

**PRODIRECTIONAL**

30-015-40254

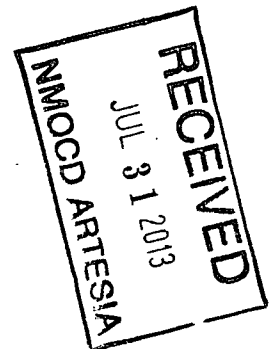
P.O. Box 750, Conroe, TX 77305 Phone: 936-441-7266

## **Concho COG Operating LLC**

BR-549 State No. 5  
Eddy County, NM

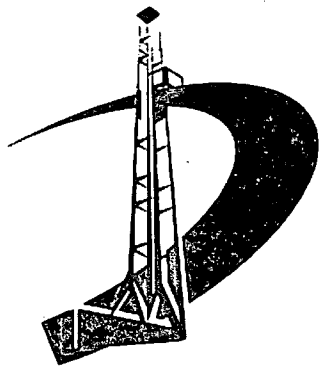
February 22, 2013

Job Number LNM 5101713



## ***Survey Completion Report***

**ORIGINAL**



# PRODIRECTIONAL

---

P.O. Box 750, Conroe, TX 77305 Phone: 936-441-7266 Fax: 936-441-7268

*February 22, 2013*

## **Concho COG Operating LLC**

BR-549 State No. 5  
Eddy County, NM

This is to certify surveys from 921' MD to a depth of 4,284' MD are true and correct MWD surveys. These surveys were taken from 01/05/2013 through 01/09/2013.

Sincerely,

John Jordan

Well Planning



## **Concho COG Operating LLC**

**Eddy County, New Mexico**

**BR 549 State**

**No. 5**

**OH**

**Survey: ProDirectional**

## **Survey Completion Report**

**22 February, 2013**





# Completion Report

|                  |                          |                                     |                                        |
|------------------|--------------------------|-------------------------------------|----------------------------------------|
| <b>Company:</b>  | Concho COG Operating LLC | <b>Local Co-ordinate Reference:</b> | Well BR-549 State #5                   |
| <b>Project:</b>  | Eddy County, New Mexico  | <b>TVD Reference:</b>               | RKB @ 3545.00usft (Original Well Elev) |
| <b>Site:</b>     | BR 549 State #5          | <b>MD Reference:</b>                | RKB @ 3545.00usft (Original Well Elev) |
| <b>Well:</b>     | BR-549 State #5          | <b>North Reference:</b>             | Grid                                   |
| <b>Wellbore:</b> | Original Hole            | <b>Survey Calculation Method:</b>   | Minimum Curvature                      |
| <b>Design:</b>   | Original Hole            | <b>Database:</b>                    | EDM 5000.1 Single User Db              |

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

|                              |                 |                          |                     |
|------------------------------|-----------------|--------------------------|---------------------|
| <b>Site</b>                  | BR 549 State #5 |                          |                     |
| <b>Site Position:</b>        |                 | <b>Northing:</b>         | 659,274.60 usft     |
| <b>From:</b>                 | Map             | <b>Easting:</b>          | 580,861.50 usft     |
| <b>Position Uncertainty:</b> | 0.00 usft       | <b>Slot Radius:</b>      | 13-3/16 "           |
|                              |                 | <b>Latitude:</b>         | 32° 48' 43.767068 N |
|                              |                 | <b>Longitude:</b>        | 104° 4' 12.502036 W |
|                              |                 | <b>Grid Convergence:</b> | 0.14 °              |

|                      |           |                 |                     |                 |               |                     |
|----------------------|-----------|-----------------|---------------------|-----------------|---------------|---------------------|
| Well                 |           | BR-549 State #5 |                     |                 |               |                     |
| Well Position        | +N/-S     | 0.00 usft       | Northing:           | 659,274.60 usft | Latitude:     | 32° 48' 43.767068 N |
|                      | +E/-W     | 0.00 usft       | Easting:            | 580,861.50 usft | Longitude:    | 104° 4' 12.502036 W |
| Position Uncertainty | 0.00 usft |                 | Wellhead Elevation: | usft            | Ground Level: | 3,545.00 usft       |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Original Hole     |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 1/16/2013          | 7.67                   | 60.61                | 48,755                     |

