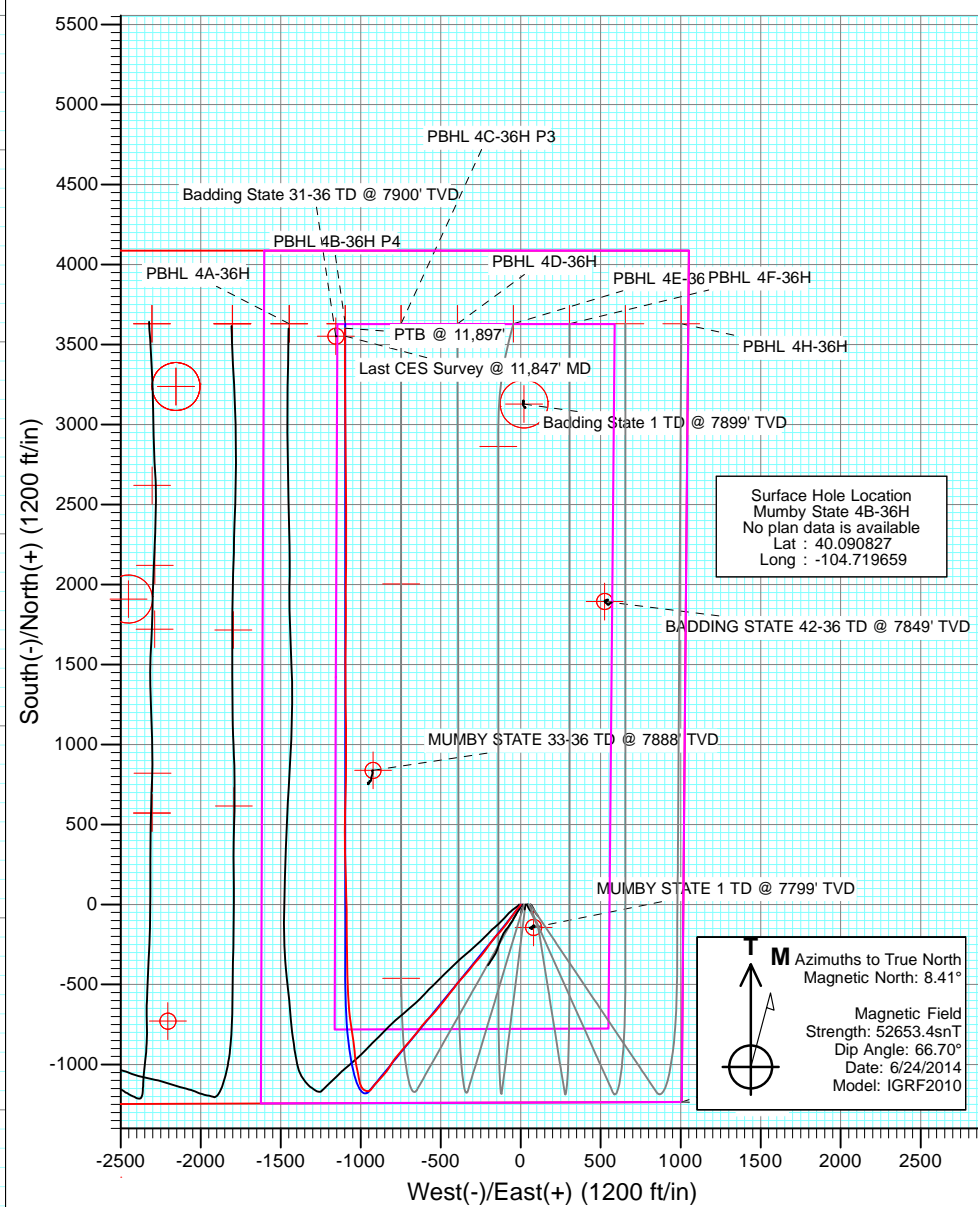
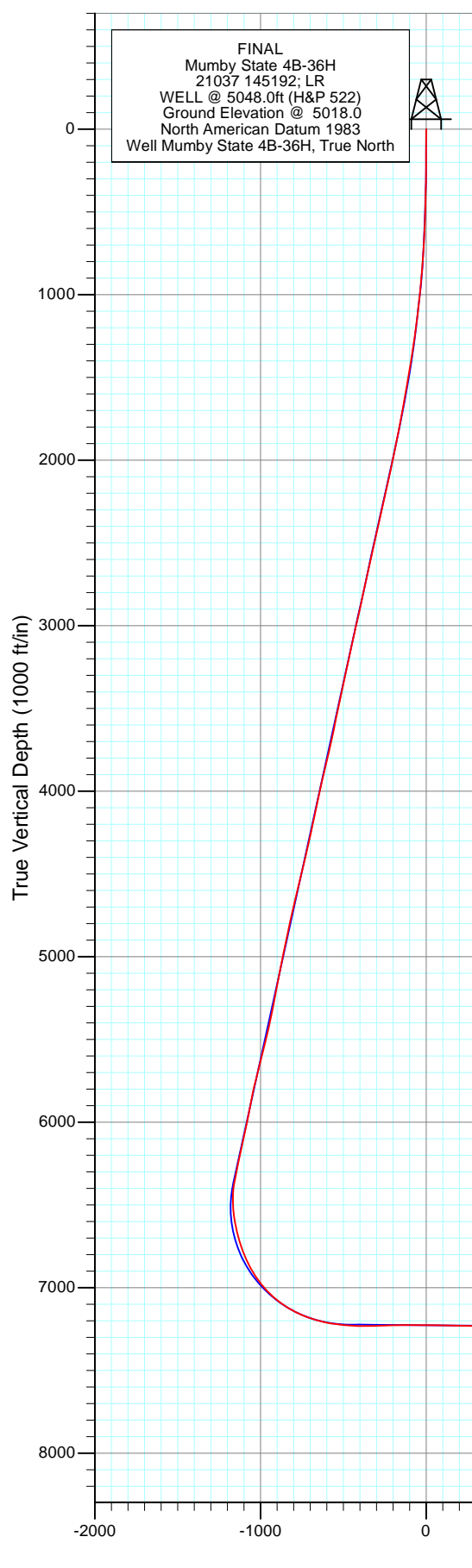
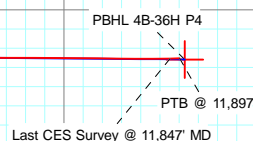




Project: DJ Wattenberg  
Site: S36 T2N-R66W (Marcus State, Mumby State)  
Well: Mumby State 4B-36H  
Wellbore: HZ  
Design: FINAL

