



**Weatherford**

**MEASURED DEPTH  
X-Y CALIPER  
HOLE VOLUME LOG**

COMPANY	WHITTING OIL AND GAS CORPORATION		
WELL	WOLF 12L-0103		
FIELD	REDTAIL		
PROVINCE/COUNTY	WELD		
COUNTRY/STATE	U.S.A. / COLORADO		
LOCATION	SHL: 619' FWL & 2558' FNL		
PERMIT NUMBER	BHL: 825' FWL & 600' FNL		
SEC 12	TWP 10N	RGE 59W	Other Services
			ARRAY INDUCTION
			MICRO IMAGER
			NEUTRON/DENSITY
			SPECTRAL GAMMA
API Number	05-123-39421		
Permanent Datum G.L., Elevation 4953 feet			
Log Measured From KB			Elevations: KB 4970.00
Drilling Measured From K.B. @ 17 FEET			DF 4970.00
			GL 4953.00
Date	15-SEPT-2014		
Run Number	ONE		
Service Order	6551-97985944		
Depth Driller	13393.00	feet	
Depth Logger	11781.00	feet	
First Reading	11746.00	feet	
Last Reading	6610.00	feet	
Casing Driller	6629.00	feet	
Casing Logger	6630.00	feet	
Bit Size	6.000	inches	
Hole Fluid Type	WBM		
Density / Viscosity	9.65 lb/USg	47.00 SEC/QT	
PH / Fluid Loss		5.60 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.97 @ 89.9	ohm-m	
Rmf @ Measured Temp	0.75 @ 89.9	ohm-m	
Rmc @ Measured Temp	1.16 @ 89.9	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.43 @206.0	ohm-m	
Time Since Circulation	1 HOUR		
Max Recorded Temp	211.00	deg F	
Equipment / Base	18086	Casper	
Recorded By	C CULLEN		
Witnessed By	E GREIGER		
WSL			WSL

**BOREHOLE RECORD**

Last Edited: 17-SEP-2014 03:03

Bit Size inches	Depth From feet	Depth To feet
6.000	6629.00	11780.00

**CASING RECORD**

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	7.000	0.00	6629.00	29.00

**REMARKS**

LOGGED WITH WLS 14.01.3220

LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT

HARDWARE:  
MDN: MIS-A SINGLE BOWSPRING USED ABOVE MDN  
MPD: 4INCH PROFILE PLATE USED, MIS-A SINGLE BOWSPRING USED BELOW MPD  
CMI: OVER BODY BASKET AND MIS-D BASKETS PLACED ABOVE AND BELOW FOR CENTRALIZATION  
SGS: RAN BELOW CMI. ECCENTRALIZED WITH SKJ.

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY

FROM 10800 TO 11800 EVERY STAND WAS WASHED DOWN AND ROTATED AT 15RPM. THE BATTERY LIFE WAS GETTING LOW BECAUSE OF THE TIME IT WAS TAKING TO WASH AND ROTATE EVERY STAND. THE DECISION WAS MADE TO DEPLOY THE DART AT NOON IN ORDER TO MAKE SURE BATTERY LIFE WAS STILL AVAILABLE SO WE DEPLOYED THE TOOLS AT 11781. TD WAS 13393.

ANNULAR HOLE VOLUME WITH 4.5 " FROM TD TO 7"-29# CASING = 510 CUBIC FEET.  
TOTAL HOLE VOLUME FROM TD TO 7"-29# CASING = 1070 CUBIC FEET

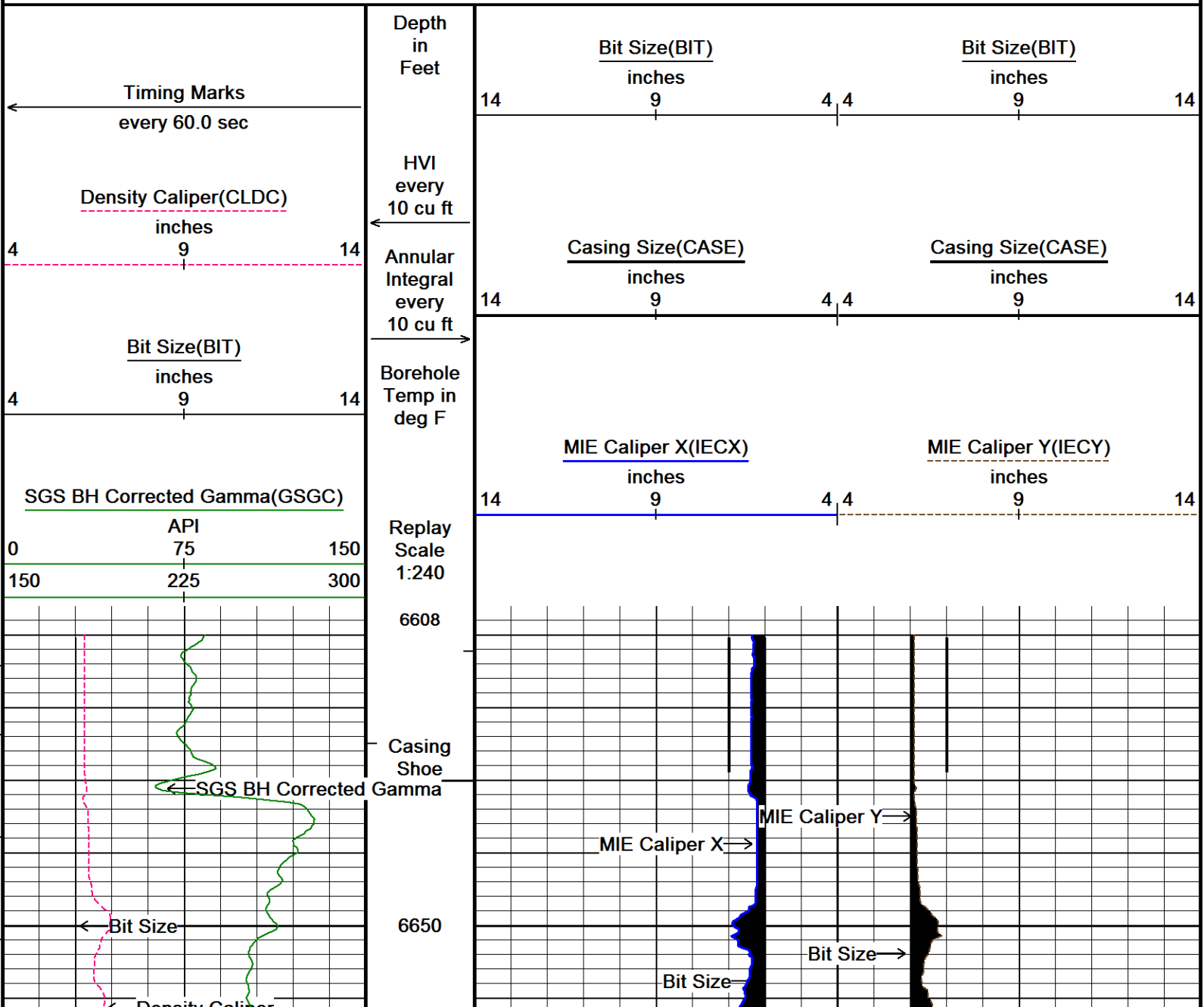
OPERATORS: J GERDES AND T DUNCAN

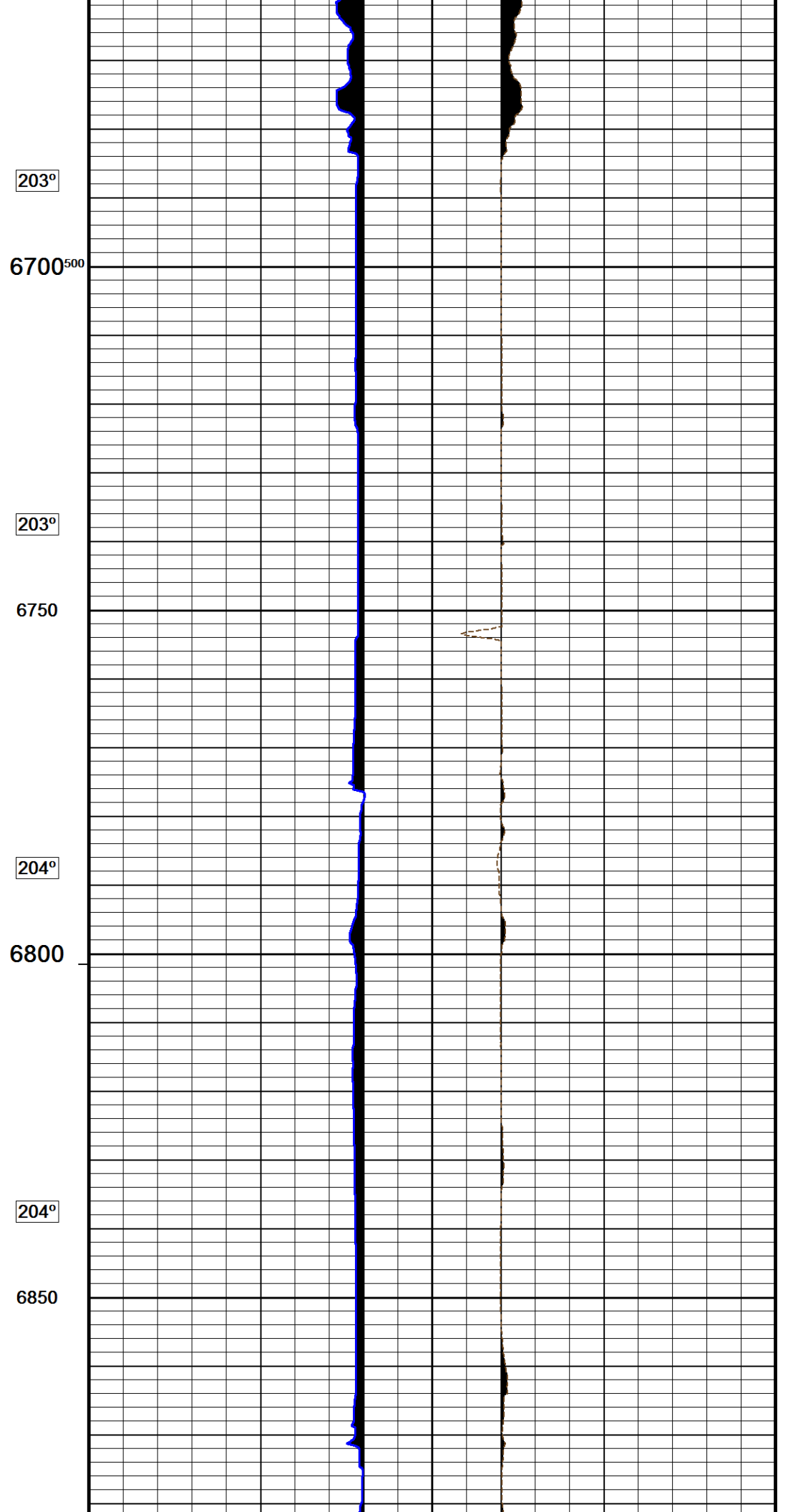
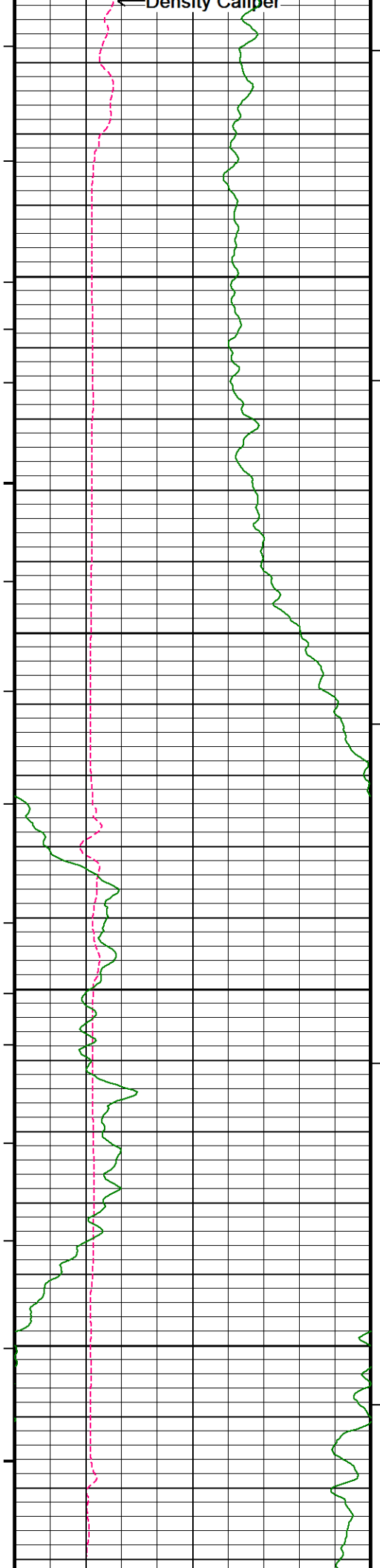
RIG: PIONEER 54

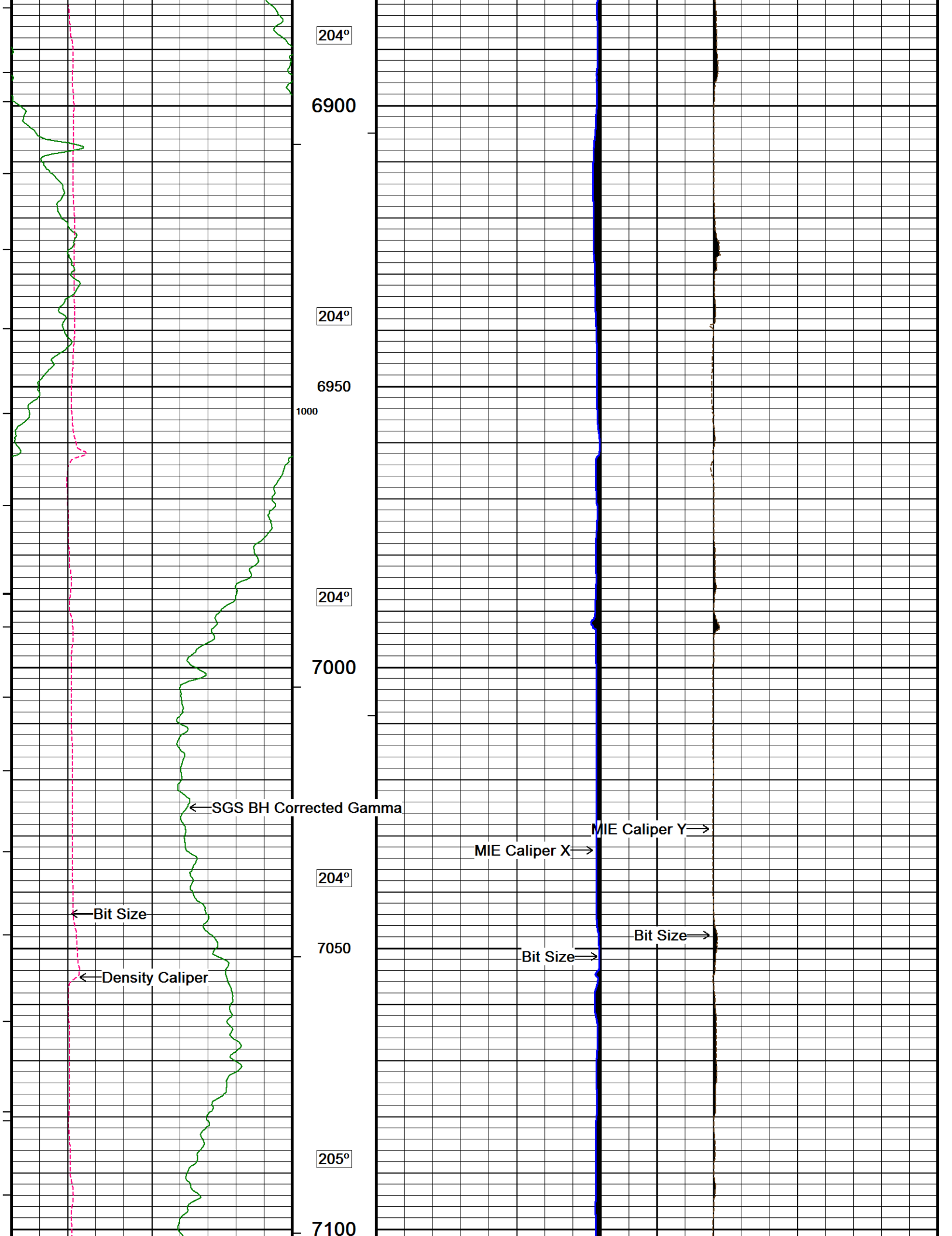
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

