

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Thornton 28W-103**

Surface Location: Thornton 28SW-HZ Pad Sec.28-T7N-R66W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

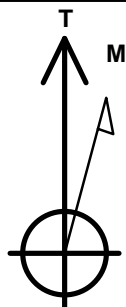
Ground Elevation: 4935.0

| +N/-S | +E/-W | Northing   | Easting    | Latitude  | Longitude   | Slot |
|-------|-------|------------|------------|-----------|-------------|------|
| 0.0   | 0.0   | 1442378.91 | 3201000.90 | 40.545480 | -104.776740 |      |

RKB-15' WELL @ 4950.0ft (RKB-15')

## WELLBORE TARGET DETAILS

| Name                           | TVD    | +N/-S   | +E/-W | Shape |
|--------------------------------|--------|---------|-------|-------|
| BHL 2140'FNL & 200'FEL, SEC.33 | 7086.0 | -4630.5 | 433.6 | Point |



Azimuths to True North  
Magnetic North: 8.62°

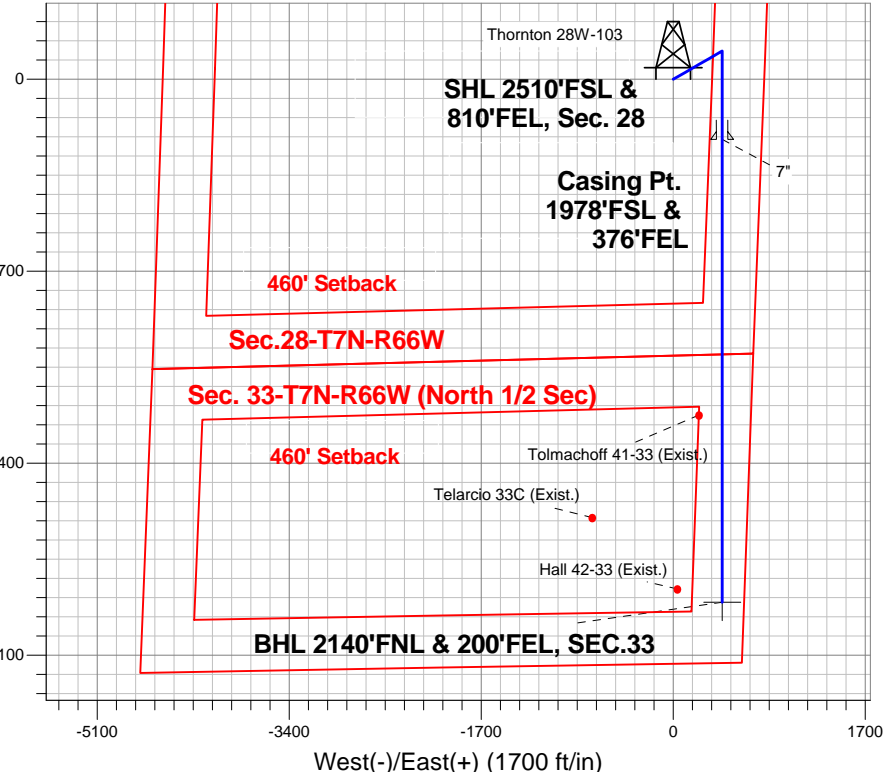
Magnetic Field  
Strength: 52997.6snT  
Dip Angle: 67.10°  
Date: 6/4/2013  
Model: IGRF2010

Thornton 28SW-HZ Pad Sec.28-T7N-R66W  
Thornton 28W-103  
Plan #1 (06-04-13)  
11:29, June 11 2013

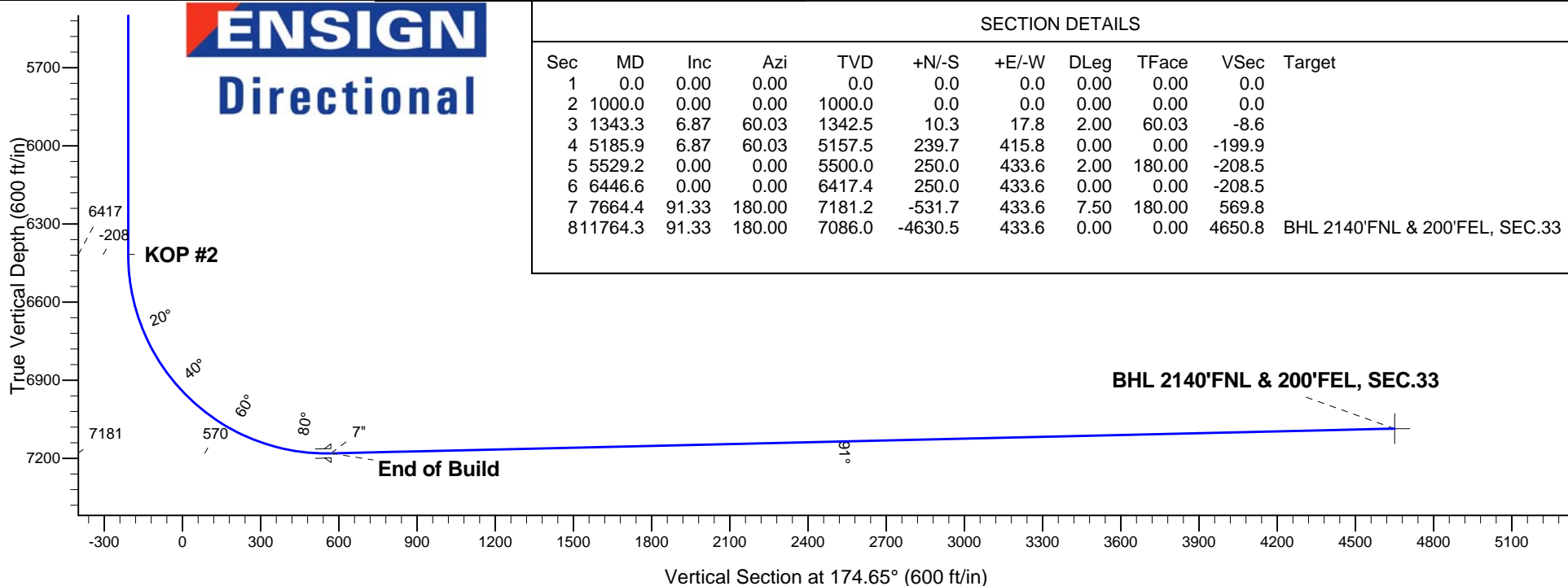
## ANNOTATIONS

| TVD    | MD     | Annotation   |
|--------|--------|--------------|
| 1000.0 | 1000.0 | KOP #1       |
| 6417.4 | 6446.6 | KOP #2       |
| 7181.2 | 7664.4 | End of Build |

South(-)/North(+) (1700 ft/in)



**ENSIGN**  
Directional



## SECTION DETAILS

| Sec | MD       | Inc   | Azi    | TVD    | +N/-S   | +E/-W | DLeg | TFace  | VSec   | Target                         |
|-----|----------|-------|--------|--------|---------|-------|------|--------|--------|--------------------------------|
| 1   | 0.0      | 0.00  | 0.00   | 0.0    | 0.0     | 0.0   | 0.00 | 0.00   | 0.0    |                                |
| 2   | 1000.0   | 0.00  | 0.00   | 1000.0 | 0.0     | 0.0   | 0.00 | 0.00   | 0.0    |                                |
| 3   | 1343.3   | 6.87  | 60.03  | 1342.5 | 10.3    | 17.8  | 2.00 | 60.03  | -8.6   |                                |
| 4   | 5185.9   | 6.87  | 60.03  | 5157.5 | 239.7   | 415.8 | 0.00 | 0.00   | -199.9 |                                |
| 5   | 5529.2   | 0.00  | 0.00   | 5500.0 | 250.0   | 433.6 | 2.00 | 180.00 | -208.5 |                                |
| 6   | 6446.6   | 0.00  | 0.00   | 6417.4 | 250.0   | 433.6 | 0.00 | 0.00   | -208.5 |                                |
| 7   | 7664.4   | 91.33 | 180.00 | 7181.2 | -531.7  | 433.6 | 7.50 | 180.00 | 569.8  |                                |
|     | 811764.3 | 91.33 | 180.00 | 7086.0 | -4630.5 | 433.6 | 0.00 | 0.00   | 4650.8 | BHL 2140'FNL & 200'FEL, SEC.33 |



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T7N-R66W**

**Thornton 28SW-HZ Pad Sec.28-T7N-R66W**

**Thornton 28W-103**

**Wellbore #1**

**Plan: Plan #1 (06-04-13)**

## **Standard Planning Report**

**11 June, 2013**

|                  |   |                                     |                           |
|------------------|---|-------------------------------------|---------------------------|
| <b>Database:</b> | Landmark                                  | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Project:</b>  | SEC.28-T7N-R66W                           | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site:</b>     | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>North Reference:</b>             | True                      |
| <b>Well:</b>     | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Wellbore:</b> | Wellbore #1                               |                                     |                           |
| <b>Design:</b>   | Plan #1 (06-04-13)                        |                                     |                           |

|                    |                               |                      |                             |
|--------------------|-------------------------------|----------------------|-----------------------------|
| <b>Project</b>     | SEC.28-T7N-R66W, Weld Country |                      |                             |
| <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                  |          | Thornton 28SW-HZ Pad Sec.28-T7N-R66W |                 |                   |             |
| Site Position:        |          | Northing:                            | 1,442,374.80 ft | Latitude:         | 40.545470   |
| From:                 | Lat/Long | Easting:                             | 3,200,942.57 ft | Longitude:        | -104.776950 |
| Position Uncertainty: | 0.0 ft   | Slot Radius:                         | "               | Grid Convergence: | 0.47 °      |

| Well                 | Thornton 28W-103 |         |                     |                 |               |             |
|----------------------|------------------|---------|---------------------|-----------------|---------------|-------------|
| Well Position        | +N/-S            | 3.6 ft  | Northing:           | 1,442,378.91 ft | Latitude:     | 40.545480   |
|                      | +E/-W            | 58.4 ft | Easting:            | 3,201,000.90 ft | Longitude:    | -104.776740 |
| Position Uncertainty |                  | 0.0 ft  | Wellhead Elevation: | ft              | Ground Level: | 4,935.0 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          | 6/4/2013           | 8.62                   | 67.10                | 52,998                     |

|                          |                              |                   |                      |                      |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| <b>Design</b>            | Plan #1 (06-04-13)           |                   |                      |                      |
| <b>Audit Notes:</b>      |                              |                   |                      |                      |
| <b>Version:</b>          | <b>Phase:</b>                | PROTOTYPE         | <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                  | 174.65               |

| <b>Plan Sections</b> |                 |             |                     |            |            |                       |                      |                     |         |                   |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|-------------------|
| Measured Depth (ft)  | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target            |
| 0.0                  | 0.00            | 0.00        | 0.0                 | 0.0        | 0.0        | 0.00                  | 0.00                 | 0.00                | 0.00    |                   |
| 1,000.0              | 0.00            | 0.00        | 1,000.0             | 0.0        | 0.0        | 0.00                  | 0.00                 | 0.00                | 0.00    |                   |
| 1,343.3              | 6.87            | 60.03       | 1,342.5             | 10.3       | 17.8       | 2.00                  | 2.00                 | 0.00                | 60.03   |                   |
| 5,185.9              | 6.87            | 60.03       | 5,157.5             | 239.7      | 415.8      | 0.00                  | 0.00                 | 0.00                | 0.00    |                   |
| 5,529.2              | 0.00            | 0.00        | 5,500.0             | 250.0      | 433.6      | 2.00                  | -2.00                | 0.00                | 180.00  |                   |
| 6,446.6              | 0.00            | 0.00        | 6,417.4             | 250.0      | 433.6      | 0.00                  | 0.00                 | 0.00                | 0.00    |                   |
| 7,664.4              | 91.33           | 180.00      | 7,181.2             | -531.7     | 433.6      | 7.50                  | 7.50                 | 0.00                | 180.00  |                   |
| 11,764.3             | 91.33           | 180.00      | 7,086.0             | -4,630.5   | 433.6      | 0.00                  | 0.00                 | 0.00                | 0.00    | BHL 2140'FNL & 2C |

|                  |   |                                     |                           |
|------------------|---|-------------------------------------|---------------------------|
| <b>Database:</b> | Landmark                                  | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Project:</b>  | SEC.28-T7N-R66W                           | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site:</b>     | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>North Reference:</b>             | True                      |
| <b>Well:</b>     | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Wellbore:</b> | Wellbore #1                               |                                     |                           |
| <b>Design:</b>   | Plan #1 (06-04-13)                        |                                     |                           |

| Planned 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) |
| 0.0                 | 0.00            | 0.00        | 0.0                 | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 100.0               | 0.00            | 0.00        | 100.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 200.0               | 0.00            | 0.00        | 200.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 300.0               | 0.00            | 0.00        | 300.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 400.0               | 0.00            | 0.00        | 400.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 500.0               | 0.00            | 0.00        | 500.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 600.0               | 0.00            | 0.00        | 600.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 700.0               | 0.00            | 0.00        | 700.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 800.0               | 0.00            | 0.00        | 800.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 900.0               | 0.00            | 0.00        | 900.0               | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| 1,000.0             | 0.00            | 0.00        | 1,000.0             | 0.0        | 0.0        | 0.0                   | 0.00                  | 0.00                 | 0.00                |
| KOP #1              |                 |             |                     |            |            |                       |                       |                      |                     |
| 1,100.0             | 2.00            | 60.03       | 1,100.0             | 0.9        | 1.5        | -0.7                  | 2.00                  | 2.00                 | 0.00                |
| 1,200.0             | 4.00            | 60.03       | 1,199.8             | 3.5        | 6.0        | -2.9                  | 2.00                  | 2.00                 | 0.00                |
| 1,300.0             | 6.00            | 60.03       | 1,299.5             | 7.8        | 13.6       | -6.5                  | 2.00                  | 2.00                 | 0.00                |
| 1,343.3             | 6.87            | 60.03       | 1,342.5             | 10.3       | 17.8       | -8.6                  | 2.00                  | 2.00                 | 0.00                |
| 1,400.0             | 6.87            | 60.03       | 1,398.8             | 13.6       | 23.7       | -11.4                 | 0.00                  | 0.00                 | 0.00                |
| 1,500.0             | 6.87            | 60.03       | 1,498.1             | 19.6       | 34.0       | -16.4                 | 0.00                  | 0.00                 | 0.00                |
| 1,600.0             | 6.87            | 60.03       | 1,597.3             | 25.6       | 44.4       | -21.3                 | 0.00                  | 0.00                 | 0.00                |
| 1,700.0             | 6.87            | 60.03       | 1,696.6             | 31.6       | 54.7       | -26.3                 | 0.00                  | 0.00                 | 0.00                |
| 1,800.0             | 6.87            | 60.03       | 1,795.9             | 37.5       | 65.1       | -31.3                 | 0.00                  | 0.00                 | 0.00                |
| 1,900.0             | 6.87            | 60.03       | 1,895.2             | 43.5       | 75.5       | -36.3                 | 0.00                  | 0.00                 | 0.00                |
| 2,000.0             | 6.87            | 60.03       | 1,994.5             | 49.5       | 85.8       | -41.3                 | 0.00                  | 0.00                 | 0.00                |
| 2,100.0             | 6.87            | 60.03       | 2,093.8             | 55.5       | 96.2       | -46.2                 | 0.00                  | 0.00                 | 0.00                |
| 2,200.0             | 6.87            | 60.03       | 2,193.0             | 61.4       | 106.5      | -51.2                 | 0.00                  | 0.00                 | 0.00                |
| 2,300.0             | 6.87            | 60.03       | 2,292.3             | 67.4       | 116.9      | -56.2                 | 0.00                  | 0.00                 | 0.00                |
| 2,400.0             | 6.87            | 60.03       | 2,391.6             | 73.4       | 127.2      | -61.2                 | 0.00                  | 0.00                 | 0.00                |
| 2,500.0             | 6.87            | 60.03       | 2,490.9             | 79.3       | 137.6      | -66.2                 | 0.00                  | 0.00                 | 0.00                |
| 2,600.0             | 6.87            | 60.03       | 2,590.2             | 85.3       | 148.0      | -71.1                 | 0.00                  | 0.00                 | 0.00                |
| 2,700.0             | 6.87            | 60.03       | 2,689.4             | 91.3       | 158.3      | -76.1                 | 0.00                  | 0.00                 | 0.00                |
| 2,800.0             | 6.87            | 60.03       | 2,788.7             | 97.3       | 168.7      | -81.1                 | 0.00                  | 0.00                 | 0.00                |
| 2,900.0             | 6.87            | 60.03       | 2,888.0             | 103.2      | 179.0      | -86.1                 | 0.00                  | 0.00                 | 0.00                |
| 3,000.0             | 6.87            | 60.03       | 2,987.3             | 109.2      | 189.4      | -91.1                 | 0.00                  | 0.00                 | 0.00                |
| 3,100.0             | 6.87            | 60.03       | 3,086.6             | 115.2      | 199.8      | -96.0                 | 0.00                  | 0.00                 | 0.00                |
| 3,200.0             | 6.87            | 60.03       | 3,185.9             | 121.1      | 210.1      | -101.0                | 0.00                  | 0.00                 | 0.00                |
| 3,300.0             | 6.87            | 60.03       | 3,285.1             | 127.1      | 220.5      | -106.0                | 0.00                  | 0.00                 | 0.00                |
| 3,400.0             | 6.87            | 60.03       | 3,384.4             | 133.1      | 230.8      | -111.0                | 0.00                  | 0.00                 | 0.00                |
| 3,500.0             | 6.87            | 60.03       | 3,483.7             | 139.1      | 241.2      | -116.0                | 0.00                  | 0.00                 | 0.00                |
| 3,600.0             | 6.87            | 60.03       | 3,583.0             | 145.0      | 251.5      | -120.9                | 0.00                  | 0.00                 | 0.00                |
| 3,700.0             | 6.87            | 60.03       | 3,682.3             | 151.0      | 261.9      | -125.9                | 0.00                  | 0.00                 | 0.00                |
| 3,800.0             | 6.87            | 60.03       | 3,781.6             | 157.0      | 272.3      | -130.9                | 0.00                  | 0.00                 | 0.00                |
| 3,900.0             | 6.87            | 60.03       | 3,880.8             | 162.9      | 282.6      | -135.9                | 0.00                  | 0.00                 | 0.00                |
| 4,000.0             | 6.87            | 60.03       | 3,980.1             | 168.9      | 293.0      | -140.9                | 0.00                  | 0.00                 | 0.00                |
| 4,100.0             | 6.87            | 60.03       | 4,079.4             | 174.9      | 303.3      | -145.8                | 0.00                  | 0.00                 | 0.00                |
| 4,200.0             | 6.87            | 60.03       | 4,178.7             | 180.9      | 313.7      | -150.8                | 0.00                  | 0.00                 | 0.00                |
| 4,300.0             | 6.87            | 60.03       | 4,278.0             | 186.8      | 324.0      | -155.8                | 0.00                  | 0.00                 | 0.00                |
| 4,400.0             | 6.87            | 60.03       | 4,377.3             | 192.8      | 334.4      | -160.8                | 0.00                  | 0.00                 | 0.00                |
| 4,500.0             | 6.87            | 60.03       | 4,476.5             | 198.8      | 344.8      | -165.8                | 0.00                  | 0.00                 | 0.00                |
| 4,600.0             | 6.87            | 60.03       | 4,575.8             | 204.7      | 355.1      | -170.7                | 0.00                  | 0.00                 | 0.00                |
| 4,700.0             | 6.87            | 60.03       | 4,675.1             | 210.7      | 365.5      | -175.7                | 0.00                  | 0.00                 | 0.00                |
| 4,800.0             | 6.87            | 60.03       | 4,774.4             | 216.7      | 375.8      | -180.7                | 0.00                  | 0.00                 | 0.00                |
| 4,900.0             | 6.87            | 60.03       | 4,873.7             | 222.7      | 386.2      | -185.7                | 0.00                  | 0.00                 | 0.00                |
| 5,000.0             | 6.87            | 60.03       | 4,972.9             | 228.6      | 396.5      | -190.7                | 0.00                  | 0.00                 | 0.00                |

