

LWD Composite Log



Natural Formation Evaluation
Gamma Ray

Scale:

1:1200 MD

Company: Noble Energy Inc

Well: Wells Ranch AF05-645

Depth Reference:

Field: Weld County

Driller's Depth

County: Weld State: Colorado

Status:

Final Print

Surface Location:

Latitude:

Longitude:

040° 25' 47.856" N

104° 21' 16.596" W

Other Services:

Directional

Rotary Steerable

API No: 05-123-42132-00

SEC: 5

TWN: 5N

RGE: 62W

Permanent Datum (P.D.): Ground Level

Elevation: 4681.00 ft

N/A

Log Measured From: Rig Floor

Above P.D.

KB: 4711.00 ft

DF: 4681.00 ft

GL:

Dates

Interval Logged

Magnetic Field Reference

Date From: 2016-02-11 Top: (ft) 1865.00

Date To: 2016-02-19 Bottom: (ft) 16168.00

Spud Date: 2016-02-10

Azi Reference North: Grid Dip Angle: (deg) 67.05

Total Magnetic Field Strength: (nT) 52676

Mag to Reference North Correction: (deg) 7.52 E

Borehole Record

Casing Record

| Hole Size (in) | From (ft) | To (ft) | Size (in) | Weight (lb/ft) | From (ft) | To (ft) |
|----------------|-----------|---------|-----------|----------------|-----------|---------|
|----------------|-----------|---------|-----------|----------------|-----------|---------|

| | | | | | | |
|-------|---------|----------|-------|-------|-------|---------|
| 8.500 | 1882.00 | 16168.00 | 9.625 | 36.00 | 30.00 | 1872.00 |
|-------|---------|----------|-------|-------|-------|---------|

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Mud Record

Deviation Record

| Type | From (ft) | To (ft) | Hole Size (in) | Interval (ft) | Inc Az (Start) | Inc Az (End) |
|------|-----------|---------|----------------|---------------|------------------|----------------|
|------|-----------|---------|----------------|---------------|------------------|----------------|

| | | | | | | |
|---------------|---------|----------|-------|----------|---------------|---------------|
| Oil Based Mud | 1882.00 | 16168.00 | 8.500 | 14286.00 | 0.34 203.16 | 90.43 90.73 |
|---------------|---------|----------|-------|----------|---------------|---------------|

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Acquisition System Software Version Other

Baker Hughes Cadence

G3.2

Pilot Studio

3.2.7268.7

Rig: H&P 321

Contractor: Helmerich & Payne Drilling Co

District: RMD Unit: D&E

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Log Run Summary

| Run No | Bit Run No. | Bit Size (in) | Bit Type | Bit Gauge Length (in) | Assembly Type | Logged Interval | | Bit Depth Interval | | Date / Time | | Circ. Hours (h) |
|--------|-------------|---------------|----------|-----------------------|----------------|-----------------|----------|--------------------|----------|------------------|------------------|-----------------|
| | | | | | | Top | Bottom | From | To | Start Logging | End Logging | |
| | | | | | | (ft) | (ft) | (ft) | (ft) | | | |
| 1 | 2 | 8.500 | PDC | 2.00 | AutoTrak Curve | 1869.27 | 10958.54 | 1882.00 | 10965.10 | 2016-02-12 00:02 | 2016-02-14 15:23 | 55.92 |
| 2 | 3 | 8.500 | PDC | 2.00 | AutoTrak Curve | 10952.37 | 15348.04 | 10965.10 | 15354.60 | 2016-02-15 05:01 | 2016-02-17 02:36 | 44.35 |
| 3 | 4 | 8.500 | PDC | 2.00 | AutoTrak Curve | 15335.27 | 16161.57 | 15348.00 | 16168.13 | 2016-02-18 06:51 | 2016-02-18 19:14 | 14.02 |

