

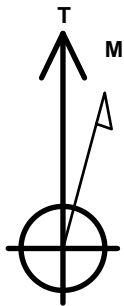
# PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Cockroft 19V-314**

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 0.0 1385874.91 3285787.09 40.388090 -104.474030  
 Original Well Elev WELL @ 4567.0ft (Original Well Elev)

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1406'FNL, 1126'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 960'FNL, 2153'FEL, SEC.24	6498.0	463.5	-6301.2	Point
LPL 943'FNL, 833'FEL, SEC.19	6523.0	463.5	293.1	Point



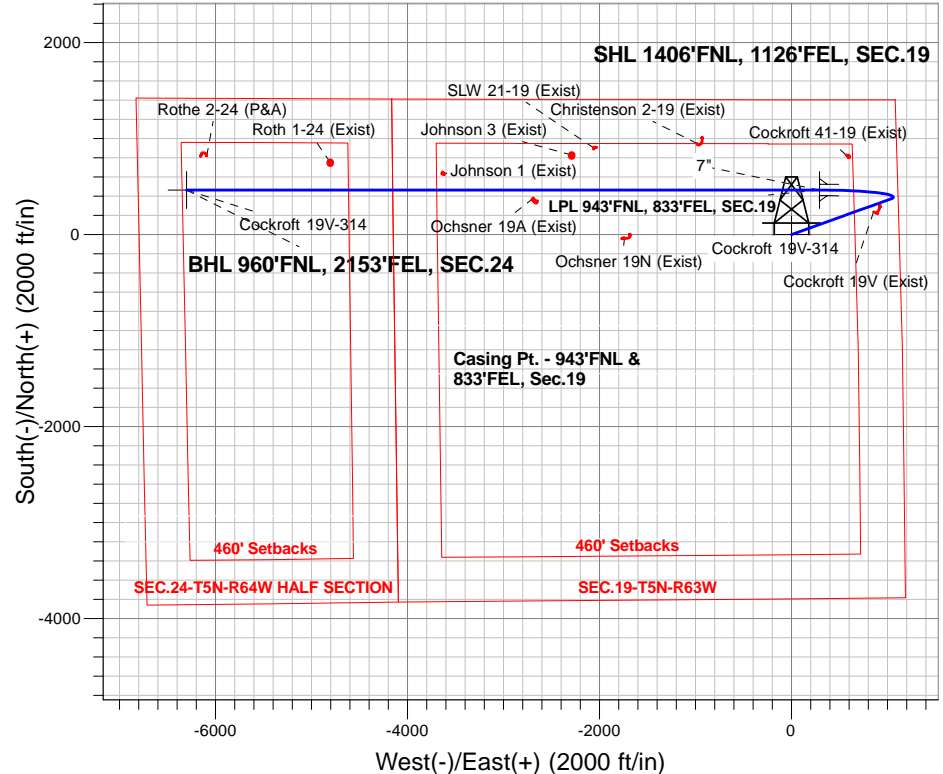
Azimuths to True North  
 Magnetic North: 8.11°

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

Cockroft 5N63W19C Pad Sec.19-T5N-R63W  
 Cockroft 19V-314  
 Plan #1 (11-13-15)  
 7:27, November 18 2015

## ANNOTATIONS

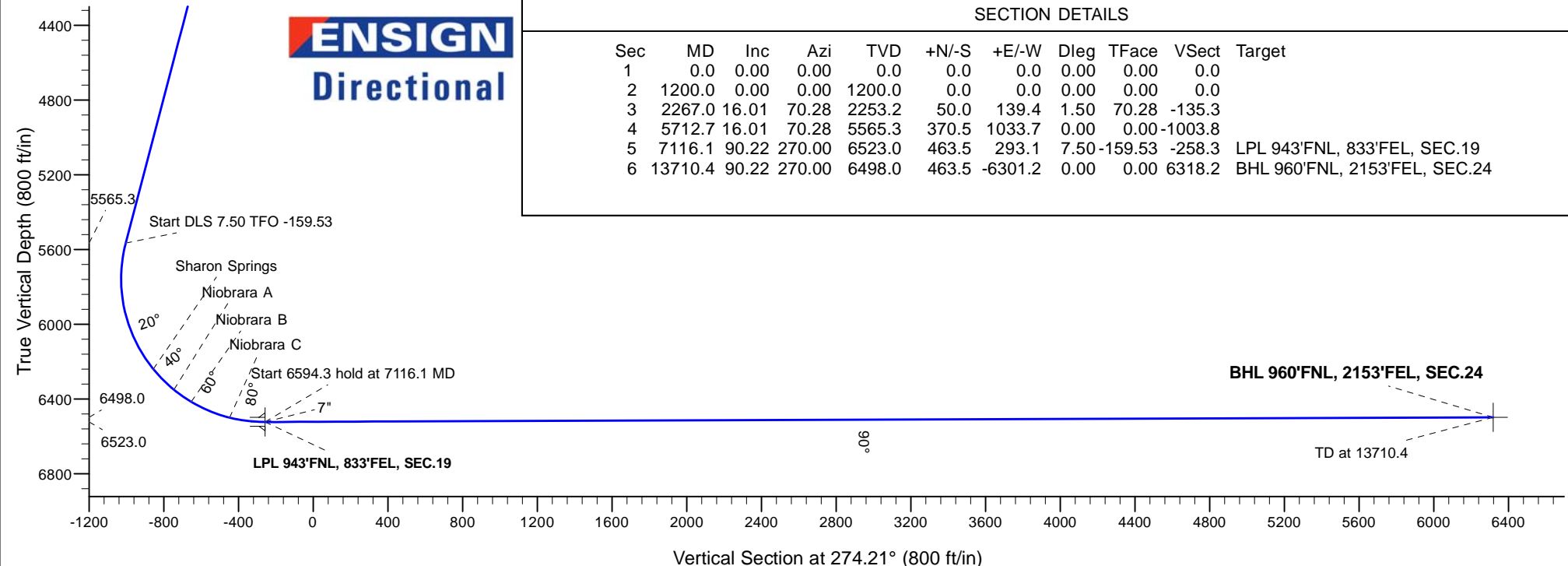
TVD	MD	Annotation
1200.0	1200.0	KOP - Start Build 1.50
2253.2	2267.0	Start 3445.6 hold at 2267.0 MD
5565.3	5712.7	Start DLS 7.50 TFO -159.53
6523.0	7116.1	Start 6594.3 hold at 7116.1 MD
6498.0	13710.4	TD at 13710.4



**ENSIGN**  
 Directional

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	2267.0	16.01	70.28	2253.2	50.0	139.4	1.50	70.28	-135.3	
4	5712.7	16.01	70.28	5565.3	370.5	1033.7	0.00	0.00	-1003.8	
5	7116.1	90.22	270.00	6523.0	463.5	293.1	7.50	-159.53	-258.3	LPL 943'FNL, 833'FEL, SEC.19
6	13710.4	90.22	270.00	6498.0	463.5	-6301.2	0.00	0.00	6318.2	BHL 960'FNL, 2153'FEL, SEC.24





# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R63W**

**Cockroft 5N63W19C Pad Sec.19-T5N-R63W**

**Cockroft 19V-314**

**Wellbore #1**

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

## **Standard Planning Report**

**18 November, 2015**

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-15)		

<b>Project</b>	SEC.19-T5N-R63W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

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

<b>Well</b>	Cockroft 19V-314		
<b>Well Position</b>	<b>+N/-S</b>	10.9 ft	<b>Northing:</b>
	<b>+E/-W</b>	41.8 ft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

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

<b>Design</b>	Plan #1 (11-13-15)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	274.21

<b>Plan Sections</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,267.0	16.01	70.28	2,253.2	50.0	139.4	1.50	1.50	0.00	70.28	
5,712.7	16.01	70.28	5,565.3	370.5	1,033.7	0.00	0.00	0.00	0.00	
7,116.1	90.22	270.00	6,523.0	463.5	293.1	7.50	5.29	-11.42	-159.53	LPL 943'FNL, 833'FEI
13,710.4	90.22	270.00	6,498.0	463.5	-6,301.2	0.00	0.00	0.00	0.00	BHL 960'FNL, 2153'F

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19V-314
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19V-314	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 1406'FNL, 1126'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
KOP - Start Build 1.50									
1,300.0	1.50	70.28	1,300.0	0.4	1.2	-1.2	1.50	1.50	0.00
1,400.0	3.00	70.28	1,399.9	1.8	4.9	-4.8	1.50	1.50	0.00
1,500.0	4.50	70.28	1,499.7	4.0	11.1	-10.8	1.50	1.50	0.00
1,600.0	6.00	70.28	1,599.3	7.1	19.7	-19.1	1.50	1.50	0.00
1,700.0	7.50	70.28	1,698.6	11.0	30.8	-29.9	1.50	1.50	0.00
1,800.0	9.00	70.28	1,797.5	15.9	44.3	-43.0	1.50	1.50	0.00
1,900.0	10.50	70.28	1,896.1	21.6	60.2	-58.5	1.50	1.50	0.00
2,000.0	12.00	70.28	1,994.2	28.2	78.6	-76.3	1.50	1.50	0.00
2,100.0	13.50	70.28	2,091.7	35.6	99.4	-96.5	1.50	1.50	0.00
2,200.0	15.00	70.28	2,188.6	43.9	122.5	-119.0	1.50	1.50	0.00
2,267.0	16.01	70.28	2,253.2	50.0	139.4	-135.3	1.50	1.50	0.00
Start 3445.6 hold at 2267.0 MD									
2,300.0	16.01	70.28	2,284.9	53.0	147.9	-143.7	0.00	0.00	0.00
2,400.0	16.01	70.28	2,381.0	62.3	173.9	-168.9	0.00	0.00	0.00
2,500.0	16.01	70.28	2,477.1	71.6	199.9	-194.1	0.00	0.00	0.00
2,600.0	16.01	70.28	2,573.3	80.9	225.8	-219.3	0.00	0.00	0.00
2,700.0	16.01	70.28	2,669.4	90.2	251.8	-244.5	0.00	0.00	0.00
2,800.0	16.01	70.28	2,765.5	99.5	277.7	-269.7	0.00	0.00	0.00
2,900.0	16.01	70.28	2,861.6	108.8	303.7	-294.9	0.00	0.00	0.00
3,000.0	16.01	70.28	2,957.8	118.1	329.6	-320.1	0.00	0.00	0.00
3,100.0	16.01	70.28	3,053.9	127.4	355.6	-345.3	0.00	0.00	0.00
3,200.0	16.01	70.28	3,150.0	136.7	381.6	-370.5	0.00	0.00	0.00
3,300.0	16.01	70.28	3,246.1	146.0	407.5	-395.7	0.00	0.00	0.00
3,392.4	16.01	70.28	3,335.0	154.6	431.5	-419.0	0.00	0.00	0.00
Parkman									
3,400.0	16.01	70.28	3,342.3	155.3	433.5	-420.9	0.00	0.00	0.00
3,500.0	16.01	70.28	3,438.4	164.6	459.4	-446.1	0.00	0.00	0.00
3,600.0	16.01	70.28	3,534.5	173.9	485.4	-471.3	0.00	0.00	0.00
3,700.0	16.01	70.28	3,630.6	183.2	511.3	-496.5	0.00	0.00	0.00
3,800.0	16.01	70.28	3,726.8	192.5	537.3	-521.7	0.00	0.00	0.00
3,900.0	16.01	70.28	3,822.9	201.8	563.2	-546.9	0.00	0.00	0.00
4,000.0	16.01	70.28	3,919.0	211.1	589.2	-572.1	0.00	0.00	0.00
4,100.0	16.01	70.28	4,015.1	220.5	615.2	-597.3	0.00	0.00	0.00
4,151.9	16.01	70.28	4,065.0	225.3	628.6	-610.4	0.00	0.00	0.00
Sussex									
4,200.0	16.01	70.28	4,111.2	229.8	641.1	-622.5	0.00	0.00	0.00
4,300.0	16.01	70.28	4,207.4	239.1	667.1	-647.7	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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	16.01	70.28	4,303.5	248.4	693.0	-672.9	0.00	0.00	0.00	
4,500.0	16.01	70.28	4,399.6	257.7	719.0	-698.1	0.00	0.00	0.00	
4,600.0	16.01	70.28	4,495.7	267.0	744.9	-723.3	0.00	0.00	0.00	
4,700.0	16.01	70.28	4,591.9	276.3	770.9	-748.6	0.00	0.00	0.00	
4,800.0	16.01	70.28	4,688.0	285.6	796.9	-773.8	0.00	0.00	0.00	
4,900.0	16.01	70.28	4,784.1	294.9	822.8	-799.0	0.00	0.00	0.00	
5,000.0	16.01	70.28	4,880.2	304.2	848.8	-824.2	0.00	0.00	0.00	
5,100.0	16.01	70.28	4,976.4	313.5	874.7	-849.4	0.00	0.00	0.00	
5,200.0	16.01	70.28	5,072.5	322.8	900.7	-874.6	0.00	0.00	0.00	
5,300.0	16.01	70.28	5,168.6	332.1	926.6	-899.8	0.00	0.00	0.00	
5,400.0	16.01	70.28	5,264.7	341.4	952.6	-925.0	0.00	0.00	0.00	
5,500.0	16.01	70.28	5,360.9	350.7	978.5	-950.2	0.00	0.00	0.00	
5,600.0	16.01	70.28	5,457.0	360.0	1,004.5	-975.4	0.00	0.00	0.00	
5,700.0	16.01	70.28	5,553.1	369.3	1,030.5	-1,000.6	0.00	0.00	0.00	
5,712.7	16.01	70.28	5,565.3	370.5	1,033.7	-1,003.8	0.00	0.00	0.00	
Start DLS 7.50 TFO -159.53										
5,800.0	10.12	57.17	5,650.3	378.7	1,051.5	-1,020.9	7.50	-6.73	-15.02	
5,900.0	5.62	10.20	5,749.5	388.3	1,059.8	-1,028.5	7.50	-4.50	-46.97	
6,000.0	8.53	310.23	5,848.8	397.9	1,055.0	-1,023.0	7.50	2.91	-59.98	
6,100.0	15.04	291.15	5,946.7	407.4	1,037.2	-1,004.5	7.50	6.51	-19.07	
6,200.0	22.18	283.77	6,041.4	416.6	1,006.7	-973.5	7.50	7.13	-7.38	
6,300.0	29.49	279.89	6,131.4	425.3	964.1	-930.3	7.50	7.31	-3.88	
6,400.0	36.87	277.44	6,215.0	433.4	910.0	-875.8	7.50	7.38	-2.44	
6,431.7	39.22	276.84	6,240.0	435.9	890.6	-856.3	7.50	7.41	-1.91	
Sharon Springs										
6,500.0	44.28	275.72	6,290.9	440.8	845.5	-810.8	7.50	7.42	-1.64	
6,587.6	50.80	274.55	6,350.0	446.6	781.1	-746.3	7.50	7.44	-1.33	
Niobrara A										
6,600.0	51.72	274.41	6,357.8	447.3	771.5	-736.6	7.50	7.44	-1.19	
6,700.0	59.17	273.34	6,414.5	452.8	689.4	-654.3	7.50	7.45	-1.07	
6,701.1	59.25	273.33	6,415.0	452.9	688.5	-653.4	7.50	7.45	-0.98	
Niobrara B										
6,800.0	66.62	272.42	6,460.0	457.3	600.5	-565.4	7.50	7.46	-0.91	
6,900.0	74.08	271.60	6,493.6	460.6	506.5	-471.3	7.50	7.46	-0.82	
6,924.8	75.94	271.41	6,500.0	461.2	482.5	-447.4	7.50	7.46	-0.78	
Niobrara C										
7,000.0	81.55	270.85	6,514.7	462.7	408.8	-373.8	7.50	7.46	-0.75	
7,100.0	89.01	270.12	6,522.9	463.5	309.2	-274.4	7.50	7.46	-0.73	
7,116.1	90.21	270.00	6,523.0	463.5	293.1	-258.3	7.48	7.45	-0.72	
Start 6594.3 hold at 7116.1 MD - 7" - LPL 943'FNL, 833'FEL, SEC.19										
7,200.0	90.22	270.00	6,522.7	463.5	209.2	-174.7	0.00	0.00	0.00	
7,300.0	90.22	270.00	6,522.3	463.5	109.2	-74.9	0.00	0.00	0.00	
7,400.0	90.22	270.00	6,521.9	463.5	9.2	24.8	0.00	0.00	0.00	
7,500.0	90.22	270.00	6,521.5	463.5	-90.8	124.5	0.00	0.00	0.00	
7,600.0	90.22	270.00	6,521.2	463.5	-190.8	224.2	0.00	0.00	0.00	
7,700.0	90.22	270.00	6,520.8	463.5	-290.8	324.0	0.00	0.00	0.00	
7,800.0	90.22	270.00	6,520.4	463.5	-390.8	423.7	0.00	0.00	0.00	
7,900.0	90.22	270.00	6,520.0	463.5	-490.8	523.4	0.00	0.00	0.00	
8,000.0	90.22	270.00	6,519.6	463.5	-590.8	623.2	0.00	0.00	0.00	
8,100.0	90.22	270.00	6,519.3	463.5	-690.8	722.9	0.00	0.00	0.00	
8,200.0	90.22	270.00	6,518.9	463.5	-790.8	822.6	0.00	0.00	0.00	
8,300.0	90.22	270.00	6,518.5	463.5	-890.8	922.4	0.00	0.00	0.00	

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
8,400.0	90.22	270.00	6,518.1	463.5	-990.8	1,022.1	0.00	0.00	0.00
8,500.0	90.22	270.00	6,517.8	463.5	-1,090.7	1,121.8	0.00	0.00	0.00
8,600.0	90.22	270.00	6,517.4	463.5	-1,190.7	1,221.5	0.00	0.00	0.00
8,700.0	90.22	270.00	6,517.0	463.5	-1,290.7	1,321.3	0.00	0.00	0.00
8,800.0	90.22	270.00	6,516.6	463.5	-1,390.7	1,421.0	0.00	0.00	0.00
8,900.0	90.22	270.00	6,516.2	463.5	-1,490.7	1,520.7	0.00	0.00	0.00
9,000.0	90.22	270.00	6,515.9	463.5	-1,590.7	1,620.5	0.00	0.00	0.00
9,100.0	90.22	270.00	6,515.5	463.5	-1,690.7	1,720.2	0.00	0.00	0.00
9,200.0	90.22	270.00	6,515.1	463.5	-1,790.7	1,819.9	0.00	0.00	0.00
9,300.0	90.22	270.00	6,514.7	463.5	-1,890.7	1,919.7	0.00	0.00	0.00
9,400.0	90.22	270.00	6,514.3	463.5	-1,990.7	2,019.4	0.00	0.00	0.00
9,500.0	90.22	270.00	6,514.0	463.5	-2,090.7	2,119.1	0.00	0.00	0.00
9,600.0	90.22	270.00	6,513.6	463.5	-2,190.7	2,218.8	0.00	0.00	0.00
9,700.0	90.22	270.00	6,513.2	463.5	-2,290.7	2,318.6	0.00	0.00	0.00
9,800.0	90.22	270.00	6,512.8	463.5	-2,390.7	2,418.3	0.00	0.00	0.00
9,900.0	90.22	270.00	6,512.4	463.5	-2,490.7	2,518.0	0.00	0.00	0.00
10,000.0	90.22	270.00	6,512.1	463.5	-2,590.7	2,617.8	0.00	0.00	0.00
10,100.0	90.22	270.00	6,511.7	463.5	-2,690.7	2,717.5	0.00	0.00	0.00
10,200.0	90.22	270.00	6,511.3	463.5	-2,790.7	2,817.2	0.00	0.00	0.00
10,300.0	90.22	270.00	6,510.9	463.5	-2,890.7	2,916.9	0.00	0.00	0.00
10,400.0	90.22	270.00	6,510.6	463.5	-2,990.7	3,016.7	0.00	0.00	0.00
10,500.0	90.22	270.00	6,510.2	463.5	-3,090.7	3,116.4	0.00	0.00	0.00
10,600.0	90.22	270.00	6,509.8	463.5	-3,190.7	3,216.1	0.00	0.00	0.00
10,700.0	90.22	270.00	6,509.4	463.5	-3,290.7	3,315.9	0.00	0.00	0.00
10,800.0	90.22	270.00	6,509.0	463.5	-3,390.7	3,415.6	0.00	0.00	0.00
10,900.0	90.22	270.00	6,508.7	463.5	-3,490.7	3,515.3	0.00	0.00	0.00
11,000.0	90.22	270.00	6,508.3	463.5	-3,590.7	3,615.1	0.00	0.00	0.00
11,100.0	90.22	270.00	6,507.9	463.5	-3,690.7	3,714.8	0.00	0.00	0.00
11,200.0	90.22	270.00	6,507.5	463.5	-3,790.7	3,814.5	0.00	0.00	0.00
11,300.0	90.22	270.00	6,507.1	463.5	-3,890.7	3,914.2	0.00	0.00	0.00
11,400.0	90.22	270.00	6,506.8	463.5	-3,990.7	4,014.0	0.00	0.00	0.00
11,500.0	90.22	270.00	6,506.4	463.5	-4,090.7	4,113.7	0.00	0.00	0.00
11,600.0	90.22	270.00	6,506.0	463.5	-4,190.7	4,213.4	0.00	0.00	0.00
11,700.0	90.22	270.00	6,505.6	463.5	-4,290.7	4,313.2	0.00	0.00	0.00
11,800.0	90.22	270.00	6,505.2	463.5	-4,390.7	4,412.9	0.00	0.00	0.00
11,900.0	90.22	270.00	6,504.9	463.5	-4,490.7	4,512.6	0.00	0.00	0.00
12,000.0	90.22	270.00	6,504.5	463.5	-4,590.7	4,612.4	0.00	0.00	0.00
12,100.0	90.22	270.00	6,504.1	463.5	-4,690.7	4,712.1	0.00	0.00	0.00
12,200.0	90.22	270.00	6,503.7	463.5	-4,790.7	4,811.8	0.00	0.00	0.00
12,300.0	90.22	270.00	6,503.3	463.5	-4,890.7	4,911.5	0.00	0.00	0.00
12,400.0	90.22	270.00	6,503.0	463.5	-4,990.7	5,011.3	0.00	0.00	0.00
12,500.0	90.22	270.00	6,502.6	463.5	-5,090.7	5,111.0	0.00	0.00	0.00
12,600.0	90.22	270.00	6,502.2	463.5	-5,190.7	5,210.7	0.00	0.00	0.00
12,700.0	90.22	270.00	6,501.8	463.5	-5,290.7	5,310.5	0.00	0.00	0.00
12,800.0	90.22	270.00	6,501.5	463.5	-5,390.7	5,410.2	0.00	0.00	0.00
12,900.0	90.22	270.00	6,501.1	463.5	-5,490.7	5,509.9	0.00	0.00	0.00
13,000.0	90.22	270.00	6,500.7	463.5	-5,590.7	5,609.7	0.00	0.00	0.00
13,100.0	90.22	270.00	6,500.3	463.5	-5,690.7	5,709.4	0.00	0.00	0.00
13,200.0	90.22	270.00	6,499.9	463.5	-5,790.7	5,809.1	0.00	0.00	0.00
13,300.0	90.22	270.00	6,499.6	463.5	-5,890.7	5,908.8	0.00	0.00	0.00
13,400.0	90.22	270.00	6,499.2	463.5	-5,990.7	6,008.6	0.00	0.00	0.00
13,500.0	90.22	270.00	6,498.8	463.5	-6,090.7	6,108.3	0.00	0.00	0.00
13,600.0	90.22	270.00	6,498.4	463.5	-6,190.7	6,208.0	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
13,700.0	90.22	270.00	6,498.0	463.5	-6,290.7	6,307.8	0.00	0.00	0.00
13,710.4	90.22	270.00	6,498.0	463.5	-6,301.2	6,318.2	0.00	0.00	0.00
TD at 13710.4 - BHL 960'FNL, 2153'FEL, SEC.24									

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 1406'FNL, 1126'FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,385,874.92	3,285,787.10	40.388090	-104.474030
BHL 960'FNL, 2153'FEL - plan hits target center - Point	0.00	0.00	6,498.0	463.5	-6,301.2	1,386,265.45	3,279,481.26	40.389360	-104.496650
LPL 943'FNL, 833'FEL, 1 - plan hits target center - Point	0.00	0.00	6,523.0	463.5	293.1	1,386,341.75	3,286,074.80	40.389362	-104.472978

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,116.1	6,523.0	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,392.4	3,335.0	Parkman		0.00	
4,151.9	4,065.0	Sussex		0.00	
6,431.7	6,240.0	Sharon Springs		0.00	
6,587.6	6,350.0	Niobrara A		0.00	
6,701.1	6,415.0	Niobrara B		0.00	
6,924.8	6,500.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,200.0	1,200.0	0.0	0.0	KOP - Start Build 1.50
2,267.0	2,253.2	50.0	139.4	Start 3445.6 hold at 2267.0 MD
5,712.7	5,565.3	370.5	1,033.7	Start DLS 7.50 TFO -159.53
7,116.1	6,523.0	463.5	293.1	Start 6594.3 hold at 7116.1 MD
13,710.4	6,498.0	463.5	-6,301.2	TD at 13710.4

# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R63W**

**Cockroft 5N63W19C Pad Sec.19-T5N-R63W**

**Cockroft 19V-314**

**Wellbore #1**

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

## **Anticollision Report**

**18 November, 2015**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

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

<b>Survey Tool Program</b>	<b>Date</b>	11/18/2015		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	13,710.4	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	45.9	43.4	18.562	CC, ES
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	13,710.4	13,732.2	626.6	231.2	1.585	SF
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	200.0	200.0	77.4	76.7	114.768	CC, ES
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	5,800.0	5,703.5	697.7	649.4	14.449	SF
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	1,200.0	1,201.0	28.8	23.6	5.567	CC
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	13,710.4	13,642.5	255.7	-124.2	0.673	Level 1, ES, SF
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	1,000.0	1,000.0	17.1	12.8	4.006	CC
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	13,710.4	13,631.4	210.5	-162.8	0.564	Level 1, ES, SF
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	1,200.0	1,200.0	14.4	9.2	2.785	CC, ES
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	13,710.4	13,648.3	690.9	295.4	1.747	SF
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	1,200.0	1,201.0	43.2	38.0	8.351	CC, ES
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	13,710.4	13,734.8	484.7	87.2	1.220	Level 2, SF
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	60.3	58.7	38.318	CC, ES
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	900.0	892.6	83.7	79.8	21.999	SF
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	800.0	800.0	31.5	28.1	9.342	CC, ES
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	1,000.0	998.7	35.4	31.2	8.395	SF
Existing Wells Sec.19-T5N-R63W						
Christenson 2-19 (Exist) - Wellbore #1 - Wellbore #1	8,393.4	6,489.9	479.6	412.6	7.165	CC
Christenson 2-19 (Exist) - Wellbore #1 - Wellbore #1	8,400.0	6,489.9	479.6	412.5	7.148	ES
Christenson 2-19 (Exist) - Wellbore #1 - Wellbore #1	8,500.0	6,489.7	491.3	421.6	7.056	SF
Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1	5,027.3	4,920.7	89.5	60.5	3.081	CC, ES, SF
Cockroft 41-19 (Exist) - Wellbore #1 - Wellbore #1	6,835.1	6,450.8	361.3	326.3	10.337	CC, ES
Cockroft 41-19 (Exist) - Wellbore #1 - Wellbore #1	6,850.0	6,456.3	361.5	326.5	10.326	SF
Johnson 1 (Exist) - Wellbore #1 - Wellbore #1	11,051.4	6,495.5	170.2	34.0	1.250	Level 3, CC, ES, SF
Johnson 3 (Exist) - Wellbore #1 - Wellbore #1	9,699.0	6,503.2	363.6	146.2	1.672	CC
Johnson 3 (Exist) - Wellbore #1 - Wellbore #1	9,700.0	6,503.2	363.6	146.2	1.672	ES, SF
Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1	10,104.2	6,507.9	89.9	-19.5	0.821	Level 1, CC, ES, SF
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,156.2	6,505.3	497.5	413.7	5.936	CC, ES
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,200.0	6,503.3	499.4	414.4	5.878	SF
Roth 1-24 (Exist) - Wellbore #1 - Wellbore #1	12,214.5	6,499.7	291.1	4.6	1.016	Level 2, CC, ES, SF
Rothe 2-24 (P&A) - Wellbore #1 - Wellbore #1	13,501.6	6,494.4	356.6	151.7	1.740	CC, ES, SF
SLW 21-19 (Exist) - Wellbore #1 - Wellbore #1	9,468.0	6,509.8	442.7	350.7	4.815	CC, ES
SLW 21-19 (Exist) - Wellbore #1 - Wellbore #1	9,500.0	6,510.0	443.8	351.0	4.782	SF

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	76.22	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 CC, ES	
700.0	700.0	698.9	698.9	1.5	1.5	75.47	11.8	45.5	47.0	44.1	2.92	16.130	
800.0	800.0	797.7	797.6	1.7	1.7	73.43	14.4	48.3	50.5	47.1	3.36	15.031	
900.0	900.0	896.3	896.0	1.9	1.9	70.59	18.7	53.0	56.4	52.6	3.81	14.803	
1,000.0	1,000.0	994.4	993.7	2.1	2.1	67.50	24.7	59.6	64.8	60.5	4.27	15.184	
1,100.0	1,100.0	1,092.0	1,090.7	2.4	2.4	64.56	32.3	67.9	75.8	71.0	4.74	15.992	
1,200.0	1,200.0	1,189.0	1,186.7	2.6	2.7	61.96	41.5	78.0	89.4	84.1	5.23	17.091	
1,300.0	1,300.0	1,285.5	1,281.8	2.8	3.0	-10.61	52.4	89.8	104.3	98.7	5.60	18.634	
1,400.0	1,399.9	1,381.5	1,376.0	3.0	3.3	-12.78	64.7	103.3	119.2	113.2	6.03	19.761	
1,500.0	1,499.7	1,477.1	1,469.4	3.2	3.7	-14.86	78.6	118.5	134.3	127.8	6.48	20.731	
1,600.0	1,599.3	1,572.3	1,561.8	3.5	4.1	-16.87	94.0	135.3	149.5	142.6	6.93	21.572	
1,700.0	1,698.6	1,667.0	1,653.2	3.7	4.5	-18.82	110.9	153.8	164.8	157.4	7.39	22.311	
1,800.0	1,797.5	1,763.9	1,746.1	4.0	5.0	-20.77	129.5	174.1	180.0	172.1	7.87	22.881	
1,900.0	1,896.1	1,862.8	1,840.9	4.3	5.5	-22.74	148.6	194.9	193.2	184.8	8.37	23.094	
2,000.0	1,994.2	1,961.9	1,935.9	4.6	6.1	-24.75	167.7	215.8	204.2	195.3	8.89	22.981	
2,100.0	2,091.7	2,061.2	2,031.0	4.9	6.6	-26.87	186.9	236.7	213.2	203.7	9.44	22.583	
2,200.0	2,188.6	2,160.6	2,126.2	5.3	7.2	-29.15	206.1	257.7	220.1	210.1	10.04	21.935	
2,267.0	2,253.2	2,227.2	2,190.0	5.6	7.6	-30.80	218.9	271.7	223.7	213.3	10.47	21.376	
2,300.0	2,284.9	2,260.0	2,221.5	5.8	7.7	-31.63	225.2	278.6	225.3	214.6	10.70	21.065	
2,400.0	2,381.0	2,359.3	2,316.7	6.3	8.3	-34.11	244.4	299.6	230.4	219.0	11.43	20.168	
2,500.0	2,477.1	2,458.7	2,411.9	6.8	8.9	-36.47	263.6	320.5	236.0	223.8	12.20	19.335	
2,600.0	2,573.3	2,558.1	2,507.2	7.3	9.4	-38.72	282.8	341.5	241.9	228.8	13.03	18.565	
2,700.0	2,669.4	2,657.5	2,602.4	7.8	10.0	-40.86	302.0	362.5	248.1	234.2	13.90	17.856	
2,800.0	2,765.5	2,756.9	2,697.6	8.3	10.6	-42.89	321.2	383.4	254.7	239.9	14.81	17.207	
2,900.0	2,861.6	2,856.2	2,792.9	8.8	11.1	-44.82	340.3	404.4	261.7	245.9	15.75	16.613	
3,000.0	2,957.8	2,955.6	2,888.1	9.4	11.7	-46.65	359.5	425.3	268.8	252.1	16.73	16.071	
3,100.0	3,053.9	3,055.0	2,983.3	9.9	12.3	-48.38	378.7	446.3	276.3	258.6	17.73	15.579	
3,200.0	3,150.0	3,154.4	3,078.6	10.5	12.9	-50.02	397.9	467.2	284.0	265.2	18.77	15.132	
3,300.0	3,246.1	3,253.8	3,173.8	11.0	13.5	-51.57	417.1	488.2	291.9	272.1	19.82	14.726	
3,400.0	3,342.3	3,353.1	3,269.0	11.6	14.0	-53.05	436.3	509.1	300.0	279.1	20.89	14.358	
3,500.0	3,438.4	3,452.5	3,364.3	12.1	14.6	-54.44	455.4	530.1	308.3	286.3	21.98	14.024	
3,600.0	3,534.5	3,551.9	3,459.5	12.7	15.2	-55.76	474.6	551.0	316.8	293.7	23.09	13.720	
3,700.0	3,630.6	3,651.3	3,554.7	13.3	15.8	-57.01	493.8	572.0	325.4	301.2	24.20	13.444	
3,800.0	3,726.8	3,750.7	3,650.0	13.8	16.4	-58.19	513.0	592.9	334.2	308.8	25.33	13.193	
3,900.0	3,822.9	3,850.0	3,745.2	14.4	16.9	-59.32	532.2	613.9	343.1	316.6	26.47	12.963	
4,000.0	3,919.0	3,949.4	3,840.4	15.0	17.5	-60.39	551.4	634.8	352.1	324.5	27.61	12.754	
4,100.0	4,015.1	4,048.8	3,935.7	15.5	18.1	-61.40	570.5	655.8	361.3	332.5	28.76	12.563	
4,200.0	4,111.2	4,148.2	4,030.9	16.1	18.7	-62.37	589.7	676.7	370.5	340.6	29.91	12.387	
4,300.0	4,207.4	4,247.6	4,126.1	16.7	19.3	-63.28	608.9	697.7	379.9	348.8	31.07	12.227	
4,400.0	4,303.5	4,347.0	4,221.4	17.2	19.8	-64.16	628.1	718.6	389.4	357.1	32.23	12.079	
4,500.0	4,399.6	4,446.3	4,316.6	17.8	20.4	-64.99	647.3	739.6	398.9	365.5	33.40	11.943	
4,600.0	4,495.7	4,545.7	4,411.8	18.4	21.0	-65.78	666.5	760.6	408.5	373.9	34.57	11.817	
4,700.0	4,591.9	4,645.1	4,507.1	18.9	21.6	-66.54	685.6	781.5	418.2	382.5	35.74	11.701	
4,800.0	4,688.0	4,744.5	4,602.3	19.5	22.2	-67.26	704.8	802.5	428.0	391.1	36.91	11.594	
4,900.0	4,784.1	4,843.9	4,697.5	20.1	22.8	-67.95	724.0	823.4	437.8	399.7	38.09	11.495	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - 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	4,880.2	4,943.2	4,792.8	20.7	23.4	-68.61	743.2	844.4	447.7	408.4	39.26	11.403	
5,100.0	4,976.4	5,042.6	4,888.0	21.2	23.9	-69.24	762.4	865.3	457.6	417.2	40.44	11.317	
5,200.0	5,072.5	5,142.0	4,983.2	21.8	24.5	-69.84	781.6	886.3	467.6	426.0	41.61	11.238	
5,300.0	5,168.6	5,241.4	5,078.5	22.4	25.1	-70.42	800.7	907.2	477.7	434.9	42.79	11.163	
5,400.0	5,264.7	5,340.8	5,173.7	23.0	25.7	-70.97	819.9	928.2	487.7	443.8	43.96	11.094	
5,500.0	5,360.9	5,440.1	5,268.9	23.6	26.3	-71.51	839.1	949.1	497.9	452.7	45.14	11.029	
5,600.0	5,457.0	5,539.5	5,364.2	24.1	26.9	-72.02	858.3	970.1	508.0	461.7	46.32	10.969	
5,700.0	5,553.1	5,638.9	5,459.4	24.7	27.4	-72.51	877.5	991.0	518.3	470.8	47.50	10.912	
5,712.7	5,565.3	5,651.5	5,471.5	24.8	27.5	-72.57	879.9	993.7	519.6	471.9	47.64	10.905	
5,750.0	5,601.4	5,688.6	5,507.1	25.0	27.7	-68.85	887.1	1,001.5	523.3	475.2	48.10	10.880	
5,800.0	5,650.3	5,738.3	5,554.7	25.1	28.0	-60.29	896.7	1,012.0	528.2	479.7	48.56	10.878	
5,850.0	5,699.8	5,787.8	5,602.1	25.3	28.3	-43.84	906.2	1,022.4	532.9	484.1	48.87	10.904	
5,900.0	5,749.5	5,835.3	5,647.8	25.4	28.5	-13.12	915.4	1,031.2	537.6	488.6	49.03	10.966	
5,950.0	5,799.2	5,882.9	5,694.2	25.4	28.7	23.80	924.8	1,037.2	542.4	493.3	49.10	11.047	
6,000.0	5,848.8	5,931.0	5,741.2	25.4	28.9	47.25	934.2	1,040.2	547.2	498.1	49.10	11.146	
6,050.0	5,898.0	5,979.5	5,788.7	25.4	29.0	59.60	943.8	1,040.1	552.1	503.1	49.03	11.261	
6,100.0	5,946.7	6,028.4	5,836.6	25.4	29.1	66.72	953.5	1,036.9	557.1	508.2	48.90	11.392	
6,150.0	5,994.5	6,077.8	5,884.6	25.3	29.2	71.29	963.1	1,030.6	562.0	513.3	48.72	11.536	
6,200.0	6,041.4	6,127.7	5,932.6	25.2	29.2	74.49	972.8	1,021.0	567.0	518.5	48.49	11.693	
6,250.0	6,087.1	6,178.1	5,980.3	25.1	29.2	76.87	982.4	1,008.0	571.9	523.7	48.22	11.860	
6,300.0	6,131.4	6,229.1	6,027.6	25.0	29.2	78.74	992.0	991.7	576.7	528.8	47.92	12.034	
6,350.0	6,174.1	6,280.6	6,074.2	24.9	29.2	80.25	1,001.4	972.0	581.5	533.9	47.61	12.214	
6,400.0	6,215.0	6,332.6	6,119.9	24.8	29.1	81.52	1,010.6	948.8	586.2	538.9	47.30	12.394	
6,450.0	6,254.0	6,385.2	6,164.4	24.6	29.0	82.60	1,019.6	922.3	590.8	543.8	47.00	12.570	
6,500.0	6,290.9	6,438.3	6,207.4	24.5	28.9	83.53	1,028.3	892.3	595.2	548.5	46.73	12.738	
6,550.0	6,325.5	6,492.1	6,248.7	24.4	28.8	84.35	1,036.6	859.0	599.4	552.9	46.50	12.890	
6,600.0	6,357.8	6,546.3	6,288.1	24.3	28.6	85.07	1,044.5	822.5	603.4	557.1	46.34	13.021	
6,650.0	6,387.4	6,601.2	6,325.1	24.3	28.5	85.72	1,052.0	782.7	607.2	561.0	46.27	13.123	
6,700.0	6,414.5	6,656.6	6,359.5	24.3	28.3	86.30	1,059.0	740.0	610.7	564.4	46.31	13.189	
6,750.0	6,438.7	6,712.5	6,391.2	24.4	28.2	86.81	1,065.4	694.3	614.0	567.5	46.47	13.212	
6,800.0	6,460.0	6,768.9	6,419.7	24.5	28.0	87.28	1,071.2	646.0	616.9	570.1	46.77	13.189	
6,850.0	6,478.3	6,825.8	6,444.8	24.6	27.8	87.68	1,076.2	595.2	619.4	572.2	47.23	13.116	
6,900.0	6,493.6	6,883.1	6,466.3	24.9	27.7	88.04	1,080.6	542.3	621.7	573.8	47.84	12.995	
6,950.0	6,505.7	6,940.8	6,483.9	25.2	27.6	88.36	1,084.2	487.5	623.5	574.9	48.61	12.826	
7,000.0	6,514.7	6,998.9	6,497.5	25.6	27.5	88.62	1,086.9	431.1	624.9	575.4	49.54	12.615	
7,050.0	6,520.4	7,057.2	6,506.9	26.0	27.4	88.84	1,088.9	373.6	626.0	575.3	50.62	12.365	
7,100.0	6,522.9	7,115.8	6,512.0	26.5	27.4	89.02	1,089.9	315.2	626.6	574.7	51.83	12.088	
7,116.1	6,523.0	7,134.7	6,512.8	26.7	27.5	89.06	1,090.1	296.3	626.7	574.4	52.25	11.994	
7,200.0	6,522.7	7,221.8	6,512.9	27.7	27.8	89.10	1,090.1	209.3	626.7	572.3	54.44	11.512	
7,300.0	6,522.3	7,321.8	6,512.6	29.2	28.6	89.11	1,090.1	109.3	626.7	569.3	57.40	10.918	
7,400.0	6,521.9	7,421.8	6,512.4	30.8	29.9	89.13	1,090.1	9.3	626.7	566.0	60.74	10.319	
7,500.0	6,521.5	7,521.8	6,512.2	32.7	31.7	89.14	1,090.1	-90.7	626.7	562.3	64.39	9.733	
7,600.0	6,521.2	7,621.8	6,511.9	34.6	33.6	89.16	1,090.1	-190.7	626.7	558.4	68.31	9.174	
7,700.0	6,520.8	7,721.8	6,511.7	36.7	35.7	89.17	1,090.1	-290.7	626.7	554.2	72.46	8.649	
7,800.0	6,520.4	7,821.8	6,511.5	38.9	37.9	89.18	1,090.1	-390.7	626.7	549.9	76.80	8.161	
7,900.0	6,520.0	7,921.8	6,511.3	41.1	40.2	89.20	1,090.1	-490.7	626.7	545.4	81.29	7.710	
8,000.0	6,519.6	8,021.8	6,511.0	43.5	42.6	89.21	1,090.1	-590.7	626.7	540.8	85.91	7.294	
8,100.0	6,519.3	8,121.8	6,510.8	45.8	45.0	89.23	1,090.1	-690.7	626.7	536.0	90.65	6.913	
8,200.0	6,518.9	8,221.8	6,510.6	48.3	47.4	89.24	1,090.1	-790.7	626.7	531.2	95.49	6.563	
8,300.0	6,518.5	8,321.8	6,510.3	50.7	49.9	89.25	1,090.1	-890.7	626.7	526.3	100.40	6.242	
8,400.0	6,518.1	8,421.8	6,510.1	53.2	52.4	89.27	1,090.1	-990.7	626.7	521.3	105.39	5.946	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - 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	6,517.8	8,521.8	6,509.9	55.7	55.0	89.28	1,090.1	-1,090.7	626.7	516.2	110.44	5.675	
8,600.0	6,517.4	8,621.8	6,509.7	58.3	57.5	89.30	1,090.1	-1,190.7	626.7	511.1	115.54	5.424	
8,700.0	6,517.0	8,721.8	6,509.4	60.9	60.1	89.31	1,090.1	-1,290.7	626.7	506.0	120.68	5.193	
8,800.0	6,516.6	8,821.8	6,509.2	63.5	62.7	89.32	1,090.1	-1,390.7	626.7	500.8	125.87	4.979	
8,900.0	6,516.2	8,921.8	6,509.0	66.1	65.3	89.34	1,090.1	-1,490.7	626.7	495.6	131.09	4.780	
9,000.0	6,515.9	9,021.8	6,508.8	68.7	68.0	89.35	1,090.1	-1,590.7	626.7	490.3	136.35	4.596	
9,100.0	6,515.5	9,121.8	6,508.5	71.3	70.6	89.36	1,090.1	-1,690.7	626.7	485.0	141.63	4.425	
9,200.0	6,515.1	9,221.8	6,508.3	74.0	73.3	89.38	1,090.1	-1,790.7	626.7	479.7	146.94	4.265	
9,300.0	6,514.7	9,321.8	6,508.1	76.7	75.9	89.39	1,090.1	-1,890.7	626.7	474.4	152.27	4.116	
9,400.0	6,514.3	9,421.8	6,507.8	79.3	78.6	89.41	1,090.1	-1,990.7	626.7	469.0	157.62	3.976	
9,500.0	6,514.0	9,521.8	6,507.6	82.0	81.3	89.42	1,090.1	-2,090.7	626.7	463.7	162.99	3.845	
9,600.0	6,513.6	9,621.8	6,507.4	84.7	84.0	89.43	1,090.1	-2,190.7	626.7	458.3	168.37	3.722	
9,700.0	6,513.2	9,721.8	6,507.2	87.4	86.7	89.45	1,090.1	-2,290.7	626.7	452.9	173.77	3.606	
9,800.0	6,512.8	9,821.8	6,506.9	90.1	89.4	89.46	1,090.1	-2,390.7	626.7	447.5	179.18	3.497	
9,900.0	6,512.4	9,921.8	6,506.7	92.8	92.1	89.48	1,090.1	-2,490.7	626.7	442.0	184.61	3.394	
10,000.0	6,512.1	10,021.8	6,506.5	95.6	94.8	89.49	1,090.1	-2,590.7	626.7	436.6	190.05	3.297	
10,100.0	6,511.7	10,121.8	6,506.2	98.3	97.6	89.50	1,090.1	-2,690.7	626.7	431.2	195.49	3.205	
10,200.0	6,511.3	10,221.8	6,506.0	101.0	100.3	89.52	1,090.1	-2,790.7	626.6	425.7	200.95	3.118	
10,300.0	6,510.9	10,321.8	6,505.8	103.7	103.0	89.53	1,090.1	-2,890.7	626.6	420.2	206.42	3.036	
10,400.0	6,510.6	10,421.8	6,505.6	106.5	105.8	89.54	1,090.1	-2,990.7	626.6	414.8	211.89	2.957	
10,500.0	6,510.2	10,521.8	6,505.3	109.2	108.5	89.56	1,090.1	-3,090.7	626.6	409.3	217.37	2.883	
10,600.0	6,509.8	10,621.8	6,505.1	112.0	111.2	89.57	1,090.1	-3,190.7	626.6	403.8	222.86	2.812	
10,700.0	6,509.4	10,721.8	6,504.9	114.7	114.0	89.59	1,090.1	-3,290.7	626.6	398.3	228.36	2.744	
10,800.0	6,509.0	10,821.8	6,504.7	117.5	116.7	89.60	1,090.1	-3,390.7	626.6	392.8	233.86	2.680	
10,900.0	6,508.7	10,921.8	6,504.4	120.2	119.5	89.61	1,090.1	-3,490.7	626.6	387.3	239.36	2.618	
11,000.0	6,508.3	11,021.8	6,504.2	123.0	122.2	89.63	1,090.1	-3,590.7	626.6	381.8	244.88	2.559	
11,100.0	6,507.9	11,121.8	6,504.0	125.7	125.0	89.64	1,090.1	-3,690.7	626.6	376.2	250.39	2.503	
11,200.0	6,507.5	11,221.8	6,503.7	128.5	127.7	89.66	1,090.1	-3,790.7	626.6	370.7	255.91	2.449	
11,300.0	6,507.1	11,321.8	6,503.5	131.2	130.5	89.67	1,090.1	-3,890.7	626.6	365.2	261.44	2.397	
11,400.0	6,506.8	11,421.8	6,503.3	134.0	133.3	89.68	1,090.1	-3,990.7	626.6	359.7	266.97	2.347	
11,500.0	6,506.4	11,521.8	6,503.1	136.8	136.0	89.70	1,090.1	-4,090.7	626.6	354.1	272.50	2.300	
11,600.0	6,506.0	11,621.8	6,502.8	139.5	138.8	89.71	1,090.1	-4,190.7	626.6	348.6	278.04	2.254	
11,700.0	6,505.6	11,721.8	6,502.6	142.3	141.6	89.72	1,090.1	-4,290.7	626.6	343.1	283.58	2.210	
11,800.0	6,505.2	11,821.8	6,502.4	145.1	144.3	89.74	1,090.1	-4,390.7	626.6	337.5	289.12	2.167	
11,900.0	6,504.9	11,921.8	6,502.2	147.8	147.1	89.75	1,090.1	-4,490.7	626.6	332.0	294.66	2.127	
12,000.0	6,504.5	12,021.8	6,501.9	150.6	149.9	89.77	1,090.1	-4,590.7	626.6	326.4	300.21	2.087	
12,100.0	6,504.1	12,121.8	6,501.7	153.4	152.7	89.78	1,090.1	-4,690.7	626.6	320.9	305.76	2.049	
12,200.0	6,503.7	12,221.8	6,501.5	156.2	155.4	89.79	1,090.1	-4,790.7	626.6	315.3	311.32	2.013	
12,300.0	6,503.3	12,321.8	6,501.2	158.9	158.2	89.81	1,090.1	-4,890.7	626.6	309.8	316.87	1.978	
12,400.0	6,503.0	12,421.8	6,501.0	161.7	161.0	89.82	1,090.1	-4,990.7	626.6	304.2	322.43	1.943	
12,500.0	6,502.6	12,521.8	6,500.8	164.5	163.8	89.84	1,090.1	-5,090.7	626.6	298.6	327.99	1.910	
12,600.0	6,502.2	12,621.8	6,500.6	167.3	166.5	89.85	1,090.1	-5,190.7	626.6	293.1	333.55	1.879	
12,700.0	6,501.8	12,721.8	6,500.3	170.1	169.3	89.86	1,090.1	-5,290.7	626.6	287.5	339.12	1.848	
12,800.0	6,501.5	12,821.8	6,500.1	172.9	172.1	89.88	1,090.1	-5,390.7	626.6	281.9	344.68	1.818	
12,900.0	6,501.1	12,921.8	6,499.9	175.6	174.9	89.89	1,090.1	-5,490.7	626.6	276.4	350.25	1.789	
13,000.0	6,500.7	13,021.8	6,499.6	178.4	177.7	89.90	1,090.1	-5,590.7	626.6	270.8	355.82	1.761	
13,100.0	6,500.3	13,121.8	6,499.4	181.2	180.4	89.92	1,090.1	-5,690.7	626.6	265.2	361.39	1.734	
13,200.0	6,499.9	13,221.8	6,499.2	184.0	183.2	89.93	1,090.1	-5,790.7	626.6	259.7	366.96	1.708	
13,300.0	6,499.6	13,321.8	6,499.0	186.8	186.0	89.95	1,090.1	-5,890.7	626.6	254.1	372.54	1.682	
13,400.0	6,499.2	13,421.8	6,498.7	189.6	188.8	89.96	1,090.1	-5,990.7	626.6	248.5	378.11	1.657	
13,500.0	6,498.8	13,521.8	6,498.5	192.4	191.6	89.97	1,090.1	-6,090.7	626.6	242.9	383.69	1.633	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design      Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - 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)			
13,600.0	6,498.4	13,621.8	6,498.3	195.1	194.4	89.99	1,090.1	-6,190.7	626.6	237.4	389.27	1.610		
13,700.0	6,498.0	13,721.8	6,498.1	197.9	197.2	90.00	1,090.1	-6,290.7	626.6	231.8	394.85	1.587		
13,710.4	6,498.0	13,732.2	6,498.0	198.2	197.5	90.00	1,090.1	-6,301.2	626.6	231.2	395.43	1.585 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - 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	76.39	18.2	75.2	77.4				
100.0	100.0	100.0	100.0	0.1	0.1	76.39	18.2	75.2	77.4	77.2	0.22	344.303	
200.0	200.0	200.0	200.0	0.3	0.3	76.39	18.2	75.2	77.4	76.7	0.67	114.768 CC, ES	
300.0	300.0	298.4	298.3	0.6	0.6	75.86	19.2	76.0	78.4	77.3	1.12	70.118	
400.0	400.0	396.6	396.5	0.8	0.8	74.34	22.0	78.5	81.6	80.1	1.57	52.082	
500.0	500.0	494.5	494.2	1.0	1.0	72.07	26.8	82.7	87.1	85.1	2.02	43.051	
600.0	600.0	592.1	591.4	1.2	1.3	69.34	33.4	88.4	94.9	92.4	2.49	38.144	
700.0	700.0	689.2	687.8	1.5	1.5	66.44	41.8	95.8	105.2	102.2	2.97	35.443	
800.0	800.0	785.6	783.3	1.7	1.8	63.61	52.0	104.7	118.1	114.6	3.47	34.032	
900.0	900.0	881.3	877.7	1.9	2.2	60.98	63.8	115.1	133.5	129.5	3.99	33.413	
1,000.0	1,000.0	976.1	970.8	2.1	2.5	58.62	77.4	126.9	151.5	146.9	4.55	33.295	
1,100.0	1,100.0	1,070.0	1,062.5	2.4	2.9	56.57	92.5	140.1	172.0	166.9	5.14	33.496	
1,200.0	1,200.0	1,162.8	1,152.6	2.6	3.3	54.79	109.1	154.6	195.1	189.3	5.75	33.903	
1,300.0	1,300.0	1,254.8	1,241.4	2.8	3.8	-17.01	127.2	170.4	219.4	213.6	5.74	38.194	
1,400.0	1,399.9	1,350.4	1,333.3	3.0	4.3	-18.52	147.2	187.9	243.0	236.8	6.21	39.126	
1,500.0	1,499.7	1,447.8	1,426.9	3.2	4.8	-19.96	167.6	205.7	264.5	257.8	6.68	39.572	
1,600.0	1,599.3	1,545.7	1,520.9	3.5	5.4	-21.36	188.1	223.6	283.8	276.6	7.17	39.605	
1,700.0	1,698.6	1,643.9	1,615.2	3.7	5.9	-22.78	208.7	241.6	300.8	293.2	7.65	39.303	
1,800.0	1,797.5	1,742.5	1,709.9	4.0	6.5	-24.23	229.4	259.7	315.7	307.6	8.15	38.721	
1,900.0	1,896.1	1,841.2	1,804.7	4.3	7.0	-25.75	250.1	277.8	328.5	319.8	8.67	37.898	
2,000.0	1,994.2	1,940.2	1,899.8	4.6	7.6	-27.36	270.8	295.9	339.2	330.0	9.20	36.865	
2,100.0	2,091.7	2,039.2	1,994.9	4.9	8.1	-29.08	291.6	314.0	347.8	338.1	9.76	35.641	
2,200.0	2,188.6	2,138.3	2,090.1	5.3	8.7	-30.94	312.4	332.2	354.6	344.2	10.35	34.243	
2,267.0	2,253.2	2,204.7	2,153.8	5.6	9.1	-32.27	326.3	344.3	358.1	347.3	10.78	33.217	
2,300.0	2,284.9	2,237.3	2,185.2	5.8	9.3	-32.96	333.1	350.3	359.7	348.7	11.00	32.683	
2,400.0	2,381.0	2,336.4	2,280.3	6.3	9.8	-34.99	353.9	368.4	364.7	353.0	11.71	31.144	
2,500.0	2,477.1	2,435.4	2,375.4	6.8	10.4	-36.97	374.7	386.6	370.2	357.7	12.46	29.715	
2,600.0	2,573.3	2,534.4	2,470.5	7.3	10.9	-38.89	395.4	404.7	376.1	362.9	13.25	28.393	
2,700.0	2,669.4	2,633.5	2,565.6	7.8	11.5	-40.75	416.2	422.8	382.4	368.4	14.08	27.172	
2,800.0	2,765.5	2,732.5	2,660.8	8.3	12.1	-42.55	436.9	441.0	389.2	374.2	14.94	26.048	
2,900.0	2,861.6	2,831.5	2,755.9	8.8	12.6	-44.29	457.7	459.1	396.3	380.4	15.84	25.015	
3,000.0	2,957.8	2,930.5	2,851.0	9.4	13.2	-45.96	478.5	477.2	403.8	387.0	16.78	24.067	
3,100.0	3,053.9	3,029.6	2,946.1	9.9	13.8	-47.58	499.2	495.4	411.6	393.8	17.74	23.199	
3,200.0	3,150.0	3,128.6	3,041.2	10.5	14.3	-49.13	520.0	513.5	419.7	400.9	18.73	22.405	
3,300.0	3,246.1	3,227.6	3,136.3	11.0	14.9	-50.62	540.7	531.6	428.1	408.3	19.75	21.679	
3,400.0	3,342.3	3,326.7	3,231.4	11.6	15.5	-52.06	561.5	549.8	436.8	416.0	20.78	21.016	
3,500.0	3,438.4	3,425.7	3,326.6	12.1	16.0	-53.44	582.3	567.9	445.7	423.9	21.84	20.409	
3,600.0	3,534.5	3,524.7	3,421.7	12.7	16.6	-54.76	603.0	586.0	454.9	432.0	22.91	19.854	
3,700.0	3,630.6	3,623.7	3,516.8	13.3	17.1	-56.04	623.8	604.2	464.4	440.4	24.00	19.346	
3,800.0	3,726.8	3,722.8	3,611.9	13.8	17.7	-57.26	644.5	622.3	474.0	448.9	25.11	18.881	
3,900.0	3,822.9	3,821.8	3,707.0	14.4	18.3	-58.43	665.3	640.4	483.9	457.7	26.22	18.455	
4,000.0	3,919.0	3,920.8	3,802.1	15.0	18.8	-59.56	686.1	658.6	494.0	466.6	27.35	18.064	
4,100.0	4,015.1	4,019.8	3,897.2	15.5	19.4	-60.64	706.8	676.7	504.2	475.7	28.48	17.705	
4,200.0	4,111.2	4,118.9	3,992.4	16.1	20.0	-61.68	727.6	694.8	514.6	485.0	29.62	17.374	
4,300.0	4,207.4	4,217.9	4,087.5	16.7	20.5	-62.67	748.3	713.0	525.2	494.4	30.77	17.070	
4,400.0	4,303.5	4,316.9	4,182.6	17.2	21.1	-63.63	769.1	731.1	535.9	504.0	31.92	16.790	
4,500.0	4,399.6	4,416.0	4,277.7	17.8	21.7	-64.55	789.9	749.2	546.8	513.7	33.08	16.531	
4,600.0	4,495.7	4,515.0	4,372.8	18.4	22.2	-65.43	810.6	767.4	557.8	523.6	34.24	16.292	
4,700.0	4,591.9	4,614.0	4,467.9	18.9	22.8	-66.28	831.4	785.5	569.0	533.6	35.41	16.070	
4,800.0	4,688.0	4,713.0	4,563.0	19.5	23.4	-67.10	852.1	803.6	580.2	543.7	36.57	15.865	
4,900.0	4,784.1	4,812.1	4,658.1	20.1	23.9	-67.89	872.9	821.8	591.6	553.9	37.74	15.674	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:		0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,880.2	4,911.1	4,753.3	20.7	24.5	-68.64	893.7	839.9	603.1	564.2	38.92	15.497			
5,100.0	4,976.4	5,010.1	4,848.4	21.2	25.1	-69.37	914.4	858.0	614.6	574.6	40.09	15.332			
5,200.0	5,072.5	5,109.2	4,943.5	21.8	25.6	-70.07	935.2	876.2	626.3	585.1	41.26	15.179			
5,300.0	5,168.6	5,208.2	5,038.6	22.4	26.2	-70.75	955.9	894.3	638.1	595.6	42.44	15.036			
5,400.0	5,264.7	5,307.2	5,133.7	23.0	26.8	-71.40	976.7	912.4	649.9	606.3	43.61	14.902			
5,500.0	5,360.9	5,406.2	5,228.8	23.6	27.4	-72.03	997.5	930.6	661.9	617.1	44.79	14.777			
5,600.0	5,457.0	5,505.3	5,323.9	24.1	27.9	-72.64	1,018.2	948.7	673.9	627.9	45.97	14.660			
5,700.0	5,553.1	5,604.3	5,419.1	24.7	28.5	-73.22	1,039.0	966.8	685.9	638.8	47.14	14.551			
5,712.7	5,565.3	5,616.8	5,431.1	24.8	28.6	-73.29	1,041.6	969.1	687.5	640.2	47.29	14.537			
5,750.0	5,601.4	5,653.9	5,466.7	25.0	28.8	-69.68	1,049.4	975.9	691.9	644.2	47.78	14.483			
5,800.0	5,650.3	5,703.5	5,514.4	25.1	29.1	-61.35	1,059.8	985.0	697.7	649.4	48.29	14.449 SF			
5,850.0	5,699.8	5,753.0	5,561.9	25.3	29.3	-45.19	1,070.2	994.1	703.2	654.6	48.67	14.449			
5,900.0	5,749.5	5,802.2	5,609.2	25.4	29.6	-14.67	1,080.5	1,003.1	708.5	659.6	48.92	14.482			
5,950.0	5,799.2	5,850.9	5,655.9	25.4	29.9	22.30	1,090.7	1,012.0	713.7	664.6	49.06	14.548			
6,000.0	5,848.8	5,898.8	5,701.9	25.4	30.2	46.02	1,100.7	1,020.8	718.8	669.7	49.08	14.645			
6,050.0	5,898.0	5,944.7	5,746.2	25.4	30.4	58.71	1,110.4	1,028.0	724.1	675.1	49.00	14.776			
6,100.0	5,946.7	5,991.2	5,791.4	25.4	30.6	66.17	1,120.2	1,032.5	729.6	680.7	48.84	14.937			
6,150.0	5,994.5	6,038.6	5,837.7	25.3	30.7	71.08	1,130.3	1,034.2	735.3	686.7	48.63	15.120			
6,200.0	6,041.4	6,087.0	5,884.9	25.2	30.9	74.63	1,140.7	1,033.0	741.2	692.9	48.37	15.323			
6,250.0	6,087.1	6,136.4	5,933.0	25.1	31.0	77.36	1,151.1	1,028.5	747.4	699.3	48.08	15.545			
6,300.0	6,131.4	6,186.8	5,981.7	25.0	31.1	79.58	1,161.8	1,020.7	753.6	705.9	47.75	15.783			
6,350.0	6,174.1	6,238.5	6,030.9	24.9	31.1	81.45	1,172.5	1,009.3	760.0	712.6	47.40	16.033			
6,400.0	6,215.0	6,291.4	6,080.4	24.8	31.1	83.06	1,183.3	994.1	766.5	719.4	47.05	16.291			
6,450.0	6,254.0	6,345.6	6,129.9	24.6	31.1	84.49	1,194.1	975.0	773.0	726.3	46.70	16.553			
6,500.0	6,290.9	6,401.2	6,179.2	24.5	31.1	85.78	1,204.9	951.6	779.5	733.1	46.36	16.813			
6,550.0	6,325.5	6,458.3	6,228.0	24.4	31.0	86.95	1,215.5	923.9	785.9	739.8	46.06	17.062			
6,600.0	6,357.8	6,516.9	6,275.8	24.3	31.0	88.02	1,226.0	891.7	792.1	746.3	45.81	17.293			
6,650.0	6,387.4	6,577.1	6,322.2	24.3	30.8	89.01	1,236.1	854.8	798.2	752.6	45.63	17.493			



