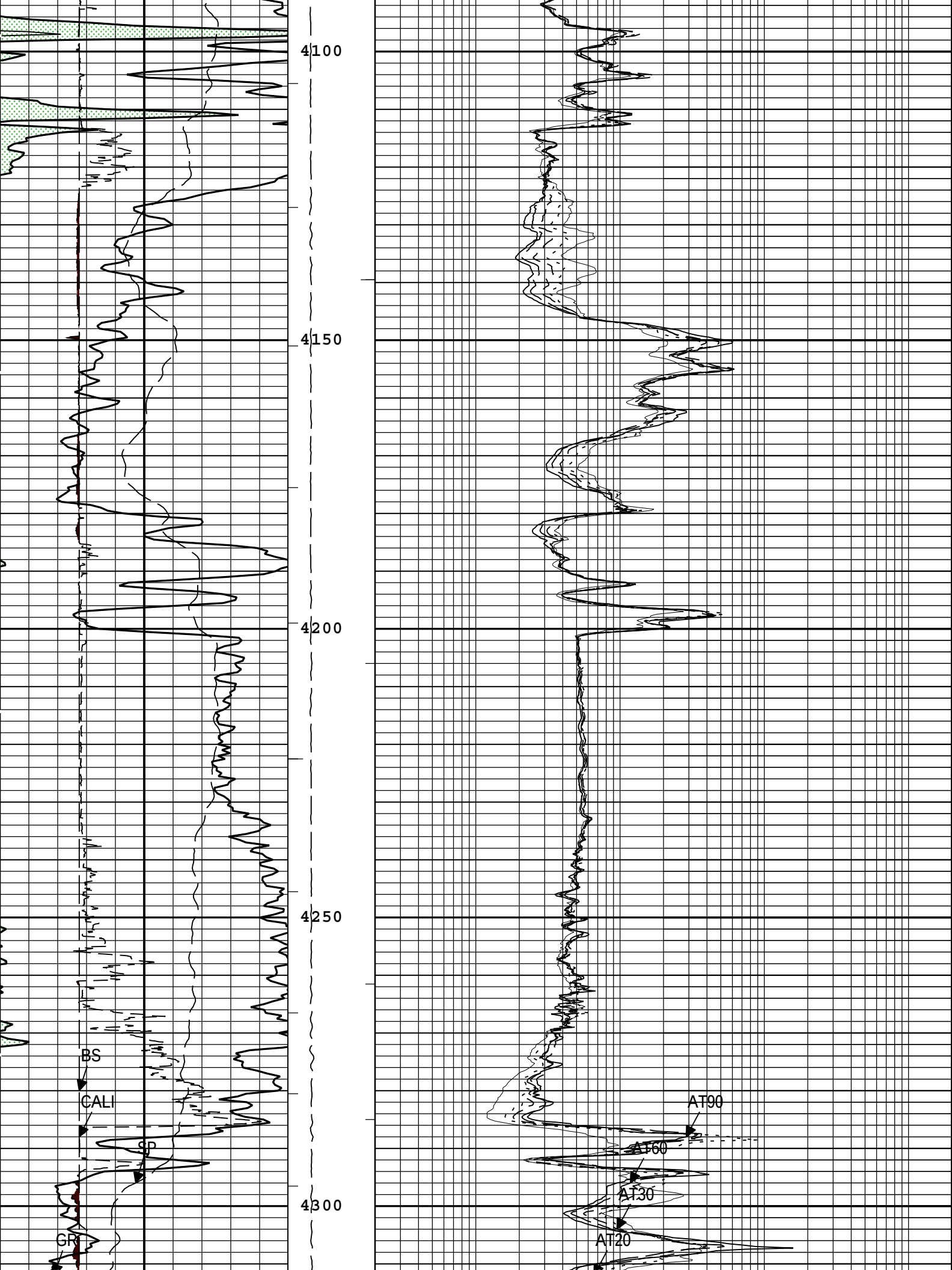
4000
4050
BS
CALI
GR
GR
GR
TENS
AT90
AT60
AT30
AT20
AT10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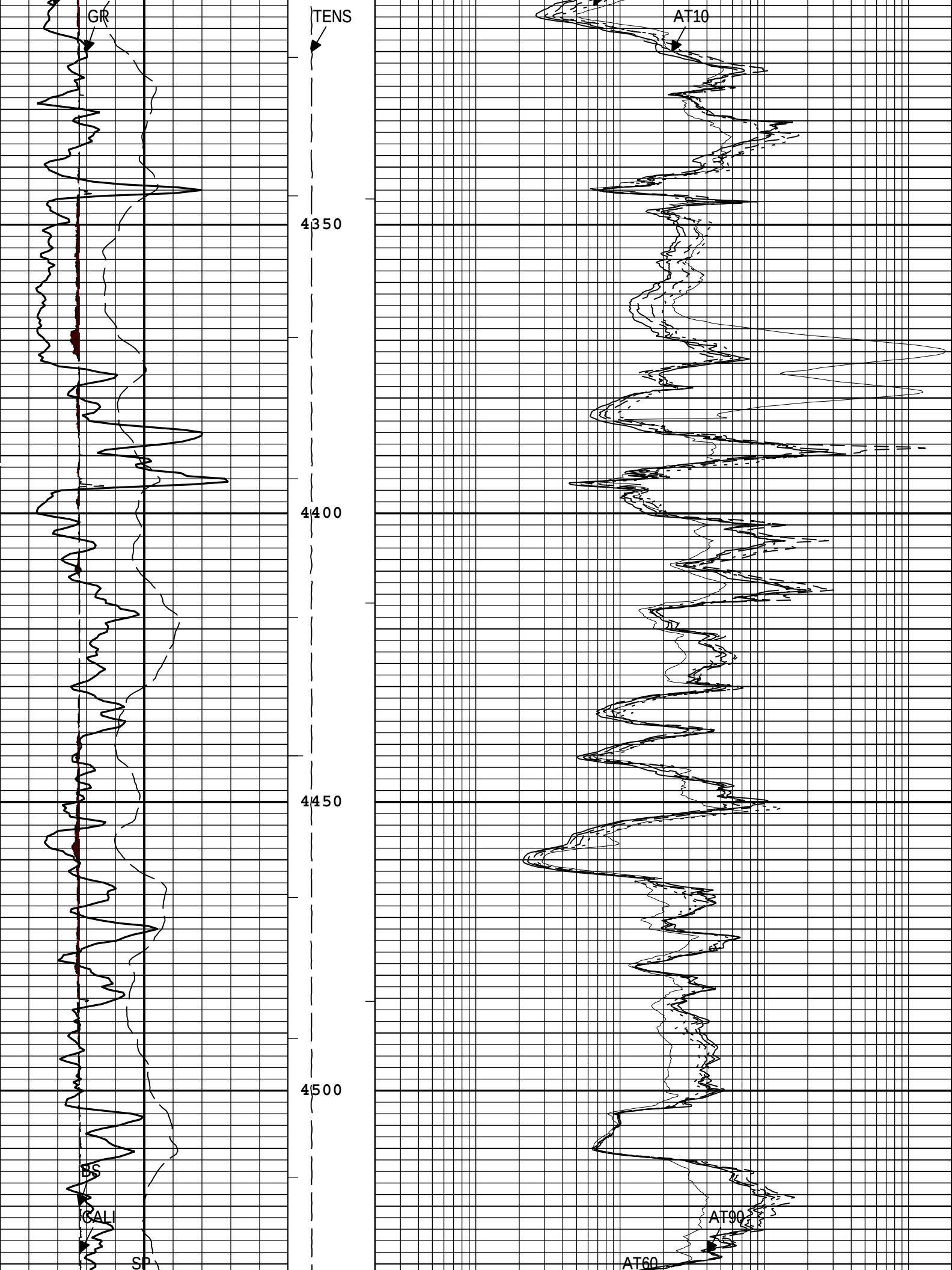