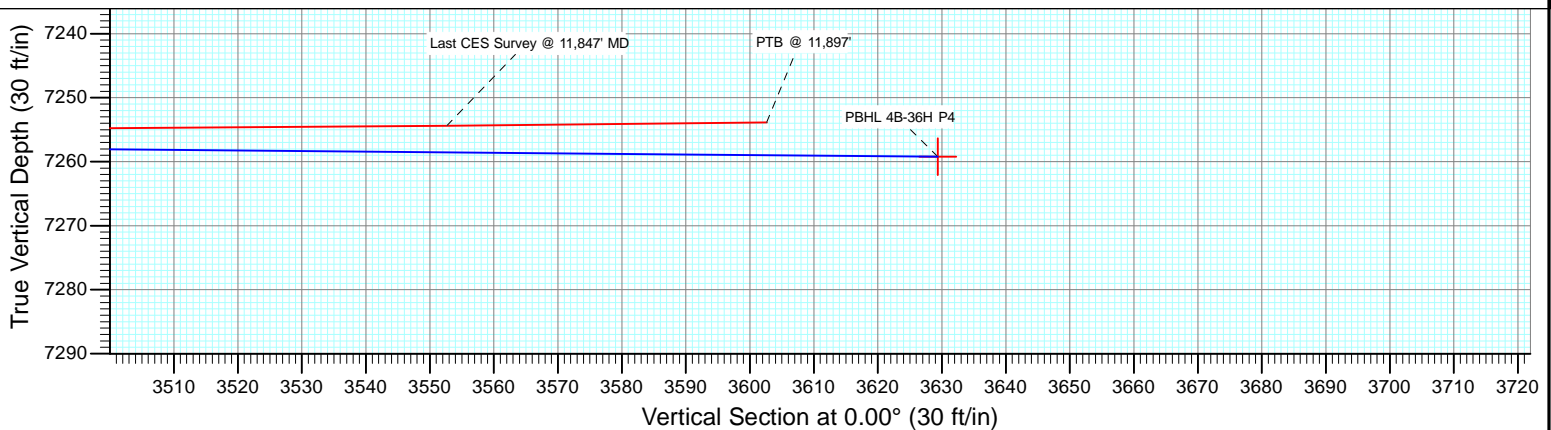
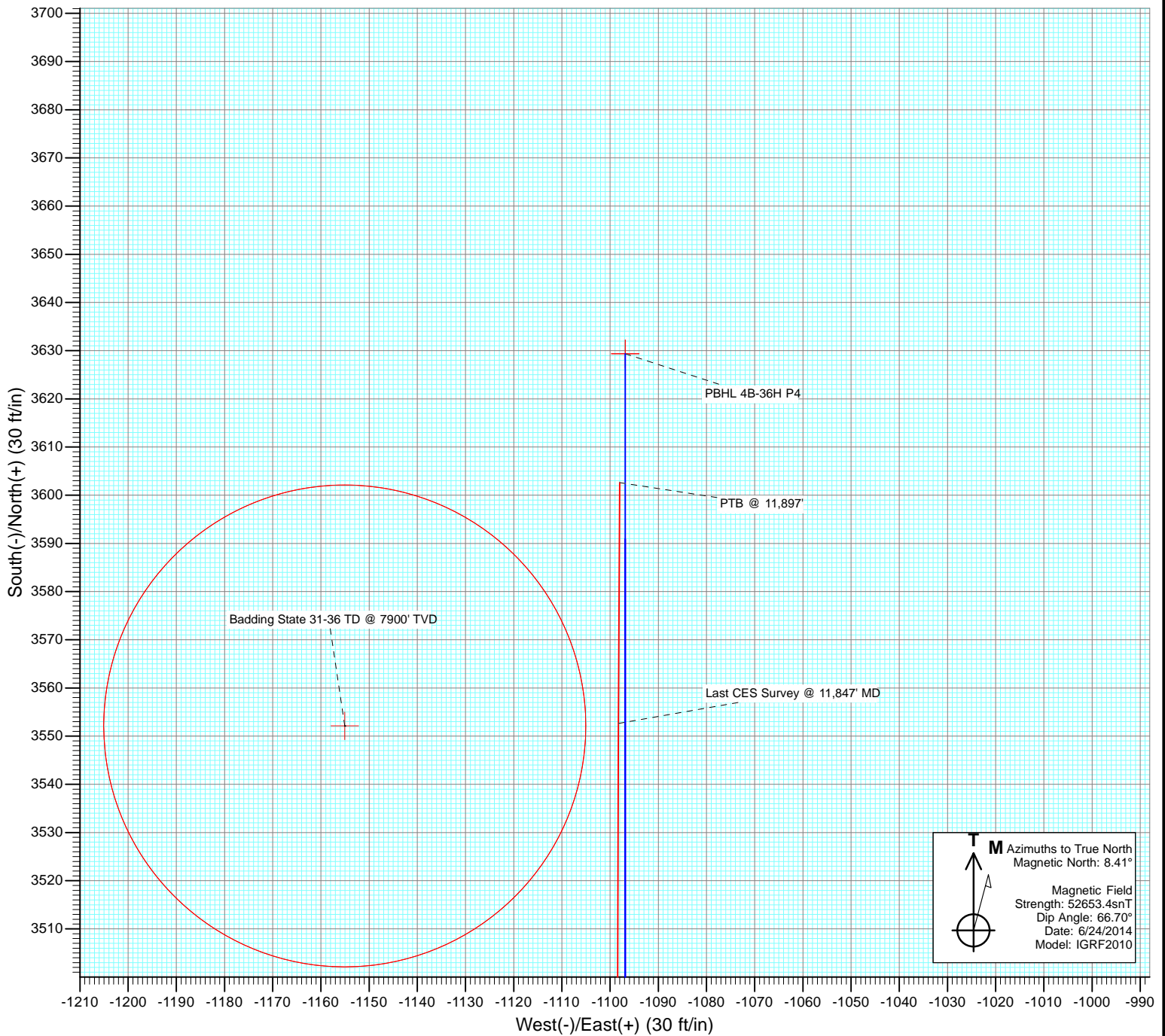


| DESIGN TARGET DETAILS |        |         |            |            |             |
|-----------------------|--------|---------|------------|------------|-------------|
| Name                  | +N/-S  | +E/-W   | Northing   | Easting    | Latitude    |
| PBHL 4B-36H P4        | 3629.3 | -1096.9 | 1280515.61 | 3217199.04 | 40.100790   |
|                       |        |         |            |            | Longitude   |
|                       |        |         |            |            | -104.723580 |





Project: DJ Wattenberg  
Site: S36 T2N-R66W (Marcus State, Mumby State)  
Well: Mumby State 4B-36H  
Wellbore: HZ  
Design: FINAL



# Cathedral Energy Services

## Survey Report

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

|                    |                           |                      |                |
|--------------------|---------------------------|----------------------|----------------|
| <b>Project</b>     | DJ Wattenberg             |                      |                |
| <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>   | Colorado Northern Zone    |                      |                |

|                       |          |  |                 |                   |             |
|-----------------------|----------|--|-----------------|-------------------|-------------|
| Site                  |          | S36 T2N-R66W (Marcus State, Mumby State) |                 |                   |             |
| Site Position:        |          | Northing:                                | 1,275,942.66 ft | Latitude:         | 40.088280   |
| From:                 | Lat/Long | Easting:                                 | 3,215,403.58 ft | Longitude:        | -104.730140 |
| Position Uncertainty: | 0.0 ft   | Slot Radius:                             | 13.200 in       | Grid Convergence: | 0.50 °      |

|                      |                    |        |                     |                 |               |             |
|----------------------|--------------------|--------|---------------------|-----------------|---------------|-------------|
| Well                 | Mumby State 4B-36H |        |                     |                 |               |             |
| Well Position        | +N/-S              | 0.0 ft | Northing:           | 1,276,896.06 ft | Latitude:     | 40.090827   |
|                      | +E/-W              | 0.0 ft | Easting:            | 3,218,327.79 ft | Longitude:    | -104.719659 |
| Position Uncertainty |                    | 0.0 ft | Wellhead Elevation: | ft              | Ground Level: | 5,018.0 ft  |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | HZ                |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 6/24/2014          | 8.41                   | 66.70                | 52,653                     |

|                          |                         |               |              |                      |     |
|--------------------------|-------------------------|---------------|--------------|----------------------|-----|
| <b>Design</b>            | FINAL                   |               |              |                      |     |
| <b>Audit Notes:</b>      |                         |               |              |                      |     |
| <b>Version:</b>          | 1.0                     | <b>Phase:</b> | ACTUAL       | <b>Tie On Depth:</b> | 0.0 |
| <b>Vertical Section:</b> | <b>Depth From (TVD)</b> | <b>+N/-S</b>  | <b>+E/-W</b> | <b>Direction</b>     |     |
|                          | (ft)                    | (ft)          | (ft)         | (°)                  |     |
|                          | 0.0                     | 0.0           | 0.0          | 0.00                 |     |

|                       |                |                          |                  |                    |  |
|-----------------------|----------------|--------------------------|------------------|--------------------|--|
| <b>Survey Program</b> | <b>Date</b>    | 7/7/2014                 |                  |                    |  |
| <b>From (ft)</b>      | <b>To (ft)</b> | <b>Survey (Wellbore)</b> | <b>Tool Name</b> | <b>Description</b> |  |
| 141.0                 | 11,897.0       | Survey #1 (HZ)           | Geolink MWD      | Geolink MWD        |  |

|                            |                        |                    |                            |                   |                   |                              |                              |                             |                              |  |
|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|------------------------------|------------------------------|-----------------------------|------------------------------|--|
| <b>Survey</b>              |                        |                    |                            |                   |                   |                              |                              |                             |                              |  |
| <b>Measured Depth (ft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>Vertical Depth (ft)</b> | <b>+N/-S (ft)</b> | <b>+E/-W (ft)</b> | <b>Vertical Section (ft)</b> | <b>Dogleg Rate (°/100ft)</b> | <b>Build Rate (°/100ft)</b> | <b>Formations / Comments</b> |  |
| 0.0                        | 0.00                   | 0.00               | 0.0                        | 0.0               | 0.0               | 0.0                          | 0.00                         | 0.00                        |                              |  |
| 141.0                      | 0.31                   | 125.74             | 141.0                      | -0.2              | 0.3               | -0.2                         | 0.22                         | 0.22                        |                              |  |
| 233.0                      | 0.48                   | 182.61             | 233.0                      | -0.8              | 0.5               | -0.8                         | 0.44                         | 0.18                        |                              |  |
| 325.0                      | 1.19                   | 206.69             | 325.0                      | -2.0              | 0.0               | -2.0                         | 0.84                         | 0.77                        |                              |  |
| 417.0                      | 2.46                   | 220.84             | 416.9                      | -4.3              | -1.7              | -4.3                         | 1.45                         | 1.38                        |                              |  |
| 509.0                      | 2.77                   | 225.59             | 508.8                      | -7.4              | -4.6              | -7.4                         | 0.41                         | 0.34                        |                              |  |
| 601.0                      | 2.68                   | 228.31             | 600.7                      | -10.4             | -7.7              | -10.4                        | 0.17                         | -0.10                       |                              |  |
| 693.0                      | 3.74                   | 213.11             | 692.6                      | -14.3             | -11.0             | -14.3                        | 1.47                         | 1.15                        |                              |  |
| 785.0                      | 4.35                   | 215.74             | 784.4                      | -19.7             | -14.7             | -19.7                        | 0.69                         | 0.66                        |                              |  |
| 877.0                      | 5.76                   | 219.70             | 876.0                      | -26.0             | -19.7             | -26.0                        | 1.58                         | 1.53                        |                              |  |
| 969.0                      | 7.73                   | 216.18             | 967.4                      | -34.6             | -26.3             | -34.6                        | 2.19                         | 2.14                        |                              |  |
| 1,061.0                    | 8.31                   | 216.97             | 1,058.5                    | -44.9             | -33.9             | -44.9                        | 0.64                         | 0.63                        |                              |  |
| 1,099.0                    | 8.00                   | 216.18             | 1,096.1                    | -49.2             | -37.1             | -49.2                        | 0.87                         | -0.82                       |                              |  |