|                          |                                |                     |                     |                           |
|--------------------------|--------------------------------|---------------------|---------------------|---------------------------|
| <b>Design</b>            | Original Hole                  |                     |                     |                           |
| <b>Audit Notes:</b>      |                                |                     |                     |                           |
| <b>Version:</b>          | 1.0                            | <b>Phase:</b>       | ACTUAL              | <b>Tie On Depth:</b> 0.00 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Direction (°)</b>      |
|                          | 0.00                           | 0.00                | 0.00                | 130.050                   |



# Completion Report

|                  |                          |                                     |                                        |
|------------------|--------------------------|-------------------------------------|----------------------------------------|
| <b>Company:</b>  | Concho COG Operating LLC | <b>Local Co-ordinate Reference:</b> | Well BR-549 State #5                   |
| <b>Project:</b>  | Eddy County, New Mexico  | <b>TVD Reference:</b>               | RKB @ 3545.00usft (Original Well Elev) |
| <b>Site:</b>     | BR 549 State #5          | <b>MD Reference:</b>                | RKB @ 3545.00usft (Original Well Elev) |
| <b>Well:</b>     | BR-549 State #5          | <b>North Reference:</b>             | Grid                                   |
| <b>Wellbore:</b> | Original Hole            | <b>Survey Calculation Method:</b>   | Minimum Curvature                      |
| <b>Design:</b>   | Original Hole            | <b>Database:</b>                    | EDM 5000.1 Single User Db              |

| Survey Program |           | Date                 | 1/16/2013  |                                  |  |
|----------------|-----------|----------------------|------------|----------------------------------|--|
| From (usft)    | To (usft) | Survey (Wellbore)    | Tool Name  | Description                      |  |
| 100.00         | 800.00    | Gyro (Original Hole) | NS-GYRO-MS | North sensing gyrocompassing m/s |  |
| 921.00         | 4,284.00  | MWD (Original Hole)  | MWD        | MWD - Standard                   |  |

