

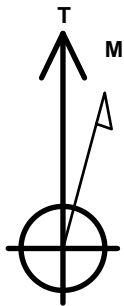
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Cockroft 19U-334**

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 1385886.36 3285831.53 40.388120 -104.473870
 Original Well Elev WELL @ 4567.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1395'FNL, 1082'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 330'FNL, 2159'FEL, SEC.24	6498.0	1079.2	-6359.5	Point
LPL 316'FNL, 852'FEL, SEC.19	6513.0	1079.2	230.3	Point



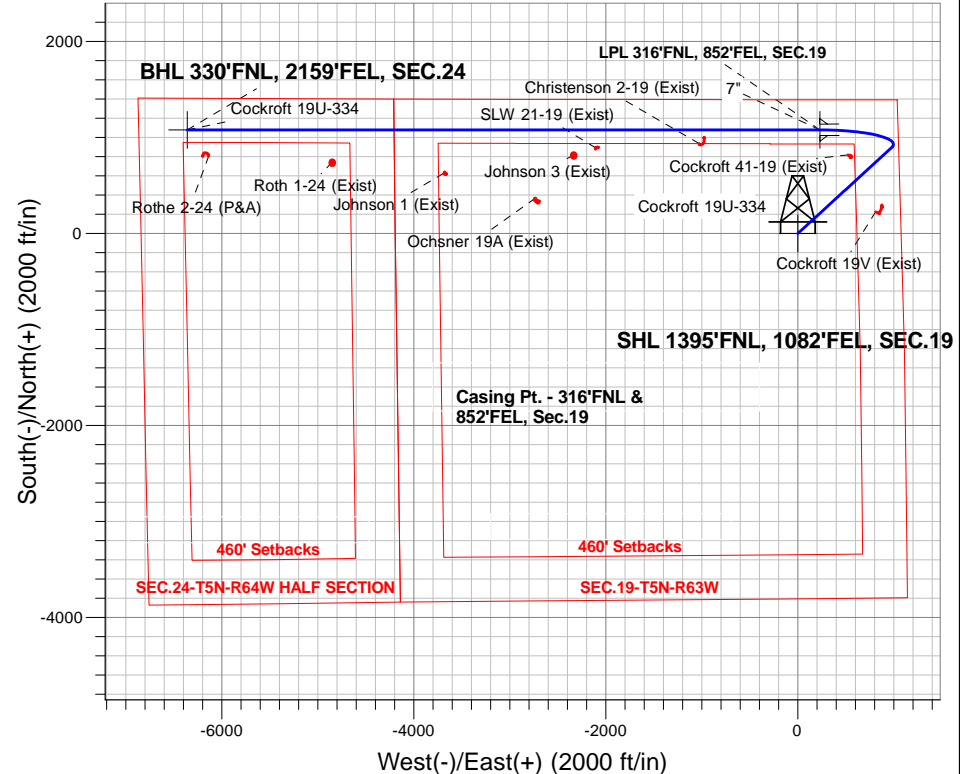
Azimuths to True North
 Magnetic North: 8.11°

Magnetic Field
 Strength: 52690.9snT
 Dip Angle: 66.93°
 Date: 11/17/2015
 Model: IGRF2010

Cockroft 5N63W19C Pad Sec.19-T5N-R63W
 Cockroft 19U-334
 Plan #1 (11-13-15)
 12:46, November 17 2015

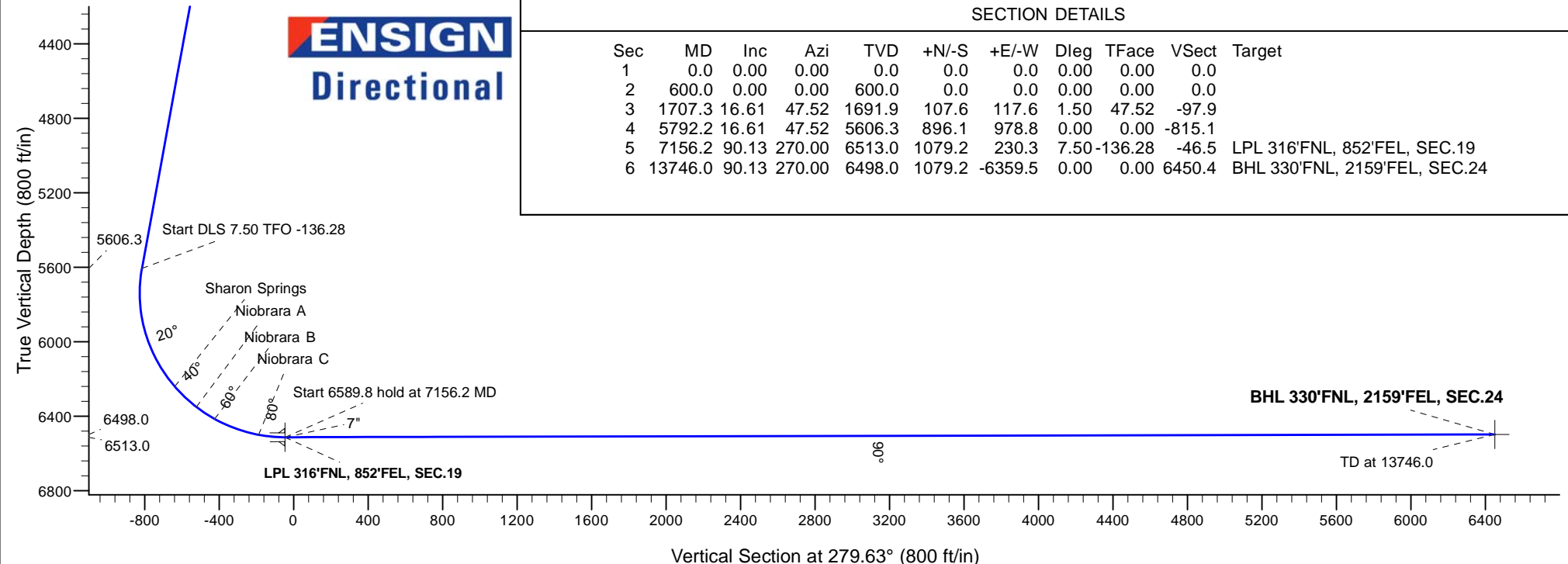
ANNOTATIONS

TVD	MD	Annotation
600.0	600.0	KOP - Start Build 1.50
1691.9	1707.3	Start 4084.9 hold at 1707.3 MD
5606.3	5792.2	Start DLS 7.50 TFO -136.28
6513.0	7156.2	Start 6589.8 hold at 7156.2 MD
6498.0	13746.0	TD at 13746.0



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1707.3	16.61	47.52	1691.9	107.6	117.6	1.50	47.52	-97.9	
4	5792.2	16.61	47.52	5606.3	896.1	978.8	0.00	0.00	-815.1	
5	7156.2	90.13	270.00	6513.0	1079.2	230.3	7.50	-136.28	-46.5	LPL 316'FNL, 852'FEL, SEC.19
6	13746.0	90.13	270.00	6498.0	1079.2	-6359.5	0.00	0.00	6450.4	BHL 330'FNL, 2159'FEL, SEC.24





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19U-334

Wellbore #1

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

Standard Planning Report

17 November, 2015

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19U-334
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 19U-334	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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

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

Well	Cockroft 19U-334		
Well Position	+N/-S	21.9 ft	Northing:
	+E/-W	86.4 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/17/2015	8.11	66.93	52,691

Design	Plan #1 (11-13-15)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	279.63

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,707.3	16.61	47.52	1,691.9	107.6	117.6	1.50	1.50	0.00	47.52	
5,792.2	16.61	47.52	5,606.3	896.1	978.8	0.00	0.00	0.00	0.00	
7,156.2	90.13	270.00	6,513.0	1,079.2	230.3	7.50	5.39	-10.08	-136.28	LPL 316'FNL, 852'FEI
13,746.0	90.13	270.00	6,498.0	1,079.2	-6,359.5	0.00	0.00	0.00	0.00	BHL 330'FNL, 2159'F

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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 19U-334	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 1395'FNL, 1082'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
KOP - Start Build 1.50									
700.0	1.50	47.52	700.0	0.9	1.0	-0.8	1.50	1.50	0.00
800.0	3.00	47.52	799.9	3.5	3.9	-3.2	1.50	1.50	0.00
900.0	4.50	47.52	899.7	8.0	8.7	-7.2	1.50	1.50	0.00
1,000.0	6.00	47.52	999.3	14.1	15.4	-12.9	1.50	1.50	0.00
1,100.0	7.50	47.52	1,098.6	22.1	24.1	-20.1	1.50	1.50	0.00
1,200.0	9.00	47.52	1,197.5	31.8	34.7	-28.9	1.50	1.50	0.00
1,300.0	10.50	47.52	1,296.1	43.2	47.2	-39.3	1.50	1.50	0.00
1,400.0	12.00	47.52	1,394.2	56.4	61.6	-51.3	1.50	1.50	0.00
1,500.0	13.50	47.52	1,491.7	71.3	77.8	-64.8	1.50	1.50	0.00
1,600.0	15.00	47.52	1,588.6	87.9	96.0	-79.9	1.50	1.50	0.00
1,700.0	16.50	47.52	1,684.9	106.2	116.0	-96.6	1.50	1.50	0.00
1,707.3	16.61	47.52	1,691.9	107.6	117.6	-97.9	1.50	1.50	0.00
Start 4084.9 hold at 1707.3 MD									
1,800.0	16.61	47.52	1,780.7	125.5	137.1	-114.2	0.00	0.00	0.00
1,900.0	16.61	47.52	1,876.5	144.8	158.2	-131.7	0.00	0.00	0.00
2,000.0	16.61	47.52	1,972.3	164.1	179.3	-149.3	0.00	0.00	0.00
2,100.0	16.61	47.52	2,068.2	183.4	200.3	-166.8	0.00	0.00	0.00
2,200.0	16.61	47.52	2,164.0	202.7	221.4	-184.4	0.00	0.00	0.00
2,300.0	16.61	47.52	2,259.8	222.0	242.5	-201.9	0.00	0.00	0.00
2,400.0	16.61	47.52	2,355.7	241.3	263.6	-219.5	0.00	0.00	0.00
2,500.0	16.61	47.52	2,451.5	260.6	284.7	-237.1	0.00	0.00	0.00
2,600.0	16.61	47.52	2,547.3	279.9	305.8	-254.6	0.00	0.00	0.00
2,700.0	16.61	47.52	2,643.1	299.2	326.8	-272.2	0.00	0.00	0.00
2,800.0	16.61	47.52	2,739.0	318.5	347.9	-289.7	0.00	0.00	0.00
2,900.0	16.61	47.52	2,834.8	337.8	369.0	-307.3	0.00	0.00	0.00
3,000.0	16.61	47.52	2,930.6	357.2	390.1	-324.8	0.00	0.00	0.00
3,100.0	16.61	47.52	3,026.4	376.5	411.2	-342.4	0.00	0.00	0.00
3,200.0	16.61	47.52	3,122.3	395.8	432.3	-360.0	0.00	0.00	0.00
3,300.0	16.61	47.52	3,218.1	415.1	453.3	-377.5	0.00	0.00	0.00
3,400.0	16.61	47.52	3,313.9	434.4	474.4	-395.1	0.00	0.00	0.00
3,422.0	16.61	47.52	3,335.0	438.6	479.1	-398.9	0.00	0.00	0.00
Parkman									
3,500.0	16.61	47.52	3,409.8	453.7	495.5	-412.6	0.00	0.00	0.00
3,600.0	16.61	47.52	3,505.6	473.0	516.6	-430.2	0.00	0.00	0.00
3,700.0	16.61	47.52	3,601.4	492.3	537.7	-447.7	0.00	0.00	0.00
3,800.0	16.61	47.52	3,697.2	511.6	558.8	-465.3	0.00	0.00	0.00
3,900.0	16.61	47.52	3,793.1	530.9	579.8	-482.9	0.00	0.00	0.00
4,000.0	16.61	47.52	3,888.9	550.2	600.9	-500.4	0.00	0.00	0.00
4,100.0	16.61	47.52	3,984.7	569.5	622.0	-518.0	0.00	0.00	0.00
4,183.8	16.61	47.52	4,065.0	585.7	639.7	-532.7	0.00	0.00	0.00
Sussex									
4,200.0	16.61	47.52	4,080.5	588.8	643.1	-535.5	0.00	0.00	0.00
4,300.0	16.61	47.52	4,176.4	608.1	664.2	-553.1	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19U-334
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 19U-334	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.0	16.61	47.52	4,272.2	627.4	685.3	-570.6	0.00	0.00	0.00
4,500.0	16.61	47.52	4,368.0	646.7	706.3	-588.2	0.00	0.00	0.00
4,600.0	16.61	47.52	4,463.9	666.0	727.4	-605.7	0.00	0.00	0.00
4,700.0	16.61	47.52	4,559.7	685.3	748.5	-623.3	0.00	0.00	0.00
4,800.0	16.61	47.52	4,655.5	704.6	769.6	-640.9	0.00	0.00	0.00
4,900.0	16.61	47.52	4,751.3	723.9	790.7	-658.4	0.00	0.00	0.00
5,000.0	16.61	47.52	4,847.2	743.2	811.8	-676.0	0.00	0.00	0.00
5,100.0	16.61	47.52	4,943.0	762.5	832.8	-693.5	0.00	0.00	0.00
5,200.0	16.61	47.52	5,038.8	781.8	853.9	-711.1	0.00	0.00	0.00
5,300.0	16.61	47.52	5,134.6	801.1	875.0	-728.6	0.00	0.00	0.00
5,400.0	16.61	47.52	5,230.5	820.4	896.1	-746.2	0.00	0.00	0.00
5,500.0	16.61	47.52	5,326.3	839.7	917.2	-763.8	0.00	0.00	0.00
5,600.0	16.61	47.52	5,422.1	859.0	938.3	-781.3	0.00	0.00	0.00
5,700.0	16.61	47.52	5,518.0	878.3	959.3	-798.9	0.00	0.00	0.00
5,792.2	16.61	47.52	5,606.3	896.1	978.8	-815.1	0.00	0.00	0.00
Start DLS 7.50 TFO -136.28									
5,800.0	16.19	46.07	5,613.8	897.6	980.4	-816.4	7.50	-5.36	-18.59
5,900.0	12.09	19.88	5,710.8	917.2	994.0	-826.5	7.50	-4.10	-26.19
6,000.0	11.89	343.19	5,808.8	936.9	994.6	-823.8	7.50	-0.20	-36.68
6,100.0	15.73	315.70	5,906.0	956.5	982.1	-808.3	7.50	3.84	-27.49
6,200.0	21.56	300.70	6,000.8	975.6	956.8	-780.1	7.50	5.82	-15.00
6,300.0	28.15	292.15	6,091.5	993.9	919.1	-739.9	7.50	6.60	-8.55
6,400.0	35.09	286.69	6,176.6	1,011.1	869.7	-688.2	7.50	6.94	-5.45
6,480.4	40.81	283.52	6,240.0	1,023.9	821.9	-639.0	7.50	7.10	-3.94
Sharon Springs									
6,500.0	42.21	282.87	6,254.6	1,026.9	809.3	-626.1	7.50	7.16	-3.37
6,600.0	49.41	279.97	6,324.3	1,040.9	739.1	-554.5	7.50	7.21	-2.90
6,640.7	52.37	278.96	6,350.0	1,046.1	707.9	-522.9	7.50	7.25	-2.46
Niobrara A									
6,700.0	56.68	277.64	6,384.4	1,053.1	660.1	-474.6	7.50	7.28	-2.24
6,759.2	61.00	276.44	6,415.0	1,059.3	609.9	-424.1	7.50	7.30	-2.03
Niobrara B									
6,800.0	63.98	275.67	6,433.9	1,063.1	573.9	-387.9	7.50	7.31	-1.88
6,900.0	71.31	273.94	6,471.9	1,070.8	481.8	-295.8	7.50	7.33	-1.74
7,000.0	78.65	272.34	6,497.8	1,076.1	385.4	-200.0	7.50	7.34	-1.59
7,011.8	79.52	272.16	6,500.0	1,076.5	373.8	-188.4	7.50	7.35	-1.54
Niobrara C									
7,100.0	86.00	270.83	6,511.1	1,078.8	286.4	-101.9	7.50	7.35	-1.51
7,156.2	90.13	270.00	6,513.0	1,079.2	230.3	-46.5	7.50	7.35	-1.48
Start 6589.8 hold at 7156.2 MD - 7" - LPL 316'FNL, 852'FEL, SEC.19									
7,200.0	90.13	270.00	6,512.9	1,079.2	186.5	-3.3	0.01	0.01	0.00
7,300.0	90.13	270.00	6,512.7	1,079.2	86.5	95.3	0.00	0.00	0.00
7,400.0	90.13	270.00	6,512.4	1,079.2	-13.5	193.9	0.00	0.00	0.00
7,500.0	90.13	270.00	6,512.2	1,079.2	-113.5	292.5	0.00	0.00	0.00
7,600.0	90.13	270.00	6,512.0	1,079.2	-213.5	391.1	0.00	0.00	0.00
7,700.0	90.13	270.00	6,511.8	1,079.2	-313.5	489.7	0.00	0.00	0.00
7,800.0	90.13	270.00	6,511.5	1,079.2	-413.5	588.3	0.00	0.00	0.00
7,900.0	90.13	270.00	6,511.3	1,079.2	-513.5	686.8	0.00	0.00	0.00
8,000.0	90.13	270.00	6,511.1	1,079.2	-613.5	785.4	0.00	0.00	0.00
8,100.0	90.13	270.00	6,510.9	1,079.2	-713.5	884.0	0.00	0.00	0.00
8,200.0	90.13	270.00	6,510.6	1,079.2	-813.5	982.6	0.00	0.00	0.00
8,300.0	90.13	270.00	6,510.4	1,079.2	-913.5	1,081.2	0.00	0.00	0.00

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Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.0	90.13	270.00	6,510.2	1,079.2	-1,013.5	1,179.8	0.00	0.00	0.00
8,500.0	90.13	270.00	6,509.9	1,079.2	-1,113.5	1,278.4	0.00	0.00	0.00
8,600.0	90.13	270.00	6,509.7	1,079.2	-1,213.5	1,377.0	0.00	0.00	0.00
8,700.0	90.13	270.00	6,509.5	1,079.2	-1,313.5	1,475.6	0.00	0.00	0.00
8,800.0	90.13	270.00	6,509.3	1,079.2	-1,413.5	1,574.2	0.00	0.00	0.00
8,900.0	90.13	270.00	6,509.0	1,079.2	-1,513.5	1,672.7	0.00	0.00	0.00
9,000.0	90.13	270.00	6,508.8	1,079.2	-1,613.5	1,771.3	0.00	0.00	0.00
9,100.0	90.13	270.00	6,508.6	1,079.2	-1,713.5	1,869.9	0.00	0.00	0.00
9,200.0	90.13	270.00	6,508.3	1,079.2	-1,813.5	1,968.5	0.00	0.00	0.00
9,300.0	90.13	270.00	6,508.1	1,079.2	-1,913.5	2,067.1	0.00	0.00	0.00
9,400.0	90.13	270.00	6,507.9	1,079.2	-2,013.5	2,165.7	0.00	0.00	0.00
9,500.0	90.13	270.00	6,507.7	1,079.2	-2,113.5	2,264.3	0.00	0.00	0.00
9,600.0	90.13	270.00	6,507.4	1,079.2	-2,213.5	2,362.9	0.00	0.00	0.00
9,700.0	90.13	270.00	6,507.2	1,079.2	-2,313.5	2,461.5	0.00	0.00	0.00
9,800.0	90.13	270.00	6,507.0	1,079.2	-2,413.5	2,560.1	0.00	0.00	0.00
9,900.0	90.13	270.00	6,506.8	1,079.2	-2,513.5	2,658.7	0.00	0.00	0.00
10,000.0	90.13	270.00	6,506.5	1,079.2	-2,613.5	2,757.2	0.00	0.00	0.00
10,100.0	90.13	270.00	6,506.3	1,079.2	-2,713.5	2,855.8	0.00	0.00	0.00
10,200.0	90.13	270.00	6,506.1	1,079.2	-2,813.5	2,954.4	0.00	0.00	0.00
10,300.0	90.13	270.00	6,505.8	1,079.2	-2,913.5	3,053.0	0.00	0.00	0.00
10,400.0	90.13	270.00	6,505.6	1,079.2	-3,013.5	3,151.6	0.00	0.00	0.00
10,500.0	90.13	270.00	6,505.4	1,079.2	-3,113.5	3,250.2	0.00	0.00	0.00
10,600.0	90.13	270.00	6,505.2	1,079.2	-3,213.5	3,348.8	0.00	0.00	0.00
10,700.0	90.13	270.00	6,504.9	1,079.2	-3,313.5	3,447.4	0.00	0.00	0.00
10,800.0	90.13	270.00	6,504.7	1,079.2	-3,413.5	3,546.0	0.00	0.00	0.00
10,900.0	90.13	270.00	6,504.5	1,079.2	-3,513.5	3,644.6	0.00	0.00	0.00
11,000.0	90.13	270.00	6,504.3	1,079.2	-3,613.5	3,743.1	0.00	0.00	0.00
11,100.0	90.13	270.00	6,504.0	1,079.2	-3,713.5	3,841.7	0.00	0.00	0.00
11,200.0	90.13	270.00	6,503.8	1,079.2	-3,813.5	3,940.3	0.00	0.00	0.00
11,300.0	90.13	270.00	6,503.6	1,079.2	-3,913.5	4,038.9	0.00	0.00	0.00
11,400.0	90.13	270.00	6,503.3	1,079.2	-4,013.5	4,137.5	0.00	0.00	0.00
11,500.0	90.13	270.00	6,503.1	1,079.2	-4,113.5	4,236.1	0.00	0.00	0.00
11,600.0	90.13	270.00	6,502.9	1,079.2	-4,213.5	4,334.7	0.00	0.00	0.00
11,700.0	90.13	270.00	6,502.7	1,079.2	-4,313.5	4,433.3	0.00	0.00	0.00
11,800.0	90.13	270.00	6,502.4	1,079.2	-4,413.5	4,531.9	0.00	0.00	0.00
11,900.0	90.13	270.00	6,502.2	1,079.2	-4,513.5	4,630.5	0.00	0.00	0.00
12,000.0	90.13	270.00	6,502.0	1,079.2	-4,613.5	4,729.0	0.00	0.00	0.00
12,100.0	90.13	270.00	6,501.7	1,079.2	-4,713.5	4,827.6	0.00	0.00	0.00
12,200.0	90.13	270.00	6,501.5	1,079.2	-4,813.5	4,926.2	0.00	0.00	0.00
12,300.0	90.13	270.00	6,501.3	1,079.2	-4,913.5	5,024.8	0.00	0.00	0.00
12,400.0	90.13	270.00	6,501.1	1,079.2	-5,013.5	5,123.4	0.00	0.00	0.00
12,500.0	90.13	270.00	6,500.8	1,079.2	-5,113.5	5,222.0	0.00	0.00	0.00
12,600.0	90.13	270.00	6,500.6	1,079.2	-5,213.5	5,320.6	0.00	0.00	0.00
12,700.0	90.13	270.00	6,500.4	1,079.2	-5,313.5	5,419.2	0.00	0.00	0.00
12,800.0	90.13	270.00	6,500.2	1,079.2	-5,413.5	5,517.8	0.00	0.00	0.00
12,900.0	90.13	270.00	6,499.9	1,079.2	-5,513.5	5,616.4	0.00	0.00	0.00
13,000.0	90.13	270.00	6,499.7	1,079.2	-5,613.5	5,714.9	0.00	0.00	0.00
13,100.0	90.13	270.00	6,499.5	1,079.2	-5,713.5	5,813.5	0.00	0.00	0.00
13,200.0	90.13	270.00	6,499.2	1,079.2	-5,813.5	5,912.1	0.00	0.00	0.00
13,300.0	90.13	270.00	6,499.0	1,079.2	-5,913.5	6,010.7	0.00	0.00	0.00
13,400.0	90.13	270.00	6,498.8	1,079.2	-6,013.5	6,109.3	0.00	0.00	0.00
13,500.0	90.13	270.00	6,498.6	1,079.2	-6,113.5	6,207.9	0.00	0.00	0.00
13,600.0	90.13	270.00	6,498.3	1,079.2	-6,213.5	6,306.5	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockcroft 19U-334
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:	Cockcroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockcroft 19U-334	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)
13,700.0	90.13	270.00	6,498.1	1,079.2	-6,313.5	6,405.1	0.00	0.00	0.00
13,746.0	90.13	270.00	6,498.0	1,079.2	-6,359.5	6,450.4	0.00	0.00	0.00
TD at 13746.0 - BHL 330'FNL, 2159'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 1395'FNL, 1082'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,385,886.37	3,285,831.54	40.388120	-104.473870
BHL 330'FNL, 2159'FEL - plan hits target center - Point	0.00	0.00	6,498.0	1,079.2	-6,359.5	1,386,891.84	3,279,460.25	40.391080	-104.496700
LPL 316'FNL, 852'FEL, 1 - plan hits target center - Point	0.00	0.00	6,513.0	1,079.2	230.3	1,386,968.11	3,286,049.32	40.391082	-104.473044

