



**EOG Resources, Inc.**

Eddy County  
Sand Tank 18 Fed Com  
#4H  
OH

Survey: MWD #1

**Pathfinder X & Y Survey Report**

20 July, 2009

**PATHFINDER**

|                  |                      |                                     |                                                |
|------------------|----------------------|-------------------------------------|------------------------------------------------|
| <b>Company:</b>  | EOG Resources, Inc.  | <b>Local Co-ordinate Reference:</b> | Well #4H                                       |
| <b>Project:</b>  | Eddy County          | <b>TVD Reference:</b>               | Well#1 @ 3532.50ft (McVay #4 19'KB Correction) |
| <b>Site:</b>     | Sand Tank 18 Fed Com | <b>MD Reference:</b>                | Well#1 @ 3532.50ft (McVay #4 19'KB Correction) |
| <b>Well:</b>     | #4H                  | <b>North Reference:</b>             | Grid                                           |
| <b>Wellbore:</b> | OH                   | <b>Survey Calculation Method:</b>   | Minimum Curvature                              |
| <b>Design:</b>   | OH                   | <b>Database:</b>                    | Midland Database                               |

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

|                              |                      |                          |                  |
|------------------------------|----------------------|--------------------------|------------------|
| <b>Site:</b>                 | Sand Tank 18 Fed Com |                          |                  |
| <b>Site Position:</b>        |                      | <b>Northing:</b>         | 636,421.700 ft   |
| <b>From:</b>                 | Map                  | <b>Easting:</b>          | 599,702.100 ft   |
| <b>Position Uncertainty:</b> | 0.00 ft              | <b>Slot Radius:</b>      | "                |
|                              |                      | <b>Latitude:</b>         | 32° 44' 57.112 N |
|                              |                      | <b>Longitude:</b>        | 104° 0' 32.560 W |
|                              |                      | <b>Grid Convergence:</b> | 0.18 °           |

|                      |       |         |                     |                |               |                  |
|----------------------|-------|---------|---------------------|----------------|---------------|------------------|
| Well                 | #4H   |         |                     |                |               |                  |
| Well Position        | +N/-S | 0.00 ft | Northing:           | 635,008.900 ft | Latitude:     | 32° 44' 43.138 N |
|                      | +E/-W | 0.00 ft | Easting:            | 599,496.900 ft | Longitude:    | 104° 0' 35.013 W |
| Position Uncertainty |       | 0.00 ft | Wellhead Elevation: | ft             | Ground Level: | 3,513.50 ft      |

|           |            |             |                    |                  |                        |
|-----------|------------|-------------|--------------------|------------------|------------------------|
| Wellbore  | OH         |             |                    |                  |                        |
| Magnetics | Model Name | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|           | IGRF200510 | 06/09/2009  | 8.06               | 60.66            | 49,110                 |

|                   |                  |        |        |                    |
|-------------------|------------------|--------|--------|--------------------|
| Design:           |                  | OH     |        |                    |
| Audit Notes:      |                  |        |        |                    |
| Version:          | 1 0              | Phase: | ACTUAL | Tie On Depth: 0 00 |
| Vertical Section: | Depth From (TVD) | +N/-S  | +E/-W  | Direction          |
|                   | (ft)             | (ft)   | (ft)   | (°)                |
|                   | 0.00             | 0 00   | 0.00   | 88.69              |

Company: EOG Resources, Inc.  
Project: Eddy County  
Site: Sand Tank 18 Fed Com  
Well: #4H  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference: Well #4H  
TVD Reference: Well#1 @ 3532.50ft (McVay #4 19'KB Correction)  
MD Reference: Well#1 @ 3532.50ft (McVay #4 19'KB Correction)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: Midland Database

| Survey Program | Date 07/20/2009 |                   |            |                             |  |
|----------------|-----------------|-------------------|------------|-----------------------------|--|
| From (ft)      | To (ft)         | Survey (Wellbore) | Tool Name  | Description                 |  |
| 100.00         | 7,500.00        | GYRO (OH)         | CB-GYRO-MS | Camera based gyro multishot |  |
| 7,617.00       | 12,386.00       | MWD #1 (OH)       | MWD        | MWD - Standard              |  |

