# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Stroh 13O-343**

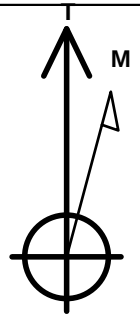
Surface Location: Stroh 13GK-HZ Pad Sec. 13-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4804.0

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Slot |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1356828.66 | 3183317.37 | 40.311030 | -104.842650 | |

Original Well Elev WELL @ 4819.0ft (Original Well Elev)

## WELLBORE TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Shape |
|---|---|---|---|---|
| SHL 2354'FSL & 1676'FWL, Sec.13 | 1.0 | 0.0 | 0.0 | Point |
| BHL 500'FSL & 2300'FWL, Sec.24 | 7131.0 | -7118.5 | 641.6 | Point |



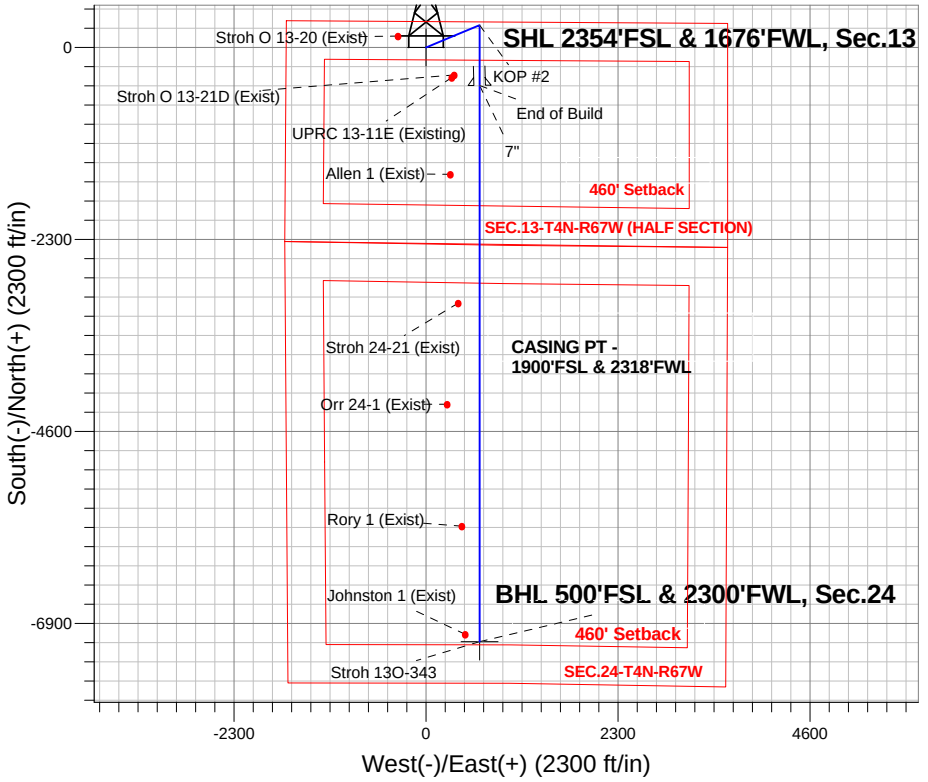

Azimuths to True North
Magnetic North: 8.53°

Magnetic Field
Strength: 52788.3snT
Dip Angle: 66.87°
Date: 3/11/2014
Model: IGRF2010

Stroh 13GK-HZ Pad Sec. 13-T4N-R67W
Stroh 13O-343
Plan #1 (3-11-14)
10:34, April 01 2014

## ANNOTATIONS

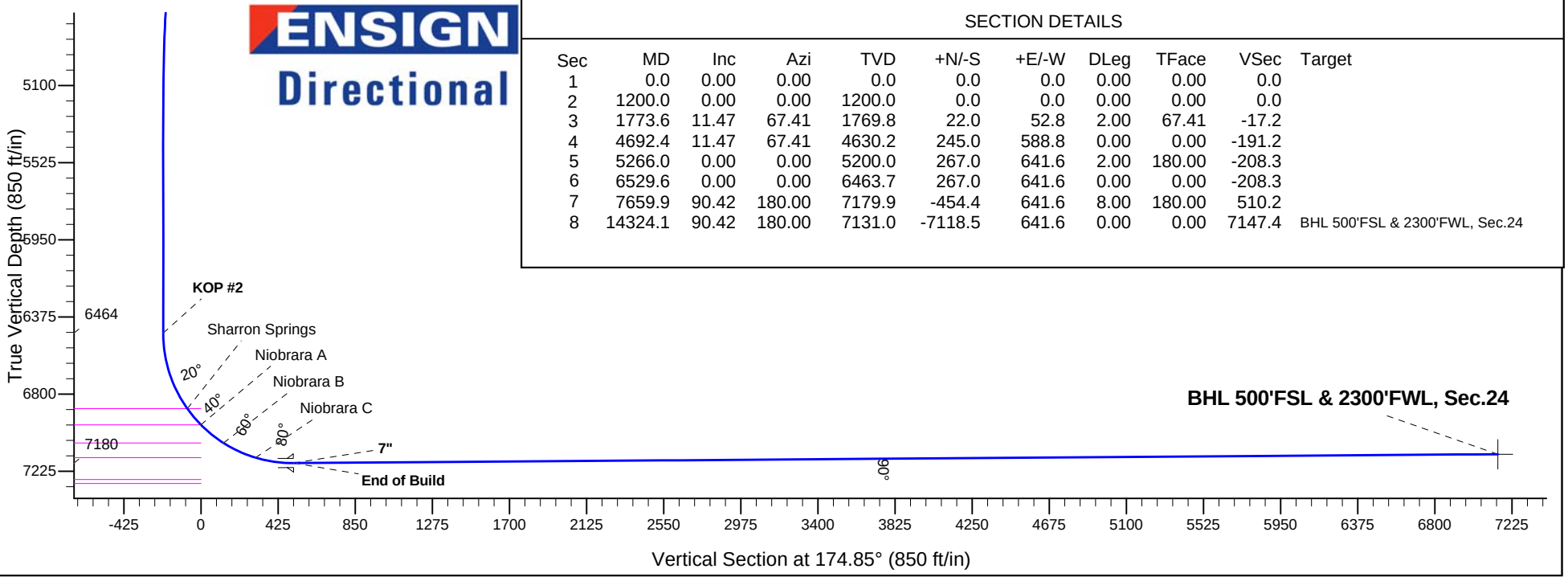
| TVD | MD | Annotation |
|---|---|---|
| 1200.0 | 1200.0 | KOP #1 |
| 6463.6 | 6529.6 | KOP #2 |
| 7179.9 | 7659.9 | End of Build |




ENSIGN Directional

## SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSec | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 2 | 1200.0 | 0.00 | 0.00 | 1200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 1773.6 | 11.47 | 67.41 | 1769.8 | 22.0 | 52.8 | 2.00 | 67.41 | -17.2 | |
| 4 | 4692.4 | 11.47 | 67.41 | 4630.2 | 245.0 | 588.8 | 0.00 | 0.00 | -191.2 | |
| 5 | 5266.0 | 0.00 | 0.00 | 5200.0 | 267.0 | 641.6 | 2.00 | 180.00 | -208.3 | |
| 6 | 6529.6 | 0.00 | 0.00 | 6463.7 | 267.0 | 641.6 | 0.00 | 0.00 | -208.3 | |
| 7 | 7659.9 | 90.42 | 180.00 | 7179.9 | -454.4 | 641.6 | 8.00 | 180.00 | 510.2 | |
| 8 | 14324.1 | 90.42 | 180.00 | 7131.0 | -7118.5 | 641.6 | 0.00 | 0.00 | 7147.4 | BHL 500'FSL & 2300'FWL, Sec.24 |



# PETROLEUM DEVELOPMENT CORP Weld County CO

**SEC.13-T4N-R67W**
**Stroh 13GK-HZ Pad Sec. 13-T4N-R67W**
**Stroh 13O-343**

**Wellbore #1**

**Plan: Plan #1 (3-11-14)**

# Standard Planning Report

**01 April, 2014**

| | | | |
|---|---|---|---|
| **Database:** | landmark | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Project:** | SEC.13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **North Reference:** | True |
| **Well:** | Stroh 13O-343 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-11-14) | | |

**Project** SEC.13-T4N-R67W, Weld County, Colorado

| | | | |
|---|---|---|---|
| **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** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,356,827.56 ft | **Latitude:** | 40.311030 |
| **From:** | Lat/Long | **Easting:** | 3,183,166.78 ft | **Longitude:** | -104.843190 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | " | **Grid Convergence:** | 0.42 ° |

**Well** Stroh 13O-343

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 ft | **Northing:** | 1,356,828.66 ft | **Latitude:** | 40.311030 |
| | **+E/-W** | 150.6 ft | **Easting:** | 3,183,317.37 ft | **Longitude:** | -104.842650 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,804.0 ft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 3/11/2014 | 8.53 | 66.87 | 52,788 |

**Design** Plan #1 (3-11-14)

**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 | 174.85 |

**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 | |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,773.6 | 11.47 | 67.41 | 1,769.8 | 22.0 | 52.8 | 2.00 | 2.00 | 0.00 | 67.41 | |
| 4,692.4 | 11.47 | 67.41 | 4,630.2 | 245.0 | 588.8 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,266.0 | 0.00 | 0.00 | 5,200.0 | 267.0 | 641.6 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,529.6 | 0.00 | 0.00 | 6,463.7 | 267.0 | 641.6 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,659.9 | 90.42 | 180.00 | 7,179.9 | -454.4 | 641.6 | 8.00 | 8.00 | 0.00 | 180.00 | |
| 14,324.1 | 90.42 | 180.00 | 7,131.0 | -7,118.5 | 641.6 | 0.00 | 0.00 | 0.00 | 0.00 | BHL 500'FSL & 23( |

| | | | |
|---|---|---|---|
| **Database:** | landmark | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Project:** | SEC.13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **North Reference:** | True |
| **Well:** | Stroh 13O-343 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-11-14) | | |

**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 2354'FSL & 1676'FWL, Sec.13** | | | | | | | | | |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 700.0 | 0.00 | 0.00 | 700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 900.0 | 0.00 | 0.00 | 900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **KOP #1** | | | | | | | | | |
| 1,300.0 | 2.00 | 67.41 | 1,300.0 | 0.7 | 1.6 | -0.5 | 2.00 | 2.00 | 0.00 |
| 1,400.0 | 4.00 | 67.41 | 1,399.8 | 2.7 | 6.4 | -2.1 | 2.00 | 2.00 | 0.00 |
| 1,500.0 | 6.00 | 67.41 | 1,499.5 | 6.0 | 14.5 | -4.7 | 2.00 | 2.00 | 0.00 |
| 1,600.0 | 8.00 | 67.41 | 1,598.7 | 10.7 | 25.7 | -8.4 | 2.00 | 2.00 | 0.00 |
| 1,700.0 | 10.00 | 67.41 | 1,697.5 | 16.7 | 40.2 | -13.0 | 2.00 | 2.00 | 0.00 |
| 1,773.6 | 11.47 | 67.41 | 1,769.8 | 22.0 | 52.8 | -17.2 | 2.00 | 2.00 | 0.00 |
| 1,800.0 | 11.47 | 67.41 | 1,795.6 | 24.0 | 57.7 | -18.7 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 11.47 | 67.41 | 1,893.6 | 31.6 | 76.0 | -24.7 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 11.47 | 67.41 | 1,991.7 | 39.3 | 94.4 | -30.7 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 11.47 | 67.41 | 2,089.7 | 46.9 | 112.8 | -36.6 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 11.47 | 67.41 | 2,187.7 | 54.6 | 131.1 | -42.6 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 11.47 | 67.41 | 2,285.7 | 62.2 | 149.5 | -48.5 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 11.47 | 67.41 | 2,383.7 | 69.9 | 167.9 | -54.5 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 11.47 | 67.41 | 2,481.7 | 77.5 | 186.2 | -60.5 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 11.47 | 67.41 | 2,579.7 | 85.1 | 204.6 | -66.4 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 11.47 | 67.41 | 2,677.7 | 92.8 | 222.9 | -72.4 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 11.47 | 67.41 | 2,775.7 | 100.4 | 241.3 | -78.3 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 11.47 | 67.41 | 2,873.7 | 108.1 | 259.7 | -84.3 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 11.47 | 67.41 | 2,971.7 | 115.7 | 278.0 | -90.3 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 11.47 | 67.41 | 3,069.7 | 123.3 | 296.4 | -96.2 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 11.47 | 67.41 | 3,167.7 | 131.0 | 314.8 | -102.2 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 11.47 | 67.41 | 3,265.7 | 138.6 | 333.1 | -108.2 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 11.47 | 67.41 | 3,363.7 | 146.3 | 351.5 | -114.1 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 11.47 | 67.41 | 3,461.7 | 153.9 | 369.8 | -120.1 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 11.47 | 67.41 | 3,559.7 | 161.5 | 388.2 | -126.0 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 11.47 | 67.41 | 3,657.7 | 169.2 | 406.6 | -132.0 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 11.47 | 67.41 | 3,755.7 | 176.8 | 424.9 | -138.0 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 11.47 | 67.41 | 3,853.7 | 184.5 | 443.3 | -143.9 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 11.47 | 67.41 | 3,951.7 | 192.1 | 461.7 | -149.9 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 11.47 | 67.41 | 4,049.7 | 199.7 | 480.0 | -155.9 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 11.47 | 67.41 | 4,147.7 | 207.4 | 498.4 | -161.8 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 11.47 | 67.41 | 4,245.7 | 215.0 | 516.7 | -167.8 | 0.00 | 0.00 | 0.00 |
| 4,400.0 | 11.47 | 67.41 | 4,343.7 | 222.7 | 535.1 | -173.7 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 11.47 | 67.41 | 4,441.7 | 230.3 | 553.5 | -179.7 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 11.47 | 67.41 | 4,539.7 | 238.0 | 571.8 | -185.7 | 0.00 | 0.00 | 0.00 |
| 4,692.4 | 11.47 | 67.41 | 4,630.2 | 245.0 | 588.8 | -191.2 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 11.32 | 67.41 | 4,637.7 | 245.6 | 590.2 | -191.6 | 2.00 | -2.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | landmark | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Project:** | SEC.13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **North Reference:** | True |
| **Well:** | Stroh 13O-343 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-11-14) | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 4,800.0 | 9.32 | 67.41 | 4,736.1 | 252.5 | 606.7 | -197.0 | 2.00 | -2.00 | 0.00 |
| 4,900.0 | 7.32 | 67.41 | 4,835.0 | 258.0 | 620.1 | -201.3 | 2.00 | -2.00 | 0.00 |
| 5,000.0 | 5.32 | 67.41 | 4,934.4 | 262.3 | 630.2 | -204.6 | 2.00 | -2.00 | 0.00 |
| 5,100.0 | 3.32 | 67.41 | 5,034.1 | 265.2 | 637.2 | -206.9 | 2.00 | -2.00 | 0.00 |
| 5,200.0 | 1.32 | 67.41 | 5,134.0 | 266.7 | 640.9 | -208.1 | 2.00 | -2.00 | 0.00 |
| 5,266.0 | 0.00 | 0.00 | 5,200.0 | 267.0 | 641.6 | -208.3 | 2.00 | -2.00 | 0.00 |
| 5,300.0 | 0.00 | 0.00 | 5,234.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 0.00 | 0.00 | 5,334.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 0.00 | 0.00 | 5,434.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,600.0 | 0.00 | 0.00 | 5,534.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,700.0 | 0.00 | 0.00 | 5,634.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,800.0 | 0.00 | 0.00 | 5,734.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 5,900.0 | 0.00 | 0.00 | 5,834.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 5,934.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,100.0 | 0.00 | 0.00 | 6,034.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,200.0 | 0.00 | 0.00 | 6,134.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,300.0 | 0.00 | 0.00 | 6,234.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,400.0 | 0.00 | 0.00 | 6,334.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,500.0 | 0.00 | 0.00 | 6,434.0 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| 6,529.6 | 0.00 | 0.00 | 6,463.6 | 267.0 | 641.6 | -208.3 | 0.00 | 0.00 | 0.00 |
| **KOP #2** | | | | | | | | | |
| 6,600.0 | 5.63 | 180.00 | 6,533.9 | 263.5 | 641.6 | -204.9 | 8.00 | 8.00 | 0.00 |
| 6,700.0 | 13.63 | 180.00 | 6,632.4 | 246.8 | 641.6 | -188.2 | 8.00 | 8.00 | 0.00 |
| 6,800.0 | 21.63 | 180.00 | 6,727.7 | 216.6 | 641.6 | -158.1 | 8.00 | 8.00 | 0.00 |
| 6,900.0 | 29.63 | 180.00 | 6,817.8 | 173.4 | 641.6 | -115.1 | 8.00 | 8.00 | 0.00 |
| 6,973.9 | 35.54 | 180.00 | 6,880.0 | 133.6 | 641.6 | -75.4 | 8.00 | 8.00 | 0.00 |
| **Sharron Springs** | | | | | | | | | |
| 7,000.0 | 37.63 | 180.00 | 6,900.9 | 118.0 | 641.6 | -59.9 | 8.00 | 8.00 | 0.00 |
| 7,090.6 | 44.88 | 180.00 | 6,969.0 | 58.3 | 641.6 | -0.5 | 8.00 | 8.00 | 0.00 |
| **Niobrara A** | | | | | | | | | |
| 7,100.0 | 45.63 | 180.00 | 6,975.6 | 51.6 | 641.6 | 6.2 | 8.00 | 8.00 | 0.00 |
| 7,200.0 | 53.63 | 180.00 | 7,040.4 | -24.5 | 641.6 | 82.0 | 8.00 | 8.00 | 0.00 |
| 7,250.8 | 57.69 | 180.00 | 7,069.0 | -66.4 | 641.6 | 123.8 | 8.00 | 8.00 | 0.00 |
| **Niobrara B** | | | | | | | | | |
| 7,300.0 | 61.63 | 180.00 | 7,093.8 | -108.9 | 641.6 | 166.0 | 8.00 | 8.00 | 0.00 |
| 7,400.0 | 69.63 | 180.00 | 7,135.1 | -199.9 | 641.6 | 256.7 | 8.00 | 8.00 | 0.00 |
| 7,447.1 | 73.39 | 180.00 | 7,150.0 | -244.5 | 641.6 | 301.1 | 8.00 | 8.00 | 0.00 |
| **Niobrara C** | | | | | | | | | |
| 7,500.0 | 77.63 | 180.00 | 7,163.2 | -295.8 | 641.6 | 352.2 | 8.00 | 8.00 | 0.00 |
| 7,600.0 | 85.63 | 180.00 | 7,177.8 | -394.6 | 641.6 | 450.6 | 8.00 | 8.00 | 0.00 |
| 7,659.9 | 90.42 | 180.00 | 7,179.9 | -454.5 | 641.6 | 510.2 | 8.00 | 8.00 | 0.00 |
| **End of Build - 7"** | | | | | | | | | |
| 7,700.0 | 90.42 | 180.00 | 7,179.6 | -494.6 | 641.6 | 550.2 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 90.42 | 180.00 | 7,178.8 | -594.6 | 641.6 | 649.8 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 90.42 | 180.00 | 7,178.1 | -694.6 | 641.6 | 749.4 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.42 | 180.00 | 7,177.4 | -794.6 | 641.6 | 848.9 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.42 | 180.00 | 7,176.6 | -894.6 | 641.6 | 948.5 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.42 | 180.00 | 7,175.9 | -994.6 | 641.6 | 1,048.1 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.42 | 180.00 | 7,175.2 | -1,094.5 | 641.6 | 1,147.7 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 90.42 | 180.00 | 7,174.4 | -1,194.5 | 641.6 | 1,247.3 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.42 | 180.00 | 7,173.7 | -1,294.5 | 641.6 | 1,346.9 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 90.42 | 180.00 | 7,173.0 | -1,394.5 | 641.6 | 1,446.5 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | landmark | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Project:** | SEC.13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **North Reference:** | True |
| **Well:** | Stroh 13O-343 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-11-14) | | |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 8,700.0 | 90.42 | 180.00 | 7,172.2 | -1,494.5 | 641.6 | 1,546.1 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.42 | 180.00 | 7,171.5 | -1,594.5 | 641.6 | 1,645.7 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.42 | 180.00 | 7,170.8 | -1,694.5 | 641.6 | 1,745.3 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.42 | 180.00 | 7,170.0 | -1,794.5 | 641.6 | 1,844.9 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.42 | 180.00 | 7,169.3 | -1,894.5 | 641.6 | 1,944.5 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.42 | 180.00 | 7,168.6 | -1,994.5 | 641.6 | 2,044.1 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.42 | 180.00 | 7,167.8 | -2,094.5 | 641.6 | 2,143.7 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.42 | 180.00 | 7,167.1 | -2,194.5 | 641.6 | 2,243.3 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.42 | 180.00 | 7,166.4 | -2,294.5 | 641.6 | 2,342.9 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.42 | 180.00 | 7,165.6 | -2,394.5 | 641.6 | 2,442.4 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.42 | 180.00 | 7,164.9 | -2,494.5 | 641.6 | 2,542.0 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.42 | 180.00 | 7,164.2 | -2,594.5 | 641.6 | 2,641.6 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.42 | 180.00 | 7,163.4 | -2,694.5 | 641.6 | 2,741.2 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.42 | 180.00 | 7,162.7 | -2,794.5 | 641.6 | 2,840.8 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.42 | 180.00 | 7,162.0 | -2,894.5 | 641.6 | 2,940.4 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.42 | 180.00 | 7,161.2 | -2,994.5 | 641.6 | 3,040.0 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.42 | 180.00 | 7,160.5 | -3,094.5 | 641.6 | 3,139.6 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.42 | 180.00 | 7,159.8 | -3,194.5 | 641.6 | 3,239.2 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.42 | 180.00 | 7,159.0 | -3,294.5 | 641.6 | 3,338.8 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.42 | 180.00 | 7,158.3 | -3,394.5 | 641.6 | 3,438.4 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.42 | 180.00 | 7,157.6 | -3,494.5 | 641.6 | 3,538.0 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.42 | 180.00 | 7,156.8 | -3,594.5 | 641.6 | 3,637.6 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.42 | 180.00 | 7,156.1 | -3,694.5 | 641.6 | 3,737.2 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.42 | 180.00 | 7,155.4 | -3,794.5 | 641.6 | 3,836.8 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 90.42 | 180.00 | 7,154.6 | -3,894.5 | 641.6 | 3,936.3 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 90.42 | 180.00 | 7,153.9 | -3,994.5 | 641.6 | 4,035.9 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 90.42 | 180.00 | 7,153.2 | -4,094.5 | 641.6 | 4,135.5 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 90.42 | 180.00 | 7,152.4 | -4,194.5 | 641.6 | 4,235.1 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 90.42 | 180.00 | 7,151.7 | -4,294.5 | 641.6 | 4,334.7 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 90.42 | 180.00 | 7,151.0 | -4,394.5 | 641.6 | 4,434.3 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 90.42 | 180.00 | 7,150.2 | -4,494.5 | 641.6 | 4,533.9 | 0.00 | 0.00 | 0.00 |
| 11,800.0 | 90.42 | 180.00 | 7,149.5 | -4,594.5 | 641.6 | 4,633.5 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 90.42 | 180.00 | 7,148.8 | -4,694.5 | 641.6 | 4,733.1 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 90.42 | 180.00 | 7,148.0 | -4,794.4 | 641.6 | 4,832.7 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 90.42 | 180.00 | 7,147.3 | -4,894.4 | 641.6 | 4,932.3 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 90.42 | 180.00 | 7,146.6 | -4,994.4 | 641.6 | 5,031.9 | 0.00 | 0.00 | 0.00 |
| 12,300.0 | 90.42 | 180.00 | 7,145.8 | -5,094.4 | 641.6 | 5,131.5 | 0.00 | 0.00 | 0.00 |
| 12,400.0 | 90.42 | 180.00 | 7,145.1 | -5,194.4 | 641.6 | 5,231.1 | 0.00 | 0.00 | 0.00 |
| 12,500.0 | 90.42 | 180.00 | 7,144.4 | -5,294.4 | 641.6 | 5,330.7 | 0.00 | 0.00 | 0.00 |
| 12,600.0 | 90.42 | 180.00 | 7,143.6 | -5,394.4 | 641.6 | 5,430.3 | 0.00 | 0.00 | 0.00 |
| 12,700.0 | 90.42 | 180.00 | 7,142.9 | -5,494.4 | 641.6 | 5,529.8 | 0.00 | 0.00 | 0.00 |
| 12,800.0 | 90.42 | 180.00 | 7,142.2 | -5,594.4 | 641.6 | 5,629.4 | 0.00 | 0.00 | 0.00 |
| 12,900.0 | 90.42 | 180.00 | 7,141.4 | -5,694.4 | 641.6 | 5,729.0 | 0.00 | 0.00 | 0.00 |
| 13,000.0 | 90.42 | 180.00 | 7,140.7 | -5,794.4 | 641.6 | 5,828.6 | 0.00 | 0.00 | 0.00 |
| 13,100.0 | 90.42 | 180.00 | 7,140.0 | -5,894.4 | 641.6 | 5,928.2 | 0.00 | 0.00 | 0.00 |
| 13,200.0 | 90.42 | 180.00 | 7,139.2 | -5,994.4 | 641.6 | 6,027.8 | 0.00 | 0.00 | 0.00 |
| 13,300.0 | 90.42 | 180.00 | 7,138.5 | -6,094.4 | 641.6 | 6,127.4 | 0.00 | 0.00 | 0.00 |
| 13,400.0 | 90.42 | 180.00 | 7,137.8 | -6,194.4 | 641.6 | 6,227.0 | 0.00 | 0.00 | 0.00 |
| 13,500.0 | 90.42 | 180.00 | 7,137.0 | -6,294.4 | 641.6 | 6,326.6 | 0.00 | 0.00 | 0.00 |
| 13,600.0 | 90.42 | 180.00 | 7,136.3 | -6,394.4 | 641.6 | 6,426.2 | 0.00 | 0.00 | 0.00 |
| 13,700.0 | 90.42 | 180.00 | 7,135.6 | -6,494.4 | 641.6 | 6,525.8 | 0.00 | 0.00 | 0.00 |
| 13,800.0 | 90.42 | 180.00 | 7,134.8 | -6,594.4 | 641.6 | 6,625.4 | 0.00 | 0.00 | 0.00 |
| 13,900.0 | 90.42 | 180.00 | 7,134.1 | -6,694.4 | 641.6 | 6,725.0 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | landmark | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Project:** | SEC.13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **North Reference:** | True |
| **Well:** | Stroh 13O-343 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Wellbore #1 | | |
| **Design:** | Plan #1 (3-11-14) | | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|
| 14,000.0 | 90.42 | 180.00 | 7,133.4 | -6,794.4 | 641.6 | 6,824.6 | 0.00 | 0.00 | 0.00 |
| 14,100.0 | 90.42 | 180.00 | 7,132.6 | -6,894.4 | 641.6 | 6,924.2 | 0.00 | 0.00 | 0.00 |
| 14,200.0 | 90.42 | 180.00 | 7,131.9 | -6,994.4 | 641.6 | 7,023.7 | 0.00 | 0.00 | 0.00 |
| 14,300.0 | 90.42 | 180.00 | 7,131.2 | -7,094.4 | 641.6 | 7,123.3 | 0.00 | 0.00 | 0.00 |
| 14,324.1 | 90.42 | 180.00 | 7,131.0 | -7,118.5 | 641.6 | 7,147.4 | 0.00 | 0.00 | 0.00 |
| **BHL 500'FSL & 2300'FWL, Sec.24** | | | | | | | | | |

