

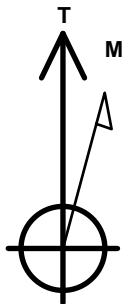
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Cockroft 19V-234**

Surface Location: Cockroft 5N63W19C Pad Sec.19-T5N-R63W
 North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
 Ground Elevation: 4554.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 1085871.13285773.21 40.388080 -104.474080
 RKB - 13' WELL @ 4567.0ft (RKB - 13')

DESIGN TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Shape |
|--------------------------------|--------|--------|---------|-------|
| SHL 1410'FNL, 1141'FEL, SEC.19 | 1.0 | 0.0 | 0.0 | Point |
| BHL 1648'FNL, 2148'FEL, SEC.24 | 6443.0 | -221.4 | -6270.7 | Point |
| LPL 1631'FNL, 816'FEL, SEC.19 | 6458.0 | -221.4 | 325.3 | Point |



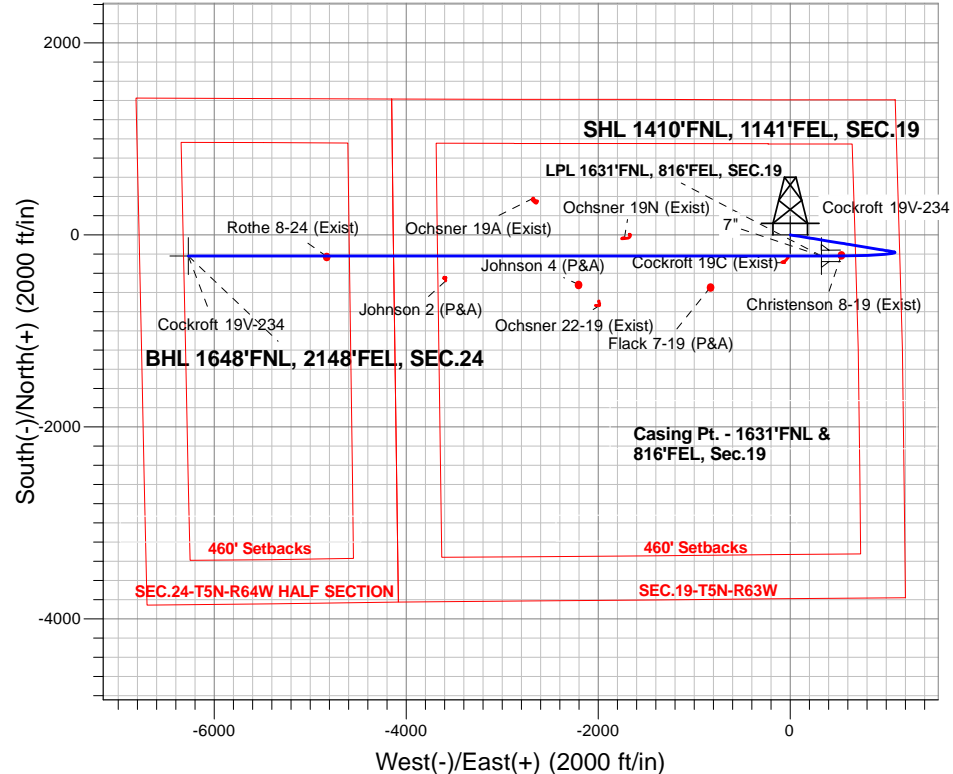
Azimuths to True North
 Magnetic North: 8.11°

Magnetic Field
 Strength: 52690.6snT
 Dip Angle: 66.93°
 Date: 11/18/2015
 Model: IGRF2010

Cockroft 5N63W19C Pad Sec.19-T5N-R63W
 Cockroft 19V-234
 Plan #1 (11-13-15)
 8:21, November 18 2015

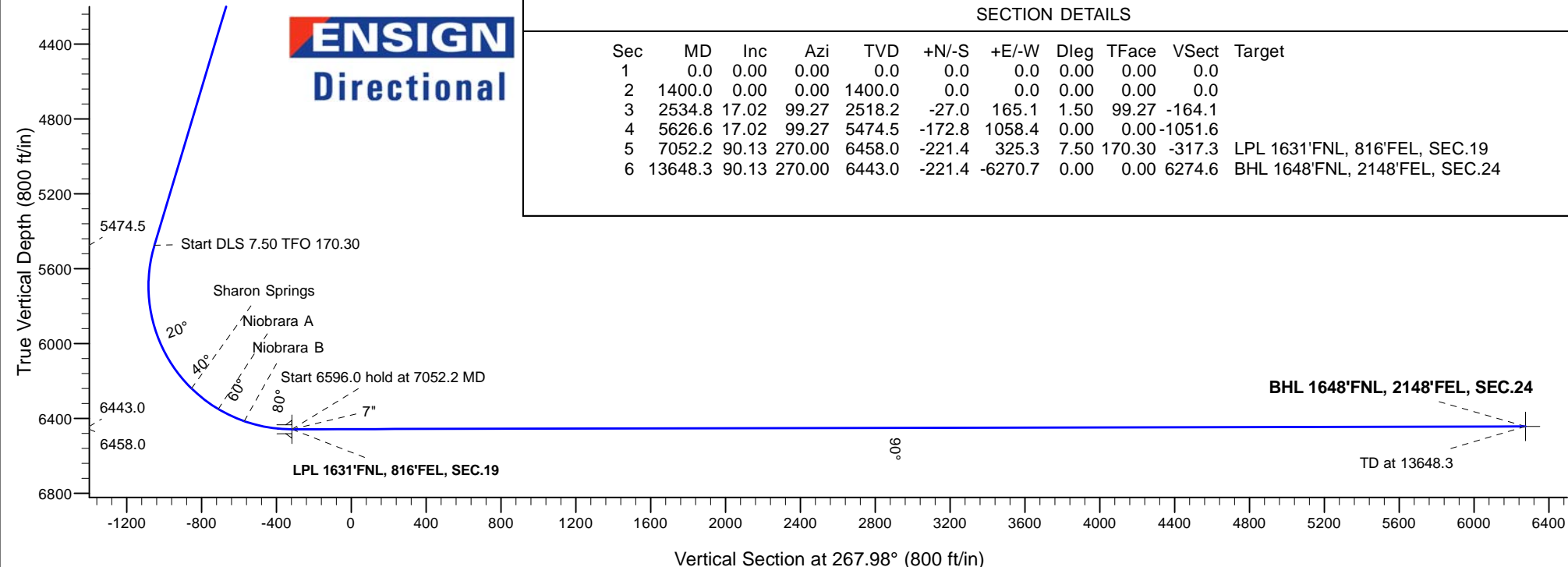
ANNOTATIONS

| TVD | MD | Annotation |
|--------|---------|--------------------------------|
| 1400.0 | 1400.0 | KOP - Start Build 1.50 |
| 2518.2 | 2534.8 | Start 3091.8 hold at 2534.8 MD |
| 5474.5 | 5626.6 | Start DLS 7.50 TFO 170.30 |
| 6458.0 | 7052.2 | Start 6596.0 hold at 7052.2 MD |
| 6443.0 | 13648.3 | TD at 13648.3 |



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 | 1400.0 | 0.00 | 0.00 | 1400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 2534.8 | 17.02 | 99.27 | 2518.2 | -27.0 | 165.1 | 1.50 | 99.27 | -164.1 | |
| 4 | 5626.6 | 17.02 | 99.27 | 5474.5 | -172.8 | 1058.4 | 0.00 | 0.00 | -1051.6 | |
| 5 | 7052.2 | 90.13 | 270.00 | 6458.0 | -221.4 | 325.3 | 7.50 | 170.30 | -317.3 | LPL 1631'FNL, 816'FEL, SEC.19 |
| 6 | 13648.3 | 90.13 | 270.00 | 6443.0 | -221.4 | -6270.7 | 0.00 | 0.00 | 6274.6 | BHL 1648'FNL, 2148'FEL, SEC.24 |





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19V-234

Wellbore #1

Plan: Plan #1 (11-13-15)

Standard Planning Report

18 November, 2015

| | | | |
|------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Database: | US_EDM | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Project: | SEC.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | North Reference: | True |
| Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #1 (11-13-15) | | |

| | | | |
|--------------------|--|----------------------|-----------------------------|
| Project | SEC.19-T5N-R63W, 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 | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | | | |
|-----------------------|----------|---------------------------------------|-------------------|-------------------|-------------|
| Site Position: | | Northing: | 1,385,863.51 usft | Latitude: | 40.388060 |
| From: | Lat/Long | Easting: | 3,285,745.44 usft | Longitude: | -104.474180 |
| Position Uncertainty: | 0.0 ft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.66 |

| | | | | | | |
|----------------------|------------------|---------|---------------------|-------------------|---------------|-------------|
| Well | Cockroft 19V-234 | | | | | |
| Well Position | +N/-S | 7.3 ft | Northing: | 1,385,871.11 usft | Latitude: | 40.388080 |
| | +E/-W | 27.9 ft | Easting: | 3,285,773.21 usft | Longitude: | -104.474080 |
| Position Uncertainty | | 0.0 ft | Wellhead Elevation: | 0.0 ft | Ground Level: | 4,554.0 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Wellbore #1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 11/18/2015 | 8.11 | 66.93 | 52,691 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | Plan #1 (11-13-15) | | | |
| 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 | 267.98 |

| 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 | |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2,534.8 | 17.02 | 99.27 | 2,518.2 | -27.0 | 165.1 | 1.50 | 1.50 | 0.00 | 99.27 | |
| 5,626.6 | 17.02 | 99.27 | 5,474.5 | -172.8 | 1,058.4 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,052.2 | 90.13 | 270.00 | 6,458.0 | -221.4 | 325.3 | 7.50 | 5.13 | 11.98 | 170.31 | LPL 1631'FNL, 816'FI |
| 13,648.3 | 90.13 | 270.00 | 6,443.0 | -221.4 | -6,270.7 | 0.00 | 0.00 | 0.00 | 0.00 | BHL 1648'FNL, 2148'I |

| | | | |
|-----------|---------------------------------------|------------------------------|-----------------------------|
| Database: | US_EDM | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Project: | SEC.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | North Reference: | True |
| Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #1 (11-13-15) | | |

| 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 |
| 1.0 | 0.00 | 0.00 | 1.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| SHL 1410'FNL, 1141'FEL, SEC.19 | | | | | | | | | |
| 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 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | 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 |
| KOP - Start Build 1.50 | | | | | | | | | |
| 1,500.0 | 1.50 | 99.27 | 1,500.0 | -0.2 | 1.3 | -1.3 | 1.50 | 1.50 | 0.00 |
| 1,600.0 | 3.00 | 99.27 | 1,599.9 | -0.8 | 5.2 | -5.1 | 1.50 | 1.50 | 0.00 |
| 1,700.0 | 4.50 | 99.27 | 1,699.7 | -1.9 | 11.6 | -11.5 | 1.50 | 1.50 | 0.00 |
| 1,800.0 | 6.00 | 99.27 | 1,799.3 | -3.4 | 20.7 | -20.5 | 1.50 | 1.50 | 0.00 |
| 1,900.0 | 7.50 | 99.27 | 1,898.6 | -5.3 | 32.3 | -32.0 | 1.50 | 1.50 | 0.00 |
| 2,000.0 | 9.00 | 99.27 | 1,997.5 | -7.6 | 46.4 | -46.1 | 1.50 | 1.50 | 0.00 |
| 2,100.0 | 10.50 | 99.27 | 2,096.1 | -10.3 | 63.1 | -62.7 | 1.50 | 1.50 | 0.00 |
| 2,200.0 | 12.00 | 99.27 | 2,194.2 | -13.4 | 82.4 | -81.9 | 1.50 | 1.50 | 0.00 |
| 2,300.0 | 13.50 | 99.27 | 2,291.7 | -17.0 | 104.2 | -103.5 | 1.50 | 1.50 | 0.00 |
| 2,400.0 | 15.00 | 99.27 | 2,388.6 | -21.0 | 128.5 | -127.6 | 1.50 | 1.50 | 0.00 |
| 2,500.0 | 16.50 | 99.27 | 2,484.9 | -25.3 | 155.2 | -154.3 | 1.50 | 1.50 | 0.00 |
| 2,534.8 | 17.02 | 99.27 | 2,518.2 | -27.0 | 165.1 | -164.1 | 1.50 | 1.50 | 0.00 |
| Start 3091.8 hold at 2534.8 MD | | | | | | | | | |
| 2,600.0 | 17.02 | 99.27 | 2,580.5 | -30.0 | 184.0 | -182.8 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 17.02 | 99.27 | 2,676.1 | -34.7 | 212.9 | -211.5 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 17.02 | 99.27 | 2,771.8 | -39.5 | 241.8 | -240.2 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 17.02 | 99.27 | 2,867.4 | -44.2 | 270.7 | -268.9 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 17.02 | 99.27 | 2,963.0 | -48.9 | 299.5 | -297.6 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 17.02 | 99.27 | 3,058.6 | -53.6 | 328.4 | -326.3 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 17.02 | 99.27 | 3,154.2 | -58.3 | 357.3 | -355.0 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 17.02 | 99.27 | 3,249.9 | -63.0 | 386.2 | -383.8 | 0.00 | 0.00 | 0.00 |
| 3,389.0 | 17.02 | 99.27 | 3,335.0 | -67.2 | 411.9 | -409.3 | 0.00 | 0.00 | 0.00 |
| Parkman | | | | | | | | | |
| 3,400.0 | 17.02 | 99.27 | 3,345.5 | -67.8 | 415.1 | -412.5 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 17.02 | 99.27 | 3,441.1 | -72.5 | 444.0 | -441.2 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 17.02 | 99.27 | 3,536.7 | -77.2 | 472.9 | -469.9 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 17.02 | 99.27 | 3,632.3 | -81.9 | 501.8 | -498.6 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 17.02 | 99.27 | 3,728.0 | -86.6 | 530.7 | -527.3 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 17.02 | 99.27 | 3,823.6 | -91.3 | 559.6 | -556.0 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 17.02 | 99.27 | 3,919.2 | -96.1 | 588.5 | -584.7 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 17.02 | 99.27 | 4,014.8 | -100.8 | 617.3 | -613.4 | 0.00 | 0.00 | 0.00 |
| 4,152.5 | 17.02 | 99.27 | 4,065.0 | -103.3 | 632.5 | -628.5 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | |
| 4,200.0 | 17.02 | 99.27 | 4,110.4 | -105.5 | 646.2 | -642.1 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 17.02 | 99.27 | 4,206.1 | -110.2 | 675.1 | -670.8 | 0.00 | 0.00 | 0.00 |

| | | | |
|-----------|---------------------------------------|------------------------------|-----------------------------|
| Database: | US_EDM | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Project: | SEC.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | North Reference: | True |
| Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #1 (11-13-15) | | |

| 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) |
| 4,400.0 | 17.02 | 99.27 | 4,301.7 | -114.9 | 704.0 | -699.5 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 17.02 | 99.27 | 4,397.3 | -119.6 | 732.9 | -728.2 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 17.02 | 99.27 | 4,492.9 | -124.4 | 761.8 | -756.9 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 17.02 | 99.27 | 4,588.5 | -129.1 | 790.7 | -785.6 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 17.02 | 99.27 | 4,684.2 | -133.8 | 819.6 | -814.4 | 0.00 | 0.00 | 0.00 |
| 4,900.0 | 17.02 | 99.27 | 4,779.8 | -138.5 | 848.5 | -843.1 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 17.02 | 99.27 | 4,875.4 | -143.2 | 877.4 | -871.8 | 0.00 | 0.00 | 0.00 |
| 5,100.0 | 17.02 | 99.27 | 4,971.0 | -147.9 | 906.3 | -900.5 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 17.02 | 99.27 | 5,066.6 | -152.7 | 935.2 | -929.2 | 0.00 | 0.00 | 0.00 |
| 5,300.0 | 17.02 | 99.27 | 5,162.2 | -157.4 | 964.0 | -957.9 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 17.02 | 99.27 | 5,257.9 | -162.1 | 992.9 | -986.6 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 17.02 | 99.27 | 5,353.5 | -166.8 | 1,021.8 | -1,015.3 | 0.00 | 0.00 | 0.00 |
| 5,600.0 | 17.02 | 99.27 | 5,449.1 | -171.5 | 1,050.7 | -1,044.0 | 0.00 | 0.00 | 0.00 |
| 5,626.6 | 17.02 | 99.27 | 5,474.5 | -172.8 | 1,058.4 | -1,051.6 | 0.00 | 0.00 | 0.00 |
| Start DLS 7.50 TFO 170.30 | | | | | | | | | |
| 5,700.0 | 11.63 | 103.87 | 5,545.6 | -176.3 | 1,076.2 | -1,069.3 | 7.50 | -7.34 | 6.26 |
| 5,800.0 | 4.72 | 126.66 | 5,644.6 | -181.2 | 1,089.3 | -1,082.2 | 7.50 | -6.91 | 22.80 |
| 5,900.0 | 4.66 | 232.76 | 5,744.4 | -186.1 | 1,089.4 | -1,082.1 | 7.50 | -0.06 | 106.10 |
| 6,000.0 | 11.56 | 256.03 | 5,843.3 | -191.0 | 1,076.4 | -1,069.0 | 7.50 | 6.89 | 23.26 |
| 6,100.0 | 18.92 | 261.71 | 5,939.8 | -195.7 | 1,050.6 | -1,043.0 | 7.50 | 7.36 | 5.69 |
| 6,200.0 | 26.35 | 264.28 | 6,032.0 | -200.3 | 1,012.4 | -1,004.7 | 7.50 | 7.44 | 2.56 |
| 6,300.0 | 33.82 | 265.77 | 6,118.5 | -204.6 | 962.5 | -954.7 | 7.50 | 7.46 | 1.49 |
| 6,400.0 | 41.29 | 266.77 | 6,197.7 | -208.5 | 901.7 | -893.8 | 7.50 | 7.48 | 1.00 |
| 6,458.3 | 45.65 | 267.23 | 6,240.0 | -210.6 | 861.7 | -853.7 | 7.50 | 7.48 | 0.78 |
| Sharon Springs | | | | | | | | | |
| 6,500.0 | 48.77 | 267.51 | 6,268.3 | -212.0 | 831.1 | -823.1 | 7.50 | 7.48 | 0.69 |
| 6,600.0 | 56.26 | 268.10 | 6,329.1 | -215.0 | 751.9 | -743.8 | 7.50 | 7.49 | 0.59 |
| 6,639.1 | 59.19 | 268.31 | 6,350.0 | -216.0 | 718.9 | -710.8 | 7.50 | 7.49 | 0.52 |
| Niobrara A | | | | | | | | | |
| 6,700.0 | 63.75 | 268.60 | 6,379.1 | -217.5 | 665.4 | -657.3 | 7.50 | 7.49 | 0.48 |
| 6,792.8 | 70.70 | 269.00 | 6,415.0 | -219.2 | 579.9 | -571.8 | 7.50 | 7.49 | 0.44 |
| Niobrara B | | | | | | | | | |
| 6,800.0 | 71.24 | 269.03 | 6,417.3 | -219.4 | 573.1 | -565.0 | 7.50 | 7.49 | 0.41 |
| 6,900.0 | 78.73 | 269.43 | 6,443.2 | -220.7 | 476.6 | -468.5 | 7.50 | 7.49 | 0.40 |
| 7,000.0 | 86.22 | 269.81 | 6,456.3 | -221.3 | 377.5 | -369.5 | 7.50 | 7.49 | 0.38 |
| 7,052.2 | 90.13 | 270.00 | 6,458.0 | -221.4 | 325.3 | -317.3 | 7.49 | 7.48 | 0.37 |
| Start 6596.0 hold at 7052.2 MD - 7" - LPL 1631'FNL, 816'FEL, SEC.19 | | | | | | | | | |
| 7,100.0 | 90.13 | 270.00 | 6,457.9 | -221.4 | 277.5 | -269.6 | 0.01 | 0.01 | 0.00 |
| 7,200.0 | 90.13 | 270.00 | 6,457.7 | -221.4 | 177.5 | -169.6 | 0.00 | 0.00 | 0.00 |
| 7,300.0 | 90.13 | 270.00 | 6,457.4 | -221.4 | 77.5 | -69.7 | 0.00 | 0.00 | 0.00 |
| 7,400.0 | 90.13 | 270.00 | 6,457.2 | -221.4 | -22.5 | 30.3 | 0.00 | 0.00 | 0.00 |
| 7,500.0 | 90.13 | 270.00 | 6,457.0 | -221.4 | -122.5 | 130.2 | 0.00 | 0.00 | 0.00 |
| 7,600.0 | 90.13 | 270.00 | 6,456.8 | -221.4 | -222.5 | 230.1 | 0.00 | 0.00 | 0.00 |
| 7,700.0 | 90.13 | 270.00 | 6,456.5 | -221.4 | -322.5 | 330.1 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 90.13 | 270.00 | 6,456.3 | -221.4 | -422.5 | 430.0 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 90.13 | 270.00 | 6,456.1 | -221.4 | -522.4 | 529.9 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.13 | 270.00 | 6,455.8 | -221.4 | -622.4 | 629.9 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.13 | 270.00 | 6,455.6 | -221.4 | -722.4 | 729.8 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.13 | 270.00 | 6,455.4 | -221.4 | -822.4 | 829.7 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.13 | 270.00 | 6,455.2 | -221.4 | -922.4 | 929.7 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 90.13 | 270.00 | 6,454.9 | -221.4 | -1,022.4 | 1,029.6 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.13 | 270.00 | 6,454.7 | -221.4 | -1,122.4 | 1,129.6 | 0.00 | 0.00 | 0.00 |

| | | | |
|-----------|---------------------------------------|------------------------------|-----------------------------|
| Database: | US_EDM | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Project: | SEC.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | North Reference: | True |
| Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #1 (11-13-15) | | |

| 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) |
| 8,600.0 | 90.13 | 270.00 | 6,454.5 | -221.4 | -1,222.4 | 1,229.5 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 90.13 | 270.00 | 6,454.3 | -221.4 | -1,322.4 | 1,329.4 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.13 | 270.00 | 6,454.0 | -221.4 | -1,422.4 | 1,429.4 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.13 | 270.00 | 6,453.8 | -221.4 | -1,522.4 | 1,529.3 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.13 | 270.00 | 6,453.6 | -221.4 | -1,622.4 | 1,629.2 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.13 | 270.00 | 6,453.3 | -221.4 | -1,722.4 | 1,729.2 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.13 | 270.00 | 6,453.1 | -221.4 | -1,822.4 | 1,829.1 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.13 | 270.00 | 6,452.9 | -221.4 | -1,922.4 | 1,929.1 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.13 | 270.00 | 6,452.7 | -221.4 | -2,022.4 | 2,029.0 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.13 | 270.00 | 6,452.4 | -221.4 | -2,122.4 | 2,128.9 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.13 | 270.00 | 6,452.2 | -221.4 | -2,222.4 | 2,228.9 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.13 | 270.00 | 6,452.0 | -221.4 | -2,322.4 | 2,328.8 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.13 | 270.00 | 6,451.8 | -221.4 | -2,422.4 | 2,428.7 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.13 | 270.00 | 6,451.5 | -221.4 | -2,522.4 | 2,528.7 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.13 | 270.00 | 6,451.3 | -221.4 | -2,622.4 | 2,628.6 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.13 | 270.00 | 6,451.1 | -221.4 | -2,722.4 | 2,728.6 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.13 | 270.00 | 6,450.8 | -221.4 | -2,822.4 | 2,828.5 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.13 | 270.00 | 6,450.6 | -221.4 | -2,922.4 | 2,928.4 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.13 | 270.00 | 6,450.4 | -221.4 | -3,022.4 | 3,028.4 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.13 | 270.00 | 6,450.2 | -221.4 | -3,122.4 | 3,128.3 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.13 | 270.00 | 6,449.9 | -221.4 | -3,222.4 | 3,228.2 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.13 | 270.00 | 6,449.7 | -221.4 | -3,322.4 | 3,328.2 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.13 | 270.00 | 6,449.5 | -221.4 | -3,422.4 | 3,428.1 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.13 | 270.00 | 6,449.2 | -221.4 | -3,522.4 | 3,528.1 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.13 | 270.00 | 6,449.0 | -221.4 | -3,622.4 | 3,628.0 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 90.13 | 270.00 | 6,448.8 | -221.4 | -3,722.4 | 3,727.9 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 90.13 | 270.00 | 6,448.6 | -221.4 | -3,822.4 | 3,827.9 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 90.13 | 270.00 | 6,448.3 | -221.4 | -3,922.4 | 3,927.8 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 90.13 | 270.00 | 6,448.1 | -221.4 | -4,022.4 | 4,027.7 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 90.13 | 270.00 | 6,447.9 | -221.4 | -4,122.4 | 4,127.7 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 90.13 | 270.00 | 6,447.7 | -221.4 | -4,222.4 | 4,227.6 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 90.13 | 270.00 | 6,447.4 | -221.4 | -4,322.4 | 4,327.6 | 0.00 | 0.00 | 0.00 |
| 11,800.0 | 90.13 | 270.00 | 6,447.2 | -221.4 | -4,422.4 | 4,427.5 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 90.13 | 270.00 | 6,447.0 | -221.4 | -4,522.4 | 4,527.4 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 90.13 | 270.00 | 6,446.7 | -221.4 | -4,622.4 | 4,627.4 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 90.13 | 270.00 | 6,446.5 | -221.4 | -4,722.4 | 4,727.3 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 90.13 | 270.00 | 6,446.3 | -221.4 | -4,822.4 | 4,827.2 | 0.00 | 0.00 | 0.00 |
| 12,300.0 | 90.13 | 270.00 | 6,446.1 | -221.4 | -4,922.4 | 4,927.2 | 0.00 | 0.00 | 0.00 |
| 12,400.0 | 90.13 | 270.00 | 6,445.8 | -221.4 | -5,022.4 | 5,027.1 | 0.00 | 0.00 | 0.00 |
| 12,500.0 | 90.13 | 270.00 | 6,445.6 | -221.4 | -5,122.4 | 5,127.1 | 0.00 | 0.00 | 0.00 |
| 12,600.0 | 90.13 | 270.00 | 6,445.4 | -221.4 | -5,222.4 | 5,227.0 | 0.00 | 0.00 | 0.00 |
| 12,700.0 | 90.13 | 270.00 | 6,445.2 | -221.4 | -5,322.4 | 5,326.9 | 0.00 | 0.00 | 0.00 |
| 12,800.0 | 90.13 | 270.00 | 6,444.9 | -221.4 | -5,422.4 | 5,426.9 | 0.00 | 0.00 | 0.00 |
| 12,900.0 | 90.13 | 270.00 | 6,444.7 | -221.4 | -5,522.4 | 5,526.8 | 0.00 | 0.00 | 0.00 |
| 13,000.0 | 90.13 | 270.00 | 6,444.5 | -221.4 | -5,622.4 | 5,626.7 | 0.00 | 0.00 | 0.00 |
| 13,100.0 | 90.13 | 270.00 | 6,444.2 | -221.4 | -5,722.4 | 5,726.7 | 0.00 | 0.00 | 0.00 |
| 13,200.0 | 90.13 | 270.00 | 6,444.0 | -221.4 | -5,822.4 | 5,826.6 | 0.00 | 0.00 | 0.00 |
| 13,300.0 | 90.13 | 270.00 | 6,443.8 | -221.4 | -5,922.4 | 5,926.6 | 0.00 | 0.00 | 0.00 |
| 13,400.0 | 90.13 | 270.00 | 6,443.6 | -221.4 | -6,022.4 | 6,026.5 | 0.00 | 0.00 | 0.00 |
| 13,500.0 | 90.13 | 270.00 | 6,443.3 | -221.4 | -6,122.4 | 6,126.4 | 0.00 | 0.00 | 0.00 |
| 13,600.0 | 90.13 | 270.00 | 6,443.1 | -221.4 | -6,222.4 | 6,226.4 | 0.00 | 0.00 | 0.00 |
| 13,648.3 | 90.13 | 270.00 | 6,443.0 | -221.4 | -6,270.7 | 6,274.6 | 0.00 | 0.00 | 0.00 |
| TD at 13648.3 - BHL 1648'FNL, 2148'FEL, SEC.24 | | | | | | | | | |

| | | | |
|-----------|---------------------------------------|------------------------------|-----------------------------|
| Database: | US_EDM | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Project: | SEC.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | North Reference: | True |
| Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #1 (11-13-15) | | |

| 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) |

| 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 |
| SHL 1410'FNL, 1141'FEI - plan hits target center - Point | 0.00 | 0.00 | 1.0 | 0.0 | 0.0 | 1,385,871.12 | 3,285,773.21 | 40.388080 | -104.474080 |
| BHL 1648'FNL, 2148'FE - plan hits target center - Point | 0.00 | 0.00 | 6,443.0 | -221.4 | -6,270.7 | 1,385,577.16 | 3,279,505.77 | 40.387470 | -104.496590 |
| LPL 1631'FNL, 816'FEL, - plan hits target center - Point | 0.00 | 0.00 | 6,458.0 | -221.4 | 325.3 | 1,385,653.49 | 3,286,101.04 | 40.387472 | -104.472913 |

| Casing Points | | | | | |
|---------------------|---------------------|------|---------------------|-------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") | |
| 7,052.2 | 6,458.0 | 7" | 7 | 8-3/4 | |

| Formations | | | | | |
|---------------------|---------------------|----------------|-----------|---------|-------------------|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
| 3,389.0 | 3,335.0 | Parkman | | 0.00 | |
| 4,152.5 | 4,065.0 | Sussex | | 0.00 | |
| 6,458.3 | 6,240.0 | Sharon Springs | | 0.00 | |
| 6,639.1 | 6,350.0 | Niobrara A | | 0.00 | |
| 6,792.8 | 6,415.0 | Niobrara B | | 0.00 | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|--------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 1,400.0 | 1,400.0 | 0.0 | 0.0 | KOP - Start Build 1.50 | |
| 2,534.8 | 2,518.2 | -27.0 | 165.1 | Start 3091.8 hold at 2534.8 MD | |
| 5,626.6 | 5,474.5 | -172.8 | 1,058.4 | Start DLS 7.50 TFO 170.30 | |
| 7,052.2 | 6,458.0 | -221.4 | 325.3 | Start 6596.0 hold at 7052.2 MD | |
| 13,648.3 | 6,443.0 | -221.4 | -6,270.7 | TD at 13648.3 | |

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19V-234

Wellbore #1

Plan #1 (11-13-15)

Anticollision Report

18 November, 2015

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | |
|-------------------------------------|---|-----------------------|---------------------|
| Reference | Plan #1 (11-13-15) | | |
| Filter type: | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| Interpolation Method: | Stations | Error Model: | ISCWSA |
| Depth Range: | Unlimited | Scan Method: | Closest Approach 3D |
| Results Limited by: | Maximum center-center distance of 800.0 ft | Error Surface: | Elliptical Conic |
| Warning Levels Evaluated at: | 2.00 Sigma | Casing Method: | Not applied |

| | | | | |
|----------------------------|------------------------|----------------------------------|------------------|--------------------|
| Survey Tool Program | Date 11/18/2015 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
| 0.0 | 13,648.3 | Plan #1 (11-13-15) (Wellbore #1) | MWD | MWD - Standard |