Crew

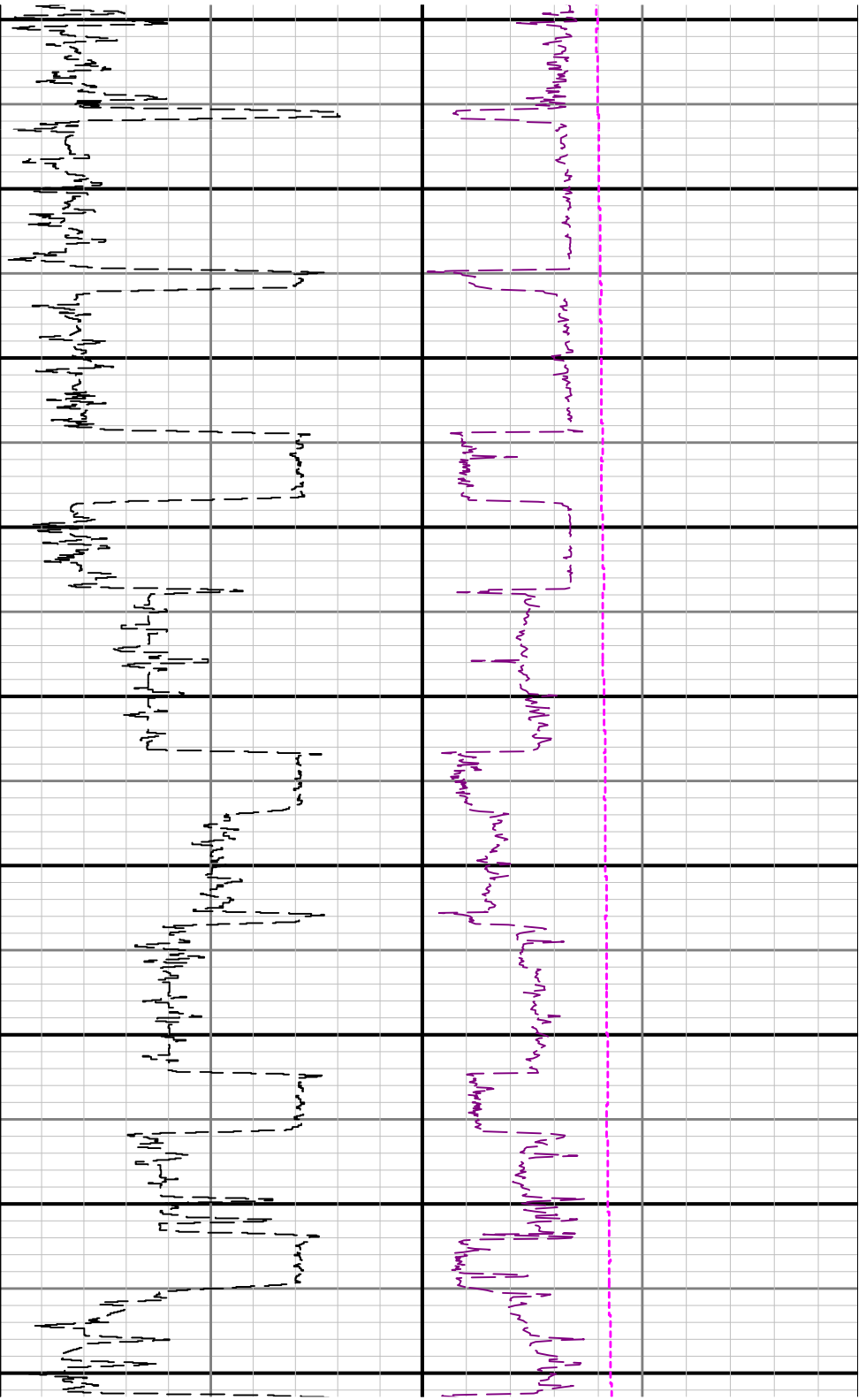
| Name | | Arrive Wellsite | Depart Wellsite | Name | | Arrive Wellsite | Depart Wellsite | Name | | Arrive Wellsite | Depart Wellsite |
|-----------------|--|-----------------|-----------------|--------------|--|-----------------|-----------------|---------------|--|-----------------|-----------------|
| Matthew Delmore | | 2016-02-10 | 2016-02-19 | Mike Gurnsey | | 2016-02-10 | 2016-02-19 | Nick Williams | | 2016-02-11 | 2016-02-19 |
| Will Drake | | 2016-02-11 | 2016-02-19 | | | | | | | | |

