



**Weatherford®**

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

|   |                |               |                                  |  |  |
|---|----------------|---------------|----------------------------------|--|--|
| COMPANY                                   |                |               | WHITTING OIL AND GAS CORPORATION |  |  |
| WELL                                      |                |               | HORSETAIL 02D-0204               |  |  |
| FIELD                                     |                |               | REDDTAIL                         |  |  |
| PROVINCE/COUNTY                           |                |               | WELD                             |  |  |
| COUNTRY/STATE                             |                |               | U.S.A. / COLORADO                |  |  |
| LOCATION                                  |                |               | SHL: 300' FNL & 750' FWL         |  |  |
| PERMIT NUMBER                             |                |               | AFE: 14-1601                     |  |  |
| SEC 2                                     | TWP 10N        | RGE 57W       | Other Services                   |  |  |
|   |                |               | INDUCTION                        |  |  |
|   |                |               | MICRO IMAGER                     |  |  |
| API Number                                |                |               | 05-123-39383                     |  |  |
| Permanent Datum G.L., Elevation 4778 feet |                |               | NEUTRON/DENSITY                  |  |  |
| Log Measured From KB                      |                |               |                                  |  |  |
| Drilling Measured From K.B. @ 17 FEET     |                |               |                                  |  |  |
| Date                                      | 14-OCT-2014    |               |                                  |  |  |
| Run Number                                | ONE            |               |                                  |  |  |
| Service Order                             | 2577-100430125 |               |                                  |  |  |
| Depth Driller                             | 9948.00        | feet          |                                  |  |  |
| Depth Logger                              | 9948.00        | feet          |                                  |  |  |
| First Reading                             | 9900.00        | feet          |                                  |  |  |
| Last Reading                              | 6031.00        | feet          |                                  |  |  |
| Casing Driller                            | 6028.00        | feet          |                                  |  |  |
| Casing Logger                             | 6031.00        | feet          |                                  |  |  |
| Bit Size                                  | 6.000          | inches        |                                  |  |  |
| Hole Fluid Type                           | WBM            |               |                                  |  |  |
| Density / Viscosity                       | 9.30 lb/USg    | 41.00 type in |                                  |  |  |
| PH / Fluid Loss                           | 9.70           | 6.80 ml/30Min |                                  |  |  |
| Sample Source                             | FLOWLINE       |               |                                  |  |  |
| Rm @ Measured Temp                        | 1.37 @ 78.2    | ohm-m         |                                  |  |  |
| Rmf @ Measured Temp                       | 1.09 @ 78.2    | ohm-m         |                                  |  |  |
| Rmc @ Measured Temp                       | 1.64 @ 78.2    | ohm-m         |                                  |  |  |
| Source Rmf / Rmc                          | CALC           | CALC          |                                  |  |  |
| Rm @ BHT                                  | 0.53 @205.0    | ohm-m         |                                  |  |  |
| Time Since Circulation                    | .5 HOURS       |               |                                  |  |  |
| Max Recorded Temp                         | 205.00         | deg F         |                                  |  |  |
| Equipment / Base                          | 18063          | Casper        |                                  |  |  |
| Recorded By                               | M.RICHINS      |               |                                  |  |  |
| Witnessed By                              | M.ODEGARD      |               | GEOLOGIST                        |  |  |

| BOREHOLE RECORD    |                |                    |                    |                     | Last Edited: 14-OCT-2014 17:22 |
|--------------------|----------------|--------------------|--------------------|---------------------|--------------------------------|
| Bit Size<br>inches |                | Depth From<br>feet |                    | Depth To<br>feet    |                                |
| 6.000              |                | 6028.00            |                    | 9948.00             |                                |
| CASING RECORD      |                |                    |                    |                     |                                |
| Type               | Size<br>inches | Depth From<br>feet | Shoe Depth<br>feet | Weight<br>pounds/ft |                                |
| SURFACE            | 7.000          | 0.00               | 6028.00            | 29.00               |                                |

| REMARKS   |
|---|
| LOGGED WITH WLS 14.01.3220  |
| LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT   |
| HARDWARE:<br>MDN: MIS-A DOUBLE BOWSPRING USED ABOVE MDN<br>MPD: 4INCH PROFILE PLATE USED, MIS-A SINGLE BOWSPRING USED BELOW MPD<br>CMI: OVER BODY BASKET AND MIS-D BASKETS PLACED ABOVE AND BELOW FOR CENTRALIZATION<br>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  |
| LONGITUDE: -103.723214<br>LATITUDE: 40.862739   |
| ANNULAR HOLE VOLUME FROM TD TO CASING AT 6031 FEET = 390 CUBIC FEET   |

ANNULAR HOLE VOLUME FROM TD TO CASING AT 6031 FEET = 810 CUBIC FEET.

DRILL PIPE DEPTH DURING DEPLOYMENT: 9833.21 FEET  
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9935.39FEET

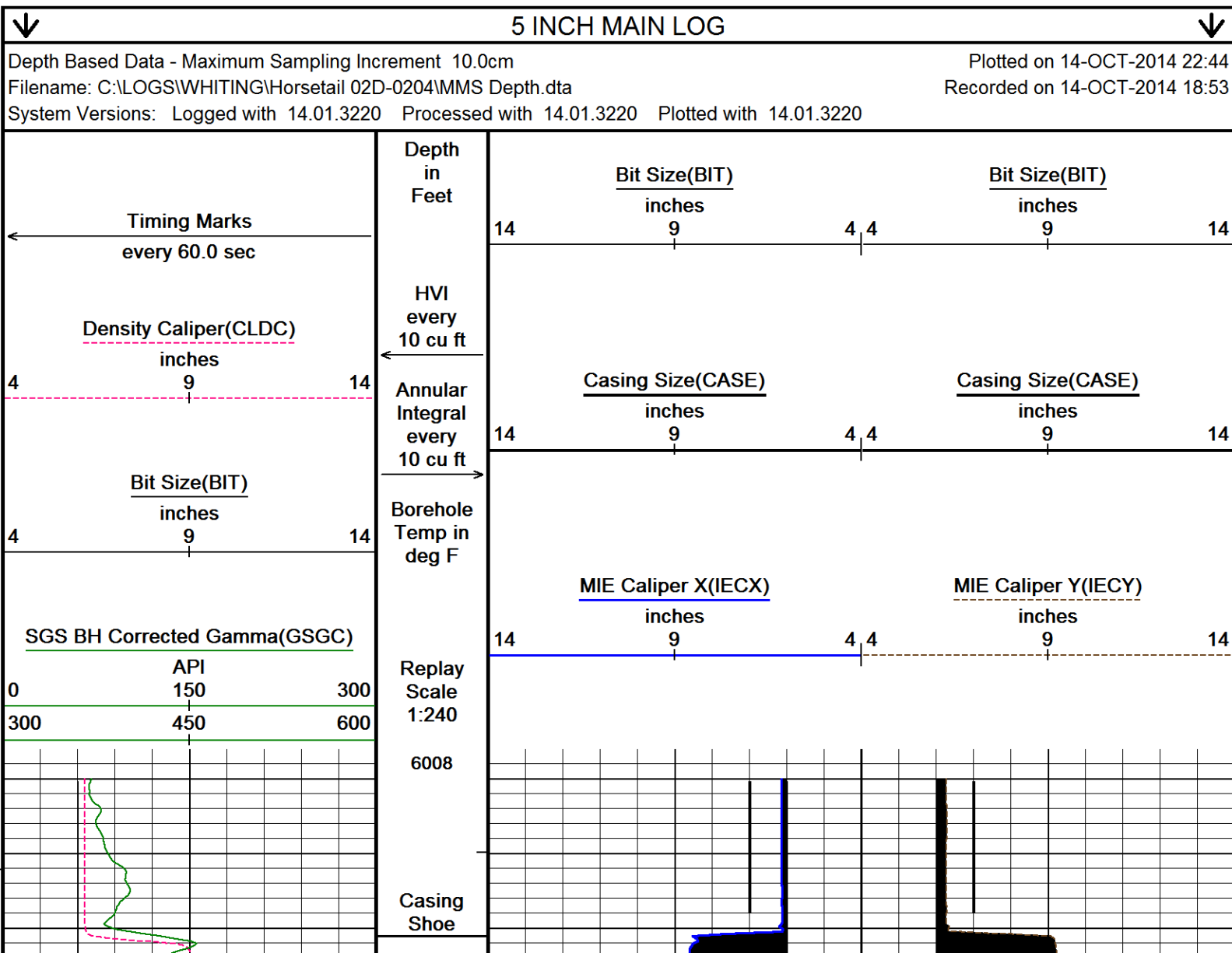
SLOWLY ROTATED LAST STAND DOWN AT 20-30 RPM TO REACH TD - EXCESSIVE STICK/SLIP LOW HOOKLOAD WHEN NOT ROTATING.

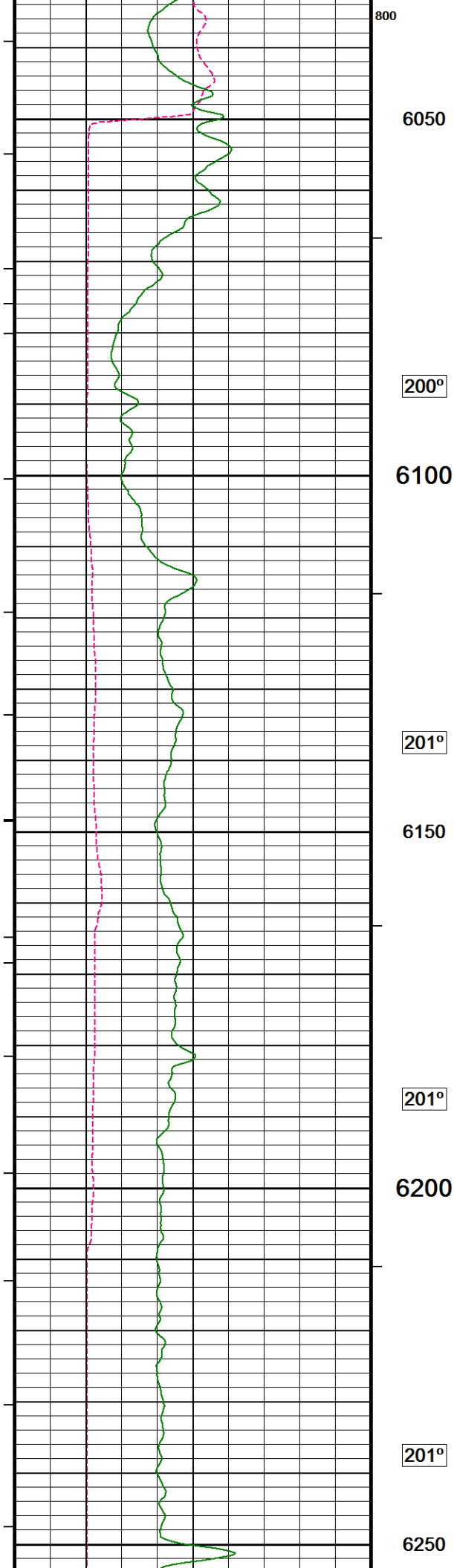
PIPE ROTATED AT 30 RPM FOR FIRST 10 STANDS DURING LOGGING RUN

OPERATORS: D.SMITH, B.GOODMAN

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.



