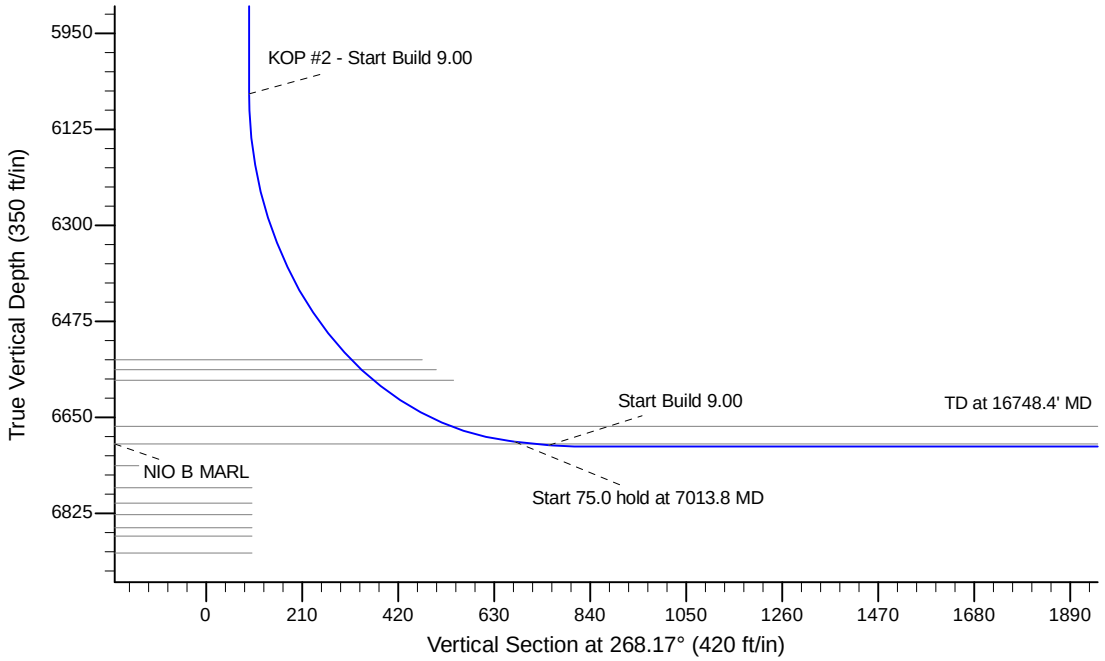
Project: Wattenberg Field
Site: A (Sec.13-T06N-R64W) Weld County, CO
Well: Lapp A15-645
Wellbore: Original Drilling
Design: APD - Rev 1

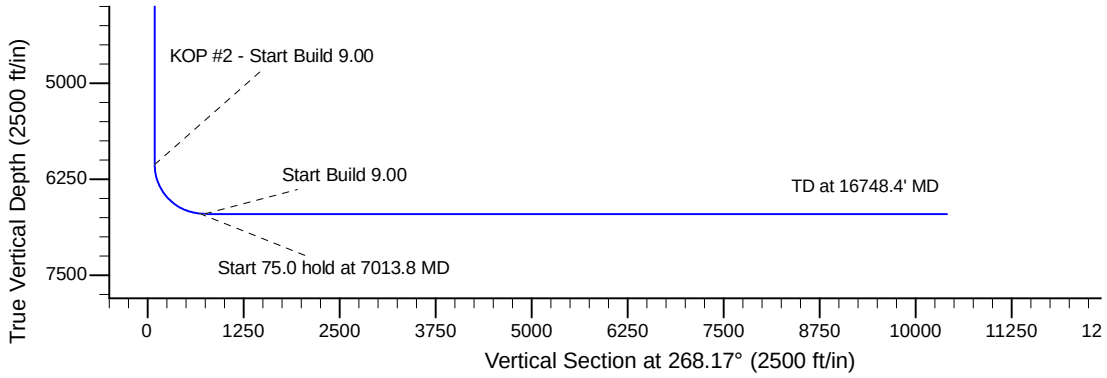
# Northern Region Drilling - Working

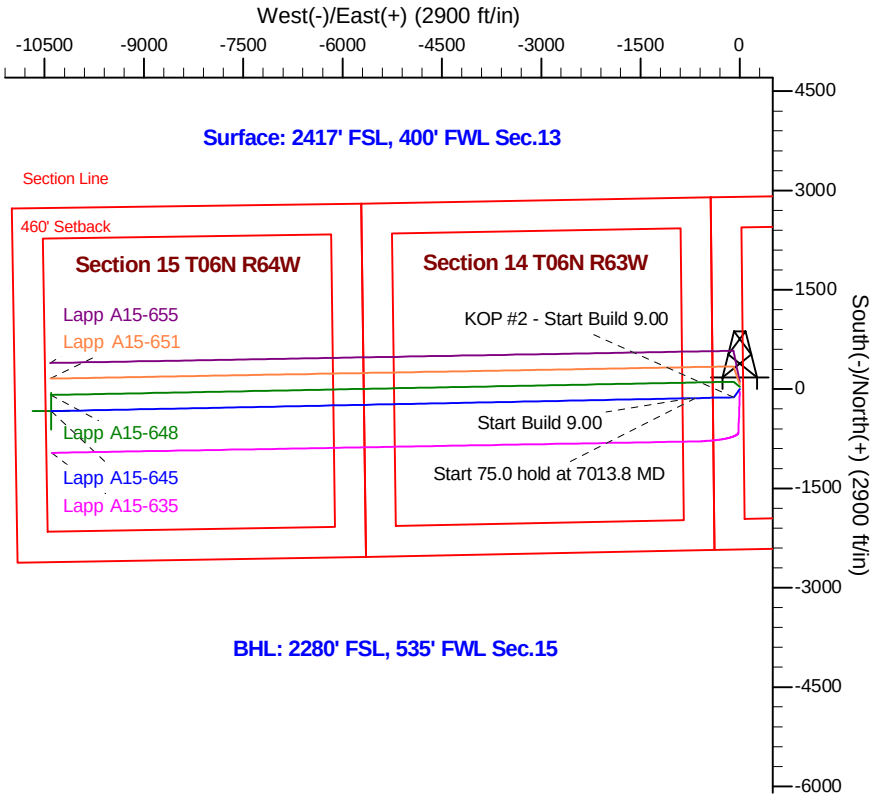
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

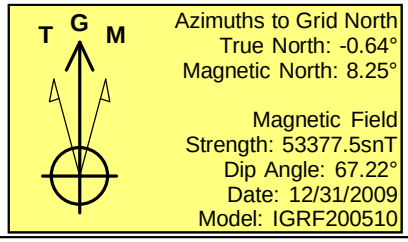
SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 2 | 2200.0 | 0.00 | 0.00 | 2200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 2600.9 | 8.02 | 215.75 | 2599.6 | -22.7 | -16.4 | 2.00 | 215.75 | 17.1 | |
| 4 | 3303.6 | 8.02 | 215.75 | 3295.4 | -102.3 | -73.6 | 0.00 | 0.00 | 76.9 | |
| 5 | 3704.5 | 0.00 | 0.00 | 3695.0 | -125.0 | -90.0 | 2.00 | 180.00 | 94.0 | |
| 6 | 6069.3 | 0.00 | 0.00 | 6059.8 | -125.0 | -90.0 | 0.00 | 0.00 | 94.0 | |
| 7 | 7013.8 | 85.00 | 268.84 | 6694.0 | -136.7 | -671.0 | 9.00 | 268.84 | 675.0 | |
| 8 | 7088.8 | 85.00 | 268.84 | 6700.6 | -138.2 | -745.7 | 0.00 | 0.00 | 749.8 | |
| 9 | 7144.3 | 90.00 | 268.84 | 6703.0 | -139.3 | -801.2 | 9.00 | 0.00 | 805.2 | |
| 10 | 16748.4 | 90.00 | 268.84 | 6703.0 | -333.0 | -10403.3 | 0.00 | 0.00 | 10408.6 | Lapp A15-645 BHL 2280'FSL, 535'FWL |