# Cathedral Energy Services

## Survey Report

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

### Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Formations / Comments |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| 1,203.0             | 9.80            | 214.90      | 1,198.8             | -62.3      | -46.5      | -62.3                 | 1.74                  | 1.73                 |                       |
| 1,295.0             | 9.30            | 213.40      | 1,289.6             | -75.0      | -55.0      | -75.0                 | 0.61                  | -0.54                |                       |
| 1,387.0             | 12.00           | 218.20      | 1,380.0             | -88.7      | -65.0      | -88.7                 | 3.09                  | 2.93                 |                       |
| 1,478.0             | 11.60           | 215.70      | 1,469.0             | -103.5     | -76.2      | -103.5                | 0.71                  | -0.44                |                       |
| 1,570.0             | 11.60           | 216.00      | 1,559.2             | -118.5     | -87.1      | -118.5                | 0.07                  | 0.00                 |                       |
| 1,662.0             | 13.00           | 220.40      | 1,649.0             | -133.9     | -99.2      | -133.9                | 1.83                  | 1.52                 |                       |
| 1,754.0             | 12.70           | 218.10      | 1,738.7             | -149.7     | -112.2     | -149.7                | 0.64                  | -0.33                |                       |
| 1,846.0             | 14.60           | 221.30      | 1,828.1             | -166.4     | -126.0     | -166.4                | 2.22                  | 2.07                 |                       |
| 1,938.0             | 16.00           | 222.20      | 1,916.9             | -184.5     | -142.2     | -184.5                | 1.54                  | 1.52                 |                       |
| 2,030.0             | 15.80           | 220.10      | 2,005.4             | -203.5     | -158.8     | -203.5                | 0.66                  | -0.22                |                       |
| 2,122.0             | 15.30           | 219.20      | 2,094.0             | -222.5     | -174.5     | -222.5                | 0.60                  | -0.54                |                       |
| 2,214.0             | 14.90           | 217.00      | 2,182.8             | -241.3     | -189.3     | -241.3                | 0.76                  | -0.43                |                       |
| 2,306.0             | 16.20           | 214.70      | 2,271.4             | -261.3     | -203.8     | -261.3                | 1.56                  | 1.41                 |                       |
| 2,398.0             | 15.30           | 213.20      | 2,360.0             | -282.0     | -217.7     | -282.0                | 1.07                  | -0.98                |                       |
| 2,490.0             | 15.00           | 220.10      | 2,448.8             | -301.3     | -232.0     | -301.3                | 1.99                  | -0.33                |                       |
| 2,582.0             | 15.60           | 220.00      | 2,537.5             | -319.9     | -247.6     | -319.9                | 0.65                  | 0.65                 |                       |
| 2,674.0             | 17.20           | 222.20      | 2,625.8             | -339.4     | -264.7     | -339.4                | 1.87                  | 1.74                 |                       |
| 2,766.0             | 16.60           | 220.00      | 2,713.8             | -359.6     | -282.3     | -359.6                | 0.95                  | -0.65                |                       |
| 2,858.0             | 15.60           | 219.00      | 2,802.2             | -379.3     | -298.6     | -379.3                | 1.13                  | -1.09                |                       |
| 2,950.0             | 16.30           | 218.50      | 2,890.7             | -399.0     | -314.4     | -399.0                | 0.78                  | 0.76                 |                       |
| 3,042.0             | 15.40           | 218.80      | 2,979.2             | -418.6     | -330.1     | -418.6                | 0.98                  | -0.98                |                       |
| 3,134.0             | 17.10           | 222.60      | 3,067.5             | -438.1     | -346.9     | -438.1                | 2.18                  | 1.85                 |                       |
| 3,226.0             | 16.30           | 221.60      | 3,155.6             | -457.7     | -364.6     | -457.7                | 0.92                  | -0.87                |                       |
| 3,320.0             | 15.30           | 221.20      | 3,246.1             | -476.9     | -381.5     | -476.9                | 1.07                  | -1.06                |                       |
| 3,415.0             | 15.80           | 217.80      | 3,337.6             | -496.6     | -397.7     | -496.6                | 1.09                  | 0.53                 |                       |
| 3,509.0             | 14.40           | 215.60      | 3,428.3             | -516.2     | -412.4     | -516.2                | 1.61                  | -1.49                |                       |
| 3,604.0             | 16.00           | 220.00      | 3,520.0             | -535.8     | -427.7     | -535.8                | 2.08                  | 1.68                 |                       |
| 3,698.0             | 14.00           | 218.10      | 3,610.8             | -554.7     | -443.0     | -554.7                | 2.19                  | -2.13                |                       |
| 3,793.0             | 15.60           | 217.90      | 3,702.7             | -573.8     | -457.9     | -573.8                | 1.69                  | 1.68                 |                       |
| 3,887.0             | 16.60           | 217.00      | 3,793.0             | -594.5     | -473.8     | -594.5                | 1.10                  | 1.06                 |                       |
| 3,982.0             | 16.70           | 220.10      | 3,884.0             | -615.8     | -490.7     | -615.8                | 0.94                  | 0.11                 |                       |
| 4,077.0             | 15.70           | 216.30      | 3,975.2             | -636.6     | -507.2     | -636.6                | 1.53                  | -1.05                |                       |
| 4,171.0             | 16.20           | 222.60      | 4,065.6             | -656.5     | -523.6     | -656.5                | 1.92                  | 0.53                 |                       |
| 4,266.0             | 15.30           | 220.00      | 4,157.0             | -675.8     | -540.6     | -675.8                | 1.20                  | -0.95                |                       |
| 4,360.0             | 16.40           | 223.70      | 4,247.5             | -694.9     | -557.7     | -694.9                | 1.59                  | 1.17                 |                       |
| 4,454.0             | 18.40           | 225.10      | 4,337.2             | -715.0     | -577.4     | -715.0                | 2.17                  | 2.13                 |                       |
| 4,549.0             | 16.90           | 224.00      | 4,427.7             | -735.5     | -597.6     | -735.5                | 1.62                  | -1.58                |                       |
| 4,643.0             | 17.70           | 217.10      | 4,517.4             | -756.7     | -615.7     | -756.7                | 2.34                  | 0.85                 |                       |
| 4,738.0             | 17.10           | 217.30      | 4,608.1             | -779.4     | -632.9     | -779.4                | 0.63                  | -0.63                |                       |
| 4,832.0             | 16.20           | 217.60      | 4,698.2             | -800.8     | -649.3     | -800.8                | 0.96                  | -0.96                |                       |
| 4,927.0             | 15.20           | 217.00      | 4,789.6             | -821.2     | -664.9     | -821.2                | 1.07                  | -1.05                |                       |
| 5,022.0             | 15.20           | 222.70      | 4,881.3             | -840.3     | -680.8     | -840.3                | 1.57                  | 0.00                 |                       |
| 5,116.0             | 16.10           | 222.10      | 4,971.8             | -859.0     | -697.9     | -859.0                | 0.97                  | 0.96                 |                       |
| 5,211.0             | 15.10           | 219.10      | 5,063.3             | -878.4     | -714.5     | -878.4                | 1.35                  | -1.05                |                       |
| 5,305.0             | 14.10           | 218.60      | 5,154.3             | -896.9     | -729.4     | -896.9                | 1.07                  | -1.06                |                       |
| 5,400.0             | 13.30           | 223.80      | 5,246.6             | -913.8     | -744.2     | -913.8                | 1.55                  | -0.84                |                       |
| 5,495.0             | 14.90           | 219.30      | 5,338.7             | -931.1     | -759.5     | -931.1                | 2.04                  | 1.68                 |                       |
| 5,589.0             | 16.50           | 220.40      | 5,429.2             | -950.7     | -775.8     | -950.7                | 1.73                  | 1.70                 |                       |
| 5,684.0             | 16.70           | 215.70      | 5,520.2             | -972.0     | -792.5     | -972.0                | 1.43                  | 0.21                 |                       |
| 5,778.0             | 16.40           | 209.90      | 5,610.4             | -994.5     | -807.0     | -994.5                | 1.79                  | -0.32                |                       |
| 5,873.0             | 16.90           | 213.80      | 5,701.4             | -1,017.6   | -821.4     | -1,017.6              | 1.29                  | 0.53                 |                       |
| 5,967.0             | 15.60           | 214.50      | 5,791.6             | -1,039.4   | -836.1     | -1,039.4              | 1.40                  | -1.38                |                       |
| 6,062.0             | 14.50           | 221.90      | 5,883.4             | -1,058.7   | -851.3     | -1,058.7              | 2.33                  | -1.16                |                       |

