


| | | | | | | | | | |
|-------------------------------------------------------------------------------------|--------------|--------------|----------------|-----|----------------------------------------------------|-------------|---------|--|--|
|  | | | | | ARRAY INDUCTION LOG | | | | |
| COMPANY | | | | | CHAMA OIL AND MINERALS | | | | |
| WELL | | | | | BROWN 24-28-49 #1H | | | | |
| FIELD | | | | | WILDCAT | | | | |
| PROVINCE/COUNTY | | | | | BENT | | | | |
| COUNTRY/STATE | | | | | U.S.A. / COLORADO | | | | |
| LOCATION | | | | | SHL: 973' FNL & 660' FEL BHL: 600 FSL & 660 FEL | | | | |
| SEC | TWP | RGE | Other Services | | | Elevations: | | | |
| 28 | 24S | 49W | MDN/MPD | | | KB | 3937.00 | | |
| API Number | | 05-011-06200 | | CMI | | DF | 3937.00 | | |
| Permit Number | | | | | | GL | 3921.00 | | |
| Permanent Datum GL, Elevation 3921 feet | | | | | | | | | |
| Log Measured From KB | | | | | | | | | |
| Drilling Measured From KB | | | | | | | | | |
| Date | 23-JULY-2013 | | | | | | | | |
| Run Number | ONE | | | | | | | | |
| Service Order | 3535481 | | | | | | | | |
| Depth Driller | 8240.00 | | | | | | feet | | |
| Depth Logger | 8240.00 | | | | | | feet | | |
| First Reading | 8215.00 | | | | | | feet | | |
| Last Reading | 5066.00 | | | | | | feet | | |
| Casing Driller | 5065.00 | | | | | | feet | | |
| Casing Logger | 5066.00 | | | | | | feet | | |
| Bit Size | 6.125 | | | | | | inches | | |
| Hole Fluid Type | WBM | | | | | | | | |
| Density / Viscosity | 9.70 | | lb/USg | | 67.00 | | CP | | |
| PH / Fluid Loss | 10.50 | | | | | | | | |
| Sample Source | FLOWLINE | | | | | | | | |
| Rm @ Measured Temp | 1.41 @ 94.1 | | | | | | ohm-m | | |
| Rmf @ Measured Temp | 1.13 @ 94.1 | | | | | | ohm-m | | |
| Rmc @ Measured Temp | 1.69 @ 94.1 | | | | | | ohm-m | | |
| Source Rmf / Rmc | CALC | | | | CALC | | | | |
| Rm @ BHT | 1.05 @127.0 | | | | | | ohm-m | | |
| Time Since Circulation | 0.5 HOUR | | | | | | | | |
| Max Recorded Temp | 127.00 | | | | deg F | | | | |
| Equipment / Base | 18063 | | | | CASPER | | | | |
| Recorded By | K. SALLER | | | | | | | | |
| Witnessed By | J. SIMPSON | | | | | | | | |

| BOREHOLE RECORD | | | | | Last Edited: 23-JUL-2013 08:29 |
|--------------------|----------------|--------------------|--------------------|---------------------|--------------------------------|
| Bit Size inches | | Depth From feet | | Depth To feet | |
| 6.125 | | 5065.00 | | 8240.00 | |
| CASING RECORD | | | | | |
| Type | Size inches | Depth From feet | Shoe Depth feet | Weight pounds/ft | |
| INTERMED | 7.000 | 0.00 | 5065.00 | 24.00 | |

| REMARKS |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOFTWARE VERSION USED: 13.04 |
| TOOLS CONVEYED VIA CML WELL SHUTTLE. |
| TRIPLE COMBO - IMAGER WAS LOGGED IN A SINGLE RUN USING A 200V MEMORY CONVEYANCE SYSTEM. |
| UNABLE TO MAKE IT TO TD ON FIRST RUN IN HOLE ON 7-18-2013. CLEANOUT TRIP/REAMING RUN PERFORMED. CREW EQUIPMENT HELD ON LOCATION - SUBSEQUENT RUN IN HOLE ON 7-23-2013 REACHED TD SUCCESSFULLY |
| HARDWARE USED: SEE TOOL DIAGRAM. |

LAT: 37.9379
LONG: -102.9077

CUSTOMER'S SCALES USED AND INTERVALS LOGGED.

ALL DEPTHS RECORDED WITH WEATHERFORD ADVANTAGE DEPTH SYSTEM IN CONJUNCTION WITH TOTCO (RIGS) EDR SYSTEM.

ALL DEPTHS CORRECTED TO DRILLER'S STRAP DEPTH.

TOTAL HOLE VOLUME FROM TD TO INTERMED CASING @ 5065FT: 845 CUBIC FEET

ANNULAR HOLE VOLUME FROM TD TO INTERMED CASING @5065FT: 480 CUBIC FEET

MAX DEVIATION 91 DEGREES AT TD.

BOREHOLE SIZE AND RUGOSITY WILL AFFECT DATA QUALITY.

DUE TO RUGOSITY AND TIGHT SPOTS DOWNHOLE, 7 MIS-D BOWSPRINGS DAMAGED AND PULLED OFF DOWNHOLE

DUE TO RUGOSITY AND TIGHT SPOTS DOWNHOLE, 1 MICRO IMAGER PAD PULLED OFF DOWNHOLE

LARGE WASHOUTS EXPERIENCED BY IMAGER AND DENSITY CALIPERS. POOR BOREHOLE CONDITIONS INDICATED

LARGE WASHOUTS SEEN AT INTERVALS: 7960FT-7980FT, 7750FT-7770FT, 7050FT-7150FT, 6930FT-6940FT, 6710FT-6730FT, 6600FT-6630FT, 6490FT-6530FT, 6380FT, 6420FT, 6210FT-6300F.

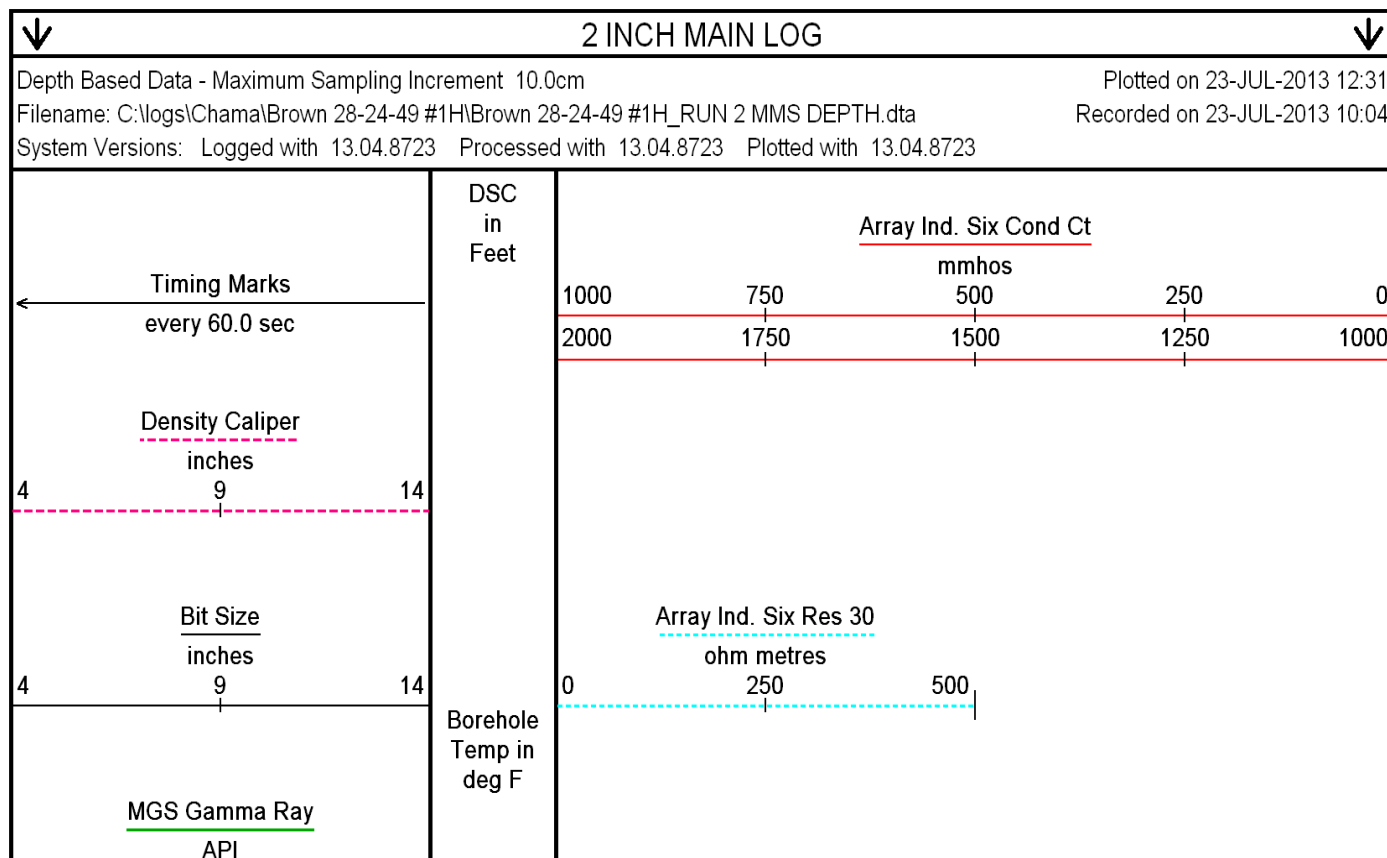
TIGHT PULLS WILL AFFECT DATA QUALITY.

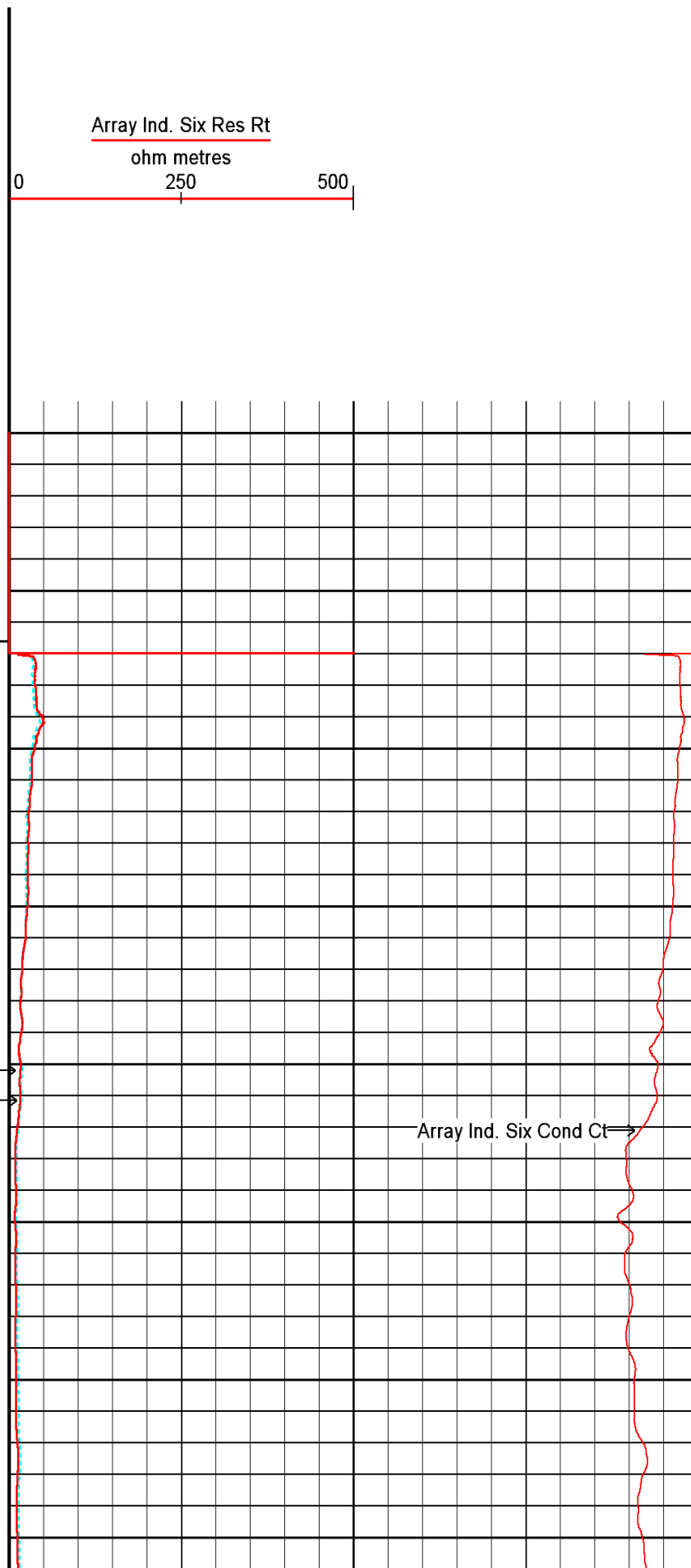
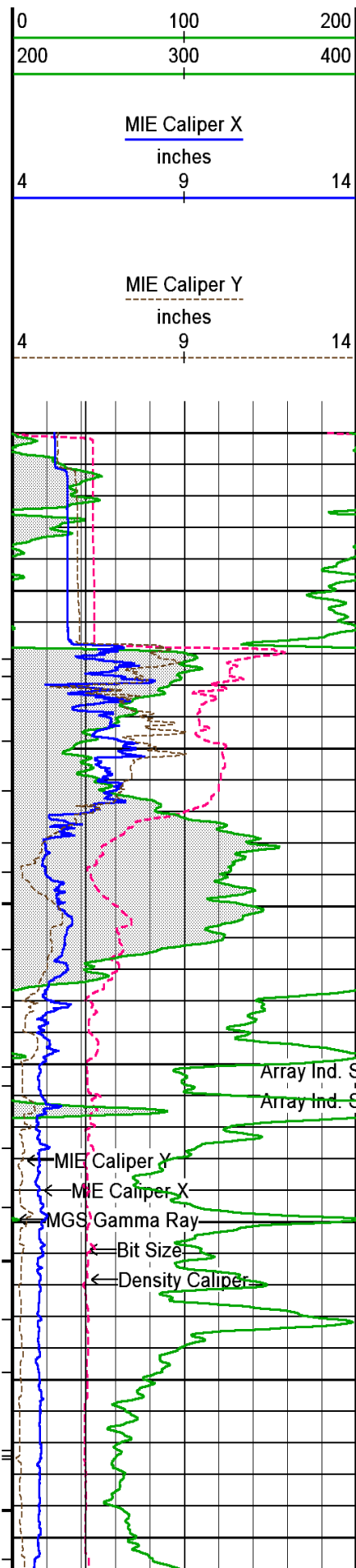
OPERATOR(S): J. GERDES, B. GOODMAN

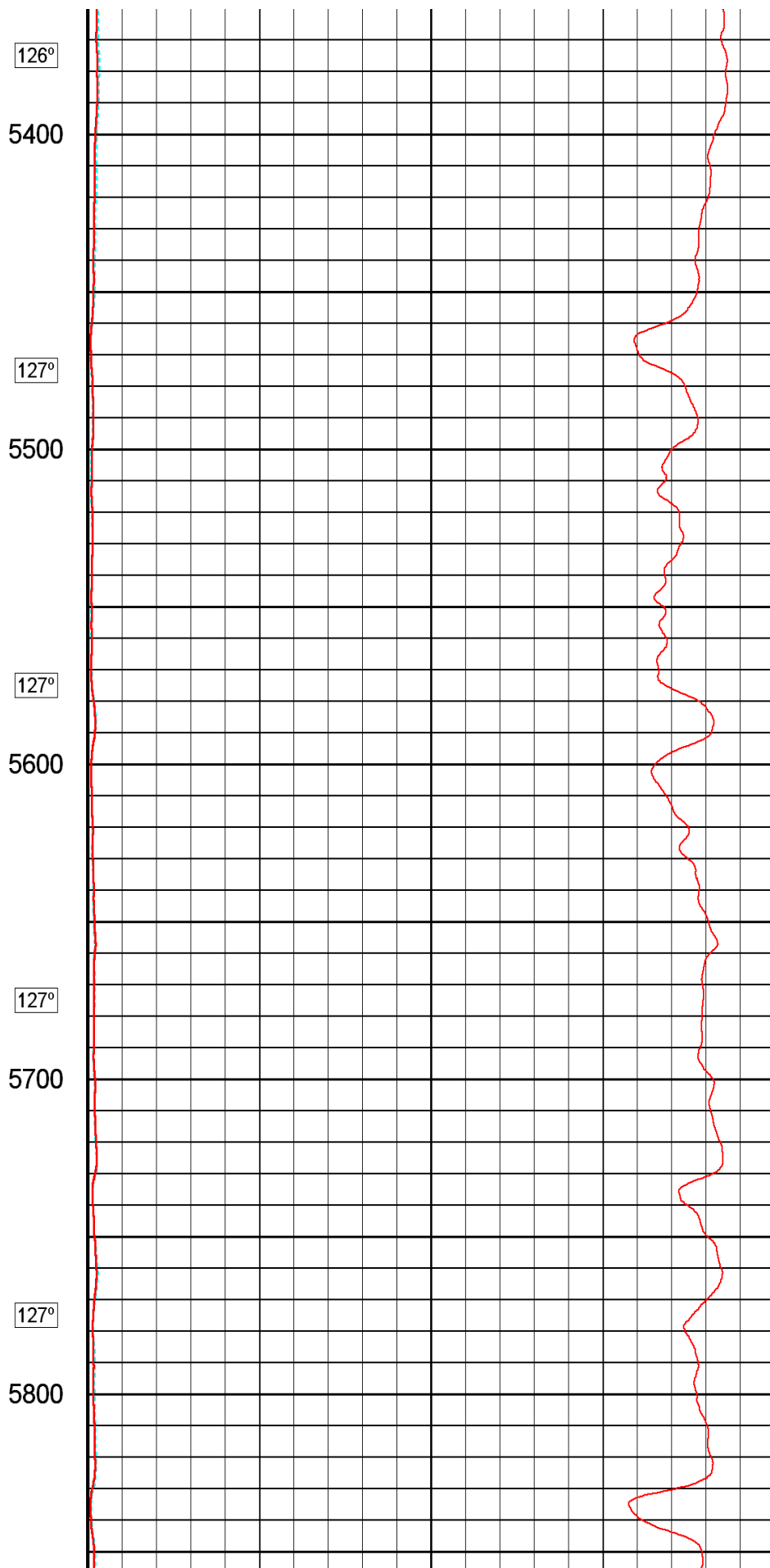
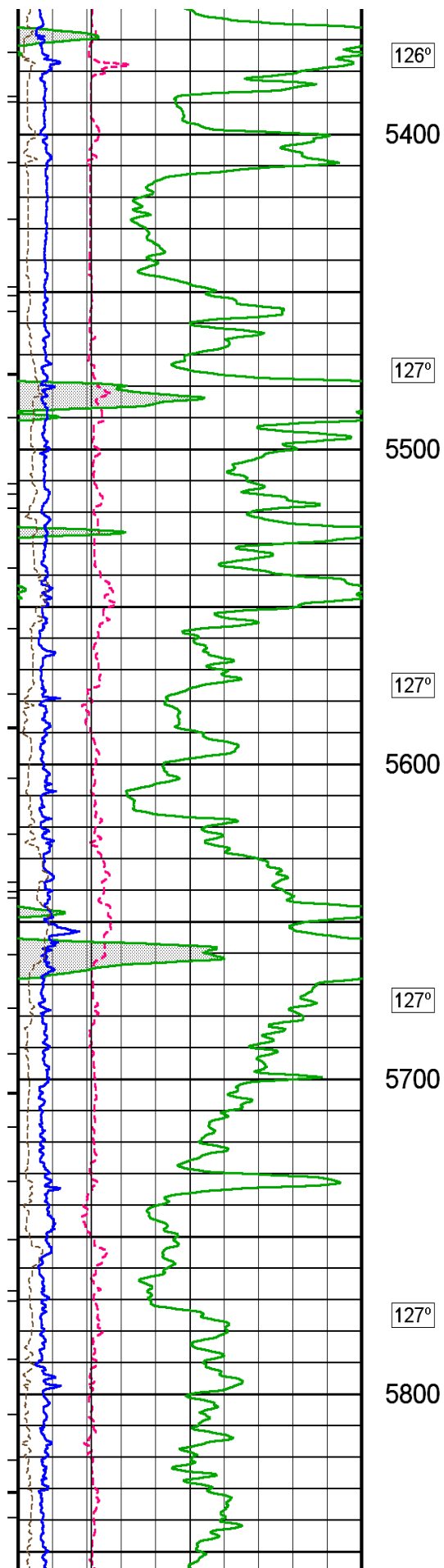
RIG: NOMAC 14

