



**COMPLETION  
& PRODUCTION  
SERVICES CO.**

COMPENSATED  
DENSITY / NEUTRON  
PE LOG

<<< Fold Here >>>

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## Comments

THANK YOU FOR USING "NABORS" HAYS, KANSAS (785) 628-6395  
DIRECTIONS  
CLAFLIN, KS., 6E. ON HWY 4 TO "RD. 4", 4S., E. INTO



## COMPLETION & PRODUCTION

# MAIN SECTION

Database File:

24152ddn.db

Dataset Pathname:

pass3.8

Presentation Format:

ldt\_neu

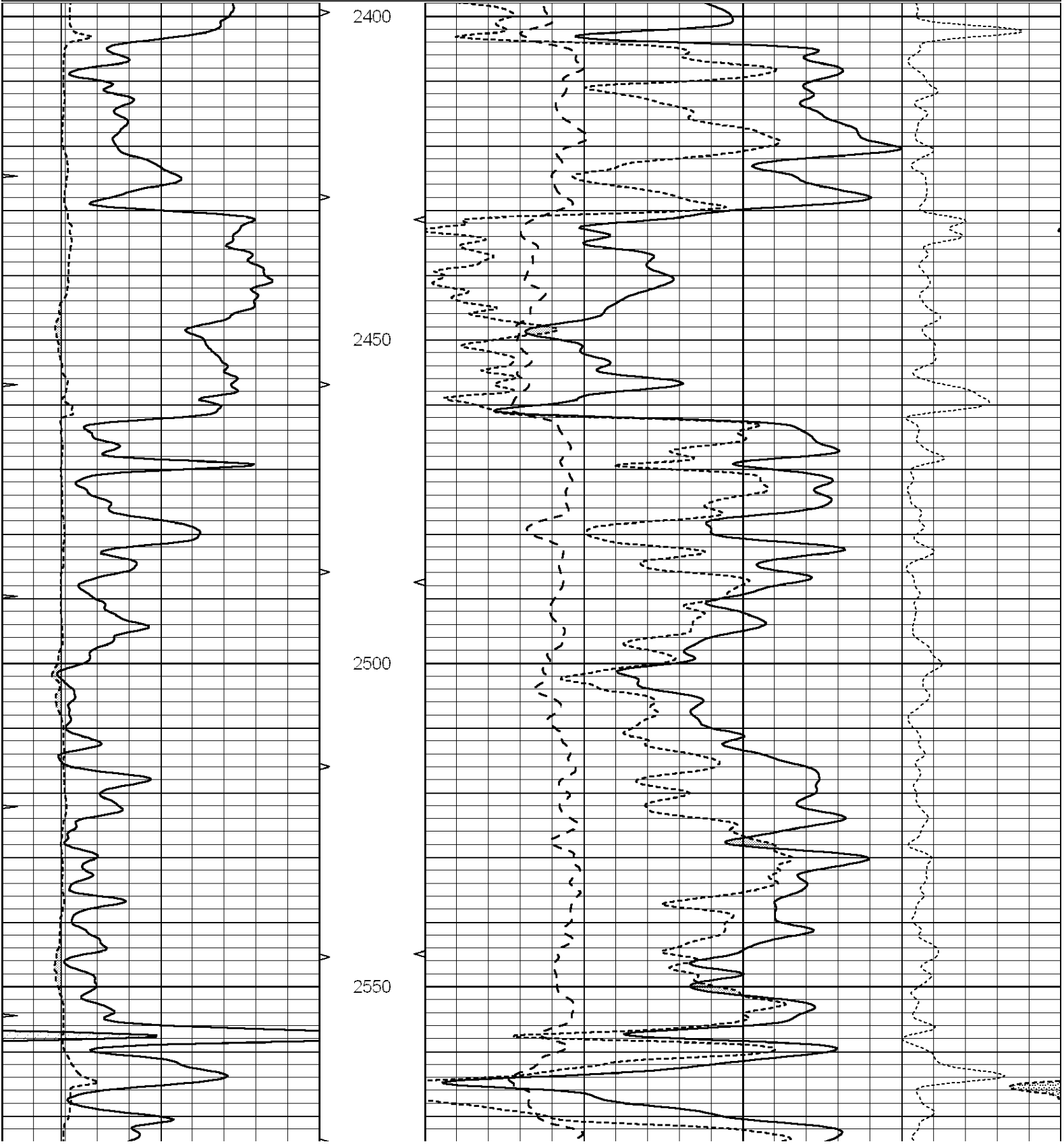
Dataset Creation:

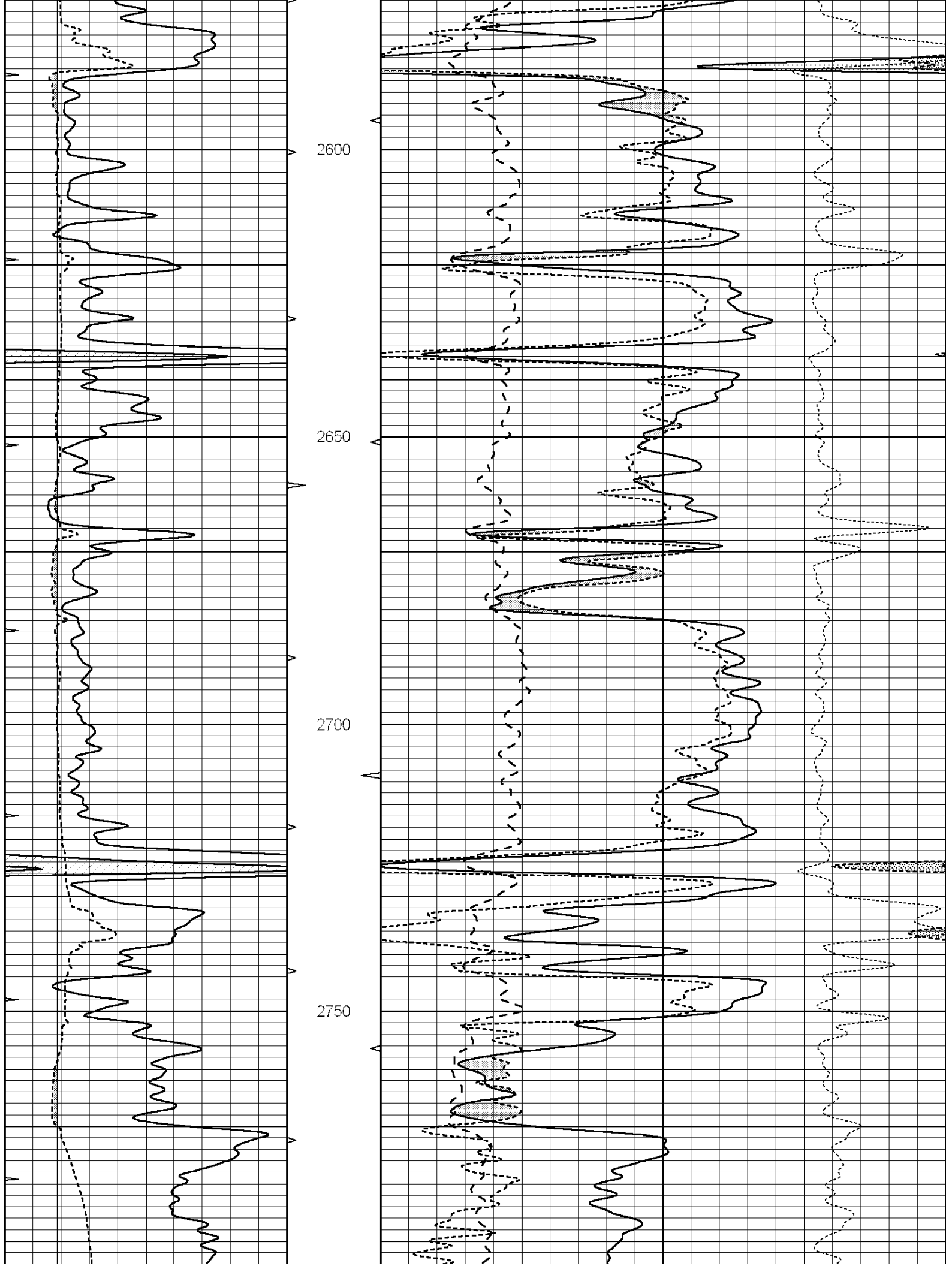
Mon May 12 14:02:45 2014

