



**PHOENIX**  
TECHNOLOGY SERVICES

30-015-40660

## **Chesapeake Operating Inc.**

Eddy County, New Mexico (NAD 1983)

PLU Remuda Basin 4 24 30 USA 1H

Job # 1211012

Rig: Latshaw 14

Design: Rig: Latshaw 14

## **Chesapeake Energy, Survey Report**

16 November, 2012





# Chesapeake Energy, Survey Report



|                  |                                    |                                     |                                 |
|------------------|------------------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Chesapeake Operating Inc.          | <b>Local Co-ordinate Reference:</b> | Well Job # 1211012              |
| <b>Project:</b>  | Eddy County, New Mexico (NAD 1983) | <b>TVD Reference:</b>               | WELL @ 3518.00usft (Latshaw 14) |
| <b>Site:</b>     | PLU Remuda Basin 4 24 30 USA 1H    | <b>MD Reference:</b>                | WELL @ 3518.00usft (Latshaw 14) |
| <b>Well:</b>     | Job # 1211012                      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Rig: Latshaw 14                    | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Rig: Latshaw 14                    | <b>Database:</b>                    | Compass5000                     |

|                    |                                    |                      |                |
|--------------------|------------------------------------|----------------------|----------------|
| <b>Project</b>     | Eddy County, New Mexico (NAD 1983) |                      |                |
| <b>Map System:</b> | US State Plane 1983                | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983          |                      |                |
| <b>Map Zone:</b>   | New Mexico Eastern Zone            |                      |                |

|                              |                                 |                          |                    |
|------------------------------|---------------------------------|--------------------------|--------------------|
| <b>Site</b>                  | PLU Remuda Basin 4 24 30 USA 1H |                          |                    |
| <b>Site Position:</b>        |                                 | <b>Northing:</b>         | 456,276.00 usft    |
| <b>From:</b>                 | Map                             | <b>Easting:</b>          | 680,982.00 usft    |
| <b>Position Uncertainty:</b> | 0.00 usft                       | <b>Slot Radius:</b>      | 13-3/16 "          |
|                              |                                 | <b>Latitude:</b>         | 32° 15' 12.8537 N  |
|                              |                                 | <b>Longitude:</b>        | 103° 52' 53.7753 W |
|                              |                                 | <b>Grid Convergence:</b> | 0.24 °             |

|                             |               |                            |                                  |
|-----------------------------|---------------|----------------------------|----------------------------------|
| <b>Well</b>                 | Job # 1211012 |                            |                                  |
| <b>Well Position</b>        | +N/-S         | 0.00 usft                  | <b>Northing:</b> 456,276.00 usft |
|                             | +E/-W         | 0.00 usft                  | <b>Easting:</b> 680,982.00 usft  |
| <b>Position Uncertainty</b> | 0.00 usft     | <b>Wellhead Elevation:</b> | 23.00 usft                       |
|                             |               | <b>Latitude:</b>           | 32° 15' 12.8537 N                |
|                             |               | <b>Longitude:</b>          | 103° 52' 53.7753 W               |
|                             |               | <b>Ground Level:</b>       | 3,495.00 usft                    |

|                  |                   |                    |                       |
|------------------|-------------------|--------------------|-----------------------|
| <b>Wellbore</b>  | Rig: Latshaw 14   |                    |                       |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination</b>    |
|                  | IGRF2010_14       | 10/17/12           | (°)                   |
|                  |                   |                    | 7.57                  |
|                  |                   |                    | <b>Dip Angle</b>      |
|                  |                   |                    | (°)                   |
|                  |                   |                    | 60.13                 |
|                  |                   |                    | <b>Field Strength</b> |
|                  |                   |                    | (nT)                  |
|                  |                   |                    | 48,465                |

|                          |                         |                      |                  |
|--------------------------|-------------------------|----------------------|------------------|
| <b>Design</b>            | Rig: Latshaw 14         |                      |                  |
| <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)</b> | <b>+N/-S</b>         | <b>+E/-W</b>     |
|                          | (usft)                  | (usft)               | (usft)           |
|                          | 0.00                    | 0.00                 | 0.00             |
|                          |                         |                      | <b>Direction</b> |
|                          |                         |                      | (°)              |
|                          |                         |                      | 172.97           |



