



**PIONEER**  
Pioneer Energy Services

## MICRORESISTIVITY LOG

|                        |                                                                    |
|------------------------|--------------------------------------------------------------------|
| Company                | COBALT ENERGY, LLC                                                 |
| Well                   | ELIZABETH A #2-36                                                  |
| Field                  | WILDCAT                                                            |
| County                 | Graham                                                             |
| State                  | KANSAS                                                             |
| Location:              | API #: 15-065-24182-00-00<br>947' FSL & 1016'<br>SE - NE - SW - SW |
| Permanent Datum        | GROUND LEVEL                                                       |
| Log Measured From      | KELLY BUSHING                                                      |
| Drilling Measured From | KELLY BUSHING                                                      |
| Elevation              | 2160'                                                              |
| Other Services         | CNL/CDL<br>DIL                                                     |
| Elevation              | 2165'                                                              |
| D.F.                   | N/A                                                                |
| G.L.                   | 2160'                                                              |
| Date                   | 02/25/2020                                                         |
| Run Number             | ONE                                                                |
| Depth Driller          | 3800'                                                              |
| Depth Logger           | 3801'                                                              |
| Bottom Logged Interval | 3800'                                                              |
| Top Log Interval       | 3100'                                                              |
| Casing Driller         | 8.625" @ 220'                                                      |
| Casing Logger          | 200                                                                |
| Bit Size               | 7.875"                                                             |
| Type Fluid in Hole     | CHEMICAL                                                           |
| Salinity, ppm CL       | 3200                                                               |
| Density / Viscosity    | 9.3 59                                                             |
| pH / Fluid Loss        | 10.0 604                                                           |
| Source of Sample       | FLOWLINE                                                           |
| Rm @ Meas. Temp        | 0.70 @ 60                                                          |
| Rmt @ Meas. Temp       | 0.53 @ 60                                                          |
| Rmc @ Meas. Temp       | 0.95 @ 60                                                          |
| Source of Rmt / Rmc    | CHARTS                                                             |
| Rm @ BHT               | 0.37 @ 114                                                         |
| Operating Rig Time     | 3 HOURS                                                            |
| Max Rec. Temp. F       | 114                                                                |
| Equipment Number       | P-24                                                               |
| Location               | HAYS                                                               |
| Recorded By            | IAN MABB                                                           |
| Witnessed By           | LARRY NICHOLSON                                                    |

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not 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.

### Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

BOGUE, KS.

SOUTH 3 MILES TO L RD, WEST TO RD 340,  
NORTH 1 MILE & EAST INTO

Log Measured From: KELLY BUSHING 5 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES  
www.pioneerenergy.com 785-625-3858

### Your Pioneer Energy Services Crew

Engineer: IAN MABB  
Operator:  
Operator:  
Operator:

### This Log Record Was Witnessed By

Primary Witness: LARRY NICHOLSON  
Secondary Witness:  
Secondary Witness:  
Secondary Witness:

Top - Bottom

|           |             |             |             |          |           |       |              |
|-----------|-------------|-------------|-------------|----------|-----------|-------|--------------|
| A         | BOREID      | BOTTEMP     | CASEOD      | CASETHCK | FLUIDDEN  | M     | MATRXDEN     |
| 1         | in<br>7.875 | degF<br>100 | in<br>5.5   | in<br>0  | g/cc<br>1 | 2     | g/cc<br>2.71 |
| NPORSEL   | PERFS       | SNDERR      | SNDERRM     | SPSHIFT  | SRFTEMP   | SZCOR | TDEPTH       |
| Limestone | 0           | mmho/m<br>0 | mmho/m<br>0 | mV<br>0  | degF<br>0 | Off   | ft<br>3801   |

| Sensor | Offset (ft) | Schematic                                                                           |                                                                                     | Description                                         | Length (ft) | O.D. (in) | Weight (lb) |
|--------|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------|-------------|-----------|-------------|
| GR     | 40.58       |    |    | GR-M&W (233-M&W)                                    | 3.00        | 3.50      | 50.00       |
|        |             |                                                                                     |                                                                                     |                                                     |             |           |             |
| CNLSC  | 37.48       |    |    | CNT-M&W (207-MW)                                    | 5.50        | 3.50      | 100.00      |
| CNSSC  | 36.73       |    |                                                                                     |                                                     |             |           |             |
| LSD    | 28.43       |  |   | CDL-M&W (817-947)                                   | 8.50        | 4.00      | 250.00      |
|        | 28.42       |                                                                                     |                                                                                     |                                                     |             |           |             |
|        | 27.93       |                                                                                     |                                                                                     |                                                     |             |           |             |
| MCAL   | 19.83       |  |  | ML-PSIML (PSI-01)                                   | 7.58        | 4.00      | 65.00       |
|        | 19.83       |                                                                                     |                                                                                     | GO Micro log tools converted to Simplec electronics |             |           |             |
|        | 19.83       |                                                                                     |                                                                                     |                                                     |             |           |             |
| RLL3F  | 15.80       |  |  |                                                     |             |           |             |
| RLL3   | 15.80       |                                                                                     |                                                                                     |                                                     |             |           |             |
| CILD   | 8.00        |  |  | DIL-PSI HIGH TEMP (952-828)                         | 18.50       | 3.50      | 220.00      |
|        |             |                                                                                     |                                                                                     |                                                     |             |           |             |

