



Weatherford

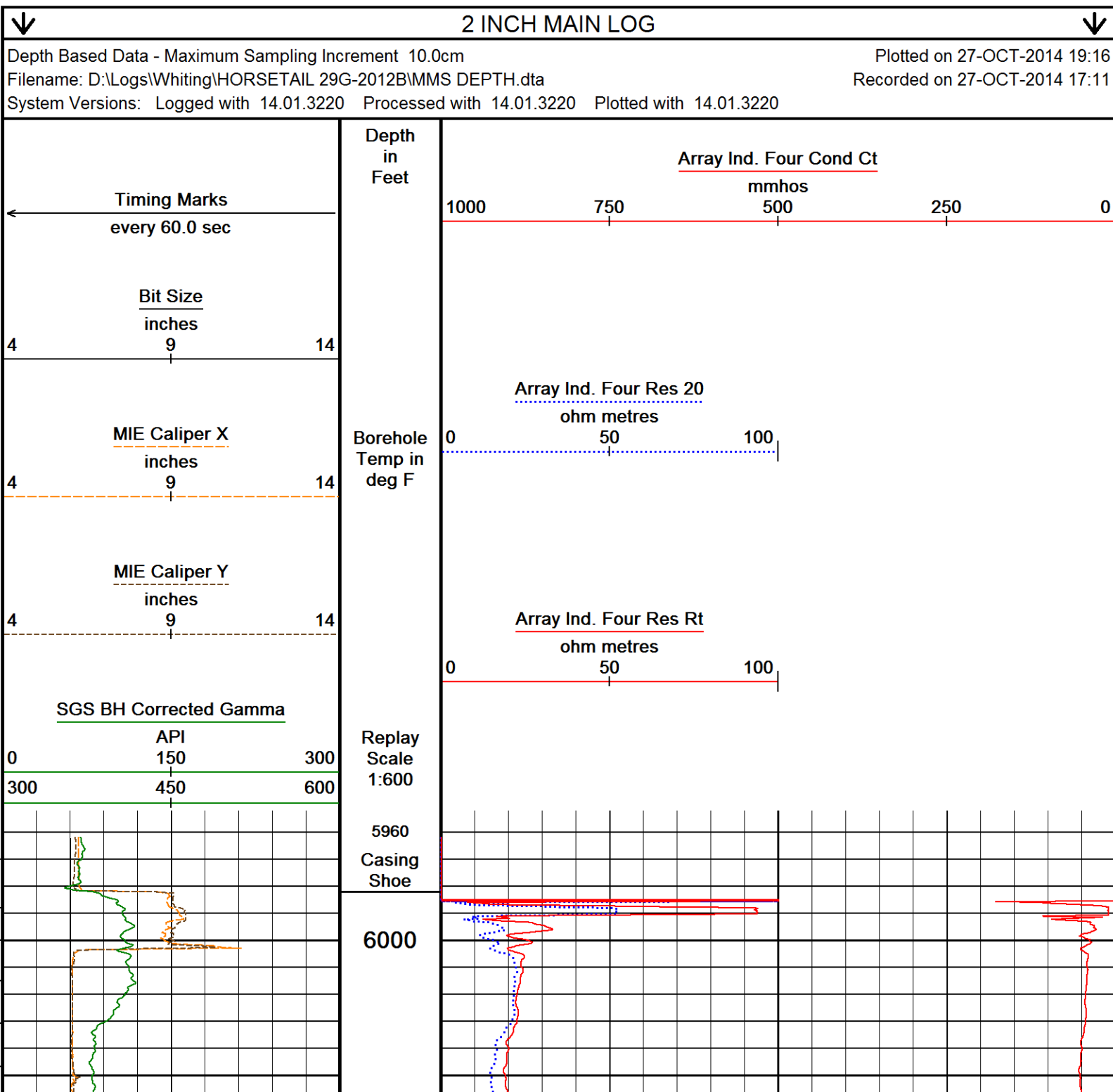
**MEASURED DEPTH
ARRAY INDUCTION
LOG**

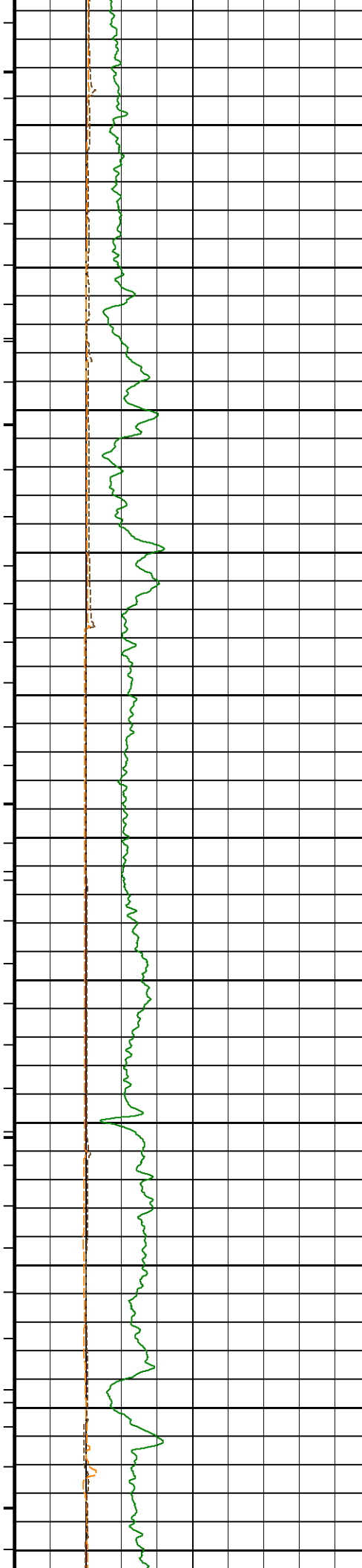
COMPANY		WHITTING OIL AND GAS CORPORATION			
WELL		HORSETAIL 29G-2012B			
FIELD		REDTAIL			
PROVINCE/COUNTY		WELD			
COUNTRY/STATE		U.S.A. / COLORADO			
LOCATION		SHL: 2328 FNL & 1888 FWL			
PERMIT NUMBER		BHL: 100 FNL & 1485 FWL			
SEC 29	TWP 10N	RGE 57W	Other Services		
		MICRO IMAGER			
		SPECTRAL GAMMA			
API Number		05-123-38804	DENSITY/NEUTRON		
Permanent Datum G.L., Elevation 4694 feet				Elevations:	feet
Log Measured From KB				KB	4712.00
Drilling Measured From K.B. @ 18 FEET				DF	4712.00
				GL	4694.00
Date	26-OCT-2014				
Run Number	ONE				
Service Order	6551-101540329				
Depth Driller	13700.00		feet		
Depth Logger	13700.00		feet		
First Reading	13676.00		feet		
Last Reading	5962.00		feet		
Casing Driller	5981.00		feet		
Casing Logger	5982.00		feet		
Bit Size	6.000		inches		
Hole Fluid Type	WBM				
Density / Viscosity	10.60 lb/USg		44.00 type in		
PH / Fluid Loss	8.40		5.60 ml/30Min		
Sample Source	FLOWLINE				
Rm @ Measured Temp	1.88 @ 86.6		ohm-m		
Rmf @ Measured Temp	1.50 @ 86.6		ohm-m		
Rmc @ Measured Temp	2.26 @ 86.6		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.79 @210.0		ohm-m		
Time Since Circulation	1 HOUR				
Max Recorded Temp	216.00		deg F		
Equipment / Base	18086		Casper		
Recorded By	C CULLEN				
Witnessed By	M ODEBERG		GEOLOGIST		
WSL			WSL		

BOREHOLE RECORD					Last Edited: 26-OCT-2014 09:16
Bit Size inches		Depth From feet		Depth To feet	
6.000		5981.00		13700.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	7.000	0.00	5981.00	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
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST
ANNULAR HOLE VOLUME FROM TD TO 7"-29# CASING AT 5982 FEET = 660 CUBIC FEET. TOTAL HOLE VOLUME FROM TD TO 7"-29# CASING AT 5982 FEET = 1510 CUBIC FEET.
OPERATORS: S I ANDON J GERDES

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.





202°

6100

202°

6200

203°

6300

203°

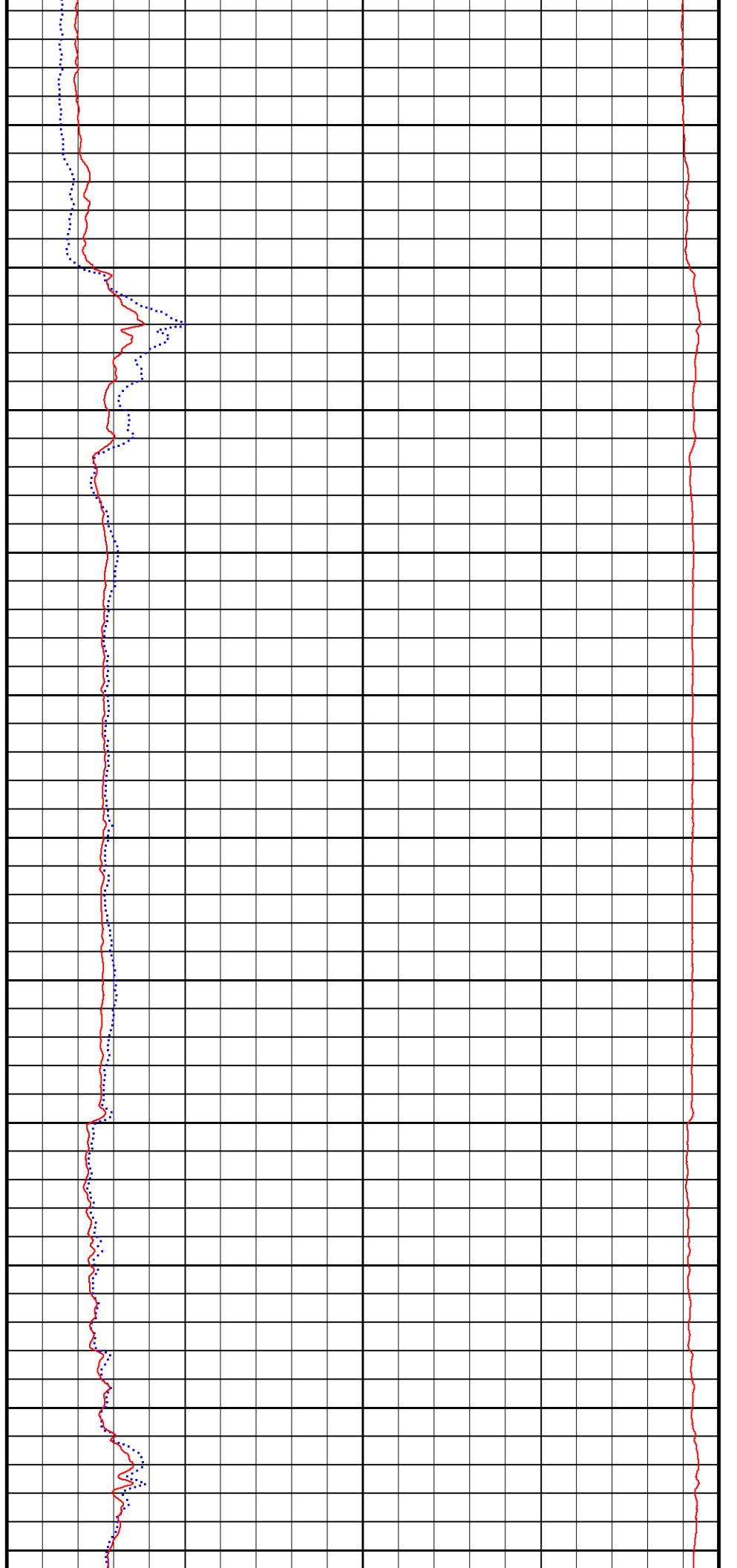
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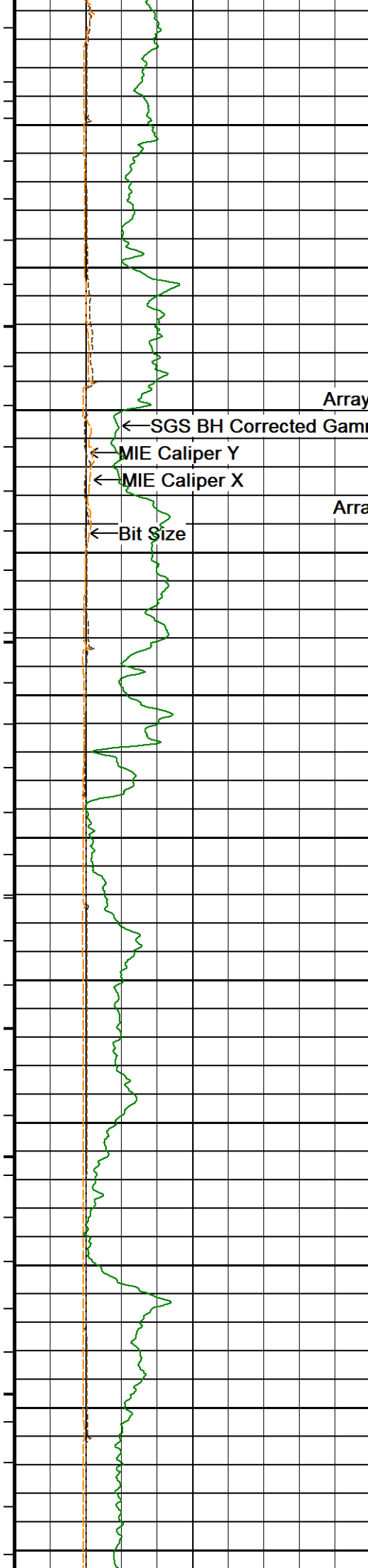
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6500

204°

6600





204°

6700

Array Ind. Four Res Rt →

← SGS BH Corrected Gamma

← MIE Caliper Y

← MIE Caliper X

← Bit Size

205°

Array Ind. Four Res 20 →

6800

205°

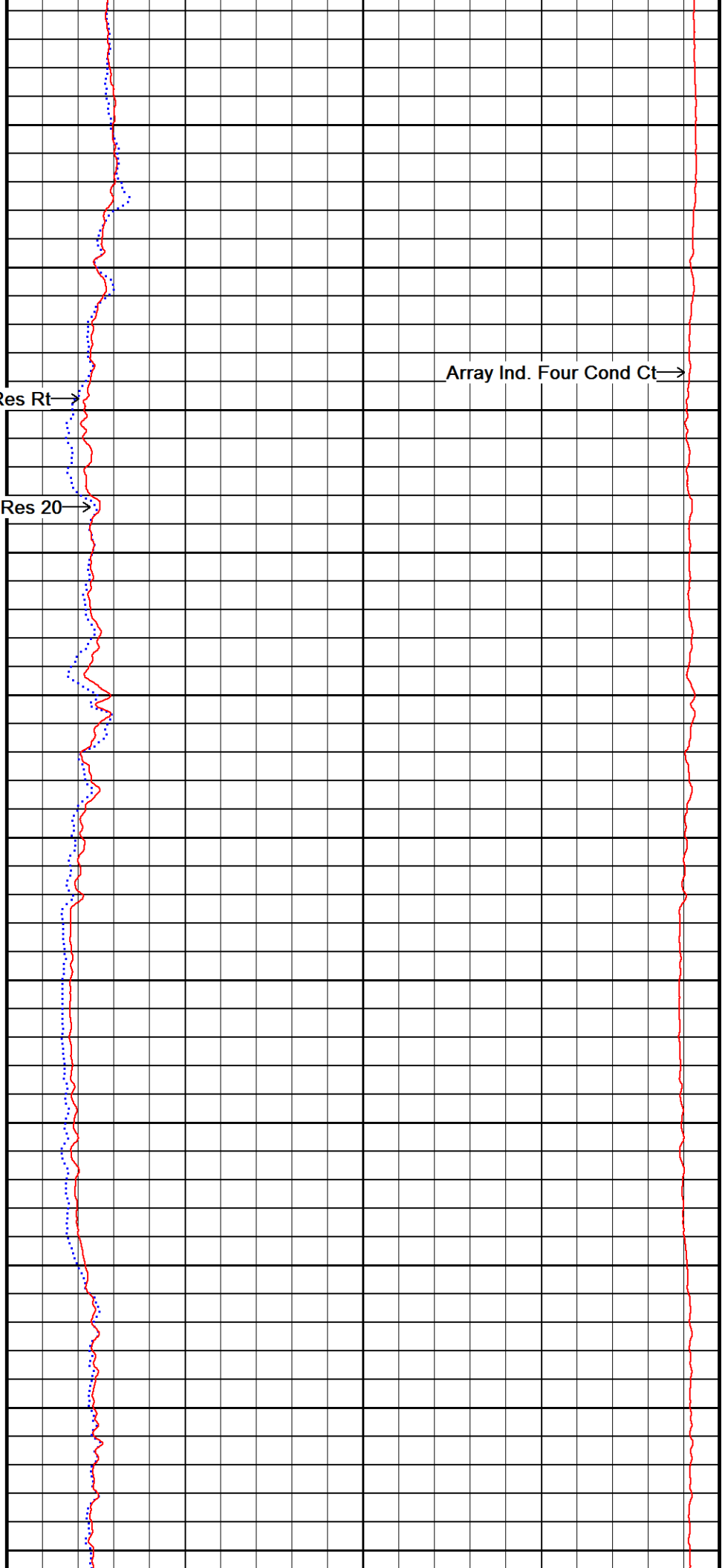
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205°

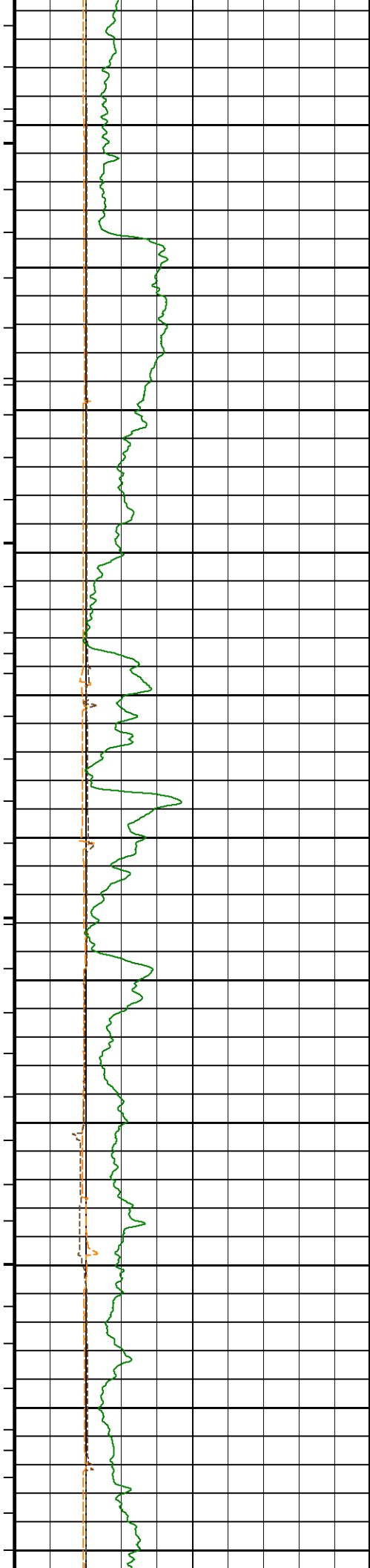
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206°

7100



Array Ind. Four Cond Ct →



206°

7200

206°

7300

207°

7400

207°

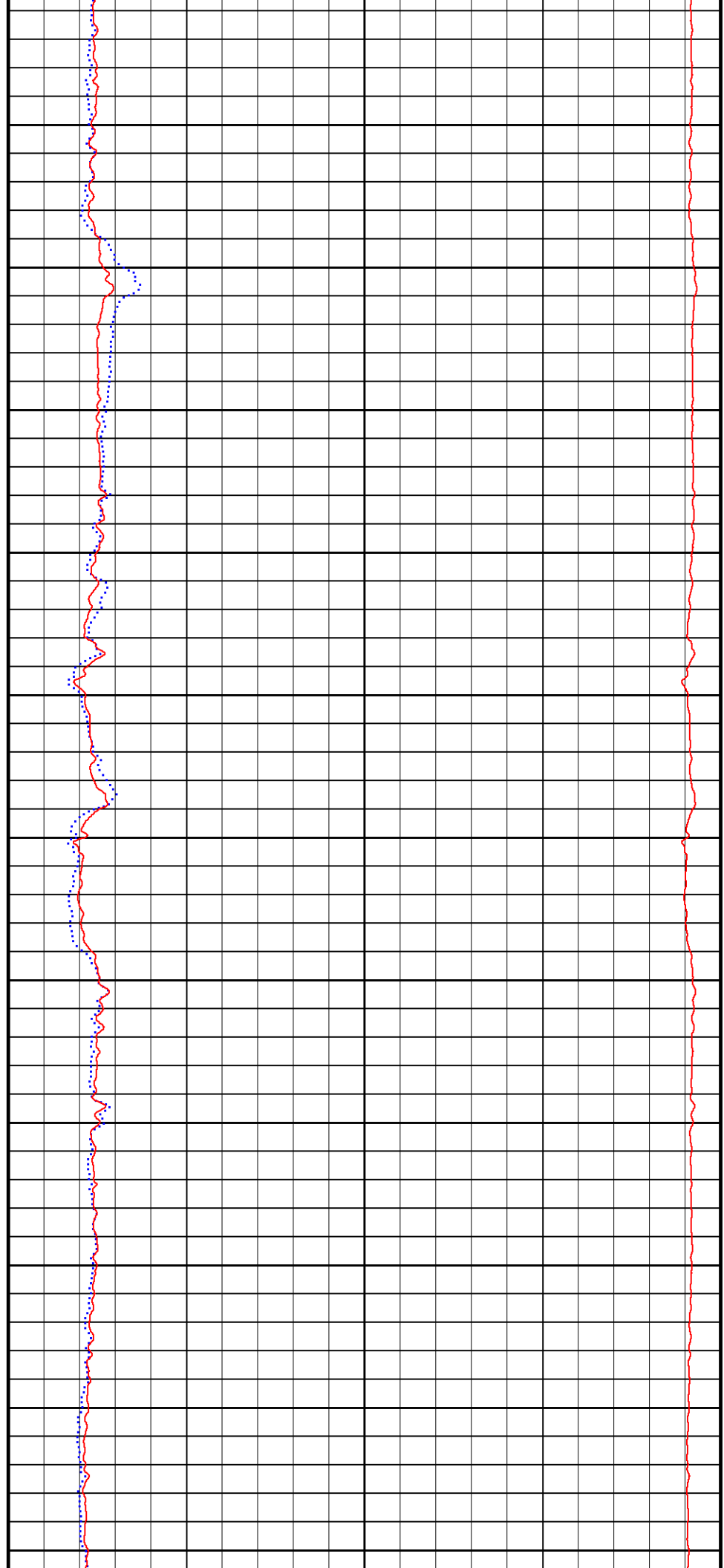
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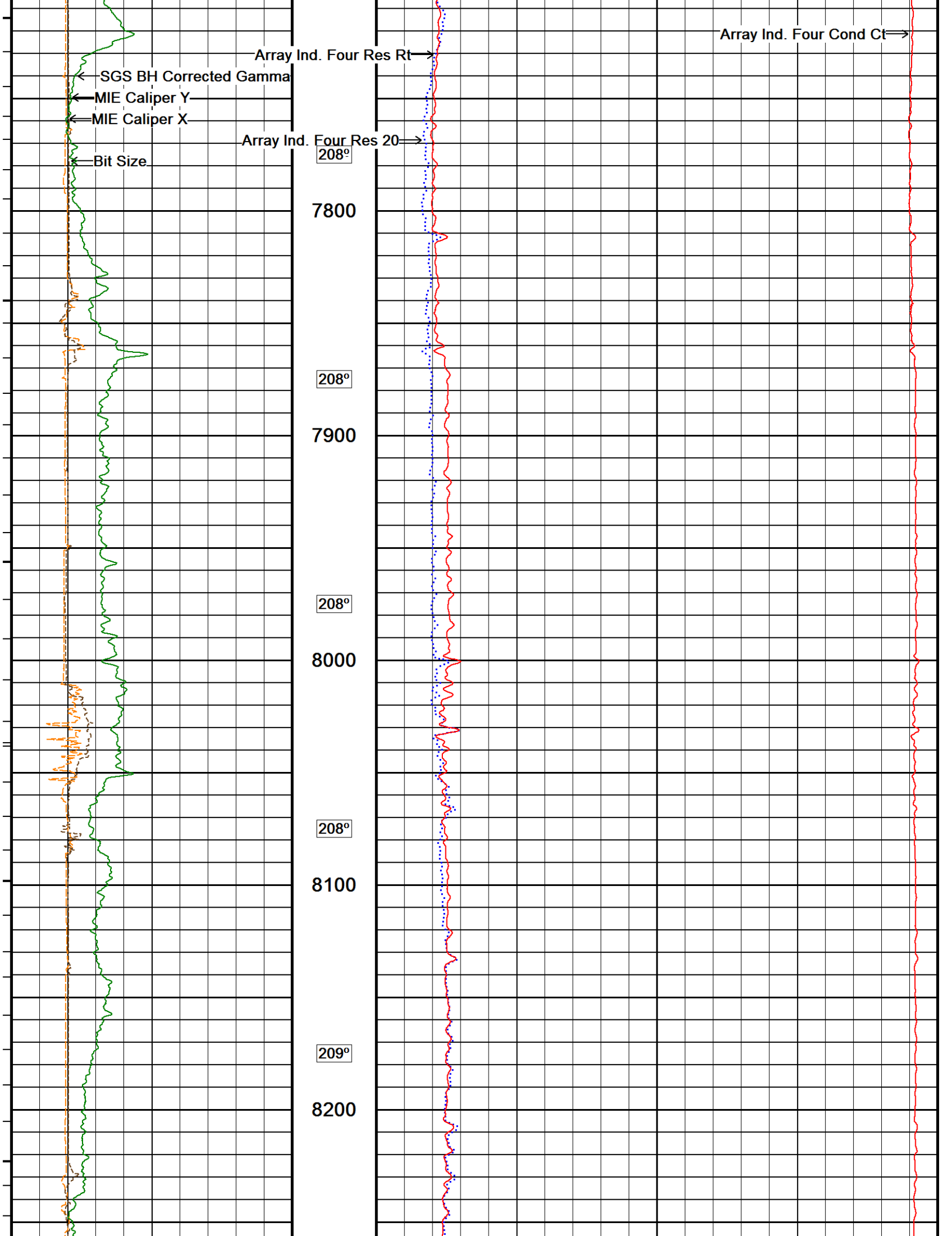
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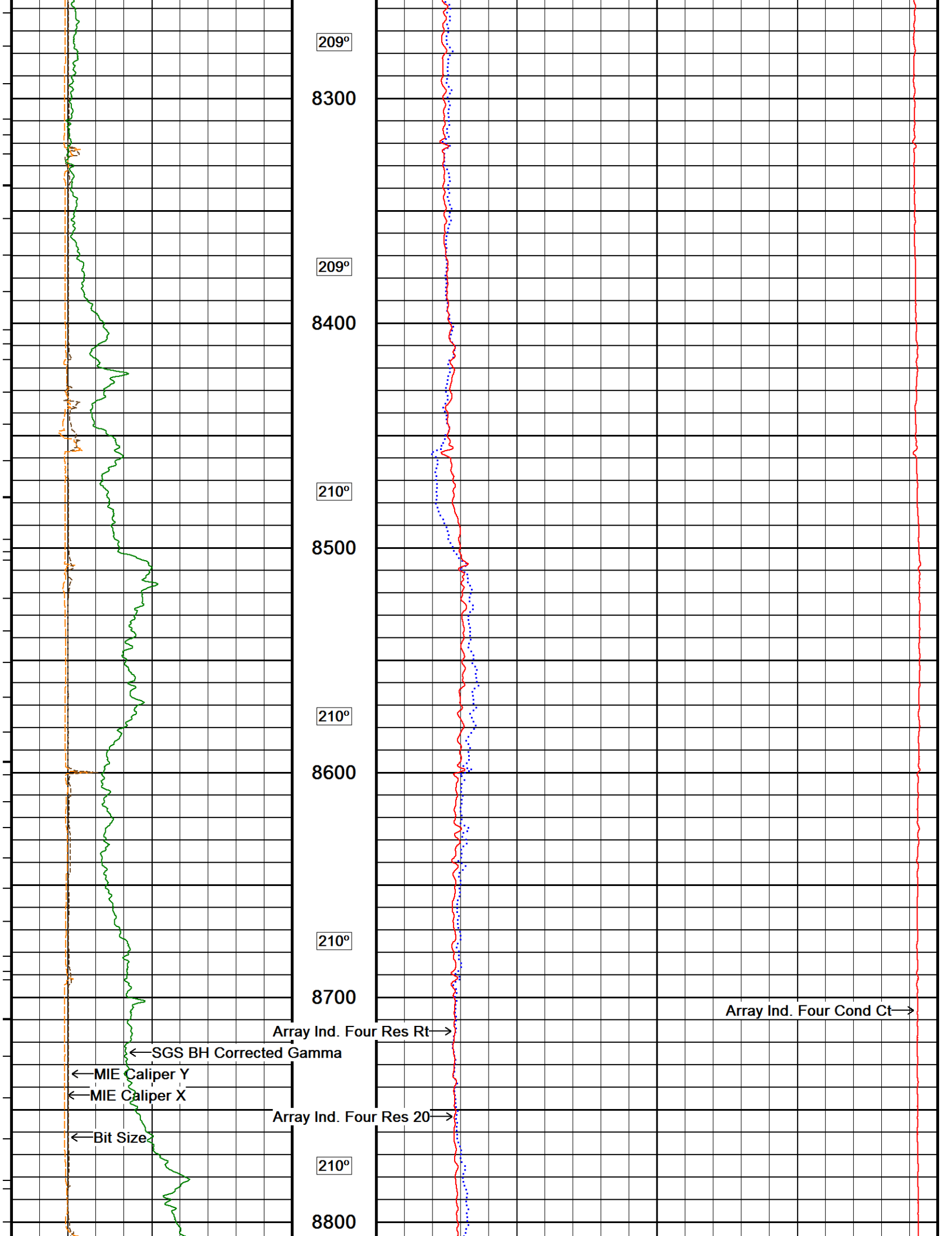
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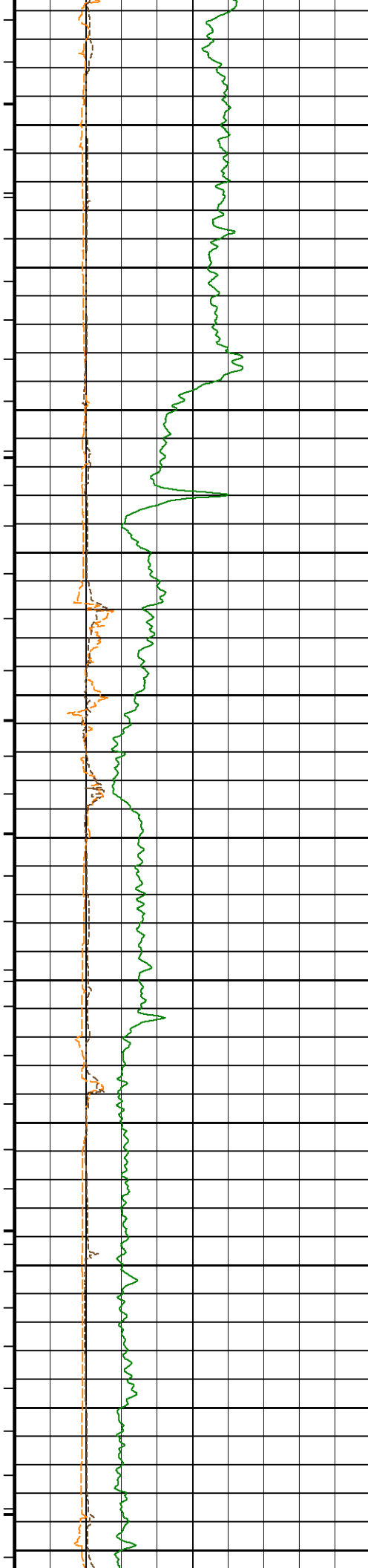
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7700









