



# DUAL INDUCTION LOG

|                              |                           |                     |                                  |
|------------------------------|---------------------------|---------------------|----------------------------------|
| Company                      | L.D. DRILLING, INC.       |                     |                                  |
| Well                         | #1-14 MARIAH              |                     |                                  |
| Field                        | WILDCAT                   |                     |                                  |
| County                       | LANE                      | State               | KANSAS                           |
| Location:                    | API # : 15-101-22637-0000 |                     | Other Services<br>CDL/CNL<br>MEL |
| Permanent Datum              | GROUND LEVEL              | Elevation           | 2776                             |
| Log Measured From            | KELLY BUSHING             | 5' A.G.L.           |                                  |
| Drilling Measured From       | KELLY BUSHING             |                     |                                  |
| SEC                          | 14                        | TWP                 | 16S                              |
| RGE                          | 30W                       |                     |                                  |
| Date                         | 10/26/19                  |                     |                                  |
| Run Number                   | ONE                       |                     |                                  |
| Depth Driller                | 4600                      |                     |                                  |
| Depth Logger                 | 4600                      |                     |                                  |
| Bottom Logged Interval       | 4598                      |                     |                                  |
| Top Log Interval             | 00                        |                     |                                  |
| Casing Driller               | 8 5/8"@285'               |                     |                                  |
| Casing Logger                | 286                       |                     |                                  |
| Bit Size                     | 7 7/8"                    |                     |                                  |
| Type Fluid in Hole           | CHEMICAL MUD              | CHLORIDES 3,700 PPM |                                  |
| Density / Viscosity          | 9.6/57                    |                     |                                  |
| pH / Fluid Loss              | 9.5/10.4                  |                     |                                  |
| Source of Sample             | FLOWLINE                  |                     |                                  |
| Rim @ Meas. Temp             | .900@70F                  |                     |                                  |
| Rmf @ Meas. Temp             | .675@70F                  |                     |                                  |
| Rmc @ Meas. Temp             | 1.08@70F                  |                     |                                  |
| Source of Rmf / Rmc          | MEASUREMENT               |                     |                                  |
| Rim @ BHT                    | .521@121F                 |                     |                                  |
| Time Circulation Stopped     | 2 HOURS                   |                     |                                  |
| Time Logger on Bottom        | 6:30 A.M.                 |                     |                                  |
| Maximum Recorded Temperature | 121F                      |                     |                                  |
| Equipment Number             | 922339                    |                     |                                  |
| Location                     | HAYS, KANSAS              |                     |                                  |
| Recorded By                  | JEFF LUEBBERS             |                     |                                  |
| Witnessed By                 | KIM SHOEMAKER             |                     |                                  |

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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 ELI WIRELINE HAYS, KANSAS (785) 628-6395  
DIRECTIONS  
HEALY, KS., 4N. ON "DODGE RD." E. INTO



# MAIN SECTION

Database File: 3975ddn.db  
Dataset Pathname: pass3.8  
Presentation Format: dil2  
Dataset Creation: Sat Oct 26 07:48:27 2019  
Charted by: Depth in Feet scaled 1:600

|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| 0    | RWA (Ohm-m)      | 1   |

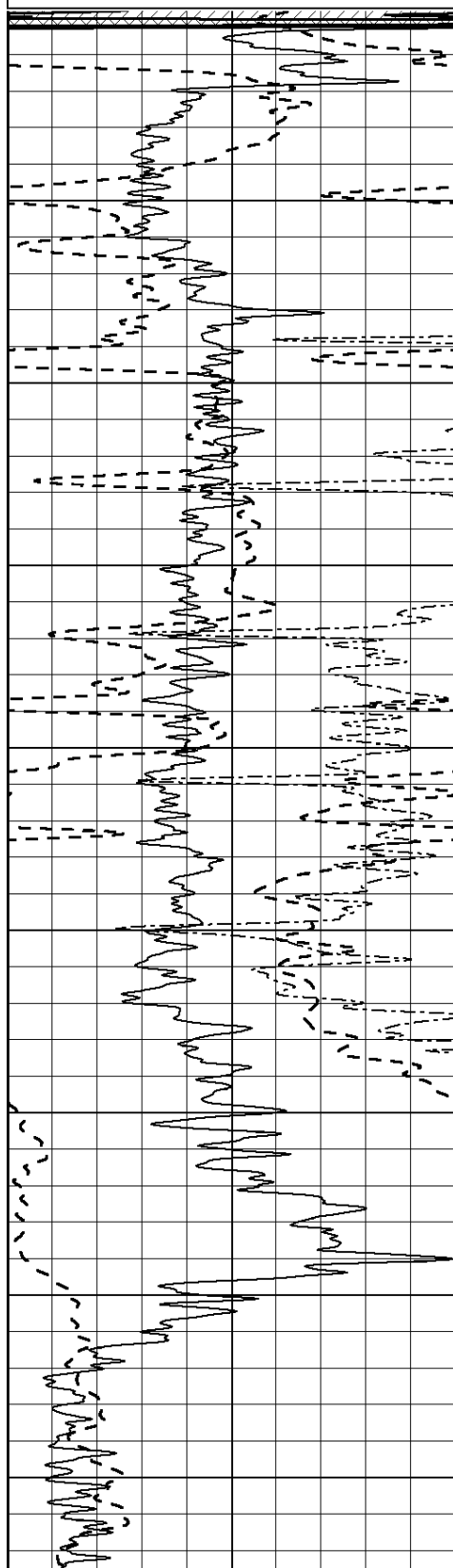
|   |              |    |
|---|--------------|----|
| 0 | RLL3 (Ohm-m) | 50 |
|---|--------------|----|

|   |              |    |
|---|--------------|----|
| 0 | RILD (Ohm-m) | 50 |
|---|--------------|----|

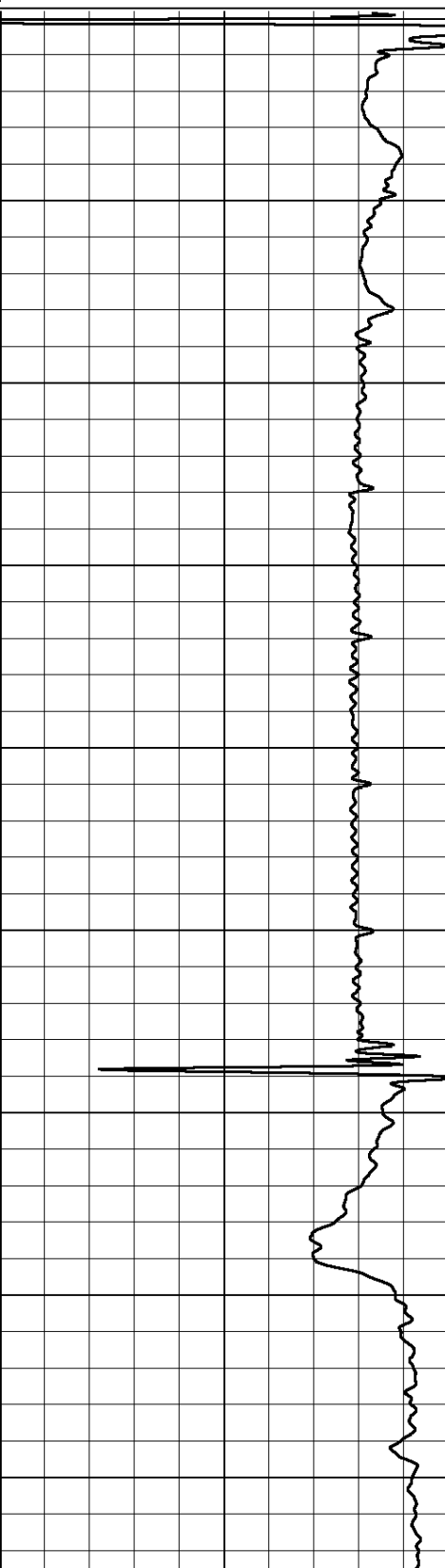
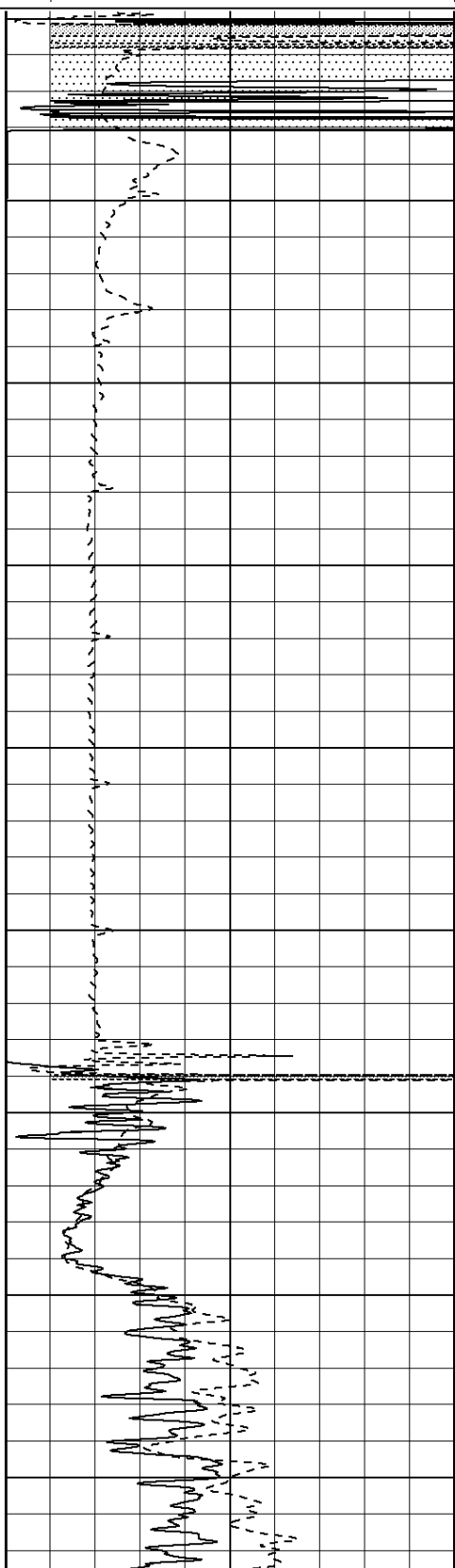
|      |               |   |
|------|---------------|---|
| 1000 | CILD (mmho/m) | 0 |
|------|---------------|---|

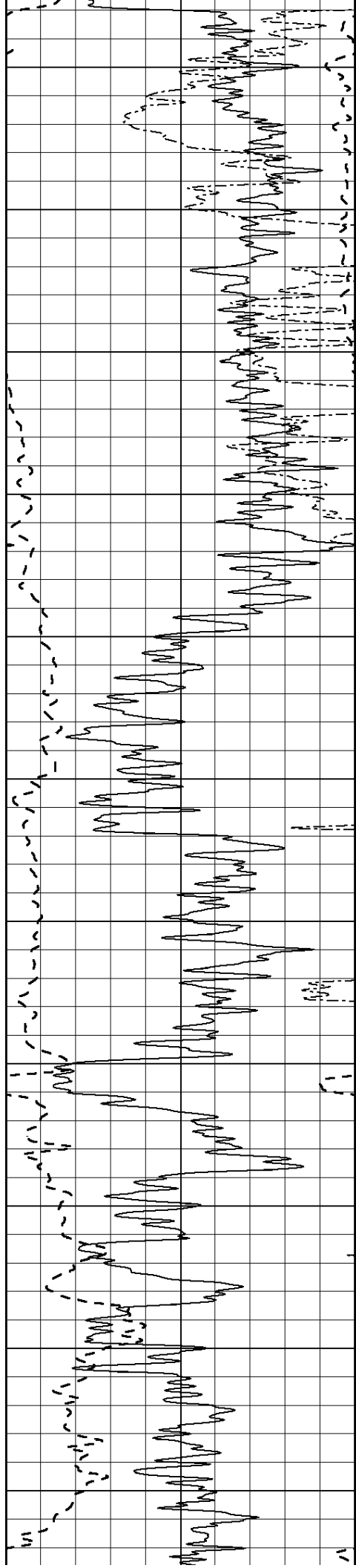
|    |                  |     |
|----|------------------|-----|
| 50 | RILD X10 (Ohm-m) | 500 |
|----|------------------|-----|

|    |                  |     |
|----|------------------|-----|
| 50 | RLL3 X10 (Ohm-m) | 500 |
|----|------------------|-----|

