

# Noble Energy

Weld County, CO (NAD 83)

Sec. 28-T9N-R59W (LC28-15-A)

Brook LC28-74-1AHNC

Job# 901400364:: API:05-123-38844

Plan B

Design: Actual Surveys

## Sperry Drilling Services

### Final Survey Report

15 September, 2014

Surface UWI : Job# 901400364:: API:05-123-38844

Well Coordinates: 1,506,937.41 N, 3,421,370.06 E (40° 42' 54.07" N, 103° 58' 47.71" W)

Ground Level: 4,843.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Brook LC28-74-1AHNC

RKB=24ft @ 4867.00usft (H&P 273)

N

Grid

API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 28-T9N-R59W (LC28-15-A)  
Well: Brook LC28-74-1AHNC  
Wellbore: Plan B  
Design: Actual Surveys

# Noble Energy

**HALLIBURTON**  
Sperry Drilling

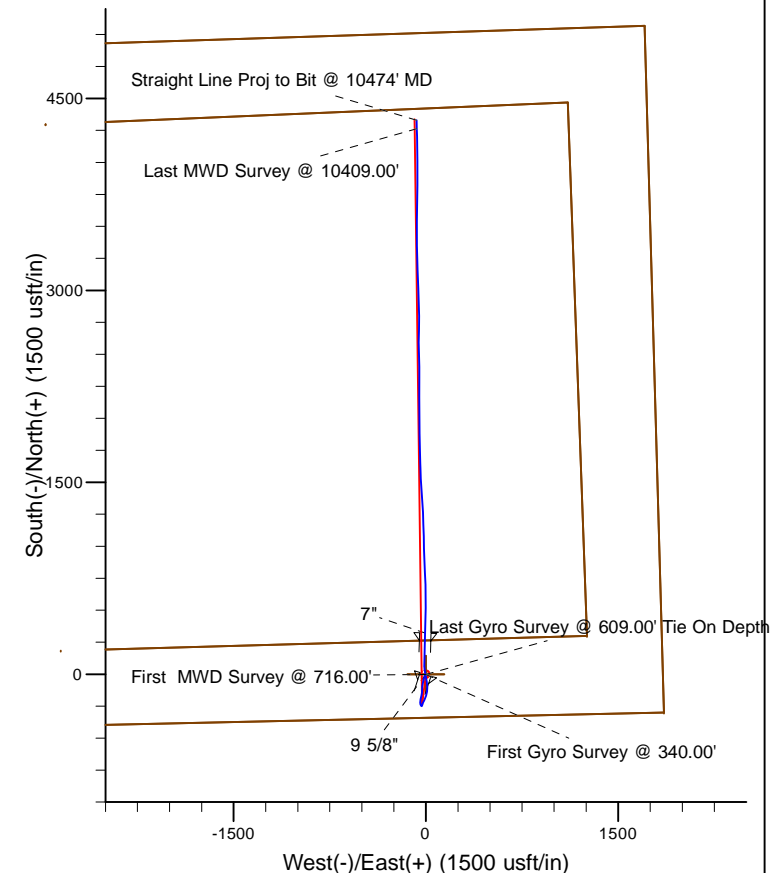
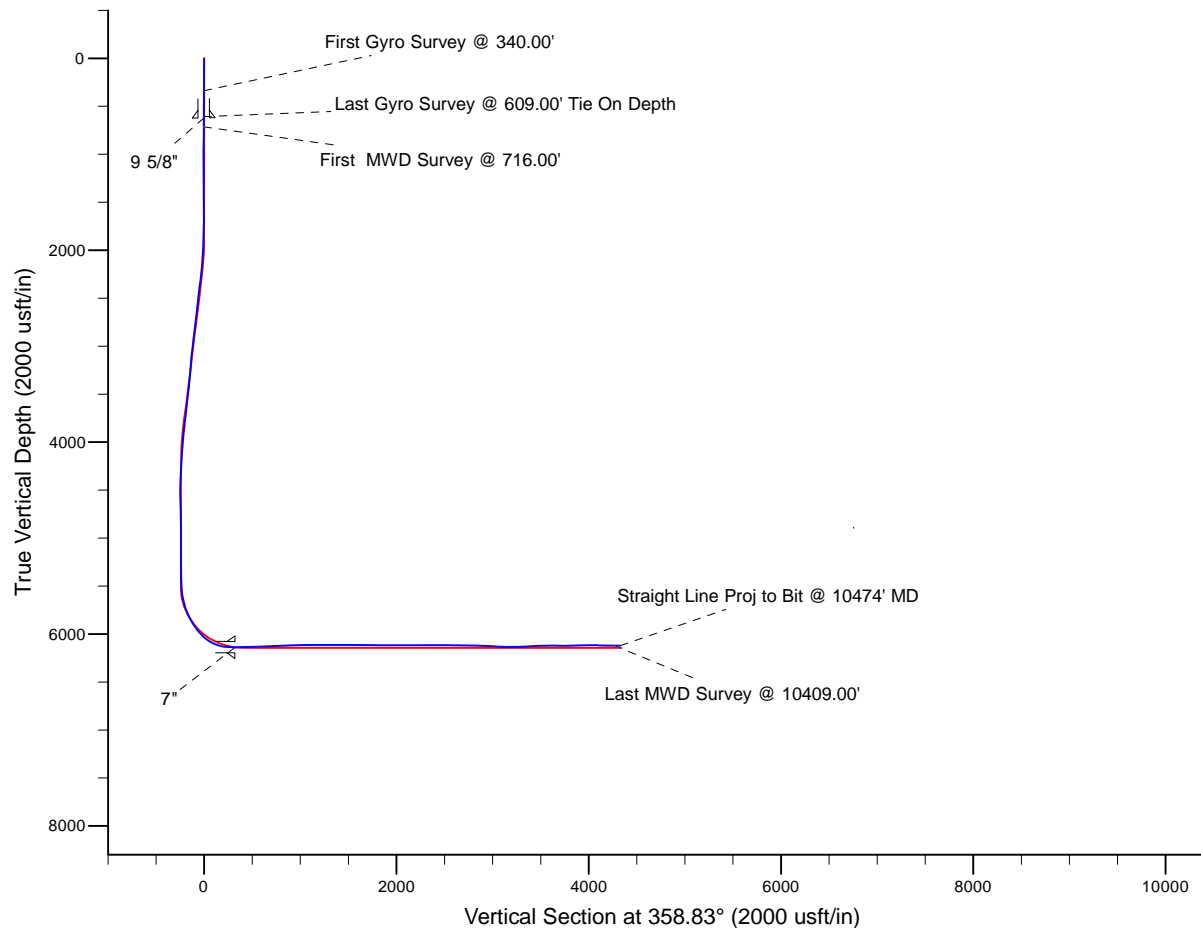
Platted SHL: 340' FNL, 1848' FWL  
Platted Lat/Long: 40.715020 N, 103.979920 W  
Location: Sec. 28-T9N-R59W