| Summary | | | | | | |
|--|-------------------------------|----------------------------|-------------------------------|--------------------------------|-------------------|---------------------|
| Site Name | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
| Offset Well - Wellbore - Design | | | | | | |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W | | | | | | |
| Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15) | 600.0 | 600.0 | 60.3 | 57.8 | 24.384 | CC, ES |
| Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15) | 1,000.0 | 993.1 | 79.0 | 74.7 | 18.523 | SF |
| Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15) | 200.0 | 200.0 | 91.8 | 91.1 | 136.116 | CC, ES |
| Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15) | 4,000.0 | 3,853.2 | 796.0 | 768.2 | 28.656 | SF |
| Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | 1,400.0 | 1,401.0 | 14.4 | 8.3 | 2.371 | CC, ES |
| Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | 13,648.3 | 13,631.5 | 445.0 | 48.1 | 1.121 | Level 2, SF |
| Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15) | 1,000.0 | 1,000.0 | 31.5 | 27.2 | 7.376 | CC, ES |
| Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15) | 1,100.0 | 1,099.2 | 32.8 | 28.0 | 6.953 | SF |
| Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15) | 1,400.0 | 1,401.0 | 28.8 | 22.7 | 4.743 | CC |
| Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15) | 13,648.3 | 13,729.5 | 211.0 | -174.3 | 0.548 | Level 1, ES, SF |
| Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | 1,200.0 | 1,200.0 | 14.4 | 9.2 | 2.785 | CC, ES |
| Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | 13,648.3 | 13,694.1 | 690.8 | 295.7 | 1.748 | SF |
| Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | 400.0 | 400.0 | 74.7 | 73.1 | 47.468 | CC, ES |
| Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | 13,648.3 | 13,684.0 | 761.6 | 365.3 | 1.922 | SF |
| Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15) | 800.0 | 800.0 | 45.9 | 42.5 | 13.612 | CC, ES |
| Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15) | 13,648.3 | 13,725.8 | 539.6 | 145.8 | 1.370 | Level 3, SF |
| Existing Wells Sec.19-T5N-R63W | | | | | | |
| Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1 | 6,839.9 | 6,423.2 | 12.3 | -141.2 | 0.080 | Level 1, CC, ES, SF |
| Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1 | 7,440.4 | 6,444.7 | 66.8 | 20.3 | 1.438 | Level 3, CC, ES, SF |
| Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1 | 8,207.7 | 6,443.4 | 321.4 | 142.0 | 1.791 | CC, ES, SF |
| Johnson 2 (P&A) - Wellbore #1 - Wellbore #1 | 10,965.7 | 6,434.2 | 252.4 | 117.0 | 1.864 | CC, ES, SF |
| Johnson 4 (P&A) - Wellbore #1 - Wellbore #1 | 9,581.1 | 6,440.2 | 295.8 | 80.7 | 1.375 | Level 3, CC, ES |
| Johnson 4 (P&A) - Wellbore #1 - Wellbore #1 | 9,600.0 | 6,440.2 | 296.4 | 80.7 | 1.374 | Level 3, SF |
| Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1 | 10,060.9 | 6,434.3 | 597.3 | 487.0 | 5.414 | CC, ES |
| Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1 | 10,100.0 | 6,433.1 | 598.6 | 487.2 | 5.374 | SF |
| Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1 | 9,113.1 | 6,445.2 | 191.2 | 106.4 | 2.255 | CC, ES, SF |
| Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1 | 9,363.7 | 6,446.2 | 514.5 | 421.6 | 5.537 | CC, ES |
| Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1 | 9,400.0 | 6,445.6 | 515.8 | 421.9 | 5.494 | SF |
| Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1 | 12,200.0 | 6,440.3 | 6.6 | -280.5 | 0.023 | Level 1, CC, ES, SF |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 76.01 | 14.6 | 58.5 | 60.3 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 76.01 | 14.6 | 58.5 | 60.3 | 60.1 | 0.22 | 268.228 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 76.01 | 14.6 | 58.5 | 60.3 | 59.6 | 0.67 | 89.409 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | 76.01 | 14.6 | 58.5 | 60.3 | 59.2 | 1.12 | 53.646 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | 76.01 | 14.6 | 58.5 | 60.3 | 58.7 | 1.57 | 38.318 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | 76.01 | 14.6 | 58.5 | 60.3 | 58.3 | 2.02 | 29.803 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | 76.01 | 14.6 | 58.5 | 60.3 | 57.8 | 2.47 | 24.384 CC, ES | |
| 700.0 | 700.0 | 698.6 | 698.6 | 1.5 | 1.5 | 75.44 | 15.4 | 59.4 | 61.4 | 58.5 | 2.91 | 21.074 | |
| 800.0 | 800.0 | 797.1 | 797.0 | 1.7 | 1.7 | 73.86 | 18.0 | 62.2 | 64.9 | 61.5 | 3.36 | 19.326 | |
| 900.0 | 900.0 | 895.3 | 895.0 | 1.9 | 1.9 | 71.58 | 22.3 | 66.9 | 70.7 | 66.9 | 3.81 | 18.580 | |
| 1,000.0 | 1,000.0 | 993.1 | 992.4 | 2.1 | 2.1 | 68.97 | 28.2 | 73.4 | 79.0 | 74.7 | 4.27 | 18.523 SF | |
| 1,100.0 | 1,100.0 | 1,090.4 | 1,089.1 | 2.4 | 2.4 | 66.33 | 35.8 | 81.7 | 89.9 | 85.1 | 4.74 | 18.947 | |
| 1,200.0 | 1,200.0 | 1,187.1 | 1,184.8 | 2.6 | 2.7 | 63.87 | 45.0 | 91.7 | 103.3 | 98.0 | 5.24 | 19.702 | |
| 1,300.0 | 1,300.0 | 1,283.0 | 1,279.4 | 2.8 | 3.0 | 61.69 | 55.7 | 103.4 | 119.3 | 113.5 | 5.77 | 20.677 | |
| 1,400.0 | 1,400.0 | 1,378.1 | 1,372.7 | 3.0 | 3.3 | 59.82 | 67.9 | 116.8 | 137.8 | 131.5 | 6.32 | 21.790 | |
| 1,500.0 | 1,500.0 | 1,472.4 | 1,464.8 | 3.2 | 3.7 | -41.15 | 81.6 | 131.7 | 157.9 | 151.4 | 6.50 | 24.275 | |
| 1,600.0 | 1,599.9 | 1,565.9 | 1,555.7 | 3.4 | 4.1 | -43.07 | 96.6 | 148.1 | 178.6 | 171.6 | 6.93 | 25.753 | |
| 1,700.0 | 1,699.7 | 1,658.7 | 1,645.2 | 3.6 | 4.5 | -45.12 | 113.0 | 166.0 | 200.0 | 192.7 | 7.37 | 27.132 | |
| 1,800.0 | 1,799.3 | 1,753.2 | 1,735.9 | 3.9 | 5.0 | -47.27 | 131.1 | 185.7 | 222.1 | 214.3 | 7.83 | 28.372 | |
| 1,900.0 | 1,898.6 | 1,850.5 | 1,829.1 | 4.1 | 5.5 | -49.53 | 149.8 | 206.2 | 243.2 | 234.9 | 8.31 | 29.271 | |
| 2,000.0 | 1,997.5 | 1,947.8 | 1,922.4 | 4.4 | 6.0 | -51.83 | 168.6 | 226.8 | 263.1 | 254.3 | 8.81 | 29.849 | |
| 2,100.0 | 2,096.1 | 2,045.3 | 2,015.7 | 4.6 | 6.5 | -54.22 | 187.4 | 247.3 | 281.9 | 272.6 | 9.36 | 30.133 | |
| 2,200.0 | 2,194.2 | 2,142.7 | 2,109.1 | 5.0 | 7.1 | -56.69 | 206.2 | 267.8 | 299.8 | 289.9 | 9.94 | 30.151 | |
| 2,300.0 | 2,291.7 | 2,240.1 | 2,202.4 | 5.3 | 7.6 | -59.26 | 225.0 | 288.4 | 317.0 | 306.4 | 10.59 | 29.929 | |
| 2,400.0 | 2,388.6 | 2,337.3 | 2,295.6 | 5.7 | 8.2 | -61.93 | 243.8 | 308.9 | 333.6 | 322.3 | 11.31 | 29.497 | |
| 2,500.0 | 2,484.9 | 2,434.3 | 2,388.6 | 6.1 | 8.7 | -64.69 | 262.5 | 329.3 | 349.9 | 337.8 | 12.11 | 28.888 | |
| 2,534.8 | 2,518.2 | 2,468.0 | 2,420.9 | 6.3 | 8.9 | -65.67 | 269.0 | 336.4 | 355.6 | 343.2 | 12.41 | 28.642 | |
| 2,600.0 | 2,580.5 | 2,531.2 | 2,481.4 | 6.6 | 9.3 | -67.62 | 281.2 | 349.7 | 366.3 | 353.3 | 13.00 | 28.169 | |
| 2,700.0 | 2,676.1 | 2,628.0 | 2,574.1 | 7.1 | 9.8 | -70.39 | 299.9 | 370.2 | 383.6 | 369.7 | 13.95 | 27.496 | |
| 2,800.0 | 2,771.8 | 2,724.8 | 2,666.9 | 7.7 | 10.4 | -72.92 | 318.6 | 390.6 | 401.7 | 386.8 | 14.94 | 26.889 | |
| 2,900.0 | 2,867.4 | 2,821.6 | 2,759.7 | 8.2 | 10.9 | -75.23 | 337.3 | 411.0 | 420.5 | 404.5 | 15.96 | 26.348 | |
| 3,000.0 | 2,963.0 | 2,918.4 | 2,852.4 | 8.8 | 11.5 | -77.35 | 356.0 | 431.4 | 439.9 | 422.9 | 17.01 | 25.869 | |
| 3,100.0 | 3,058.6 | 3,015.2 | 2,945.2 | 9.3 | 12.1 | -79.30 | 374.7 | 451.8 | 459.9 | 441.8 | 18.07 | 25.447 | |
| 3,200.0 | 3,154.2 | 3,112.0 | 3,038.0 | 9.9 | 12.6 | -81.08 | 393.4 | 472.2 | 480.4 | 461.2 | 19.16 | 25.077 | |
| 3,300.0 | 3,249.9 | 3,208.8 | 3,130.7 | 10.5 | 13.2 | -82.72 | 412.0 | 492.6 | 501.2 | 481.0 | 20.25 | 24.752 | |
| 3,400.0 | 3,345.5 | 3,305.7 | 3,223.5 | 11.1 | 13.8 | -84.23 | 430.7 | 513.0 | 522.5 | 501.1 | 21.35 | 24.468 | |
| 3,500.0 | 3,441.1 | 3,402.5 | 3,316.3 | 11.7 | 14.3 | -85.62 | 449.4 | 533.4 | 544.0 | 521.6 | 22.46 | 24.219 | |
| 3,600.0 | 3,536.7 | 3,499.3 | 3,409.1 | 12.3 | 14.9 | -86.91 | 468.1 | 553.9 | 565.9 | 542.3 | 23.58 | 24.000 | |
| 3,700.0 | 3,632.3 | 3,596.1 | 3,501.8 | 12.8 | 15.4 | -88.10 | 486.8 | 574.3 | 588.0 | 563.3 | 24.70 | 23.808 | |
| 3,800.0 | 3,728.0 | 3,692.9 | 3,594.6 | 13.4 | 16.0 | -89.21 | 505.5 | 594.7 | 610.3 | 584.5 | 25.82 | 23.639 | |
| 3,900.0 | 3,823.6 | 3,789.7 | 3,687.4 | 14.0 | 16.6 | -90.24 | 524.2 | 615.1 | 632.8 | 605.9 | 26.94 | 23.491 | |
| 4,000.0 | 3,919.2 | 3,886.5 | 3,780.1 | 14.6 | 17.1 | -91.20 | 542.9 | 635.5 | 655.6 | 627.5 | 28.06 | 23.359 | |
| 4,100.0 | 4,014.8 | 3,983.3 | 3,872.9 | 15.3 | 17.7 | -92.09 | 561.5 | 655.9 | 678.4 | 649.3 | 29.19 | 23.243 | |
| 4,200.0 | 4,110.4 | 4,080.1 | 3,965.7 | 15.9 | 18.3 | -92.93 | 580.2 | 676.3 | 701.5 | 671.2 | 30.31 | 23.140 | |
| 4,300.0 | 4,206.1 | 4,177.0 | 4,058.5 | 16.5 | 18.9 | -93.71 | 598.9 | 696.7 | 724.6 | 693.2 | 31.44 | 23.049 | |
| 4,400.0 | 4,301.7 | 4,273.8 | 4,151.2 | 17.1 | 19.4 | -94.45 | 617.6 | 717.1 | 747.9 | 715.4 | 32.56 | 22.968 | |
| 4,500.0 | 4,397.3 | 4,370.6 | 4,244.0 | 17.7 | 20.0 | -95.14 | 636.3 | 737.6 | 771.3 | 737.6 | 33.69 | 22.895 | |
| 4,600.0 | 4,492.9 | 4,467.4 | 4,336.8 | 18.3 | 20.6 | -95.79 | 655.0 | 758.0 | 794.8 | 760.0 | 34.81 | 22.831 | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | |
| Reference | | | | Offset | | | Semi Major Axis | | Distance | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 76.22 | 21.9 | 89.1 | 91.8 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 76.22 | 21.9 | 89.1 | 91.8 | 91.6 | 0.22 | 408.347 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 76.22 | 21.9 | 89.1 | 91.8 | 91.1 | 0.67 | 136.116 CC, ES | |
| 300.0 | 300.0 | 298.1 | 298.0 | 0.6 | 0.6 | 75.78 | 22.8 | 90.0 | 92.8 | 91.7 | 1.12 | 83.089 | |
| 400.0 | 400.0 | 396.0 | 395.9 | 0.8 | 0.8 | 74.50 | 25.6 | 92.4 | 96.0 | 94.5 | 1.56 | 61.399 | |
| 500.0 | 500.0 | 493.6 | 493.3 | 1.0 | 1.0 | 72.55 | 30.4 | 96.6 | 101.4 | 99.4 | 2.02 | 50.201 | |
| 600.0 | 600.0 | 590.9 | 590.2 | 1.2 | 1.3 | 70.16 | 36.9 | 102.3 | 109.2 | 106.7 | 2.49 | 43.799 | |
| 700.0 | 700.0 | 687.7 | 686.4 | 1.5 | 1.5 | 67.56 | 45.3 | 109.6 | 119.4 | 116.4 | 2.99 | 39.965 | |
| 800.0 | 800.0 | 783.8 | 781.6 | 1.7 | 1.8 | 64.93 | 55.4 | 118.4 | 132.0 | 128.5 | 3.51 | 37.652 | |
| 900.0 | 900.0 | 879.3 | 875.7 | 1.9 | 2.2 | 62.43 | 67.2 | 128.8 | 147.3 | 143.2 | 4.06 | 36.297 | |
| 1,000.0 | 1,000.0 | 973.8 | 968.5 | 2.1 | 2.5 | 60.14 | 80.7 | 140.5 | 165.1 | 160.4 | 4.64 | 35.568 | |
| 1,100.0 | 1,100.0 | 1,067.4 | 1,060.0 | 2.4 | 2.9 | 58.08 | 95.7 | 153.7 | 185.4 | 180.1 | 5.26 | 35.262 | |
| 1,200.0 | 1,200.0 | 1,160.0 | 1,149.9 | 2.6 | 3.3 | 56.27 | 112.2 | 168.1 | 208.2 | 202.3 | 5.91 | 35.246 | |
| 1,300.0 | 1,300.0 | 1,251.4 | 1,238.2 | 2.8 | 3.8 | 54.69 | 130.2 | 183.7 | 233.5 | 226.9 | 6.59 | 35.444 | |
| 1,400.0 | 1,400.0 | 1,345.9 | 1,329.0 | 3.0 | 4.3 | 53.28 | 149.9 | 201.0 | 260.6 | 253.3 | 7.31 | 35.626 | |
| 1,500.0 | 1,500.0 | 1,442.1 | 1,421.4 | 3.2 | 4.8 | -47.05 | 170.1 | 218.6 | 287.1 | 280.3 | 6.71 | 42.804 | |
| 1,600.0 | 1,599.9 | 1,538.7 | 1,514.1 | 3.4 | 5.3 | -48.26 | 190.3 | 236.3 | 312.0 | 304.8 | 7.16 | 43.544 | |
| 1,700.0 | 1,699.7 | 1,635.5 | 1,607.1 | 3.6 | 5.9 | -49.61 | 210.6 | 254.0 | 335.4 | 327.8 | 7.63 | 43.961 | |
| 1,800.0 | 1,799.3 | 1,732.5 | 1,700.3 | 3.9 | 6.4 | -51.09 | 230.9 | 271.8 | 357.4 | 349.3 | 8.10 | 44.105 | |
| 1,900.0 | 1,898.6 | 1,829.6 | 1,793.5 | 4.1 | 7.0 | -52.70 | 251.3 | 289.6 | 378.2 | 369.6 | 8.59 | 44.012 | |
| 2,000.0 | 1,997.5 | 1,926.7 | 1,886.8 | 4.4 | 7.5 | -54.42 | 271.7 | 307.3 | 397.9 | 388.8 | 9.10 | 43.702 | |
| 2,100.0 | 2,096.1 | 2,023.9 | 1,980.1 | 4.6 | 8.0 | -56.26 | 292.0 | 325.1 | 416.5 | 406.9 | 9.64 | 43.186 | |
| 2,200.0 | 2,194.2 | 2,120.9 | 2,073.4 | 5.0 | 8.6 | -58.21 | 312.4 | 342.9 | 434.3 | 424.1 | 10.22 | 42.476 | |
| 2,300.0 | 2,291.7 | 2,217.9 | 2,166.5 | 5.3 | 9.1 | -60.28 | 332.7 | 360.7 | 451.4 | 440.5 | 10.86 | 41.581 | |
| 2,400.0 | 2,388.6 | 2,314.6 | 2,259.4 | 5.7 | 9.7 | -62.45 | 353.0 | 378.4 | 468.0 | 456.4 | 11.55 | 40.519 | |
| 2,500.0 | 2,484.9 | 2,411.0 | 2,352.0 | 6.1 | 10.2 | -64.72 | 373.2 | 396.0 | 484.2 | 471.9 | 12.32 | 39.313 | |
| 2,534.8 | 2,518.2 | 2,444.5 | 2,384.1 | 6.3 | 10.4 | -65.54 | 380.2 | 402.1 | 489.8 | 477.2 | 12.60 | 38.865 | |
| 2,600.0 | 2,580.5 | 2,507.2 | 2,444.3 | 6.6 | 10.8 | -67.18 | 393.3 | 413.6 | 500.5 | 487.4 | 13.16 | 38.028 | |
| 2,700.0 | 2,676.1 | 2,603.3 | 2,536.7 | 7.1 | 11.3 | -69.58 | 413.5 | 431.2 | 517.7 | 503.7 | 14.06 | 36.821 | |
| 2,800.0 | 2,771.8 | 2,699.4 | 2,629.0 | 7.7 | 11.9 | -71.82 | 433.7 | 448.8 | 535.8 | 520.8 | 15.00 | 35.716 | |
| 2,900.0 | 2,867.4 | 2,795.6 | 2,721.4 | 8.2 | 12.4 | -73.92 | 453.8 | 466.4 | 554.7 | 538.7 | 15.98 | 34.713 | |
| 3,000.0 | 2,963.0 | 2,891.7 | 2,813.7 | 8.8 | 13.0 | -75.88 | 474.0 | 484.0 | 574.2 | 557.2 | 16.98 | 33.809 | |
| 3,100.0 | 3,058.6 | 2,987.9 | 2,906.0 | 9.3 | 13.5 | -77.72 | 494.1 | 501.7 | 594.4 | 576.4 | 18.01 | 32.998 | |
| 3,200.0 | 3,154.2 | 3,084.0 | 2,998.4 | 9.9 | 14.1 | -79.44 | 514.3 | 519.3 | 615.1 | 596.1 | 19.06 | 32.272 | |
| 3,300.0 | 3,249.9 | 3,180.2 | 3,090.7 | 10.5 | 14.6 | -81.05 | 534.4 | 536.9 | 636.4 | 616.3 | 20.12 | 31.624 | |
| 3,400.0 | 3,345.5 | 3,276.3 | 3,183.1 | 11.1 | 15.2 | -82.56 | 554.6 | 554.5 | 658.1 | 636.9 | 21.20 | 31.046 | |
| 3,500.0 | 3,441.1 | 3,372.4 | 3,275.4 | 11.7 | 15.7 | -83.97 | 574.7 | 572.1 | 680.3 | 658.0 | 22.28 | 30.529 | |
| 3,600.0 | 3,536.7 | 3,468.6 | 3,367.8 | 12.3 | 16.3 | -85.30 | 594.9 | 589.7 | 702.8 | 679.4 | 23.37 | 30.068 | |
| 3,700.0 | 3,632.3 | 3,564.7 | 3,460.1 | 12.8 | 16.8 | -86.54 | 615.0 | 607.3 | 725.6 | 701.2 | 24.47 | 29.655 | |
| 3,800.0 | 3,728.0 | 3,660.9 | 3,552.4 | 13.4 | 17.4 | -87.71 | 635.2 | 624.9 | 748.8 | 723.2 | 25.57 | 29.285 | |
| 3,900.0 | 3,823.6 | 3,757.0 | 3,644.8 | 14.0 | 17.9 | -88.81 | 655.4 | 642.5 | 772.3 | 745.6 | 26.67 | 28.954 | |
| 4,000.0 | 3,919.2 | 3,853.2 | 3,737.1 | 14.6 | 18.5 | -89.85 | 675.5 | 660.1 | 796.0 | 768.2 | 27.78 | 28.656 SF | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: | | Reference | | Offset | | Semi Major Axis | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -104.64 | -3.6 | -13.9 | 14.4 | 14.4 | 0.00 | N/A | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -104.64 | -3.6 | -13.9 | 14.4 | 14.2 | 0.23 | 63.415 | | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -104.64 | -3.6 | -13.9 | 14.4 | 13.7 | 0.68 | 21.279 | | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -104.64 | -3.6 | -13.9 | 14.4 | 13.3 | 1.13 | 12.784 | | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 0.8 | -104.64 | -3.6 | -13.9 | 14.4 | 12.8 | 1.58 | 9.137 | | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 1.0 | -104.64 | -3.6 | -13.9 | 14.4 | 12.4 | 2.03 | 7.109 | | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 1.2 | -104.64 | -3.6 | -13.9 | 14.4 | 11.9 | 2.47 | 5.817 | | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.5 | 1.5 | -104.64 | -3.6 | -13.9 | 14.4 | 11.5 | 2.92 | 4.923 | | |
| 800.0 | 800.0 | 801.0 | 801.0 | 1.7 | 1.7 | -104.64 | -3.6 | -13.9 | 14.4 | 11.0 | 3.37 | 4.267 | | |
| 900.0 | 900.0 | 901.0 | 901.0 | 1.9 | 1.9 | -104.64 | -3.6 | -13.9 | 14.4 | 10.6 | 3.82 | 3.765 | | |
| 1,000.0 | 1,000.0 | 1,001.0 | 1,001.0 | 2.1 | 2.1 | -104.64 | -3.6 | -13.9 | 14.4 | 10.1 | 4.27 | 3.369 | | |
| 1,100.0 | 1,100.0 | 1,101.0 | 1,101.0 | 2.4 | 2.4 | -104.64 | -3.6 | -13.9 | 14.4 | 9.7 | 4.72 | 3.049 | | |
| 1,200.0 | 1,200.0 | 1,201.0 | 1,201.0 | 2.6 | 2.6 | -104.64 | -3.6 | -13.9 | 14.4 | 9.2 | 5.17 | 2.784 | | |
| 1,300.0 | 1,300.0 | 1,301.0 | 1,301.0 | 2.8 | 2.8 | -104.64 | -3.6 | -13.9 | 14.4 | 8.8 | 5.62 | 2.561 | | |
| 1,400.0 | 1,400.0 | 1,401.0 | 1,401.0 | 3.0 | 3.0 | -104.64 | -3.6 | -13.9 | 14.4 | 8.3 | 6.07 | 2.371 CC, ES | | |
| 1,500.0 | 1,500.0 | 1,501.0 | 1,501.0 | 3.2 | 3.3 | 158.03 | -3.6 | -13.9 | 15.6 | 9.1 | 6.50 | 2.399 | | |
| 1,600.0 | 1,599.9 | 1,600.9 | 1,600.9 | 3.4 | 3.5 | 162.38 | -3.6 | -13.9 | 19.3 | 12.4 | 6.92 | 2.789 | | |
| 1,700.0 | 1,699.7 | 1,701.3 | 1,701.3 | 3.6 | 3.7 | 167.11 | -3.4 | -12.6 | 24.3 | 17.0 | 7.32 | 3.315 | | |
| 1,800.0 | 1,799.3 | 1,801.9 | 1,801.8 | 3.9 | 3.9 | 171.89 | -2.8 | -8.7 | 29.4 | 21.6 | 7.71 | 3.806 | | |
| 1,900.0 | 1,898.6 | 1,902.5 | 1,902.2 | 4.1 | 4.1 | 176.64 | -1.7 | -2.1 | 34.6 | 26.5 | 8.11 | 4.273 | | |
| 2,000.0 | 1,997.5 | 2,003.3 | 2,002.5 | 4.4 | 4.3 | -178.67 | -0.2 | 7.1 | 40.2 | 31.7 | 8.50 | 4.732 | | |
| 2,100.0 | 2,096.1 | 2,104.1 | 2,102.6 | 4.6 | 4.6 | -174.11 | 1.7 | 18.9 | 46.2 | 37.3 | 8.91 | 5.189 | | |
| 2,200.0 | 2,194.2 | 2,205.0 | 2,202.5 | 5.0 | 4.8 | -169.72 | 4.1 | 33.3 | 52.7 | 43.3 | 9.32 | 5.648 | | |
| 2,300.0 | 2,291.7 | 2,305.9 | 2,301.9 | 5.3 | 5.1 | -165.54 | 6.8 | 50.3 | 59.7 | 49.9 | 9.77 | 6.107 | | |
| 2,400.0 | 2,388.6 | 2,406.9 | 2,400.9 | 5.7 | 5.4 | -161.58 | 10.1 | 69.9 | 67.2 | 57.0 | 10.25 | 6.558 | | |
| 2,500.0 | 2,484.9 | 2,508.0 | 2,499.4 | 6.1 | 5.8 | -157.87 | 13.7 | 92.1 | 75.5 | 64.7 | 10.80 | 6.990 | | |
| 2,534.8 | 2,518.2 | 2,543.1 | 2,533.6 | 6.3 | 5.9 | -156.63 | 15.0 | 100.4 | 78.5 | 67.5 | 11.00 | 7.134 | | |
| 2,600.0 | 2,580.5 | 2,609.1 | 2,597.4 | 6.6 | 6.2 | -154.27 | 17.7 | 116.8 | 83.9 | 72.4 | 11.45 | 7.326 | | |
| 2,700.0 | 2,676.1 | 2,710.2 | 2,694.7 | 7.1 | 6.6 | -150.17 | 22.2 | 144.2 | 90.9 | 78.7 | 12.23 | 7.431 | | |
| 2,800.0 | 2,771.8 | 2,811.4 | 2,791.2 | 7.7 | 7.1 | -145.45 | 27.1 | 174.1 | 96.7 | 83.5 | 13.16 | 7.348 | | |
| 2,900.0 | 2,867.4 | 2,911.1 | 2,885.8 | 8.2 | 7.6 | -140.54 | 32.1 | 205.1 | 102.1 | 87.9 | 14.22 | 7.180 | | |
| 3,000.0 | 2,963.0 | 3,010.6 | 2,980.2 | 8.8 | 8.2 | -136.14 | 37.2 | 236.2 | 108.1 | 92.8 | 15.36 | 7.043 | | |
| 3,100.0 | 3,058.6 | 3,110.1 | 3,074.6 | 9.3 | 8.7 | -132.23 | 42.3 | 267.2 | 114.8 | 98.2 | 16.55 | 6.934 | | |
| 3,200.0 | 3,154.2 | 3,209.6 | 3,169.0 | 9.9 | 9.3 | -128.75 | 47.4 | 298.2 | 121.9 | 104.1 | 17.78 | 6.852 | | |
| 3,300.0 | 3,249.9 | 3,309.1 | 3,263.4 | 10.5 | 9.9 | -125.67 | 52.4 | 329.3 | 129.4 | 110.3 | 19.04 | 6.793 | | |
| 3,400.0 | 3,345.5 | 3,408.6 | 3,357.8 | 11.1 | 10.5 | -122.92 | 57.5 | 360.3 | 137.2 | 116.9 | 20.32 | 6.752 | | |
| 3,500.0 | 3,441.1 | 3,508.1 | 3,452.2 | 11.7 | 11.1 | -120.48 | 62.6 | 391.3 | 145.3 | 123.7 | 21.61 | 6.725 | | |
| 3,600.0 | 3,536.7 | 3,607.6 | 3,546.6 | 12.3 | 11.7 | -118.30 | 67.6 | 422.4 | 153.6 | 130.8 | 22.90 | 6.710 | | |
| 3,700.0 | 3,632.3 | 3,707.0 | 3,640.9 | 12.8 | 12.3 | -116.35 | 72.7 | 453.4 | 162.2 | 138.0 | 24.19 | 6.705 | | |
| 3,800.0 | 3,728.0 | 3,806.5 | 3,735.3 | 13.4 | 12.9 | -114.59 | 77.8 | 484.4 | 170.9 | 145.4 | 25.49 | 6.706 | | |
| 3,900.0 | 3,823.6 | 3,906.0 | 3,829.7 | 14.0 | 13.6 | -113.00 | 82.8 | 515.5 | 179.8 | 153.0 | 26.78 | 6.713 | | |
| 4,000.0 | 3,919.2 | 4,005.5 | 3,924.1 | 14.6 | 14.2 | -111.57 | 87.9 | 546.5 | 188.7 | 160.7 | 28.07 | 6.724 | | |
| 4,100.0 | 4,014.8 | 4,105.0 | 4,018.5 | 15.3 | 14.8 | -110.26 | 93.0 | 577.5 | 197.8 | 168.5 | 29.36 | 6.738 | | |
| 4,200.0 | 4,110.4 | 4,204.5 | 4,112.9 | 15.9 | 15.5 | -109.07 | 98.1 | 608.6 | 207.0 | 176.4 | 30.65 | 6.754 | | |
| 4,300.0 | 4,206.1 | 4,304.0 | 4,207.3 | 16.5 | 16.1 | -107.98 | 103.1 | 639.6 | 216.3 | 184.3 | 31.94 | 6.772 | | |
| 4,400.0 | 4,301.7 | 4,403.5 | 4,301.7 | 17.1 | 16.7 | -106.98 | 108.2 | 670.6 | 225.6 | 192.4 | 33.22 | 6.791 | | |
| 4,500.0 | 4,397.3 | 4,503.0 | 4,396.1 | 17.7 | 17.4 | -106.06 | 113.3 | 701.6 | 235.0 | 200.5 | 34.50 | 6.811 | | |
| 4,600.0 | 4,492.9 | 4,602.4 | 4,490.5 | 18.3 | 18.0 | -105.21 | 118.3 | 732.7 | 244.5 | 208.7 | 35.78 | 6.831 | | |
| 4,700.0 | 4,588.5 | 4,701.9 | 4,584.8 | 18.9 | 18.7 | -104.43 | 123.4 | 763.7 | 254.0 | 216.9 | 37.06 | 6.852 | | |
| 4,800.0 | 4,684.2 | 4,801.4 | 4,679.2 | 19.5 | 19.3 | -103.70 | 128.5 | 794.7 | 263.5 | 225.2 | 38.34 | 6.873 | | |
| 4,900.0 | 4,779.8 | 4,900.9 | 4,773.6 | 20.2 | 20.0 | -103.02 | 133.5 | 825.8 | 273.1 | 233.5 | 39.62 | 6.893 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | | | Offset | | | Semi Major Axis | | Distance | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.0 | 4,875.4 | 5,000.4 | 4,868.0 | 20.8 | 20.6 | -102.39 | 138.6 | 856.8 | 282.7 | 241.8 | 40.89 | 6.914 | |
| 5,100.0 | 4,971.0 | 5,099.9 | 4,962.4 | 21.4 | 21.3 | -101.80 | 143.7 | 887.8 | 292.4 | 250.2 | 42.16 | 6.934 | |
| 5,200.0 | 5,066.6 | 5,199.4 | 5,056.8 | 22.0 | 21.9 | -101.25 | 148.8 | 918.9 | 302.0 | 258.6 | 43.44 | 6.954 | |
| 5,300.0 | 5,162.2 | 5,298.9 | 5,151.2 | 22.6 | 22.6 | -100.73 | 153.8 | 949.9 | 311.7 | 267.0 | 44.71 | 6.973 | |
| 5,400.0 | 5,257.9 | 5,398.4 | 5,245.6 | 23.2 | 23.2 | -100.24 | 158.9 | 980.9 | 321.5 | 275.5 | 45.98 | 6.992 | |
| 5,500.0 | 5,353.5 | 5,497.9 | 5,340.0 | 23.9 | 23.9 | -99.78 | 164.0 | 1,012.0 | 331.2 | 284.0 | 47.25 | 7.011 | |
| 5,600.0 | 5,449.1 | 5,597.3 | 5,434.4 | 24.5 | 24.5 | -99.35 | 169.0 | 1,043.0 | 341.0 | 292.5 | 48.52 | 7.029 | |
| 5,626.6 | 5,474.5 | 5,623.6 | 5,459.3 | 24.6 | 24.7 | -99.30 | 170.4 | 1,050.8 | 343.6 | 294.8 | 48.82 | 7.038 | |
| 5,650.0 | 5,497.0 | 5,646.6 | 5,481.5 | 24.8 | 24.8 | -100.57 | 171.6 | 1,057.0 | 345.9 | 296.9 | 49.06 | 7.050 | |
| 5,700.0 | 5,545.6 | 5,695.8 | 5,529.4 | 25.0 | 25.0 | -104.36 | 174.1 | 1,068.0 | 350.9 | 301.5 | 49.44 | 7.099 | |
| 5,750.0 | 5,594.9 | 5,745.0 | 5,577.9 | 25.1 | 25.1 | -111.23 | 176.7 | 1,075.8 | 356.0 | 306.3 | 49.72 | 7.160 | |
| 5,800.0 | 5,644.6 | 5,794.2 | 5,626.8 | 25.2 | 25.2 | -127.77 | 179.4 | 1,080.5 | 361.1 | 311.2 | 49.92 | 7.234 | |
| 5,850.0 | 5,694.5 | 5,843.4 | 5,675.8 | 25.3 | 25.3 | 179.38 | 182.0 | 1,082.1 | 366.3 | 316.2 | 50.05 | 7.318 | |
| 5,900.0 | 5,744.4 | 5,892.5 | 5,724.9 | 25.3 | 25.3 | 125.55 | 184.6 | 1,080.4 | 371.4 | 321.3 | 50.10 | 7.413 | |
| 5,950.0 | 5,794.1 | 5,941.7 | 5,773.7 | 25.3 | 25.3 | 108.68 | 187.3 | 1,075.6 | 376.5 | 326.4 | 50.09 | 7.517 | |
| 6,000.0 | 5,843.3 | 5,990.8 | 5,822.2 | 25.3 | 25.3 | 101.76 | 189.9 | 1,067.7 | 381.6 | 331.6 | 50.01 | 7.630 | |
| 6,050.0 | 5,892.0 | 6,040.0 | 5,870.0 | 25.2 | 25.3 | 98.01 | 192.4 | 1,056.7 | 386.6 | 336.7 | 49.89 | 7.749 | |
| 6,100.0 | 5,939.8 | 6,089.2 | 5,917.1 | 25.1 | 25.2 | 95.61 | 195.0 | 1,042.6 | 391.5 | 341.8 | 49.72 | 7.874 | |
| 6,150.0 | 5,986.5 | 6,138.4 | 5,963.2 | 25.0 | 25.1 | 93.93 | 197.5 | 1,025.5 | 396.3 | 346.8 | 49.52 | 8.003 | |
| 6,200.0 | 6,032.0 | 6,187.7 | 6,008.1 | 24.9 | 25.0 | 92.66 | 199.9 | 1,005.5 | 401.0 | 351.7 | 49.30 | 8.134 | |
| 6,250.0 | 6,076.1 | 6,237.0 | 6,051.7 | 24.8 | 24.9 | 91.65 | 202.2 | 982.5 | 405.5 | 356.5 | 49.06 | 8.266 | |
| 6,300.0 | 6,118.5 | 6,286.4 | 6,093.7 | 24.7 | 24.7 | 90.84 | 204.5 | 956.8 | 409.9 | 361.1 | 48.83 | 8.395 | |
| 6,350.0 | 6,159.1 | 6,335.8 | 6,134.0 | 24.6 | 24.6 | 90.17 | 206.7 | 928.4 | 414.1 | 365.5 | 48.61 | 8.519 | |
| 6,400.0 | 6,197.7 | 6,385.2 | 6,172.5 | 24.5 | 24.5 | 89.60 | 208.7 | 897.4 | 418.1 | 369.6 | 48.42 | 8.635 | |
| 6,450.0 | 6,234.2 | 6,434.7 | 6,208.9 | 24.4 | 24.5 | 89.12 | 210.7 | 863.9 | 421.8 | 373.5 | 48.27 | 8.738 | |
| 6,500.0 | 6,268.3 | 6,484.2 | 6,243.1 | 24.3 | 24.4 | 88.71 | 212.5 | 828.1 | 425.3 | 377.1 | 48.19 | 8.826 | |
| 6,550.0 | 6,300.0 | 6,533.9 | 6,275.0 | 24.3 | 24.4 | 88.36 | 214.2 | 790.1 | 428.6 | 380.4 | 48.18 | 8.895 | |
| 6,600.0 | 6,329.1 | 6,583.5 | 6,304.3 | 24.4 | 24.4 | 88.07 | 215.8 | 750.1 | 431.6 | 383.3 | 48.27 | 8.940 | |
| 6,650.0 | 6,355.5 | 6,633.3 | 6,331.0 | 24.4 | 24.5 | 87.82 | 217.3 | 708.2 | 434.3 | 385.8 | 48.47 | 8.960 | |
| 6,700.0 | 6,379.1 | 6,683.1 | 6,355.0 | 24.6 | 24.7 | 87.62 | 218.6 | 664.6 | 436.7 | 388.0 | 48.79 | 8.952 | |
| 6,750.0 | 6,399.7 | 6,732.9 | 6,376.1 | 24.8 | 24.9 | 87.46 | 219.7 | 619.5 | 438.9 | 389.6 | 49.23 | 8.915 | |
| 6,800.0 | 6,417.3 | 6,782.8 | 6,394.3 | 25.0 | 25.1 | 87.34 | 220.7 | 573.0 | 440.7 | 390.9 | 49.81 | 8.848 | |
| 6,850.0 | 6,431.9 | 6,832.8 | 6,409.4 | 25.4 | 25.5 | 87.26 | 221.5 | 525.4 | 442.2 | 391.7 | 50.51 | 8.754 | |
| 6,900.0 | 6,443.2 | 6,882.8 | 6,421.4 | 25.8 | 25.9 | 87.22 | 222.1 | 476.8 | 443.4 | 392.0 | 51.35 | 8.635 | |
| 6,950.0 | 6,451.4 | 6,932.9 | 6,430.1 | 26.2 | 26.3 | 87.21 | 222.6 | 427.5 | 444.2 | 391.9 | 52.31 | 8.493 | |
| 7,000.0 | 6,456.3 | 6,983.0 | 6,435.7 | 26.7 | 26.8 | 87.23 | 222.9 | 377.7 | 444.8 | 391.4 | 53.38 | 8.332 | |
| 7,052.2 | 6,458.0 | 7,035.4 | 6,438.0 | 27.3 | 27.4 | 87.29 | 223.1 | 325.4 | 445.0 | 390.4 | 54.60 | 8.150 | |
| 7,100.0 | 6,457.9 | 7,083.2 | 6,437.9 | 27.9 | 28.0 | 87.30 | 223.1 | 277.6 | 445.0 | 389.2 | 55.81 | 7.973 | |
| 7,200.0 | 6,457.7 | 7,183.2 | 6,437.7 | 29.3 | 29.4 | 87.30 | 223.1 | 177.6 | 445.0 | 386.3 | 58.65 | 7.587 | |
| 7,300.0 | 6,457.4 | 7,283.2 | 6,437.5 | 30.9 | 31.0 | 87.30 | 223.1 | 77.6 | 445.0 | 383.1 | 61.86 | 7.193 | |
| 7,400.0 | 6,457.2 | 7,383.2 | 6,437.2 | 32.7 | 32.8 | 87.30 | 223.1 | -22.4 | 445.0 | 379.6 | 65.40 | 6.804 | |
| 7,500.0 | 6,457.0 | 7,483.2 | 6,437.0 | 34.6 | 34.7 | 87.30 | 223.1 | -122.4 | 445.0 | 375.7 | 69.22 | 6.429 | |
| 7,600.0 | 6,456.8 | 7,583.2 | 6,436.8 | 36.6 | 36.7 | 87.30 | 223.1 | -222.4 | 445.0 | 371.7 | 73.26 | 6.073 | |
| 7,700.0 | 6,456.5 | 7,683.2 | 6,436.5 | 38.7 | 38.8 | 87.30 | 223.1 | -322.4 | 445.0 | 367.5 | 77.50 | 5.741 | |
| 7,800.0 | 6,456.3 | 7,783.2 | 6,436.3 | 40.9 | 41.0 | 87.30 | 223.1 | -422.4 | 445.0 | 363.0 | 81.91 | 5.432 | |
| 7,900.0 | 6,456.1 | 7,883.2 | 6,436.1 | 43.2 | 43.3 | 87.30 | 223.1 | -522.4 | 445.0 | 358.5 | 86.46 | 5.146 | |
| 8,000.0 | 6,455.8 | 7,983.2 | 6,435.9 | 45.5 | 45.7 | 87.30 | 223.1 | -622.4 | 445.0 | 353.8 | 91.13 | 4.883 | |
| 8,100.0 | 6,455.6 | 8,083.2 | 6,435.6 | 47.9 | 48.0 | 87.30 | 223.1 | -722.4 | 445.0 | 349.1 | 95.90 | 4.640 | |
| 8,200.0 | 6,455.4 | 8,183.2 | 6,435.4 | 50.4 | 50.5 | 87.30 | 223.1 | -822.4 | 445.0 | 344.2 | 100.76 | 4.416 | |
| 8,300.0 | 6,455.2 | 8,283.2 | 6,435.2 | 52.8 | 52.9 | 87.30 | 223.1 | -922.4 | 445.0 | 339.3 | 105.69 | 4.210 | |
| 8,400.0 | 6,454.9 | 8,383.2 | 6,435.0 | 55.3 | 55.4 | 87.30 | 223.1 | -1,022.4 | 445.0 | 334.3 | 110.68 | 4.020 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft | |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|--|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft | |
| Survey Program: | | Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | | |
| 8,500.0 | 6,454.7 | 8,483.2 | 6,434.7 | 57.9 | 58.0 | 87.30 | 223.1 | -1,122.4 | 445.0 | 329.2 | 115.74 | 3.844 | | | |
| 8,600.0 | 6,454.5 | 8,583.2 | 6,434.5 | 60.4 | 60.5 | 87.30 | 223.1 | -1,222.4 | 445.0 | 324.1 | 120.84 | 3.682 | | | |
| 8,700.0 | 6,454.3 | 8,683.2 | 6,434.3 | 63.0 | 63.1 | 87.30 | 223.1 | -1,322.4 | 445.0 | 319.0 | 125.99 | 3.532 | | | |
| 8,800.0 | 6,454.0 | 8,783.2 | 6,434.0 | 65.6 | 65.7 | 87.30 | 223.1 | -1,422.4 | 445.0 | 313.8 | 131.18 | 3.392 | | | |
| 8,900.0 | 6,453.8 | 8,883.2 | 6,433.8 | 68.2 | 68.3 | 87.30 | 223.1 | -1,522.4 | 445.0 | 308.6 | 136.39 | 3.262 | | | |