| MD (ft)  | Inc (°) | Azi (°) | TVD (ft) | TVDSS (ft) | N/S (ft) | E/W (ft) | V. Sec (ft) | D Leg (°/100ft) | Northing (ft) | Easting (ft) |
|----------|---------|---------|----------|------------|----------|----------|-------------|-----------------|---------------|--------------|
| 7,500.00 | 2.30    | 304.32  | 7,498.06 | 3,965.56   | 31.75    | -64.36   | -63.62      | 0.00            | 635,040.65    | 599,432.54   |
| 7,617.00 | 2.37    | 300.64  | 7,614.97 | 4,082.47   | 34.31    | -68.38   | -67.58      | 0.14            | 635,043.21    | 599,428.52   |
| 7,648.00 | 2.11    | 303.33  | 7,645.94 | 4,113.44   | 34.95    | -69.41   | -68.59      | 0.90            | 635,043.85    | 599,427.49   |
| 7,680.00 | 1.58    | 299.17  | 7,677.92 | 4,145.42   | 35.49    | -70.29   | -69.46      | 1.71            | 635,044.39    | 599,426.61   |
| 7,710.00 | 1.06    | 101.88  | 7,707.92 | 4,175.42   | 35.63    | -70.38   | -69.55      | 8.70            | 635,044.53    | 599,426.52   |
| 7,741.00 | 5.01    | 101.47  | 7,738.87 | 4,206.37   | 35.31    | -68.77   | -67.95      | 12.74           | 635,044.21    | 599,428.13   |
| 7,773.00 | 8.79    | 103.98  | 7,770.63 | 4,238.13   | 34.44    | -65.03   | -64.22      | 11.85           | 635,043.34    | 599,431.87   |
| 7,803.00 | 12.31   | 98.49   | 7,800.12 | 4,267.62   | 33.41    | -59.64   | -58.86      | 12.19           | 635,042.31    | 599,437.26   |
| 7,834.00 | 17.24   | 95.58   | 7,830.09 | 4,297.59   | 32.48    | -51.79   | -51.04      | 16.08           | 635,041.38    | 599,445.11   |
| 7,866.00 | 22.25   | 95.34   | 7,860.20 | 4,327.70   | 31.45    | -41.03   | -40.31      | 15.66           | 635,040.35    | 599,455.87   |
| 7,897.00 | 27.52   | 95.93   | 7,888.31 | 4,355.81   | 30.16    | -28.06   | -27.36      | 17.02           | 635,039.06    | 599,468.84   |
| 7,928.00 | 32.98   | 95.01   | 7,915.08 | 4,382.58   | 28.69    | -12.52   | -11.86      | 17.68           | 635,037.59    | 599,484.38   |
| 7,959.00 | 37.37   | 94.16   | 7,940.41 | 4,407.91   | 27.27    | 5.28     | 5.90        | 14.25           | 635,036.17    | 599,502.18   |
| 7,991.00 | 42.82   | 93.48   | 7,964.88 | 4,432.38   | 25.90    | 25.84    | 26.42       | 17.09           | 635,034.80    | 599,522.74   |
| 8,022.00 | 47.04   | 93.39   | 7,986.83 | 4,454.33   | 24.59    | 47.68    | 48.23       | 13.61           | 635,033.49    | 599,544.58   |
| 8,053.00 | 51.18   | 93.79   | 8,007.11 | 4,474.61   | 23.12    | 71.07    | 71.58       | 13.39           | 635,032.02    | 599,567.97   |
| 8,084.00 | 56.98   | 92.91   | 8,025.29 | 4,492.79   | 21.66    | 96.12    | 96.59       | 18.85           | 635,030.56    | 599,593.02   |
| 8,116.00 | 62.61   | 91.34   | 8,041.39 | 4,508.89   | 20.65    | 123.74   | 124.18      | 18.10           | 635,029.55    | 599,620.64   |
| 8,147.00 | 68.85   | 91.29   | 8,054.12 | 4,521.62   | 20.00    | 151.98   | 152.40      | 20.13           | 635,028.90    | 599,648.88   |
| 8,178.00 | 75.01   | 90.66   | 8,063.73 | 4,531.23   | 19.50    | 181.44   | 181.83      | 19.96           | 635,028.40    | 599,678.34   |
| 8,273.00 | 86.70   | 87.23   | 8,078.81 | 4,546.31   | 21.27    | 275.03   | 275.45      | 12.81           | 635,030.17    | 599,771.93   |

