



**COMPLETION  
& PRODUCTION  
SERVICES CO.**

**DUAL  
INDUCTION  
LOG**

|                              |              |                            |                                                  |
|------------------------------|--------------|----------------------------|--------------------------------------------------|
| Company IA OPERATING, INC.   |              | Company IA OPERATING, INC. |                                                  |
| Well                         | ARCHER #21-2 | Well                       | ARCHER #21-2                                     |
| Field                        | STUDLEY WEST | Field                      | STUDLEY WEST                                     |
| County                       | SHERIDAN     | County                     | SHERIDAN                                         |
| State                        | KANSAS       | State                      | KANSAS                                           |
| Location:                    |              | API # : 15-179-21407-00-00 | Other Services<br>CNL/CDL<br>MEL/SON             |
| Permanent Datum              |              | NW - NW - SE - NE          |                                                  |
| Log Measured From            |              | 1518' FNL & 1076' FEL      |                                                  |
| Drilling Measured From       |              | SEC 21 TWP 8S RGE 26W      |                                                  |
| GROUND LEVEL Elevation       |              | 2413                       | Elevation<br>K.B. 2421<br>D.F. 2419<br>G.L. 2413 |
| KELLY BUSHING                |              |                            |                                                  |
| Date                         | 7-24-15      |                            |                                                  |
| Run Number                   | ONE          |                            |                                                  |
| Depth Driller                | 3880         |                            |                                                  |
| Depth Logger                 | 3880         |                            |                                                  |
| Bottom Logged Interval       | 3878         |                            |                                                  |
| Top Log Interval             | 00           |                            |                                                  |
| Casing Driller               | 8 5/8 @ 241' |                            |                                                  |
| Casing Logger                | 240'         |                            |                                                  |
| Bit Size                     | 7 7/8        |                            |                                                  |
| Type Fluid in Hole           | CHEMICAL MUD | CHLORIDES 500 PPM          |                                                  |
| Density / Viscosity          | 9.0/53       |                            |                                                  |
| pH / Fluid Loss              | 11.0/7.2     |                            |                                                  |
| Source of Sample             | FLOWLINE     |                            |                                                  |
| Rm @ Meas. Temp              | 0.95 @ 94F   |                            |                                                  |
| Rmf @ Meas. Temp             | 0.71 @ 94F   |                            |                                                  |
| Rmc @ Meas. Temp             | 1.14 @ 94F   |                            |                                                  |
| Source of Rmf / Rmc          | MEASUREMENT  |                            |                                                  |
| Rm @ BHT                     | 0.78 @ 115F  |                            |                                                  |
| Time Circulation Stopped     | 2 HOURS      |                            |                                                  |
| Time Logger on Bottom        |              |                            |                                                  |
| Maximum Recorded Temperature | 115F         |                            |                                                  |
| Equipment Number             | 3802         |                            |                                                  |
| Location                     | HAYS, KANSAS |                            |                                                  |
| Recorded By                  | IAN MABB     |                            |                                                  |
| Witnessed By                 | JEFF LAWLER  |                            |                                                  |

<<< Fold Here >>>

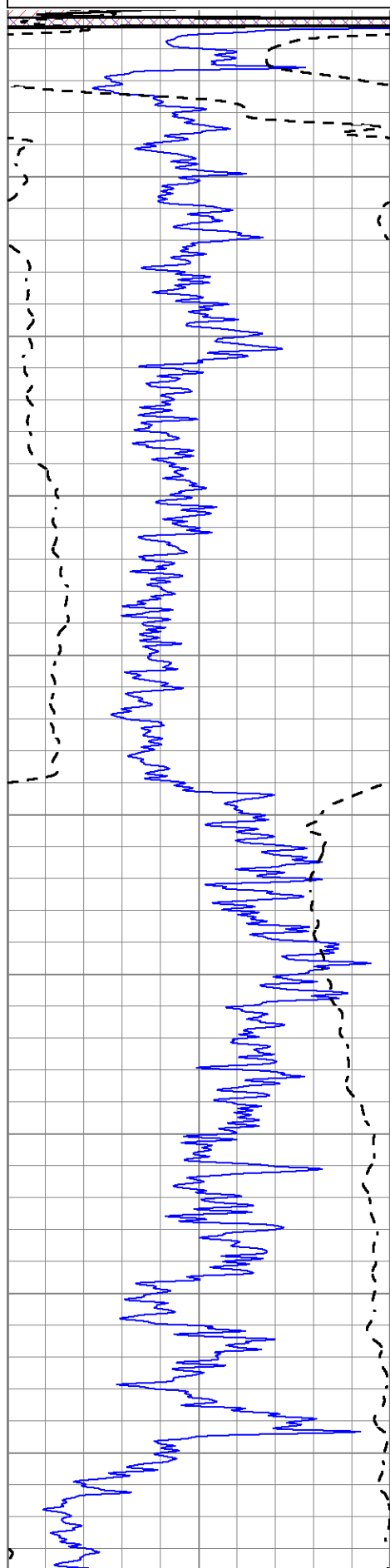
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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 set out in our current Price Schedule.

Comments

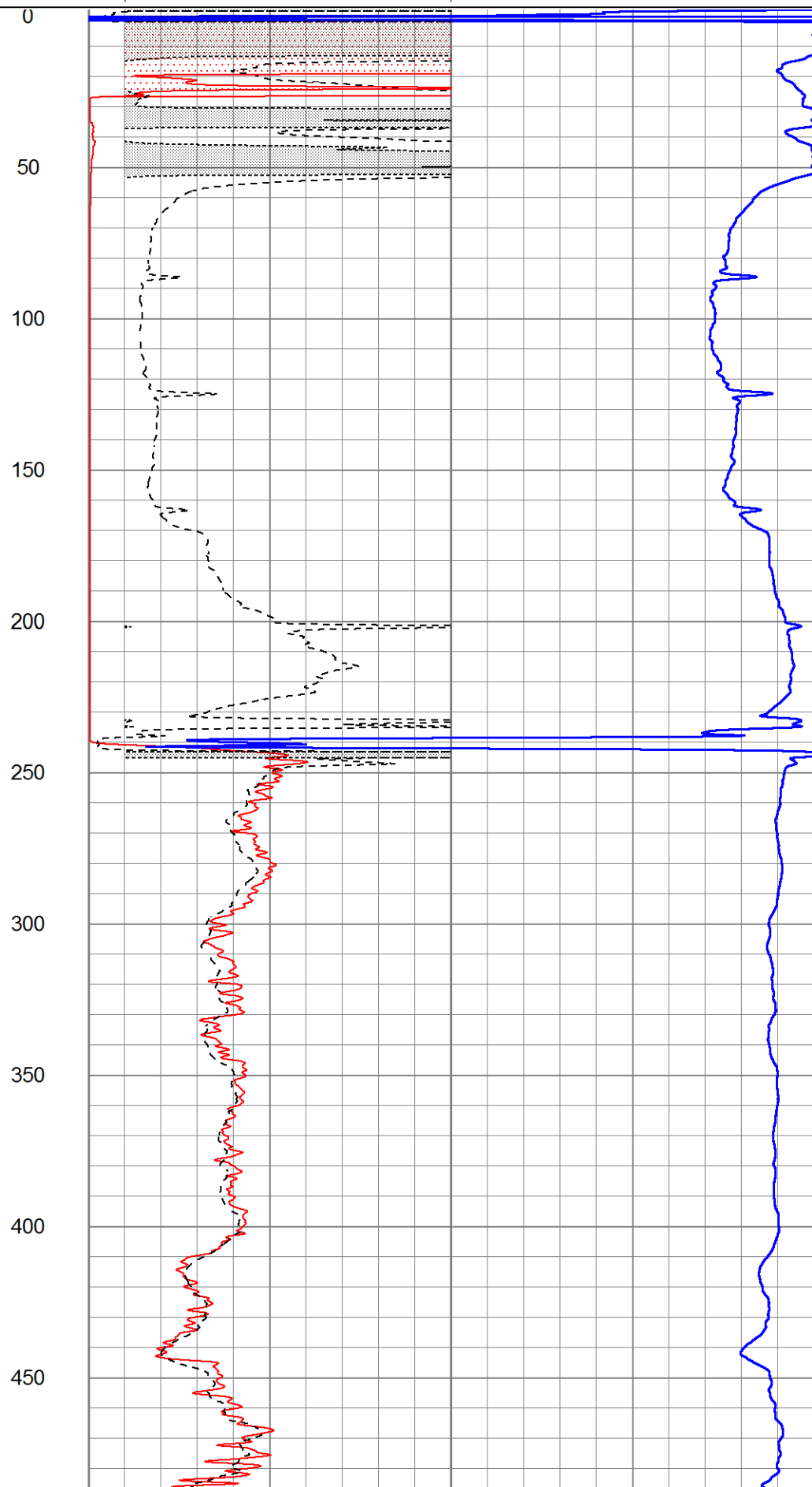
THANK YOU FOR USING NABORS, HAYS, KS. ( 785 ) 628-6395  
DIRECTIONS : STUDLEY, KS. - WEST TO 90 E - SOUTH 1/4 MILE FOLLOW EAST - AT THE FORK  
VEER LEFT AND FOLLOW THROUGH THE CATTLE GUARD - KEEP VEERING LEFT FOR ABOUT 2  
MILES TO THE RIG