CILM

4.70

SP

0.20

Dataset: cobalt\_elizabeth\_a\_2\_36.db: field/well/stackmel/pass3  
 Total length: 43.08 ft  
 Total weight: 685.00 lb  
 O.D.: 4.00 in

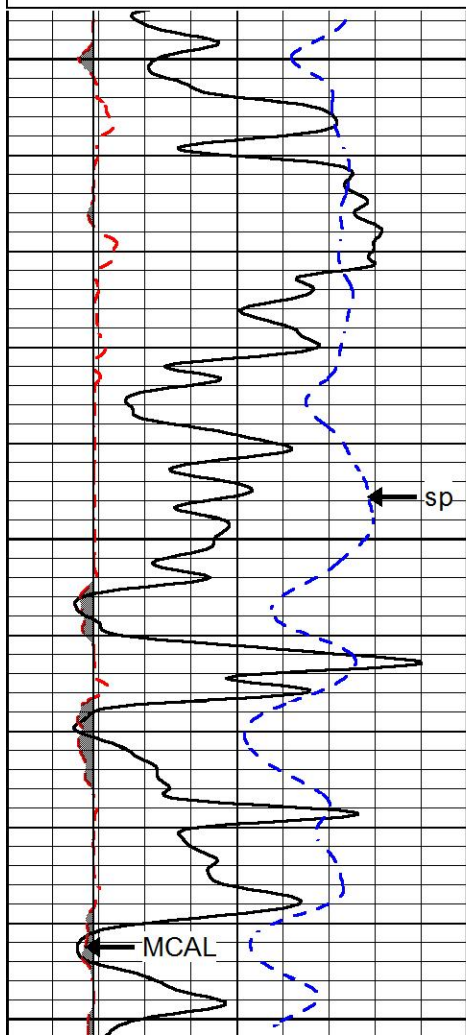


# MAIN PASS

Database File cobalt\_elizabeth\_a\_2\_36.db  
 Dataset Pathname stackmel/pass3.1  
 Presentation Format \_micro  
 Dataset Creation Mon Feb 24 23:57:53 2020  
 Charted by Depth in Feet scaled 1:240

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| 6    | MCAL (in)        | 16  |
| 6    | Bit Size (in)    | 16  |
| -200 | sp (mV)          | 0   |

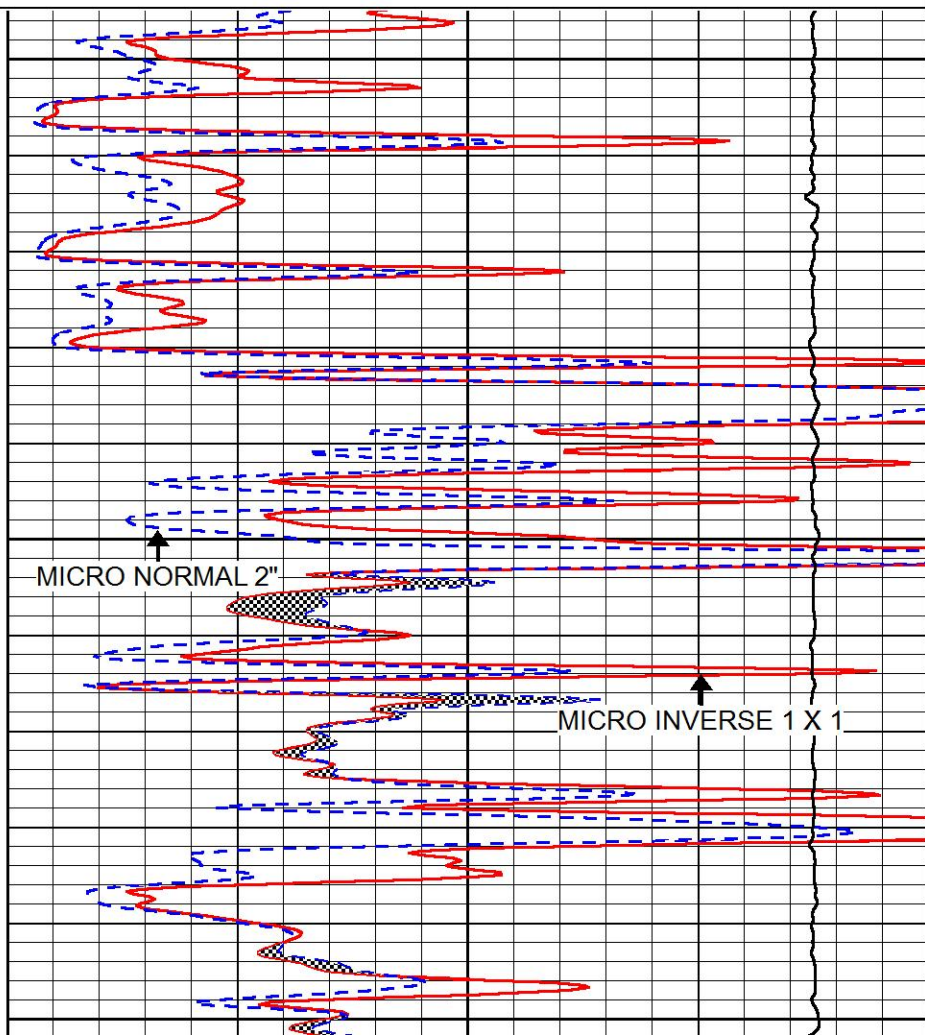
|       |                             |    |
|-------|-----------------------------|----|
| 0     | MICRO INVERSE 1 X 1 (Ohm-m) | 40 |
| 0     | MICRO NORMAL 2" (Ohm-m)     | 40 |
| 10000 | Line Weight (lb)            | 0  |