|                  |   |                                     |                           |
|------------------|---|-------------------------------------|---------------------------|
| <b>Database:</b> | Landmark                                  | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Project:</b>  | SEC.28-T7N-R66W                           | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site:</b>     | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>North Reference:</b>             | True                      |
| <b>Well:</b>     | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Wellbore:</b> | Wellbore #1                               |                                     |                           |
| <b>Design:</b>   | Plan #1 (06-04-13)                        |                                     |                           |

| Planned 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) |
| 5,100.0                  | 6.87            | 60.03       | 5,072.2             | 234.6     | 406.9     | -195.6                | 0.00                  | 0.00                 | 0.00                |
| 5,185.9                  | 6.87            | 60.03       | 5,157.5             | 239.7     | 415.8     | -199.9                | 0.00                  | 0.00                 | 0.00                |
| 5,200.0                  | 6.58            | 60.03       | 5,171.5             | 240.6     | 417.2     | -200.6                | 2.00                  | -2.00                | 0.00                |
| 5,300.0                  | 4.58            | 60.03       | 5,271.0             | 245.4     | 425.7     | -204.7                | 2.00                  | -2.00                | 0.00                |
| 5,400.0                  | 2.58            | 60.03       | 5,370.8             | 248.5     | 431.1     | -207.3                | 2.00                  | -2.00                | 0.00                |
| 5,500.0                  | 0.58            | 60.03       | 5,470.8             | 249.9     | 433.5     | -208.4                | 2.00                  | -2.00                | 0.00                |
| 5,529.2                  | 0.00            | 0.00        | 5,500.0             | 250.0     | 433.6     | -208.5                | 2.00                  | -2.00                | 0.00                |
| 5,600.0                  | 0.00            | 0.00        | 5,570.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 5,700.0                  | 0.00            | 0.00        | 5,670.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 5,800.0                  | 0.00            | 0.00        | 5,770.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 5,900.0                  | 0.00            | 0.00        | 5,870.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,000.0                  | 0.00            | 0.00        | 5,970.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,100.0                  | 0.00            | 0.00        | 6,070.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,200.0                  | 0.00            | 0.00        | 6,170.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,300.0                  | 0.00            | 0.00        | 6,270.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,400.0                  | 0.00            | 0.00        | 6,370.8             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| 6,446.6                  | 0.00            | 0.00        | 6,417.4             | 250.0     | 433.6     | -208.5                | 0.00                  | 0.00                 | 0.00                |
| <b>KOP #2</b>            |                 |             |                     |           |           |                       |                       |                      |                     |
| 6,500.0                  | 4.00            | 180.00      | 6,470.8             | 248.1     | 433.6     | -206.6                | 7.50                  | 7.50                 | 0.00                |
| 6,600.0                  | 11.50           | 180.00      | 6,569.8             | 234.7     | 433.6     | -193.2                | 7.50                  | 7.50                 | 0.00                |
| 6,700.0                  | 19.00           | 180.00      | 6,666.2             | 208.4     | 433.6     | -167.0                | 7.50                  | 7.50                 | 0.00                |
| 6,800.0                  | 26.50           | 180.00      | 6,758.3             | 169.7     | 433.6     | -128.6                | 7.50                  | 7.50                 | 0.00                |
| 6,900.0                  | 34.00           | 180.00      | 6,844.6             | 119.4     | 433.6     | -78.4                 | 7.50                  | 7.50                 | 0.00                |
| 7,000.0                  | 41.50           | 180.00      | 6,923.7             | 58.2      | 433.6     | -17.5                 | 7.50                  | 7.50                 | 0.00                |
| 7,100.0                  | 49.00           | 180.00      | 6,994.0             | -12.8     | 433.6     | 53.2                  | 7.50                  | 7.50                 | 0.00                |
| 7,200.0                  | 56.50           | 180.00      | 7,054.5             | -92.3     | 433.6     | 132.4                 | 7.50                  | 7.50                 | 0.00                |
| 7,300.0                  | 64.00           | 180.00      | 7,104.1             | -179.1    | 433.6     | 218.7                 | 7.50                  | 7.50                 | 0.00                |
| 7,400.0                  | 71.50           | 180.00      | 7,141.9             | -271.6    | 433.6     | 310.8                 | 7.50                  | 7.50                 | 0.00                |
| 7,500.0                  | 79.00           | 180.00      | 7,167.3             | -368.2    | 433.6     | 407.0                 | 7.50                  | 7.50                 | 0.00                |
| 7,600.0                  | 86.50           | 180.00      | 7,179.9             | -467.3    | 433.6     | 505.7                 | 7.50                  | 7.50                 | 0.00                |
| 7,664.4                  | 91.33           | 180.00      | 7,181.2             | -531.7    | 433.6     | 569.8                 | 7.50                  | 7.50                 | 0.00                |
| <b>End of Build - 7"</b> |                 |             |                     |           |           |                       |                       |                      |                     |
| 7,700.0                  | 91.33           | 180.00      | 7,180.3             | -567.3    | 433.6     | 605.3                 | 0.00                  | 0.00                 | 0.00                |
| 7,800.0                  | 91.33           | 180.00      | 7,178.0             | -667.3    | 433.6     | 704.8                 | 0.00                  | 0.00                 | 0.00                |
| 7,900.0                  | 91.33           | 180.00      | 7,175.7             | -767.2    | 433.6     | 804.3                 | 0.00                  | 0.00                 | 0.00                |
| 8,000.0                  | 91.33           | 180.00      | 7,173.4             | -867.2    | 433.6     | 903.9                 | 0.00                  | 0.00                 | 0.00                |
| 8,100.0                  | 91.33           | 180.00      | 7,171.1             | -967.2    | 433.6     | 1,003.4               | 0.00                  | 0.00                 | 0.00                |
| 8,200.0                  | 91.33           | 180.00      | 7,168.7             | -1,067.2  | 433.6     | 1,103.0               | 0.00                  | 0.00                 | 0.00                |
| 8,300.0                  | 91.33           | 180.00      | 7,166.4             | -1,167.1  | 433.6     | 1,202.5               | 0.00                  | 0.00                 | 0.00                |
| 8,400.0                  | 91.33           | 180.00      | 7,164.1             | -1,267.1  | 433.6     | 1,302.0               | 0.00                  | 0.00                 | 0.00                |
| 8,500.0                  | 91.33           | 180.00      | 7,161.8             | -1,367.1  | 433.6     | 1,401.6               | 0.00                  | 0.00                 | 0.00                |
| 8,600.0                  | 91.33           | 180.00      | 7,159.4             | -1,467.1  | 433.6     | 1,501.1               | 0.00                  | 0.00                 | 0.00                |
| 8,700.0                  | 91.33           | 180.00      | 7,157.1             | -1,567.0  | 433.6     | 1,600.6               | 0.00                  | 0.00                 | 0.00                |
| 8,800.0                  | 91.33           | 180.00      | 7,154.8             | -1,667.0  | 433.6     | 1,700.2               | 0.00                  | 0.00                 | 0.00                |
| 8,900.0                  | 91.33           | 180.00      | 7,152.5             | -1,767.0  | 433.6     | 1,799.7               | 0.00                  | 0.00                 | 0.00                |
| 9,000.0                  | 91.33           | 180.00      | 7,150.2             | -1,867.0  | 433.6     | 1,899.3               | 0.00                  | 0.00                 | 0.00                |
| 9,100.0                  | 91.33           | 180.00      | 7,147.8             | -1,966.9  | 433.6     | 1,998.8               | 0.00                  | 0.00                 | 0.00                |
| 9,200.0                  | 91.33           | 180.00      | 7,145.5             | -2,066.9  | 433.6     | 2,098.3               | 0.00                  | 0.00                 | 0.00                |
| 9,300.0                  | 91.33           | 180.00      | 7,143.2             | -2,166.9  | 433.6     | 2,197.9               | 0.00                  | 0.00                 | 0.00                |
| 9,400.0                  | 91.33           | 180.00      | 7,140.9             | -2,266.8  | 433.6     | 2,297.4               | 0.00                  | 0.00                 | 0.00                |
| 9,500.0                  | 91.33           | 180.00      | 7,138.6             | -2,366.8  | 433.6     | 2,396.9               | 0.00                  | 0.00                 | 0.00                |
| 9,600.0                  | 91.33           | 180.00      | 7,136.2             | -2,466.8  | 433.6     | 2,496.5               | 0.00                  | 0.00                 | 0.00                |
| 9,700.0                  | 91.33           | 180.00      | 7,133.9             | -2,566.8  | 433.6     | 2,596.0               | 0.00                  | 0.00                 | 0.00                |

|                  |   |                                     |                           |
|------------------|---|-------------------------------------|---------------------------|
| <b>Database:</b> | Landmark                                  | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Company:</b>  | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Project:</b>  | SEC.28-T7N-R66W                           | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site:</b>     | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>North Reference:</b>             | True                      |
| <b>Well:</b>     | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Wellbore:</b> | Wellbore #1                               |                                     |                           |
| <b>Design:</b>   | Plan #1 (06-04-13)                        |                                     |                           |

## Planned 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) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 9,800.0                                   | 91.33           | 180.00      | 7,131.6             | -2,666.7   | 433.6      | 2,695.6               | 0.00                  | 0.00                 | 0.00                |
| 9,900.0                                   | 91.33           | 180.00      | 7,129.3             | -2,766.7   | 433.6      | 2,795.1               | 0.00                  | 0.00                 | 0.00                |
| 10,000.0                                  | 91.33           | 180.00      | 7,127.0             | -2,866.7   | 433.6      | 2,894.6               | 0.00                  | 0.00                 | 0.00                |
| 10,100.0                                  | 91.33           | 180.00      | 7,124.6             | -2,966.7   | 433.6      | 2,994.2               | 0.00                  | 0.00                 | 0.00                |
| 10,200.0                                  | 91.33           | 180.00      | 7,122.3             | -3,066.6   | 433.6      | 3,093.7               | 0.00                  | 0.00                 | 0.00                |
| 10,300.0                                  | 91.33           | 180.00      | 7,120.0             | -3,166.6   | 433.6      | 3,193.2               | 0.00                  | 0.00                 | 0.00                |
| 10,400.0                                  | 91.33           | 180.00      | 7,117.7             | -3,266.6   | 433.6      | 3,292.8               | 0.00                  | 0.00                 | 0.00                |
| 10,500.0                                  | 91.33           | 180.00      | 7,115.3             | -3,366.5   | 433.6      | 3,392.3               | 0.00                  | 0.00                 | 0.00                |
| 10,600.0                                  | 91.33           | 180.00      | 7,113.0             | -3,466.5   | 433.6      | 3,491.9               | 0.00                  | 0.00                 | 0.00                |
| 10,700.0                                  | 91.33           | 180.00      | 7,110.7             | -3,566.5   | 433.6      | 3,591.4               | 0.00                  | 0.00                 | 0.00                |
| 10,800.0                                  | 91.33           | 180.00      | 7,108.4             | -3,666.5   | 433.6      | 3,690.9               | 0.00                  | 0.00                 | 0.00                |
| 10,900.0                                  | 91.33           | 180.00      | 7,106.1             | -3,766.4   | 433.6      | 3,790.5               | 0.00                  | 0.00                 | 0.00                |
| 11,000.0                                  | 91.33           | 180.00      | 7,103.7             | -3,866.4   | 433.6      | 3,890.0               | 0.00                  | 0.00                 | 0.00                |
| 11,100.0                                  | 91.33           | 180.00      | 7,101.4             | -3,966.4   | 433.6      | 3,989.5               | 0.00                  | 0.00                 | 0.00                |
| 11,200.0                                  | 91.33           | 180.00      | 7,099.1             | -4,066.4   | 433.6      | 4,089.1               | 0.00                  | 0.00                 | 0.00                |
| 11,300.0                                  | 91.33           | 180.00      | 7,096.8             | -4,166.3   | 433.6      | 4,188.6               | 0.00                  | 0.00                 | 0.00                |
| 11,400.0                                  | 91.33           | 180.00      | 7,094.5             | -4,266.3   | 433.6      | 4,288.2               | 0.00                  | 0.00                 | 0.00                |
| 11,500.0                                  | 91.33           | 180.00      | 7,092.1             | -4,366.3   | 433.6      | 4,387.7               | 0.00                  | 0.00                 | 0.00                |
| 11,600.0                                  | 91.33           | 180.00      | 7,089.8             | -4,466.3   | 433.6      | 4,487.2               | 0.00                  | 0.00                 | 0.00                |
| 11,700.0                                  | 91.33           | 180.00      | 7,087.5             | -4,566.2   | 433.6      | 4,586.8               | 0.00                  | 0.00                 | 0.00                |
| 11,760.7                                  | 91.33           | 180.00      | 7,086.1             | -4,626.9   | 433.6      | 4,647.2               | 0.00                  | 0.00                 | 0.00                |
| <b>BHL 2140'FNL &amp; 541'FEL, SEC.33</b> |                 |             |                     |            |            |                       |                       |                      |                     |
| 11,764.3                                  | 91.33           | 180.00      | 7,086.0             | -4,630.5   | 433.6      | 4,650.8               | 0.00                  | 0.00                 | 0.00                |
| <b>BHL 2140'FNL &amp; 200'FEL, SEC.33</b> |                 |             |                     |            |            |                       |                       |                      |                     |

## Casing Points

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---------------------|---------------------|------|---------------------|-------------------|
| 7,664.4             | 7,181.2             | 7"   | 7                   | 7-1/2             |

## Plan Annotations

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Local Coordinates |               | Comment      |
|---------------------------|---------------------------|-------------------|---------------|--------------|
|                           |                           | +N/-S<br>(ft)     | +E/-W<br>(ft) |              |
| 1,000.0                   | 1,000.0                   | 0.0               | 0.0           | KOP #1       |
| 6,446.6                   | 6,417.4                   | 250.0             | 433.6         | KOP #2       |
| 7,664.4                   | 7,181.2                   | -531.7            | 433.6         | End of Build |



