



LWD MEMORY LOG

Gamma Ray

Company: Verdad oil and Gas Corporation

Well: Helen 24-4H

Field: Weld

County: Weld Country: United States

State: Colorado

Surface Location: 040° 07' 12.209" N  
Longitude: 104° 30' 06.199" W

Status: Final Print

API No: 05-123-46800-00

Job ID: 9172894

SEC: 24

TWN: 2N

RGE: 64W

Elevation: 0.00 ft

Above P.D. 4942.00 ft

Elev. KB: 4942.00 ft

Elev. DF: 4925.00 ft

Elev. GL: 4925.00 ft

Permanent Datum (P.D.): Mean Sea Level

Log Measured From: Rig Floor

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Interval Drilled

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

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Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Magnetic Field Reference

Azi Reference North: True

Total Magnetic Field Strength: (nT) 52208

Mag to Reference North Correction: (deg) 8.14

Hole Size (in) From (ft) To (ft)

13.500 17.00 1767.00

8.500 1767.00 16721.00

Size (in) Weight (lb/ft) From (ft) To (ft)

9.625 36.00 17.00 1757.00

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Deviation Record

Inc | Az (Start) Inc | Az (End)

0.27 | 209.35 27.03 | 227.38

27.03 | 227.38 91.41 | 184.99

Interval (ft) Inc | Az (Start) Inc | Az (End)

1750.00 0.27 | 209.35 27.03 | 227.38

14954.00 27.03 | 227.38 91.41 | 184.99

Water Based Mud 17.00 1767.00 13.500 1750.00

Diesel-Oil Based Mud 1767.00 16721.00 8.500 14954.00

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

17.00 1767.00 13.500 1750.00 0.27 | 209.35 27.03 | 227.38

1767.00 16721.00 8.500 14954.00 27.03 | 227.38 91.41 | 184.99

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

Water Based Mud 17.00 1767.00 13.500 1750.00 0.27 | 209.35 27.03 | 227.38

Diesel-Oil Based Mud 1767.00 16721.00 8.500 14954.00 27.03 | 227.38 91.41 | 184.99

Acquisition System Software Version Other

Baker Hughes Cadence RT 4.2

Plot Studio 4.2.8155.1

Rig: Xtreme 24

Contractor: Xtreme Drilling

District: RMA

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 (ft)        | Bottom (ft) | From (ft)          | To (ft)  | Start Logging    | End Logging      |                 |
| 1      | 1           | 13.500        | PDC      | 4.00                  | Steerable        | 0.00            | 0.00        | 17.00              | 395.00   | N/A              | N/A              | 3.34            |
| 2      | 1           | 13.500        | PDC      | 4.00                  | Steerable        | 0.00            | 0.00        | 395.00             | 1767.00  | N/A              | N/A              | 9.21            |
| 3      | 3           | 8.500         | PDC      | 3.50                  | Rotary Steerable | 1767.00         | 2322.00     | 1767.00            | 2335.00  | 2018-05-24 00:44 | 2018-05-24 03:29 | 4.01            |
| 4      | 4           | 8.500         | PDC      | 3.50                  | Rotary Steerable | 2322.00         | 16708.00    | 2335.00            | 16721.00 | 2018-05-24 07:30 | 2018-05-27 16:44 | 74.63           |

Crew

| Name         | Arrive Wellsite | Depart Wellsite | Name            | Arrive Wellsite | Depart Wellsite | Name | Arrive Wellsite | Depart Wellsite |
|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|------|-----------------|-----------------|
| Matthew Yule | 2018-05-14      | 2018-05-15      | Enyonam Anyigba | 2018-05-23      | 2018-05-28      |      |                 |                 |

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+ (%) |
|------------------|---------|---------------------|-----------------|---------------|----------------|-----|------------------|-------------|------------|-----------------------|--------|
| 2018-05-14 20:58 | 1       | 138.00              | Water Based Mud | 8.4           | 1              | 9   | N/A              | 0/99        | Active Pit | 400                   | 0.00   |
| 2018-05-15 16:51 | 2       | 1564.00             | Water Based Mud | 9.3           | 1              | 8.5 | N/A              | 0/100       | Active Pit | 700                   | 0.00   |

|                  |   |          |                      |     |    |     |     |       |            |       |      |
|------------------|---|----------|----------------------|-----|----|-----|-----|-------|------------|-------|------|
| 2018-05-23 17:16 | 3 | 1767.00  | Diesel-Oil Based Mud | 9.7 | 19 | N/A | 9.8 | 78/22 | Active Pit | 29000 | 0.00 |
| 2018-05-24 05:59 | 4 | 2334.00  | Diesel-Oil Based Mud | 9.7 | 19 | N/A | 9.8 | 74/26 | Active Pit | 31000 | 0.00 |
| 2018-05-25 20:42 | 4 | 9132.00  | Diesel-Oil Based Mud | 9.8 | 18 | N/A | 9.6 | 75/25 | Active Pit | 32000 | 0.00 |
| 2018-05-26 22:14 | 4 | 13623.00 | Diesel-Oil Based Mud | 9.8 | 20 | N/A | 9.6 | 77/23 | Active Pit | 30000 | 0.00 |