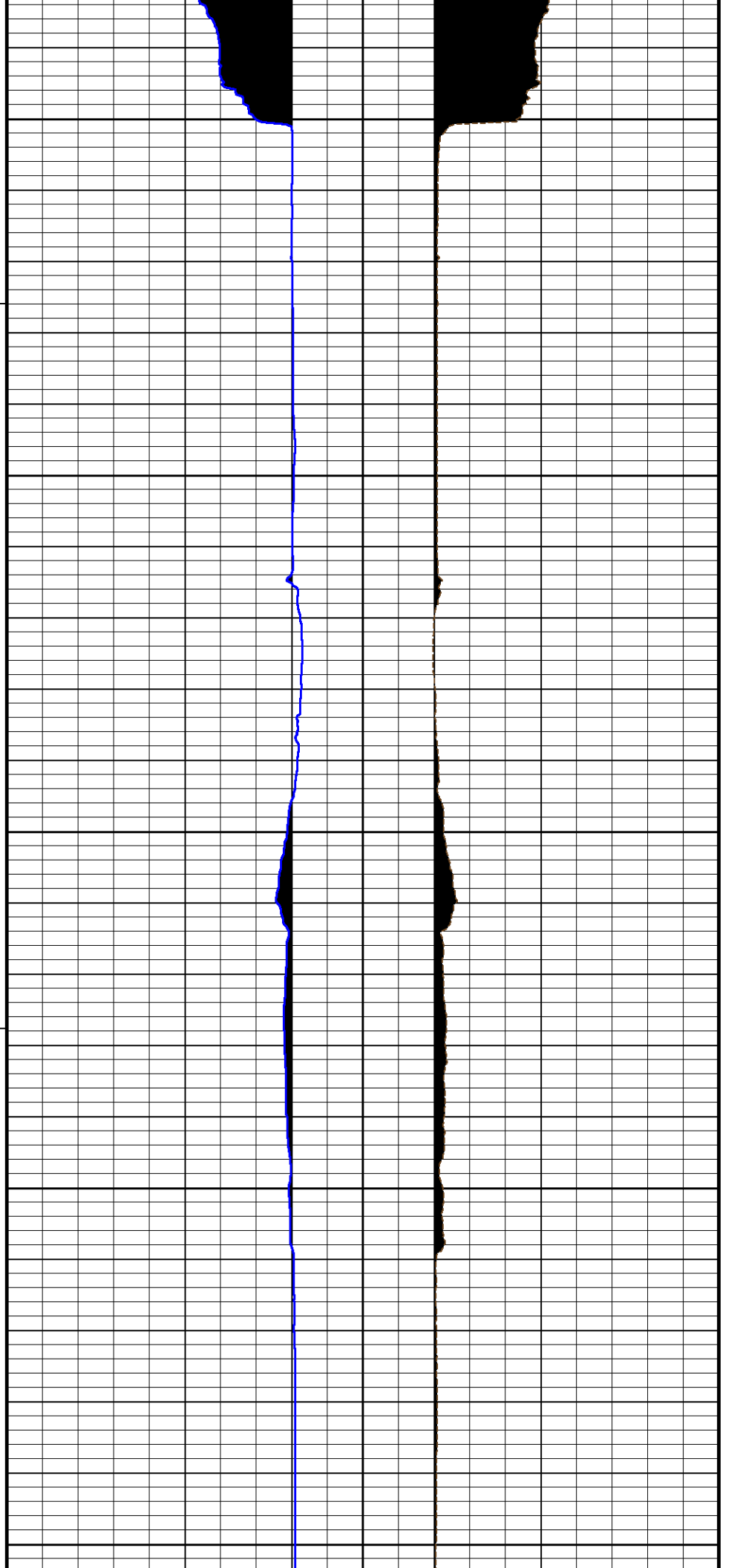


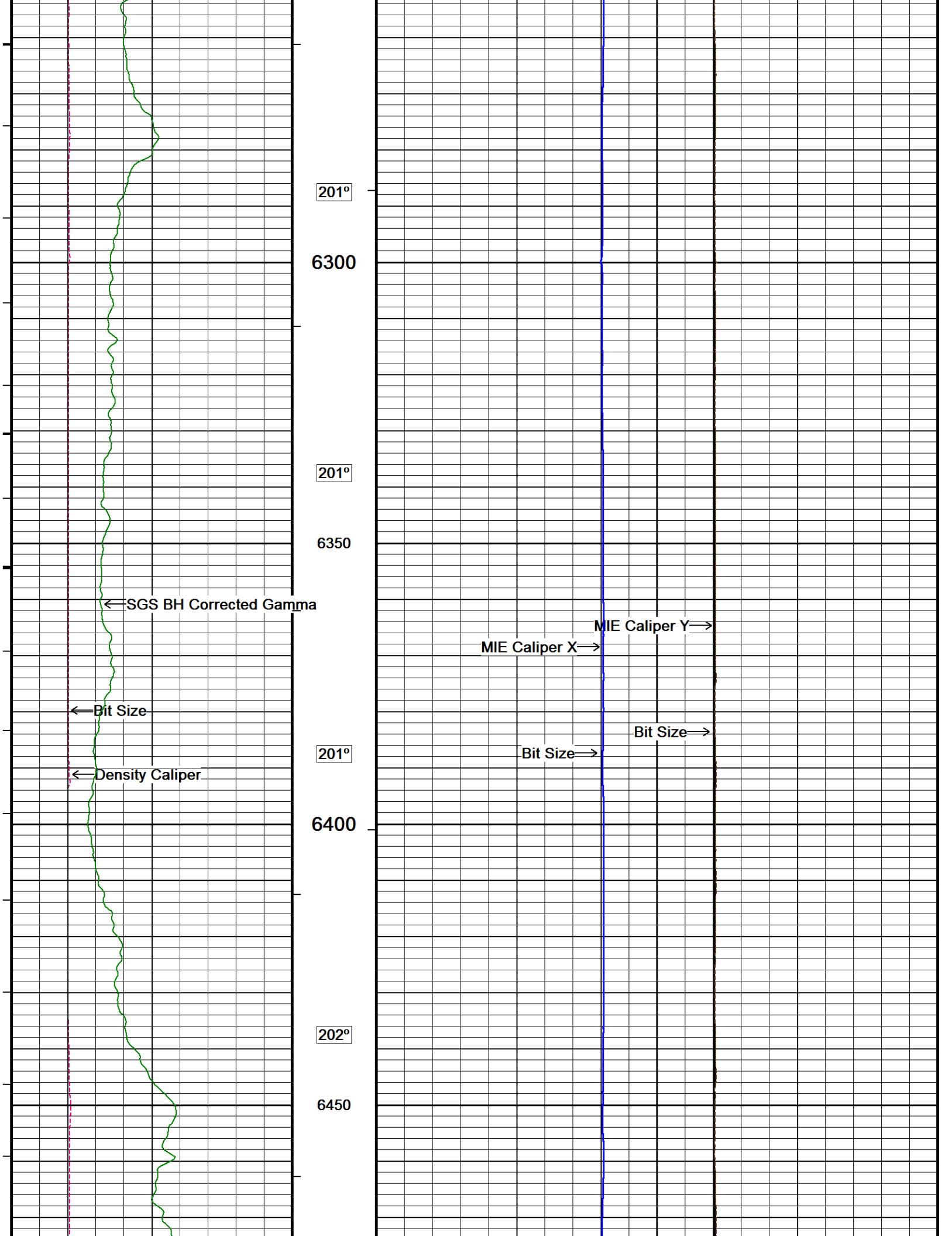
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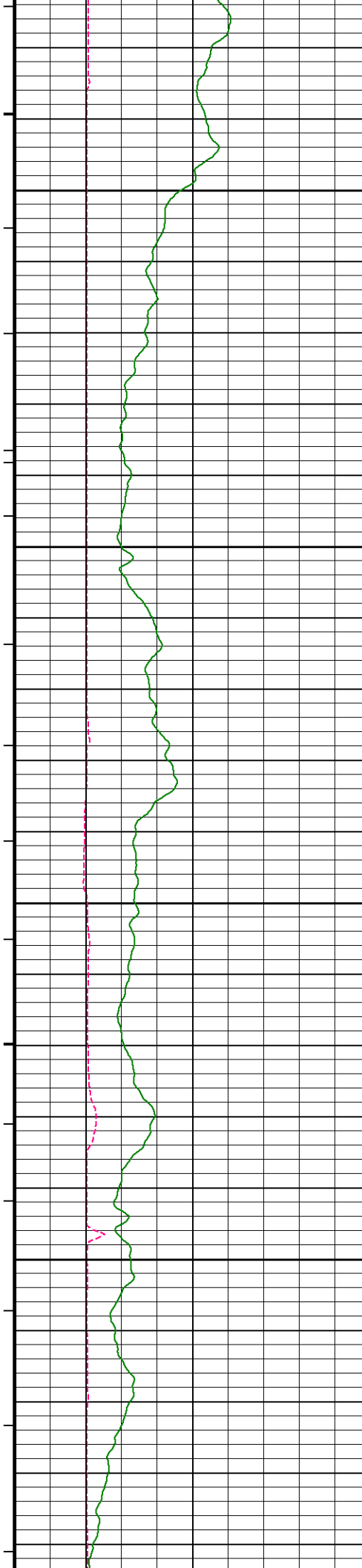
201°

201°

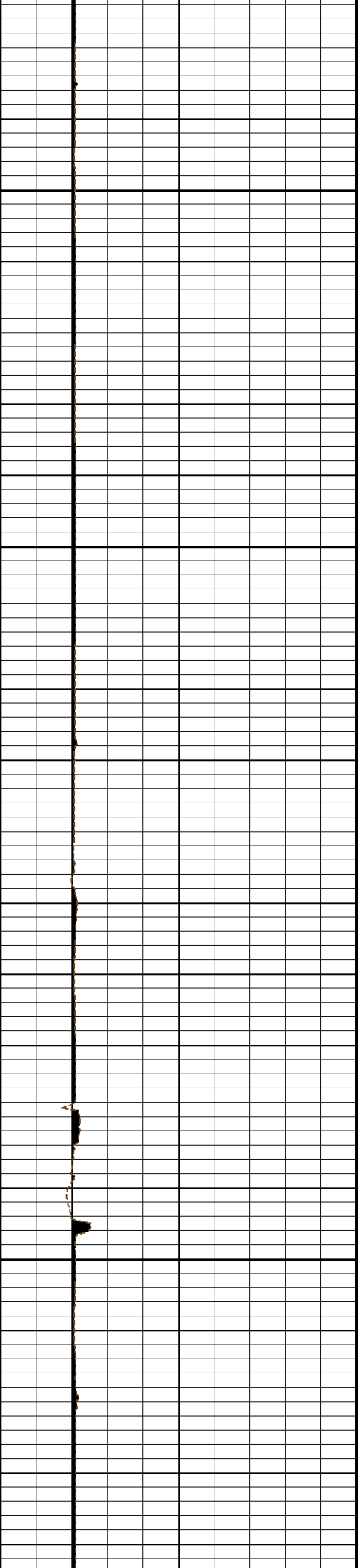
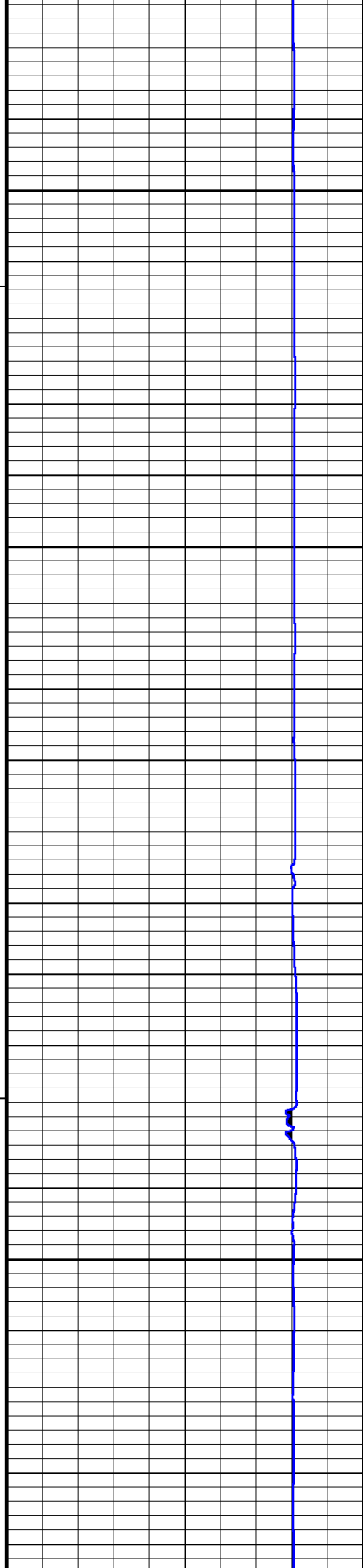
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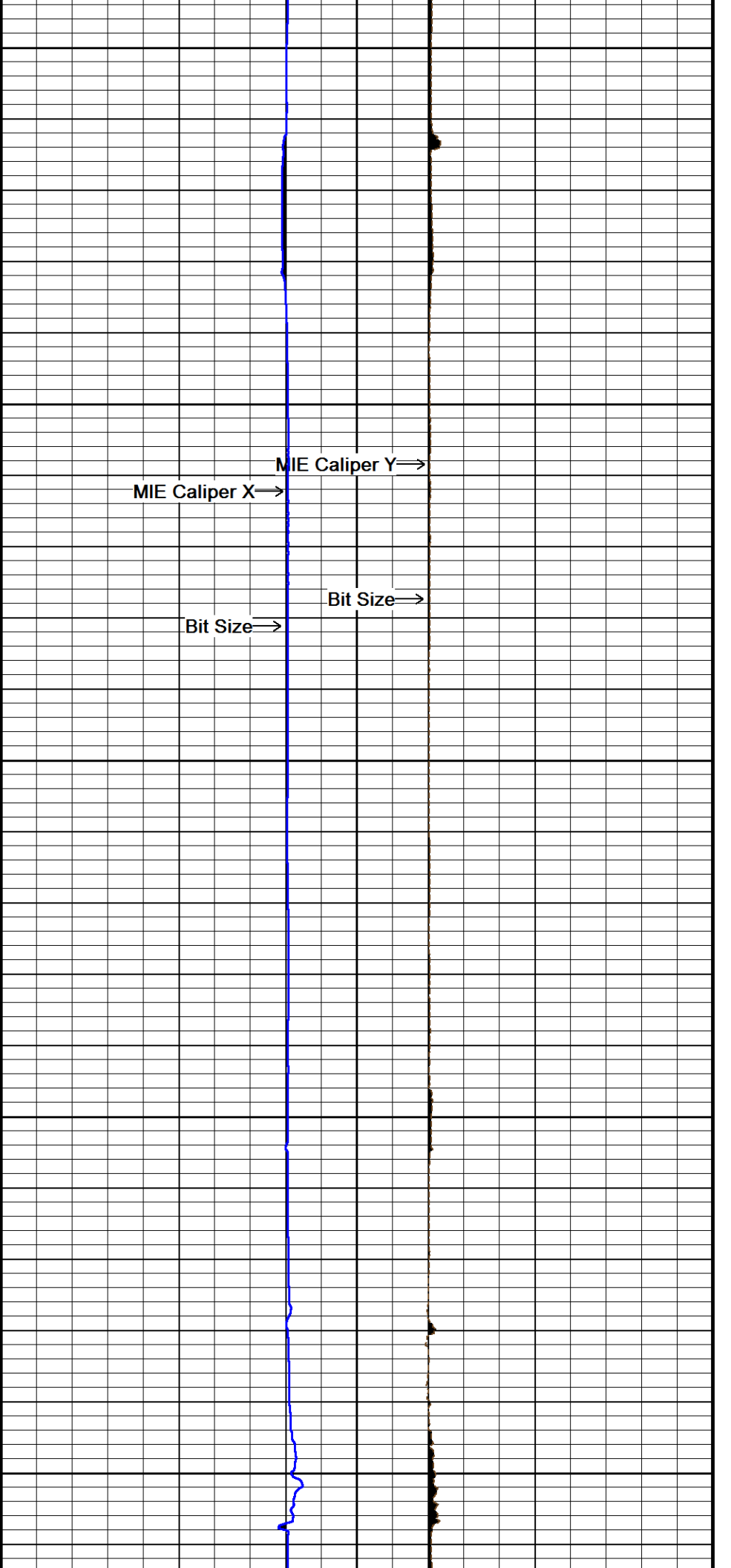
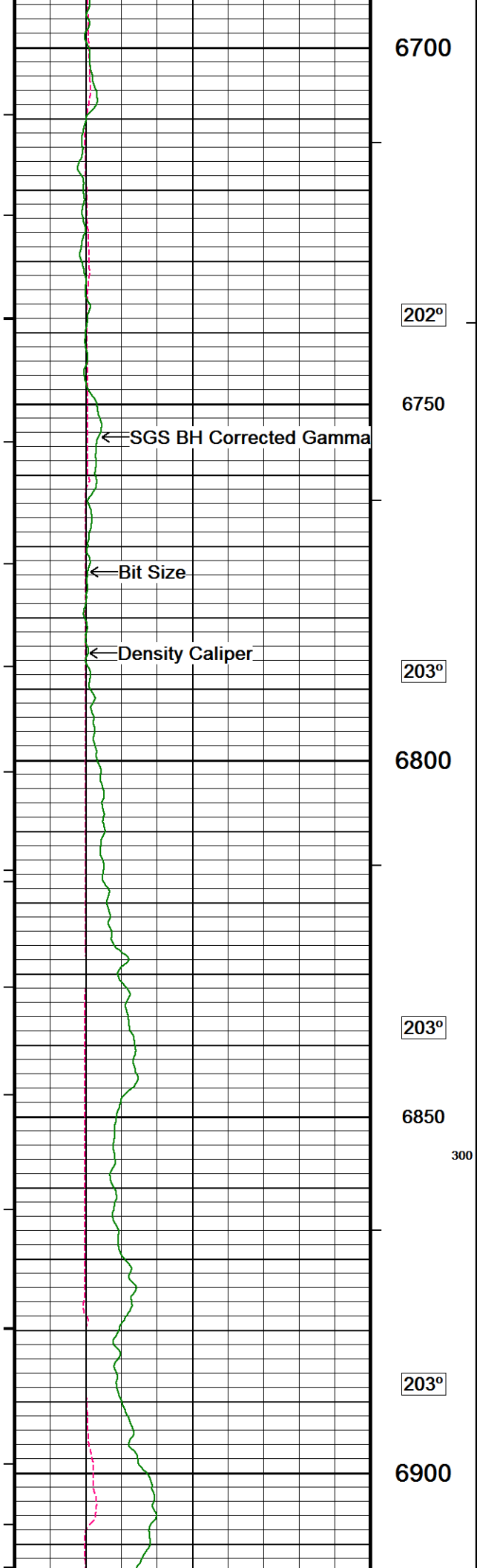