| 9,000.0 | 6,453.6 | 8,983.2 | 6,433.6 | 70.9 | 70.9 | 87.30 | 223.1 | -1,622.4 | 445.0 | 303.3 | 141.64 | 3.141 | | | |
| 9,100.0 | 6,453.3 | 9,083.2 | 6,433.4 | 73.5 | 73.6 | 87.30 | 223.1 | -1,722.4 | 445.0 | 298.0 | 146.92 | 3.029 | | | |
| 9,200.0 | 6,453.1 | 9,183.2 | 6,433.1 | 76.2 | 76.2 | 87.30 | 223.1 | -1,822.4 | 445.0 | 292.7 | 152.22 | 2.923 | | | |
| 9,300.0 | 6,452.9 | 9,283.2 | 6,432.9 | 78.8 | 78.9 | 87.30 | 223.1 | -1,922.4 | 445.0 | 287.4 | 157.55 | 2.824 | | | |
| 9,400.0 | 6,452.7 | 9,383.2 | 6,432.7 | 81.5 | 81.6 | 87.30 | 223.1 | -2,022.4 | 445.0 | 282.1 | 162.89 | 2.732 | | | |
| 9,500.0 | 6,452.4 | 9,483.2 | 6,432.5 | 84.2 | 84.2 | 87.30 | 223.1 | -2,122.4 | 445.0 | 276.7 | 168.25 | 2.645 | | | |
| 9,600.0 | 6,452.2 | 9,583.2 | 6,432.2 | 86.9 | 86.9 | 87.30 | 223.1 | -2,222.4 | 445.0 | 271.3 | 173.63 | 2.563 | | | |
| 9,700.0 | 6,452.0 | 9,683.2 | 6,432.0 | 89.6 | 89.6 | 87.30 | 223.1 | -2,322.4 | 445.0 | 265.9 | 179.02 | 2.486 | | | |
| 9,800.0 | 6,451.8 | 9,783.2 | 6,431.8 | 92.3 | 92.3 | 87.30 | 223.1 | -2,422.4 | 445.0 | 260.5 | 184.42 | 2.413 | | | |
| 9,900.0 | 6,451.5 | 9,883.2 | 6,431.5 | 95.0 | 95.0 | 87.30 | 223.1 | -2,522.4 | 445.0 | 255.1 | 189.84 | 2.344 | | | |
| 10,000.0 | 6,451.3 | 9,983.2 | 6,431.3 | 97.7 | 97.8 | 87.30 | 223.1 | -2,622.4 | 445.0 | 249.7 | 195.27 | 2.279 | | | |
| 10,100.0 | 6,451.1 | 10,083.2 | 6,431.1 | 100.4 | 100.5 | 87.30 | 223.1 | -2,722.4 | 445.0 | 244.2 | 200.71 | 2.217 | | | |
| 10,200.0 | 6,450.8 | 10,183.2 | 6,430.9 | 103.2 | 103.2 | 87.30 | 223.1 | -2,822.4 | 445.0 | 238.8 | 206.15 | 2.158 | | | |
| 10,300.0 | 6,450.6 | 10,283.2 | 6,430.6 | 105.9 | 105.9 | 87.30 | 223.1 | -2,922.4 | 445.0 | 233.3 | 211.61 | 2.103 | | | |
| 10,400.0 | 6,450.4 | 10,383.2 | 6,430.4 | 108.6 | 108.7 | 87.30 | 223.1 | -3,022.4 | 445.0 | 227.9 | 217.08 | 2.050 | | | |
| 10,500.0 | 6,450.2 | 10,483.2 | 6,430.2 | 111.4 | 111.4 | 87.30 | 223.1 | -3,122.4 | 445.0 | 222.4 | 222.55 | 1.999 | | | |
| 10,600.0 | 6,449.9 | 10,583.2 | 6,430.0 | 114.1 | 114.1 | 87.30 | 223.1 | -3,222.4 | 445.0 | 216.9 | 228.03 | 1.951 | | | |
| 10,700.0 | 6,449.7 | 10,683.2 | 6,429.7 | 116.8 | 116.9 | 87.30 | 223.0 | -3,322.4 | 445.0 | 211.4 | 233.51 | 1.905 | | | |
| 10,800.0 | 6,449.5 | 10,783.2 | 6,429.5 | 119.6 | 119.6 | 87.30 | 223.0 | -3,422.4 | 445.0 | 206.0 | 239.01 | 1.862 | | | |
| 10,900.0 | 6,449.2 | 10,883.2 | 6,429.3 | 122.3 | 122.4 | 87.30 | 223.0 | -3,522.4 | 445.0 | 200.5 | 244.50 | 1.820 | | | |
| 11,000.0 | 6,449.0 | 10,983.2 | 6,429.0 | 125.1 | 125.1 | 87.30 | 223.0 | -3,622.4 | 445.0 | 194.9 | 250.01 | 1.780 | | | |
| 11,100.0 | 6,448.8 | 11,083.2 | 6,428.8 | 127.9 | 127.9 | 87.30 | 223.0 | -3,722.4 | 445.0 | 189.4 | 255.51 | 1.741 | | | |
| 11,200.0 | 6,448.6 | 11,183.2 | 6,428.6 | 130.6 | 130.7 | 87.30 | 223.0 | -3,822.4 | 445.0 | 183.9 | 261.03 | 1.705 | | | |
| 11,300.0 | 6,448.3 | 11,283.2 | 6,428.4 | 133.4 | 133.4 | 87.30 | 223.0 | -3,922.4 | 445.0 | 178.4 | 266.54 | 1.669 | | | |
| 11,400.0 | 6,448.1 | 11,383.2 | 6,428.1 | 136.1 | 136.2 | 87.30 | 223.0 | -4,022.4 | 445.0 | 172.9 | 272.06 | 1.635 | | | |
| 11,500.0 | 6,447.9 | 11,483.2 | 6,427.9 | 138.9 | 138.9 | 87.30 | 223.0 | -4,122.4 | 445.0 | 167.4 | 277.59 | 1.603 | | | |
| 11,600.0 | 6,447.7 | 11,583.2 | 6,427.7 | 141.7 | 141.7 | 87.30 | 223.0 | -4,222.4 | 445.0 | 161.8 | 283.12 | 1.572 | | | |
| 11,700.0 | 6,447.4 | 11,683.2 | 6,427.5 | 144.4 | 144.5 | 87.30 | 223.0 | -4,322.4 | 445.0 | 156.3 | 288.65 | 1.542 | | | |
| 11,800.0 | 6,447.2 | 11,783.2 | 6,427.2 | 147.2 | 147.2 | 87.30 | 223.0 | -4,422.4 | 445.0 | 150.8 | 294.18 | 1.513 | | | |
| 11,900.0 | 6,447.0 | 11,883.2 | 6,427.0 | 150.0 | 150.0 | 87.30 | 223.0 | -4,522.4 | 445.0 | 145.2 | 299.72 | 1.485 Level 3 | | | |
| 12,000.0 | 6,446.7 | 11,983.2 | 6,426.8 | 152.8 | 152.8 | 87.30 | 223.0 | -4,622.4 | 445.0 | 139.7 | 305.26 | 1.458 Level 3 | | | |
| 12,100.0 | 6,446.5 | 12,083.2 | 6,426.5 | 155.5 | 155.6 | 87.30 | 223.0 | -4,722.4 | 445.0 | 134.2 | 310.80 | 1.432 Level 3 | | | |
| 12,200.0 | 6,446.3 | 12,183.2 | 6,426.3 | 158.3 | 158.3 | 87.30 | 223.0 | -4,822.4 | 445.0 | 128.6 | 316.35 | 1.407 Level 3 | | | |
| 12,300.0 | 6,446.1 | 12,283.2 | 6,426.1 | 161.1 | 161.1 | 87.30 | 223.0 | -4,922.4 | 445.0 | 123.1 | 321.90 | 1.382 Level 3 | | | |
| 12,400.0 | 6,445.8 | 12,383.2 | 6,425.9 | 163.9 | 163.9 | 87.30 | 223.0 | -5,022.4 | 445.0 | 117.5 | 327.45 | 1.359 Level 3 | | | |
| 12,500.0 | 6,445.6 | 12,483.2 | 6,425.6 | 166.6 | 166.7 | 87.30 | 223.0 | -5,122.4 | 445.0 | 112.0 | 333.00 | 1.336 Level 3 | | | |
| 12,600.0 | 6,445.4 | 12,583.2 | 6,425.4 | 169.4 | 169.5 | 87.30 | 223.0 | -5,222.4 | 445.0 | 106.4 | 338.56 | 1.314 Level 3 | | | |
| 12,700.0 | 6,445.2 | 12,683.2 | 6,425.2 | 172.2 | 172.2 | 87.30 | 223.0 | -5,322.4 | 445.0 | 100.8 | 344.11 | 1.293 Level 3 | | | |
| 12,800.0 | 6,444.9 | 12,783.2 | 6,425.0 | 175.0 | 175.0 | 87.30 | 223.0 | -5,422.4 | 445.0 | 95.3 | 349.67 | 1.272 Level 3 | | | |
| 12,900.0 | 6,444.7 | 12,883.2 | 6,424.7 | 177.8 | 177.8 | 87.30 | 223.0 | -5,522.4 | 445.0 | 89.7 | 355.23 | 1.253 Level 3 | | | |
| 13,000.0 | 6,444.5 | 12,983.2 | 6,424.5 | 180.6 | 180.6 | 87.30 | 223.0 | -5,622.4 | 445.0 | 84.2 | 360.79 | 1.233 Level 2 | | | |
| 13,100.0 | 6,444.2 | 13,083.2 | 6,424.3 | 183.3 | 183.4 | 87.30 | 223.0 | -5,722.4 | 445.0 | 78.6 | 366.36 | 1.215 Level 2 | | | |
| 13,200.0 | 6,444.0 | 13,183.2 | 6,424.0 | 186.1 | 186.2 | 87.30 | 223.0 | -5,822.4 | 445.0 | 73.0 | 371.92 | 1.196 Level 2 | | | |
| 13,300.0 | 6,443.8 | 13,283.2 | 6,423.8 | 188.9 | 188.9 | 87.30 | 223.0 | -5,922.4 | 445.0 | 67.5 | 377.49 | 1.179 Level 2 | | | |
| 13,400.0 | 6,443.6 | 13,383.2 | 6,423.6 | 191.7 | 191.7 | 87.30 | 223.0 | -6,022.4 | 445.0 | 61.9 | 383.06 | 1.162 Level 2 | | | |
| 13,500.0 | 6,443.3 | 13,483.2 | 6,423.4 | 194.5 | 194.5 | 87.30 | 223.0 | -6,122.4 | 445.0 | 56.3 | 388.63 | 1.145 Level 2 | | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | | | | | | | | | | | |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|-------------|
| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 13,600.0 | 6,443.1 | 13,583.2 | 6,423.1 | 197.3 | 197.3 | 87.30 | 223.0 | -6,222.4 | 445.0 | 50.8 | 394.20 | 1.129 | Level 2 |
| 13,648.3 | 6,443.0 | 13,631.5 | 6,423.0 | 198.6 | 198.6 | 87.30 | 223.0 | -6,270.6 | 445.0 | 48.1 | 396.89 | 1.121 | Level 2, SF |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|------------------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Semi Major Axis Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 76.62 | 7.3 | 30.6 | 31.5 | | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 76.62 | 7.3 | 30.6 | 31.5 | 31.3 | 0.22 | 140.137 | | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 76.62 | 7.3 | 30.6 | 31.5 | 30.8 | 0.67 | 46.712 | | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | 76.62 | 7.3 | 30.6 | 31.5 | 30.4 | 1.12 | 28.027 | | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | 76.62 | 7.3 | 30.6 | 31.5 | 29.9 | 1.57 | 20.020 | | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | 76.62 | 7.3 | 30.6 | 31.5 | 29.5 | 2.02 | 15.571 | | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | 76.62 | 7.3 | 30.6 | 31.5 | 29.0 | 2.47 | 12.740 | | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | 76.62 | 7.3 | 30.6 | 31.5 | 28.6 | 2.92 | 10.780 | | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | 76.62 | 7.3 | 30.6 | 31.5 | 28.1 | 3.37 | 9.342 | | |
| 900.0 | 900.0 | 900.0 | 900.0 | 1.9 | 1.9 | 76.62 | 7.3 | 30.6 | 31.5 | 27.7 | 3.82 | 8.243 | | |
| 1,000.0 | 1,000.0 | 1,000.0 | 1,000.0 | 2.1 | 2.1 | 76.62 | 7.3 | 30.6 | 31.5 | 27.2 | 4.27 | 7.376 CC, ES | | |
| 1,100.0 | 1,100.0 | 1,099.2 | 1,099.2 | 2.4 | 2.4 | 76.06 | 7.9 | 31.8 | 32.8 | 28.0 | 4.71 | 6.953 SF | | |
| 1,200.0 | 1,200.0 | 1,198.2 | 1,198.1 | 2.6 | 2.6 | 74.64 | 9.7 | 35.2 | 36.6 | 31.4 | 5.15 | 7.100 | | |
| 1,300.0 | 1,300.0 | 1,297.0 | 1,296.7 | 2.8 | 2.8 | 72.82 | 12.6 | 40.9 | 42.9 | 37.3 | 5.59 | 7.674 | | |
| 1,400.0 | 1,400.0 | 1,395.4 | 1,394.7 | 3.0 | 3.0 | 71.04 | 16.8 | 48.8 | 51.8 | 45.8 | 6.04 | 8.577 | | |
| 1,500.0 | 1,500.0 | 1,493.4 | 1,492.0 | 3.2 | 3.3 | -30.30 | 22.0 | 58.8 | 62.2 | 55.8 | 6.45 | 9.647 | | |
| 1,600.0 | 1,599.9 | 1,591.0 | 1,588.7 | 3.4 | 3.5 | -32.99 | 28.4 | 71.1 | 73.0 | 66.1 | 6.86 | 10.639 | | |
| 1,700.0 | 1,699.7 | 1,688.3 | 1,684.6 | 3.6 | 3.8 | -35.99 | 35.9 | 85.5 | 84.3 | 77.0 | 7.28 | 11.580 | | |
| 1,800.0 | 1,799.3 | 1,785.1 | 1,779.6 | 3.9 | 4.1 | -39.15 | 44.5 | 101.9 | 96.3 | 88.6 | 7.72 | 12.486 | | |
| 1,900.0 | 1,898.6 | 1,881.6 | 1,873.7 | 4.1 | 4.5 | -42.32 | 54.2 | 120.4 | 109.2 | 101.0 | 8.17 | 13.365 | | |
| 2,000.0 | 1,997.5 | 1,977.5 | 1,966.8 | 4.4 | 4.9 | -45.45 | 64.9 | 140.9 | 123.0 | 114.3 | 8.65 | 14.212 | | |
| 2,100.0 | 2,096.1 | 2,072.9 | 2,058.9 | 4.6 | 5.3 | -48.47 | 76.6 | 163.3 | 137.8 | 128.6 | 9.17 | 15.017 | | |
| 2,200.0 | 2,194.2 | 2,171.3 | 2,153.4 | 5.0 | 5.8 | -51.58 | 89.3 | 187.6 | 152.6 | 142.8 | 9.76 | 15.636 | | |
| 2,300.0 | 2,291.7 | 2,269.9 | 2,248.1 | 5.3 | 6.3 | -54.84 | 102.0 | 211.9 | 166.3 | 155.9 | 10.41 | 15.976 | | |
| 2,400.0 | 2,388.6 | 2,368.5 | 2,342.8 | 5.7 | 6.8 | -58.28 | 114.6 | 236.2 | 179.2 | 168.0 | 11.15 | 16.071 | | |
| 2,500.0 | 2,484.9 | 2,467.0 | 2,437.4 | 6.1 | 7.3 | -61.91 | 127.3 | 260.5 | 191.4 | 179.4 | 11.99 | 15.968 | | |
| 2,534.8 | 2,518.2 | 2,501.2 | 2,470.3 | 6.3 | 7.5 | -63.21 | 131.7 | 268.9 | 195.6 | 183.3 | 12.30 | 15.895 | | |
| 2,600.0 | 2,580.5 | 2,565.4 | 2,531.9 | 6.6 | 7.8 | -65.69 | 140.0 | 284.7 | 203.5 | 190.6 | 12.93 | 15.739 | | |
| 2,700.0 | 2,676.1 | 2,663.7 | 2,626.4 | 7.1 | 8.3 | -69.14 | 152.7 | 309.0 | 216.4 | 202.5 | 13.94 | 15.530 | | |
| 2,800.0 | 2,771.8 | 2,762.1 | 2,720.8 | 7.7 | 8.9 | -72.19 | 165.3 | 333.2 | 230.0 | 215.0 | 14.98 | 15.353 | | |
| 2,900.0 | 2,867.4 | 2,860.4 | 2,815.3 | 8.2 | 9.4 | -74.90 | 178.0 | 357.5 | 244.2 | 228.1 | 16.06 | 15.207 | | |
| 3,000.0 | 2,963.0 | 2,958.8 | 2,909.8 | 8.8 | 10.0 | -77.31 | 190.7 | 381.7 | 258.8 | 241.6 | 17.15 | 15.087 | | |
| 3,100.0 | 3,058.6 | 3,057.2 | 3,004.3 | 9.3 | 10.5 | -79.46 | 203.3 | 406.0 | 273.8 | 255.6 | 18.27 | 14.991 | | |
| 3,200.0 | 3,154.2 | 3,155.5 | 3,098.8 | 9.9 | 11.1 | -81.39 | 216.0 | 430.2 | 289.2 | 269.8 | 19.39 | 14.913 | | |
| 3,300.0 | 3,249.9 | 3,253.9 | 3,193.2 | 10.5 | 11.6 | -83.12 | 228.6 | 454.5 | 304.9 | 284.4 | 20.53 | 14.853 | | |
| 3,400.0 | 3,345.5 | 3,352.3 | 3,287.7 | 11.1 | 12.2 | -84.69 | 241.3 | 478.7 | 320.8 | 299.1 | 21.67 | 14.805 | | |
| 3,500.0 | 3,441.1 | 3,450.6 | 3,382.2 | 11.7 | 12.7 | -86.10 | 254.0 | 503.0 | 336.9 | 314.1 | 22.81 | 14.769 | | |
| 3,600.0 | 3,536.7 | 3,549.0 | 3,476.7 | 12.3 | 13.3 | -87.39 | 266.6 | 527.2 | 353.2 | 329.3 | 23.96 | 14.742 | | |
| 3,700.0 | 3,632.3 | 3,647.3 | 3,571.2 | 12.8 | 13.8 | -88.56 | 279.3 | 551.5 | 369.7 | 344.6 | 25.11 | 14.723 | | |
| 3,800.0 | 3,728.0 | 3,745.7 | 3,665.6 | 13.4 | 14.4 | -89.64 | 292.0 | 575.7 | 386.3 | 360.1 | 26.26 | 14.709 | | |
| 3,900.0 | 3,823.6 | 3,844.1 | 3,760.1 | 14.0 | 15.0 | -90.62 | 304.6 | 600.0 | 403.1 | 375.6 | 27.42 | 14.701 | | |
| 4,000.0 | 3,919.2 | 3,942.4 | 3,854.6 | 14.6 | 15.5 | -91.53 | 317.3 | 624.2 | 419.9 | 391.3 | 28.57 | 14.696 | | |
| 4,100.0 | 4,014.8 | 4,040.8 | 3,949.1 | 15.3 | 16.1 | -92.36 | 330.0 | 648.5 | 436.8 | 407.1 | 29.73 | 14.695 | | |
| 4,200.0 | 4,110.4 | 4,139.1 | 4,043.6 | 15.9 | 16.6 | -93.14 | 342.6 | 672.7 | 453.9 | 423.0 | 30.88 | 14.697 | | |
| 4,300.0 | 4,206.1 | 4,237.5 | 4,138.1 | 16.5 | 17.2 | -93.86 | 355.3 | 697.0 | 471.0 | 438.9 | 32.04 | 14.700 | | |
| 4,400.0 | 4,301.7 | 4,335.9 | 4,232.5 | 17.1 | 17.8 | -94.52 | 368.0 | 721.2 | 488.1 | 454.9 | 33.19 | 14.706 | | |
| 4,500.0 | 4,397.3 | 4,434.2 | 4,327.0 | 17.7 | 18.3 | -95.15 | 380.6 | 745.5 | 505.3 | 471.0 | 34.35 | 14.713 | | |
| 4,600.0 | 4,492.9 | 4,532.6 | 4,421.5 | 18.3 | 18.9 | -95.73 | 393.3 | 769.7 | 522.6 | 487.1 | 35.50 | 14.721 | | |
| 4,700.0 | 4,588.5 | 4,631.0 | 4,516.0 | 18.9 | 19.5 | -96.27 | 406.0 | 794.0 | 539.9 | 503.3 | 36.66 | 14.730 | | |
| 4,800.0 | 4,684.2 | 4,729.3 | 4,610.5 | 19.5 | 20.0 | -96.78 | 418.6 | 818.2 | 557.3 | 519.5 | 37.81 | 14.740 | | |
| 4,900.0 | 4,779.8 | 4,827.7 | 4,704.9 | 20.2 | 20.6 | -97.26 | 431.3 | 842.5 | 574.7 | 535.8 | 38.96 | 14.750 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 5,000.0 | 4,875.4 | 4,926.0 | 4,799.4 | 20.8 | 21.2 | -97.71 | 443.9 | 866.7 | 592.2 | 552.0 | 40.12 | 14.761 | | |
| 5,100.0 | 4,971.0 | 5,024.4 | 4,893.9 | 21.4 | 21.8 | -98.14 | 456.6 | 891.0 | 609.6 | 568.4 | 41.27 | 14.771 | | |
| 5,200.0 | 5,066.6 | 5,122.8 | 4,988.4 | 22.0 | 22.3 | -98.54 | 469.3 | 915.2 | 627.2 | 584.7 | 42.42 | 14.783 | | |
| 5,300.0 | 5,162.2 | 5,221.1 | 5,082.9 | 22.6 | 22.9 | -98.92 | 481.9 | 939.5 | 644.7 | 601.1 | 43.58 | 14.794 | | |
| 5,400.0 | 5,257.9 | 5,319.5 | 5,177.3 | 23.2 | 23.5 | -99.28 | 494.6 | 963.7 | 662.3 | 617.5 | 44.73 | 14.805 | | |
| 5,500.0 | 5,353.5 | 5,417.9 | 5,271.8 | 23.9 | 24.0 | -99.63 | 507.3 | 988.0 | 679.8 | 634.0 | 45.88 | 14.817 | | |
| 5,600.0 | 5,449.1 | 5,516.2 | 5,366.3 | 24.5 | 24.6 | -99.95 | 519.9 | 1,012.2 | 697.5 | 650.4 | 47.04 | 14.828 | | |
| 5,626.6 | 5,474.5 | 5,542.4 | 5,391.4 | 24.6 | 24.8 | -100.03 | 523.3 | 1,018.7 | 702.2 | 654.8 | 47.34 | 14.831 | | |
| 5,650.0 | 5,497.0 | 5,565.4 | 5,413.6 | 24.8 | 24.9 | -101.47 | 526.3 | 1,024.3 | 706.3 | 658.7 | 47.61 | 14.835 | | |
| 5,700.0 | 5,545.6 | 5,614.6 | 5,460.8 | 25.0 | 25.2 | -105.41 | 532.6 | 1,036.5 | 715.0 | 667.0 | 48.10 | 14.866 | | |
| 5,750.0 | 5,594.9 | 5,663.0 | 5,507.3 | 25.1 | 25.4 | -112.19 | 538.8 | 1,048.3 | 723.8 | 675.3 | 48.52 | 14.919 | | |
| 5,800.0 | 5,644.6 | 5,709.8 | 5,552.7 | 25.2 | 25.7 | -128.60 | 544.9 | 1,057.6 | 732.6 | 683.7 | 48.83 | 15.002 | | |
| 5,850.0 | 5,694.5 | 5,756.8 | 5,598.9 | 25.3 | 25.8 | 178.67 | 551.1 | 1,064.1 | 741.4 | 692.4 | 49.05 | 15.115 | | |
| 5,900.0 | 5,744.4 | 5,804.2 | 5,645.7 | 25.3 | 25.9 | 124.98 | 557.4 | 1,067.8 | 750.3 | 701.1 | 49.20 | 15.251 | | |
| 5,950.0 | 5,794.1 | 5,851.8 | 5,692.9 | 25.3 | 26.0 | 108.22 | 563.7 | 1,068.5 | 759.2 | 709.9 | 49.28 | 15.407 | | |
| 6,000.0 | 5,843.3 | 5,900.0 | 5,740.6 | 25.3 | 26.1 | 101.43 | 570.1 | 1,066.2 | 768.1 | 718.8 | 49.29 | 15.582 | | |
| 6,050.0 | 5,892.0 | 5,948.2 | 5,788.1 | 25.2 | 26.1 | 97.79 | 576.5 | 1,060.9 | 776.9 | 727.6 | 49.25 | 15.775 | | |
| 6,100.0 | 5,939.8 | 5,997.0 | 5,835.7 | 25.1 | 26.1 | 95.50 | 582.9 | 1,052.5 | 785.5 | 736.4 | 49.15 | 15.984 | | |
| 6,150.0 | 5,986.5 | 6,046.2 | 5,883.0 | 25.0 | 26.1 | 93.92 | 589.2 | 1,040.9 | 794.1 | 745.1 | 49.00 | 16.206 | | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|-----------------------|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | | |
| Offset | | | | | | | | | | | | | | |
| Semi Major Axis | | | | | | | | | | | | | | |
| Distance | | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -104.65 | -7.3 | -27.9 | 28.8 | 28.8 | 0.00 | N/A | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | -104.65 | -7.3 | -27.9 | 28.8 | 28.6 | 0.23 | 126.835 | | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -104.65 | -7.3 | -27.9 | 28.8 | 28.1 | 0.68 | 42.559 | | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 0.6 | -104.65 | -7.3 | -27.9 | 28.8 | 27.7 | 1.13 | 25.569 | | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 0.8 | -104.65 | -7.3 | -27.9 | 28.8 | 27.2 | 1.58 | 18.274 | | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 1.0 | -104.65 | -7.3 | -27.9 | 28.8 | 26.8 | 2.03 | 14.218 | | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 1.2 | -104.65 | -7.3 | -27.9 | 28.8 | 26.3 | 2.47 | 11.635 | | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.5 | 1.5 | -104.65 | -7.3 | -27.9 | 28.8 | 25.9 | 2.92 | 9.847 | | |
| 800.0 | 800.0 | 801.0 | 801.0 | 1.7 | 1.7 | -104.65 | -7.3 | -27.9 | 28.8 | 25.4 | 3.37 | 8.535 | | |
| 900.0 | 900.0 | 901.0 | 901.0 | 1.9 | 1.9 | -104.65 | -7.3 | -27.9 | 28.8 | 25.0 | 3.82 | 7.531 | | |
| 1,000.0 | 1,000.0 | 1,001.0 | 1,001.0 | 2.1 | 2.1 | -104.65 | -7.3 | -27.9 | 28.8 | 24.5 | 4.27 | 6.739 | | |
| 1,100.0 | 1,100.0 | 1,101.0 | 1,101.0 | 2.4 | 2.4 | -104.65 | -7.3 | -27.9 | 28.8 | 24.1 | 4.72 | 6.097 | | |
| 1,200.0 | 1,200.0 | 1,201.0 | 1,201.0 | 2.6 | 2.6 | -104.65 | -7.3 | -27.9 | 28.8 | 23.6 | 5.17 | 5.567 | | |
| 1,300.0 | 1,300.0 | 1,301.0 | 1,301.0 | 2.8 | 2.8 | -104.65 | -7.3 | -27.9 | 28.8 | 23.2 | 5.62 | 5.122 | | |
| 1,400.0 | 1,400.0 | 1,401.0 | 1,401.0 | 3.0 | 3.0 | -104.65 | -7.3 | -27.9 | 28.8 | 22.7 | 6.07 | 4.743 CC | | |
| 1,500.0 | 1,500.0 | 1,501.0 | 1,501.0 | 3.2 | 3.3 | 157.09 | -7.3 | -27.9 | 30.0 | 23.5 | 6.50 | 4.612 | | |
| 1,600.0 | 1,599.9 | 1,600.9 | 1,600.9 | 3.4 | 3.5 | 159.67 | -7.3 | -27.9 | 33.6 | 26.7 | 6.92 | 4.862 | | |
| 1,700.0 | 1,699.7 | 1,700.7 | 1,700.7 | 3.6 | 3.7 | 162.91 | -7.3 | -27.9 | 39.8 | 32.5 | 7.34 | 5.431 | | |
| 1,800.0 | 1,799.3 | 1,800.3 | 1,800.3 | 3.9 | 3.9 | 166.05 | -7.3 | -27.9 | 48.7 | 40.9 | 7.75 | 6.279 | | |
| 1,900.0 | 1,898.6 | 1,901.1 | 1,901.1 | 4.1 | 4.1 | 168.70 | -7.3 | -26.5 | 58.8 | 50.7 | 8.15 | 7.217 | | |
| 2,000.0 | 1,997.5 | 2,002.3 | 2,002.2 | 4.4 | 4.4 | 170.91 | -7.3 | -22.5 | 69.0 | 60.5 | 8.54 | 8.085 | | |
| 2,100.0 | 2,096.1 | 2,103.7 | 2,103.4 | 4.6 | 4.6 | 172.85 | -7.4 | -15.8 | 79.2 | 70.3 | 8.92 | 8.880 | | |
| 2,200.0 | 2,194.2 | 2,205.4 | 2,204.6 | 5.0 | 4.8 | 174.61 | -7.4 | -6.4 | 89.5 | 80.1 | 9.31 | 9.608 | | |
| 2,300.0 | 2,291.7 | 2,307.3 | 2,305.8 | 5.3 | 5.0 | 176.25 | -7.5 | 5.8 | 99.7 | 90.0 | 9.70 | 10.278 | | |
| 2,400.0 | 2,388.6 | 2,409.6 | 2,407.0 | 5.7 | 5.3 | 177.80 | -7.6 | 20.7 | 110.0 | 99.9 | 10.09 | 10.895 | | |
| 2,500.0 | 2,484.9 | 2,512.1 | 2,507.9 | 6.1 | 5.6 | 179.29 | -7.7 | 38.3 | 120.3 | 109.8 | 10.50 | 11.460 | | |
| 2,534.8 | 2,518.2 | 2,547.8 | 2,543.0 | 6.3 | 5.7 | 179.80 | -7.8 | 45.1 | 123.9 | 113.2 | 10.64 | 11.645 | | |
| 2,600.0 | 2,580.5 | 2,614.9 | 2,608.7 | 6.6 | 5.9 | -179.26 | -7.9 | 58.7 | 130.1 | 119.1 | 10.94 | 11.885 | | |
| 2,700.0 | 2,676.1 | 2,718.1 | 2,709.3 | 7.1 | 6.2 | -177.81 | -8.1 | 81.9 | 137.4 | 126.0 | 11.43 | 12.021 | | |
| 2,800.0 | 2,771.8 | 2,821.6 | 2,809.5 | 7.7 | 6.6 | -176.27 | -8.2 | 107.9 | 142.2 | 130.3 | 11.94 | 11.910 | | |
| 2,900.0 | 2,867.4 | 2,925.3 | 2,909.1 | 8.2 | 7.1 | -174.56 | -8.4 | 136.7 | 144.5 | 132.0 | 12.48 | 11.581 | | |
| 3,000.0 | 2,963.0 | 3,029.0 | 3,007.9 | 8.8 | 7.6 | -172.62 | -8.7 | 168.2 | 144.3 | 131.2 | 13.05 | 11.057 | | |
| 3,100.0 | 3,058.6 | 3,131.0 | 3,104.3 | 9.3 | 8.1 | -170.38 | -8.9 | 201.5 | 141.8 | 128.2 | 13.66 | 10.382 | | |
| 3,200.0 | 3,154.2 | 3,230.8 | 3,198.5 | 9.9 | 8.7 | -168.06 | -9.1 | 234.6 | 139.1 | 124.8 | 14.32 | 9.718 | | |
| 3,300.0 | 3,249.9 | 3,330.6 | 3,292.6 | 10.5 | 9.2 | -165.65 | -9.4 | 267.6 | 136.7 | 121.7 | 15.04 | 9.092 | | |
| 3,400.0 | 3,345.5 | 3,430.4 | 3,386.8 | 11.1 | 9.8 | -163.16 | -9.6 | 300.7 | 134.5 | 118.7 | 15.82 | 8.502 | | |
| 3,500.0 | 3,441.1 | 3,530.2 | 3,481.0 | 11.7 | 10.4 | -160.59 | -9.8 | 333.8 | 132.6 | 115.9 | 16.69 | 7.947 | | |
| 3,600.0 | 3,536.7 | 3,630.0 | 3,575.1 | 12.3 | 11.1 | -157.95 | -10.1 | 366.8 | 131.0 | 113.3 | 17.64 | 7.427 | | |
| 3,700.0 | 3,632.3 | 3,729.8 | 3,669.3 | 12.8 | 11.7 | -155.25 | -10.3 | 399.9 | 129.6 | 110.9 | 18.67 | 6.942 | | |
| 3,800.0 | 3,728.0 | 3,829.6 | 3,763.5 | 13.4 | 12.3 | -152.50 | -10.5 | 433.0 | 128.6 | 108.8 | 19.80 | 6.493 | | |
| 3,900.0 | 3,823.6 | 3,929.4 | 3,857.6 | 14.0 | 13.0 | -149.71 | -10.8 | 466.0 | 127.8 | 106.8 | 21.01 | 6.081 | | |
| 4,000.0 | 3,919.2 | 4,029.2 | 3,951.8 | 14.6 | 13.6 | -146.89 | -11.0 | 499.1 | 127.3 | 105.0 | 22.32 | 5.706 | | |
| 4,095.7 | 4,010.7 | 4,124.7 | 4,041.9 | 15.2 | 14.3 | -144.18 | -11.2 | 530.8 | 127.2 | 103.6 | 23.64 | 5.381 | | |
| 4,100.0 | 4,014.8 | 4,129.0 | 4,045.9 | 15.3 | 14.3 | -144.06 | -11.2 | 532.2 | 127.2 | 103.5 | 23.70 | 5.367 | | |
| 4,200.0 | 4,110.4 | 4,228.8 | 4,140.1 | 15.9 | 15.0 | -141.23 | -11.5 | 565.3 | 127.4 | 102.2 | 25.16 | 5.063 | | |
| 4,300.0 | 4,206.1 | 4,328.6 | 4,234.3 | 16.5 | 15.6 | -138.42 | -11.7 | 598.3 | 127.8 | 101.2 | 26.68 | 4.792 | | |
| 4,400.0 | 4,301.7 | 4,428.4 | 4,328.4 | 17.1 | 16.3 | -135.63 | -11.9 | 631.4 | 128.6 | 100.4 | 28.25 | 4.553 | | |
| 4,500.0 | 4,397.3 | 4,528.2 | 4,422.6 | 17.7 | 17.0 | -132.88 | -12.2 | 664.5 | 129.7 | 99.9 | 29.87 | 4.343 | | |
| 4,600.0 | 4,492.9 | 4,628.0 | 4,516.8 | 18.3 | 17.6 | -130.19 | -12.4 | 697.5 | 131.1 | 99.6 | 31.51 | 4.161 | | |
| 4,700.0 | 4,588.5 | 4,727.8 | 4,610.9 | 18.9 | 18.3 | -127.55 | -12.6 | 730.6 | 132.8 | 99.6 | 33.18 | 4.002 | | |
| 4,800.0 | 4,684.2 | 4,827.6 | 4,705.1 | 19.5 | 19.0 | -124.99 | -12.9 | 763.7 | 134.7 | 99.9 | 34.85 | 3.865 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15) | | Offset Site Error: | | 0.0 ft |
|---------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---|---------|--------------------|--|--------|
| Survey Program: | | 0-MWD | | | | | | | | | | | Offset Well Error: | | 0.0 ft | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | | | | |
| 4,900.0 | 4,779.8 | 4,927.4 | 4,799.2 | 20.2 | 19.7 | -122.50 | -13.1 | 796.7 | 136.9 | 100.4 | 36.53 | 3.748 | | | | | |
| 5,000.0 | 4,875.4 | 5,027.2 | 4,893.4 | 20.8 | 20.4 | -120.10 | -13.3 | 829.8 | 139.4 | 101.2 | 38.20 | 3.649 | | | | | |
| 5,100.0 | 4,971.0 | 5,127.0 | 4,987.6 | 21.4 | 21.1 | -117.78 | -13.6 | 862.9 | 142.1 | 102.2 | 39.85 | 3.564 | | | | | |
| 5,200.0 | 5,066.6 | 5,226.8 | 5,081.7 | 22.0 | 21.7 | -115.56 | -13.8 | 896.0 | 145.0 | 103.5 | 41.50 | 3.494 | | | | | |
| 5,300.0 | 5,162.2 | 5,326.6 | 5,175.9 | 22.6 | 22.4 | -113.42 | -14.0 | 929.0 | 148.1 | 105.0 | 43.12 | 3.435 | | | | | |
| 5,400.0 | 5,257.9 | 5,426.4 | 5,270.1 | 23.2 | 23.1 | -111.37 | -14.3 | 962.1 | 151.4 | 106.7 | 44.72 | 3.386 | | | | | |
| 5,500.0 | 5,353.5 | 5,526.2 | 5,364.2 | 23.9 | 23.8 | -109.42 | -14.5 | 995.2 | 154.9 | 108.6 | 46.29 | 3.347 | | | | | |
| 5,600.0 | 5,449.1 | 5,626.0 | 5,458.4 | 24.5 | 24.5 | -107.55 | -14.7 | 1,028.2 | 158.6 | 110.8 | 47.84 | 3.316 | | | | | |
| 5,626.6 | 5,474.5 | 5,652.6 | 5,483.4 | 24.6 | 24.7 | -107.07 | -14.8 | 1,037.0 | 159.6 | 111.4 | 48.24 | 3.308 | | | | | |
| 5,650.0 | 5,497.0 | 5,675.9 | 5,505.5 | 24.8 | 24.8 | -107.66 | -14.8 | 1,044.8 | 160.5 | 111.9 | 48.59 | 3.302 | | | | | |
| 5,700.0 | 5,545.6 | 5,724.5 | 5,551.8 | 25.0 | 25.1 | -109.77 | -15.0 | 1,059.4 | 162.3 | 113.1 | 49.21 | 3.297 | | | | | |
| 5,750.0 | 5,594.9 | 5,773.3 | 5,599.1 | 25.1 | 25.3 | -114.97 | -15.1 | 1,071.2 | 164.2 | 114.5 | 49.71 | 3.303 | | | | | |
| 5,800.0 | 5,644.6 | 5,822.4 | 5,647.4 | 25.2 | 25.5 | -129.86 | -15.2 | 1,079.9 | 166.2 | 116.1 | 50.10 | 3.318 | | | | | |
| 5,850.0 | 5,694.5 | 5,871.7 | 5,696.3 | 25.3 | 25.6 | 178.91 | -15.3 | 1,085.5 | 168.4 | 118.0 | 50.39 | 3.342 | | | | | |
| 5,900.0 | 5,744.4 | 5,921.2 | 5,745.8 | 25.3 | 25.6 | 126.68 | -15.4 | 1,088.0 | 170.7 | 120.1 | 50.58 | 3.374 | | | | | |
| 5,950.0 | 5,794.1 | 5,971.0 | 5,795.6 | 25.3 | 25.7 | 111.36 | -15.6 | 1,087.2 | 173.0 | 122.3 | 50.67 | 3.414 | | | | | |
| 6,000.0 | 5,843.3 | 6,021.1 | 5,845.6 | 25.3 | 25.7 | 105.95 | -15.7 | 1,083.2 | 175.4 | 124.7 | 50.68 | 3.461 | | | | | |
| 6,050.0 | 5,892.0 | 6,071.5 | 5,895.4 | 25.2 | 25.7 | 103.65 | -15.8 | 1,075.8 | 177.9 | 127.3 | 50.61 | 3.515 | | | | | |
| 6,100.0 | 5,939.8 | 6,122.1 | 5,944.9 | 25.1 | 25.6 | 102.65 | -15.9 | 1,065.1 | 180.4 | 130.0 | 50.46 | 3.576 | | | | | |
| 6,150.0 | 5,986.5 | 6,173.1 | 5,993.8 | 25.0 | 25.5 | 102.30 | -16.1 | 1,051.1 | 183.0 | 132.7 | 50.25 | 3.642 | | | | | |
| 6,200.0 | 6,032.0 | 6,224.3 | 6,042.0 | 24.9 | 25.4 | 102.30 | -16.2 | 1,033.8 | 185.6 | 135.6 | 49.98 | 3.713 | | | | | |
| 6,250.0 | 6,076.1 | 6,275.7 | 6,089.1 | 24.8 | 25.3 | 102.50 | -16.3 | 1,013.1 | 188.1 | 138.5 | 49.68 | 3.787 | | | | | |
| 6,300.0 | 6,118.5 | 6,327.5 | 6,135.0 | 24.7 | 25.2 | 102.83 | -16.4 | 989.2 | 190.7 | 141.3 | 49.35 | 3.864 | | | | | |
| 6,350.0 | 6,159.1 | 6,379.6 | 6,179.4 | 24.6 | 25.1 | 103.22 | -16.5 | 962.0 | 193.2 | 144.2 | 49.01 | 3.941 | | | | | |
| 6,400.0 | 6,197.7 | 6,431.9 | 6,222.1 | 24.5 | 25.0 | 103.64 | -16.6 | 931.8 | 195.6 | 146.9 | 48.68 | 4.018 | | | | | |
| 6,450.0 | 6,234.2 | 6,484.4 | 6,262.8 | 24.4 | 24.9 | 104.08 | -16.7 | 898.5 | 197.9 | 149.6 | 48.38 | 4.092 | | | | | |
| 6,500.0 | 6,268.3 | 6,537.3 | 6,301.2 | 24.3 | 24.8 | 104.52 | -16.8 | 862.3 | 200.2 | 152.1 | 48.12 | 4.160 | | | | | |
| 6,550.0 | 6,300.0 | 6,590.3 | 6,337.3 | 24.3 | 24.8 | 104.94 | -16.9 | 823.4 | 202.3 | 154.4 | 47.93 | 4.221 | | | | | |
| 6,600.0 | 6,329.1 | 6,643.6 | 6,370.7 | 24.4 | 24.8 | 105.34 | -17.0 | 781.9 | 204.3 | 156.5 | 47.83 | 4.272 | | | | | |
| 6,650.0 | 6,355.5 | 6,697.2 | 6,401.2 | 24.4 | 24.9 | 105.72 | -17.1 | 737.9 | 206.2 | 158.3 | 47.83 | 4.310 | | | | | |
| 6,700.0 | 6,379.1 | 6,750.9 | 6,428.7 | 24.6 | 25.0 | 106.06 | -17.1 | 691.8 | 207.8 | 159.9 | 47.96 | 4.333 | | | | | |
| 6,750.0 | 6,399.7 | 6,804.8 | 6,453.0 | 24.8 | 25.2 | 106.37 | -17.2 | 643.7 | 209.3 | 161.1 | 48.23 | 4.340 | | | | | |
| 6,800.0 | 6,417.3 | 6,858.8 | 6,473.8 | 25.0 | 25.5 | 106.64 | -17.3 | 593.8 | 210.6 | 162.0 | 48.65 | 4.329 | | | | | |
| 6,850.0 | 6,431.9 | 6,913.0 | 6,491.1 | 25.4 | 25.9 | 106.88 | -17.3 | 542.5 | 211.7 | 162.5 | 49.22 | 4.301 | | | | | |
| 6,900.0 | 6,443.2 | 6,967.3 | 6,504.8 | 25.8 | 26.3 | 107.07 | -17.3 | 489.9 | 212.6 | 162.6 | 49.94 | 4.256 | | | | | |
| 6,950.0 | 6,451.4 | 7,021.7 | 6,514.7 | 26.2 | 26.9 | 107.23 | -17.4 | 436.4 | 213.2 | 162.4 | 50.81 | 4.197 | | | | | |
| 7,000.0 | 6,456.3 | 7,076.2 | 6,520.8 | 26.7 | 27.4 | 107.34 | -17.4 | 382.3 | 213.6 | 161.8 | 51.81 | 4.123 | | | | | |
| 7,052.2 | 6,458.0 | 7,133.2 | 6,523.0 | 27.3 | 28.1 | 107.42 | -17.4 | 325.4 | 213.8 | 160.8 | 52.99 | 4.035 | | | | | |
| 7,100.0 | 6,457.9 | 7,181.3 | 6,522.8 | 27.9 | 28.7 | 107.40 | -17.4 | 277.3 | 213.8 | 159.6 | 54.18 | 3.946 | | | | | |
| 7,200.0 | 6,457.7 | 7,281.3 | 6,522.5 | 29.3 | 30.1 | 107.36 | -17.4 | 177.3 | 213.8 | 156.8 | 56.93 | 3.755 | | | | | |
| 7,300.0 | 6,457.4 | 7,381.3 | 6,522.1 | 30.9 | 31.7 | 107.32 | -17.4 | 77.3 | 213.7 | 153.7 | 60.04 | 3.559 | | | | | |
| 7,400.0 | 6,457.2 | 7,481.3 | 6,521.7 | 32.7 | 33.5 | 107.29 | -17.4 | -22.7 | 213.7 | 150.2 | 63.46 | 3.367 | | | | | |
| 7,500.0 | 6,457.0 | 7,581.3 | 6,521.3 | 34.6 | 35.4 | 107.25 | -17.4 | -122.7 | 213.6 | 146.5 | 67.13 | 3.182 | | | | | |
| 7,600.0 | 6,456.8 | 7,681.3 | 6,520.9 | 36.6 | 37.4 | 107.21 | -17.4 | -222.7 | 213.6 | 142.5 | 71.03 | 3.007 | | | | | |