210°

8900

211°

9000

211°

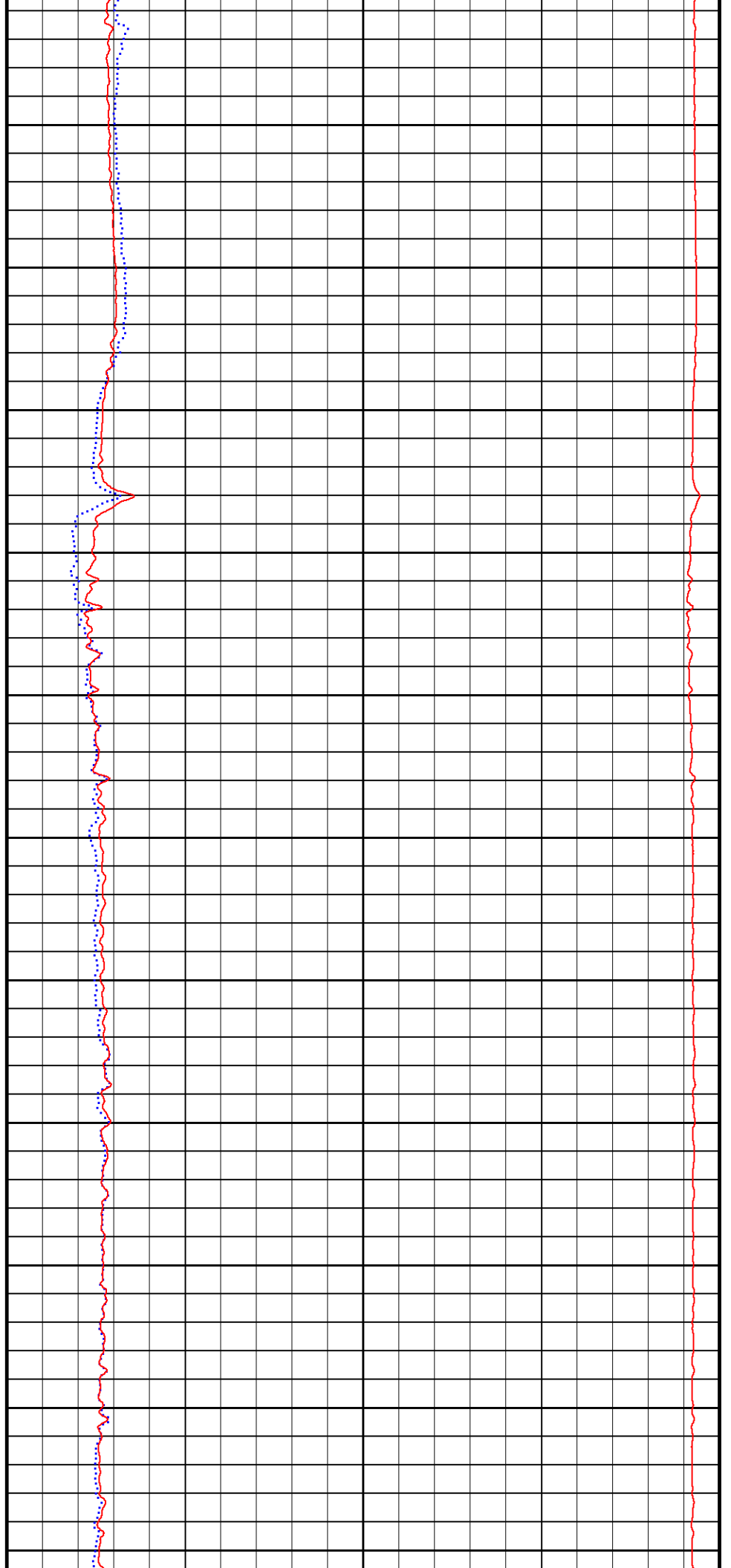
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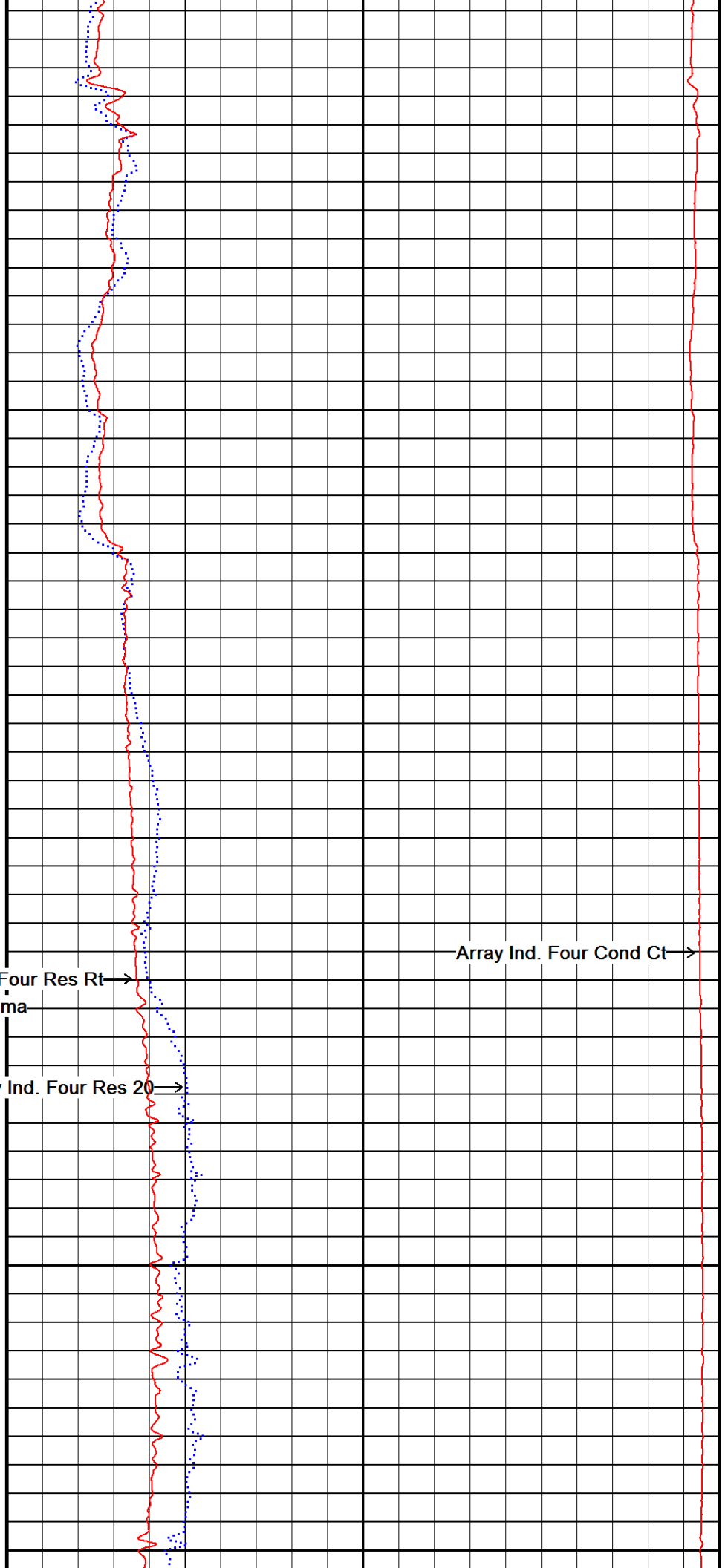
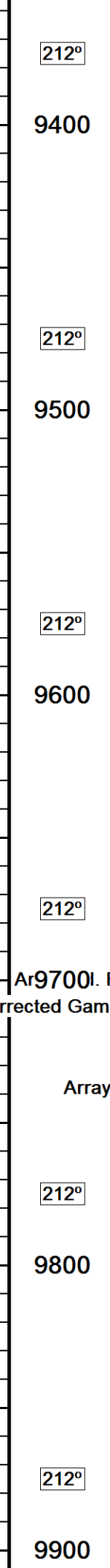
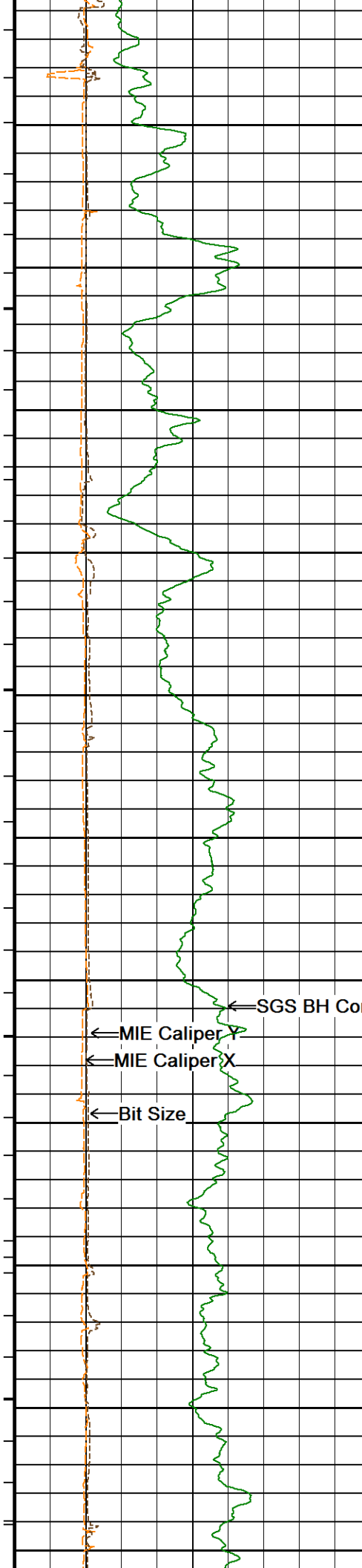
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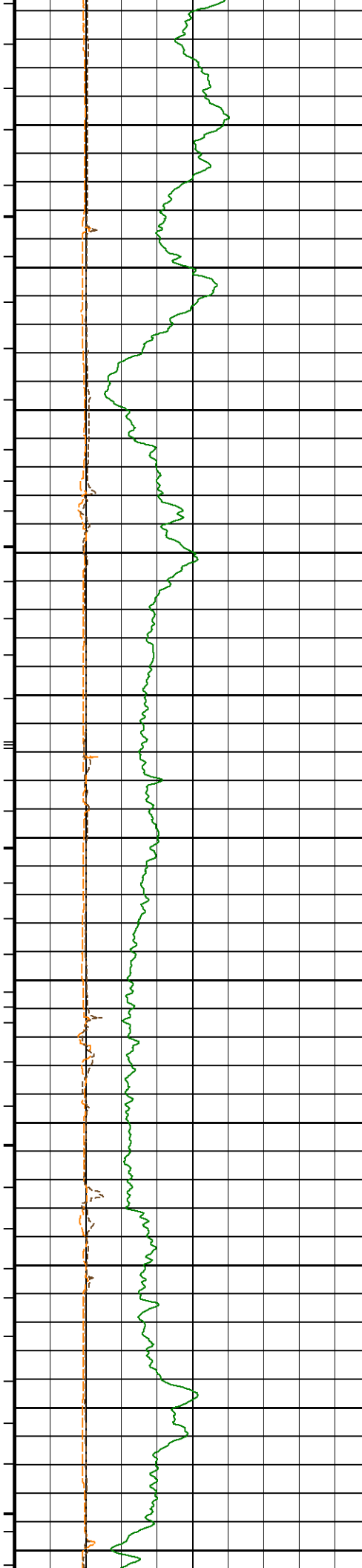
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211°

9300







212°

10000

213°

10100

213°

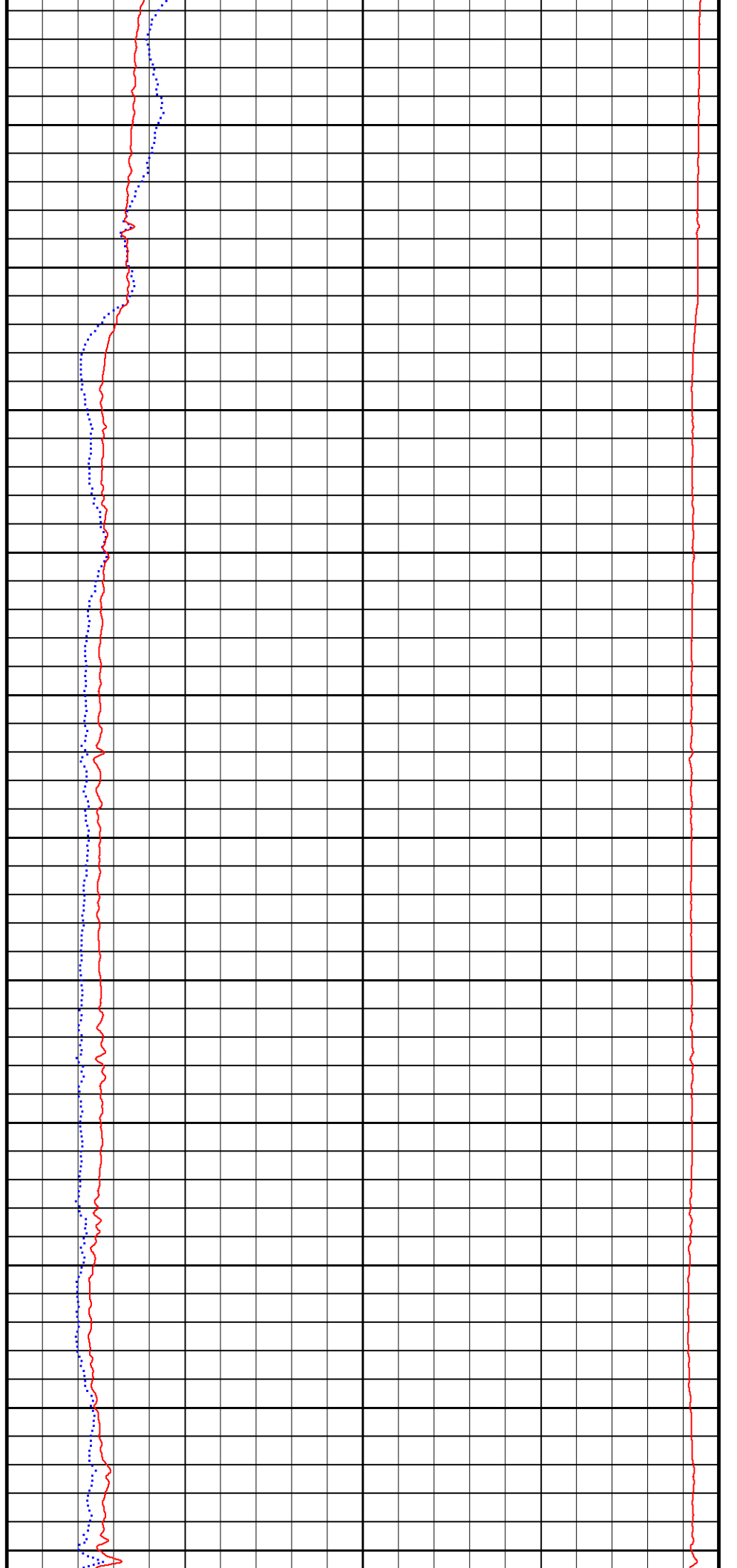
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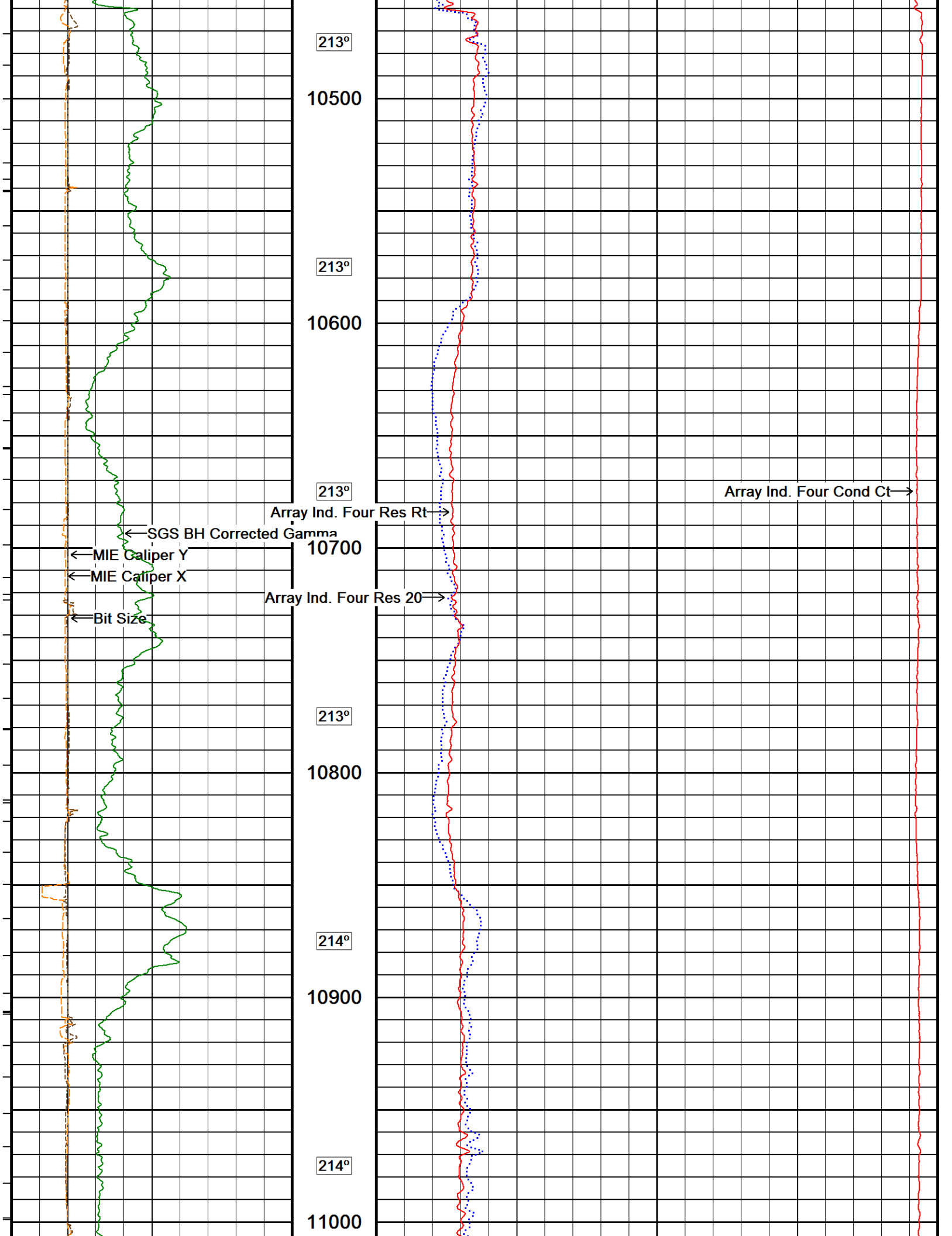
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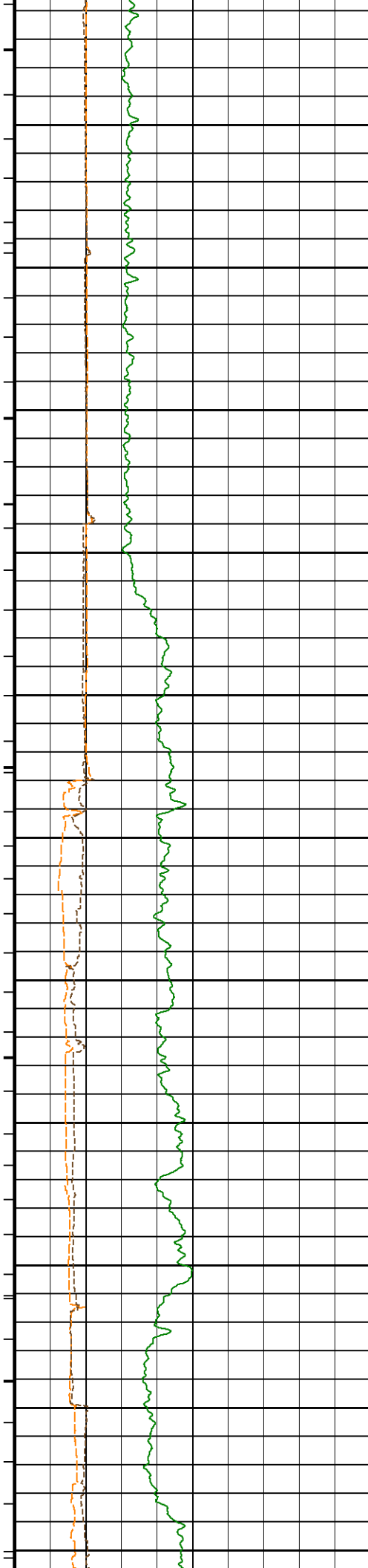
10300

213°

10400







214°

11100

214°

11200

214°

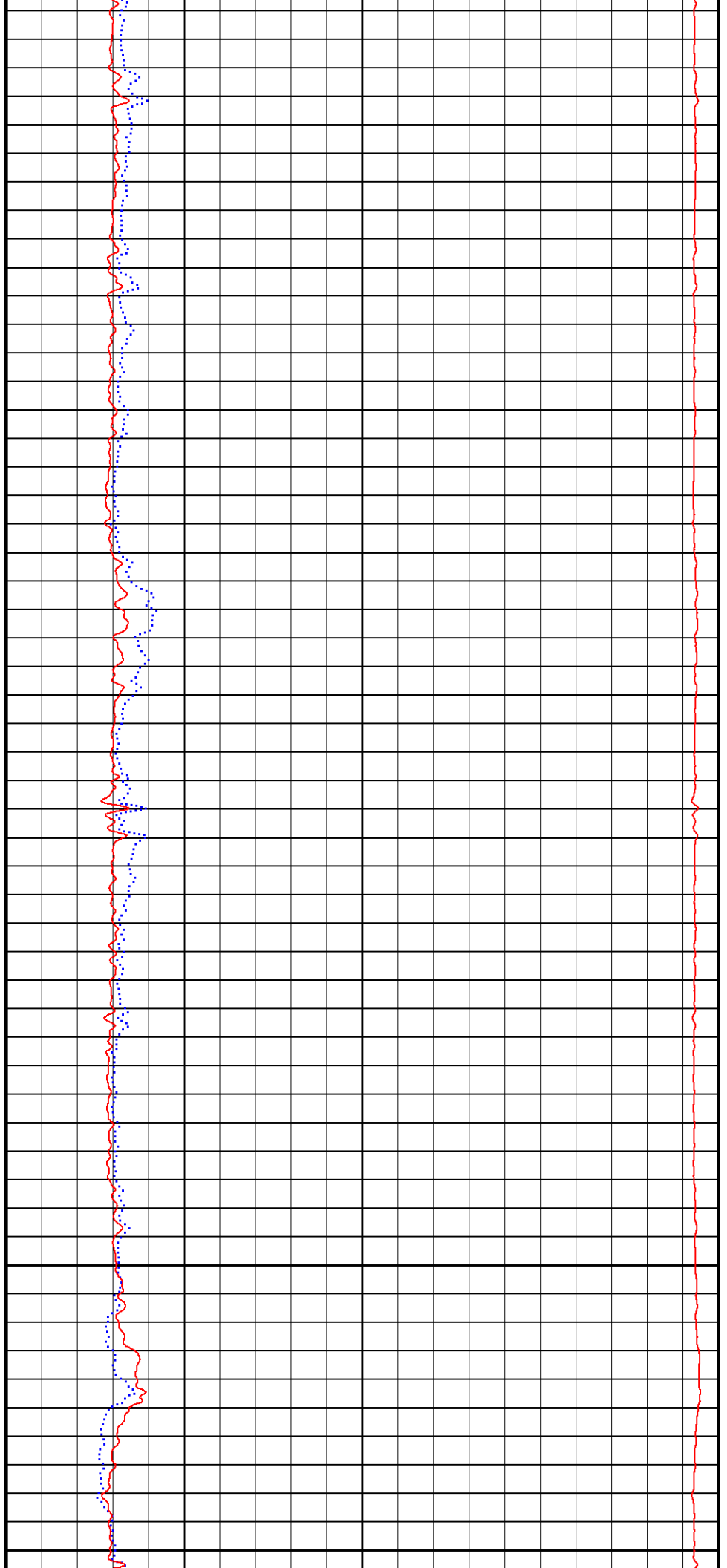
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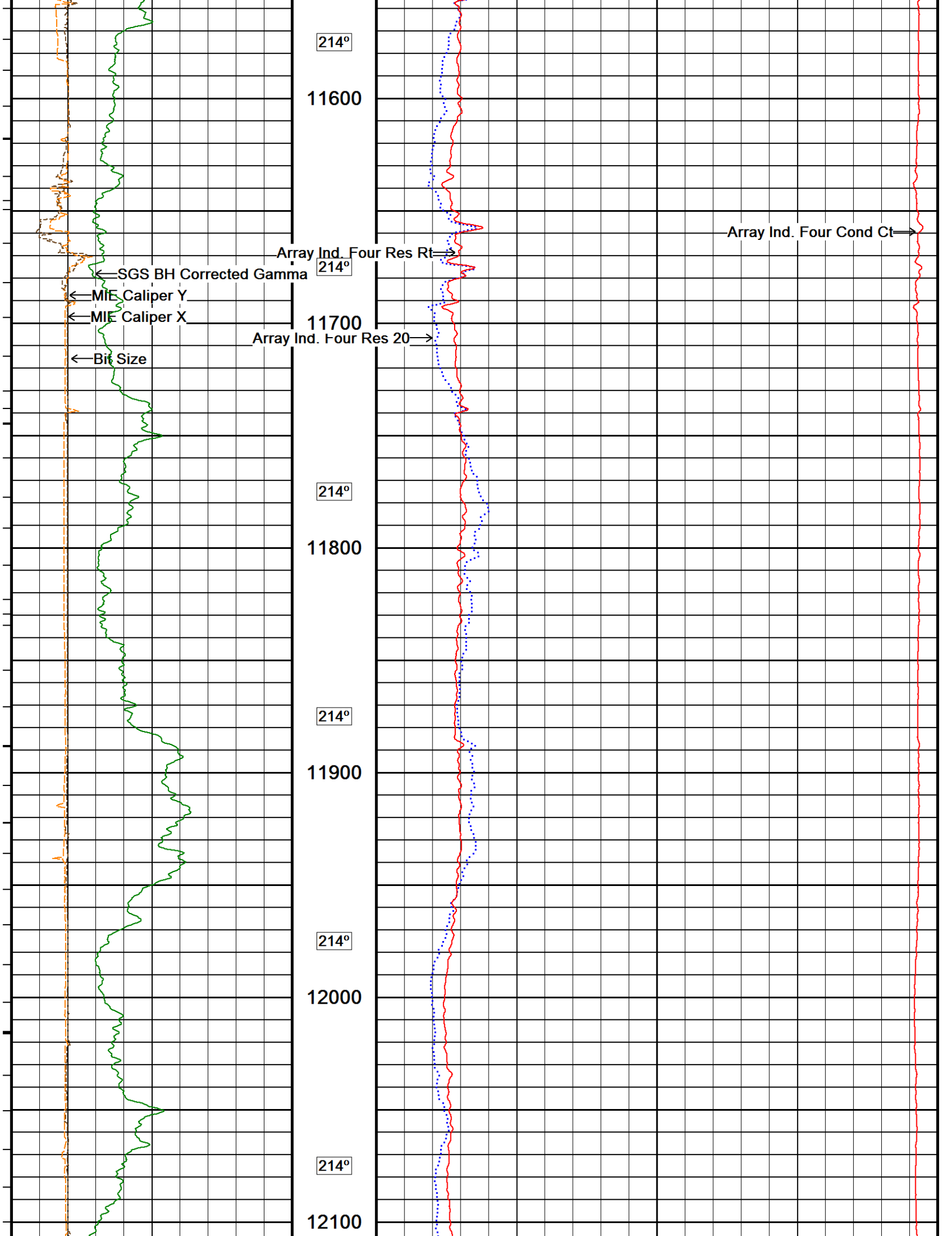
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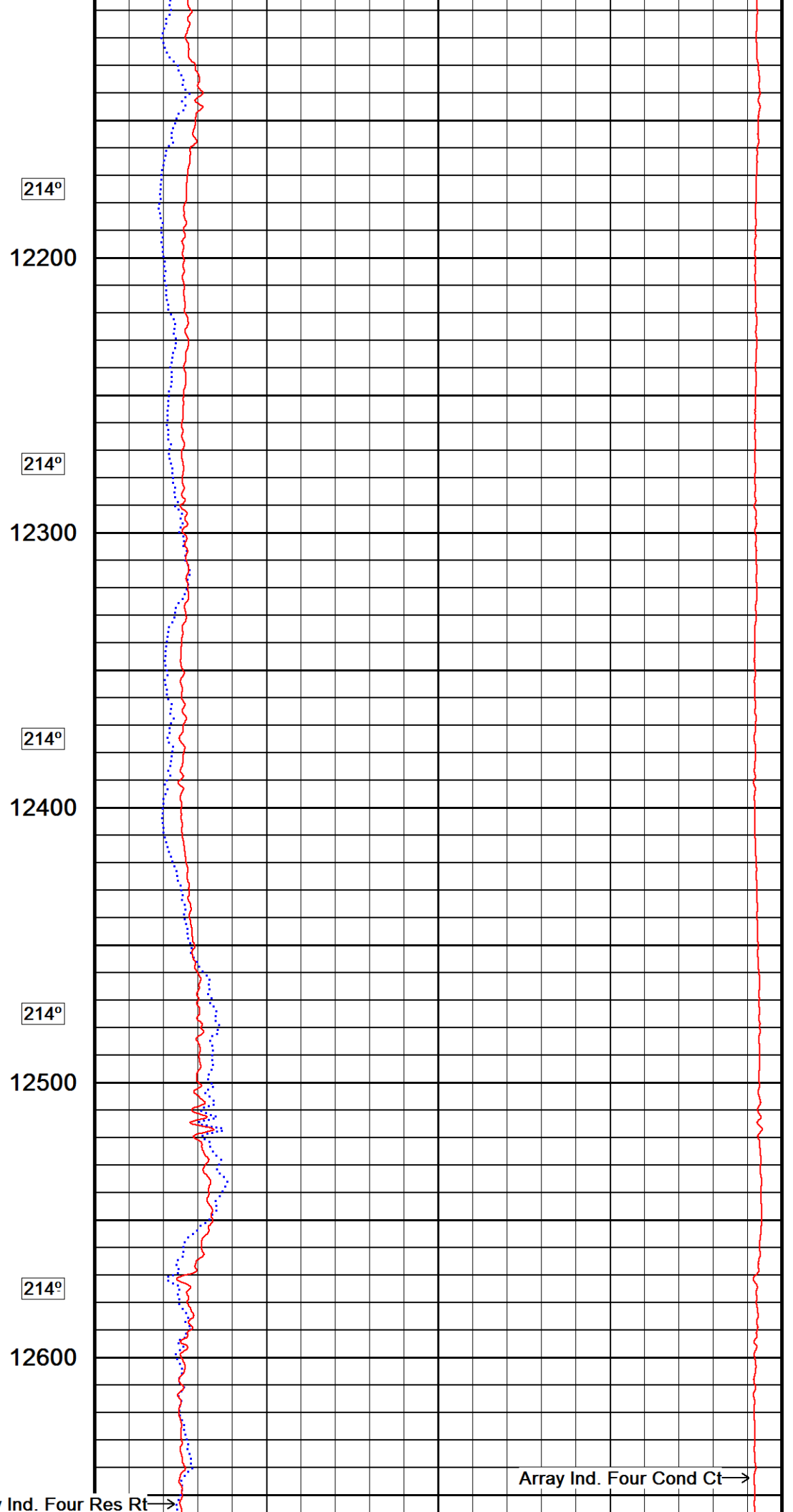
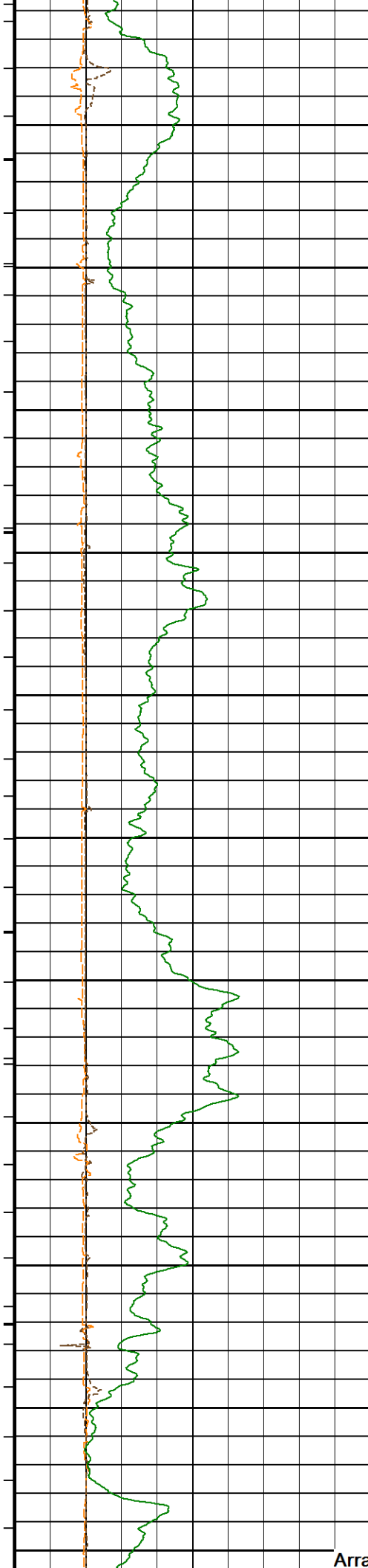
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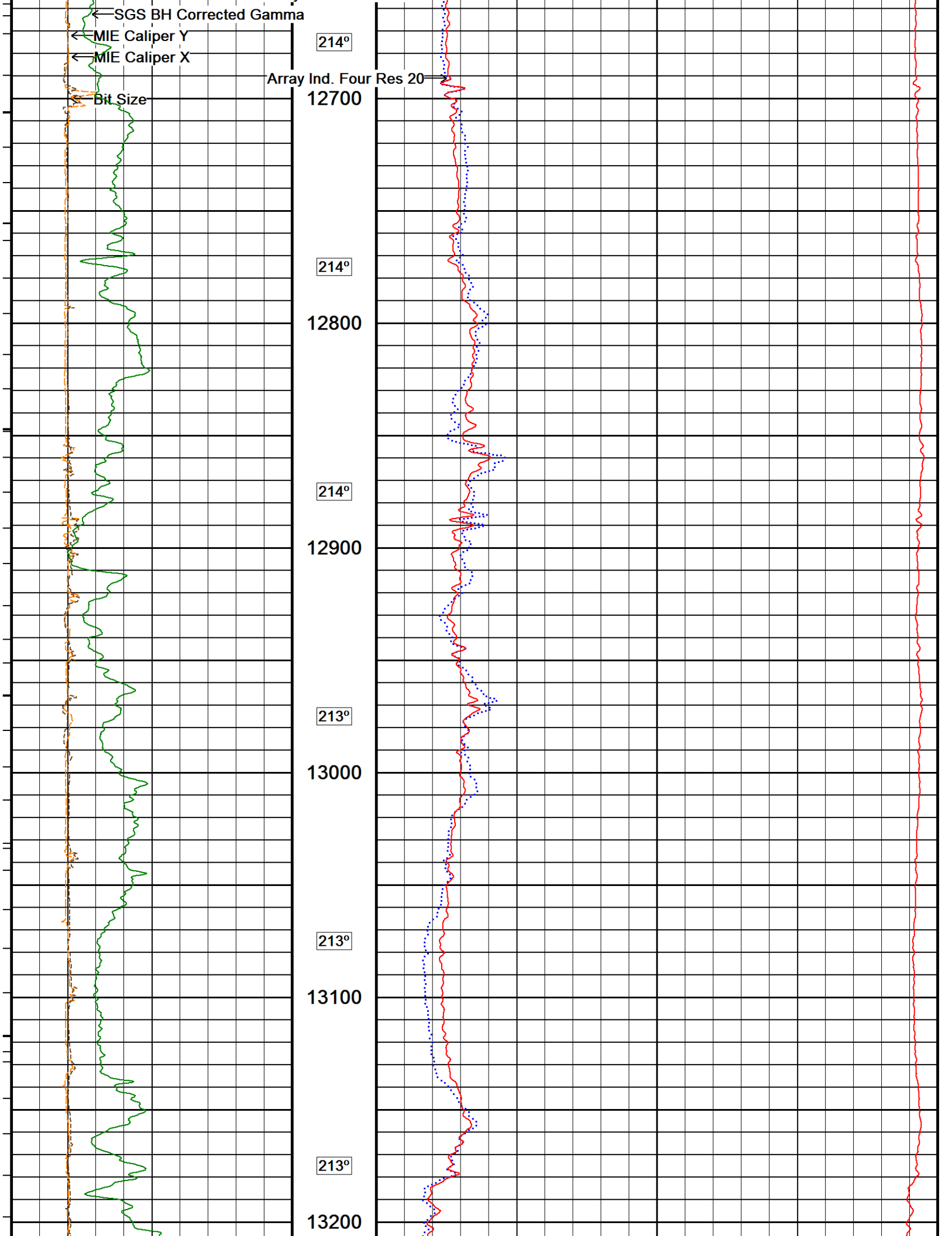
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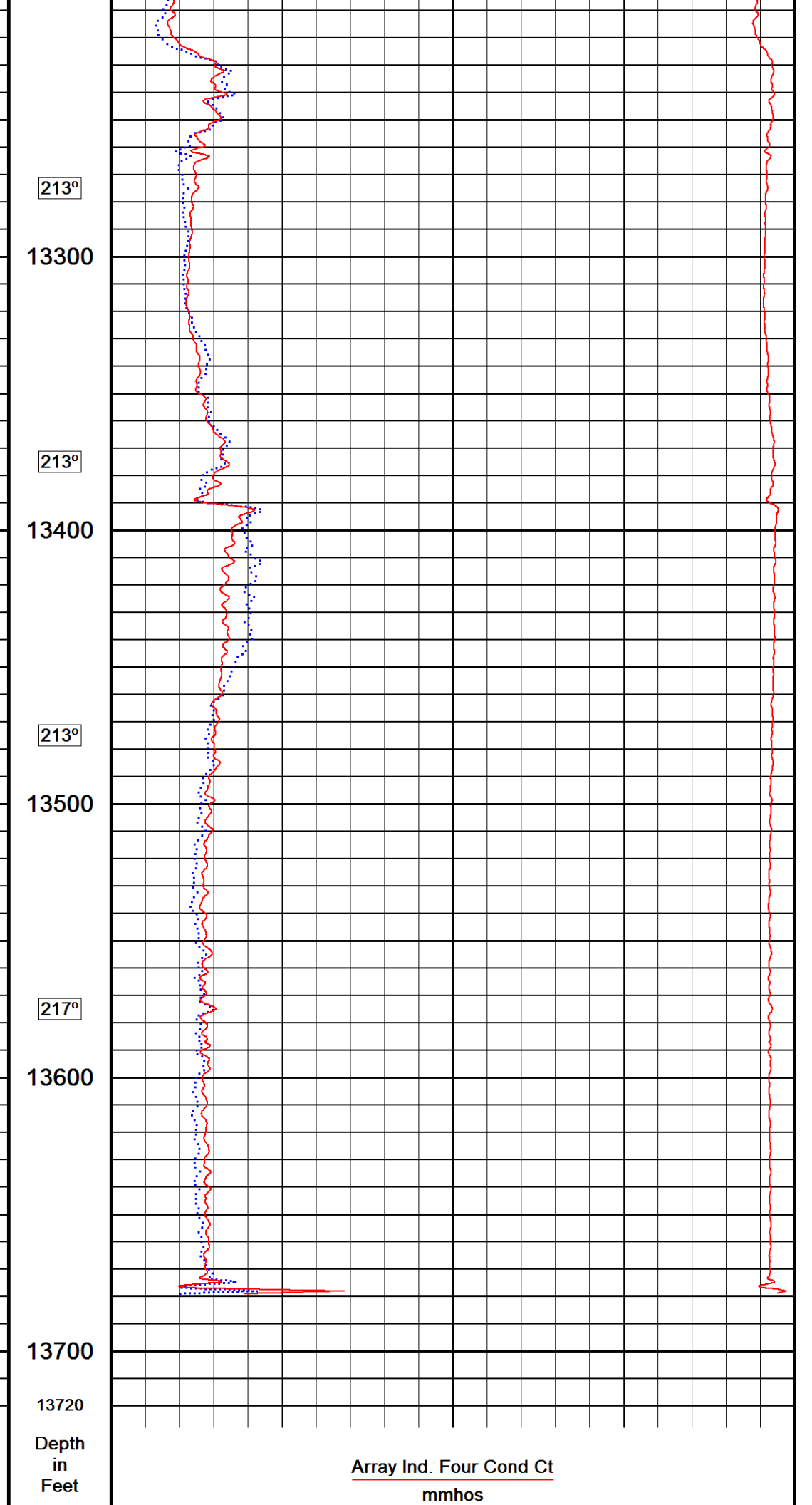
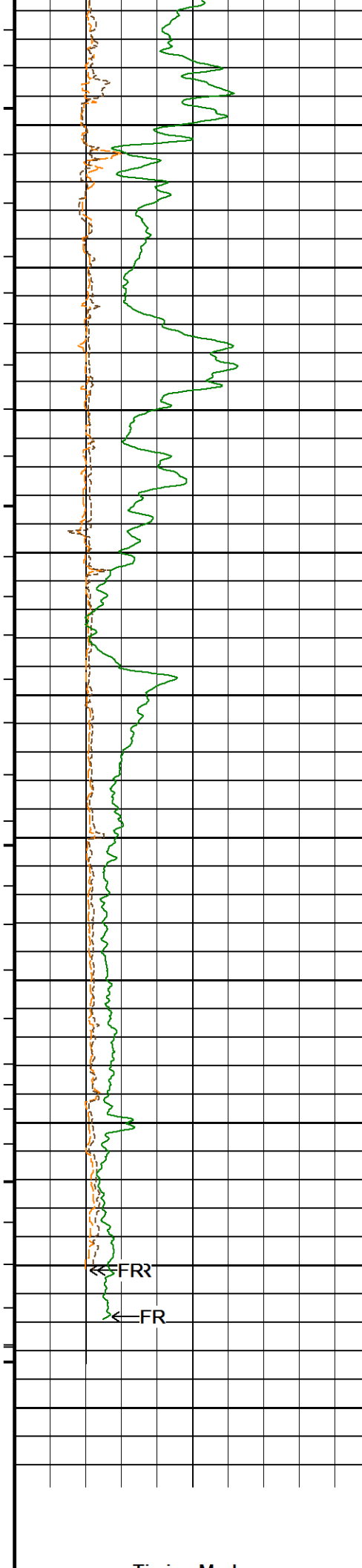
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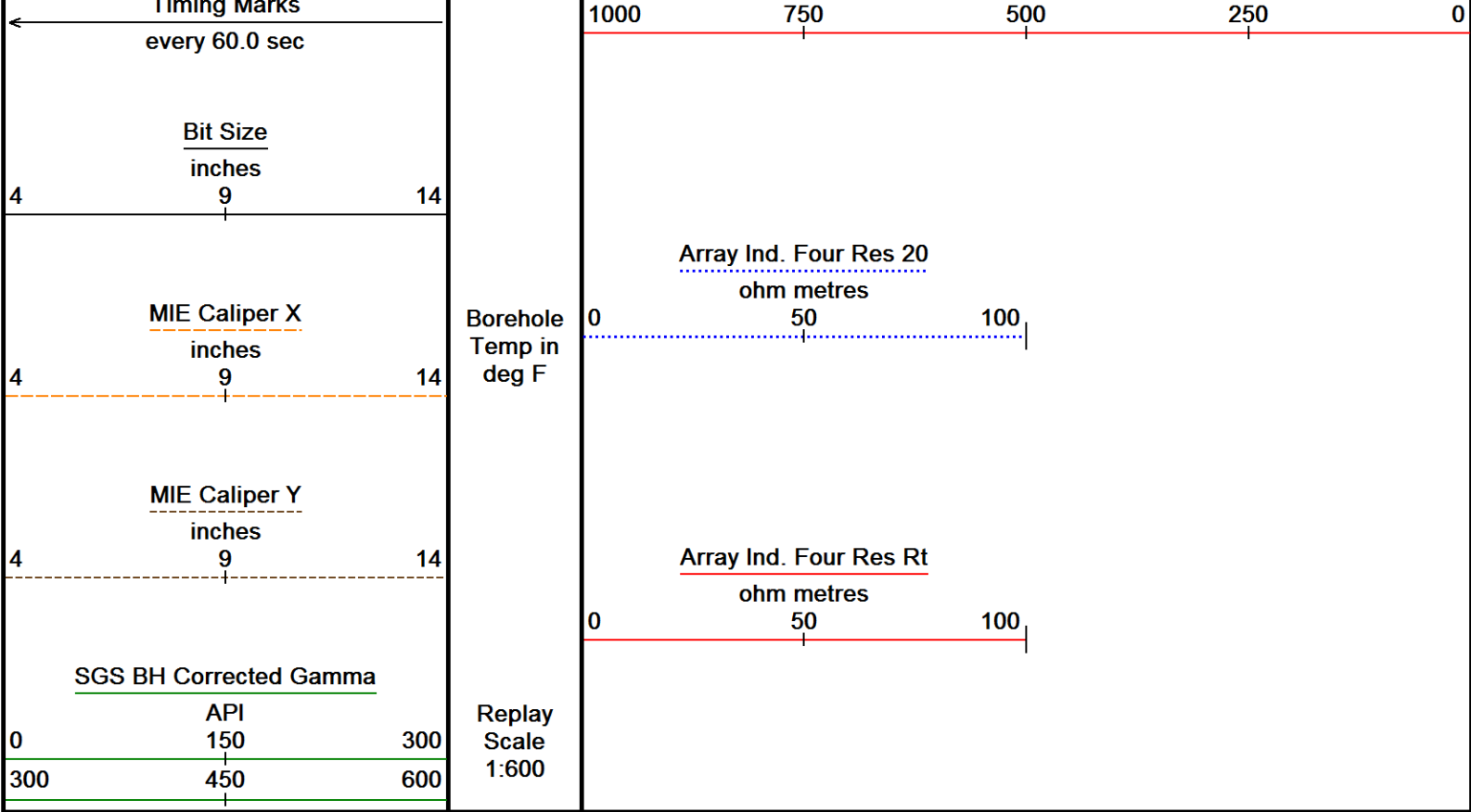












