# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Peterson 14W-434**

Surface Location: Peterson 14WX-HZ Pad Sec.14-T5N-R64W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4571.0

| +N/-S | +E/-W | Northing | Easting | Latittude | Longitude | Slot |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1388714.09 | 3275955.04 | 40.396190 | -104.509210 | |

RKB - 15' WELL @ 4586.0ft (RKB - 15')

## WELLBORE TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Shape |
|---|---|---|---|---|
| SHL 1517'FSL, 310'FEL | 1.0 | 0.0 | 0.0 | Point |
| BHL 2385'FSL & 500'FWL | 6686.0 | 882.0 | -4372.9 | Point |

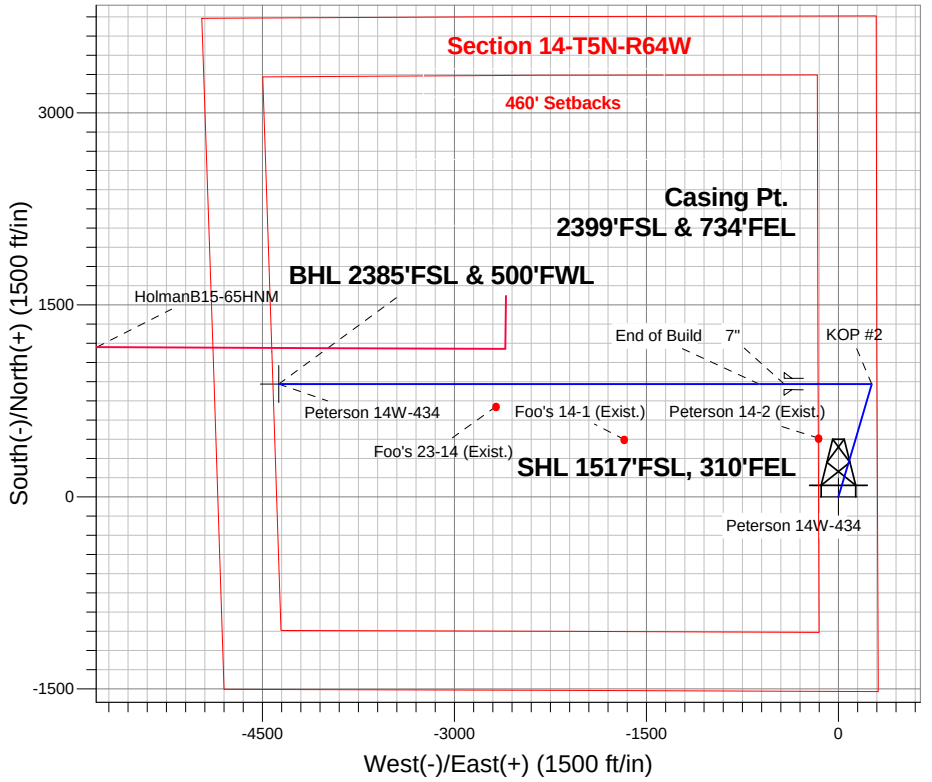

Azimuths to True North
Magnetic North: 8.36°

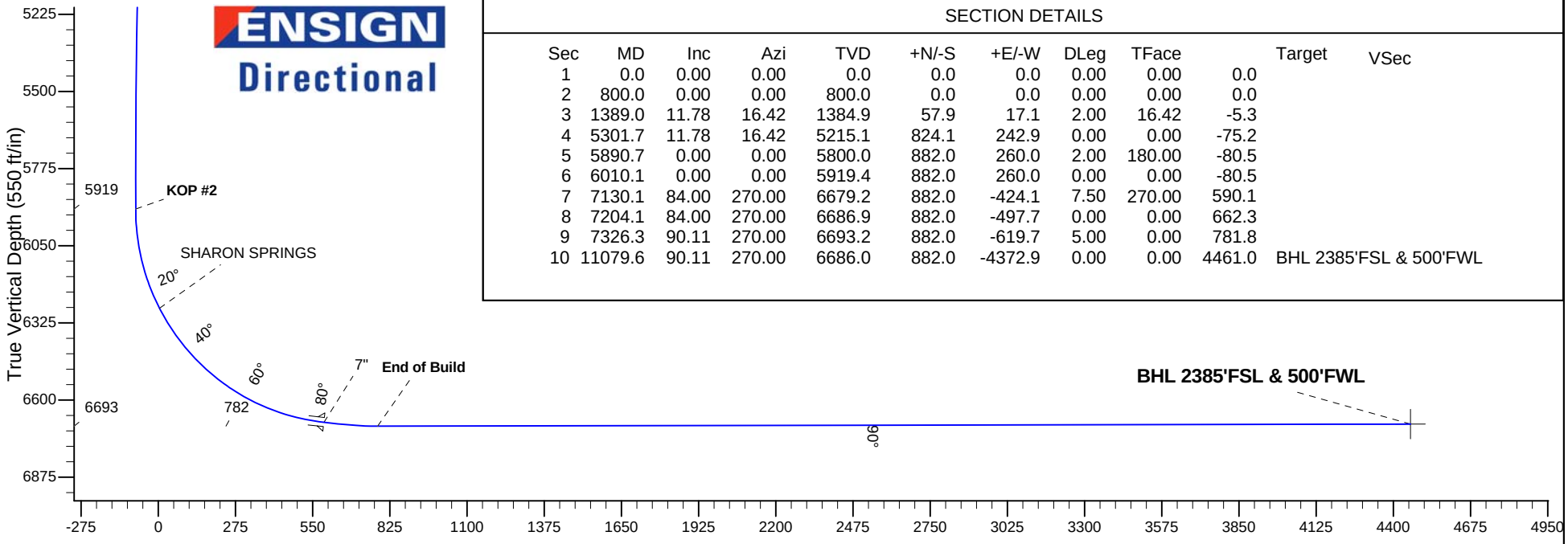
Magnetic Field
Strength: 52870.8snT
Dip Angle: 66.99°
Date: 3/7/2014
Model: IGRF2010

## ANNOTATIONS

| TVD | MD | Annotation |
|---|---|---|
| 800.0 | 800.0 | KOP #1 |
| 5919.4 | 6010.1 | KOP #2 |
| 6693.2 | 7326.3 | End of Build |

Peterson 14WX-HZ Pad Sec.14-T5N-R64W
Peterson 14W-434
Plan #1 (3-07-14)
7:22, March 12 2014




## SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | | Target | VSec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 2 | 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 3 | 1389.0 | 11.78 | 16.42 | 1384.9 | 57.9 | 17.1 | 2.00 | 16.42 | -5.3 | | |
| 4 | 5301.7 | 11.78 | 16.42 | 5215.1 | 824.1 | 242.9 | 0.00 | 0.00 | -75.2 | | |
| 5 | 5890.7 | 0.00 | 0.00 | 5800.0 | 882.0 | 260.0 | 2.00 | 180.00 | -80.5 | | |
| 6 | 6010.1 | 0.00 | 0.00 | 5919.4 | 882.0 | 260.0 | 0.00 | 0.00 | -80.5 | | |
| 7 | 7130.1 | 84.00 | 270.00 | 6679.2 | 882.0 | -424.1 | 7.50 | 270.00 | 590.1 | | |
| 8 | 7204.1 | 84.00 | 270.00 | 6686.9 | 882.0 | -497.7 | 0.00 | 0.00 | 662.3 | | |
| 9 | 7326.3 | 90.11 | 270.00 | 6693.2 | 882.0 | -619.7 | 5.00 | 0.00 | 781.8 | | |
| 10 | 11079.6 | 90.11 | 270.00 | 6686.0 | 882.0 | -4372.9 | 0.00 | 0.00 | 4461.0 | BHL 2385'FSL & 500'FWL | |

# PETROLEUM DEVELOPMENT CORP Weld County CO

**SEC.14-T5N-R64W**
**Peterson 14WX-HZ Pad Sec.14-T5N-R64W**
**Peterson 14W-434**

**Wellbore #1**

**Plan: Plan #1 (3-07-14)**

# Standard Planning Report

**10 March, 2014**

| | | | |
|---|---|---|---|
| **Database:** | Landmark | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Project:** | SEC.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **North Reference:** | True |
| **Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-07-14) | | |

**Project** SEC.14-T5N-R64W, Weld County, CO

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | Using Well Reference Point |
| **Map Zone:** | Colorado Northern Zone | | Using geodetic scale factor |

**Site** Peterson 14WX-HZ Pad Sec.14-T5N-R64W

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,388,684.96 ft | **Latitude:** | 40.396110 |
| **From:** | Lat/Long | **Easting:** | 3,275,955.37 ft | **Longitude:** | -104.509210 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | " | **Grid Convergence:** | 0.64 ° |

**Well** Peterson 14W-434

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 29.1 ft | **Northing:** | 1,388,714.09 ft | **Latitude:** | 40.396190 |
| | **+E/-W** | 0.0 ft | **Easting:** | 3,275,955.04 ft | **Longitude:** | -104.509210 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,571.0 ft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 3/7/2014 | 8.36 | 66.99 | 52,871 |

**Design** Plan #1 (3-07-14)

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | | **Phase:** | PROTOTYPE | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 281.40 |

**Plan Sections**

| 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 | |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,389.0 | 11.78 | 16.42 | 1,384.9 | 57.9 | 17.1 | 2.00 | 2.00 | 0.00 | 16.42 | |
| 5,301.7 | 11.78 | 16.42 | 5,215.1 | 824.1 | 242.9 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,890.7 | 0.00 | 0.00 | 5,800.0 | 882.0 | 260.0 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,010.1 | 0.00 | 0.00 | 5,919.4 | 882.0 | 260.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,130.1 | 84.00 | 270.00 | 6,679.2 | 882.0 | -424.1 | 7.50 | 7.50 | 0.00 | 270.00 | |
| 7,204.1 | 84.00 | 270.00 | 6,686.9 | 882.0 | -497.7 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,326.3 | 90.11 | 270.00 | 6,693.2 | 882.0 | -619.7 | 5.00 | 5.00 | 0.00 | 0.00 | |
| 11,079.6 | 90.11 | 270.00 | 6,686.0 | 882.0 | -4,372.9 | 0.00 | 0.00 | 0.00 | 0.00 | BHL 2385'FSL & 5( |

| | | | |
|---|---|---|---|
| **Database:** | Landmark | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Project:** | SEC.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **North Reference:** | True |
| **Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-07-14) | | |