WELL DETAILS: Lapp A15-645

Ground Level: 4668.0

| | | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 1421282.00 | 3276375.59 | 40.485570 | -104.506390 |

Plan: APD - Rev 1 (Lapp A15-645/Original Drilling)

Created By: Shailey Jewell Date: 15:42, January 12 2016

Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____

# Northern Region Drilling - Working

**Wattenberg Field**
**A (06N-64W)**
**Lapp A15-645**

**Original Drilling**

**Plan: APD - Rev 1**

# Standard Planning Report

**12 January, 2016**

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Project** Wattenberg Field, Weld County CO

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

**Site** A (06N-64W)

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,408,077.93 usft | **Latitude:** | 40.449320 |
| **From:** | Lat/Long | **Easting:** | 3,276,618.19 usft | **Longitude:** | -104.506050 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.64 ° |

**Well** Lapp A15-645

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 13,204.6 ft | **Northing:** | 1,421,282.00 usft | **Latitude:** | 40.485570 |
| | **+E/-W** | -242.6 ft | **Easting:** | 3,276,375.60 usft | **Longitude:** | -104.506390 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | 0.0 ft | **Ground Level:** | 4,668.0 ft |

**Wellbore** Original Drilling

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF200510 | 12/31/2009 | 8.89 | 67.22 | 53,378 |

