

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTFORM APPROVED  
OMB NO 1004-0135  
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*OCD Hobbs  
HOBBS OCD

NOV 07 2012

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

|                                                                                                                                 |                                                    |                                                  |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------|
| 1 Type of Well<br><input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other |                                                    | 5 Lease Serial No<br>NMNM120908                  |
| 2 Name of Operator<br>COG PRODUCTION LLC                                                                                        |                                                    | 6 If Indian, Allottee or Tribe Name              |
| Contact: DEBORA WILBOURN<br>E-Mail dwilbourn@concho.com                                                                         |                                                    | 7 If Unit or CA/Agreement, Name and/or No        |
| 3a Address<br>2208 W MAIN STREET<br>ARTESIA, NM 88210                                                                           | 3b Phone No (include area code)<br>Ph 575-748-6958 | 8 Well Name and No.<br>REDHEAD 31 FEDERAL 1H     |
| 4 Location of Well (Footage, Sec., T, R, M, or Survey Description)<br>Sec 31 T24S R32E NWNW Lot 1 330FNL 990FWL                 |                                                    | 9 API Well No<br>30-025-40390-00-X1              |
|                                                                                                                                 |                                                    | 10 Field and Pool, or Exploratory<br>WILDCAT     |
|                                                                                                                                 |                                                    | 11 County or Parish, and State<br>LEA COUNTY, NM |

**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

| TYPE OF SUBMISSION                                   | TYPE OF ACTION                                                                                                                                                               |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Notice of Intent | <input type="checkbox"/> Acidize <input type="checkbox"/> Deepen <input type="checkbox"/> Production (Start/Resume) <input type="checkbox"/> Water Shut-Off                  |
| <input type="checkbox"/> Subsequent Report           | <input type="checkbox"/> Alter Casing <input type="checkbox"/> Fracture Treat <input type="checkbox"/> Reclamation <input type="checkbox"/> Well Integrity                   |
| <input type="checkbox"/> Final Abandonment Notice    | <input type="checkbox"/> Casing Repair <input type="checkbox"/> New Construction <input type="checkbox"/> Recomplete <input checked="" type="checkbox"/> Other               |
|                                                      | <input type="checkbox"/> Change Plans <input type="checkbox"/> Plug and Abandon <input type="checkbox"/> Temporarily Abandon <input type="checkbox"/> Change to Original APD |
|                                                      | <input type="checkbox"/> Convert to Injection <input type="checkbox"/> Plug Back <input type="checkbox"/> Water Disposal                                                     |

13 Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC respectfully requests the following changes:

Production casing section.

Kick off and drill 7-7/8" curve & lateral to 14,803' MD/10,490' TVD (see attached directional plan)  
Run 5-1/2" 17# P-110 LTC csg to TD

Cmt in 1 stage with:

Lead: 1000 sx 50:50:10 H + Salt + Gilsonite + CF + CFR-3 @ 11.8 ppg/2.5 yield

Tail: 1000 sx 50:50:2 H + Salt + GasStop + CFR-3 @ 14.4 ppg/1.25 yield

Minimum tie back to 4300'

35% excess on OH

|                                                                                                                                                                                                         |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 14 I hereby certify that the foregoing is true and correct                                                                                                                                              |                             |
| Electronic Submission #157103 verified by the BLM Well Information System<br>For COG PRODUCTION LLC, sent to the Hobbs<br>Committed to AFMSS for processing by KURT SIMMONS on 11/01/2012 (13KMS1385SE) |                             |
| Name (Printed/Typed) DEBORA WILBOURN                                                                                                                                                                    | Title DRLG ENGINEERING TECH |
| Signature (Electronic Submission)                                                                                                                                                                       | Date 11/01/2012             |

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

|                                                                                                                                                                                                                                                           |                          |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|
| Approved By CHRISTOPHER WALLS                                                                                                                                                                                                                             | Title PETROLEUM ENGINEER | Date 11/01/2012 |
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. |                          | Office Hobbs    |

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\***

NOV 08 2012

# Archer

## COG Operating, LLC

Lea County(NM27E)

Sec.31-T24S-R32E

Redhead 31 Federal #1H-

Wellbore #1

HOBBS OCD

NOV 07 2012

Plan: Design #2

RECEIVED

## Standard Planning Report

30 October, 2012





Project: Lea County(NM27E)  
Site: Sec.31-T24S-R32E  
Well: Redhead 31 Federal #1H  
Wellbore: Wellbore #1  
Design: Design #2  
Lat: 32° 10' 48.243 N  
Long: 103° 43' 9.434 W  
GL: 3514.0  
KB: WELL @ 3531.0usft (Original Well Elev)

# Archer

## SECTION DETAILS

| MD      | Inc   | Azi    | TVD     | +N/-S   | +E/-W | Dleg  | TFace  | VSect  | Annotation                      |
|---------|-------|--------|---------|---------|-------|-------|--------|--------|---------------------------------|
| 9500.0  | 1.86  | 244.66 | 9498.8  | -44.8   | -53.0 | 0.00  | 0.00   | 45.0   | Tie on                          |
| 9900.0  | 1.86  | 244.66 | 9898.6  | -50.4   | -64.7 | 0.00  | 0.00   | 50.7   | Start Drop -2.00                |
| 9993.0  | 0.00  | 0.00   | 9991.6  | -51.0   | -66.1 | 2.00  | 180.00 | 51.3   | Start 20.9 hold at 9993.0 MD    |
| 10013.9 | 0.00  | 0.00   | 10012.5 | -51.0   | -66.1 | 0.00  | 0.00   | 51.3   | Start Build 12.00               |
| 10763.9 | 90.00 | 179.43 | 10490.0 | -528.4  | -61.4 | 12.00 | 179.43 | 528.7  | Start 4039.7 hold at 10763.9 MD |
| 14803.6 | 90.00 | 179.43 | 10490.0 | -4567.9 | -21.4 | 0.00  | 0.00   | 4568.0 | TD at 14803.6                   |

## WELL DETAILS: Redhead 31 Federal #1H

| +N/-S | +E/-W | Northing  | Ground Level: | 3514.0    | Longitude                            | Slot |
|-------|-------|-----------|---------------|-----------|--------------------------------------|------|
| 0.0   | 0.0   | 429771.20 | Easting       | 689979.70 | 32° 10' 48.243 N<br>103° 43' 9.434 W |      |

