

30-025-43932

# **COG OPERATING, LLC**

**Lea County, NM (NAD27) NMEZ**

**White Falcon 16 Federal COM**

**#22H**

**OH**

**Design: OH**

## **Standard Survey Report**

**22 February, 2018**

# Survey Report

|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING, LLC          | <b>Local Co-ordinate Reference:</b> | Well #22H                               |
| <b>Project:</b>  | Lea County, NM (NAD27) NMEZ | <b>TVD Reference:</b>               | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Site:</b>     | White Falcon 16 Federal COM | <b>MD Reference:</b>                | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | OH                          | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | OH                          | <b>Database:</b>                    | EDM 5000.14 Single User Db              |

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Lea County, NM (NAD27) NMEZ          |                      |                |
| <b>Map System:</b> | US State Plane 1927 (Exact solution) | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | NAD 1927 (NADCON CONUS)              |                      |                |
| <b>Map Zone:</b>   | New Mexico East 3001                 |                      |                |

|                              |                             |                     |                 |                                     |
|------------------------------|-----------------------------|---------------------|-----------------|-------------------------------------|
| <b>Site</b>                  | White Falcon 16 Federal COM |                     |                 |                                     |
| <b>Position:</b>             |                             | <b>Northing:</b>    | 414,844.60 usft | <b>Latitude:</b> 32° 8' 12.801 N    |
| <b>Map</b>                   |                             | <b>Easting:</b>     | 796,941.60 usft | <b>Longitude:</b> 103° 22' 26.517 W |
| <b>Position Uncertainty:</b> | 0.00 usft                   | <b>Slot Radius:</b> | 13-3/16 "       | <b>Grid Convergence:</b> 0.51 °     |

|                             |           |                            |                                  |                                     |
|-----------------------------|-----------|----------------------------|----------------------------------|-------------------------------------|
| <b>Well</b>                 | #22H      |                            |                                  |                                     |
| <b>Position</b>             | +N/-S     | 0.00 usft                  | <b>Northing:</b> 414,843.90 usft | <b>Latitude:</b> 32° 8' 12.801 N    |
|                             | +E/-W     | 0.00 usft                  | <b>Easting:</b> 796,861.70 usft  | <b>Longitude:</b> 103° 22' 27.446 W |
| <b>Position Uncertainty</b> | 0.00 usft | <b>Wellhead Elevation:</b> | usft                             | <b>Ground Level:</b> 3,246.60 usft  |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | OH                |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2015          | 11/17/17           | 6.81                   | 60.01                | 47,865.21991249            |

|                          |                                |                     |                     |                      |      |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|------|
| <b>Design</b>            | OH                             |                     |                     |                      |      |
| <b>Audit Notes:</b>      |                                |                     |                     |                      |      |
| <b>Version:</b>          | 1.0                            | <b>Phase:</b>       | ACTUAL              | <b>Tie On Depth:</b> | 0.00 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Direction (°)</b> |      |
|                          | 0.00                           | 0.00                | 0.00                | 179.48               |      |

|                       |                  |                          |                  |                                   |  |
|-----------------------|------------------|--------------------------|------------------|-----------------------------------|--|
| <b>Survey Program</b> | Date 02/22/18    |                          |                  |                                   |  |
| <b>From (usft)</b>    | <b>To (usft)</b> | <b>Survey (Wellbore)</b> | <b>Tool Name</b> | <b>Description</b>                |  |
| 100.00                | 11,645.00        | Survey #1 - Gyro (OH)    | GYD_DP_MS        | Gyrodata gyro-compassing and drop |  |
| 11,834.00             | 22,472.00        | Survey #2 - VON MWD (OH) | MWD              | MWD v3: standard declination      |  |
| 22,531.00             | 22,531.00        | Survey #3 - PTB (OH)     | Projection       | Projection                        |  |

|                              |                        |                    |                              |                     |                     |                                |                                |                               |                              |  |
|------------------------------|------------------------|--------------------|------------------------------|---------------------|---------------------|--------------------------------|--------------------------------|-------------------------------|------------------------------|--|
| <b>Survey</b>                |                        |                    |                              |                     |                     |                                |                                |                               |                              |  |
| <b>Measured Depth (usft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>Vertical Depth (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Vertical Section (usft)</b> | <b>Dogleg Rate (°/100usft)</b> | <b>Build Rate (°/100usft)</b> | <b>Turn Rate (°/100usft)</b> |  |
| 0.00                         | 0.00                   | 0.00               | 0.00                         | 0.00                | 0.00                | 0.00                           | 0.00                           | 0.00                          | 0.00                         |  |
| 100.00                       | 0.48                   | 307.80             | 100.00                       | 0.26                | -0.33               | -0.26                          | 0.48                           | 0.48                          | 0.00                         |  |
| 125.00                       | 0.58                   | 302.33             | 125.00                       | 0.39                | -0.52               | -0.39                          | 0.45                           | 0.40                          | -21.88                       |  |
| 150.00                       | 0.64                   | 311.36             | 150.00                       | 0.55                | -0.73               | -0.56                          | 0.45                           | 0.24                          | 36.12                        |  |
| 175.00                       | 0.60                   | 329.71             | 174.99                       | 0.75                | -0.90               | -0.76                          | 0.81                           | -0.16                         | 73.40                        |  |
| 200.00                       | 0.72                   | 319.84             | 199.99                       | 0.99                | -1.07               | -1.00                          | 0.66                           | 0.48                          | -39.48                       |  |
| 225.00                       | 0.70                   | 322.45             | 224.99                       | 1.23                | -1.26               | -1.24                          | 0.15                           | -0.08                         | 10.44                        |  |
| 250.00                       | 0.68                   | 330.89             | 249.99                       | 1.48                | -1.43               | -1.49                          | 0.41                           | -0.08                         | 33.76                        |  |
| 275.00                       | 0.71                   | 328.53             | 274.99                       | 1.74                | -1.58               | -1.75                          | 0.17                           | 0.12                          | -9.44                        |  |

# Survey Report

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**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------|-----------------|-------------|-----------------------|-------------|-------------|-------------------------|-------------------------|------------------------|-----------------------|
| 300.00                | 0.69            | 321.99      | 299.99                | 1.99        | -1.76       | -2.01                   | 0.33                    | -0.08                  | -26.16                |
| 325.00                | 0.75            | 324.38      | 324.98                | 2.24        | -1.94       | -2.26                   | 0.27                    | 0.24                   | 9.56                  |
| 350.00                | 0.71            | 317.24      | 349.98                | 2.49        | -2.15       | -2.51                   | 0.40                    | -0.16                  | -28.56                |
| 375.00                | 0.68            | 330.64      | 374.98                | 2.73        | -2.32       | -2.75                   | 0.66                    | -0.12                  | 53.60                 |
| 400.00                | 0.67            | 339.21      | 399.98                | 3.00        | -2.45       | -3.02                   | 0.41                    | -0.04                  | 34.28                 |
| 425.00                | 0.71            | 338.24      | 424.98                | 3.28        | -2.56       | -3.30                   | 0.17                    | 0.16                   | -3.88                 |
| 450.00                | 0.68            | 336.75      | 449.97                | 3.56        | -2.67       | -3.58                   | 0.14                    | -0.12                  | -5.96                 |
| 475.00                | 0.69            | 344.22      | 474.97                | 3.84        | -2.77       | -3.87                   | 0.36                    | 0.04                   | 29.88                 |
| 500.00                | 0.69            | 336.88      | 499.97                | 4.12        | -2.87       | -4.15                   | 0.35                    | 0.00                   | -29.36                |
| 525.00                | 0.70            | 340.09      | 524.97                | 4.41        | -2.98       | -4.43                   | 0.16                    | 0.04                   | 12.84                 |
| 550.00                | 0.71            | 328.43      | 549.97                | 4.68        | -3.12       | -4.71                   | 0.57                    | 0.04                   | -46.64                |
| 575.00                | 0.68            | 1.13        | 574.97                | 4.96        | -3.19       | -4.99                   | 1.57                    | -0.12                  | 130.80                |
| 600.00                | 0.74            | 23.57       | 599.96                | 5.26        | -3.13       | -5.29                   | 1.13                    | 0.24                   | 89.76                 |
| 625.00                | 0.55            | 343.42      | 624.96                | 5.52        | -3.10       | -5.55                   | 1.91                    | -0.76                  | -160.60               |
| 650.00                | 0.53            | 344.52      | 649.96                | 5.75        | -3.16       | -5.78                   | 0.09                    | -0.08                  | 4.40                  |
| 675.00                | 0.53            | 352.78      | 674.96                | 5.97        | -3.21       | -6.00                   | 0.31                    | 0.00                   | 33.04                 |
| 700.00                | 0.42            | 346.41      | 699.96                | 6.18        | -3.24       | -6.21                   | 0.49                    | -0.44                  | -25.48                |
| 725.00                | 0.44            | 342.97      | 724.96                | 6.36        | -3.29       | -6.39                   | 0.13                    | 0.08                   | -13.76                |
| 750.00                | 0.42            | 338.77      | 749.96                | 6.54        | -3.35       | -6.57                   | 0.15                    | -0.08                  | -16.80                |
| 775.00                | 0.47            | 351.33      | 774.96                | 6.72        | -3.40       | -6.75                   | 0.44                    | 0.20                   | 50.24                 |
| 800.00                | 0.51            | 350.02      | 799.96                | 6.93        | -3.44       | -6.96                   | 0.17                    | 0.16                   | -5.24                 |
| 825.00                | 0.39            | 352.34      | 824.96                | 7.13        | -3.47       | -7.16                   | 0.49                    | -0.48                  | 9.28                  |
| 850.00                | 0.42            | 357.14      | 849.95                | 7.30        | -3.48       | -7.33                   | 0.18                    | 0.12                   | 19.20                 |
| 875.00                | 0.32            | 350.86      | 874.95                | 7.46        | -3.50       | -7.49                   | 0.43                    | -0.40                  | -25.12                |
| 900.00                | 0.29            | 3.66        | 899.95                | 7.60        | -3.51       | -7.63                   | 0.30                    | -0.12                  | 51.20                 |
| 925.00                | 0.27            | 17.58       | 924.95                | 7.71        | -3.49       | -7.75                   | 0.28                    | -0.08                  | 55.68                 |
| 950.00                | 0.22            | 54.92       | 949.95                | 7.80        | -3.43       | -7.83                   | 0.66                    | -0.20                  | 149.36                |
| 975.00                | 0.17            | 66.13       | 974.95                | 7.84        | -3.36       | -7.87                   | 0.25                    | -0.20                  | 44.84                 |
| 1,000.00              | 0.35            | 137.85      | 999.95                | 7.80        | -3.27       | -7.83                   | 1.35                    | 0.72                   | 286.88                |
| 1,025.00              | 0.53            | 159.95      | 1,024.95              | 7.63        | -3.18       | -7.66                   | 0.98                    | 0.72                   | 88.40                 |
| 1,050.00              | 0.60            | 149.43      | 1,049.95              | 7.41        | -3.07       | -7.44                   | 0.50                    | 0.28                   | -42.08                |
| 1,075.00              | 0.56            | 151.52      | 1,074.95              | 7.19        | -2.95       | -7.22                   | 0.18                    | -0.16                  | 8.36                  |
| 1,100.00              | 0.55            | 146.26      | 1,099.95              | 6.99        | -2.82       | -7.01                   | 0.21                    | -0.04                  | -21.04                |
| 1,125.00              | 0.61            | 150.10      | 1,124.95              | 6.77        | -2.69       | -6.79                   | 0.29                    | 0.24                   | 15.36                 |
| 1,150.00              | 0.70            | 146.19      | 1,149.95              | 6.53        | -2.54       | -6.55                   | 0.40                    | 0.36                   | -15.64                |
| 1,175.00              | 0.77            | 150.30      | 1,174.94              | 6.26        | -2.37       | -6.28                   | 0.35                    | 0.28                   | 16.44                 |
| 1,200.00              | 0.82            | 148.10      | 1,199.94              | 5.96        | -2.19       | -5.98                   | 0.23                    | 0.20                   | -8.80                 |
| 1,225.00              | 0.81            | 156.22      | 1,224.94              | 5.64        | -2.03       | -5.66                   | 0.46                    | -0.04                  | 32.48                 |
| 1,250.00              | 0.81            | 156.40      | 1,249.94              | 5.32        | -1.89       | -5.34                   | 0.01                    | 0.00                   | 0.72                  |
| 1,275.00              | 0.79            | 153.45      | 1,274.93              | 5.00        | -1.74       | -5.02                   | 0.18                    | -0.08                  | -11.80                |
| 1,300.00              | 0.75            | 155.57      | 1,299.93              | 4.70        | -1.59       | -4.72                   | 0.20                    | -0.16                  | 8.48                  |
| 1,325.00              | 0.78            | 156.68      | 1,324.93              | 4.40        | -1.46       | -4.41                   | 0.13                    | 0.12                   | 4.44                  |
| 1,350.00              | 0.84            | 143.95      | 1,349.93              | 4.09        | -1.28       | -4.10                   | 0.76                    | 0.24                   | -50.92                |

# Survey Report

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**Wellbore:** OH  
**Design:** OH