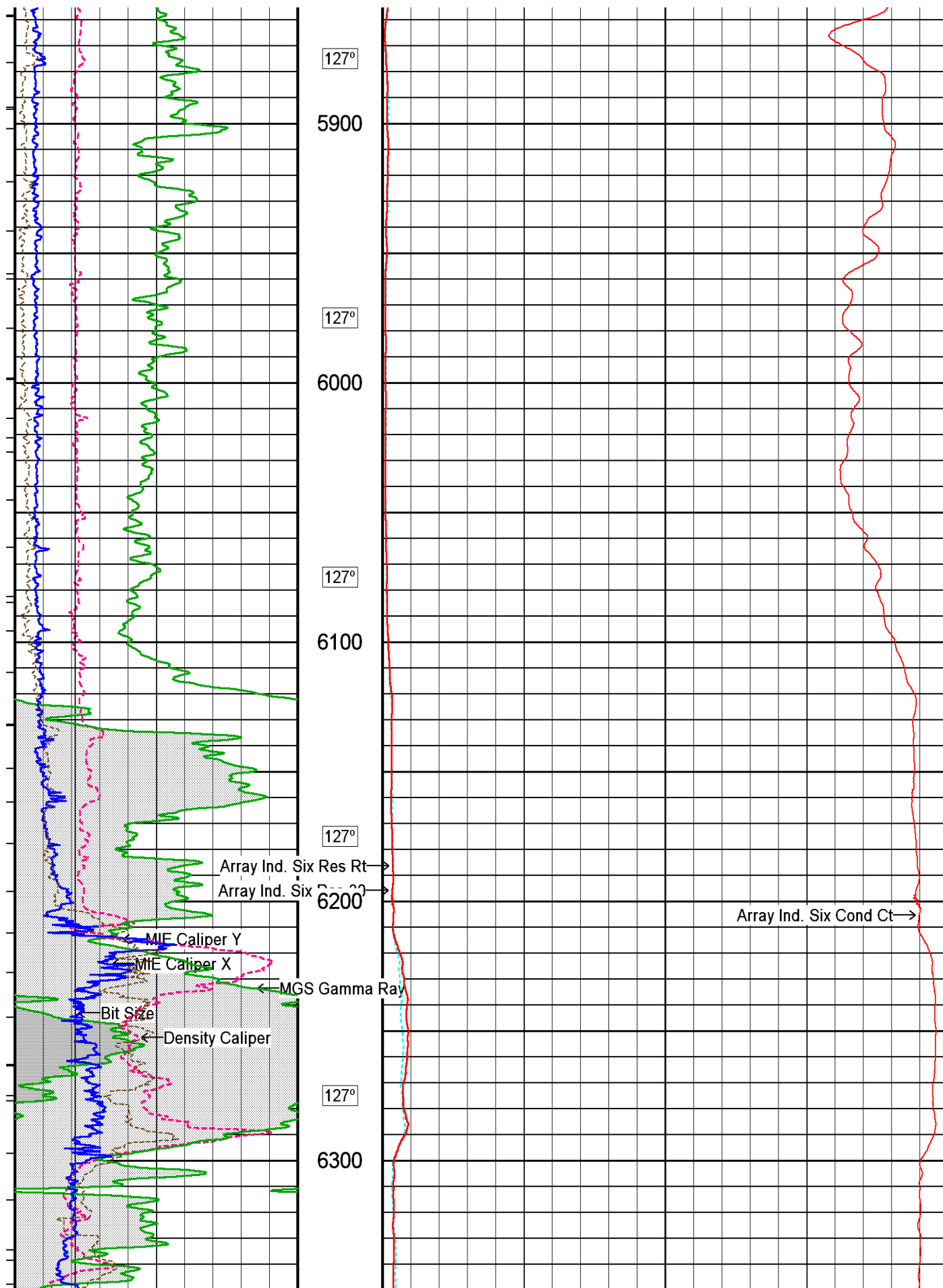
SERVICE ORDER #3535481

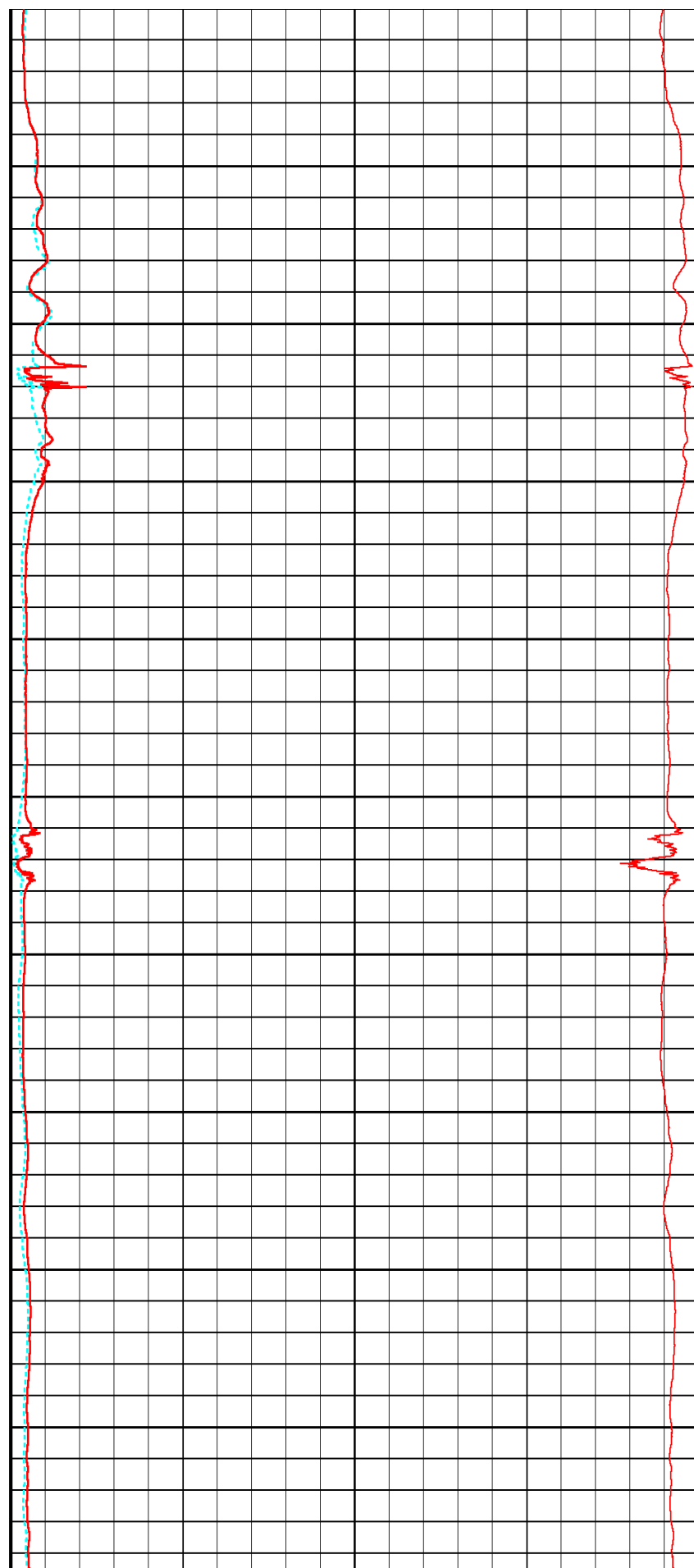
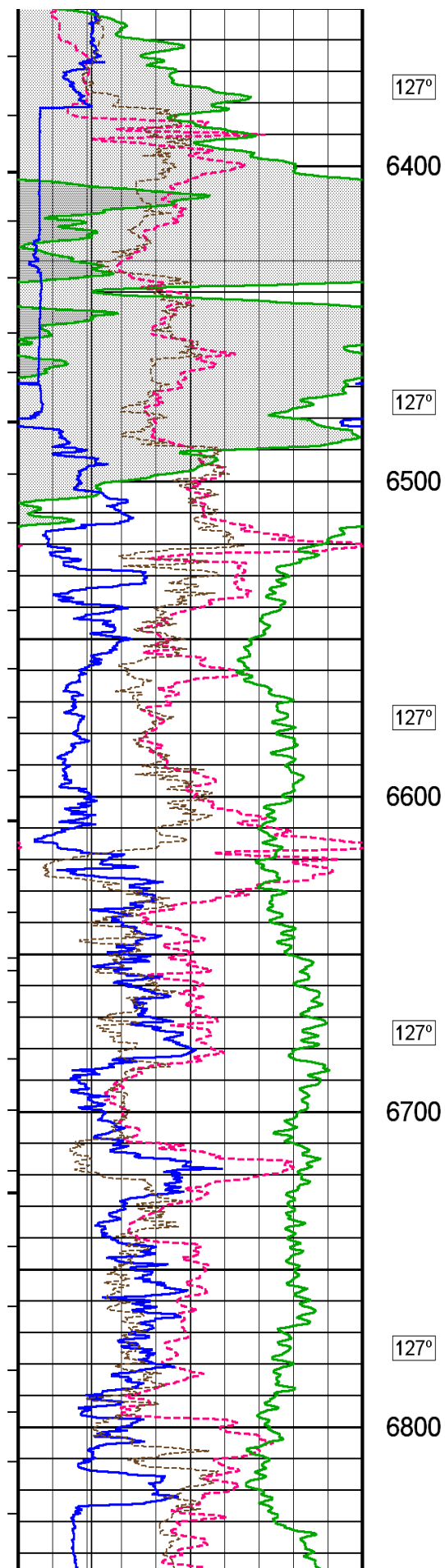
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