**Design** APD - Rev 1

**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 | 268.17 |

**Plan Sections**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2,600.9 | 8.02 | 215.75 | 2,599.6 | -22.7 | -16.4 | 2.00 | 2.00 | 0.00 | 215.75 | |
| 3,303.6 | 8.02 | 215.75 | 3,295.4 | -102.3 | -73.6 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3,704.5 | 0.00 | 0.00 | 3,695.0 | -125.0 | -90.0 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,069.3 | 0.00 | 0.00 | 6,059.8 | -125.0 | -90.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,013.8 | 85.00 | 268.84 | 6,694.0 | -136.7 | -671.0 | 9.00 | 9.00 | 0.00 | 268.84 | |
| 7,088.8 | 85.00 | 268.84 | 6,700.6 | -138.2 | -745.7 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,144.3 | 90.00 | 268.84 | 6,703.0 | -139.3 | -801.2 | 9.00 | 9.00 | 0.00 | 0.00 | |
| 16,748.4 | 90.00 | 268.84 | 6,703.0 | -333.0 | -10,403.3 | 0.00 | 0.00 | 0.00 | 0.00 | Lapp A15-645 BHL 22 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 50.0 | 0.00 | 0.00 | 50.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 150.0 | 0.00 | 0.00 | 150.0 | 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 |
| 250.0 | 0.00 | 0.00 | 250.0 | 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 |
| 350.0 | 0.00 | 0.00 | 350.0 | 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 |
| 450.0 | 0.00 | 0.00 | 450.0 | 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 |
| 550.0 | 0.00 | 0.00 | 550.0 | 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 |
| 650.0 | 0.00 | 0.00 | 650.0 | 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 |
| 750.0 | 0.00 | 0.00 | 750.0 | 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 |
| 850.0 | 0.00 | 0.00 | 850.0 | 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 |
| 950.0 | 0.00 | 0.00 | 950.0 | 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 |
| 1,050.0 | 0.00 | 0.00 | 1,050.0 | 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 |
| 1,150.0 | 0.00 | 0.00 | 1,150.0 | 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 |
| 1,250.0 | 0.00 | 0.00 | 1,250.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,350.0 | 0.00 | 0.00 | 1,350.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,450.0 | 0.00 | 0.00 | 1,450.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,550.0 | 0.00 | 0.00 | 1,550.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,650.0 | 0.00 | 0.00 | 1,650.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,750.0 | 0.00 | 0.00 | 1,750.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,850.0 | 0.00 | 0.00 | 1,850.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 1,950.0 | 0.00 | 0.00 | 1,950.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,050.0 | 0.00 | 0.00 | 2,050.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,150.0 | 0.00 | 0.00 | 2,150.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 2,250.0 | 1.00 | 215.75 | 2,250.0 | -0.4 | -0.3 | 0.3 | 2.00 | 2.00 | 0.00 |
| 2,300.0 | 2.00 | 215.75 | 2,300.0 | -1.4 | -1.0 | 1.1 | 2.00 | 2.00 | 0.00 |
| 2,350.0 | 3.00 | 215.75 | 2,349.9 | -3.2 | -2.3 | 2.4 | 2.00 | 2.00 | 0.00 |
| 2,400.0 | 4.00 | 215.75 | 2,399.8 | -5.7 | -4.1 | 4.3 | 2.00 | 2.00 | 0.00 |
| 2,450.0 | 5.00 | 215.75 | 2,449.7 | -8.8 | -6.4 | 6.6 | 2.00 | 2.00 | 0.00 |
| 2,500.0 | 6.00 | 215.75 | 2,499.5 | -12.7 | -9.2 | 9.6 | 2.00 | 2.00 | 0.00 |
| 2,550.0 | 7.00 | 215.75 | 2,549.1 | -17.3 | -12.5 | 13.0 | 2.00 | 2.00 | 0.00 |
| 2,600.0 | 8.00 | 215.75 | 2,598.7 | -22.6 | -16.3 | 17.0 | 2.00 | 2.00 | 0.00 |
| 2,600.9 | 8.02 | 215.75 | 2,599.6 | -22.7 | -16.4 | 17.1 | 2.00 | 2.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 2,650.0 | 8.02 | 215.75 | 2,648.2 | -28.3 | -20.4 | 21.3 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 8.02 | 215.75 | 2,697.7 | -33.9 | -24.4 | 25.5 | 0.00 | 0.00 | 0.00 |
| 2,750.0 | 8.02 | 215.75 | 2,747.2 | -39.6 | -28.5 | 29.8 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 8.02 | 215.75 | 2,796.7 | -45.3 | -32.6 | 34.0 | 0.00 | 0.00 | 0.00 |
| 2,850.0 | 8.02 | 215.75 | 2,846.3 | -50.9 | -36.7 | 38.3 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 8.02 | 215.75 | 2,895.8 | -56.6 | -40.7 | 42.5 | 0.00 | 0.00 | 0.00 |
| 2,950.0 | 8.02 | 215.75 | 2,945.3 | -62.2 | -44.8 | 46.8 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 8.02 | 215.75 | 2,994.8 | -67.9 | -48.9 | 51.0 | 0.00 | 0.00 | 0.00 |
| 3,050.0 | 8.02 | 215.75 | 3,044.3 | -73.6 | -53.0 | 55.3 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 8.02 | 215.75 | 3,093.8 | -79.2 | -57.0 | 59.5 | 0.00 | 0.00 | 0.00 |
| 3,150.0 | 8.02 | 215.75 | 3,143.3 | -84.9 | -61.1 | 63.8 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 8.02 | 215.75 | 3,192.8 | -90.5 | -65.2 | 68.1 | 0.00 | 0.00 | 0.00 |
| 3,250.0 | 8.02 | 215.75 | 3,242.3 | -96.2 | -69.3 | 72.3 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 8.02 | 215.75 | 3,291.9 | -101.9 | -73.3 | 76.6 | 0.00 | 0.00 | 0.00 |
| 3,303.6 | 8.02 | 215.75 | 3,295.4 | -102.3 | -73.6 | 76.9 | 0.00 | 0.00 | 0.00 |
| 3,350.0 | 7.09 | 215.75 | 3,341.4 | -107.2 | -77.2 | 80.6 | 2.00 | -2.00 | 0.00 |
| 3,400.0 | 6.09 | 215.75 | 3,391.1 | -111.9 | -80.6 | 84.1 | 2.00 | -2.00 | 0.00 |
| 3,450.0 | 5.09 | 215.75 | 3,440.9 | -115.8 | -83.4 | 87.1 | 2.00 | -2.00 | 0.00 |
| 3,500.0 | 4.09 | 215.75 | 3,490.7 | -119.1 | -85.7 | 89.5 | 2.00 | -2.00 | 0.00 |
| 3,550.0 | 3.09 | 215.75 | 3,540.6 | -121.6 | -87.6 | 91.4 | 2.00 | -2.00 | 0.00 |
| 3,600.0 | 2.09 | 215.75 | 3,590.5 | -123.5 | -88.9 | 92.8 | 2.00 | -2.00 | 0.00 |
| 3,650.0 | 1.09 | 215.75 | 3,640.5 | -124.6 | -89.7 | 93.6 | 2.00 | -2.00 | 0.00 |
| 3,700.0 | 0.09 | 215.75 | 3,690.5 | -125.0 | -90.0 | 94.0 | 2.00 | -2.00 | 0.00 |
| 3,704.5 | 0.00 | 0.00 | 3,695.0 | -125.0 | -90.0 | 94.0 | 2.00 | -2.00 | 0.00 |
| 3,750.0 | 0.00 | 0.00 | 3,740.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 0.00 | 0.00 | 3,790.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 3,850.0 | 0.00 | 0.00 | 3,840.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 0.00 | 0.00 | 3,890.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 3,950.0 | 0.00 | 0.00 | 3,940.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 0.00 | 0.00 | 3,990.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,050.0 | 0.00 | 0.00 | 4,040.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 0.00 | 0.00 | 4,090.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,150.0 | 0.00 | 0.00 | 4,140.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 0.00 | 0.00 | 4,190.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,250.0 | 0.00 | 0.00 | 4,240.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 0.00 | 0.00 | 4,290.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,350.0 | 0.00 | 0.00 | 4,340.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,400.0 | 0.00 | 0.00 | 4,390.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,450.0 | 0.00 | 0.00 | 4,440.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 0.00 | 0.00 | 4,490.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,550.0 | 0.00 | 0.00 | 4,540.