## WELLBORE TARGET DETAILS (LAT/LONG)

| Name            | TVD     | +N/-S   | +E/-W | Latitude        | Longitude        | Shape |
|-----------------|---------|---------|-------|-----------------|------------------|-------|
| R#1 Fed 1H PBHL | 10490.0 | -4567.9 | -21.4 | 32° 10' 3.041 N | 103° 43' 9.986 W | Point |

## PROJECT DETAILS: Lea County(NM27E)

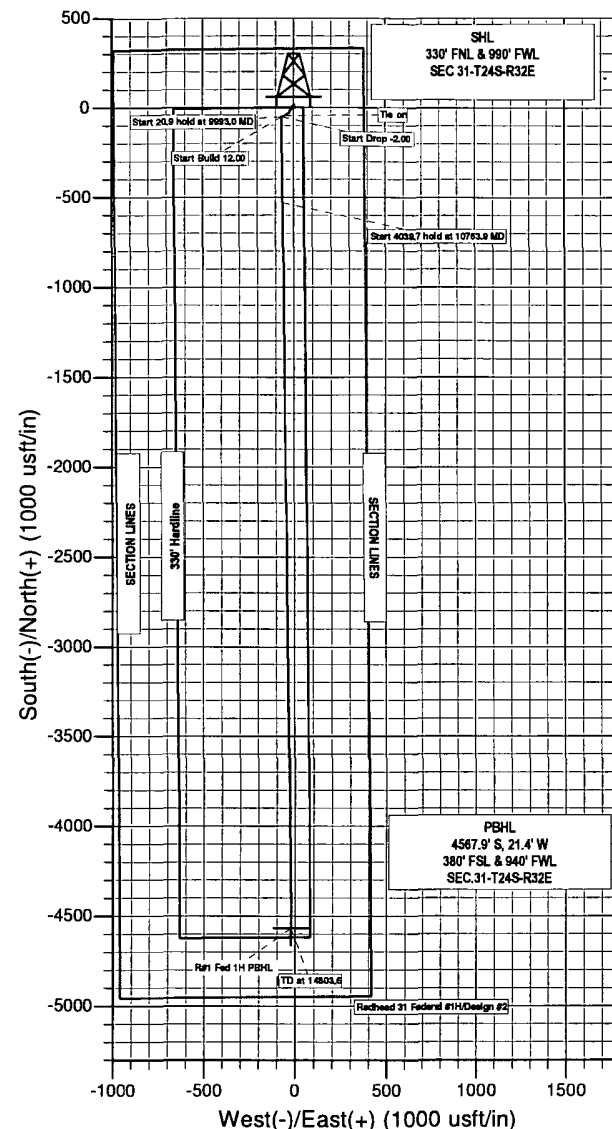
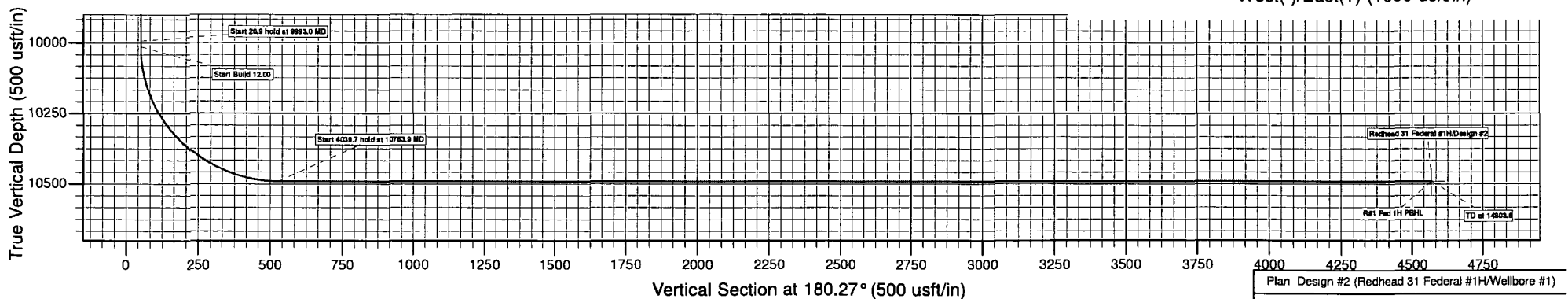
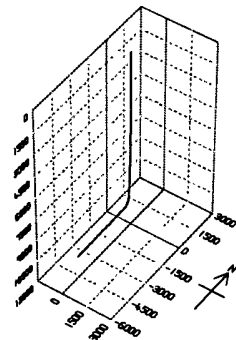
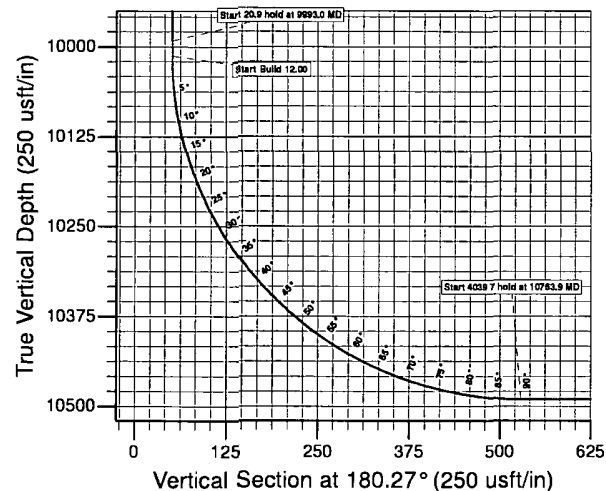
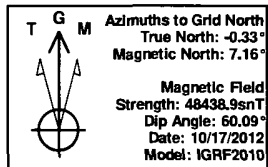
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001