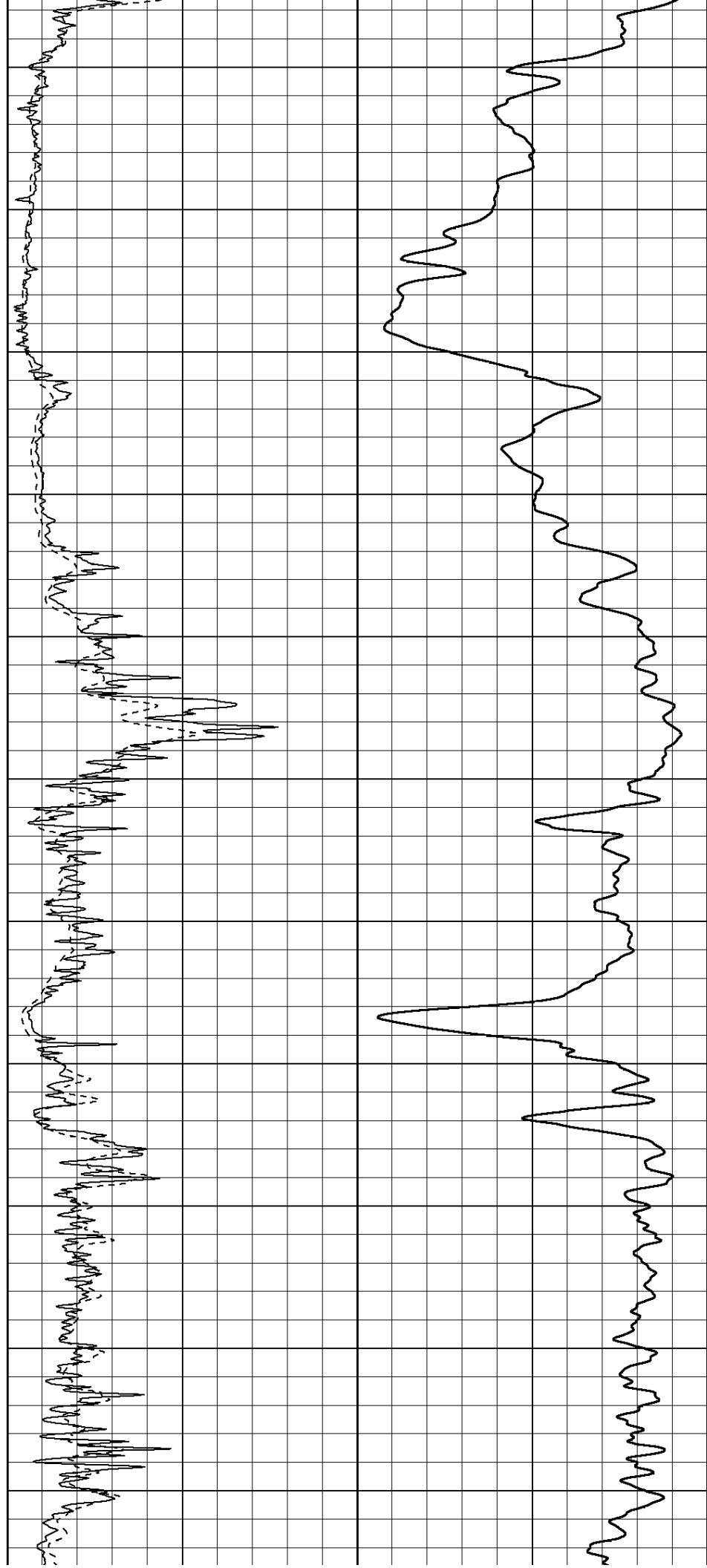


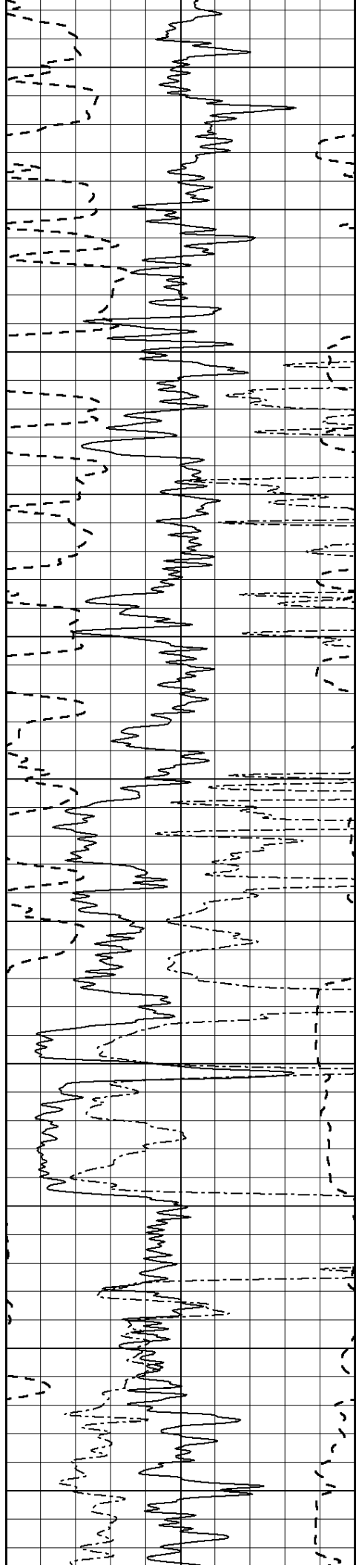
0  
50  
100  
150  
200  
250  
300  
350  
400



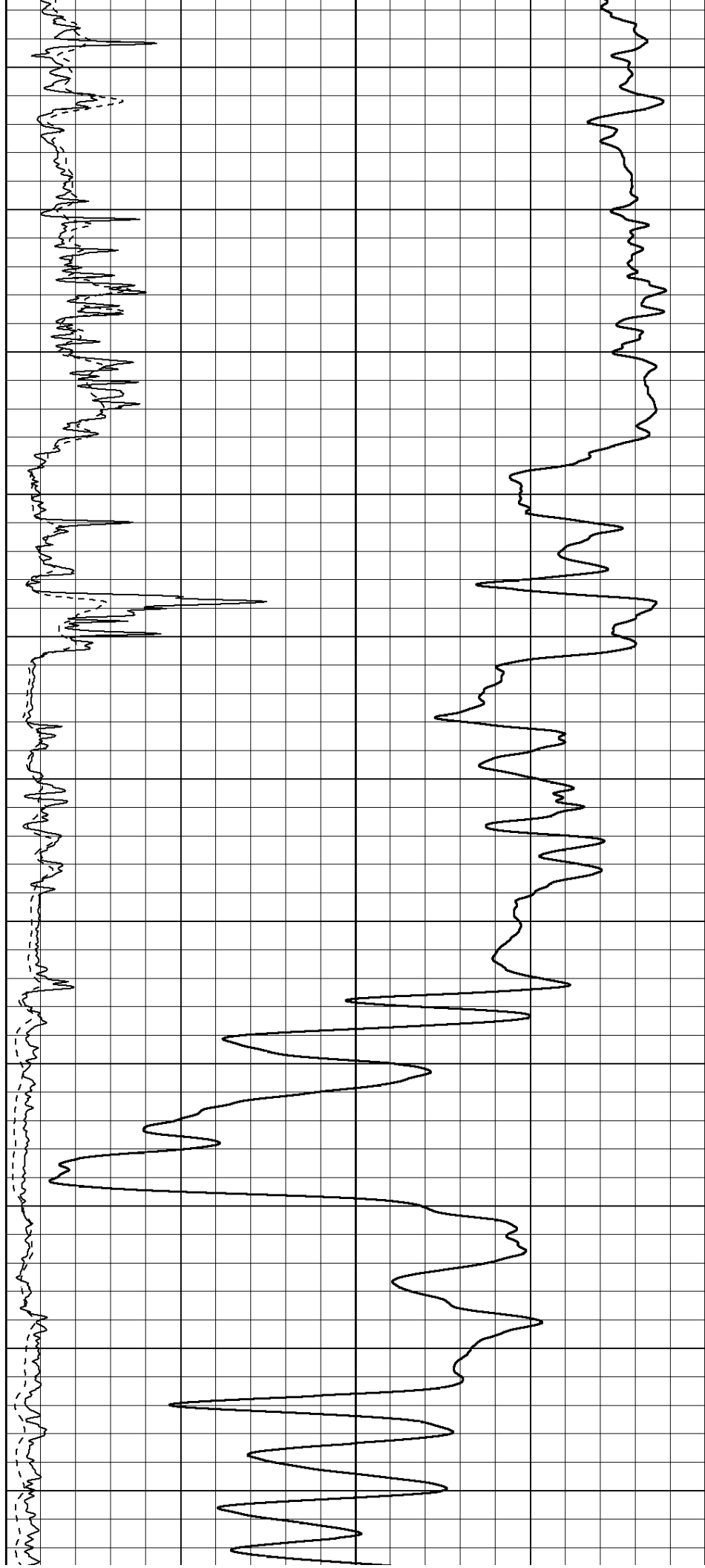


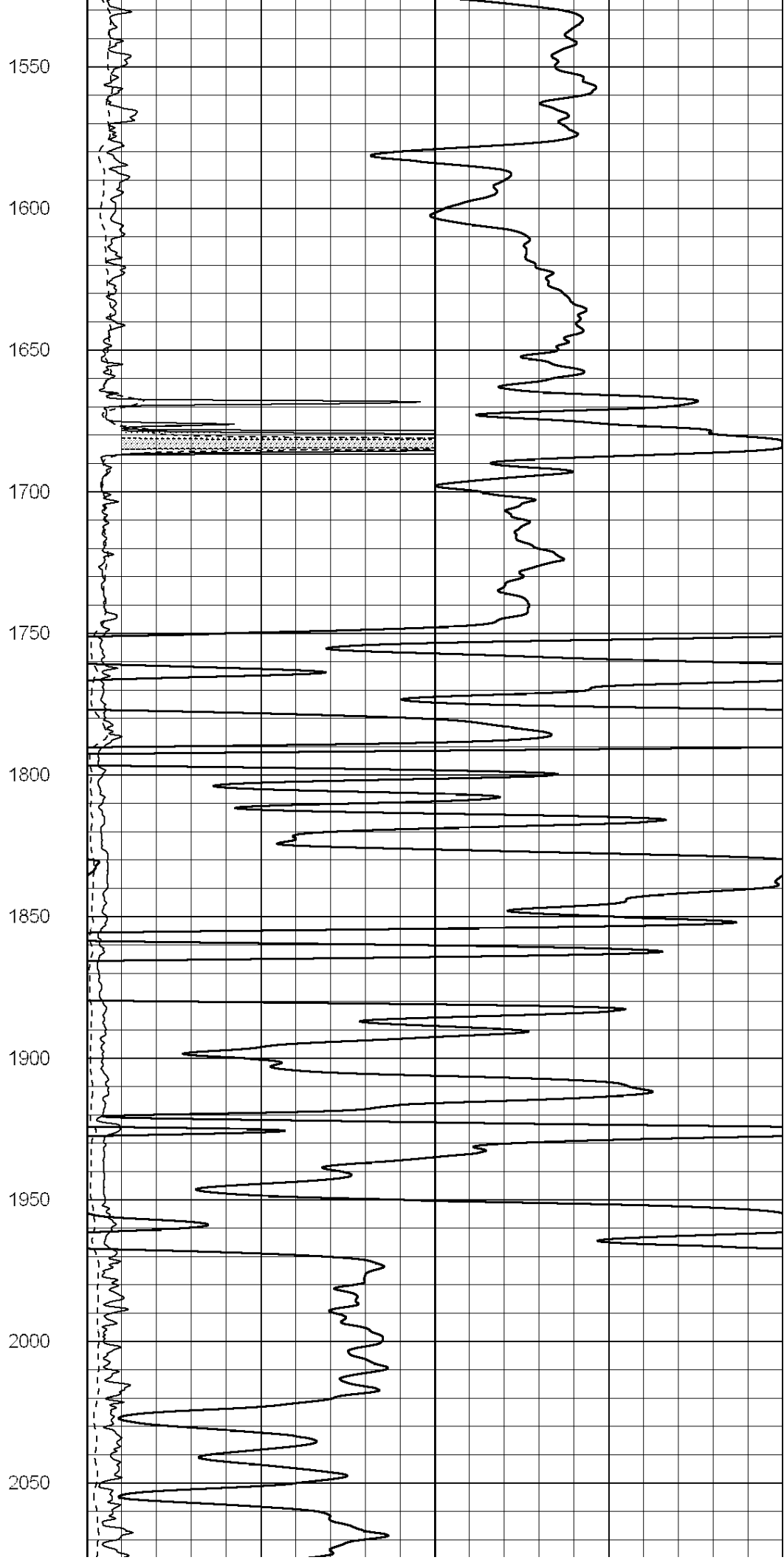
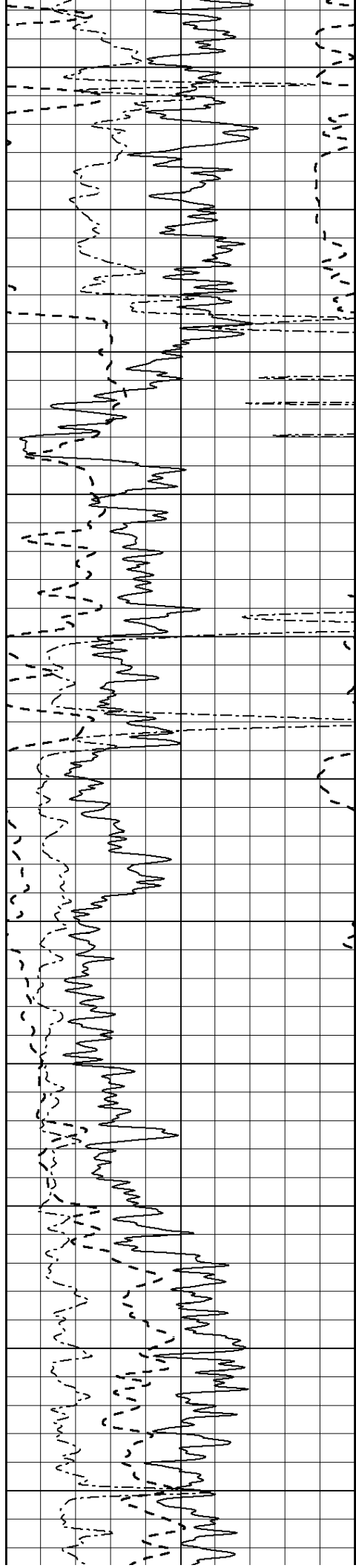
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500  
550  
600  
650  
700  
750  
800  
850  
900  
950