~7" Casing: 669' FNL, 1851' FEL  
Lat/Long: 40° 31' 6.490" N, 104° 27' 10.855" W  
State Planes - CO Northern: 1,433,437.43N, 3,291,079.78E  
Location: Sec. 4-T6N-R63W

Platted BHL: 675' FNL, 1815' FEL  
Lat/Long: 40.726930 N, 103.979970 W  
State Planes - CO Northern: 1511275.70 N, 3421281.82 E  
Location: Sec. 28-T9N-R59W

## LEGEND

- △ Brook LC28-74-1AHNC, Plan B, Rev B0 - PROPOSAL V0
- Actual Surveys



WELL DETAILS: Brook LC28-74-1AHNC

Ground Level: 4843.00  
RKB=24ft @ 4867.00usft (H&P 273)

Created By: Gordy Roth  
Created On: 08/27/2014

## Design Report for Brook LC28-74-1AHNC - Actual Surveys

| Measured Depth (usft)                          | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|--|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 0.00   | 0.00            | 0.00        | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                    |
| 340.00   | 0.60            | 216.94      | 339.99                | -1.42        | -1.07        | -1.40                   | 0.18                    |
| <b>First Gyro Survey @ 340.00'</b>             |                 |             |                       |              |              |                         |                         |
| 609.00   | 0.20            | 12.54       | 608.99                | -2.09        | -1.81        | -2.05                   | 0.29                    |
| <b>Last Gyro Survey @ 609.00' Tie On Depth</b> |                 |             |                       |              |              |                         |                         |
| 622.14   | 0.14            | 18.16       | 622.13                | -2.05        | -1.80        | -2.02                   | 0.46                    |
| <b>9 5/8"</b>                                  |                 |             |                       |              |              |                         |                         |
| 716.00   | 0.30            | 170.36      | 715.99                | -2.18        | -1.73        | -2.15                   | 0.46                    |
| <b>First MWD Survey @ 716.00'</b>              |                 |             |                       |              |              |                         |                         |
| 809.00   | 0.41            | 129.61      | 808.99                | -2.64        | -1.43        | -2.61                   | 0.29                    |
| 902.00   | 0.15            | 193.30      | 901.99                | -2.97        | -1.20        | -2.94                   | 0.40                    |
| 1,088.00                                       | 0.11            | 166.56      | 1,087.99              | -3.38        | -1.22        | -3.35                   | 0.04                    |
| 1,274.00                                       | 0.28            | 195.30      | 1,273.99              | -3.99        | -1.29        | -3.96                   | 0.10                    |
| 1,460.00                                       | 0.03            | 183.08      | 1,459.98              | -4.48        | -1.42        | -4.45                   | 0.13                    |
| 1,553.00                                       | 0.22            | 291.26      | 1,552.98              | -4.44        | -1.58        | -4.40                   | 0.25                    |
| 1,645.00                                       | 0.29            | 253.19      | 1,644.98              | -4.44        | -1.97        | -4.40                   | 0.19                    |
| 1,737.00                                       | 0.22            | 159.43      | 1,736.98              | -4.67        | -2.13        | -4.63                   | 0.41                    |
| 1,832.00                                       | 0.04            | 197.45      | 1,831.98              | -4.87        | -2.08        | -4.83                   | 0.20                    |
| 1,927.00                                       | 2.06            | 213.97      | 1,926.96              | -6.32        | -3.04        | -6.26                   | 2.13                    |
| 2,022.00                                       | 3.84            | 205.85      | 2,021.83              | -10.60       | -5.38        | -10.49                  | 1.92                    |
| 2,117.00                                       | 5.84            | 205.12      | 2,116.49              | -17.84       | -8.82        | -17.66                  | 2.11                    |
| 2,212.00                                       | 5.53            | 204.06      | 2,211.02              | -26.40       | -12.74       | -26.13                  | 0.34                    |
| 2,307.00                                       | 7.67            | 194.88      | 2,305.39              | -36.71       | -16.24       | -36.37                  | 2.50                    |
| 2,401.00                                       | 7.17            | 192.47      | 2,398.60              | -48.50       | -19.11       | -48.10                  | 0.63                    |