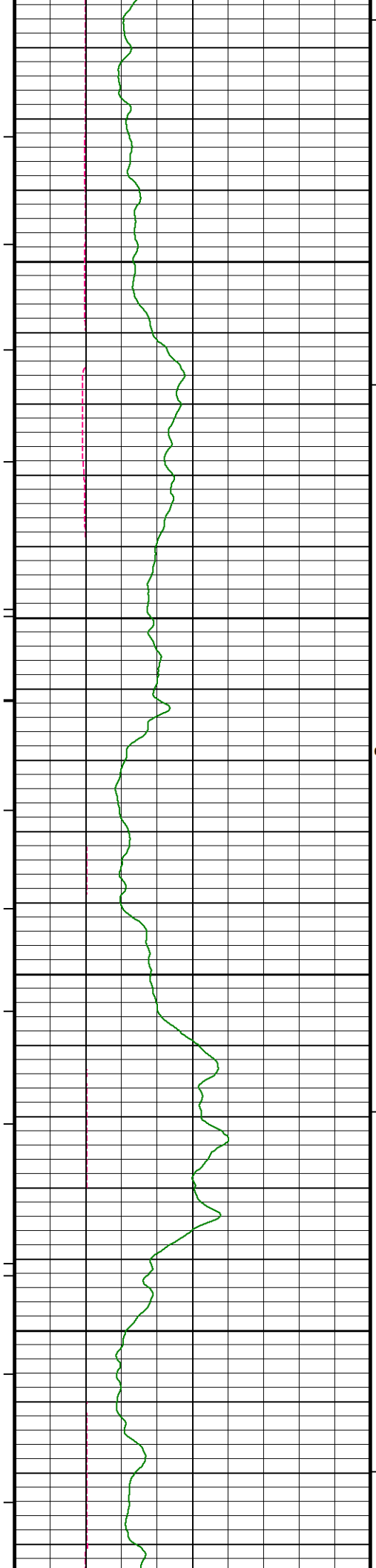




202°  
6500  
700  
202°  
6550  
202°  
6600  
202°  
6650  
202°







203°

6950

203°

7000

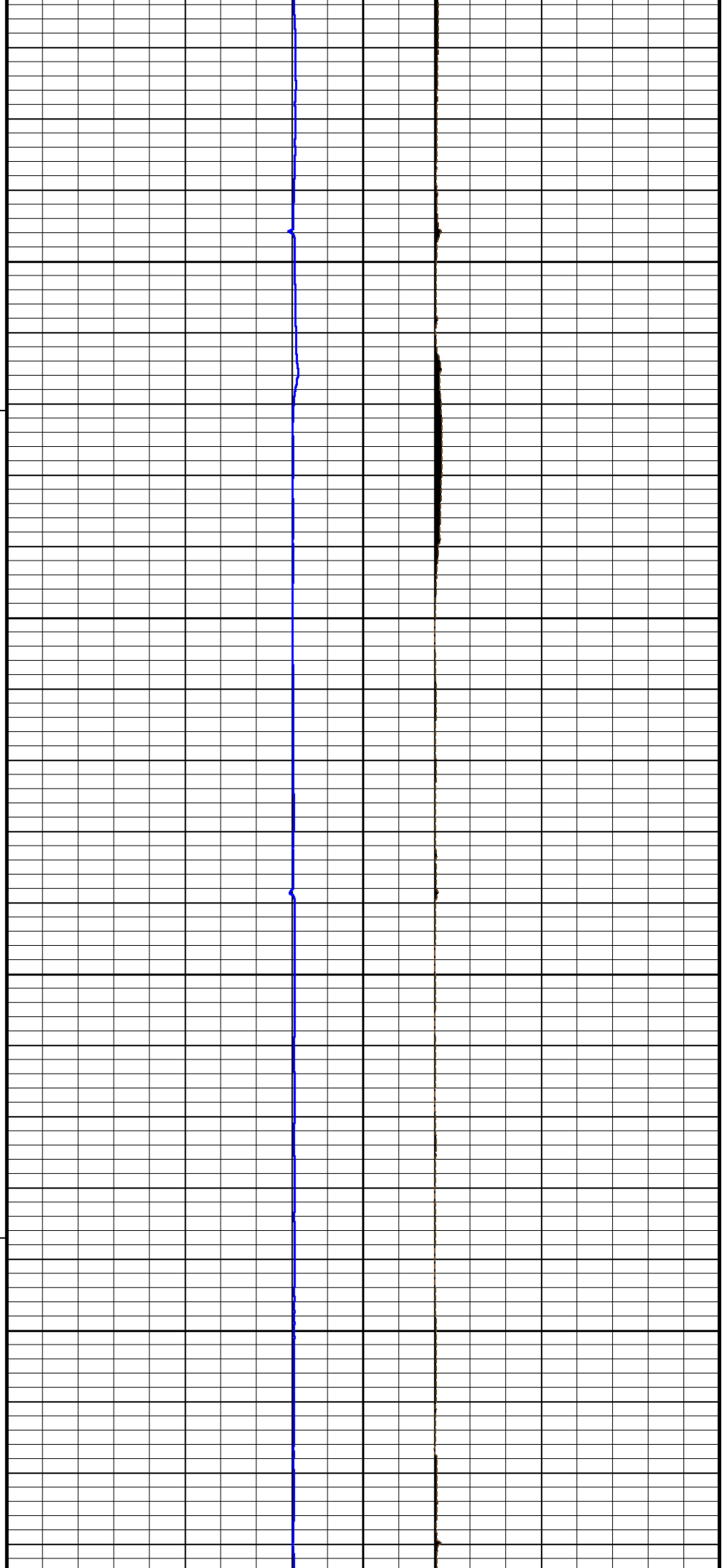
600

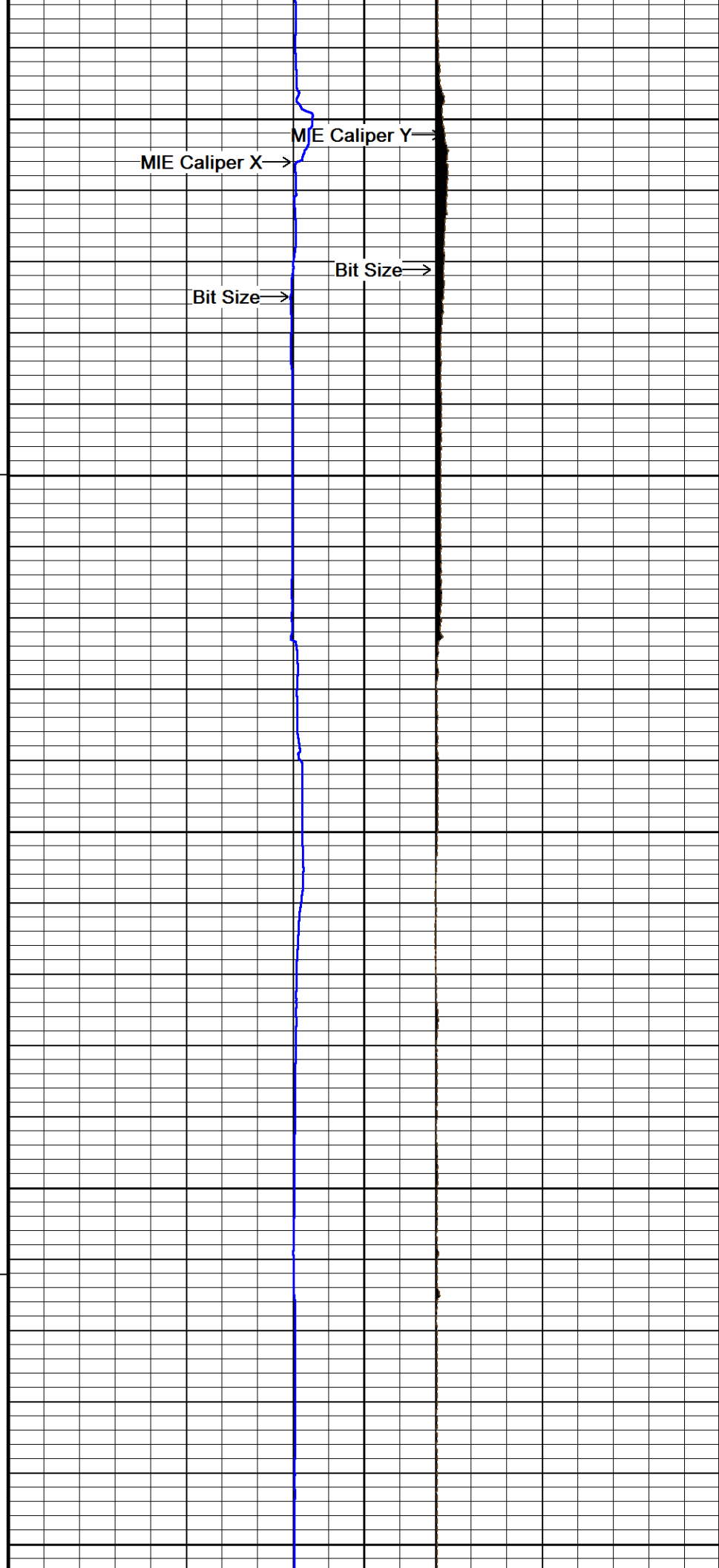
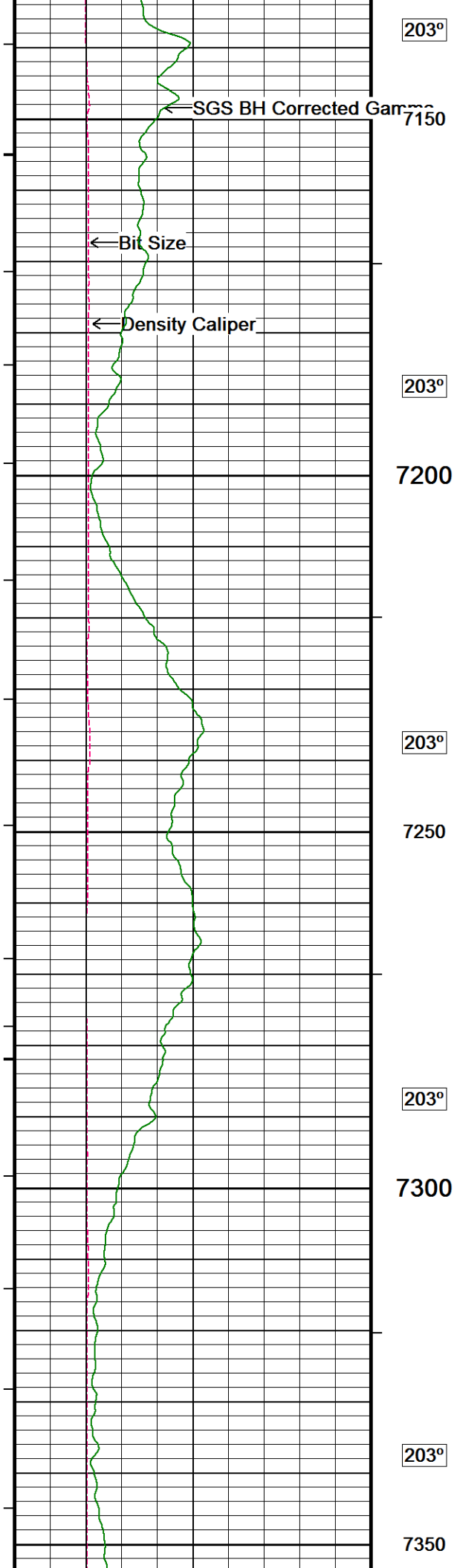
203°