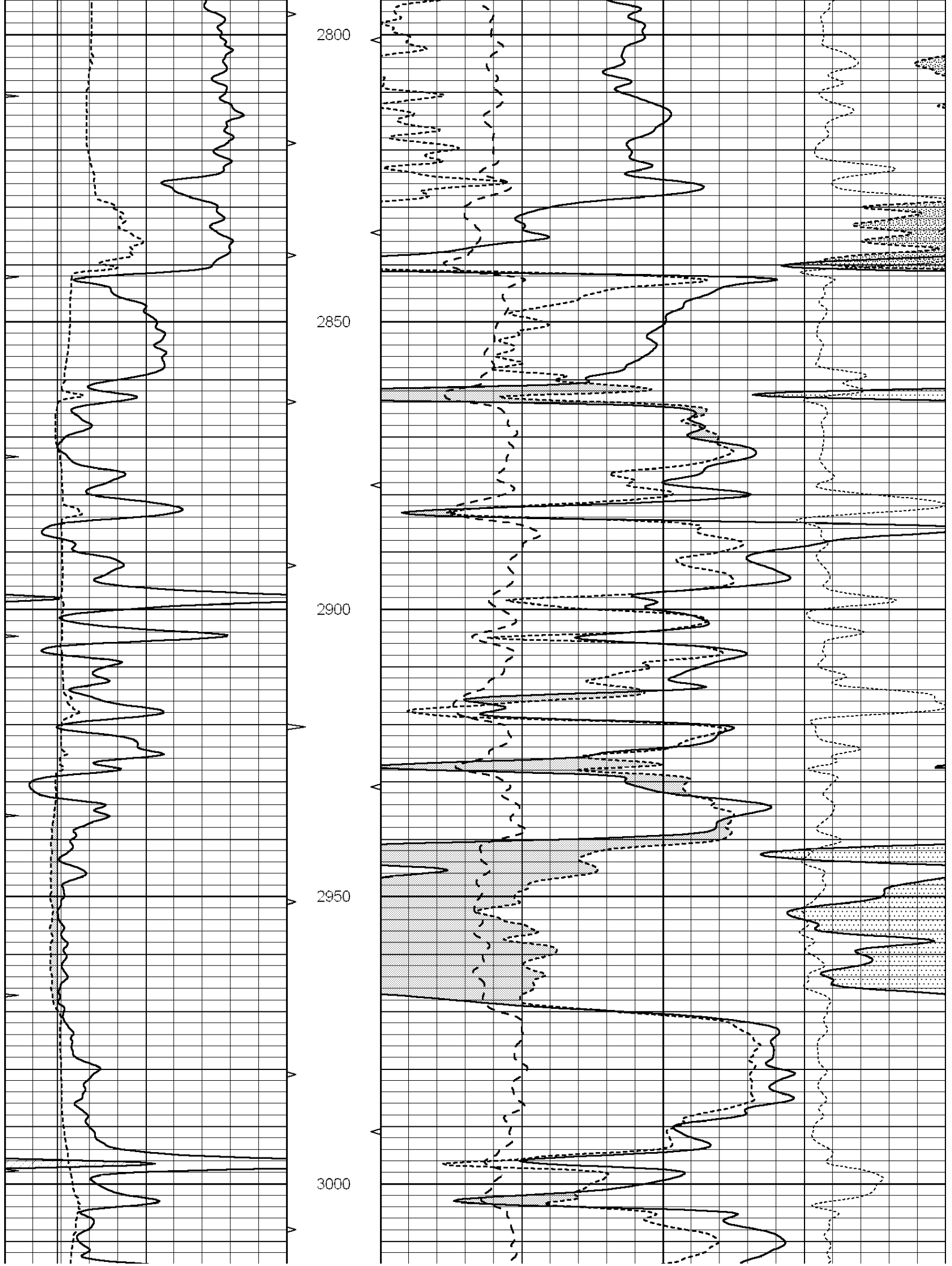
Charted by:

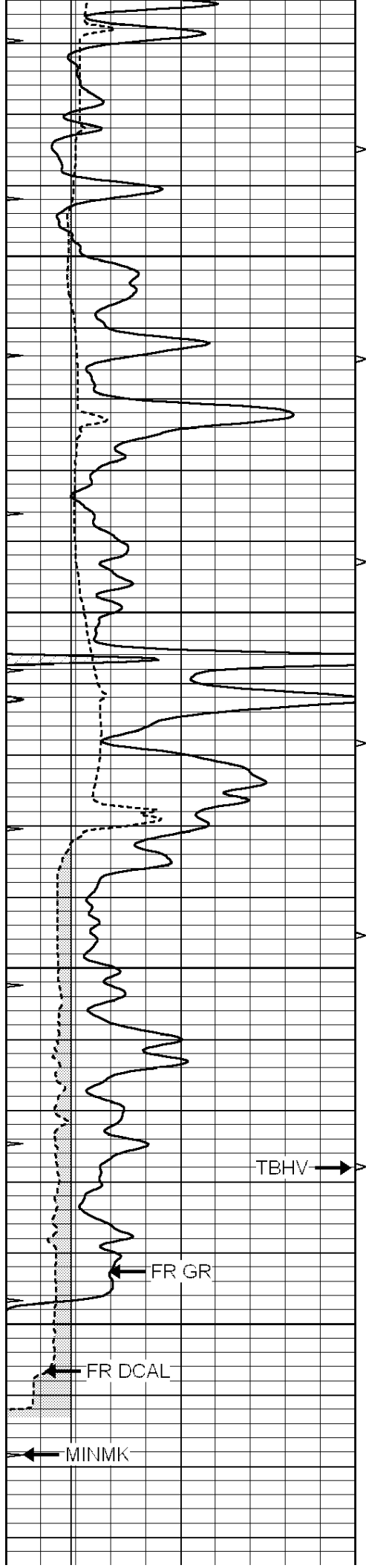
Depth in Feet scaled 1:240

|   |                  |     |          |    |                          |                          |       |                   |      |     |
|---|------------------|-----|----------|----|--------------------------|--------------------------|-------|-------------------|------|-----|
| 0 | GAMMA RAY (GAPI) | 150 | ABHV     | 30 | COMPENSATED DENSITY (pu) |                          |       |                   | -10  |     |
| 6 | CALIPER (in)     | 16  | 10 (ft3) | 0  | 30                       | COMPENSATED NEUTRON (pu) |       |                   |      | -10 |
| 0 | MINMK            | 20  | TBHV     | 0  | PE                       | 10                       | -0.25 | CORRECTION (g/cc) | 0.25 |     |
|   |                  |     | 0 (ft3)  | 10 |                          |                          |       |                   |      |     |