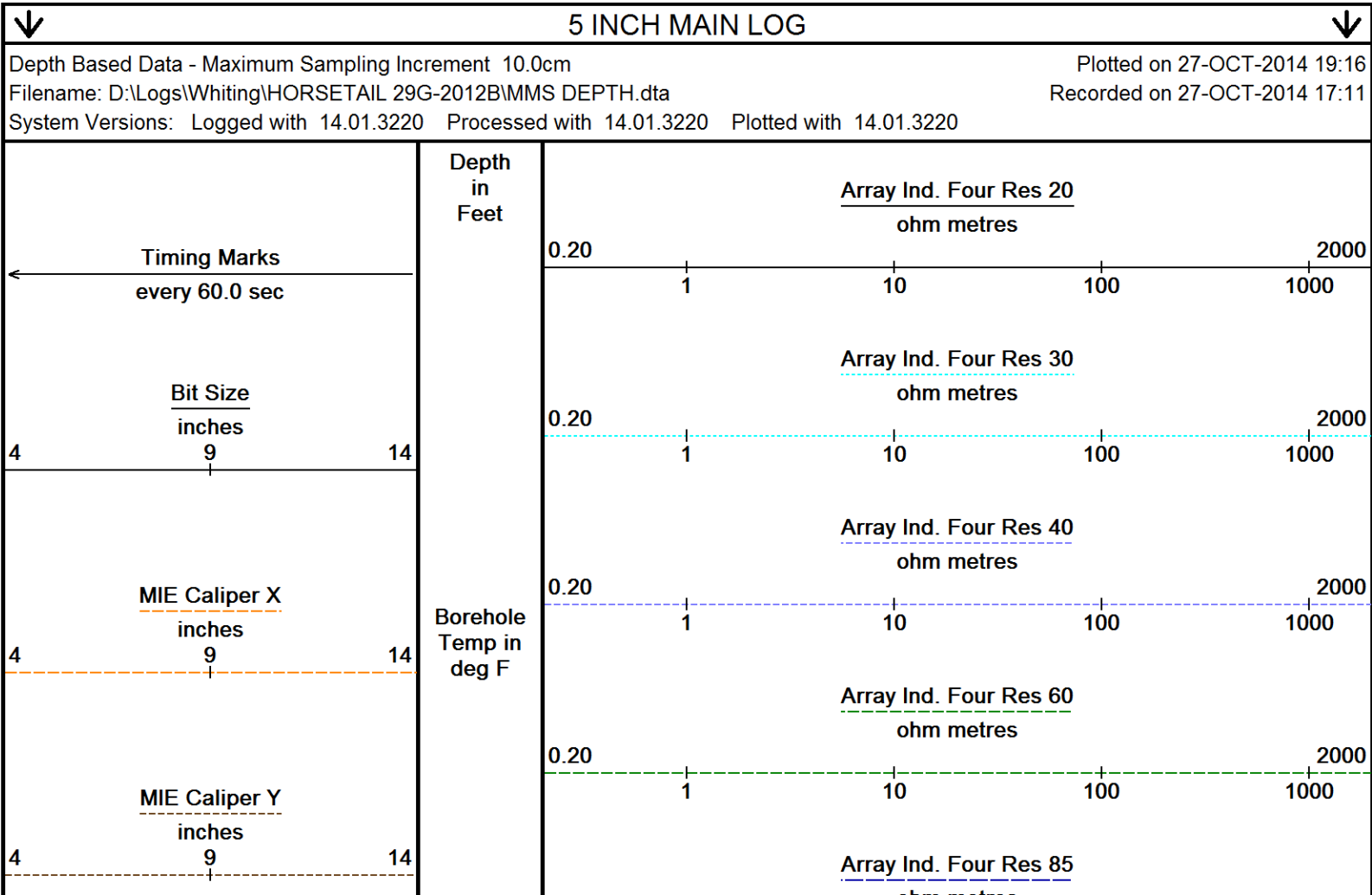
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: D:\Logs\Whiting\HORSETAIL 29G-2012B\MMS DEPTH.dta
System Versions: Logged with 14.01.3220 Processed with 14.01.3220 Plotted with 14.01.3220

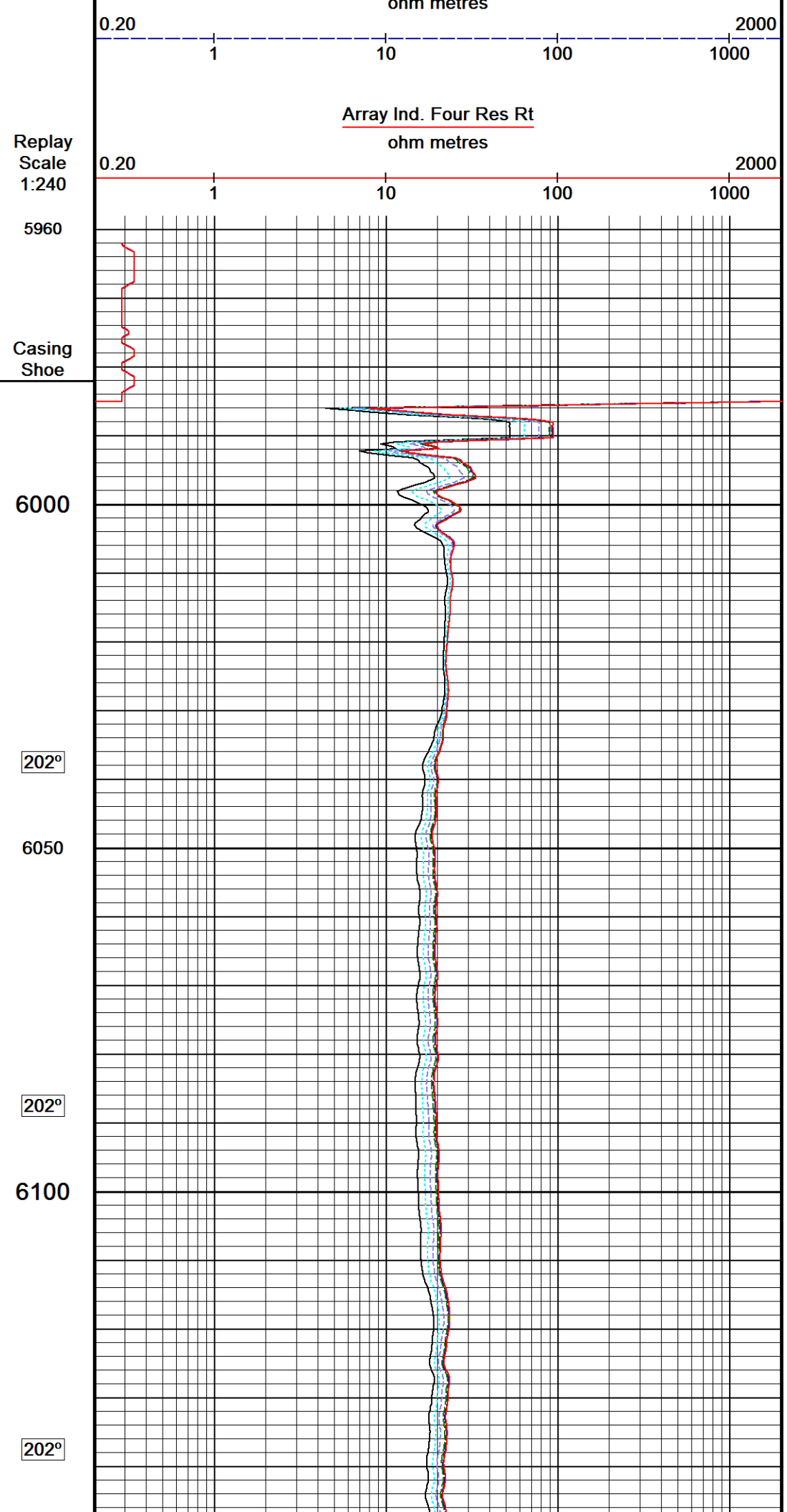
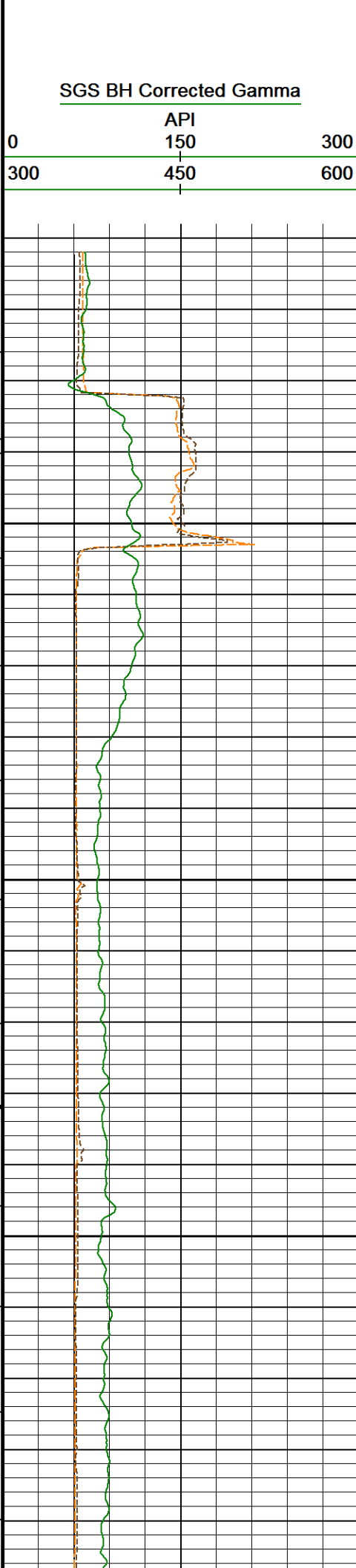
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Recorded on 27-OCT-2014 17:11

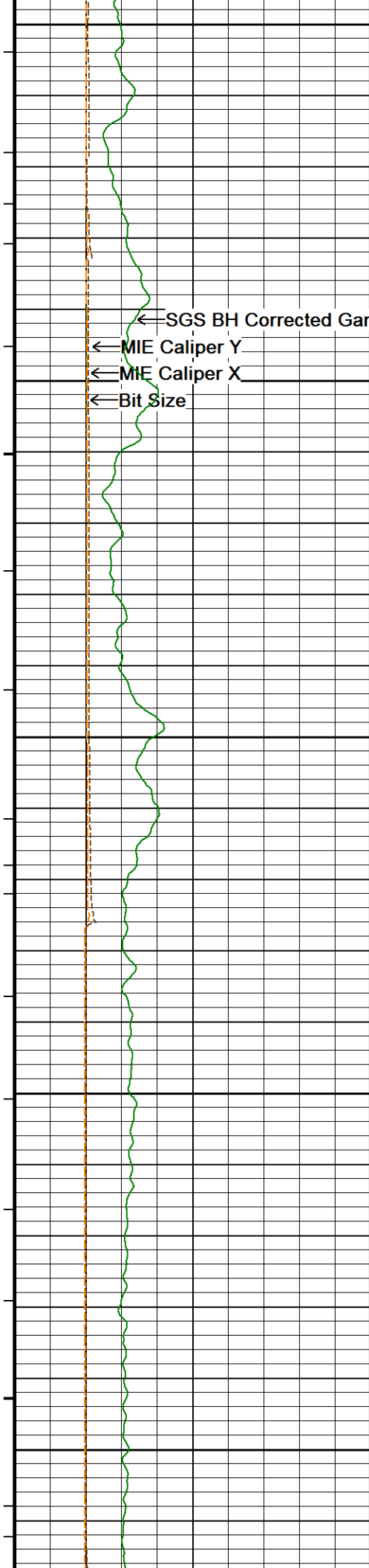
↑

2 INCH MAIN LOG

↑







6150

202°

6200

203°

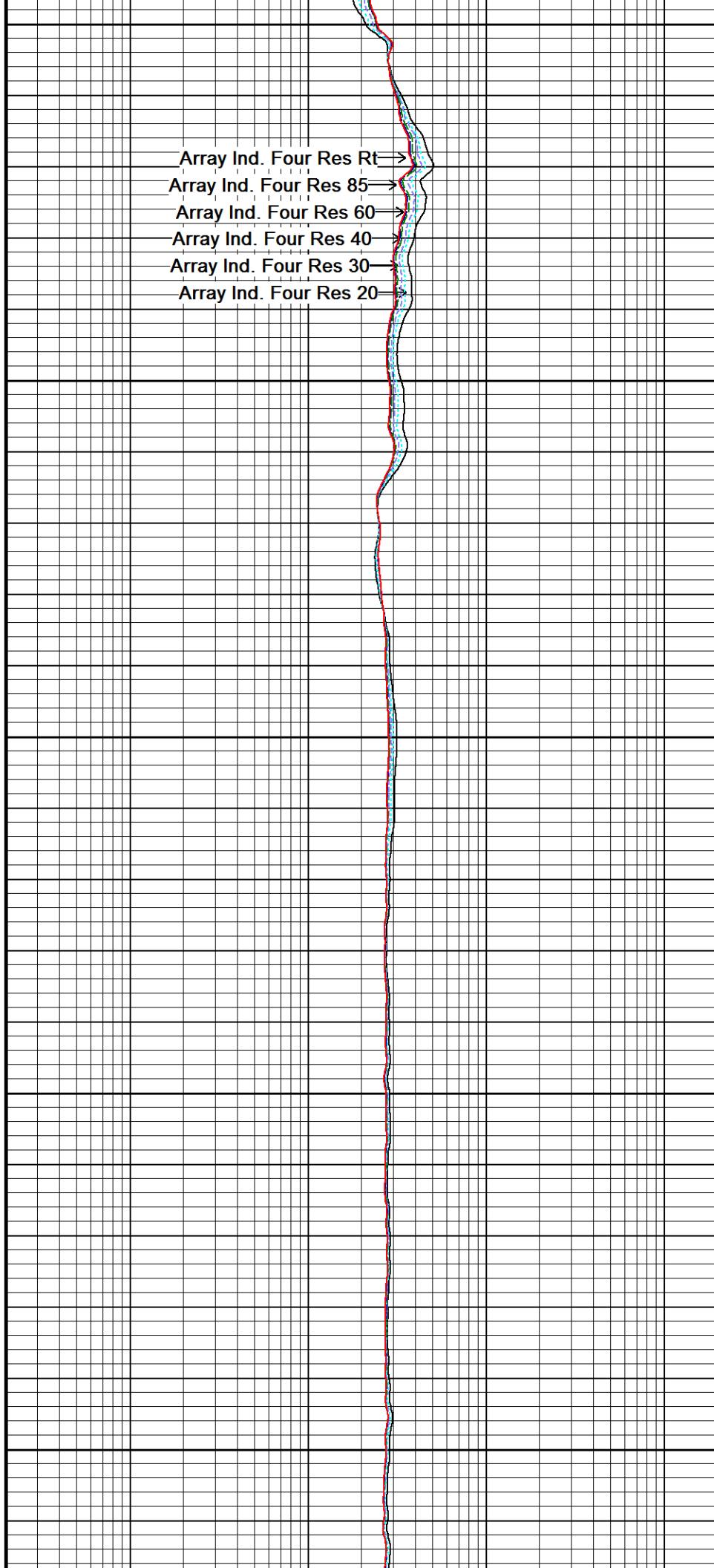
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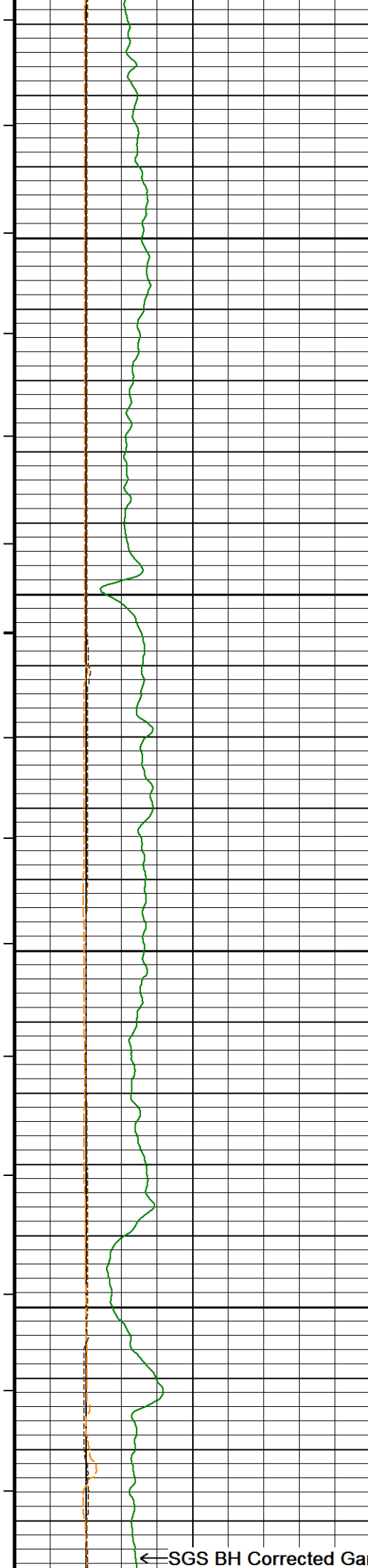
203°

6300

203°

6350





203°

6400

203°

6450

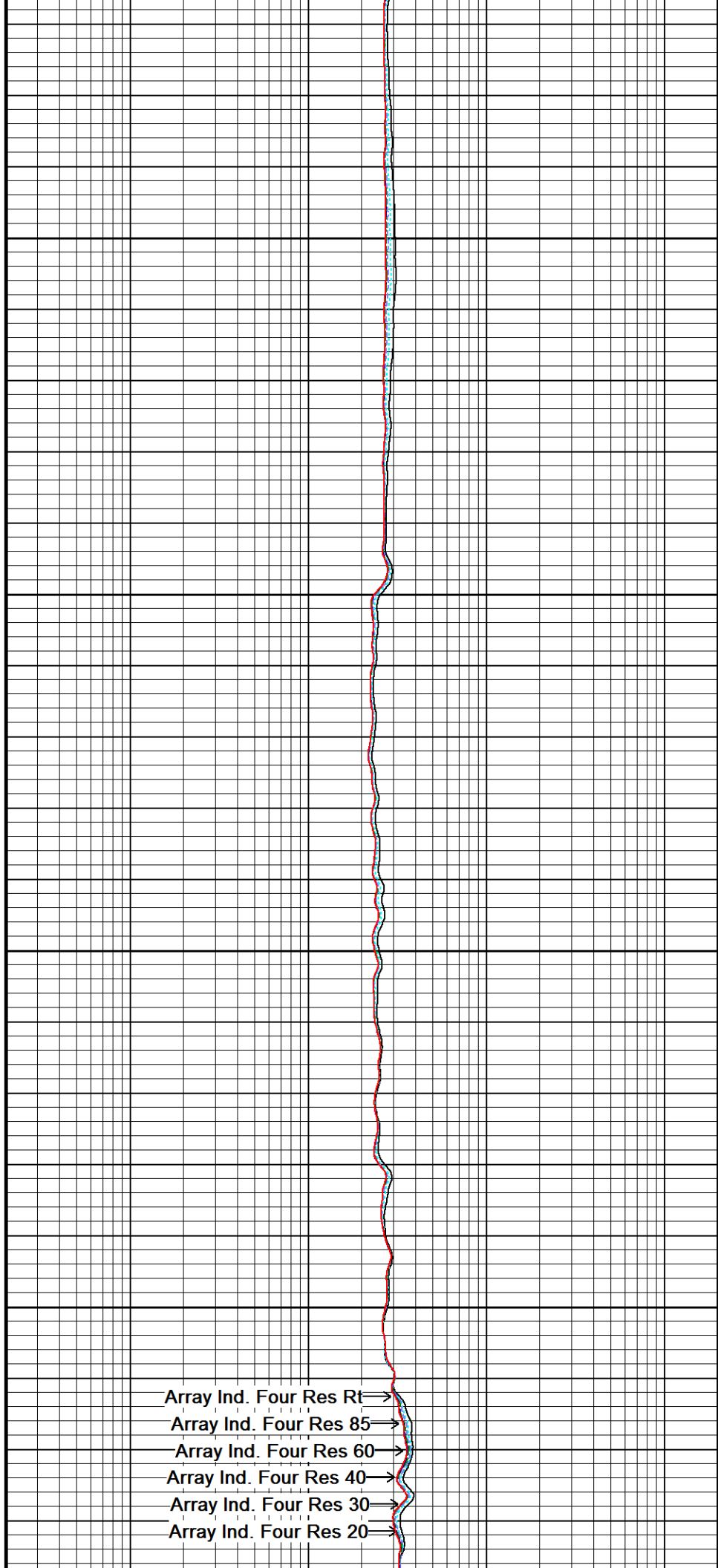
204°

6500

204°

6550

←SGS BH Corrected Gamma



Array Ind. Four Res Rt

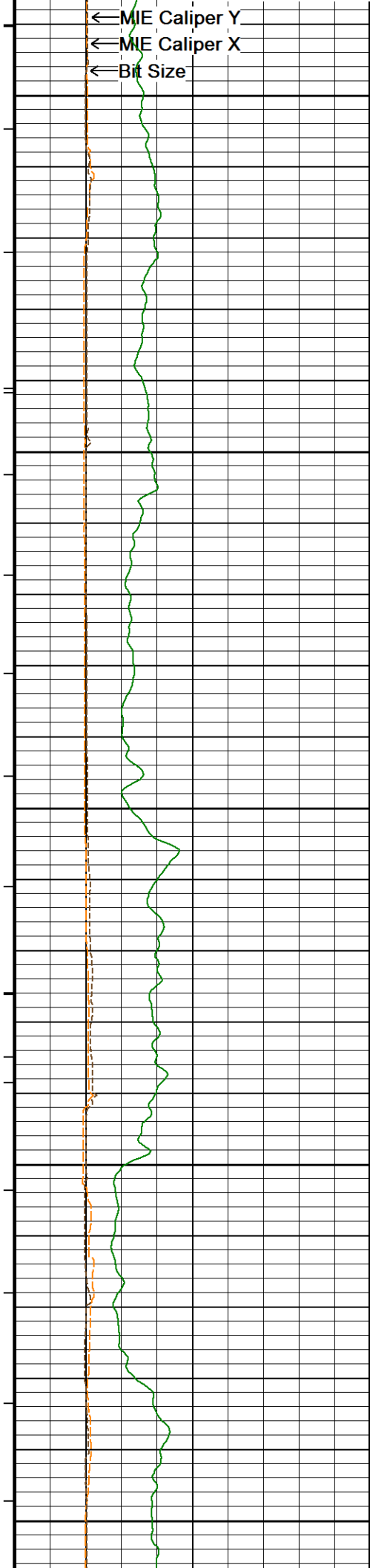
Array Ind. Four Res 85

Array Ind. Four Res 60

Array Ind. Four Res 40

Array Ind. Four Res 30

Array Ind. Four Res 20



204°

6600

204°

6650

204°

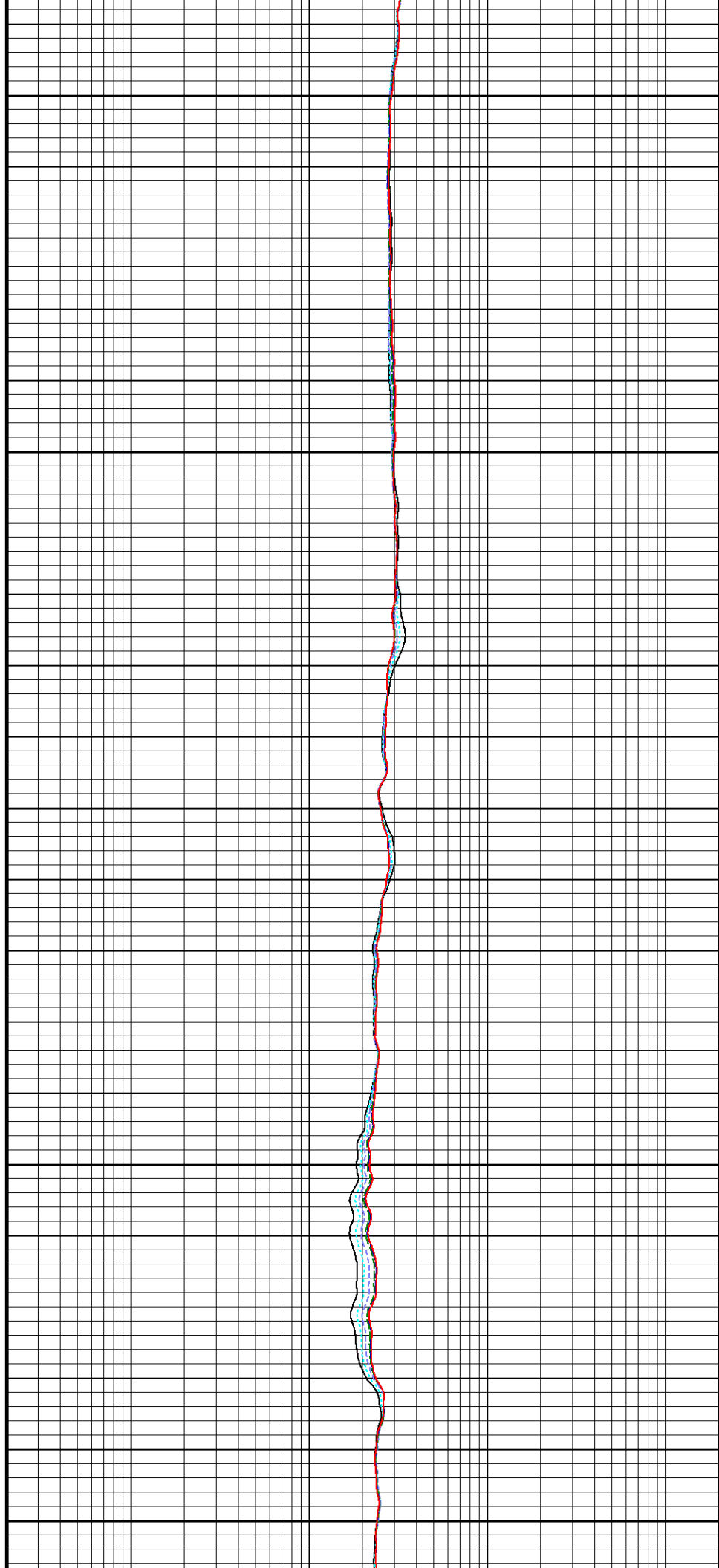
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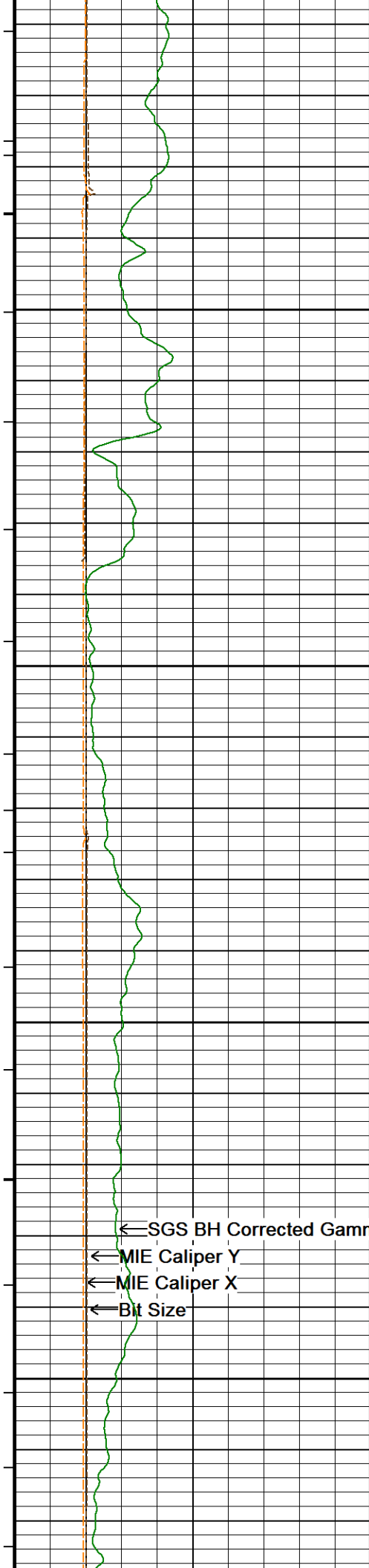
204°