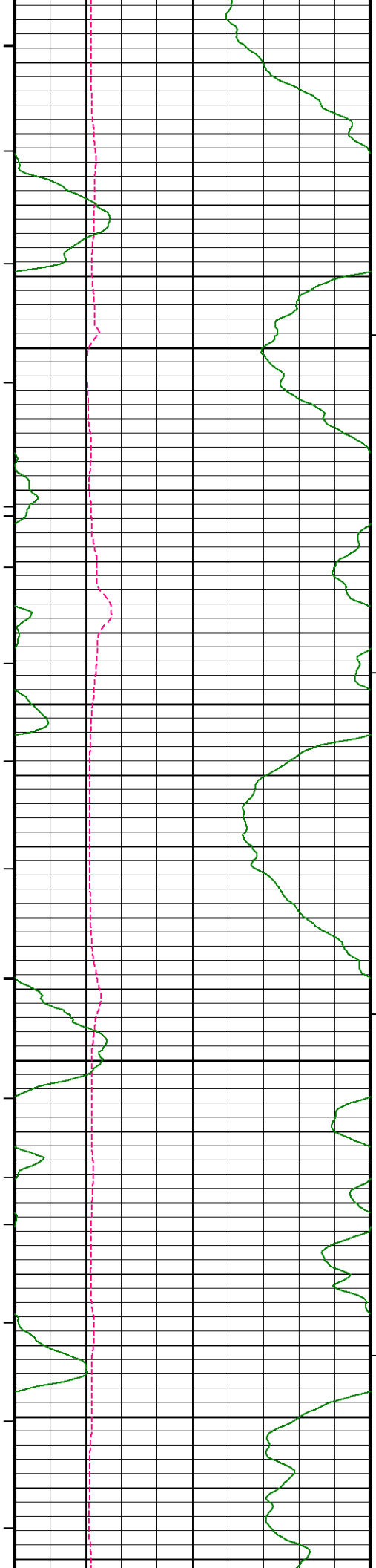
**5 INCH MAIN LOG**

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 17-SEP-2014 03:08  
 Filename: D:\Logs\Whiting\WOLF 12L-0103\MMS DEPTH2.dta Recorded on 17-SEP-2014 01:04  
 System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220









205°

7150

205°

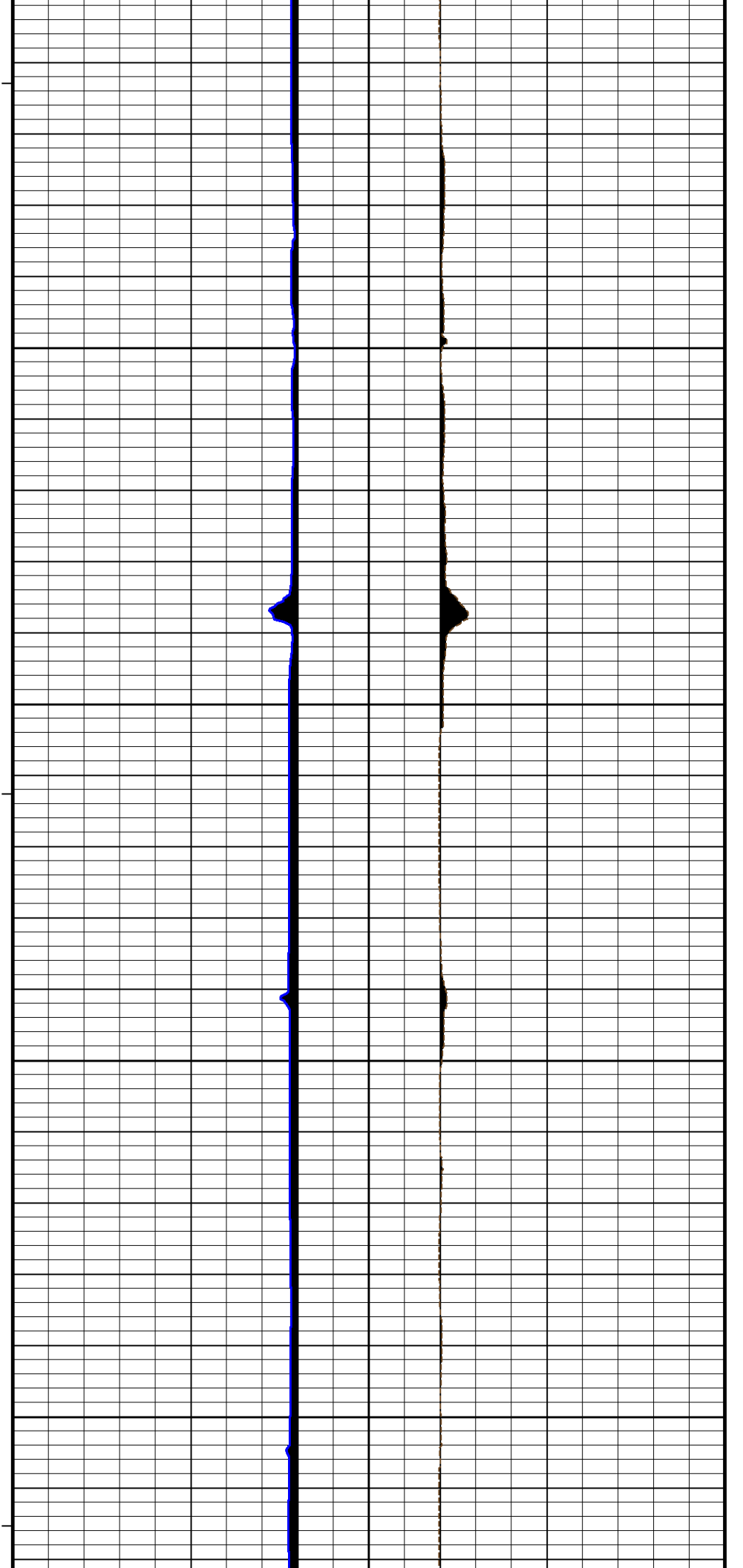
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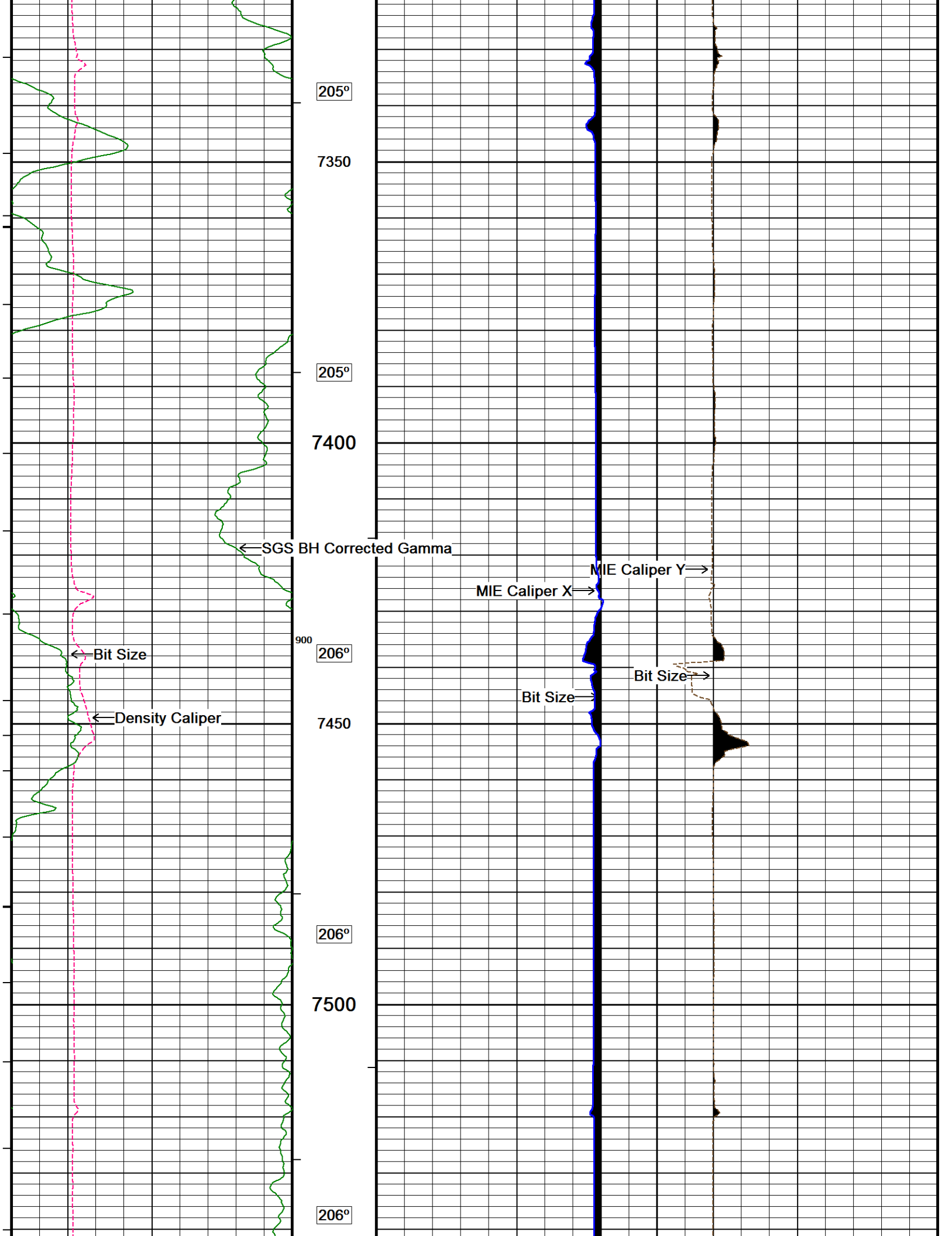
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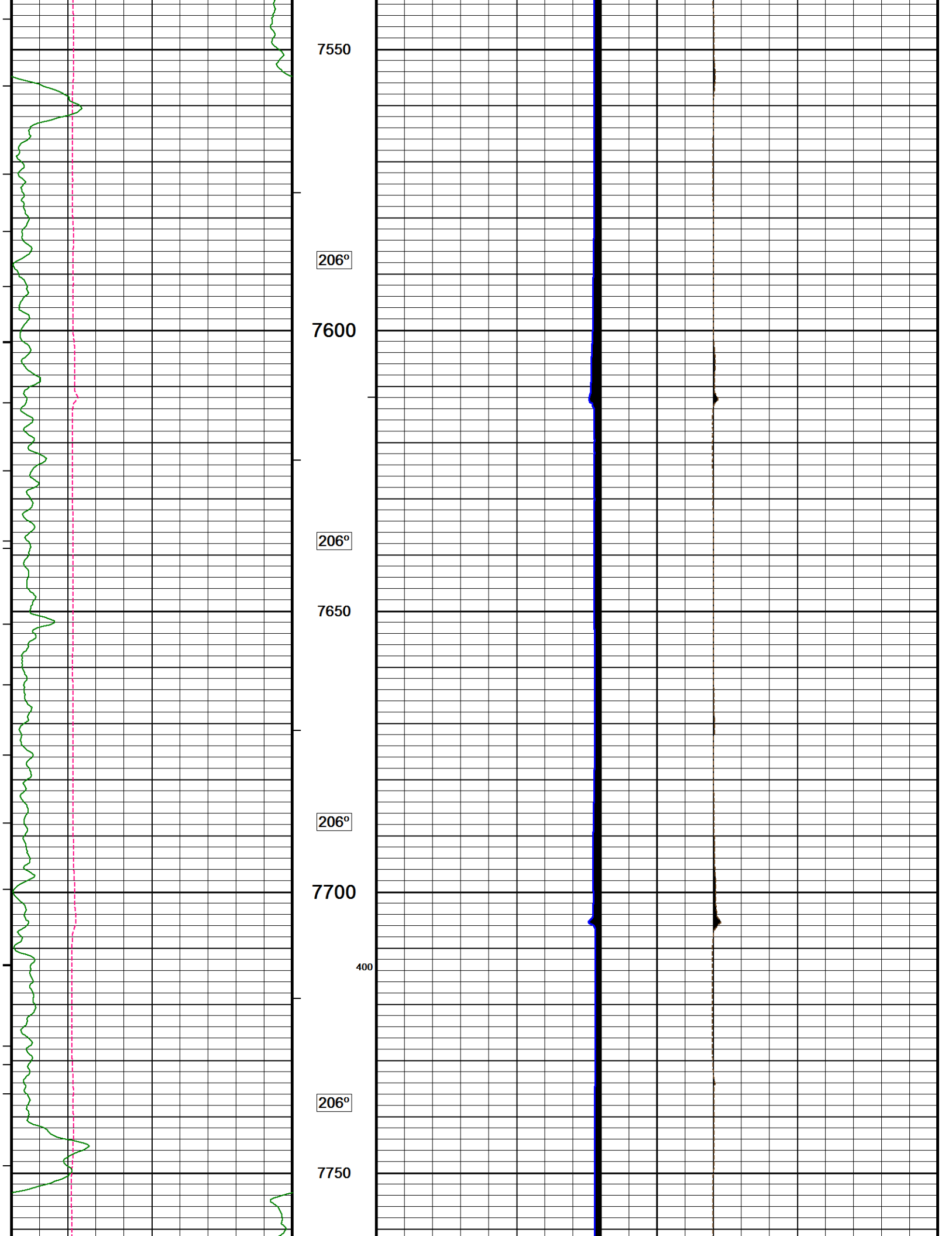
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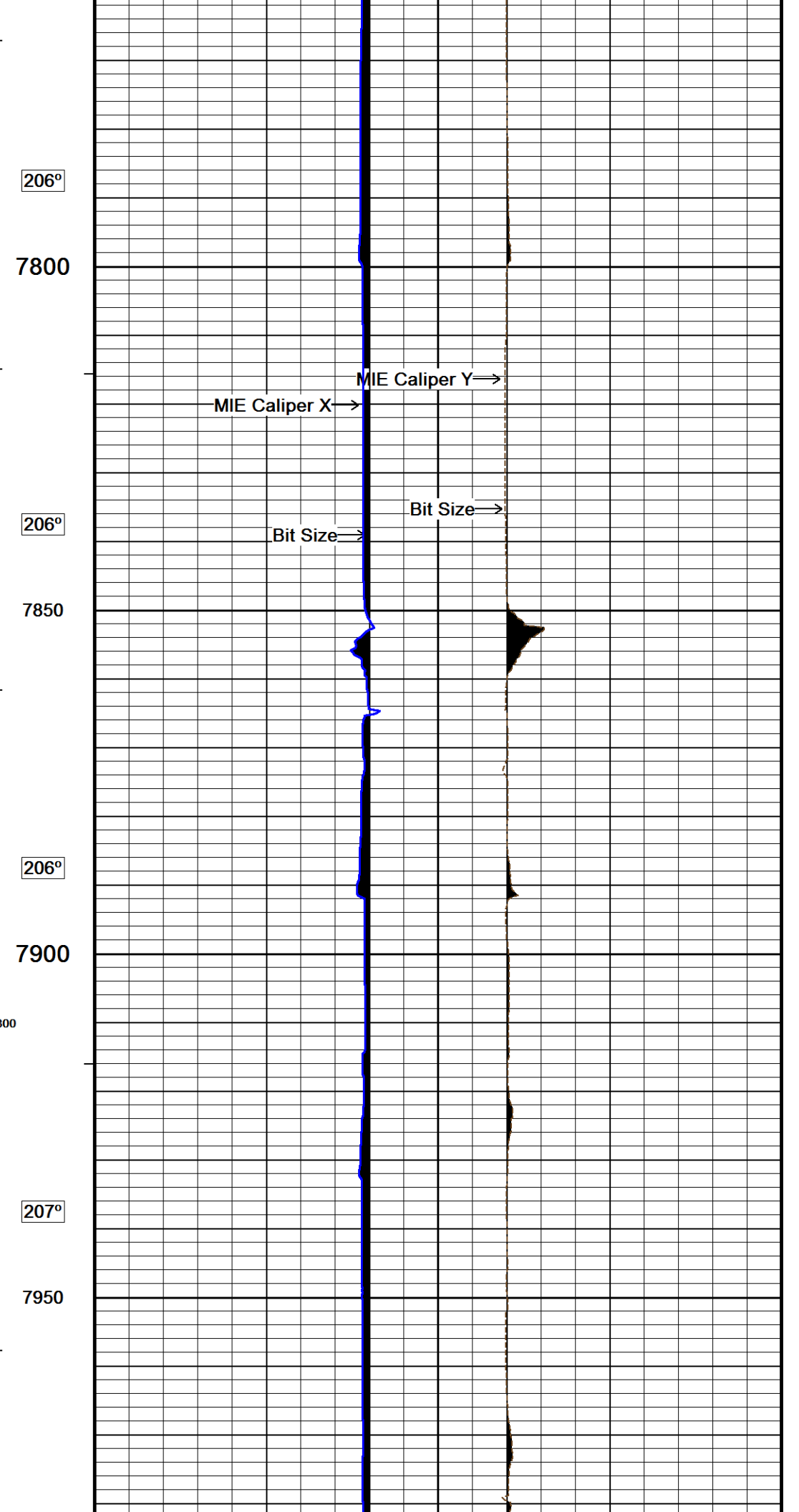
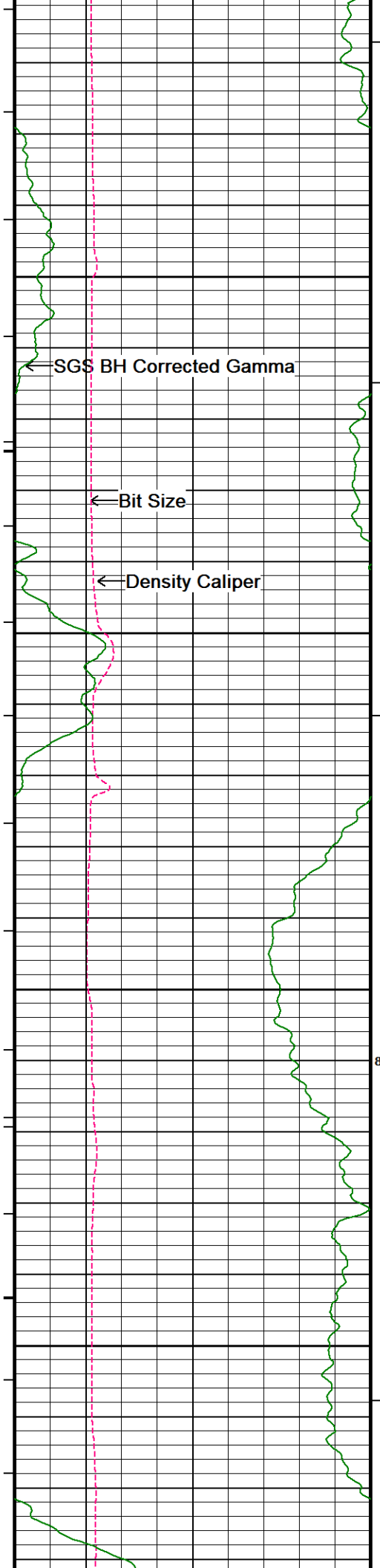
205°