## Casing Points

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---|---|---|---|---|
| 7,659.9 | 7,179.9 | 7" | 7 | 7-1/2 |

## Formations

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 6,973.9 | 6,880.0 | Sharron Springs | | 0.00 | |
| 7,090.6 | 6,969.0 | Niobrara A | | 0.00 | |
| 7,250.8 | 7,069.0 | Niobrara B | | 0.00 | |
| 7,447.1 | 7,150.0 | Niobrara C | | 0.00 | |
| | 7,270.0 | Ft Hays | | 0.00 | |
| | 7,292.0 | Codell | | 0.00 | |

## Plan Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 1,200.0 | 1,200.0 | 0.0 | 0.0 | KOP #1 |
| 6,529.6 | 6,463.6 | 267.0 | 641.6 | KOP #2 |
| 7,659.9 | 7,179.9 | -454.5 | 641.6 | End of Build |

ENSIGN Directional

# PETROLEUM DEVELOPMENT CORP Weld County CO

**SEC.13-T4N-R67W**
**Stroh 13GK-HZ Pad Sec. 13-T4N-R67W**
**Stroh 13O-343**

**Wellbore #1**
**Plan #1 (3-11-14)**

# Anticollision Report

**01 April, 2014**

PDC ENERGY
Growing E&P Value

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Reference** Plan #1 (3-11-14)

| | | | |
|---|---|---|---|
| **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** 4/1/2014

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 14,324.1 | Plan #1 (3-11-14) (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 |
|---|---|---|---|---|---|---|
| Existing Wells - Sec.13-T4N-R67W | | | | | | |
| Allen 1 (Exist) - Wellbore #1 - Wellbore #1 | 8,724.6 | 7,158.0 | 351.6 | 174.6 | 1.986 | CC, ES, SF |
| Johnston 1 (Exist) - Wellbore #1 - Wellbore #1 | 14,236.7 | 7,041.6 | 173.0 | -104.5 | 0.623 | Level 1, CC, ES, SF |
| Orr 24-1 (Exist) - Wellbore #1 - Wellbore #1 | 11,478.8 | 7,059.9 | 390.6 | 165.1 | 1.733 | CC, ES |
| Orr 24-1 (Exist) - Wellbore #1 - Wellbore #1 | 11,500.0 | 7,059.7 | 391.2 | 165.3 | 1.732 | SF |
| Rory 1 (Exist) - Wellbore #1 - Wellbore #1 | 12,939.7 | 7,050.1 | 212.0 | -40.9 | 0.838 | Level 1, CC, ES, SF |
| Stroh 24-21 (Exist) - Wellbore #1 - Wellbore #1 | 10,269.3 | 7,090.7 | 256.7 | 53.3 | 1.262 | Level 3, CC, ES, SF |
| Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1 | 1,200.0 | 1,190.0 | 361.8 | 335.4 | 13.713 | CC |
| Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1 | 1,300.0 | 1,290.0 | 363.1 | 334.5 | 12.698 | ES |
| Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1 | 7,100.0 | 6,965.6 | 980.9 | 826.0 | 6.333 | SF |
| Stroh O 13-21D (Exist) - Wellbore #1 - Wellbore #1 | 7,532.7 | 7,158.5 | 304.2 | 143.6 | 1.894 | CC, ES, SF |
| UPRC 13-11E (Existing) - Wellbore #1 - Wellbore #1 | 7,565.9 | 7,163.4 | 334.8 | 173.9 | 2.080 | CC, ES, SF |
| Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | | | | | | |
| Stroh 13G-323 - Wellbore #1 - Plan #1 (3-11-14) | 366.3 | 367.3 | 119.9 | 118.5 | 84.200 | CC |
| Stroh 13G-323 - Wellbore #1 - Plan #1 (3-11-14) | 400.0 | 400.0 | 119.9 | 118.4 | 76.223 | ES |
| Stroh 13G-323 - Wellbore #1 - Plan #1 (3-11-14) | 1,200.0 | 1,159.3 | 223.0 | 217.4 | 39.711 | SF |
| Stroh 13G-403 - Wellbore #1 - Plan #1 (3-11-14) | 166.0 | 168.0 | 150.6 | 150.1 | 286.370 | CC |
| Stroh 13G-403 - Wellbore #1 - Plan #1 (3-11-14) | 200.0 | 200.0 | 150.6 | 149.9 | 223.363 | ES |
| Stroh 13G-403 - Wellbore #1 - Plan #1 (3-11-14) | 1,200.0 | 1,136.6 | 307.0 | 300.8 | 49.447 | SF |
| Stroh 13K-203 - Wellbore #1 - Plan #1 (3-11-14) | 1,200.0 | 1,201.0 | 61.4 | 56.2 | 11.863 | CC, ES |
| Stroh 13K-203 - Wellbore #1 - Plan #1 (3-11-14) | 14,324.1 | 14,171.3 | 871.9 | 595.9 | 3.159 | SF |
| Stroh 13K-423 - Wellbore #1 - Plan #1 (3-11-14) | 1,200.0 | 1,201.0 | 30.7 | 25.5 | 5.932 | CC, ES |
| Stroh 13K-423 - Wellbore #1 - Plan #1 (3-11-14) | 14,324.1 | 14,350.5 | 560.0 | 290.6 | 2.079 | SF |
| Stroh 13K-443 - Wellbore #1 - Plan #1 (3-11-14) | 1,200.0 | 1,201.0 | 89.2 | 84.1 | 17.256 | CC, ES |
| Stroh 13K-443 - Wellbore #1 - Plan #1 (3-11-14) | 1,400.0 | 1,400.0 | 95.7 | 89.7 | 15.857 | SF |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Allen 1 (Exist) - Wellbore #1 - Wellbore #1

**Survey Program:** 7436-UNKNOWN

**Offset Site Error:** 0.0 ft

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7,800.0 | 7,178.8 | 7,164.8 | 7,164.8 | 22.3 | 143.3 | 91.10 | -1,519.2 | 290.1 | 989.2 | 825.8 | 163.34 | 6.056 | |
| 7,900.0 | 7,178.1 | 7,164.1 | 7,164.1 | 23.4 | 143.3 | 90.99 | -1,519.2 | 290.1 | 896.4 | 731.9 | 164.55 | 5.448 | |
| 8,000.0 | 7,177.4 | 7,163.4 | 7,163.4 | 24.6 | 143.3 | 90.87 | -1,519.2 | 290.1 | 805.4 | 639.5 | 165.84 | 4.856 | |