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 0.00 | 0.00 | 4,590.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,650.0 | 0.00 | 0.00 | 4,640.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 0.00 | 0.00 | 4,690.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,750.0 | 0.00 | 0.00 | 4,740.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 0.00 | 0.00 | 4,790.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,850.0 | 0.00 | 0.00 | 4,840.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,900.0 | 0.00 | 0.00 | 4,890.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 4,950.0 | 0.00 | 0.00 | 4,940.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 0.00 | 0.00 | 4,990.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,050.0 | 0.00 | 0.00 | 5,040.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,100.0 | 0.00 | 0.00 | 5,090.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,150.0 | 0.00 | 0.00 | 5,140.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 0.00 | 0.00 | 5,190.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,250.0 | 0.00 | 0.00 | 5,240.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,300.0 | 0.00 | 0.00 | 5,290.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,350.0 | 0.00 | 0.00 | 5,340.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 0.00 | 0.00 | 5,390.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,450.0 | 0.00 | 0.00 | 5,440.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 0.00 | 0.00 | 5,490.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,550.0 | 0.00 | 0.00 | 5,540.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,600.0 | 0.00 | 0.00 | 5,590.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,650.0 | 0.00 | 0.00 | 5,640.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,700.0 | 0.00 | 0.00 | 5,690.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,750.0 | 0.00 | 0.00 | 5,740.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,800.0 | 0.00 | 0.00 | 5,790.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,850.0 | 0.00 | 0.00 | 5,840.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,900.0 | 0.00 | 0.00 | 5,890.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 5,950.0 | 0.00 | 0.00 | 5,940.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 5,990.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 6,050.0 | 0.00 | 0.00 | 6,040.5 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 6,069.3 | 0.00 | 0.00 | 6,059.8 | -125.0 | -90.0 | 94.0 | 0.00 | 0.00 | 0.00 |
| 6,100.0 | 2.76 | 268.84 | 6,090.5 | -125.0 | -90.7 | 94.7 | 9.00 | 9.00 | 0.00 |
| 6,150.0 | 7.26 | 268.84 | 6,140.3 | -125.1 | -95.1 | 99.1 | 9.00 | 9.00 | 0.00 |
| 6,200.0 | 11.76 | 268.84 | 6,189.6 | -125.3 | -103.4 | 107.3 | 9.00 | 9.00 | 0.00 |
| 6,250.0 | 16.26 | 268.84 | 6,238.1 | -125.5 | -115.5 | 119.4 | 9.00 | 9.00 | 0.00 |
| 6,300.0 | 20.76 | 268.84 | 6,285.5 | -125.8 | -131.3 | 135.3 | 9.00 | 9.00 | 0.00 |
| 6,350.0 | 25.26 | 268.84 | 6,331.5 | -126.2 | -150.9 | 154.8 | 9.00 | 9.00 | 0.00 |
| 6,400.0 | 29.76 | 268.84 | 6,375.8 | -126.7 | -173.9 | 177.9 | 9.00 | 9.00 | 0.00 |
| 6,450.0 | 34.26 | 268.84 | 6,418.2 | -127.2 | -200.4 | 204.4 | 9.00 | 9.00 | 0.00 |
| 6,500.0 | 38.76 | 268.84 | 6,458.4 | -127.8 | -230.2 | 234.1 | 9.00 | 9.00 | 0.00 |
| 6,550.0 | 43.26 | 268.84 | 6,496.1 | -128.5 | -263.0 | 266.9 | 9.00 | 9.00 | 0.00 |
| 6,600.0 | 47.76 | 268.84 | 6,531.2 | -129.2 | -298.6 | 302.6 | 9.00 | 9.00 | 0.00 |
| 6,650.0 | 52.26 | 268.84 | 6,563.3 | -130.0 | -336.9 | 340.9 | 9.00 | 9.00 | 0.00 |
| 6,700.0 | 56.76 | 268.84 | 6,592.3 | -130.8 | -377.6 | 381.6 | 9.00 | 9.00 | 0.00 |
| 6,750.0 | 61.26 | 268.84 | 6,618.0 | -131.7 | -420.4 | 424.4 | 9.00 | 9.00 | 0.00 |
| 6,800.0 | 65.76 | 268.84 | 6,640.3 | -132.6 | -465.2 | 469.2 | 9.00 | 9.00 | 0.00 |
| 6,850.0 | 70.26 | 268.84 | 6,659.1 | -133.5 | -511.5 | 515.5 | 9.00 | 9.00 | 0.00 |
| 6,900.0 | 74.76 | 268.84 | 6,674.1 | -134.5 | -559.2 | 563.2 | 9.00 | 9.00 | 0.00 |
| 6,950.0 | 79.26 | 268.84 | 6,685.3 | -135.4 | -607.9 | 611.9 | 9.00 | 9.00 | 0.00 |
| 7,000.0 | 83.76 | 268.84 | 6,692.7 | -136.4 | -657.3 | 661.3 | 9.00 | 9.00 | 0.00 |
| 7,013.8 | 85.00 | 268.84 | 6,694.0 | -136.7 | -671.0 | 675.0 | 9.00 | 9.00 | 0.00 |
| 7,050.0 | 85.00 | 268.84 | 6,697.2 | -137.4 | -707.1 | 711.1 | 0.00 | 0.00 | 0.00 |
| 7,088.8 | 85.00 | 268.84 | 6,700.6 | -138.2 | -745.7 | 749.8 | 0.00 | 0.00 | 0.00 |
| 7,100.0 | 86.01 | 268.84 | 6,701.5 | -138.4 | -756.9 | 760.9 | 9.00 | 9.00 | 0.00 |
| 7,144.3 | 90.00 | 268.84 | 6,703.0 | -139.3 | -801.2 | 805.2 | 9.00 | 9.00 | 0.00 |
| 7,150.0 | 90.00 | 268.84 | 6,703.0 | -139.5 | -806.9 | 810.9 | 0.00 | 0.00 | 0.00 |
| 7,200.0 | 90.00 | 268.84 | 6,703.0 | -140.5 | -856.9 | 860.9 | 0.00 | 0.00 | 0.00 |
| 7,250.0 | 90.00 | 268.84 | 6,703.0 | -141.5 | -906.8 | 910.9 | 0.00 | 0.00 | 0.00 |
| 7,300.0 | 90.00 | 268.84 | 6,703.0 | -142.5 | -956.8 | 960.9 | 0.00 | 0.00 | 0.00 |
| 7,350.0 | 90.00 | 268.84 | 6,703.0 | -143.5 | -1,006.8 | 1,010.9 | 0.00 | 0.00 | 0.00 |
| 7,400.0 | 90.00 | 268.84 | 6,703.0 | -144.5 | -1,056.8 | 1,060.9 | 0.00 | 0.00 | 0.00 |
| 7,450.0 | 90.00 | 268.84 | 6,703.0 | -145.5 | -1,106.8 | 1,110.9 | 0.00 | 0.00 | 0.00 |
| 7,500.0 | 90.00 | 268.84 | 6,703.0 | -146.5 | -1,156.8 | 1,160.9 | 0.00 | 0.00 | 0.00 |
| 7,550.0 | 90.00 | 268.84 | 6,703.0 | -147.5 | -1,206.8 | 1,210.9 | 0.00 | 0.00 | 0.00 |
| 7,600.0 | 90.00 | 268.84 | 6,703.0 | -148.5 | -1,256.8 | 1,260.9 | 0.00 | 0.00 | 0.00 |
| 7,650.0 | 90.00 | 268.84 | 6,703.0 | -149.5 | -1,306.8 | 1,310.9 | 0.00 | 0.00 | 0.00 |
| 7,700.0 | 90.00 | 268.84 | 6,703.0 | -150.5 | -1,356.7 | 1,360.9 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 7,750.0 | 90.00 | 268.84 | 6,703.0 | -151.6 | -1,406.7 | 1,410.9 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 90.00 | 268.84 | 6,703.0 | -152.6 | -1,456.7 | 1,460.9 | 0.00 | 0.00 | 0.00 |
| 7,850.0 | 90.00 | 268.84 | 6,703.0 | -153.6 | -1,506.7 | 1,510.9 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 90.00 | 268.84 | 6,703.0 | -154.6 | -1,556.7 | 1,560.9 | 0.00 | 0.00 | 0.00 |
| 7,950.0 | 90.00 | 268.84 | 6,703.0 | -155.6 | -1,606.7 | 1,610.9 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.00 | 268.84 | 6,703.0 | -156.6 | -1,656.7 | 1,660.9 | 0.00 | 0.00 | 0.00 |
| 8,050.0 | 90.00 | 268.84 | 6,703.0 | -157.6 | -1,706.7 | 1,710.8 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.00 | 268.84 | 6,703.0 | -158.6 | -1,756.7 | 1,760.8 | 0.00 | 0.00 | 0.00 |
| 8,150.0 | 90.00 | 268.84 | 6,703.0 | -159.6 | -1,806.7 | 1,810.8 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.00 | 268.84 | 6,703.0 | -160.6 | -1,856.6 | 1,860.8 | 0.00 | 0.00 | 0.00 |
| 8,250.0 | 90.00 | 268.84 | 6,703.0 | -161.6 | -1,906.6 | 1,910.8 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.00 | 268.84 | 6,703.0 | -162.6 | -1,956.6 | 1,960.8 | 0.00 | 0.00 | 0.00 |
| 8,350.0 | 90.00 | 268.84 | 6,703.0 | -163.7 | -2,006.6 | 2,010.8 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 90.00 | 268.84 | 6,703.0 | -164.7 | -2,056.6 | 2,060.8 | 0.00 | 0.00 | 0.00 |