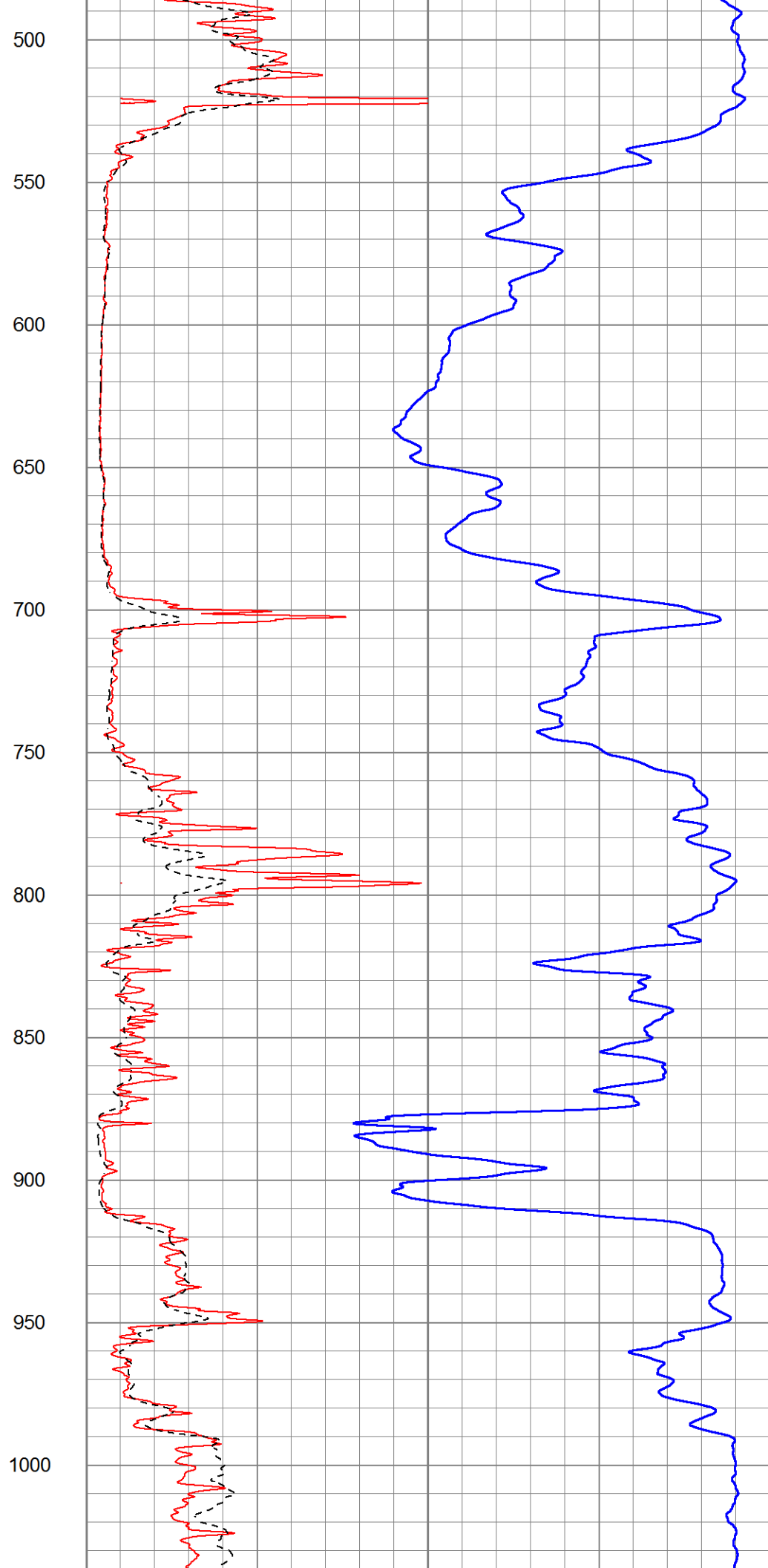
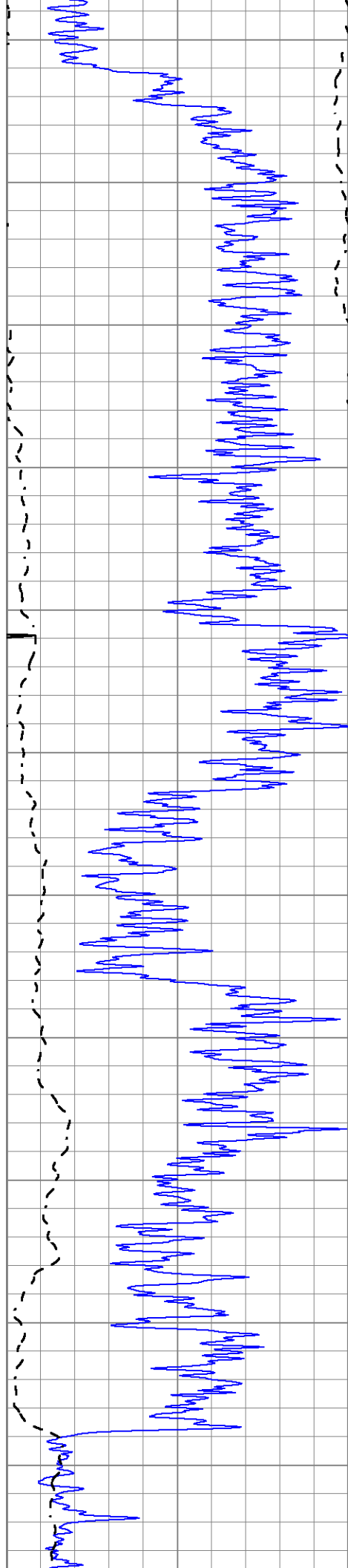
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Dataset Pathname pass3.2  
Presentation Format \_dil2  
Dataset Creation Fri Jul 24 20:20:35 2015  
Charted by Depth in Feet scaled 1:600

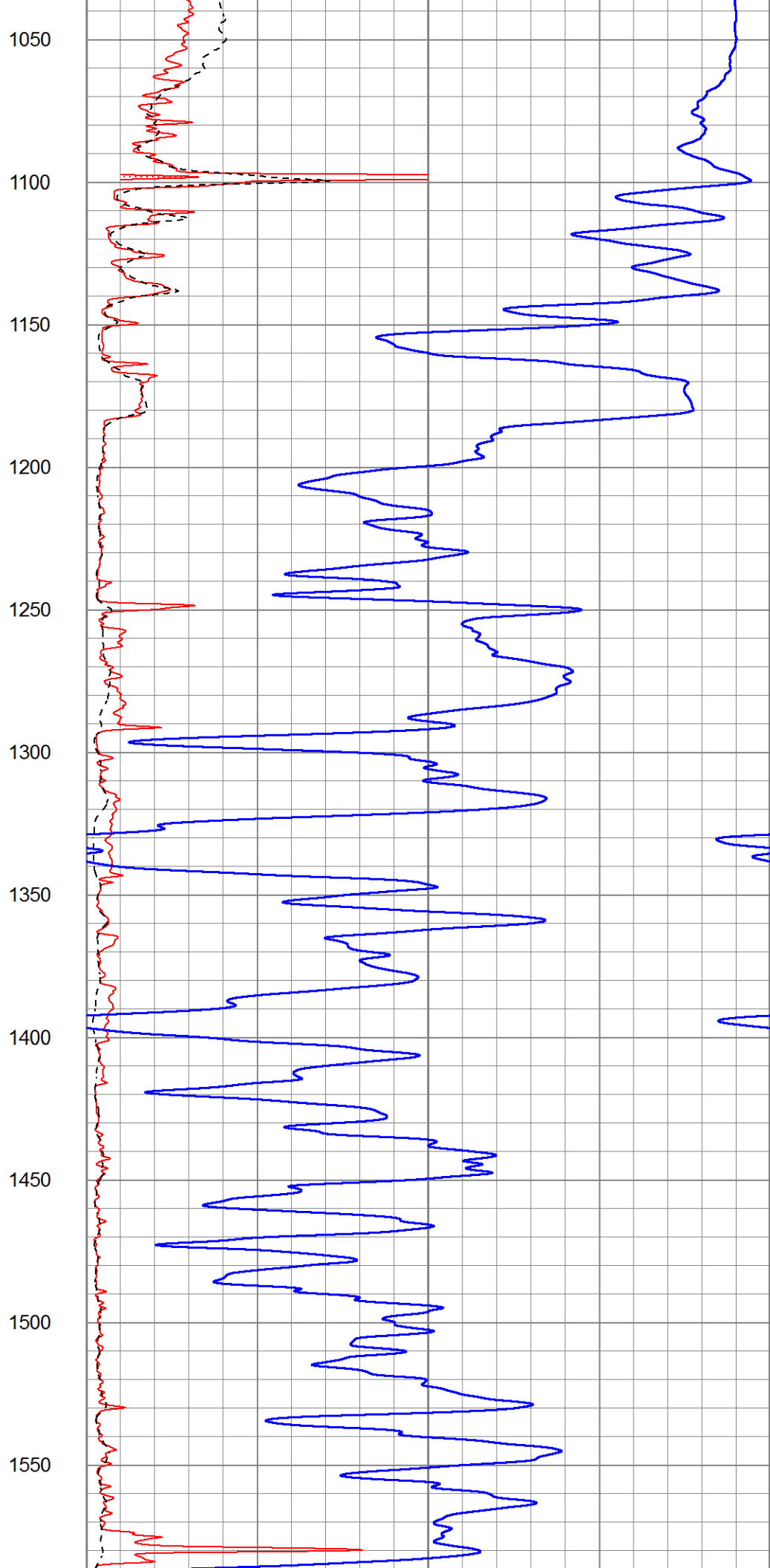
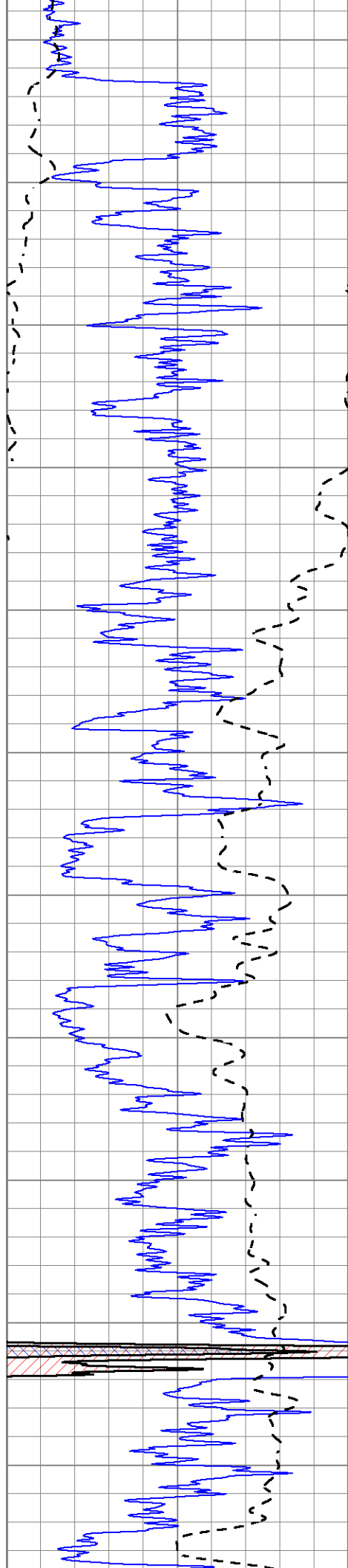
|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -100 | SP (mV)          | 100 |