6750

205°

6800





205°

6850

205°

6900

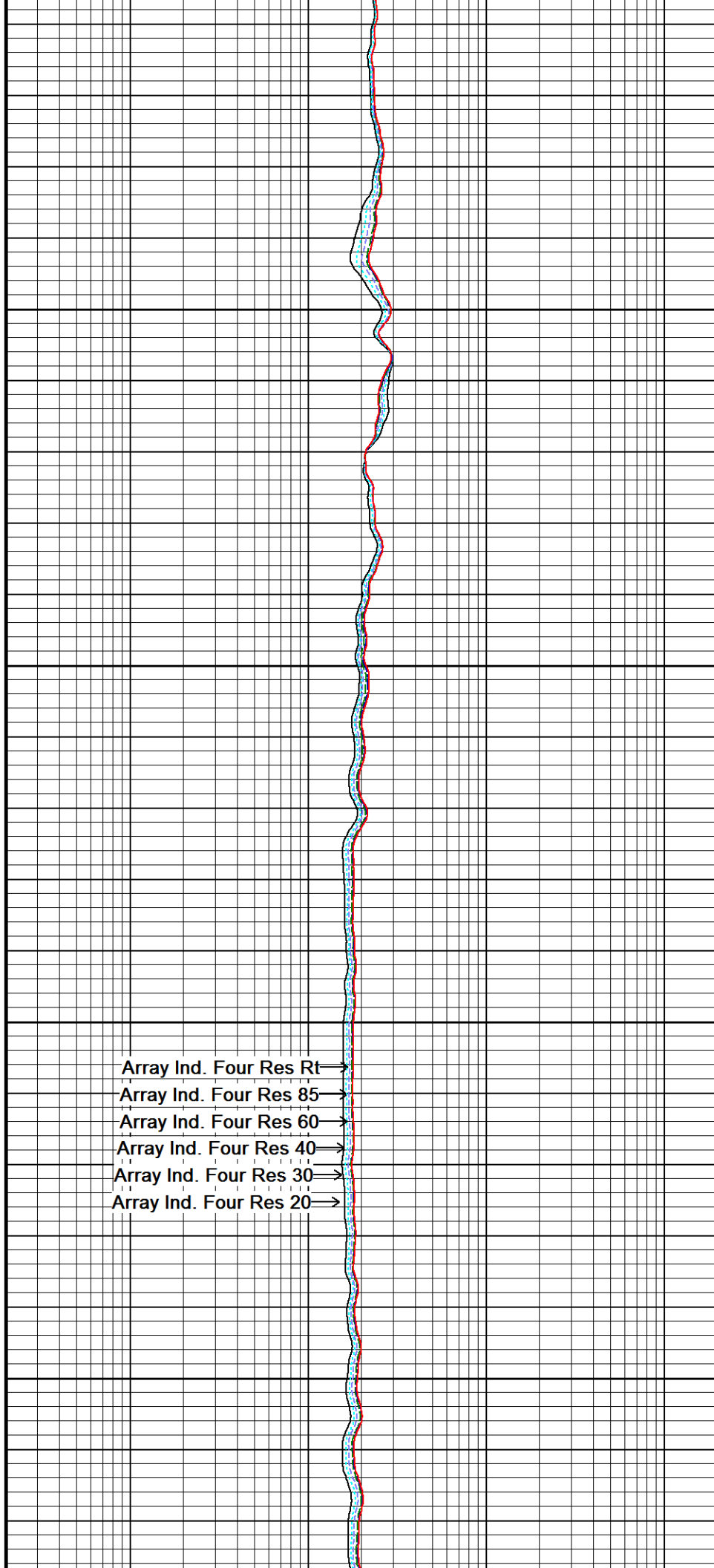
205°

6950

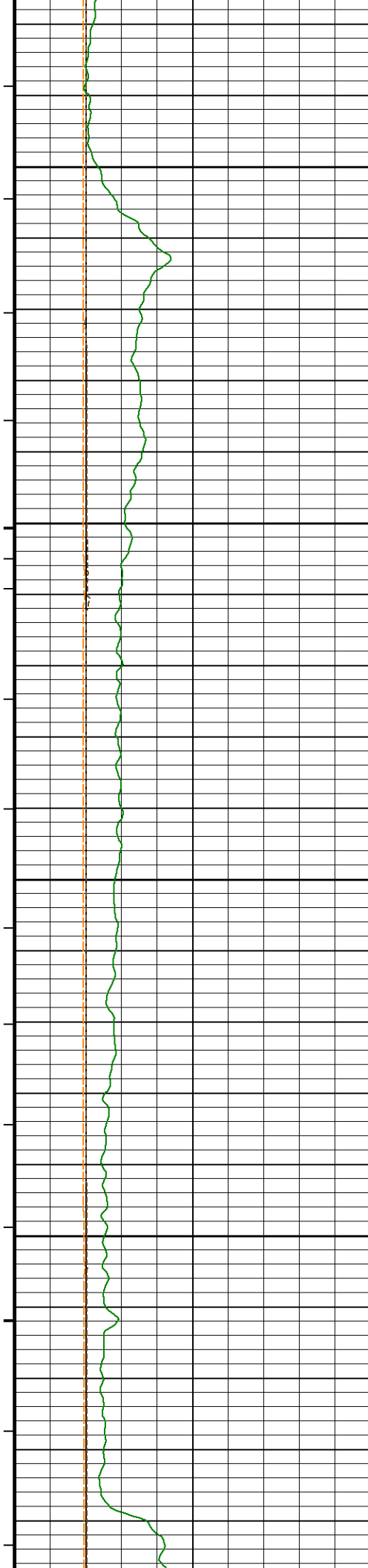
←SGS BH Corrected Gamma
←MIE Caliper Y
←MIE Caliper X
←Bit Size

205°

7000



Array Ind. Four Res Rt
Array Ind. Four Res 85
Array Ind. Four Res 60
Array Ind. Four Res 40
Array Ind. Four Res 30
Array Ind. Four Res 20



206°

7050

206°

7100

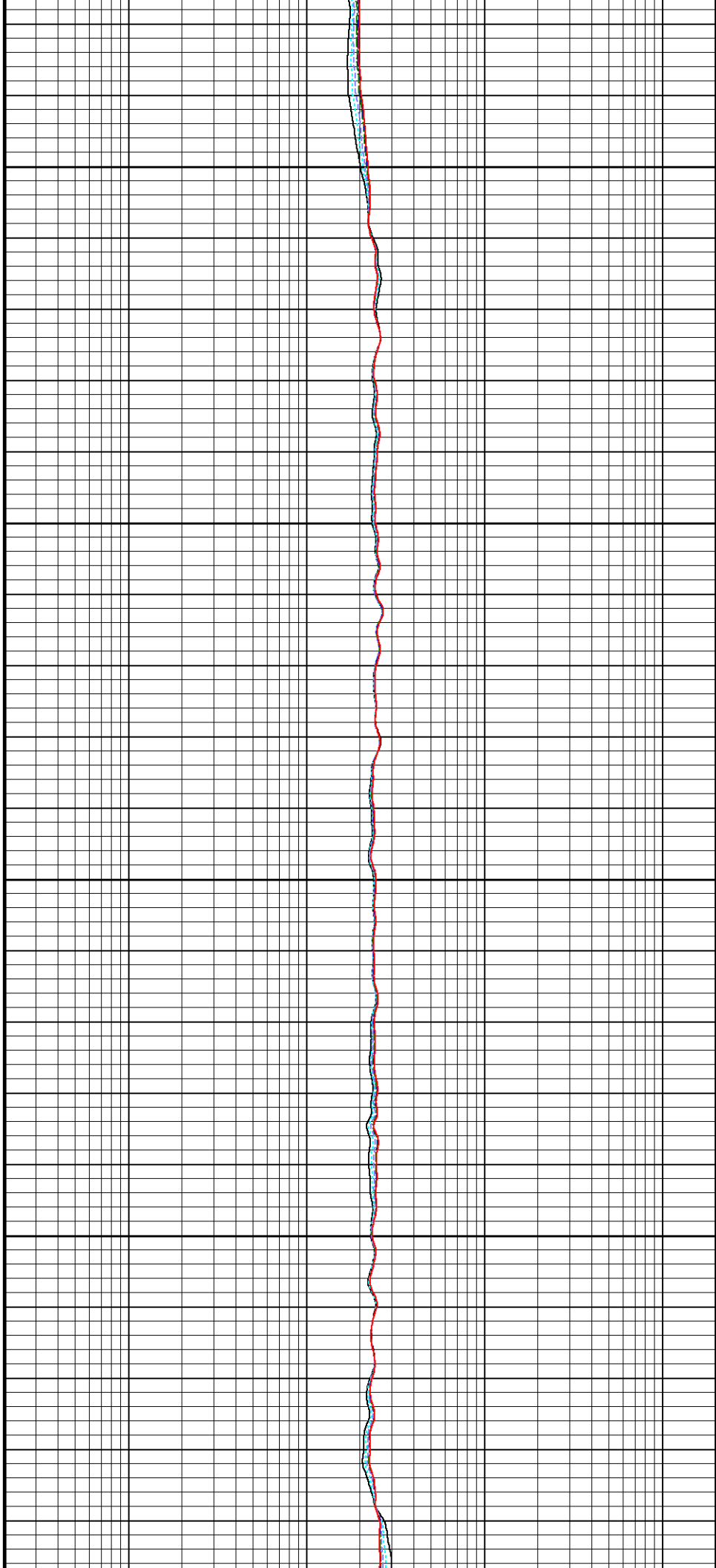
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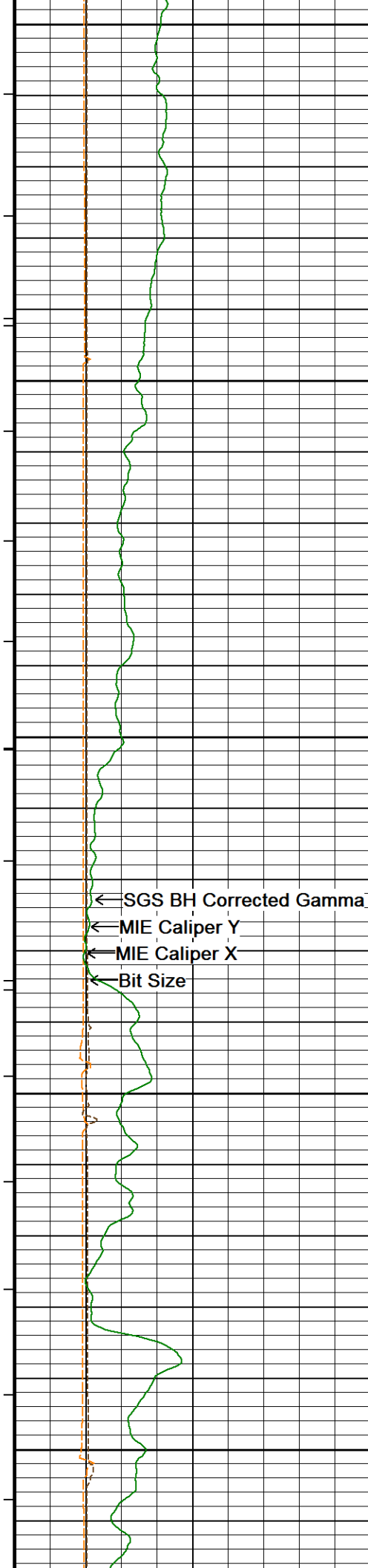
7150

206°

7200

206°





7250

206°

7300

206°

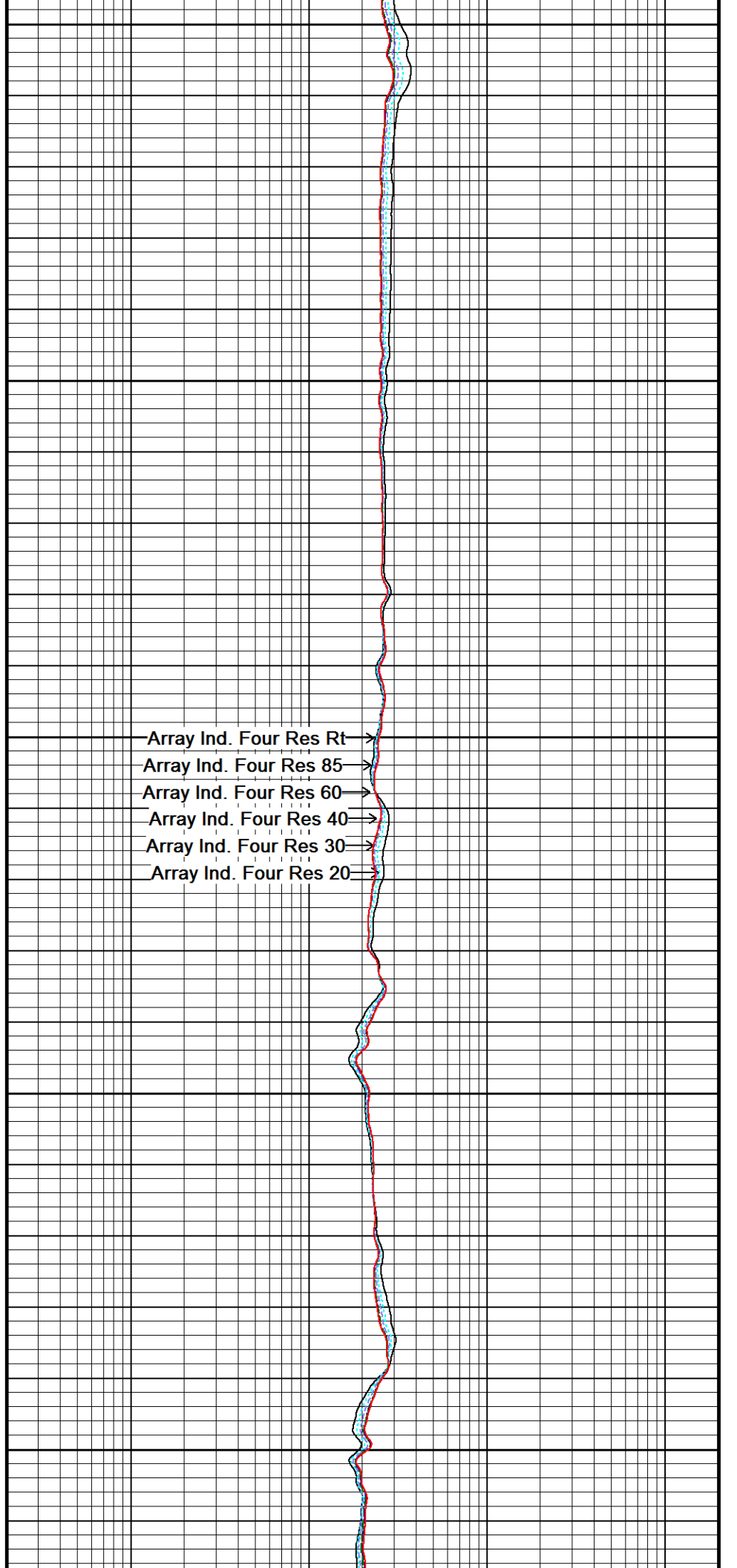
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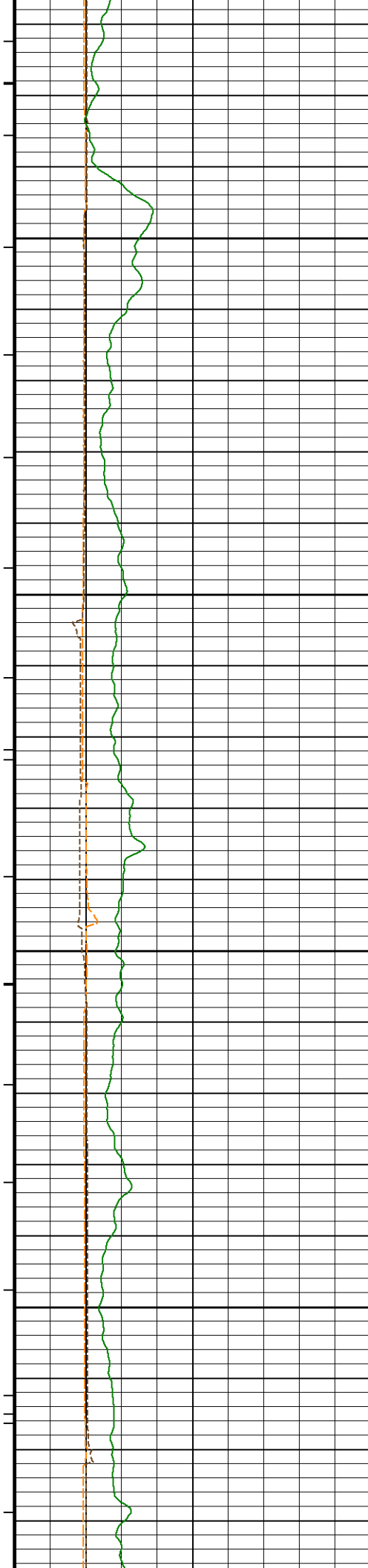
207°

7400

207°

7450





207°

7500

207°

7550

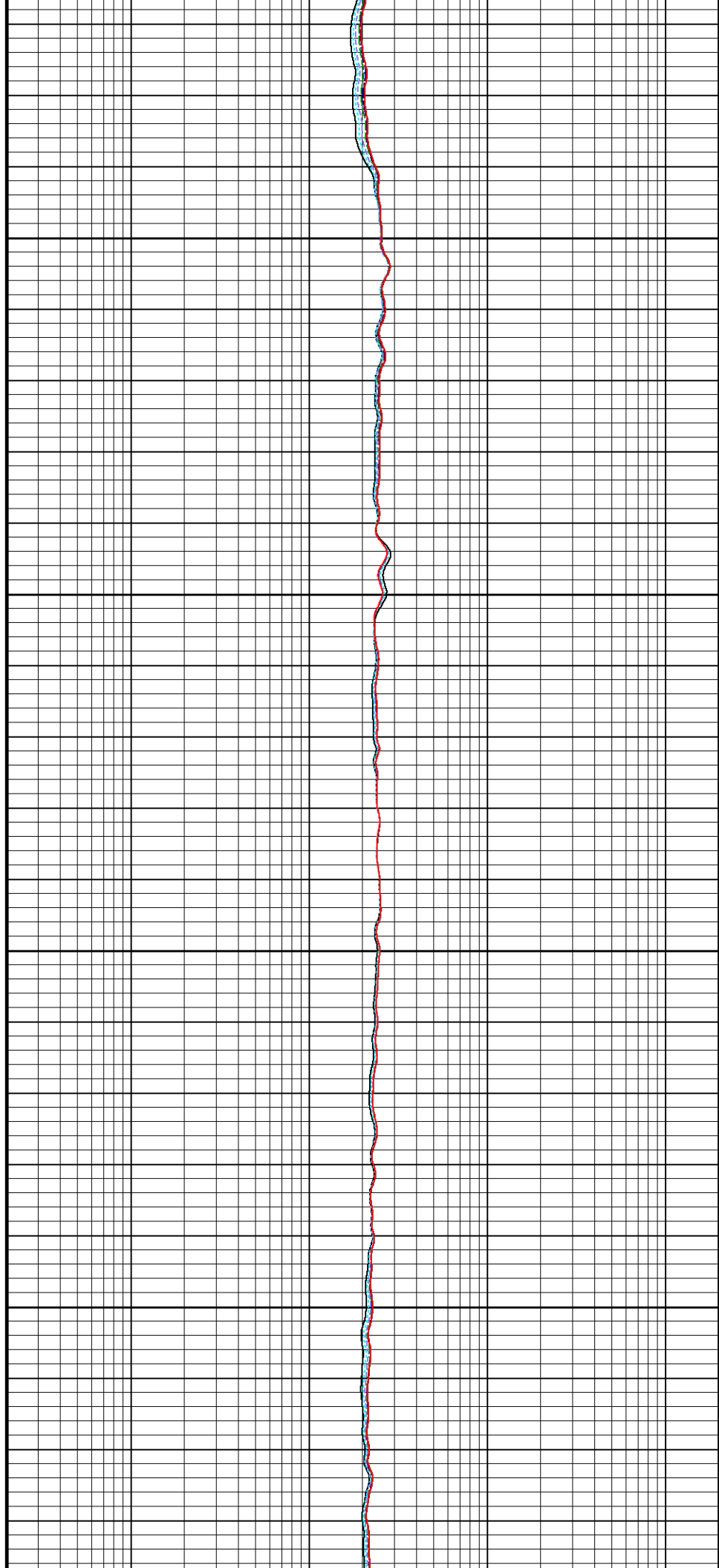
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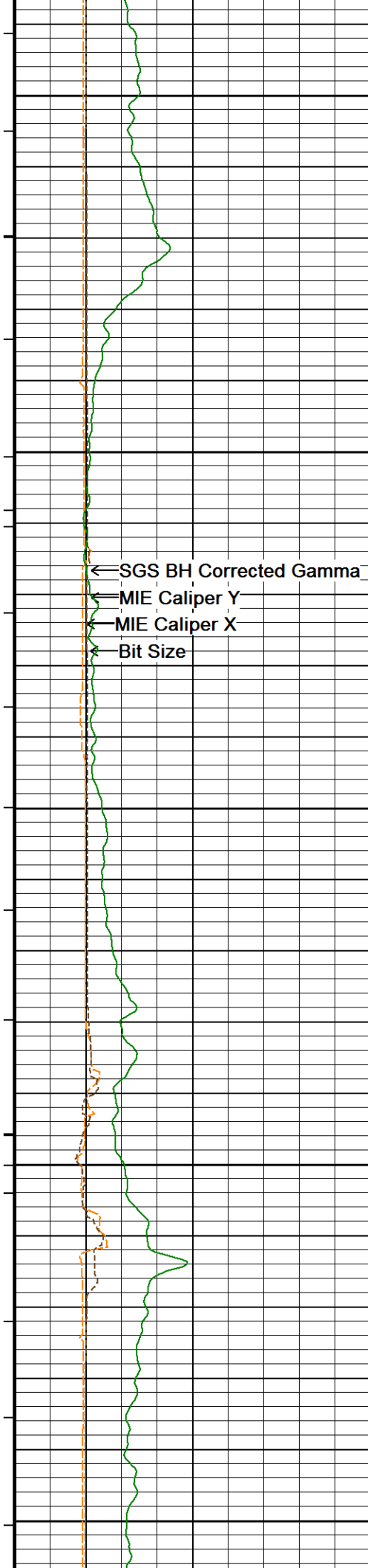
7600

207°

7650

7700





208°

7700

208°

7750

208°

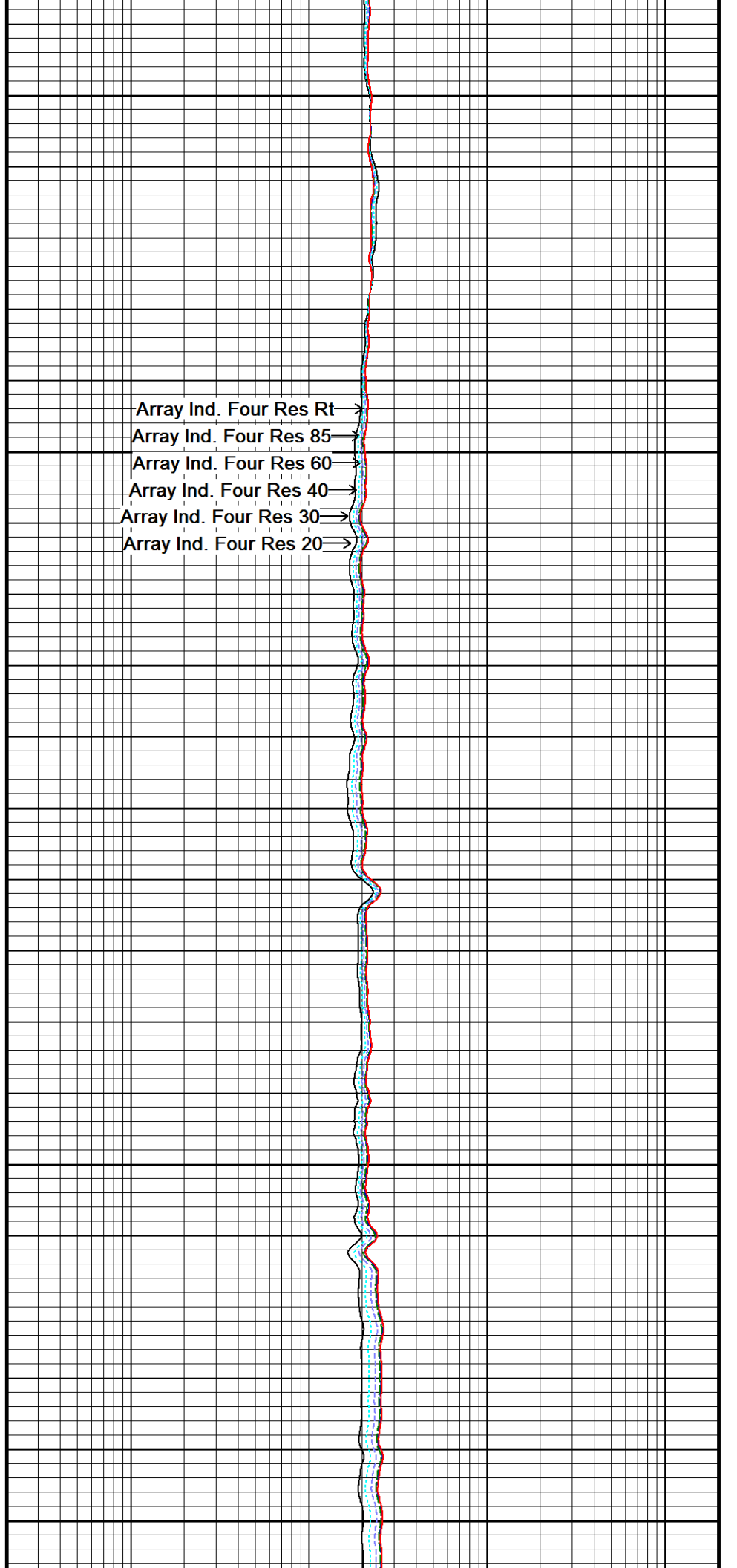
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208°

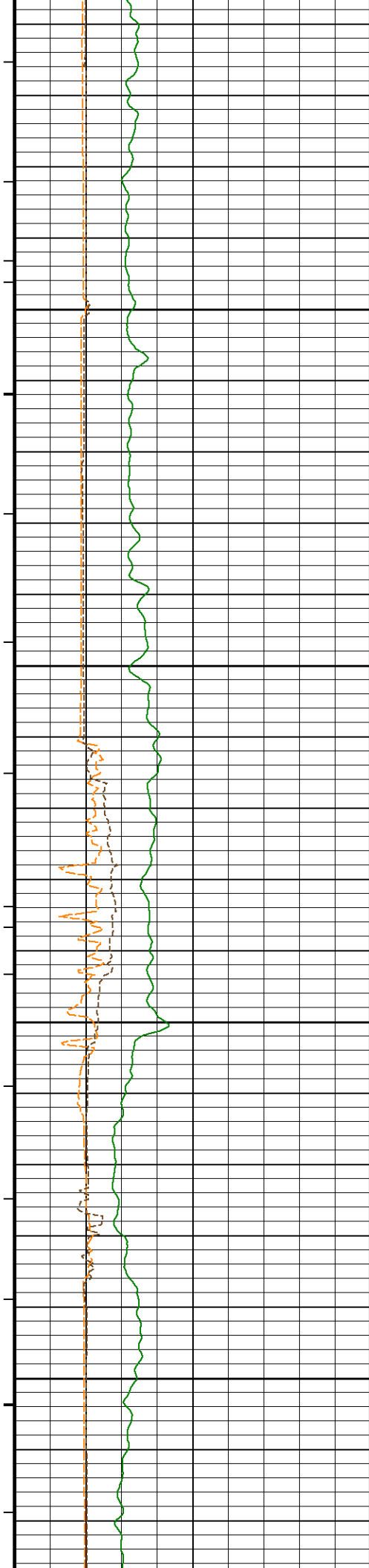
7850

208°

7900



Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
Array Ind. Four Res 40 →
Array Ind. Four Res 30 →
Array Ind. Four Res 20 →