System Datum: Mean Sea Level

## SITE DETAILS: Sec.31-T24S-R32E

Site Centre Latitude: 32° 10' 48.243 N  
Longitude: 103° 43' 9.434 W

Positional Uncertainty: 0.0  
Convergence: 0.33  
Local North: Grid



|           |                        |                              |                                        |
|-----------|------------------------|------------------------------|----------------------------------------|
| Database: | EDMDBBW                | Local Co-ordinate Reference: | Well Redhead 31 Federal #1H            |
| Company:  | COG Operating, LLC     | TVD Reference:               | WELL @ 3531.0usft (Original Well Elev) |
| Project:  | Lea County(NM27E)      | MD Reference:                | WELL @ 3531.0usft (Original Well Elev) |
| Site:     | Sec.31-T24S-R32E       | North Reference:             | Grid                                   |
| Well:     | Redhead 31 Federal #1H | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | Wellbore #1            |                              |                                        |
| Design:   | Design #2              |                              |                                        |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Lea County(NM27E)                    |               |                |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum:  | NAD 1927 (NADCON CONUS)              |               |                |
| Map Zone:   | New Mexico East 3001                 |               |                |

|                       |                  |                   |                  |
|-----------------------|------------------|-------------------|------------------|
| Site                  | Sec.31-T24S-R32E |                   |                  |
| Site Position:        |                  | Northing:         | 429,771.20 usft  |
| From:                 | Map              | Easting:          | 689,979.70 usft  |
| Position Uncertainty: | 0.0 usft         | Slot Radius:      | 13-3/16"         |
|                       |                  | Latitude:         | 32° 10' 48.243 N |
|                       |                  | Longitude:        | 103° 43' 9.434 W |
|                       |                  | Grid Convergence: | 0.33 °           |

|                      |                        |                     |                           |
|----------------------|------------------------|---------------------|---------------------------|
| Well                 | Redhead 31 Federal #1H |                     |                           |
| Well Position        | +N/-S                  | 0.0 usft            | Northing: 429,771.20 usft |
|                      | +E/-W                  | 0.0 usft            | Easting: 689,979.70 usft  |
| Position Uncertainty | 0.0 usft               | Wellhead Elevation: | usft                      |
|                      |                        | Latitude:           | 32° 10' 48.243 N          |
|                      |                        | Longitude:          | 103° 43' 9.434 W          |
|                      |                        | Ground Level:       | 3,514.0 usft              |

|           |             |             |                |
|-----------|-------------|-------------|----------------|
| Wellbore  | Wellbore #1 |             |                |
| Magnetics | Model Name  | Sample Date | Declination    |
|           |             |             | (°)            |
|           | IGRF2010    | 10/17/12    | 7.49           |
|           |             |             | Dip Angle      |
|           |             |             | (°)            |
|           |             |             | Field Strength |
|           |             |             | (nT)           |
|           |             |             | 60.09          |
|           |             |             | 48,439         |

|                   |                  |        |                       |
|-------------------|------------------|--------|-----------------------|
| Design            | Design #2        |        |                       |
| Audit Notes:      |                  |        |                       |
| Version:          | Phase:           | PLAN   | Tie On Depth: 9,500.0 |
| Vertical Section: | Depth From (TVD) | +N/-S  | +E/-W                 |
|                   | (usft)           | (usft) | (usft)                |
|                   | 0.0              | 0.0    | 0.0                   |
|                   |                  |        | Direction             |
|                   |                  |        | (°)                   |
|                   |                  |        | 180.27                |

| Plan Sections: |             |         |          |          |        |             |             |             |        |                 |
|----------------|-------------|---------|----------|----------|--------|-------------|-------------|-------------|--------|-----------------|
| Measured       | Inclination | Azimuth | Vertical | +N/-S    | +E/-W  | Dogleg      | Build       | Turn        | TFO    | Target          |
| Depth          | (°)         | (°)     | Depth    | (usft)   | (usft) | Rate        | Rate        | Rate        | (°)    |                 |
| (usft)         |             |         | (usft)   |          |        | (°/100usft) | (°/100usft) | (°/100usft) |        |                 |
| 9,500.0        | 1.86        | 244.66  | 9,498.8  | -44.8    | -53.0  | 0.00        | 0.00        | 0.00        | 0.00   |                 |
| 9,900.0        | 1.86        | 244.66  | 9,898.6  | -50.4    | -64.7  | 0.00        | 0.00        | 0.00        | 0.00   |                 |
| 9,993.0        | 0.00        | 0.00    | 9,991.6  | -51.0    | -66.1  | 2.00        | -2.00       | 0.00        | 180.00 |                 |
| 10,013.9       | 0.00        | 0.00    | 10,012.5 | -51.0    | -66.1  | 0.00        | 0.00        | 0.00        | 0.00   |                 |
| 10,763.9       | 90.00       | 179.43  | 10,490.0 | -528.4   | -61.4  | 12.00       | 12.00       | 0.00        | 179.43 | R#1 Fed 1H PBHL |
| 14,803.6       | 90.00       | 179.43  | 10,490.0 | -4,567.9 | -21.4  | 0.00        | 0.00        | 0.00        | 0.00   |                 |

|           |                        |                              |                                        |
|-----------|------------------------|------------------------------|----------------------------------------|
| Database: | EDMDBBW                | Local Co-ordinate Reference: | Well Redhead 31 Federal #1H            |
| Company:  | COG Operating, LLC     | TVD Reference:               | WELL @ 3531.0usft (Original Well Elev) |
| Project:  | Lea County(NM27E)      | MD Reference:                | WELL @ 3531.0usft (Original Well Elev) |
| Site:     | Sec.31-T24S-R32E       | North Reference:             | Grd                                    |
| Well:     | Redhead 31 Federal #1H | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | Wellbore #1            |                              |                                        |
| Design:   | Design #2              |                              |                                        |

