



## COG OPERATING LLC

Eddy County, NM (NAN27 NME)

Electra Federal #58

Electra Federal #58

DH - Job #32D0211160

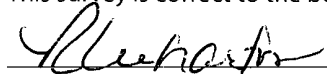
30-015-38182

Survey: MWD Survey

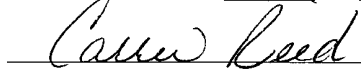
## SDI Standard Survey Report

21 March, 2011

This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 22nd of March, 2011.



Notary Signature  
County of Midland  
State of Texas



Scientific Drilling  
Directional Drilling Operations



Scientific Drilling International, Inc.  
SDI Standard Survey Report



|           |                             |                              |                                         |
|-----------|-----------------------------|------------------------------|-----------------------------------------|
| Company:  | COG OPERATING LLC           | Local Co-ordinate Reference: | Site Electra Federal #58                |
| Project:  | Eddy County, NM (NAN27 NME) | TVD Reference:               | KB Elev (14') @ 3731.0usft (United #40) |
| Site:     | Electra Federal #58         | MD Reference:                | KB Elev (14') @ 3731.0usft (United #40) |
| Well:     | Electra Federal #58         | North Reference:             | Grid                                    |
| Wellbore: | DH - Job #32D0211160        | Survey Calculation Method:   | Minimum Curvature                       |
| Design:   | Actual                      | Database:                    | EDM-Regulatory                          |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Eddy County, NM (NAN27 NME)          |               |                |
| 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                  | Electra Federal #58 |              |                 |                   |                   |
| Site Position:        |                     | Northing:    | 674,802.80 usft | Latitude:         | 32° 51' 16.442 N  |
| From:                 | Map                 | Easting:     | 613,883.50 usft | Longitude:        | 103° 57' 44.933 W |
| Position Uncertainty: | 0.0 usft            | Slot Radius: | 13-3/16"        | Grid Convergence: | 0.20 °            |

|                      |                     |          |                     |                 |               |                   |
|----------------------|---------------------|----------|---------------------|-----------------|---------------|-------------------|
| Well                 | Electra Federal #58 |          |                     |                 |               |                   |
| Well Position        | +N/-S               | 0.0 usft | Northing:           | 674,802.80 usft | Latitude:     | 32° 51' 16.442 N  |
|                      | +E/-W               | 0.0 usft | Easting:            | 613,883.50 usft | Longitude:    | 103° 57' 44.933 W |
| Position Uncertainty |                     | 0.0 usft | Wellhead Elevation: | usft            | Ground Level: | 3,717.0 usft      |

|           |                      |             |                 |               |                     |
|-----------|----------------------|-------------|-----------------|---------------|---------------------|
| Wellbore  | DH - Job #32D0211160 |             |                 |               |                     |
| Magnetics | Model Name           | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|           | IGRF200510           | 7/21/2010   | 7.91            | 60.74         | 49,073              |

|                   |                            |                 |                 |                   |
|-------------------|----------------------------|-----------------|-----------------|-------------------|
| Design            | Actual                     |                 |                 |                   |
| Audit Notes:      |                            |                 |                 |                   |
| Version:          | 1.0                        | Phase:          | ACTUAL          | Tie On Depth: 0.0 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°)  |
|                   | 0.0                        | 0.0             | 0.0             | 2.61              |

|                |           |                                    |           |                                    |  |
|----------------|-----------|------------------------------------|-----------|------------------------------------|--|
| Survey Program | Date      | 3/21/2011                          |           |                                    |  |
| From (usft)    | To (usft) | Survey (Wellbore)                  | Tool Name | Description                        |  |
| 100.0          | 1,263.0   | Gyro Survey (DH - Job #32D0211160) | Keeper    | Standard Wireline Keeper ver 1.0.2 |  |
| 1,367.0        | 4,417.0   | MWD Survey (DH - Job #32D0211160)  | MWD       | MWD - Standard                     |  |

