



DUAL INDUCTION LOG

Company DOWNING-NELSON OIL CO., INC.
 Well MARK ARMBRISTER#1-27
 Field FLAX
 County TREGO
 State KANSAS

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 Well MARK ARMBRISTER#1-27
 Field FLAX
 County TREGO State KANSAS

Location: API # : 15-195-23034-00-00
 2000 FNL & 2560 FEL
 SEC 27 TWP 13S RGE 21W
 Permanent Datum GROUND LEVEL Elevation 2359'
 Log Measured From KELLY BUSHING 8' A.G.L.
 Drilling Measured From KELLY BUSHING
 Elevation
 K.B. 2367
 D.F. 2365
 G.L. 2359

| | |
|------------------------------|-----------------|
| Date | 01/21/18 |
| Run Number | ONE |
| Depth Driller | 4245 |
| Depth Logger | 4246 |
| Bottom Logged Interval | 4244 |
| Top Log Interval | 00 |
| Casing Driller | 8 5/8@ 221 |
| Casing Logger | 221 |
| Bit Size | 7 7/8" |
| Type Fluid in Hole | CHEMICAL MUD |
| Density / Viscosity | 9.2/57 |
| pH / Fluid Loss | 10.0/7.6 |
| Source of Sample | FLOWLINE |
| Rm @ Meas. Temp | .90@58 |
| Rmt @ Meas. Temp | .68@58 |
| Rmc @ Meas. Temp | 1.08@58 |
| Source of Rmf / Rmc | MEASURED |
| Rm @ BHT | .44@118 |
| Time Circulation Stopped | 2 HOURS |
| Time Logger on Bottom | /// |
| Maximum Recorded Temperature | 118F |
| Equipment Number | 4010 |
| Location | HAYS, KANSAS |
| Recorded By | GUS PFANENSTIEL |
| Witnessed By | MARC DOWNING |

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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, KS. (785) 628-6395

DIRECTIONS
 I 70 RIGGA EXIT SOUTH TO P RD. GO SOUTH ABOUT 3/4 MILE,
 EAST INTO.



MAIN PASS

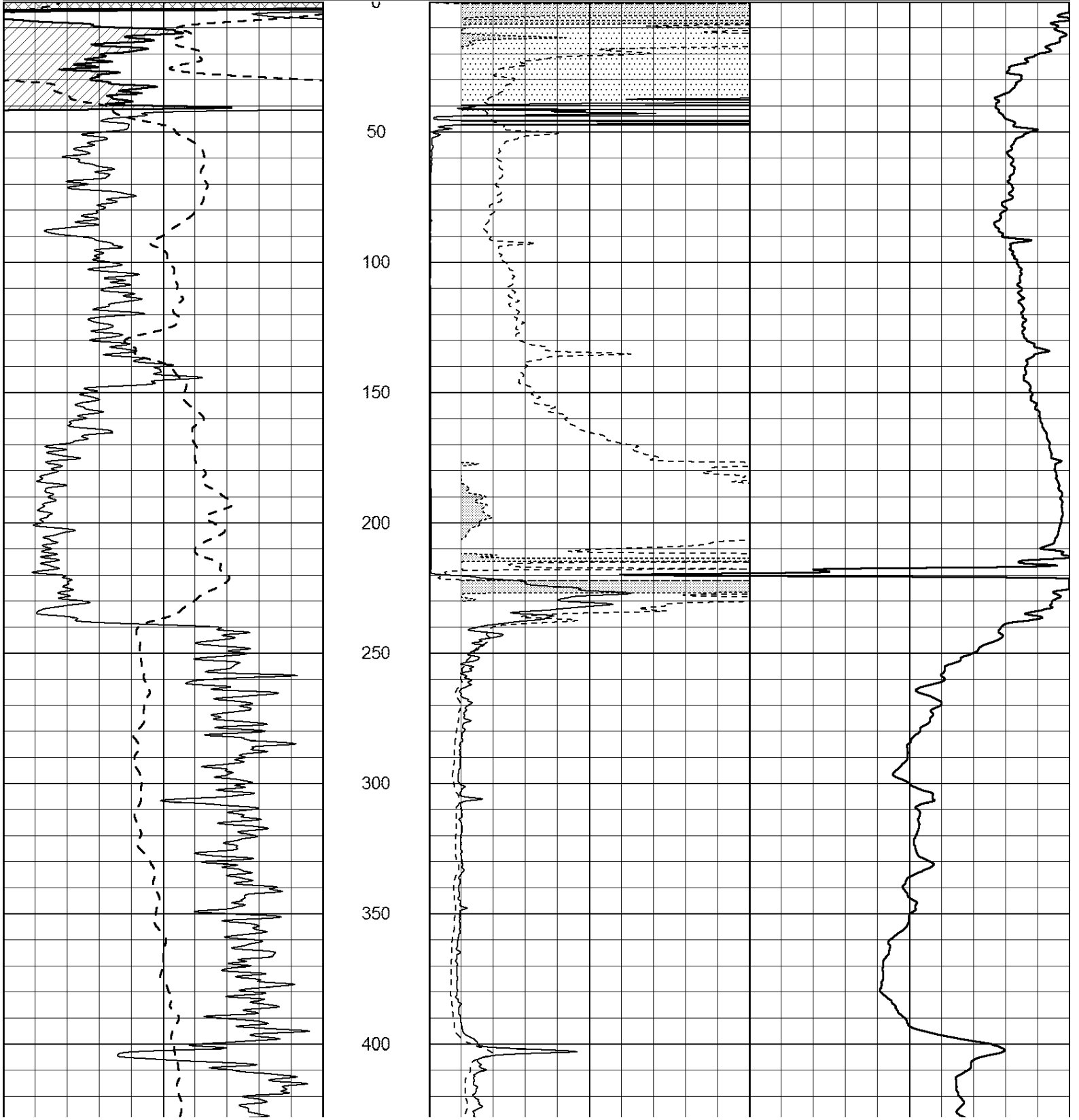
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 Dataset Pathname: pass3.1
 Presentation Format: _dil2
 Dataset Creation: Sun Jan 21 11:07:13 2018 by Calc Open-Cased 090629
 Charted by: Depth in Feet scaled 1:600

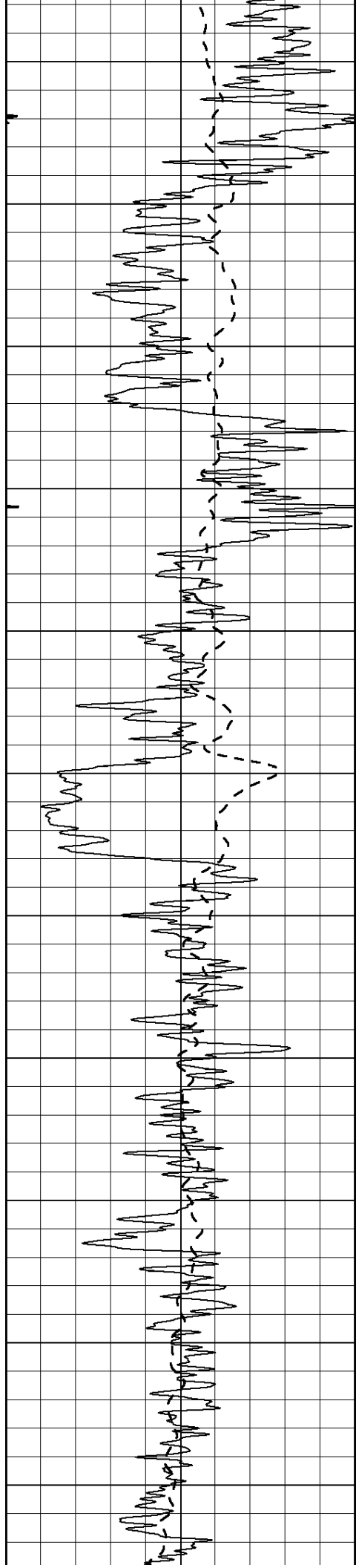
| | | |
|------|------------------|-----|
| 0 | Gamma Ray (GAPI) | 150 |
| -100 | SP (mV) | 100 |

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

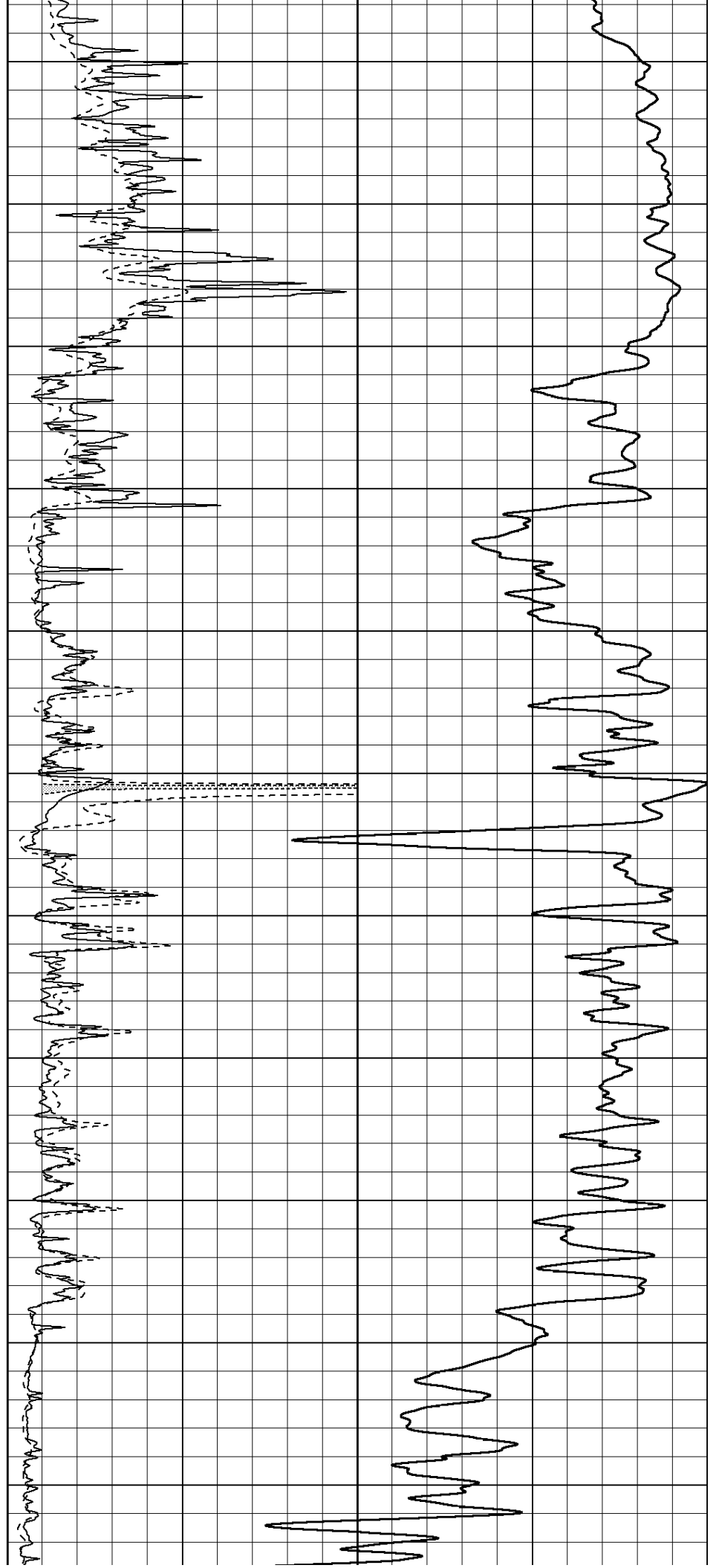
| | | |
|------|---------------|---|
| 1000 | CILD (mmho/m) | 0 |
|------|---------------|---|