Equipment and Service Data

| Run No. | Tool     | Serial Number | Measurement          | Sensor Offset (ft) | Bit Offset (ft) | Max O.D. (in) | Min I.D. (in) |
|---------|----------|---------------|----------------------|--------------------|-----------------|---------------|---------------|
| 1       | NaviTrak | 12595928      | Directional (mag)    | 17.41              | 59.78           | 8.125         | 0.000         |
| 1       | NaviTrak | 12595928      | VSS                  | 17.41              | 59.78           | 8.125         | 0.000         |
| 2       | NaviTrak | 11912310      | VSS                  | 17.07              | 59.44           | 8.000         | 0.000         |
| 2       | NaviTrak | 11912310      | Directional (mag)    | 17.07              | 59.44           | 8.000         | 0.000         |
| 3       | ATC_SU   | 12536524      | Near Bit VSS         | 5.93               | 6.71            | 7.000         | 4.330         |
| 3       | ATC_SU   | 12536524      | Near Bit Inclination | 5.93               | 6.71            | 7.000         | 4.330         |
| 3       | ATC_MWD  | 12661246      | Gamma (single)       | 2.77               | 12.88           | 7.000         | 3.250         |
| 3       | ATC_MWD  | 12661246      | Directional (mag)    | 12.27              | 22.38           | 7.000         | 3.250         |
| 4       | ATC_SU   | 12536524      | Near Bit VSS         | 5.93               | 6.71            | 7.000         | 4.330         |
| 4       | ATC_SU   | 12536524      | Near Bit Inclination | 5.93               | 6.71            | 7.000         | 4.330         |
| 4       | ATC_MWD  | 12661246      | Gamma (single)       | 2.77               | 12.88           | 7.000         | 3.250         |
| 4       | ATC_MWD  | 12661246      | Directional (mag)    | 12.27              | 22.38           | 7.000         | 3.250         |

Service and Tool Mnemonics

| Mnemonic | Name     | Description                                       |
|----------|----------|---|
| NTK      | NaviTrak | Probe Based Directional Module, NaviTrak Platform |
| ATC_SU   | ATC_SU   | Auto Trak Curve Steering Unit                     |
| ATC_MWD  | ATC_MWD  | Auto Trak Curve MWD                               |
| ATC_LCPM | ATC_LCPM | Auto Trak Curve LCPM                              |

Comments


|   |  |
|---|--|
| 1 | Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified. |
| 2 | Baker Hughes drilling services runs 1 and 2 utilized an 8 inch NaviTrak Service (Directional only) behind a 13 1/2 inch bit and steerable assembly from 17 to 1767 feet MD (17 to 1716 feet TVD)                                     |
| 3 | Baker Hughes drilling services run 3 and 4 utilized a 6 3/4 inch Navigamma Service (Directional and Gamma Ray) behind an 8 1/2 inch bit and rotary steerable assembly from 1767 to 16721 feet MD (1716 to 6787 feet TVD)             |