208°

7950

208°

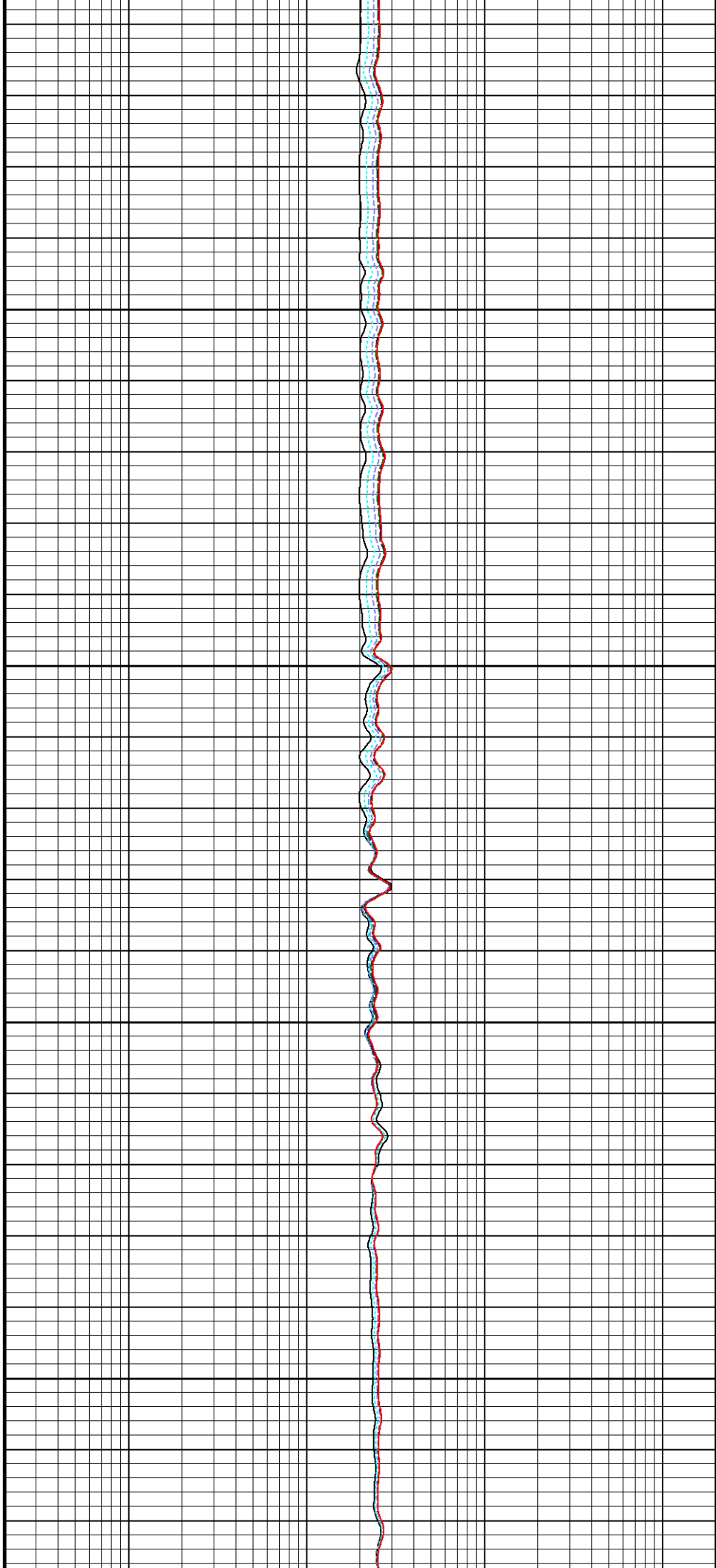
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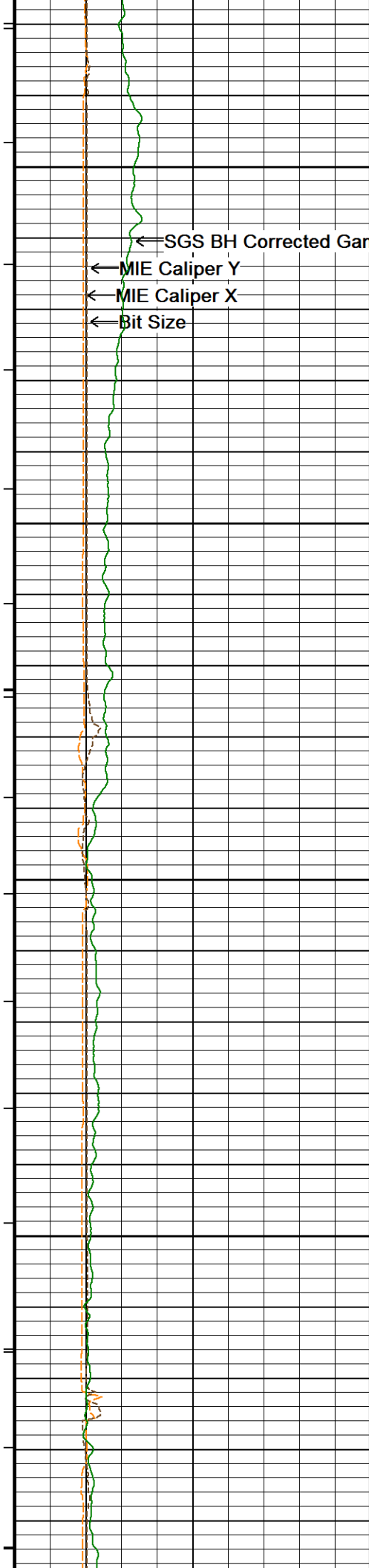
208°

8050

208°

8100





209°

8150

209°

8200

209°

8250

209°

8300

209°

Array Ind. Four Res Rt→

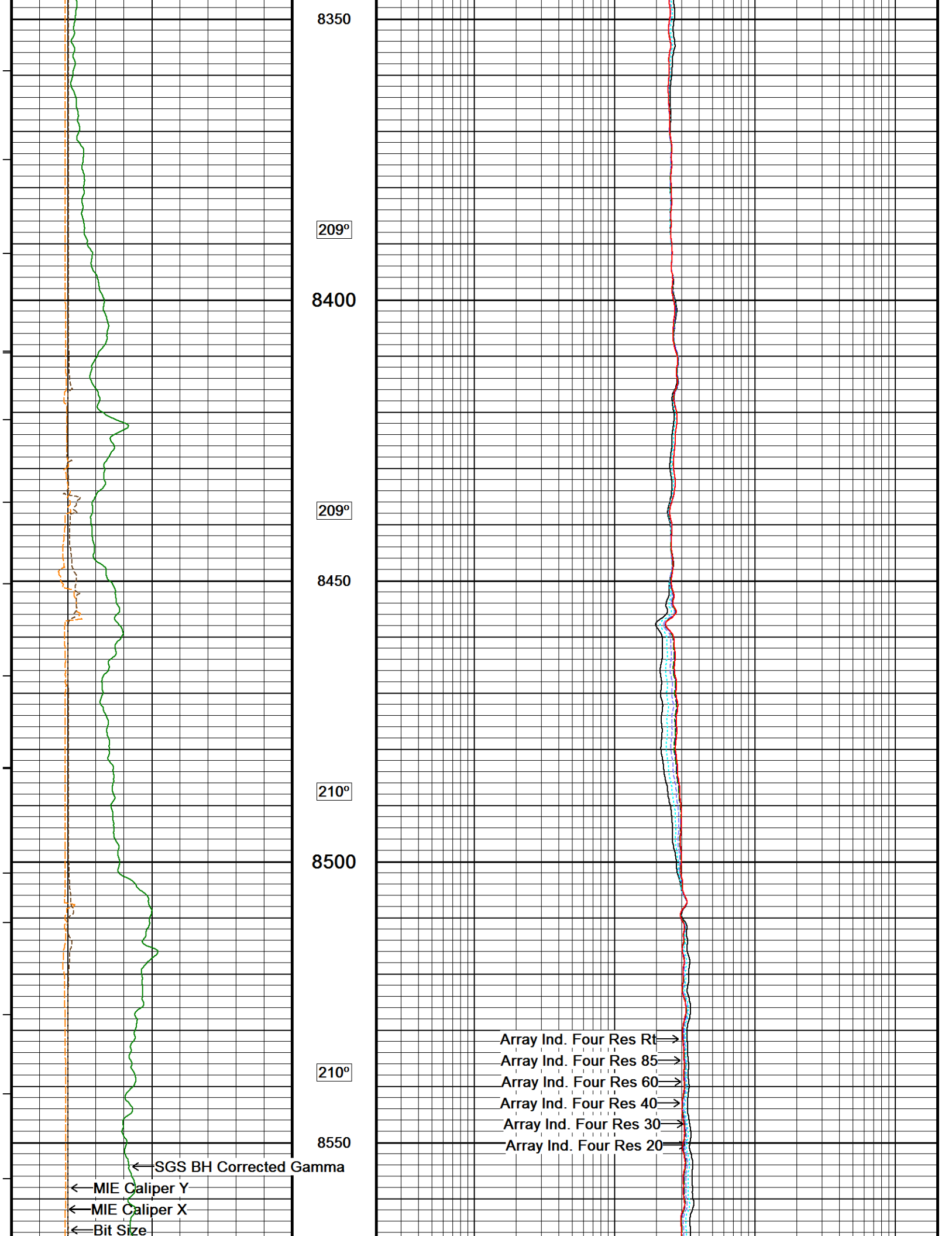
Array Ind. Four Res 85→

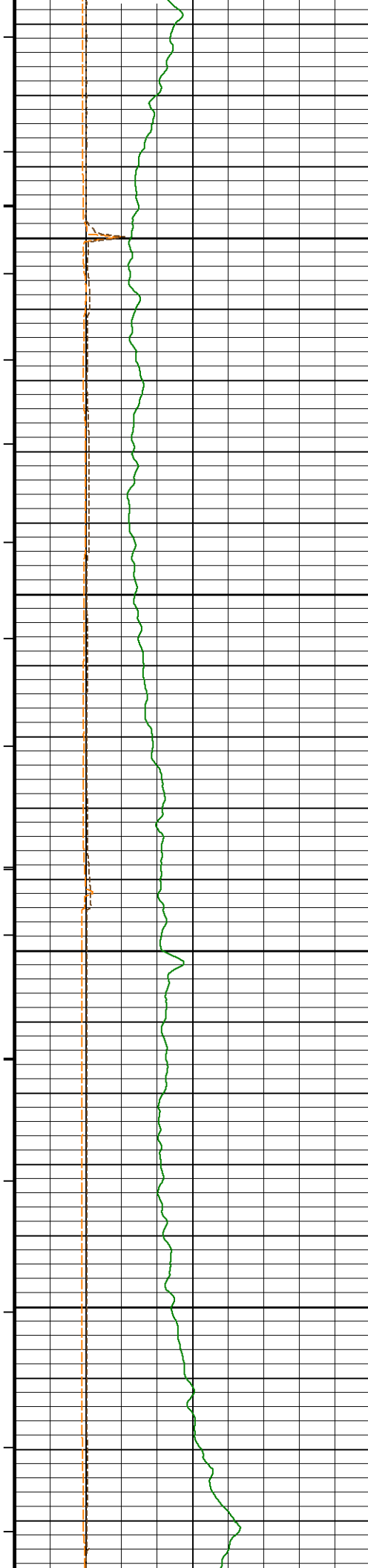
Array Ind. Four Res 60→

Array Ind. Four Res 40→

Array Ind. Four Res 30→

Array Ind. Four Res 20→





210°

8600

210°

8650

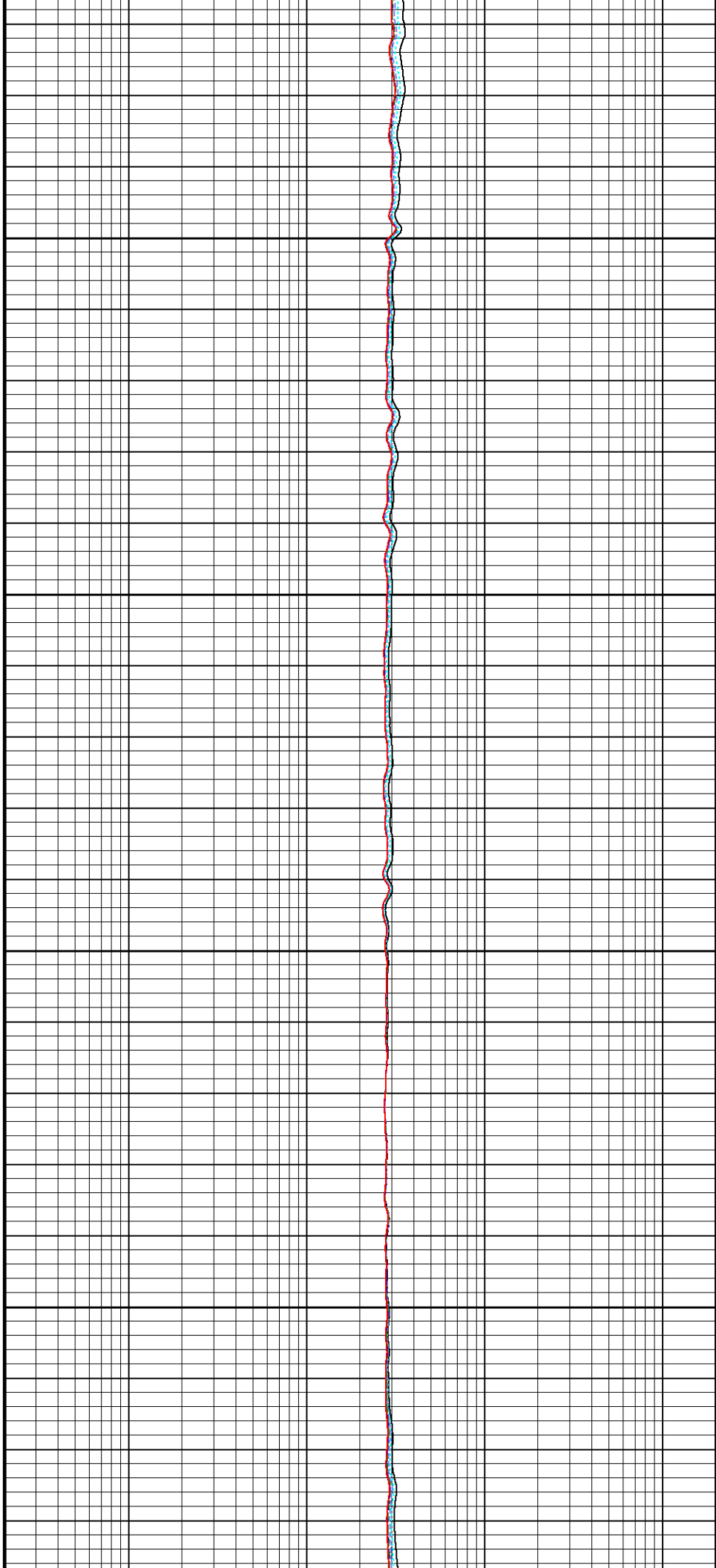
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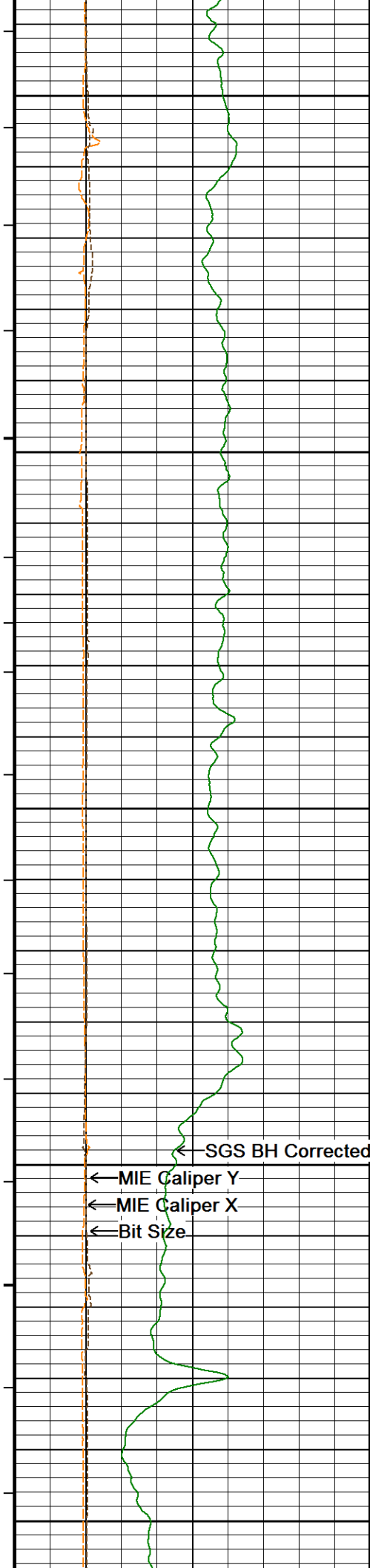
8700

210°

8750

210°





210°

8800

210°

8850

210°

8900

211°

← SGS BH Corrected Gamma 8950

← MIE Caliper Y

← MIE Caliper X

← Bit Size

211°

9000

Array Ind. Four Res Rt →

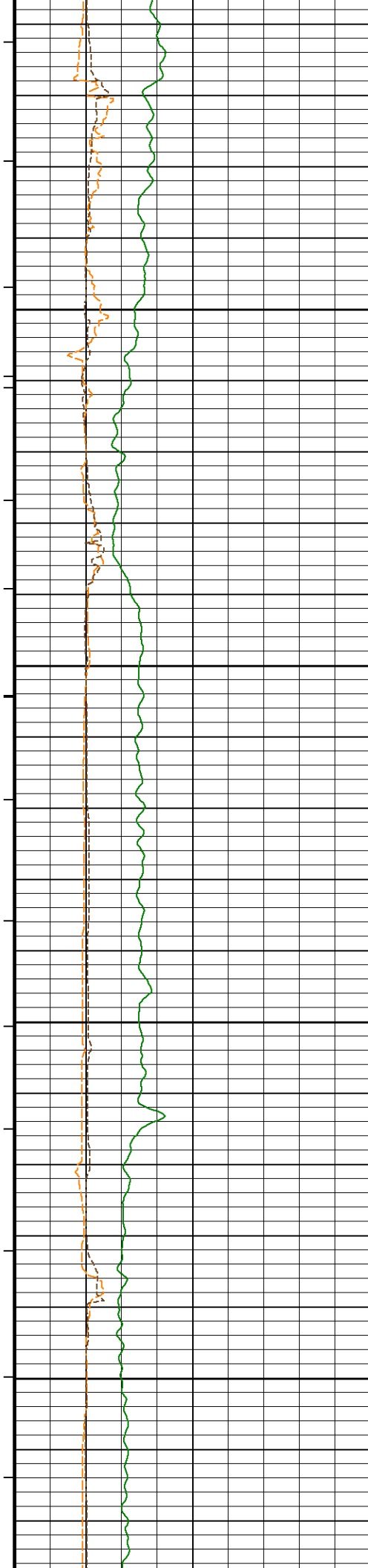
Array Ind. Four Res 85 →

Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →



211°

9050

211°

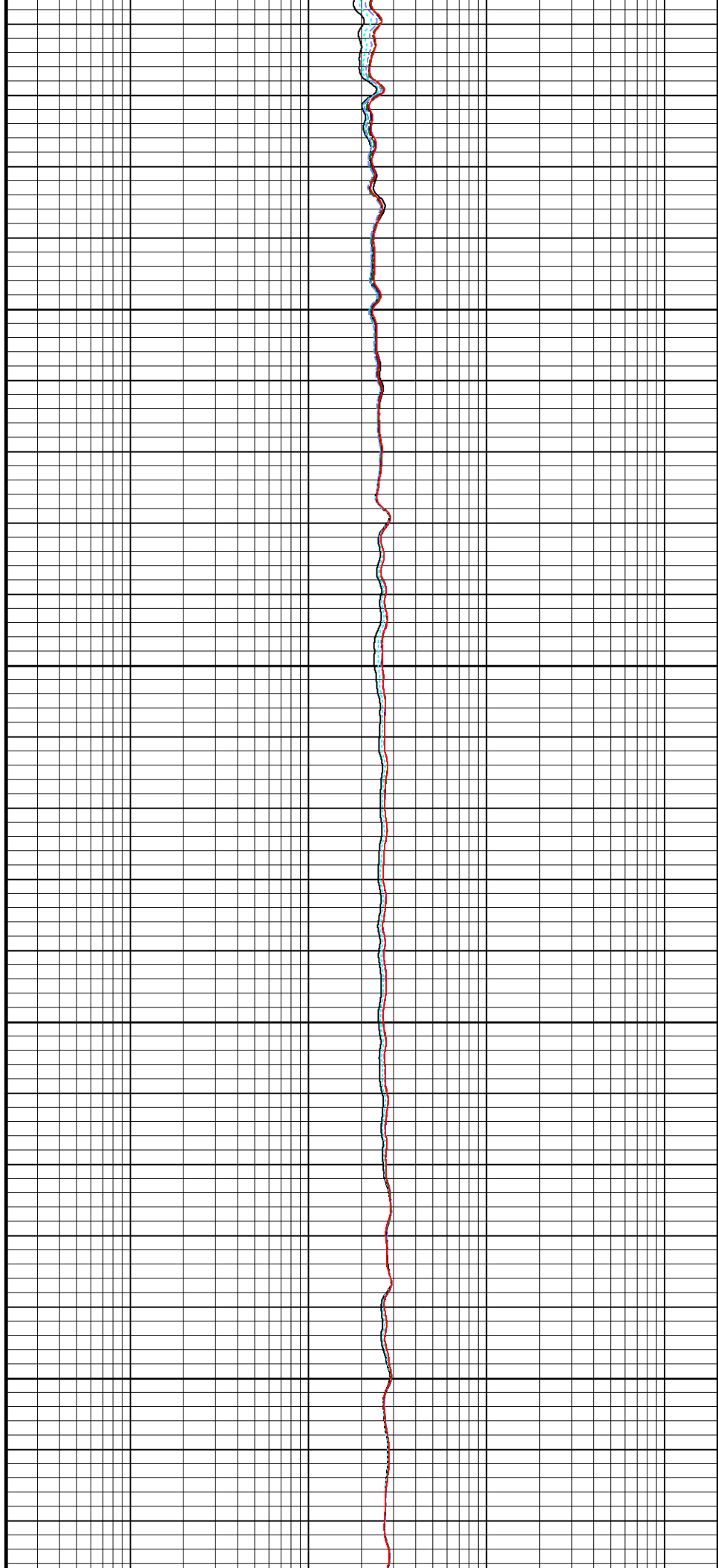
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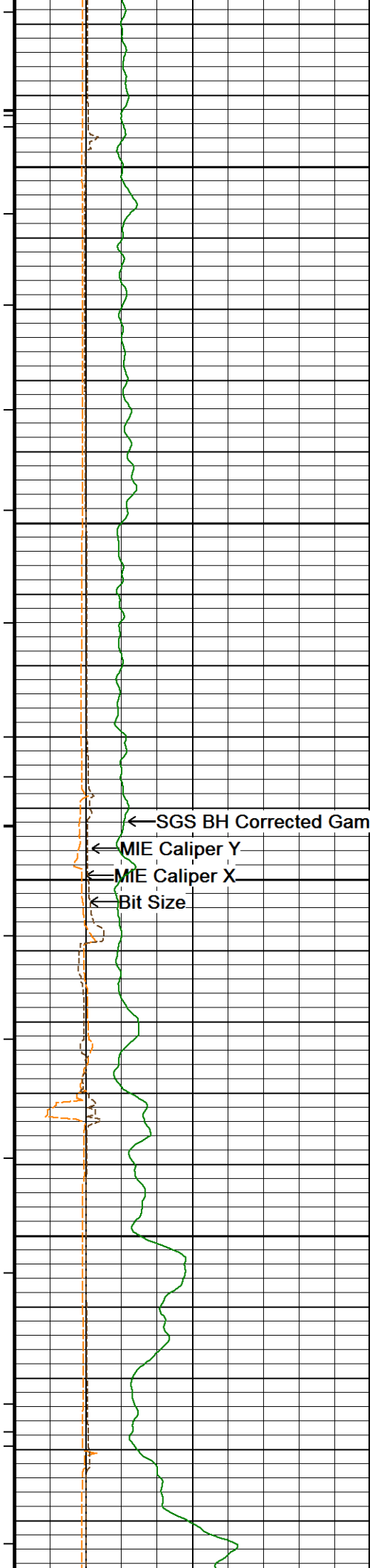
211°

9150

211°

9200





211°

9250

211°

9300

212°

9350

212°

9400

212°

← SGS BH Corrected Gamma

← MIE Caliper Y

← MIE Caliper X

← Bit Size

Array Ind. Four Res Rt →

Array Ind. Four Res 85 →

Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

Array Ind. Four Res 30 →

Array Ind. Four Res 20 →



9450

212°

9500

212°

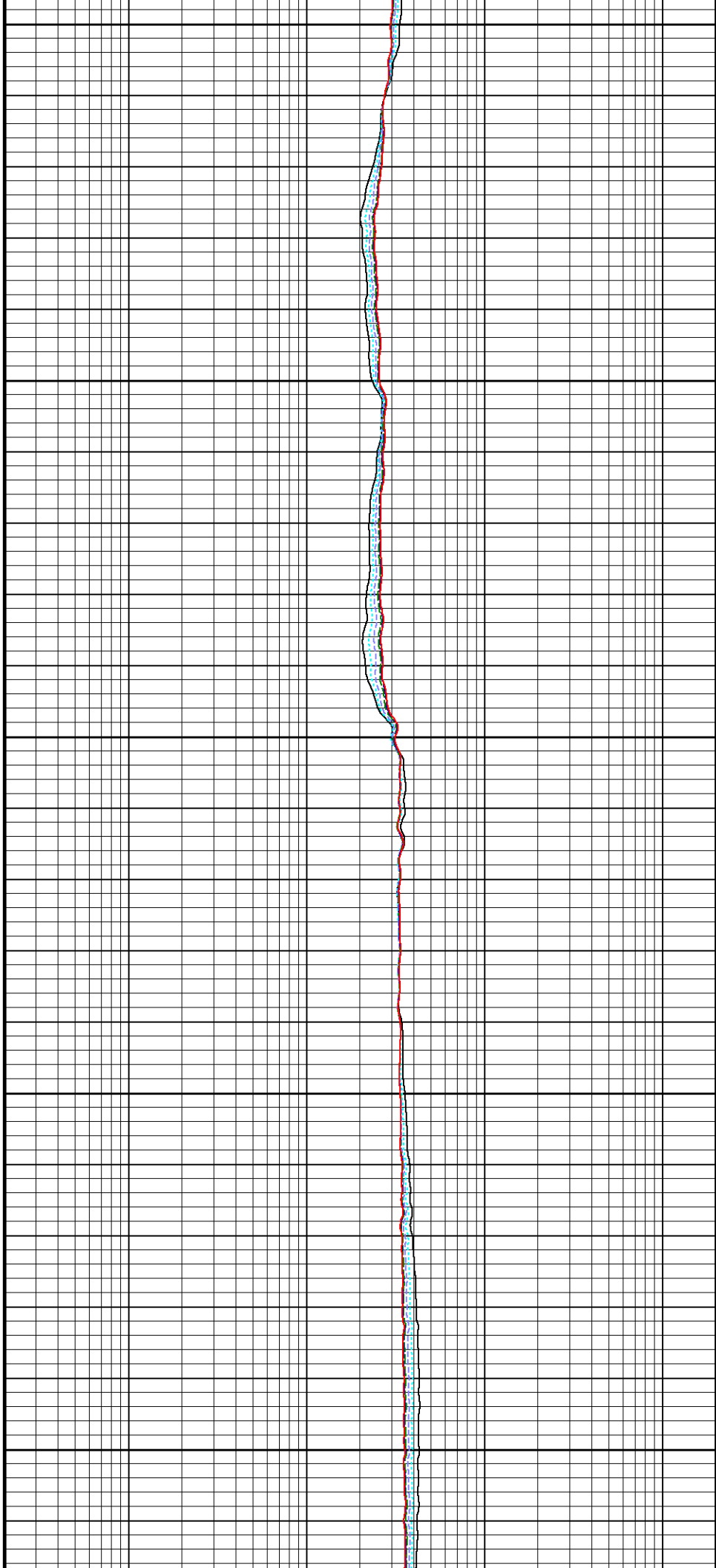
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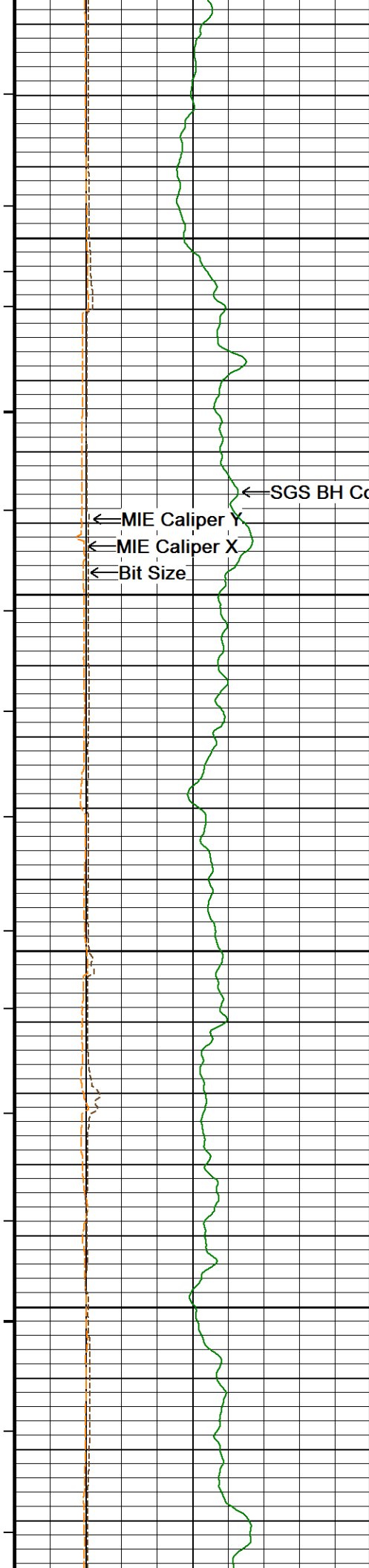
212°

9600

212°

9650





212°

9700

212°

9750

212°

9800

212°

9850

9900

← SGS BH Corrected Gamma

← MIE Caliper Y

← MIE Caliper X

← Bit Size

Array Ind. Four Res Rt →

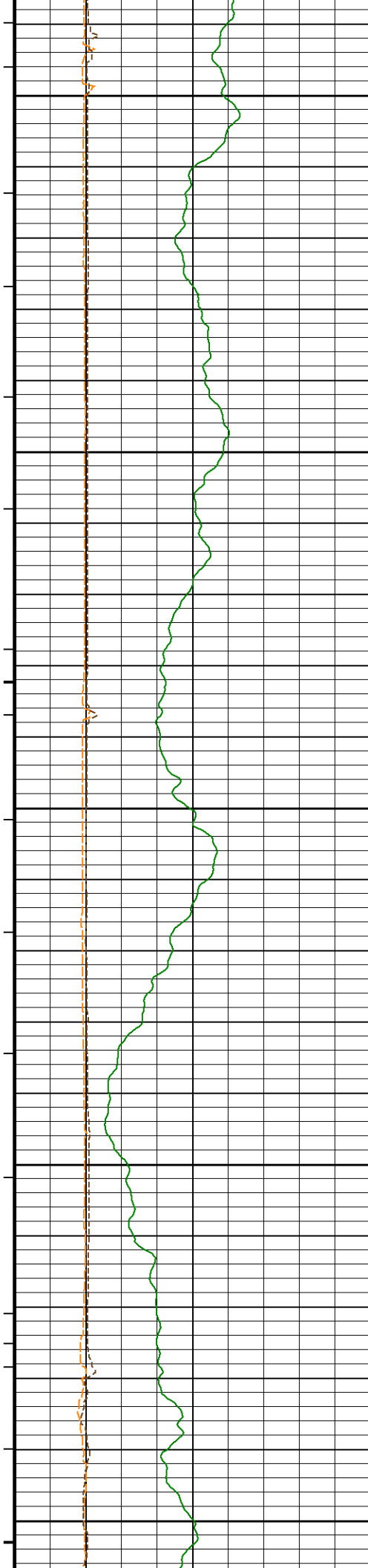
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Array Ind. Four Res 60 →

