

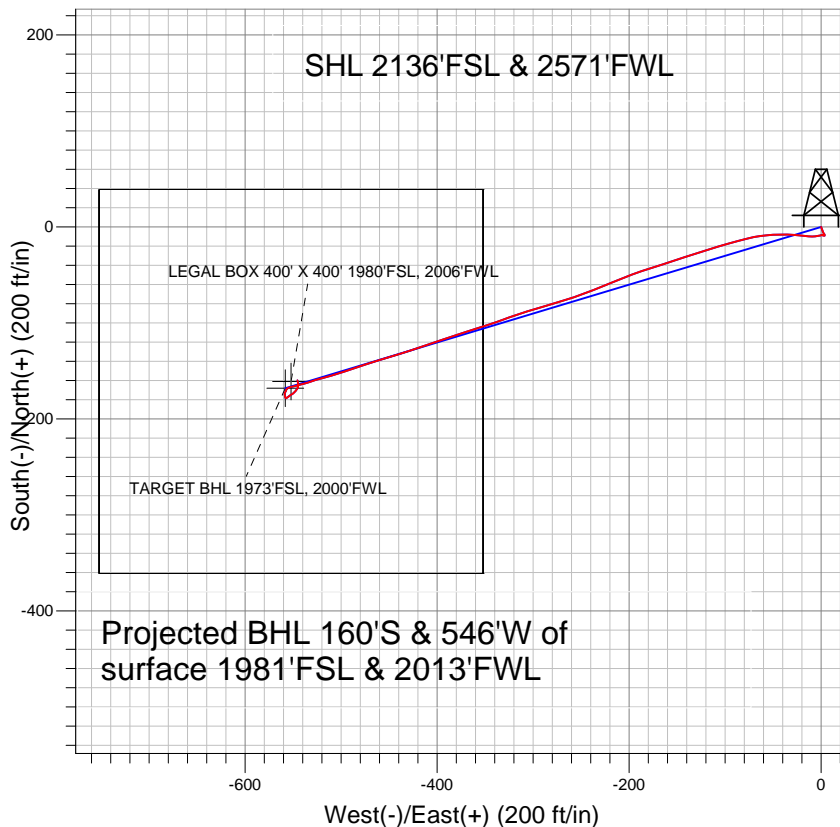
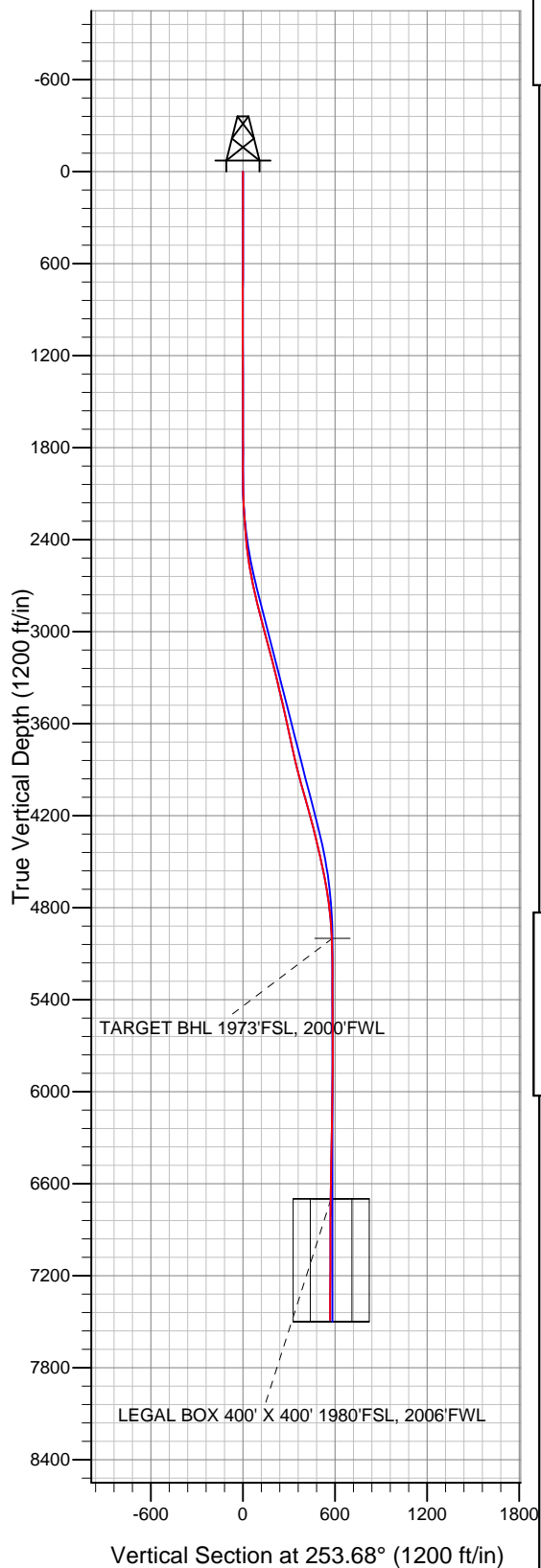
Well Name: **Carlson 23-2D**