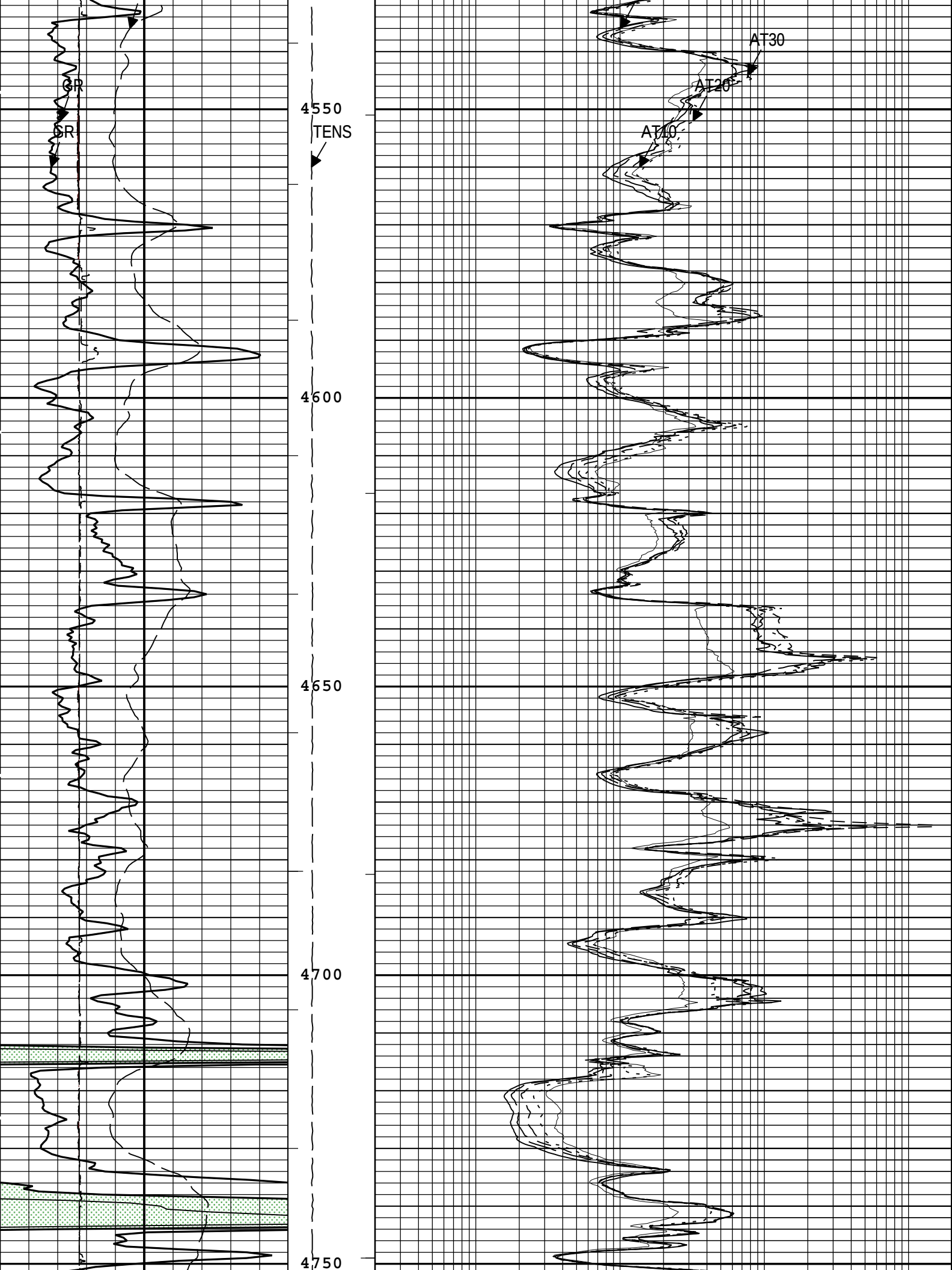
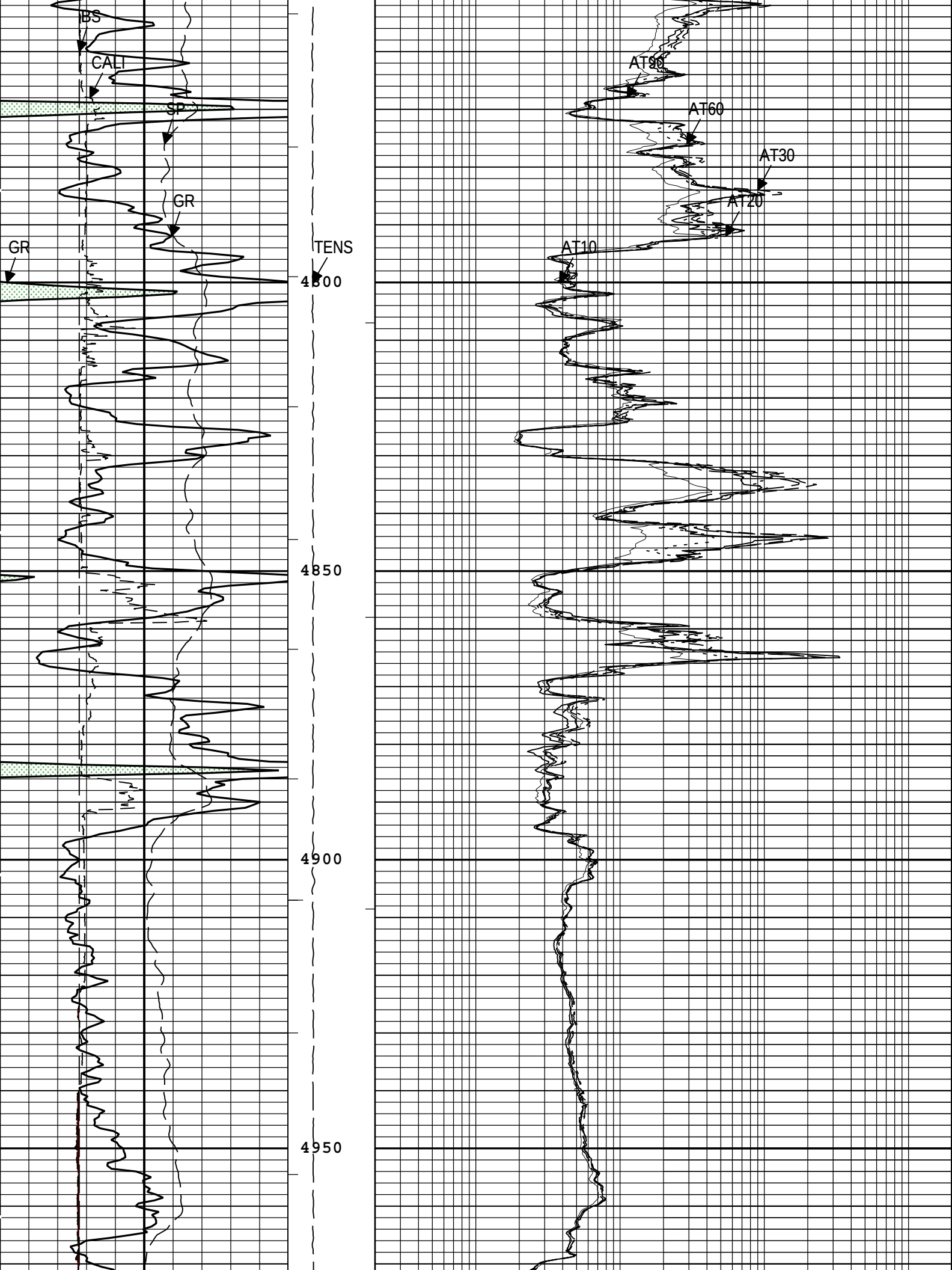
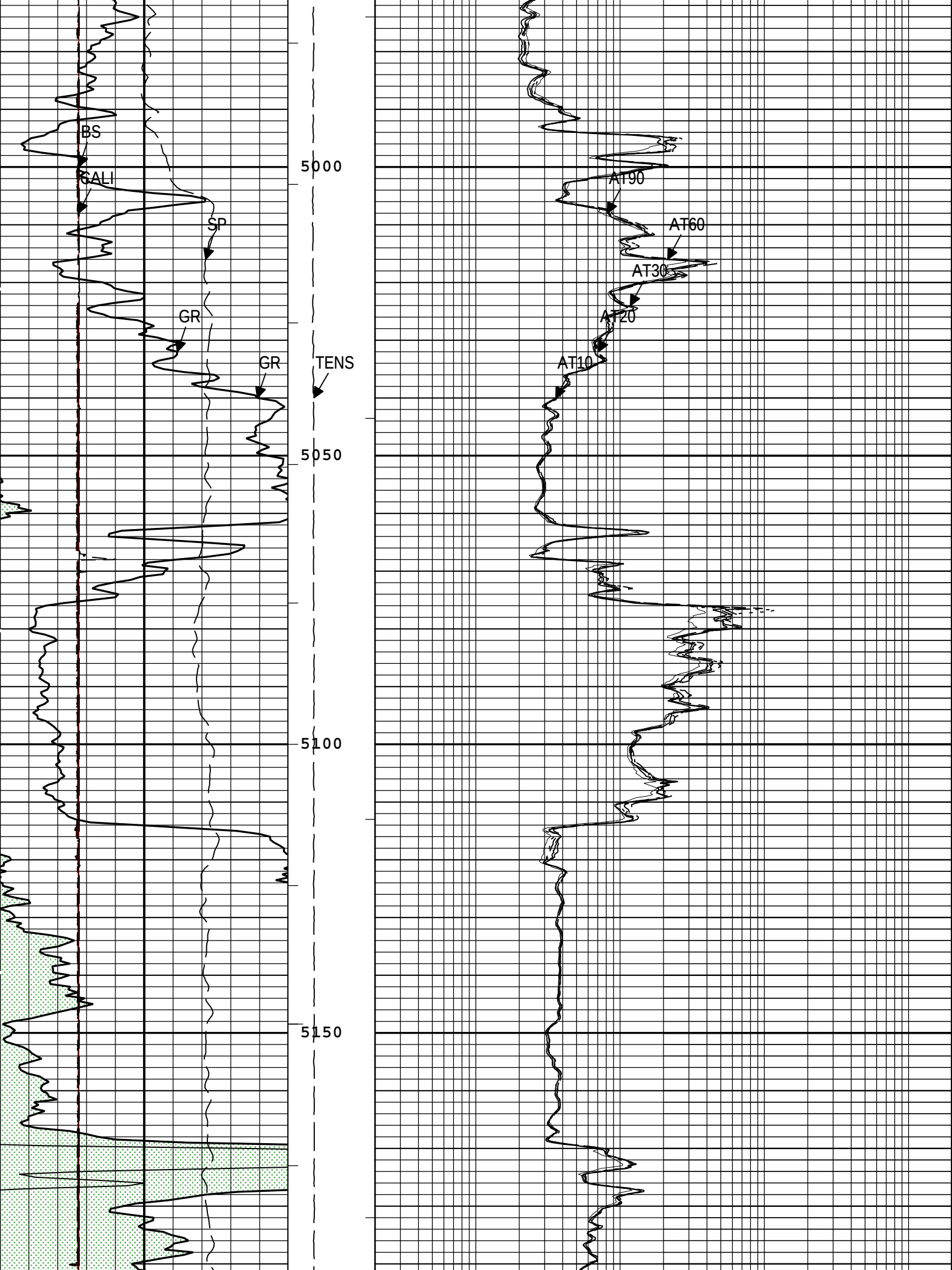
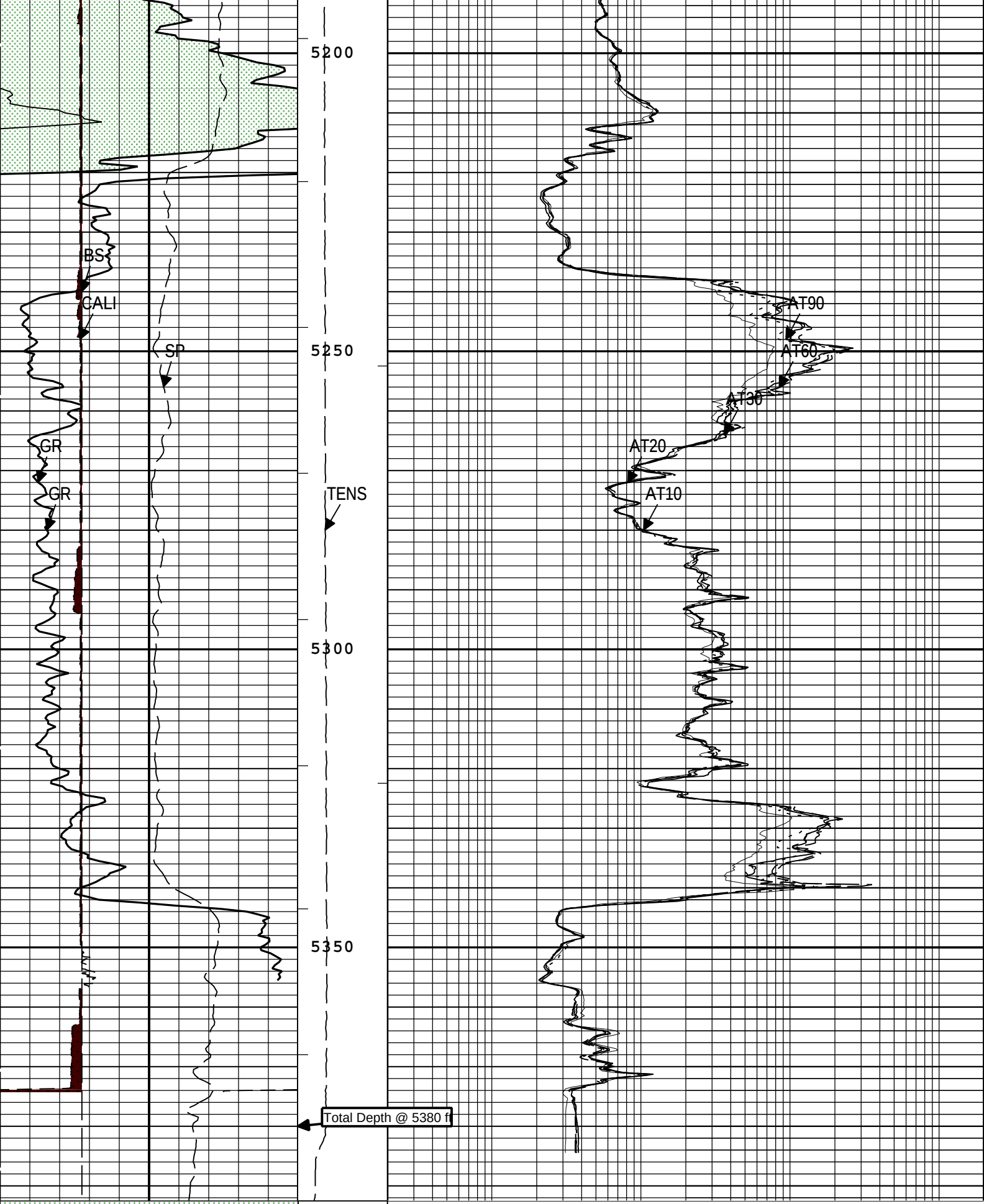
4150
4200
4250
4300
BS
CALI
SP
GR
AT90
AT60
AT30
AT20