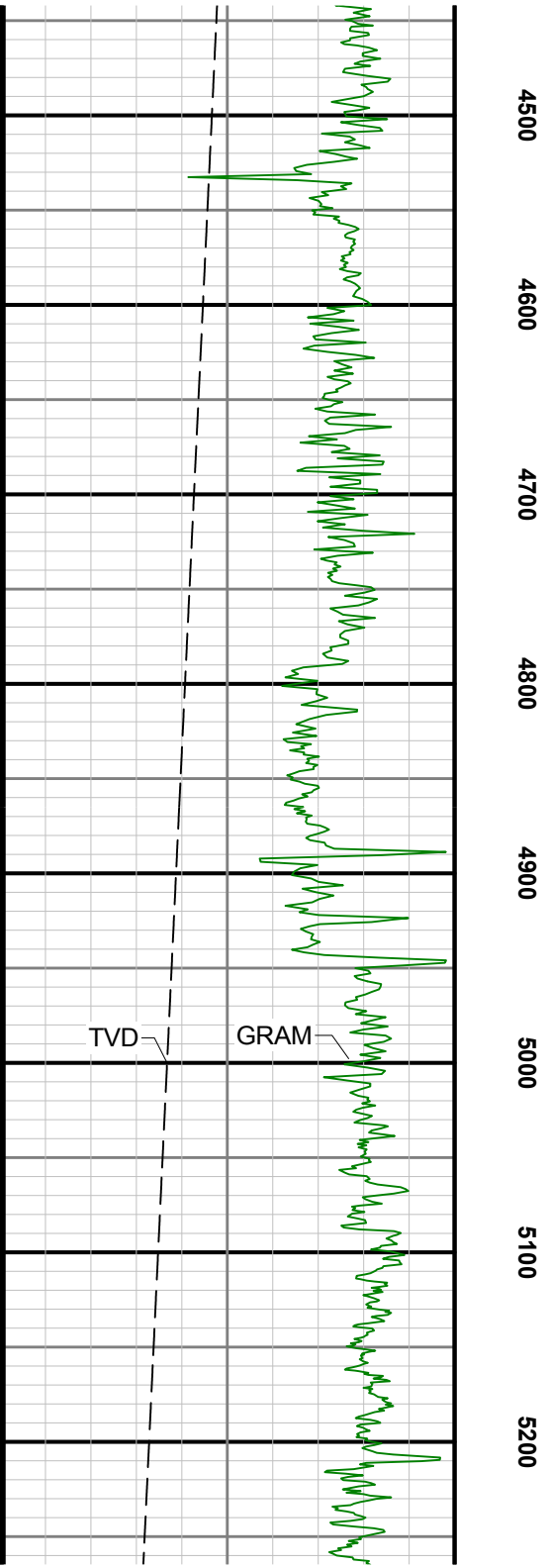
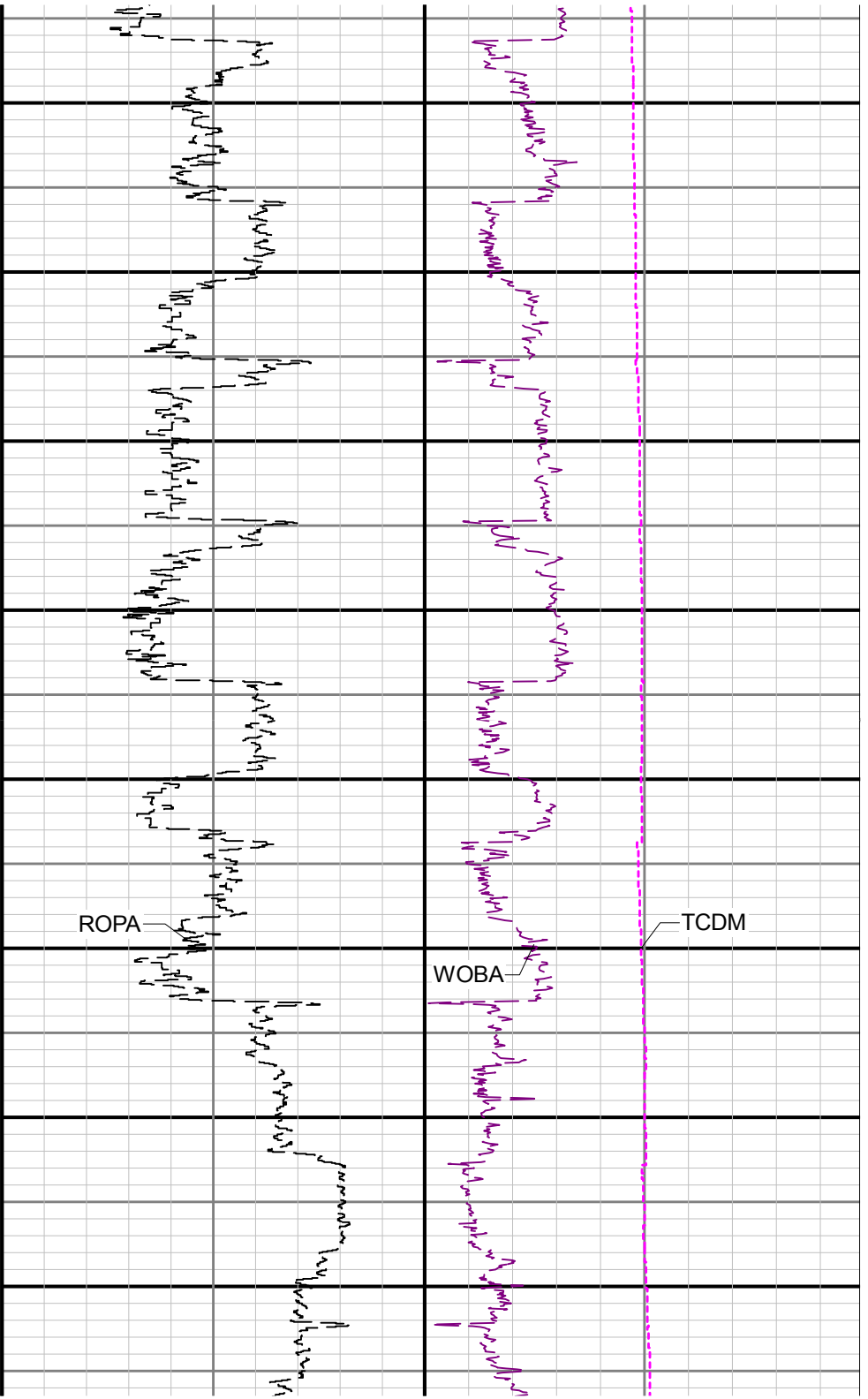
Mud Properties Record