**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 |
| 1.0 | 0.00 | 0.00 | 1.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **SHL 1517'FSL, 310'FEL** | | | | | | | | | |
| 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 |
| **KOP #1** | | | | | | | | | |
| 900.0 | 2.00 | 16.42 | 900.0 | 1.7 | 0.5 | -0.2 | 2.00 | 2.00 | 0.00 |
| 1,000.0 | 4.00 | 16.42 | 999.8 | 6.7 | 2.0 | -0.6 | 2.00 | 2.00 | 0.00 |
| 1,100.0 | 6.00 | 16.42 | 1,099.5 | 15.1 | 4.4 | -1.4 | 2.00 | 2.00 | 0.00 |
| 1,200.0 | 8.00 | 16.42 | 1,198.7 | 26.7 | 7.9 | -2.4 | 2.00 | 2.00 | 0.00 |
| 1,300.0 | 10.00 | 16.42 | 1,297.5 | 41.7 | 12.3 | -3.8 | 2.00 | 2.00 | 0.00 |
| 1,389.0 | 11.78 | 16.42 | 1,384.9 | 57.9 | 17.1 | -5.3 | 2.00 | 2.00 | 0.00 |
| 1,400.0 | 11.78 | 16.42 | 1,395.6 | 60.0 | 17.7 | -5.5 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 11.78 | 16.42 | 1,493.5 | 79.6 | 23.5 | -7.3 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 11.78 | 16.42 | 1,591.4 | 99.2 | 29.2 | -9.1 | 0.00 | 0.00 | 0.00 |
| 1,700.0 | 11.78 | 16.42 | 1,689.3 | 118.8 | 35.0 | -10.8 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 11.78 | 16.42 | 1,787.2 | 138.4 | 40.8 | -12.6 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 11.78 | 16.42 | 1,885.1 | 157.9 | 46.6 | -14.4 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 11.78 | 16.42 | 1,983.0 | 177.5 | 52.3 | -16.2 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 11.78 | 16.42 | 2,080.9 | 197.1 | 58.1 | -18.0 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 11.78 | 16.42 | 2,178.8 | 216.7 | 63.9 | -19.8 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 11.78 | 16.42 | 2,276.7 | 236.3 | 69.7 | -21.6 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 11.78 | 16.42 | 2,374.6 | 255.9 | 75.4 | -23.3 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 11.78 | 16.42 | 2,472.5 | 275.4 | 81.2 | -25.1 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 11.78 | 16.42 | 2,570.4 | 295.0 | 87.0 | -26.9 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 11.78 | 16.42 | 2,668.2 | 314.6 | 92.7 | -28.7 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 11.78 | 16.42 | 2,766.1 | 334.2 | 98.5 | -30.5 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 11.78 | 16.42 | 2,864.0 | 353.8 | 104.3 | -32.3 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 11.78 | 16.42 | 2,961.9 | 373.4 | 110.1 | -34.1 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 11.78 | 16.42 | 3,059.8 | 393.0 | 115.8 | -35.9 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 11.78 | 16.42 | 3,157.7 | 412.5 | 121.6 | -37.6 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 11.78 | 16.42 | 3,255.6 | 432.1 | 127.4 | -39.4 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 11.78 | 16.42 | 3,353.5 | 451.7 | 133.2 | -41.2 | 0.00 | 0.00 | 0.00 |
| 3,455.7 | 11.78 | 16.42 | 3,408.0 | 462.6 | 136.4 | -42.2 | 0.00 | 0.00 | 0.00 |
| **PARKMAN** | | | | | | | | | |
| 3,500.0 | 11.78 | 16.42 | 3,451.4 | 471.3 | 138.9 | -43.0 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 11.78 | 16.42 | 3,549.3 | 490.9 | 144.7 | -44.8 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 11.78 | 16.42 | 3,647.2 | 510.5 | 150.5 | -46.6 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 11.78 | 16.42 | 3,745.1 | 530.0 | 156.2 | -48.4 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 11.78 | 16.42 | 3,843.0 | 549.6 | 162.0 | -50.1 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 11.78 | 16.42 | 3,940.9 | 569.2 | 167.8 | -51.9 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 11.78 | 16.42 | 4,038.8 | 588.8 | 173.6 | -53.7 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 11.78 | 16.42 | 4,136.6 | 608.4 | 179.3 | -55.5 | 0.00 | 0.00 | 0.00 |
| 4,213.6 | 11.78 | 16.42 | 4,150.0 | 611.0 | 180.1 | -55.8 | 0.00 | 0.00 | 0.00 |
| **SUSSEX** | | | | | | | | | |
| 4,300.0 | 11.78 | 16.42 | 4,234.5 | 628.0 | 185.1 | -57.3 | 0.00 | 0.00 | 0.00 |
| 4,400.0 | 11.78 | 16.42 | 4,332.4 | 647.5 | 190.9 | -59.1 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Landmark | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Project:** | SEC.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **North Reference:** | True |
| **Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-07-14) | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 4,500.0 | 11.78 | 16.42 | 4,430.3 | 667.1 | 196.7 | -60.9 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 11.78 | 16.42 | 4,528.2 | 686.7 | 202.4 | -62.7 | 0.00 | 0.00 | 0.00 |
| 4,642.7 | 11.78 | 16.42 | 4,570.0 | 695.1 | 204.9 | -63.4 | 0.00 | 0.00 | 0.00 |
| **SHANNON** | | | | | | | | | |
| 4,700.0 | 11.78 | 16.42 | 4,626.1 | 706.3 | 208.2 | -64.4 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 11.78 | 16.42 | 4,724.0 | 725.9 | 214.0 | -66.2 | 0.00 | 0.00 | 0.00 |
| 4,900.0 | 11.78 | 16.42 | 4,821.9 | 745.5 | 219.7 | -68.0 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 11.78 | 16.42 | 4,919.8 | 765.0 | 225.5 | -69.8 | 0.00 | 0.00 | 0.00 |
| 5,100.0 | 11.78 | 16.42 | 5,017.7 | 784.6 | 231.3 | -71.6 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 11.78 | 16.42 | 5,115.6 | 804.2 | 237.1 | -73.4 | 0.00 | 0.00 | 0.00 |
| 5,300.0 | 11.78 | 16.42 | 5,213.5 | 823.8 | 242.8 | -75.2 | 0.00 | 0.00 | 0.00 |
| 5,301.7 | 11.78 | 16.42 | 5,215.1 | 824.1 | 242.9 | -75.2 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 9.81 | 16.42 | 5,311.7 | 841.8 | 248.1 | -76.8 | 2.00 | -2.00 | 0.00 |
| 5,500.0 | 7.81 | 16.42 | 5,410.5 | 856.5 | 252.5 | -78.1 | 2.00 | -2.00 | 0.00 |
| 5,600.0 | 5.81 | 16.42 | 5,509.8 | 867.9 | 255.8 | -79.2 | 2.00 | -2.00 | 0.00 |
| 5,700.0 | 3.81 | 16.42 | 5,609.4 | 875.9 | 258.2 | -79.9 | 2.00 | -2.00 | 0.00 |
| 5,800.0 | 1.81 | 16.42 | 5,709.3 | 880.6 | 259.6 | -80.4 | 2.00 | -2.00 | 0.00 |
| 5,890.7 | 0.00 | 0.00 | 5,800.0 | 882.0 | 260.0 | -80.5 | 2.00 | -2.00 | 0.00 |
| 5,900.0 | 0.00 | 0.00 | 5,809.3 | 882.0 | 260.0 | -80.5 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 5,909.3 | 882.0 | 260.0 | -80.5 | 0.00 | 0.00 | 0.00 |
| 6,010.1 | 0.00 | 0.00 | 5,919.4 | 882.0 | 260.0 | -80.5 | 0.00 | 0.00 | 0.00 |
| **KOP #2** | | | | | | | | | |
| 6,100.0 | 6.74 | 270.00 | 6,009.1 | 882.0 | 254.7 | -75.3 | 7.50 | 7.50 | 0.00 |
| 6,200.0 | 14.24 | 270.00 | 6,107.4 | 882.0 | 236.5 | -57.5 | 7.50 | 7.50 | 0.00 |
| 6,300.0 | 21.74 | 270.00 | 6,202.4 | 882.0 | 205.7 | -27.2 | 7.50 | 7.50 | 0.00 |
| 6,377.7 | 27.57 | 270.00 | 6,273.0 | 882.0 | 173.3 | 4.6 | 7.50 | 7.50 | 0.00 |
| **SHARON SPRINGS** | | | | | | | | | |
| 6,400.0 | 29.24 | 270.00 | 6,292.6 | 882.0 | 162.7 | 14.9 | 7.50 | 7.50 | 0.00 |
| 6,500.0 | 36.74 | 270.00 | 6,376.4 | 882.0 | 108.3 | 68.3 | 7.50 | 7.50 | 0.00 |
| 6,600.0 | 44.24 | 270.00 | 6,452.4 | 882.0 | 43.4 | 131.9 | 7.50 | 7.50 | 0.00 |
| 6,700.0 | 51.74 | 270.00 | 6,519.3 | 882.0 | -30.9 | 204.7 | 7.50 | 7.50 | 0.00 |
| 6,800.0 | 59.24 | 270.00 | 6,575.9 | 882.0 | -113.2 | 285.4 | 7.50 | 7.50 | 0.00 |
| 6,900.0 | 66.74 | 270.00 | 6,621.3 | 882.0 | -202.3 | 372.7 | 7.50 | 7.50 | 0.00 |
| 7,000.0 | 74.24 | 270.00 | 6,654.7 | 882.0 | -296.4 | 465.0 | 7.50 | 7.50 | 0.00 |
| 7,100.0 | 81.74 | 270.00 | 6,675.5 | 882.0 | -394.2 | 560.8 | 7.50 | 7.50 | 0.00 |
| 7,130.1 | 84.00 | 270.00 | 6,679.2 | 882.0 | -424.1 | 590.1 | 7.50 | 7.50 | 0.00 |
| **7"** | | | | | | | | | |
| 7,200.0 | 84.00 | 270.00 | 6,686.5 | 882.0 | -493.6 | 658.2 | 0.00 | 0.00 | 0.00 |
| 7,204.1 | 84.00 | 270.00 | 6,686.9 | 882.0 | -497.7 | 662.3 | 0.00 | 0.00 | 0.00 |
| 7,300.0 | 88.79 | 270.00 | 6,693.0 | 882.0 | -593.3 | 756.0 | 5.00 | 5.00 | 0.00 |
| 7,326.3 | 90.11 | 270.00 | 6,693.2 | 882.0 | -619.6 | 781.8 | 5.00 | 5.00 | 0.00 |
| **End of Build** | | | | | | | | | |
| 7,400.0 | 90.11 | 270.00 | 6,693.1 | 882.0 | -693.3 | 854.0 | 0.00 | 0.00 | 0.00 |
| 7,500.0 | 90.11 | 270.00 | 6,692.9 | 882.0 | -793.3 | 952.1 | 0.00 | 0.00 | 0.00 |
| 7,600.0 | 90.11 | 270.00 | 6,692.7 | 882.0 | -893.3 | 1,050.1 | 0.00 | 0.00 | 0.00 |
| 7,700.0 | 90.11 | 270.00 | 6,692.5 | 882.0 | -993.3 | 1,148.1 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 90.11 | 270.00 | 6,692.3 | 882.0 | -1,093.3 | 1,246.1 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 90.11 | 270.00 | 6,692.1 | 882.0 | -1,193.3 | 1,344.2 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.11 | 270.00 | 6,691.9 | 882.0 | -1,293.3 | 1,442.2 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.11 | 270.00 | 6,691.7 | 882.0 | -1,393.3 | 1,540.2 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.11 | 270.00 | 6,691.5 | 882.0 | -1,493.3 | 1,638.2 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.11 | 270.00 | 6,691.3 | 882.0 | -1,593.3 | 1,736.3 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | Landmark | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Project:** | SEC.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **North Reference:** | True |
| **Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-07-14) | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 8,400.0 | 90.11 | 270.00 | 6,691.1 | 882.0 | -1,693.3 | 1,834.3 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.11 | 270.00 | 6,691.0 | 882.0 | -1,793.3 | 1,932.3 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 90.11 | 270.00 | 6,690.8 | 882.0 | -1,893.3 | 2,030.3 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 90.11 | 270.00 | 6,690.6 | 882.0 | -1,993.3 | 2,128.4 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.11 | 270.00 | 6,690.4 | 882.0 | -2,093.3 | 2,226.4 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.11 | 270.00 | 6,690.2 | 882.0 | -2,193.3 | 2,324.4 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.11 | 270.00 | 6,690.0 | 882.0 | -2,293.3 | 2,422.4 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.11 | 270.00 | 6,689.8 | 882.0 | -2,393.3 | 2,520.5 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.11 | 270.00 | 6,689.6 | 882.0 | -2,493.3 | 2,618.5 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.11 | 270.00 | 6,689.4 | 882.0 | -2,593.3 | 2,716.5 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.11 | 270.00 | 6,689.2 | 882.0 | -2,693.3 | 2,814.5 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.11 | 270.00 | 6,689.0 | 882.0 | -2,793.3 | 2,912.6 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.11 | 270.00 | 6,688.8 | 882.0 | -2,893.3 | 3,010.6 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.11 | 270.00 | 6,688.6 | 882.0 | -2,993.3 | 3,108.6 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.11 | 270.00 | 6,688.5 | 882.0 | -3,093.3 | 3,206.7 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.11 | 270.00 | 6,688.3 | 882.0 | -3,193.3 | 3,304.7 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.11 | 270.00 | 6,688.1 | 882.0 | -3,293.3 | 3,402.7 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.11 | 270.00 | 6,687.9 | 882.0 | -3,393.3 | 3,500.7 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.11 | 270.00 | 6,687.7 | 882.0 | -3,493.3 | 3,598.8 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.11 | 270.00 | 6,687.5 | 882.0 | -3,593.3 | 3,696.8 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.11 | 270.00 | 6,687.3 | 882.0 | -3,693.3 | 3,794.8 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.11 | 270.00 | 6,687.1 | 882.0 | -3,793.3 | 3,892.8 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.11 | 270.00 | 6,686.9 | 882.0 | -3,893.3 | 3,990.9 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.11 | 270.00 | 6,686.7 | 882.0 | -3,993.3 | 4,088.9 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.11 | 270.00 | 6,686.5 | 882.0 | -4,093.3 | 4,186.9 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.11 | 270.00 | 6,686.3 | 882.0 | -4,193.3 | 4,284.9 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.11 | 270.00 | 6,686.2 | 882.0 | -4,293.3 | 4,383.0 | 0.00 | 0.00 | 0.00 |
| 11,079.6 | 90.11 | 270.00 | 6,686.0 | 882.0 | -4,372.9 | 4,461.0 | 0.00 | 0.00 | 0.00 |
| **BHL 2385'FSL & 500'FWL** | | | | | | | | | |

**Casing Points**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---|---|---|---|---|
| 7,130.1 | 6,679.2 | 7" | 7 | 7-1/2 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 3,455.7 | 3,408.0 | PARKMAN | | | |
| 4,213.6 | 4,150.0 | SUSSEX | | | |
| 4,642.7 | 4,570.0 | SHANNON | | | |
| 6,377.7 | 6,273.0 | SHARON SPRINGS | | | |

| | | | |
|---|---|---|---|
| **Database:** | Landmark | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Project:** | SEC.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **North Reference:** | True |
| **Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-07-14) | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 800.0 | 800.0 | 0.0 | 0.0 | KOP #1 |
| 6,010.1 | 5,919.4 | 882.0 | 260.0 | KOP #2 |
| 7,326.3 | 6,693.2 | 882.0 | -619.6 | End of Build |

ENSIGN Directional

# PETROLEUM DEVELOPMENT CORP Weld County CO

**SEC.14-T5N-R64W**
**Peterson 14WX-HZ Pad Sec.14-T5N-R64W**
**Peterson 14W-434**

**Wellbore #1**
**Plan #1 (3-07-14)**

# Anticollision Report

**10 March, 2014**

PDC ENERGY
Growing E&P Value

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Reference** Plan #1 (3-07-14)

| | | | |
|---|---|---|---|
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD Interval 100.0ft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 1,000.0ft | **Error Surface:** | Elliptical Conic |

**Warning Levels Evaluated at:** 2.00 **Sigma**

**Survey Tool Program** **Date** 3/7/2014

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 11,079.6 | Plan #1 (3-07-14) (Wellbore #1) | MWD | MWD - Standard |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Holman B15-65HNM Pad Sec.14-T5N-R64W | | | | | | |
| HolmanB15-65HNM - Wellbore #1 - Plan #1 | 10,100.0 | 7,099.5 | 307.7 | 195.1 | 2.731 | CC |
| HolmanB15-65HNM - Wellbore #1 - Plan #1 | 11,079.6 | 8,077.1 | 310.6 | 149.9 | 1.933 | ES, SF |
| Peterson 14WX-HZ Pad (Exist) Sec.14-T5N-R64W | | | | | | |
| Foo's 14-1 (Exist.) - Wellbore #1 - Wellbore #1 | 8,380.6 | 6,681.2 | 433.8 | 248.6 | 2.342 | CC |
| Foo's 14-1 (Exist.) - Wellbore #1 - Wellbore #1 | 8,400.0 | 6,681.1 | 434.3 | 248.5 | 2.338 | ES, SF |
| Foo's 23-14 (Exist.) - Wellbore #1 - Wellbore #1 | 9,383.3 | 6,685.3 | 175.1 | -37.4 | 0.824 | Level 1, CC, ES, SF |
| Peterson 14-2 (Exist.) - Wellbore #1 - Wellbore #1 | 3,034.0 | 2,980.2 | 279.4 | 210.0 | 4.024 | CC |
| Peterson 14-2 (Exist.) - Wellbore #1 - Wellbore #1 | 3,200.0 | 3,142.7 | 281.5 | 208.1 | 3.838 | ES |
| Peterson 14-2 (Exist.) - Wellbore #1 - Wellbore #1 | 6,900.0 | 6,606.3 | 425.5 | 275.4 | 2.835 | SF |
| Peterson 14WX-HZ Pad Sec.14-T5N-R64W | | | | | | |
| Peterson 14W-234 - Wellbore #1 - Plan #1 (3-07-14) | 800.0 | 800.0 | 29.1 | 25.8 | 8.645 | CC, ES |
| Peterson 14W-234 - Wellbore #1 - Plan #1 (3-07-14) | 11,079.6 | 10,862.9 | 360.7 | 132.1 | 1.578 | SF |
| Peterson 14X-304 - Wellbore #1 - Plan #1 (3-07-14) | 800.0 | 800.0 | 91.1 | 87.7 | 27.013 | CC, ES |
| Peterson 14X-304 - Wellbore #1 - Plan #1 (3-07-14) | 11,079.6 | 10,881.3 | 992.9 | 744.6 | 3.998 | SF |
| Peterson 14X-414 - Wellbore #1 - Plan #1 (3-07-14) | 800.0 | 800.0 | 61.9 | 58.6 | 18.370 | CC, ES |
| Peterson 14X-414 - Wellbore #1 - Plan #1 (3-07-14) | 11,079.6 | 10,986.1 | 659.8 | 408.9 | 2.630 | SF |

**Offset Design** Holman B15-65HNM Pad Sec.14-T5N-R64W - HolmanB15-65HNM - Wellbore #1 - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0- **Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,600.0 | 6,690.8 | 6,300.0 | 6,234.2 | 58.1 | 15.2 | 29.95 | 1,156.8 | -2,712.3 | 987.5 | 945.1 | 42.38 | 23.299 | |
| 8,700.0 | 6,690.6 | 6,300.0 | 6,234.2 | 60.8 | 15.2 | 29.95 | 1,156.8 | -2,712.3 | 906.2 | 862.4 | 43.84 | 20.670 | |
| 8,800.0 | 6,690.4 | 6,336.5 | 6,264.7 | 63.5 | 15.3 | 31.62 | 1,156.9 | -2,732.4 | 827.3 | 780.4 | 46.86 | 17.655 | |
| 8,900.0 | 6,690.2 | 6,365.4 | 6,288.0 | 66.2 | 15.4 | 33.02 | 1,156.9 | -2,749.5 | 751.5 | 701.8 | 49.74 | 15.109 | |
| 9,000.0 | 6,690.0 | 6,400.0 | 6,315.0 | 68.9 | 15.5 | 34.78 | 1,157.0 | -2,771.1 | 679.3 | 626.2 | 53.08 | 12.798 | |
| 9,100.0 | 6,689.8 | 6,434.1 | 6,340.6 | 71.6 | 15.6 | 36.60 | 1,157.1 | -2,793.6 | 611.3 | 554.7 | 56.61 | 10.798 | |
| 9,200.0 | 6,689.6 | 6,474.8 | 6,369.7 | 74.3 | 15.8 | 38.88 | 1,157.2 | -2,822.1 | 548.4 | 487.6 | 60.76 | 9.026 | |
| 9,300.0 | 6,689.4 | 6,520.6 | 6,400.4 | 77.0 | 16.1 | 41.57 | 1,157.4 | -2,856.0 | 491.5 | 426.0 | 65.48 | 7.507 | |
| 9,400.0 | 6,689.2 | 6,572.0 | 6,432.2 | 79.7 | 16.4 | 44.68 | 1,157.5 | -2,896.4 | 441.6 | 370.8 | 70.81 | 6.236 | |
| 9,500.0 | 6,689.0 | 6,629.5 | 6,464.2 | 82.5 | 16.9 | 48.20 | 1,157.7 | -2,944.0 | 399.6 | 322.8 | 76.76 | 5.205 | |

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

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Holman B15-65HNM Pad Sec.14-T5N-R64W - HolmanB15-65HNM - Wellbore #1 - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0- **Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9,600.0 | 6,688.8 | 6,693.2 | 6,495.2 | 85.2 | 17.6 | 52.02 | 1,158.0 | -2,999.7 | 366.0 | 282.9 | 83.18 | 4.401 | |
| 9,700.0 | 6,688.6 | 6,763.1 | 6,523.3 | 87.9 | 18.6 | 55.87 | 1,158.2 | -3,063.8 | 341.1 | 251.3 | 89.82 | 3.798 | |
| 9,800.0 | 6,688.5 | 6,838.8 | 6,546.5 | 90.7 | 19.8 | 59.35 | 1,158.5 | -3,135.7 | 324.2 | 227.9 | 96.30 | 3.367 | |
| 9,900.0 | 6,688.3 | 6,918.9 | 6,562.7 | 93.4 | 21.2 | 61.94 | 1,158.8 | -3,214.1 | 314.4 | 212.2 | 102.22 | 3.076 | |
| 10,000.0 | 6,688.1 | 7,009.5 | 6,571.9 | 96.2 | 23.1 | 63.51 | 1,159.2 | -3,304.3 | 309.9 | 202.3 | 107.64 | 2.879 | |
| 10,100.0 | 6,687.9 | 7,099.5 | 6,577.0 | 99.0 | 25.0 | 64.42 | 1,159.6 | -3,394.1 | 307.7 | 195.1 | 112.67 | 2.731 | CC |
| 10,109.6 | 6,687.9 | 7,107.2 | 6,577.0 | 99.2 | 25.2 | 64.42 | 1,159.6 | -3,401.8 | 307.8 | 194.7 | 113.07 | 2.722 | |
| 10,200.0 | 6,687.7 | 7,197.6 | 6,577.0 | 101.7 | 27.2 | 64.48 | 1,160.0 | -3,492.2 | 308.0 | 190.7 | 117.28 | 2.626 | |
| 10,300.0 | 6,687.5 | 7,297.6 | 6,577.0 | 104.5 | 29.5 | 64.55 | 1,160.4 | -3,592.2 | 308.3 | 186.3 | 122.02 | 2.527 | |
| 10,400.0 | 6,687.3 | 7,397.6 | 6,577.0 | 107.2 | 32.0 | 64.61 | 1,160.8 | -3,692.2 | 308.6 | 181.8 | 126.83 | 2.433 | |
| 10,500.0 | 6,687.1 | 7,497.6 | 6,577.0 | 110.0 | 34.4 | 64.68 | 1,161.2 | -3,792.2 | 308.9 | 177.2 | 131.70 | 2.345 | |
| 10,600.0 | 6,686.9 | 7,597.6 | 6,577.0 | 112.8 | 37.0 | 64.74 | 1,161.6 | -3,892.2 | 309.2 | 172.6 | 136.61 | 2.263 | |
| 10,700.0 | 6,686.7 | 7,697.6 | 6,577.0 | 115.6 | 39.5 | 64.81 | 1,162.1 | -3,992.2 | 309.5 | 167.9 | 141.57 | 2.186 | |
| 10,800.0 | 6,686.5 | 7,797.6 | 6,577.0 | 118.3 | 42.1 | 64.87 | 1,162.5 | -4,092.2 | 309.8 | 163.2 | 146.56 | 2.114 | |
| 10,900.0 | 6,686.3 | 7,897.6 | 6,577.0 | 121.1 | 44.8 | 64.94 | 1,162.9 | -4,192.2 | 310.1 | 158.5 | 151.57 | 2.046 | |
| 11,000.0 | 6,686.2 | 7,997.6 | 6,577.0 | 123.9 | 47.4 | 65.00 | 1,163.3 | -4,292.2 | 310.3 | 153.7 | 156.61 | 1.982 | |
| 11,079.6 | 6,686.0 | 8,077.1 | 6,577.0 | 126.1 | 49.5 | 65.05 | 1,163.6 | -4,371.7 | 310.6 | 149.9 | 160.64 | 1.933 | ES, SF |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad (Exist) Sec.14-T5N-R64W - Foo's 14-1 (Exist.) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 6805-UNKNOWN

