

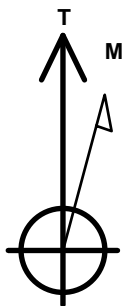
PETROLEUM DEVELOPMENT CORP DJ Basin

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

Surface Location: Cockroft 5N63W19C Pad Sec.19-T5N-R63W
 North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
 Ground Elevation: 4554.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1385882.55 3285817.65 40.388110 -104.473920
 RKB - 13' WELL @ 4567.0ft (RKB - 13')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1399'FNL, 1097'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 2182'FNL, 2143'FEL, SEC.24	6508.0	-767.9	-6304.3	Point
LPL 2167'FNL, 805'FEL, SEC.19	6518.0	-767.9	291.9	Point



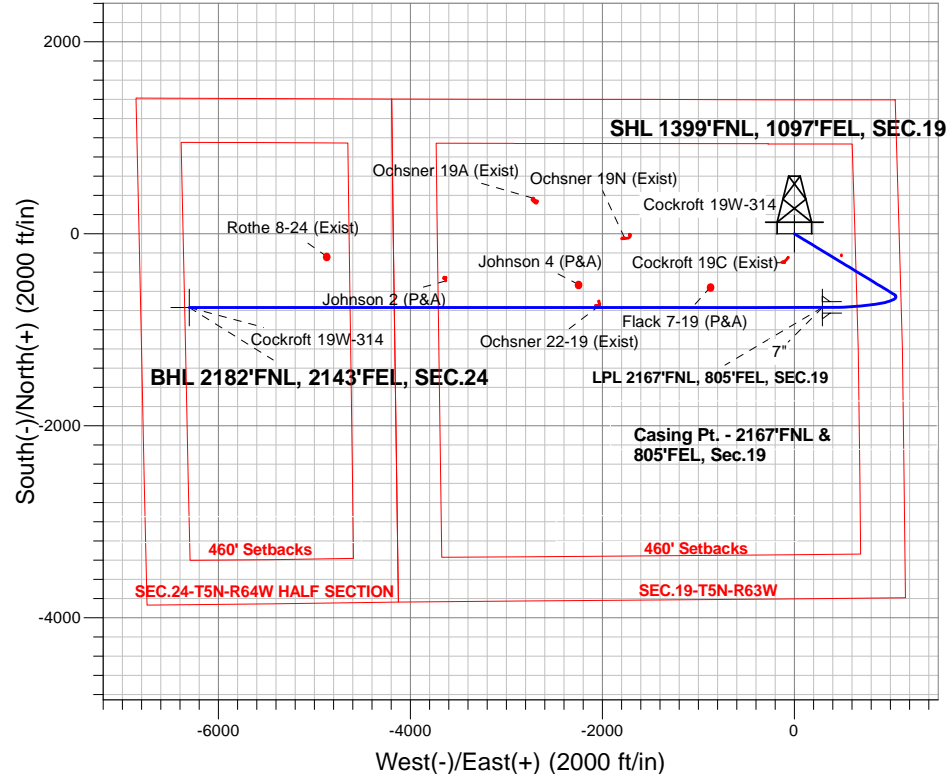
Azimuths to True North
 Magnetic North: 8.11°

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

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

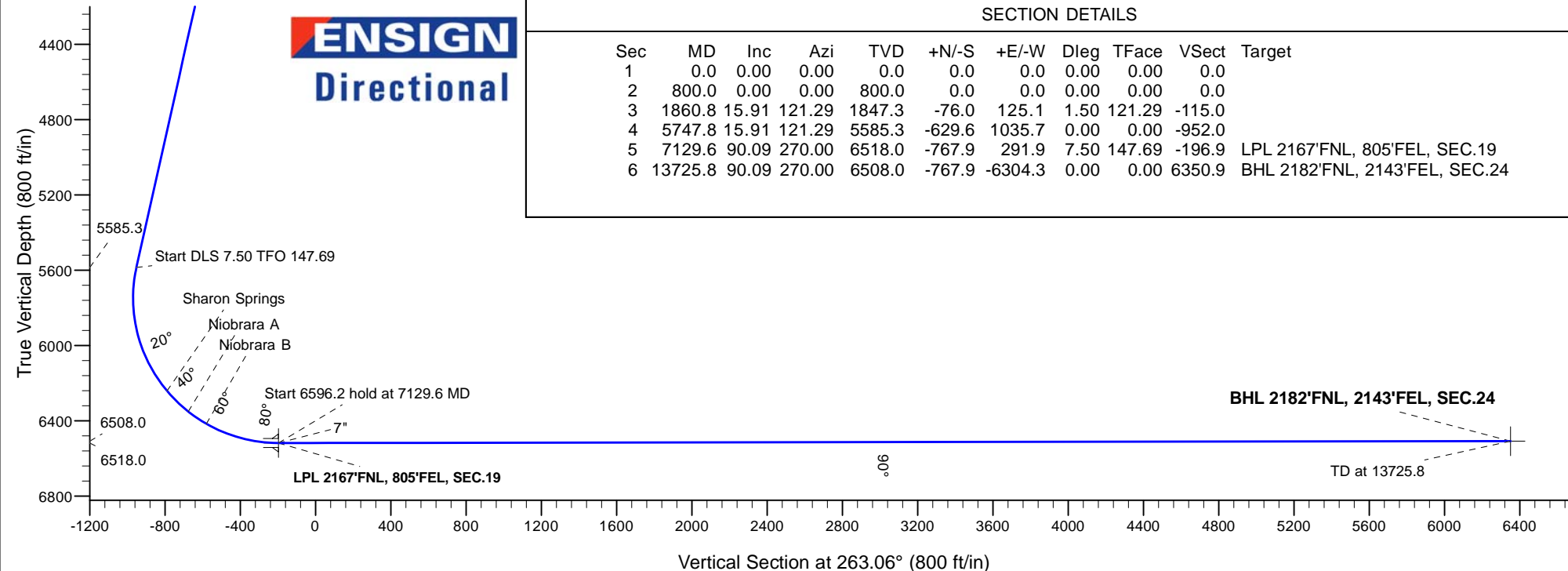
ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	KOP - Start Build 1.50
1847.3	1860.8	Start 3887.0 hold at 1860.8 MD
5585.3	5747.8	Start DLS 7.50 TFO 147.69
6518.0	7129.6	Start 6596.2 hold at 7129.6 MD
6508.0	13725.8	TD at 13725.8



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	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1860.8	15.91	121.29	1847.3	-76.0	125.1	1.50	121.29	-115.0	
4	5747.8	15.91	121.29	5585.3	-629.6	1035.7	0.00	0.00	-952.0	
5	7129.6	90.09	270.00	6518.0	-767.9	291.9	7.50	147.69	-196.9	LPL 2167'FNL, 805'FEL, SEC.19
6	13725.8	90.09	270.00	6508.0	-767.9	-6304.3	0.00	0.00	6350.9	BHL 2182'FNL, 2143'FEL, SEC.24





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19W-314

Wellbore #1

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

Standard Planning Report

18 November, 2015

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

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

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

Well	Cockroft 19W-314					
Well Position	+N/-S	18.2 ft	Northing:	1,385,882.55 usft	Latitude:	40.388110
	+E/-W	72.4 ft	Easting:	3,285,817.65 usft	Longitude:	-104.473920
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,554.0 ft

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

Design	Plan #1 (11-13-15)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	263.06

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	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,860.8	15.91	121.29	1,847.3	-76.0	125.1	1.50	1.50	0.00	121.29	
5,747.8	15.91	121.29	5,585.3	-629.6	1,035.7	0.00	0.00	0.00	0.00	
7,129.6	90.09	270.00	6,518.0	-767.9	291.9	7.50	5.37	10.76	147.69	LPL 2167'FNL, 805'FI
13,725.8	90.09	270.00	6,508.0	-767.9	-6,304.3	0.00	0.00	0.00	0.00	BHL 2182'FNL, 2143'I

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

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 1399'FNL, 1097'FEL, SEC.19									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
900.0	1.50	121.29	900.0	-0.7	1.1	-1.0	1.50	1.50	0.00
1,000.0	3.00	121.29	999.9	-2.7	4.5	-4.1	1.50	1.50	0.00
1,100.0	4.50	121.29	1,099.7	-6.1	10.1	-9.2	1.50	1.50	0.00
1,200.0	6.00	121.29	1,199.3	-10.9	17.9	-16.4	1.50	1.50	0.00
1,300.0	7.50	121.29	1,298.6	-17.0	27.9	-25.7	1.50	1.50	0.00
1,400.0	9.00	121.29	1,397.5	-24.4	40.2	-36.9	1.50	1.50	0.00
1,500.0	10.50	121.29	1,496.1	-33.2	54.7	-50.2	1.50	1.50	0.00
1,600.0	12.00	121.29	1,594.2	-43.4	71.3	-65.6	1.50	1.50	0.00
1,700.0	13.50	121.29	1,691.7	-54.8	90.2	-82.9	1.50	1.50	0.00
1,800.0	15.00	121.29	1,788.6	-67.6	111.2	-102.2	1.50	1.50	0.00
1,860.8	15.91	121.29	1,847.3	-76.0	125.1	-115.0	1.50	1.50	0.00
Start 3887.0 hold at 1860.8 MD									
1,900.0	15.91	121.29	1,884.9	-81.6	134.2	-123.4	0.00	0.00	0.00
2,000.0	15.91	121.29	1,981.1	-95.8	157.7	-144.9	0.00	0.00	0.00
2,100.0	15.91	121.29	2,077.3	-110.1	181.1	-166.5	0.00	0.00	0.00
2,200.0	15.91	121.29	2,173.4	-124.3	204.5	-188.0	0.00	0.00	0.00
2,300.0	15.91	121.29	2,269.6	-138.6	228.0	-209.5	0.00	0.00	0.00
2,400.0	15.91	121.29	2,365.8	-152.8	251.4	-231.1	0.00	0.00	0.00
2,500.0	15.91	121.29	2,461.9	-167.0	274.8	-252.6	0.00	0.00	0.00
2,600.0	15.91	121.29	2,558.1	-181.3	298.2	-274.1	0.00	0.00	0.00
2,700.0	15.91	121.29	2,654.3	-195.5	321.7	-295.7	0.00	0.00	0.00
2,800.0	15.91	121.29	2,750.4	-209.8	345.1	-317.2	0.00	0.00	0.00
2,900.0	15.91	121.29	2,846.6	-224.0	368.5	-338.7	0.00	0.00	0.00
3,000.0	15.91	121.29	2,942.8	-238.3	392.0	-360.3	0.00	0.00	0.00
3,100.0	15.91	121.29	3,038.9	-252.5	415.4	-381.8	0.00	0.00	0.00
3,200.0	15.91	121.29	3,135.1	-266.7	438.8	-403.3	0.00	0.00	0.00
3,300.0	15.91	121.29	3,231.3	-281.0	462.2	-424.9	0.00	0.00	0.00
3,400.0	15.91	121.29	3,327.4	-295.2	485.7	-446.4	0.00	0.00	0.00
3,408.9	15.91	121.29	3,336.0	-296.5	487.8	-448.3	0.00	0.00	0.00
Parkman									
3,500.0	15.91	121.29	3,423.6	-309.5	509.1	-468.0	0.00	0.00	0.00
3,600.0	15.91	121.29	3,519.8	-323.7	532.5	-489.5	0.00	0.00	0.00
3,700.0	15.91	121.29	3,615.9	-337.9	556.0	-511.0	0.00	0.00	0.00
3,800.0	15.91	121.29	3,712.1	-352.2	579.4	-532.6	0.00	0.00	0.00
3,900.0	15.91	121.29	3,808.3	-366.4	602.8	-554.1	0.00	0.00	0.00
4,000.0	15.91	121.29	3,904.4	-380.7	626.2	-575.6	0.00	0.00	0.00
4,100.0	15.91	121.29	4,000.6	-394.9	649.7	-597.2	0.00	0.00	0.00
4,168.0	15.91	121.29	4,066.0	-404.6	665.6	-611.8	0.00	0.00	0.00
Sussex									
4,200.0	15.91	121.29	4,096.8	-409.1	673.1	-618.7	0.00	0.00	0.00
4,300.0	15.91	121.29	4,192.9	-423.4	696.5	-640.2	0.00	0.00	0.00

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Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19W-314	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.0	15.91	121.29	4,289.1	-437.6	720.0	-661.8	0.00	0.00	0.00
4,500.0	15.91	121.29	4,385.3	-451.9	743.4	-683.3	0.00	0.00	0.00
4,600.0	15.91	121.29	4,481.5	-466.1	766.8	-704.8	0.00	0.00	0.00
4,700.0	15.91	121.29	4,577.6	-480.3	790.2	-726.4	0.00	0.00	0.00
4,800.0	15.91	121.29	4,673.8	-494.6	813.7	-747.9	0.00	0.00	0.00
4,900.0	15.91	121.29	4,770.0	-508.8	837.1	-769.4	0.00	0.00	0.00
5,000.0	15.91	121.29	4,866.1	-523.1	860.5	-791.0	0.00	0.00	0.00
5,100.0	15.91	121.29	4,962.3	-537.3	884.0	-812.5	0.00	0.00	0.00
5,200.0	15.91	121.29	5,058.5	-551.6	907.4	-834.0	0.00	0.00	0.00
5,300.0	15.91	121.29	5,154.6	-565.8	930.8	-855.6	0.00	0.00	0.00
5,400.0	15.91	121.29	5,250.8	-580.0	954.2	-877.1	0.00	0.00	0.00
5,500.0	15.91	121.29	5,347.0	-594.3	977.7	-898.6	0.00	0.00	0.00
5,600.0	15.91	121.29	5,443.1	-608.5	1,001.1	-920.2	0.00	0.00	0.00
5,700.0	15.91	121.29	5,539.3	-622.8	1,024.5	-941.7	0.00	0.00	0.00
5,747.8	15.91	121.29	5,585.3	-629.6	1,035.7	-952.0	0.00	0.00	0.00
Start DLS 7.50 TFO 147.69									
5,800.0	12.77	130.79	5,635.8	-637.1	1,046.2	-961.5	7.50	-6.02	18.20
5,900.0	8.69	165.73	5,734.2	-651.6	1,056.5	-969.9	7.50	-4.08	34.93
6,000.0	9.98	212.65	5,833.0	-666.3	1,053.6	-965.4	7.50	1.29	46.93
6,100.0	15.34	237.31	5,930.6	-680.7	1,037.8	-947.9	7.50	5.36	24.66
6,200.0	21.97	248.45	6,025.3	-694.8	1,009.2	-917.8	7.50	6.63	11.14
6,300.0	29.01	254.50	6,115.5	-708.1	968.4	-875.7	7.50	7.04	6.05
6,400.0	36.23	258.32	6,199.7	-720.6	916.0	-822.2	7.50	7.21	3.83
6,452.5	40.05	259.84	6,241.0	-726.7	884.2	-789.8	7.50	7.29	2.89
Sharon Springs									
6,500.0	43.53	261.02	6,276.4	-732.0	853.0	-758.2	7.50	7.32	2.48
6,600.0	50.88	263.07	6,344.3	-742.1	780.4	-684.9	7.50	7.35	2.05
6,610.7	51.67	263.26	6,351.0	-743.1	772.1	-676.6	7.50	7.37	1.81
Niobrara A									
6,700.0	58.25	264.73	6,402.2	-750.7	699.4	-603.5	7.50	7.38	1.64
6,726.9	60.24	265.13	6,416.0	-752.7	676.4	-580.4	7.50	7.39	1.49
Niobrara B									
6,800.0	65.65	266.14	6,449.2	-757.6	611.5	-515.4	7.50	7.40	1.39
6,900.0	73.06	267.40	6,484.5	-762.9	518.1	-422.1	7.50	7.41	1.26
6,966.1	77.96	268.18	6,501.0	-765.3	454.2	-358.3	7.50	7.41	1.17
Niobrara C									
7,000.0	80.47	268.56	6,507.3	-766.3	420.9	-325.2	7.50	7.42	1.14
7,100.0	87.89	269.67	6,517.5	-767.8	321.5	-226.3	7.50	7.42	1.11
7,129.6	90.09	270.00	6,518.0	-767.9	291.9	-196.9	7.50	7.42	1.10
Start 6596.2 hold at 7129.6 MD - 7" - LPL 2167'FNL, 805'FEL, SEC.19									
7,200.0	90.09	270.00	6,517.9	-767.9	221.5	-127.0	0.00	0.00	0.00
7,300.0	90.09	270.00	6,517.7	-767.9	121.5	-27.8	0.00	0.00	0.00
7,400.0	90.09	270.00	6,517.6	-767.9	21.5	71.5	0.00	0.00	0.00
7,500.0	90.09	270.00	6,517.4	-767.9	-78.5	170.8	0.00	0.00	0.00
7,600.0	90.09	270.00	6,517.3	-767.9	-178.5	270.0	0.00	0.00	0.00
7,700.0	90.09	270.00	6,517.1	-767.9	-278.5	369.3	0.00	0.00	0.00
7,800.0	90.09	270.00	6,517.0	-767.9	-378.5	468.6	0.00	0.00	0.00
7,900.0	90.09	270.00	6,516.8	-767.9	-478.5	567.8	0.00	0.00	0.00
8,000.0	90.09	270.00	6,516.7	-767.9	-578.5	667.1	0.00	0.00	0.00
8,100.0	90.09	270.00	6,516.5	-767.9	-678.5	766.4	0.00	0.00	0.00
8,200.0	90.09	270.00	6,516.4	-767.9	-778.5	865.6	0.00	0.00	0.00
8,300.0	90.09	270.00	6,516.2	-767.9	-878.5	964.9	0.00	0.00	0.00