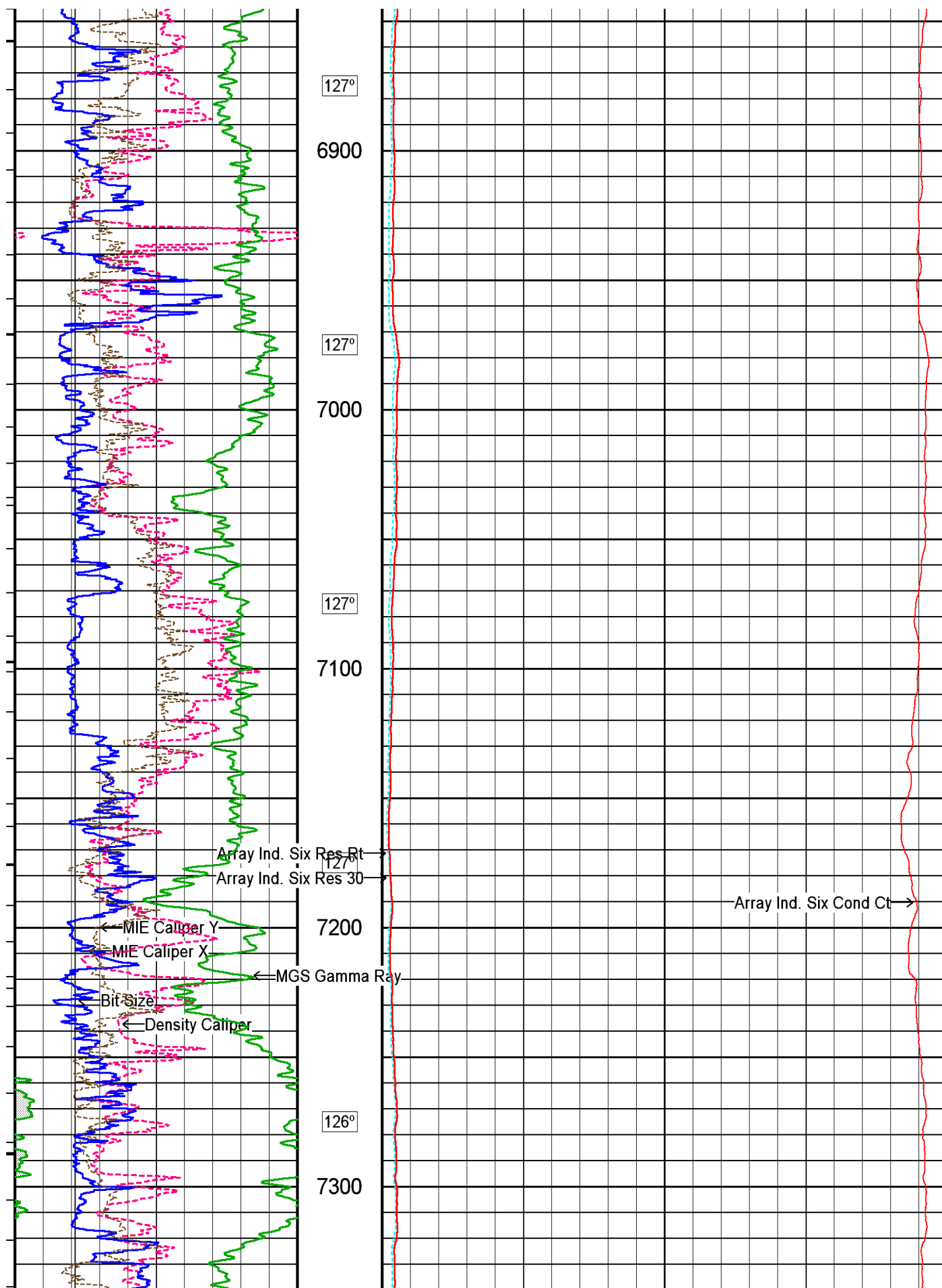


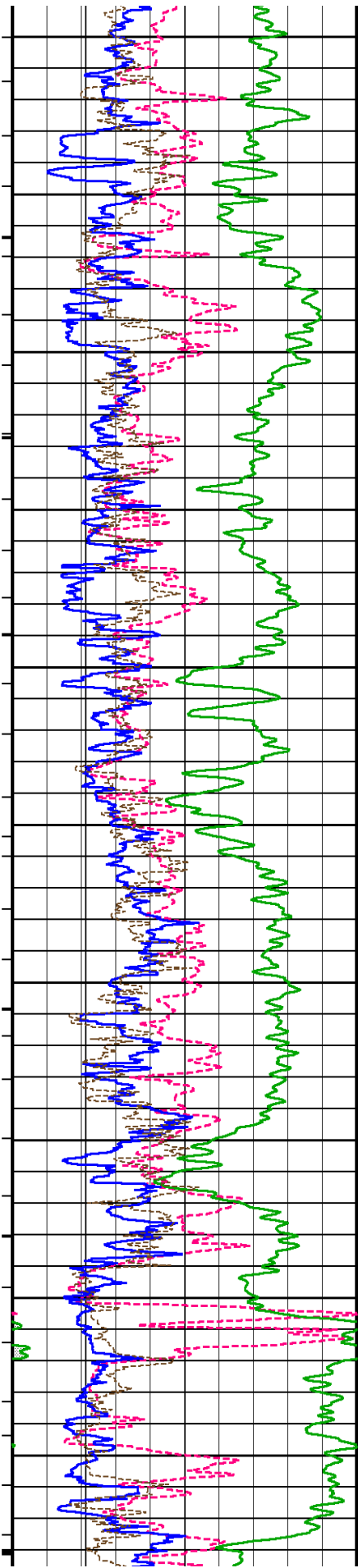












126°

7400

126°

7500

126°

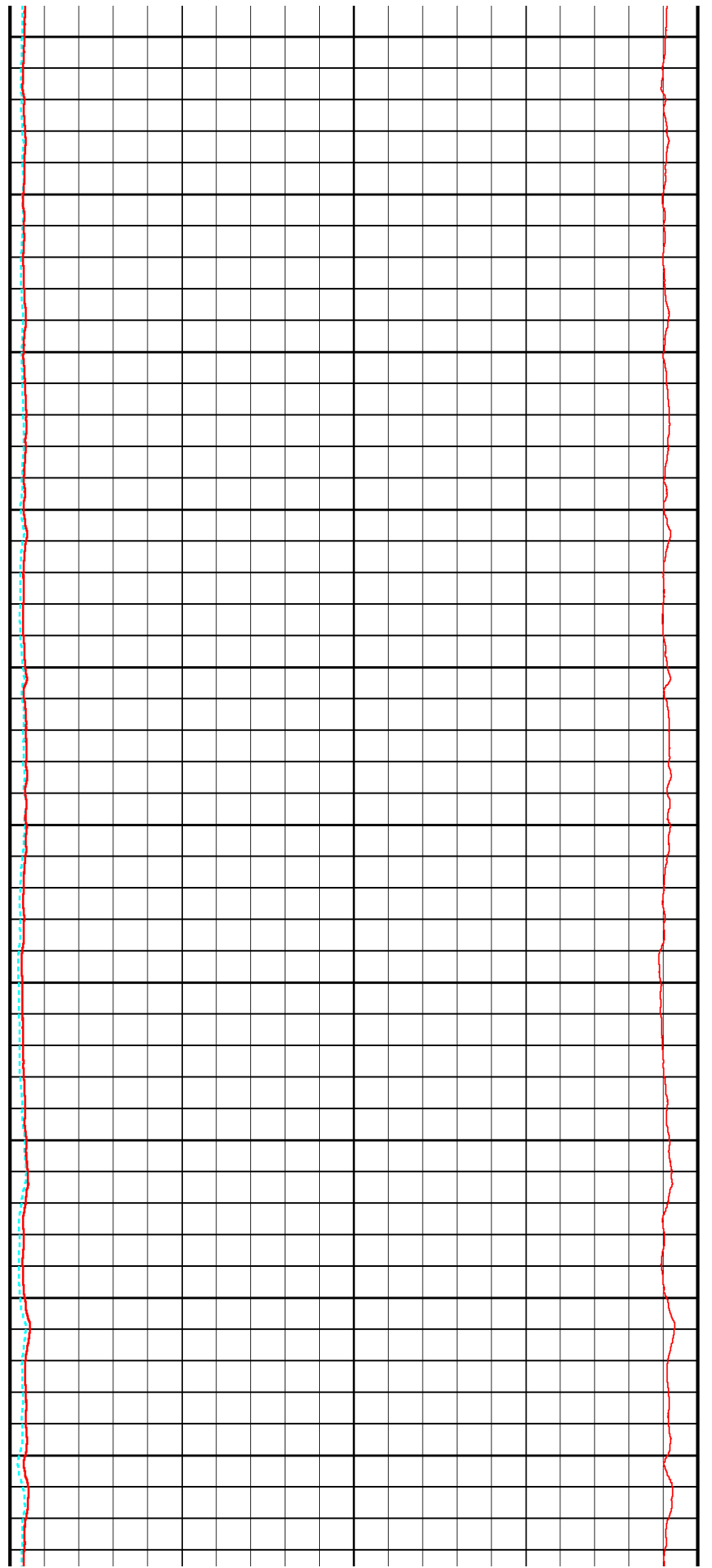
7600

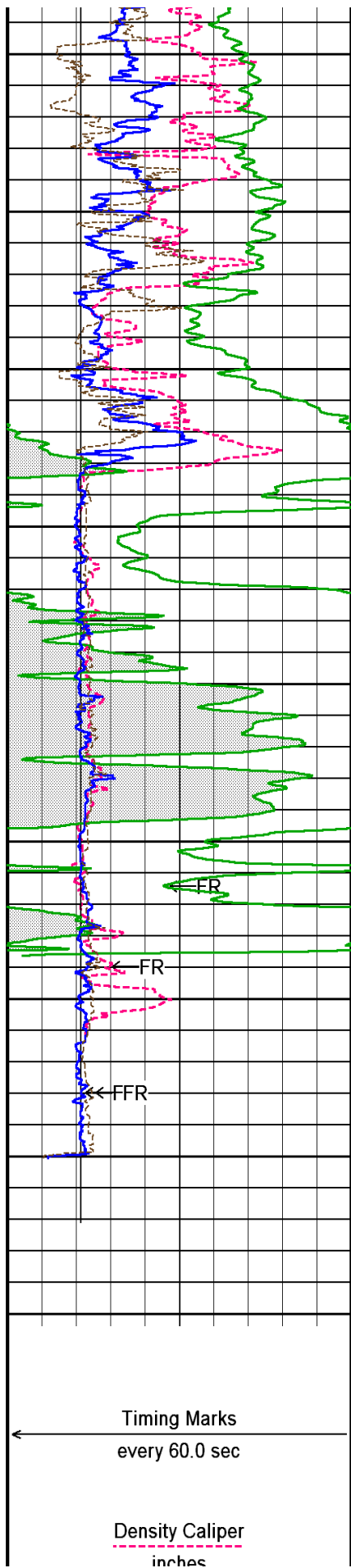
126°

7700

126°

7800





125°

7900

126°

8000

127°

8100

8200

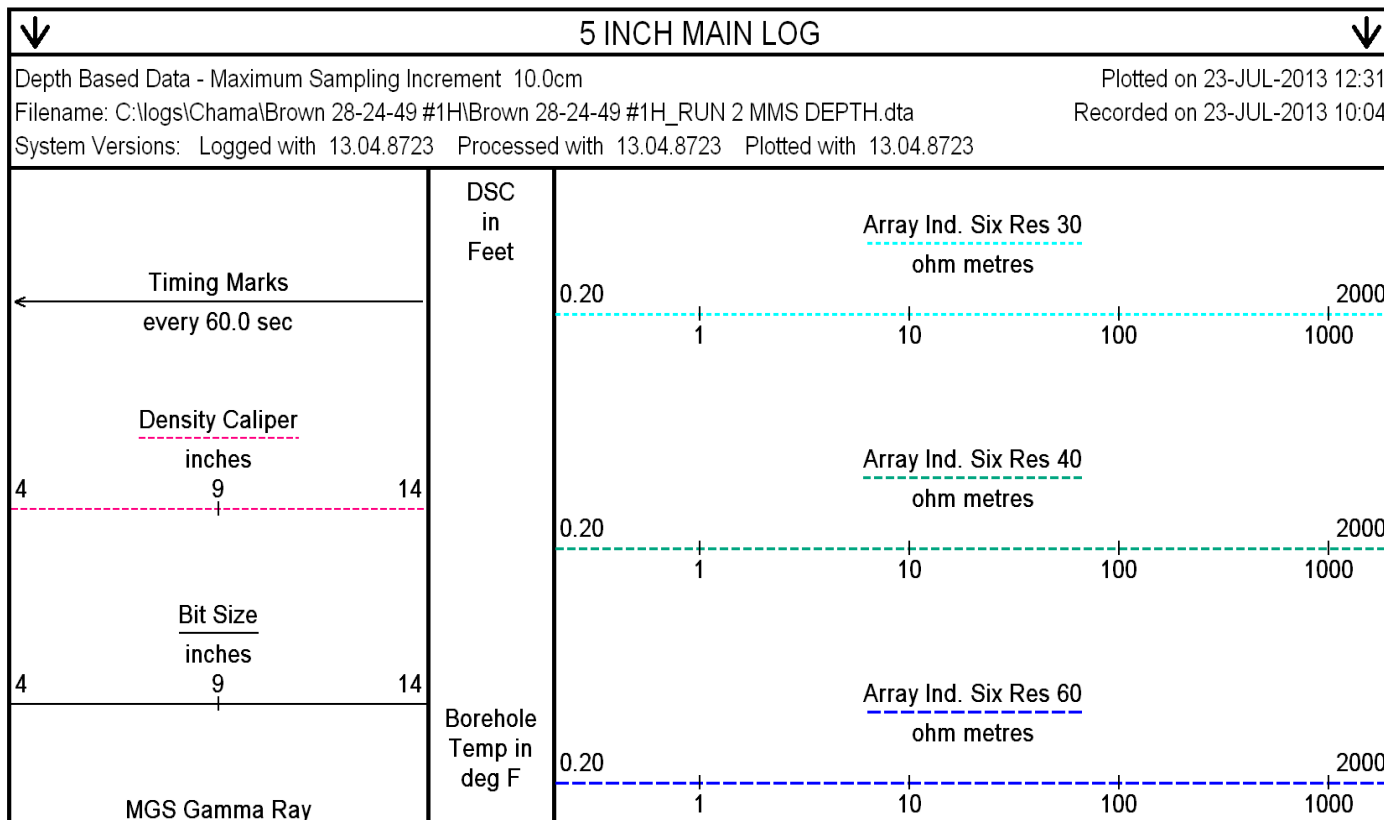
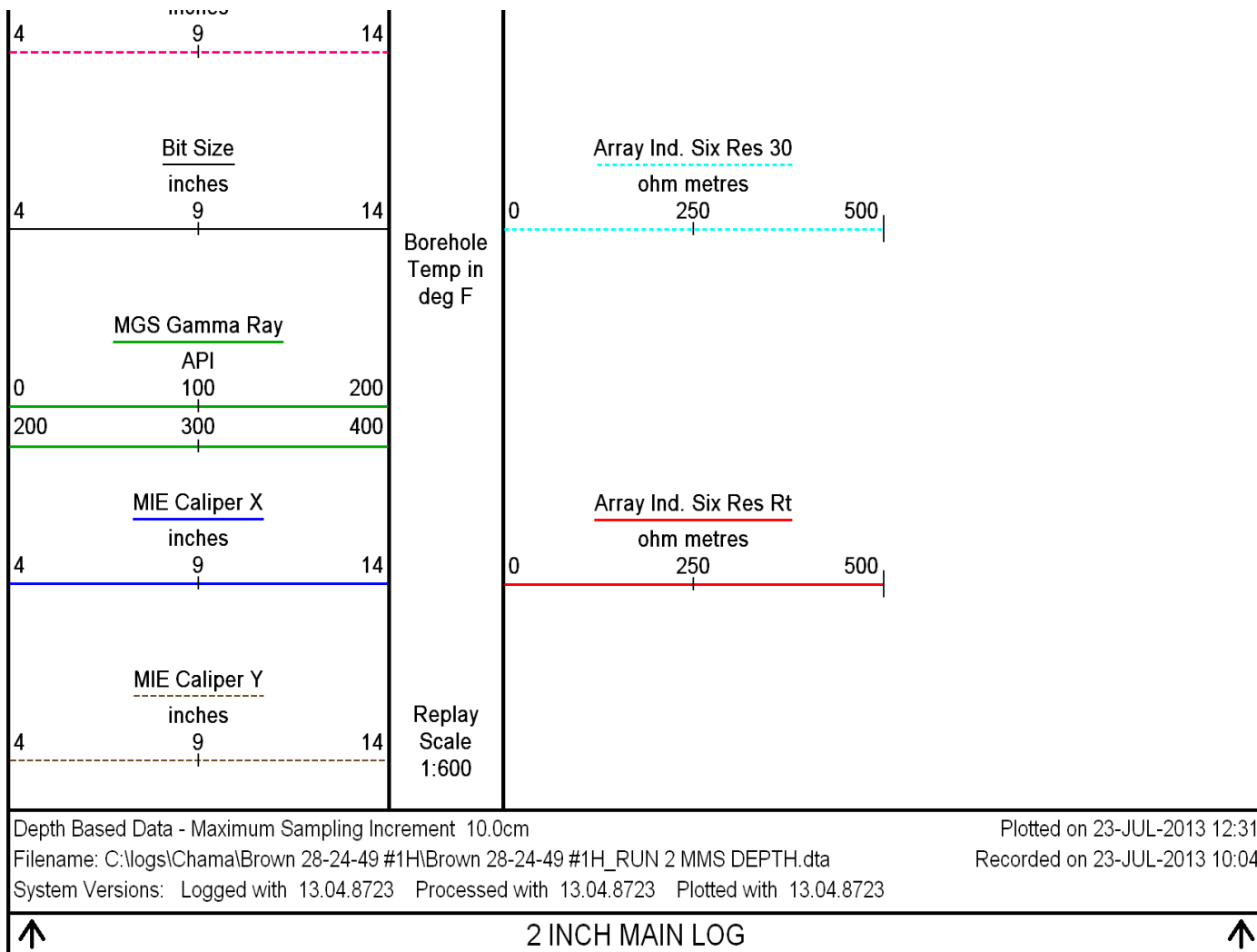
8250
DSC
in
Feet

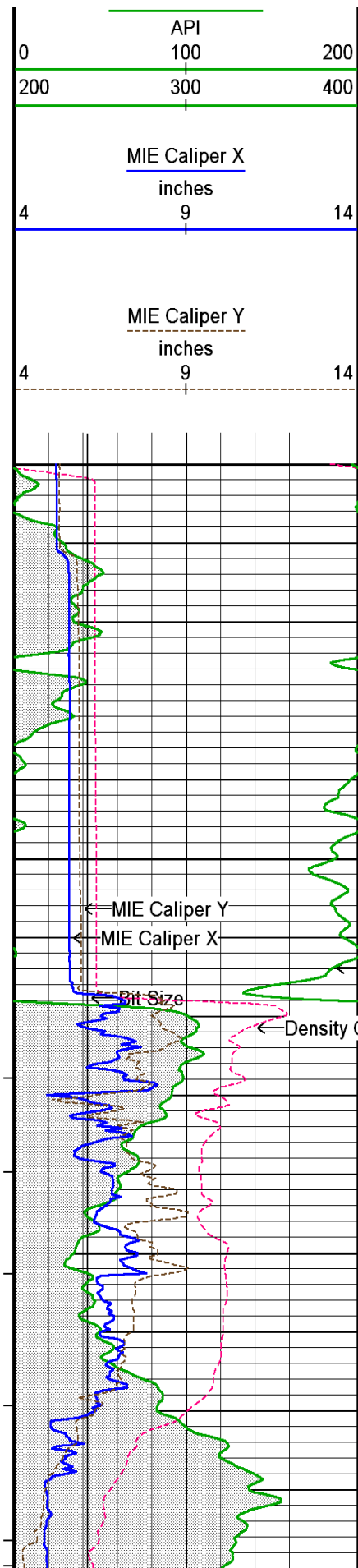
Array Ind. Six Cond Ct

mmhos

| | | | | |
|------|------|------|------|------|
| 1000 | 750 | 500 | 250 | 0 |
| 2000 | 1750 | 1500 | 1250 | 1000 |

FR





Replay
Scale
1:240

5000

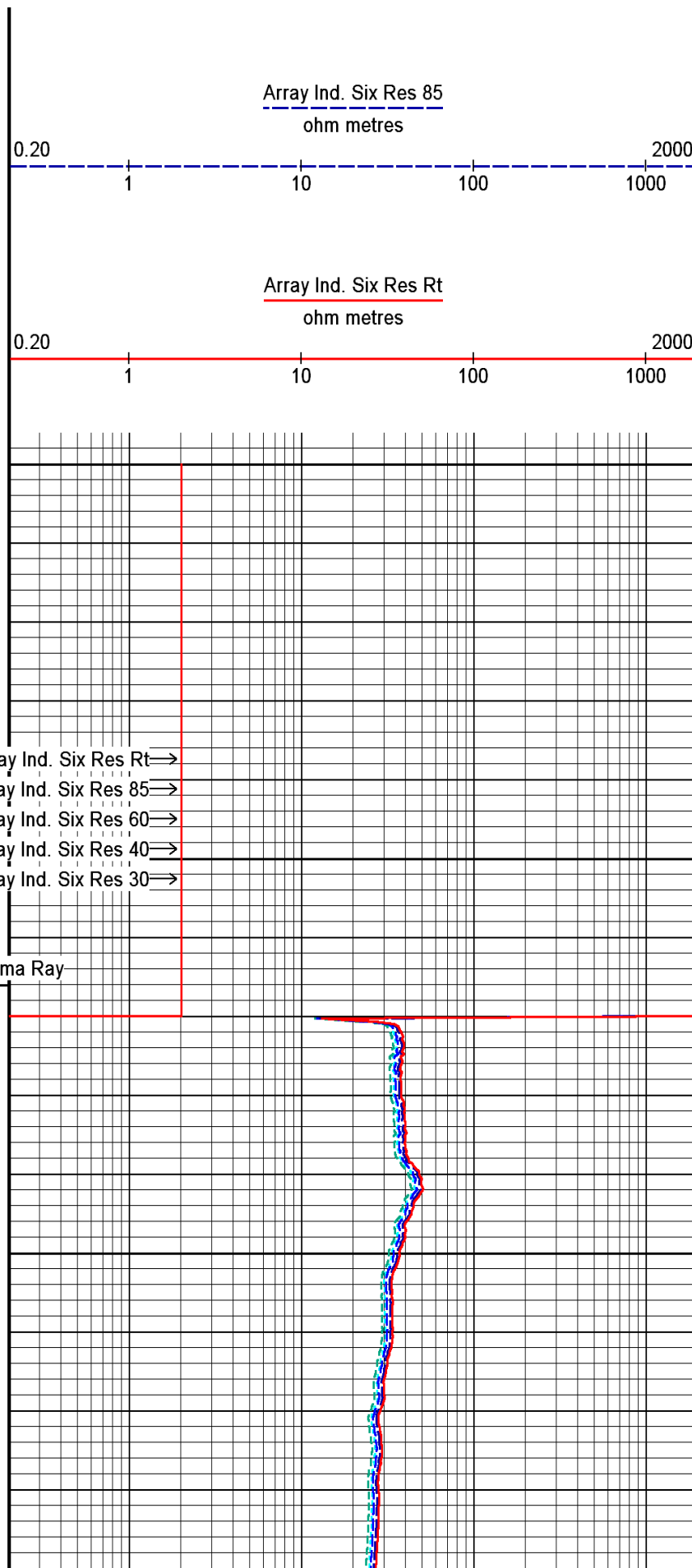
125° Array Ind. Six Res Rt →
Array Ind. Six Res 85 →
Array Ind. Six Res 60 →
5050 Array Ind. Six Res 40 →
Array Ind. Six Res 30 →

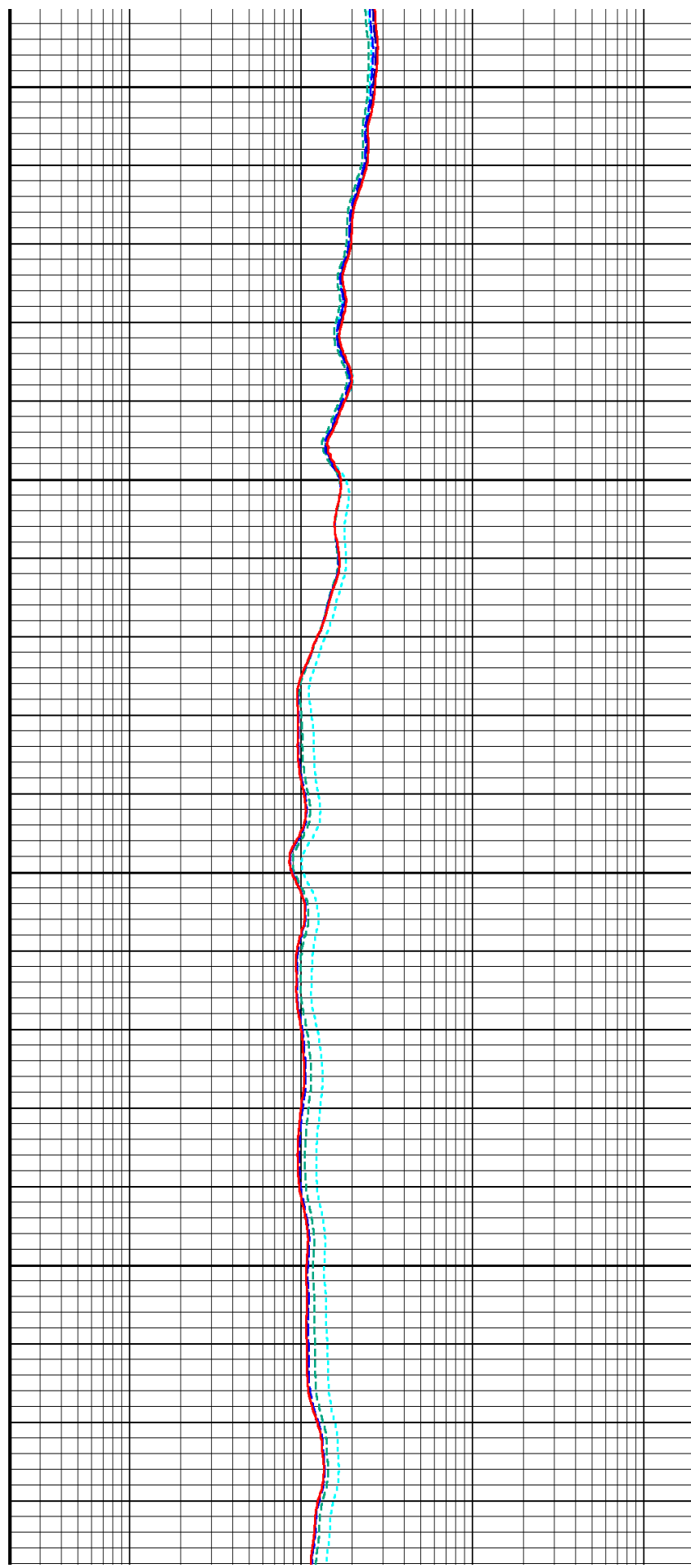
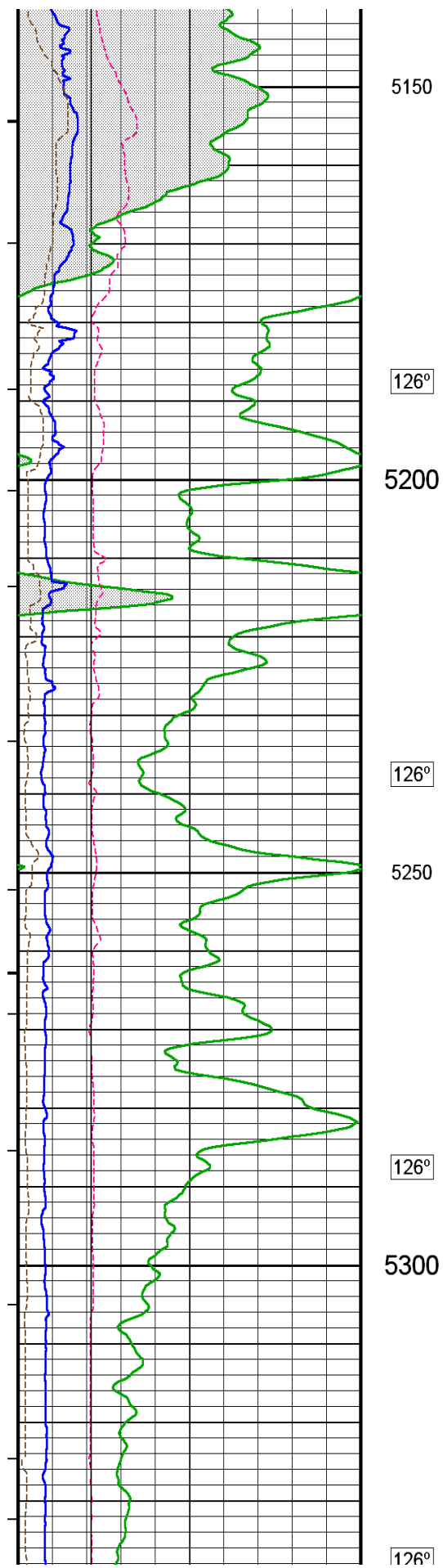
Casina
MGS Gamma Ray