GR
TENS
AT10
4350
4400
4450
4500
BS
CALI
SP
AT90
AT60


GR
SR
4550
TENS
AT30
AT20
AT10
4600
4650
4700
4750


BS
CALI
SP
GR
GR
TENS
AT90
AT60
AT30
AT20
AT10
4800
4850
4900
4950


BS
CALI
SP
GR
GR
TENS
AT90
AT60
AT30
AT20
AT10
5000
5050
5100
5150



BACKUP GAMMA RAY

Mudcake

Gamma Ray (GR) HGNS[1]

Cable Tension (TENS)

0 lbf 8000

Array Induction Two Foot Resistivity A10 (AT10) AIT_SpliceGroup[1]

0.2 ohm.m 2000

Array Induction Two Foot Resistivity A20 (AT20) AIT_SpliceGroup[1]

0.2 ohm.m 2000

0	gAPI	150

Spontaneous Potential (SP) AIT_SpliceGroup[1]		
-160	mV	40

Caliper (CALI) HDRS[1]		
6	in	16

Bit Size (BS)		
6	in	16

Array Induction Two Foot Resistivity A30 (AT30) AIT_SpliceGroup[1]		
0.2	ohm.m	2000

Array Induction Two Foot Resistivity A60 (AT60) AIT_SpliceGroup[1]		
0.2	ohm.m	2000

Array Induction Two Foot Resistivity A90 (AT90) AIT_SpliceGroup[1]		
0.2	ohm.m	2000

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 5 IN MUD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:55

ONE

Resistivity Repeat Pass 10" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	42.65	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	122.83	ft3

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Repeat[4]:Up	Up	4586.37 ft	5393.65 ft	04-Mar-2013 8:20:20 AM	04-Mar-2013 8:35:03 AM	1.25 ft	

All depths are referenced to toolstring zero

Log

ONE: Repeat[4]:Up

Description: AIT Basic Log Two Format: Log (AIT 5 IN MUD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:59

Channel	Source	Sampling
AT10	AIT-M:AMIS:AMIS	3in
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-B:HRCC-B:HRCC-B	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)

ICV - Integrated Cement Volume every 100.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

BACKUP GAMMA RAY

Mudcake

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-160 mV 40

Caliper (CALI) HDRS-B

6 in 16

Bit Size (BS)

6 in 16

Cable Tension (TENS)