7300









206°

7800

206°

7850

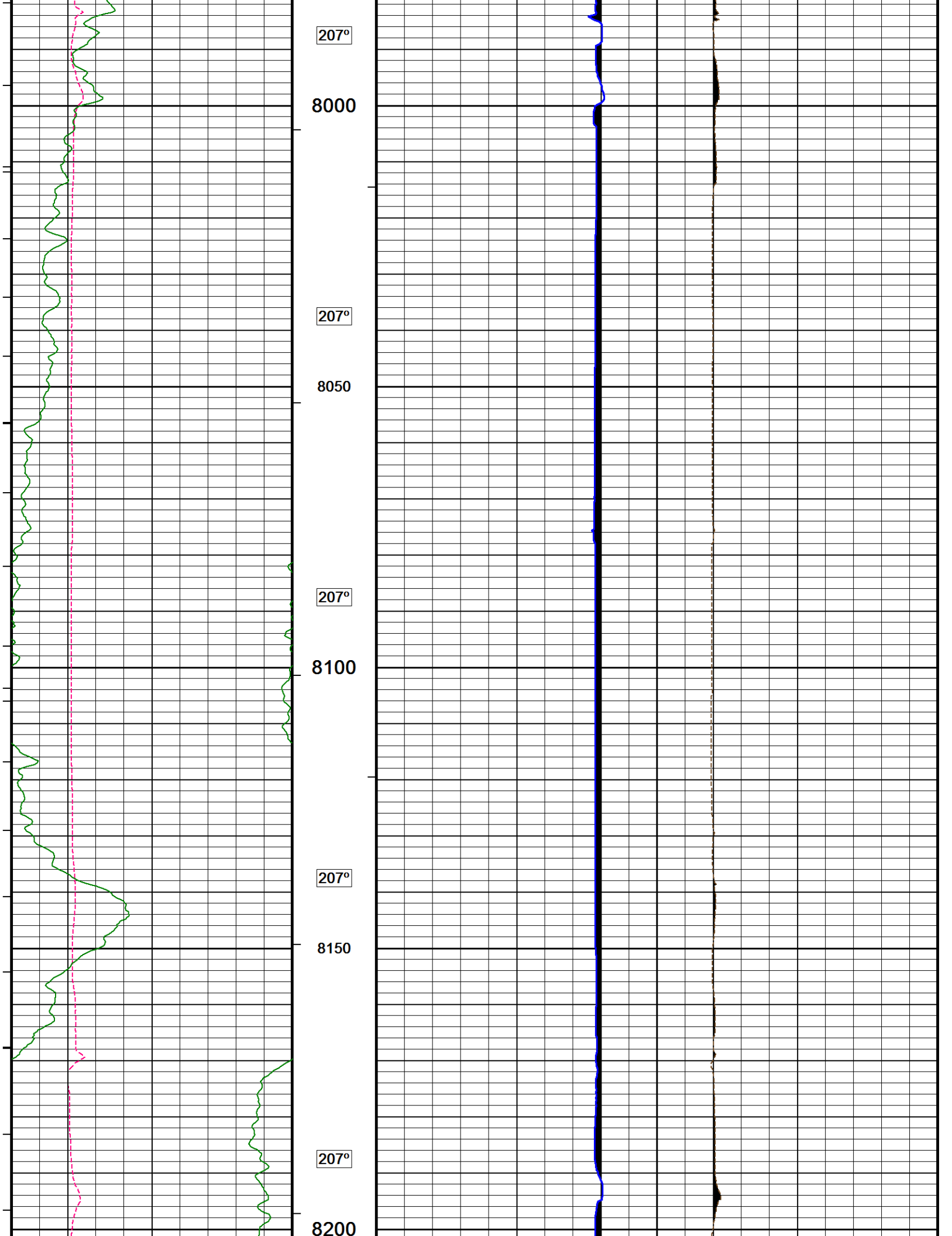
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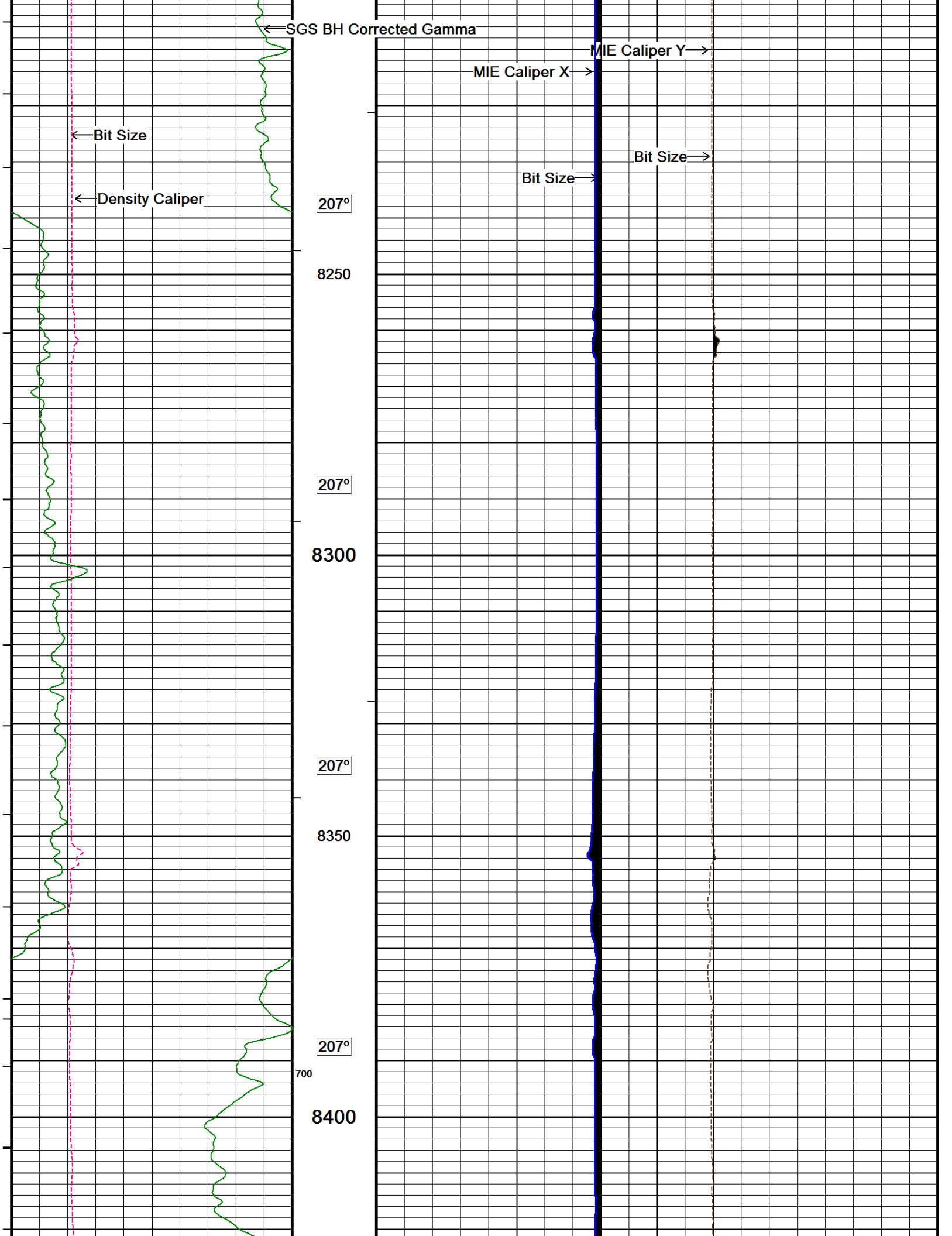
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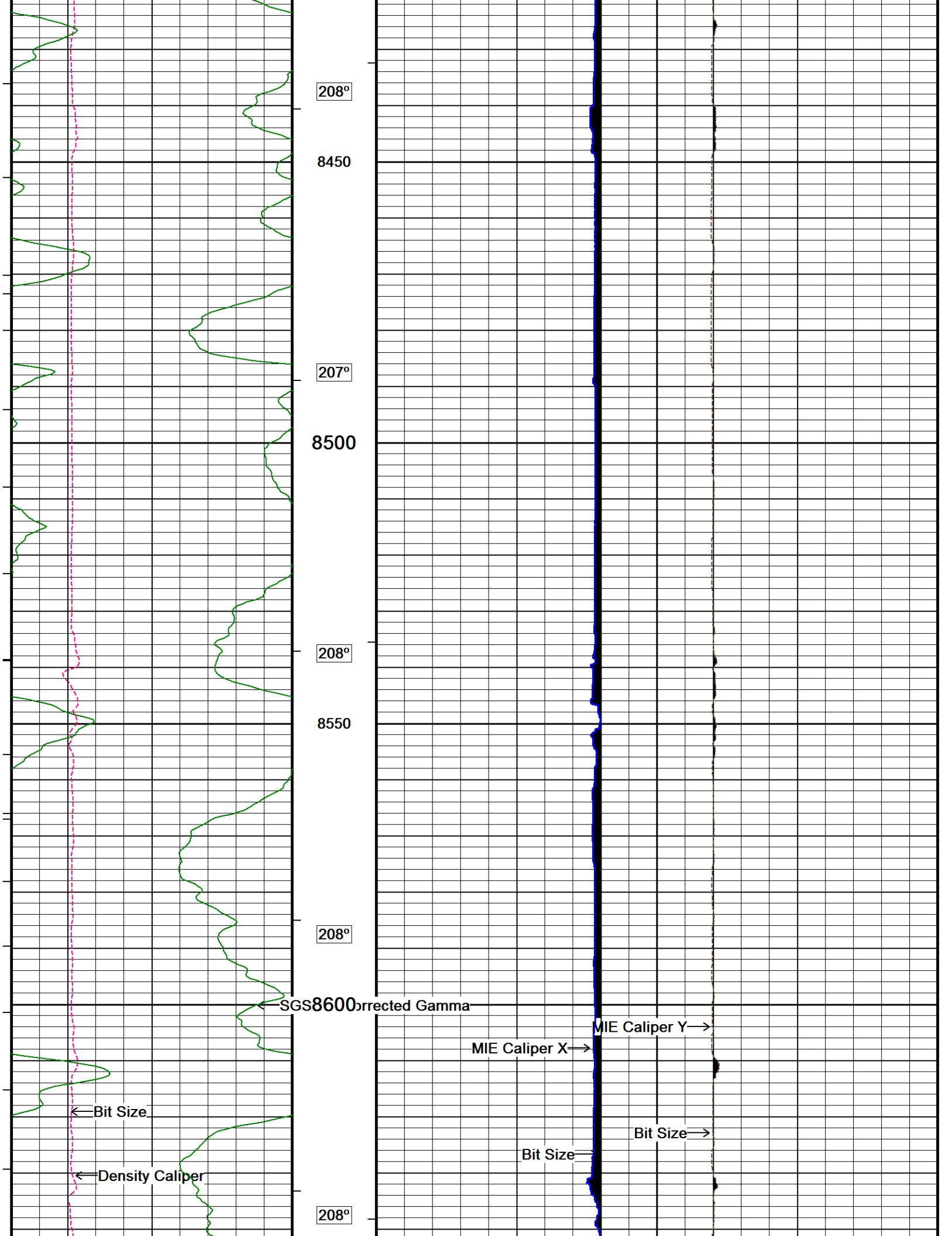