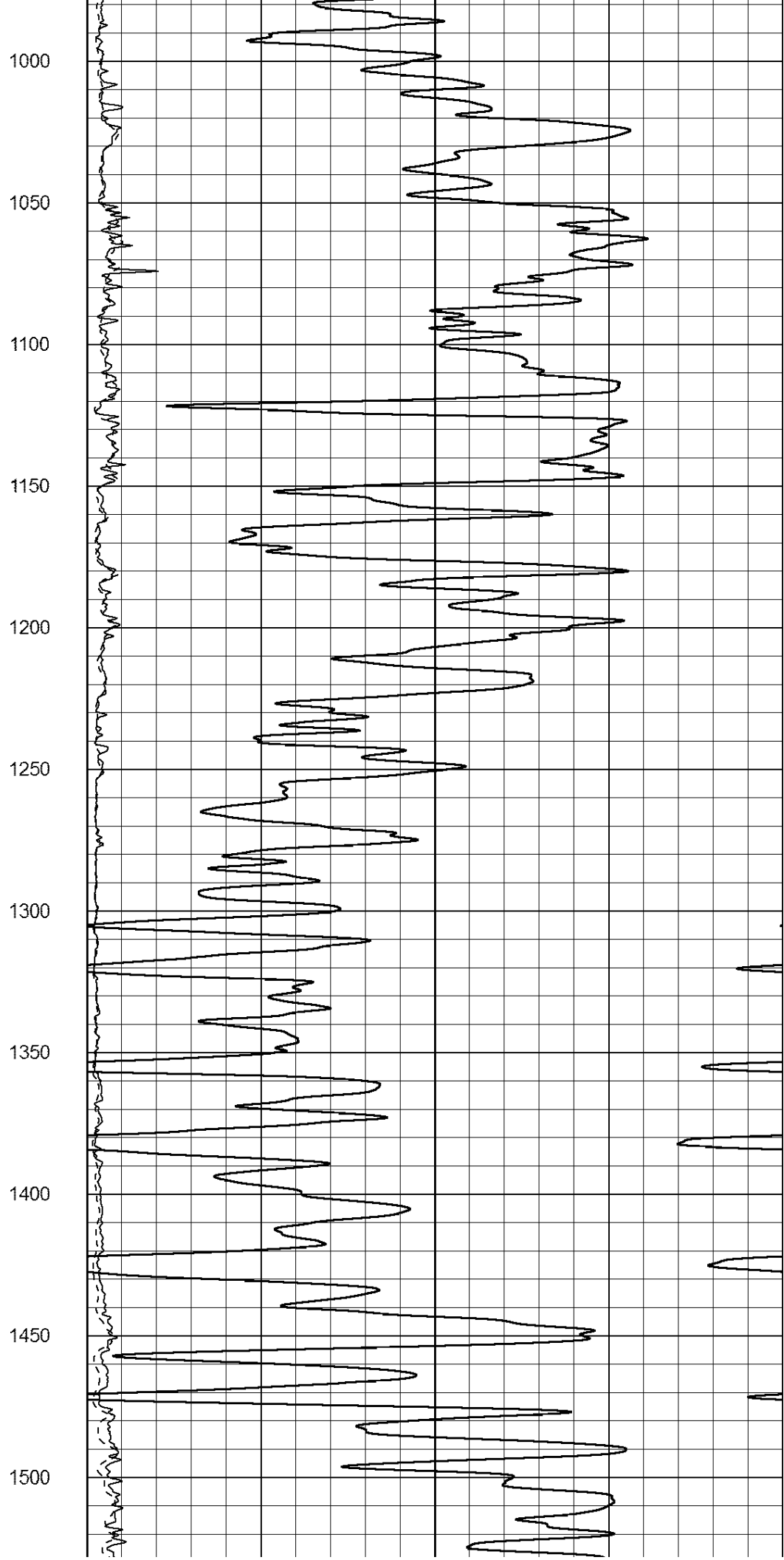
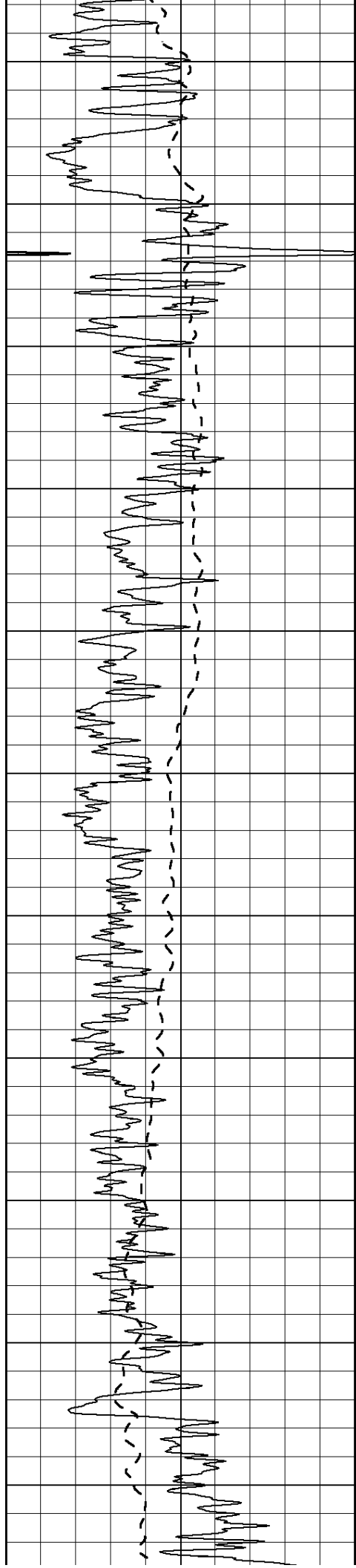
| | | |
|----|------------------|-----|
| 50 | RILD X10 (Ohm-m) | 500 |
| 50 | RLL3 X10 (Ohm-m) | 500 |

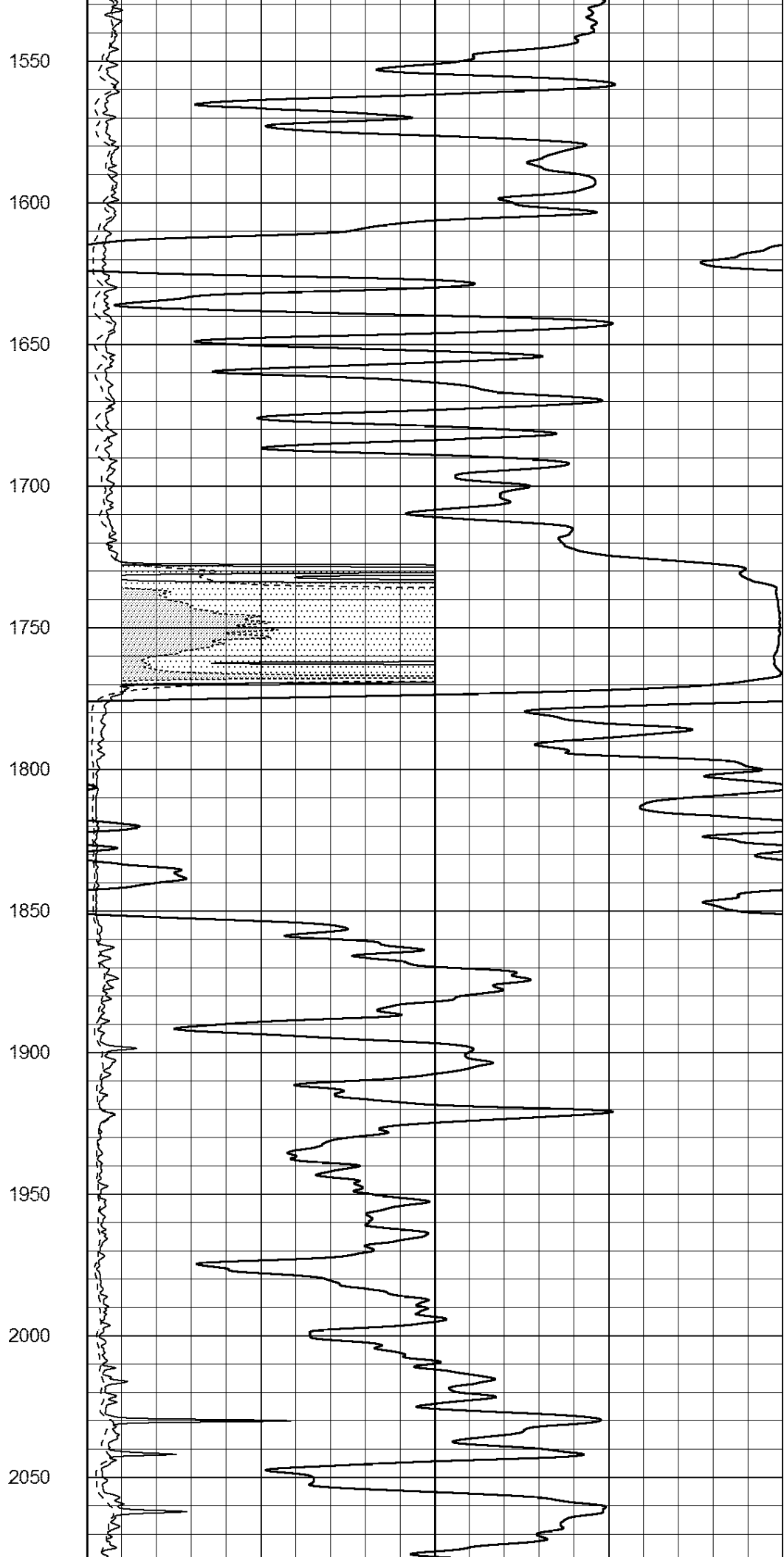
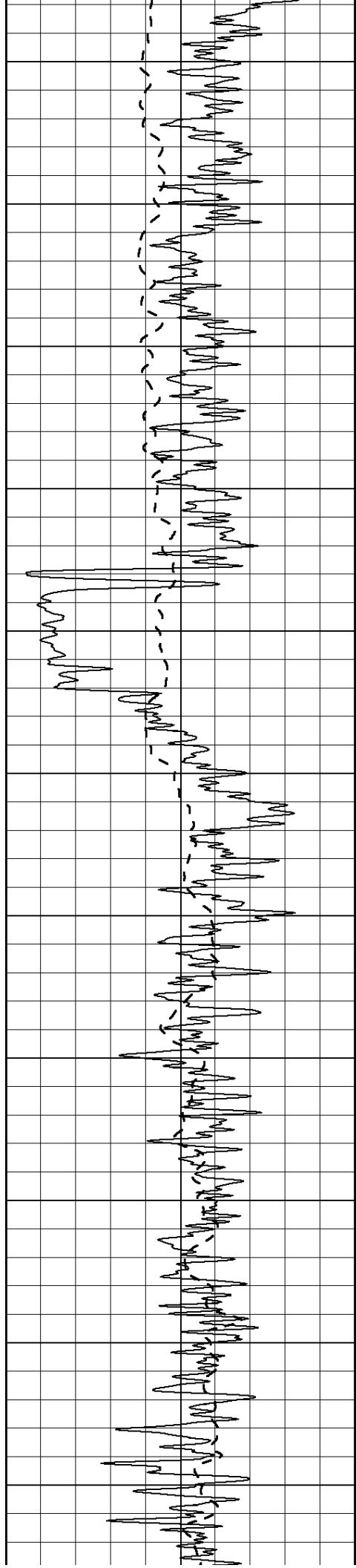