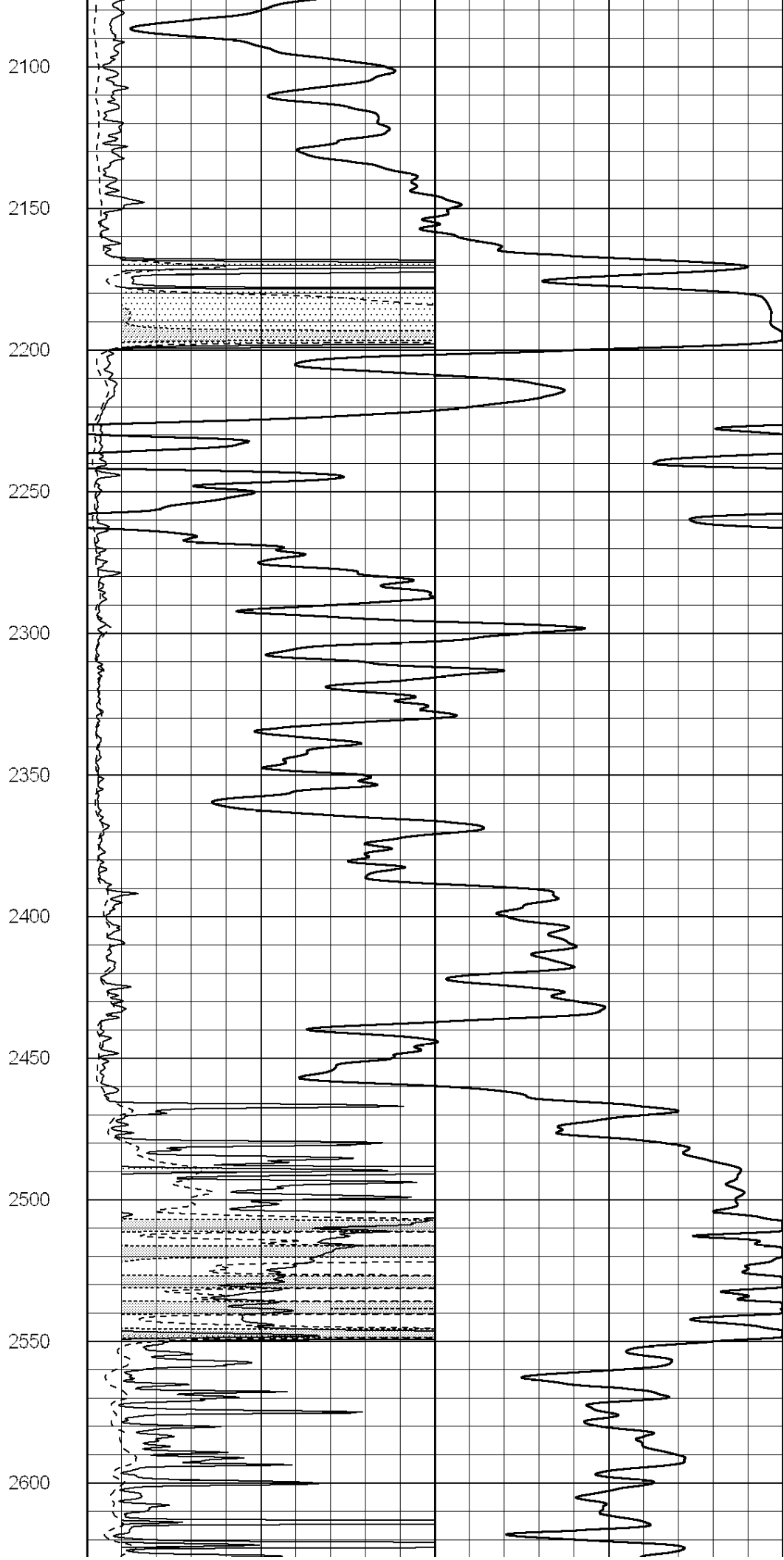
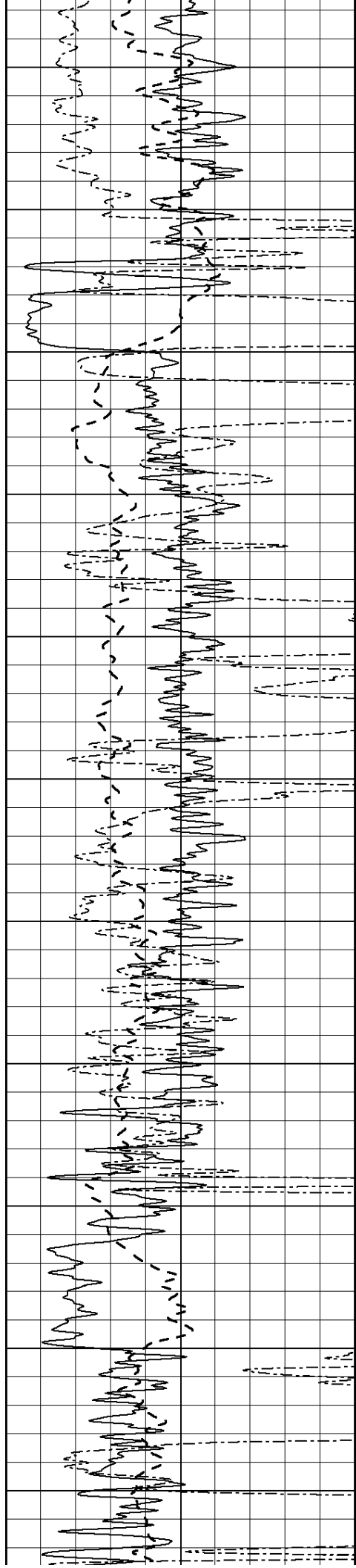


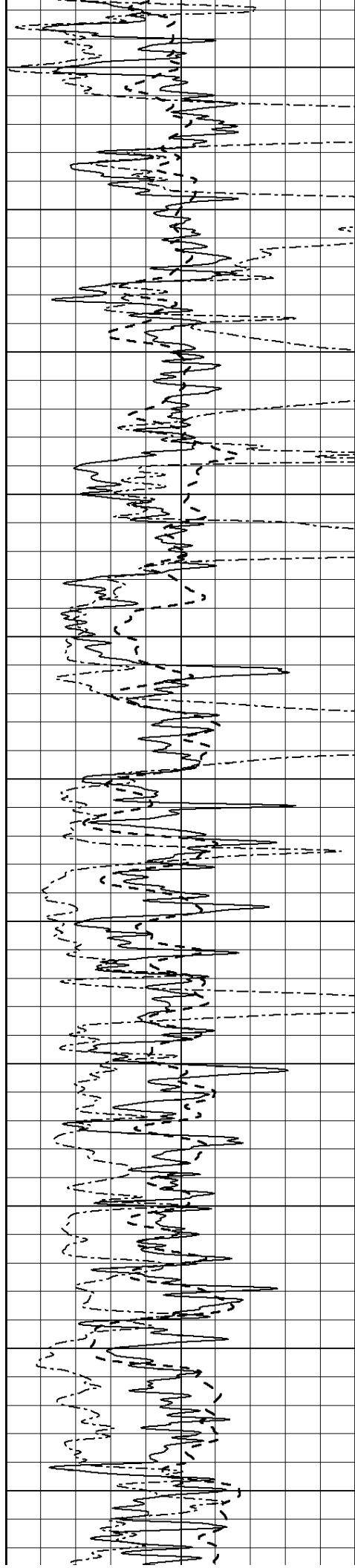


1000  
1050  
1100  
1150  
1200  
1250  
1300  
1350  
1400  
1450  
1500









2650

2700

2750

2800

2850

2900

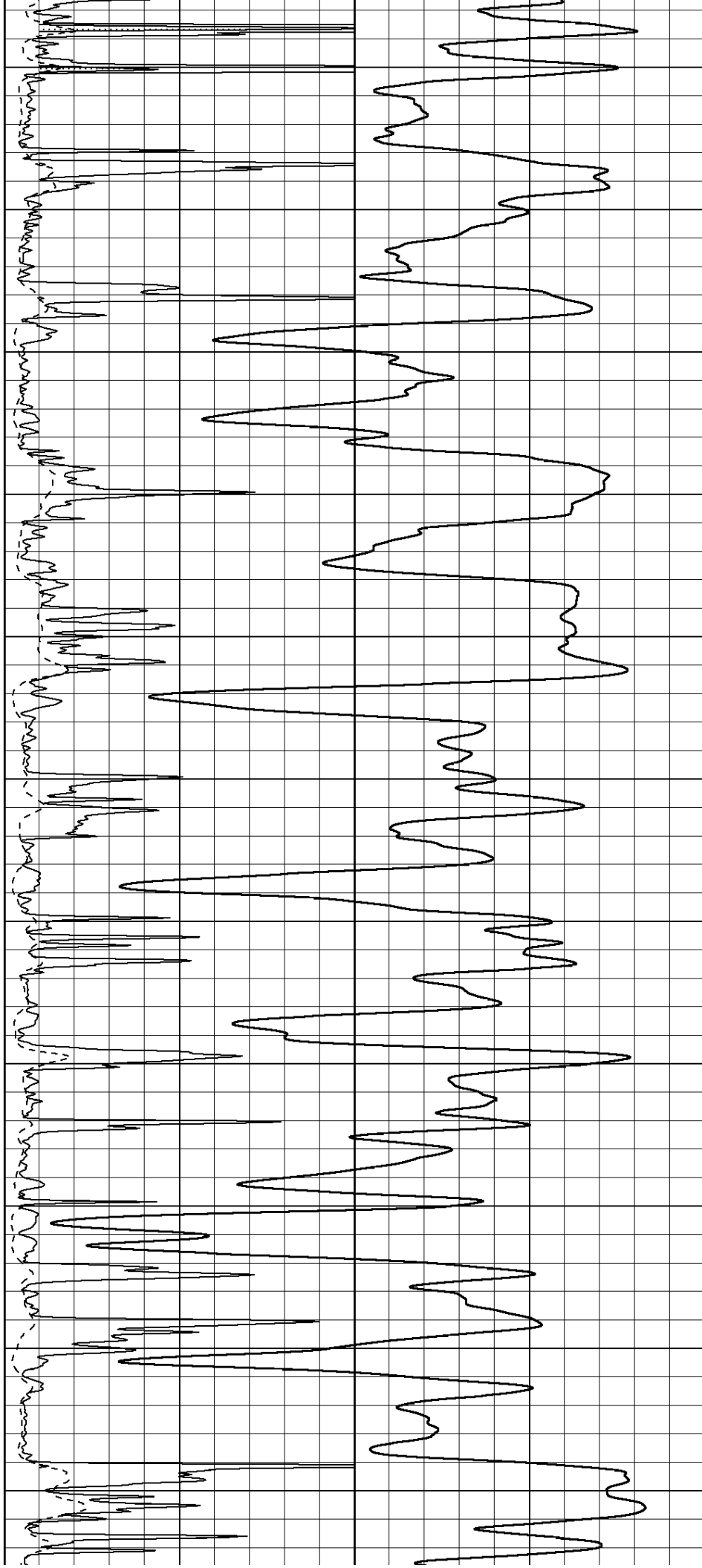
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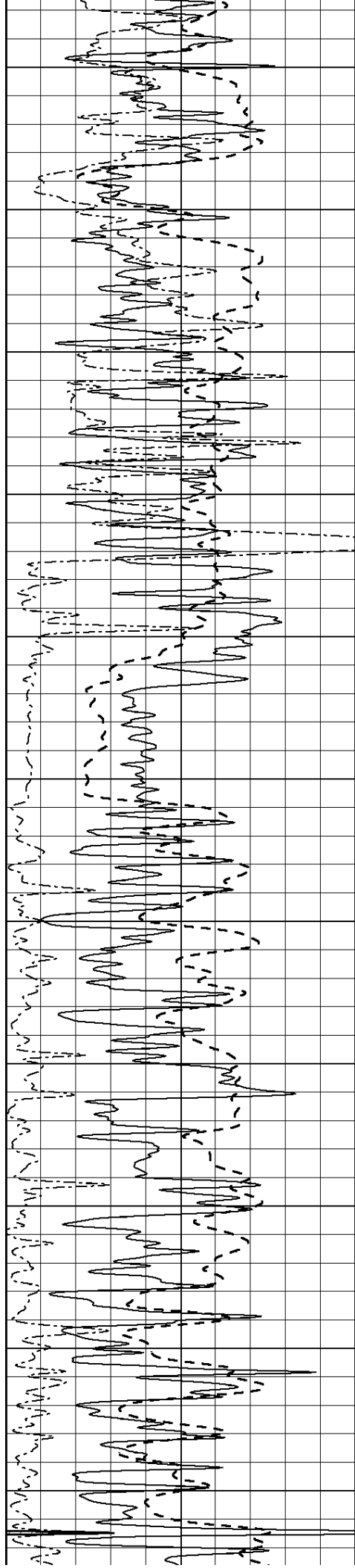
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3050