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 Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Allen 1 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7436-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,100.0 | 7,176.6 | 7,162.6 | 7,162.6 | 25.8 | 143.3 | 90.75 | -1,519.2 | 290.1 | 716.7 | 549.5 | 167.22 | 4.286 | |
| 8,200.0 | 7,175.9 | 7,161.9 | 7,161.9 | 27.2 | 143.2 | 90.63 | -1,519.2 | 290.1 | 631.5 | 462.8 | 168.67 | 3.744 | |
| 8,300.0 | 7,175.2 | 7,161.2 | 7,161.2 | 28.6 | 143.2 | 90.51 | -1,519.2 | 290.1 | 551.3 | 381.1 | 170.17 | 3.239 | |
| 8,400.0 | 7,174.4 | 7,160.4 | 7,160.4 | 30.1 | 143.2 | 90.39 | -1,519.2 | 290.1 | 478.5 | 306.8 | 171.72 | 2.786 | |
| 8,500.0 | 7,173.7 | 7,159.7 | 7,159.7 | 31.6 | 143.2 | 90.27 | -1,519.2 | 290.1 | 417.2 | 243.9 | 173.32 | 2.407 | |
| 8,600.0 | 7,173.0 | 7,159.0 | 7,159.0 | 33.2 | 143.2 | 90.15 | -1,519.2 | 290.1 | 373.0 | 198.1 | 174.94 | 2.132 | |
| 8,700.0 | 7,172.2 | 7,158.2 | 7,158.2 | 34.8 | 143.2 | 90.03 | -1,519.2 | 290.1 | 352.4 | 175.8 | 176.59 | 1.996 | |
| 8,724.6 | 7,172.0 | 7,158.0 | 7,158.0 | 35.2 | 143.2 | 90.00 | -1,519.2 | 290.1 | 351.6 | 174.6 | 177.01 | 1.986 | CC, ES, SF |
| 8,800.0 | 7,171.5 | 7,157.5 | 7,157.5 | 36.5 | 143.1 | 89.91 | -1,519.2 | 290.1 | 359.6 | 181.3 | 178.27 | 2.017 | |
| 8,900.0 | 7,170.8 | 7,156.8 | 7,156.8 | 38.1 | 143.1 | 89.79 | -1,519.2 | 290.1 | 392.9 | 212.9 | 179.97 | 2.183 | |
| 9,000.0 | 7,170.0 | 7,156.0 | 7,156.0 | 39.8 | 143.1 | 89.67 | -1,519.2 | 290.1 | 446.6 | 264.9 | 181.69 | 2.458 | |
| 9,100.0 | 7,169.3 | 7,155.3 | 7,155.3 | 41.5 | 143.1 | 89.55 | -1,519.2 | 290.1 | 514.3 | 330.9 | 183.42 | 2.804 | |
| 9,200.0 | 7,168.6 | 7,154.6 | 7,154.6 | 43.2 | 143.1 | 89.43 | -1,519.2 | 290.1 | 591.2 | 406.1 | 185.17 | 3.193 | |
| 9,300.0 | 7,167.8 | 7,153.8 | 7,153.8 | 45.0 | 143.1 | 89.31 | -1,519.2 | 290.1 | 674.3 | 487.3 | 186.93 | 3.607 | |
| 9,400.0 | 7,167.1 | 7,153.1 | 7,153.1 | 46.7 | 143.1 | 89.19 | -1,519.2 | 290.1 | 761.4 | 572.7 | 188.70 | 4.035 | |
| 9,500.0 | 7,166.4 | 7,152.4 | 7,152.4 | 48.5 | 143.0 | 89.07 | -1,519.2 | 290.1 | 851.3 | 660.9 | 190.48 | 4.470 | |
| 9,600.0 | 7,165.6 | 7,151.6 | 7,151.6 | 50.3 | 143.0 | 88.95 | -1,519.2 | 290.1 | 943.3 | 751.1 | 192.26 | 4.906 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Johnston 1 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7366-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13,300.0 | 7,138.5 | 7,048.5 | 7,048.5 | 119.2 | 141.0 | 92.27 | -7,031.1 | 468.7 | 952.5 | 692.9 | 259.62 | 3.669 | |
| 13,400.0 | 7,137.8 | 7,047.8 | 7,047.8 | 121.1 | 141.0 | 92.03 | -7,031.1 | 468.7 | 854.4 | 592.8 | 261.54 | 3.267 | |
| 13,500.0 | 7,137.0 | 7,047.0 | 7,047.0 | 123.0 | 140.9 | 91.79 | -7,031.1 | 468.7 | 756.7 | 493.3 | 263.45 | 2.872 | |
| 13,600.0 | 7,136.3 | 7,046.3 | 7,046.3 | 124.9 | 140.9 | 91.55 | -7,031.1 | 468.7 | 659.8 | 394.4 | 265.36 | 2.486 | |
| 13,700.0 | 7,135.6 | 7,045.6 | 7,045.6 | 126.8 | 140.9 | 91.30 | -7,031.1 | 468.7 | 563.9 | 296.6 | 267.27 | 2.110 | |
| 13,800.0 | 7,134.8 | 7,044.8 | 7,044.8 | 128.7 | 140.9 | 91.06 | -7,031.1 | 468.7 | 469.7 | 200.5 | 269.17 | 1.745 | |
| 13,900.0 | 7,134.1 | 7,044.1 | 7,044.1 | 130.6 | 140.9 | 90.82 | -7,031.1 | 468.7 | 378.5 | 107.5 | 271.07 | 1.396 | Level 3 |
| 14,000.0 | 7,133.4 | 7,043.4 | 7,043.4 | 132.5 | 140.9 | 90.57 | -7,031.1 | 468.7 | 293.2 | 20.2 | 272.96 | 1.074 | Level 2 |
| 14,100.0 | 7,132.6 | 7,042.6 | 7,042.6 | 134.4 | 140.9 | 90.33 | -7,031.1 | 468.7 | 220.5 | -54.4 | 274.85 | 0.802 | Level 1 |
| 14,200.0 | 7,131.9 | 7,041.9 | 7,041.9 | 136.3 | 140.8 | 90.09 | -7,031.1 | 468.7 | 176.8 | -99.9 | 276.74 | 0.639 | Level 1 |
| 14,236.7 | 7,131.6 | 7,041.6 | 7,041.6 | 137.0 | 140.8 | 90.00 | -7,031.1 | 468.7 | 173.0 | -104.5 | 277.43 | 0.623 | Level 1, CC, ES, SF |
| 14,300.0 | 7,131.2 | 7,041.2 | 7,041.2 | 138.2 | 140.8 | 89.85 | -7,031.1 | 468.7 | 184.2 | -94.4 | 278.62 | 0.661 | Level 1 |
| 14,324.1 | 7,131.0 | 7,041.0 | 7,041.0 | 138.6 | 140.8 | 89.79 | -7,031.1 | 468.7 | 193.8 | -85.3 | 279.08 | 0.694 | Level 1 |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Orr 24-1 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7351-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,600.0 | 7,158.3 | 7,066.3 | 7,066.3 | 68.5 | 141.3 | 90.94 | -4,273.3 | 251.0 | 961.7 | 752.6 | 209.09 | 4.600 | |
| 10,700.0 | 7,157.6 | 7,065.6 | 7,065.6 | 70.3 | 141.3 | 90.84 | -4,273.3 | 251.0 | 871.3 | 660.3 | 210.94 | 4.130 | |
| 10,800.0 | 7,156.8 | 7,064.8 | 7,064.8 | 72.2 | 141.3 | 90.73 | -4,273.3 | 251.0 | 783.2 | 570.4 | 212.80 | 3.680 | |
| 10,900.0 | 7,156.1 | 7,064.1 | 7,064.1 | 74.0 | 141.3 | 90.62 | -4,273.3 | 251.0 | 698.3 | 483.6 | 214.66 | 3.253 | |
| 11,000.0 | 7,155.4 | 7,063.4 | 7,063.4 | 75.9 | 141.3 | 90.51 | -4,273.3 | 251.0 | 617.9 | 401.4 | 216.52 | 2.854 | |
| 11,100.0 | 7,154.6 | 7,062.6 | 7,062.6 | 77.8 | 141.3 | 90.41 | -4,273.3 | 251.0 | 544.1 | 325.7 | 218.38 | 2.492 | |
| 11,200.0 | 7,153.9 | 7,061.9 | 7,061.9 | 79.6 | 141.2 | 90.30 | -4,273.3 | 251.0 | 479.9 | 259.7 | 220.24 | 2.179 | |
| 11,300.0 | 7,153.2 | 7,061.2 | 7,061.2 | 81.5 | 141.2 | 90.19 | -4,273.3 | 251.0 | 429.6 | 207.5 | 222.10 | 1.934 | |
| 11,400.0 | 7,152.4 | 7,060.4 | 7,060.4 | 83.4 | 141.2 | 90.08 | -4,273.3 | 251.0 | 398.5 | 174.5 | 223.97 | 1.779 | |
| 11,478.8 | 7,151.9 | 7,059.9 | 7,059.9 | 84.8 | 141.2 | 90.00 | -4,273.3 | 251.0 | 390.6 | 165.1 | 225.44 | 1.733 | CC, ES |
| 11,500.0 | 7,151.7 | 7,059.7 | 7,059.7 | 85.2 | 141.2 | 89.98 | -4,273.3 | 251.0 | 391.2 | 165.3 | 225.84 | 1.732 | SF |
| 11,600.0 | 7,151.0 | 7,059.0 | 7,059.0 | 87.1 | 141.2 | 89.87 | -4,273.3 | 251.0 | 408.9 | 181.2 | 227.70 | 1.796 | |
| 11,700.0 | 7,150.2 | 7,058.2 | 7,058.2 | 89.0 | 141.2 | 89.76 | -4,273.3 | 251.0 | 448.8 | 219.3 | 229.57 | 1.955 | |
| 11,800.0 | 7,149.5 | 7,057.5 | 7,057.5 | 90.9 | 141.2 | 89.65 | -4,273.3 | 251.0 | 505.7 | 274.2 | 231.44 | 2.185 | |
| 11,900.0 | 7,148.8 | 7,056.8 | 7,056.8 | 92.7 | 141.1 | 89.55 | -4,273.3 | 251.0 | 574.4 | 341.1 | 233.31 | 2.462 | |
| 12,000.0 | 7,148.0 | 7,056.0 | 7,056.0 | 94.6 | 141.1 | 89.44 | -4,273.3 | 251.0 | 651.3 | 416.1 | 235.18 | 2.769 | |
| 12,100.0 | 7,147.3 | 7,055.3 | 7,055.3 | 96.5 | 141.1 | 89.33 | -4,273.3 | 251.0 | 733.7 | 496.7 | 237.05 | 3.095 | |
| 12,200.0 | 7,146.6 | 7,054.6 | 7,054.6 | 98.4 | 141.1 | 89.22 | -4,273.3 | 251.0 | 820.1 | 581.2 | 238.91 | 3.433 | |
| 12,300.0 | 7,145.8 | 7,053.8 | 7,053.8 | 100.3 | 141.1 | 89.12 | -4,273.3 | 251.0 | 909.3 | 668.5 | 240.78 | 3.776 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Rory 1 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7369-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,000.0 | 7,148.0 | 7,057.0 | 7,057.0 | 94.6 | 141.1 | 91.86 | -5,734.2 | 429.6 | 963.3 | 728.2 | 235.18 | 4.096 | |
| 12,100.0 | 7,147.3 | 7,056.3 | 7,056.3 | 96.5 | 141.1 | 91.66 | -5,734.2 | 429.6 | 866.1 | 629.0 | 237.07 | 3.653 | |
| 12,200.0 | 7,146.6 | 7,055.6 | 7,055.6 | 98.4 | 141.1 | 91.46 | -5,734.2 | 429.6 | 769.5 | 530.6 | 238.96 | 3.220 | |
| 12,300.0 | 7,145.8 | 7,054.8 | 7,054.8 | 100.3 | 141.1 | 91.27 | -5,734.2 | 429.6 | 674.0 | 433.1 | 240.86 | 2.798 | |
| 12,400.0 | 7,145.1 | 7,054.1 | 7,054.1 | 102.2 | 141.1 | 91.07 | -5,734.2 | 429.6 | 579.9 | 337.1 | 242.74 | 2.389 | |
| 12,500.0 | 7,144.4 | 7,053.4 | 7,053.4 | 104.0 | 141.1 | 90.87 | -5,734.2 | 429.6 | 488.2 | 243.6 | 244.63 | 1.996 | |
| 12,600.0 | 7,143.6 | 7,052.6 | 7,052.6 | 105.9 | 141.1 | 90.67 | -5,734.2 | 429.6 | 400.5 | 154.0 | 246.52 | 1.625 | |
| 12,700.0 | 7,142.9 | 7,051.9 | 7,051.9 | 107.8 | 141.0 | 90.47 | -5,734.2 | 429.6 | 320.1 | 71.7 | 248.40 | 1.288 | Level 3 |
| 12,800.0 | 7,142.2 | 7,051.2 | 7,051.2 | 109.7 | 141.0 | 90.28 | -5,734.2 | 429.6 | 253.9 | 3.7 | 250.28 | 1.015 | Level 2 |
| 12,900.0 | 7,141.4 | 7,050.4 | 7,050.4 | 111.6 | 141.0 | 90.08 | -5,734.2 | 429.6 | 215.7 | -36.4 | 252.16 | 0.856 | Level 1 |
| 12,939.7 | 7,141.1 | 7,050.1 | 7,050.1 | 112.4 | 141.0 | 90.00 | -5,734.2 | 429.6 | 212.0 | -40.9 | 252.91 | 0.838 | Level 1, CC, ES, SF |
| 13,000.0 | 7,140.7 | 7,049.7 | 7,049.7 | 113.5 | 141.0 | 89.88 | -5,734.2 | 429.6 | 220.4 | -33.6 | 254.04 | 0.868 | Level 1 |
| 13,100.0 | 7,140.0 | 7,049.0 | 7,049.0 | 115.4 | 141.0 | 89.68 | -5,734.2 | 429.6 | 265.8 | 9.9 | 255.92 | 1.039 | Level 2 |
| 13,200.0 | 7,139.2 | 7,048.2 | 7,048.2 | 117.3 | 141.0 | 89.48 | -5,734.2 | 429.6 | 335.7 | 77.9 | 257.79 | 1.302 | Level 3 |
| 13,300.0 | 7,138.5 | 7,047.5 | 7,047.5 | 119.2 | 141.0 | 89.29 | -5,734.2 | 429.6 | 418.0 | 158.4 | 259.66 | 1.610 | |
| 13,400.0 | 7,137.8 | 7,046.8 | 7,046.8 | 121.1 | 140.9 | 89.09 | -5,734.2 | 429.6 | 506.7 | 245.2 | 261.53 | 1.938 | |
| 13,500.0 | 7,137.0 | 7,046.0 | 7,046.0 | 123.0 | 140.9 | 88.89 | -5,734.2 | 429.6 | 599.0 | 335.6 | 263.40 | 2.274 | |
| 13,600.0 | 7,136.3 | 7,045.3 | 7,045.3 | 124.9 | 140.9 | 88.69 | -5,734.2 | 429.6 | 693.4 | 428.2 | 265.26 | 2.614 | |
| 13,700.0 | 7,135.6 | 7,044.6 | 7,044.6 | 126.8 | 140.9 | 88.49 | -5,734.2 | 429.6 | 789.2 | 522.1 | 267.12 | 2.955 | |
| 13,800.0 | 7,134.8 | 7,043.8 | 7,043.8 | 128.7 | 140.9 | 88.30 | -5,734.2 | 429.6 | 886.0 | 617.0 | 268.98 | 3.294 | |
| 13,900.0 | 7,134.1 | 7,043.1 | 7,043.1 | 130.6 | 140.9 | 88.10 | -5,734.2 | 429.6 | 983.4 | 712.5 | 270.84 | 3.631 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Stroh 24-21 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7400-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9,400.0 | 7,167.1 | 7,097.1 | 7,097.1 | 46.7 | 141.9 | 91.42 | -3,063.8 | 384.9 | 906.4 | 718.8 | 187.63 | 4.831 | |
| 9,500.0 | 7,166.4 | 7,096.4 | 7,096.4 | 48.5 | 141.9 | 91.26 | -3,063.8 | 384.9 | 811.0 | 621.6 | 189.42 | 4.281 | |
| 9,600.0 | 7,165.6 | 7,095.6 | 7,095.6 | 50.3 | 141.9 | 91.09 | -3,063.8 | 384.9 | 716.8 | 525.6 | 191.23 | 3.749 | |
| 9,700.0 | 7,164.9 | 7,094.9 | 7,094.9 | 52.1 | 141.9 | 90.93 | -3,063.8 | 384.9 | 624.5 | 431.5 | 193.03 | 3.235 | |
| 9,800.0 | 7,164.2 | 7,094.2 | 7,094.2 | 53.9 | 141.9 | 90.77 | -3,063.8 | 384.9 | 534.9 | 340.1 | 194.85 | 2.745 | |
| 9,900.0 | 7,163.4 | 7,093.4 | 7,093.4 | 55.7 | 141.9 | 90.60 | -3,063.8 | 384.9 | 449.8 | 253.1 | 196.67 | 2.287 | |
| 10,000.0 | 7,162.7 | 7,092.7 | 7,092.7 | 57.5 | 141.9 | 90.44 | -3,063.8 | 384.9 | 372.1 | 173.6 | 198.49 | 1.874 | |
| 10,100.0 | 7,162.0 | 7,092.0 | 7,092.0 | 59.3 | 141.8 | 90.28 | -3,063.8 | 384.9 | 307.5 | 107.2 | 200.31 | 1.535 | |
| 10,200.0 | 7,161.2 | 7,091.2 | 7,091.2 | 61.1 | 141.8 | 90.11 | -3,063.8 | 384.9 | 265.9 | 63.8 | 202.14 | 1.315 | Level 3 |
| 10,269.3 | 7,160.7 | 7,090.7 | 7,090.7 | 62.4 | 141.8 | 90.00 | -3,063.8 | 384.9 | 256.7 | 53.3 | 203.42 | 1.262 | Level 3, CC, ES, SF |
| 10,300.0 | 7,160.5 | 7,090.5 | 7,090.5 | 63.0 | 141.8 | 89.95 | -3,063.8 | 384.9 | 258.5 | 54.6 | 203.98 | 1.267 | Level 3 |
| 10,400.0 | 7,159.8 | 7,089.8 | 7,089.8 | 64.8 | 141.8 | 89.79 | -3,063.8 | 384.9 | 288.1 | 82.2 | 205.81 | 1.400 | Level 3 |
| 10,500.0 | 7,159.0 | 7,089.0 | 7,089.0 | 66.6 | 141.8 | 89.62 | -3,063.8 | 384.9 | 345.1 | 137.5 | 207.65 | 1.662 | |
| 10,600.0 | 7,158.3 | 7,088.3 | 7,088.3 | 68.5 | 141.8 | 89.46 | -3,063.8 | 384.9 | 418.6 | 209.1 | 209.49 | 1.998 | |
| 10,700.0 | 7,157.6 | 7,087.6 | 7,087.6 | 70.3 | 141.8 | 89.30 | -3,063.8 | 384.9 | 501.4 | 290.0 | 211.33 | 2.372 | |
| 10,800.0 | 7,156.8 | 7,086.8 | 7,086.8 | 72.2 | 141.7 | 89.13 | -3,063.8 | 384.9 | 589.5 | 376.3 | 213.17 | 2.765 | |
| 10,900.0 | 7,156.1 | 7,086.1 | 7,086.1 | 74.0 | 141.7 | 88.97 | -3,063.8 | 384.9 | 680.9 | 465.9 | 215.01 | 3.167 | |
| 11,000.0 | 7,155.4 | 7,085.4 | 7,085.4 | 75.9 | 141.7 | 88.80 | -3,063.8 | 384.9 | 774.4 | 557.6 | 216.85 | 3.571 | |
| 11,100.0 | 7,154.6 | 7,084.6 | 7,084.6 | 77.8 | 141.7 | 88.64 | -3,063.8 | 384.9 | 869.4 | 650.7 | 218.70 | 3.975 | |
| 11,200.0 | 7,153.9 | 7,083.9 | 7,083.9 | 79.6 | 141.7 | 88.48 | -3,063.8 | 384.9 | 965.4 | 744.9 | 220.54 | 4.377 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7438-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 | -68.13 | 134.8 | -335.8 | 362.0 | | | | |
| 100.0 | 100.0 | 90.0 | 90.0 | 0.1 | 1.8 | -68.13 | 134.8 | -335.8 | 361.8 | 359.9 | 1.91 | 189.182 | |
| 200.0 | 200.0 | 190.0 | 190.0 | 0.3 | 3.8 | -68.13 | 134.8 | -335.8 | 361.8 | 357.7 | 4.14 | 87.454 | |
| 300.0 | 300.0 | 290.0 | 290.0 | 0.6 | 5.8 | -68.13 | 134.8 | -335.8 | 361.8 | 355.5 | 6.36 | 56.872 | |
| 400.0 | 400.0 | 390.0 | 390.0 | 0.8 | 7.8 | -68.13 | 134.8 | -335.8 | 361.8 | 353.2 | 8.59 | 42.137 | |
| 500.0 | 500.0 | 490.0 | 490.0 | 1.0 | 9.8 | -68.13 | 134.8 | -335.8 | 361.8 | 351.0 | 10.81 | 33.466 | |
| 600.0 | 600.0 | 590.0 | 590.0 | 1.2 | 11.8 | -68.13 | 134.8 | -335.8 | 361.8 | 348.8 | 13.04 | 27.755 | |
| 700.0 | 700.0 | 690.0 | 690.0 | 1.5 | 13.8 | -68.13 | 134.8 | -335.8 | 361.8 | 346.6 | 15.26 | 23.709 | |
| 800.0 | 800.0 | 790.0 | 790.0 | 1.7 | 15.8 | -68.13 | 134.8 | -335.8 | 361.8 | 344.3 | 17.49 | 20.692 | |
| 900.0 | 900.0 | 890.0 | 890.0 | 1.9 | 17.8 | -68.13 | 134.8 | -335.8 | 361.8 | 342.1 | 19.71 | 18.357 | |
| 1,000.0 | 1,000.0 | 990.0 | 990.0 | 2.1 | 19.8 | -68.13 | 134.8 | -335.8 | 361.8 | 339.9 | 21.94 | 16.495 | |
| 1,100.0 | 1,100.0 | 1,090.0 | 1,090.0 | 2.4 | 21.8 | -68.13 | 134.8 | -335.8 | 361.8 | 337.7 | 24.16 | 14.976 | |
| 1,200.0 | 1,200.0 | 1,190.0 | 1,190.0 | 2.6 | 23.8 | -68.13 | 134.8 | -335.8 | 361.8 | 335.4 | 26.38 | 13.713 | CC |
| 1,300.0 | 1,300.0 | 1,290.0 | 1,290.0 | 2.8 | 25.8 | -135.71 | 134.8 | -335.8 | 363.1 | 334.5 | 28.59 | 12.698 | ES |
| 1,400.0 | 1,399.8 | 1,389.8 | 1,389.8 | 3.0 | 27.8 | -136.23 | 134.8 | -335.8 | 366.8 | 336.1 | 30.77 | 11.922 | |
| 1,500.0 | 1,499.5 | 1,489.5 | 1,489.5 | 3.2 | 29.8 | -137.06 | 134.8 | -335.8 | 373.2 | 340.3 | 32.92 | 11.336 | |
| 1,600.0 | 1,598.7 | 1,588.7 | 1,588.7 | 3.5 | 31.8 | -138.18 | 134.8 | -335.8 | 382.2 | 347.2 | 35.04 | 10.909 | |
| 1,700.0 | 1,697.5 | 1,687.5 | 1,687.5 | 3.7 | 33.7 | -139.54 | 134.8 | -335.8 | 394.1 | 357.0 | 37.11 | 10.618 | |
| 1,800.0 | 1,795.6 | 1,785.6 | 1,785.6 | 4.0 | 35.7 | -141.12 | 134.8 | -335.8 | 408.8 | 369.6 | 39.18 | 10.433 | |
| 1,900.0 | 1,893.6 | 1,883.6 | 1,883.6 | 4.4 | 37.7 | -142.79 | 134.8 | -335.8 | 424.6 | 383.2 | 41.35 | 10.267 | |
| 2,000.0 | 1,991.7 | 1,981.7 | 1,981.7 | 4.7 | 39.6 | -144.34 | 134.8 | -335.8 | 440.7 | 397.1 | 43.53 | 10.124 | |
| 2,100.0 | 2,089.7 | 2,079.7 | 2,079.7 | 5.1 | 41.6 | -145.79 | 134.8 | -335.8 | 457.1 | 411.4 | 45.71 | 10.000 | |
| 2,200.0 | 2,187.7 | 2,177.7 | 2,177.7 | 5.5 | 43.6 | -147.13 | 134.8 | -335.8 | 473.8 | 425.9 | 47.89 | 9.893 | |
| 2,300.0 | 2,285.7 | 2,275.7 | 2,275.7 | 5.8 | 45.5 | -148.39 | 134.8 | -335.8 | 490.7 | 440.6 | 50.07 | 9.800 | |
| 2,400.0 | 2,383.7 | 2,373.7 | 2,373.7 | 6.2 | 47.5 | -149.56 | 134.8 | -335.8 | 507.8 | 455.6 | 52.25 | 9.719 | |
| 2,500.0 | 2,481.7 | 2,471.7 | 2,471.7 | 6.6 | 49.4 | -150.65 | 134.8 | -335.8 | 525.1 | 470.7 | 54.43 | 9.648 | |
| 2,600.0 | 2,579.7 | 2,569.7 | 2,569.7 | 7.0 | 51.4 | -151.68 | 134.8 | -335.8 | 542.6 | 486.0 | 56.61 | 9.585 | |
| 2,700.0 | 2,677.7 | 2,667.7 | 2,667.7 | 7.4 | 53.4 | -152.64 | 134.8 | -335.8 | 560.3 | 501.5 | 58.79 | 9.530 | |
| 2,800.0 | 2,775.7 | 2,765.7 | 2,765.7 | 7.8 | 55.3 | -153.54 | 134.8 | -335.8 | 578.1 | 517.1 | 60.97 | 9.481 | |
| 2,900.0 | 2,873.7 | 2,863.7 | 2,863.7 | 8.3 | 57.3 | -154.39 | 134.8 | -335.8 | 596.1 | 532.9 | 63.15 | 9.438 | |
| 3,000.0 | 2,971.7 | 2,961.7 | 2,961.7 | 8.7 | 59.2 | -155.19 | 134.8 | -335.8 | 614.1 | 548.8 | 65.33 | 9.400 | |
| 3,100.0 | 3,069.7 | 3,059.7 | 3,059.7 | 9.1 | 61.2 | -155.94 | 134.8 | -335.8 | 632.3 | 564.8 | 67.51 | 9.366 | |
| 3,200.0 | 3,167.7 | 3,157.7 | 3,157.7 | 9.5 | 63.2 | -156.65 | 134.8 | -335.8 | 650.5 | 580.9 | 69.69 | 9.335 | |
| 3,300.0 | 3,265.7 | 3,255.7 | 3,255.7 | 9.9 | 65.1 | -157.33 | 134.8 | -335.8 | 668.9 | 597.0 | 71.87 | 9.307 | |
| 3,400.0 | 3,363.7 | 3,353.7 | 3,353.7 | 10.4 | 67.1 | -157.96 | 134.8 | -335.8 | 687.4 | 613.3 | 74.05 | 9.283 | |
| 3,500.0 | 3,461.7 | 3,451.7 | 3,451.7 | 10.8 | 69.0 | -158.57 | 134.8 | -335.8 | 705.9 | 629.7 | 76.22 | 9.261 | |
| 3,600.0 | 3,559.7 | 3,549.7 | 3,549.7 | 11.2 | 71.0 | -159.14 | 134.8 | -335.8 | 724.5 | 646.1 | 78.40 | 9.241 | |
| 3,700.0 | 3,657.7 | 3,647.7 | 3,647.7 | 11.6 | 73.0 | -159.69 | 134.8 | -335.8 | 743.1 | 662.6 | 80.58 | 9.223 | |
| 3,800.0 | 3,755.7 | 3,745.7 | 3,745.7 | 12.1 | 74.9 | -160.20 | 134.8 | -335.8 | 761.9 | 679.1 | 82.76 | 9.206 | |
| 3,900.0 | 3,853.7 | 3,843.7 | 3,843.7 | 12.5 | 76.9 | -160.70 | 134.8 | -335.8 | 780.7 | 695.7 | 84.93 | 9.191 | |
| 4,000.0 | 3,951.7 | 3,941.7 | 3,941.7 | 12.9 | 78.8 | -161.17 | 134.8 | -335.8 | 799.5 | 712.4 | 87.11 | 9.178 | |
| 4,100.0 | 4,049.7 | 4,039.7 | 4,039.7 | 13.3 | 80.8 | -161.62 | 134.8 | -335.8 | 818.4 | 729.1 | 89.29 | 9.166 | |
| 4,200.0 | 4,147.7 | 4,137.7 | 4,137.7 | 13.8 | 82.8 | -162.04 | 134.8 | -335.8 | 837.3 | 745.8 | 91.46 | 9.155 | |
| 4,300.0 | 4,245.7 | 4,235.7 | 4,235.7 | 14.2 | 84.7 | -162.45 | 134.8 | -335.8 | 856.3 | 762.6 | 93.64 | 9.144 | |
| 4,400.0 | 4,343.7 | 4,333.7 | 4,333.7 | 14.6 | 86.7 | -162.85 | 134.8 | -335.8 | 875.3 | 779.5 | 95.82 | 9.135 | |
| 4,500.0 | 4,441.7 | 4,431.7 | 4,431.7 | 15.1 | 88.6 | -163.22 | 134.8 | -335.8 | 894.4 | 796.4 | 98.00 | 9.127 | |
| 4,600.0 | 4,539.7 | 4,529.7 | 4,529.7 | 15.5 | 90.6 | -163.58 | 134.8 | -335.8 | 913.5 | 813.3 | 100.17 | 9.119 | |
| 4,700.0 | 4,637.7 | 4,627.7 | 4,627.7 | 15.9 | 92.6 | -163.93 | 134.8 | -335.8 | 932.6 | 830.2 | 102.39 | 9.108 | |
| 4,800.0 | 4,736.1 | 4,726.1 | 4,726.1 | 16.2 | 94.5 | -164.33 | 134.8 | -335.8 | 949.8 | 844.7 | 105.09 | 9.038 | |
| 4,900.0 | 4,835.0 | 4,825.0 | 4,825.0 | 16.5 | 96.5 | -164.63 | 134.8 | -335.8 | 963.8 | 856.1 | 107.69 | 8.949 | |
| 5,000.0 | 4,934.4 | 4,924.4 | 4,924.4 | 16.8 | 98.5 | -164.86 | 134.8 | -335.8 | 974.4 | 864.2 | 110.19 | 8.843 | |

