## Results of Directional Survey

| | | | | |
|---|---|---|---|---|
| API number: | 30-025-40900 | | | |
| OGRID: | | Operator: | CONOCOPHILLIPS COMPANY | |
| | | Property: | BUCK 17 FEDERAL COM | # 3H |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| surface | ULSTR: | B | 20 | T | 26S | R | 32E |
| | | | | 10 | FNL | 2625 | FEL |
| BH Loc | ULSTR: | C | 17 | T | 26S | R | 32E |
| 14080 | MD | 9232.5 | TVD | 303 | FNL | 3076 | FEL |
| | | | | 4977 | FSL | | |
| Top Perf/OH | ULSTR: | B | 20 | T | 26S | R | 32E |
| 8152 | MD | 8120.8 | TVD | 22 | FNL | 3069 | FEL |
| Bot Perf/OH | ULSTR: | C | 17 | T | 26S | R | 32E |
| 14046 | MD | 9234.2 | TVD | 337 | FNL | 3076 | FEL |
| | | | | 4943 | FSL | | |

| | MD | N/S | E/W | VD |
|---|---|---|---|---|
| | 8119 | -11.90 | -443.40 | 8087.8 |
| TOP PERFS/OH | **8152** | -11.88 | -443.60 | 8120.78 |
| | 8253 | -11.80 | -444.20 | 8221.70 |
| | 13989 | 4895.90 | -450.20 | 9237.10 |
| BOT PERFS/OH | **14046** | 4952.84 | -450.58 | 9234.22 |
| | 14080 | 4986.80 | -450.80 | 9232.50 |

| | | | | |
|---|---|---|---|---|
| NEXT TO LAST | 13989 | 4895.90 | -450.20 | 9237.10 |
| LAST READING | 14080 | 4986.80 | -450.80 | 9232.50 |
| TD | **14080** | 4986.80 | -450.80 | 9232.50 |

| | | | | |
|---|---|---|---|---|
| Surface Location | 10 | FN | 2625 | FE |
| Projected BHL | 4977 | FS | 3076 | FE |
| Location of | | | | |
| Top Perfs/OH | 22 | FN | 3069 | FE |
| Bottom Perfs/OH | 4943 | FS | 3076 | FE |

*SUMMARY of Subsurface Locations*

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Location** | B-20-26S-32E | 10 | FN | 2625 | FE | Vert. Depth |
| | | | | | | |
| **Top Perfs/OH** | B-20-26S-32E | 22 | FN | 3069 | FE | 8120.78 |
| **Bottom Perfs/OH** | C-17-26S-32E | 4943 | FS | 3076 | FE | 9234.22 |
| | | | | | | |
| **Projected TD** | C-17-26S-32E | 4977 | FS | 3076 | FE | 9232.50 |

ConocoPhillips

# Conoco Phillips

Lea County, New Mexico
Sec 20, T26S, 32E
Buck Federal 17 #3H

Wellbore #1



Survey: MWD

# DDC Survey Report

04 April, 2013

DDC
The DIRECTIONAL DRILLING COMPANY

The DIRECTIONAL DRILLING COMPANY

# Survey Certification Sheet

| Conoco Phillips. | GC-13193 | 4/4/13 |
|---|---|---|
| Company | Job Number | Date |

| Sec20, T26S, R32E | Buck Federal 17#3H | Lea, NM |
|---|---|---|
| Lease | Well Name | County & State |

API: 30-025-40900

Surveyed from a depth of: 169 feet to 14080 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Kevin Whittington

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The Directional Drilling Company, ou=GM of Guidance Services, email=larryw@directionaldrillers.com, c=US
Date: 2013.04.08 15:32:59 -05'00'

Larry Wright
MWD General Manager

• 11390 FM 830 • Willis, Texas 77318 •
• PH 936-856-4332 • FAX 936-856-8678 •

| | | | |
|---|---|---|---|
| **Company:** | Conoco Phillips | **Local Co-ordinate Reference:** | Well Buck Federal 17 #3H |
| **Project:** | Lea County, New Mexico | **TVD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **MD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Well:** | Buck Federal 17 #3H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM 5000.1 Single User Db |