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

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.0	90.09	270.00	6,516.1	-767.9	-978.5	1,064.2	0.00	0.00	0.00
8,500.0	90.09	270.00	6,515.9	-767.9	-1,078.5	1,163.4	0.00	0.00	0.00
8,600.0	90.09	270.00	6,515.8	-767.9	-1,178.5	1,262.7	0.00	0.00	0.00
8,700.0	90.09	270.00	6,515.6	-767.9	-1,278.5	1,362.0	0.00	0.00	0.00
8,800.0	90.09	270.00	6,515.5	-767.9	-1,378.5	1,461.2	0.00	0.00	0.00
8,900.0	90.09	270.00	6,515.3	-767.9	-1,478.5	1,560.5	0.00	0.00	0.00
9,000.0	90.09	270.00	6,515.2	-767.9	-1,578.5	1,659.8	0.00	0.00	0.00
9,100.0	90.09	270.00	6,515.0	-767.9	-1,678.5	1,759.0	0.00	0.00	0.00
9,200.0	90.09	270.00	6,514.9	-767.9	-1,778.5	1,858.3	0.00	0.00	0.00
9,300.0	90.09	270.00	6,514.7	-767.9	-1,878.5	1,957.5	0.00	0.00	0.00
9,400.0	90.09	270.00	6,514.6	-767.9	-1,978.5	2,056.8	0.00	0.00	0.00
9,500.0	90.09	270.00	6,514.4	-767.9	-2,078.5	2,156.1	0.00	0.00	0.00
9,600.0	90.09	270.00	6,514.3	-767.9	-2,178.5	2,255.3	0.00	0.00	0.00
9,700.0	90.09	270.00	6,514.1	-767.9	-2,278.5	2,354.6	0.00	0.00	0.00
9,800.0	90.09	270.00	6,514.0	-767.9	-2,378.5	2,453.9	0.00	0.00	0.00
9,900.0	90.09	270.00	6,513.8	-767.9	-2,478.5	2,553.1	0.00	0.00	0.00
10,000.0	90.09	270.00	6,513.6	-767.9	-2,578.5	2,652.4	0.00	0.00	0.00
10,100.0	90.09	270.00	6,513.5	-767.9	-2,678.5	2,751.7	0.00	0.00	0.00
10,200.0	90.09	270.00	6,513.3	-767.9	-2,778.5	2,850.9	0.00	0.00	0.00
10,300.0	90.09	270.00	6,513.2	-767.9	-2,878.5	2,950.2	0.00	0.00	0.00
10,400.0	90.09	270.00	6,513.0	-767.9	-2,978.5	3,049.5	0.00	0.00	0.00
10,500.0	90.09	270.00	6,512.9	-767.9	-3,078.5	3,148.7	0.00	0.00	0.00
10,600.0	90.09	270.00	6,512.7	-767.9	-3,178.5	3,248.0	0.00	0.00	0.00
10,700.0	90.09	270.00	6,512.6	-767.9	-3,278.5	3,347.3	0.00	0.00	0.00
10,800.0	90.09	270.00	6,512.4	-767.9	-3,378.5	3,446.5	0.00	0.00	0.00
10,900.0	90.09	270.00	6,512.3	-767.9	-3,478.5	3,545.8	0.00	0.00	0.00
11,000.0	90.09	270.00	6,512.1	-767.9	-3,578.5	3,645.1	0.00	0.00	0.00
11,100.0	90.09	270.00	6,512.0	-767.9	-3,678.5	3,744.3	0.00	0.00	0.00
11,200.0	90.09	270.00	6,511.8	-767.9	-3,778.5	3,843.6	0.00	0.00	0.00
11,300.0	90.09	270.00	6,511.7	-767.9	-3,878.5	3,942.9	0.00	0.00	0.00
11,400.0	90.09	270.00	6,511.5	-767.9	-3,978.5	4,042.1	0.00	0.00	0.00
11,500.0	90.09	270.00	6,511.4	-767.9	-4,078.5	4,141.4	0.00	0.00	0.00
11,600.0	90.09	270.00	6,511.2	-767.9	-4,178.5	4,240.7	0.00	0.00	0.00
11,700.0	90.09	270.00	6,511.1	-767.9	-4,278.5	4,339.9	0.00	0.00	0.00
11,800.0	90.09	270.00	6,510.9	-767.9	-4,378.5	4,439.2	0.00	0.00	0.00
11,900.0	90.09	270.00	6,510.8	-767.9	-4,478.5	4,538.5	0.00	0.00	0.00
12,000.0	90.09	270.00	6,510.6	-767.9	-4,578.5	4,637.7	0.00	0.00	0.00
12,100.0	90.09	270.00	6,510.5	-767.9	-4,678.5	4,737.0	0.00	0.00	0.00
12,200.0	90.09	270.00	6,510.3	-767.9	-4,778.5	4,836.3	0.00	0.00	0.00
12,300.0	90.09	270.00	6,510.2	-767.9	-4,878.5	4,935.5	0.00	0.00	0.00
12,400.0	90.09	270.00	6,510.0	-767.9	-4,978.5	5,034.8	0.00	0.00	0.00
12,500.0	90.09	270.00	6,509.9	-767.9	-5,078.5	5,134.1	0.00	0.00	0.00
12,600.0	90.09	270.00	6,509.7	-767.9	-5,178.5	5,233.3	0.00	0.00	0.00
12,700.0	90.09	270.00	6,509.6	-767.9	-5,278.5	5,332.6	0.00	0.00	0.00
12,800.0	90.09	270.00	6,509.4	-767.9	-5,378.5	5,431.9	0.00	0.00	0.00
12,900.0	90.09	270.00	6,509.3	-767.9	-5,478.5	5,531.1	0.00	0.00	0.00
13,000.0	90.09	270.00	6,509.1	-767.9	-5,578.5	5,630.4	0.00	0.00	0.00
13,100.0	90.09	270.00	6,508.9	-767.9	-5,678.5	5,729.7	0.00	0.00	0.00
13,200.0	90.09	270.00	6,508.8	-767.9	-5,778.5	5,828.9	0.00	0.00	0.00
13,300.0	90.09	270.00	6,508.6	-767.9	-5,878.5	5,928.2	0.00	0.00	0.00
13,400.0	90.09	270.00	6,508.5	-767.9	-5,978.5	6,027.5	0.00	0.00	0.00
13,500.0	90.09	270.00	6,508.3	-767.9	-6,078.5	6,126.7	0.00	0.00	0.00
13,600.0	90.09	270.00	6,508.2	-767.9	-6,178.5	6,226.0	0.00	0.00	0.00

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

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,700.0	90.09	270.00	6,508.0	-767.9	-6,278.5	6,325.3	0.00	0.00	0.00
13,725.8	90.09	270.00	6,508.0	-767.9	-6,304.3	6,350.9	0.00	0.00	0.00
TD at 13725.8 - BHL 2182'FNL, 2143'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 1399'FNL, 1097'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,385,882.56	3,285,817.65	40.388110	-104.473920
BHL 2182'FNL, 2143'FE - plan hits target center - Point	0.00	0.00	6,508.0	-767.9	-6,304.3	1,385,041.81	3,279,522.97	40.386000	-104.496550
LPL 2167'FNL, 805'FEL, - plan hits target center - Point	0.00	0.00	6,518.0	-767.9	291.9	1,385,118.12	3,286,118.41	40.386002	-104.472872

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,129.6	6,518.0	7"	7	8-3/4	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,408.9	3,336.0	Parkman		0.00	
4,168.0	4,066.0	Sussex		0.00	
6,452.5	6,241.0	Sharon Springs		0.00	
6,610.7	6,351.0	Niobrara A		0.00	
6,726.9	6,416.0	Niobrara B		0.00	
6,966.1	6,501.0	Niobrara C		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
800.0	800.0	0.0	0.0	KOP - Start Build 1.50
1,860.8	1,847.3	-76.0	125.1	Start 3887.0 hold at 1860.8 MD
5,747.8	5,585.3	-629.6	1,035.7	Start DLS 7.50 TFO 147.69
7,129.6	6,518.0	-767.9	291.9	Start 6596.2 hold at 7129.6 MD
13,725.8	6,508.0	-767.9	-6,304.3	TD at 13725.8

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.19-T5N-R63W

Cockroft 5N63W19C Pad Sec.19-T5N-R63W

Cockroft 19W-314

Wellbore #1

Plan #1 (11-13-15)

Anticollision Report

18 November, 2015

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

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

Survey Tool Program	Date	11/18/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,725.8	Plan #1 (11-13-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Cockroft 5N63W19C Pad Sec.19-T5N-R63W						
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	600.0	600.0	14.4	11.9	5.823	CC, ES
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	700.0	699.6	15.6	12.6	5.336	SF
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	200.0	200.0	45.9	45.2	68.056	CC, ES
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	700.0	692.4	74.6	71.6	24.905	SF
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	800.0	801.0	60.3	56.9	17.870	CC, ES
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	1,100.0	1,100.7	69.1	64.4	14.883	SF
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	800.0	800.0	14.4	11.0	4.270	CC, ES
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	900.0	900.0	15.3	11.5	4.035	SF
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	800.0	800.0	45.9	42.5	13.612	CC, ES
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	13,725.8	13,637.1	539.5	146.0	1.371	Level 3, SF
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	800.0	801.0	74.7	71.3	22.137	CC, ES
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	13,725.8	13,718.3	739.6	342.9	1.865	SF
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	800.0	800.0	31.5	28.1	9.342	CC, ES
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	1,000.0	999.9	35.4	31.2	8.400	SF
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	28.8	27.2	18.301	CC
Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)	13,725.8	13,684.0	235.1	-147.1	0.615	Level 1, ES, SF
Existing Wells Sec.19-T5N-R63W						
Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1	3,269.2	3,195.6	67.9	-8.7	0.886	Level 1, CC
Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1	3,300.0	3,225.3	68.4	-8.8	0.886	Level 1, ES, SF
Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1	1,512.3	1,493.9	245.3	239.3	40.886	CC, ES
Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1	7,600.0	6,512.4	473.3	425.8	9.965	SF
Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1	8,296.2	6,504.2	214.2	34.0	1.188	Level 2, CC
Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1	8,300.0	6,504.2	214.2	33.9	1.188	Level 2, ES, SF
Johnson 2 (P&A) - Wellbore #1 - Wellbore #1	11,054.4	6,511.9	281.2	145.9	2.079	CC, ES, SF
Johnson 4 (P&A) - Wellbore #1 - Wellbore #1	9,669.6	6,502.1	239.7	23.7	1.110	Level 2, CC, ES, SF
Ochsner 19A (Exist) - Wellbore #1 - Wellbore #1						Out of range
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,199.0	6,509.0	726.6	642.2	8.611	CC
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,200.0	6,508.9	726.6	642.2	8.608	ES
Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1	9,400.0	6,500.2	753.9	664.2	8.404	SF
Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1	9,451.7	6,504.6	21.5	-71.1	0.232	Level 1, CC, ES, SF
Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1	12,293.8	6,504.2	531.6	243.4	1.845	CC
Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1	12,300.0	6,504.2	531.6	243.2	1.844	ES, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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-334 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						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		
500.0	500.0	500.0	500.0	1.0	1.0	75.34	3.6	13.9	14.4	12.4	2.02	7.117		
600.0	600.0	600.0	600.0	1.2	1.2	75.34	3.6	13.9	14.4	11.9	2.47	5.823 CC, ES		
700.0	700.0	699.6	699.6	1.5	1.5	73.11	4.5	14.9	15.6	12.6	2.92	5.336 SF		
800.0	800.0	799.2	799.1	1.7	1.7	68.07	7.1	17.8	19.2	15.8	3.36	5.705		
900.0	900.0	898.4	898.1	1.9	1.9	-60.87	11.5	22.5	24.7	20.9	3.79	6.526		
1,000.0	999.9	997.3	996.6	2.1	2.1	-70.46	17.6	29.2	32.1	27.9	4.20	7.648		
1,100.0	1,099.7	1,095.7	1,094.3	2.3	2.4	-79.52	25.3	37.6	42.2	37.5	4.64	9.092		
1,200.0	1,199.3	1,193.4	1,191.0	2.5	2.7	-87.06	34.7	47.9	55.2	50.1	5.10	10.817		
1,300.0	1,298.6	1,290.3	1,286.5	2.8	3.0	-93.00	45.6	59.8	71.3	65.7	5.60	12.733		
1,400.0	1,397.5	1,386.3	1,380.8	3.0	3.3	-97.58	58.1	73.4	90.5	84.4	6.14	14.746		
1,500.0	1,496.1	1,481.3	1,473.5	3.3	3.7	-101.11	72.0	88.6	112.8	106.1	6.73	16.774		
1,600.0	1,594.2	1,575.2	1,564.6	3.7	4.1	-103.85	87.2	105.2	138.1	130.8	7.37	18.755		
1,700.0	1,691.7	1,667.8	1,653.9	4.1	4.5	-105.99	103.8	123.3	166.4	158.3	8.06	20.638		
1,800.0	1,788.6	1,761.2	1,743.5	4.5	5.0	-107.80	121.7	142.8	197.1	188.3	8.81	22.367		
1,860.8	1,847.3	1,818.7	1,798.6	4.8	5.3	-108.90	132.8	155.0	216.5	207.2	9.30	23.273		
1,900.0	1,884.9	1,855.7	1,834.0	5.0	5.5	-109.75	139.9	162.8	229.1	219.4	9.63	23.791		
2,000.0	1,981.1	1,950.0	1,924.4	5.5	6.0	-111.55	158.1	182.6	261.4	250.9	10.48	24.949		
2,100.0	2,077.3	2,044.3	2,014.8	6.1	6.5	-112.95	176.3	202.5	293.9	282.6	11.35	25.906		
2,200.0	2,173.4	2,138.7	2,105.3	6.6	7.1	-114.07	194.5	222.4	326.6	314.3	12.23	26.704		
2,300.0	2,269.6	2,233.0	2,195.7	7.1	7.6	-114.99	212.8	242.3	359.3	346.2	13.12	27.377		
2,400.0	2,365.8	2,327.4	2,286.1	7.7	8.1	-115.76	231.0	262.2	392.1	378.1	14.03	27.949		
2,500.0	2,461.9	2,421.7	2,376.5	8.3	8.7	-116.41	249.2	282.1	425.0	410.0	14.94	28.441		
2,600.0	2,558.1	2,516.1	2,466.9	8.8	9.2	-116.96	267.4	302.0	457.9	442.0	15.86	28.868		
2,700.0	2,654.3	2,610.4	2,557.3	9.4	9.7	-117.44	285.6	321.9	490.8	474.0	16.79	29.240		
2,800.0	2,750.4	2,704.8	2,647.7	10.0	10.3	-117.86	303.8	341.8	523.8	506.0	17.71	29.568		
2,900.0	2,846.6	2,799.1	2,738.1	10.5	10.8	-118.24	322.0	361.7	556.7	538.1	18.65	29.858		
3,000.0	2,942.8	2,893.5	2,828.5	11.1	11.4	-118.57	340.2	381.6	589.7	570.2	19.58	30.116		
3,100.0	3,038.9	2,987.8	2,918.9	11.7	11.9	-118.86	358.4	401.5	622.8	602.2	20.52	30.347		
3,200.0	3,135.1	3,082.2	3,009.3	12.3	12.5	-119.12	376.7	421.3	655.8	634.3	21.46	30.555		
3,300.0	3,231.3	3,176.5	3,099.8	12.8	13.0	-119.36	394.9	441.2	688.8	666.4	22.41	30.744		
3,400.0	3,327.4	3,270.8	3,190.2	13.4	13.6	-119.58	413.1	461.1	721.9	698.5	23.35	30.915		
3,500.0	3,423.6	3,365.2	3,280.6	14.0	14.1	-119.78	431.3	481.0	755.0	730.7	24.30	31.071		
3,600.0	3,519.8	3,459.5	3,371.0	14.6	14.7	-119.96	449.5	500.9	788.0	762.8	25.25	31.214		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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							Warning			
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					
0.0	0.0	0.0	0.0	0.0	0.0	76.23	10.9	44.6	45.9								
100.0	100.0	100.0	100.0	0.1	0.1	76.23	10.9	44.6	45.9	45.7	0.22	204.167					
200.0	200.0	200.0	200.0	0.3	0.3	76.23	10.9	44.6	45.9	45.2	0.67	68.056	CC, ES				
300.0	300.0	299.0	299.0	0.6	0.6	75.33	11.9	45.4	47.0	45.8	1.12	41.966					
400.0	400.0	397.9	397.8	0.8	0.8	72.87	14.8	47.9	50.2	48.7	1.57	32.056					
500.0	500.0	496.5	496.2	1.0	1.0	69.41	19.6	52.1	55.8	53.8	2.03	27.562					
600.0	600.0	594.7	594.0	1.2	1.3	65.63	26.3	58.0	63.9	61.4	2.50	25.565					
700.0	700.0	692.4	691.0	1.5	1.5	62.00	34.8	65.4	74.6	71.6	3.00	24.905	SF				
800.0	800.0	789.4	787.1	1.7	1.8	58.78	45.1	74.4	88.0	84.5	3.52	25.020					
900.0	900.0	885.8	882.1	1.9	2.2	-65.66	57.2	85.0	103.4	99.6	3.85	26.894					
1,000.0	999.9	981.2	975.8	2.1	2.5	-69.26	70.9	96.9	120.6	116.3	4.27	28.215					
1,100.0	1,099.7	1,075.7	1,068.1	2.3	2.9	-72.98	86.2	110.3	139.9	135.2	4.72	29.642					
1,200.0	1,199.3	1,169.1	1,158.8	2.5	3.4	-76.60	103.0	125.0	161.5	156.3	5.19	31.142					
1,300.0	1,298.6	1,261.3	1,247.7	2.8	3.8	-79.99	121.2	140.9	185.7	180.0	5.68	32.665					
1,400.0	1,397.5	1,356.2	1,338.9	3.0	4.3	-83.27	141.1	158.3	211.7	205.4	6.23	33.993					
1,500.0	1,496.1	1,451.7	1,430.6	3.3	4.9	-86.39	161.1	175.8	238.2	231.4	6.81	34.957					
1,600.0	1,594.2	1,546.8	1,521.9	3.7	5.4	-89.36	181.1	193.2	265.4	258.0	7.46	35.591					
1,700.0	1,691.7	1,641.5	1,612.9	4.1	5.9	-92.20	200.9	210.6	293.4	285.3	8.16	35.961					
1,800.0	1,788.6	1,735.8	1,703.5	4.5	6.4	-94.91	220.7	227.8	322.4	313.5	8.92	36.133					
1,860.8	1,847.3	1,792.9	1,758.3	4.8	6.7	-96.51	232.7	238.3	340.6	331.2	9.42	36.167					
1,900.0	1,884.9	1,829.6	1,793.5	5.0	7.0	-97.67	240.4	245.0	352.5	342.8	9.75	36.154					
2,000.0	1,981.1	1,923.3	1,883.5	5.5	7.5	-100.30	260.0	262.1	383.5	372.9	10.62	36.121					
2,100.0	2,077.3	2,016.9	1,973.5	6.1	8.0	-102.56	279.6	279.3	415.1	403.6	11.50	36.095					
2,200.0	2,173.4	2,110.6	2,063.4	6.6	8.5	-104.49	299.3	296.4	447.2	434.8	12.39	36.079					
2,300.0	2,269.6	2,204.3	2,153.4	7.1	9.1	-106.18	318.9	313.6	479.7	466.4	13.30	36.073					
2,400.0	2,365.8	2,297.9	2,243.4	7.7	9.6	-107.65	338.5	330.7	512.5	498.3	14.21	36.076					
2,500.0	2,461.9	2,391.6	2,333.4	8.3	10.1	-108.94	358.2	347.9	545.7	530.5	15.12	36.087					
2,600.0	2,558.1	2,485.3	2,423.3	8.8	10.7	-110.09	377.8	365.1	579.0	563.0	16.04	36.104					
2,700.0	2,654.3	2,579.0	2,513.3	9.4	11.2	-111.11	397.5	382.2	612.5	595.6	16.95	36.126					
2,800.0	2,750.4	2,672.6	2,603.3	10.0	11.7	-112.03	417.1	399.4	646.2	628.3	17.87	36.151					
2,900.0	2,846.6	2,766.3	2,693.2	10.5	12.3	-112.86	436.7	416.5	680.0	661.2	18.80	36.180					
3,000.0	2,942.8	2,860.0	2,783.2	11.1	12.8	-113.61	456.4	433.7	713.9	694.2	19.72	36.210					
3,100.0	3,038.9	2,953.6	2,873.2	11.7	13.3	-114.30	476.0	450.8	748.0	727.3	20.64	36.241					
3,200.0	3,135.1	3,047.3	2,963.1	12.3	13.9	-114.92	495.6	468.0	782.1	760.5	21.56	36.273					