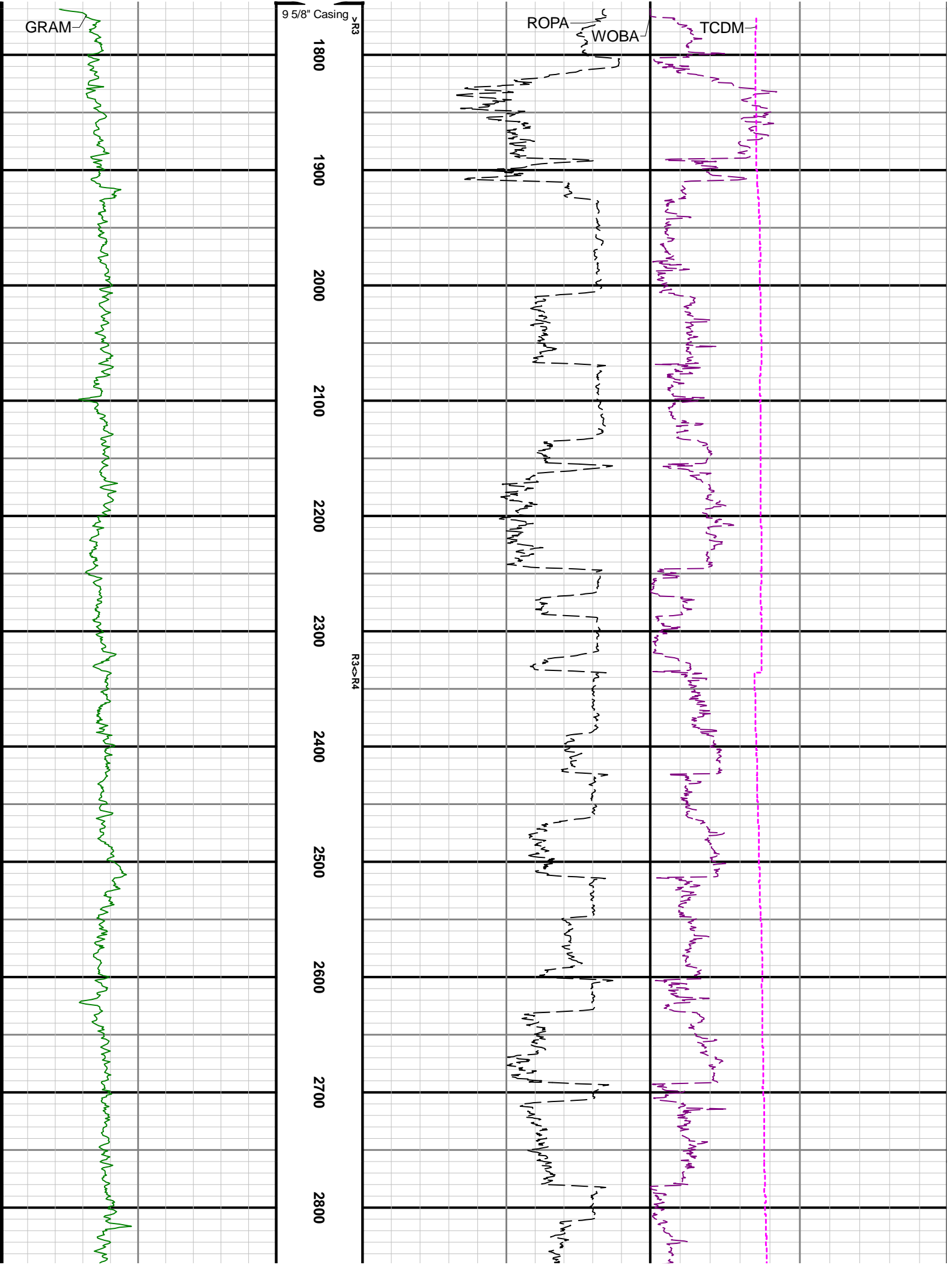
Remarks

| Number | Measured Depth (ft) | Hole Section (in) | Run No. | Remark  |
|--------|---------------------|-------------------|---------|---|
| 1      | 16708.00            | 8.500             | 4       | The interval from 16708 to 16721 feet MD (6787 feet TVD) was not logged due to sensor to bit offset at TD |