| 7,700.0 | 6,456.5 | 7,781.3 | 6,520.6 | 38.7 | 39.5 | 107.17 | -17.4 | -322.7 | 213.5 | 138.4 | 75.11 | 2.843 | | | | | |
| 7,800.0 | 6,456.3 | 7,881.3 | 6,520.2 | 40.9 | 41.7 | 107.13 | -17.4 | -422.7 | 213.5 | 134.1 | 79.35 | 2.690 | | | | | |
| 7,900.0 | 6,456.1 | 7,981.3 | 6,519.8 | 43.2 | 44.0 | 107.09 | -17.4 | -522.7 | 213.4 | 129.7 | 83.73 | 2.549 | | | | | |
| 8,000.0 | 6,455.8 | 8,081.3 | 6,519.4 | 45.5 | 46.3 | 107.05 | -17.4 | -622.7 | 213.4 | 125.2 | 88.22 | 2.419 | | | | | |
| 8,100.0 | 6,455.6 | 8,181.3 | 6,519.0 | 47.9 | 48.7 | 107.01 | -17.4 | -722.7 | 213.4 | 120.5 | 92.81 | 2.299 | | | | | |
| 8,200.0 | 6,455.4 | 8,281.3 | 6,518.7 | 50.4 | 51.1 | 106.97 | -17.4 | -822.7 | 213.3 | 115.8 | 97.49 | 2.188 | | | | | |
| 8,300.0 | 6,455.2 | 8,381.3 | 6,518.3 | 52.8 | 53.5 | 106.94 | -17.4 | -922.7 | 213.3 | 111.0 | 102.24 | 2.086 | | | | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15) | | Offset Site Error: | | 0.0 ft |
|---------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---|---------|--------------------|--|--------|
| Survey Program: | | 0-MWD | | | | | | | | | | | Offset Well Error: | | 0.0 ft | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | | | | |
| 8,400.0 | 6,454.9 | 8,481.3 | 6,517.9 | 55.3 | 56.0 | 106.90 | -17.4 | -1,022.7 | 213.2 | 106.2 | 107.05 | 1.992 | | | | | |
| 8,500.0 | 6,454.7 | 8,581.3 | 6,517.5 | 57.9 | 58.6 | 106.86 | -17.4 | -1,122.7 | 213.2 | 101.3 | 111.92 | 1.905 | | | | | |
| 8,600.0 | 6,454.5 | 8,681.3 | 6,517.1 | 60.4 | 61.1 | 106.82 | -17.4 | -1,222.7 | 213.1 | 96.3 | 116.84 | 1.824 | | | | | |
| 8,700.0 | 6,454.3 | 8,781.3 | 6,516.8 | 63.0 | 63.7 | 106.78 | -17.4 | -1,322.7 | 213.1 | 91.3 | 121.80 | 1.749 | | | | | |
| 8,800.0 | 6,454.0 | 8,881.3 | 6,516.4 | 65.6 | 66.3 | 106.74 | -17.4 | -1,422.7 | 213.0 | 86.2 | 126.80 | 1.680 | | | | | |
| 8,900.0 | 6,453.8 | 8,981.3 | 6,516.0 | 68.2 | 68.9 | 106.70 | -17.4 | -1,522.7 | 213.0 | 81.2 | 131.84 | 1.616 | | | | | |
| 9,000.0 | 6,453.6 | 9,081.3 | 6,515.6 | 70.9 | 71.5 | 106.66 | -17.4 | -1,622.7 | 213.0 | 76.1 | 136.91 | 1.555 | | | | | |
| 9,100.0 | 6,453.3 | 9,181.3 | 6,515.3 | 73.5 | 74.1 | 106.62 | -17.4 | -1,722.7 | 212.9 | 70.9 | 142.00 | 1.499 | Level 3 | | | | |
| 9,200.0 | 6,453.1 | 9,281.3 | 6,514.9 | 76.2 | 76.8 | 106.58 | -17.4 | -1,822.7 | 212.9 | 65.7 | 147.12 | 1.447 | Level 3 | | | | |
| 9,300.0 | 6,452.9 | 9,381.3 | 6,514.5 | 78.8 | 79.4 | 106.55 | -17.4 | -1,922.7 | 212.8 | 60.6 | 152.27 | 1.398 | Level 3 | | | | |
| 9,400.0 | 6,452.7 | 9,481.3 | 6,514.1 | 81.5 | 82.1 | 106.51 | -17.4 | -2,022.7 | 212.8 | 55.4 | 157.43 | 1.352 | Level 3 | | | | |
| 9,500.0 | 6,452.4 | 9,581.3 | 6,513.7 | 84.2 | 84.8 | 106.47 | -17.4 | -2,122.7 | 212.7 | 50.1 | 162.62 | 1.308 | Level 3 | | | | |
| 9,600.0 | 6,452.2 | 9,681.3 | 6,513.4 | 86.9 | 87.5 | 106.43 | -17.4 | -2,222.7 | 212.7 | 44.9 | 167.82 | 1.267 | Level 3 | | | | |
| 9,700.0 | 6,452.0 | 9,781.3 | 6,513.0 | 89.6 | 90.1 | 106.39 | -17.4 | -2,322.7 | 212.7 | 39.6 | 173.03 | 1.229 | Level 2 | | | | |
| 9,800.0 | 6,451.8 | 9,881.3 | 6,512.6 | 92.3 | 92.8 | 106.35 | -17.4 | -2,422.7 | 212.6 | 34.3 | 178.27 | 1.193 | Level 2 | | | | |
| 9,900.0 | 6,451.5 | 9,981.3 | 6,512.2 | 95.0 | 95.6 | 106.31 | -17.4 | -2,522.7 | 212.6 | 29.1 | 183.51 | 1.158 | Level 2 | | | | |
| 10,000.0 | 6,451.3 | 10,081.3 | 6,511.8 | 97.7 | 98.3 | 106.27 | -17.4 | -2,622.7 | 212.5 | 23.8 | 188.77 | 1.126 | Level 2 | | | | |
| 10,100.0 | 6,451.1 | 10,181.3 | 6,511.5 | 100.4 | 101.0 | 106.23 | -17.4 | -2,722.7 | 212.5 | 18.4 | 194.04 | 1.095 | Level 2 | | | | |
| 10,200.0 | 6,450.8 | 10,281.3 | 6,511.1 | 103.2 | 103.7 | 106.19 | -17.4 | -2,822.7 | 212.4 | 13.1 | 199.32 | 1.066 | Level 2 | | | | |
| 10,300.0 | 6,450.6 | 10,381.3 | 6,510.7 | 105.9 | 106.4 | 106.15 | -17.4 | -2,922.7 | 212.4 | 7.8 | 204.62 | 1.038 | Level 2 | | | | |
| 10,400.0 | 6,450.4 | 10,481.3 | 6,510.3 | 108.6 | 109.2 | 106.11 | -17.4 | -3,022.7 | 212.4 | 2.4 | 209.92 | 1.012 | Level 2 | | | | |
| 10,500.0 | 6,450.2 | 10,581.3 | 6,509.9 | 111.4 | 111.9 | 106.08 | -17.4 | -3,122.7 | 212.3 | -2.9 | 215.23 | 0.986 | Level 1 | | | | |
| 10,600.0 | 6,449.9 | 10,681.3 | 6,509.6 | 114.1 | 114.6 | 106.04 | -17.4 | -3,222.7 | 212.3 | -8.3 | 220.55 | 0.962 | Level 1 | | | | |
| 10,700.0 | 6,449.7 | 10,781.3 | 6,509.2 | 116.8 | 117.4 | 106.00 | -17.4 | -3,322.7 | 212.2 | -13.6 | 225.88 | 0.940 | Level 1 | | | | |
| 10,800.0 | 6,449.5 | 10,881.3 | 6,508.8 | 119.6 | 120.1 | 105.96 | -17.4 | -3,422.7 | 212.2 | -19.0 | 231.21 | 0.918 | Level 1 | | | | |
| 10,900.0 | 6,449.2 | 10,981.3 | 6,508.4 | 122.3 | 122.9 | 105.92 | -17.4 | -3,522.7 | 212.2 | -24.4 | 236.56 | 0.897 | Level 1 | | | | |
| 11,000.0 | 6,449.0 | 11,081.3 | 6,508.1 | 125.1 | 125.6 | 105.88 | -17.4 | -3,622.7 | 212.1 | -29.8 | 241.91 | 0.877 | Level 1 | | | | |
| 11,100.0 | 6,448.8 | 11,181.3 | 6,507.7 | 127.9 | 128.4 | 105.84 | -17.4 | -3,722.7 | 212.1 | -35.2 | 247.26 | 0.858 | Level 1 | | | | |
| 11,200.0 | 6,448.6 | 11,281.3 | 6,507.3 | 130.6 | 131.1 | 105.80 | -17.4 | -3,822.7 | 212.0 | -40.6 | 252.63 | 0.839 | Level 1 | | | | |
| 11,300.0 | 6,448.3 | 11,381.3 | 6,506.9 | 133.4 | 133.9 | 105.76 | -17.4 | -3,922.7 | 212.0 | -46.0 | 258.00 | 0.822 | Level 1 | | | | |
| 11,400.0 | 6,448.1 | 11,481.3 | 6,506.5 | 136.1 | 136.7 | 105.72 | -17.4 | -4,022.7 | 211.9 | -51.4 | 263.37 | 0.805 | Level 1 | | | | |
| 11,500.0 | 6,447.9 | 11,581.3 | 6,506.2 | 138.9 | 139.4 | 105.68 | -17.4 | -4,122.7 | 211.9 | -56.8 | 268.75 | 0.788 | Level 1 | | | | |
| 11,600.0 | 6,447.7 | 11,681.3 | 6,505.8 | 141.7 | 142.2 | 105.64 | -17.4 | -4,222.7 | 211.9 | -62.3 | 274.14 | 0.773 | Level 1 | | | | |
| 11,700.0 | 6,447.4 | 11,781.3 | 6,505.4 | 144.4 | 144.9 | 105.60 | -17.4 | -4,322.7 | 211.8 | -67.7 | 279.53 | 0.758 | Level 1 | | | | |
| 11,800.0 | 6,447.2 | 11,881.3 | 6,505.0 | 147.2 | 147.7 | 105.56 | -17.4 | -4,422.7 | 211.8 | -73.1 | 284.92 | 0.743 | Level 1 | | | | |
| 11,900.0 | 6,447.0 | 11,981.3 | 6,504.6 | 150.0 | 150.5 | 105.52 | -17.4 | -4,522.7 | 211.7 | -78.6 | 290.32 | 0.729 | Level 1 | | | | |
| 12,000.0 | 6,446.7 | 12,081.3 | 6,504.3 | 152.8 | 153.3 | 105.48 | -17.4 | -4,622.7 | 211.7 | -84.0 | 295.73 | 0.716 | Level 1 | | | | |
| 12,100.0 | 6,446.5 | 12,181.3 | 6,503.9 | 155.5 | 156.0 | 105.44 | -17.4 | -4,722.7 | 211.7 | -89.5 | 301.14 | 0.703 | Level 1 | | | | |
| 12,200.0 | 6,446.3 | 12,281.3 | 6,503.5 | 158.3 | 158.8 | 105.41 | -17.4 | -4,822.7 | 211.6 | -94.9 | 306.55 | 0.690 | Level 1 | | | | |
| 12,300.0 | 6,446.1 | 12,381.3 | 6,503.1 | 161.1 | 161.6 | 105.37 | -17.4 | -4,922.7 | 211.6 | -100.4 | 311.97 | 0.678 | Level 1 | | | | |
| 12,400.0 | 6,445.8 | 12,481.3 | 6,502.8 | 163.9 | 164.4 | 105.33 | -17.4 | -5,022.7 | 211.5 | -105.9 | 317.39 | 0.666 | Level 1 | | | | |
| 12,500.0 | 6,445.6 | 12,581.3 | 6,502.4 | 166.6 | 167.1 | 105.29 | -17.4 | -5,122.6 | 211.5 | -111.3 | 322.82 | 0.655 | Level 1 | | | | |
| 12,600.0 | 6,445.4 | 12,681.3 | 6,502.0 | 169.4 | 169.9 | 105.25 | -17.4 | -5,222.6 | 211.5 | -116.8 | 328.25 | 0.644 | Level 1 | | | | |
| 12,700.0 | 6,445.2 | 12,781.3 | 6,501.6 | 172.2 | 172.7 | 105.21 | -17.4 | -5,322.6 | 211.4 | -122.3 | 333.68 | 0.634 | Level 1 | | | | |
| 12,800.0 | 6,444.9 | 12,881.3 | 6,501.2 | 175.0 | 175.5 | 105.17 | -17.4 | -5,422.6 | 211.4 | -127.7 | 339.12 | 0.623 | Level 1 | | | | |
| 12,900.0 | 6,444.7 | 12,981.3 | 6,500.9 | 177.8 | 178.3 | 105.13 | -17.4 | -5,522.6 | 211.3 | -133.2 | 344.56 | 0.613 | Level 1 | | | | |
| 13,000.0 | 6,444.5 | 13,081.3 | 6,500.5 | 180.6 | 181.0 | 105.09 | -17.4 | -5,622.6 | 211.3 | -138.7 | 350.01 | 0.604 | Level 1 | | | | |
| 13,100.0 | 6,444.2 | 13,181.3 | 6,500.1 | 183.3 | 183.8 | 105.05 | -17.4 | -5,722.6 | 211.3 | -144.2 | 355.45 | 0.594 | Level 1 | | | | |
| 13,200.0 | 6,444.0 | 13,281.3 | 6,499.7 | 186.1 | 186.6 | 105.01 | -17.4 | -5,822.6 | 211.2 | -149.7 | 360.91 | 0.585 | Level 1 | | | | |
| 13,300.0 | 6,443.8 | 13,381.3 | 6,499.3 | 188.9 | 189.4 | 104.97 | -17.4 | -5,922.6 | 211.2 | -155.2 | 366.36 | 0.576 | Level 1 | | | | |
| 13,400.0 | 6,443.6 | 13,481.3 | 6,499.0 | 191.7 | 192.2 | 104.93 | -17.4 | -6,022.6 | 211.1 | -160.7 | 371.82 | 0.568 | Level 1 | | | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | | | | | | | | | | | | |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 13,500.0 | 6,443.3 | 13,581.3 | 6,498.6 | 194.5 | 195.0 | 104.89 | -17.4 | -6,122.6 | 211.1 | -166.2 | 377.28 | 0.560 | Level 1 | |
| 13,600.0 | 6,443.1 | 13,681.3 | 6,498.2 | 197.3 | 197.7 | 104.85 | -17.4 | -6,222.6 | 211.1 | -171.7 | 382.74 | 0.551 | Level 1 | |
| 13,648.3 | 6,443.0 | 13,729.5 | 6,498.0 | 198.6 | 199.1 | 104.83 | -17.4 | -6,270.9 | 211.0 | -174.3 | 385.38 | 0.548 | Level 1, ES, SF | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | Offset Site Error: | | 0.0 ft | | |
|-----------------|----------------|---|----------------|-----------------|--------|-------------------|------------------------|------------|-----------------|------------------|--------------------|-------------------|--------------------|--|--------------------|--|--------|
| Survey Program: | | 0-MWD | | | | | | | | | | | | | Offset Well Error: | | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | | | | |
| Measured Depth | Vertical Depth | Measured Depth | Vertical Depth | Reference | Offset | Highside Toolface | Offset Wellbore Centre | | Between Centres | Between Ellipses | Minimum Separation | Separation Factor | Warning | | | | |
| (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (°) | +N/-S (ft) | +E/-W (ft) | (ft) | (ft) | (ft) | | | | | | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 75.34 | 3.6 | 13.9 | 14.4 | 14.4 | 0.00 | N/A | | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 75.34 | 3.6 | 13.9 | 14.4 | 14.2 | 0.22 | 64.054 | | | | | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 75.34 | 3.6 | 13.9 | 14.4 | 13.7 | 0.67 | 21.351 | | | | | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | 75.34 | 3.6 | 13.9 | 14.4 | 13.3 | 1.12 | 12.811 | | | | | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | 75.34 | 3.6 | 13.9 | 14.4 | 12.8 | 1.57 | 9.151 | | | | | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | 75.34 | 3.6 | 13.9 | 14.4 | 12.4 | 2.02 | 7.117 | | | | | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | 75.34 | 3.6 | 13.9 | 14.4 | 11.9 | 2.47 | 5.823 | | | | | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | 75.34 | 3.6 | 13.9 | 14.4 | 11.5 | 2.92 | 4.927 | | | | | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | 75.34 | 3.6 | 13.9 | 14.4 | 11.0 | 3.37 | 4.270 | | | | | |
| 900.0 | 900.0 | 900.0 | 900.0 | 1.9 | 1.9 | 75.34 | 3.6 | 13.9 | 14.4 | 10.6 | 3.82 | 3.768 | | | | | |
| 1,000.0 | 1,000.0 | 1,000.0 | 1,000.0 | 2.1 | 2.1 | 75.34 | 3.6 | 13.9 | 14.4 | 10.1 | 4.27 | 3.371 | | | | | |
| 1,100.0 | 1,100.0 | 1,100.0 | 1,100.0 | 2.4 | 2.4 | 75.34 | 3.6 | 13.9 | 14.4 | 9.7 | 4.72 | 3.050 | | | | | |
| 1,200.0 | 1,200.0 | 1,200.0 | 1,200.0 | 2.6 | 2.6 | 75.34 | 3.6 | 13.9 | 14.4 | 9.2 | 5.17 | 2.785 | CC, ES | | | | |
| 1,300.0 | 1,300.0 | 1,299.6 | 1,299.6 | 2.8 | 2.8 | 74.92 | 4.1 | 15.2 | 15.7 | 10.1 | 5.61 | 2.798 | | | | | |
| 1,400.0 | 1,400.0 | 1,399.1 | 1,399.0 | 3.0 | 3.0 | 74.00 | 5.4 | 18.8 | 19.6 | 13.6 | 6.04 | 3.242 | | | | | |
| 1,500.0 | 1,500.0 | 1,498.3 | 1,498.0 | 3.2 | 3.2 | -27.48 | 7.6 | 24.9 | 24.9 | 18.5 | 6.46 | 3.859 | | | | | |
| 1,600.0 | 1,599.9 | 1,597.4 | 1,596.7 | 3.4 | 3.5 | -31.25 | 10.6 | 33.4 | 30.6 | 23.7 | 6.86 | 4.459 | | | | | |
| 1,700.0 | 1,699.7 | 1,696.4 | 1,695.0 | 3.6 | 3.7 | -35.71 | 14.5 | 44.2 | 36.8 | 29.5 | 7.28 | 5.059 | | | | | |
| 1,800.0 | 1,799.3 | 1,795.0 | 1,792.6 | 3.9 | 4.0 | -40.39 | 19.2 | 57.5 | 43.7 | 36.0 | 7.71 | 5.672 | | | | | |
| 1,900.0 | 1,898.6 | 1,893.5 | 1,889.7 | 4.1 | 4.2 | -45.01 | 24.8 | 73.0 | 51.4 | 43.3 | 8.16 | 6.304 | | | | | |
| 2,000.0 | 1,997.5 | 1,991.6 | 1,986.0 | 4.4 | 4.6 | -49.39 | 31.2 | 90.9 | 60.1 | 51.5 | 8.65 | 6.952 | | | | | |
| 2,100.0 | 2,096.1 | 2,089.5 | 2,081.5 | 4.6 | 4.9 | -53.44 | 38.4 | 111.0 | 69.8 | 60.7 | 9.19 | 7.603 | | | | | |
| 2,200.0 | 2,194.2 | 2,187.1 | 2,176.1 | 5.0 | 5.3 | -57.13 | 46.4 | 133.3 | 80.7 | 70.9 | 9.78 | 8.243 | | | | | |
| 2,300.0 | 2,291.7 | 2,284.7 | 2,270.2 | 5.3 | 5.7 | -60.48 | 55.2 | 157.9 | 92.6 | 82.1 | 10.46 | 8.852 | | | | | |
| 2,400.0 | 2,388.6 | 2,383.8 | 2,365.5 | 5.7 | 6.2 | -64.08 | 64.5 | 183.6 | 104.3 | 93.1 | 11.23 | 9.288 | | | | | |
| 2,500.0 | 2,484.9 | 2,482.9 | 2,460.7 | 6.1 | 6.7 | -68.11 | 73.7 | 209.3 | 115.4 | 103.3 | 12.11 | 9.530 | | | | | |
| 2,534.8 | 2,518.2 | 2,517.3 | 2,493.8 | 6.3 | 6.8 | -69.60 | 76.9 | 218.3 | 119.2 | 106.7 | 12.44 | 9.578 | | | | | |
| 2,600.0 | 2,580.5 | 2,581.8 | 2,555.8 | 6.6 | 7.2 | -72.38 | 82.9 | 235.0 | 126.4 | 113.3 | 13.09 | 9.651 | | | | | |
| 2,700.0 | 2,676.1 | 2,680.8 | 2,651.0 | 7.1 | 7.7 | -76.06 | 92.1 | 260.7 | 137.9 | 123.8 | 14.13 | 9.761 | | | | | |
| 2,800.0 | 2,771.8 | 2,779.8 | 2,746.1 | 7.7 | 8.2 | -79.17 | 101.3 | 286.4 | 149.9 | 134.7 | 15.19 | 9.868 | | | | | |
| 2,900.0 | 2,867.4 | 2,878.8 | 2,841.2 | 8.2 | 8.7 | -81.81 | 110.5 | 312.1 | 162.3 | 146.0 | 16.27 | 9.971 | | | | | |
| 3,000.0 | 2,963.0 | 2,977.7 | 2,936.4 | 8.8 | 9.3 | -84.07 | 119.7 | 337.8 | 174.9 | 157.6 | 17.37 | 10.069 | | | | | |
| 3,100.0 | 3,058.6 | 3,076.7 | 3,031.5 | 9.3 | 9.8 | -86.03 | 128.9 | 363.5 | 187.8 | 169.3 | 18.48 | 10.161 | | | | | |
| 3,200.0 | 3,154.2 | 3,175.7 | 3,126.6 | 9.9 | 10.3 | -87.74 | 138.1 | 389.2 | 200.9 | 181.3 | 19.60 | 10.249 | | | | | |
| 3,300.0 | 3,249.9 | 3,274.7 | 3,221.8 | 10.5 | 10.9 | -89.23 | 147.3 | 414.9 | 214.2 | 193.4 | 20.73 | 10.331 | | | | | |
| 3,400.0 | 3,345.5 | 3,373.6 | 3,316.9 | 11.1 | 11.4 | -90.56 | 156.5 | 440.5 | 227.5 | 205.7 | 21.86 | 10.407 | | | | | |
| 3,500.0 | 3,441.1 | 3,472.6 | 3,412.0 | 11.7 | 12.0 | -91.73 | 165.7 | 466.2 | 241.0 | 218.0 | 23.00 | 10.479 | | | | | |
| 3,600.0 | 3,536.7 | 3,571.6 | 3,507.2 | 12.3 | 12.5 | -92.78 | 174.9 | 491.9 | 254.6 | 230.4 | 24.14 | 10.547 | | | | | |
| 3,700.0 | 3,632.3 | 3,670.5 | 3,602.3 | 12.8 | 13.1 | -93.72 | 184.1 | 517.6 | 268.2 | 242.9 | 25.28 | 10.610 | | | | | |
| 3,800.0 | 3,728.0 | 3,769.5 | 3,697.5 | 13.4 | 13.6 | -94.58 | 193.4 | 543.3 | 281.9 | 255.5 | 26.42 | 10.669 | | | | | |
| 3,900.0 | 3,823.6 | 3,868.5 | 3,792.6 | 14.0 | 14.2 | -95.35 | 202.6 | 569.0 | 295.7 | 268.1 | 27.57 | 10.725 | | | | | |
| 4,000.0 | 3,919.2 | 3,967.5 | 3,887.7 | 14.6 | 14.8 | -96.05 | 211.8 | 594.7 | 309.5 | 280.8 | 28.72 | 10.777 | | | | | |
| 4,100.0 | 4,014.8 | 4,066.4 | 3,982.9 | 15.3 | 15.3 | -96.70 | 221.0 | 620.4 | 323.3 | 293.5 | 29.87 | 10.826 | | | | | |
| 4,200.0 | 4,110.4 | 4,165.4 | 4,078.0 | 15.9 | 15.9 | -97.29 | 230.2 | 646.1 | 337.2 | 306.2 | 31.02 | 10.872 | | | | | |
| 4,300.0 | 4,206.1 | 4,264.4 | 4,173.1 | 16.5 | 16.5 | -97.84 | 239.4 | 671.8 | 351.2 | 319.0 | 32.17 | 10.916 | | | | | |
| 4,400.0 | 4,301.7 | 4,363.4 | 4,268.3 | 17.1 | 17.0 | -98.34 | 248.6 | 697.4 | 365.1 | 331.8 | 33.32 | 10.957 | | | | | |
| 4,500.0 | 4,397.3 | 4,462.3 | 4,363.4 | 17.7 | 17.6 | -98.80 | 257.8 | 723.1 | 379.1 | 344.6 | 34.48 | 10.996 | | | | | |
| 4,600.0 | 4,492.9 | 4,561.3 | 4,458.5 | 18.3 | 18.2 | -99.24 | 267.0 | 748.8 | 393.1 | 357.5 | 35.63 | 11.032 | | | | | |
| 4,700.0 | 4,588.5 | 4,660.3 | 4,553.7 | 18.9 | 18.7 | -99.64 | 276.2 | 774.5 | 407.1 | 370.3 | 36.78 | 11.067 | | | | | |
| 4,800.0 | 4,684.2 | 4,759.2 | 4,648.8 | 19.5 | 19.3 | -100.02 | 285.4 | 800.2 | 421.1 | 383.2 | 37.94 | 11.100 | | | | | |
| 4,900.0 | 4,779.8 | 4,858.2 | 4,744.0 | 20.2 | 19.9 | -100.37 | 294.6 | 825.9 | 435.2 | 396.1 | 39.10 | 11.132 | | | | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | |
| Reference | | | | Offset | | | Semi Major Axis | | Distance | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.0 | 4,875.4 | 4,957.2 | 4,839.1 | 20.8 | 20.4 | -100.70 | 303.8 | 851.6 | 449.3 | 409.0 | 40.25 | 11.161 | |
| 5,100.0 | 4,971.0 | 5,056.2 | 4,934.2 | 21.4 | 21.0 | -101.01 | 313.0 | 877.3 | 463.3 | 421.9 | 41.41 | 11.190 | |
| 5,200.0 | 5,066.6 | 5,155.1 | 5,029.4 | 22.0 | 21.6 | -101.30 | 322.2 | 903.0 | 477.4 | 434.9 | 42.57 | 11.217 | |
| 5,300.0 | 5,162.2 | 5,254.1 | 5,124.5 | 22.6 | 22.1 | -101.58 | 331.4 | 928.7 | 491.5 | 447.8 | 43.72 | 11.242 | |
| 5,400.0 | 5,257.9 | 5,353.1 | 5,219.6 | 23.2 | 22.7 | -101.84 | 340.7 | 954.3 | 505.7 | 460.8 | 44.88 | 11.267 | |
| 5,500.0 | 5,353.5 | 5,452.1 | 5,314.8 | 23.9 | 23.3 | -102.08 | 349.9 | 980.0 | 519.8 | 473.8 | 46.04 | 11.290 | |
| 5,600.0 | 5,449.1 | 5,551.0 | 5,409.9 | 24.5 | 23.8 | -102.31 | 359.1 | 1,005.7 | 533.9 | 486.7 | 47.20 | 11.312 | |
| 5,626.6 | 5,474.5 | 5,577.4 | 5,435.2 | 24.6 | 24.0 | -102.37 | 361.5 | 1,012.6 | 537.7 | 490.2 | 47.51 | 11.318 | |
| 5,650.0 | 5,497.0 | 5,600.5 | 5,457.5 | 24.8 | 24.1 | -103.71 | 363.7 | 1,018.6 | 541.0 | 493.2 | 47.76 | 11.327 | |
| 5,700.0 | 5,545.6 | 5,650.0 | 5,505.0 | 25.0 | 24.4 | -107.39 | 368.3 | 1,031.4 | 547.9 | 499.7 | 48.24 | 11.358 | |
| 5,750.0 | 5,594.9 | 5,699.2 | 5,552.4 | 25.1 | 24.7 | -113.81 | 372.9 | 1,044.2 | 554.7 | 506.0 | 48.67 | 11.395 | |
| 5,800.0 | 5,644.6 | 5,746.5 | 5,598.0 | 25.2 | 24.9 | -129.71 | 377.3 | 1,055.7 | 561.4 | 512.4 | 49.02 | 11.452 | |
| 5,850.0 | 5,694.5 | 5,793.5 | 5,644.0 | 25.3 | 25.1 | 178.08 | 381.7 | 1,064.5 | 568.2 | 519.0 | 49.25 | 11.537 | |
| 5,900.0 | 5,744.4 | 5,840.9 | 5,690.8 | 25.3 | 25.2 | 124.89 | 386.2 | 1,070.4 | 575.2 | 525.8 | 49.40 | 11.643 | |
| 5,950.0 | 5,794.1 | 5,888.8 | 5,738.3 | 25.3 | 25.3 | 108.64 | 390.9 | 1,073.5 | 582.2 | 532.7 | 49.48 | 11.766 | |
| 6,000.0 | 5,843.3 | 5,937.2 | 5,786.4 | 25.3 | 25.4 | 102.33 | 395.5 | 1,073.5 | 589.3 | 539.8 | 49.49 | 11.906 | |
| 6,050.0 | 5,892.0 | 5,986.0 | 5,835.0 | 25.2 | 25.4 | 99.17 | 400.2 | 1,070.4 | 596.3 | 546.9 | 49.44 | 12.062 | |
| 6,100.0 | 5,939.8 | 6,035.4 | 5,883.7 | 25.1 | 25.4 | 97.35 | 404.9 | 1,064.1 | 603.4 | 554.1 | 49.33 | 12.232 | |
| 6,150.0 | 5,986.5 | 6,085.4 | 5,932.5 | 25.0 | 25.4 | 96.21 | 409.7 | 1,054.5 | 610.5 | 561.3 | 49.18 | 12.415 | |
| 6,200.0 | 6,032.0 | 6,136.0 | 5,981.2 | 24.9 | 25.3 | 95.48 | 414.4 | 1,041.6 | 617.5 | 568.5 | 48.98 | 12.607 | |
| 6,250.0 | 6,076.1 | 6,187.2 | 6,029.5 | 24.8 | 25.3 | 95.00 | 419.1 | 1,025.3 | 624.4 | 575.6 | 48.75 | 12.808 | |
| 6,300.0 | 6,118.5 | 6,239.0 | 6,077.1 | 24.7 | 25.2 | 94.69 | 423.7 | 1,005.5 | 631.1 | 582.6 | 48.50 | 13.012 | |
| 6,350.0 | 6,159.1 | 6,291.4 | 6,123.9 | 24.6 | 25.0 | 94.49 | 428.2 | 982.1 | 637.6 | 589.4 | 48.24 | 13.218 | |
| 6,400.0 | 6,197.7 | 6,344.6 | 6,169.5 | 24.5 | 24.9 | 94.37 | 432.7 | 955.3 | 644.0 | 596.0 | 47.99 | 13.419 | |
| 6,450.0 | 6,234.2 | 6,398.4 | 6,213.7 | 24.4 | 24.8 | 94.32 | 437.0 | 924.9 | 650.1 | 602.3 | 47.76 | 13.611 | |
| 6,500.0 | 6,268.3 | 6,452.9 | 6,256.2 | 24.3 | 24.6 | 94.31 | 441.1 | 891.0 | 655.9 | 608.3 | 47.58 | 13.786 | |
| 6,550.0 | 6,300.0 | 6,508.1 | 6,296.7 | 24.3 | 24.5 | 94.34 | 445.0 | 853.7 | 661.4 | 614.0 | 47.45 | 13.938 | |
| 6,600.0 | 6,329.1 | 6,564.0 | 6,334.8 | 24.4 | 24.4 | 94.40 | 448.7 | 813.1 | 666.6 | 619.1 | 47.41 | 14.059 | |
| 6,650.0 | 6,355.5 | 6,620.5 | 6,370.2 | 24.4 | 24.3 | 94.48 | 452.2 | 769.2 | 671.3 | 623.8 | 47.47 | 14.141 | |
| 6,700.0 | 6,379.1 | 6,677.6 | 6,402.7 | 24.6 | 24.3 | 94.57 | 455.3 | 722.3 | 675.6 | 628.0 | 47.65 | 14.177 | |
| 6,750.0 | 6,399.7 | 6,735.4 | 6,431.9 | 24.8 | 24.3 | 94.67 | 458.2 | 672.6 | 679.5 | 631.5 | 47.97 | 14.164 | |
| 6,800.0 | 6,417.3 | 6,793.7 | 6,457.5 | 25.0 | 24.5 | 94.78 | 460.7 | 620.2 | 682.9 | 634.4 | 48.44 | 14.097 | |
| 6,850.0 | 6,431.9 | 6,852.5 | 6,479.2 | 25.4 | 24.7 | 94.90 | 462.8 | 565.6 | 685.7 | 636.6 | 49.07 | 13.975 | |
| 6,900.0 | 6,443.2 | 6,911.8 | 6,496.7 | 25.8 | 25.0 | 95.02 | 464.5 | 509.0 | 688.0 | 638.2 | 49.86 | 13.798 | |
| 6,950.0 | 6,451.4 | 6,971.5 | 6,510.0 | 26.2 | 25.4 | 95.14 | 465.8 | 450.9 | 689.8 | 639.0 | 50.82 | 13.574 | |
| 7,000.0 | 6,456.3 | 7,031.5 | 6,518.7 | 26.7 | 25.9 | 95.25 | 466.7 | 391.6 | 691.0 | 639.1 | 51.91 | 13.310 | |
| 7,052.2 | 6,458.0 | 7,094.4 | 6,522.8 | 27.3 | 26.5 | 95.37 | 467.1 | 328.8 | 691.6 | 638.4 | 53.19 | 13.001 | |
| 7,100.0 | 6,457.9 | 7,145.9 | 6,522.9 | 27.9 | 27.1 | 95.39 | 467.1 | 277.3 | 691.6 | 637.2 | 54.43 | 12.706 | |
| 7,200.0 | 6,457.7 | 7,245.9 | 6,522.5 | 29.3 | 28.4 | 95.38 | 467.1 | 177.3 | 691.6 | 634.4 | 57.24 | 12.082 | |
| 7,300.0 | 6,457.4 | 7,345.9 | 6,522.1 | 30.9 | 29.9 | 95.37 | 467.1 | 77.3 | 691.6 | 631.1 | 60.43 | 11.445 | |
| 7,400.0 | 6,457.2 | 7,445.9 | 6,521.7 | 32.7 | 31.7 | 95.36 | 467.1 | -22.7 | 691.6 | 627.6 | 63.95 | 10.814 | |
| 7,500.0 | 6,457.0 | 7,545.9 | 6,521.4 | 34.6 | 33.6 | 95.34 | 467.1 | -122.7 | 691.5 | 623.8 | 67.75 | 10.207 | |
| 7,600.0 | 6,456.8 | 7,645.9 | 6,521.0 | 36.6 | 35.6 | 95.33 | 467.1 | -222.7 | 691.5 | 619.7 | 71.79 | 9.633 | |
| 7,700.0 | 6,456.5 | 7,745.9 | 6,520.6 | 38.7 | 37.7 | 95.32 | 467.1 | -322.7 | 691.5 | 615.5 | 76.02 | 9.096 | |
| 7,800.0 | 6,456.3 | 7,845.9 | 6,520.2 | 40.9 | 39.9 | 95.30 | 467.1 | -422.7 | 691.5 | 611.1 | 80.43 | 8.598 | |
| 7,900.0 | 6,456.1 | 7,945.9 | 6,519.9 | 43.2 | 42.2 | 95.29 | 467.1 | -522.7 | 691.5 | 606.5 | 84.97 | 8.138 | |
| 8,000.0 | 6,455.8 | 8,045.9 | 6,519.5 | 45.5 | 44.6 | 95.28 | 467.1 | -622.7 | 691.5 | 601.8 | 89.63 | 7.714 | |
| 8,100.0 | 6,455.6 | 8,145.9 | 6,519.1 | 47.9 | 46.9 | 95.27 | 467.1 | -722.7 | 691.5 | 597.1 | 94.40 | 7.325 | |
| 8,200.0 | 6,455.4 | 8,245.9 | 6,518.7 | 50.4 | 49.4 | 95.25 | 467.1 | -822.7 | 691.5 | 592.2 | 99.25 | 6.967 | |
| 8,300.0 | 6,455.2 | 8,345.9 | 6,518.3 | 52.8 | 51.9 | 95.24 | 467.1 | -922.7 | 691.4 | 587.3 | 104.18 | 6.637 | |
| 8,400.0 | 6,454.9 | 8,445.9 | 6,518.0 | 55.3 | 54.4 | 95.23 | 467.1 | -1,022.7 | 691.4 | 582.2 | 109.18 | 6.333 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 8,500.0 | 6,454.7 | 8,545.9 | 6,517.6 | 57.9 | 56.9 | 95.22 | 467.1 | -1,122.7 | 691.4 | 577.2 | 114.23 | 6.053 | |
| 8,600.0 | 6,454.5 | 8,645.9 | 6,517.2 | 60.4 | 59.5 | 95.20 | 467.1 | -1,222.7 | 691.4 | 572.1 | 119.32 | 5.794 | |
| 8,700.0 | 6,454.3 | 8,745.9 | 6,516.8 | 63.0 | 62.1 | 95.19 | 467.1 | -1,322.7 | 691.4 | 566.9 | 124.47 | 5.555 | |
| 8,800.0 | 6,454.0 | 8,845.9 | 6,516.4 | 65.6 | 64.7 | 95.18 | 467.1 | -1,422.7 | 691.4 | 561.7 | 129.65 | 5.333 | |
| 8,900.0 | 6,453.8 | 8,945.9 | 6,516.1 | 68.2 | 67.3 | 95.17 | 467.1 | -1,522.7 | 691.4 | 556.5 | 134.86 | 5.126 | |
| 9,000.0 | 6,453.6 | 9,045.9 | 6,515.7 | 70.9 | 69.9 | 95.15 | 467.1 | -1,622.7 | 691.3 | 551.2 | 140.11 | 4.934 | |
| 9,100.0 | 6,453.3 | 9,145.9 | 6,515.3 | 73.5 | 72.6 | 95.14 | 467.1 | -1,722.7 | 691.3 | 545.9 | 145.38 | 4.755 | |
| 9,200.0 | 6,453.1 | 9,245.9 | 6,514.9 | 76.2 | 75.2 | 95.13 | 467.1 | -1,822.7 | 691.3 | 540.6 | 150.67 | 4.588 | |
| 9,300.0 | 6,452.9 | 9,345.9 | 6,514.5 | 78.8 | 77.9 | 95.12 | 467.1 | -1,922.7 | 691.3 | 535.3 | 155.99 | 4.432 | |
| 9,400.0 | 6,452.7 | 9,445.9 | 6,514.2 | 81.5 | 80.6 | 95.10 | 467.1 | -2,022.7 | 691.3 | 530.0 | 161.33 | 4.285 | |
| 9,500.0 | 6,452.4 | 9,545.9 | 6,513.8 | 84.2 | 83.3 | 95.09 | 467.1 | -2,122.7 | 691.3 | 524.6 | 166.68 | 4.147 | |
| 9,600.0 | 6,452.2 | 9,645.9 | 6,513.4 | 86.9 | 86.0 | 95.08 | 467.1 | -2,222.7 | 691.3 | 519.2 | 172.05 | 4.018 | |
| 9,700.0 | 6,452.0 | 9,745.9 | 6,513.0 | 89.6 | 88.7 | 95.07 | 467.1 | -2,322.7 | 691.2 | 513.8 | 177.44 | 3.896 | |
| 9,800.0 | 6,451.8 | 9,845.9 | 6,512.7 | 92.3 | 91.4 | 95.05 | 467.1 | -2,422.7 | 691.2 | 508.4 | 182.84 | 3.781 | |
| 9,900.0 | 6,451.5 | 9,945.9 | 6,512.3 | 95.0 | 94.1 | 95.04 | 467.1 | -2,522.7 | 691.2 | 503.0 | 188.25 | 3.672 | |
| 10,000.0 | 6,451.3 | 10,045.9 | 6,511.9 | 97.7 | 96.8 | 95.03 | 467.1 | -2,622.7 | 691.2 | 497.5 | 193.67 | 3.569 | |
| 10,100.0 | 6,451.1 | 10,145.9 | 6,511.5 | 100.4 | 99.5 | 95.02 | 467.1 | -2,722.7 | 691.2 | 492.1 | 199.10 | 3.472 | |
| 10,200.0 | 6,450.8 | 10,245.9 | 6,511.1 | 103.2 | 102.3 | 95.00 | 467.1 | -2,822.7 | 691.2 | 486.6 | 204.54 | 3.379 | |
| 10,300.0 | 6,450.6 | 10,345.9 | 6,510.8 | 105.9 | 105.0 | 94.99 | 467.1 | -2,922.7 | 691.2 | 481.2 | 209.99 | 3.291 | |
| 10,400.0 | 6,450.4 | 10,445.9 | 6,510.4 | 108.6 | 107.7 | 94.98 | 467.1 | -3,022.7 | 691.2 | 475.7 | 215.45 | 3.208 | |
| 10,500.0 | 6,450.2 | 10,545.9 | 6,510.0 | 111.4 | 110.5 | 94.97 | 467.1 | -3,122.7 | 691.1 | 470.2 | 220.91 | 3.129 | |
| 10,600.0 | 6,449.9 | 10,645.9 | 6,509.6 | 114.1 | 113.2 | 94.95 | 467.1 | -3,222.7 | 691.1 | 464.7 | 226.39 | 3.053 | |
| 10,700.0 | 6,449.7 | 10,745.9 | 6,509.2 | 116.8 | 116.0 | 94.94 | 467.1 | -3,322.7 | 691.1 | 459.3 | 231.86 | 2.981 | |
| 10,800.0 | 6,449.5 | 10,845.9 | 6,508.9 | 119.6 | 118.7 | 94.93 | 467.1 | -3,422.7 | 691.1 | 453.8 | 237.35 | 2.912 | |
| 10,900.0 | 6,449.2 | 10,945.9 | 6,508.5 | 122.3 | 121.5 | 94.92 | 467.1 | -3,522.7 | 691.1 | 448.3 | 242.84 | 2.846 | |
| 11,000.0 | 6,449.0 | 11,045.9 | 6,508.1 | 125.1 | 124.2 | 94.90 | 467.1 | -3,622.7 | 691.1 | 442.7 | 248.34 | 2.783 | |
| 11,100.0 | 6,448.8 | 11,145.9 | 6,507.7 | 127.9 | 127.0 | 94.89 | 467.1 | -3,722.7 | 691.1 | 437.2 | 253.84 | 2.722 | |
| 11,200.0 | 6,448.6 | 11,245.9 | 6,507.3 | 130.6 | 129.7 | 94.88 | 467.1 | -3,822.7 | 691.1 | 431.7 | 259.34 | 2.665 | |
| 11,300.0 | 6,448.3 | 11,345.9 | 6,507.0 | 133.4 | 132.5 | 94.87 | 467.1 | -3,922.7 | 691.0 | 426.2 | 264.85 | 2.609 | |
| 11,400.0 | 6,448.1 | 11,445.9 | 6,506.6 | 136.1 | 135.3 | 94.85 | 467.1 | -4,022.7 | 691.0 | 420.7 | 270.37 | 2.556 | |
| 11,500.0 | 6,447.9 | 11,545.9 | 6,506.2 | 138.9 | 138.0 | 94.84 | 467.1 | -4,122.7 | 691.0 | 415.1 | 275.88 | 2.505 | |
| 11,600.0 | 6,447.7 | 11,645.9 | 6,505.8 | 141.7 | 140.8 | 94.83 | 467.1 | -4,222.7 | 691.0 | 409.6 | 281.41 | 2.456 | |
| 11,700.0 | 6,447.4 | 11,745.9 | 6,505.4 | 144.4 | 143.6 | 94.82 | 467.1 | -4,322.7 | 691.0 | 404.1 | 286.93 | 2.408 | |
| 11,800.0 | 6,447.2 | 11,845.9 | 6,505.1 | 147.2 | 146.3 | 94.80 | 467.1 | -4,422.7 | 691.0 | 398.5 | 292.46 | 2.363 | |
| 11,900.0 | 6,447.0 | 11,945.9 | 6,504.7 | 150.0 | 149.1 | 94.79 | 467.1 | -4,522.7 | 691.0 | 393.0 | 297.99 | 2.319 | |
| 12,000.0 | 6,446.7 | 12,045.9 | 6,504.3 | 152.8 | 151.9 | 94.78 | 467.1 | -4,622.7 | 691.0 | 387.4 | 303.53 | 2.276 | |
| 12,100.0 | 6,446.5 | 12,145.9 | 6,503.9 | 155.5 | 154.7 | 94.77 | 467.1 | -4,722.7 | 690.9 | 381.9 | 309.06 | 2.236 | |
| 12,200.0 | 6,446.3 | 12,245.9 | 6,503.6 | 158.3 | 157.4 | 94.75 | 467.1 | -4,822.7 | 690.9 | 376.3 | 314.60 | 2.196 | |