| 2,496.00                                       | 6.72            | 190.23      | 2,492.90              | -59.75       | -21.38       | -59.31                  | 0.55                    |
| 2,591.00                                       | 6.69            | 189.80      | 2,587.25              | -70.68       | -23.31       | -70.19                  | 0.06                    |
| 2,686.00                                       | 6.47            | 191.58      | 2,681.63              | -81.37       | -25.33       | -80.84                  | 0.32                    |
| 2,781.00                                       | 6.36            | 190.41      | 2,776.03              | -91.79       | -27.35       | -91.22                  | 0.18                    |
| 2,875.00                                       | 7.45            | 181.83      | 2,869.35              | -103.00      | -28.49       | -102.40                 | 1.59                    |
| 2,970.00                                       | 6.92            | 182.39      | 2,963.61              | -114.88      | -28.92       | -114.27                 | 0.56                    |
| 3,065.00                                       | 6.27            | 186.11      | 3,057.98              | -125.76      | -29.71       | -125.12                 | 0.82                    |
| 3,160.00                                       | 5.25            | 181.06      | 3,152.50              | -135.26      | -30.35       | -134.61                 | 1.20                    |
| 3,255.00                                       | 4.10            | 182.67      | 3,247.18              | -143.00      | -30.58       | -142.35                 | 1.22                    |
| 3,350.00                                       | 5.22            | 187.31      | 3,341.87              | -150.68      | -31.29       | -150.01                 | 1.24                    |
| 3,445.00                                       | 6.64            | 195.07      | 3,436.36              | -160.27      | -33.27       | -159.56                 | 1.71                    |
| 3,540.00                                       | 6.55            | 194.59      | 3,530.73              | -170.81      | -36.06       | -170.05                 | 0.11                    |
| 3,635.00                                       | 6.56            | 194.29      | 3,625.11              | -181.32      | -38.77       | -180.49                 | 0.04                    |
| 3,730.00                                       | 6.93            | 185.73      | 3,719.45              | -192.28      | -40.68       | -191.41                 | 1.13                    |
| 3,825.00                                       | 6.28            | 185.37      | 3,813.82              | -203.15      | -41.74       | -202.26                 | 0.69                    |
| 3,920.00                                       | 5.68            | 186.55      | 3,908.30              | -213.00      | -42.76       | -212.08                 | 0.64                    |
| 4,014.00                                       | 5.08            | 177.55      | 4,001.89              | -221.78      | -43.11       | -220.85                 | 1.10                    |
| 4,109.00                                       | 4.66            | 181.39      | 4,096.55              | -229.84      | -43.03       | -228.91                 | 0.56                    |
| 4,204.00                                       | 3.24            | 158.03      | 4,191.32              | -236.19      | -42.12       | -235.28                 | 2.23                    |
| 4,394.00                                       | 3.25            | 148.36      | 4,381.02              | -245.75      | -37.28       | -244.94                 | 0.29                    |
| 4,489.00                                       | 2.38            | 105.41      | 4,475.92              | -248.57      | -33.97       | -247.83                 | 2.33                    |
| 4,583.00                                       | 1.45            | 46.78       | 4,569.87              | -248.27      | -31.22       | -247.59                 | 2.17                    |
| 4,678.00                                       | 2.02            | 30.78       | 4,664.83              | -246.01      | -29.49       | -245.36                 | 0.78                    |
| 4,773.00                                       | 2.30            | 311.54      | 4,759.78              | -243.31      | -30.06       | -242.65                 | 2.91                    |
| 4,868.00                                       | 0.25            | 301.62      | 4,854.75              | -241.93      | -31.66       | -241.24                 | 2.16                    |
| 5,058.00                                       | 0.44            | 28.61       | 5,044.75              | -241.08      | -31.66       | -240.38                 | 0.26                    |