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,156.2	6,513.0	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,422.0	3,335.0	Parkman		0.00	
4,183.8	4,065.0	Sussex		0.00	
6,480.4	6,240.0	Sharon Springs		0.00	
6,640.7	6,350.0	Niobrara A		0.00	
6,759.2	6,415.0	Niobrara B		0.00	
7,011.8	6,500.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
600.0	600.0	0.0	0.0	KOP - Start Build 1.50
1,707.3	1,691.9	107.6	117.6	Start 4084.9 hold at 1707.3 MD
5,792.2	5,606.3	896.1	978.8	Start DLS 7.50 TFO -136.28
7,156.2	6,513.0	1,079.2	230.3	Start 6589.8 hold at 7156.2 MD
13,746.0	6,498.0	1,079.2	-6,359.5	TD at 13746.0

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19U-334

Wellbore #1

Plan #1 (11-13-15)

Anticollision Report

17 November, 2015

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

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

Survey Tool Program	Date 11/17/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,746.0	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-404 - Wellbore #1 - Plan #1 (11-13-15)	200.0	200.0	31.5	30.8	46.708	CC
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	13,746.0	13,827.9	223.0	-138.8	0.616	Level 1, ES, SF
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	600.0	601.0	74.7	72.2	30.179	CC, ES
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	5,700.0	5,715.2	720.4	671.5	14.736	SF
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	600.0	600.0	28.8	26.3	11.646	CC, ES
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	13,746.0	13,634.3	436.5	47.1	1.121	Level 2, SF
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	600.0	600.0	60.3	57.8	24.384	CC, ES
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	900.0	899.7	70.9	67.0	18.584	SF
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	600.0	601.0	89.1	86.6	35.997	CC, ES
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	5,100.0	5,093.5	791.7	751.2	19.564	SF
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	600.0	600.0	45.9	43.4	18.562	CC, ES
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	13,746.0	13,710.4	626.8	231.0	1.584	SF
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	14.4	12.8	9.151	CC, ES
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	600.0	599.4	18.0	15.5	7.415	SF
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	600.0	600.0	14.4	11.9	5.823	CC, ES
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	700.0	700.0	15.6	12.6	5.332	SF
Existing Wells Sec.19-T5N-R63W						
Christenson 2-19 (Exist) - Wellbore #1 - Wellbore #1	8,415.2	6,493.9	147.1	81.2	2.232	CC, ES, SF
Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1	3,873.1	3,770.7	399.9	376.6	17.194	CC
Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1	3,900.0	3,796.6	400.0	376.5	17.038	ES
Cockroft 19V (Exist) - Wellbore #1 - Wellbore #1	4,300.0	4,180.8	420.4	394.2	16.069	SF
Cockroft 41-19 (Exist) - Wellbore #1 - Wellbore #1	4,426.5	4,283.9	207.4	179.3	7.394	CC, ES
Cockroft 41-19 (Exist) - Wellbore #1 - Wellbore #1	4,500.0	4,353.8	208.6	180.1	7.314	SF
Johnson 1 (Exist) - Wellbore #1 - Wellbore #1	11,073.4	6,511.0	456.3	321.1	3.375	CC, ES
Johnson 1 (Exist) - Wellbore #1 - Wellbore #1	11,100.0	6,511.3	457.1	321.1	3.362	SF
Johnson 3 (Exist) - Wellbore #1 - Wellbore #1	9,720.8	6,497.2	263.0	46.7	1.216	Level 2, CC, ES, SF
Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1	10,125.7	6,514.5	716.5	608.0	6.604	CC, ES
Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1	10,300.0	6,508.5	737.4	624.2	6.512	SF
Roth 1-24 (Exist) - Wellbore #1 - Wellbore #1	12,236.3	6,497.4	335.5	50.0	1.175	Level 2, CC, ES, SF
Rothe 2-24 (P&A) - Wellbore #1 - Wellbore #1	13,523.3	6,490.3	270.0	66.0	1.323	Level 3, CC, ES, SF
SLW 21-19 (Exist) - Wellbore #1 - Wellbore #1	9,489.7	6,497.9	183.9	93.0	2.023	CC, ES
SLW 21-19 (Exist) - Wellbore #1 - Wellbore #1	9,500.0	6,498.0	184.2	93.0	2.020	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	76.64	7.3	30.6	31.5					
100.0	100.0	100.0	100.0	0.1	0.1	76.64	7.3	30.6	31.5	31.3	0.22	140.125		
200.0	200.0	200.0	200.0	0.3	0.3	76.64	7.3	30.6	31.5	30.8	0.67	46.708 CC		
300.0	300.0	299.3	299.3	0.6	0.6	75.32	8.3	31.5	32.6	31.4	1.12	29.045		
400.0	400.0	398.5	398.4	0.8	0.8	71.84	11.2	34.0	35.9	34.3	1.57	22.799		
500.0	500.0	497.4	497.1	1.0	1.0	67.31	16.0	38.3	41.6	39.5	2.03	20.491		
600.0	600.0	595.9	595.2	1.2	1.3	62.76	22.7	44.1	49.9	47.4	2.49	20.019		
700.0	700.0	694.0	692.7	1.5	1.5	11.46	31.3	51.6	59.6	56.6	2.93	20.301		
800.0	799.9	791.9	789.6	1.7	1.9	8.53	41.8	60.8	69.3	65.9	3.39	20.461		
900.0	899.7	889.6	885.8	1.9	2.2	6.14	54.0	71.5	79.1	75.3	3.85	20.554		
1,000.0	999.3	986.9	981.4	2.1	2.6	4.11	68.1	83.8	88.9	84.6	4.32	20.596		
1,100.0	1,098.6	1,084.1	1,076.2	2.4	3.0	2.33	84.0	97.6	98.7	93.9	4.79	20.595		
1,200.0	1,197.5	1,180.9	1,170.2	2.7	3.4	0.74	101.6	113.0	108.5	103.2	5.28	20.558		
1,300.0	1,296.1	1,277.6	1,263.3	3.0	3.9	-0.72	121.0	130.0	118.2	112.5	5.77	20.493		
1,400.0	1,394.2	1,377.2	1,359.0	3.4	4.4	-2.07	141.9	148.2	126.7	120.4	6.28	20.190		
1,500.0	1,491.7	1,476.9	1,454.8	3.8	5.0	-3.31	162.8	166.5	132.6	125.8	6.80	19.515		
1,600.0	1,588.6	1,576.8	1,550.8	4.2	5.5	-4.53	183.7	184.8	136.0	128.7	7.33	18.568		
1,707.3	1,691.9	1,684.1	1,653.8	4.7	6.1	-5.90	206.2	204.4	136.8	128.9	7.91	17.305		
1,800.0	1,780.7	1,776.7	1,742.8	5.2	6.7	-7.14	225.6	221.4	136.3	127.8	8.44	16.147		
1,900.0	1,876.5	1,876.7	1,838.8	5.7	7.2	-8.48	246.6	239.7	135.7	126.7	9.03	15.034		
2,000.0	1,972.3	1,976.6	1,934.8	6.3	7.8	-9.84	267.5	258.0	135.3	125.7	9.64	14.039		
2,100.0	2,068.2	2,076.6	2,030.8	6.8	8.3	-11.20	288.5	276.3	134.9	124.7	10.26	13.145		
2,200.0	2,164.0	2,176.5	2,126.8	7.4	8.9	-12.57	309.4	294.6	134.6	123.7	10.91	12.337		
2,300.0	2,259.8	2,276.5	2,222.8	8.0	9.5	-13.95	330.4	312.9	134.4	122.8	11.59	11.603		
2,400.0	2,355.7	2,376.4	2,318.8	8.5	10.0	-15.33	351.4	331.2	134.3	122.0	12.28	10.935		
2,500.0	2,451.5	2,476.4	2,414.8	9.1	10.6	-16.71	372.3	349.5	134.2	121.2	13.00	10.323		
2,521.7	2,472.3	2,498.1	2,435.6	9.2	10.7	-17.01	376.9	353.5	134.2	121.1	13.16	10.197		
2,600.0	2,547.3	2,576.3	2,510.7	9.7	11.2	-18.09	393.3	367.8	134.3	120.5	13.75	9.762		
2,700.0	2,643.1	2,676.3	2,606.7	10.2	11.7	-19.47	414.2	386.1	134.4	119.8	14.53	9.246		
2,800.0	2,739.0	2,776.2	2,702.7	10.8	12.3	-20.85	435.2	404.4	134.5	119.2	15.34	8.771		
2,900.0	2,834.8	2,876.2	2,798.7	11.4	12.9	-22.22	456.1	422.7	134.8	118.6	16.18	8.333		
3,000.0	2,930.6	2,976.1	2,894.7	12.0	13.5	-23.59	477.1	441.0	135.1	118.1	17.04	7.929		
3,100.0	3,026.4	3,076.0	2,990.7	12.6	14.0	-24.95	498.0	459.3	135.5	117.6	17.94	7.555		
3,200.0	3,122.3	3,176.0	3,086.7	13.1	14.6	-26.30	519.0	477.6	136.0	117.2	18.87	7.209		
3,300.0	3,218.1	3,275.9	3,182.7	13.7	15.2	-27.64	539.9	495.9	136.6	116.8	19.83	6.889		
3,400.0	3,313.9	3,375.9	3,278.7	14.3	15.7	-28.97	560.9	514.2	137.2	116.4	20.81	6.593		
3,500.0	3,409.8	3,475.8	3,374.7	14.9	16.3	-30.28	581.8	532.5	137.9	116.1	21.83	6.319		
3,600.0	3,505.6	3,575.8	3,470.7	15.5	16.9	-31.58	602.8	550.8	138.7	115.8	22.87	6.066		
3,700.0	3,601.4	3,675.7	3,566.7	16.1	17.4	-32.87	623.7	569.1	139.6	115.6	23.93	5.831		
3,800.0	3,697.2	3,775.7	3,662.7	16.6	18.0	-34.14	644.7	587.4	140.5	115.4	25.03	5.613		
3,900.0	3,793.1	3,875.6	3,758.7	17.2	18.6	-35.39	665.6	605.7	141.5	115.3	26.14	5.411		
4,000.0	3,888.9	3,975.6	3,854.7	17.8	19.2	-36.63	686.6	624.0	142.5	115.2	27.28	5.224		
4,100.0	3,984.7	4,075.5	3,950.7	18.4	19.7	-37.84	707.6	642.3	143.6	115.2	28.44	5.050		
4,200.0	4,080.5	4,175.5	4,046.7	19.0	20.3	-39.04	728.5	660.6	144.8	115.2	29.62	4.890		
4,300.0	4,176.4	4,275.4	4,142.7	19.6	20.9	-40.22	749.5	678.9	146.1	115.3	30.81	4.740		
4,400.0	4,272.2	4,375.4	4,238.7	20.2	21.4	-41.37	770.4	697.2	147.4	115.3	32.03	4.601		
4,500.0	4,368.0	4,475.3	4,334.7	20.7	22.0	-42.51	791.4	715.5	148.7	115.5	33.26	4.473		
4,600.0	4,463.9	4,575.3	4,430.7	21.3	22.6	-43.63	812.3	733.8	150.2	115.7	34.50	4.353		
4,700.0	4,559.7	4,675.2	4,526.7	21.9	23.2	-44.72	833.3	752.1	151.6	115.9	35.75	4.242		
4,800.0	4,655.5	4,775.2	4,622.7	22.5	23.7	-45.79	854.2	770.4	153.2	116.2	37.02	4.138		
4,900.0	4,751.3	4,875.1	4,718.7	23.1	24.3	-46.84	875.2	788.7	154.8	116.5	38.29	4.042		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - 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					
5,000.0	4,847.2	4,975.1	4,814.7	23.7	24.9	-47.87	896.1	807.0	156.4	116.8	39.58	3.952						
5,100.0	4,943.0	5,075.0	4,910.7	24.3	25.5	-48.88	917.1	825.3	158.1	117.2	40.87	3.868						
5,200.0	5,038.8	5,174.9	5,006.7	24.9	26.0	-49.86	938.0	843.6	159.8	117.6	42.17	3.790						
5,300.0	5,134.6	5,274.9	5,102.7	25.5	26.6	-50.83	959.0	861.9	161.6	118.1	43.47	3.717						
5,400.0	5,230.5	5,374.8	5,198.7	26.0	27.2	-51.77	979.9	880.2	163.4	118.6	44.78	3.649						
5,500.0	5,326.3	5,474.8	5,294.7	26.6	27.7	-52.69	1,000.9	898.5	165.3	119.2	46.10	3.586						
5,600.0	5,422.1	5,574.7	5,390.7	27.2	28.3	-53.59	1,021.8	916.9	167.2	119.8	47.42	3.526						
5,700.0	5,518.0	5,674.7	5,486.7	27.8	28.9	-54.47	1,042.8	935.2	169.2	120.4	48.74	3.471						
5,792.2	5,606.3	5,766.8	5,575.2	28.3	29.4	-55.27	1,062.1	952.0	171.0	121.0	49.95	3.423						
5,800.0	5,613.8	5,774.6	5,582.7	28.4	29.5	-53.94	1,063.7	953.5	171.1	121.1	50.05	3.419						
5,850.0	5,662.1	5,824.6	5,630.7	28.6	29.7	-42.87	1,074.2	962.6	171.8	121.4	50.37	3.411						
5,900.0	5,710.8	5,874.4	5,678.5	28.8	30.0	-26.92	1,084.7	971.7	172.0	121.8	50.19	3.427						
5,950.0	5,759.8	5,923.5	5,725.7	28.9	30.3	-6.84	1,095.0	980.4	172.0	122.5	49.55	3.472						
6,000.0	5,808.8	5,972.1	5,772.8	29.0	30.5	13.72	1,105.3	986.4	172.3	123.6	48.73	3.536						
6,050.0	5,857.6	6,021.2	5,820.7	29.1	30.7	31.44	1,115.7	989.4	172.9	125.1	47.82	3.616						
6,100.0	5,906.0	6,070.9	5,869.2	29.2	30.8	45.32	1,126.3	989.2	173.8	127.0	46.86	3.710						
6,150.0	5,953.8	6,121.0	5,918.0	29.2	30.9	55.99	1,136.9	985.7	175.1	129.2	45.88	3.816						
6,200.0	6,000.8	6,171.6	5,967.0	29.2	31.0	64.33	1,147.6	978.8	176.7	131.8	44.91	3.934						
6,250.0	6,046.7	6,222.8	6,016.0	29.2	31.1	71.06	1,158.3	968.5	178.5	134.6	43.95	4.061						
6,300.0	6,091.5	6,274.5	6,064.7	29.1	31.1	76.64	1,169.0	954.8	180.6	137.6	43.04	4.196						
6,350.0	6,134.8	6,326.8	6,112.9	29.1	31.1	81.37	1,179.5	937.5	182.9	140.8	42.18	4.338						
6,400.0	6,176.6	6,379.6	6,160.2	29.0	31.1	85.47	1,189.8	916.6	185.5	144.1	41.38	4.482						
6,450.0	6,216.6	6,432.9	6,206.6	28.9	31.1	89.05	1,199.9	892.1	188.2	147.5	40.66	4.628						
6,500.0	6,254.6	6,486.9	6,251.6	28.8	31.0	92.22	1,209.8	864.1	190.9	150.9	40.03	4.770						
6,550.0	6,290.6	6,541.4	6,295.0	28.6	30.9	95.02	1,219.2	832.6	193.8	154.3	39.50	4.907						
6,600.0	6,324.3	6,596.4	6,336.5	28.5	30.8	97.52	1,228.3	797.6	196.7	157.6	39.08	5.032						
6,650.0	6,355.6	6,652.0	6,375.8	28.3	30.7	99.73	1,236.9	759.3	199.5	160.7	38.80	5.142						
6,700.0	6,384.4	6,708.0	6,412.6	28.2	30.5	101.69	1,244.9	717.8	202.3	163.6	38.67	5.230						
6,750.0	6,410.5	6,764.6	6,446.6	28.1	30.4	103.42	1,252.3	673.2	204.9	166.2	38.71	5.293						
6,800.0	6,433.9	6,821.6	6,477.5	27.9	30.2	104.93	1,259.1	625.8	207.4	168.4	38.93	5.326						
6,850.0	6,454.3	6,879.0	6,505.1	27.8	30.0	106.24	1,265.1	575.8	209.6	170.3	39.35	5.327						
6,900.0	6,471.9	6,936.9	6,529.0	27.7	29.9	107.34	1,270.3	523.4	211.7	171.7	39.96	5.296						
6,950.0	6,486.4	6,995.0	6,549.1	27.6	29.7	108.26	1,274.7	469.0	213.4	172.7	40.78	5.234						
7,000.0	6,497.8	7,053.5	6,565.2	27.5	29.5	109.00	1,278.2	413.0	214.9	173.1	41.78	5.143						
7,050.0	6,506.0	7,112.1	6,577.1	27.4	29.3	109.56	1,280.8	355.6	216.0	173.1	42.97	5.028						
7,100.0	6,511.1	7,171.0	6,584.7	27.4	29.2	109.95	1,282.5	297.3	216.8	172.5	44.31	4.893						
7,150.0	6,513.0	7,230.0	6,587.9	27.5	29.0	110.17	1,283.2	238.4	217.3	171.5	45.79	4.746						
7,156.2	6,513.0	7,237.3	6,588.0	27.5	29.0	110.18	1,283.2	231.1	217.3	171.3	45.98	4.727						
7,200.0	6,512.9	7,281.9	6,588.0	27.6	28.9	110.21	1,283.2	186.5	217.4	170.4	47.00	4.625						
7,300.0	6,512.7	7,381.9	6,588.0	28.3	28.8	110.27	1,283.2	86.5	217.4	167.8	49.64	4.380						
7,400.0	6,512.4	7,481.9	6,588.0	29.6	29.4	110.32	1,283.2	-13.5	217.5	164.9	52.67	4.130						
7,500.0	6,512.2	7,581.9	6,588.0	31.3	31.0	110.38	1,283.2	-113.5	217.6	161.6	56.03	3.883						
7,600.0	6,512.0	7,681.9	6,588.0	33.2	32.9	110.44	1,283.2	-213.5	217.7	158.0	59.67	3.648						
7,700.0	6,511.8	7,781.9	6,588.0	35.3	35.1	110.49	1,283.2	-313.5	217.8	154.2	63.54	3.427						
7,800.0	6,511.5	7,881.9	6,588.0	37.4	37.3	110.55	1,283.2	-413.5	217.8	150.3	67.59	3.223						
7,900.0	6,511.3	7,981.9	6,588.0	39.7	39.6	110.61	1,283.2	-513.5	217.9	146.1	71.80	3.035						
8,000.0	6,511.1	8,081.9	6,588.0	42.1	42.0	110.66	1,283.2	-613.5	218.0	141.9	76.13	2.864						
8,100.0	6,510.9	8,181.9	6,588.0	44.5	44.4	110.72	1,283.2	-713.5	218.1	137.5	80.57	2.707						
8,200.0	6,510.6	8,281.9	6,588.0	46.9	46.8	110.77	1,283.2	-813.5	218.2	133.1	85.11	2.563						
8,300.0	6,510.4	8,381.9	6,588.0	49.4	49.3	110.83	1,283.2	-913.5	218.2	128.5	89.71	2.433						
8,400.0	6,510.2	8,481.9	6,588.0	51.9	51.8	110.88	1,283.2	-1,013.5	218.3	123.9	94.38	2.313						