| 8,450.0 | 90.00 | 268.84 | 6,703.0 | -165.7 | -2,106.6 | 2,110.8 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.00 | 268.84 | 6,703.0 | -166.7 | -2,156.6 | 2,160.8 | 0.00 | 0.00 | 0.00 |
| 8,550.0 | 90.00 | 268.84 | 6,703.0 | -167.7 | -2,206.6 | 2,210.8 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 90.00 | 268.84 | 6,703.0 | -168.7 | -2,256.6 | 2,260.8 | 0.00 | 0.00 | 0.00 |
| 8,650.0 | 90.00 | 268.84 | 6,703.0 | -169.7 | -2,306.6 | 2,310.8 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 90.00 | 268.84 | 6,703.0 | -170.7 | -2,356.5 | 2,360.8 | 0.00 | 0.00 | 0.00 |
| 8,750.0 | 90.00 | 268.84 | 6,703.0 | -171.7 | -2,406.5 | 2,410.8 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.00 | 268.84 | 6,703.0 | -172.7 | -2,456.5 | 2,460.8 | 0.00 | 0.00 | 0.00 |
| 8,850.0 | 90.00 | 268.84 | 6,703.0 | -173.7 | -2,506.5 | 2,510.8 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.00 | 268.84 | 6,703.0 | -174.7 | -2,556.5 | 2,560.8 | 0.00 | 0.00 | 0.00 |
| 8,950.0 | 90.00 | 268.84 | 6,703.0 | -175.7 | -2,606.5 | 2,610.8 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.00 | 268.84 | 6,703.0 | -176.8 | -2,656.5 | 2,660.8 | 0.00 | 0.00 | 0.00 |
| 9,050.0 | 90.00 | 268.84 | 6,703.0 | -177.8 | -2,706.5 | 2,710.8 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.00 | 268.84 | 6,703.0 | -178.8 | -2,756.5 | 2,760.8 | 0.00 | 0.00 | 0.00 |
| 9,150.0 | 90.00 | 268.84 | 6,703.0 | -179.8 | -2,806.5 | 2,810.8 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.00 | 268.84 | 6,703.0 | -180.8 | -2,856.4 | 2,860.8 | 0.00 | 0.00 | 0.00 |
| 9,250.0 | 90.00 | 268.84 | 6,703.0 | -181.8 | -2,906.4 | 2,910.8 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.00 | 268.84 | 6,703.0 | -182.8 | -2,956.4 | 2,960.8 | 0.00 | 0.00 | 0.00 |
| 9,350.0 | 90.00 | 268.84 | 6,703.0 | -183.8 | -3,006.4 | 3,010.8 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.00 | 268.84 | 6,703.0 | -184.8 | -3,056.4 | 3,060.8 | 0.00 | 0.00 | 0.00 |
| 9,450.0 | 90.00 | 268.84 | 6,703.0 | -185.8 | -3,106.4 | 3,110.7 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.00 | 268.84 | 6,703.0 | -186.8 | -3,156.4 | 3,160.7 | 0.00 | 0.00 | 0.00 |
| 9,550.0 | 90.00 | 268.84 | 6,703.0 | -187.8 | -3,206.4 | 3,210.7 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.00 | 268.84 | 6,703.0 | -188.9 | -3,256.4 | 3,260.7 | 0.00 | 0.00 | 0.00 |
| 9,650.0 | 90.00 | 268.84 | 6,703.0 | -189.9 | -3,306.4 | 3,310.7 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.00 | 268.84 | 6,703.0 | -190.9 | -3,356.3 | 3,360.7 | 0.00 | 0.00 | 0.00 |
| 9,750.0 | 90.00 | 268.84 | 6,703.0 | -191.9 | -3,406.3 | 3,410.7 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.00 | 268.84 | 6,703.0 | -192.9 | -3,456.3 | 3,460.7 | 0.00 | 0.00 | 0.00 |
| 9,850.0 | 90.00 | 268.84 | 6,703.0 | -193.9 | -3,506.3 | 3,510.7 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.00 | 268.84 | 6,703.0 | -194.9 | -3,556.3 | 3,560.7 | 0.00 | 0.00 | 0.00 |
| 9,950.0 | 90.00 | 268.84 | 6,703.0 | -195.9 | -3,606.3 | 3,610.7 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.00 | 268.84 | 6,703.0 | -196.9 | -3,656.3 | 3,660.7 | 0.00 | 0.00 | 0.00 |
| 10,050.0 | 90.00 | 268.84 | 6,703.0 | -197.9 | -3,706.3 | 3,710.7 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.00 | 268.84 | 6,703.0 | -198.9 | -3,756.3 | 3,760.7 | 0.00 | 0.00 | 0.00 |
| 10,150.0 | 90.00 | 268.84 | 6,703.0 | -199.9 | -3,806.3 | 3,810.7 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.00 | 268.84 | 6,703.0 | -201.0 | -3,856.2 | 3,860.7 | 0.00 | 0.00 | 0.00 |
| 10,250.0 | 90.00 | 268.84 | 6,703.0 | -202.0 | -3,906.2 | 3,910.7 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.00 | 268.84 | 6,703.0 | -203.0 | -3,956.2 | 3,960.7 | 0.00 | 0.00 | 0.00 |
| 10,350.0 | 90.00 | 268.84 | 6,703.0 | -204.0 | -4,006.2 | 4,010.7 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.00 | 268.84 | 6,703.0 | -205.0 | -4,056.2 | 4,060.7 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,450.0 | 90.00 | 268.84 | 6,703.0 | -206.0 | -4,106.2 | 4,110.7 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.00 | 268.84 | 6,703.0 | -207.0 | -4,156.2 | 4,160.7 | 0.00 | 0.00 | 0.00 |
| 10,550.0 | 90.00 | 268.84 | 6,703.0 | -208.0 | -4,206.2 | 4,210.7 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.00 | 268.84 | 6,703.0 | -209.0 | -4,256.2 | 4,260.7 | 0.00 | 0.00 | 0.00 |
| 10,650.0 | 90.00 | 268.84 | 6,703.0 | -210.0 | -4,306.1 | 4,310.7 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.00 | 268.84 | 6,703.0 | -211.0 | -4,356.1 | 4,360.7 | 0.00 | 0.00 | 0.00 |
| 10,750.0 | 90.00 | 268.84 | 6,703.0 | -212.0 | -4,406.1 | 4,410.7 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.00 | 268.84 | 6,703.0 | -213.0 | -4,456.1 | 4,460.7 | 0.00 | 0.00 | 0.00 |
| 10,850.0 | 90.00 | 268.84 | 6,703.0 | -214.1 | -4,506.1 | 4,510.7 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.00 | 268.84 | 6,703.0 | -215.1 | -4,556.1 | 4,560.6 | 0.00 | 0.00 | 0.00 |
| 10,950.0 | 90.00 | 268.84 | 6,703.0 | -216.1 | -4,606.1 | 4,610.6 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.00 | 268.84 | 6,703.0 | -217.1 | -4,656.1 | 4,660.6 | 0.00 | 0.00 | 0.00 |
| 11,050.0 | 90.00 | 268.84 | 6,703.0 | -218.1 | -4,706.1 | 4,710.6 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 90.00 | 268.84 | 6,703.0 | -219.1 | -4,756.1 | 4,760.6 | 0.00 | 0.00 | 0.00 |
| 11,150.0 | 90.00 | 268.84 | 6,703.0 | -220.1 | -4,806.0 | 4,810.6 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 90.00 | 268.84 | 6,703.0 | -221.1 | -4,856.0 | 4,860.6 | 0.00 | 0.00 | 0.00 |
| 11,250.0 | 90.00 | 268.84 | 6,703.0 | -222.1 | -4,906.0 | 4,910.6 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 90.00 | 268.84 | 6,703.0 | -223.1 | -4,956.0 | 4,960.6 | 0.00 | 0.00 | 0.00 |
| 11,350.0 | 90.00 | 268.84 | 6,703.0 | -224.1 | -5,006.0 | 5,010.6 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 90.00 | 268.84 | 6,703.0 | -225.1 | -5,056.0 | 5,060.6 | 0.00 | 0.00 | 0.00 |
| 11,450.0 | 90.00 | 268.84 | 6,703.0 | -226.2 | -5,106.0 | 5,110.6 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 90.00 | 268.84 | 6,703.0 | -227.2 | -5,156.0 | 5,160.6 | 0.00 | 0.00 | 0.00 |
| 11,550.0 | 90.00 | 268.84 | 6,703.0 | -228.2 | -5,206.0 | 5,210.6 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 90.00 | 268.84 | 6,703.0 | -229.2 | -5,256.0 | 5,260.6 | 0.00 | 0.00 | 0.00 |
| 11,650.0 | 90.00 | 268.84 | 6,703.0 | -230.2 | -5,305.9 | 5,310.6 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 90.00 | 268.84 | 6,703.0 | -231.2 | -5,355.9 | 5,360.6 | 0.00 | 0.00 | 0.00 |
| 11,750.0 | 90.00 | 268.84 | 6,703.0 | -232.2 | -5,405.9 | 5,410.6 | 0.00 | 0.00 | 0.00 |
| 11,800.0 | 90.00 | 268.84 | 6,703.0 | -233.2 | -5,455.9 | 5,460.6 | 0.00 | 0.00 | 0.00 |
| 11,850.0 | 90.00 | 268.84 | 6,703.0 | -234.2 | -5,505.9 | 5,510.6 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 90.00 | 268.84 | 6,703.0 | -235.2 | -5,555.9 | 5,560.6 | 0.00 | 0.00 | 0.00 |
| 11,950.0 | 90.00 | 268.84 | 6,703.0 | -236.2 | -5,605.9 | 5,610.6 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 90.00 | 268.84 | 6,703.0 | -237.2 | -5,655.9 | 5,660.6 | 0.00 | 0.00 | 0.00 |