3050

3100

3150

3200

TBHV →

FR GR

FR DCAL

MINMK

5.5" ABHV

PE

FR DPOR

FR CNPOR

CORRECTION

2.71 LIMESTONE MATRIX

LTD 3231

|   |                  |     |          |    |                          |                                 |
|---|------------------|-----|----------|----|--------------------------|---------------------------------|
| 0 | GAMMA RAY (GAPI) | 150 | ABHV     | 30 | COMPENSATED DENSITY (pu) | -10                             |
| 6 | CALIPER (in)     | 16  | 10 (ft3) | 0  | COMPENSATED NEUTRON (pu) | -10                             |
| 0 | MINMK            | 20  | TBHV     | 0  | PE                       | 10 -0.25 CORRECTION (g/cc) 0.25 |
|   |                  |     | 0 (ft3)  | 10 |                          |                                 |

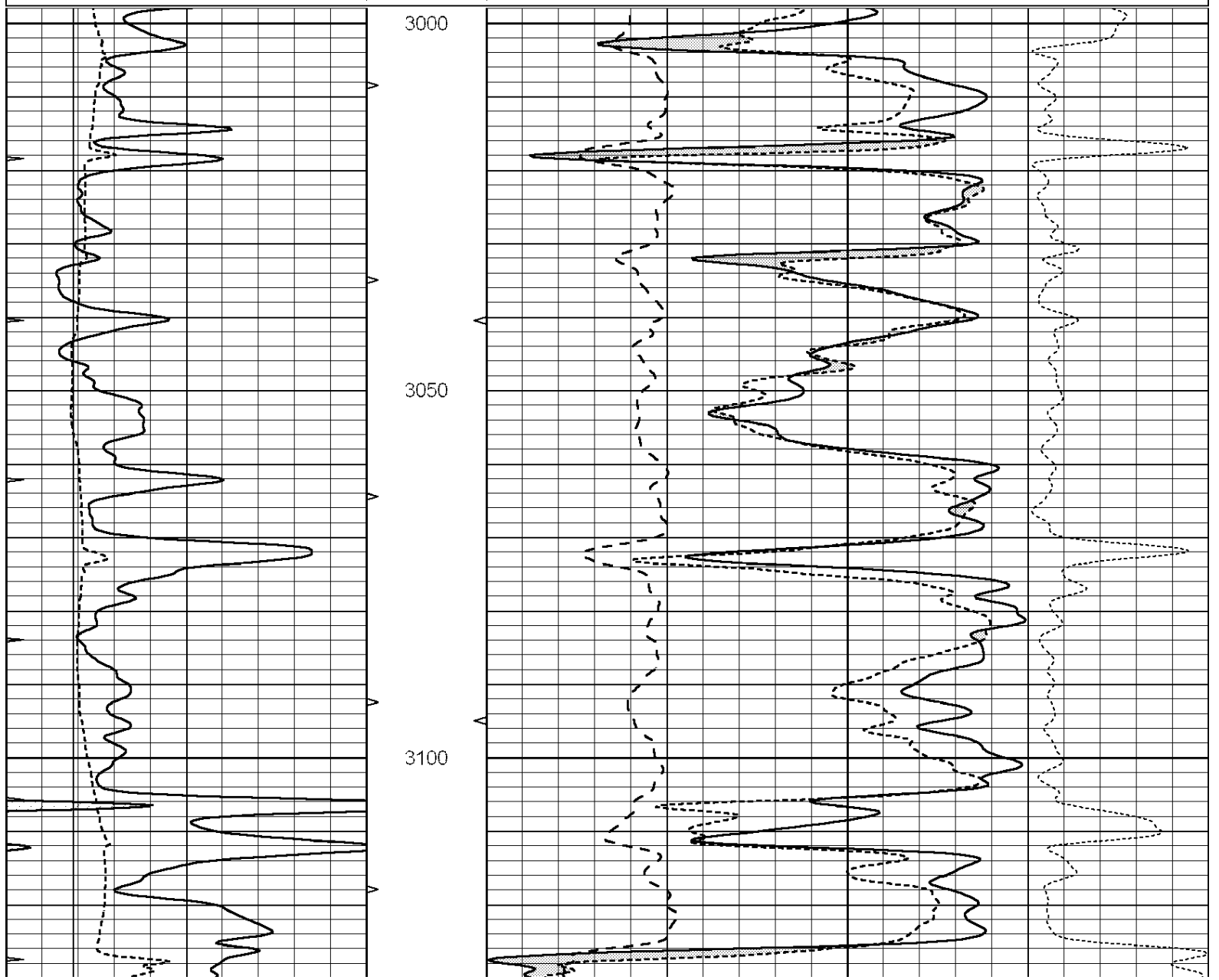


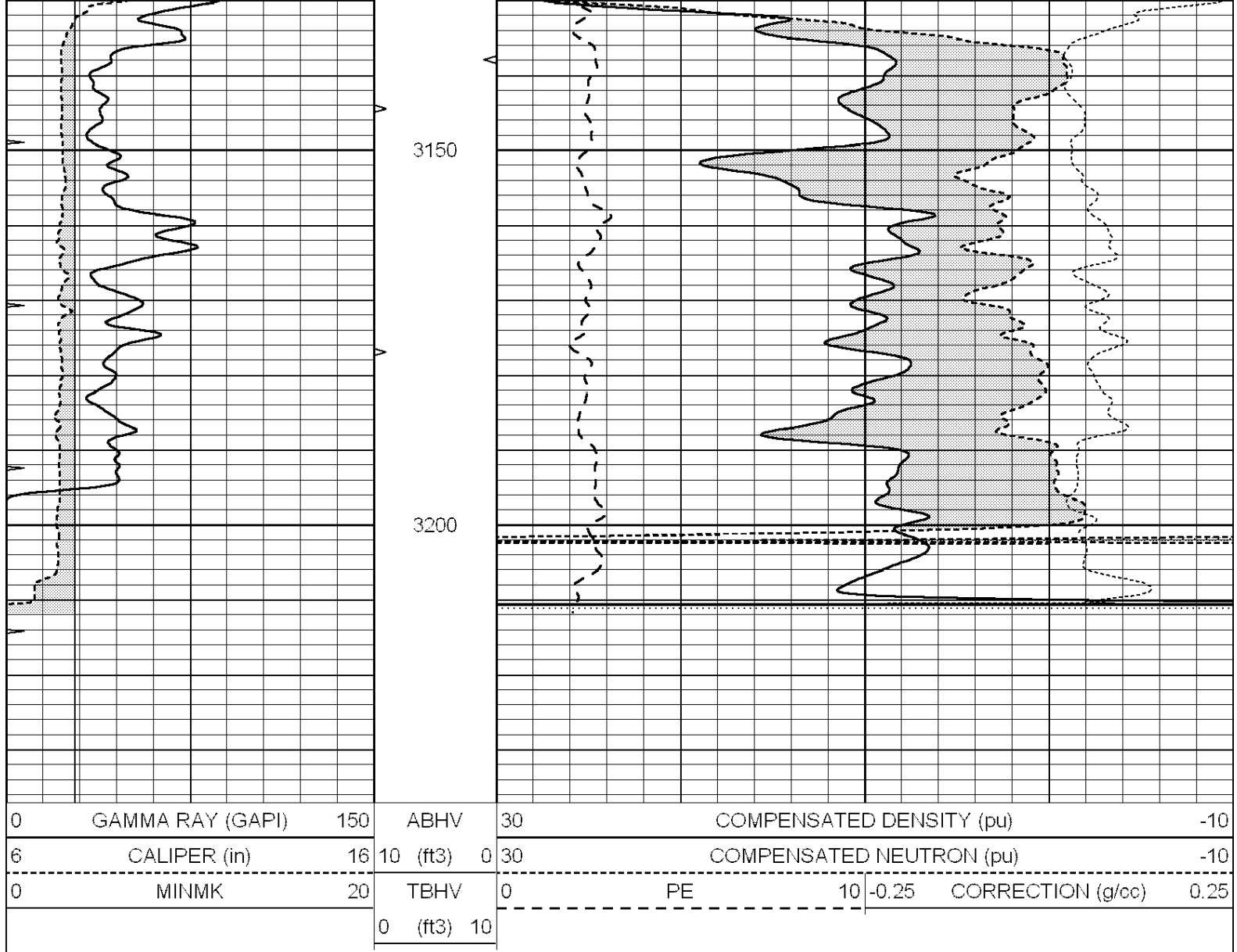
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# REPEAT SECTION

