

# PDC Energy Inc. DJ Basin

Well Name: **Popham 11N**

Surface Location: Popham 4N64W03 Pad Sec.3-T4N-R64W  
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

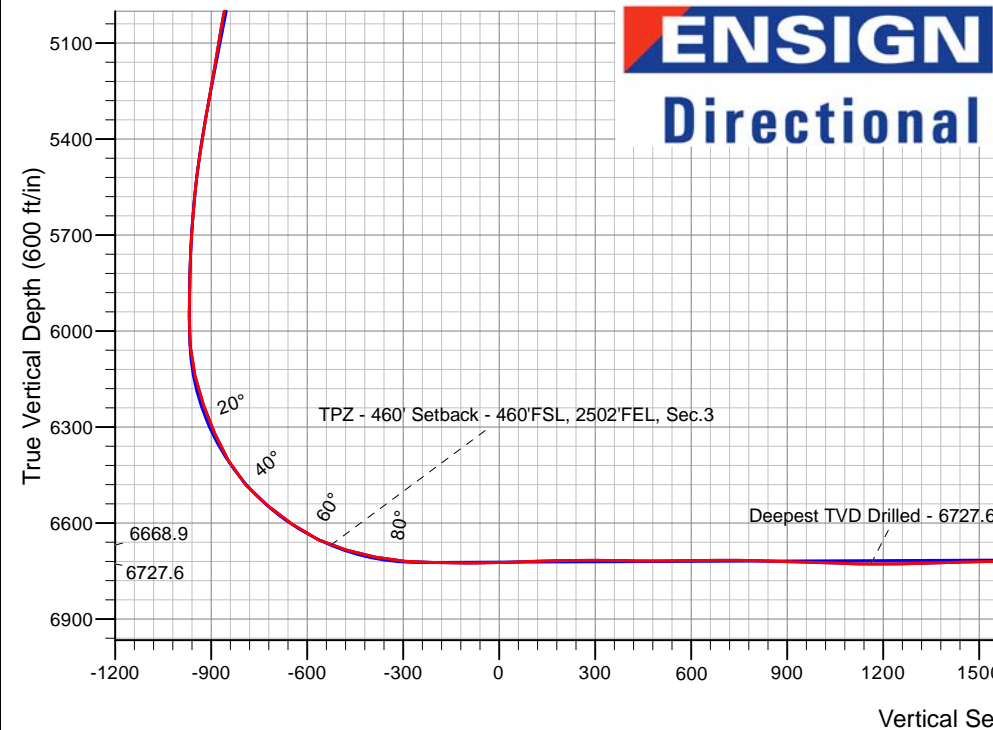
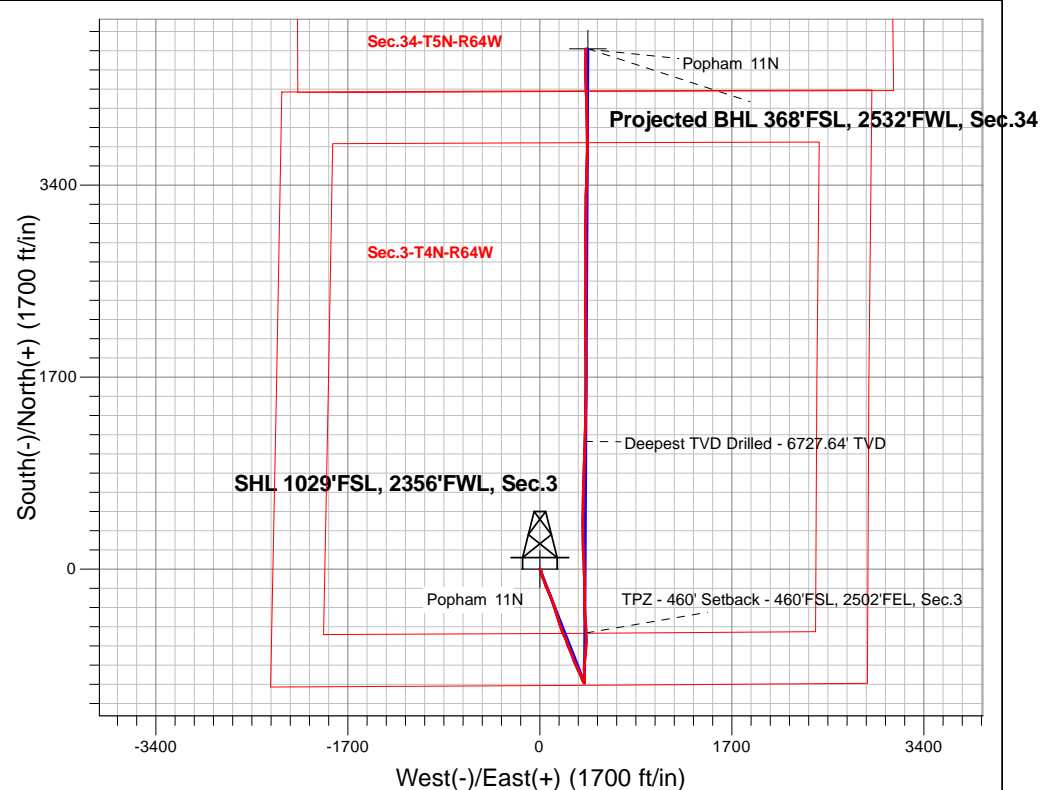
Ground Elevation: 4662.0

| +N/-S | +E/-W | Northing          | Easting | Latitude  | Longitude   | Slot |
|-------|-------|-------------------|---------|-----------|-------------|------|
| 0.0   | 0.0   | 1367047.763268307 | 47      | 40.336950 | -104.537510 |      |