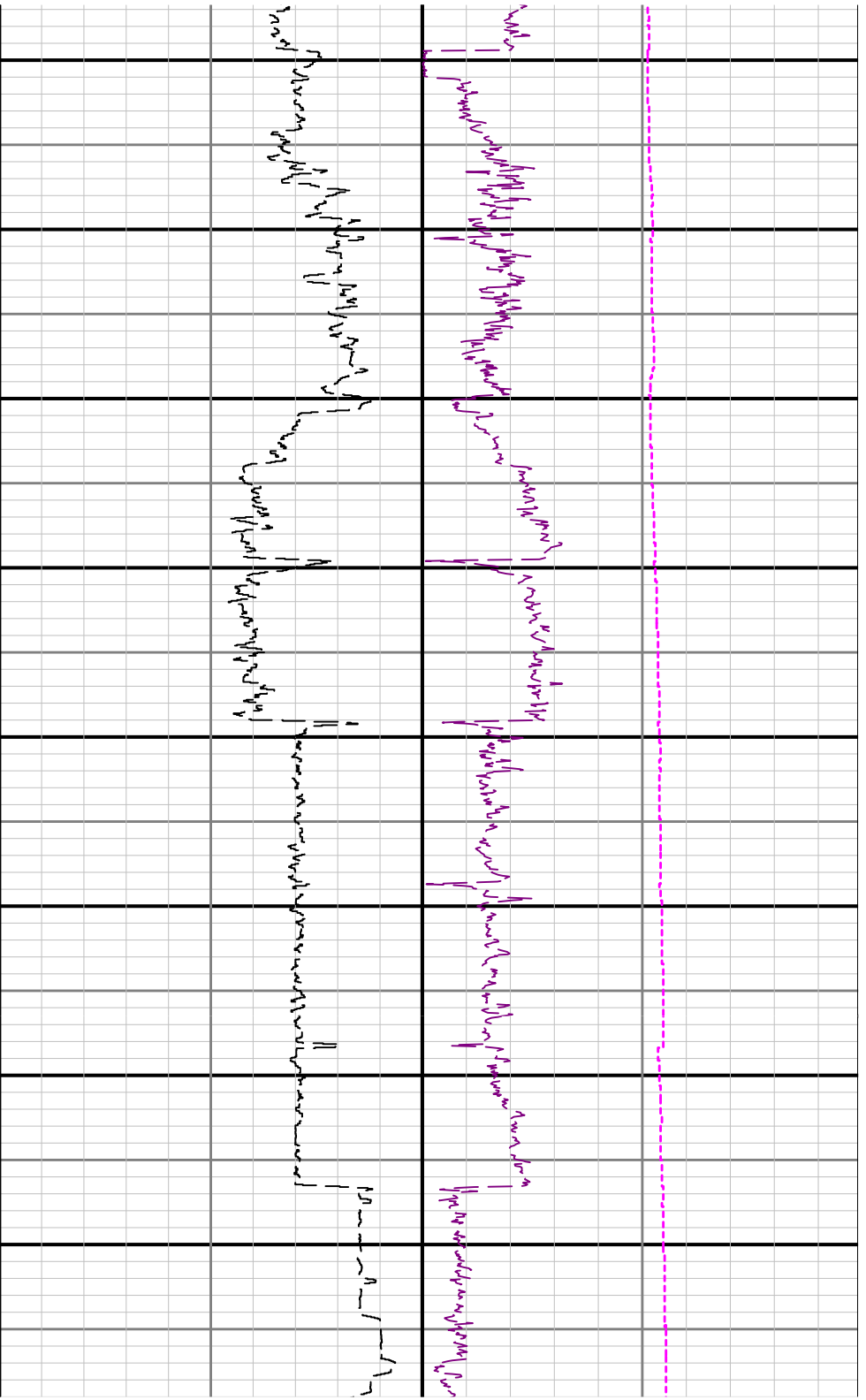
| Date / Time | Run No. | Measured Depth (ft) | Mud Type | Density (ppg) | Viscosity (cP) | pH | Fluid Loss (cm3) | Oil / Water | Source | Total Chlorides (ppm) | K+ (%) |
|------------------|---------|---------------------|---------------|---------------|----------------|-----|------------------|-------------|------------|-----------------------|--------|
| 2016-02-11 13:30 | 1 | 1872.00 | Oil Based Mud | 9.6 | 17 | N/A | 13.2 | 59.2/29.0 | Active Pit | 49000 | 0.00 |
| 2016-02-12 02:30 | 1 | 2470.00 | Oil Based Mud | 9.5 | 20 | N/A | 12.8 | 59.6/29.0 | Active Pit | 46000 | 0.00 |
| 2016-02-12 13:30 | 1 | 5394.00 | Oil Based Mud | 9.5 | 21 | N/A | 13.2 | 58.8/30.0 | Active Pit | 48000 | 0.00 |
| 2016-02-13 02:30 | 1 | 7190.00 | Oil Based Mud | 9.8 | 21 | N/A | 10.0 | 60.0/27.0 | Active Pit | 48000 | 0.00 |
| 2016-02-13 13:00 | 1 | 8600.00 | Oil Based Mud | 10.0 | 26 | N/A | 9.6 | 59.6/30.4 | Active Pit | 47000 | 0.00 |