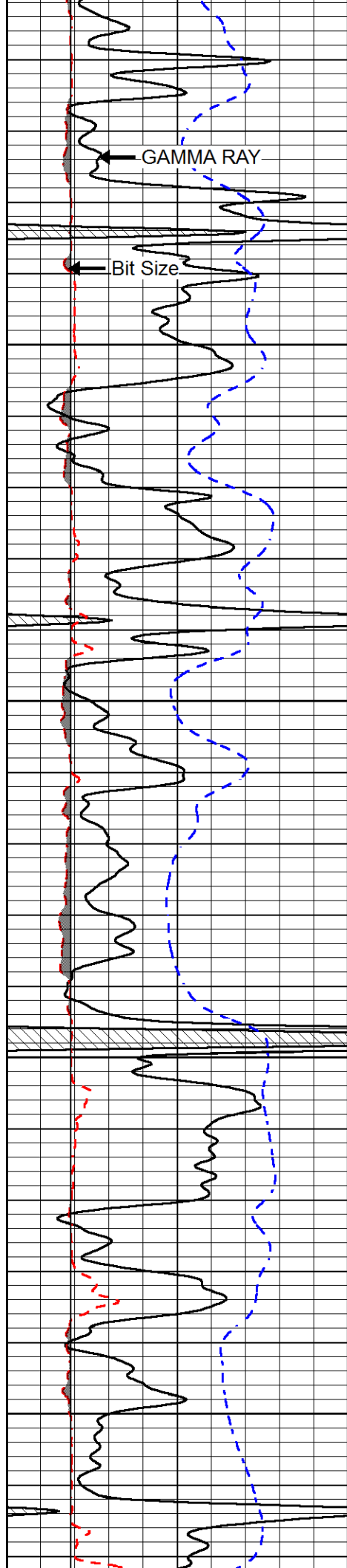


3100

3150

3200