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7,500.0 | 6,692.9 | 6,682.9 | 6,682.9 | 30.5 | 133.7 | -90.22 | 448.2 | -1,674.0 | 981.7 | 818.8 | 162.95 | 6.025 | |
| 7,600.0 | 6,692.7 | 6,682.7 | 6,682.7 | 32.8 | 133.7 | -90.20 | 448.2 | -1,674.0 | 893.1 | 727.8 | 165.30 | 5.403 | |
| 7,700.0 | 6,692.5 | 6,682.5 | 6,682.5 | 35.1 | 133.6 | -90.17 | 448.2 | -1,674.0 | 807.2 | 639.4 | 167.72 | 4.813 | |
| 7,800.0 | 6,692.3 | 6,682.3 | 6,682.3 | 37.5 | 133.6 | -90.15 | 448.2 | -1,674.0 | 724.8 | 554.6 | 170.19 | 4.259 | |
| 7,900.0 | 6,692.1 | 6,682.1 | 6,682.1 | 40.0 | 133.6 | -90.12 | 448.2 | -1,674.0 | 647.5 | 474.8 | 172.71 | 3.749 | |
| 8,000.0 | 6,691.9 | 6,681.9 | 6,681.9 | 42.5 | 133.6 | -90.10 | 448.2 | -1,674.0 | 577.2 | 401.9 | 175.26 | 3.293 | |
| 8,100.0 | 6,691.7 | 6,681.7 | 6,681.7 | 45.0 | 133.6 | -90.07 | 448.2 | -1,674.0 | 516.7 | 338.9 | 177.85 | 2.905 | |
| 8,200.0 | 6,691.5 | 6,681.5 | 6,681.5 | 47.6 | 133.6 | -90.05 | 448.2 | -1,674.0 | 470.0 | 289.5 | 180.46 | 2.604 | |
| 8,300.0 | 6,691.3 | 6,681.3 | 6,681.3 | 50.2 | 133.6 | -90.02 | 448.2 | -1,674.0 | 441.3 | 258.2 | 183.09 | 2.410 | |
| 8,380.6 | 6,691.2 | 6,681.2 | 6,681.2 | 52.3 | 133.6 | -90.00 | 448.2 | -1,674.0 | 433.8 | 248.6 | 185.23 | 2.342 | CC |
| 8,400.0 | 6,691.1 | 6,681.1 | 6,681.1 | 52.8 | 133.6 | -90.00 | 448.2 | -1,674.0 | 434.3 | 248.5 | 185.74 | 2.338 | ES, SF |
| 8,500.0 | 6,691.0 | 6,681.0 | 6,681.0 | 55.5 | 133.6 | -89.97 | 448.2 | -1,674.0 | 450.0 | 261.6 | 188.40 | 2.388 | |
| 8,600.0 | 6,690.8 | 6,680.8 | 6,680.8 | 58.1 | 133.6 | -89.94 | 448.2 | -1,674.0 | 486.1 | 295.1 | 191.08 | 2.544 | |
| 8,700.0 | 6,690.6 | 6,680.6 | 6,680.6 | 60.8 | 133.6 | -89.92 | 448.2 | -1,674.0 | 538.7 | 344.9 | 193.77 | 2.780 | |
| 8,800.0 | 6,690.4 | 6,680.4 | 6,680.4 | 63.5 | 133.6 | -89.89 | 448.2 | -1,674.0 | 603.4 | 406.9 | 196.47 | 3.071 | |
| 8,900.0 | 6,690.2 | 6,680.2 | 6,680.2 | 66.2 | 133.6 | -89.87 | 448.2 | -1,674.0 | 676.7 | 477.5 | 199.18 | 3.398 | |
| 9,000.0 | 6,690.0 | 6,680.0 | 6,680.0 | 68.9 | 133.6 | -89.84 | 448.2 | -1,674.0 | 756.2 | 554.3 | 201.90 | 3.745 | |
| 9,100.0 | 6,689.8 | 6,679.8 | 6,679.8 | 71.6 | 133.6 | -89.82 | 448.2 | -1,674.0 | 840.1 | 635.4 | 204.62 | 4.105 | |
| 9,200.0 | 6,689.6 | 6,679.6 | 6,679.6 | 74.3 | 133.6 | -89.79 | 448.2 | -1,674.0 | 927.1 | 719.8 | 207.35 | 4.471 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad (Exist) Sec.14-T5N-R64W - Foo's 23-14 (Exist.) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 6882-UNKNOWN

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,400.0 | 6,691.1 | 6,687.1 | 6,687.1 | 52.8 | 133.7 | -90.62 | 706.9 | -2,676.7 | 998.8 | 812.9 | 185.87 | 5.374 | |
| 8,500.0 | 6,691.0 | 6,687.0 | 6,687.0 | 55.5 | 133.7 | -90.55 | 706.9 | -2,676.7 | 900.5 | 712.0 | 188.54 | 4.776 | |
| 8,600.0 | 6,690.8 | 6,686.8 | 6,686.8 | 58.1 | 133.7 | -90.49 | 706.9 | -2,676.7 | 802.7 | 611.5 | 191.22 | 4.198 | |
| 8,700.0 | 6,690.6 | 6,686.6 | 6,686.6 | 60.8 | 133.7 | -90.43 | 706.9 | -2,676.7 | 705.4 | 511.5 | 193.91 | 3.638 | |
| 8,800.0 | 6,690.4 | 6,686.4 | 6,686.4 | 63.5 | 133.7 | -90.37 | 706.9 | -2,676.7 | 609.1 | 412.5 | 196.61 | 3.098 | |
| 8,900.0 | 6,690.2 | 6,686.2 | 6,686.2 | 66.2 | 133.7 | -90.30 | 706.9 | -2,676.7 | 514.1 | 314.8 | 199.32 | 2.579 | |
| 9,000.0 | 6,690.0 | 6,686.0 | 6,686.0 | 68.9 | 133.7 | -90.24 | 706.9 | -2,676.7 | 421.4 | 219.4 | 202.03 | 2.086 | |
| 9,100.0 | 6,689.8 | 6,685.8 | 6,685.8 | 71.6 | 133.7 | -90.18 | 706.9 | -2,676.7 | 333.1 | 128.3 | 204.75 | 1.627 | |
| 9,200.0 | 6,689.6 | 6,685.6 | 6,685.6 | 74.3 | 133.7 | -90.12 | 706.9 | -2,676.7 | 253.5 | 46.0 | 207.48 | 1.222 | Level 2 |
| 9,300.0 | 6,689.4 | 6,685.4 | 6,685.4 | 77.0 | 133.7 | -90.05 | 706.9 | -2,676.7 | 193.9 | -16.3 | 210.22 | 0.923 | Level 1 |
| 9,383.3 | 6,689.3 | 6,685.3 | 6,685.3 | 79.3 | 133.7 | -90.00 | 706.9 | -2,676.7 | 175.1 | -37.4 | 212.50 | 0.824 | Level 1, CC, ES, SF |
| 9,400.0 | 6,689.2 | 6,685.2 | 6,685.2 | 79.7 | 133.7 | -89.99 | 706.9 | -2,676.7 | 175.9 | -37.1 | 212.95 | 0.826 | Level 1 |
| 9,500.0 | 6,689.0 | 6,685.0 | 6,685.0 | 82.5 | 133.7 | -89.93 | 706.9 | -2,676.7 | 210.4 | -5.3 | 215.70 | 0.975 | Level 1 |
| 9,600.0 | 6,688.8 | 6,684.8 | 6,684.8 | 85.2 | 133.7 | -89.86 | 706.9 | -2,676.7 | 278.6 | 60.1 | 218.44 | 1.275 | Level 3 |
| 9,700.0 | 6,688.6 | 6,684.6 | 6,684.6 | 87.9 | 133.7 | -89.80 | 706.9 | -2,676.7 | 361.8 | 140.7 | 221.19 | 1.636 | |
| 9,800.0 | 6,688.5 | 6,684.5 | 6,684.5 | 90.7 | 133.7 | -89.74 | 706.9 | -2,676.7 | 452.0 | 228.0 | 223.94 | 2.018 | |
| 9,900.0 | 6,688.3 | 6,684.3 | 6,684.3 | 93.4 | 133.7 | -89.68 | 706.9 | -2,676.7 | 545.5 | 318.8 | 226.70 | 2.406 | |
| 10,000.0 | 6,688.1 | 6,684.1 | 6,684.1 | 96.2 | 133.7 | -89.61 | 706.9 | -2,676.7 | 641.0 | 411.6 | 229.46 | 2.794 | |
| 10,100.0 | 6,687.9 | 6,683.9 | 6,683.9 | 99.0 | 133.7 | -89.55 | 706.9 | -2,676.7 | 737.7 | 505.5 | 232.22 | 3.177 | |
| 10,200.0 | 6,687.7 | 6,683.7 | 6,683.7 | 101.7 | 133.7 | -89.49 | 706.9 | -2,676.7 | 835.2 | 600.2 | 234.98 | 3.554 | |
| 10,300.0 | 6,687.5 | 6,683.5 | 6,683.5 | 104.5 | 133.7 | -89.42 | 706.9 | -2,676.7 | 933.2 | 695.5 | 237.74 | 3.925 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad (Exist) Sec.14-T5N-R64W - Peterson 14-2 (Exist.) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 6866-UNKNOWN

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 | -18.77 | 459.0 | -156.0 | 485.0 | | | | |
| 100.0 | 100.0 | 85.0 | 85.0 | 0.1 | 1.7 | -18.77 | 459.0 | -156.0 | 484.8 | 483.0 | 1.81 | 267.472 | |
| 200.0 | 200.0 | 185.0 | 185.0 | 0.3 | 3.7 | -18.77 | 459.0 | -156.0 | 484.8 | 480.8 | 4.04 | 120.082 | |
| 300.0 | 300.0 | 285.0 | 285.0 | 0.6 | 5.7 | -18.77 | 459.0 | -156.0 | 484.8 | 478.6 | 6.26 | 77.420 | |
| 400.0 | 400.0 | 385.0 | 385.0 | 0.8 | 7.7 | -18.77 | 459.0 | -156.0 | 484.8 | 476.3 | 8.49 | 57.125 | |
| 500.0 | 500.0 | 485.0 | 485.0 | 1.0 | 9.7 | -18.77 | 459.0 | -156.0 | 484.8 | 474.1 | 10.71 | 45.261 | |
| 600.0 | 600.0 | 585.0 | 585.0 | 1.2 | 11.7 | -18.77 | 459.0 | -156.0 | 484.8 | 471.9 | 12.94 | 37.477 | |
| 700.0 | 700.0 | 685.0 | 685.0 | 1.5 | 13.7 | -18.77 | 459.0 | -156.0 | 484.8 | 469.7 | 15.16 | 31.977 | |
| 800.0 | 800.0 | 785.0 | 785.0 | 1.7 | 15.7 | -18.77 | 459.0 | -156.0 | 484.8 | 467.4 | 17.39 | 27.885 | |
| 900.0 | 900.0 | 885.0 | 885.0 | 1.9 | 17.7 | -35.33 | 459.0 | -156.0 | 483.4 | 463.8 | 19.60 | 24.660 | |
| 1,000.0 | 999.8 | 984.8 | 984.8 | 2.1 | 19.7 | -35.74 | 459.0 | -156.0 | 479.1 | 457.3 | 21.80 | 21.980 | |
| 1,100.0 | 1,099.5 | 1,084.5 | 1,084.5 | 2.4 | 21.7 | -36.44 | 459.0 | -156.0 | 472.1 | 448.1 | 23.97 | 19.693 | |
| 1,200.0 | 1,198.7 | 1,183.7 | 1,183.7 | 2.6 | 23.7 | -37.45 | 459.0 | -156.0 | 462.3 | 436.2 | 26.12 | 17.699 | |
| 1,300.0 | 1,297.5 | 1,282.5 | 1,282.5 | 2.9 | 25.6 | -38.82 | 459.0 | -156.0 | 449.9 | 421.7 | 28.25 | 15.926 | |
| 1,400.0 | 1,395.6 | 1,380.6 | 1,380.6 | 3.2 | 27.6 | -40.55 | 459.0 | -156.0 | 435.2 | 404.8 | 30.38 | 14.322 | |
| 1,500.0 | 1,493.5 | 1,478.5 | 1,478.5 | 3.6 | 29.6 | -42.34 | 459.0 | -156.0 | 419.7 | 387.1 | 32.64 | 12.860 | |
| 1,600.0 | 1,591.4 | 1,576.4 | 1,576.4 | 3.9 | 31.5 | -44.27 | 459.0 | -156.0 | 404.7 | 369.8 | 34.91 | 11.592 | |
| 1,700.0 | 1,689.3 | 1,674.3 | 1,674.3 | 4.3 | 33.5 | -46.34 | 459.0 | -156.0 | 390.2 | 353.0 | 37.21 | 10.486 | |
| 1,800.0 | 1,787.2 | 1,772.2 | 1,772.2 | 4.7 | 35.4 | -48.56 | 459.0 | -156.0 | 376.2 | 336.7 | 39.53 | 9.517 | |
| 1,900.0 | 1,885.1 | 1,870.1 | 1,870.1 | 5.1 | 37.4 | -50.95 | 459.0 | -156.0 | 362.9 | 321.0 | 41.88 | 8.665 | |
| 2,000.0 | 1,983.0 | 1,968.0 | 1,968.0 | 5.5 | 39.4 | -53.51 | 459.0 | -156.0 | 350.2 | 306.0 | 44.25 | 7.915 | |
| 2,100.0 | 2,080.9 | 2,065.9 | 2,065.9 | 5.9 | 41.3 | -56.25 | 459.0 | -156.0 | 338.3 | 291.6 | 46.64 | 7.254 | |
| 2,200.0 | 2,178.8 | 2,163.8 | 2,163.8 | 6.3 | 43.3 | -59.18 | 459.0 | -156.0 | 327.2 | 278.2 | 49.05 | 6.671 | |
| 2,300.0 | 2,276.7 | 2,261.7 | 2,261.7 | 6.7 | 45.2 | -62.30 | 459.0 | -156.0 | 317.1 | 265.6 | 51.48 | 6.159 | |
| 2,400.0 | 2,374.6 | 2,359.6 | 2,359.6 | 7.1 | 47.2 | -65.60 | 459.0 | -156.0 | 307.9 | 254.0 | 53.93 | 5.710 | |
| 2,500.0 | 2,472.5 | 2,457.5 | 2,457.5 | 7.6 | 49.1 | -69.09 | 459.0 | -156.0 | 299.9 | 243.5 | 56.39 | 5.319 | |
| 2,600.0 | 2,570.4 | 2,555.4 | 2,555.4 | 8.0 | 51.1 | -72.75 | 459.0 | -156.0 | 293.1 | 234.3 | 58.86 | 4.980 | |
| 2,700.0 | 2,668.2 | 2,653.2 | 2,653.2 | 8.4 | 53.1 | -76.56 | 459.0 | -156.0 | 287.6 | 226.3 | 61.32 | 4.690 | |
| 2,800.0 | 2,766.1 | 2,751.1 | 2,751.1 | 8.8 | 55.0 | -80.50 | 459.0 | -156.0 | 283.5 | 219.7 | 63.78 | 4.445 | |
| 2,900.0 | 2,864.0 | 2,849.0 | 2,849.0 | 9.3 | 57.0 | -84.52 | 459.0 | -156.0 | 280.7 | 214.5 | 66.21 | 4.240 | |
| 3,000.0 | 2,961.9 | 2,946.9 | 2,946.9 | 9.7 | 58.9 | -88.61 | 459.0 | -156.0 | 279.5 | 210.9 | 68.63 | 4.073 | |
| 3,034.0 | 2,995.2 | 2,980.2 | 2,980.2 | 9.8 | 59.6 | -90.00 | 459.0 | -156.0 | 279.4 | 210.0 | 69.44 | 4.024 | CC |
| 3,100.0 | 3,059.8 | 3,044.8 | 3,044.8 | 10.1 | 60.9 | -92.70 | 459.0 | -156.0 | 279.7 | 208.7 | 71.00 | 3.940 | |
| 3,200.0 | 3,157.7 | 3,142.7 | 3,142.7 | 10.5 | 62.9 | -96.77 | 459.0 | -156.0 | 281.5 | 208.1 | 73.34 | 3.838 | ES |
| 3,300.0 | 3,255.6 | 3,240.6 | 3,240.6 | 11.0 | 64.8 | -100.77 | 459.0 | -156.0 | 284.6 | 209.0 | 75.64 | 3.763 | |
| 3,400.0 | 3,353.5 | 3,338.5 | 3,338.5 | 11.4 | 66.8 | -104.67 | 459.0 | -156.0 | 289.2 | 211.3 | 77.90 | 3.713 | |
| 3,500.0 | 3,451.4 | 3,436.4 | 3,436.4 | 11.8 | 68.7 | -108.43 | 459.0 | -156.0 | 295.2 | 215.0 | 80.11 | 3.684 | |
| 3,600.0 | 3,549.3 | 3,534.3 | 3,534.3 | 12.3 | 70.7 | -112.04 | 459.0 | -156.0 | 302.4 | 220.1 | 82.29 | 3.674 | |
| 3,700.0 | 3,647.2 | 3,632.2 | 3,632.2 | 12.7 | 72.6 | -115.47 | 459.0 | -156.0 | 310.7 | 226.3 | 84.44 | 3.680 | |
| 3,800.0 | 3,745.1 | 3,730.1 | 3,730.1 | 13.1 | 74.6 | -118.72 | 459.0 | -156.0 | 320.2 | 233.6 | 86.56 | 3.699 | |
| 3,900.0 | 3,843.0 | 3,828.0 | 3,828.0 | 13.6 | 76.6 | -121.78 | 459.0 | -156.0 | 330.6 | 242.0 | 88.66 | 3.729 | |
| 4,000.0 | 3,940.9 | 3,925.9 | 3,925.9 | 14.0 | 78.5 | -124.64 | 459.0 | -156.0 | 342.0 | 251.3 | 90.74 | 3.769 | |
| 4,100.0 | 4,038.8 | 4,023.8 | 4,023.8 | 14.4 | 80.5 | -127.33 | 459.0 | -156.0 | 354.2 | 261.4 | 92.82 | 3.816 | |
| 4,200.0 | 4,136.6 | 4,121.6 | 4,121.6 | 14.9 | 82.4 | -129.83 | 459.0 | -156.0 | 367.1 | 272.2 | 94.88 | 3.869 | |
| 4,300.0 | 4,234.5 | 4,219.5 | 4,219.5 | 15.3 | 84.4 | -132.16 | 459.0 | -156.0 | 380.6 | 283.7 | 96.94 | 3.927 | |
| 4,400.0 | 4,332.4 | 4,317.4 | 4,317.4 | 15.7 | 86.3 | -134.34 | 459.0 | -156.0 | 394.8 | 295.8 | 98.99 | 3.988 | |
| 4,500.0 | 4,430.3 | 4,415.3 | 4,415.3 | 16.2 | 88.3 | -136.36 | 459.0 | -156.0 | 409.5 | 308.4 | 101.05 | 4.052 | |
| 4,600.0 | 4,528.2 | 4,513.2 | 4,513.2 | 16.6 | 90.3 | -138.24 | 459.0 | -156.0 | 424.6 | 321.5 | 103.10 | 4.118 | |
| 4,700.0 | 4,626.1 | 4,611.1 | 4,611.1 | 17.0 | 92.2 | -140.00 | 459.0 | -156.0 | 440.2 | 335.0 | 105.16 | 4.186 | |
| 4,800.0 | 4,724.0 | 4,709.0 | 4,709.0 | 17.5 | 94.2 | -141.63 | 459.0 | -156.0 | 456.1 | 348.9 | 107.23 | 4.254 | |
| 4,900.0 | 4,821.9 | 4,806.9 | 4,806.9 | 17.9 | 96.1 | -143.16 | 459.0 | -156.0 | 472.4 | 363.2 | 109.30 | 4.323 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad (Exist) Sec.14-T5N-R64W - Peterson 14-2 (Exist.) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 6866-UNKNOWN