7050

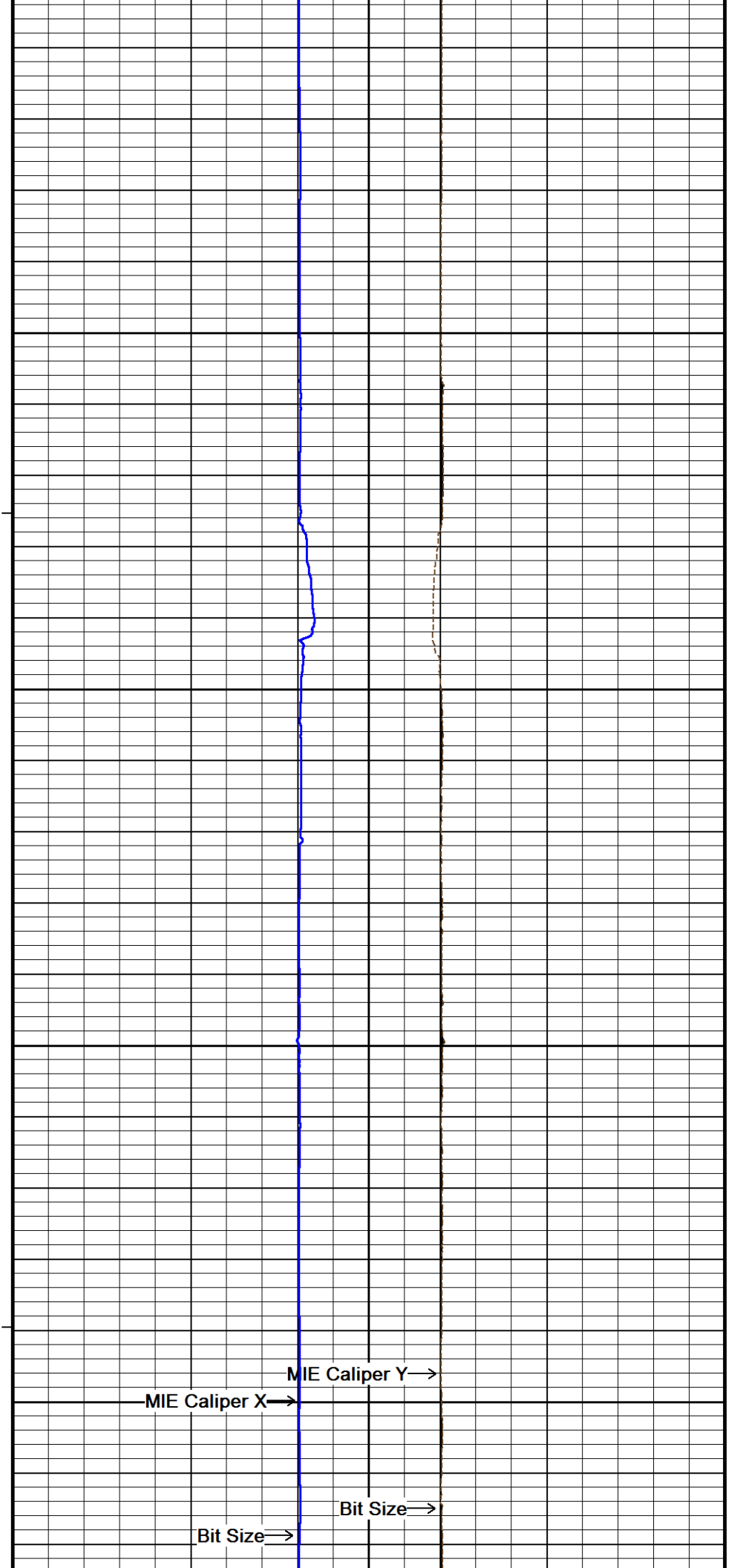
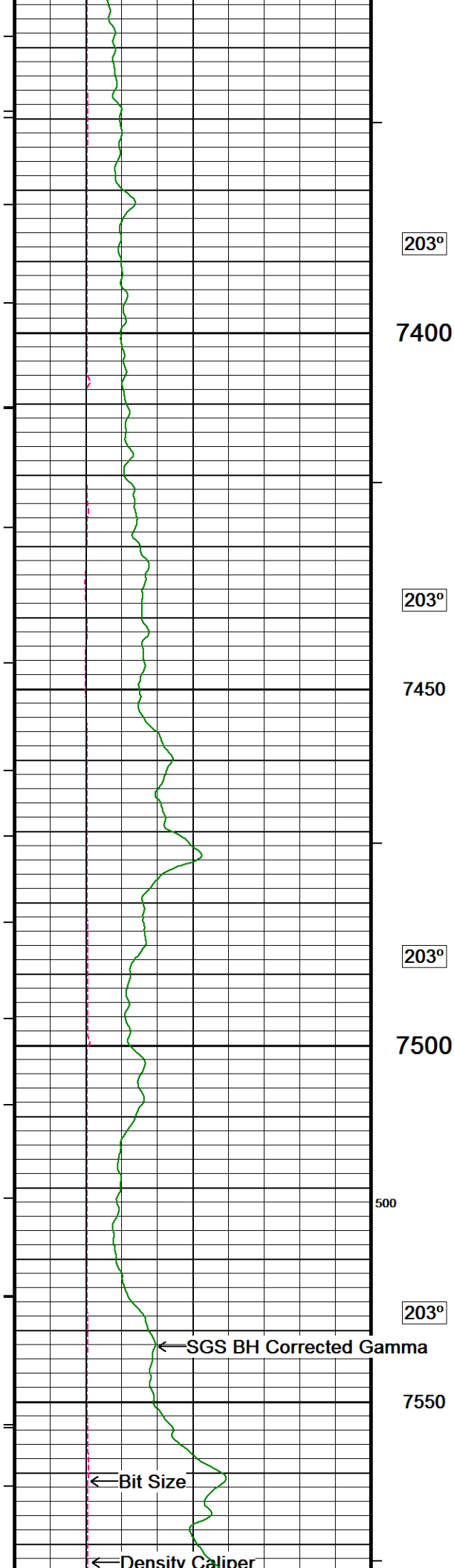
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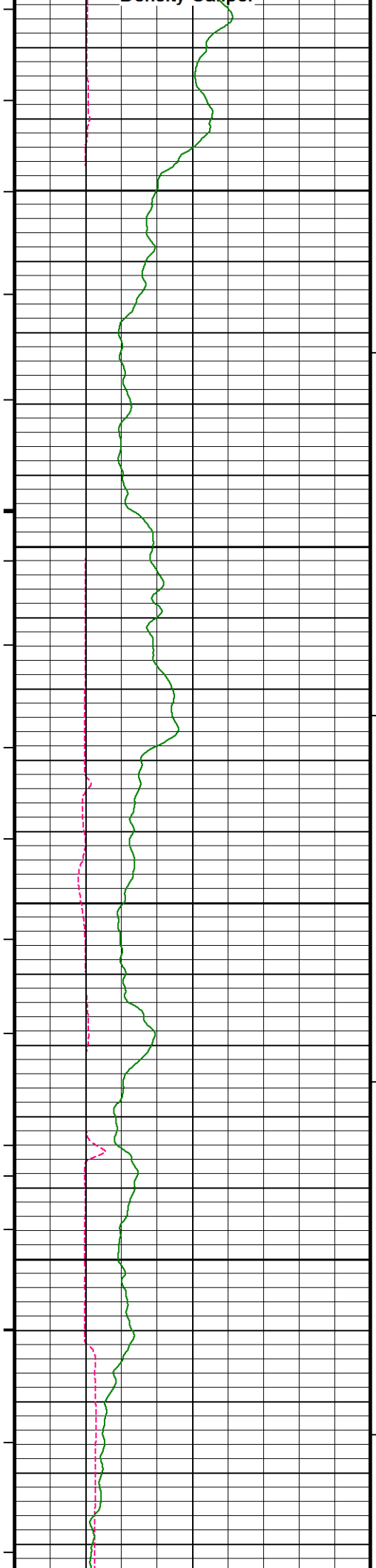
7100











203°

7600

203°

7650

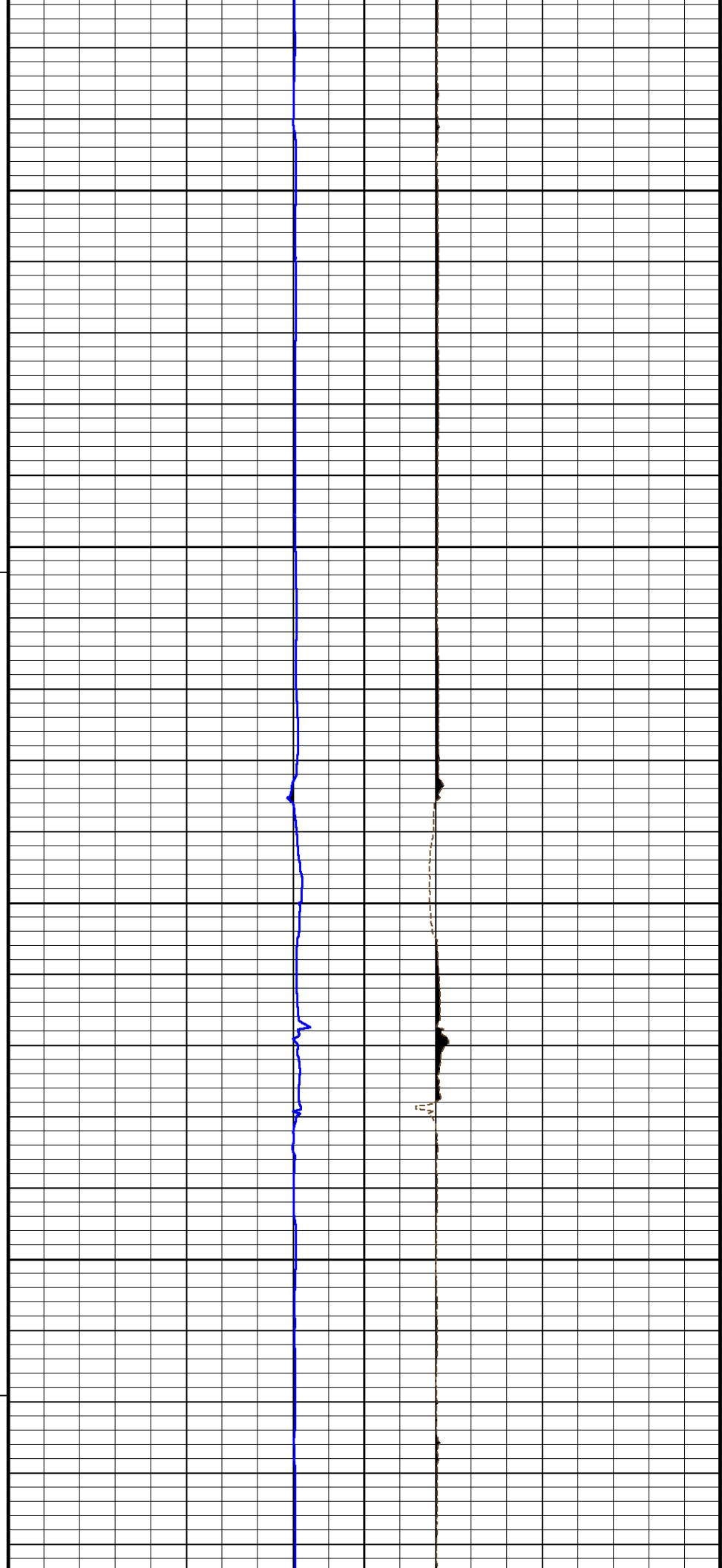
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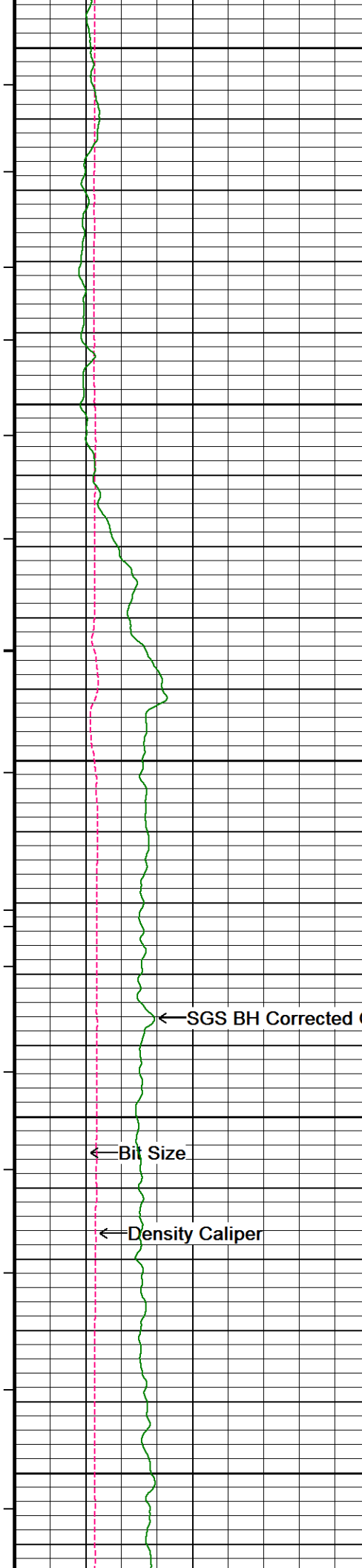
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203°

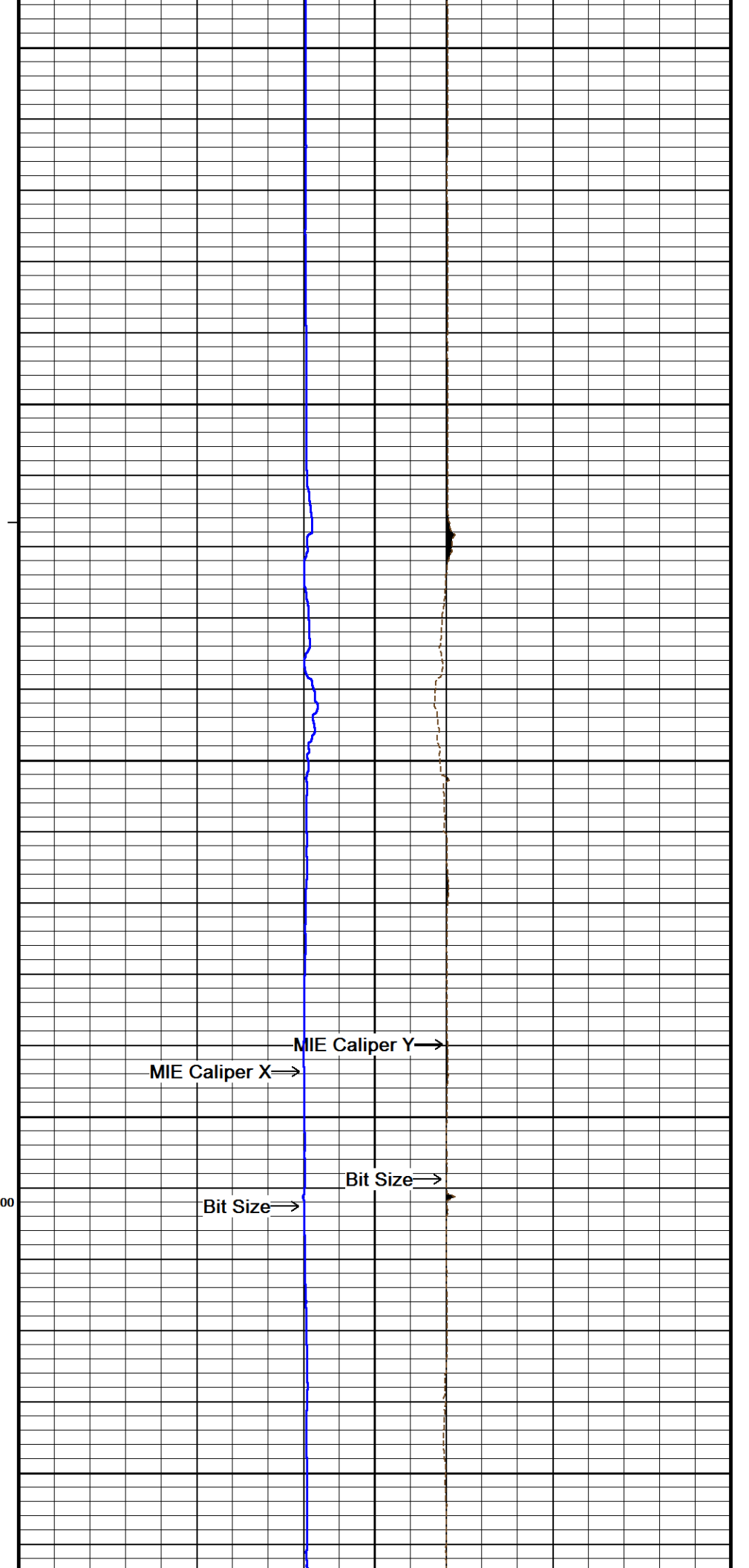
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203°