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset				Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,500.0	6,509.9	8,581.9	6,588.0	54.4	54.3	110.94	1,283.2	-1,113.5	218.4	119.3	99.11	2.204		
8,600.0	6,509.7	8,681.9	6,588.0	57.0	56.9	111.00	1,283.2	-1,213.5	218.5	114.6	103.88	2.103		
8,700.0	6,509.5	8,781.9	6,588.0	59.6	59.5	111.05	1,283.2	-1,313.5	218.6	109.9	108.69	2.011		
8,800.0	6,509.3	8,881.9	6,588.0	62.2	62.1	111.11	1,283.2	-1,413.5	218.7	105.1	113.53	1.926		
8,900.0	6,509.0	8,981.9	6,588.0	64.8	64.7	111.16	1,283.2	-1,513.5	218.7	100.3	118.41	1.847		
9,000.0	6,508.8	9,081.9	6,588.0	67.4	67.3	111.22	1,283.2	-1,613.5	218.8	95.5	123.31	1.775		
9,100.0	6,508.6	9,181.9	6,588.0	70.0	70.0	111.27	1,283.2	-1,713.5	218.9	90.7	128.23	1.707		
9,200.0	6,508.3	9,281.9	6,588.0	72.7	72.6	111.33	1,283.2	-1,813.5	219.0	85.8	133.17	1.644		
9,300.0	6,508.1	9,381.9	6,588.0	75.4	75.3	111.38	1,283.2	-1,913.5	219.1	80.9	138.12	1.586		
9,400.0	6,507.9	9,481.9	6,588.0	78.0	77.9	111.44	1,283.2	-2,013.5	219.2	76.1	143.10	1.532		
9,500.0	6,507.7	9,581.9	6,588.0	80.7	80.6	111.50	1,283.2	-2,113.5	219.2	71.2	148.08	1.481 Level 3		
9,600.0	6,507.4	9,681.9	6,588.0	83.4	83.3	111.55	1,283.2	-2,213.5	219.3	66.3	153.07	1.433 Level 3		
9,700.0	6,507.2	9,781.9	6,588.0	86.1	86.0	111.61	1,283.2	-2,313.5	219.4	61.3	158.08	1.388 Level 3		
9,800.0	6,507.0	9,881.9	6,588.0	88.8	88.7	111.66	1,283.2	-2,413.5	219.5	56.4	163.09	1.346 Level 3		
9,900.0	6,506.8	9,981.9	6,588.0	91.5	91.4	111.72	1,283.2	-2,513.5	219.6	51.5	168.11	1.306 Level 3		
10,000.0	6,506.5	10,081.9	6,588.0	94.2	94.1	111.77	1,283.2	-2,613.5	219.7	46.5	173.13	1.269 Level 3		
10,100.0	6,506.3	10,181.9	6,588.0	97.0	96.8	111.83	1,283.2	-2,713.5	219.7	41.6	178.17	1.233 Level 2		
10,200.0	6,506.1	10,281.9	6,588.0	99.7	99.6	111.88	1,283.2	-2,813.5	219.8	36.6	183.20	1.200 Level 2		
10,300.0	6,505.8	10,381.9	6,588.0	102.4	102.3	111.94	1,283.2	-2,913.5	219.9	31.7	188.24	1.168 Level 2		
10,400.0	6,505.6	10,481.9	6,588.0	105.2	105.0	111.99	1,283.2	-3,013.5	220.0	26.7	193.28	1.138 Level 2		
10,500.0	6,505.4	10,581.9	6,588.0	107.9	107.8	112.05	1,283.2	-3,113.5	220.1	21.8	198.33	1.110 Level 2		
10,600.0	6,505.2	10,681.9	6,588.0	110.6	110.5	112.10	1,283.2	-3,213.5	220.2	16.8	203.38	1.083 Level 2		
10,700.0	6,504.9	10,781.9	6,588.0	113.4	113.2	112.16	1,283.2	-3,313.5	220.3	11.8	208.43	1.057 Level 2		
10,800.0	6,504.7	10,881.9	6,588.0	116.1	116.0	112.21	1,283.2	-3,413.5	220.3	6.9	213.48	1.032 Level 2		
10,900.0	6,504.5	10,981.9	6,588.0	118.9	118.7	112.27	1,283.2	-3,513.5	220.4	1.9	218.53	1.009 Level 2		
11,000.0	6,504.3	11,081.9	6,588.0	121.6	121.5	112.32	1,283.2	-3,613.5	220.5	-3.1	223.58	0.986 Level 1		
11,100.0	6,504.0	11,181.9	6,588.0	124.4	124.2	112.37	1,283.2	-3,713.5	220.6	-8.0	228.63	0.965 Level 1		
11,200.0	6,503.8	11,281.9	6,588.0	127.1	127.0	112.43	1,283.2	-3,813.5	220.7	-13.0	233.69	0.944 Level 1		
11,300.0	6,503.6	11,381.9	6,588.0	129.9	129.8	112.48	1,283.2	-3,913.5	220.8	-18.0	238.74	0.925 Level 1		
11,400.0	6,503.3	11,481.9	6,588.0	132.7	132.5	112.54	1,283.2	-4,013.5	220.9	-22.9	243.79	0.906 Level 1		
11,500.0	6,503.1	11,581.9	6,588.0	135.4	135.3	112.59	1,283.2	-4,113.5	221.0	-27.9	248.84	0.888 Level 1		
11,600.0	6,502.9	11,681.9	6,588.0	138.2	138.0	112.65	1,283.2	-4,213.5	221.0	-32.8	253.89	0.871 Level 1		
11,700.0	6,502.7	11,781.9	6,588.0	141.0	140.8	112.70	1,283.2	-4,313.5	221.1	-37.8	258.94	0.854 Level 1		
11,800.0	6,502.4	11,881.9	6,588.0	143.7	143.6	112.76	1,283.2	-4,413.5	221.2	-42.8	263.99	0.838 Level 1		
11,900.0	6,502.2	11,981.9	6,588.0	146.5	146.3	112.81	1,283.2	-4,513.5	221.3	-47.7	269.04	0.823 Level 1		
12,000.0	6,502.0	12,081.9	6,588.0	149.3	149.1	112.86	1,283.2	-4,613.5	221.4	-52.7	274.08	0.808 Level 1		
12,100.0	6,501.7	12,181.9	6,588.0	152.0	151.9	112.92	1,283.2	-4,713.5	221.5	-57.6	279.12	0.794 Level 1		
12,200.0	6,501.5	12,281.9	6,588.0	154.8	154.7	112.97	1,283.2	-4,813.5	221.6	-62.6	284.16	0.780 Level 1		
12,300.0	6,501.3	12,381.9	6,588.0	157.6	157.4	113.03	1,283.2	-4,913.5	221.7	-67.5	289.20	0.766 Level 1		
12,400.0	6,501.1	12,481.9	6,588.0	160.4	160.2	113.08	1,283.2	-5,013.5	221.8	-72.5	294.24	0.754 Level 1		
12,500.0	6,500.8	12,581.9	6,588.0	163.2	163.0	113.13	1,283.2	-5,113.5	221.8	-77.4	299.28	0.741 Level 1		
12,600.0	6,500.6	12,681.9	6,588.0	165.9	165.8	113.19	1,283.2	-5,213.5	221.9	-82.4	304.31	0.729 Level 1		
12,700.0	6,500.4	12,781.9	6,588.0	168.7	168.5	113.24	1,283.2	-5,313.5	222.0	-87.3	309.34	0.718 Level 1		
12,800.0	6,500.2	12,881.9	6,588.0	171.5	171.3	113.30	1,283.2	-5,413.5	222.1	-92.2	314.37	0.707 Level 1		
12,900.0	6,499.9	12,981.9	6,588.0	174.3	174.1	113.35	1,283.2	-5,513.5	222.2	-97.2	319.39	0.696 Level 1		
13,000.0	6,499.7	13,081.9	6,588.0	177.1	176.9	113.40	1,283.2	-5,613.5	222.3	-102.1	324.42	0.685 Level 1		
13,100.0	6,499.5	13,181.9	6,588.0	179.8	179.7	113.46	1,283.2	-5,713.5	222.4	-107.0	329.44	0.675 Level 1		
13,200.0	6,499.2	13,281.9	6,588.0	182.6	182.4	113.51	1,283.2	-5,813.5	222.5	-112.0	334.45	0.665 Level 1		
13,300.0	6,499.0	13,381.9	6,588.0	185.4	185.2	113.57	1,283.2	-5,913.5	222.6	-116.9	339.47	0.656 Level 1		
13,400.0	6,498.8	13,481.9	6,588.0	188.2	188.0	113.62	1,283.2	-6,013.5	222.7	-121.8	344.48	0.646 Level 1		
13,500.0	6,498.6	13,581.9	6,588.0	191.0	190.8	113.67	1,283.2	-6,113.5	222.8	-126.7	349.49	0.637 Level 1		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 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	
13,600.0	6,498.3	13,681.9	6,588.0	193.8	193.6	113.73	1,283.2	-6,213.5	222.9	-131.6	354.49	0.629	Level 1	
13,700.0	6,498.1	13,781.9	6,588.0	196.6	196.4	113.78	1,283.2	-6,313.5	222.9	-136.6	359.50	0.620	Level 1	
13,746.0	6,498.0	13,827.9	6,588.0	197.8	197.7	113.80	1,283.2	-6,359.5	223.0	-138.8	361.79	0.616	Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-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	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum	Separation								
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Centres (ft)	Ellipses (ft)	Separation (ft)	Factor	Warning							
0.0	0.0	1.0	1.0	0.0	0.0	-104.12	-18.2	-72.4	74.7	74.7	0.00	N/A								
100.0	100.0	101.0	101.0	0.1	0.1	-104.12	-18.2	-72.4	74.7	74.5	0.23	328.984								
200.0	200.0	201.0	201.0	0.3	0.3	-104.12	-18.2	-72.4	74.7	74.0	0.68	110.390								
300.0	300.0	301.0	301.0	0.6	0.6	-104.12	-18.2	-72.4	74.7	73.6	1.13	66.322								
400.0	400.0	401.0	401.0	0.8	0.8	-104.12	-18.2	-72.4	74.7	73.1	1.58	47.400								
500.0	500.0	501.0	501.0	1.0	1.0	-104.12	-18.2	-72.4	74.7	72.7	2.03	36.878								
600.0	600.0	601.0	601.0	1.2	1.2	-104.12	-18.2	-72.4	74.7	72.2	2.47	30.179 CC, ES								
700.0	700.0	701.0	701.0	1.5	1.5	-152.10	-18.2	-72.4	75.8	72.9	2.92	25.960								
800.0	799.9	800.9	800.9	1.7	1.7	-153.41	-18.2	-72.4	79.3	76.0	3.37	23.560								
900.0	899.7	900.7	900.7	1.9	1.9	-155.34	-18.2	-72.4	85.2	81.4	3.82	22.340								
1,000.0	999.3	1,000.3	1,000.3	2.1	2.1	-157.62	-18.2	-72.4	93.6	89.4	4.26	21.954								
1,100.0	1,098.6	1,099.6	1,099.6	2.4	2.4	-160.02	-18.2	-72.4	104.6	99.9	4.72	22.183								
1,200.0	1,197.5	1,198.5	1,198.5	2.7	2.6	-162.33	-18.2	-72.4	118.2	113.0	5.17	22.881								
1,300.0	1,296.1	1,297.1	1,297.1	3.0	2.8	-164.45	-18.2	-72.4	134.4	128.8	5.62	23.941								
1,400.0	1,394.2	1,395.2	1,395.2	3.4	3.0	-166.34	-18.2	-72.4	153.4	147.3	6.06	25.287								
1,500.0	1,491.7	1,492.7	1,492.7	3.8	3.2	-167.97	-18.2	-72.4	174.9	168.4	6.51	26.857								
1,600.0	1,588.6	1,589.6	1,589.6	4.2	3.5	-169.38	-18.2	-72.4	199.1	192.1	6.96	28.607								
1,707.3	1,691.9	1,698.2	1,698.2	4.7	3.7	-170.86	-18.0	-71.2	226.8	219.4	7.43	30.516								
1,800.0	1,780.7	1,793.2	1,793.1	5.2	3.9	-172.23	-17.4	-67.6	249.9	242.1	7.86	31.818								
1,900.0	1,876.5	1,896.7	1,896.4	5.7	4.1	-173.71	-16.4	-61.1	272.8	264.4	8.32	32.772								
2,000.0	1,972.3	2,001.1	2,000.4	6.3	4.3	-175.23	-14.8	-51.7	293.4	284.6	8.80	33.324								
2,100.0	2,068.2	2,106.4	2,104.9	6.8	4.6	-176.80	-12.8	-39.3	311.8	302.5	9.30	33.526								
2,200.0	2,164.0	2,212.4	2,209.7	7.4	4.9	-178.47	-10.3	-24.1	328.1	318.3	9.82	33.424								
2,300.0	2,259.8	2,318.8	2,314.6	8.0	5.2	179.76	-7.3	-5.9	342.3	332.0	10.36	33.049								
2,400.0	2,355.7	2,425.6	2,419.1	8.5	5.5	177.86	-3.9	15.3	354.5	343.6	10.93	32.433								
2,500.0	2,451.5	2,532.5	2,523.3	9.1	5.9	175.81	0.0	39.3	364.8	353.3	11.55	31.590								
2,600.0	2,547.3	2,639.4	2,626.7	9.7	6.3	173.60	4.4	66.3	373.3	361.1	12.22	30.544								
2,700.0	2,643.1	2,746.2	2,729.1	10.2	6.8	171.21	9.3	96.0	380.2	367.2	12.97	29.319								
2,800.0	2,739.0	2,850.9	2,828.6	10.8	7.3	168.68	14.5	127.8	385.7	371.9	13.79	27.971								
2,900.0	2,834.8	2,949.3	2,922.1	11.4	7.8	166.27	19.5	158.6	391.2	376.6	14.66	26.696								
3,000.0	2,930.6	3,047.8	3,015.5	12.0	8.4	163.94	24.5	189.3	397.5	381.9	15.58	25.509								
3,100.0	3,026.4	3,146.3	3,108.9	12.6	8.9	161.68	29.6	220.0	404.4	387.8	16.56	24.413								
3,200.0	3,122.3	3,244.8	3,202.4	13.1	9.5	159.50	34.6	250.7	411.9	394.3	17.60	23.405								
3,300.0	3,218.1	3,343.2	3,295.8	13.7	10.1	157.40	39.6	281.4	420.0	401.3	18.68	22.485								
3,400.0	3,313.9	3,441.7	3,389.2	14.3	10.7	155.38	44.6	312.1	428.7	408.9	19.80	21.649								
3,500.0	3,409.8	3,540.2	3,482.6	14.9	11.3	153.44	49.6	342.9	437.9	416.9	20.96	20.892								
3,600.0	3,505.6	3,638.7	3,576.1	15.5	11.9	151.58	54.6	373.6	447.5	425.4	22.15	20.209								
3,700.0	3,601.4	3,737.1	3,669.5	16.1	12.5	149.80	59.7	404.3	457.7	434.3	23.36	19.593								
3,800.0	3,697.2	3,835.6	3,762.9	16.6	13.1	148.09	64.7	435.0	468.2	443.6	24.59	19.038								
3,900.0	3,793.1	3,934.1	3,856.4	17.2	13.7	146.46	69.7	465.7	479.2	453.3	25.85	18.539								
4,000.0	3,888.9	4,032.6	3,949.8	17.8	14.4	144.91	74.7	496.4	490.5	463.4	27.11	18.090								
4,100.0	3,984.7	4,131.0	4,043.2	18.4	15.0	143.42	79.7	527.1	502.2	473.8	28.39	17.686								
4,200.0	4,080.5	4,229.5	4,136.6	19.0	15.6	142.00	84.8	557.9	514.2	484.5	29.68	17.323								
4,300.0	4,176.4	4,328.0	4,230.1	19.6	16.2	140.64	89.8	588.6	526.4	495.5	30.98	16.996								
4,400.0	4,272.2	4,426.5	4,323.5	20.2	16.9	139.35	94.8	619.3	539.0	506.8	32.28	16.701								
4,500.0	4,368.0	4,524.9	4,416.9	20.7	17.5	138.12	99.8	650.0	551.9	518.3	33.58	16.435								
4,600.0	4,463.9	4,623.4	4,510.4	21.3	18.2	136.94	104.8	680.7	565.0	530.1	34.89	16.194								
4,700.0	4,559.7	4,721.9	4,603.8	21.9	18.8	135.81	109.8	711.4	578.3	542.1	36.19	15.977								
4,800.0	4,655.5	4,820.4	4,697.2	22.5	19.4	134.74	114.9	742.2	591.8	554.3	37.50	15.780								
4,900.0	4,751.3	4,918.8	4,790.6	23.1	20.1	133.71	119.9	772.9	605.5	566.7	38.81	15.602								
5,000.0	4,847.2	5,017.3	4,884.1	23.7	20.7	132.73	124.9	803.6	619.4	579.3	40.12	15.440								