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| 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) |
| 1,375.00              | 0.93            | 142.62      | 1,374.92              | 3.78         | -1.05        | -3.79                   | 0.37                    | 0.36                   | -5.32                 |
| 1,400.00              | 0.96            | 150.46      | 1,399.92              | 3.44         | -0.82        | -3.45                   | 0.53                    | 0.12                   | 31.36                 |
| 1,425.00              | 0.94            | 153.63      | 1,424.92              | 3.07         | -0.63        | -3.08                   | 0.22                    | -0.08                  | 12.68                 |
| 1,450.00              | 0.88            | 151.30      | 1,449.91              | 2.72         | -0.45        | -2.72                   | 0.28                    | -0.24                  | -9.32                 |
| 1,475.00              | 0.89            | 152.67      | 1,474.91              | 2.38         | -0.27        | -2.38                   | 0.09                    | 0.04                   | 5.48                  |
| 1,500.00              | 0.91            | 148.95      | 1,499.91              | 2.04         | -0.07        | -2.04                   | 0.25                    | 0.08                   | -14.88                |
| 1,525.00              | 0.80            | 177.24      | 1,524.91              | 1.69         | 0.04         | -1.69                   | 1.73                    | -0.44                  | 113.16                |
| 1,550.00              | 0.90            | 230.71      | 1,549.90              | 1.39         | -0.11        | -1.39                   | 3.08                    | 0.40                   | 213.88                |
| 1,575.00              | 1.41            | 258.47      | 1,574.90              | 1.21         | -0.56        | -1.21                   | 2.97                    | 2.04                   | 111.04                |
| 1,600.00              | 1.76            | 269.98      | 1,599.89              | 1.15         | -1.25        | -1.16                   | 1.89                    | 1.40                   | 46.04                 |
| 1,625.00              | 1.91            | 280.51      | 1,624.88              | 1.22         | -2.04        | -1.24                   | 1.47                    | 0.60                   | 42.12                 |
| 1,650.00              | 1.99            | 292.78      | 1,649.86              | 1.47         | -2.85        | -1.49                   | 1.70                    | 0.32                   | 49.08                 |
| 1,675.00              | 2.20            | 300.54      | 1,674.84              | 1.88         | -3.66        | -1.91                   | 1.41                    | 0.84                   | 31.04                 |
| 1,700.00              | 2.11            | 304.21      | 1,699.83              | 2.38         | -4.46        | -2.42                   | 0.66                    | -0.36                  | 14.68                 |
| 1,725.00              | 1.97            | 305.83      | 1,724.81              | 2.89         | -5.19        | -2.94                   | 0.61                    | -0.56                  | 6.48                  |
| 1,750.00              | 1.85            | 304.86      | 1,749.80              | 3.37         | -5.87        | -3.43                   | 0.50                    | -0.48                  | -3.88                 |
| 1,775.00              | 1.73            | 300.82      | 1,774.78              | 3.80         | -6.52        | -3.86                   | 0.70                    | -0.48                  | -16.16                |
| 1,800.00              | 1.83            | 299.77      | 1,799.77              | 4.19         | -7.19        | -4.25                   | 0.42                    | 0.40                   | -4.20                 |
| 1,825.00              | 1.69            | 301.38      | 1,824.76              | 4.58         | -7.85        | -4.65                   | 0.59                    | -0.56                  | 6.44                  |
| 1,850.00              | 1.69            | 302.04      | 1,849.75              | 4.97         | -8.48        | -5.04                   | 0.08                    | 0.00                   | 2.64                  |
| 1,875.00              | 1.81            | 300.46      | 1,874.74              | 5.36         | -9.13        | -5.44                   | 0.52                    | 0.48                   | -6.32                 |
| 1,900.00              | 1.82            | 309.04      | 1,899.73              | 5.81         | -9.78        | -5.90                   | 1.09                    | 0.04                   | 34.32                 |
| 1,925.00              | 2.09            | 314.14      | 1,924.71              | 6.38         | -10.42       | -6.47                   | 1.28                    | 1.08                   | 20.40                 |
| 1,950.00              | 2.21            | 322.69      | 1,949.69              | 7.08         | -11.04       | -7.18                   | 1.37                    | 0.48                   | 34.20                 |
| 1,975.00              | 2.40            | 326.49      | 1,974.67              | 7.90         | -11.62       | -8.01                   | 0.97                    | 0.76                   | 15.20                 |
| 2,000.00              | 2.36            | 324.22      | 1,999.65              | 8.75         | -12.21       | -8.87                   | 0.41                    | -0.16                  | -9.08                 |
| 2,025.00              | 2.13            | 326.30      | 2,024.63              | 9.56         | -12.77       | -9.67                   | 0.98                    | -0.92                  | 8.32                  |
| 2,050.00              | 1.97            | 324.83      | 2,049.62              | 10.30        | -13.27       | -10.42                  | 0.67                    | -0.64                  | -5.88                 |
| 2,075.00              | 1.82            | 325.08      | 2,074.60              | 10.97        | -13.75       | -11.10                  | 0.60                    | -0.60                  | 1.00                  |
| 2,100.00              | 1.79            | 324.73      | 2,099.59              | 11.62        | -14.20       | -11.75                  | 0.13                    | -0.12                  | -1.40                 |
| 2,125.00              | 1.62            | 322.97      | 2,124.58              | 12.22        | -14.64       | -12.35                  | 0.71                    | -0.68                  | -7.04                 |
| 2,150.00              | 1.71            | 322.16      | 2,149.57              | 12.80        | -15.08       | -12.93                  | 0.37                    | 0.36                   | -3.24                 |
| 2,175.00              | 1.57            | 326.91      | 2,174.56              | 13.38        | -15.49       | -13.52                  | 0.78                    | -0.56                  | 19.00                 |
| 2,200.00              | 1.56            | 324.95      | 2,199.55              | 13.94        | -15.88       | -14.09                  | 0.22                    | -0.04                  | -7.84                 |
| 2,225.00              | 1.64            | 328.46      | 2,224.54              | 14.53        | -16.26       | -14.67                  | 0.51                    | 0.32                   | 14.04                 |
| 2,250.00              | 1.51            | 326.79      | 2,249.53              | 15.11        | -16.63       | -15.26                  | 0.55                    | -0.52                  | -6.68                 |
| 2,275.00              | 1.41            | 324.43      | 2,274.52              | 15.63        | -16.99       | -15.79                  | 0.47                    | -0.40                  | -9.44                 |
| 2,300.00              | 2.07            | 288.96      | 2,299.51              | 16.03        | -17.59       | -16.19                  | 4.93                    | 2.64                   | -141.88               |
| 2,325.00              | 1.25            | 303.75      | 2,324.50              | 16.33        | -18.25       | -16.49                  | 3.67                    | -3.28                  | 59.16                 |
| 2,350.00              | 1.11            | 293.22      | 2,349.50              | 16.57        | -18.69       | -16.74                  | 1.03                    | -0.56                  | -42.12                |
| 2,375.00              | 0.84            | 307.77      | 2,374.49              | 16.78        | -19.06       | -16.95                  | 1.46                    | -1.08                  | 58.20                 |
| 2,400.00              | 1.20            | 291.41      | 2,399.49              | 16.99        | -19.45       | -17.17                  | 1.84                    | 1.44                   | -65.44                |
| 2,425.00              | 1.20            | 290.51      | 2,424.48              | 17.18        | -19.94       | -17.36                  | 0.08                    | 0.00                   | -3.60                 |

# Survey Report

|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING, LLC          | <b>Local Co-ordinate Reference:</b> | Well #22H                               |
| <b>Project:</b>  | Lea County, NM (NAD27) NMEZ | <b>TVD Reference:</b>               | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Site:</b>     | White Falcon 16 Federal COM | <b>MD Reference:</b>                | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | OH                          | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | OH                          | <b>Database:</b>                    | EDM 5000.14 Single User Db              |

| 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 2,450.00              | 1.19            | 288.44      | 2,449.48              | 17.35        | -20.43       | -17.54                  | 0.18                    | -0.04                  | -8.28                 |
| 2,475.00              | 1.20            | 289.52      | 2,474.47              | 17.52        | -20.92       | -17.71                  | 0.10                    | 0.04                   | 4.32                  |
| 2,500.00              | 1.22            | 302.21      | 2,499.47              | 17.75        | -21.40       | -17.94                  | 1.07                    | 0.08                   | 50.76                 |
| 2,525.00              | 1.06            | 325.96      | 2,524.46              | 18.08        | -21.75       | -18.28                  | 1.98                    | -0.64                  | 95.00                 |
| 2,550.00              | 1.26            | 310.49      | 2,549.46              | 18.45        | -22.09       | -18.65                  | 1.48                    | 0.80                   | -61.88                |
| 2,575.00              | 1.26            | 316.45      | 2,574.45              | 18.83        | -22.49       | -19.03                  | 0.52                    | 0.00                   | 23.84                 |
| 2,600.00              | 1.28            | 311.22      | 2,599.44              | 19.21        | -22.89       | -19.42                  | 0.47                    | 0.08                   | -20.92                |
| 2,625.00              | 1.35            | 317.31      | 2,624.44              | 19.61        | -23.30       | -19.83                  | 0.62                    | 0.28                   | 24.36                 |
| 2,650.00              | 1.24            | 325.52      | 2,649.43              | 20.05        | -23.65       | -20.27                  | 0.86                    | -0.44                  | 32.84                 |
| 2,675.00              | 1.11            | 318.93      | 2,674.43              | 20.46        | -23.96       | -20.68                  | 0.75                    | -0.52                  | -26.36                |
| 2,700.00              | 0.99            | 316.90      | 2,699.42              | 20.80        | -24.27       | -21.02                  | 0.50                    | -0.48                  | -8.12                 |
| 2,725.00              | 1.03            | 316.13      | 2,724.42              | 21.12        | -24.57       | -21.34                  | 0.17                    | 0.16                   | -3.08                 |
| 2,750.00              | 1.01            | 321.72      | 2,749.41              | 21.45        | -24.86       | -21.68                  | 0.41                    | -0.08                  | 22.36                 |
| 2,775.00              | 0.95            | 320.36      | 2,774.41              | 21.79        | -25.13       | -22.01                  | 0.26                    | -0.24                  | -5.44                 |
| 2,800.00              | 0.89            | 325.29      | 2,799.41              | 22.11        | -25.38       | -22.34                  | 0.40                    | -0.24                  | 19.72                 |
| 2,825.00              | 0.88            | 322.48      | 2,824.40              | 22.42        | -25.60       | -22.65                  | 0.18                    | -0.04                  | -11.24                |
| 2,850.00              | 0.90            | 318.37      | 2,849.40              | 22.72        | -25.85       | -22.95                  | 0.27                    | 0.08                   | -16.44                |
| 2,875.00              | 1.01            | 318.24      | 2,874.40              | 23.03        | -26.13       | -23.26                  | 0.44                    | 0.44                   | -0.52                 |
| 2,900.00              | 1.03            | 321.36      | 2,899.39              | 23.37        | -26.41       | -23.61                  | 0.24                    | 0.08                   | 12.48                 |
| 2,925.00              | 1.03            | 329.88      | 2,924.39              | 23.74        | -26.67       | -23.98                  | 0.61                    | 0.00                   | 34.08                 |
| 2,950.00              | 0.99            | 327.16      | 2,949.39              | 24.11        | -26.90       | -24.36                  | 0.25                    | -0.16                  | -10.88                |
| 2,975.00              | 1.00            | 326.34      | 2,974.38              | 24.48        | -27.14       | -24.72                  | 0.07                    | 0.04                   | -3.28                 |
| 3,000.00              | 1.15            | 328.04      | 2,999.38              | 24.87        | -27.39       | -25.12                  | 0.61                    | 0.60                   | 6.80                  |
| 3,025.00              | 1.27            | 336.21      | 3,024.37              | 25.34        | -27.63       | -25.59                  | 0.84                    | 0.48                   | 32.68                 |
| 3,050.00              | 1.21            | 331.37      | 3,049.37              | 25.82        | -27.87       | -26.07                  | 0.48                    | -0.24                  | -19.36                |
| 3,075.00              | 1.39            | 336.84      | 3,074.36              | 26.33        | -28.12       | -26.59                  | 0.87                    | 0.72                   | 21.88                 |
| 3,100.00              | 1.48            | 335.61      | 3,099.35              | 26.91        | -28.37       | -27.16                  | 0.38                    | 0.36                   | -4.92                 |
| 3,125.00              | 1.50            | 340.90      | 3,124.34              | 27.51        | -28.61       | -27.77                  | 0.56                    | 0.08                   | 21.16                 |
| 3,150.00              | 1.54            | 335.11      | 3,149.33              | 28.12        | -28.86       | -28.38                  | 0.63                    | 0.16                   | -23.16                |
| 3,175.00              | 1.45            | 333.55      | 3,174.33              | 28.71        | -29.14       | -28.97                  | 0.40                    | -0.36                  | -6.24                 |
| 3,200.00              | 1.58            | 337.27      | 3,199.32              | 29.31        | -29.42       | -29.58                  | 0.65                    | 0.52                   | 14.88                 |
| 3,225.00              | 1.62            | 340.25      | 3,224.31              | 29.96        | -29.67       | -30.23                  | 0.37                    | 0.16                   | 11.92                 |
| 3,250.00              | 1.53            | 336.41      | 3,249.30              | 30.60        | -29.92       | -30.87                  | 0.55                    | -0.36                  | -15.36                |
| 3,275.00              | 1.36            | 331.89      | 3,274.29              | 31.17        | -30.19       | -31.44                  | 0.82                    | -0.68                  | -18.08                |
| 3,300.00              | 1.24            | 327.50      | 3,299.28              | 31.66        | -30.48       | -31.93                  | 0.62                    | -0.48                  | -17.56                |
| 3,325.00              | 1.08            | 323.48      | 3,324.28              | 32.08        | -30.76       | -32.35                  | 0.72                    | -0.64                  | -16.08                |
| 3,350.00              | 0.92            | 321.11      | 3,349.27              | 32.42        | -31.03       | -32.70                  | 0.66                    | -0.64                  | -9.48                 |
| 3,375.00              | 0.67            | 330.48      | 3,374.27              | 32.70        | -31.23       | -32.99                  | 1.12                    | -1.00                  | 37.48                 |
| 3,400.00              | 0.63            | 321.59      | 3,399.27              | 32.94        | -31.39       | -33.22                  | 0.43                    | -0.16                  | -35.56                |
| 3,425.00              | 0.70            | 316.13      | 3,424.27              | 33.16        | -31.58       | -33.44                  | 0.38                    | 0.28                   | -21.84                |
| 3,450.00              | 0.54            | 315.95      | 3,449.27              | 33.35        | -31.77       | -33.64                  | 0.64                    | -0.64                  | -0.72                 |
| 3,475.00              | 0.51            | 317.59      | 3,474.27              | 33.52        | -31.92       | -33.81                  | 0.13                    | -0.12                  | 6.56                  |
| 3,500.00              | 0.59            | 312.49      | 3,499.27              | 33.69        | -32.09       | -33.98                  | 0.37                    | 0.32                   | -20.40                |
| 3,525.00              | 0.64            | 310.45      | 3,524.26              | 33.87        | -32.29       | -34.16                  | 0.22                    | 0.20                   | -8.16                 |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
| 3,550.00              | 0.73            | 323.35      | 3,549.26              | 34.08        | -32.49       | -34.38                  | 0.71                    | 0.36                   | 51.60                 |
| 3,575.00              | 0.63            | 330.61      | 3,574.26              | 34.33        | -32.66       | -34.63                  | 0.53                    | -0.40                  | 29.04                 |
| 3,600.00              | 0.68            | 324.61      | 3,599.26              | 34.57        | -32.81       | -34.87                  | 0.34                    | 0.20                   | -24.00                |
| 3,625.00              | 0.74            | 327.38      | 3,624.26              | 34.83        | -32.98       | -35.13                  | 0.28                    | 0.24                   | 11.08                 |
| 3,650.00              | 0.79            | 328.25      | 3,649.25              | 35.11        | -33.16       | -35.41                  | 0.21                    | 0.20                   | 3.48                  |
| 3,675.00              | 0.77            | 333.39      | 3,674.25              | 35.41        | -33.33       | -35.71                  | 0.29                    | -0.08                  | 20.56                 |
| 3,700.00              | 0.70            | 331.15      | 3,699.25              | 35.69        | -33.48       | -35.99                  | 0.30                    | -0.28                  | -8.96                 |
| 3,725.00              | 0.85            | 329.01      | 3,724.25              | 35.99        | -33.65       | -36.29                  | 0.61                    | 0.60                   | -8.56                 |
| 3,750.00              | 0.82            | 339.84      | 3,749.25              | 36.31        | -33.80       | -36.62                  | 0.64                    | -0.12                  | 43.32                 |
| 3,775.00              | 0.71            | 324.98      | 3,774.24              | 36.61        | -33.95       | -36.91                  | 0.90                    | -0.44                  | -59.44                |
| 3,800.00              | 0.79            | 327.28      | 3,799.24              | 36.88        | -34.14       | -37.19                  | 0.34                    | 0.32                   | 9.20                  |
| 3,825.00              | 0.84            | 333.85      | 3,824.24              | 37.19        | -34.31       | -37.50                  | 0.42                    | 0.20                   | 26.28                 |
| 3,850.00              | 0.79            | 335.45      | 3,849.24              | 37.51        | -34.46       | -37.82                  | 0.22                    | -0.20                  | 6.40                  |
| 3,875.00              | 0.86            | 334.14      | 3,874.23              | 37.84        | -34.61       | -38.15                  | 0.29                    | 0.28                   | -5.24                 |
| 3,900.00              | 0.93            | 335.56      | 3,899.23              | 38.19        | -34.78       | -38.50                  | 0.29                    | 0.28                   | 5.68                  |
| 3,925.00              | 0.97            | 334.14      | 3,924.23              | 38.56        | -34.96       | -38.88                  | 0.19                    | 0.16                   | -5.68                 |
| 3,950.00              | 1.13            | 339.73      | 3,949.22              | 38.99        | -35.13       | -39.30                  | 0.76                    | 0.64                   | 22.36                 |
| 3,975.00              | 1.06            | 347.81      | 3,974.22              | 39.44        | -35.27       | -39.76                  | 0.68                    | -0.28                  | 32.32                 |
| 4,000.00              | 1.12            | 340.01      | 3,999.21              | 39.90        | -35.40       | -40.22                  | 0.64                    | 0.24                   | -31.20                |
| 4,025.00              | 1.29            | 346.45      | 4,024.21              | 40.40        | -35.55       | -40.72                  | 0.87                    | 0.68                   | 25.76                 |
| 4,050.00              | 1.42            | 345.28      | 4,049.20              | 40.97        | -35.70       | -41.30                  | 0.53                    | 0.52                   | -4.68                 |
| 4,075.00              | 1.10            | 341.25      | 4,074.19              | 41.50        | -35.85       | -41.83                  | 1.33                    | -1.28                  | -16.12                |
| 4,100.00              | 0.98            | 338.60      | 4,099.19              | 41.93        | -36.01       | -42.25                  | 0.52                    | -0.48                  | -10.60                |
| 4,125.00              | 0.83            | 345.75      | 4,124.19              | 42.30        | -36.13       | -42.63                  | 0.75                    | -0.60                  | 28.60                 |
| 4,150.00              | 0.48            | 43.36       | 4,149.19              | 42.55        | -36.10       | -42.88                  | 2.81                    | -1.40                  | 230.44                |
| 4,175.00              | 0.60            | 81.99       | 4,174.19              | 42.65        | -35.90       | -42.97                  | 1.50                    | 0.48                   | 154.52                |
| 4,200.00              | 0.77            | 90.04       | 4,199.18              | 42.67        | -35.60       | -42.99                  | 0.78                    | 0.68                   | 32.20                 |
| 4,225.00              | 1.01            | 90.55       | 4,224.18              | 42.66        | -35.21       | -42.98                  | 0.96                    | 0.96                   | 2.04                  |
| 4,250.00              | 0.94            | 94.75       | 4,249.18              | 42.65        | -34.79       | -42.96                  | 0.40                    | -0.28                  | 16.80                 |
| 4,275.00              | 0.93            | 87.44       | 4,274.17              | 42.64        | -34.38       | -42.95                  | 0.48                    | -0.04                  | -29.24                |
| 4,300.00              | 0.98            | 95.96       | 4,299.17              | 42.62        | -33.97       | -42.93                  | 0.60                    | 0.20                   | 34.08                 |
| 4,325.00              | 0.48            | 100.31      | 4,324.17              | 42.58        | -33.65       | -42.89                  | 2.01                    | -2.00                  | 17.40                 |
| 4,350.00              | 0.34            | 357.61      | 4,349.17              | 42.64        | -33.55       | -42.94                  | 2.59                    | -0.56                  | -410.80               |
| 4,375.00              | 0.66            | 297.13      | 4,374.17              | 42.78        | -33.68       | -43.08                  | 2.30                    | 1.28                   | -241.92               |
| 4,400.00              | 1.19            | 291.12      | 4,399.16              | 42.94        | -34.05       | -43.24                  | 2.15                    | 2.12                   | -24.04                |
| 4,425.00              | 1.60            | 289.31      | 4,424.16              | 43.15        | -34.62       | -43.46                  | 1.65                    | 1.64                   | -7.24                 |
| 4,450.00              | 2.10            | 286.03      | 4,449.14              | 43.39        | -35.39       | -43.71                  | 2.04                    | 2.00                   | -13.12                |
| 4,475.00              | 2.41            | 290.74      | 4,474.12              | 43.70        | -36.33       | -44.03                  | 1.44                    | 1.24                   | 18.84                 |
| 4,500.00              | 2.65            | 293.77      | 4,499.10              | 44.12        | -37.35       | -44.46                  | 1.10                    | 0.96                   | 12.12                 |
| 4,525.00              | 2.79            | 294.59      | 4,524.07              | 44.61        | -38.43       | -44.95                  | 0.58                    | 0.56                   | 3.28                  |
| 4,550.00              | 2.62            | 302.06      | 4,549.04              | 45.16        | -39.47       | -45.52                  | 1.56                    | -0.68                  | 29.88                 |
| 4,575.00              | 2.50            | 307.71      | 4,574.02              | 45.80        | -40.38       | -46.16                  | 1.12                    | -0.48                  | 22.60                 |
| 4,600.00              | 2.51            | 322.53      | 4,598.99              | 46.57        | -41.15       | -46.94                  | 2.58                    | 0.04                   | 59.28                 |