WELL @ 4685.0ft

## FINAL SURVEY

**Projected Bottom Hole Location**  
**12,139'MD 6694'TVD 4605'N & 408'E of SHL**  
**91.70 degree Incl @ 1.10 degree AZM**



**ENSIGN**  
**Directional**

Popham 4N64W03 Pad Sec.3-T4N-R64W  
Popham 11N  
Popham 11N Wellbore #1  
8:54, February 19 2019

### ANNOTATIONS

| TVD    | MD     | Annotation                                    |
|--------|--------|---|
| 6668.9 | 6959.6 | TPZ - 460' Setback - 460'FSL, 2502'FEL, Sec.3 |
| 6727.6 | 8663.0 | Deepest TVD Drilled - 6727.64' TVD            |

### LEGEND

- ◇ Popham 11N, Popham 11N Wellbore #1, Plan #3 (2-12-19) V0
- Popham 11N Wellbore #1
- Survey #1

**Projected BHL 368'FSL, 2532'FWL, Sec.34**

Popham 11N



## **PDC Energy Inc. DJ Basin**

**SEC.3-T4N-R64W**

**Popham 4N64W03 Pad Sec.3-T4N-R64W**

**Popham 11N**

**Popham 11N Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**19 February, 2019**

|                  |                                   |                                     |                   |
|------------------|-----------------------------------|-------------------------------------|-------------------|
| <b>Company:</b>  | PDC Energy Inc. DJ Basin          | <b>Local Co-ordinate Reference:</b> | Well Popham 11N   |
| <b>Project:</b>  | SEC.3-T4N-R64W                    | <b>TVD Reference:</b>               | WELL @ 4685.0ft   |
| <b>Site:</b>     | Popham 4N64W03 Pad Sec.3-T4N-R64W | <b>MD Reference:</b>                | WELL @ 4685.0ft   |
| <b>Well:</b>     | Popham 11N                        | <b>North Reference:</b>             | True              |
| <b>Wellbore:</b> | Popham 11N Wellbore #1            | <b>Survey Calculation Method:</b>   | Minimum Curvature |
| <b>Design:</b>   | Popham 11N Wellbore #1            | <b>Database:</b>                    | US_EDM            |

|                    |                                 |                      |                             |
|--------------------|---------------------------------|----------------------|-----------------------------|
| <b>Project</b>     | SEC.3-T4N-R64W, Weld County, CO |                      |                             |
| <b>Map System:</b> | US State Plane 1983             | <b>System Datum:</b> | Mean Sea Level              |
| <b>Geo Datum:</b>  | North American Datum 1983       |                      | Using Well Reference Point  |
| <b>Map Zone:</b>   | Colorado Northern Zone          |                      | Using geodetic scale factor |

|                       |                                   |              |                   |                   |             |
|-----------------------|-----------------------------------|--------------|-------------------|-------------------|-------------|
| Site                  | Popham 4N64W03 Pad Sec.3-T4N-R64W |              |                   |                   |             |
| Site Position:        |                                   | Northing:    | 1,367,183.37 usft | Latitude:         | 40.337327   |
| From:                 | Lat/Long                          | Easting:     | 3,268,156.99 usft | Longitude:        | -104.538045 |
| Position Uncertainty: | 0.0 ft                            | Slot Radius: | 13-3/16 "         | Grid Convergence: | 0.62 °      |

| Well                 | Popham 11N |        |                     |                   |               |             |
|----------------------|------------|--------|---------------------|-------------------|---------------|-------------|
| Well Position        | +N/-S      | 0.0 ft | Northing:           | 1,367,047.76 usft | Latitude:     | 40.336950   |
|                      | +E/-W      | 0.0 ft | Easting:            | 3,268,307.47 usft | Longitude:    | -104.537510 |
| Position Uncertainty |            | 0.0 ft | Wellhead Elevation: | 0.0 ft            | Ground Level: | 4,662.0 ft  |

|                  |                        |                    |                        |                      |                            |
|------------------|------------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Popham 11N Wellbore #1 |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b>      | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | HDGM                   | 2/11/2019          | 8.15                   | 66.87                | 52,182                     |

|                          |                              |                   |                   |                      |     |
|--------------------------|------------------------------|-------------------|-------------------|----------------------|-----|
| <b>Design</b>            | Popham 11N Wellbore #1       |                   |                   |                      |     |
| <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               | 5.28                 |     |

|                       |                |                                    |                  |                    |  |
|-----------------------|----------------|------------------------------------|------------------|--------------------|--|
| <b>Survey Program</b> | <b>Date</b>    | 2/19/2019                          |                  |                    |  |
| <b>From (ft)</b>      | <b>To (ft)</b> | <b>Survey (Wellbore)</b>           | <b>Tool Name</b> | <b>Description</b> |  |
| 157.0                 | 12,139.0       | Survey #1 (Popham 11N Wellbore #1) | MWD              | MWD - Standard     |  |