| Survey                                   |            |                      |               |                  |               |               |                            |                        |                    |                   |  |
|------------------------------------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|--|
| MD<br>(usft)                             | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |  |
| 0.00                                     | 0.00       | 0.000                | 0.00          | 0.00             | 0.00          | 0.00          | 0.00                       | 0.000                  | 659,274.60         | 580,861.50        |  |
| 100.00                                   | 0.22       | 14.370               | 100.00        | -0.08            | 0.19          | 0.05          | 0.19                       | 14.370                 | 659,274.79         | 580,861.55        |  |
| Gyro                                     |            |                      |               |                  |               |               |                            |                        |                    |                   |  |
| 200.00                                   | 0.37       | 31.710               | 200.00        | -0.21            | 0.65          | 0.27          | 0.70                       | 22.285                 | 659,275.25         | 580,861.77        |  |
| 300.00                                   | 0.63       | 86.560               | 300.00        | 0.14             | 0.95          | 0.98          | 1.37                       | 45.863                 | 659,275.55         | 580,862.48        |  |
| 400.00                                   | 0.92       | 73.730               | 399.99        | 0.98             | 1.21          | 2.30          | 2.60                       | 62.239                 | 659,275.81         | 580,863.80        |  |
| 500.00                                   | 1.20       | 82.350               | 499.97        | 2.13             | 1.58          | 4.11          | 4.40                       | 69.021                 | 659,276.18         | 580,865.61        |  |
| 600.00                                   | 1.49       | 78.020               | 599.94        | 3.64             | 1.99          | 6.42          | 6.72                       | 72.815                 | 659,276.59         | 580,867.92        |  |
| 700.00                                   | 1.43       | 77.070               | 699.91        | 5.19             | 2.53          | 8.91          | 9.26                       | 74.117                 | 659,277.13         | 580,870.41        |  |
| 800.00                                   | 1.53       | 67.400               | 799.88        | 6.55             | 3.33          | 11.36         | 11.83                      | 73.673                 | 659,277.93         | 580,872.86        |  |
| 921.00                                   | 1.30       | 81.200               | 920.84        | 8.20             | 4.16          | 14.21         | 14.80                      | 73.685                 | 659,278.76         | 580,875.71        |  |
| Professional Directional Ltd MWD surveys |            |                      |               |                  |               |               |                            |                        |                    |                   |  |
| 984.00                                   | 1.00       | 80.900               | 983.83        | 9.03             | 4.35          | 15.45         | 16.06                      | 74.265                 | 659,278.95         | 580,876.95        |  |
| 1,080.00                                 | 1.90       | 112.300              | 1,079.80      | 11.09            | 3.88          | 17.75         | 18.17                      | 77.664                 | 659,278.48         | 580,879.25        |  |
| 1,175.00                                 | 3.70       | 120.800              | 1,174.68      | 15.62            | 1.72          | 21.84         | 21.91                      | 85.510                 | 659,276.32         | 580,883.34        |  |
| 1,271.00                                 | 5.00       | 122.200              | 1,270.40      | 22.82            | -2.10         | 28.05         | 28.12                      | 94.282                 | 659,272.50         | 580,889.55        |  |
| 1,367.00                                 | 4.50       | 119.200              | 1,366.07      | 30.66            | -6.17         | 34.87         | 35.41                      | 100.028                | 659,268.43         | 580,896.37        |  |
| 1,462.00                                 | 4.10       | 115.300              | 1,460.80      | 37.61            | -9.44         | 41.20         | 42.26                      | 102.901                | 659,265.16         | 580,902.70        |  |
| 1,558.00                                 | 3.70       | 113.600              | 1,556.58      | 43.90            | -12.14        | 47.14         | 48.68                      | 104.446                | 659,262.46         | 580,908.64        |  |
| 1,653.00                                 | 3.70       | 127.300              | 1,651.38      | 49.90            | -15.23        | 52.39         | 54.55                      | 106.209                | 659,259.37         | 580,913.89        |  |
| 1,749.00                                 | 3.80       | 129.300              | 1,747.18      | 56.17            | -19.12        | 57.31         | 60.42                      | 108.449                | 659,255.48         | 580,918.81        |  |
| 1,845.00                                 | 4.00       | 130.600              | 1,842.96      | 62.70            | -23.31        | 62.31         | 66.53                      | 110.512                | 659,251.29         | 580,923.81        |  |



# Completion Report

**Company:** Concho COG Operating LLC  
**Project:** Eddy County, New Mexico  
**Site:** BR 549 State #5  
**Well:** BR-549 State #5  
**Wellbore:** Original Hole  
**Design:** Original Hole

**Local Co-ordinate Reference:** Well BR-549 State #5  
**TVD Reference:** RKB @ 3545.00usft (Original Well Elev)  
**MD Reference:** RKB @ 3545.00usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

## Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 1,941.00     | 3.90       | 130.800              | 1,938.73      | 69.31            | -27.63        | 67.33         | 72.78                      | 112.309                | 659,246.97         | 580,928.83        |
| 2,036.00     | 3.50       | 135.000              | 2,033.53      | 75.43            | -31.79        | 71.82         | 78.54                      | 113.873                | 659,242.81         | 580,933.32        |
| 2,132.00     | 4.40       | 133.700              | 2,129.30      | 82.03            | -36.40        | 76.56         | 84.77                      | 115.431                | 659,238.20         | 580,938.06        |
| 2,227.00     | 4.40       | 134.100              | 2,224.02      | 89.30            | -41.46        | 81.81         | 91.72                      | 116.873                | 659,233.14         | 580,943.31        |
| 2,323.00     | 4.40       | 134.300              | 2,319.74      | 96.65            | -46.59        | 87.09         | 98.77                      | 118.146                | 659,228.01         | 580,948.59        |
| 2,419.00     | 4.30       | 133.000              | 2,415.46      | 103.91           | -51.62        | 92.36         | 105.80                     | 119.200                | 659,222.98         | 580,953.86        |
| 2,515.00     | 4.30       | 133.400              | 2,511.19      | 111.10           | -56.55        | 97.61         | 112.80                     | 120.085                | 659,218.05         | 580,959.11        |
| 2,610.00     | 4.30       | 133.400              | 2,605.92      | 118.21           | -61.44        | 102.78        | 119.74                     | 120.870                | 659,213.16         | 580,964.28        |
| 2,705.00     | 4.40       | 133.100              | 2,700.65      | 125.41           | -66.38        | 108.03        | 126.79                     | 121.568                | 659,208.22         | 580,969.53        |
| 2,801.00     | 4.40       | 135.200              | 2,796.37      | 132.75           | -71.51        | 113.31        | 133.99                     | 122.254                | 659,203.09         | 580,974.81        |
| 2,894.00     | 4.60       | 133.000              | 2,889.08      | 140.03           | -76.58        | 118.55        | 141.14                     | 122.861                | 659,198.02         | 580,980.05        |
| 2,990.00     | 4.40       | 134.500              | 2,984.79      | 147.54           | -81.79        | 124.00        | 148.54                     | 123.409                | 659,192.81         | 580,985.50        |
| 3,086.00     | 4.40       | 131.600              | 3,080.50      | 154.90           | -86.81        | 129.38        | 155.80                     | 123.862                | 659,187.79         | 580,990.88        |
| 3,181.00     | 4.10       | 130.600              | 3,175.24      | 161.93           | -91.44        | 134.68        | 162.79                     | 124.175                | 659,183.16         | 580,996.18        |
| 3,277.00     | 4.10       | 130.500              | 3,271.00      | 168.80           | -95.91        | 139.90        | 169.61                     | 124.432                | 659,178.69         | 581,001.40        |
| 3,372.00     | 4.20       | 129.100              | 3,365.75      | 175.67           | -100.30       | 145.18        | 176.46                     | 124.641                | 659,174.30         | 581,006.68        |
| 3,468.00     | 4.40       | 137.900              | 3,461.48      | 182.84           | -105.25       | 150.37        | 183.55                     | 124.990                | 659,169.35         | 581,011.87        |
| 3,563.00     | 5.00       | 158.300              | 3,556.16      | 190.09           | -111.81       | 154.35        | 190.59                     | 125.918                | 659,162.79         | 581,015.85        |
| 3,659.00     | 4.70       | 165.900              | 3,651.82      | 196.97           | -119.51       | 156.85        | 197.19                     | 127.304                | 659,155.09         | 581,018.35        |
| 3,755.00     | 4.10       | 159.800              | 3,747.54      | 203.13           | -126.54       | 159.00        | 203.21                     | 128.515                | 659,148.06         | 581,020.50        |
| 3,850.00     | 2.50       | 148.800              | 3,842.38      | 208.04           | -131.50       | 161.24        | 208.07                     | 129.199                | 659,143.10         | 581,022.74        |
| 3,946.00     | 1.10       | 133.500              | 3,938.33      | 210.95           | -133.93       | 163.00        | 210.96                     | 129.409                | 659,140.67         | 581,024.50        |
| 4,041.00     | 0.70       | 6.100                | 4,033.32      | 211.53           | -133.98       | 163.72        | 211.55                     | 129.295                | 659,140.62         | 581,025.22        |
| 4,137.00     | 0.70       | 290.100              | 4,129.32      | 210.65           | -133.19       | 163.23        | 210.68                     | 129.214                | 659,141.41         | 581,024.73        |
| 4,233.00     | 0.30       | 190.100              | 4,225.32      | 210.23           | -133.24       | 162.64        | 210.25                     | 129.326                | 659,141.36         | 581,024.14        |
| 4,284.00     | 0.30       | 190.100              | 4,276.31      | 210.36           | -133.50       | 162.59        | 210.38                     | 129.389                | 659,141.10         | 581,024.09        |

Survey projected



# Completion Report

**Company:** Concho COG Operating LLC  
**Project:** Eddy County, New Mexico  
**Site:** BR 549 State #5  
**Well:** BR-549 State #5  
**Wellbore:** Original Hole  
**Design:** Original Hole

**Local Co-ordinate Reference:** Well BR-549 State #5  
**TVD Reference:** RKB @ 3545.00usft (Original Well Elev)  
**MD Reference:** RKB @ 3545.00usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