# Cathedral Energy Services

## Survey Report

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

| Survey              |                 |             |                     |            |            |                       |                       |                      |                       |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Formations / Comments |
| 6,157.0             | 15.30           | 221.40      | 5,975.2             | -1,077.0   | -867.5     | -1,077.0              | 0.85                  | 0.84                 |                       |
| 6,251.0             | 16.00           | 224.70      | 6,065.7             | -1,095.5   | -884.9     | -1,095.5              | 1.20                  | 0.74                 |                       |
| 6,346.0             | 15.90           | 219.40      | 6,157.0             | -1,114.9   | -902.3     | -1,114.9              | 1.54                  | -0.11                |                       |
| 6,440.0             | 14.80           | 217.60      | 6,247.7             | -1,134.3   | -917.8     | -1,134.3              | 1.28                  | -1.17                |                       |
| 6,535.0             | 15.00           | 220.80      | 6,339.5             | -1,153.3   | -933.3     | -1,153.3              | 0.89                  | 0.21                 |                       |
| 6,582.0             | 12.60           | 228.90      | 6,385.1             | -1,161.2   | -941.1     | -1,161.2              | 6.54                  | -5.11                |                       |
| 6,629.0             | 10.80           | 254.50      | 6,431.2             | -1,165.8   | -949.2     | -1,165.8              | 11.58                 | -3.83                |                       |
| 6,677.0             | 12.10           | 273.50      | 6,478.3             | -1,166.7   | -958.6     | -1,166.7              | 8.27                  | 2.71                 |                       |
| 6,724.0             | 13.10           | 288.00      | 6,524.1             | -1,164.7   | -968.6     | -1,164.7              | 7.04                  | 2.13                 |                       |
| 6,772.0             | 14.40           | 303.60      | 6,570.8             | -1,159.7   | -978.7     | -1,159.7              | 8.16                  | 2.71                 |                       |
| 6,819.0             | 15.90           | 320.00      | 6,616.2             | -1,151.6   | -987.7     | -1,151.6              | 9.62                  | 3.19                 |                       |
| 6,866.0             | 15.90           | 330.20      | 6,661.4             | -1,141.0   | -995.1     | -1,141.0              | 5.94                  | 0.00                 |                       |
| 6,913.0             | 16.50           | 339.10      | 6,706.5             | -1,129.2   | -1,000.6   | -1,129.2              | 5.43                  | 1.28                 |                       |
| 6,961.0             | 18.90           | 346.10      | 6,752.2             | -1,115.3   | -1,004.9   | -1,115.3              | 6.67                  | 5.00                 |                       |
| 7,008.0             | 20.90           | 348.30      | 6,796.4             | -1,099.7   | -1,008.5   | -1,099.7              | 4.54                  | 4.26                 |                       |
| 7,055.0             | 24.40           | 348.70      | 6,839.8             | -1,082.0   | -1,012.1   | -1,082.0              | 7.45                  | 7.45                 |                       |
| 7,102.0             | 28.00           | 348.70      | 6,882.0             | -1,061.6   | -1,016.1   | -1,061.6              | 7.66                  | 7.66                 |                       |
| 7,150.0             | 33.10           | 348.00      | 6,923.3             | -1,037.7   | -1,021.1   | -1,037.7              | 10.65                 | 10.62                |                       |
| 7,197.0             | 38.40           | 348.60      | 6,961.4             | -1,010.9   | -1,026.6   | -1,010.9              | 11.30                 | 11.28                |                       |
| 7,244.0             | 42.30           | 351.70      | 6,997.2             | -980.9     | -1,031.8   | -980.9                | 9.33                  | 8.30                 |                       |
| 7,291.0             | 45.60           | 354.80      | 7,031.1             | -948.5     | -1,035.6   | -948.5                | 8.38                  | 7.02                 |                       |
| 7,339.0             | 49.20           | 355.30      | 7,063.6             | -913.3     | -1,038.6   | -913.3                | 7.54                  | 7.50                 |                       |
| 7,386.0             | 52.80           | 353.60      | 7,093.1             | -877.0     | -1,042.2   | -877.0                | 8.16                  | 7.66                 |                       |
| 7,433.0             | 57.30           | 351.80      | 7,120.0             | -838.8     | -1,047.1   | -838.8                | 10.08                 | 9.57                 |                       |
| 7,480.0             | 63.50           | 350.50      | 7,143.3             | -798.4     | -1,053.4   | -798.4                | 13.41                 | 13.19                |                       |
| 7,528.0             | 67.20           | 351.40      | 7,163.3             | -755.3     | -1,060.3   | -755.3                | 7.89                  | 7.71                 |                       |
| 7,575.0             | 70.10           | 353.10      | 7,180.4             | -712.0     | -1,066.2   | -712.0                | 7.03                  | 6.17                 |                       |
| 7,622.0             | 73.20           | 354.50      | 7,195.2             | -667.6     | -1,071.0   | -667.6                | 7.18                  | 6.60                 |                       |
| 7,669.0             | 76.80           | 354.80      | 7,207.3             | -622.4     | -1,075.2   | -622.4                | 7.68                  | 7.66                 |                       |
| 7,717.0             | 81.60           | 356.40      | 7,216.3             | -575.4     | -1,078.8   | -575.4                | 10.52                 | 10.00                |                       |
| 7,764.0             | 82.70           | 358.80      | 7,222.8             | -528.9     | -1,080.8   | -528.9                | 5.57                  | 2.34                 |                       |
| 7,796.0             | 83.30           | 359.00      | 7,226.6             | -497.2     | -1,081.4   | -497.2                | 1.97                  | 1.87                 |                       |
| 7,882.0             | 89.10           | 358.40      | 7,232.3             | -411.4     | -1,083.3   | -411.4                | 6.78                  | 6.74                 |                       |
| 7,977.0             | 92.30           | 358.60      | 7,231.2             | -316.5     | -1,085.8   | -316.5                | 3.37                  | 3.37                 |                       |
| 8,072.0             | 91.20           | 359.60      | 7,228.3             | -221.5     | -1,087.3   | -221.5                | 1.56                  | -1.16                |                       |
| 8,166.0             | 91.30           | 359.70      | 7,226.2             | -127.5     | -1,087.9   | -127.5                | 0.15                  | 0.11                 |                       |
| 8,261.0             | 88.90           | 359.20      | 7,226.1             | -32.6      | -1,088.8   | -32.6                 | 2.58                  | -2.53                |                       |
| 8,355.0             | 89.10           | 358.80      | 7,227.7             | 61.4       | -1,090.4   | 61.4                  | 0.48                  | 0.21                 |                       |
| 8,450.0             | 89.00           | 358.00      | 7,229.3             | 156.4      | -1,093.1   | 156.4                 | 0.85                  | -0.11                |                       |
| 8,544.0             | 88.90           | 358.60      | 7,231.0             | 250.3      | -1,095.9   | 250.3                 | 0.65                  | -0.11                |                       |
| 8,639.0             | 88.80           | 358.30      | 7,232.9             | 345.3      | -1,098.4   | 345.3                 | 0.33                  | -0.11                |                       |
| 8,733.0             | 89.50           | 0.00        | 7,234.3             | 439.2      | -1,099.8   | 439.2                 | 1.96                  | 0.74                 |                       |
| 8,827.0             | 90.70           | 1.70        | 7,234.1             | 533.2      | -1,098.4   | 533.2                 | 2.21                  | 1.28                 |                       |
| 8,922.0             | 91.30           | 1.70        | 7,232.5             | 628.2      | -1,095.6   | 628.2                 | 0.63                  | 0.63                 |                       |
| 9,016.0             | 91.20           | 0.10        | 7,230.4             | 722.1      | -1,094.1   | 722.1                 | 1.71                  | -0.11                |                       |
| 9,110.0             | 89.70           | 0.80        | 7,229.7             | 816.1      | -1,093.4   | 816.1                 | 1.76                  | -1.60                |                       |
| 9,205.0             | 88.20           | 0.90        | 7,231.4             | 911.1      | -1,092.0   | 911.1                 | 1.58                  | -1.58                |                       |
| 9,299.0             | 87.80           | 359.80      | 7,234.7             | 1,005.0    | -1,091.4   | 1,005.0               | 1.24                  | -0.43                |                       |
| 9,394.0             | 88.50           | 359.30      | 7,237.8             | 1,100.0    | -1,092.2   | 1,100.0               | 0.91                  | 0.74                 |                       |
| 9,488.0             | 88.80           | 359.40      | 7,240.0             | 1,193.9    | -1,093.2   | 1,193.9               | 0.34                  | 0.32                 |                       |
| 9,583.0             | 88.40           | 358.70      | 7,242.3             | 1,288.9    | -1,094.8   | 1,288.9               | 0.85                  | -0.42                |                       |
| 9,677.0             | 89.60           | 0.40        | 7,244.0             | 1,382.9    | -1,095.5   | 1,382.9               | 2.21                  | 1.28                 |                       |
| 9,772.0             | 88.80           | 0.20        | 7,245.3             | 1,477.9    | -1,095.0   | 1,477.9               | 0.87                  | -0.84                |                       |