|                                      |                        |                    |                            |                   |                   |                              |                                |                               |                              |  |
|--------------------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|------------------------------|--------------------------------|-------------------------------|------------------------------|--|
| <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 (°/100usft)</b> | <b>Build Rate (°/100usft)</b> | <b>Turn Rate (°/100usft)</b> |  |
| 0.0                                  | 0.00                   | 0.00               | 0.0                        | 0.0               | 0.0               | 0.0                          | 0.00                           | 0.00                          | 0.00                         |  |
| 1.0                                  | 0.00                   | 94.18              | 1.0                        | 0.0               | 0.0               | 0.0                          | 0.24                           | 0.24                          | 0.00                         |  |
| <b>SHL 1029'FSL, 2356'FWL, Sec.3</b> |                        |                    |                            |                   |                   |                              |                                |                               |                              |  |
| 157.0                                | 0.37                   | 94.18              | 157.0                      | 0.0               | 0.5               | 0.0                          | 0.24                           | 0.24                          | 0.00                         |  |
| 252.0                                | 1.08                   | 137.32             | 252.0                      | -0.7              | 1.4               | -0.6                         | 0.89                           | 0.75                          | 45.41                        |  |
| 347.0                                | 2.46                   | 155.40             | 346.9                      | -3.2              | 2.9               | -3.0                         | 1.55                           | 1.45                          | 19.03                        |  |
| 443.0                                | 3.53                   | 158.72             | 442.8                      | -7.9              | 4.8               | -7.4                         | 1.13                           | 1.11                          | 3.46                         |  |
| 538.0                                | 5.51                   | 153.07             | 537.5                      | -14.6             | 7.9               | -13.9                        | 2.13                           | 2.08                          | -5.95                        |  |
| 633.0                                | 7.05                   | 158.84             | 631.9                      | -24.2             | 12.1              | -22.9                        | 1.75                           | 1.62                          | 6.07                         |  |
| 728.0                                | 9.59                   | 166.20             | 725.9                      | -37.3             | 16.1              | -35.6                        | 2.89                           | 2.67                          | 7.75                         |  |
| 823.0                                | 9.67                   | 163.91             | 819.6                      | -52.6             | 20.2              | -50.5                        | 0.41                           | 0.08                          | -2.41                        |  |

|                  |                                   |                                     |                   |
|------------------|-----------------------------------|-------------------------------------|-------------------|
| <b>Company:</b>  | PDC Energy Inc. DJ Basin          | <b>Local Co-ordinate Reference:</b> | Well Popham 11N   |
| <b>Project:</b>  | SEC.3-T4N-R64W                    | <b>TVD Reference:</b>               | WELL @ 4685.0ft   |
| <b>Site:</b>     | Popham 4N64W03 Pad Sec.3-T4N-R64W | <b>MD Reference:</b>                | WELL @ 4685.0ft   |
| <b>Well:</b>     | Popham 11N                        | <b>North Reference:</b>             | True              |
| <b>Wellbore:</b> | Popham 11N Wellbore #1            | <b>Survey Calculation Method:</b>   | Minimum Curvature |
| <b>Design:</b>   | Popham 11N Wellbore #1            | <b>Database:</b>                    | US_EDM            |