| 12,050.0 | 90.00 | 268.84 | 6,703.0 | -238.3 | -5,705.9 | 5,710.6 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 90.00 | 268.84 | 6,703.0 | -239.3 | -5,755.9 | 5,760.6 | 0.00 | 0.00 | 0.00 |
| 12,150.0 | 90.00 | 268.84 | 6,703.0 | -240.3 | -5,805.8 | 5,810.6 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 90.00 | 268.84 | 6,703.0 | -241.3 | -5,855.8 | 5,860.6 | 0.00 | 0.00 | 0.00 |
| 12,250.0 | 90.00 | 268.84 | 6,703.0 | -242.3 | -5,905.8 | 5,910.6 | 0.00 | 0.00 | 0.00 |
| 12,300.0 | 90.00 | 268.84 | 6,703.0 | -243.3 | -5,955.8 | 5,960.5 | 0.00 | 0.00 | 0.00 |
| 12,350.0 | 90.00 | 268.84 | 6,703.0 | -244.3 | -6,005.8 | 6,010.5 | 0.00 | 0.00 | 0.00 |
| 12,400.0 | 90.00 | 268.84 | 6,703.0 | -245.3 | -6,055.8 | 6,060.5 | 0.00 | 0.00 | 0.00 |
| 12,450.0 | 90.00 | 268.84 | 6,703.0 | -246.3 | -6,105.8 | 6,110.5 | 0.00 | 0.00 | 0.00 |
| 12,500.0 | 90.00 | 268.84 | 6,703.0 | -247.3 | -6,155.8 | 6,160.5 | 0.00 | 0.00 | 0.00 |
| 12,550.0 | 90.00 | 268.84 | 6,703.0 | -248.3 | -6,205.8 | 6,210.5 | 0.00 | 0.00 | 0.00 |
| 12,600.0 | 90.00 | 268.84 | 6,703.0 | -249.3 | -6,255.8 | 6,260.5 | 0.00 | 0.00 | 0.00 |
| 12,650.0 | 90.00 | 268.84 | 6,703.0 | -250.3 | -6,305.7 | 6,310.5 | 0.00 | 0.00 | 0.00 |
| 12,700.0 | 90.00 | 268.84 | 6,703.0 | -251.4 | -6,355.7 | 6,360.5 | 0.00 | 0.00 | 0.00 |
| 12,750.0 | 90.00 | 268.84 | 6,703.0 | -252.4 | -6,405.7 | 6,410.5 | 0.00 | 0.00 | 0.00 |
| 12,800.0 | 90.00 | 268.84 | 6,703.0 | -253.4 | -6,455.7 | 6,460.5 | 0.00 | 0.00 | 0.00 |
| 12,850.0 | 90.00 | 268.84 | 6,703.0 | -254.4 | -6,505.7 | 6,510.5 | 0.00 | 0.00 | 0.00 |
| 12,900.0 | 90.00 | 268.84 | 6,703.0 | -255.4 | -6,555.7 | 6,560.5 | 0.00 | 0.00 | 0.00 |
| 12,950.0 | 90.00 | 268.84 | 6,703.0 | -256.4 | -6,605.7 | 6,610.5 | 0.00 | 0.00 | 0.00 |
| 13,000.0 | 90.00 | 268.84 | 6,703.0 | -257.4 | -6,655.7 | 6,660.5 | 0.00 | 0.00 | 0.00 |
| 13,050.0 | 90.00 | 268.84 | 6,703.0 | -258.4 | -6,705.7 | 6,710.5 | 0.00 | 0.00 | 0.00 |
| 13,100.0 | 90.00 | 268.84 | 6,703.0 | -259.4 | -6,755.7 | 6,760.5 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 13,150.0 | 90.00 | 268.84 | 6,703.0 | -260.4 | -6,805.6 | 6,810.5 | 0.00 | 0.00 | 0.00 |
| 13,200.0 | 90.00 | 268.84 | 6,703.0 | -261.4 | -6,855.6 | 6,860.5 | 0.00 | 0.00 | 0.00 |
| 13,250.0 | 90.00 | 268.84 | 6,703.0 | -262.4 | -6,905.6 | 6,910.5 | 0.00 | 0.00 | 0.00 |
| 13,300.0 | 90.00 | 268.84 | 6,703.0 | -263.5 | -6,955.6 | 6,960.5 | 0.00 | 0.00 | 0.00 |
| 13,350.0 | 90.00 | 268.84 | 6,703.0 | -264.5 | -7,005.6 | 7,010.5 | 0.00 | 0.00 | 0.00 |
| 13,400.0 | 90.00 | 268.84 | 6,703.0 | -265.5 | -7,055.6 | 7,060.5 | 0.00 | 0.00 | 0.00 |
| 13,450.0 | 90.00 | 268.84 | 6,703.0 | -266.5 | -7,105.6 | 7,110.5 | 0.00 | 0.00 | 0.00 |
| 13,500.0 | 90.00 | 268.84 | 6,703.0 | -267.5 | -7,155.6 | 7,160.5 | 0.00 | 0.00 | 0.00 |
| 13,550.0 | 90.00 | 268.84 | 6,703.0 | -268.5 | -7,205.6 | 7,210.5 | 0.00 | 0.00 | 0.00 |
| 13,600.0 | 90.00 | 268.84 | 6,703.0 | -269.5 | -7,255.5 | 7,260.5 | 0.00 | 0.00 | 0.00 |
| 13,650.0 | 90.00 | 268.84 | 6,703.0 | -270.5 | -7,305.5 | 7,310.5 | 0.00 | 0.00 | 0.00 |
| 13,700.0 | 90.00 | 268.84 | 6,703.0 | -271.5 | -7,355.5 | 7,360.5 | 0.00 | 0.00 | 0.00 |
| 13,750.0 | 90.00 | 268.84 | 6,703.0 | -272.5 | -7,405.5 | 7,410.4 | 0.00 | 0.00 | 0.00 |
| 13,800.0 | 90.00 | 268.84 | 6,703.0 | -273.5 | -7,455.5 | 7,460.4 | 0.00 | 0.00 | 0.00 |
| 13,850.0 | 90.00 | 268.84 | 6,703.0 | -274.5 | -7,505.5 | 7,510.4 | 0.00 | 0.00 | 0.00 |
| 13,900.0 | 90.00 | 268.84 | 6,703.0 | -275.6 | -7,555.5 | 7,560.4 | 0.00 | 0.00 | 0.00 |
| 13,950.0 | 90.00 | 268.84 | 6,703.0 | -276.6 | -7,605.5 | 7,610.4 | 0.00 | 0.00 | 0.00 |
| 14,000.0 | 90.00 | 268.84 | 6,703.0 | -277.6 | -7,655.5 | 7,660.4 | 0.00 | 0.00 | 0.00 |
| 14,050.0 | 90.00 | 268.84 | 6,703.0 | -278.6 | -7,705.5 | 7,710.4 | 0.00 | 0.00 | 0.00 |
| 14,100.0 | 90.00 | 268.84 | 6,703.0 | -279.6 | -7,755.4 | 7,760.4 | 0.00 | 0.00 | 0.00 |
| 14,150.0 | 90.00 | 268.84 | 6,703.0 | -280.6 | -7,805.4 | 7,810.4 | 0.00 | 0.00 | 0.00 |
| 14,200.0 | 90.00 | 268.84 | 6,703.0 | -281.6 | -7,855.4 | 7,860.4 | 0.00 | 0.00 | 0.00 |
| 14,250.0 | 90.00 | 268.84 | 6,703.0 | -282.6 | -7,905.4 | 7,910.4 | 0.00 | 0.00 | 0.00 |
| 14,300.0 | 90.00 | 268.84 | 6,703.0 | -283.6 | -7,955.4 | 7,960.4 | 0.00 | 0.00 | 0.00 |
| 14,350.0 | 90.00 | 268.84 | 6,703.0 | -284.6 | -8,005.4 | 8,010.4 | 0.00 | 0.00 | 0.00 |
| 14,400.0 | 90.00 | 268.84 | 6,703.0 | -285.6 | -8,055.4 | 8,060.4 | 0.00 | 0.00 | 0.00 |
| 14,450.0 | 90.00 | 268.84 | 6,703.0 | -286.6 | -8,105.4 | 8,110.4 | 0.00 | 0.00 | 0.00 |
| 14,500.0 | 90.00 | 268.84 | 6,703.0 | -287.6 | -8,155.4 | 8,160.4 | 0.00 | 0.00 | 0.00 |
| 14,550.0 | 90.00 | 268.84 | 6,703.0 | -288.7 | -8,205.4 | 8,210.4 | 0.00 | 0.00 | 0.00 |
| 14,600.0 | 90.00 | 268.84 | 6,703.0 | -289.7 | -8,255.3 | 8,260.4 | 0.00 | 0.00 | 0.00 |
| 14,650.0 | 90.00 | 268.84 | 6,703.0 | -290.7 | -8,305.3 | 8,310.4 | 0.00 | 0.00 | 0.00 |
| 14,700.0 | 90.00 | 268.84 | 6,703.0 | -291.7 | -8,355.3 | 8,360.4 | 0.00 | 0.00 | 0.00 |
| 14,750.0 | 90.00 | 268.84 | 6,703.0 | -292.7 | -8,405.3 | 8,410.4 | 0.00 | 0.00 | 0.00 |
| 14,800.0 | 90.00 | 268.84 | 6,703.0 | -293.7 | -8,455.3 | 8,460.4 | 0.00 | 0.00 | 0.00 |
| 14,850.0 | 90.00 | 268.84 | 6,703.0 | -294.7 | -8,505.3 | 8,510.4 | 0.00 | 0.00 | 0.00 |
| 14,900.0 | 90.00 | 268.84 | 6,703.0 | -295.7 | -8,555.3 | 8,560.4 | 0.00 | 0.00 | 0.00 |
| 14,950.0 | 90.00 | 268.84 | 6,703.0 | -296.7 | -8,605.3 | 8,610.4 | 0.00 | 0.00 | 0.00 |
| 15,000.0 | 90.00 | 268.84 | 6,703.0 | -297.7 | -8,655.3 | 8,660.4 | 0.00 | 0.00 | 0.00 |
| 15,050.0 | 90.00 | 268.84 | 6,703.0 | -298.7 | -8,705.3 | 8,710.4 | 0.00 | 0.00 | 0.00 |
| 15,100.0 | 90.00 | 268.84 | 6,703.0 | -299.7 | -8,755.2 | 8,760.4 | 0.00 | 0.00 | 0.00 |
| 15,150.0 | 90.00 | 268.84 | 6,703.0 | -300.8 | -8,805.2 | 8,810.3 | 0.00 | 0.00 | 0.00 |
| 15,200.0 | 90.00 | 268.84 | 6,703.0 | -301.8 | -8,855.2 | 8,860.3 | 0.00 | 0.00 | 0.00 |
| 15,250.0 | 90.00 | 268.84 | 6,703.0 | -302.8 | -8,905.2 | 8,910.3 | 0.00 | 0.00 | 0.00 |
| 15,300.0 | 90.00 | 268.84 | 6,703.0 | -303.8 | -8,955.2 | 8,960.3 | 0.00 | 0.00 | 0.00 |
| 15,350.0 | 90.00 | 268.84 | 6,703.0 | -304.8 | -9,005.2 | 9,010.3 | 0.00 | 0.00 | 0.00 |
| 15,400.0 | 90.00 | 268.84 | 6,703.0 | -305.8 | -9,055.2 | 9,060.3 | 0.00 | 0.00 | 0.00 |
| 15,450.0 | 90.00 | 268.84 | 6,703.0 | -306.8 | -9,105.2 | 9,110.3 | 0.00 | 0.00 | 0.00 |
| 15,500.0 | 90.00 | 268.84 | 6,703.0 | -307.8 | -9,155.2 | 9,160.3 | 0.00 | 0.00 | 0.00 |
| 15,550.0 | 90.00 | 268.84 | 6,703.0 | -308.8 | -9,205.2 | 9,210.3 | 0.00 | 0.00 | 0.00 |
| 15,600.0 | 90.00 | 268.84 | 6,703.0 | -309.8 | -9,255.1 | 9,260.3 | 0.00 | 0.00 | 0.00 |
| 15,650.0 | 90.00 | 268.84 | 6,703.0 | -310.8 | -9,305.1 | 9,310.3 | 0.00 | 0.00 | 0.00 |
| 15,700.0 | 90.00 | 268.84 | 6,703.0 | -311.8 | -9,355.1 | 9,360.3 | 0.00 | 0.00 | 0.00 |
| 15,750.0 | 90.00 | 268.84 | 6,703.0 | -312.8 | -9,405.1 | 9,410.3 | 0.00 | 0.00 | 0.00 |
| 15,800.0 | 90.00 | 268.84 | 6,703.0 | -313.9 | -9,455.1 | 9,460.3 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Planned Survey**