# Cathedral Energy Services

## Survey Report

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

### Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Formations / Comments        |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|------------------------------|
| 9,866.0             | 90.60           | 0.50        | 7,245.8             | 1,571.9    | -1,094.5   | 1,571.9               | 1.94                  | 1.91                 |                              |
| 9,961.0             | 90.50           | 0.40        | 7,244.9             | 1,666.8    | -1,093.7   | 1,666.8               | 0.15                  | -0.11                |                              |
| 10,055.0            | 90.90           | 0.80        | 7,243.7             | 1,760.8    | -1,092.7   | 1,760.8               | 0.60                  | 0.43                 |                              |
| 10,150.0            | 89.90           | 359.40      | 7,243.1             | 1,855.8    | -1,092.6   | 1,855.8               | 1.81                  | -1.05                |                              |
| 10,244.0            | 90.10           | 359.30      | 7,243.1             | 1,949.8    | -1,093.6   | 1,949.8               | 0.24                  | 0.21                 |                              |
| 10,339.0            | 89.40           | 0.90        | 7,243.5             | 2,044.8    | -1,093.5   | 2,044.8               | 1.84                  | -0.74                |                              |
| 10,433.0            | 89.50           | 0.30        | 7,244.4             | 2,138.8    | -1,092.5   | 2,138.8               | 0.65                  | 0.11                 |                              |
| 10,528.0            | 89.10           | 0.10        | 7,245.5             | 2,233.8    | -1,092.2   | 2,233.8               | 0.47                  | -0.42                |                              |
| 10,622.0            | 88.80           | 0.40        | 7,247.3             | 2,327.8    | -1,091.7   | 2,327.8               | 0.45                  | -0.32                |                              |
| 10,717.0            | 89.10           | 0.10        | 7,249.0             | 2,422.8    | -1,091.3   | 2,422.8               | 0.45                  | 0.32                 |                              |
| 10,811.0            | 88.90           | 0.30        | 7,250.6             | 2,516.8    | -1,091.0   | 2,516.8               | 0.30                  | -0.21                |                              |
| 10,906.0            | 90.20           | 359.40      | 7,251.4             | 2,611.7    | -1,091.2   | 2,611.7               | 1.66                  | 1.37                 |                              |
| 11,000.0            | 90.70           | 359.70      | 7,250.6             | 2,705.7    | -1,092.0   | 2,705.7               | 0.62                  | 0.53                 |                              |
| 11,095.0            | 89.70           | 359.10      | 7,250.3             | 2,800.7    | -1,093.0   | 2,800.7               | 1.23                  | -1.05                |                              |
| 11,189.0            | 89.40           | 359.00      | 7,251.1             | 2,894.7    | -1,094.5   | 2,894.7               | 0.34                  | -0.32                |                              |
| 11,284.0            | 89.70           | 359.00      | 7,251.8             | 2,989.7    | -1,096.2   | 2,989.7               | 0.32                  | 0.32                 |                              |
| 11,378.0            | 89.40           | 358.70      | 7,252.5             | 3,083.7    | -1,098.1   | 3,083.7               | 0.45                  | -0.32                |                              |
| 11,473.0            | 89.20           | 0.00        | 7,253.7             | 3,178.7    | -1,099.2   | 3,178.7               | 1.38                  | -0.21                |                              |
| 11,568.0            | 89.70           | 0.30        | 7,254.6             | 3,273.7    | -1,098.9   | 3,273.7               | 0.61                  | 0.53                 |                              |
| 11,662.0            | 89.80           | 0.10        | 7,255.0             | 3,367.7    | -1,098.6   | 3,367.7               | 0.24                  | 0.11                 |                              |
| 11,756.0            | 90.20           | 0.00        | 7,255.0             | 3,461.7    | -1,098.5   | 3,461.7               | 0.44                  | 0.43                 |                              |
| 11,847.0            | 90.60           | 0.30        | 7,254.4             | 3,552.6    | -1,098.3   | 3,552.6               | 0.55                  | 0.44                 | Last CES Survey @ 11,847' MD |
| 11,897.0            | 90.60           | 0.30        | 7,253.9             | 3,602.6    | -1,098.0   | 3,602.6               | 0.00                  | 0.00                 | PTB @ 11,897'                |

### Targets

#### Target Name

| - hit/miss target<br>- Shape  | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude  | Longitude   |
|---|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| PBHL 4B-36H<br>- actual wellpath misses target center by 43.1ft at 11897.0ft MD (7253.9 TVD, 3602.6 N, -1098.0 E)<br>- Point    | 0.00          | 0.00         | 7,220.0  | 3,629.3    | -1,096.9   | 1,280,515.61  | 3,217,199.04 | 40.100790 | -104.723580 |
| PBHL 4B-36H P4<br>- actual wellpath misses target center by 27.3ft at 11897.0ft MD (7253.9 TVD, 3602.6 N, -1098.0 E)<br>- Point | 0.00          | 0.00         | 7,259.2  | 3,629.3    | -1,096.9   | 1,280,515.61  | 3,217,199.04 | 40.100790 | -104.723580 |

### Design Annotations

|  | Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Local Coordinates |               | Comment                      |
|--|---------------------------|---------------------------|-------------------|---------------|------------------------------|
|  |                           |                           | +N/-S<br>(ft)     | +E/-W<br>(ft) |                              |
|  | 11,847.0                  | 7,254.4                   | 3,552.6           | -1,098.3      | Last CES Survey @ 11,847' MD |
|  | 11,897.0                  | 7,253.9                   | 3,602.6           | -1,098.0      | PTB @ 11,897'                |

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

# **EnCana Oil & Gas (USA) Inc**

**DJ Wattenberg**

**S36 T2N-R66W (Marcus State, Mumby State)**

**Mumby State 4B-36H**

**HZ**

**Design: FINAL**

## **Survey Report - Geographic**

**07 July, 2014**

# Cathedral Energy Services

## Survey Report - Geographic

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

|                    |                           |                      |                |
|--------------------|---------------------------|----------------------|----------------|
| <b>Project</b>     | DJ Wattenberg             |                      |                |
| <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>   | Colorado Northern Zone    |                      |                |

|                       |          |  |                 |                   |             |
|-----------------------|----------|--|-----------------|-------------------|-------------|
| Site                  |          | S36 T2N-R66W (Marcus State, Mumby State) |                 |                   |             |
| Site Position:        |          | Northing:                                | 1,275,942.66 ft | Latitude:         | 40.088280   |
| From:                 | Lat/Long | Easting:                                 | 3,215,403.58 ft | Longitude:        | -104.730140 |
| Position Uncertainty: | 0.0 ft   | Slot Radius:                             | 13.200 in       | Grid Convergence: | 0.50 °      |

|                      |                    |        |                     |                 |               |             |
|----------------------|--------------------|--------|---------------------|-----------------|---------------|-------------|
| Well                 | Mumby State 4B-36H |        |                     |                 |               |             |
| Well Position        | +N/-S              | 0.0 ft | Northing:           | 1,276,896.06 ft | Latitude:     | 40.090827   |
|                      | +E/-W              | 0.0 ft | Easting:            | 3,218,327.80 ft | Longitude:    | -104.719659 |
| Position Uncertainty |                    | 0.0 ft | Wellhead Elevation: | ft              | Ground Level: | 5,018.0 ft  |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | HZ                |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 6/24/2014          | 8.41                   | 66.70                | 52,653                     |

|                          |                              |                   |                   |                      |     |
|--------------------------|------------------------------|-------------------|-------------------|----------------------|-----|
| <b>Design</b>            | FINAL                        |                   |                   |                      |     |
| <b>Audit Notes:</b>      |                              |                   |                   |                      |     |
| <b>Version:</b>          | 1.0                          | <b>Phase:</b>     | ACTUAL            | <b>Tie On Depth:</b> | 0.0 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (ft)</b> | <b>+N/-S (ft)</b> | <b>+E/-W (ft)</b> | <b>Direction (°)</b> |     |
|                          | 0.0                          | 0.0               | 0.0               | 0.00                 |     |

|                       |                |                          |                  |                    |  |
|-----------------------|----------------|--------------------------|------------------|--------------------|--|
| <b>Survey Program</b> | <b>Date</b>    | 7/7/2014                 |                  |                    |  |
| <b>From (ft)</b>      | <b>To (ft)</b> | <b>Survey (Wellbore)</b> | <b>Tool Name</b> | <b>Description</b> |  |
| 141.0                 | 11,897.0       | Survey #1 (HZ)           | Geolink MWD      | Geolink MWD        |  |

|                            |                        |                    |                            |                   |                   |                          |                         |                 |                  |
|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|--------------------------|-------------------------|-----------------|------------------|
| <b>Survey</b>              |                        |                    |                            |                   |                   |                          |                         |                 |                  |
| <b>Measured Depth (ft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>Vertical Depth (ft)</b> | <b>+N/-S (ft)</b> | <b>+E/-W (ft)</b> | <b>Map Northing (ft)</b> | <b>Map Easting (ft)</b> | <b>Latitude</b> | <b>Longitude</b> |
| 0.0                        | 0.00                   | 0.00               | 0.0                        | 0.0               | 0.0               | 1,276,896.06             | 3,218,327.80            | 40.090827       | -104.719659      |
| 141.0                      | 0.31                   | 125.74             | 141.0                      | -0.2              | 0.3               | 1,276,895.84             | 3,218,328.11            | 40.090826       | -104.719658      |
| 233.0                      | 0.48                   | 182.61             | 233.0                      | -0.8              | 0.5               | 1,276,895.31             | 3,218,328.30            | 40.090825       | -104.719657      |
| 325.0                      | 1.19                   | 206.69             | 325.0                      | -2.0              | 0.0               | 1,276,894.07             | 3,218,327.86            | 40.090822       | -104.719659      |
| 417.0                      | 2.46                   | 220.84             | 416.9                      | -4.3              | -1.7              | 1,276,891.70             | 3,218,326.16            | 40.090815       | -104.719665      |
| 509.0                      | 2.77                   | 225.59             | 508.8                      | -7.4              | -4.6              | 1,276,888.63             | 3,218,323.31            | 40.090807       | -104.719676      |
| 601.0                      | 2.68                   | 228.31             | 600.7                      | -10.4             | -7.7              | 1,276,885.61             | 3,218,320.14            | 40.090799       | -104.719687      |
| 693.0                      | 3.74                   | 213.11             | 692.6                      | -14.3             | -11.0             | 1,276,881.64             | 3,218,316.93            | 40.090788       | -104.719699      |
| 785.0                      | 4.35                   | 215.74             | 784.4                      | -19.7             | -14.7             | 1,276,876.26             | 3,218,313.30            | 40.090773       | -104.719712      |
| 877.0                      | 5.76                   | 219.70             | 876.0                      | -26.0             | -19.7             | 1,276,869.84             | 3,218,308.37            | 40.090756       | -104.719730      |
| 969.0                      | 7.73                   | 216.18             | 967.4                      | -34.6             | -26.3             | 1,276,861.23             | 3,218,301.84            | 40.090732       | -104.719753      |
| 1,061.0                    | 8.31                   | 216.97             | 1,058.5                    | -44.9             | -33.9             | 1,276,850.86             | 3,218,294.28            | 40.090704       | -104.719780      |