0 lbf 8000

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

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

0.2 ohm.m 2000

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

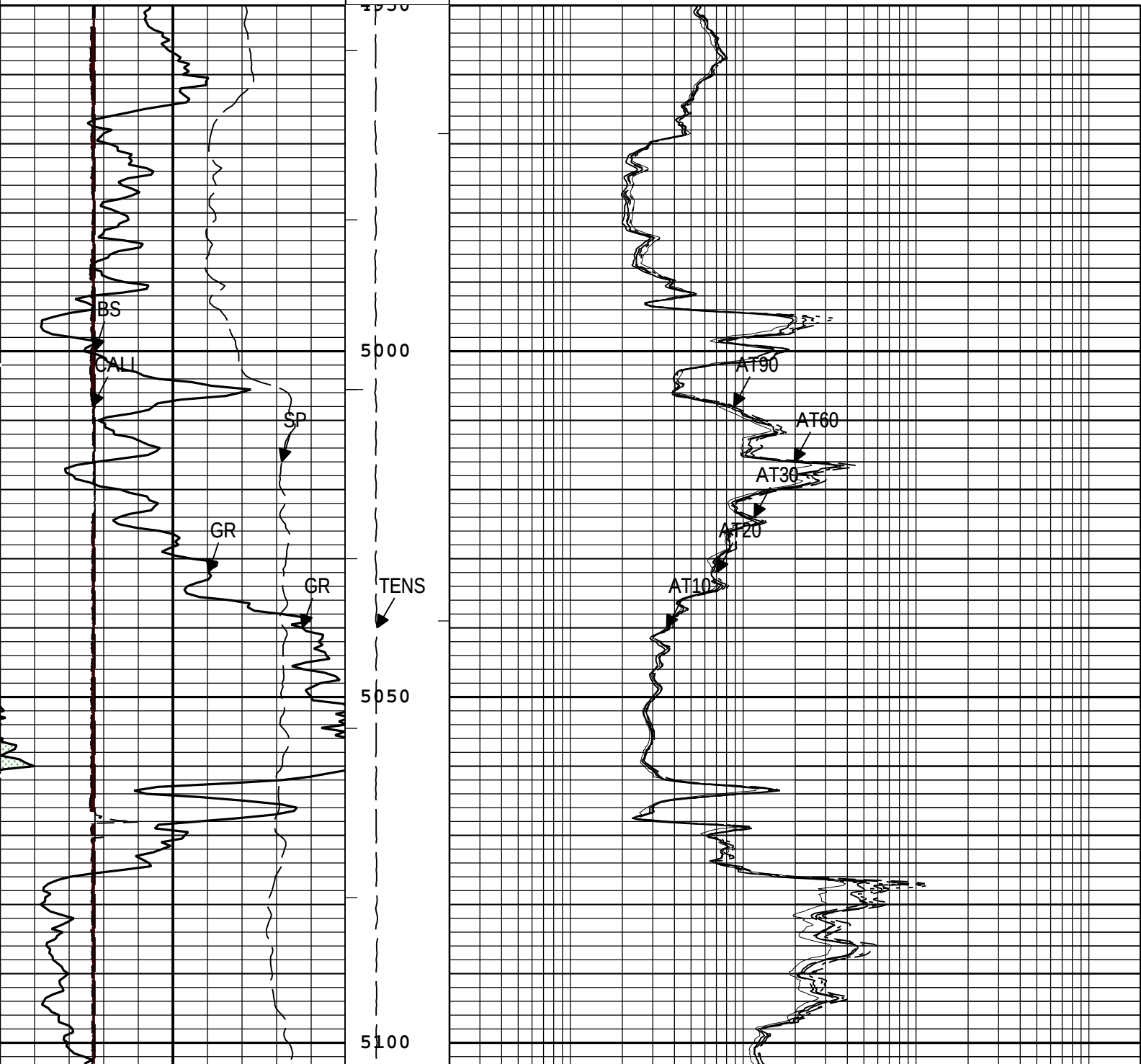
0.2 ohm.m 2000

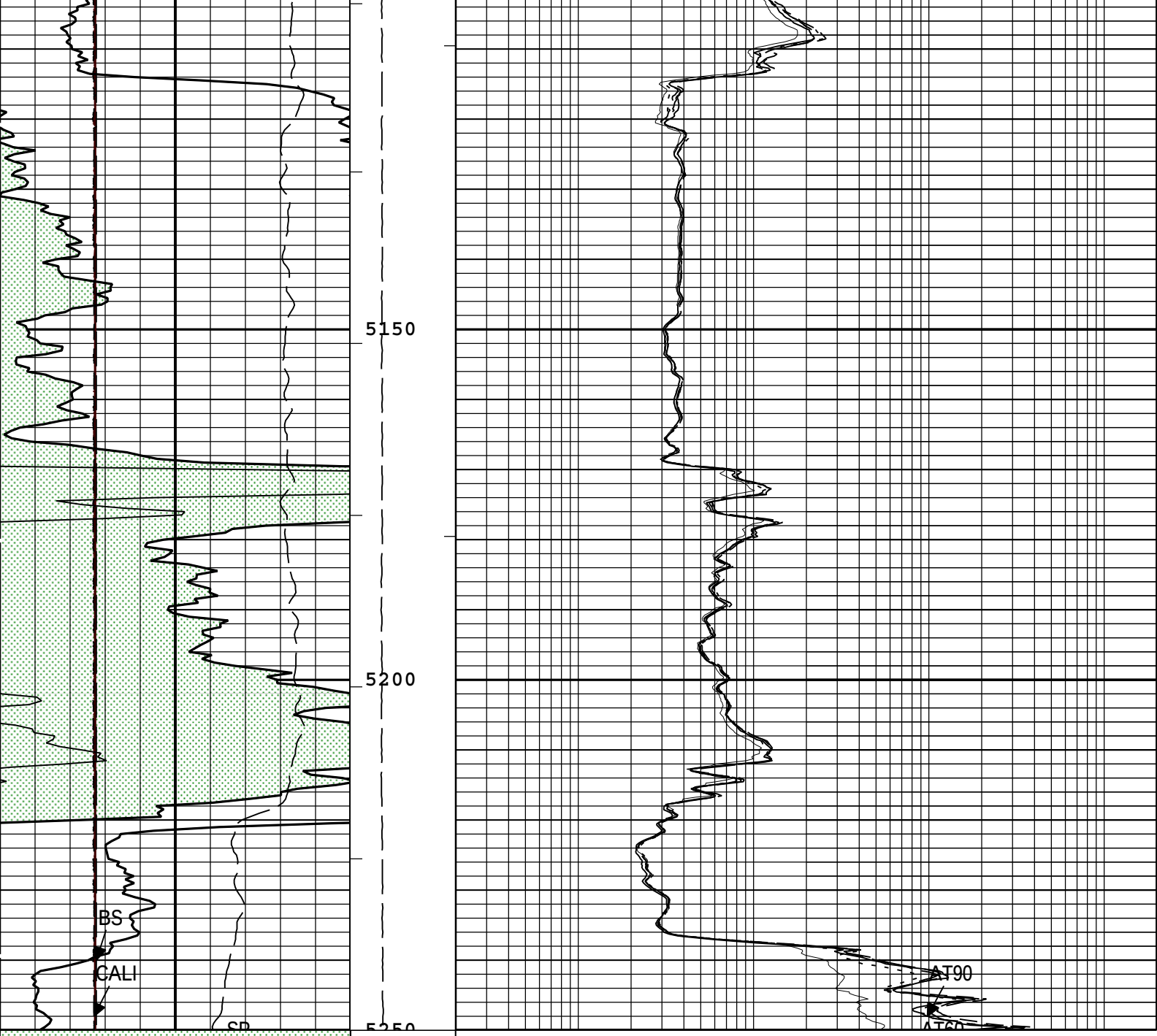
Array Induction Two Foot Resistivity A60 (AT60) AIT-M

0.2 ohm.m 2000

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

0.2 ohm.m 2000





BACKUP GAMMA RAY

Mudcake

Gamma Ray (GR) HGNS-H

0 gAPI 150

Spontaneous Potential (SP) AIT-M

-160 mV 40

Caliper (CALI) HDRS-B

6 in 16

Bit Size (BS)

6 in 16

Cable Tension (TENS)

0 lbf 8000

Array Induction Two Foot Resistivity A10 (AT10) AIT-M

0.2 ohm.m 2000

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

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 5 IN MUD) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:02:59

ONE

Resistivity Repeat Analysis

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Repeat[4]:Up	Up	4586.37 ft	5393.65 ft	04-Mar-2013 8:20:20 AM	04-Mar-2013 8:35:03 AM	1.25 ft	
ONE	Main[5]:Up	Up	2660.86 ft	5392.23 ft	04-Mar-2013 8:46:47 AM	04-Mar-2013 9:34:45 AM	0.00 ft	

All depths are referenced to toolstring zero

Log

ONE: Main[5]:Up

Description: AIT Basic Log Two Format: Log (AIT 5 IN MUD RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:03:00

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

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

Spontaneous Potential (SP) AIT-M

-160 mV 40

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

0 gAPI 150

Main To Repeat

Repeat To Main

Cable Tension (TENS)