| Planned 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) |
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |
| 100.0                 | 0.14            | 275.25      | 100.0                 | 0.0          | -0.1         | 0.0                     | 0.14                    | 0.14                   | 0.00                  |
| 200.0                 | 0.24            | 222.94      | 200.0                 | -0.1         | -0.4         | 0.1                     | 0.19                    | 0.10                   | -52.31                |
| 300.0                 | 0.09            | 309.70      | 300.0                 | -0.2         | -0.6         | 0.2                     | 0.25                    | -0.15                  | 86.76                 |
| 400.0                 | 0.20            | 321.58      | 400.0                 | 0.0          | -0.8         | 0.1                     | 0.11                    | 0.11                   | 11.88                 |
| 500.0                 | 0.31            | 345.32      | 500.0                 | 0.4          | -0.9         | -0.3                    | 0.15                    | 0.11                   | 23.74                 |
| 600.0                 | 0.63            | 312.03      | 600.0                 | 1.0          | -1.4         | -1.0                    | 0.41                    | 0.32                   | -33.29                |
| 700.0                 | 0.54            | 334.14      | 700.0                 | 1.8          | -2.0         | -1.8                    | 0.24                    | -0.09                  | 22.11                 |
| 800.0                 | 0.57            | 314.88      | 800.0                 | 2.5          | -2.6         | -2.5                    | 0.19                    | 0.03                   | -19.26                |
| 900.0                 | 0.86            | 312.46      | 900.0                 | 3.4          | -3.5         | -3.4                    | 0.29                    | 0.29                   | -2.42                 |
| 1,000.0               | 0.65            | 308.99      | 1,000.0               | 4.3          | -4.5         | -4.2                    | 0.21                    | -0.21                  | -3.47                 |
| 1,100.0               | 0.58            | 307.22      | 1,100.0               | 4.9          | -5.3         | -4.9                    | 0.07                    | -0.07                  | -1.77                 |
| 1,200.0               | 0.70            | 291.37      | 1,200.0               | 5.5          | -6.3         | -5.4                    | 0.21                    | 0.12                   | -15.85                |
| 1,300.0               | 0.76            | 298.67      | 1,299.9               | 6.0          | -7.5         | -6.0                    | 0.11                    | 0.06                   | 7.30                  |
| 1,400.0               | 0.54            | 319.47      | 1,399.9               | 6.7          | -8.3         | -6.6                    | 0.32                    | -0.22                  | 20.80                 |
| 1,500.0               | 0.38            | 318.40      | 1,499.9               | 7.3          | -8.9         | -7.2                    | 0.16                    | -0.16                  | -1.07                 |
| 1,600.0               | 0.28            | 330.96      | 1,599.9               | 7.7          | -9.2         | -7.7                    | 0.12                    | -0.10                  | 12.56                 |
| 1,700.0               | 0.42            | 320.86      | 1,699.9               | 8.2          | -9.6         | -8.2                    | 0.15                    | 0.14                   | -10.10                |
| 1,800.0               | 0.10            | 331.37      | 1,799.9               | 8.6          | -9.8         | -8.6                    | 0.32                    | -0.32                  | 10.51                 |
| 1,900.0               | 0.18            | 282.35      | 1,899.9               | 8.7          | -10.0        | -8.7                    | 0.14                    | 0.08                   | -49.02                |
| 2,000.0               | 0.26            | 339.59      | 1,999.9               | 9.0          | -10.3        | -8.9                    | 0.22                    | 0.08                   | 57.24                 |
| 2,100.0               | 0.16            | 103.25      | 2,099.9               | 9.1          | -10.2        | -9.1                    | 0.37                    | -0.10                  | 123.66                |
| 2,200.0               | 0.18            | 322.29      | 2,199.9               | 9.2          | -10.2        | -9.2                    | 0.32                    | 0.02                   | -140.96               |
| 2,300.0               | 0.16            | 238.62      | 2,299.9               | 9.3          | -10.4        | -9.2                    | 0.23                    | -0.02                  | -83.67                |
| 2,400.0               | 0.10            | 149.04      | 2,399.9               | 9.1          | -10.4        | -9.1                    | 0.19                    | -0.06                  | -89.58                |
| 2,500.0               | 0.11            | 81.53       | 2,499.9               | 9.1          | -10.3        | -9.0                    | 0.12                    | 0.01                   | -67.51                |
| 2,600.0               | 0.21            | 306.09      | 2,599.9               | 9.2          | -10.4        | -9.2                    | 0.30                    | 0.10                   | -135.44               |
| 2,700.0               | 0.14            | 154.84      | 2,699.9               | 9.2          | -10.5        | -9.1                    | 0.34                    | -0.07                  | -151.25               |
| 2,800.0               | 0.04            | 341.21      | 2,799.9               | 9.1          | -10.4        | -9.1                    | 0.18                    | -0.10                  | -173.63               |
| 2,900.0               | 0.39            | 68.95       | 2,899.9               | 9.3          | -10.1        | -9.2                    | 0.39                    | 0.35                   | 87.74                 |
| 3,000.0               | 0.41            | 90.93       | 2,999.9               | 9.4          | -9.4         | -9.3                    | 0.15                    | 0.02                   | 21.98                 |
| 3,100.0               | 0.85            | 88.98       | 3,099.9               | 9.4          | -8.3         | -9.4                    | 0.44                    | 0.44                   | -1.95                 |
| 3,200.0               | 1.45            | 74.16       | 3,199.9               | 9.8          | -6.4         | -9.7                    | 0.66                    | 0.60                   | -14.82                |
| 3,300.0               | 1.23            | 74.90       | 3,299.9               | 10.4         | -4.1         | -10.4                   | 0.22                    | -0.22                  | 0.74                  |
| 3,400.0               | 1.09            | 63.87       | 3,399.9               | 11.1         | -2.2         | -11.1                   | 0.26                    | -0.14                  | -11.03                |
| 3,500.0               | 1.41            | 66.81       | 3,499.8               | 12.0         | -0.2         | -12.0                   | 0.33                    | 0.32                   | 2.94                  |
| 3,600.0               | 1.32            | 62.73       | 3,599.8               | 13.0         | 1.9          | -13.0                   | 0.13                    | -0.09                  | -4.08                 |
| 3,700.0               | 0.91            | 52.00       | 3,699.8               | 14.0         | 3.6          | -14.0                   | 0.46                    | -0.41                  | -10.73                |
| 3,800.0               | 0.61            | 27.99       | 3,799.8               | 15.0         | 4.4          | -15.0                   | 0.43                    | -0.30                  | -24.01                |
| 3,900.0               | 0.35            | 50.10       | 3,899.8               | 15.6         | 4.9          | -15.7                   | 0.31                    | -0.26                  | 22.11                 |
| 4,000.0               | 0.14            | 41.69       | 3,999.8               | 15.9         | 5.2          | -15.9                   | 0.21                    | -0.21                  | -8.41                 |
| 4,100.0               | 0.35            | 178.14      | 4,099.8               | 15.7         | 5.3          | -15.7                   | 0.46                    | 0.21                   | 136.45                |
| 4,200.0               | 1.05            | 181.39      | 4,199.8               | 14.5         | 5.3          | -14.5                   | 0.70                    | 0.70                   | 3.25                  |
| 4,300.0               | 1.23            | 177.70      | 4,299.7               | 12.5         | 5.3          | -12.5                   | 0.19                    | 0.18                   | -3.69                 |
| 4,400.0               | 1.31            | 187.01      | 4,399.7               | 10.3         | 5.2          | -10.3                   | 0.22                    | 0.08                   | 9.31                  |
| 4,500.0               | 0.99            | 199.16      | 4,499.7               | 8.3          | 4.8          | -8.4                    | 0.40                    | -0.32                  | 12.15                 |
| 4,600.0               | 0.87            | 203.08      | 4,599.7               | 6.8          | 4.2          | -6.8                    | 0.14                    | -0.12                  | 3.92                  |
| 4,700.0               | 0.84            | 205.70      | 4,699.7               | 5.5          | 3.6          | -5.5                    | 0.05                    | -0.03                  | 2.62                  |
| 4,800.0               | 0.78            | 217.77      | 4,799.7               | 4.3          | 2.9          | -4.3                    | 0.18                    | -0.06                  | 12.07                 |
| 4,900.0               | 0.72            | 215.57      | 4,899.7               | 3.2          | 2.1          | -3.2                    | 0.07                    | -0.06                  | -2.20                 |
| 5,000.0               | 0.92            | 219.41      | 4,999.6               | 2.1          | 1.2          | -2.1                    | 0.21                    | 0.20                   | 3.84                  |
| 5,100.0               | 0.67            | 220.82      | 5,099.6               | 1.0          | 0.3          | -1.0                    | 0.25                    | -0.25                  | 1.41                  |
| 5,200.0               | 0.83            | 232.22      | 5,199.6               | 0.1          | -0.6         | -0.1                    | 0.22                    | 0.16                   | 11.40                 |
| 5,300.0               | 0.67            | 236.03      | 5,299.6               | -0.6         | -1.7         | 0.6                     | 0.17                    | -0.16                  | 3.81                  |