3100

3150





3200

3250

3300

3350

3400

3450

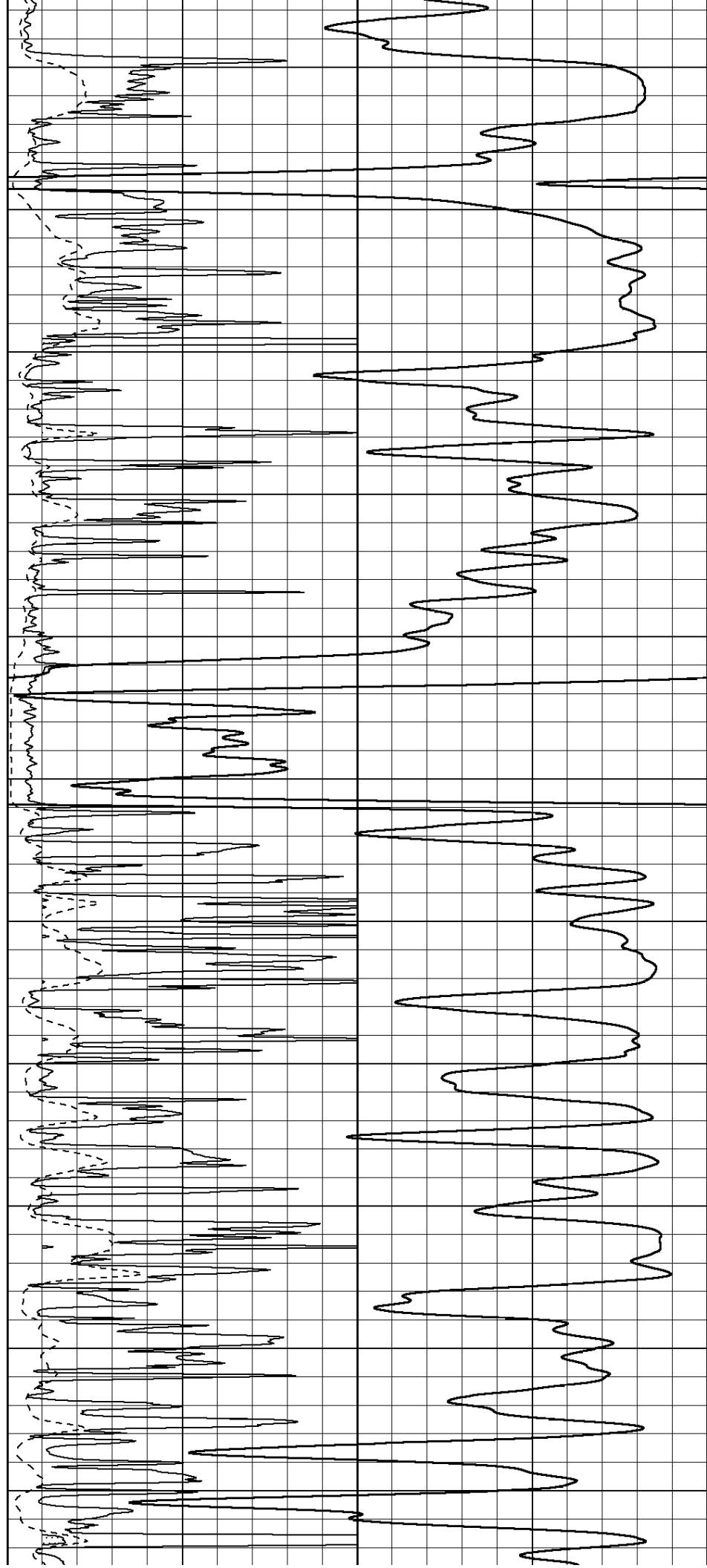
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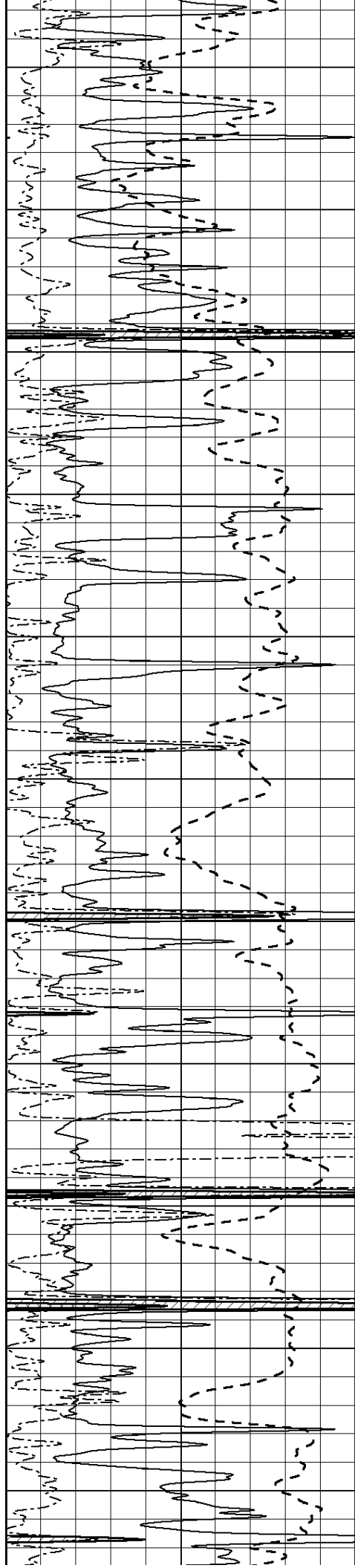
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3600

3650

3700





3750

3800

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4000

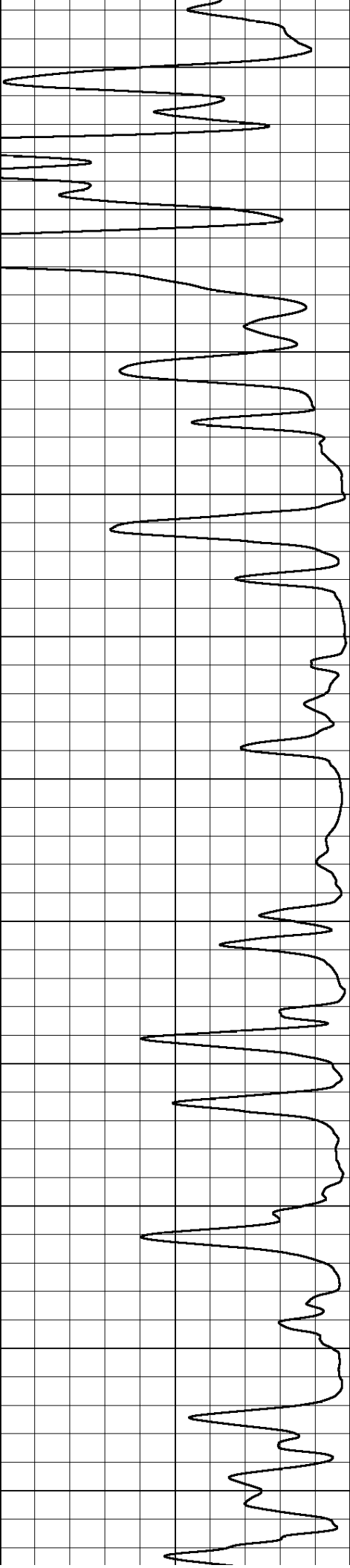
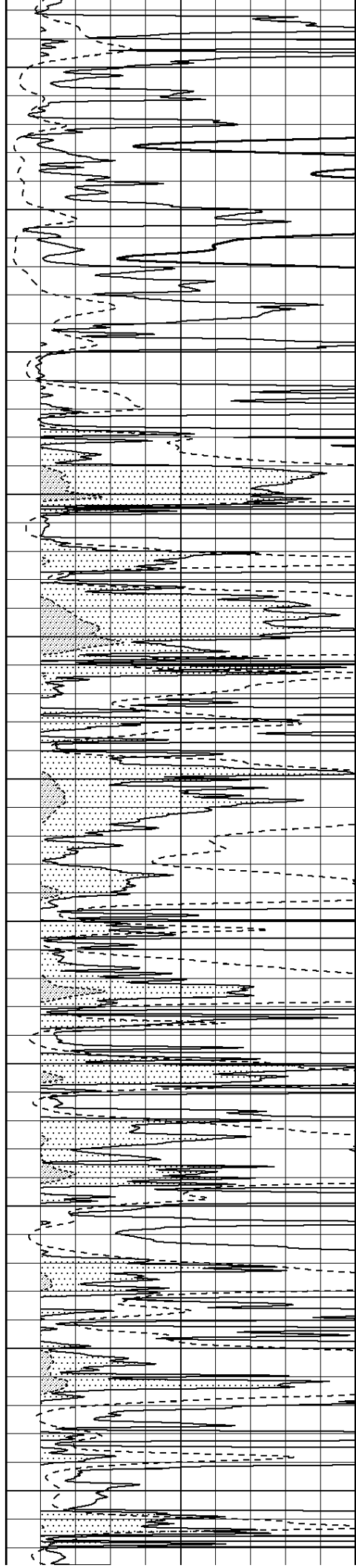
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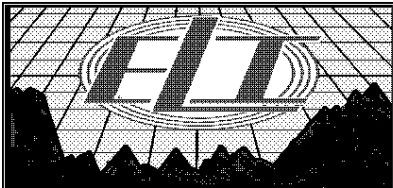
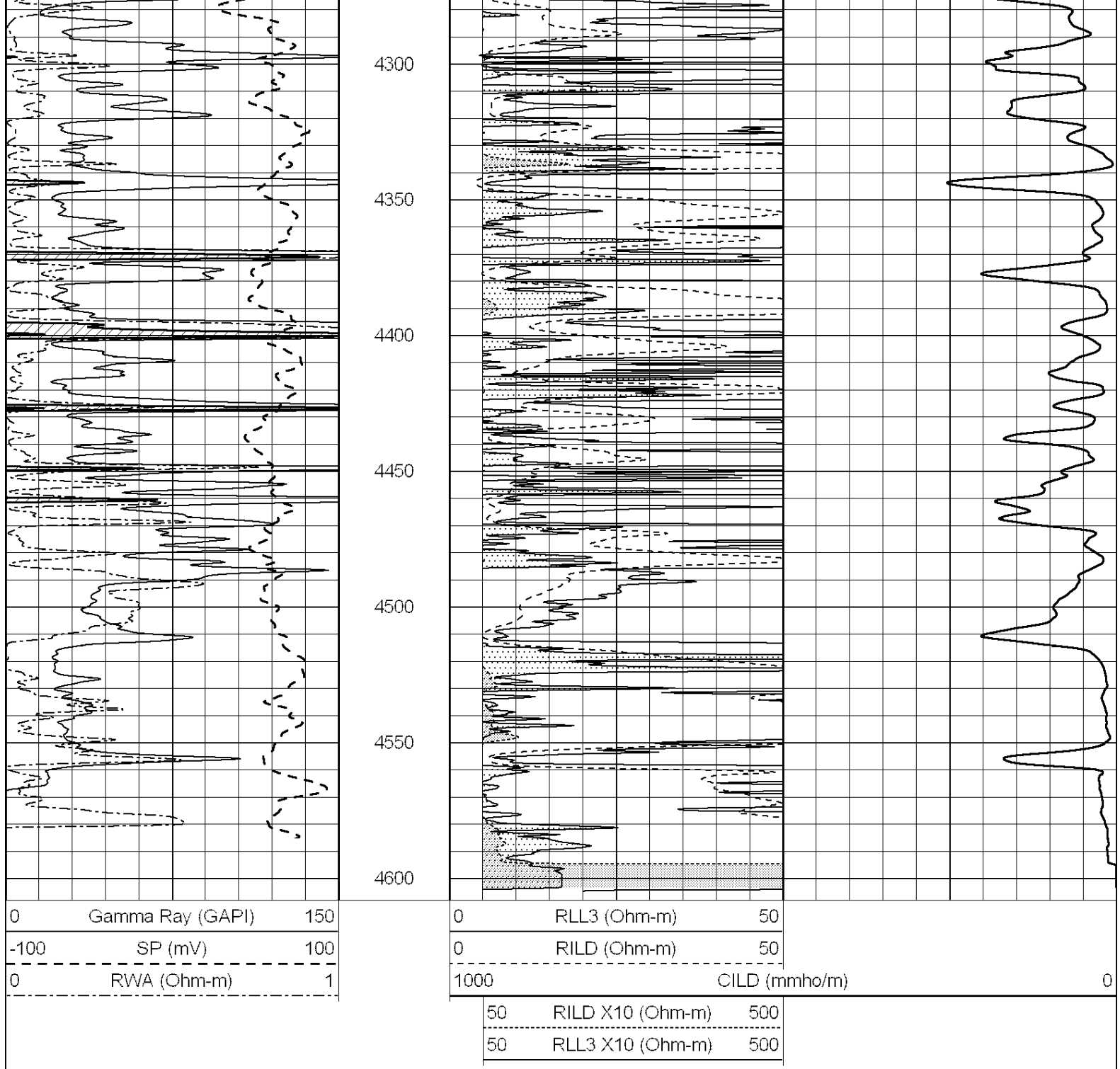
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4150

4200

4250

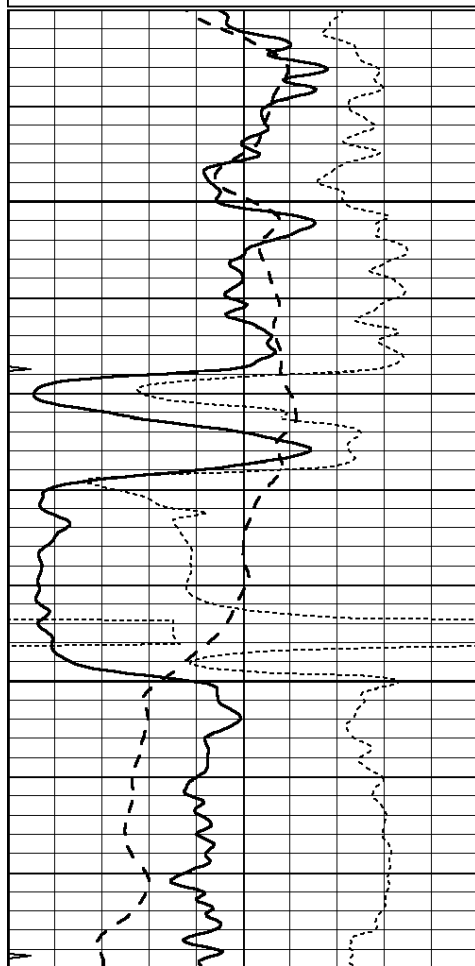




# ANHYDRITE

Database File: 3975ddn.db  
 Dataset Pathname: pass3.8A  
 Presentation Format: \_dil  
 Dataset Creation: Sat Oct 26 07:49:41 2019  
 Charted by: Depth in Feet scaled 1:240