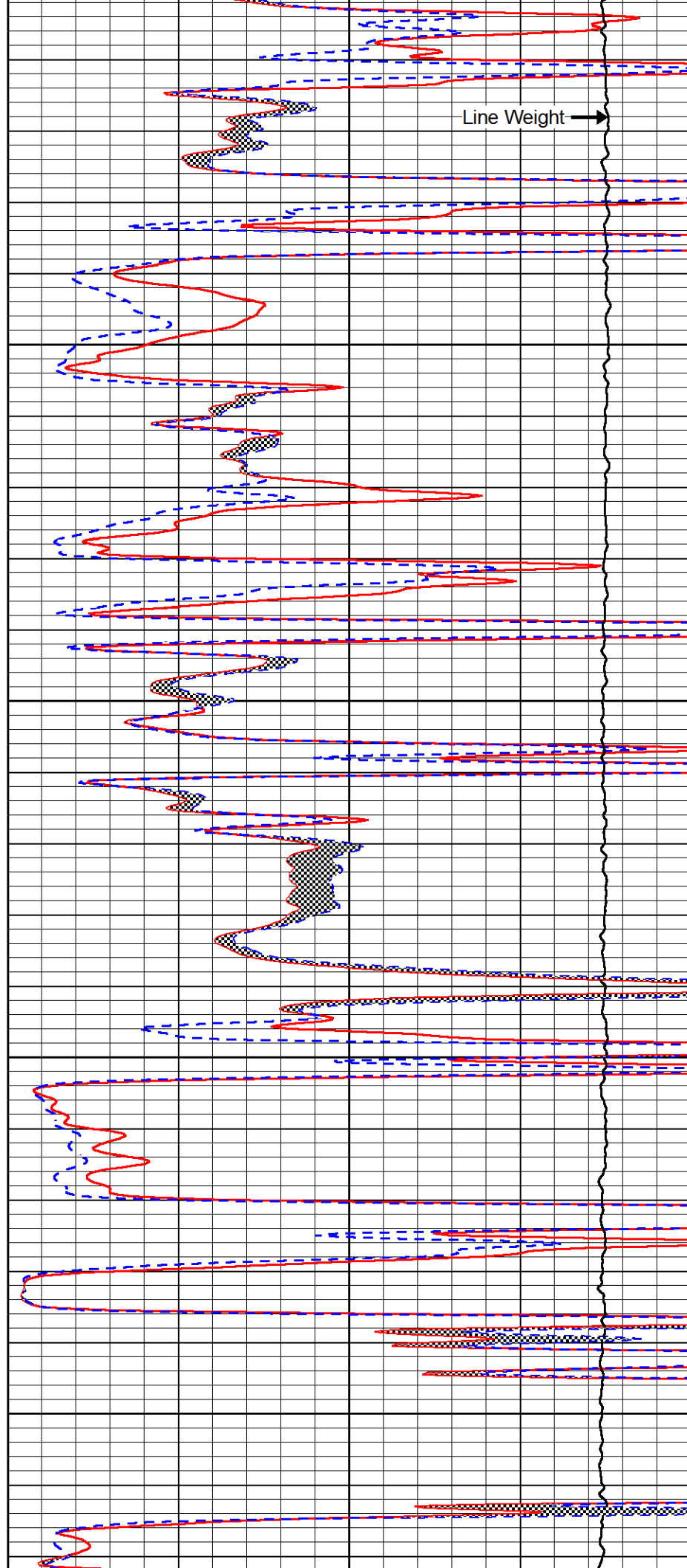


3250

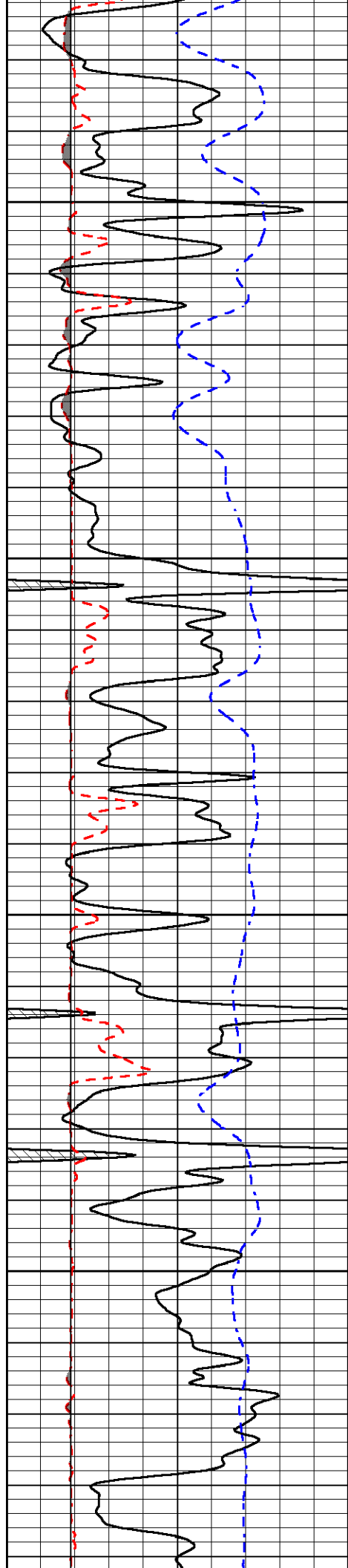