Surface Location: Carlson 2OD Pad Sec.2-T6N-R66W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4860.0

| +N/-S   | +E/-W | Northing   | Easting    | Latitude         | Longitude         | Slot |
|---|-------|------------|------------|------------------|-------------------|------|
| 0.0   | 0.0   | 1431715.43 | 3209768.38 | 40° 30' 57.636 N | 104° 44' 43.872 W |      |
| Original Well Elev WELL @ 4873.0ft (Original Well Elev) |       |            |            |                  |                   |      |

## PETROLEUM DEVELOPMENT CORP Weld County CO



### LEGEND

- Carlson 23-2D, Wellbore #1, Plan #2 (8-21-10) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
 7553'MD & 7488'TVD @ 569' VS  
 1.6 deg Inc 338.5 deg AZ

Project: SEC.2-T6N-R66W  
 Site: Carlson 2OD Pad Sec.2-T6N-R66W  
 Well: Carlson 23-2D  
 Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.2-T6N-R66W**

**Carlson 20D Pad Sec.2-T6N-R66W**

**Carlson 23-2D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**01 December, 2010**

|                  |   |                                     |                                      |
|------------------|---|-------------------------------------|--------------------------------------|
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Carlson 23-2D                   |
| <b>Project:</b>  | SEC.2-T6N-R66W                            | <b>TVD Reference:</b>               | WELL @ 4873.0ft (Original Well Elev) |
| <b>Site:</b>     | Carlson 2OD Pad Sec.2-T6N-R66W            | <b>MD Reference:</b>                | WELL @ 4873.0ft (Original Well Elev) |
| <b>Well:</b>     | Carlson 23-2D                             | <b>North Reference:</b>             | True                                 |
| <b>Wellbore:</b> | Wellbore #1                               | <b>Survey Calculation Method:</b>   | Minimum Curvature                    |
| <b>Design:</b>   | Wellbore #1                               | <b>Database:</b>                    | Landmark                             |

|                    |                                       |                      |                             |
|--------------------|---------------------------------------|----------------------|-----------------------------|
| <b>Project</b>     | SEC.2-T6N-R66W, Weld County, Colorado |                      |                             |
| <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                  | Carlson 2OD Pad Sec.2-T6N-R66W |              |                |                   |                   |
| Site Position:        |                                | Northing:    | 1,431,780.54ft | Latitude:         | 40° 30' 58.284 N  |
| From:                 | Lat/Long                       | Easting:     | 3,209,712.21ft | Longitude:        | 104° 44' 44.592 W |
| Position Uncertainty: | 0.0 ft                         | Slot Radius: | "              | Grid Convergence: | 0.49 °            |