|           |                        |                              |                                        |
|-----------|------------------------|------------------------------|----------------------------------------|
| Database: | EDMDBBW                | Local Co-ordinate Reference: | Well Redhead 31 Federal #1H            |
| Company:  | COG Operating, LLC     | TVD Reference:               | WELL @ 3531.0usft (Original Well Elev) |
| Project:  | Lea County(NM27E)      | MD Reference:                | WELL @ 3531.0usft (Original Well Elev) |
| Site:     | Sec.31-T24S-R32E       | North Reference:             | Grid                                   |
| Well:     | Redhead 31 Federal #1H | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | Wellbore #1            |                              |                                        |
| Design:   | Design #2              |                              |                                        |

| Planned Survey               |                 |             |                       |              |              |                         |                         |                        |                       |  |
|------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft)        | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 5,400.0                      | 0.72            | 231.33      | 5,399.6               | -1.3         | -2.7         | 1.4                     | 0.08                    | 0.05                   | -4.70                 |  |
| 5,500.0                      | 0.82            | 236.92      | 5,499.6               | -2.1         | -3.7         | 2.1                     | 0.12                    | 0.10                   | 5.59                  |  |
| 5,600.0                      | 0.74            | 247.38      | 5,599.6               | -2.8         | -4.9         | 2.8                     | 0.16                    | -0.08                  | 10.46                 |  |
| 5,700.0                      | 0.74            | 227.70      | 5,699.6               | -3.5         | -6.0         | 3.5                     | 0.25                    | 0.00                   | -19.68                |  |
| 5,800.0                      | 0.70            | 237.98      | 5,799.6               | -4.2         | -7.0         | 4.2                     | 0.14                    | -0.04                  | 10.28                 |  |
| 5,900.0                      | 0.84            | 242.84      | 5,899.6               | -4.9         | -8.2         | 4.9                     | 0.15                    | 0.14                   | 4.86                  |  |
| 6,000.0                      | 0.94            | 258.36      | 5,999.6               | -5.4         | -9.6         | 5.4                     | 0.26                    | 0.10                   | 15.52                 |  |
| 6,100.0                      | 0.99            | 255.23      | 6,099.5               | -5.8         | -11.3        | 5.8                     | 0.07                    | 0.05                   | -3.13                 |  |
| 6,200.0                      | 0.58            | 254.75      | 6,199.5               | -6.1         | -12.6        | 6.2                     | 0.41                    | -0.41                  | -0.48                 |  |
| 6,300.0                      | 0.95            | 244.99      | 6,299.5               | -6.6         | -13.8        | 6.7                     | 0.39                    | 0.37                   | -9.76                 |  |
| 6,400.0                      | 0.67            | 263.38      | 6,399.5               | -7.0         | -15.2        | 7.1                     | 0.38                    | -0.28                  | 18.39                 |  |
| 6,500.0                      | 0.48            | 249.14      | 6,499.5               | -7.2         | -16.1        | 7.3                     | 0.24                    | -0.19                  | -14.24                |  |
| 6,600.0                      | 0.28            | 205.19      | 6,599.5               | -7.6         | -16.6        | 7.7                     | 0.34                    | -0.20                  | -43.95                |  |
| 6,700.0                      | 0.27            | 232.16      | 6,699.5               | -8.0         | -16.9        | 8.0                     | 0.13                    | -0.01                  | 26.97                 |  |
| 6,800.0                      | 0.48            | 221.42      | 6,799.5               | -8.4         | -17.4        | 8.5                     | 0.22                    | 0.21                   | -10.74                |  |
| 6,900.0                      | 0.59            | 194.10      | 6,899.5               | -9.2         | -17.8        | 9.3                     | 0.27                    | 0.11                   | -27.32                |  |
| 7,000.0                      | 0.54            | 218.95      | 6,999.5               | -10.1        | -18.2        | 10.2                    | 0.25                    | -0.05                  | 24.85                 |  |
| 7,100.0                      | 0.36            | 205.99      | 7,099.5               | -10.7        | -18.7        | 10.8                    | 0.21                    | -0.18                  | -12.96                |  |
| 7,200.0                      | 0.48            | 195.90      | 7,199.5               | -11.4        | -18.9        | 11.5                    | 0.14                    | 0.12                   | -10.09                |  |
| 7,300.0                      | 0.80            | 211.63      | 7,299.5               | -12.4        | -19.4        | 12.5                    | 0.36                    | 0.32                   | 15.73                 |  |
| 7,400.0                      | 0.67            | 189.68      | 7,399.5               | -13.6        | -19.8        | 13.7                    | 0.31                    | -0.13                  | -21.95                |  |
| 7,500.0                      | 0.89            | 205.88      | 7,499.5               | -14.9        | -20.3        | 15.0                    | 0.31                    | 0.22                   | 16.20                 |  |
| 7,600.0                      | 0.88            | 185.91      | 7,599.5               | -16.3        | -20.7        | 16.4                    | 0.31                    | -0.01                  | -19.97                |  |
| 7,700.0                      | 0.91            | 197.83      | 7,699.4               | -17.9        | -21.0        | 18.0                    | 0.19                    | 0.03                   | 11.92                 |  |