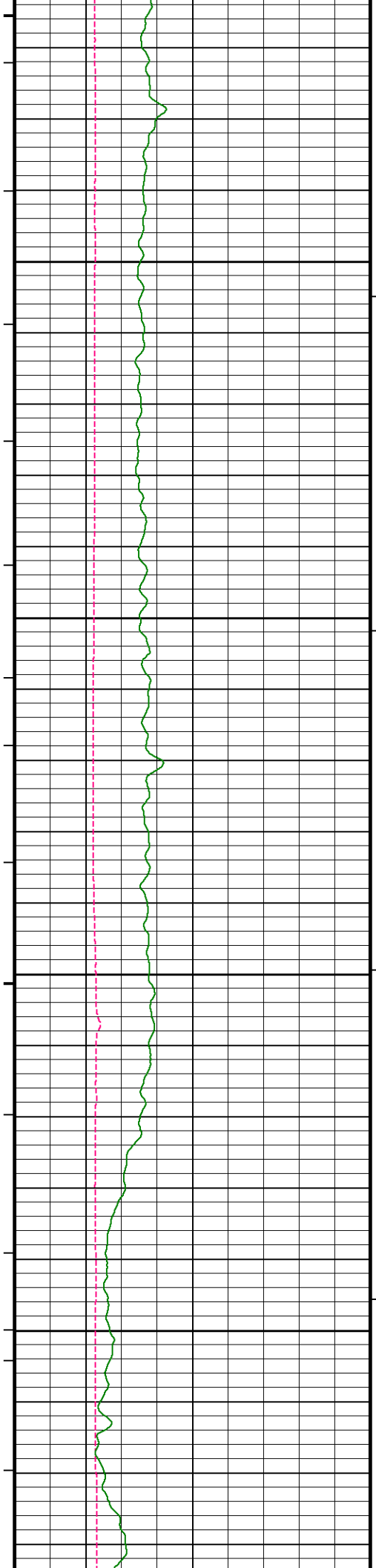




7800  
203°  
7850  
203°  
7900  
203°  
← SGS BH Corrected Gamma  
203°  
7950  
200  
203°  
8000  
400