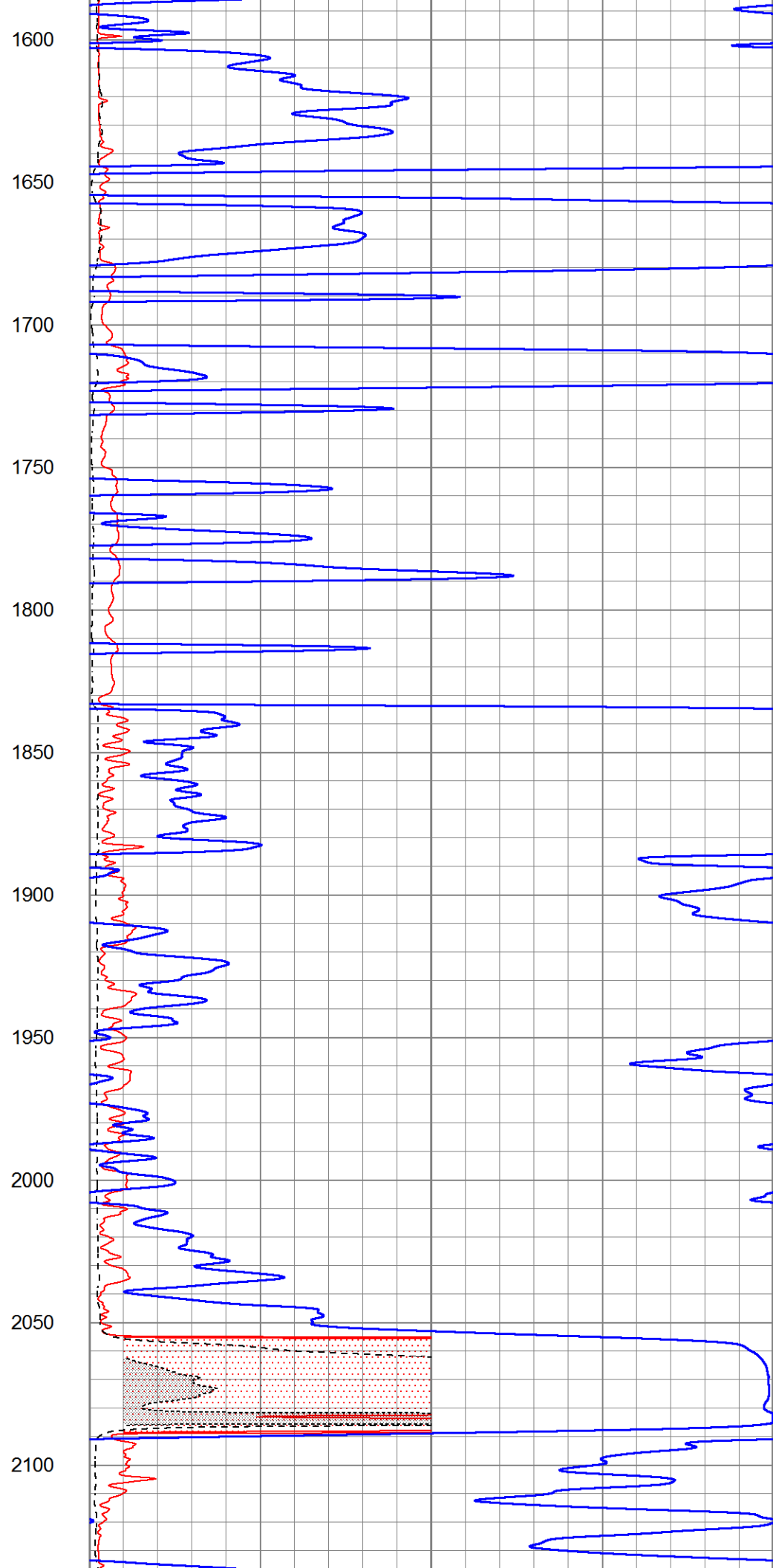
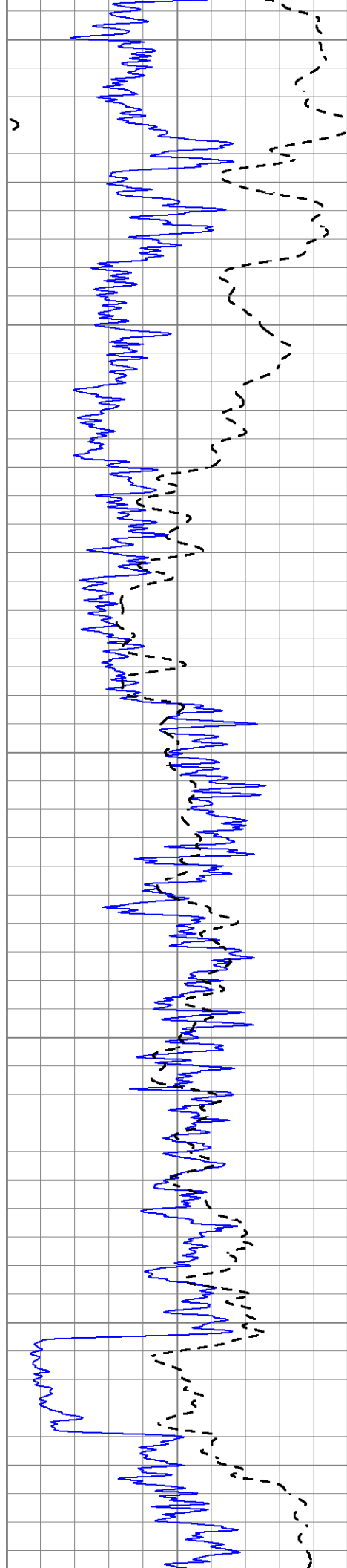


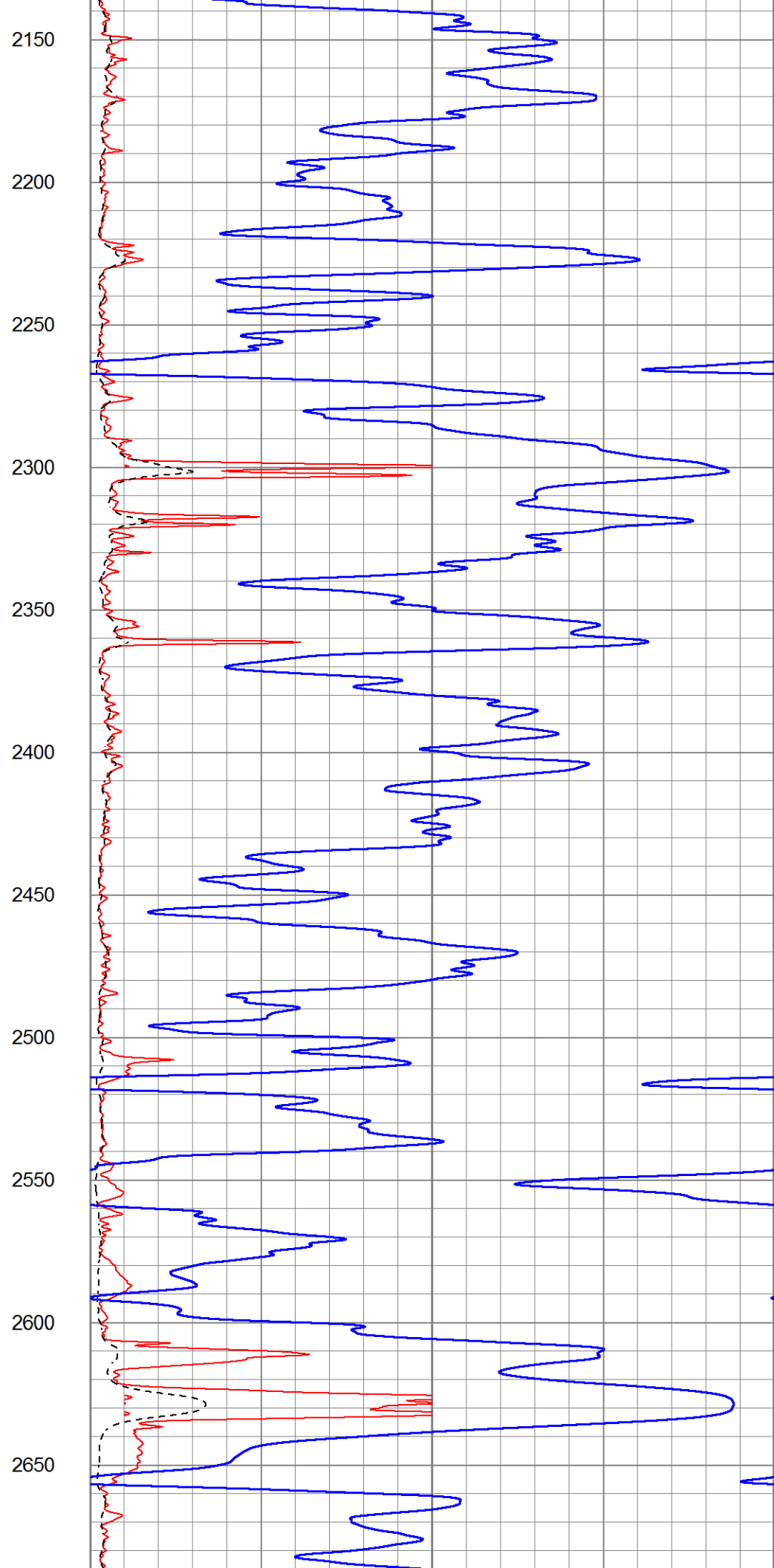
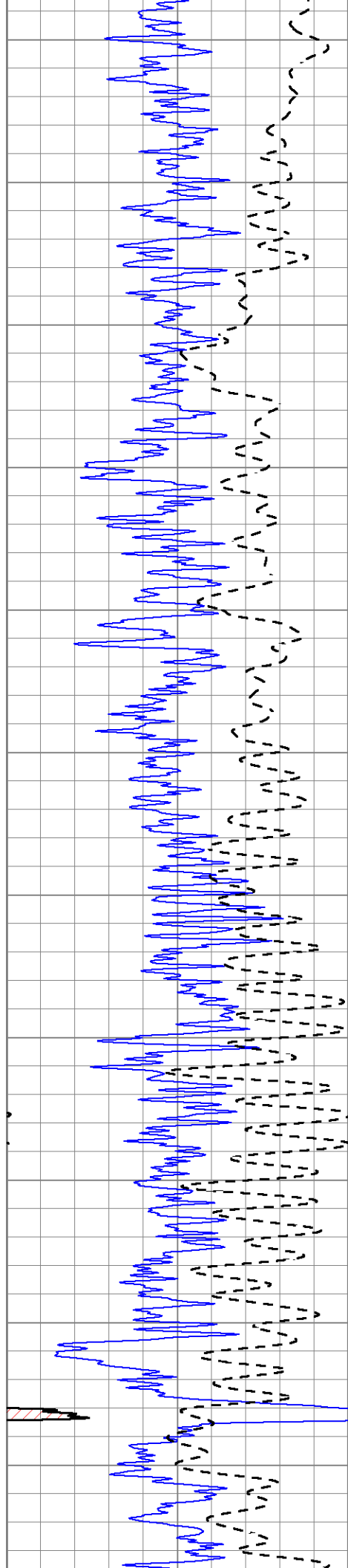
|      |                        |     |
|------|------------------------|-----|
| 1000 | CILD (mmho/m)          | 0   |
| 0    | RLL3 (Ohm-m)           | 50  |
| 0    | Deep Induction (Ohm-m) | 50  |
| 50   | RILD X10 (Ohm-m)       | 500 |
| 50   | RLL3 X10 (Ohm-m)       | 500 |