Array Ind. Four Res 40 →

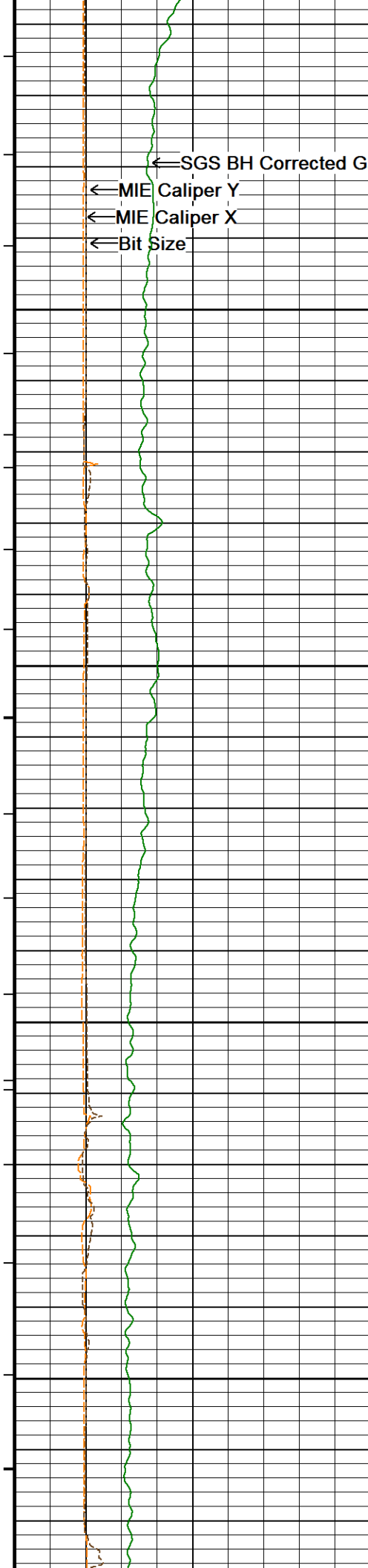
Array Ind. Four Res 30 →

Array Ind. Four Res 20 →



212°
9900
212°
9950
212°
10000
213°
10050
213°
10100





213°

10150

213°

10200

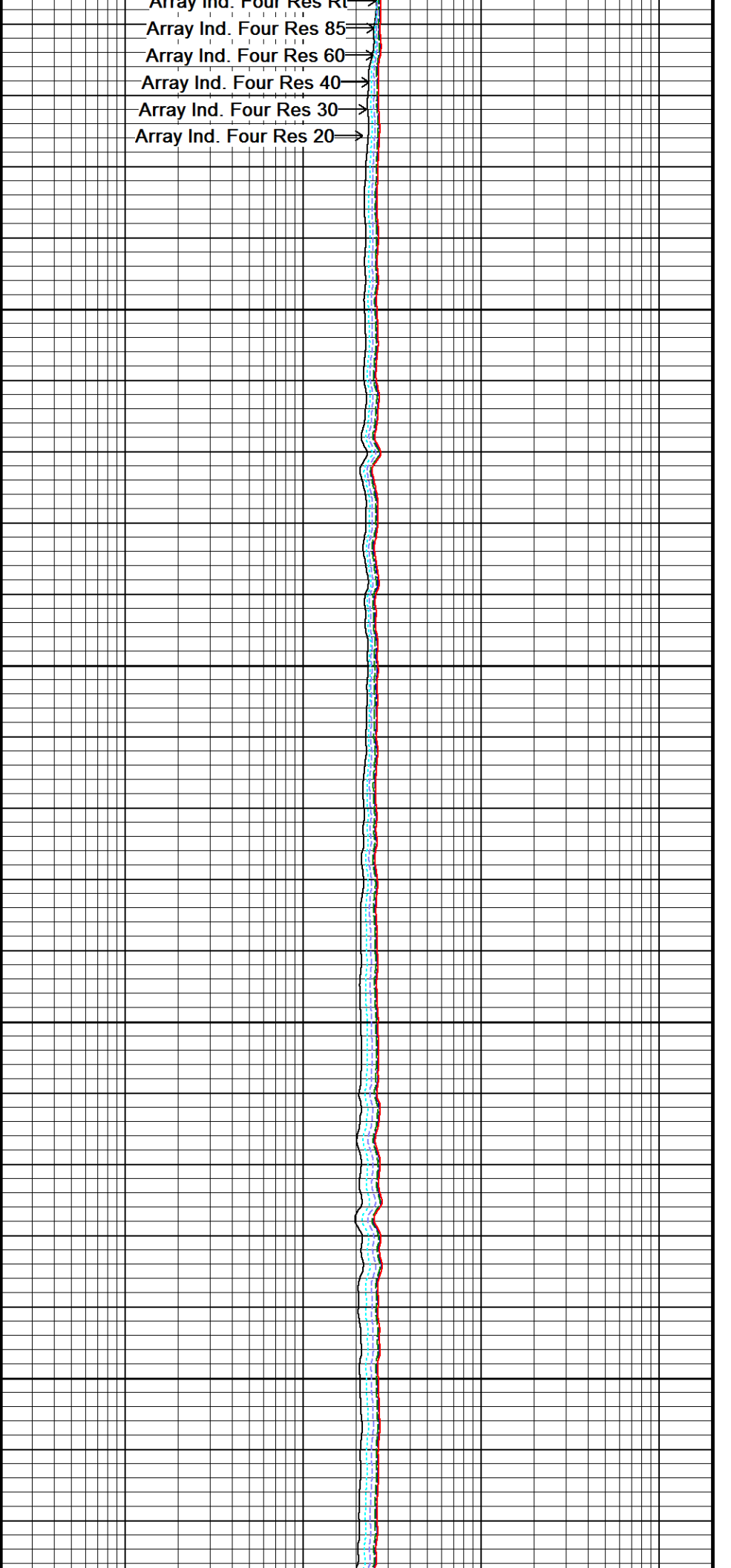
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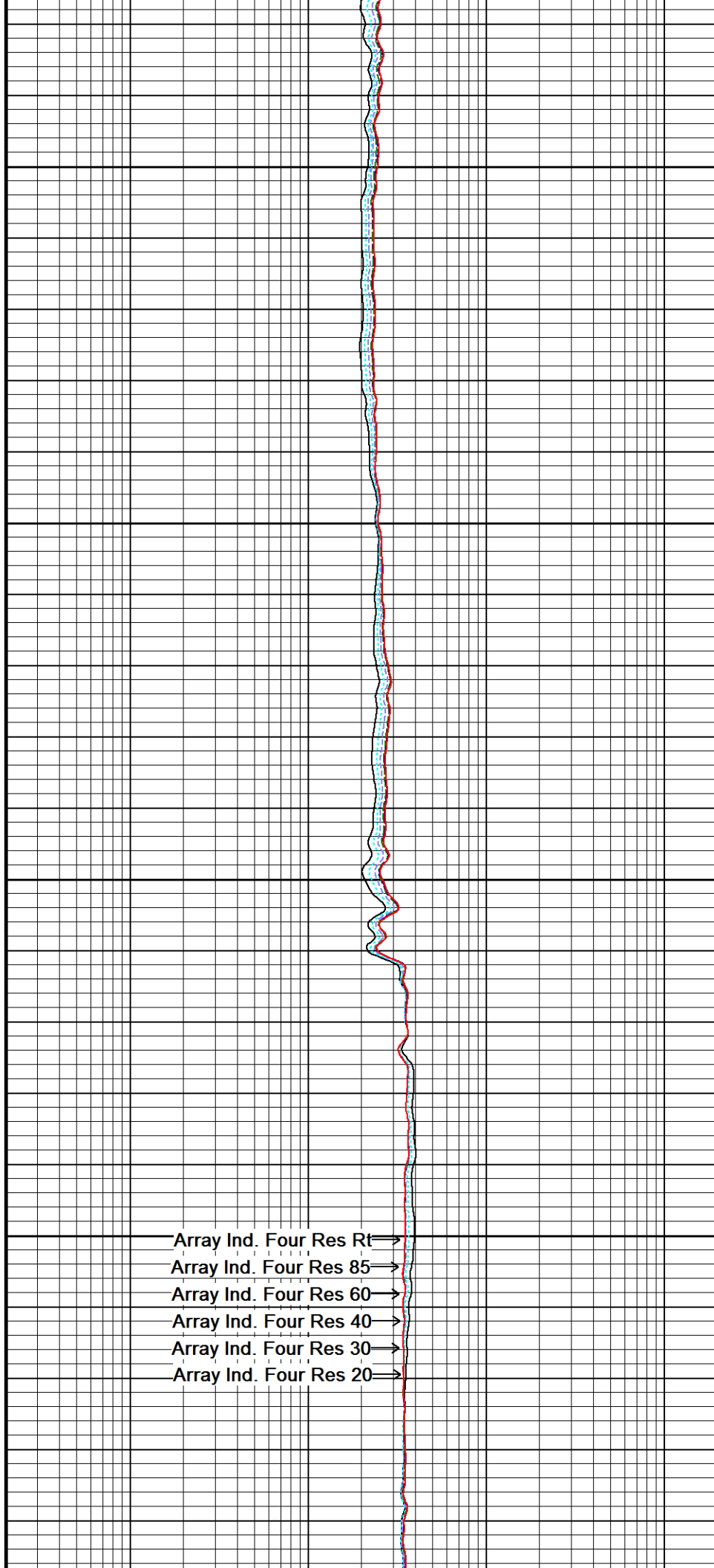
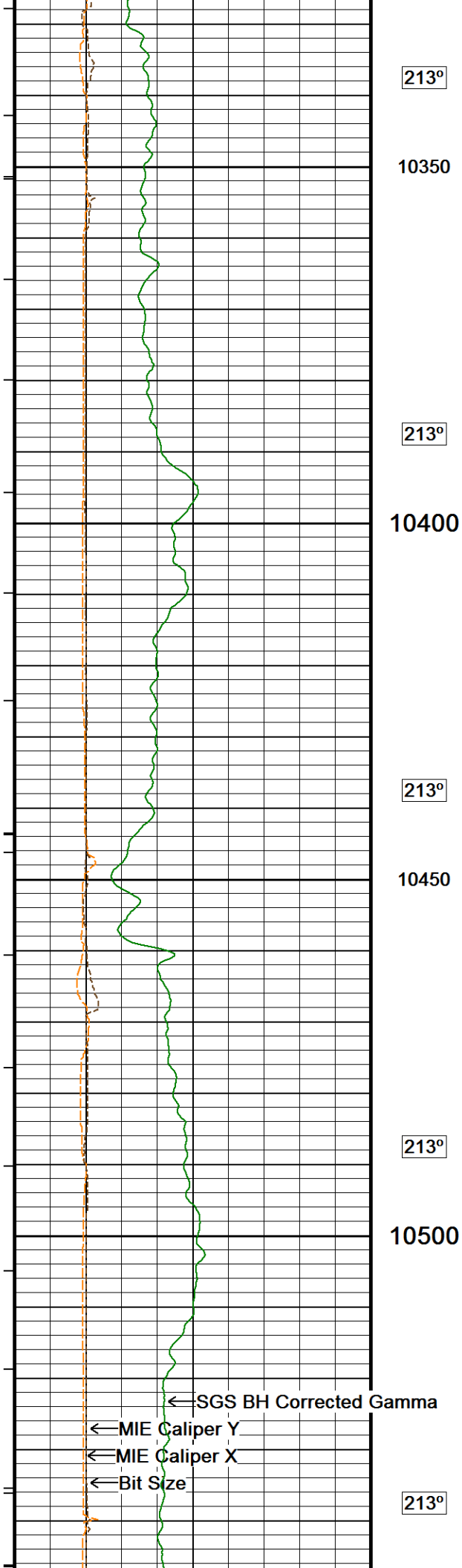
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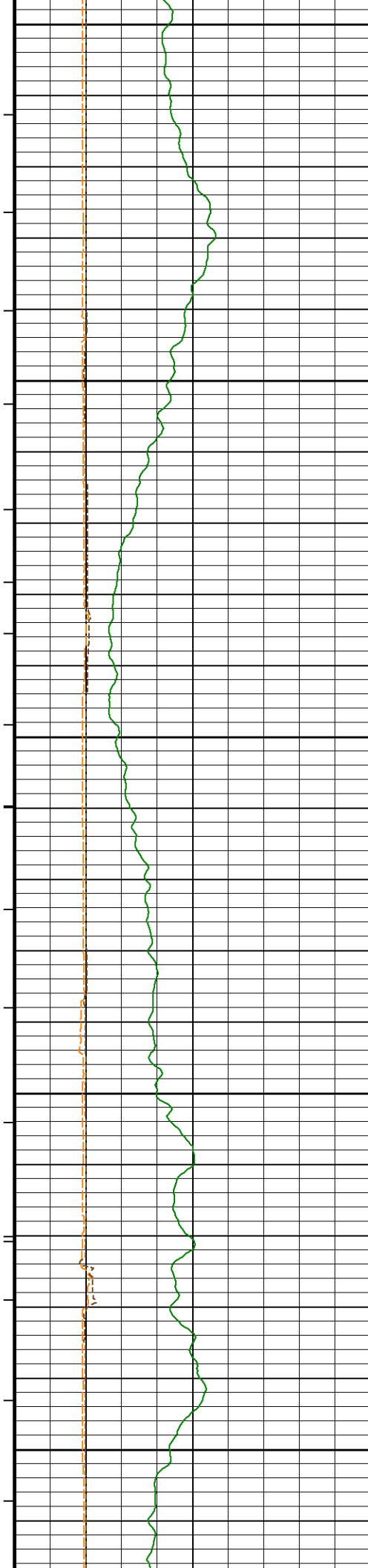
213°

10300

Array Ind. Four Res Rt
Array Ind. Four Res 85
Array Ind. Four Res 60
Array Ind. Four Res 40
Array Ind. Four Res 30
Array Ind. Four Res 20







10550

213°

10600

213°

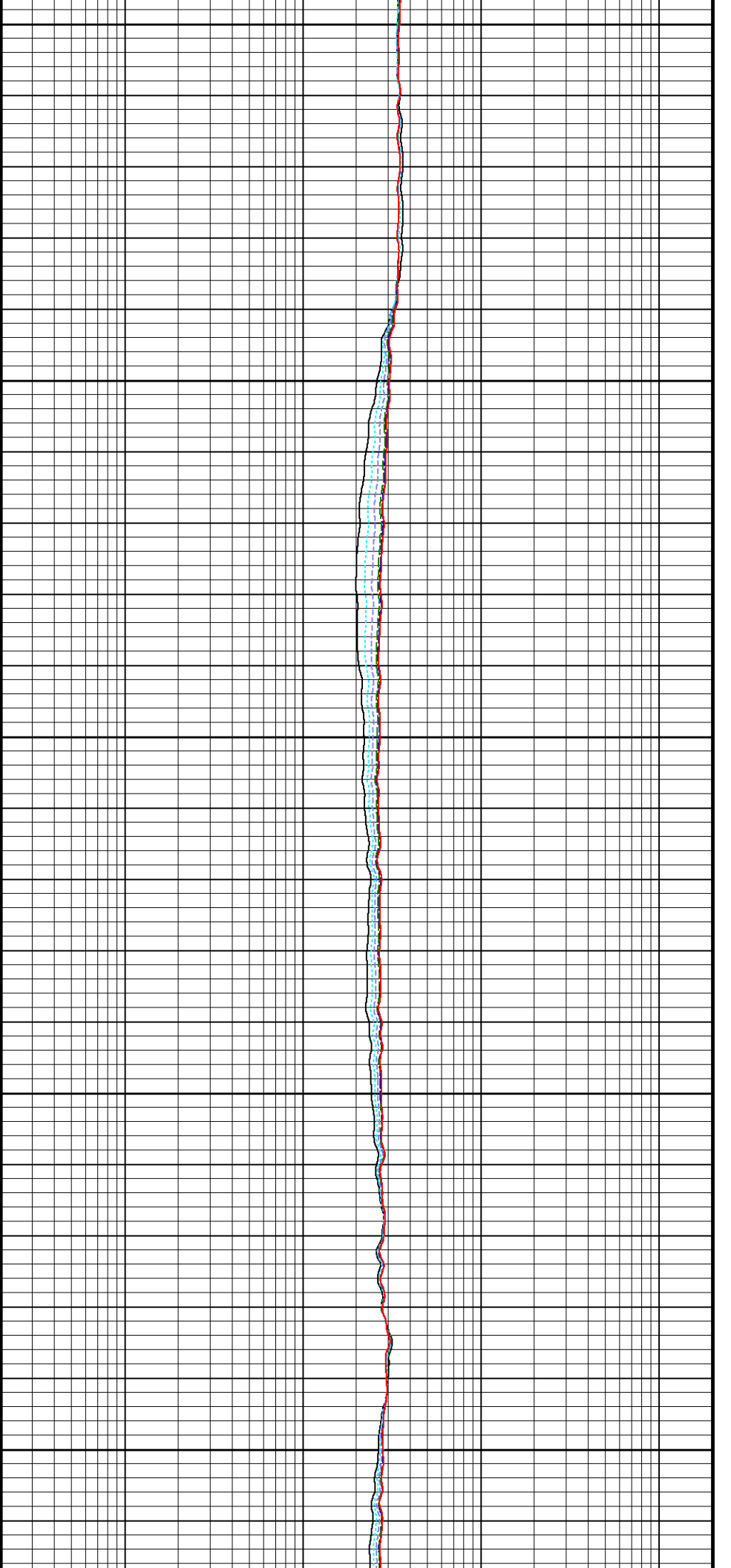
10650

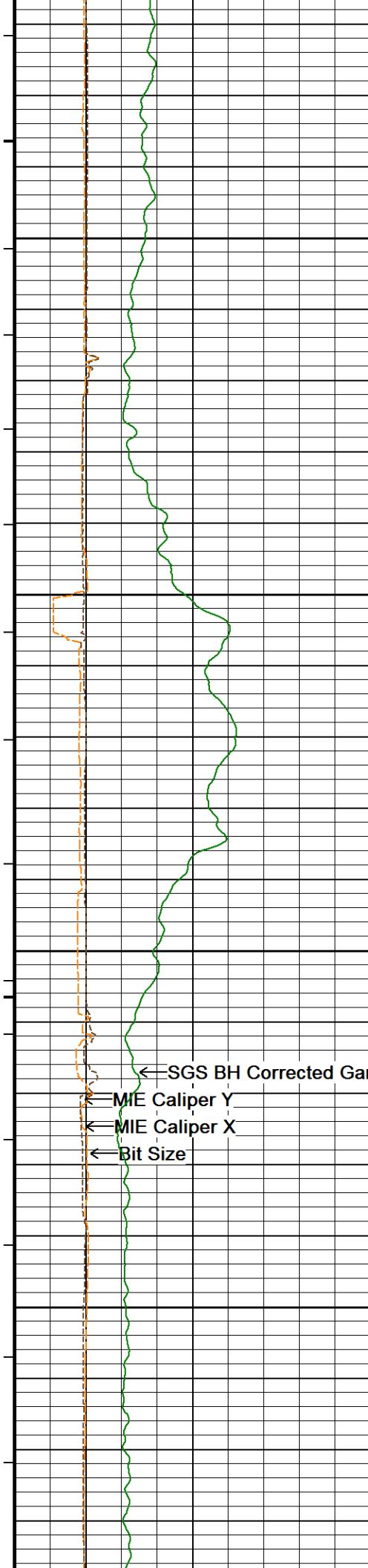
213°

10700

213°

10750





214°

10800

214°

10850

214°

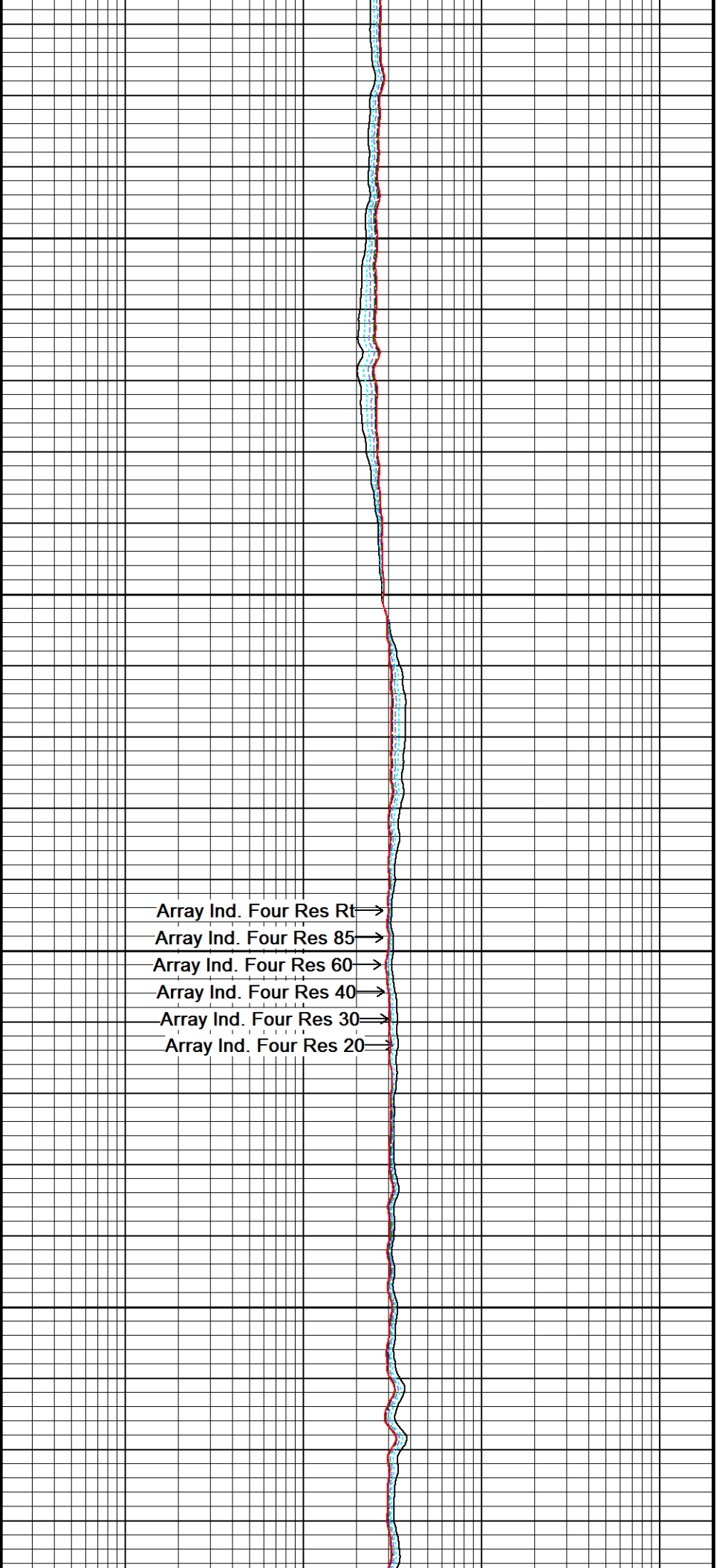
10900

214°

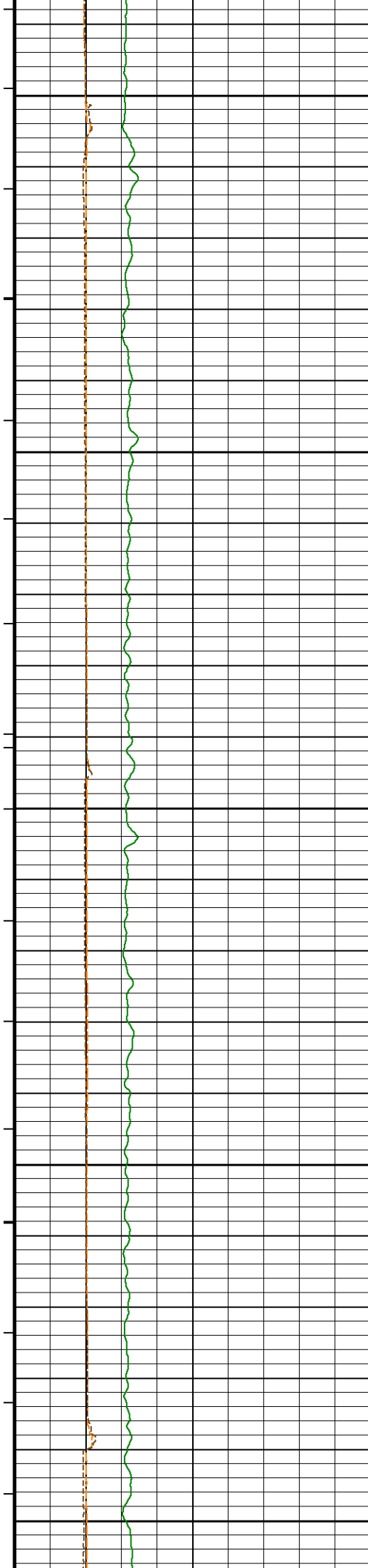
10950

11000

←SGS BH Corrected Gamma
←MIE Caliper Y
←MIE Caliper X
←Bit Size



Array Ind. Four Res Rt
Array Ind. Four Res 85
Array Ind. Four Res 60
Array Ind. Four Res 40
Array Ind. Four Res 30
Array Ind. Four Res 20