| 12,300.0 | 6,446.1 | 12,345.9 | 6,503.2 | 161.1 | 160.2 | 94.74 | 467.1 | -4,922.7 | 690.9 | 370.8 | 320.15 | 2.158 | |
| 12,400.0 | 6,445.8 | 12,445.9 | 6,502.8 | 163.9 | 163.0 | 94.73 | 467.1 | -5,022.7 | 690.9 | 365.2 | 325.69 | 2.121 | |
| 12,500.0 | 6,445.6 | 12,545.9 | 6,502.4 | 166.6 | 165.8 | 94.72 | 467.1 | -5,122.7 | 690.9 | 359.7 | 331.24 | 2.086 | |
| 12,600.0 | 6,445.4 | 12,645.9 | 6,502.0 | 169.4 | 168.6 | 94.70 | 467.1 | -5,222.7 | 690.9 | 354.1 | 336.79 | 2.051 | |
| 12,700.0 | 6,445.2 | 12,745.9 | 6,501.7 | 172.2 | 171.3 | 94.69 | 467.1 | -5,322.7 | 690.9 | 348.5 | 342.34 | 2.018 | |
| 12,800.0 | 6,444.9 | 12,845.9 | 6,501.3 | 175.0 | 174.1 | 94.68 | 467.1 | -5,422.7 | 690.9 | 343.0 | 347.89 | 1.986 | |
| 12,900.0 | 6,444.7 | 12,945.9 | 6,500.9 | 177.8 | 176.9 | 94.67 | 467.1 | -5,522.7 | 690.8 | 337.4 | 353.45 | 1.955 | |
| 13,000.0 | 6,444.5 | 13,045.9 | 6,500.5 | 180.6 | 179.7 | 94.65 | 467.1 | -5,622.7 | 690.8 | 331.8 | 359.00 | 1.924 | |
| 13,100.0 | 6,444.2 | 13,145.9 | 6,500.1 | 183.3 | 182.5 | 94.64 | 467.1 | -5,722.6 | 690.8 | 326.3 | 364.56 | 1.895 | |
| 13,200.0 | 6,444.0 | 13,245.9 | 6,499.8 | 186.1 | 185.3 | 94.63 | 467.1 | -5,822.6 | 690.8 | 320.7 | 370.12 | 1.866 | |
| 13,300.0 | 6,443.8 | 13,345.9 | 6,499.4 | 188.9 | 188.1 | 94.62 | 467.1 | -5,922.6 | 690.8 | 315.1 | 375.69 | 1.839 | |
| 13,400.0 | 6,443.6 | 13,445.9 | 6,499.0 | 191.7 | 190.8 | 94.60 | 467.1 | -6,022.6 | 690.8 | 309.5 | 381.25 | 1.812 | |
| 13,500.0 | 6,443.3 | 13,545.9 | 6,498.6 | 194.5 | 193.6 | 94.59 | 467.1 | -6,122.6 | 690.8 | 304.0 | 386.82 | 1.786 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | | | | | | | | | | | | |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---------------------------|--------|
| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 13,600.0 | 6,443.1 | 13,645.9 | 6,498.2 | 197.3 | 196.4 | 94.58 | 467.1 | -6,222.6 | 690.8 | 298.4 | 392.38 | 1.760 | | |
| 13,648.3 | 6,443.0 | 13,694.1 | 6,498.1 | 198.6 | 197.8 | 94.57 | 467.1 | -6,270.9 | 690.8 | 295.7 | 395.07 | 1.748 SF | | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | | | Offset | | | Semi Major Axis | | Distance | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 75.88 | 18.2 | 72.4 | 74.7 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 75.88 | 18.2 | 72.4 | 74.7 | 74.5 | 0.22 | 332.279 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 75.88 | 18.2 | 72.4 | 74.7 | 74.0 | 0.67 | 110.760 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | 75.88 | 18.2 | 72.4 | 74.7 | 73.6 | 1.12 | 66.456 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | 75.88 | 18.2 | 72.4 | 74.7 | 73.1 | 1.57 | 47.468 CC, ES | |
| 500.0 | 500.0 | 498.8 | 498.8 | 1.0 | 1.0 | 76.66 | 17.4 | 73.4 | 75.5 | 73.5 | 2.00 | 37.733 | |
| 600.0 | 600.0 | 597.5 | 597.4 | 1.2 | 1.2 | 78.90 | 15.0 | 76.4 | 77.9 | 75.5 | 2.42 | 32.180 | |
| 700.0 | 700.0 | 696.0 | 695.7 | 1.5 | 1.4 | 82.33 | 10.9 | 81.3 | 82.1 | 79.3 | 2.85 | 28.786 | |
| 800.0 | 800.0 | 794.0 | 793.3 | 1.7 | 1.6 | 86.54 | 5.3 | 88.1 | 88.5 | 85.2 | 3.30 | 26.826 | |
| 900.0 | 900.0 | 891.5 | 890.2 | 1.9 | 1.9 | 91.08 | -1.8 | 96.8 | 97.3 | 93.6 | 3.77 | 25.853 | |
| 1,000.0 | 1,000.0 | 988.4 | 986.1 | 2.1 | 2.2 | 95.59 | -10.5 | 107.4 | 108.8 | 104.5 | 4.26 | 25.564 | |
| 1,100.0 | 1,100.0 | 1,084.5 | 1,080.9 | 2.4 | 2.5 | 99.78 | -20.6 | 119.7 | 122.9 | 118.2 | 4.78 | 25.739 | |
| 1,200.0 | 1,200.0 | 1,179.8 | 1,174.4 | 2.6 | 2.9 | 103.52 | -32.1 | 133.7 | 139.9 | 134.5 | 5.33 | 26.222 | |
| 1,300.0 | 1,300.0 | 1,274.1 | 1,266.5 | 2.8 | 3.3 | 106.77 | -45.0 | 149.4 | 159.5 | 153.6 | 5.93 | 26.899 | |
| 1,400.0 | 1,400.0 | 1,367.3 | 1,357.0 | 3.0 | 3.7 | 109.55 | -59.1 | 166.5 | 181.9 | 175.3 | 6.57 | 27.691 | |
| 1,500.0 | 1,500.0 | 1,459.6 | 1,446.1 | 3.2 | 4.2 | 12.64 | -74.5 | 185.2 | 205.6 | 199.0 | 6.57 | 31.303 | |
| 1,600.0 | 1,599.9 | 1,556.5 | 1,539.3 | 3.4 | 4.7 | 14.83 | -91.4 | 205.8 | 228.3 | 221.3 | 7.02 | 32.529 | |
| 1,700.0 | 1,699.7 | 1,654.1 | 1,633.1 | 3.6 | 5.2 | 16.78 | -108.4 | 226.5 | 248.9 | 241.4 | 7.47 | 33.311 | |
| 1,800.0 | 1,799.3 | 1,752.0 | 1,727.2 | 3.9 | 5.8 | 18.60 | -125.4 | 247.2 | 267.2 | 259.3 | 7.93 | 33.713 | |
| 1,900.0 | 1,898.6 | 1,850.3 | 1,821.7 | 4.1 | 6.3 | 20.37 | -142.6 | 268.0 | 283.5 | 275.1 | 8.39 | 33.796 | |
| 2,000.0 | 1,997.5 | 1,948.8 | 1,916.5 | 4.4 | 6.9 | 22.12 | -159.7 | 288.9 | 297.5 | 288.7 | 8.85 | 33.607 | |
| 2,100.0 | 2,096.1 | 2,047.6 | 2,011.5 | 4.6 | 7.5 | 23.91 | -176.9 | 309.9 | 309.5 | 300.2 | 9.33 | 33.180 | |
| 2,200.0 | 2,194.2 | 2,146.6 | 2,106.7 | 5.0 | 8.0 | 25.77 | -194.2 | 330.8 | 319.4 | 309.6 | 9.82 | 32.538 | |
| 2,300.0 | 2,291.7 | 2,245.6 | 2,201.9 | 5.3 | 8.6 | 27.73 | -211.4 | 351.8 | 327.4 | 317.1 | 10.33 | 31.699 | |
| 2,400.0 | 2,388.6 | 2,344.6 | 2,297.1 | 5.7 | 9.2 | 29.82 | -228.7 | 372.8 | 333.5 | 322.6 | 10.87 | 30.672 | |
| 2,500.0 | 2,484.9 | 2,443.6 | 2,392.3 | 6.1 | 9.8 | 32.07 | -245.9 | 393.8 | 337.8 | 326.3 | 11.46 | 29.467 | |
| 2,534.8 | 2,518.2 | 2,478.0 | 2,425.4 | 6.3 | 10.0 | 32.90 | -251.9 | 401.1 | 338.9 | 327.2 | 11.68 | 29.007 | |
| 2,600.0 | 2,580.5 | 2,542.5 | 2,487.4 | 6.6 | 10.3 | 34.47 | -263.1 | 414.7 | 341.0 | 328.8 | 12.13 | 28.103 | |
| 2,700.0 | 2,676.1 | 2,641.4 | 2,582.5 | 7.1 | 10.9 | 36.85 | -280.4 | 435.7 | 344.6 | 331.7 | 12.87 | 26.782 | |
| 2,800.0 | 2,771.8 | 2,740.3 | 2,677.6 | 7.7 | 11.5 | 39.18 | -297.6 | 456.7 | 348.8 | 335.2 | 13.66 | 25.540 | |
| 2,900.0 | 2,867.4 | 2,839.2 | 2,772.7 | 8.2 | 12.1 | 41.45 | -314.8 | 477.6 | 353.6 | 339.1 | 14.51 | 24.378 | |
| 3,000.0 | 2,963.0 | 2,938.1 | 2,867.8 | 8.8 | 12.6 | 43.65 | -332.0 | 498.6 | 358.9 | 343.5 | 15.41 | 23.297 | |
| 3,100.0 | 3,058.6 | 3,037.0 | 2,962.9 | 9.3 | 13.2 | 45.79 | -349.3 | 519.5 | 364.8 | 348.5 | 16.36 | 22.297 | |
| 3,200.0 | 3,154.2 | 3,135.9 | 3,058.1 | 9.9 | 13.8 | 47.86 | -366.5 | 540.5 | 371.2 | 353.8 | 17.36 | 21.377 | |
| 3,300.0 | 3,249.9 | 3,234.8 | 3,153.2 | 10.5 | 14.4 | 49.86 | -383.7 | 561.5 | 378.0 | 359.6 | 18.41 | 20.535 | |
| 3,400.0 | 3,345.5 | 3,333.7 | 3,248.3 | 11.1 | 15.0 | 51.79 | -401.0 | 582.4 | 385.3 | 365.8 | 19.49 | 19.766 | |
| 3,500.0 | 3,441.1 | 3,432.6 | 3,343.4 | 11.7 | 15.5 | 53.64 | -418.2 | 603.4 | 393.0 | 372.4 | 20.61 | 19.067 | |
| 3,600.0 | 3,536.7 | 3,531.5 | 3,438.5 | 12.3 | 16.1 | 55.42 | -435.4 | 624.3 | 401.1 | 379.4 | 21.76 | 18.433 | |
| 3,700.0 | 3,632.3 | 3,630.4 | 3,533.6 | 12.8 | 16.7 | 57.13 | -452.6 | 645.3 | 409.6 | 386.7 | 22.94 | 17.858 | |
| 3,800.0 | 3,728.0 | 3,729.3 | 3,628.7 | 13.4 | 17.3 | 58.78 | -469.9 | 666.2 | 418.5 | 394.3 | 24.14 | 17.337 | |
| 3,900.0 | 3,823.6 | 3,828.2 | 3,723.8 | 14.0 | 17.9 | 60.35 | -487.1 | 687.2 | 427.6 | 402.3 | 25.35 | 16.867 | |
| 4,000.0 | 3,919.2 | 3,927.1 | 3,818.9 | 14.6 | 18.5 | 61.85 | -504.3 | 708.2 | 437.1 | 410.5 | 26.59 | 16.441 | |
| 4,100.0 | 4,014.8 | 4,026.0 | 3,914.0 | 15.3 | 19.0 | 63.30 | -521.5 | 729.1 | 446.9 | 419.1 | 27.83 | 16.056 | |
| 4,200.0 | 4,110.4 | 4,124.9 | 4,009.1 | 15.9 | 19.6 | 64.68 | -538.8 | 750.1 | 456.9 | 427.8 | 29.09 | 15.707 | |
| 4,300.0 | 4,206.1 | 4,223.7 | 4,104.2 | 16.5 | 20.2 | 66.00 | -556.0 | 771.0 | 467.2 | 436.9 | 30.36 | 15.391 | |
| 4,400.0 | 4,301.7 | 4,322.6 | 4,199.3 | 17.1 | 20.8 | 67.26 | -573.2 | 792.0 | 477.8 | 446.1 | 31.63 | 15.105 | |
| 4,500.0 | 4,397.3 | 4,421.5 | 4,294.4 | 17.7 | 21.4 | 68.47 | -590.5 | 813.0 | 488.5 | 455.6 | 32.91 | 14.846 | |
| 4,600.0 | 4,492.9 | 4,520.4 | 4,389.5 | 18.3 | 22.0 | 69.63 | -607.7 | 833.9 | 499.5 | 465.3 | 34.19 | 14.610 | |
| 4,700.0 | 4,588.5 | 4,619.3 | 4,484.6 | 18.9 | 22.5 | 70.74 | -624.9 | 854.9 | 510.7 | 475.2 | 35.47 | 14.396 | |
| 4,800.0 | 4,684.2 | 4,718.2 | 4,579.7 | 19.5 | 23.1 | 71.80 | -642.1 | 875.8 | 522.0 | 485.3 | 36.76 | 14.201 | |
| 4,900.0 | 4,779.8 | 4,817.1 | 4,674.8 | 20.2 | 23.7 | 72.81 | -659.4 | 896.8 | 533.5 | 495.5 | 38.05 | 14.023 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|-----------------------|---------------------|---|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 5,000.0 | 4,875.4 | 4,916.0 | 4,769.9 | 20.8 | 24.3 | 73.79 | -676.6 | 917.8 | 545.2 | 505.9 | 39.33 | 13.861 | | |
| 5,100.0 | 4,971.0 | 5,014.9 | 4,865.0 | 21.4 | 24.9 | 74.72 | -693.8 | 938.7 | 557.0 | 516.4 | 40.62 | 13.713 | | |
| 5,200.0 | 5,066.6 | 5,113.8 | 4,960.1 | 22.0 | 25.5 | 75.61 | -711.0 | 959.7 | 569.0 | 527.1 | 41.90 | 13.578 | | |
| 5,300.0 | 5,162.2 | 5,212.7 | 5,055.2 | 22.6 | 26.0 | 76.47 | -728.3 | 980.6 | 581.1 | 537.9 | 43.19 | 13.454 | | |
| 5,400.0 | 5,257.9 | 5,311.6 | 5,150.3 | 23.2 | 26.6 | 77.29 | -745.5 | 1,001.6 | 593.3 | 548.8 | 44.47 | 13.341 | | |
| 5,500.0 | 5,353.5 | 5,410.5 | 5,245.4 | 23.9 | 27.2 | 78.08 | -762.7 | 1,022.5 | 605.6 | 559.9 | 45.75 | 13.237 | | |
| 5,600.0 | 5,449.1 | 5,509.4 | 5,340.5 | 24.5 | 27.8 | 78.84 | -779.9 | 1,043.5 | 618.1 | 571.1 | 47.03 | 13.142 | | |
| 5,626.6 | 5,474.5 | 5,535.7 | 5,365.8 | 24.6 | 27.9 | 79.03 | -784.5 | 1,049.1 | 621.4 | 574.0 | 47.37 | 13.117 | | |
| 5,650.0 | 5,497.0 | 5,558.9 | 5,388.1 | 24.8 | 28.1 | 78.32 | -788.6 | 1,054.0 | 624.4 | 576.7 | 47.70 | 13.089 | | |
| 5,700.0 | 5,545.6 | 5,608.4 | 5,435.7 | 25.0 | 28.4 | 75.49 | -797.2 | 1,064.5 | 630.7 | 582.4 | 48.27 | 13.064 | | |
| 5,750.0 | 5,594.9 | 5,658.0 | 5,483.4 | 25.1 | 28.7 | 69.27 | -805.8 | 1,075.0 | 637.0 | 588.3 | 48.73 | 13.073 | | |
| 5,800.0 | 5,644.6 | 5,707.2 | 5,530.7 | 25.2 | 29.0 | 53.10 | -814.4 | 1,085.4 | 643.4 | 594.3 | 49.07 | 13.113 | | |
| 5,850.0 | 5,694.5 | 5,756.2 | 5,577.9 | 25.3 | 29.2 | 0.40 | -823.0 | 1,095.2 | 649.9 | 600.6 | 49.28 | 13.188 | | |
| 5,900.0 | 5,744.4 | 5,805.5 | 5,626.0 | 25.3 | 29.4 | -53.29 | -831.7 | 1,102.0 | 656.5 | 607.1 | 49.38 | 13.294 | | |
| 5,950.0 | 5,794.1 | 5,855.5 | 5,675.0 | 25.3 | 29.5 | -70.03 | -840.6 | 1,105.7 | 663.1 | 613.7 | 49.41 | 13.420 | | |
| 6,000.0 | 5,843.3 | 5,906.0 | 5,724.7 | 25.3 | 29.7 | -76.83 | -849.6 | 1,106.2 | 669.8 | 620.5 | 49.38 | 13.564 | | |
| 6,050.0 | 5,892.0 | 5,957.1 | 5,774.9 | 25.2 | 29.7 | -80.46 | -858.7 | 1,103.2 | 676.6 | 627.3 | 49.29 | 13.726 | | |
| 6,100.0 | 5,939.8 | 6,008.9 | 5,825.4 | 25.1 | 29.8 | -82.74 | -867.8 | 1,096.7 | 683.3 | 634.1 | 49.15 | 13.903 | | |
| 6,150.0 | 5,986.5 | 6,061.3 | 5,876.0 | 25.0 | 29.8 | -84.33 | -877.0 | 1,086.7 | 690.0 | 641.0 | 48.96 | 14.093 | | |
| 6,200.0 | 6,032.0 | 6,114.3 | 5,926.4 | 24.9 | 29.8 | -85.50 | -886.1 | 1,072.9 | 696.5 | 647.8 | 48.73 | 14.293 | | |
| 6,250.0 | 6,076.1 | 6,168.1 | 5,976.4 | 24.8 | 29.8 | -86.40 | -895.2 | 1,055.4 | 703.0 | 654.5 | 48.48 | 14.500 | | |
| 6,300.0 | 6,118.5 | 6,222.5 | 6,025.7 | 24.7 | 29.7 | -87.13 | -904.1 | 1,034.0 | 709.3 | 661.1 | 48.22 | 14.710 | | |
| 6,350.0 | 6,159.1 | 6,277.6 | 6,073.9 | 24.6 | 29.6 | -87.72 | -912.9 | 1,008.9 | 715.4 | 667.5 | 47.96 | 14.918 | | |
| 6,400.0 | 6,197.7 | 6,333.4 | 6,120.7 | 24.5 | 29.5 | -88.21 | -921.4 | 979.8 | 721.3 | 673.6 | 47.71 | 15.118 | | |
| 6,450.0 | 6,234.2 | 6,389.8 | 6,165.9 | 24.4 | 29.4 | -88.62 | -929.6 | 947.0 | 726.9 | 679.4 | 47.49 | 15.305 | | |
| 6,500.0 | 6,268.3 | 6,447.0 | 6,209.1 | 24.3 | 29.3 | -88.97 | -937.4 | 910.4 | 732.2 | 684.8 | 47.33 | 15.469 | | |
| 6,550.0 | 6,300.0 | 6,504.7 | 6,249.8 | 24.3 | 29.1 | -89.26 | -944.8 | 870.2 | 737.1 | 689.9 | 47.24 | 15.602 | | |
| 6,600.0 | 6,329.1 | 6,563.0 | 6,287.8 | 24.4 | 29.0 | -89.50 | -951.7 | 826.5 | 741.7 | 694.4 | 47.25 | 15.696 | | |
| 6,650.0 | 6,355.5 | 6,621.9 | 6,322.8 | 24.4 | 28.8 | -89.70 | -958.1 | 779.6 | 745.8 | 698.4 | 47.37 | 15.743 | | |
| 6,700.0 | 6,379.1 | 6,681.3 | 6,354.3 | 24.6 | 28.7 | -89.86 | -963.8 | 729.6 | 749.5 | 701.9 | 47.63 | 15.736 | | |
| 6,750.0 | 6,399.7 | 6,741.1 | 6,382.2 | 24.8 | 28.6 | -89.98 | -968.9 | 676.9 | 752.8 | 704.7 | 48.03 | 15.672 | | |
| 6,800.0 | 6,417.3 | 6,801.3 | 6,406.0 | 25.0 | 28.5 | -90.06 | -973.2 | 621.8 | 755.5 | 706.9 | 48.59 | 15.547 | | |
| 6,850.0 | 6,431.9 | 6,861.8 | 6,425.5 | 25.4 | 28.4 | -90.11 | -976.8 | 564.7 | 757.8 | 708.4 | 49.33 | 15.361 | | |
| 6,900.0 | 6,443.2 | 6,922.5 | 6,440.6 | 25.8 | 28.4 | -90.13 | -979.6 | 506.0 | 759.5 | 709.2 | 50.23 | 15.121 | | |
| 6,950.0 | 6,451.4 | 6,983.4 | 6,451.1 | 26.2 | 28.4 | -90.11 | -981.5 | 446.1 | 760.6 | 709.4 | 51.28 | 14.834 | | |
| 7,000.0 | 6,456.3 | 7,044.2 | 6,456.8 | 26.7 | 28.5 | -90.06 | -982.5 | 385.5 | 761.3 | 708.8 | 52.46 | 14.511 | | |
| 7,052.2 | 6,458.0 | 7,104.5 | 6,458.0 | 27.3 | 28.6 | -90.00 | -982.8 | 325.3 | 761.4 | 707.6 | 53.80 | 14.153 | | |
| 7,100.0 | 6,457.9 | 7,152.2 | 6,457.9 | 27.9 | 28.9 | -90.00 | -982.8 | 277.6 | 761.4 | 706.4 | 55.03 | 13.837 | | |
| 7,200.0 | 6,457.7 | 7,252.2 | 6,457.6 | 29.3 | 29.6 | -90.00 | -982.8 | 177.6 | 761.4 | 703.5 | 57.87 | 13.158 | | |
| 7,300.0 | 6,457.4 | 7,352.2 | 6,457.4 | 30.9 | 30.7 | -90.00 | -982.8 | 77.6 | 761.4 | 700.3 | 61.09 | 12.463 | | |
| 7,400.0 | 6,457.2 | 7,452.2 | 6,457.2 | 32.7 | 32.2 | -90.00 | -982.8 | -22.4 | 761.4 | 696.7 | 64.65 | 11.778 | | |
| 7,500.0 | 6,457.0 | 7,552.2 | 6,456.9 | 34.6 | 34.0 | -90.00 | -982.8 | -122.4 | 761.4 | 692.9 | 68.48 | 11.118 | | |
| 7,600.0 | 6,456.8 | 7,652.2 | 6,456.7 | 36.6 | 36.0 | -90.00 | -982.8 | -222.4 | 761.4 | 688.8 | 72.55 | 10.495 | | |
| 7,700.0 | 6,456.5 | 7,752.2 | 6,456.5 | 38.7 | 38.1 | -90.00 | -982.8 | -322.4 | 761.4 | 684.6 | 76.81 | 9.913 | | |
| 7,800.0 | 6,456.3 | 7,852.2 | 6,456.3 | 40.9 | 40.3 | -90.00 | -982.8 | -422.4 | 761.4 | 680.1 | 81.24 | 9.372 | | |
| 7,900.0 | 6,456.1 | 7,952.2 | 6,456.0 | 43.2 | 42.6 | -90.00 | -982.8 | -522.4 | 761.4 | 675.6 | 85.81 | 8.873 | | |
| 8,000.0 | 6,455.8 | 8,052.2 | 6,455.8 | 45.5 | 45.0 | -90.00 | -982.8 | -622.4 | 761.4 | 670.9 | 90.49 | 8.414 | | |
| 8,100.0 | 6,455.6 | 8,152.2 | 6,455.6 | 47.9 | 47.4 | -90.00 | -982.8 | -722.4 | 761.4 | 666.1 | 95.28 | 7.991 | | |
| 8,200.0 | 6,455.4 | 8,252.2 | 6,455.4 | 50.4 | 49.9 | -90.00 | -982.8 | -822.4 | 761.4 | 661.2 | 100.16 | 7.602 | | |
| 8,300.0 | 6,455.2 | 8,352.2 | 6,455.1 | 52.8 | 52.4 | -90.00 | -982.8 | -922.4 | 761.4 | 656.3 | 105.11 | 7.244 | | |
| 8,400.0 | 6,454.9 | 8,452.2 | 6,454.9 | 55.3 | 54.9 | -90.00 | -982.8 | -1,022.4 | 761.4 | 651.3 | 110.12 | 6.914 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 8,500.0 | 6,454.7 | 8,552.2 | 6,454.7 | 57.9 | 57.4 | -90.00 | -982.8 | -1,122.4 | 761.4 | 646.2 | 115.19 | 6.610 | |
| 8,600.0 | 6,454.5 | 8,652.2 | 6,454.4 | 60.4 | 60.0 | -90.00 | -982.8 | -1,222.4 | 761.4 | 641.1 | 120.31 | 6.329 | |
| 8,700.0 | 6,454.3 | 8,752.2 | 6,454.2 | 63.0 | 62.6 | -90.00 | -982.8 | -1,322.4 | 761.4 | 635.9 | 125.47 | 6.068 | |
| 8,800.0 | 6,454.0 | 8,852.2 | 6,454.0 | 65.6 | 65.2 | -90.00 | -982.8 | -1,422.4 | 761.4 | 630.7 | 130.67 | 5.827 | |
| 8,900.0 | 6,453.8 | 8,952.2 | 6,453.8 | 68.2 | 67.8 | -90.00 | -982.8 | -1,522.4 | 761.4 | 625.5 | 135.90 | 5.602 | |
| 9,000.0 | 6,453.6 | 9,052.2 | 6,453.5 | 70.9 | 70.5 | -90.00 | -982.8 | -1,622.4 | 761.4 | 620.2 | 141.17 | 5.394 | |
| 9,100.0 | 6,453.3 | 9,152.2 | 6,453.3 | 73.5 | 73.1 | -90.00 | -982.8 | -1,722.4 | 761.4 | 614.9 | 146.46 | 5.199 | |
| 9,200.0 | 6,453.1 | 9,252.2 | 6,453.1 | 76.2 | 75.8 | -90.00 | -982.8 | -1,822.4 | 761.4 | 609.6 | 151.77 | 5.017 | |
| 9,300.0 | 6,452.9 | 9,352.2 | 6,452.9 | 78.8 | 78.5 | -90.00 | -982.8 | -1,922.4 | 761.4 | 604.3 | 157.11 | 4.846 | |
| 9,400.0 | 6,452.7 | 9,452.2 | 6,452.6 | 81.5 | 81.2 | -90.00 | -982.8 | -2,022.4 | 761.4 | 598.9 | 162.46 | 4.687 | |
| 9,500.0 | 6,452.4 | 9,552.2 | 6,452.4 | 84.2 | 83.8 | -90.00 | -982.8 | -2,122.4 | 761.4 | 593.6 | 167.83 | 4.537 | |
| 9,600.0 | 6,452.2 | 9,652.2 | 6,452.2 | 86.9 | 86.5 | -90.00 | -982.8 | -2,222.4 | 761.4 | 588.2 | 173.22 | 4.395 | |
| 9,700.0 | 6,452.0 | 9,752.2 | 6,451.9 | 89.6 | 89.2 | -90.00 | -982.8 | -2,322.4 | 761.4 | 582.8 | 178.62 | 4.263 | |
| 9,800.0 | 6,451.8 | 9,852.2 | 6,451.7 | 92.3 | 92.0 | -90.00 | -982.8 | -2,422.4 | 761.4 | 577.4 | 184.04 | 4.137 | |
| 9,900.0 | 6,451.5 | 9,952.2 | 6,451.5 | 95.0 | 94.7 | -90.00 | -982.8 | -2,522.4 | 761.4 | 571.9 | 189.47 | 4.019 | |
| 10,000.0 | 6,451.3 | 10,052.2 | 6,451.3 | 97.7 | 97.4 | -90.00 | -982.8 | -2,622.4 | 761.4 | 566.5 | 194.90 | 3.907 | |
| 10,100.0 | 6,451.1 | 10,152.2 | 6,451.0 | 100.4 | 100.1 | -90.00 | -982.8 | -2,722.4 | 761.4 | 561.0 | 200.35 | 3.800 | |
| 10,200.0 | 6,450.8 | 10,252.2 | 6,450.8 | 103.2 | 102.8 | -90.00 | -982.8 | -2,822.4 | 761.4 | 555.6 | 205.81 | 3.700 | |
| 10,300.0 | 6,450.6 | 10,352.2 | 6,450.6 | 105.9 | 105.6 | -90.00 | -982.8 | -2,922.4 | 761.4 | 550.1 | 211.28 | 3.604 | |
| 10,400.0 | 6,450.4 | 10,452.2 | 6,450.4 | 108.6 | 108.3 | -90.00 | -982.8 | -3,022.4 | 761.4 | 544.6 | 216.75 | 3.513 | |
| 10,500.0 | 6,450.2 | 10,552.2 | 6,450.1 | 111.4 | 111.1 | -90.00 | -982.8 | -3,122.4 | 761.4 | 539.2 | 222.23 | 3.426 | |
| 10,600.0 | 6,449.9 | 10,652.2 | 6,449.9 | 114.1 | 113.8 | -90.00 | -982.8 | -3,222.4 | 761.4 | 533.7 | 227.72 | 3.344 | |
| 10,700.0 | 6,449.7 | 10,752.2 | 6,449.7 | 116.8 | 116.6 | -90.00 | -982.8 | -3,322.4 | 761.4 | 528.2 | 233.21 | 3.265 | |
| 10,800.0 | 6,449.5 | 10,852.2 | 6,449.4 | 119.6 | 119.3 | -90.00 | -982.8 | -3,422.4 | 761.4 | 522.7 | 238.72 | 3.190 | |
| 10,900.0 | 6,449.2 | 10,952.2 | 6,449.2 | 122.3 | 122.1 | -90.00 | -982.8 | -3,522.4 | 761.4 | 517.2 | 244.22 | 3.118 | |
| 11,000.0 | 6,449.0 | 11,052.2 | 6,449.0 | 125.1 | 124.8 | -90.00 | -982.8 | -3,622.4 | 761.4 | 511.7 | 249.73 | 3.049 | |
| 11,100.0 | 6,448.8 | 11,152.2 | 6,448.8 | 127.9 | 127.6 | -90.00 | -982.8 | -3,722.4 | 761.4 | 506.2 | 255.25 | 2.983 | |
| 11,200.0 | 6,448.6 | 11,252.2 | 6,448.5 | 130.6 | 130.3 | -90.00 | -982.8 | -3,822.4 | 761.4 | 500.6 | 260.77 | 2.920 | |
| 11,300.0 | 6,448.3 | 11,352.2 | 6,448.3 | 133.4 | 133.1 | -90.00 | -982.8 | -3,922.4 | 761.4 | 495.1 | 266.29 | 2.859 | |
| 11,400.0 | 6,448.1 | 11,452.2 | 6,448.1 | 136.1 | 135.9 | -90.00 | -982.8 | -4,022.4 | 761.4 | 489.6 | 271.82 | 2.801 | |
| 11,500.0 | 6,447.9 | 11,552.2 | 6,447.8 | 138.9 | 138.6 | -90.00 | -982.8 | -4,122.4 | 761.4 | 484.0 | 277.35 | 2.745 | |
| 11,600.0 | 6,447.7 | 11,652.2 | 6,447.6 | 141.7 | 141.4 | -90.00 | -982.8 | -4,222.4 | 761.4 | 478.5 | 282.89 | 2.692 | |
| 11,700.0 | 6,447.4 | 11,752.2 | 6,447.4 | 144.4 | 144.2 | -90.00 | -982.8 | -4,322.4 | 761.4 | 473.0 | 288.43 | 2.640 | |
| 11,800.0 | 6,447.2 | 11,852.2 | 6,447.2 | 147.2 | 146.9 | -90.00 | -982.8 | -4,422.4 | 761.4 | 467.4 | 293.97 | 2.590 | |
| 11,900.0 | 6,447.0 | 11,952.2 | 6,446.9 | 150.0 | 149.7 | -90.00 | -982.8 | -4,522.4 | 761.4 | 461.9 | 299.52 | 2.542 | |
| 12,000.0 | 6,446.7 | 12,052.2 | 6,446.7 | 152.8 | 152.5 | -90.00 | -982.8 | -4,622.4 | 761.4 | 456.3 | 305.06 | 2.496 | |
| 12,100.0 | 6,446.5 | 12,152.2 | 6,446.5 | 155.5 | 155.3 | -90.00 | -982.8 | -4,722.4 | 761.4 | 450.8 | 310.61 | 2.451 | |
| 12,200.0 | 6,446.3 | 12,252.2 | 6,446.3 | 158.3 | 158.0 | -90.00 | -982.8 | -4,822.4 | 761.4 | 445.2 | 316.17 | 2.408 | |
| 12,300.0 | 6,446.1 | 12,352.2 | 6,446.0 | 161.1 | 160.8 | -90.00 | -982.8 | -4,922.4 | 761.4 | 439.7 | 321.72 | 2.367 | |
| 12,400.0 | 6,445.8 | 12,452.2 | 6,445.8 | 163.9 | 163.6 | -90.00 | -982.8 | -5,022.4 | 761.4 | 434.1 | 327.28 | 2.326 | |
| 12,500.0 | 6,445.6 | 12,552.2 | 6,445.6 | 166.6 | 166.4 | -90.00 | -982.8 | -5,122.4 | 761.4 | 428.6 | 332.84 | 2.288 | |
| 12,600.0 | 6,445.4 | 12,652.2 | 6,445.3 | 169.4 | 169.1 | -90.00 | -982.8 | -5,222.4 | 761.4 | 423.0 | 338.40 | 2.250 | |
| 12,700.0 | 6,445.2 | 12,752.2 | 6,445.1 | 172.2 | 171.9 | -90.00 | -982.8 | -5,322.4 | 761.4 | 417.4 | 343.97 | 2.214 | |
| 12,800.0 | 6,444.9 | 12,852.2 | 6,444.9 | 175.0 | 174.7 | -90.00 | -982.8 | -5,422.4 | 761.4 | 411.9 | 349.53 | 2.178 | |
| 12,900.0 | 6,444.7 | 12,952.2 | 6,444.7 | 177.8 | 177.5 | -90.00 | -982.8 | -5,522.4 | 761.4 | 406.3 | 355.10 | 2.144 | |
| 13,000.0 | 6,444.5 | 13,052.2 | 6,444.4 | 180.6 | 180.3 | -90.00 | -982.8 | -5,622.4 | 761.4 | 400.7 | 360.67 | 2.111 | |
| 13,100.0 | 6,444.2 | 13,152.2 | 6,444.2 | 183.3 | 183.1 | -90.00 | -982.8 | -5,722.4 | 761.4 | 395.2 | 366.24 | 2.079 | |
| 13,200.0 | 6,444.0 | 13,252.2 | 6,444.0 | 186.1 | 185.8 | -90.00 | -982.8 | -5,822.4 | 761.4 | 389.6 | 371.81 | 2.048 | |
| 13,300.0 | 6,443.8 | 13,352.2 | 6,443.8 | 188.9 | 188.6 | -90.00 | -982.8 | -5,922.4 | 761.4 | 384.0 | 377.38 | 2.018 | |
| 13,400.0 | 6,443.6 | 13,452.2 | 6,443.5 | 191.7 | 191.4 | -90.00 | -982.8 | -6,022.4 | 761.4 | 378.5 | 382.96 | 1.988 | |
| 13,500.0 | 6,443.3 | 13,552.2 | 6,443.3 | 194.5 | 194.2 | -90.00 | -982.8 | -6,122.4 | 761.4 | 372.9 | 388.54 | 1.960 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | | | | | | | | | | | | |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---------------------------|--------|
| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 13,600.0 | 6,443.1 | 13,652.2 | 6,443.1 | 197.3 | 197.0 | -90.00 | -982.8 | -6,222.4 | 761.4 | 367.3 | 394.11 | 1.932 | | |
| 13,618.2 | 6,443.1 | 13,670.5 | 6,443.0 | 197.8 | 197.5 | -90.00 | -982.8 | -6,240.7 | 761.4 | 366.3 | 395.13 | 1.927 | | |
| 13,648.3 | 6,443.0 | 13,684.0 | 6,443.0 | 198.6 | 197.9 | -90.00 | -982.8 | -6,254.2 | 761.6 | 365.3 | 396.34 | 1.922 SF | | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | |
| Reference | | | | Offset | | | Semi Major Axis | | Distance | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 76.22 | 10.9 | 44.6 | 45.9 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 76.22 | 10.9 | 44.6 | 45.9 | 45.7 | 0.22 | 204.180 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 76.22 | 10.9 | 44.6 | 45.9 | 45.2 | 0.67 | 68.060 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | 76.22 | 10.9 | 44.6 | 45.9 | 44.8 | 1.12 | 40.836 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | 76.22 | 10.9 | 44.6 | 45.9 | 44.3 | 1.57 | 29.169 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | 76.22 | 10.9 | 44.6 | 45.9 | 43.9 | 2.02 | 22.687 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | 76.22 | 10.9 | 44.6 | 45.9 | 43.4 | 2.47 | 18.562 | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.5 | 1.5 | 76.22 | 10.9 | 44.6 | 45.9 | 43.0 | 2.92 | 15.706 | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.7 | 1.7 | 76.22 | 10.9 | 44.6 | 45.9 | 42.5 | 3.37 | 13.612 CC, ES | |
| 900.0 | 900.0 | 899.1 | 899.1 | 1.9 | 1.9 | 77.33 | 10.3 | 45.7 | 46.8 | 43.0 | 3.80 | 12.324 | |
| 1,000.0 | 1,000.0 | 998.1 | 998.1 | 2.1 | 2.1 | 80.42 | 8.3 | 49.0 | 49.7 | 45.5 | 4.21 | 11.793 | |
| 1,100.0 | 1,100.0 | 1,096.9 | 1,096.6 | 2.4 | 2.3 | 84.81 | 4.9 | 54.4 | 54.8 | 50.1 | 4.64 | 11.803 | |
| 1,200.0 | 1,200.0 | 1,195.2 | 1,194.5 | 2.6 | 2.5 | 89.70 | 0.3 | 62.0 | 62.3 | 57.2 | 5.08 | 12.265 | |
| 1,300.0 | 1,300.0 | 1,293.0 | 1,291.7 | 2.8 | 2.7 | 94.44 | -5.6 | 71.7 | 72.4 | 66.9 | 5.53 | 13.089 | |
| 1,400.0 | 1,400.0 | 1,390.2 | 1,387.9 | 3.0 | 3.0 | 98.66 | -12.7 | 83.5 | 85.3 | 79.3 | 6.01 | 14.186 | |
| 1,500.0 | 1,500.0 | 1,486.8 | 1,483.1 | 3.2 | 3.3 | 2.98 | -21.1 | 97.2 | 99.6 | 93.2 | 6.37 | 15.631 | |
| 1,600.0 | 1,599.9 | 1,583.0 | 1,577.6 | 3.4 | 3.6 | 6.12 | -30.6 | 112.9 | 114.0 | 107.2 | 6.78 | 16.801 | |
| 1,700.0 | 1,699.7 | 1,678.8 | 1,671.1 | 3.6 | 4.0 | 8.94 | -41.3 | 130.6 | 128.6 | 121.3 | 7.20 | 17.843 | |
| 1,800.0 | 1,799.3 | 1,774.2 | 1,763.7 | 3.9 | 4.4 | 11.55 | -53.2 | 150.2 | 143.3 | 135.6 | 7.63 | 18.778 | |
| 1,900.0 | 1,898.6 | 1,869.5 | 1,855.6 | 4.1 | 4.9 | 13.98 | -66.3 | 171.7 | 158.2 | 150.1 | 8.06 | 19.622 | |
| 2,000.0 | 1,997.5 | 1,968.3 | 1,950.6 | 4.4 | 5.4 | 16.34 | -80.4 | 194.8 | 171.8 | 163.3 | 8.51 | 20.202 | |
| 2,100.0 | 2,096.1 | 2,067.4 | 2,045.9 | 4.6 | 5.9 | 18.60 | -94.5 | 218.0 | 183.3 | 174.4 | 8.96 | 20.454 | |
| 2,200.0 | 2,194.2 | 2,166.7 | 2,141.4 | 5.0 | 6.4 | 20.86 | -108.6 | 241.3 | 192.6 | 183.2 | 9.44 | 20.414 | |
| 2,300.0 | 2,291.7 | 2,266.1 | 2,236.9 | 5.3 | 7.0 | 23.20 | -122.8 | 264.6 | 199.8 | 189.9 | 9.93 | 20.116 | |
| 2,400.0 | 2,388.6 | 2,365.5 | 2,332.6 | 5.7 | 7.5 | 25.70 | -137.0 | 287.9 | 205.0 | 194.5 | 10.47 | 19.585 | |
| 2,500.0 | 2,484.9 | 2,465.0 | 2,428.2 | 6.1 | 8.1 | 28.41 | -151.1 | 311.2 | 208.2 | 197.1 | 11.05 | 18.840 | |
| 2,534.8 | 2,518.2 | 2,499.6 | 2,461.5 | 6.3 | 8.3 | 29.41 | -156.1 | 319.3 | 208.9 | 197.6 | 11.27 | 18.536 | |
| 2,600.0 | 2,580.5 | 2,564.4 | 2,523.8 | 6.6 | 8.6 | 31.33 | -165.3 | 334.5 | 210.1 | 198.4 | 11.73 | 17.920 | |
| 2,700.0 | 2,676.1 | 2,663.8 | 2,619.4 | 7.1 | 9.2 | 34.22 | -179.4 | 357.8 | 212.5 | 200.0 | 12.48 | 17.027 | |
| 2,800.0 | 2,771.8 | 2,763.2 | 2,715.0 | 7.7 | 9.8 | 37.05 | -193.6 | 381.0 | 215.3 | 202.1 | 13.30 | 16.194 | |
| 2,900.0 | 2,867.4 | 2,862.6 | 2,810.6 | 8.2 | 10.3 | 39.79 | -207.7 | 404.3 | 218.7 | 204.6 | 14.18 | 15.421 | |
| 3,000.0 | 2,963.0 | 2,962.0 | 2,906.2 | 8.8 | 10.9 | 42.44 | -221.9 | 427.6 | 222.6 | 207.5 | 15.13 | 14.710 | |
| 3,100.0 | 3,058.6 | 3,061.4 | 3,001.8 | 9.3 | 11.5 | 45.00 | -236.1 | 450.9 | 227.0 | 210.8 | 16.14 | 14.061 | |
| 3,200.0 | 3,154.2 | 3,160.8 | 3,097.4 | 9.9 | 12.0 | 47.46 | -250.2 | 474.2 | 231.8 | 214.6 | 17.20 | 13.471 | |
| 3,300.0 | 3,249.9 | 3,260.1 | 3,192.9 | 10.5 | 12.6 | 49.82 | -264.4 | 497.5 | 237.0 | 218.6 | 18.31 | 12.939 | |
| 3,400.0 | 3,345.5 | 3,359.5 | 3,288.5 | 11.1 | 13.2 | 52.07 | -278.5 | 520.8 | 242.5 | 223.1 | 19.46 | 12.462 | |
| 3,500.0 | 3,441.1 | 3,458.9 | 3,384.1 | 11.7 | 13.8 | 54.22 | -292.7 | 544.1 | 248.5 | 227.8 | 20.65 | 12.035 | |
| 3,600.0 | 3,536.7 | 3,558.3 | 3,479.7 | 12.3 | 14.4 | 56.26 | -306.8 | 567.3 | 254.8 | 232.9 | 21.86 | 11.655 | |
| 3,700.0 | 3,632.3 | 3,657.7 | 3,575.3 | 12.8 | 14.9 | 58.21 | -321.0 | 590.6 | 261.3 | 238.3 | 23.10 | 11.316 | |
| 3,800.0 | 3,728.0 | 3,757.1 | 3,670.9 | 13.4 | 15.5 | 60.06 | -335.1 | 613.9 | 268.2 | 243.9 | 24.35 | 11.015 | |
| 3,900.0 | 3,823.6 | 3,856.5 | 3,766.5 | 14.0 | 16.1 | 61.81 | -349.3 | 637.2 | 275.4 | 249.7 | 25.62 | 10.748 | |
| 4,000.0 | 3,919.2 | 3,955.9 | 3,862.1 | 14.6 | 16.7 | 63.48 | -363.4 | 660.5 | 282.8 | 255.9 | 26.90 | 10.510 | |
| 4,100.0 | 4,014.8 | 4,055.3 | 3,957.6 | 15.3 | 17.3 | 65.06 | -377.6 | 683.8 | 290.4 | 262.2 | 28.19 | 10.299 | |
| 4,200.0 | 4,110.4 | 4,154.7 | 4,053.2 | 15.9 | 17.8 | 66.56 | -391.8 | 707.1 | 298.2 | 268.7 | 29.49 | 10.112 | |
| 4,300.0 | 4,206.1 | 4,254.1 | 4,148.8 | 16.5 | 18.4 | 67.98 | -405.9 | 730.4 | 306.2 | 275.4 | 30.79 | 9.945 | |
| 4,400.0 | 4,301.7 | 4,353.5 | 4,244.4 | 17.1 | 19.0 | 69.33 | -420.1 | 753.6 | 314.4 | 282.3 | 32.10 | 9.796 | |
| 4,500.0 | 4,397.3 | 4,452.9 | 4,340.0 | 17.7 | 19.6 | 70.61 | -434.2 | 776.9 | 322.8 | 289.4 | 33.40 | 9.664 | |
| 4,600.0 | 4,492.9 | 4,552.3 | 4,435.6 | 18.3 | 20.2 | 71.83 | -448.4 | 800.2 | 331.3 | 296.6 | 34.71 | 9.546 | |