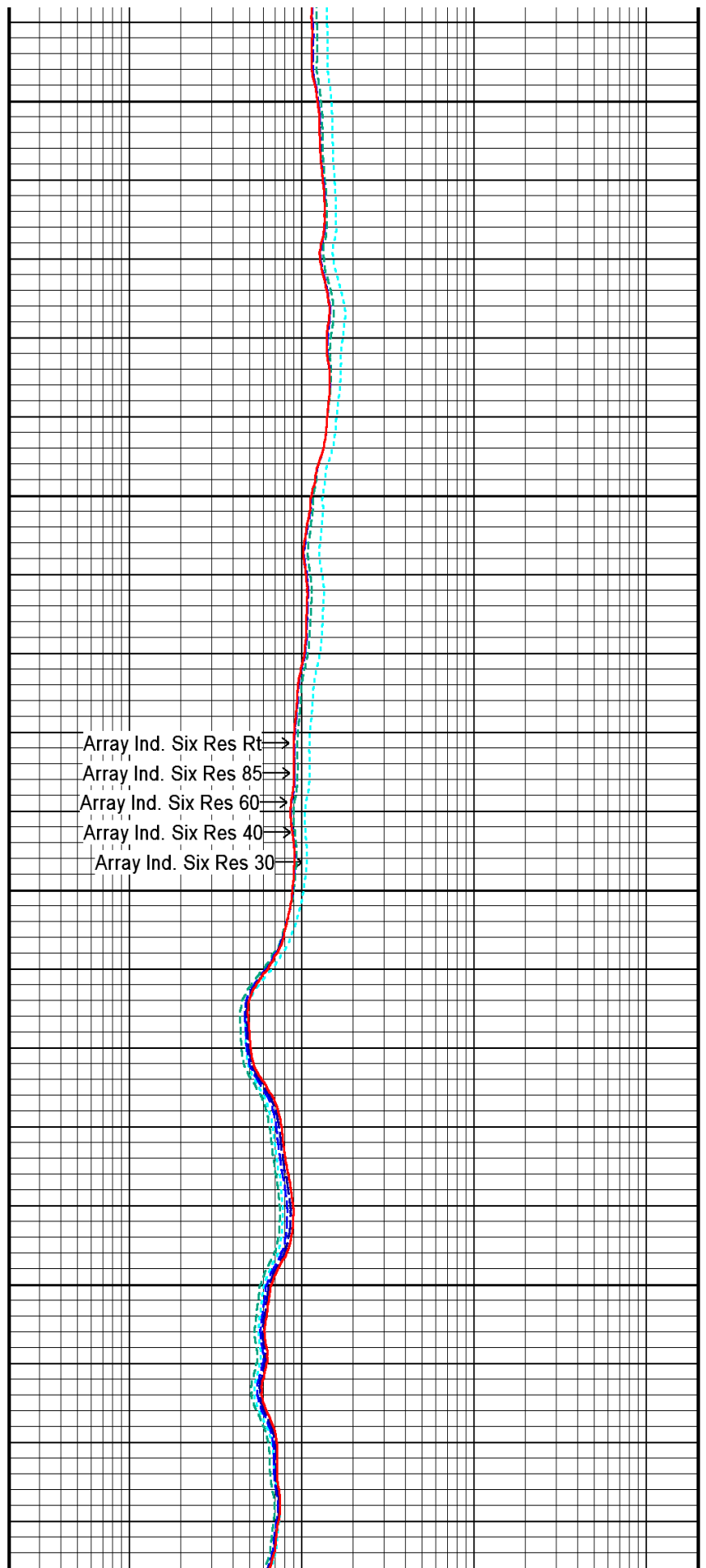
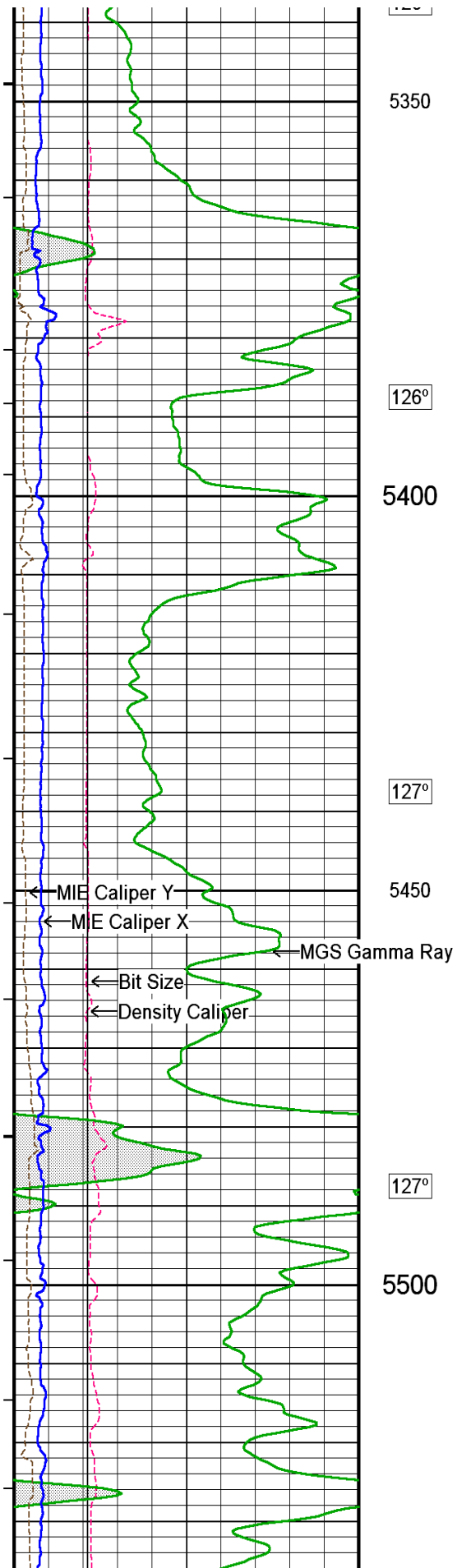
126°

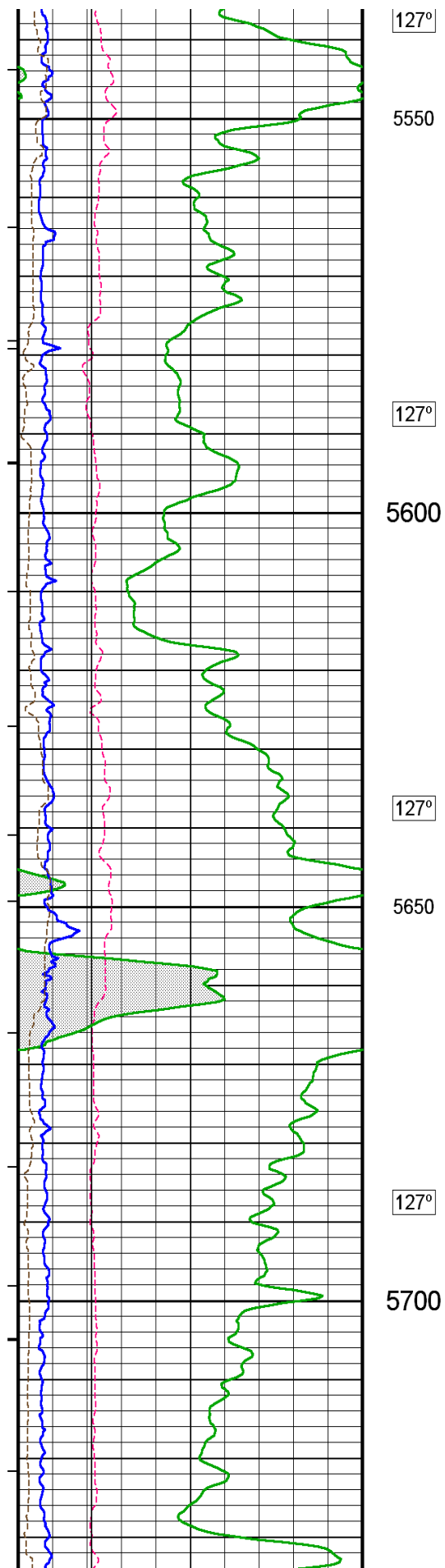
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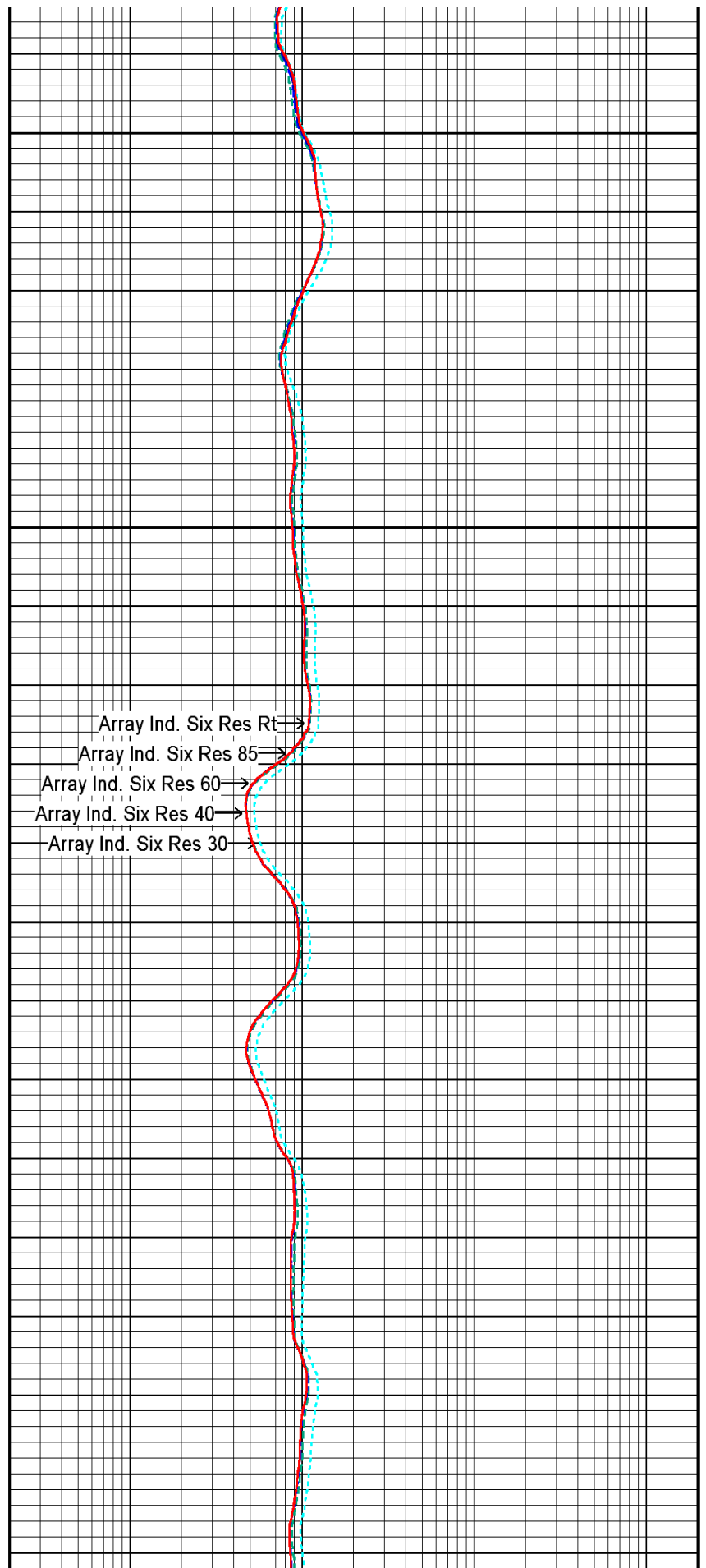
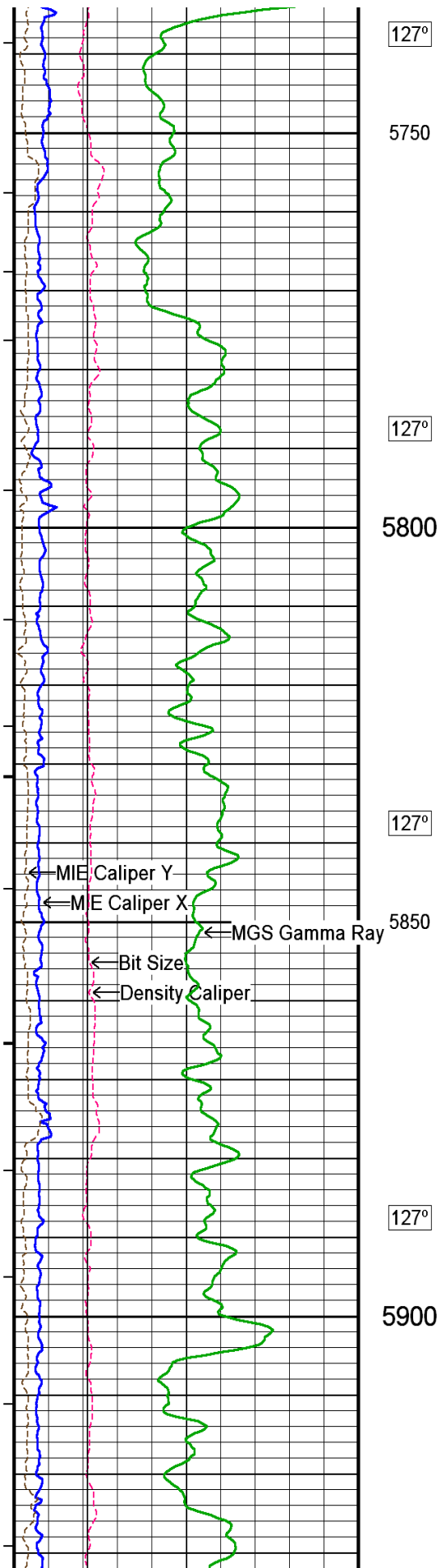
126°

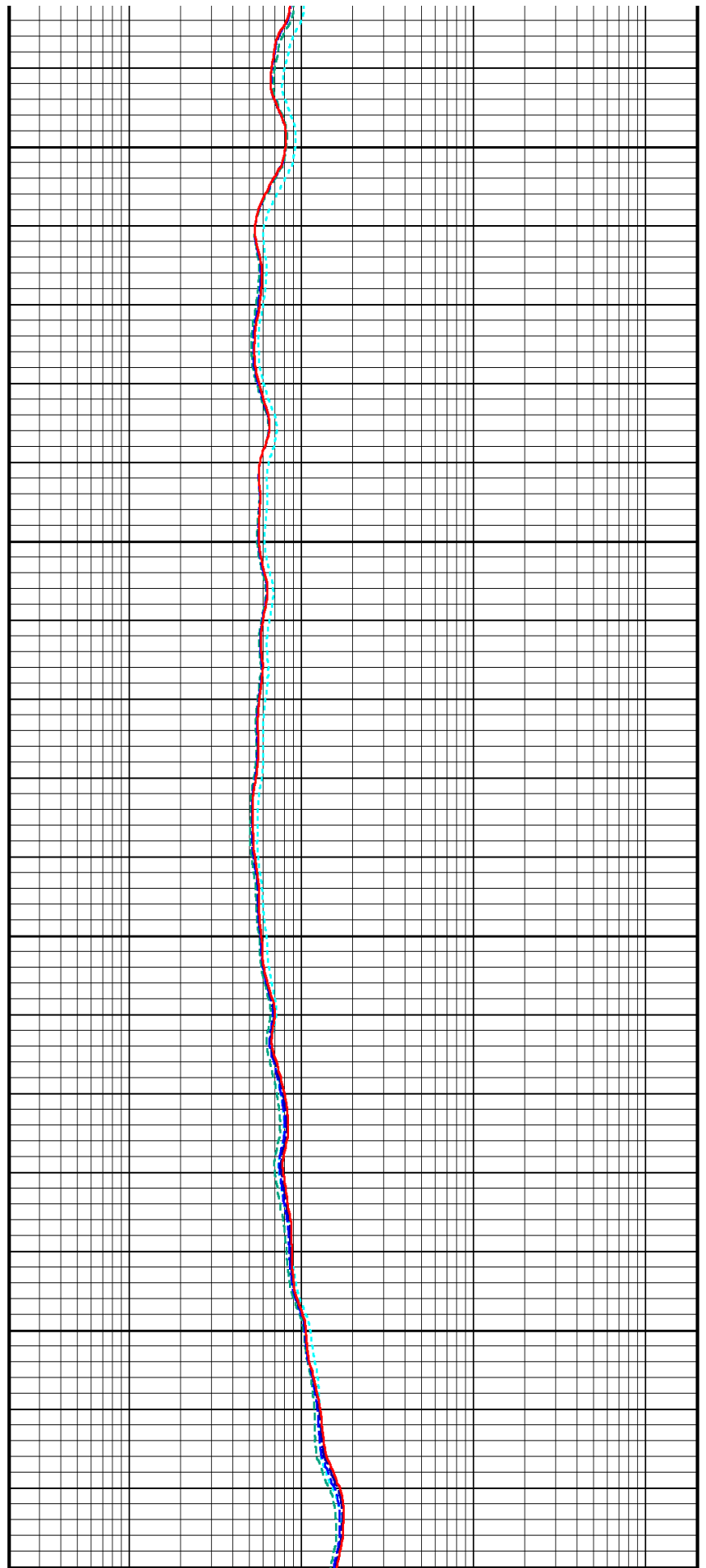
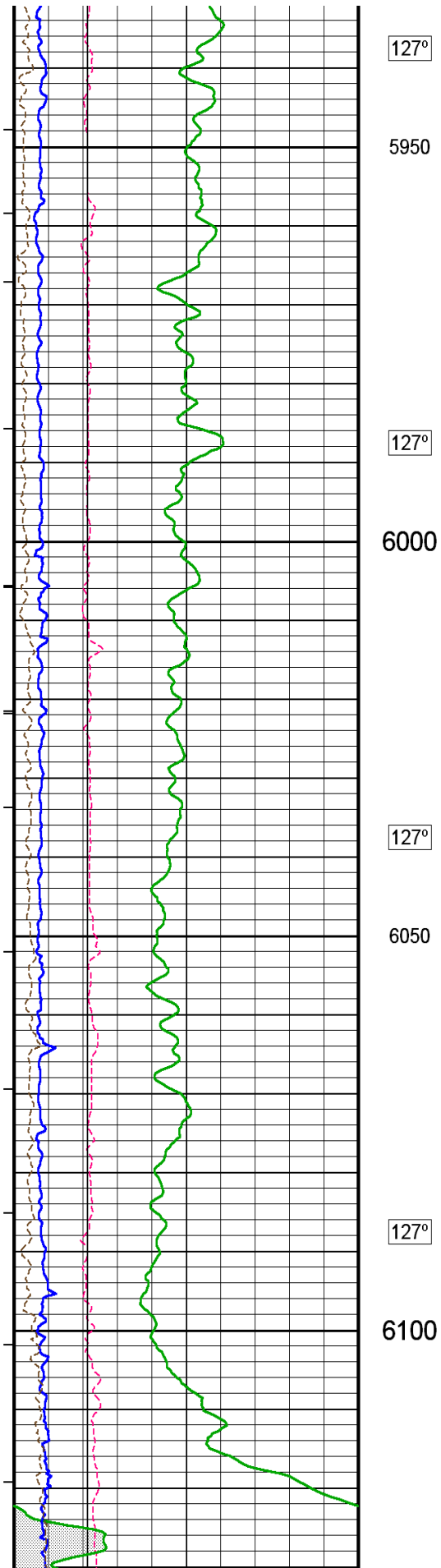


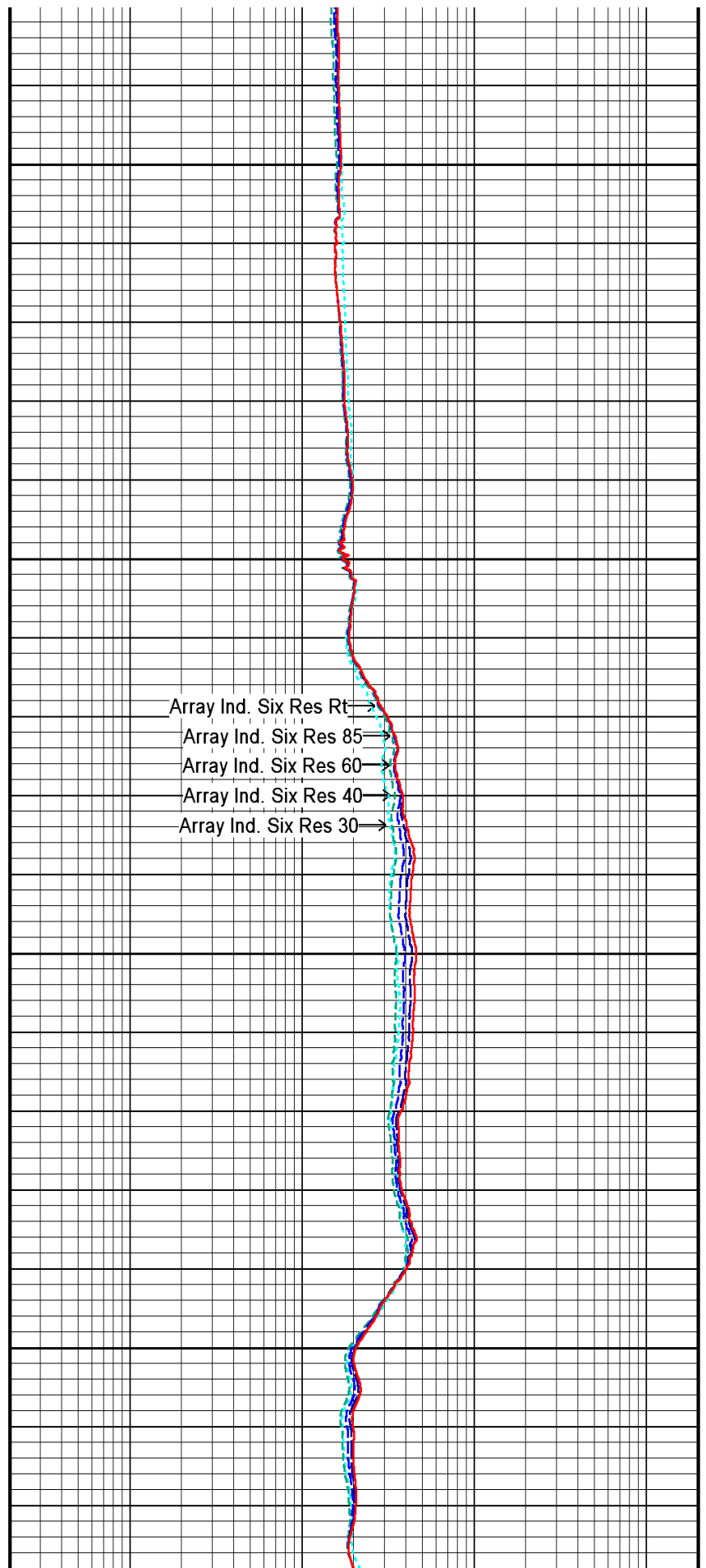
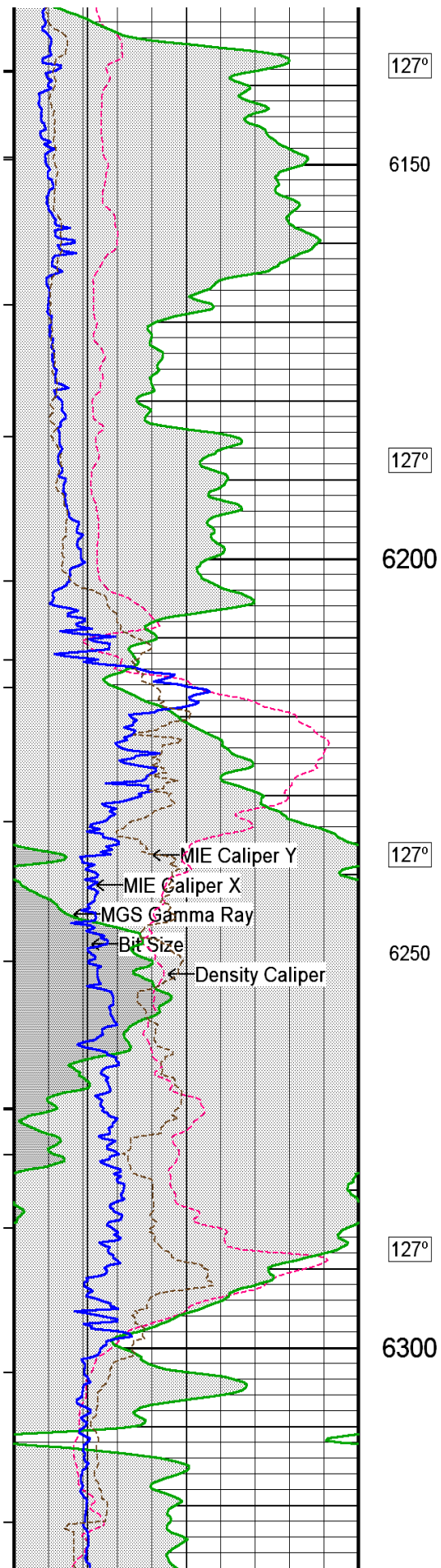