|                       |                 |             |                     |                    |                  |                     |                         |
|-----------------------|-----------------|-------------|---------------------|--------------------|------------------|---------------------|-------------------------|
| Survey                |                 |             |                     |                    |                  |                     |                         |
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | True Vertical Depth | North/South (usft) | East/West (usft) | Closure Azimuth (°) | Closure Distance (usft) |
| 0.0                   | 0.00            | 0.00        | 0.0                 | 0.0                | 0.0              | 0.00                | 0.0                     |
| 100.0                 | 0.18            | 118.91      | 100.0               | -0.1               | 0.1              | 118.91              | 0.2                     |
| 200.0                 | 0.06            | 172.90      | 200.0               | -0.2               | 0.3              | 125.91              | 0.3                     |
| 300.0                 | 0.28            | 157.71      | 300.0               | -0.5               | 0.4              | 141.70              | 0.6                     |
| 400.0                 | 0.94            | 162.74      | 400.0               | -1.5               | 0.7              | 154.33              | 1.7                     |
| 500.0                 | 1.10            | 171.85      | 500.0               | -3.2               | 1.1              | 161.23              | 3.4                     |
| 600.0                 | 0.88            | 174.24      | 600.0               | -4.9               | 1.3              | 165.15              | 5.1                     |
| 700.0                 | 1.11            | 169.99      | 699.9               | -6.7               | 1.6              | 166.85              | 6.8                     |
| 800.0                 | 0.62            | 157.91      | 799.9               | -8.1               | 1.9              | 166.64              | 8.3                     |
| 900.0                 | 0.76            | 156.19      | 899.9               | -9.2               | 2.4              | 165.42              | 9.5                     |
| 1,000.0               | 0.88            | 129.56      | 999.9               | -10.3              | 3.3              | 162.48              | 10.8                    |



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|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING LLC           | <b>Local Co-ordinate Reference:</b> | Site Electra Federal #58                |
| <b>Project:</b>  | Eddy County, NM (NAN27 NME) | <b>TVD Reference:</b>               | KB Elev (14') @ 3731.0usft (United #40) |
| <b>Site:</b>     | Electra Federal #58         | <b>MD Reference:</b>                | KB Elev (14') @ 3731.0usft (United #40) |
| <b>Well:</b>     | Electra Federal #58         | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | DH - Job #32D0211160        | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | Actual                      | <b>Database:</b>                    | EDM-Regulatory                          |

| Survey                   |                    |                |                        |                       |                     |                        |                            |  |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|--|
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |  |
| 1,100.0                  | 1.19               | 127.91         | 1,099.9                | -11.4                 | 4.7                 | 157.80                 | 12.4                       |  |
| 1,200.0                  | 1.10               | 131.19         | 1,199.9                | -12.7                 | 6.2                 | 153.96                 | 14.1                       |  |
| 1,263.0                  | 1.50               | 118.73         | 1,262.9                | -13.5                 | 7.4                 | 151.32                 | 15.4                       |  |



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|           |                             |                              |                                         |
|-----------|-----------------------------|------------------------------|-----------------------------------------|
| Company:  | COG OPERATING LLC           | Local Co-ordinate Reference: | Site Electra Federal #58                |
| Project:  | Eddy County, NM (NAN27 NME) | TVD Reference:               | KB Elev (14') @ 3731.0usft (United #40) |
| Site:     | Electra Federal #58         | MD Reference:                | KB Elev (14') @ 3731.0usft (United #40) |
| Well:     | Electra Federal #58         | North Reference:             | Grid                                    |
| Wellbore: | DH - Job #32D0211160        | Survey Calculation Method:   | Minimum Curvature                       |
| Design:   | Actual                      | Database:                    | EDM-Regulatory                          |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     | Eddy County, NM (NAN27 NME)          |               |                |
| 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                  | Electra Federal #58 |                   |                   |
| Site Position:        |                     | Northing:         | 674,802.80 usft   |
| From:                 | Map                 | Easting:          | 613,883.50 usft   |
| Position Uncertainty: | 0.0 usft            | Slot Radius:      | 13-3/16"          |
|                       |                     | Latitude:         | 32° 51' 16.442 N  |
|                       |                     | Longitude:        | 103° 57' 44.933 W |
|                       |                     | Grid Convergence: | 0.20 °            |

|                      |                     |                     |                   |
|----------------------|---------------------|---------------------|-------------------|
| Well                 | Electra Federal #58 |                     |                   |
| Well Position        | +N/-S               | 0.0 usft            | Northing:         |
|                      | +E/-W               | 0.0 usft            | Easting:          |
| Position Uncertainty | 0.0 usft            | Wellhead Elevation: | usft              |
|                      |                     | Latitude:           | 32° 51' 16.442 N  |
|                      |                     | Longitude:          | 103° 57' 44.933 W |
|                      |                     | Ground Level:       | 3,717.0 usft      |