| 4,700.0 | 4,588.5 | 4,651.7 | 4,531.2 | 18.9 | 20.8 | 72.98 | -462.5 | 823.5 | 339.9 | 303.9 | 36.01 | 9.440 | |
| 4,800.0 | 4,684.2 | 4,751.1 | 4,626.7 | 19.5 | 21.3 | 74.08 | -476.7 | 846.8 | 348.7 | 311.4 | 37.31 | 9.346 | |
| 4,900.0 | 4,779.8 | 4,850.5 | 4,722.3 | 20.2 | 21.9 | 75.12 | -490.8 | 870.1 | 357.6 | 319.0 | 38.61 | 9.262 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|-----------------------|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | | |
| Offset | | | | | | | | | | | | | | |
| Semi Major Axis | | | | | | | | | | | | | | |
| Distance | | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 5,000.0 | 4,875.4 | 4,949.9 | 4,817.9 | 20.8 | 22.5 | 76.11 | -505.0 | 893.4 | 366.7 | 326.7 | 39.91 | 9.186 | | |
| 5,100.0 | 4,971.0 | 5,049.3 | 4,913.5 | 21.4 | 23.1 | 77.06 | -519.2 | 916.6 | 375.8 | 334.6 | 41.21 | 9.119 | | |
| 5,200.0 | 5,066.6 | 5,148.7 | 5,009.1 | 22.0 | 23.7 | 77.96 | -533.3 | 939.9 | 385.0 | 342.5 | 42.50 | 9.058 | | |
| 5,300.0 | 5,162.2 | 5,248.1 | 5,104.7 | 22.6 | 24.3 | 78.81 | -547.5 | 963.2 | 394.3 | 350.5 | 43.79 | 9.004 | | |
| 5,400.0 | 5,257.9 | 5,347.5 | 5,200.3 | 23.2 | 24.9 | 79.63 | -561.6 | 986.5 | 403.7 | 358.6 | 45.08 | 8.955 | | |
| 5,500.0 | 5,353.5 | 5,446.9 | 5,295.9 | 23.9 | 25.4 | 80.41 | -575.8 | 1,009.8 | 413.2 | 366.8 | 46.37 | 8.911 | | |
| 5,600.0 | 5,449.1 | 5,546.2 | 5,391.4 | 24.5 | 26.0 | 81.16 | -589.9 | 1,033.1 | 422.7 | 375.1 | 47.65 | 8.872 | | |
| 5,626.6 | 5,474.5 | 5,572.7 | 5,416.9 | 24.6 | 26.2 | 81.35 | -593.7 | 1,039.3 | 425.3 | 377.3 | 47.99 | 8.862 | | |
| 5,650.0 | 5,497.0 | 5,596.0 | 5,439.3 | 24.8 | 26.3 | 80.56 | -597.0 | 1,044.7 | 427.5 | 379.2 | 48.29 | 8.853 | | |
| 5,700.0 | 5,545.6 | 5,645.7 | 5,487.1 | 25.0 | 26.6 | 77.47 | -604.1 | 1,056.4 | 432.2 | 383.4 | 48.81 | 8.856 | | |
| 5,750.0 | 5,594.9 | 5,695.4 | 5,534.8 | 25.1 | 26.9 | 70.86 | -611.2 | 1,068.0 | 436.9 | 387.7 | 49.19 | 8.882 | | |
| 5,800.0 | 5,644.6 | 5,744.6 | 5,582.2 | 25.2 | 27.2 | 54.16 | -618.2 | 1,079.6 | 441.5 | 392.1 | 49.44 | 8.931 | | |
| 5,850.0 | 5,694.5 | 5,793.3 | 5,629.3 | 25.3 | 27.4 | 0.94 | -625.2 | 1,089.6 | 446.3 | 396.8 | 49.53 | 9.011 | | |
| 5,900.0 | 5,744.4 | 5,842.5 | 5,677.5 | 25.3 | 27.6 | -53.24 | -632.3 | 1,096.7 | 451.2 | 401.7 | 49.53 | 9.110 | | |
| 5,950.0 | 5,794.1 | 5,892.2 | 5,726.5 | 25.3 | 27.7 | -70.47 | -639.5 | 1,100.7 | 456.3 | 406.9 | 49.46 | 9.225 | | |
| 6,000.0 | 5,843.3 | 5,942.6 | 5,776.3 | 25.3 | 27.8 | -77.74 | -646.9 | 1,101.4 | 461.5 | 412.2 | 49.33 | 9.356 | | |
| 6,050.0 | 5,892.0 | 5,993.5 | 5,826.6 | 25.2 | 27.8 | -81.84 | -654.4 | 1,098.8 | 466.8 | 417.7 | 49.14 | 9.500 | | |
| 6,100.0 | 5,939.8 | 6,045.1 | 5,877.2 | 25.1 | 27.9 | -84.57 | -661.9 | 1,092.7 | 472.2 | 423.3 | 48.90 | 9.656 | | |
| 6,150.0 | 5,986.5 | 6,097.3 | 5,928.0 | 25.0 | 27.9 | -86.58 | -669.4 | 1,083.0 | 477.6 | 429.0 | 48.62 | 9.823 | | |
| 6,200.0 | 6,032.0 | 6,150.2 | 5,978.6 | 24.9 | 27.8 | -88.17 | -676.9 | 1,069.6 | 483.0 | 434.7 | 48.31 | 9.998 | | |
| 6,250.0 | 6,076.1 | 6,203.8 | 6,028.9 | 24.8 | 27.8 | -89.48 | -684.3 | 1,052.5 | 488.3 | 440.4 | 47.98 | 10.178 | | |
| 6,300.0 | 6,118.5 | 6,258.1 | 6,078.4 | 24.7 | 27.7 | -90.59 | -691.7 | 1,031.5 | 493.6 | 446.0 | 47.65 | 10.360 | | |
| 6,350.0 | 6,159.1 | 6,313.1 | 6,126.9 | 24.6 | 27.6 | -91.54 | -698.9 | 1,006.8 | 498.8 | 451.5 | 47.32 | 10.540 | | |
| 6,400.0 | 6,197.7 | 6,368.8 | 6,174.2 | 24.5 | 27.5 | -92.37 | -705.9 | 978.2 | 503.8 | 456.8 | 47.03 | 10.712 | | |
| 6,450.0 | 6,234.2 | 6,425.1 | 6,219.7 | 24.4 | 27.3 | -93.10 | -712.6 | 945.7 | 508.6 | 461.8 | 46.78 | 10.872 | | |
| 6,500.0 | 6,268.3 | 6,482.1 | 6,263.3 | 24.3 | 27.2 | -93.74 | -719.1 | 909.6 | 513.2 | 466.6 | 46.59 | 11.014 | | |
| 6,550.0 | 6,300.0 | 6,539.8 | 6,304.5 | 24.3 | 27.1 | -94.31 | -725.2 | 869.7 | 517.5 | 471.0 | 46.49 | 11.130 | | |
| 6,600.0 | 6,329.1 | 6,598.1 | 6,343.1 | 24.4 | 26.9 | -94.80 | -730.9 | 826.4 | 521.5 | 475.0 | 46.50 | 11.215 | | |
| 6,650.0 | 6,355.5 | 6,656.9 | 6,378.5 | 24.4 | 26.8 | -95.22 | -736.2 | 779.8 | 525.2 | 478.5 | 46.64 | 11.261 | | |
| 6,700.0 | 6,379.1 | 6,716.2 | 6,410.6 | 24.6 | 26.7 | -95.58 | -741.0 | 730.1 | 528.4 | 481.5 | 46.92 | 11.262 | | |
| 6,750.0 | 6,399.7 | 6,776.1 | 6,439.0 | 24.8 | 26.7 | -95.87 | -745.2 | 677.7 | 531.3 | 484.0 | 47.36 | 11.218 | | |
| 6,800.0 | 6,417.3 | 6,836.3 | 6,463.4 | 25.0 | 26.7 | -96.10 | -748.8 | 622.7 | 533.8 | 485.8 | 47.97 | 11.127 | | |
| 6,850.0 | 6,431.9 | 6,896.8 | 6,483.5 | 25.4 | 26.7 | -96.28 | -751.8 | 565.7 | 535.8 | 487.0 | 48.74 | 10.991 | | |
| 6,900.0 | 6,443.2 | 6,957.6 | 6,499.2 | 25.8 | 26.8 | -96.39 | -754.1 | 507.1 | 537.3 | 487.6 | 49.69 | 10.812 | | |
| 6,950.0 | 6,451.4 | 7,018.6 | 6,510.2 | 26.2 | 27.1 | -96.45 | -755.8 | 447.2 | 538.3 | 487.5 | 50.80 | 10.597 | | |
| 7,000.0 | 6,456.3 | 7,079.6 | 6,516.5 | 26.7 | 27.4 | -96.44 | -756.7 | 386.5 | 538.9 | 486.8 | 52.04 | 10.354 | | |
| 7,052.2 | 6,458.0 | 7,140.9 | 6,518.0 | 27.3 | 27.8 | -96.39 | -757.0 | 325.2 | 538.9 | 485.5 | 53.44 | 10.085 | | |
| 7,100.0 | 6,457.9 | 7,188.6 | 6,517.9 | 27.9 | 28.2 | -96.39 | -757.0 | 277.5 | 538.9 | 484.3 | 54.63 | 9.864 | | |
| 7,200.0 | 6,457.7 | 7,288.6 | 6,517.8 | 29.3 | 29.3 | -96.40 | -757.0 | 177.5 | 538.9 | 481.5 | 57.46 | 9.380 | | |
| 7,300.0 | 6,457.4 | 7,388.6 | 6,517.6 | 30.9 | 30.7 | -96.41 | -757.0 | 77.5 | 538.9 | 478.3 | 60.66 | 8.885 | | |
| 7,400.0 | 6,457.2 | 7,488.6 | 6,517.5 | 32.7 | 32.3 | -96.42 | -757.0 | -22.5 | 538.9 | 474.8 | 64.19 | 8.396 | | |
| 7,500.0 | 6,457.0 | 7,588.6 | 6,517.3 | 34.6 | 34.1 | -96.43 | -757.0 | -122.5 | 539.0 | 471.0 | 68.00 | 7.926 | | |
| 7,600.0 | 6,456.8 | 7,688.6 | 6,517.2 | 36.6 | 36.1 | -96.43 | -757.0 | -222.5 | 539.0 | 466.9 | 72.04 | 7.482 | | |
| 7,700.0 | 6,456.5 | 7,788.6 | 6,517.0 | 38.7 | 38.3 | -96.44 | -757.0 | -322.5 | 539.0 | 462.7 | 76.27 | 7.066 | | |
| 7,800.0 | 6,456.3 | 7,888.6 | 6,516.8 | 40.9 | 40.5 | -96.45 | -757.0 | -422.5 | 539.0 | 458.3 | 80.67 | 6.681 | | |
| 7,900.0 | 6,456.1 | 7,988.6 | 6,516.7 | 43.2 | 42.8 | -96.46 | -757.0 | -522.5 | 539.0 | 453.8 | 85.21 | 6.325 | | |
| 8,000.0 | 6,455.8 | 8,088.6 | 6,516.5 | 45.5 | 45.1 | -96.47 | -757.0 | -622.5 | 539.0 | 449.1 | 89.87 | 5.997 | | |
| 8,100.0 | 6,455.6 | 8,188.6 | 6,516.4 | 47.9 | 47.5 | -96.47 | -757.0 | -722.5 | 539.0 | 444.4 | 94.63 | 5.696 | | |
| 8,200.0 | 6,455.4 | 8,288.6 | 6,516.2 | 50.4 | 50.0 | -96.48 | -757.0 | -822.5 | 539.0 | 439.5 | 99.48 | 5.419 | | |
| 8,300.0 | 6,455.2 | 8,388.6 | 6,516.1 | 52.8 | 52.4 | -96.49 | -757.0 | -922.5 | 539.0 | 434.6 | 104.39 | 5.163 | | |
| 8,400.0 | 6,454.9 | 8,488.6 | 6,515.9 | 55.3 | 55.0 | -96.50 | -757.0 | -1,022.5 | 539.0 | 429.6 | 109.38 | 4.928 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | Offset Site Error: | | 0.0 ft |
|-----------------------|----------------|---|----------------|-----------------|--------|-------------------|------------------------|------------|-----------------|------------------|--------------------|-------------------|--------------------|--|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | Warning | | |
| Measured Depth | Vertical Depth | Measured Depth | Vertical Depth | Reference | Offset | Highside Toolface | Offset Wellbore Centre | | Between Centres | Between Ellipses | Minimum Separation | Separation Factor | | | |
| (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (°) | +N/-S (ft) | +E/-W (ft) | (ft) | (ft) | (ft) | | | | |
| 8,500.0 | 6,454.7 | 8,588.6 | 6,515.8 | 57.9 | 57.5 | -96.51 | -757.0 | -1,122.5 | 539.0 | 424.6 | 114.42 | 4.711 | | | |
| 8,600.0 | 6,454.5 | 8,688.6 | 6,515.6 | 60.4 | 60.1 | -96.51 | -757.0 | -1,222.5 | 539.0 | 419.5 | 119.50 | 4.511 | | | |
| 8,700.0 | 6,454.3 | 8,788.6 | 6,515.5 | 63.0 | 62.7 | -96.52 | -757.0 | -1,322.5 | 539.0 | 414.4 | 124.63 | 4.325 | | | |
| 8,800.0 | 6,454.0 | 8,888.6 | 6,515.3 | 65.6 | 65.3 | -96.53 | -757.0 | -1,422.5 | 539.1 | 409.3 | 129.80 | 4.153 | | | |
| 8,900.0 | 6,453.8 | 8,988.6 | 6,515.2 | 68.2 | 67.9 | -96.54 | -757.0 | -1,522.5 | 539.1 | 404.1 | 135.00 | 3.993 | | | |
| 9,000.0 | 6,453.6 | 9,088.6 | 6,515.0 | 70.9 | 70.5 | -96.55 | -757.0 | -1,622.5 | 539.1 | 398.8 | 140.23 | 3.844 | | | |
| | | | | | | | | | | | | | | | |
| 9,100.0 | 6,453.3 | 9,188.6 | 6,514.9 | 73.5 | 73.2 | -96.55 | -757.0 | -1,722.5 | 539.1 | 393.6 | 145.49 | 3.705 | | | |
| 9,200.0 | 6,453.1 | 9,288.6 | 6,514.7 | 76.2 | 75.8 | -96.56 | -757.0 | -1,822.5 | 539.1 | 388.3 | 150.77 | 3.576 | | | |
| 9,300.0 | 6,452.9 | 9,388.6 | 6,514.6 | 78.8 | 78.5 | -96.57 | -757.0 | -1,922.5 | 539.1 | 383.0 | 156.07 | 3.454 | | | |
| 9,400.0 | 6,452.7 | 9,488.6 | 6,514.4 | 81.5 | 81.2 | -96.58 | -757.0 | -2,022.5 | 539.1 | 377.7 | 161.39 | 3.340 | | | |
| 9,500.0 | 6,452.4 | 9,588.6 | 6,514.3 | 84.2 | 83.9 | -96.59 | -757.0 | -2,122.5 | 539.1 | 372.4 | 166.73 | 3.234 | | | |
| | | | | | | | | | | | | | | | |
| 9,600.0 | 6,452.2 | 9,688.6 | 6,514.1 | 86.9 | 86.6 | -96.59 | -757.0 | -2,222.5 | 539.1 | 367.0 | 172.08 | 3.133 | | | |
| 9,700.0 | 6,452.0 | 9,788.6 | 6,514.0 | 89.6 | 89.3 | -96.60 | -757.0 | -2,322.5 | 539.1 | 361.7 | 177.45 | 3.038 | | | |
| 9,800.0 | 6,451.8 | 9,888.6 | 6,513.8 | 92.3 | 92.0 | -96.61 | -757.0 | -2,422.5 | 539.1 | 356.3 | 182.83 | 2.949 | | | |
| 9,900.0 | 6,451.5 | 9,988.6 | 6,513.7 | 95.0 | 94.7 | -96.62 | -757.0 | -2,522.5 | 539.1 | 350.9 | 188.22 | 2.864 | | | |
| 10,000.0 | 6,451.3 | 10,088.6 | 6,513.5 | 97.7 | 97.4 | -96.63 | -757.0 | -2,622.5 | 539.2 | 345.5 | 193.62 | 2.785 | | | |
| | | | | | | | | | | | | | | | |
| 10,100.0 | 6,451.1 | 10,188.6 | 6,513.4 | 100.4 | 100.1 | -96.63 | -757.0 | -2,722.5 | 539.2 | 340.1 | 199.03 | 2.709 | | | |
| 10,200.0 | 6,450.8 | 10,288.6 | 6,513.2 | 103.2 | 102.9 | -96.64 | -757.0 | -2,822.5 | 539.2 | 334.7 | 204.46 | 2.637 | | | |
| 10,300.0 | 6,450.6 | 10,388.6 | 6,513.1 | 105.9 | 105.6 | -96.65 | -757.0 | -2,922.5 | 539.2 | 329.3 | 209.89 | 2.569 | | | |
| 10,400.0 | 6,450.4 | 10,488.6 | 6,512.9 | 108.6 | 108.3 | -96.66 | -757.0 | -3,022.5 | 539.2 | 323.9 | 215.32 | 2.504 | | | |
| 10,500.0 | 6,450.2 | 10,588.6 | 6,512.8 | 111.4 | 111.1 | -96.67 | -757.0 | -3,122.5 | 539.2 | 318.4 | 220.77 | 2.442 | | | |
| | | | | | | | | | | | | | | | |
| 10,600.0 | 6,449.9 | 10,688.6 | 6,512.6 | 114.1 | 113.8 | -96.67 | -757.0 | -3,222.5 | 539.2 | 313.0 | 226.22 | 2.384 | | | |
| 10,700.0 | 6,449.7 | 10,788.6 | 6,512.5 | 116.8 | 116.6 | -96.68 | -757.0 | -3,322.5 | 539.2 | 307.5 | 231.68 | 2.327 | | | |
| 10,800.0 | 6,449.5 | 10,888.6 | 6,512.3 | 119.6 | 119.3 | -96.69 | -757.0 | -3,422.5 | 539.2 | 302.1 | 237.14 | 2.274 | | | |
| 10,900.0 | 6,449.2 | 10,988.6 | 6,512.1 | 122.3 | 122.1 | -96.70 | -757.0 | -3,522.5 | 539.2 | 296.6 | 242.61 | 2.223 | | | |
| 11,000.0 | 6,449.0 | 11,088.6 | 6,512.0 | 125.1 | 124.8 | -96.71 | -757.0 | -3,622.5 | 539.2 | 291.2 | 248.08 | 2.174 | | | |
| | | | | | | | | | | | | | | | |
| 11,100.0 | 6,448.8 | 11,188.6 | 6,511.8 | 127.9 | 127.6 | -96.71 | -757.0 | -3,722.5 | 539.2 | 285.7 | 253.56 | 2.127 | | | |
| 11,200.0 | 6,448.6 | 11,288.6 | 6,511.7 | 130.6 | 130.3 | -96.72 | -757.0 | -3,822.5 | 539.3 | 280.2 | 259.04 | 2.082 | | | |
| 11,300.0 | 6,448.3 | 11,388.6 | 6,511.5 | 133.4 | 133.1 | -96.73 | -757.0 | -3,922.5 | 539.3 | 274.7 | 264.53 | 2.039 | | | |
| 11,400.0 | 6,448.1 | 11,488.6 | 6,511.4 | 136.1 | 135.9 | -96.74 | -757.0 | -4,022.5 | 539.3 | 269.3 | 270.02 | 1.997 | | | |
| 11,500.0 | 6,447.9 | 11,588.6 | 6,511.2 | 138.9 | 138.6 | -96.75 | -757.0 | -4,122.5 | 539.3 | 263.8 | 275.51 | 1.957 | | | |
| | | | | | | | | | | | | | | | |
| 11,600.0 | 6,447.7 | 11,688.6 | 6,511.1 | 141.7 | 141.4 | -96.75 | -757.0 | -4,222.5 | 539.3 | 258.3 | 281.01 | 1.919 | | | |
| 11,700.0 | 6,447.4 | 11,788.6 | 6,510.9 | 144.4 | 144.2 | -96.76 | -757.0 | -4,322.5 | 539.3 | 252.8 | 286.51 | 1.882 | | | |
| 11,800.0 | 6,447.2 | 11,888.6 | 6,510.8 | 147.2 | 146.9 | -96.77 | -757.0 | -4,422.5 | 539.3 | 247.3 | 292.01 | 1.847 | | | |
| 11,900.0 | 6,447.0 | 11,988.6 | 6,510.6 | 150.0 | 149.7 | -96.78 | -757.0 | -4,522.5 | 539.3 | 241.8 | 297.52 | 1.813 | | | |
| 12,000.0 | 6,446.7 | 12,088.6 | 6,510.5 | 152.8 | 152.5 | -96.79 | -757.0 | -4,622.5 | 539.3 | 236.3 | 303.03 | 1.780 | | | |
| | | | | | | | | | | | | | | | |
| 12,100.0 | 6,446.5 | 12,188.6 | 6,510.3 | 155.5 | 155.3 | -96.79 | -757.0 | -4,722.5 | 539.3 | 230.8 | 308.54 | 1.748 | | | |
| 12,200.0 | 6,446.3 | 12,288.6 | 6,510.2 | 158.3 | 158.0 | -96.80 | -757.0 | -4,822.5 | 539.3 | 225.3 | 314.05 | 1.717 | | | |
| 12,300.0 | 6,446.1 | 12,388.6 | 6,510.0 | 161.1 | 160.8 | -96.81 | -757.0 | -4,922.5 | 539.4 | 219.8 | 319.56 | 1.688 | | | |
| 12,400.0 | 6,445.8 | 12,488.6 | 6,509.9 | 163.9 | 163.6 | -96.82 | -757.0 | -5,022.5 | 539.4 | 214.3 | 325.08 | 1.659 | | | |
| 12,500.0 | 6,445.6 | 12,588.6 | 6,509.7 | 166.6 | 166.4 | -96.83 | -757.0 | -5,122.5 | 539.4 | 208.8 | 330.60 | 1.631 | | | |
| | | | | | | | | | | | | | | | |
| 12,600.0 | 6,445.4 | 12,688.6 | 6,509.6 | 169.4 | 169.2 | -96.83 | -757.0 | -5,222.5 | 539.4 | 203.3 | 336.12 | 1.605 | | | |
| 12,700.0 | 6,445.2 | 12,788.6 | 6,509.4 | 172.2 | 171.9 | -96.84 | -757.0 | -5,322.5 | 539.4 | 197.7 | 341.64 | 1.579 | | | |
| 12,800.0 | 6,444.9 | 12,888.6 | 6,509.3 | 175.0 | 174.7 | -96.85 | -757.0 | -5,422.5 | 539.4 | 192.2 | 347.17 | 1.554 | | | |
| 12,900.0 | 6,444.7 | 12,988.6 | 6,509.1 | 177.8 | 177.5 | -96.86 | -757.0 | -5,522.5 | 539.4 | 186.7 | 352.70 | 1.529 | | | |
| 13,000.0 | 6,444.5 | 13,088.6 | 6,509.0 | 180.6 | 180.3 | -96.87 | -757.0 | -5,622.5 | 539.4 | 181.2 | 358.22 | 1.506 | | | |
| | | | | | | | | | | | | | | | |
| 13,100.0 | 6,444.2 | 13,188.6 | 6,508.8 | 183.3 | 183.1 | -96.87 | -757.0 | -5,722.5 | 539.4 | 175.7 | 363.75 | 1.483 Level 3 | | | |
| 13,200.0 | 6,444.0 | 13,288.6 | 6,508.7 | 186.1 | 185.9 | -96.88 | -757.0 | -5,822.5 | 539.4 | 170.1 | 369.28 | 1.461 Level 3 | | | |
| 13,300.0 | 6,443.8 | 13,388.6 | 6,508.5 | 188.9 | 188.6 | -96.89 | -757.0 | -5,922.5 | 539.4 | 164.6 | 374.81 | 1.439 Level 3 | | | |
| 13,400.0 | 6,443.6 | 13,488.6 | 6,508.4 | 191.7 | 191.4 | -96.90 | -757.0 | -6,022.5 | 539.4 | 159.1 | 380.35 | 1.418 Level 3 | | | |
| 13,500.0 | 6,443.3 | 13,588.6 | 6,508.2 | 194.5 | 194.2 | -96.91 | -757.0 | -6,122.5 | 539.5 | 153.6 | 385.88 | 1.398 Level 3 | | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| | | | | | | | | | | | | | | |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---------------------------|--------|
| Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15) | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 13,600.0 | 6,443.1 | 13,688.6 | 6,508.1 | 197.3 | 197.0 | -96.91 | -757.0 | -6,222.5 | 539.5 | 148.0 | 391.41 | 1.378 | Level 3 | |
| 13,621.6 | 6,443.1 | 13,710.3 | 6,508.0 | 197.9 | 197.6 | -96.92 | -757.0 | -6,244.2 | 539.5 | 146.9 | 392.61 | 1.374 | Level 3 | |
| 13,648.3 | 6,443.0 | 13,725.8 | 6,508.0 | 198.6 | 198.0 | -96.92 | -757.0 | -6,259.7 | 539.6 | 145.8 | 393.78 | 1.370 | Level 3, SF | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 6732-UNKNOWN | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 111.22 | -207.6 | 534.9 | 573.8 | | | | |
| 100.0 | 100.0 | 94.0 | 94.0 | 0.1 | 1.9 | 111.22 | -207.6 | 534.9 | 573.8 | 571.8 | 1.99 | 287.945 | |
| 200.0 | 200.0 | 194.0 | 194.0 | 0.3 | 3.9 | 111.22 | -207.6 | 534.9 | 573.8 | 569.5 | 4.22 | 136.046 | |
| 300.0 | 300.0 | 294.0 | 294.0 | 0.6 | 5.9 | 111.22 | -207.6 | 534.9 | 573.8 | 567.3 | 6.44 | 89.063 | |
| 400.0 | 400.0 | 394.0 | 394.0 | 0.8 | 7.9 | 111.22 | -207.6 | 534.9 | 573.8 | 565.1 | 8.67 | 66.201 | |
| 500.0 | 500.0 | 494.0 | 494.0 | 1.0 | 9.9 | 111.22 | -207.6 | 534.9 | 573.8 | 562.9 | 10.89 | 52.678 | |
| 600.0 | 600.0 | 594.0 | 594.0 | 1.2 | 11.9 | 111.22 | -207.6 | 534.9 | 573.8 | 560.6 | 13.12 | 43.743 | |
| 700.0 | 700.0 | 694.0 | 694.0 | 1.5 | 13.9 | 111.22 | -207.6 | 534.9 | 573.8 | 558.4 | 15.34 | 37.400 | |
| 800.0 | 800.0 | 794.0 | 794.0 | 1.7 | 15.9 | 111.22 | -207.6 | 534.9 | 573.8 | 556.2 | 17.57 | 32.663 | |
| 900.0 | 900.0 | 894.0 | 894.0 | 1.9 | 17.9 | 111.22 | -207.6 | 534.9 | 573.8 | 554.0 | 19.79 | 28.991 | |
| 1,000.0 | 1,000.0 | 994.0 | 994.0 | 2.1 | 19.9 | 111.22 | -207.6 | 534.9 | 573.8 | 551.7 | 22.02 | 26.061 | |
| 1,100.0 | 1,100.0 | 1,094.0 | 1,094.0 | 2.4 | 21.9 | 111.22 | -207.6 | 534.9 | 573.8 | 549.5 | 24.24 | 23.670 | |
| 1,200.0 | 1,200.0 | 1,194.0 | 1,194.0 | 2.6 | 23.9 | 111.22 | -207.6 | 534.9 | 573.8 | 547.3 | 26.46 | 21.680 | |
| 1,300.0 | 1,300.0 | 1,294.0 | 1,294.0 | 2.8 | 25.9 | 111.22 | -207.6 | 534.9 | 573.8 | 545.1 | 28.69 | 19.999 | |
| 1,400.0 | 1,400.0 | 1,394.0 | 1,394.0 | 3.0 | 27.9 | 111.22 | -207.6 | 534.9 | 573.8 | 542.8 | 30.91 | 18.559 | |
| 1,500.0 | 1,500.0 | 1,494.0 | 1,494.0 | 3.2 | 29.9 | 11.98 | -207.6 | 534.9 | 572.5 | 539.4 | 33.11 | 17.289 | |
| 1,600.0 | 1,599.9 | 1,593.9 | 1,593.9 | 3.4 | 31.9 | 12.07 | -207.6 | 534.9 | 568.6 | 533.4 | 35.27 | 16.122 | |
| 1,700.0 | 1,699.7 | 1,693.7 | 1,693.7 | 3.6 | 33.9 | 12.23 | -207.6 | 534.9 | 562.2 | 524.8 | 37.40 | 15.032 | |
| 1,800.0 | 1,799.3 | 1,793.3 | 1,793.3 | 3.9 | 35.9 | 12.46 | -207.6 | 534.9 | 553.3 | 513.8 | 39.50 | 14.006 | |
| 1,900.0 | 1,898.6 | 1,892.6 | 1,892.6 | 4.1 | 37.9 | 12.77 | -207.6 | 534.9 | 541.8 | 500.3 | 41.57 | 13.034 | |
| 2,000.0 | 1,997.5 | 1,991.5 | 1,991.5 | 4.4 | 39.8 | 13.16 | -207.6 | 534.9 | 527.8 | 484.2 | 43.59 | 12.108 | |
| 2,100.0 | 2,096.1 | 2,090.1 | 2,090.1 | 4.6 | 41.8 | 13.65 | -207.6 | 534.9 | 511.3 | 465.8 | 45.57 | 11.220 | |
| 2,200.0 | 2,194.2 | 2,188.2 | 2,188.2 | 5.0 | 43.8 | 14.26 | -207.6 | 534.9 | 492.4 | 444.9 | 47.51 | 10.364 | |
| 2,300.0 | 2,291.7 | 2,285.7 | 2,285.7 | 5.3 | 45.7 | 15.00 | -207.6 | 534.9 | 471.0 | 421.6 | 49.40 | 9.535 | |
| 2,400.0 | 2,388.6 | 2,382.6 | 2,382.6 | 5.7 | 47.7 | 15.92 | -207.6 | 534.9 | 447.2 | 396.0 | 51.24 | 8.728 | |
| 2,500.0 | 2,484.9 | 2,478.9 | 2,478.9 | 6.1 | 49.6 | 17.04 | -207.6 | 534.9 | 421.1 | 368.1 | 53.04 | 7.939 | |
| 2,534.8 | 2,518.2 | 2,512.2 | 2,512.2 | 6.3 | 50.2 | 17.50 | -207.6 | 534.9 | 411.5 | 357.8 | 53.66 | 7.668 | |
| 2,600.0 | 2,580.5 | 2,574.5 | 2,574.5 | 6.6 | 51.5 | 18.33 | -207.6 | 534.9 | 393.3 | 338.2 | 55.07 | 7.142 | |
| 2,700.0 | 2,676.1 | 2,670.1 | 2,670.1 | 7.1 | 53.4 | 19.77 | -207.6 | 534.9 | 365.5 | 308.2 | 57.25 | 6.384 | |
| 2,800.0 | 2,771.8 | 2,765.8 | 2,765.8 | 7.7 | 55.3 | 21.44 | -207.6 | 534.9 | 337.9 | 278.5 | 59.46 | 5.684 | |
| 2,900.0 | 2,867.4 | 2,861.4 | 2,861.4 | 8.2 | 57.2 | 23.40 | -207.6 | 534.9 | 310.7 | 249.0 | 61.71 | 5.034 | |
| 3,000.0 | 2,963.0 | 2,957.0 | 2,957.0 | 8.8 | 59.1 | 25.72 | -207.6 | 534.9 | 283.9 | 219.8 | 64.02 | 4.434 | |
| 3,100.0 | 3,058.6 | 3,052.6 | 3,052.6 | 9.3 | 61.1 | 28.52 | -207.6 | 534.9 | 257.6 | 191.1 | 66.42 | 3.878 | |
| 3,200.0 | 3,154.2 | 3,148.2 | 3,148.2 | 9.9 | 63.0 | 31.94 | -207.6 | 534.9 | 232.0 | 163.1 | 68.91 | 3.366 | |
| 3,300.0 | 3,249.9 | 3,243.9 | 3,243.9 | 10.5 | 64.9 | 36.15 | -207.6 | 534.9 | 207.4 | 135.8 | 71.55 | 2.898 | |
| 3,400.0 | 3,345.5 | 3,339.5 | 3,339.5 | 11.1 | 66.8 | 41.43 | -207.6 | 534.9 | 184.1 | 109.8 | 74.39 | 2.475 | |
| 3,500.0 | 3,441.1 | 3,435.1 | 3,435.1 | 11.7 | 68.7 | 48.10 | -207.6 | 534.9 | 162.9 | 85.4 | 77.46 | 2.102 | |
| 3,600.0 | 3,536.7 | 3,530.7 | 3,530.7 | 12.3 | 70.6 | 56.51 | -207.6 | 534.9 | 144.4 | 63.6 | 80.79 | 1.788 | |
| 3,700.0 | 3,632.3 | 3,626.3 | 3,626.3 | 12.8 | 72.5 | 66.93 | -207.6 | 534.9 | 130.0 | 45.7 | 84.27 | 1.543 | |
| 3,800.0 | 3,728.0 | 3,722.0 | 3,722.0 | 13.4 | 74.4 | 79.23 | -207.6 | 534.9 | 121.1 | 33.5 | 87.61 | 1.382 Level 3 | |
| 3,880.7 | 3,805.1 | 3,799.1 | 3,799.1 | 13.9 | 76.0 | 90.00 | -207.6 | 534.9 | 118.8 | 28.9 | 89.91 | 1.321 Level 3 | |
| 3,900.0 | 3,823.6 | 3,817.6 | 3,817.6 | 14.0 | 76.4 | 92.60 | -207.6 | 534.9 | 118.9 | 28.5 | 90.39 | 1.315 Level 3 | |
| 4,000.0 | 3,919.2 | 3,913.2 | 3,913.2 | 14.6 | 78.3 | 105.70 | -207.6 | 534.9 | 123.8 | 31.4 | 92.39 | 1.340 Level 3 | |
| 4,100.0 | 4,014.8 | 4,008.8 | 4,008.8 | 15.3 | 80.2 | 117.33 | -207.6 | 534.9 | 135.0 | 41.2 | 93.79 | 1.439 Level 3 | |
| 4,200.0 | 4,110.4 | 4,104.4 | 4,104.4 | 15.9 | 82.1 | 126.96 | -207.6 | 534.9 | 151.1 | 56.2 | 94.93 | 1.592 | |
| 4,300.0 | 4,206.1 | 4,200.1 | 4,200.1 | 16.5 | 84.0 | 134.66 | -207.6 | 534.9 | 170.8 | 74.7 | 96.07 | 1.778 | |
| 4,400.0 | 4,301.7 | 4,295.7 | 4,295.7 | 17.1 | 85.9 | 140.75 | -207.6 | 534.9 | 192.9 | 95.6 | 97.34 | 1.982 | |
| 4,500.0 | 4,397.3 | 4,391.3 | 4,391.3 | 17.7 | 87.8 | 145.58 | -207.6 | 534.9 | 216.7 | 118.0 | 98.76 | 2.194 | |
| 4,600.0 | 4,492.9 | 4,486.9 | 4,486.9 | 18.3 | 89.7 | 149.46 | -207.6 | 534.9 | 241.7 | 141.4 | 100.32 | 2.410 | |
| 4,700.0 | 4,588.5 | 4,582.5 | 4,582.5 | 18.9 | 91.7 | 152.62 | -207.6 | 534.9 | 267.6 | 165.6 | 101.99 | 2.624 | |
| 4,800.0 | 4,684.2 | 4,678.2 | 4,678.2 | 19.5 | 93.6 | 155.22 | -207.6 | 534.9 | 294.1 | 190.4 | 103.74 | 2.835 | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|--|--------------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 6732-UNKNOWN | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Semi Major Axis Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 4,900.0 | 4,779.8 | 4,773.8 | 4,773.8 | 20.2 | 95.5 | 157.40 | -207.6 | 534.9 | 321.1 | 215.6 | 105.57 | 3.042 | |
| 5,000.0 | 4,875.4 | 4,869.4 | 4,869.4 | 20.8 | 97.4 | 159.24 | -207.6 | 534.9 | 348.5 | 241.1 | 107.45 | 3.244 | |
| 5,100.0 | 4,971.0 | 4,965.0 | 4,965.0 | 21.4 | 99.3 | 160.81 | -207.6 | 534.9 | 376.2 | 266.8 | 109.37 | 3.439 | |
| 5,200.0 | 5,066.6 | 5,060.6 | 5,060.6 | 22.0 | 101.2 | 162.17 | -207.6 | 534.9 | 404.1 | 292.7 | 111.33 | 3.629 | |
| 5,300.0 | 5,162.2 | 5,156.2 | 5,156.2 | 22.6 | 103.1 | 163.36 | -207.6 | 534.9 | 432.1 | 318.8 | 113.31 | 3.814 | |
| 5,400.0 | 5,257.9 | 5,251.9 | 5,251.9 | 23.2 | 105.0 | 164.40 | -207.6 | 534.9 | 460.3 | 345.0 | 115.31 | 3.992 | |
| 5,500.0 | 5,353.5 | 5,347.5 | 5,347.5 | 23.9 | 106.9 | 165.32 | -207.6 | 534.9 | 488.7 | 371.3 | 117.33 | 4.165 | |
| 5,600.0 | 5,449.1 | 5,443.1 | 5,443.1 | 24.5 | 108.9 | 166.14 | -207.6 | 534.9 | 517.1 | 397.8 | 119.37 | 4.332 | |
| 5,626.6 | 5,474.5 | 5,468.5 | 5,468.5 | 24.6 | 109.4 | 166.34 | -207.6 | 534.9 | 524.7 | 404.8 | 119.91 | 4.376 | |
| 5,650.0 | 5,497.0 | 5,491.0 | 5,491.0 | 24.8 | 109.8 | 165.47 | -207.6 | 534.9 | 531.0 | 409.7 | 121.30 | 4.378 | |
| 5,700.0 | 5,545.6 | 5,539.6 | 5,539.6 | 25.0 | 110.8 | 162.48 | -207.6 | 534.9 | 542.2 | 418.3 | 123.93 | 4.375 | |
| 5,750.0 | 5,594.9 | 5,588.9 | 5,588.9 | 25.1 | 111.8 | 156.35 | -207.6 | 534.9 | 550.3 | 424.2 | 126.08 | 4.365 | |
| 5,800.0 | 5,644.6 | 5,638.6 | 5,638.6 | 25.2 | 112.8 | 140.51 | -207.6 | 534.9 | 555.1 | 427.4 | 127.71 | 4.346 | |
| 5,850.0 | 5,694.5 | 5,688.5 | 5,688.5 | 25.3 | 113.8 | 88.31 | -207.6 | 534.9 | 556.6 | 427.8 | 128.81 | 4.321 | |
| 5,900.0 | 5,744.4 | 5,738.4 | 5,738.4 | 25.3 | 114.8 | 35.10 | -207.6 | 534.9 | 554.9 | 425.6 | 129.36 | 4.290 | |
| 5,950.0 | 5,794.1 | 5,788.1 | 5,788.1 | 25.3 | 115.8 | 18.81 | -207.6 | 534.9 | 550.0 | 420.7 | 129.33 | 4.253 | |
| 6,000.0 | 5,843.3 | 5,837.3 | 5,837.3 | 25.3 | 116.7 | 12.45 | -207.6 | 534.9 | 541.8 | 413.1 | 128.72 | 4.209 | |
| 6,050.0 | 5,892.0 | 5,886.0 | 5,886.0 | 25.2 | 117.7 | 9.24 | -207.6 | 534.9 | 530.4 | 402.9 | 127.52 | 4.159 | |
| 6,100.0 | 5,939.8 | 5,933.8 | 5,933.8 | 25.1 | 118.7 | 7.36 | -207.6 | 534.9 | 515.9 | 390.2 | 125.72 | 4.103 | |
| 6,150.0 | 5,986.5 | 5,980.5 | 5,980.5 | 25.0 | 119.6 | 6.17 | -207.6 | 534.9 | 498.3 | 374.9 | 123.31 | 4.041 | |
| 6,200.0 | 6,032.0 | 6,026.0 | 6,026.0 | 24.9 | 120.5 | 5.40 | -207.6 | 534.9 | 477.6 | 357.3 | 120.31 | 3.970 | |
| 6,250.0 | 6,076.1 | 6,070.1 | 6,070.1 | 24.8 | 121.4 | 4.90 | -207.6 | 534.9 | 454.1 | 337.3 | 116.72 | 3.890 | |
| 6,300.0 | 6,118.5 | 6,112.5 | 6,112.5 | 24.7 | 122.2 | 4.59 | -207.6 | 534.9 | 427.7 | 315.1 | 112.55 | 3.800 | |
| 6,350.0 | 6,159.1 | 6,153.1 | 6,153.1 | 24.6 | 123.1 | 4.45 | -207.6 | 534.9 | 398.6 | 290.8 | 107.81 | 3.697 | |
| 6,400.0 | 6,197.7 | 6,191.7 | 6,191.7 | 24.5 | 123.8 | 4.47 | -207.6 | 534.9 | 366.9 | 264.3 | 102.55 | 3.578 | |
| 6,450.0 | 6,234.2 | 6,228.2 | 6,228.2 | 24.4 | 124.6 | 4.65 | -207.6 | 534.9 | 332.7 | 235.9 | 96.79 | 3.438 | |
| 6,500.0 | 6,268.3 | 6,262.3 | 6,262.3 | 24.3 | 125.2 | 5.04 | -207.6 | 534.9 | 296.3 | 205.7 | 90.60 | 3.270 | |
| 6,550.0 | 6,300.0 | 6,294.0 | 6,294.0 | 24.3 | 125.9 | 5.72 | -207.6 | 534.9 | 257.7 | 173.6 | 84.10 | 3.064 | |
| 6,600.0 | 6,329.1 | 6,323.1 | 6,323.1 | 24.4 | 126.5 | 6.88 | -207.6 | 534.9 | 217.1 | 139.6 | 77.51 | 2.801 | |
| 6,650.0 | 6,355.5 | 6,349.5 | 6,349.5 | 24.4 | 127.0 | 8.90 | -207.6 | 534.9 | 174.8 | 103.3 | 71.46 | 2.446 | |
| 6,700.0 | 6,379.1 | 6,373.1 | 6,373.1 | 24.6 | 127.5 | 12.72 | -207.6 | 534.9 | 130.9 | 63.0 | 67.85 | 1.929 | |
| 6,750.0 | 6,399.7 | 6,393.7 | 6,393.7 | 24.8 | 127.9 | 21.20 | -207.6 | 534.9 | 85.7 | 12.0 | 73.65 | 1.163 Level 2 | |
| 6,800.0 | 6,417.3 | 6,411.3 | 6,411.3 | 25.0 | 128.2 | 45.31 | -207.6 | 534.9 | 40.0 | -72.8 | 112.74 | 0.355 Level 1 | |
| 6,839.9 | 6,429.2 | 6,423.2 | 6,423.2 | 25.3 | 128.5 | 90.00 | -207.6 | 534.9 | 12.3 | -141.2 | 153.56 | 0.080 Level 1, CC, ES, SF | |
| 6,850.0 | 6,431.9 | 6,425.9 | 6,425.9 | 25.4 | 128.5 | 101.63 | -207.6 | 534.9 | 15.7 | -135.2 | 150.93 | 0.104 Level 1 | |
| 6,900.0 | 6,443.2 | 6,437.2 | 6,437.2 | 25.8 | 128.7 | 132.58 | -207.6 | 534.9 | 59.7 | -56.3 | 116.00 | 0.515 Level 1 | |
| 6,950.0 | 6,451.4 | 6,445.4 | 6,445.4 | 26.2 | 128.9 | 138.01 | -207.6 | 534.9 | 108.4 | 2.9 | 105.55 | 1.027 Level 2 | |
| 7,000.0 | 6,456.3 | 6,450.3 | 6,450.3 | 26.7 | 129.0 | 128.34 | -207.6 | 534.9 | 157.9 | 35.1 | 122.86 | 1.286 Level 3 | |
| 7,052.2 | 6,458.0 | 6,452.0 | 6,452.0 | 27.3 | 129.0 | 88.02 | -207.6 | 534.9 | 210.0 | 53.8 | 156.17 | 1.345 Level 3 | |
| 7,100.0 | 6,457.9 | 6,451.9 | 6,451.9 | 27.9 | 129.0 | 87.56 | -207.6 | 534.9 | 257.7 | 101.0 | 156.72 | 1.644 | |
| 7,200.0 | 6,457.7 | 6,451.7 | 6,451.7 | 29.3 | 129.0 | 86.62 | -207.6 | 534.9 | 357.6 | 199.6 | 158.00 | 2.263 | |
| 7,300.0 | 6,457.4 | 6,451.4 | 6,451.4 | 30.9 | 129.0 | 85.68 | -207.6 | 534.9 | 457.5 | 298.1 | 159.43 | 2.870 | |
| 7,400.0 | 6,457.2 | 6,451.2 | 6,451.2 | 32.7 | 129.0 | 84.73 | -207.6 | 534.9 | 557.5 | 396.5 | 160.97 | 3.463 | |
| 7,500.0 | 6,457.0 | 6,451.0 | 6,451.0 | 34.6 | 129.0 | 83.80 | -207.6 | 534.9 | 657.5 | 494.9 | 162.60 | 4.043 | |
| 7,600.0 | 6,456.8 | 6,450.8 | 6,450.8 | 36.6 | 129.0 | 82.86 | -207.6 | 534.9 | 757.4 | 593.1 | 164.31 | 4.610 | |