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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				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	-104.65	-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 CC	
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-175.15	-7.3	-27.9		30.1	24.5	5.61	5.363	
1,400.0	1,399.9	1,400.9	1,400.9	3.0	3.0	-175.71	-7.3	-27.9		34.0	28.0	6.04	5.629	
1,500.0	1,499.7	1,500.7	1,500.7	3.2	3.3	-176.39	-7.3	-27.9		40.5	34.1	6.47	6.263	
1,600.0	1,599.3	1,600.3	1,600.3	3.5	3.5	-177.05	-7.3	-27.9		49.7	42.8	6.90	7.199	
1,700.0	1,698.6	1,701.2	1,701.1	3.7	3.7	-177.80	-7.1	-26.5		60.1	52.8	7.31	8.217	
1,800.0	1,797.5	1,802.3	1,802.2	4.0	3.9	-178.72	-6.4	-22.6		70.6	62.8	7.72	9.142	
1,900.0	1,896.1	1,903.7	1,903.4	4.3	4.1	-179.75	-5.3	-15.9		81.0	72.9	8.12	9.974	
2,000.0	1,994.2	2,005.4	2,004.7	4.6	4.4	179.15	-3.8	-6.6		91.5	83.0	8.53	10.726	
2,100.0	2,091.7	2,107.4	2,105.9	4.9	4.6	177.99	-1.9	5.4		102.0	93.1	8.95	11.406	
2,200.0	2,188.6	2,209.6	2,207.0	5.3	4.9	176.80	0.5	20.0		112.6	103.3	9.37	12.020	
2,267.0	2,253.2	2,278.3	2,274.7	5.6	5.0	175.98	2.4	31.4		119.7	110.1	9.66	12.396	
2,300.0	2,284.9	2,312.1	2,308.0	5.8	5.1	175.58	3.4	37.5		123.1	113.3	9.82	12.536	
2,400.0	2,381.0	2,415.0	2,408.8	6.3	5.5	174.25	6.7	57.6		131.7	121.3	10.32	12.752	
2,500.0	2,477.1	2,518.2	2,509.4	6.8	5.8	172.75	10.4	80.5		137.7	126.8	10.86	12.684	
2,600.0	2,573.3	2,621.7	2,609.6	7.3	6.2	171.01	14.6	106.2		141.2	129.8	11.42	12.370	
2,700.0	2,669.4	2,725.2	2,709.0	7.8	6.7	168.96	19.2	134.5		142.4	130.4	12.03	11.839	
2,800.0	2,765.5	2,828.5	2,807.5	8.3	7.2	166.51	24.3	165.5		141.2	128.5	12.70	11.123	
2,900.0	2,861.6	2,928.3	2,902.1	8.8	7.7	163.86	29.4	196.6		139.1	125.7	13.42	10.361	
3,000.0	2,957.8	3,028.1	2,996.8	9.4	8.3	161.14	34.5	227.7		137.3	123.0	14.22	9.653	
3,100.0	3,053.9	3,127.8	3,091.4	9.9	8.8	158.35	39.5	258.8		135.7	120.7	15.09	8.996	
3,200.0	3,150.0	3,227.6	3,186.1	10.5	9.4	155.50	44.6	289.9		134.6	118.5	16.04	8.391	
3,300.0	3,246.1	3,327.4	3,280.7	11.0	10.0	152.62	49.7	321.0		133.7	116.7	17.06	7.837	
3,400.0	3,342.3	3,427.1	3,375.4	11.6	10.6	149.70	54.8	352.2		133.2	115.1	18.17	7.333	
3,492.0	3,430.7	3,518.9	3,462.5	12.1	11.1	147.01	59.5	380.8		133.1	113.8	19.25	6.913	
3,500.0	3,438.4	3,526.9	3,470.0	12.1	11.2	146.77	59.9	383.3		133.1	113.7	19.35	6.878	
3,600.0	3,534.5	3,626.7	3,564.7	12.7	11.8	143.84	65.0	414.4		133.3	112.7	20.60	6.471	
3,700.0	3,630.6	3,726.4	3,659.3	13.3	12.4	140.93	70.1	445.5		133.8	111.9	21.91	6.109	
3,800.0	3,726.8	3,826.2	3,754.0	13.8	13.1	138.05	75.1	476.6		134.7	111.5	23.27	5.790	
3,900.0	3,822.9	3,926.0	3,848.7	14.4	13.7	135.21	80.2	507.8		136.0	111.3	24.67	5.511	
4,000.0	3,919.0	4,025.7	3,943.3	15.0	14.3	132.43	85.3	538.9		137.5	111.4	26.11	5.267	
4,100.0	4,015.1	4,125.5	4,038.0	15.5	14.9	129.72	90.4	570.0		139.4	111.8	27.57	5.056	
4,200.0	4,111.2	4,225.3	4,132.6	16.1	15.6	127.09	95.5	601.1		141.6	112.5	29.05	4.874	
4,300.0	4,207.4	4,325.0	4,227.3	16.7	16.2	124.54	100.6	632.2		144.1	113.5	30.53	4.719	
4,400.0	4,303.5	4,424.8	4,321.9	17.2	16.9	122.08	105.6	663.3		146.8	114.8	32.01	4.586	
4,500.0	4,399.6	4,524.6	4,416.6	17.8	17.5	119.72	110.7	694.5		149.8	116.3	33.49	4.474	
4,600.0	4,495.7	4,624.3	4,511.2	18.4	18.2	117.45	115.8	725.6		153.1	118.1	34.95	4.380	
4,700.0	4,591.9	4,724.1	4,605.9	18.9	18.8	115.28	120.9	756.7		156.6	120.2	36.40	4.301	
4,800.0	4,688.0	4,823.9	4,700.5	19.5	19.5	113.21	126.0	787.8		160.3	122.4	37.84	4.236	

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	
4,900.0	4,784.1	4,923.6	4,795.2	20.1	20.1	111.23	131.1	818.9	164.2	124.9	39.25	4.182		
5,000.0	4,880.2	5,023.4	4,889.8	20.7	20.8	109.35	136.1	850.1	168.3	127.6	40.65	4.139		
5,100.0	4,976.4	5,123.2	4,984.5	21.2	21.4	107.56	141.2	881.2	172.5	130.5	42.03	4.105		
5,200.0	5,072.5	5,222.9	5,079.1	21.8	22.1	105.85	146.3	912.3	176.9	133.5	43.39	4.078		
5,300.0	5,168.6	5,322.7	5,173.8	22.4	22.7	104.23	151.4	943.4	181.5	136.8	44.72	4.058		
5,400.0	5,264.7	5,422.5	5,268.5	23.0	23.4	102.69	156.5	974.5	186.2	140.2	46.04	4.044		
5,500.0	5,360.9	5,522.2	5,363.1	23.6	24.0	101.23	161.6	1,005.6	191.1	143.7	47.34	4.036		
5,600.0	5,457.0	5,623.0	5,458.8	24.1	24.7	99.92	166.7	1,036.8	196.0	147.3	48.60	4.032		
5,700.0	5,553.1	5,727.2	5,560.3	24.7	25.1	101.41	172.2	1,059.4	199.3	149.8	49.52	4.025		
5,712.7	5,565.3	5,740.3	5,573.2	24.8	25.1	101.88	172.8	1,061.3	199.6	150.0	49.61	4.024		
5,750.0	5,601.4	5,778.5	5,611.2	25.0	25.2	107.49	174.9	1,065.4	200.6	150.8	49.77	4.030		
5,800.0	5,650.3	5,829.4	5,661.9	25.1	25.3	118.24	177.6	1,068.0	202.0	152.2	49.84	4.054		
5,850.0	5,699.8	5,879.8	5,712.2	25.3	25.3	136.53	180.3	1,067.2	203.7	153.9	49.79	4.092		
5,900.0	5,749.5	5,929.7	5,761.9	25.4	25.3	168.87	183.0	1,063.2	205.6	156.0	49.64	4.143		
5,950.0	5,799.2	5,979.3	5,810.8	25.4	25.3	-152.63	185.6	1,055.9	207.8	158.4	49.40	4.206		
6,000.0	5,848.8	6,028.4	5,858.8	25.4	25.3	-127.66	188.2	1,045.7	210.1	161.0	49.09	4.280		
6,050.0	5,898.0	6,077.1	5,905.6	25.4	25.2	-113.83	190.7	1,032.4	212.6	163.9	48.72	4.365		
6,100.0	5,946.7	6,125.4	5,951.1	25.4	25.1	-105.32	193.2	1,016.4	215.3	167.0	48.29	4.458		
6,150.0	5,994.5	6,173.4	5,995.2	25.3	25.0	-99.42	195.5	997.6	218.1	170.2	47.84	4.558		
6,200.0	6,041.4	6,221.1	6,037.7	25.2	24.9	-94.97	197.8	976.3	220.9	173.6	47.36	4.665		
6,250.0	6,087.1	6,268.3	6,078.5	25.1	24.8	-91.41	200.0	952.6	223.9	177.0	46.87	4.776		
6,300.0	6,131.4	6,315.3	6,117.6	25.0	24.7	-88.44	202.1	926.5	226.8	180.4	46.39	4.890		
6,350.0	6,174.1	6,362.0	6,154.7	24.9	24.6	-85.91	204.1	898.3	229.8	183.9	45.92	5.004		
6,400.0	6,215.0	6,408.4	6,189.8	24.8	24.5	-83.72	206.0	868.1	232.7	187.2	45.50	5.116		
6,450.0	6,254.0	6,454.5	6,222.9	24.6	24.4	-81.78	207.8	835.9	235.6	190.5	45.12	5.223		
6,500.0	6,290.9	6,500.0	6,253.5	24.5	24.4	-80.08	209.4	802.4	238.5	193.7	44.81	5.322		
6,550.0	6,325.5	6,546.1	6,282.4	24.4	24.4	-78.55	211.0	766.5	241.2	196.6	44.58	5.410		
6,600.0	6,357.8	6,591.5	6,308.8	24.3	24.4	-77.20	212.4	729.6	243.8	199.3	44.45	5.484		
6,650.0	6,387.4	6,636.8	6,332.8	24.3	24.5	-76.00	213.7	691.2	246.2	201.8	44.43	5.542		
6,700.0	6,414.5	6,681.9	6,354.5	24.3	24.7	-74.94	214.9	651.7	248.5	204.0	44.54	5.580		
6,750.0	6,438.7	6,726.8	6,373.7	24.4	24.8	-74.01	215.9	611.1	250.6	205.8	44.77	5.597		
6,800.0	6,460.0	6,771.6	6,390.5	24.5	25.1	-73.20	216.8	569.6	252.5	207.3	45.14	5.593		
6,850.0	6,478.3	6,816.2	6,404.7	24.6	25.3	-72.50	217.6	527.3	254.1	208.5	45.65	5.567		
6,900.0	6,493.6	6,860.8	6,416.5	24.9	25.7	-71.92	218.2	484.4	255.6	209.3	46.30	5.520		
6,950.0	6,505.7	6,905.2	6,425.7	25.2	26.1	-71.44	218.7	440.9	256.7	209.7	47.08	5.453		
7,000.0	6,514.7	6,950.0	6,432.4	25.6	26.5	-71.06	219.1	396.6	257.7	209.7	47.99	5.370		
7,050.0	6,520.4	6,994.0	6,436.5	26.0	27.0	-70.79	219.3	352.9	258.3	209.3	49.01	5.272		
7,100.0	6,522.9	7,038.2	6,438.0	26.5	27.5	-70.61	219.4	308.6	258.7	208.6	50.13	5.162		
7,116.1	6,523.0	7,053.6	6,438.0	26.7	27.6	-70.59	219.4	293.3	258.8	208.3	50.53	5.122		
7,200.0	6,522.7	7,137.4	6,437.8	27.7	28.8	-70.61	219.4	209.4	258.8	206.1	52.66	4.914		
7,300.0	6,522.3	7,237.4	6,437.6	29.2	30.3	-70.64	219.4	109.4	258.7	203.2	55.54	4.658		
7,400.0	6,521.9	7,337.4	6,437.3	30.8	32.0	-70.68	219.4	9.4	258.7	199.9	58.77	4.401		
7,500.0	6,521.5	7,437.4	6,437.1	32.7	33.8	-70.71	219.4	-90.6	258.6	196.3	62.29	4.152		
7,600.0	6,521.2	7,537.4	6,436.9	34.6	35.8	-70.74	219.4	-190.6	258.6	192.5	66.06	3.914		
7,700.0	6,520.8	7,637.4	6,436.7	36.7	37.9	-70.77	219.4	-290.6	258.5	188.5	70.03	3.692		
7,800.0	6,520.4	7,737.4	6,436.4	38.9	40.0	-70.80	219.4	-390.6	258.5	184.3	74.17	3.485		
7,900.0	6,520.0	7,837.4	6,436.2	41.1	42.3	-70.84	219.4	-490.6	258.4	179.9	78.46	3.294		
8,000.0	6,519.6	7,937.4	6,436.0	43.5	44.6	-70.87	219.4	-590.6	258.4	175.5	82.87	3.118		
8,100.0	6,519.3	8,037.4	6,435.7	45.8	46.9	-70.90	219.4	-690.6	258.3	170.9	87.39	2.956		
8,200.0	6,518.9	8,137.4	6,435.5	48.3	49.4	-70.93	219.4	-790.6	258.3	166.3	92.00	2.807		
8,300.0	6,518.5	8,237.4	6,435.3	50.7	51.8	-70.96	219.4	-890.6	258.2	161.5	96.68	2.671		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - 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		
8,400.0	6,518.1	8,337.4	6,435.1	53.2	54.3	-70.99	219.4	-990.6	258.2	156.7	101.44	2.545			
8,500.0	6,517.8	8,437.4	6,434.8	55.7	56.8	-71.03	219.4	-1,090.6	258.1	151.9	106.25	2.429			
8,600.0	6,517.4	8,537.4	6,434.6	58.3	59.3	-71.06	219.4	-1,190.6	258.1	146.9	111.11	2.323			
8,700.0	6,517.0	8,637.4	6,434.4	60.9	61.9	-71.09	219.4	-1,290.6	258.0	142.0	116.02	2.224			
8,800.0	6,516.6	8,737.4	6,434.2	63.5	64.5	-71.12	219.4	-1,390.6	258.0	137.0	120.96	2.133			
8,900.0	6,516.2	8,837.4	6,433.9	66.1	67.1	-71.15	219.4	-1,490.6	257.9	132.0	125.94	2.048			
9,000.0	6,515.9	8,937.4	6,433.7	68.7	69.7	-71.19	219.4	-1,590.6	257.9	126.9	130.96	1.969			
9,100.0	6,515.5	9,037.4	6,433.5	71.3	72.4	-71.22	219.4	-1,690.6	257.8	121.8	136.00	1.896			
9,200.0	6,515.1	9,137.4	6,433.2	74.0	75.0	-71.25	219.4	-1,790.6	257.8	116.7	141.06	1.827			
9,300.0	6,514.7	9,237.4	6,433.0	76.7	77.7	-71.28	219.4	-1,890.6	257.7	111.6	146.15	1.763			
9,400.0	6,514.3	9,337.4	6,432.8	79.3	80.3	-71.31	219.4	-1,990.6	257.7	106.4	151.26	1.703			
9,500.0	6,514.0	9,437.4	6,432.6	82.0	83.0	-71.35	219.4	-2,090.6	257.6	101.2	156.39	1.647			
9,600.0	6,513.6	9,537.4	6,432.3	84.7	85.7	-71.38	219.4	-2,190.6	257.6	96.0	161.54	1.594			
9,700.0	6,513.2	9,637.4	6,432.1	87.4	88.4	-71.41	219.4	-2,290.6	257.5	90.8	166.70	1.545			
9,800.0	6,512.8	9,737.4	6,431.9	90.1	91.1	-71.44	219.4	-2,390.6	257.5	85.6	171.88	1.498 Level 3			
9,900.0	6,512.4	9,837.4	6,431.7	92.8	93.8	-71.47	219.4	-2,490.6	257.4	80.4	177.07	1.454 Level 3			
10,000.0	6,512.1	9,937.4	6,431.4	95.6	96.5	-71.51	219.4	-2,590.6	257.4	75.1	182.27	1.412 Level 3			
10,100.0	6,511.7	10,037.4	6,431.2	98.3	99.2	-71.54	219.4	-2,690.6	257.3	69.8	187.49	1.373 Level 3			
10,200.0	6,511.3	10,137.4	6,431.0	101.0	102.0	-71.57	219.4	-2,790.6	257.3	64.6	192.71	1.335 Level 3			
10,300.0	6,510.9	10,237.4	6,430.7	103.7	104.7	-71.60	219.4	-2,890.6	257.2	59.3	197.95	1.300 Level 3			
10,400.0	6,510.6	10,337.4	6,430.5	106.5	107.4	-71.63	219.4	-2,990.6	257.2	54.0	203.19	1.266 Level 3			
10,500.0	6,510.2	10,437.4	6,430.3	109.2	110.1	-71.67	219.4	-3,090.6	257.1	48.7	208.45	1.234 Level 2			
10,600.0	6,509.8	10,537.4	6,430.1	112.0	112.9	-71.70	219.4	-3,190.6	257.1	43.4	213.71	1.203 Level 2			
10,700.0	6,509.4	10,637.4	6,429.8	114.7	115.6	-71.73	219.4	-3,290.6	257.0	38.1	218.98	1.174 Level 2			
10,800.0	6,509.0	10,737.4	6,429.6	117.5	118.4	-71.76	219.4	-3,390.5	257.0	32.7	224.26	1.146 Level 2			
10,900.0	6,508.7	10,837.4	6,429.4	120.2	121.1	-71.79	219.4	-3,490.5	256.9	27.4	229.54	1.119 Level 2			
11,000.0	6,508.3	10,937.4	6,429.1	123.0	123.9	-71.83	219.4	-3,590.5	256.9	22.1	234.83	1.094 Level 2			
11,100.0	6,507.9	11,037.4	6,428.9	125.7	126.6	-71.86	219.4	-3,690.5	256.9	16.7	240.13	1.070 Level 2			
11,200.0	6,507.5	11,137.4	6,428.7	128.5	129.4	-71.89	219.4	-3,790.5	256.8	11.4	245.43	1.046 Level 2			
11,300.0	6,507.1	11,237.4	6,428.5	131.2	132.2	-71.92	219.4	-3,890.5	256.8	6.0	250.74	1.024 Level 2			
11,400.0	6,506.8	11,337.4	6,428.2	134.0	134.9	-71.96	219.4	-3,990.5	256.7	0.7	256.06	1.003 Level 2			
11,500.0	6,506.4	11,437.4	6,428.0	136.8	137.7	-71.99	219.4	-4,090.5	256.7	-4.7	261.38	0.982 Level 1			
11,600.0	6,506.0	11,537.4	6,427.8	139.5	140.4	-72.02	219.4	-4,190.5	256.6	-10.1	266.71	0.962 Level 1			
11,700.0	6,505.6	11,637.4	6,427.6	142.3	143.2	-72.05	219.4	-4,290.5	256.6	-15.5	272.04	0.943 Level 1			
11,800.0	6,505.2	11,737.4	6,427.3	145.1	146.0	-72.08	219.4	-4,390.5	256.5	-20.8	277.37	0.925 Level 1			
11,900.0	6,504.9	11,837.4	6,427.1	147.8	148.8	-72.12	219.4	-4,490.5	256.5	-26.2	282.71	0.907 Level 1			
12,000.0	6,504.5	11,937.4	6,426.9	150.6	151.5	-72.15	219.4	-4,590.5	256.4	-31.6	288.06	0.890 Level 1			
12,100.0	6,504.1	12,037.4	6,426.6	153.4	154.3	-72.18	219.4	-4,690.5	256.4	-37.0	293.40	0.874 Level 1			
12,200.0	6,503.7	12,137.4	6,426.4	156.2	157.1	-72.21	219.4	-4,790.5	256.3	-42.4	298.76	0.858 Level 1			
12,300.0	6,503.3	12,237.4	6,426.2	158.9	159.8	-72.25	219.4	-4,890.5	256.3	-47.8	304.11	0.843 Level 1			
12,400.0	6,503.0	12,337.4	6,426.0	161.7	162.6	-72.28	219.4	-4,990.5	256.2	-53.2	309.47	0.828 Level 1			
12,500.0	6,502.6	12,437.4	6,425.7	164.5	165.4	-72.31	219.4	-5,090.5	256.2	-58.6	314.84	0.814 Level 1			
12,600.0	6,502.2	12,537.4	6,425.5	167.3	168.2	-72.34	219.4	-5,190.5	256.2	-64.0	320.21	0.800 Level 1			
12,700.0	6,501.8	12,637.4	6,425.3	170.1	171.0	-72.38	219.4	-5,290.5	256.1	-69.5	325.58	0.787 Level 1			
12,800.0	6,501.5	12,737.4	6,425.1	172.9	173.7	-72.41	219.4	-5,390.5	256.1	-74.9	330.95	0.774 Level 1			
12,900.0	6,501.1	12,837.4	6,424.8	175.6	176.5	-72.44	219.4	-5,490.5	256.0	-80.3	336.33	0.761 Level 1			
13,000.0	6,500.7	12,937.4	6,424.6	178.4	179.3	-72.47	219.4	-5,590.5	256.0	-85.7	341.71	0.749 Level 1			
13,100.0	6,500.3	13,037.4	6,424.4	181.2	182.1	-72.50	219.4	-5,690.5	255.9	-91.2	347.10	0.737 Level 1			
13,200.0	6,499.9	13,137.4	6,424.1	184.0	184.9	-72.54	219.4	-5,790.5	255.9	-96.6	352.49	0.726 Level 1			
13,300.0	6,499.6	13,237.4	6,423.9	186.8	187.7	-72.57	219.4	-5,890.5	255.8	-102.0	357.88	0.715 Level 1			
13,400.0	6,499.2	13,337.4	6,423.7	189.6	190.4	-72.60	219.4	-5,990.5	255.8	-107.5	363.27	0.704 Level 1			