| 2016-02-14 02:30 | 1 | 9795.00 | Oil Based Mud | 10.2 | 31 | N/A | 8.8 | 58.6/26.0 | Active Pit | 46000 | 0.00 |
| 2016-02-14 13:30 | 1 | 10800.00 | Oil Based Mud | 10.3 | 35 | N/A | 9.2 | 57.0/27.0 | Active Pit | 48000 | 0.00 |
| 2016-02-15 13:30 | 2 | 11935.00 | Oil Based Mud | 10.4 | 36 | N/A | 8.4 | 58.0/25.0 | Active Pit | 42000 | 0.00 |
| 2016-02-16 02:30 | 2 | 13186.00 | Oil Based Mud | 10.7 | 39 | N/A | 9.2 | 57.6/24.0 | Active Pit | 40000 | 0.00 |
| 2016-02-16 13:30 | 2 | 14302.00 | Oil Based Mud | 10.7 | 34 | N/A | 10.4 | 59.0/22.0 | Active Pit | 43000 | 0.00 |
| 2016-02-17 02:30 | 2 | 15343.00 | Oil Based Mud | 10.7 | 37 | N/A | 10.8 | 60.0/20.4 | Active Pit | 35000 | 0.00 |
| 2016-02-15 02:30 | 2 | 10960.00 | Oil Based Mud | 10.5 | 33 | N/A | 8.4 | 57.0/26.2 | Active Pit | 45000 | 0.00 |
| 2016-02-18 02:30 | 3 | 15348.00 | Oil Based Mud | 10.8 | 30 | N/A | 8.2 | 59.0/21.0 | Active Pit | 40000 | 0.00 |
| 2016-02-18 13:15 | 3 | 15728.00 | Oil Based Mud | 10.8 | 34 | N/A | 8.4 | 59.0/20.0 | Active Pit | 38000 | 0.00 |