MIE Caliper X  
MIE Caliper Y  
Bit Size  
Bit Size



203°

8050

203°

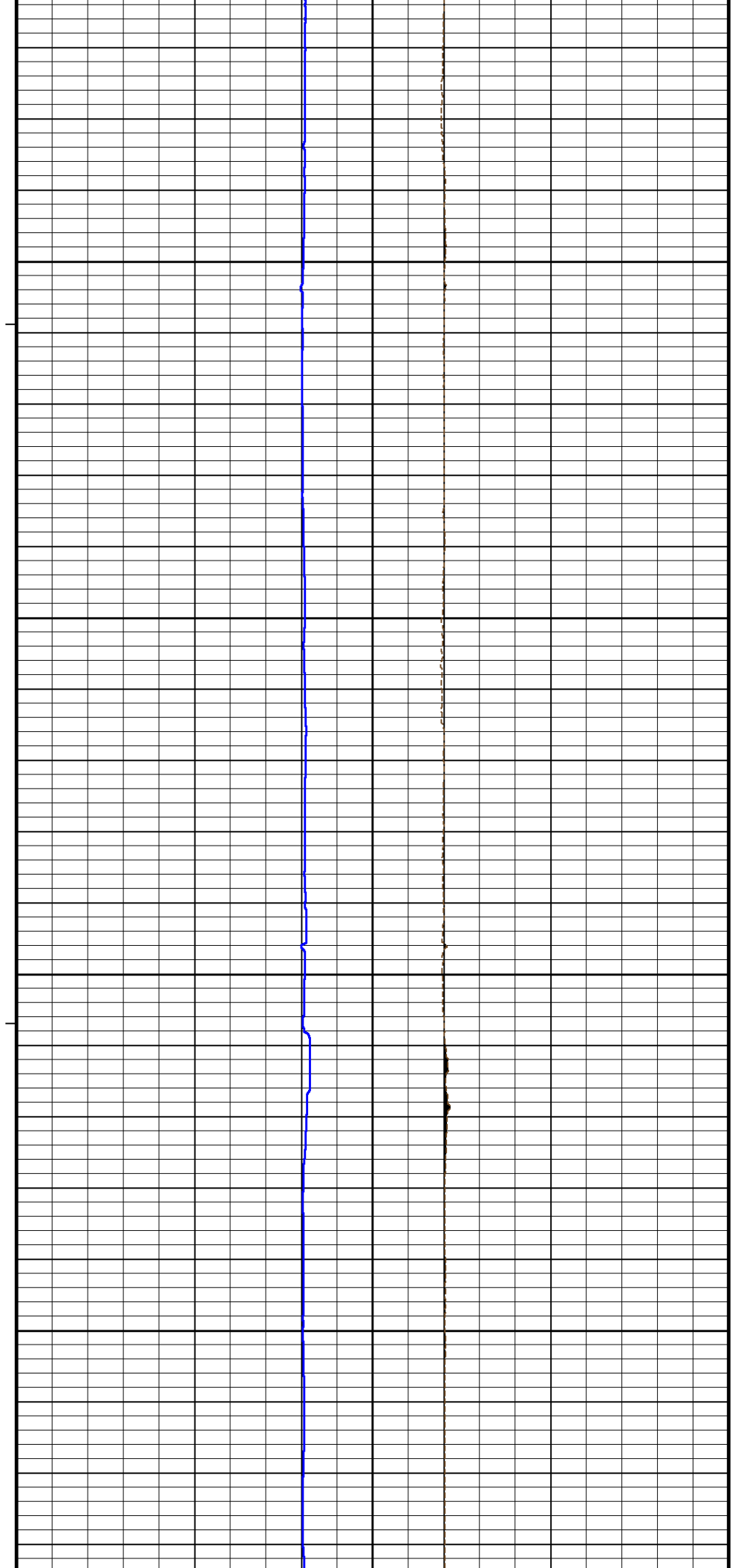
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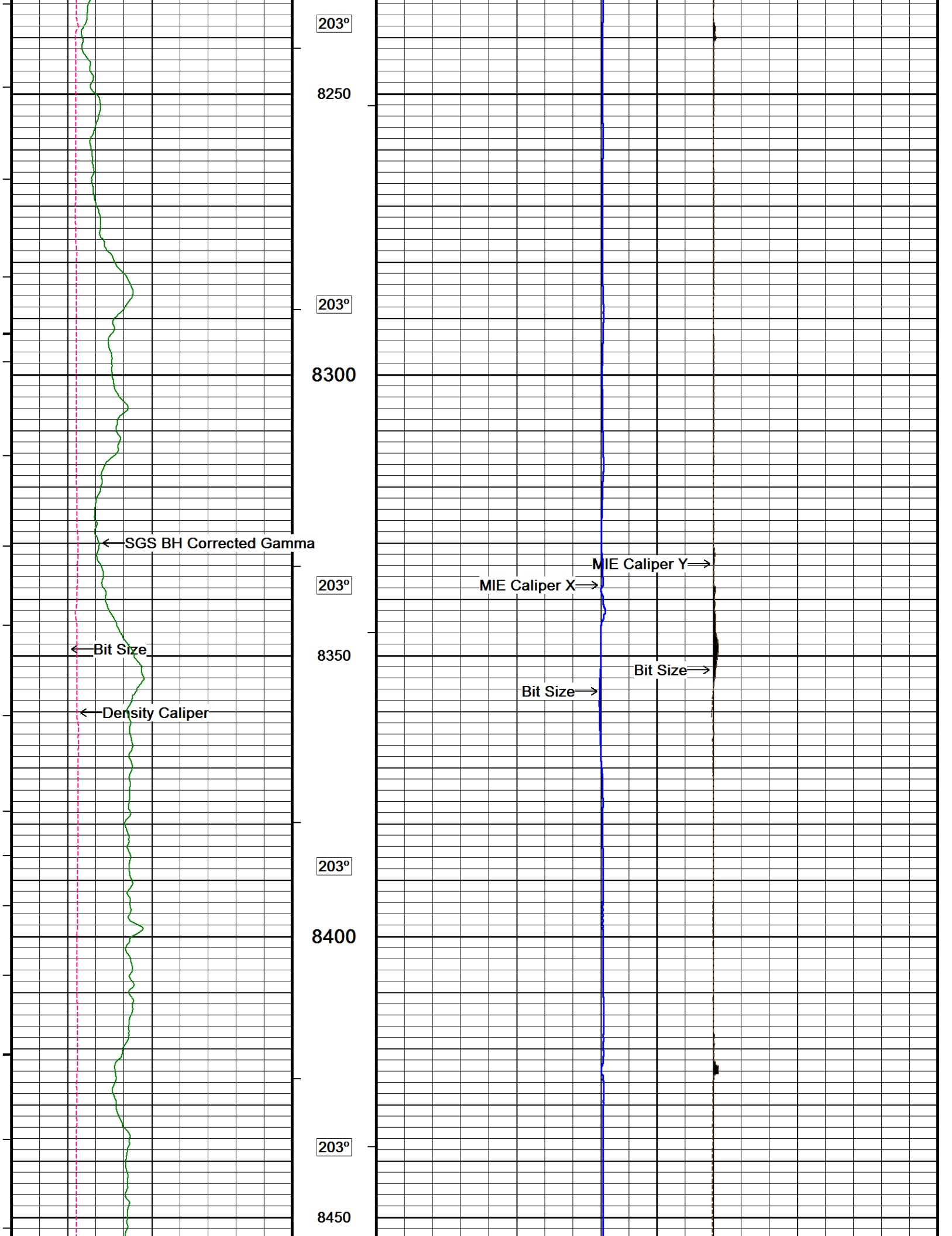
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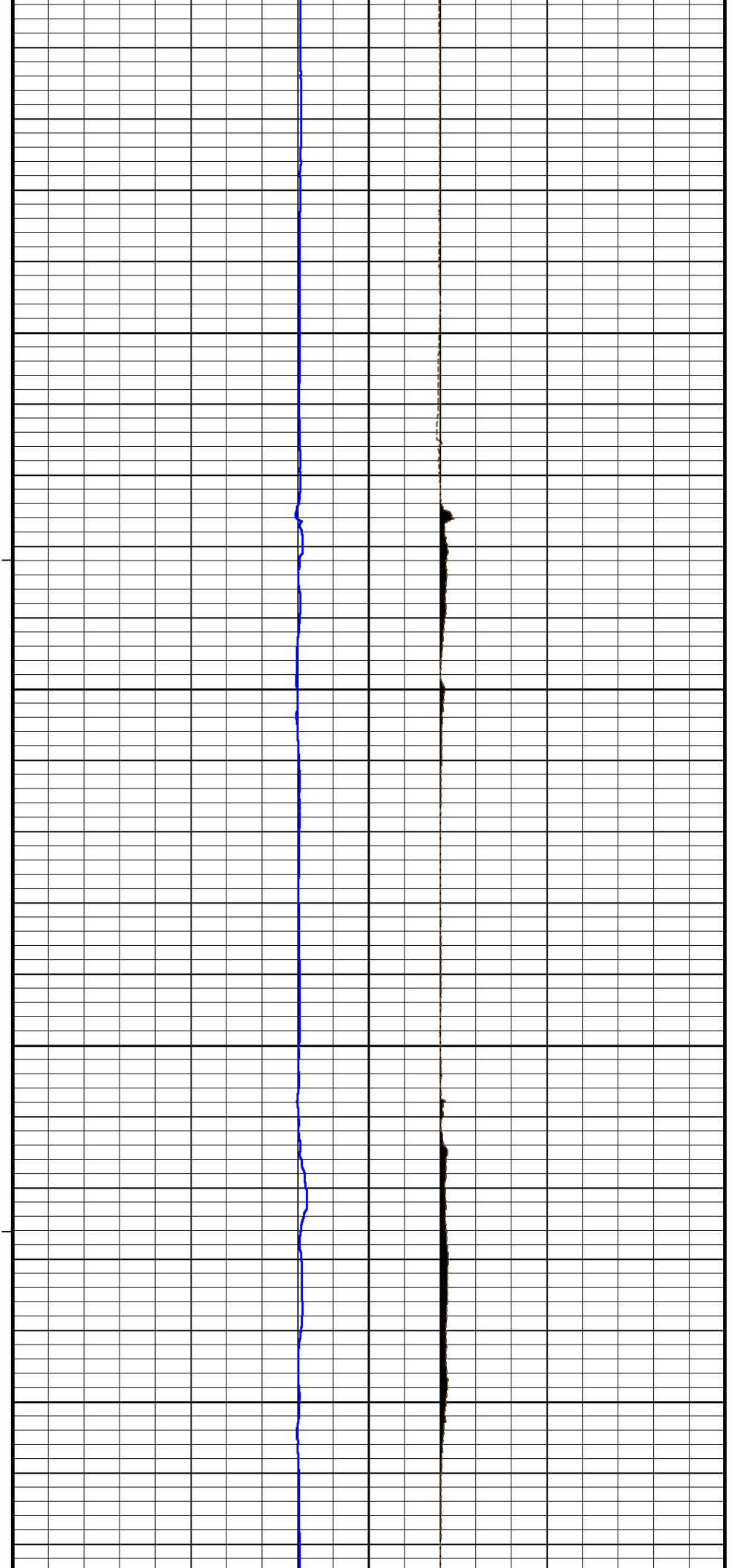
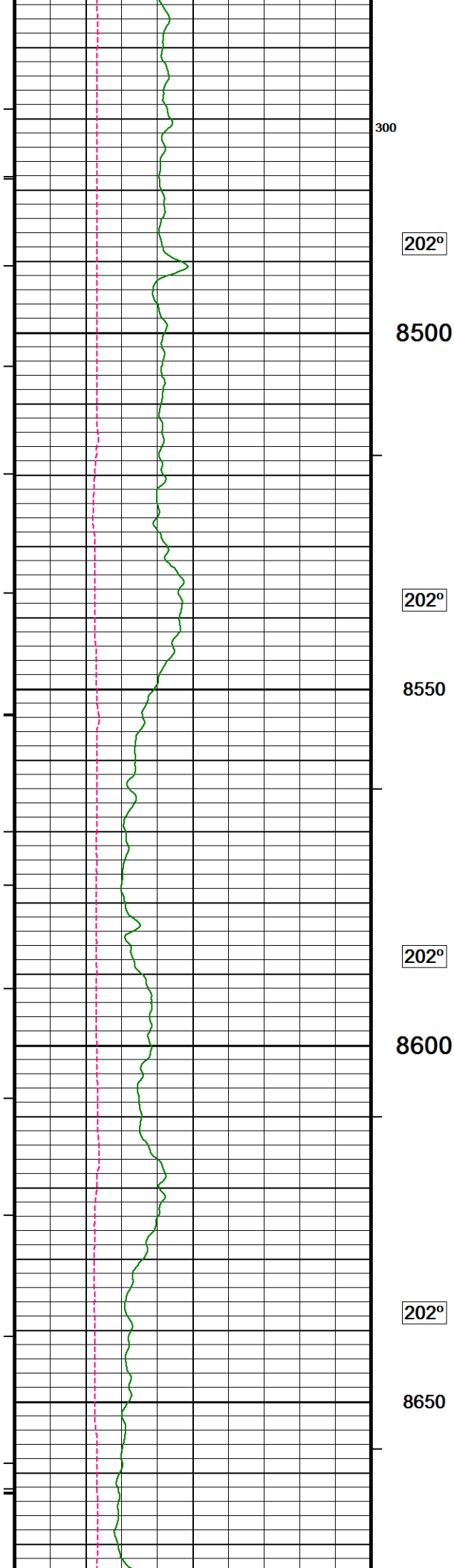
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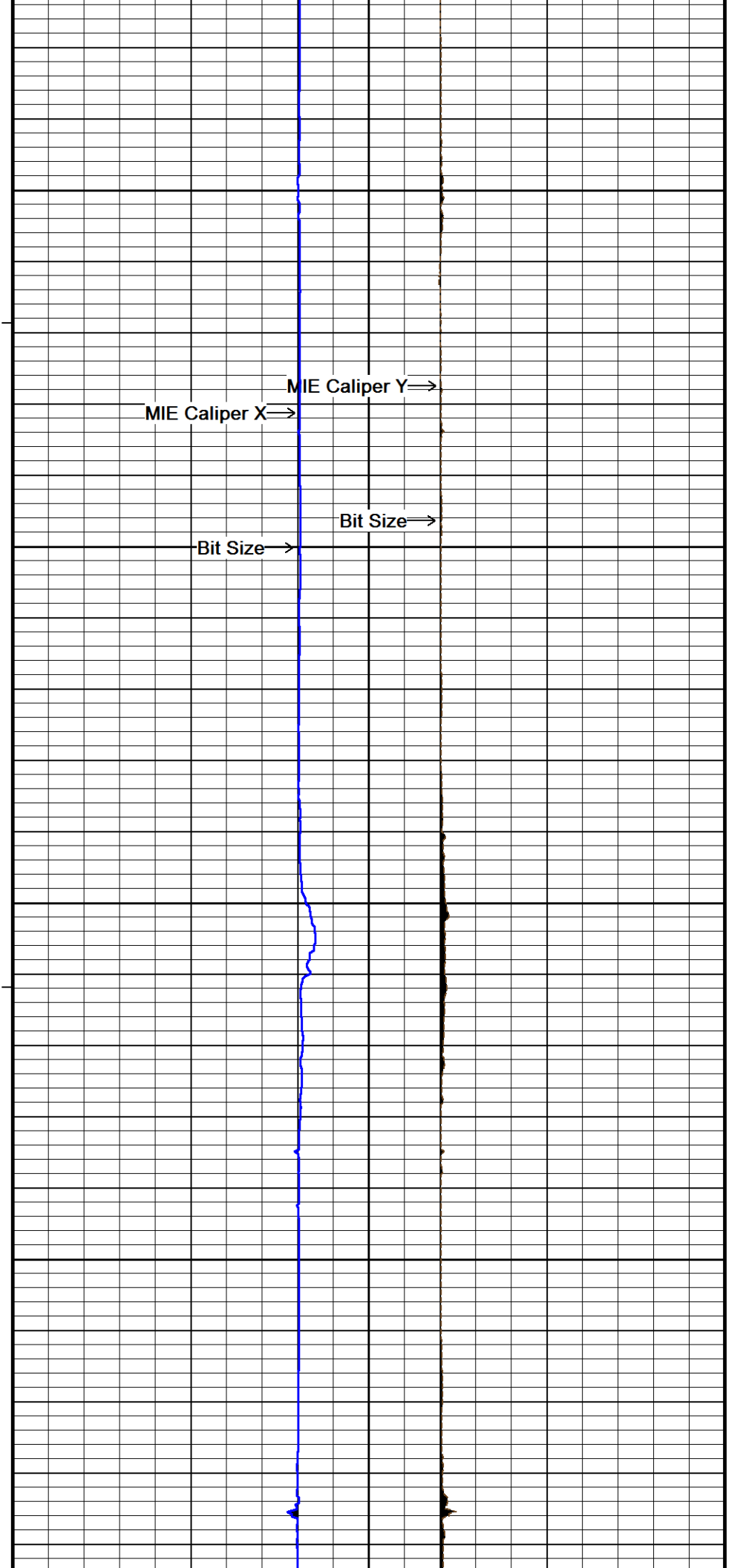
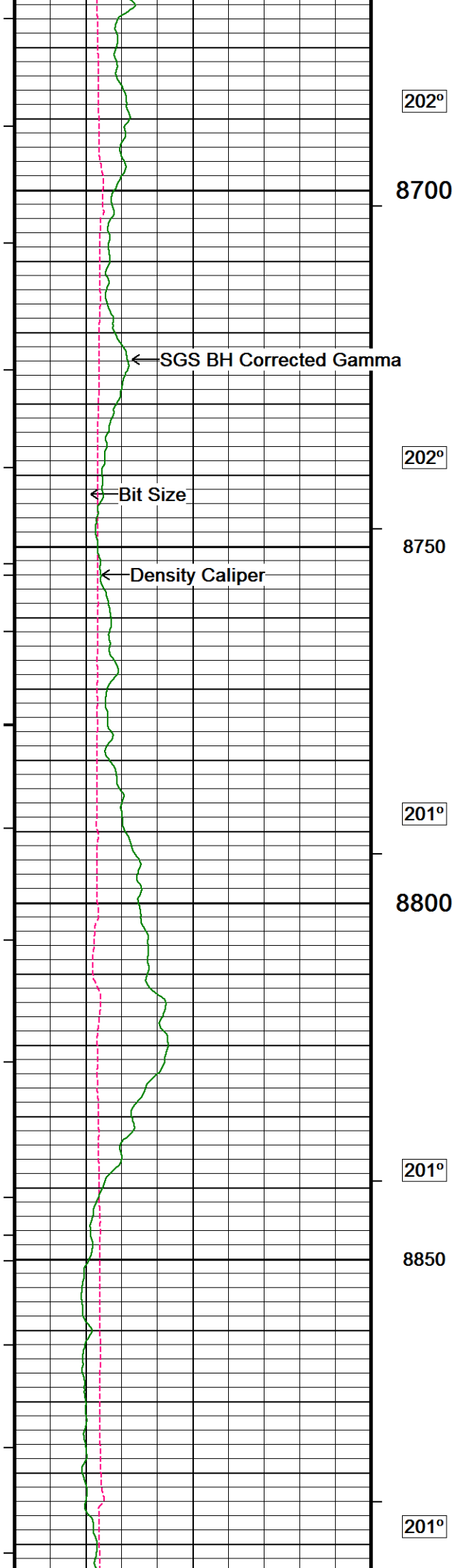
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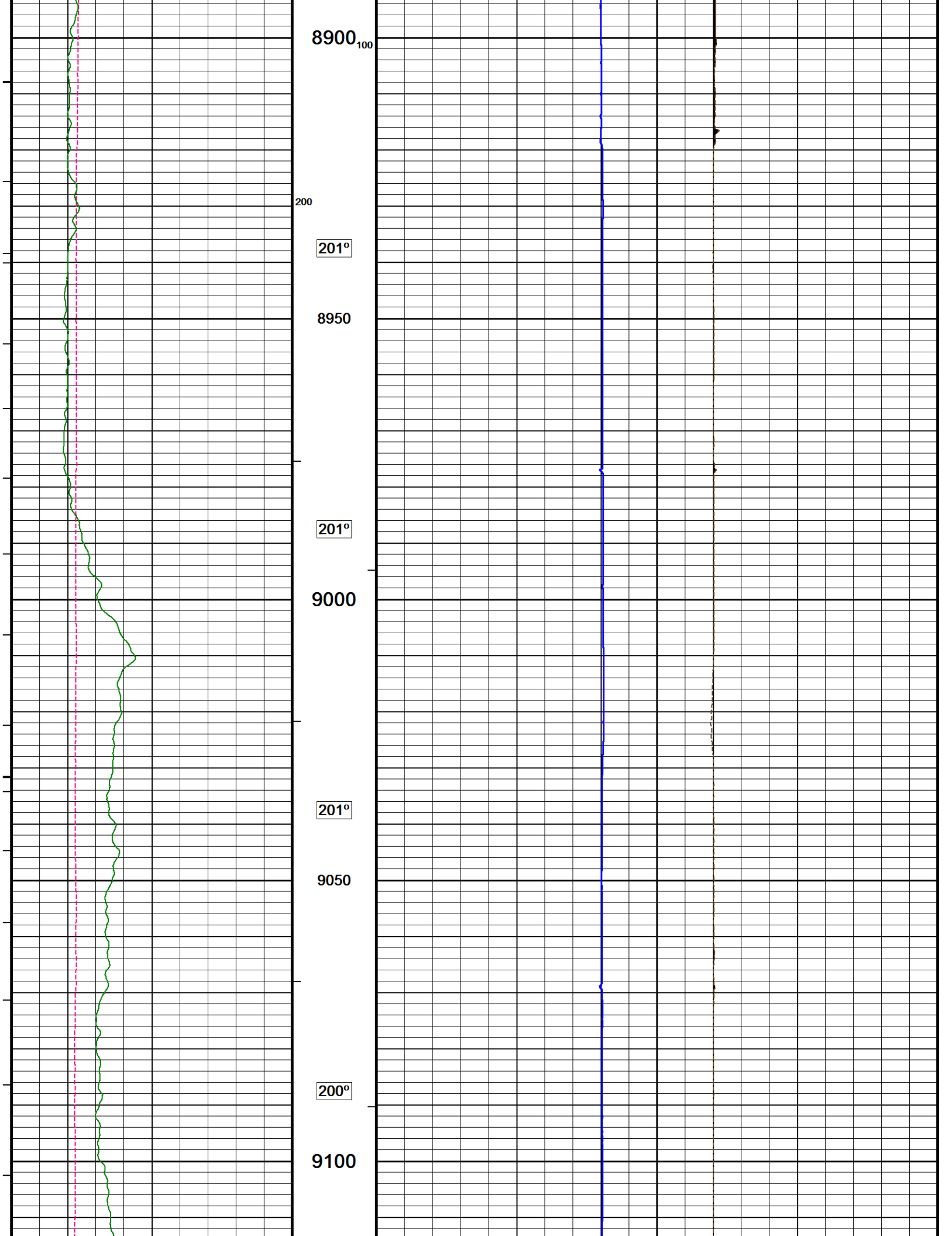
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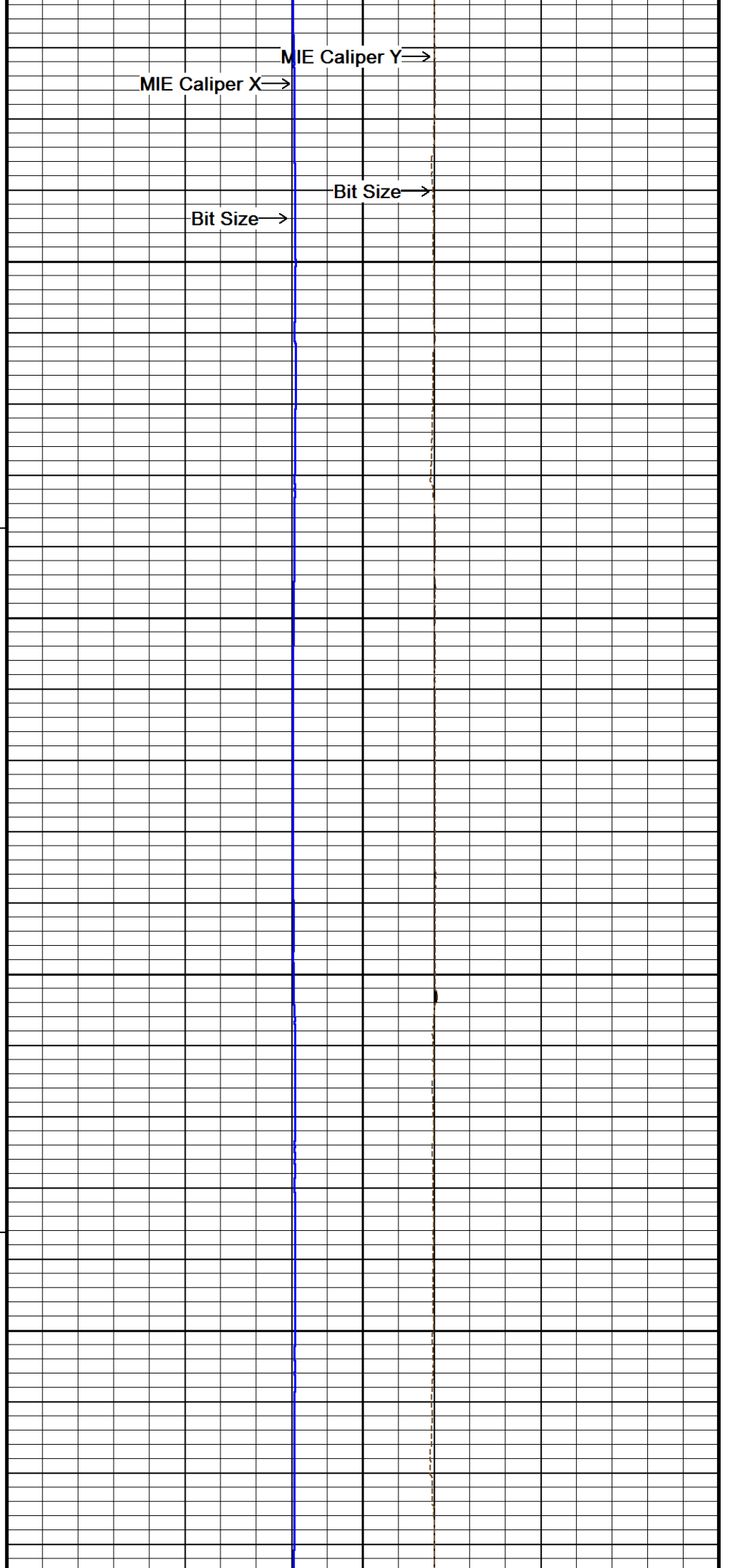
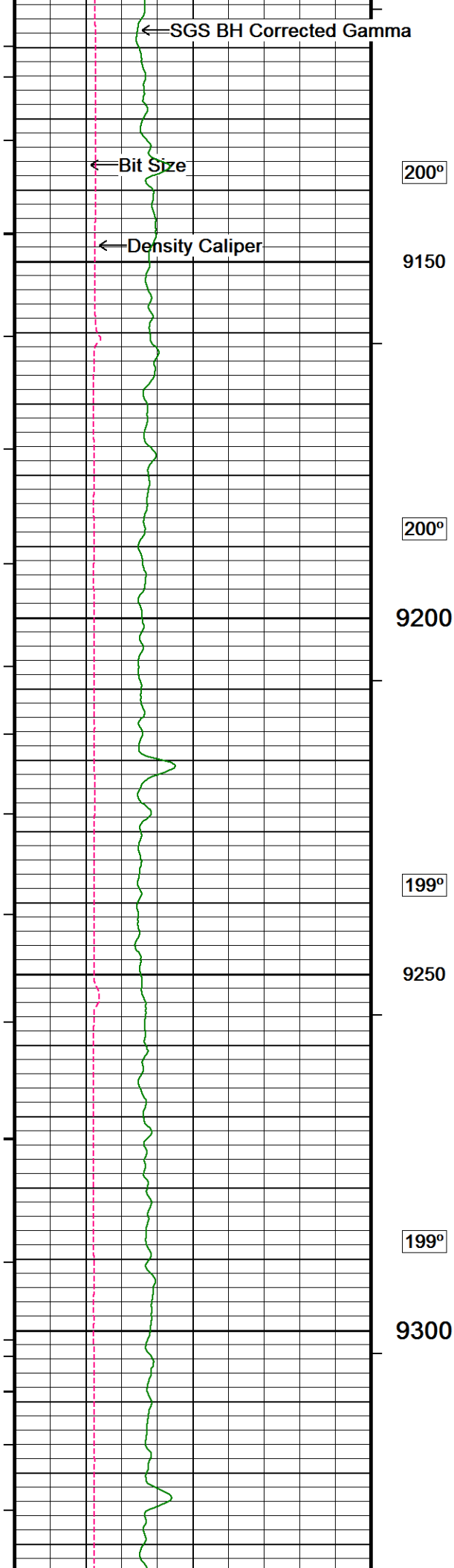