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 Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Stroh O 13-20 (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7438-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,100.0 | 5,034.1 | 5,024.1 | 5,024.1 | 17.0 | 100.5 | -165.01 | 134.8 | -335.8 | 981.7 | 869.1 | 112.59 | 8.719 | |
| 5,200.0 | 5,134.0 | 5,124.0 | 5,124.0 | 17.1 | 102.5 | -165.09 | 134.8 | -335.8 | 985.6 | 870.7 | 114.85 | 8.581 | |
| 5,300.0 | 5,234.0 | 5,224.0 | 5,224.0 | 17.3 | 104.5 | -97.70 | 134.8 | -335.8 | 986.3 | 869.3 | 117.02 | 8.428 | |
| 5,400.0 | 5,334.0 | 5,324.0 | 5,324.0 | 17.4 | 106.5 | -97.70 | 134.8 | -335.8 | 986.3 | 867.1 | 119.21 | 8.273 | |
| 5,500.0 | 5,434.0 | 5,424.0 | 5,424.0 | 17.6 | 108.5 | -97.70 | 134.8 | -335.8 | 986.3 | 864.9 | 121.41 | 8.124 | |
| 5,600.0 | 5,534.0 | 5,524.0 | 5,524.0 | 17.7 | 110.5 | -97.70 | 134.8 | -335.8 | 986.3 | 862.7 | 123.60 | 7.980 | |
| 5,700.0 | 5,634.0 | 5,624.0 | 5,624.0 | 17.9 | 112.5 | -97.70 | 134.8 | -335.8 | 986.3 | 860.5 | 125.79 | 7.841 | |
| 5,800.0 | 5,734.0 | 5,724.0 | 5,724.0 | 18.0 | 114.5 | -97.70 | 134.8 | -335.8 | 986.3 | 858.3 | 127.99 | 7.706 | |
| 5,900.0 | 5,834.0 | 5,824.0 | 5,824.0 | 18.2 | 116.5 | -97.70 | 134.8 | -335.8 | 986.3 | 856.1 | 130.18 | 7.576 | |
| 6,000.0 | 5,934.0 | 5,924.0 | 5,924.0 | 18.3 | 118.5 | -97.70 | 134.8 | -335.8 | 986.3 | 853.9 | 132.38 | 7.451 | |
| 6,100.0 | 6,034.0 | 6,024.0 | 6,024.0 | 18.5 | 120.5 | -97.70 | 134.8 | -335.8 | 986.3 | 851.7 | 134.58 | 7.329 | |
| 6,200.0 | 6,134.0 | 6,124.0 | 6,124.0 | 18.6 | 122.5 | -97.70 | 134.8 | -335.8 | 986.3 | 849.5 | 136.77 | 7.211 | |
| 6,300.0 | 6,234.0 | 6,224.0 | 6,224.0 | 18.8 | 124.5 | -97.70 | 134.8 | -335.8 | 986.3 | 847.3 | 138.97 | 7.097 | |
| 6,400.0 | 6,334.0 | 6,324.0 | 6,324.0 | 18.9 | 126.5 | -97.70 | 134.8 | -335.8 | 986.3 | 845.1 | 141.17 | 6.987 | |
| 6,500.0 | 6,434.0 | 6,424.0 | 6,424.0 | 19.1 | 128.5 | -97.70 | 134.8 | -335.8 | 986.3 | 842.9 | 143.37 | 6.879 | |
| 6,600.0 | 6,533.9 | 6,523.9 | 6,523.9 | 19.2 | 130.5 | 82.53 | 134.8 | -335.8 | 985.9 | 840.3 | 145.52 | 6.775 | |
| 6,700.0 | 6,632.4 | 6,622.4 | 6,622.4 | 19.3 | 132.4 | 83.64 | 134.8 | -335.8 | 983.8 | 836.2 | 147.59 | 6.666 | |
| 6,800.0 | 6,727.7 | 6,717.7 | 6,717.7 | 19.3 | 134.4 | 85.55 | 134.8 | -335.8 | 980.8 | 831.2 | 149.62 | 6.556 | |
| 6,900.0 | 6,817.8 | 6,807.8 | 6,807.8 | 19.3 | 136.2 | 88.04 | 134.8 | -335.8 | 978.2 | 826.6 | 151.59 | 6.453 | |
| 6,971.8 | 6,878.3 | 6,868.3 | 6,868.3 | 19.3 | 137.4 | 90.00 | 134.8 | -335.8 | 977.4 | 824.5 | 152.91 | 6.392 | |
| 7,000.0 | 6,900.9 | 6,890.9 | 6,890.9 | 19.3 | 137.8 | 90.78 | 134.8 | -335.8 | 977.6 | 824.2 | 153.39 | 6.373 | |
| 7,100.0 | 6,975.6 | 6,965.6 | 6,965.6 | 19.3 | 139.3 | 93.40 | 134.8 | -335.8 | 980.9 | 826.0 | 154.89 | 6.333 | SF |
| 7,200.0 | 7,040.4 | 7,030.4 | 7,030.4 | 19.3 | 140.6 | 95.52 | 134.8 | -335.8 | 990.3 | 834.2 | 156.06 | 6.346 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Stroh O 13-21D (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7540-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 | 134.17 | -327.9 | 337.5 | 470.6 | | | | |
| 100.0 | 100.0 | 89.0 | 89.0 | 0.1 | 1.8 | 134.17 | -327.9 | 337.5 | 470.5 | 468.6 | 1.89 | 248.608 | |
| 200.0 | 200.0 | 189.0 | 189.0 | 0.3 | 3.8 | 134.17 | -327.9 | 337.5 | 470.5 | 466.4 | 4.12 | 114.275 | |
| 300.0 | 300.0 | 289.0 | 289.0 | 0.6 | 5.8 | 134.17 | -327.9 | 337.5 | 470.5 | 464.2 | 6.34 | 74.188 | |
| 400.0 | 400.0 | 389.0 | 389.0 | 0.8 | 7.8 | 134.17 | -327.9 | 337.5 | 470.5 | 461.9 | 8.57 | 54.922 | |
| 500.0 | 500.0 | 489.0 | 489.0 | 1.0 | 9.8 | 134.17 | -327.9 | 337.5 | 470.5 | 459.7 | 10.79 | 43.600 | |
| 600.0 | 600.0 | 589.0 | 589.0 | 1.2 | 11.8 | 134.17 | -327.9 | 337.5 | 470.5 | 457.5 | 13.02 | 36.147 | |
| 700.0 | 700.0 | 689.0 | 689.0 | 1.5 | 13.8 | 134.17 | -327.9 | 337.5 | 470.5 | 455.3 | 15.24 | 30.871 | |
| 800.0 | 800.0 | 789.0 | 789.0 | 1.7 | 15.8 | 134.17 | -327.9 | 337.5 | 470.5 | 453.0 | 17.47 | 26.939 | |
| 900.0 | 900.0 | 889.0 | 889.0 | 1.9 | 17.8 | 134.17 | -327.9 | 337.5 | 470.5 | 450.8 | 19.69 | 23.895 | |
| 1,000.0 | 1,000.0 | 989.0 | 989.0 | 2.1 | 19.8 | 134.17 | -327.9 | 337.5 | 470.5 | 448.6 | 21.92 | 21.469 | |
| 1,100.0 | 1,100.0 | 1,089.0 | 1,089.0 | 2.4 | 21.8 | 134.17 | -327.9 | 337.5 | 470.5 | 446.4 | 24.14 | 19.491 | |
| 1,200.0 | 1,200.0 | 1,189.0 | 1,189.0 | 2.6 | 23.8 | 134.17 | -327.9 | 337.5 | 470.5 | 444.1 | 26.36 | 17.846 | |
| 1,300.0 | 1,300.0 | 1,289.0 | 1,289.0 | 2.8 | 25.8 | 66.98 | -327.9 | 337.5 | 469.8 | 441.2 | 28.58 | 16.440 | |
| 1,400.0 | 1,399.8 | 1,388.8 | 1,388.8 | 3.0 | 27.8 | 67.60 | -327.9 | 337.5 | 467.8 | 437.0 | 30.78 | 15.199 | |
| 1,500.0 | 1,499.5 | 1,488.5 | 1,488.5 | 3.2 | 29.8 | 68.65 | -327.9 | 337.5 | 464.5 | 431.6 | 32.98 | 14.086 | |
| 1,600.0 | 1,598.7 | 1,587.7 | 1,587.7 | 3.5 | 31.8 | 70.14 | -327.9 | 337.5 | 460.2 | 425.0 | 35.18 | 13.080 | |
| 1,700.0 | 1,697.5 | 1,686.5 | 1,686.5 | 3.7 | 33.7 | 72.07 | -327.9 | 337.5 | 455.1 | 417.7 | 37.41 | 12.166 | |
| 1,800.0 | 1,795.6 | 1,784.6 | 1,784.6 | 4.0 | 35.7 | 74.41 | -327.9 | 337.5 | 449.5 | 409.9 | 39.66 | 11.334 | |
| 1,900.0 | 1,893.6 | 1,882.6 | 1,882.6 | 4.4 | 37.7 | 76.83 | -327.9 | 337.5 | 444.5 | 402.5 | 41.96 | 10.593 | |
| 2,000.0 | 1,991.7 | 1,980.7 | 1,980.7 | 4.7 | 39.6 | 79.30 | -327.9 | 337.5 | 440.3 | 396.0 | 44.28 | 9.943 | |
| 2,100.0 | 2,089.7 | 2,078.7 | 2,078.7 | 5.1 | 41.6 | 81.82 | -327.9 | 337.5 | 437.0 | 390.4 | 46.62 | 9.374 | |
| 2,200.0 | 2,187.7 | 2,176.7 | 2,176.7 | 5.5 | 43.5 | 84.36 | -327.9 | 337.5 | 434.5 | 385.6 | 48.97 | 8.874 | |
| 2,300.0 | 2,285.7 | 2,274.7 | 2,274.7 | 5.8 | 45.5 | 86.93 | -327.9 | 337.5 | 433.0 | 381.7 | 51.32 | 8.437 | |
| 2,400.0 | 2,383.7 | 2,372.7 | 2,372.7 | 6.2 | 47.5 | 89.51 | -327.9 | 337.5 | 432.4 | 378.7 | 53.68 | 8.055 | |
| 2,419.0 | 2,402.3 | 2,391.3 | 2,391.3 | 6.3 | 47.8 | 90.00 | -327.9 | 337.5 | 432.4 | 378.2 | 54.13 | 7.988 | |
| 2,500.0 | 2,481.7 | 2,470.7 | 2,470.7 | 6.6 | 49.4 | 92.09 | -327.9 | 337.5 | 432.7 | 376.6 | 56.04 | 7.721 | |
| 2,600.0 | 2,579.7 | 2,568.7 | 2,568.7 | 7.0 | 51.4 | 94.66 | -327.9 | 337.5 | 433.9 | 375.5 | 58.39 | 7.430 | |
| 2,700.0 | 2,677.7 | 2,666.7 | 2,666.7 | 7.4 | 53.3 | 97.22 | -327.9 | 337.5 | 436.0 | 375.2 | 60.74 | 7.177 | |
| 2,800.0 | 2,775.7 | 2,764.7 | 2,764.7 | 7.8 | 55.3 | 99.75 | -327.9 | 337.5 | 438.9 | 375.9 | 63.08 | 6.958 | |
| 2,900.0 | 2,873.7 | 2,862.7 | 2,862.7 | 8.3 | 57.3 | 102.23 | -327.9 | 337.5 | 442.8 | 377.4 | 65.41 | 6.770 | |
| 3,000.0 | 2,971.7 | 2,960.7 | 2,960.7 | 8.7 | 59.2 | 104.68 | -327.9 | 337.5 | 447.5 | 379.8 | 67.73 | 6.607 | |
| 3,100.0 | 3,069.7 | 3,058.7 | 3,058.7 | 9.1 | 61.2 | 107.07 | -327.9 | 337.5 | 453.1 | 383.0 | 70.04 | 6.469 | |
| 3,200.0 | 3,167.7 | 3,156.7 | 3,156.7 | 9.5 | 63.1 | 109.40 | -327.9 | 337.5 | 459.4 | 387.1 | 72.33 | 6.352 | |
| 3,300.0 | 3,265.7 | 3,254.7 | 3,254.7 | 9.9 | 65.1 | 111.66 | -327.9 | 337.5 | 466.5 | 391.9 | 74.61 | 6.253 | |
| 3,400.0 | 3,363.7 | 3,352.7 | 3,352.7 | 10.4 | 67.1 | 113.86 | -327.9 | 337.5 | 474.3 | 397.5 | 76.88 | 6.170 | |
| 3,500.0 | 3,461.7 | 3,450.7 | 3,450.7 | 10.8 | 69.0 | 115.98 | -327.9 | 337.5 | 482.9 | 403.7 | 79.13 | 6.102 | |
| 3,600.0 | 3,559.7 | 3,548.7 | 3,548.7 | 11.2 | 71.0 | 118.03 | -327.9 | 337.5 | 492.0 | 410.7 | 81.37 | 6.047 | |
| 3,700.0 | 3,657.7 | 3,646.7 | 3,646.7 | 11.6 | 72.9 | 120.01 | -327.9 | 337.5 | 501.8 | 418.2 | 83.60 | 6.003 | |
| 3,800.0 | 3,755.7 | 3,744.7 | 3,744.7 | 12.1 | 74.9 | 121.91 | -327.9 | 337.5 | 512.2 | 426.4 | 85.82 | 5.969 | |
| 3,900.0 | 3,853.7 | 3,842.7 | 3,842.7 | 12.5 | 76.9 | 123.73 | -327.9 | 337.5 | 523.2 | 435.1 | 88.03 | 5.943 | |
| 4,000.0 | 3,951.7 | 3,940.7 | 3,940.7 | 12.9 | 78.8 | 125.48 | -327.9 | 337.5 | 534.6 | 444.4 | 90.23 | 5.925 | |
| 4,100.0 | 4,049.7 | 4,038.7 | 4,038.7 | 13.3 | 80.8 | 127.16 | -327.9 | 337.5 | 546.5 | 454.1 | 92.42 | 5.914 | |
| 4,200.0 | 4,147.7 | 4,136.7 | 4,136.7 | 13.8 | 82.7 | 128.76 | -327.9 | 337.5 | 558.9 | 464.3 | 94.60 | 5.908 | |
| 4,300.0 | 4,245.7 | 4,234.7 | 4,234.7 | 14.2 | 84.7 | 130.30 | -327.9 | 337.5 | 571.7 | 475.0 | 96.78 | 5.908 | |
| 4,400.0 | 4,343.7 | 4,332.7 | 4,332.7 | 14.6 | 86.7 | 131.77 | -327.9 | 337.5 | 584.9 | 486.0 | 98.95 | 5.912 | |
| 4,500.0 | 4,441.7 | 4,430.7 | 4,430.7 | 15.1 | 88.6 | 133.17 | -327.9 | 337.5 | 598.5 | 497.4 | 101.11 | 5.919 | |
| 4,600.0 | 4,539.7 | 4,528.7 | 4,528.7 | 15.5 | 90.6 | 134.52 | -327.9 | 337.5 | 612.4 | 509.2 | 103.28 | 5.930 | |
| 4,700.0 | 4,637.7 | 4,626.7 | 4,626.7 | 15.9 | 92.5 | 135.81 | -327.9 | 337.5 | 626.7 | 521.2 | 105.45 | 5.943 | |
| 4,800.0 | 4,736.1 | 4,725.1 | 4,725.1 | 16.2 | 94.5 | 137.10 | -327.9 | 337.5 | 639.8 | 531.9 | 107.83 | 5.933 | |
| 4,900.0 | 4,835.0 | 4,824.0 | 4,824.0 | 16.5 | 96.5 | 138.11 | -327.9 | 337.5 | 650.5 | 540.3 | 110.19 | 5.904 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - Stroh O 13-21D (Exist) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7540-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 | 4,934.4 | 4,923.4 | 4,923.4 | 16.8 | 98.5 | 138.86 | -327.9 | 337.5 | 658.8 | 546.3 | 112.51 | 5.855 | |
| 5,100.0 | 5,034.1 | 5,023.1 | 5,023.1 | 17.0 | 100.5 | 139.36 | -327.9 | 337.5 | 664.5 | 549.7 | 114.78 | 5.789 | |
| 5,200.0 | 5,134.0 | 5,123.0 | 5,123.0 | 17.1 | 102.5 | 139.63 | -327.9 | 337.5 | 667.5 | 550.6 | 116.98 | 5.707 | |
| 5,300.0 | 5,234.0 | 5,223.0 | 5,223.0 | 17.3 | 104.5 | -152.92 | -327.9 | 337.5 | 668.1 | 549.0 | 119.12 | 5.609 | |
| 5,400.0 | 5,334.0 | 5,323.0 | 5,323.0 | 17.4 | 106.5 | -152.92 | -327.9 | 337.5 | 668.1 | 546.8 | 121.29 | 5.509 | |
| 5,500.0 | 5,434.0 | 5,423.0 | 5,423.0 | 17.6 | 108.5 | -152.92 | -327.9 | 337.5 | 668.1 | 544.7 | 123.46 | 5.412 | |
| 5,600.0 | 5,534.0 | 5,523.0 | 5,523.0 | 17.7 | 110.5 | -152.92 | -327.9 | 337.5 | 668.1 | 542.5 | 125.63 | 5.318 | |
| 5,700.0 | 5,634.0 | 5,623.0 | 5,623.0 | 17.9 | 112.5 | -152.92 | -327.9 | 337.5 | 668.1 | 540.3 | 127.80 | 5.228 | |
| 5,800.0 | 5,734.0 | 5,723.0 | 5,723.0 | 18.0 | 114.5 | -152.92 | -327.9 | 337.5 | 668.1 | 538.1 | 129.98 | 5.140 | |
| 5,900.0 | 5,834.0 | 5,823.0 | 5,823.0 | 18.2 | 116.5 | -152.92 | -327.9 | 337.5 | 668.1 | 536.0 | 132.15 | 5.056 | |
| 6,000.0 | 5,934.0 | 5,923.0 | 5,923.0 | 18.3 | 118.5 | -152.92 | -327.9 | 337.5 | 668.1 | 533.8 | 134.33 | 4.974 | |
| 6,100.0 | 6,034.0 | 6,023.0 | 6,023.0 | 18.5 | 120.5 | -152.92 | -327.9 | 337.5 | 668.1 | 531.6 | 136.51 | 4.894 | |
| 6,200.0 | 6,134.0 | 6,123.0 | 6,123.0 | 18.6 | 122.5 | -152.92 | -327.9 | 337.5 | 668.1 | 529.4 | 138.69 | 4.818 | |
| 6,300.0 | 6,234.0 | 6,223.0 | 6,223.0 | 18.8 | 124.5 | -152.92 | -327.9 | 337.5 | 668.1 | 527.3 | 140.87 | 4.743 | |
| 6,400.0 | 6,334.0 | 6,323.0 | 6,323.0 | 18.9 | 126.5 | -152.92 | -327.9 | 337.5 | 668.1 | 525.1 | 143.05 | 4.671 | |
| 6,500.0 | 6,434.0 | 6,423.0 | 6,423.0 | 19.1 | 128.5 | -152.92 | -327.9 | 337.5 | 668.1 | 522.9 | 145.23 | 4.600 | |
| 6,600.0 | 6,533.9 | 6,522.9 | 6,522.9 | 19.2 | 130.5 | 27.33 | -327.9 | 337.5 | 665.1 | 518.3 | 146.73 | 4.532 | |
| 6,700.0 | 6,632.4 | 6,621.4 | 6,621.4 | 19.3 | 132.4 | 28.57 | -327.9 | 337.5 | 650.2 | 504.2 | 146.00 | 4.454 | |
| 6,800.0 | 6,727.7 | 6,716.7 | 6,716.7 | 19.3 | 134.3 | 31.01 | -327.9 | 337.5 | 623.6 | 480.3 | 143.32 | 4.352 | |
| 6,900.0 | 6,817.8 | 6,806.8 | 6,806.8 | 19.3 | 136.1 | 34.92 | -327.9 | 337.5 | 586.3 | 446.7 | 139.58 | 4.200 | |
| 7,000.0 | 6,900.9 | 6,889.9 | 6,889.9 | 19.3 | 137.8 | 40.74 | -327.9 | 337.5 | 539.8 | 403.1 | 136.62 | 3.951 | |
| 7,100.0 | 6,975.6 | 6,964.6 | 6,964.6 | 19.3 | 139.3 | 48.90 | -327.9 | 337.5 | 486.4 | 349.3 | 137.06 | 3.548 | |
| 7,200.0 | 7,040.4 | 7,029.4 | 7,029.4 | 19.3 | 140.6 | 59.40 | -327.9 | 337.5 | 429.6 | 287.0 | 142.64 | 3.012 | |
| 7,300.0 | 7,093.8 | 7,082.8 | 7,082.8 | 19.4 | 141.7 | 71.11 | -327.9 | 337.5 | 374.8 | 223.7 | 151.06 | 2.481 | |
| 7,400.0 | 7,135.1 | 7,124.1 | 7,124.1 | 19.6 | 142.5 | 81.67 | -327.9 | 337.5 | 330.0 | 172.6 | 157.41 | 2.096 | |
| 7,500.0 | 7,163.2 | 7,152.2 | 7,152.2 | 20.0 | 143.0 | 88.70 | -327.9 | 337.5 | 305.9 | 145.7 | 160.14 | 1.910 | |
| 7,532.7 | 7,169.5 | 7,158.5 | 7,158.5 | 20.2 | 143.2 | 90.00 | -327.9 | 337.5 | 304.2 | 143.6 | 160.60 | 1.894 | CC, ES, SF |
| 7,600.0 | 7,177.8 | 7,166.8 | 7,166.8 | 20.6 | 143.3 | 90.96 | -327.9 | 337.5 | 311.4 | 150.1 | 161.32 | 1.930 | |
| 7,700.0 | 7,179.6 | 7,168.6 | 7,168.6 | 21.4 | 143.4 | 89.77 | -327.9 | 337.5 | 346.8 | 184.6 | 162.30 | 2.137 | |
| 7,800.0 | 7,178.8 | 7,167.8 | 7,167.8 | 22.3 | 143.4 | 89.63 | -327.9 | 337.5 | 404.5 | 241.2 | 163.37 | 2.476 | |
| 7,900.0 | 7,178.1 | 7,167.1 | 7,167.1 | 23.4 | 143.3 | 89.49 | -327.9 | 337.5 | 476.4 | 311.9 | 164.56 | 2.895 | |
| 8,000.0 | 7,177.4 | 7,166.4 | 7,166.4 | 24.6 | 143.3 | 89.36 | -327.9 | 337.5 | 557.1 | 391.2 | 165.85 | 3.359 | |
| 8,100.0 | 7,176.6 | 7,165.6 | 7,165.6 | 25.8 | 143.3 | 89.22 | -327.9 | 337.5 | 643.2 | 475.9 | 167.22 | 3.846 | |
| 8,200.0 | 7,175.9 | 7,164.9 | 7,164.9 | 27.2 | 143.3 | 89.08 | -327.9 | 337.5 | 732.8 | 564.1 | 168.65 | 4.345 | |
| 8,300.0 | 7,175.2 | 7,164.2 | 7,164.2 | 28.6 | 143.3 | 88.94 | -327.9 | 337.5 | 824.8 | 654.7 | 170.15 | 4.848 | |
| 8,400.0 | 7,174.4 | 7,163.4 | 7,163.4 | 30.1 | 143.3 | 88.80 | -327.9 | 337.5 | 918.5 | 746.8 | 171.69 | 5.350 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - UPRC 13-11E (Existing) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7416-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 | 139.62 | -360.7 | 306.8 | 473.6 | | | | |
| 100.0 | 100.0 | 89.0 | 89.0 | 0.1 | 1.8 | 139.62 | -360.7 | 306.8 | 473.5 | 471.6 | 1.89 | 250.182 | |
| 200.0 | 200.0 | 189.0 | 189.0 | 0.3 | 3.8 | 139.62 | -360.7 | 306.8 | 473.5 | 469.4 | 4.12 | 114.999 | |
| 300.0 | 300.0 | 289.0 | 289.0 | 0.6 | 5.8 | 139.62 | -360.7 | 306.8 | 473.5 | 467.1 | 6.34 | 74.658 | |
| 400.0 | 400.0 | 389.0 | 389.0 | 0.8 | 7.8 | 139.62 | -360.7 | 306.8 | 473.5 | 464.9 | 8.57 | 55.270 | |
| 500.0 | 500.0 | 489.0 | 489.0 | 1.0 | 9.8 | 139.62 | -360.7 | 306.8 | 473.5 | 462.7 | 10.79 | 43.876 | |
| 600.0 | 600.0 | 589.0 | 589.0 | 1.2 | 11.8 | 139.62 | -360.7 | 306.8 | 473.5 | 460.5 | 13.02 | 36.376 | |
| 700.0 | 700.0 | 689.0 | 689.0 | 1.5 | 13.8 | 139.62 | -360.7 | 306.8 | 473.5 | 458.2 | 15.24 | 31.066 | |
| 800.0 | 800.0 | 789.0 | 789.0 | 1.7 | 15.8 | 139.62 | -360.7 | 306.8 | 473.5 | 456.0 | 17.47 | 27.109 | |
| 900.0 | 900.0 | 889.0 | 889.0 | 1.9 | 17.8 | 139.62 | -360.7 | 306.8 | 473.5 | 453.8 | 19.69 | 24.046 | |
| 1,000.0 | 1,000.0 | 989.0 | 989.0 | 2.1 | 19.8 | 139.62 | -360.7 | 306.8 | 473.5 | 451.6 | 21.92 | 21.605 | |
| 1,100.0 | 1,100.0 | 1,089.0 | 1,089.0 | 2.4 | 21.8 | 139.62 | -360.7 | 306.8 | 473.5 | 449.3 | 24.14 | 19.614 | |
| 1,200.0 | 1,200.0 | 1,189.0 | 1,189.0 | 2.6 | 23.8 | 139.62 | -360.7 | 306.8 | 473.5 | 447.1 | 26.36 | 17.959 | |
| 1,300.0 | 1,300.0 | 1,289.0 | 1,289.0 | 2.8 | 25.8 | 72.42 | -360.7 | 306.8 | 473.0 | 444.4 | 28.58 | 16.549 | |
| 1,400.0 | 1,399.8 | 1,388.8 | 1,388.8 | 3.0 | 27.8 | 73.06 | -360.7 | 306.8 | 471.4 | 440.6 | 30.78 | 15.313 | |
| 1,500.0 | 1,499.5 | 1,488.5 | 1,488.5 | 3.2 | 29.8 | 74.12 | -360.7 | 306.8 | 468.9 | 435.9 | 32.99 | 14.214 | |
| 1,600.0 | 1,598.7 | 1,587.7 | 1,587.7 | 3.5 | 31.8 | 75.61 | -360.7 | 306.8 | 465.7 | 430.5 | 35.21 | 13.229 | |
| 1,700.0 | 1,697.5 | 1,686.5 | 1,686.5 | 3.7 | 33.7 | 77.54 | -360.7 | 306.8 | 462.1 | 424.6 | 37.44 | 12.341 | |
| 1,800.0 | 1,795.6 | 1,784.6 | 1,784.6 | 4.0 | 35.7 | 79.87 | -360.7 | 306.8 | 458.3 | 418.6 | 39.71 | 11.542 | |
| 1,900.0 | 1,893.6 | 1,882.6 | 1,882.6 | 4.4 | 37.7 | 82.29 | -360.7 | 306.8 | 455.1 | 413.1 | 42.00 | 10.836 | |
| 2,000.0 | 1,991.7 | 1,980.7 | 1,980.7 | 4.7 | 39.6 | 84.73 | -360.7 | 306.8 | 452.8 | 408.5 | 44.32 | 10.218 | |
| 2,100.0 | 2,089.7 | 2,078.7 | 2,078.7 | 5.1 | 41.6 | 87.20 | -360.7 | 306.8 | 451.4 | 404.8 | 46.65 | 9.677 | |
| 2,200.0 | 2,187.7 | 2,176.7 | 2,176.7 | 5.5 | 43.5 | 89.67 | -360.7 | 306.8 | 450.9 | 401.9 | 48.99 | 9.203 | |
| 2,213.3 | 2,200.6 | 2,189.6 | 2,189.6 | 5.5 | 43.8 | 90.00 | -360.7 | 306.8 | 450.8 | 401.5 | 49.30 | 9.145 | |
| 2,300.0 | 2,285.7 | 2,274.7 | 2,274.7 | 5.8 | 45.5 | 92.15 | -360.7 | 306.8 | 451.2 | 399.8 | 51.33 | 8.790 | |
| 2,400.0 | 2,383.7 | 2,372.7 | 2,372.7 | 6.2 | 47.5 | 94.62 | -360.7 | 306.8 | 452.4 | 398.7 | 53.68 | 8.428 | |
| 2,500.0 | 2,481.7 | 2,470.7 | 2,470.7 | 6.6 | 49.4 | 97.07 | -360.7 | 306.8 | 454.4 | 398.4 | 56.02 | 8.112 | |
| 2,600.0 | 2,579.7 | 2,568.7 | 2,568.7 | 7.0 | 51.4 | 99.49 | -360.7 | 306.8 | 457.4 | 399.0 | 58.36 | 7.837 | |
| 2,700.0 | 2,677.7 | 2,666.7 | 2,666.7 | 7.4 | 53.3 | 101.88 | -360.7 | 306.8 | 461.1 | 400.4 | 60.69 | 7.598 | |
| 2,800.0 | 2,775.7 | 2,764.7 | 2,764.7 | 7.8 | 55.3 | 104.23 | -360.7 | 306.8 | 465.7 | 402.7 | 63.01 | 7.391 | |
| 2,900.0 | 2,873.7 | 2,862.7 | 2,862.7 | 8.3 | 57.3 | 106.54 | -360.7 | 306.8 | 471.1 | 405.8 | 65.32 | 7.211 | |
| 3,000.0 | 2,971.7 | 2,960.7 | 2,960.7 | 8.7 | 59.2 | 108.78 | -360.7 | 306.8 | 477.2 | 409.6 | 67.63 | 7.057 | |
| 3,100.0 | 3,069.7 | 3,058.7 | 3,058.7 | 9.1 | 61.2 | 110.98 | -360.7 | 306.8 | 484.1 | 414.2 | 69.92 | 6.924 | |
| 3,200.0 | 3,167.7 | 3,156.7 | 3,156.7 | 9.5 | 63.1 | 113.10 | -360.7 | 306.8 | 491.7 | 419.5 | 72.20 | 6.811 | |
| 3,300.0 | 3,265.7 | 3,254.7 | 3,254.7 | 9.9 | 65.1 | 115.17 | -360.7 | 306.8 | 500.0 | 425.5 | 74.46 | 6.714 | |
| 3,400.0 | 3,363.7 | 3,352.7 | 3,352.7 | 10.4 | 67.1 | 117.16 | -360.7 | 306.8 | 508.9 | 432.2 | 76.72 | 6.633 | |
| 3,500.0 | 3,461.7 | 3,450.7 | 3,450.7 | 10.8 | 69.0 | 119.09 | -360.7 | 306.8 | 518.4 | 439.4 | 78.97 | 6.565 | |
| 3,600.0 | 3,559.7 | 3,548.7 | 3,548.7 | 11.2 | 71.0 | 120.94 | -360.7 | 306.8 | 528.5 | 447.3 | 81.20 | 6.509 | |
| 3,700.0 | 3,657.7 | 3,646.7 | 3,646.7 | 11.6 | 72.9 | 122.73 | -360.7 | 306.8 | 539.2 | 455.7 | 83.43 | 6.463 | |
| 3,800.0 | 3,755.7 | 3,744.7 | 3,744.7 | 12.1 | 74.9 | 124.45 | -360.7 | 306.8 | 550.3 | 464.7 | 85.64 | 6.426 | |
| 3,900.0 | 3,853.7 | 3,842.7 | 3,842.7 | 12.5 | 76.9 | 126.10 | -360.7 | 306.8 | 562.0 | 474.1 | 87.85 | 6.397 | |
| 4,000.0 | 3,951.7 | 3,940.7 | 3,940.7 | 12.9 | 78.8 | 127.68 | -360.7 | 306.8 | 574.1 | 484.0 | 90.05 | 6.375 | |
| 4,100.0 | 4,049.7 | 4,038.7 | 4,038.7 | 13.3 | 80.8 | 129.20 | -360.7 | 306.8 | 586.6 | 494.3 | 92.24 | 6.359 | |
| 4,200.0 | 4,147.7 | 4,136.7 | 4,136.7 | 13.8 | 82.7 | 130.66 | -360.7 | 306.8 | 599.5 | 505.1 | 94.43 | 6.349 | |
| 4,300.0 | 4,245.7 | 4,234.7 | 4,234.7 | 14.2 | 84.7 | 132.06 | -360.7 | 306.8 | 612.8 | 516.2 | 96.61 | 6.343 | |
| 4,400.0 | 4,343.7 | 4,332.7 | 4,332.7 | 14.6 | 86.7 | 133.39 | -360.7 | 306.8 | 626.4 | 527.6 | 98.79 | 6.341 | |
| 4,500.0 | 4,441.7 | 4,430.7 | 4,430.7 | 15.1 | 88.6 | 134.67 | -360.7 | 306.8 | 640.4 | 539.4 | 100.96 | 6.343 | |
| 4,600.0 | 4,539.7 | 4,528.7 | 4,528.7 | 15.5 | 90.6 | 135.90 | -360.7 | 306.8 | 654.7 | 551.5 | 103.12 | 6.348 | |
| 4,700.0 | 4,637.7 | 4,626.7 | 4,626.7 | 15.9 | 92.5 | 137.09 | -360.7 | 306.8 | 669.2 | 563.9 | 105.31 | 6.355 | |
| 4,800.0 | 4,736.1 | 4,725.1 | 4,725.1 | 16.2 | 94.5 | 138.28 | -360.7 | 306.8 | 682.6 | 574.9 | 107.71 | 6.337 | |
| 4,900.0 | 4,835.0 | 4,824.0 | 4,824.0 | 16.5 | 96.5 | 139.22 | -360.7 | 306.8 | 693.5 | 583.4 | 110.08 | 6.300 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Existing Wells - Sec.13-T4N-R67W - UPRC 13-11E (Existing) - Wellbore #1 - Wellbore #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 7416-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 | 4,934.4 | 4,923.4 | 4,923.4 | 16.8 | 98.5 | 139.91 | -360.7 | 306.8 | 701.9 | 589.5 | 112.41 | 6.244 | |
| 5,100.0 | 5,034.1 | 5,023.1 | 5,023.1 | 17.0 | 100.5 | 140.38 | -360.7 | 306.8 | 707.7 | 593.0 | 114.68 | 6.171 | |
| 5,200.0 | 5,134.0 | 5,123.0 | 5,123.0 | 17.1 | 102.5 | 140.63 | -360.7 | 306.8 | 710.8 | 593.9 | 116.89 | 6.081 | |
| 5,300.0 | 5,234.0 | 5,223.0 | 5,223.0 | 17.3 | 104.5 | -151.92 | -360.7 | 306.8 | 711.4 | 592.4 | 119.03 | 5.977 | |
| 5,400.0 | 5,334.0 | 5,323.0 | 5,323.0 | 17.4 | 106.5 | -151.92 | -360.7 | 306.8 | 711.4 | 590.2 | 121.20 | 5.870 | |
| 5,500.0 | 5,434.0 | 5,423.0 | 5,423.0 | 17.6 | 108.5 | -151.92 | -360.7 | 306.8 | 711.4 | 588.0 | 123.37 | 5.766 | |
| 5,600.0 | 5,534.0 | 5,523.0 | 5,523.0 | 17.7 | 110.5 | -151.92 | -360.7 | 306.8 | 711.4 | 585.8 | 125.54 | 5.666 | |