# Survey Report

|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING, LLC          | <b>Local Co-ordinate Reference:</b> | Well #22H                               |
| <b>Project:</b>  | Lea County, NM (NAD27) NMEZ | <b>TVD Reference:</b>               | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Site:</b>     | White Falcon 16 Federal COM | <b>MD Reference:</b>                | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | OH                          | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | OH                          | <b>Database:</b>                    | EDM 5000.14 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) |
| 4,625.00              | 2.27            | 339.99      | 4,623.97              | 47.47        | -41.65       | -47.84                  | 3.05                    | -0.96                  | 69.84                 |
| 4,650.00              | 2.17            | 349.07      | 4,648.95              | 48.40        | -41.91       | -48.78                  | 1.46                    | -0.40                  | 36.32                 |
| 4,675.00              | 2.25            | 359.32      | 4,673.94              | 49.35        | -42.00       | -49.73                  | 1.61                    | 0.32                   | 41.00                 |
| 4,700.00              | 2.10            | 12.66       | 4,698.92              | 50.29        | -41.91       | -50.67                  | 2.11                    | -0.60                  | 53.36                 |
| 4,725.00              | 1.94            | 45.61       | 4,723.90              | 51.03        | -41.51       | -51.41                  | 4.62                    | -0.64                  | 131.80                |
| 4,750.00              | 1.71            | 71.78       | 4,748.89              | 51.45        | -40.85       | -51.81                  | 3.42                    | -0.92                  | 104.68                |
| 4,775.00              | 1.97            | 101.41      | 4,773.88              | 51.48        | -40.07       | -51.84                  | 3.90                    | 1.04                   | 118.52                |
| 4,800.00              | 2.05            | 114.00      | 4,798.86              | 51.21        | -39.24       | -51.56                  | 1.79                    | 0.32                   | 50.36                 |
| 4,825.00              | 2.11            | 122.08      | 4,823.85              | 50.78        | -38.45       | -51.13                  | 1.20                    | 0.24                   | 32.32                 |
| 4,850.00              | 2.13            | 129.81      | 4,848.83              | 50.24        | -37.70       | -50.58                  | 1.15                    | 0.08                   | 30.92                 |
| 4,875.00              | 1.79            | 150.56      | 4,873.82              | 49.60        | -37.15       | -49.94                  | 3.12                    | -1.36                  | 83.00                 |
| 4,900.00              | 1.42            | 182.57      | 4,898.81              | 48.96        | -36.97       | -49.29                  | 3.82                    | -1.48                  | 128.04                |
| 4,925.00              | 1.51            | 203.62      | 4,923.80              | 48.34        | -37.12       | -48.68                  | 2.17                    | 0.36                   | 84.20                 |
| 4,950.00              | 1.65            | 220.88      | 4,948.79              | 47.77        | -37.49       | -48.11                  | 1.98                    | 0.56                   | 69.04                 |
| 4,975.00              | 1.70            | 219.05      | 4,973.78              | 47.21        | -37.95       | -47.55                  | 0.29                    | 0.20                   | -7.32                 |
| 5,000.00              | 1.78            | 219.79      | 4,998.77              | 46.62        | -38.44       | -46.97                  | 0.33                    | 0.32                   | 2.96                  |
| 5,025.00              | 1.79            | 223.12      | 5,023.75              | 46.04        | -38.95       | -46.39                  | 0.42                    | 0.04                   | 13.32                 |
| 5,050.00              | 1.78            | 223.30      | 5,048.74              | 45.47        | -39.49       | -45.83                  | 0.05                    | -0.04                  | 0.72                  |
| 5,075.00              | 1.68            | 223.37      | 5,073.73              | 44.92        | -40.00       | -45.29                  | 0.40                    | -0.40                  | 0.28                  |
| 5,100.00              | 1.72            | 224.37      | 5,098.72              | 44.39        | -40.52       | -44.76                  | 0.20                    | 0.16                   | 4.00                  |
| 5,125.00              | 1.72            | 228.99      | 5,123.71              | 43.87        | -41.06       | -44.25                  | 0.55                    | 0.00                   | 18.48                 |
| 5,150.00              | 1.70            | 238.45      | 5,148.70              | 43.43        | -41.66       | -43.81                  | 1.13                    | -0.08                  | 37.84                 |
| 5,175.00              | 2.00            | 250.07      | 5,173.68              | 43.09        | -42.39       | -43.47                  | 1.92                    | 1.20                   | 46.48                 |
| 5,200.00              | 2.37            | 258.70      | 5,198.67              | 42.84        | -43.30       | -43.23                  | 1.98                    | 1.48                   | 34.52                 |
| 5,225.00              | 2.55            | 263.25      | 5,223.64              | 42.68        | -44.36       | -43.08                  | 1.06                    | 0.72                   | 18.20                 |
| 5,250.00              | 2.50            | 266.54      | 5,248.62              | 42.58        | -45.46       | -42.99                  | 0.61                    | -0.20                  | 13.16                 |
| 5,275.00              | 2.70            | 271.71      | 5,273.59              | 42.56        | -46.59       | -42.98                  | 1.23                    | 0.80                   | 20.68                 |
| 5,300.00              | 2.76            | 291.92      | 5,298.57              | 42.80        | -47.74       | -43.24                  | 3.84                    | 0.24                   | 80.84                 |
| 5,325.00              | 2.76            | 297.43      | 5,323.54              | 43.31        | -48.83       | -43.75                  | 1.06                    | 0.00                   | 22.04                 |
| 5,350.00              | 2.57            | 302.34      | 5,348.51              | 43.88        | -49.84       | -44.33                  | 1.19                    | -0.76                  | 19.64                 |
| 5,375.00              | 2.55            | 304.49      | 5,373.48              | 44.50        | -50.77       | -44.96                  | 0.39                    | -0.08                  | 8.60                  |
| 5,400.00              | 2.47            | 304.68      | 5,398.46              | 45.12        | -51.67       | -45.59                  | 0.32                    | -0.32                  | 0.76                  |
| 5,425.00              | 2.40            | 308.54      | 5,423.44              | 45.75        | -52.53       | -46.23                  | 0.71                    | -0.28                  | 15.44                 |
| 5,450.00              | 2.40            | 310.42      | 5,448.42              | 46.42        | -53.33       | -46.90                  | 0.31                    | 0.00                   | 7.52                  |
| 5,475.00              | 2.36            | 306.44      | 5,473.39              | 47.06        | -54.15       | -47.55                  | 0.68                    | -0.16                  | -15.92                |
| 5,500.00              | 2.37            | 310.48      | 5,498.37              | 47.70        | -54.95       | -48.20                  | 0.67                    | 0.04                   | 16.16                 |
| 5,525.00              | 2.35            | 306.55      | 5,523.35              | 48.34        | -55.76       | -48.85                  | 0.65                    | -0.08                  | -15.72                |
| 5,550.00              | 2.30            | 303.09      | 5,548.33              | 48.92        | -56.59       | -49.44                  | 0.60                    | -0.20                  | -13.84                |
| 5,575.00              | 2.30            | 303.17      | 5,573.31              | 49.47        | -57.43       | -49.99                  | 0.01                    | 0.00                   | 0.32                  |
| 5,600.00              | 2.27            | 296.55      | 5,598.29              | 49.97        | -58.29       | -50.49                  | 1.06                    | -0.12                  | -26.48                |
| 5,625.00              | 2.46            | 309.92      | 5,623.27              | 50.53        | -59.15       | -51.07                  | 2.33                    | 0.76                   | 53.48                 |
| 5,650.00              | 2.44            | 310.98      | 5,648.25              | 51.23        | -59.96       | -51.77                  | 0.20                    | -0.08                  | 4.24                  |
| 5,675.00              | 2.31            | 307.39      | 5,673.23              | 51.88        | -60.76       | -52.43                  | 0.79                    | -0.52                  | -14.36                |