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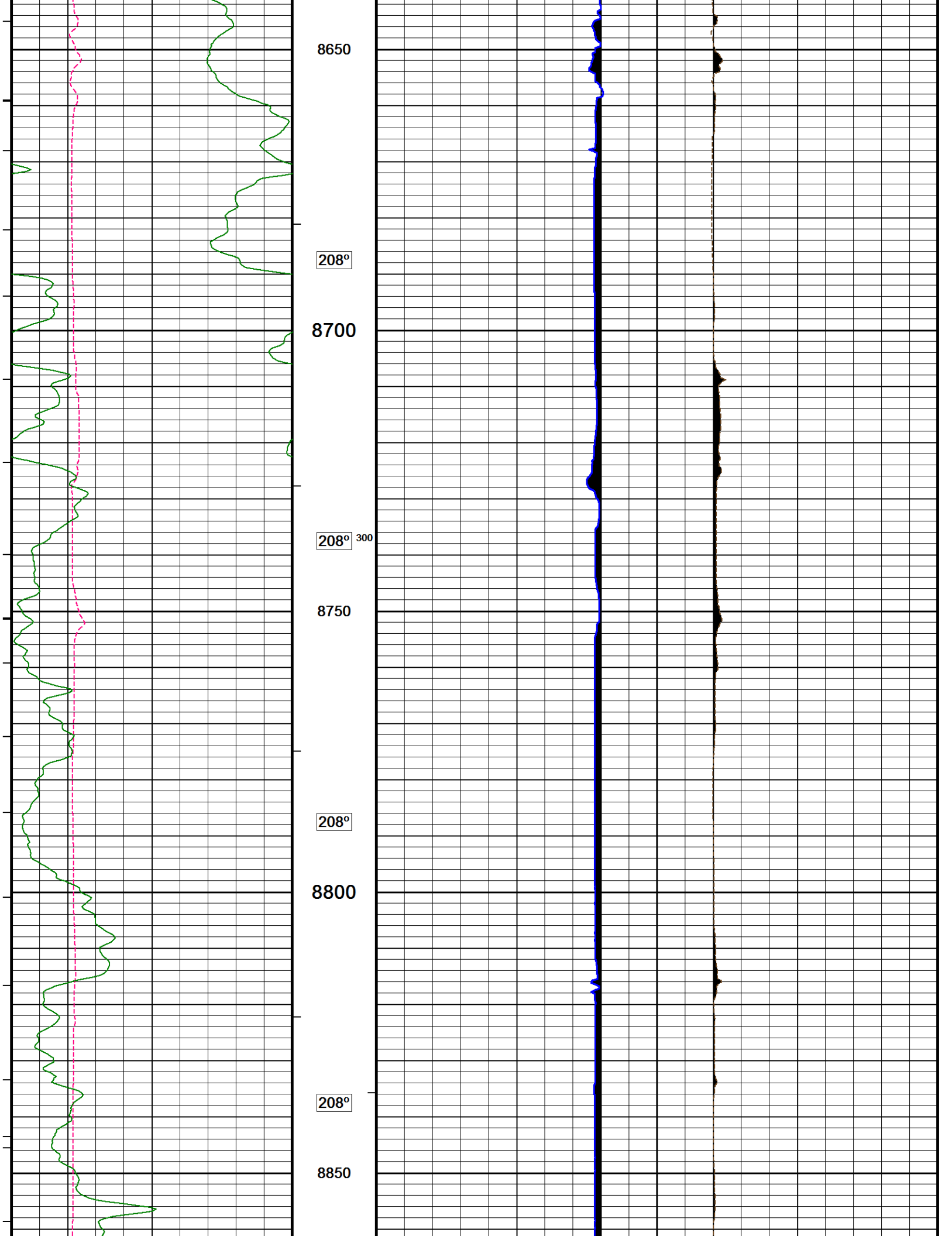
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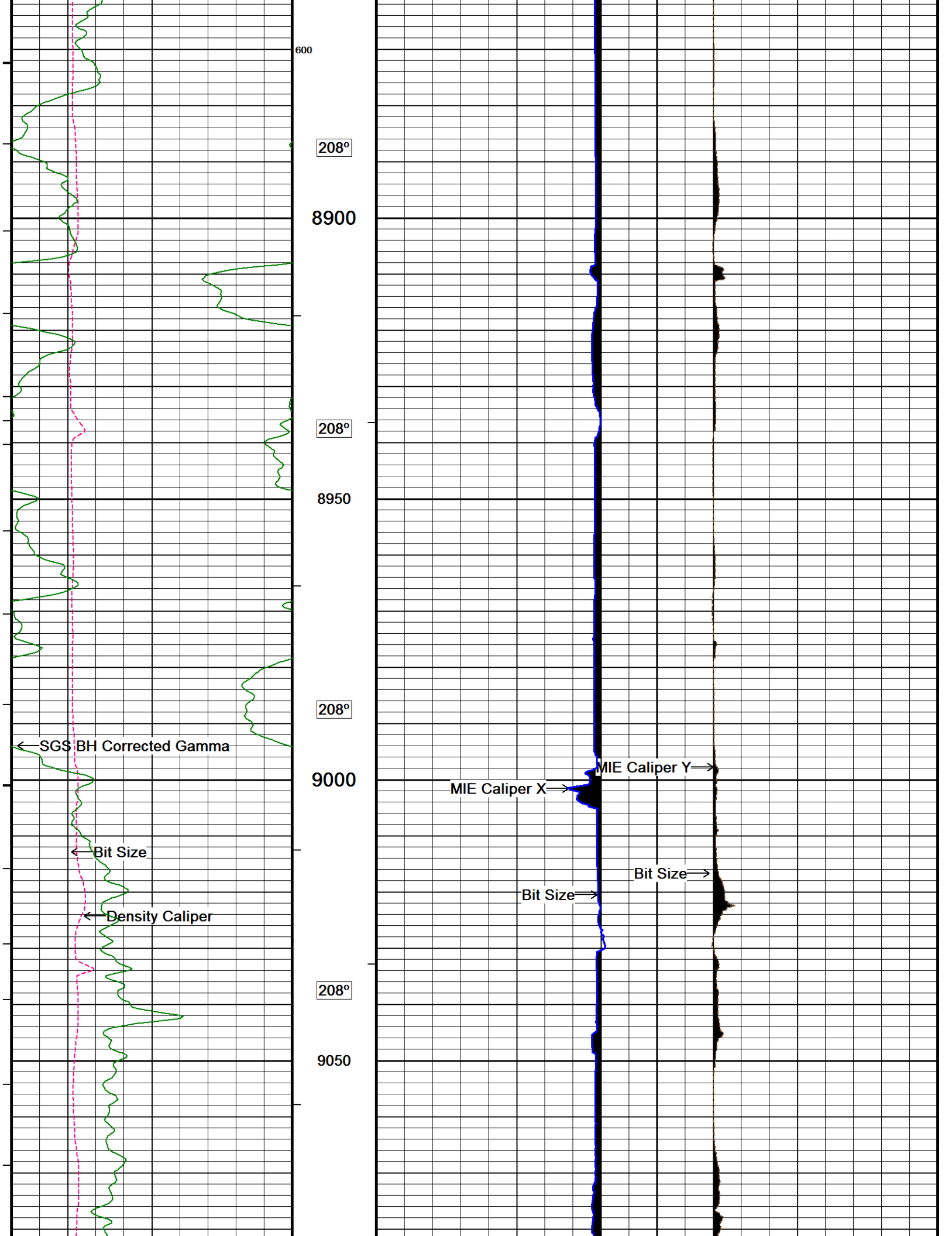
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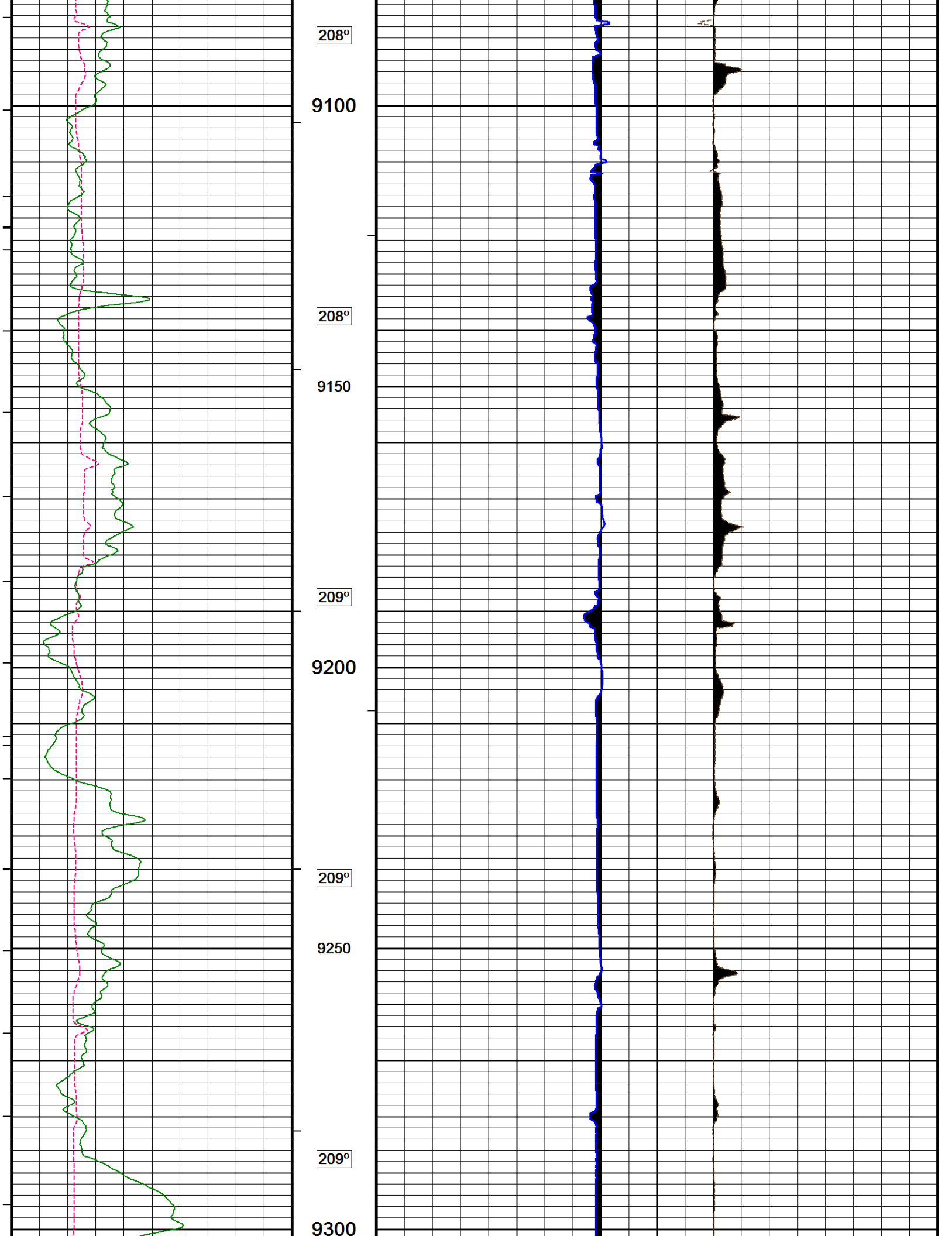