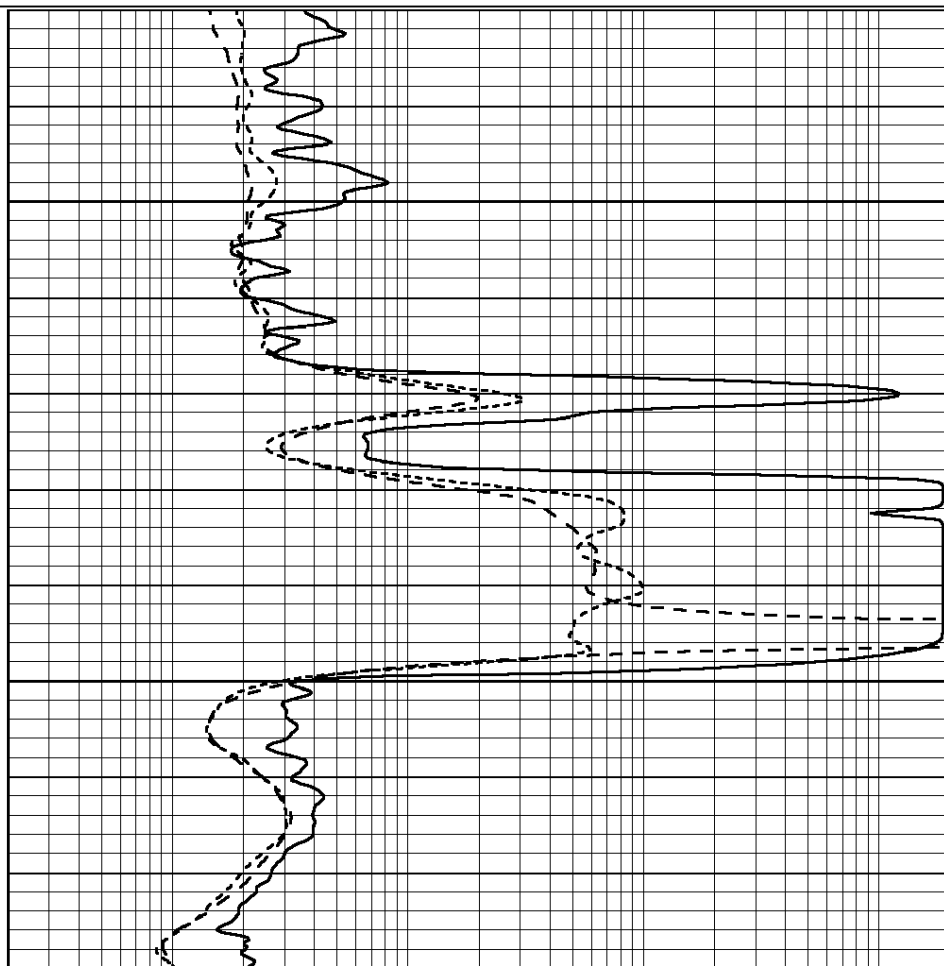
|      |                  |     |     |                          |      |
|------|------------------|-----|-----|--------------------------|------|
| 0    | GAMMA RAY (GAPI) | 150 | 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| -100 | SP (mV)          | 100 | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| -250 | Rxo/Rt           | 50  | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| 0    | MINMK            | 20  |     |                          |      |



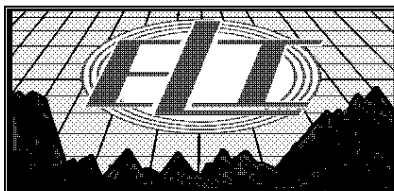
|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

2150

2200



|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



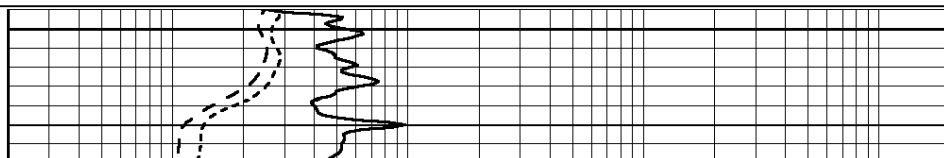
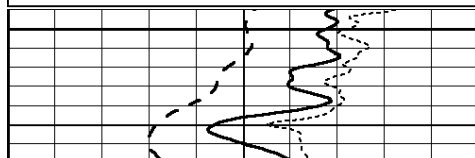
# MAIN SECTION

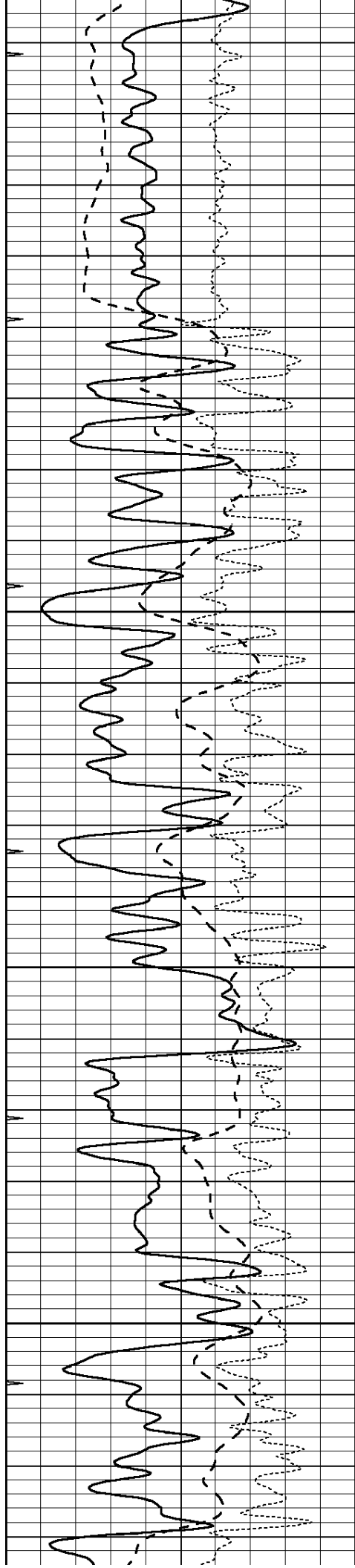
Database File: 3975ddn.db  
 Dataset Pathname: pass3.8  
 Presentation Format: \_dil  
 Dataset Creation: Sat Oct 26 07:48:27 2019  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |

3400



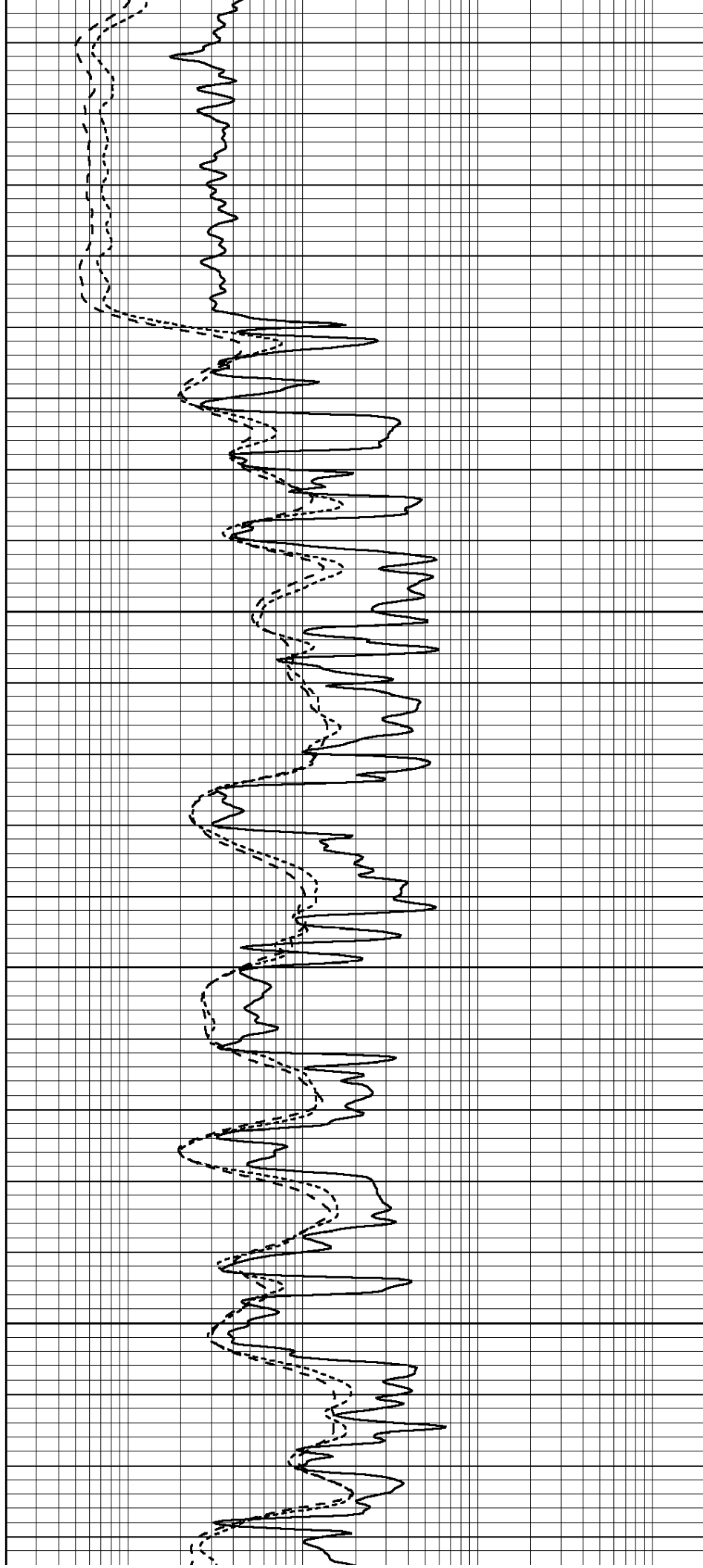


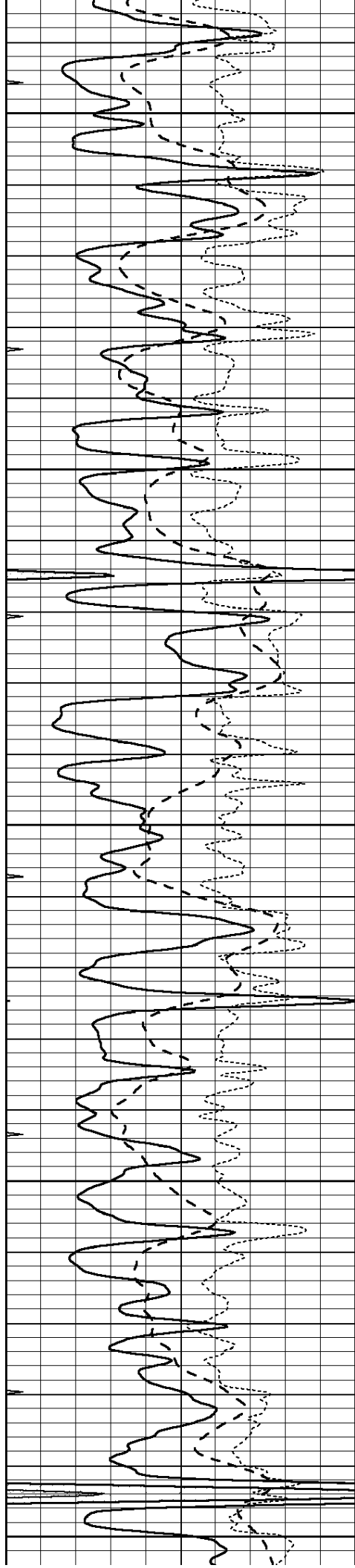
3450

3500

3550

3600





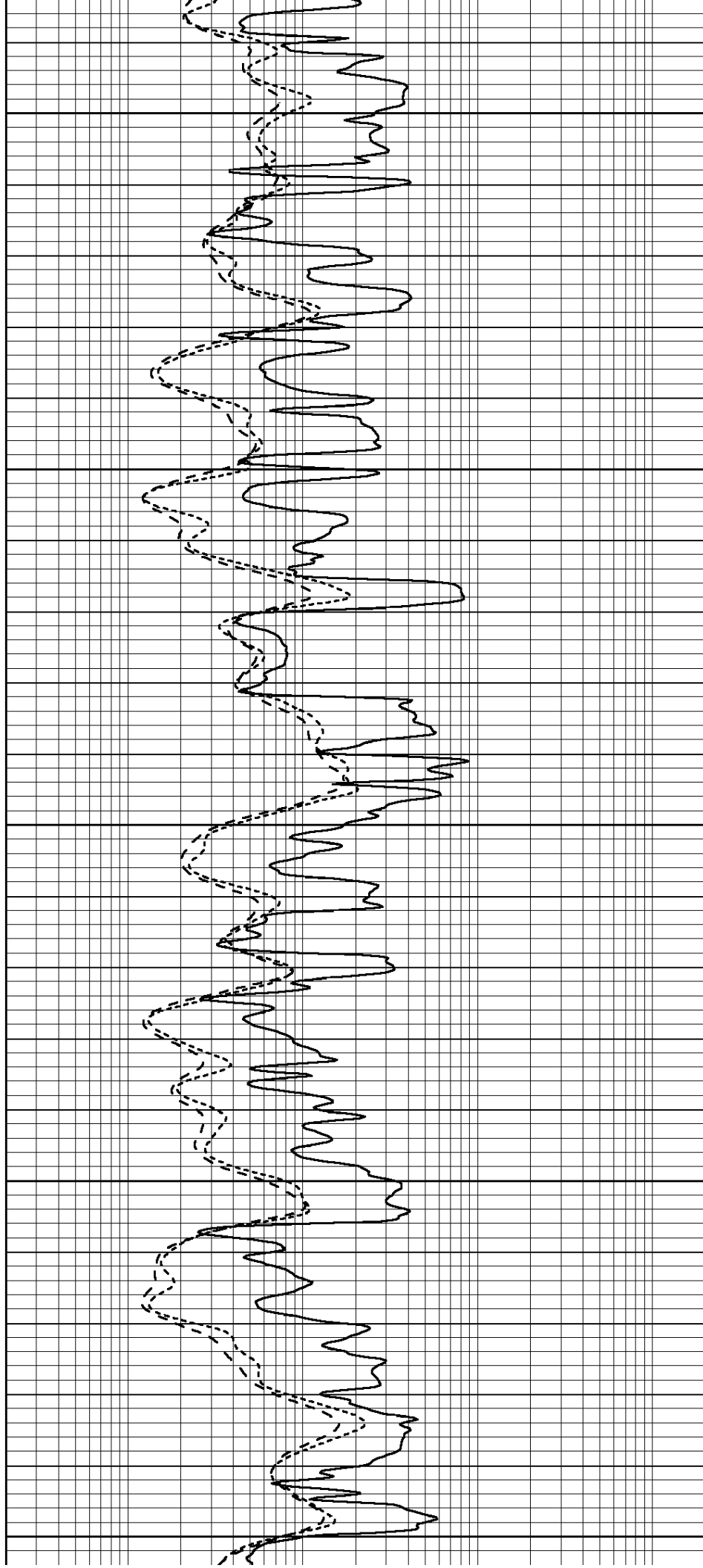
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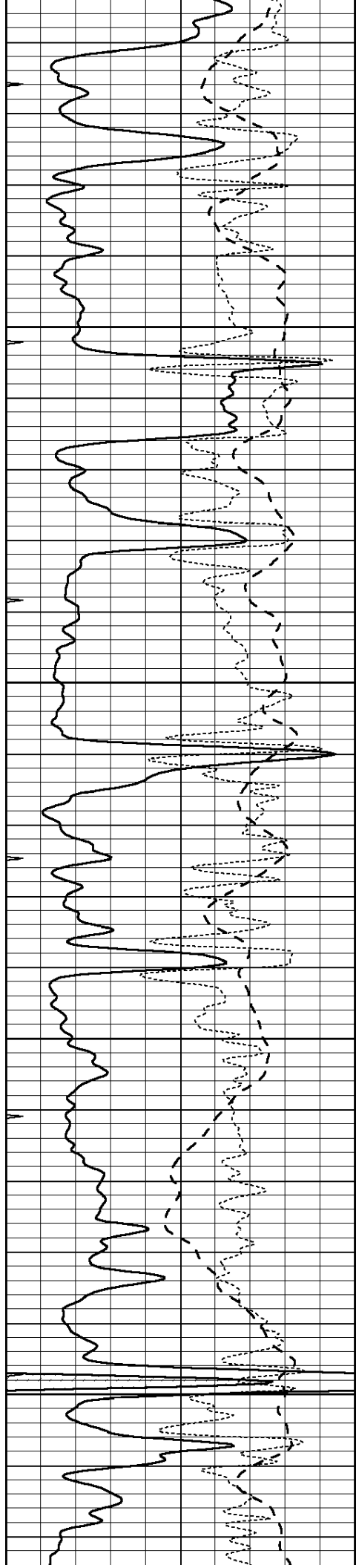
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3750