| 7,800.0                      | 0.76            | 188.65      | 7,799.4               | -19.3        | -21.4        | 19.4                    | 0.20                    | -0.15                  | -9.18                 |  |
| 7,900.0                      | 0.97            | 194.91      | 7,899.4               | -20.7        | -21.7        | 20.8                    | 0.23                    | 0.21                   | 6.26                  |  |
| 8,000.0                      | 1.00            | 207.59      | 7,999.4               | -22.3        | -22.3        | 22.4                    | 0.22                    | 0.03                   | 12.68                 |  |
| 8,100.0                      | 0.91            | 207.41      | 8,099.4               | -23.8        | -23.1        | 23.9                    | 0.09                    | -0.09                  | -0.18                 |  |
| 8,200.0                      | 0.94            | 200.19      | 8,199.4               | -25.3        | -23.7        | 25.4                    | 0.12                    | 0.03                   | -7.22                 |  |
| 8,300.0                      | 1.20            | 206.54      | 8,299.4               | -27.0        | -24.5        | 27.1                    | 0.29                    | 0.26                   | 6.35                  |  |
| 8,400.0                      | 1.34            | 212.99      | 8,399.3               | -28.9        | -25.6        | 29.0                    | 0.20                    | 0.14                   | 6.45                  |  |
| 8,500.0                      | 1.30            | 231.40      | 8,499.3               | -30.6        | -27.1        | 30.7                    | 0.42                    | -0.04                  | 18.41                 |  |
| 8,600.0                      | 1.47            | 238.63      | 8,599.3               | -32.0        | -29.1        | 32.1                    | 0.24                    | 0.17                   | 7.23                  |  |
| 8,700.0                      | 1.13            | 264.32      | 8,699.3               | -32.7        | -31.2        | 32.9                    | 0.67                    | -0.34                  | 25.69                 |  |
| 8,800.0                      | 1.64            | 249.98      | 8,799.2               | -33.3        | -33.5        | 33.5                    | 0.61                    | 0.51                   | -14.34                |  |
| 8,900.0                      | 2.38            | 231.77      | 8,899.2               | -35.1        | -36.5        | 35.3                    | 0.97                    | 0.74                   | -18.21                |  |
| 9,000.0                      | 2.11            | 223.30      | 8,999.1               | -37.7        | -39.4        | 37.9                    | 0.43                    | -0.27                  | -8.47                 |  |
| 9,100.0                      | 1.58            | 234.94      | 9,099.0               | -39.9        | -41.7        | 40.1                    | 0.65                    | -0.53                  | 11.64                 |  |
| 9,200.0                      | 1.89            | 256.06      | 9,199.0               | -41.1        | -44.5        | 41.3                    | 0.71                    | 0.31                   | 21.12                 |  |
| 9,300.0                      | 1.86            | 250.48      | 9,298.9               | -42.0        | -47.6        | 42.2                    | 0.18                    | -0.03                  | -5.58                 |  |
| 9,400.0                      | 1.63            | 236.41      | 9,398.9               | -43.3        | -50.3        | 43.6                    | 0.48                    | -0.23                  | -14.07                |  |
| Tie on                       |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,500.0                      | 1.86            | 244.66      | 9,498.8               | -44.8        | -53.0        | 45.0                    | 0.34                    | 0.23                   | 8.25                  |  |
| 9,600.0                      | 1.86            | 244.66      | 9,598.8               | -46.2        | -55.9        | 46.5                    | 0.00                    | 0.00                   | 0.00                  |  |
| 9,700.0                      | 1.86            | 244.66      | 9,698.7               | -47.6        | -58.8        | 47.9                    | 0.00                    | 0.00                   | 0.00                  |  |
| 9,800.0                      | 1.86            | 244.66      | 9,798.7               | -49.0        | -61.8        | 49.3                    | 0.00                    | 0.00                   | 0.00                  |  |
| Start Drop -2.00             |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,900.0                      | 1.86            | 244.66      | 9,898.6               | -50.4        | -64.7        | 50.7                    | 0.00                    | 0.00                   | 0.00                  |  |
| Start 20.9 hold at 9993.0 MD |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 9,993.0                      | 0.00            | 0.00        | 9,991.6               | -51.0        | -66.1        | 51.3                    | 2.00                    | -2.00                  | 0.00                  |  |
| 10,000.0                     | 0.00            | 0.00        | 9,998.6               | -51.0        | -66.1        | 51.3                    | 0.00                    | 0.00                   | 0.00                  |  |
| Start Build -12.00           |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 10,013.9                     | 0.00            | 0.00        | 10,012.5              | -51.0        | -66.1        | 51.3                    | 0.00                    | 0.00                   | 0.00                  |  |



|           |                        |                              |                                        |
|-----------|------------------------|------------------------------|----------------------------------------|
| Database: | EDMDBBW                | Local Co-ordinate Reference: | Well Redhead 31 Federal #1H            |
| Company:  | COG Operating, LLC     | TVD Reference:               | WELL @ 3531.0usft (Original Well Elev) |
| Project:  | Lea County(NM27E)      | MD Reference:                | WELL @ 3531.0usft (Original Well Elev) |
| Site:     | Sec 31-T24S-R32E       | North Reference:             | Grid                                   |
| Well:     | Redhead 31 Federal #1H | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | Wellbore #1            |                              |                                        |
| Design:   | Design #2              |                              |                                        |