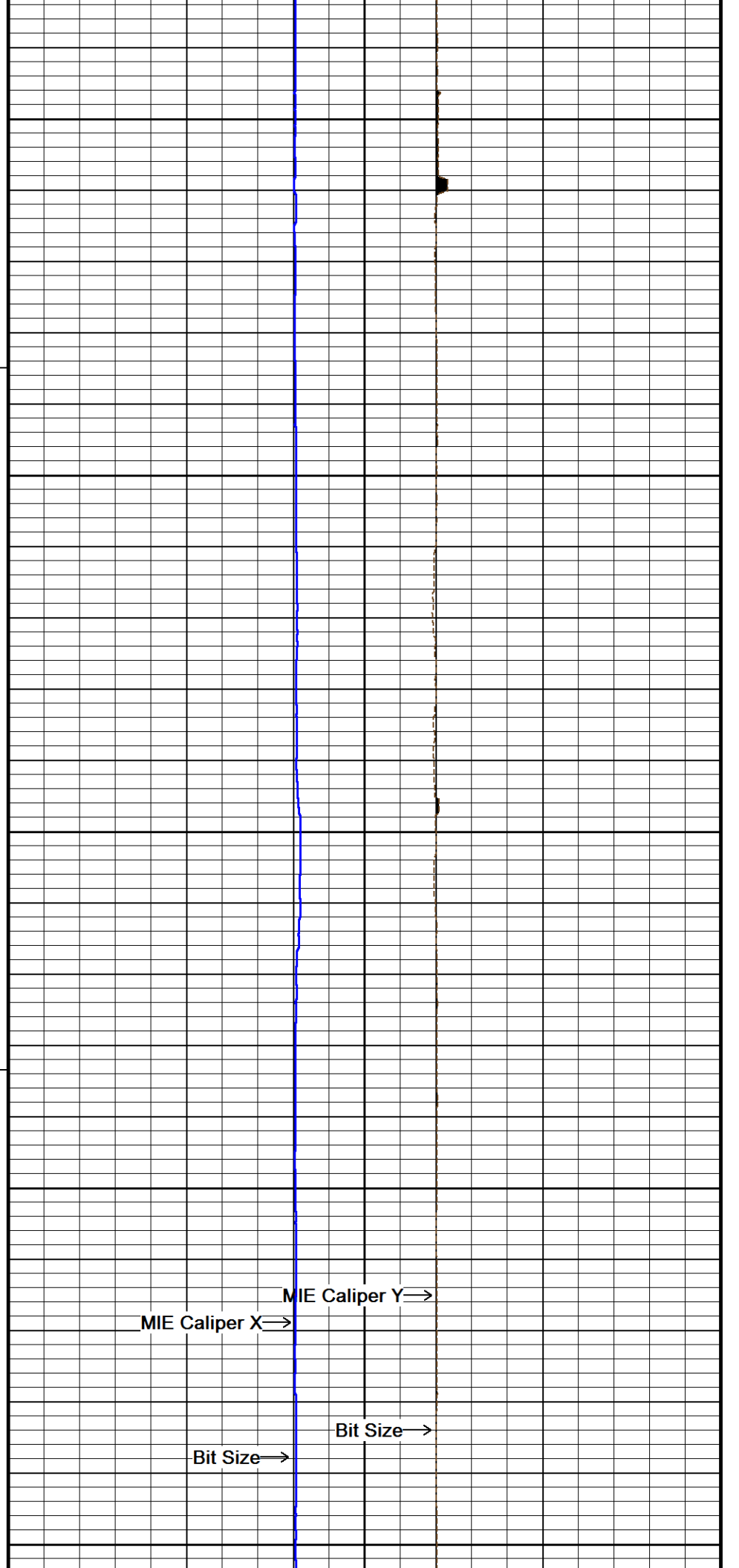
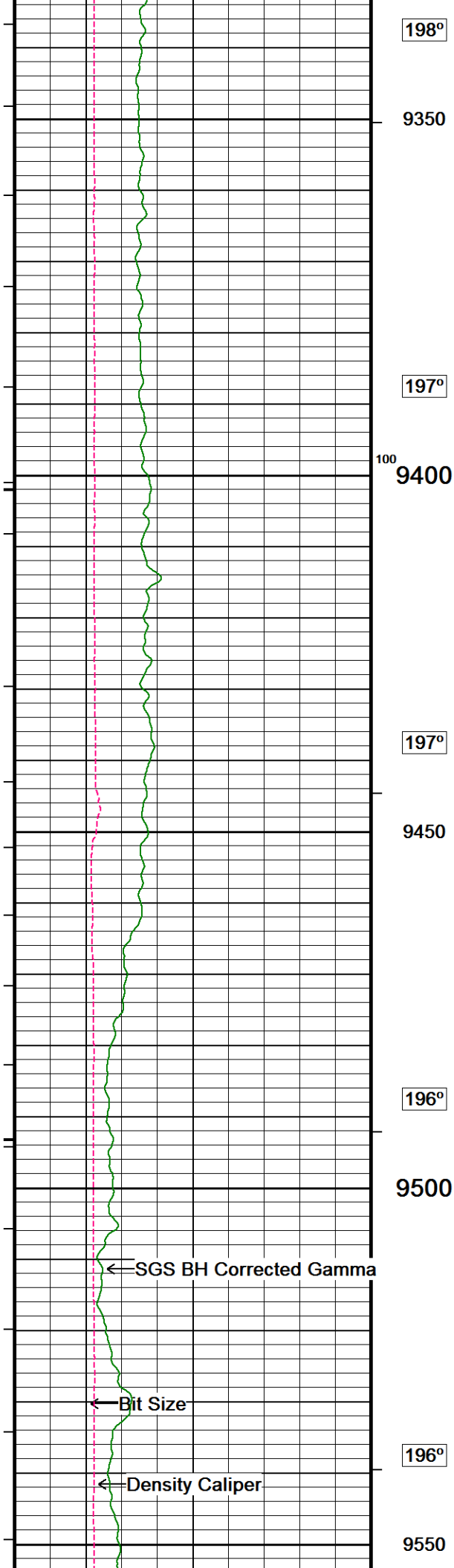