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: 500-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -175.22 | -233.2 | -19.5 | 234.3 | | | | | |
| 100.0 | 100.0 | 86.8 | 86.8 | 0.1 | 0.1 | -175.22 | -233.2 | -19.5 | 234.0 | 233.8 | 0.21 | 1,112.635 | | |
| 200.0 | 200.0 | 186.6 | 186.6 | 0.3 | 0.2 | -175.22 | -233.3 | -19.5 | 234.1 | 233.6 | 0.55 | 427.696 | | |
| 300.0 | 300.0 | 286.4 | 286.4 | 0.6 | 0.3 | -175.22 | -233.5 | -19.5 | 234.3 | 233.5 | 0.88 | 264.938 | | |
| 400.0 | 400.0 | 386.2 | 386.2 | 0.8 | 0.4 | -175.22 | -233.8 | -19.6 | 234.6 | 233.4 | 1.22 | 192.079 | | |
| 500.0 | 500.0 | 486.0 | 486.0 | 1.0 | 0.5 | -175.22 | -234.2 | -19.6 | 235.0 | 233.5 | 1.56 | 150.793 | | |
| 600.0 | 600.0 | 586.0 | 586.0 | 1.2 | 0.7 | -175.21 | -234.7 | -19.7 | 235.5 | 233.5 | 1.97 | 119.452 | | |
| 700.0 | 700.0 | 685.7 | 685.7 | 1.5 | 0.9 | -175.23 | -235.1 | -19.6 | 235.9 | 233.6 | 2.40 | 98.487 | | |
| 800.0 | 800.0 | 786.0 | 786.0 | 1.7 | 1.1 | -175.24 | -235.7 | -19.6 | 236.5 | 233.6 | 2.83 | 83.622 | | |
| 900.0 | 900.0 | 885.8 | 885.8 | 1.9 | 1.3 | -175.23 | -236.1 | -19.7 | 236.9 | 233.7 | 3.26 | 72.712 | | |
| 1,000.0 | 1,000.0 | 986.4 | 986.4 | 2.1 | 1.6 | -175.24 | -236.5 | -19.7 | 237.3 | 233.6 | 3.69 | 64.314 | | |
| 1,100.0 | 1,100.0 | 1,087.5 | 1,087.5 | 2.4 | 1.8 | -175.25 | -236.6 | -19.7 | 237.4 | 233.2 | 4.12 | 57.602 | | |
| 1,200.0 | 1,200.0 | 1,187.1 | 1,187.1 | 2.6 | 2.0 | -175.25 | -236.4 | -19.6 | 237.2 | 232.7 | 4.55 | 52.112 | | |
| 1,220.2 | 1,220.2 | 1,207.2 | 1,207.2 | 2.6 | 2.0 | -175.23 | -236.4 | -19.7 | 237.2 | 232.6 | 4.64 | 51.131 | | |
| 1,300.0 | 1,300.0 | 1,287.0 | 1,287.0 | 2.8 | 2.2 | -175.20 | -236.4 | -19.9 | 237.2 | 232.2 | 4.99 | 47.575 | | |
| 1,322.6 | 1,322.6 | 1,309.6 | 1,309.6 | 2.9 | 2.2 | -175.20 | -236.4 | -19.9 | 237.2 | 232.1 | 5.08 | 46.657 | | |
| 1,400.0 | 1,400.0 | 1,386.8 | 1,386.8 | 3.0 | 2.4 | -175.20 | -236.4 | -19.9 | 237.2 | 231.8 | 5.42 | 43.768 | | |
| 1,500.0 | 1,500.0 | 1,486.1 | 1,486.1 | 3.2 | 2.6 | 85.91 | -236.6 | -20.1 | 237.4 | 231.5 | 5.84 | 40.643 | | |
| 1,600.0 | 1,599.9 | 1,585.8 | 1,585.8 | 3.4 | 2.8 | 86.97 | -237.0 | -20.7 | 237.5 | 231.3 | 6.25 | 37.984 | | |
| 1,700.0 | 1,699.7 | 1,685.3 | 1,685.3 | 3.6 | 3.0 | 88.70 | -237.4 | -21.5 | 237.8 | 231.2 | 6.68 | 35.621 | | |
| 1,800.0 | 1,799.3 | 1,784.6 | 1,784.6 | 3.9 | 3.2 | 91.07 | -237.9 | -22.4 | 238.5 | 231.4 | 7.11 | 33.535 | | |
| 1,900.0 | 1,898.6 | 1,883.5 | 1,883.5 | 4.1 | 3.5 | 94.06 | -238.5 | -23.4 | 239.8 | 232.2 | 7.56 | 31.717 | | |
| 2,000.0 | 1,997.5 | 1,982.1 | 1,982.1 | 4.4 | 3.7 | 97.61 | -239.1 | -24.7 | 242.2 | 234.2 | 8.03 | 30.169 | | |
| 2,100.0 | 2,096.1 | 2,079.7 | 2,079.7 | 4.6 | 3.9 | 101.60 | -239.9 | -26.0 | 246.3 | 237.8 | 8.52 | 28.916 | | |
| 2,200.0 | 2,194.2 | 2,176.7 | 2,176.7 | 5.0 | 4.1 | 105.92 | -241.0 | -27.3 | 252.6 | 243.6 | 9.03 | 27.985 | | |
| 2,300.0 | 2,291.7 | 2,273.2 | 2,273.1 | 5.3 | 4.3 | 110.42 | -242.4 | -28.6 | 261.7 | 252.1 | 9.56 | 27.382 | | |
| 2,400.0 | 2,388.6 | 2,369.1 | 2,369.0 | 5.7 | 4.5 | 114.97 | -244.2 | -29.9 | 273.8 | 263.7 | 10.10 | 27.109 | | |
| 2,500.0 | 2,484.9 | 2,464.2 | 2,464.1 | 6.1 | 4.7 | 119.45 | -246.3 | -31.2 | 289.2 | 278.6 | 10.65 | 27.158 | | |
| 2,534.8 | 2,518.2 | 2,497.2 | 2,497.0 | 6.3 | 4.8 | 120.97 | -247.1 | -31.6 | 295.4 | 284.5 | 10.84 | 27.247 | | |
| 2,600.0 | 2,580.5 | 2,559.3 | 2,559.1 | 6.6 | 4.9 | 123.85 | -248.7 | -32.5 | 307.8 | 296.6 | 11.20 | 27.469 | | |
| 2,700.0 | 2,676.1 | 2,654.5 | 2,654.3 | 7.1 | 5.2 | 127.87 | -251.0 | -33.8 | 328.2 | 316.4 | 11.75 | 27.926 | | |
| 2,800.0 | 2,771.8 | 2,749.7 | 2,749.4 | 7.7 | 5.4 | 131.42 | -253.4 | -35.2 | 350.1 | 337.8 | 12.29 | 28.487 | | |
| 2,900.0 | 2,867.4 | 2,844.9 | 2,844.6 | 8.2 | 5.6 | 134.57 | -255.7 | -36.6 | 373.2 | 360.3 | 12.81 | 29.120 | | |
| 3,000.0 | 2,963.0 | 2,940.1 | 2,939.7 | 8.8 | 5.8 | 137.36 | -258.1 | -38.0 | 397.2 | 383.9 | 13.33 | 29.798 | | |
| 3,100.0 | 3,058.6 | 3,035.0 | 3,034.6 | 9.3 | 6.0 | 139.84 | -260.4 | -39.5 | 422.2 | 408.4 | 13.84 | 30.507 | | |
| 3,200.0 | 3,154.2 | 3,129.5 | 3,129.1 | 9.9 | 6.2 | 142.07 | -262.6 | -41.2 | 447.9 | 433.6 | 14.34 | 31.241 | | |
| 3,300.0 | 3,249.9 | 3,223.9 | 3,223.4 | 10.5 | 6.4 | 144.10 | -264.5 | -43.1 | 474.4 | 459.6 | 14.83 | 31.991 | | |
| 3,400.0 | 3,345.5 | 3,318.0 | 3,317.5 | 11.1 | 6.6 | 145.94 | -266.3 | -45.3 | 501.6 | 486.3 | 15.32 | 32.750 | | |
| 3,500.0 | 3,441.1 | 3,412.0 | 3,411.5 | 11.7 | 6.8 | 147.63 | -267.9 | -47.8 | 529.4 | 513.6 | 15.80 | 33.511 | | |
| 3,600.0 | 3,536.7 | 3,505.8 | 3,505.2 | 12.3 | 7.0 | 149.17 | -269.2 | -50.5 | 557.8 | 541.5 | 16.28 | 34.272 | | |
| 3,700.0 | 3,632.3 | 3,599.7 | 3,599.1 | 12.8 | 7.2 | 150.58 | -270.6 | -53.4 | 586.7 | 569.9 | 16.76 | 35.016 | | |
| 3,800.0 | 3,728.0 | 3,693.6 | 3,692.9 | 13.4 | 7.4 | 151.86 | -272.1 | -56.4 | 616.0 | 598.8 | 17.23 | 35.746 | | |
| 3,900.0 | 3,823.6 | 3,787.4 | 3,786.6 | 14.0 | 7.6 | 153.01 | -273.6 | -59.5 | 645.8 | 628.0 | 17.71 | 36.458 | | |
| 4,000.0 | 3,919.2 | 3,881.1 | 3,880.3 | 14.6 | 7.9 | 154.06 | -275.3 | -62.7 | 675.8 | 657.6 | 18.19 | 37.151 | | |
| 4,100.0 | 4,014.8 | 3,974.8 | 3,973.9 | 15.3 | 8.1 | 155.01 | -277.1 | -66.0 | 706.2 | 687.6 | 18.67 | 37.824 | | |
| 4,200.0 | 4,110.4 | 4,071.7 | 4,070.7 | 15.9 | 8.3 | 155.92 | -278.9 | -69.4 | 736.8 | 717.6 | 19.15 | 38.479 | | |
| 4,300.0 | 4,206.1 | 4,170.0 | 4,168.9 | 16.5 | 8.5 | 156.78 | -280.3 | -72.4 | 767.1 | 747.4 | 19.62 | 39.093 | | |
| 4,400.0 | 4,301.7 | 4,268.5 | 4,267.4 | 17.1 | 8.7 | 157.61 | -281.4 | -75.1 | 797.0 | 776.9 | 20.09 | 39.665 | | |
| 6,650.0 | 6,355.5 | 6,363.0 | 6,361.5 | 24.4 | 12.9 | -7.45 | -287.1 | -64.8 | 777.7 | 763.2 | 14.56 | 53.414 | | |
| 6,700.0 | 6,379.1 | 6,384.8 | 6,383.2 | 24.6 | 12.9 | -9.58 | -287.3 | -64.3 | 733.2 | 719.0 | 14.17 | 51.758 | | |
| 6,750.0 | 6,399.7 | 6,403.8 | 6,402.2 | 24.8 | 13.0 | -12.51 | -287.6 | -63.8 | 687.3 | 672.9 | 14.38 | 47.796 | | |