**Project** Lea County, New Mexico

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

**Site** Sec 20, T26S, 32E

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 376,829.70 usft | **Latitude:** | 32° 2' 3.859 N |
| **From:** | Map | **Easting:** | 698,257.30 usft | **Longitude:** | 103° 41' 36.778 W |
| **Position Uncertainty:** | 0.0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.34 ° |

**Well** Buck Federal 17 #3H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 377,175.88 usft | **Latitude:** | 32° 2' 7.340 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 697,317.44 usft | **Longitude:** | 103° 41' 47.673 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | usft | **Ground Level:** | 3,176.0 usft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | BGGM2012 | 3/5/2013 | 7.53 | 59.90 | 48,343 |

**Design** Wellbore #1

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | 1.0 | **Phase:** | ACTUAL | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 354.96 |

**Survey Program** **Date** 4/2/2013

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 169.0 | 14,080.0 | MWD (Wellbore #1) | MWD default | MWD - Standard |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| FIRST MWD SURVEY @ 169' MD / 169' TVD | | | | | | | | | |
| 169.0 | 1.10 | 275.10 | 169.0 | 0.1 | -1.6 | 0.3 | 0.65 | 0.65 | 0.00 |
| 264.0 | 1.10 | 276.30 | 264.0 | 0.3 | -3.4 | 0.6 | 0.02 | 0.00 | 1.26 |
| 356.0 | 1.00 | 269.10 | 356.0 | 0.4 | -5.1 | 0.9 | 0.18 | -0.11 | -7.83 |
| 464.0 | 0.30 | 24.40 | 464.0 | 0.7 | -5.9 | 1.2 | 1.07 | -0.65 | 106.76 |
| 553.0 | 0.40 | 298.50 | 553.0 | 1.0 | -6.1 | 1.5 | 0.54 | 0.11 | -96.52 |
| 643.0 | 0.70 | 280.00 | 642.9 | 1.3 | -6.9 | 1.9 | 0.38 | 0.33 | -20.56 |
| 732.0 | 1.40 | 194.60 | 731.9 | 0.3 | -7.7 | 1.0 | 1.70 | 0.79 | -95.96 |
| 822.0 | 1.50 | 179.80 | 821.9 | -1.9 | -8.0 | -1.2 | 0.43 | 0.11 | -16.44 |
| 911.0 | 0.30 | 74.20 | 910.9 | -3.0 | -7.8 | -2.3 | 1.81 | -1.35 | -118.65 |