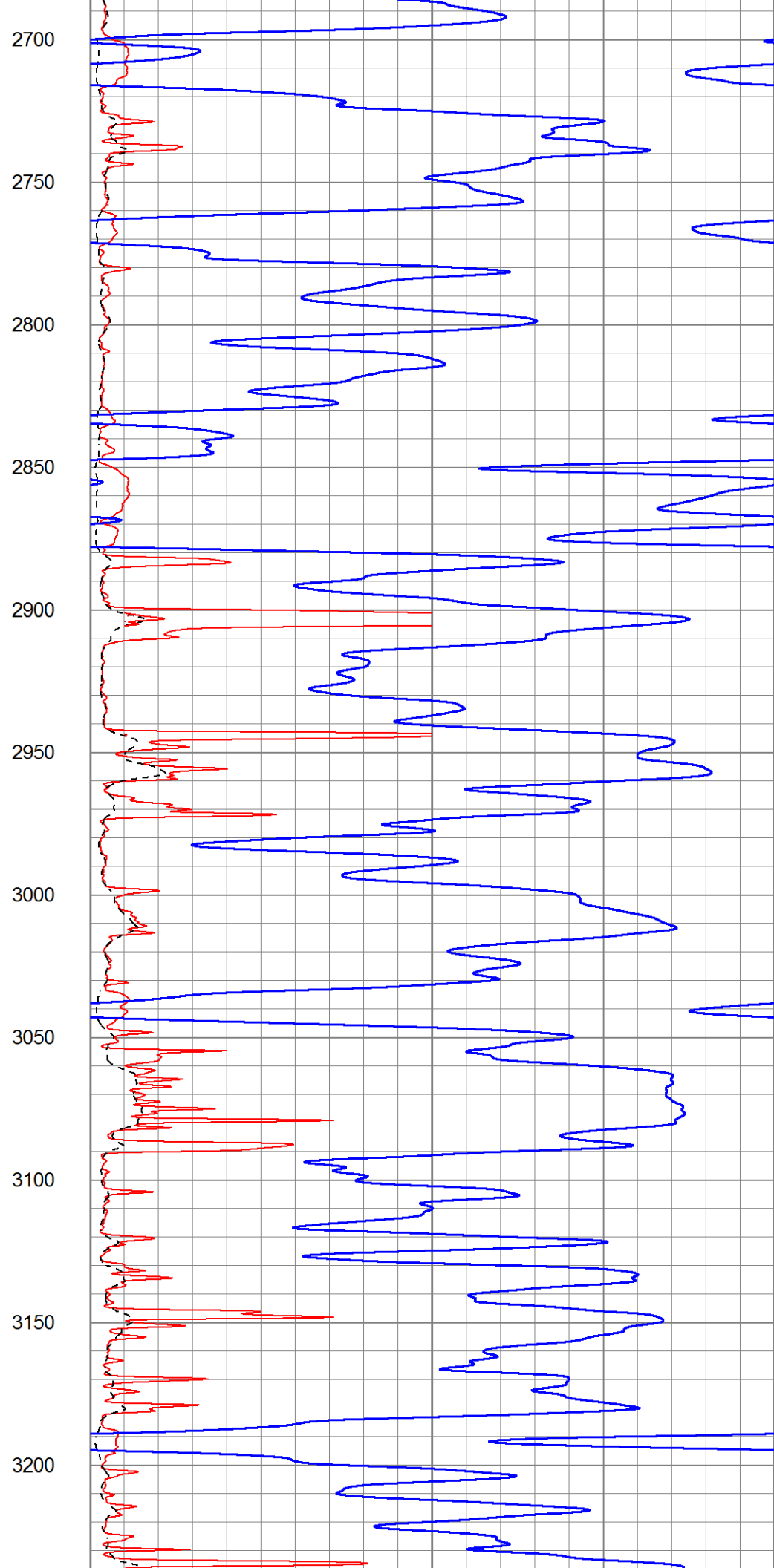
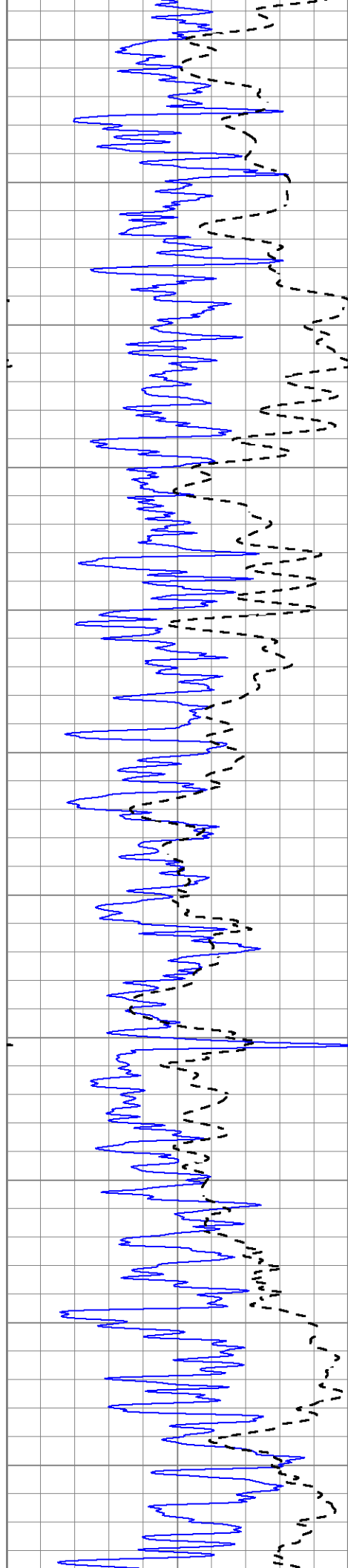


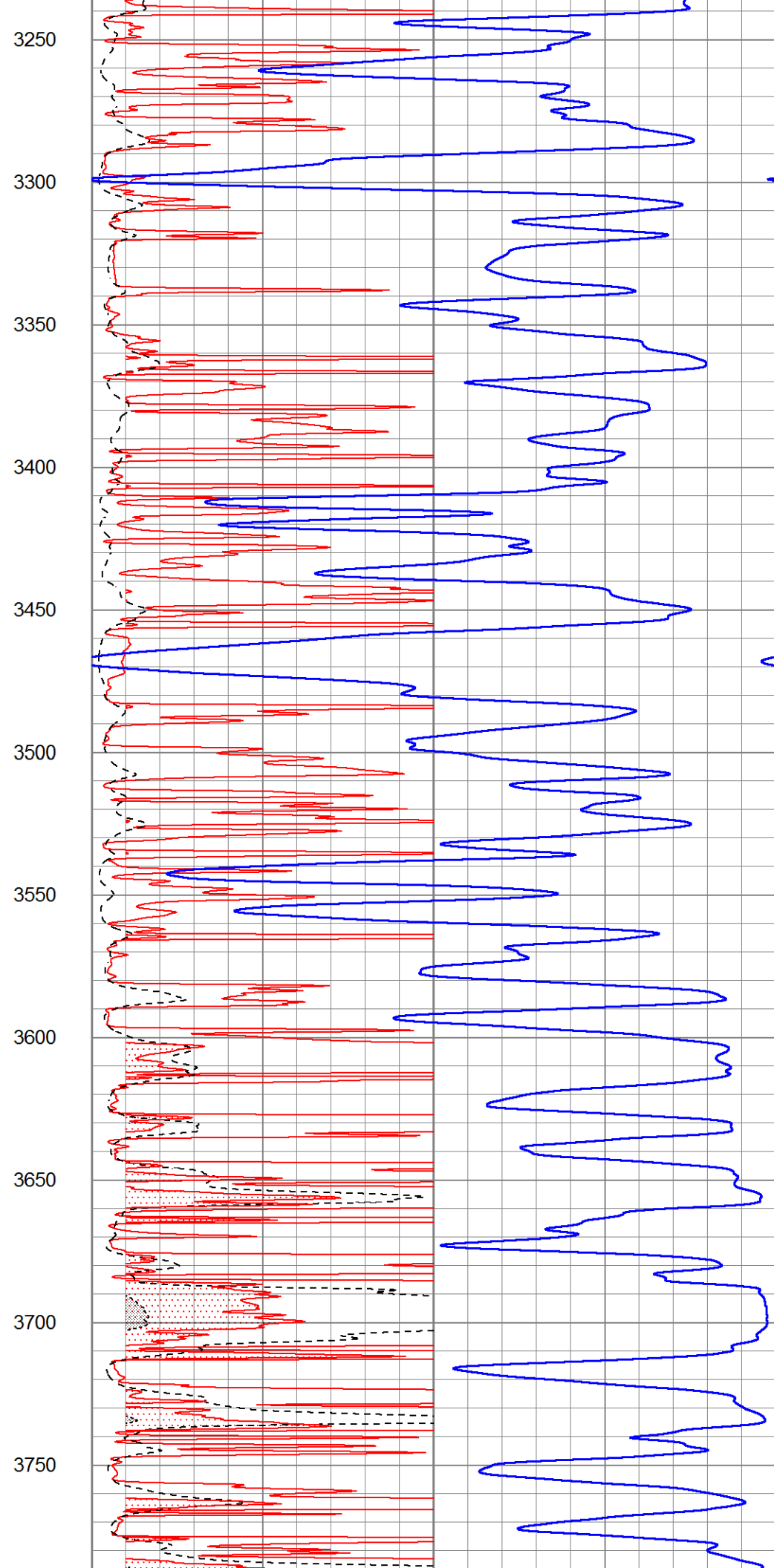
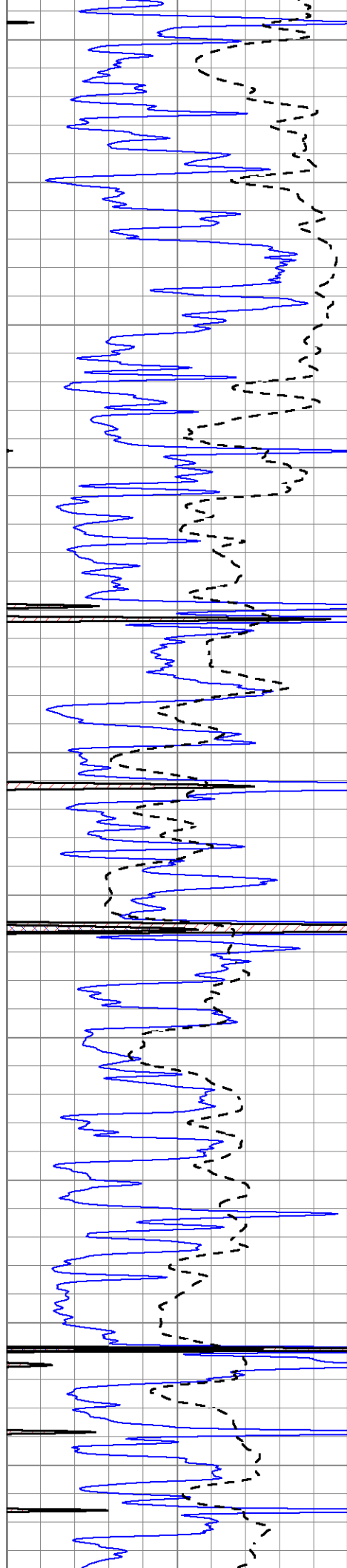