214°

11000

214°

11050

214°

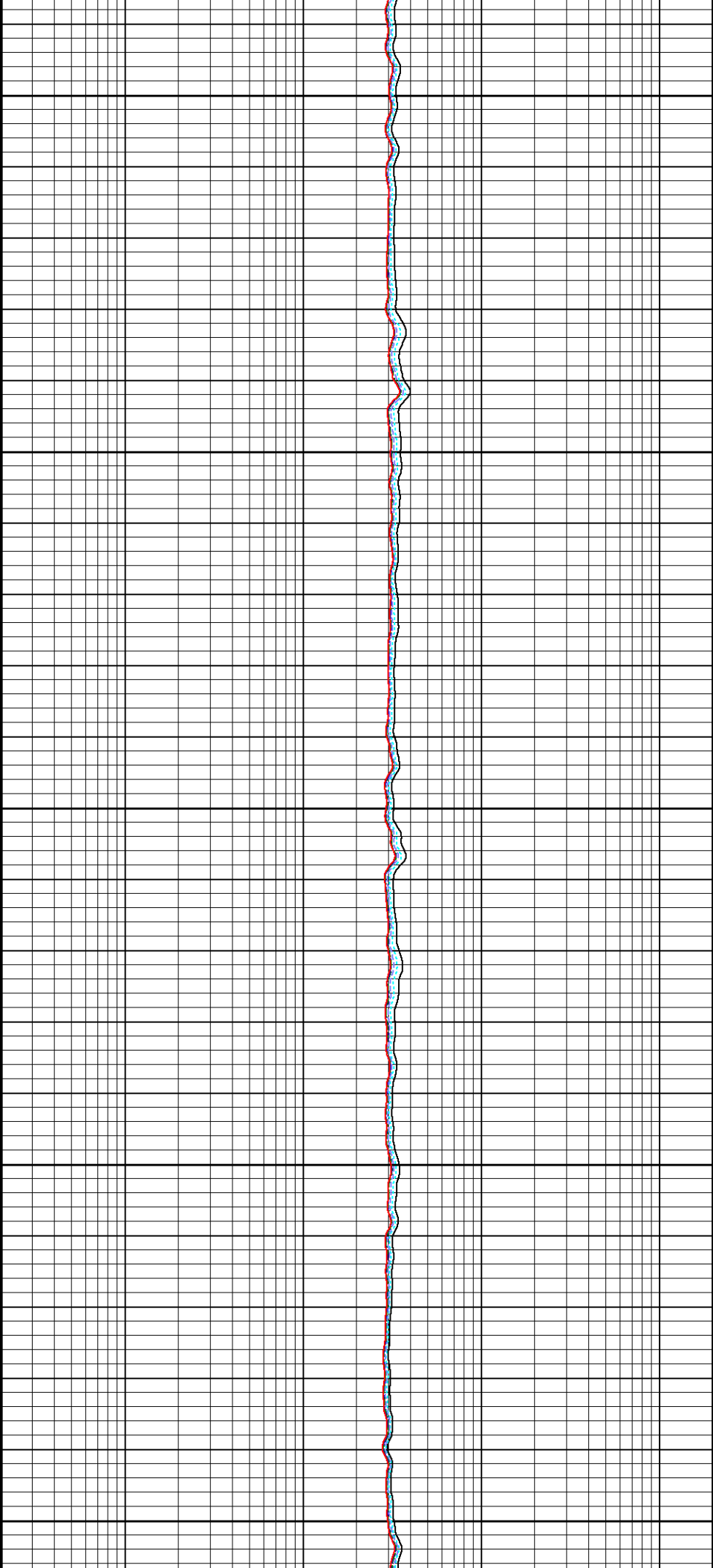
11100

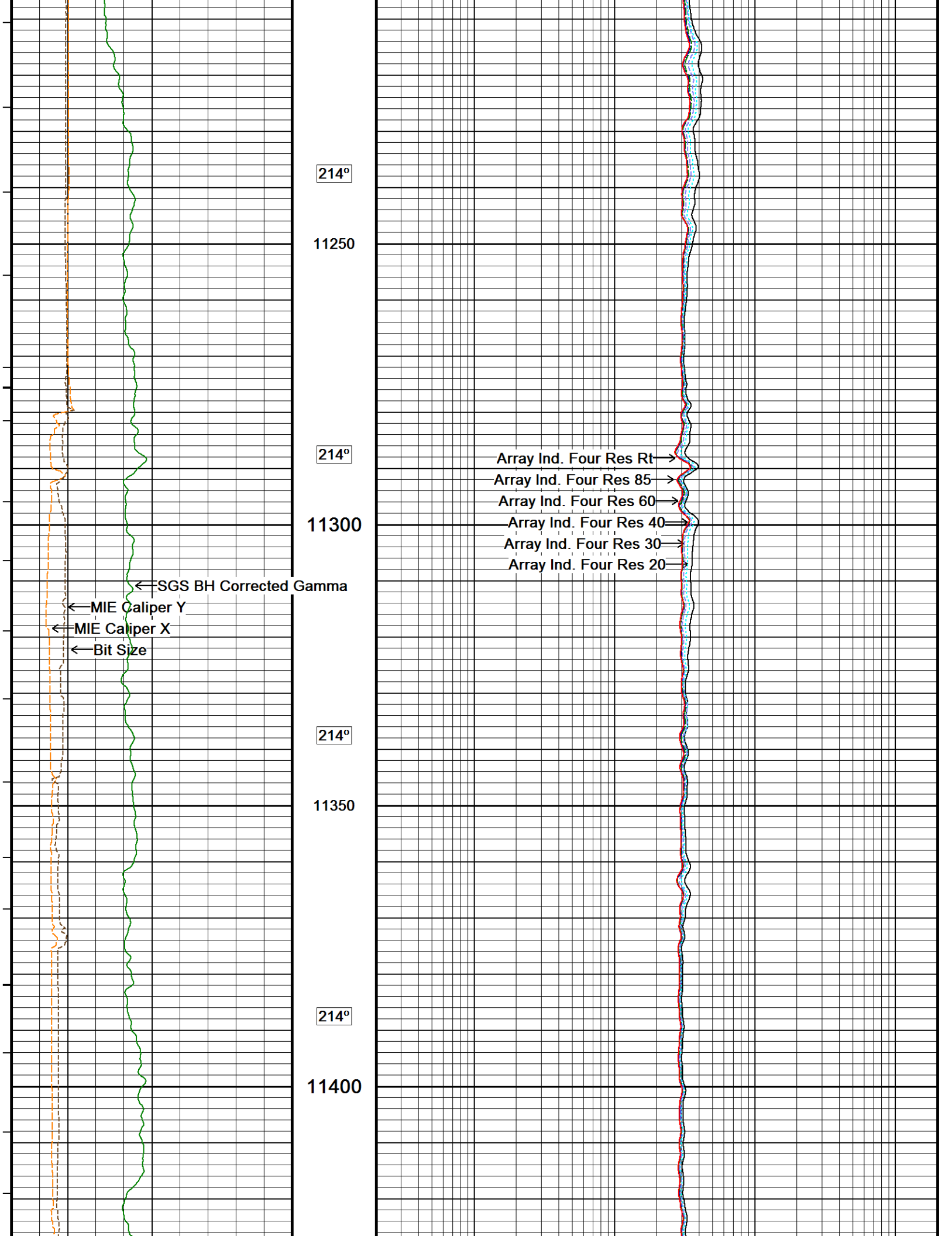
214°

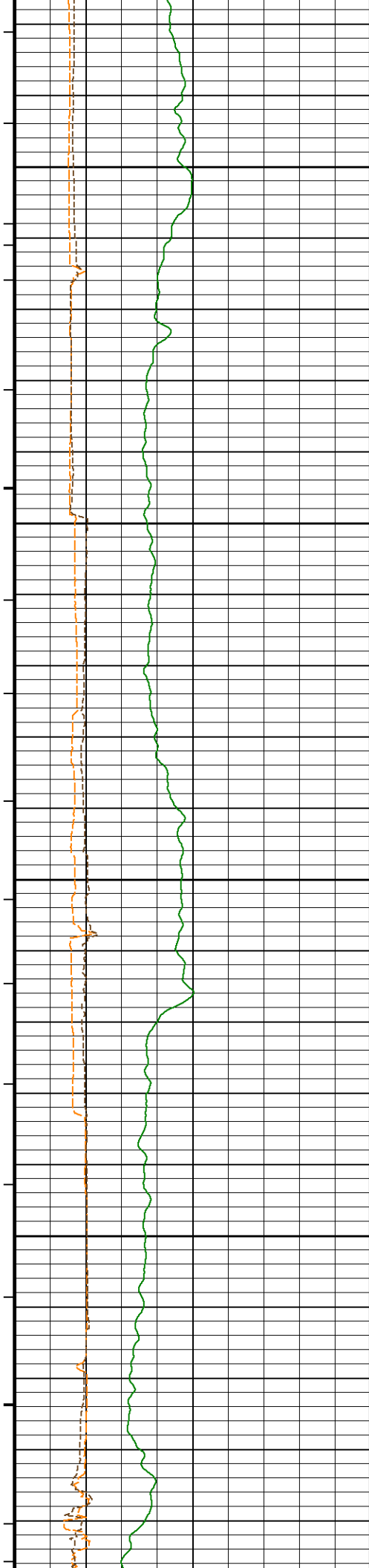
11150

214°

11200







214°

11450

214°

11500

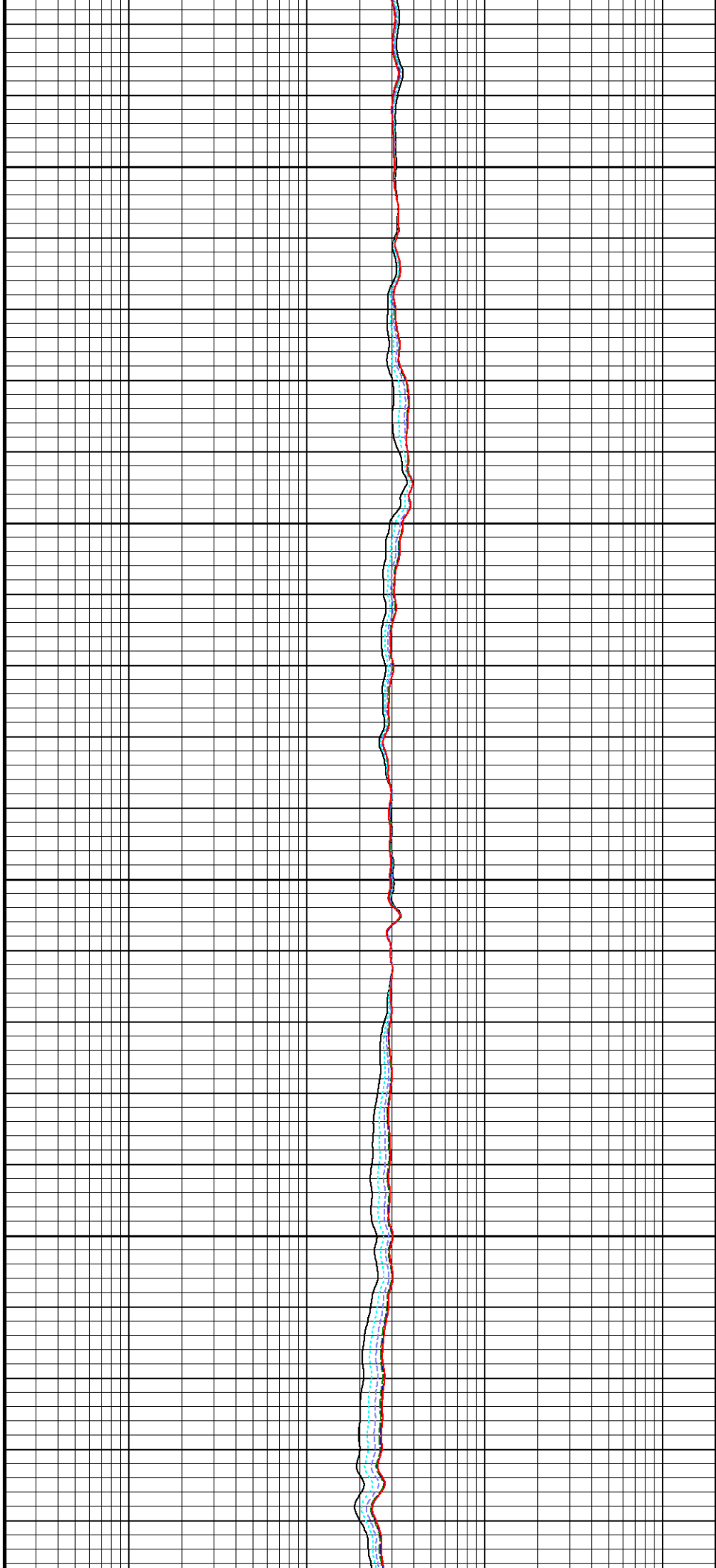
214°

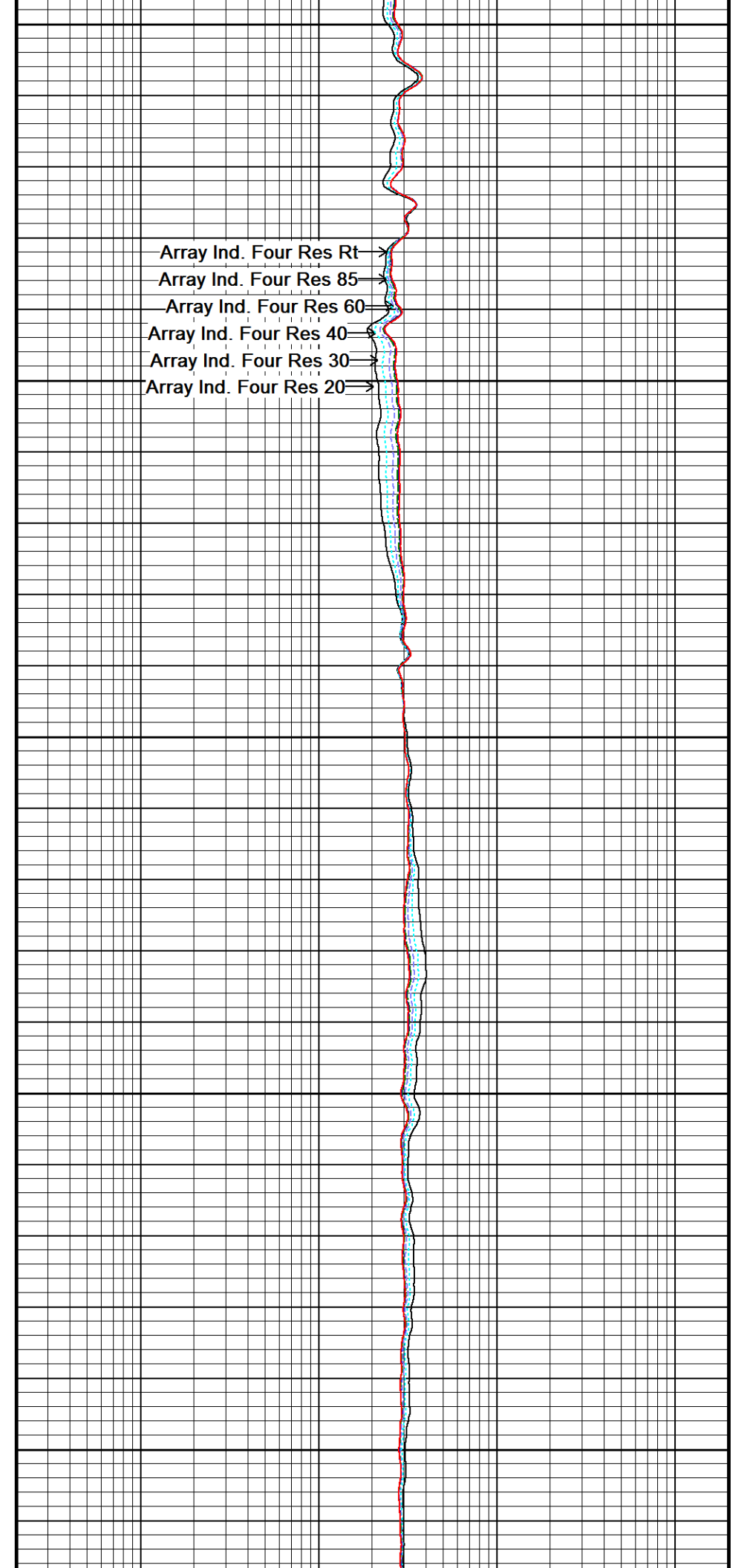
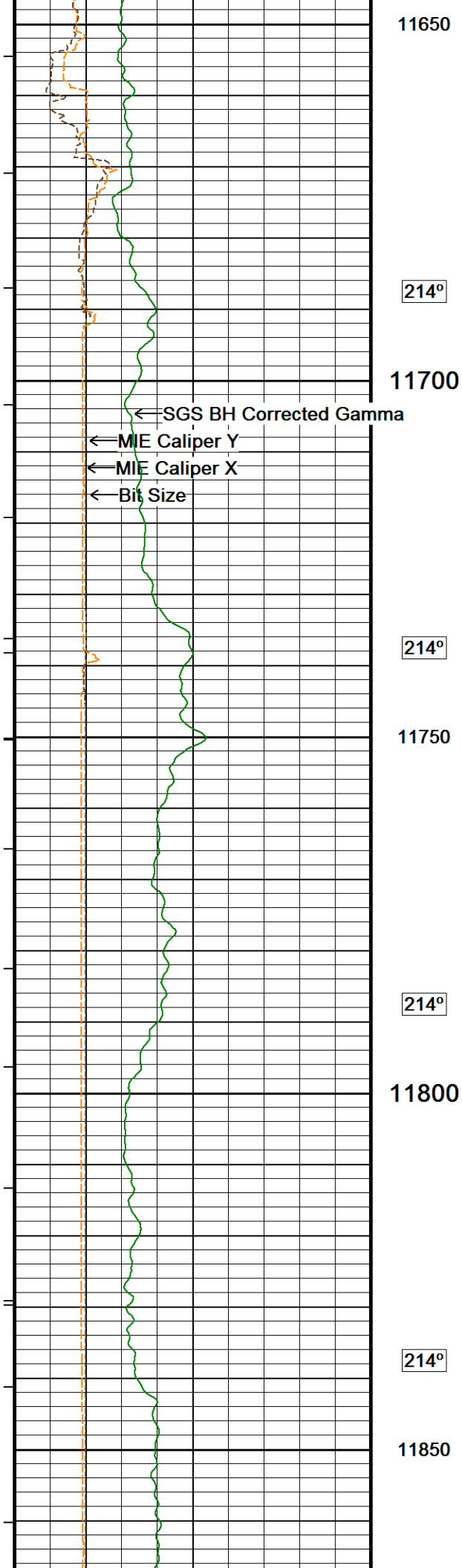
11550

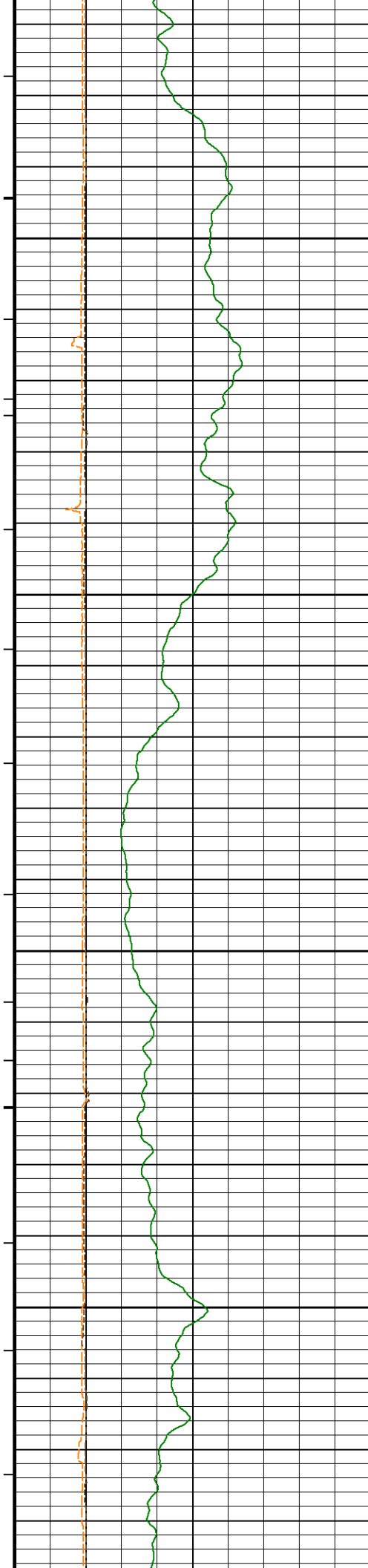
214°

11600

214°







214°

11900

214°

11950

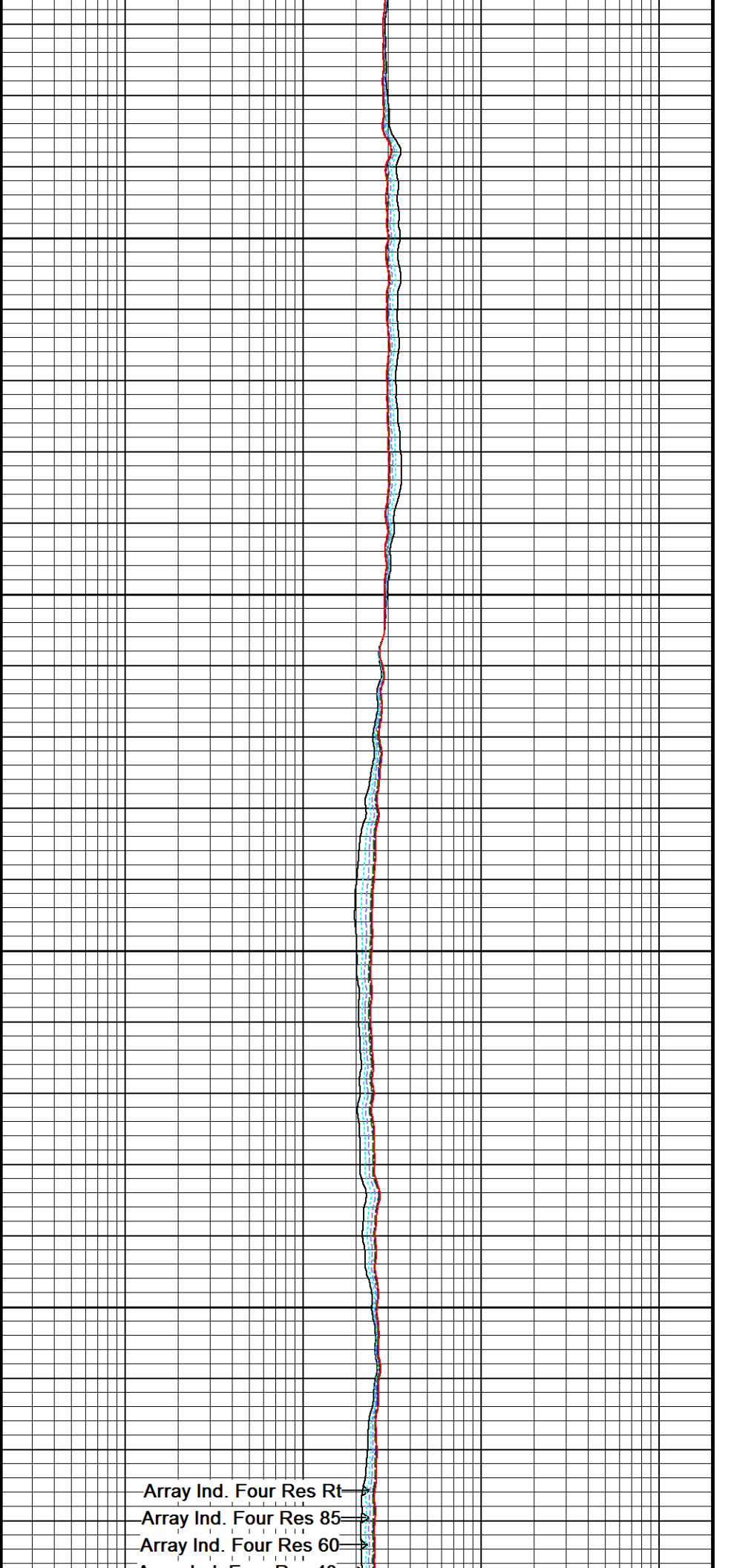
214°

12000

214°

12050

214°

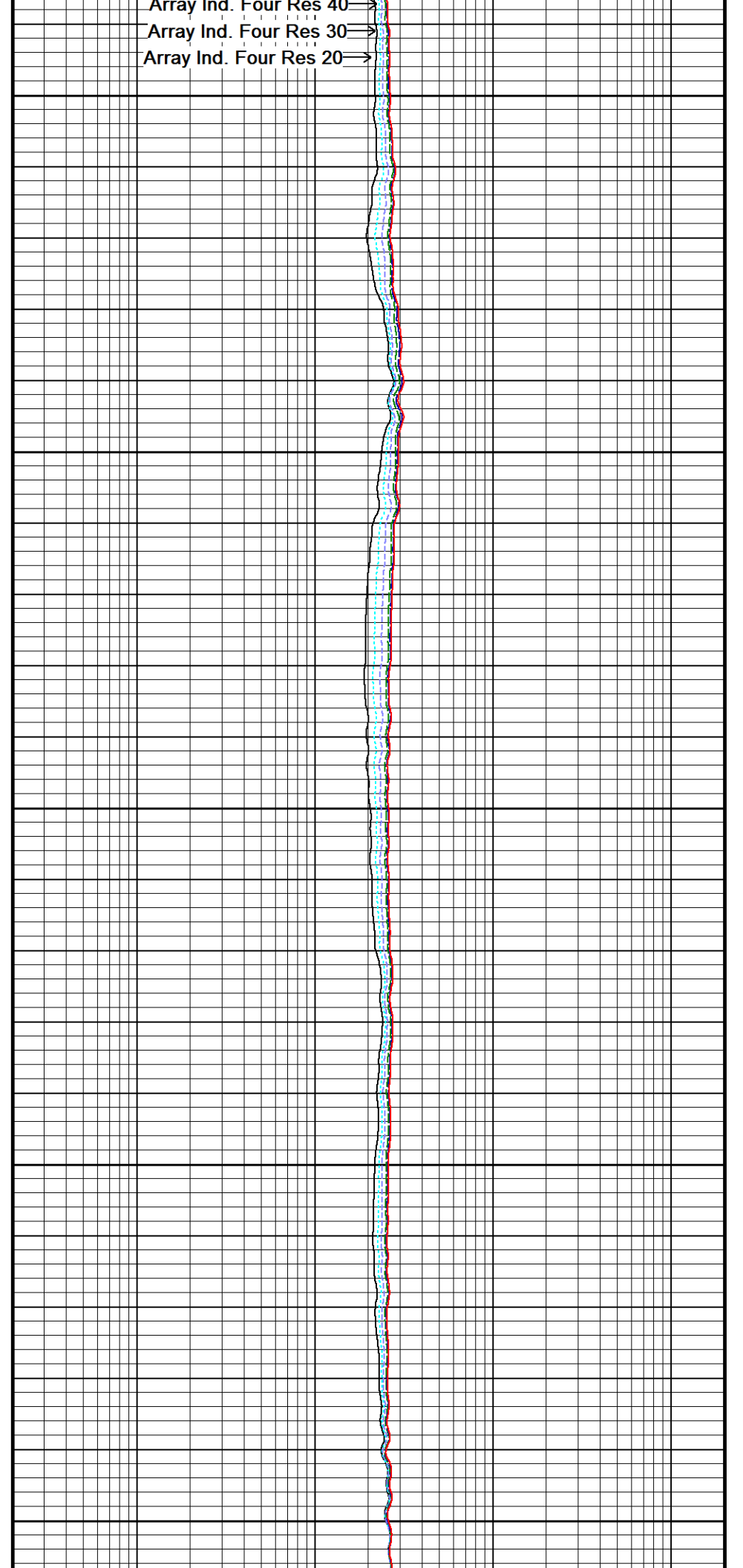
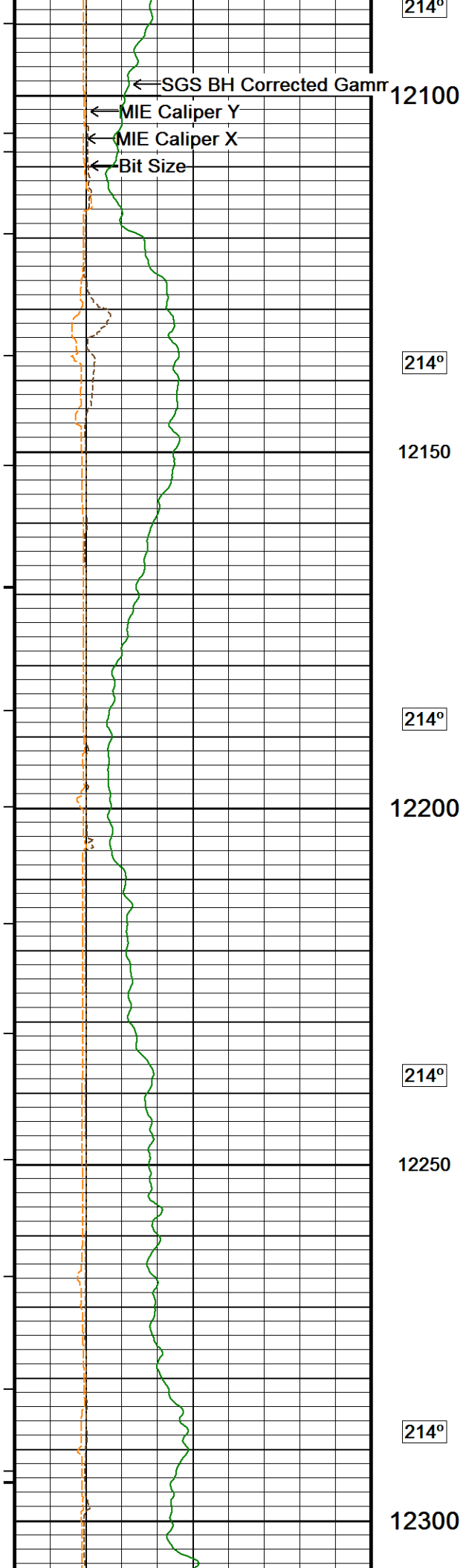


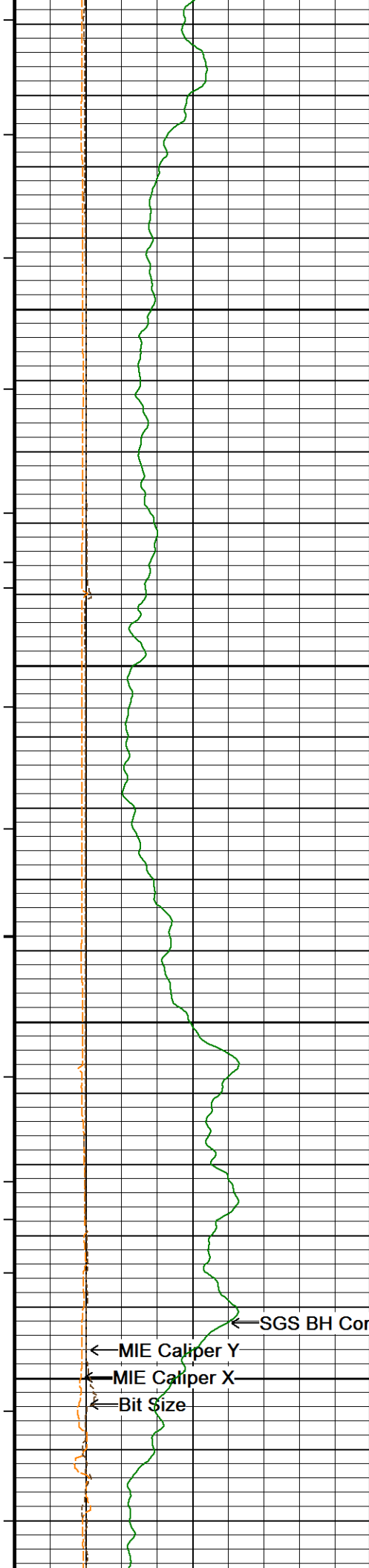
Array Ind. Four Res Rt

Array Ind. Four Res 85

Array Ind. Four Res 60

Array Ind. Four Res 40





214°

12350

214°

12400

214°

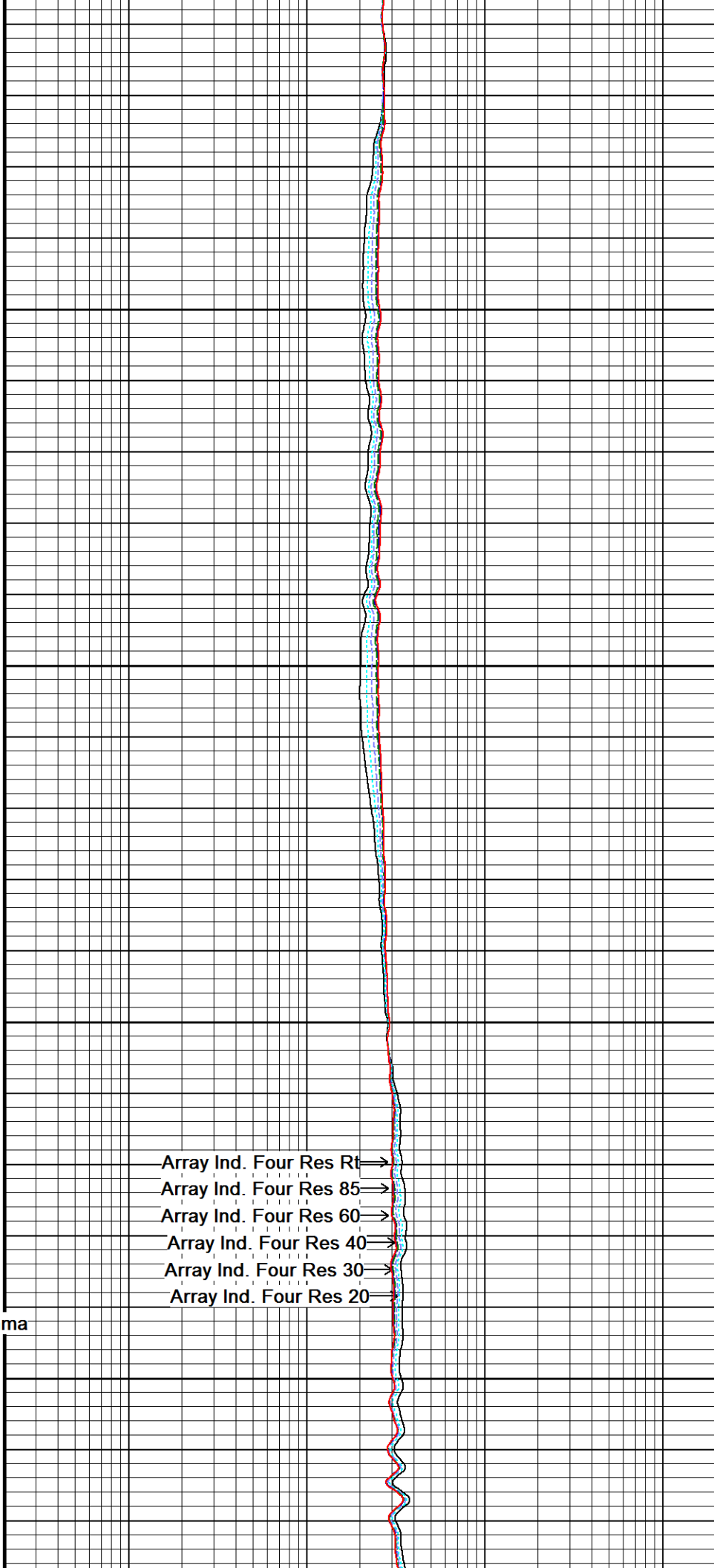
12450

214°

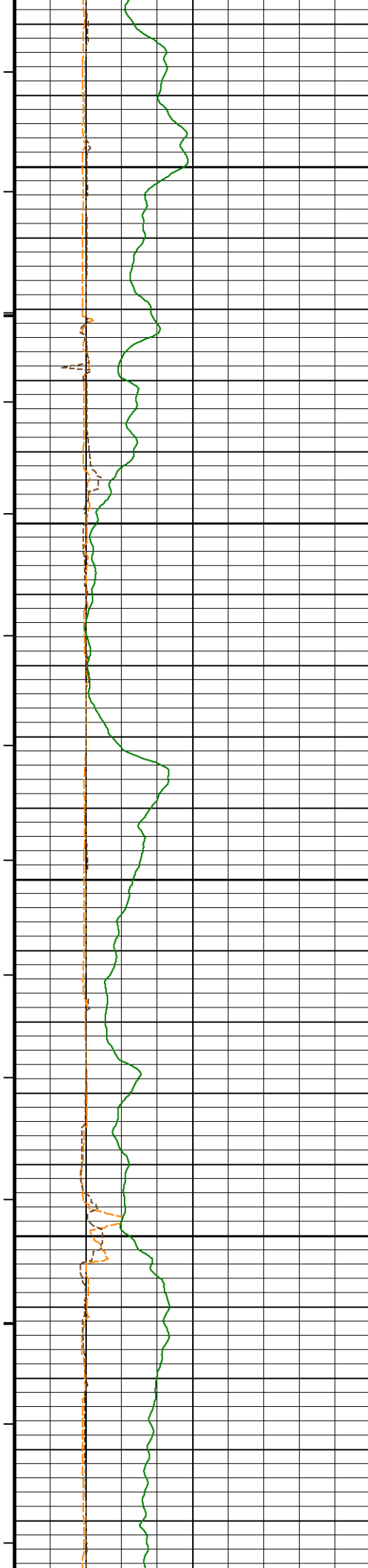
12500

← MIE Caliper Y
← MIE Caliper X
← Bit Size

← SGS BH Corrected Gamma



Array Ind. Four Res Rt →
Array Ind. Four Res 85 →
Array Ind. Four Res 60 →
Array Ind. Four Res 40 →
Array Ind. Four Res 30 →
Array Ind. Four Res 20 →



214°

12550

214°

12600

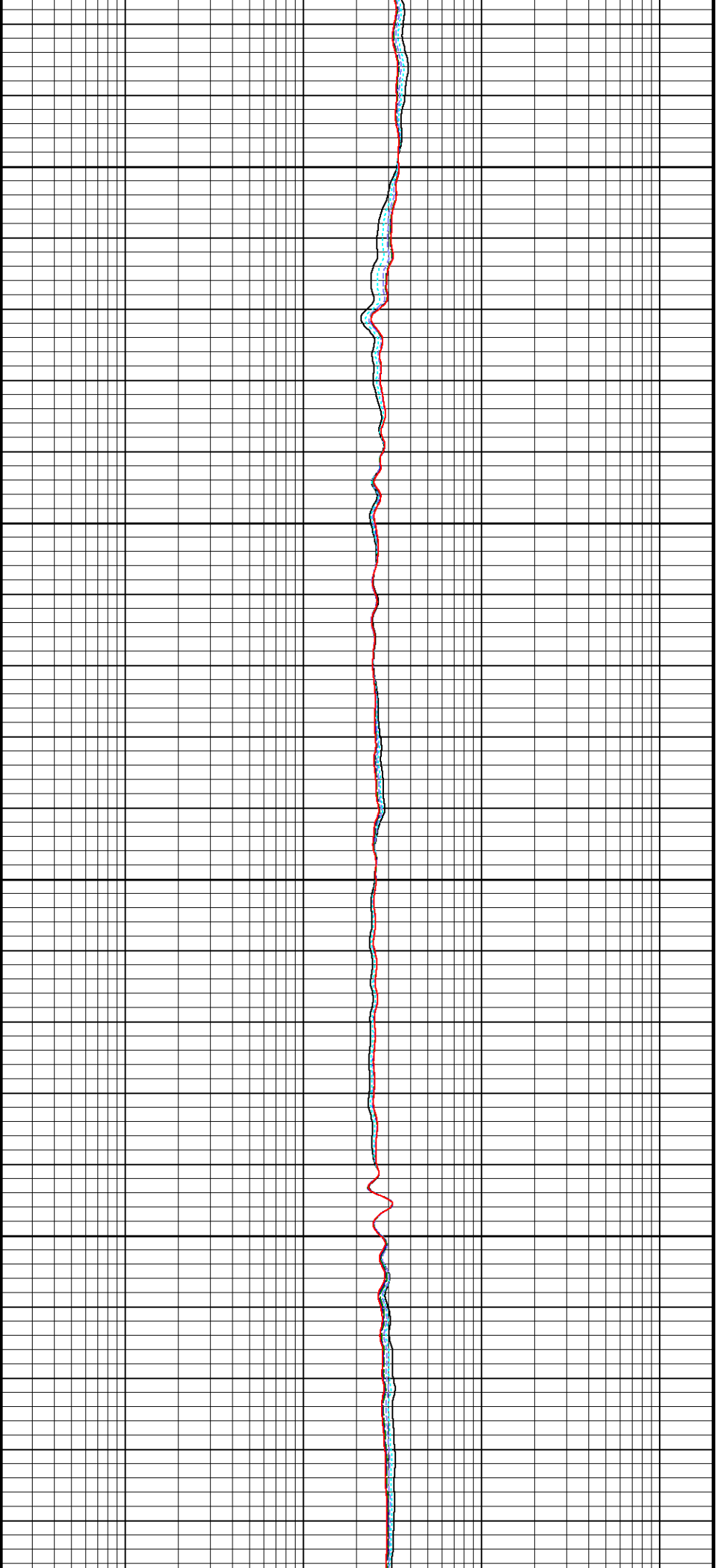
214°

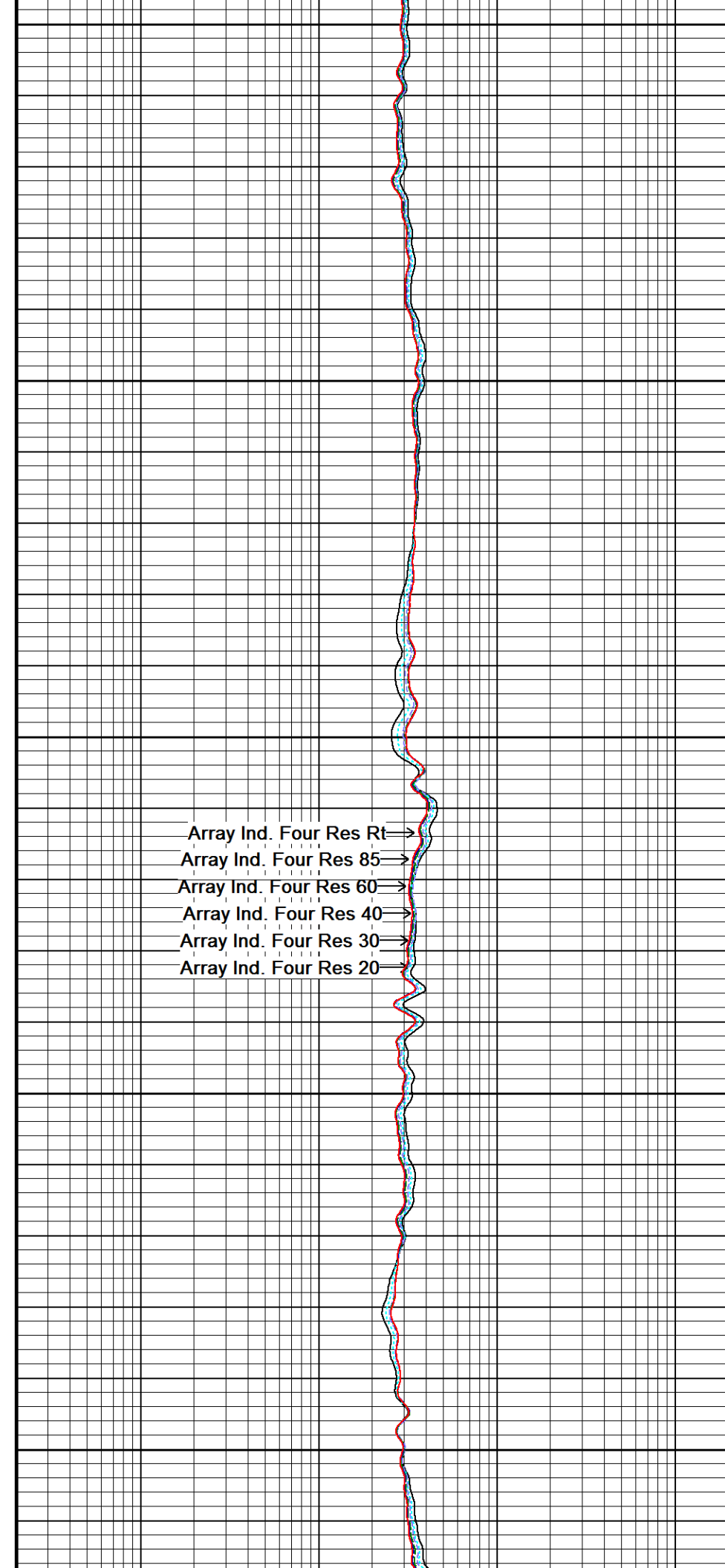
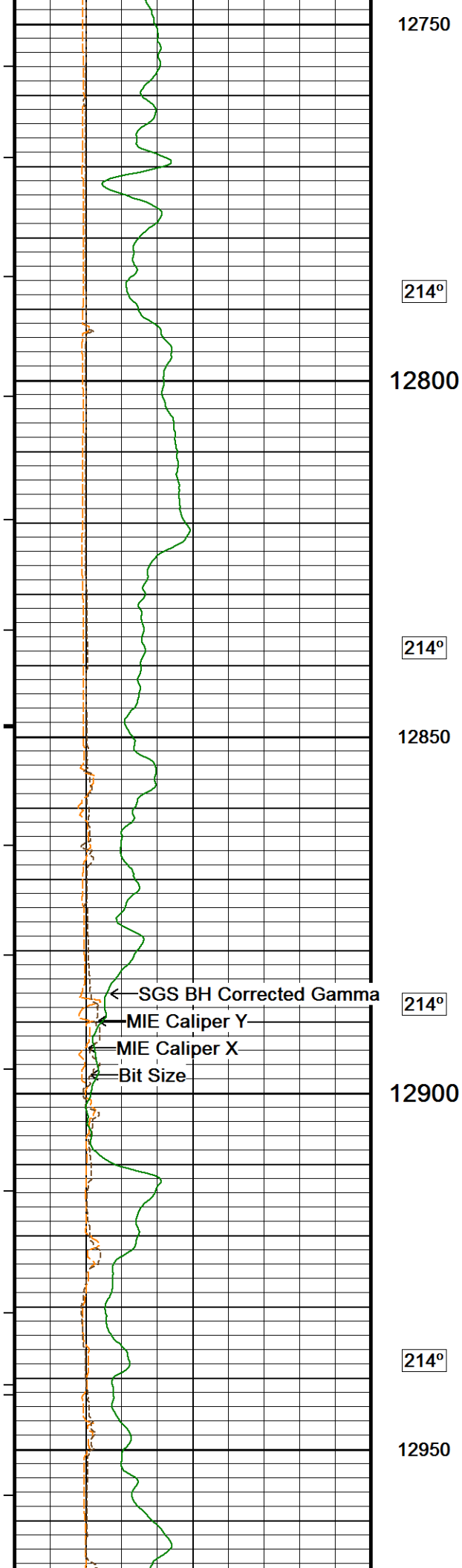
12650