|                      |               |        |                     |                 |               |                   |
|----------------------|---------------|--------|---------------------|-----------------|---------------|-------------------|
| Well                 | Carlson 23-2D |        |                     |                 |               |                   |
| Well Position        | +N-S          | 0.0 ft | Northing:           | 1,431,715.43 ft | Latitude:     | 40° 30' 57.636 N  |
|                      | +E-W          | 0.0 ft | Easting:            | 3,209,768.38 ft | Longitude:    | 104° 44' 43.872 W |
| Position Uncertainty |               | 0.0 ft | Wellhead Elevation: | ft              | Ground Level: | 4,860.0 ft        |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | 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> |
|                  | IGRF2010          | 6/22/2010          | 9.00                   | 67.18                | 53,298                     |

|                          |                              |                   |                   |                      |     |
|--------------------------|------------------------------|-------------------|-------------------|----------------------|-----|
| <b>Design</b>            | 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               | 253.68               |     |

|                       |                |                          |                  |                    |  |
|-----------------------|----------------|--------------------------|------------------|--------------------|--|
| <b>Survey Program</b> | <b>Date</b>    | 12/1/2010                |                  |                    |  |
| <b>From (ft)</b>      | <b>To (ft)</b> | <b>Survey (Wellbore)</b> | <b>Tool Name</b> | <b>Description</b> |  |
| 700.0                 | 7,553.0        | Survey #1 (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 (°/100ft)</b> | <b>Build Rate (°/100ft)</b> | <b>Turn Rate (°/100ft)</b> |  |
| 0.0                        | 0.00                   | 0.00               | 0.0                        | 0.0               | 0.0               | 0.0                          | 0.00                         | 0.00                        | 0.00                       |  |
| 700.0                      | 1.00                   | 159.50             | 700.0                      | -5.7              | 2.1               | -0.4                         | 0.14                         | 0.14                        | 0.00                       |  |
| 794.0                      | 0.80                   | 147.30             | 794.0                      | -7.0              | 2.8               | -0.7                         | 0.29                         | -0.21                       | -12.98                     |  |
| 887.0                      | 0.40                   | 134.50             | 886.9                      | -7.8              | 3.4               | -1.0                         | 0.45                         | -0.43                       | -13.76                     |  |
| 980.0                      | 0.60                   | 169.40             | 979.9                      | -8.5              | 3.7               | -1.1                         | 0.38                         | 0.22                        | 37.53                      |  |
| 1,073.0                    | 0.10                   | 259.40             | 1,072.9                    | -9.0              | 3.7               | -1.0                         | 0.65                         | -0.54                       | 96.77                      |  |
| 1,167.0                    | 0.30                   | 233.30             | 1,166.9                    | -9.2              | 3.4               | -0.7                         | 0.23                         | 0.21                        | -27.77                     |  |
| 1,260.0                    | 0.30                   | 338.00             | 1,259.9                    | -9.1              | 3.1               | -0.4                         | 0.51                         | 0.00                        | 112.58                     |  |
| 1,353.0                    | 0.20                   | 294.10             | 1,352.9                    | -8.8              | 2.9               | -0.3                         | 0.22                         | -0.11                       | -47.20                     |  |
| 1,446.0                    | 0.20                   | 241.30             | 1,445.9                    | -8.8              | 2.6               | 0.0                          | 0.19                         | 0.00                        | -56.77                     |  |
| 1,539.0                    | 0.20                   | 236.90             | 1,538.9                    | -9.0              | 2.3               | 0.3                          | 0.02                         | 0.00                        | -4.73                      |  |
| 1,633.0                    | 0.10                   | 349.10             | 1,632.9                    | -9.0              | 2.2               | 0.4                          | 0.27                         | -0.11                       | 119.36                     |  |