Curve Mnemonics

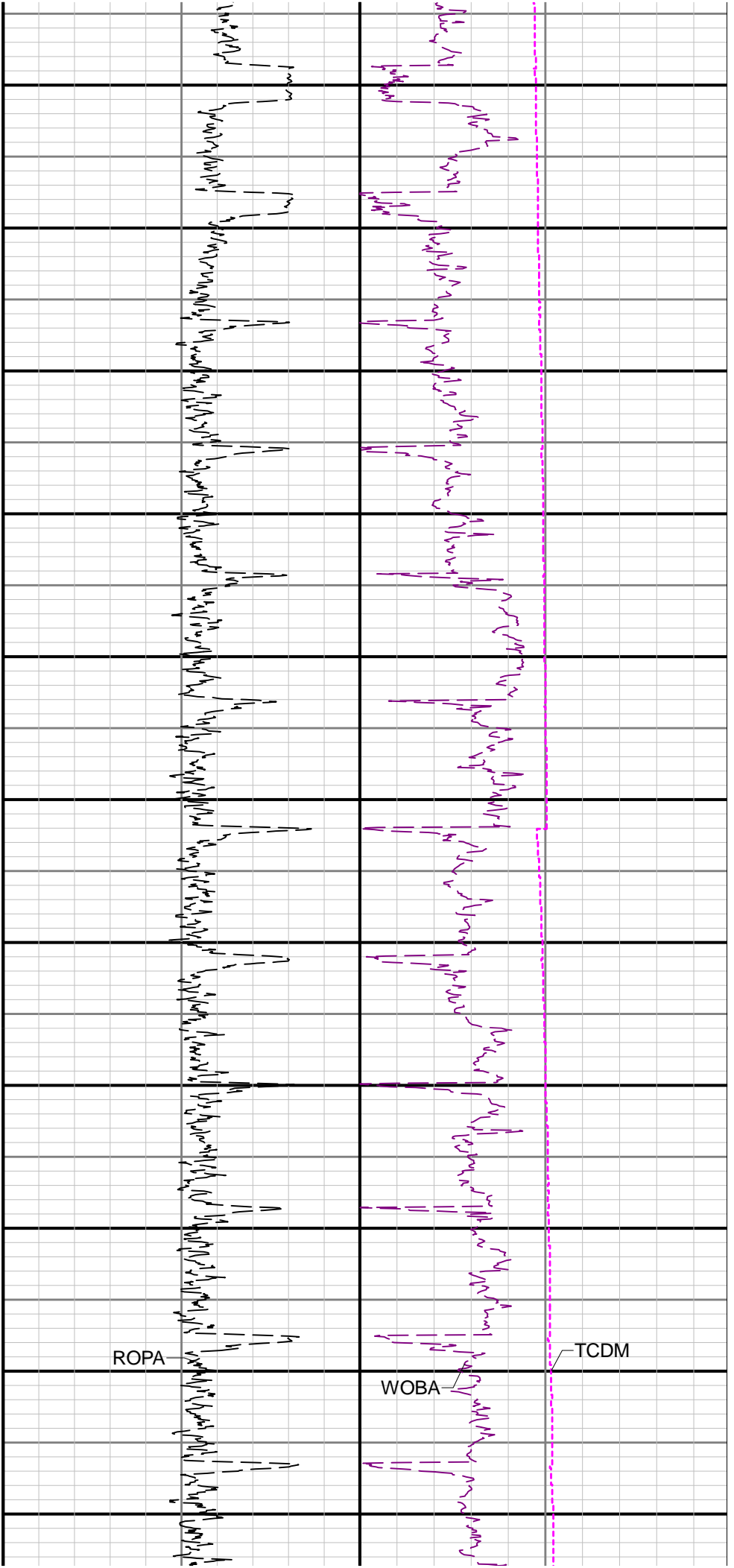
| Presented Curves | Description                                | Units |
|------------------|--|-------|
| ROPA             | Depth Averaged ROP 3 ft Average            | ft/h  |
| TVD              | True Vertical Depth                        | ft    |
| WOBA             | Weight On Bit, Average 1 ft Average        | klb   |
| GRAM             | Gamma Ray - Apparent - Memory 3 ft Average | API   |
| TCDM             | Directional Real-Time Survey Temperature   | degF  |

|  |                     |  |                  |  |             |
|--|---------------------|--|------------------|--|-------------|
| <div><div>BAKER HUGHES</div><div>a GE company</div></div> <div></div> | <div>Company</div>  | Verdad oil and Gas Corporation                                   |                  |  |             |
|  | <div>Well</div>     | Helen 24-4H  |                  |  |             |
|  | <div>Interval</div> | <div>Date From:</div>  | 2018-05-14 20:17 | <div>Top:</div>  | 1767.00 ft  |
|  | <div>Created</div>  | <div>Date To:</div>  | 2018-05-28 06:49 | <div>Bottom:</div>   | 16721.00 ft |
|  |                     | 2018-05-28 08:06:55  |                  |  |             |
| <div>Gamma Ray - Apparent 3 ft Average GRAM</div> <div>0300</div>  | MD 1:1200 feet      | <div>Depth Averaged ROP 3 ft Average ROPA</div> <div>10000</div> |                  | <div>Weight On Bit, Average 1 ft Average WOBA</div> <div>050</div>   |             |
| <div>API</div> <div>True Vertical Depth TVD</div> <div>80006000</div> <div>ft</div>  |                     | ft/h   |                  | klb  |             |
|  |                     |  |                  | <div>Downhole Temperature TCDM</div> <div>0300</div> <div>degF</div> |             |
|  | 1700                |  |                  |  |             |
|  |                     |  |                  |  |             |
|  |                     |  |                  |  |             |









5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100

ROPA

WOBA

TCDM

GRAM