# Chesapeake Energy, Survey Report



|                  |                                    |                                     |                                 |
|------------------|------------------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Chesapeake Operating Inc.          | <b>Local Co-ordinate Reference:</b> | Well Job # 1211012              |
| <b>Project:</b>  | Eddy County, New Mexico (NAD 1983) | <b>TVD Reference:</b>               | WELL @ 3518.00usft (Latshaw 14) |
| <b>Site:</b>     | PLU Remuda Basin 4 24 30 USA 1H    | <b>MD Reference:</b>                | WELL @ 3518.00usft (Latshaw 14) |
| <b>Well:</b>     | Job # 1211012                      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Rig: Latshaw 14                    | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Rig: Latshaw 14                    | <b>Database:</b>                    | Compass5000                     |

| Survey Program |           | Date                                    | 11/16/12  |                |  |
|----------------|-----------|-----------------------------------------|-----------|----------------|--|
| From (usft)    | To (usft) | Survey (Wellbore)                       | Tool Name | Description    |  |
| 176.00         | 8,491.00  | Phoenix MWD Surveys Pilot (Rig: Latshaw | MWD       | MWD - Standard |  |
| 8,565.00       | 13,743.00 | Phoenix MWD Surveys (Rig: Latshaw 14)   | MWD       | MWD - Standard |  |

| Survey    |         |                   |              |            |            |            |               |                  |                 |                |  |
|-----------|---------|-------------------|--------------|------------|------------|------------|---------------|------------------|-----------------|----------------|--|
| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |  |
| 0.00      | 0.00    | 0.00              | 3,518.00     | 0.00       | 0.00       | 0.00       | 0.00          | 0.00             | 456,276.00      | 680,982.00     |  |
| 176.00    | 1.00    | 299.80            | 3,342.01     | 175.99     | 0.76       | -1.33      | -0.92         | 0.57             | 456,276.76      | 680,980.67     |  |
| 360.00    | 1.00    | 294.60            | 3,158.04     | 359.96     | 2.23       | -4.19      | -2.73         | 0.05             | 456,278.23      | 680,977.81     |  |
| 528.00    | 1.10    | 292.70            | 2,990.07     | 527.93     | 3.46       | -7.01      | -4.29         | 0.06             | 456,279.46      | 680,974.99     |  |
| 669.00    | 1.00    | 261.90            | 2,849.09     | 668.91     | 3.81       | -9.47      | -4.94         | 0.40             | 456,279.81      | 680,972.53     |  |
| 858.00    | 1.20    | 254.30            | 2,660.12     | 857.88     | 3.04       | -13.01     | -4.61         | 0.13             | 456,279.04      | 680,968.99     |  |
| 1,048.00  | 1.00    | 246.70            | 2,470.16     | 1,047.84   | 1.85       | -16.45     | -3.85         | 0.13             | 456,277.85      | 680,965.55     |  |
| 1,238.00  | 1.10    | 244.40            | 2,280.19     | 1,237.81   | 0.41       | -19.62     | -2.80         | 0.06             | 456,276.41      | 680,962.38     |  |
| 1,429.00  | 0.70    | 224.50            | 2,089.21     | 1,428.79   | -1.22      | -22.09     | -1.49         | 0.26             | 456,274.78      | 680,959.91     |  |
| 1,619.00  | 0.70    | 207.70            | 1,899.23     | 1,618.77   | -3.07      | -23.44     | 0.18          | 0.11             | 456,272.93      | 680,958.56     |  |
| 1,809.00  | 0.60    | 239.00            | 1,709.24     | 1,808.76   | -4.61      | -24.83     | 1.54          | 0.19             | 456,271.39      | 680,957.17     |  |
| 2,000.00  | 0.40    | 283.30            | 1,518.25     | 1,999.75   | -4.98      | -26.34     | 1.72          | 0.22             | 456,271.02      | 680,955.66     |  |
| 2,190.00  | 0.70    | 30.10             | 1,328.25     | 2,189.75   | -3.82      | -26.40     | 0.56          | 0.47             | 456,272.18      | 680,955.60     |  |
| 2,380.00  | 0.90    | 11.30             | 1,138.27     | 2,379.73   | -1.35      | -25.53     | -1.78         | 0.17             | 456,274.65      | 680,956.47     |  |
| 2,570.00  | 0.40    | 356.90            | 948.28       | 2,569.72   | 0.77       | -25.27     | -3.86         | 0.27             | 456,276.77      | 680,956.73     |  |
| 2,760.00  | 0.20    | 335.80            | 758.28       | 2,759.72   | 1.74       | -25.44     | -4.84         | 0.12             | 456,277.74      | 680,956.56     |  |
| 2,950.00  | 0.40    | 326.50            | 568.29       | 2,949.71   | 2.59       | -25.95     | -5.75         | 0.11             | 456,278.59      | 680,956.05     |  |
| 3,140.00  | 0.40    | 76.10             | 378.29       | 3,139.71   | 3.31       | -25.67     | -6.42         | 0.34             | 456,279.31      | 680,956.33     |  |
| 3,330.00  | 0.80    | 118.80            | 188.30       | 3,329.70   | 2.83       | -23.86     | -5.73         | 0.30             | 456,278.83      | 680,958.14     |  |
| 3,520.00  | 2.00    | 129.10            | -1.64        | 3,519.64   | 0.10       | -20.13     | -2.56         | 0.64             | 456,276.10      | 680,961.87     |  |
| 3,711.00  | 2.50    | 134.70            | -192.49      | 3,710.49   | -4.94      | -14.58     | 3.11          | 0.29             | 456,271.06      | 680,967.42     |  |