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T7N-R66W**

**Thornton 28SW-HZ Pad Sec.28-T7N-R66W**

**Thornton 28W-103**

**Wellbore #1**

**Plan #1 (06-04-13)**

## **Anticollision Report**

**11 June, 2013**



|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

|                                     |   |                       |                     |
|-------------------------------------|---|-----------------------|---------------------|
| <b>Reference</b>                    | Plan #1 (06-04-13)  |                       |                     |
| <b>Filter type:</b>                 | NO GLOBAL FILTER: Using user defined selection & filtering criteria |                       |                     |
| <b>Interpolation Method:</b>        | Stations  | <b>Error Model:</b>   | ISCWSA              |
| <b>Depth Range:</b>                 | Unlimited   | <b>Scan Method:</b>   | Closest Approach 3D |
| <b>Results Limited by:</b>          | Maximum center-center distance of 1,000.0ft                         | <b>Error Surface:</b> | Elliptical Conic    |
| <b>Warning Levels Evaluated at:</b> | 2.00 Sigma  |                       |                     |

|                            |                |                                  |                  |                    |
|----------------------------|----------------|----------------------------------|------------------|--------------------|
| <b>Survey Tool Program</b> | <b>Date</b>    | 6/5/2013                         |                  |                    |
| <b>From (ft)</b>           | <b>To (ft)</b> | <b>Survey (Wellbore)</b>         | <b>Tool Name</b> | <b>Description</b> |
| 0.0                        | 11,764.3       | Plan #1 (06-04-13) (Wellbore #1) | MWD              | MWD - Standard     |

| Summary   |                               |                            |                               |                       |                   |                     |
|---|-------------------------------|----------------------------|-------------------------------|-----------------------|-------------------|---------------------|
| Site Name   | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Between Ellipses (ft) | Separation Factor | Warning             |
| Offset Well - Wellbore - Design                       |                               |                            |                               |                       |                   |                     |
| Existing Wells  |                               |                            |                               |                       |                   |                     |
| Hall 42-33 (Exist.) - Wellbore #1 - Wellbore #1       | 11,647.7                      | 7,044.7                    | 397.5                         | 167.6                 | 1.729             | CC, ES, SF          |
| Telarcio 33C (Exist.) - Wellbore #1 - Wellbore #1     |                               |                            |                               |                       |                   | Out of range        |
| Tolmachoff 41-33 (Exist.) - Wellbore #1 - Wellbore #1 | 10,106.2                      | 7,094.5                    | 205.7                         | 3.7                   | 1.019             | Level 2, CC, ES, SF |
| Thornton 28SW-HZ Pad Sec.28-T7N-R66W                  |                               |                            |                               |                       |                   |                     |
| Thornton 28S-223 - Wellbore #1 - Plan #1 (06-04-13)   | 1,000.0                       | 1,000.0                    | 58.5                          | 54.2                  | 13.693            | CC, ES              |
| Thornton 28S-223 - Wellbore #1 - Plan #1 (06-04-13)   | 11,764.3                      | 11,882.8                   | 627.1                         | 447.5                 | 3.492             | SF                  |
| Thornton 28S-403 - Wellbore #1 - Plan #1 (06-04-13)   | 1,000.0                       | 1,000.0                    | 89.0                          | 84.7                  | 20.843            | CC, ES              |
| Thornton 28S-403 - Wellbore #1 - Plan #1 (06-04-13)   | 11,764.3                      | 11,988.7                   | 981.5                         | 806.8                 | 5.620             | SF                  |
| Thornton 28W-443 - Wellbore #1 - Plan #1 (06-04-13)   | 1,000.0                       | 1,000.0                    | 30.6                          | 26.3                  | 7.159             | CC, ES              |
| Thornton 28W-443 - Wellbore #1 - Plan #1 (06-04-13)   | 11,764.3                      | 11,975.0                   | 461.5                         | 316.7                 | 3.187             | SF                  |

| <b>Offset Design</b>   | Existing Wells - Hall 42-33 (Exist.) - Wellbore #1 - Wellbore #1 |                     |                     |                |             |                       |                                   |                   |                      |                       |                         |                   | <b>Offset Site Error:</b> | 0.0 ft |
|------------------------|--|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|-------------------|----------------------|-----------------------|-------------------------|-------------------|---------------------------|--------|
| <b>Survey Program:</b> | 7500-UNKNOWN   |                     |                     |                |             |                       |                                   |                   |                      |                       |                         |                   | <b>Offset Well Error:</b> | 0.0 ft |
| Reference              | Offset   | Semi Major Axis     |                     | Distance       |             | Minimum Separation    |                                   | Separation Factor |                      | Warning               |                         |                   |                           |        |
| Measured Depth (ft)    | Vertical Depth (ft)  | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft)        | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor |                           |        |
| 10,800.0               | 7,108.4  | 7,064.4             | 7,064.4             | 73.3           | 141.3       | 92.83                 | -4,513.9                          | 36.1              | 936.1                | 721.9                 | 214.15                  | 4.371             |                           |        |
| 10,900.0               | 7,106.1  | 7,062.1             | 7,062.1             | 75.2           | 141.2       | 92.50                 | -4,513.9                          | 36.1              | 846.6                | 630.6                 | 216.02                  | 3.919             |                           |        |
| 11,000.0               | 7,103.7  | 7,059.7             | 7,059.7             | 77.1           | 141.2       | 92.17                 | -4,513.9                          | 36.1              | 759.8                | 541.9                 | 217.90                  | 3.487             |                           |        |
| 11,100.0               | 7,101.4  | 7,057.4             | 7,057.4             | 78.9           | 141.1       | 91.83                 | -4,513.9                          | 36.1              | 676.6                | 456.8                 | 219.76                  | 3.079             |                           |        |
| 11,200.0               | 7,099.1  | 7,055.1             | 7,055.1             | 80.8           | 141.1       | 91.50                 | -4,513.9                          | 36.1              | 598.6                | 377.0                 | 221.63                  | 2.701             |                           |        |
| 11,300.0               | 7,096.8  | 7,052.8             | 7,052.8             | 82.7           | 141.1       | 91.16                 | -4,513.9                          | 36.1              | 528.0                | 304.6                 | 223.49                  | 2.363             |                           |        |
| 11,400.0               | 7,094.5  | 7,050.5             | 7,050.5             | 84.6           | 141.0       | 90.83                 | -4,513.9                          | 36.1              | 468.3                | 243.0                 | 225.34                  | 2.078             |                           |        |
| 11,500.0               | 7,092.1  | 7,048.1             | 7,048.1             | 86.5           | 141.0       | 90.49                 | -4,513.9                          | 36.1              | 424.0                | 196.8                 | 227.19                  | 1.866             |                           |        |
| 11,600.0               | 7,089.8  | 7,045.8             | 7,045.8             | 88.4           | 140.9       | 90.16                 | -4,513.9                          | 36.1              | 400.4                | 171.3                 | 229.03                  | 1.748             |                           |        |
| 11,647.7               | 7,088.7  | 7,044.7             | 7,044.7             | 89.3           | 140.9       | 90.00                 | -4,513.9                          | 36.1              | 397.5                | 167.6                 | 229.91                  | 1.729             | CC, ES, SF                |        |
| 11,700.0               | 7,087.5  | 7,043.5             | 7,043.5             | 90.3           | 140.9       | 89.83                 | -4,513.9                          | 36.1              | 400.9                | 170.1                 | 230.87                  | 1.737             |                           |        |
| 11,764.3               | 7,086.0  | 7,042.0             | 7,042.0             | 91.5           | 140.8       | 89.61                 | -4,513.9                          | 36.1              | 414.2                | 182.2                 | 232.05                  | 1.785             |                           |        |



|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design                |                | Existing Wells - Tolmachoff 41-33 (Exist.) - Wellbore #1 - Wellbore #1 |                |                 |        |                   |                        |            |                 |                  |                    |                   | Offset Site Error:  |                    | 0.0 ft |        |
|------------------------------|----------------|--|----------------|-----------------|--------|-------------------|------------------------|------------|-----------------|------------------|--------------------|-------------------|---------------------|--------------------|--------|--------|
| Survey Program: 7500-UNKNOWN |                |  |                |                 |        |                   |                        |            |                 |                  |                    |                   |                     | Offset Well Error: |        | 0.0 ft |
| Reference                    |                | Offset   |                | Semi Major Axis |        | Distance          |                        |            |                 |                  |                    |                   | Warning             |                    |        |        |
| Measured Depth               | Vertical Depth | Measured Depth   | Vertical Depth | Reference       | Offset | Highside Toolface | Offset Wellbore Centre |            | Between Centres | Between Ellipses | Minimum Separation | Separation Factor |                     |                    |        |        |
| Depth (ft)                   | Depth (ft)     | Depth (ft)   | Depth (ft)     | (ft)            | (ft)   | (°)               | +N/-S (ft)             | +E/-W (ft) | (ft)            | (ft)             | (ft)               |                   |                     |                    |        |        |
| 9,200.0                      | 7,145.5        | 7,115.5  | 7,115.5        | 44.0            | 142.3  | 95.84             | -2,972.9               | 227.9      | 929.0           | 744.0            | 185.04             | 5.021             |                     |                    |        |        |
| 9,300.0                      | 7,143.2        | 7,113.2  | 7,113.2        | 45.7            | 142.3  | 95.20             | -2,972.9               | 227.9      | 831.8           | 644.9            | 186.96             | 4.449             |                     |                    |        |        |
| 9,400.0                      | 7,140.9        | 7,110.9  | 7,110.9        | 47.5            | 142.2  | 94.55             | -2,972.9               | 227.9      | 735.4           | 546.5            | 188.87             | 3.894             |                     |                    |        |        |
| 9,500.0                      | 7,138.6        | 7,108.6  | 7,108.6        | 49.3            | 142.2  | 93.91             | -2,972.9               | 227.9      | 640.0           | 449.2            | 190.77             | 3.355             |                     |                    |        |        |
| 9,600.0                      | 7,136.2        | 7,106.2  | 7,106.2        | 51.2            | 142.1  | 93.27             | -2,972.9               | 227.9      | 546.3           | 353.6            | 192.65             | 2.836             |                     |                    |        |        |
| 9,700.0                      | 7,133.9        | 7,103.9  | 7,103.9        | 53.0            | 142.1  | 92.62             | -2,972.9               | 227.9      | 455.2           | 260.7            | 194.52             | 2.340             |                     |                    |        |        |
| 9,800.0                      | 7,131.6        | 7,101.6  | 7,101.6        | 54.8            | 142.0  | 91.98             | -2,972.9               | 227.9      | 368.8           | 172.4            | 196.38             | 1.878             |                     |                    |        |        |
| 9,900.0                      | 7,129.3        | 7,099.3  | 7,099.3        | 56.6            | 142.0  | 91.33             | -2,972.9               | 227.9      | 291.2           | 93.0             | 198.22             | 1.469             | Level 3             |                    |        |        |
| 10,000.0                     | 7,127.0        | 7,097.0  | 7,097.0        | 58.5            | 141.9  | 90.69             | -2,972.9               | 227.9      | 231.5           | 31.4             | 200.04             | 1.157             | Level 2             |                    |        |        |
| 10,100.0                     | 7,124.6        | 7,094.6  | 7,094.6        | 60.3            | 141.9  | 90.04             | -2,972.9               | 227.9      | 205.8           | 4.0              | 201.85             | 1.020             | Level 2             |                    |        |        |
| 10,106.2                     | 7,124.5        | 7,094.5  | 7,094.5        | 60.4            | 141.9  | 90.00             | -2,972.9               | 227.9      | 205.7           | 3.7              | 201.96             | 1.019             | Level 2, CC, ES, SF |                    |        |        |
| 10,200.0                     | 7,122.3        | 7,092.3  | 7,092.3        | 62.2            | 141.8  | 89.39             | -2,972.9               | 227.9      | 226.1           | 22.4             | 203.63             | 1.110             | Level 2             |                    |        |        |
| 10,300.0                     | 7,120.0        | 7,090.0  | 7,090.0        | 64.0            | 141.8  | 88.75             | -2,972.9               | 227.9      | 282.6           | 77.2             | 205.39             | 1.376             | Level 3             |                    |        |        |
| 10,400.0                     | 7,117.7        | 7,087.7  | 7,087.7        | 65.9            | 141.8  | 88.10             | -2,972.9               | 227.9      | 358.6           | 151.5            | 207.13             | 1.731             |                     |                    |        |        |
| 10,500.0                     | 7,115.3        | 7,085.3  | 7,085.3        | 67.7            | 141.7  | 87.46             | -2,972.9               | 227.9      | 444.2           | 235.4            | 208.85             | 2.127             |                     |                    |        |        |
| 10,600.0                     | 7,113.0        | 7,083.0  | 7,083.0        | 69.6            | 141.7  | 86.81             | -2,972.9               | 227.9      | 534.8           | 324.3            | 210.54             | 2.540             |                     |                    |        |        |
| 10,700.0                     | 7,110.7        | 7,080.7  | 7,080.7        | 71.5            | 141.6  | 86.17             | -2,972.9               | 227.9      | 628.3           | 416.1            | 212.21             | 2.961             |                     |                    |        |        |
| 10,800.0                     | 7,108.4        | 7,078.4  | 7,078.4        | 73.3            | 141.6  | 85.52             | -2,972.9               | 227.9      | 723.5           | 509.6            | 213.85             | 3.383             |                     |                    |        |        |
| 10,900.0                     | 7,106.1        | 7,076.1  | 7,076.1        | 75.2            | 141.5  | 84.88             | -2,972.9               | 227.9      | 819.8           | 604.3            | 215.47             | 3.805             |                     |                    |        |        |
| 11,000.0                     | 7,103.7        | 7,073.7  | 7,073.7        | 77.1            | 141.5  | 84.24             | -2,972.9               | 227.9      | 916.9           | 699.9            | 217.07             | 4.224             |                     |                    |        |        |