Database File: 24152ddn.db  
Dataset Pathname: pass2.6  
Presentation Format: ldt\_neu  
Dataset Creation: Mon May 12 13:27:44 2014  
Charted by: Depth in Feet scaled 1:240

|   |                  |     |          |    |                          |                                 |
|---|------------------|-----|----------|----|--------------------------|---------------------------------|
| 0 | GAMMA RAY (GAPI) | 150 | ABHV     | 30 | COMPENSATED DENSITY (pu) | -10                             |
| 6 | CALIPER (in)     | 16  | 10 (ft3) | 0  | COMPENSATED NEUTRON (pu) | -10                             |
| 0 | MINMK            | 20  | TBHV     | 0  | PE                       | 10 -0.25 CORRECTION (g/cc) 0.25 |
|   |                  |     | 0 (ft3)  | 10 |                          |                                 |





### Calibration Report

Database File: 24152ddn.db  
Dataset Pathname: pass3.8  
Dataset Creation: Mon May 12 14:02:45 2014

### Dual Induction Calibration Report

Serial-Model: PROBE9-DILG  
Surface Cal Performed: Sat May 03 21:20:05 2014  
Downhole Cal Performed: Mon Jul 28 12:02:56 2008  
After Survey Verification Performed: 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 | 660.000 | -9.000  |
| Medium    | 0.039  | 0.728 | V | 0.000      | 464.000 | mmho/m | 650.000 | -20.000 |
| 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: 003N      Model: PRB     |  |  |  |  |  |  |  |  |

| Master Calibration |            |             |          |                     | Performed Tue Sep 08 14:14:44 2009 |  |         |      |
|--------------------|------------|-------------|----------|---------------------|------------------------------------|--|---------|------|
|                    | Background | Magnesium   | Aluminum | Sandstone           |                                    |  |         |      |
| Window 1           | 2042.6     | 12312.8     | 4225.8   | 13758.4             |                                    |  |         | cps  |
| Window 2           | 1855.8     | 10134.7     | 3624.2   | 11113.1             |                                    |  |         | cps  |
| Window 3           | 1639.4     | 6760.2      | 2716.3   | 7260.3              |                                    |  |         | cps  |
| Window 4           | 466.4      | 469.2       | 466.1    | 476.5               |                                    |  |         | cps  |
| Long Space         | 0.0        | 8278.9      | 1768.4   | 9257.4              |                                    |  |         | cps  |
| Short Space        | 2.2        | 2377.3      | 1544.1   | 2574.2              |                                    |  |         | cps  |
| Rho                |            | 1.7100      | 2.5900   | 1.3800              |                                    |  |         | g/cc |
| Pe                 |            | 0.0000      | 2.5700   | 1.5500              |                                    |  |         |      |
| Rib Angle          | : 44.4     | Rib Slope   | : 0.979  | Density/Spine Ratio |                                    |  | : 0.549 |      |
| Spine Angle        | : 74.4     | Spine Slope | : 3.577  | Spine Intercept     |                                    |  | : -18.8 |      |

| 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:                         |                          | 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:                             | Sat May 03 22:43:08 2014 |          |        |
| Calibrator Value:                      | 1.0                      | GAPI     |        |
| Background Reading:                    | 0.0                      | cps      |        |
| Calibrator Reading:                    | 1.0                      | cps      |        |
| Sensitivity:                           | 0.2800                   | GAPI/cps |        |