# Chesapeake Energy, Survey Report



|                  |                                    |                                     |                                 |
|------------------|------------------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Chesapeake Operating Inc.          | <b>Local Co-ordinate Reference:</b> | Well Job # 1211012              |
| <b>Project:</b>  | Eddy County, New Mexico (NAD 1983) | <b>TVD Reference:</b>               | WELL @ 3518.00usft (Latshaw 14) |
| <b>Site:</b>     | PLU Remuda Basin 4 24 30 USA 1H    | <b>MD Reference:</b>                | WELL @ 3518.00usft (Latshaw 14) |
| <b>Well:</b>     | Job # 1211012                      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Rig: Latshaw 14                    | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Rig: Latshaw 14                    | <b>Database:</b>                    | Compass5000                     |

| Survey       |            |                      |                 |               |               |               |                  |                     |                    |                   |
|--------------|------------|----------------------|-----------------|---------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVDSS<br>(usft) | TVD<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
| 3,926.00     | 1.60       | 132.90               | -407.35         | 3,925.35      | -10.28        | -9.05         | 9.09             | 0.42                | 456,265.72         | 680,972.95        |
| 4,116.00     | 1.70       | 141.60               | -597.27         | 4,115.27      | -14.29        | -5.35         | 13.53            | 0.14                | 456,261.71         | 680,976.65        |
| 4,306.00     | 1.50       | 126.20               | -787.20         | 4,305.20      | -17.97        | -1.60         | 17.64            | 0.25                | 456,258.03         | 680,980.40        |
| 4,497.00     | 1.10       | 134.70               | -978.15         | 4,496.15      | -20.74        | 1.72          | 20.79            | 0.23                | 456,255.26         | 680,983.72        |
| 4,687.00     | 1.30       | 133.20               | -1,168.11       | 4,686.11      | -23.49        | 4.59          | 23.88            | 0.11                | 456,252.51         | 680,986.59        |
| 4,877.00     | 0.90       | 142.40               | -1,358.07       | 4,876.07      | -26.15        | 7.07          | 26.82            | 0.23                | 456,249.85         | 680,989.07        |
| 5,068.00     | 0.60       | 117.80               | -1,549.06       | 5,067.06      | -27.81        | 8.87          | 28.68            | 0.23                | 456,248.19         | 680,990.87        |
| 5,258.00     | 0.80       | 162.40               | -1,739.05       | 5,257.05      | -29.53        | 10.15         | 30.56            | 0.30                | 456,246.47         | 680,992.15        |
| 5,448.00     | 0.40       | 145.00               | -1,929.04       | 5,447.04      | -31.34        | 10.94         | 32.44            | 0.23                | 456,244.66         | 680,992.94        |
| 5,638.00     | 0.60       | 181.40               | -2,119.03       | 5,637.03      | -32.88        | 11.29         | 34.01            | 0.19                | 456,243.12         | 680,993.29        |
| 5,828.00     | 0.70       | 155.90               | -2,309.02       | 5,827.02      | -34.93        | 11.74         | 36.11            | 0.16                | 456,241.07         | 680,993.74        |
| 6,019.00     | 0.40       | 209.40               | -2,500.01       | 6,018.01      | -36.58        | 11.89         | 37.76            | 0.29                | 456,239.42         | 680,993.89        |
| 6,209.00     | 0.70       | 167.70               | -2,690.00       | 6,208.00      | -38.29        | 11.81         | 39.45            | 0.25                | 456,237.71         | 680,993.81        |
| 6,399.00     | 0.60       | 181.80               | -2,879.99       | 6,397.99      | -40.42        | 12.03         | 41.59            | 0.10                | 456,235.58         | 680,994.03        |
| 6,589.00     | 0.70       | 193.20               | -3,069.98       | 6,587.98      | -42.54        | 11.73         | 43.66            | 0.09                | 456,233.46         | 680,993.73        |
| 6,780.00     | 1.00       | 179.80               | -3,260.95       | 6,778.95      | -45.35        | 11.47         | 46.41            | 0.19                | 456,230.65         | 680,993.47        |
| 6,970.00     | 1.00       | 167.70               | -3,450.93       | 6,968.93      | -48.62        | 11.83         | 49.71            | 0.11                | 456,227.38         | 680,993.83        |
| 7,160.00     | 1.50       | 174.60               | -3,640.88       | 7,158.88      | -52.72        | 12.42         | 53.84            | 0.27                | 456,223.28         | 680,994.42        |
| 7,350.00     | 1.70       | 165.20               | -3,830.81       | 7,348.81      | -57.92        | 13.37         | 59.12            | 0.17                | 456,218.08         | 680,995.37        |
| 7,540.00     | 1.90       | 169.40               | -4,020.71       | 7,538.71      | -63.74        | 14.67         | 65.06            | 0.13                | 456,212.26         | 680,996.67        |
| 7,730.00     | 1.90       | 166.40               | -4,210.61       | 7,728.61      | -69.90        | 15.99         | 71.33            | 0.05                | 456,206.10         | 680,997.99        |
| 7,920.00     | 1.80       | 183.40               | -4,400.51       | 7,918.51      | -75.94        | 16.56         | 77.39            | 0.29                | 456,200.06         | 680,998.56        |
| 8,111.00     | 1.10       | 236.10               | -4,591.46       | 8,109.46      | -79.96        | 14.86         | 81.17            | 0.75                | 456,196.04         | 680,996.86        |
| 8,301.00     | 1.30       | 139.80               | -4,781.43       | 8,299.43      | -82.62        | 14.73         | 83.80            | 0.94                | 456,193.38         | 680,996.73        |
| 8,491.00     | 2.40       | 208.20               | -4,971.35       | 8,489.35      | -87.77        | 14.24         | 88.86            | 1.19                | 456,188.23         | 680,996.24        |
| Tie In, 8491 |            |                      |                 |               |               |               |                  |                     |                    |                   |