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
13,500.0	6,498.8	13,437.4	6,423.5	192.4	193.2	-72.63	219.4	-6,090.5	255.7	-112.9	368.67	0.694	Level 1	
13,600.0	6,498.4	13,537.4	6,423.2	195.1	196.0	-72.67	219.4	-6,190.5	255.7	-118.4	374.07	0.684	Level 1	
13,700.0	6,498.0	13,637.4	6,423.0	197.9	198.8	-72.70	219.4	-6,290.5	255.7	-123.8	379.47	0.674	Level 1	
13,705.2	6,498.0	13,642.5	6,423.0	198.1	199.0	-72.70	219.4	-6,295.7	255.7	-124.1	379.75	0.673	Level 1	
13,710.4	6,498.0	13,642.5	6,423.0	198.2	199.0	-72.70	219.4	-6,295.7	255.7	-124.2	379.89	0.673	Level 1, ES, SF	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	0.0	0.0	0.0	0.0	77.69	3.6	16.7	17.1	17.1	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	77.69	3.6	16.7	17.1	16.9	0.22	76.113		
200.0	200.0	200.0	200.0	0.3	0.3	77.69	3.6	16.7	17.1	16.4	0.67	25.371		
300.0	300.0	300.0	300.0	0.6	0.6	77.69	3.6	16.7	17.1	16.0	1.12	15.223		
400.0	400.0	400.0	400.0	0.8	0.8	77.69	3.6	16.7	17.1	15.5	1.57	10.873		
500.0	500.0	500.0	500.0	1.0	1.0	77.69	3.6	16.7	17.1	15.1	2.02	8.457		
600.0	600.0	600.0	600.0	1.2	1.2	77.69	3.6	16.7	17.1	14.6	2.47	6.919		
700.0	700.0	700.0	700.0	1.5	1.5	77.69	3.6	16.7	17.1	14.2	2.92	5.855		
800.0	800.0	800.0	800.0	1.7	1.7	77.69	3.6	16.7	17.1	13.7	3.37	5.074		
900.0	900.0	900.0	900.0	1.9	1.9	77.69	3.6	16.7	17.1	13.3	3.82	4.477		
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	77.69	3.6	16.7	17.1	12.8	4.27	4.006 CC		
1,100.0	1,100.0	1,099.5	1,099.5	2.4	2.4	76.62	4.2	17.9	18.4	13.7	4.71	3.898		
1,200.0	1,200.0	1,199.0	1,198.9	2.6	2.6	74.16	6.0	21.3	22.2	17.0	5.15	4.305		
1,300.0	1,300.0	1,298.2	1,297.9	2.8	2.8	1.29	9.0	27.0	27.3	21.7	5.58	4.891		
1,400.0	1,399.9	1,397.3	1,396.6	3.0	3.0	-1.10	13.2	35.0	32.4	26.4	6.00	5.396		
1,500.0	1,499.7	1,496.2	1,494.9	3.2	3.3	-3.37	18.5	45.2	37.5	31.0	6.42	5.835		
1,600.0	1,599.3	1,595.1	1,592.7	3.5	3.5	-5.56	25.1	57.7	42.6	35.7	6.85	6.219		
1,700.0	1,698.6	1,693.8	1,689.9	3.7	3.8	-7.70	32.7	72.4	47.7	40.5	7.28	6.559		
1,800.0	1,797.5	1,792.3	1,786.6	4.0	4.1	-9.79	41.6	89.3	53.0	45.2	7.72	6.861		
1,900.0	1,896.1	1,890.7	1,882.7	4.3	4.5	-11.84	51.5	108.4	58.3	50.1	8.17	7.128		
2,000.0	1,994.2	1,989.0	1,978.0	4.6	4.9	-13.85	62.6	129.6	63.6	55.0	8.64	7.363		
2,100.0	2,091.7	2,087.3	2,072.7	4.9	5.4	-15.83	74.8	152.9	69.1	59.9	9.13	7.563		
2,200.0	2,188.6	2,187.2	2,168.6	5.3	5.8	-18.03	87.7	177.6	73.1	63.4	9.66	7.568		
2,267.0	2,253.2	2,254.2	2,232.9	5.6	6.2	-19.75	96.3	194.1	74.5	64.4	10.04	7.420		
2,300.0	2,284.9	2,287.1	2,264.6	5.8	6.3	-20.65	100.5	202.2	74.9	64.7	10.25	7.311		
2,400.0	2,381.0	2,387.0	2,360.6	6.3	6.9	-23.32	113.4	226.8	76.3	65.4	10.91	6.998		
2,500.0	2,477.1	2,487.0	2,456.6	6.8	7.4	-25.89	126.3	251.5	77.9	66.3	11.62	6.705		
2,600.0	2,573.3	2,586.9	2,552.6	7.3	7.9	-28.35	139.1	276.1	79.7	67.3	12.38	6.434		
2,700.0	2,669.4	2,686.8	2,648.5	7.8	8.5	-30.70	152.0	300.7	81.5	68.3	13.19	6.181		
2,800.0	2,765.5	2,786.7	2,744.5	8.3	9.0	-32.94	164.9	325.4	83.5	69.5	14.05	5.948		
2,900.0	2,861.6	2,886.7	2,840.5	8.8	9.6	-35.08	177.7	350.0	85.7	70.7	14.94	5.733		
3,000.0	2,957.8	2,986.6	2,936.5	9.4	10.1	-37.11	190.6	374.7	87.9	72.0	15.88	5.536		
3,100.0	3,053.9	3,086.5	3,032.5	9.9	10.7	-39.03	203.5	399.3	90.3	73.4	16.85	5.356		
3,200.0	3,150.0	3,186.5	3,128.5	10.5	11.2	-40.86	216.3	423.9	92.7	74.8	17.85	5.192		
3,300.0	3,246.1	3,286.4	3,224.5	11.0	11.8	-42.59	229.2	448.6	95.2	76.3	18.89	5.043		
3,400.0	3,342.3	3,386.3	3,320.4	11.6	12.4	-44.23	242.1	473.2	97.8	77.9	19.94	4.907		
3,500.0	3,438.4	3,486.2	3,416.4	12.1	12.9	-45.78	254.9	497.8	100.5	79.5	21.02	4.783		
3,600.0	3,534.5	3,586.2	3,512.4	12.7	13.5	-47.26	267.8	522.5	103.3	81.2	22.11	4.671		
3,700.0	3,630.6	3,686.1	3,608.4	13.3	14.1	-48.65	280.7	547.1	106.1	82.9	23.23	4.569		
3,800.0	3,726.8	3,786.0	3,704.4	13.8	14.6	-49.97	293.5	571.7	109.0	84.7	24.35	4.477		
3,900.0	3,822.9	3,885.9	3,800.4	14.4	15.2	-51.22	306.4	596.4	111.9	86.5	25.49	4.392		
4,000.0	3,919.0	3,985.9	3,896.3	15.0	15.8	-52.41	319.3	621.0	114.9	88.3	26.63	4.316		
4,100.0	4,015.1	4,085.8	3,992.3	15.5	16.3	-53.54	332.1	645.6	118.0	90.2	27.79	4.246		
4,200.0	4,111.2	4,185.7	4,088.3	16.1	16.9	-54.61	345.0	670.3	121.1	92.1	28.95	4.182		
4,300.0	4,207.4	4,285.7	4,184.3	16.7	17.5	-55.63	357.9	694.9	124.2	94.1	30.12	4.123		
4,400.0	4,303.5	4,385.6	4,280.3	17.2	18.1	-56.59	370.7	719.5	127.3	96.0	31.29	4.069		
4,500.0	4,399.6	4,485.5	4,376.3	17.8	18.6	-57.51	383.6	744.2	130.5	98.1	32.47	4.020		
4,600.0	4,495.7	4,585.4	4,472.3	18.4	19.2	-58.39	396.5	768.8	133.8	100.1	33.65	3.975		
4,700.0	4,591.9	4,685.4	4,568.2	18.9	19.8	-59.22	409.3	793.4	137.0	102.2	34.83	3.933		
4,800.0	4,688.0	4,785.3	4,664.2	19.5	20.4	-60.02	422.2	818.1	140.3	104.3	36.02	3.895		
4,900.0	4,784.1	4,885.2	4,760.2	20.1	21.0	-60.78	435.1	842.7	143.6	106.4	37.21	3.860		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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
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	4,880.2	4,985.2	4,856.2	20.7	21.5	-61.50	447.9	867.4	146.9	108.5	38.40	3.827		
5,100.0	4,976.4	5,085.1	4,952.2	21.2	22.1	-62.19	460.8	892.0	150.3	110.7	39.59	3.796		
5,200.0	5,072.5	5,185.0	5,048.2	21.8	22.7	-62.86	473.6	916.6	153.7	112.9	40.78	3.768		
5,300.0	5,168.6	5,284.9	5,144.2	22.4	23.3	-63.49	486.5	941.3	157.1	115.1	41.97	3.742		
5,400.0	5,264.7	5,384.9	5,240.1	23.0	23.8	-64.10	499.4	965.9	160.5	117.3	43.16	3.718		
5,500.0	5,360.9	5,484.8	5,336.1	23.6	24.4	-64.68	512.2	990.5	163.9	119.5	44.36	3.695		
5,600.0	5,457.0	5,584.7	5,432.1	24.1	25.0	-65.23	525.1	1,015.2	167.3	121.8	45.55	3.674		
5,700.0	5,553.1	5,685.1	5,528.7	24.7	25.5	-66.05	538.1	1,039.1	170.8	124.0	46.78	3.650		
5,712.7	5,565.3	5,697.8	5,541.1	24.8	25.6	-66.35	539.7	1,041.6	171.2	124.2	46.97	3.644		
5,750.0	5,601.4	5,735.4	5,577.8	25.0	25.7	-63.34	544.6	1,047.6	172.4	124.9	47.51	3.628		
5,800.0	5,650.3	5,785.4	5,627.1	25.1	25.9	-56.05	551.3	1,052.8	174.1	126.0	48.12	3.619		
5,850.0	5,699.8	5,835.1	5,676.4	25.3	26.0	-41.18	557.9	1,054.7	176.0	127.3	48.62	3.619		
5,900.0	5,749.5	5,884.7	5,725.4	25.4	26.1	-12.20	564.4	1,053.4	177.9	128.9	49.03	3.629		
5,950.0	5,799.2	5,933.9	5,774.1	25.4	26.1	23.03	571.0	1,048.9	179.9	130.6	49.33	3.647		
6,000.0	5,848.8	5,983.0	5,822.1	25.4	26.1	44.82	577.4	1,041.3	182.0	132.5	49.53	3.674		
6,050.0	5,898.0	6,031.8	5,869.3	25.4	26.1	55.57	583.7	1,030.6	184.1	134.5	49.64	3.709		
6,100.0	5,946.7	6,080.4	5,915.5	25.4	26.0	61.13	590.0	1,017.1	186.3	136.6	49.65	3.752		
6,150.0	5,994.5	6,128.8	5,960.6	25.3	25.9	64.21	596.0	1,000.6	188.5	138.9	49.57	3.802		
6,200.0	6,041.4	6,177.0	6,004.4	25.2	25.9	65.96	601.9	981.4	190.6	141.2	49.41	3.858		
6,250.0	6,087.1	6,225.0	6,046.8	25.1	25.8	66.97	607.6	959.5	192.8	143.6	49.18	3.921		
6,300.0	6,131.4	6,272.8	6,087.5	25.0	25.6	67.52	613.0	935.1	194.9	146.1	48.88	3.988		
6,350.0	6,174.1	6,320.5	6,126.5	24.9	25.5	67.79	618.3	908.3	197.0	148.5	48.54	4.059		
6,400.0	6,215.0	6,368.0	6,163.7	24.8	25.4	67.87	623.3	879.2	199.1	150.9	48.17	4.133		
6,450.0	6,254.0	6,415.3	6,198.9	24.6	25.3	67.84	628.0	847.9	201.0	153.2	47.78	4.207		
6,500.0	6,290.9	6,462.5	6,232.0	24.5	25.1	67.73	632.5	814.5	202.9	155.5	47.39	4.281		
6,550.0	6,325.5	6,509.6	6,262.9	24.4	25.0	67.58	636.6	779.3	204.6	157.6	47.03	4.351		
6,600.0	6,357.8	6,556.5	6,291.6	24.3	25.0	67.41	640.5	742.3	206.3	159.5	46.71	4.416		
6,650.0	6,387.4	6,603.4	6,317.9	24.3	24.9	67.24	644.0	703.7	207.8	161.3	46.46	4.472		
6,700.0	6,414.5	6,650.0	6,341.6	24.3	24.8	67.07	647.2	663.7	209.1	162.9	46.29	4.518		
6,750.0	6,438.7	6,696.9	6,363.1	24.4	24.8	66.92	650.1	622.2	210.4	164.1	46.23	4.550		
6,800.0	6,460.0	6,743.5	6,381.8	24.5	24.9	66.78	652.6	579.6	211.4	165.1	46.30	4.567		
6,850.0	6,478.3	6,790.0	6,397.9	24.6	25.0	66.67	654.8	535.9	212.4	165.8	46.51	4.566		
6,900.0	6,493.6	6,836.6	6,411.4	24.9	25.1	66.59	656.6	491.5	213.1	166.2	46.86	4.548		
6,950.0	6,505.7	6,883.0	6,422.2	25.2	25.3	66.55	658.1	446.3	213.7	166.3	47.36	4.511		
7,000.0	6,514.7	6,929.5	6,430.1	25.6	25.6	66.53	659.2	400.5	214.1	166.1	48.02	4.458		
7,050.0	6,520.4	6,976.0	6,435.4	26.0	26.0	66.55	659.9	354.4	214.3	165.5	48.82	4.389		
7,100.0	6,522.9	7,022.4	6,437.8	26.5	26.4	66.61	660.2	308.0	214.3	164.6	49.76	4.307		
7,116.1	6,523.0	7,037.4	6,438.0	26.7	26.5	66.63	660.2	293.0	214.3	164.2	50.09	4.278		
7,200.0	6,522.7	7,121.0	6,437.8	27.7	27.4	66.67	660.2	209.4	214.3	162.1	52.18	4.107		
7,300.0	6,522.3	7,221.0	6,437.6	29.2	28.8	66.71	660.2	109.4	214.2	159.2	55.00	3.895		
7,400.0	6,521.9	7,321.0	6,437.4	30.8	30.4	66.74	660.2	9.4	214.1	156.0	58.16	3.682		
7,500.0	6,521.5	7,421.0	6,437.1	32.7	32.3	66.78	660.2	-90.6	214.1	152.5	61.59	3.476		
7,600.0	6,521.2	7,521.0	6,436.9	34.6	34.2	66.82	660.2	-190.6	214.0	148.8	65.27	3.279		
7,700.0	6,520.8	7,621.0	6,436.7	36.7	36.3	66.85	660.2	-290.6	214.0	144.8	69.14	3.095		
7,800.0	6,520.4	7,721.0	6,436.5	38.9	38.5	66.89	660.2	-390.6	213.9	140.7	73.18	2.923		
7,900.0	6,520.0	7,821.0	6,436.2	41.1	40.8	66.93	660.2	-490.6	213.8	136.5	77.37	2.764		
8,000.0	6,519.6	7,921.0	6,436.0	43.5	43.1	66.97	660.2	-590.6	213.8	132.1	81.68	2.618		
8,100.0	6,519.3	8,021.0	6,435.8	45.8	45.5	67.00	660.2	-690.6	213.7	127.6	86.09	2.483		
8,200.0	6,518.9	8,121.0	6,435.5	48.3	47.9	67.04	660.2	-790.6	213.7	123.1	90.59	2.359		
8,300.0	6,518.5	8,221.0	6,435.3	50.7	50.4	67.08	660.2	-890.6	213.6	118.4	95.16	2.245		
8,400.0	6,518.1	8,321.0	6,435.1	53.2	52.9	67.12	660.2	-990.6	213.6	113.7	99.81	2.140		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation	Warning				
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor					
8,500.0	6,517.8	8,421.0	6,434.9	55.7	55.4	67.15	660.2	-1,090.6	213.5	109.0	104.51	2.043					
8,600.0	6,517.4	8,521.0	6,434.6	58.3	58.0	67.19	660.2	-1,190.6	213.4	104.2	109.26	1.953					
8,700.0	6,517.0	8,621.0	6,434.4	60.9	60.6	67.23	660.2	-1,290.6	213.4	99.3	114.06	1.871					
8,800.0	6,516.6	8,721.0	6,434.2	63.5	63.2	67.27	660.2	-1,390.6	213.3	94.4	118.89	1.794					
8,900.0	6,516.2	8,821.0	6,434.0	66.1	65.8	67.30	660.2	-1,490.6	213.3	89.5	123.77	1.723					
9,000.0	6,515.9	8,921.0	6,433.7	68.7	68.4	67.34	660.2	-1,590.6	213.2	84.5	128.67	1.657					
9,100.0	6,515.5	9,021.0	6,433.5	71.3	71.1	67.38	660.2	-1,690.6	213.1	79.5	133.60	1.595					
9,200.0	6,515.1	9,121.0	6,433.3	74.0	73.7	67.42	660.2	-1,790.6	213.1	74.5	138.56	1.538					
9,300.0	6,514.7	9,221.0	6,433.0	76.7	76.4	67.45	660.2	-1,890.6	213.0	69.5	143.54	1.484	Level 3				
9,400.0	6,514.3	9,321.0	6,432.8	79.3	79.1	67.49	660.2	-1,990.6	213.0	64.4	148.55	1.434	Level 3				
9,500.0	6,514.0	9,421.0	6,432.6	82.0	81.8	67.53	660.2	-2,090.6	212.9	59.3	153.57	1.386	Level 3				
9,600.0	6,513.6	9,521.0	6,432.4	84.7	84.5	67.57	660.2	-2,190.6	212.8	54.2	158.61	1.342	Level 3				
9,700.0	6,513.2	9,621.0	6,432.1	87.4	87.2	67.60	660.2	-2,290.6	212.8	49.1	163.67	1.300	Level 3				
9,800.0	6,512.8	9,721.0	6,431.9	90.1	89.9	67.64	660.2	-2,390.6	212.7	44.0	168.74	1.261	Level 3				
9,900.0	6,512.4	9,821.0	6,431.7	92.8	92.6	67.68	660.2	-2,490.6	212.7	38.8	173.83	1.223	Level 2				
10,000.0	6,512.1	9,921.0	6,431.4	95.6	95.3	67.72	660.2	-2,590.6	212.6	33.7	178.93	1.188	Level 2				
10,100.0	6,511.7	10,021.0	6,431.2	98.3	98.0	67.76	660.2	-2,690.6	212.6	28.5	184.04	1.155	Level 2				
10,200.0	6,511.3	10,121.0	6,431.0	101.0	100.8	67.79	660.2	-2,790.6	212.5	23.3	189.16	1.123	Level 2				
10,300.0	6,510.9	10,221.0	6,430.8	103.7	103.5	67.83	660.2	-2,890.6	212.4	18.1	194.30	1.093	Level 2				
10,400.0	6,510.6	10,321.0	6,430.5	106.5	106.2	67.87	660.2	-2,990.6	212.4	12.9	199.44	1.065	Level 2				
10,500.0	6,510.2	10,421.0	6,430.3	109.2	109.0	67.91	660.2	-3,090.6	212.3	7.7	204.60	1.038	Level 2				
10,600.0	6,509.8	10,521.0	6,430.1	112.0	111.7	67.94	660.2	-3,190.6	212.3	2.5	209.76	1.012	Level 2				
10,700.0	6,509.4	10,621.0	6,429.9	114.7	114.5	67.98	660.2	-3,290.6	212.2	-2.7	214.93	0.987	Level 1				
10,800.0	6,509.0	10,721.0	6,429.6	117.5	117.2	68.02	660.2	-3,390.6	212.2	-8.0	220.11	0.964	Level 1				
10,900.0	6,508.7	10,821.0	6,429.4	120.2	120.0	68.06	660.2	-3,490.6	212.1	-13.2	225.30	0.941	Level 1				
11,000.0	6,508.3	10,921.0	6,429.2	123.0	122.7	68.10	660.2	-3,590.6	212.0	-18.5	230.50	0.920	Level 1				
11,100.0	6,507.9	11,021.0	6,428.9	125.7	125.5	68.13	660.2	-3,690.6	212.0	-23.7	235.70	0.899	Level 1				
11,200.0	6,507.5	11,121.0	6,428.7	128.5	128.2	68.17	660.2	-3,790.6	211.9	-29.0	240.91	0.880	Level 1				
11,300.0	6,507.1	11,221.0	6,428.5	131.2	131.0	68.21	660.2	-3,890.6	211.9	-34.2	246.12	0.861	Level 1				
11,400.0	6,506.8	11,321.0	6,428.3	134.0	133.8	68.25	660.2	-3,990.6	211.8	-39.5	251.34	0.843	Level 1				
11,500.0	6,506.4	11,421.0	6,428.0	136.8	136.5	68.29	660.2	-4,090.6	211.8	-44.8	256.57	0.825	Level 1				
11,600.0	6,506.0	11,521.0	6,427.8	139.5	139.3	68.32	660.2	-4,190.6	211.7	-50.1	261.81	0.809	Level 1				
11,700.0	6,505.6	11,621.0	6,427.6	142.3	142.1	68.36	660.2	-4,290.5	211.6	-55.4	267.05	0.793	Level 1				
11,800.0	6,505.2	11,721.0	6,427.4	145.1	144.8	68.40	660.2	-4,390.5	211.6	-60.7	272.29	0.777	Level 1				
11,900.0	6,504.9	11,821.0	6,427.1	147.8	147.6	68.44	660.2	-4,490.5	211.5	-66.0	277.54	0.762	Level 1				
12,000.0	6,504.5	11,921.0	6,426.9	150.6	150.4	68.48	660.2	-4,590.5	211.5	-71.3	282.80	0.748	Level 1				
12,100.0	6,504.1	12,021.0	6,426.7	153.4	153.2	68.52	660.2	-4,690.5	211.4	-76.6	288.06	0.734	Level 1				
12,200.0	6,503.7	12,121.0	6,426.4	156.2	155.9	68.55	660.2	-4,790.5	211.4	-82.0	293.32	0.721	Level 1				
12,300.0	6,503.3	12,221.0	6,426.2	158.9	158.7	68.59	660.2	-4,890.5	211.3	-87.3	298.59	0.708	Level 1				
12,400.0	6,503.0	12,321.0	6,426.0	161.7	161.5	68.63	660.2	-4,990.5	211.3	-92.6	303.87	0.695	Level 1				
12,500.0	6,502.6	12,421.0	6,425.8	164.5	164.3	68.67	660.2	-5,090.5	211.2	-97.9	309.14	0.683	Level 1				
12,600.0	6,502.2	12,521.0	6,425.5	167.3	167.1	68.71	660.2	-5,190.5	211.1	-103.3	314.43	0.672	Level 1				
12,700.0	6,501.8	12,621.0	6,425.3	170.1	169.8	68.74	660.2	-5,290.5	211.1	-108.6	319.71	0.660	Level 1				
12,800.0	6,501.5	12,721.0	6,425.1	172.9	172.6	68.78	660.2	-5,390.5	211.0	-114.0	325.01	0.649	Level 1				
12,900.0	6,501.1	12,821.0	6,424.9	175.6	175.4	68.82	660.2	-5,490.5	211.0	-119.3	330.30	0.639	Level 1				
13,000.0	6,500.7	12,921.0	6,424.6	178.4	178.2	68.86	660.2	-5,590.5	210.9	-124.7	335.60	0.629	Level 1				
13,100.0	6,500.3	13,021.0	6,424.4	181.2	181.0	68.90	660.2	-5,690.5	210.9	-130.0	340.90	0.619	Level 1				
13,200.0	6,499.9	13,121.0	6,424.2	184.0	183.8	68.94	660.2	-5,790.5	210.8	-135.4	346.21	0.609	Level 1				
13,300.0	6,499.6	13,221.0	6,423.9	186.8	186.6	68.98	660.2	-5,890.5	210.8	-140.8	351.52	0.600	Level 1				
13,400.0	6,499.2	13,321.0	6,423.7	189.6	189.3	69.01	660.2	-5,990.5	210.7	-146.1	356.84	0.590	Level 1				
13,500.0	6,498.8	13,421.0	6,423.5	192.4	192.1	69.05	660.2	-6,090.5	210.7	-151.5	362.16	0.582	Level 1				