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-223 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |                |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD  |                     |                     |                     |                |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Well Error: | 0.0 ft |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning            |        |
| 0.0  | 0.0                 | 0.0                 | 0.0                 | 0.0            | 0.0         | -93.57                | -3.6                              | -58.4                             | 58.5                 |                       |                         |                   |                    |        |
| 100.0  | 100.0               | 100.0               | 100.0               | 0.1            | 0.1         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 58.3                  | 0.22                    | 260.168           |                    |        |
| 200.0  | 200.0               | 200.0               | 200.0               | 0.3            | 0.3         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 57.8                  | 0.67                    | 86.723            |                    |        |
| 300.0  | 300.0               | 300.0               | 300.0               | 0.6            | 0.6         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 57.4                  | 1.12                    | 52.034            |                    |        |
| 400.0  | 400.0               | 400.0               | 400.0               | 0.8            | 0.8         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 56.9                  | 1.57                    | 37.167            |                    |        |
| 500.0  | 500.0               | 500.0               | 500.0               | 1.0            | 1.0         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 56.5                  | 2.02                    | 28.908            |                    |        |
| 600.0  | 600.0               | 600.0               | 600.0               | 1.2            | 1.2         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 56.0                  | 2.47                    | 23.652            |                    |        |
| 700.0  | 700.0               | 700.0               | 700.0               | 1.5            | 1.5         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 55.6                  | 2.92                    | 20.013            |                    |        |
| 800.0  | 800.0               | 800.0               | 800.0               | 1.7            | 1.7         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 55.1                  | 3.37                    | 17.345            |                    |        |
| 900.0  | 900.0               | 900.0               | 900.0               | 1.9            | 1.9         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 54.7                  | 3.82                    | 15.304            |                    |        |
| 1,000.0  | 1,000.0             | 1,000.0             | 1,000.0             | 2.1            | 2.1         | -93.57                | -3.6                              | -58.4                             | 58.5                 | 54.2                  | 4.27                    | 13.693 CC, ES     |                    |        |
| 1,100.0  | 1,100.0             | 1,100.0             | 1,100.0             | 2.4            | 2.4         | -154.33               | -3.6                              | -58.4                             | 60.0                 | 55.3                  | 4.71                    | 12.743            |                    |        |
| 1,200.0  | 1,199.8             | 1,199.8             | 1,199.8             | 2.6            | 2.6         | -156.29               | -3.6                              | -58.4                             | 64.8                 | 59.7                  | 5.15                    | 12.594            |                    |        |
| 1,300.0  | 1,299.5             | 1,299.5             | 1,299.5             | 2.8            | 2.8         | -158.99               | -3.6                              | -58.4                             | 72.9                 | 67.3                  | 5.58                    | 13.068            |                    |        |
| 1,343.3  | 1,342.5             | 1,342.5             | 1,342.5             | 2.9            | 2.9         | -160.25               | -3.6                              | -58.4                             | 77.4                 | 71.7                  | 5.76                    | 13.438            |                    |        |
| 1,400.0  | 1,398.8             | 1,398.8             | 1,398.8             | 3.0            | 3.0         | -161.81               | -3.6                              | -58.4                             | 83.8                 | 77.8                  | 6.01                    | 13.947            |                    |        |
| 1,500.0  | 1,498.1             | 1,498.1             | 1,498.1             | 3.3            | 3.3         | -164.06               | -3.6                              | -58.4                             | 95.3                 | 88.8                  | 6.45                    | 14.763            |                    |        |
| 1,600.0  | 1,597.3             | 1,597.3             | 1,597.3             | 3.6            | 3.5         | -165.82               | -3.6                              | -58.4                             | 106.8                | 99.9                  | 6.90                    | 15.485            |                    |        |
| 1,700.0  | 1,696.6             | 1,696.6             | 1,696.6             | 3.8            | 3.7         | -167.23               | -3.6                              | -58.4                             | 118.5                | 111.1                 | 7.35                    | 16.125            |                    |        |
| 1,800.0  | 1,795.9             | 1,795.9             | 1,795.9             | 4.1            | 3.9         | -168.40               | -3.6                              | -58.4                             | 130.2                | 122.4                 | 7.80                    | 16.696            |                    |        |
| 1,900.0  | 1,895.2             | 1,895.2             | 1,895.2             | 4.4            | 4.1         | -169.37               | -3.6                              | -58.4                             | 141.9                | 133.6                 | 8.25                    | 17.207            |                    |        |
| 2,000.0  | 1,994.5             | 1,994.5             | 1,994.5             | 4.7            | 4.4         | -170.19               | -3.6                              | -58.4                             | 153.7                | 145.0                 | 8.70                    | 17.667            |                    |        |
| 2,100.0  | 2,093.8             | 2,093.2             | 2,093.2             | 5.0            | 4.6         | -170.36               | -2.3                              | -59.0                             | 165.6                | 156.4                 | 9.15                    | 18.102            |                    |        |
| 2,200.0  | 2,193.0             | 2,191.8             | 2,191.7             | 5.3            | 4.8         | -169.42               | 2.1                               | -61.2                             | 177.9                | 168.3                 | 9.60                    | 18.531            |                    |        |
| 2,300.0  | 2,292.3             | 2,290.0             | 2,289.5             | 5.6            | 5.0         | -167.59               | 9.5                               | -64.8                             | 190.7                | 180.6                 | 10.06                   | 18.960            |                    |        |
| 2,400.0  | 2,391.6             | 2,387.7             | 2,386.6             | 5.9            | 5.3         | -165.07               | 19.9                              | -69.8                             | 204.3                | 193.7                 | 10.53                   | 19.404            |                    |        |
| 2,500.0  | 2,490.9             | 2,486.3             | 2,484.3             | 6.2            | 5.5         | -162.53               | 31.4                              | -75.5                             | 218.5                | 207.5                 | 11.01                   | 19.839            |                    |        |
| 2,600.0  | 2,590.2             | 2,584.8             | 2,582.0             | 6.5            | 5.7         | -160.31               | 42.9                              | -81.1                             | 233.1                | 221.6                 | 11.51                   | 20.253            |                    |        |
| 2,700.0  | 2,689.4             | 2,683.4             | 2,679.7             | 6.8            | 6.0         | -158.34               | 54.4                              | -86.7                             | 248.0                | 236.0                 | 12.01                   | 20.642            |                    |        |
| 2,800.0  | 2,788.7             | 2,781.9             | 2,777.4             | 7.1            | 6.3         | -156.60               | 66.0                              | -92.3                             | 263.1                | 250.6                 | 12.52                   | 21.008            |                    |        |
| 2,900.0  | 2,888.0             | 2,880.5             | 2,875.1             | 7.4            | 6.5         | -155.05               | 77.5                              | -97.9                             | 278.5                | 265.4                 | 13.04                   | 21.352            |                    |        |
| 3,000.0  | 2,987.3             | 2,979.0             | 2,972.8             | 7.7            | 6.8         | -153.66               | 89.0                              | -103.6                            | 294.0                | 280.4                 | 13.57                   | 21.674            |                    |        |
| 3,100.0  | 3,086.6             | 3,077.6             | 3,070.5             | 8.0            | 7.1         | -152.41               | 100.5                             | -109.2                            | 309.7                | 295.6                 | 14.09                   | 21.976            |                    |        |
| 3,200.0  | 3,185.9             | 3,176.1             | 3,168.2             | 8.3            | 7.4         | -151.28               | 112.1                             | -114.8                            | 325.5                | 310.9                 | 14.62                   | 22.260            |                    |        |
| 3,300.0  | 3,285.1             | 3,274.7             | 3,265.9             | 8.6            | 7.6         | -150.26               | 123.6                             | -120.4                            | 341.5                | 326.3                 | 15.16                   | 22.526            |                    |        |
| 3,400.0  | 3,384.4             | 3,373.2             | 3,363.7             | 8.9            | 7.9         | -149.33               | 135.1                             | -126.1                            | 357.5                | 341.8                 | 15.70                   | 22.776            |                    |        |
| 3,500.0  | 3,483.7             | 3,471.8             | 3,461.4             | 9.2            | 8.2         | -148.47               | 146.6                             | -131.7                            | 373.6                | 357.4                 | 16.24                   | 23.012            |                    |        |
| 3,600.0  | 3,583.0             | 3,570.3             | 3,559.1             | 9.6            | 8.5         | -147.69               | 158.1                             | -137.3                            | 389.8                | 373.0                 | 16.78                   | 23.234            |                    |        |
| 3,700.0  | 3,682.3             | 3,668.8             | 3,656.8             | 9.9            | 8.8         | -146.97               | 169.7                             | -142.9                            | 406.0                | 388.7                 | 17.32                   | 23.443            |                    |        |
| 3,800.0  | 3,781.6             | 3,767.4             | 3,754.5             | 10.2           | 9.1         | -146.30               | 181.2                             | -148.5                            | 422.4                | 404.5                 | 17.87                   | 23.641            |                    |        |
| 3,900.0  | 3,880.8             | 3,865.9             | 3,852.2             | 10.5           | 9.4         | -145.69               | 192.7                             | -154.2                            | 438.7                | 420.3                 | 18.41                   | 23.828            |                    |        |
| 4,000.0  | 3,980.1             | 3,964.5             | 3,949.9             | 10.8           | 9.7         | -145.12               | 204.2                             | -159.8                            | 455.1                | 436.2                 | 18.96                   | 24.005            |                    |        |
| 4,100.0  | 4,079.4             | 4,063.0             | 4,047.6             | 11.1           | 10.0        | -144.59               | 215.8                             | -165.4                            | 471.6                | 452.1                 | 19.51                   | 24.173            |                    |        |
| 4,200.0  | 4,178.7             | 4,163.4             | 4,147.1             | 11.4           | 10.3        | -144.09               | 227.4                             | -171.1                            | 488.0                | 468.0                 | 20.06                   | 24.333            |                    |        |
| 4,300.0  | 4,278.0             | 4,272.1             | 4,255.3             | 11.7           | 10.6        | -143.85               | 237.6                             | -176.1                            | 503.2                | 482.6                 | 20.57                   | 24.466            |                    |        |
| 4,400.0  | 4,377.3             | 4,381.5             | 4,364.4             | 12.0           | 10.8        | -144.03               | 244.2                             | -179.3                            | 516.4                | 495.3                 | 21.04                   | 24.539            |                    |        |
| 4,500.0  | 4,476.5             | 4,491.2             | 4,474.1             | 12.4           | 11.0        | -144.58               | 246.9                             | -180.6                            | 527.6                | 506.1                 | 21.49                   | 24.549            |                    |        |
| 4,600.0  | 4,575.8             | 4,593.0             | 4,575.8             | 12.7           | 11.2        | -145.33               | 247.0                             | -180.7                            | 537.4                | 515.5                 | 21.92                   | 24.519            |                    |        |
| 4,700.0  | 4,675.1             | 4,692.3             | 4,675.1             | 13.0           | 11.3        | -146.04               | 247.0                             | -180.7                            | 547.3                | 525.0                 | 22.37                   | 24.472            |                    |        |
| 4,800.0  | 4,774.4             | 4,791.5             | 4,774.4             | 13.3           | 11.5        | -146.72               | 247.0                             | -180.7                            | 557.3                | 534.5                 | 22.81                   | 24.430            |                    |        |
| 4,900.0  | 4,873.7             | 4,890.8             | 4,873.7             | 13.6           | 11.7        | -147.38               | 247.0                             | -180.7                            | 567.4                | 544.1                 | 23.26                   | 24.393            |                    |        |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-223 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 5,000.0  | 4,972.9             | 4,990.1             | 4,972.9             | 13.9      | 11.9   | -148.02         |                       | 247.0                             | -180.7                            | 577.5                | 553.8                 | 23.71                   | 24.361             |         |
| 5,100.0  | 5,072.2             | 5,089.4             | 5,072.2             | 14.2      | 12.1   | -148.64         |                       | 247.0                             | -180.7                            | 587.7                | 563.5                 | 24.15                   | 24.333             |         |
| 5,185.9  | 5,157.5             | 5,174.6             | 5,157.5             | 14.5      | 12.3   | -149.15         |                       | 247.0                             | -180.7                            | 596.5                | 572.0                 | 24.53                   | 24.312             |         |
| 5,200.0  | 5,171.5             | 5,188.7             | 5,171.5             | 14.5      | 12.3   | -149.25         |                       | 247.0                             | -180.7                            | 597.9                | 573.3                 | 24.60                   | 24.306             |         |
| 5,300.0  | 5,271.0             | 5,288.2             | 5,271.0             | 14.8      | 12.5   | -149.80         |                       | 247.0                             | -180.7                            | 606.3                | 581.3                 | 25.03                   | 24.228             |         |
| 5,400.0  | 5,370.8             | 5,388.0             | 5,370.8             | 15.0      | 12.8   | -150.15         |                       | 247.0                             | -180.7                            | 611.7                | 586.3                 | 25.43                   | 24.060             |         |
| 5,500.0  | 5,470.8             | 5,488.0             | 5,470.8             | 15.1      | 13.0   | -150.30         |                       | 247.0                             | -180.7                            | 614.1                | 588.3                 | 25.80                   | 23.804             |         |
| 5,529.2  | 5,500.0             | 5,517.2             | 5,500.0             | 15.2      | 13.0   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 588.4                 | 25.90                   | 23.713             |         |
| 5,600.0  | 5,570.8             | 5,588.0             | 5,570.8             | 15.3      | 13.2   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 588.1                 | 26.18                   | 23.463             |         |
| 5,700.0  | 5,670.8             | 5,688.0             | 5,670.8             | 15.5      | 13.4   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 587.7                 | 26.58                   | 23.106             |         |
| 5,800.0  | 5,770.8             | 5,788.0             | 5,770.8             | 15.6      | 13.6   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 587.3                 | 26.99                   | 22.759             |         |
| 5,900.0  | 5,870.8             | 5,888.0             | 5,870.8             | 15.8      | 13.8   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 586.9                 | 27.40                   | 22.421             |         |
| 6,000.0  | 5,970.8             | 5,988.0             | 5,970.8             | 16.0      | 14.0   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 586.5                 | 27.81                   | 22.092             |         |
| 6,100.0  | 6,070.8             | 6,088.0             | 6,070.8             | 16.2      | 14.2   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 586.1                 | 28.21                   | 21.771             |         |
| 6,200.0  | 6,170.8             | 6,188.0             | 6,170.8             | 16.3      | 14.4   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 585.6                 | 28.63                   | 21.459             |         |
| 6,300.0  | 6,270.8             | 6,288.0             | 6,270.8             | 16.5      | 14.6   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 585.2                 | 29.04                   | 21.155             |         |
| 6,400.0  | 6,370.8             | 6,388.0             | 6,370.8             | 16.7      | 14.8   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 584.8                 | 29.45                   | 20.858             |         |
| 6,446.6  | 6,417.4             | 6,434.6             | 6,417.4             | 16.8      | 14.9   | -90.28          |                       | 247.0                             | -180.7                            | 614.3                | 584.6                 | 29.64                   | 20.723             |         |
| 6,450.0  | 6,420.8             | 6,438.0             | 6,420.8             | 16.8      | 14.9   | 89.73           |                       | 247.0                             | -180.7                            | 614.3                | 584.6                 | 29.66                   | 20.713             |         |
| 6,500.0  | 6,470.8             | 6,487.9             | 6,470.8             | 16.9      | 15.0   | 89.90           |                       | 247.0                             | -180.7                            | 614.3                | 584.4                 | 29.84                   | 20.583             |         |
| 6,513.8  | 6,484.5             | 6,501.7             | 6,484.5             | 16.9      | 15.1   | 90.00           |                       | 247.0                             | -180.7                            | 614.3                | 584.4                 | 29.89                   | 20.550             |         |
| 6,550.0  | 6,520.5             | 6,537.6             | 6,520.5             | 16.9      | 15.1   | 90.37           |                       | 247.0                             | -180.7                            | 614.3                | 584.3                 | 30.02                   | 20.462             |         |
| 6,600.0  | 6,569.8             | 6,587.3             | 6,570.1             | 17.0      | 15.2   | 91.11           |                       | 246.7                             | -180.7                            | 614.4                | 584.2                 | 30.18                   | 20.356             |         |
| 6,650.0  | 6,618.4             | 6,637.6             | 6,620.4             | 17.0      | 15.3   | 91.89           |                       | 243.6                             | -180.7                            | 614.6                | 584.3                 | 30.30                   | 20.283             |         |
| 6,700.0  | 6,666.2             | 6,686.6             | 6,670.9             | 17.0      | 15.4   | 92.67           |                       | 237.1                             | -180.7                            | 615.0                | 584.6                 | 30.39                   | 20.235             |         |
| 6,750.0  | 6,712.9             | 6,740.1             | 6,721.4             | 17.0      | 15.4   | 93.44           |                       | 227.1                             | -180.7                            | 615.4                | 585.0                 | 30.45                   | 20.208             |         |
| 6,800.0  | 6,758.3             | 6,792.2             | 6,771.7             | 17.0      | 15.4   | 94.20           |                       | 213.5                             | -180.7                            | 616.0                | 585.5                 | 30.50                   | 20.198             |         |
| 6,850.0  | 6,802.3             | 6,845.0             | 6,821.6             | 17.1      | 15.5   | 94.95           |                       | 196.3                             | -180.7                            | 616.6                | 586.1                 | 30.52                   | 20.202             |         |
| 6,900.0  | 6,844.6             | 6,898.4             | 6,870.8             | 17.1      | 15.5   | 95.68           |                       | 175.4                             | -180.7                            | 617.4                | 586.8                 | 30.54                   | 20.214             |         |
| 6,950.0  | 6,885.2             | 6,952.5             | 6,918.9             | 17.1      | 15.5   | 96.38           |                       | 150.8                             | -180.7                            | 618.2                | 587.6                 | 30.56                   | 20.227             |         |
| 7,000.0  | 6,923.7             | 7,007.2             | 6,965.7             | 17.1      | 15.5   | 97.06           |                       | 122.6                             | -180.7                            | 619.1                | 588.5                 | 30.60                   | 20.232             |         |
| 7,050.0  | 6,960.0             | 7,062.5             | 7,010.9             | 17.1      | 15.5   | 97.71           |                       | 90.7                              | -180.7                            | 620.0                | 589.3                 | 30.66                   | 20.220             |         |
| 7,100.0  | 6,994.0             | 7,118.5             | 7,054.1             | 17.1      | 15.5   | 98.33           |                       | 55.2                              | -180.7                            | 620.9                | 590.2                 | 30.76                   | 20.183             |         |
| 7,150.0  | 7,025.5             | 7,175.0             | 7,095.1             | 17.2      | 15.6   | 98.91           |                       | 16.1                              | -180.7                            | 621.9                | 591.0                 | 30.92                   | 20.111             |         |
| 7,200.0  | 7,054.5             | 7,232.1             | 7,133.4             | 17.2      | 15.6   | 99.45           |                       | -26.2                             | -180.7                            | 622.8                | 591.7                 | 31.15                   | 19.995             |         |
| 7,250.0  | 7,080.7             | 7,289.8             | 7,168.7             | 17.3      | 15.7   | 99.95           |                       | -71.8                             | -180.7                            | 623.7                | 592.3                 | 31.46                   | 19.829             |         |
| 7,300.0  | 7,104.1             | 7,348.0             | 7,200.8             | 17.5      | 15.9   | 100.39          |                       | -120.3                            | -180.7                            | 624.6                | 592.7                 | 31.86                   | 19.606             |         |
| 7,350.0  | 7,124.5             | 7,406.7             | 7,229.3             | 17.7      | 16.2   | 100.79          |                       | -171.6                            | -180.7                            | 625.4                | 593.0                 | 32.37                   | 19.322             |         |
| 7,400.0  | 7,141.9             | 7,465.8             | 7,253.9             | 17.9      | 16.6   | 101.14          |                       | -225.3                            | -180.7                            | 626.1                | 593.1                 | 32.99                   | 18.979             |         |
| 7,450.0  | 7,156.2             | 7,525.3             | 7,274.5             | 18.2      | 17.0   | 101.42          |                       | -281.1                            | -180.7                            | 626.7                | 593.0                 | 33.73                   | 18.583             |         |
| 7,500.0  | 7,167.3             | 7,585.0             | 7,290.7             | 18.6      | 17.4   | 101.66          |                       | -338.6                            | -180.7                            | 627.2                | 592.7                 | 34.57                   | 18.141             |         |
| 7,550.0  | 7,175.3             | 7,645.0             | 7,302.4             | 19.0      | 18.0   | 101.83          |                       | -397.4                            | -180.7                            | 627.6                | 592.1                 | 35.53                   | 17.663             |         |
| 7,600.0  | 7,179.9             | 7,705.2             | 7,309.4             | 19.5      | 18.5   | 101.94          |                       | -457.2                            | -180.7                            | 627.9                | 591.3                 | 36.60                   | 17.156             |         |
| 7,650.0  | 7,181.4             | 7,765.5             | 7,311.8             | 20.0      | 19.2   | 101.99          |                       | -517.4                            | -180.7                            | 628.0                | 590.2                 | 37.75                   | 16.634             |         |
| 7,664.4  | 7,181.2             | 7,782.8             | 7,311.6             | 20.1      | 19.3   | 101.99          |                       | -534.7                            | -180.7                            | 628.0                | 589.9                 | 38.10                   | 16.482             |         |
| 7,700.0  | 7,180.3             | 7,818.6             | 7,310.7             | 20.5      | 19.8   | 101.98          |                       | -570.5                            | -180.7                            | 628.0                | 589.1                 | 38.90                   | 16.144             |         |
| 7,800.0  | 7,178.0             | 7,918.6             | 7,308.3             | 21.7      | 21.0   | 101.98          |                       | -670.4                            | -180.7                            | 627.9                | 586.7                 | 41.26                   | 15.219             |         |
| 7,900.0  | 7,175.7             | 8,018.6             | 7,305.8             | 23.0      | 22.3   | 101.97          |                       | -770.4                            | -180.7                            | 627.9                | 584.1                 | 43.82                   | 14.328             |         |
| 8,000.0  | 7,173.4             | 8,118.6             | 7,303.4             | 24.3      | 23.7   | 101.96          |                       | -870.4                            | -180.7                            | 627.9                | 581.3                 | 46.55                   | 13.488             |         |
| 8,100.0  | 7,171.1             | 8,218.6             | 7,301.0             | 25.7      | 25.1   | 101.95          |                       | -970.3                            | -180.7                            | 627.9                | 578.5                 | 49.42                   | 12.705             |         |
| 8,200.0  | 7,168.7             | 8,318.6             | 7,298.6             | 27.2      | 26.6   | 101.94          |                       | -1,070.3                          | -180.7                            | 627.9                | 575.5                 | 52.40                   | 11.981             |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-223 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |            |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |            |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 8,300.0  | 7,166.4             | 8,418.6             | 7,296.1             | 28.8      | 28.2   | 101.93          | 101.93                | -1,170.3                          | -180.7     | 627.8                | 572.4                 | 55.48                   | 11.316             |         |
| 8,400.0  | 7,164.1             | 8,518.6             | 7,293.7             | 30.3      | 29.8   | 101.92          | 101.92                | -1,270.3                          | -180.7     | 627.8                | 569.2                 | 58.64                   | 10.705             |         |
| 8,500.0  | 7,161.8             | 8,618.6             | 7,291.3             | 32.0      | 31.4   | 101.91          | 101.91                | -1,370.2                          | -180.7     | 627.8                | 565.9                 | 61.88                   | 10.146             |         |
| 8,600.0  | 7,159.4             | 8,718.6             | 7,288.9             | 33.6      | 33.1   | 101.90          | 101.90                | -1,470.2                          | -180.7     | 627.8                | 562.6                 | 65.17                   | 9.634              |         |
| 8,700.0  | 7,157.1             | 8,818.6             | 7,286.4             | 35.3      | 34.8   | 101.89          | 101.89                | -1,570.2                          | -180.7     | 627.8                | 559.2                 | 68.51                   | 9.163              |         |
| 8,800.0  | 7,154.8             | 8,918.6             | 7,284.0             | 37.0      | 36.5   | 101.88          | 101.88                | -1,670.1                          | -180.7     | 627.7                | 555.8                 | 71.89                   | 8.732              |         |
| 8,900.0  | 7,152.5             | 9,018.6             | 7,281.6             | 38.7      | 38.3   | 101.87          | 101.87                | -1,770.1                          | -180.7     | 627.7                | 552.4                 | 75.31                   | 8.335              |         |
| 9,000.0  | 7,150.2             | 9,118.6             | 7,279.2             | 40.4      | 40.0   | 101.86          | 101.86                | -1,870.1                          | -180.7     | 627.7                | 548.9                 | 78.77                   | 7.969              |         |
| 9,100.0  | 7,147.8             | 9,218.6             | 7,276.7             | 42.2      | 41.8   | 101.85          | 101.85                | -1,970.1                          | -180.7     | 627.7                | 545.4                 | 82.25                   | 7.631              |         |
| 9,200.0  | 7,145.5             | 9,318.6             | 7,274.3             | 44.0      | 43.6   | 101.84          | 101.84                | -2,070.0                          | -180.7     | 627.6                | 541.9                 | 85.76                   | 7.319              |         |
| 9,300.0  | 7,143.2             | 9,418.6             | 7,271.9             | 45.7      | 45.4   | 101.83          | 101.83                | -2,170.0                          | -180.7     | 627.6                | 538.3                 | 89.29                   | 7.029              |         |
| 9,400.0  | 7,140.9             | 9,518.6             | 7,269.5             | 47.5      | 47.2   | 101.83          | 101.83                | -2,270.0                          | -180.7     | 627.6                | 534.8                 | 92.84                   | 6.760              |         |
| 9,500.0  | 7,138.6             | 9,618.6             | 7,267.0             | 49.3      | 49.0   | 101.82          | 101.82                | -2,369.9                          | -180.7     | 627.6                | 531.2                 | 96.41                   | 6.510              |         |
| 9,600.0  | 7,136.2             | 9,718.6             | 7,264.6             | 51.2      | 50.8   | 101.81          | 101.81                | -2,469.9                          | -180.7     | 627.6                | 527.6                 | 99.99                   | 6.276              |         |
| 9,700.0  | 7,133.9             | 9,818.6             | 7,262.2             | 53.0      | 52.7   | 101.80          | 101.80                | -2,569.9                          | -180.7     | 627.5                | 524.0                 | 103.59                  | 6.058              |         |
| 9,800.0  | 7,131.6             | 9,918.6             | 7,259.8             | 54.8      | 54.5   | 101.79          | 101.79                | -2,669.8                          | -180.7     | 627.5                | 520.3                 | 107.20                  | 5.854              |         |
| 9,900.0  | 7,129.3             | 10,018.6            | 7,257.3             | 56.6      | 56.3   | 101.78          | 101.78                | -2,769.8                          | -180.7     | 627.5                | 516.7                 | 110.83                  | 5.662              |         |
| 10,000.0   | 7,127.0             | 10,118.6            | 7,254.9             | 58.5      | 58.2   | 101.77          | 101.77                | -2,869.8                          | -180.7     | 627.5                | 513.0                 | 114.46                  | 5.482              |         |
| 10,100.0   | 7,124.6             | 10,218.6            | 7,252.5             | 60.3      | 60.0   | 101.76          | 101.76                | -2,969.8                          | -180.7     | 627.5                | 509.4                 | 118.10                  | 5.313              |         |
| 10,200.0   | 7,122.3             | 10,318.6            | 7,250.0             | 62.2      | 61.9   | 101.75          | 101.75                | -3,069.7                          | -180.7     | 627.4                | 505.7                 | 121.75                  | 5.153              |         |
| 10,300.0   | 7,120.0             | 10,418.6            | 7,247.6             | 64.0      | 63.8   | 101.74          | 101.74                | -3,169.7                          | -180.7     | 627.4                | 502.0                 | 125.41                  | 5.003              |         |
| 10,400.0   | 7,117.7             | 10,518.6            | 7,245.2             | 65.9      | 65.6   | 101.73          | 101.73                | -3,269.7                          | -180.7     | 627.4                | 498.3                 | 129.08                  | 4.861              |         |
| 10,500.0   | 7,115.3             | 10,618.6            | 7,242.8             | 67.7      | 67.5   | 101.72          | 101.72                | -3,369.6                          | -180.7     | 627.4                | 494.6                 | 132.75                  | 4.726              |         |
| 10,600.0   | 7,113.0             | 10,718.6            | 7,240.3             | 69.6      | 69.4   | 101.71          | 101.71                | -3,469.6                          | -180.7     | 627.4                | 490.9                 | 136.43                  | 4.598              |         |
| 10,700.0   | 7,110.7             | 10,818.6            | 7,237.9             | 71.5      | 71.2   | 101.70          | 101.70                | -3,569.6                          | -180.7     | 627.3                | 487.2                 | 140.12                  | 4.477              |         |
| 10,800.0   | 7,108.4             | 10,918.6            | 7,235.5             | 73.3      | 73.1   | 101.69          | 101.69                | -3,669.6                          | -180.7     | 627.3                | 483.5                 | 143.81                  | 4.362              |         |
| 10,900.0   | 7,106.1             | 11,018.6            | 7,233.1             | 75.2      | 75.0   | 101.68          | 101.68                | -3,769.5                          | -180.7     | 627.3                | 479.8                 | 147.50                  | 4.253              |         |
| 11,000.0   | 7,103.7             | 11,118.6            | 7,230.6             | 77.1      | 76.9   | 101.68          | 101.68                | -3,869.5                          | -180.7     | 627.3                | 476.1                 | 151.20                  | 4.149              |         |
| 11,100.0   | 7,101.4             | 11,218.6            | 7,228.2             | 78.9      | 78.8   | 101.67          | 101.67                | -3,969.5                          | -180.7     | 627.3                | 472.4                 | 154.90                  | 4.049              |         |
| 11,200.0   | 7,099.1             | 11,318.6            | 7,225.8             | 80.8      | 80.6   | 101.66          | 101.66                | -4,069.4                          | -180.7     | 627.2                | 468.6                 | 158.61                  | 3.955              |         |
| 11,300.0   | 7,096.8             | 11,418.6            | 7,223.4             | 82.7      | 82.5   | 101.65          | 101.65                | -4,169.4                          | -180.7     | 627.2                | 464.9                 | 162.32                  | 3.864              |         |
| 11,400.0   | 7,094.5             | 11,518.6            | 7,220.9             | 84.6      | 84.4   | 101.64          | 101.64                | -4,269.4                          | -180.7     | 627.2                | 461.2                 | 166.04                  | 3.777              |         |
| 11,500.0   | 7,092.1             | 11,618.6            | 7,218.5             | 86.5      | 86.3   | 101.63          | 101.63                | -4,369.3                          | -180.7     | 627.2                | 457.4                 | 169.76                  | 3.695              |         |
| 11,600.0   | 7,089.8             | 11,718.6            | 7,216.1             | 88.4      | 88.2   | 101.62          | 101.62                | -4,469.3                          | -180.7     | 627.2                | 453.7                 | 173.48                  | 3.615              |         |
| 11,700.0   | 7,087.5             | 11,818.6            | 7,213.7             | 90.3      | 90.1   | 101.61          | 101.61                | -4,569.3                          | -180.7     | 627.1                | 449.9                 | 177.20                  | 3.539              |         |
| 11,764.3   | 7,086.0             | 11,882.8            | 7,212.1             | 91.5      | 91.3   | 101.60          | 101.60                | -4,633.6                          | -180.7     | 627.1                | 447.5                 | 179.60                  | 3.492 SF           |         |