3300

3350

3400





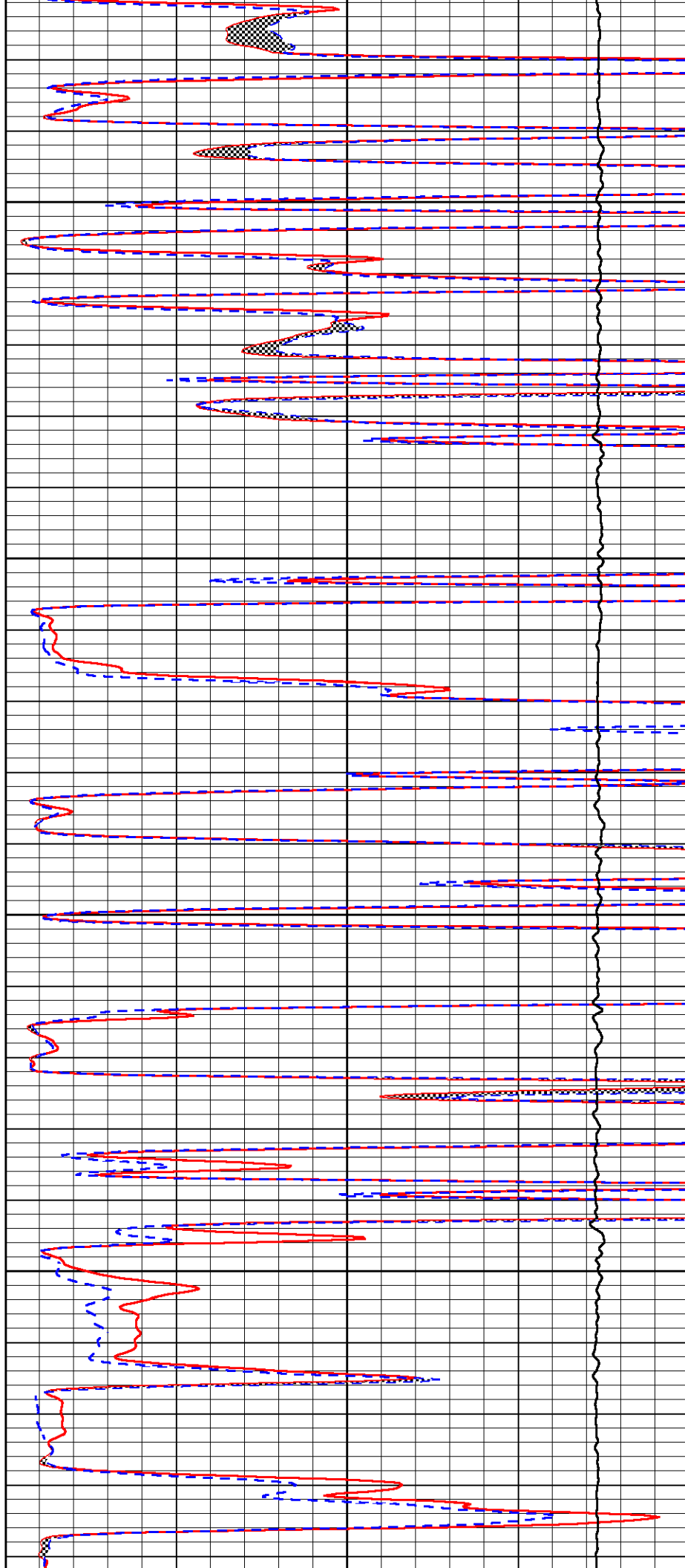