# Survey Report

|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING, LLC          | <b>Local Co-ordinate Reference:</b> | Well #22H                               |
| <b>Project:</b>  | Lea County, NM (NAD27) NMEZ | <b>TVD Reference:</b>               | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Site:</b>     | White Falcon 16 Federal COM | <b>MD Reference:</b>                | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | OH                          | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | OH                          | <b>Database:</b>                    | EDM 5000.14 Single User Db              |

| Survey                      |                    |                |                             |                 |                 |                               |                               |                              |                             |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
| 5,700.00                    | 2.49               | 308.96         | 5,698.20                    | 52.53           | -61.59          | -53.09                        | 0.77                          | 0.72                         | 6.28                        |
| 5,725.00                    | 2.44               | 310.09         | 5,723.18                    | 53.21           | -62.42          | -53.78                        | 0.28                          | -0.20                        | 4.52                        |
| 5,750.00                    | 2.29               | 305.39         | 5,748.16                    | 53.85           | -63.23          | -54.42                        | 0.98                          | -0.60                        | -18.80                      |
| 5,775.00                    | 2.40               | 309.75         | 5,773.14                    | 54.47           | -64.04          | -55.05                        | 0.84                          | 0.44                         | 17.44                       |
| 5,800.00                    | 2.32               | 310.14         | 5,798.12                    | 55.13           | -64.83          | -55.72                        | 0.33                          | -0.32                        | 1.56                        |
| 5,825.00                    | 2.29               | 308.92         | 5,823.10                    | 55.77           | -65.60          | -56.36                        | 0.23                          | -0.12                        | -4.88                       |
| 5,850.00                    | 2.37               | 309.51         | 5,848.08                    | 56.41           | -66.39          | -57.01                        | 0.33                          | 0.32                         | 2.36                        |
| 5,875.00                    | 2.34               | 310.94         | 5,873.06                    | 57.08           | -67.18          | -57.68                        | 0.26                          | -0.12                        | 5.72                        |
| 5,900.00                    | 2.36               | 310.29         | 5,898.03                    | 57.74           | -67.95          | -58.36                        | 0.13                          | 0.08                         | -2.60                       |
| 5,925.00                    | 2.40               | 310.92         | 5,923.01                    | 58.42           | -68.74          | -59.04                        | 0.19                          | 0.16                         | 2.52                        |
| 5,950.00                    | 2.35               | 309.85         | 5,947.99                    | 59.09           | -69.53          | -59.72                        | 0.27                          | -0.20                        | -4.28                       |
| 5,975.00                    | 2.43               | 310.71         | 5,972.97                    | 59.76           | -70.33          | -60.40                        | 0.35                          | 0.32                         | 3.44                        |
| 6,000.00                    | 2.47               | 311.42         | 5,997.95                    | 60.47           | -71.13          | -61.11                        | 0.20                          | 0.16                         | 2.84                        |
| 6,025.00                    | 2.51               | 312.08         | 6,022.92                    | 61.19           | -71.94          | -61.84                        | 0.20                          | 0.16                         | 2.64                        |
| 6,050.00                    | 2.42               | 310.93         | 6,047.90                    | 61.90           | -72.75          | -62.56                        | 0.41                          | -0.36                        | -4.60                       |
| 6,075.00                    | 2.36               | 309.95         | 6,072.88                    | 62.58           | -73.54          | -63.24                        | 0.29                          | -0.24                        | -3.92                       |
| 6,100.00                    | 2.32               | 309.67         | 6,097.86                    | 63.23           | -74.33          | -63.90                        | 0.17                          | -0.16                        | -1.12                       |
| 6,125.00                    | 2.34               | 308.95         | 6,122.84                    | 63.88           | -75.11          | -64.56                        | 0.14                          | 0.08                         | -2.88                       |
| 6,150.00                    | 2.36               | 308.82         | 6,147.82                    | 64.52           | -75.91          | -65.21                        | 0.08                          | 0.08                         | -0.52                       |
| 6,175.00                    | 2.33               | 311.94         | 6,172.80                    | 65.18           | -76.69          | -65.88                        | 0.52                          | -0.12                        | 12.48                       |
| 6,200.00                    | 2.43               | 308.74         | 6,197.77                    | 65.85           | -77.48          | -66.55                        | 0.67                          | 0.40                         | -12.80                      |
| 6,225.00                    | 2.34               | 309.21         | 6,222.75                    | 66.51           | -78.29          | -67.22                        | 0.37                          | -0.36                        | 1.88                        |
| 6,250.00                    | 2.29               | 308.35         | 6,247.73                    | 67.14           | -79.08          | -67.86                        | 0.24                          | -0.20                        | -3.44                       |
| 6,275.00                    | 2.31               | 307.12         | 6,272.71                    | 67.75           | -79.87          | -68.48                        | 0.21                          | 0.08                         | -4.92                       |
| 6,300.00                    | 2.38               | 309.48         | 6,297.69                    | 68.39           | -80.67          | -69.12                        | 0.48                          | 0.28                         | 9.44                        |
| 6,325.00                    | 2.36               | 310.51         | 6,322.67                    | 69.05           | -81.46          | -69.79                        | 0.19                          | -0.08                        | 4.12                        |
| 6,350.00                    | 2.46               | 307.97         | 6,347.65                    | 69.72           | -82.28          | -70.46                        | 0.59                          | 0.40                         | -10.16                      |
| 6,375.00                    | 2.38               | 310.36         | 6,372.62                    | 70.38           | -83.10          | -71.13                        | 0.52                          | -0.32                        | 9.56                        |
| 6,400.00                    | 2.40               | 309.86         | 6,397.60                    | 71.05           | -83.89          | -71.81                        | 0.12                          | 0.08                         | -2.00                       |
| 6,425.00                    | 2.36               | 310.01         | 6,422.58                    | 71.72           | -84.69          | -72.49                        | 0.16                          | -0.16                        | 0.60                        |
| 6,450.00                    | 2.49               | 308.58         | 6,447.56                    | 72.39           | -85.51          | -73.16                        | 0.57                          | 0.52                         | -5.72                       |
| 6,475.00                    | 2.42               | 307.89         | 6,472.54                    | 73.05           | -86.35          | -73.83                        | 0.30                          | -0.28                        | -2.76                       |
| 6,500.00                    | 2.54               | 310.05         | 6,497.51                    | 73.73           | -87.19          | -74.52                        | 0.61                          | 0.48                         | 8.64                        |
| 6,525.00                    | 2.41               | 309.25         | 6,522.49                    | 74.42           | -88.02          | -75.22                        | 0.54                          | -0.52                        | -3.20                       |
| 6,550.00                    | 2.55               | 309.95         | 6,547.47                    | 75.11           | -88.86          | -75.92                        | 0.57                          | 0.56                         | 2.80                        |
| 6,575.00                    | 2.40               | 311.66         | 6,572.44                    | 75.82           | -89.67          | -76.63                        | 0.67                          | -0.60                        | 6.84                        |
| 6,600.00                    | 2.40               | 309.50         | 6,597.42                    | 76.50           | -90.47          | -77.32                        | 0.36                          | 0.00                         | -8.64                       |
| 6,625.00                    | 2.26               | 311.28         | 6,622.40                    | 77.16           | -91.24          | -77.98                        | 0.63                          | -0.56                        | 7.12                        |
| 6,650.00                    | 2.10               | 315.27         | 6,647.38                    | 77.81           | -91.93          | -78.64                        | 0.88                          | -0.64                        | 15.96                       |
| 6,675.00                    | 2.04               | 318.98         | 6,672.37                    | 78.47           | -92.55          | -79.31                        | 0.59                          | -0.24                        | 14.84                       |
| 6,700.00                    | 1.73               | 328.12         | 6,697.35                    | 79.13           | -93.04          | -79.97                        | 1.72                          | -1.24                        | 36.56                       |
| 6,725.00                    | 1.53               | 335.21         | 6,722.34                    | 79.75           | -93.38          | -80.59                        | 1.13                          | -0.80                        | 28.36                       |
| 6,750.00                    | 1.50               | 338.26         | 6,747.33                    | 80.36           | -93.64          | -81.20                        | 0.34                          | -0.12                        | 12.20                       |
| 6,775.00                    | 1.46               | 334.65         | 6,772.33                    | 80.95           | -93.90          | -81.80                        | 0.41                          | -0.16                        | -14.44                      |