| | | | |
|---|---|---|---|
| **Company:** | Conoco Phillips | **Local Co-ordinate Reference:** | Well Buck Federal 17 #3H |
| **Project:** | Lea County, New Mexico | **TVD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Site:** | Sec 20, T26S, 32E | **MD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Well:** | Buck Federal 17 #3H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 978.0 | 1.40 | 13.20 | 977.9 | -2.2 | -7.4 | -1.5 | 1.91 | 1.64 | -91.04 |
| 1,132.0 | 3.60 | 352.40 | 1,131.7 | 4.4 | -7.6 | 5.1 | 1.52 | 1.43 | -13.51 |
| 1,222.0 | 4.10 | 311.10 | 1,221.5 | 9.3 | -10.4 | 10.2 | 3.06 | 0.56 | -45.89 |
| 1,311.0 | 6.10 | 291.10 | 1,310.2 | 13.1 | -17.2 | 14.6 | 2.97 | 2.25 | -22.47 |
| 1,400.0 | 7.50 | 274.50 | 1,398.6 | 15.3 | -27.5 | 17.6 | 2.70 | 1.57 | -18.65 |
| 1,490.0 | 6.90 | 264.40 | 1,487.9 | 15.2 | -38.7 | 18.6 | 1.55 | -0.67 | -11.22 |
| 1,579.0 | 7.00 | 261.20 | 1,576.2 | 13.9 | -49.4 | 18.2 | 0.45 | 0.11 | -3.60 |
| 1,669.0 | 8.90 | 264.20 | 1,665.3 | 12.3 | -61.7 | 17.7 | 2.16 | 2.11 | 3.33 |
| 1,758.0 | 9.90 | 265.90 | 1,753.2 | 11.1 | -76.2 | 17.7 | 1.17 | 1.12 | 1.91 |
| 1,848.0 | 8.50 | 266.30 | 1,842.0 | 10.1 | -90.6 | 18.0 | 1.56 | -1.56 | 0.44 |
| 1,937.0 | 8.30 | 267.70 | 1,930.0 | 9.4 | -103.5 | 18.5 | 0.32 | -0.22 | 1.57 |
| 2,027.0 | 9.00 | 267.70 | 2,019.0 | 8.9 | -117.1 | 19.1 | 0.78 | 0.78 | 0.00 |
| 2,116.0 | 9.10 | 266.80 | 2,106.9 | 8.2 | -131.0 | 19.7 | 0.19 | 0.11 | -1.01 |
| 2,206.0 | 8.90 | 268.00 | 2,195.8 | 7.6 | -145.1 | 20.3 | 0.30 | -0.22 | 1.33 |
| 2,295.0 | 8.60 | 267.00 | 2,283.8 | 7.0 | -158.6 | 20.9 | 0.38 | -0.34 | -1.12 |
| 2,385.0 | 10.10 | 269.80 | 2,372.6 | 6.6 | -173.2 | 21.8 | 1.74 | 1.67 | 3.11 |
| 2,474.0 | 9.50 | 270.90 | 2,460.3 | 6.7 | -188.4 | 23.2 | 0.71 | -0.67 | 1.24 |
| 2,564.0 | 8.90 | 270.90 | 2,549.1 | 6.9 | -202.8 | 24.7 | 0.67 | -0.67 | 0.00 |
| 2,653.0 | 8.20 | 271.60 | 2,637.1 | 7.2 | -216.0 | 26.2 | 0.80 | -0.79 | 0.79 |
| 2,743.0 | 9.10 | 268.60 | 2,726.1 | 7.2 | -229.5 | 27.3 | 1.12 | 1.00 | -3.33 |