| 5,700.0 | 5,634.0 | 5,623.0 | 5,623.0 | 17.9 | 112.5 | -151.92 | -360.7 | 306.8 | 711.4 | 583.7 | 127.72 | 5.570 | |
| 5,800.0 | 5,734.0 | 5,723.0 | 5,723.0 | 18.0 | 114.5 | -151.92 | -360.7 | 306.8 | 711.4 | 581.5 | 129.89 | 5.477 | |
| 5,900.0 | 5,834.0 | 5,823.0 | 5,823.0 | 18.2 | 116.5 | -151.92 | -360.7 | 306.8 | 711.4 | 579.3 | 132.07 | 5.387 | |
| 6,000.0 | 5,934.0 | 5,923.0 | 5,923.0 | 18.3 | 118.5 | -151.92 | -360.7 | 306.8 | 711.4 | 577.1 | 134.25 | 5.299 | |
| 6,100.0 | 6,034.0 | 6,023.0 | 6,023.0 | 18.5 | 120.5 | -151.92 | -360.7 | 306.8 | 711.4 | 575.0 | 136.43 | 5.214 | |
| 6,200.0 | 6,134.0 | 6,123.0 | 6,123.0 | 18.6 | 122.5 | -151.92 | -360.7 | 306.8 | 711.4 | 572.8 | 138.61 | 5.132 | |
| 6,300.0 | 6,234.0 | 6,223.0 | 6,223.0 | 18.8 | 124.5 | -151.92 | -360.7 | 306.8 | 711.4 | 570.6 | 140.79 | 5.053 | |
| 6,400.0 | 6,334.0 | 6,323.0 | 6,323.0 | 18.9 | 126.5 | -151.92 | -360.7 | 306.8 | 711.4 | 568.4 | 142.97 | 4.976 | |
| 6,500.0 | 6,434.0 | 6,423.0 | 6,423.0 | 19.1 | 128.5 | -151.92 | -360.7 | 306.8 | 711.4 | 566.2 | 145.15 | 4.901 | |
| 6,600.0 | 6,533.9 | 6,522.9 | 6,522.9 | 19.2 | 130.5 | 28.33 | -360.7 | 306.8 | 708.3 | 561.7 | 146.67 | 4.830 | |
| 6,700.0 | 6,632.4 | 6,621.4 | 6,621.4 | 19.3 | 132.4 | 29.56 | -360.7 | 306.8 | 693.7 | 547.7 | 145.99 | 4.751 | |
| 6,800.0 | 6,727.7 | 6,716.7 | 6,716.7 | 19.3 | 134.3 | 31.97 | -360.7 | 306.8 | 667.3 | 523.9 | 143.40 | 4.653 | |
| 6,900.0 | 6,817.8 | 6,806.8 | 6,806.8 | 19.3 | 136.1 | 35.81 | -360.7 | 306.8 | 630.3 | 490.5 | 139.81 | 4.508 | |
| 7,000.0 | 6,900.9 | 6,889.9 | 6,889.9 | 19.3 | 137.8 | 41.45 | -360.7 | 306.8 | 584.2 | 447.2 | 136.97 | 4.265 | |
| 7,100.0 | 6,975.6 | 6,964.6 | 6,964.6 | 19.3 | 139.3 | 49.27 | -360.7 | 306.8 | 531.1 | 393.8 | 137.34 | 3.867 | |
| 7,200.0 | 7,040.4 | 7,029.4 | 7,029.4 | 19.3 | 140.6 | 59.23 | -360.7 | 306.8 | 474.5 | 332.0 | 142.51 | 3.329 | |
| 7,300.0 | 7,093.8 | 7,082.8 | 7,082.8 | 19.4 | 141.7 | 70.34 | -360.7 | 306.8 | 418.9 | 268.4 | 150.53 | 2.783 | |
| 7,400.0 | 7,135.1 | 7,124.1 | 7,124.1 | 19.6 | 142.5 | 80.51 | -360.7 | 306.8 | 371.4 | 214.5 | 156.96 | 2.366 | |
| 7,500.0 | 7,163.2 | 7,152.2 | 7,152.2 | 20.0 | 143.0 | 87.62 | -360.7 | 306.8 | 341.1 | 181.1 | 160.03 | 2.131 | |
| 7,565.9 | 7,174.4 | 7,163.4 | 7,163.4 | 20.4 | 143.3 | 90.00 | -360.7 | 306.8 | 334.8 | 173.9 | 160.97 | 2.080 | CC, ES, SF |
| 7,600.0 | 7,177.8 | 7,166.8 | 7,166.8 | 20.6 | 143.3 | 90.44 | -360.7 | 306.8 | 336.6 | 175.2 | 161.32 | 2.086 | |
| 7,700.0 | 7,179.6 | 7,168.6 | 7,168.6 | 21.4 | 143.4 | 89.83 | -360.7 | 306.8 | 360.6 | 198.3 | 162.30 | 2.222 | |
| 7,800.0 | 7,178.8 | 7,167.8 | 7,167.8 | 22.3 | 143.4 | 89.71 | -360.7 | 306.8 | 408.5 | 245.1 | 163.38 | 2.500 | |
| 7,900.0 | 7,178.1 | 7,167.1 | 7,167.1 | 23.4 | 143.3 | 89.58 | -360.7 | 306.8 | 472.9 | 308.3 | 164.57 | 2.873 | |
| 8,000.0 | 7,177.4 | 7,166.4 | 7,166.4 | 24.6 | 143.3 | 89.46 | -360.7 | 306.8 | 548.1 | 382.2 | 165.86 | 3.305 | |
| 8,100.0 | 7,176.6 | 7,165.6 | 7,165.6 | 25.8 | 143.3 | 89.33 | -360.7 | 306.8 | 630.2 | 463.0 | 167.23 | 3.769 | |
| 8,200.0 | 7,175.9 | 7,164.9 | 7,164.9 | 27.2 | 143.3 | 89.20 | -360.7 | 306.8 | 716.9 | 548.2 | 168.66 | 4.250 | |
| 8,300.0 | 7,175.2 | 7,164.2 | 7,164.2 | 28.6 | 143.3 | 89.08 | -360.7 | 306.8 | 806.7 | 636.5 | 170.16 | 4.741 | |
| 8,400.0 | 7,174.4 | 7,163.4 | 7,163.4 | 30.1 | 143.3 | 88.95 | -360.7 | 306.8 | 898.6 | 726.9 | 171.70 | 5.234 | |
| 8,500.0 | 7,173.7 | 7,162.7 | 7,162.7 | 31.6 | 143.3 | 88.83 | -360.7 | 306.8 | 992.1 | 818.8 | 173.28 | 5.725 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13G-323 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 1.0 | 1.0 | 0.0 | 0.0 | -90.00 | 0.0 | -119.9 | 119.9 | 119.9 | 0.00 | N/A | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -90.00 | 0.0 | -119.9 | 119.9 | 119.7 | 0.23 | 528.259 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -90.00 | 0.0 | -119.9 | 119.9 | 119.2 | 0.68 | 177.256 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -90.00 | 0.0 | -119.9 | 119.9 | 118.8 | 1.13 | 106.495 | |
| 366.3 | 366.3 | 367.3 | 367.3 | 0.7 | 0.7 | -90.00 | 0.0 | -119.9 | 119.9 | 118.5 | 1.42 | 84.200 | CC |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | -90.00 | 0.0 | -119.9 | 119.9 | 118.4 | 1.57 | 76.223 | ES |
| 500.0 | 500.0 | 497.0 | 496.9 | 1.0 | 1.0 | -89.88 | 0.3 | -121.5 | 121.6 | 119.6 | 2.01 | 60.605 | |
| 600.0 | 600.0 | 592.7 | 592.6 | 1.2 | 1.2 | -89.55 | 1.0 | -126.3 | 126.6 | 124.2 | 2.44 | 51.912 | |
| 700.0 | 700.0 | 688.1 | 687.6 | 1.5 | 1.4 | -89.05 | 2.2 | -134.2 | 134.9 | 132.0 | 2.89 | 46.703 | |
| 800.0 | 800.0 | 782.8 | 781.6 | 1.7 | 1.7 | -88.45 | 3.9 | -145.2 | 146.5 | 143.1 | 3.36 | 43.567 | |
| 900.0 | 900.0 | 876.7 | 874.5 | 1.9 | 2.0 | -87.81 | 6.1 | -159.0 | 161.3 | 157.5 | 3.87 | 41.712 | |
| 1,000.0 | 1,000.0 | 969.5 | 965.8 | 2.1 | 2.3 | -87.17 | 8.7 | -175.7 | 179.4 | 175.0 | 4.41 | 40.691 | |
| 1,100.0 | 1,100.0 | 1,061.9 | 1,056.0 | 2.4 | 2.7 | -86.57 | 11.7 | -195.1 | 200.6 | 195.6 | 4.99 | 40.235 | |
| 1,200.0 | 1,200.0 | 1,159.3 | 1,150.9 | 2.6 | 3.1 | -86.02 | 15.1 | -216.8 | 223.0 | 217.4 | 5.62 | 39.711 | SF |
| 1,300.0 | 1,300.0 | 1,256.4 | 1,245.5 | 2.8 | 3.5 | -152.95 | 18.4 | -238.4 | 247.0 | 241.4 | 5.60 | 44.099 | |
| 1,400.0 | 1,399.8 | 1,352.7 | 1,339.3 | 3.0 | 4.0 | -152.83 | 21.8 | -259.8 | 273.9 | 267.9 | 6.04 | 45.337 | |
| 1,500.0 | 1,499.5 | 1,448.1 | 1,432.3 | 3.2 | 4.4 | -152.96 | 25.1 | -281.1 | 303.9 | 297.4 | 6.48 | 46.880 | |
| 1,600.0 | 1,598.7 | 1,542.4 | 1,524.2 | 3.5 | 4.9 | -153.27 | 28.4 | -302.0 | 336.8 | 329.9 | 6.91 | 48.732 | |
| 1,700.0 | 1,697.5 | 1,635.6 | 1,615.0 | 3.7 | 5.3 | -153.70 | 31.6 | -322.8 | 372.7 | 365.4 | 7.34 | 50.793 | |
| 1,800.0 | 1,795.6 | 1,727.7 | 1,704.7 | 4.0 | 5.7 | -154.28 | 34.8 | -343.3 | 411.5 | 403.7 | 7.77 | 52.951 | |
| 1,900.0 | 1,893.6 | 1,819.3 | 1,794.0 | 4.4 | 6.2 | -155.04 | 37.9 | -363.7 | 451.1 | 442.9 | 8.24 | 54.757 | |
| 2,000.0 | 1,991.7 | 1,911.0 | 1,883.3 | 4.7 | 6.6 | -155.68 | 41.1 | -384.1 | 490.8 | 482.1 | 8.71 | 56.323 | |
| 2,100.0 | 2,089.7 | 2,002.7 | 1,972.6 | 5.1 | 7.1 | -156.22 | 44.3 | -404.5 | 530.5 | 521.3 | 9.20 | 57.690 | |
| 2,200.0 | 2,187.7 | 2,094.3 | 2,061.9 | 5.5 | 7.5 | -156.69 | 47.5 | -424.9 | 570.3 | 560.6 | 9.68 | 58.890 | |
| 2,300.0 | 2,285.7 | 2,186.0 | 2,151.2 | 5.8 | 8.0 | -157.10 | 50.7 | -445.3 | 610.1 | 599.9 | 10.18 | 59.951 | |
| 2,400.0 | 2,383.7 | 2,277.6 | 2,240.5 | 6.2 | 8.4 | -157.45 | 53.8 | -465.7 | 649.9 | 639.2 | 10.67 | 60.894 | |
| 2,500.0 | 2,481.7 | 2,369.3 | 2,329.9 | 6.6 | 8.9 | -157.77 | 57.0 | -486.0 | 689.7 | 678.6 | 11.17 | 61.736 | |
| 2,600.0 | 2,579.7 | 2,461.0 | 2,419.2 | 7.0 | 9.3 | -158.05 | 60.2 | -506.4 | 729.6 | 717.9 | 11.67 | 62.493 | |
| 2,700.0 | 2,677.7 | 2,552.6 | 2,508.5 | 7.4 | 9.8 | -158.30 | 63.4 | -526.8 | 769.4 | 757.2 | 12.18 | 63.175 | |
| 2,800.0 | 2,775.7 | 2,644.3 | 2,597.8 | 7.8 | 10.2 | -158.53 | 66.5 | -547.2 | 809.3 | 796.6 | 12.69 | 63.793 | |
| 2,900.0 | 2,873.7 | 2,736.0 | 2,687.1 | 8.3 | 10.7 | -158.73 | 69.7 | -567.6 | 849.2 | 836.0 | 13.20 | 64.354 | |
| 3,000.0 | 2,971.7 | 2,827.6 | 2,776.4 | 8.7 | 11.1 | -158.92 | 72.9 | -588.0 | 889.1 | 875.4 | 13.71 | 64.867 | |
| 3,100.0 | 3,069.7 | 2,919.3 | 2,865.7 | 9.1 | 11.6 | -159.09 | 76.1 | -608.4 | 929.0 | 914.7 | 14.22 | 65.336 | |
| 3,200.0 | 3,167.7 | 3,010.9 | 2,955.0 | 9.5 | 12.0 | -159.25 | 79.2 | -628.8 | 968.9 | 954.1 | 14.73 | 65.767 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13G-403 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 2.0 | 2.0 | 0.0 | 0.0 | -90.00 | 0.0 | -150.6 | 150.6 | 150.6 | 0.00 | N/A | |
| 100.0 | 100.0 | 102.0 | 102.0 | 0.1 | 0.1 | -90.00 | 0.0 | -150.6 | 150.6 | 150.4 | 0.23 | 656.891 | |
| 166.0 | 166.0 | 168.0 | 168.0 | 0.3 | 0.3 | -90.00 | 0.0 | -150.6 | 150.6 | 150.1 | 0.53 | 286.370 | CC |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -90.00 | 0.0 | -150.6 | 150.6 | 149.9 | 0.67 | 223.363 | ES |
| 300.0 | 300.0 | 296.9 | 296.9 | 0.6 | 0.5 | -89.90 | 0.3 | -152.2 | 152.3 | 151.2 | 1.11 | 137.321 | |
| 400.0 | 400.0 | 391.8 | 391.6 | 0.8 | 0.8 | -89.61 | 1.1 | -156.9 | 157.3 | 155.7 | 1.55 | 101.687 | |
| 500.0 | 500.0 | 486.2 | 485.7 | 1.0 | 1.0 | -89.17 | 2.4 | -164.7 | 165.5 | 163.5 | 2.01 | 82.520 | |
| 600.0 | 600.0 | 579.9 | 578.8 | 1.2 | 1.3 | -88.63 | 4.2 | -175.4 | 177.0 | 174.5 | 2.49 | 71.029 | |
| 700.0 | 700.0 | 672.9 | 670.8 | 1.5 | 1.6 | -88.03 | 6.5 | -189.0 | 191.7 | 188.7 | 3.01 | 63.639 | |
| 800.0 | 800.0 | 764.9 | 761.2 | 1.7 | 1.9 | -87.41 | 9.3 | -205.3 | 209.5 | 206.0 | 3.57 | 58.716 | |
| 900.0 | 900.0 | 855.7 | 850.0 | 1.9 | 2.3 | -86.81 | 12.5 | -224.3 | 230.6 | 226.4 | 4.16 | 55.356 | |
| 1,000.0 | 1,000.0 | 945.2 | 936.8 | 2.1 | 2.7 | -86.25 | 16.1 | -245.6 | 254.6 | 249.8 | 4.80 | 53.094 | |
| 1,100.0 | 1,100.0 | 1,040.2 | 1,028.4 | 2.4 | 3.2 | -85.71 | 20.3 | -270.2 | 280.8 | 275.3 | 5.49 | 51.114 | |
| 1,200.0 | 1,200.0 | 1,136.6 | 1,121.5 | 2.6 | 3.7 | -85.25 | 24.5 | -295.2 | 307.0 | 300.8 | 6.21 | 49.447 | SF |
| 1,300.0 | 1,300.0 | 1,232.7 | 1,214.2 | 2.8 | 4.3 | -152.15 | 28.7 | -320.1 | 334.7 | 329.0 | 5.70 | 58.696 | |
| 1,400.0 | 1,399.8 | 1,327.9 | 1,306.0 | 3.0 | 4.8 | -151.92 | 32.9 | -344.8 | 365.3 | 359.2 | 6.15 | 59.363 | |
| 1,500.0 | 1,499.5 | 1,422.0 | 1,396.9 | 3.2 | 5.3 | -151.88 | 37.1 | -369.2 | 398.9 | 392.3 | 6.60 | 60.462 | |
| 1,600.0 | 1,598.7 | 1,515.1 | 1,486.7 | 3.5 | 5.8 | -152.00 | 41.2 | -393.4 | 435.4 | 428.4 | 7.03 | 61.896 | |
| 1,700.0 | 1,697.5 | 1,606.9 | 1,575.2 | 3.7 | 6.3 | -152.22 | 45.2 | -417.2 | 474.8 | 467.3 | 7.47 | 63.599 | |
| 1,800.0 | 1,795.6 | 1,697.4 | 1,662.6 | 4.0 | 6.8 | -152.62 | 49.2 | -440.6 | 516.9 | 509.0 | 7.90 | 65.403 | |
| 1,900.0 | 1,893.6 | 1,787.5 | 1,749.5 | 4.4 | 7.3 | -153.28 | 53.1 | -464.0 | 559.9 | 551.5 | 8.38 | 66.803 | |
| 2,000.0 | 1,991.7 | 1,877.7 | 1,836.5 | 4.7 | 7.8 | -153.84 | 57.1 | -487.4 | 602.9 | 594.1 | 8.87 | 67.992 | |
| 2,100.0 | 2,089.7 | 1,967.8 | 1,923.4 | 5.1 | 8.3 | -154.32 | 61.1 | -510.8 | 646.0 | 636.6 | 9.36 | 69.011 | |
| 2,200.0 | 2,187.7 | 2,057.9 | 2,010.4 | 5.5 | 8.8 | -154.75 | 65.0 | -534.1 | 689.1 | 679.2 | 9.86 | 69.891 | |
| 2,300.0 | 2,285.7 | 2,148.0 | 2,097.3 | 5.8 | 9.4 | -155.12 | 69.0 | -557.5 | 732.2 | 721.8 | 10.36 | 70.657 | |
| 2,400.0 | 2,383.7 | 2,238.2 | 2,184.3 | 6.2 | 9.9 | -155.46 | 72.9 | -580.9 | 775.4 | 764.5 | 10.87 | 71.326 | |
| 2,500.0 | 2,481.7 | 2,328.3 | 2,271.2 | 6.6 | 10.4 | -155.76 | 76.9 | -604.2 | 818.5 | 807.1 | 11.38 | 71.917 | |
| 2,600.0 | 2,579.7 | 2,418.4 | 2,358.2 | 7.0 | 10.9 | -156.03 | 80.9 | -627.6 | 861.7 | 849.8 | 11.90 | 72.439 | |
| 2,700.0 | 2,677.7 | 2,508.5 | 2,445.1 | 7.4 | 11.4 | -156.27 | 84.8 | -651.0 | 904.9 | 892.5 | 12.41 | 72.905 | |
| 2,800.0 | 2,775.7 | 2,598.7 | 2,532.1 | 7.8 | 11.9 | -156.49 | 88.8 | -674.4 | 948.1 | 935.2 | 12.93 | 73.322 | |
| 2,900.0 | 2,873.7 | 2,688.8 | 2,619.0 | 8.3 | 12.4 | -156.69 | 92.7 | -697.7 | 991.3 | 977.9 | 13.45 | 73.696 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-203 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 1.0 | 1.0 | 0.0 | 0.0 | -90.00 | 0.0 | -61.4 | 61.4 | 61.4 | 0.00 | N/A | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -90.00 | 0.0 | -61.4 | 61.4 | 61.1 | 0.23 | 270.272 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -90.00 | 0.0 | -61.4 | 61.4 | 60.7 | 0.68 | 90.689 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -90.00 | 0.0 | -61.4 | 61.4 | 60.2 | 1.13 | 54.486 | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 0.8 | -90.00 | 0.0 | -61.4 | 61.4 | 59.8 | 1.58 | 38.941 | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 1.0 | -90.00 | 0.0 | -61.4 | 61.4 | 59.3 | 2.03 | 30.297 | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 1.2 | -90.00 | 0.0 | -61.4 | 61.4 | 58.9 | 2.47 | 24.793 | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.5 | 1.5 | -90.00 | 0.0 | -61.4 | 61.4 | 58.4 | 2.92 | 20.982 | |
| 800.0 | 800.0 | 801.0 | 801.0 | 1.7 | 1.7 | -90.00 | 0.0 | -61.4 | 61.4 | 58.0 | 3.37 | 18.186 | |
| 900.0 | 900.0 | 901.0 | 901.0 | 1.9 | 1.9 | -90.00 | 0.0 | -61.4 | 61.4 | 57.5 | 3.82 | 16.048 | |
| 1,000.0 | 1,000.0 | 1,001.0 | 1,001.0 | 2.1 | 2.1 | -90.00 | 0.0 | -61.4 | 61.4 | 57.1 | 4.27 | 14.360 | |
| 1,100.0 | 1,100.0 | 1,101.0 | 1,101.0 | 2.4 | 2.4 | -90.00 | 0.0 | -61.4 | 61.4 | 56.6 | 4.72 | 12.993 | |
| 1,200.0 | 1,200.0 | 1,201.0 | 1,201.0 | 2.6 | 2.6 | -90.00 | 0.0 | -61.4 | 61.4 | 56.2 | 5.17 | 11.863 | CC, ES |
| 1,300.0 | 1,300.0 | 1,301.0 | 1,301.0 | 2.8 | 2.8 | -158.00 | 0.0 | -61.4 | 63.0 | 57.4 | 5.61 | 11.222 | |
| 1,400.0 | 1,399.8 | 1,400.8 | 1,400.8 | 3.0 | 3.0 | -159.63 | 0.0 | -61.4 | 67.9 | 61.8 | 6.04 | 11.236 | |
| 1,500.0 | 1,499.5 | 1,500.5 | 1,500.5 | 3.2 | 3.3 | -161.86 | 0.0 | -61.4 | 76.1 | 69.6 | 6.46 | 11.772 | |
| 1,600.0 | 1,598.7 | 1,599.7 | 1,599.7 | 3.5 | 3.5 | -164.27 | 0.0 | -61.4 | 87.8 | 80.9 | 6.88 | 12.751 | |
| 1,700.0 | 1,697.5 | 1,697.0 | 1,697.0 | 3.7 | 3.7 | -165.68 | 1.4 | -62.3 | 103.6 | 96.3 | 7.29 | 14.205 | |
| 1,800.0 | 1,795.6 | 1,793.3 | 1,793.2 | 4.0 | 3.9 | -165.65 | 5.5 | -64.9 | 124.0 | 116.3 | 7.71 | 16.095 | |
| 1,900.0 | 1,893.6 | 1,888.8 | 1,888.3 | 4.4 | 4.1 | -164.61 | 12.2 | -69.3 | 146.8 | 138.6 | 8.15 | 18.001 | |
| 2,000.0 | 1,991.7 | 1,983.3 | 1,982.2 | 4.7 | 4.4 | -162.87 | 21.5 | -75.3 | 171.0 | 162.4 | 8.62 | 19.848 | |
| 2,100.0 | 2,089.7 | 2,077.9 | 2,075.7 | 5.1 | 4.6 | -160.78 | 33.2 | -83.0 | 196.8 | 187.7 | 9.10 | 21.632 | |
| 2,200.0 | 2,187.7 | 2,174.1 | 2,170.8 | 5.5 | 4.9 | -158.98 | 45.7 | -91.1 | 223.1 | 213.5 | 9.60 | 23.251 | |
| 2,300.0 | 2,285.7 | 2,270.4 | 2,265.9 | 5.8 | 5.1 | -157.56 | 58.2 | -99.3 | 249.7 | 239.6 | 10.11 | 24.696 | |
| 2,400.0 | 2,383.7 | 2,366.6 | 2,361.0 | 6.2 | 5.4 | -156.41 | 70.7 | -107.4 | 276.3 | 265.7 | 10.63 | 25.981 | |
| 2,500.0 | 2,481.7 | 2,462.9 | 2,456.0 | 6.6 | 5.7 | -155.46 | 83.2 | -115.6 | 303.0 | 291.8 | 11.17 | 27.132 | |
| 2,600.0 | 2,579.7 | 2,559.1 | 2,551.1 | 7.0 | 6.0 | -154.67 | 95.7 | -123.7 | 329.8 | 318.1 | 11.71 | 28.163 | |
| 2,700.0 | 2,677.7 | 2,655.4 | 2,646.2 | 7.4 | 6.3 | -154.00 | 108.3 | -131.9 | 356.6 | 344.4 | 12.26 | 29.089 | |
| 2,800.0 | 2,775.7 | 2,751.7 | 2,741.3 | 7.8 | 6.6 | -153.42 | 120.8 | -140.0 | 383.5 | 370.7 | 12.82 | 29.924 | |
| 2,900.0 | 2,873.7 | 2,847.9 | 2,836.4 | 8.3 | 6.9 | -152.91 | 133.3 | -148.2 | 410.4 | 397.0 | 13.38 | 30.679 | |
| 3,000.0 | 2,971.7 | 2,944.2 | 2,931.5 | 8.7 | 7.2 | -152.47 | 145.8 | -156.3 | 437.3 | 423.4 | 13.94 | 31.364 | |
| 3,100.0 | 3,069.7 | 3,040.4 | 3,026.6 | 9.1 | 7.5 | -152.08 | 158.3 | -164.5 | 464.3 | 449.8 | 14.51 | 31.987 | |
| 3,200.0 | 3,167.7 | 3,136.7 | 3,121.7 | 9.5 | 7.8 | -151.73 | 170.8 | -172.6 | 491.3 | 476.2 | 15.09 | 32.557 | |
| 3,300.0 | 3,265.7 | 3,232.9 | 3,216.7 | 9.9 | 8.2 | -151.42 | 183.3 | -180.8 | 518.2 | 502.6 | 15.67 | 33.078 | |
| 3,400.0 | 3,363.7 | 3,329.2 | 3,311.8 | 10.4 | 8.5 | -151.14 | 195.9 | -188.9 | 545.2 | 529.0 | 16.25 | 33.557 | |
| 3,500.0 | 3,461.7 | 3,425.4 | 3,406.9 | 10.8 | 8.8 | -150.88 | 208.4 | -197.1 | 572.2 | 555.4 | 16.83 | 33.998 | |
| 3,600.0 | 3,559.7 | 3,521.7 | 3,502.0 | 11.2 | 9.1 | -150.65 | 220.9 | -205.2 | 599.3 | 581.8 | 17.42 | 34.405 | |
| 3,700.0 | 3,657.7 | 3,624.7 | 3,603.8 | 11.6 | 9.5 | -150.46 | 233.9 | -213.7 | 626.1 | 608.1 | 18.00 | 34.779 | |
| 3,800.0 | 3,755.7 | 3,737.5 | 3,715.8 | 12.1 | 9.7 | -150.52 | 245.2 | -221.0 | 650.8 | 632.3 | 18.55 | 35.088 | |
| 3,900.0 | 3,853.7 | 3,851.5 | 3,829.5 | 12.5 | 10.0 | -150.88 | 252.7 | -226.0 | 673.2 | 654.1 | 19.07 | 35.304 | |
| 4,000.0 | 3,951.7 | 3,966.5 | 3,944.3 | 12.9 | 10.2 | -151.52 | 256.5 | -228.4 | 693.1 | 673.6 | 19.56 | 35.443 | |
| 4,100.0 | 4,049.7 | 4,072.8 | 4,050.7 | 13.3 | 10.4 | -152.32 | 257.0 | -228.7 | 711.1 | 691.1 | 20.01 | 35.531 | |
| 4,200.0 | 4,147.7 | 4,170.8 | 4,148.7 | 13.8 | 10.6 | -153.04 | 257.0 | -228.7 | 728.8 | 708.3 | 20.47 | 35.602 | |
| 4,300.0 | 4,245.7 | 4,268.8 | 4,246.7 | 14.2 | 10.7 | -153.73 | 257.0 | -228.7 | 746.7 | 725.7 | 20.93 | 35.668 | |
| 4,400.0 | 4,343.7 | 4,366.8 | 4,344.7 | 14.6 | 10.9 | -154.39 | 257.0 | -228.7 | 764.6 | 743.2 | 21.39 | 35.738 | |
| 4,500.0 | 4,441.7 | 4,464.8 | 4,442.7 | 15.1 | 11.1 | -155.01 | 257.0 | -228.7 | 782.7 | 760.8 | 21.86 | 35.810 | |
| 4,600.0 | 4,539.7 | 4,562.8 | 4,540.7 | 15.5 | 11.3 | -155.61 | 257.0 | -228.7 | 800.8 | 778.5 | 22.32 | 35.883 | |
| 4,700.0 | 4,637.7 | 4,660.8 | 4,638.7 | 15.9 | 11.5 | -156.20 | 257.0 | -228.7 | 819.0 | 796.2 | 22.78 | 35.952 | |
| 4,800.0 | 4,736.1 | 4,759.2 | 4,737.1 | 16.2 | 11.7 | -156.82 | 257.0 | -228.7 | 835.5 | 812.2 | 23.26 | 35.923 | |
| 4,900.0 | 4,835.0 | 4,858.2 | 4,836.0 | 16.5 | 11.9 | -157.31 | 257.0 | -228.7 | 848.8 | 825.1 | 23.71 | 35.804 | |
| 5,000.0 | 4,934.4 | 4,957.6 | 4,935.4 | 16.8 | 12.1 | -157.67 | 257.0 | -228.7 | 859.0 | 834.9 | 24.13 | 35.597 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-203 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 5,034.1 | 5,057.3 | 5,035.1 | 17.0 | 12.3 | -157.91 | 257.0 | -228.7 | 866.0 | 841.4 | 24.53 | 35.309 | |
| 5,200.0 | 5,134.0 | 5,157.2 | 5,135.0 | 17.1 | 12.5 | -158.04 | 257.0 | -228.7 | 869.7 | 844.8 | 24.89 | 34.942 | |
| 5,300.0 | 5,234.0 | 5,257.2 | 5,235.0 | 17.3 | 12.7 | -90.66 | 257.0 | -228.7 | 870.4 | 845.2 | 25.25 | 34.479 | |
| 5,400.0 | 5,334.0 | 5,357.2 | 5,335.0 | 17.4 | 12.9 | -90.66 | 257.0 | -228.7 | 870.4 | 844.8 | 25.63 | 33.955 | |
| 5,500.0 | 5,434.0 | 5,457.2 | 5,435.0 | 17.6 | 13.1 | -90.66 | 257.0 | -228.7 | 870.4 | 844.4 | 26.03 | 33.445 | |
| 5,600.0 | 5,534.0 | 5,557.2 | 5,535.0 | 17.7 | 13.3 | -90.66 | 257.0 | -228.7 | 870.4 | 844.0 | 26.42 | 32.947 | |
| 5,700.0 | 5,634.0 | 5,657.2 | 5,635.0 | 17.9 | 13.5 | -90.66 | 257.0 | -228.7 | 870.4 | 843.6 | 26.81 | 32.462 | |
| 5,800.0 | 5,734.0 | 5,757.2 | 5,735.0 | 18.0 | 13.7 | -90.66 | 257.0 | -228.7 | 870.4 | 843.2 | 27.21 | 31.989 | |
| 5,900.0 | 5,834.0 | 5,857.2 | 5,835.0 | 18.2 | 13.9 | -90.66 | 257.0 | -228.7 | 870.4 | 842.8 | 27.61 | 31.527 | |
| 6,000.0 | 5,934.0 | 5,957.2 | 5,935.0 | 18.3 | 14.1 | -90.66 | 257.0 | -228.7 | 870.4 | 842.4 | 28.01 | 31.077 | |
| 6,100.0 | 6,034.0 | 6,057.2 | 6,035.0 | 18.5 | 14.3 | -90.66 | 257.0 | -228.7 | 870.4 | 842.0 | 28.41 | 30.638 | |
| 6,200.0 | 6,134.0 | 6,157.2 | 6,135.0 | 18.6 | 14.5 | -90.66 | 257.0 | -228.7 | 870.4 | 841.6 | 28.81 | 30.210 | |
| 6,300.0 | 6,234.0 | 6,257.2 | 6,235.0 | 18.8 | 14.7 | -90.66 | 257.0 | -228.7 | 870.4 | 841.2 | 29.22 | 29.793 | |
| 6,400.0 | 6,334.0 | 6,357.2 | 6,335.0 | 18.9 | 14.9 | -90.66 | 257.0 | -228.7 | 870.4 | 840.8 | 29.62 | 29.385 | |
| 6,418.8 | 6,352.9 | 6,376.0 | 6,353.9 | 19.0 | 14.9 | -90.66 | 257.0 | -228.7 | 870.4 | 840.7 | 29.70 | 29.309 | |
| 6,500.0 | 6,434.0 | 6,456.1 | 6,433.8 | 19.1 | 15.1 | -90.86 | 254.0 | -228.7 | 870.5 | 840.5 | 29.97 | 29.041 | |
| 6,600.0 | 6,533.9 | 6,552.7 | 6,529.2 | 19.2 | 15.2 | 88.34 | 238.7 | -228.7 | 870.7 | 840.6 | 30.19 | 28.847 | |
| 6,700.0 | 6,632.4 | 6,647.7 | 6,620.1 | 19.3 | 15.2 | 87.52 | 211.3 | -228.7 | 871.2 | 840.9 | 30.27 | 28.782 | |
| 6,800.0 | 6,727.7 | 6,741.3 | 6,705.3 | 19.3 | 15.2 | 86.76 | 172.8 | -228.7 | 871.8 | 841.5 | 30.28 | 28.792 | |
| 6,900.0 | 6,817.8 | 6,833.7 | 6,783.8 | 19.3 | 15.2 | 86.06 | 124.3 | -228.7 | 872.4 | 842.2 | 30.28 | 28.816 | |
| 7,000.0 | 6,900.9 | 6,924.9 | 6,854.6 | 19.3 | 15.2 | 85.43 | 66.8 | -228.7 | 873.2 | 842.8 | 30.33 | 28.789 | |
| 7,100.0 | 6,975.6 | 7,015.2 | 6,916.9 | 19.3 | 15.3 | 84.89 | 1.4 | -228.7 | 873.9 | 843.3 | 30.51 | 28.640 | |
| 7,200.0 | 7,040.4 | 7,104.8 | 6,970.0 | 19.3 | 15.3 | 84.44 | -70.6 | -228.7 | 874.5 | 843.6 | 30.89 | 28.310 | |
| 7,300.0 | 7,093.8 | 7,193.7 | 7,013.5 | 19.4 | 15.7 | 84.09 | -148.1 | -228.7 | 875.0 | 843.5 | 31.53 | 27.754 | |
| 7,400.0 | 7,135.1 | 7,282.3 | 7,047.0 | 19.6 | 16.2 | 83.84 | -230.0 | -228.7 | 875.4 | 843.0 | 32.46 | 26.969 | |
| 7,500.0 | 7,163.2 | 7,370.5 | 7,070.0 | 20.0 | 16.9 | 83.69 | -315.1 | -228.7 | 875.7 | 842.0 | 33.70 | 25.987 | |
| 7,600.0 | 7,177.8 | 7,458.6 | 7,082.4 | 20.6 | 17.6 | 83.66 | -402.3 | -228.7 | 875.7 | 840.5 | 35.22 | 24.865 | |
| 7,700.0 | 7,179.6 | 7,550.9 | 7,084.6 | 21.4 | 18.6 | 83.71 | -494.5 | -228.7 | 875.6 | 838.6 | 37.08 | 23.618 | |