## Design Annotations

| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                                  |
|-----------------------------|-----------------------------|-------------------|-----------------|------------------------------------------|
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                                          |
| 100.00                      | 100.00                      | 0.19              | 0.05            | Gyro                                     |
| 921.00                      | 920.84                      | 4.16              | 14.21           | Professional Directional Ltd MWD surveys |
| 4,284.00                    | 4,276.31                    | -133.50           | 162.59          | Survey projected                         |

Checked By:

*Mike Court*

Approved By:

*SA*

Date:

2-22-2013



PO Box 1370  
Artesia, NM 88211-1370  
(575) 748-1288



January 14, 2013

COG, LLC  
One Concho Center  
600 W. Illinois Ave.  
Midland, TX 79701

RE: BR-549 State #5  
205' FNL & 180' FWL  
Sec. 27, T17S, R29E  
Eddy County, New Mexico

Dear Sir,

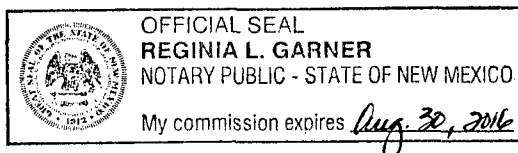
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham  
Drilling Superintendent

State of New Mexico }  
County of Eddy }

The foregoing was acknowledged before me this 14<sup>th</sup> day of January, 2013.





## BR-549 State #5

| Date      | Depth | Dev/Inc | Dir/AZ |
|-----------|-------|---------|--------|
| 1/3/2013  | 329   | 0.50    |        |
| 1/4/2013  | 781   | 1.20    |        |
| 1/6/2013  | 921   | 1.30    | 81.20  |
| 1/6/2013  | 984   | 1.00    | 80.90  |
| 1/6/2013  | 1080  | 1.90    | 112.30 |
| 1/6/2013  | 1366  | 4.50    | 119.20 |
| 1/6/2013  | 1462  | 4.10    | 115.30 |
| 1/6/2013  | 1557  | 3.70    | 113.60 |
| 1/6/2013  | 1749  | 3.80    | 129.30 |
| 1/6/2013  | 1844  | 4.00    | 130.60 |
| 1/6/2013  | 1940  | 3.90    | 130.80 |
| 1/7/2013  | 2132  | 4.40    | 133.70 |
| 1/7/2013  | 2227  | 4.40    | 134.10 |
| 1/7/2013  | 2323  | 4.40    | 134.30 |
| 1/7/2013  | 2418  | 4.30    | 133.00 |
| 1/7/2013  | 2515  | 4.30    | 133.40 |
| 1/7/2013  | 2610  | 4.40    | 135.60 |
| 1/7/2013  | 2705  | 4.40    | 133.10 |
| 1/8/2013  | 2894  | 4.60    | 133.00 |
| 1/8/2013  | 2989  | 4.40    | 134.50 |
| 1/8/2013  | 3085  | 4.40    | 131.60 |
| 1/8/2013  | 3372  | 4.20    | 129.10 |
| 1/8/2013  | 3467  | 4.40    | 137.90 |
| 1/8/2013  | 3563  | 5.00    | 158.30 |
| 1/9/2013  | 3659  | 4.70    | 165.90 |
| 1/9/2013  | 3755  | 4.10    | 159.10 |
| 1/9/2013  | 3850  | 2.50    | 148.80 |
| 1/9/2013  | 3946  | 1.10    | 133.50 |
| 1/9/2013  | 4041  | 0.70    | 6.10   |
| 1/9/2013  | 4137  | 0.70    | 290.10 |
| 1/9/2013  | 4233  | 3.00    | 190.10 |
| 1/10/2013 | 4659  | 0.30    |        |
| 1/11/2013 | 5073  | 2.80    |        |
| 1/11/2013 | 5137  | 2.90    |        |
| 1/11/2013 | 5199  | 3.00    |        |
| 1/11/2013 | 5262  | 2.70    |        |
| 1/11/2013 | 5326  | 2.70    |        |
| 1/11/2013 | 5390  | 2.80    |        |
| 1/11/2013 | 5453  | 2.70    |        |