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-403 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |                |             |                      |                       |                                   |                                   |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|----------------|-------------|----------------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |                |             |                      |                       |                                   |                                   |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Semi Major Axis (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 0.0  | 0.0                 | 0.0                 | 0.0                 | 0.0            | 0.0         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 |                       |                         |                    |         |
| 100.0  | 100.0               | 100.0               | 100.0               | 0.1            | 0.1         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 88.8                  | 0.22                    | 396.012            |         |
| 200.0  | 200.0               | 200.0               | 200.0               | 0.3            | 0.3         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 88.3                  | 0.67                    | 132.004            |         |
| 300.0  | 300.0               | 300.0               | 300.0               | 0.6            | 0.6         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 87.9                  | 1.12                    | 79.202             |         |
| 400.0  | 400.0               | 400.0               | 400.0               | 0.8            | 0.8         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 87.4                  | 1.57                    | 56.573             |         |
| 500.0  | 500.0               | 500.0               | 500.0               | 1.0            | 1.0         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 87.0                  | 2.02                    | 44.001             |         |
| 600.0  | 600.0               | 600.0               | 600.0               | 1.2            | 1.2         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 86.5                  | 2.47                    | 36.001             |         |
| 700.0  | 700.0               | 700.0               | 700.0               | 1.5            | 1.5         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 86.1                  | 2.92                    | 30.462             |         |
| 800.0  | 800.0               | 800.0               | 800.0               | 1.7            | 1.7         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 85.6                  | 3.37                    | 26.401             |         |
| 900.0  | 900.0               | 900.0               | 900.0               | 1.9            | 1.9         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 85.2                  | 3.82                    | 23.295             |         |
| 1,000.0  | 1,000.0             | 1,000.0             | 1,000.0             | 2.1            | 2.1         | -92.35               | -92.35                | -3.7                              | -88.9                             | 89.0                 | 84.7                  | 4.27                    | 20.843 CC, ES      |         |
| 1,100.0  | 1,100.0             | 1,097.4             | 1,097.4             | 2.4            | 2.3         | -152.28              | -152.28               | -2.8                              | -90.3                             | 92.0                 | 87.3                  | 4.70                    | 19.564             |         |
| 1,200.0  | 1,199.8             | 1,194.3             | 1,194.1             | 2.6            | 2.6         | -151.98              | -151.98               | -0.2                              | -94.6                             | 100.8                | 95.7                  | 5.12                    | 19.683             |         |
| 1,300.0  | 1,299.5             | 1,290.2             | 1,289.7             | 2.8            | 2.8         | -151.57              | -151.57               | 4.0                               | -101.5                            | 115.5                | 110.0                 | 5.55                    | 20.825             |         |
| 1,343.3  | 1,342.5             | 1,331.3             | 1,330.6             | 2.9            | 2.9         | -151.37              | -151.37               | 6.3                               | -105.3                            | 123.7                | 118.0                 | 5.73                    | 21.573             |         |
| 1,400.0  | 1,398.8             | 1,385.0             | 1,383.9             | 3.0            | 3.0         | -151.12              | -151.12               | 9.8                               | -111.0                            | 135.5                | 129.5                 | 5.98                    | 22.646             |         |
| 1,500.0  | 1,498.1             | 1,482.7             | 1,480.7             | 3.3            | 3.3         | -150.63              | -150.63               | 16.5                              | -121.9                            | 156.9                | 150.5                 | 6.43                    | 24.397             |         |
| 1,600.0  | 1,597.3             | 1,580.4             | 1,577.5             | 3.6            | 3.5         | -150.25              | -150.25               | 23.2                              | -132.8                            | 178.3                | 171.4                 | 6.89                    | 25.897             |         |
| 1,700.0  | 1,696.6             | 1,678.0             | 1,674.4             | 3.8            | 3.8         | -149.96              | -149.96               | 29.9                              | -143.7                            | 199.7                | 192.4                 | 7.35                    | 27.182             |         |
| 1,800.0  | 1,795.9             | 1,775.7             | 1,771.2             | 4.1            | 4.1         | -149.72              | -149.72               | 36.5                              | -154.6                            | 221.1                | 213.3                 | 7.82                    | 28.292             |         |
| 1,900.0  | 1,895.2             | 1,873.4             | 1,868.0             | 4.4            | 4.4         | -149.53              | -149.53               | 43.2                              | -165.6                            | 242.6                | 234.3                 | 8.29                    | 29.255             |         |
| 2,000.0  | 1,994.5             | 1,971.1             | 1,964.9             | 4.7            | 4.7         | -149.36              | -149.36               | 49.9                              | -176.5                            | 264.0                | 255.2                 | 8.77                    | 30.102             |         |
| 2,100.0  | 2,093.8             | 2,068.7             | 2,061.7             | 5.0            | 5.0         | -149.22              | -149.22               | 56.6                              | -187.4                            | 285.4                | 276.1                 | 9.25                    | 30.847             |         |
| 2,200.0  | 2,193.0             | 2,166.4             | 2,158.5             | 5.3            | 5.3         | -149.10              | -149.10               | 63.3                              | -198.3                            | 306.8                | 297.1                 | 9.74                    | 31.508             |         |
| 2,300.0  | 2,292.3             | 2,264.1             | 2,255.4             | 5.6            | 5.6         | -149.00              | -149.00               | 70.0                              | -209.3                            | 328.2                | 318.0                 | 10.23                   | 32.097             |         |
| 2,400.0  | 2,391.6             | 2,361.8             | 2,352.2             | 5.9            | 5.9         | -148.91              | -148.91               | 76.6                              | -220.2                            | 349.7                | 339.0                 | 10.72                   | 32.625             |         |
| 2,500.0  | 2,490.9             | 2,459.4             | 2,449.0             | 6.2            | 6.2         | -148.83              | -148.83               | 83.3                              | -231.1                            | 371.1                | 359.9                 | 11.21                   | 33.101             |         |
| 2,600.0  | 2,590.2             | 2,557.1             | 2,545.9             | 6.5            | 6.5         | -148.76              | -148.76               | 90.0                              | -242.0                            | 392.5                | 380.8                 | 11.71                   | 33.531             |         |
| 2,700.0  | 2,689.4             | 2,654.8             | 2,642.7             | 6.8            | 6.8         | -148.69              | -148.69               | 96.7                              | -252.9                            | 414.0                | 401.7                 | 12.20                   | 33.921             |         |
| 2,800.0  | 2,788.7             | 2,752.5             | 2,739.5             | 7.1            | 7.1         | -148.63              | -148.63               | 103.4                             | -263.9                            | 435.4                | 422.7                 | 12.70                   | 34.277             |         |
| 2,900.0  | 2,888.0             | 2,850.2             | 2,836.4             | 7.4            | 7.5         | -148.58              | -148.58               | 110.1                             | -274.8                            | 456.8                | 443.6                 | 13.20                   | 34.603             |         |
| 3,000.0  | 2,987.3             | 2,947.8             | 2,933.2             | 7.7            | 7.8         | -148.53              | -148.53               | 116.7                             | -285.7                            | 478.2                | 464.5                 | 13.70                   | 34.903             |         |
| 3,100.0  | 3,086.6             | 3,045.5             | 3,030.0             | 8.0            | 8.1         | -148.49              | -148.49               | 123.4                             | -296.6                            | 499.7                | 485.5                 | 14.20                   | 35.178             |         |
| 3,200.0  | 3,185.9             | 3,143.2             | 3,126.9             | 8.3            | 8.4         | -148.45              | -148.45               | 130.1                             | -307.6                            | 521.1                | 506.4                 | 14.71                   | 35.433             |         |
| 3,300.0  | 3,285.1             | 3,240.9             | 3,223.7             | 8.6            | 8.7         | -148.41              | -148.41               | 136.8                             | -318.5                            | 542.5                | 527.3                 | 15.21                   | 35.668             |         |
| 3,400.0  | 3,384.4             | 3,338.5             | 3,320.5             | 8.9            | 9.0         | -148.38              | -148.38               | 143.5                             | -329.4                            | 564.0                | 548.2                 | 15.71                   | 35.887             |         |
| 3,500.0  | 3,483.7             | 3,436.2             | 3,417.4             | 9.2            | 9.4         | -148.35              | -148.35               | 150.1                             | -340.3                            | 585.4                | 569.2                 | 16.22                   | 36.091             |         |
| 3,600.0  | 3,583.0             | 3,533.9             | 3,514.2             | 9.6            | 9.7         | -148.32              | -148.32               | 156.8                             | -351.2                            | 606.8                | 590.1                 | 16.73                   | 36.281             |         |
| 3,700.0  | 3,682.3             | 3,631.6             | 3,611.0             | 9.9            | 10.0        | -148.29              | -148.29               | 163.5                             | -362.2                            | 628.2                | 611.0                 | 17.23                   | 36.458             |         |
| 3,800.0  | 3,781.6             | 3,729.2             | 3,707.9             | 10.2           | 10.3        | -148.26              | -148.26               | 170.2                             | -373.1                            | 649.7                | 631.9                 | 17.74                   | 36.625             |         |
| 3,900.0  | 3,880.8             | 3,826.9             | 3,804.7             | 10.5           | 10.6        | -148.24              | -148.24               | 176.9                             | -384.0                            | 671.1                | 652.9                 | 18.25                   | 36.781             |         |
| 4,000.0  | 3,980.1             | 3,924.6             | 3,901.5             | 10.8           | 11.0        | -148.22              | -148.22               | 183.6                             | -394.9                            | 692.5                | 673.8                 | 18.75                   | 36.928             |         |
| 4,100.0  | 4,079.4             | 4,022.3             | 3,998.4             | 11.1           | 11.3        | -148.20              | -148.20               | 190.2                             | -405.9                            | 714.0                | 694.7                 | 19.26                   | 37.066             |         |
| 4,200.0  | 4,178.7             | 4,119.9             | 4,095.2             | 11.4           | 11.6        | -148.18              | -148.18               | 196.9                             | -416.8                            | 735.4                | 715.6                 | 19.77                   | 37.196             |         |
| 4,300.0  | 4,278.0             | 4,217.6             | 4,192.0             | 11.7           | 11.9        | -148.16              | -148.16               | 203.6                             | -427.7                            | 756.8                | 736.5                 | 20.28                   | 37.319             |         |
| 4,400.0  | 4,377.3             | 4,315.3             | 4,288.9             | 12.0           | 12.2        | -148.14              | -148.14               | 210.3                             | -438.6                            | 778.3                | 757.5                 | 20.79                   | 37.436             |         |
| 4,500.0  | 4,476.5             | 4,413.0             | 4,385.7             | 12.4           | 12.6        | -148.12              | -148.12               | 217.0                             | -449.5                            | 799.7                | 778.4                 | 21.30                   | 37.546             |         |
| 4,600.0  | 4,575.8             | 4,510.7             | 4,482.5             | 12.7           | 12.9        | -148.11              | -148.11               | 223.6                             | -460.5                            | 821.1                | 799.3                 | 21.81                   | 37.651             |         |
| 4,700.0  | 4,675.1             | 4,608.3             | 4,579.4             | 13.0           | 13.2        | -148.09              | -148.09               | 230.3                             | -471.4                            | 842.5                | 820.2                 | 22.32                   | 37.750             |         |
| 4,800.0  | 4,774.4             | 4,724.5             | 4,694.6             | 13.3           | 13.5        | -148.10              | -148.10               | 237.8                             | -483.6                            | 863.4                | 840.6                 | 22.85                   | 37.787             |         |
| 4,900.0  | 4,873.7             | 4,858.2             | 4,827.9             | 13.6           | 13.8        | -148.29              | -148.29               | 243.6                             | -493.1                            | 880.8                | 857.4                 | 23.37                   | 37.695             |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-403 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 5,000.0  | 4,972.9             | 4,993.4             | 4,963.0             | 13.9      | 14.1   | -148.68         |                       | 246.2                             | -497.4                            | 894.1                | 870.3                 | 23.86                   | 37.470             |         |
| 5,100.0  | 5,072.2             | 5,102.7             | 5,072.2             | 14.2      | 14.2   | -149.11         |                       | 246.3                             | -497.6                            | 904.5                | 880.2                 | 24.31                   | 37.204             |         |
| 5,185.9  | 5,157.5             | 5,187.9             | 5,157.5             | 14.5      | 14.4   | -149.44         |                       | 246.3                             | -497.6                            | 913.4                | 888.7                 | 24.70                   | 36.979             |         |
| 5,200.0  | 5,171.5             | 5,202.0             | 5,171.5             | 14.5      | 14.4   | -149.51         |                       | 246.3                             | -497.6                            | 914.8                | 890.0                 | 24.77                   | 36.933             |         |
| 5,300.0  | 5,271.0             | 5,301.5             | 5,271.0             | 14.8      | 14.6   | -149.90         |                       | 246.3                             | -497.6                            | 923.2                | 898.0                 | 25.22                   | 36.608             |         |
| 5,400.0  | 5,370.8             | 5,401.3             | 5,370.8             | 15.0      | 14.7   | -150.14         |                       | 246.3                             | -497.6                            | 928.6                | 903.0                 | 25.64                   | 36.223             |         |
| 5,500.0  | 5,470.8             | 5,501.2             | 5,470.8             | 15.1      | 14.9   | -150.25         |                       | 246.3                             | -497.6                            | 931.0                | 905.0                 | 26.02                   | 35.779             |         |
| 5,529.2  | 5,500.0             | 5,530.4             | 5,500.0             | 15.2      | 15.0   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 905.0                 | 26.13                   | 35.637             |         |
| 5,600.0  | 5,570.8             | 5,601.2             | 5,570.8             | 15.3      | 15.1   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 904.8                 | 26.40                   | 35.274             |         |
| 5,700.0  | 5,670.8             | 5,701.2             | 5,670.8             | 15.5      | 15.3   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 904.4                 | 26.79                   | 34.755             |         |
| 5,800.0  | 5,770.8             | 5,801.2             | 5,770.8             | 15.6      | 15.4   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 904.0                 | 27.19                   | 34.249             |         |
| 5,900.0  | 5,870.8             | 5,901.2             | 5,870.8             | 15.8      | 15.6   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 903.6                 | 27.59                   | 33.755             |         |
| 6,000.0  | 5,970.8             | 6,001.2             | 5,970.8             | 16.0      | 15.8   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 903.2                 | 27.99                   | 33.274             |         |
| 6,100.0  | 6,070.8             | 6,101.2             | 6,070.8             | 16.2      | 16.0   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 902.8                 | 28.39                   | 32.804             |         |
| 6,200.0  | 6,170.8             | 6,201.2             | 6,170.8             | 16.3      | 16.2   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 902.4                 | 28.79                   | 32.346             |         |
| 6,300.0  | 6,270.8             | 6,301.2             | 6,270.8             | 16.5      | 16.4   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 902.0                 | 29.19                   | 31.899             |         |
| 6,400.0  | 6,370.8             | 6,401.2             | 6,370.8             | 16.7      | 16.5   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 901.6                 | 29.60                   | 31.463             |         |
| 6,446.6  | 6,417.4             | 6,447.9             | 6,417.4             | 16.8      | 16.6   | -90.22          |                       | 246.3                             | -497.6                            | 931.2                | 901.4                 | 29.79                   | 31.263             |         |
| 6,450.0  | 6,420.8             | 6,451.2             | 6,420.8             | 16.8      | 16.6   | 89.78           |                       | 246.3                             | -497.6                            | 931.2                | 901.4                 | 29.80                   | 31.249             |         |
| 6,500.0  | 6,470.8             | 6,501.2             | 6,470.8             | 16.9      | 16.7   | 89.89           |                       | 246.3                             | -497.6                            | 931.2                | 901.2                 | 29.98                   | 31.063             |         |
| 6,521.3  | 6,492.0             | 6,522.4             | 6,492.0             | 16.9      | 16.8   | 90.00           |                       | 246.3                             | -497.6                            | 931.2                | 901.1                 | 30.05                   | 30.991             |         |
| 6,550.0  | 6,520.5             | 6,550.9             | 6,520.5             | 16.9      | 16.8   | 90.20           |                       | 246.3                             | -497.6                            | 931.2                | 901.0                 | 30.14                   | 30.895             |         |
| 6,600.0  | 6,569.8             | 6,600.2             | 6,569.8             | 17.0      | 16.9   | 90.71           |                       | 246.3                             | -497.6                            | 931.2                | 901.0                 | 30.29                   | 30.749             |         |
| 6,650.0  | 6,618.4             | 6,648.8             | 6,618.4             | 17.0      | 17.0   | 91.38           |                       | 246.3                             | -497.6                            | 931.5                | 901.0                 | 30.42                   | 30.623             |         |
| 6,700.0  | 6,666.2             | 6,697.8             | 6,667.4             | 17.0      | 17.1   | 92.21           |                       | 246.0                             | -497.6                            | 931.9                | 901.4                 | 30.53                   | 30.526             |         |
| 6,750.0  | 6,712.9             | 6,748.6             | 6,718.0             | 17.0      | 17.2   | 93.08           |                       | 242.7                             | -497.6                            | 932.6                | 902.0                 | 30.61                   | 30.473             |         |
| 6,800.0  | 6,758.3             | 6,800.4             | 6,769.4             | 17.0      | 17.2   | 93.94           |                       | 235.9                             | -497.6                            | 933.6                | 902.9                 | 30.66                   | 30.449             |         |
| 6,850.0  | 6,802.3             | 6,853.4             | 6,821.3             | 17.1      | 17.3   | 94.80           |                       | 225.3                             | -497.6                            | 934.7                | 904.0                 | 30.70                   | 30.451             |         |
| 6,900.0  | 6,844.6             | 6,907.6             | 6,873.6             | 17.1      | 17.3   | 95.64           |                       | 210.8                             | -497.6                            | 936.1                | 905.4                 | 30.72                   | 30.471             |         |
| 6,950.0  | 6,885.2             | 6,963.1             | 6,925.8             | 17.1      | 17.3   | 96.47           |                       | 192.2                             | -497.6                            | 937.6                | 906.9                 | 30.74                   | 30.502             |         |
| 7,000.0  | 6,923.7             | 7,019.9             | 6,977.7             | 17.1      | 17.3   | 97.28           |                       | 169.2                             | -497.6                            | 939.3                | 908.6                 | 30.77                   | 30.532             |         |
| 7,050.0  | 6,960.0             | 7,078.1             | 7,029.0             | 17.1      | 17.3   | 98.07           |                       | 141.8                             | -497.6                            | 941.1                | 910.3                 | 30.81                   | 30.550             |         |
| 7,100.0  | 6,994.0             | 7,137.6             | 7,079.2             | 17.1      | 17.3   | 98.83           |                       | 109.8                             | -497.6                            | 943.0                | 912.2                 | 30.88                   | 30.542             |         |
| 7,150.0  | 7,025.5             | 7,198.5             | 7,127.8             | 17.2      | 17.3   | 99.56           |                       | 73.0                              | -497.6                            | 945.0                | 914.0                 | 30.99                   | 30.493             |         |
| 7,200.0  | 7,054.5             | 7,260.9             | 7,174.3             | 17.2      | 17.4   | 100.24          |                       | 31.6                              | -497.6                            | 947.0                | 915.8                 | 31.17                   | 30.382             |         |
| 7,250.0  | 7,080.7             | 7,324.6             | 7,218.2             | 17.3      | 17.4   | 100.89          |                       | -14.6                             | -497.6                            | 948.9                | 917.5                 | 31.42                   | 30.198             |         |
| 7,300.0  | 7,104.1             | 7,389.7             | 7,258.9             | 17.5      | 17.4   | 101.48          |                       | -65.3                             | -497.6                            | 950.8                | 919.0                 | 31.76                   | 29.933             |         |
| 7,350.0  | 7,124.5             | 7,456.0             | 7,295.8             | 17.7      | 17.5   | 102.01          |                       | -120.4                            | -497.6                            | 952.5                | 920.3                 | 32.22                   | 29.564             |         |
| 7,400.0  | 7,141.9             | 7,523.5             | 7,328.3             | 17.9      | 17.7   | 102.47          |                       | -179.6                            | -497.6                            | 954.1                | 921.3                 | 32.80                   | 29.091             |         |
| 7,450.0  | 7,156.2             | 7,592.1             | 7,355.9             | 18.2      | 17.9   | 102.87          |                       | -242.4                            | -497.6                            | 955.5                | 922.0                 | 33.50                   | 28.523             |         |
| 7,500.0  | 7,167.3             | 7,661.6             | 7,377.9             | 18.6      | 18.3   | 103.19          |                       | -308.2                            | -497.6                            | 956.6                | 922.2                 | 34.34                   | 27.859             |         |
| 7,550.0  | 7,175.3             | 7,731.7             | 7,394.0             | 19.0      | 18.8   | 103.42          |                       | -376.4                            | -497.6                            | 957.4                | 922.1                 | 35.31                   | 27.118             |         |
| 7,600.0  | 7,179.9             | 7,799.8             | 7,403.6             | 19.5      | 19.4   | 103.57          |                       | -443.8                            | -497.6                            | 957.9                | 921.6                 | 36.37                   | 26.339             |         |
| 7,650.0  | 7,181.4             | 7,849.6             | 7,408.8             | 20.0      | 19.9   | 103.72          |                       | -493.4                            | -497.6                            | 958.8                | 921.5                 | 37.36                   | 25.665             |         |
| 7,664.4  | 7,181.2             | 7,863.9             | 7,410.3             | 20.1      | 20.0   | 103.79          |                       | -507.6                            | -497.6                            | 959.3                | 921.6                 | 37.65                   | 25.480             |         |
| 7,700.0  | 7,180.3             | 7,907.4             | 7,414.2             | 20.5      | 20.5   | 104.07          |                       | -550.9                            | -497.6                            | 960.2                | 921.8                 | 38.46                   | 24.967             |         |
| 7,800.0  | 7,178.0             | 8,025.1             | 7,416.8             | 21.7      | 21.8   | 104.38          |                       | -668.5                            | -497.6                            | 961.3                | 920.4                 | 40.93                   | 23.485             |         |
| 7,900.0  | 7,175.7             | 8,125.1             | 7,416.3             | 23.0      | 23.1   | 104.49          |                       | -768.5                            | -497.6                            | 961.8                | 918.3                 | 43.43                   | 22.145             |         |
| 8,000.0  | 7,173.4             | 8,225.1             | 7,415.8             | 24.3      | 24.4   | 104.59          |                       | -868.5                            | -497.6                            | 962.2                | 916.1                 | 46.09                   | 20.875             |         |
| 8,100.0  | 7,171.1             | 8,325.0             | 7,415.3             | 25.7      | 25.8   | 104.69          |                       | -968.5                            | -497.6                            | 962.7                | 913.8                 | 48.89                   | 19.689             |         |
| 8,200.0  | 7,168.7             | 8,425.0             | 7,414.7             | 27.2      | 27.3   | 104.80          |                       | -1,068.5                          | -497.6                            | 963.1                | 911.3                 | 51.81                   | 18.590             |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28S-403 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |                |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD  |                     |                     |                     |                |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Well Error: | 0.0 ft |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning            |        |
| 8,300.0  | 7,166.4             | 8,525.0             | 7,414.2             | 28.8           | 28.8        | 104.90                | -1,168.4                          | -497.6                            | 963.6                | 908.8                 | 54.82                   | 17.578            |                    |        |
| 8,400.0  | 7,164.1             | 8,625.0             | 7,413.7             | 30.3           | 30.4        | 105.00                | -1,268.4                          | -497.6                            | 964.0                | 906.1                 | 57.91                   | 16.648            |                    |        |
| 8,500.0  | 7,161.8             | 8,725.0             | 7,413.2             | 32.0           | 32.0        | 105.11                | -1,368.4                          | -497.6                            | 964.5                | 903.4                 | 61.07                   | 15.794            |                    |        |
| 8,600.0  | 7,159.4             | 8,825.0             | 7,412.6             | 33.6           | 33.6        | 105.21                | -1,468.4                          | -497.6                            | 965.0                | 900.7                 | 64.28                   | 15.012            |                    |        |
| 8,700.0  | 7,157.1             | 8,924.9             | 7,412.1             | 35.3           | 35.3        | 105.31                | -1,568.4                          | -497.6                            | 965.5                | 897.9                 | 67.54                   | 14.294            |                    |        |
| 8,800.0  | 7,154.8             | 9,024.9             | 7,411.6             | 37.0           | 37.0        | 105.41                | -1,668.4                          | -497.6                            | 965.9                | 895.1                 | 70.85                   | 13.634            |                    |        |
| 8,900.0  | 7,152.5             | 9,124.9             | 7,411.1             | 38.7           | 38.7        | 105.52                | -1,768.3                          | -497.6                            | 966.4                | 892.2                 | 74.19                   | 13.027            |                    |        |
| 9,000.0  | 7,150.2             | 9,224.9             | 7,410.5             | 40.4           | 40.5        | 105.62                | -1,868.3                          | -497.6                            | 966.9                | 889.3                 | 77.56                   | 12.467            |                    |        |
| 9,100.0  | 7,147.8             | 9,324.9             | 7,410.0             | 42.2           | 42.2        | 105.72                | -1,968.3                          | -497.6                            | 967.4                | 886.4                 | 80.95                   | 11.950            |                    |        |
| 9,200.0  | 7,145.5             | 9,424.9             | 7,409.5             | 44.0           | 44.0        | 105.82                | -2,068.3                          | -497.6                            | 967.9                | 883.5                 | 84.37                   | 11.472            |                    |        |
| 9,300.0  | 7,143.2             | 9,524.8             | 7,409.0             | 45.7           | 45.7        | 105.93                | -2,168.3                          | -497.6                            | 968.4                | 880.6                 | 87.80                   | 11.029            |                    |        |
| 9,400.0  | 7,140.9             | 9,624.8             | 7,408.4             | 47.5           | 47.5        | 106.03                | -2,268.2                          | -497.6                            | 968.9                | 877.6                 | 91.26                   | 10.617            |                    |        |
| 9,500.0  | 7,138.6             | 9,724.8             | 7,407.9             | 49.3           | 49.3        | 106.13                | -2,368.2                          | -497.6                            | 969.4                | 874.6                 | 94.72                   | 10.234            |                    |        |
| 9,600.0  | 7,136.2             | 9,824.8             | 7,407.4             | 51.2           | 51.1        | 106.23                | -2,468.2                          | -497.6                            | 969.9                | 871.7                 | 98.20                   | 9.876             |                    |        |
| 9,700.0  | 7,133.9             | 9,924.8             | 7,406.9             | 53.0           | 53.0        | 106.34                | -2,568.2                          | -497.6                            | 970.4                | 868.7                 | 101.69                  | 9.542             |                    |        |
| 9,800.0  | 7,131.6             | 10,024.8            | 7,406.4             | 54.8           | 54.8        | 106.44                | -2,668.2                          | -497.6                            | 970.9                | 865.7                 | 105.19                  | 9.229             |                    |        |
| 9,900.0  | 7,129.3             | 10,124.7            | 7,405.8             | 56.6           | 56.6        | 106.54                | -2,768.2                          | -497.6                            | 971.4                | 862.7                 | 108.70                  | 8.936             |                    |        |
| 10,000.0   | 7,127.0             | 10,224.7            | 7,405.3             | 58.5           | 58.4        | 106.64                | -2,868.1                          | -497.6                            | 971.9                | 859.7                 | 112.21                  | 8.661             |                    |        |
| 10,100.0   | 7,124.6             | 10,324.7            | 7,404.8             | 60.3           | 60.3        | 106.74                | -2,968.1                          | -497.6                            | 972.4                | 856.7                 | 115.74                  | 8.402             |                    |        |
| 10,200.0   | 7,122.3             | 10,424.7            | 7,404.3             | 62.2           | 62.1        | 106.84                | -3,068.1                          | -497.6                            | 972.9                | 853.7                 | 119.26                  | 8.158             |                    |        |
| 10,300.0   | 7,120.0             | 10,524.7            | 7,403.7             | 64.0           | 64.0        | 106.94                | -3,168.1                          | -497.6                            | 973.5                | 850.7                 | 122.79                  | 7.928             |                    |        |
| 10,400.0   | 7,117.7             | 10,624.7            | 7,403.2             | 65.9           | 65.8        | 107.05                | -3,268.1                          | -497.6                            | 974.0                | 847.7                 | 126.32                  | 7.710             |                    |        |
| 10,500.0   | 7,115.3             | 10,724.6            | 7,402.7             | 67.7           | 67.7        | 107.15                | -3,368.1                          | -497.6                            | 974.5                | 844.7                 | 129.86                  | 7.504             |                    |        |
| 10,600.0   | 7,113.0             | 10,824.6            | 7,402.2             | 69.6           | 69.6        | 107.25                | -3,468.0                          | -497.6                            | 975.0                | 841.6                 | 133.40                  | 7.309             |                    |        |
| 10,700.0   | 7,110.7             | 10,924.6            | 7,401.6             | 71.5           | 71.4        | 107.35                | -3,568.0                          | -497.6                            | 975.6                | 838.6                 | 136.94                  | 7.124             |                    |        |
| 10,800.0   | 7,108.4             | 11,024.6            | 7,401.1             | 73.3           | 73.3        | 107.45                | -3,668.0                          | -497.6                            | 976.1                | 835.6                 | 140.48                  | 6.948             |                    |        |
| 10,900.0   | 7,106.1             | 11,124.6            | 7,400.6             | 75.2           | 75.2        | 107.55                | -3,768.0                          | -497.6                            | 976.7                | 832.6                 | 144.02                  | 6.781             |                    |        |
| 11,000.0   | 7,103.7             | 11,224.6            | 7,400.1             | 77.1           | 77.0        | 107.65                | -3,868.0                          | -497.6                            | 977.2                | 829.6                 | 147.57                  | 6.622             |                    |        |
| 11,100.0   | 7,101.4             | 11,324.6            | 7,399.5             | 78.9           | 78.9        | 107.75                | -3,968.0                          | -497.6                            | 977.8                | 826.6                 | 151.11                  | 6.470             |                    |        |
| 11,200.0   | 7,099.1             | 11,424.5            | 7,399.0             | 80.8           | 80.8        | 107.85                | -4,067.9                          | -497.6                            | 978.3                | 823.6                 | 154.66                  | 6.326             |                    |        |
| 11,300.0   | 7,096.8             | 11,524.5            | 7,398.5             | 82.7           | 82.7        | 107.95                | -4,167.9                          | -497.6                            | 978.9                | 820.7                 | 158.20                  | 6.187             |                    |        |
| 11,400.0   | 7,094.5             | 11,624.5            | 7,398.0             | 84.6           | 84.6        | 108.05                | -4,267.9                          | -497.6                            | 979.4                | 817.7                 | 161.74                  | 6.055             |                    |        |
| 11,500.0   | 7,092.1             | 11,724.5            | 7,397.5             | 86.5           | 86.4        | 108.15                | -4,367.9                          | -497.6                            | 980.0                | 814.7                 | 165.29                  | 5.929             |                    |        |
| 11,600.0   | 7,089.8             | 11,824.5            | 7,396.9             | 88.4           | 88.3        | 108.25                | -4,467.9                          | -497.6                            | 980.5                | 811.7                 | 168.83                  | 5.808             |                    |        |
| 11,700.0   | 7,087.5             | 11,924.5            | 7,396.4             | 90.3           | 90.2        | 108.35                | -4,567.8                          | -497.6                            | 981.1                | 808.7                 | 172.37                  | 5.692             |                    |        |
| 11,764.3   | 7,086.0             | 11,988.7            | 7,396.1             | 91.5           | 91.4        | 108.41                | -4,632.1                          | -497.6                            | 981.5                | 806.8                 | 174.64                  | 5.620 SF          |                    |        |