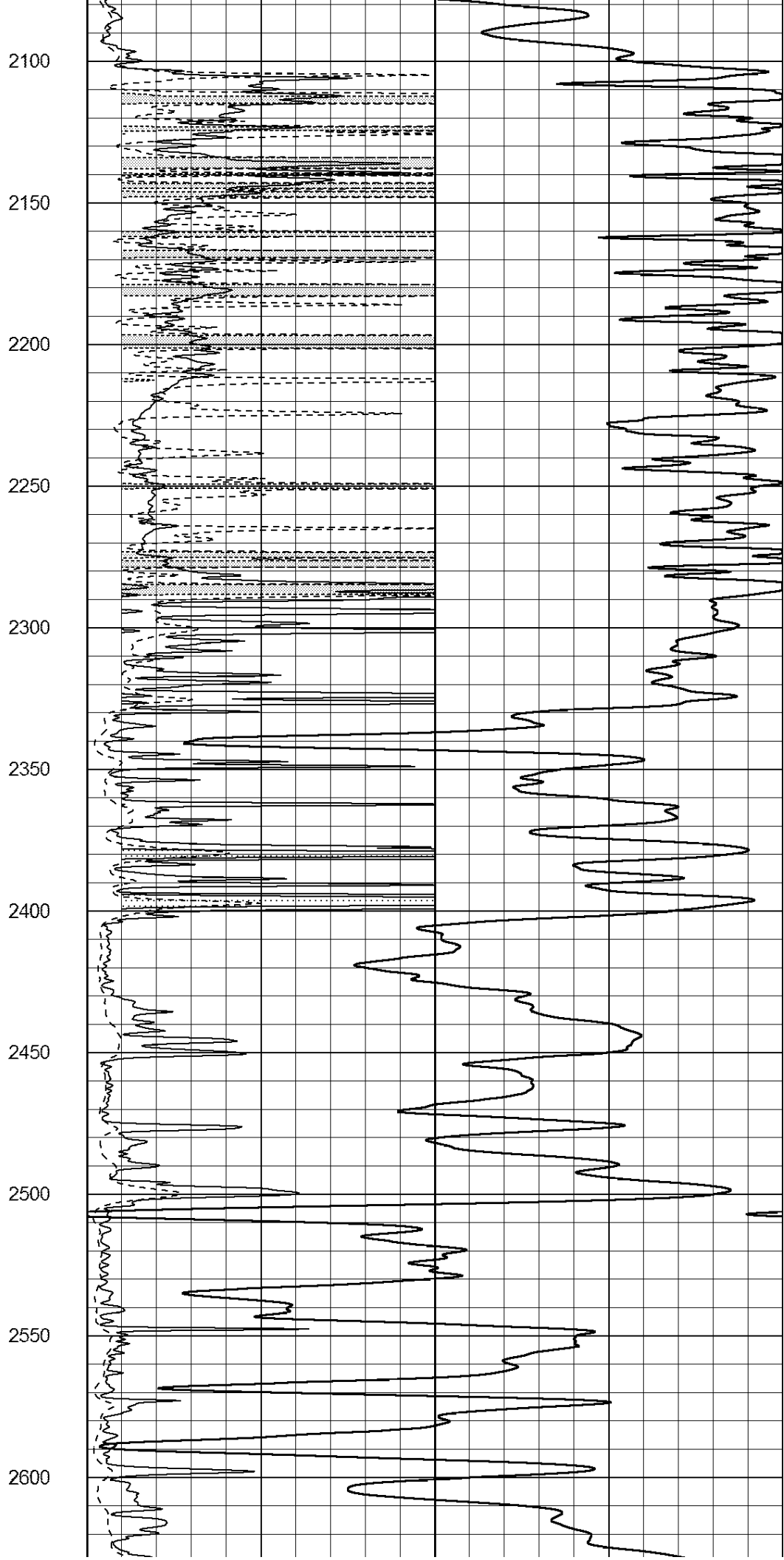
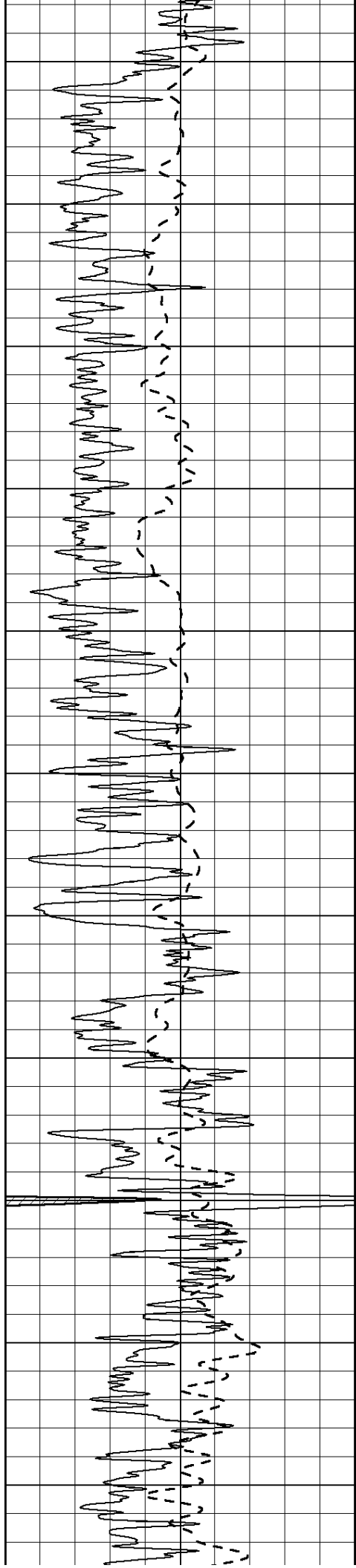


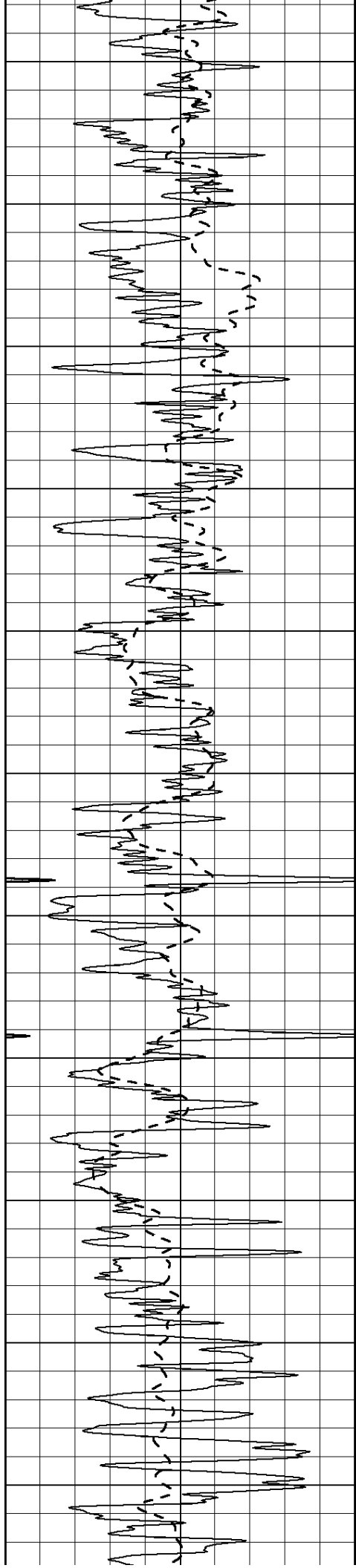
450
500
550
600
650
700
750
800
850
900
950