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 15,850.0 | 90.00 | 268.84 | 6,703.0 | -314.9 | -9,505.1 | 9,510.3 | 0.00 | 0.00 | 0.00 |
| 15,900.0 | 90.00 | 268.84 | 6,703.0 | -315.9 | -9,555.1 | 9,560.3 | 0.00 | 0.00 | 0.00 |
| 15,950.0 | 90.00 | 268.84 | 6,703.0 | -316.9 | -9,605.1 | 9,610.3 | 0.00 | 0.00 | 0.00 |
| 16,000.0 | 90.00 | 268.84 | 6,703.0 | -317.9 | -9,655.1 | 9,660.3 | 0.00 | 0.00 | 0.00 |
| 16,050.0 | 90.00 | 268.84 | 6,703.0 | -318.9 | -9,705.1 | 9,710.3 | 0.00 | 0.00 | 0.00 |
| 16,100.0 | 90.00 | 268.84 | 6,703.0 | -319.9 | -9,755.0 | 9,760.3 | 0.00 | 0.00 | 0.00 |
| 16,150.0 | 90.00 | 268.84 | 6,703.0 | -320.9 | -9,805.0 | 9,810.3 | 0.00 | 0.00 | 0.00 |
| 16,200.0 | 90.00 | 268.84 | 6,703.0 | -321.9 | -9,855.0 | 9,860.3 | 0.00 | 0.00 | 0.00 |
| 16,250.0 | 90.00 | 268.84 | 6,703.0 | -322.9 | -9,905.0 | 9,910.3 | 0.00 | 0.00 | 0.00 |
| 16,300.0 | 90.00 | 268.84 | 6,703.0 | -323.9 | -9,955.0 | 9,960.3 | 0.00 | 0.00 | 0.00 |
| 16,350.0 | 90.00 | 268.84 | 6,703.0 | -324.9 | -10,005.0 | 10,010.3 | 0.00 | 0.00 | 0.00 |
| 16,400.0 | 90.00 | 268.84 | 6,703.0 | -326.0 | -10,055.0 | 10,060.3 | 0.00 | 0.00 | 0.00 |
| 16,450.0 | 90.00 | 268.84 | 6,703.0 | -327.0 | -10,105.0 | 10,110.3 | 0.00 | 0.00 | 0.00 |
| 16,500.0 | 90.00 | 268.84 | 6,703.0 | -328.0 | -10,155.0 | 10,160.3 | 0.00 | 0.00 | 0.00 |
| 16,550.0 | 90.00 | 268.84 | 6,703.0 | -329.0 | -10,205.0 | 10,210.3 | 0.00 | 0.00 | 0.00 |
| 16,600.0 | 90.00 | 268.84 | 6,703.0 | -330.0 | -10,254.9 | 10,260.2 | 0.00 | 0.00 | 0.00 |
| 16,650.0 | 90.00 | 268.84 | 6,703.0 | -331.0 | -10,304.9 | 10,310.2 | 0.00 | 0.00 | 0.00 |
| 16,700.0 | 90.00 | 268.84 | 6,703.0 | -332.0 | -10,354.9 | 10,360.2 | 0.00 | 0.00 | 0.00 |
| 16,748.4 | 90.00 | 268.84 | 6,703.0 | -333.0 | -10,403.3 | 10,408.6 | 0.00 | 0.00 | 0.00 |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Lapp A15-645 BHL 2280<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 6,703.0 | -333.0 | -10,403.3 | 1,420,949.03 | 3,265,972.66 | 40.484970 | -104.543800 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 436.0 | 436.0 | PIERRE | | 0.00 | |
| 456.0 | 456.0 | UPPER PIERRE AQUIFER TOP | | 0.00 | |
| 1,498.0 | 1,498.0 | UPPER PIERRE AQUIFER BASE | | 0.00 | |
| 3,525.4 | 3,516.0 | PARKMAN | | 0.00 | |
| 4,064.5 | 4,055.0 | SUSSEX | | 0.00 | |
| 4,833.5 | 4,824.0 | SHANNON | | 0.00 | |
| 5,902.5 | 5,893.0 | TEEPEE BUTTES | | 0.00 | |
| 6,621.0 | 6,545.0 | SHARON SPRINGS | | 0.00 | |
| 6,649.5 | 6,563.0 | NIO A CHALK | | 0.00 | |
| 6,681.6 | 6,582.0 | NIO A MARL | | 0.00 | |
| 6,871.6 | 6,666.0 | NIO B CHALK | | 0.00 | |
| 7,059.2 | 6,698.0 | NIO B MARL | | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | EDM01P | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Company:** | Northern Region Drilling - Working | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Project:** | Wattenberg Field | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site:** | A (06N-64W) | **North Reference:** | Grid |
| **Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Original Drilling | | |
| **Design:** | APD - Rev 1 | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 2,200.0 | 2,200.0 | 0.0 | 0.0 | KOP - Start Build 2.00 |
| 3,303.6 | 3,295.4 | -102.3 | -73.6 | Start Drop -2.00 |
| 6,069.3 | 6,059.8 | -125.0 | -90.0 | KOP #2 - Start Build 9.00 |
| 7,013.8 | 6,694.0 | -136.7 | -671.0 | Start 75.0 hold at 7013.8 MD |
| 7,088.8 | 6,700.6 | -138.2 | -745.7 | Start Build 9.00 |
| 16,748.4 | 6,703.0 | -333.0 | -10,403.3 | TD at 16748.4 |