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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							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	-103.99	-14.6	-58.5	60.3	60.3	0.00	N/A					
100.0	100.0	101.0	101.0	0.1	0.1	-103.99	-14.6	-58.5	60.3	60.1	0.23	265.568					
200.0	200.0	201.0	201.0	0.3	0.3	-103.99	-14.6	-58.5	60.3	59.6	0.68	89.111					
300.0	300.0	301.0	301.0	0.6	0.6	-103.99	-14.6	-58.5	60.3	59.2	1.13	53.538					
400.0	400.0	401.0	401.0	0.8	0.8	-103.99	-14.6	-58.5	60.3	58.7	1.58	38.263					
500.0	500.0	501.0	501.0	1.0	1.0	-103.99	-14.6	-58.5	60.3	58.3	2.03	29.770					
600.0	600.0	601.0	601.0	1.2	1.2	-103.99	-14.6	-58.5	60.3	57.8	2.47	24.362					
700.0	700.0	701.0	701.0	1.5	1.5	-103.99	-14.6	-58.5	60.3	57.4	2.92	20.617					
800.0	800.0	801.0	801.0	1.7	1.7	-103.99	-14.6	-58.5	60.3	56.9	3.37	17.870	CC, ES				
900.0	900.0	901.0	901.0	1.9	1.9	135.58	-14.6	-58.5	61.2	57.4	3.80	16.098					
1,000.0	999.9	1,000.9	1,000.9	2.1	2.1	138.01	-14.6	-58.5	64.1	59.9	4.22	15.192					
1,100.0	1,099.7	1,100.7	1,100.7	2.3	2.4	141.59	-14.6	-58.5	69.1	64.4	4.64	14.883	SF				
1,200.0	1,199.3	1,200.3	1,200.3	2.5	2.6	145.78	-14.6	-58.5	76.5	71.4	5.07	15.076					
1,300.0	1,298.6	1,299.6	1,299.6	2.8	2.8	150.09	-14.6	-58.5	86.5	80.9	5.51	15.698					
1,400.0	1,397.5	1,398.5	1,398.5	3.0	3.0	154.13	-14.6	-58.5	99.2	93.2	5.94	16.683					
1,500.0	1,496.1	1,497.1	1,497.1	3.3	3.3	157.73	-14.6	-58.5	114.7	108.3	6.38	17.969					
1,600.0	1,594.2	1,595.2	1,595.2	3.7	3.5	160.82	-14.6	-58.5	133.0	126.2	6.82	19.502					
1,700.0	1,691.7	1,696.2	1,696.2	4.1	3.7	163.70	-14.4	-57.3	153.0	145.7	7.25	21.113					
1,800.0	1,788.6	1,797.7	1,797.6	4.5	3.9	166.53	-13.7	-53.5	173.4	165.8	7.66	22.652					
1,860.8	1,847.3	1,859.5	1,859.3	4.8	4.0	168.23	-13.2	-49.8	186.2	178.3	7.91	23.542					
1,900.0	1,884.9	1,899.4	1,899.1	5.0	4.1	169.33	-12.7	-46.9	194.3	186.2	8.08	24.044					
2,000.0	1,981.1	2,001.7	2,001.0	5.5	4.3	172.03	-11.2	-37.7	213.7	205.2	8.53	25.056					
2,100.0	2,077.3	2,104.7	2,103.2	6.1	4.6	174.67	-9.2	-25.6	231.4	222.4	8.99	25.728					
2,200.0	2,173.4	2,208.1	2,205.5	6.6	4.9	177.32	-6.8	-10.8	247.3	237.8	9.48	26.099					
2,300.0	2,269.6	2,311.8	2,307.7	7.1	5.1	-179.96	-3.9	6.8	261.6	251.6	9.99	26.198					
2,400.0	2,365.8	2,415.6	2,409.4	7.7	5.5	-177.14	-0.6	27.1	274.4	263.9	10.53	26.050					
2,500.0	2,461.9	2,519.5	2,510.6	8.3	5.8	-174.19	3.2	50.2	285.9	274.7	11.14	25.671					
2,600.0	2,558.1	2,623.2	2,611.0	8.8	6.2	-171.07	7.4	75.9	296.2	284.4	11.81	25.080					
2,700.0	2,654.3	2,726.5	2,710.3	9.4	6.7	-167.78	12.0	104.3	305.6	293.0	12.57	24.303					
2,800.0	2,750.4	2,829.4	2,808.3	10.0	7.2	-164.30	17.1	135.1	314.3	300.9	13.44	23.379					
2,900.0	2,846.6	2,927.2	2,901.1	10.5	7.7	-160.99	22.0	165.6	323.4	309.0	14.39	22.470					
3,000.0	2,942.8	3,025.1	2,993.9	11.1	8.2	-157.87	27.0	196.1	333.5	318.1	15.41	21.640					
3,100.0	3,038.9	3,122.9	3,086.7	11.7	8.8	-154.93	32.0	226.6	344.6	328.1	16.50	20.892					
3,200.0	3,135.1	3,220.7	3,179.5	12.3	9.4	-152.18	37.0	257.1	356.6	338.9	17.63	20.228					
3,300.0	3,231.3	3,318.5	3,272.3	12.8	9.9	-149.60	42.0	287.6	369.3	350.5	18.80	19.644					
3,400.0	3,327.4	3,416.3	3,365.1	13.4	10.5	-147.20	47.0	318.1	382.7	362.7	20.00	19.134					
3,500.0	3,423.6	3,514.2	3,457.9	14.0	11.1	-144.96	51.9	348.7	396.8	375.6	21.23	18.691					
3,600.0	3,519.8	3,612.0	3,550.7	14.6	11.7	-142.87	56.9	379.2	411.5	389.0	22.47	18.309					
3,700.0	3,615.9	3,709.8	3,643.6	15.2	12.3	-140.93	61.9	409.7	426.6	402.9	23.73	17.978					
3,800.0	3,712.1	3,807.6	3,736.4	15.8	12.9	-139.11	66.9	440.2	442.2	417.2	24.99	17.694					
3,900.0	3,808.3	3,905.4	3,829.2	16.3	13.6	-137.42	71.9	470.7	458.2	432.0	26.26	17.450					
4,000.0	3,904.4	4,003.3	3,922.0	16.9	14.2	-135.85	76.9	501.2	474.6	447.1	27.53	17.240					
4,100.0	4,000.6	4,101.1	4,014.8	17.5	14.8	-134.38	81.9	531.7	491.3	462.5	28.80	17.060					
4,200.0	4,096.8	4,198.9	4,107.6	18.1	15.4	-133.00	86.8	562.2	508.3	478.2	30.07	16.905					
4,300.0	4,192.9	4,296.7	4,200.4	18.7	16.0	-131.72	91.8	592.7	525.6	494.3	31.34	16.772					
4,400.0	4,289.1	4,394.5	4,293.2	19.3	16.7	-130.51	96.8	623.3	543.1	510.5	32.60	16.659					
4,500.0	4,385.3	4,492.4	4,386.0	19.9	17.3	-129.38	101.8	653.8	560.9	527.0	33.86	16.562					
4,600.0	4,481.5	4,590.2	4,478.8	20.5	17.9	-128.32	106.8	684.3	578.8	543.7	35.12	16.479					
4,700.0	4,577.6	4,688.0	4,571.6	21.0	18.6	-127.32	111.8	714.8	596.9	560.6	36.38	16.408					
4,800.0	4,673.8	4,785.8	4,664.4	21.6	19.2	-126.38	116.7	745.3	615.2	577.6	37.63	16.348					
4,900.0	4,770.0	4,883.6	4,757.2	22.2	19.9	-125.50	121.7	775.8	633.7	594.8	38.88	16.298					