2650

2700

2750

2800

2850

2900

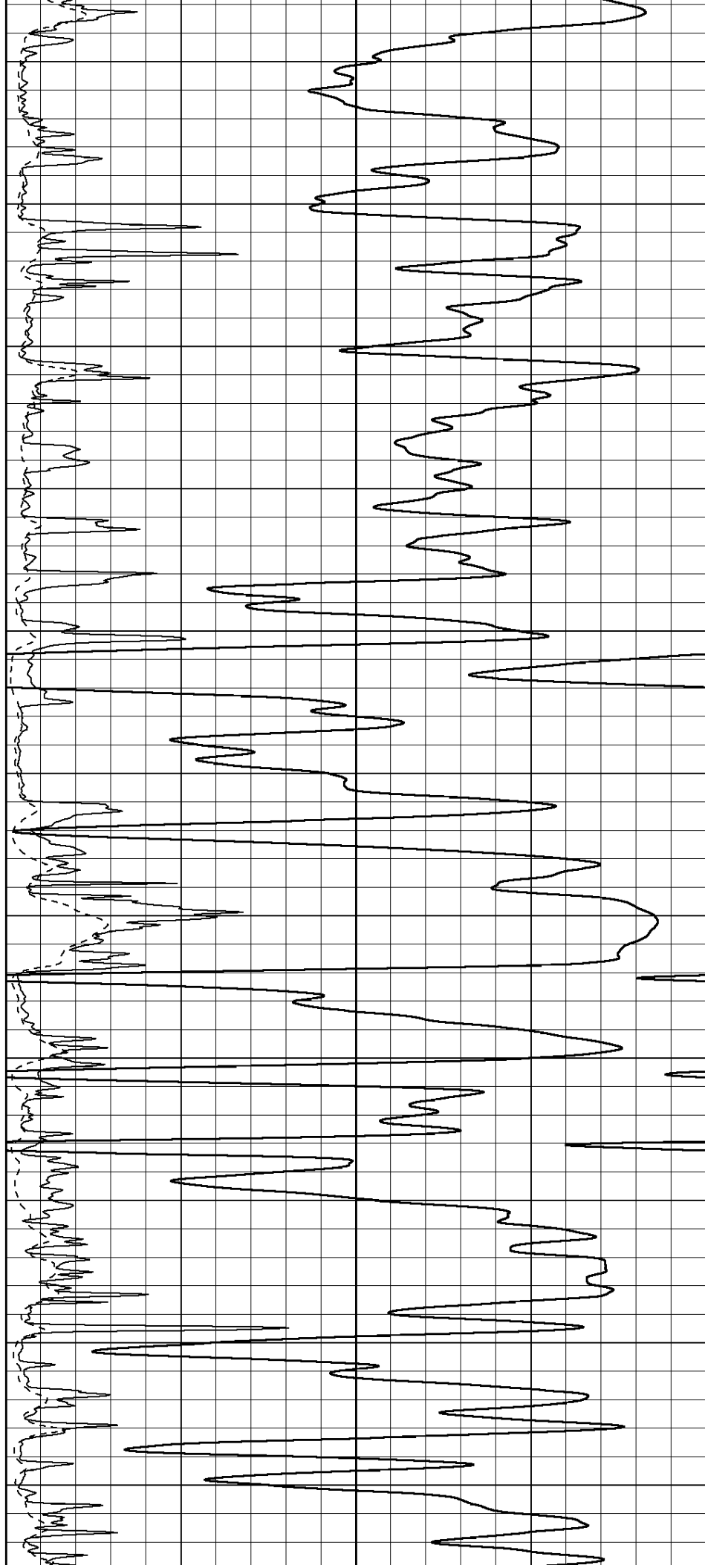
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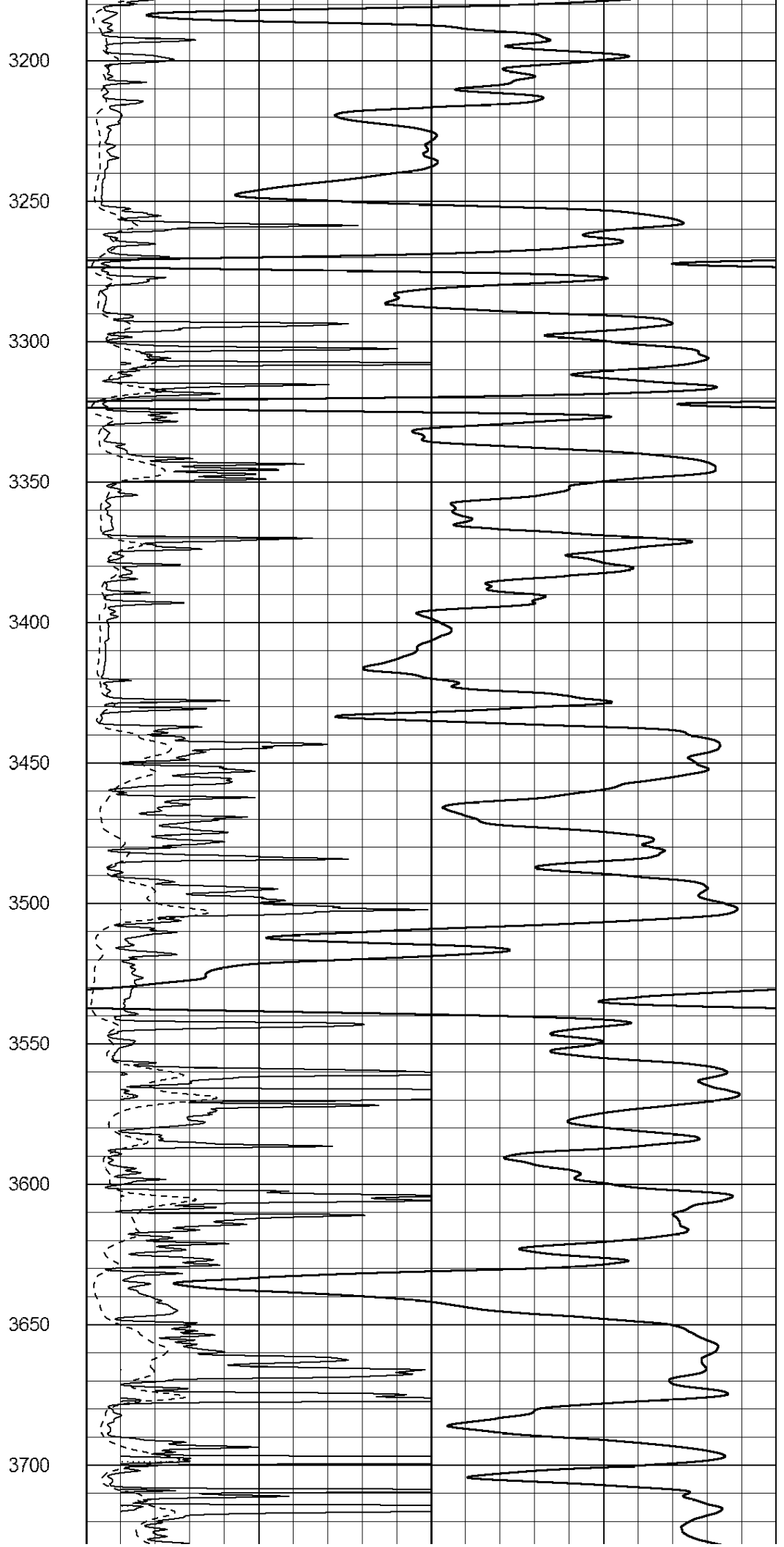
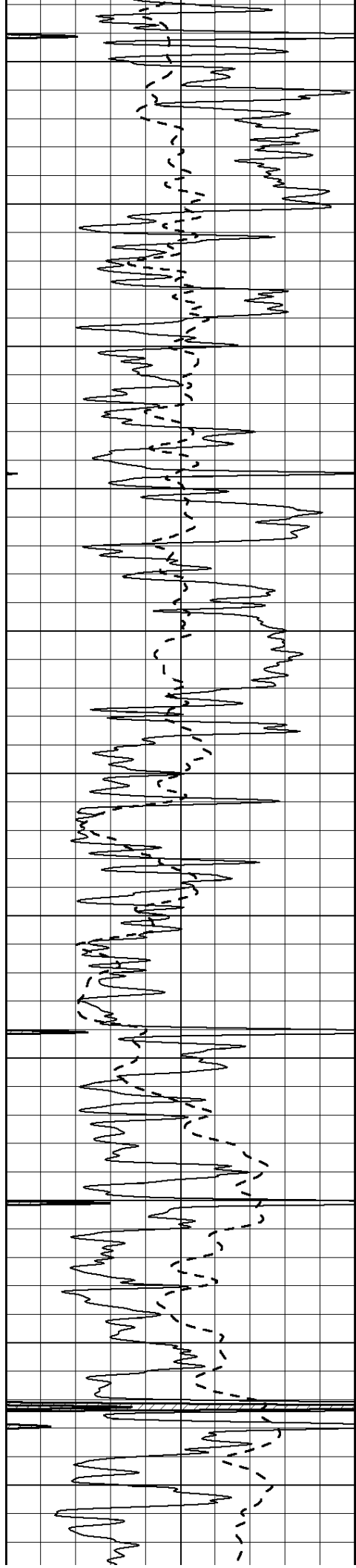
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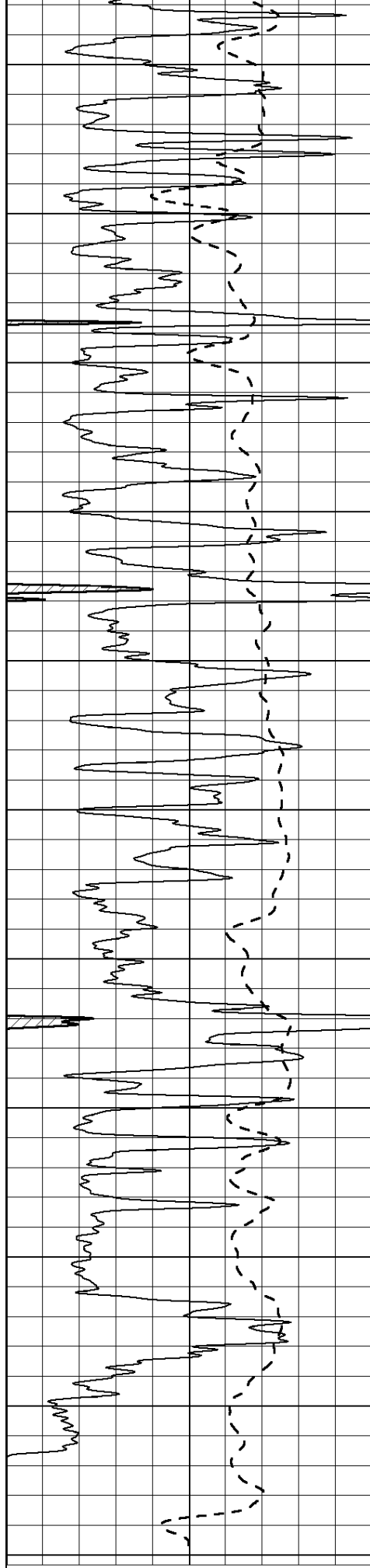
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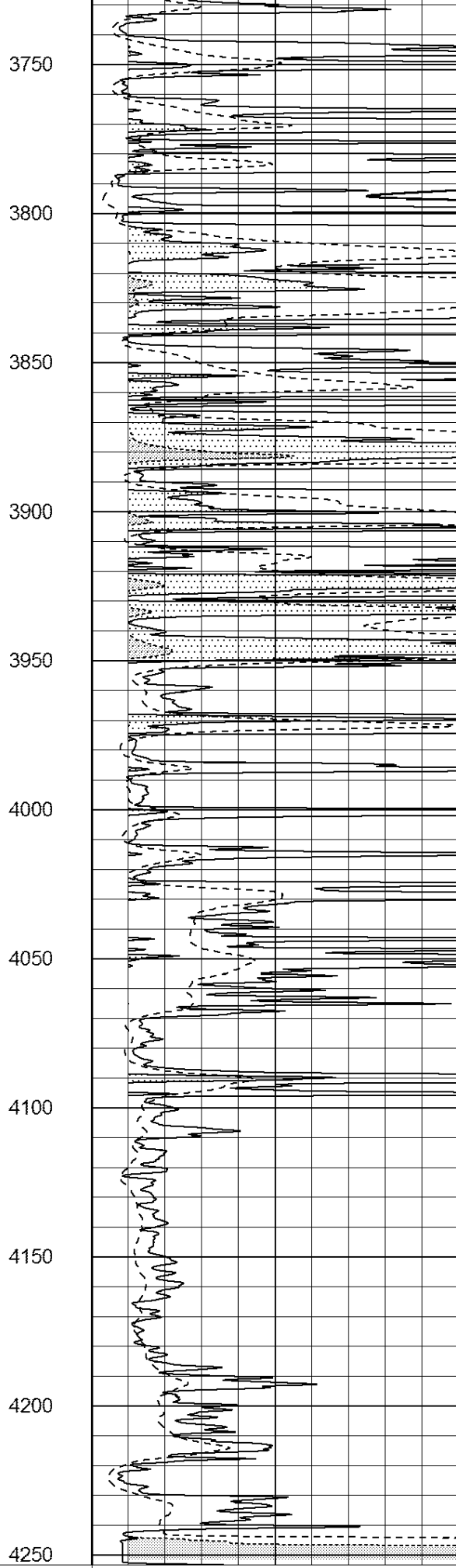
3150



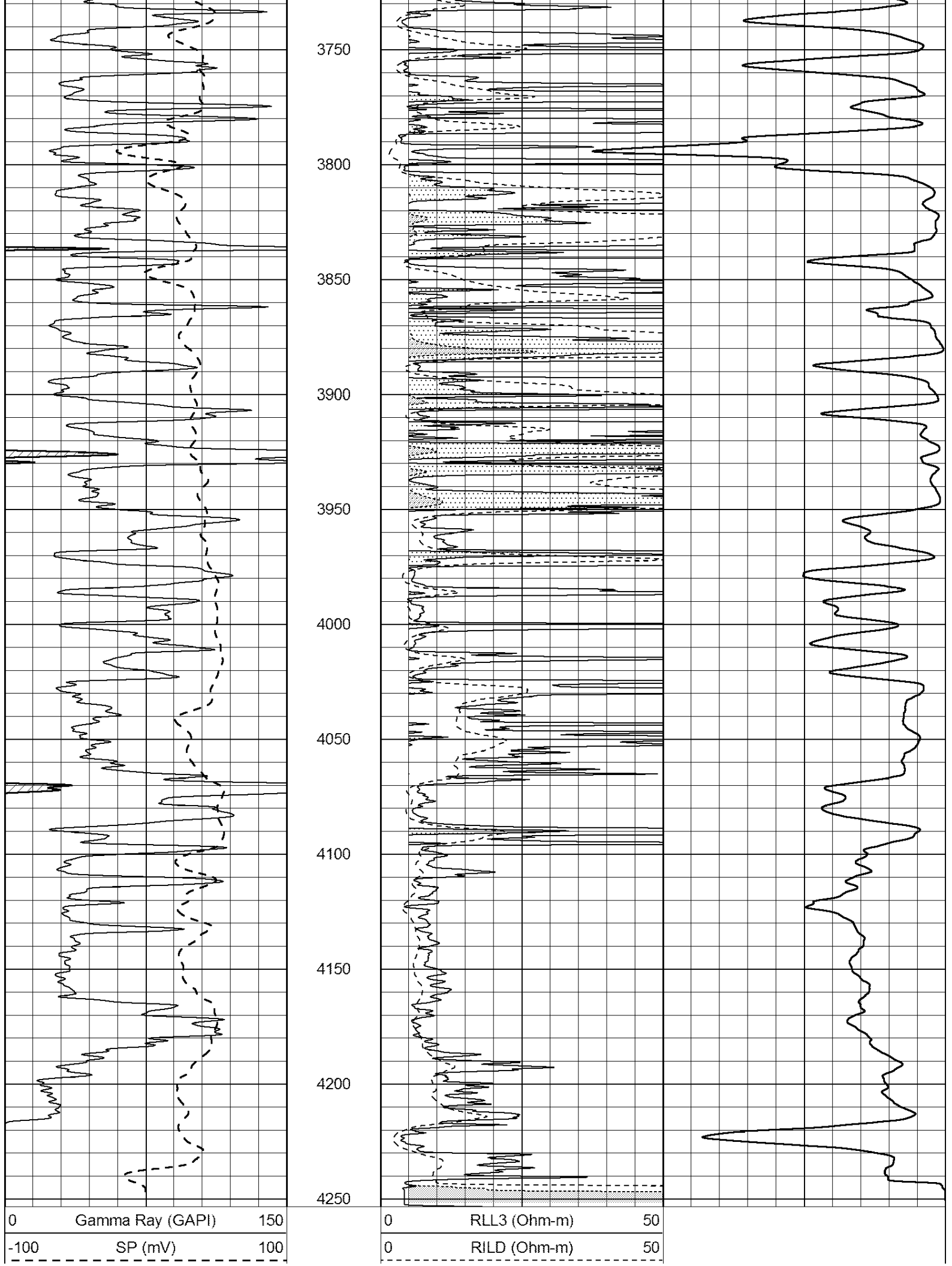
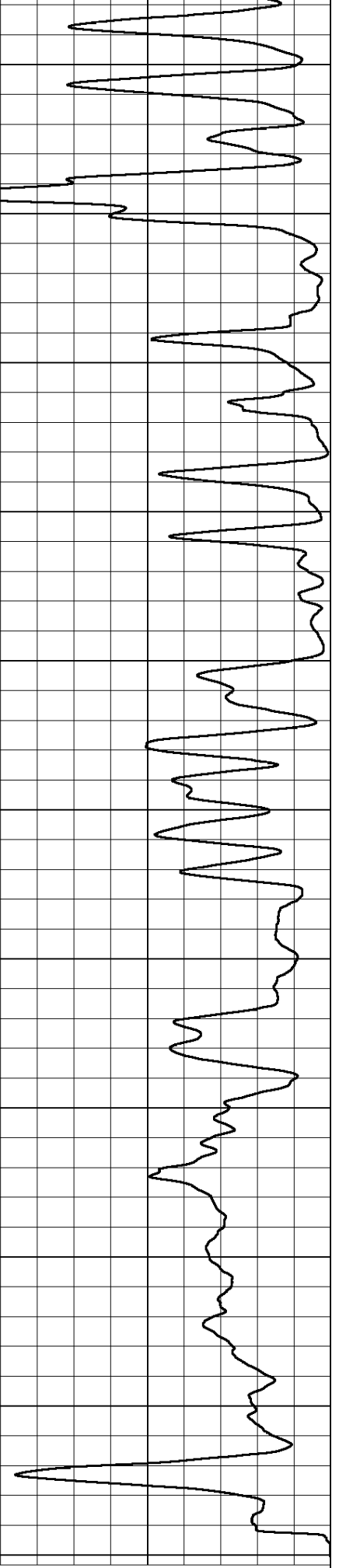