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28W-443 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |                                   |                               |                                |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |                                   |                               |                                |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 0.0  | 0.0                 | 0.0                 | 0.0                 | 0.0       | 0.0    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          |                                |                         |                    |         |
| 100.0  | 100.0               | 100.0               | 100.0               | 0.1       | 0.1    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 30.3                           | 0.22                    | 136.014            |         |
| 200.0  | 200.0               | 200.0               | 200.0               | 0.3       | 0.3    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 29.9                           | 0.67                    | 45.338             |         |
| 300.0  | 300.0               | 300.0               | 300.0               | 0.6       | 0.6    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 29.4                           | 1.12                    | 27.203             |         |
| 400.0  | 400.0               | 400.0               | 400.0               | 0.8       | 0.8    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 29.0                           | 1.57                    | 19.431             |         |
| 500.0  | 500.0               | 500.0               | 500.0               | 1.0       | 1.0    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 28.5                           | 2.02                    | 15.113             |         |
| 600.0  | 600.0               | 600.0               | 600.0               | 1.2       | 1.2    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 28.1                           | 2.47                    | 12.365             |         |
| 700.0  | 700.0               | 700.0               | 700.0               | 1.5       | 1.5    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 27.6                           | 2.92                    | 10.463             |         |
| 800.0  | 800.0               | 800.0               | 800.0               | 1.7       | 1.7    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 27.2                           | 3.37                    | 9.068              |         |
| 900.0  | 900.0               | 900.0               | 900.0               | 1.9       | 1.9    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 26.8                           | 3.82                    | 8.001              |         |
| 1,000.0  | 1,000.0             | 1,000.0             | 1,000.0             | 2.1       | 2.1    | -90.00          | -90.00                | 0.0                               | -30.6                             | 30.6                          | 26.3                           | 4.27                    | 7.159 CC, ES       |         |
| 1,100.0  | 1,100.0             | 1,100.0             | 1,100.0             | 2.4       | 2.4    | -151.58         | -151.58               | 0.0                               | -30.6                             | 32.1                          | 27.4                           | 4.71                    | 6.811              |         |
| 1,200.0  | 1,199.8             | 1,199.8             | 1,199.8             | 2.6       | 2.6    | -155.42         | -155.42               | 0.0                               | -30.6                             | 36.8                          | 31.6                           | 5.15                    | 7.149              |         |
| 1,300.0  | 1,299.5             | 1,299.5             | 1,299.5             | 2.8       | 2.8    | -160.00         | -160.00               | 0.0                               | -30.6                             | 44.9                          | 39.3                           | 5.58                    | 8.045              |         |
| 1,343.3  | 1,342.5             | 1,342.5             | 1,342.5             | 2.9       | 2.9    | -161.89         | -161.89               | 0.0                               | -30.6                             | 49.5                          | 43.7                           | 5.76                    | 8.583              |         |
| 1,400.0  | 1,398.8             | 1,398.8             | 1,398.8             | 3.0       | 3.0    | -164.05         | -164.05               | 0.0                               | -30.6                             | 55.9                          | 49.9                           | 6.01                    | 9.306              |         |
| 1,500.0  | 1,498.1             | 1,498.1             | 1,498.1             | 3.3       | 3.3    | -166.84         | -166.84               | 0.0                               | -30.6                             | 67.5                          | 61.1                           | 6.45                    | 10.463             |         |
| 1,600.0  | 1,597.3             | 1,599.2             | 1,599.2             | 3.6       | 3.5    | -167.94         | -167.94               | 1.5                               | -29.8                             | 78.0                          | 71.1                           | 6.90                    | 11.311             |         |
| 1,700.0  | 1,696.6             | 1,700.9             | 1,700.8             | 3.8       | 3.7    | -167.09         | -167.09               | 6.3                               | -27.5                             | 86.1                          | 78.7                           | 7.35                    | 11.720             |         |
| 1,800.0  | 1,795.9             | 1,802.6             | 1,802.0             | 4.1       | 3.9    | -164.73         | -164.73               | 14.3                              | -23.5                             | 91.8                          | 84.0                           | 7.80                    | 11.771             |         |
| 1,900.0  | 1,895.2             | 1,902.4             | 1,901.3             | 4.4       | 4.2    | -162.04         | -162.04               | 23.4                              | -19.0                             | 96.8                          | 88.5                           | 8.27                    | 11.711             |         |
| 2,000.0  | 1,994.5             | 2,002.2             | 2,000.6             | 4.7       | 4.4    | -159.62         | -159.62               | 32.5                              | -14.6                             | 102.0                         | 93.2                           | 8.74                    | 11.666             |         |
| 2,100.0  | 2,093.8             | 2,101.9             | 2,099.8             | 5.0       | 4.7    | -157.43         | -157.43               | 41.7                              | -10.1                             | 107.3                         | 98.1                           | 9.23                    | 11.630             |         |
| 2,200.0  | 2,193.0             | 2,201.7             | 2,199.1             | 5.3       | 4.9    | -155.45         | -155.45               | 50.8                              | -5.6                              | 112.8                         | 103.1                          | 9.72                    | 11.602             |         |
| 2,300.0  | 2,292.3             | 2,301.5             | 2,298.3             | 5.6       | 5.2    | -153.66         | -153.66               | 59.9                              | -1.1                              | 118.4                         | 108.2                          | 10.23                   | 11.579             |         |
| 2,400.0  | 2,391.6             | 2,401.3             | 2,397.6             | 5.9       | 5.4    | -152.03         | -152.03               | 69.0                              | 3.4                               | 124.1                         | 113.4                          | 10.74                   | 11.559             |         |
| 2,500.0  | 2,490.9             | 2,501.0             | 2,496.9             | 6.2       | 5.7    | -150.55         | -150.55               | 78.1                              | 7.9                               | 129.9                         | 118.6                          | 11.25                   | 11.543             |         |
| 2,600.0  | 2,590.2             | 2,600.8             | 2,596.1             | 6.5       | 5.9    | -149.19         | -149.19               | 87.2                              | 12.3                              | 135.8                         | 124.0                          | 11.78                   | 11.528             |         |
| 2,700.0  | 2,689.4             | 2,700.6             | 2,695.4             | 6.8       | 6.2    | -147.94         | -147.94               | 96.4                              | 16.8                              | 141.7                         | 129.4                          | 12.31                   | 11.515             |         |
| 2,800.0  | 2,788.7             | 2,800.4             | 2,794.6             | 7.1       | 6.5    | -146.80         | -146.80               | 105.5                             | 21.3                              | 147.7                         | 134.9                          | 12.84                   | 11.504             |         |
| 2,900.0  | 2,888.0             | 2,900.2             | 2,893.9             | 7.4       | 6.7    | -145.75         | -145.75               | 114.6                             | 25.8                              | 153.8                         | 140.4                          | 13.38                   | 11.493             |         |
| 3,000.0  | 2,987.3             | 2,999.9             | 2,993.2             | 7.7       | 7.0    | -144.77         | -144.77               | 123.7                             | 30.3                              | 159.9                         | 146.0                          | 13.92                   | 11.484             |         |
| 3,100.0  | 3,086.6             | 3,099.7             | 3,092.4             | 8.0       | 7.3    | -143.87         | -143.87               | 132.8                             | 34.8                              | 166.0                         | 151.6                          | 14.47                   | 11.476             |         |
| 3,200.0  | 3,185.9             | 3,199.5             | 3,191.7             | 8.3       | 7.6    | -143.03         | -143.03               | 141.9                             | 39.2                              | 172.2                         | 157.2                          | 15.02                   | 11.468             |         |
| 3,300.0  | 3,285.1             | 3,299.3             | 3,290.9             | 8.6       | 7.8    | -142.25         | -142.25               | 151.1                             | 43.7                              | 178.5                         | 162.9                          | 15.57                   | 11.461             |         |
| 3,400.0  | 3,384.4             | 3,399.0             | 3,390.2             | 8.9       | 8.1    | -141.53         | -141.53               | 160.2                             | 48.2                              | 184.7                         | 168.6                          | 16.12                   | 11.455             |         |
| 3,500.0  | 3,483.7             | 3,498.8             | 3,489.4             | 9.2       | 8.4    | -140.85         | -140.85               | 169.3                             | 52.7                              | 191.0                         | 174.3                          | 16.68                   | 11.449             |         |
| 3,600.0  | 3,583.0             | 3,598.6             | 3,588.7             | 9.6       | 8.7    | -140.21         | -140.21               | 178.4                             | 57.2                              | 197.3                         | 180.1                          | 17.24                   | 11.443             |         |
| 3,700.0  | 3,682.3             | 3,698.4             | 3,688.0             | 9.9       | 9.0    | -139.62         | -139.62               | 187.5                             | 61.7                              | 203.6                         | 185.8                          | 17.80                   | 11.438             |         |
| 3,800.0  | 3,781.6             | 3,798.2             | 3,787.2             | 10.2      | 9.2    | -139.06         | -139.06               | 196.6                             | 66.1                              | 210.0                         | 191.6                          | 18.36                   | 11.434             |         |
| 3,900.0  | 3,880.8             | 3,897.9             | 3,886.5             | 10.5      | 9.5    | -138.53         | -138.53               | 205.8                             | 70.6                              | 216.3                         | 197.4                          | 18.93                   | 11.430             |         |
| 4,000.0  | 3,980.1             | 3,997.7             | 3,985.7             | 10.8      | 9.8    | -138.03         | -138.03               | 214.9                             | 75.1                              | 222.7                         | 203.2                          | 19.49                   | 11.426             |         |
| 4,100.0  | 4,079.4             | 4,097.5             | 4,085.0             | 11.1      | 10.1   | -137.56         | -137.56               | 224.0                             | 79.6                              | 229.1                         | 209.1                          | 20.06                   | 11.422             |         |
| 4,200.0  | 4,178.7             | 4,197.3             | 4,184.3             | 11.4      | 10.4   | -137.12         | -137.12               | 233.1                             | 84.1                              | 235.5                         | 214.9                          | 20.63                   | 11.419             |         |
| 4,300.0  | 4,278.0             | 4,295.6             | 4,282.2             | 11.7      | 10.6   | -136.92         | -136.92               | 241.2                             | 88.1                              | 242.2                         | 221.0                          | 21.15                   | 11.449             |         |
| 4,400.0  | 4,377.3             | 4,393.4             | 4,379.8             | 12.0      | 10.8   | -137.47         | -137.47               | 246.4                             | 90.6                              | 249.6                         | 228.0                          | 21.60                   | 11.559             |         |
| 4,500.0  | 4,476.5             | 4,490.7             | 4,477.1             | 12.4      | 11.0   | -138.70         | -138.70               | 248.6                             | 91.7                              | 257.9                         | 235.9                          | 21.98                   | 11.734             |         |
| 4,600.0  | 4,575.8             | 4,589.5             | 4,575.8             | 12.7      | 11.1   | -140.36         | -140.36               | 248.7                             | 91.7                              | 267.0                         | 244.7                          | 22.35                   | 11.949             |         |
| 4,700.0  | 4,675.1             | 4,688.7             | 4,675.1             | 13.0      | 11.3   | -141.94         | -141.94               | 248.7                             | 91.7                              | 276.4                         | 253.6                          | 22.73                   | 12.156             |         |
| 4,800.0  | 4,774.4             | 4,788.0             | 4,774.4             | 13.3      | 11.5   | -143.41         | -143.41               | 248.7                             | 91.7                              | 285.9                         | 262.8                          | 23.13                   | 12.363             |         |
| 4,900.0  | 4,873.7             | 4,887.3             | 4,873.7             | 13.6      | 11.7   | -144.79         | -144.79               | 248.7                             | 91.7                              | 295.6                         | 272.1                          | 23.52                   | 12.568             |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28W-443 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |                                   |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 5,000.0  | 4,972.9             | 4,986.6             | 4,972.9             | 13.9      | 11.9   | -146.08         |                       | 248.7                             | 91.7                              | 305.5                | 281.6                 | 23.92                   | 12.772             |         |
| 5,100.0  | 5,072.2             | 5,085.9             | 5,072.2             | 14.2      | 12.1   | -147.29         |                       | 248.7                             | 91.7                              | 315.5                | 291.2                 | 24.32                   | 12.974             |         |
| 5,185.9  | 5,157.5             | 5,171.1             | 5,157.5             | 14.5      | 12.3   | -148.27         |                       | 248.7                             | 91.7                              | 324.2                | 299.5                 | 24.66                   | 13.145             |         |
| 5,200.0  | 5,171.5             | 5,185.2             | 5,171.5             | 14.5      | 12.3   | -148.44         |                       | 248.7                             | 91.7                              | 325.6                | 300.9                 | 24.72                   | 13.172             |         |
| 5,300.0  | 5,271.0             | 5,284.7             | 5,271.0             | 14.8      | 12.5   | -149.39         |                       | 248.7                             | 91.7                              | 333.9                | 308.8                 | 25.09                   | 13.308             |         |
| 5,400.0  | 5,370.8             | 5,384.5             | 5,370.8             | 15.0      | 12.7   | -149.98         |                       | 248.7                             | 91.7                              | 339.3                | 313.9                 | 25.46                   | 13.329             |         |
| 5,500.0  | 5,470.8             | 5,484.4             | 5,470.8             | 15.1      | 12.9   | -150.24         |                       | 248.7                             | 91.7                              | 341.7                | 315.9                 | 25.81                   | 13.241             |         |
| 5,529.2  | 5,500.0             | 5,513.6             | 5,500.0             | 15.2      | 13.0   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 316.0                 | 25.91                   | 13.194             |         |
| 5,600.0  | 5,570.8             | 5,584.4             | 5,570.8             | 15.3      | 13.2   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 315.7                 | 26.19                   | 13.055             |         |
| 5,700.0  | 5,670.8             | 5,684.4             | 5,670.8             | 15.5      | 13.4   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 315.3                 | 26.59                   | 12.857             |         |
| 5,800.0  | 5,770.8             | 5,784.4             | 5,770.8             | 15.6      | 13.6   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 314.9                 | 27.00                   | 12.664             |         |
| 5,900.0  | 5,870.8             | 5,884.4             | 5,870.8             | 15.8      | 13.8   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 314.5                 | 27.40                   | 12.476             |         |
| 6,000.0  | 5,970.8             | 5,984.4             | 5,970.8             | 16.0      | 14.0   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 314.1                 | 27.81                   | 12.293             |         |
| 6,100.0  | 6,070.8             | 6,084.4             | 6,070.8             | 16.2      | 14.2   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 313.6                 | 28.22                   | 12.114             |         |
| 6,200.0  | 6,170.8             | 6,184.4             | 6,170.8             | 16.3      | 14.4   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 313.2                 | 28.63                   | 11.941             |         |
| 6,300.0  | 6,270.8             | 6,284.4             | 6,270.8             | 16.5      | 14.6   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 312.8                 | 29.04                   | 11.771             |         |
| 6,400.0  | 6,370.8             | 6,384.4             | 6,370.8             | 16.7      | 14.8   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 312.4                 | 29.46                   | 11.606             |         |
| 6,446.6  | 6,417.4             | 6,431.1             | 6,417.4             | 16.8      | 14.9   | -90.22          |                       | 248.7                             | 91.7                              | 341.9                | 312.2                 | 29.65                   | 11.531             |         |
| 6,450.0  | 6,420.8             | 6,434.4             | 6,420.8             | 16.8      | 14.9   | 89.78           |                       | 248.7                             | 91.7                              | 341.9                | 312.2                 | 29.66                   | 11.526             |         |
| 6,491.4  | 6,462.2             | 6,475.8             | 6,462.2             | 16.9      | 15.0   | 90.00           |                       | 248.7                             | 91.7                              | 341.9                | 312.0                 | 29.82                   | 11.463             |         |
| 6,500.0  | 6,470.8             | 6,484.4             | 6,470.8             | 16.9      | 15.0   | 90.09           |                       | 248.7                             | 91.7                              | 341.9                | 312.0                 | 29.86                   | 11.450             |         |
| 6,550.0  | 6,520.5             | 6,534.1             | 6,520.5             | 16.9      | 15.1   | 90.94           |                       | 248.7                             | 91.7                              | 341.9                | 311.8                 | 30.06                   | 11.373             |         |
| 6,600.0  | 6,569.8             | 6,583.4             | 6,569.8             | 17.0      | 15.2   | 92.30           |                       | 248.7                             | 91.7                              | 342.2                | 311.9                 | 30.28                   | 11.301             |         |
| 6,650.0  | 6,618.4             | 6,632.0             | 6,618.4             | 17.0      | 15.3   | 94.13           |                       | 248.7                             | 91.7                              | 342.8                | 312.3                 | 30.49                   | 11.243             |         |
| 6,700.0  | 6,666.2             | 6,681.0             | 6,666.2             | 17.0      | 15.4   | 96.37           |                       | 248.3                             | 91.7                              | 344.2                | 313.5                 | 30.69                   | 11.214             |         |
| 6,750.0  | 6,712.9             | 6,732.0             | 6,712.9             | 17.0      | 15.5   | 98.70           |                       | 245.1                             | 91.7                              | 346.2                | 315.4                 | 30.85                   | 11.225             |         |
| 6,800.0  | 6,758.3             | 6,784.0             | 6,758.3             | 17.0      | 15.6   | 101.00          |                       | 238.2                             | 91.7                              | 348.9                | 317.9                 | 30.94                   | 11.275             |         |
| 6,850.0  | 6,802.3             | 6,837.2             | 6,802.3             | 17.1      | 15.6   | 103.24          |                       | 227.7                             | 91.7                              | 352.0                | 321.1                 | 30.98                   | 11.365             |         |
| 6,900.0  | 6,844.6             | 6,891.6             | 6,844.6             | 17.1      | 15.6   | 105.42          |                       | 213.1                             | 91.7                              | 355.7                | 324.8                 | 30.96                   | 11.491             |         |
| 6,950.0  | 6,885.2             | 6,947.3             | 6,885.2             | 17.1      | 15.7   | 107.52          |                       | 194.4                             | 91.7                              | 359.8                | 329.0                 | 30.88                   | 11.652             |         |
| 7,000.0  | 6,923.7             | 7,004.3             | 6,923.7             | 17.1      | 15.7   | 109.54          |                       | 171.3                             | 91.7                              | 364.3                | 333.5                 | 30.76                   | 11.843             |         |
| 7,050.0  | 6,960.0             | 7,062.7             | 7,030.3             | 17.1      | 15.7   | 111.45          |                       | 143.8                             | 91.7                              | 369.0                | 338.4                 | 30.61                   | 12.056             |         |
| 7,100.0  | 6,994.0             | 7,122.4             | 7,080.6             | 17.1      | 15.7   | 113.26          |                       | 111.5                             | 91.7                              | 373.9                | 343.5                 | 30.44                   | 12.284             |         |
| 7,150.0  | 7,025.5             | 7,183.6             | 7,129.4             | 17.2      | 15.7   | 114.94          |                       | 74.6                              | 91.7                              | 378.9                | 348.6                 | 30.28                   | 12.513             |         |
| 7,200.0  | 7,054.5             | 7,246.2             | 7,176.0             | 17.2      | 15.8   | 116.50          |                       | 32.9                              | 91.7                              | 383.8                | 353.7                 | 30.15                   | 12.731             |         |
| 7,250.0  | 7,080.7             | 7,310.2             | 7,220.0             | 17.3      | 15.8   | 117.92          |                       | -13.6                             | 91.7                              | 388.6                | 358.5                 | 30.08                   | 12.920             |         |
| 7,300.0  | 7,104.1             | 7,375.5             | 7,260.8             | 17.5      | 16.0   | 119.19          |                       | -64.6                             | 91.7                              | 393.1                | 363.0                 | 30.10                   | 13.060             |         |
| 7,350.0  | 7,124.5             | 7,442.1             | 7,297.6             | 17.7      | 16.2   | 120.32          |                       | -120.0                            | 91.7                              | 397.3                | 367.0                 | 30.23                   | 13.140             |         |
| 7,400.0  | 7,141.9             | 7,509.9             | 7,330.1             | 17.9      | 16.5   | 121.28          |                       | -179.5                            | 91.7                              | 401.0                | 370.4                 | 30.51                   | 13.141             |         |
| 7,450.0  | 7,156.2             | 7,578.7             | 7,357.5             | 18.2      | 17.0   | 122.07          |                       | -242.6                            | 91.7                              | 404.1                | 373.2                 | 30.96                   | 13.053             |         |
| 7,500.0  | 7,167.3             | 7,648.3             | 7,379.4             | 18.6      | 17.4   | 122.70          |                       | -308.7                            | 91.7                              | 406.7                | 375.1                 | 31.58                   | 12.877             |         |
| 7,550.0  | 7,175.3             | 7,718.6             | 7,395.2             | 19.0      | 18.0   | 123.15          |                       | -377.1                            | 91.7                              | 408.5                | 376.1                 | 32.40                   | 12.610             |         |
| 7,600.0  | 7,179.9             | 7,785.9             | 7,404.5             | 19.5      | 18.7   | 123.42          |                       | -443.7                            | 91.7                              | 409.7                | 376.3                 | 33.37                   | 12.279             |         |
| 7,650.0  | 7,181.4             | 7,835.7             | 7,409.7             | 20.0      | 19.2   | 123.73          |                       | -493.3                            | 91.7                              | 411.8                | 377.5                 | 34.30                   | 12.007             |         |
| 7,664.4  | 7,181.2             | 7,850.0             | 7,411.2             | 20.1      | 19.3   | 123.87          |                       | -507.5                            | 91.7                              | 412.8                | 378.2                 | 34.57                   | 11.941             |         |
| 7,700.0  | 7,180.3             | 7,894.1             | 7,415.0             | 20.5      | 19.8   | 124.42          |                       | -551.4                            | 91.7                              | 415.0                | 379.8                 | 35.19                   | 11.794             |         |
| 7,800.0  | 7,178.0             | 8,011.3             | 7,417.5             | 21.7      | 21.2   | 125.00          |                       | -668.6                            | 91.7                              | 417.4                | 380.1                 | 37.24                   | 11.207             |         |
| 7,900.0  | 7,175.7             | 8,111.3             | 7,416.9             | 23.0      | 22.5   | 125.20          |                       | -768.6                            | 91.7                              | 418.4                | 379.0                 | 39.39                   | 10.623             |         |
| 8,000.0  | 7,173.4             | 8,211.3             | 7,416.4             | 24.3      | 23.9   | 125.40          |                       | -868.5                            | 91.7                              | 419.4                | 377.8                 | 41.66                   | 10.069             |         |
| 8,100.0  | 7,171.1             | 8,311.3             | 7,415.8             | 25.7      | 25.3   | 125.60          |                       | -968.5                            | 91.7                              | 420.5                | 376.4                 | 44.04                   | 9.548              |         |
| 8,200.0  | 7,168.7             | 8,411.3             | 7,415.3             | 27.2      | 26.8   | 125.80          |                       | -1,068.5                          | 91.7                              | 421.5                | 375.0                 | 46.50                   | 9.064              |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