Equipment and Service Data

| Run No. | Tool | Serial Number | Measurement | Sensor Offset | Bit Offset | Max O.D. | Min I.D. |
|---------|------|---------------|-------------|---------------|------------|----------|----------|
|---------|------|---------------|-------------|---------------|------------|----------|----------|







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5500

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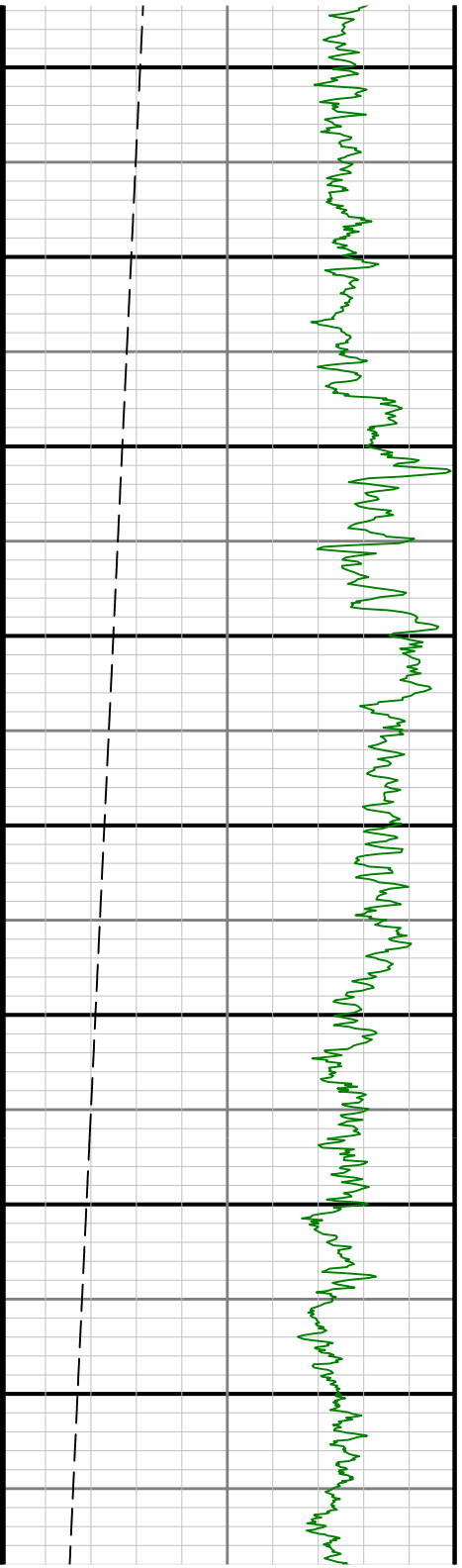
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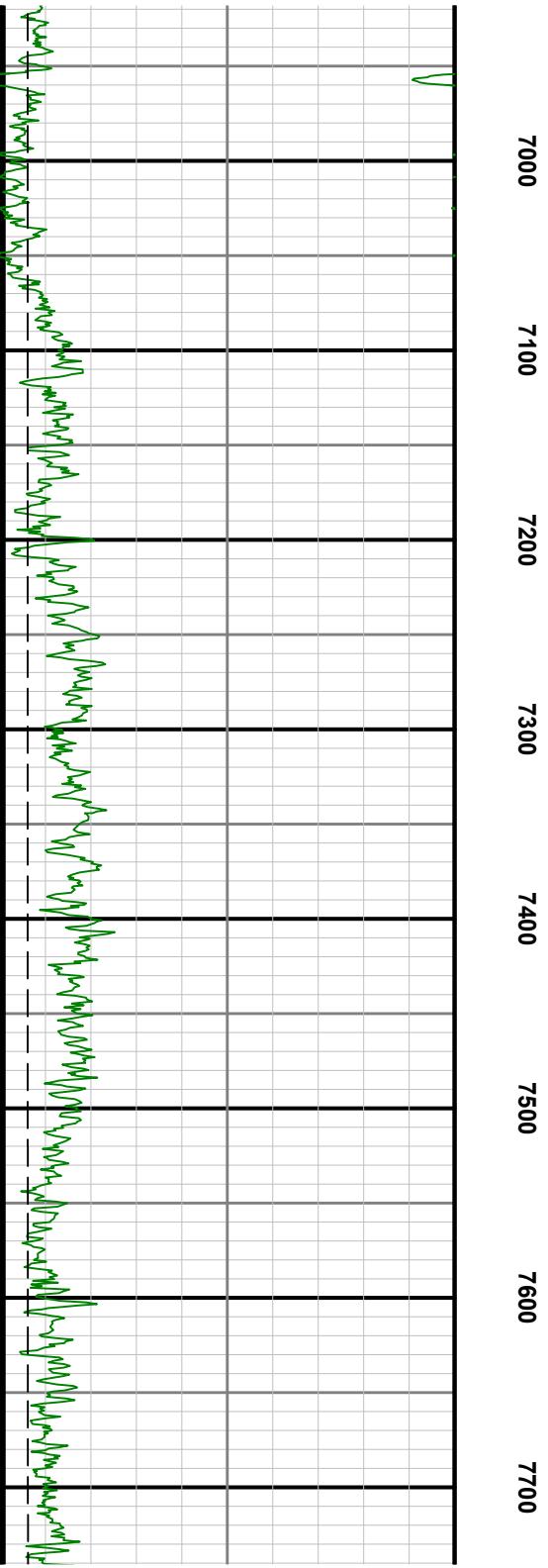
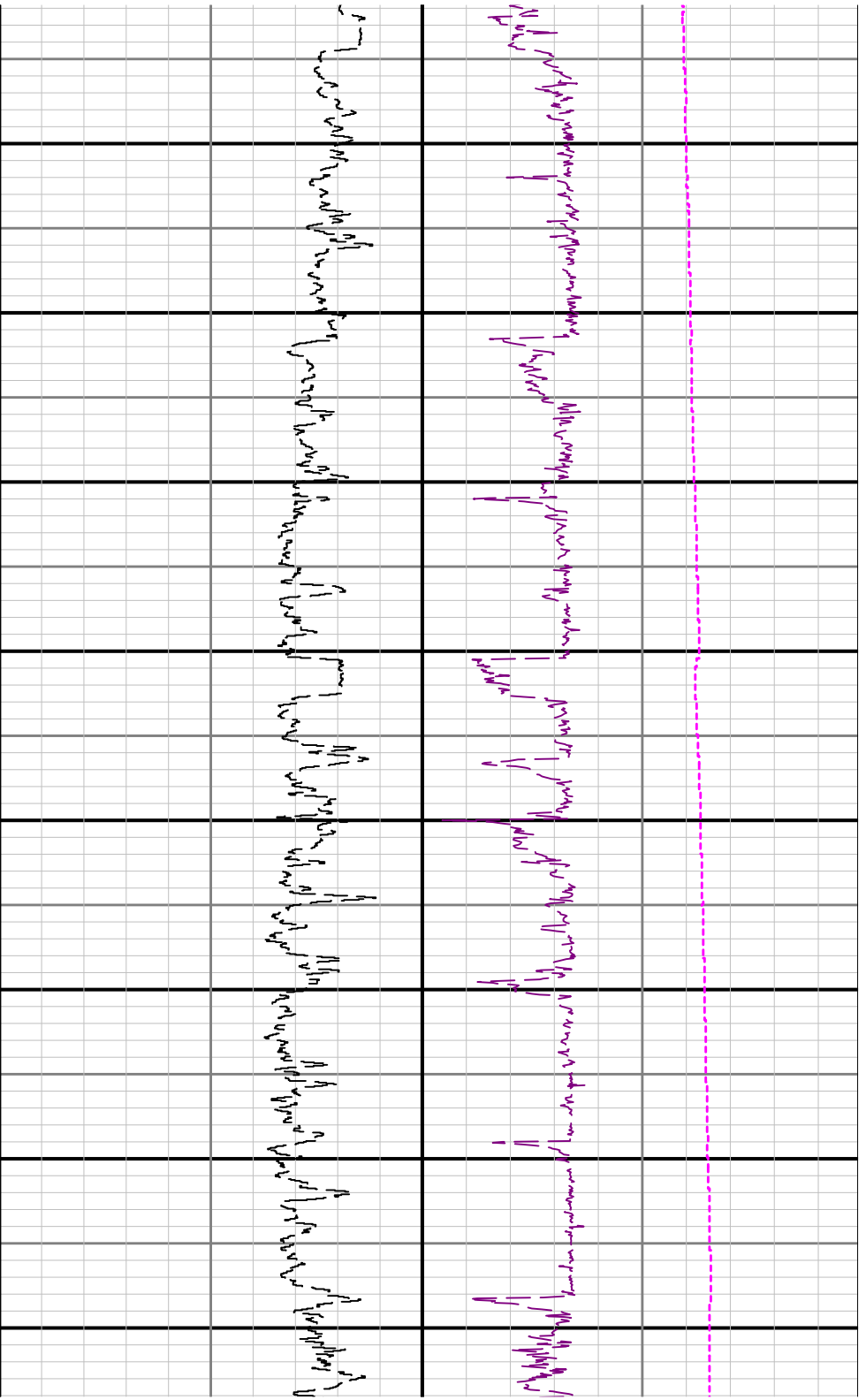
5800