| Survey              |                 |             |                     |            |            |                       |                         |                        |                       |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 918.0               | 10.33           | 161.90      | 913.2               | -68.4      | 25.1       | -65.8                 | 0.79                    | 0.69                   | -2.12                 |
| 1,014.0             | 11.46           | 160.77      | 1,007.4             | -85.6      | 30.9       | -82.4                 | 1.20                    | 1.18                   | -1.18                 |
| 1,109.0             | 11.82           | 157.80      | 1,100.5             | -103.5     | 37.7       | -99.6                 | 0.74                    | 0.38                   | -3.13                 |
| 1,204.0             | 12.82           | 160.88      | 1,193.3             | -122.5     | 44.8       | -117.8                | 1.26                    | 1.05                   | 3.24                  |
| 1,299.0             | 13.52           | 159.43      | 1,285.8             | -142.8     | 52.1       | -137.4                | 0.81                    | 0.74                   | -1.53                 |
| 1,395.0             | 12.78           | 158.26      | 1,379.3             | -163.2     | 60.0       | -157.0                | 0.82                    | -0.77                  | -1.22                 |
| 1,490.0             | 12.08           | 156.64      | 1,472.0             | -182.1     | 67.8       | -175.1                | 0.82                    | -0.74                  | -1.71                 |
| 1,634.0             | 11.04           | 156.27      | 1,613.1             | -208.5     | 79.4       | -200.3                | 0.72                    | -0.72                  | -0.26                 |
| 1,772.0             | 9.48            | 155.55      | 1,748.9             | -231.0     | 89.4       | -221.8                | 1.13                    | -1.13                  | -0.52                 |
| 1,868.0             | 9.61            | 160.66      | 1,843.6             | -245.7     | 95.3       | -235.9                | 0.89                    | 0.14                   | 5.32                  |
| 1,963.0             | 11.29           | 159.54      | 1,937.0             | -261.9     | 101.2      | -251.5                | 1.78                    | 1.77                   | -1.18                 |
| 2,058.0             | 13.22           | 160.81      | 2,029.8             | -280.9     | 108.0      | -269.8                | 2.05                    | 2.03                   | 1.34                  |
| 2,153.0             | 12.99           | 160.29      | 2,122.4             | -301.2     | 115.2      | -289.3                | 0.27                    | -0.24                  | -0.55                 |
| 2,248.0             | 11.51           | 158.05      | 2,215.2             | -320.1     | 122.3      | -307.4                | 1.64                    | -1.56                  | -2.36                 |
| 2,343.0             | 12.46           | 158.18      | 2,308.1             | -338.4     | 129.7      | -325.0                | 1.00                    | 1.00                   | 0.14                  |
| 2,438.0             | 13.84           | 163.52      | 2,400.6             | -358.8     | 136.7      | -344.7                | 1.93                    | 1.45                   | 5.62                  |
| 2,533.0             | 13.23           | 163.41      | 2,493.0             | -380.1     | 143.0      | -365.3                | 0.64                    | -0.64                  | -0.12                 |
| 2,628.0             | 13.02           | 163.66      | 2,585.5             | -400.8     | 149.2      | -385.4                | 0.23                    | -0.22                  | 0.26                  |
| 2,724.0             | 12.91           | 163.26      | 2,679.1             | -421.4     | 155.3      | -405.3                | 0.15                    | -0.11                  | -0.42                 |
| 2,819.0             | 13.02           | 162.74      | 2,771.6             | -441.8     | 161.5      | -425.1                | 0.17                    | 0.12                   | -0.55                 |
| 2,914.0             | 12.41           | 162.00      | 2,864.3             | -461.7     | 167.8      | -444.3                | 0.66                    | -0.64                  | -0.78                 |
| 3,010.0             | 12.20           | 161.21      | 2,958.1             | -481.1     | 174.3      | -463.1                | 0.28                    | -0.22                  | -0.82                 |
| 3,105.0             | 11.62           | 161.10      | 3,051.1             | -499.7     | 180.6      | -481.0                | 0.61                    | -0.61                  | -0.12                 |
| 3,200.0             | 12.87           | 161.53      | 3,143.9             | -518.8     | 187.1      | -499.4                | 1.32                    | 1.32                   | 0.45                  |
| 3,295.0             | 11.80           | 161.01      | 3,236.7             | -538.0     | 193.6      | -517.9                | 1.13                    | -1.13                  | -0.55                 |
| 3,390.0             | 13.54           | 155.65      | 3,329.4             | -557.3     | 201.3      | -536.4                | 2.21                    | 1.83                   | -5.64                 |
| 3,486.0             | 12.24           | 155.87      | 3,423.0             | -576.9     | 210.1      | -555.1                | 1.36                    | -1.35                  | 0.23                  |
| 3,581.0             | 11.31           | 156.41      | 3,516.0             | -594.6     | 218.0      | -572.0                | 0.99                    | -0.98                  | 0.57                  |
| 3,677.0             | 11.40           | 155.97      | 3,610.1             | -611.9     | 225.6      | -588.5                | 0.13                    | 0.09                   | -0.46                 |
| 3,773.0             | 12.81           | 160.79      | 3,703.9             | -630.6     | 233.0      | -606.5                | 1.81                    | 1.47                   | 5.02                  |
| 3,868.0             | 12.59           | 160.08      | 3,796.6             | -650.3     | 240.0      | -625.4                | 0.28                    | -0.23                  | -0.75                 |
| 3,964.0             | 12.40           | 159.06      | 3,890.4             | -669.7     | 247.2      | -644.1                | 0.30                    | -0.20                  | -1.06                 |
| 4,060.0             | 11.65           | 158.83      | 3,984.2             | -688.4     | 254.4      | -662.1                | 0.78                    | -0.78                  | -0.24                 |
| 4,156.0             | 12.75           | 158.02      | 4,078.1             | -707.3     | 261.9      | -680.2                | 1.16                    | 1.15                   | -0.84                 |
| 4,251.0             | 12.37           | 158.12      | 4,170.8             | -726.4     | 269.6      | -698.5                | 0.40                    | -0.40                  | 0.11                  |
| 4,346.0             | 11.93           | 154.06      | 4,263.7             | -744.7     | 277.7      | -716.0                | 1.01                    | -0.46                  | -4.27                 |
| 4,442.0             | 13.21           | 159.90      | 4,357.4             | -763.9     | 285.8      | -734.4                | 1.88                    | 1.33                   | 6.08                  |
| 4,538.0             | 12.49           | 159.35      | 4,451.0             | -783.9     | 293.2      | -753.6                | 0.76                    | -0.75                  | -0.57                 |
| 4,633.0             | 11.26           | 165.13      | 4,543.9             | -802.5     | 299.2      | -771.6                | 1.80                    | -1.29                  | 6.08                  |
| 4,729.0             | 12.69           | 154.88      | 4,637.9             | -821.1     | 306.1      | -789.5                | 2.66                    | 1.49                   | -10.68                |
| 4,825.0             | 11.91           | 155.44      | 4,731.7             | -839.7     | 314.7      | -807.2                | 0.82                    | -0.81                  | 0.58                  |
| 4,920.0             | 12.89           | 155.61      | 4,824.4             | -858.3     | 323.1      | -824.9                | 1.03                    | 1.03                   | 0.18                  |
| 5,016.0             | 12.86           | 155.02      | 4,918.0             | -877.7     | 332.1      | -843.4                | 0.14                    | -0.03                  | -0.61                 |