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
13,600.0	6,498.4	13,521.0	6,423.3	195.1	194.9	69.09	660.2	-6,190.5	210.6	-156.9	367.48	0.573	Level 1	
13,700.0	6,498.0	13,621.0	6,423.0	197.9	197.7	69.13	660.2	-6,290.5	210.5	-162.3	372.80	0.565	Level 1	
13,710.4	6,498.0	13,631.4	6,423.0	198.2	198.0	69.13	660.2	-6,301.0	210.5	-162.8	373.36	0.564	Level 1, ES, SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - 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					
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-3.6	-13.9	14.4	14.4	0.00	N/A					
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-3.6	-13.9	14.4	14.2	0.22	64.054					
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-3.6	-13.9	14.4	13.7	0.67	21.351					
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-3.6	-13.9	14.4	13.3	1.12	12.811					
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-3.6	-13.9	14.4	12.8	1.57	9.151					
500.0	500.0	500.0	500.0	1.0	1.0	-104.66	-3.6	-13.9	14.4	12.4	2.02	7.117					
600.0	600.0	600.0	600.0	1.2	1.2	-104.66	-3.6	-13.9	14.4	11.9	2.47	5.823					
700.0	700.0	700.0	700.0	1.5	1.5	-104.66	-3.6	-13.9	14.4	11.5	2.92	4.927					
800.0	800.0	800.0	800.0	1.7	1.7	-104.66	-3.6	-13.9	14.4	11.0	3.37	4.270					
900.0	900.0	900.0	900.0	1.9	1.9	-104.66	-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	-104.66	-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	-104.66	-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	-104.66	-3.6	-13.9	14.4	9.2	5.17	2.785 CC, ES					
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-175.36	-3.6	-13.9	15.7	10.1	5.61	2.799					
1,400.0	1,399.9	1,399.9	1,399.9	3.0	3.0	-176.28	-3.6	-13.9	19.6	13.6	6.04	3.248					
1,500.0	1,499.7	1,500.3	1,500.3	3.2	3.2	-178.55	-3.9	-12.6	25.0	18.5	6.45	3.871					
1,600.0	1,599.3	1,600.7	1,600.6	3.5	3.4	177.60	-4.5	-8.7	30.7	23.9	6.85	4.481					
1,700.0	1,698.6	1,701.2	1,700.9	3.7	3.7	173.02	-5.6	-2.2	37.0	29.7	7.26	5.094					
1,800.0	1,797.5	1,801.8	1,801.0	4.0	3.9	168.21	-7.0	6.9	44.0	36.3	7.68	5.725					
1,900.0	1,896.1	1,902.3	1,900.9	4.3	4.1	163.44	-9.0	18.6	51.8	43.7	8.12	6.379					
2,000.0	1,994.2	2,002.8	2,000.3	4.6	4.4	158.90	-11.3	32.9	60.7	52.1	8.60	7.052					
2,100.0	2,091.7	2,103.3	2,099.3	4.9	4.7	154.68	-14.0	49.8	70.6	61.4	9.13	7.730					
2,200.0	2,188.6	2,203.7	2,197.8	5.3	5.0	150.80	-17.2	69.2	81.6	71.9	9.72	8.397					
2,267.0	2,253.2	2,270.9	2,263.4	5.6	5.2	148.40	-19.6	83.6	89.7	79.5	10.16	8.828					
2,300.0	2,284.9	2,304.0	2,295.5	5.8	5.3	147.26	-20.8	91.1	93.7	83.3	10.40	9.014					
2,400.0	2,381.0	2,404.3	2,392.7	6.3	5.7	143.49	-24.8	115.6	105.5	94.3	11.20	9.418					
2,500.0	2,477.1	2,504.5	2,489.1	6.8	6.2	139.29	-29.2	142.6	116.6	104.5	12.11	9.629					
2,600.0	2,573.3	2,603.8	2,584.1	7.3	6.7	135.03	-33.9	171.1	127.6	114.5	13.11	9.732					
2,700.0	2,669.4	2,702.7	2,678.8	7.8	7.2	131.41	-38.5	199.7	139.2	125.0	14.16	9.831					
2,800.0	2,765.5	2,801.7	2,773.4	8.3	7.7	128.36	-43.2	228.3	151.2	136.0	15.23	9.929					
2,900.0	2,861.6	2,900.7	2,868.0	8.8	8.2	125.77	-47.9	256.9	163.6	147.3	16.33	10.024					
3,000.0	2,957.8	2,999.7	2,962.7	9.4	8.8	123.54	-52.5	285.5	176.3	158.9	17.43	10.115					
3,100.0	3,053.9	3,098.6	3,057.3	9.9	9.3	121.61	-57.2	314.1	189.3	170.7	18.55	10.201					
3,200.0	3,150.0	3,197.6	3,152.0	10.5	9.9	119.93	-61.9	342.7	202.4	182.7	19.68	10.283					
3,300.0	3,246.1	3,296.6	3,246.6	11.0	10.5	118.45	-66.5	371.3	215.6	194.8	20.81	10.361					
3,400.0	3,342.3	3,395.6	3,341.2	11.6	11.0	117.15	-71.2	399.9	229.0	207.1	21.95	10.434					
3,500.0	3,438.4	3,494.5	3,435.9	12.1	11.6	115.99	-75.9	428.5	242.5	219.4	23.09	10.503					
3,600.0	3,534.5	3,593.5	3,530.5	12.7	12.2	114.95	-80.5	457.1	256.1	231.8	24.23	10.568					
3,700.0	3,630.6	3,692.5	3,625.1	13.3	12.8	114.02	-85.2	485.7	269.7	244.4	25.38	10.629					
3,800.0	3,726.8	3,791.4	3,719.8	13.8	13.4	113.17	-89.9	514.3	283.4	256.9	26.52	10.686					
3,900.0	3,822.9	3,890.4	3,814.4	14.4	14.0	112.41	-94.5	542.9	297.2	269.5	27.67	10.740					
4,000.0	3,919.0	3,989.4	3,909.0	15.0	14.6	111.71	-99.2	571.5	311.0	282.2	28.82	10.791					
4,100.0	4,015.1	4,088.4	4,003.7	15.5	15.2	111.07	-103.9	600.1	324.9	294.9	29.97	10.839					
4,200.0	4,111.2	4,187.3	4,098.3	16.1	15.8	110.49	-108.6	628.7	338.8	307.7	31.13	10.884					
4,300.0	4,207.4	4,286.3	4,193.0	16.7	16.4	109.95	-113.2	657.2	352.7	320.4	32.28	10.926					
4,400.0	4,303.5	4,385.3	4,287.6	17.2	17.0	109.45	-117.9	685.8	366.7	333.2	33.43	10.967					
4,500.0	4,399.6	4,484.3	4,382.2	17.8	17.6	108.99	-122.6	714.4	380.6	346.0	34.59	11.005					
4,600.0	4,495.7	4,583.2	4,476.9	18.4	18.2	108.56	-127.2	743.0	394.6	358.9	35.74	11.041					
4,700.0	4,591.9	4,682.2	4,571.5	18.9	18.8	108.16	-131.9	771.6	408.7	371.8	36.90	11.075					
4,800.0	4,688.0	4,781.2	4,666.1	19.5	19.4	107.78	-136.6	800.2	422.7	384.6	38.06	11.107					
4,900.0	4,784.1	4,880.1	4,760.8	20.1	20.0	107.43	-141.2	828.8	436.8	397.5	39.21	11.138					