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	4,943.0	5,115.8	4,977.5	24.3	21.4	131.79	129.9	834.3	633.5	592.1	41.42	15.294		
5,200.0	5,038.8	5,214.3	5,070.9	24.9	22.0	130.89	134.9	865.0	647.7	605.0	42.73	15.160		
5,300.0	5,134.6	5,312.7	5,164.3	25.5	22.7	130.03	139.9	895.7	662.1	618.1	44.03	15.039		
5,400.0	5,230.5	5,411.2	5,257.8	26.0	23.3	129.21	145.0	926.4	676.6	631.3	45.33	14.928		
5,500.0	5,326.3	5,509.7	5,351.2	26.6	24.0	128.42	150.0	957.2	691.3	644.7	46.62	14.828		
5,600.0	5,422.1	5,608.7	5,445.2	27.2	24.6	127.66	155.0	988.0	706.1	658.2	47.91	14.738		
5,700.0	5,518.0	5,715.2	5,548.5	27.8	25.1	127.57	160.6	1,012.9	720.4	671.5	48.88	14.736 SF		
5,792.2	5,606.3	5,812.3	5,644.8	28.3	25.3	128.49	165.8	1,022.9	732.7	683.3	49.37	14.841		
5,800.0	5,613.8	5,820.3	5,652.8	28.4	25.3	130.08	166.2	1,023.2	733.7	684.3	49.36	14.863		
5,850.0	5,662.1	5,871.7	5,704.1	28.6	25.3	142.15	168.9	1,023.0	740.3	691.1	49.29	15.021		
5,900.0	5,710.8	5,922.4	5,754.6	28.8	25.3	157.99	171.7	1,019.4	747.2	698.1	49.13	15.209		
5,950.0	5,759.8	5,972.5	5,804.1	28.9	25.3	177.02	174.3	1,012.6	754.2	705.3	48.90	15.421		
6,000.0	5,808.8	6,022.0	5,852.6	29.0	25.3	-163.65	176.9	1,002.6	761.2	712.6	48.63	15.655		
6,050.0	5,857.6	6,071.0	5,899.8	29.1	25.2	-147.19	179.5	989.7	768.4	720.1	48.31	15.907		
6,100.0	5,906.0	6,119.5	5,945.6	29.2	25.1	-134.57	181.9	974.0	775.6	727.6	47.96	16.172		
6,150.0	5,953.8	6,167.5	5,989.8	29.2	25.0	-125.17	184.3	955.5	782.8	735.2	47.59	16.447		
6,200.0	6,000.8	6,215.0	6,032.4	29.2	24.9	-118.09	186.6	934.6	789.9	742.7	47.22	16.728		
6,250.0	6,046.7	6,262.1	6,073.3	29.2	24.8	-112.60	188.8	911.3	797.0	750.2	46.86	17.009		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference				Offset			Semi Major Axis			Distance				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	-7.3	-27.9		28.8				
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-7.3	-27.9		28.8	28.6	0.22	128.108	
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-7.3	-27.9		28.8	28.1	0.67	42.703	
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-7.3	-27.9		28.8	27.7	1.12	25.622	
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-7.3	-27.9		28.8	27.2	1.57	18.301	
500.0	500.0	500.0	500.0	1.0	1.0	-104.66	-7.3	-27.9		28.8	26.8	2.02	14.234	
600.0	600.0	600.0	600.0	1.2	1.2	-104.66	-7.3	-27.9		28.8	26.3	2.47	11.646 CC, ES	
700.0	700.0	700.0	700.0	1.5	1.5	-153.34	-7.3	-27.9		30.0	27.0	2.92	10.262	
800.0	799.9	799.9	799.9	1.7	1.7	-156.33	-7.3	-27.9		33.5	30.1	3.37	9.959	
900.0	899.7	899.7	899.7	1.9	1.9	-160.10	-7.3	-27.9		39.6	35.8	3.81	10.382	
1,000.0	999.3	999.3	999.3	2.1	2.1	-163.76	-7.3	-27.9		48.3	44.0	4.26	11.331	
1,100.0	1,098.6	1,100.1	1,100.1	2.4	2.4	-166.97	-6.7	-26.7		58.4	53.7	4.70	12.410	
1,200.0	1,197.5	1,201.2	1,201.1	2.7	2.6	-169.80	-4.8	-23.2		68.5	63.4	5.14	13.336	
1,300.0	1,296.1	1,302.6	1,302.3	3.0	2.8	-172.40	-1.7	-17.2		78.8	73.2	5.58	14.121	
1,400.0	1,394.2	1,404.2	1,403.4	3.4	3.0	-174.86	2.6	-8.9		89.1	83.1	6.02	14.796	
1,500.0	1,491.7	1,506.0	1,504.6	3.8	3.3	-177.20	8.2	1.8		99.6	93.1	6.48	15.380	
1,600.0	1,588.6	1,608.1	1,605.6	4.2	3.6	-179.47	15.1	15.0		110.3	103.3	6.94	15.885	
1,707.3	1,691.9	1,717.9	1,713.7	4.7	3.9	178.17	23.9	31.8		121.9	114.4	7.46	16.342	
1,800.0	1,780.7	1,813.1	1,806.9	5.2	4.2	176.16	32.6	48.6		131.0	123.0	7.95	16.471	
1,900.0	1,876.5	1,916.1	1,907.3	5.7	4.6	173.91	43.3	69.0		138.5	130.0	8.52	16.260	
2,000.0	1,972.3	2,019.3	2,007.3	6.3	5.0	171.46	55.3	92.0		143.8	134.7	9.13	15.746	
2,100.0	2,068.2	2,121.0	2,105.1	6.8	5.5	168.83	68.2	116.7		147.1	137.3	9.80	15.010	
2,200.0	2,164.0	2,220.8	2,200.9	7.4	6.0	166.28	81.0	141.3		150.3	139.8	10.51	14.298	
2,300.0	2,259.8	2,320.5	2,296.7	8.0	6.5	163.85	93.9	165.9		153.8	142.5	11.27	13.642	
2,400.0	2,355.7	2,420.2	2,392.5	8.5	7.0	161.53	106.7	190.5		157.6	145.5	12.08	13.038	
2,500.0	2,451.5	2,520.0	2,488.3	9.1	7.6	159.32	119.6	215.0		161.6	148.6	12.94	12.485	
2,600.0	2,547.3	2,619.7	2,584.1	9.7	8.1	157.21	132.4	239.6		165.8	152.0	13.84	11.981	
2,700.0	2,643.1	2,719.4	2,679.9	10.2	8.6	155.22	145.3	264.2		170.2	155.5	14.78	11.522	
2,800.0	2,739.0	2,819.1	2,775.6	10.8	9.2	153.33	158.1	288.8		174.9	159.1	15.75	11.105	
2,900.0	2,834.8	2,918.9	2,871.4	11.4	9.7	151.54	170.9	313.4		179.7	163.0	16.75	10.728	
3,000.0	2,930.6	3,018.6	2,967.2	12.0	10.3	149.84	183.8	338.0		184.7	166.9	17.78	10.387	
3,100.0	3,026.4	3,118.3	3,063.0	12.6	10.8	148.24	196.6	362.6		189.9	171.0	18.84	10.079	
3,200.0	3,122.3	3,218.1	3,158.8	13.1	11.4	146.71	209.5	387.1		195.1	175.2	19.91	9.800	
3,300.0	3,218.1	3,317.8	3,254.6	13.7	12.0	145.28	222.3	411.7		200.6	179.6	21.01	9.548	
3,400.0	3,313.9	3,417.5	3,350.4	14.3	12.5	143.91	235.1	436.3		206.1	184.0	22.11	9.319	
3,500.0	3,409.8	3,517.2	3,446.2	14.9	13.1	142.62	248.0	460.9		211.7	188.5	23.24	9.112	
3,600.0	3,505.6	3,617.0	3,542.0	15.5	13.7	141.40	260.8	485.5		217.5	193.1	24.37	8.924	
3,700.0	3,601.4	3,716.7	3,637.8	16.1	14.2	140.24	273.7	510.1		223.3	197.8	25.51	8.753	
3,800.0	3,697.2	3,816.4	3,733.6	16.6	14.8	139.14	286.5	534.7		229.3	202.6	26.67	8.598	
3,900.0	3,793.1	3,916.2	3,829.4	17.2	15.4	138.09	299.3	559.2		235.3	207.4	27.82	8.456	
4,000.0	3,888.9	4,015.9	3,925.2	17.8	15.9	137.10	312.2	583.8		241.4	212.4	28.99	8.326	
4,100.0	3,984.7	4,115.6	4,021.0	18.4	16.5	136.15	325.0	608.4		247.5	217.3	30.16	8.207	
4,200.0	4,080.5	4,215.4	4,116.8	19.0	17.1	135.26	337.9	633.0		253.7	222.4	31.33	8.098	
4,300.0	4,176.4	4,315.1	4,212.6	19.6	17.7	134.40	350.7	657.6		260.0	227.5	32.51	7.998	
4,400.0	4,272.2	4,414.8	4,308.4	20.2	18.2	133.59	363.5	682.2		266.3	232.6	33.69	7.906	
4,500.0	4,368.0	4,514.5	4,404.2	20.7	18.8	132.81	376.4	706.8		272.7	237.8	34.87	7.821	
4,600.0	4,463.9	4,614.3	4,499.9	21.3	19.4	132.07	389.2	731.4		279.1	243.1	36.05	7.743	
4,700.0	4,559.7	4,714.0	4,595.7	21.9	20.0	131.36	402.1	755.9		285.6	248.4	37.24	7.670	
4,800.0	4,655.5	4,813.7	4,691.5	22.5	20.5	130.69	414.9	780.5		292.1	253.7	38.42	7.603	
4,900.0	4,751.3	4,913.5	4,787.3	23.1	21.1	130.04	427.8	805.1		298.7	259.1	39.61	7.540	
5,000.0	4,847.2	5,013.2	4,883.1	23.7	21.7	129.42	440.6	829.7		305.3	264.5	40.80	7.482	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,943.0	5,112.9	4,978.9	24.3	22.3	128.83	453.4	854.3	311.9	269.9	41.99	7.428	
5,200.0	5,038.8	5,212.6	5,074.7	24.9	22.8	128.26	466.3	878.9	318.6	275.4	43.18	7.378	
5,300.0	5,134.6	5,312.4	5,170.5	25.5	23.4	127.72	479.1	903.5	325.2	280.9	44.37	7.331	
5,400.0	5,230.5	5,412.1	5,266.3	26.0	24.0	127.19	492.0	928.0	332.0	286.4	45.56	7.287	
5,500.0	5,326.3	5,511.8	5,362.1	26.6	24.6	126.69	504.8	952.6	338.7	292.0	46.75	7.245	
5,600.0	5,422.1	5,611.6	5,457.9	27.2	25.2	126.21	517.6	977.2	345.5	297.5	47.94	7.207	
5,700.0	5,518.0	5,714.9	5,557.8	27.8	25.7	126.18	531.0	999.9	351.9	303.0	48.93	7.192	
5,792.2	5,606.3	5,810.9	5,652.4	28.3	25.9	128.02	543.7	1,009.6	356.7	307.6	49.10	7.266	
5,800.0	5,613.8	5,818.9	5,660.3	28.4	26.0	129.67	544.8	1,009.8	357.1	308.1	49.06	7.279	
5,850.0	5,662.1	5,869.7	5,710.6	28.6	26.0	142.15	551.5	1,009.5	359.7	311.0	48.77	7.376	
5,900.0	5,710.8	5,919.9	5,760.3	28.8	26.1	158.40	558.2	1,005.9	362.6	314.2	48.39	7.494	
5,950.0	5,759.8	5,969.5	5,809.0	28.9	26.1	177.82	564.7	999.1	365.7	317.7	47.93	7.629	
6,000.0	5,808.8	6,018.6	5,856.6	29.0	26.1	-162.47	571.1	989.3	369.0	321.5	47.43	7.779	
6,050.0	5,857.6	6,067.1	5,903.0	29.1	26.0	-145.64	577.3	976.5	372.5	325.6	46.89	7.943	
6,100.0	5,906.0	6,115.2	5,948.0	29.2	26.0	-132.68	583.4	961.0	376.1	329.8	46.34	8.117	
6,150.0	5,953.8	6,162.7	5,991.6	29.2	25.9	-122.96	589.2	942.8	379.9	334.1	45.78	8.298	
6,200.0	6,000.8	6,209.8	6,033.5	29.2	25.8	-115.58	594.9	922.2	383.7	338.5	45.23	8.485	
6,250.0	6,046.7	6,256.4	6,073.7	29.2	25.7	-109.80	600.3	899.2	387.7	343.0	44.70	8.673	
6,300.0	6,091.5	6,302.6	6,112.2	29.1	25.6	-105.16	605.4	874.1	391.7	347.5	44.20	8.860	
6,350.0	6,134.8	6,350.0	6,149.9	29.1	25.4	-101.30	610.5	845.9	395.6	351.9	43.74	9.045	
6,400.0	6,176.6	6,394.0	6,183.3	29.0	25.3	-98.11	615.0	817.7	399.6	356.2	43.37	9.214	
6,450.0	6,216.6	6,439.1	6,215.9	28.9	25.2	-95.36	619.4	786.7	403.5	360.4	43.05	9.372	
6,500.0	6,254.6	6,484.0	6,246.4	28.8	25.1	-92.99	623.5	754.1	407.2	364.4	42.81	9.512	
6,550.0	6,290.6	6,528.5	6,274.8	28.6	25.0	-90.91	627.3	720.0	410.9	368.2	42.67	9.629	
6,600.0	6,324.3	6,572.8	6,301.0	28.5	24.9	-89.10	630.8	684.5	414.4	371.8	42.64	9.719	
6,650.0	6,355.6	6,616.8	6,325.0	28.3	24.9	-87.51	634.0	647.8	417.7	375.0	42.72	9.779	
6,700.0	6,384.4	6,660.6	6,346.7	28.2	24.8	-86.11	637.0	609.9	420.8	377.9	42.92	9.806	
6,750.0	6,410.5	6,704.2	6,366.2	28.1	24.9	-84.89	639.6	570.9	423.7	380.5	43.25	9.798	
6,800.0	6,433.9	6,750.0	6,384.2	27.9	24.9	-83.81	642.0	528.9	426.4	382.6	43.72	9.752	
6,850.0	6,454.3	6,790.9	6,398.2	27.8	25.0	-82.91	643.9	490.6	428.7	384.4	44.32	9.674	
6,900.0	6,471.9	6,834.0	6,410.7	27.7	25.1	-82.13	645.6	449.4	430.8	385.7	45.05	9.562	
6,950.0	6,486.4	6,877.0	6,420.9	27.6	25.3	-81.48	647.0	407.6	432.6	386.7	45.91	9.422	
7,000.0	6,497.8	6,919.9	6,428.7	27.5	25.6	-80.96	648.0	365.5	434.0	387.1	46.88	9.258	
7,050.0	6,506.0	6,962.7	6,434.2	27.4	25.8	-80.56	648.8	323.0	435.1	387.2	47.95	9.075	
7,100.0	6,511.1	7,005.4	6,437.2	27.4	26.2	-80.27	649.2	280.4	435.9	386.8	49.11	8.876	
7,150.0	6,513.0	7,049.2	6,438.0	27.5	26.6	-80.10	649.3	236.6	436.4	386.0	50.37	8.664	
7,156.2	6,513.0	7,055.4	6,438.0	27.5	26.7	-80.10	649.3	230.5	436.4	385.8	50.54	8.634	
7,200.0	6,512.9	7,099.2	6,437.9	27.6	27.2	-80.10	649.3	186.6	436.4	384.8	51.63	8.452	
7,300.0	6,512.7	7,199.2	6,437.6	28.3	28.5	-80.10	649.3	86.6	436.4	381.9	54.46	8.013	
7,400.0	6,512.4	7,299.2	6,437.4	29.6	30.1	-80.10	649.3	-13.4	436.4	378.7	57.69	7.565	
7,500.0	6,512.2	7,399.2	6,437.2	31.3	31.8	-80.10	649.3	-113.4	436.4	375.1	61.24	7.125	
7,600.0	6,512.0	7,499.2	6,437.0	33.2	33.8	-80.10	649.3	-213.4	436.4	371.3	65.08	6.705	
7,700.0	6,511.8	7,599.2	6,436.7	35.3	35.8	-80.10	649.3	-313.4	436.4	367.2	69.15	6.311	
7,800.0	6,511.5	7,699.2	6,436.5	37.4	38.0	-80.10	649.3	-413.4	436.4	363.0	73.41	5.945	
7,900.0	6,511.3	7,799.2	6,436.3	39.7	40.3	-80.10	649.3	-513.4	436.4	358.6	77.83	5.607	
8,000.0	6,511.1	7,899.2	6,436.0	42.1	42.6	-80.10	649.3	-613.4	436.4	354.0	82.39	5.297	
8,100.0	6,510.9	7,999.2	6,435.8	44.5	45.0	-80.10	649.3	-713.4	436.4	349.3	87.06	5.013	
8,200.0	6,510.6	8,099.2	6,435.6	46.9	47.4	-80.10	649.3	-813.4	436.4	344.6	91.83	4.752	
8,300.0	6,510.4	8,199.2	6,435.4	49.4	49.8	-80.10	649.3	-913.4	436.4	339.7	96.68	4.514	
8,400.0	6,510.2	8,299.2	6,435.1	51.9	52.3	-80.10	649.3	-1,013.4	436.4	334.8	101.60	4.295	
8,500.0	6,509.9	8,399.2	6,434.9	54.4	54.9	-80.10	649.3	-1,113.4	436.4	329.8	106.58	4.094	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft		
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	6,509.7	8,499.2	6,434.7	57.0	57.4	-80.10	649.3	-1,213.4	436.4	324.8	111.62	3.910					
8,700.0	6,509.5	8,599.2	6,434.5	59.6	60.0	-80.10	649.3	-1,313.4	436.4	319.7	116.70	3.739					
8,800.0	6,509.3	8,699.2	6,434.2	62.2	62.6	-80.10	649.3	-1,413.4	436.4	314.6	121.82	3.582					
8,900.0	6,509.0	8,799.2	6,434.0	64.8	65.2	-80.10	649.3	-1,513.4	436.4	309.4	126.98	3.437					
9,000.0	6,508.8	8,899.2	6,433.8	67.4	67.8	-80.10	649.3	-1,613.4	436.4	304.2	132.16	3.302					
9,100.0	6,508.6	8,999.2	6,433.5	70.0	70.5	-80.10	649.3	-1,713.4	436.4	299.0	137.38	3.177					
9,200.0	6,508.3	9,099.2	6,433.3	72.7	73.1	-80.10	649.3	-1,813.4	436.4	293.8	142.62	3.060					
9,300.0	6,508.1	9,199.2	6,433.1	75.4	75.8	-80.10	649.3	-1,913.4	436.4	288.5	147.88	2.951					
9,400.0	6,507.9	9,299.2	6,432.9	78.0	78.5	-80.10	649.3	-2,013.4	436.4	283.2	153.16	2.849					
9,500.0	6,507.7	9,399.2	6,432.6	80.7	81.2	-80.10	649.3	-2,113.4	436.4	277.9	158.46	2.754					
9,600.0	6,507.4	9,499.2	6,432.4	83.4	83.9	-80.10	649.3	-2,213.4	436.4	272.6	163.78	2.665					
9,700.0	6,507.2	9,599.2	6,432.2	86.1	86.6	-80.10	649.3	-2,313.4	436.4	267.3	169.11	2.581					
9,800.0	6,507.0	9,699.2	6,432.0	88.8	89.3	-80.10	649.3	-2,413.4	436.4	261.9	174.45	2.502					
9,900.0	6,506.8	9,799.2	6,431.7	91.5	92.0	-80.10	649.3	-2,513.4	436.4	256.6	179.80	2.427					
10,000.0	6,506.5	9,899.2	6,431.5	94.2	94.7	-80.10	649.3	-2,613.4	436.4	251.2	185.17	2.357					
10,100.0	6,506.3	9,999.2	6,431.3	97.0	97.4	-80.10	649.3	-2,713.4	436.4	245.8	190.55	2.290					
10,200.0	6,506.1	10,099.2	6,431.0	99.7	100.2	-80.10	649.3	-2,813.4	436.4	240.5	195.93	2.227					
10,300.0	6,505.8	10,199.2	6,430.8	102.4	102.9	-80.10	649.3	-2,913.4	436.4	235.1	201.32	2.168					
10,400.0	6,505.6	10,299.2	6,430.6	105.2	105.6	-80.10	649.3	-3,013.4	436.4	229.7	206.73	2.111					
10,500.0	6,505.4	10,399.2	6,430.4	107.9	108.4	-80.10	649.3	-3,113.4	436.4	224.3	212.13	2.057					
10,600.0	6,505.2	10,499.2	6,430.1	110.6	111.1	-80.10	649.3	-3,213.4	436.4	218.8	217.55	2.006					
10,700.0	6,504.9	10,599.2	6,429.9	113.4	113.9	-80.10	649.3	-3,313.4	436.4	213.4	222.97	1.957					
10,800.0	6,504.7	10,699.2	6,429.7	116.1	116.6	-80.10	649.3	-3,413.3	436.4	208.0	228.40	1.911					
10,900.0	6,504.5	10,799.2	6,429.5	118.9	119.4	-80.10	649.3	-3,513.3	436.4	202.6	233.83	1.866					
11,000.0	6,504.3	10,899.2	6,429.2	121.6	122.1	-80.10	649.3	-3,613.3	436.4	197.1	239.27	1.824					
11,100.0	6,504.0	10,999.2	6,429.0	124.4	124.9	-80.10	649.3	-3,713.3	436.4	191.7	244.71	1.783					
11,200.0	6,503.8	11,099.2	6,428.8	127.1	127.6	-80.10	649.3	-3,813.3	436.4	186.2	250.16	1.744					
11,300.0	6,503.6	11,199.2	6,428.5	129.9	130.4	-80.10	649.3	-3,913.3	436.4	180.8	255.61	1.707					
11,400.0	6,503.3	11,299.2	6,428.3	132.7	133.2	-80.10	649.3	-4,013.3	436.4	175.3	261.06	1.672					
11,500.0	6,503.1	11,399.2	6,428.1	135.4	135.9	-80.10	649.3	-4,113.3	436.4	169.9	266.52	1.637					
11,600.0	6,502.9	11,499.2	6,427.9	138.2	138.7	-80.10	649.3	-4,213.3	436.4	164.4	271.98	1.604					
11,700.0	6,502.7	11,599.2	6,427.6	141.0	141.5	-80.10	649.3	-4,313.3	436.4	158.9	277.45	1.573					
11,800.0	6,502.4	11,699.2	6,427.4	143.7	144.2	-80.10	649.3	-4,413.3	436.4	153.5	282.91	1.542					
11,900.0	6,502.2	11,799.2	6,427.2	146.5	147.0	-80.10	649.3	-4,513.3	436.4	148.0	288.38	1.513					
12,000.0	6,502.0	11,899.2	6,426.9	149.3	149.8	-80.10	649.3	-4,613.3	436.4	142.5	293.86	1.485 Level 3					
12,100.0	6,501.7	11,999.2	6,426.7	152.0	152.6	-80.10	649.3	-4,713.3	436.4	137.1	299.33	1.458 Level 3					
12,200.0	6,501.5	12,099.2	6,426.5	154.8	155.3	-80.10	649.3	-4,813.3	436.4	131.6	304.81	1.432 Level 3					
12,300.0	6,501.3	12,199.2	6,426.3	157.6	158.1	-80.10	649.3	-4,913.3	436.4	126.1	310.29	1.406 Level 3					
12,400.0	6,501.1	12,299.2	6,426.0	160.4	160.9	-80.10	649.3	-5,013.3	436.4	120.6	315.77	1.382 Level 3					
12,500.0	6,500.8	12,399.2	6,425.8	163.2	163.7	-80.10	649.3	-5,113.3	436.4	115.1	321.26	1.358 Level 3					
12,600.0	6,500.6	12,499.2	6,425.6	165.9	166.5	-80.10	649.3	-5,213.3	436.4	109.6	326.74	1.336 Level 3					
12,700.0	6,500.4	12,599.2	6,425.4	168.7	169.2	-80.10	649.3	-5,313.3	436.4	104.2	332.23	1.314 Level 3					
12,800.0	6,500.2	12,699.2	6,425.1	171.5	172.0	-80.10	649.3	-5,413.3	436.4	98.7	337.72	1.292 Level 3					
12,900.0	6,499.9	12,799.2	6,424.9	174.3	174.8	-80.10	649.3	-5,513.3	436.4	93.2	343.21	1.271 Level 3					
13,000.0	6,499.7	12,899.2	6,424.7	177.1	177.6	-80.10	649.3	-5,613.3	436.4	87.7	348.71	1.251 Level 3					
13,100.0	6,499.5	12,999.2	6,424.4	179.8	180.4	-80.10	649.3	-5,713.3	436.4	82.2	354.20	1.232 Level 2					
13,200.0	6,499.2	13,099.2	6,424.2	182.6	183.2	-80.10	649.3	-5,813.3	436.4	76.7	359.70	1.213 Level 2					
13,300.0	6,499.0	13,199.2	6,424.0	185.4	185.9	-80.10	649.3	-5,913.3	436.4	71.2	365.19	1.195 Level 2					
13,400.0	6,498.8	13,299.2	6,423.8	188.2	188.7	-80.10	649.3	-6,013.3	436.4	65.7	370.69	1.177 Level 2					
13,500.0	6,498.6	13,399.2	6,423.5	191.0	191.5	-80.10	649.3	-6,113.3	436.4	60.2	376.19	1.160 Level 2					
13,600.0	6,498.3	13,499.2	6,423.3	193.8	194.3	-80.10	649.3	-6,213.3	436.4	54.7	381.69	1.143 Level 2					