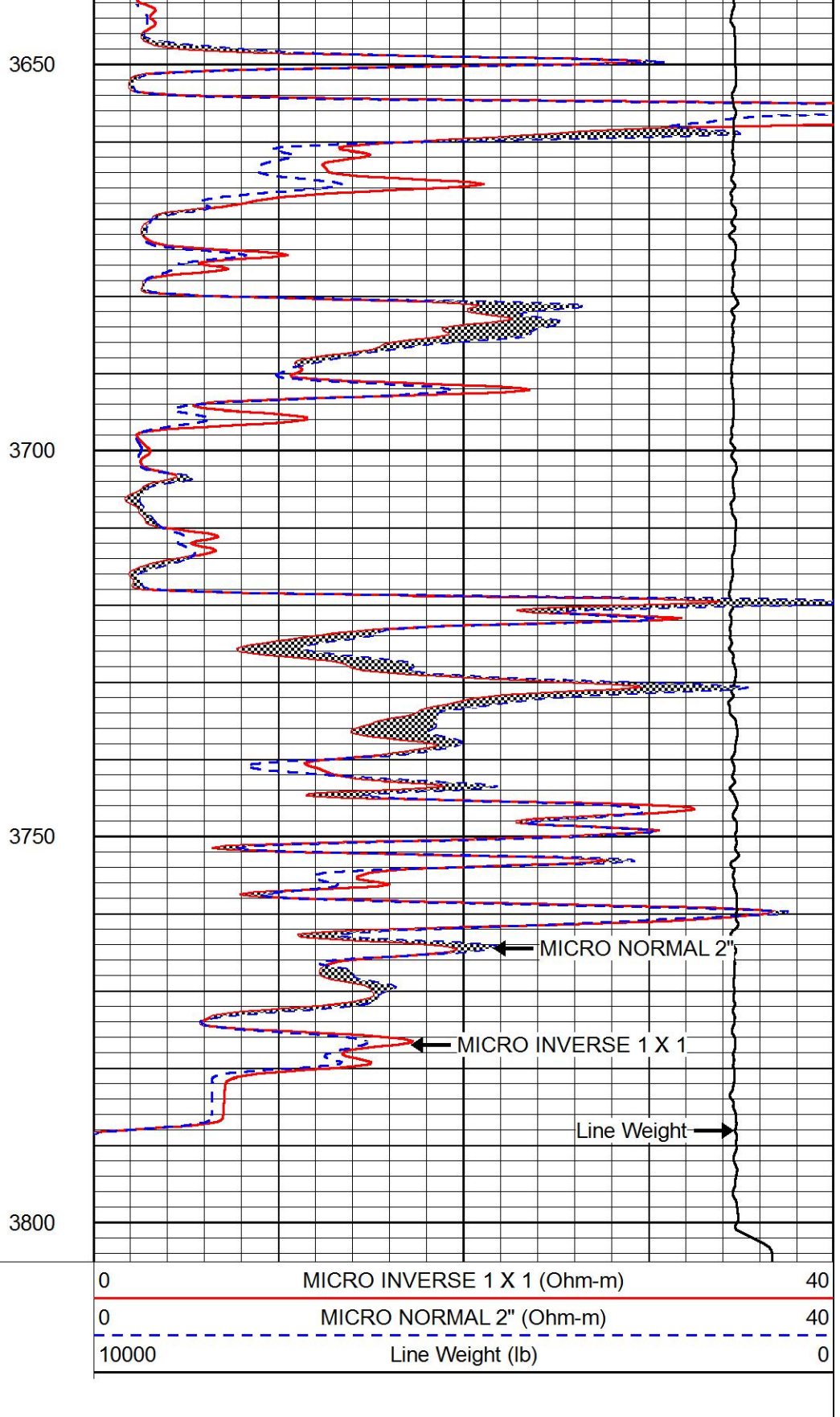
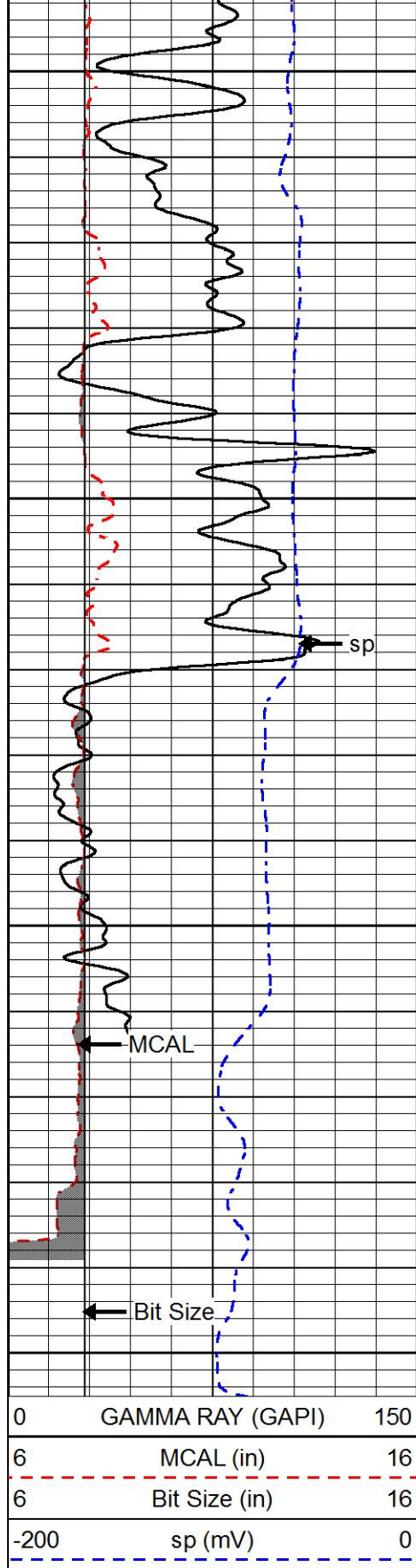
3450