| 7,800.0 | 7,178.8 | 7,650.9 | 7,084.6 | 22.3 | 19.7 | 83.75 | -594.5 | -228.7 | 875.6 | 836.3 | 39.30 | 22.281 | |
| 7,900.0 | 7,178.1 | 7,750.9 | 7,084.5 | 23.4 | 21.0 | 83.80 | -694.5 | -228.7 | 875.5 | 833.7 | 41.74 | 20.973 | |
| 8,000.0 | 7,177.4 | 7,850.9 | 7,084.4 | 24.6 | 22.3 | 83.84 | -794.5 | -228.7 | 875.4 | 831.0 | 44.39 | 19.722 | |
| 8,100.0 | 7,176.6 | 7,950.9 | 7,084.3 | 25.8 | 23.7 | 83.88 | -894.5 | -228.7 | 875.3 | 828.2 | 47.19 | 18.548 | |
| 8,200.0 | 7,175.9 | 8,050.9 | 7,084.3 | 27.2 | 25.2 | 83.93 | -994.5 | -228.7 | 875.3 | 825.1 | 50.14 | 17.458 | |
| 8,300.0 | 7,175.2 | 8,150.9 | 7,084.2 | 28.6 | 26.8 | 83.97 | -1,094.5 | -228.7 | 875.2 | 822.0 | 53.19 | 16.454 | |
| 8,400.0 | 7,174.4 | 8,250.9 | 7,084.1 | 30.1 | 28.4 | 84.01 | -1,194.5 | -228.7 | 875.1 | 818.8 | 56.34 | 15.533 | |
| 8,500.0 | 7,173.7 | 8,350.9 | 7,084.1 | 31.6 | 30.0 | 84.06 | -1,294.5 | -228.7 | 875.1 | 815.5 | 59.57 | 14.690 | |
| 8,600.0 | 7,173.0 | 8,450.9 | 7,084.0 | 33.2 | 31.6 | 84.10 | -1,394.5 | -228.7 | 875.0 | 812.1 | 62.86 | 13.919 | |
| 8,700.0 | 7,172.2 | 8,550.9 | 7,083.9 | 34.8 | 33.3 | 84.14 | -1,494.5 | -228.7 | 874.9 | 808.7 | 66.22 | 13.213 | |
| 8,800.0 | 7,171.5 | 8,650.9 | 7,083.9 | 36.5 | 35.0 | 84.19 | -1,594.5 | -228.7 | 874.9 | 805.2 | 69.62 | 12.566 | |
| 8,900.0 | 7,170.8 | 8,750.9 | 7,083.8 | 38.1 | 36.8 | 84.23 | -1,694.5 | -228.7 | 874.8 | 801.7 | 73.07 | 11.973 | |
| 9,000.0 | 7,170.0 | 8,850.8 | 7,083.7 | 39.8 | 38.5 | 84.27 | -1,794.5 | -228.7 | 874.7 | 798.2 | 76.55 | 11.427 | |
| 9,100.0 | 7,169.3 | 8,950.8 | 7,083.6 | 41.5 | 40.3 | 84.31 | -1,894.5 | -228.7 | 874.7 | 794.6 | 80.06 | 10.925 | |
| 9,200.0 | 7,168.6 | 9,050.8 | 7,083.6 | 43.2 | 42.1 | 84.36 | -1,994.5 | -228.7 | 874.6 | 791.0 | 83.61 | 10.461 | |
| 9,300.0 | 7,167.8 | 9,150.8 | 7,083.5 | 45.0 | 43.9 | 84.40 | -2,094.5 | -228.7 | 874.5 | 787.4 | 87.17 | 10.032 | |
| 9,400.0 | 7,167.1 | 9,250.8 | 7,083.4 | 46.7 | 45.7 | 84.44 | -2,194.5 | -228.7 | 874.5 | 783.7 | 90.76 | 9.635 | |
| 9,500.0 | 7,166.4 | 9,350.8 | 7,083.4 | 48.5 | 47.5 | 84.49 | -2,294.5 | -228.7 | 874.4 | 780.0 | 94.37 | 9.266 | |
| 9,600.0 | 7,165.6 | 9,450.8 | 7,083.3 | 50.3 | 49.3 | 84.53 | -2,394.5 | -228.7 | 874.3 | 776.3 | 98.00 | 8.922 | |
| 9,700.0 | 7,164.9 | 9,550.8 | 7,083.2 | 52.1 | 51.1 | 84.57 | -2,494.5 | -228.7 | 874.3 | 772.6 | 101.64 | 8.602 | |
| 9,800.0 | 7,164.2 | 9,650.8 | 7,083.2 | 53.9 | 52.9 | 84.62 | -2,594.5 | -228.7 | 874.2 | 768.9 | 105.29 | 8.303 | |
| 9,900.0 | 7,163.4 | 9,750.8 | 7,083.1 | 55.7 | 54.8 | 84.66 | -2,694.4 | -228.7 | 874.2 | 765.2 | 108.96 | 8.023 | |
| 10,000.0 | 7,162.7 | 9,850.8 | 7,083.0 | 57.5 | 56.6 | 84.70 | -2,794.4 | -228.7 | 874.1 | 761.5 | 112.64 | 7.760 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-203 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 7,162.0 | 9,950.8 | 7,082.9 | 59.3 | 58.5 | 84.75 | -2,894.4 | -228.7 | 874.0 | 757.7 | 116.33 | 7.513 | |
| 10,200.0 | 7,161.2 | 10,050.8 | 7,082.9 | 61.1 | 60.3 | 84.79 | -2,994.4 | -228.7 | 874.0 | 753.9 | 120.03 | 7.281 | |
| 10,300.0 | 7,160.5 | 10,150.8 | 7,082.8 | 63.0 | 62.2 | 84.83 | -3,094.4 | -228.7 | 873.9 | 750.2 | 123.74 | 7.063 | |
| 10,400.0 | 7,159.8 | 10,250.8 | 7,082.7 | 64.8 | 64.0 | 84.88 | -3,194.4 | -228.7 | 873.9 | 746.4 | 127.45 | 6.856 | |
| 10,500.0 | 7,159.0 | 10,350.8 | 7,082.7 | 66.6 | 65.9 | 84.92 | -3,294.4 | -228.7 | 873.8 | 742.6 | 131.17 | 6.661 | |
| 10,600.0 | 7,158.3 | 10,450.8 | 7,082.6 | 68.5 | 67.8 | 84.96 | -3,394.4 | -228.7 | 873.7 | 738.8 | 134.90 | 6.477 | |
| 10,700.0 | 7,157.6 | 10,550.8 | 7,082.5 | 70.3 | 69.6 | 85.01 | -3,494.4 | -228.7 | 873.7 | 735.0 | 138.64 | 6.302 | |
| 10,800.0 | 7,156.8 | 10,650.8 | 7,082.5 | 72.2 | 71.5 | 85.05 | -3,594.4 | -228.7 | 873.6 | 731.2 | 142.38 | 6.136 | |
| 10,900.0 | 7,156.1 | 10,750.8 | 7,082.4 | 74.0 | 73.4 | 85.09 | -3,694.4 | -228.7 | 873.6 | 727.4 | 146.13 | 5.978 | |
| 11,000.0 | 7,155.4 | 10,850.8 | 7,082.3 | 75.9 | 75.3 | 85.14 | -3,794.4 | -228.7 | 873.5 | 723.6 | 149.88 | 5.828 | |
| 11,100.0 | 7,154.6 | 10,950.8 | 7,082.2 | 77.8 | 77.2 | 85.18 | -3,894.4 | -228.7 | 873.5 | 719.8 | 153.63 | 5.685 | |
| 11,200.0 | 7,153.9 | 11,050.8 | 7,082.2 | 79.6 | 79.0 | 85.22 | -3,994.4 | -228.7 | 873.4 | 716.0 | 157.39 | 5.549 | |
| 11,300.0 | 7,153.2 | 11,150.8 | 7,082.1 | 81.5 | 80.9 | 85.27 | -4,094.4 | -228.7 | 873.3 | 712.2 | 161.16 | 5.419 | |
| 11,400.0 | 7,152.4 | 11,250.8 | 7,082.0 | 83.4 | 82.8 | 85.31 | -4,194.4 | -228.7 | 873.3 | 708.4 | 164.92 | 5.295 | |
| 11,500.0 | 7,151.7 | 11,350.8 | 7,082.0 | 85.2 | 84.7 | 85.35 | -4,294.4 | -228.7 | 873.2 | 704.5 | 168.70 | 5.176 | |
| 11,600.0 | 7,151.0 | 11,450.8 | 7,081.9 | 87.1 | 86.6 | 85.40 | -4,394.4 | -228.7 | 873.2 | 700.7 | 172.47 | 5.063 | |
| 11,700.0 | 7,150.2 | 11,550.8 | 7,081.8 | 89.0 | 88.5 | 85.44 | -4,494.4 | -228.7 | 873.1 | 696.9 | 176.25 | 4.954 | |
| 11,800.0 | 7,149.5 | 11,650.8 | 7,081.8 | 90.9 | 90.4 | 85.48 | -4,594.4 | -228.7 | 873.1 | 693.0 | 180.03 | 4.850 | |
| 11,900.0 | 7,148.8 | 11,750.8 | 7,081.7 | 92.7 | 92.2 | 85.53 | -4,694.4 | -228.7 | 873.0 | 689.2 | 183.81 | 4.750 | |
| 12,000.0 | 7,148.0 | 11,850.8 | 7,081.6 | 94.6 | 94.1 | 85.57 | -4,794.4 | -228.7 | 873.0 | 685.4 | 187.60 | 4.653 | |
| 12,100.0 | 7,147.3 | 11,950.8 | 7,081.6 | 96.5 | 96.0 | 85.61 | -4,894.4 | -228.7 | 872.9 | 681.5 | 191.39 | 4.561 | |
| 12,200.0 | 7,146.6 | 12,050.8 | 7,081.5 | 98.4 | 97.9 | 85.66 | -4,994.4 | -228.7 | 872.9 | 677.7 | 195.18 | 4.472 | |
| 12,300.0 | 7,145.8 | 12,150.8 | 7,081.4 | 100.3 | 99.8 | 85.70 | -5,094.4 | -228.7 | 872.8 | 673.9 | 198.97 | 4.387 | |
| 12,400.0 | 7,145.1 | 12,250.8 | 7,081.3 | 102.2 | 101.7 | 85.74 | -5,194.4 | -228.7 | 872.8 | 670.0 | 202.76 | 4.304 | |
| 12,500.0 | 7,144.4 | 12,350.8 | 7,081.3 | 104.0 | 103.6 | 85.79 | -5,294.4 | -228.7 | 872.7 | 666.2 | 206.56 | 4.225 | |
| 12,600.0 | 7,143.6 | 12,450.8 | 7,081.2 | 105.9 | 105.5 | 85.83 | -5,394.4 | -228.7 | 872.7 | 662.3 | 210.36 | 4.148 | |
| 12,700.0 | 7,142.9 | 12,550.8 | 7,081.1 | 107.8 | 107.4 | 85.87 | -5,494.4 | -228.7 | 872.6 | 658.5 | 214.16 | 4.075 | |
| 12,800.0 | 7,142.2 | 12,650.8 | 7,081.1 | 109.7 | 109.3 | 85.92 | -5,594.4 | -228.7 | 872.6 | 654.6 | 217.96 | 4.003 | |
| 12,900.0 | 7,141.4 | 12,750.8 | 7,081.0 | 111.6 | 111.2 | 85.96 | -5,694.4 | -228.7 | 872.5 | 650.8 | 221.77 | 3.934 | |
| 13,000.0 | 7,140.7 | 12,850.8 | 7,080.9 | 113.5 | 113.1 | 86.01 | -5,794.4 | -228.7 | 872.5 | 646.9 | 225.57 | 3.868 | |
| 13,100.0 | 7,140.0 | 12,950.8 | 7,080.9 | 115.4 | 115.0 | 86.05 | -5,894.4 | -228.7 | 872.4 | 643.1 | 229.38 | 3.803 | |
| 13,200.0 | 7,139.2 | 13,050.8 | 7,080.8 | 117.3 | 116.9 | 86.09 | -5,994.4 | -228.7 | 872.4 | 639.2 | 233.19 | 3.741 | |
| 13,300.0 | 7,138.5 | 13,150.8 | 7,080.7 | 119.2 | 118.8 | 86.14 | -6,094.4 | -228.7 | 872.3 | 635.4 | 237.00 | 3.681 | |
| 13,400.0 | 7,137.8 | 13,250.8 | 7,080.6 | 121.1 | 120.7 | 86.18 | -6,194.4 | -228.7 | 872.3 | 631.5 | 240.81 | 3.622 | |
| 13,500.0 | 7,137.0 | 13,350.8 | 7,080.6 | 123.0 | 122.6 | 86.22 | -6,294.4 | -228.7 | 872.3 | 627.6 | 244.62 | 3.566 | |
| 13,600.0 | 7,136.3 | 13,450.7 | 7,080.5 | 124.9 | 124.5 | 86.27 | -6,394.4 | -228.7 | 872.2 | 623.8 | 248.43 | 3.511 | |
| 13,700.0 | 7,135.6 | 13,550.7 | 7,080.4 | 126.8 | 126.4 | 86.31 | -6,494.4 | -228.7 | 872.2 | 619.9 | 252.25 | 3.458 | |
| 13,800.0 | 7,134.8 | 13,650.7 | 7,080.4 | 128.7 | 128.4 | 86.35 | -6,594.4 | -228.7 | 872.1 | 616.1 | 256.06 | 3.406 | |
| 13,900.0 | 7,134.1 | 13,750.7 | 7,080.3 | 130.6 | 130.3 | 86.40 | -6,694.4 | -228.7 | 872.1 | 612.2 | 259.88 | 3.356 | |
| 14,000.0 | 7,133.4 | 13,850.7 | 7,080.2 | 132.5 | 132.2 | 86.44 | -6,794.4 | -228.7 | 872.0 | 608.3 | 263.70 | 3.307 | |
| 14,100.0 | 7,132.6 | 13,950.7 | 7,080.2 | 134.4 | 134.1 | 86.48 | -6,894.4 | -228.7 | 872.0 | 604.5 | 267.52 | 3.260 | |
| 14,200.0 | 7,131.9 | 14,050.7 | 7,080.1 | 136.3 | 136.0 | 86.53 | -6,994.4 | -228.7 | 872.0 | 600.6 | 271.34 | 3.214 | |
| 14,300.0 | 7,131.2 | 14,150.7 | 7,080.0 | 138.2 | 137.9 | 86.57 | -7,094.4 | -228.7 | 871.9 | 596.8 | 275.16 | 3.169 | |
| 14,321.0 | 7,131.0 | 14,171.3 | 7,080.0 | 138.6 | 138.3 | 86.58 | -7,114.9 | -228.7 | 871.9 | 596.0 | 275.95 | 3.160 | |
| 14,324.1 | 7,131.0 | 14,171.3 | 7,080.0 | 138.6 | 138.3 | 86.58 | -7,114.9 | -228.7 | 871.9 | 595.9 | 276.01 | 3.159 | SF |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-423 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 1.0 | 1.0 | 0.0 | 0.0 | -90.00 | 0.0 | -30.7 | 30.7 | 30.7 | 0.00 | N/A | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -90.00 | 0.0 | -30.7 | 30.7 | 30.5 | 0.23 | 135.136 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -90.00 | 0.0 | -30.7 | 30.7 | 30.0 | 0.68 | 45.345 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -90.00 | 0.0 | -30.7 | 30.7 | 29.6 | 1.13 | 27.243 | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 0.8 | -90.00 | 0.0 | -30.7 | 30.7 | 29.1 | 1.58 | 19.470 | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 1.0 | -90.00 | 0.0 | -30.7 | 30.7 | 28.7 | 2.03 | 15.148 | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 1.2 | -90.00 | 0.0 | -30.7 | 30.7 | 28.2 | 2.47 | 12.397 | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.5 | 1.5 | -90.00 | 0.0 | -30.7 | 30.7 | 27.8 | 2.92 | 10.491 | |
| 800.0 | 800.0 | 801.0 | 801.0 | 1.7 | 1.7 | -90.00 | 0.0 | -30.7 | 30.7 | 27.3 | 3.37 | 9.093 | |
| 900.0 | 900.0 | 901.0 | 901.0 | 1.9 | 1.9 | -90.00 | 0.0 | -30.7 | 30.7 | 26.9 | 3.82 | 8.024 | |
| 1,000.0 | 1,000.0 | 1,001.0 | 1,001.0 | 2.1 | 2.1 | -90.00 | 0.0 | -30.7 | 30.7 | 26.4 | 4.27 | 7.180 | |
| 1,100.0 | 1,100.0 | 1,101.0 | 1,101.0 | 2.4 | 2.4 | -90.00 | 0.0 | -30.7 | 30.7 | 26.0 | 4.72 | 6.496 | |
| 1,200.0 | 1,200.0 | 1,201.0 | 1,201.0 | 2.6 | 2.6 | -90.00 | 0.0 | -30.7 | 30.7 | 25.5 | 5.17 | 5.932 | CC, ES |
| 1,300.0 | 1,300.0 | 1,301.0 | 1,301.0 | 2.8 | 2.8 | -158.58 | 0.0 | -30.7 | 32.3 | 26.7 | 5.61 | 5.756 | |
| 1,400.0 | 1,399.8 | 1,400.8 | 1,400.8 | 3.0 | 3.0 | -161.50 | 0.0 | -30.7 | 37.2 | 31.2 | 6.04 | 6.163 | |
| 1,500.0 | 1,499.5 | 1,500.5 | 1,500.5 | 3.2 | 3.3 | -164.93 | 0.0 | -30.7 | 45.6 | 39.1 | 6.46 | 7.051 | |
| 1,600.0 | 1,598.7 | 1,599.7 | 1,599.7 | 3.5 | 3.5 | -168.04 | 0.0 | -30.7 | 57.4 | 50.5 | 6.88 | 8.346 | |
| 1,700.0 | 1,697.5 | 1,698.5 | 1,698.5 | 3.7 | 3.7 | -170.54 | 0.0 | -30.7 | 72.8 | 65.5 | 7.29 | 9.983 | |
| 1,800.0 | 1,795.6 | 1,796.6 | 1,796.6 | 4.0 | 3.9 | -172.46 | 0.0 | -30.7 | 91.6 | 83.9 | 7.71 | 11.877 | |
| 1,900.0 | 1,893.6 | 1,894.6 | 1,894.6 | 4.4 | 4.1 | -173.80 | 0.0 | -30.7 | 111.3 | 103.2 | 8.15 | 13.653 | |
| 2,000.0 | 1,991.7 | 1,992.7 | 1,992.7 | 4.7 | 4.4 | -174.74 | 0.0 | -30.7 | 131.1 | 122.5 | 8.60 | 15.241 | |
| 2,100.0 | 2,089.7 | 2,094.1 | 2,094.1 | 5.1 | 4.6 | -175.03 | 1.4 | -30.0 | 149.9 | 140.8 | 9.06 | 16.546 | |
| 2,200.0 | 2,187.7 | 2,196.7 | 2,196.5 | 5.5 | 4.8 | -174.35 | 6.0 | -27.6 | 166.2 | 156.7 | 9.52 | 17.465 | |
| 2,300.0 | 2,285.7 | 2,299.9 | 2,299.4 | 5.8 | 5.1 | -172.92 | 14.0 | -23.6 | 180.2 | 170.2 | 9.99 | 18.042 | |
| 2,400.0 | 2,383.7 | 2,403.5 | 2,402.1 | 6.2 | 5.3 | -170.86 | 25.3 | -17.9 | 191.9 | 181.4 | 10.47 | 18.326 | |
| 2,500.0 | 2,481.7 | 2,503.3 | 2,500.9 | 6.6 | 5.5 | -168.60 | 38.3 | -11.4 | 202.3 | 191.3 | 10.96 | 18.452 | |
| 2,600.0 | 2,579.7 | 2,602.5 | 2,599.0 | 7.0 | 5.8 | -166.56 | 51.3 | -4.9 | 213.0 | 201.5 | 11.48 | 18.562 | |
| 2,700.0 | 2,677.7 | 2,701.6 | 2,697.1 | 7.4 | 6.1 | -164.72 | 64.2 | 1.6 | 224.0 | 212.0 | 12.00 | 18.657 | |
| 2,800.0 | 2,775.7 | 2,800.8 | 2,795.2 | 7.8 | 6.3 | -163.05 | 77.1 | 8.1 | 235.1 | 222.6 | 12.55 | 18.739 | |
| 2,900.0 | 2,873.7 | 2,899.9 | 2,893.3 | 8.3 | 6.6 | -161.53 | 90.1 | 14.6 | 246.5 | 233.4 | 13.11 | 18.806 | |
| 3,000.0 | 2,971.7 | 2,999.1 | 2,991.4 | 8.7 | 6.9 | -160.15 | 103.0 | 21.1 | 258.0 | 244.3 | 13.68 | 18.862 | |
| 3,100.0 | 3,069.7 | 3,098.2 | 3,089.5 | 9.1 | 7.2 | -158.89 | 115.9 | 27.6 | 269.6 | 255.3 | 14.26 | 18.907 | |
| 3,200.0 | 3,167.7 | 3,197.4 | 3,187.6 | 9.5 | 7.5 | -157.73 | 128.9 | 34.1 | 281.3 | 266.5 | 14.85 | 18.944 | |
| 3,300.0 | 3,265.7 | 3,296.5 | 3,285.6 | 9.9 | 7.8 | -156.66 | 141.8 | 40.6 | 293.2 | 277.7 | 15.45 | 18.972 | |
| 3,400.0 | 3,363.7 | 3,395.7 | 3,383.7 | 10.4 | 8.1 | -155.68 | 154.7 | 47.0 | 305.1 | 289.1 | 16.07 | 18.993 | |
| 3,500.0 | 3,461.7 | 3,494.8 | 3,481.8 | 10.8 | 8.4 | -154.77 | 167.7 | 53.5 | 317.2 | 300.5 | 16.69 | 19.009 | |
| 3,600.0 | 3,559.7 | 3,594.0 | 3,579.9 | 11.2 | 8.7 | -153.93 | 180.6 | 60.0 | 329.3 | 312.0 | 17.31 | 19.021 | |
| 3,700.0 | 3,657.7 | 3,693.1 | 3,678.0 | 11.6 | 9.0 | -153.14 | 193.5 | 66.5 | 341.4 | 323.5 | 17.94 | 19.028 | |
| 3,800.0 | 3,755.7 | 3,792.3 | 3,776.1 | 12.1 | 9.3 | -152.41 | 206.5 | 73.0 | 353.7 | 335.1 | 18.58 | 19.032 | |
| 3,900.0 | 3,853.7 | 3,891.4 | 3,874.2 | 12.5 | 9.6 | -151.73 | 219.4 | 79.5 | 366.0 | 346.7 | 19.23 | 19.034 | |
| 4,000.0 | 3,951.7 | 3,990.6 | 3,972.3 | 12.9 | 9.9 | -151.10 | 232.3 | 86.0 | 378.3 | 358.4 | 19.88 | 19.033 | |
| 4,100.0 | 4,049.7 | 4,085.7 | 4,066.5 | 13.3 | 10.2 | -150.70 | 243.6 | 91.7 | 391.1 | 370.6 | 20.47 | 19.110 | |
| 4,200.0 | 4,147.7 | 4,180.2 | 4,160.5 | 13.8 | 10.4 | -150.75 | 252.0 | 95.9 | 405.1 | 384.1 | 20.98 | 19.306 | |
| 4,300.0 | 4,245.7 | 4,274.2 | 4,254.3 | 14.2 | 10.6 | -151.19 | 257.7 | 98.8 | 420.2 | 398.8 | 21.44 | 19.597 | |
| 4,400.0 | 4,343.7 | 4,367.6 | 4,347.7 | 14.6 | 10.8 | -151.99 | 260.6 | 100.2 | 436.5 | 414.7 | 21.85 | 19.976 | |
| 4,500.0 | 4,441.7 | 4,462.6 | 4,442.7 | 15.1 | 11.0 | -153.07 | 261.0 | 100.4 | 454.1 | 431.8 | 22.23 | 20.424 | |
| 4,600.0 | 4,539.7 | 4,560.6 | 4,540.7 | 15.5 | 11.1 | -154.16 | 261.0 | 100.4 | 472.0 | 449.3 | 22.63 | 20.859 | |
| 4,700.0 | 4,637.7 | 4,658.6 | 4,638.7 | 15.9 | 11.3 | -155.18 | 261.0 | 100.4 | 490.0 | 467.0 | 23.03 | 21.274 | |
| 4,800.0 | 4,736.1 | 4,757.0 | 4,737.1 | 16.2 | 11.5 | -156.16 | 261.0 | 100.4 | 506.4 | 482.9 | 23.44 | 21.605 | |
| 4,900.0 | 4,835.0 | 4,856.0 | 4,836.0 | 16.5 | 11.7 | -156.91 | 261.0 | 100.4 | 519.6 | 495.8 | 23.83 | 21.808 | |
| 5,000.0 | 4,934.4 | 4,955.4 | 4,935.4 | 16.8 | 11.9 | -157.46 | 261.0 | 100.4 | 529.8 | 505.6 | 24.21 | 21.888 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-423 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 5,034.1 | 5,055.1 | 5,035.1 | 17.0 | 12.1 | -157.82 | 261.0 | 100.4 | 536.8 | 512.2 | 24.56 | 21.852 | |
| 5,200.0 | 5,134.0 | 5,155.0 | 5,135.0 | 17.1 | 12.3 | -158.01 | 261.0 | 100.4 | 540.5 | 515.6 | 24.90 | 21.705 | |
| 5,300.0 | 5,234.0 | 5,255.0 | 5,235.0 | 17.3 | 12.5 | -90.64 | 261.0 | 100.4 | 541.2 | 516.0 | 25.25 | 21.439 | |
| 5,400.0 | 5,334.0 | 5,355.0 | 5,335.0 | 17.4 | 12.7 | -90.64 | 261.0 | 100.4 | 541.2 | 515.6 | 25.64 | 21.113 | |
| 5,500.0 | 5,434.0 | 5,455.0 | 5,435.0 | 17.6 | 12.9 | -90.64 | 261.0 | 100.4 | 541.2 | 515.2 | 26.03 | 20.795 | |
| 5,600.0 | 5,534.0 | 5,555.0 | 5,535.0 | 17.7 | 13.1 | -90.64 | 261.0 | 100.4 | 541.2 | 514.8 | 26.42 | 20.485 | |
| 5,700.0 | 5,634.0 | 5,655.0 | 5,635.0 | 17.9 | 13.3 | -90.64 | 261.0 | 100.4 | 541.2 | 514.4 | 26.82 | 20.183 | |
| 5,800.0 | 5,734.0 | 5,755.0 | 5,735.0 | 18.0 | 13.5 | -90.64 | 261.0 | 100.4 | 541.2 | 514.0 | 27.21 | 19.889 | |
| 5,900.0 | 5,834.0 | 5,855.0 | 5,835.0 | 18.2 | 13.7 | -90.64 | 261.0 | 100.4 | 541.2 | 513.6 | 27.61 | 19.602 | |
| 6,000.0 | 5,934.0 | 5,955.0 | 5,935.0 | 18.3 | 14.0 | -90.64 | 261.0 | 100.4 | 541.2 | 513.2 | 28.01 | 19.322 | |
| 6,100.0 | 6,034.0 | 6,055.0 | 6,035.0 | 18.5 | 14.2 | -90.64 | 261.0 | 100.4 | 541.2 | 512.8 | 28.41 | 19.049 | |
| 6,200.0 | 6,134.0 | 6,155.0 | 6,135.0 | 18.6 | 14.4 | -90.64 | 261.0 | 100.4 | 541.2 | 512.4 | 28.82 | 18.782 | |
| 6,300.0 | 6,234.0 | 6,255.0 | 6,235.0 | 18.8 | 14.6 | -90.64 | 261.0 | 100.4 | 541.2 | 512.0 | 29.22 | 18.523 | |
| 6,400.0 | 6,334.0 | 6,355.0 | 6,335.0 | 18.9 | 14.8 | -90.64 | 261.0 | 100.4 | 541.2 | 511.6 | 29.63 | 18.269 | |
| 6,500.0 | 6,434.0 | 6,455.0 | 6,435.0 | 19.1 | 15.0 | -90.64 | 261.0 | 100.4 | 541.2 | 511.2 | 30.03 | 18.022 | |
| 6,600.0 | 6,533.9 | 6,554.8 | 6,534.9 | 19.2 | 15.2 | 89.71 | 260.8 | 100.4 | 541.2 | 510.8 | 30.42 | 17.790 | |
| 6,635.1 | 6,568.7 | 6,589.7 | 6,569.7 | 19.3 | 15.2 | 90.00 | 259.3 | 100.4 | 541.2 | 510.7 | 30.52 | 17.733 | |
| 6,700.0 | 6,632.4 | 6,654.6 | 6,634.3 | 19.3 | 15.3 | 90.56 | 252.1 | 100.4 | 541.2 | 510.5 | 30.68 | 17.638 | |
| 6,800.0 | 6,727.7 | 6,755.5 | 6,732.7 | 19.3 | 15.4 | 91.50 | 230.2 | 100.4 | 541.4 | 510.5 | 30.83 | 17.558 | |
| 6,900.0 | 6,817.8 | 6,857.6 | 6,828.4 | 19.3 | 15.4 | 92.51 | 195.1 | 100.4 | 541.7 | 510.8 | 30.90 | 17.532 | |
| 7,000.0 | 6,900.9 | 6,961.0 | 6,919.8 | 19.3 | 15.4 | 93.57 | 146.9 | 100.4 | 542.3 | 511.3 | 30.94 | 17.526 | |
| 7,100.0 | 6,975.6 | 7,065.8 | 7,004.9 | 19.3 | 15.5 | 94.66 | 85.8 | 100.4 | 543.0 | 512.0 | 31.04 | 17.496 | |
| 7,200.0 | 7,040.4 | 7,172.2 | 7,081.9 | 19.3 | 15.5 | 95.76 | 12.6 | 100.4 | 544.0 | 512.7 | 31.29 | 17.387 | |
| 7,300.0 | 7,093.8 | 7,280.1 | 7,148.9 | 19.4 | 15.7 | 96.86 | -72.0 | 100.4 | 545.1 | 513.3 | 31.80 | 17.144 | |
| 7,400.0 | 7,135.1 | 7,389.7 | 7,204.0 | 19.6 | 16.2 | 97.92 | -166.6 | 100.4 | 546.5 | 513.8 | 32.66 | 16.732 | |
| 7,500.0 | 7,163.2 | 7,501.0 | 7,245.6 | 20.0 | 16.9 | 98.93 | -269.7 | 100.4 | 547.9 | 513.9 | 33.95 | 16.140 | |
| 7,600.0 | 7,177.8 | 7,613.9 | 7,272.0 | 20.6 | 17.8 | 99.86 | -379.3 | 100.4 | 549.4 | 513.7 | 35.68 | 15.397 | |
| 7,700.0 | 7,179.6 | 7,718.9 | 7,284.2 | 21.4 | 18.8 | 100.84 | -483.7 | 100.4 | 551.1 | 513.5 | 37.67 | 14.632 | |
| 7,800.0 | 7,178.8 | 7,827.8 | 7,291.6 | 22.3 | 20.0 | 101.67 | -592.2 | 100.4 | 552.6 | 512.7 | 39.91 | 13.848 | |
| 7,900.0 | 7,178.1 | 7,930.4 | 7,291.7 | 23.4 | 21.3 | 101.75 | -694.8 | 100.4 | 552.8 | 510.4 | 42.35 | 13.054 | |
| 8,000.0 | 7,177.4 | 8,030.4 | 7,291.4 | 24.6 | 22.6 | 101.80 | -794.8 | 100.4 | 552.9 | 507.9 | 44.94 | 12.303 | |
| 8,100.0 | 7,176.6 | 8,130.4 | 7,291.2 | 25.8 | 24.0 | 101.85 | -894.8 | 100.4 | 553.0 | 505.3 | 47.68 | 11.597 | |
| 8,200.0 | 7,175.9 | 8,230.4 | 7,291.0 | 27.2 | 25.5 | 101.90 | -994.8 | 100.4 | 553.1 | 502.5 | 50.56 | 10.938 | |
| 8,300.0 | 7,175.2 | 8,330.4 | 7,290.7 | 28.6 | 27.0 | 101.95 | -1,094.8 | 100.4 | 553.2 | 499.6 | 53.55 | 10.330 | |
| 8,400.0 | 7,174.4 | 8,430.4 | 7,290.5 | 30.1 | 28.6 | 102.00 | -1,194.8 | 100.4 | 553.3 | 496.7 | 56.63 | 9.770 | |
| 8,500.0 | 7,173.7 | 8,530.4 | 7,290.2 | 31.6 | 30.2 | 102.05 | -1,294.8 | 100.4 | 553.4 | 493.6 | 59.79 | 9.256 | |
| 8,600.0 | 7,173.0 | 8,630.4 | 7,290.0 | 33.2 | 31.9 | 102.10 | -1,394.8 | 100.4 | 553.5 | 490.5 | 63.01 | 8.784 | |
| 8,700.0 | 7,172.2 | 8,730.4 | 7,289.7 | 34.8 | 33.5 | 102.15 | -1,494.8 | 100.4 | 553.6 | 487.3 | 66.29 | 8.351 | |
| 8,800.0 | 7,171.5 | 8,830.4 | 7,289.5 | 36.5 | 35.2 | 102.20 | -1,594.8 | 100.4 | 553.7 | 484.1 | 69.62 | 7.954 | |
| 8,900.0 | 7,170.8 | 8,930.4 | 7,289.2 | 38.1 | 37.0 | 102.25 | -1,694.8 | 100.4 | 553.8 | 480.8 | 72.98 | 7.588 | |
| 9,000.0 | 7,170.0 | 9,030.4 | 7,289.0 | 39.8 | 38.7 | 102.30 | -1,794.8 | 100.4 | 553.9 | 477.5 | 76.39 | 7.251 | |
| 9,100.0 | 7,169.3 | 9,130.4 | 7,288.8 | 41.5 | 40.5 | 102.35 | -1,894.8 | 100.4 | 554.0 | 474.2 | 79.82 | 6.941 | |
| 9,200.0 | 7,168.6 | 9,230.4 | 7,288.5 | 43.2 | 42.2 | 102.40 | -1,994.8 | 100.4 | 554.1 | 470.8 | 83.28 | 6.654 | |
| 9,300.0 | 7,167.8 | 9,330.4 | 7,288.3 | 45.0 | 44.0 | 102.45 | -2,094.8 | 100.4 | 554.2 | 467.5 | 86.76 | 6.388 | |
| 9,400.0 | 7,167.1 | 9,430.4 | 7,288.0 | 46.7 | 45.8 | 102.49 | -2,194.8 | 100.4 | 554.3 | 464.1 | 90.27 | 6.141 | |
| 9,500.0 | 7,166.4 | 9,530.4 | 7,287.8 | 48.5 | 47.6 | 102.54 | -2,294.8 | 100.4 | 554.4 | 460.6 | 93.79 | 5.911 | |
| 9,600.0 | 7,165.6 | 9,630.4 | 7,287.5 | 50.3 | 49.4 | 102.59 | -2,394.8 | 100.4 | 554.5 | 457.2 | 97.33 | 5.698 | |
| 9,700.0 | 7,164.9 | 9,730.4 | 7,287.3 | 52.1 | 51.3 | 102.64 | -2,494.8 | 100.4 | 554.6 | 453.8 | 100.88 | 5.498 | |
| 9,800.0 | 7,164.2 | 9,830.4 | 7,287.0 | 53.9 | 53.1 | 102.69 | -2,594.8 | 100.4 | 554.7 | 450.3 | 104.44 | 5.312 | |
| 9,900.0 | 7,163.4 | 9,930.4 | 7,286.8 | 55.7 | 54.9 | 102.74 | -2,694.8 | 100.4 | 554.9 | 446.8 | 108.02 | 5.137 | |
| 10,000.0 | 7,162.7 | 10,030.4 | 7,286.6 | 57.5 | 56.8 | 102.79 | -2,794.8 | 100.4 | 555.0 | 443.4 | 111.60 | 4.973 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-423 - Wellbore #1 - Plan #1 (3-11-14)