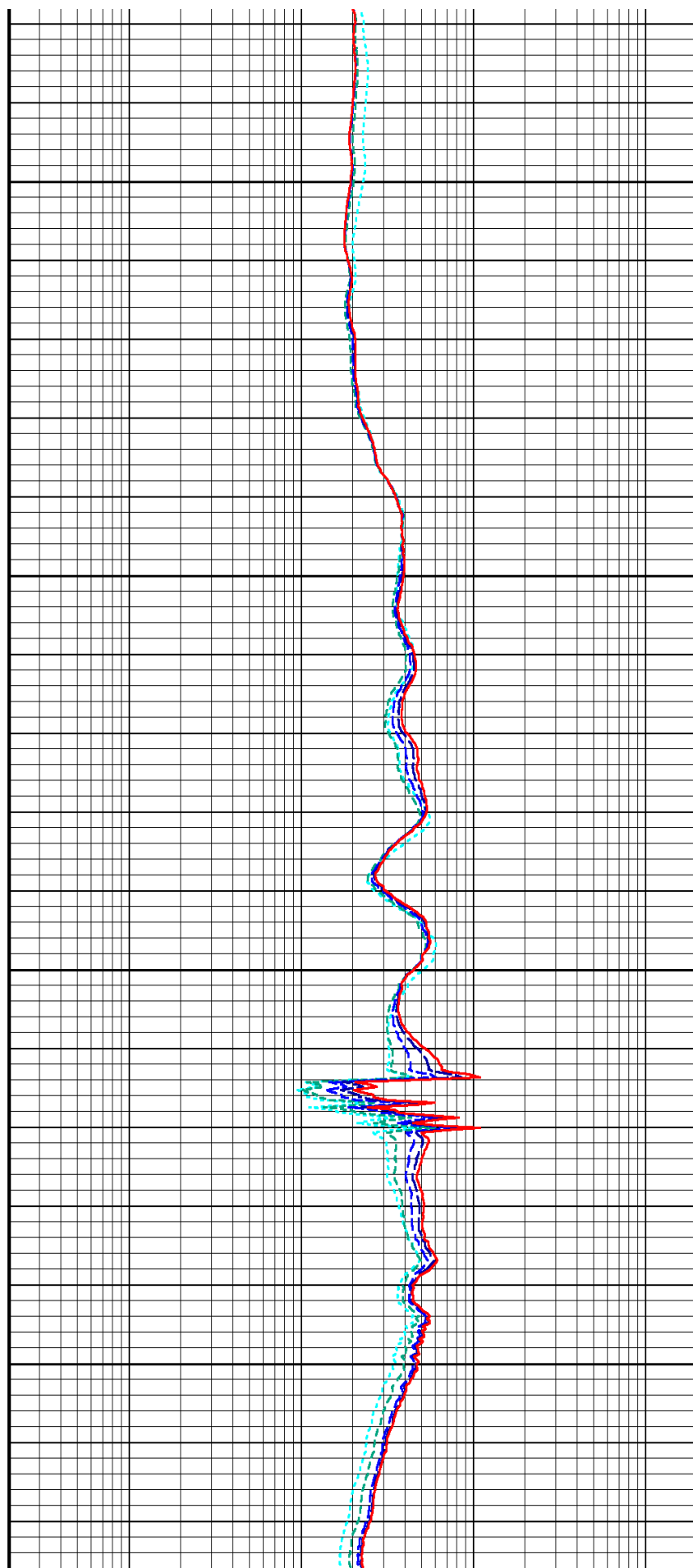
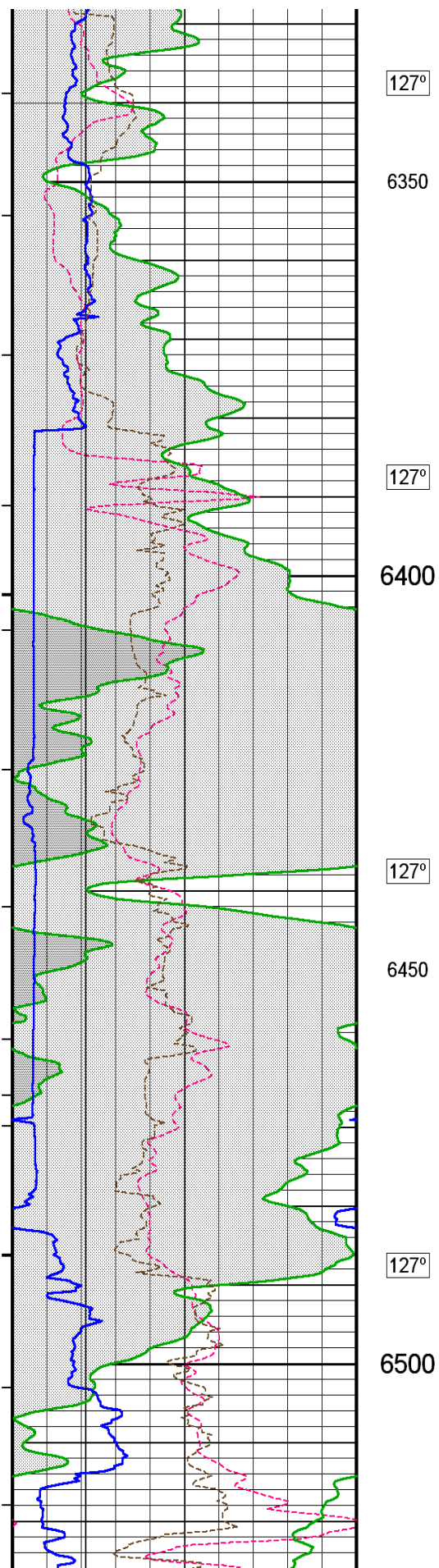


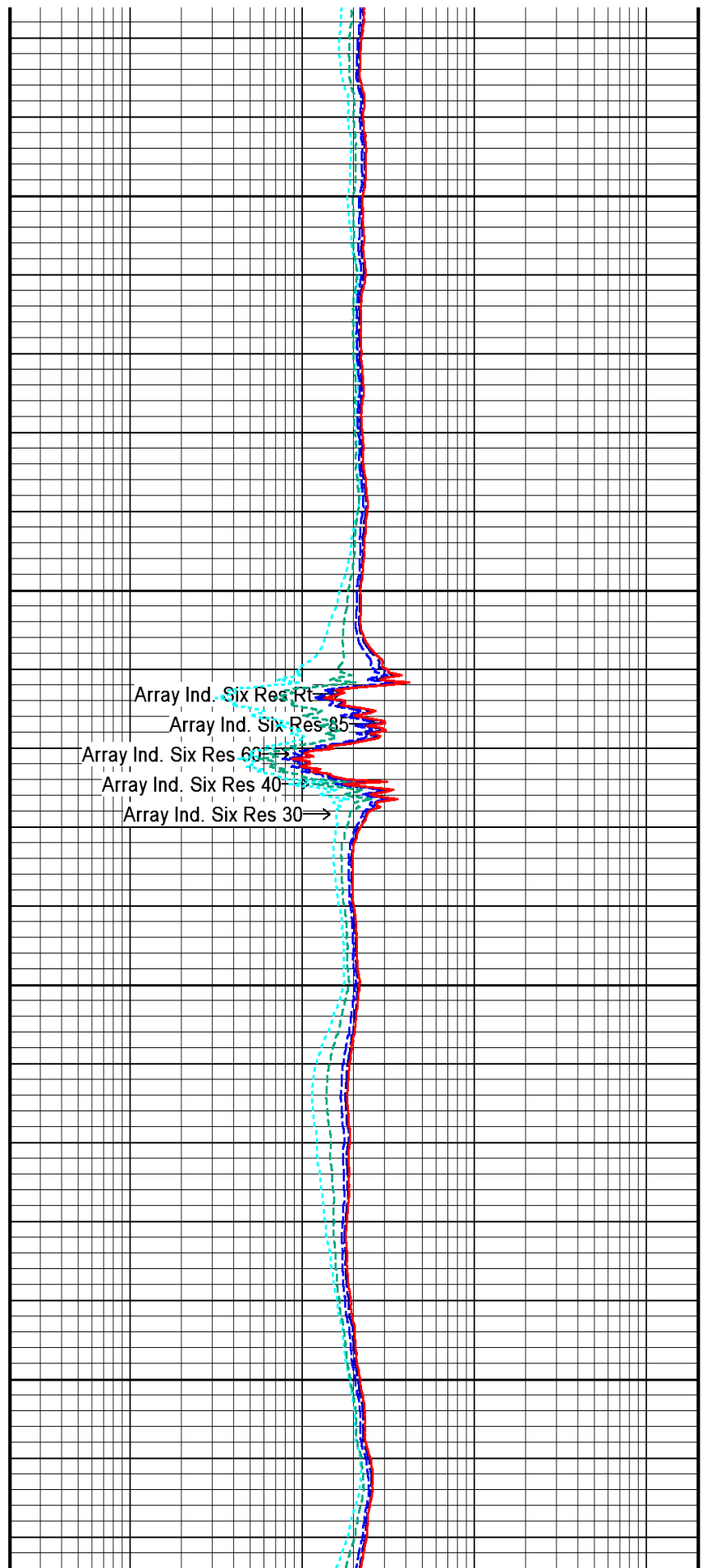
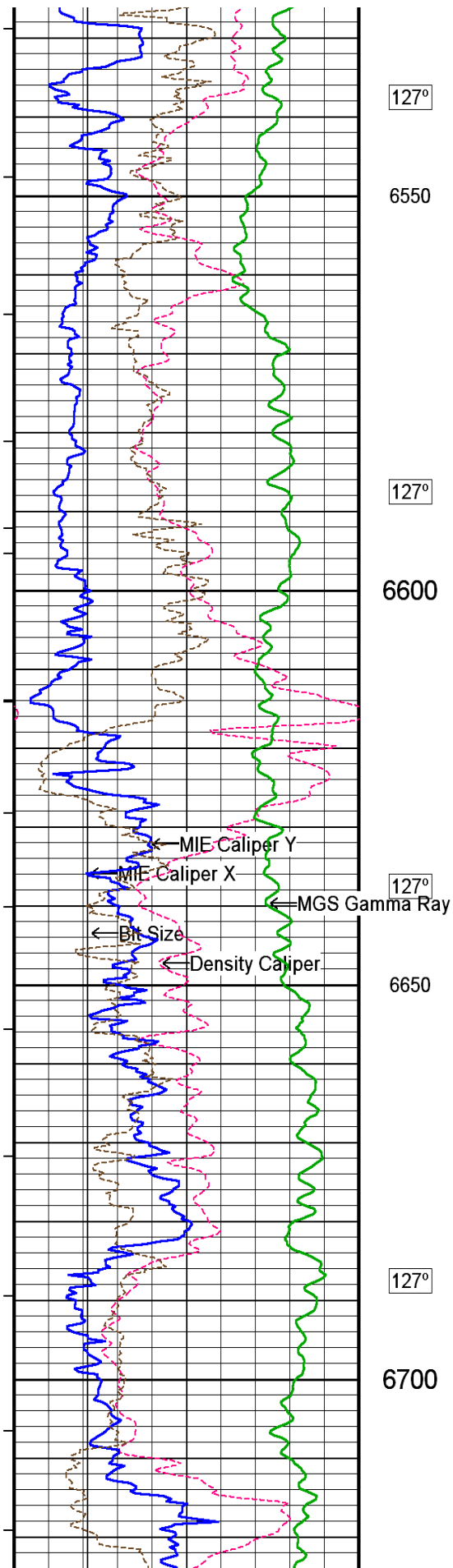


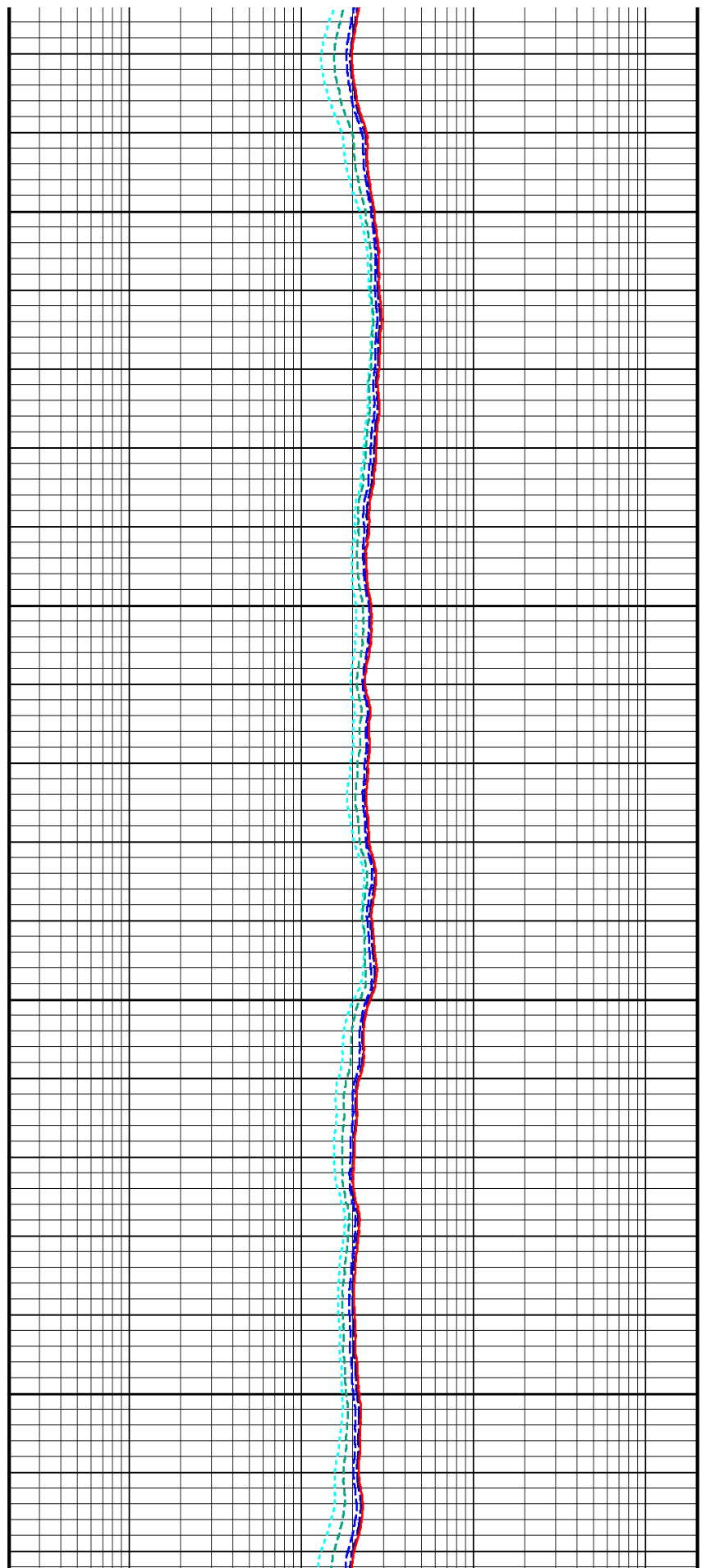
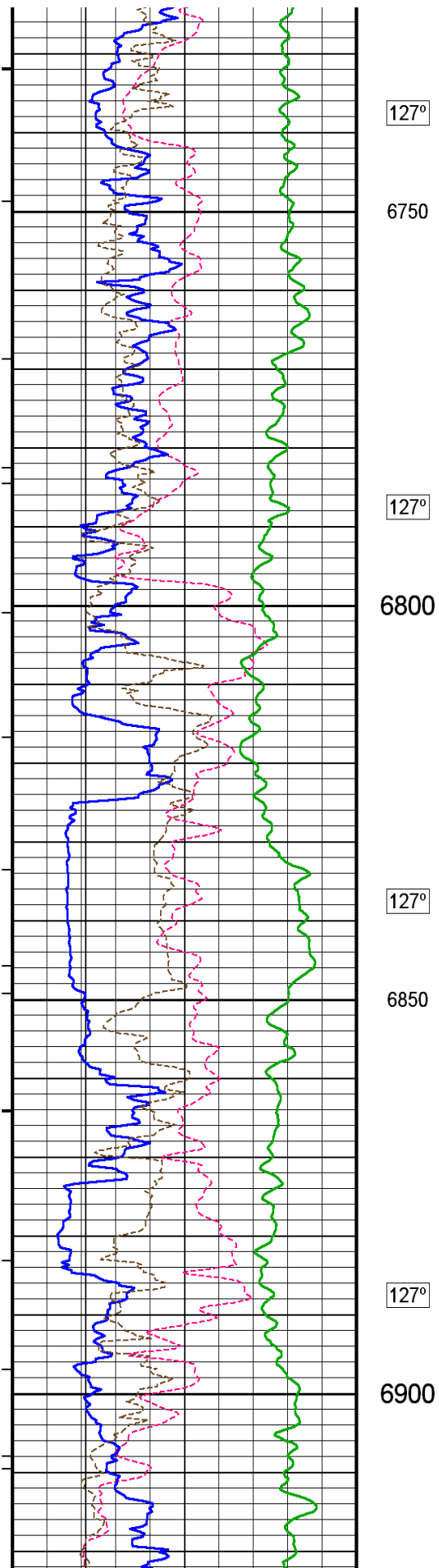