# Chesapeake Energy, Survey Report

Company: Chesapeake Operating Inc.  
Project: Eddy County, New Mexico (NAD 1983)  
Site: PLU Remuda Basin 4 24 30 USA 1H  
Well: Job # 1211012  
Wellbore: Rig: Latshaw 14  
Design: Rig: Latshaw 14

Local Co-ordinate Reference: Well Job # 1211012  
TVD Reference: WELL @ 3518.00usft (Latshaw 14)  
MD Reference: WELL @ 3518.00usft (Latshaw 14)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: Compass5000

## Survey

| MD<br>(usft)                         | Inc<br>(°) | Azi (azimuth)<br>(°) | TVDSS<br>(usft) | TVD<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
|--------------------------------------|------------|----------------------|-----------------|---------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| 8,565.00                             | 8.80       | 190.00               | -5,044.96       | 8,562.96      | -94.72        | 12.53         | 95.54            | 8.87                | 456,181.28         | 680,994.53        |
| First Phoenix MWD Surveys @ 8565' MD |            |                      |                 |               |               |               |                  |                     |                    |                   |
| 8,597.00                             | 13.00      | 180.70               | -5,076.38       | 8,594.38      | -100.73       | 12.06         | 101.45           | 14.19               | 456,175.27         | 680,994.06        |
| 8,629.00                             | 17.30      | 179.20               | -5,107.26       | 8,625.26      | -109.09       | 12.08         | 109.75           | 13.49               | 456,166.91         | 680,994.08        |
| 8,660.00                             | 21.70      | 177.40               | -5,136.47       | 8,654.47      | -119.43       | 12.40         | 120.05           | 14.32               | 456,156.57         | 680,994.40        |
| 8,692.00                             | 25.70      | 175.70               | -5,165.77       | 8,683.77      | -132.27       | 13.19         | 132.89           | 12.68               | 456,143.73         | 680,995.19        |
| 8,724.00                             | 30.30      | 173.40               | -5,194.02       | 8,712.02      | -147.21       | 14.64         | 147.90           | 14.76               | 456,128.79         | 680,996.64        |
| 8,755.00                             | 34.50      | 171.00               | -5,220.19       | 8,738.19      | -163.66       | 16.92         | 164.50           | 14.17               | 456,112.34         | 680,998.92        |
| 8,787.00                             | 37.10      | 169.00               | -5,246.14       | 8,764.14      | -182.09       | 20.18         | 183.19           | 8.91                | 456,093.91         | 681,002.18        |
| 8,819.00                             | 39.10      | 169.80               | -5,271.32       | 8,789.32      | -201.50       | 23.80         | 202.90           | 6.44                | 456,074.50         | 681,005.80        |
| 8,851.00                             | 40.60      | 170.10               | -5,295.89       | 8,813.89      | -221.69       | 27.38         | 223.37           | 4.73                | 456,054.31         | 681,009.38        |
| 8,882.00                             | 42.70      | 170.40               | -5,319.05       | 8,837.05      | -241.99       | 30.87         | 243.95           | 6.80                | 456,034.01         | 681,012.87        |
| 8,914.00                             | 44.70      | 171.20               | -5,342.18       | 8,860.18      | -263.81       | 34.40         | 266.04           | 6.48                | 456,012.19         | 681,016.40        |
| 8,945.00                             | 46.90      | 171.90               | -5,363.79       | 8,881.79      | -285.80       | 37.66         | 288.26           | 7.28                | 455,990.20         | 681,019.66        |
| 8,977.00                             | 48.10      | 171.90               | -5,385.41       | 8,903.41      | -309.15       | 40.99         | 311.84           | 3.75                | 455,966.85         | 681,022.99        |
| 9,009.00                             | 50.20      | 171.60               | -5,406.34       | 8,924.34      | -333.11       | 44.46         | 336.04           | 6.60                | 455,942.89         | 681,026.46        |
| 9,041.00                             | 54.20      | 171.40               | -5,425.95       | 8,943.95      | -358.11       | 48.20         | 361.31           | 12.51               | 455,917.89         | 681,030.20        |
| 9,072.00                             | 56.20      | 170.50               | -5,443.64       | 8,961.64      | -383.24       | 52.21         | 386.75           | 6.88                | 455,892.76         | 681,034.21        |
| 9,104.00                             | 57.70      | 170.30               | -5,461.09       | 8,979.09      | -409.69       | 56.68         | 413.55           | 4.72                | 455,866.31         | 681,038.68        |
| 9,136.00                             | 59.40      | 171.20               | -5,477.79       | 8,995.79      | -436.63       | 61.07         | 440.82           | 5.83                | 455,839.37         | 681,043.07        |
| 9,168.00                             | 63.00      | 172.70               | -5,493.20       | 9,011.20      | -464.39       | 64.99         | 468.86           | 11.98               | 455,811.61         | 681,046.99        |
| 9,200.00                             | 65.70      | 173.50               | -5,507.05       | 9,025.05      | -493.03       | 68.45         | 497.70           | 8.73                | 455,782.97         | 681,050.45        |
| 9,231.00                             | 69.50      | 173.50               | -5,518.86       | 9,036.86      | -521.50       | 71.69         | 526.35           | 12.26               | 455,754.50         | 681,053.69        |
| 9,263.00                             | 74.50      | 173.50               | -5,528.75       | 9,046.75      | -551.73       | 75.14         | 556.78           | 15.62               | 455,724.27         | 681,057.14        |
| 9,295.00                             | 78.50      | 173.00               | -5,536.22       | 9,054.22      | -582.62       | 78.79         | 587.89           | 12.59               | 455,693.38         | 681,060.79        |
| 9,327.00                             | 81.10      | 172.70               | -5,541.88       | 9,059.88      | -613.87       | 82.71         | 619.38           | 8.18                | 455,662.13         | 681,064.71        |
| 9,358.00                             | 84.00      | 172.40               | -5,545.90       | 9,063.90      | -644.34       | 86.70         | 650.11           | 9.40                | 455,631.66         | 681,068.70        |