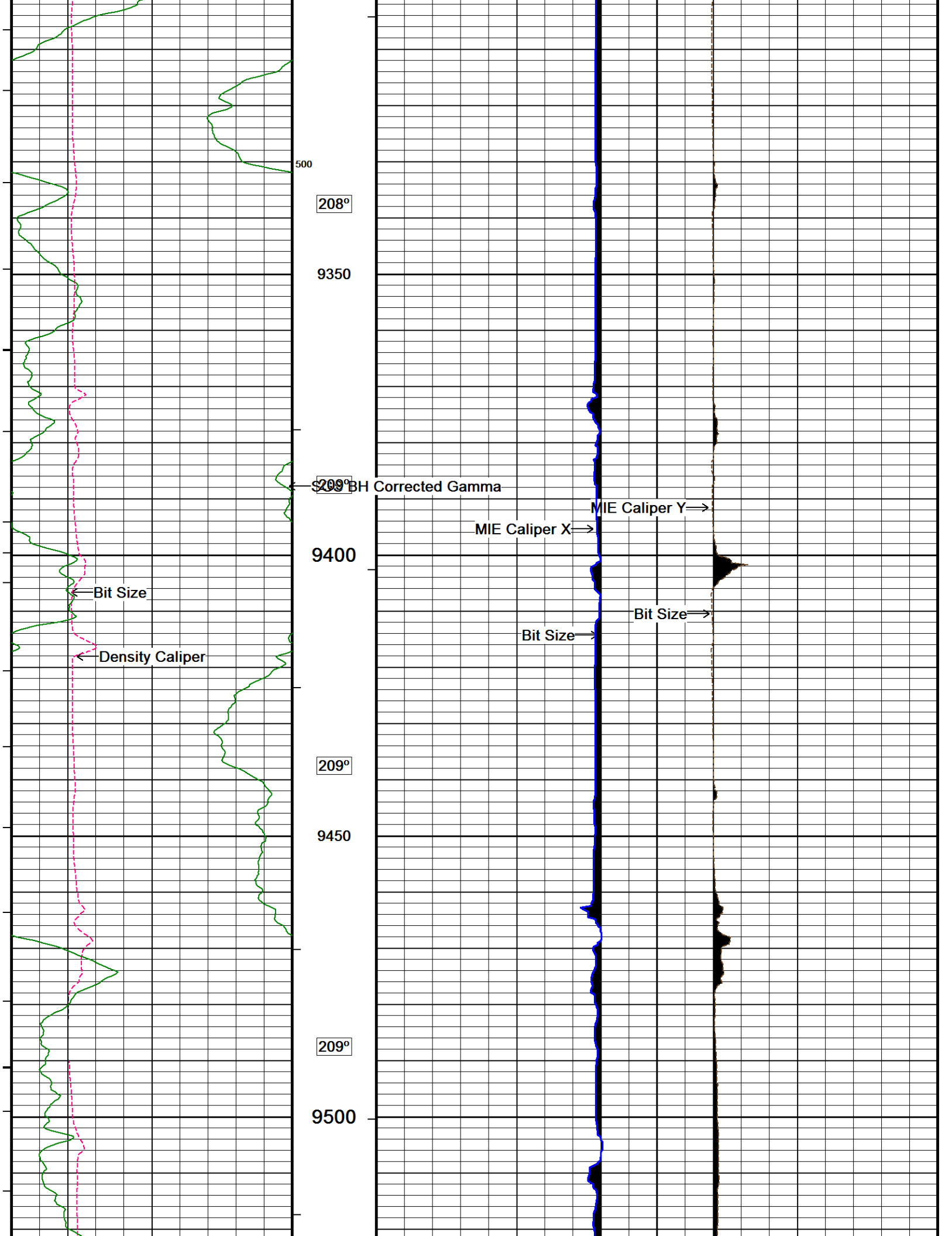


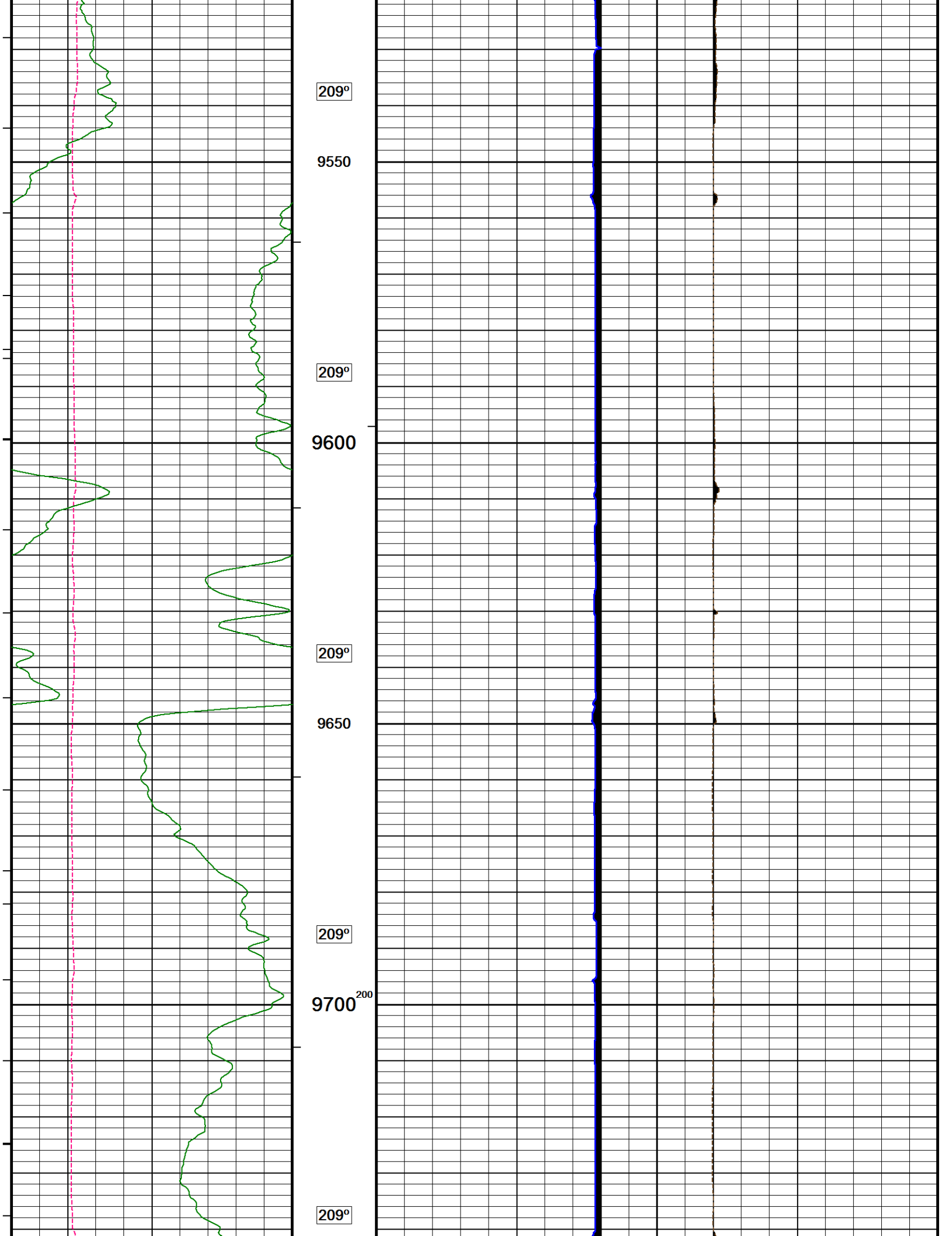


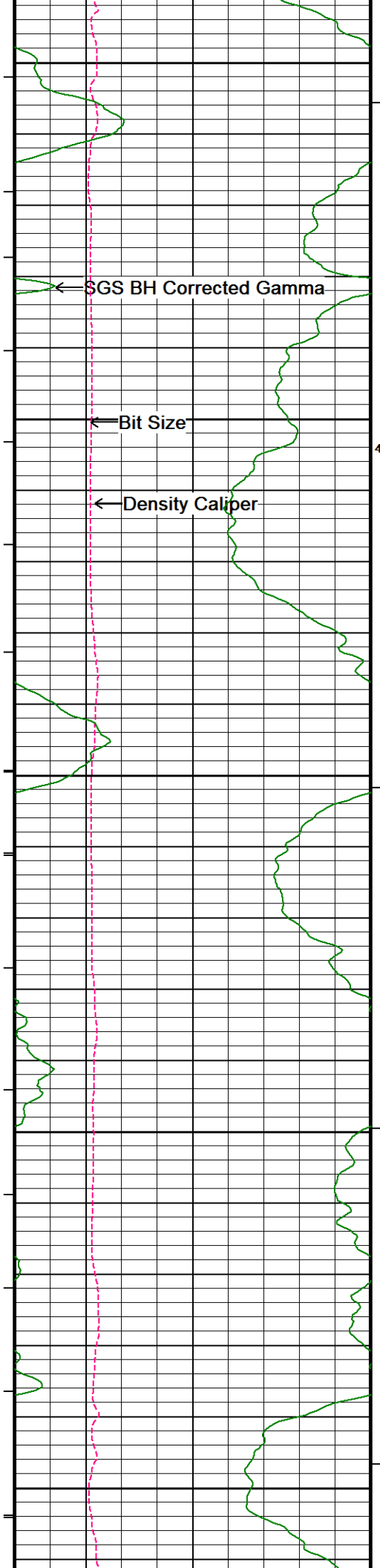




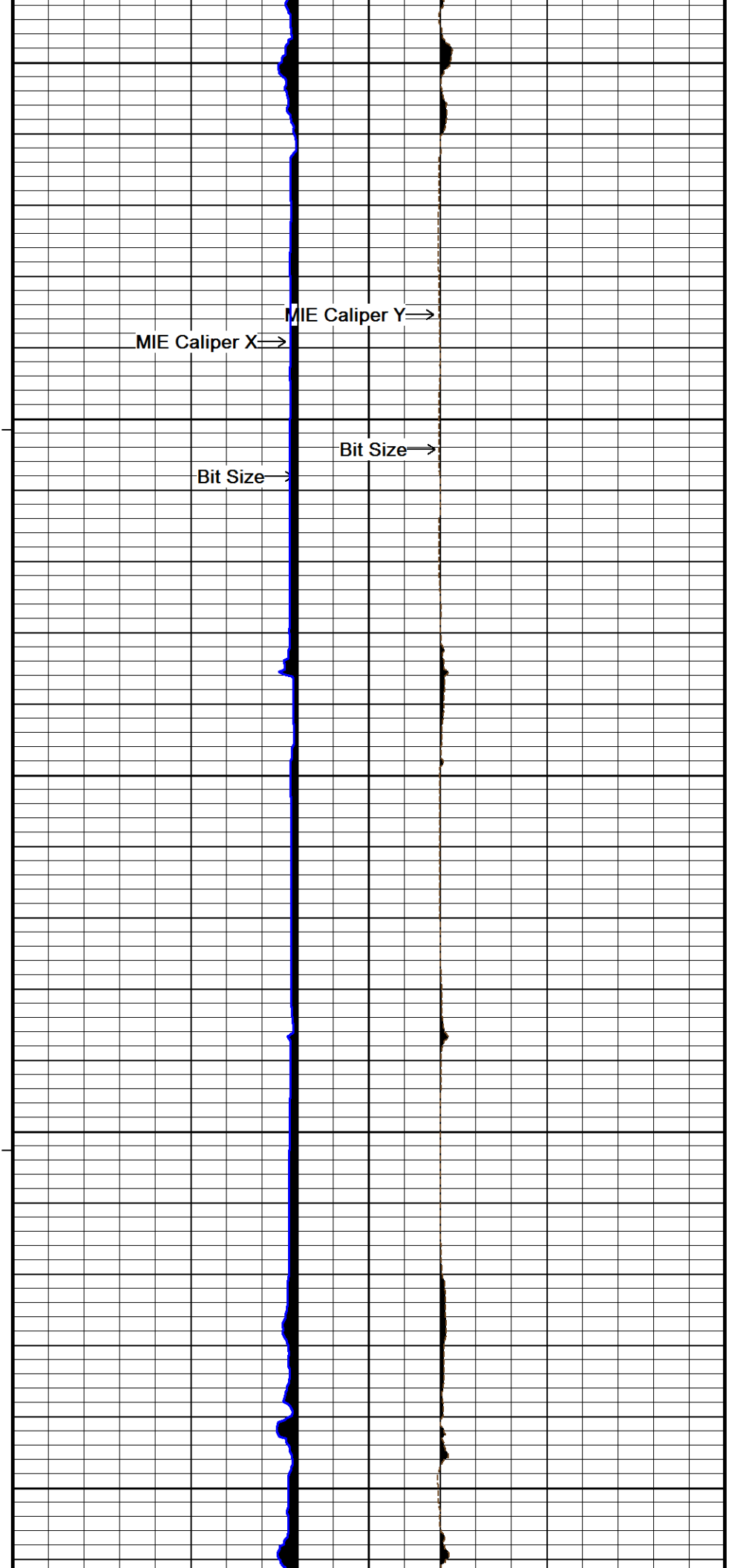




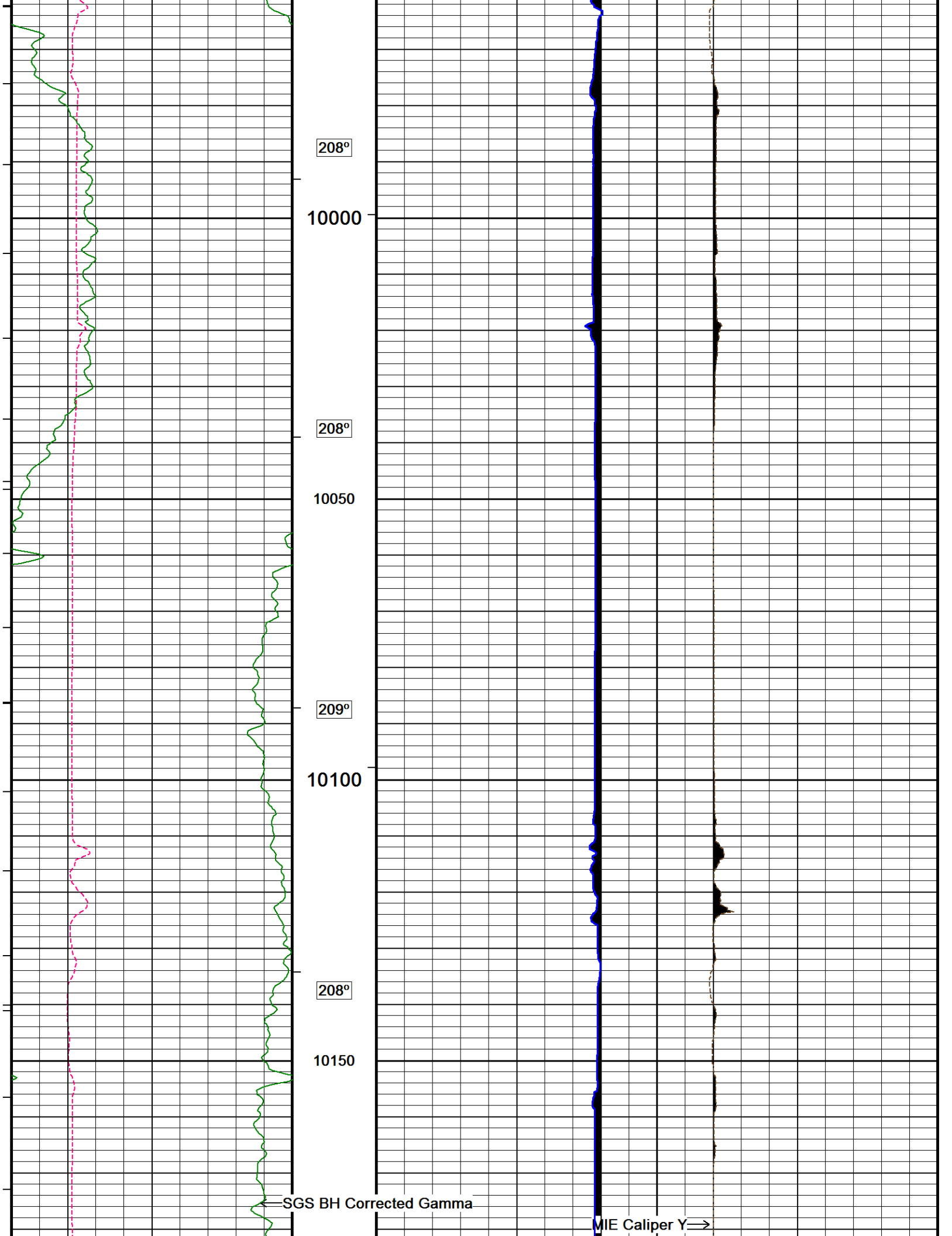




9750  
209°  
9800  
400  
209°  
9850  
209°  
9900  
209°  
9950



MIE Caliper X →  
MIE Caliper Y →  
Bit Size →



208°

10000

208°

10050

209°

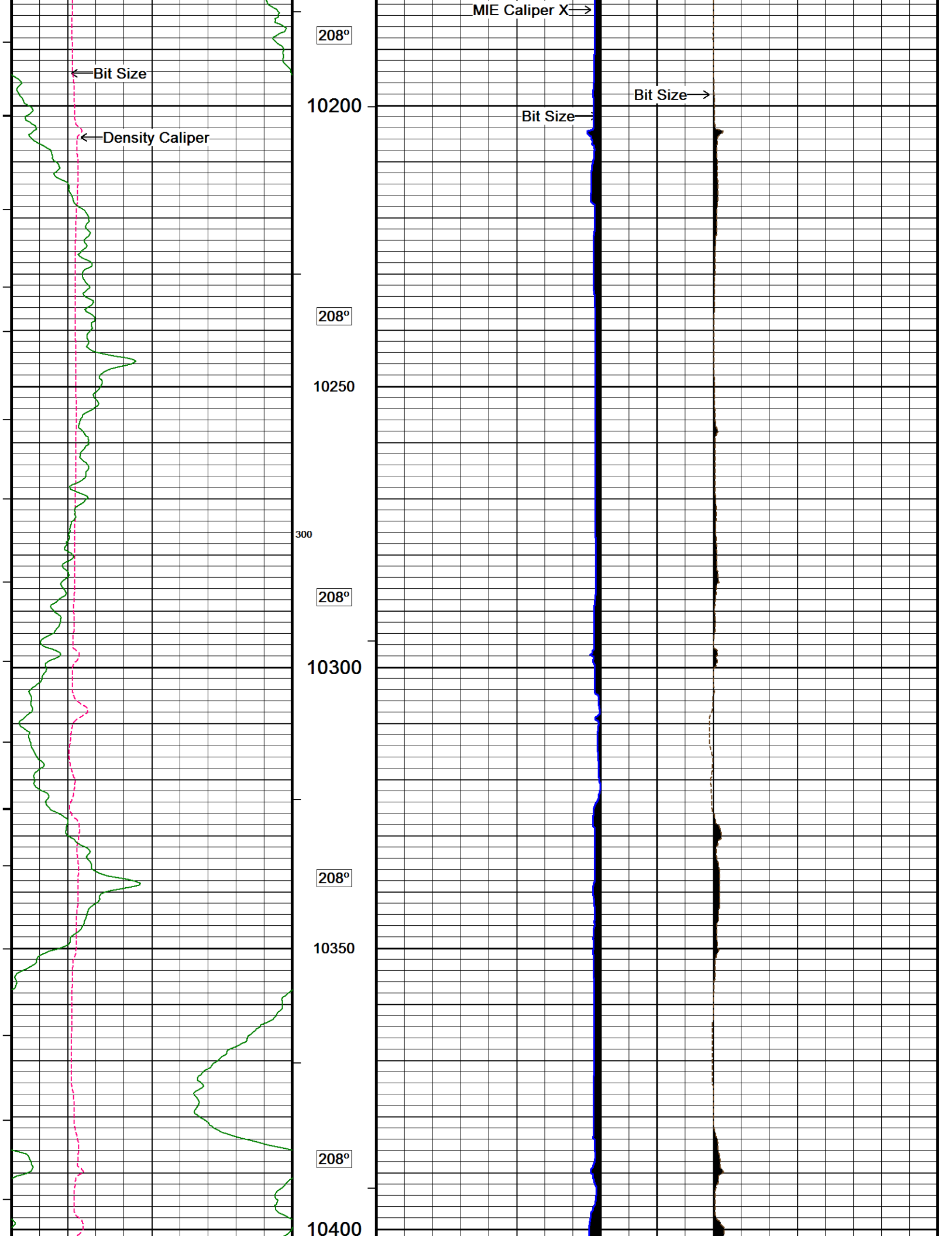