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
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	
13,700.0	6,498.1	13,599.2	6,423.1	196.6	197.1	-80.10	649.3	-6,313.3	436.4	49.2	387.20	1.127	Level 2	
13,720.4	6,498.1	13,619.6	6,423.0	197.1	197.7	-80.10	649.3	-6,333.7	436.4	48.1	388.32	1.124	Level 2	
13,746.0	6,498.0	13,634.3	6,423.0	197.8	198.1	-80.10	649.3	-6,348.5	436.5	47.1	389.43	1.121	Level 2, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-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
0.0	0.0	0.0	0.0	0.0	0.0	-103.99	-14.6	-58.5	60.3				
100.0	100.0	100.0	100.0	0.1	0.1	-103.99	-14.6	-58.5	60.3	60.1	0.22	268.228	
200.0	200.0	200.0	200.0	0.3	0.3	-103.99	-14.6	-58.5	60.3	59.6	0.67	89.409	
300.0	300.0	300.0	300.0	0.6	0.6	-103.99	-14.6	-58.5	60.3	59.2	1.12	53.646	
400.0	400.0	400.0	400.0	0.8	0.8	-103.99	-14.6	-58.5	60.3	58.7	1.57	38.318	
500.0	500.0	500.0	500.0	1.0	1.0	-103.99	-14.6	-58.5	60.3	58.3	2.02	29.803	
600.0	600.0	600.0	600.0	1.2	1.2	-103.99	-14.6	-58.5	60.3	57.8	2.47	24.384	CC, ES
700.0	700.0	700.0	700.0	1.5	1.5	-152.09	-14.6	-58.5	61.4	58.5	2.92	21.048	
800.0	799.9	799.9	799.9	1.7	1.7	-153.69	-14.6	-58.5	64.9	61.6	3.36	19.299	
900.0	899.7	899.7	899.7	1.9	1.9	-156.00	-14.6	-58.5	70.9	67.0	3.81	18.584	SF
1,000.0	999.3	999.3	999.3	2.1	2.1	-158.64	-14.6	-58.5	79.3	75.0	4.26	18.607	
1,100.0	1,098.6	1,098.6	1,098.6	2.4	2.4	-161.30	-14.6	-58.5	90.4	85.7	4.71	19.175	
1,200.0	1,197.5	1,197.5	1,197.5	2.7	2.6	-163.77	-14.6	-58.5	104.1	98.9	5.16	20.158	
1,300.0	1,296.1	1,296.1	1,296.1	3.0	2.8	-165.96	-14.6	-58.5	120.4	114.8	5.61	21.462	
1,400.0	1,394.2	1,394.2	1,394.2	3.4	3.0	-167.84	-14.6	-58.5	139.5	133.4	6.06	23.015	
1,500.0	1,491.7	1,494.7	1,494.7	3.8	3.2	-169.76	-14.8	-57.3	160.3	153.8	6.49	24.678	
1,600.0	1,588.6	1,595.4	1,595.3	4.2	3.4	-171.95	-15.4	-53.6	181.9	175.0	6.91	26.307	
1,707.3	1,691.9	1,703.5	1,703.2	4.7	3.7	-174.48	-16.5	-46.6	206.1	198.8	7.37	27.966	
1,800.0	1,780.7	1,797.0	1,796.3	5.2	3.9	-176.75	-17.9	-38.2	227.0	219.2	7.80	29.092	
1,900.0	1,876.5	1,898.4	1,896.9	5.7	4.1	-179.23	-19.8	-26.5	248.2	239.9	8.29	29.937	
2,000.0	1,972.3	2,000.0	1,997.5	6.3	4.4	178.22	-22.2	-12.1	268.2	259.4	8.81	30.442	
2,100.0	2,068.2	2,101.7	2,097.8	6.8	4.6	175.59	-24.9	4.9	287.2	277.8	9.37	30.639	
2,200.0	2,164.0	2,203.4	2,197.5	7.4	5.0	172.86	-28.1	24.6	305.2	295.3	9.99	30.560	
2,300.0	2,259.8	2,305.0	2,296.6	8.0	5.3	170.03	-31.8	46.8	322.6	311.9	10.67	30.236	
2,400.0	2,355.7	2,406.3	2,394.7	8.5	5.7	167.10	-35.8	71.6	339.4	328.0	11.43	29.700	
2,500.0	2,451.5	2,507.2	2,491.7	9.1	6.2	164.07	-40.3	98.8	356.0	343.7	12.28	28.998	
2,600.0	2,547.3	2,605.0	2,585.3	9.7	6.7	161.12	-44.9	126.9	372.7	359.5	13.19	28.247	
2,700.0	2,643.1	2,701.8	2,677.9	10.2	7.2	158.45	-49.4	154.9	390.3	376.1	14.16	27.564	
2,800.0	2,739.0	2,798.6	2,770.5	10.8	7.7	156.00	-54.0	182.9	408.7	393.5	15.16	26.951	
2,900.0	2,834.8	2,895.4	2,863.0	11.4	8.2	153.76	-58.5	210.8	427.7	411.5	16.20	26.404	
3,000.0	2,930.6	2,992.3	2,955.6	12.0	8.7	151.70	-63.1	238.8	447.4	430.1	17.26	25.922	
3,100.0	3,026.4	3,089.1	3,048.2	12.6	9.3	149.82	-67.7	266.8	467.5	449.2	18.34	25.497	
3,200.0	3,122.3	3,185.9	3,140.7	13.1	9.8	148.10	-72.2	294.7	488.1	468.7	19.43	25.125	
3,300.0	3,218.1	3,282.7	3,233.3	13.7	10.4	146.51	-76.8	322.7	509.2	488.6	20.53	24.800	
3,400.0	3,313.9	3,379.5	3,325.9	14.3	10.9	145.04	-81.4	350.7	530.5	508.9	21.64	24.515	
3,500.0	3,409.8	3,476.3	3,418.4	14.9	11.5	143.69	-85.9	378.7	552.2	529.4	22.76	24.265	
3,600.0	3,505.6	3,573.1	3,511.0	15.5	12.1	142.44	-90.5	406.6	574.1	550.3	23.88	24.045	
3,700.0	3,601.4	3,669.9	3,603.6	16.1	12.7	141.28	-95.1	434.6	596.3	571.3	25.00	23.853	
3,800.0	3,697.2	3,766.7	3,696.2	16.6	13.2	140.21	-99.6	462.6	618.7	592.6	26.13	23.683	
3,900.0	3,793.1	3,863.5	3,788.7	17.2	13.8	139.20	-104.2	490.5	641.4	614.1	27.25	23.534	
4,000.0	3,888.9	3,960.4	3,881.3	17.8	14.4	138.27	-108.8	518.5	664.1	635.8	28.38	23.402	
4,100.0	3,984.7	4,057.2	3,973.9	18.4	15.0	137.40	-113.3	546.5	687.1	657.6	29.51	23.285	
4,200.0	4,080.5	4,154.0	4,066.4	19.0	15.6	136.58	-117.9	574.4	710.2	679.5	30.63	23.182	
4,300.0	4,176.4	4,250.8	4,159.0	19.6	16.2	135.81	-122.5	602.4	733.4	701.6	31.76	23.090	
4,400.0	4,272.2	4,347.6	4,251.6	20.2	16.8	135.09	-127.0	630.4	756.7	723.8	32.89	23.008	
4,500.0	4,368.0	4,444.4	4,344.1	20.7	17.4	134.42	-131.6	658.4	780.2	746.1	34.02	22.935	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
0.0	0.0	1.0	1.0	0.0	0.0	-104.20	-21.9	-86.4	89.1	89.1	0.00	N/A					
100.0	100.0	101.0	101.0	0.1	0.1	-104.20	-21.9	-86.4	89.1	88.9	0.23	392.402					
200.0	200.0	201.0	201.0	0.3	0.3	-104.20	-21.9	-86.4	89.1	88.4	0.68	131.670					
300.0	300.0	301.0	301.0	0.6	0.6	-104.20	-21.9	-86.4	89.1	88.0	1.13	79.107					
400.0	400.0	401.0	401.0	0.8	0.8	-104.20	-21.9	-86.4	89.1	87.5	1.58	56.537					
500.0	500.0	501.0	501.0	1.0	1.0	-104.20	-21.9	-86.4	89.1	87.1	2.03	43.987					
600.0	600.0	601.0	601.0	1.2	1.2	-104.20	-21.9	-86.4	89.1	86.6	2.47	35.997 CC, ES					
700.0	700.0	701.0	701.0	1.5	1.5	-152.11	-21.9	-86.4	90.2	87.3	2.92	30.888					
800.0	799.9	800.9	800.9	1.7	1.7	-153.21	-21.9	-86.4	93.7	90.4	3.37	27.836					
900.0	899.7	900.7	900.7	1.9	1.9	-154.87	-21.9	-86.4	99.6	95.8	3.82	26.109					
1,000.0	999.3	1,000.3	1,000.3	2.1	2.1	-156.88	-21.9	-86.4	108.0	103.7	4.26	25.316					
1,100.0	1,098.6	1,099.6	1,099.6	2.4	2.4	-159.05	-21.9	-86.4	118.9	114.2	4.72	25.209					
1,200.0	1,197.5	1,198.5	1,198.5	2.7	2.6	-161.20	-21.9	-86.4	132.4	127.2	5.17	25.623					
1,300.0	1,296.1	1,297.1	1,297.1	3.0	2.8	-163.23	-21.9	-86.4	148.5	142.9	5.62	26.442					
1,400.0	1,394.2	1,395.2	1,395.2	3.4	3.0	-165.08	-21.9	-86.4	167.3	161.3	6.07	27.579					
1,500.0	1,491.7	1,492.7	1,492.7	3.8	3.2	-166.73	-21.9	-86.4	188.8	182.3	6.52	28.970					
1,600.0	1,588.6	1,589.6	1,589.6	4.2	3.5	-168.17	-21.9	-86.4	212.8	205.9	6.96	30.565					
1,707.3	1,691.9	1,692.9	1,692.9	4.7	3.7	-169.51	-21.9	-86.4	241.5	234.1	7.44	32.457					
1,800.0	1,780.7	1,781.7	1,781.7	5.2	3.9	-170.54	-21.9	-86.4	267.7	259.8	7.88	33.974					
1,900.0	1,876.5	1,882.8	1,882.8	5.7	4.1	-171.60	-21.9	-85.5	295.2	286.9	8.35	35.354					
2,000.0	1,972.3	1,986.1	1,986.0	6.3	4.3	-172.78	-21.9	-81.8	320.8	312.0	8.82	36.393					
2,100.0	2,068.2	2,090.3	2,090.1	6.8	4.5	-174.07	-21.9	-75.3	344.4	335.1	9.29	37.083					
2,200.0	2,164.0	2,195.4	2,194.7	7.4	4.8	-175.47	-22.0	-65.9	366.0	356.2	9.77	37.457					
2,300.0	2,259.8	2,301.1	2,299.7	8.0	5.0	-177.00	-22.1	-53.5	385.7	375.4	10.27	37.553					
2,400.0	2,355.7	2,407.3	2,404.7	8.5	5.3	-178.64	-22.2	-38.2	403.5	392.7	10.79	37.394					
2,500.0	2,451.5	2,513.8	2,509.7	9.1	5.6	179.58	-22.3	-19.9	419.6	408.3	11.34	37.000					
2,600.0	2,547.3	2,620.5	2,614.2	9.7	5.9	177.66	-22.5	1.4	434.1	422.1	11.93	36.396					
2,700.0	2,643.1	2,727.2	2,718.2	10.2	6.3	175.60	-22.6	25.6	447.0	434.5	12.56	35.584					
2,800.0	2,739.0	2,833.8	2,821.2	10.8	6.7	173.40	-22.8	52.7	458.6	445.3	13.26	34.586					
2,900.0	2,834.8	2,940.0	2,923.1	11.4	7.1	171.04	-23.0	82.5	469.0	455.0	14.03	33.418					
3,000.0	2,930.6	3,045.7	3,023.8	12.0	7.6	168.52	-23.3	115.0	478.4	463.5	14.90	32.110					
3,100.0	3,026.4	3,146.4	3,118.8	12.6	8.2	166.01	-23.5	148.1	487.4	471.5	15.84	30.778					
3,200.0	3,122.3	3,243.8	3,210.7	13.1	8.7	163.64	-23.7	180.4	497.1	480.3	16.82	29.554					
3,300.0	3,218.1	3,341.1	3,302.6	13.7	9.3	161.36	-24.0	212.6	507.6	489.7	17.86	28.422					
3,400.0	3,313.9	3,438.5	3,394.4	14.3	9.9	159.18	-24.2	244.9	518.9	500.0	18.95	27.384					
3,500.0	3,409.8	3,535.8	3,486.3	14.9	10.5	157.08	-24.4	277.1	531.0	510.9	20.08	26.440					
3,600.0	3,505.6	3,633.2	3,578.1	15.5	11.1	155.08	-24.7	309.4	543.8	522.5	21.25	25.585					
3,700.0	3,601.4	3,730.5	3,670.0	16.1	11.7	153.17	-24.9	341.6	557.2	534.7	22.45	24.814					
3,800.0	3,697.2	3,827.9	3,761.8	16.6	12.3	151.35	-25.1	373.9	571.2	547.5	23.68	24.120					
3,900.0	3,793.1	3,925.3	3,853.7	17.2	13.0	149.62	-25.3	406.2	585.7	560.8	24.93	23.498					
4,000.0	3,888.9	4,022.6	3,945.5	17.8	13.6	147.97	-25.6	438.4	600.8	574.6	26.19	22.941					
4,100.0	3,984.7	4,120.0	4,037.4	18.4	14.2	146.40	-25.8	470.7	616.4	588.9	27.47	22.441					
4,200.0	4,080.5	4,217.3	4,129.2	19.0	14.9	144.90	-26.0	502.9	632.4	603.6	28.75	21.994					
4,300.0	4,176.4	4,314.7	4,221.1	19.6	15.5	143.48	-26.2	535.2	648.8	618.7	30.05	21.594					
4,400.0	4,272.2	4,412.0	4,313.0	20.2	16.2	142.12	-26.5	567.5	665.6	634.2	31.34	21.235					
4,500.0	4,368.0	4,509.4	4,404.8	20.7	16.8	140.83	-26.7	599.7	682.7	650.1	32.65	20.913					
4,600.0	4,463.9	4,606.7	4,496.7	21.3	17.5	139.61	-26.9	632.0	700.2	666.2	33.95	20.624					
4,700.0	4,559.7	4,704.1	4,588.5	21.9	18.2	138.44	-27.2	664.2	718.0	682.7	35.25	20.365					
4,800.0	4,655.5	4,801.4	4,680.4	22.5	18.8	137.33	-27.4	696.5	736.0	699.5	36.56	20.132					
4,900.0	4,751.3	4,898.8	4,772.2	23.1	19.5	136.27	-27.6	728.8	754.3	716.5	37.86	19.923					
5,000.0	4,847.2	4,996.1	4,864.1	23.7	20.2	135.26	-27.8	761.0	772.9	733.7	39.17	19.734					