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,000.0 | 4,919.8 | 4,904.8 | 4,904.8 | 18.4 | 98.1 | -144.58 | 459.0 | -156.0 | 489.1 | 377.7 | 111.37 | 4.391 | |
| 5,100.0 | 5,017.7 | 5,002.7 | 5,002.7 | 18.8 | 100.1 | -145.92 | 459.0 | -156.0 | 506.0 | 392.5 | 113.44 | 4.460 | |
| 5,200.0 | 5,115.6 | 5,100.6 | 5,100.6 | 19.2 | 102.0 | -147.16 | 459.0 | -156.0 | 523.1 | 407.6 | 115.53 | 4.528 | |
| 5,300.0 | 5,213.5 | 5,198.5 | 5,198.5 | 19.7 | 104.0 | -148.33 | 459.0 | -156.0 | 540.5 | 422.9 | 117.61 | 4.595 | |
| 5,400.0 | 5,311.7 | 5,296.7 | 5,296.7 | 20.0 | 105.9 | -149.50 | 459.0 | -156.0 | 556.6 | 436.4 | 120.17 | 4.632 | |
| 5,500.0 | 5,410.5 | 5,395.5 | 5,395.5 | 20.3 | 107.9 | -150.41 | 459.0 | -156.0 | 569.9 | 447.3 | 122.66 | 4.646 | |
| 5,600.0 | 5,509.8 | 5,494.8 | 5,494.8 | 20.6 | 109.9 | -151.09 | 459.0 | -156.0 | 580.3 | 455.2 | 125.08 | 4.639 | |
| 5,700.0 | 5,609.4 | 5,594.4 | 5,594.4 | 20.8 | 111.9 | -151.56 | 459.0 | -156.0 | 587.7 | 460.2 | 127.43 | 4.612 | |
| 5,800.0 | 5,709.3 | 5,694.3 | 5,694.3 | 20.9 | 113.9 | -151.82 | 459.0 | -156.0 | 592.0 | 462.3 | 129.68 | 4.565 | |
| 5,900.0 | 5,809.3 | 5,794.3 | 5,794.3 | 21.1 | 115.9 | -135.48 | 459.0 | -156.0 | 593.2 | 457.6 | 135.66 | 4.373 | |
| 6,000.0 | 5,909.3 | 5,894.3 | 5,894.3 | 21.2 | 117.9 | -135.48 | 459.0 | -156.0 | 593.2 | 455.4 | 137.80 | 4.305 | |
| 6,100.0 | 6,009.1 | 5,994.1 | 5,994.1 | 21.3 | 119.9 | -46.04 | 459.0 | -156.0 | 589.6 | 454.0 | 135.51 | 4.351 | |
| 6,200.0 | 6,107.4 | 6,092.4 | 6,092.4 | 21.4 | 121.8 | -48.03 | 459.0 | -156.0 | 577.0 | 441.1 | 135.88 | 4.246 | |
| 6,300.0 | 6,202.4 | 6,187.4 | 6,187.4 | 21.4 | 123.7 | -51.54 | 459.0 | -156.0 | 556.5 | 420.8 | 135.64 | 4.103 | |
| 6,400.0 | 6,292.6 | 6,277.6 | 6,277.6 | 21.4 | 125.6 | -56.68 | 459.0 | -156.0 | 529.6 | 393.8 | 135.75 | 3.901 | |
| 6,500.0 | 6,376.4 | 6,361.4 | 6,361.4 | 21.4 | 127.2 | -63.41 | 459.0 | -156.0 | 498.7 | 361.5 | 137.24 | 3.634 | |
| 6,600.0 | 6,452.4 | 6,437.4 | 6,437.4 | 21.4 | 128.7 | -71.34 | 459.0 | -156.0 | 467.6 | 327.1 | 140.51 | 3.328 | |
| 6,700.0 | 6,519.3 | 6,504.3 | 6,504.3 | 21.4 | 130.1 | -79.62 | 459.0 | -156.0 | 441.1 | 296.5 | 144.57 | 3.051 | |
| 6,800.0 | 6,575.9 | 6,560.9 | 6,560.9 | 21.5 | 131.2 | -87.04 | 459.0 | -156.0 | 425.1 | 277.2 | 147.93 | 2.874 | |
| 6,848.8 | 6,599.5 | 6,584.5 | 6,584.5 | 21.6 | 131.7 | -90.00 | 459.0 | -156.0 | 423.0 | 273.8 | 149.14 | 2.836 | |
| 6,900.0 | 6,621.3 | 6,606.3 | 6,606.3 | 21.7 | 132.1 | -92.47 | 459.0 | -156.0 | 425.5 | 275.4 | 150.06 | 2.835 SF | |
| 7,000.0 | 6,654.7 | 6,639.7 | 6,639.7 | 22.2 | 132.8 | -95.15 | 459.0 | -156.0 | 445.7 | 294.0 | 151.73 | 2.937 | |
| 7,100.0 | 6,675.5 | 6,660.5 | 6,660.5 | 23.1 | 133.2 | -94.63 | 459.0 | -156.0 | 485.4 | 331.6 | 153.87 | 3.155 | |
| 7,200.0 | 6,686.5 | 6,671.5 | 6,671.5 | 24.6 | 133.4 | -94.77 | 459.0 | -156.0 | 541.2 | 385.2 | 155.93 | 3.471 | |
| 7,300.0 | 6,693.0 | 6,678.0 | 6,678.0 | 26.4 | 133.6 | -91.25 | 459.0 | -156.0 | 608.4 | 450.0 | 158.44 | 3.840 | |
| 7,400.0 | 6,693.1 | 6,678.1 | 6,678.1 | 28.4 | 133.6 | -89.86 | 459.0 | -156.0 | 683.8 | 523.3 | 160.58 | 4.259 | |
| 7,500.0 | 6,692.9 | 6,677.9 | 6,677.9 | 30.5 | 133.6 | -89.83 | 459.0 | -156.0 | 764.9 | 602.1 | 162.84 | 4.698 | |
| 7,600.0 | 6,692.7 | 6,677.7 | 6,677.7 | 32.8 | 133.6 | -89.81 | 459.0 | -156.0 | 850.1 | 684.9 | 165.18 | 5.146 | |
| 7,700.0 | 6,692.5 | 6,677.5 | 6,677.5 | 35.1 | 133.5 | -89.78 | 459.0 | -156.0 | 938.1 | 770.5 | 167.60 | 5.597 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14W-234 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 | -180.00 | -29.1 | 0.0 | 29.1 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | -180.00 | -29.1 | 0.0 | 29.1 | 28.9 | 0.22 | 129.668 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -180.00 | -29.1 | 0.0 | 29.1 | 28.5 | 0.67 | 43.223 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | -180.00 | -29.1 | 0.0 | 29.1 | 28.0 | 1.12 | 25.934 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | -180.00 | -29.1 | 0.0 | 29.1 | 27.6 | 1.57 | 18.524 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | -180.00 | -29.1 | 0.0 | 29.1 | 27.1 | 2.02 | 14.408 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | -180.00 | -29.1 | 0.0 | 29.1 | 26.7 | 2.47 | 11.788 | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | -180.00 | -29.1 | 0.0 | 29.1 | 26.2 | 2.92 | 9.974 | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | -180.00 | -29.1 | 0.0 | 29.1 | 25.8 | 3.37 | 8.645 | CC, ES |
| 900.0 | 900.0 | 900.0 | 900.0 | 1.9 | 1.9 | 164.48 | -29.1 | 0.0 | 30.8 | 27.0 | 3.82 | 8.067 | |
| 1,000.0 | 999.8 | 999.8 | 999.8 | 2.1 | 2.1 | 166.70 | -29.1 | 0.0 | 35.9 | 31.6 | 4.27 | 8.409 | |
| 1,100.0 | 1,099.5 | 1,100.9 | 1,100.9 | 2.4 | 2.4 | 168.55 | -27.5 | 0.7 | 42.8 | 38.0 | 4.71 | 9.074 | |
| 1,200.0 | 1,198.7 | 1,202.2 | 1,202.0 | 2.6 | 2.6 | 169.36 | -22.6 | 2.9 | 49.7 | 44.6 | 5.15 | 9.654 | |
| 1,300.0 | 1,297.5 | 1,303.8 | 1,303.2 | 2.9 | 2.8 | 169.50 | -14.4 | 6.5 | 56.8 | 51.2 | 5.59 | 10.152 | |
| 1,400.0 | 1,395.6 | 1,405.5 | 1,404.2 | 3.2 | 3.1 | 169.20 | -2.9 | 11.6 | 63.8 | 57.8 | 6.04 | 10.570 | |
| 1,500.0 | 1,493.5 | 1,506.1 | 1,503.6 | 3.6 | 3.3 | 168.48 | 10.9 | 17.7 | 69.6 | 63.1 | 6.52 | 10.679 | |
| 1,600.0 | 1,591.4 | 1,605.9 | 1,602.3 | 3.9 | 3.6 | 167.82 | 24.9 | 23.9 | 75.3 | 68.2 | 7.01 | 10.729 | |
| 1,700.0 | 1,689.3 | 1,705.8 | 1,700.9 | 4.3 | 3.9 | 167.25 | 38.9 | 30.0 | 80.9 | 73.4 | 7.52 | 10.762 | |
| 1,800.0 | 1,787.2 | 1,805.6 | 1,799.6 | 4.7 | 4.2 | 166.76 | 52.8 | 36.2 | 86.5 | 78.5 | 8.03 | 10.782 | |
| 1,900.0 | 1,885.1 | 1,905.5 | 1,898.3 | 5.1 | 4.5 | 166.32 | 66.8 | 42.4 | 92.2 | 83.6 | 8.54 | 10.791 | |
| 2,000.0 | 1,983.0 | 2,005.3 | 1,996.9 | 5.5 | 4.9 | 165.94 | 80.8 | 48.5 | 97.8 | 88.8 | 9.06 | 10.793 | |
| 2,100.0 | 2,080.9 | 2,105.1 | 2,095.6 | 5.9 | 5.2 | 165.60 | 94.7 | 54.7 | 103.5 | 93.9 | 9.59 | 10.790 | |
| 2,200.0 | 2,178.8 | 2,205.0 | 2,194.2 | 6.3 | 5.5 | 165.30 | 108.7 | 60.9 | 109.1 | 99.0 | 10.12 | 10.783 | |
| 2,300.0 | 2,276.7 | 2,304.8 | 2,292.9 | 6.7 | 5.8 | 165.02 | 122.7 | 67.0 | 114.8 | 104.1 | 10.66 | 10.774 | |
| 2,400.0 | 2,374.6 | 2,404.6 | 2,391.6 | 7.1 | 6.2 | 164.77 | 136.6 | 73.2 | 120.5 | 109.3 | 11.19 | 10.763 | |
| 2,500.0 | 2,472.5 | 2,504.5 | 2,490.2 | 7.6 | 6.5 | 164.54 | 150.6 | 79.4 | 126.1 | 114.4 | 11.73 | 10.750 | |
| 2,600.0 | 2,570.4 | 2,604.3 | 2,588.9 | 8.0 | 6.9 | 164.34 | 164.6 | 85.5 | 131.8 | 119.5 | 12.28 | 10.736 | |
| 2,700.0 | 2,668.2 | 2,704.2 | 2,687.6 | 8.4 | 7.2 | 164.14 | 178.5 | 91.7 | 137.5 | 124.6 | 12.82 | 10.722 | |
| 2,800.0 | 2,766.1 | 2,804.0 | 2,786.2 | 8.8 | 7.5 | 163.97 | 192.5 | 97.9 | 143.1 | 129.8 | 13.37 | 10.708 | |
| 2,900.0 | 2,864.0 | 2,903.8 | 2,884.9 | 9.3 | 7.9 | 163.81 | 206.5 | 104.1 | 148.8 | 134.9 | 13.92 | 10.693 | |
| 3,000.0 | 2,961.9 | 3,003.7 | 2,983.6 | 9.7 | 8.2 | 163.66 | 220.4 | 110.2 | 154.5 | 140.0 | 14.47 | 10.679 | |
| 3,100.0 | 3,059.8 | 3,103.5 | 3,082.2 | 10.1 | 8.6 | 163.52 | 234.4 | 116.4 | 160.1 | 145.1 | 15.02 | 10.664 | |
| 3,200.0 | 3,157.7 | 3,203.4 | 3,180.9 | 10.5 | 8.9 | 163.39 | 248.3 | 122.6 | 165.8 | 150.2 | 15.57 | 10.650 | |
| 3,300.0 | 3,255.6 | 3,303.2 | 3,279.6 | 11.0 | 9.3 | 163.27 | 262.3 | 128.7 | 171.5 | 155.4 | 16.12 | 10.636 | |
| 3,400.0 | 3,353.5 | 3,403.0 | 3,378.2 | 11.4 | 9.6 | 163.15 | 276.3 | 134.9 | 177.2 | 160.5 | 16.68 | 10.622 | |
| 3,500.0 | 3,451.4 | 3,502.9 | 3,476.9 | 11.8 | 10.0 | 163.05 | 290.2 | 141.1 | 182.8 | 165.6 | 17.23 | 10.609 | |
| 3,600.0 | 3,549.3 | 3,602.7 | 3,575.5 | 12.3 | 10.3 | 162.95 | 304.2 | 147.2 | 188.5 | 170.7 | 17.79 | 10.596 | |
| 3,700.0 | 3,647.2 | 3,702.5 | 3,674.2 | 12.7 | 10.7 | 162.85 | 318.2 | 153.4 | 194.2 | 175.8 | 18.35 | 10.583 | |
| 3,800.0 | 3,745.1 | 3,802.4 | 3,772.9 | 13.1 | 11.0 | 162.76 | 332.1 | 159.6 | 199.9 | 181.0 | 18.91 | 10.571 | |
| 3,900.0 | 3,843.0 | 3,902.2 | 3,871.5 | 13.6 | 11.4 | 162.68 | 346.1 | 165.7 | 205.6 | 186.1 | 19.47 | 10.559 | |
| 4,000.0 | 3,940.9 | 4,002.1 | 3,970.2 | 14.0 | 11.7 | 162.60 | 360.1 | 171.9 | 211.2 | 191.2 | 20.03 | 10.548 | |
| 4,100.0 | 4,038.8 | 4,101.9 | 4,068.9 | 14.4 | 12.1 | 162.52 | 374.0 | 178.1 | 216.9 | 196.3 | 20.59 | 10.536 | |
| 4,200.0 | 4,136.6 | 4,201.7 | 4,167.5 | 14.9 | 12.5 | 162.45 | 388.0 | 184.2 | 222.6 | 201.4 | 21.15 | 10.525 | |
| 4,300.0 | 4,234.5 | 4,301.6 | 4,266.2 | 15.3 | 12.8 | 162.38 | 402.0 | 190.4 | 228.3 | 206.6 | 21.71 | 10.515 | |
| 4,400.0 | 4,332.4 | 4,401.4 | 4,364.9 | 15.7 | 13.2 | 162.32 | 415.9 | 196.6 | 233.9 | 211.7 | 22.27 | 10.505 | |
| 4,500.0 | 4,430.3 | 4,501.3 | 4,463.5 | 16.2 | 13.5 | 162.26 | 429.9 | 202.7 | 239.6 | 216.8 | 22.83 | 10.495 | |
| 4,600.0 | 4,528.2 | 4,601.1 | 4,562.2 | 16.6 | 13.9 | 162.20 | 443.9 | 208.9 | 245.3 | 221.9 | 23.40 | 10.485 | |
| 4,700.0 | 4,626.1 | 4,700.9 | 4,660.9 | 17.0 | 14.2 | 162.14 | 457.8 | 215.1 | 251.0 | 227.0 | 23.96 | 10.476 | |
| 4,800.0 | 4,724.0 | 4,800.8 | 4,759.5 | 17.5 | 14.6 | 162.09 | 471.8 | 221.2 | 256.7 | 232.1 | 24.52 | 10.467 | |
| 4,900.0 | 4,821.9 | 4,900.6 | 4,858.2 | 17.9 | 14.9 | 162.04 | 485.7 | 227.4 | 262.3 | 237.3 | 25.09 | 10.458 | |
| 5,000.0 | 4,919.8 | 5,000.4 | 4,956.8 | 18.4 | 15.3 | 161.99 | 499.7 | 233.6 | 268.0 | 242.4 | 25.65 | 10.450 | |