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - 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	4,880.2	4,979.1	4,855.4	20.7	20.6	107.11	-145.9	857.4	450.8	410.5	40.37	11.167	
5,100.0	4,976.4	5,078.1	4,950.1	21.2	21.3	106.80	-150.6	886.0	464.9	423.4	41.53	11.195	
5,200.0	5,072.5	5,177.1	5,044.7	21.8	21.9	106.51	-155.2	914.6	479.0	436.3	42.69	11.222	
5,300.0	5,168.6	5,276.0	5,139.3	22.4	22.5	106.23	-159.9	943.2	493.1	449.3	43.84	11.247	
5,400.0	5,264.7	5,375.0	5,234.0	23.0	23.1	105.98	-164.6	971.8	507.2	462.2	45.00	11.271	
5,500.0	5,360.9	5,474.0	5,328.6	23.6	23.7	105.73	-169.2	1,000.4	521.4	475.2	46.16	11.295	
5,600.0	5,457.0	5,573.0	5,423.2	24.1	24.3	105.50	-173.9	1,029.0	535.5	488.2	47.32	11.317	
5,700.0	5,553.1	5,673.6	5,519.9	24.7	24.9	105.43	-178.7	1,056.7	549.6	501.2	48.42	11.351	
5,712.7	5,565.3	5,686.6	5,532.5	24.8	24.9	105.50	-179.3	1,059.5	551.3	502.8	48.54	11.359	
5,750.0	5,601.4	5,724.8	5,570.0	25.0	25.0	110.20	-181.1	1,066.7	556.5	507.7	48.82	11.400	
5,800.0	5,650.3	5,775.7	5,620.4	25.1	25.2	119.75	-183.6	1,073.4	563.5	514.5	49.09	11.481	
5,850.0	5,699.8	5,826.5	5,671.0	25.3	25.3	136.84	-186.1	1,076.7	570.7	521.4	49.27	11.582	
5,900.0	5,749.5	5,877.1	5,721.6	25.4	25.3	168.02	-188.6	1,076.6	577.8	528.5	49.37	11.703	
5,950.0	5,799.2	5,927.5	5,771.8	25.4	25.3	-154.61	-191.1	1,073.2	585.0	535.6	49.40	11.842	
6,000.0	5,848.8	5,977.8	5,821.5	25.4	25.3	-130.72	-193.6	1,066.5	592.2	542.8	49.37	11.996	
6,050.0	5,898.0	6,027.9	5,870.6	25.4	25.3	-117.94	-196.0	1,056.6	599.4	550.1	49.27	12.164	
6,100.0	5,946.7	6,077.8	5,918.7	25.4	25.2	-110.42	-198.4	1,043.5	606.4	557.3	49.13	12.344	
6,150.0	5,994.5	6,127.6	5,965.7	25.3	25.1	-105.46	-200.7	1,027.4	613.4	564.5	48.94	12.533	
6,200.0	6,041.4	6,177.2	6,011.5	25.2	25.0	-101.89	-202.9	1,008.2	620.3	571.5	48.72	12.730	
6,250.0	6,087.1	6,226.8	6,055.8	25.1	24.9	-99.15	-205.1	986.3	626.9	578.5	48.48	12.931	
6,300.0	6,131.4	6,276.2	6,098.5	25.0	24.7	-96.96	-207.2	961.5	633.4	585.2	48.23	13.133	
6,350.0	6,174.1	6,325.4	6,139.4	24.9	24.6	-95.14	-209.3	934.1	639.7	591.7	47.98	13.333	
6,400.0	6,215.0	6,374.6	6,178.3	24.8	24.5	-93.59	-211.2	904.2	645.7	598.0	47.74	13.525	
6,450.0	6,254.0	6,423.7	6,215.2	24.6	24.4	-92.26	-213.0	871.9	651.4	603.9	47.53	13.705	
6,500.0	6,290.9	6,472.7	6,249.9	24.5	24.4	-91.09	-214.7	837.4	656.9	609.5	47.37	13.866	
6,550.0	6,325.5	6,521.5	6,282.3	24.4	24.3	-90.06	-216.3	800.8	662.0	614.7	47.27	14.004	
6,600.0	6,357.8	6,570.3	6,312.2	24.3	24.3	-89.15	-217.8	762.3	666.8	619.5	47.25	14.112	
6,650.0	6,387.4	6,619.0	6,339.5	24.3	24.4	-88.35	-219.2	722.0	671.2	623.8	47.32	14.184	
6,700.0	6,414.5	6,667.7	6,364.2	24.3	24.5	-87.63	-220.4	680.1	675.2	627.7	47.49	14.217	
6,750.0	6,438.7	6,716.2	6,386.1	24.4	24.6	-87.00	-221.5	636.8	678.8	631.0	47.78	14.206	
6,800.0	6,460.0	6,764.7	6,405.2	24.5	24.9	-86.45	-222.4	592.3	682.0	633.8	48.20	14.150	
6,850.0	6,478.3	6,813.1	6,421.5	24.6	25.1	-85.98	-223.2	546.7	684.7	636.0	48.74	14.049	
6,900.0	6,493.6	6,861.5	6,434.8	24.9	25.5	-85.57	-223.9	500.2	687.0	637.6	49.41	13.904	
6,950.0	6,505.7	6,909.7	6,445.1	25.2	25.8	-85.23	-224.4	453.1	688.9	638.7	50.21	13.720	
7,000.0	6,514.7	6,957.9	6,452.4	25.6	26.3	-84.96	-224.8	405.5	690.3	639.1	51.13	13.501	
7,050.0	6,520.4	7,006.1	6,456.7	26.0	26.8	-84.76	-225.0	357.5	691.2	639.0	52.15	13.253	
7,100.0	6,522.9	7,054.2	6,458.0	26.5	27.3	-84.62	-225.1	309.4	691.6	638.3	53.28	12.981	
7,116.1	6,523.0	7,070.4	6,458.0	26.7	27.5	-84.60	-225.1	293.2	691.6	638.0	53.67	12.886	
7,200.0	6,522.7	7,154.2	6,457.8	27.7	28.7	-84.61	-225.1	209.4	691.6	635.7	55.90	12.372	
7,300.0	6,522.3	7,254.2	6,457.5	29.2	30.2	-84.63	-225.1	109.4	691.6	632.7	58.92	11.738	
7,400.0	6,521.9	7,354.2	6,457.3	30.8	31.9	-84.64	-225.1	9.4	691.6	629.3	62.30	11.102	
7,500.0	6,521.5	7,454.2	6,457.1	32.7	33.7	-84.65	-225.1	-90.6	691.6	625.6	65.98	10.482	
7,600.0	6,521.2	7,554.2	6,456.9	34.6	35.7	-84.66	-225.1	-190.6	691.6	621.7	69.91	9.892	
7,700.0	6,520.8	7,654.2	6,456.6	36.7	37.8	-84.68	-225.1	-290.6	691.5	617.5	74.06	9.338	
7,800.0	6,520.4	7,754.2	6,456.4	38.9	39.9	-84.69	-225.1	-390.6	691.5	613.1	78.39	8.822	
7,900.0	6,520.0	7,854.2	6,456.2	41.1	42.2	-84.70	-225.1	-490.6	691.5	608.6	82.87	8.344	
8,000.0	6,519.6	7,954.2	6,455.9	43.5	44.5	-84.71	-225.1	-590.6	691.5	604.0	87.48	7.904	
8,100.0	6,519.3	8,054.2	6,455.7	45.8	46.8	-84.73	-225.1	-690.6	691.5	599.3	92.20	7.500	
8,200.0	6,518.9	8,154.2	6,455.5	48.3	49.3	-84.74	-225.1	-790.6	691.5	594.5	97.02	7.127	
8,300.0	6,518.5	8,254.2	6,455.3	50.7	51.7	-84.75	-225.1	-890.6	691.5	589.5	101.91	6.785	
8,400.0	6,518.1	8,354.2	6,455.0	53.2	54.2	-84.76	-225.1	-990.6	691.4	584.6	106.88	6.469	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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		
8,500.0	6,517.8	8,454.2	6,454.8	55.7	56.7	-84.78	-225.1	-1,090.6	691.4	579.5	111.90	6.179		
8,600.0	6,517.4	8,554.2	6,454.6	58.3	59.3	-84.79	-225.1	-1,190.6	691.4	574.4	116.98	5.910		
8,700.0	6,517.0	8,654.2	6,454.4	60.9	61.8	-84.80	-225.1	-1,290.6	691.4	569.3	122.11	5.662		
8,800.0	6,516.6	8,754.2	6,454.1	63.5	64.4	-84.81	-225.1	-1,390.6	691.4	564.1	127.27	5.432		
8,900.0	6,516.2	8,854.2	6,453.9	66.1	67.0	-84.83	-225.1	-1,490.6	691.4	558.9	132.47	5.219		
9,000.0	6,515.9	8,954.2	6,453.7	68.7	69.7	-84.84	-225.1	-1,590.6	691.4	553.7	137.70	5.021		
9,100.0	6,515.5	9,054.2	6,453.4	71.3	72.3	-84.85	-225.1	-1,690.6	691.3	548.4	142.96	4.836		
9,200.0	6,515.1	9,154.2	6,453.2	74.0	74.9	-84.86	-225.1	-1,790.6	691.3	543.1	148.25	4.663		
9,300.0	6,514.7	9,254.2	6,453.0	76.7	77.6	-84.88	-225.1	-1,890.6	691.3	537.8	153.55	4.502		
9,400.0	6,514.3	9,354.2	6,452.8	79.3	80.3	-84.89	-225.1	-1,990.6	691.3	532.4	158.88	4.351		
9,500.0	6,514.0	9,454.2	6,452.5	82.0	82.9	-84.90	-225.1	-2,090.6	691.3	527.1	164.23	4.209		
9,600.0	6,513.6	9,554.2	6,452.3	84.7	85.6	-84.91	-225.1	-2,190.6	691.3	521.7	169.59	4.076		
9,700.0	6,513.2	9,654.2	6,452.1	87.4	88.3	-84.93	-225.1	-2,290.6	691.3	516.3	174.97	3.951		
9,800.0	6,512.8	9,754.2	6,451.9	90.1	91.0	-84.94	-225.1	-2,390.6	691.3	510.9	180.36	3.833		
9,900.0	6,512.4	9,854.2	6,451.6	92.8	93.7	-84.95	-225.1	-2,490.6	691.2	505.5	185.76	3.721		
10,000.0	6,512.1	9,954.2	6,451.4	95.6	96.5	-84.96	-225.1	-2,590.6	691.2	500.0	191.18	3.616		
10,100.0	6,511.7	10,054.2	6,451.2	98.3	99.2	-84.98	-225.1	-2,690.6	691.2	494.6	196.61	3.516		
10,200.0	6,511.3	10,154.2	6,450.9	101.0	101.9	-84.99	-225.1	-2,790.6	691.2	489.2	202.05	3.421		
10,300.0	6,510.9	10,254.2	6,450.7	103.7	104.6	-85.00	-225.1	-2,890.6	691.2	483.7	207.49	3.331		
10,400.0	6,510.6	10,354.2	6,450.5	106.5	107.4	-85.01	-225.1	-2,990.6	691.2	478.2	212.95	3.246		
10,500.0	6,510.2	10,454.2	6,450.3	109.2	110.1	-85.03	-225.1	-3,090.6	691.2	472.8	218.41	3.165		
10,600.0	6,509.8	10,554.2	6,450.0	112.0	112.8	-85.04	-225.1	-3,190.6	691.1	467.3	223.88	3.087		
10,700.0	6,509.4	10,654.2	6,449.8	114.7	115.6	-85.05	-225.1	-3,290.6	691.1	461.8	229.35	3.013		
10,800.0	6,509.0	10,754.2	6,449.6	117.5	118.3	-85.07	-225.1	-3,390.6	691.1	456.3	234.84	2.943		
10,900.0	6,508.7	10,854.2	6,449.4	120.2	121.1	-85.08	-225.1	-3,490.6	691.1	450.8	240.32	2.876		
11,000.0	6,508.3	10,954.2	6,449.1	123.0	123.8	-85.09	-225.1	-3,590.6	691.1	445.3	245.82	2.811		
11,100.0	6,507.9	11,054.2	6,448.9	125.7	126.6	-85.10	-225.1	-3,690.6	691.1	439.8	251.32	2.750		
11,200.0	6,507.5	11,154.2	6,448.7	128.5	129.4	-85.12	-225.1	-3,790.6	691.1	434.2	256.82	2.691		
11,300.0	6,507.1	11,254.2	6,448.4	131.2	132.1	-85.13	-225.1	-3,890.6	691.1	428.7	262.33	2.634		
11,400.0	6,506.8	11,354.2	6,448.2	134.0	134.9	-85.14	-225.1	-3,990.6	691.0	423.2	267.84	2.580		
11,500.0	6,506.4	11,454.2	6,448.0	136.8	137.6	-85.15	-225.1	-4,090.6	691.0	417.7	273.36	2.528		
11,600.0	6,506.0	11,554.2	6,447.8	139.5	140.4	-85.17	-225.1	-4,190.6	691.0	412.1	278.88	2.478		
11,700.0	6,505.6	11,654.2	6,447.5	142.3	143.2	-85.18	-225.1	-4,290.6	691.0	406.6	284.40	2.430		
11,800.0	6,505.2	11,754.2	6,447.3	145.1	145.9	-85.19	-225.1	-4,390.6	691.0	401.1	289.93	2.383		
11,900.0	6,504.9	11,854.2	6,447.1	147.8	148.7	-85.20	-225.1	-4,490.6	691.0	395.5	295.46	2.339		
12,000.0	6,504.5	11,954.2	6,446.9	150.6	151.5	-85.22	-225.1	-4,590.6	691.0	390.0	300.99	2.296		
12,100.0	6,504.1	12,054.2	6,446.6	153.4	154.3	-85.23	-225.1	-4,690.6	691.0	384.4	306.53	2.254		
12,200.0	6,503.7	12,154.2	6,446.4	156.2	157.0	-85.24	-225.1	-4,790.6	690.9	378.9	312.06	2.214		
12,300.0	6,503.3	12,254.2	6,446.2	158.9	159.8	-85.25	-225.1	-4,890.6	690.9	373.3	317.61	2.175		
12,400.0	6,503.0	12,354.2	6,445.9	161.7	162.6	-85.27	-225.1	-4,990.6	690.9	367.8	323.15	2.138		
12,500.0	6,502.6	12,454.2	6,445.7	164.5	165.4	-85.28	-225.1	-5,090.6	690.9	362.2	328.69	2.102		
12,600.0	6,502.2	12,554.2	6,445.5	167.3	168.2	-85.29	-225.1	-5,190.6	690.9	356.6	334.24	2.067		
12,700.0	6,501.8	12,654.2	6,445.3	170.1	170.9	-85.30	-225.1	-5,290.6	690.9	351.1	339.79	2.033		
12,800.0	6,501.5	12,754.2	6,445.0	172.9	173.7	-85.32	-225.1	-5,390.6	690.9	345.5	345.35	2.000		
12,900.0	6,501.1	12,854.2	6,444.8	175.6	176.5	-85.33	-225.1	-5,490.6	690.8	339.9	350.90	1.969		
13,000.0	6,500.7	12,954.2	6,444.6	178.4	179.3	-85.34	-225.1	-5,590.6	690.8	334.4	356.46	1.938		
13,100.0	6,500.3	13,054.2	6,444.4	181.2	182.1	-85.35	-225.1	-5,690.6	690.8	328.8	362.02	1.908		
13,200.0	6,499.9	13,154.2	6,444.1	184.0	184.9	-85.37	-225.1	-5,790.6	690.8	323.2	367.58	1.879		
13,300.0	6,499.6	13,254.2	6,443.9	186.8	187.6	-85.38	-225.1	-5,890.6	690.8	317.7	373.14	1.851		
13,400.0	6,499.2	13,354.2	6,443.7	189.6	190.4	-85.39	-225.1	-5,990.6	690.8	312.1	378.70	1.824		
13,500.0	6,498.8	13,454.2	6,443.4	192.4	193.2	-85.40	-225.1	-6,090.6	690.8	306.5	384.26	1.798		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												<b>Offset Site Error:</b>	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)												<b>Offset Well Error:</b>	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	6,498.4	13,554.2	6,443.2	195.1	196.0	-85.42	-225.1	-6,190.6	690.8	300.9	389.83	1.772	
13,670.4	6,498.2	13,624.6	6,443.1	197.1	198.0	-85.42	-225.1	-6,261.0	690.8	297.0	393.75	1.754	
13,700.0	6,498.0	13,648.3	6,443.0	197.9	198.6	-85.43	-225.1	-6,284.6	690.8	295.5	395.23	1.748	
13,710.4	6,498.0	13,648.3	6,443.0	198.2	198.6	-85.43	-225.1	-6,284.6	690.9	295.4	395.52	1.747 SF	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	-10.9	-41.8	43.2	43.2	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-104.65	-10.9	-41.8	43.2	43.0	0.23	190.254		
200.0	200.0	201.0	201.0	0.3	0.3	-104.65	-10.9	-41.8	43.2	42.5	0.68	63.839		
300.0	300.0	301.0	301.0	0.6	0.6	-104.65	-10.9	-41.8	43.2	42.1	1.13	38.355		
400.0	400.0	401.0	401.0	0.8	0.8	-104.65	-10.9	-41.8	43.2	41.6	1.58	27.412		
500.0	500.0	501.0	501.0	1.0	1.0	-104.65	-10.9	-41.8	43.2	41.2	2.03	21.327		
600.0	600.0	601.0	601.0	1.2	1.2	-104.65	-10.9	-41.8	43.2	40.7	2.47	17.453		
700.0	700.0	701.0	701.0	1.5	1.5	-104.65	-10.9	-41.8	43.2	40.3	2.92	14.770		
800.0	800.0	801.0	801.0	1.7	1.7	-104.65	-10.9	-41.8	43.2	39.8	3.37	12.802		
900.0	900.0	901.0	901.0	1.9	1.9	-104.65	-10.9	-41.8	43.2	39.4	3.82	11.297		
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	-104.65	-10.9	-41.8	43.2	38.9	4.27	10.108		
1,100.0	1,100.0	1,101.0	1,101.0	2.4	2.4	-104.65	-10.9	-41.8	43.2	38.5	4.72	9.146		
1,200.0	1,200.0	1,201.0	1,201.0	2.6	2.6	-104.65	-10.9	-41.8	43.2	38.0	5.17	8.351 CC, ES		
1,300.0	1,300.0	1,301.0	1,301.0	2.8	2.8	-175.08	-10.9	-41.8	44.5	38.9	5.61	7.929		
1,400.0	1,399.9	1,400.9	1,400.9	3.0	3.0	-175.48	-10.9	-41.8	48.4	42.4	6.04	8.012		
1,500.0	1,499.7	1,500.7	1,500.7	3.2	3.3	-176.01	-10.9	-41.8	54.9	48.5	6.47	8.487		
1,600.0	1,599.3	1,600.3	1,600.3	3.5	3.5	-176.57	-10.9	-41.8	64.1	57.2	6.90	9.285		
1,700.0	1,698.6	1,699.6	1,699.6	3.7	3.7	-177.09	-10.9	-41.8	75.8	68.5	7.32	10.348		
1,800.0	1,797.5	1,798.5	1,798.5	4.0	3.9	-177.55	-10.9	-41.8	90.1	82.4	7.75	11.633		
1,900.0	1,896.1	1,899.7	1,899.7	4.3	4.1	-178.16	-10.9	-40.5	105.8	97.7	8.16	12.977		
2,000.0	1,994.2	2,001.3	2,001.2	4.6	4.3	-179.05	-11.0	-36.5	121.7	113.1	8.55	14.230		
2,100.0	2,091.7	2,103.3	2,102.9	4.9	4.6	179.86	-11.0	-29.8	137.6	128.7	8.95	15.380		
2,200.0	2,188.6	2,205.6	2,204.8	5.3	4.8	178.65	-11.1	-20.3	153.8	144.4	9.35	16.438		
2,267.0	2,253.2	2,274.3	2,273.1	5.6	4.9	177.78	-11.1	-12.4	164.7	155.1	9.63	17.098		
2,300.0	2,284.9	2,308.2	2,306.7	5.8	5.0	177.34	-11.2	-8.0	169.9	160.2	9.79	17.367		
2,400.0	2,381.0	2,411.5	2,408.9	6.3	5.3	175.92	-11.3	7.1	184.3	174.1	10.27	17.951		
2,500.0	2,477.1	2,515.3	2,511.2	6.8	5.6	174.37	-11.4	25.0	196.4	185.6	10.78	18.223		
2,600.0	2,573.3	2,619.6	2,613.4	7.3	5.9	172.64	-11.5	45.8	206.1	194.8	11.31	18.223		
2,700.0	2,669.4	2,724.2	2,715.2	7.8	6.2	170.70	-11.7	69.5	213.6	201.7	11.88	17.975		
2,800.0	2,765.5	2,828.9	2,816.5	8.3	6.7	168.51	-11.9	95.9	219.0	206.5	12.51	17.508		
2,900.0	2,861.6	2,933.5	2,917.0	8.8	7.1	166.04	-12.1	125.2	222.4	209.2	13.20	16.847		
3,000.0	2,957.8	3,038.0	3,016.4	9.4	7.6	163.23	-12.3	157.1	223.9	209.9	13.97	16.020		
3,100.0	3,053.9	3,139.7	3,112.5	9.9	8.1	160.15	-12.6	190.5	224.0	209.2	14.84	15.093		
3,200.0	3,150.0	3,239.0	3,206.2	10.5	8.7	157.10	-12.8	223.3	224.6	208.8	15.79	14.223		
3,300.0	3,246.1	3,338.3	3,299.9	11.0	9.3	154.07	-13.0	256.2	225.8	208.9	16.82	13.425		
3,400.0	3,342.3	3,437.5	3,393.5	11.6	9.9	151.08	-13.3	289.1	227.6	209.6	17.92	12.698		
3,500.0	3,438.4	3,536.8	3,487.2	12.1	10.5	148.14	-13.5	322.0	230.0	210.9	19.10	12.044		
3,600.0	3,534.5	3,636.1	3,580.9	12.7	11.1	145.28	-13.7	354.9	233.0	212.7	20.33	11.460		
3,700.0	3,630.6	3,735.4	3,674.5	13.3	11.7	142.49	-14.0	387.8	236.6	215.0	21.62	10.943		
3,800.0	3,726.8	3,834.6	3,768.2	13.8	12.4	139.79	-14.2	420.7	240.8	217.8	22.95	10.489		
3,900.0	3,822.9	3,933.9	3,861.8	14.4	13.0	137.18	-14.4	453.6	245.4	221.1	24.32	10.092		
4,000.0	3,919.0	4,033.2	3,955.5	15.0	13.7	134.68	-14.7	486.5	250.6	224.9	25.71	9.747		
4,100.0	4,015.1	4,132.4	4,049.2	15.5	14.3	132.28	-14.9	519.4	256.2	229.1	27.12	9.449		
4,200.0	4,111.2	4,231.7	4,142.8	16.1	15.0	129.99	-15.1	552.3	262.3	233.7	28.54	9.191		
4,300.0	4,207.4	4,331.0	4,236.5	16.7	15.6	127.80	-15.3	585.2	268.7	238.8	29.96	8.970		
4,400.0	4,303.5	4,430.3	4,330.2	17.2	16.3	125.72	-15.6	618.1	275.6	244.2	31.38	8.780		
4,500.0	4,399.6	4,529.5	4,423.8	17.8	17.0	123.74	-15.8	651.0	282.8	249.9	32.81	8.619		
4,600.0	4,495.7	4,628.8	4,517.5	18.4	17.7	121.86	-16.0	683.9	290.3	256.0	34.22	8.481		
4,700.0	4,591.9	4,728.1	4,611.2	18.9	18.3	120.07	-16.3	716.8	298.1	262.4	35.63	8.365		
4,800.0	4,688.0	4,827.4	4,704.8	19.5	19.0	118.38	-16.5	749.7	306.1	269.1	37.03	8.267		
4,900.0	4,784.1	4,926.6	4,798.5	20.1	19.7	116.78	-16.7	782.5	314.5	276.1	38.42	8.184		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	4,880.2	5,025.9	4,892.1	20.7	20.4	115.25	-17.0	815.4	323.0	283.2	39.80	8.116		
5,100.0	4,976.4	5,125.2	4,985.8	21.2	21.0	113.81	-17.2	848.3	331.8	290.7	41.17	8.059		
5,200.0	5,072.5	5,224.4	5,079.5	21.8	21.7	112.44	-17.4	881.2	340.8	298.3	42.53	8.013		
5,300.0	5,168.6	5,323.7	5,173.1	22.4	22.4	111.14	-17.7	914.1	350.0	306.1	43.88	7.976		
5,400.0	5,264.7	5,423.0	5,266.8	23.0	23.1	109.91	-17.9	947.0	359.3	314.1	45.21	7.947		
5,500.0	5,360.9	5,522.3	5,360.5	23.6	23.8	108.75	-18.1	979.9	368.8	322.3	46.54	7.925		
5,600.0	5,457.0	5,621.5	5,454.1	24.1	24.5	107.64	-18.4	1,012.8	378.5	330.6	47.85	7.908		
5,700.0	5,553.1	5,721.7	5,549.1	24.7	25.1	106.77	-18.6	1,044.7	388.2	339.1	49.08	7.909		
5,712.7	5,565.3	5,734.6	5,561.5	24.8	25.1	106.76	-18.6	1,048.2	389.4	340.2	49.21	7.913		
5,750.0	5,601.4	5,772.5	5,598.3	25.0	25.3	111.15	-18.7	1,057.0	393.0	343.5	49.51	7.937		
5,800.0	5,650.3	5,823.2	5,648.2	25.1	25.5	120.28	-18.8	1,066.1	397.8	348.0	49.80	7.989		
5,850.0	5,699.8	5,873.9	5,698.6	25.3	25.6	136.96	-19.0	1,071.8	402.7	352.7	50.00	8.054		
5,900.0	5,749.5	5,924.6	5,749.3	25.4	25.6	167.73	-19.1	1,074.1	407.6	357.5	50.12	8.133		
5,950.0	5,799.2	5,975.3	5,799.9	25.4	25.7	-155.29	-19.2	1,073.1	412.6	362.4	50.16	8.225		
6,000.0	5,848.8	6,026.0	5,850.4	25.4	25.7	-131.79	-19.3	1,068.7	417.5	367.3	50.14	8.326		
6,050.0	5,898.0	6,076.7	5,900.5	25.4	25.6	-119.39	-19.5	1,061.0	422.4	372.3	50.05	8.438		
6,100.0	5,946.7	6,127.3	5,949.9	25.4	25.6	-112.22	-19.6	1,049.9	427.2	377.3	49.92	8.558		
6,150.0	5,994.5	6,178.0	5,998.5	25.3	25.5	-107.61	-19.7	1,035.7	431.9	382.2	49.74	8.684		
6,200.0	6,041.4	6,228.6	6,046.0	25.2	25.4	-104.37	-19.8	1,018.2	436.6	387.1	49.52	8.816		
6,250.0	6,087.1	6,279.2	6,092.2	25.1	25.3	-101.94	-19.9	997.7	441.1	391.8	49.28	8.951		
6,300.0	6,131.4	6,329.7	6,137.0	25.0	25.2	-100.05	-20.1	974.1	445.5	396.5	49.03	9.086		
6,350.0	6,174.1	6,380.3	6,180.0	24.9	25.1	-98.51	-20.2	947.7	449.8	401.0	48.79	9.219		
6,400.0	6,215.0	6,430.9	6,221.3	24.8	25.0	-97.22	-20.3	918.5	453.8	405.3	48.56	9.346		
6,450.0	6,254.0	6,481.4	6,260.5	24.6	24.9	-96.13	-20.4	886.6	457.7	409.3	48.36	9.465		
6,500.0	6,290.9	6,531.9	6,297.4	24.5	24.8	-95.18	-20.5	852.2	461.4	413.2	48.20	9.571		
6,550.0	6,325.5	6,582.4	6,332.1	24.4	24.8	-94.36	-20.5	815.5	464.8	416.7	48.12	9.660		
6,600.0	6,357.8	6,632.8	6,364.2	24.3	24.8	-93.64	-20.6	776.5	468.0	419.9	48.11	9.728		
6,650.0	6,387.4	6,683.3	6,393.6	24.3	24.9	-93.00	-20.7	735.6	471.0	422.8	48.20	9.771		
6,700.0	6,414.5	6,733.7	6,420.3	24.3	25.0	-92.43	-20.8	692.9	473.6	425.2	48.39	9.787		
6,750.0	6,438.7	6,784.0	6,444.0	24.4	25.2	-91.93	-20.8	648.5	476.1	427.3	48.71	9.773		
6,800.0	6,460.0	6,834.4	6,464.8	24.5	25.4	-91.48	-20.9	602.6	478.2	429.0	49.16	9.728		
6,850.0	6,478.3	6,884.7	6,482.5	24.6	25.7	-91.10	-20.9	555.6	480.0	430.3	49.73	9.652		
6,900.0	6,493.6	6,934.9	6,497.1	24.9	26.1	-90.76	-21.0	507.5	481.5	431.1	50.44	9.547		
6,950.0	6,505.7	6,985.1	6,508.5	25.2	26.5	-90.47	-21.0	458.6	482.8	431.5	51.28	9.415		
7,000.0	6,514.7	7,035.3	6,516.6	25.6	27.0	-90.24	-21.0	409.1	483.7	431.4	52.23	9.260		
7,050.0	6,520.4	7,085.4	6,521.4	26.0	27.5	-90.04	-21.0	359.3	484.2	430.9	53.30	9.086		
7,100.0	6,522.9	7,135.4	6,523.0	26.5	28.1	-89.90	-21.0	309.2	484.5	430.1	54.45	8.898		
7,116.1	6,523.0	7,151.6	6,522.9	26.7	28.3	-89.88	-21.0	293.1	484.5	429.7	54.86	8.833		
7,200.0	6,522.7	7,235.4	6,522.6	27.7	29.5	-89.88	-21.0	209.2	484.5	427.4	57.09	8.487		
7,300.0	6,522.3	7,335.4	6,522.2	29.2	31.0	-89.88	-21.0	109.2	484.5	424.4	60.11	8.061		
7,400.0	6,521.9	7,435.4	6,521.9	30.8	32.7	-89.88	-21.0	9.2	484.5	421.0	63.48	7.632		
7,500.0	6,521.5	7,535.4	6,521.5	32.7	34.5	-89.88	-21.0	-90.8	484.5	417.4	67.16	7.214		
7,600.0	6,521.2	7,635.4	6,521.1	34.6	36.5	-89.88	-21.0	-190.8	484.5	413.4	71.09	6.815		
7,700.0	6,520.8	7,735.4	6,520.7	36.7	38.5	-89.88	-21.0	-290.8	484.5	409.3	75.24	6.440		
7,800.0	6,520.4	7,835.4	6,520.4	38.9	40.7	-89.88	-21.0	-390.7	484.5	405.0	79.57	6.089		
7,900.0	6,520.0	7,935.4	6,520.0	41.1	42.9	-89.88	-21.0	-490.7	484.5	400.5	84.05	5.765		
8,000.0	6,519.6	8,035.4	6,519.6	43.5	45.2	-89.88	-21.0	-590.7	484.5	395.9	88.66	5.465		
8,100.0	6,519.3	8,135.4	6,519.2	45.8	47.6	-89.88	-21.0	-690.7	484.5	391.1	93.39	5.188		
8,200.0	6,518.9	8,235.4	6,518.8	48.3	50.0	-89.88	-21.0	-790.7	484.5	386.3	98.20	4.934		
8,300.0	6,518.5	8,335.4	6,518.5	50.7	52.4	-89.88	-21.0	-890.7	484.5	381.4	103.10	4.699		
8,400.0	6,518.1	8,435.4	6,518.1	53.2	54.9	-89.88	-21.0	-990.7	484.5	376.5	108.07	4.483		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	
8,500.0	6,517.8	8,535.4	6,517.7	55.7	57.4	-89.88	-21.0	-1,090.7	484.5	371.4	113.10	4.284		
8,600.0	6,517.4	8,635.4	6,517.3	58.3	59.9	-89.88	-21.0	-1,190.7	484.5	366.3	118.19	4.100		
8,700.0	6,517.0	8,735.4	6,516.9	60.9	62.5	-89.88	-21.0	-1,290.7	484.5	361.2	123.32	3.929		
8,800.0	6,516.6	8,835.4	6,516.6	63.5	65.1	-89.88	-21.0	-1,390.7	484.5	356.0	128.49	3.771		
8,900.0	6,516.2	8,935.4	6,516.2	66.1	67.7	-89.88	-21.0	-1,490.7	484.5	350.8	133.70	3.624		
9,000.0	6,515.9	9,035.4	6,515.8	68.7	70.3	-89.88	-21.0	-1,590.7	484.5	345.6	138.94	3.487		
9,100.0	6,515.5	9,135.4	6,515.4	71.3	72.9	-89.88	-21.0	-1,690.7	484.5	340.3	144.20	3.360		
9,200.0	6,515.1	9,235.4	6,515.0	74.0	75.5	-89.88	-21.0	-1,790.7	484.5	335.0	149.50	3.241		
9,300.0	6,514.7	9,335.4	6,514.7	76.7	78.2	-89.88	-21.0	-1,890.7	484.5	329.7	154.82	3.130		
9,400.0	6,514.3	9,435.4	6,514.3	79.3	80.9	-89.88	-21.0	-1,990.7	484.5	324.4	160.15	3.025		
9,500.0	6,514.0	9,535.4	6,513.9	82.0	83.5	-89.88	-21.0	-2,090.7	484.5	319.0	165.51	2.927		
9,600.0	6,513.6	9,635.4	6,513.5	84.7	86.2	-89.88	-21.0	-2,190.7	484.5	313.6	170.88	2.835		
9,700.0	6,513.2	9,735.4	6,513.2	87.4	88.9	-89.88	-21.0	-2,290.7	484.5	308.3	176.27	2.749		
9,800.0	6,512.8	9,835.4	6,512.8	90.1	91.6	-89.88	-21.0	-2,390.7	484.5	302.9	181.68	2.667		
9,900.0	6,512.4	9,935.4	6,512.4	92.8	94.3	-89.88	-21.0	-2,490.7	484.5	297.4	187.09	2.590		
10,000.0	6,512.1	10,035.4	6,512.0	95.6	97.0	-89.88	-21.0	-2,590.7	484.5	292.0	192.52	2.517		
10,100.0	6,511.7	10,135.4	6,511.6	98.3	99.7	-89.88	-21.0	-2,690.7	484.5	286.6	197.96	2.448		
10,200.0	6,511.3	10,235.4	6,511.3	101.0	102.5	-89.88	-21.0	-2,790.7	484.5	281.1	203.41	2.382		
10,300.0	6,510.9	10,335.4	6,510.9	103.7	105.2	-89.88	-21.0	-2,890.7	484.5	275.7	208.87	2.320		
10,400.0	6,510.6	10,435.4	6,510.5	106.5	107.9	-89.88	-21.0	-2,990.7	484.5	270.2	214.33	2.261		
10,500.0	6,510.2	10,535.4	6,510.1	109.2	110.6	-89.88	-21.0	-3,090.7	484.5	264.7	219.81	2.204		
10,600.0	6,509.8	10,635.4	6,509.7	112.0	113.4	-89.88	-21.0	-3,190.7	484.5	259.2	225.29	2.151		
10,700.0	6,509.4	10,735.4	6,509.4	114.7	116.1	-89.88	-21.0	-3,290.7	484.5	253.8	230.77	2.100		
10,800.0	6,509.0	10,835.4	6,509.0	117.5	118.9	-89.88	-21.0	-3,390.7	484.5	248.3	236.27	2.051		
10,900.0	6,508.7	10,935.4	6,508.6	120.2	121.6	-89.88	-21.0	-3,490.7	484.5	242.8	241.77	2.004		
11,000.0	6,508.3	11,035.4	6,508.2	123.0	124.4	-89.88	-21.0	-3,590.7	484.5	237.3	247.27	1.959		
11,100.0	6,507.9	11,135.4	6,507.8	125.7	127.1	-89.88	-21.0	-3,690.7	484.5	231.7	252.78	1.917		
11,200.0	6,507.5	11,235.4	6,507.5	128.5	129.9	-89.88	-21.0	-3,790.7	484.5	226.2	258.30	1.876		
11,300.0	6,507.1	11,335.4	6,507.1	131.2	132.6	-89.88	-21.0	-3,890.7	484.5	220.7	263.82	1.837		
11,400.0	6,506.8	11,435.4	6,506.7	134.0	135.4	-89.88	-21.0	-3,990.7	484.5	215.2	269.34	1.799		
11,500.0	6,506.4	11,535.4	6,506.3	136.8	138.2	-89.88	-21.0	-4,090.7	484.5	209.7	274.87	1.763		
11,600.0	6,506.0	11,635.4	6,506.0	139.5	140.9	-89.88	-21.0	-4,190.7	484.5	204.1	280.40	1.728		
11,700.0	6,505.6	11,735.4	6,505.6	142.3	143.7	-89.88	-21.0	-4,290.7	484.5	198.6	285.94	1.695		
11,800.0	6,505.2	11,835.4	6,505.2	145.1	146.4	-89.88	-21.0	-4,390.7	484.5	193.1	291.48	1.662		
11,900.0	6,504.9	11,935.4	6,504.8	147.8	149.2	-89.88	-21.0	-4,490.7	484.5	187.5	297.02	1.631		
12,000.0	6,504.5	12,035.4	6,504.4	150.6	152.0	-89.88	-21.0	-4,590.7	484.5	182.0	302.56	1.601		
12,100.0	6,504.1	12,135.4	6,504.1	153.4	154.8	-89.88	-21.0	-4,690.7	484.5	176.4	308.11	1.573		
12,200.0	6,503.7	12,235.4	6,503.7	156.2	157.5	-89.88	-21.0	-4,790.7	484.5	170.9	313.66	1.545		
12,300.0	6,503.3	12,335.4	6,503.3	158.9	160.3	-89.88	-21.0	-4,890.7	484.5	165.3	319.21	1.518		
12,400.0	6,503.0	12,435.4	6,502.9	161.7	163.1	-89.88	-21.0	-4,990.7	484.5	159.8	324.77	1.492 Level 3		
12,500.0	6,502.6	12,535.4	6,502.5	164.5	165.9	-89.88	-21.0	-5,090.7	484.5	154.2	330.32	1.467 Level 3		
12,600.0	6,502.2	12,635.4	6,502.2	167.3	168.6	-89.88	-21.0	-5,190.7	484.5	148.7	335.88	1.443 Level 3		
12,700.0	6,501.8	12,735.4	6,501.8	170.1	171.4	-89.88	-21.0	-5,290.7	484.5	143.1	341.44	1.419 Level 3		
12,800.0	6,501.5	12,835.4	6,501.4	172.9	174.2	-89.88	-21.0	-5,390.7	484.5	137.5	347.01	1.396 Level 3		
12,900.0	6,501.1	12,935.4	6,501.0	175.6	177.0	-89.88	-21.0	-5,490.7	484.5	132.0	352.57	1.374 Level 3		
13,000.0	6,500.7	13,035.4	6,500.7	178.4	179.8	-89.88	-21.0	-5,590.7	484.5	126.4	358.14	1.353 Level 3		
13,100.0	6,500.3	13,135.4	6,500.3	181.2	182.5	-89.88	-21.0	-5,690.7	484.5	120.8	363.71	1.332 Level 3		
13,200.0	6,499.9	13,235.4	6,499.9	184.0	185.3	-89.88	-21.0	-5,790.7	484.5	115.3	369.28	1.312 Level 3		
13,300.0	6,499.6	13,335.4	6,499.5	186.8	188.1	-89.88	-21.0	-5,890.7	484.5	109.7	374.85	1.293 Level 3		
13,400.0	6,499.2	13,435.4	6,499.1	189.6	190.9	-89.88	-21.0	-5,990.7	484.5	104.1	380.42	1.274 Level 3		
13,500.0	6,498.8	13,535.4	6,498.8	192.4	193.7	-89.88	-21.0	-6,090.7	484.5	98.5	385.99	1.255 Level 3		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													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	
13,600.0	6,498.4	13,635.4	6,498.4	195.1	196.5	-89.88	-21.0	-6,190.7	484.5	93.0	391.57	1.237	Level 2	
13,660.8	6,498.2	13,696.3	6,498.1	196.8	198.2	-89.88	-21.0	-6,251.6	484.5	89.6	394.96	1.227	Level 2	
13,700.0	6,498.0	13,734.8	6,498.0	197.9	199.2	-89.88	-21.0	-6,290.1	484.5	87.4	397.13	1.220	Level 2	
13,710.4	6,498.0	13,734.8	6,498.0	198.2	199.2	-89.88	-21.0	-6,290.1	484.7	87.2	397.42	1.220	Level 2, SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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	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 CC, ES	
500.0	500.0	499.0	499.0	1.0	1.0	76.98	13.8	59.5	61.1	59.1	2.00	30.532	
600.0	600.0	598.0	597.9	1.2	1.2	79.73	11.3	62.5	63.5	61.1	2.42	26.239	
700.0	700.0	696.6	696.3	1.5	1.4	83.84	7.3	67.4	67.9	65.0	2.86	23.750	
800.0	800.0	794.9	794.2	1.7	1.6	88.74	1.6	74.3	74.5	71.2	3.32	22.460	
900.0	900.0	892.6	891.2	1.9	1.9	93.83	-5.6	83.0	83.7	79.8	3.80	21.999 SF	
1,000.0	1,000.0	989.7	987.3	2.1	2.2	98.67	-14.3	93.6	95.5	91.2	4.32	22.110	
1,100.0	1,100.0	1,086.0	1,082.3	2.4	2.5	102.98	-24.4	106.0	110.2	105.3	4.87	22.609	
1,200.0	1,200.0	1,181.5	1,176.0	2.6	2.9	106.70	-36.0	120.0	127.6	122.1	5.46	23.362	
1,300.0	1,300.0	1,276.1	1,268.4	2.8	3.3	39.67	-48.9	135.8	146.8	141.1	5.61	26.155	
1,400.0	1,399.9	1,369.9	1,359.5	3.0	3.7	42.91	-63.2	153.1	166.8	160.7	6.06	27.529	
1,500.0	1,499.7	1,462.9	1,449.2	3.2	4.2	46.10	-78.7	172.0	187.8	181.3	6.51	28.868	
1,600.0	1,599.3	1,560.0	1,542.6	3.5	4.7	49.30	-95.6	192.6	208.9	202.0	6.97	29.986	
1,700.0	1,698.6	1,657.1	1,636.0	3.7	5.2	52.38	-112.6	213.2	229.0	221.6	7.44	30.789	
1,800.0	1,797.5	1,754.3	1,729.4	4.0	5.8	55.42	-129.5	233.8	248.3	240.4	7.93	31.304	
1,900.0	1,896.1	1,851.4	1,822.9	4.3	6.3	58.45	-146.4	254.4	267.0	258.5	8.46	31.551	
2,000.0	1,994.2	1,948.5	1,916.2	4.6	6.9	61.50	-163.3	274.9	285.1	276.1	9.04	31.544	
2,100.0	2,091.7	2,045.4	2,009.4	4.9	7.4	64.59	-180.2	295.5	303.0	293.3	9.68	31.305	
2,200.0	2,188.6	2,142.1	2,102.3	5.3	8.0	67.71	-197.0	315.9	320.8	310.4	10.39	30.861	
2,267.0	2,253.2	2,206.7	2,164.5	5.6	8.4	69.83	-208.3	329.6	332.8	321.9	10.92	30.468	
2,300.0	2,284.9	2,238.5	2,195.0	5.8	8.6	70.94	-213.8	336.4	338.8	327.6	11.20	30.255	
2,400.0	2,381.0	2,334.8	2,287.7	6.3	9.1	74.08	-230.6	356.8	357.7	345.7	12.07	29.640	
2,500.0	2,477.1	2,431.1	2,380.3	6.8	9.7	76.91	-247.4	377.2	377.6	364.6	12.99	29.080	
2,600.0	2,573.3	2,527.4	2,472.9	7.3	10.2	79.46	-264.2	397.6	398.3	384.4	13.94	28.579	
2,700.0	2,669.4	2,623.7	2,565.5	7.8	10.8	81.76	-280.9	418.0	419.7	404.8	14.92	28.137	
2,800.0	2,765.5	2,720.0	2,658.1	8.3	11.4	83.84	-297.7	438.4	441.8	425.8	15.92	27.751	
2,900.0	2,861.6	2,816.4	2,750.8	8.8	11.9	85.72	-314.5	458.8	464.3	447.4	16.94	27.415	
3,000.0	2,957.8	2,912.7	2,843.4	9.4	12.5	87.44	-331.3	479.3	487.3	469.3	17.96	27.125	
3,100.0	3,053.9	3,009.0	2,936.0	9.9	13.1	89.00	-348.0	499.7	510.6	491.6	19.00	26.874	
3,200.0	3,150.0	3,105.3	3,028.6	10.5	13.6	90.42	-364.8	520.1	534.3	514.3	20.04	26.658	
3,300.0	3,246.1	3,201.6	3,121.2	11.0	14.2	91.73	-381.6	540.5	558.3	537.2	21.09	26.471	
3,400.0	3,342.3	3,297.9	3,213.9	11.6	14.8	92.93	-398.4	560.9	582.5	560.4	22.14	26.310	
3,500.0	3,438.4	3,394.3	3,306.5	12.1	15.3	94.03	-415.2	581.3	607.0	583.8	23.19	26.171	
3,600.0	3,534.5	3,490.6	3,399.1	12.7	15.9	95.05	-431.9	601.7	631.6	607.4	24.25	26.050	
3,700.0	3,630.6	3,586.9	3,491.7	13.3	16.5	95.99	-448.7	622.1	656.5	631.2	25.30	25.946	
3,800.0	3,726.8	3,683.2	3,584.4	13.8	17.0	96.87	-465.5	642.6	681.4	655.1	26.36	25.855	
3,900.0	3,822.9	3,779.5	3,677.0	14.4	17.6	97.68	-482.3	663.0	706.6	679.2	27.41	25.777	
4,000.0	3,919.0	3,875.8	3,769.6	15.0	18.2	98.44	-499.0	683.4	731.8	703.4	28.47	25.708	
4,100.0	4,015.1	3,972.2	3,862.2	15.5	18.7	99.15	-515.8	703.8	757.2	727.7	29.52	25.649	
4,200.0	4,111.2	4,068.5	3,954.8	16.1	19.3	99.81	-532.6	724.2	782.6	752.1	30.57	25.598	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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 (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	76.62	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 CC, ES		