|                  |                                   |                                     |                   |
|------------------|-----------------------------------|-------------------------------------|-------------------|
| <b>Company:</b>  | PDC Energy Inc. DJ Basin          | <b>Local Co-ordinate Reference:</b> | Well Popham 11N   |
| <b>Project:</b>  | SEC.3-T4N-R64W                    | <b>TVD Reference:</b>               | WELL @ 4685.0ft   |
| <b>Site:</b>     | Popham 4N64W03 Pad Sec.3-T4N-R64W | <b>MD Reference:</b>                | WELL @ 4685.0ft   |
| <b>Well:</b>     | Popham 11N                        | <b>North Reference:</b>             | True              |
| <b>Wellbore:</b> | Popham 11N Wellbore #1            | <b>Survey Calculation Method:</b>   | Minimum Curvature |
| <b>Design:</b>   | Popham 11N Wellbore #1            | <b>Database:</b>                    | US_EDM            |

| Survey  |                 |             |                     |            |            |                       |                         |                        |                       |  |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (ft)                           | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 5,110.0                                       | 12.15           | 153.93      | 5,009.8             | -896.1     | 340.8      | -860.9                | 0.80                    | -0.76                  | -1.16                 |  |
| 5,206.0                                       | 10.60           | 153.92      | 5,103.9             | -913.1     | 349.2      | -877.1                | 1.61                    | -1.61                  | -0.01                 |  |
| 5,302.0                                       | 11.26           | 156.99      | 5,198.2             | -929.6     | 356.7      | -892.9                | 0.92                    | 0.69                   | 3.20                  |  |
| 5,397.0                                       | 10.95           | 158.08      | 5,291.4             | -946.5     | 363.7      | -909.0                | 0.39                    | -0.33                  | 1.15                  |  |
| 5,492.0                                       | 10.60           | 158.51      | 5,384.7             | -963.0     | 370.3      | -924.9                | 0.38                    | -0.37                  | 0.45                  |  |
| 5,588.0                                       | 9.37            | 158.21      | 5,479.3             | -978.5     | 376.4      | -939.7                | 1.28                    | -1.28                  | -0.31                 |  |
| 5,682.0                                       | 6.46            | 151.26      | 5,572.4             | -990.2     | 381.8      | -950.9                | 3.25                    | -3.10                  | -7.39                 |  |
| 5,778.0                                       | 5.37            | 144.25      | 5,667.8             | -998.6     | 387.0      | -958.8                | 1.36                    | -1.14                  | -7.30                 |  |
| 5,874.0                                       | 2.80            | 155.80      | 5,763.6             | -1,004.4   | 390.6      | -964.2                | 2.80                    | -2.68                  | 12.03                 |  |
| 5,968.0                                       | 0.97            | 141.88      | 5,857.5             | -1,007.1   | 392.0      | -966.8                | 1.99                    | -1.95                  | -14.81                |  |
| 6,063.0                                       | 1.37            | 149.34      | 5,952.5             | -1,008.7   | 393.1      | -968.3                | 0.45                    | 0.42                   | 7.85                  |  |
| 6,157.0                                       | 4.85            | 6.68        | 6,046.4             | -1,005.8   | 394.2      | -965.2                | 6.38                    | 3.70                   | -151.77               |  |
| 6,252.0                                       | 13.46           | 1.02        | 6,140.1             | -990.7     | 394.8      | -950.2                | 9.10                    | 9.06                   | -5.96                 |  |
| 6,347.0                                       | 19.07           | 359.21      | 6,231.3             | -964.1     | 394.8      | -923.7                | 5.93                    | 5.91                   | -1.91                 |  |
| 6,442.0                                       | 23.91           | 359.42      | 6,319.7             | -929.3     | 394.4      | -889.1                | 5.10                    | 5.09                   | 0.22                  |  |
| 6,537.0                                       | 29.60           | 358.55      | 6,404.4             | -886.6     | 393.6      | -846.6                | 6.00                    | 5.99                   | -0.92                 |  |
| 6,632.0                                       | 42.32           | 4.05        | 6,481.2             | -831.0     | 395.3      | -791.1                | 13.80                   | 13.39                  | 5.79                  |  |
| 6,727.0                                       | 50.72           | 7.00        | 6,546.5             | -762.4     | 402.0      | -722.2                | 9.12                    | 8.84                   | 3.11                  |  |
| 6,822.0                                       | 55.27           | 3.73        | 6,603.7             | -686.9     | 409.1      | -646.4                | 5.52                    | 4.79                   | -3.44                 |  |
| 6,917.0                                       | 63.67           | 358.98      | 6,651.9             | -605.2     | 410.8      | -564.9                | 9.83                    | 8.84                   | -5.00                 |  |
| 6,959.6                                       | 69.24           | 357.88      | 6,668.9             | -566.2     | 409.8      | -526.1                | 13.30                   | 13.09                  | -2.57                 |  |