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,866.1	4,981.5	4,850.0	22.8	20.5	-124.66	126.7	806.3	652.3	612.1	40.13	16.255		
5,100.0	4,962.3	5,079.3	4,942.9	23.4	21.1	-123.87	131.7	836.8	671.0	629.6	41.37	16.219		
5,200.0	5,058.5	5,177.1	5,035.7	24.0	21.8	-123.12	136.7	867.3	689.8	647.2	42.61	16.190		
5,300.0	5,154.6	5,274.9	5,128.5	24.6	22.4	-122.42	141.7	897.9	708.7	664.9	43.84	16.166		
5,400.0	5,250.8	5,372.8	5,221.3	25.2	23.1	-121.75	146.7	928.4	727.8	682.7	45.08	16.146		
5,500.0	5,347.0	5,470.6	5,314.1	25.8	23.7	-121.11	151.6	958.9	746.9	700.6	46.30	16.130		
5,600.0	5,443.1	5,568.4	5,406.9	26.3	24.3	-120.50	156.6	989.4	766.1	718.6	47.53	16.118		
5,700.0	5,539.3	5,665.6	5,499.9	26.9	24.9	-120.14	161.6	1,017.1	785.4	736.8	48.63	16.153		
5,747.8	5,585.3	5,712.0	5,545.3	27.2	25.0	-120.27	164.1	1,026.3	794.7	745.7	49.02	16.212		
5,750.0	5,587.4	5,714.1	5,547.4	27.2	25.1	-120.62	164.2	1,026.7	795.2	746.1	49.03	16.218		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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	-3.6	-13.9	14.4	14.4	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-3.6	-13.9	14.4	14.2	0.22	64.054		
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-3.6	-13.9	14.4	13.7	0.67	21.351		
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-3.6	-13.9	14.4	13.3	1.12	12.811		
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-3.6	-13.9	14.4	12.8	1.57	9.151		
500.0	500.0	500.0	500.0	1.0	1.0	-104.66	-3.6	-13.9	14.4	12.4	2.02	7.117		
600.0	600.0	600.0	600.0	1.2	1.2	-104.66	-3.6	-13.9	14.4	11.9	2.47	5.823		
700.0	700.0	700.0	700.0	1.5	1.5	-104.66	-3.6	-13.9	14.4	11.5	2.92	4.927		
800.0	800.0	800.0	800.0	1.7	1.7	-104.66	-3.6	-13.9	14.4	11.0	3.37	4.270 CC, ES		
900.0	900.0	900.0	900.0	1.9	1.9	137.56	-3.6	-13.9	15.3	11.5	3.80	4.035 SF		
1,000.0	999.9	999.9	999.9	2.1	2.1	145.80	-3.6	-13.9	18.4	14.2	4.22	4.371		
1,100.0	1,099.7	1,100.2	1,100.2	2.3	2.4	156.37	-3.0	-12.8	23.0	18.4	4.63	4.976		
1,200.0	1,199.3	1,200.4	1,200.3	2.5	2.6	168.27	-1.2	-9.3	28.8	23.8	5.04	5.721		
1,300.0	1,298.6	1,300.4	1,300.1	2.8	2.8	179.62	1.8	-3.5	36.6	31.2	5.46	6.707		
1,400.0	1,397.5	1,400.1	1,399.4	3.0	3.0	-170.64	6.0	4.6	46.9	41.0	5.90	7.946		
1,500.0	1,496.1	1,499.4	1,498.0	3.3	3.3	-162.74	11.4	15.0	59.8	53.4	6.37	9.385		
1,600.0	1,594.2	1,598.3	1,595.8	3.7	3.5	-156.47	18.0	27.5	75.4	68.5	6.89	10.948		
1,700.0	1,691.7	1,696.5	1,692.7	4.1	3.8	-151.49	25.7	42.2	93.7	86.3	7.46	12.558		
1,800.0	1,788.6	1,794.1	1,788.4	4.5	4.2	-147.50	34.4	59.0	114.6	106.5	8.10	14.152		
1,860.8	1,847.3	1,853.2	1,846.1	4.8	4.4	-145.44	40.3	70.2	128.6	120.1	8.53	15.087		
1,900.0	1,884.9	1,891.0	1,883.0	5.0	4.5	-144.28	44.2	77.8	138.0	129.1	8.82	15.650		
2,000.0	1,981.1	1,987.4	1,976.5	5.5	4.9	-141.30	55.1	98.6	162.2	152.6	9.61	16.868		
2,100.0	2,077.3	2,083.3	2,068.9	6.1	5.3	-138.36	67.0	121.3	187.1	176.6	10.48	17.846		
2,200.0	2,173.4	2,179.6	2,161.4	6.6	5.8	-135.81	79.4	145.1	212.6	201.2	11.40	18.644		
2,300.0	2,269.6	2,276.0	2,253.9	7.1	6.3	-133.81	91.8	168.8	238.4	226.0	12.34	19.319		
2,400.0	2,365.8	2,372.3	2,346.4	7.7	6.8	-132.20	104.2	192.6	264.4	251.1	13.29	19.893		
2,500.0	2,461.9	2,468.6	2,438.9	8.3	7.3	-130.87	116.6	216.3	290.5	276.3	14.25	20.384		
2,600.0	2,558.1	2,564.9	2,531.4	8.8	7.8	-129.77	129.0	240.0	316.8	301.6	15.23	20.808		
2,700.0	2,654.3	2,661.2	2,624.0	9.4	8.3	-128.83	141.4	263.8	343.2	327.0	16.21	21.177		
2,800.0	2,750.4	2,757.5	2,716.5	10.0	8.8	-128.03	153.8	287.5	369.7	352.5	17.19	21.500		
2,900.0	2,846.6	2,853.8	2,809.0	10.5	9.4	-127.33	166.2	311.3	396.2	378.0	18.19	21.784		
3,000.0	2,942.8	2,950.2	2,901.5	11.1	9.9	-126.73	178.6	335.0	422.7	403.6	19.18	22.037		
3,100.0	3,038.9	3,046.5	2,994.0	11.7	10.4	-126.19	191.0	358.8	449.4	429.2	20.18	22.262		
3,200.0	3,135.1	3,142.8	3,086.5	12.3	11.0	-125.71	203.4	382.5	476.0	454.8	21.19	22.464		
3,300.0	3,231.3	3,239.1	3,179.0	12.8	11.5	-125.29	215.8	406.3	502.7	480.5	22.20	22.647		
3,400.0	3,327.4	3,335.4	3,271.6	13.4	12.1	-124.90	228.2	430.0	529.3	506.1	23.20	22.812		
3,500.0	3,423.6	3,431.7	3,364.1	14.0	12.6	-124.56	240.6	453.8	556.0	531.8	24.22	22.962		
3,600.0	3,519.8	3,528.1	3,456.6	14.6	13.2	-124.24	253.0	477.5	582.8	557.5	25.23	23.099		
3,700.0	3,615.9	3,624.4	3,549.1	15.2	13.7	-123.95	265.4	501.2	609.5	583.3	26.24	23.224		
3,800.0	3,712.1	3,720.7	3,641.6	15.8	14.3	-123.69	277.8	525.0	636.3	609.0	27.26	23.339		
3,900.0	3,808.3	3,817.0	3,734.1	16.3	14.8	-123.45	290.2	548.7	663.0	634.7	28.28	23.446		
4,000.0	3,904.4	3,913.3	3,826.7	16.9	15.4	-123.23	302.6	572.5	689.8	660.5	29.30	23.544		
4,100.0	4,000.6	4,009.6	3,919.2	17.5	15.9	-123.02	315.0	596.2	716.6	686.3	30.32	23.635		
4,200.0	4,096.8	4,106.0	4,011.7	18.1	16.5	-122.83	327.4	620.0	743.4	712.0	31.34	23.720		
4,300.0	4,192.9	4,202.3	4,104.2	18.7	17.0	-122.65	339.8	643.7	770.2	737.8	32.36	23.799		
4,400.0	4,289.1	4,298.6	4,196.7	19.3	17.6	-122.48	352.2	667.5	797.0	763.6	33.38	23.873		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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	-103.78	-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	
700.0	700.0	700.0	700.0	1.5	1.5	-103.78	-10.9	-44.6	45.9	43.0	2.92	15.706	
800.0	800.0	800.0	800.0	1.7	1.7	-103.78	-10.9	-44.6	45.9	42.5	3.37	13.612	CC, ES
900.0	900.0	900.0	900.0	1.9	1.9	136.05	-10.9	-44.6	46.8	43.0	3.80	12.321	
1,000.0	999.9	999.9	999.9	2.1	2.1	139.16	-10.9	-44.6	49.7	45.5	4.22	11.796	
1,100.0	1,099.7	1,099.7	1,099.7	2.3	2.4	143.58	-10.9	-44.6	54.8	50.2	4.64	11.822	
1,200.0	1,199.3	1,199.3	1,199.3	2.5	2.6	148.51	-10.9	-44.6	62.5	57.4	5.07	12.321	
1,300.0	1,298.6	1,298.6	1,298.6	2.8	2.8	153.27	-10.9	-44.6	72.7	67.2	5.50	13.222	
1,400.0	1,397.5	1,397.5	1,397.5	3.0	3.0	157.50	-10.9	-44.6	85.8	79.9	5.94	14.458	
1,500.0	1,496.1	1,496.7	1,496.7	3.3	3.2	161.20	-11.1	-43.3	100.5	94.1	6.36	15.804	
1,600.0	1,594.2	1,600.3	1,600.2	3.7	3.4	164.47	-11.8	-39.4	115.3	108.5	6.76	17.052	
1,700.0	1,691.7	1,702.2	1,701.9	4.1	3.7	167.44	-12.9	-32.8	130.3	123.2	7.17	18.178	
1,800.0	1,788.6	1,804.4	1,803.7	4.5	3.9	170.20	-14.4	-23.5	145.6	138.0	7.58	19.202	
1,860.8	1,847.3	1,866.8	1,865.6	4.8	4.0	171.81	-15.5	-16.5	155.0	147.2	7.84	19.780	
1,900.0	1,884.9	1,907.0	1,905.5	5.0	4.1	172.82	-16.3	-11.4	160.9	152.9	8.01	20.082	
2,000.0	1,981.1	2,010.2	2,007.6	5.5	4.4	175.28	-18.8	3.4	174.5	166.0	8.48	20.578	
2,100.0	2,077.3	2,114.0	2,109.8	6.1	4.7	177.66	-21.7	21.1	185.7	176.7	8.96	20.725	
2,200.0	2,173.4	2,218.1	2,211.9	6.6	5.0	-179.93	-25.0	41.6	194.7	185.2	9.47	20.564	
2,300.0	2,269.6	2,322.5	2,313.6	7.1	5.4	-177.41	-28.8	64.8	201.5	191.5	10.00	20.139	
2,400.0	2,365.8	2,427.1	2,414.7	7.7	5.8	-174.72	-33.0	90.9	206.2	195.6	10.59	19.471	
2,500.0	2,461.9	2,531.5	2,515.0	8.3	6.3	-171.77	-37.7	119.6	208.9	197.6	11.23	18.593	
2,600.0	2,558.1	2,631.1	2,610.2	8.8	6.8	-168.84	-42.4	148.4	210.8	198.9	11.94	17.664	
2,700.0	2,654.3	2,730.5	2,705.3	9.4	7.3	-165.97	-47.1	177.1	213.4	200.7	12.70	16.796	
2,800.0	2,750.4	2,829.8	2,800.3	10.0	7.8	-163.17	-51.8	205.8	216.4	202.9	13.54	15.984	
2,900.0	2,846.6	2,929.2	2,895.3	10.5	8.4	-160.46	-56.5	234.5	220.0	205.5	14.44	15.231	
3,000.0	2,942.8	3,028.6	2,990.4	11.1	8.9	-157.83	-61.2	263.3	224.0	208.6	15.41	14.538	
3,100.0	3,038.9	3,128.0	3,085.4	11.7	9.5	-155.31	-65.9	292.0	228.5	212.1	16.43	13.906	
3,200.0	3,135.1	3,227.4	3,180.5	12.3	10.1	-152.88	-70.6	320.7	233.4	215.9	17.51	13.332	
3,300.0	3,231.3	3,326.8	3,275.5	12.8	10.6	-150.56	-75.3	349.4	238.8	220.1	18.63	12.816	
3,400.0	3,327.4	3,426.2	3,370.6	13.4	11.2	-148.34	-79.9	378.1	244.5	224.7	19.79	12.352	
3,500.0	3,423.6	3,525.6	3,465.6	14.0	11.8	-146.23	-84.6	406.8	250.5	229.6	20.99	11.938	
3,600.0	3,519.8	3,625.0	3,560.6	14.6	12.4	-144.22	-89.3	435.5	256.9	234.7	22.21	11.569	
3,700.0	3,615.9	3,724.4	3,655.7	15.2	13.0	-142.30	-94.0	464.3	263.6	240.2	23.45	11.240	
3,800.0	3,712.1	3,823.8	3,750.7	15.8	13.6	-140.49	-98.7	493.0	270.6	245.9	24.71	10.949	
3,900.0	3,808.3	3,923.2	3,845.8	16.3	14.2	-138.76	-103.4	521.7	277.8	251.8	25.99	10.689	
4,000.0	3,904.4	4,022.6	3,940.8	16.9	14.8	-137.12	-108.1	550.4	285.3	258.0	27.28	10.459	
4,100.0	4,000.6	4,122.0	4,035.8	17.5	15.4	-135.57	-112.8	579.1	293.0	264.4	28.57	10.254	
4,200.0	4,096.8	4,221.4	4,130.9	18.1	16.0	-134.10	-117.4	607.8	300.8	271.0	29.87	10.072	
4,300.0	4,192.9	4,320.8	4,225.9	18.7	16.6	-132.70	-122.1	636.6	308.9	277.7	31.17	9.910	
4,400.0	4,289.1	4,420.2	4,321.0	19.3	17.2	-131.37	-126.8	665.3	317.2	284.7	32.48	9.766	
4,500.0	4,385.3	4,519.6	4,416.0	19.9	17.8	-130.12	-131.5	694.0	325.6	291.8	33.79	9.637	
4,600.0	4,481.5	4,619.0	4,511.1	20.5	18.4	-128.92	-136.2	722.7	334.2	299.1	35.09	9.522	
4,700.0	4,577.6	4,718.4	4,606.1	21.0	19.0	-127.79	-140.9	751.4	342.9	306.5	36.40	9.420	
4,800.0	4,673.8	4,817.8	4,701.1	21.6	19.6	-126.71	-145.6	780.1	351.7	314.0	37.70	9.328	
4,900.0	4,770.0	4,917.2	4,796.2	22.2	20.3	-125.68	-150.3	808.9	360.6	321.6	39.00	9.246	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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
5,000.0	4,866.1	5,016.6	4,891.2	22.8	20.9	-124.71	-155.0	837.6	369.7	329.4	40.30	9.173	
5,100.0	4,962.3	5,116.0	4,986.3	23.4	21.5	-123.78	-159.6	866.3	378.8	337.2	41.60	9.107	
5,200.0	5,058.5	5,215.3	5,081.3	24.0	22.1	-122.89	-164.3	895.0	388.1	345.2	42.89	9.048	
5,300.0	5,154.6	5,314.7	5,176.3	24.6	22.7	-122.05	-169.0	923.7	397.4	353.2	44.18	8.995	
5,400.0	5,250.8	5,414.1	5,271.4	25.2	23.3	-121.24	-173.7	952.4	406.9	361.4	45.47	8.947	
5,500.0	5,347.0	5,513.5	5,366.4	25.8	23.9	-120.48	-178.4	981.2	416.3	369.6	46.76	8.904	
5,600.0	5,443.1	5,612.9	5,461.5	26.3	24.6	-119.74	-183.1	1,009.9	425.9	377.9	48.04	8.866	
5,700.0	5,539.3	5,713.6	5,559.0	26.9	25.0	-119.69	-187.9	1,034.2	435.4	386.4	49.02	8.883	
5,747.8	5,585.3	5,761.5	5,606.3	27.2	25.1	-120.26	-190.2	1,041.2	439.9	390.6	49.28	8.926	
5,750.0	5,587.4	5,763.7	5,608.5	27.2	25.1	-120.62	-190.3	1,041.5	440.1	390.8	49.29	8.929	
5,800.0	5,635.8	5,813.3	5,657.8	27.4	25.2	-130.66	-192.8	1,045.5	444.8	395.5	49.31	9.021	
5,850.0	5,684.8	5,862.4	5,706.9	27.6	25.3	-145.58	-195.2	1,046.3	449.7	400.5	49.25	9.132	
5,900.0	5,734.2	5,911.3	5,755.6	27.7	25.3	-167.25	-197.6	1,044.0	454.7	405.6	49.11	9.258	
5,950.0	5,783.6	5,959.7	5,803.7	27.8	25.3	166.80	-200.0	1,038.6	459.8	410.8	48.92	9.398	
6,000.0	5,833.0	6,007.8	5,851.0	27.9	25.3	144.28	-202.3	1,030.3	464.9	416.2	48.68	9.550	
6,050.0	5,882.0	6,055.6	5,897.4	27.9	25.2	128.62	-204.6	1,019.0	470.0	421.6	48.39	9.713	
6,100.0	5,930.6	6,103.1	5,942.7	27.9	25.1	118.21	-206.8	1,005.0	475.2	427.1	48.08	9.883	
6,150.0	5,978.4	6,150.0	5,986.5	27.8	25.0	111.04	-209.0	988.5	480.3	432.5	47.75	10.059	
6,200.0	6,025.3	6,197.3	6,029.6	27.8	24.9	105.83	-211.1	969.0	485.3	437.9	47.40	10.239	
6,250.0	6,071.1	6,244.0	6,070.8	27.7	24.8	101.86	-213.2	947.3	490.3	443.2	47.06	10.418	
6,300.0	6,115.5	6,290.4	6,110.5	27.6	24.7	98.72	-215.1	923.2	495.1	448.4	46.73	10.595	
6,350.0	6,158.5	6,336.7	6,148.5	27.5	24.6	96.16	-217.0	896.9	499.8	453.4	46.42	10.766	
6,400.0	6,199.7	6,382.8	6,184.6	27.4	24.5	94.04	-218.8	868.4	504.3	458.1	46.16	10.926	
6,450.0	6,239.1	6,428.6	6,218.8	27.3	24.4	92.24	-220.5	837.9	508.6	462.7	45.94	11.071	
6,500.0	6,276.4	6,474.3	6,251.1	27.2	24.4	90.71	-222.1	805.6	512.7	466.9	45.79	11.196	
6,550.0	6,311.5	6,519.9	6,281.2	27.0	24.3	89.39	-223.6	771.4	516.6	470.9	45.72	11.298	
6,600.0	6,344.3	6,565.3	6,309.2	26.9	24.3	88.25	-225.0	735.7	520.2	474.5	45.75	11.372	
6,650.0	6,374.6	6,610.6	6,335.0	26.8	24.4	87.27	-226.2	698.4	523.5	477.7	45.87	11.413	
6,700.0	6,402.2	6,655.8	6,358.4	26.7	24.5	86.43	-227.4	659.8	526.6	480.5	46.11	11.420	
6,750.0	6,427.2	6,700.0	6,379.1	26.7	24.6	85.72	-228.4	620.8	529.3	482.8	46.47	11.391	
6,800.0	6,449.2	6,746.0	6,398.2	26.7	24.8	85.12	-229.4	579.0	531.7	484.8	46.97	11.321	
6,850.0	6,468.4	6,791.0	6,414.4	26.7	25.0	84.62	-230.2	537.0	533.8	486.2	47.59	11.217	
6,900.0	6,484.5	6,835.9	6,428.1	26.7	25.3	84.23	-230.9	494.3	535.5	487.2	48.34	11.079	
6,950.0	6,497.5	6,880.8	6,439.3	26.8	25.6	83.93	-231.4	450.8	536.9	487.7	49.21	10.911	
7,000.0	6,507.3	6,925.7	6,447.8	27.0	26.0	83.72	-231.8	406.7	537.9	487.7	50.19	10.718	
7,050.0	6,514.0	6,970.6	6,453.8	27.2	26.4	83.61	-232.1	362.2	538.6	487.3	51.28	10.504	
7,100.0	6,517.5	7,015.5	6,457.2	27.5	26.9	83.58	-232.3	317.5	538.9	486.5	52.45	10.275	
7,129.6	6,518.0	7,042.1	6,458.0	27.7	27.2	83.60	-232.4	290.9	538.9	485.7	53.18	10.134	
7,150.3	6,518.0	7,061.6	6,458.0	27.9	27.4	83.61	-232.4	271.4	538.9	485.2	53.67	10.041	
7,200.0	6,517.9	7,111.3	6,457.9	28.3	28.1	83.60	-232.4	221.7	538.9	484.0	54.93	9.810	
7,300.0	6,517.7	7,211.3	6,457.6	29.4	29.5	83.60	-232.4	121.7	538.9	481.1	57.80	9.324	
7,400.0	6,517.6	7,311.3	6,457.4	30.8	31.1	83.59	-232.4	21.7	538.9	477.9	61.04	8.828	
7,500.0	6,517.4	7,411.3	6,457.2	32.5	32.9	83.58	-232.4	-78.3	538.9	474.3	64.61	8.341	
7,600.0	6,517.3	7,511.3	6,457.0	34.4	34.8	83.57	-232.4	-178.3	538.9	470.5	68.44	7.874	
7,700.0	6,517.1	7,611.3	6,456.7	36.4	36.8	83.56	-232.4	-278.3	538.9	466.4	72.51	7.433	
7,800.0	6,517.0	7,711.3	6,456.5	38.5	39.0	83.56	-232.4	-378.3	538.9	462.2	76.76	7.021	
7,900.0	6,516.8	7,811.3	6,456.3	40.7	41.2	83.55	-232.4	-478.3	539.0	457.8	81.18	6.639	
8,000.0	6,516.7	7,911.3	6,456.0	43.0	43.5	83.54	-232.4	-578.3	539.0	453.2	85.74	6.286	
8,100.0	6,516.5	8,011.3	6,455.8	45.4	45.8	83.53	-232.4	-678.3	539.0	448.6	90.41	5.962	
8,200.0	6,516.4	8,111.3	6,455.6	47.8	48.2	83.52	-232.4	-778.3	539.0	443.8	95.18	5.663	
8,300.0	6,516.2	8,211.3	6,455.4	50.2	50.7	83.52	-232.4	-878.3	539.0	439.0	100.03	5.388	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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-234 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft	
Survey Program:		0-MWD												Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance											
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning					
8,400.0	6,516.1	8,311.3	6,455.1	52.7	53.1	83.51	-232.4	-978.3	539.0	434.0	104.96	5.135						
8,500.0	6,515.9	8,411.3	6,454.9	55.2	55.6	83.50	-232.4	-1,078.3	539.0	429.1	109.95	4.902						
8,600.0	6,515.8	8,511.3	6,454.7	57.8	58.2	83.49	-232.4	-1,178.3	539.0	424.0	114.99	4.687						
8,700.0	6,515.6	8,611.3	6,454.5	60.4	60.7	83.48	-232.4	-1,278.3	539.0	418.9	120.08	4.489						
8,800.0	6,515.5	8,711.3	6,454.2	62.9	63.3	83.48	-232.4	-1,378.3	539.0	413.8	125.22	4.305						
8,900.0	6,515.3	8,811.3	6,454.0	65.6	65.9	83.47	-232.4	-1,478.3	539.0	408.7	130.39	4.134						
9,000.0	6,515.2	8,911.3	6,453.8	68.2	68.5	83.46	-232.4	-1,578.3	539.1	403.5	135.59	3.976						
9,100.0	6,515.0	9,011.3	6,453.5	70.8	71.2	83.45	-232.4	-1,678.3	539.1	398.2	140.83	3.828						
9,200.0	6,514.9	9,111.3	6,453.3	73.5	73.8	83.44	-232.4	-1,778.3	539.1	393.0	146.09	3.690						
9,300.0	6,514.7	9,211.3	6,453.1	76.1	76.5	83.44	-232.4	-1,878.3	539.1	387.7	151.37	3.561						
9,400.0	6,514.6	9,311.3	6,452.9	78.8	79.1	83.43	-232.4	-1,978.3	539.1	382.4	156.67	3.441						
9,500.0	6,514.4	9,411.3	6,452.6	81.5	81.8	83.42	-232.4	-2,078.3	539.1	377.1	161.99	3.328						
9,600.0	6,514.3	9,511.3	6,452.4	84.2	84.5	83.41	-232.4	-2,178.3	539.1	371.8	167.33	3.222						
9,700.0	6,514.1	9,611.3	6,452.2	86.9	87.2	83.40	-232.4	-2,278.3	539.1	366.4	172.69	3.122						
9,800.0	6,514.0	9,711.3	6,452.0	89.6	89.9	83.40	-232.4	-2,378.3	539.1	361.1	178.06	3.028						
9,900.0	6,513.8	9,811.3	6,451.7	92.3	92.6	83.39	-232.4	-2,478.3	539.1	355.7	183.44	2.939						
10,000.0	6,513.6	9,911.3	6,451.5	95.0	95.3	83.38	-232.4	-2,578.3	539.1	350.3	188.83	2.855						
10,100.0	6,513.5	10,011.3	6,451.3	97.7	98.0	83.37	-232.4	-2,678.3	539.1	344.9	194.24	2.776						
10,200.0	6,513.3	10,111.3	6,451.0	100.4	100.7	83.36	-232.4	-2,778.3	539.2	339.5	199.65	2.701						
10,300.0	6,513.2	10,211.3	6,450.8	103.2	103.5	83.36	-232.4	-2,878.3	539.2	334.1	205.07	2.629						
10,400.0	6,513.0	10,311.3	6,450.6	105.9	106.2	83.35	-232.3	-2,978.3	539.2	328.7	210.50	2.561						
10,500.0	6,512.9	10,411.3	6,450.4	108.6	108.9	83.34	-232.3	-3,078.3	539.2	323.2	215.94	2.497						
10,600.0	6,512.7	10,511.3	6,450.1	111.4	111.7	83.33	-232.3	-3,178.3	539.2	317.8	221.39	2.436						
10,700.0	6,512.6	10,611.3	6,449.9	114.1	114.4	83.32	-232.3	-3,278.3	539.2	312.4	226.84	2.377						
10,800.0	6,512.4	10,711.3	6,449.7	116.9	117.2	83.32	-232.3	-3,378.3	539.2	306.9	232.30	2.321						
10,900.0	6,512.3	10,811.3	6,449.5	119.6	119.9	83.31	-232.3	-3,478.3	539.2	301.5	237.76	2.268						
11,000.0	6,512.1	10,911.3	6,449.2	122.4	122.7	83.30	-232.3	-3,578.3	539.2	296.0	243.23	2.217						
11,100.0	6,512.0	11,011.3	6,449.0	125.1	125.4	83.29	-232.3	-3,678.3	539.2	290.5	248.70	2.168						
11,200.0	6,511.8	11,111.3	6,448.8	127.9	128.2	83.28	-232.3	-3,778.3	539.2	285.1	254.18	2.121						
11,300.0	6,511.7	11,211.3	6,448.5	130.7	130.9	83.28	-232.3	-3,878.3	539.3	279.6	259.66	2.077						
11,400.0	6,511.5	11,311.3	6,448.3	133.4	133.7	83.27	-232.3	-3,978.3	539.3	274.1	265.15	2.034						
11,500.0	6,511.4	11,411.3	6,448.1	136.2	136.5	83.26	-232.3	-4,078.3	539.3	268.6	270.64	1.993						
11,600.0	6,511.2	11,511.3	6,447.9	139.0	139.2	83.25	-232.3	-4,178.3	539.3	263.1	276.14	1.953						
11,700.0	6,511.1	11,611.3	6,447.6	141.7	142.0	83.24	-232.3	-4,278.3	539.3	257.7	281.63	1.915						
11,800.0	6,510.9	11,711.3	6,447.4	144.5	144.8	83.24	-232.3	-4,378.3	539.3	252.2	287.13	1.878						
11,900.0	6,510.8	11,811.3	6,447.2	147.3	147.5	83.23	-232.3	-4,478.3	539.3	246.7	292.64	1.843						
12,000.0	6,510.6	11,911.3	6,446.9	150.0	150.3	83.22	-232.3	-4,578.3	539.3	241.2	298.14	1.809						
12,100.0	6,510.5	12,011.3	6,446.7	152.8	153.1	83.21	-232.3	-4,678.3	539.3	235.7	303.65	1.776						
12,200.0	6,510.3	12,111.3	6,446.5	155.6	155.8	83.20	-232.3	-4,778.3	539.3	230.2	309.16	1.744						
12,300.0	6,510.2	12,211.3	6,446.3	158.4	158.6	83.20	-232.3	-4,878.3	539.3	224.7	314.67	1.714						
12,400.0	6,510.0	12,311.3	6,446.0	161.1	161.4	83.19	-232.3	-4,978.3	539.3	219.2	320.19	1.684						
12,500.0	6,509.9	12,411.3	6,445.8	163.9	164.2	83.18	-232.3	-5,078.3	539.4	213.6	325.71	1.656						
12,600.0	6,509.7	12,511.3	6,445.6	166.7	167.0	83.17	-232.3	-5,178.3	539.4	208.1	331.23	1.628						
12,700.0	6,509.6	12,611.3	6,445.4	169.5	169.7	83.16	-232.3	-5,278.3	539.4	202.6	336.75	1.602						
12,800.0	6,509.4	12,711.3	6,445.1	172.3	172.5	83.16	-232.3	-5,378.3	539.4	197.1	342.27	1.576						
12,900.0	6,509.3	12,811.3	6,444.9	175.0	175.3	83.15	-232.3	-5,478.3	539.4	191.6	347.80	1.551						
13,000.0	6,509.1	12,911.3	6,444.7	177.8	178.1	83.14	-232.3	-5,578.3	539.4	186.1	353.32	1.527						
13,100.0	6,508.9	13,011.3	6,444.4	180.6	180.9	83.13	-232.3	-5,678.3	539.4	180.6	358.85	1.503						
13,200.0	6,508.8	13,111.3	6,444.2	183.4	183.7	83.12	-232.3	-5,778.3	539.4	175.0	364.38	1.480 Level 3						
13,300.0	6,508.6	13,211.3	6,444.0	186.2	186.4	83.12	-232.3	-5,878.3	539.4	169.5	369.91	1.458 Level 3						
13,400.0	6,508.5	13,311.3	6,443.8	189.0	189.2	83.11	-232.3	-5,978.3	539.4	164.0	375.44	1.437 Level 3						