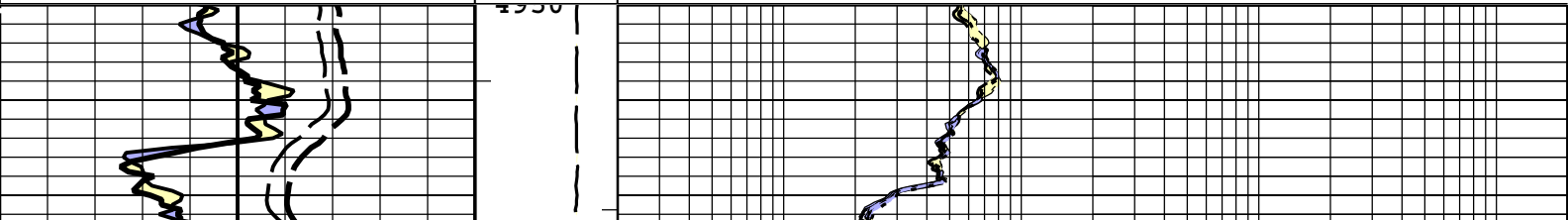
8000 lbf 0

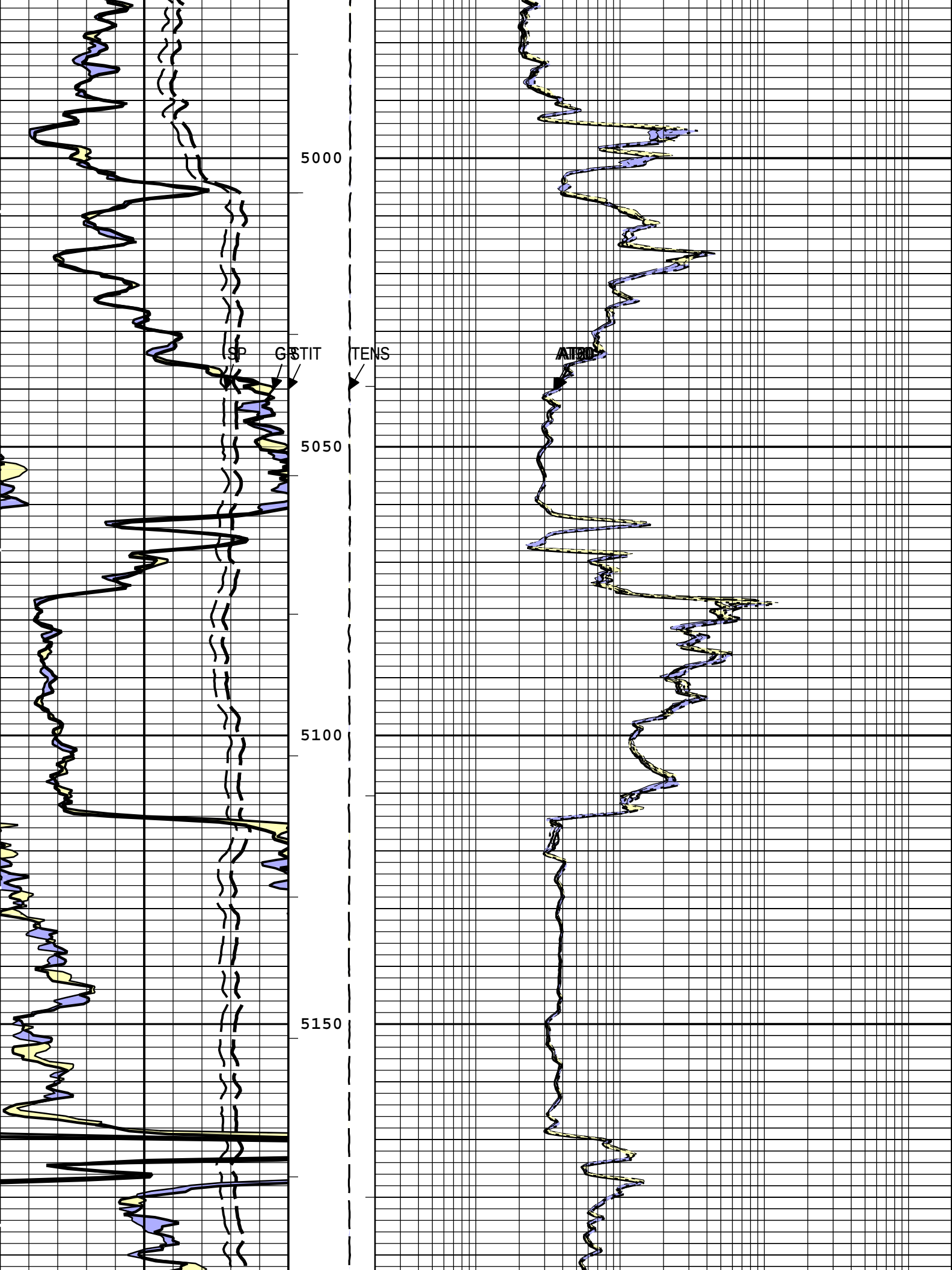
Main To Repeat

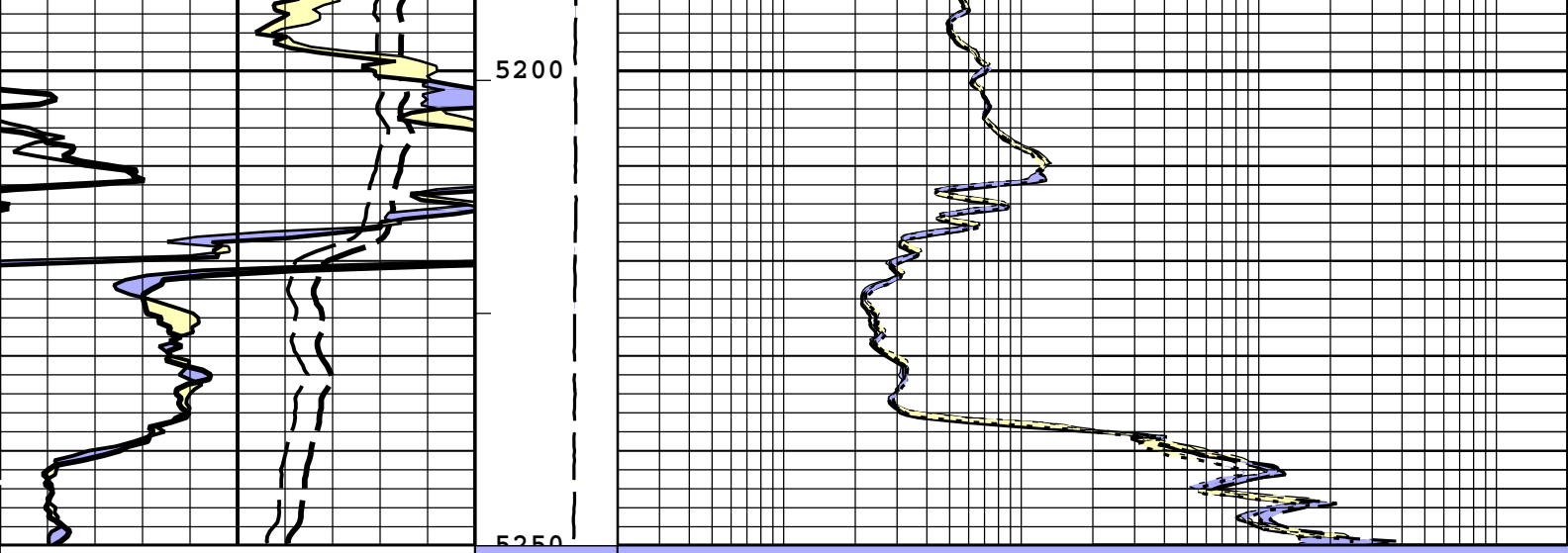
Repeat To Main

Stuck Tool Indicator, Total (STIT)

0 ft 50




5000
SP
GR
TENS
ATR90
5050
5100
5150



Main To Repeat

Repeat To Main

Spontaneous Potential (SP) AIT-M

-160 mV 40

Main To Repeat

Repeat To Main

Gamma Ray (GR) HGNS-H

0 gAPI 150

Main To Repeat

Repeat To Main

Cable Tension (TENS)

8000 lbf 0

Main To Repeat

Repeat To Main

Stuck Tool Indicator, Total (STIT)

0 ft 50

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

Main To Repeat

Repeat To Main

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

0.2 ohm.m 2000

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 5 IN MUD RA) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:03:00

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

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 14:57:01 17-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Test Loop Gain - 0		Master	1.000	0.950	1.008	1.050
Test Loop Phase - 0	deg	Master	0	-3.000	0.535	3.000
Test Loop Gain - 1		Master	1.000	0.950	1.007	1.050
Test Loop Phase - 1	deg	Master	0	-3.000	0.599	3.000
Test Loop Gain - 2		Master	1.000	0.950	1.010	1.050
Test Loop Phase - 2	deg	Master	0	-3.000	0.311	3.000
Test Loop Gain - 3		Master	1.000	0.950	1.002	1.050
Test Loop Phase - 3	deg	Master	0	-3.000	0.134	3.000
Test Loop Gain - 4		Master	1.000	0.950	0.989	1.050
Test Loop Phase - 4	deg	Master	0	-3.000	0.016	3.000
Test Loop Gain - 5		Master	1.000	0.950	0.986	1.050
Test Loop Phase - 5	deg	Master	0	-3.000	-0.155	3.000
Test Loop Gain - 6		Master	1.000	0.950	0.993	1.050
Test Loop Phase - 6	deg	Master	0	-3.000	-0.111	3.000
Test Loop Gain - 7		Master	1.000	0.950	1.011	1.050
Test Loop Phase - 7	deg	Master	0	-3.000	0.498	3.000