# Survey Report

|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING, LLC          | <b>Local Co-ordinate Reference:</b> | Well #22H                               |
| <b>Project:</b>  | Lea County, NM (NAD27) NMEZ | <b>TVD Reference:</b>               | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Site:</b>     | White Falcon 16 Federal COM | <b>MD Reference:</b>                | RKB @ 3271.60usft (Latshaw 44 - KB=25') |
| <b>Well:</b>     | #22H                        | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | OH                          | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | OH                          | <b>Database:</b>                    | EDM 5000.14 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) |
| 6,800.00              | 1.47            | 339.17      | 6,797.32              | 81.53        | -94.15       | -82.39                  | 0.46                    | 0.04                   | 18.08                 |
| 6,825.00              | 1.49            | 337.14      | 6,822.31              | 82.13        | -94.39       | -82.99                  | 0.22                    | 0.08                   | -8.12                 |
| 6,850.00              | 1.66            | 338.23      | 6,847.30              | 82.77        | -94.65       | -83.63                  | 0.69                    | 0.68                   | 4.36                  |
| 6,875.00              | 1.53            | 336.54      | 6,872.29              | 83.41        | -94.92       | -84.27                  | 0.55                    | -0.52                  | -6.76                 |
| 6,900.00              | 1.50            | 338.70      | 6,897.28              | 84.02        | -95.17       | -84.88                  | 0.26                    | -0.12                  | 8.64                  |
| 6,925.00              | 1.45            | 334.62      | 6,922.27              | 84.61        | -95.42       | -85.48                  | 0.47                    | -0.20                  | -16.32                |
| 6,950.00              | 1.53            | 339.81      | 6,947.26              | 85.21        | -95.67       | -86.08                  | 0.63                    | 0.32                   | 20.76                 |
| 6,975.00              | 1.43            | 334.09      | 6,972.26              | 85.81        | -95.93       | -86.67                  | 0.71                    | -0.40                  | -22.88                |
| 7,000.00              | 1.47            | 334.75      | 6,997.25              | 86.38        | -96.20       | -87.25                  | 0.17                    | 0.16                   | 2.64                  |
| 7,025.00              | 1.59            | 340.33      | 7,022.24              | 86.99        | -96.45       | -87.87                  | 0.76                    | 0.48                   | 22.32                 |
| 7,050.00              | 1.51            | 338.48      | 7,047.23              | 87.63        | -96.69       | -88.50                  | 0.38                    | -0.32                  | -7.40                 |
| 7,075.00              | 1.44            | 339.06      | 7,072.22              | 88.23        | -96.92       | -89.10                  | 0.29                    | -0.28                  | 2.32                  |
| 7,100.00              | 1.46            | 328.91      | 7,097.21              | 88.79        | -97.20       | -89.67                  | 1.03                    | 0.08                   | -40.60                |
| 7,125.00              | 1.49            | 339.23      | 7,122.21              | 89.37        | -97.48       | -90.25                  | 1.07                    | 0.12                   | 41.28                 |
| 7,150.00              | 1.52            | 334.01      | 7,147.20              | 89.97        | -97.74       | -90.85                  | 0.56                    | 0.12                   | -20.88                |
| 7,175.00              | 1.56            | 339.05      | 7,172.19              | 90.59        | -98.01       | -91.47                  | 0.56                    | 0.16                   | 20.16                 |
| 7,200.00              | 1.72            | 337.18      | 7,197.18              | 91.25        | -98.27       | -92.14                  | 0.67                    | 0.64                   | -7.48                 |
| 7,225.00              | 1.55            | 343.18      | 7,222.17              | 91.92        | -98.52       | -92.81                  | 0.96                    | -0.68                  | 24.00                 |
| 7,250.00              | 1.61            | 335.57      | 7,247.16              | 92.56        | -98.76       | -93.46                  | 0.87                    | 0.24                   | -30.44                |
| 7,275.00              | 1.69            | 338.89      | 7,272.15              | 93.23        | -99.04       | -94.12                  | 0.50                    | 0.32                   | 13.28                 |
| 7,300.00              | 1.59            | 337.76      | 7,297.14              | 93.89        | -99.30       | -94.79                  | 0.42                    | -0.40                  | -4.52                 |
| 7,325.00              | 1.79            | 334.74      | 7,322.13              | 94.57        | -99.60       | -95.47                  | 0.88                    | 0.80                   | -12.08                |
| 7,350.00              | 1.76            | 340.47      | 7,347.11              | 95.28        | -99.90       | -96.18                  | 0.72                    | -0.12                  | 22.92                 |
| 7,375.00              | 1.65            | 339.41      | 7,372.10              | 95.98        | -100.15      | -96.89                  | 0.46                    | -0.44                  | -4.24                 |
| 7,400.00              | 1.80            | 337.59      | 7,397.09              | 96.68        | -100.43      | -97.59                  | 0.64                    | 0.60                   | -7.28                 |
| 7,425.00              | 1.68            | 333.92      | 7,422.08              | 97.37        | -100.74      | -98.28                  | 0.65                    | -0.48                  | -14.68                |
| 7,450.00              | 1.82            | 334.93      | 7,447.07              | 98.06        | -101.07      | -98.97                  | 0.57                    | 0.56                   | 4.04                  |
| 7,475.00              | 1.83            | 326.80      | 7,472.06              | 98.75        | -101.45      | -99.67                  | 1.04                    | 0.04                   | -32.52                |
| 7,500.00              | 1.94            | 326.02      | 7,497.04              | 99.44        | -101.91      | -100.36                 | 0.45                    | 0.44                   | -3.12                 |
| 7,525.00              | 1.91            | 323.26      | 7,522.03              | 100.12       | -102.39      | -101.05                 | 0.39                    | -0.12                  | -11.04                |
| 7,550.00              | 1.91            | 323.37      | 7,547.01              | 100.79       | -102.89      | -101.72                 | 0.01                    | 0.00                   | 0.44                  |
| 7,575.00              | 1.93            | 327.28      | 7,572.00              | 101.48       | -103.37      | -102.42                 | 0.53                    | 0.08                   | 15.64                 |
| 7,600.00              | 1.91            | 323.43      | 7,596.99              | 102.17       | -103.84      | -103.11                 | 0.52                    | -0.08                  | -15.40                |
| 7,625.00              | 1.93            | 321.92      | 7,621.97              | 102.84       | -104.35      | -103.78                 | 0.22                    | 0.08                   | -6.04                 |
| 7,650.00              | 1.75            | 318.56      | 7,646.96              | 103.45       | -104.86      | -104.40                 | 0.84                    | -0.72                  | -13.44                |
| 7,675.00              | 1.80            | 318.26      | 7,671.95              | 104.03       | -105.38      | -104.98                 | 0.20                    | 0.20                   | -1.20                 |
| 7,700.00              | 1.78            | 318.47      | 7,696.94              | 104.62       | -105.90      | -105.57                 | 0.08                    | -0.08                  | 0.84                  |
| 7,725.00              | 1.78            | 314.55      | 7,721.92              | 105.18       | -106.43      | -106.14                 | 0.49                    | 0.00                   | -15.68                |
| 7,750.00              | 1.86            | 316.97      | 7,746.91              | 105.75       | -106.98      | -106.71                 | 0.44                    | 0.32                   | 9.68                  |
| 7,775.00              | 1.76            | 318.32      | 7,771.90              | 106.33       | -107.52      | -107.30                 | 0.43                    | -0.40                  | 5.40                  |
| 7,800.00              | 1.85            | 318.67      | 7,796.89              | 106.92       | -108.04      | -107.90                 | 0.36                    | 0.36                   | 1.40                  |
| 7,825.00              | 1.71            | 316.45      | 7,821.87              | 107.49       | -108.56      | -108.48                 | 0.62                    | -0.56                  | -8.88                 |
| 7,850.00              | 1.90            | 317.21      | 7,846.86              | 108.07       | -109.10      | -109.05                 | 0.77                    | 0.76                   | 3.04                  |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------|-----------------|-------------|-----------------------|-------------|-------------|-------------------------|-------------------------|------------------------|-----------------------|
| 7,875.00              | 1.75            | 314.21      | 7,871.85              | 108.64      | -109.66     | -109.63                 | 0.71                    | -0.60                  | -12.00                |
| 7,900.00              | 1.77            | 306.49      | 7,896.84              | 109.14      | -110.24     | -110.13                 | 0.95                    | 0.08                   | -30.88                |
| 7,925.00              | 1.67            | 310.38      | 7,921.83              | 109.60      | -110.83     | -110.60                 | 0.61                    | -0.40                  | 15.56                 |
| 7,950.00              | 1.84            | 312.53      | 7,946.81              | 110.11      | -111.40     | -111.11                 | 0.73                    | 0.68                   | 8.60                  |
| 7,975.00              | 1.75            | 306.14      | 7,971.80              | 110.60      | -112.00     | -111.62                 | 0.88                    | -0.36                  | -25.56                |
| 8,000.00              | 1.81            | 319.58      | 7,996.79              | 111.13      | -112.57     | -112.15                 | 1.68                    | 0.24                   | 53.76                 |
| 8,025.00              | 1.81            | 309.38      | 8,021.78              | 111.68      | -113.13     | -112.70                 | 1.29                    | 0.00                   | -40.80                |
| 8,050.00              | 1.70            | 314.65      | 8,046.77              | 112.19      | -113.70     | -113.22                 | 0.78                    | -0.44                  | 21.08                 |
| 8,075.00              | 1.81            | 311.56      | 8,071.75              | 112.71      | -114.26     | -113.75                 | 0.58                    | 0.44                   | -12.36                |
| 8,100.00              | 1.75            | 303.57      | 8,096.74              | 113.19      | -114.87     | -114.23                 | 1.02                    | -0.24                  | -31.96                |
| 8,125.00              | 1.74            | 307.29      | 8,121.73              | 113.63      | -115.49     | -114.67                 | 0.45                    | -0.04                  | 14.88                 |
| 8,150.00              | 1.75            | 301.60      | 8,146.72              | 114.06      | -116.12     | -115.11                 | 0.69                    | 0.04                   | -22.76                |
| 8,175.00              | 1.85            | 308.15      | 8,171.71              | 114.51      | -116.76     | -115.56                 | 0.91                    | 0.40                   | 26.20                 |
| 8,200.00              | 1.80            | 305.44      | 8,196.69              | 114.99      | -117.40     | -116.05                 | 0.40                    | -0.20                  | -10.84                |
| 8,225.00              | 1.81            | 308.21      | 8,221.68              | 115.46      | -118.03     | -116.52                 | 0.35                    | 0.04                   | 11.08                 |
| 8,250.00              | 1.73            | 301.23      | 8,246.67              | 115.90      | -118.66     | -116.97                 | 0.92                    | -0.32                  | -27.92                |
| 8,275.00              | 1.85            | 305.50      | 8,271.66              | 116.33      | -119.31     | -117.41                 | 0.72                    | 0.48                   | 17.08                 |
| 8,300.00              | 1.80            | 309.08      | 8,296.64              | 116.81      | -119.95     | -117.89                 | 0.50                    | -0.20                  | 14.32                 |
| 8,325.00              | 1.73            | 306.40      | 8,321.63              | 117.28      | -120.55     | -118.37                 | 0.43                    | -0.28                  | -10.72                |
| 8,350.00              | 1.79            | 307.39      | 8,346.62              | 117.74      | -121.17     | -118.84                 | 0.27                    | 0.24                   | 3.96                  |
| 8,375.00              | 1.68            | 307.36      | 8,371.61              | 118.20      | -121.77     | -119.30                 | 0.44                    | -0.44                  | -0.12                 |
| 8,400.00              | 1.75            | 305.22      | 8,396.60              | 118.64      | -122.37     | -119.75                 | 0.38                    | 0.28                   | -8.56                 |
| 8,425.00              | 1.51            | 303.23      | 8,421.59              | 119.04      | -122.96     | -120.16                 | 0.99                    | -0.96                  | -7.96                 |
| 8,450.00              | 1.62            | 302.52      | 8,446.58              | 119.41      | -123.53     | -120.53                 | 0.45                    | 0.44                   | -2.84                 |
| 8,475.00              | 1.55            | 301.51      | 8,471.57              | 119.78      | -124.12     | -120.90                 | 0.30                    | -0.28                  | -4.04                 |
| 8,500.00              | 1.63            | 300.62      | 8,496.56              | 120.14      | -124.71     | -121.27                 | 0.33                    | 0.32                   | -3.56                 |
| 8,525.00              | 1.51            | 305.64      | 8,521.55              | 120.51      | -125.29     | -121.64                 | 0.73                    | -0.48                  | 20.08                 |
| 8,550.00              | 1.64            | 302.21      | 8,546.54              | 120.89      | -125.86     | -122.03                 | 0.64                    | 0.52                   | -13.72                |
| 8,575.00              | 1.58            | 298.87      | 8,571.53              | 121.25      | -126.46     | -122.39                 | 0.45                    | -0.24                  | -13.36                |
| 8,600.00              | 1.57            | 299.23      | 8,596.52              | 121.59      | -127.06     | -122.73                 | 0.06                    | -0.04                  | 1.44                  |
| 8,625.00              | 1.71            | 297.63      | 8,621.51              | 121.93      | -127.69     | -123.08                 | 0.59                    | 0.56                   | -6.40                 |
| 8,650.00              | 1.57            | 291.97      | 8,646.50              | 122.23      | -128.34     | -123.39                 | 0.86                    | -0.56                  | -22.64                |
| 8,675.00              | 1.68            | 322.21      | 8,671.49              | 122.64      | -128.88     | -123.81                 | 3.42                    | 0.44                   | 120.96                |
| 8,700.00              | 1.61            | 299.87      | 8,696.48              | 123.11      | -129.41     | -124.28                 | 2.56                    | -0.28                  | -89.36                |
| 8,725.00              | 1.57            | 300.49      | 8,721.47              | 123.46      | -130.01     | -124.63                 | 0.17                    | -0.16                  | 2.48                  |
| 8,750.00              | 1.63            | 301.58      | 8,746.46              | 123.82      | -130.61     | -125.00                 | 0.27                    | 0.24                   | 4.36                  |
| 8,775.00              | 1.49            | 301.14      | 8,771.45              | 124.17      | -131.19     | -125.36                 | 0.56                    | -0.56                  | -1.76                 |
| 8,800.00              | 1.68            | 299.02      | 8,796.44              | 124.52      | -131.79     | -125.71                 | 0.80                    | 0.76                   | -8.48                 |
| 8,825.00              | 1.58            | 300.55      | 8,821.43              | 124.87      | -132.41     | -126.07                 | 0.44                    | -0.40                  | 6.12                  |
| 8,850.00              | 1.64            | 297.92      | 8,846.42              | 125.21      | -133.02     | -126.42                 | 0.38                    | 0.24                   | -10.52                |
| 8,875.00              | 1.61            | 300.38      | 8,871.41              | 125.56      | -133.64     | -126.77                 | 0.30                    | -0.12                  | 9.84                  |
| 8,900.00              | 1.58            | 298.86      | 8,896.40              | 125.90      | -134.24     | -127.12                 | 0.21                    | -0.12                  | -6.08                 |
| 8,925.00              | 1.63            | 294.93      | 8,921.39              | 126.22      | -134.87     | -127.44                 | 0.48                    | 0.20                   | -15.72                |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 8,950.00              | 1.58            | 296.61      | 8,946.38              | 126.52       | -135.50      | -127.75                 | 0.27                    | -0.20                  | 6.72                  |
| 8,975.00              | 1.64            | 296.69      | 8,971.37              | 126.84       | -136.13      | -128.07                 | 0.24                    | 0.24                   | 0.32                  |
| 9,000.00              | 1.52            | 300.22      | 8,996.36              | 127.17       | -136.73      | -128.40                 | 0.62                    | -0.48                  | 14.12                 |
| 9,025.00              | 1.56            | 295.16      | 9,021.36              | 127.48       | -137.33      | -128.72                 | 0.57                    | 0.16                   | -20.24                |
| 9,050.00              | 1.62            | 296.90      | 9,046.35              | 127.78       | -137.95      | -129.03                 | 0.31                    | 0.24                   | 6.96                  |
| 9,075.00              | 1.55            | 295.93      | 9,071.34              | 128.09       | -138.57      | -129.34                 | 0.30                    | -0.28                  | -3.88                 |
| 9,100.00              | 1.66            | 295.92      | 9,096.33              | 128.40       | -139.20      | -129.65                 | 0.44                    | 0.44                   | -0.04                 |
| 9,125.00              | 1.59            | 299.70      | 9,121.32              | 128.73       | -139.83      | -129.99                 | 0.51                    | -0.28                  | 15.12                 |
| 9,150.00              | 1.58            | 305.52      | 9,146.31              | 129.10       | -140.41      | -130.37                 | 0.64                    | -0.04                  | 23.28                 |
| 9,175.00              | 1.70            | 297.02      | 9,171.30              | 129.47       | -141.02      | -130.74                 | 1.08                    | 0.48                   | -34.00                |
| 9,200.00              | 1.56            | 298.82      | 9,196.29              | 129.80       | -141.65      | -131.08                 | 0.60                    | -0.56                  | 7.20                  |
| 9,225.00              | 1.68            | 296.37      | 9,221.28              | 130.13       | -142.27      | -131.41                 | 0.55                    | 0.48                   | -9.80                 |
| 9,250.00              | 1.55            | 298.17      | 9,246.27              | 130.45       | -142.90      | -131.74                 | 0.56                    | -0.52                  | 7.20                  |
| 9,275.00              | 1.66            | 295.65      | 9,271.26              | 130.76       | -143.53      | -132.06                 | 0.52                    | 0.44                   | -10.08                |
| 9,300.00              | 1.75            | 291.96      | 9,296.25              | 131.06       | -144.21      | -132.37                 | 0.57                    | 0.36                   | -14.76                |
| 9,325.00              | 1.82            | 288.18      | 9,321.23              | 131.33       | -144.94      | -132.64                 | 0.55                    | 0.28                   | -15.12                |
| 9,350.00              | 1.83            | 291.56      | 9,346.22              | 131.60       | -145.69      | -132.92                 | 0.43                    | 0.04                   | 13.52                 |