|           |                      |             |                |
|-----------|----------------------|-------------|----------------|
| Wellbore  | DH - Job #32D0211160 |             |                |
| Magnetics | Model Name           | Sample Date | Declination    |
|           |                      |             | (°)            |
|           | IGRF200510           | 7/21/2010   | 7.91           |
|           |                      |             | Dip Angle      |
|           |                      |             | (°)            |
|           |                      |             | 60.74          |
|           |                      |             | Field Strength |
|           |                      |             | (nT)           |
|           |                      |             | 49,073         |

|                   |                  |               |           |
|-------------------|------------------|---------------|-----------|
| Design            | Actual           |               |           |
| Audit Notes:      |                  |               |           |
| Version:          | 1.0              | Phase:        | ACTUAL    |
|                   |                  | Tie On Depth: | 0.0       |
| Vertical Section: | Depth From (TVD) | +N/-S         | +E/-W     |
|                   | (usft)           | (usft)        | (usft)    |
|                   | 0.0              | 0.0           | 0.0       |
|                   |                  |               | Direction |
|                   |                  |               | (°)       |
|                   |                  |               | 2.61      |

|                |                |                                    |                                    |
|----------------|----------------|------------------------------------|------------------------------------|
| Survey Program | Date 3/21/2011 |                                    |                                    |
| From           | To             | Survey (Wellbore)                  | Tool Name                          |
| (usft)         | (usft)         |                                    |                                    |
| 100.0          | 1,263.0        | Gyro Survey (DH - Job #32D0211160) | Keeper                             |
| 1,367.0        | 4,417.0        | MWD Survey (DH - Job #32D0211160)  | MWD                                |
|                |                |                                    | Description                        |
|                |                |                                    | Standard Wireline Keeper ver 1.0.2 |
|                |                |                                    | MWD - Standard                     |

|                |             |         |                  |
|----------------|-------------|---------|------------------|
| Survey         |             |         |                  |
| Measured Depth | Inclination | Azimuth | True Vertical    |
| (usft)         | (°)         | (°)     | Depth            |
| 1,263.0        | 1.50        | 118.73  | 1,262.9          |
| 1,367.0        | 1.49        | 128.98  | 1,366.8          |
| 1,462.0        | 0.77        | 90.67   | 1,461.8          |
| 1,557.0        | 1.80        | 10.92   | 1,556.8          |
| 1,652.0        | 3.88        | 5.06    | 1,651.7          |
| 1,747.0        | 5.11        | 8.99    | 1,746.4          |
| 1,842.0        | 4.94        | 5.68    | 1,841.0          |
| 1,937.0        | 4.61        | 5.70    | 1,935.7          |
| 2,032.0        | 4.29        | 1.94    | 2,030.4          |
| 2,127.0        | 3.60        | 2.76    | 2,125.2          |
| 2,223.0        | 3.90        | 344.24  | 2,221.0          |
|                |             |         | North/South      |
|                |             |         | (usft)           |
|                |             |         | -13.5            |
|                |             |         | -15.0            |
|                |             |         | -15.8            |
|                |             |         | -14.3            |
|                |             |         | -9.7             |
|                |             |         | -2.3             |
|                |             |         | 6.0              |
|                |             |         | 13.8             |
|                |             |         | 21.2             |
|                |             |         | 27.7             |
|                |             |         | 33.9             |
|                |             |         | East/West        |
|                |             |         | (usft)           |
|                |             |         | 7.4              |
|                |             |         | 9.6              |
|                |             |         | 11.2             |
|                |             |         | 12.2             |
|                |             |         | 12.7             |
|                |             |         | 13.7             |
|                |             |         | 14.7             |
|                |             |         | 15.5             |
|                |             |         | 16.0             |
|                |             |         | 16.3             |
|                |             |         | 15.5             |
|                |             |         | Closure Azimuth  |
|                |             |         | (°)              |
|                |             |         | 151.32           |
|                |             |         | 147.31           |
|                |             |         | 144.59           |
|                |             |         | 139.72           |
|                |             |         | 127.25           |
|                |             |         | 99.52            |
|                |             |         | 67.98            |
|                |             |         | 48.29            |
|                |             |         | 37.10            |
|                |             |         | 30.43            |
|                |             |         | 24.65            |
|                |             |         | Closure Distance |
|                |             |         | (usft)           |
|                |             |         | 15.4             |
|                |             |         | 17.8             |
|                |             |         | 19.4             |
|                |             |         | 18.8             |
|                |             |         | 16.0             |
|                |             |         | 13.9             |
|                |             |         | 15.9             |
|                |             |         | 20.8             |
|                |             |         | 26.5             |
|                |             |         | 32.1             |
|                |             |         | 37.3             |