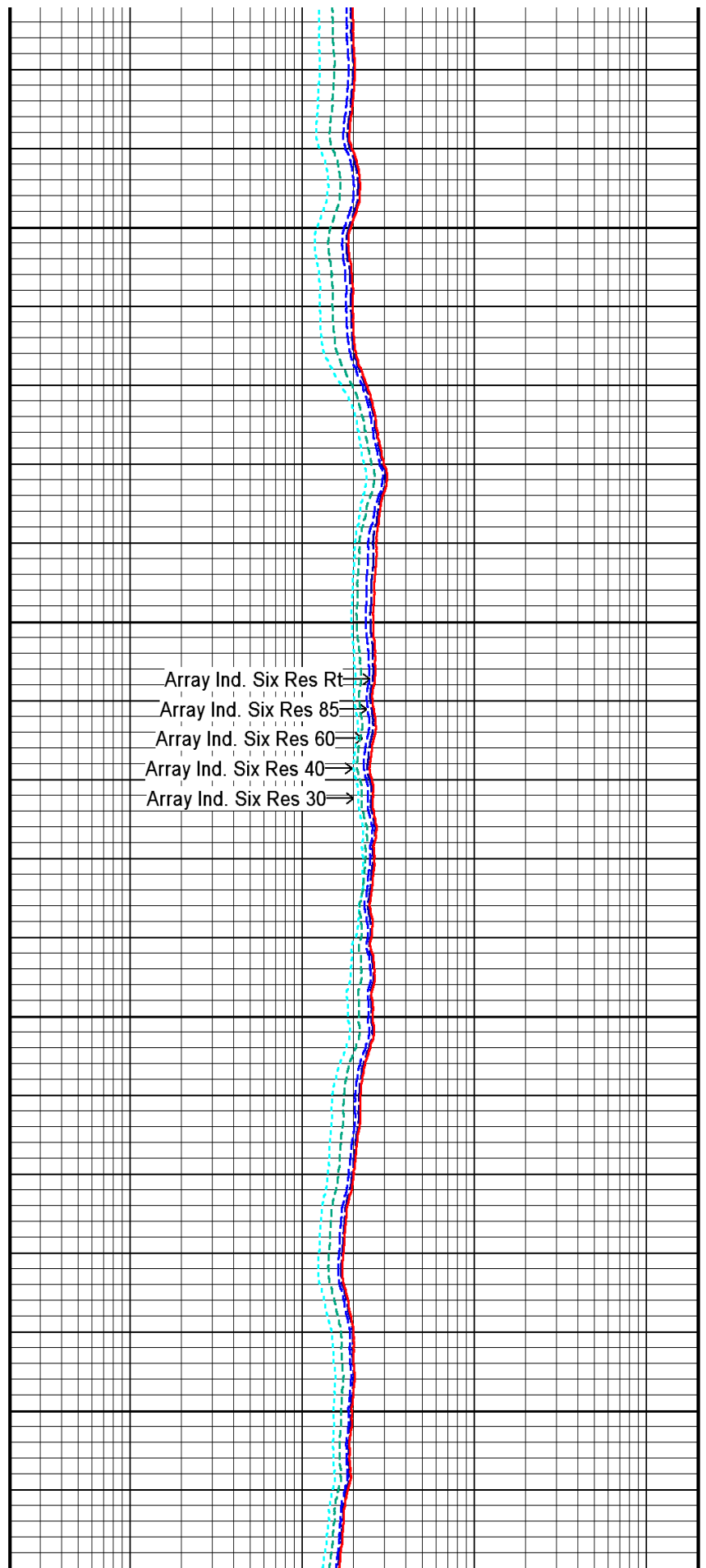
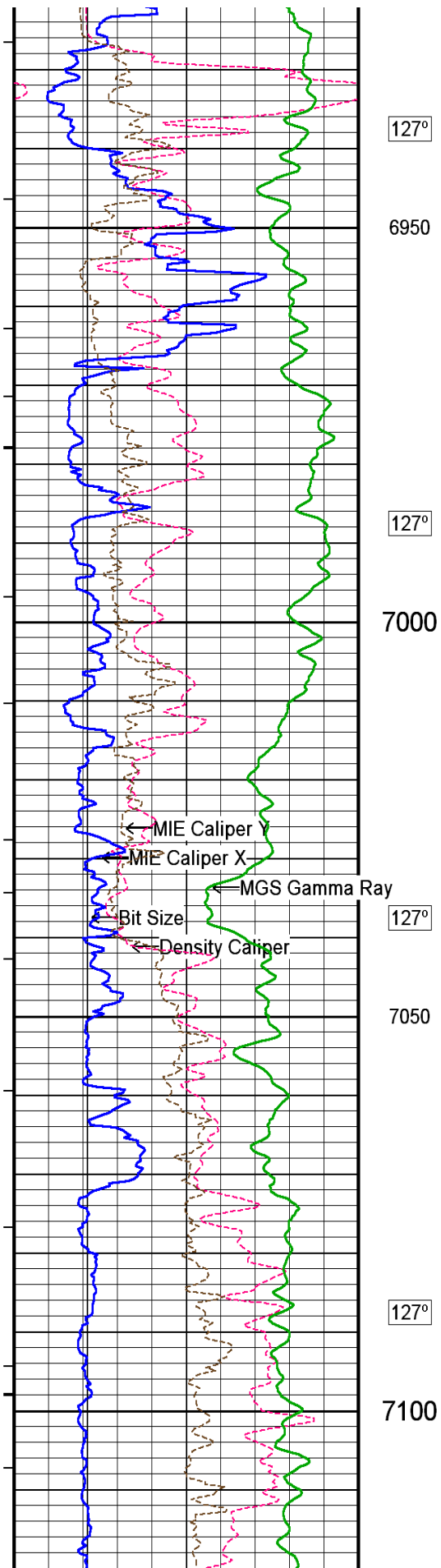


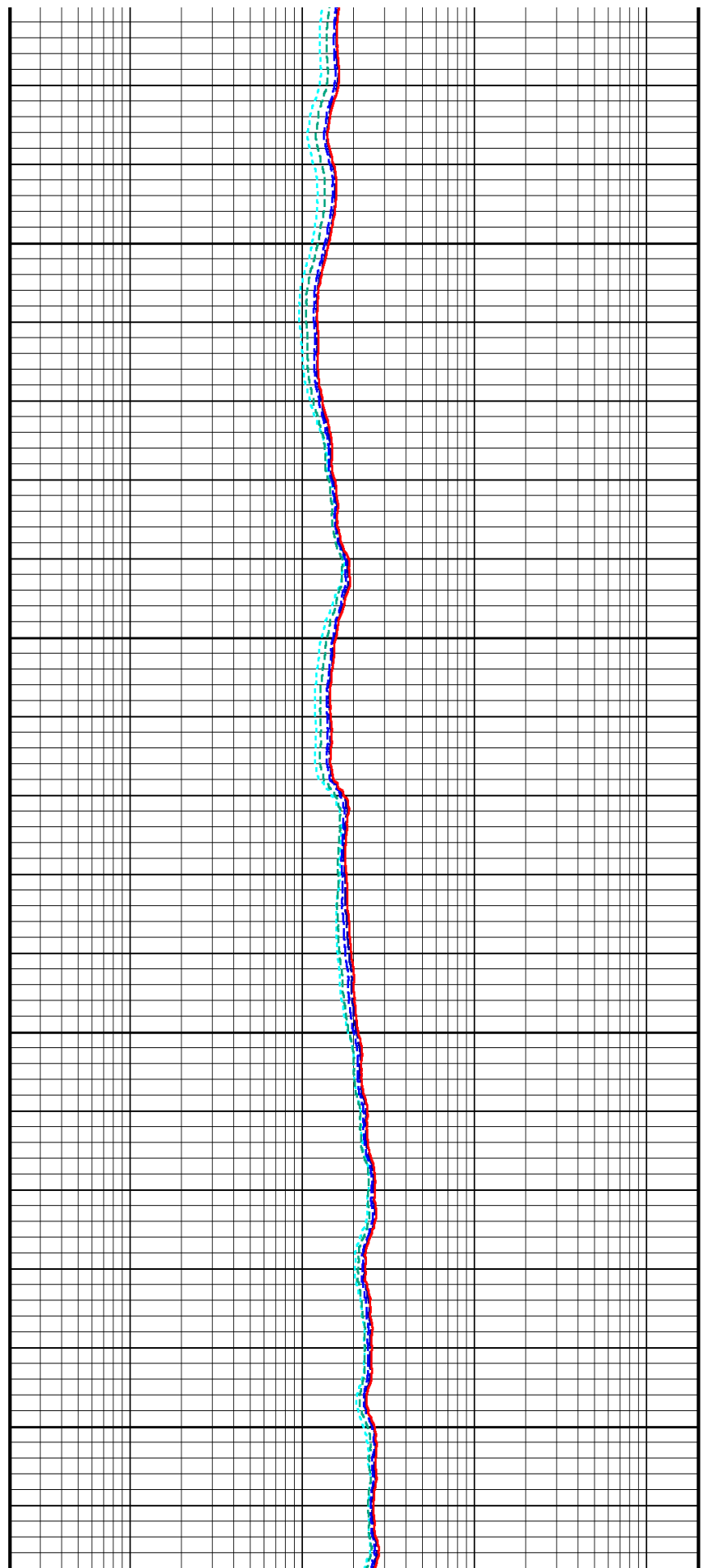
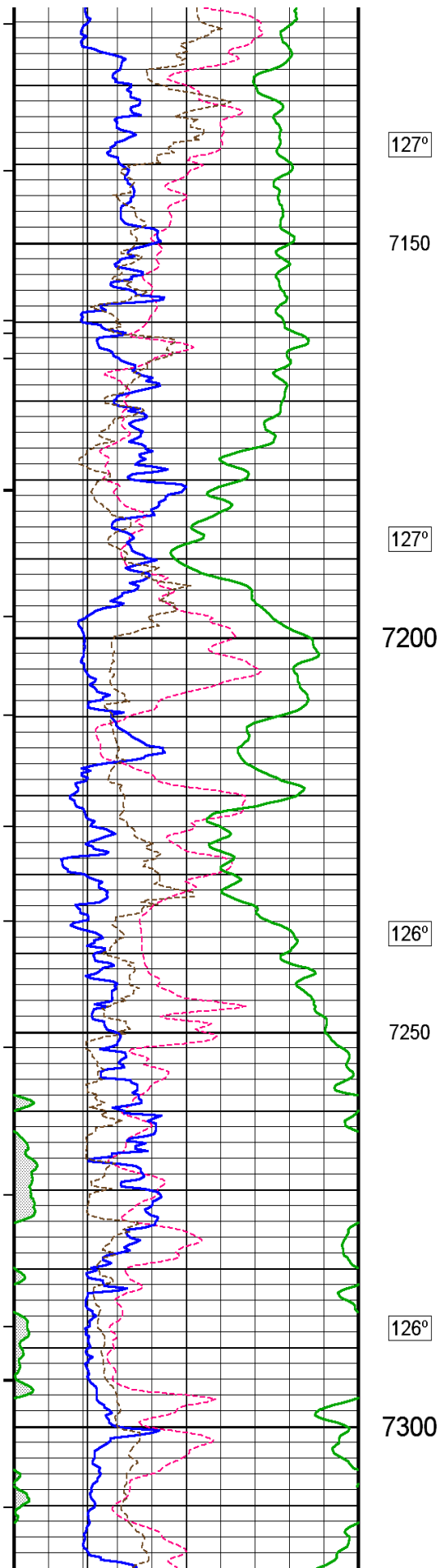


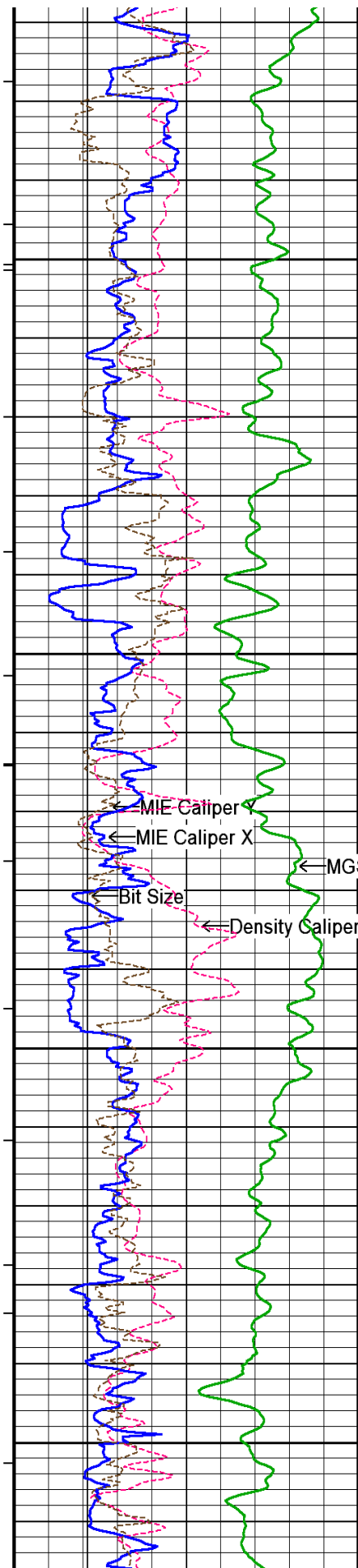












126°

7350

126°

7400

MIE Caliper

MIE Caliper X

Bit Size

Density Caliper

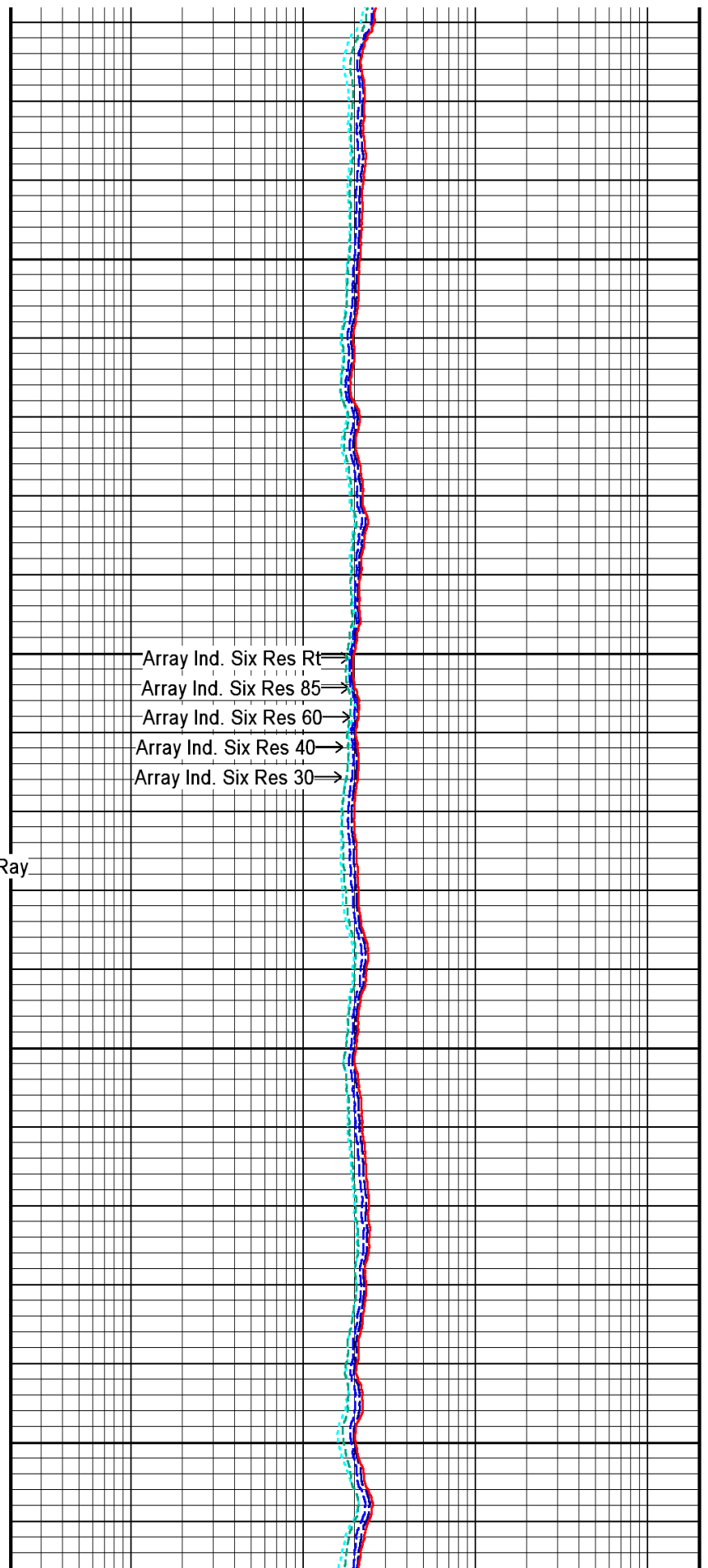
MGS Gamma Ray

126°

7450

126°

7500



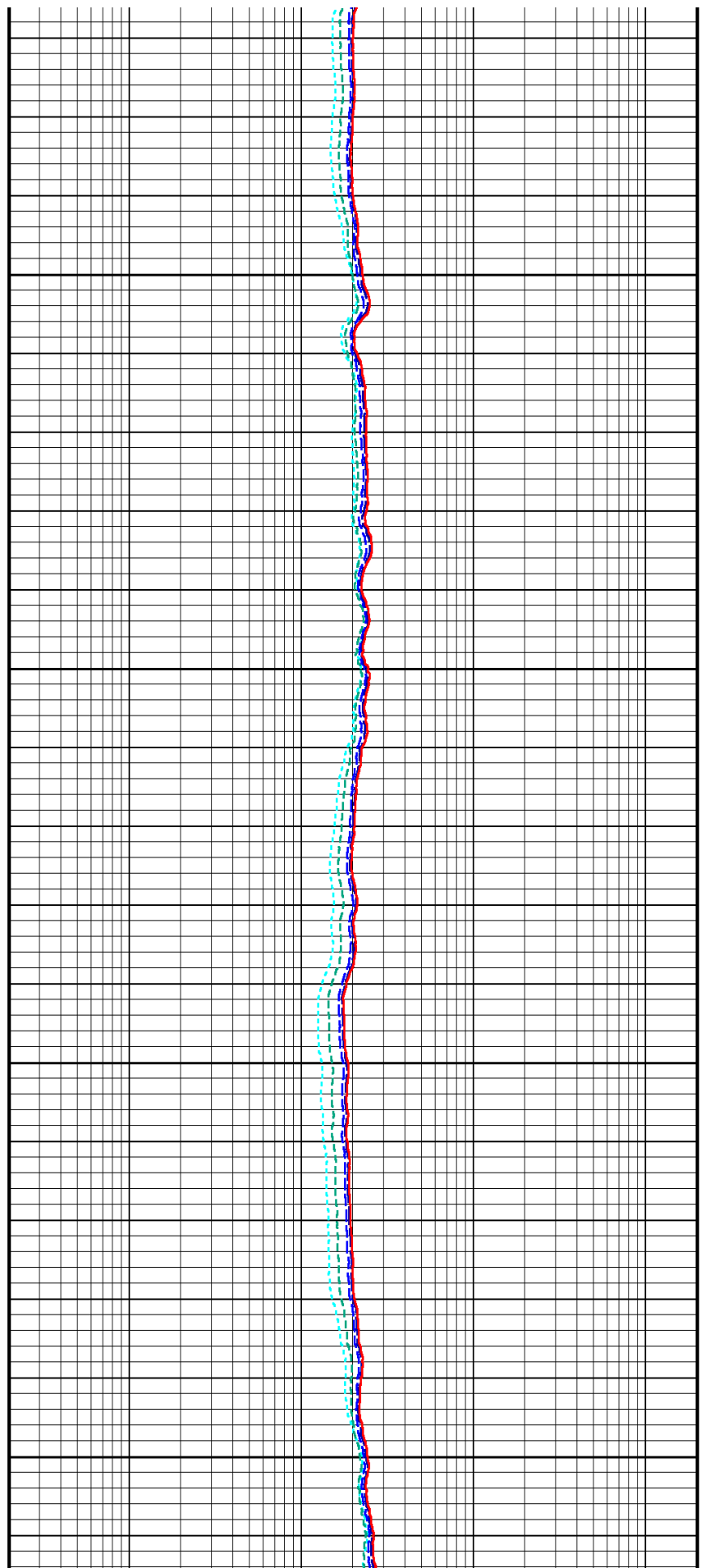
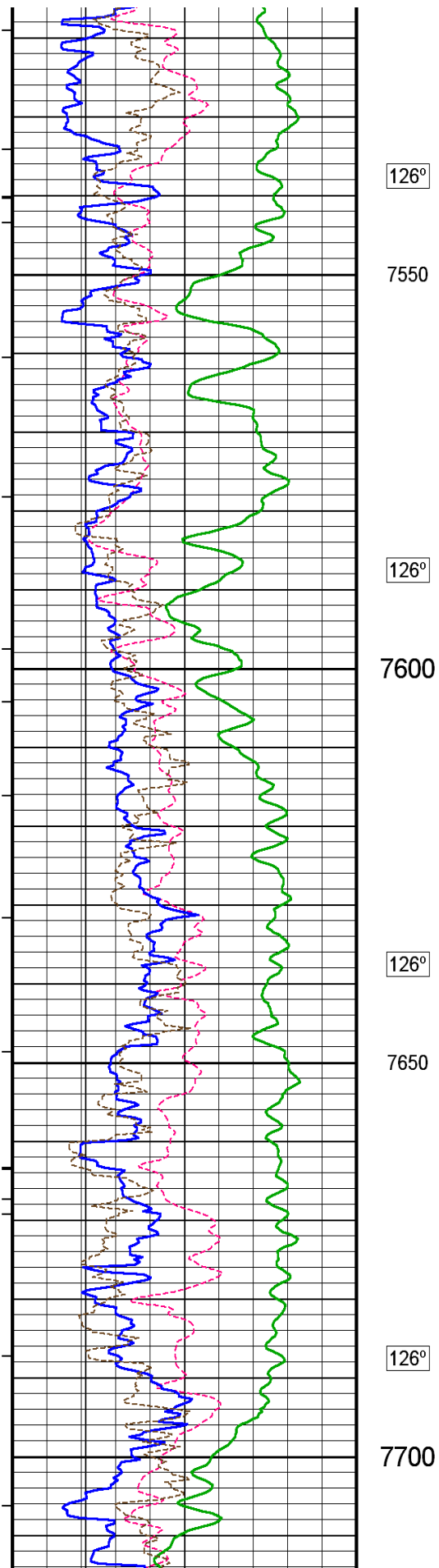
Array Ind. Six Res Rt