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

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14W-234 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.0 | 5,017.7 | 5,100.3 | 5,055.5 | 18.8 | 15.6 | 161.94 | 513.7 | 239.7 | 273.7 | 247.5 | 26.21 | 10.441 | |
| 5,200.0 | 5,115.6 | 5,200.1 | 5,154.2 | 19.2 | 16.0 | 161.90 | 527.6 | 245.9 | 279.4 | 252.6 | 26.78 | 10.433 | |
| 5,300.0 | 5,213.5 | 5,292.4 | 5,245.5 | 19.7 | 16.3 | 161.96 | 539.4 | 251.1 | 286.3 | 259.0 | 27.28 | 10.496 | |
| 5,400.0 | 5,311.7 | 5,383.6 | 5,336.2 | 20.0 | 16.5 | 162.23 | 548.4 | 255.1 | 294.5 | 266.8 | 27.70 | 10.630 | |
| 5,500.0 | 5,410.5 | 5,474.7 | 5,427.1 | 20.3 | 16.7 | 162.52 | 554.8 | 257.9 | 302.2 | 274.2 | 28.04 | 10.776 | |
| 5,600.0 | 5,509.8 | 5,565.6 | 5,517.9 | 20.6 | 16.8 | 162.85 | 558.5 | 259.5 | 309.5 | 281.2 | 28.33 | 10.925 | |
| 5,700.0 | 5,609.4 | 5,657.2 | 5,609.4 | 20.8 | 17.0 | 163.22 | 559.6 | 260.0 | 316.4 | 287.8 | 28.57 | 11.073 | |
| 5,800.0 | 5,709.3 | 5,757.1 | 5,709.3 | 20.9 | 17.1 | 163.50 | 559.6 | 260.0 | 321.1 | 292.2 | 28.82 | 11.140 | |
| 5,900.0 | 5,809.3 | 5,857.0 | 5,809.1 | 21.1 | 17.3 | -179.68 | 559.6 | 258.2 | 322.5 | 285.1 | 37.31 | 8.644 | |
| 6,000.0 | 5,909.3 | 5,955.0 | 5,906.3 | 21.2 | 17.4 | -177.37 | 559.5 | 245.2 | 322.8 | 285.0 | 37.79 | 8.543 | |
| 6,100.0 | 6,009.1 | 6,050.0 | 5,998.0 | 21.3 | 17.4 | -83.82 | 559.5 | 220.8 | 324.5 | 295.6 | 28.88 | 11.234 | |
| 6,200.0 | 6,107.4 | 6,142.2 | 6,083.5 | 21.4 | 17.4 | -80.44 | 559.5 | 186.5 | 327.3 | 298.5 | 28.77 | 11.376 | |
| 6,300.0 | 6,202.4 | 6,232.7 | 6,162.8 | 21.4 | 17.4 | -77.28 | 559.4 | 143.0 | 331.0 | 302.2 | 28.76 | 11.509 | |
| 6,400.0 | 6,292.6 | 6,321.5 | 6,235.1 | 21.4 | 17.4 | -74.39 | 559.4 | 91.5 | 335.4 | 306.5 | 28.88 | 11.613 | |
| 6,500.0 | 6,376.4 | 6,408.8 | 6,299.9 | 21.4 | 17.4 | -71.81 | 559.3 | 33.0 | 340.1 | 310.9 | 29.14 | 11.669 | |
| 6,600.0 | 6,452.4 | 6,494.9 | 6,356.9 | 21.4 | 17.4 | -69.57 | 559.2 | -31.5 | 344.8 | 315.3 | 29.59 | 11.653 | |
| 6,700.0 | 6,519.3 | 6,579.9 | 6,405.6 | 21.4 | 17.5 | -67.66 | 559.1 | -101.1 | 349.4 | 319.1 | 30.28 | 11.541 | |
| 6,800.0 | 6,575.9 | 6,664.1 | 6,446.0 | 21.5 | 17.8 | -66.09 | 559.0 | -174.9 | 353.5 | 322.3 | 31.26 | 11.309 | |
| 6,900.0 | 6,621.3 | 6,750.0 | 6,478.6 | 21.7 | 18.6 | -64.85 | 559.0 | -254.3 | 357.0 | 324.4 | 32.62 | 10.942 | |
| 7,000.0 | 6,654.7 | 6,830.6 | 6,500.8 | 22.2 | 19.7 | -64.00 | 558.9 | -331.7 | 359.6 | 325.3 | 34.34 | 10.471 | |
| 7,100.0 | 6,675.5 | 6,913.2 | 6,515.1 | 23.1 | 21.2 | -63.46 | 558.8 | -413.0 | 361.3 | 324.8 | 36.49 | 9.901 | |
| 7,200.0 | 6,686.5 | 6,995.5 | 6,520.5 | 24.6 | 22.7 | -62.92 | 558.7 | -495.1 | 363.5 | 324.2 | 39.30 | 9.249 | |
| 7,300.0 | 6,693.0 | 7,094.0 | 6,520.9 | 26.4 | 24.8 | -61.99 | 558.6 | -593.6 | 366.4 | 324.1 | 42.24 | 8.674 | |
| 7,400.0 | 6,693.1 | 7,194.0 | 6,521.3 | 28.4 | 27.0 | -62.04 | 558.4 | -693.6 | 366.3 | 320.3 | 46.05 | 7.955 | |
| 7,500.0 | 6,692.9 | 7,294.0 | 6,521.7 | 30.5 | 29.2 | -62.13 | 558.3 | -793.6 | 366.2 | 316.0 | 50.19 | 7.296 | |
| 7,600.0 | 6,692.7 | 7,394.0 | 6,522.1 | 32.8 | 31.6 | -62.22 | 558.2 | -893.6 | 366.0 | 311.5 | 54.49 | 6.717 | |
| 7,700.0 | 6,692.5 | 7,494.0 | 6,522.5 | 35.1 | 34.1 | -62.31 | 558.1 | -993.6 | 365.8 | 306.9 | 58.91 | 6.210 | |
| 7,800.0 | 6,692.3 | 7,594.0 | 6,522.9 | 37.5 | 36.5 | -62.40 | 558.0 | -1,093.6 | 365.7 | 302.2 | 63.43 | 5.764 | |
| 7,900.0 | 6,692.1 | 7,694.0 | 6,523.3 | 40.0 | 39.1 | -62.49 | 557.9 | -1,193.6 | 365.5 | 297.4 | 68.04 | 5.372 | |
| 8,000.0 | 6,691.9 | 7,794.0 | 6,523.7 | 42.5 | 41.6 | -62.58 | 557.7 | -1,293.6 | 365.3 | 292.6 | 72.71 | 5.024 | |
| 8,100.0 | 6,691.7 | 7,894.0 | 6,524.1 | 45.0 | 44.2 | -62.67 | 557.6 | -1,393.6 | 365.1 | 287.7 | 77.45 | 4.715 | |
| 8,200.0 | 6,691.5 | 7,994.0 | 6,524.5 | 47.6 | 46.9 | -62.76 | 557.5 | -1,493.6 | 365.0 | 282.7 | 82.23 | 4.438 | |
| 8,300.0 | 6,691.3 | 8,094.0 | 6,524.9 | 50.2 | 49.5 | -62.85 | 557.4 | -1,593.6 | 364.8 | 277.8 | 87.06 | 4.191 | |
| 8,400.0 | 6,691.1 | 8,194.0 | 6,525.3 | 52.8 | 52.2 | -62.95 | 557.3 | -1,693.6 | 364.6 | 272.7 | 91.92 | 3.967 | |
| 8,500.0 | 6,691.0 | 8,294.0 | 6,525.7 | 55.5 | 54.8 | -63.04 | 557.2 | -1,793.6 | 364.5 | 267.7 | 96.81 | 3.765 | |
| 8,600.0 | 6,690.8 | 8,394.0 | 6,526.1 | 58.1 | 57.5 | -63.13 | 557.0 | -1,893.6 | 364.3 | 262.6 | 101.74 | 3.581 | |
| 8,700.0 | 6,690.6 | 8,494.0 | 6,526.5 | 60.8 | 60.2 | -63.22 | 556.9 | -1,993.6 | 364.2 | 257.5 | 106.68 | 3.413 | |
| 8,800.0 | 6,690.4 | 8,594.0 | 6,526.9 | 63.5 | 62.9 | -63.31 | 556.8 | -2,093.6 | 364.0 | 252.3 | 111.66 | 3.260 | |
| 8,900.0 | 6,690.2 | 8,694.0 | 6,527.3 | 66.2 | 65.6 | -63.40 | 556.7 | -2,193.6 | 363.8 | 247.2 | 116.65 | 3.119 | |
| 9,000.0 | 6,690.0 | 8,794.0 | 6,527.7 | 68.9 | 68.4 | -63.50 | 556.6 | -2,293.6 | 363.7 | 242.0 | 121.67 | 2.989 | |
| 9,100.0 | 6,689.8 | 8,894.0 | 6,528.1 | 71.6 | 71.1 | -63.59 | 556.5 | -2,393.6 | 363.5 | 236.8 | 126.70 | 2.869 | |
| 9,200.0 | 6,689.6 | 8,994.0 | 6,528.5 | 74.3 | 73.8 | -63.68 | 556.3 | -2,493.6 | 363.4 | 231.6 | 131.75 | 2.758 | |
| 9,300.0 | 6,689.4 | 9,094.0 | 6,528.9 | 77.0 | 76.6 | -63.77 | 556.2 | -2,593.6 | 363.2 | 226.4 | 136.81 | 2.655 | |
| 9,400.0 | 6,689.2 | 9,194.0 | 6,529.3 | 79.7 | 79.3 | -63.86 | 556.1 | -2,693.6 | 363.0 | 221.1 | 141.89 | 2.559 | |
| 9,500.0 | 6,689.0 | 9,294.0 | 6,529.7 | 82.5 | 82.1 | -63.96 | 556.0 | -2,793.6 | 362.9 | 215.9 | 146.99 | 2.469 | |
| 9,600.0 | 6,688.8 | 9,394.0 | 6,530.1 | 85.2 | 84.8 | -64.05 | 555.9 | -2,893.6 | 362.7 | 210.6 | 152.09 | 2.385 | |
| 9,700.0 | 6,688.6 | 9,494.0 | 6,530.5 | 87.9 | 87.6 | -64.14 | 555.7 | -2,993.6 | 362.6 | 205.4 | 157.21 | 2.306 | |
| 9,800.0 | 6,688.5 | 9,594.0 | 6,530.9 | 90.7 | 90.3 | -64.23 | 555.6 | -3,093.6 | 362.4 | 200.1 | 162.35 | 2.232 | |
| 9,900.0 | 6,688.3 | 9,694.0 | 6,531.3 | 93.4 | 93.1 | -64.33 | 555.5 | -3,193.6 | 362.3 | 194.8 | 167.49 | 2.163 | |
| 10,000.0 | 6,688.1 | 9,794.0 | 6,531.7 | 96.2 | 95.8 | -64.42 | 555.4 | -3,293.6 | 362.1 | 189.5 | 172.65 | 2.097 | |
| 10,100.0 | 6,687.9 | 9,894.0 | 6,532.1 | 99.0 | 98.6 | -64.51 | 555.3 | -3,393.6 | 362.0 | 184.2 | 177.81 | 2.036 | |