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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	
13,500.0	6,508.3	13,411.3	6,443.5	191.7	192.0	83.10	-232.3	-6,078.3	539.4	158.5	380.97	1.416	Level 3	
13,600.0	6,508.2	13,511.3	6,443.3	194.5	194.8	83.09	-232.3	-6,178.3	539.5	152.9	386.51	1.396	Level 3	
13,700.0	6,508.0	13,611.3	6,443.1	197.3	197.6	83.08	-232.3	-6,278.3	539.5	147.4	392.04	1.376	Level 3	
13,725.8	6,508.0	13,637.1	6,443.0	198.0	198.3	83.08	-232.3	-6,304.1	539.5	146.0	393.47	1.371	Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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							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	-104.12	-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		
700.0	700.0	701.0	701.0	1.5	1.5	-104.12	-18.2	-72.4	74.7	71.8	2.92	25.540		
800.0	800.0	801.0	801.0	1.7	1.7	-104.12	-18.2	-72.4	74.7	71.3	3.37	22.137 CC, ES		
900.0	900.0	901.0	901.0	1.9	1.9	135.29	-18.2	-72.4	75.6	71.8	3.80	19.883		
1,000.0	999.9	1,000.9	1,000.9	2.1	2.1	137.27	-18.2	-72.4	78.4	74.2	4.22	18.599		
1,100.0	1,099.7	1,100.7	1,100.7	2.3	2.4	140.28	-18.2	-72.4	83.4	78.7	4.64	17.961		
1,200.0	1,199.3	1,200.3	1,200.3	2.5	2.6	143.91	-18.2	-72.4	90.6	85.5	5.07	17.859		
1,300.0	1,298.6	1,299.6	1,299.6	2.8	2.8	147.78	-18.2	-72.4	100.4	94.9	5.51	18.213		
1,400.0	1,397.5	1,398.5	1,398.5	3.0	3.0	151.57	-18.2	-72.4	112.8	106.8	5.95	18.955		
1,500.0	1,496.1	1,497.1	1,497.1	3.3	3.3	155.07	-18.2	-72.4	128.0	121.6	6.39	20.023		
1,600.0	1,594.2	1,595.2	1,595.2	3.7	3.5	158.19	-18.2	-72.4	145.9	139.1	6.83	21.364		
1,700.0	1,691.7	1,692.7	1,692.7	4.1	3.7	160.90	-18.2	-72.4	166.7	159.4	7.27	22.929		
1,800.0	1,788.6	1,789.6	1,789.6	4.5	3.9	163.22	-18.2	-72.4	190.2	182.5	7.71	24.678		
1,860.8	1,847.3	1,850.9	1,850.9	4.8	4.0	164.54	-18.2	-72.1	205.5	197.5	7.97	25.789		
1,900.0	1,884.9	1,890.8	1,890.8	5.0	4.1	165.39	-18.2	-71.3	215.2	207.1	8.15	26.421		
2,000.0	1,981.1	1,993.6	1,993.5	5.5	4.3	167.42	-18.3	-67.5	238.5	229.9	8.59	27.763		
2,100.0	2,077.3	2,097.5	2,097.2	6.1	4.5	169.29	-18.3	-60.9	259.5	250.4	9.04	28.701		
2,200.0	2,173.4	2,202.3	2,201.5	6.6	4.8	171.11	-18.4	-51.3	278.2	268.7	9.50	29.284		
2,300.0	2,269.6	2,307.9	2,306.4	7.1	5.0	172.92	-18.5	-38.7	294.7	284.7	9.97	29.557		
2,400.0	2,365.8	2,414.1	2,411.4	7.7	5.3	174.77	-18.6	-23.2	308.9	298.4	10.45	29.557		
2,500.0	2,461.9	2,520.8	2,516.5	8.3	5.6	176.70	-18.7	-4.6	320.9	309.9	10.95	29.308		
2,600.0	2,558.1	2,627.7	2,621.3	8.8	5.9	178.73	-18.8	16.9	330.8	319.3	11.47	28.845		
2,700.0	2,654.3	2,734.9	2,725.6	9.4	6.3	-179.11	-19.0	41.4	338.6	326.6	12.02	28.171		
2,800.0	2,750.4	2,842.0	2,829.1	10.0	6.7	-176.78	-19.2	68.8	344.5	331.9	12.62	27.305		
2,900.0	2,846.6	2,948.9	2,931.6	10.5	7.2	-174.26	-19.4	99.0	348.6	335.4	13.28	26.260		
3,000.0	2,942.8	3,055.4	3,032.9	11.1	7.7	-171.52	-19.7	132.0	351.1	337.1	14.02	25.052		
3,100.0	3,038.9	3,156.5	3,128.3	11.7	8.2	-168.74	-19.9	165.4	352.8	337.9	14.83	23.790		
3,200.0	3,135.1	3,255.0	3,221.3	12.3	8.8	-166.04	-20.1	198.0	355.1	339.3	15.71	22.604		
3,300.0	3,231.3	3,353.5	3,314.2	12.8	9.4	-163.37	-20.4	230.7	358.2	341.5	16.67	21.491		
3,400.0	3,327.4	3,452.1	3,407.2	13.4	10.0	-160.76	-20.6	263.3	362.0	344.4	17.70	20.458		
3,500.0	3,423.6	3,550.6	3,500.2	14.0	10.6	-158.21	-20.8	295.9	366.7	347.9	18.80	19.506		
3,600.0	3,519.8	3,649.1	3,593.1	14.6	11.2	-155.73	-21.0	328.6	372.1	352.1	19.96	18.637		
3,700.0	3,615.9	3,747.6	3,686.1	15.2	11.8	-153.32	-21.3	361.2	378.1	356.9	21.18	17.850		
3,800.0	3,712.1	3,846.2	3,779.1	15.8	12.4	-150.98	-21.5	393.9	384.8	362.4	22.45	17.142		
3,900.0	3,808.3	3,944.7	3,872.0	16.3	13.1	-148.73	-21.7	426.5	392.2	368.4	23.76	16.508		
4,000.0	3,904.4	4,043.2	3,965.0	16.9	13.7	-146.56	-22.0	459.2	400.1	375.0	25.10	15.943		
4,100.0	4,000.6	4,141.8	4,058.0	17.5	14.4	-144.48	-22.2	491.8	408.7	382.2	26.47	15.440		
4,200.0	4,096.8	4,240.3	4,150.9	18.1	15.0	-142.48	-22.4	524.5	417.7	389.8	27.85	14.995		
4,300.0	4,192.9	4,338.8	4,243.9	18.7	15.7	-140.57	-22.7	557.1	427.2	398.0	29.26	14.602		
4,400.0	4,289.1	4,437.4	4,336.9	19.3	16.4	-138.74	-22.9	589.8	437.2	406.5	30.67	14.254		
4,500.0	4,385.3	4,535.9	4,429.8	19.9	17.0	-137.00	-23.1	622.4	447.6	415.5	32.09	13.947		
4,600.0	4,481.5	4,634.4	4,522.8	20.5	17.7	-135.33	-23.3	655.1	458.4	424.9	33.52	13.677		
4,700.0	4,577.6	4,733.0	4,615.8	21.0	18.4	-133.74	-23.6	687.7	469.6	434.7	34.94	13.439		
4,800.0	4,673.8	4,831.5	4,708.7	21.6	19.0	-132.23	-23.8	720.4	481.1	444.8	36.37	13.229		
4,900.0	4,770.0	4,930.0	4,801.7	22.2	19.7	-130.78	-24.0	753.0	493.0	455.2	37.79	13.045		