900.0	900.0	899.4	899.4	1.9	1.9	78.22	6.6	31.7	32.4	28.6	3.80	8.537		
1,000.0	1,000.0	998.7	998.6	2.1	2.1	82.51	4.6	35.1	35.4	31.2	4.22	8.395 SF		
1,100.0	1,100.0	1,097.6	1,097.3	2.4	2.3	88.21	1.3	40.5	40.7	36.0	4.64	8.756		
1,200.0	1,200.0	1,196.2	1,195.5	2.6	2.5	94.01	-3.4	48.2	48.5	43.4	5.09	9.535		
1,300.0	1,300.0	1,294.4	1,293.0	2.8	2.7	29.39	-9.3	57.9	58.0	52.5	5.49	10.559		
1,400.0	1,399.9	1,392.1	1,389.8	3.0	3.0	35.22	-16.5	69.8	68.1	62.2	5.91	11.534		
1,500.0	1,499.7	1,489.4	1,485.6	3.2	3.3	40.99	-24.9	83.7	79.4	73.0	6.33	12.535		
1,600.0	1,599.3	1,586.1	1,580.5	3.5	3.6	46.51	-34.6	99.5	92.0	85.2	6.77	13.588		
1,700.0	1,698.6	1,682.1	1,674.3	3.7	4.0	51.67	-45.4	117.3	106.1	98.9	7.22	14.689		
1,800.0	1,797.5	1,777.5	1,766.9	4.0	4.4	56.39	-57.3	136.9	122.0	114.3	7.71	15.817		
1,900.0	1,896.1	1,872.6	1,858.5	4.3	4.9	60.67	-70.4	158.5	139.7	131.5	8.25	16.937		
2,000.0	1,994.2	1,970.2	1,952.5	4.6	5.4	64.78	-84.3	181.3	158.0	149.1	8.85	17.839		
2,100.0	2,091.7	2,067.8	2,046.3	4.9	5.9	68.77	-98.2	204.2	176.0	166.4	9.54	18.453		
2,200.0	2,188.6	2,165.3	2,140.1	5.3	6.4	72.68	-112.1	227.0	194.0	183.7	10.30	18.823		
2,267.0	2,253.2	2,230.5	2,202.7	5.6	6.8	75.28	-121.4	242.3	206.1	195.3	10.87	18.960		
2,300.0	2,284.9	2,262.6	2,233.6	5.8	6.9	76.60	-125.9	249.8	212.2	201.1	11.17	19.003		
2,400.0	2,381.0	2,359.8	2,327.0	6.3	7.5	80.19	-139.8	272.6	231.3	219.2	12.09	19.124		
2,500.0	2,477.1	2,456.9	2,420.5	6.8	8.0	83.23	-153.6	295.4	251.1	238.1	13.06	19.233		
2,600.0	2,573.3	2,554.1	2,514.0	7.3	8.6	85.82	-167.5	318.1	271.5	257.5	14.04	19.334		
2,700.0	2,669.4	2,651.3	2,607.5	7.8	9.1	88.06	-181.3	340.9	292.4	277.4	15.05	19.429		
2,800.0	2,765.5	2,748.5	2,700.9	8.3	9.7	89.99	-195.2	363.7	313.7	297.6	16.07	19.518		
2,900.0	2,861.6	2,845.7	2,794.4	8.8	10.2	91.68	-209.0	386.5	335.2	318.1	17.10	19.603		
3,000.0	2,957.8	2,942.9	2,887.9	9.4	10.8	93.17	-222.8	409.2	357.0	338.9	18.14	19.684		
3,100.0	3,053.9	3,040.1	2,981.4	9.9	11.3	94.49	-236.7	432.0	379.0	359.9	19.18	19.761		
3,200.0	3,150.0	3,137.3	3,074.8	10.5	11.9	95.66	-250.5	454.8	401.2	381.0	20.23	19.834		
3,300.0	3,246.1	3,234.5	3,168.3	11.0	12.5	96.71	-264.4	477.5	423.5	402.3	21.28	19.904		
3,400.0	3,342.3	3,331.7	3,261.8	11.6	13.0	97.66	-278.2	500.3	446.0	423.7	22.33	19.970		
3,500.0	3,438.4	3,428.9	3,355.2	12.1	13.6	98.51	-292.0	523.1	468.5	445.1	23.39	20.033		
3,600.0	3,534.5	3,526.1	3,448.7	12.7	14.2	99.29	-305.9	545.9	491.2	466.7	24.45	20.092		
3,700.0	3,630.6	3,623.3	3,542.2	13.3	14.7	100.00	-319.7	568.6	513.9	488.4	25.50	20.149		
3,800.0	3,726.8	3,720.5	3,635.7	13.8	15.3	100.64	-333.6	591.4	536.7	510.1	26.56	20.203		
3,900.0	3,822.9	3,817.7	3,729.1	14.4	15.9	101.24	-347.4	614.2	559.5	531.9	27.62	20.254		
4,000.0	3,919.0	3,914.9	3,822.6	15.0	16.4	101.79	-361.3	637.0	582.4	553.7	28.69	20.303		
4,100.0	4,015.1	4,012.1	3,916.1	15.5	17.0	102.30	-375.1	659.7	605.4	575.6	29.75	20.349		
4,200.0	4,111.2	4,109.3	4,009.5	16.1	17.6	102.77	-388.9	682.5	628.4	597.5	30.81	20.394		
4,300.0	4,207.4	4,206.5	4,103.0	16.7	18.1	103.21	-402.8	705.3	651.4	619.5	31.87	20.436		
4,400.0	4,303.5	4,303.7	4,196.5	17.2	18.7	103.61	-416.6	728.0	674.4	641.5	32.94	20.476		
4,500.0	4,399.6	4,400.9	4,290.0	17.8	19.3	103.99	-430.5	750.8	697.5	663.5	34.00	20.514		
4,600.0	4,495.7	4,498.1	4,383.4	18.4	19.9	104.35	-444.3	773.6	720.6	685.6	35.07	20.551		
4,700.0	4,591.9	4,595.3	4,476.9	18.9	20.4	104.68	-458.1	796.4	743.8	707.7	36.13	20.586		
4,800.0	4,688.0	4,692.5	4,570.4	19.5	21.0	105.00	-472.0	819.1	766.9	729.7	37.20	20.619		
4,900.0	4,784.1	4,789.7	4,663.9	20.1	21.6	105.29	-485.8	841.9	790.1	751.9	38.26	20.651		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing Wells Sec.19-T5N-R63W - Christenson 2-19 (Exist) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
<b>Survey Program:</b> 100-NS-GYRO-MS													<b>Offset Well Error:</b>	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		
7,800.0	6,520.4	6,491.3	6,489.4	38.9	13.9	89.07	943.0	-984.1	762.9	710.1	52.80	14.450		
7,900.0	6,520.0	6,491.1	6,489.1	41.1	13.9	89.04	943.0	-984.1	688.0	633.0	55.05	12.499		
8,000.0	6,519.6	6,490.9	6,488.9	43.5	13.9	89.01	943.0	-984.1	620.3	562.9	57.36	10.813		
8,100.0	6,519.3	6,490.6	6,488.7	45.8	13.9	88.98	943.0	-984.1	562.2	502.4	59.73	9.412		
8,200.0	6,518.9	6,490.4	6,488.4	48.3	13.9	88.96	943.0	-984.1	517.1	454.9	62.15	8.320		
8,300.0	6,518.5	6,490.2	6,488.2	50.7	13.9	88.93	943.0	-984.1	488.6	424.0	64.61	7.562		
8,393.4	6,518.2	6,489.9	6,488.0	53.1	13.9	88.90	943.0	-984.1	479.6	412.6	66.93	7.165 CC		
8,400.0	6,518.1	6,489.9	6,488.0	53.2	13.9	88.90	943.0	-984.1	479.6	412.5	67.10	7.148 ES		
8,500.0	6,517.8	6,489.7	6,487.7	55.7	13.9	88.87	943.0	-984.1	491.3	421.6	69.62	7.056 SF		
8,600.0	6,517.4	6,489.5	6,487.5	58.3	13.9	88.85	943.0	-984.1	522.2	450.0	72.17	7.235		
8,700.0	6,517.0	6,489.2	6,487.3	60.9	13.9	88.82	942.9	-984.1	569.2	494.4	74.74	7.615		
8,800.0	6,516.6	6,489.0	6,487.0	63.5	13.9	88.79	942.9	-984.1	628.7	551.4	77.33	8.130		
8,900.0	6,516.2	6,488.8	6,486.8	66.1	13.9	88.76	942.9	-984.1	697.6	617.6	79.94	8.726		
9,000.0	6,515.9	6,488.5	6,486.6	68.7	13.9	88.74	942.9	-984.1	773.3	690.7	82.57	9.365		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19V (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		
2,400.0	2,381.0	2,386.0	2,385.8	6.3	4.7	1.64	306.3	919.1	784.2	774.5	9.70	80.829		
2,500.0	2,477.1	2,482.9	2,482.8	6.8	4.8	1.66	307.2	919.8	757.6	747.5	10.10	74.975		
2,600.0	2,573.3	2,580.2	2,580.0	7.3	4.9	1.69	307.8	920.6	730.9	720.4	10.48	69.742		
2,700.0	2,669.4	2,677.4	2,677.2	7.8	5.0	1.74	308.2	921.3	704.1	693.3	10.85	64.880		
2,800.0	2,765.5	2,774.6	2,774.4	8.3	5.2	1.80	308.5	921.8	677.2	666.0	11.23	60.314		
2,900.0	2,861.6	2,871.7	2,871.5	8.8	5.3	1.88	308.7	922.4	650.2	638.5	11.61	56.022		
3,000.0	2,957.8	2,968.8	2,968.5	9.4	5.4	1.98	308.6	922.8	623.0	611.0	11.99	51.981		
3,100.0	3,053.9	3,068.8	3,068.6	9.9	5.5	2.14	308.1	923.1	595.6	583.2	12.36	48.192		
3,200.0	3,150.0	3,169.8	3,169.5	10.5	5.6	2.46	306.0	923.0	567.3	554.6	12.73	44.571		
3,300.0	3,246.1	3,270.1	3,269.8	11.0	5.7	2.97	302.3	922.5	538.3	525.2	13.10	41.087		
3,400.0	3,342.3	3,369.8	3,369.4	11.6	5.8	3.70	297.0	921.6	508.4	495.0	13.48	37.730		
3,500.0	3,438.4	3,468.8	3,468.1	12.1	5.9	4.70	290.2	920.3	477.9	464.1	13.86	34.491		
3,600.0	3,534.5	3,564.2	3,563.2	12.7	6.0	5.92	282.7	918.7	447.0	432.8	14.27	31.335		
3,700.0	3,630.6	3,658.5	3,657.2	13.3	6.1	7.22	275.7	917.1	416.4	401.7	14.70	28.333		
3,800.0	3,726.8	3,753.0	3,751.5	13.8	6.2	8.62	269.5	915.4	386.0	370.9	15.14	25.497		
3,900.0	3,822.9	3,847.6	3,845.9	14.4	6.4	10.15	263.8	913.6	356.0	340.4	15.60	22.817		
4,000.0	3,919.0	3,942.4	3,940.6	15.0	6.5	11.84	258.9	911.8	326.2	310.2	16.09	20.283		
4,100.0	4,015.1	4,037.7	4,035.7	15.5	6.6	13.74	254.5	909.9	296.8	280.2	16.62	17.864		
4,200.0	4,111.2	4,133.2	4,131.2	16.1	6.8	16.00	250.4	907.9	267.6	250.4	17.22	15.542		
4,300.0	4,207.4	4,228.8	4,226.6	16.7	7.0	18.76	246.4	905.6	238.7	220.8	17.90	13.338		
4,400.0	4,303.5	4,324.2	4,321.9	17.2	7.2	22.22	242.6	903.1	210.3	191.6	18.69	11.252		
4,500.0	4,399.6	4,419.6	4,417.2	17.8	7.3	26.68	239.0	900.5	182.5	162.9	19.65	9.290		
4,600.0	4,495.7	4,514.7	4,512.2	18.4	7.5	32.57	235.5	897.6	156.0	135.1	20.87	7.471		
4,700.0	4,591.9	4,609.0	4,606.4	18.9	7.7	40.43	232.3	895.1	131.8	109.3	22.47	5.864		
4,800.0	4,688.0	4,703.8	4,701.1	19.5	7.9	51.05	229.5	893.2	111.5	86.9	24.51	4.548		
4,900.0	4,784.1	4,798.9	4,796.2	20.1	8.1	65.00	227.0	891.8	96.8	70.0	26.80	3.611		
5,000.0	4,880.2	4,894.5	4,891.8	20.7	8.2	81.76	224.8	891.0	89.9	61.2	28.71	3.130		
5,027.3	4,906.4	4,920.7	4,917.9	20.8	8.3	86.54	224.3	890.9	89.5	60.5	29.06	3.081 CC, ES, SF		
5,100.0	4,976.4	4,990.6	4,987.8	21.2	8.4	99.01	223.0	890.8	91.9	62.3	29.52	3.111		
5,200.0	5,072.5	5,086.7	5,084.0	21.8	8.6	114.06	221.5	891.1	101.7	72.5	29.26	3.476		
5,300.0	5,168.6	5,183.1	5,180.4	22.4	8.8	125.82	220.1	891.7	117.3	88.7	28.56	4.106		
5,400.0	5,264.7	5,279.8	5,277.0	23.0	8.9	134.57	218.9	892.7	136.3	108.4	27.89	4.888		
5,500.0	5,360.9	5,376.6	5,373.8	23.6	9.1	141.05	217.8	894.1	157.4	130.0	27.42	5.743		
5,600.0	5,457.0	5,473.6	5,470.8	24.1	9.3	145.93	216.9	895.8	179.7	152.6	27.14	6.621		
5,700.0	5,553.1	5,570.0	5,567.1	24.7	9.4	149.72	216.1	897.6	202.8	175.7	27.02	7.503		
5,712.7	5,565.3	5,582.1	5,579.3	24.8	9.4	150.15	216.0	897.8	205.8	178.7	27.02	7.616		
5,750.0	5,601.4	5,618.1	5,615.2	25.0	9.5	155.77	215.9	898.2	214.1	187.1	27.02	7.924		
5,800.0	5,650.3	5,666.7	5,663.9	25.1	9.6	165.79	215.7	898.7	223.5	196.4	27.09	8.251		
5,850.0	5,699.8	5,715.8	5,713.0	25.3	9.7	-177.38	215.6	898.9	230.8	203.6	27.23	8.476		
5,900.0	5,749.5	5,765.2	5,762.3	25.4	9.8	-147.12	215.5	899.0	236.1	208.6	27.44	8.604		
5,950.0	5,799.2	5,814.6	5,811.7	25.4	9.8	-111.28	215.6	898.8	239.2	211.5	27.70	8.635		
6,000.0	5,848.8	5,863.8	5,861.0	25.4	9.9	-89.54	215.7	898.5	240.2	212.2	28.02	8.574		
6,050.0	5,898.0	5,912.8	5,910.0	25.4	10.0	-79.51	215.9	897.9	239.4	211.0	28.43	8.423		
6,100.0	5,946.7	5,961.4	5,958.5	25.4	10.1	-75.37	216.2	897.2	237.0	208.1	28.94	8.190		
6,150.0	5,994.5	6,009.3	6,006.5	25.3	10.2	-74.45	216.5	896.3	233.3	203.7	29.58	7.887		
6,200.0	6,041.4	6,056.5	6,053.6	25.2	10.3	-75.60	216.9	895.2	228.7	198.3	30.36	7.533		
6,250.0	6,087.1	6,102.6	6,099.8	25.1	10.4	-78.26	217.4	894.0	223.8	192.6	31.24	7.163		
6,300.0	6,131.4	6,147.7	6,144.8	25.0	10.4	-82.07	218.0	892.6	219.3	187.1	32.18	6.816		
6,350.0	6,174.1	6,191.5	6,188.5	24.9	10.5	-86.75	218.6	891.0	216.1	183.0	33.06	6.537		
6,392.1	6,208.7	6,227.2	6,224.2	24.8	10.6	-91.14	219.2	889.7	215.1	181.4	33.67	6.388		
6,400.0	6,215.0	6,233.7	6,230.8	24.8	10.6	-91.99	219.3	889.4	215.1	181.4	33.77	6.371		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19V (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		
6,450.0	6,254.0	6,274.4	6,271.4	24.6	10.7	-97.46	220.0	887.7	217.4	183.2	34.21	6.356		
6,500.0	6,290.9	6,313.3	6,310.2	24.5	10.7	-102.82	220.8	885.9	223.8	189.5	34.32	6.522		
6,550.0	6,325.5	6,350.2	6,347.1	24.4	10.8	-107.79	221.5	884.1	234.9	200.8	34.11	6.888		
6,600.0	6,357.8	6,385.1	6,381.9	24.3	10.9	-112.14	222.3	882.3	251.1	217.4	33.67	7.457		
6,650.0	6,387.4	6,417.6	6,414.4	24.3	10.9	-115.75	223.1	880.5	272.1	239.0	33.09	8.222		
6,700.0	6,414.5	6,447.8	6,444.5	24.3	11.0	-118.54	223.8	878.7	297.6	265.1	32.50	9.158		
6,750.0	6,438.7	6,475.4	6,472.1	24.4	11.1	-120.46	224.5	877.0	327.3	295.3	32.01	10.226		
6,800.0	6,460.0	6,500.4	6,497.0	24.5	11.1	-121.48	225.2	875.5	360.6	328.9	31.72	11.369		
6,850.0	6,478.3	6,522.3	6,518.9	24.6	11.1	-121.53	225.8	874.0	396.9	365.2	31.72	12.513		
6,900.0	6,493.6	6,541.3	6,537.8	24.9	11.2	-120.56	226.3	872.8	435.9	403.8	32.08	13.588		
6,950.0	6,505.7	6,557.2	6,553.6	25.2	11.2	-118.44	226.8	871.7	477.1	444.2	32.83	14.530		
7,000.0	6,514.7	6,569.9	6,566.3	25.6	11.2	-115.01	227.2	870.9	520.0	486.0	33.98	15.303		
7,050.0	6,520.4	6,579.4	6,575.8	26.0	11.3	-110.04	227.5	870.2	564.4	529.0	35.44	15.928		
7,100.0	6,522.9	6,585.6	6,581.9	26.5	11.3	-103.35	227.7	869.8	609.9	572.9	36.98	16.493		
7,116.1	6,523.0	6,586.8	6,583.2	26.7	11.3	-100.81	227.7	869.7	624.7	587.3	37.44	16.688		
7,200.0	6,522.7	6,592.6	6,588.9	27.7	11.3	-102.15	227.9	869.3	702.9	664.5	38.39	18.309		
7,300.0	6,522.3	6,599.5	6,595.8	29.2	11.3	-103.75	228.1	868.8	797.5	757.8	39.68	20.098		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 41-19 (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)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
2,800.0	2,765.5	2,749.4	2,749.3	8.3	5.1	-47.03	818.2	602.5	788.6	776.1	12.53	62.948		
2,900.0	2,861.6	2,846.6	2,846.5	8.8	5.3	-48.47	818.3	603.3	770.2	757.0	13.20	58.354		
3,000.0	2,957.8	2,943.7	2,943.5	9.4	5.5	-49.98	818.5	603.9	752.1	738.2	13.89	54.154		
3,100.0	3,053.9	3,042.6	3,042.4	9.9	5.7	-51.62	818.5	604.2	734.5	719.9	14.61	50.269		
3,200.0	3,150.0	3,144.0	3,143.9	10.5	5.9	-53.37	818.0	604.4	716.8	701.4	15.37	46.640		
3,300.0	3,246.1	3,245.3	3,245.1	11.0	6.1	-55.18	816.7	604.6	699.1	682.9	16.15	43.299		
3,400.0	3,342.3	3,346.4	3,346.2	11.6	6.3	-57.08	814.6	604.7	681.3	664.4	16.94	40.219		
3,500.0	3,438.4	3,447.2	3,447.0	12.1	6.5	-59.06	811.7	604.8	663.6	645.8	17.75	37.379		
3,600.0	3,534.5	3,543.6	3,543.3	12.7	6.7	-61.06	808.5	604.8	646.0	627.5	18.55	34.829		
3,700.0	3,630.6	3,635.5	3,635.2	13.3	6.8	-63.06	805.8	604.7	629.7	610.4	19.32	32.588		
3,800.0	3,726.8	3,727.4	3,727.1	13.8	7.0	-65.18	803.6	604.5	614.9	594.8	20.11	30.573		
3,900.0	3,822.9	3,819.5	3,819.1	14.4	7.1	-67.40	802.1	604.2	601.7	580.8	20.91	28.773		
4,000.0	3,919.0	3,911.6	3,911.2	15.0	7.3	-69.73	801.2	603.8	590.2	568.5	21.72	27.173		
4,100.0	4,015.1	4,003.8	4,003.5	15.5	7.4	-72.14	800.8	603.2	580.5	558.0	22.53	25.763		
4,200.0	4,111.2	4,099.2	4,098.9	16.1	7.5	-74.72	800.8	602.5	572.3	549.0	23.31	24.552		
4,300.0	4,207.4	4,194.5	4,194.1	16.7	7.6	-77.39	800.8	601.6	565.6	541.5	24.09	23.482		
4,400.0	4,303.5	4,289.7	4,289.3	17.2	7.7	-80.12	801.0	600.5	560.3	535.5	24.85	22.549		
4,500.0	4,399.6	4,384.7	4,384.3	17.8	7.9	-82.91	801.2	599.1	556.6	531.0	25.60	21.746		
4,600.0	4,495.7	4,479.7	4,479.3	18.4	8.0	-85.75	801.5	597.5	554.5	528.2	26.32	21.066		
4,694.9	4,586.9	4,571.4	4,571.0	18.9	8.1	-88.50	801.7	595.9	553.9	526.9	27.03	20.495		
4,700.0	4,591.9	4,576.4	4,575.9	18.9	8.1	-88.65	801.8	595.8	553.9	526.9	27.06	20.466		
4,800.0	4,688.0	4,673.8	4,673.3	19.5	8.3	-91.53	801.9	594.6	554.6	526.8	27.79	19.956		
4,900.0	4,784.1	4,771.4	4,771.0	20.1	8.5	-94.37	802.0	593.8	556.4	527.9	28.48	19.536		
5,000.0	4,880.2	4,869.3	4,868.9	20.7	8.6	-97.16	801.9	593.6	559.4	530.2	29.14	19.195		
5,100.0	4,976.4	4,967.4	4,967.0	21.2	8.8	-99.89	801.7	593.8	563.3	533.5	29.77	18.925		
5,200.0	5,072.5	5,063.8	5,063.4	21.8	9.0	-102.50	801.4	594.3	568.3	538.0	30.36	18.718		
5,300.0	5,168.6	5,159.2	5,158.8	22.4	9.1	-105.03	801.3	594.9	574.7	543.7	30.93	18.582		
5,400.0	5,264.7	5,254.7	5,254.2	23.0	9.3	-107.50	801.3	595.4	582.3	550.9	31.46	18.512		
5,500.0	5,360.9	5,350.1	5,349.7	23.6	9.5	-109.90	801.4	595.9	591.3	559.3	31.96	18.501		
5,600.0	5,457.0	5,445.6	5,445.1	24.1	9.6	-112.23	801.7	596.3	601.5	569.0	32.43	18.544		
5,700.0	5,553.1	5,539.7	5,539.3	24.7	9.8	-114.45	802.1	596.6	612.8	580.0	32.86	18.648		
5,712.7	5,565.3	5,551.4	5,551.0	24.8	9.8	-114.72	802.1	596.6	614.4	581.5	32.91	18.666		
5,750.0	5,601.4	5,586.1	5,585.6	25.0	9.9	-111.59	802.4	596.6	618.4	585.4	33.04	18.718		
5,800.0	5,650.3	5,633.0	5,632.6	25.1	9.9	-103.89	802.7	596.4	622.1	588.9	33.14	18.773		
5,850.0	5,699.8	5,680.4	5,679.9	25.3	10.0	-88.35	803.2	596.1	623.6	590.4	33.18	18.795		
5,900.0	5,749.5	5,728.1	5,727.6	25.4	10.0	-58.42	803.7	595.7	623.0	589.8	33.17	18.780		
5,950.0	5,799.2	5,775.8	5,775.3	25.4	10.1	-22.00	804.2	595.1	620.0	586.9	33.11	18.727		
6,000.0	5,848.8	5,823.5	5,823.0	25.4	10.2	1.24	804.9	594.3	614.9	581.9	33.00	18.632		
6,050.0	5,898.0	5,870.9	5,870.4	25.4	10.2	13.70	805.6	593.4	607.4	574.6	32.85	18.489		
6,100.0	5,946.7	5,917.8	5,917.3	25.4	10.3	21.24	806.4	592.4	597.8	565.1	32.68	18.293		
6,150.0	5,994.5	5,964.2	5,963.6	25.3	10.3	26.59	807.2	591.2	586.0	553.5	32.49	18.036		
6,200.0	6,041.4	6,010.0	6,009.5	25.2	10.4	30.95	808.1	589.9	572.2	539.9	32.31	17.707		
6,250.0	6,087.1	6,055.9	6,055.3	25.1	10.5	34.93	809.0	588.6	556.4	524.2	32.17	17.294		
6,300.0	6,131.4	6,100.4	6,099.8	25.0	10.5	38.84	810.0	587.3	538.8	506.8	32.10	16.789		
6,350.0	6,174.1	6,143.5	6,142.8	24.9	10.6	42.90	811.0	586.0	519.7	487.6	32.10	16.191		
6,400.0	6,215.0	6,184.9	6,184.2	24.8	10.6	47.21	812.0	584.8	499.4	467.2	32.21	15.504		
6,450.0	6,254.0	6,224.4	6,223.7	24.6	10.7	51.83	813.0	583.7	478.3	445.8	32.44	14.745		
6,500.0	6,290.9	6,262.0	6,261.3	24.5	10.7	56.76	814.0	582.6	456.8	424.0	32.76	13.943		
6,550.0	6,325.5	6,297.4	6,296.6	24.4	10.8	61.93	815.0	581.6	435.6	402.4	33.16	13.137		
6,600.0	6,357.8	6,330.4	6,329.6	24.3	10.8	67.23	815.9	580.6	415.4	381.8	33.58	12.371		
6,650.0	6,387.4	6,361.0	6,360.2	24.3	10.9	72.47	816.8	579.7	397.0	363.0	33.97	11.687		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 41-19 (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							
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	
6,700.0	6,414.5	6,389.0	6,388.2	24.3	10.9	77.45	817.6	578.9	381.4	347.1	34.30	11.120		
6,750.0	6,438.7	6,414.3	6,413.4	24.4	10.9	81.96	818.4	578.2	369.6	335.1	34.56	10.695		
6,800.0	6,460.0	6,436.7	6,435.9	24.5	11.0	85.83	819.1	577.5	362.7	328.0	34.78	10.428		
6,835.1	6,473.2	6,450.8	6,449.9	24.6	11.0	88.08	819.5	577.1	361.3	326.3	34.95	10.337 CC, ES		
6,850.0	6,478.3	6,456.3	6,455.4	24.6	11.0	88.91	819.7	577.0	361.5	326.5	35.01	10.326 SF		
6,900.0	6,493.6	6,472.8	6,471.9	24.9	11.0	91.12	820.3	576.5	366.6	331.3	35.29	10.387		
6,950.0	6,505.7	6,486.2	6,485.3	25.2	11.0	92.39	820.7	576.1	378.0	342.3	35.66	10.599		
7,000.0	6,514.7	6,496.5	6,495.6	25.6	11.0	92.66	821.0	575.8	395.4	359.3	36.15	10.940		
7,050.0	6,520.4	6,503.7	6,502.7	26.0	11.1	91.89	821.3	575.6	418.4	381.7	36.74	11.389		
7,100.0	6,522.9	6,507.6	6,506.7	26.5	11.1	90.05	821.4	575.5	446.1	408.7	37.40	11.928		
7,116.1	6,523.0	6,508.2	6,507.2	26.7	11.1	89.23	821.4	575.5	455.9	418.3	37.62	12.120		
7,200.0	6,522.7	6,510.3	6,509.3	27.7	11.1	89.56	821.5	575.4	512.1	473.4	38.71	13.231		
7,300.0	6,522.3	6,512.8	6,511.8	29.2	11.1	89.96	821.6	575.4	587.8	547.6	40.20	14.621		
7,400.0	6,521.9	6,515.3	6,514.3	30.8	11.1	90.36	821.7	575.3	669.8	628.0	41.88	15.995		
7,500.0	6,521.5	6,517.7	6,516.8	32.7	11.1	90.75	821.7	575.2	756.2	712.5	43.71	17.302		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,300.0	6,510.9	6,486.4	6,485.5	103.7	11.8	85.10	633.3	-3,642.0	770.4	655.2	115.20	6.688		
10,400.0	6,510.6	6,487.7	6,486.9	106.5	11.8	85.55	633.3	-3,642.0	673.3	555.3	117.99	5.706		
10,500.0	6,510.2	6,489.0	6,488.2	109.2	11.8	85.99	633.4	-3,642.1	577.1	456.3	120.78	4.778		
10,600.0	6,509.8	6,490.3	6,489.4	112.0	11.8	86.41	633.4	-3,642.1	482.4	358.9	123.56	3.904		
10,700.0	6,509.4	6,491.5	6,490.6	114.7	11.8	86.82	633.4	-3,642.1	390.5	264.1	126.34	3.090		
10,800.0	6,509.0	6,492.7	6,491.8	117.5	11.8	87.22	633.5	-3,642.1	303.6	174.5	129.13	2.351		
10,900.0	6,508.7	6,493.8	6,493.0	120.2	11.8	87.61	633.5	-3,642.1	227.8	95.9	131.91	1.727		
11,000.0	6,508.3	6,494.9	6,494.1	123.0	11.8	87.98	633.6	-3,642.1	177.8	43.1	134.68	1.320	Level 3	
11,051.4	6,508.1	6,495.5	6,494.7	124.4	11.8	88.17	633.6	-3,642.2	170.2	34.0	136.11	1.250	Level 3, CC, ES, SF	
11,100.0	6,507.9	6,496.0	6,495.2	125.7	11.8	88.35	633.6	-3,642.2	177.0	39.5	137.46	1.287	Level 3	
11,200.0	6,507.5	6,497.1	6,496.2	128.5	11.8	88.70	633.6	-3,642.2	225.9	85.6	140.23	1.611		
11,300.0	6,507.1	6,500.0	6,499.2	131.2	11.8	89.69	633.7	-3,642.2	301.2	158.2	143.01	2.106		
11,400.0	6,506.8	6,500.0	6,499.2	134.0	11.8	89.69	633.7	-3,642.2	387.9	242.1	145.77	2.661		
11,500.0	6,506.4	6,500.0	6,499.2	136.8	11.8	89.69	633.7	-3,642.2	479.7	331.2	148.54	3.230		
11,600.0	6,506.0	6,500.0	6,499.2	139.5	11.8	89.69	633.7	-3,642.2	574.3	423.0	151.31	3.796		
11,700.0	6,505.6	6,502.0	6,501.2	142.3	11.8	90.37	633.8	-3,642.3	670.5	516.4	154.06	4.352		
11,800.0	6,505.2	6,503.0	6,502.1	145.1	11.8	90.68	633.8	-3,642.3	767.6	610.8	156.82	4.895		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 3 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6880-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		
9,000.0	6,515.9	6,505.9	6,505.9	68.7	130.1	90.42	827.1	-2,289.8	787.9	589.2	198.77	3.964		
9,100.0	6,515.5	6,505.5	6,505.5	71.3	130.1	90.36	827.1	-2,289.8	700.7	499.3	201.40	3.479		
9,200.0	6,515.1	6,505.1	6,505.1	74.0	130.1	90.30	827.1	-2,289.8	617.4	413.4	204.05	3.026		
9,300.0	6,514.7	6,504.7	6,504.7	76.7	130.1	90.24	827.1	-2,289.8	539.8	333.1	206.71	2.612		
9,400.0	6,514.3	6,504.3	6,504.3	79.3	130.1	90.18	827.1	-2,289.8	470.8	261.4	209.38	2.248		
9,500.0	6,514.0	6,504.0	6,504.0	82.0	130.1	90.12	827.1	-2,289.8	414.5	202.5	212.05	1.955		
9,600.0	6,513.6	6,503.6	6,503.6	84.7	130.1	90.06	827.1	-2,289.8	376.8	162.1	214.74	1.755		
9,699.0	6,513.2	6,503.2	6,503.2	87.4	130.1	90.00	827.1	-2,289.8	363.6	146.2	217.41	1.672 CC		
9,700.0	6,513.2	6,503.2	6,503.2	87.4	130.1	90.00	827.1	-2,289.8	363.6	146.2	217.43	1.672 ES, SF		
9,800.0	6,512.8	6,502.8	6,502.8	90.1	130.1	89.94	827.1	-2,289.8	377.4	157.2	220.13	1.714		
9,900.0	6,512.4	6,502.4	6,502.4	92.8	130.0	89.88	827.1	-2,289.8	415.4	192.6	222.84	1.864		
10,000.0	6,512.1	6,502.1	6,502.1	95.6	130.0	89.82	827.1	-2,289.8	472.0	246.4	225.55	2.093		
10,100.0	6,511.7	6,501.7	6,501.7	98.3	130.0	89.76	827.1	-2,289.8	541.3	313.0	228.27	2.371		
10,200.0	6,511.3	6,501.3	6,501.3	101.0	130.0	89.70	827.1	-2,289.8	619.0	388.0	230.99	2.680		
10,300.0	6,510.9	6,500.9	6,500.9	103.7	130.0	89.64	827.1	-2,289.8	702.4	468.7	233.71	3.005		
10,400.0	6,510.6	6,500.6	6,500.6	106.5	130.0	89.58	827.1	-2,289.8	789.7	553.2	236.44	3.340		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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						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		
9,400.0	6,514.3	6,532.5	6,530.0	79.3	11.1	-106.41	374.1	-2,694.1	709.4	622.0	87.42	8.115		
9,500.0	6,514.0	6,529.2	6,526.7	82.0	11.1	-104.41	374.0	-2,694.2	610.4	519.7	90.75	6.727		
9,600.0	6,513.6	6,525.8	6,523.3	84.7	11.1	-102.35	374.0	-2,694.3	511.8	417.8	94.04	5.442		
9,700.0	6,513.2	6,522.3	6,519.8	87.4	11.1	-100.22	373.9	-2,694.4	413.8	316.5	97.29	4.253		
9,800.0	6,512.8	6,518.8	6,516.3	90.1	11.1	-98.04	373.8	-2,694.6	317.0	216.5	100.46	3.155		
9,900.0	6,512.4	6,515.3	6,512.8	92.8	11.1	-95.81	373.8	-2,694.7	223.0	119.4	103.54	2.153		
10,000.0	6,512.1	6,511.7	6,509.2	95.6	11.1	-93.53	373.7	-2,694.8	137.5	31.0	106.51	1.291 Level 3		
10,100.0	6,511.7	6,508.1	6,505.6	98.3	11.1	-91.22	373.6	-2,694.9	90.0	-19.3	109.34	0.823 Level 1		
10,104.2	6,511.7	6,507.9	6,505.4	98.4	11.1	-91.12	373.6	-2,694.9	89.9	-19.5	109.45	0.821 Level 1, CC, ES, SF		
10,200.0	6,511.3	6,504.4	6,501.9	101.0	11.1	-88.86	373.5	-2,695.0	131.3	19.3	112.01	1.173 Level 2		
10,300.0	6,510.9	6,500.6	6,498.1	103.7	11.1	-86.49	373.5	-2,695.2	215.4	100.9	114.50	1.881		
10,400.0	6,510.6	6,500.0	6,497.5	106.5	11.1	-86.10	373.5	-2,695.2	309.0	191.8	117.17	2.637		
10,500.0	6,510.2	6,493.3	6,490.8	109.2	11.1	-81.89	373.3	-2,695.4	405.6	286.7	118.95	3.410		
10,600.0	6,509.8	6,489.7	6,487.2	112.0	11.1	-79.67	373.3	-2,695.5	503.6	382.7	120.91	4.165		
10,700.0	6,509.4	6,486.1	6,483.7	114.7	11.1	-77.51	373.2	-2,695.6	602.2	479.5	122.71	4.907		
10,800.0	6,509.0	6,482.6	6,480.2	117.5	11.1	-75.42	373.1	-2,695.8	701.1	576.8	124.33	5.639		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	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		
8,600.0	6,517.4	6,529.1	6,526.4	58.3	11.1	-92.55	-34.0	-1,746.0	745.8	676.5	69.31	10.760		
8,700.0	6,517.0	6,525.1	6,522.3	60.9	11.1	-92.08	-34.0	-1,746.2	674.7	602.8	71.89	9.385		
8,800.0	6,516.6	6,520.9	6,518.2	63.5	11.0	-91.60	-34.0	-1,746.3	611.7	537.2	74.48	8.212		
8,900.0	6,516.2	6,516.6	6,513.9	66.1	11.0	-91.11	-34.0	-1,746.5	559.5	482.4	77.09	7.258		
9,000.0	6,515.9	6,512.3	6,509.6	68.7	11.0	-90.61	-34.0	-1,746.7	521.4	441.7	79.70	6.541		
9,100.0	6,515.5	6,507.9	6,505.1	71.3	11.0	-90.10	-34.0	-1,746.9	500.6	418.3	82.33	6.081		
9,156.2	6,515.3	6,505.3	6,502.6	72.8	11.0	-89.81	-34.0	-1,747.0	497.5	413.7	83.81	5.936 CC, ES		
9,200.0	6,515.1	6,503.3	6,500.6	74.0	11.0	-89.58	-34.0	-1,747.1	499.4	414.4	84.96	5.878 SF		
9,300.0	6,514.7	6,500.0	6,497.3	76.7	11.0	-89.20	-33.9	-1,747.2	517.8	430.2	87.61	5.910		
9,400.0	6,514.3	6,500.0	6,497.3	79.3	11.0	-89.20	-33.9	-1,747.2	553.9	463.6	90.28	6.135		
9,500.0	6,514.0	6,489.9	6,487.2	82.0	11.0	-88.03	-33.9	-1,747.6	604.5	511.6	92.88	6.508		
9,600.0	6,513.6	6,485.5	6,482.8	84.7	11.0	-87.53	-33.9	-1,747.8	666.3	570.8	95.53	6.975		
9,700.0	6,513.2	6,481.2	6,478.5	87.4	11.0	-87.03	-33.9	-1,748.0	736.6	638.4	98.17	7.503		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Roth 1-24 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6821-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	6,506.4	6,502.4	6,502.4	136.8	130.0	90.53	754.6	-4,805.2	771.5	504.8	266.75	2.892		
11,600.0	6,506.0	6,502.0	6,502.0	139.5	130.0	90.46	754.6	-4,805.2	679.9	410.4	269.51	2.523		
11,700.0	6,505.6	6,501.6	6,501.6	142.3	130.0	90.38	754.6	-4,805.2	591.1	318.8	272.28	2.171		
11,800.0	6,505.2	6,501.2	6,501.2	145.1	130.0	90.31	754.6	-4,805.2	506.5	231.4	275.05	1.841		
11,900.0	6,504.9	6,500.9	6,500.9	147.8	130.0	90.23	754.6	-4,805.2	428.5	150.7	277.82	1.542		
12,000.0	6,504.5	6,500.5	6,500.5	150.6	130.0	90.16	754.6	-4,805.2	361.6	81.0	280.58	1.289	Level 3	
12,100.0	6,504.1	6,500.1	6,500.1	153.4	130.0	90.09	754.6	-4,805.2	312.8	29.4	283.35	1.104	Level 2	
12,200.0	6,503.7	6,499.7	6,499.7	156.2	130.0	90.01	754.6	-4,805.2	291.5	5.3	286.13	1.019	Level 2	
12,214.5	6,503.7	6,499.7	6,499.7	156.6	130.0	90.00	754.6	-4,805.2	291.1	4.6	286.53	1.016	Level 2, CC, ES, SF	
12,300.0	6,503.3	6,499.3	6,499.3	158.9	130.0	89.94	754.6	-4,805.2	303.4	14.5	288.90	1.050	Level 2	
12,400.0	6,503.0	6,499.0	6,499.0	161.7	130.0	89.86	754.6	-4,805.2	345.2	53.5	291.67	1.183	Level 2	
12,500.0	6,502.6	6,498.6	6,498.6	164.5	130.0	89.79	754.6	-4,805.2	407.7	113.3	294.44	1.385	Level 3	
12,600.0	6,502.2	6,498.2	6,498.2	167.3	130.0	89.71	754.6	-4,805.2	483.1	185.9	297.22	1.625		
12,700.0	6,501.8	6,497.8	6,497.8	170.1	130.0	89.64	754.6	-4,805.2	566.1	266.1	299.99	1.887		
12,800.0	6,501.5	6,497.5	6,497.5	172.9	129.9	89.56	754.6	-4,805.2	653.9	351.1	302.77	2.160		
12,900.0	6,501.1	6,497.1	6,497.1	175.6	129.9	89.49	754.6	-4,805.2	744.8	439.2	305.54	2.438		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Rothe 2-24 (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		
12,800.0	6,501.5	6,497.3	6,495.9	172.9	12.6	90.83	820.1	-6,092.3	787.0	601.6	185.39	4.245		
12,900.0	6,501.1	6,496.9	6,495.5	175.6	12.6	90.76	820.1	-6,092.3	699.3	511.1	188.18	3.716		
13,000.0	6,500.7	6,496.5	6,495.1	178.4	12.6	90.69	820.1	-6,092.3	615.4	424.5	190.97	3.223		
13,100.0	6,500.3	6,496.1	6,494.7	181.2	12.6	90.62	820.1	-6,092.3	537.1	343.3	193.76	2.772		
13,200.0	6,499.9	6,495.6	6,494.2	184.0	12.6	90.55	820.1	-6,092.3	467.0	270.5	196.55	2.376		
13,300.0	6,499.6	6,495.2	6,493.8	186.8	12.6	90.49	820.1	-6,092.3	409.7	210.3	199.34	2.055		
13,400.0	6,499.2	6,494.8	6,493.4	189.6	12.6	90.42	820.1	-6,092.3	370.8	168.7	202.13	1.835		
13,500.0	6,498.8	6,494.4	6,493.0	192.4	12.6	90.35	820.1	-6,092.3	356.6	151.7	204.92	1.740		
13,501.6	6,498.8	6,494.4	6,493.0	192.4	12.6	90.35	820.1	-6,092.3	356.6	151.7	204.96	1.740	CC, ES, SF	
13,600.0	6,498.4	6,493.9	6,492.5	195.1	12.6	90.28	820.1	-6,092.3	370.0	162.3	207.71	1.781		
13,700.0	6,498.0	6,493.5	6,492.1	197.9	12.6	90.21	820.1	-6,092.3	408.1	197.6	210.50	1.939		
13,710.4	6,498.0	6,493.5	6,492.1	198.2	12.6	90.21	820.1	-6,092.3	413.3	202.5	210.79	1.961		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - SLW 21-19 (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		
8,900.0	6,516.2	6,505.2	6,504.5	66.1	10.8	89.92	906.2	-2,058.8	720.1	643.3	76.87	9.369		
9,000.0	6,515.9	6,506.0	6,505.3	68.7	10.8	90.02	906.2	-2,058.8	644.2	564.7	79.49	8.104		
9,100.0	6,515.5	6,506.8	6,506.1	71.3	10.8	90.13	906.2	-2,058.8	575.7	493.5	82.13	7.009		
9,200.0	6,515.1	6,507.6	6,506.9	74.0	10.8	90.23	906.2	-2,058.8	517.5	432.7	84.78	6.104		
9,300.0	6,514.7	6,508.4	6,507.7	76.7	10.8	90.33	906.2	-2,058.8	473.5	386.0	87.45	5.415		
9,400.0	6,514.3	6,509.2	6,508.4	79.3	10.8	90.44	906.1	-2,058.8	447.9	357.7	90.12	4.970		
9,468.0	6,514.1	6,509.8	6,509.0	81.2	10.8	90.51	906.1	-2,058.8	442.7	350.7	91.94	4.815 CC, ES		
9,500.0	6,514.0	6,510.0	6,509.2	82.0	10.8	90.54	906.1	-2,058.8	443.8	351.0	92.80	4.782 SF		
9,600.0	6,513.6	6,510.8	6,510.0	84.7	10.8	90.64	906.1	-2,058.8	461.9	366.4	95.49	4.837		
9,700.0	6,513.2	6,511.6	6,510.8	87.4	10.8	90.74	906.1	-2,058.8	499.7	401.6	98.19	5.090		
9,800.0	6,512.8	6,512.4	6,511.6	90.1	10.8	90.84	906.1	-2,058.8	553.3	452.4	100.89	5.484		
9,900.0	6,512.4	6,513.2	6,512.4	92.8	10.8	90.95	906.1	-2,058.8	618.5	514.9	103.60	5.970		
10,000.0	6,512.1	6,514.0	6,513.2	95.6	10.8	91.05	906.1	-2,058.9	692.0	585.7	106.31	6.510		
10,100.0	6,511.7	6,514.7	6,514.0	98.3	10.8	91.15	906.1	-2,058.9	771.6	662.5	109.03	7.077		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4567.0ft (Original Well Elev)