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

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14W-234 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,200.0 | 6,687.7 | 9,994.0 | 6,532.5 | 101.7 | 101.4 | -64.60 | 555.2 | -3,493.6 | 361.8 | 178.8 | 182.99 | 1.977 | |
| 10,300.0 | 6,687.5 | 10,094.0 | 6,532.9 | 104.5 | 104.2 | -64.70 | 555.0 | -3,593.6 | 361.7 | 173.5 | 188.18 | 1.922 | |
| 10,400.0 | 6,687.3 | 10,194.0 | 6,533.3 | 107.2 | 106.9 | -64.79 | 554.9 | -3,693.6 | 361.5 | 168.2 | 193.37 | 1.870 | |
| 10,500.0 | 6,687.1 | 10,294.0 | 6,533.7 | 110.0 | 109.7 | -64.88 | 554.8 | -3,793.6 | 361.4 | 162.8 | 198.58 | 1.820 | |
| 10,600.0 | 6,686.9 | 10,394.0 | 6,534.1 | 112.8 | 112.5 | -64.98 | 554.7 | -3,893.6 | 361.2 | 157.4 | 203.80 | 1.773 | |
| 10,700.0 | 6,686.7 | 10,494.0 | 6,534.5 | 115.6 | 115.3 | -65.07 | 554.6 | -3,993.6 | 361.1 | 152.1 | 209.02 | 1.728 | |
| 10,800.0 | 6,686.5 | 10,594.0 | 6,534.9 | 118.3 | 118.0 | -65.16 | 554.5 | -4,093.5 | 361.0 | 146.7 | 214.26 | 1.685 | |
| 10,900.0 | 6,686.3 | 10,694.0 | 6,535.3 | 121.1 | 120.8 | -65.26 | 554.3 | -4,193.5 | 360.8 | 141.3 | 219.50 | 1.644 | |
| 11,000.0 | 6,686.2 | 10,794.0 | 6,535.7 | 123.9 | 123.6 | -65.35 | 554.2 | -4,293.5 | 360.7 | 135.9 | 224.75 | 1.605 | |
| 11,056.2 | 6,686.0 | 10,850.2 | 6,536.0 | 125.4 | 125.2 | -65.40 | 554.2 | -4,349.8 | 360.6 | 132.9 | 227.71 | 1.584 | |
| 11,079.6 | 6,686.0 | 10,862.9 | 6,536.0 | 126.1 | 125.5 | -65.41 | 554.1 | -4,362.5 | 360.7 | 132.1 | 228.64 | 1.578 | SF |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-304 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 | -180.00 | -91.1 | 0.0 | 91.1 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | -180.00 | -91.1 | 0.0 | 91.1 | 90.8 | 0.22 | 405.194 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -180.00 | -91.1 | 0.0 | 91.1 | 90.4 | 0.67 | 135.065 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | -180.00 | -91.1 | 0.0 | 91.1 | 90.0 | 1.12 | 81.039 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | -180.00 | -91.1 | 0.0 | 91.1 | 89.5 | 1.57 | 57.885 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | -180.00 | -91.1 | 0.0 | 91.1 | 89.1 | 2.02 | 45.022 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | -180.00 | -91.1 | 0.0 | 91.1 | 88.6 | 2.47 | 36.836 | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | -180.00 | -91.1 | 0.0 | 91.1 | 88.2 | 2.92 | 31.169 | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | -180.00 | -91.1 | 0.0 | 91.1 | 87.7 | 3.37 | 27.013 | CC, ES |
| 900.0 | 900.0 | 900.0 | 900.0 | 1.9 | 1.9 | 163.87 | -91.1 | 0.0 | 92.7 | 88.9 | 3.82 | 24.275 | |
| 1,000.0 | 999.8 | 999.8 | 999.8 | 2.1 | 2.1 | 164.70 | -91.1 | 0.0 | 97.8 | 93.5 | 4.27 | 22.910 | |
| 1,100.0 | 1,099.5 | 1,099.5 | 1,099.5 | 2.4 | 2.4 | 165.90 | -91.1 | 0.0 | 106.2 | 101.5 | 4.71 | 22.536 | |
| 1,200.0 | 1,198.7 | 1,198.7 | 1,198.7 | 2.6 | 2.6 | 167.28 | -91.1 | 0.0 | 118.1 | 112.9 | 5.15 | 22.906 | |
| 1,300.0 | 1,297.5 | 1,297.5 | 1,297.5 | 2.9 | 2.8 | 168.70 | -91.1 | 0.0 | 133.4 | 127.8 | 5.59 | 23.850 | |
| 1,400.0 | 1,395.6 | 1,395.6 | 1,395.6 | 3.2 | 3.0 | 170.05 | -91.1 | 0.0 | 152.1 | 146.1 | 6.03 | 25.231 | |
| 1,500.0 | 1,493.5 | 1,493.5 | 1,493.5 | 3.6 | 3.2 | 171.22 | -91.1 | 0.0 | 172.3 | 165.8 | 6.49 | 26.562 | |
| 1,600.0 | 1,591.4 | 1,591.4 | 1,591.4 | 3.9 | 3.5 | 172.15 | -91.1 | 0.0 | 192.5 | 185.6 | 6.95 | 27.710 | |
| 1,700.0 | 1,689.3 | 1,689.3 | 1,689.3 | 4.3 | 3.7 | 172.90 | -91.1 | 0.0 | 212.8 | 205.3 | 7.41 | 28.710 | |
| 1,800.0 | 1,787.2 | 1,787.2 | 1,787.2 | 4.7 | 3.9 | 173.52 | -91.1 | 0.0 | 233.0 | 225.2 | 7.88 | 29.586 | |
| 1,900.0 | 1,885.1 | 1,885.1 | 1,885.1 | 5.1 | 4.1 | 174.04 | -91.1 | 0.0 | 253.3 | 245.0 | 8.34 | 30.361 | |
| 2,000.0 | 1,983.0 | 1,983.0 | 1,983.0 | 5.5 | 4.3 | 174.48 | -91.1 | 0.0 | 273.7 | 264.8 | 8.81 | 31.048 | |
| 2,100.0 | 2,080.9 | 2,082.1 | 2,082.1 | 5.9 | 4.6 | 174.64 | -91.1 | 1.2 | 293.8 | 284.5 | 9.28 | 31.672 | |
| 2,200.0 | 2,178.8 | 2,181.5 | 2,181.4 | 6.3 | 4.8 | 174.15 | -91.4 | 5.7 | 313.5 | 303.8 | 9.74 | 32.205 | |
| 2,300.0 | 2,276.7 | 2,280.1 | 2,279.7 | 6.7 | 5.0 | 173.21 | -91.8 | 13.2 | 332.9 | 322.7 | 10.20 | 32.631 | |
| 2,400.0 | 2,374.6 | 2,378.1 | 2,377.4 | 7.1 | 5.2 | 172.32 | -92.2 | 20.9 | 352.3 | 341.7 | 10.68 | 32.996 | |
| 2,500.0 | 2,472.5 | 2,476.1 | 2,475.0 | 7.6 | 5.4 | 171.53 | -92.6 | 28.7 | 371.8 | 360.7 | 11.16 | 33.316 | |
| 2,600.0 | 2,570.4 | 2,574.0 | 2,572.7 | 8.0 | 5.6 | 170.81 | -93.1 | 36.5 | 391.4 | 379.7 | 11.65 | 33.596 | |
| 2,700.0 | 2,668.2 | 2,672.0 | 2,670.3 | 8.4 | 5.8 | 170.16 | -93.5 | 44.2 | 411.0 | 398.8 | 12.14 | 33.844 | |
| 2,800.0 | 2,766.1 | 2,769.9 | 2,768.0 | 8.8 | 6.1 | 169.57 | -93.9 | 52.0 | 430.6 | 418.0 | 12.64 | 34.061 | |
| 2,900.0 | 2,864.0 | 2,867.9 | 2,865.6 | 9.3 | 6.3 | 169.04 | -94.3 | 59.7 | 450.3 | 437.2 | 13.15 | 34.254 | |
| 3,000.0 | 2,961.9 | 2,965.8 | 2,963.3 | 9.7 | 6.5 | 168.54 | -94.8 | 67.5 | 470.1 | 456.4 | 13.65 | 34.425 | |
| 3,100.0 | 3,059.8 | 3,063.8 | 3,060.9 | 10.1 | 6.7 | 168.09 | -95.2 | 75.3 | 489.8 | 475.7 | 14.17 | 34.577 | |
| 3,200.0 | 3,157.7 | 3,161.8 | 3,158.6 | 10.5 | 7.0 | 167.67 | -95.6 | 83.0 | 509.6 | 494.9 | 14.68 | 34.712 | |
| 3,300.0 | 3,255.6 | 3,259.7 | 3,256.2 | 11.0 | 7.2 | 167.28 | -96.0 | 90.8 | 529.4 | 514.2 | 15.20 | 34.833 | |
| 3,400.0 | 3,353.5 | 3,357.7 | 3,353.9 | 11.4 | 7.5 | 166.93 | -96.5 | 98.5 | 549.3 | 533.5 | 15.72 | 34.942 | |
| 3,500.0 | 3,451.4 | 3,455.6 | 3,451.5 | 11.8 | 7.7 | 166.59 | -96.9 | 106.3 | 569.1 | 552.9 | 16.24 | 35.039 | |
| 3,600.0 | 3,549.3 | 3,553.6 | 3,549.2 | 12.3 | 7.9 | 166.28 | -97.3 | 114.0 | 589.0 | 572.2 | 16.77 | 35.127 | |
| 3,700.0 | 3,647.2 | 3,651.5 | 3,646.8 | 12.7 | 8.2 | 165.99 | -97.7 | 121.8 | 608.9 | 591.6 | 17.29 | 35.206 | |
| 3,800.0 | 3,745.1 | 3,749.5 | 3,744.5 | 13.1 | 8.4 | 165.72 | -98.1 | 129.6 | 628.8 | 610.9 | 17.82 | 35.278 | |
| 3,900.0 | 3,843.0 | 3,847.5 | 3,842.1 | 13.6 | 8.7 | 165.46 | -98.6 | 137.3 | 648.7 | 630.3 | 18.35 | 35.343 | |
| 4,000.0 | 3,940.9 | 3,945.4 | 3,939.8 | 14.0 | 8.9 | 165.22 | -99.0 | 145.1 | 668.6 | 649.7 | 18.89 | 35.402 | |
| 4,100.0 | 4,038.8 | 4,043.4 | 4,037.4 | 14.4 | 9.2 | 164.99 | -99.4 | 152.8 | 688.5 | 669.1 | 19.42 | 35.455 | |
| 4,200.0 | 4,136.6 | 4,141.3 | 4,135.1 | 14.9 | 9.4 | 164.78 | -99.8 | 160.6 | 708.5 | 688.5 | 19.95 | 35.504 | |
| 4,300.0 | 4,234.5 | 4,239.3 | 4,232.7 | 15.3 | 9.7 | 164.58 | -100.3 | 168.4 | 728.4 | 707.9 | 20.49 | 35.549 | |
| 4,400.0 | 4,332.4 | 4,337.2 | 4,330.4 | 15.7 | 9.9 | 164.38 | -100.7 | 176.1 | 748.4 | 727.4 | 21.03 | 35.589 | |
| 4,500.0 | 4,430.3 | 4,435.2 | 4,428.0 | 16.2 | 10.2 | 164.20 | -101.1 | 183.9 | 768.3 | 746.8 | 21.57 | 35.627 | |
| 4,600.0 | 4,528.2 | 4,533.2 | 4,525.7 | 16.6 | 10.4 | 164.03 | -101.5 | 191.6 | 788.3 | 766.2 | 22.11 | 35.661 | |
| 4,700.0 | 4,626.1 | 4,631.1 | 4,623.3 | 17.0 | 10.7 | 163.87 | -102.0 | 199.4 | 808.3 | 785.7 | 22.65 | 35.692 | |
| 4,800.0 | 4,724.0 | 4,729.1 | 4,721.0 | 17.5 | 10.9 | 163.71 | -102.4 | 207.1 | 828.3 | 805.1 | 23.19 | 35.721 | |
| 4,900.0 | 4,821.9 | 4,827.0 | 4,818.6 | 17.9 | 11.2 | 163.56 | -102.8 | 214.9 | 848.3 | 824.6 | 23.73 | 35.748 | |
| 5,000.0 | 4,919.8 | 4,925.0 | 4,916.3 | 18.4 | 11.4 | 163.42 | -103.2 | 222.7 | 868.3 | 844.0 | 24.27 | 35.772 | |