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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
5,000.0	4,866.1	5,028.6	4,894.6	22.8	20.4	-129.40	-24.3	785.7	505.1	465.9	39.21	12.883	
5,100.0	4,962.3	5,127.1	4,987.6	23.4	21.1	-128.09	-24.5	818.3	517.6	476.9	40.62	12.740	
5,200.0	5,058.5	5,225.6	5,080.6	24.0	21.7	-126.84	-24.7	851.0	530.3	488.2	42.03	12.615	
5,300.0	5,154.6	5,324.1	5,173.5	24.6	22.4	-125.65	-25.0	883.6	543.2	499.7	43.43	12.506	
5,400.0	5,250.8	5,422.7	5,266.5	25.2	23.1	-124.51	-25.2	916.3	556.3	511.5	44.83	12.410	
5,500.0	5,347.0	5,521.2	5,359.5	25.8	23.8	-123.42	-25.4	948.9	569.7	523.5	46.22	12.326	
5,600.0	5,443.1	5,619.7	5,452.4	26.3	24.5	-122.39	-25.7	981.6	583.2	535.7	47.60	12.254	
5,700.0	5,539.3	5,717.6	5,545.2	26.9	25.1	-121.51	-25.9	1,013.0	597.0	548.1	48.88	12.213	
5,747.8	5,585.3	5,764.3	5,590.3	27.2	25.3	-121.43	-26.0	1,024.6	603.7	554.3	49.34	12.235	
5,750.0	5,587.4	5,766.4	5,592.4	27.2	25.3	-121.77	-26.0	1,025.1	604.0	554.6	49.35	12.238	
5,800.0	5,635.8	5,815.1	5,640.2	27.4	25.4	-131.26	-26.1	1,034.2	611.1	561.5	49.58	12.324	
5,850.0	5,684.8	5,863.8	5,688.6	27.6	25.6	-145.65	-26.2	1,040.3	618.2	568.5	49.73	12.431	
5,900.0	5,734.2	5,912.5	5,737.1	27.7	25.6	-166.80	-26.4	1,043.2	625.4	575.6	49.80	12.557	
5,950.0	5,783.6	5,961.1	5,785.7	27.8	25.7	-167.74	-26.5	1,043.0	632.6	582.8	49.81	12.701	
6,000.0	5,833.0	6,009.7	5,834.2	27.9	25.7	145.71	-26.6	1,039.8	639.8	590.1	49.75	12.860	
6,050.0	5,882.0	6,058.3	5,882.4	27.9	25.7	130.51	-26.7	1,033.5	647.0	597.3	49.64	13.032	
6,100.0	5,930.6	6,106.9	5,930.1	27.9	25.6	120.55	-26.8	1,024.1	654.0	604.5	49.49	13.216	
6,150.0	5,978.4	6,155.5	5,977.1	27.8	25.5	113.79	-27.0	1,011.7	661.0	611.7	49.29	13.409	
6,200.0	6,025.3	6,204.2	6,023.2	27.8	25.5	108.98	-27.1	996.4	667.8	618.7	49.07	13.608	
6,250.0	6,071.1	6,252.9	6,068.3	27.7	25.4	105.39	-27.2	978.1	674.5	625.6	48.83	13.811	
6,300.0	6,115.5	6,301.6	6,112.3	27.6	25.3	102.61	-27.3	957.0	680.9	632.4	48.59	14.015	
6,350.0	6,158.5	6,350.4	6,154.8	27.5	25.1	100.39	-27.4	933.0	687.2	638.9	48.35	14.214	
6,400.0	6,199.7	6,399.3	6,195.7	27.4	25.0	98.57	-27.5	906.4	693.2	645.1	48.12	14.406	
6,450.0	6,239.1	6,448.2	6,235.0	27.3	24.9	97.07	-27.6	877.2	698.9	651.0	47.93	14.583	
6,500.0	6,276.4	6,497.2	6,272.3	27.2	24.9	95.80	-27.7	845.4	704.4	656.6	47.78	14.742	
6,550.0	6,311.5	6,546.3	6,307.6	27.0	24.8	94.73	-27.8	811.3	709.5	661.8	47.69	14.876	
6,600.0	6,344.3	6,595.5	6,340.7	26.9	24.8	93.82	-27.9	774.9	714.2	666.6	47.68	14.980	
6,650.0	6,374.6	6,644.8	6,371.4	26.8	24.8	93.04	-27.9	736.4	718.6	670.9	47.76	15.047	
6,700.0	6,402.2	6,694.2	6,399.6	26.7	24.9	92.39	-28.0	695.9	722.7	674.7	47.95	15.073	
6,750.0	6,427.2	6,743.6	6,425.2	26.7	25.0	91.83	-28.1	653.5	726.3	678.1	48.25	15.054	
6,800.0	6,449.2	6,793.2	6,448.1	26.7	25.2	91.37	-28.1	609.6	729.5	680.8	48.67	14.988	
6,850.0	6,468.4	6,842.9	6,468.0	26.7	25.4	91.00	-28.2	564.1	732.3	683.1	49.23	14.876	
6,900.0	6,484.5	6,892.6	6,485.0	26.7	25.8	90.71	-28.2	517.4	734.7	684.7	49.91	14.719	
6,950.0	6,497.5	6,942.4	6,499.0	26.8	26.1	90.49	-28.3	469.6	736.6	685.8	50.73	14.520	
7,000.0	6,507.3	6,992.4	6,509.8	27.0	26.6	90.35	-28.3	420.8	738.0	686.3	51.67	14.284	
7,050.0	6,514.0	7,042.3	6,517.5	27.2	27.1	90.28	-28.3	371.4	739.0	686.3	52.72	14.019	
7,100.0	6,517.5	7,092.4	6,521.8	27.5	27.6	90.27	-28.3	321.6	739.5	685.6	53.86	13.729	
7,129.6	6,518.0	7,122.1	6,522.9	27.7	28.0	90.30	-28.3	291.9	739.6	685.0	54.59	13.549	
7,200.0	6,517.9	7,192.5	6,522.8	28.3	28.8	90.30	-28.3	221.5	739.6	683.2	56.36	13.122	
7,300.0	6,517.7	7,292.5	6,522.4	29.4	30.3	90.28	-28.3	121.5	739.6	680.3	59.25	12.483	
7,400.0	6,517.6	7,392.5	6,522.0	30.8	31.9	90.27	-28.3	21.5	739.6	677.1	62.50	11.833	
7,500.0	6,517.4	7,492.5	6,521.7	32.5	33.7	90.25	-28.3	-78.5	739.6	673.5	66.07	11.193	
7,600.0	6,517.3	7,592.5	6,521.3	34.4	35.6	90.23	-28.3	-178.5	739.6	669.7	69.92	10.578	
7,700.0	6,517.1	7,692.5	6,520.9	36.4	37.6	90.21	-28.3	-278.5	739.6	665.6	73.99	9.996	
7,800.0	6,517.0	7,792.5	6,520.5	38.5	39.7	90.20	-28.3	-378.5	739.6	661.3	78.25	9.452	
7,900.0	6,516.8	7,892.5	6,520.1	40.7	42.0	90.18	-28.3	-478.5	739.6	656.9	82.67	8.946	
8,000.0	6,516.7	7,992.5	6,519.8	43.0	44.2	90.16	-28.3	-578.5	739.6	652.3	87.24	8.478	
8,100.0	6,516.5	8,092.5	6,519.4	45.4	46.6	90.14	-28.3	-678.5	739.6	647.7	91.92	8.046	
8,200.0	6,516.4	8,192.5	6,519.0	47.8	48.9	90.13	-28.3	-778.5	739.6	642.9	96.70	7.648	
8,300.0	6,516.2	8,292.5	6,518.6	50.2	51.4	90.11	-28.3	-878.5	739.6	638.0	101.57	7.282	
8,400.0	6,516.1	8,392.5	6,518.2	52.7	53.8	90.09	-28.3	-978.5	739.6	633.1	106.51	6.944	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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	6,515.9	8,492.5	6,517.9	55.2	56.3	90.07	-28.3	-1,078.5	739.6	628.1	111.51	6.632		
8,600.0	6,515.8	8,592.5	6,517.5	57.8	58.8	90.06	-28.3	-1,178.5	739.6	623.0	116.57	6.344		
8,700.0	6,515.6	8,692.5	6,517.1	60.4	61.4	90.04	-28.3	-1,278.5	739.6	617.9	121.68	6.078		
8,800.0	6,515.5	8,792.5	6,516.7	62.9	64.0	90.02	-28.3	-1,378.5	739.6	612.7	126.84	5.831		
8,900.0	6,515.3	8,892.5	6,516.3	65.6	66.5	90.00	-28.3	-1,478.5	739.6	607.5	132.03	5.602		
9,000.0	6,515.2	8,992.5	6,516.0	68.2	69.2	89.98	-28.3	-1,578.5	739.6	602.3	137.26	5.388		
9,100.0	6,515.0	9,092.5	6,515.6	70.8	71.8	89.97	-28.3	-1,678.5	739.6	597.1	142.51	5.190		
9,200.0	6,514.9	9,192.5	6,515.2	73.5	74.4	89.95	-28.3	-1,778.5	739.6	591.8	147.79	5.004		
9,300.0	6,514.7	9,292.5	6,514.8	76.1	77.1	89.93	-28.3	-1,878.5	739.6	586.5	153.10	4.831		
9,400.0	6,514.6	9,392.5	6,514.5	78.8	79.7	89.91	-28.3	-1,978.5	739.6	581.1	158.43	4.668		
9,500.0	6,514.4	9,492.5	6,514.1	81.5	82.4	89.90	-28.3	-2,078.5	739.6	575.8	163.78	4.516		
9,508.9	6,514.4	9,501.4	6,514.0	81.7	82.6	89.90	-28.3	-2,087.4	739.6	575.3	164.25	4.503		
9,600.0	6,514.3	9,592.5	6,513.7	84.2	85.1	89.88	-28.3	-2,178.5	739.6	570.4	169.14	4.373		
9,700.0	6,514.1	9,692.5	6,513.3	86.9	87.8	89.86	-28.3	-2,278.5	739.6	565.1	174.52	4.238		
9,800.0	6,514.0	9,792.5	6,512.9	89.6	90.4	89.84	-28.3	-2,378.5	739.6	559.7	179.92	4.111		
9,900.0	6,513.8	9,892.5	6,512.6	92.3	93.1	89.83	-28.3	-2,478.5	739.6	554.2	185.33	3.991		
10,000.0	6,513.6	9,992.5	6,512.2	95.0	95.9	89.81	-28.3	-2,578.5	739.6	548.8	190.75	3.877		
10,100.0	6,513.5	10,092.5	6,511.8	97.7	98.6	89.79	-28.3	-2,678.5	739.6	543.4	196.18	3.770		
10,200.0	6,513.3	10,192.5	6,511.4	100.4	101.3	89.77	-28.3	-2,778.5	739.6	538.0	201.63	3.668		
10,300.0	6,513.2	10,292.5	6,511.0	103.2	104.0	89.76	-28.3	-2,878.5	739.6	532.5	207.08	3.571		
10,400.0	6,513.0	10,392.5	6,510.7	105.9	106.7	89.74	-28.3	-2,978.5	739.6	527.0	212.54	3.480		
10,500.0	6,512.9	10,492.5	6,510.3	108.6	109.5	89.72	-28.3	-3,078.5	739.6	521.6	218.01	3.392		
10,600.0	6,512.7	10,592.5	6,509.9	111.4	112.2	89.70	-28.3	-3,178.5	739.6	516.1	223.49	3.309		
10,700.0	6,512.6	10,692.5	6,509.5	114.1	114.9	89.69	-28.3	-3,278.5	739.6	510.6	228.97	3.230		
10,800.0	6,512.4	10,792.5	6,509.1	116.9	117.7	89.67	-28.3	-3,378.5	739.6	505.1	234.46	3.154		
10,900.0	6,512.3	10,892.5	6,508.8	119.6	120.4	89.65	-28.3	-3,478.5	739.6	499.6	239.96	3.082		
11,000.0	6,512.1	10,992.5	6,508.4	122.4	123.2	89.63	-28.3	-3,578.5	739.6	494.1	245.46	3.013		
11,100.0	6,512.0	11,092.5	6,508.0	125.1	125.9	89.62	-28.3	-3,678.5	739.6	488.6	250.97	2.947		
11,200.0	6,511.8	11,192.5	6,507.6	127.9	128.7	89.60	-28.3	-3,778.5	739.6	483.1	256.48	2.884		
11,300.0	6,511.7	11,292.5	6,507.3	130.7	131.4	89.58	-28.3	-3,878.5	739.6	477.6	261.99	2.823		
11,400.0	6,511.5	11,392.5	6,506.9	133.4	134.2	89.56	-28.3	-3,978.5	739.6	472.1	267.51	2.765		
11,500.0	6,511.4	11,492.5	6,506.5	136.2	137.0	89.54	-28.3	-4,078.5	739.6	466.5	273.04	2.709		
11,600.0	6,511.2	11,592.5	6,506.1	139.0	139.7	89.53	-28.3	-4,178.5	739.6	461.0	278.57	2.655		
11,700.0	6,511.1	11,692.5	6,505.7	141.7	142.5	89.51	-28.3	-4,278.5	739.6	455.5	284.10	2.603		
11,800.0	6,510.9	11,792.5	6,505.4	144.5	145.3	89.49	-28.3	-4,378.5	739.6	450.0	289.64	2.554		
11,900.0	6,510.8	11,892.5	6,505.0	147.3	148.0	89.47	-28.3	-4,478.5	739.6	444.4	295.17	2.506		
12,000.0	6,510.6	11,992.5	6,504.6	150.0	150.8	89.46	-28.3	-4,578.5	739.6	438.9	300.72	2.459		
12,100.0	6,510.5	12,092.5	6,504.2	152.8	153.6	89.44	-28.3	-4,678.5	739.6	433.3	306.26	2.415		
12,200.0	6,510.3	12,192.5	6,503.8	155.6	156.3	89.42	-28.3	-4,778.5	739.6	427.8	311.81	2.372		
12,300.0	6,510.2	12,292.5	6,503.5	158.4	159.1	89.40	-28.3	-4,878.5	739.6	422.2	317.36	2.331		
12,400.0	6,510.0	12,392.5	6,503.1	161.1	161.9	89.39	-28.3	-4,978.5	739.6	416.7	322.91	2.290		
12,500.0	6,509.9	12,492.5	6,502.7	163.9	164.7	89.37	-28.3	-5,078.4	739.6	411.1	328.46	2.252		
12,600.0	6,509.7	12,592.5	6,502.3	166.7	167.4	89.35	-28.3	-5,178.4	739.6	405.6	334.02	2.214		
12,700.0	6,509.6	12,692.5	6,501.9	169.5	170.2	89.33	-28.3	-5,278.4	739.6	400.0	339.58	2.178		
12,800.0	6,509.4	12,792.5	6,501.6	172.3	173.0	89.32	-28.3	-5,378.4	739.6	394.5	345.14	2.143		
12,900.0	6,509.3	12,892.5	6,501.2	175.0	175.8	89.30	-28.3	-5,478.4	739.6	388.9	350.70	2.109		
13,000.0	6,509.1	12,992.5	6,500.8	177.8	178.6	89.28	-28.3	-5,578.4	739.6	383.4	356.26	2.076		
13,100.0	6,508.9	13,092.5	6,500.4	180.6	181.3	89.26	-28.3	-5,678.4	739.6	377.8	361.83	2.044		
13,200.0	6,508.8	13,192.5	6,500.1	183.4	184.1	89.25	-28.3	-5,778.4	739.6	372.2	367.40	2.013		
13,300.0	6,508.6	13,292.5	6,499.7	186.2	186.9	89.23	-28.3	-5,878.4	739.6	366.7	372.96	1.983		
13,400.0	6,508.5	13,392.5	6,499.3	189.0	189.7	89.21	-28.3	-5,978.4	739.6	361.1	378.53	1.954		

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,500.0	6,508.3	13,492.5	6,498.9	191.7	192.5	89.19	-28.3	-6,078.4	739.6	355.5	384.11	1.926	
13,600.0	6,508.2	13,592.5	6,498.5	194.5	195.3	89.17	-28.3	-6,178.4	739.6	350.0	389.68	1.898	
13,700.0	6,508.0	13,692.5	6,498.2	197.3	198.1	89.16	-28.3	-6,278.4	739.6	344.4	395.25	1.871	
13,725.8	6,508.0	13,718.3	6,498.1	198.0	198.8	89.15	-28.3	-6,304.2	739.6	342.9	396.69	1.865 SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Cockroft 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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	
0.0	0.0	0.0	0.0	0.0	0.0	-103.38	-7.3	-30.6	31.5				
100.0	100.0	100.0	100.0	0.1	0.1	-103.38	-7.3	-30.6	31.5	31.3	0.22	140.137	
200.0	200.0	200.0	200.0	0.3	0.3	-103.38	-7.3	-30.6	31.5	30.8	0.67	46.712	
300.0	300.0	300.0	300.0	0.6	0.6	-103.38	-7.3	-30.6	31.5	30.4	1.12	28.027	
400.0	400.0	400.0	400.0	0.8	0.8	-103.38	-7.3	-30.6	31.5	29.9	1.57	20.020	
500.0	500.0	500.0	500.0	1.0	1.0	-103.38	-7.3	-30.6	31.5	29.5	2.02	15.571	
600.0	600.0	600.0	600.0	1.2	1.2	-103.38	-7.3	-30.6	31.5	29.0	2.47	12.740	
700.0	700.0	700.0	700.0	1.5	1.5	-103.38	-7.3	-30.6	31.5	28.6	2.92	10.780	
800.0	800.0	800.0	800.0	1.7	1.7	-103.38	-7.3	-30.6	31.5	28.1	3.37	9.342 CC, ES	
900.0	900.0	900.0	900.0	1.9	1.9	136.94	-7.3	-30.6	32.4	28.6	3.80	8.536	
1,000.0	999.9	999.9	999.9	2.1	2.1	141.25	-7.3	-30.6	35.4	31.2	4.22	8.400 SF	
1,100.0	1,099.7	1,099.7	1,099.7	2.3	2.4	146.97	-7.3	-30.6	40.7	36.1	4.64	8.779	
1,200.0	1,199.3	1,199.3	1,199.3	2.5	2.6	152.80	-7.3	-30.6	48.7	43.6	5.07	9.603	
1,300.0	1,298.6	1,299.9	1,299.9	2.8	2.8	158.62	-6.8	-29.4	58.2	52.8	5.49	10.612	
1,400.0	1,397.5	1,400.6	1,400.5	3.0	3.0	164.65	-5.5	-25.7	68.6	62.7	5.90	11.627	
1,500.0	1,496.1	1,501.1	1,500.8	3.3	3.2	170.64	-3.3	-19.5	80.1	73.8	6.31	12.684	
1,600.0	1,594.2	1,601.5	1,600.8	3.7	3.5	176.42	-0.2	-10.8	93.0	86.3	6.74	13.809	
1,700.0	1,691.7	1,701.7	1,700.3	4.1	3.7	-178.15	3.8	0.3	107.6	100.5	7.18	14.999	
1,800.0	1,788.6	1,801.6	1,799.1	4.5	4.0	-173.14	8.7	13.9	124.1	116.5	7.65	16.226	
1,860.8	1,847.3	1,862.2	1,858.8	4.8	4.1	-170.31	12.0	23.2	135.1	127.1	7.96	16.970	
1,900.0	1,884.9	1,901.1	1,897.2	5.0	4.3	-168.57	14.4	29.8	142.4	134.2	8.18	17.401	
2,000.0	1,981.1	2,000.5	1,994.7	5.5	4.6	-164.28	20.9	48.0	160.7	151.9	8.80	18.258	
2,100.0	2,077.3	2,099.8	2,091.5	6.1	4.9	-160.11	28.3	68.7	178.9	169.4	9.51	18.816	
2,200.0	2,173.4	2,198.7	2,187.4	6.6	5.3	-156.01	36.5	91.6	197.0	186.7	10.30	19.127	
2,300.0	2,269.6	2,296.9	2,281.9	7.1	5.8	-152.01	45.4	116.5	215.5	204.3	11.19	19.258	
2,400.0	2,365.8	2,394.1	2,375.3	7.7	6.2	-148.53	54.5	141.7	234.7	222.6	12.13	19.346	
2,500.0	2,461.9	2,491.3	2,468.7	8.3	6.7	-145.57	63.5	166.9	254.6	241.5	13.11	19.426	
2,600.0	2,558.1	2,588.5	2,562.2	8.8	7.2	-143.04	72.6	192.2	275.1	261.0	14.11	19.502	
2,700.0	2,654.3	2,685.6	2,655.6	9.4	7.7	-140.87	81.6	217.4	296.1	281.0	15.13	19.575	
2,800.0	2,750.4	2,782.8	2,749.0	10.0	8.2	-138.98	90.6	242.6	317.4	301.3	16.16	19.647	
2,900.0	2,846.6	2,880.0	2,842.5	10.5	8.7	-137.32	99.7	267.9	339.0	321.8	17.19	19.717	
3,000.0	2,942.8	2,977.2	2,935.9	11.1	9.3	-135.87	108.7	293.1	360.9	342.6	18.24	19.785	
3,100.0	3,038.9	3,074.4	3,029.3	11.7	9.8	-134.58	117.8	318.3	382.9	363.6	19.29	19.852	
3,200.0	3,135.1	3,171.6	3,122.7	12.3	10.3	-133.43	126.8	343.5	405.1	384.8	20.34	19.916	
3,300.0	3,231.3	3,268.8	3,216.2	12.8	10.9	-132.40	135.8	368.8	427.4	406.0	21.40	19.977	
3,400.0	3,327.4	3,366.0	3,309.6	13.4	11.4	-131.47	144.9	394.0	449.9	427.4	22.45	20.036	
3,500.0	3,423.6	3,463.2	3,403.0	14.0	11.9	-130.63	153.9	419.2	472.5	449.0	23.51	20.093	
3,600.0	3,519.8	3,560.4	3,496.5	14.6	12.5	-129.86	163.0	444.5	495.1	470.5	24.57	20.148	
3,700.0	3,615.9	3,657.6	3,589.9	15.2	13.0	-129.17	172.0	469.7	517.8	492.2	25.64	20.200	
3,800.0	3,712.1	3,754.8	3,683.3	15.8	13.6	-128.53	181.1	494.9	540.6	513.9	26.70	20.250	
3,900.0	3,808.3	3,852.0	3,776.7	16.3	14.1	-127.94	190.1	520.1	563.5	535.7	27.76	20.297	
4,000.0	3,904.4	3,949.2	3,870.2	16.9	14.7	-127.40	199.1	545.4	586.4	557.6	28.83	20.343	
4,100.0	4,000.6	4,046.4	3,963.6	17.5	15.2	-126.90	208.2	570.6	609.4	579.5	29.89	20.386	
4,200.0	4,096.8	4,143.6	4,057.0	18.1	15.8	-126.43	217.2	595.8	632.4	601.4	30.96	20.428	
4,300.0	4,192.9	4,240.8	4,150.5	18.7	16.3	-126.00	226.3	621.1	655.4	623.4	32.02	20.467	
4,400.0	4,289.1	4,338.0	4,243.9	19.3	16.9	-125.60	235.3	646.3	678.5	645.4	33.09	20.505	
4,500.0	4,385.3	4,435.2	4,337.3	19.9	17.4	-125.22	244.3	671.5	701.5	667.4	34.15	20.542	
4,600.0	4,481.5	4,532.4	4,430.8	20.5	18.0	-124.87	253.4	696.7	724.7	689.4	35.22	20.576	
4,700.0	4,577.6	4,629.6	4,524.2	21.0	18.5	-124.54	262.4	722.0	747.8	711.5	36.28	20.610	
4,800.0	4,673.8	4,726.8	4,617.6	21.6	19.1	-124.23	271.5	747.2	771.0	733.6	37.35	20.642	
4,900.0	4,770.0	4,824.0	4,711.0	22.2	19.7	-123.94	280.5	772.4	794.2	755.7	38.42	20.672	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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