| Planned 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) |  |
| 10,025.0                        | 1.33               | 179.43         | 10,023.6                    | -51.1           | -86.1           | 51.4                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,050.0                        | 4.33               | 179.43         | 10,048.6                    | -52.4           | -86.1           | 52.7                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,075.0                        | 7.33               | 179.43         | 10,073.4                    | -54.9           | -86.0           | 55.2                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,100.0                        | 10.33              | 179.43         | 10,098.1                    | -58.7           | -86.0           | 59.1                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,125.0                        | 13.33              | 179.43         | 10,122.6                    | -63.9           | -85.9           | 64.2                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,150.0                        | 16.33              | 179.43         | 10,146.8                    | -70.3           | -85.9           | 70.6                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,175.0                        | 19.33              | 179.43         | 10,170.6                    | -77.9           | -85.8           | 78.2                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,200.0                        | 22.33              | 179.43         | 10,193.9                    | -86.8           | -85.7           | 87.1                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,225.0                        | 25.33              | 179.43         | 10,216.8                    | -96.9           | -85.6           | 97.2                          | 12.00                         | 12.00                        | 0.00                        |  |
| 10,250.0                        | 28.33              | 179.43         | 10,239.1                    | -108.2          | -85.5           | 108.5                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,275.0                        | 31.33              | 179.43         | 10,260.8                    | -120.6          | -85.4           | 120.9                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,300.0                        | 34.33              | 179.43         | 10,281.8                    | -134.2          | -85.2           | 134.5                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,325.0                        | 37.33              | 179.43         | 10,302.1                    | -148.8          | -85.1           | 149.1                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,350.0                        | 40.33              | 179.43         | 10,321.5                    | -164.5          | -85.0           | 164.8                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,375.0                        | 43.33              | 179.43         | 10,340.2                    | -181.2          | -84.8           | 181.5                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,400.0                        | 46.33              | 179.43         | 10,357.9                    | -198.8          | -84.6           | 199.1                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,425.0                        | 49.33              | 179.43         | 10,374.7                    | -217.3          | -84.4           | 217.6                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,450.0                        | 52.33              | 179.43         | 10,390.5                    | -236.7          | -84.2           | 237.0                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,475.0                        | 55.33              | 179.43         | 10,405.2                    | -256.9          | -84.0           | 257.2                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,500.0                        | 58.33              | 179.43         | 10,418.9                    | -277.8          | -83.8           | 278.1                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,525.0                        | 61.33              | 179.43         | 10,431.5                    | -299.4          | -83.6           | 299.7                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,550.0                        | 64.33              | 179.43         | 10,442.9                    | -321.6          | -83.4           | 321.9                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,575.0                        | 67.33              | 179.43         | 10,453.1                    | -344.4          | -83.2           | 344.7                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,600.0                        | 70.33              | 179.43         | 10,462.1                    | -367.8          | -82.9           | 368.0                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,625.0                        | 73.33              | 179.43         | 10,469.9                    | -391.5          | -82.7           | 391.8                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,650.0                        | 76.33              | 179.43         | 10,476.5                    | -415.6          | -82.5           | 415.9                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,675.0                        | 79.33              | 179.43         | 10,481.7                    | -440.1          | -82.2           | 440.3                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,700.0                        | 82.33              | 179.43         | 10,485.7                    | -464.7          | -82.0           | 465.0                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,725.0                        | 85.33              | 179.43         | 10,488.4                    | -489.6          | -81.7           | 489.9                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,750.0                        | 88.33              | 179.43         | 10,489.8                    | -514.5          | -81.5           | 514.8                         | 12.00                         | 12.00                        | 0.00                        |  |
| Start 4039.7 hold at 10763.9 MD |                    |                |                             |                 |                 |                               |                               |                              |                             |  |
| 10,763.9                        | 90.00              | 179.43         | 10,490.0                    | -528.4          | -81.4           | 528.7                         | 12.00                         | 12.00                        | 0.00                        |  |
| 10,800.0                        | 90.00              | 179.43         | 10,490.0                    | -564.5          | -81.0           | 564.8                         | 0.00                          | 0.00                         | 0.00                        |  |
| 10,900.0                        | 90.00              | 179.43         | 10,490.0                    | -664.5          | -80.0           | 664.8                         | 0.00                          | 0.00                         | 0.00                        |  |
| 11,000.0                        | 90.00              | 179.43         | 10,490.0                    | -764.5          | -59.0           | 764.8                         | 0.00                          | 0.00                         | 0.00                        |  |
| 11,100.0                        | 90.00              | 179.43         | 10,490.0                    | -864.5          | -58.0           | 864.8                         | 0.00                          | 0.00                         | 0.00                        |  |
| 11,200.0                        | 90.00              | 179.43         | 10,490.0                    | -964.5          | -57.0           | 964.8                         | 0.00                          | 0.00                         | 0.00                        |  |
| 11,300.0                        | 90.00              | 179.43         | 10,490.0                    | -1,064.5        | -56.0           | 1,064.8                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,400.0                        | 90.00              | 179.43         | 10,490.0                    | -1,164.5        | -55.1           | 1,164.8                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,500.0                        | 90.00              | 179.43         | 10,490.0                    | -1,264.5        | -54.1           | 1,264.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,600.0                        | 90.00              | 179.43         | 10,490.0                    | -1,364.5        | -53.1           | 1,364.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,700.0                        | 90.00              | 179.43         | 10,490.0                    | -1,464.5        | -52.1           | 1,464.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,800.0                        | 90.00              | 179.43         | 10,490.0                    | -1,564.5        | -51.1           | 1,564.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 11,900.0                        | 90.00              | 179.43         | 10,490.0                    | -1,664.5        | -50.1           | 1,664.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,000.0                        | 90.00              | 179.43         | 10,490.0                    | -1,764.5        | -49.1           | 1,764.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,100.0                        | 90.00              | 179.43         | 10,490.0                    | -1,864.5        | -48.1           | 1,864.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,200.0                        | 90.00              | 179.43         | 10,490.0                    | -1,964.5        | -47.1           | 1,964.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,300.0                        | 90.00              | 179.43         | 10,490.0                    | -2,064.5        | -46.2           | 2,064.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,400.0                        | 90.00              | 179.43         | 10,490.0                    | -2,164.5        | -45.2           | 2,164.7                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,500.0                        | 90.00              | 179.43         | 10,490.0                    | -2,264.5        | -44.2           | 2,264.6                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,600.0                        | 90.00              | 179.43         | 10,490.0                    | -2,364.5        | -43.2           | 2,364.6                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,700.0                        | 90.00              | 179.43         | 10,490.0                    | -2,464.5        | -42.2           | 2,464.6                       | 0.00                          | 0.00                         | 0.00                        |  |
| 12,800.0                        | 90.00              | 179.43         | 10,490.0                    | -2,564.4        | -41.2           | 2,564.6                       | 0.00                          | 0.00                         | 0.00                        |  |