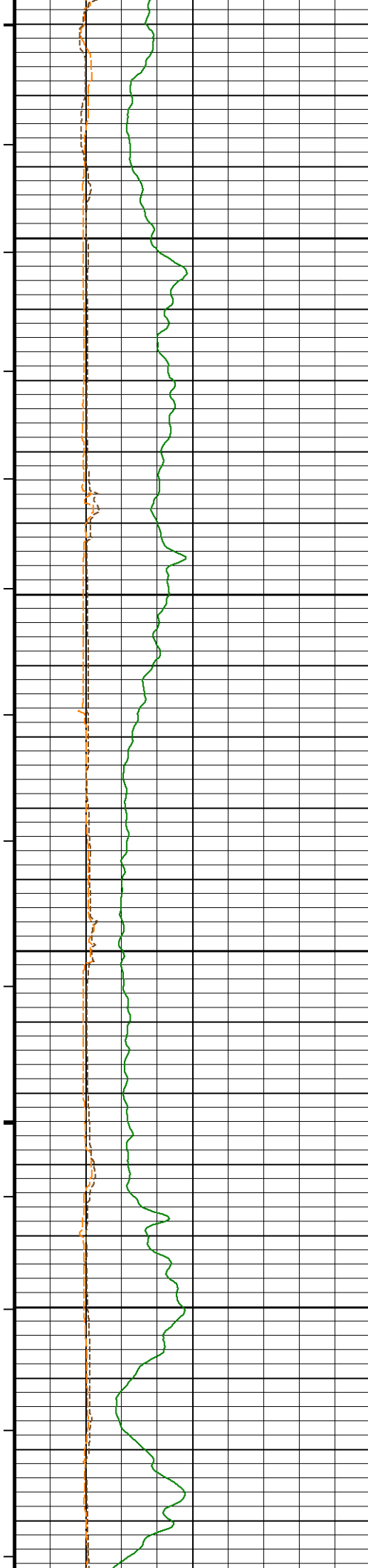
214°

12700

214°







214°

13000

213°

13050

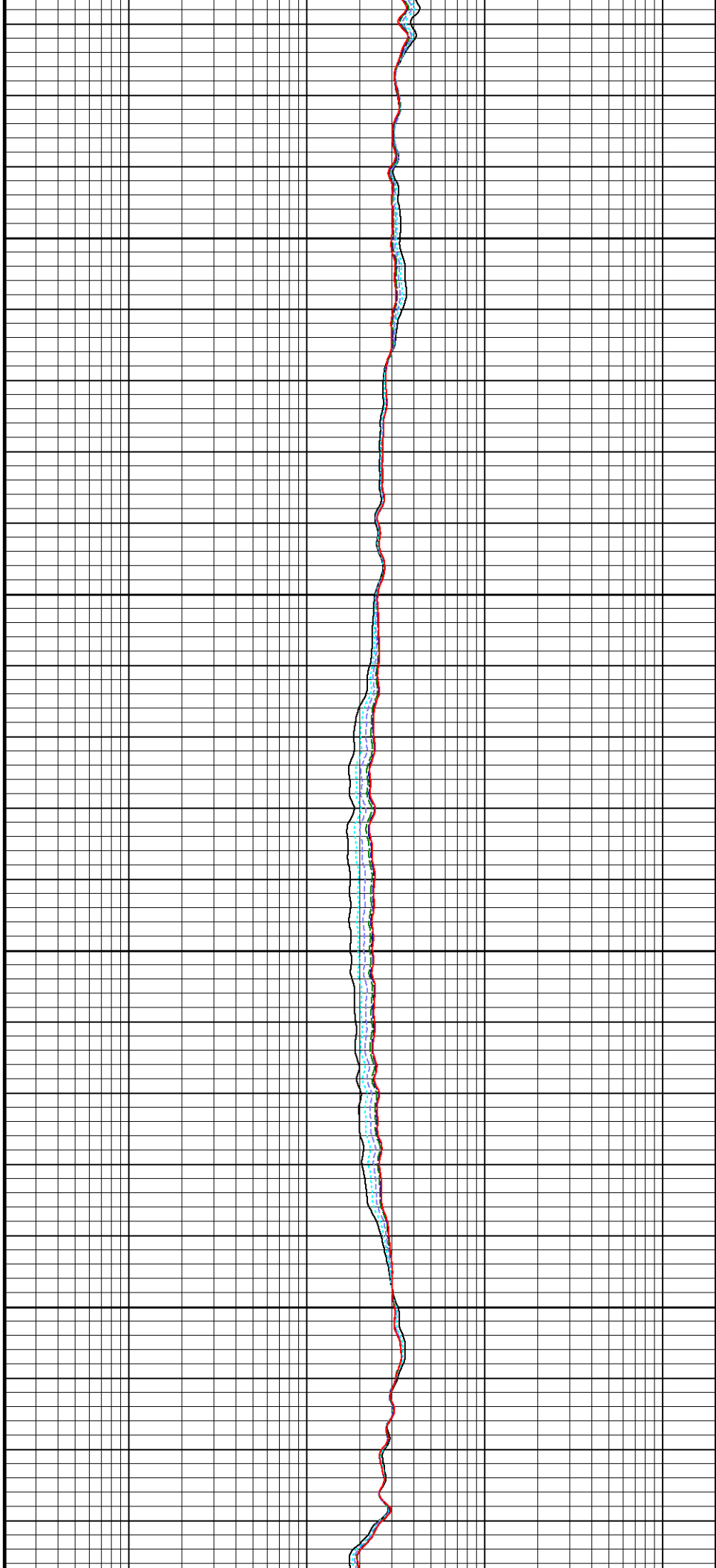
213°

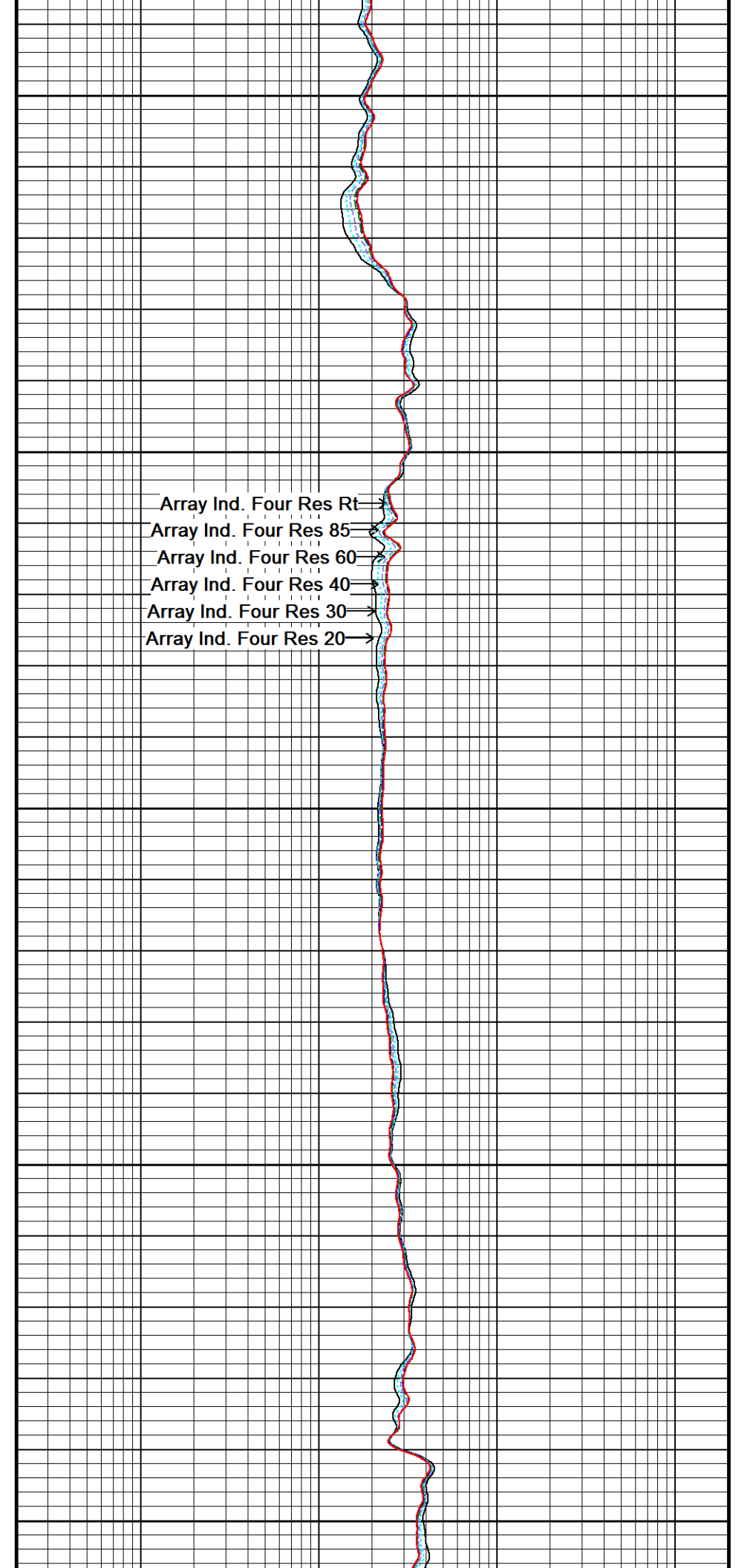
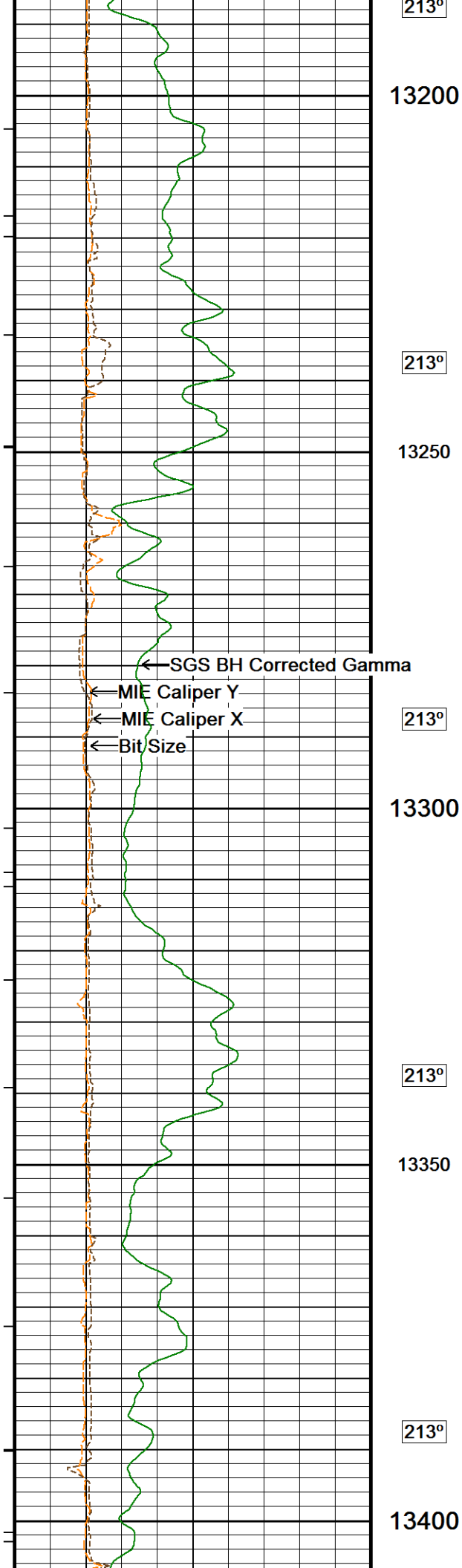
13100

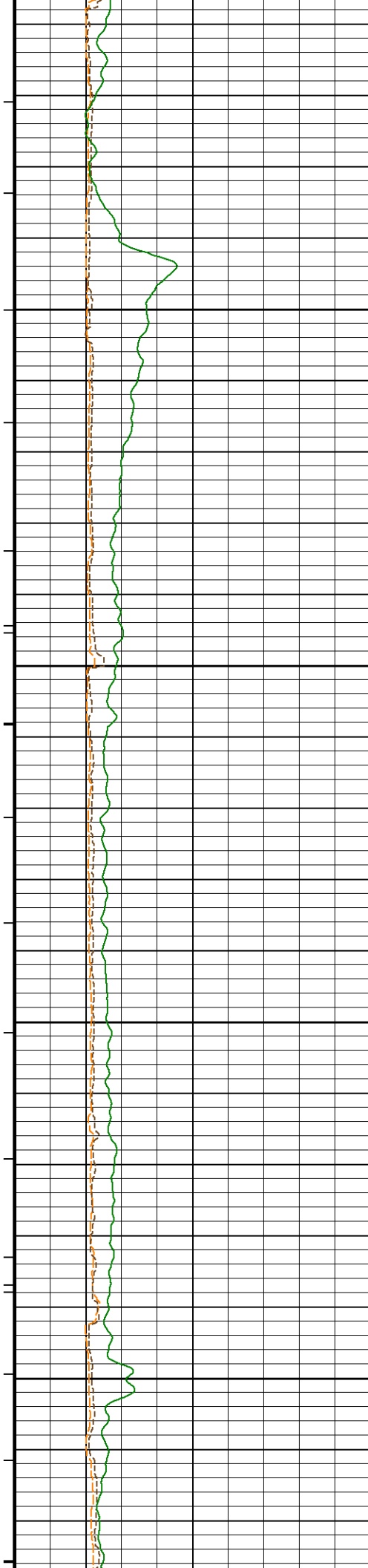
213°

13150

213°







213°

13450

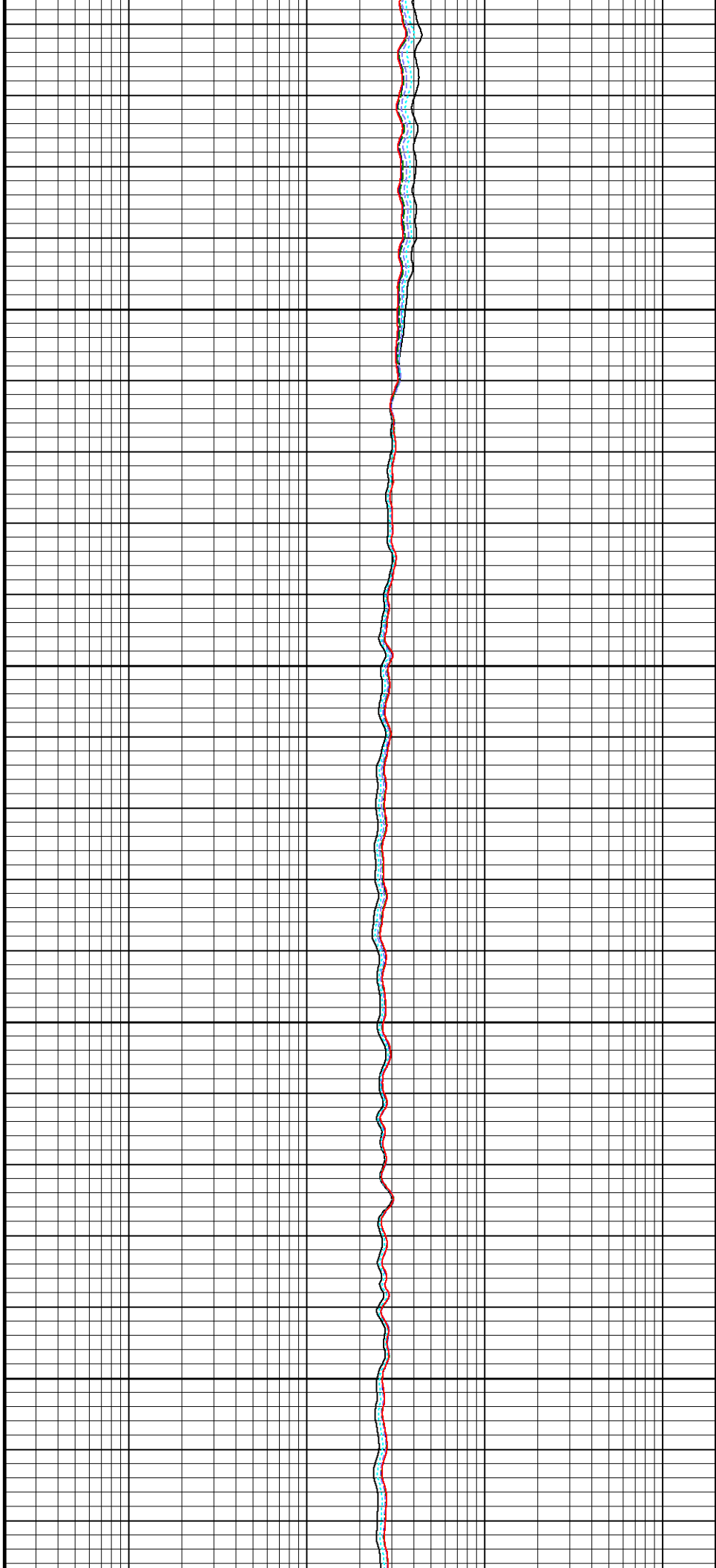
214°

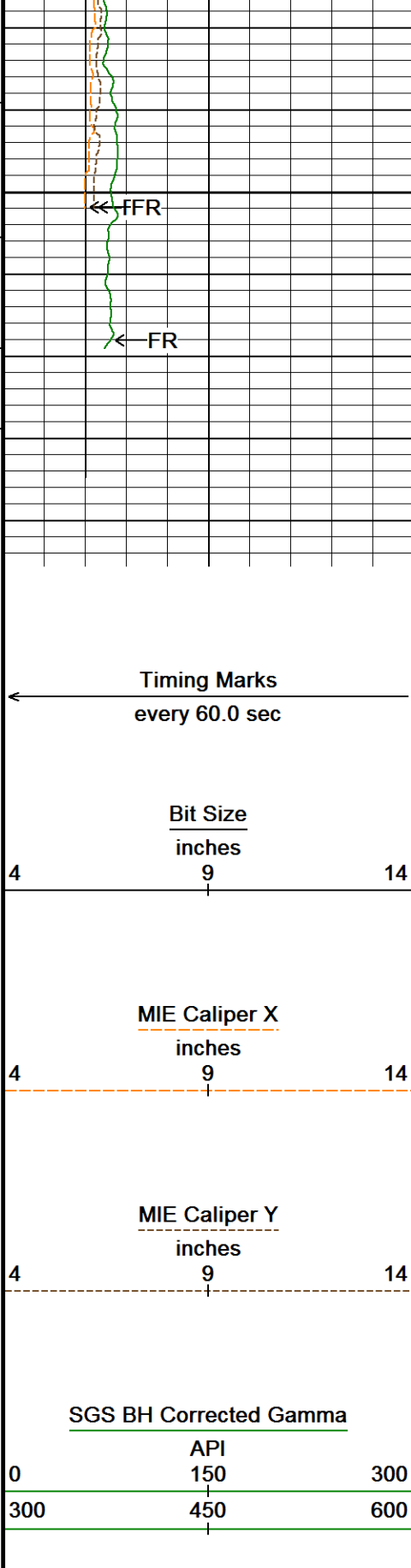
13500

216°

13550

13600



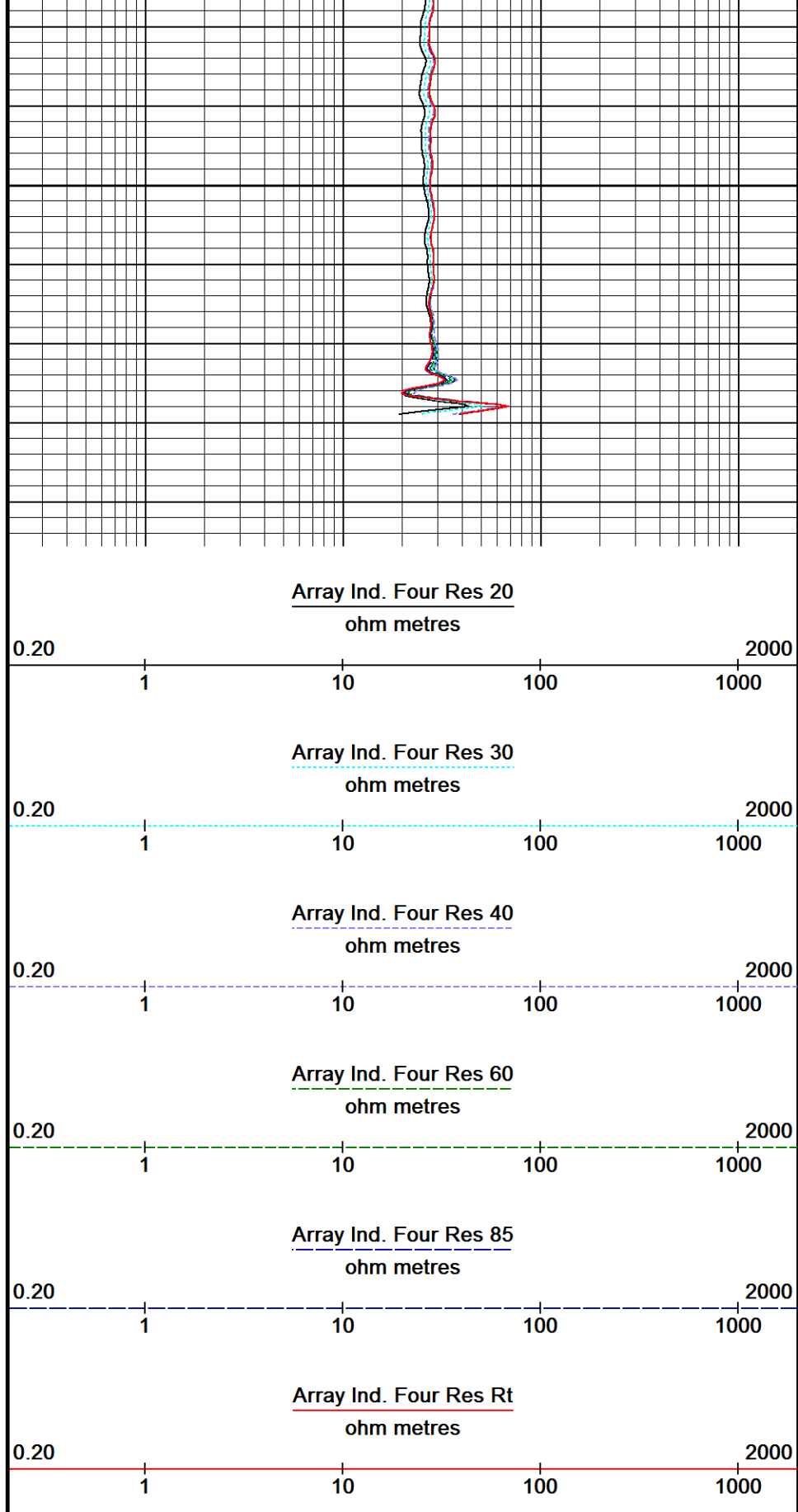


13650

Depth in Feet

Borehole Temp in deg F

Replay Scale 1:240



Down-hole Tension Calibration All 000

Field Calibration on 24-OCT-2010 03:34

Reading No	Measured	
1	15659.85	0.00
2	15734.68	370.00

General Constants All 000

Last Edited on 27-OCT-2014,16:20

General Parameters

Mud Resistivity	1.880	ohm-metres
Mud Resistivity Temperature	86.600	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	XY Caliper	
HVOL Caliper 1	MIE Diam. X Armswing	
HVOL Caliper 2	MIE Diam. Y Armswing	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	MIE Diam. X Armswing	

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 189

Last Edited on 18-SEP-2012,14:07

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	

High Resolution Temperature Calibration MGS-D.A 185

Field Calibration on 28-FEB-2014,12:06

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

High Resolution Temperature Constants MGS-D.A 185

Last Edited on 10-APR-2014,11:59

Pre-filter Length	11
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SP Calibration MGS-D.A 185

Field Calibration on 28-FEB-2014,12:05

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

Gamma Calibration MGS-D.A 185

Field Calibration on 26-OCT-2014 09:34

	Measured	Calibrated (API)
Background	165	116
Calibrator (Gross)	1022	718

Calibrator (Gross)	1022	710
Calibrator (Net)	857	602
Gamma Constants MGS-D.A 185		Last Edited on 26-OCT-2014,13:00
Gamma Calibrator Number	GRCC224	
Mud Density	1.27	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%
Neutron Calibration MDN-B.J 372		Base Calibration on 01-OCT-2014 13:06 Field Check on 26-OCT-2014 09:44
Base Calibration		
	Measured	Calibrated (cps)
	Near Far	Near Far
	2881 87	3714 110
Ratio	33.018	33.764
Field Calibrator at Base		
		Calibrated (cps)
		2377 3500
Ratio		0.679
Field Check		
		Calibrated (cps)
		2405 3548
Ratio		0.678
Neutron Constants MDN-B.J 372		Last Edited on 27-OCT-2014,16:21
Neutron Source Id	P44385B	
Neutron Jig Number	NJ5236	
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 09-OCT-2014 14:29
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	11111111.0000	mAmp
Image Processing	11111111	
Navigation Constants MIE-A A 173		Last Edited on 10-SEP-2014 09:35

Navigation Constants MIE-A.A 173		0.00	degrees	East	Last Edited on 15-SEP-2014,09:00	
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 Constants MIE-A.A 173					Last Edited on	
Magnetometer Calibrator Number		000				
Accelerometer Parameters MIE-A.A 173					Last Edited on 26-OCT-2014,10:01	
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						
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 26-OCT-2014 10:05	
					Field Calibration on 26-OCT-2014 10:07	
Base Calibration						
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.		Calibrator Size (in)		
1	26645	27489		5.96		
2	36054	37578		7.98		
3	45717	47596		9.86		
4	56451	58410		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	25036	26114	25590	25375	5.96	
2	33290	34908	34476	33887	7.98	
3	41361	43260	42764	42134	9.86	
4	50340	52903	53157	51547	11.88	
5	0	0	0	0	0.00	
Field Calibration						
	Measured	Measured		Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)		Caliper(in)		
	5.89	5.97		5.96		
	Measured	Measured	Measured	Measured	Actual	

Pad 2 Caliper(in)	3.01	Pad 4 Caliper(in)	2.99	Pad 6 Caliper(in)	2.98	Pad 8 Caliper(in)	2.98	Caliper(in)	5.96
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Caliper Constants MIE-A.A 173	Last Edited on
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Caliper Difference for BRKT	0.120	inches
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High Resolution Temperature Calibration MAI-B.J 375	Field Calibration on 24-SEP-2014,03:39
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	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

High Resolution Temperature Constants MAI-B.J 375	Last Edited on 24-SEP-2014,03:39
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Pre-filter Length	11
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Induction Calibration MAI-B.J 375	Base Calibration on 06-MAR-2014,09:29
	Field Check on 26-OCT-2014 09:40

Base Calibration				
Test Loop Calibration		Measured	Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.2	476.3	9.3	966.2
2	6.0	379.5	7.6	821.4
3	3.1	258.6	5.2	566.0
4	1.5	131.2	2.6	279.2
Array Temperature		74.3	Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			12.8	3802.1
2			30.5	3542.4
3			29.3	3049.5
4			20.5	2097.0
Deep			18.5	1993.6
Medium			42.4	4012.6
Shallow			44.7	5231.5
Array Temperature			69.5	Deg F

Induction Constants MAI-B.J 375	Last Edited on 27-OCT-2014,16:22
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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	

Caliper Calibration MPD-C.J 378			Base Calibration on 26-OCT-2014 09:57
			Field Calibration on 26-OCT-2014 09:58
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	13871	4.00	
2	21735	5.96	
3	30021	7.98	
4	37927	9.86	
5	46879	11.88	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	5.97	5.96	

Photo Density Calibration MPD-C.J 378				Base Calibration on 01-OCT-2014 11:53	
				Field Check on 26-OCT-2014 09:50	
Density Calibration					
Base Calibration		Measured		Calibrated (sdu)	
		Near	Far	Near	Far
	Background	1145	1223		
	Reference 1	56123	24901	59443	30683
	Reference 2	22147	2322	25113	2508
Field Check at Base					
		1145.2	1222.9		
Field Check					
		1146.1	1229.7		
PE Calibration					
Base Calibration		Measured		Calibrated	
	WS	WH	Ratio	Ratio	
	Background	209	1030		
	Reference 1	24056	55936	0.434	0.372
	Reference 2	6396	22017	0.295	0.268
Field Check at Base					
	209.3	1029.7			
Field Check					
	209.5	1029.6			

Density Constants MPD-C.J 378		Last Edited on 26-OCT-2014,13:00	
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	1.27	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

Spectral Gamma Calibration SGS-E.J 128						Base Calibration on 25-SEP-2014 17:21 Field Calibration on 13-OCT-2014,17:33	
Base Calibration							
Potassium Calibrator							
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5		
Background	106.5	36.9	3.8	1.4	2.3		
Calibrator (Gross)	234.7	121.4	29.0	1.5	2.4		
Calibrator (Net)	128.2	84.5	25.2	0.1	0.1		
	K %	U ppm	Th ppm				
Concentrations	5.9	0.0	0.0				
Uranium Calibrator							
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5		
Background	106.5	36.9	3.8	1.4	2.3		
Calibrator (Gross)	561.8	196.8	17.3	11.1	5.9		
Calibrator (Net)	455.4	159.9	13.5	9.7	3.6		
	K %	U ppm	Th ppm				
Concentrations	0.0	16.6	0.0				
Thorium Calibrator							
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5		
Background	106.5	36.9	3.8	1.4	2.3		
Calibrator (Gross)	424.1	156.4	12.6	6.6	17.3		
Calibrator (Net)	317.6	119.5	8.8	5.2	14.9		
	K %	U ppm	Th ppm				
Concentrations	0.0	0.0	44.7				
Mixture Calibrator							
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5		
Background	106.5	36.9	3.8	1.4	2.3		
Calibrator (Gross)	906.0	369.5	48.4	14.6	19.8		
Calibrator (Net)	799.6	332.5	44.6	13.2	17.5		
Field Calibration							
Gamma Ray							
	Measured		Calibrated (API)				
Background	157		31				
Calibrator (Gross)	1356		271				
Calibrator (Net)	1199		240				
Mixture Calibrator							
	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5		
Background	105.4	35.9	3.8	1.4	2.2		
Calibrator (Gross)	900.9	365.2	48.3	14.3	19.5		
Calibrator (Net)	795.4	329.3	44.5	12.9	17.3		

Spectral Gamma Constants SGS-E.J 128			Last Edited on 26-OCT-2014,13:00
Background Calibrator Number	440		
Mixture Calibrator Number	450		
Potassium Calibrator Number	500		
Uranium Calibrator Number	506		
Thorium Calibrator Number	503		
Mud Density	1.27	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

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

400V EXT
 MLK-A 1 LG: 14.23 ft WT: 30.9 lb OD: 2.240 in

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

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

SKJ-E.B Compact Knuckle Joint
 SKJ-E.B 614 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MBS-G.A 200v Compact Battery Sub
 MBS-G.A 126 LG: 17.06 ft WT: 123.5 lb OD: 2.240 in

Compact Memory Sub F.A
 MMS-F.A 189 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.
 MTI-C.A 136 LG: 1.54 ft WT: 13.2 lb OD: 2.244 in

Compact Short Gamma
 MGS-D.A 185 LG: 3.41 ft WT: 24.3 lb OD: 2.244 in

Compact Collar Locator
 MCL-C.A 96 LG: 3.17 ft WT: 26.5 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

SHA-H Compact Swivel Head Adaptor
 SHA-H 142 LG: 2.30 ft WT: 22.0 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

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 731 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

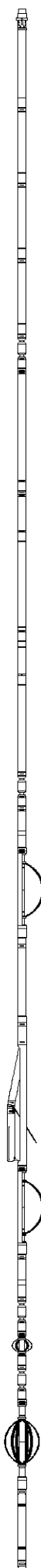
SHA-J.B Compact Swivel Head Adaptor
 SHA-J.B 512 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

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

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 695 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

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

MIS-D.A Compact Inline Bowspring sub



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

Compact MMI Memory Section

MIM-A.A 173 LG: 4.65 ft WT: 26.5 lb OD: 2.240 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

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

SKJ-E.B Compact Knuckle Joint

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

Spectral Gamma Ray Sub

SGS-E.J 128 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

SKJ-E.A Compact Knuckle Joint

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

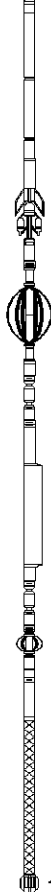
MIS-E.B Compact Inline Standoff sub

MIS-E.B 694 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

Compact Induction

MAI-B.J 375 LG: 10.81 ft WT: 48.5 lb OD: 2.240 in

Total Length: 160.56 ft Weight: 1128.8 lb



Tool Zero

(0.13ft from bottom)

COMPANY	WHITING OIL AND GAS CORPORATION
WELL	HORSETAIL 29G-2012B
FIELD	REDTAIL
PROVINCE/COUNTY	WELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	4712.00	feet	First Reading	13676.00	feet
Elevation Drill Floor	4712.00	feet	Depth Driller	13700.00	feet
Elevation Ground Level	4694.00	feet	Depth Logger	13700.00	feet



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MEASURED DEPTH
ARRAY INDUCTION
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