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

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	75.34	7.3	27.9	28.8				
100.0	100.0	100.0	100.0	0.1	0.1	75.34	7.3	27.9	28.8	28.6	0.22	128.108	
200.0	200.0	200.0	200.0	0.3	0.3	75.34	7.3	27.9	28.8	28.1	0.67	42.703	
300.0	300.0	300.0	300.0	0.6	0.6	75.34	7.3	27.9	28.8	27.7	1.12	25.622	
400.0	400.0	400.0	400.0	0.8	0.8	75.34	7.3	27.9	28.8	27.2	1.57	18.301 CC	
500.0	500.0	499.5	499.5	1.0	1.0	77.38	6.5	28.9	29.6	27.6	2.00	14.780	
600.0	600.0	598.9	598.8	1.2	1.2	82.85	4.0	31.9	32.1	29.7	2.42	13.264	
700.0	700.0	698.1	697.8	1.5	1.4	90.15	-0.1	36.8	36.9	34.0	2.86	12.923	
800.0	800.0	796.8	796.1	1.7	1.6	97.54	-5.8	43.8	44.3	41.0	3.30	13.427	
900.0	900.0	895.2	893.8	1.9	1.9	-17.72	-13.1	52.6	53.3	49.6	3.73	14.304	
1,000.0	999.9	993.3	990.9	2.1	2.2	-13.17	-21.9	63.4	62.6	58.5	4.15	15.100	
1,100.0	1,099.7	1,091.1	1,087.3	2.3	2.5	-9.54	-32.3	76.0	72.0	67.5	4.58	15.745	
1,200.0	1,199.3	1,188.7	1,183.1	2.5	2.9	-6.53	-44.2	90.5	81.6	76.6	5.01	16.267	
1,300.0	1,298.6	1,286.0	1,278.1	2.8	3.3	-3.94	-57.7	106.9	91.2	85.7	5.46	16.688	
1,400.0	1,397.5	1,383.0	1,372.2	3.0	3.8	-1.67	-72.6	125.0	100.8	94.9	5.92	17.028	
1,500.0	1,496.1	1,480.4	1,466.0	3.3	4.3	0.39	-89.1	145.1	110.4	104.0	6.39	17.288	
1,600.0	1,594.2	1,580.0	1,561.8	3.7	4.8	2.24	-106.4	166.2	118.4	111.5	6.87	17.247	
1,700.0	1,691.7	1,679.8	1,657.8	4.1	5.4	3.93	-123.8	187.3	123.9	116.5	7.36	16.840	
1,800.0	1,788.6	1,779.7	1,753.8	4.5	5.9	5.59	-141.2	208.5	126.8	119.0	7.86	16.145	
1,860.8	1,847.3	1,840.5	1,812.3	4.8	6.3	6.63	-151.8	221.4	127.4	119.3	8.17	15.603	
1,900.0	1,884.9	1,879.6	1,849.9	5.0	6.5	7.31	-158.6	229.7	127.5	119.1	8.38	15.218	
2,000.0	1,981.1	1,979.5	1,946.0	5.5	7.1	9.05	-176.0	250.9	127.8	118.9	8.93	14.308	
2,100.0	2,077.3	2,079.4	2,042.1	6.1	7.6	10.78	-193.4	272.0	128.2	118.7	9.51	13.487	
2,200.0	2,173.4	2,179.4	2,138.2	6.6	8.2	12.49	-210.8	293.2	128.8	118.7	10.11	12.741	
2,300.0	2,269.6	2,279.3	2,234.3	7.1	8.8	14.19	-228.2	314.4	129.4	118.7	10.73	12.061	
2,400.0	2,365.8	2,379.2	2,330.4	7.7	9.4	15.87	-245.6	335.6	130.2	118.8	11.38	11.437	
2,500.0	2,461.9	2,479.1	2,426.5	8.3	10.0	17.53	-263.0	356.7	131.1	119.0	12.07	10.862	
2,600.0	2,558.1	2,579.1	2,522.6	8.8	10.5	19.16	-280.4	377.9	132.1	119.3	12.78	10.331	
2,700.0	2,654.3	2,679.0	2,618.7	9.4	11.1	20.77	-297.8	399.1	133.1	119.6	13.53	9.840	
2,800.0	2,750.4	2,778.9	2,714.8	10.0	11.7	22.36	-315.3	420.3	134.3	120.0	14.31	9.386	
2,900.0	2,846.6	2,878.8	2,810.8	10.5	12.3	23.91	-332.7	441.4	135.6	120.5	15.13	8.966	
3,000.0	2,942.8	2,978.8	2,906.9	11.1	12.9	25.43	-350.1	462.6	137.0	121.1	15.98	8.576	
3,100.0	3,038.9	3,078.7	3,003.0	11.7	13.5	26.92	-367.5	483.8	138.5	121.7	16.86	8.216	
3,200.0	3,135.1	3,178.6	3,099.1	12.3	14.1	28.38	-384.9	505.0	140.1	122.3	17.77	7.883	
3,300.0	3,231.3	3,278.5	3,195.2	12.8	14.6	29.81	-402.3	526.2	141.8	123.1	18.72	7.574	
3,400.0	3,327.4	3,378.5	3,291.3	13.4	15.2	31.20	-419.7	547.3	143.5	123.8	19.69	7.289	
3,500.0	3,423.6	3,478.4	3,387.4	14.0	15.8	32.56	-437.1	568.5	145.4	124.7	20.69	7.025	
3,600.0	3,519.8	3,578.3	3,483.5	14.6	16.4	33.88	-454.5	589.7	147.3	125.6	21.72	6.782	
3,700.0	3,615.9	3,678.2	3,579.6	15.2	17.0	35.17	-471.9	610.9	149.3	126.5	22.77	6.556	
3,800.0	3,712.1	3,778.2	3,675.7	15.8	17.6	36.42	-489.3	632.0	151.3	127.5	23.84	6.348	
3,900.0	3,808.3	3,878.1	3,771.8	16.3	18.2	37.64	-506.7	653.2	153.5	128.6	24.93	6.156	
4,000.0	3,904.4	3,978.0	3,867.8	16.9	18.8	38.83	-524.1	674.4	155.7	129.6	26.05	5.977	
4,100.0	4,000.6	4,077.9	3,963.9	17.5	19.3	39.98	-541.5	695.6	158.0	130.8	27.18	5.812	
4,200.0	4,096.8	4,177.9	4,060.0	18.1	19.9	41.10	-558.9	716.7	160.3	132.0	28.32	5.660	
4,300.0	4,192.9	4,277.8	4,156.1	18.7	20.5	42.18	-576.3	737.9	162.7	133.2	29.48	5.518	
4,400.0	4,289.1	4,377.7	4,252.2	19.3	21.1	43.24	-593.8	759.1	165.1	134.5	30.65	5.387	
4,500.0	4,385.3	4,477.6	4,348.3	19.9	21.7	44.26	-611.2	780.3	167.6	135.8	31.84	5.265	
4,600.0	4,481.5	4,577.5	4,444.4	20.5	22.3	45.25	-628.6	801.5	170.2	137.2	33.03	5.152	
4,700.0	4,577.6	4,677.5	4,540.5	21.0	22.9	46.22	-646.0	822.6	172.8	138.6	34.24	5.047	
4,800.0	4,673.8	4,777.4	4,636.6	21.6	23.5	47.15	-663.4	843.8	175.5	140.0	35.45	4.949	
4,900.0	4,770.0	4,877.3	4,732.7	22.2	24.1	48.06	-680.8	865.0	178.1	141.5	36.67	4.858	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
							+N/-S (ft)	+E/-W (ft)									
5,000.0	4,866.1	4,977.2	4,828.8	22.8	24.7	48.94	-698.2	886.2	180.9	143.0	37.90	4.773					
5,100.0	4,962.3	5,077.2	4,924.8	23.4	25.2	49.79	-715.6	907.3	183.7	144.5	39.13	4.694					
5,200.0	5,058.5	5,177.1	5,020.9	24.0	25.8	50.61	-733.0	928.5	186.5	146.1	40.37	4.620					
5,300.0	5,154.6	5,277.0	5,117.0	24.6	26.4	51.42	-750.4	949.7	189.3	147.7	41.61	4.551					
5,400.0	5,250.8	5,376.9	5,213.1	25.2	27.0	52.20	-767.8	970.9	192.2	149.4	42.85	4.486					
5,500.0	5,347.0	5,476.9	5,309.2	25.8	27.6	52.95	-785.2	992.0	195.2	151.1	44.10	4.426					
5,600.0	5,443.1	5,576.8	5,405.3	26.3	28.2	53.68	-802.6	1,013.2	198.1	152.8	45.35	4.369					
5,700.0	5,539.3	5,676.7	5,501.4	26.9	28.8	54.39	-820.0	1,034.4	201.1	154.5	46.61	4.315					
5,747.8	5,585.3	5,724.5	5,547.3	27.2	29.1	54.73	-828.4	1,044.5	202.6	155.4	47.21	4.291					
5,750.0	5,587.4	5,726.7	5,549.5	27.2	29.1	54.44	-828.7	1,045.0	202.6	155.4	47.23	4.290					
5,800.0	5,635.8	5,777.2	5,598.4	27.4	29.3	46.01	-837.6	1,053.9	204.2	156.4	47.77	4.274					
5,850.0	5,684.8	5,827.6	5,647.7	27.6	29.5	32.68	-846.5	1,059.5	205.7	157.5	48.23	4.265					
5,900.0	5,734.2	5,878.0	5,697.2	27.7	29.6	12.58	-855.5	1,061.8	207.3	158.7	48.61	4.265					
5,950.0	5,783.6	5,928.2	5,746.6	27.8	29.7	-11.83	-864.5	1,060.7	208.9	160.0	48.90	4.271					
6,000.0	5,833.0	5,978.4	5,795.8	27.9	29.8	-32.83	-873.4	1,056.4	210.5	161.3	49.13	4.284					
6,050.0	5,882.0	6,028.5	5,844.5	27.9	29.8	-47.02	-882.2	1,048.8	212.0	162.8	49.28	4.303					
6,100.0	5,930.6	6,078.5	5,892.5	27.9	29.8	-56.00	-890.9	1,038.0	213.6	164.3	49.36	4.328					
6,150.0	5,978.4	6,128.4	5,939.7	27.8	29.8	-61.79	-899.5	1,024.1	215.2	165.8	49.37	4.358					
6,200.0	6,025.3	6,178.3	5,985.8	27.8	29.7	-65.67	-907.8	1,007.1	216.7	167.4	49.33	4.394					
6,250.0	6,071.1	6,228.1	6,030.6	27.7	29.7	-68.36	-916.0	987.1	218.2	169.0	49.23	4.433					
6,300.0	6,115.5	6,277.7	6,074.0	27.6	29.6	-70.28	-923.8	964.2	219.7	170.6	49.09	4.476					
6,350.0	6,158.5	6,327.3	6,115.8	27.5	29.5	-71.67	-931.4	938.6	221.1	172.2	48.92	4.521					
6,400.0	6,199.7	6,376.9	6,155.7	27.4	29.4	-72.70	-938.7	910.3	222.5	173.8	48.72	4.567					
6,450.0	6,239.1	6,426.3	6,193.8	27.3	29.3	-73.46	-945.6	879.4	223.9	175.3	48.52	4.613					
6,500.0	6,276.4	6,475.7	6,229.7	27.2	29.2	-74.03	-952.1	846.2	225.1	176.8	48.33	4.658					
6,550.0	6,311.5	6,525.0	6,263.4	27.0	29.1	-74.45	-958.2	810.7	226.3	178.2	48.15	4.700					
6,600.0	6,344.3	6,574.3	6,294.8	26.9	28.9	-74.76	-963.9	773.2	227.4	179.4	48.02	4.736					
6,650.0	6,374.6	6,623.5	6,323.7	26.8	28.8	-74.98	-969.2	733.7	228.5	180.5	47.95	4.765					
6,700.0	6,402.2	6,672.6	6,350.0	26.7	28.7	-75.13	-974.0	692.5	229.4	181.5	47.95	4.785					
6,750.0	6,427.2	6,721.7	6,373.6	26.7	28.6	-75.23	-978.3	649.7	230.3	182.3	48.04	4.795					
6,800.0	6,449.2	6,770.8	6,394.4	26.7	28.5	-75.30	-982.1	605.5	231.1	182.9	48.23	4.791					
6,850.0	6,468.4	6,819.8	6,412.4	26.7	28.4	-75.32	-985.3	560.0	231.8	183.2	48.54	4.775					
6,900.0	6,484.5	6,868.7	6,427.4	26.7	28.4	-75.33	-988.1	513.5	232.4	183.4	48.98	4.744					
6,950.0	6,497.5	6,917.6	6,439.5	26.8	28.4	-75.31	-990.3	466.2	232.8	183.3	49.54	4.700					
7,000.0	6,507.3	6,966.5	6,448.6	27.0	28.4	-75.27	-992.0	418.2	233.2	183.0	50.24	4.642					
7,050.0	6,514.0	7,015.3	6,454.7	27.2	28.4	-75.22	-993.1	369.8	233.5	182.4	51.06	4.573					
7,100.0	6,517.5	7,064.2	6,457.7	27.5	28.5	-75.16	-993.6	321.0	233.6	181.6	52.00	4.493					
7,129.6	6,518.0	7,093.2	6,458.0	27.7	28.6	-75.12	-993.7	292.0	233.7	181.0	52.61	4.442					
7,200.0	6,517.9	7,163.6	6,457.8	28.3	28.9	-75.11	-993.7	221.7	233.7	179.3	54.37	4.298					
7,300.0	6,517.7	7,263.6	6,457.6	29.4	29.7	-75.09	-993.7	121.7	233.7	176.5	57.18	4.087					
7,400.0	6,517.6	7,363.6	6,457.4	30.8	30.9	-75.07	-993.7	21.7	233.7	173.3	60.36	3.872					
7,500.0	6,517.4	7,463.6	6,457.1	32.5	32.4	-75.05	-993.7	-78.3	233.7	169.9	63.84	3.661					
7,600.0	6,517.3	7,563.6	6,456.9	34.4	34.2	-75.03	-993.7	-178.3	233.7	166.2	67.58	3.459					
7,700.0	6,517.1	7,663.6	6,456.7	36.4	36.2	-75.02	-993.7	-278.3	233.8	162.2	71.54	3.268					
7,800.0	6,517.0	7,763.6	6,456.5	38.5	38.3	-75.00	-993.7	-378.3	233.8	158.1	75.68	3.089					
7,900.0	6,516.8	7,863.6	6,456.2	40.7	40.6	-74.98	-993.7	-478.3	233.8	153.8	79.98	2.924					
8,000.0	6,516.7	7,963.6	6,456.0	43.0	42.9	-74.96	-993.7	-578.3	233.8	149.4	84.40	2.770					
8,100.0	6,516.5	8,063.6	6,455.8	45.4	45.2	-74.94	-993.7	-678.3	233.8	144.9	88.94	2.629					
8,200.0	6,516.4	8,163.6	6,455.6	47.8	47.7	-74.93	-993.7	-778.3	233.9	140.3	93.57	2.499					
8,300.0	6,516.2	8,263.6	6,455.3	50.2	50.1	-74.91	-993.7	-878.3	233.9	135.6	98.29	2.380					
8,400.0	6,516.1	8,363.6	6,455.1	52.7	52.6	-74.89	-993.7	-978.3	233.9	130.8	103.07	2.269					