| 9,375.00              | 1.87            | 287.66      | 9,371.21              | 131.87       | -146.45      | -133.20                 | 0.53                    | 0.16                   | -15.60                |
| 9,400.00              | 1.96            | 282.47      | 9,396.19              | 132.09       | -147.25      | -133.42                 | 0.78                    | 0.36                   | -20.76                |
| 9,425.00              | 1.89            | 289.93      | 9,421.18              | 132.32       | -148.06      | -133.66                 | 1.04                    | -0.28                  | 29.84                 |
| 9,450.00              | 1.97            | 293.18      | 9,446.17              | 132.63       | -148.84      | -133.98                 | 0.54                    | 0.32                   | 13.00                 |
| 9,475.00              | 1.91            | 293.58      | 9,471.15              | 132.97       | -149.62      | -134.32                 | 0.25                    | -0.24                  | 1.60                  |
| 9,500.00              | 1.96            | 289.00      | 9,496.14              | 133.27       | -150.40      | -134.63                 | 0.65                    | 0.20                   | -18.32                |
| 9,525.00              | 2.00            | 291.49      | 9,521.12              | 133.57       | -151.21      | -134.94                 | 0.38                    | 0.16                   | 9.96                  |
| 9,550.00              | 1.91            | 293.18      | 9,546.11              | 133.89       | -152.00      | -135.27                 | 0.43                    | -0.36                  | 6.76                  |
| 9,575.00              | 1.94            | 291.15      | 9,571.09              | 134.21       | -152.78      | -135.59                 | 0.30                    | 0.12                   | -8.12                 |
| 9,600.00              | 2.05            | 290.83      | 9,596.08              | 134.52       | -153.59      | -135.91                 | 0.44                    | 0.44                   | -1.28                 |
| 9,625.00              | 2.05            | 292.63      | 9,621.06              | 134.85       | -154.42      | -136.25                 | 0.26                    | 0.00                   | 7.20                  |
| 9,650.00              | 1.98            | 295.56      | 9,646.05              | 135.21       | -155.22      | -136.62                 | 0.50                    | -0.28                  | 11.72                 |
| 9,675.00              | 1.97            | 295.02      | 9,671.03              | 135.58       | -156.00      | -136.99                 | 0.08                    | -0.04                  | -2.16                 |
| 9,700.00              | 2.00            | 297.25      | 9,696.02              | 135.96       | -156.78      | -137.38                 | 0.33                    | 0.12                   | 8.92                  |
| 9,725.00              | 2.09            | 301.13      | 9,721.00              | 136.40       | -157.56      | -137.82                 | 0.66                    | 0.36                   | 15.52                 |
| 9,750.00              | 2.07            | 298.55      | 9,745.98              | 136.85       | -158.35      | -138.28                 | 0.38                    | -0.08                  | -10.32                |
| 9,775.00              | 2.11            | 300.73      | 9,770.97              | 137.30       | -159.14      | -138.74                 | 0.36                    | 0.16                   | 8.72                  |
| 9,800.00              | 2.03            | 302.88      | 9,795.95              | 137.78       | -159.90      | -139.22                 | 0.45                    | -0.32                  | 8.60                  |
| 9,825.00              | 2.01            | 304.56      | 9,820.94              | 138.26       | -160.64      | -139.72                 | 0.25                    | -0.08                  | 6.72                  |
| 9,850.00              | 2.07            | 302.02      | 9,845.92              | 138.75       | -161.38      | -140.21                 | 0.43                    | 0.24                   | -10.16                |
| 9,875.00              | 2.09            | 300.87      | 9,870.90              | 139.23       | -162.16      | -140.69                 | 0.19                    | 0.08                   | -4.60                 |
| 9,900.00              | 2.11            | 302.52      | 9,895.89              | 139.71       | -162.94      | -141.18                 | 0.25                    | 0.08                   | 6.60                  |
| 9,925.00              | 2.02            | 303.87      | 9,920.87              | 140.20       | -163.69      | -141.68                 | 0.41                    | -0.36                  | 5.40                  |
| 9,950.00              | 2.03            | 303.08      | 9,945.86              | 140.69       | -164.43      | -142.17                 | 0.12                    | 0.04                   | -3.16                 |
| 9,975.00              | 1.97            | 305.88      | 9,970.84              | 141.18       | -165.14      | -142.67                 | 0.46                    | -0.24                  | 11.20                 |
| 10,000.00             | 1.96            | 305.91      | 9,995.83              | 141.68       | -165.84      | -143.18                 | 0.04                    | -0.04                  | 0.12                  |
| 10,025.00             | 1.96            | 304.29      | 10,020.81             | 142.18       | -166.54      | -143.68                 | 0.22                    | 0.00                   | -6.48                 |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------|-----------------|-------------|-----------------------|-------------|-------------|-------------------------|-------------------------|------------------------|-----------------------|
| 10,050.00             | 1.92            | 304.93      | 10,045.80             | 142.66      | -167.24     | -144.17                 | 0.18                    | -0.16                  | 2.56                  |
| 10,075.00             | 1.78            | 311.19      | 10,070.78             | 143.15      | -167.87     | -144.67                 | 0.98                    | -0.56                  | 25.04                 |
| 10,100.00             | 1.65            | 307.97      | 10,095.77             | 143.63      | -168.45     | -145.15                 | 0.65                    | -0.52                  | -12.88                |
| 10,125.00             | 1.49            | 303.31      | 10,120.76             | 144.03      | -169.00     | -145.56                 | 0.82                    | -0.64                  | -18.64                |
| 10,150.00             | 1.40            | 300.76      | 10,145.75             | 144.36      | -169.54     | -145.90                 | 0.44                    | -0.36                  | -10.20                |
| 10,175.00             | 1.29            | 300.99      | 10,170.75             | 144.66      | -170.04     | -146.20                 | 0.44                    | -0.44                  | 0.92                  |
| 10,200.00             | 1.10            | 296.09      | 10,195.74             | 144.91      | -170.50     | -146.46                 | 0.86                    | -0.76                  | -19.60                |
| 10,225.00             | 1.18            | 297.08      | 10,220.74             | 145.14      | -170.94     | -146.68                 | 0.33                    | 0.32                   | 3.96                  |
| 10,250.00             | 1.13            | 297.12      | 10,245.73             | 145.37      | -171.39     | -146.92                 | 0.20                    | -0.20                  | 0.16                  |
| 10,275.00             | 1.15            | 286.98      | 10,270.73             | 145.55      | -171.85     | -147.11                 | 0.81                    | 0.08                   | -40.56                |
| 10,300.00             | 1.17            | 278.32      | 10,295.72             | 145.66      | -172.34     | -147.22                 | 0.71                    | 0.08                   | -34.64                |
| 10,325.00             | 1.14            | 280.72      | 10,320.72             | 145.75      | -172.84     | -147.31                 | 0.23                    | -0.12                  | 9.60                  |
| 10,350.00             | 1.19            | 273.08      | 10,345.71             | 145.81      | -173.34     | -147.37                 | 0.65                    | 0.20                   | -30.56                |
| 10,375.00             | 1.22            | 275.74      | 10,370.71             | 145.85      | -173.87     | -147.42                 | 0.25                    | 0.12                   | 10.64                 |
| 10,400.00             | 1.30            | 271.31      | 10,395.70             | 145.88      | -174.41     | -147.46                 | 0.50                    | 0.32                   | -17.72                |
| 10,425.00             | 1.30            | 275.19      | 10,420.69             | 145.91      | -174.98     | -147.49                 | 0.35                    | 0.00                   | 15.52                 |
| 10,450.00             | 1.32            | 269.41      | 10,445.69             | 145.93      | -175.55     | -147.52                 | 0.53                    | 0.08                   | -23.12                |
| 10,475.00             | 1.29            | 268.40      | 10,470.68             | 145.92      | -176.12     | -147.52                 | 0.15                    | -0.12                  | -4.04                 |
| 10,500.00             | 1.28            | 271.39      | 10,495.67             | 145.92      | -176.68     | -147.52                 | 0.27                    | -0.04                  | 11.96                 |
| 10,525.00             | 1.30            | 273.13      | 10,520.67             | 145.95      | -177.24     | -147.55                 | 0.18                    | 0.08                   | 6.96                  |
| 10,550.00             | 1.39            | 275.70      | 10,545.66             | 145.99      | -177.83     | -147.60                 | 0.43                    | 0.36                   | 10.28                 |
| 10,575.00             | 1.53            | 277.26      | 10,570.65             | 146.06      | -178.46     | -147.68                 | 0.58                    | 0.56                   | 6.24                  |
| 10,600.00             | 1.55            | 274.17      | 10,595.64             | 146.13      | -179.13     | -147.75                 | 0.34                    | 0.08                   | -12.36                |
| 10,625.00             | 1.64            | 274.00      | 10,620.63             | 146.18      | -179.82     | -147.81                 | 0.36                    | 0.36                   | -0.68                 |
| 10,650.00             | 1.57            | 272.80      | 10,645.62             | 146.22      | -180.52     | -147.85                 | 0.31                    | -0.28                  | -4.80                 |
| 10,675.00             | 1.58            | 275.33      | 10,670.62             | 146.27      | -181.21     | -147.91                 | 0.28                    | 0.04                   | 10.12                 |
| 10,700.00             | 1.69            | 273.27      | 10,695.61             | 146.32      | -181.92     | -147.97                 | 0.50                    | 0.44                   | -8.24                 |
| 10,725.00             | 1.62            | 274.50      | 10,720.59             | 146.37      | -182.64     | -148.02                 | 0.31                    | -0.28                  | 4.92                  |
| 10,750.00             | 1.70            | 277.94      | 10,745.58             | 146.45      | -183.36     | -148.11                 | 0.51                    | 0.32                   | 13.76                 |
| 10,775.00             | 1.80            | 274.09      | 10,770.57             | 146.53      | -184.12     | -148.19                 | 0.62                    | 0.40                   | -15.40                |
| 10,800.00             | 1.67            | 270.76      | 10,795.56             | 146.56      | -184.87     | -148.23                 | 0.66                    | -0.52                  | -13.32                |
| 10,825.00             | 1.67            | 268.63      | 10,820.55             | 146.56      | -185.60     | -148.24                 | 0.25                    | 0.00                   | -8.52                 |
| 10,850.00             | 1.52            | 272.74      | 10,845.54             | 146.57      | -186.30     | -148.25                 | 0.75                    | -0.60                  | 16.44                 |
| 10,875.00             | 1.44            | 273.17      | 10,870.53             | 146.60      | -186.94     | -148.29                 | 0.32                    | -0.32                  | 1.72                  |
| 10,900.00             | 1.33            | 269.71      | 10,895.53             | 146.61      | -187.55     | -148.31                 | 0.55                    | -0.44                  | -13.84                |
| 10,925.00             | 1.29            | 270.51      | 10,920.52             | 146.62      | -188.12     | -148.32                 | 0.18                    | -0.16                  | 3.20                  |
| 10,950.00             | 1.32            | 273.23      | 10,945.51             | 146.63      | -188.69     | -148.34                 | 0.28                    | 0.12                   | 10.88                 |
| 10,975.00             | 1.29            | 269.47      | 10,970.51             | 146.65      | -189.26     | -148.36                 | 0.36                    | -0.12                  | -15.04                |
| 11,000.00             | 1.35            | 272.83      | 10,995.50             | 146.66      | -189.83     | -148.38                 | 0.39                    | 0.24                   | 13.44                 |
| 11,025.00             | 1.47            | 269.47      | 11,020.49             | 146.67      | -190.45     | -148.39                 | 0.58                    | 0.48                   | -13.44                |
| 11,050.00             | 1.50            | 268.00      | 11,045.48             | 146.66      | -191.09     | -148.39                 | 0.19                    | 0.12                   | -5.88                 |
| 11,075.00             | 1.87            | 272.64      | 11,070.47             | 146.66      | -191.83     | -148.40                 | 1.58                    | 1.48                   | 18.56                 |
| 11,100.00             | 2.44            | 273.55      | 11,095.45             | 146.72      | -192.77     | -148.46                 | 2.28                    | 2.28                   | 3.64                  |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 11,125.00                               | 2.83            | 280.28      | 11,120.43             | 146.86       | -193.90      | -148.61                 | 1.99                    | 1.56                   | 26.92                 |
| 11,150.00                               | 3.60            | 281.42      | 11,145.39             | 147.13       | -195.28      | -148.89                 | 3.09                    | 3.08                   | 4.56                  |
| 11,175.00                               | 4.19            | 281.71      | 11,170.33             | 147.47       | -196.94      | -149.25                 | 2.36                    | 2.36                   | 1.16                  |
| 11,200.00                               | 5.13            | 283.33      | 11,195.25             | 147.91       | -198.93      | -149.71                 | 3.80                    | 3.76                   | 6.48                  |
| 11,225.00                               | 5.76            | 283.80      | 11,220.13             | 148.47       | -201.23      | -150.29                 | 2.53                    | 2.52                   | 1.88                  |
| 11,250.00                               | 6.48            | 284.46      | 11,244.99             | 149.12       | -203.82      | -150.96                 | 2.89                    | 2.88                   | 2.64                  |
| 11,275.00                               | 6.71            | 285.38      | 11,269.83             | 149.86       | -206.59      | -151.73                 | 1.01                    | 0.92                   | 3.68                  |
| 11,300.00                               | 7.23            | 286.88      | 11,294.64             | 150.70       | -209.50      | -152.60                 | 2.20                    | 2.08                   | 6.00                  |
| 11,325.00                               | 7.35            | 288.50      | 11,319.44             | 151.67       | -212.53      | -153.59                 | 0.95                    | 0.48                   | 6.48                  |
| 11,350.00                               | 6.99            | 291.38      | 11,344.24             | 152.73       | -215.46      | -154.68                 | 2.03                    | -1.44                  | 11.52                 |
| 11,375.00                               | 5.95            | 288.38      | 11,369.08             | 153.69       | -218.11      | -155.66                 | 4.37                    | -4.16                  | -12.00                |
| 11,400.00                               | 4.03            | 282.22      | 11,393.99             | 154.29       | -220.19      | -156.28                 | 7.96                    | -7.68                  | -24.64                |
| 11,425.00                               | 2.36            | 269.89      | 11,418.95             | 154.47       | -221.57      | -156.47                 | 7.19                    | -6.68                  | -49.32                |
| 11,450.00                               | 1.25            | 223.11      | 11,443.94             | 154.27       | -222.27      | -156.28                 | 7.03                    | -4.44                  | -187.12               |
| 11,475.00                               | 1.59            | 185.73      | 11,468.93             | 153.73       | -222.49      | -155.74                 | 3.86                    | 1.36                   | -149.52               |
| 11,500.00                               | 2.01            | 179.86      | 11,493.92             | 152.94       | -222.52      | -154.96                 | 1.83                    | 1.68                   | -23.48                |
| 11,525.00                               | 2.33            | 182.09      | 11,518.90             | 152.00       | -222.54      | -154.01                 | 1.32                    | 1.28                   | 8.92                  |
| 11,550.00                               | 2.20            | 184.65      | 11,543.88             | 151.01       | -222.60      | -153.02                 | 0.66                    | -0.52                  | 10.24                 |
| 11,575.00                               | 2.28            | 191.55      | 11,568.86             | 150.04       | -222.74      | -152.06                 | 1.12                    | 0.32                   | 27.60                 |
| 11,600.00                               | 1.92            | 204.30      | 11,593.85             | 149.18       | -223.01      | -151.19                 | 2.35                    | -1.44                  | 51.00                 |
| 11,625.81                               | 1.63            | 222.43      | 11,619.64             | 148.51       | -223.43      | -150.53                 | 2.43                    | -1.12                  | 70.24                 |
| 11,645.00                               | 1.45            | 239.34      | 11,638.83             | 148.19       | -223.83      | -150.21                 | 2.54                    | -0.94                  | 88.12                 |
| 11,834.00                               | 1.20            | 271.49      | 11,827.78             | 147.02       | -227.86      | -149.08                 | 0.41                    | -0.13                  | 17.01                 |
| 11,897.00                               | 0.97            | 282.81      | 11,890.77             | 147.15       | -229.04      | -149.23                 | 0.50                    | -0.37                  | 17.97                 |
| 11,928.00                               | 0.72            | 277.76      | 11,921.76             | 147.24       | -229.49      | -149.31                 | 0.84                    | -0.81                  | -16.29                |
| 11,960.00                               | 4.24            | 193.59      | 11,953.73             | 146.11       | -229.97      | -148.20                 | 13.21                   | 11.00                  | -263.03               |
| <b>KOP: 11960.00' MD, 11953.73' TVD</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,973.86                               | 5.40            | 193.31      | 11,967.54             | 144.98       | -230.24      | -147.06                 | 8.39                    | 8.39                   | -2.04                 |
| <b>KOP(WF22H)</b>                       |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,991.00                               | 6.84            | 193.09      | 11,984.59             | 143.20       | -230.66      | -145.29                 | 8.39                    | 8.39                   | -1.27                 |
| 12,023.00                               | 11.49           | 177.45      | 12,016.17             | 138.16       | -230.95      | -140.25                 | 16.36                   | 14.53                  | -48.88                |
| 12,054.00                               | 16.60           | 178.82      | 12,046.24             | 130.64       | -230.72      | -132.73                 | 16.52                   | 16.48                  | 4.42                  |
| 12,086.00                               | 20.65           | 177.84      | 12,076.55             | 120.43       | -230.41      | -122.51                 | 12.69                   | 12.66                  | -3.06                 |
| 12,118.00                               | 24.06           | 177.14      | 12,106.14             | 108.27       | -229.87      | -110.35                 | 10.69                   | 10.66                  | -2.19                 |
| 12,149.00                               | 27.32           | 176.26      | 12,134.08             | 94.86        | -229.09      | -96.93                  | 10.59                   | 10.52                  | -2.84                 |