| TPZ - 460' Setback - 460'FSL, 2502'FEL, Sec.3 |                 |             |                     |            |            |                       |                         |                        |                       |  |
| 7,012.0                                       | 76.11           | 356.64      | 6,684.5             | -516.3     | 407.4      | -476.6                | 13.30                   | 13.10                  | -2.37                 |  |
| 7,106.0                                       | 77.67           | 353.72      | 6,705.9             | -425.1     | 399.7      | -386.5                | 3.45                    | 1.66                   | -3.11                 |  |
| 7,201.0                                       | 86.39           | 359.70      | 6,719.0             | -331.3     | 394.3      | -293.6                | 11.09                   | 9.18                   | 6.29                  |  |
| 7,243.2                                       | 87.19           | 0.12        | 6,721.4             | -289.1     | 394.3      | -251.6                | 2.14                    | 1.89                   | 1.00                  |  |
| LPL 737'FSL, 2512'FEL, Sec.3                  |                 |             |                     |            |            |                       |                         |                        |                       |  |
| 7,296.0                                       | 88.19           | 0.65        | 6,723.5             | -236.4     | 394.6      | -199.1                | 2.14                    | 1.89                   | 1.00                  |  |
| 7,391.0                                       | 90.23           | 359.85      | 6,724.8             | -141.4     | 395.0      | -104.5                | 2.31                    | 2.15                   | -0.84                 |  |
| 7,420.0                                       | 90.54           | 359.14      | 6,724.6             | -112.4     | 394.8      | -75.6                 | 2.67                    | 1.07                   | -2.45                 |  |
| 7,516.0                                       | 91.60           | 358.35      | 6,722.8             | -16.4      | 392.7      | 19.8                  | 1.38                    | 1.10                   | -0.82                 |  |
| 7,611.0                                       | 92.48           | 357.47      | 6,719.5             | 78.4       | 389.2      | 113.9                 | 1.31                    | 0.93                   | -0.93                 |  |
| 7,707.0                                       | 90.55           | 358.28      | 6,716.9             | 174.3      | 385.7      | 209.1                 | 2.18                    | -2.01                  | 0.84                  |  |
| 7,802.0                                       | 89.89           | 358.68      | 6,716.6             | 269.3      | 383.1      | 303.4                 | 0.81                    | -0.69                  | 0.42                  |  |
| 7,897.0                                       | 89.09           | 358.68      | 6,717.4             | 364.3      | 380.9      | 397.8                 | 0.84                    | -0.84                  | 0.00                  |  |
| 7,993.0                                       | 90.20           | 0.47        | 6,718.0             | 460.3      | 380.2      | 493.3                 | 2.19                    | 1.16                   | 1.86                  |  |
| 8,089.0                                       | 90.35           | 1.54        | 6,717.5             | 556.2      | 381.9      | 589.0                 | 1.13                    | 0.16                   | 1.11                  |  |
| 8,185.0                                       | 90.98           | 1.37        | 6,716.4             | 652.2      | 384.4      | 684.8                 | 0.68                    | 0.66                   | -0.18                 |  |
| 8,280.0                                       | 88.33           | 2.74        | 6,717.0             | 747.1      | 387.8      | 779.6                 | 3.14                    | -2.79                  | 1.44                  |  |
| 8,376.0                                       | 88.36           | 2.34        | 6,719.8             | 843.0      | 392.0      | 875.5                 | 0.42                    | 0.03                   | -0.42                 |  |
| 8,471.0                                       | 88.23           | 1.51        | 6,722.6             | 937.9      | 395.2      | 970.3                 | 0.88                    | -0.14                  | -0.87                 |  |
| 8,567.0                                       | 88.24           | 0.95        | 6,725.6             | 1,033.8    | 397.3      | 1,066.0               | 0.58                    | 0.01                   | -0.58                 |  |
| 8,663.0                                       | 89.27           | 1.20        | 6,727.6             | 1,129.8    | 399.1      | 1,161.7               | 1.10                    | 1.07                   | 0.26                  |  |
| Deepest TVD Drilled - 6727.64' TVD            |                 |             |                     |            |            |                       |                         |                        |                       |  |

|                  |                                   |                                     |                   |
|------------------|-----------------------------------|-------------------------------------|-------------------|
| <b>Company:</b>  | PDC Energy Inc. DJ Basin          | <b>Local Co-ordinate Reference:</b> | Well Popham 11N   |
| <b>Project:</b>  | SEC.3-T4N-R64W                    | <b>TVD Reference:</b>               | WELL @ 4685.0ft   |
| <b>Site:</b>     | Popham 4N64W03 Pad Sec.3-T4N-R64W | <b>MD Reference:</b>                | WELL @ 4685.0ft   |
| <b>Well:</b>     | Popham 11N                        | <b>North Reference:</b>             | True              |
| <b>Wellbore:</b> | Popham 11N Wellbore #1            | <b>Survey Calculation Method:</b>   | Minimum Curvature |
| <b>Design:</b>   | Popham 11N Wellbore #1            | <b>Database:</b>                    | US_EDM            |