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

| | | | |
|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|---------------------|--------|
| Survey Program: 500-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 6,800.0 | 6,417.3 | 6,419.8 | 6,418.2 | 25.0 | 13.0 | -16.73 | -287.8 | -63.4 | 640.3 | 624.8 | 15.56 | 41.160 | | |
| 6,850.0 | 6,431.9 | 6,432.9 | 6,431.3 | 25.4 | 13.0 | -23.11 | -288.0 | -63.1 | 592.4 | 574.2 | 18.25 | 32.454 | | |
| 6,900.0 | 6,443.2 | 6,442.9 | 6,441.3 | 25.8 | 13.1 | -33.26 | -288.1 | -62.9 | 543.8 | 520.6 | 23.24 | 23.396 | | |
| 6,950.0 | 6,451.4 | 6,449.8 | 6,448.3 | 26.2 | 13.1 | -49.55 | -288.2 | -62.7 | 494.7 | 463.9 | 30.82 | 16.051 | | |
| 7,000.0 | 6,456.3 | 6,453.6 | 6,452.0 | 26.7 | 13.1 | -72.69 | -288.3 | -62.7 | 445.3 | 407.2 | 38.14 | 11.675 | | |
| 7,052.2 | 6,458.0 | 6,454.1 | 6,452.5 | 27.3 | 13.1 | -97.14 | -288.3 | -62.7 | 393.8 | 353.8 | 39.93 | 9.861 | | |
| 7,100.0 | 6,457.9 | 6,453.0 | 6,451.4 | 27.9 | 13.1 | -96.18 | -288.3 | -62.7 | 346.8 | 306.2 | 40.61 | 8.540 | | |
| 7,200.0 | 6,457.7 | 6,450.5 | 6,449.0 | 29.3 | 13.1 | -94.14 | -288.3 | -62.7 | 249.4 | 207.3 | 42.16 | 5.917 | | |
| 7,300.0 | 6,457.4 | 6,448.1 | 6,446.5 | 30.9 | 13.1 | -92.07 | -288.2 | -62.8 | 155.4 | 111.6 | 43.86 | 3.544 | | |
| 7,400.0 | 6,457.2 | 6,445.7 | 6,444.1 | 32.7 | 13.1 | -89.97 | -288.2 | -62.8 | 78.0 | 32.4 | 45.68 | 1.709 | | |
| 7,440.4 | 6,457.1 | 6,444.7 | 6,443.1 | 33.4 | 13.1 | -89.12 | -288.2 | -62.9 | 66.8 | 20.3 | 46.45 | 1.438 | Level 3, CC, ES, SF | |
| 7,500.0 | 6,457.0 | 6,443.2 | 6,441.6 | 34.6 | 13.1 | -87.86 | -288.1 | -62.9 | 89.5 | 41.9 | 47.57 | 1.881 | | |
| 7,600.0 | 6,456.8 | 6,440.7 | 6,439.1 | 36.6 | 13.1 | -85.74 | -288.1 | -62.9 | 173.0 | 123.4 | 49.52 | 3.493 | | |
| 7,700.0 | 6,456.5 | 6,438.2 | 6,436.6 | 38.7 | 13.0 | -83.60 | -288.1 | -63.0 | 268.0 | 216.5 | 51.49 | 5.204 | | |
| 7,800.0 | 6,456.3 | 6,435.7 | 6,434.1 | 40.9 | 13.0 | -81.47 | -288.0 | -63.1 | 365.6 | 312.2 | 53.46 | 6.839 | | |
| 7,900.0 | 6,456.1 | 6,433.2 | 6,431.6 | 43.2 | 13.0 | -79.34 | -288.0 | -63.1 | 464.3 | 408.9 | 55.41 | 8.379 | | |
| 8,000.0 | 6,455.8 | 6,430.6 | 6,429.0 | 45.5 | 13.0 | -77.23 | -288.0 | -63.2 | 563.4 | 506.1 | 57.32 | 9.829 | | |
| 8,100.0 | 6,455.6 | 6,428.0 | 6,426.4 | 47.9 | 13.0 | -75.13 | -287.9 | -63.2 | 662.8 | 603.6 | 59.18 | 11.199 | | |
| 8,200.0 | 6,455.4 | 6,425.4 | 6,423.9 | 50.4 | 13.0 | -73.05 | -287.9 | -63.3 | 762.3 | 701.3 | 60.97 | 12.502 | | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 6701-UNKNOWN | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 7,500.0 | 6,457.0 | 6,445.0 | 6,445.0 | 34.6 | 128.9 | -90.29 | -542.8 | -830.2 | 777.3 | 613.8 | 163.46 | 4.755 | | |
| 7,600.0 | 6,456.8 | 6,444.8 | 6,444.8 | 36.6 | 128.9 | -90.25 | -542.8 | -830.2 | 687.5 | 522.0 | 165.49 | 4.154 | | |
| 7,700.0 | 6,456.5 | 6,444.5 | 6,444.5 | 38.7 | 128.9 | -90.21 | -542.8 | -830.2 | 600.9 | 433.3 | 167.61 | 3.585 | | |
| 7,800.0 | 6,456.3 | 6,444.3 | 6,444.3 | 40.9 | 128.9 | -90.17 | -542.8 | -830.2 | 519.2 | 349.3 | 169.82 | 3.057 | | |
| 7,900.0 | 6,456.1 | 6,444.1 | 6,444.1 | 43.2 | 128.9 | -90.12 | -542.8 | -830.2 | 445.0 | 272.9 | 172.09 | 2.586 | | |
| 8,000.0 | 6,455.8 | 6,443.8 | 6,443.8 | 45.5 | 128.9 | -90.08 | -542.8 | -830.2 | 382.7 | 208.3 | 174.43 | 2.194 | | |
| 8,100.0 | 6,455.6 | 6,443.6 | 6,443.6 | 47.9 | 128.9 | -90.04 | -542.8 | -830.2 | 339.0 | 162.2 | 176.81 | 1.917 | | |
| 8,200.0 | 6,455.4 | 6,443.4 | 6,443.4 | 50.4 | 128.9 | -90.00 | -542.8 | -830.2 | 321.5 | 142.3 | 179.24 | 1.794 | | |
| 8,207.7 | 6,455.4 | 6,443.4 | 6,443.4 | 50.6 | 128.9 | -90.00 | -542.8 | -830.2 | 321.4 | 142.0 | 179.43 | 1.791 | CC, ES, SF | |
| 8,300.0 | 6,455.2 | 6,443.2 | 6,443.2 | 52.8 | 128.9 | -89.96 | -542.8 | -830.2 | 334.4 | 152.7 | 181.71 | 1.840 | | |
| 8,400.0 | 6,454.9 | 6,442.9 | 6,442.9 | 55.3 | 128.9 | -89.92 | -542.8 | -830.2 | 374.5 | 190.3 | 184.21 | 2.033 | | |
| 8,500.0 | 6,454.7 | 6,442.7 | 6,442.7 | 57.9 | 128.9 | -89.88 | -542.8 | -830.2 | 434.4 | 247.7 | 186.73 | 2.327 | | |
| 8,600.0 | 6,454.5 | 6,442.5 | 6,442.5 | 60.4 | 128.8 | -89.84 | -542.8 | -830.2 | 507.1 | 317.9 | 189.28 | 2.679 | | |
| 8,700.0 | 6,454.3 | 6,442.3 | 6,442.3 | 63.0 | 128.8 | -89.80 | -542.8 | -830.2 | 587.9 | 396.1 | 191.86 | 3.064 | | |
| 8,800.0 | 6,454.0 | 6,442.0 | 6,442.0 | 65.6 | 128.8 | -89.76 | -542.8 | -830.2 | 673.9 | 479.4 | 194.45 | 3.466 | | |
| 8,900.0 | 6,453.8 | 6,441.8 | 6,441.8 | 68.2 | 128.8 | -89.72 | -542.8 | -830.2 | 763.3 | 566.2 | 197.06 | 3.873 | | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 2 (P&A) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|------------|
| Survey Program: 100-NS-GYRO-MS | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 10,300.0 | 6,450.6 | 6,436.0 | 6,434.9 | 105.9 | 11.3 | -88.60 | -473.8 | -3,588.1 | 712.0 | 594.8 | 117.19 | 6.076 | |
| 10,400.0 | 6,450.4 | 6,435.8 | 6,434.7 | 108.6 | 11.3 | -88.54 | -473.8 | -3,588.1 | 619.5 | 499.6 | 119.92 | 5.166 | |
| 10,500.0 | 6,450.2 | 6,435.5 | 6,434.4 | 111.4 | 11.3 | -88.48 | -473.8 | -3,588.1 | 529.7 | 407.1 | 122.65 | 4.319 | |
| 10,600.0 | 6,449.9 | 6,435.2 | 6,434.1 | 114.1 | 11.3 | -88.41 | -473.7 | -3,588.1 | 444.4 | 319.0 | 125.39 | 3.544 | |
| 10,700.0 | 6,449.7 | 6,434.9 | 6,433.8 | 116.8 | 11.3 | -88.35 | -473.7 | -3,588.1 | 366.5 | 238.4 | 128.13 | 2.860 | |
| 10,800.0 | 6,449.5 | 6,434.6 | 6,433.5 | 119.6 | 11.3 | -88.28 | -473.7 | -3,588.1 | 302.0 | 171.1 | 130.87 | 2.307 | |
| 10,900.0 | 6,449.2 | 6,434.3 | 6,433.2 | 122.3 | 11.3 | -88.22 | -473.7 | -3,588.1 | 260.8 | 127.2 | 133.62 | 1.952 | |
| 10,965.7 | 6,449.1 | 6,434.2 | 6,433.0 | 124.2 | 11.3 | -88.17 | -473.7 | -3,588.1 | 252.4 | 117.0 | 135.43 | 1.864 | CC, ES, SF |
| 11,000.0 | 6,449.0 | 6,434.0 | 6,432.9 | 125.1 | 11.3 | -88.15 | -473.7 | -3,588.1 | 254.7 | 118.4 | 136.37 | 1.868 | |
| 11,100.0 | 6,448.8 | 6,433.7 | 6,432.6 | 127.9 | 11.3 | -88.08 | -473.7 | -3,588.1 | 285.9 | 146.8 | 139.12 | 2.055 | |
| 11,200.0 | 6,448.6 | 6,433.4 | 6,432.3 | 130.6 | 11.3 | -88.01 | -473.7 | -3,588.1 | 344.4 | 202.5 | 141.87 | 2.428 | |
| 11,300.0 | 6,448.3 | 6,433.1 | 6,432.0 | 133.4 | 11.3 | -87.94 | -473.7 | -3,588.1 | 418.9 | 274.3 | 144.62 | 2.896 | |
| 11,400.0 | 6,448.1 | 6,432.8 | 6,431.7 | 136.1 | 11.3 | -87.86 | -473.7 | -3,588.1 | 502.3 | 354.9 | 147.38 | 3.408 | |
| 11,500.0 | 6,447.9 | 6,432.5 | 6,431.3 | 138.9 | 11.3 | -87.79 | -473.7 | -3,588.1 | 590.9 | 440.8 | 150.13 | 3.936 | |
| 11,600.0 | 6,447.7 | 6,432.1 | 6,431.0 | 141.7 | 11.3 | -87.71 | -473.6 | -3,588.1 | 682.7 | 529.8 | 152.89 | 4.465 | |
| 11,700.0 | 6,447.4 | 6,431.8 | 6,430.7 | 144.4 | 11.3 | -87.63 | -473.6 | -3,588.1 | 776.5 | 620.8 | 155.65 | 4.989 | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 4 (P&A) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 6700-UNKNOWN | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Semi Major Axis | | Highside Toolface (°) | Offset Wellbore Centre | | Distance | | Minimum Separation (ft) | Separation Factor | Warning | |
| Reference | Offset | Reference | Offset | Reference (ft) | Offset (ft) | | +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | | | | |
| 8,900.0 | 6,453.8 | 6,441.8 | 6,441.8 | 68.2 | 128.8 | -90.30 | -517.2 | -2,203.5 | 742.6 | 545.5 | 197.05 | 3.768 | | |
| 9,000.0 | 6,453.6 | 6,441.6 | 6,441.6 | 70.9 | 128.8 | -90.26 | -517.2 | -2,203.5 | 652.1 | 452.4 | 199.68 | 3.266 | | |
| 9,100.0 | 6,453.3 | 6,441.3 | 6,441.3 | 73.5 | 128.8 | -90.21 | -517.2 | -2,203.5 | 564.8 | 362.4 | 202.32 | 2.791 | | |
| 9,200.0 | 6,453.1 | 6,441.1 | 6,441.1 | 76.2 | 128.8 | -90.17 | -517.2 | -2,203.5 | 482.4 | 277.5 | 204.97 | 2.354 | | |
| 9,300.0 | 6,452.9 | 6,440.9 | 6,440.9 | 78.8 | 128.8 | -90.12 | -517.2 | -2,203.5 | 408.1 | 200.4 | 207.63 | 1.965 | | |
| 9,400.0 | 6,452.7 | 6,440.7 | 6,440.7 | 81.5 | 128.8 | -90.08 | -517.2 | -2,203.5 | 346.8 | 136.5 | 210.30 | 1.649 | | |
| 9,500.0 | 6,452.4 | 6,440.4 | 6,440.4 | 84.2 | 128.8 | -90.04 | -517.2 | -2,203.5 | 306.7 | 93.7 | 212.98 | 1.440 | Level 3 | |
| 9,581.1 | 6,452.2 | 6,440.2 | 6,440.2 | 86.4 | 128.8 | -90.00 | -517.2 | -2,203.5 | 295.8 | 80.7 | 215.16 | 1.375 | Level 3, CC, ES | |
| 9,600.0 | 6,452.2 | 6,440.2 | 6,440.2 | 86.9 | 128.8 | -89.99 | -517.2 | -2,203.5 | 296.4 | 80.7 | 215.67 | 1.374 | Level 3, SF | |
| 9,700.0 | 6,452.0 | 6,440.0 | 6,440.0 | 89.6 | 128.8 | -89.95 | -517.2 | -2,203.5 | 318.8 | 100.5 | 218.36 | 1.460 | Level 3 | |
| 9,800.0 | 6,451.8 | 6,439.8 | 6,439.8 | 92.3 | 128.8 | -89.90 | -517.2 | -2,203.5 | 368.0 | 146.9 | 221.06 | 1.665 | | |
| 9,900.0 | 6,451.5 | 6,439.5 | 6,439.5 | 95.0 | 128.8 | -89.86 | -517.2 | -2,203.5 | 435.0 | 211.2 | 223.77 | 1.944 | | |
| 10,000.0 | 6,451.3 | 6,439.3 | 6,439.3 | 97.7 | 128.8 | -89.82 | -517.2 | -2,203.5 | 512.8 | 286.3 | 226.48 | 2.264 | | |
| 10,100.0 | 6,451.1 | 6,439.1 | 6,439.1 | 100.4 | 128.8 | -89.77 | -517.2 | -2,203.5 | 597.3 | 368.1 | 229.20 | 2.606 | | |
| 10,200.0 | 6,450.8 | 6,438.8 | 6,438.8 | 103.2 | 128.8 | -89.73 | -517.2 | -2,203.5 | 686.0 | 454.0 | 231.92 | 2.958 | | |
| 10,300.0 | 6,450.6 | 6,438.6 | 6,438.6 | 105.9 | 128.8 | -89.68 | -517.2 | -2,203.5 | 777.4 | 542.7 | 234.65 | 3.313 | | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 500-NS-GYRO-MS | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 9,600.0 | 6,452.2 | 6,449.3 | 6,446.8 | 86.9 | 11.0 | 90.35 | 376.1 | -2,682.9 | 754.3 | 656.5 | 97.88 | 7.707 | |
| 9,700.0 | 6,452.0 | 6,445.9 | 6,443.5 | 89.6 | 11.0 | 90.03 | 376.0 | -2,683.0 | 697.8 | 597.2 | 100.57 | 6.938 | |
| 9,800.0 | 6,451.8 | 6,442.7 | 6,440.2 | 92.3 | 11.0 | 89.72 | 376.0 | -2,683.1 | 651.8 | 548.5 | 103.27 | 6.311 | |
| 9,900.0 | 6,451.5 | 6,439.4 | 6,437.0 | 95.0 | 11.0 | 89.41 | 375.9 | -2,683.2 | 618.6 | 512.6 | 105.97 | 5.838 | |
| 10,000.0 | 6,451.3 | 6,436.2 | 6,433.8 | 97.7 | 11.0 | 89.10 | 375.9 | -2,683.3 | 600.4 | 491.8 | 108.67 | 5.525 | |
| 10,060.9 | 6,451.2 | 6,434.3 | 6,431.9 | 99.4 | 11.0 | 88.92 | 375.8 | -2,683.3 | 597.3 | 487.0 | 110.32 | 5.414 CC, ES | |
| 10,100.0 | 6,451.1 | 6,433.1 | 6,430.6 | 100.4 | 11.0 | 88.80 | 375.8 | -2,683.4 | 598.6 | 487.2 | 111.38 | 5.374 SF | |
| 10,200.0 | 6,450.8 | 6,429.9 | 6,427.5 | 103.2 | 11.0 | 88.50 | 375.7 | -2,683.5 | 613.3 | 499.2 | 114.09 | 5.376 | |
| 10,300.0 | 6,450.6 | 6,426.8 | 6,424.4 | 105.9 | 11.0 | 88.20 | 375.7 | -2,683.5 | 643.4 | 526.6 | 116.80 | 5.508 | |
| 10,400.0 | 6,450.4 | 6,423.8 | 6,421.4 | 108.6 | 11.0 | 87.91 | 375.6 | -2,683.6 | 686.8 | 567.3 | 119.51 | 5.747 | |
| 10,500.0 | 6,450.2 | 6,420.8 | 6,418.4 | 111.4 | 11.0 | 87.62 | 375.6 | -2,683.7 | 741.2 | 619.0 | 122.22 | 6.065 | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 600-NS-GYRO-MS | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 8,400.0 | 6,454.9 | 6,476.4 | 6,473.7 | 55.3 | 11.0 | 99.32 | -30.2 | -1,734.2 | 737.6 | 672.0 | 65.59 | 11.246 | | |
| 8,500.0 | 6,454.7 | 6,471.9 | 6,469.2 | 57.9 | 11.0 | 98.01 | -30.2 | -1,734.4 | 641.7 | 573.4 | 68.29 | 9.396 | | |
| 8,600.0 | 6,454.5 | 6,467.5 | 6,464.8 | 60.4 | 11.0 | 96.70 | -30.2 | -1,734.6 | 547.1 | 476.1 | 71.00 | 7.705 | | |
| 8,700.0 | 6,454.3 | 6,463.0 | 6,460.4 | 63.0 | 11.0 | 95.39 | -30.2 | -1,734.8 | 454.8 | 381.1 | 73.71 | 6.170 | | |
| 8,800.0 | 6,454.0 | 6,458.7 | 6,456.0 | 65.6 | 11.0 | 94.09 | -30.2 | -1,735.0 | 366.6 | 290.2 | 76.42 | 4.797 | | |
| 8,900.0 | 6,453.8 | 6,454.3 | 6,451.7 | 68.2 | 11.0 | 92.80 | -30.2 | -1,735.1 | 286.2 | 207.0 | 79.11 | 3.617 | | |
| 9,000.0 | 6,453.6 | 6,450.0 | 6,447.4 | 70.9 | 11.0 | 91.51 | -30.2 | -1,735.3 | 222.1 | 140.3 | 81.78 | 2.716 | | |
| 9,100.0 | 6,453.3 | 6,445.8 | 6,443.1 | 73.5 | 10.9 | 90.24 | -30.2 | -1,735.5 | 191.7 | 107.2 | 84.44 | 2.270 | | |
| 9,113.1 | 6,453.3 | 6,445.2 | 6,442.5 | 73.8 | 10.9 | 90.07 | -30.2 | -1,735.5 | 191.2 | 106.4 | 84.78 | 2.255 CC, ES, SF | | |
| 9,200.0 | 6,453.1 | 6,441.5 | 6,438.9 | 76.2 | 10.9 | 88.97 | -30.2 | -1,735.7 | 210.0 | 123.0 | 87.07 | 2.412 | | |
| 9,300.0 | 6,452.9 | 6,437.3 | 6,434.7 | 78.8 | 10.9 | 87.72 | -30.2 | -1,735.8 | 267.3 | 177.6 | 89.67 | 2.981 | | |
| 9,400.0 | 6,452.7 | 6,433.2 | 6,430.5 | 81.5 | 10.9 | 86.47 | -30.2 | -1,736.0 | 344.6 | 252.4 | 92.24 | 3.736 | | |
| 9,500.0 | 6,452.4 | 6,429.1 | 6,426.4 | 84.2 | 10.9 | 85.24 | -30.2 | -1,736.1 | 431.3 | 336.5 | 94.77 | 4.551 | | |
| 9,600.0 | 6,452.2 | 6,425.0 | 6,422.3 | 86.9 | 10.9 | 84.03 | -30.2 | -1,736.3 | 522.7 | 425.5 | 97.26 | 5.375 | | |
| 9,700.0 | 6,452.0 | 6,420.9 | 6,418.3 | 89.6 | 10.9 | 82.83 | -30.2 | -1,736.5 | 616.8 | 517.1 | 99.71 | 6.186 | | |
| 9,800.0 | 6,451.8 | 6,416.9 | 6,414.2 | 92.3 | 10.9 | 81.65 | -30.2 | -1,736.6 | 712.5 | 610.4 | 102.12 | 6.977 | | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 500-NS-GYRO-MS | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 8,800.0 | 6,454.0 | 6,455.2 | 6,453.0 | 65.6 | 12.4 | -91.36 | -735.8 | -1,986.1 | 763.2 | 685.2 | 77.99 | 9.786 | |
| 8,900.0 | 6,453.8 | 6,453.7 | 6,451.5 | 68.2 | 12.4 | -91.20 | -735.9 | -1,986.1 | 692.6 | 612.0 | 80.60 | 8.593 | |
| 9,000.0 | 6,453.6 | 6,452.2 | 6,450.0 | 70.9 | 12.4 | -91.03 | -735.9 | -1,986.1 | 630.1 | 546.8 | 83.24 | 7.570 | |
| 9,100.0 | 6,453.3 | 6,450.6 | 6,448.4 | 73.5 | 12.4 | -90.85 | -735.9 | -1,986.1 | 578.1 | 492.3 | 85.88 | 6.732 | |
| 9,200.0 | 6,453.1 | 6,449.0 | 6,446.8 | 76.2 | 12.4 | -90.67 | -735.9 | -1,986.1 | 539.9 | 451.4 | 88.54 | 6.098 | |
| 9,300.0 | 6,452.9 | 6,447.3 | 6,445.1 | 78.8 | 12.4 | -90.48 | -735.9 | -1,986.2 | 518.4 | 427.2 | 91.21 | 5.684 | |
| 9,363.7 | 6,452.7 | 6,446.2 | 6,444.0 | 80.5 | 12.4 | -90.36 | -735.9 | -1,986.2 | 514.5 | 421.6 | 92.91 | 5.537 CC, ES | |
| 9,400.0 | 6,452.7 | 6,445.6 | 6,443.4 | 81.5 | 12.4 | -90.29 | -735.9 | -1,986.2 | 515.8 | 421.9 | 93.88 | 5.494 SF | |
| 9,500.0 | 6,452.4 | 6,443.8 | 6,441.6 | 84.2 | 12.4 | -90.09 | -735.9 | -1,986.2 | 532.2 | 435.7 | 96.57 | 5.512 | |
| 9,600.0 | 6,452.2 | 6,442.0 | 6,439.8 | 86.9 | 12.4 | -89.89 | -735.9 | -1,986.2 | 566.1 | 466.9 | 99.26 | 5.704 | |
| 9,700.0 | 6,452.0 | 6,440.1 | 6,437.9 | 89.6 | 12.4 | -89.68 | -735.9 | -1,986.3 | 614.6 | 512.7 | 101.96 | 6.028 | |
| 9,800.0 | 6,451.8 | 6,438.2 | 6,435.9 | 92.3 | 12.4 | -89.46 | -736.0 | -1,986.3 | 674.5 | 569.9 | 104.66 | 6.445 | |
| 9,900.0 | 6,451.5 | 6,436.1 | 6,433.9 | 95.0 | 12.4 | -89.24 | -736.0 | -1,986.3 | 743.1 | 635.7 | 107.37 | 6.921 | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

| Offset Design | | Existing Wells Sec.19-T5N-R63W - Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | Offset Site Error: | | 0.0 ft | |
|------------------------------|---------------------|---|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------------------|---------|--|
| Survey Program: 6735-UNKNOWN | | | | | | | | | | | | Offset Well Error: | | 0.0 ft | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | | |
| 11,500.0 | 6,447.9 | 6,441.9 | 6,441.9 | 138.9 | 128.8 | -111.93 | -225.4 | -4,827.7 | 705.3 | 456.1 | 249.17 | 2.830 | | | |
| 11,600.0 | 6,447.7 | 6,441.7 | 6,441.7 | 141.7 | 128.8 | -109.06 | -225.4 | -4,827.7 | 605.3 | 349.0 | 256.28 | 2.362 | | | |
| 11,700.0 | 6,447.4 | 6,441.4 | 6,441.4 | 144.4 | 128.8 | -106.09 | -225.4 | -4,827.7 | 505.3 | 242.3 | 263.00 | 1.921 | | | |
| 11,800.0 | 6,447.2 | 6,441.2 | 6,441.2 | 147.2 | 128.8 | -103.02 | -225.4 | -4,827.7 | 405.3 | 136.0 | 269.22 | 1.505 | | | |
| 11,900.0 | 6,447.0 | 6,441.0 | 6,441.0 | 150.0 | 128.8 | -99.88 | -225.4 | -4,827.7 | 305.3 | 30.4 | 274.83 | 1.11 | Level 2 | | |
| 12,000.0 | 6,446.7 | 6,440.7 | 6,440.7 | 152.8 | 128.8 | -96.68 | -225.4 | -4,827.7 | 205.3 | -74.4 | 279.73 | 0.734 | Level 1 | | |
| | | | | | | | | | | | | | | | |
| 12,100.0 | 6,446.5 | 6,440.5 | 6,440.5 | 155.5 | 128.8 | -93.44 | -225.4 | -4,827.7 | 105.3 | -178.5 | 283.85 | 0.371 | Level 1 | | |
| 12,200.0 | 6,446.3 | 6,440.3 | 6,440.3 | 158.3 | 128.8 | -90.17 | -225.4 | -4,827.7 | 6.6 | -280.5 | 287.11 | 0.023 | Level 1, CC, ES, SF | | |
| 12,211.8 | 6,446.3 | 6,440.3 | 6,440.3 | 158.6 | 128.8 | -89.79 | -225.4 | -4,827.7 | 7.6 | -279.8 | 287.44 | 0.027 | Level 1 | | |
| 12,300.0 | 6,446.1 | 6,440.1 | 6,440.1 | 161.1 | 128.8 | -86.90 | -225.4 | -4,827.7 | 94.8 | -194.6 | 289.48 | 0.328 | Level 1 | | |
| 12,400.0 | 6,445.8 | 6,439.8 | 6,439.8 | 163.9 | 128.8 | -83.66 | -225.4 | -4,827.7 | 194.8 | -96.2 | 290.95 | 0.670 | Level 1 | | |
| | | | | | | | | | | | | | | | |
| 12,500.0 | 6,445.6 | 6,439.6 | 6,439.6 | 166.6 | 128.8 | -80.45 | -225.4 | -4,827.7 | 294.8 | 3.3 | 291.53 | 1.011 | Level 2 | | |
| 12,600.0 | 6,445.4 | 6,439.4 | 6,439.4 | 169.4 | 128.8 | -77.30 | -225.4 | -4,827.7 | 394.8 | 103.5 | 291.25 | 1.355 | Level 3 | | |
| 12,700.0 | 6,445.2 | 6,439.2 | 6,439.2 | 172.2 | 128.8 | -74.23 | -225.4 | -4,827.7 | 494.8 | 204.6 | 290.18 | 1.705 | | | |
| 12,800.0 | 6,444.9 | 6,438.9 | 6,438.9 | 175.0 | 128.8 | -71.25 | -225.4 | -4,827.7 | 594.8 | 306.4 | 288.40 | 2.062 | | | |
| 12,900.0 | 6,444.7 | 6,438.7 | 6,438.7 | 177.8 | 128.8 | -68.37 | -225.4 | -4,827.7 | 694.8 | 408.8 | 285.98 | 2.429 | | | |
| | | | | | | | | | | | | | | | |
| 13,000.0 | 6,444.5 | 6,438.5 | 6,438.5 | 180.6 | 128.8 | -65.60 | -225.4 | -4,827.7 | 794.8 | 511.8 | 283.01 | 2.808 | | | |

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|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP DJ Basin | Local Co-ordinate Reference: | Well Cockroft 19V-234 |
| Project: | SEC.19-T5N-R63W | TVD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Reference Site: | Cockroft 5N63W19C Pad Sec.19-T5N-R63W | MD Reference: | WELL @ 4567.0ft (RKB - 13') |
| Site Error: | 0.0 ft | North Reference: | True |
| Reference Well: | Cockroft 19V-234 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0 ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | US_EDM |
| Reference Design: | Plan #1 (11-13-15) | Offset TVD Reference: | Offset Datum |

Reference Depths are relative to WELL @ 4567.0ft (RKB - 13')

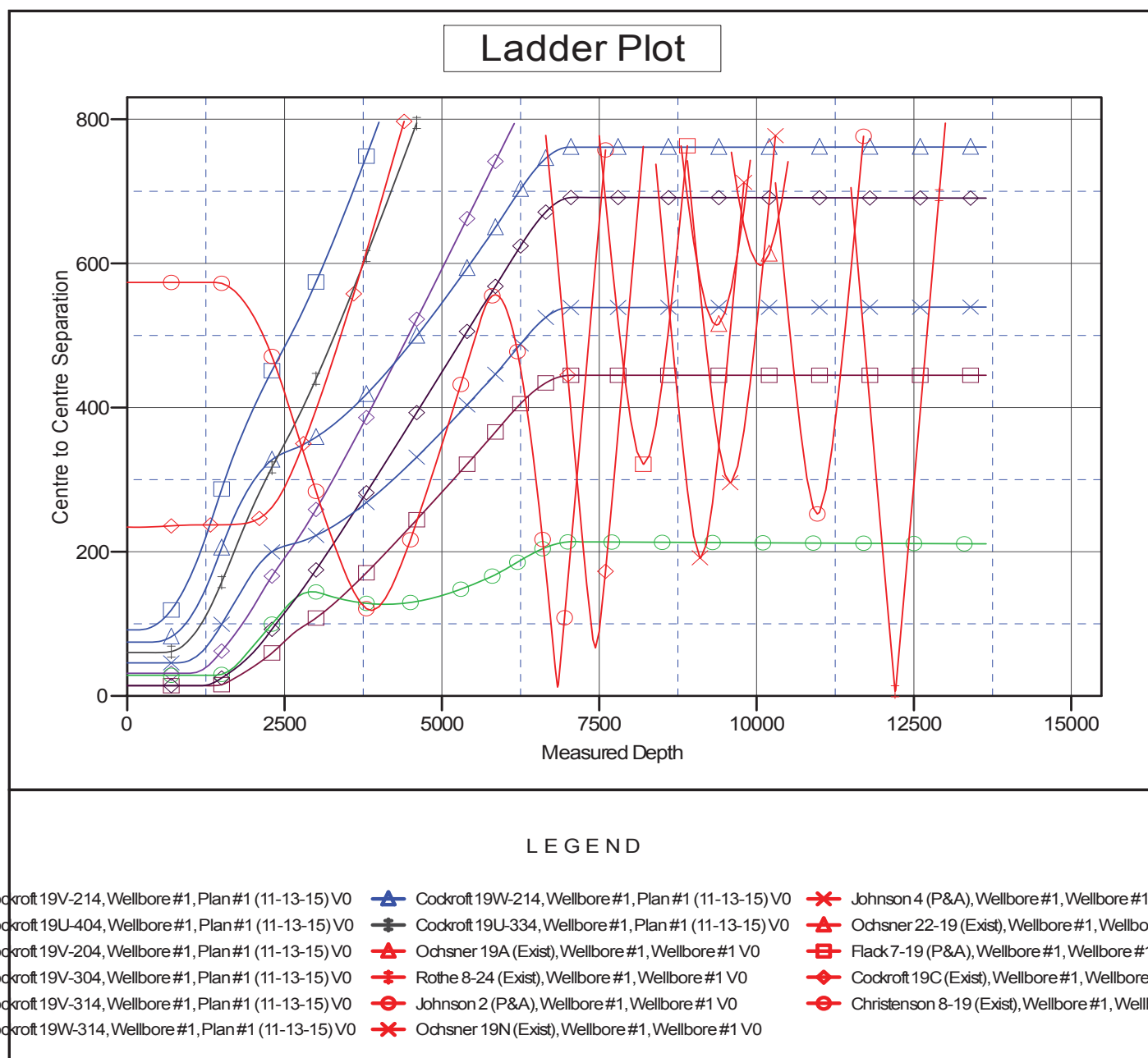
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19V-234

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°



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|--|--|
| Reference Depths are relative to WELL @ 4567.0ft (RKB - 13') | Coordinates are relative to: Cockroft 19V-234 |
| 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: 0.66° |