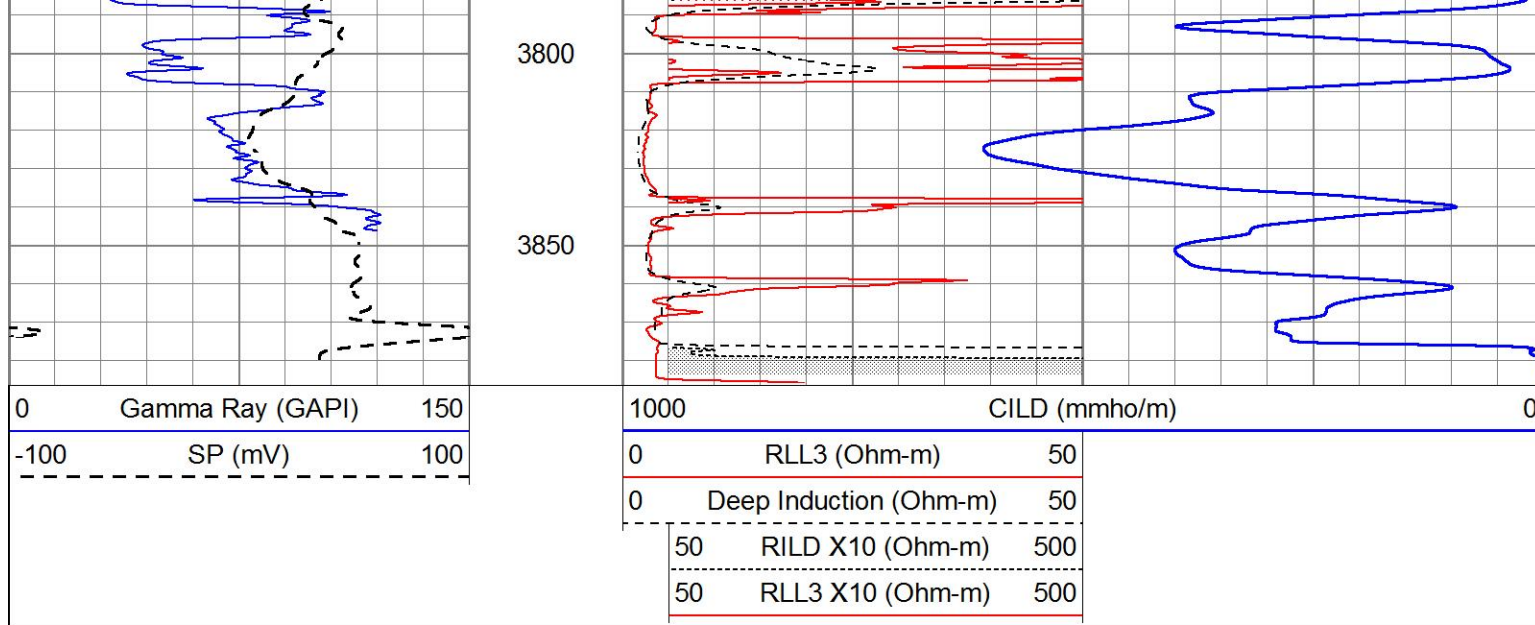








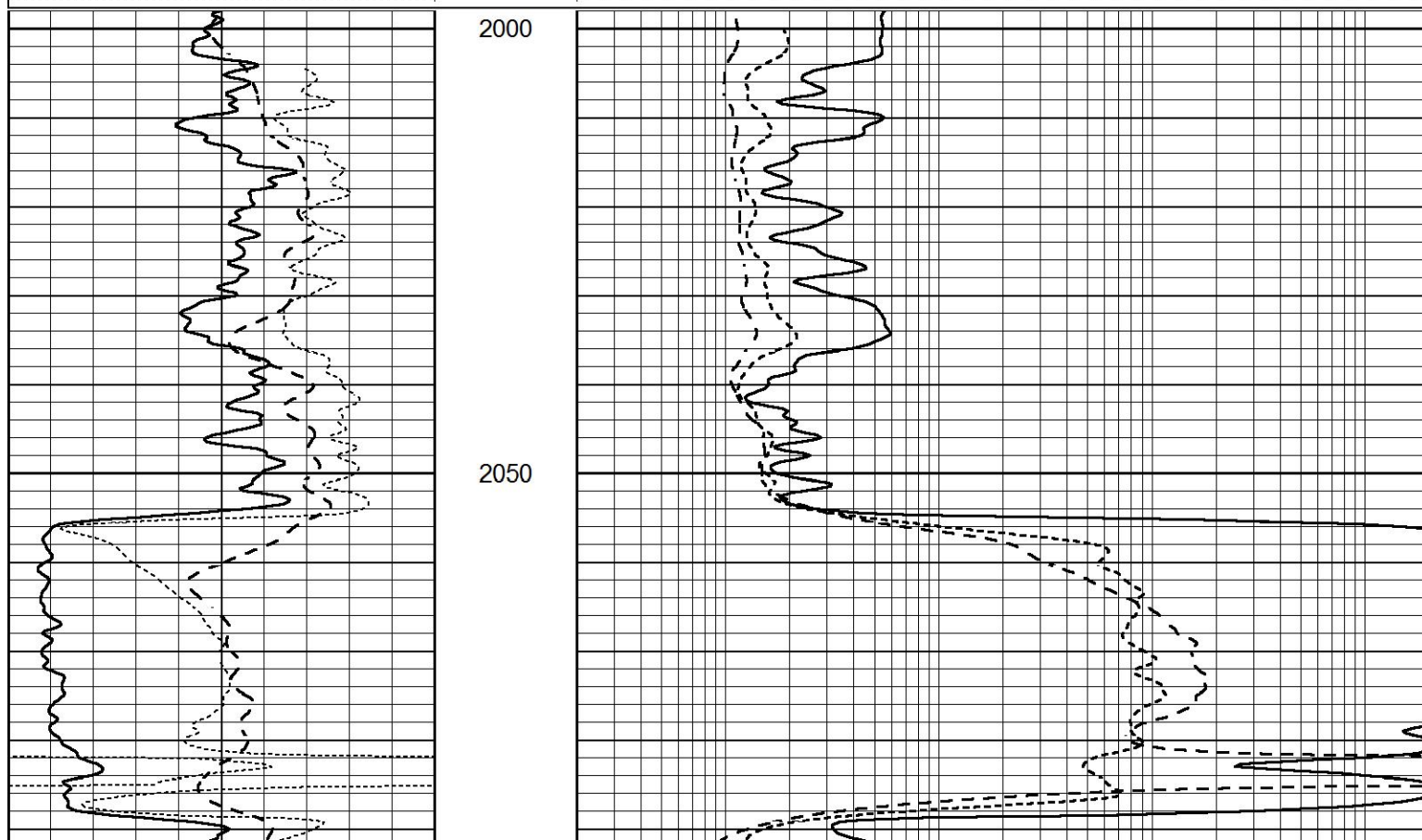


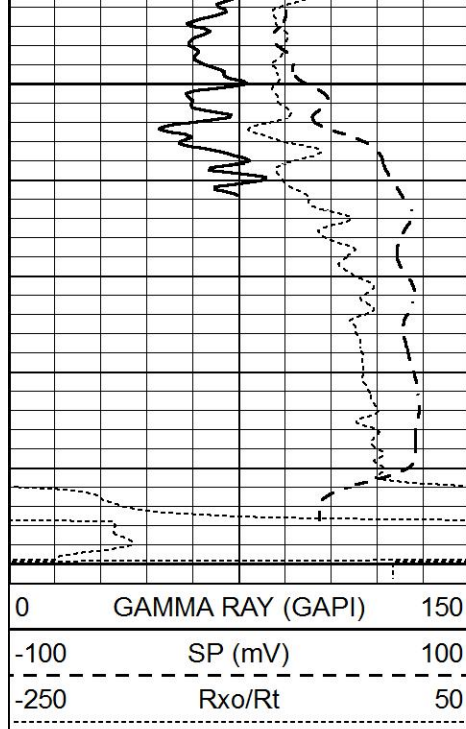


# ANHYDRITE SECTION

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 Presentation Format \_dil  
 Dataset Creation Fri Jul 24 20:25:03 2015  
 Charted by Depth in Feet scaled 1:240

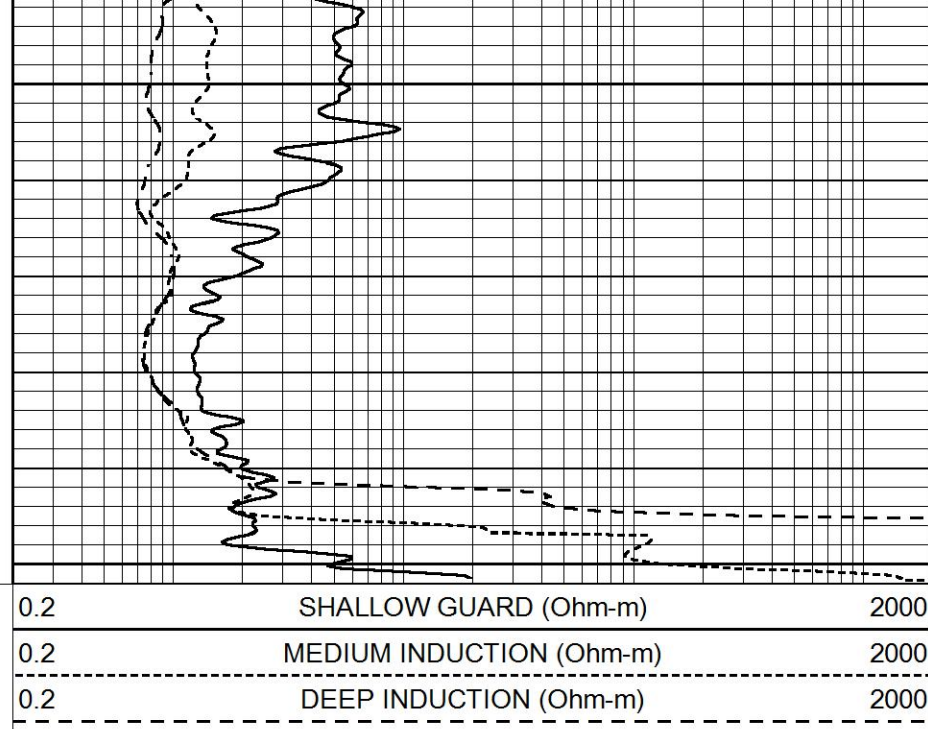
|      |                  |     |     |                          |      |
|------|------------------|-----|-----|--------------------------|------|
| 0    | GAMMA RAY (GAPI) | 150 | 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| -100 | SP (mV)          | 100 | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| -250 | Rxo/Rt           | 50  | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |





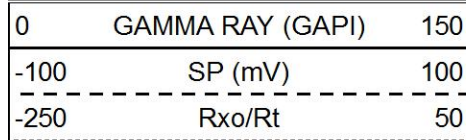
2100

2150



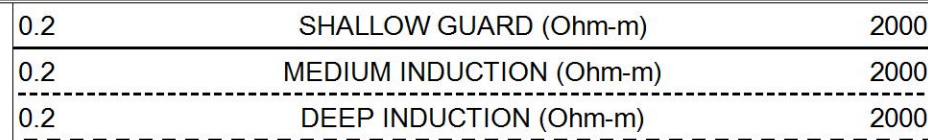
# MAIN SECTION

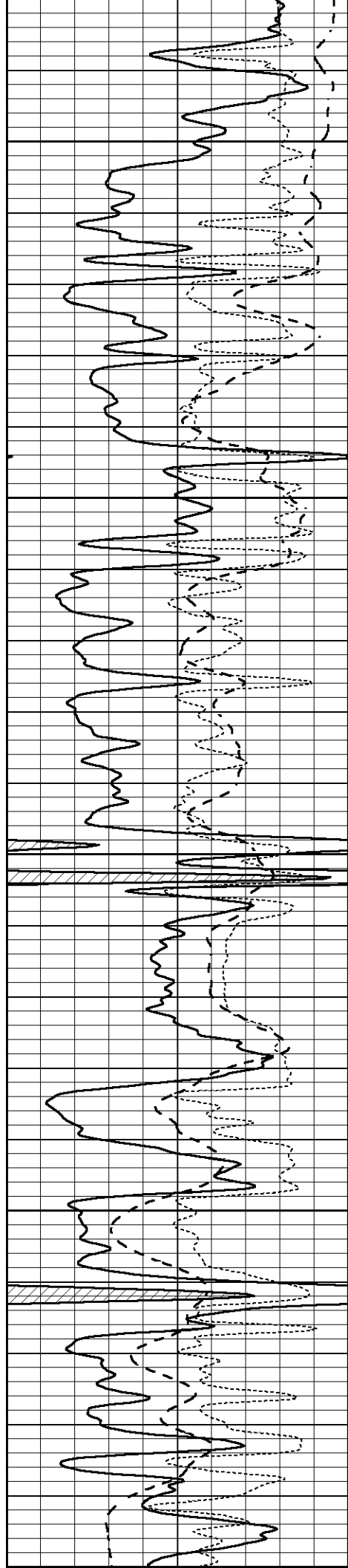
Database File 26601ddn8.db  
Dataset Pathname pass3.1  
Presentation Format \_dil  
Dataset Creation Fri Jul 24 20:00:02 2015  
Charted by Depth in Feet scaled 1:240



3250

3300





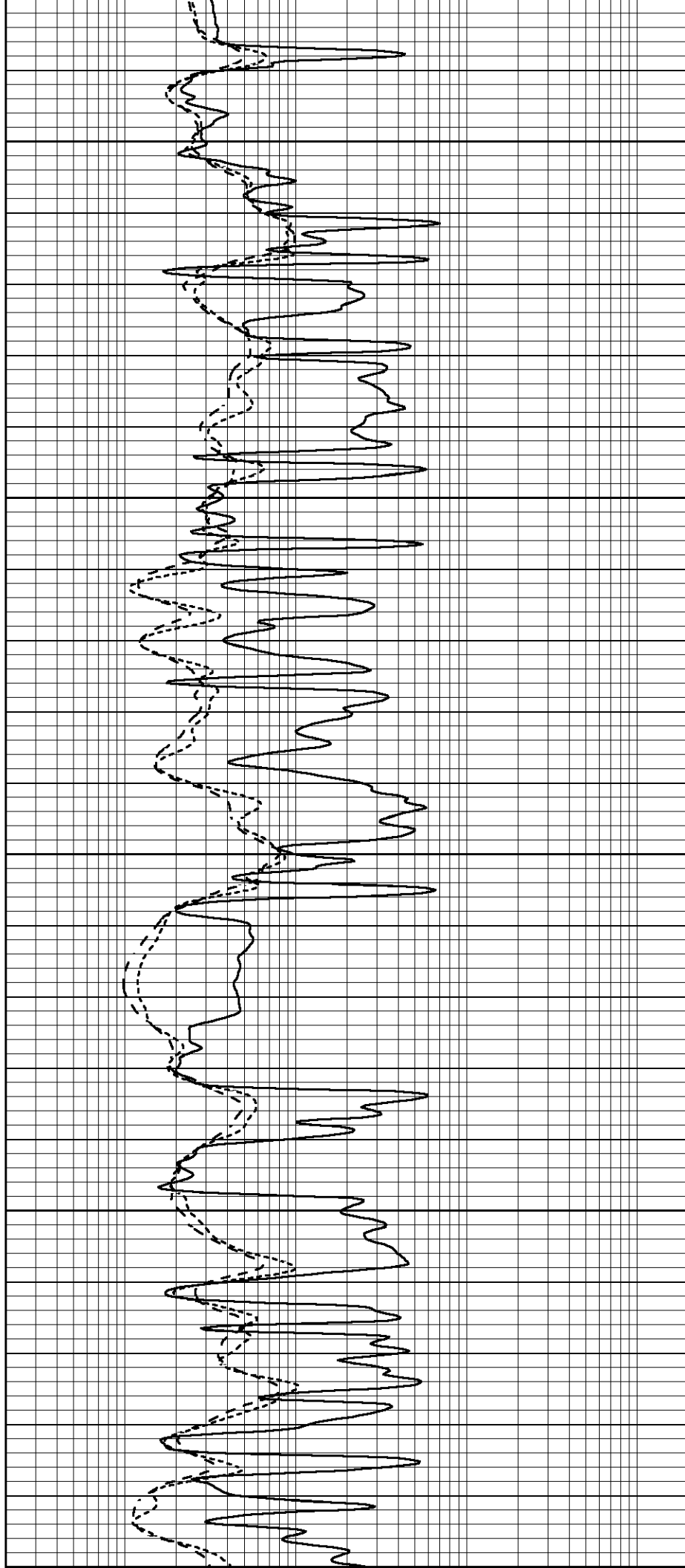
3350

3400

3450

3500

3550



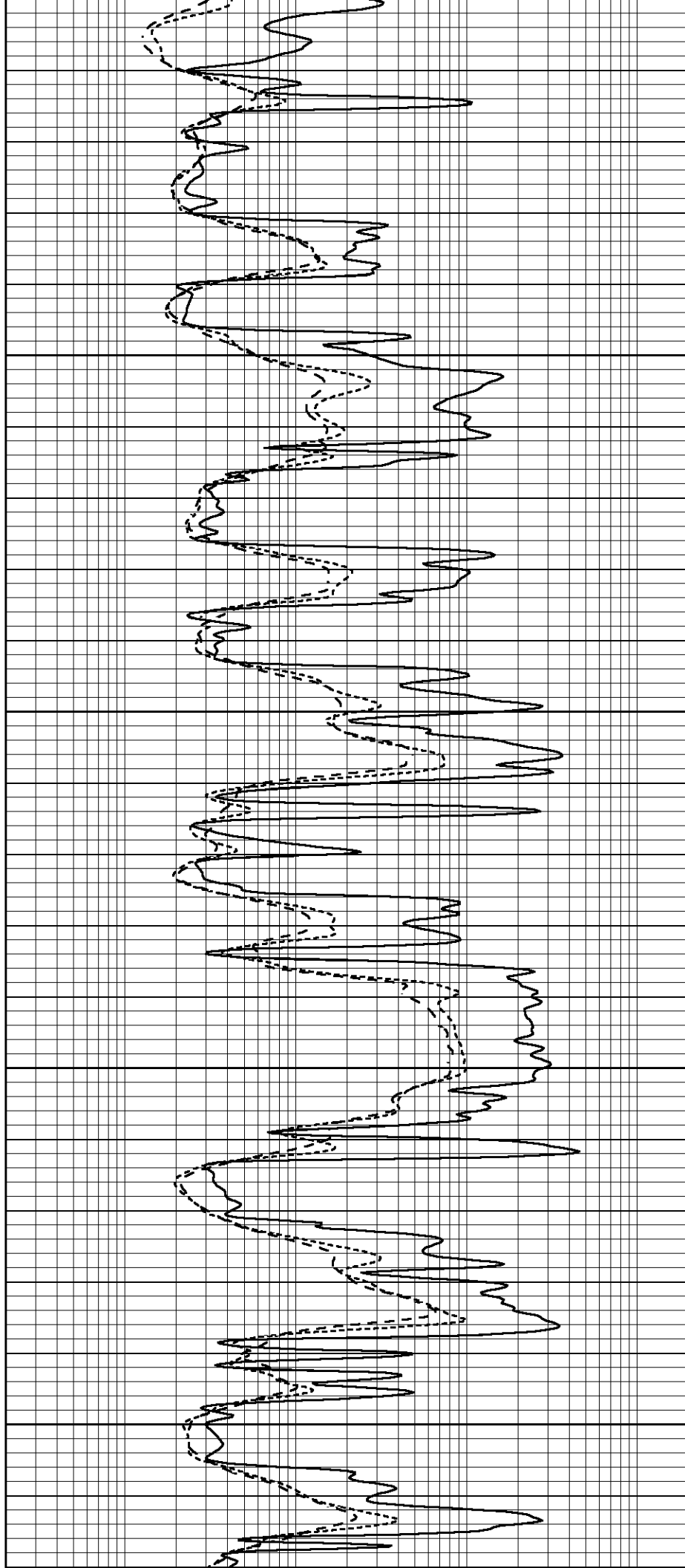
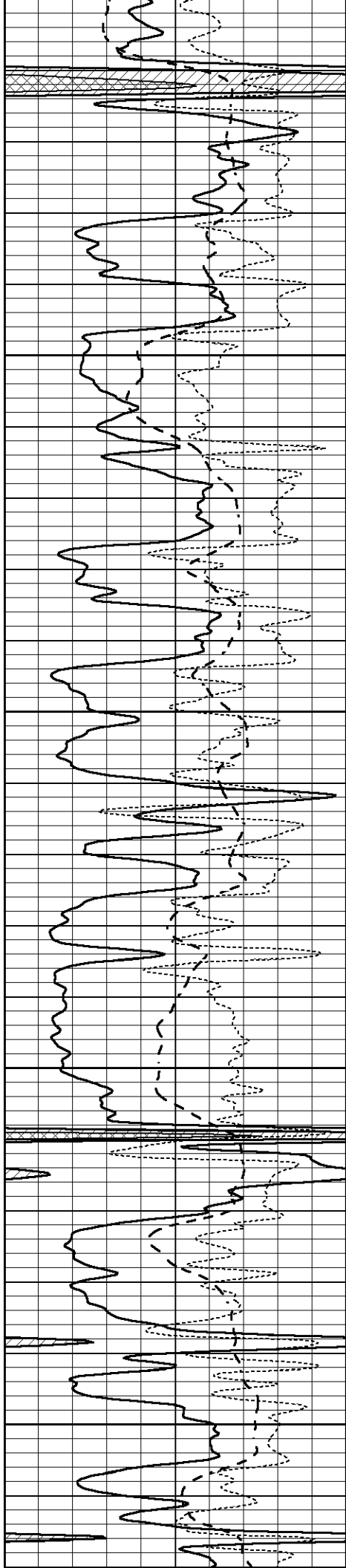
3550