# Cathedral Energy Services

## Survey Report - Geographic

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

| Survey              |                 |             |                     |            |            |                   |                  |           |             |
|---------------------|-----------------|-------------|---------------------|------------|------------|-------------------|------------------|-----------|-------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (ft) | Map Easting (ft) | Latitude  | Longitude   |
| 1,099.0             | 8.00            | 216.18      | 1,096.1             | -49.2      | -37.1      | 1,276,846.50      | 3,218,291.11     | 40.090692 | -104.719792 |
| 1,203.0             | 9.80            | 214.90      | 1,198.8             | -62.3      | -46.5      | 1,276,833.32      | 3,218,281.89     | 40.090656 | -104.719825 |
| 1,295.0             | 9.30            | 213.40      | 1,289.6             | -75.0      | -55.0      | 1,276,820.62      | 3,218,273.43     | 40.090621 | -104.719856 |
| 1,387.0             | 12.00           | 218.20      | 1,380.0             | -88.7      | -65.0      | 1,276,806.80      | 3,218,263.54     | 40.090584 | -104.719892 |
| 1,478.0             | 11.60           | 215.70      | 1,469.0             | -103.5     | -76.2      | 1,276,791.84      | 3,218,252.48     | 40.090543 | -104.719932 |
| 1,570.0             | 11.60           | 216.00      | 1,559.2             | -118.5     | -87.1      | 1,276,776.75      | 3,218,241.78     | 40.090502 | -104.719970 |
| 1,662.0             | 13.00           | 220.40      | 1,649.0             | -133.9     | -99.2      | 1,276,761.28      | 3,218,229.77     | 40.090459 | -104.720014 |
| 1,754.0             | 12.70           | 218.10      | 1,738.7             | -149.7     | -112.2     | 1,276,745.33      | 3,218,216.96     | 40.090416 | -104.720060 |
| 1,846.0             | 14.60           | 221.30      | 1,828.1             | -166.4     | -126.0     | 1,276,728.54      | 3,218,203.22     | 40.090370 | -104.720110 |
| 1,938.0             | 16.00           | 222.20      | 1,916.9             | -184.5     | -142.2     | 1,276,710.29      | 3,218,187.21     | 40.090321 | -104.720168 |
| 2,030.0             | 15.80           | 220.10      | 2,005.4             | -203.5     | -158.8     | 1,276,691.17      | 3,218,170.79     | 40.090268 | -104.720227 |
| 2,122.0             | 15.30           | 219.20      | 2,094.0             | -222.5     | -174.5     | 1,276,672.05      | 3,218,155.22     | 40.090216 | -104.720283 |
| 2,214.0             | 14.90           | 217.00      | 2,182.8             | -241.3     | -189.3     | 1,276,653.06      | 3,218,140.59     | 40.090165 | -104.720336 |
| 2,306.0             | 16.20           | 214.70      | 2,271.4             | -261.3     | -203.8     | 1,276,632.94      | 3,218,126.35     | 40.090110 | -104.720388 |
| 2,398.0             | 15.30           | 213.20      | 2,360.0             | -282.0     | -217.7     | 1,276,612.11      | 3,218,112.58     | 40.090053 | -104.720437 |
| 2,490.0             | 15.00           | 220.10      | 2,448.8             | -301.3     | -232.0     | 1,276,592.72      | 3,218,098.43     | 40.090000 | -104.720489 |
| 2,582.0             | 15.60           | 220.00      | 2,537.5             | -319.9     | -247.6     | 1,276,574.00      | 3,218,082.97     | 40.089949 | -104.720544 |
| 2,674.0             | 17.20           | 222.20      | 2,625.8             | -339.4     | -264.7     | 1,276,554.29      | 3,218,066.06     | 40.089895 | -104.720605 |
| 2,766.0             | 16.60           | 220.00      | 2,713.8             | -359.6     | -282.3     | 1,276,534.00      | 3,218,048.65     | 40.089840 | -104.720668 |
| 2,858.0             | 15.60           | 219.00      | 2,802.2             | -379.3     | -298.6     | 1,276,514.17      | 3,218,032.59     | 40.089786 | -104.720726 |
| 2,950.0             | 16.30           | 218.50      | 2,890.7             | -399.0     | -314.4     | 1,276,494.32      | 3,218,016.94     | 40.089732 | -104.720783 |
| 3,042.0             | 15.40           | 218.80      | 2,979.2             | -418.6     | -330.1     | 1,276,474.55      | 3,218,001.42     | 40.089678 | -104.720839 |
| 3,134.0             | 17.10           | 222.60      | 3,067.5             | -438.1     | -346.9     | 1,276,454.93      | 3,217,984.78     | 40.089624 | -104.720899 |
| 3,226.0             | 16.30           | 221.60      | 3,155.6             | -457.7     | -364.6     | 1,276,435.16      | 3,217,967.23     | 40.089571 | -104.720962 |
| 3,320.0             | 15.30           | 221.20      | 3,246.1             | -476.9     | -381.5     | 1,276,415.82      | 3,217,950.47     | 40.089518 | -104.721023 |
| 3,415.0             | 15.80           | 217.80      | 3,337.6             | -496.6     | -397.7     | 1,276,396.03      | 3,217,934.46     | 40.089464 | -104.721081 |
| 3,509.0             | 14.40           | 215.60      | 3,428.3             | -516.2     | -412.4     | 1,276,376.28      | 3,217,919.99     | 40.089410 | -104.721133 |
| 3,604.0             | 16.00           | 220.00      | 3,520.0             | -535.8     | -427.7     | 1,276,356.51      | 3,217,904.87     | 40.089356 | -104.721188 |
| 3,698.0             | 14.00           | 218.10      | 3,610.8             | -554.7     | -443.0     | 1,276,337.50      | 3,217,889.69     | 40.089304 | -104.721243 |
| 3,793.0             | 15.60           | 217.90      | 3,702.7             | -573.8     | -457.9     | 1,276,318.25      | 3,217,874.92     | 40.089252 | -104.721296 |
| 3,887.0             | 16.60           | 217.00      | 3,793.0             | -594.5     | -473.8     | 1,276,297.41      | 3,217,859.26     | 40.089195 | -104.721353 |
| 3,982.0             | 16.70           | 220.10      | 3,884.0             | -615.8     | -490.7     | 1,276,275.98      | 3,217,842.49     | 40.089137 | -104.721413 |
| 4,077.0             | 15.70           | 216.30      | 3,975.2             | -636.6     | -507.2     | 1,276,255.04      | 3,217,826.27     | 40.089080 | -104.721472 |
| 4,171.0             | 16.20           | 222.60      | 4,065.6             | -656.5     | -523.6     | 1,276,234.99      | 3,217,810.04     | 40.089025 | -104.721531 |
| 4,266.0             | 15.30           | 220.00      | 4,157.0             | -675.8     | -540.6     | 1,276,215.49      | 3,217,793.18     | 40.088972 | -104.721591 |
| 4,360.0             | 16.40           | 223.70      | 4,247.5             | -694.9     | -557.7     | 1,276,196.24      | 3,217,776.21     | 40.088919 | -104.721653 |
| 4,454.0             | 18.40           | 225.10      | 4,337.2             | -715.0     | -577.4     | 1,276,176.00      | 3,217,756.71     | 40.088864 | -104.721723 |
| 4,549.0             | 16.90           | 224.00      | 4,427.7             | -735.5     | -597.6     | 1,276,155.31      | 3,217,736.67     | 40.088808 | -104.721795 |
| 4,643.0             | 17.70           | 217.10      | 4,517.4             | -756.7     | -615.7     | 1,276,133.92      | 3,217,718.75     | 40.088750 | -104.721860 |
| 4,738.0             | 17.10           | 217.30      | 4,608.1             | -779.4     | -632.9     | 1,276,111.14      | 3,217,701.77     | 40.088688 | -104.721921 |
| 4,832.0             | 16.20           | 217.60      | 4,698.2             | -800.8     | -649.3     | 1,276,089.61      | 3,217,685.59     | 40.088629 | -104.721980 |
| 4,927.0             | 15.20           | 217.00      | 4,789.6             | -821.2     | -664.9     | 1,276,069.03      | 3,217,670.19     | 40.088573 | -104.722036 |
| 5,022.0             | 15.20           | 222.70      | 4,881.3             | -840.3     | -680.8     | 1,276,049.79      | 3,217,654.41     | 40.088520 | -104.722093 |
| 5,116.0             | 16.10           | 222.10      | 4,971.8             | -859.0     | -697.9     | 1,276,030.91      | 3,217,637.48     | 40.088469 | -104.722154 |
| 5,211.0             | 15.10           | 219.10      | 5,063.3             | -878.4     | -714.5     | 1,276,011.39      | 3,217,621.02     | 40.088416 | -104.722213 |
| 5,305.0             | 14.10           | 218.60      | 5,154.3             | -896.9     | -729.4     | 1,275,992.81      | 3,217,606.32     | 40.088365 | -104.722266 |
| 5,400.0             | 13.30           | 223.80      | 5,246.6             | -913.8     | -744.2     | 1,275,975.75      | 3,217,591.68     | 40.088319 | -104.722319 |
| 5,495.0             | 14.90           | 219.30      | 5,338.7             | -931.1     | -759.5     | 1,275,958.28      | 3,217,576.53     | 40.088271 | -104.722374 |
| 5,589.0             | 16.50           | 220.40      | 5,429.2             | -950.7     | -775.8     | 1,275,938.61      | 3,217,560.40     | 40.088217 | -104.722432 |
| 5,684.0             | 16.70           | 215.70      | 5,520.2             | -972.0     | -792.5     | 1,275,917.11      | 3,217,543.88     | 40.088159 | -104.722492 |
| 5,778.0             | 16.40           | 209.90      | 5,610.4             | -994.5     | -807.0     | 1,275,894.51      | 3,217,529.58     | 40.088097 | -104.722544 |
| 5,873.0             | 16.90           | 213.80      | 5,701.4             | -1,017.6   | -821.4     | 1,275,871.28      | 3,217,515.42     | 40.088034 | -104.722595 |
| 5,967.0             | 15.60           | 214.50      | 5,791.6             | -1,039.4   | -836.1     | 1,275,849.38      | 3,217,500.85     | 40.087974 | -104.722648 |
| 6,062.0             | 14.50           | 221.90      | 5,883.4             | -1,058.7   | -851.3     | 1,275,829.87      | 3,217,485.84     | 40.087921 | -104.722702 |
| 6,157.0             | 15.30           | 221.40      | 5,975.2             | -1,077.0   | -867.5     | 1,275,811.47      | 3,217,469.77     | 40.087870 | -104.722760 |