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 14:57:01 17-Jan-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-100.308	119.000
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-140.764	2250.000
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	152.820	204.000
Sonde Error Correction Quad - 1		Master	-----	-625.000	166.215	625.000
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	105.444	156.000
Sonde Error Correction Quad - 2		Master	-----	-350.000	-62.807	350.000
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	59.507	89.000
Sonde Error Correction Quad - 3		Master	-----	-250.000	87.865	250.000
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	25.021	35.000
Sonde Error Correction Quad - 4		Master	-----	-63.000	49.198	63.000
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	12.667	24.000
Sonde Error Correction Quad - 5		Master	-----	-50.000	-24.105	50.000
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.260	15.000
Sonde Error Correction Quad - 6		Master	-----	-30.000	1.445	30.000
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.975	5.000
Sonde Error Correction Quad - 7		Master	-----	-30.000	-0.225	30.000

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 14:57:01 17-Jan-2013

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): 14:57:01 17-Jan-2013 Before (Measured): 11:17:25 03-Mar-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Thru Cal Mag - 0	V	Master	-----	0.366	0.597	0.854
		Before	-----	0.366	0.596	0.854
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 0	deg	Master	-----	137.000	-170.235	-103.000
		Before	-----	137.000	-164.815	-103.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.420	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 1	V	Master	-----	0.762	1.223	1.778
		Before	-----	0.762	1.222	1.778
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 1	deg	Master	-----	136.000	-171.311	-104.000
		Before	-----	136.000	-165.887	-104.000
		After	-----	-----	-----	-----

		Before-Master	-----	-----	5.424	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 2	V	Master	-----	0.372	0.607	0.868
		Before	-----	0.372	0.606	0.868
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 2	deg	Master	-----	132.000	-174.847	-108.000
		Before	-----	132.000	-169.425	-108.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.422	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 3	V	Master	-----	0.420	0.685	0.980
		Before	-----	0.420	0.684	0.980
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 3	deg	Master	-----	131.000	-175.601	-109.000
		Before	-----	131.000	-170.177	-109.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	5.424	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 4	V	Master	-----	0.804	1.281	1.876
		Before	-----	0.804	1.280	1.876
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 4	deg	Master	-----	125.000	178.297	-115.000
		Before	-----	125.000	-176.279	-115.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.576	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 5	V	Master	-----	1.176	1.864	2.744
		Before	-----	1.176	1.863	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 5	deg	Master	-----	122.000	176.701	-118.000
		Before	-----	122.000	-177.873	-118.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.574	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 6	V	Master	-----	1.176	1.866	2.744
		Before	-----	1.176	1.864	2.744
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.002	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 6	deg	Master	-----	121.000	176.683	-119.000
		Before	-----	121.000	-177.889	-119.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.572	-----
		After-Before	-----	-----	-----	-----
Thru Cal Mag - 7	V	Master	-----	0.846	1.341	1.974
		Before	-----	0.846	1.340	1.974
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.001	-----
		After-Before	-----	-----	-----	-----
Thru Cal Phase - 7	deg	Master	-----	115.000	176.017	-125.000
		Before	-----	115.000	-178.524	-125.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-354.541	-----
		After-Before	-----	-----	-----	-----
SPA Zero	mV	Master		-50.000	-0.410	50.000
		Before		-50.000	-0.433	50.000
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-0.023	-----
		After-Before	-----	-----	-----	-----
SPA Plus	mV	Master		941.000	991.327	1040.000

		Before		941.000	991.210	1040.000	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.117	-----	
		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-B (HILT Density and Rxo Sonde, 125 degC) Calibration - Run ONE

Primary Equipment :

HILT High-Resolution Control Cartridge, 125 degC	HRCC-B	835
HILT Resistivity Gamma-Ray Density Device, 125 degC	HRGD-B	1732

Auxiliary Equipment :

HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5398
HILT High-Resolution Control Cartridge, 125 degC	HRCC-B	835
HILT High-Resolution Mechanical Sonde, 125 degC	HRMS-B	

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): 11:21:18 03-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Small Ring	in	Before	8.00	6.00	8.37	10.00
Large Ring	in	Before	12.00	9.00	12.53	15.00

HDRS Density Calibration - Inversion Results

Master (EEPROM): 17:24:00 18-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Rho Aluminum	g/cm3	Master	2.596	2.586	2.599	2.606
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696
Pe Aluminum		Master	2.570	2.470	2.567	2.670
Pe Magnesium		Master	2.650	2.550	2.635	2.750

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 17:24:00 18-Feb-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Average Deviation	%	Master	0	-0.6000	0.2382	0.6000
BS Max Deviation	%	Master	0	-1.6000	0.5762	1.6000
SS Average Deviation	%	Master	0	-1.0000	0.2679	1.0000
SS Max Deviation	%	Master	0	-2.5000	0.9505	2.5000
LS Average Deviation	%	Master	0	-1.5000	0.5151	1.5000
LS Max Deviation	%	Master	0	-3.5000	1.3331	3.5000

HDRS Density Calibration - Background Summary

Master (EEPROM): 17:24:00 18-Feb-2013 Before (Measured): 11:23:39 03-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Window Ratio		Master	1.0000		0.7383	
		Before	0.7383	0.7014	0.7385	0.7752
		Before-Master	-----	-----	0.0002	-----
BS Window Sum	1/s	Master	1		8949	
		Before	8949	8502	8947	9397
		Before-Master	-----	-----	-2	-----

SS Window Ratio		Master	1.0000		0.4913	
		Before	0.4913	0.4667	0.4909	0.5159
		Before-Master	-----	-----	-0.0004	-----
SS Window Sum	1/s	Master	1		9056	
		Before	9056	8603	9042	9509
		Before-Master	-----	-----	-14	-----
LS Window Ratio		Master	1.0000		0.2908	
		Before	0.2908	0.2762	0.2882	0.3053
		Before-Master	-----	-----	-0.0026	-----
LS Window Sum	1/s	Master	1		960	
		Before	960	912	948	1008
		Before-Master	-----	-----	-12	-----

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 17:24:00 18-Feb-2013 Before (Measured): 11:23:39 03-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS PM High Voltage	V	Master		1000	1706	2400
		Before		1000	1735	2400
		Before-Master	-----	-100	29	100
SS PM High Voltage	V	Master		1000	1868	2400
		Before		1000	1886	2400
		Before-Master	-----	-100	18	100
LS PM High Voltage	V	Master		1000	1476	2400
		Before		1000	1484	2400
		Before-Master	-----	-100	8	100

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM): 17:24:00 18-Feb-2013 Before (Measured): 11:23:39 03-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
BS Crystal Resolution	%	Master		5.00	10.89	25.00
		Before		5.00	10.89	25.00
		Before-Master	-----	-1.00	0.00	1.00
SS Crystal Resolution	%	Master		5.00	10.67	20.00
		Before		5.00	10.78	20.00
		Before-Master	-----	-1.00	0.11	1.00
LS Crystal Resolution	%	Master		5.00	10.04	20.00
		Before		5.00	9.97	20.00
		Before-Master	-----	-1.00	-0.07	1.00

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured): 06:54:26 04-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Main Resistivity	ohm.m	Before	3875	3565	3853	4185
Deep Resistivity	ohm.m	Before	3830	3524	3793	4136
Shallow Resistivity	ohm.m	Before	3830	3524	3803	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	

Auxiliary Equipment :

HGNS Accelerometer, 150 degC	HACCZ-H	3574
AmBe Neutron Logging Source	NSR-F	5219

Calibration Parameter :

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

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 06:53:53 04-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.0	32.8

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Feb-2005

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	-----	-----	5116.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	14.873	-----
Accelerometer Coefficients - 2		Master	-----	-----	0.003	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.729	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	298.500	-----
Accelerometer Coefficients - 9		Master	-----	-----	1.005	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 19:23:08 12-Dec-2012 Before (Measured): 11:14:47 03-Mar-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	27.0	40.0
		Before	0	5.0	28.9	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.1	1.9	4.1
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	27.8	40.0
		Before	0	5.0	27.1	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.2	-0.7	4.2
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4812.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	1971.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	4848.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	1983.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 11:18:37 03-Mar-2013 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	25.5	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	179.8	152.4	157.1	200.0
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	1.02	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): 11:13:33 03-Mar-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Caliper Small Ring Measurement	in	Before	8.000	4.000	6.309	12.000
Caliper Large Ring Measurement	in	Before	12.000	6.000	10.398	18.000
Caliper Gain		Before			0.978	
Caliper Offset	in	Before			1.827	

Electrical Calibration - Microlog Calibration

Before (Measured): 11:10:30 03-Mar-2013 After:

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	8.675	10.720
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
Micro Normal Gain		Before			0.775	
		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	6.615	9.000
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
Micro Inverse Gain		Before			0.756	
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
Micro Inverse Offset	ohm.m	Before			0.000	
		After			NOT DONE	
		After-Before	-----	-----	-----	-----

ONE

Resistivity Main Pass 1" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
ONE	Main[7]:Up	Up	48.78 ft	5392.63 ft	04-Mar-2013 10:04:27 AM	04-Mar-2013 11:40:41 AM	1.44 ft	