## Design Report for Brook LC28-74-1AHNC - Actual Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 5,152.00              | 0.62            | 64.65       | 5,138.74              | -240.54      | -31.03       | -239.86                 | 0.39                    |
| 5,247.00              | 0.50            | 49.14       | 5,233.74              | -240.05      | -30.25       | -239.39                 | 0.20                    |
| 5,342.00              | 0.55            | 46.57       | 5,328.73              | -239.47      | -29.61       | -238.81                 | 0.06                    |
| 5,432.00              | 0.60            | 48.14       | 5,418.73              | -238.85      | -28.94       | -238.22                 | 0.06                    |
| 5,527.00              | 2.96            | 24.58       | 5,513.68              | -236.29      | -27.55       | -235.68                 | 2.55                    |
| 5,574.00              | 7.63            | 15.80       | 5,560.47              | -232.18      | -26.20       | -231.60                 | 10.06                   |
| 5,621.00              | 11.45           | 22.14       | 5,606.81              | -224.86      | -23.59       | -224.33                 | 8.42                    |
| 5,668.00              | 14.53           | 27.26       | 5,652.60              | -215.29      | -19.13       | -214.86                 | 6.99                    |
| 5,716.00              | 18.45           | 26.41       | 5,698.62              | -203.13      | -12.99       | -202.83                 | 8.18                    |
| 5,763.00              | 22.50           | 24.63       | 5,742.64              | -188.29      | -5.93        | -188.13                 | 8.72                    |
| 5,811.00              | 25.07           | 19.74       | 5,786.56              | -170.36      | 1.33         | -170.36                 | 6.74                    |
| 5,858.00              | 26.13           | 11.62       | 5,828.96              | -150.85      | 6.78         | -150.95                 | 7.79                    |
| 5,906.00              | 29.29           | 4.39        | 5,871.46              | -128.78      | 9.81         | -128.95                 | 9.60                    |
| 5,953.00              | 33.54           | 359.49      | 5,911.57              | -104.31      | 10.58        | -104.51                 | 10.54                   |
| 6,001.00              | 37.34           | 352.27      | 5,950.69              | -76.61       | 8.50         | -76.76                  | 11.77                   |
| 6,048.00              | 41.81           | 349.89      | 5,986.91              | -47.04       | 3.83         | -47.11                  | 10.04                   |
| 6,096.00              | 47.08           | 349.81      | 6,021.17              | -13.97       | -2.09        | -13.92                  | 10.98                   |
| 6,143.00              | 51.91           | 351.76      | 6,051.69              | 21.30        | -7.79        | 21.45                   | 10.75                   |
| 6,190.00              | 58.55           | 356.40      | 6,078.48              | 59.67        | -11.71       | 59.89                   | 16.28                   |
| 6,237.00              | 64.79           | 359.67      | 6,100.78              | 100.98       | -13.09       | 101.23                  | 14.62                   |
| 6,285.00              | 72.40           | 2.24        | 6,118.29              | 145.63       | -12.32       | 145.85                  | 16.62                   |
| 6,332.00              | 79.44           | 2.87        | 6,129.72              | 191.14       | -10.28       | 191.31                  | 15.03                   |
| 6,380.00              | 86.05           | 3.52        | 6,135.77              | 238.66       | -7.63        | 238.76                  | 13.84                   |
| 6,441.00              | 89.60           | 2.25        | 6,138.09              | 299.53       | -4.56        | 299.56                  | 6.18                    |
| 6,462.46              | 89.84           | 1.97        | 6,138.19              | 320.97       | -3.77        | 320.98                  | 1.72                    |