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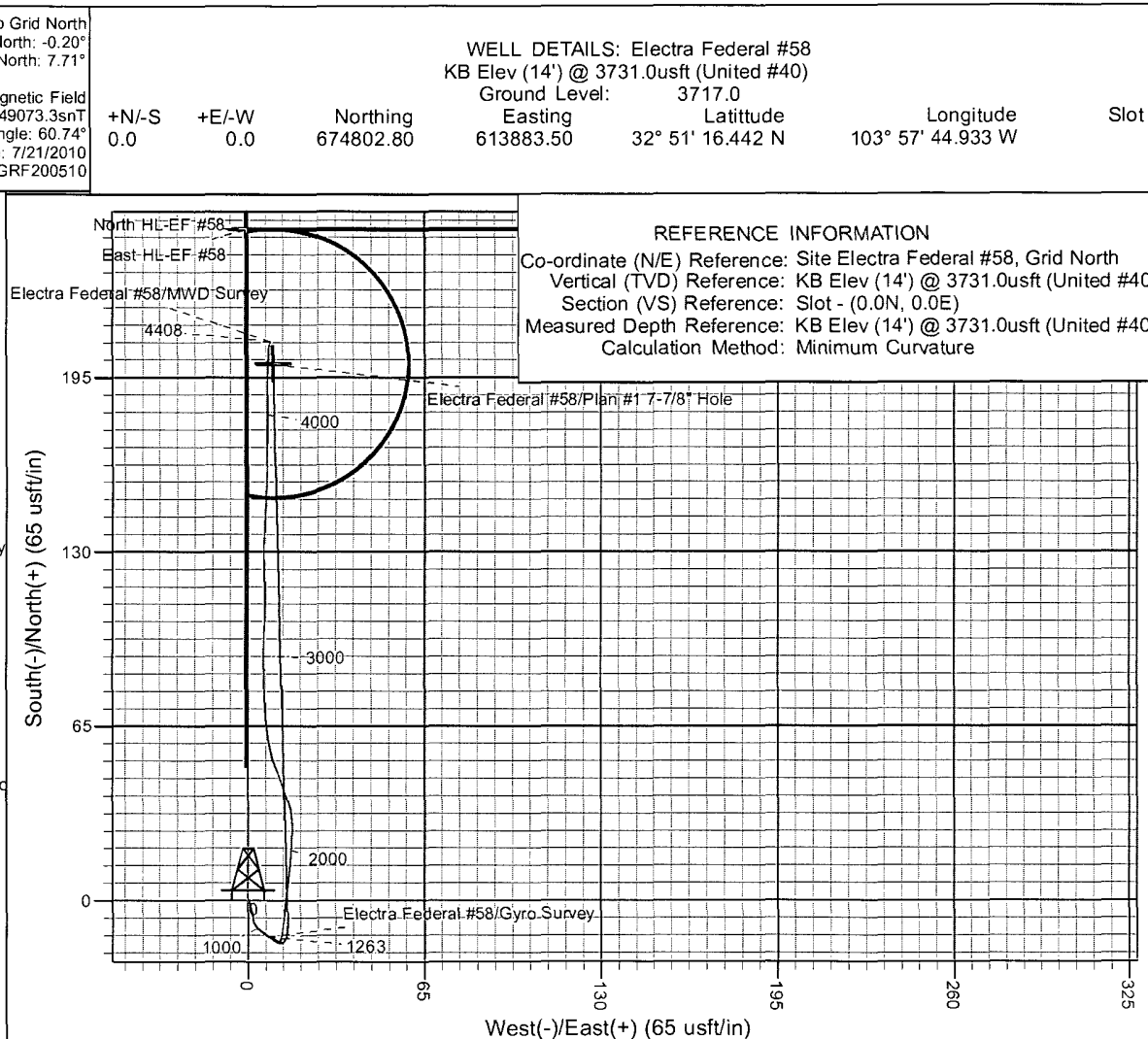
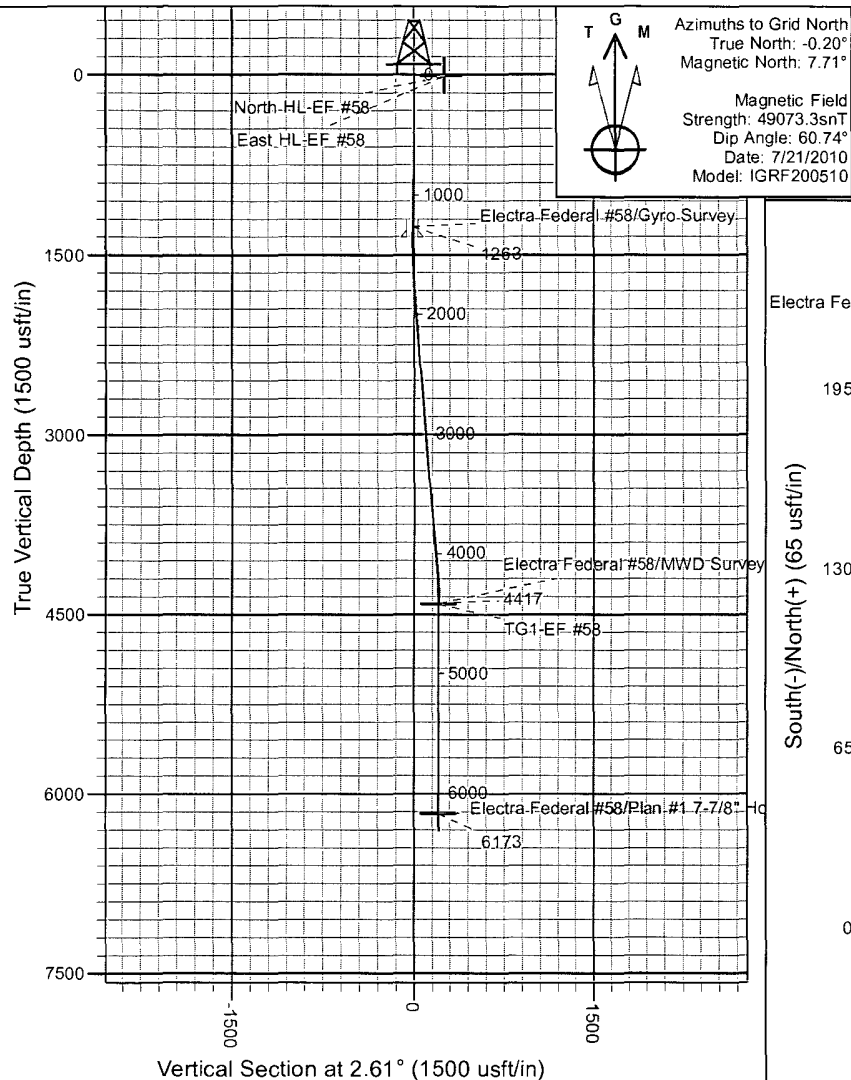
|                  |                             |                                     |                                         |
|------------------|-----------------------------|-------------------------------------|-----------------------------------------|
| <b>Company:</b>  | COG OPERATING LLC           | <b>Local Co-ordinate Reference:</b> | Site Electra Federal #58                |
| <b>Project:</b>  | Eddy County, NM (NAN27 NME) | <b>TVD Reference:</b>               | KB Elev (14') @ 3731.0usft (United #40) |
| <b>Site:</b>     | Electra Federal #58         | <b>MD Reference:</b>                | KB Elev (14') @ 3731.0usft (United #40) |
| <b>Well:</b>     | Electra Federal #58         | <b>North Reference:</b>             | Grid                                    |
| <b>Wellbore:</b> | DH - Job #32D0211160        | <b>Survey Calculation Method:</b>   | Minimum Curvature                       |
| <b>Design:</b>   | Actual                      | <b>Database:</b>                    | EDM-Regulatory                          |