|           |                      |                              |                                                |
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| Site:     | Sand Tank 18 Fed Com | MD Reference:                | Well#1 @ 3532.50ft (McVay #4 19'KB Correction) |
| Well:     | #4H                  | North Reference:             | Grid                                           |
| Wellbore: | OH                   | Survey Calculation Method:   | Minimum Curvature                              |
| Design:   | OH                   | Database:                    | Midland Database                               |

| MD<br>(ft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |
|------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|
| 8,367.00   | 88.02      | 88.18      | 8,083.14    | 4,550.64      | 25.03       | 368.86      | 369.33         | 1.73              | 635,033.93       | 599,865.76      |
| 8,460.00   | 90.13      | 88.50      | 8,084.64    | 4,552.14      | 27.72       | 461.80      | 462.31         | 2.29              | 635,036.62       | 599,958.70      |
| 8,553.00   | 90.40      | 88.52      | 8,084.21    | 4,551.71      | 30.14       | 554.77      | 555.31         | 0.29              | 635,039.04       | 600,051.67      |
| 8,647.00   | 90.57      | 89.18      | 8,083.41    | 4,550.91      | 32.03       | 648.74      | 649.31         | 0.73              | 635,040.93       | 600,145.64      |
| 8,740.00   | 90.66      | 89.89      | 8,082.42    | 4,549.92      | 32.78       | 741.73      | 742.29         | 0.77              | 635,041.68       | 600,238.63      |
| 8,834.00   | 89.60      | 90.27      | 8,082.20    | 4,549.70      | 32.65       | 835.73      | 836.26         | 1.20              | 635,041.55       | 600,332.63      |
| 8,928.00   | 89.69      | 90.44      | 8,082.79    | 4,550.29      | 32.07       | 929.73      | 930.22         | 0.20              | 635,040.97       | 600,426.63      |
| 9,021.00   | 89.78      | 90.50      | 8,083.22    | 4,550.72      | 31.31       | 1,022.73    | 1,023.17       | 0.12              | 635,040.21       | 600,519.63      |
| 9,116.00   | 89.87      | 90.72      | 8,083.51    | 4,551.01      | 30.29       | 1,117.72    | 1,118.12       | 0.25              | 635,039.19       | 600,614.62      |
| 9,210.00   | 89.96      | 90.46      | 8,083.65    | 4,551.15      | 29.33       | 1,211.71    | 1,212.07       | 0.29              | 635,038.23       | 600,708.61      |
| 9,303.00   | 89.78      | 89.76      | 8,083.86    | 4,551.36      | 29.15       | 1,304.71    | 1,305.04       | 0.78              | 635,038.05       | 600,801.61      |