# Chesapeake Energy, Survey Report



|                  |                                    |                                     |                                 |
|------------------|------------------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Chesapeake Operating Inc.          | <b>Local Co-ordinate Reference:</b> | Well Job # 1211012              |
| <b>Project:</b>  | Eddy County, New Mexico (NAD 1983) | <b>TVD Reference:</b>               | WELL @ 3518.00usft (Latshaw 14) |
| <b>Site:</b>     | PLU Remuda Basin 4 24 30 USA 1H    | <b>MD Reference:</b>                | WELL @ 3518.00usft (Latshaw 14) |
| <b>Well:</b>     | Job # 1211012                      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Rig: Latshaw 14                    | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Rig: Latshaw 14                    | <b>Database:</b>                    | Compass5000                     |

| Survey       |            |                      |                 |               |               |               |                  |                     |                    |                   |
|--------------|------------|----------------------|-----------------|---------------|---------------|---------------|------------------|---------------------|--------------------|-------------------|
| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVDSS<br>(usft) | TVD<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V. Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
| 9,390.00     | 87.50      | 172.70               | -5,548.27       | 9,066.27      | -675.98       | 90.84         | 682.02           | 10.98               | 455,600.02         | 681,072.84        |
| 9,453.00     | 88.80      | 173.50               | -5,550.31       | 9,068.31      | -738.49       | 98.40         | 744.98           | 2.42                | 455,537.51         | 681,080.40        |
| 9,549.00     | 90.50      | 174.10               | -5,550.90       | 9,068.90      | -833.92       | 108.77        | 840.97           | 1.88                | 455,442.08         | 681,090.77        |
| 9,644.00     | 91.70      | 173.80               | -5,549.07       | 9,067.07      | -928.38       | 118.78        | 935.93           | 1.30                | 455,347.62         | 681,100.78        |
| 9,739.00     | 92.70      | 173.80               | -5,545.42       | 9,063.42      | -1,022.75     | 129.03        | 1,030.85         | 1.05                | 455,253.25         | 681,111.03        |
| 9,834.00     | 91.90      | 172.70               | -5,541.61       | 9,059.61      | -1,117.01     | 140.19        | 1,125.77         | 1.43                | 455,158.99         | 681,122.19        |
| 9,929.00     | 91.50      | 172.70               | -5,538.79       | 9,056.79      | -1,211.20     | 152.25        | 1,220.73         | 0.42                | 455,064.80         | 681,134.25        |
| 10,025.00    | 90.30      | 172.90               | -5,537.29       | 9,055.29      | -1,306.43     | 164.28        | 1,316.72         | 1.27                | 454,969.57         | 681,146.28        |
| 10,120.00    | 92.00      | 172.70               | -5,535.38       | 9,053.38      | -1,400.66     | 176.19        | 1,411.69         | 1.80                | 454,875.34         | 681,158.19        |
| 10,215.00    | 91.70      | 173.20               | -5,532.31       | 9,050.31      | -1,494.89     | 187.84        | 1,506.64         | 0.61                | 454,781.11         | 681,169.84        |