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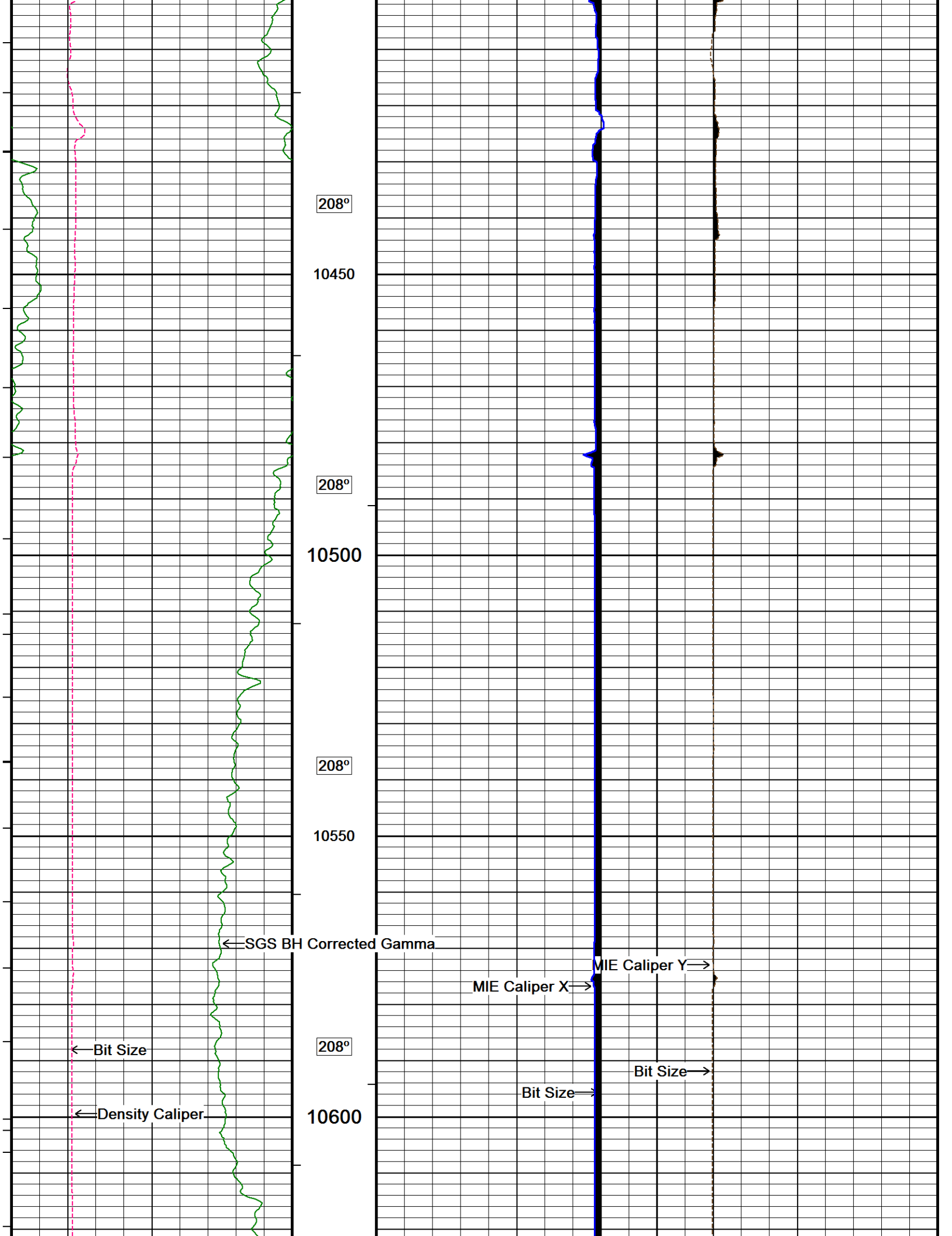
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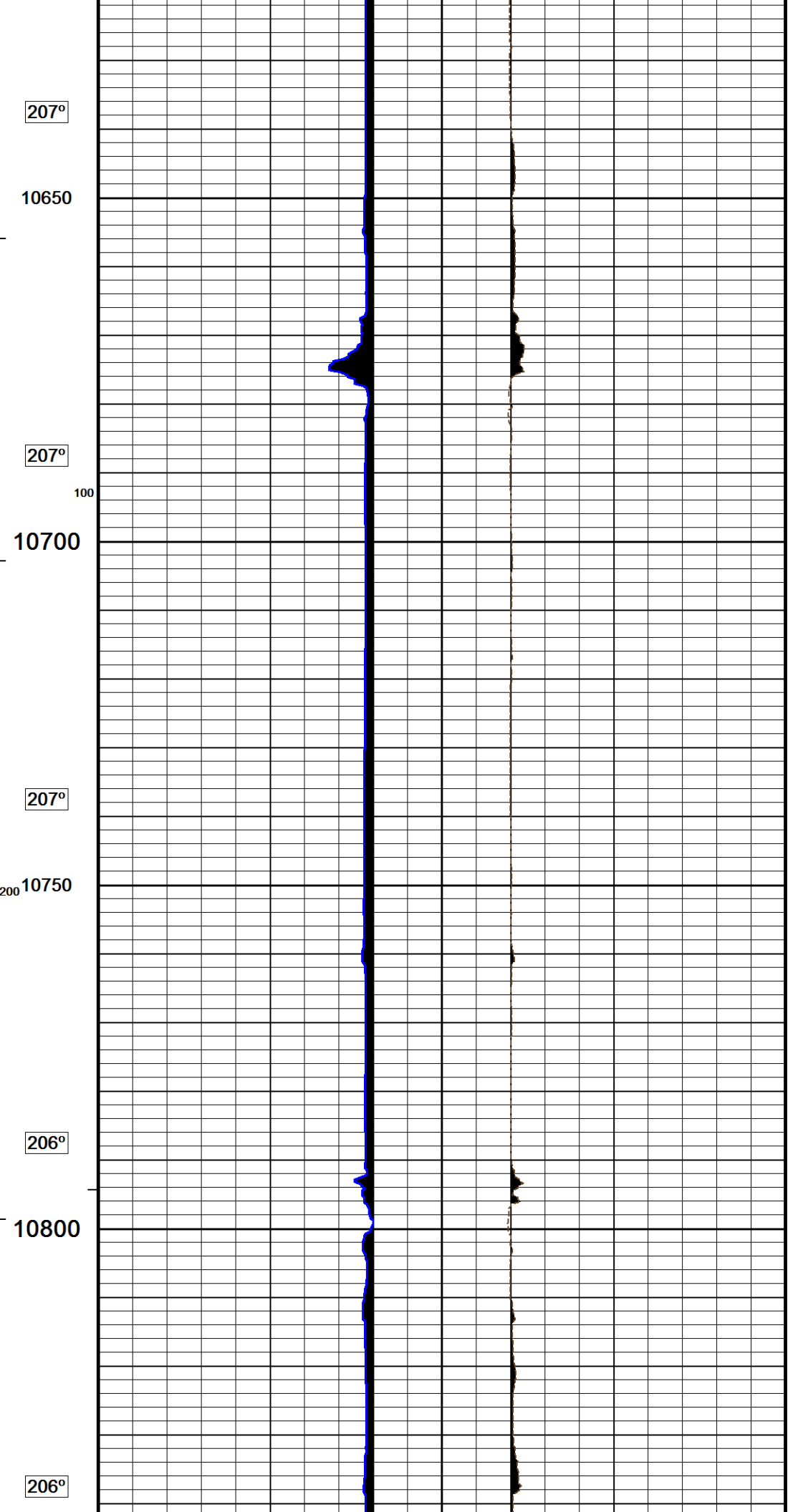
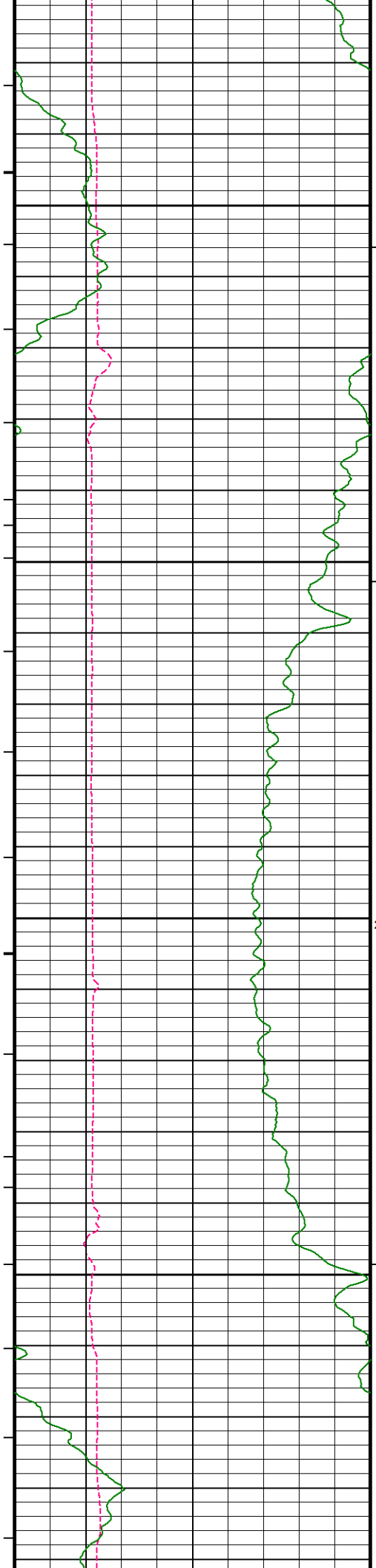
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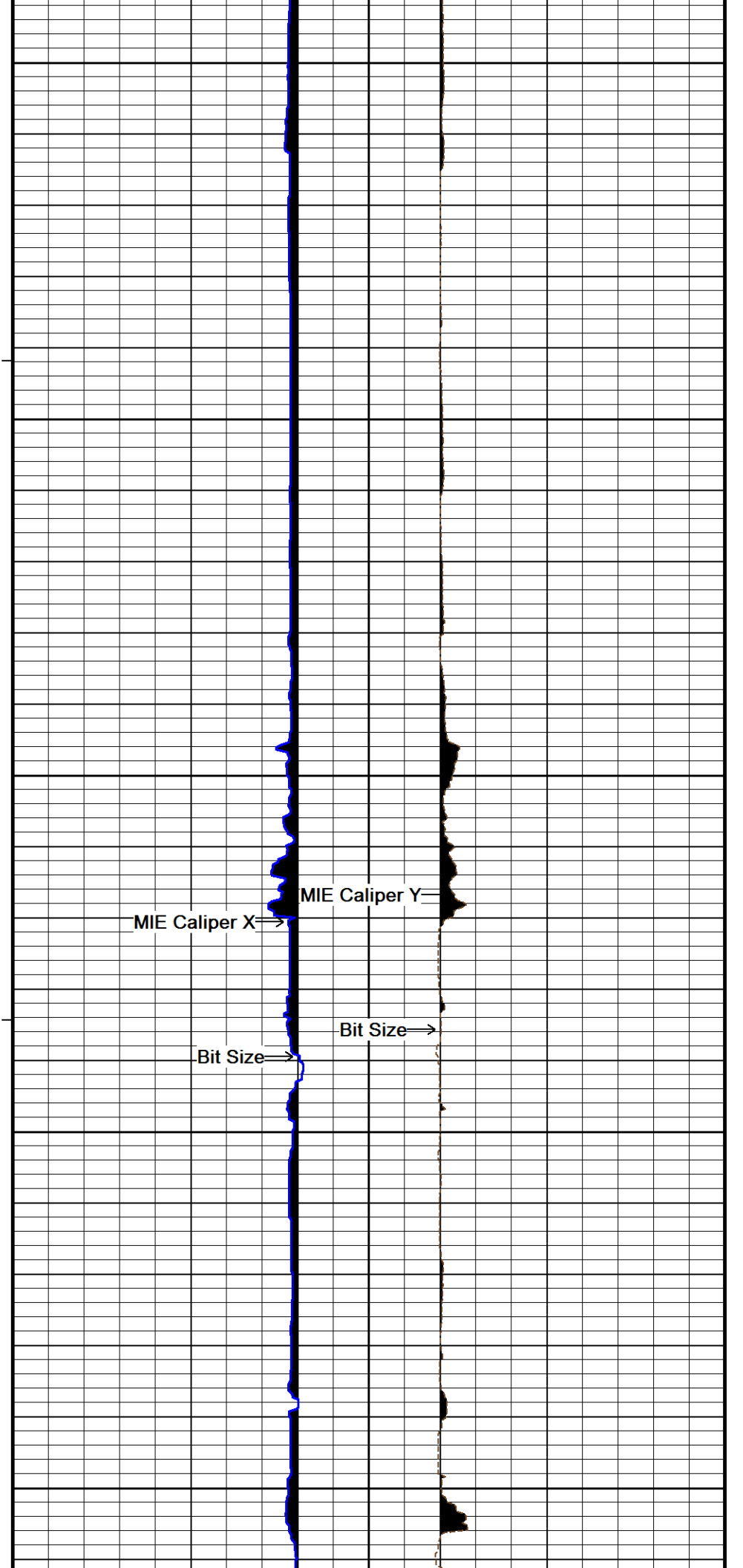
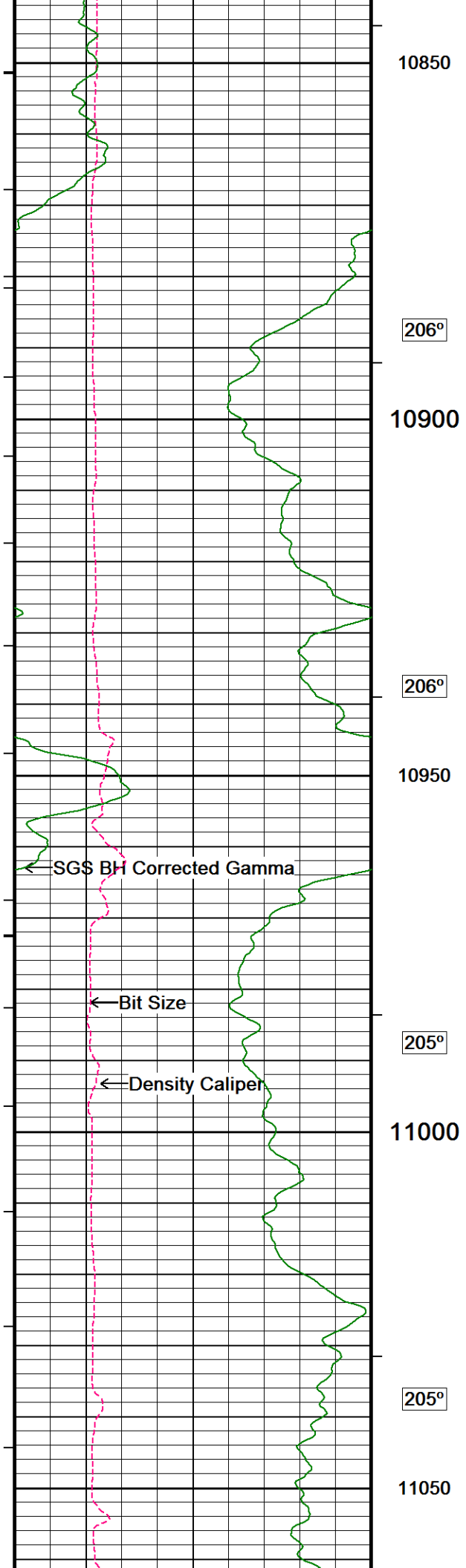
← SGS BH Corrected Gamma