# Northern Region Drilling - Working

**Wattenberg Field**
**A (06N-64W)**
**Lapp A15-645**

**Original Drilling**
**APD - Rev 1**

# Anticollision Summary Report

**12 January, 2016**

# Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region Drilling - Working | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Project:** | Wattenberg Field | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Reference Site:** | A (06N-64W) | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site Error:** | 0.0 ft | **North Reference:** | Grid |
| **Reference Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Original Drilling | **Database:** | EDM01P |
| **Reference Design:** | APD - Rev 1 | **Offset TVD Reference:** | Offset Datum |

| | | | |
|---|---|---|---|
| **Reference** | APD - Rev 1 | | |
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD Interval 50.0ft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 10,000.0 ft | **Error Surface:** | Elliptical Conic |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 1/12/2016

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 16,748.2 | APD - Rev 1 (Original Drilling) | MWD | MWD - Standard |

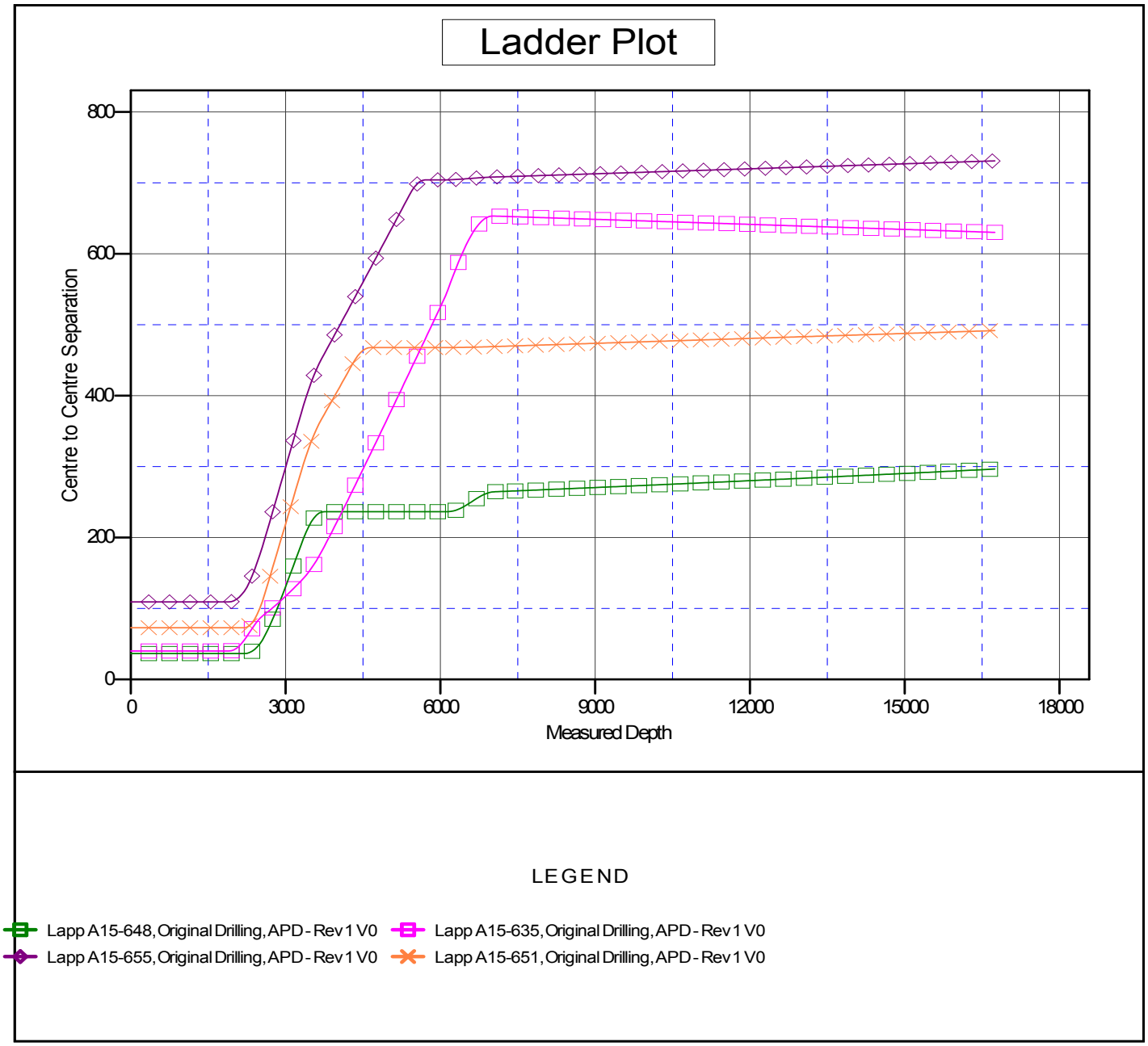
**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| A (06N-64W) | | | | | | |
| Lapp A15-635 - Original Drilling - APD - Rev 1 | 1,900.0 | 1,900.0 | 40.1 | 31.8 | 4.850 | CC, ES |
| Lapp A15-635 - Original Drilling - APD - Rev 1 | 16,748.4 | 16,826.2 | 630.3 | 200.8 | 1.468 | Level 2, SF |
| Lapp A15-648 - Original Drilling - APD - Rev 1 | 2,200.0 | 2,200.0 | 36.4 | 26.8 | 3.791 | CC |
| Lapp A15-648 - Original Drilling - APD - Rev 1 | 16,748.4 | 16,861.5 | 296.6 | -185.3 | 0.615 | Level 1, ES, SF |
| Lapp A15-651 - Original Drilling - APD - Rev 1 | 2,183.0 | 2,184.0 | 72.9 | 63.3 | 7.640 | CC |
| Lapp A15-651 - Original Drilling - APD - Rev 1 | 16,748.4 | 16,760.5 | 491.8 | -85.3 | 0.852 | Level 1, ES, SF |
| Lapp A15-655 - Original Drilling - APD - Rev 1 | 1,900.0 | 1,900.0 | 109.3 | 101.0 | 13.228 | CC, ES |
| Lapp A15-655 - Original Drilling - APD - Rev 1 | 16,748.4 | 16,835.2 | 731.1 | 155.9 | 1.271 | Level 2, SF |

| | | | |
|---|---|---|---|
| **Company:** | Northern Region Drilling - Working | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Project:** | Wattenberg Field | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Reference Site:** | A (06N-64W) | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site Error:** | 0.0 ft | **North Reference:** | Grid |
| **Reference Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Original Drilling | **Database:** | EDM01P |
| **Reference Design:** | APD - Rev 1 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 4692.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Lapp A15-645
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.64°



| | | | |
|---|---|---|---|
| **Company:** | Northern Region Drilling - Working | **Local Co-ordinate Reference:** | Well Lapp A15-645 |
| **Project:** | Wattenberg Field | **TVD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Reference Site:** | A (06N-64W) | **MD Reference:** | WELL @ 4692.0ft (Original Well Elev) |
| **Site Error:** | 0.0 ft | **North Reference:** | Grid |
| **Reference Well:** | Lapp A15-645 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Original Drilling | **Database:** | EDM01P |
| **Reference Design:** | APD - Rev 1 | **Offset TVD Reference:** | Offset Datum |

| | |
|---|---|
| Reference Depths are relative to WELL @ 4692.0ft (Original Well Elev) | Coordinates are relative to: Lapp A15-645 |
| Offset Depths are relative to Offset Datum | Coordinate System is US State Plane 1983, Colorado Northern Zone |
| Central Meridian is -105.500000 | Grid Convergence at Surface is: 0.64° |