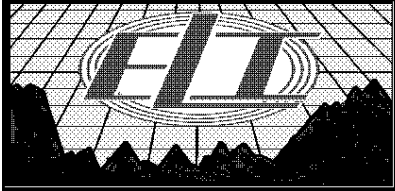
0 Gamma Ray (GAPI) 150
 -100 SP (mV) 100



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



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



MAIN PASS

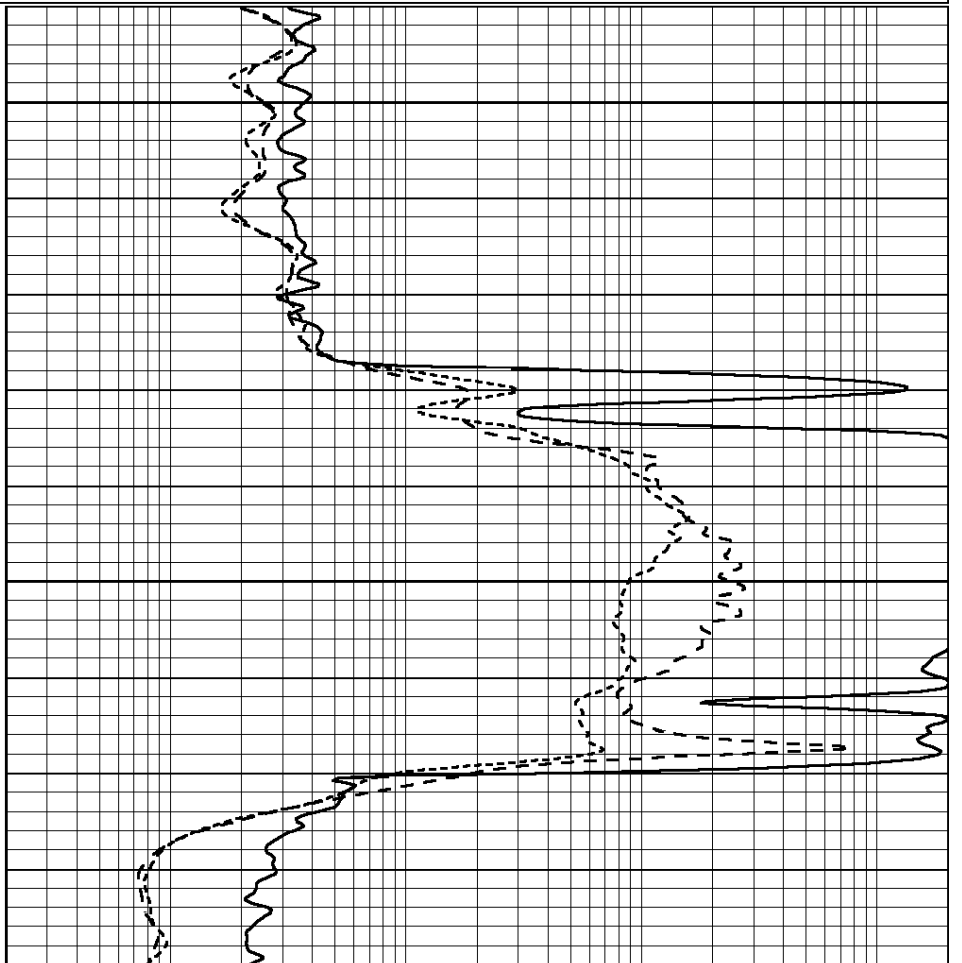
Database File: 2401ddn.db
 Dataset Pathname: pass3.1
 Presentation Format: _dil
 Dataset Creation: Sun Jan 21 11:07:13 2018 by Calc Open-Cased 090629
 Charted by: Depth in Feet scaled 1:240

| | | |
|------|------------------|-----|
| 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 |

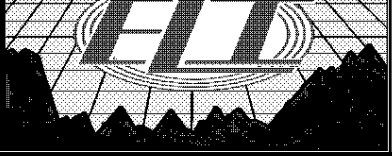


| | | |
|------|------------------|-----|
| 0 | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV) | 100 |
| -250 | Rxo/Rt | 50 |
| 0 | MINMK | 20 |



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



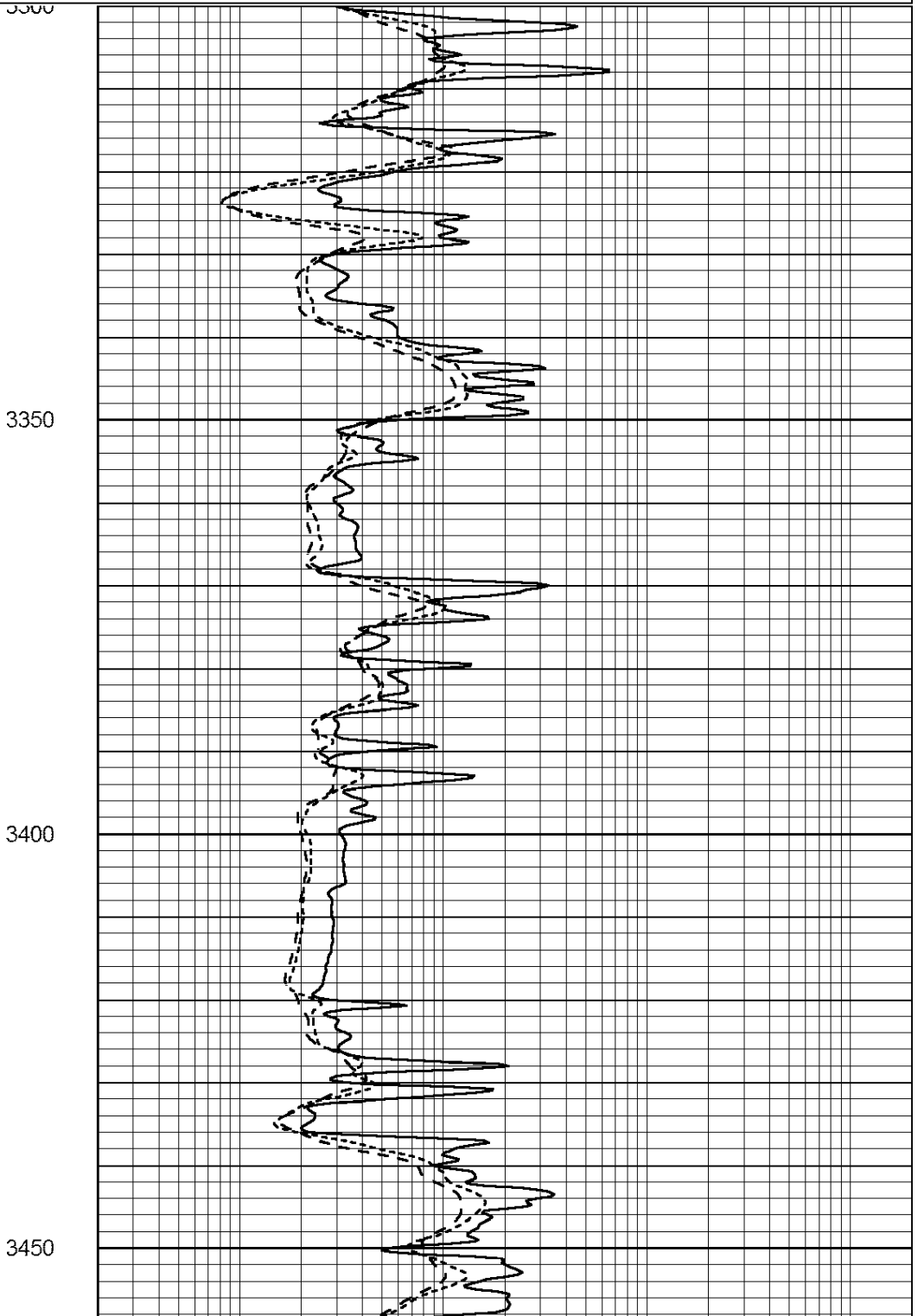
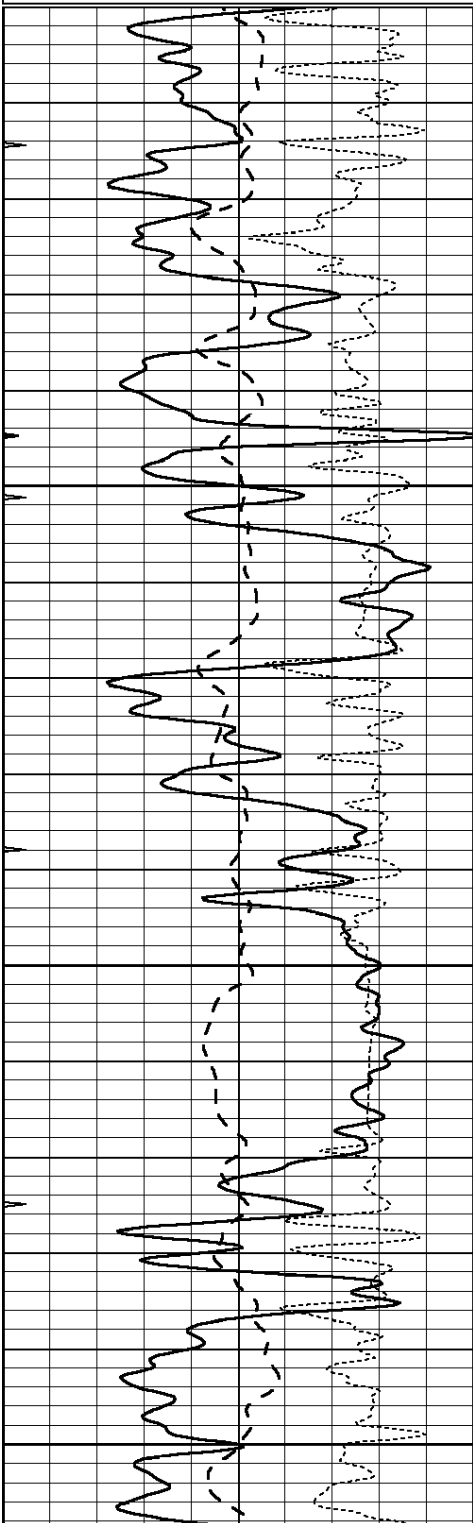