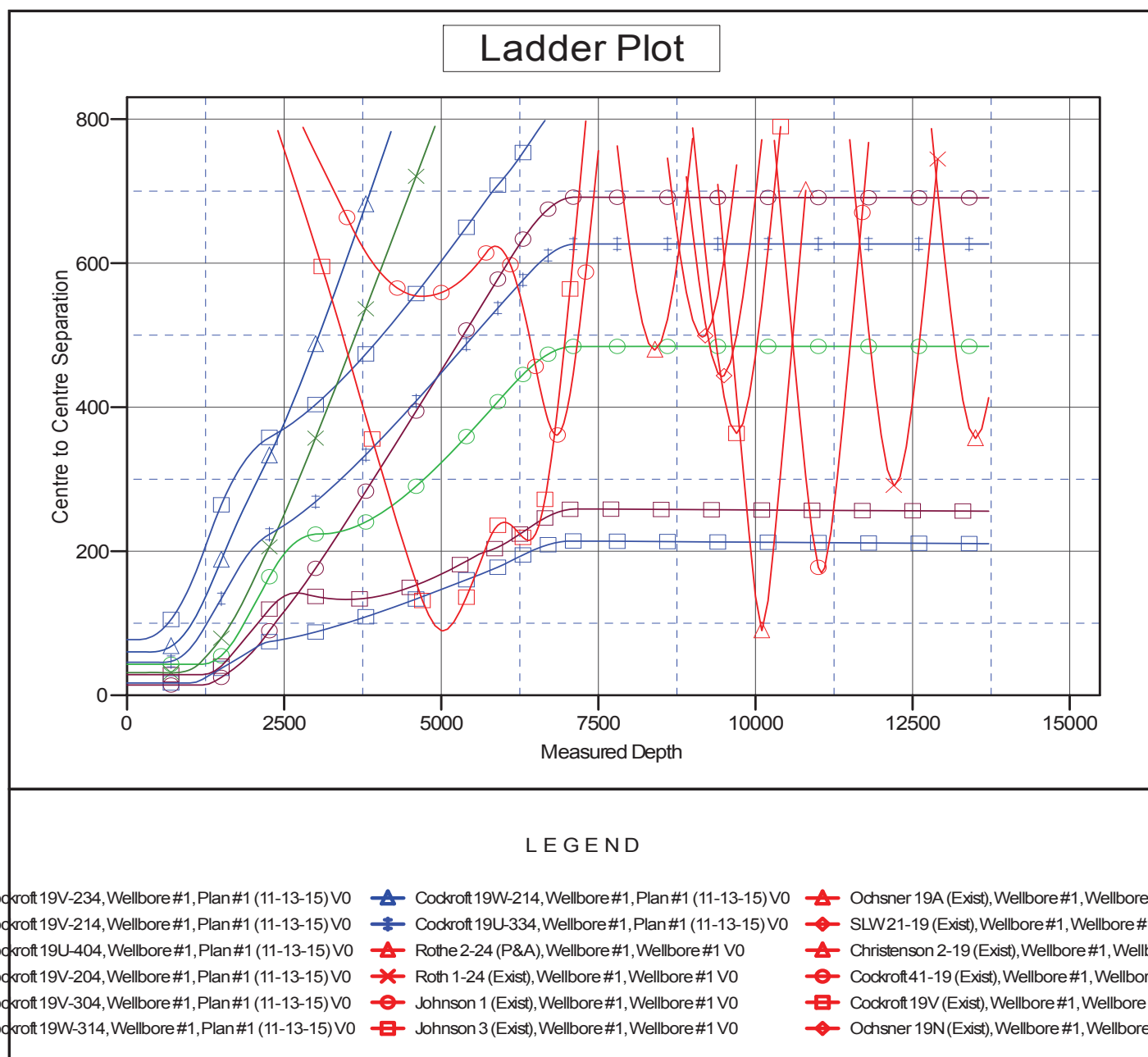
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19V-314

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°





<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19V-314
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19V-314	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4567.0ft (Original Well Elev)

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19V-314

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°