| 7"                    |                 |             |                       |              |              |                         |                         |
| 6,555.00              | 90.89           | 0.78        | 6,137.60              | 413.48       | -1.55        | 413.43                  | 1.72                    |
| 6,650.00              | 92.81           | 358.98      | 6,134.53              | 508.42       | -1.75        | 508.35                  | 2.77                    |
| 6,745.00              | 91.54           | 359.16      | 6,130.93              | 603.34       | -3.29        | 603.28                  | 1.35                    |
| 6,839.00              | 92.07           | 359.38      | 6,127.97              | 697.28       | -4.49        | 697.23                  | 0.61                    |
| 6,934.00              | 92.77           | 357.44      | 6,123.96              | 792.16       | -7.12        | 792.14                  | 2.17                    |
| 7,029.00              | 91.73           | 357.63      | 6,120.23              | 887.00       | -11.20       | 887.04                  | 1.11                    |
| 7,124.00              | 91.51           | 358.20      | 6,117.54              | 981.89       | -14.66       | 981.99                  | 0.64                    |
| 7,219.00              | 90.74           | 359.15      | 6,115.68              | 1,076.85     | -16.85       | 1,076.97                | 1.29                    |
| 7,313.00              | 89.81           | 358.21      | 6,115.22              | 1,170.82     | -19.02       | 1,170.96                | 1.41                    |
| 7,408.00              | 90.06           | 357.36      | 6,115.33              | 1,265.75     | -22.69       | 1,265.95                | 0.93                    |
| 7,503.00              | 90.15           | 356.07      | 6,115.16              | 1,360.59     | -28.13       | 1,360.88                | 1.36                    |
| 7,598.00              | 90.00           | 355.67      | 6,115.03              | 1,455.34     | -34.97       | 1,455.75                | 0.45                    |
| 7,693.00              | 90.06           | 357.60      | 6,114.98              | 1,550.17     | -40.55       | 1,550.68                | 2.03                    |
| 7,788.00              | 88.00           | 358.81      | 6,116.59              | 1,645.11     | -43.53       | 1,645.65                | 2.51                    |
| 7,883.00              | 90.59           | 358.02      | 6,117.76              | 1,740.06     | -46.15       | 1,740.63                | 2.85                    |
| 7,978.00              | 89.91           | 359.46      | 6,117.35              | 1,835.03     | -48.24       | 1,835.63                | 1.68                    |
| 8,073.00              | 89.38           | 359.31      | 6,117.94              | 1,930.02     | -49.26       | 1,930.62                | 0.58                    |
| 8,168.00              | 88.70           | 358.92      | 6,119.53              | 2,025.00     | -50.73       | 2,025.61                | 0.83                    |
| 8,262.00              | 91.88           | 359.90      | 6,119.05              | 2,118.98     | -51.70       | 2,119.59                | 3.54                    |
| 8,357.00              | 90.62           | 0.77        | 6,116.98              | 2,213.95     | -51.14       | 2,214.53                | 1.61                    |
| 8,452.00              | 90.06           | 359.77      | 6,116.41              | 2,308.94     | -50.69       | 2,309.50                | 1.21                    |
| 8,546.00              | 89.82           | 358.93      | 6,116.51              | 2,402.94     | -51.76       | 2,403.49                | 0.93                    |
| 8,641.00              | 89.20           | 358.76      | 6,117.33              | 2,497.91     | -53.68       | 2,498.49                | 0.68                    |
| 8,736.00              | 89.91           | 359.57      | 6,118.06              | 2,592.90     | -55.06       | 2,593.48                | 1.13                    |
| 8,831.00              | 89.85           | 0.93        | 6,118.26              | 2,687.90     | -54.65       | 2,688.45                | 1.43                    |