|                  |   |                                     |                                      |
|------------------|---|-------------------------------------|--------------------------------------|
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Carlson 23-2D                   |
| <b>Project:</b>  | SEC.2-T6N-R66W                            | <b>TVD Reference:</b>               | WELL @ 4873.0ft (Original Well Elev) |
| <b>Site:</b>     | Carlson 2OD Pad Sec.2-T6N-R66W            | <b>MD Reference:</b>                | WELL @ 4873.0ft (Original Well Elev) |
| <b>Well:</b>     | Carlson 23-2D                             | <b>North Reference:</b>             | True                                 |
| <b>Wellbore:</b> | Wellbore #1                               | <b>Survey Calculation Method:</b>   | Minimum Curvature                    |
| <b>Design:</b>   | Wellbore #1                               | <b>Database:</b>                    | Landmark                             |

| Survey                                   |                 |             |                     |            |            |                       |                       |                      |                     |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft)                      | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 1,726.0                                  | 0.10            | 228.60      | 1,725.9             | -9.0       | 2.1        | 0.5                   | 0.19                  | 0.00                 | -129.57             |
| 1,819.0                                  | 0.40            | 302.90      | 1,818.9             | -8.8       | 1.8        | 0.8                   | 0.41                  | 0.32                 | 79.89               |
| 1,912.0                                  | 0.40            | 62.50       | 1,911.9             | -8.5       | 1.8        | 0.7                   | 0.74                  | 0.00                 | 128.60              |
| 2,005.0                                  | 0.20            | 241.70      | 2,004.9             | -8.4       | 1.9        | 0.5                   | 0.65                  | -0.22                | 192.69              |
| 2,098.0                                  | 1.70            | 264.30      | 2,097.9             | -8.7       | 0.4        | 2.0                   | 1.63                  | 1.61                 | 24.30               |
| 2,191.0                                  | 3.20            | 255.70      | 2,190.8             | -9.4       | -3.5       | 6.0                   | 1.66                  | 1.61                 | -9.25               |
| 2,284.0                                  | 4.30            | 271.30      | 2,283.6             | -10.0      | -9.5       | 11.9                  | 1.60                  | 1.18                 | 16.77               |
| 2,377.0                                  | 5.80            | 277.00      | 2,376.3             | -9.3       | -17.6      | 19.6                  | 1.70                  | 1.61                 | 6.13                |
| 2,471.0                                  | 7.30            | 274.30      | 2,469.7             | -8.3       | -28.3      | 29.5                  | 1.63                  | 1.60                 | -2.87               |
| 2,564.0                                  | 9.10            | 269.80      | 2,561.7             | -7.9       | -41.6      | 42.1                  | 2.05                  | 1.94                 | -4.84               |
| 2,656.0                                  | 10.90           | 264.10      | 2,652.3             | -8.8       | -57.5      | 57.6                  | 2.23                  | 1.96                 | -6.20               |
| 2,750.0                                  | 12.40           | 256.80      | 2,744.4             | -12.0      | -76.2      | 76.5                  | 2.23                  | 1.60                 | -7.77               |
| 2,843.0                                  | 13.70           | 253.80      | 2,835.0             | -17.4      | -96.4      | 97.5                  | 1.58                  | 1.40                 | -3.23               |
| 2,936.0                                  | 15.60           | 252.70      | 2,924.9             | -24.2      | -119.0     | 121.0                 | 2.06                  | 2.04                 | -1.18               |
| 3,029.0                                  | 14.90           | 251.50      | 3,014.7             | -31.7      | -142.2     | 145.4                 | 0.83                  | -0.75                | -1.29               |
| 3,123.0                                  | 14.30           | 252.80      | 3,105.6             | -39.0      | -164.8     | 169.1                 | 0.73                  | -0.64                | 1.38                |
| 3,216.0                                  | 14.40           | 251.50      | 3,195.7             | -46.0      | -186.7     | 192.1                 | 0.36                  | 0.11                 | -1.40               |
| 3,309.0                                  | 14.10           | 247.20      | 3,285.9             | -54.1      | -208.1     | 215.0                 | 1.18                  | -0.32                | -4.62               |
| 3,402.0                                  | 13.30           | 248.50      | 3,376.2             | -62.4      | -228.5     | 236.9                 | 0.92                  | -0.86                | 1.40                |
| 3,496.0                                  | 13.00           | 249.70      | 3,467.8             | -70.0      | -248.5     | 258.2                 | 0.43                  | -0.32                | 1.28                |
| 3,589.0                                  | 12.40           | 252.60      | 3,558.5             | -76.6      | -267.9     | 278.6                 | 0.94                  | -0.65                | 3.12                |
| 3,682.0                                  | 12.40           | 254.30      | 3,649.3             | -82.3      | -287.0     | 298.6                 | 0.39                  | 0.00                 | 1.83                |
| 3,776.0                                  | 12.20           | 253.00      | 3,741.2             | -88.0      | -306.2     | 318.6                 | 0.36                  | -0.21                | -1.38               |