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

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-304 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.0 | 5,017.7 | 5,023.0 | 5,013.9 | 18.8 | 11.7 | 163.28 | -103.7 | 230.4 | 888.3 | 863.5 | 24.82 | 35.795 | |
| 5,200.0 | 5,115.6 | 5,120.9 | 5,111.6 | 19.2 | 12.0 | 163.15 | -104.1 | 238.2 | 908.3 | 882.9 | 25.36 | 35.815 | |
| 5,300.0 | 5,213.5 | 5,218.9 | 5,209.2 | 19.7 | 12.2 | 163.03 | -104.5 | 245.9 | 928.3 | 902.4 | 25.91 | 35.835 | |
| 5,400.0 | 5,311.7 | 5,317.8 | 5,307.9 | 20.0 | 12.4 | 163.00 | -104.9 | 253.6 | 946.7 | 920.3 | 26.46 | 35.776 | |
| 5,500.0 | 5,410.5 | 5,418.7 | 5,408.6 | 20.3 | 12.6 | 163.06 | -105.2 | 258.5 | 961.7 | 934.8 | 26.91 | 35.742 | |
| 5,600.0 | 5,509.8 | 5,519.9 | 5,509.8 | 20.6 | 12.8 | 163.25 | -105.3 | 260.0 | 973.1 | 945.9 | 27.29 | 35.658 | |
| 5,700.0 | 5,609.4 | 5,619.5 | 5,609.4 | 20.8 | 13.0 | 163.44 | -105.3 | 260.0 | 981.2 | 953.5 | 27.64 | 35.495 | |
| 5,800.0 | 5,709.3 | 5,719.4 | 5,709.3 | 20.9 | 13.2 | 163.54 | -105.3 | 260.0 | 985.9 | 957.9 | 27.97 | 35.244 | |
| 5,900.0 | 5,809.3 | 5,819.4 | 5,809.3 | 21.1 | 13.4 | -180.00 | -105.3 | 260.0 | 987.3 | 954.1 | 33.15 | 29.781 | |
| 5,941.6 | 5,850.9 | 5,861.0 | 5,850.8 | 21.1 | 13.5 | -179.99 | -105.3 | 259.8 | 987.3 | 954.0 | 33.29 | 29.657 | |
| 6,000.0 | 5,909.3 | 5,919.2 | 5,909.0 | 21.2 | 13.6 | -179.79 | -105.3 | 256.5 | 987.3 | 953.8 | 33.48 | 29.486 | |
| 6,100.0 | 6,009.1 | 6,017.4 | 6,005.9 | 21.3 | 13.7 | -89.17 | -105.3 | 240.7 | 987.4 | 958.6 | 28.82 | 34.259 | |
| 6,200.0 | 6,107.4 | 6,114.4 | 6,098.8 | 21.4 | 13.8 | -88.56 | -105.3 | 213.2 | 987.6 | 958.7 | 28.93 | 34.132 | |
| 6,300.0 | 6,202.4 | 6,210.1 | 6,186.4 | 21.4 | 13.8 | -87.98 | -105.3 | 174.6 | 987.9 | 958.9 | 29.02 | 34.039 | |
| 6,400.0 | 6,292.6 | 6,304.8 | 6,267.5 | 21.4 | 13.9 | -87.44 | -105.3 | 126.1 | 988.3 | 959.1 | 29.17 | 33.881 | |
| 6,500.0 | 6,376.4 | 6,400.0 | 6,342.5 | 21.4 | 14.1 | -86.93 | -105.3 | 67.5 | 988.7 | 959.2 | 29.49 | 33.527 | |
| 6,600.0 | 6,452.4 | 6,491.2 | 6,406.9 | 21.4 | 14.5 | -86.49 | -105.3 | 3.0 | 989.1 | 959.0 | 30.11 | 32.851 | |
| 6,700.0 | 6,519.3 | 6,583.2 | 6,463.7 | 21.4 | 15.1 | -86.09 | -105.3 | -69.3 | 989.6 | 958.4 | 31.17 | 31.752 | |
| 6,800.0 | 6,575.9 | 6,674.6 | 6,511.1 | 21.5 | 16.0 | -85.76 | -105.3 | -147.4 | 990.0 | 957.2 | 32.75 | 30.228 | |
| 6,900.0 | 6,621.3 | 6,765.5 | 6,548.6 | 21.7 | 17.1 | -85.50 | -105.3 | -230.2 | 990.3 | 955.4 | 34.91 | 28.370 | |
| 7,000.0 | 6,654.7 | 6,856.0 | 6,576.0 | 22.2 | 18.5 | -85.30 | -105.3 | -316.4 | 990.6 | 953.0 | 37.62 | 26.332 | |
| 7,100.0 | 6,675.5 | 6,946.3 | 6,592.9 | 23.1 | 20.1 | -85.18 | -105.3 | -405.0 | 990.8 | 950.0 | 40.82 | 24.274 | |
| 7,200.0 | 6,686.5 | 7,036.2 | 6,599.3 | 24.6 | 21.9 | -84.98 | -105.3 | -494.6 | 991.1 | 946.7 | 44.41 | 22.317 | |
| 7,300.0 | 6,693.0 | 7,134.6 | 6,599.1 | 26.4 | 24.0 | -84.57 | -105.3 | -593.0 | 991.7 | 943.3 | 48.43 | 20.480 | |
| 7,400.0 | 6,693.1 | 7,234.6 | 6,598.7 | 28.4 | 26.2 | -84.54 | -105.3 | -693.0 | 991.8 | 939.0 | 52.78 | 18.789 | |
| 7,500.0 | 6,692.9 | 7,334.6 | 6,598.4 | 30.5 | 28.6 | -84.53 | -105.3 | -793.0 | 991.8 | 934.4 | 57.37 | 17.288 | |
| 7,600.0 | 6,692.7 | 7,434.6 | 6,598.0 | 32.8 | 31.0 | -84.52 | -105.3 | -893.0 | 991.8 | 929.7 | 62.12 | 15.966 | |
| 7,700.0 | 6,692.5 | 7,534.6 | 6,597.7 | 35.1 | 33.5 | -84.51 | -105.3 | -993.0 | 991.8 | 924.8 | 67.00 | 14.804 | |
| 7,800.0 | 6,692.3 | 7,634.6 | 6,597.3 | 37.5 | 36.0 | -84.51 | -105.3 | -1,093.0 | 991.8 | 919.9 | 71.98 | 13.779 | |
| 7,900.0 | 6,692.1 | 7,734.6 | 6,597.0 | 40.0 | 38.6 | -84.50 | -105.3 | -1,193.0 | 991.9 | 914.8 | 77.05 | 12.873 | |
| 8,000.0 | 6,691.9 | 7,834.6 | 6,596.6 | 42.5 | 41.2 | -84.49 | -105.3 | -1,293.0 | 991.9 | 909.7 | 82.18 | 12.069 | |
| 8,100.0 | 6,691.7 | 7,934.6 | 6,596.3 | 45.0 | 43.8 | -84.48 | -105.3 | -1,393.0 | 991.9 | 904.5 | 87.38 | 11.352 | |
| 8,200.0 | 6,691.5 | 8,034.6 | 6,595.9 | 47.6 | 46.4 | -84.47 | -105.3 | -1,493.0 | 991.9 | 899.3 | 92.61 | 10.710 | |
| 8,300.0 | 6,691.3 | 8,134.6 | 6,595.6 | 50.2 | 49.1 | -84.46 | -105.3 | -1,593.0 | 991.9 | 894.0 | 97.89 | 10.133 | |
| 8,400.0 | 6,691.1 | 8,234.6 | 6,595.2 | 52.8 | 51.8 | -84.45 | -105.3 | -1,693.0 | 991.9 | 888.7 | 103.20 | 9.612 | |
| 8,500.0 | 6,691.0 | 8,334.6 | 6,594.9 | 55.5 | 54.5 | -84.44 | -105.3 | -1,793.0 | 991.9 | 883.4 | 108.54 | 9.139 | |
| 8,600.0 | 6,690.8 | 8,434.6 | 6,594.5 | 58.1 | 57.2 | -84.43 | -105.3 | -1,893.0 | 992.0 | 878.1 | 113.90 | 8.709 | |
| 8,700.0 | 6,690.6 | 8,534.6 | 6,594.2 | 60.8 | 59.9 | -84.42 | -105.3 | -1,993.0 | 992.0 | 872.7 | 119.28 | 8.316 | |
| 8,800.0 | 6,690.4 | 8,634.6 | 6,593.8 | 63.5 | 62.6 | -84.42 | -105.3 | -2,093.0 | 992.0 | 867.3 | 124.68 | 7.956 | |
| 8,900.0 | 6,690.2 | 8,734.6 | 6,593.5 | 66.2 | 65.3 | -84.41 | -105.3 | -2,193.0 | 992.0 | 861.9 | 130.10 | 7.625 | |
| 9,000.0 | 6,690.0 | 8,834.6 | 6,593.1 | 68.9 | 68.1 | -84.40 | -105.3 | -2,293.0 | 992.0 | 856.5 | 135.53 | 7.319 | |
| 9,100.0 | 6,689.8 | 8,934.6 | 6,592.8 | 71.6 | 70.8 | -84.39 | -105.3 | -2,393.0 | 992.0 | 851.1 | 140.97 | 7.037 | |
| 9,200.0 | 6,689.6 | 9,034.6 | 6,592.4 | 74.3 | 73.5 | -84.38 | -105.3 | -2,493.0 | 992.1 | 845.6 | 146.43 | 6.775 | |
| 9,300.0 | 6,689.4 | 9,134.6 | 6,592.1 | 77.0 | 76.3 | -84.37 | -105.3 | -2,593.0 | 992.1 | 840.2 | 151.89 | 6.531 | |
| 9,400.0 | 6,689.2 | 9,234.6 | 6,591.7 | 79.7 | 79.1 | -84.36 | -105.3 | -2,693.0 | 992.1 | 834.7 | 157.37 | 6.304 | |
| 9,500.0 | 6,689.0 | 9,334.6 | 6,591.4 | 82.5 | 81.8 | -84.35 | -105.3 | -2,793.0 | 992.1 | 829.3 | 162.85 | 6.092 | |
| 9,600.0 | 6,688.8 | 9,434.6 | 6,591.0 | 85.2 | 84.6 | -84.34 | -105.3 | -2,893.0 | 992.1 | 823.8 | 168.33 | 5.894 | |
| 9,700.0 | 6,688.6 | 9,534.6 | 6,590.7 | 87.9 | 87.3 | -84.33 | -105.3 | -2,993.0 | 992.1 | 818.3 | 173.83 | 5.708 | |
| 9,800.0 | 6,688.5 | 9,634.6 | 6,590.4 | 90.7 | 90.1 | -84.33 | -105.3 | -3,093.0 | 992.1 | 812.8 | 179.33 | 5.533 | |
| 9,900.0 | 6,688.3 | 9,734.6 | 6,590.0 | 93.4 | 92.9 | -84.32 | -105.3 | -3,193.0 | 992.2 | 807.3 | 184.83 | 5.368 | |
| 10,000.0 | 6,688.1 | 9,834.6 | 6,589.7 | 96.2 | 95.7 | -84.31 | -105.3 | -3,293.0 | 992.2 | 801.8 | 190.34 | 5.213 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-304 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,100.0 | 6,687.9 | 9,934.6 | 6,589.3 | 99.0 | 98.4 | -84.30 | -105.3 | -3,393.0 | 992.2 | 796.3 | 195.85 | 5.066 | |
| 10,200.0 | 6,687.7 | 10,034.6 | 6,589.0 | 101.7 | 101.2 | -84.29 | -105.3 | -3,493.0 | 992.2 | 790.8 | 201.37 | 4.927 | |
| 10,300.0 | 6,687.5 | 10,134.6 | 6,588.6 | 104.5 | 104.0 | -84.28 | -105.3 | -3,593.0 | 992.2 | 785.3 | 206.89 | 4.796 | |
| 10,400.0 | 6,687.3 | 10,234.6 | 6,588.3 | 107.2 | 106.8 | -84.27 | -105.3 | -3,693.0 | 992.2 | 779.8 | 212.42 | 4.671 | |
| 10,500.0 | 6,687.1 | 10,334.6 | 6,587.9 | 110.0 | 109.5 | -84.26 | -105.3 | -3,793.0 | 992.3 | 774.3 | 217.95 | 4.553 | |
| 10,600.0 | 6,686.9 | 10,434.6 | 6,587.6 | 112.8 | 112.3 | -84.25 | -105.3 | -3,893.0 | 992.3 | 768.8 | 223.48 | 4.440 | |
| 10,700.0 | 6,686.7 | 10,534.6 | 6,587.2 | 115.6 | 115.1 | -84.24 | -105.3 | -3,993.0 | 992.3 | 763.3 | 229.01 | 4.333 | |
| 10,800.0 | 6,686.5 | 10,634.6 | 6,586.9 | 118.3 | 117.9 | -84.23 | -105.3 | -4,093.0 | 992.3 | 757.8 | 234.54 | 4.231 | |
| 10,900.0 | 6,686.3 | 10,734.6 | 6,586.5 | 121.1 | 120.7 | -84.23 | -105.3 | -4,193.0 | 992.3 | 752.2 | 240.08 | 4.133 | |
| 11,000.0 | 6,686.2 | 10,834.6 | 6,586.2 | 123.9 | 123.1 | -84.22 | -105.3 | -4,293.0 | 992.3 | 747.1 | 245.28 | 4.046 | |
| 11,028.3 | 6,686.1 | 10,862.9 | 6,586.1 | 124.7 | 123.6 | -84.21 | -105.3 | -4,321.2 | 992.3 | 745.8 | 246.57 | 4.025 | |
| 11,079.6 | 6,686.0 | 10,881.3 | 6,586.0 | 126.1 | 124.0 | -84.21 | -105.3 | -4,339.6 | 992.9 | 744.6 | 248.32 | 3.998 | SF |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-414 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 | -180.00 | -61.9 | 0.0 | 61.9 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | -180.00 | -61.9 | 0.0 | 61.9 | 61.7 | 0.22 | 275.544 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -180.00 | -61.9 | 0.0 | 61.9 | 61.3 | 0.67 | 91.848 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | -180.00 | -61.9 | 0.0 | 61.9 | 60.8 | 1.12 | 55.109 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | -180.00 | -61.9 | 0.0 | 61.9 | 60.4 | 1.57 | 39.363 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | -180.00 | -61.9 | 0.0 | 61.9 | 59.9 | 2.02 | 30.616 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | -180.00 | -61.9 | 0.0 | 61.9 | 59.5 | 2.47 | 25.049 | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | -180.00 | -61.9 | 0.0 | 61.9 | 59.0 | 2.92 | 21.196 | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | -180.00 | -61.9 | 0.0 | 61.9 | 58.6 | 3.37 | 18.370 | CC, ES |
| 900.0 | 900.0 | 900.0 | 900.0 | 1.9 | 1.9 | 164.01 | -61.9 | 0.0 | 63.6 | 59.8 | 3.82 | 16.648 | |
| 1,000.0 | 999.8 | 999.8 | 999.8 | 2.1 | 2.1 | 165.19 | -61.9 | 0.0 | 68.7 | 64.4 | 4.27 | 16.084 | |
| 1,100.0 | 1,099.5 | 1,099.5 | 1,099.5 | 2.4 | 2.4 | 166.80 | -61.9 | 0.0 | 77.1 | 72.4 | 4.71 | 16.362 | |
| 1,200.0 | 1,198.7 | 1,198.7 | 1,198.7 | 2.6 | 2.6 | 168.55 | -61.9 | 0.0 | 89.0 | 83.9 | 5.15 | 17.272 | |
| 1,300.0 | 1,297.5 | 1,297.5 | 1,297.5 | 2.9 | 2.8 | 170.20 | -61.9 | 0.0 | 104.4 | 98.8 | 5.59 | 18.672 | |
| 1,400.0 | 1,395.6 | 1,395.6 | 1,395.6 | 3.2 | 3.0 | 171.66 | -61.9 | 0.0 | 123.2 | 117.2 | 6.03 | 20.447 | |
| 1,500.0 | 1,493.5 | 1,493.5 | 1,493.5 | 3.6 | 3.2 | 172.84 | -61.9 | 0.0 | 143.5 | 137.0 | 6.48 | 22.130 | |
| 1,600.0 | 1,591.4 | 1,596.0 | 1,596.0 | 3.9 | 3.5 | 173.46 | -60.7 | 1.1 | 162.5 | 155.5 | 6.95 | 23.384 | |
| 1,700.0 | 1,689.3 | 1,700.0 | 1,699.8 | 4.3 | 3.7 | 173.31 | -56.8 | 4.7 | 178.5 | 171.1 | 7.42 | 24.065 | |
| 1,800.0 | 1,787.2 | 1,804.4 | 1,803.8 | 4.7 | 3.9 | 172.57 | -50.0 | 10.9 | 191.5 | 183.6 | 7.90 | 24.247 | |
| 1,900.0 | 1,885.1 | 1,903.6 | 1,902.5 | 5.1 | 4.2 | 171.71 | -42.4 | 17.8 | 203.2 | 194.8 | 8.38 | 24.241 | |
| 2,000.0 | 1,983.0 | 2,002.9 | 2,001.2 | 5.5 | 4.4 | 170.94 | -34.8 | 24.8 | 214.9 | 206.1 | 8.87 | 24.221 | |
| 2,100.0 | 2,080.9 | 2,102.2 | 2,100.0 | 5.9 | 4.7 | 170.26 | -27.2 | 31.7 | 226.7 | 217.3 | 9.37 | 24.192 | |
| 2,200.0 | 2,178.8 | 2,201.4 | 2,198.7 | 6.3 | 4.9 | 169.64 | -19.7 | 38.6 | 238.5 | 228.7 | 9.88 | 24.155 | |
| 2,300.0 | 2,276.7 | 2,300.7 | 2,297.5 | 6.7 | 5.2 | 169.08 | -12.1 | 45.6 | 250.4 | 240.0 | 10.38 | 24.112 | |
| 2,400.0 | 2,374.6 | 2,400.0 | 2,396.2 | 7.1 | 5.4 | 168.57 | -4.5 | 52.5 | 262.2 | 251.3 | 10.90 | 24.066 | |
| 2,500.0 | 2,472.5 | 2,499.2 | 2,494.9 | 7.6 | 5.7 | 168.10 | 3.1 | 59.4 | 274.1 | 262.7 | 11.41 | 24.018 | |
| 2,600.0 | 2,570.4 | 2,598.5 | 2,593.7 | 8.0 | 5.9 | 167.67 | 10.7 | 66.4 | 286.0 | 274.1 | 11.93 | 23.967 | |
| 2,700.0 | 2,668.2 | 2,697.8 | 2,692.4 | 8.4 | 6.2 | 167.28 | 18.3 | 73.3 | 297.9 | 285.5 | 12.46 | 23.916 | |
| 2,800.0 | 2,766.1 | 2,797.0 | 2,791.1 | 8.8 | 6.5 | 166.92 | 25.9 | 80.2 | 309.9 | 296.9 | 12.98 | 23.865 | |
| 2,900.0 | 2,864.0 | 2,896.3 | 2,889.9 | 9.3 | 6.8 | 166.58 | 33.5 | 87.2 | 321.8 | 308.3 | 13.51 | 23.814 | |
| 3,000.0 | 2,961.9 | 2,995.6 | 2,988.6 | 9.7 | 7.0 | 166.27 | 41.1 | 94.1 | 333.8 | 319.7 | 14.05 | 23.763 | |
| 3,100.0 | 3,059.8 | 3,094.8 | 3,087.3 | 10.1 | 7.3 | 165.98 | 48.6 | 101.0 | 345.7 | 331.1 | 14.58 | 23.714 | |
| 3,200.0 | 3,157.7 | 3,194.1 | 3,186.1 | 10.5 | 7.6 | 165.71 | 56.2 | 108.0 | 357.7 | 342.6 | 15.11 | 23.665 | |
| 3,300.0 | 3,255.6 | 3,293.4 | 3,284.8 | 11.0 | 7.8 | 165.46 | 63.8 | 114.9 | 369.7 | 354.0 | 15.65 | 23.617 | |
| 3,400.0 | 3,353.5 | 3,392.6 | 3,383.5 | 11.4 | 8.1 | 165.22 | 71.4 | 121.8 | 381.6 | 365.4 | 16.19 | 23.570 | |
| 3,500.0 | 3,451.4 | 3,491.9 | 3,482.3 | 11.8 | 8.4 | 165.00 | 79.0 | 128.8 | 393.6 | 376.9 | 16.73 | 23.525 | |
| 3,600.0 | 3,549.3 | 3,591.2 | 3,581.0 | 12.3 | 8.7 | 164.79 | 86.6 | 135.7 | 405.6 | 388.3 | 17.27 | 23.481 | |
| 3,700.0 | 3,647.2 | 3,690.4 | 3,679.7 | 12.7 | 9.0 | 164.59 | 94.2 | 142.6 | 417.6 | 399.8 | 17.82 | 23.438 | |
| 3,800.0 | 3,745.1 | 3,789.7 | 3,778.5 | 13.1 | 9.2 | 164.40 | 101.8 | 149.6 | 429.6 | 411.3 | 18.36 | 23.396 | |
| 3,900.0 | 3,843.0 | 3,889.0 | 3,877.2 | 13.6 | 9.5 | 164.23 | 109.4 | 156.5 | 441.6 | 422.7 | 18.91 | 23.356 | |
| 4,000.0 | 3,940.9 | 3,988.2 | 3,975.9 | 14.0 | 9.8 | 164.06 | 116.9 | 163.4 | 453.6 | 434.2 | 19.46 | 23.317 | |
| 4,100.0 | 4,038.8 | 4,087.5 | 4,074.7 | 14.4 | 10.1 | 163.90 | 124.5 | 170.4 | 465.6 | 445.6 | 20.00 | 23.279 | |
| 4,200.0 | 4,136.6 | 4,186.8 | 4,173.4 | 14.9 | 10.4 | 163.75 | 132.1 | 177.3 | 477.7 | 457.1 | 20.55 | 23.242 | |
| 4,300.0 | 4,234.5 | 4,286.0 | 4,272.1 | 15.3 | 10.7 | 163.61 | 139.7 | 184.2 | 489.7 | 468.6 | 21.10 | 23.207 | |
| 4,400.0 | 4,332.4 | 4,385.3 | 4,370.9 | 15.7 | 10.9 | 163.47 | 147.3 | 191.2 | 501.7 | 480.1 | 21.65 | 23.172 | |
| 4,500.0 | 4,430.3 | 4,484.6 | 4,469.6 | 16.2 | 11.2 | 163.34 | 154.9 | 198.1 | 513.7 | 491.5 | 22.20 | 23.139 | |
| 4,600.0 | 4,528.2 | 4,583.8 | 4,568.3 | 16.6 | 11.5 | 163.22 | 162.5 | 205.0 | 525.8 | 503.0 | 22.75 | 23.106 | |
| 4,700.0 | 4,626.1 | 4,683.1 | 4,667.1 | 17.0 | 11.8 | 163.10 | 170.1 | 212.0 | 537.8 | 514.5 | 23.31 | 23.075 | |
| 4,800.0 | 4,724.0 | 4,782.4 | 4,765.8 | 17.5 | 12.1 | 162.99 | 177.7 | 218.9 | 549.8 | 526.0 | 23.86 | 23.045 | |
| 4,900.0 | 4,821.9 | 4,881.7 | 4,864.5 | 17.9 | 12.4 | 162.88 | 185.3 | 225.8 | 561.9 | 537.4 | 24.41 | 23.015 | |
| 5,000.0 | 4,919.8 | 4,980.9 | 4,963.3 | 18.4 | 12.7 | 162.77 | 192.8 | 232.8 | 573.9 | 548.9 | 24.97 | 22.987 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-414 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.0 | 5,017.7 | 5,080.2 | 5,062.0 | 18.8 | 12.9 | 162.67 | 200.4 | 239.7 | 585.9 | 560.4 | 25.52 | 22.959 | |
| 5,200.0 | 5,115.6 | 5,179.5 | 5,160.7 | 19.2 | 13.2 | 162.58 | 208.0 | 246.6 | 598.0 | 571.9 | 26.08 | 22.932 | |
| 5,300.0 | 5,213.5 | 5,271.1 | 5,252.0 | 19.7 | 13.5 | 162.52 | 214.7 | 252.7 | 610.4 | 583.8 | 26.59 | 22.955 | |
| 5,400.0 | 5,311.7 | 5,356.9 | 5,337.5 | 20.0 | 13.7 | 162.65 | 219.3 | 256.9 | 623.1 | 596.1 | 27.05 | 23.039 | |
| 5,500.0 | 5,410.5 | 5,442.5 | 5,423.0 | 20.3 | 13.8 | 162.85 | 221.9 | 259.3 | 634.7 | 607.3 | 27.41 | 23.157 | |
| 5,600.0 | 5,509.8 | 5,529.3 | 5,509.8 | 20.6 | 14.0 | 163.12 | 222.7 | 260.0 | 645.2 | 617.5 | 27.73 | 23.270 | |
| 5,700.0 | 5,609.4 | 5,628.9 | 5,609.4 | 20.8 | 14.1 | 163.38 | 222.7 | 260.0 | 653.2 | 625.2 | 28.05 | 23.292 | |
| 5,800.0 | 5,709.3 | 5,728.8 | 5,709.3 | 20.9 | 14.3 | 163.53 | 222.7 | 260.0 | 658.0 | 629.6 | 28.36 | 23.204 | |
| 5,900.0 | 5,809.3 | 5,828.8 | 5,809.3 | 21.1 | 14.5 | -180.00 | 222.7 | 260.0 | 659.3 | 625.0 | 34.35 | 19.194 | |
| 6,000.0 | 5,909.3 | 5,928.8 | 5,909.3 | 21.2 | 14.7 | -180.00 | 222.7 | 260.0 | 659.3 | 624.6 | 34.69 | 19.009 | |
| 6,100.0 | 6,009.1 | 6,028.8 | 6,009.1 | 21.3 | 14.9 | -90.00 | 222.7 | 254.7 | 659.3 | 630.0 | 29.34 | 22.469 | |
| 6,200.0 | 6,107.4 | 6,128.8 | 6,107.3 | 21.4 | 14.9 | -90.00 | 222.7 | 236.5 | 659.3 | 629.8 | 29.53 | 22.326 | |
| 6,300.0 | 6,202.4 | 6,228.8 | 6,202.4 | 21.4 | 15.0 | -90.00 | 222.7 | 205.7 | 659.3 | 629.7 | 29.65 | 22.235 | |
| 6,400.0 | 6,292.6 | 6,328.8 | 6,292.6 | 21.4 | 15.0 | -90.00 | 222.7 | 162.6 | 659.3 | 629.6 | 29.78 | 22.138 | |
| 6,500.0 | 6,376.4 | 6,428.8 | 6,376.4 | 21.4 | 15.0 | -90.00 | 222.7 | 108.2 | 659.3 | 629.3 | 30.03 | 21.955 | |
| 6,600.0 | 6,452.4 | 6,528.8 | 6,452.4 | 21.4 | 15.0 | -90.00 | 222.7 | 43.3 | 659.3 | 628.8 | 30.54 | 21.586 | |
| 6,700.0 | 6,519.3 | 6,628.8 | 6,519.3 | 21.4 | 15.3 | -90.00 | 222.7 | -30.9 | 659.3 | 627.9 | 31.48 | 20.943 | |
| 6,800.0 | 6,575.9 | 6,728.8 | 6,575.9 | 21.5 | 16.1 | -90.00 | 222.7 | -113.2 | 659.3 | 626.4 | 32.98 | 19.990 | |
| 6,900.0 | 6,621.3 | 6,828.7 | 6,621.2 | 21.7 | 17.2 | -90.00 | 222.7 | -202.3 | 659.3 | 624.2 | 35.13 | 18.769 | |
| 7,000.0 | 6,654.7 | 6,928.7 | 6,654.6 | 22.2 | 18.6 | -90.00 | 222.7 | -296.5 | 659.3 | 621.4 | 37.92 | 17.389 | |
| 7,100.0 | 6,675.5 | 7,028.7 | 6,675.4 | 23.1 | 20.4 | -90.00 | 222.7 | -394.2 | 659.3 | 618.1 | 41.27 | 15.978 | |
| 7,200.0 | 6,686.5 | 7,128.7 | 6,686.5 | 24.6 | 22.3 | -90.00 | 222.7 | -493.6 | 659.3 | 614.3 | 45.05 | 14.635 | |
| 7,300.0 | 6,693.0 | 7,228.7 | 6,692.9 | 26.4 | 24.4 | -90.00 | 222.7 | -593.3 | 659.3 | 610.2 | 49.17 | 13.409 | |
| 7,400.0 | 6,693.1 | 7,328.7 | 6,693.0 | 28.4 | 26.6 | -90.00 | 222.7 | -693.3 | 659.3 | 605.8 | 53.54 | 12.314 | |
| 7,500.0 | 6,692.9 | 7,428.7 | 6,692.8 | 30.5 | 28.9 | -90.00 | 222.7 | -793.3 | 659.4 | 601.2 | 58.12 | 11.345 | |
| 7,600.0 | 6,692.7 | 7,528.7 | 6,692.6 | 32.8 | 31.3 | -90.00 | 222.7 | -893.3 | 659.4 | 596.5 | 62.87 | 10.488 | |
| 7,700.0 | 6,692.5 | 7,628.7 | 6,692.4 | 35.1 | 33.8 | -90.00 | 222.7 | -993.3 | 659.4 | 591.6 | 67.75 | 9.733 | |
| 7,800.0 | 6,692.3 | 7,728.7 | 6,692.3 | 37.5 | 36.3 | -90.00 | 222.7 | -1,093.3 | 659.4 | 586.6 | 72.73 | 9.066 | |
| 7,900.0 | 6,692.1 | 7,828.7 | 6,692.1 | 40.0 | 38.8 | -90.00 | 222.7 | -1,193.3 | 659.4 | 581.6 | 77.80 | 8.475 | |
| 8,000.0 | 6,691.9 | 7,928.7 | 6,691.9 | 42.5 | 41.4 | -90.00 | 222.7 | -1,293.3 | 659.4 | 576.4 | 82.95 | 7.949 | |
| 8,100.0 | 6,691.7 | 8,028.7 | 6,691.7 | 45.0 | 44.0 | -90.00 | 222.7 | -1,393.3 | 659.4 | 571.2 | 88.15 | 7.480 | |
| 8,200.0 | 6,691.5 | 8,128.7 | 6,691.5 | 47.6 | 46.6 | -90.00 | 222.6 | -1,493.3 | 659.4 | 566.0 | 93.40 | 7.060 | |
| 8,300.0 | 6,691.3 | 8,228.7 | 6,691.3 | 50.2 | 49.3 | -90.00 | 222.6 | -1,593.3 | 659.4 | 560.7 | 98.69 | 6.681 | |
| 8,400.0 | 6,691.1 | 8,328.7 | 6,691.1 | 52.8 | 52.0 | -90.00 | 222.6 | -1,693.3 | 659.4 | 555.4 | 104.01 | 6.339 | |
| 8,500.0 | 6,691.0 | 8,428.7 | 6,690.9 | 55.5 | 54.6 | -90.00 | 222.6 | -1,793.3 | 659.4 | 550.0 | 109.37 | 6.029 | |
| 8,600.0 | 6,690.8 | 8,528.7 | 6,690.7 | 58.1 | 57.3 | -90.00 | 222.6 | -1,893.3 | 659.4 | 544.6 | 114.75 | 5.746 | |
| 8,700.0 | 6,690.6 | 8,628.7 | 6,690.5 | 60.8 | 60.0 | -90.00 | 222.6 | -1,993.3 | 659.4 | 539.2 | 120.15 | 5.488 | |
| 8,800.0 | 6,690.4 | 8,728.7 | 6,690.3 | 63.5 | 62.8 | -90.00 | 222.6 | -2,093.3 | 659.4 | 533.8 | 125.57 | 5.251 | |
| 8,900.0 | 6,690.2 | 8,828.7 | 6,690.1 | 66.2 | 65.5 | -90.00 | 222.6 | -2,193.3 | 659.4 | 528.4 | 131.01 | 5.033 | |
| 9,000.0 | 6,690.0 | 8,928.7 | 6,689.9 | 68.9 | 68.2 | -90.00 | 222.6 | -2,293.3 | 659.4 | 522.9 | 136.46 | 4.832 | |
| 9,100.0 | 6,689.8 | 9,028.7 | 6,689.8 | 71.6 | 70.9 | -90.00 | 222.6 | -2,393.3 | 659.4 | 517.5 | 141.92 | 4.646 | |
| 9,200.0 | 6,689.6 | 9,128.7 | 6,689.6 | 74.3 | 73.7 | -90.00 | 222.6 | -2,493.3 | 659.4 | 512.0 | 147.40 | 4.473 | |
| 9,300.0 | 6,689.4 | 9,228.7 | 6,689.4 | 77.0 | 76.4 | -90.00 | 222.6 | -2,593.3 | 659.4 | 506.5 | 152.89 | 4.313 | |
| 9,400.0 | 6,689.2 | 9,328.7 | 6,689.2 | 79.7 | 79.2 | -90.00 | 222.6 | -2,693.3 | 659.4 | 501.0 | 158.38 | 4.163 | |
| 9,500.0 | 6,689.0 | 9,428.7 | 6,689.0 | 82.5 | 81.9 | -90.00 | 222.6 | -2,793.3 | 659.4 | 495.5 | 163.89 | 4.023 | |
| 9,600.0 | 6,688.8 | 9,528.7 | 6,688.8 | 85.2 | 84.7 | -90.00 | 222.6 | -2,893.3 | 659.4 | 490.0 | 169.40 | 3.893 | |
| 9,700.0 | 6,688.6 | 9,628.7 | 6,688.6 | 87.9 | 87.5 | -90.00 | 222.6 | -2,993.3 | 659.4 | 484.5 | 174.92 | 3.770 | |
| 9,800.0 | 6,688.5 | 9,728.7 | 6,688.4 | 90.7 | 90.2 | -90.00 | 222.6 | -3,093.3 | 659.4 | 478.9 | 180.44 | 3.654 | |
| 9,900.0 | 6,688.3 | 9,828.7 | 6,688.2 | 93.4 | 93.0 | -90.00 | 222.6 | -3,193.3 | 659.4 | 473.4 | 185.97 | 3.546 | |
| 10,000.0 | 6,688.1 | 9,928.7 | 6,688.0 | 96.2 | 95.8 | -90.00 | 222.6 | -3,293.3 | 659.4 | 467.9 | 191.51 | 3.443 | |
| 10,100.0 | 6,687.9 | 10,028.7 | 6,687.8 | 99.0 | 98.5 | -90.00 | 222.6 | -3,393.3 | 659.4 | 462.3 | 197.05 | 3.346 | |