## Design Report for Brook LC28-74-1AHNC - Actual Surveys

| Measured Depth (usft)                 | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|---------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 8,925.00                              | 88.74           | 0.03        | 6,119.42              | 2,781.88     | -53.86       | 2,782.40                | 1.52                    |
| 9,020.00                              | 87.66           | 358.67      | 6,122.40              | 2,876.83     | -54.93       | 2,877.35                | 1.83                    |
| 9,115.00                              | 86.61           | 357.97      | 6,127.15              | 2,971.67     | -57.72       | 2,972.22                | 1.33                    |
| 9,209.00                              | 87.29           | 357.53      | 6,132.15              | 3,065.46     | -61.40       | 3,066.07                | 0.86                    |
| 9,304.00                              | 89.29           | 358.58      | 6,134.99              | 3,160.36     | -64.62       | 3,161.02                | 2.38                    |
| 9,399.00                              | 90.83           | 358.20      | 6,134.89              | 3,255.32     | -67.29       | 3,256.01                | 1.67                    |
| 9,494.00                              | 94.07           | 359.04      | 6,130.83              | 3,350.19     | -69.58       | 3,350.91                | 3.52                    |
| 9,588.00                              | 92.75           | 359.53      | 6,125.24              | 3,444.01     | -70.75       | 3,444.74                | 1.50                    |
| 9,683.00                              | 90.52           | 1.05        | 6,122.53              | 3,538.96     | -70.27       | 3,539.66                | 2.84                    |
| 9,778.00                              | 90.43           | 0.54        | 6,121.74              | 3,633.95     | -68.95       | 3,634.60                | 0.55                    |
| 9,873.00                              | 88.89           | 0.75        | 6,122.30              | 3,728.94     | -67.88       | 3,729.55                | 1.64                    |
| 9,968.00                              | 91.14           | 0.48        | 6,122.28              | 3,823.93     | -66.86       | 3,824.50                | 2.39                    |
| 10,062.00                             | 91.67           | 359.91      | 6,119.97              | 3,917.90     | -66.54       | 3,918.44                | 0.83                    |
| 10,157.00                             | 90.99           | 359.58      | 6,117.77              | 4,012.87     | -66.96       | 4,013.40                | 0.80                    |
| 10,252.00                             | 88.43           | 359.63      | 6,118.25              | 4,107.86     | -67.62       | 4,108.39                | 2.70                    |
| 10,347.00                             | 88.98           | 358.84      | 6,120.40              | 4,202.83     | -68.89       | 4,203.36                | 1.01                    |
| 10,409.00                             | 90.28           | 358.00      | 6,120.80              | 4,264.80     | -70.60       | 4,265.35                | 2.50                    |
| Last MWD Survey @ 10409.00'           |                 |             |                       |              |              |                         |                         |
| 10,474.00                             | 90.28           | 358.00      | 6,120.48              | 4,329.76     | -72.86       | 4,330.35                | 0.00                    |
| Straight Line Proj to Bit @ 10474' MD |                 |             |                       |              |              |                         |                         |

Design Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                                 |
|-----------------------|-----------------------|-------------------|--------------|---|
|                       |                       | +N/-S (usft)      | +E/-W (usft) |   |
| 340.00                | 339.99                | -1.42             | -1.07        | First Gyro Survey @ 340.00'             |
| 609.00                | 608.99                | -2.09             | -1.81        | Last Gyro Survey @ 609.00' Tie On Depth |
| 716.00                | 715.99                | -2.18             | -1.73        | First MWD Survey @ 716.00'              |
| 10,409.00             | 6,120.80              | 4,264.80          | -70.60       | Last MWD Survey @ 10409.00'             |
| 10,474.00             | 6,120.48              | 4,329.76          | -72.86       | Straight Line Proj to Bit @ 10474' MD   |

Vertical Section Information

| Angle Type | Target                  | Azimuth (°) | Origin Type | Origin       |              | Start TVD (usft) |
|------------|-------------------------|-------------|-------------|--------------|--------------|------------------|
|            |                         |             |             | +N/_S (usft) | +E/-W (usft) |                  |
| Target     | Brook LC28-74-1AHNC_BHL | 358.83      | Slot        | 0.00         | 0.00         | 0.00             |

Survey tool program

| From (usft) | To (usft) | Survey/Plan               | Survey Tool |
|-------------|-----------|---------------------------|-------------|
| 340.00      | 609.00    | Surface Gyro Surveys      | Flexi-Shot  |
| 716.00      | 6,441.00  | MWD Surveys- Intermediate | MWD+SC      |
| 6,555.00    | 10,474.00 | MWD Surveys- Production   | MWD+SC      |

Casing Details

| Measured Depth (usft) | Vertical Depth (usft) | Name   | Casing Diameter (") | Hole Diameter (") |
|-----------------------|-----------------------|--------|---------------------|-------------------|
| 622.14                | 622.13                | 9 5/8" | 9-5/8               | 13-3/4            |
| 6,462.46              | 6,138.19              | 7"     | 7                   | 8-3/4             |