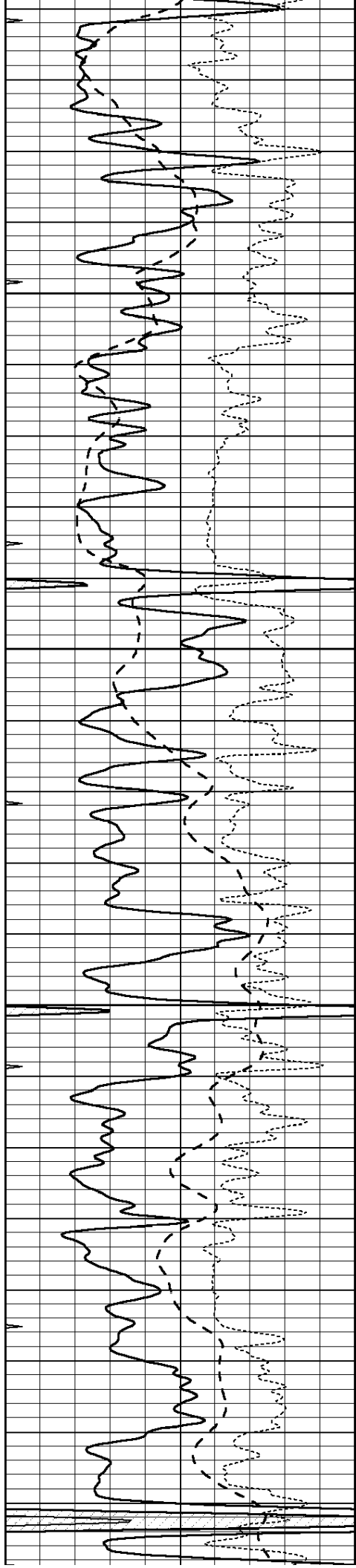
MAIN PASS

Database File: 2401ddn.db
 Dataset Pathname: pass3.1
 Presentation Format: _dil
 Dataset Creation: Sun Jan 21 11:07:13 2018 by Calc Open-Cased 090629
 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 |