| 2,832.0 | 9.10 | 265.40 | 2,814.0 | 6.5 | -243.6 | 27.8 | 0.57 | 0.00 | -3.60 |
| 2,921.0 | 8.60 | 264.40 | 2,901.9 | 5.3 | -257.2 | 27.8 | 0.59 | -0.56 | -1.12 |
| 3,011.0 | 10.30 | 267.50 | 2,990.7 | 4.3 | -272.0 | 28.1 | 1.97 | 1.89 | 3.44 |
| 3,100.0 | 9.80 | 269.10 | 3,078.3 | 3.8 | -287.5 | 29.0 | 0.64 | -0.56 | 1.80 |
| 3,190.0 | 9.90 | 267.70 | 3,167.0 | 3.4 | -302.9 | 29.9 | 0.29 | 0.11 | -1.56 |
| 3,279.0 | 10.50 | 266.80 | 3,254.6 | 2.6 | -318.6 | 30.6 | 0.70 | 0.67 | -1.01 |
| 3,369.0 | 9.90 | 268.60 | 3,343.2 | 1.9 | -334.5 | 31.3 | 0.75 | -0.67 | 2.00 |
| 3,458.0 | 8.90 | 268.80 | 3,431.0 | 1.6 | -349.1 | 32.3 | 1.12 | -1.12 | 0.22 |
| 3,548.0 | 7.70 | 269.10 | 3,520.0 | 1.4 | -362.1 | 33.2 | 1.33 | -1.33 | 0.33 |
| 3,637.0 | 7.60 | 269.50 | 3,608.2 | 1.2 | -373.9 | 34.1 | 0.13 | -0.11 | 0.45 |
| 3,726.0 | 6.90 | 268.90 | 3,696.5 | 1.1 | -385.1 | 34.9 | 0.79 | -0.79 | -0.67 |
| 3,816.0 | 5.80 | 268.20 | 3,786.0 | 0.8 | -395.1 | 35.5 | 1.23 | -1.22 | -0.78 |
| 3,906.0 | 4.70 | 266.60 | 3,875.6 | 0.5 | -403.3 | 35.9 | 1.23 | -1.22 | -1.78 |
| 3,995.0 | 3.50 | 262.80 | 3,964.4 | -0.1 | -409.7 | 35.9 | 1.38 | -1.35 | -4.27 |
| 4,085.0 | 2.70 | 249.10 | 4,054.2 | -1.2 | -414.4 | 35.2 | 1.21 | -0.89 | -15.22 |
| 4,174.0 | 2.00 | 239.90 | 4,143.2 | -2.7 | -417.7 | 34.0 | 0.89 | -0.79 | -10.34 |
| 4,263.0 | 0.50 | 261.00 | 4,232.1 | -3.6 | -419.4 | 33.3 | 1.73 | -1.69 | 23.71 |
| 4,398.0 | 0.70 | 241.50 | 4,367.1 | -4.0 | -420.7 | 32.9 | 0.21 | 0.15 | -14.44 |
| 4,541.0 | 0.60 | 241.00 | 4,510.1 | -4.8 | -422.1 | 32.3 | 0.07 | -0.07 | -0.35 |
| 4,586.0 | 0.60 | 243.30 | 4,555.1 | -5.0 | -422.5 | 32.1 | 0.05 | 0.00 | 5.11 |
| 4,675.0 | 0.60 | 246.20 | 4,644.1 | -5.4 | -423.4 | 31.8 | 0.03 | 0.00 | 3.26 |
| 4,765.0 | 0.70 | 264.70 | 4,734.1 | -5.7 | -424.4 | 31.6 | 0.26 | 0.11 | 20.56 |
| 4,854.0 | 0.80 | 284.60 | 4,823.1 | -5.6 | -425.5 | 31.8 | 0.31 | 0.11 | 22.36 |
| 4,944.0 | 0.70 | 302.90 | 4,913.1 | -5.1 | -426.6 | 32.4 | 0.29 | -0.11 | 20.33 |