| 12,180.00                               | 30.08           | 178.34      | 12,161.27             | 79.99        | -228.40      | -82.06                  | 9.47                    | 8.90                   | 6.71                  |
| 12,212.00                               | 31.75           | 182.98      | 12,188.72             | 63.56        | -228.61      | -65.63                  | 9.09                    | 5.22                   | 14.50                 |
| 12,243.00                               | 32.95           | 187.66      | 12,214.92             | 47.06        | -230.16      | -49.15                  | 8.96                    | 3.87                   | 15.10                 |
| 12,275.00                               | 35.57           | 188.89      | 12,241.36             | 29.24        | -232.76      | -31.35                  | 8.47                    | 8.19                   | 3.84                  |
| 12,306.00                               | 38.51           | 189.02      | 12,266.10             | 10.79        | -235.66      | -12.93                  | 9.49                    | 9.48                   | 0.42                  |
| 12,338.00                               | 41.88           | 188.57      | 12,290.54             | -9.62        | -238.82      | 7.45                    | 10.57                   | 10.53                  | -1.41                 |
| 12,369.00                               | 44.90           | 188.34      | 12,313.07             | -30.68       | -241.95      | 28.48                   | 9.76                    | 9.74                   | -0.74                 |
| 12,401.00                               | 46.90           | 186.66      | 12,335.34             | -53.46       | -244.94      | 51.23                   | 7.30                    | 6.25                   | -5.25                 |
| 12,432.00                               | 48.40           | 184.49      | 12,356.22             | -76.26       | -247.16      | 74.01                   | 7.08                    | 4.84                   | -7.00                 |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|----------------------------------------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 12,464.00                                                            | 51.05           | 184.06      | 12,376.91             | -100.60      | -248.98      | 98.34                   | 8.34                    | 8.28                   | -1.34                 |
| 12,477.03                                                            | 51.69           | 185.06      | 12,385.04             | -110.75      | -249.79      | 108.48                  | 7.74                    | 4.89                   | 7.67                  |
| Cross 330' Offset:12477.03' MD, 12385.04' TVD, 51.69° INC            |                 |             |                       |              |              |                         |                         |                        |                       |
| 12,495.00                                                            | 52.58           | 186.41      | 12,396.07             | -124.86      | -251.21      | 122.58                  | 7.74                    | 4.97                   | 7.51                  |
| 12,527.00                                                            | 53.68           | 188.46      | 12,415.27             | -150.25      | -254.52      | 147.93                  | 6.17                    | 3.44                   | 6.41                  |
| 12,558.00                                                            | 56.09           | 187.94      | 12,433.10             | -175.34      | -258.14      | 172.99                  | 7.89                    | 7.77                   | -1.68                 |
| 12,590.00                                                            | 59.25           | 186.85      | 12,450.21             | -202.15      | -261.61      | 199.77                  | 10.29                   | 9.88                   | -3.41                 |
| 12,621.00                                                            | 61.73           | 185.61      | 12,465.48             | -228.97      | -264.54      | 226.56                  | 8.72                    | 8.00                   | -4.00                 |
| 12,653.00                                                            | 64.35           | 184.53      | 12,479.99             | -257.38      | -267.05      | 254.94                  | 8.72                    | 8.19                   | -3.38                 |
| 12,684.00                                                            | 68.17           | 183.12      | 12,492.47             | -285.69      | -268.94      | 283.23                  | 13.01                   | 12.32                  | -4.55                 |
| 12,716.00                                                            | 71.55           | 182.21      | 12,503.49             | -315.69      | -270.33      | 313.23                  | 10.89                   | 10.56                  | -2.84                 |
| 12,748.00                                                            | 73.95           | 180.39      | 12,512.98             | -346.24      | -271.03      | 343.77                  | 9.26                    | 7.50                   | -5.69                 |
| 12,757.00                                                            | 75.16           | 179.93      | 12,515.37             | -354.92      | -271.05      | 352.44                  | 14.32                   | 13.44                  | -5.11                 |
| 12,788.00                                                            | 78.56           | 179.13      | 12,522.42             | -385.10      | -270.80      | 382.62                  | 11.25                   | 10.97                  | -2.58                 |
| 12,819.00                                                            | 82.59           | 179.66      | 12,527.49             | -415.67      | -270.48      | 413.20                  | 13.11                   | 13.00                  | 1.71                  |
| 12,823.85                                                            | 83.25           | 179.60      | 12,528.09             | -420.48      | -270.45      | 418.01                  | 13.74                   | 13.69                  | -1.20                 |
| FTP(WF22H)                                                           |                 |             |                       |              |              |                         |                         |                        |                       |
| 12,851.00                                                            | 86.97           | 179.28      | 12,530.40             | -447.53      | -270.18      | 445.06                  | 13.74                   | 13.69                  | -1.19                 |
| 12,883.00                                                            | 89.10           | 179.18      | 12,531.50             | -479.51      | -269.75      | 477.04                  | 6.66                    | 6.66                   | -0.31                 |
| EOC: 12883.00' MD, 12531.50' TVD, 89.10° INC, 179.18° AZ, 477.04' VS |                 |             |                       |              |              |                         |                         |                        |                       |
| 12,977.00                                                            | 89.83           | 178.72      | 12,532.38             | -573.49      | -268.03      | 571.03                  | 0.92                    | 0.78                   | -0.49                 |
| 13,071.00                                                            | 89.44           | 180.25      | 12,532.98             | -667.48      | -267.19      | 665.02                  | 1.68                    | -0.41                  | 1.63                  |
| 13,166.00                                                            | 89.72           | 179.95      | 12,533.67             | -762.47      | -267.35      | 760.02                  | 0.43                    | 0.29                   | -0.32                 |
| 13,260.00                                                            | 90.73           | 179.88      | 12,533.31             | -856.47      | -267.21      | 854.01                  | 1.08                    | 1.07                   | -0.07                 |
| 13,355.00                                                            | 91.90           | 179.86      | 12,531.13             | -951.44      | -267.00      | 948.98                  | 1.23                    | 1.23                   | -0.02                 |
| 13,450.00                                                            | 90.67           | 179.24      | 12,528.99             | -1,046.42    | -266.25      | 1,043.96                | 1.45                    | -1.29                  | -0.65                 |
| 13,544.00                                                            | 89.10           | 178.55      | 12,529.18             | -1,140.39    | -264.44      | 1,137.95                | 1.82                    | -1.67                  | -0.73                 |
| 13,639.00                                                            | 90.34           | 178.75      | 12,529.65             | -1,235.37    | -262.20      | 1,232.93                | 1.32                    | 1.31                   | 0.21                  |
| 13,734.00                                                            | 87.20           | 177.64      | 12,531.69             | -1,330.28    | -259.21      | 1,327.88                | 3.51                    | -3.31                  | -1.17                 |
| 13,828.00                                                            | 86.75           | 177.16      | 12,536.65             | -1,424.05    | -254.95      | 1,421.68                | 0.70                    | -0.48                  | -0.51                 |
| 13,923.00                                                            | 88.21           | 177.66      | 12,540.82             | -1,518.86    | -250.66      | 1,516.53                | 1.62                    | 1.54                   | 0.53                  |
| 14,018.00                                                            | 90.39           | 179.67      | 12,541.98             | -1,613.82    | -248.45      | 1,611.50                | 3.12                    | 2.29                   | 2.12                  |
| 14,113.00                                                            | 90.34           | 181.24      | 12,541.38             | -1,708.81    | -249.20      | 1,706.48                | 1.65                    | -0.05                  | 1.65                  |
| 14,208.00                                                            | 86.53           | 179.11      | 12,543.97             | -1,803.75    | -249.50      | 1,801.41                | 4.59                    | -4.01                  | -2.24                 |
| 14,302.00                                                            | 86.42           | 178.20      | 12,549.75             | -1,897.55    | -247.29      | 1,895.23                | 0.97                    | -0.12                  | -0.97                 |
| 14,397.00                                                            | 88.38           | 179.35      | 12,554.06             | -1,992.42    | -245.27      | 1,990.11                | 2.39                    | 2.06                   | 1.21                  |
| 14,492.00                                                            | 87.36           | 178.30      | 12,557.59             | -2,087.33    | -243.32      | 2,085.04                | 1.54                    | -1.07                  | -1.11                 |
| 14,586.00                                                            | 89.78           | 179.78      | 12,559.94             | -2,181.28    | -241.75      | 2,179.00                | 3.02                    | 2.57                   | 1.57                  |
| 14,681.00                                                            | 90.73           | 180.51      | 12,559.52             | -2,276.28    | -241.99      | 2,273.99                | 1.26                    | 1.00                   | 0.77                  |
| 14,776.00                                                            | 91.23           | 180.21      | 12,557.89             | -2,371.26    | -242.58      | 2,368.96                | 0.61                    | 0.53                   | -0.32                 |
| 14,870.00                                                            | 90.34           | 179.63      | 12,556.60             | -2,465.25    | -242.45      | 2,462.95                | 1.13                    | -0.95                  | -0.62                 |
| 14,965.00                                                            | 89.83           | 179.38      | 12,556.46             | -2,560.25    | -241.63      | 2,557.95                | 0.60                    | -0.54                  | -0.26                 |
| 15,059.00                                                            | 92.18           | 180.15      | 12,554.81             | -2,654.23    | -241.25      | 2,651.93                | 2.63                    | 2.50                   | 0.82                  |
| 15,153.00                                                            | 93.75           | 180.97      | 12,549.95             | -2,748.09    | -242.16      | 2,745.78                | 1.88                    | 1.67                   | 0.87                  |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 15,247.00             | 93.02           | 181.24      | 12,544.40             | -2,841.91    | -243.97      | 2,839.58                | 0.83                    | -0.78                  | 0.29                  |
| 15,341.00             | 92.18           | 181.29      | 12,540.14             | -2,935.79    | -246.05      | 2,933.44                | 0.90                    | -0.89                  | 0.05                  |
| 15,434.00             | 91.12           | 181.76      | 12,537.46             | -3,028.72    | -248.52      | 3,026.34                | 1.25                    | -1.14                  | 0.51                  |
| 15,528.00             | 90.28           | 181.61      | 12,536.31             | -3,122.67    | -251.28      | 3,120.26                | 0.91                    | -0.89                  | -0.16                 |
| 15,621.00             | 91.23           | 182.08      | 12,535.09             | -3,215.61    | -254.28      | 3,213.17                | 1.14                    | 1.02                   | 0.51                  |
| 15,714.00             | 88.43           | 181.15      | 12,535.36             | -3,308.56    | -256.90      | 3,306.09                | 3.17                    | -3.01                  | -1.00                 |
| 15,808.00             | 88.43           | 178.13      | 12,537.94             | -3,402.51    | -256.31      | 3,400.05                | 3.21                    | 0.00                   | -3.21                 |
| 15,903.00             | 88.60           | 177.66      | 12,540.40             | -3,497.42    | -252.82      | 3,494.98                | 0.53                    | 0.18                   | -0.49                 |
| 15,997.00             | 89.16           | 177.11      | 12,542.24             | -3,591.30    | -248.53      | 3,588.90                | 0.83                    | 0.60                   | -0.59                 |
| 16,091.00             | 88.88           | 176.42      | 12,543.85             | -3,685.14    | -243.23      | 3,682.78                | 0.79                    | -0.30                  | -0.73                 |
| 16,185.00             | 89.27           | 177.36      | 12,545.36             | -3,778.99    | -238.13      | 3,776.67                | 1.08                    | 0.41                   | 1.00                  |
| 16,279.00             | 89.72           | 177.31      | 12,546.19             | -3,872.88    | -233.76      | 3,870.60                | 0.48                    | 0.48                   | -0.05                 |
| 16,373.00             | 90.50           | 179.08      | 12,546.01             | -3,966.83    | -230.80      | 3,964.57                | 2.06                    | 0.83                   | 1.88                  |
| 16,467.00             | 91.68           | 180.07      | 12,544.22             | -4,060.81    | -230.10      | 4,058.55                | 1.64                    | 1.26                   | 1.05                  |
| 16,561.00             | 90.34           | 180.07      | 12,542.57             | -4,154.79    | -230.21      | 4,152.53                | 1.43                    | -1.43                  | 0.00                  |
| 16,655.00             | 89.38           | 180.86      | 12,542.80             | -4,248.78    | -230.98      | 4,246.51                | 1.32                    | -1.02                  | 0.84                  |
| 16,749.00             | 89.94           | 180.54      | 12,543.35             | -4,342.78    | -232.13      | 4,340.49                | 0.69                    | 0.60                   | -0.34                 |
| 16,843.00             | 89.38           | 180.17      | 12,543.91             | -4,436.77    | -232.71      | 4,434.48                | 0.71                    | -0.60                  | -0.39                 |
| 16,938.00             | 90.34           | 180.40      | 12,544.14             | -4,531.77    | -233.18      | 4,529.47                | 1.04                    | 1.01                   | 0.24                  |
| 17,032.00             | 90.45           | 179.52      | 12,543.50             | -4,625.77    | -233.12      | 4,623.46                | 0.94                    | 0.12                   | -0.94                 |
| 17,126.00             | 90.34           | 179.95      | 12,542.85             | -4,719.76    | -232.68      | 4,717.46                | 0.47                    | -0.12                  | 0.46                  |
| 17,220.00             | 89.05           | 178.62      | 12,543.35             | -4,813.75    | -231.51      | 4,811.45                | 1.97                    | -1.37                  | -1.41                 |
| 17,314.00             | 89.44           | 178.12      | 12,544.59             | -4,907.70    | -228.83      | 4,905.42                | 0.67                    | 0.41                   | -0.53                 |
| 17,408.00             | 89.27           | 176.34      | 12,545.64             | -5,001.58    | -224.29      | 4,999.34                | 1.90                    | -0.18                  | -1.89                 |
| 17,502.00             | 89.44           | 175.80      | 12,546.70             | -5,095.36    | -217.85      | 5,093.17                | 0.60                    | 0.18                   | -0.57                 |
| 17,596.00             | 87.42           | 178.35      | 12,549.28             | -5,189.19    | -213.05      | 5,187.04                | 3.46                    | -2.15                  | 2.71                  |
| 17,691.00             | 88.88           | 178.77      | 12,552.35             | -5,284.10    | -210.67      | 5,281.97                | 1.60                    | 1.54                   | 0.44                  |
| 17,785.00             | 91.12           | 179.99      | 12,552.35             | -5,378.09    | -209.65      | 5,375.97                | 2.71                    | 2.38                   | 1.30                  |
| 17,879.00             | 91.90           | 180.98      | 12,549.87             | -5,472.05    | -210.45      | 5,469.92                | 1.34                    | 0.83                   | 1.05                  |
| 17,973.00             | 92.30           | 181.38      | 12,546.42             | -5,565.97    | -212.38      | 5,563.81                | 0.60                    | 0.43                   | 0.43                  |
| 18,067.00             | 92.41           | 180.59      | 12,542.56             | -5,659.87    | -214.00      | 5,657.70                | 0.85                    | 0.12                   | -0.84                 |
| 18,161.00             | 89.61           | 181.81      | 12,540.90             | -5,753.83    | -215.96      | 5,751.63                | 3.25                    | -2.98                  | 1.30                  |
| 18,255.00             | 87.53           | 182.03      | 12,543.25             | -5,847.74    | -219.11      | 5,845.51                | 2.23                    | -2.21                  | 0.23                  |
| 18,349.00             | 87.87           | 181.78      | 12,547.02             | -5,941.61    | -222.23      | 5,939.35                | 0.45                    | 0.36                   | -0.27                 |
| 18,444.00             | 90.84           | 180.70      | 12,548.09             | -6,036.57    | -224.29      | 6,034.29                | 3.33                    | 3.13                   | -1.14                 |
| 18,539.00             | 90.50           | 181.00      | 12,546.98             | -6,131.56    | -225.70      | 6,129.25                | 0.48                    | -0.36                  | 0.32                  |
| 18,633.00             | 89.22           | 182.25      | 12,547.21             | -6,225.51    | -228.36      | 6,223.18                | 1.90                    | -1.36                  | 1.33                  |
| 18,728.00             | 87.42           | 180.87      | 12,550.00             | -6,320.43    | -230.95      | 6,318.07                | 2.39                    | -1.89                  | -1.45                 |
| 18,823.00             | 85.85           | 179.56      | 12,555.57             | -6,415.26    | -231.31      | 6,412.90                | 2.15                    | -1.65                  | -1.38                 |
| 18,918.00             | 86.58           | 180.39      | 12,561.84             | -6,510.05    | -231.27      | 6,507.69                | 1.16                    | 0.77                   | 0.87                  |
| 19,013.00             | 89.33           | 181.39      | 12,565.23             | -6,604.97    | -232.74      | 6,602.59                | 3.08                    | 2.89                   | 1.05                  |
| 19,107.00             | 88.88           | 181.01      | 12,566.70             | -6,698.94    | -234.71      | 6,696.53                | 0.63                    | -0.48                  | -0.40                 |
| 19,203.00             | 89.94           | 179.56      | 12,567.69             | -6,794.93    | -235.19      | 6,792.51                | 1.87                    | 1.10                   | -1.51                 |