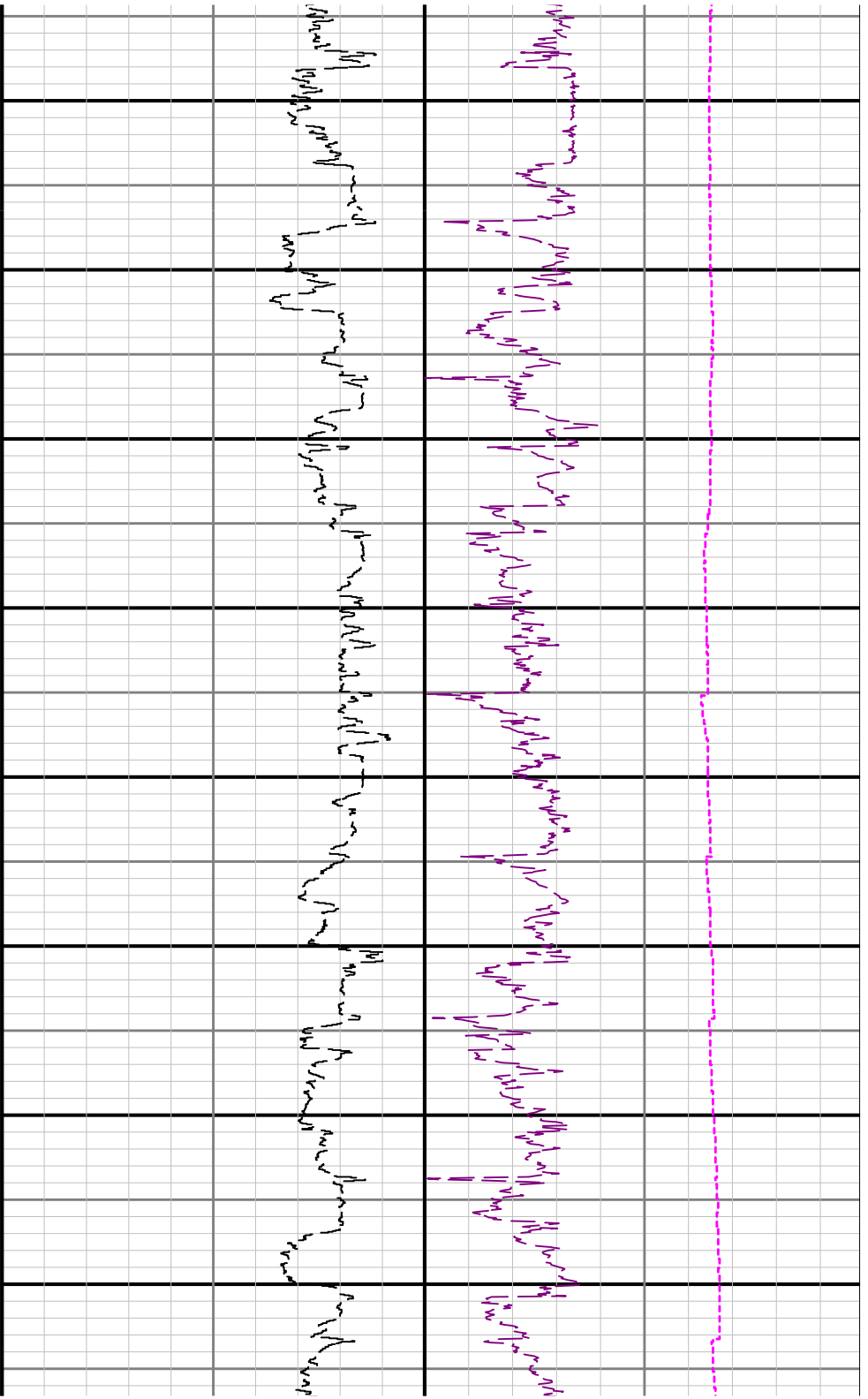
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7800 7900 8000 8100 8200 8300 8400 8500