| 3,869.0                                  | 12.70           | 249.40      | 3,832.0             | -94.4      | -325.2     | 338.6                 | 0.99                  | 0.54                 | -3.87               |
| 3,962.0                                  | 15.20           | 251.80      | 3,922.2             | -101.8     | -346.3     | 361.0                 | 2.76                  | 2.69                 | 2.58                |
| 4,056.0                                  | 15.30           | 252.60      | 4,012.9             | -109.4     | -369.9     | 385.7                 | 0.25                  | 0.11                 | 0.85                |
| 4,149.0                                  | 15.80           | 251.30      | 4,102.5             | -117.1     | -393.6     | 410.6                 | 0.66                  | 0.54                 | -1.40               |
| 4,242.0                                  | 15.30           | 251.10      | 4,192.1             | -125.2     | -417.2     | 435.5                 | 0.54                  | -0.54                | -0.22               |
| 4,335.0                                  | 14.20           | 252.50      | 4,282.0             | -132.6     | -439.7     | 459.2                 | 1.24                  | -1.18                | 1.51                |
| 4,428.0                                  | 13.60           | 253.60      | 4,372.3             | -139.1     | -461.0     | 481.5                 | 0.70                  | -0.65                | 1.18                |
| 4,521.0                                  | 12.80           | 251.00      | 4,462.9             | -145.5     | -481.3     | 502.8                 | 1.07                  | -0.86                | -2.80               |
| 4,614.0                                  | 11.70           | 252.20      | 4,553.7             | -151.8     | -500.0     | 522.5                 | 1.21                  | -1.18                | 1.29                |
| 4,707.0                                  | 10.20           | 254.70      | 4,645.0             | -156.8     | -516.9     | 540.1                 | 1.69                  | -1.61                | 2.69                |
| 4,800.0                                  | 8.20            | 251.90      | 4,736.8             | -161.1     | -531.2     | 555.0                 | 2.20                  | -2.15                | -3.01               |
| 4,894.0                                  | 5.80            | 256.10      | 4,830.1             | -164.3     | -542.1     | 566.5                 | 2.61                  | -2.55                | 4.47                |
| 4,987.0                                  | 4.00            | 257.20      | 4,922.8             | -166.1     | -549.9     | 574.4                 | 1.94                  | -1.94                | 1.18                |
| 5,064.6                                  | 2.75            | 247.85      | 5,000.2             | -167.4     | -554.2     | 578.9                 | 1.76                  | -1.61                | -12.05              |
| TARGET BHL 1973'FSL, 2000'FWL            |                 |             |                     |            |            |                       |                       |                      |                     |
| 5,081.0                                  | 2.50            | 244.70      | 5,016.6             | -167.7     | -554.9     | 579.7                 | 1.76                  | -1.52                | -19.20              |
| 5,174.0                                  | 0.70            | 197.60      | 5,109.6             | -169.1     | -556.9     | 582.0                 | 2.24                  | -1.94                | -50.65              |
| 5,360.0                                  | 0.50            | 204.30      | 5,295.6             | -171.0     | -557.6     | 583.2                 | 0.11                  | -0.11                | 3.60                |
| 5,547.0                                  | 0.70            | 210.10      | 5,482.6             | -172.7     | -558.5     | 584.5                 | 0.11                  | 0.11                 | 3.10                |
| 5,733.0                                  | 1.60            | 168.50      | 5,668.5             | -176.2     | -558.6     | 585.6                 | 0.63                  | 0.48                 | -22.37              |
| 5,919.0                                  | 0.40            | 79.00       | 5,854.5             | -178.6     | -557.4     | 585.1                 | 0.88                  | -0.65                | -48.12              |
| 6,103.0                                  | 0.80            | 47.10       | 6,038.5             | -177.6     | -555.8     | 583.4                 | 0.28                  | 0.22                 | -17.34              |
| 6,289.0                                  | 1.20            | 56.60       | 6,224.5             | -175.7     | -553.3     | 580.3                 | 0.23                  | 0.22                 | 5.11                |
| 6,476.0                                  | 1.20            | 55.50       | 6,411.4             | -173.5     | -550.0     | 576.6                 | 0.01                  | 0.00                 | -0.59               |
| 6,661.0                                  | 1.00            | 33.90       | 6,596.4             | -171.1     | -547.5     | 573.5                 | 0.25                  | -0.11                | -11.68              |
| 6,764.7                                  | 1.11            | 34.32       | 6,700.1             | -169.5     | -546.4     | 572.0                 | 0.11                  | 0.11                 | 0.40                |
| LEGAL BOX 400' X 400' 1980'FSL, 2006'FWL |                 |             |                     |            |            |                       |                       |                      |                     |
| 6,848.0                                  | 1.20            | 34.60       | 6,783.4             | -168.1     | -545.5     | 570.7                 | 0.11                  | 0.11                 | 0.34                |
| 7,034.0                                  | 0.40            | 215.50      | 6,969.4             | -167.0     | -544.8     | 569.7                 | 0.86                  | -0.43                | -96.29              |
| 7,221.0                                  | 0.80            | 8.30        | 7,156.4             | -166.3     | -544.9     | 569.7                 | 0.63                  | 0.21                 | 81.71               |