| Survey                                  |                 |             |                     |            |            |                       |                         |                        |                       |  |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (ft)                     | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 8,758.0                                 | 91.42           | 1.84        | 6,727.1             | 1,224.7    | 401.6      | 1,256.5               | 2.36                    | 2.26                   | 0.67                  |  |
| 8,854.0                                 | 91.60           | 1.28        | 6,724.5             | 1,320.7    | 404.2      | 1,352.3               | 0.61                    | 0.19                   | -0.58                 |  |
| 8,949.0                                 | 91.98           | 0.77        | 6,721.6             | 1,415.6    | 405.9      | 1,447.0               | 0.67                    | 0.40                   | -0.54                 |  |
| 9,044.0                                 | 90.29           | 0.98        | 6,719.7             | 1,510.6    | 407.3      | 1,541.6               | 1.79                    | -1.78                  | 0.22                  |  |
| 9,140.0                                 | 90.52           | 0.66        | 6,719.0             | 1,606.6    | 408.7      | 1,637.4               | 0.41                    | 0.24                   | -0.33                 |  |
| 9,235.0                                 | 90.59           | 359.94      | 6,718.1             | 1,701.6    | 409.2      | 1,732.0               | 0.76                    | 0.07                   | -0.76                 |  |
| 9,331.0                                 | 90.66           | 359.16      | 6,717.0             | 1,797.5    | 408.5      | 1,827.5               | 0.82                    | 0.07                   | -0.81                 |  |
| 9,427.0                                 | 90.52           | 358.81      | 6,716.1             | 1,893.5    | 406.8      | 1,922.9               | 0.39                    | -0.15                  | -0.36                 |  |
| 9,522.0                                 | 90.87           | 358.60      | 6,714.9             | 1,988.5    | 404.6      | 2,017.3               | 0.43                    | 0.37                   | -0.22                 |  |
| 9,618.0                                 | 90.08           | 359.94      | 6,714.1             | 2,084.5    | 403.4      | 2,112.8               | 1.62                    | -0.82                  | 1.40                  |  |
| 9,714.0                                 | 90.06           | 0.22        | 6,714.0             | 2,180.5    | 403.5      | 2,208.4               | 0.29                    | -0.02                  | 0.29                  |  |
| 9,809.0                                 | 89.13           | 1.33        | 6,714.7             | 2,275.5    | 404.8      | 2,303.1               | 1.52                    | -0.98                  | 1.17                  |  |
| 9,904.0                                 | 88.94           | 0.71        | 6,716.3             | 2,370.4    | 406.5      | 2,397.8               | 0.68                    | -0.20                  | -0.65                 |  |
| 9,999.0                                 | 88.92           | 359.97      | 6,718.0             | 2,465.4    | 407.1      | 2,492.4               | 0.78                    | -0.02                  | -0.78                 |  |
| 10,095.0                                | 88.82           | 359.45      | 6,719.9             | 2,561.4    | 406.6      | 2,587.9               | 0.55                    | -0.10                  | -0.54                 |  |
| 10,190.0                                | 90.01           | 359.46      | 6,720.9             | 2,656.4    | 405.7      | 2,682.4               | 1.25                    | 1.25                   | 0.01                  |  |
| 10,286.0                                | 91.33           | 0.61        | 6,719.8             | 2,752.4    | 405.7      | 2,778.0               | 1.82                    | 1.38                   | 1.20                  |  |
| 10,381.0                                | 91.64           | 359.82      | 6,717.3             | 2,847.3    | 406.1      | 2,872.6               | 0.89                    | 0.33                   | -0.83                 |  |
| 10,477.0                                | 91.69           | 359.54      | 6,714.5             | 2,943.3    | 405.6      | 2,968.1               | 0.30                    | 0.05                   | -0.29                 |  |
| 10,572.0                                | 91.46           | 1.06        | 6,711.9             | 3,038.3    | 406.0      | 3,062.7               | 1.62                    | -0.24                  | 1.60                  |  |
| 10,668.0                                | 91.66           | 0.60        | 6,709.3             | 3,134.2    | 407.4      | 3,158.4               | 0.52                    | 0.21                   | -0.48                 |  |
| 10,763.0                                | 91.62           | 0.08        | 6,706.6             | 3,229.2    | 408.0      | 3,253.0               | 0.55                    | -0.04                  | -0.55                 |  |
| 10,859.0                                | 90.22           | 2.25        | 6,705.0             | 3,325.1    | 410.0      | 3,348.8               | 2.69                    | -1.46                  | 2.26                  |  |
| 10,954.0                                | 89.77           | 1.77        | 6,705.0             | 3,420.1    | 413.3      | 3,443.6               | 0.69                    | -0.47                  | -0.51                 |  |
| 11,050.0                                | 89.47           | 1.61        | 6,705.7             | 3,516.0    | 416.1      | 3,539.4               | 0.35                    | -0.31                  | -0.17                 |  |
| 11,145.0                                | 89.34           | 1.07        | 6,706.7             | 3,611.0    | 418.3      | 3,634.2               | 0.58                    | -0.14                  | -0.57                 |  |
| 11,240.0                                | 89.57           | 0.76        | 6,707.6             | 3,706.0    | 419.9      | 3,728.9               | 0.41                    | 0.24                   | -0.33                 |  |
| 11,336.0                                | 89.77           | 359.73      | 6,708.1             | 3,802.0    | 420.3      | 3,824.5               | 1.09                    | 0.21                   | -1.07                 |  |
| 11,432.0                                | 90.00           | 359.37      | 6,708.3             | 3,898.0    | 419.5      | 3,920.0               | 0.45                    | 0.24                   | -0.38                 |  |
| 11,527.0                                | 90.42           | 358.52      | 6,708.0             | 3,993.0    | 417.8      | 4,014.5               | 1.00                    | 0.44                   | -0.89                 |  |
| 11,623.0                                | 91.00           | 357.79      | 6,706.8             | 4,088.9    | 414.7      | 4,109.7               | 0.97                    | 0.60                   | -0.76                 |  |
| 11,718.0                                | 91.24           | 358.31      | 6,704.9             | 4,183.8    | 411.4      | 4,203.9               | 0.60                    | 0.25                   | 0.55                  |  |
| 11,814.0                                | 91.40           | 358.70      | 6,702.7             | 4,279.8    | 408.9      | 4,299.2               | 0.44                    | 0.17                   | 0.41                  |  |
| 11,909.0                                | 91.55           | 357.67      | 6,700.3             | 4,374.7    | 405.9      | 4,393.5               | 1.10                    | 0.16                   | -1.08                 |  |
| 12,005.0                                | 91.15           | 1.15        | 6,698.0             | 4,470.6    | 404.9      | 4,488.9               | 3.65                    | -0.42                  | 3.63                  |  |
| 12,079.0                                | 91.70           | 1.10        | 6,696.2             | 4,544.6    | 406.4      | 4,562.7               | 0.75                    | 0.74                   | -0.07                 |  |
| 12,139.0                                | 91.70           | 1.10        | 6,694.4             | 4,604.6    | 407.5      | 4,622.5               | 0.00                    | 0.00                   | 0.00                  |  |
| Projected BHL 368'FSL, 2532'FWL, Sec.34 |                 |             |                     |            |            |                       |                         |                        |                       |  |