| 9,397.00   | 90.13      | 88.81      | 8,083.93    | 4,551.43      | 30.32       | 1,398.70    | 1,399.03       | 1.08              | 635,039.22       | 600,895.60      |
| 9,490.00   | 88.99      | 89.12      | 8,084.64    | 4,552.14      | 32.00       | 1,491.68    | 1,492.03       | 1.27              | 635,040.90       | 600,988.58      |
| 9,583.00   | 87.23      | 89.58      | 8,087.71    | 4,555.21      | 33.05       | 1,584.62    | 1,584.97       | 1.96              | 635,041.95       | 601,081.52      |
| 9,677.00   | 86.88      | 89.19      | 8,092.54    | 4,560.04      | 34.06       | 1,678.49    | 1,678.83       | 0.56              | 635,042.96       | 601,175.39      |
| 9,768.00   | 86.88      | 89.12      | 8,097.49    | 4,564.99      | 35.40       | 1,769.35    | 1,769.70       | 0.08              | 635,044.30       | 601,266.25      |
| 9,863.00   | 87.67      | 89.20      | 8,102.01    | 4,569.51      | 36.79       | 1,864.23    | 1,864.59       | 0.84              | 635,045.69       | 601,361.13      |
| 9,956.00   | 88.99      | 88.48      | 8,104.72    | 4,572.22      | 38.68       | 1,957.17    | 1,957.54       | 1.62              | 635,047.58       | 601,454.07      |
| 10,050.00  | 89.25      | 88.66      | 8,106.16    | 4,573.66      | 41.02       | 2,051.13    | 2,051.53       | 0.34              | 635,049.92       | 601,548.03      |
| 10,143.00  | 89.52      | 87.92      | 8,107.16    | 4,574.66      | 43.80       | 2,144.08    | 2,144.52       | 0.85              | 635,052.70       | 601,640.98      |
| 10,236.00  | 89.25      | 88.20      | 8,108.16    | 4,575.66      | 46.94       | 2,237.02    | 2,237.51       | 0.42              | 635,055.84       | 601,733.92      |
| 10,330.00  | 89.16      | 88.79      | 8,109.46    | 4,576.96      | 49.41       | 2,330.98    | 2,331.50       | 0.63              | 635,058.31       | 601,827.88      |
| 10,422.00  | 89.08      | 89.34      | 8,110.88    | 4,578.38      | 50.91       | 2,422.96    | 2,423.49       | 0.60              | 635,059.81       | 601,919.86      |
| 10,515.00  | 89.16      | 89.58      | 8,112.31    | 4,579.81      | 51.79       | 2,515.94    | 2,516.47       | 0.27              | 635,060.69       | 602,012.84      |
| 10,608.00  | 88.81      | 89.35      | 8,113.95    | 4,581.45      | 52.66       | 2,608.92    | 2,609.45       | 0.45              | 635,061.56       | 602,105.82      |
| 10,701.00  | 88.72      | 88.73      | 8,115.96    | 4,583.46      | 54.22       | 2,701.89    | 2,702.42       | 0.67              | 635,063.12       | 602,198.79      |
| 10,795.00  | 88.99      | 88.77      | 8,117.84    | 4,585.34      | 56.27       | 2,795.85    | 2,796.40       | 0.29              | 635,065.17       | 602,292.75      |