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis		Distance								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.0	4,943.0	5,093.5	4,955.9	24.3	20.8	134.30	-28.1	793.3	791.7	751.2	40.47	19.564 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-103.78	-10.9	-44.6	45.9				
100.0	100.0	100.0	100.0	0.1	0.1	-103.78	-10.9	-44.6	45.9	45.7	0.22	204.180	
200.0	200.0	200.0	200.0	0.3	0.3	-103.78	-10.9	-44.6	45.9	45.2	0.67	68.060	
300.0	300.0	300.0	300.0	0.6	0.6	-103.78	-10.9	-44.6	45.9	44.8	1.12	40.836	
400.0	400.0	400.0	400.0	0.8	0.8	-103.78	-10.9	-44.6	45.9	44.3	1.57	29.169	
500.0	500.0	500.0	500.0	1.0	1.0	-103.78	-10.9	-44.6	45.9	43.9	2.02	22.687	
600.0	600.0	600.0	600.0	1.2	1.2	-103.78	-10.9	-44.6	45.9	43.4	2.47	18.562 CC, ES	
700.0	700.0	700.0	700.0	1.5	1.5	-152.06	-10.9	-44.6	47.0	44.1	2.92	16.116	
800.0	799.9	799.9	799.9	1.7	1.7	-154.13	-10.9	-44.6	50.5	47.2	3.36	15.022	
900.0	899.7	899.7	899.7	1.9	1.9	-156.99	-10.9	-44.6	56.5	52.7	3.81	14.819	
1,000.0	999.3	999.3	999.3	2.1	2.1	-160.09	-10.9	-44.6	65.0	60.8	4.26	15.256	
1,100.0	1,098.6	1,098.6	1,098.6	2.4	2.4	-163.05	-10.9	-44.6	76.2	71.5	4.71	16.169	
1,200.0	1,197.5	1,197.5	1,197.5	2.7	2.6	-165.66	-10.9	-44.6	90.0	84.9	5.16	17.441	
1,300.0	1,296.1	1,298.8	1,298.8	3.0	2.8	-168.05	-10.5	-43.4	105.3	99.7	5.60	18.794	
1,400.0	1,394.2	1,400.4	1,400.3	3.4	3.0	-170.35	-9.2	-39.6	120.7	114.7	6.04	20.001	
1,500.0	1,491.7	1,502.4	1,502.1	3.8	3.2	-172.57	-6.9	-33.3	136.3	129.8	6.47	21.055	
1,600.0	1,588.6	1,604.7	1,604.0	4.2	3.5	-174.75	-3.7	-24.4	152.1	145.1	6.92	21.985	
1,707.3	1,691.9	1,714.9	1,713.3	4.7	3.7	-177.04	0.8	-12.0	169.3	161.9	7.40	22.861	
1,800.0	1,780.7	1,810.4	1,807.8	5.2	4.0	-178.99	5.5	1.2	183.3	175.4	7.87	23.302	
1,900.0	1,876.5	1,914.1	1,910.0	5.7	4.3	-178.91	11.5	18.1	196.2	187.9	8.39	23.394	
2,000.0	1,972.3	2,018.3	2,012.0	6.3	4.6	-176.73	18.5	37.6	207.0	198.0	8.94	23.145	
2,100.0	2,068.2	2,122.8	2,113.8	6.8	5.0	-174.43	26.5	59.8	215.5	206.0	9.53	22.607	
2,200.0	2,164.0	2,227.4	2,215.0	7.4	5.5	-171.94	35.4	84.7	222.0	211.8	10.18	21.808	
2,300.0	2,259.8	2,328.8	2,312.5	8.0	5.9	-169.37	44.8	110.8	227.0	216.1	10.88	20.869	
2,400.0	2,355.7	2,428.1	2,408.1	8.5	6.4	-166.93	54.0	136.6	232.3	220.7	11.62	19.988	
2,500.0	2,451.5	2,527.5	2,503.6	9.1	6.9	-164.61	63.2	162.4	238.0	225.5	12.41	19.170	
2,600.0	2,547.3	2,626.9	2,599.1	9.7	7.4	-162.40	72.5	188.2	244.0	230.7	13.25	18.414	
2,700.0	2,643.1	2,726.3	2,694.6	10.2	7.9	-160.30	81.7	214.0	250.4	236.3	14.13	17.717	
2,800.0	2,739.0	2,825.7	2,790.2	10.8	8.4	-158.30	91.0	239.8	257.1	242.0	15.05	17.079	
2,900.0	2,834.8	2,925.0	2,885.7	11.4	9.0	-156.41	100.2	265.6	264.1	248.1	16.01	16.497	
3,000.0	2,930.6	3,024.4	2,981.2	12.0	9.5	-154.61	109.5	291.4	271.4	254.4	17.00	15.966	
3,100.0	3,026.4	3,123.8	3,076.8	12.6	10.1	-152.91	118.7	317.2	278.9	260.9	18.01	15.484	
3,200.0	3,122.3	3,223.2	3,172.3	13.1	10.6	-151.30	128.0	343.0	286.7	267.6	19.05	15.046	
3,300.0	3,218.1	3,322.6	3,267.8	13.7	11.1	-149.78	137.2	368.8	294.7	274.5	20.12	14.648	
3,400.0	3,313.9	3,421.9	3,363.3	14.3	11.7	-148.33	146.4	394.6	302.8	281.6	21.20	14.287	
3,500.0	3,409.8	3,521.3	3,458.9	14.9	12.3	-146.97	155.7	420.4	311.2	288.9	22.29	13.960	
3,600.0	3,505.6	3,620.7	3,554.4	15.5	12.8	-145.67	164.9	446.2	319.7	296.3	23.40	13.662	
3,700.0	3,601.4	3,720.1	3,649.9	16.1	13.4	-144.44	174.2	472.0	328.4	303.9	24.52	13.392	
3,800.0	3,697.2	3,819.5	3,745.5	16.6	13.9	-143.28	183.4	497.8	337.2	311.6	25.65	13.145	
3,900.0	3,793.1	3,918.8	3,841.0	17.2	14.5	-142.17	192.7	523.6	346.2	319.4	26.79	12.921	
4,000.0	3,888.9	4,018.2	3,936.5	17.8	15.1	-141.12	201.9	549.4	355.3	327.3	27.94	12.716	
4,100.0	3,984.7	4,117.6	4,032.0	18.4	15.6	-140.13	211.2	575.2	364.5	335.4	29.09	12.528	
4,200.0	4,080.5	4,217.0	4,127.6	19.0	16.2	-139.18	220.4	601.0	373.8	343.5	30.25	12.356	
4,300.0	4,176.4	4,316.4	4,223.1	19.6	16.8	-138.28	229.6	626.7	383.2	351.7	31.41	12.198	
4,400.0	4,272.2	4,415.7	4,318.6	20.2	17.3	-137.42	238.9	652.5	392.6	360.1	32.58	12.053	
4,500.0	4,368.0	4,515.1	4,414.2	20.7	17.9	-136.60	248.1	678.3	402.2	368.5	33.74	11.919	
4,600.0	4,463.9	4,614.5	4,509.7	21.3	18.5	-135.82	257.4	704.1	411.8	376.9	34.91	11.796	
4,700.0	4,559.7	4,713.9	4,605.2	21.9	19.0	-135.08	266.6	729.9	421.6	385.5	36.09	11.682	
4,800.0	4,655.5	4,813.3	4,700.7	22.5	19.6	-134.37	275.9	755.7	431.3	394.1	37.26	11.577	
4,900.0	4,751.3	4,912.6	4,796.3	23.1	20.2	-133.69	285.1	781.5	441.2	402.8	38.44	11.479	
5,000.0	4,847.2	5,012.0	4,891.8	23.7	20.7	-133.04	294.4	807.3	451.1	411.5	39.61	11.388	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							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		
5,100.0	4,943.0	5,111.4	4,987.3	24.3	21.3	132.42	303.6	833.1	461.1	420.3	40.79	11.304		
5,200.0	5,038.8	5,210.8	5,082.9	24.9	21.9	131.82	312.8	858.9	471.1	429.1	41.96	11.225		
5,300.0	5,134.6	5,310.2	5,178.4	25.5	22.5	131.25	322.1	884.7	481.1	438.0	43.14	11.152		
5,400.0	5,230.5	5,409.6	5,273.9	26.0	23.0	130.71	331.3	910.5	491.2	446.9	44.32	11.084		
5,500.0	5,326.3	5,508.9	5,369.4	26.6	23.6	130.18	340.6	936.3	501.4	455.9	45.50	11.020		
5,600.0	5,422.1	5,608.3	5,465.0	27.2	24.2	129.68	349.8	962.1	511.6	464.9	46.68	10.960		
5,700.0	5,518.0	5,707.7	5,560.5	27.8	24.8	129.19	359.1	987.9	521.8	473.9	47.85	10.904		
5,792.2	5,606.3	5,802.9	5,653.2	28.3	25.1	129.32	368.0	1,007.4	530.9	482.3	48.65	10.914		
5,800.0	5,613.8	5,811.0	5,661.2	28.4	25.2	130.84	368.8	1,008.5	531.7	483.0	48.67	10.926		
5,850.0	5,662.1	5,862.4	5,712.1	28.6	25.3	142.45	373.7	1,013.7	536.5	487.8	48.72	11.013		
5,900.0	5,710.8	5,913.6	5,763.0	28.8	25.4	157.85	378.7	1,015.4	541.5	492.8	48.69	11.120		
5,950.0	5,759.8	5,964.5	5,813.7	28.9	25.4	176.44	383.6	1,013.6	546.4	497.8	48.59	11.246		
6,000.0	5,808.8	6,015.2	5,863.8	29.0	25.4	-164.65	388.4	1,008.6	551.4	503.0	48.42	11.389		
6,050.0	5,857.6	6,065.7	5,913.3	29.1	25.4	-148.60	393.2	1,000.2	556.4	508.2	48.19	11.546		
6,100.0	5,906.0	6,115.8	5,961.9	29.2	25.4	-136.37	397.9	988.7	561.4	513.5	47.92	11.715		
6,150.0	5,953.8	6,165.8	6,009.5	29.2	25.3	-127.36	402.6	974.0	566.4	518.7	47.62	11.893		
6,200.0	6,000.8	6,215.5	6,055.7	29.2	25.2	-120.65	407.0	956.3	571.2	524.0	47.29	12.079		
6,250.0	6,046.7	6,265.0	6,100.5	29.2	25.1	-115.50	411.4	935.8	576.0	529.1	46.95	12.269		
6,300.0	6,091.5	6,314.3	6,143.7	29.1	25.0	-111.45	415.6	912.5	580.7	534.1	46.61	12.459		
6,350.0	6,134.8	6,363.4	6,185.2	29.1	24.9	-108.18	419.6	886.5	585.3	539.0	46.29	12.645		
6,400.0	6,176.6	6,412.3	6,224.8	29.0	24.7	-105.47	423.5	858.1	589.7	543.8	45.99	12.824		
6,450.0	6,216.6	6,461.0	6,262.3	28.9	24.6	-103.20	427.1	827.3	594.0	548.3	45.73	12.989		
6,500.0	6,254.6	6,509.5	6,297.7	28.8	24.5	-101.26	430.5	794.3	598.1	552.5	45.53	13.136		
6,550.0	6,290.6	6,557.8	6,330.8	28.6	24.4	-99.59	433.8	759.2	601.9	556.5	45.40	13.259		
6,600.0	6,324.3	6,606.0	6,361.5	28.5	24.3	-98.13	436.7	722.2	605.6	560.2	45.35	13.353		
6,650.0	6,355.6	6,654.0	6,389.7	28.3	24.3	-96.87	439.5	683.5	609.0	563.6	45.40	13.413		
6,700.0	6,384.4	6,701.9	6,415.4	28.2	24.3	-95.76	442.0	643.2	612.1	566.5	45.57	13.434		
6,750.0	6,410.5	6,750.0	6,438.7	28.1	24.4	-94.79	444.3	601.1	615.0	569.1	45.85	13.413		
6,800.0	6,433.9	6,797.2	6,458.9	27.9	24.5	-93.95	446.2	558.5	617.6	571.3	46.26	13.349		
6,850.0	6,454.3	6,844.7	6,476.5	27.8	24.6	-93.22	448.0	514.4	619.8	573.0	46.81	13.242		
6,900.0	6,471.9	6,892.1	6,491.4	27.7	24.8	-92.60	449.4	469.5	621.8	574.3	47.48	13.096		
6,950.0	6,486.4	6,939.4	6,503.4	27.6	25.1	-92.08	450.6	423.8	623.5	575.2	48.28	12.913		
7,000.0	6,497.8	6,986.5	6,512.6	27.5	25.5	-91.65	451.5	377.6	624.8	575.6	49.20	12.698		
7,050.0	6,506.0	7,033.6	6,518.9	27.4	25.9	-91.31	452.1	330.9	625.8	575.5	50.23	12.458		
7,100.0	6,511.1	7,080.6	6,522.3	27.4	26.3	-91.07	452.5	284.1	626.4	575.1	51.35	12.199		
7,150.0	6,513.0	7,128.2	6,523.0	27.5	26.9	-90.91	452.6	236.4	626.7	574.1	52.57	11.922		
7,156.2	6,513.0	7,134.4	6,522.9	27.5	26.9	-90.91	452.6	230.3	626.7	574.0	52.73	11.885		
7,200.0	6,512.9	7,178.2	6,522.8	27.6	27.5	-90.90	452.6	186.4	626.7	572.9	53.85	11.638		
7,300.0	6,512.7	7,278.2	6,522.4	28.3	28.9	-90.89	452.6	86.4	626.7	570.0	56.72	11.049		
7,400.0	6,512.4	7,378.2	6,522.0	29.6	30.5	-90.87	452.6	-13.6	626.7	566.7	59.98	10.448		
7,500.0	6,512.2	7,478.2	6,521.6	31.3	32.3	-90.86	452.6	-113.6	626.7	563.1	63.57	9.858		
7,600.0	6,512.0	7,578.2	6,521.2	33.2	34.2	-90.85	452.6	-213.6	626.7	559.3	67.44	9.293		
7,700.0	6,511.8	7,678.2	6,520.9	35.3	36.3	-90.83	452.6	-313.6	626.7	555.2	71.54	8.760		
7,800.0	6,511.5	7,778.2	6,520.5	37.4	38.4	-90.82	452.6	-413.6	626.7	550.9	75.84	8.264		
7,900.0	6,511.3	7,878.2	6,520.1	39.7	40.7	-90.80	452.6	-513.6	626.7	546.4	80.30	7.805		
8,000.0	6,511.1	7,978.2	6,519.7	42.1	43.0	-90.79	452.6	-613.6	626.7	541.8	84.90	7.382		
8,100.0	6,510.9	8,078.2	6,519.4	44.5	45.3	-90.78	452.6	-713.6	626.7	537.1	89.61	6.993		
8,200.0	6,510.6	8,178.2	6,519.0	46.9	47.7	-90.76	452.6	-813.6	626.7	532.3	94.43	6.637		
8,300.0	6,510.4	8,278.2	6,518.6	49.4	50.2	-90.75	452.6	-913.6	626.7	527.4	99.32	6.309		
8,400.0	6,510.2	8,378.2	6,518.2	51.9	52.7	-90.74	452.6	-1,013.6	626.7	522.4	104.30	6.009		
8,500.0	6,509.9	8,478.2	6,517.8	54.4	55.2	-90.72	452.6	-1,113.6	626.7	517.3	109.33	5.732		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis			Distance			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,600.0	6,509.7	8,578.2	6,517.5	57.0	57.7	-90.71	452.6	-1,213.6	626.7	512.3	114.42	5.477	
8,700.0	6,509.5	8,678.2	6,517.1	59.6	60.3	-90.69	452.6	-1,313.6	626.7	507.1	119.56	5.242	
8,800.0	6,509.3	8,778.2	6,516.7	62.2	62.9	-90.68	452.6	-1,413.6	626.7	501.9	124.74	5.024	
8,900.0	6,509.0	8,878.2	6,516.3	64.8	65.5	-90.67	452.6	-1,513.6	626.7	496.7	129.95	4.822	
9,000.0	6,508.8	8,978.2	6,515.9	67.4	68.1	-90.65	452.6	-1,613.6	626.7	491.5	135.20	4.635	
9,100.0	6,508.6	9,078.2	6,515.6	70.0	70.8	-90.64	452.6	-1,713.6	626.7	486.2	140.48	4.461	
9,200.0	6,508.3	9,178.2	6,515.2	72.7	73.4	-90.62	452.6	-1,813.6	626.7	480.9	145.78	4.299	
9,300.0	6,508.1	9,278.2	6,514.8	75.4	76.1	-90.61	452.6	-1,913.6	626.7	475.6	151.10	4.147	
9,400.0	6,507.9	9,378.2	6,514.4	78.0	78.8	-90.60	452.6	-2,013.6	626.7	470.2	156.45	4.006	
9,500.0	6,507.7	9,478.2	6,514.0	80.7	81.4	-90.58	452.6	-2,113.5	626.7	464.8	161.81	3.873	
9,600.0	6,507.4	9,578.2	6,513.7	83.4	84.1	-90.57	452.6	-2,213.5	626.7	459.5	167.20	3.748	
9,700.0	6,507.2	9,678.2	6,513.3	86.1	86.8	-90.56	452.6	-2,313.5	626.7	454.1	172.59	3.631	
9,800.0	6,507.0	9,778.2	6,512.9	88.8	89.5	-90.54	452.6	-2,413.5	626.7	448.7	178.00	3.520	
9,900.0	6,506.8	9,878.2	6,512.5	91.5	92.2	-90.53	452.6	-2,513.5	626.7	443.2	183.43	3.416	
10,000.0	6,506.5	9,978.2	6,512.1	94.2	95.0	-90.51	452.6	-2,613.5	626.7	437.8	188.86	3.318	
10,100.0	6,506.3	10,078.2	6,511.8	97.0	97.7	-90.50	452.6	-2,713.5	626.7	432.3	194.31	3.225	
10,200.0	6,506.1	10,178.2	6,511.4	99.7	100.4	-90.49	452.6	-2,813.5	626.6	426.9	199.76	3.137	
10,300.0	6,505.8	10,278.2	6,511.0	102.4	103.1	-90.47	452.6	-2,913.5	626.6	421.4	205.23	3.053	
10,400.0	6,505.6	10,378.2	6,510.6	105.2	105.9	-90.46	452.6	-3,013.5	626.6	415.9	210.70	2.974	
10,500.0	6,505.4	10,478.2	6,510.3	107.9	108.6	-90.44	452.6	-3,113.5	626.6	410.5	216.18	2.899	
10,600.0	6,505.2	10,578.2	6,509.9	110.6	111.4	-90.43	452.6	-3,213.5	626.6	405.0	221.67	2.827	
10,700.0	6,504.9	10,678.2	6,509.5	113.4	114.1	-90.42	452.6	-3,313.5	626.6	399.5	227.16	2.759	
10,800.0	6,504.7	10,778.2	6,509.1	116.1	116.9	-90.40	452.6	-3,413.5	626.6	394.0	232.66	2.693	
10,900.0	6,504.5	10,878.2	6,508.7	118.9	119.6	-90.39	452.6	-3,513.5	626.6	388.5	238.16	2.631	
11,000.0	6,504.3	10,978.2	6,508.4	121.6	122.4	-90.38	452.6	-3,613.5	626.6	383.0	243.67	2.572	
11,100.0	6,504.0	11,078.2	6,508.0	124.4	125.1	-90.36	452.6	-3,713.5	626.6	377.4	249.19	2.515	
11,200.0	6,503.8	11,178.2	6,507.6	127.1	127.9	-90.35	452.6	-3,813.5	626.6	371.9	254.71	2.460	
11,300.0	6,503.6	11,278.2	6,507.2	129.9	130.6	-90.33	452.6	-3,913.5	626.6	366.4	260.23	2.408	
11,400.0	6,503.3	11,378.2	6,506.8	132.7	133.4	-90.32	452.6	-4,013.5	626.6	360.9	265.76	2.358	
11,500.0	6,503.1	11,478.2	6,506.5	135.4	136.2	-90.31	452.6	-4,113.5	626.6	355.3	271.29	2.310	
11,600.0	6,502.9	11,578.2	6,506.1	138.2	138.9	-90.29	452.6	-4,213.5	626.6	349.8	276.83	2.264	
11,700.0	6,502.7	11,678.2	6,505.7	141.0	141.7	-90.28	452.6	-4,313.5	626.6	344.3	282.37	2.219	
11,800.0	6,502.4	11,778.2	6,505.3	143.7	144.5	-90.26	452.6	-4,413.5	626.6	338.7	287.91	2.176	
11,900.0	6,502.2	11,878.2	6,504.9	146.5	147.2	-90.25	452.6	-4,513.5	626.6	333.2	293.46	2.135	
12,000.0	6,502.0	11,978.2	6,504.6	149.3	150.0	-90.24	452.6	-4,613.5	626.6	327.6	299.00	2.096	
12,100.0	6,501.7	12,078.2	6,504.2	152.0	152.8	-90.22	452.6	-4,713.5	626.6	322.1	304.55	2.058	
12,200.0	6,501.5	12,178.2	6,503.8	154.8	155.6	-90.21	452.6	-4,813.5	626.6	316.5	310.11	2.021	
12,300.0	6,501.3	12,278.2	6,503.4	157.6	158.3	-90.20	452.6	-4,913.5	626.6	311.0	315.66	1.985	
12,400.0	6,501.1	12,378.2	6,503.1	160.4	161.1	-90.18	452.6	-5,013.5	626.6	305.4	321.22	1.951	
12,500.0	6,500.8	12,478.2	6,502.7	163.2	163.9	-90.17	452.6	-5,113.5	626.6	299.8	326.78	1.918	
12,600.0	6,500.6	12,578.2	6,502.3	165.9	166.7	-90.15	452.6	-5,213.5	626.6	294.3	332.34	1.885	
12,700.0	6,500.4	12,678.2	6,501.9	168.7	169.5	-90.14	452.6	-5,313.5	626.6	288.7	337.91	1.854	
12,800.0	6,500.2	12,778.2	6,501.5	171.5	172.2	-90.13	452.6	-5,413.5	626.6	283.2	343.47	1.824	
12,900.0	6,499.9	12,878.2	6,501.2	174.3	175.0	-90.11	452.6	-5,513.5	626.6	277.6	349.04	1.795	
13,000.0	6,499.7	12,978.2	6,500.8	177.1	177.8	-90.10	452.6	-5,613.5	626.6	272.0	354.61	1.767	
13,100.0	6,499.5	13,078.2	6,500.4	179.8	180.6	-90.08	452.6	-5,713.5	626.6	266.4	360.18	1.740	
13,200.0	6,499.2	13,178.2	6,500.0	182.6	183.4	-90.07	452.6	-5,813.5	626.6	260.9	365.75	1.713	
13,300.0	6,499.0	13,278.2	6,499.6	185.4	186.2	-90.06	452.6	-5,913.5	626.6	255.3	371.32	1.688	
13,400.0	6,498.8	13,378.2	6,499.3	188.2	189.0	-90.04	452.6	-6,013.5	626.6	249.7	376.90	1.663	
13,500.0	6,498.6	13,478.2	6,498.9	191.0	191.7	-90.03	452.6	-6,113.5	626.6	244.1	382.48	1.638	
13,600.0	6,498.3	13,578.2	6,498.5	193.8	194.5	-90.02	452.6	-6,213.5	626.6	238.6	388.05	1.615	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,700.0	6,498.1	13,678.2	6,498.1	196.6	197.3	-90.00	452.6	-6,313.5	626.6	233.0	393.63	1.592		
13,729.1	6,498.0	13,707.4	6,498.0	197.4	198.1	-90.00	452.6	-6,342.7	626.6	231.4	395.26	1.585		
13,746.0	6,498.0	13,710.4	6,498.0	197.8	198.2	-90.00	452.6	-6,345.7	626.8	231.0	395.81	1.584 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft			
Survey Program:				0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor								
0.0	0.0	0.0	0.0	0.0	0.0	75.34	3.6	13.9	14.4	14.4	0.00	N/A								
100.0	100.0	100.0	100.0	0.1	0.1	75.34	3.6	13.9	14.4	14.2	0.22	64.054								
200.0	200.0	200.0	200.0	0.3	0.3	75.34	3.6	13.9	14.4	13.7	0.67	21.351								
300.0	300.0	300.0	300.0	0.6	0.6	75.34	3.6	13.9	14.4	13.3	1.12	12.811								
400.0	400.0	400.0	400.0	0.8	0.8	75.34	3.6	13.9	14.4	12.8	1.57	9.151	CC, ES							
500.0	500.0	499.8	499.7	1.0	1.0	79.32	2.8	14.9	15.2	13.2	2.00	7.595								
600.0	600.0	599.4	599.3	1.2	1.2	88.92	0.3	17.9	18.0	15.5	2.42	7.415	SF							
700.0	700.0	698.7	698.4	1.5	1.4	54.36	-3.8	22.9	22.5	19.7	2.85	7.905								
800.0	799.9	797.7	796.9	1.7	1.6	68.79	-9.5	29.9	29.3	26.0	3.28	8.917								
900.0	899.7	896.0	894.6	1.9	1.9	81.34	-16.8	38.8	39.3	35.5	3.73	10.528								
1,000.0	999.3	993.6	991.2	2.1	2.2	90.93	-25.6	49.5	52.9	48.7	4.20	12.589								
1,100.0	1,098.6	1,090.3	1,086.5	2.4	2.5	97.92	-35.9	62.0	70.2	65.5	4.71	14.901								
1,200.0	1,197.5	1,185.9	1,180.3	2.7	2.9	103.00	-47.5	76.2	91.1	85.8	5.26	17.305								
1,300.0	1,296.1	1,280.3	1,272.5	3.0	3.3	106.73	-60.5	91.9	115.4	109.5	5.86	19.691								
1,400.0	1,394.2	1,373.4	1,362.9	3.4	3.7	109.52	-74.7	109.2	142.9	136.4	6.50	21.989								
1,500.0	1,491.7	1,465.2	1,451.4	3.8	4.2	111.64	-90.1	127.9	173.6	166.5	7.19	24.156								
1,600.0	1,588.6	1,559.3	1,542.0	4.2	4.7	113.55	-106.5	147.9	206.5	198.6	7.93	26.022								
1,707.3	1,691.9	1,659.8	1,638.6	4.7	5.3	115.51	-123.9	169.2	243.2	234.4	8.78	27.697								
1,800.0	1,780.7	1,746.2	1,721.7	5.2	5.7	117.39	-139.0	187.5	275.7	266.1	9.56	28.849								
1,900.0	1,876.5	1,839.5	1,811.3	5.7	6.3	118.97	-155.2	207.2	311.0	300.6	10.41	29.879								
2,000.0	1,972.3	1,932.7	1,901.0	6.3	6.8	120.23	-171.5	227.0	346.4	335.1	11.27	30.737								
2,100.0	2,068.2	2,026.0	1,990.7	6.8	7.3	121.26	-187.7	246.8	382.0	369.9	12.14	31.459								
2,200.0	2,164.0	2,119.2	2,080.4	7.4	7.9	122.12	-204.0	266.5	417.7	404.6	13.02	32.074								
2,300.0	2,259.8	2,212.5	2,170.1	8.0	8.4	122.84	-220.2	286.3	453.4	439.5	13.91	32.603								
2,400.0	2,355.7	2,305.7	2,259.7	8.5	9.0	123.45	-236.5	306.1	489.2	474.4	14.80	33.063								
2,500.0	2,451.5	2,399.0	2,349.4	9.1	9.5	123.98	-252.7	325.8	525.0	509.3	15.69	33.464								
2,600.0	2,547.3	2,492.3	2,439.1	9.7	10.0	124.44	-269.0	345.6	560.9	544.3	16.59	33.818								
2,700.0	2,643.1	2,585.5	2,528.8	10.2	10.6	124.85	-285.2	365.4	596.8	579.3	17.48	34.132								
2,800.0	2,739.0	2,678.8	2,618.5	10.8	11.1	125.21	-301.5	385.1	632.7	614.3	18.39	34.412								
2,900.0	2,834.8	2,772.0	2,708.1	11.4	11.7	125.54	-317.7	404.9	668.6	649.3	19.29	34.664								
3,000.0	2,930.6	2,865.3	2,797.8	12.0	12.2	125.83	-333.9	424.6	704.6	684.4	20.19	34.891								
3,100.0	3,026.4	2,958.5	2,887.5	12.6	12.8	126.09	-350.2	444.4	740.6	719.5	21.10	35.096								
3,200.0	3,122.3	3,051.8	2,977.2	13.1	13.3	126.33	-366.4	464.2	776.5	754.5	22.01	35.284								