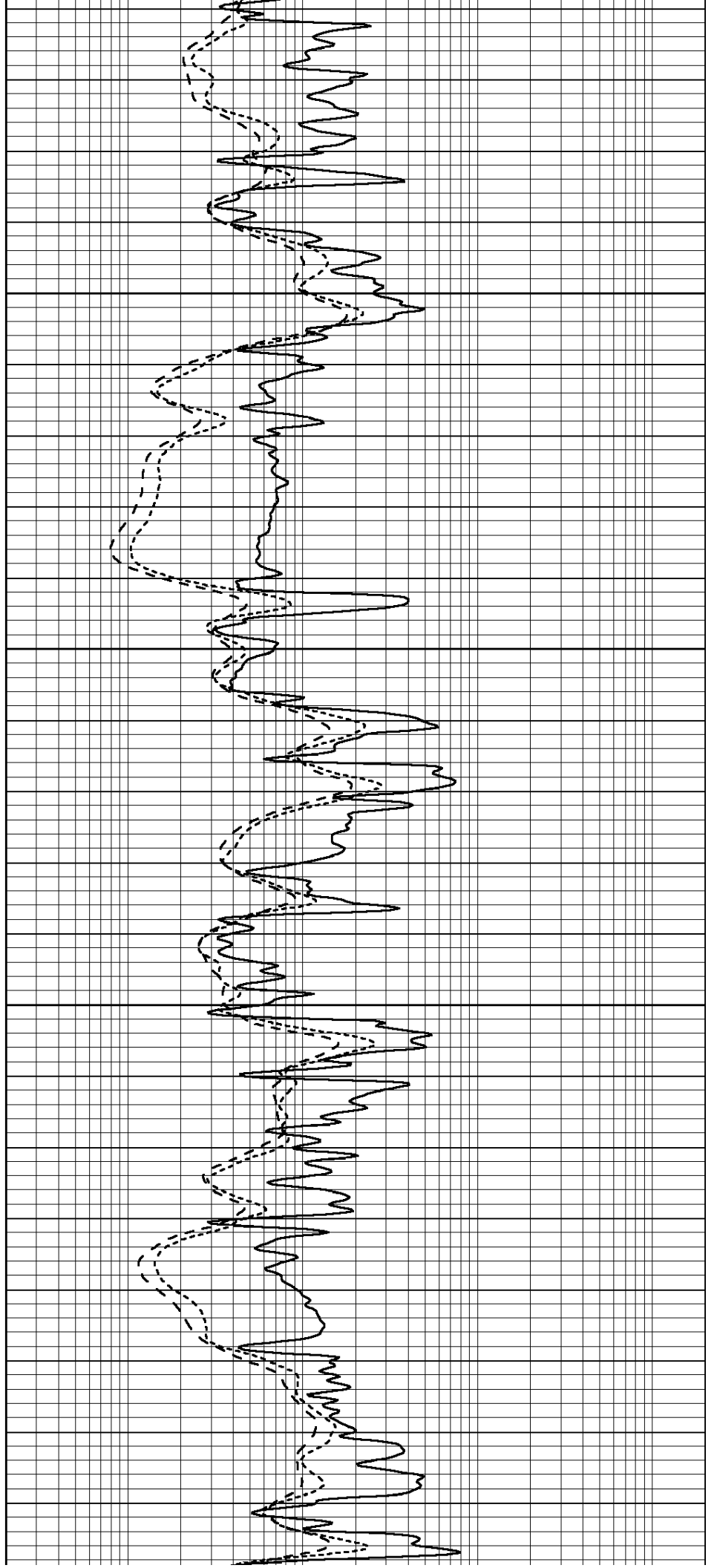


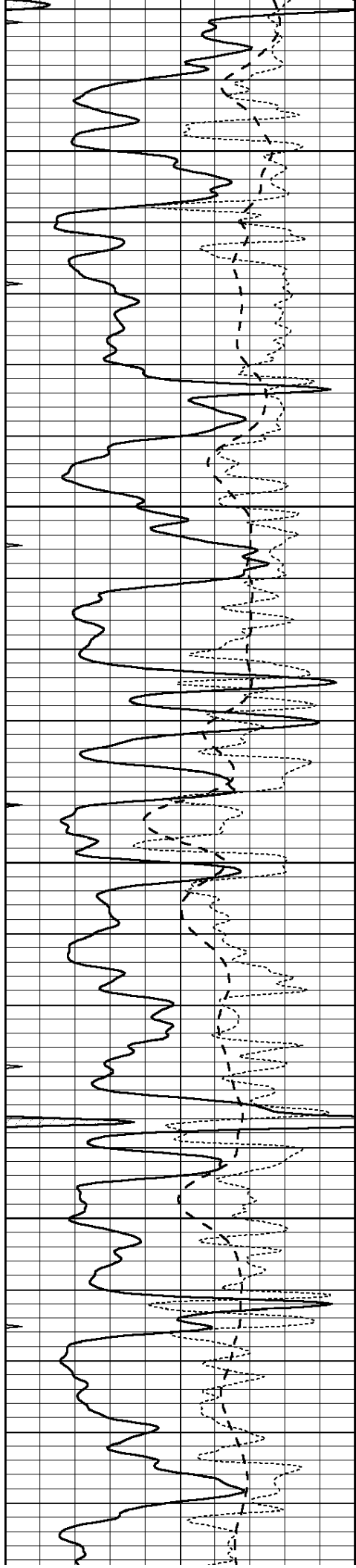
3500

3550

3600

3650



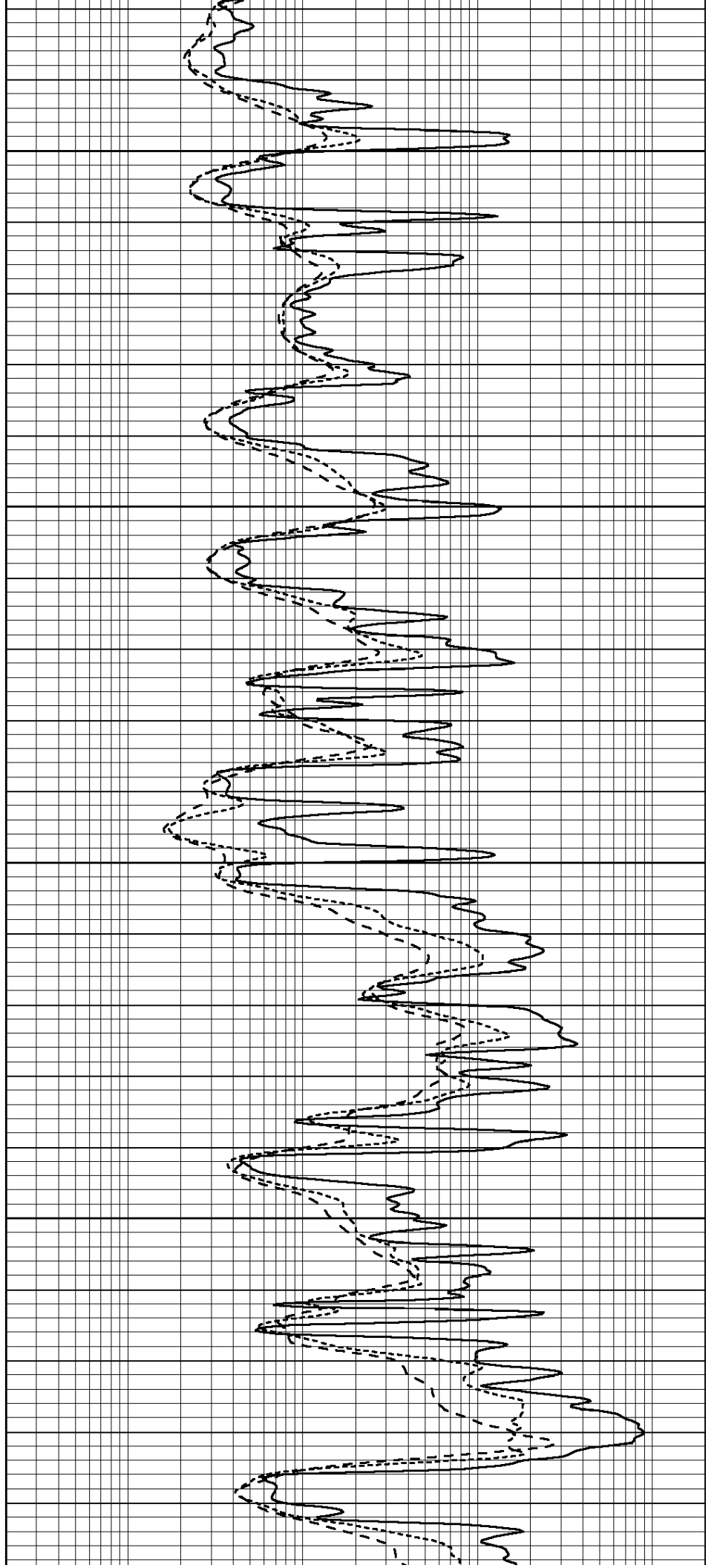


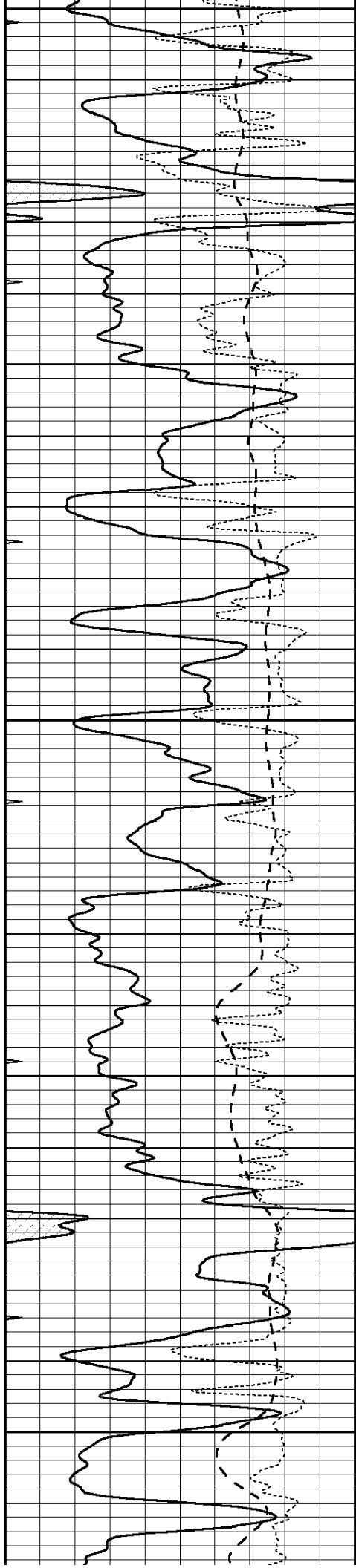
3700

3750

3800

3850





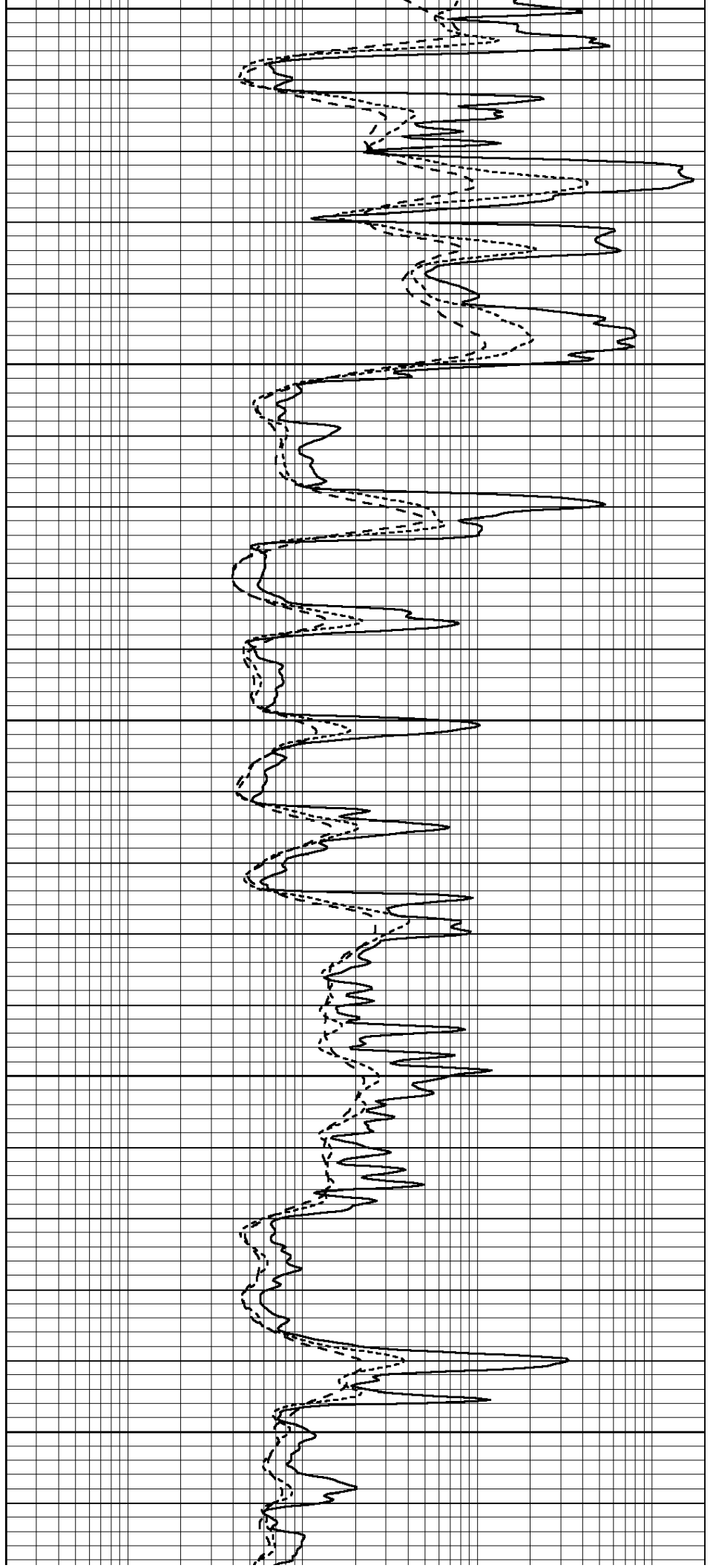
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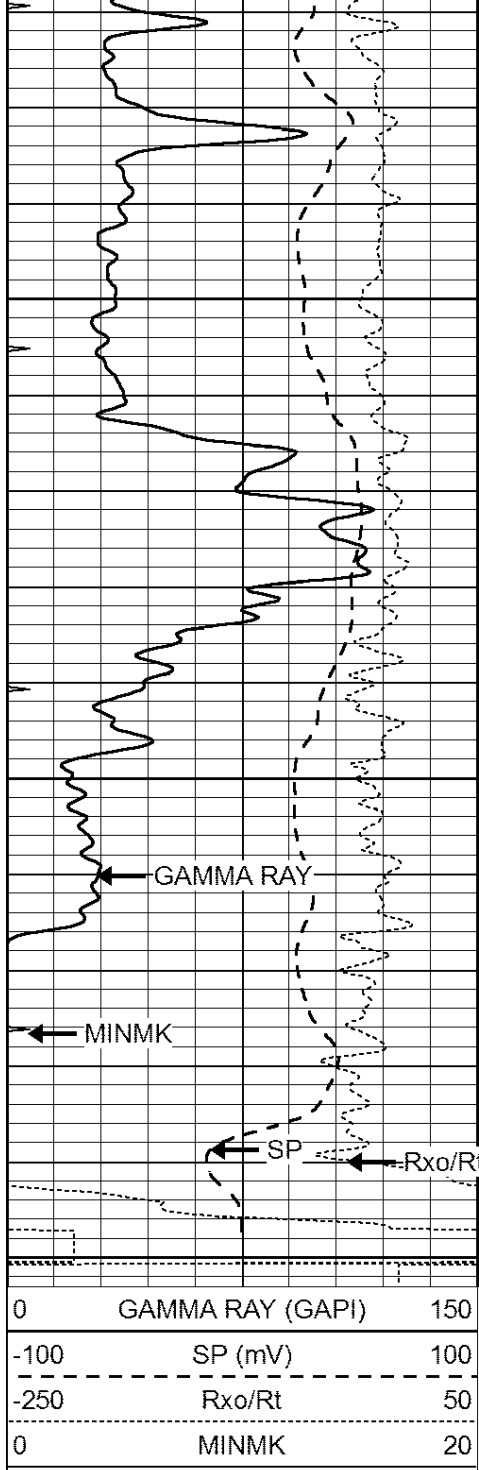
3950

4000

4050

4100



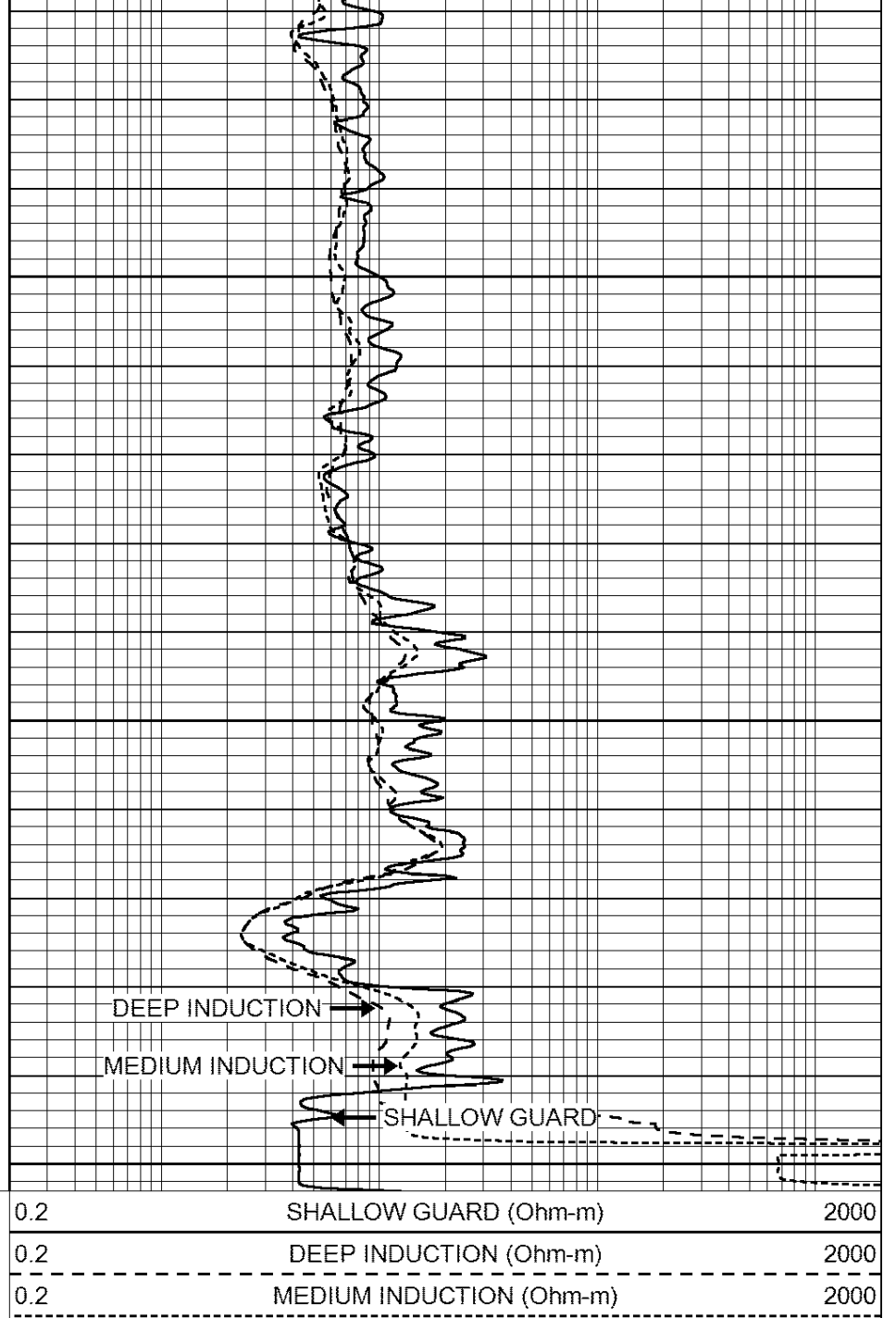


4150

4200

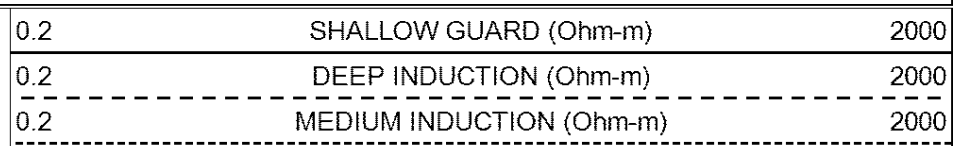
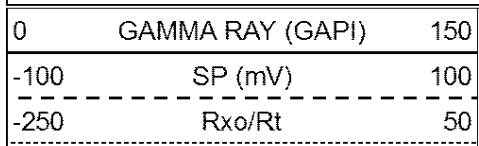
LTD 4246