| Offset Design Thornton 28SW-HZ Pad Sec.28-T7N-R66W - Thornton 28W-443 - Wellbore #1 - Plan #1 (06-04-13) |                     |                     |                     |           |        |                 |                       |                                   |            |                      |                       |                         | Offset Site Error: | 0.0 ft  |
|--|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD  |                     |                     |                     |           |        |                 |                       |                                   |            |                      |                       |                         | Offset Well Error: | 0.0 ft  |
| Measured Depth (ft)  | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor  | Warning |
| 8,300.0  | 7,166.4             | 8,511.2             | 7,414.8             | 28.8      | 28.4   | 125.99          |                       | -1,168.5                          | 91.7       | 422.6                | 373.5                 | 49.04                   | 8.617              |         |
| 8,400.0  | 7,164.1             | 8,611.2             | 7,414.2             | 30.3      | 30.0   | 126.19          |                       | -1,268.5                          | 91.7       | 423.6                | 372.0                 | 51.64                   | 8.204              |         |
| 8,500.0  | 7,161.8             | 8,711.2             | 7,413.7             | 32.0      | 31.6   | 126.38          |                       | -1,368.5                          | 91.7       | 424.7                | 370.4                 | 54.28                   | 7.823              |         |
| 8,600.0  | 7,159.4             | 8,811.2             | 7,413.1             | 33.6      | 33.3   | 126.57          |                       | -1,468.4                          | 91.7       | 425.7                | 368.8                 | 56.97                   | 7.473              |         |
| 8,700.0  | 7,157.1             | 8,911.2             | 7,412.6             | 35.3      | 35.0   | 126.76          |                       | -1,568.4                          | 91.7       | 426.8                | 367.1                 | 59.68                   | 7.151              |         |
| 8,800.0  | 7,154.8             | 9,011.2             | 7,412.0             | 37.0      | 36.7   | 126.96          |                       | -1,668.4                          | 91.7       | 427.9                | 365.4                 | 62.43                   | 6.854              |         |
| 8,900.0  | 7,152.5             | 9,111.1             | 7,411.5             | 38.7      | 38.4   | 127.15          |                       | -1,768.4                          | 91.7       | 428.9                | 363.7                 | 65.19                   | 6.579              |         |
| 9,000.0  | 7,150.2             | 9,211.1             | 7,411.0             | 40.4      | 40.2   | 127.33          |                       | -1,868.4                          | 91.7       | 430.0                | 362.0                 | 67.97                   | 6.326              |         |
| 9,100.0  | 7,147.8             | 9,311.1             | 7,410.4             | 42.2      | 41.9   | 127.52          |                       | -1,968.3                          | 91.7       | 431.1                | 360.3                 | 70.77                   | 6.092              |         |
| 9,200.0  | 7,145.5             | 9,411.1             | 7,409.9             | 44.0      | 43.7   | 127.71          |                       | -2,068.3                          | 91.7       | 432.2                | 358.6                 | 73.57                   | 5.874              |         |
| 9,300.0  | 7,143.2             | 9,511.1             | 7,409.3             | 45.7      | 45.5   | 127.90          |                       | -2,168.3                          | 91.7       | 433.3                | 356.9                 | 76.38                   | 5.672              |         |
| 9,400.0  | 7,140.9             | 9,611.1             | 7,408.8             | 47.5      | 47.3   | 128.08          |                       | -2,268.3                          | 91.7       | 434.4                | 355.2                 | 79.20                   | 5.484              |         |
| 9,500.0  | 7,138.6             | 9,711.0             | 7,408.3             | 49.3      | 49.1   | 128.26          |                       | -2,368.3                          | 91.7       | 435.5                | 353.4                 | 82.02                   | 5.309              |         |
| 9,600.0  | 7,136.2             | 9,811.0             | 7,407.7             | 51.2      | 50.9   | 128.45          |                       | -2,468.3                          | 91.7       | 436.6                | 351.7                 | 84.85                   | 5.145              |         |
| 9,700.0  | 7,133.9             | 9,911.0             | 7,407.2             | 53.0      | 52.8   | 128.63          |                       | -2,568.2                          | 91.7       | 437.7                | 350.0                 | 87.67                   | 4.992              |         |
| 9,800.0  | 7,131.6             | 10,011.0            | 7,406.6             | 54.8      | 54.6   | 128.81          |                       | -2,668.2                          | 91.7       | 438.8                | 348.3                 | 90.49                   | 4.849              |         |
| 9,900.0  | 7,129.3             | 10,111.0            | 7,406.1             | 56.6      | 56.4   | 128.99          |                       | -2,768.2                          | 91.7       | 439.9                | 346.6                 | 93.31                   | 4.714              |         |
| 10,000.0   | 7,127.0             | 10,211.0            | 7,405.6             | 58.5      | 58.3   | 129.17          |                       | -2,868.2                          | 91.7       | 441.0                | 344.9                 | 96.13                   | 4.588              |         |
| 10,100.0   | 7,124.6             | 10,311.0            | 7,405.0             | 60.3      | 60.1   | 129.35          |                       | -2,968.2                          | 91.7       | 442.2                | 343.2                 | 98.94                   | 4.469              |         |
| 10,200.0   | 7,122.3             | 10,410.9            | 7,404.5             | 62.2      | 62.0   | 129.53          |                       | -3,068.2                          | 91.7       | 443.3                | 341.5                 | 101.75                  | 4.356              |         |
| 10,300.0   | 7,120.0             | 10,510.9            | 7,403.9             | 64.0      | 63.9   | 129.71          |                       | -3,168.1                          | 91.7       | 444.4                | 339.9                 | 104.56                  | 4.250              |         |
| 10,400.0   | 7,117.7             | 10,610.9            | 7,403.4             | 65.9      | 65.7   | 129.88          |                       | -3,268.1                          | 91.7       | 445.6                | 338.2                 | 107.36                  | 4.150              |         |
| 10,500.0   | 7,115.3             | 10,710.9            | 7,402.9             | 67.7      | 67.6   | 130.06          |                       | -3,368.1                          | 91.7       | 446.7                | 336.6                 | 110.15                  | 4.055              |         |
| 10,600.0   | 7,113.0             | 10,810.9            | 7,402.3             | 69.6      | 69.5   | 130.23          |                       | -3,468.1                          | 91.7       | 447.9                | 334.9                 | 112.94                  | 3.965              |         |
| 10,700.0   | 7,110.7             | 10,910.9            | 7,401.8             | 71.5      | 71.3   | 130.40          |                       | -3,568.1                          | 91.7       | 449.0                | 333.3                 | 115.72                  | 3.880              |         |
| 10,800.0   | 7,108.4             | 11,010.8            | 7,401.2             | 73.3      | 73.2   | 130.58          |                       | -3,668.1                          | 91.7       | 450.2                | 331.7                 | 118.50                  | 3.799              |         |
| 10,900.0   | 7,106.1             | 11,110.8            | 7,400.7             | 75.2      | 75.1   | 130.75          |                       | -3,768.0                          | 91.7       | 451.3                | 330.1                 | 121.26                  | 3.722              |         |
| 11,000.0   | 7,103.7             | 11,210.8            | 7,400.1             | 77.1      | 77.0   | 130.92          |                       | -3,868.0                          | 91.7       | 452.5                | 328.5                 | 124.02                  | 3.649              |         |
| 11,100.0   | 7,101.4             | 11,310.8            | 7,399.6             | 78.9      | 78.8   | 131.09          |                       | -3,968.0                          | 91.7       | 453.7                | 326.9                 | 126.77                  | 3.579              |         |
| 11,200.0   | 7,099.1             | 11,410.8            | 7,399.1             | 80.8      | 80.7   | 131.26          |                       | -4,068.0                          | 91.7       | 454.8                | 325.3                 | 129.51                  | 3.512              |         |
| 11,300.0   | 7,096.8             | 11,510.8            | 7,398.5             | 82.7      | 82.6   | 131.43          |                       | -4,168.0                          | 91.7       | 456.0                | 323.8                 | 132.25                  | 3.448              |         |
| 11,400.0   | 7,094.5             | 11,610.7            | 7,398.0             | 84.6      | 84.5   | 131.59          |                       | -4,267.9                          | 91.7       | 457.2                | 322.2                 | 134.97                  | 3.387              |         |
| 11,500.0   | 7,092.1             | 11,710.7            | 7,397.4             | 86.5      | 86.4   | 131.76          |                       | -4,367.9                          | 91.7       | 458.4                | 320.7                 | 137.69                  | 3.329              |         |
| 11,600.0   | 7,089.8             | 11,810.7            | 7,396.9             | 88.4      | 88.3   | 131.93          |                       | -4,467.9                          | 91.7       | 459.6                | 319.2                 | 140.40                  | 3.273              |         |
| 11,700.0   | 7,087.5             | 11,910.7            | 7,396.4             | 90.3      | 90.2   | 132.09          |                       | -4,567.9                          | 91.7       | 460.8                | 317.7                 | 143.10                  | 3.220              |         |
| 11,764.3   | 7,086.0             | 11,975.0            | 7,396.0             | 91.5      | 91.4   | 132.20          |                       | -4,632.2                          | 91.7       | 461.5                | 316.7                 | 144.83                  | 3.187 SF           |         |