| 10,310.00    | 91.30      | 173.10               | -5,529.83       | 9,047.83      | -1,589.18     | 199.17        | 1,601.61         | 0.43                | 454,686.82         | 681,181.17        |
| 10,405.00    | 91.20      | 173.00               | -5,527.75       | 9,045.75      | -1,683.46     | 210.66        | 1,696.59         | 0.15                | 454,592.54         | 681,192.66        |
| 10,500.00    | 90.10      | 172.70               | -5,526.68       | 9,044.68      | -1,777.71     | 222.48        | 1,791.58         | 1.20                | 454,498.29         | 681,204.48        |
| 10,596.00    | 91.10      | 172.60               | -5,525.67       | 9,043.67      | -1,872.92     | 234.76        | 1,887.57         | 1.05                | 454,403.08         | 681,216.76        |
| 10,691.00    | 90.20      | 172.40               | -5,524.59       | 9,042.59      | -1,967.10     | 247.16        | 1,982.56         | 0.97                | 454,308.90         | 681,229.16        |
| 10,786.00    | 92.60      | 173.10               | -5,522.27       | 9,040.27      | -2,061.30     | 259.15        | 2,077.52         | 2.63                | 454,214.70         | 681,241.15        |
| 10,881.00    | 91.90      | 173.40               | -5,518.54       | 9,036.54      | -2,155.57     | 270.31        | 2,172.45         | 0.80                | 454,120.43         | 681,252.31        |
| 10,976.00    | 91.10      | 173.00               | -5,516.06       | 9,034.06      | -2,249.87     | 281.55        | 2,267.41         | 0.94                | 454,026.13         | 681,263.55        |
| 11,071.00    | 90.20      | 172.80               | -5,514.98       | 9,032.98      | -2,344.13     | 293.29        | 2,362.41         | 0.97                | 453,931.87         | 681,275.29        |
| 11,166.00    | 90.50      | 172.60               | -5,514.40       | 9,032.40      | -2,438.36     | 305.36        | 2,457.40         | 0.38                | 453,837.64         | 681,287.36        |
| 11,262.00    | 90.70      | 172.30               | -5,513.39       | 9,031.39      | -2,533.52     | 317.98        | 2,553.39         | 0.38                | 453,742.48         | 681,299.98        |
| 11,357.00    | 90.20      | 172.30               | -5,512.65       | 9,030.65      | -2,627.66     | 330.70        | 2,648.39         | 0.53                | 453,648.34         | 681,312.70        |
| 11,452.00    | 90.40      | 172.70               | -5,512.15       | 9,030.15      | -2,721.85     | 343.10        | 2,743.38         | 0.47                | 453,554.15         | 681,325.10        |
| 11,547.00    | 90.10      | 172.90               | -5,511.73       | 9,029.73      | -2,816.10     | 355.01        | 2,838.38         | 0.38                | 453,459.90         | 681,337.01        |
| 11,642.00    | 89.10      | 172.60               | -5,512.40       | 9,030.40      | -2,910.34     | 367.00        | 2,933.37         | 1.10                | 453,365.66         | 681,349.00        |
| 11,737.00    | 90.10      | 172.40               | -5,513.06       | 9,031.06      | -3,004.52     | 379.40        | 3,028.37         | 1.07                | 453,271.48         | 681,361.40        |
| 11,833.00    | 89.10      | 172.40               | -5,513.73       | 9,031.73      | -3,099.67     | 392.09        | 3,124.36         | 1.04                | 453,176.33         | 681,374.09        |