## Design Report for Brook LC28-74-1AHNC - Actual Surveys

**Wellbore Targets**

| Target Name<br>- hit/miss target<br>- Shape   | Dip<br>Angle<br>(°) | Dip<br>Dir.<br>(°) | TVD<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Northing<br>(usft) | Easting<br>(usft) | Latitude         | Longitude         |
|---|---------------------|--------------------|---------------|-----------------|-----------------|--------------------|-------------------|------------------|-------------------|
| Brook LC28-74-1AHNC   | 0.00                | 0.00               | 0.00          | 0.01            | 0.00            | 1,506,937.41       | 3,421,370.06      | 40° 42' 54.072 N | 103° 58' 47.712 W |
| - actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)              |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Polygon   |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Point 1   |                     |                    |               | 0.00            | 4,898.37        | -3,568.42          | 1,511,835.73      | 3,417,801.67     |                   |
| Point 2   |                     |                    |               | 0.00            | -416.00         | -3,450.34          | 1,506,521.42      | 3,417,919.75     |                   |
| Point 3   |                     |                    |               | 0.00            | -299.68         | 1,857.26           | 1,506,637.74      | 3,423,227.30     |                   |
| Point 4   |                     |                    |               | 0.00            | 5,068.79        | 1,706.60           | 1,512,006.15      | 3,423,076.64     |                   |
| Point 5   |                     |                    |               | 0.00            | 4,898.37        | -3,568.42          | 1,511,835.73      | 3,417,801.67     |                   |
| Brook LC28-74-1AHNC   | 0.00                | 0.00               | 0.00          | 0.01            | 0.00            | 1,506,937.41       | 3,421,370.06      | 40° 42' 54.072 N | 103° 58' 47.712 W |
| - actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)              |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Polygon   |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Point 1   |                     |                    |               | 0.00            | 4,298.36        | -2,968.42          | 1,511,235.73      | 3,418,401.67     |                   |
| Point 2   |                     |                    |               | 0.00            | 184.01          | -2,850.34          | 1,507,121.42      | 3,418,519.75     |                   |
| Point 3   |                     |                    |               | 0.00            | 300.33          | 1,257.26           | 1,507,237.74      | 3,422,627.30     |                   |
| Point 4   |                     |                    |               | 0.00            | 4,468.78        | 1,106.59           | 1,511,406.15      | 3,422,476.64     |                   |
| Point 5   |                     |                    |               | 0.00            | 4,298.36        | -2,968.42          | 1,511,235.73      | 3,418,401.67     |                   |
| Brook LC28-74-1AHNC   | 0.00                | 0.00               | 0.00          | 0.01            | 0.00            | 1,506,937.41       | 3,421,370.06      | 40° 42' 54.072 N | 103° 58' 47.712 W |
| - actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)              |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Point   |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Brook LC28-74-1AHNC   | 0.00                | 0.00               | 6,145.00      | 4,338.33        | -88.24          | 1,511,275.70       | 3,421,281.82      | 40° 43' 36.948 N | 103° 58' 47.892 W |
| - actual wellpath misses target center by 30.19usft at 10474.00usft MD (6120.48 TVD, 4329.76 N, -72.86 E) |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Point   |                     |                    |               |                 |                 |                    |                   |                  |                   |

**Directional Difficulty Index**

|                                     |                |                               |                                  |
|-------------------------------------|----------------|-------------------------------|----------------------------------|
| Average Dogleg over Survey:         | 1.93 °/100usft | Maximum Dogleg over Survey:   | 16.62 °/100usft at 6,285.00 usft |
| Net Tortousity applicable to Plans: | 0.94 °/100usft | Directional Difficulty Index: | 6.224                            |

**Audit Info**

North Reference Sheet for Sec. 28-T9N-R59W (LC28-15-A) - Brook  
LC28-74-1AHNC - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24ft @ 4867.00usft (H&P 273). Northing and Easting are relative to Brook LC28-74-1AHNC

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998963

Grid Coordinates of Well: 1,506,937.41 usft N, 3,421,370.06 usft E

Geographical Coordinates of Well: 40° 42' 54.07" N, 103° 58' 47.71" W

Grid Convergence at Surface is: 0.98°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,474.00usft  
the Bottom Hole Displacement is 4,330.37usft in the Direction of 359.04° (Grid).

Magnetic Convergence at surface is: -7.14° (16 July 2014, , BGGM2014)