3800

3850



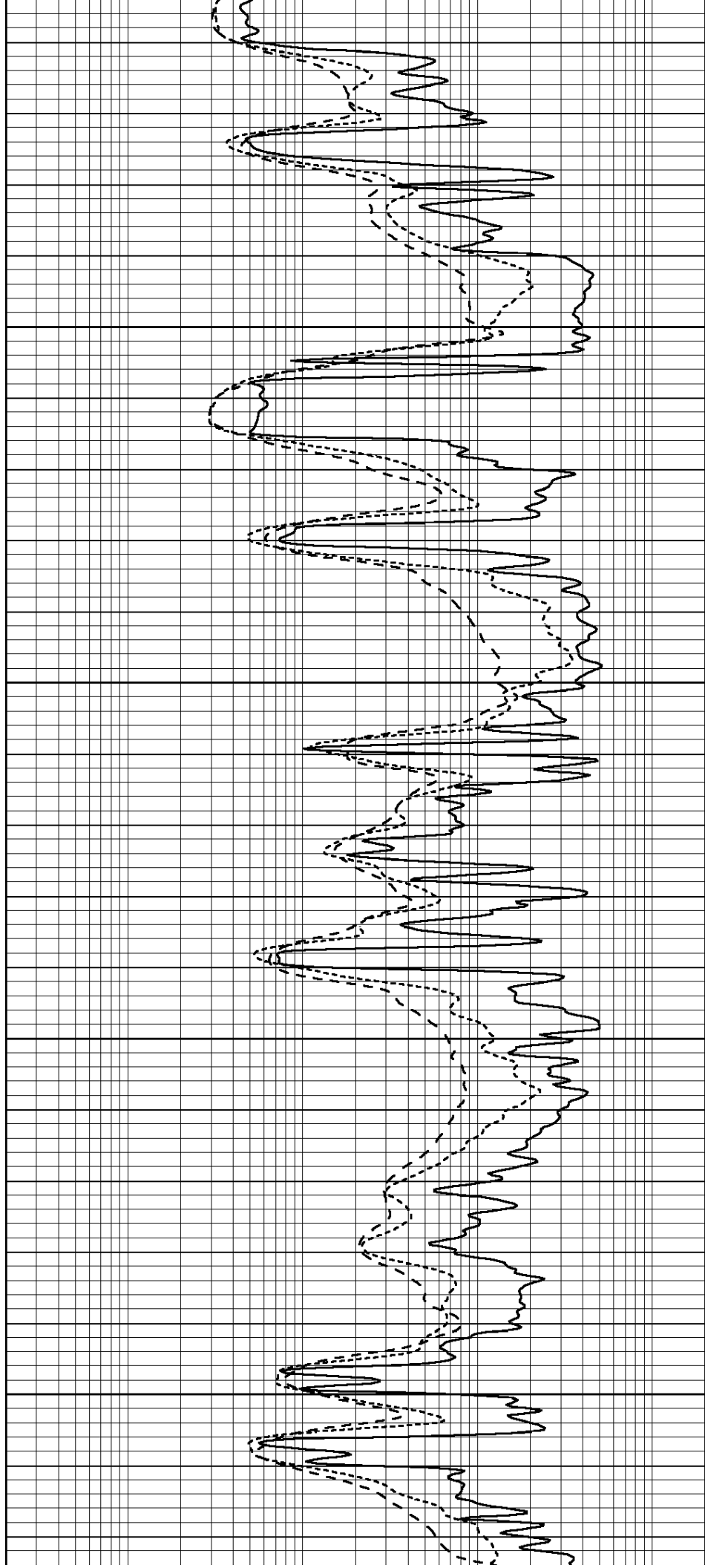


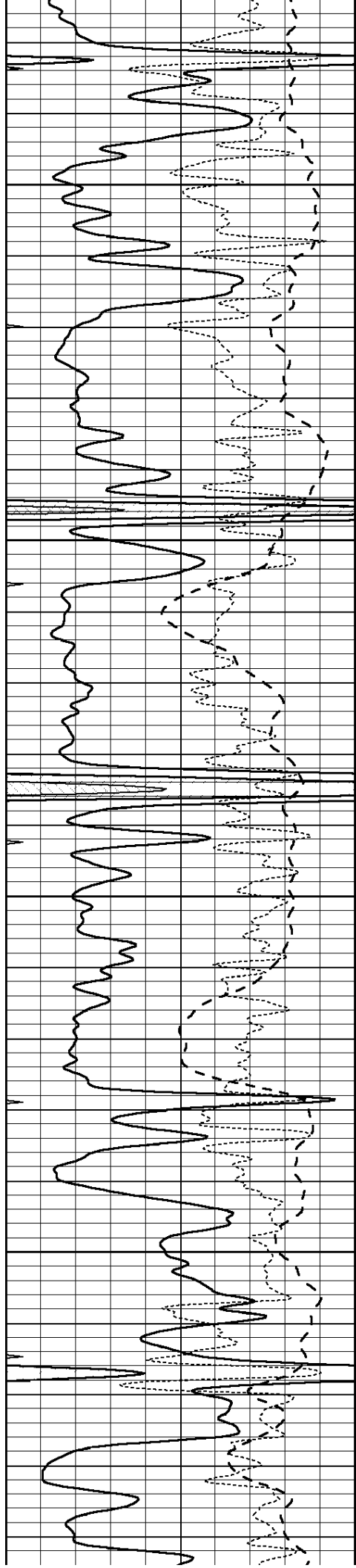
3900

3950

4000

4050



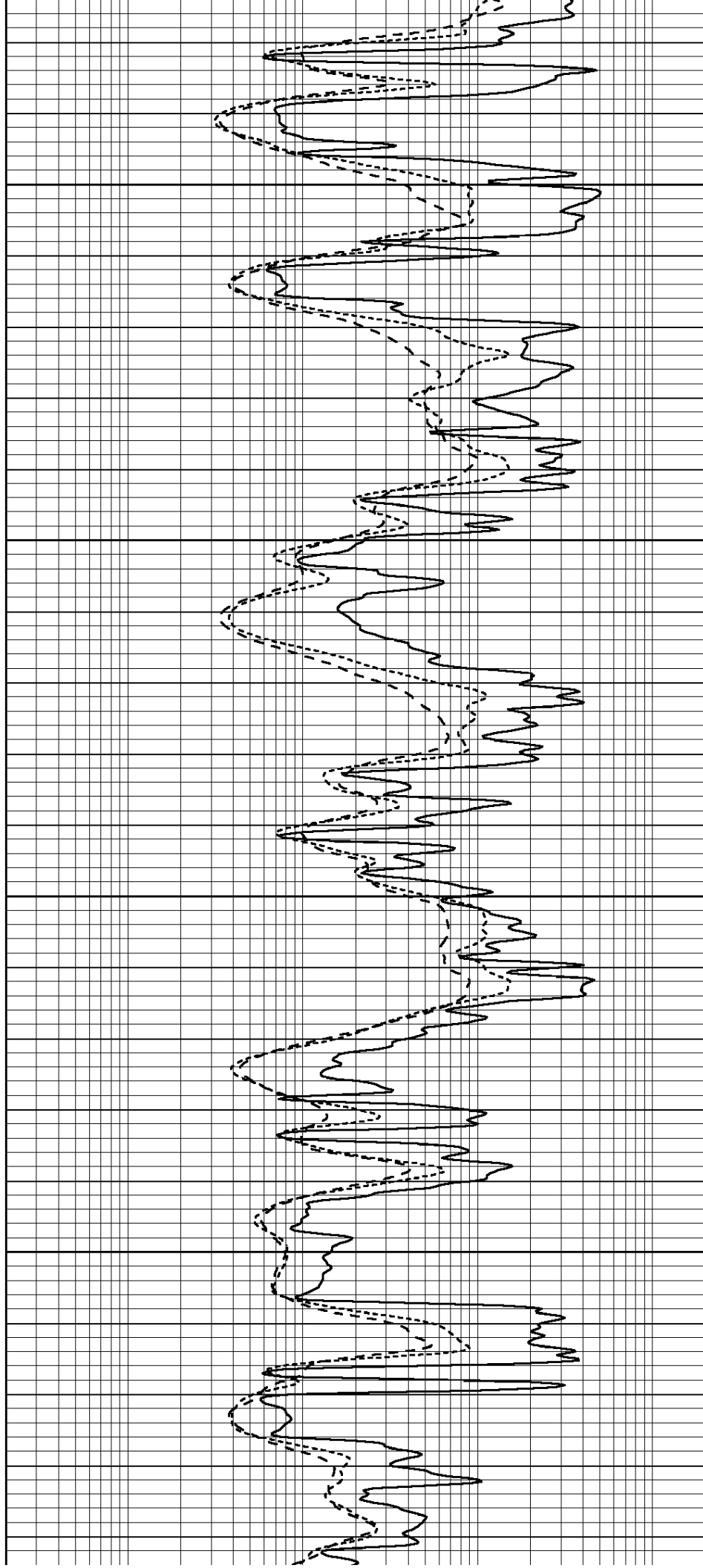


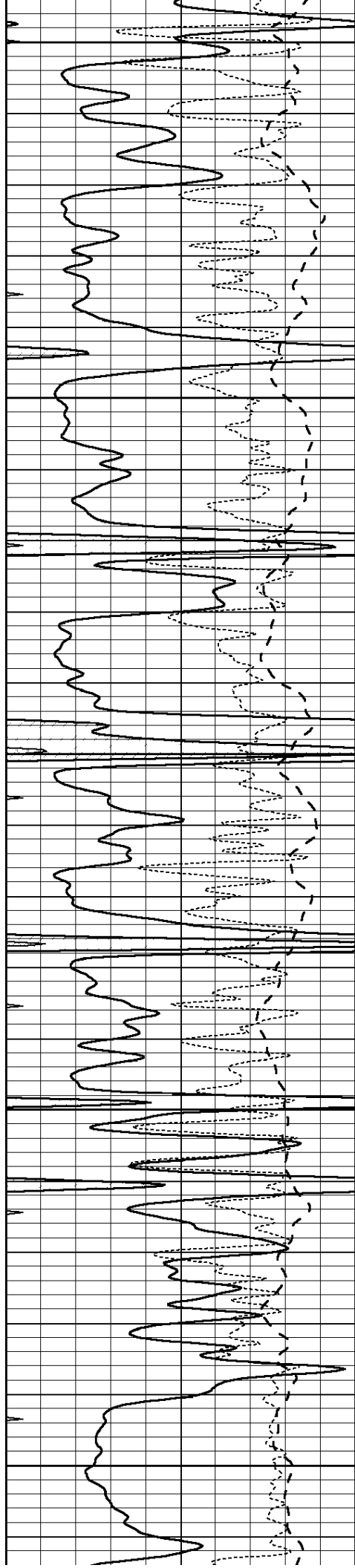
4100

4150

4200

4250





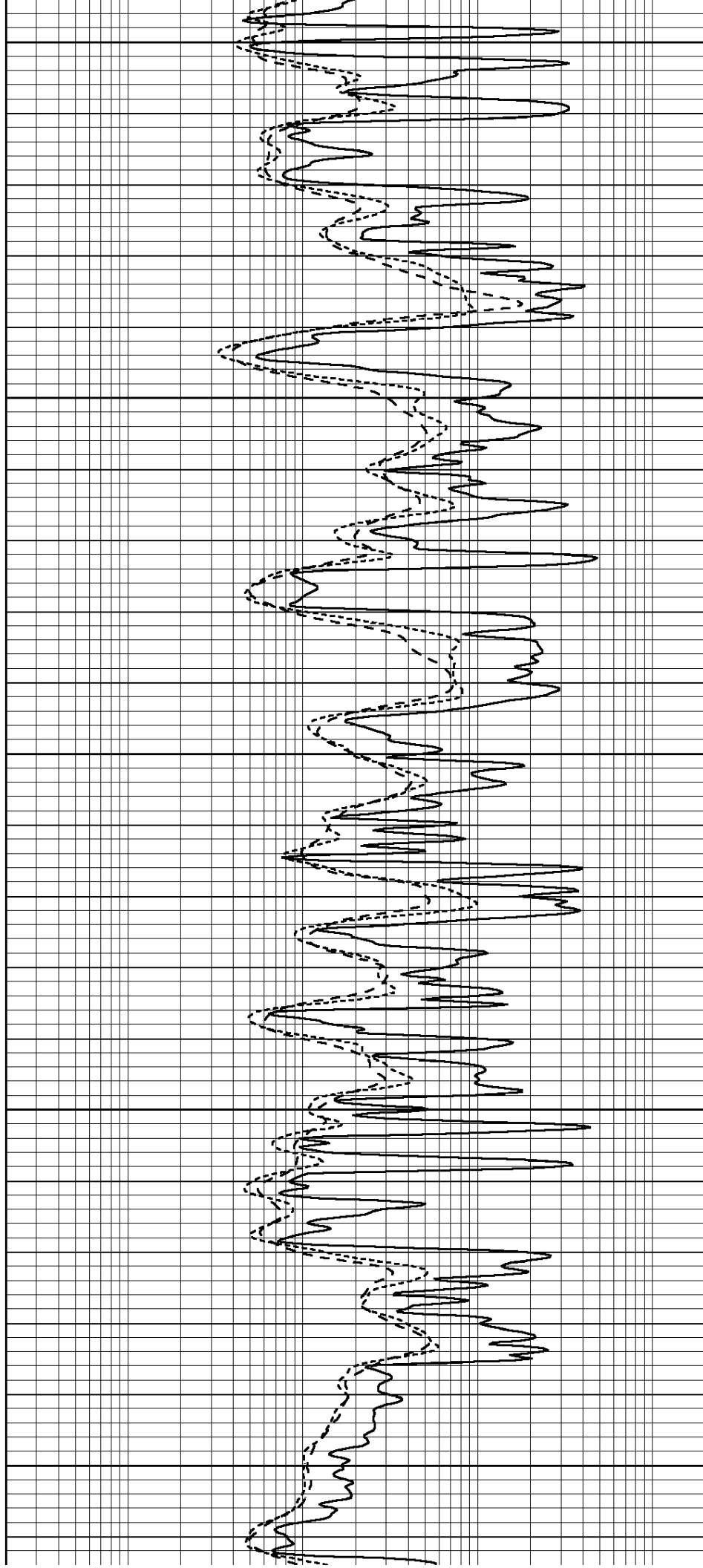
4300

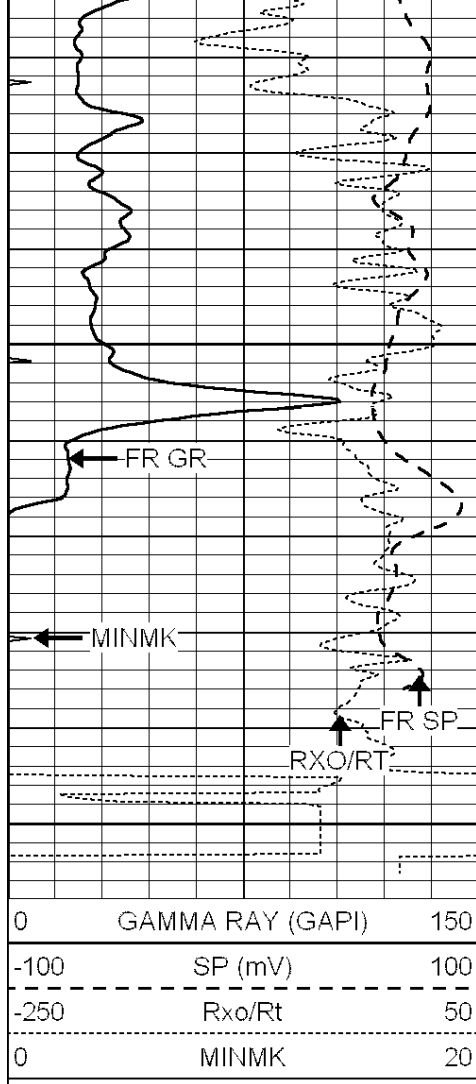
4350

4400

4450

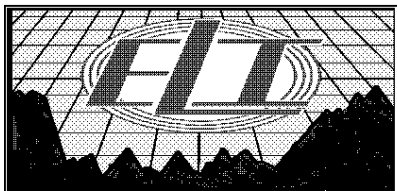
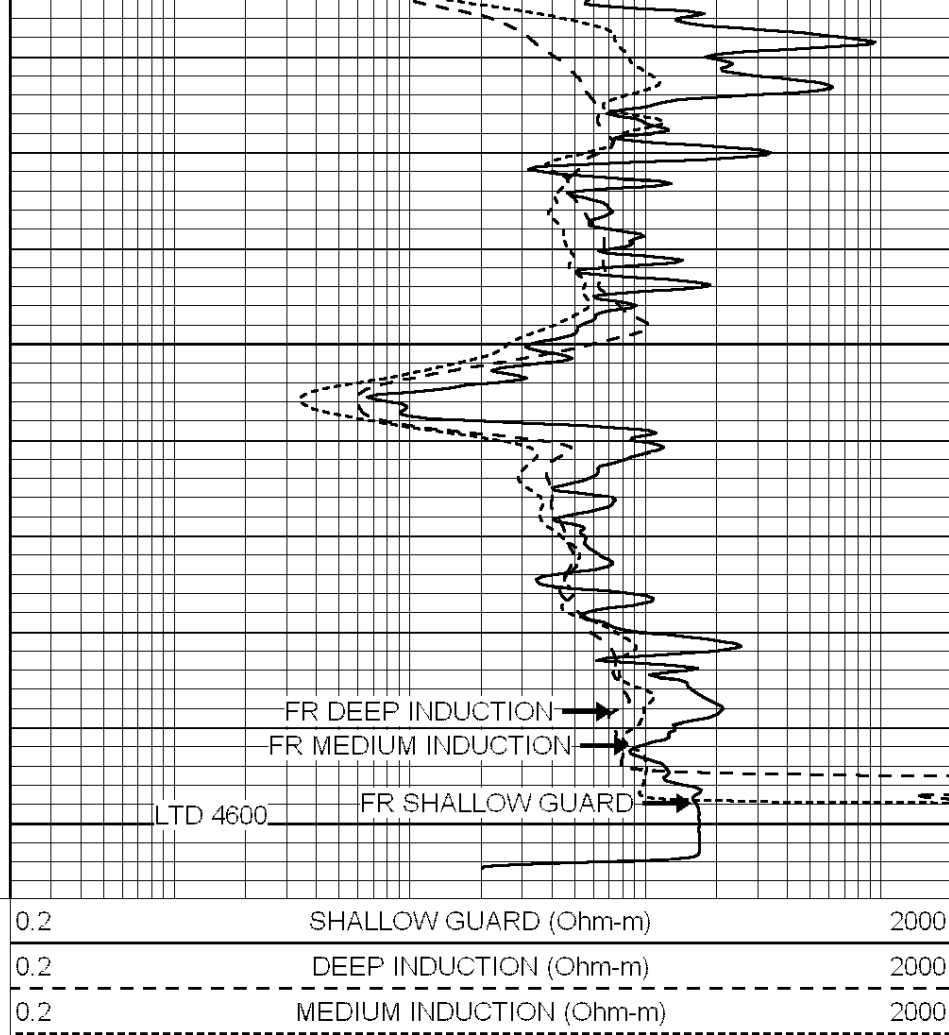
4500





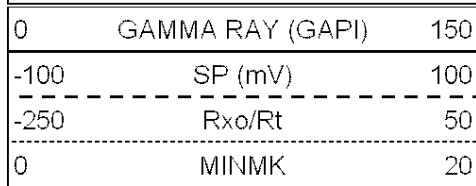
4550

4600

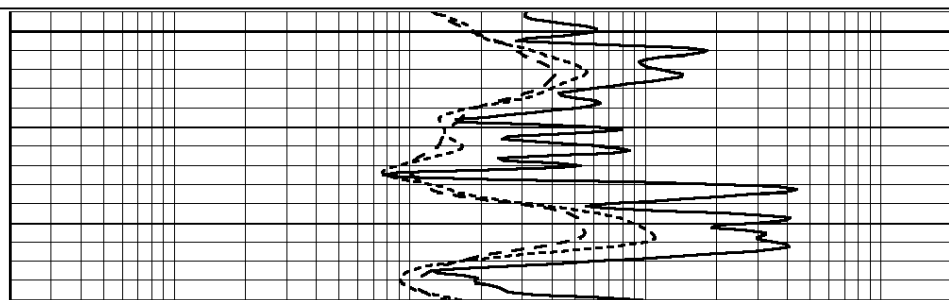
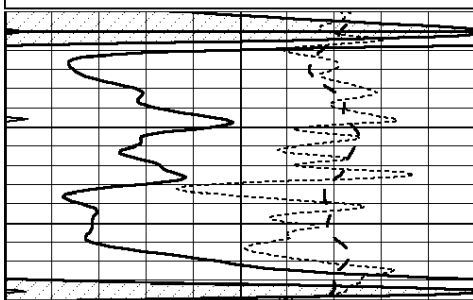
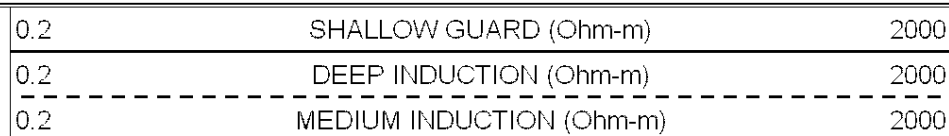


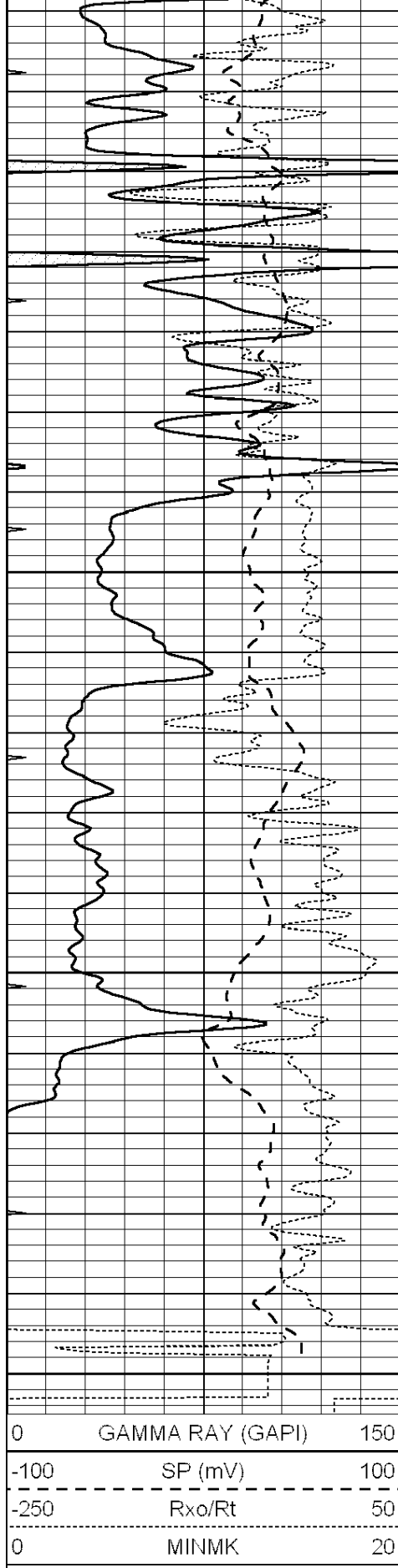
# REPEAT SECTION

Database File: 3975ddn.db  
 Dataset Pathname: pass2.7  
 Presentation Format: \_dil  
 Dataset Creation: Sat Oct 26 07:42:59 2019 by Calc SOC 120430  
 Charted by: Depth in Feet scaled 1:240