All depths are referenced to toolstring zero

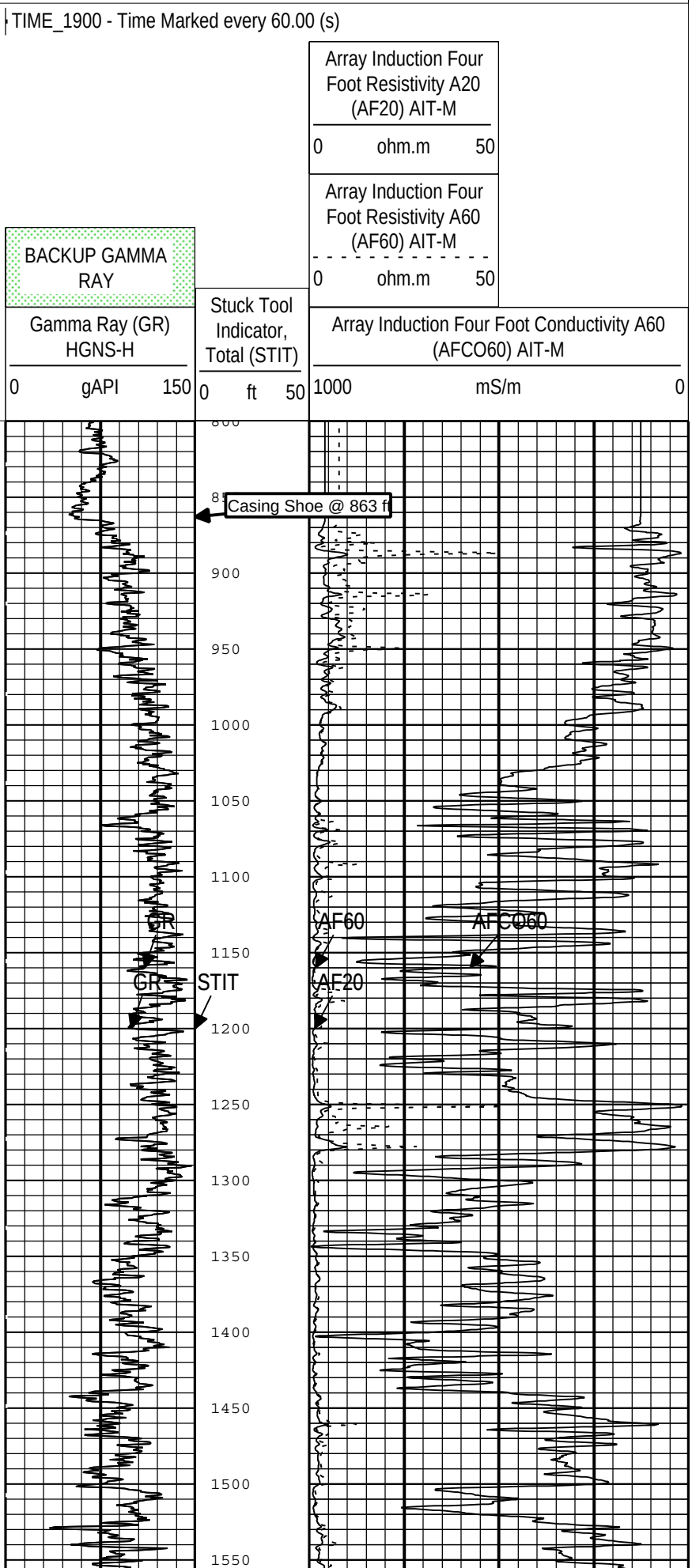
Log

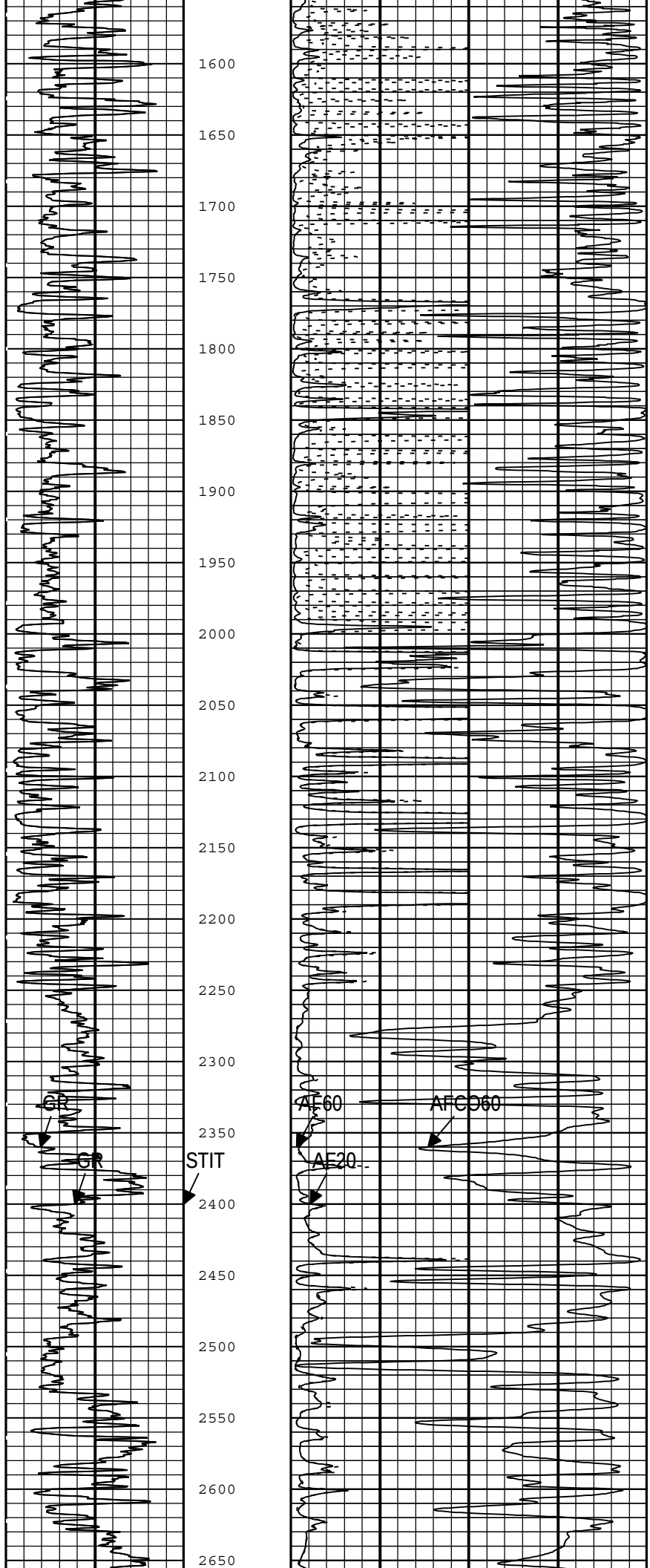
ONE: Main[7]:Up

Description: Format: Log (RILEY MUD) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:03:14

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
STIT	DepthCorrection	6in
TIME_1900	WLWorkflow	0.1in