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference				Offset			Semi Major Axis			Distance				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 CC, ES	
700.0	700.0	700.0	700.0	1.5	1.5	-154.42	-3.6	-13.9		15.6	12.6	2.92	5.332 SF	
800.0	799.9	799.9	799.9	1.7	1.7	-159.47	-3.6	-13.9		19.2	15.8	3.37	5.700	
900.0	899.7	900.0	900.0	1.9	1.9	-167.23	-4.3	-12.8		24.8	21.0	3.79	6.526	
1,000.0	999.3	999.9	999.8	2.1	2.1	-176.97	-6.4	-9.5		32.2	28.0	4.21	7.660	
1,100.0	1,098.6	1,099.5	1,099.2	2.4	2.3	173.80	-9.7	-3.9		42.4	37.7	4.64	9.126	
1,200.0	1,197.5	1,198.5	1,197.8	2.7	2.5	166.07	-14.4	3.8		55.6	50.4	5.10	10.884	
1,300.0	1,296.1	1,296.9	1,295.5	3.0	2.8	159.93	-20.4	13.7		71.9	66.3	5.60	12.843	
1,400.0	1,394.2	1,394.5	1,392.1	3.4	3.0	155.10	-27.6	25.5		91.4	85.3	6.13	14.906	
1,500.0	1,491.7	1,491.3	1,487.5	3.8	3.3	151.29	-36.0	39.4		114.1	107.4	6.72	16.986	
1,600.0	1,588.6	1,587.0	1,581.4	4.2	3.6	148.22	-45.6	55.1		139.8	132.5	7.35	19.020	
1,707.3	1,691.9	1,688.4	1,680.4	4.7	4.0	145.54	-57.1	74.0		170.7	162.7	8.09	21.100	
1,800.0	1,780.7	1,775.1	1,764.6	5.2	4.4	143.68	-67.9	91.9		199.3	190.5	8.80	22.646	
1,900.0	1,876.5	1,868.0	1,854.2	5.7	4.9	141.66	-80.7	112.8		231.1	221.5	9.62	24.035	
2,000.0	1,972.3	1,962.4	1,944.9	6.3	5.3	139.89	-94.1	134.9		263.5	253.0	10.48	25.151	
2,100.0	2,068.2	2,056.7	2,035.6	6.8	5.8	138.51	-107.6	157.0		296.0	284.6	11.35	26.081	
2,200.0	2,164.0	2,151.1	2,126.4	7.4	6.3	137.40	-121.0	179.1		328.6	316.4	12.24	26.858	
2,300.0	2,259.8	2,245.4	2,217.1	8.0	6.8	136.49	-134.4	201.2		361.4	348.2	13.14	27.513	
2,400.0	2,355.7	2,339.8	2,307.8	8.5	7.4	135.73	-147.9	223.3		394.2	380.2	14.04	28.071	
2,500.0	2,451.5	2,434.1	2,398.6	9.1	7.9	135.09	-161.3	245.5		427.1	412.1	14.96	28.551	
2,600.0	2,547.3	2,528.5	2,489.3	9.7	8.4	134.54	-174.7	267.6		460.0	444.1	15.88	28.967	
2,700.0	2,643.1	2,622.8	2,580.0	10.2	9.0	134.06	-188.2	289.7		492.9	476.1	16.80	29.332	
2,800.0	2,739.0	2,717.1	2,670.7	10.8	9.5	133.65	-201.6	311.8		525.9	508.1	17.73	29.652	
2,900.0	2,834.8	2,811.5	2,761.5	11.4	10.0	133.28	-215.0	333.9		558.8	540.2	18.67	29.936	
3,000.0	2,930.6	2,905.8	2,852.2	12.0	10.6	132.95	-228.5	356.0		591.8	572.2	19.60	30.189	
3,100.0	3,026.4	3,000.2	2,942.9	12.6	11.1	132.66	-241.9	378.1		624.9	604.3	20.54	30.416	
3,200.0	3,122.3	3,094.5	3,033.7	13.1	11.7	132.40	-255.4	400.2		657.9	636.4	21.49	30.620	
3,300.0	3,218.1	3,188.9	3,124.4	13.7	12.2	132.16	-268.8	422.3		690.9	668.5	22.43	30.805	
3,400.0	3,313.9	3,283.2	3,215.1	14.3	12.8	131.94	-282.2	444.4		724.0	700.6	23.37	30.973	
3,500.0	3,409.8	3,377.6	3,305.9	14.9	13.3	131.74	-295.7	466.5		757.1	732.7	24.32	31.126	
3,600.0	3,505.6	3,471.9	3,396.6	15.5	13.8	131.56	-309.1	488.6		790.1	764.9	25.27	31.267	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Christenson 2-19 (Exist) - 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		
7,700.0	6,511.8	6,494.5	6,492.5	35.3	13.9	-91.32	932.1	-1,028.7	730.1	680.9	49.18	14.846		
7,800.0	6,511.5	6,494.4	6,492.4	37.4	13.9	-91.29	932.1	-1,028.7	632.5	581.2	51.32	12.324		
7,900.0	6,511.3	6,494.3	6,492.4	39.7	13.9	-91.26	932.1	-1,028.7	535.7	482.2	53.55	10.004		
8,000.0	6,511.1	6,494.3	6,492.3	42.1	13.9	-91.23	932.1	-1,028.7	440.4	384.6	55.85	7.886		
8,100.0	6,510.9	6,494.2	6,492.2	44.5	13.9	-91.20	932.1	-1,028.7	347.8	289.6	58.21	5.975		
8,200.0	6,510.6	6,494.1	6,492.1	46.9	13.9	-91.16	932.1	-1,028.7	260.6	200.0	60.61	4.300		
8,300.0	6,510.4	6,494.0	6,492.0	49.4	13.9	-91.13	932.1	-1,028.7	186.8	123.8	63.06	2.963		
8,400.0	6,510.2	6,493.9	6,492.0	51.9	13.9	-91.10	932.1	-1,028.7	147.9	82.4	65.55	2.256		
8,415.2	6,510.1	6,493.9	6,492.0	52.3	13.9	-91.10	932.1	-1,028.7	147.1	81.2	65.93	2.232 CC, ES, SF		
8,500.0	6,509.9	6,493.8	6,491.9	54.4	13.9	-91.07	932.1	-1,028.7	169.8	101.8	68.06	2.495		
8,600.0	6,509.7	6,493.8	6,491.8	57.0	13.9	-91.04	932.1	-1,028.7	236.2	165.6	70.61	3.346		
8,700.0	6,509.5	6,493.7	6,491.7	59.6	13.9	-91.01	932.1	-1,028.7	320.6	247.4	73.18	4.381		
8,800.0	6,509.3	6,493.6	6,491.6	62.2	13.9	-90.98	932.1	-1,028.7	412.0	336.2	75.77	5.438		
8,900.0	6,509.0	6,493.5	6,491.6	64.8	13.9	-90.94	932.1	-1,028.7	506.7	428.3	78.38	6.465		
9,000.0	6,508.8	6,493.4	6,491.5	67.4	13.9	-90.91	932.1	-1,028.7	603.1	522.1	81.00	7.445		
9,100.0	6,508.6	6,493.4	6,491.4	70.0	13.9	-90.88	932.1	-1,028.7	700.5	616.8	83.64	8.375		
9,200.0	6,508.3	6,493.3	6,491.3	72.7	13.9	-90.85	932.1	-1,028.7	798.5	712.2	86.29	9.254		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 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	
1,600.0	1,588.6	1,605.2	1,605.2	4.2	3.3	29.22	283.1	871.6	799.8	793.0	6.86	116.607	
1,707.3	1,691.9	1,705.3	1,705.2	4.7	3.5	30.35	284.2	871.1	774.0	766.6	7.39	104.699	
1,800.0	1,780.7	1,791.6	1,791.5	5.2	3.6	31.23	285.4	870.9	751.1	743.2	7.89	95.135	
1,900.0	1,876.5	1,884.9	1,884.8	5.7	3.8	32.23	287.0	871.1	726.9	718.5	8.46	85.973	
2,000.0	1,972.3	1,978.5	1,978.3	6.3	4.0	33.29	288.8	871.5	703.4	694.4	9.03	77.856	
2,100.0	2,068.2	2,074.4	2,074.2	6.8	4.2	34.43	290.8	872.2	680.4	670.8	9.60	70.859	
2,200.0	2,164.0	2,170.9	2,170.7	7.4	4.3	35.69	292.5	872.9	657.7	647.5	10.18	64.599	
2,300.0	2,259.8	2,267.3	2,267.1	8.0	4.5	37.05	294.0	873.6	635.2	624.4	10.78	58.921	
2,400.0	2,355.7	2,363.6	2,363.4	8.5	4.6	38.54	295.1	874.3	613.1	601.7	11.40	53.763	
2,500.0	2,451.5	2,459.8	2,459.6	9.1	4.8	40.15	296.1	875.1	591.5	579.4	12.05	49.072	
2,600.0	2,547.3	2,556.2	2,556.0	9.7	4.9	41.92	296.7	875.8	570.3	557.6	12.71	44.879	
2,700.0	2,643.1	2,652.7	2,652.5	10.2	5.0	43.83	297.2	876.5	549.7	536.3	13.38	41.093	
2,800.0	2,739.0	2,749.1	2,748.9	10.8	5.1	45.90	297.5	877.1	529.6	515.5	14.08	37.627	
2,900.0	2,834.8	2,845.4	2,845.2	11.4	5.2	48.14	297.7	877.6	510.2	495.4	14.81	34.460	
3,000.0	2,930.6	2,941.7	2,941.5	12.0	5.3	50.56	297.7	878.1	491.6	476.0	15.57	31.574	
3,100.0	3,026.4	3,038.0	3,037.8	12.6	5.5	53.20	297.5	878.5	473.9	457.5	16.36	28.963	
3,200.0	3,122.3	3,133.9	3,133.7	13.1	5.5	56.17	296.0	878.5	457.2	440.1	17.19	26.605	
3,300.0	3,218.1	3,229.0	3,228.7	13.7	5.6	59.50	293.1	878.2	442.0	423.9	18.05	24.486	
3,400.0	3,313.9	3,323.3	3,322.9	14.3	5.7	63.19	288.8	877.5	428.5	409.6	18.95	22.618	
3,500.0	3,409.8	3,416.6	3,416.1	14.9	5.8	67.23	283.1	876.4	417.4	397.6	19.86	21.014	
3,600.0	3,505.6	3,509.3	3,508.5	15.5	5.9	71.60	276.1	875.0	409.1	388.3	20.79	19.678	
3,700.0	3,601.4	3,604.7	3,603.6	16.1	6.0	76.27	268.7	873.4	403.5	381.8	21.74	18.566	
3,800.0	3,697.2	3,700.5	3,699.1	16.6	6.2	80.97	261.9	871.8	400.5	377.9	22.64	17.694	
3,873.1	3,767.3	3,770.7	3,769.2	17.1	6.3	84.40	257.4	870.5	399.9	376.6	23.26	17.194 CC	
3,900.0	3,793.1	3,796.6	3,795.0	17.2	6.3	85.66	255.9	870.0	400.0	376.5	23.47	17.038 ES	
4,000.0	3,888.9	3,893.0	3,891.2	17.8	6.4	90.29	250.4	868.2	401.7	377.5	24.24	16.572	
4,100.0	3,984.7	3,989.7	3,987.8	18.4	6.6	94.81	245.7	866.3	405.7	380.8	24.93	16.272	
4,200.0	4,080.5	4,085.3	4,083.3	19.0	6.7	99.16	241.5	864.4	411.9	386.3	25.58	16.101	
4,300.0	4,176.4	4,180.8	4,178.7	19.6	6.9	103.38	237.4	862.2	420.4	394.2	26.16	16.069 SF	
4,400.0	4,272.2	4,276.2	4,274.0	20.2	7.1	107.44	233.6	859.8	430.9	404.3	26.66	16.163	
4,500.0	4,368.0	4,371.6	4,369.3	20.7	7.2	111.31	229.8	857.3	443.5	416.4	27.10	16.367	
4,600.0	4,463.9	4,467.0	4,464.6	21.3	7.4	115.00	226.3	854.5	457.9	430.4	27.47	16.667	
4,700.0	4,559.7	4,562.5	4,559.9	21.9	7.6	118.46	222.9	851.7	474.0	446.1	27.81	17.043	
4,800.0	4,655.5	4,658.3	4,655.7	22.5	7.8	121.64	219.9	849.5	491.4	463.3	28.12	17.476	
4,900.0	4,751.3	4,754.6	4,751.9	23.1	8.0	124.56	217.2	847.8	510.1	481.7	28.41	17.952	
5,000.0	4,847.2	4,851.4	4,848.7	23.7	8.2	127.22	214.8	846.7	529.7	501.0	28.70	18.457	
5,100.0	4,943.0	4,948.6	4,945.8	24.3	8.3	129.64	212.8	846.2	549.9	520.9	28.98	18.976	
5,200.0	5,038.8	5,045.6	5,042.8	24.9	8.5	131.83	211.2	846.3	570.7	541.5	29.26	19.507	
5,300.0	5,134.6	5,142.2	5,139.4	25.5	8.7	133.82	209.8	846.8	592.1	562.6	29.53	20.050	
5,400.0	5,230.5	5,239.0	5,236.2	26.0	8.9	135.64	208.5	847.7	613.9	584.1	29.81	20.594	
5,500.0	5,326.3	5,336.0	5,333.2	26.6	9.0	137.32	207.3	848.9	636.1	606.0	30.10	21.135	
5,600.0	5,422.1	5,433.3	5,430.5	27.2	9.2	138.85	206.3	850.5	658.6	628.2	30.39	21.669	
5,700.0	5,518.0	5,530.7	5,527.9	27.8	9.4	140.27	205.4	852.4	681.3	650.6	30.70	22.194	
5,792.2	5,606.3	5,620.3	5,617.5	28.3	9.5	141.53	204.9	853.7	702.5	671.5	30.98	22.677	
5,800.0	5,613.8	5,627.9	5,625.1	28.4	9.5	143.16	204.9	853.7	704.2	673.3	30.97	22.740	
5,850.0	5,662.1	5,676.8	5,674.0	28.6	9.6	155.35	204.7	854.2	715.5	684.5	30.93	23.133	
5,900.0	5,710.8	5,726.2	5,723.3	28.8	9.7	171.01	204.6	854.4	726.1	695.2	30.93	23.476	
5,950.0	5,759.8	5,775.7	5,772.9	28.9	9.8	-170.42	204.6	854.4	736.2	705.2	30.98	23.765	
6,000.0	5,808.8	5,825.3	5,822.5	29.0	9.9	-151.83	204.6	854.2	745.6	714.6	31.07	24.000	
6,050.0	5,857.6	5,874.8	5,872.0	29.1	9.9	-136.36	204.8	853.8	754.4	723.2	31.19	24.183	
6,100.0	5,906.0	5,924.0	5,921.1	29.2	10.0	-124.97	205.0	853.2	762.5	731.1	31.35	24.319	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 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	
6,150.0	5,953.8	5,972.7	5,969.9	29.2	10.1	-117.02	205.3	852.4	770.1	738.5	31.54	24.415	
6,200.0	6,000.8	6,020.9	6,018.0	29.2	10.2	-111.57	205.7	851.5	777.1	745.4	31.75	24.475	
6,250.0	6,046.7	6,068.4	6,065.5	29.2	10.3	-107.86	206.1	850.4	783.9	751.9	31.99	24.507	
6,300.0	6,091.5	6,114.9	6,112.0	29.1	10.4	-105.39	206.6	849.0	790.4	758.2	32.23	24.527	
6,350.0	6,134.8	6,160.2	6,157.3	29.1	10.5	-103.80	207.2	847.6	797.0	764.5	32.47	24.545	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 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	
1,800.0	1,780.7	1,765.7	1,765.6	5.2	3.4	-17.32	806.1	543.9	792.9	785.4	7.49	105.824	
1,900.0	1,876.5	1,860.1	1,860.0	5.7	3.6	-17.88	806.0	544.8	766.0	758.0	7.97	96.132	
2,000.0	1,972.3	1,954.7	1,954.6	6.3	3.7	-18.46	806.1	546.1	739.4	730.9	8.45	87.462	
2,100.0	2,068.2	2,050.1	2,050.0	6.8	3.9	-19.08	806.2	547.5	713.0	704.1	8.94	79.717	
2,200.0	2,164.0	2,146.1	2,146.0	7.4	4.1	-19.74	806.3	549.1	686.8	677.3	9.44	72.747	
2,300.0	2,259.8	2,242.2	2,242.1	8.0	4.2	-20.46	806.4	550.6	660.6	650.7	9.95	66.413	
2,400.0	2,355.7	2,338.3	2,338.2	8.5	4.4	-21.24	806.5	552.1	634.6	624.1	10.47	60.636	
2,500.0	2,451.5	2,434.3	2,434.2	9.1	4.5	-22.09	806.7	553.7	608.7	597.7	11.00	55.354	
2,600.0	2,547.3	2,530.7	2,530.5	9.7	4.7	-23.01	806.9	555.2	583.0	571.5	11.55	50.478	
2,700.0	2,643.1	2,627.5	2,627.3	10.2	4.9	-24.03	807.0	556.6	557.3	545.2	12.13	45.930	
2,800.0	2,739.0	2,724.2	2,724.0	10.8	5.1	-25.18	807.2	557.7	531.8	519.0	12.74	41.742	
2,900.0	2,834.8	2,820.8	2,820.6	11.4	5.2	-26.47	807.4	558.5	506.3	493.0	13.37	37.877	
3,000.0	2,930.6	2,917.2	2,917.1	12.0	5.4	-27.92	807.5	559.2	481.0	467.0	14.02	34.304	
3,100.0	3,026.4	3,014.0	3,013.9	12.6	5.6	-29.56	807.6	559.5	456.0	441.3	14.71	30.989	
3,200.0	3,122.3	3,113.0	3,112.9	13.1	5.8	-31.43	807.3	559.8	430.9	415.4	15.46	27.862	
3,300.0	3,218.1	3,211.7	3,211.5	13.7	6.0	-33.51	806.3	560.0	405.5	389.2	16.25	24.946	
3,400.0	3,313.9	3,310.0	3,309.8	14.3	6.2	-35.84	804.5	560.1	380.0	362.9	17.09	22.229	
3,500.0	3,409.8	3,408.0	3,407.8	14.9	6.4	-38.48	802.0	560.2	354.4	336.4	17.99	19.699	
3,600.0	3,505.6	3,500.0	3,499.7	15.5	6.6	-41.32	799.0	560.2	329.0	310.1	18.93	17.384	
3,700.0	3,601.4	3,598.5	3,598.2	16.1	6.8	-44.85	795.8	560.2	304.5	284.6	19.94	15.275	
3,800.0	3,697.2	3,691.9	3,691.5	16.6	6.9	-48.77	793.5	560.0	281.9	260.9	21.00	13.424	
3,900.0	3,793.1	3,785.5	3,785.1	17.2	7.1	-53.32	791.7	559.7	261.6	239.4	22.15	11.808	
4,000.0	3,888.9	3,879.3	3,878.9	17.8	7.2	-58.56	790.5	559.3	243.9	220.5	23.38	10.434	
4,100.0	3,984.7	3,973.3	3,972.9	18.4	7.4	-64.49	789.9	558.9	229.3	204.7	24.63	9.311	
4,200.0	4,080.5	4,068.3	4,067.9	19.0	7.5	-71.12	789.9	558.2	218.3	192.4	25.83	8.448	
4,300.0	4,176.4	4,163.5	4,163.2	19.6	7.6	-78.36	789.9	557.4	210.9	183.9	26.93	7.830	
4,400.0	4,272.2	4,258.7	4,258.3	20.2	7.7	-85.97	790.0	556.3	207.5	179.7	27.84	7.454	
4,426.5	4,297.6	4,283.9	4,283.5	20.3	7.7	-88.02	790.0	556.0	207.4	179.3	28.05	7.394 CC, ES	
4,500.0	4,368.0	4,353.8	4,353.4	20.7	7.8	-93.69	790.2	555.0	208.6	180.1	28.52	7.314 SF	
4,600.0	4,463.9	4,448.9	4,448.4	21.3	7.9	-101.21	790.4	553.4	213.9	185.0	28.93	7.395	
4,700.0	4,559.7	4,544.6	4,544.1	21.9	8.1	-108.34	790.7	551.7	223.3	194.1	29.13	7.664	
4,800.0	4,655.5	4,641.2	4,640.8	22.5	8.2	-114.90	791.0	550.4	235.6	206.5	29.19	8.073	
4,900.0	4,751.3	4,738.1	4,737.7	23.1	8.4	-120.79	791.1	549.5	250.4	221.3	29.13	8.595	
5,000.0	4,847.2	4,835.1	4,834.7	23.7	8.6	-126.02	791.0	549.0	267.0	238.0	29.02	9.202	
5,100.0	4,943.0	4,932.3	4,931.9	24.3	8.7	-130.65	790.9	549.1	285.2	256.3	28.89	9.870	
5,200.0	5,038.8	5,029.1	5,028.7	24.9	8.9	-134.72	790.6	549.6	304.5	275.7	28.78	10.578	
5,300.0	5,134.6	5,124.9	5,124.5	25.5	9.1	-138.27	790.4	550.1	325.1	296.3	28.72	11.318	
5,400.0	5,230.5	5,220.7	5,220.3	26.0	9.2	-141.37	790.3	550.6	346.8	318.1	28.70	12.082	
5,500.0	5,326.3	5,316.6	5,316.1	26.6	9.4	-144.09	790.4	551.1	369.4	340.6	28.73	12.858	
5,600.0	5,422.1	5,412.4	5,412.0	27.2	9.6	-146.48	790.6	551.6	392.7	363.9	28.80	13.636	
5,700.0	5,518.0	5,508.2	5,507.7	27.8	9.7	-148.59	791.0	551.9	416.7	387.7	28.91	14.411	
5,792.2	5,606.3	5,594.5	5,594.0	28.3	9.9	-150.25	791.5	552.0	439.4	410.4	29.03	15.140	
5,800.0	5,613.8	5,601.8	5,601.4	28.4	9.9	-148.96	791.5	552.0	441.4	412.3	29.07	15.184	
5,850.0	5,662.1	5,649.0	5,648.5	28.6	9.9	-138.80	791.9	551.8	452.0	422.8	29.25	15.457	
5,900.0	5,710.8	5,696.6	5,696.1	28.8	10.0	-124.96	792.4	551.4	459.9	430.6	29.28	15.707	
5,950.0	5,759.8	5,744.4	5,744.0	28.9	10.1	-108.04	792.9	550.9	464.8	435.7	29.16	15.938	
6,000.0	5,808.8	5,792.4	5,791.9	29.0	10.1	-90.93	793.5	550.2	466.9	438.0	28.91	16.153	
6,050.0	5,857.6	5,840.2	5,839.7	29.1	10.2	-76.83	794.2	549.4	466.3	437.7	28.52	16.351	
6,100.0	5,906.0	5,887.7	5,887.2	29.2	10.2	-66.73	794.9	548.5	462.8	434.8	28.00	16.530	
6,150.0	5,953.8	5,934.8	5,934.3	29.2	10.3	-60.04	795.7	547.4	456.7	429.4	27.38	16.684	
6,200.0	6,000.8	5,981.3	5,980.8	29.2	10.4	-55.89	796.6	546.2	448.1	421.4	26.67	16.799	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 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		
6,250.0	6,046.7	6,027.7	6,027.1	29.2	10.4	-53.61	797.5	544.8	437.0	411.0	25.93	16.850		
6,300.0	6,091.5	6,073.4	6,072.8	29.1	10.5	-52.80	798.5	543.5	423.5	398.3	25.22	16.792		
6,350.0	6,134.8	6,117.9	6,117.2	29.1	10.5	-53.17	799.5	542.2	407.9	383.2	24.63	16.559		
6,400.0	6,176.6	6,160.8	6,160.1	29.0	10.6	-54.58	800.5	541.0	390.4	366.1	24.29	16.074		
6,450.0	6,216.6	6,202.0	6,201.4	28.9	10.7	-56.94	801.5	539.8	371.5	347.2	24.33	15.272		
6,500.0	6,254.6	6,241.4	6,240.7	28.8	10.7	-60.20	802.5	538.6	351.6	326.7	24.85	14.150		
6,550.0	6,290.6	6,278.8	6,278.0	28.6	10.8	-64.29	803.5	537.6	331.3	305.4	25.88	12.802		
6,600.0	6,324.3	6,313.9	6,313.1	28.5	10.8	-69.06	804.5	536.5	311.3	284.0	27.32	11.395		
6,650.0	6,355.6	6,346.7	6,345.9	28.3	10.8	-74.32	805.4	535.6	292.8	263.8	28.99	10.101		
6,700.0	6,384.4	6,377.0	6,376.2	28.2	10.9	-79.78	806.3	534.7	276.8	246.2	30.63	9.037		
6,750.0	6,410.5	6,404.7	6,403.8	28.1	10.9	-85.08	807.2	533.9	264.9	232.8	32.06	8.263		
6,800.0	6,433.9	6,429.6	6,428.7	27.9	11.0	-89.88	807.9	533.2	258.5	225.3	33.17	7.793		
6,823.1	6,443.7	6,440.1	6,439.3	27.9	11.0	-91.85	808.3	532.9	257.7	224.1	33.57	7.676		
6,850.0	6,454.3	6,451.6	6,450.7	27.8	11.0	-93.89	808.6	532.5	258.8	224.8	33.95	7.622		
6,900.0	6,471.9	6,470.8	6,469.8	27.7	11.0	-96.92	809.3	532.0	266.5	232.0	34.50	7.725		
6,950.0	6,486.4	6,486.8	6,485.9	27.6	11.0	-98.83	809.8	531.5	281.6	246.7	34.94	8.061		
7,000.0	6,497.8	6,499.8	6,498.9	27.5	11.0	-99.54	810.2	531.2	303.5	268.1	35.37	8.580		
7,050.0	6,506.0	6,509.5	6,508.5	27.4	11.1	-98.98	810.5	530.9	331.0	295.1	35.87	9.228		
7,100.0	6,511.1	6,516.0	6,515.0	27.4	11.1	-97.15	810.7	530.7	363.0	326.6	36.44	9.962		
7,150.0	6,513.0	6,519.3	6,518.3	27.5	11.1	-94.05	810.9	530.6	398.5	361.5	37.03	10.762		
7,156.2	6,513.0	6,519.5	6,518.5	27.5	11.1	-93.59	810.9	530.6	403.1	366.0	37.10	10.866		
7,200.0	6,512.9	6,520.6	6,519.6	27.6	11.1	-93.83	810.9	530.6	436.7	399.1	37.65	11.599		
7,300.0	6,512.7	6,523.2	6,522.3	28.3	11.1	-94.39	811.0	530.5	519.2	480.1	39.08	13.285		
7,400.0	6,512.4	6,525.8	6,524.9	29.6	11.1	-94.94	811.1	530.4	606.9	566.2	40.70	14.912		
7,500.0	6,512.2	6,528.4	6,527.4	31.3	11.1	-95.49	811.2	530.3	698.0	655.5	42.48	16.429		
7,600.0	6,512.0	6,531.0	6,530.0	33.2	11.1	-96.04	811.2	530.3	791.2	746.8	44.40	17.819		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
10,500.0	6,505.4	6,504.9	6,504.1	107.9	11.8	-91.00	622.9	-3,686.9	732.8	613.3	119.43	6.136		
10,600.0	6,505.2	6,506.0	6,505.2	110.6	11.8	-91.14	623.0	-3,686.9	657.5	535.3	122.17	5.381		
10,700.0	6,504.9	6,507.1	6,506.3	113.4	11.8	-91.28	623.0	-3,686.9	589.6	464.6	124.92	4.719		
10,800.0	6,504.7	6,508.2	6,507.4	116.1	11.8	-91.42	623.0	-3,686.9	531.9	404.2	127.68	4.166		
10,900.0	6,504.5	6,509.3	6,508.4	118.9	11.8	-91.55	623.1	-3,686.9	488.1	357.7	130.43	3.742		
11,000.0	6,504.3	6,510.3	6,509.5	121.6	11.8	-91.68	623.1	-3,686.9	462.1	329.0	133.18	3.470		
11,073.4	6,504.1	6,511.0	6,510.2	123.7	11.8	-91.77	623.1	-3,686.9	456.3	321.1	135.21	3.375 CC, ES		
11,100.0	6,504.0	6,511.3	6,510.5	124.4	11.8	-91.81	623.1	-3,686.9	457.1	321.1	135.94	3.362 SF		
11,200.0	6,503.8	6,512.3	6,511.4	127.1	11.8	-91.93	623.2	-3,687.0	473.5	334.8	138.70	3.414		
11,300.0	6,503.6	6,513.3	6,512.4	129.9	11.8	-92.05	623.2	-3,687.0	509.4	368.0	141.46	3.601		
11,400.0	6,503.3	6,514.2	6,513.3	132.7	11.8	-92.17	623.2	-3,687.0	561.1	416.9	144.22	3.891		
11,500.0	6,503.1	6,515.1	6,514.3	135.4	11.8	-92.28	623.3	-3,687.0	624.6	477.7	146.98	4.250		
11,600.0	6,502.9	6,516.0	6,515.2	138.2	11.8	-92.40	623.3	-3,687.0	696.8	547.0	149.74	4.653		
11,700.0	6,502.7	6,516.9	6,516.0	141.0	11.8	-92.51	623.3	-3,687.0	775.1	622.6	152.50	5.083		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 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	6,508.8	6,498.8	6,498.8	67.4	130.0	-90.36	816.2	-2,334.3	767.3	570.3	197.06	3.894		
9,100.0	6,508.6	6,498.6	6,498.6	70.0	130.0	-90.31	816.2	-2,334.3	674.2	474.6	199.69	3.376		
9,200.0	6,508.3	6,498.3	6,498.3	72.7	130.0	-90.26	816.2	-2,334.3	583.5	381.1	202.34	2.884		
9,300.0	6,508.1	6,498.1	6,498.1	75.4	130.0	-90.21	816.2	-2,334.3	496.3	291.3	205.00	2.421		
9,400.0	6,507.9	6,497.9	6,497.9	78.0	130.0	-90.16	816.2	-2,334.3	414.9	207.2	207.67	1.998		
9,500.0	6,507.7	6,497.7	6,497.7	80.7	130.0	-90.11	816.2	-2,334.3	343.4	133.1	210.34	1.633		
9,600.0	6,507.4	6,497.4	6,497.4	83.4	129.9	-90.06	816.2	-2,334.3	289.5	76.4	213.03	1.359 Level 3		
9,700.0	6,507.2	6,497.2	6,497.2	86.1	129.9	-90.01	816.2	-2,334.3	263.9	48.1	215.72	1.223 Level 2		
9,720.8	6,507.2	6,497.2	6,497.2	86.7	129.9	-90.00	816.2	-2,334.3	263.0	46.7	216.28	1.216 Level 2, CC, ES, SF		
9,800.0	6,507.0	6,497.0	6,497.0	88.8	129.9	-89.96	816.2	-2,334.3	274.7	56.3	218.42	1.258 Level 3		
9,900.0	6,506.8	6,496.8	6,496.8	91.5	129.9	-89.91	816.2	-2,334.3	318.3	97.1	221.13	1.439 Level 3		
10,000.0	6,506.5	6,496.5	6,496.5	94.2	129.9	-89.86	816.2	-2,334.3	383.6	159.7	223.84	1.714		
10,100.0	6,506.3	6,496.3	6,496.3	97.0	129.9	-89.81	816.2	-2,334.3	461.5	234.9	226.56	2.037		
10,200.0	6,506.1	6,496.1	6,496.1	99.7	129.9	-89.76	816.2	-2,334.3	546.6	317.3	229.28	2.384		
10,300.0	6,505.8	6,495.8	6,495.8	102.4	129.9	-89.71	816.2	-2,334.3	636.1	404.1	232.00	2.742		
10,400.0	6,505.6	6,495.6	6,495.6	105.2	129.9	-89.66	816.2	-2,334.3	728.3	493.6	234.73	3.103		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 500-NS-GYRO-MS												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,800.0	6,507.0	6,525.2	6,522.7	88.8	11.1	-91.96	363.0	-2,738.9	787.0	687.3	99.66	7.897	
9,900.0	6,506.8	6,521.9	6,519.5	91.5	11.1	-91.70	363.0	-2,739.0	751.2	648.8	102.37	7.338	
10,000.0	6,506.5	6,518.7	6,516.2	94.2	11.1	-91.43	362.9	-2,739.1	727.4	622.4	105.08	6.923	
10,100.0	6,506.3	6,515.3	6,512.8	97.0	11.1	-91.17	362.8	-2,739.2	717.0	609.2	107.79	6.652	
10,125.7	6,506.2	6,514.5	6,512.0	97.7	11.1	-91.10	362.8	-2,739.3	716.5	608.0	108.49	6.604 CC, ES	
10,200.0	6,506.1	6,511.9	6,509.5	99.7	11.1	-90.90	362.8	-2,739.4	720.4	609.8	110.51	6.518	
10,300.0	6,505.8	6,508.5	6,506.0	102.4	11.1	-90.62	362.7	-2,739.5	737.4	624.2	113.23	6.512 SF	
10,400.0	6,505.6	6,505.1	6,502.6	105.2	11.1	-90.35	362.6	-2,739.6	767.2	651.2	115.95	6.616	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - 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							
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	
11,600.0	6,502.9	6,498.9	6,498.9	138.2	130.0	-90.25	743.7	-4,849.8	719.3	451.4	267.91	2.685		
11,700.0	6,502.7	6,498.7	6,498.7	141.0	130.0	-90.21	743.7	-4,849.8	632.6	361.9	270.67	2.337		
11,800.0	6,502.4	6,498.4	6,498.4	143.7	130.0	-90.17	743.7	-4,849.8	550.4	276.9	273.44	2.013		
11,900.0	6,502.2	6,498.2	6,498.2	146.5	130.0	-90.13	743.7	-4,849.8	475.0	198.8	276.21	1.720		
12,000.0	6,502.0	6,498.0	6,498.0	149.3	130.0	-90.09	743.7	-4,849.8	410.4	131.4	278.98	1.471	Level 3	
12,100.0	6,501.7	6,497.7	6,497.7	152.0	130.0	-90.05	743.7	-4,849.8	362.1	80.4	281.75	1.285	Level 3	
12,200.0	6,501.5	6,497.5	6,497.5	154.8	130.0	-90.01	743.7	-4,849.8	337.5	53.0	284.52	1.186	Level 2	
12,236.3	6,501.4	6,497.4	6,497.4	155.8	129.9	-90.00	743.7	-4,849.8	335.5	50.0	285.52	1.175	Level 2, CC, ES, SF	
12,300.0	6,501.3	6,497.3	6,497.3	157.6	129.9	-89.98	743.7	-4,849.8	341.5	54.2	287.29	1.189	Level 2	
12,400.0	6,501.1	6,497.1	6,497.1	160.4	129.9	-89.94	743.7	-4,849.8	373.3	83.3	290.06	1.287	Level 3	
12,500.0	6,500.8	6,496.8	6,496.8	163.2	129.9	-89.90	743.7	-4,849.8	426.8	133.9	292.84	1.457	Level 3	
12,600.0	6,500.6	6,496.6	6,496.6	165.9	129.9	-89.86	743.7	-4,849.8	494.9	199.2	295.61	1.674		
12,700.0	6,500.4	6,496.4	6,496.4	168.7	129.9	-89.82	743.7	-4,849.8	572.4	274.0	298.39	1.918		
12,800.0	6,500.2	6,496.2	6,496.2	171.5	129.9	-89.78	743.7	-4,849.8	656.0	354.9	301.17	2.178		
12,900.0	6,499.9	6,495.9	6,495.9	174.3	129.9	-89.74	743.7	-4,849.8	743.7	439.8	303.94	2.447		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Rothe 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	6,500.2	6,492.2	6,490.8	171.5	12.6	-90.07	809.2	-6,136.8	772.1	588.2	183.86	4.199		
12,900.0	6,499.9	6,491.9	6,490.6	174.3	12.6	-90.01	809.2	-6,136.8	679.3	492.6	186.65	3.639		
13,000.0	6,499.7	6,491.7	6,490.3	177.1	12.6	-89.95	809.2	-6,136.8	588.9	399.4	189.43	3.109		
13,100.0	6,499.5	6,491.4	6,490.0	179.8	12.6	-89.89	809.2	-6,136.8	502.1	309.9	192.21	2.612		
13,200.0	6,499.2	6,491.1	6,489.7	182.6	12.6	-89.84	809.2	-6,136.8	421.2	226.2	194.99	2.160		
13,300.0	6,499.0	6,490.9	6,489.5	185.4	12.6	-89.78	809.2	-6,136.8	350.4	152.6	197.78	1.772		
13,400.0	6,498.8	6,490.6	6,489.2	188.2	12.6	-89.72	809.2	-6,136.8	296.8	96.2	200.56	1.480	Level 3	
13,500.0	6,498.6	6,490.3	6,488.9	191.0	12.6	-89.66	809.2	-6,136.8	271.0	67.6	203.35	1.333	Level 3	
13,523.3	6,498.5	6,490.3	6,488.9	191.6	12.6	-89.65	809.2	-6,136.8	270.0	66.0	204.00	1.323	Level 3, CC, ES, SF	
13,600.0	6,498.3	6,490.0	6,488.7	193.8	12.6	-89.61	809.2	-6,136.8	280.6	74.5	206.13	1.361	Level 3	
13,700.0	6,498.1	6,489.8	6,488.4	196.6	12.6	-89.55	809.2	-6,136.8	322.6	113.7	208.92	1.544		
13,746.0	6,498.0	6,489.6	6,488.3	197.8	12.6	-89.52	809.2	-6,136.8	349.9	139.7	210.20	1.665		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - 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		
8,800.0	6,509.3	6,491.5	6,490.8	62.2	10.8	-87.53	895.4	-2,103.2	713.8	641.3	72.44	9.853		
8,900.0	6,509.0	6,492.4	6,491.7	64.8	10.8	-87.81	895.4	-2,103.2	617.7	542.6	75.08	8.227		
9,000.0	6,508.8	6,493.3	6,492.6	67.4	10.8	-88.09	895.4	-2,103.2	523.1	445.3	77.73	6.729		
9,100.0	6,508.6	6,494.3	6,493.5	70.0	10.8	-88.38	895.3	-2,103.2	430.9	350.5	80.40	5.359		
9,200.0	6,508.3	6,495.2	6,494.4	72.7	10.8	-88.66	895.3	-2,103.2	343.1	260.1	83.08	4.130		
9,300.0	6,508.1	6,496.1	6,495.3	75.4	10.8	-88.95	895.3	-2,103.2	264.2	178.4	85.77	3.080		
9,400.0	6,507.9	6,497.0	6,496.2	78.0	10.8	-89.24	895.3	-2,103.2	204.6	116.1	88.47	2.313		
9,489.7	6,507.7	6,497.9	6,497.1	80.4	10.8	-89.50	895.3	-2,103.2	183.9	93.0	90.90	2.023 CC, ES		
9,500.0	6,507.7	6,498.0	6,497.2	80.7	10.8	-89.53	895.3	-2,103.2	184.2	93.0	91.17	2.020 SF		
9,600.0	6,507.4	6,498.9	6,498.1	83.4	10.8	-89.83	895.3	-2,103.2	214.4	120.5	93.89	2.284		
9,700.0	6,507.2	6,499.9	6,499.1	86.1	10.8	-90.12	895.3	-2,103.3	279.3	182.7	96.60	2.892		
9,800.0	6,507.0	6,500.8	6,500.0	88.8	10.8	-90.42	895.3	-2,103.3	360.7	261.3	99.32	3.631		
9,900.0	6,506.8	6,501.8	6,501.0	91.5	10.8	-90.71	895.3	-2,103.3	449.6	347.5	102.05	4.406		
10,000.0	6,506.5	6,502.7	6,501.9	94.2	10.8	-91.00	895.3	-2,103.3	542.4	437.6	104.78	5.177		
10,100.0	6,506.3	6,503.6	6,502.9	97.0	10.8	-91.30	895.3	-2,103.3	637.4	529.9	107.51	5.929		
10,200.0	6,506.1	6,504.6	6,503.8	99.7	10.8	-91.59	895.3	-2,103.3	733.7	623.4	110.24	6.655		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19U-334
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (Original Well Elev)
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19U-334	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