| Survey                   |                    |                |                        |                       |                     |                        |                            |  |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|--|
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |  |
| 2,317.0                  | 4.42               | 340.11         | 2,314.7                | 40.3                  | 13.4                | 18.42                  | 42.5                       |  |
| 2,413.0                  | 3.57               | 339.14         | 2,410.5                | 46.6                  | 11.1                | 13.41                  | 47.9                       |  |
| 2,511.0                  | 4.14               | 339.36         | 2,508.3                | 52.8                  | 8.8                 | 9.44                   | 53.5                       |  |
| 2,610.0                  | 4.92               | 355.23         | 2,607.0                | 60.4                  | 7.2                 | 6.77                   | 60.8                       |  |
| 2,705.0                  | 4.35               | 352.27         | 2,701.6                | 68.0                  | 6.3                 | 5.33                   | 68.3                       |  |
| 2,800.0                  | 4.63               | 359.43         | 2,796.4                | 75.4                  | 5.8                 | 4.41                   | 75.6                       |  |
| 2,895.0                  | 4.52               | 0.53           | 2,891.1                | 83.0                  | 5.8                 | 4.01                   | 83.2                       |  |
| 2,990.0                  | 4.18               | 356.76         | 2,985.8                | 90.2                  | 5.7                 | 3.59                   | 90.3                       |  |
| 3,085.0                  | 5.28               | 3.54           | 3,080.5                | 98.0                  | 5.7                 | 3.35                   | 98.1                       |  |
| 3,181.0                  | 5.00               | 0.24           | 3,176.1                | 106.6                 | 6.0                 | 3.23                   | 106.7                      |  |
| 3,276.0                  | 4.92               | 359.83         | 3,270.7                | 114.8                 | 6.0                 | 3.00                   | 114.9                      |  |
| 3,371.0                  | 4.96               | 358.79         | 3,365.4                | 123.0                 | 5.9                 | 2.76                   | 123.1                      |  |
| 3,466.0                  | 4.72               | 358.06         | 3,460.0                | 131.0                 | 5.7                 | 2.49                   | 131.1                      |  |
| 3,561.0                  | 5.48               | 5.14           | 3,554.6                | 139.4                 | 6.0                 | 2.46                   | 139.5                      |  |
| 3,656.0                  | 5.33               | 1.36           | 3,649.2                | 148.3                 | 6.5                 | 2.51                   | 148.5                      |  |
| 3,751.0                  | 5.45               | 2.68           | 3,743.8                | 157.3                 | 6.8                 | 2.48                   | 157.4                      |  |
| 3,846.0                  | 5.27               | 1.24           | 3,838.4                | 166.1                 | 7.1                 | 2.45                   | 166.3                      |  |
| 3,941.0                  | 5.33               | 0.60           | 3,933.0                | 174.9                 | 7.3                 | 2.37                   | 175.0                      |  |
| 4,036.0                  | 5.30               | 358.85         | 4,027.6                | 183.7                 | 7.2                 | 2.25                   | 183.8                      |  |
| 4,131.0                  | 5.17               | 359.61         | 4,122.2                | 192.4                 | 7.1                 | 2.11                   | 192.5                      |  |
| 4,226.0                  | 4.31               | 2.98           | 4,216.9                | 200.2                 | 7.3                 | 2.07                   | 200.3                      |  |
| 4,322.0                  | 2.27               | 9.65           | 4,312.7                | 205.7                 | 7.8                 | 2.16                   | 205.8                      |  |
| 4,417.0                  | 0.84               | 3.73           | 4,407.7                | 208.2                 | 8.1                 | 2.23                   | 208.4                      |  |

| Survey Annotations          |                             |                   |                 |                 |
|-----------------------------|-----------------------------|-------------------|-----------------|-----------------|
| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment         |
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                 |
| 1,263.0                     | 1,262.9                     | -13.5             | 7.4             | Gyro Tie-in     |
| 4,417.0                     | 4,407.7                     | 208.2             | 8.1             | Last MWD Survey |



Project: Eddy County, NM (NAN27 NME)  
 Site: Electra Federal #58  
 Well: Electra Federal #58  
 Wellbore: DH - Job #32D0211160  
 Design: Plan #1 7-7/8" Hole



COMPANY DETAILS: COG OPERATING LLC  
 223032  
 Calculation Method: Minimum Curvature  
 Error System: ISCWSA  
 Scan Method: Closest Approach 3D  
 Error Surface: Elliptical Conic  
 Warning Method: Error Ratio

PROJECT DETAILS: Eddy County, NM (NAN27 NME)  
 Geodetic System: NAD 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: Electra Federal #58  
 Site Centre Latitude: 32° 51' 16.442 N  
 Longitude: 103° 57' 44.933 W  
 Positional Uncertainty: 0.0  
 Convergence: 0.20  
 Local North: Grid