**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 | 7,162.0 | 10,130.4 | 7,286.3 | 59.3 | 58.6 | 102.84 | -2,894.8 | 100.4 | 555.1 | 439.9 | 115.20 | 4.818 | |
| 10,200.0 | 7,161.2 | 10,230.4 | 7,286.1 | 61.1 | 60.5 | 102.89 | -2,994.8 | 100.4 | 555.2 | 436.4 | 118.80 | 4.673 | |
| 10,300.0 | 7,160.5 | 10,330.4 | 7,285.8 | 63.0 | 62.3 | 102.94 | -3,094.8 | 100.4 | 555.3 | 432.9 | 122.41 | 4.536 | |
| 10,400.0 | 7,159.8 | 10,430.4 | 7,285.6 | 64.8 | 64.2 | 102.99 | -3,194.8 | 100.4 | 555.4 | 429.4 | 126.02 | 4.407 | |
| 10,500.0 | 7,159.0 | 10,530.4 | 7,285.3 | 66.6 | 66.0 | 103.04 | -3,294.8 | 100.4 | 555.5 | 425.9 | 129.65 | 4.285 | |
| 10,600.0 | 7,158.3 | 10,630.4 | 7,285.1 | 68.5 | 67.9 | 103.09 | -3,394.8 | 100.4 | 555.6 | 422.3 | 133.27 | 4.169 | |
| 10,700.0 | 7,157.6 | 10,730.4 | 7,284.8 | 70.3 | 69.8 | 103.13 | -3,494.8 | 100.4 | 555.7 | 418.8 | 136.90 | 4.059 | |
| 10,800.0 | 7,156.8 | 10,830.4 | 7,284.6 | 72.2 | 71.6 | 103.18 | -3,594.8 | 100.4 | 555.8 | 415.3 | 140.54 | 3.955 | |
| 10,900.0 | 7,156.1 | 10,930.4 | 7,284.4 | 74.0 | 73.5 | 103.23 | -3,694.8 | 100.4 | 556.0 | 411.8 | 144.18 | 3.856 | |
| 11,000.0 | 7,155.4 | 11,030.4 | 7,284.1 | 75.9 | 75.4 | 103.28 | -3,794.8 | 100.4 | 556.1 | 408.2 | 147.82 | 3.762 | |
| 11,100.0 | 7,154.6 | 11,130.4 | 7,283.9 | 77.8 | 77.3 | 103.33 | -3,894.8 | 100.4 | 556.2 | 404.7 | 151.47 | 3.672 | |
| 11,200.0 | 7,153.9 | 11,230.4 | 7,283.6 | 79.6 | 79.1 | 103.38 | -3,994.8 | 100.4 | 556.3 | 401.2 | 155.11 | 3.586 | |
| 11,300.0 | 7,153.2 | 11,330.4 | 7,283.4 | 81.5 | 81.0 | 103.43 | -4,094.8 | 100.4 | 556.4 | 397.6 | 158.76 | 3.505 | |
| 11,400.0 | 7,152.4 | 11,430.4 | 7,283.1 | 83.4 | 82.9 | 103.48 | -4,194.8 | 100.4 | 556.5 | 394.1 | 162.42 | 3.426 | |
| 11,500.0 | 7,151.7 | 11,530.4 | 7,282.9 | 85.2 | 84.8 | 103.53 | -4,294.8 | 100.4 | 556.6 | 390.6 | 166.07 | 3.352 | |
| 11,600.0 | 7,151.0 | 11,630.4 | 7,282.6 | 87.1 | 86.7 | 103.57 | -4,394.8 | 100.4 | 556.7 | 387.0 | 169.73 | 3.280 | |
| 11,700.0 | 7,150.2 | 11,730.4 | 7,282.4 | 89.0 | 88.6 | 103.62 | -4,494.8 | 100.4 | 556.9 | 383.5 | 173.39 | 3.212 | |
| 11,800.0 | 7,149.5 | 11,830.4 | 7,282.2 | 90.9 | 90.4 | 103.67 | -4,594.8 | 100.4 | 557.0 | 379.9 | 177.04 | 3.146 | |
| 11,900.0 | 7,148.8 | 11,930.4 | 7,281.9 | 92.7 | 92.3 | 103.72 | -4,694.8 | 100.4 | 557.1 | 376.4 | 180.70 | 3.083 | |
| 12,000.0 | 7,148.0 | 12,030.4 | 7,281.7 | 94.6 | 94.2 | 103.77 | -4,794.8 | 100.4 | 557.2 | 372.8 | 184.37 | 3.022 | |
| 12,100.0 | 7,147.3 | 12,130.4 | 7,281.4 | 96.5 | 96.1 | 103.82 | -4,894.8 | 100.4 | 557.3 | 369.3 | 188.03 | 2.964 | |
| 12,200.0 | 7,146.6 | 12,230.3 | 7,281.2 | 98.4 | 98.0 | 103.87 | -4,994.8 | 100.4 | 557.4 | 365.7 | 191.69 | 2.908 | |
| 12,300.0 | 7,145.8 | 12,330.3 | 7,280.9 | 100.3 | 99.9 | 103.92 | -5,094.8 | 100.4 | 557.6 | 362.2 | 195.35 | 2.854 | |
| 12,400.0 | 7,145.1 | 12,430.3 | 7,280.7 | 102.2 | 101.8 | 103.97 | -5,194.8 | 100.4 | 557.7 | 358.7 | 199.02 | 2.802 | |
| 12,500.0 | 7,144.4 | 12,530.3 | 7,280.4 | 104.0 | 103.7 | 104.01 | -5,294.8 | 100.4 | 557.8 | 355.1 | 202.68 | 2.752 | |
| 12,600.0 | 7,143.6 | 12,630.3 | 7,280.2 | 105.9 | 105.6 | 104.06 | -5,394.8 | 100.4 | 557.9 | 351.6 | 206.34 | 2.704 | |
| 12,700.0 | 7,142.9 | 12,730.3 | 7,280.0 | 107.8 | 107.5 | 104.11 | -5,494.8 | 100.4 | 558.0 | 348.0 | 210.01 | 2.657 | |
| 12,800.0 | 7,142.2 | 12,830.3 | 7,279.7 | 109.7 | 109.4 | 104.16 | -5,594.8 | 100.4 | 558.1 | 344.5 | 213.67 | 2.612 | |
| 12,900.0 | 7,141.4 | 12,930.3 | 7,279.5 | 111.6 | 111.3 | 104.21 | -5,694.8 | 100.4 | 558.3 | 340.9 | 217.34 | 2.569 | |
| 13,000.0 | 7,140.7 | 13,030.3 | 7,279.2 | 113.5 | 113.2 | 104.26 | -5,794.8 | 100.4 | 558.4 | 337.4 | 221.00 | 2.527 | |
| 13,100.0 | 7,140.0 | 13,130.3 | 7,279.0 | 115.4 | 115.1 | 104.31 | -5,894.8 | 100.4 | 558.5 | 333.8 | 224.66 | 2.486 | |
| 13,200.0 | 7,139.2 | 13,230.3 | 7,278.7 | 117.3 | 117.0 | 104.35 | -5,994.8 | 100.4 | 558.6 | 330.3 | 228.33 | 2.447 | |
| 13,300.0 | 7,138.5 | 13,330.3 | 7,278.5 | 119.2 | 118.9 | 104.40 | -6,094.8 | 100.4 | 558.8 | 326.8 | 231.99 | 2.409 | |
| 13,400.0 | 7,137.8 | 13,430.3 | 7,278.2 | 121.1 | 120.8 | 104.45 | -6,194.8 | 100.4 | 558.9 | 323.2 | 235.65 | 2.372 | |
| 13,500.0 | 7,137.0 | 13,530.3 | 7,278.0 | 123.0 | 122.7 | 104.50 | -6,294.8 | 100.4 | 559.0 | 319.7 | 239.32 | 2.336 | |
| 13,600.0 | 7,136.3 | 13,630.3 | 7,277.8 | 124.9 | 124.6 | 104.55 | -6,394.7 | 100.4 | 559.1 | 316.1 | 242.98 | 2.301 | |
| 13,700.0 | 7,135.6 | 13,730.3 | 7,277.5 | 126.8 | 126.5 | 104.60 | -6,494.7 | 100.4 | 559.2 | 312.6 | 246.64 | 2.267 | |
| 13,800.0 | 7,134.8 | 13,830.3 | 7,277.3 | 128.7 | 128.4 | 104.65 | -6,594.7 | 100.4 | 559.4 | 309.1 | 250.30 | 2.235 | |
| 13,900.0 | 7,134.1 | 13,930.3 | 7,277.0 | 130.6 | 130.3 | 104.69 | -6,694.7 | 100.4 | 559.5 | 305.5 | 253.96 | 2.203 | |
| 14,000.0 | 7,133.4 | 14,030.3 | 7,276.8 | 132.5 | 132.2 | 104.74 | -6,794.7 | 100.4 | 559.6 | 302.0 | 257.62 | 2.172 | |
| 14,100.0 | 7,132.6 | 14,130.3 | 7,276.5 | 134.4 | 134.1 | 104.79 | -6,894.7 | 100.4 | 559.7 | 298.5 | 261.28 | 2.142 | |
| 14,200.0 | 7,131.9 | 14,230.3 | 7,276.3 | 136.3 | 136.1 | 104.84 | -6,994.7 | 100.4 | 559.9 | 294.9 | 264.94 | 2.113 | |
| 14,300.0 | 7,131.2 | 14,330.3 | 7,276.0 | 138.2 | 138.0 | 104.89 | -7,094.7 | 100.4 | 560.0 | 291.4 | 268.59 | 2.085 | |
| 14,324.1 | 7,131.0 | 14,350.5 | 7,276.0 | 138.6 | 138.3 | 104.90 | -7,114.9 | 100.4 | 560.0 | 290.6 | 269.40 | 2.079 | SF |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Stroh 13GK-HZ Pad Sec. 13-T4N-R67W - Stroh 13K-443 - Wellbore #1 - Plan #1 (3-11-14)