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

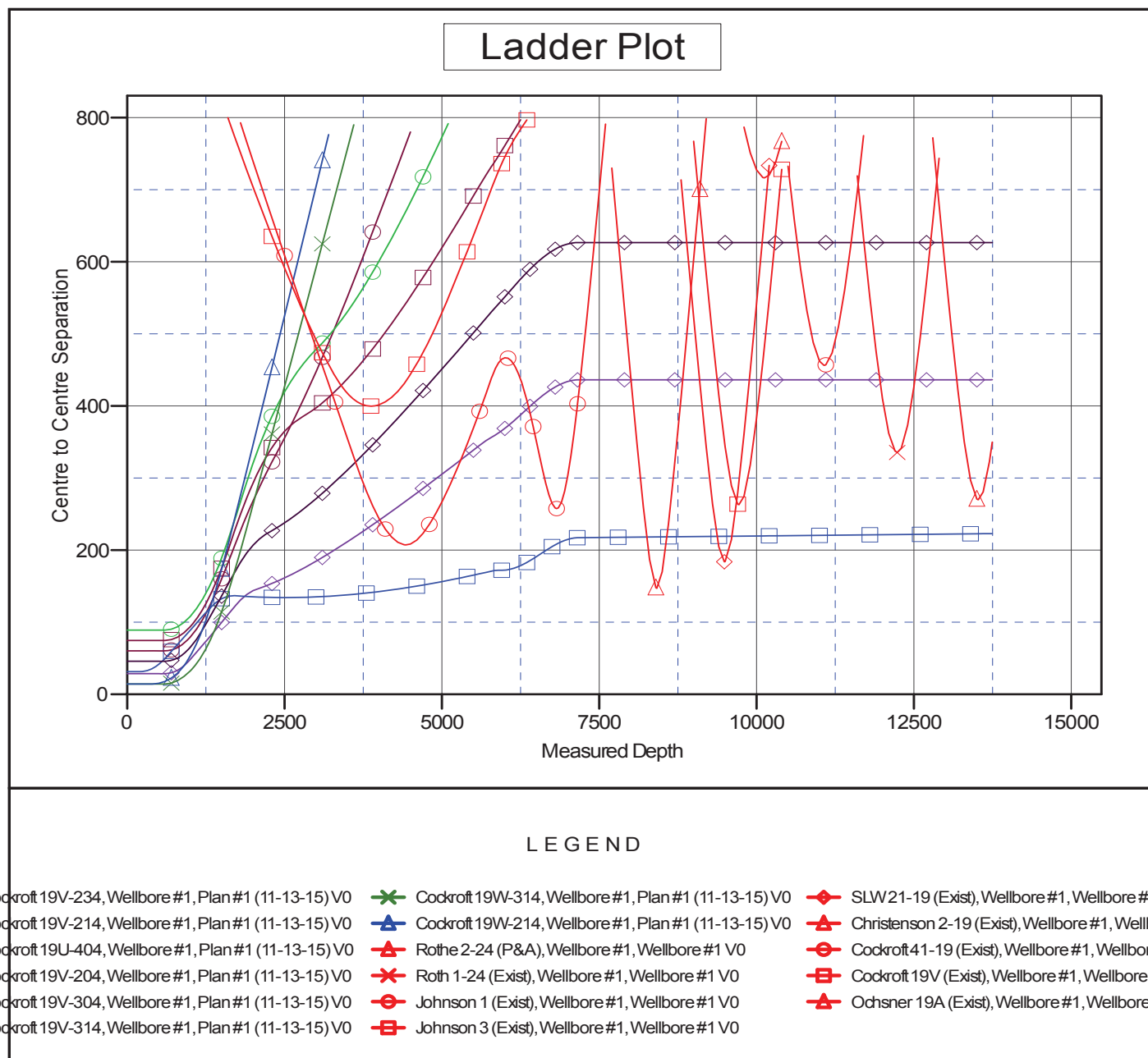
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19U-334

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°



Reference Depths are relative to WELL @ 4567.0ft (Original Well Elev)	Coordinates are relative to: Cockroft 19U-334
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000	Grid Convergence at Surface is: 0.66°