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1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150
2200
2250
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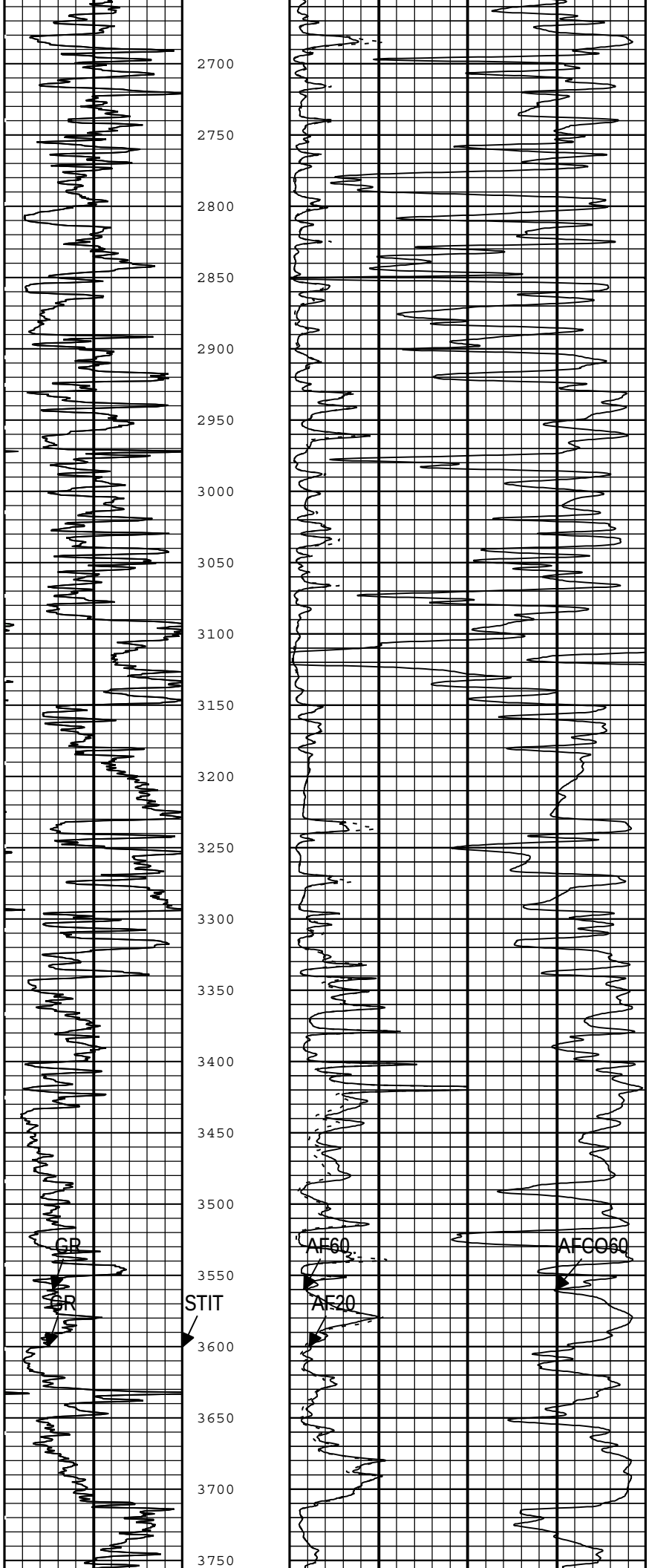
2350
2400
2450
2500
2550
2600
2650
GR
GR
STIT
AF60
AFCO60
AF20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2750
2800
2850
2900
2950
3000
3050
3100
3150
3200
3250
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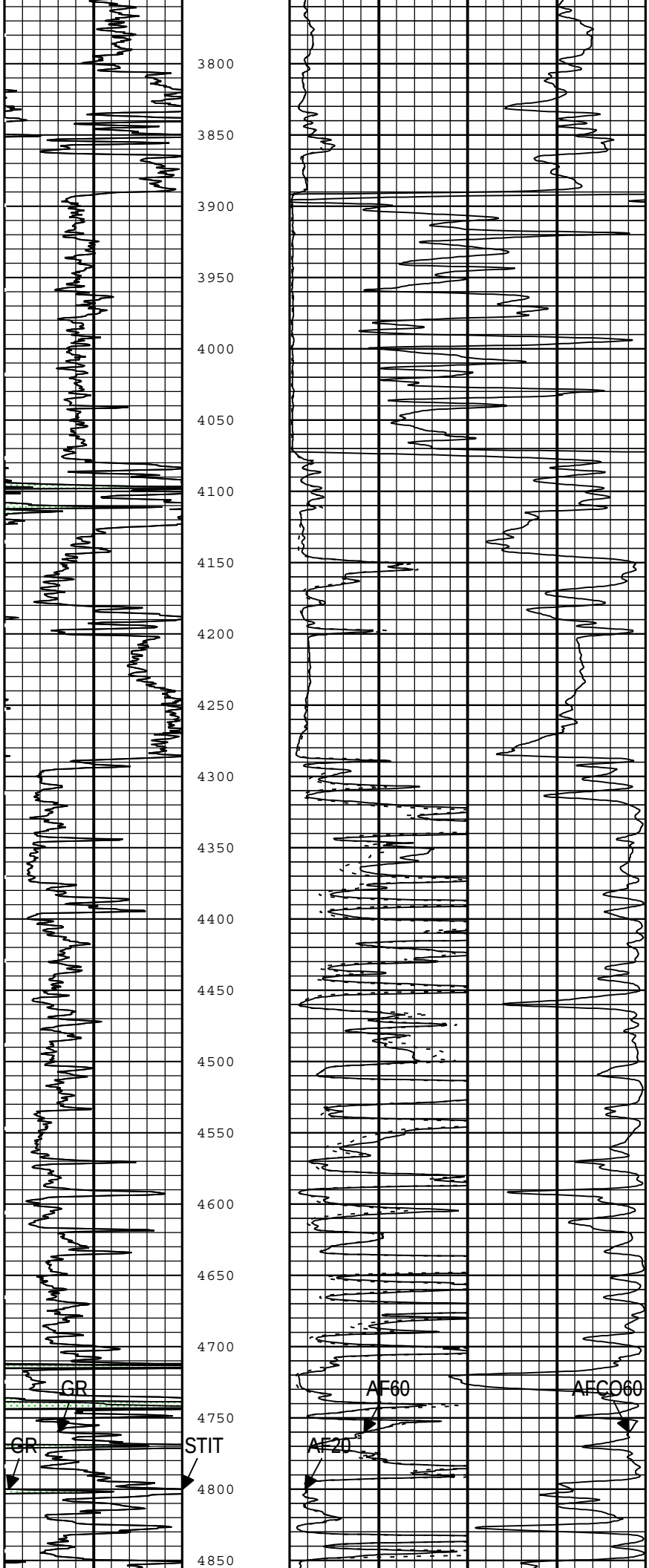
3750
GR
GR
STIT
AF60
AF20
AFCO60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GR
GR
STIT
AF60
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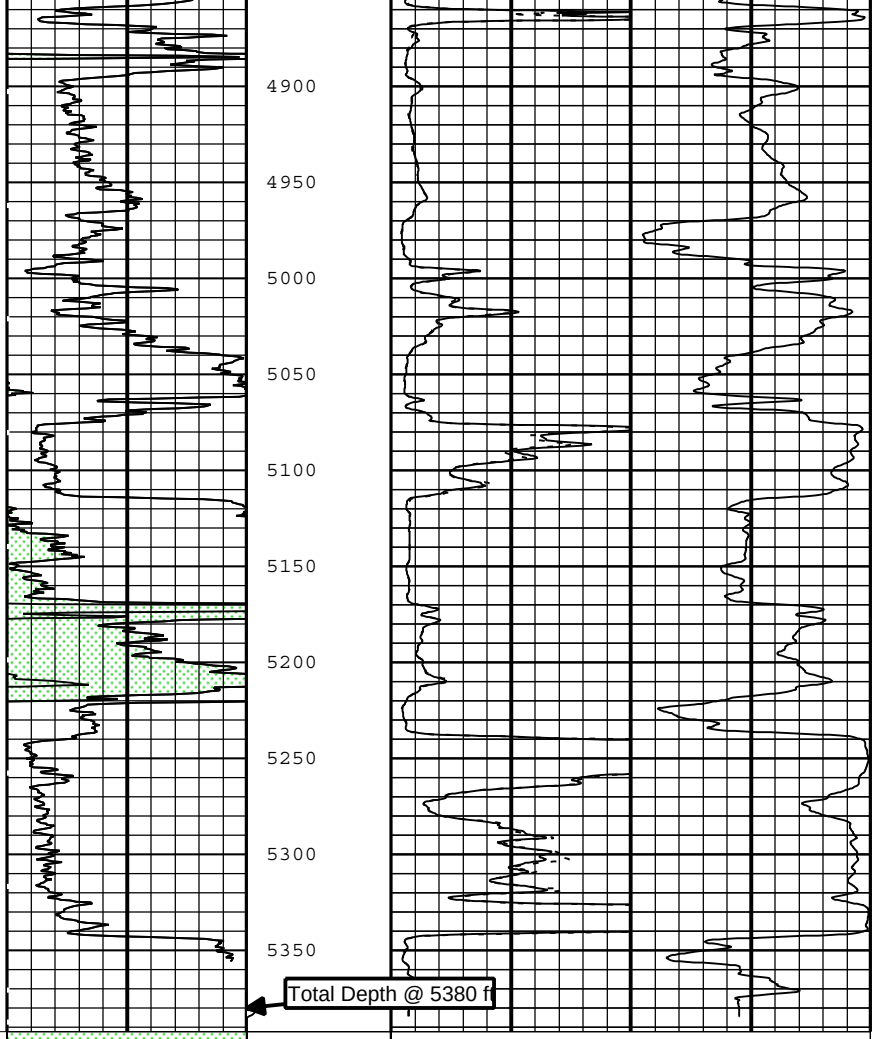
AFCO60



BACKUP GAMMA RAY

Gamma Ray (GR) HGNS-H

0 gAPI 150

Stuck Tool Indicator, Total (STIT)

0 ft 50

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

1000 mS/m 0

Array Induction Four Foot Resistivity A20 (AF20) AIT-M

0 ohm.m 50

Array Induction Four Foot Resistivity A60 (AF60) AIT-M

0 ohm.m 50

TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (RILEY MUD) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 04-Mar-2013 19:03:14

Company: TUG HILL OPERATING, LLC

Schlumberger

Well: DONOVAN 2-10 AH

Field: UNKNOWN

County: BARBER

State: KANSAS

RESISTIVITY LOG

RESISTIVITY LOG

ARRAY INDUCTION/GAMMA RAY/SP

PLATFORM EXPRESS