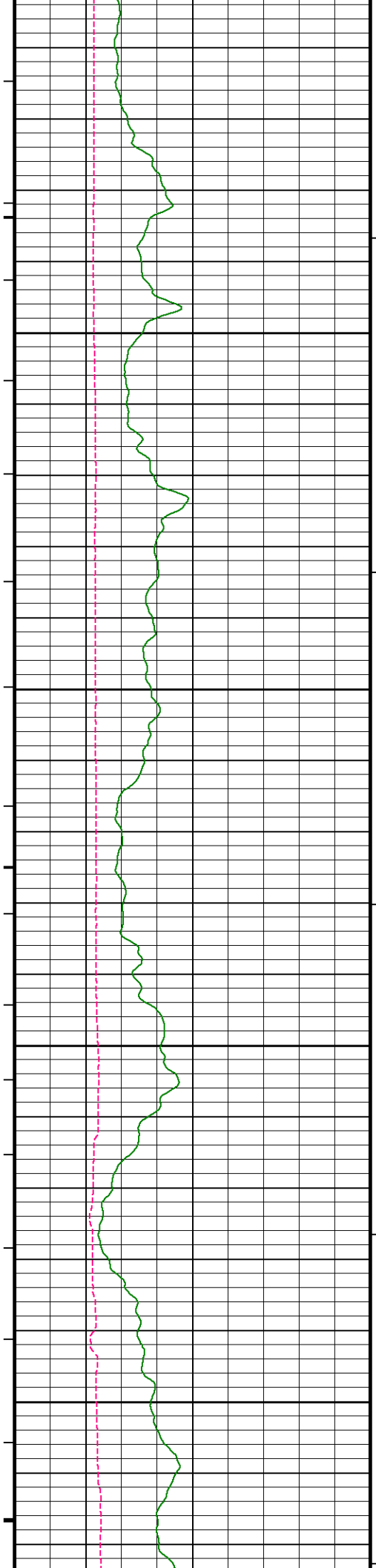




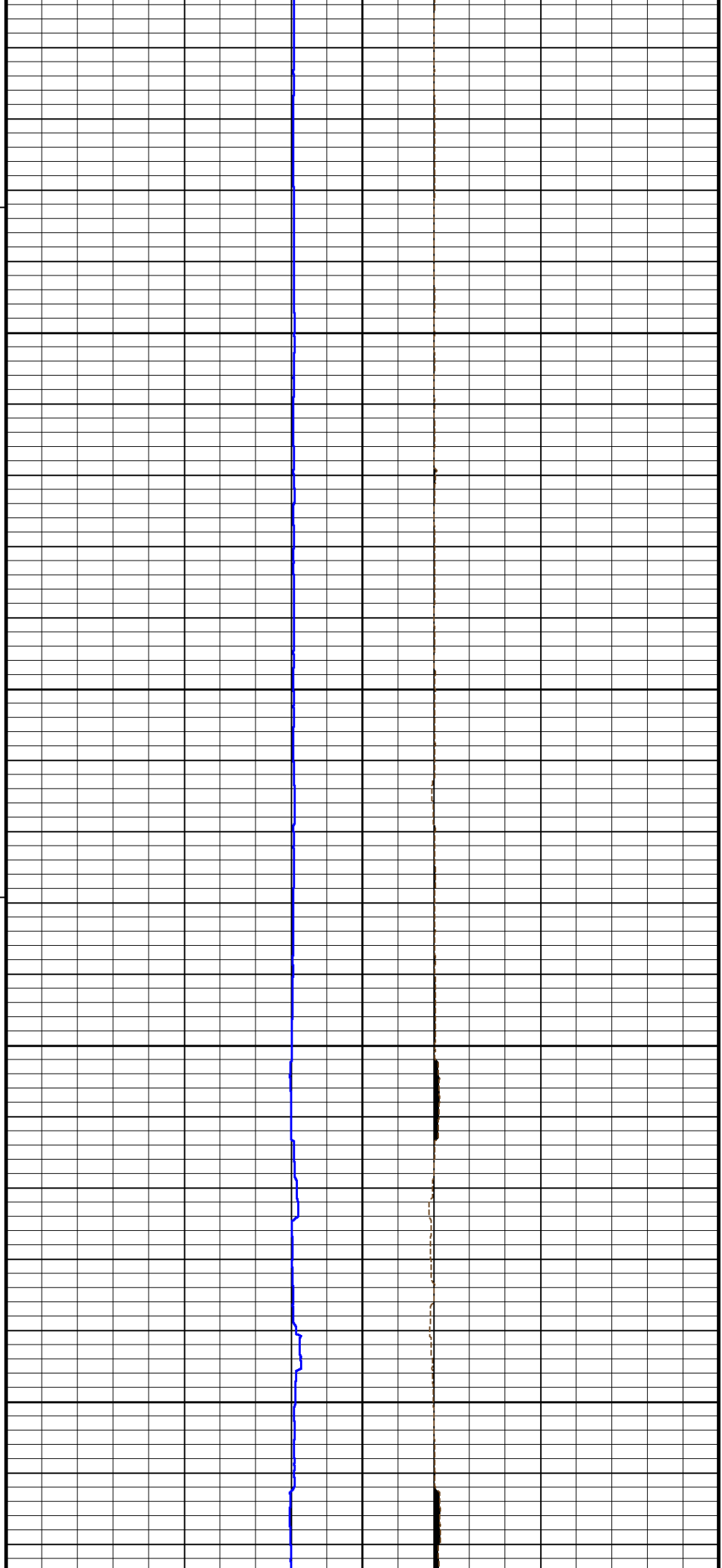


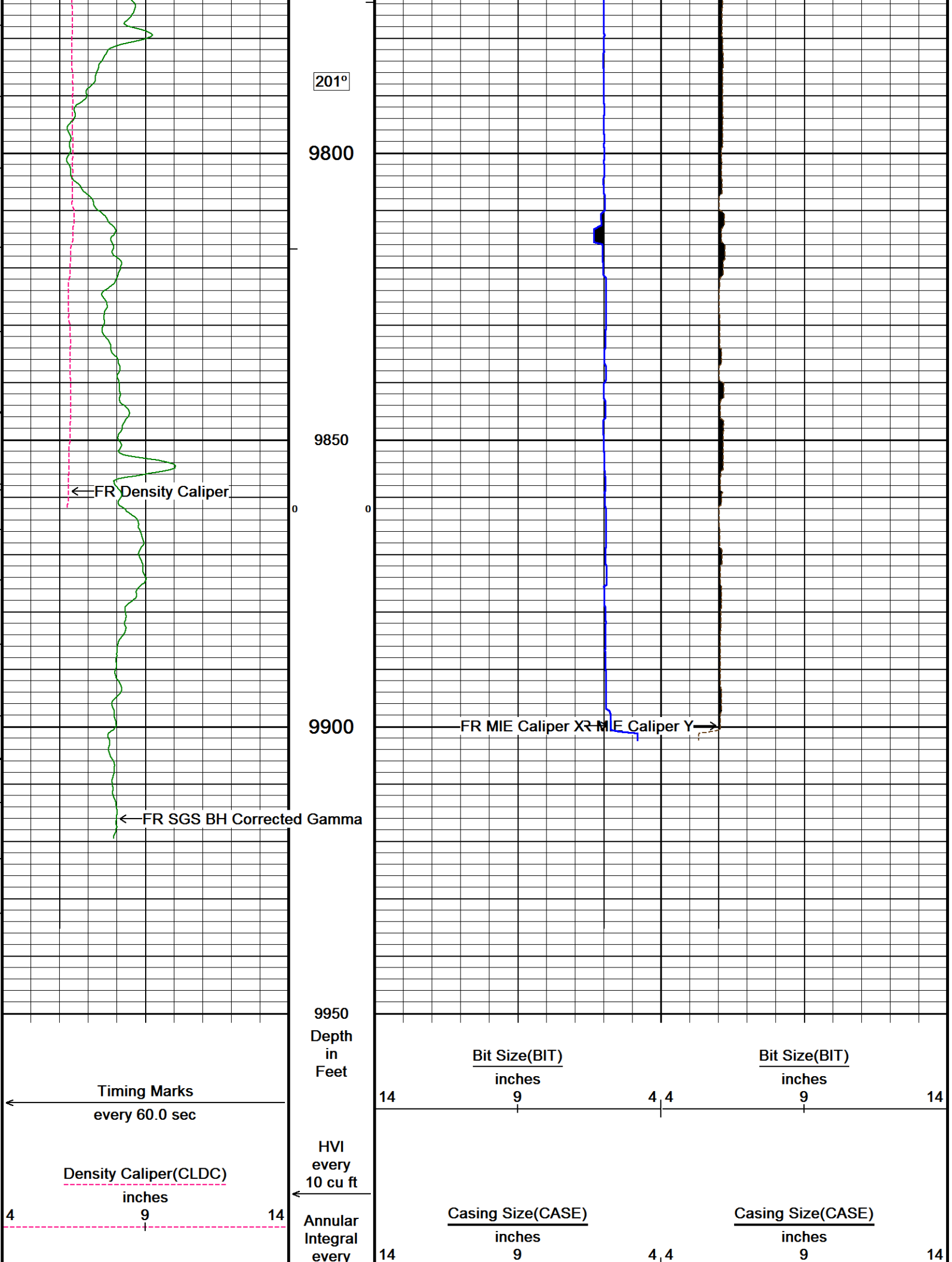


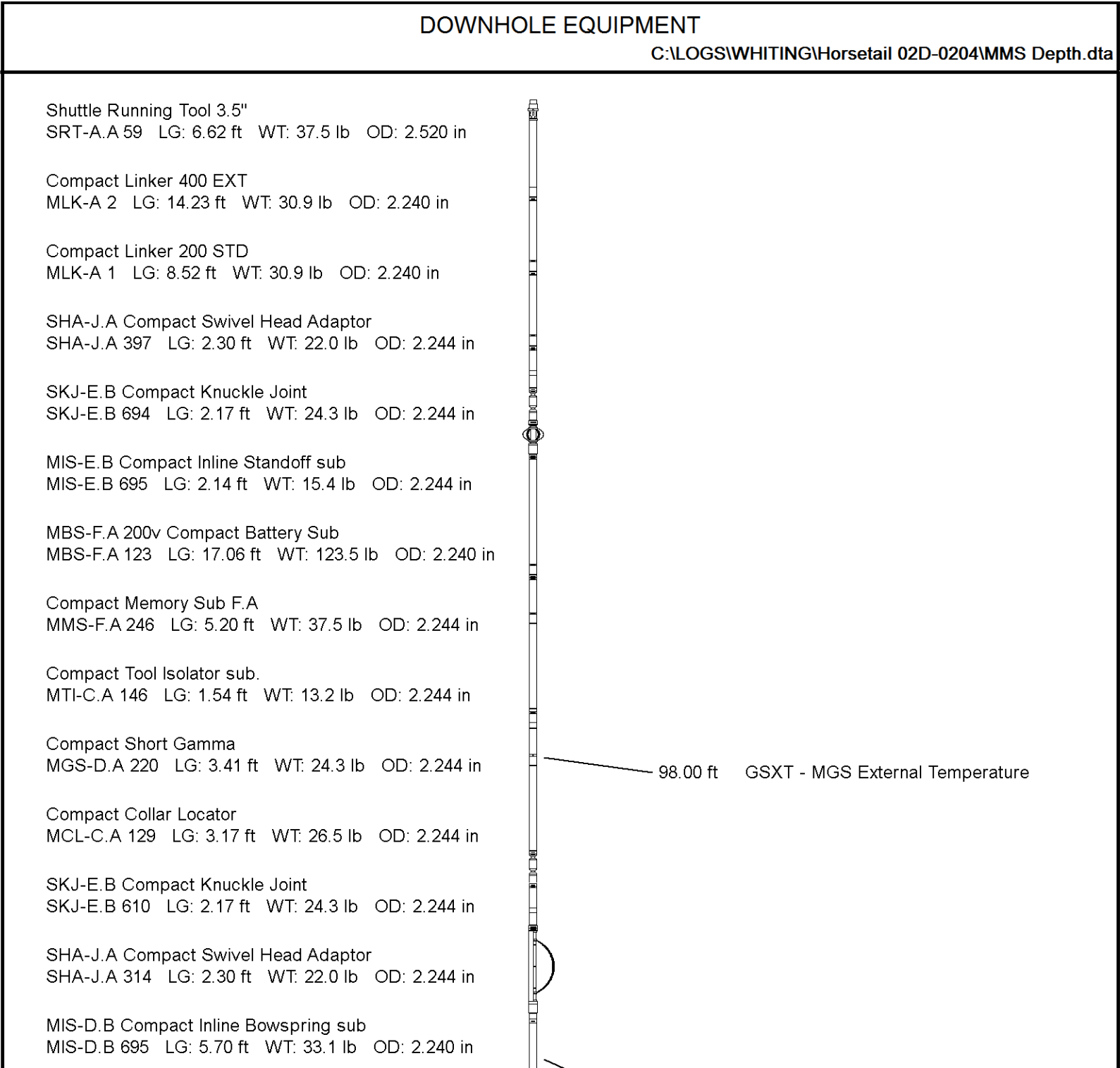
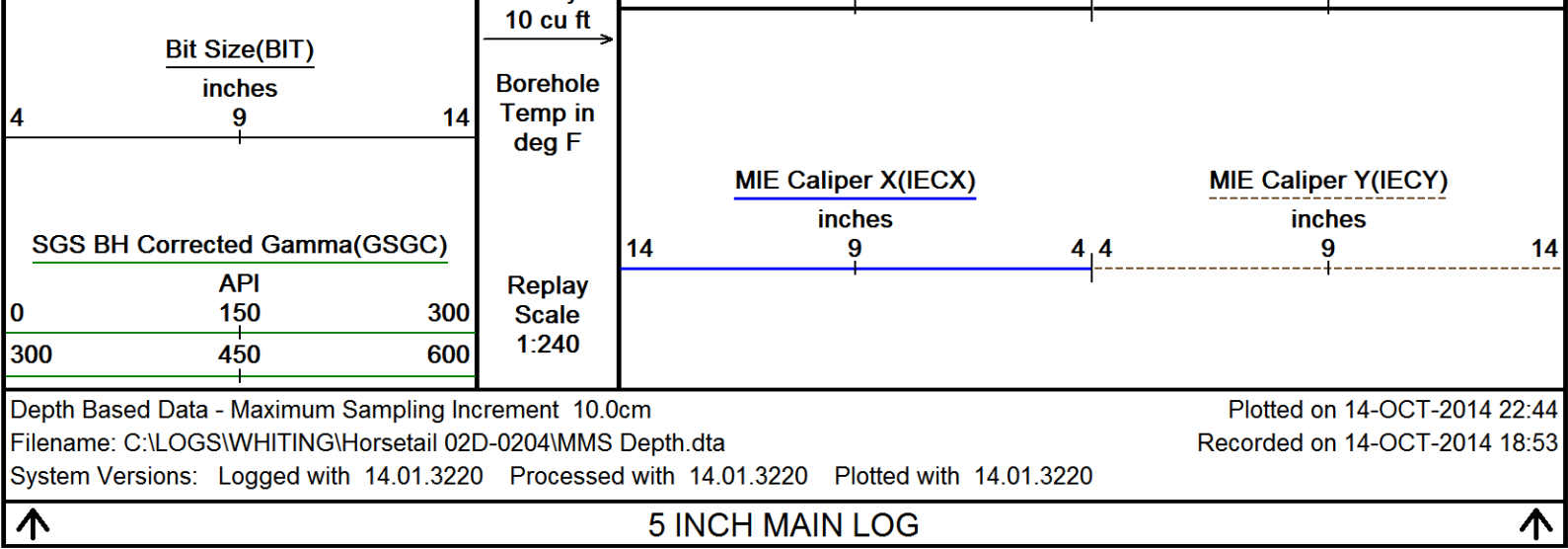




195°  
9600  
194°  
9650  
194°  
9700  
195°  
9750







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

SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 682 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 537 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-E.A Compact Inline Standoff sub  
MIS-E.A 363 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint  
SKJ-E.A 410 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 698 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section  
MIM-A.J 244 LG: 4.65 ft WT: 26.5 lb OD: 2.244 in

Compact MMI Electrode Section  
MIE-A.J 241 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

MIS-D.B Compact Inline Bowspring sub  
MIS-D.B 810 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SKJ-E.A Compact Knuckle Joint  
SKJ-E.A 203 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

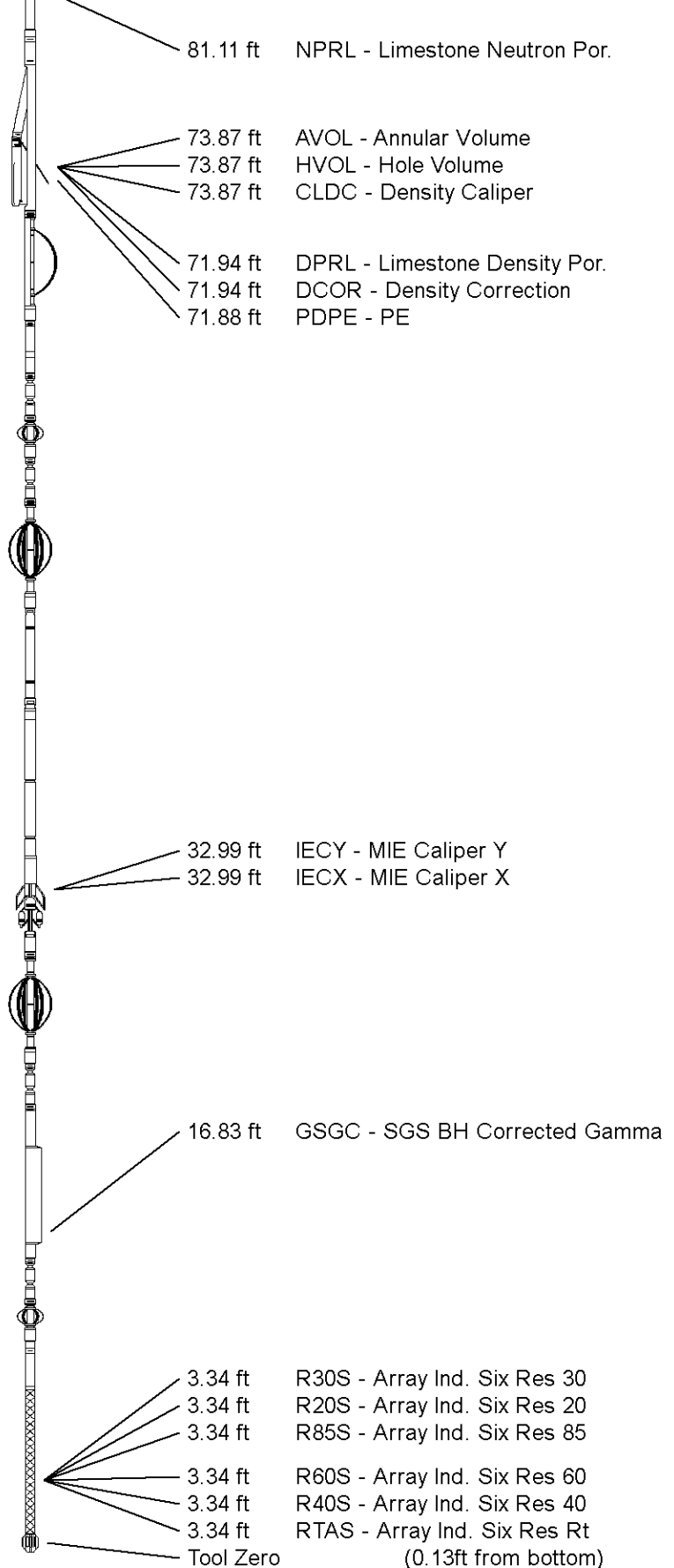
Spectral Gamma Ray Sub  
SGS-E.J 128 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

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

MIS-E.B Compact Inline Standoff sub  
MIS-E.B 662 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in


Compact Induction  
MAI-B.A 289 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 160.68 ft Weight: 1135.4 lb



|                 |                                 |
|-----------------|---------------------------------|
| COMPANY         | WHITING OIL AND GAS CORPORATION |
| WELL            | HORSETAIL 02D-0204              |
| FIELD           | REDTAIL                         |
| PROVINCE/COUNTY | WELD                            |
| COUNTRY/STATE   | U.S.A. / COLORADO               |

|                         |         |      |               |         |      |
|-------------------------|---------|------|---------------|---------|------|
| Elevation Kelly Bushing | 4795.00 | feet | First Reading | 9900.00 | feet |
| Elevation Drill Floor   | 4795.00 | feet | Depth Driller | 9948.00 | feet |
| Elevation Ground Level  | 4778.00 | feet | Depth Logger  | 9948.00 | feet |



**Weatherford**<sup>®</sup>

MEASURED DEPTH  
X-Y CALIPER  
HOLE VOLUME LOG