# Chesapeake Energy, Survey Report



|                  |                                    |                                     |                                 |
|------------------|------------------------------------|-------------------------------------|---------------------------------|
| <b>Company:</b>  | Chesapeake Operating Inc.          | <b>Local Co-ordinate Reference:</b> | Well Job # 1211012              |
| <b>Project:</b>  | Eddy County, New Mexico (NAD 1983) | <b>TVD Reference:</b>               | WELL @ 3518.00usft (Latshaw 14) |
| <b>Site:</b>     | PLU Remuda Basin 4-24-30 USA 1H    | <b>MD Reference:</b>                | WELL @ 3518.00usft (Latshaw 14) |
| <b>Well:</b>     | Job # 1211012                      | <b>North Reference:</b>             | Grid                            |
| <b>Wellbore:</b> | Rig: Latshaw 14                    | <b>Survey Calculation Method:</b>   | Minimum Curvature               |
| <b>Design:</b>   | Rig: Latshaw 14                    | <b>Database:</b>                    | Compass5000                     |

| Survey                               |            |                      |                 |               |               |               |                 |                     |                    |                   |
|--------------------------------------|------------|----------------------|-----------------|---------------|---------------|---------------|-----------------|---------------------|--------------------|-------------------|
| MD<br>(usft)                         | Inc<br>(°) | Azi (azimuth)<br>(°) | TVDSS<br>(usft) | TVD<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | V.Sec<br>(usft) | DLeg<br>(°/100usft) | Northing<br>(usft) | Easting<br>(usft) |
| 11,928.00                            | 90.50      | 173.40               | -5,514.06       | 9,032.06      | -3,193.94     | 403.84        | 3,219.36        | 1.81                | 453,082.06         | 681,385.84        |
| 12,023.00                            | 89.10      | 173.60               | -5,514.39       | 9,032.39      | -3,288.33     | 414.59        | 3,314.35        | 1.49                | 452,987.67         | 681,396.59        |
| 12,118.00                            | 88.60      | 173.20               | -5,516.30       | 9,034.30      | -3,382.68     | 425.51        | 3,409.33        | 0.67                | 452,893.32         | 681,407.51        |
| 12,213.00                            | 90.10      | 172.40               | -5,517.38       | 9,035.38      | -3,476.92     | 437.41        | 3,504.32        | 1.79                | 452,799.08         | 681,419.41        |
| 12,308.00                            | 89.90      | 172.30               | -5,517.38       | 9,035.38      | -3,571.07     | 450.06        | 3,599.31        | 0.24                | 452,704.93         | 681,432.06        |
| 12,403.00                            | 88.80      | 172.00               | -5,518.46       | 9,036.46      | -3,665.18     | 463.03        | 3,694.29        | 1.20                | 452,610.82         | 681,445.03        |
| 12,498.00                            | 90.00      | 172.80               | -5,519.45       | 9,037.45      | -3,759.33     | 475.60        | 3,789.28        | 1.52                | 452,516.67         | 681,457.60        |
| 12,594.00                            | 89.00      | 173.20               | -5,520.29       | 9,038.29      | -3,854.61     | 487.29        | 3,885.28        | 1.12                | 452,421.39         | 681,469.29        |
| 12,689.00                            | 88.80      | 174.20               | -5,522.11       | 9,040.11      | -3,949.02     | 497.72        | 3,980.25        | 1.07                | 452,326.98         | 681,479.72        |
| 12,784.00                            | 90.20      | 173.90               | -5,522.94       | 9,040.94      | -4,043.50     | 507.56        | 4,075.23        | 1.51                | 452,232.50         | 681,489.56        |
| 12,879.00                            | 90.00      | 173.30               | -5,522.78       | 9,040.78      | -4,137.91     | 518.15        | 4,170.22        | 0.67                | 452,138.09         | 681,500.15        |
| 12,974.00                            | 89.30      | 173.70               | -5,523.36       | 9,041.36      | -4,232.30     | 528.91        | 4,265.21        | 0.85                | 452,043.70         | 681,510.91        |
| 13,069.00                            | 88.50      | 173.60               | -5,525.18       | 9,043.18      | -4,326.70     | 539.41        | 4,360.19        | 0.85                | 451,949.30         | 681,521.41        |
| 13,164.00                            | 89.50      | 173.30               | -5,526.84       | 9,044.84      | -4,421.06     | 550.25        | 4,455.17        | 1.10                | 451,854.94         | 681,532.25        |
| 13,259.00                            | 89.50      | 173.20               | -5,527.67       | 9,045.67      | -4,515.40     | 561.41        | 4,550.16        | 0.11                | 451,760.60         | 681,543.41        |
| 13,355.00                            | 87.60      | 173.10               | -5,530.10       | 9,048.10      | -4,610.68     | 572.86        | 4,646.13        | 1.98                | 451,665.32         | 681,554.86        |
| 13,450.00                            | 89.10      | 172.90               | -5,532.83       | 9,050.83      | -4,704.93     | 584.43        | 4,741.09        | 1.59                | 451,571.07         | 681,566.43        |
| 13,545.00                            | 89.50      | 172.60               | -5,533.99       | 9,051.99      | -4,799.16     | 596.42        | 4,836.08        | 0.53                | 451,476.84         | 681,578.42        |
| 13,640.00                            | 88.70      | 172.00               | -5,535.48       | 9,053.48      | -4,893.29     | 609.15        | 4,931.06        | 1.05                | 451,382.71         | 681,591.15        |
| Last Phoenix MWD Surveys @ 13640' MD |            |                      |                 |               |               |               |                 |                     |                    |                   |
| 13,743.00                            | 88.70      | 172.10               | -5,537.82       | 9,055.82      | -4,995.28     | 623.39        | 5,034.02        | 0.10                | 451,280.72         | 681,605.39        |
| Projection to TD @ 13743' MD         |            |                      |                 |               |               |               |                 |                     |                    |                   |