Company: EOG Resources, Inc.  
Project: Eddy County  
Site: Sand Tank 18 Fed Com  
Well: #4H  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Database:

Well #4H  
Well#1 @ 3532.50ft (McVay #4 19'KB Correction)  
Well#1 @ 3532.50ft (McVay #4 19'KB Correction)  
Grid  
Minimum Curvature  
Midland Database

Survey

| MD<br>(ft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V:Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |
|------------|------------|------------|-------------|---------------|-------------|-------------|---------------|-------------------|------------------|-----------------|
| 10,887.00  | 89.25      | 88.88      | 8,119.25    | 4,586.75      | 58.15       | 2,887.82    | 2,888.39      | 0.31              | 635,067.05       | 602,384.72      |
| 10,981.00  | 89.16      | 88.61      | 8,120.55    | 4,588.05      | 60.21       | 2,981.79    | 2,982.38      | 0.30              | 635,069.11       | 602,478.69      |
| 11,075.00  | 89.25      | 88.07      | 8,121.86    | 4,589.36      | 62.93       | 3,075.74    | 3,076.37      | 0.58              | 635,071.83       | 602,572.64      |
| 11,168.00  | 87.76      | 88.65      | 8,124.28    | 4,591.78      | 65.60       | 3,168.66    | 3,169.34      | 1.72              | 635,074.50       | 602,665.56      |
| 11,263.00  | 87.76      | 88.53      | 8,128.00    | 4,595.50      | 67.93       | 3,263.56    | 3,264.26      | 0.13              | 635,076.83       | 602,760.46      |
| 11,359.00  | 87.85      | 88.57      | 8,131.67    | 4,599.17      | 70.36       | 3,359.46    | 3,360.19      | 0.10              | 635,079.26       | 602,856.36      |
| 11,454.00  | 88.29      | 88.36      | 8,134.87    | 4,602.37      | 72.90       | 3,454.37    | 3,455.14      | 0.51              | 635,081.80       | 602,951.27      |
| 11,547.00  | 88.55      | 88.17      | 8,137.44    | 4,604.94      | 75.72       | 3,547.30    | 3,548.10      | 0.35              | 635,084.62       | 603,044.20      |
| 11,642.00  | 88.29      | 87.49      | 8,140.06    | 4,607.56      | 79.31       | 3,642.19    | 3,643.05      | 0.77              | 635,088.21       | 603,139.09      |
| 11,738.00  | 87.14      | 88.42      | 8,143.88    | 4,611.38      | 82.74       | 3,738.05    | 3,738.96      | 1.54              | 635,091.64       | 603,234.95      |
| 11,833.00  | 87.23      | 87.54      | 8,148.55    | 4,616.05      | 86.08       | 3,832.88    | 3,833.84      | 0.93              | 635,094.98       | 603,329.78      |
| 11,927.00  | 86.88      | 87.34      | 8,153.38    | 4,620.88      | 90.27       | 3,926.66    | 3,927.70      | 0.43              | 635,099.17       | 603,423.56      |
| 12,023.00  | 87.67      | 86.95      | 8,157.94    | 4,625.44      | 95.05       | 4,022.43    | 4,023.55      | 0.92              | 635,103.95       | 603,519.33      |
| 12,118.00  | 88.02      | 86.38      | 8,161.52    | 4,629.02      | 100.57      | 4,117.20    | 4,118.42      | 0.70              | 635,109.47       | 603,614.10      |
| 12,245.00  | 89.43      | 85.84      | 8,164.34    | 4,631.84      | 109.19      | 4,243.87    | 4,245.26      | 1.19              | 635,118.09       | 603,740.77      |
| 12,309.00  | 89.96      | 85.32      | 8,164.68    | 4,632.18      | 114.12      | 4,307.68    | 4,309.16      | 1.16              | 635,123.02       | 603,804.58      |
| 12,386.00  | 89.96      | 85.32      | 8,164.74    | 4,632.24      | 120.40      | 4,384.42    | 4,386.03      | 0.00              | 635,129.30       | 603,881.32      |

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Wellbore: OH  
Design: OH

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Survey Calculation Method: Minimum Curvature  
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#### Targets

| Target Name                                                                     | Dip Angle<br>(°) | Dip Dir<br>(°) | TVD<br>(ft) | +N/-S<br>(ft) | +E/-W<br>(ft) | Northing<br>(ft) | Easting<br>(ft) | Latitude         | Longitude         |
|---------------------------------------------------------------------------------|------------------|----------------|-------------|---------------|---------------|------------------|-----------------|------------------|-------------------|
| BHL (#4H)                                                                       | 0.00             | 0.00           | 8,141.37    | 105.30        | 4,619.60      | 635,114.200      | 604,116.500     | 32° 44' 44 037 N | 103° 59' 40.920 W |
| - survey misses by 236.82ft at 12386.00ft MD (8164 74 TVD, 120.40 N, 4384.42 E) |                  |                |             |               |               |                  |                 |                  |                   |
| - Point                                                                         |                  |                |             |               |               |                  |                 |                  |                   |

#### Survey Annotations

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Local Coordinates<br>+N/-S<br>(ft) | +E/-W<br>(ft) | Comment                |
|---------------------------|---------------------------|------------------------------------|---------------|------------------------|
| 8,249.00                  | 8,073.51                  | 19.59                              | 251.58        | Proj. To Bit @ 8249'MD |

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