|           |                        |                              |                                        |
|-----------|------------------------|------------------------------|----------------------------------------|
| Database: | EDMDBBW                | Local Co-ordinate Reference: | Well Redhead 31 Federal #1H            |
| Company:  | COG Operating, LLC     | TVD Reference:               | WELL @ 3531.0usft (Original Well Elev) |
| Project:  | Lea County(NM27E)      | MD Reference:                | WELL @ 3531.0usft (Original Well Elev) |
| Site:     | Sec 31-T24S-R32E       | North Reference:             | Grid                                   |
| Well:     | Redhead 31 Federal #1H | Survey Calculation Method:   | Minimum Curvature                      |
| Wellbore: | Wellbore #1            |                              |                                        |
| Design:   | Design #2              |                              |                                        |

| Planned 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) |
| 12,900.0              | 90.00           | 179.43      | 10,490.0              | -2,664.4     | -40.2        | 2,664.6                 | 0.00                    | 0.00                   | 0.00                  |
| 13,000.0              | 90.00           | 179.43      | 10,490.0              | -2,764.4     | -39.2        | 2,764.6                 | 0.00                    | 0.00                   | 0.00                  |
| 13,100.0              | 90.00           | 179.43      | 10,490.0              | -2,864.4     | -38.2        | 2,864.6                 | 0.00                    | 0.00                   | 0.00                  |
| 13,200.0              | 90.00           | 179.43      | 10,490.0              | -2,964.4     | -37.3        | 2,964.6                 | 0.00                    | 0.00                   | 0.00                  |
| 13,300.0              | 90.00           | 179.43      | 10,490.0              | -3,064.4     | -36.3        | 3,064.6                 | 0.00                    | 0.00                   | 0.00                  |
| 13,400.0              | 90.00           | 179.43      | 10,490.0              | -3,164.4     | -35.3        | 3,164.5                 | 0.00                    | 0.00                   | 0.00                  |
| 13,500.0              | 90.00           | 179.43      | 10,490.0              | -3,264.4     | -34.3        | 3,264.5                 | 0.00                    | 0.00                   | 0.00                  |
| 13,600.0              | 90.00           | 179.43      | 10,490.0              | -3,364.4     | -33.3        | 3,364.5                 | 0.00                    | 0.00                   | 0.00                  |
| 13,700.0              | 90.00           | 179.43      | 10,490.0              | -3,464.4     | -32.3        | 3,464.5                 | 0.00                    | 0.00                   | 0.00                  |
| 13,800.0              | 90.00           | 179.43      | 10,490.0              | -3,564.4     | -31.3        | 3,564.5                 | 0.00                    | 0.00                   | 0.00                  |
| 13,900.0              | 90.00           | 179.43      | 10,490.0              | -3,664.4     | -30.3        | 3,664.5                 | 0.00                    | 0.00                   | 0.00                  |
| 14,000.0              | 90.00           | 179.43      | 10,490.0              | -3,764.4     | -29.3        | 3,764.5                 | 0.00                    | 0.00                   | 0.00                  |
| 14,100.0              | 90.00           | 179.43      | 10,490.0              | -3,864.4     | -28.4        | 3,864.5                 | 0.00                    | 0.00                   | 0.00                  |
| 14,200.0              | 90.00           | 179.43      | 10,490.0              | -3,964.4     | -27.4        | 3,964.5                 | 0.00                    | 0.00                   | 0.00                  |
| 14,300.0              | 90.00           | 179.43      | 10,490.0              | -4,064.4     | -26.4        | 4,064.5                 | 0.00                    | 0.00                   | 0.00                  |
| 14,400.0              | 90.00           | 179.43      | 10,490.0              | -4,164.4     | -25.4        | 4,164.4                 | 0.00                    | 0.00                   | 0.00                  |
| 14,500.0              | 90.00           | 179.43      | 10,490.0              | -4,264.4     | -24.4        | 4,264.4                 | 0.00                    | 0.00                   | 0.00                  |
| 14,600.0              | 90.00           | 179.43      | 10,490.0              | -4,364.4     | -23.4        | 4,364.4                 | 0.00                    | 0.00                   | 0.00                  |
| 14,700.0              | 90.00           | 179.43      | 10,490.0              | -4,464.4     | -22.4        | 4,464.4                 | 0.00                    | 0.00                   | 0.00                  |
| TD at 14803.6         |                 |             |                       |              |              |                         |                         |                        |                       |
| 14,803.6              | 90.00           | 179.43      | 10,490.0              | -4,567.9     | -21.4        | 4,568.0                 | 0.00                    | 0.00                   | 0.00                  |

| Design Targets            |               |              |            |              |              |                 |                |                 |                  |
|---------------------------|---------------|--------------|------------|--------------|--------------|-----------------|----------------|-----------------|------------------|
| Target Name               | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude        | Longitude        |
| R#1 Fed 1H PBHL           | 0.00          | 0.00         | 10,490.0   | -4,567.9     | -21.4        | 425,203.30      | 689,958.30     | 32° 10' 3.041 N | 103° 43' 9.988 W |
| - plan hits target center |               |              |            |              |              |                 |                |                 |                  |
| - Point                   |               |              |            |              |              |                 |                |                 |                  |

| Plan Annotations      |                       |              |              |                                 |
|-----------------------|-----------------------|--------------|--------------|---------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Comment                         |
| 9,500.0               | 9,498.8               | -44.8        | -53.0        | Tie on                          |
| 9,900.0               | 9,898.6               | -50.4        | -64.7        | Start Drop -2.00                |
| 9,993.0               | 9,991.6               | -51.0        | -66.1        | Start 20.9 hold at 9993.0 MD    |
| 10,013.9              | 10,012.5              | -51.0        | -66.1        | Start Build 12.00               |
| 10,763.9              | 10,490.0              | -528.4       | -61.4        | Start 4039.7 hold at 10763.9 MD |
| 14,803.6              | 10,490.0              | -4,567.9     | -21.4        | TD at 14803.6                   |