**Offset Site Error:** 0.0 ft

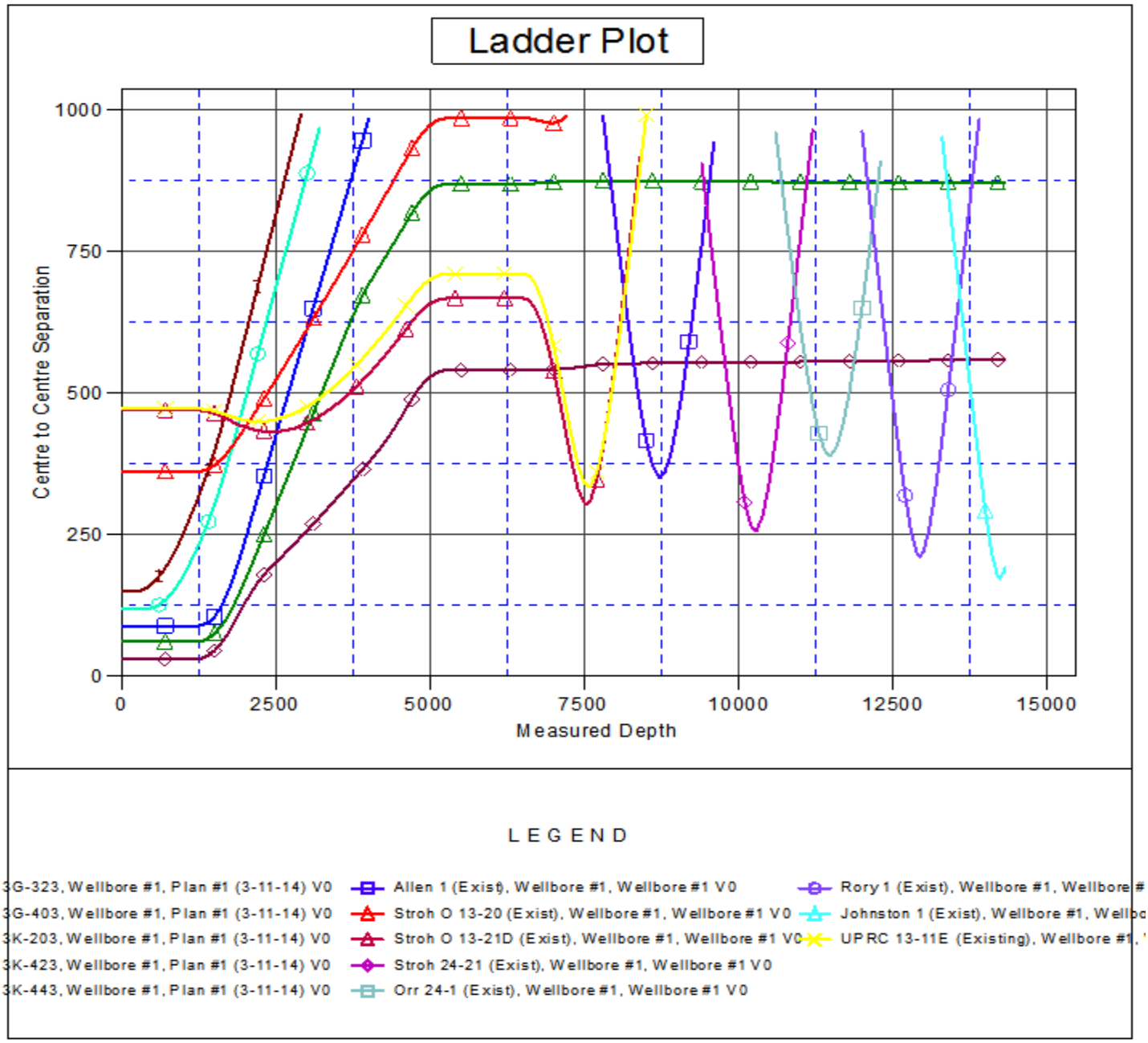
**Survey Program:** 0-MWD

**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 | 1.0 | 1.0 | 0.0 | 0.0 | -90.00 | 0.0 | -89.2 | 89.2 | 89.2 | 0.00 | N/A | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -90.00 | 0.0 | -89.2 | 89.2 | 89.0 | 0.23 | 393.123 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -90.00 | 0.0 | -89.2 | 89.2 | 88.6 | 0.68 | 131.912 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -90.00 | 0.0 | -89.2 | 89.2 | 88.1 | 1.13 | 79.252 | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 0.8 | -90.00 | 0.0 | -89.2 | 89.2 | 87.7 | 1.58 | 56.641 | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 1.0 | -90.00 | 0.0 | -89.2 | 89.2 | 87.2 | 2.03 | 44.068 | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 1.2 | -90.00 | 0.0 | -89.2 | 89.2 | 86.8 | 2.47 | 36.063 | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.5 | 1.5 | -90.00 | 0.0 | -89.2 | 89.2 | 86.3 | 2.92 | 30.519 | |
| 800.0 | 800.0 | 801.0 | 801.0 | 1.7 | 1.7 | -90.00 | 0.0 | -89.2 | 89.2 | 85.9 | 3.37 | 26.453 | |
| 900.0 | 900.0 | 901.0 | 901.0 | 1.9 | 1.9 | -90.00 | 0.0 | -89.2 | 89.2 | 85.4 | 3.82 | 23.342 | |
| 1,000.0 | 1,000.0 | 1,001.0 | 1,001.0 | 2.1 | 2.1 | -90.00 | 0.0 | -89.2 | 89.2 | 85.0 | 4.27 | 20.887 | |
| 1,100.0 | 1,100.0 | 1,101.0 | 1,101.0 | 2.4 | 2.4 | -90.00 | 0.0 | -89.2 | 89.2 | 84.5 | 4.72 | 18.898 | |
| 1,200.0 | 1,200.0 | 1,201.0 | 1,201.0 | 2.6 | 2.6 | -90.00 | 0.0 | -89.2 | 89.2 | 84.1 | 5.17 | 17.256 | CC, ES |
| 1,300.0 | 1,300.0 | 1,301.0 | 1,301.0 | 2.8 | 2.8 | -157.82 | 0.0 | -89.2 | 90.9 | 85.2 | 5.61 | 16.193 | |
| 1,400.0 | 1,399.8 | 1,400.0 | 1,400.0 | 3.0 | 3.0 | -158.95 | 0.0 | -89.2 | 95.7 | 89.7 | 6.04 | 15.857 | SF |
| 1,500.0 | 1,499.5 | 1,497.0 | 1,496.9 | 3.2 | 3.2 | -160.40 | 0.2 | -90.9 | 105.6 | 99.1 | 6.45 | 16.378 | |
| 1,600.0 | 1,598.7 | 1,591.9 | 1,591.7 | 3.5 | 3.4 | -161.72 | 0.9 | -95.6 | 122.0 | 115.2 | 6.84 | 17.827 | |
| 1,700.0 | 1,697.5 | 1,684.9 | 1,684.5 | 3.7 | 3.6 | -162.77 | 1.9 | -103.3 | 144.9 | 137.7 | 7.24 | 20.014 | |
| 1,800.0 | 1,795.6 | 1,775.7 | 1,774.6 | 4.0 | 3.9 | -163.58 | 3.3 | -113.6 | 174.0 | 166.3 | 7.64 | 22.770 | |
| 1,900.0 | 1,893.6 | 1,864.4 | 1,862.4 | 4.4 | 4.1 | -164.10 | 5.0 | -126.5 | 206.8 | 198.7 | 8.06 | 25.646 | |
| 2,000.0 | 1,991.7 | 1,951.3 | 1,947.9 | 4.7 | 4.3 | -164.30 | 7.1 | -141.7 | 242.4 | 233.9 | 8.49 | 28.541 | |
| 2,100.0 | 2,089.7 | 2,043.9 | 2,038.8 | 5.1 | 4.6 | -164.37 | 9.5 | -159.3 | 279.5 | 270.6 | 8.93 | 31.288 | |
| 2,200.0 | 2,187.7 | 2,136.8 | 2,129.9 | 5.5 | 4.9 | -164.42 | 11.9 | -177.0 | 316.6 | 307.2 | 9.38 | 33.767 | |
| 2,300.0 | 2,285.7 | 2,229.6 | 2,221.0 | 5.8 | 5.2 | -164.46 | 14.3 | -194.7 | 353.7 | 343.9 | 9.83 | 35.978 | |
| 2,400.0 | 2,383.7 | 2,322.5 | 2,312.2 | 6.2 | 5.5 | -164.50 | 16.7 | -212.4 | 390.8 | 380.5 | 10.29 | 37.992 | |
| 2,500.0 | 2,481.7 | 2,415.4 | 2,403.3 | 6.6 | 5.9 | -164.53 | 19.1 | -230.1 | 427.9 | 417.1 | 10.75 | 39.809 | |
| 2,600.0 | 2,579.7 | 2,508.2 | 2,494.4 | 7.0 | 6.2 | -164.55 | 21.4 | -247.8 | 465.0 | 453.7 | 11.22 | 41.457 | |
| 2,700.0 | 2,677.7 | 2,601.1 | 2,585.6 | 7.4 | 6.6 | -164.57 | 23.8 | -265.6 | 502.1 | 490.4 | 11.69 | 42.957 | |
| 2,800.0 | 2,775.7 | 2,694.0 | 2,676.7 | 7.8 | 6.9 | -164.59 | 26.2 | -283.3 | 539.1 | 527.0 | 12.16 | 44.327 | |
| 2,900.0 | 2,873.7 | 2,786.8 | 2,767.8 | 8.3 | 7.3 | -164.60 | 28.6 | -301.0 | 576.2 | 563.6 | 12.64 | 45.581 | |
| 3,000.0 | 2,971.7 | 2,879.7 | 2,858.9 | 8.7 | 7.7 | -164.62 | 31.0 | -318.7 | 613.3 | 600.2 | 13.12 | 46.733 | |
| 3,100.0 | 3,069.7 | 2,972.6 | 2,950.1 | 9.1 | 8.0 | -164.63 | 33.4 | -336.4 | 650.4 | 636.8 | 13.61 | 47.794 | |
| 3,200.0 | 3,167.7 | 3,065.4 | 3,041.2 | 9.5 | 8.4 | -164.64 | 35.8 | -354.1 | 687.5 | 673.4 | 14.10 | 48.773 | |
| 3,300.0 | 3,265.7 | 3,158.3 | 3,132.3 | 9.9 | 8.8 | -164.65 | 38.2 | -371.8 | 724.6 | 710.0 | 14.59 | 49.680 | |
| 3,400.0 | 3,363.7 | 3,251.2 | 3,223.5 | 10.4 | 9.2 | -164.66 | 40.6 | -389.5 | 761.7 | 746.6 | 15.08 | 50.521 | |
| 3,500.0 | 3,461.7 | 3,344.0 | 3,314.6 | 10.8 | 9.5 | -164.67 | 43.0 | -407.2 | 798.8 | 783.2 | 15.57 | 51.303 | |
| 3,600.0 | 3,559.7 | 3,436.9 | 3,405.7 | 11.2 | 9.9 | -164.67 | 45.4 | -424.9 | 835.9 | 819.8 | 16.06 | 52.031 | |
| 3,700.0 | 3,657.7 | 3,529.8 | 3,496.9 | 11.6 | 10.3 | -164.68 | 47.8 | -442.6 | 873.0 | 856.4 | 16.56 | 52.711 | |
| 3,800.0 | 3,755.7 | 3,622.6 | 3,588.0 | 12.1 | 10.7 | -164.69 | 50.2 | -460.3 | 910.1 | 893.0 | 17.06 | 53.347 | |
| 3,900.0 | 3,853.7 | 3,715.5 | 3,679.1 | 12.5 | 11.1 | -164.69 | 52.6 | -478.1 | 947.2 | 929.6 | 17.56 | 53.943 | |
| 4,000.0 | 3,951.7 | 3,808.4 | 3,770.3 | 12.9 | 11.5 | -164.70 | 55.0 | -495.8 | 984.2 | 966.2 | 18.06 | 54.503 | |

| | | | |
|---|---|---|---|
| **Company:** | PETROLEUM DEVELOPMENT CORP Weld County CO | **Local Co-ordinate Reference:** | Well Stroh 13O-343 |
| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 4819.0ft (Original Well Elev) Coordinates are relative to: Stroh 13O-343
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: 0.42°



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| **Project:** | SEC.13-T4N-R67W | **TVD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Reference Site:** | Stroh 13GK-HZ Pad Sec. 13-T4N-R67W | **MD Reference:** | WELL @ 4819.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Stroh 13O-343 | **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 (3-11-14) | **Offset TVD Reference:** | Offset Datum |

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