|                  |   |                                     |                                      |
|------------------|---|-------------------------------------|--------------------------------------|
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Carlson 23-2D                   |
| <b>Project:</b>  | SEC.2-T6N-R66W                            | <b>TVD Reference:</b>               | WELL @ 4873.0ft (Original Well Elev) |
| <b>Site:</b>     | Carlson 2OD Pad Sec.2-T6N-R66W            | <b>MD Reference:</b>                | WELL @ 4873.0ft (Original Well Elev) |
| <b>Well:</b>     | Carlson 23-2D                             | <b>North Reference:</b>             | True                                 |
| <b>Wellbore:</b> | Wellbore #1                               | <b>Survey Calculation Method:</b>   | Minimum Curvature                    |
| <b>Design:</b>   | Wellbore #1                               | <b>Database:</b>                    | Landmark                             |

| Survey              |                 |             |                     |            |            |                       |                       |                      |                     |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 7,408.0             | 1.10            | 1.40        | 7,343.3             | -163.2     | -544.7     | 568.6                 | 0.17                  | 0.16                 | -3.69               |
| 7,503.0             | 1.60            | 338.50      | 7,438.3             | -161.0     | -545.2     | 568.5                 | 0.76                  | 0.53                 | -24.11              |
| 7,553.0             | 1.60            | 338.50      | 7,488.3             | -159.7     | -545.7     | 568.6                 | 0.00                  | 0.00                 | 0.00                |

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