# Cathedral Energy Services

## Survey Report - Geographic

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

| Survey              |                 |             |                     |            |            |                   |                  |           |             |
|---------------------|-----------------|-------------|---------------------|------------|------------|-------------------|------------------|-----------|-------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (ft) | Map Easting (ft) | Latitude  | Longitude   |
| 6,251.0             | 16.00           | 224.70      | 6,065.7             | -1,095.5   | -884.9     | 1,275,792.81      | 3,217,452.62     | 40.087820 | -104.722822 |
| 6,346.0             | 15.90           | 219.40      | 6,157.0             | -1,114.9   | -902.3     | 1,275,773.29      | 3,217,435.32     | 40.087767 | -104.722884 |
| 6,440.0             | 14.80           | 217.60      | 6,247.7             | -1,134.3   | -917.8     | 1,275,753.69      | 3,217,419.99     | 40.087713 | -104.722940 |
| 6,535.0             | 15.00           | 220.80      | 6,339.5             | -1,153.3   | -933.3     | 1,275,734.64      | 3,217,404.72     | 40.087661 | -104.722995 |
| 6,582.0             | 12.60           | 228.90      | 6,385.1             | -1,161.2   | -941.1     | 1,275,726.59      | 3,217,396.95     | 40.087639 | -104.723023 |
| 6,629.0             | 10.80           | 254.50      | 6,431.2             | -1,165.8   | -949.2     | 1,275,721.97      | 3,217,388.88     | 40.087627 | -104.723052 |
| 6,677.0             | 12.10           | 273.50      | 6,478.3             | -1,166.7   | -958.6     | 1,275,720.99      | 3,217,379.53     | 40.087624 | -104.723085 |
| 6,724.0             | 13.10           | 288.00      | 6,524.1             | -1,164.7   | -968.6     | 1,275,722.85      | 3,217,369.53     | 40.087630 | -104.723121 |
| 6,772.0             | 14.40           | 303.60      | 6,570.8             | -1,159.7   | -978.7     | 1,275,727.75      | 3,217,359.34     | 40.087643 | -104.723157 |
| 6,819.0             | 15.90           | 320.00      | 6,616.2             | -1,151.6   | -987.7     | 1,275,735.84      | 3,217,350.25     | 40.087666 | -104.723189 |
| 6,866.0             | 15.90           | 330.20      | 6,661.4             | -1,141.0   | -995.1     | 1,275,746.30      | 3,217,342.82     | 40.087695 | -104.723216 |
| 6,913.0             | 16.50           | 339.10      | 6,706.5             | -1,129.2   | -1,000.6   | 1,275,758.07      | 3,217,337.14     | 40.087727 | -104.723236 |
| 6,961.0             | 18.90           | 346.10      | 6,752.2             | -1,115.3   | -1,004.9   | 1,275,771.95      | 3,217,332.71     | 40.087765 | -104.723251 |
| 7,008.0             | 20.90           | 348.30      | 6,796.4             | -1,099.7   | -1,008.5   | 1,275,787.52      | 3,217,329.05     | 40.087808 | -104.723264 |
| 7,055.0             | 24.40           | 348.70      | 6,839.8             | -1,082.0   | -1,012.1   | 1,275,805.22      | 3,217,325.29     | 40.087857 | -104.723276 |
| 7,102.0             | 28.00           | 348.70      | 6,882.0             | -1,061.6   | -1,016.1   | 1,275,825.53      | 3,217,321.04     | 40.087913 | -104.723291 |
| 7,150.0             | 33.10           | 348.00      | 6,923.3             | -1,037.7   | -1,021.1   | 1,275,849.37      | 3,217,315.90     | 40.087978 | -104.723309 |
| 7,197.0             | 38.40           | 348.60      | 6,961.4             | -1,010.9   | -1,026.6   | 1,275,876.20      | 3,217,310.10     | 40.088052 | -104.723329 |
| 7,244.0             | 42.30           | 351.70      | 6,997.2             | -980.9     | -1,031.8   | 1,275,906.13      | 3,217,304.67     | 40.088134 | -104.723347 |
| 7,291.0             | 45.60           | 354.80      | 7,031.1             | -948.5     | -1,035.6   | 1,275,938.48      | 3,217,300.58     | 40.088223 | -104.723361 |
| 7,339.0             | 49.20           | 355.30      | 7,063.6             | -913.3     | -1,038.6   | 1,275,973.64      | 3,217,297.23     | 40.088320 | -104.723371 |
| 7,386.0             | 52.80           | 353.60      | 7,093.1             | -877.0     | -1,042.2   | 1,276,009.96      | 3,217,293.36     | 40.088420 | -104.723384 |
| 7,433.0             | 57.30           | 351.80      | 7,120.0             | -838.8     | -1,047.1   | 1,276,048.11      | 3,217,288.11     | 40.088524 | -104.723402 |
| 7,480.0             | 63.50           | 350.50      | 7,143.3             | -798.4     | -1,053.4   | 1,276,088.41      | 3,217,281.46     | 40.088635 | -104.723424 |
| 7,528.0             | 67.20           | 351.40      | 7,163.3             | -755.3     | -1,060.3   | 1,276,131.42      | 3,217,274.23     | 40.088753 | -104.723449 |
| 7,575.0             | 70.10           | 353.10      | 7,180.4             | -712.0     | -1,066.2   | 1,276,174.74      | 3,217,267.95     | 40.088873 | -104.723470 |
| 7,622.0             | 73.20           | 354.50      | 7,195.2             | -667.6     | -1,071.0   | 1,276,219.04      | 3,217,262.75     | 40.088994 | -104.723487 |
| 7,669.0             | 76.80           | 354.80      | 7,207.3             | -622.4     | -1,075.2   | 1,276,264.19      | 3,217,258.12     | 40.089118 | -104.723502 |
| 7,717.0             | 81.60           | 356.40      | 7,216.3             | -575.4     | -1,078.8   | 1,276,311.15      | 3,217,254.09     | 40.089247 | -104.723515 |
| 7,764.0             | 82.70           | 358.80      | 7,222.7             | -528.9     | -1,080.8   | 1,276,357.65      | 3,217,251.74     | 40.089375 | -104.723522 |
| 7,796.0             | 83.30           | 359.00      | 7,226.6             | -497.2     | -1,081.4   | 1,276,389.40      | 3,217,250.85     | 40.089462 | -104.723524 |
| 7,882.0             | 89.10           | 358.40      | 7,232.3             | -411.4     | -1,083.3   | 1,276,475.13      | 3,217,248.15     | 40.089698 | -104.723531 |
| 7,977.0             | 92.30           | 358.60      | 7,231.2             | -316.5     | -1,085.8   | 1,276,570.05      | 3,217,244.82     | 40.089958 | -104.723540 |
| 8,072.0             | 91.20           | 359.60      | 7,228.3             | -221.5     | -1,087.3   | 1,276,664.98      | 3,217,242.50     | 40.090219 | -104.723545 |
| 8,166.0             | 91.30           | 359.70      | 7,226.2             | -127.5     | -1,087.9   | 1,276,758.94      | 3,217,241.10     | 40.090477 | -104.723548 |
| 8,261.0             | 88.90           | 359.20      | 7,226.1             | -32.6      | -1,088.8   | 1,276,853.92      | 3,217,239.35     | 40.090738 | -104.723551 |
| 8,355.0             | 89.10           | 358.80      | 7,227.7             | 61.4       | -1,090.4   | 1,276,947.87      | 3,217,236.88     | 40.090996 | -104.723557 |
| 8,450.0             | 89.00           | 358.00      | 7,229.3             | 156.4      | -1,093.1   | 1,277,042.80      | 3,217,233.39     | 40.091256 | -104.723566 |
| 8,544.0             | 88.90           | 358.60      | 7,231.0             | 250.3      | -1,095.9   | 1,277,136.71      | 3,217,229.78     | 40.091514 | -104.723576 |
| 8,639.0             | 88.80           | 358.30      | 7,232.9             | 345.3      | -1,098.4   | 1,277,231.63      | 3,217,226.37     | 40.091775 | -104.723585 |
| 8,733.0             | 89.50           | 0.00        | 7,234.3             | 439.2      | -1,099.8   | 1,277,325.59      | 3,217,224.15     | 40.092033 | -104.723590 |
| 8,827.0             | 90.70           | 1.70        | 7,234.1             | 533.2      | -1,098.4   | 1,277,419.58      | 3,217,224.72     | 40.092291 | -104.723585 |
| 8,922.0             | 91.30           | 1.70        | 7,232.5             | 628.2      | -1,095.6   | 1,277,514.55      | 3,217,226.70     | 40.092551 | -104.723575 |
| 9,016.0             | 91.20           | 0.10        | 7,230.4             | 722.1      | -1,094.1   | 1,277,608.52      | 3,217,227.35     | 40.092809 | -104.723570 |
| 9,110.0             | 89.70           | 0.80        | 7,229.7             | 816.1      | -1,093.4   | 1,277,702.51      | 3,217,227.26     | 40.093067 | -104.723567 |
| 9,205.0             | 88.20           | 0.90        | 7,231.4             | 911.1      | -1,092.0   | 1,277,797.49      | 3,217,227.84     | 40.093328 | -104.723562 |
| 9,299.0             | 87.80           | 359.80      | 7,234.7             | 1,005.0    | -1,091.4   | 1,277,891.43      | 3,217,227.58     | 40.093586 | -104.723560 |
| 9,394.0             | 88.50           | 359.30      | 7,237.8             | 1,100.0    | -1,092.2   | 1,277,986.37      | 3,217,226.00     | 40.093847 | -104.723563 |
| 9,488.0             | 88.80           | 359.40      | 7,240.0             | 1,193.9    | -1,093.2   | 1,278,080.33      | 3,217,224.11     | 40.094105 | -104.723567 |
| 9,583.0             | 88.40           | 358.70      | 7,242.3             | 1,288.9    | -1,094.8   | 1,278,175.27      | 3,217,221.70     | 40.094365 | -104.723573 |
| 9,677.0             | 89.60           | 0.40        | 7,244.0             | 1,382.9    | -1,095.5   | 1,278,269.23      | 3,217,220.13     | 40.094623 | -104.723575 |
| 9,772.0             | 88.80           | 0.20        | 7,245.3             | 1,477.9    | -1,095.0   | 1,278,364.22      | 3,217,219.80     | 40.094884 | -104.723573 |
| 9,866.0             | 90.60           | 0.50        | 7,245.8             | 1,571.9    | -1,094.5   | 1,278,458.22      | 3,217,219.54     | 40.095142 | -104.723571 |
| 9,961.0             | 90.50           | 0.40        | 7,244.9             | 1,666.8    | -1,093.7   | 1,278,553.21      | 3,217,219.45     | 40.095403 | -104.723569 |
| 10,055.0            | 90.90           | 0.80        | 7,243.7             | 1,760.8    | -1,092.7   | 1,278,647.21      | 3,217,219.61     | 40.095661 | -104.723565 |