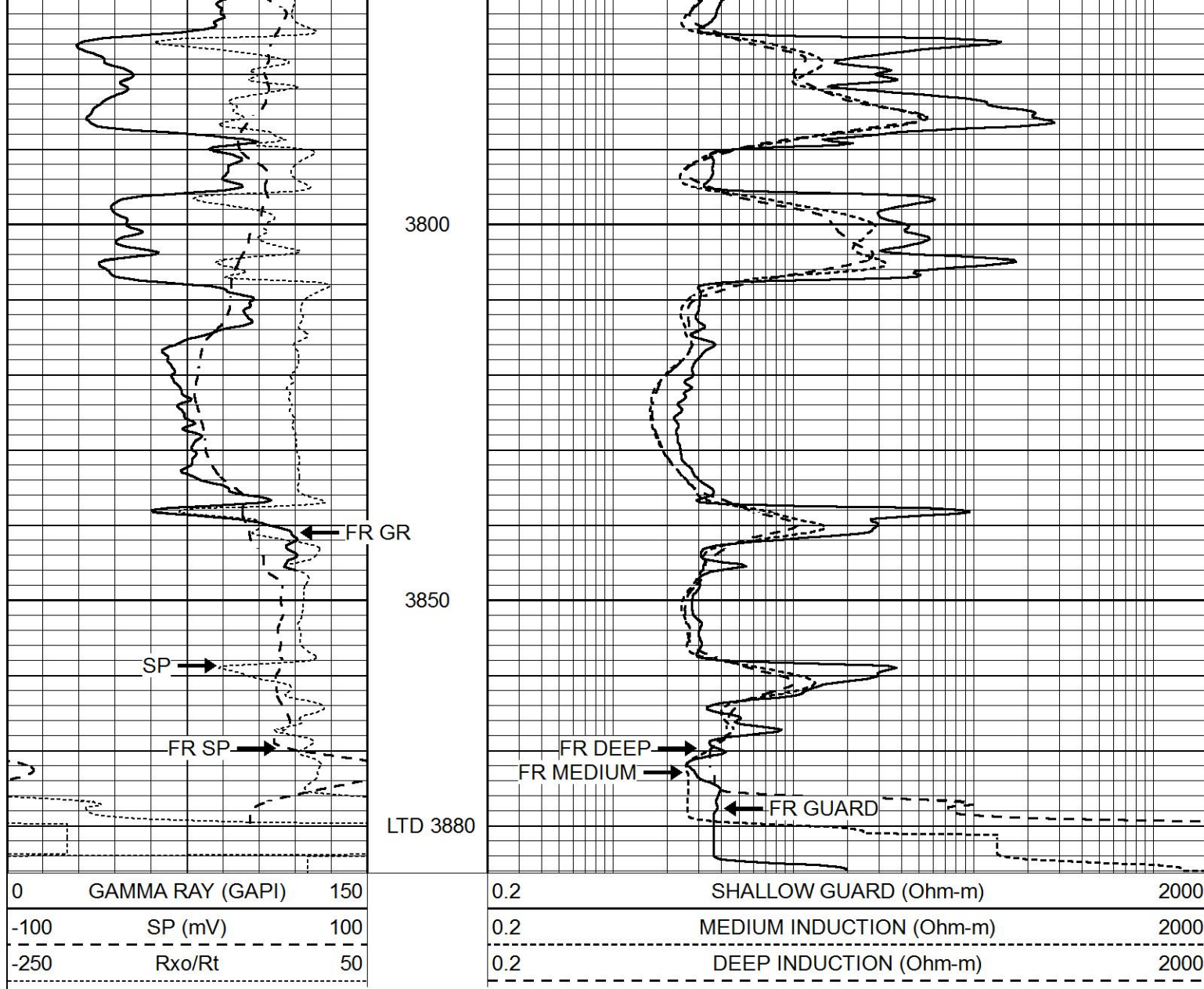
3600

3650

3700

3750

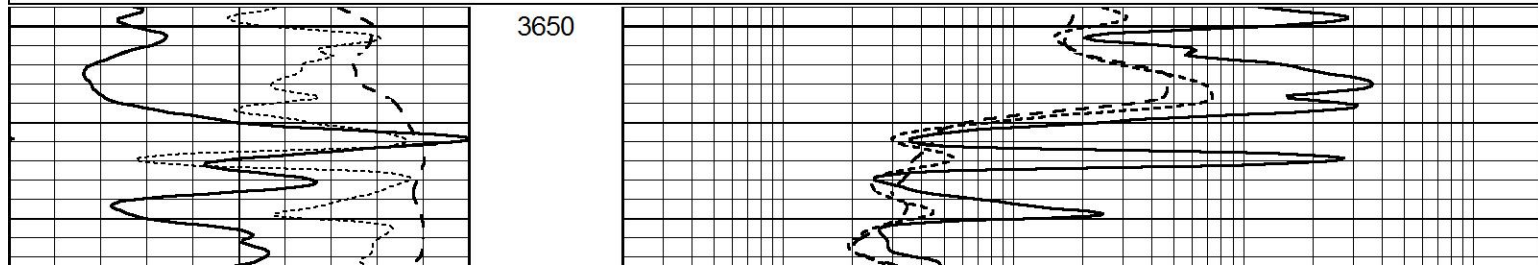


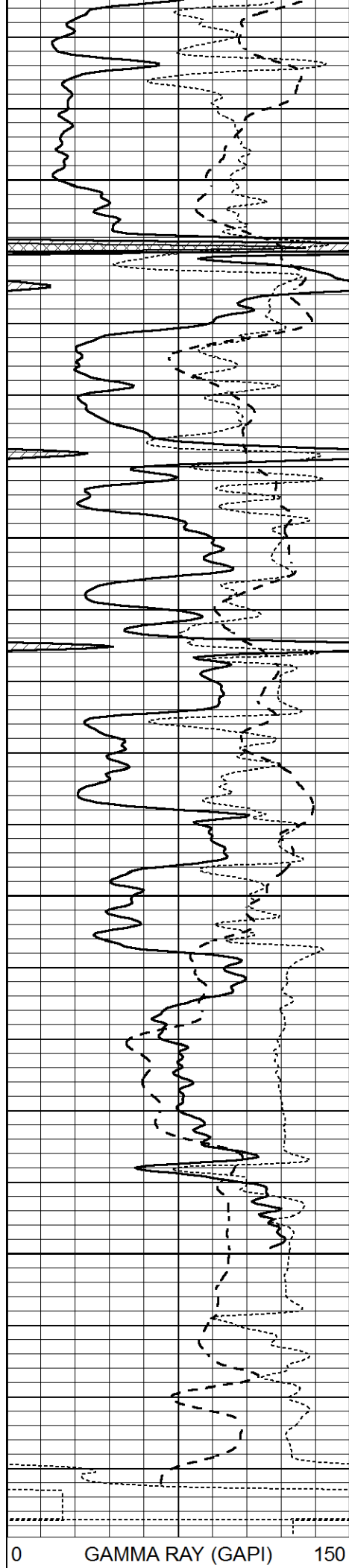


# REPEAT SECTION

Database File 26601ddn8.db  
 Dataset Pathname pass2.1  
 Presentation Format \_dil  
 Dataset Creation Fri Jul 24 19:59:10 2015  
 Charted by Depth in Feet scaled 1:240

|      |                  |     |     |                          |      |
|------|------------------|-----|-----|--------------------------|------|
| 0    | GAMMA RAY (GAPI) | 150 | 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| -100 | SP (mV)          | 100 | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| -250 | Rxo/Rt           | 50  | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |





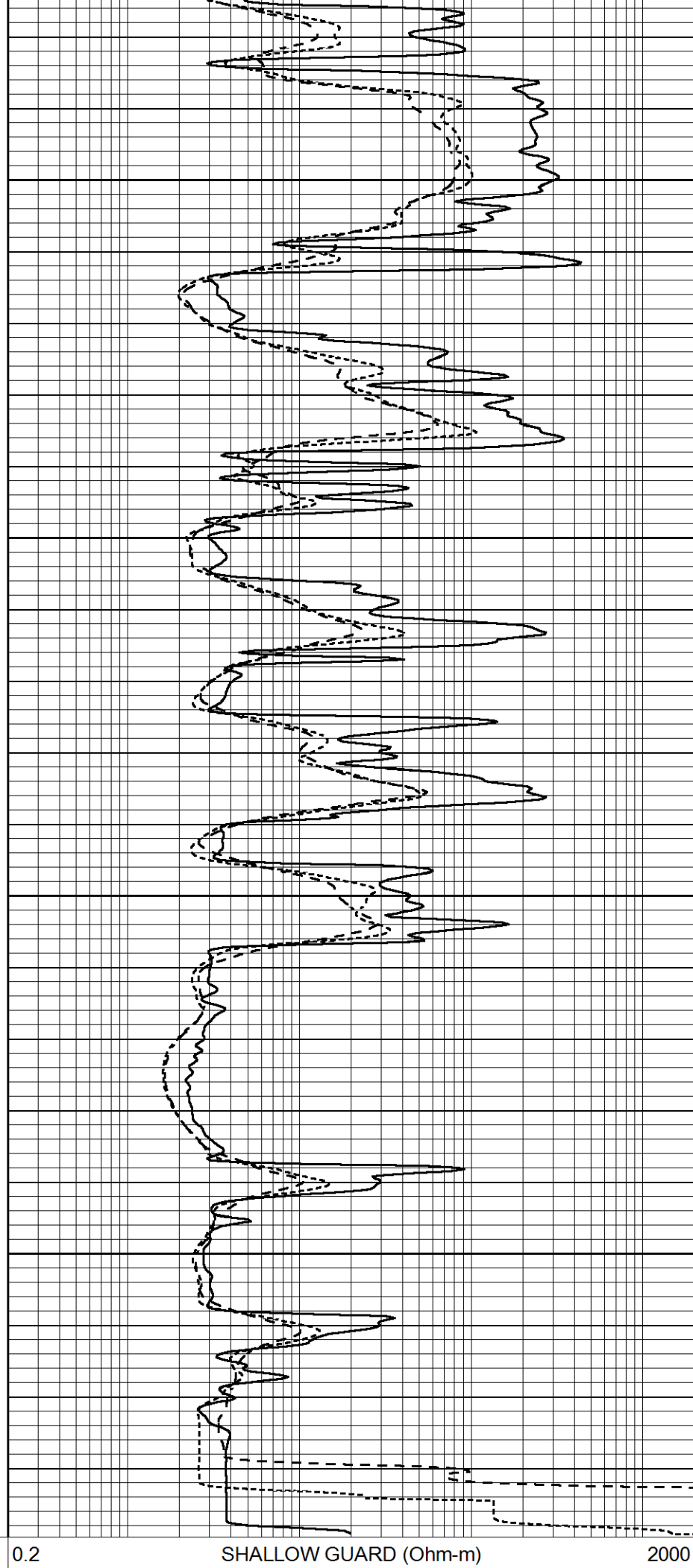
3700

3750

3800

3850

0 GAMMA RAY (GAPI) 150



0.2 SHALLOW GUARD (Ohm-m) 2000

|      |         |     |     |                          |      |
|------|---------|-----|-----|--------------------------|------|
| -100 | SP (mV) | 100 | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| -250 | Rxo/Rt  | 50  | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |

| Calibration Report |                          |
|--------------------|--------------------------|
| Database File      | 26601ddn8.db             |
| Dataset Pathname   | pass3.2                  |
| Dataset Creation   | Fri Jul 24 20:20:35 2015 |

| Dual Induction Calibration Report |
|-----------------------------------|
|-----------------------------------|

|                                      |                          |
|--------------------------------------|--------------------------|
| Serial-Model:                        | FW1410-56-Probe          |
| Surface Cal Performed:               | Fri Mar 13 14:03:50 2015 |
| Downhole Cal Performed:              | Fri Mar 13 15:37:29 2015 |
| After Survey Verification Performed: | Fri Mar 13 15:37:29 2015 |

| Surface Calibration |        | Readings |   | References |         |        | Results |        |
|---------------------|--------|----------|---|------------|---------|--------|---------|--------|
| Loop:               | Air    | Loop     |   | Air        | Loop    |        | m       | b      |
| Deep                | 0.008  | 0.765    | V | 1.000      | 400.000 | mmho/m | 527.061 | -3.201 |
| Medium              | -0.056 | 0.761    | V | 1.000      | 464.000 | mmho/m | 567.187 | 32.510 |
| Internal:           | Zero   | Cal      |   | Zero       | Cal     |        | m       | b      |
| Deep                | 0.005  | 0.624    | V | 0.000      | 400.000 | mmho/m | 645.611 | -3.034 |
| Medium              | 0.012  | 0.721    | V | 0.000      | 464.000 | mmho/m | 653.591 | -7.532 |

| Downhole Calibration |        | Readings |        | References |          |        | Results |        |
|----------------------|--------|----------|--------|------------|----------|--------|---------|--------|
|                      | Zero   | Cal      |        | Zero       | Cal      |        | m'      | b'     |
| Deep                 | -0.647 | 301.329  | mmho/m | -0.780     | 336.378  | mmho/m | 1.117   | -0.058 |
| Medium               | 38.256 | 411.013  | mmho/m | 39.046     | 441.706  | mmho/m | 1.080   | -2.280 |
| LL3                  |        | 7.471    | V      |            | 1500.000 | Ohm-m  |         |        |
|                      |        | 0.001    | V      |            | 20.000   | Ohm-m  |         |        |
|                      |        | -7.085   | V      |            | 6000.000 | mmho-m |         |        |

| After Survey Verification |       | Readings |        | Targets |          |        | Results |       |
|---------------------------|-------|----------|--------|---------|----------|--------|---------|-------|
|                           | Zero  | Cal      |        | Zero    | Cal      |        | m'      | b'    |
| Deep                      | 0.000 | 0.000    | mmho/m | -0.647  | 301.329  | mmho/m | 1.000   | 0.000 |
| Medium                    | 0.000 | 0.000    | mmho/m | 38.256  | 411.013  | mmho/m | 1.000   | 0.000 |
| LL3                       |       | 0.000    | Ohm-m  |         | 1500.000 | Ohm-m  |         |       |
|                           |       | 0.000    | Ohm-m  |         | 20.000   | Ohm-m  |         |       |
|                           |       | 0.000    | mmho-m |         | 3745.000 | mmho-m |         |       |

| Litho Density Calibration Report |          |
|----------------------------------|----------|
| Serial:                          | 140704   |
| Model:                           | V4_10P   |
| Source Number:                   | 74GBq-19 |

| Master Calibration |            | Performed: Wed Feb 11 18:53:41 2015 |           |     |
|--------------------|------------|-------------------------------------|-----------|-----|
|                    | Background | Aluminum                            | Magnesium |     |
| Window 1           | 613.01     | 6027.40                             | 27508.60  | cps |
| Window 2           | 48.21      | 1424.77                             | 7132.66   | cps |
| Window 4           | 266.48     | 1373.19                             | 5767.15   | cps |
| Window 5           | 622.07     | 10090.30                            | 18937.90  | cps |
| Window 6           | 49.07      | 1682.84                             | 3271.18   | cps |
| Window 8           | 298.04     | 3248.38                             | 5980.58   | cps |

|              |               |           |              |         |          |
|--------------|---------------|-----------|--------------|---------|----------|
| Bulk Density | -             | 2.6020    | 1.6830       | g/cc    |          |
| Pe           | -             | 3.0000    | 2.5070       | b/e     |          |
| LS Alpha:    | : -1.8451     | SS Alpha: | : -0.7542    | LS CPE: | : 1.0882 |
| LS Beta:     | : 138648.8473 | SS Beta:  | : 21960.9250 | SS CPE: | : 1.5181 |

|                                              |      |     |                                     |  |  |
|----------------------------------------------|------|-----|-------------------------------------|--|--|
| Before Survey Background Counts Verification |      |     | Performed: Wed Dec 31 18:00:00 1969 |  |  |
| Window 1                                     | 0.00 | cps |                                     |  |  |
| Window 2                                     | 0.00 | cps |                                     |  |  |
| Window 4                                     | 0.00 | cps |                                     |  |  |
| Window 5                                     | 0.00 | cps |                                     |  |  |
| Window 6                                     | 0.00 | cps |                                     |  |  |
| Window 8                                     | 0.00 | cps |                                     |  |  |

|                                             |      |     |                                     |  |  |
|---------------------------------------------|------|-----|-------------------------------------|--|--|
| After Survey Background Counts Verification |      |     | Performed: Wed Dec 31 18:00:00 1969 |  |  |
| Window 1                                    | 0.00 | cps |                                     |  |  |
| Window 2                                    | 0.00 | cps |                                     |  |  |
| Window 4                                    | 0.00 | cps |                                     |  |  |
| Window 5                                    | 0.00 | cps |                                     |  |  |
| Window 6                                    | 0.00 | cps |                                     |  |  |
| Window 8                                    | 0.00 | cps |                                     |  |  |

|                                  |          |                 |      |                                     |        |
|----------------------------------|----------|-----------------|------|-------------------------------------|--------|
| Lithodensity Caliper Calibration |          |                 |      | Performed: Wed Feb 11 18:53:41 2015 |        |
| Results                          | Readings | References (in) |      |                                     |        |
| Low                              | High     | Low             | High | Gain                                | Offset |
| 5123.0                           | 9461.6   | 8.5             | 14.0 | 0.0                                 | 1.4    |

|                                    |           |         |            |  |  |
|------------------------------------|-----------|---------|------------|--|--|
| Before Survey Caliper Verification |           |         | Performed: |  |  |
|                                    | Reference | Reading |            |  |  |
|                                    | _____     | _____   |            |  |  |
| Caliper (in)                       |           |         |            |  |  |

|                                   |           |         |            |  |  |
|-----------------------------------|-----------|---------|------------|--|--|
| After Survey Caliper Verification |           |         | Performed: |  |  |
|                                   | Reference | Reading |            |  |  |
|                                   | _____     | _____   |            |  |  |
| Caliper (in)                      |           |         |            |  |  |

Compensated Neutron Calibration Report

|                |           |
|----------------|-----------|
| Serial Number: | 080620PMC |
| Tool Model:    | NABORS    |

|                         |          |          |        |  |
|-------------------------|----------|----------|--------|--|
| PRE-SURVEY VERIFICATION |          |          |        |  |
| Detector                | Readings | Measured | Target |  |
| Short Space             | cps      |          |        |  |
| Long Space              | cps      | pu       | pu     |  |

|                          |          |          |        |  |
|--------------------------|----------|----------|--------|--|
| POST-SURVEY VERIFICATION |          |          |        |  |
| Detector                 | Readings | Measured | Target |  |

|                              |                          |          |    |
|------------------------------|--------------------------|----------|----|
| Short Space                  | cps                      |          |    |
| Long Space                   | cps                      | pu       | pu |
| Gamma Ray Calibration Report |                          |          |    |
| Serial Number:               | 46001                    |          |    |
| Tool Model:                  | Probe1                   |          |    |
| Performed:                   | Mon Nov 24 09:45:18 2014 |          |    |
| Calibrator Value:            | 1.0                      | GAPI     |    |
| Background Reading:          | 0.0                      | cps      |    |
| Calibrator Reading:          | 1.0                      | cps      |    |
| Sensitivity:                 | 0.2600                   | GAPI/cps |    |