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|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Peterson 14WX-HZ Pad Sec.14-T5N-R64W - Peterson 14X-414 - Wellbore #1 - Plan #1 (3-07-14)

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,200.0 | 6,687.7 | 10,128.7 | 6,687.6 | 101.7 | 101.3 | -90.00 | 222.6 | -3,493.3 | 659.4 | 456.8 | 202.59 | 3.255 | |
| 10,300.0 | 6,687.5 | 10,228.7 | 6,687.5 | 104.5 | 104.1 | -90.00 | 222.6 | -3,593.3 | 659.4 | 451.3 | 208.14 | 3.168 | |
| 10,400.0 | 6,687.3 | 10,328.7 | 6,687.3 | 107.2 | 106.8 | -90.00 | 222.6 | -3,693.3 | 659.4 | 445.7 | 213.69 | 3.086 | |
| 10,500.0 | 6,687.1 | 10,428.7 | 6,687.1 | 110.0 | 109.6 | -90.00 | 222.6 | -3,793.3 | 659.4 | 440.2 | 219.25 | 3.008 | |
| 10,600.0 | 6,686.9 | 10,528.7 | 6,686.9 | 112.8 | 112.4 | -90.00 | 222.6 | -3,893.3 | 659.4 | 434.6 | 224.81 | 2.933 | |
| 10,700.0 | 6,686.7 | 10,628.7 | 6,686.7 | 115.6 | 115.2 | -90.00 | 222.6 | -3,993.3 | 659.4 | 429.0 | 230.37 | 2.862 | |
| 10,800.0 | 6,686.5 | 10,728.7 | 6,686.5 | 118.3 | 118.0 | -90.00 | 222.6 | -4,093.3 | 659.4 | 423.5 | 235.93 | 2.795 | |
| 10,900.0 | 6,686.3 | 10,828.7 | 6,686.3 | 121.1 | 120.8 | -90.00 | 222.6 | -4,193.3 | 659.4 | 417.9 | 241.50 | 2.730 | |
| 11,000.0 | 6,686.2 | 10,928.7 | 6,686.1 | 123.9 | 123.5 | -90.00 | 222.6 | -4,293.3 | 659.4 | 412.3 | 247.07 | 2.669 | |
| 11,037.2 | 6,686.1 | 10,965.9 | 6,686.0 | 124.9 | 124.6 | -90.00 | 222.6 | -4,330.5 | 659.4 | 410.3 | 249.14 | 2.647 | |
| 11,079.6 | 6,686.0 | 10,986.1 | 6,686.0 | 126.1 | 125.1 | -90.00 | 222.6 | -4,350.7 | 659.8 | 408.9 | 250.88 | 2.630 | SF |

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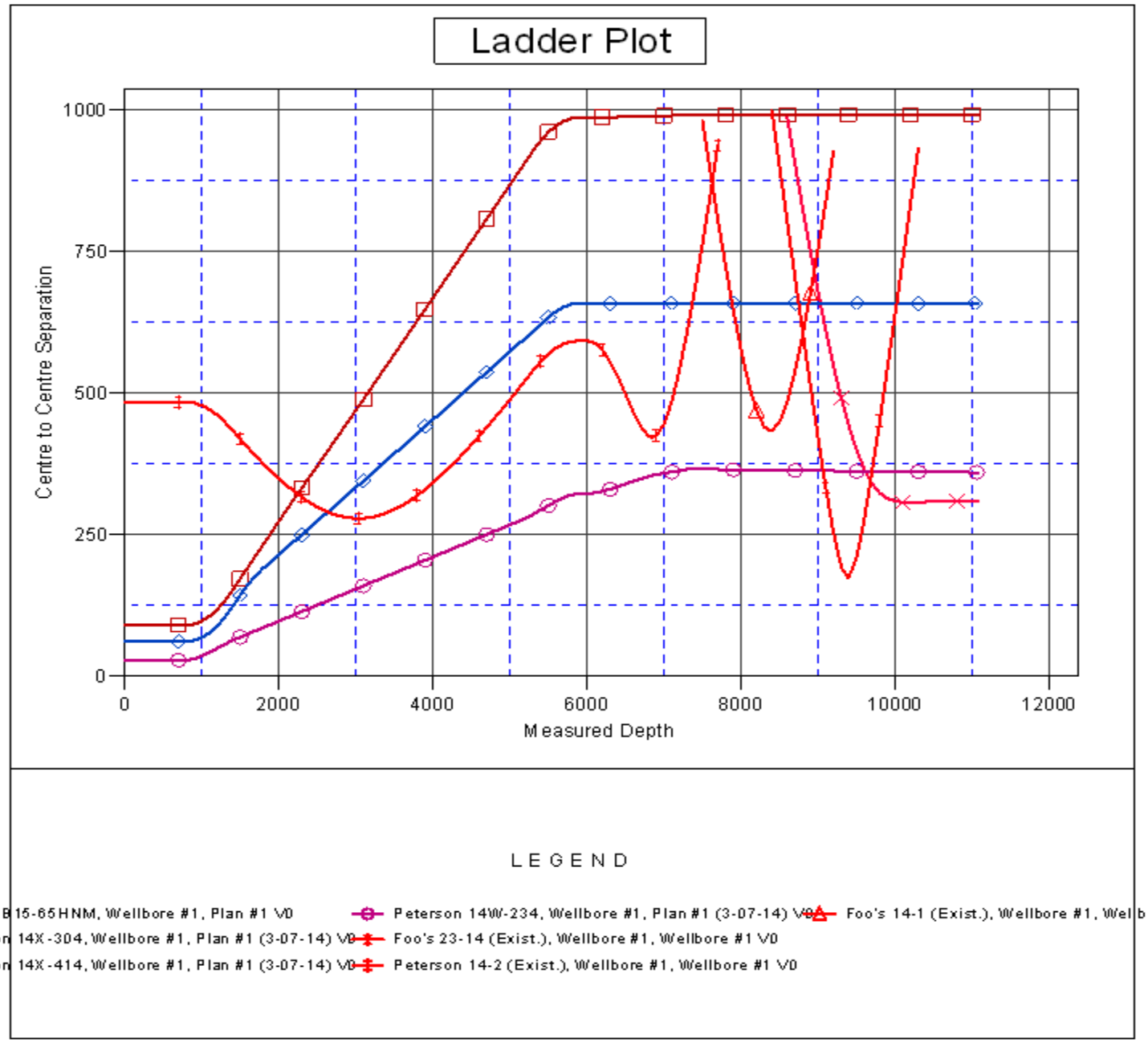
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 4586.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Peterson 14W-434
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.64°



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|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Peterson 14W-434 |
| **Project:** | SEC.14-T5N-R64W | **TVD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Reference Site:** | Peterson 14WX-HZ Pad Sec.14-T5N-R64W | **MD Reference:** | WELL @ 4586.0ft (RKB - 15') |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Peterson 14W-434 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Wellbore #1 | **Database:** | Landmark |
| **Reference Design:** | Plan #1 (3-07-14) | **Offset TVD Reference:** | Offset Datum |

| | |
|---|---|
| Reference Depths are relative to WELL @ 4586.0ft (RKB - 15') | Coordinates are relative to: Peterson 14W-434 |
| 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: 0.64° |