# Cathedral Energy Services

## Survey Report - Geographic

|                  |  |                                     |                             |
|------------------|--|-------------------------------------|-----------------------------|
| <b>Company:</b>  | EnCana Oil & Gas (USA) Inc               | <b>Local Co-ordinate Reference:</b> | Well Mumby State 4B-36H     |
| <b>Project:</b>  | DJ Wattenberg                            | <b>TVD Reference:</b>               | WELL @ 5048.0ft (H&P 522)   |
| <b>Site:</b>     | S36 T2N-R66W (Marcus State, Mumby State) | <b>MD Reference:</b>                | WELL @ 5048.0ft (H&P 522)   |
| <b>Well:</b>     | Mumby State 4B-36H                       | <b>North Reference:</b>             | True                        |
| <b>Wellbore:</b> | HZ                                       | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Design:</b>   | FINAL                                    | <b>Database:</b>                    | USA EDM 5000 Multi Users DB |

| Survey                              |                 |             |                     |            |            |                   |                  |           |             |
|-------------------------------------|-----------------|-------------|---------------------|------------|------------|-------------------|------------------|-----------|-------------|
| Measured Depth (ft)                 | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (ft) | Map Easting (ft) | Latitude  | Longitude   |
| 10,150.0                            | 89.90           | 359.40      | 7,243.1             | 1,855.8    | -1,092.6   | 1,278,742.20      | 3,217,218.94     | 40.095922 | -104.723565 |
| 10,244.0                            | 90.10           | 359.30      | 7,243.1             | 1,949.8    | -1,093.6   | 1,278,836.18      | 3,217,217.05     | 40.096180 | -104.723568 |
| 10,339.0                            | 89.40           | 0.90        | 7,243.5             | 2,044.8    | -1,093.5   | 1,278,931.17      | 3,217,216.38     | 40.096440 | -104.723568 |
| 10,433.0                            | 89.50           | 0.30        | 7,244.4             | 2,138.8    | -1,092.5   | 1,279,025.17      | 3,217,216.53     | 40.096698 | -104.723564 |
| 10,528.0                            | 89.10           | 0.10        | 7,245.5             | 2,233.8    | -1,092.2   | 1,279,120.16      | 3,217,216.03     | 40.096959 | -104.723563 |
| 10,622.0                            | 88.80           | 0.40        | 7,247.3             | 2,327.8    | -1,091.7   | 1,279,214.14      | 3,217,215.61     | 40.097217 | -104.723562 |
| 10,717.0                            | 89.10           | 0.10        | 7,249.0             | 2,422.8    | -1,091.3   | 1,279,309.13      | 3,217,215.19     | 40.097478 | -104.723560 |
| 10,811.0                            | 88.90           | 0.30        | 7,250.6             | 2,516.8    | -1,091.0   | 1,279,403.11      | 3,217,214.69     | 40.097736 | -104.723559 |
| 10,906.0                            | 90.20           | 359.40      | 7,251.4             | 2,611.7    | -1,091.2   | 1,279,498.10      | 3,217,213.61     | 40.097997 | -104.723560 |
| 11,000.0                            | 90.70           | 359.70      | 7,250.6             | 2,705.7    | -1,092.0   | 1,279,592.08      | 3,217,212.04     | 40.098255 | -104.723563 |
| 11,095.0                            | 89.70           | 359.10      | 7,250.3             | 2,800.7    | -1,093.0   | 1,279,687.06      | 3,217,210.21     | 40.098515 | -104.723566 |
| 11,189.0                            | 89.40           | 359.00      | 7,251.1             | 2,894.7    | -1,094.5   | 1,279,781.03      | 3,217,207.83     | 40.098773 | -104.723572 |
| 11,284.0                            | 89.70           | 359.00      | 7,251.8             | 2,989.7    | -1,096.2   | 1,279,875.99      | 3,217,205.33     | 40.099034 | -104.723578 |
| 11,378.0                            | 89.40           | 358.70      | 7,252.5             | 3,083.7    | -1,098.1   | 1,279,969.95      | 3,217,202.62     | 40.099292 | -104.723585 |
| 11,473.0                            | 89.20           | 0.00        | 7,253.7             | 3,178.7    | -1,099.2   | 1,280,064.92      | 3,217,200.71     | 40.099553 | -104.723588 |
| 11,568.0                            | 89.70           | 0.30        | 7,254.6             | 3,273.7    | -1,098.9   | 1,280,159.92      | 3,217,200.12     | 40.099814 | -104.723588 |
| 11,662.0                            | 89.80           | 0.10        | 7,255.0             | 3,367.7    | -1,098.6   | 1,280,253.92      | 3,217,199.62     | 40.100072 | -104.723586 |
| 11,756.0                            | 90.20           | 0.00        | 7,255.0             | 3,461.7    | -1,098.5   | 1,280,347.91      | 3,217,198.87     | 40.100330 | -104.723586 |
| 11,847.0                            | 90.60           | 0.30        | 7,254.4             | 3,552.6    | -1,098.3   | 1,280,438.88      | 3,217,198.31     | 40.100579 | -104.723585 |
| <b>Last CES Survey @ 11,847' MD</b> |                 |             |                     |            |            |                   |                  |           |             |
| 11,897.0                            | 90.60           | 0.30        | 7,253.9             | 3,602.6    | -1,098.0   | 1,280,488.88      | 3,217,198.13     | 40.100717 | -104.723584 |
| <b>PTB @ 11,897'</b>                |                 |             |                     |            |            |                   |                  |           |             |

| Design Targets   |               |              |          |            |            |               |              |           |             |
|--|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| Target Name  | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude  | Longitude   |
| - hit/miss target  |               |              |          |            |            |               |              |           |             |
| - Shape  |               |              |          |            |            |               |              |           |             |
| PBHL 4B-36H P4   | 0.00          | 0.00         | 7,259.2  | 3,629.3    | -1,096.9   | 1,280,515.61  | 3,217,199.04 | 40.100790 | -104.723580 |
| - actual wellpath misses target center by 27.3ft at 11897.0ft MD (7253.9 TVD, 3602.6 N, -1098.0 E) |               |              |          |            |            |               |              |           |             |
| - Point  |               |              |          |            |            |               |              |           |             |

| Design Annotations  |                     |                   |            |                              |  |
|---------------------|---------------------|-------------------|------------|------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates |            | Comment                      |  |
|                     |                     | +N/-S (ft)        | +E/-W (ft) |                              |  |
| 11,847.0            | 7,254.4             | 3,552.6           | -1,098.3   | Last CES Survey @ 11,847' MD |  |
| 11,897.0            | 7,253.9             | 3,602.6           | -1,098.0   | PTB @ 11,897'                |  |

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