| | | | |
|---|---|---|---|
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| **Site:** | Sec 20, T26S, 32E | **MD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Well:** | Buck Federal 17 #3H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,033.0 | 0.80 | 296.90 | 5,002.1 | -4.5 | -427.6 | 33.0 | 0.14 | 0.11 | -6.74 |
| 5,122.0 | 0.80 | 296.40 | 5,091.1 | -4.0 | -428.7 | 33.7 | 0.01 | 0.00 | -0.56 |
| 5,212.0 | 0.70 | 283.50 | 5,181.1 | -3.6 | -429.8 | 34.2 | 0.22 | -0.11 | -14.33 |
| 5,301.0 | 0.80 | 273.10 | 5,270.1 | -3.4 | -430.9 | 34.5 | 0.19 | 0.11 | -11.69 |
| 5,390.0 | 0.90 | 260.50 | 5,359.0 | -3.5 | -432.2 | 34.5 | 0.24 | 0.11 | -14.16 |
| 5,480.0 | 0.70 | 295.80 | 5,449.0 | -3.4 | -433.4 | 34.7 | 0.58 | -0.22 | 39.22 |
| 5,614.0 | 1.00 | 275.10 | 5,583.0 | -2.9 | -435.3 | 35.3 | 0.32 | 0.22 | -15.45 |
| 5,748.0 | 1.00 | 280.00 | 5,717.0 | -2.6 | -437.7 | 35.9 | 0.06 | 0.00 | 3.66 |
| 5,883.0 | 0.70 | 289.30 | 5,852.0 | -2.1 | -439.6 | 36.5 | 0.24 | -0.22 | 6.89 |
| 6,017.0 | 0.80 | 289.10 | 5,986.0 | -1.6 | -441.2 | 37.2 | 0.07 | 0.07 | -0.15 |
| 6,106.0 | 0.70 | 283.20 | 6,075.0 | -1.2 | -442.4 | 37.6 | 0.14 | -0.11 | -6.63 |
| 6,241.0 | 0.90 | 273.90 | 6,210.0 | -1.0 | -444.2 | 38.1 | 0.18 | 0.15 | -6.89 |
| 6,420.0 | 1.10 | 258.00 | 6,388.9 | -1.2 | -447.3 | 38.1 | 0.19 | 0.11 | -8.88 |
| 6,598.0 | 1.10 | 255.20 | 6,566.9 | -2.0 | -450.6 | 37.6 | 0.03 | 0.00 | -1.57 |
| 6,688.0 | 1.00 | 207.10 | 6,656.9 | -2.9 | -451.8 | 36.8 | 0.96 | -0.11 | -53.44 |
| 6,777.0 | 0.80 | 116.50 | 6,745.9 | -3.9 | -451.6 | 35.8 | 1.45 | -0.22 | -101.80 |
| 6,867.0 | 1.00 | 109.80 | 6,835.9 | -4.5 | -450.3 | 35.1 | 0.25 | 0.22 | -7.44 |
| 6,956.0 | 1.10 | 120.70 | 6,924.8 | -5.2 | -448.9 | 34.3 | 0.25 | 0.11 | 12.25 |
| 7,046.0 | 1.10 | 123.70 | 7,014.8 | -6.1 | -447.4 | 33.3 | 0.06 | 0.00 | 3.33 |
| 7,135.0 | 0.90 | 75.60 | 7,103.8 | -6.4 | -446.0 | 32.8 | 0.94 | -0.22 | -54.04 |
| 7,225.0 | 0.90 | 70.10 | 7,193.8 | -6.0 | -444.7 | 33.1 | 0.10 | 0.00 | -6.11 |
| 7,314.0 | 0.70 | 90.50 | 7,282.8 | -5.7 | -443.5 | 33.3 | 0.39 | -0.22 | 22.92 |
| 7,404.0 | 0.70 | 113.40 | 7,372.8 | -5.9 | -442.4 | 32.9 | 0.31 | 0.00 | 25.44 |
| 7,493.0 | 0.90 | 132.50 | 7,461.8 | -6.6 | -441.4 | 32.2 | 0.37 | 0.22 | 21.46 |
| 7,582.0 | 0.40 | 237.80 | 7,550.8 | -7.3 | -441.1 | 31.5 | 1.21 | -0.56 | 118.31 |
| 7,717.0 | 0.50 | 238.00 | 7,685.8 | -7.8 | -442.0 | 31.0 | 0.07 | 0.07 | 0.15 |
| 7,851.0 | 0.50 | 188.40 | 7,819.8 | -8.7 | -442.6 | 30.2 | 0.31 | 0.00 | -37.01 |
| 7,985.0 | 1.10 | 187.90 | 7,953.8 | -10.6 | -442.9 | 28.4 | 0.45 | 0.45 | -0.37 |
| 8,119.0 | 0.30 | 258.60 | 8,087.8 | -11.9 | -443.4 | 27.1 | 0.78 | -0.60 | 52.76 |
| 8,253.0 | 0.40 | 294.10 | 8,221.7 | -11.8 | -444.2 | 27.3 | 0.17 | 0.07 | 26.49 |
| 8,387.0 | 0.30 | 292.30 | 8,355.7 | -11.5 | -444.9 | 27.7 | 0.08 | -0.07 | -1.34 |
| 8,522.0 | 0.70 | 263.80 | 8,490.7 | -11.4 | -446.1 | 27.8 | 0.34 | 0.30 | -21.11 |
| 8,656.0 | 0.70 | 231.10 | 8,624.7 | -12.0 | -447.5 | 27.3 | 0.29 | 0.00 | -24.40 |
| 8,741.0 | 1.70 | 227.30 | 8,709.7 | -13.2 | -448.8 | 26.3 | 1.18 | 1.18 | -4.47 |
| 8,786.0 | 3.30 | 308.10 | 8,754.7 | -12.9 | -450.4 | 26.7 | 7.69 | 3.56 | 179.56 |
| 8,830.0 | 8.50 | 332.90 | 8,798.4 | -9.2 | -452.8 | 30.6 | 12.90 | 11.82 | 56.36 |
| 8,875.0 | 13.50 | 343.80 | 8,842.6 | -1.2 | -455.8 | 38.9 | 11.99 | 11.11 | 24.22 |
| 8,920.0 | 17.40 | 346.50 | 8,886.0 | 10.4 | -458.9 | 50.7 | 8.81 | 8.67 | 6.00 |
| 8,965.0 | 22.30 | 345.60 | 8,928.3 | 25.2 | -462.6 | 65.8 | 10.91 | 10.89 | -2.00 |
| 9,009.0 | 26.80 | 348.40 | 8,968.3 | 43.0 | -466.6 | 83.9 | 10.56 | 10.23 | 6.36 |
| 9,054.0 | 30.00 | 354.00 | 9,007.9 | 64.2 | -469.8 | 105.2 | 9.25 | 7.11 | 12.44 |
| 9,099.0 | 33.00 | 355.60 | 9,046.2 | 87.6 | -472.0 | 128.7 | 6.92 | 6.67 | -3.56 |
| 9,144.0 | 37.30 | 357.50 | 9,083.0 | 113.4 | -473.5 | 154.6 | 9.86 | 9.56 | 4.22 |