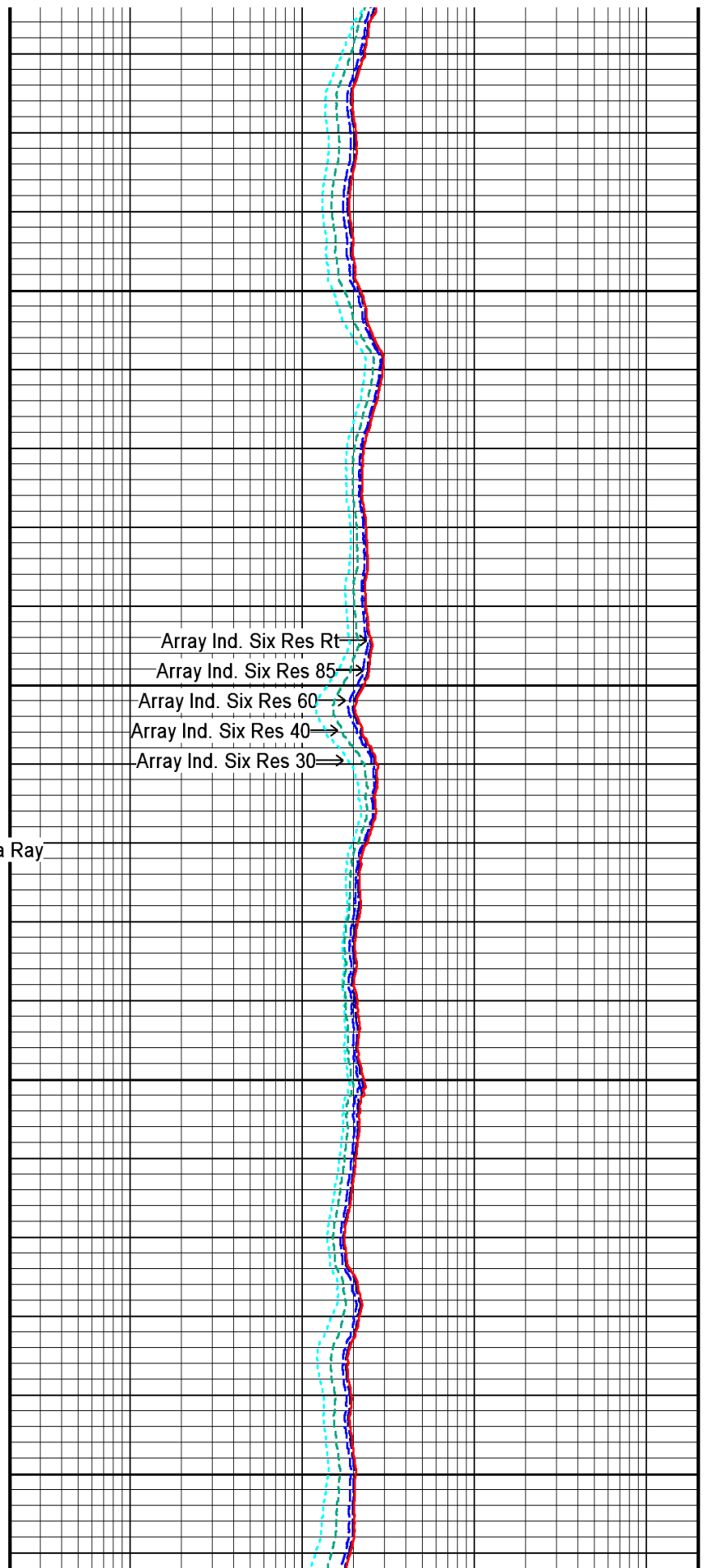
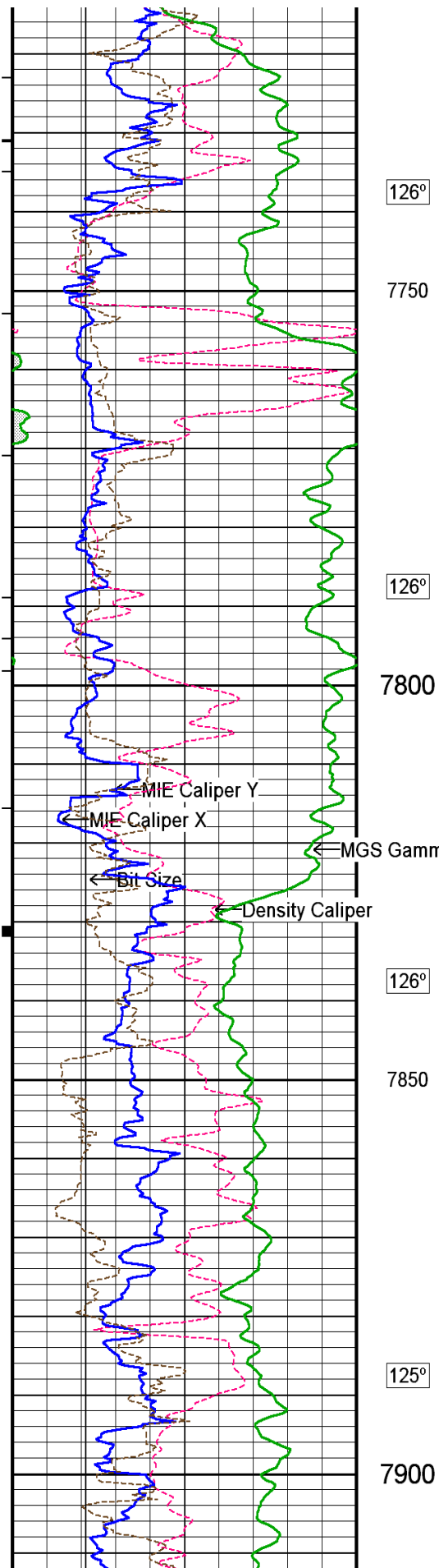
Array Ind. Six Res 85

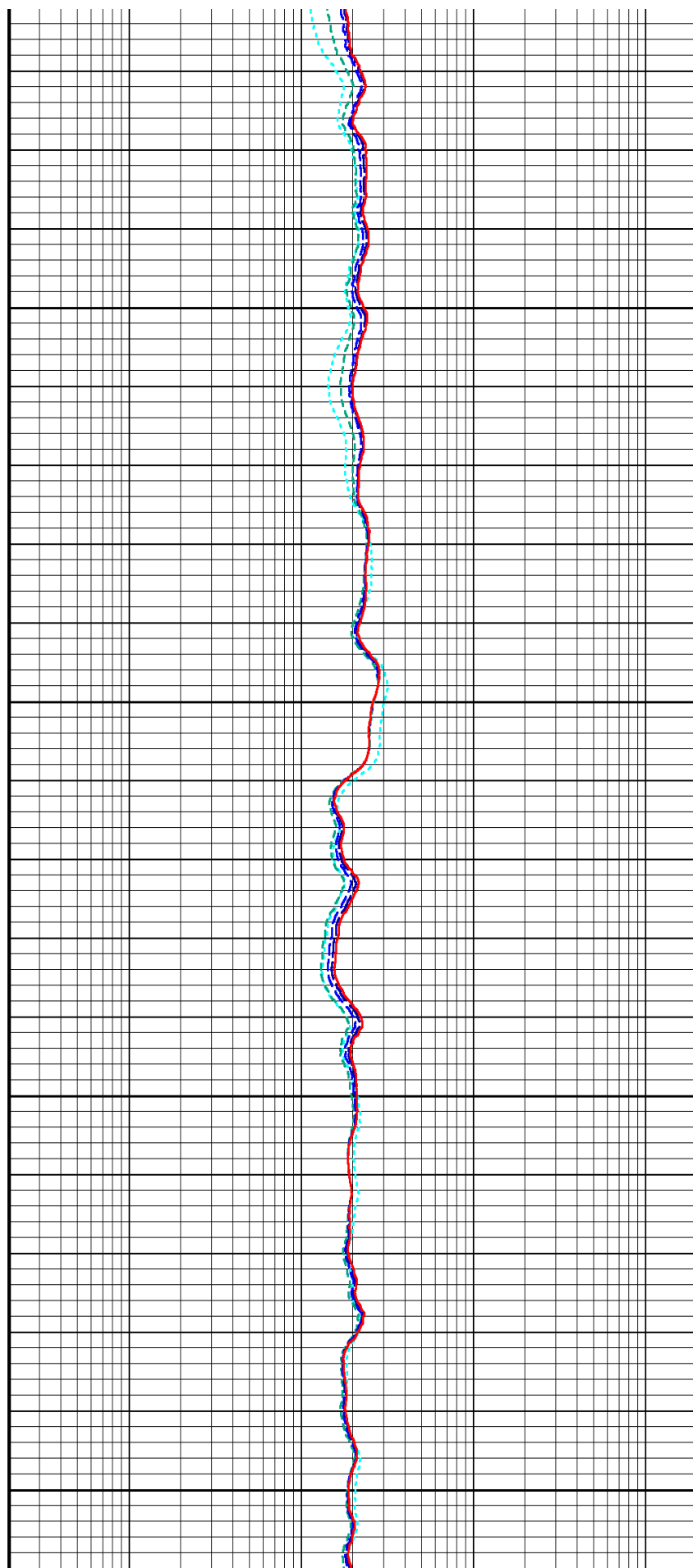
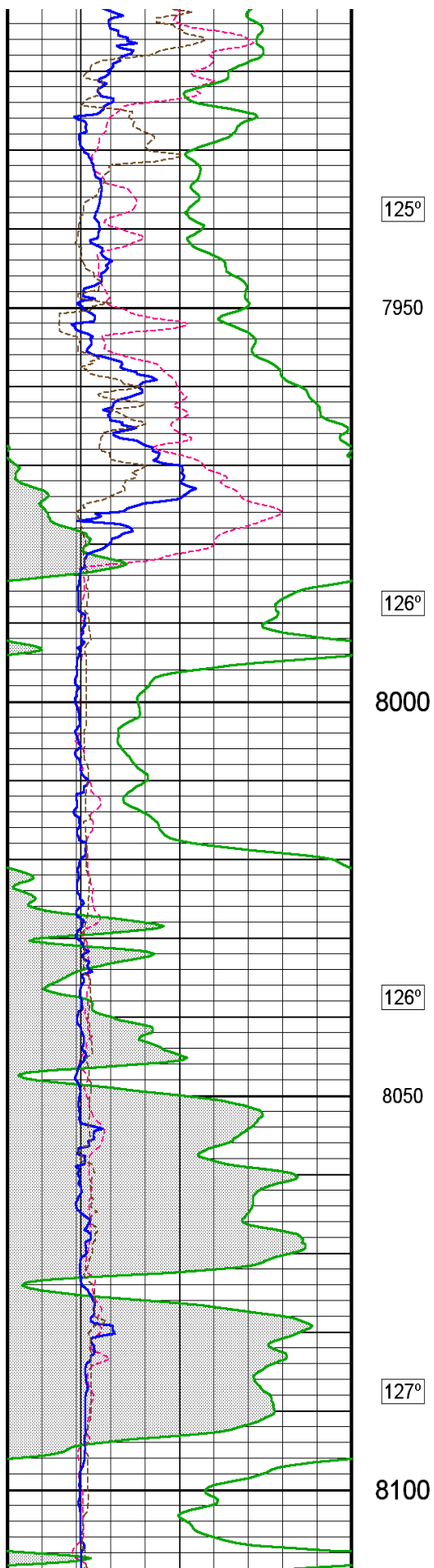
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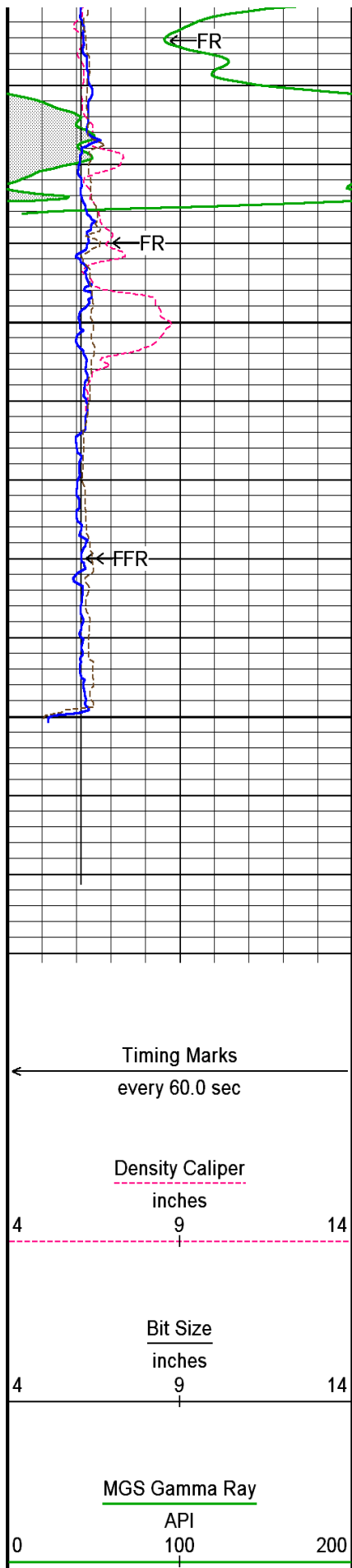
Array Ind. Six Res 40

Array Ind. Six Res 30









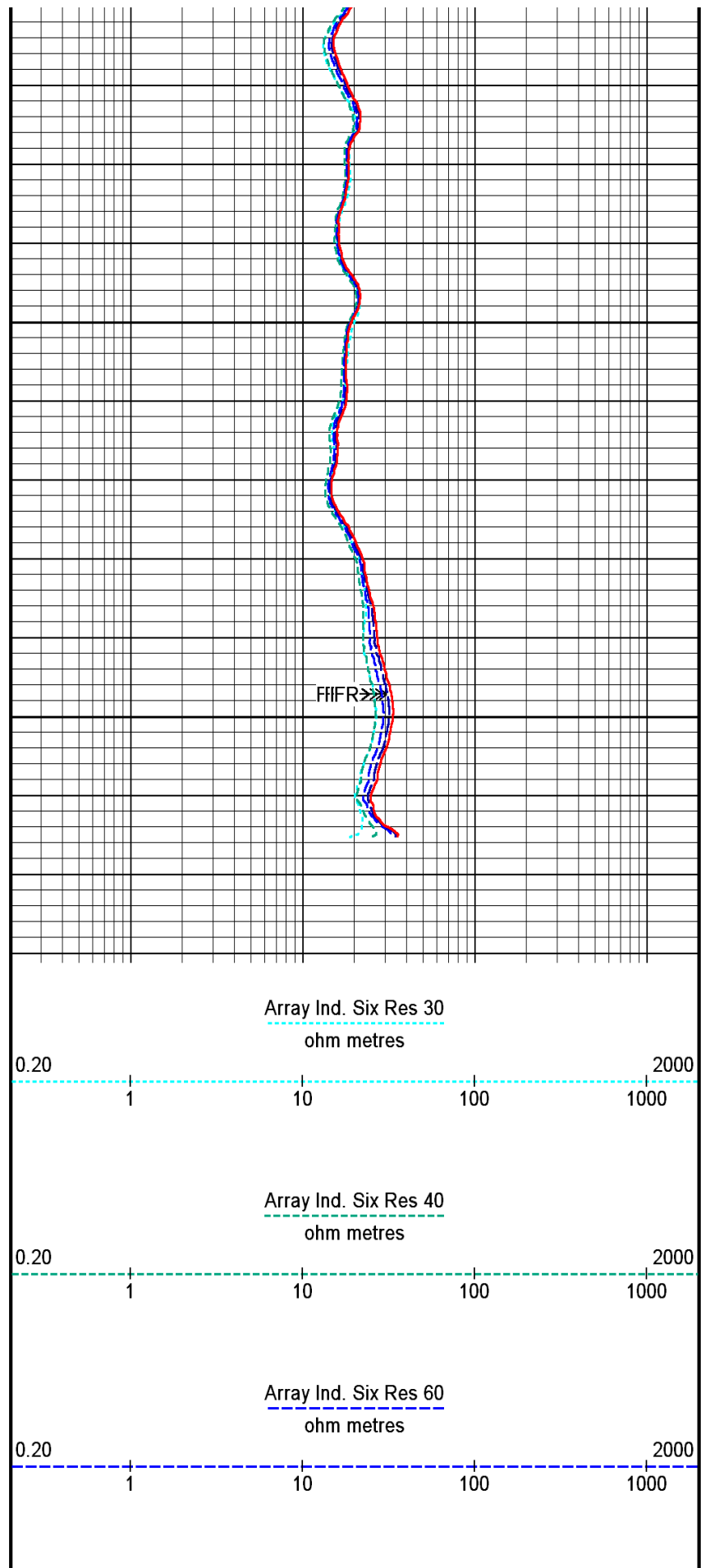
72°

8150

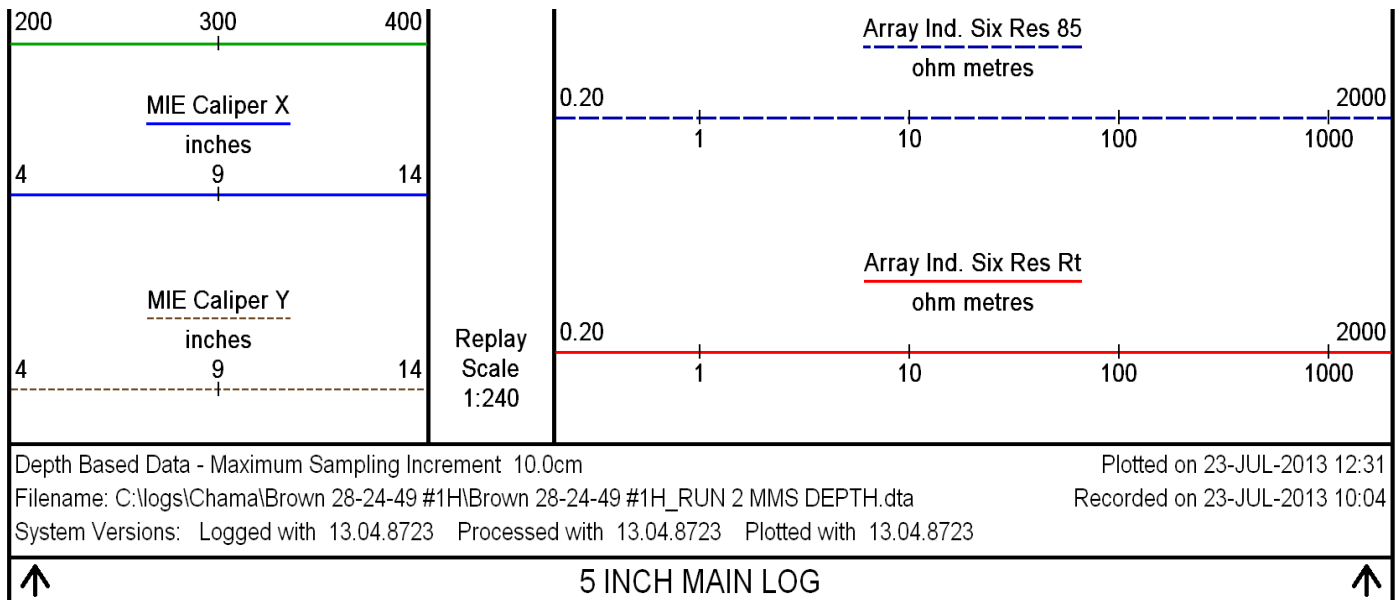
8200

DSC
in
Feet

Borehole
Temp in
deg F



FFFR>>>



BEFORE SURVEY CALIBRATION

C:\logs\Chama\Brown 28-24-49 #1H\Brown 28-24-49 #1H_RUN 2 MMS DEPTH.dta

General Constants All 000

Last Edited on 23-JUL-2013,08:29

General Parameters

| | | |
|-----------------------------|----------|------------|
| Mud Resistivity | 1.410 | ohm-metres |
| Mud Resistivity Temperature | 94.100 | 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 Caliper X | |
| HVOL Caliper 2 | Density Caliper | |
| Annular Volume Diameter | 4.500 | inches |
| Caliper for Differential Caliper | Density Caliper | |