3500

3550

3600

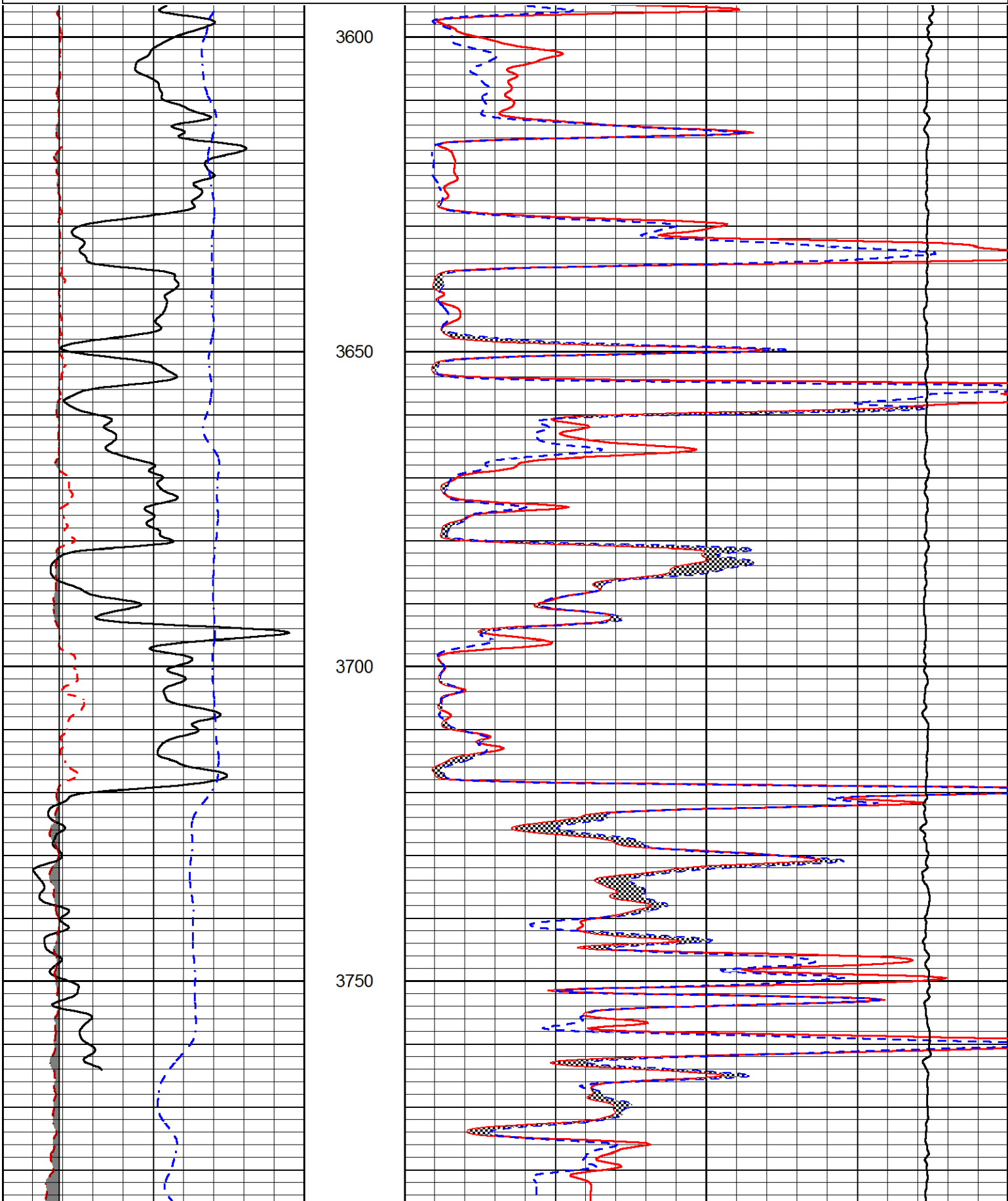


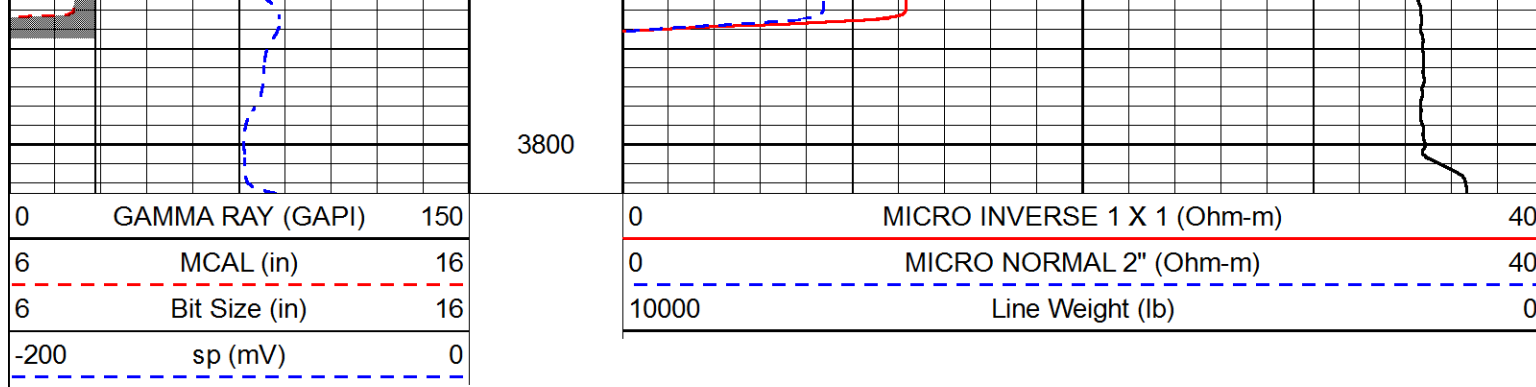


# REPEAT SECTION

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| 6    | MCAL (in)        | 16  |
| 6    | Bit Size (in)    | 16  |
| -200 | sp (mV)          | 0   |

|       |                             |    |
|-------|-----------------------------|----|
| 0     | MICRO INVERSE 1 X 1 (Ohm-m) | 40 |
| 0     | MICRO NORMAL 2" (Ohm-m)     | 40 |
| 10000 | Line Weight (lb)            | 0  |





| Calibration Report |                            |
|--------------------|----------------------------|
| Database File      | cobalt_elizabeth_a_2_36.db |
| Dataset Pathname   | stackmel/pass3.1           |
| Dataset Creation   | Mon Feb 24 23:57:53 2020   |

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

|                        |                          |
|------------------------|--------------------------|
| Serial-Model:          | 952-828-PSI HIGH TEMP    |
| Calibration Performed: | Wed Oct 09 13:38:53 2019 |

| Loop:  | Readings |          | References |         |        | Results |         |
|--------|----------|----------|------------|---------|--------|---------|---------|
|        | Air      | Loop     | Air        | Loop    |        | Gain    | Offset  |
| Deep   | 167.000  | 835.000  | 0.000      | 255.000 | mmho/m | 0.400   | -27.500 |
| Medium | 0.000    | 1348.000 | 142.000    | 255.000 | mmho/m | 0.275   | -27.000 |

| Microlog Calibration Report |  |
|-----------------------------|--|
|-----------------------------|--|

|               |                          |
|---------------|--------------------------|
| Serial-Model: | PSI-01-PSIML             |
| Performed:    | Sat Feb 01 06:29:21 2020 |

|         | Readings |        | References |         |       | Results    |           |
|---------|----------|--------|------------|---------|-------|------------|-----------|
|         | Zero     | Cal    | Zero       | Cal     |       | m          | b         |
| Normal  | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 11000.0000 | -0.7000   |
| Inverse | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 15000.0000 | -1.3000   |
| Caliper | 1.0000   | 1.0827 | 5.0000     | 16.5000 | in    | 139.1950   | -135.8000 |