| | | | |
|---|---|---|---|
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| **Site:** | Sec 20, T26S, 32E | **MD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Well:** | Buck Federal 17 #3H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 9,188.0 | 40.90 | 0.70 | 9,117.2 | 141.2 | -473.9 | 182.3 | 9.38 | 8.18 | 7.27 |
| 9,233.0 | 46.30 | 1.00 | 9,149.7 | 172.2 | -473.4 | 213.1 | 12.01 | 12.00 | 0.67 |
| 9,278.0 | 52.20 | 0.00 | 9,179.1 | 206.3 | -473.2 | 247.0 | 13.22 | 13.11 | -2.22 |
| 9,322.0 | 58.60 | 359.30 | 9,204.1 | 242.5 | -473.4 | 283.1 | 14.60 | 14.55 | -1.59 |
| 9,367.0 | 65.20 | 358.80 | 9,225.3 | 282.1 | -474.0 | 322.7 | 14.70 | 14.67 | -1.11 |
| 9,412.0 | 71.80 | 359.10 | 9,241.8 | 324.0 | -474.8 | 364.4 | 14.68 | 14.67 | 0.67 |
| 9,457.0 | 78.70 | 0.30 | 9,253.2 | 367.5 | -475.0 | 407.8 | 15.55 | 15.33 | 2.67 |
| 9,492.0 | 85.00 | 0.70 | 9,258.2 | 402.1 | -474.7 | 442.2 | 18.04 | 18.00 | 1.14 |
| 9,544.0 | 92.30 | 1.00 | 9,259.4 | 454.0 | -474.0 | 493.9 | 14.05 | 14.04 | 0.58 |
| 9,589.0 | 93.30 | 0.90 | 9,257.2 | 499.0 | -473.2 | 538.6 | 2.23 | 2.22 | -0.22 |
| 9,680.0 | 94.20 | 3.20 | 9,251.2 | 589.7 | -470.0 | 628.7 | 2.71 | 0.99 | 2.53 |
| 9,771.0 | 93.30 | 3.70 | 9,245.3 | 680.4 | -464.5 | 718.5 | 1.13 | -0.99 | 0.55 |
| 9,862.0 | 90.80 | 4.20 | 9,242.0 | 771.1 | -458.2 | 808.4 | 2.80 | -2.75 | 0.55 |
| 9,952.0 | 91.00 | 4.90 | 9,240.6 | 860.8 | -451.1 | 897.1 | 0.81 | 0.22 | 0.78 |
| 10,043.0 | 90.70 | 3.50 | 9,239.3 | 951.5 | -444.4 | 986.9 | 1.57 | -0.33 | -1.54 |
| 10,134.0 | 89.90 | 0.30 | 9,238.8 | 1,042.5 | -441.4 | 1,077.2 | 3.62 | -0.88 | -3.52 |
| 10,225.0 | 88.70 | 359.50 | 9,239.9 | 1,133.5 | -441.6 | 1,167.9 | 1.58 | -1.32 | -0.88 |
| 10,315.0 | 87.50 | 359.60 | 9,242.9 | 1,223.4 | -442.3 | 1,257.5 | 1.34 | -1.33 | 0.11 |
| 10,406.0 | 91.10 | 0.70 | 9,244.0 | 1,314.4 | -442.0 | 1,348.1 | 4.14 | 3.96 | 1.21 |
| 10,497.0 | 90.30 | 1.70 | 9,242.9 | 1,405.3 | -440.1 | 1,438.6 | 1.41 | -0.88 | 1.10 |
| 10,588.0 | 91.40 | 2.10 | 9,241.5 | 1,496.3 | -437.1 | 1,528.9 | 1.29 | 1.21 | 0.44 |