4400



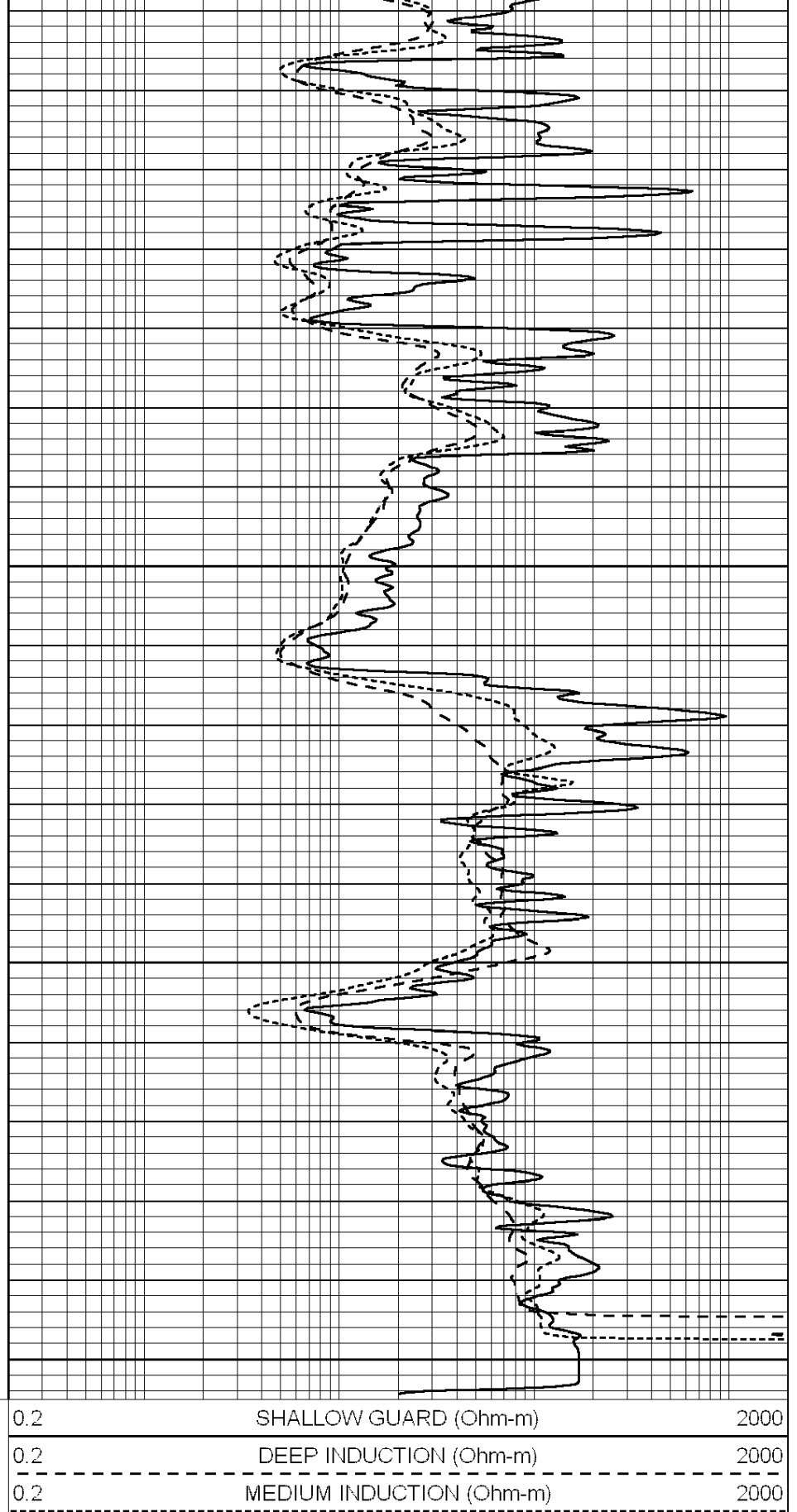


4450

4500

4550

4600



### Calibration Report

Database File: 1598ddn.db  
Dataset Pathname: pass4  
Dataset Creation: Wed Aug 30 02:13:00 2017 by Log SOC 120430

|                                                                                                            |            |             |           |                                                                                                 |            |        |           |         |
|------------------------------------------------------------------------------------------------------------|------------|-------------|-----------|-------------------------------------------------------------------------------------------------|------------|--------|-----------|---------|
| Dual Induction Calibration Report                                                                          |            |             |           |                                                                                                 |            |        |           |         |
| Serial-Model:<br>Surface Cal Performed:<br>Downhole Cal Performed:<br>After Survey Verification Performed: |            |             |           | PROBE7-DILG<br>Wed Aug 30 00:06:33 2017<br>Mon Jul 28 12:02:56 2008<br>Mon Jul 28 12:02:56 2008 |            |        |           |         |
| Surface Calibration                                                                                        |            |             |           |                                                                                                 |            |        |           |         |
|                                                                                                            |            | Readings    |           |                                                                                                 | References |        | Results   |         |
| Loop:                                                                                                      | Air        | Loop        |           | Air                                                                                             | Loop       |        | m         | b       |
| Deep                                                                                                       | -0.014     | 0.629       | V         | 0.000                                                                                           | 400.000    | mmho/m | 620.000   | 0.000   |
| Medium                                                                                                     | 0.039      | 0.728       | V         | 0.000                                                                                           | 464.000    | mmho/m | 675.000   | -44.000 |
| Internal:                                                                                                  | Zero       | Cal         |           | Zero                                                                                            | Cal        |        | m         | b       |
| Deep                                                                                                       | 0.011      | 0.610       | V         | 0.000                                                                                           | 400.000    | mmho/m | 667.135   | -7.256  |
| Medium                                                                                                     | 0.005      | 0.712       | V         | 0.000                                                                                           | 464.000    | mmho/m | 655.677   | -3.102  |
| Downhole Calibration                                                                                       |            |             |           |                                                                                                 |            |        |           |         |
|                                                                                                            |            | Readings    |           |                                                                                                 | References |        | Results   |         |
|                                                                                                            | Zero       | Cal         |           | Zero                                                                                            | Cal        |        | m'        | b'      |
| Deep                                                                                                       | 0.000      | 0.000       | mmho/m    | 14.508                                                                                          | 388.384    | mmho/m | 1.000     | 0.000   |
| Medium                                                                                                     | 0.000      | 0.000       | mmho/m    | 166.367                                                                                         | 504.400    | mmho/m | 1.000     | 0.000   |
| LL3                                                                                                        |            | 7.500       | V         |                                                                                                 | 1400.000   | Ohm-m  |           |         |
|                                                                                                            |            | 0.000       | V         |                                                                                                 | 20.000     | Ohm-m  |           |         |
|                                                                                                            |            | -7.200      | V         |                                                                                                 | 4000.000   | mmho-m |           |         |
| After Survey Verification                                                                                  |            |             |           |                                                                                                 |            |        |           |         |
|                                                                                                            |            | Readings    |           |                                                                                                 | Targets    |        | Results   |         |
|                                                                                                            | Zero       | Cal         |           | Zero                                                                                            | Cal        |        | m'        | b'      |
| Deep                                                                                                       | 0.000      | 0.000       | mmho/m    | 0.000                                                                                           | 0.000      | mmho/m | 0.000     | 0.000   |
| Medium                                                                                                     | 0.000      | 0.000       | mmho/m    | 0.000                                                                                           | 0.000      | mmho/m | 0.000     | 0.000   |
| LL3                                                                                                        |            | 1.000       | Ohm-m     |                                                                                                 | 1.000      | Ohm-m  |           |         |
|                                                                                                            |            | 0.000       | Ohm-m     |                                                                                                 | 0.000      | Ohm-m  |           |         |
|                                                                                                            |            | 1.000       | mmho-m    |                                                                                                 | 1.000      | mmho-m |           |         |
| Litho Density Calibration Report                                                                           |            |             |           |                                                                                                 |            |        |           |         |
| Serial: 002                                                                                                |            |             |           | Model: PRB                                                                                      |            |        |           |         |
| Master Calibration                                                                                         |            |             |           |                                                                                                 |            |        |           |         |
| Performed Mon Aug 21 11:27:42 2017                                                                         |            |             |           |                                                                                                 |            |        |           |         |
|                                                                                                            | Background |             | Magnesium |                                                                                                 | Aluminum   |        | Sandstone |         |
| Window 1                                                                                                   | 837.1      |             | 10632.5   |                                                                                                 | 2945.1     |        | 12110.1   |         |
| Window 2                                                                                                   | 772.0      |             | 9117.4    |                                                                                                 | 2570.1     |        | 10197.3   |         |
| Window 3                                                                                                   | 631.7      |             | 4669.0    |                                                                                                 | 1481.9     |        | 5042.9    |         |
| Window 4                                                                                                   | 187.0      |             | 187.5     |                                                                                                 | 185.9      |        | 189.9     |         |
| Long Space                                                                                                 | 0.0        |             | 8345.4    |                                                                                                 | 1798.1     |        | 9425.3    |         |
| Short Space                                                                                                | 1.1        |             | 1927.9    |                                                                                                 | 1285.9     |        | 2050.2    |         |
| Rho                                                                                                        |            |             | 1.7100    |                                                                                                 | 2.5960     |        | 1.3800    |         |
| Pe                                                                                                         |            |             | 0.0000    |                                                                                                 | 2.5700     |        | 1.5500    |         |
| Rib Angle                                                                                                  | : 45.2     | Rib Slope   | : 1.008   | Density/Spine Ratio                                                                             | : 0.558    |        |           |         |
| Spine Angle                                                                                                | : 75.2     | Spine Slope | : 3.790   | Spine Intercept                                                                                 | : -19.6    |        |           |         |
| Before Survey Verification                                                                                 |            |             |           |                                                                                                 |            |        |           |         |
| Performed Wed Dec 31 18:00:00 1969                                                                         |            |             |           |                                                                                                 |            |        |           |         |
| Window 1                                                                                                   | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Window 2                                                                                                   | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Window 3                                                                                                   | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Window 4                                                                                                   | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Long Space                                                                                                 | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Short Space                                                                                                | 0.0        |             | 0.0       |                                                                                                 | 0.0        |        | 0.0       |         |
| Rho                                                                                                        |            |             | 0.0000    |                                                                                                 | 0.0000     |        | 0.0000    |         |
| Pe                                                                                                         |            |             | 0.0000    |                                                                                                 | 0.0000     |        | 0.0000    |         |

|                     |     |        |        |        |      |
|---------------------|-----|--------|--------|--------|------|
| Window 3            | 0.0 | 0.0    | 0.0    | 0.0    | cps  |
| Window 4            | 0.0 | 0.0    | 0.0    | 0.0    | cps  |
| Long Space          | 0.0 | 0.0    | 0.0    | 0.0    | cps  |
| Short Space         | 0.0 | 0.0    | 0.0    | 0.0    | cps  |
| Measured Rho        |     | 0.0000 | 0.0000 | 0.0000 | g/cc |
| Measured Correction |     | 0.0000 | 0.0000 | 0.0000 | g/cc |
| Measured Pe         |     |        | 0.0000 | 0.0000 |      |

|                           |     |        |                                    |        |      |
|---------------------------|-----|--------|------------------------------------|--------|------|
| After Survey Verification |     |        | Performed Wed Dec 31 18:00:00 1969 |        |      |
| Window 1                  | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Window 2                  | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Window 3                  | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Window 4                  | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Long Space                | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Short Space               | 0.0 | 0.0    | 0.0                                | 0.0    | cps  |
| Measured Rho              |     | 0.0000 | 0.0000                             | 0.0000 | g/cc |
| Measured Correction       |     | 0.0000 | 0.0000                             | 0.0000 | g/cc |
| Measured Pe               |     |        | 0.0000                             | 0.0000 |      |

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| Compensated Neutron Calibration Report |
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|                |        |
|----------------|--------|
| Serial Number: | 070808 |
| Tool Model:    | Probe  |

|                         |          |          |        |
|-------------------------|----------|----------|--------|
| 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:      | 070558                   |          |
| Tool Model:         | OPEN_GR                  |          |
| Performed:          | Wed May 31 00:09:32 2017 |          |
| Calibrator Value:   | 1.0                      | GAPI     |
| Background Reading: | 0.0                      | cps      |
| Calibrator Reading: | 1.0                      | cps      |
| Sensitivity:        | 0.2800                   | GAPI/cps |