|  |  |
|--|--|
| Reference Depths are relative to WELL @ 4950.0ft (RKB-15') | Coordinates are relative to: Thornton 28W-103                    |
| Offset Depths are relative to Offset Datum                 | Coordinate System is US State Plane 1983, Colorado Northern Zone |
| Central Meridian is -105.500000 °                          | Grid Convergence at Surface is: 0.47°                            |



|                           |   |                                     |                           |
|---------------------------|---|-------------------------------------|---------------------------|
| <b>Company:</b>           | PETROLEUM DEVELOPMENT CORP Weld County CO | <b>Local Co-ordinate Reference:</b> | Well Thornton 28W-103     |
| <b>Project:</b>           | SEC.28-T7N-R66W                           | <b>TVD Reference:</b>               | WELL @ 4950.0ft (RKB-15') |
| <b>Reference Site:</b>    | Thornton 28SW-HZ Pad Sec.28-T7N-R66W      | <b>MD Reference:</b>                | WELL @ 4950.0ft (RKB-15') |
| <b>Site Error:</b>        | 0.0ft                                     | <b>North Reference:</b>             | True                      |
| <b>Reference Well:</b>    | Thornton 28W-103                          | <b>Survey Calculation Method:</b>   | Minimum Curvature         |
| <b>Well Error:</b>        | 0.0ft                                     | <b>Output errors are at</b>         | 2.00 sigma                |
| <b>Reference Wellbore</b> | Wellbore #1                               | <b>Database:</b>                    | Landmark                  |
| <b>Reference Design:</b>  | Plan #1 (06-04-13)                        | <b>Offset TVD Reference:</b>        | Offset Datum              |

Reference Depths are relative to WELL @ 4950.0ft (RKB-15')  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: Thornton 28W-103  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.47°