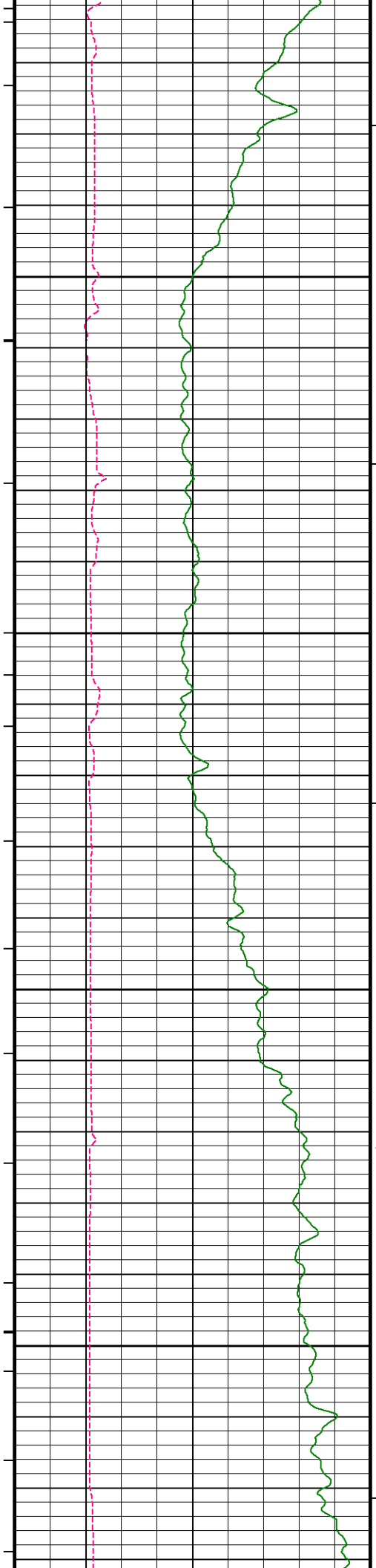
MIE Caliper Y →











205°

11100

205°

11150

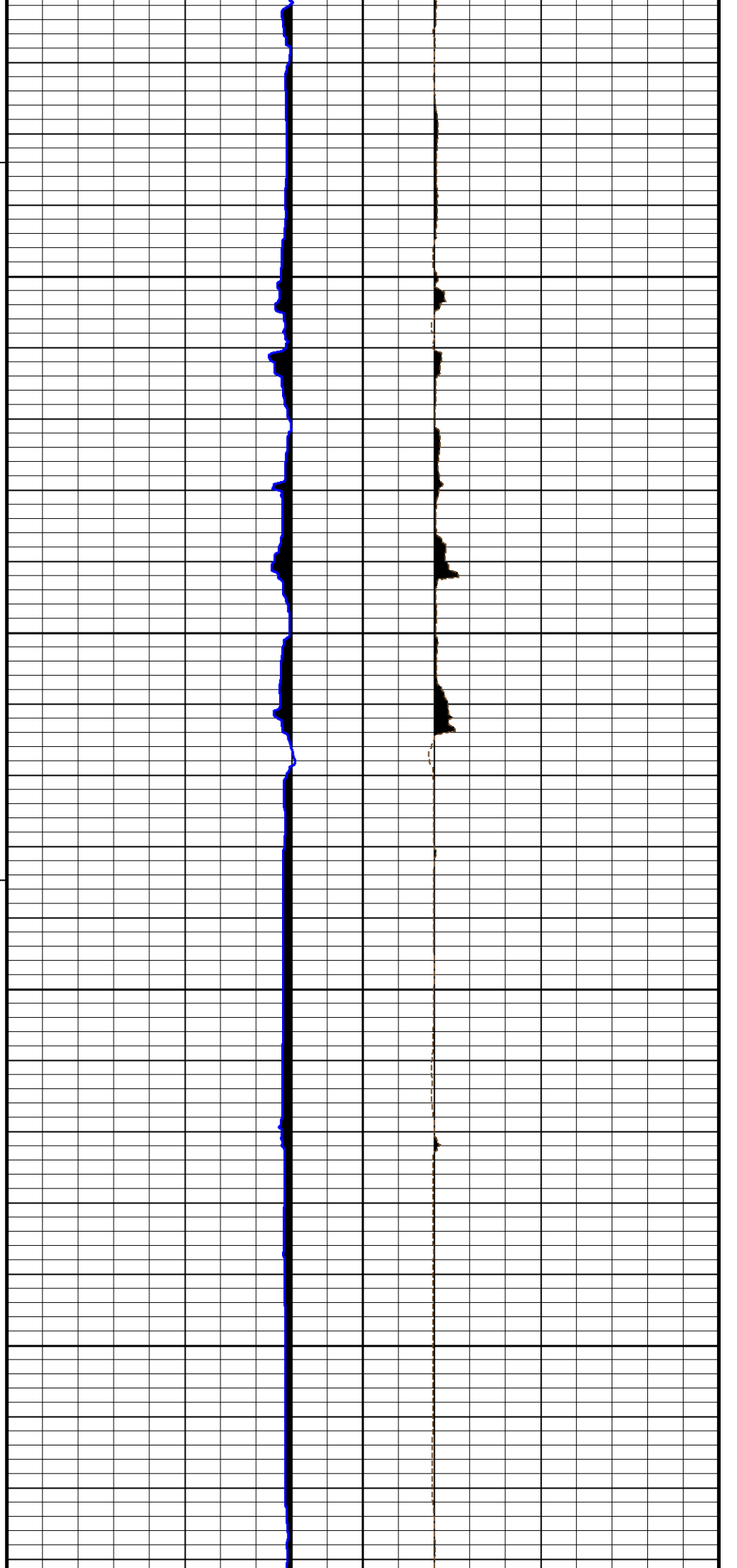
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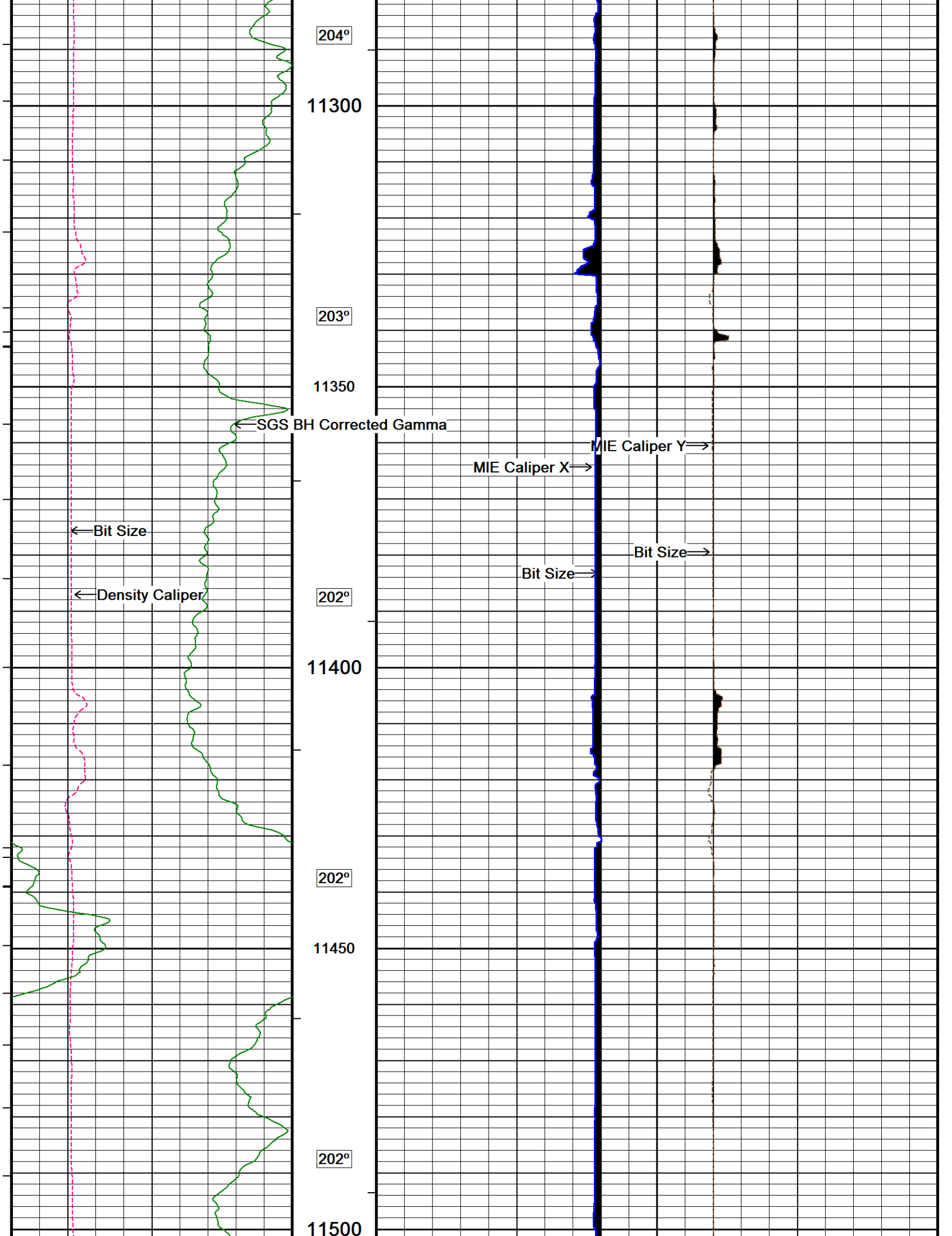
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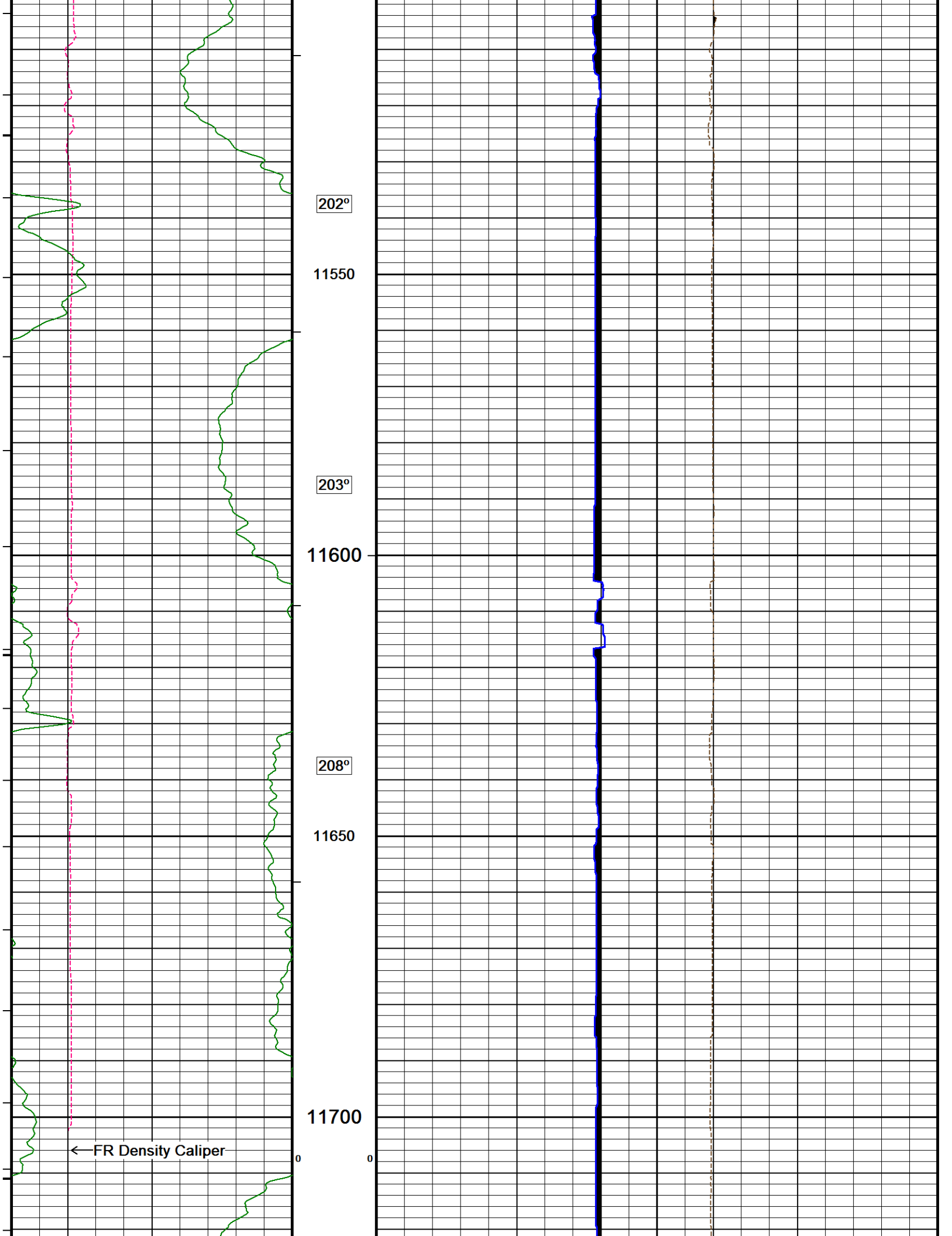
100

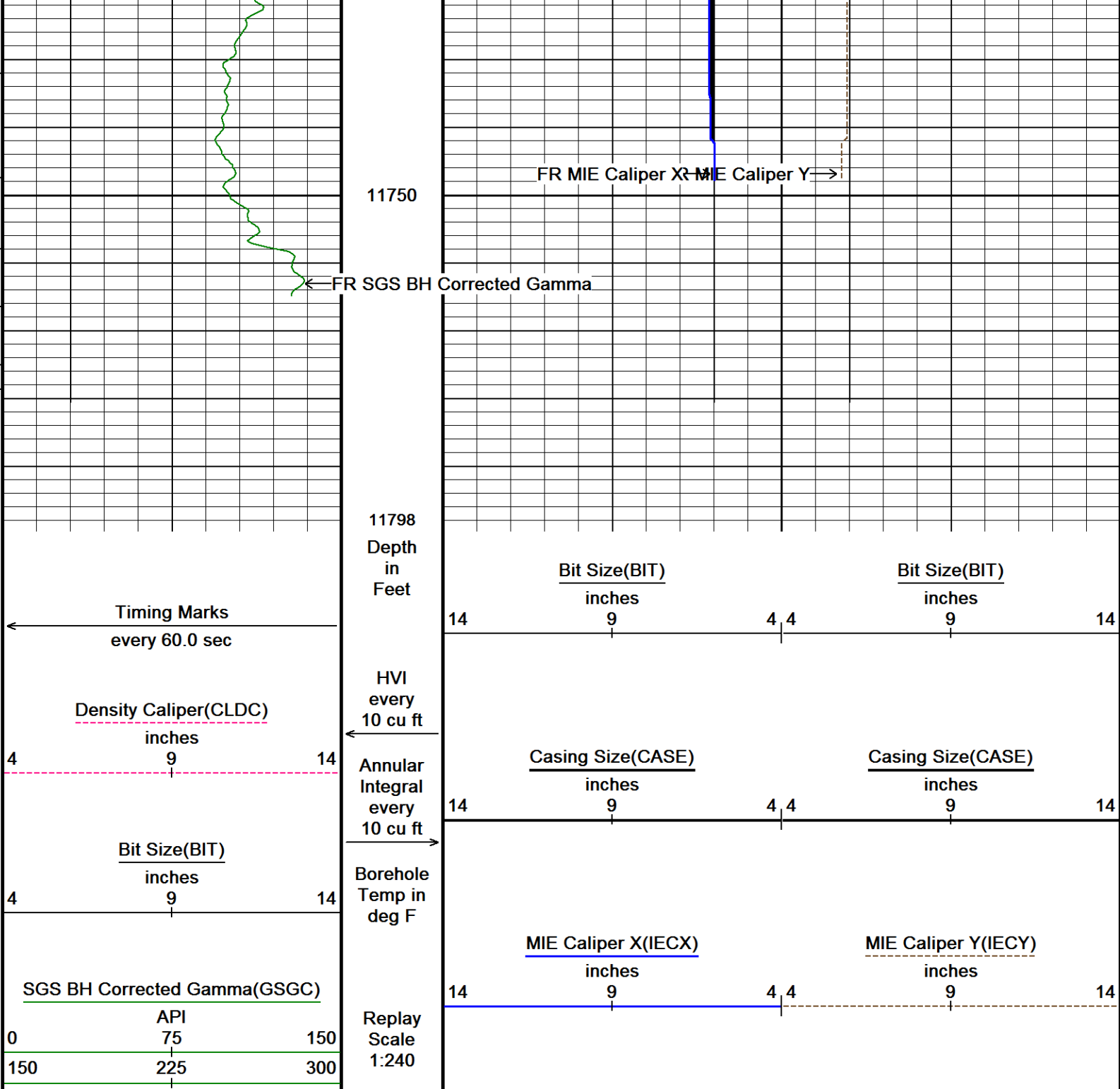
204°

11250









Depth Based Data - Maximum Sampling Increment 10.0cm  
 Filename: D:\Logs\Whiting\WOLF 12L-0103\MMS DEPTH2.dta  
 System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220

Plotted on 17-SEP-2014 03:08  
 Recorded on 17-SEP-2014 01:04

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION			
D:\Logs\Whiting\WOLF 12L-0103\MMS DEPTH2.dta			
Down-hole Tension Calibration All 000			
			Field Calibration on 24-OCT-2010 03:34
Reading No	Measured	Applied	
1	15659.85	0.00	
2	15734.68	370.00	

General Constants All 000 Last Edited on 16-SEP-2014,22:59

General Parameters

Mud Resistivity	0.970	ohm-metres
Mud Resistivity Temperature	89.900	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Four Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	

Down-hole Tension Calibration SMS 0

Field Calibration on 03-MAR-2014 17:38

Reading No	Measured	Calibrated (lbs)
1	15344.12	0.00
2	16163.79	590.00

Strain Gauge Constants MMS-F.A 248

Last Edited on

Atmospheric Pressure	14.70	psi						
Serial Number	0							
Calibration Date	000000000000							
Base Check Date								
Dead Weight Serial Number	0							
Dead Weight Gravitational Correction	1.0							
Temperature	75.0	150.0	250.0	350.0	degrees F			
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Gamma Calibration MGS-D.A 219