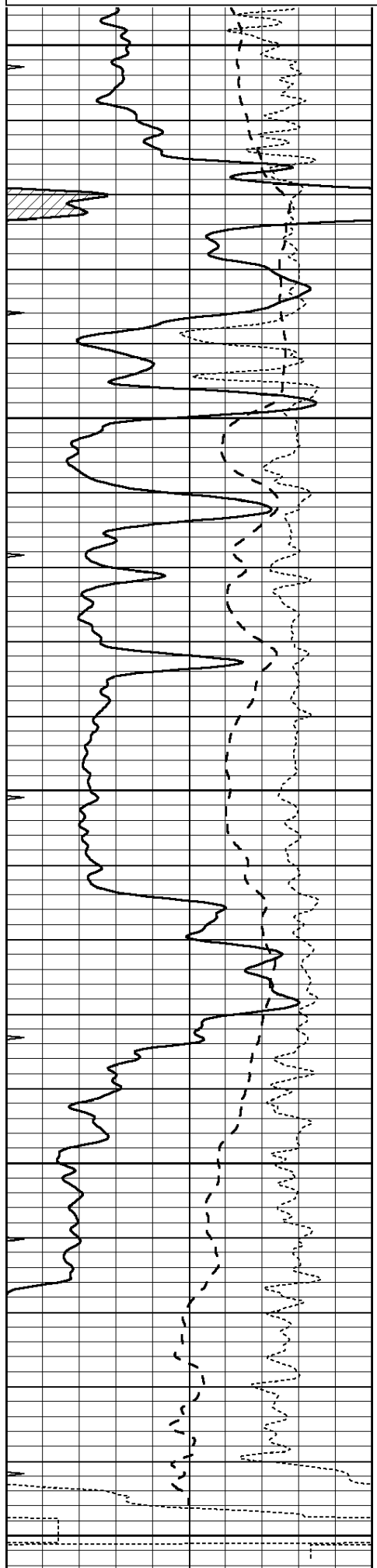
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REPEAT SECTION

Database File: 2401ddn.db
 Dataset Pathname: pass2.1
 Presentation Format: _dil
 Dataset Creation: Sun Jan 21 10:34:28 2018
 Charted by: Depth in Feet scaled 1:240





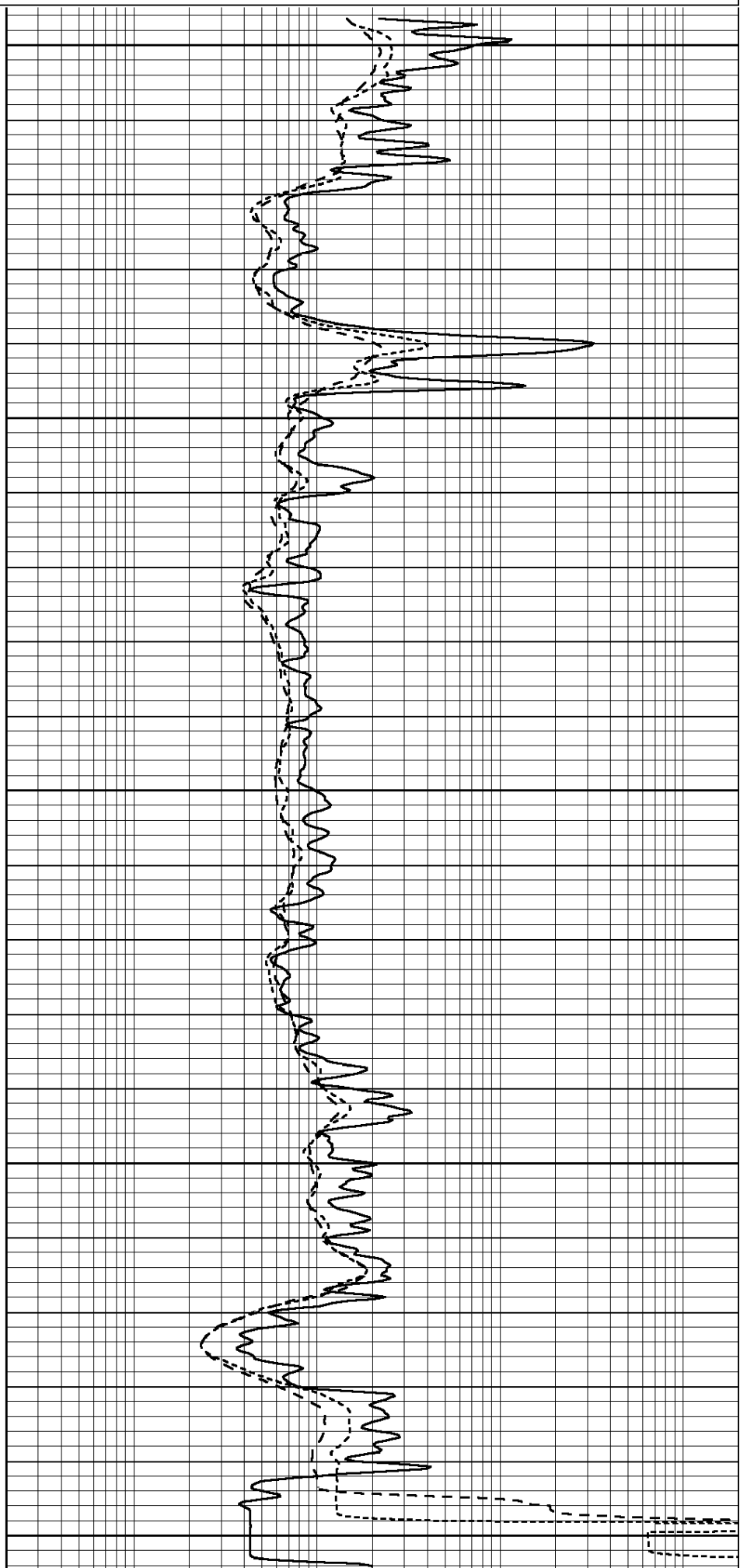
4050

4110

4150

4200

4250



| | | | | | |
|------|------------------|-----|-----|--------------------------|------|
| 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 | | | |

Calibration Report

Database File: pe2.db
 Dataset Pathname: pass2
 Dataset Creation: Mon Aug 21 11:58:02 2017 by Log Open-Cased 090629

Dual Induction Calibration Report

Serial-Model: PROBE8-DILG
 Surface Cal Performed: Mon Aug 21 11:58:18 2017
 Downhole Cal Performed: Mon Aug 21 11:58:21 2017
 After Survey Verification Performed: Mon Aug 21 11:58:23 2017

Surface Calibration

| Loop: | Readings | | | | References | | Results | |
|-----------|----------|-------|---|-------|------------|--------|---------|---------|
| | Air | Loop | | | Air | Loop | m | b |
| Deep | 0.015 | 0.648 | V | 0.000 | 400.000 | mmho/m | 620.000 | 0.000 |
| Medium | 0.029 | 0.796 | V | 0.000 | 464.000 | mmho/m | 590.000 | -12.000 |
| Internal: | Zero | Cal | | Zero | Cal | | m | b |
| Deep | 0.017 | 0.657 | V | 0.000 | 400.000 | mmho/m | 625.153 | -10.619 |
| Medium | 0.016 | 0.757 | V | 0.000 | 464.000 | mmho/m | 625.992 | -9.739 |

Downhole Calibration

| | Readings | | | | References | | Results | |
|--------|----------|--------|--------|-------|------------|--------|---------|-------|
| | Zero | Cal | | | Zero | Cal | m' | b' |
| Deep | 0.000 | 0.000 | mmho/m | 2.011 | 405.777 | mmho/m | 1.000 | 0.000 |
| Medium | 0.000 | 0.000 | mmho/m | 7.590 | 503.393 | mmho/m | 1.000 | 0.000 |
| LL3 | | 7.500 | V | | 1500.000 | Ohm-m | | |
| | | 0.000 | V | | 20.000 | Ohm-m | | |
| | | -7.200 | V | | 3800.000 | 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 11:56:41 2017

| | Background | Magnesium | Aluminum | Sandstone | |
|------------|------------|-----------|----------|-----------|-----|
| Window 1 | 833.6 | 7394.2 | 2287.3 | 8111.8 | cps |
| Window 2 | 768.9 | 6322.3 | 1995.6 | 6800.0 | cps |
| Window 3 | 621.5 | 3261.9 | 1186.4 | 3380.9 | cps |
| Window 4 | 184.2 | 185.7 | 184.9 | 184.8 | cps |
| Long Space | 0.0 | 5553.4 | 1226.6 | 6031.1 | cps |

| | | | | | |
|-------------|-----|--------|--------|--------|------|
| Short Space | 1.2 | 1307.5 | 903.9 | 1387.7 | cps |
| Rho | | 1.7100 | 2.5900 | 1.3800 | g/cc |
| Pe | | 0.0000 | 2.5700 | 1.5500 | |

| | | | | | |
|-------------|--------|-------------|---------|---------------------|---------|
| Rib Angle | : 46.3 | Rib Slope | : 1.045 | Density/Spine Ratio | : 0.566 |
| Spine Angle | : 76.3 | Spine Slope | : 4.090 | Spine Intercept | : -20.7 |

Before 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 | |

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 | |

Compensated Neutron Calibration Report

Serial Number: 6I
Tool Model: G

CALIBRATION

| Detector | Readings | Target | Normalization |
|-------------|----------|----------|---------------|
| Short Space | 1.00 cps | 1.00 cps | 1.0000 |
| Long Space | 1.00 cps | 1.00 cps | 1.0000 |

PRE-SURVEY VERIFICATION

| | Detector | Readings | Measured | Target |
|----|-------------|----------|----------|--------|
| 1) | Short Space | cps | | |
| | Long Space | cps | pu | pu |
| 2) | Short Space | cps | | |
| | Long Space | cps | pu | |
| 3) | Short Space | cps | | |
| | Long Space | cps | pu | |

POST-SURVEY VERIFICATION

| | Detector | Readings | Measured | Target |
|----|-------------|----------|----------|--------|
| 1) | Short Space | cps | | |
| | Long Space | cps | pu | pu |

| | | | | |
|----|-------------|-----|----|----|
| 2) | Short Space | cps | | |
| | Long Space | cps | pu | pu |
| 3) | Short Space | cps | | |
| | Long Space | cps | pu | pu |

Gamma Ray Calibration Report

| | | | |
|---------------------|--------------------------|----------|--|
| Serial Number: | GR6 | | |
| Tool Model: | OPEN | | |
| Performed: | Mon Aug 21 11:59:01 2017 | | |
| Calibrator Value: | 150.0 | GAPI | |
| Background Reading: | 0.0 | cps | |
| Calibrator Reading: | 276.0 | cps | |
| Sensitivity: | 0.5500 | GAPI/cps | |