| 10,678.0 | 90.90 | 2.10 | 9,239.7 | 1,586.2 | -433.8 | 1,618.2 | 0.56 | -0.56 | 0.00 |
| 10,769.0 | 91.40 | 359.50 | 9,237.9 | 1,677.2 | -432.6 | 1,708.7 | 2.91 | 0.55 | -2.86 |
| 10,860.0 | 90.40 | 359.80 | 9,236.5 | 1,768.2 | -433.1 | 1,799.4 | 1.15 | -1.10 | 0.33 |
| 10,950.0 | 90.10 | 358.80 | 9,236.1 | 1,858.1 | -434.2 | 1,889.1 | 1.16 | -0.33 | -1.11 |
| 11,041.0 | 89.20 | 357.90 | 9,236.6 | 1,949.1 | -436.8 | 1,979.9 | 1.40 | -0.99 | -0.99 |
| 11,132.0 | 90.10 | 358.90 | 9,237.2 | 2,040.1 | -439.4 | 2,070.8 | 1.48 | 0.99 | 1.10 |
| 11,222.0 | 91.40 | 359.60 | 9,236.0 | 2,130.1 | -440.5 | 2,160.5 | 1.64 | 1.44 | 0.78 |
| 11,313.0 | 92.00 | 357.50 | 9,233.3 | 2,221.0 | -442.9 | 2,251.3 | 2.40 | 0.66 | -2.31 |
| 11,404.0 | 90.00 | 357.00 | 9,231.7 | 2,311.9 | -447.2 | 2,342.2 | 2.27 | -2.20 | -0.55 |
| 11,495.0 | 89.60 | 358.80 | 9,232.0 | 2,402.8 | -450.5 | 2,433.1 | 2.03 | -0.44 | 1.98 |
| 11,585.0 | 88.00 | 358.80 | 9,233.9 | 2,492.7 | -452.4 | 2,522.9 | 1.78 | -1.78 | 0.00 |
| 11,676.0 | 88.60 | 359.30 | 9,236.6 | 2,583.7 | -453.9 | 2,613.6 | 0.86 | 0.66 | 0.55 |
| 11,767.0 | 89.30 | 359.10 | 9,238.3 | 2,674.7 | -455.2 | 2,704.3 | 0.80 | 0.77 | -0.22 |
| 11,857.0 | 90.70 | 359.80 | 9,238.3 | 2,764.7 | -456.1 | 2,794.0 | 1.74 | 1.56 | 0.78 |
| 11,948.0 | 90.30 | 0.20 | 9,237.5 | 2,855.7 | -456.1 | 2,884.7 | 0.62 | -0.44 | 0.44 |
| 12,039.0 | 90.80 | 0.50 | 9,236.6 | 2,946.6 | -455.5 | 2,975.3 | 0.64 | 0.55 | 0.33 |
| 12,130.0 | 89.90 | 0.30 | 9,236.1 | 3,037.6 | -454.9 | 3,065.9 | 1.01 | -0.99 | -0.22 |
| 12,220.0 | 91.60 | 359.60 | 9,234.9 | 3,127.6 | -455.0 | 3,155.5 | 2.04 | 1.89 | -0.78 |
| 12,311.0 | 91.40 | 359.80 | 9,232.5 | 3,218.6 | -455.4 | 3,246.2 | 0.31 | -0.22 | 0.22 |
| 12,402.0 | 88.20 | 0.30 | 9,232.8 | 3,309.6 | -455.4 | 3,336.8 | 3.56 | -3.52 | 0.55 |
| 12,492.0 | 88.70 | 1.60 | 9,235.3 | 3,399.5 | -453.9 | 3,426.3 | 1.55 | 0.56 | 1.44 |
| 12,583.0 | 89.10 | 1.00 | 9,237.0 | 3,490.5 | -451.8 | 3,516.7 | 0.79 | 0.44 | -0.66 |