Field Calibration on 15-SEP-2014 17:05

	Measured	Calibrated (API)
Background	135	92
Calibrator (Gross)	1024	701
Calibrator (Net)	889	609

Gamma Constants MGS-D.A 219

Last Edited on 16-SEP-2014,23:00

Gamma Calibrator Number	GRCC 224	
Mud Density	1.16	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MGS-D.A 219

Field Calibration on 24-JUL-2014,18:59

	Measured	Calibrated (mV)
Reference 1	-100.0	-100.0
Reference 2	100.0	100.0

High Resolution Temperature Calibration MGS-D.A 219

Field Calibration on 24-JUL-2014,18:59

	Measured	Calibrated(Deg F)
Lower	20.00	20.00
Upper	200.00	200.00

High Resolution Temperature Constants MGS-D.A 219

Last Edited on 24-JUL-2014,18:59

## Neutron Calibration MDN-B.J 372

Base Calibration on 28-AUG-2014 09:05

Field Check on 15-SEP-2014 16:28

## Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	2928	89	3714	110
	32.979		33.764	

## Field Calibrator at Base

	Calibrated (cps)
Ratio	2324 3439
	0.676

## Field Check

	Calibrated (cps)
Ratio	2424 3535
	0.686

## Neutron Constants MDN-B.J 372

Last Edited on 15-SEP-2014,16:25

Neutron Source Id	P31115B	
Neutron Jig Number	NJ5299	
Air Hole Processing	Modified Ratio	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	None	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

## Imager Pad Check MIE-A.A 173

Field Check on 28-JUL-2014 13:58

Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified

## Compact Micro Imager Constants MIE-A.A 173

Last Edited on 24-AUG-2014,16:32

Sonde Configuration	Imager Mode	
Arm-Pad Kit	Normal Pads (12.25 in)	
Arm-Pad Kit Serial Number		
Centre Pad 1 Rotational Offset	0.00	degrees
Image/Borehole Ovality Reference	Azimuth of Pad 1	
Non Active Buttons	Omit	
Search Angle	0.00	degrees
Correlation Interval	3.28	feet
Correlation Step	1.64	feet
Current Offset	0.0000	mAmp
Squasher Start	N/A	mAmp
Image Processing	Enabled	

## Navigation Constants MIE-A.A 173

Last Edited on 10-SEP-2014,09:35

Magnetic Declination	0.00	degrees	East
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## Magnetometer Parameters MIE-A.A 173

Date Of Last Magnetometer Calibration	17-JUL-2014,16:28		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.011067	-0.996373
Offset	0.009674	-0.014518	0.002543

Magnetometer Calibrator Number 000

## Accelerometer Parameters MIE-A.A 173

Date Of Last Accelerometer Calibration 15-JUL-2014,13:24

	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.113967	-1.108777	-1.100961
Offset	0.007433	0.003599	0.006425

## Accelerometer Constants MIE-A.A 173

Last Edited on 15-SEP-2014,16:43

Accelerometer Calibrator Number 000

## Accelerometer Temperature Characterisation

## X Accelerometer

Serial Number	648			
Calibration Date	19-Aug-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	-9.57706e-006	9.83611e-009	1.13245e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.83616e-004	1.98700e-007	1.44742e-009

## Y Accelerometer

Serial Number	652			
Calibration Date	19-Aug-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.42793e-006	-1.11656e-008	-4.36730e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.75161e-004	2.12516e-007	8.53262e-010

## Z Accelerometer

Serial Number	588			
Calibration Date	06-May-2008			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	2.55228e-005	-4.28668e-009	8.28710e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.82774e-004	2.50728e-007	1.25354e-009

## Caliper Calibration MIE-A.A 173

Base Calibration on 15-SEP-2014 16:49

Field Calibration on 15-SEP-2014 16:51

## Base Calibration

Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)
1	25596	27177	5.96
2	35531	37467	7.98
3	42540	46891	9.86
4	49316	57779	11.88
5	0	0	0.00

Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25350	25662	25136	25847	5.96
2	34138	34121	33803	34657	7.98
3	43605	40646	40186	44503	9.86
4	55526	47326	47020	56371	11.88
5	0	0	0	0	0.00

## Field Calibration

	Measured Pads 1-5 Caliper(in)	Measured Pads 3-7 Caliper(in)	Actual Caliper(in)		
	5.98	5.97	5.96		
	Measured Pad 2 Caliper(in)	Measured Pad 4 Caliper(in)	Measured Pad 6 Caliper(in)	Measured Pad 8 Caliper(in)	Actual Caliper(in)
	2.95	3.01	3.03	2.96	5.96

## Caliper Constants MIE-A.A 173

Last Edited on

Caliper Difference for BRKT 0.120 inches

## Induction Calibration MAI-B.J 434

Base Calibration on 24-JAN-2012,20:11

Field Check on 15-SEP-2014 16:41

## Base Calibration

Test Loop Calibration	Measured	Calibrated (mmho/m)
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Test Loop Calibration		measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	14.7	442.4	9.3	966.2	
2	5.0	355.7	7.6	821.4	
3	3.2	250.0	5.2	566.0	
4	1.6	129.2	2.6	279.2	
Array Temperature		23.6		Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1			19.6	4103.6	
2			34.6	3790.9	
3			30.1	3169.0	
4			20.7	2138.8	
Deep			16.9	1969.4	
Medium			44.0	4225.0	
Shallow			54.3	5753.5	
Array Temperature				84.7	Deg F

Induction Constants MAI-B.J 434		Last Edited on 15-SEP-2014,16:39			
Induction Model		RtAP-WBM			
Caliper for Borehole Corr.		Density Caliper			
Hole Size for Borehole Correction		N/A		inches	
Tool Centred		No			
Stand-off Type		Fins			
Stand-off		0.50		inches	
Number of Fins on Stand-off		6.0000			
Stand-off Fin Angle		60.00		degrees	
Stand-off Fin Width		0.5000		inches	
Borehole Corr. Rm Source		Temperature Corr			
Temp. for Rm Corr.		MGS External Temperature			
Squasher Start		0.0020		mhos/metre	
Squasher Offset		N/A		mhos/metre	
Borehole Normalisation					
DRM1	0.0000	DRC1	0.0000		
DRM2	0.0000	DRC2	0.0000		
MRM1	0.0000	MRC1	0.0000		
MRM2	0.0000	MRC2	0.0000		
SRM1	0.0000	SRC1	0.0000		
SRM2	0.0000	SRC2	0.0000		
Calibration Site Corrections					
Channel 1	0.00		mmhos/metre		
Channel 2	0.00		mmhos/metre		
Channel 3	0.00		mmhos/metre		
Channel 4	0.00		mmhos/metre		
Apparent Porosity and Water Saturation Constants					
Archie Constant (A)	1.00				
Cementation Exponent (M)	2.00				
Saturation Exponent (N)	2.00				
Saturation of Water for Apor	100.00		percent		
Resistivity of Water for Apor and Sw	0.05		ohm-m		
Resistivity of Mud Filtrate for Sw	0.00		ohm-m		
Source for Rt	0.00				
Source for Rxo	0.00				

High Resolution Temperature Calibration MAI-B.J 434		Field Calibration on 24-JAN-2012,20:11	
	Measured	Calibrated(Deg C)	
Lower	10.00	10.00	
Upper	100.00	100.00	

High Resolution Temperature Constants MAI-B.J 434		Last Edited on	
Pre-filter Length	11		

Photo Density Calibration MPD-C.J 378		Base Calibration on 28-AUG-2014 14:26	
		Field Check on 15-SEP-2014 16:34	

Density Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Base Calibration				
Background	1151	1225		
Reference 1	56652	25552	59443	30683
Reference 2	22274	2349	25113	2508
Field Check at Base	1151.5	1225.5		
Field Check	1147.4	1227.9		

PE Calibration	Base Calibration	Measured			Calibrated
		WS	WH	Ratio	Ratio
	Background	211	1032		
	Reference 1	24495	56459	0.438	0.372
	Reference 2	6523	22145	0.299	0.268
	Field Check at Base	211.2	1031.7		
	Field Check	212.4	1030.2		

Density Constants MPD-C.J 378 Last Edited on 16-SEP-2014,23:00

Density Source Id	P44264B	
Nylon Calibrator Number	652	
Aluminium Calibrator Number	659	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.16	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.71	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	
0.00	0.00	

Caliper Calibration MPD-C.J 378 Base Calibration on 28-AUG-2014 13:41  
Field Calibration on 15-SEP-2014 16:38

Base Calibration	Measured	Calibrator Size (in)
Reading No		
1	13040	4.00
2	21312	5.96
3	29748	7.98
4	37680	9.86
5	46993	11.88
6	N/A	N/A
Field Calibration	Measured Caliper (in)	Actual Caliper (in)
	5.89	5.96

Spectral Gamma Calibration SGS-E.J 167 Base Calibration on 07-AUG-2014 16:23  
Field Calibration on 21-AUG-2014 11:11

Base Calibration	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Potassium Calibrator					

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.9	38.0	4.1	1.5	3.1
Calibrator (Gross)	244.6	128.0	29.0	1.8	3.8
Calibrator (Net)	131.7	90.0	24.8	0.3	0.7

Concentrations	K %	U ppm	Th ppm
	5.9	0.0	0.0

#### Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.9	38.0	4.1	1.5	3.1
Calibrator (Gross)	549.0	191.7	17.1	10.6	5.4
Calibrator (Net)	436.1	153.7	13.0	9.1	2.3

Concentrations	K %	U ppm	Th ppm
	0.0	16.6	0.0

#### Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.9	38.0	4.1	1.5	3.1
Calibrator (Gross)	419.6	151.1	12.1	6.7	16.9
Calibrator (Net)	306.7	113.1	8.0	5.2	13.8

Concentrations	K %	U ppm	Th ppm
	0.0	0.0	44.7

#### Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.9	38.0	4.1	1.5	3.1
Calibrator (Gross)	896.6	362.0	47.7	14.1	19.8
Calibrator (Net)	783.7	324.0	43.6	12.6	16.7

#### Field Calibration

##### Gamma Ray

	Measured	Calibrated (API)
Background	157	33
Calibrator (Gross)	1360	283
Calibrator (Net)	1203	250

#### Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	105.6	35.9	3.8	1.4	2.2
Calibrator (Gross)	893.6	373.4	49.4	15.4	21.0
Calibrator (Net)	788.0	337.4	45.6	13.9	18.8

Spectral Gamma Constants SGS-E.J 167

Last Edited on 16-SEP-2014,23:01

Background Calibrator Number	440
Mixture Calibrator Number	450
Potassium Calibrator Number	500
Uranium Calibrator Number	506
Thorium Calibrator Number	503
Mud Density	1.16 gm/cc
Caliper Source for Processing	Density Caliper
Tool Position	Eccentred
Concentration of KCl	kppm
K Mud Type	Chloride
K Mud Concentration	0.00 %

## DOWNHOLE EQUIPMENT

D:\Logs\Whiting\WOLF 12L-0103\MMS DEPTH2.dta

Shuttle Running Tool 3.5" (SRT A)  
SRT-A 6 LG: 6.47 ft WT: 37.5 lb OD: 2.520 in

MLK-A 3 LG: 4.48 ft WT: 30.9 lb OD: 2.240 in



Compact Linker MMR  
MLK-A 1 LG: 14.23 ft WT: 30.9 lb OD: 2.240 in

Compact Linker 200V EXT  
MLK-A 2 LG: 8.52 ft WT: 30.9 lb OD: 2.240 in

SKJ-E.A Compact Knuckle Joint  
SKJ-E.A 246 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MBS-F.A 200v Compact Battery Sub  
MBS-F.A 119 LG: 17.06 ft WT: 123.5 lb OD: 2.240 in

Compact Memory Sub F.A  
MMS-F.A 248 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.  
MTI-C.A 145 LG: 1.54 ft WT: 13.2 lb OD: 2.244 in

Compact Short Gamma  
MGS-D.A 219 LG: 3.41 ft WT: 24.3 lb OD: 2.244 in

Compact Collar Locator  
MCL-C.A 128 LG: 3.17 ft WT: 26.5 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 597 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 512 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 731 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Neutron  
MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper  
MPD-C.J 378 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 723 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 678 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint  
SKJ-E.A 244 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.B Compact Inline Standoff sub  
MIS-E.B 693 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

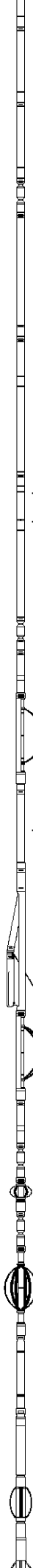
SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 612 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.A Compact Inline Bowspring sub  
MIS-D.A 293 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section  
MIM-A.A 207 LG: 4.65 ft WT: 26.5 lb OD: 2.244 in

Compact MMI Electrode Section  
MIE-A.A 173 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

MIS-D.A Compact Inline Bowspring sub



99.98 ft GRGM - MGS Gamma Ray  
98.00 ft GSXT - MGS External Temperature

81.11 ft NPRL - Limestone Neutron Por.

73.87 ft AVOL - Annular Volume  
73.87 ft CLDC - Density Caliper  
71.94 ft DPRL - Limestone Density Por.  
71.94 ft DCOR - Density Correction  
71.88 ft PDPE - PE

32.99 ft IECX - MIE Caliper X  
32.99 ft IECY - MIE Caliper Y

MIS-D.A Compact Inline Downspring sub  
 MIS-D.A 437 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SKJ-E.A Compact Knuckle Joint  
 SKJ-E.A 245 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

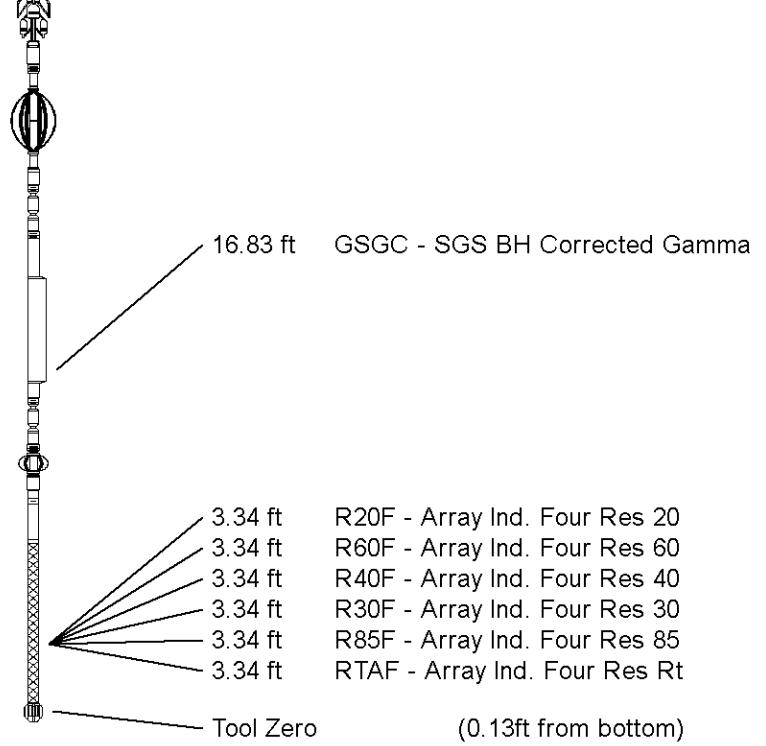
Spectral Gamma Ray Sub  
 SGS-E.J 167 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

SKJ-E.B Compact Knuckle Joint  
 SKJ-E.B 603 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.B Compact Inline Standoff sub  
 MIS-E.B 787 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

Compact Induction  
 MAI-B.J 434 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 160.57 ft Weight: 1128.8 lb



COMPANY	WHITING OIL AND GAS CORPORATION
WELL	WOLF 12L-0103
FIELD	REDTAIL
PROVINCE/COUNTY	WELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4970.00	feet	First Reading	11746.00	feet
Elevation Drill Floor	4970.00	feet	Depth Driller	13393.00	feet
Elevation Ground Level	4953.00	feet	Depth Logger	11781.00	feet



**Weatherford**<sup>®</sup>

MEASURED DEPTH  
 X-Y CALIPER  
 HOLE VOLUME LOG