# Survey Report

**Company:** COG OPERATING, LLC  
**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 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) |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 19,297.00                                                                                                                        | 90.67           | 177.56      | 12,567.19             | -6,888.89    | -232.82      | 6,886.49                | 2.26                    | 0.78                   | -2.13                 |
| 19,392.00                                                                                                                        | 90.39           | 176.48      | 12,566.31             | -6,983.76    | -227.89      | 6,981.40                | 1.17                    | -0.29                  | -1.14                 |
| 19,487.00                                                                                                                        | 89.27           | 174.52      | 12,566.59             | -7,078.46    | -220.43      | 7,076.17                | 2.38                    | -1.18                  | -2.06                 |
| 19,581.00                                                                                                                        | 91.23           | 177.01      | 12,566.18             | -7,172.19    | -213.49      | 7,169.96                | 3.37                    | 2.09                   | 2.65                  |
| 19,676.00                                                                                                                        | 90.78           | 178.09      | 12,564.52             | -7,267.09    | -209.43      | 7,264.89                | 1.23                    | -0.47                  | 1.14                  |
| 19,767.00                                                                                                                        | 90.22           | 177.65      | 12,563.72             | -7,358.02    | -206.05      | 7,355.85                | 0.78                    | -0.62                  | -0.48                 |
| 19,866.00                                                                                                                        | 90.45           | 177.27      | 12,563.14             | -7,456.92    | -201.66      | 7,454.78                | 0.45                    | 0.23                   | -0.38                 |
| 19,961.00                                                                                                                        | 91.01           | 177.54      | 12,561.93             | -7,551.81    | -197.36      | 7,549.71                | 0.65                    | 0.59                   | 0.28                  |
| 20,056.00                                                                                                                        | 90.11           | 178.34      | 12,561.00             | -7,646.75    | -193.95      | 7,644.67                | 1.27                    | -0.95                  | 0.84                  |
| 20,150.00                                                                                                                        | 90.56           | 177.79      | 12,560.45             | -7,740.69    | -190.77      | 7,738.64                | 0.76                    | 0.48                   | -0.59                 |
| 20,245.00                                                                                                                        | 88.66           | 180.10      | 12,561.10             | -7,835.66    | -189.02      | 7,833.62                | 3.15                    | -2.00                  | 2.43                  |
| 20,339.00                                                                                                                        | 89.66           | 180.34      | 12,562.48             | -7,929.65    | -189.39      | 7,927.60                | 1.09                    | 1.06                   | 0.26                  |
| 20,434.00                                                                                                                        | 89.44           | 180.23      | 12,563.23             | -8,024.64    | -189.86      | 8,022.59                | 0.26                    | -0.23                  | -0.12                 |
| 20,527.00                                                                                                                        | 88.88           | 179.02      | 12,564.59             | -8,117.63    | -189.25      | 8,115.58                | 1.43                    | -0.60                  | -1.30                 |
| 20,622.00                                                                                                                        | 89.44           | 178.88      | 12,565.98             | -8,212.60    | -187.51      | 8,210.56                | 0.61                    | 0.59                   | -0.15                 |
| 20,716.00                                                                                                                        | 90.17           | 178.32      | 12,566.30             | -8,306.57    | -185.21      | 8,304.55                | 0.98                    | 0.78                   | -0.60                 |
| 20,810.00                                                                                                                        | 90.28           | 180.26      | 12,565.93             | -8,400.56    | -184.05      | 8,398.55                | 2.07                    | 0.12                   | 2.06                  |
| 20,904.00                                                                                                                        | 89.27           | 180.52      | 12,566.30             | -8,494.56    | -184.69      | 8,492.53                | 1.11                    | -1.07                  | 0.28                  |
| 20,999.00                                                                                                                        | 87.54           | 179.32      | 12,568.95             | -8,589.52    | -184.55      | 8,587.49                | 2.22                    | -1.82                  | -1.26                 |
| 21,094.00                                                                                                                        | 87.31           | 178.70      | 12,573.21             | -8,684.41    | -182.92      | 8,682.39                | 0.70                    | -0.24                  | -0.65                 |
| 21,189.00                                                                                                                        | 88.26           | 179.47      | 12,576.89             | -8,779.32    | -181.40      | 8,777.31                | 1.29                    | 1.00                   | 0.81                  |
| 21,284.00                                                                                                                        | 89.44           | 180.44      | 12,578.79             | -8,874.30    | -181.33      | 8,872.29                | 1.61                    | 1.24                   | 1.02                  |
| 21,379.00                                                                                                                        | 89.72           | 180.96      | 12,579.49             | -8,969.29    | -182.49      | 8,967.26                | 0.62                    | 0.29                   | 0.55                  |
| 21,474.00                                                                                                                        | 90.11           | 180.55      | 12,579.63             | -9,064.28    | -183.74      | 9,062.24                | 0.60                    | 0.41                   | -0.43                 |
| 21,569.00                                                                                                                        | 90.06           | 180.43      | 12,579.49             | -9,159.28    | -184.55      | 9,157.22                | 0.14                    | -0.05                  | -0.13                 |
| 21,663.00                                                                                                                        | 90.06           | 180.72      | 12,579.39             | -9,253.27    | -185.49      | 9,251.21                | 0.31                    | 0.00                   | 0.31                  |
| 21,758.00                                                                                                                        | 90.50           | 181.08      | 12,578.93             | -9,348.26    | -186.99      | 9,346.18                | 0.60                    | 0.46                   | 0.38                  |
| 21,853.00                                                                                                                        | 90.95           | 181.28      | 12,577.72             | -9,443.23    | -188.94      | 9,441.13                | 0.52                    | 0.47                   | 0.21                  |
| 21,948.00                                                                                                                        | 90.34           | 184.65      | 12,576.65             | -9,538.08    | -193.85      | 9,535.93                | 3.60                    | -0.64                  | 3.55                  |
| 22,042.00                                                                                                                        | 90.06           | 185.51      | 12,576.33             | -9,631.71    | -202.18      | 9,629.48                | 0.96                    | -0.30                  | 0.91                  |
| 22,137.00                                                                                                                        | 89.16           | 180.17      | 12,576.97             | -9,726.56    | -206.88      | 9,724.28                | 5.70                    | -0.95                  | -5.62                 |
| 22,231.00                                                                                                                        | 89.22           | 176.42      | 12,578.30             | -9,820.49    | -204.09      | 9,818.23                | 3.99                    | 0.06                   | -3.99                 |
| 22,325.00                                                                                                                        | 88.60           | 175.64      | 12,580.09             | -9,914.25    | -197.58      | 9,912.04                | 1.06                    | -0.66                  | -0.83                 |
| 22,412.20                                                                                                                        | 89.01           | 176.86      | 12,581.91             | -10,001.24   | -191.88      | 9,999.09                | 1.48                    | 0.47                   | 1.40                  |
| <b>Cross 330' Offset: 22412.20' MD, 12581.91' TVD, 89.01° INC</b>                                                                |                 |             |                       |              |              |                         |                         |                        |                       |
| 22,420.00                                                                                                                        | 89.05           | 176.97      | 12,582.04             | -10,009.03   | -191.46      | 10,006.88               | 1.48                    | 0.47                   | 1.40                  |
| 22,472.00                                                                                                                        | 89.22           | 179.37      | 12,582.82             | -10,060.99   | -189.80      | 10,058.85               | 4.63                    | 0.33                   | 4.62                  |
| <b>Final MWD Survey: 22472.00' MD, 12582.82' TVD</b>                                                                             |                 |             |                       |              |              |                         |                         |                        |                       |
| 22,531.00                                                                                                                        | 89.22           | 179.37      | 12,583.63             | -10,119.98   | -189.15      | 10,117.85               | 0.00                    | 0.00                   | 0.00                  |
| <b>BHL: 22351.00' MD, 0.00' TVD, 0.00° INC, 0.00° AZ, 0.00° +N/-S, 0.00° +E/-W, 0.00° VS - 211' FSL / 339' FWL - PHBL(WF22H)</b> |                 |             |                       |              |              |                         |                         |                        |                       |



# Survey Report

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**Project:** Lea County, NM (NAD27) NMEZ  
**Site:** White Falcon 16 Federal COM  
**Well:** #22H  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well #22H  
**TVD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**MD Reference:** RKB @ 3271.60usft (Latshaw 44 - KB=25')  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.14 Single User Db

## Design Annotations

| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                                                                      |
|-----------------------------|-----------------------------|-------------------|-----------------|------------------------------------------------------------------------------|
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                                                                              |
| 11,960.00                   | 11,953.73                   | 146.11            | -229.97         | KOP: 11960.00' MD, 11953.73' TVD                                             |
| 12,477.03                   | 12,385.04                   | -110.75           | -249.79         | Cross 330' Offset: 12477.03' MD, 12385.04' TVD, 51.69° INC                   |
| 12,883.00                   | 12,531.50                   | -479.51           | -269.75         | EOC: 12883.00' MD, 12531.50' TVD, 89.10° INC, 179.18° AZ, 477.04' VS         |
| 22,412.20                   | 12,581.91                   | -10,001.24        | -191.88         | Cross 330' Offset: 22412.20' MD, 12581.91' TVD, 89.01° INC                   |
| 22,472.00                   | 12,582.82                   | -10,060.99        | -189.80         | Final MWD Survey: 22472.00' MD, 12582.82' TVD                                |
| 22,531.00                   | 12,583.63                   | -10,119.98        | -189.15         | BHL: 22351.00' MD, 0.00' TVD, 0.00° INC, 0.00° AZ, 0.00' +N/-S, 0.00' +E/-W, |
| 22,531.00                   | 12,583.63                   | -10,119.98        | -189.15         | 211' FSL / 339' FWL                                                          |

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_