| | | | |
|---|---|---|---|
| **Company:** | Conoco Phillips | **Local Co-ordinate Reference:** | Well Buck Federal 17 #3H |
| **Project:** | Lea County, New Mexico | **TVD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Site:** | Sec 20 T26S 32E | **MD Reference:** | WELL @ 3192.0usft (Precision #827) |
| **Well:** | Buck Federal 17 #3H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | EDM 5000.1 Single User Db |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 12,674.0 | 90.40 | 1.70 | 9,237.4 | 3,581.5 | -449.7 | 3,607.1 | 1.62 | 1.43 | 0.77 |
| 12,764.0 | 87.80 | 0.20 | 9,238.8 | 3,671.4 | -448.2 | 3,696.6 | 3.34 | -2.89 | -1.67 |
| 12,855.0 | 88.40 | 1.00 | 9,241.8 | 3,762.4 | -447.2 | 3,787.1 | 1.10 | 0.66 | 0.88 |
| 12,946.0 | 89.10 | 1.70 | 9,243.8 | 3,853.3 | -445.1 | 3,877.5 | 1.09 | 0.77 | 0.77 |
| 13,037.0 | 89.50 | 2.30 | 9,244.9 | 3,944.3 | -441.9 | 3,967.8 | 0.79 | 0.44 | 0.66 |
| 13,127.0 | 89.90 | 0.90 | 9,245.4 | 4,034.2 | -439.4 | 4,057.2 | 1.62 | 0.44 | -1.56 |
| 13,218.0 | 90.10 | 359.80 | 9,245.4 | 4,125.2 | -438.8 | 4,147.8 | 1.23 | 0.22 | -1.21 |
| 13,309.0 | 91.60 | 359.10 | 9,244.1 | 4,216.2 | -439.7 | 4,238.5 | 1.82 | 1.65 | -0.77 |
| 13,399.0 | 89.80 | 358.90 | 9,243.0 | 4,306.2 | -441.3 | 4,328.3 | 2.01 | -2.00 | -0.22 |
| 13,490.0 | 88.60 | 358.80 | 9,244.2 | 4,397.2 | -443.1 | 4,419.1 | 1.32 | -1.32 | -0.11 |
| 13,581.0 | 89.30 | 358.80 | 9,245.9 | 4,488.1 | -445.0 | 4,509.9 | 0.77 | 0.77 | 0.00 |
| 13,671.0 | 90.10 | 359.30 | 9,246.4 | 4,578.1 | -446.5 | 4,599.6 | 1.05 | 0.89 | 0.56 |
| 13,762.0 | 91.10 | 358.90 | 9,245.4 | 4,669.1 | -447.9 | 4,690.4 | 1.18 | 1.10 | -0.44 |
| 13,853.0 | 92.10 | 359.60 | 9,242.9 | 4,760.0 | -449.1 | 4,781.1 | 1.34 | 1.10 | 0.77 |
| 13,944.0 | 92.50 | 359.50 | 9,239.2 | 4,851.0 | -449.8 | 4,871.7 | 0.45 | 0.44 | -0.11 |
| 13,989.0 | 92.90 | 359.60 | 9,237.1 | 4,895.9 | -450.2 | 4,916.5 | 0.92 | 0.89 | 0.22 |
| TD @ 14080' MD / 9232.5' TVD | | | | | | | | | |
| 14,080.0 | 92.90 | 359.60 | 9,232.5 | 4,986.8 | -450.8 | 5,007.1 | 0.00 | 0.00 | 0.00 |

**Survey Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 169.0 | 169.0 | 0.1 | -1.6 | FIRST MWD SURVEY @ 169' MD / 169' TVD |
| 14,080.0 | 9,232.5 | 4,986.8 | -450.8 | TD @ 14080' MD / 9232.5' TVD |

Checked By: _____ Approved By: _____ Date: _____