|                  |                                   |                                     |                   |
|------------------|-----------------------------------|-------------------------------------|-------------------|
| <b>Company:</b>  | PDC Energy Inc. DJ Basin          | <b>Local Co-ordinate Reference:</b> | Well Popham 11N   |
| <b>Project:</b>  | SEC.3-T4N-R64W                    | <b>TVD Reference:</b>               | WELL @ 4685.0ft   |
| <b>Site:</b>     | Popham 4N64W03 Pad Sec.3-T4N-R64W | <b>MD Reference:</b>                | WELL @ 4685.0ft   |
| <b>Well:</b>     | Popham 11N                        | <b>North Reference:</b>             | True              |
| <b>Wellbore:</b> | Popham 11N Wellbore #1            | <b>Survey Calculation Method:</b>   | Minimum Curvature |
| <b>Design:</b>   | Popham 11N Wellbore #1            | <b>Database:</b>                    | US_EDM            |

| Design Targets  |           |          |         |         |       |              |              |           |             |
|---|-----------|----------|---------|---------|-------|--------------|--------------|-----------|-------------|
| Target Name   | Dip Angle | Dip Dir. | TVD     | +N/-S   | +E/-W | Northing     | Easting      | Latitude  | Longitude   |
| - hit/miss target   | (°)       | (°)      | (ft)    | (ft)    | (ft)  | (usft)       | (usft)       |           |             |
| - Shape   |           |          |         |         |       |              |              |           |             |
| SHL 1029'FSL, 2356'FW   | 0.00      | 0.00     | 1.0     | 0.0     | 0.0   | 1,367,047.77 | 3,268,307.47 | 40.336950 | -104.537510 |
| - survey hits target center   |           |          |         |         |       |              |              |           |             |
| - Point   |           |          |         |         |       |              |              |           |             |
| Projected BHL 368'FSL,  | 0.00      | 0.00     | 6,703.0 | 4,606.6 | 425.6 | 1,371,658.52 | 3,268,683.08 | 40.349595 | -104.535983 |
| - survey misses target center by 20.2ft at 12139.0ft MD (6694.4 TVD, 4604.6 N, 407.5 E) |           |          |         |         |       |              |              |           |             |
| - Point   |           |          |         |         |       |              |              |           |             |

| Survey Annotations |                |                   |       |   |  |
|--------------------|----------------|-------------------|-------|---|--|
| Measured Depth     | Vertical Depth | Local Coordinates |       |   |  |
| (ft)               | (ft)           | +N/-S             | +E/-W |   |  |
| (ft)               | (ft)           | (ft)              | (ft)  | Comment                                       |  |
| 6,959.6            | 6,668.9        | -566.2            | 409.8 | TPZ - 460' Setback - 460'FSL, 2502'FEL, Sec.3 |  |
| 8,663.0            | 6,727.6        | 1,129.8           | 399.1 | Deepest TVD Drilled - 6727.64' TVD            |  |

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