# Chesapeake Energy, Survey Report



|           |                                    |                              |                                 |
|-----------|------------------------------------|------------------------------|---------------------------------|
| Company:  | Chesapeake Operating Inc.          | Local Co-ordinate Reference: | Well Job # 1211012              |
| Project:  | Eddy County, New Mexico (NAD 1983) | TVD Reference:               | WELL @ 3518.00usft (Latshaw 14) |
| Site:     | PLU Remuda Basin 4:24 30 USA 1H    | MD Reference:                | WELL @ 3518.00usft (Latshaw 14) |
| Well:     | Job # 1211012                      | North Reference:             | Grid                            |
| Wellbore: | Rig Latshaw 14                     | Survey Calculation Method:   | Minimum Curvature               |
| Design:   | Rig Latshaw 14                     | Database:                    | Compass5000                     |

| Design Annotations    |                       |                   |              |                                      |
|-----------------------|-----------------------|-------------------|--------------|--------------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                              |
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                                      |
| 8,491.00              | 8,489.35              | -87.77            | 14.24        | Tie In, 8491'                        |
| 8,565.00              | 8,562.96              | -94.72            | 12.53        | First Phoenix MWD Surveys @ 8565' MD |
| 13,640.00             | 9,053.48              | -4,893.29         | 609.15       | Last Phoenix MWD Surveys @ 13640' MD |
| 13,743.00             | 9,055.82              | -4,995.28         | 623.39       | Projection to TD @ 13743' MD         |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|



# Chesapeake Operating Inc.

Project: Eddy County, New Mexico (NAD 1983)

Site: PLU Remuda Basin 4 24 30 USA 1H

Well: Job # 1211012

Wellbore: Rig: Latshaw 14

Plan: Plan 4 11-10-12

WELL DETAILS: Job # 1211012

Ground Level: 3495.00  
Northing: 456276.00 Easting: 680982.00 Latitude: 32° 15' 12.8537 N Longitude: 103° 52' 53.7753 W

Azimuths to Grid North  
True North: -0.24°  
Magnetic North: 7.33°  
Magnetic Field  
Strength: 48465.4nT  
Dip Angle: 60.13°  
Date: 10/17/2012  
Model: IGRF2010\_14

## SECTION DETAILS

| MD       | Inc   | Azi    | TVD     | +N/S     | +E/W   | Dleg | TFace   | VSet    |
|----------|-------|--------|---------|----------|--------|------|---------|---------|
| 9834.00  | 91.90 | 172.70 | 9059.81 | -1117.01 | 140.19 | 0.00 | 0.00    | 1125.77 |
| 9869.01  | 92.50 | 173.34 | 9058.27 | -1151.74 | 144.44 | 2.50 | 40.86   | 1160.76 |
| 10237.56 | 92.50 | 173.34 | 9042.20 | -1157.45 | 187.15 | 0.00 | 0.00    | 1528.95 |
| 10338.59 | 90.00 | 172.97 | 9040.00 | -1017.73 | 109.18 | 2.50 | -171.59 | 1620.94 |
| 13760.59 | 90.00 | 172.97 | 9040.00 | -5014.00 | 618.00 | 0.00 | 0.00    | 5051.94 |

PLU Remuda Basin 4 24 30 USA 1H PBHL v4

## FORMATION TOP DETAILS

| TVDPath | MDPath   | Formation           | DipAngle | DipDir |
|---------|----------|---------------------|----------|--------|
| 9011.00 |          | FBS Sand            | 0.00     | 172.97 |
| 9139.00 |          | FBS Shale           | 0.00     | 172.97 |
| 9040.00 | 10338.59 | Target @ 90.00° Inc | 0.00     | 172.97 |

## ANNOTATIONS

| TVD     | MD       | Annotation                      |
|---------|----------|---------------------------------|
| 9059.81 | 9834.00  | Tie In, 2.50°/100' Build & Turn |
| 9058.27 | 9869.01  | Hold 92.50° Inc, 173.34° Azim   |
| 9042.20 | 10237.56 | Begin 2.50°/100' Drop & Turn    |
| 9040.00 | 10338.59 | Hold 90.00° Inc, 172.97° Azim   |
| 9040.00 | 13760.59 | TD at 13760.59' MD              |