| Compensated Density Calibration Report |  |
|----------------------------------------|--|
|----------------------------------------|--|

|                               |                          |
|-------------------------------|--------------------------|
| Serial-Model:                 | 817-947-M&W              |
| Source / Verifier:            | 16955B / 2ci             |
| Master Calibration Performed: | Tue Sep 24 21:18:50 2019 |

| Master Calibration  |         |      |  |                             |  |               |     |
|---------------------|---------|------|--|-----------------------------|--|---------------|-----|
|                     | Density |      |  | Far Detector                |  | Near Detector |     |
|                     |         |      |  |                             |  |               |     |
| Magnesium           | 1.755   | g/cc |  | 6127.15                     |  | 5922.31       | cps |
| Aluminum            | 2.680   | g/cc |  | 1141.85                     |  | 3762.09       | cps |
| Spine Angle = 74.89 |         |      |  | Density/Spine Ratio = 0.532 |  |               |     |
|                     | Size    |      |  | Reading                     |  |               |     |
|                     |         |      |  |                             |  |               |     |
| Small Ring          | 4.50    | in   |  | 1.02                        |  |               |     |
| Large Ring          | 15.00   | in   |  | 1.33                        |  |               |     |



Large Ring

15.00

in

1.55

## Compensated Neutron Calibration Report

Serial Number: 207-MW  
Tool Model: M&W  
Calibration Performed: WED FEB 13 10:30:30 2019

| Detector    | Readings    | Target      | Normalization |
|-------------|-------------|-------------|---------------|
| Short Space | 6240.00 cps | 1000.00 cps | 1.6025        |
| Long Space  | 460.00 cps  | 1000.00 cps | 1.9500        |

## Gamma Ray Calibration Report

Serial Number: 233-M&W  
Tool Model: M&W  
Calibration Performed: Fri Feb 07 01:42:40 2014

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 1.0 cps

Sensitivity: 0.5500 GAPI/cps



Company COBALT ENERGY, LLC  
Well ELIZABETH A #2-36  
Field WILDCAT  
County Graham  
State KANSAS