Rwa Parameters

| | |
|------------------|-----------------------|
| Porosity used | Base Density Porosity |
| Resistivity used | Array Ind. Six Res Rt |
| RWA Constant A | 0.610 |
| RWA Constant M | 2.150 |

Down-hole Tension Calibration SMS 0

Field Calibration on 16-AUG-2012 17:34

| Reading No | Measured | |
|------------|----------|---------|
| 1 | 15060.53 | 0.00 |
| 2 | 17539.73 | 1400.00 |

Strain Gauge Constants MMS-E.B 159

Last Edited on 13-OCT-2012,09:03

| | | |
|--------------------------------------|--------------|-------|
| 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 |
| Pressure psia | Inc. | Dec. |
| 0.0 | 0.000 | 0.000 |
| 2000.0 | 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 | |

MMS Parameters MMS-E.B 159

Last Edited on 21-JUL-2013 22:57

Logging Parameters

| | | |
|--------------------------------|---------|-----------|
| Firmware Version | 2v40 | |
| Caliper Open On | MAI | |
| Caliper Open Delay | | minutes |
| Caliper Closed On | Unknown | |
| Caliper Closed Delay | N/A | minutes |
| Sample Rate | 1.00 | seconds |
| Use Deep Sleep | Yes | |
| Delay Deep Sleep | No | |
| Deep Sleep Wake Time | 540.0 | minutes |
| Deep Sleep Wake on Temperature | No | |
| Deep Sleep Wake Temperature | N/A | degrees C |
| Deep Sleep Wake on Pressure | No | |
| Deep Sleep Wake Pressure | N/A | psi |
| MMI Pad Pressure | 8.0 | |

Release Parameters

| | | |
|-----------------------------------|---------|---------|
| Pulse Duration Base Level | 20.0 | seconds |
| Pulse Duration Transition Time | 10.0 | seconds |
| Pulse Duration Status Pulse From | 20.0 | seconds |
| Pulse Duration Caliper Close From | 70.0 | seconds |
| Pulse Duration Caliper Open From | 100.0 | seconds |
| Pulse Duration Release Pulse From | 140.0 | seconds |
| Pulse Duration Release Pulse To | 200.0 | seconds |
| Pulse Release Duration | 60.0 | seconds |
| Pulse Discriminator Pressure Band | 269.0 | seconds |
| Pulse Pressure Discriminator | 607.0 | seconds |
| Use Negative Pulsing | No | |
| Good Status Reply Open Hole | 65535.0 | seconds |
| Good Status Reply Cased Hole | 20.0 | seconds |
| Bad Status Reply | 50.0 | seconds |
| Status Pulse To | 30.0 | seconds |
| Caliper Close To | | seconds |
| Caliper Open To | 110.0 | seconds |

Configuration

MMS,MGS,MDN,MPD,MPD,MIM,MIE,MAI

High Resolution Temperature Calibration MGS-C.J 141

Field Calibration on 07-JUN-2013,15:34

| | Measured | Calibrated(Deg F) |
|-------|----------|-------------------|
| Lower | 10.00 | 10.00 |
| Upper | 50.00 | 50.00 |

High Resolution Temperature Constants MGS-C.J 141

Last Edited on 07-JUN-2013,15:34

| | |
|-------------------|----|
| Pre-filter Length | 11 |
|-------------------|----|

Gamma Calibration MGS-C.J 141

Field Calibration on 18-JUL-2013 20:08

| | Measured | Calibrated (API) |
|--------------------|----------|------------------|
| Background | 121 | 83 |
| Calibrator (Gross) | 893 | 617 |
| Calibrator (Net) | 773 | 534 |

Gamma Constants MGS-C.J 141

Last Edited on 23-JUL-2013,04:40

| | | | |
|---------------------------------------|--------------------------|------------------|----------------------------------------|
| Gamma Calibrator Number | GRCC225 | | |
| Mud Density | 1.16 | gm/cc | |
| Caliper Source for Processing | Density Caliper | | |
| Tool Position | Eccentred | | |
| Concentration of KCl | 1.00 | kppm | |
| SP Calibration MGS-C.J 141 | | | |
| | Measured | Calibrated (mV) | Field Calibration on 07-JUN-2013,15:34 |
| Reference 1 | 100.0 | 100.0 | |
| Reference 2 | -100.0 | -100.0 | |
| Neutron Calibration MDN-B.A 275 | | | |
| | | | Base Calibration on 05-JUL-2013 15:12 |
| | | | Field Check on 18-JUL-2013 19:59 |
| Base Calibration | | | |
| | Measured | Calibrated (cps) | |
| | Near Far | Near Far | |
| | 2973 91 | 3714 110 | |
| Ratio | 32.573 | 33.764 | |
| Field Calibrator at Base | | Calibrated (cps) | |
| | | 2353 3446 | |
| Ratio | | 0.683 | |
| Field Check | | Calibrated (cps) | |
| | | 2320 3400 | |
| Ratio | | 0.682 | |
| Neutron Constants MDN-B.A 275 | | | |
| | | | Last Edited on 23-JUL-2013,08:28 |
| Neutron Source Id | P31131B | | |
| Neutron Jig Number | NJ6630 | | |
| Epithermal Neutron | No | | |
| 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 | MGS External Temperature | | |
| 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 | | |
| Navigation Constants MIE-A.A 125 | | | |
| | | | Last Edited on 10-FEB-2013,11:59 |
| Magnetic Declination | 0.00 | degrees | East |
| Magnetometer Parameters MIE-A.A 125 | | | |
| Date Of Last Magnetometer Calibration | 13-MAY-2013,09:50 | | |
| | X Magnetometer | Y Magnetometer | Z Magnetometer |
| Slope | -1.000000 | -1.012953 | -1.002250 |
| Offset | 0.013073 | -0.019881 | 0.005280 |
| Magnetometer Constants MIE-A.A 125 | | | |
| | | | Last Edited on |
| Magnetometer Calibrator Number | 000 | | |
| Accelerometer Parameters MIE-A.A 125 | | | |

| | | | | | |
|--------------------------------------------|----------------------|---------------------------------------------------------------------------------|----------------------------------|-------------------|----------------------|
| Date Of Last Accelerometer Calibration | | 3-MAY-2013,16:16 | | | |
| | X Accelerometer | Y Accelerometer | Z Accelerometer | | |
| Slope | -1.108853 | -1.106755 | -1.113952 | | |
| Offset | 0.003965 | -0.001907 | -0.002706 | | |
| Accelerometer Constants MIE-A.A 125 | | | Last Edited on 06-AUG-2012,17:03 | | |
| Accelerometer Calibrator Number | | 000 | | | |
| Accelerometer Temperature Characterisation | | | | | |
| X Accelerometer | | | | | |
| Serial Number | 898 | | | | |
| Calibration Date | 12-Apr-2010 | | | | |
| | B0 | B1 | B2 | B3 | |
| Bias(g) | 0.00000e+000 | 3.09504e-006 | -4.17750e-009 | 1.00603e-010 | |
| | SF0 | SF1 | SF2 | SF3 | |
| Scale Factor(mA/g) | 3.00000e+000 | 2.73446e-004 | 3.06615e-007 | 8.00001e-010 | |
| Y Accelerometer | | | | | |
| Serial Number | 867 | | | | |
| Calibration Date | 25-Jun-2009 | | | | |
| | B0 | B1 | B2 | B3 | |
| Bias(g) | 0.00000e+000 | 8.88300e-006 | 1.42920e-008 | -7.14234e-011 | |
| | SF0 | SF1 | SF2 | SF3 | |
| Scale Factor(mA/g) | 3.00000e+000 | 2.84901e-004 | 3.65464e-007 | 1.00140e-009 | |
| Z Accelerometer | | | | | |
| Serial Number | 883 | | | | |
| Calibration Date | 10-Apr-2010 | | | | |
| | B0 | B1 | B2 | B3 | |
| Bias(g) | 0.00000e+000 | 8.19055e-006 | -3.32398e-008 | 7.38691e-011 | |
| | SF0 | SF1 | SF2 | SF3 | |
| Scale Factor(mA/g) | 3.00000e+000 | 2.68615e-004 | 3.36203e-007 | 6.38362e-010 | |
| Caliper Calibration MIE-A.A 125 | | Base Calibration on 10-FEB-2013 10:55 Field Calibration on 18-JUL-2013 20:15 | | | |
| Base Calibration | | | | | |
| Reading No | Pads 1-5 Meas. | Pads 3-7 Meas. | Calibrator Size (in) | | |
| 1 | 25167 | 26161 | 5.97 | | |
| 2 | 35176 | 35886 | 7.96 | | |
| 3 | 44927 | 45127 | 9.86 | | |
| 4 | 55923 | 56671 | 11.92 | | |
| 5 | 0 | 0 | 0.00 | | |
| Reading No | Pad 2 Meas. | Pad 4 Meas. | Pad 6 Meas. | Pad 8 Meas. | Calibrator Size (in) |
| 1 | 25113 | 25419 | 24538 | 26452 | 5.97 |
| 2 | 33598 | 34110 | 32429 | 34258 | 7.96 |
| 3 | 42159 | 42473 | 40007 | 41906 | 9.86 |
| 4 | 51495 | 51987 | 50111 | 51377 | 11.92 |
| 5 | 0 | 0 | 0 | 0 | 0.00 |
| Field Calibration | | | | | |
| | Measured | Measured | Actual | | |
| | Pads 1-5 Caliper(in) | Pads 3-7 Caliper(in) | Caliper(in) | | |
| | 5.99 | 5.98 | 5.97 | | |
| | Measured | Measured | Measured | Measured | Actual |
| | Pad 2 Caliper(in) | Pad 4 Caliper(in) | Pad 6 Caliper(in) | Pad 8 Caliper(in) | Caliper(in) |
| | 3.04 | 2.98 | 3.06 | 3.00 | 5.97 |
| Caliper Constants MIE-A.A 125 | | Last Edited on 13-JUL-2012,11:48 | | | |
| Caliper Difference for BRKT | | 0.120 | inches | | |
| Imager Pad Check MIE-A.A 125 | | Field Check on | | | |

| | | | |
|-------|----------------|-------|----------------|
| Pad 1 | Pad Not Tested | Pad 5 | Pad Not Tested |
| Pad 2 | Pad Not Tested | Pad 6 | Pad Not Tested |
| Pad 3 | Pad Not Tested | Pad 7 | Pad Not Tested |
| Pad 4 | Pad Not Tested | Pad 8 | Pad Not Tested |

| | | | | |
|--------------------------------------------|--|------------------------|----------------------------------|--|
| Compact Micro Imager Constants MIE-A.A 125 | | | Last Edited on 12-NOV-2012,08:42 | |
| 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 | | 0.0500 | mAmp | |
| Image Processing | | Enabled | | |

| | | | | |
|-----------------------------------------------------|----------|-------------------|----------------------------------------|--|
| High Resolution Temperature Calibration MAI-B.J 376 | | | Field Calibration on 09-JUL-2013,19:43 | |
| | Measured | Calibrated(Deg F) | | |
| Lower | 20.00 | 20.00 | | |
| Upper | 50.00 | 50.00 | | |

| | | | | |
|---------------------------------------------------|--|----|----------------------------------|--|
| High Resolution Temperature Constants MAI-B.J 376 | | | Last Edited on 09-JUL-2013,19:43 | |
| Pre-filter Length | | 11 | | |

| | | | | |
|-----------------------------------|---------------------|----------|---------------------------------------|---------------------|
| Induction Calibration MAI-B.J 376 | | | Base Calibration on 05-JUL-2013,15:38 | |
| | | | Field Check on 18-JUL-2013 19:20 | |
| Base Calibration | | | | |
| Test Loop Calibration | | Measured | | Calibrated (mmho/m) |
| Channel | Low | High | Low | High |
| 1 | 16.4 | 461.5 | 9.3 | 966.2 |
| 2 | 5.9 | 377.0 | 7.6 | 821.4 |
| 3 | 3.1 | 255.4 | 5.2 | 566.0 |
| 4 | 1.7 | 130.3 | 2.6 | 279.2 |
| Array Temperature | | 73.8 | Deg F | |
| Channel | Base Check (mmho/m) | | Field Check (mmho/m) | |
| | Low | High | Low | High |
| 1 | | | 16.0 | 3946.1 |
| 2 | | | 31.3 | 3584.0 |
| 3 | | | 30.1 | 3103.1 |
| 4 | | | 20.6 | 2124.3 |
| Deep | | | 19.1 | 2052.6 |
| Medium | | | 43.3 | 4062.6 |
| Shallow | | | 45.9 | 5259.7 |
| Array Temperature | | | 90.6 | Deg F |

| | | | | |
|-----------------------------------|--|-----------------|----------------------------------|--|
| Induction Constants MAI-B.J 376 | | | Last Edited on 23-JUL-2013,08:27 | |
| 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.A 280 | | | Base Calibration on 05-JUL-2013 11:04 Field Calibration on 18-JUL-2013 19:42 | |
| Base Calibration | | | | |
| Reading No | Measured | Calibrator Size (in) | | |
| 1 | 16586 | 4.01 | | |
| 2 | 24847 | 5.97 | | |
| 3 | 33152 | 7.96 | | |
| 4 | 41328 | 9.86 | | |
| 5 | 50512 | 11.92 | | |
| 6 | N/A | N/A | | |
| Field Calibration | | | | |
| | Measured Caliper (in) | Actual Caliper (in) | | |
| | 5.89 | 5.97 | | |

| | | | | |
|---------------------------------------|--------|----------|---------------------------------------------------------------------------|-------|
| Photo Density Calibration MPD-C.A 280 | | | Base Calibration on 05-JUL-2013 11:37 Field Check on 18-JUL-2013 19:31 | |
| Density Calibration | | | | |
| Base Calibration | | Measured | Calibrated (sdu) | |
| | Near | Far | Near | Far |
| Reference 1 | 56540 | 28078 | 59443 | 30683 |
| Reference 2 | 23140 | 2609 | 25113 | 2508 |
| Field Check at Base | | | | |
| | 1358.3 | 1384.2 | | |
| Field Check | | | | |
| | 1354.3 | 1381.6 | | |
| PE Calibration | | | | |
| Base Calibration | | Measured | Calibrated | |
| | WS | WH | Ratio | Ratio |
| Background | 246 | 1213 | | |
| Reference 1 | 22622 | 56321 | 0.406 | 0.372 |
| Reference 2 | 6325 | 22985 | 0.279 | 0.268 |

| Reference 2 | 0.25 | 2.2500 | 0.275 | 0.200 |
|-------------------------------|-----------------|--------|----------------------------------|-------|
| Field Check at Base | 246.4 | 1213.2 | | |
| Field Check | 245.0 | 1211.9 | | |
| Density Constants MPD-C.A 280 | | | Last Edited on 23-JUL-2013,08:27 | |
| Density Source Id | P21136B | | | |
| Nylon Calibrator Number | DNCE 652 | | | |
| Aluminium Calibrator Number | DACD 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) | | | |
| 2.68 | 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 | | | |

| DOWNHOLE EQUIPMENT | |
|-------------------------------------------------------------------------|--|
| C:\logs\Chama\Brown 28-24-49 #1H\Brown 28-24-49 #1H_RUN 2 MMS DEPTH.dta | |
| Shuttle Running Tool 3.5") | |
| SRT-A.A 59 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in | |
| 400v ext tube linker | |
| MLK-A 2 LG: 14.23 ft WT: 30.9 lb OD: 2.24 in | |
| 200v std tube linker | |
| MLK-A 1 LG: 8.53 ft WT: 30.9 lb OD: 2.24 in | |
| MML Tube Linker | |
| MLK-A 4 LG: 4.40 ft WT: 30.9 lb OD: 2.24 in | |
| SKJ-D.A Compact Knuckle Joint | |
| SKJ-D.A 66 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in | |
| MBS-F.A 200v Compact Battery Sub | |
| MBS-F.A 120 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in | |
| Compact Memory Sub E.B | |

MMS-E.B 159 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.

MTI-B.A 53 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma

MGS-C.J 141 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator

MCL-B.J 67 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 612 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor

SHA-J.B 597 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 698 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron

MDN-B.A 275 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-C.A 280 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 695 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor

SHA-J.B 506 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 610 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub

MIS-E.B 693 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint

SKJ-E.B 614 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 709 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact MMI Memory Section

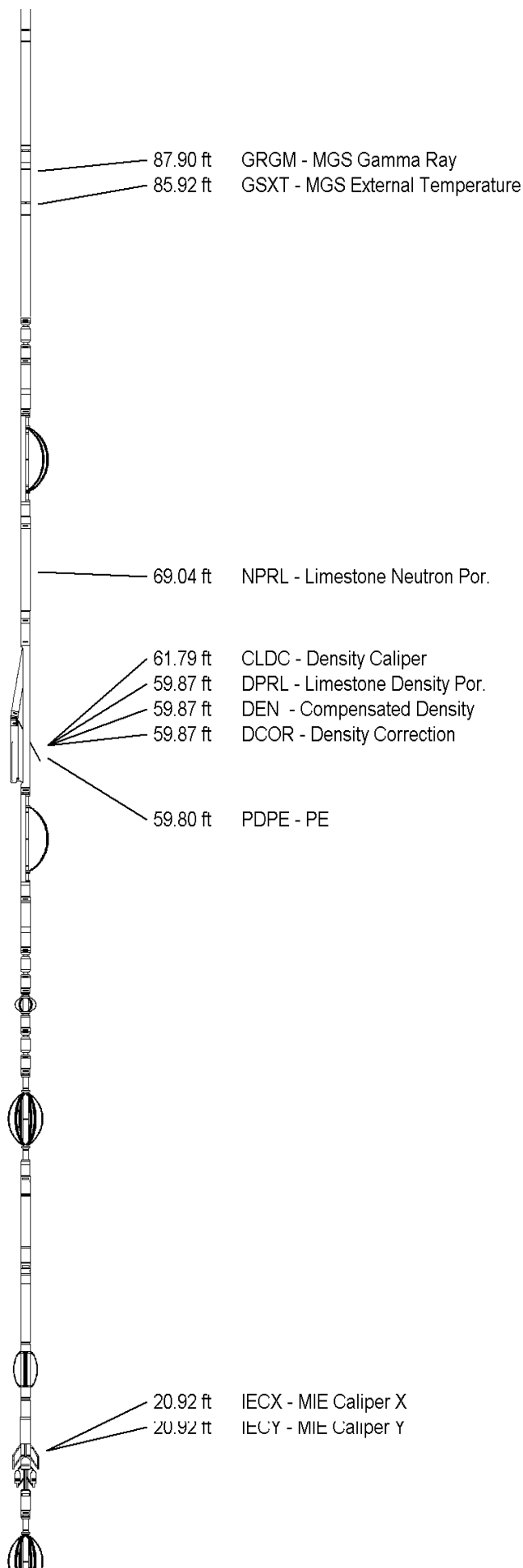
MIM-A.A 125 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section

MIE-A.A 125 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

MIS-D.B Compact Inline Bowspring sub

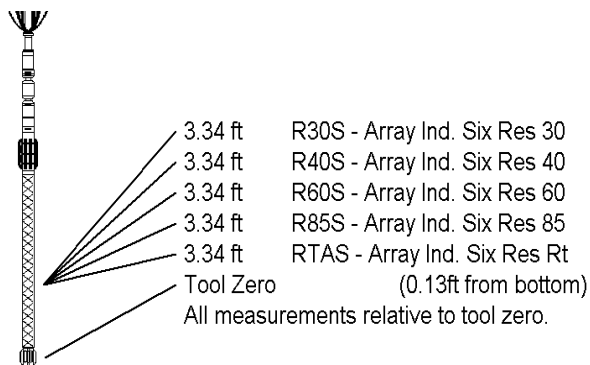
MIS-D.B 700 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in



SKJ-E.A Compact Knuckle Joint
 SKJ-E.A 410 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Induction
 MAI-B.J 376 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 148.57 ft Weight: 983.3 lb



| | |
|-----------------|------------------------|
| COMPANY | CHAMA OIL AND MINERALS |
| WELL | BROWN 24-28-49 #1H |
| FIELD | WILDCAT |
| PROVINCE/COUNTY | BENT |
| COUNTRY/STATE | U.S.A. / COLORADO |

| | | | | | |
|-------------------------|---------|------|---------------|---------|------|
| Elevation Kelly Bushing | 3937.00 | feet | First Reading | 8215.00 | feet |
| Elevation Drill Floor | 3937.00 | feet | Depth Driller | 8240.00 | feet |
| Elevation Ground Level | 3921.00 | feet | Depth Logger | 8240.00 | feet |



Weatherford®

ARRAY INDUCTION
 LOG