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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		
8,500.0	6,515.9	8,463.6	6,454.9	55.2	55.2	-74.87	-993.7	-1,078.3	233.9	126.0	107.92	2.168		
8,600.0	6,515.8	8,563.6	6,454.6	57.8	57.7	-74.85	-993.7	-1,178.3	234.0	121.1	112.81	2.074		
8,700.0	6,515.6	8,663.6	6,454.4	60.4	60.3	-74.84	-993.7	-1,278.3	234.0	116.2	117.76	1.987		
8,800.0	6,515.5	8,763.6	6,454.2	62.9	62.9	-74.82	-993.7	-1,378.3	234.0	111.3	122.74	1.906		
8,900.0	6,515.3	8,863.6	6,454.0	65.6	65.5	-74.80	-993.7	-1,478.3	234.0	106.3	127.76	1.832		
9,000.0	6,515.2	8,963.6	6,453.7	68.2	68.1	-74.78	-993.7	-1,578.3	234.0	101.2	132.81	1.762		
9,100.0	6,515.0	9,063.6	6,453.5	70.8	70.8	-74.77	-993.7	-1,678.3	234.1	96.2	137.89	1.697		
9,200.0	6,514.9	9,163.6	6,453.3	73.5	73.4	-74.75	-993.7	-1,778.3	234.1	91.1	142.99	1.637		
9,300.0	6,514.7	9,263.6	6,453.1	76.1	76.1	-74.73	-993.7	-1,878.3	234.1	86.0	148.12	1.580		
9,400.0	6,514.6	9,363.6	6,452.8	78.8	78.8	-74.71	-993.7	-1,978.3	234.1	80.9	153.26	1.528		
9,500.0	6,514.4	9,463.6	6,452.6	81.5	81.5	-74.69	-993.7	-2,078.3	234.1	75.7	158.43	1.478 Level 3		
9,600.0	6,514.3	9,563.6	6,452.4	84.2	84.1	-74.68	-993.7	-2,178.3	234.2	70.6	163.60	1.431 Level 3		
9,700.0	6,514.1	9,663.6	6,452.1	86.9	86.8	-74.66	-993.7	-2,278.3	234.2	65.4	168.80	1.387 Level 3		
9,800.0	6,514.0	9,763.6	6,451.9	89.6	89.6	-74.64	-993.7	-2,378.3	234.2	60.2	174.00	1.346 Level 3		
9,900.0	6,513.8	9,863.6	6,451.7	92.3	92.3	-74.62	-993.7	-2,478.3	234.2	55.0	179.22	1.307 Level 3		
10,000.0	6,513.6	9,963.6	6,451.5	95.0	95.0	-74.60	-993.7	-2,578.3	234.2	49.8	184.45	1.270 Level 3		
10,100.0	6,513.5	10,063.6	6,451.2	97.7	97.7	-74.59	-993.7	-2,678.3	234.3	44.6	189.69	1.235 Level 2		
10,200.0	6,513.3	10,163.6	6,451.0	100.4	100.4	-74.57	-993.7	-2,778.3	234.3	39.4	194.94	1.202 Level 2		
10,300.0	6,513.2	10,263.6	6,450.8	103.2	103.2	-74.55	-993.7	-2,878.3	234.3	34.1	200.19	1.170 Level 2		
10,400.0	6,513.0	10,363.6	6,450.6	105.9	105.9	-74.53	-993.7	-2,978.3	234.3	28.9	205.45	1.141 Level 2		
10,500.0	6,512.9	10,463.6	6,450.3	108.6	108.6	-74.52	-993.7	-3,078.3	234.4	23.6	210.72	1.112 Level 2		
10,600.0	6,512.7	10,563.6	6,450.1	111.4	111.4	-74.50	-993.7	-3,178.3	234.4	18.4	216.00	1.085 Level 2		
10,700.0	6,512.6	10,663.6	6,449.9	114.1	114.1	-74.48	-993.7	-3,278.3	234.4	13.1	221.28	1.059 Level 2		
10,800.0	6,512.4	10,763.6	6,449.6	116.9	116.9	-74.46	-993.7	-3,378.3	234.4	7.8	226.57	1.035 Level 2		
10,900.0	6,512.3	10,863.6	6,449.4	119.6	119.6	-74.44	-993.7	-3,478.3	234.4	2.6	231.86	1.011 Level 2		
11,000.0	6,512.1	10,963.6	6,449.2	122.4	122.4	-74.43	-993.7	-3,578.3	234.5	-2.7	237.16	0.989 Level 1		
11,100.0	6,512.0	11,063.6	6,449.0	125.1	125.1	-74.41	-993.7	-3,678.3	234.5	-8.0	242.46	0.967 Level 1		
11,200.0	6,511.8	11,163.6	6,448.7	127.9	127.9	-74.39	-993.7	-3,778.3	234.5	-13.3	247.76	0.946 Level 1		
11,300.0	6,511.7	11,263.6	6,448.5	130.7	130.6	-74.37	-993.7	-3,878.3	234.5	-18.5	253.07	0.927 Level 1		
11,400.0	6,511.5	11,363.6	6,448.3	133.4	133.4	-74.36	-993.7	-3,978.3	234.5	-23.8	258.38	0.908 Level 1		
11,500.0	6,511.4	11,463.6	6,448.1	136.2	136.2	-74.34	-993.7	-4,078.3	234.6	-29.1	263.69	0.890 Level 1		
11,600.0	6,511.2	11,563.6	6,447.8	139.0	138.9	-74.32	-993.7	-4,178.3	234.6	-34.4	269.01	0.872 Level 1		
11,700.0	6,511.1	11,663.6	6,447.6	141.7	141.7	-74.30	-993.7	-4,278.3	234.6	-39.7	274.33	0.855 Level 1		
11,800.0	6,510.9	11,763.6	6,447.4	144.5	144.5	-74.28	-993.7	-4,378.3	234.6	-45.0	279.65	0.839 Level 1		
11,900.0	6,510.8	11,863.6	6,447.1	147.3	147.2	-74.27	-993.7	-4,478.3	234.6	-50.3	284.97	0.823 Level 1		
12,000.0	6,510.6	11,963.6	6,446.9	150.0	150.0	-74.25	-993.7	-4,578.3	234.7	-55.6	290.30	0.808 Level 1		
12,100.0	6,510.5	12,063.6	6,446.7	152.8	152.8	-74.23	-993.7	-4,678.3	234.7	-60.9	295.63	0.794 Level 1		
12,200.0	6,510.3	12,163.6	6,446.5	155.6	155.6	-74.21	-993.7	-4,778.3	234.7	-66.2	300.96	0.780 Level 1		
12,300.0	6,510.2	12,263.6	6,446.2	158.4	158.3	-74.20	-993.7	-4,878.3	234.7	-71.6	306.29	0.766 Level 1		
12,400.0	6,510.0	12,363.6	6,446.0	161.1	161.1	-74.18	-993.7	-4,978.3	234.8	-76.9	311.62	0.753 Level 1		
12,500.0	6,509.9	12,463.6	6,445.8	163.9	163.9	-74.16	-993.8	-5,078.3	234.8	-82.2	316.95	0.741 Level 1		
12,600.0	6,509.7	12,563.6	6,445.5	166.7	166.7	-74.14	-993.8	-5,178.3	234.8	-87.5	322.29	0.729 Level 1		
12,700.0	6,509.6	12,663.6	6,445.3	169.5	169.5	-74.12	-993.8	-5,278.3	234.8	-92.8	327.62	0.717 Level 1		
12,800.0	6,509.4	12,763.6	6,445.1	172.3	172.2	-74.11	-993.8	-5,378.3	234.8	-98.1	332.96	0.705 Level 1		
12,900.0	6,509.3	12,863.6	6,444.9	175.0	175.0	-74.09	-993.8	-5,478.3	234.9	-103.4	338.30	0.694 Level 1		
13,000.0	6,509.1	12,963.6	6,444.6	177.8	177.8	-74.07	-993.8	-5,578.3	234.9	-108.7	343.63	0.684 Level 1		
13,100.0	6,508.9	13,063.6	6,444.4	180.6	180.6	-74.05	-993.8	-5,678.3	234.9	-114.1	348.97	0.673 Level 1		
13,200.0	6,508.8	13,163.6	6,444.2	183.4	183.4	-74.04	-993.8	-5,778.3	234.9	-119.4	354.31	0.663 Level 1		
13,300.0	6,508.6	13,263.6	6,444.0	186.2	186.2	-74.02	-993.8	-5,878.3	235.0	-124.7	359.65	0.653 Level 1		
13,400.0	6,508.5	13,363.6	6,443.7	189.0	188.9	-74.00	-993.8	-5,978.3	235.0	-130.0	364.99	0.644 Level 1		
13,500.0	6,508.3	13,463.6	6,443.5	191.7	191.7	-73.98	-993.8	-6,078.3	235.0	-135.3	370.33	0.635 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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference														
Offset														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,600.0	6,508.2	13,563.6	6,443.3	194.5	194.5	-73.97	-993.8	-6,178.3	235.0	-140.7	375.67	0.626	Level 1	
13,700.0	6,508.0	13,663.6	6,443.0	197.3	197.3	-73.95	-993.8	-6,278.3	235.0	-146.0	381.02	0.617	Level 1	
13,709.2	6,508.0	13,672.7	6,443.0	197.6	197.6	-73.95	-993.8	-6,287.5	235.0	-146.5	381.51	0.616	Level 1	
13,725.8	6,508.0	13,684.0	6,443.0	198.0	197.9	-73.94	-993.8	-6,298.7	235.1	-147.1	382.25	0.615	Level 1, ES, SF	

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

Offset Design Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 6732-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	114.03	-218.6	490.3	536.8				
100.0	100.0	94.0	94.0	0.1	1.9	114.03	-218.6	490.3	536.8	534.8	1.99	269.403	
200.0	200.0	194.0	194.0	0.3	3.9	114.03	-218.6	490.3	536.8	532.6	4.22	127.286	
300.0	300.0	294.0	294.0	0.6	5.9	114.03	-218.6	490.3	536.8	530.4	6.44	83.328	
400.0	400.0	394.0	394.0	0.8	7.9	114.03	-218.6	490.3	536.8	528.1	8.67	61.938	
500.0	500.0	494.0	494.0	1.0	9.9	114.03	-218.6	490.3	536.8	525.9	10.89	49.286	
600.0	600.0	594.0	594.0	1.2	11.9	114.03	-218.6	490.3	536.8	523.7	13.12	40.926	
700.0	700.0	694.0	694.0	1.5	13.9	114.03	-218.6	490.3	536.8	521.5	15.34	34.991	
800.0	800.0	794.0	794.0	1.7	15.9	114.03	-218.6	490.3	536.8	519.2	17.57	30.560	
900.0	900.0	894.0	894.0	1.9	17.9	-7.28	-218.6	490.3	535.5	515.7	19.76	27.096	
1,000.0	999.9	993.9	993.9	2.1	19.9	-7.35	-218.6	490.3	531.6	509.7	21.93	24.241	
1,100.0	1,099.7	1,093.7	1,093.7	2.3	21.9	-7.45	-218.6	490.3	525.1	501.0	24.08	21.806	
1,200.0	1,199.3	1,193.3	1,193.3	2.5	23.9	-7.60	-218.6	490.3	516.1	489.8	26.21	19.688	
1,300.0	1,298.6	1,292.6	1,292.6	2.8	25.9	-7.80	-218.6	490.3	504.4	476.1	28.32	17.813	
1,400.0	1,397.5	1,391.5	1,391.5	3.0	27.8	-8.06	-218.6	490.3	490.2	459.8	30.39	16.131	
1,500.0	1,496.1	1,490.1	1,490.1	3.3	29.8	-8.38	-218.6	490.3	473.4	441.0	32.43	14.601	
1,600.0	1,594.2	1,588.2	1,588.2	3.7	31.8	-8.79	-218.6	490.3	454.1	419.7	34.42	13.193	
1,700.0	1,691.7	1,685.7	1,685.7	4.1	33.7	-9.29	-218.6	490.3	432.3	395.9	36.38	11.885	
1,800.0	1,788.6	1,782.6	1,782.6	4.5	35.7	-9.91	-218.6	490.3	408.0	369.7	38.29	10.657	
1,860.8	1,847.3	1,841.3	1,841.3	4.8	36.8	-10.36	-218.6	490.3	392.1	352.6	39.43	9.944	
1,900.0	1,884.9	1,878.9	1,878.9	5.0	37.6	-10.65	-218.6	490.3	381.5	341.2	40.26	9.475	
2,000.0	1,981.1	1,975.1	1,975.1	5.5	39.5	-11.47	-218.6	490.3	354.5	312.1	42.40	8.361	
2,100.0	2,077.3	2,071.3	2,071.3	6.1	41.4	-12.42	-218.6	490.3	327.7	283.1	44.56	7.354	
2,200.0	2,173.4	2,167.4	2,167.4	6.6	43.3	-13.54	-218.6	490.3	300.9	254.2	46.73	6.439	
2,300.0	2,269.6	2,263.6	2,263.6	7.1	45.3	-14.88	-218.6	490.3	274.3	225.3	48.92	5.606	
2,400.0	2,365.8	2,359.8	2,359.8	7.7	47.2	-16.50	-218.6	490.3	247.8	196.6	51.15	4.844	
2,500.0	2,461.9	2,455.9	2,455.9	8.3	49.1	-18.51	-218.6	490.3	221.5	168.1	53.42	4.148	
2,600.0	2,558.1	2,552.1	2,552.1	8.8	51.0	-21.04	-218.6	490.3	195.6	139.9	55.75	3.509	
2,700.0	2,654.3	2,648.3	2,648.3	9.4	53.0	-24.34	-218.6	490.3	170.2	112.0	58.18	2.925	
2,800.0	2,750.4	2,744.4	2,744.4	10.0	54.9	-28.75	-218.6	490.3	145.5	84.7	60.77	2.394	
2,900.0	2,846.6	2,840.6	2,840.6	10.5	56.8	-34.89	-218.6	490.3	121.9	58.3	63.61	1.916	
3,000.0	2,942.8	2,936.8	2,936.8	11.1	58.7	-43.72	-218.6	490.3	100.3	33.4	66.85	1.500 Level 3	
3,100.0	3,038.9	3,032.9	3,032.9	11.7	60.7	-56.69	-218.6	490.3	82.2	11.6	70.59	1.165 Level 2	
3,200.0	3,135.1	3,129.1	3,129.1	12.3	62.6	-74.96	-218.6	490.3	70.5	-4.0	74.47	0.947 Level 1	
3,269.2	3,201.6	3,195.6	3,195.6	12.7	63.9	-90.00	-218.6	490.3	67.9	-8.7	76.58	0.886 Level 1, CC	
3,300.0	3,231.3	3,225.3	3,225.3	12.8	64.5	-96.82	-218.6	490.3	68.4	-8.8	77.25	0.886 Level 1, ES, SF	
3,400.0	3,327.4	3,321.4	3,321.4	13.4	66.4	-116.93	-218.6	490.3	76.8	-1.6	78.39	0.979 Level 1	
3,500.0	3,423.6	3,417.6	3,417.6	14.0	68.4	-131.88	-218.6	490.3	92.8	13.8	78.98	1.175 Level 2	
3,600.0	3,519.8	3,513.8	3,513.8	14.6	70.3	-142.11	-218.6	490.3	113.3	33.4	79.84	1.419 Level 3	
3,700.0	3,615.9	3,609.9	3,609.9	15.2	72.2	-149.14	-218.6	490.3	136.2	55.2	81.08	1.680	
3,800.0	3,712.1	3,706.1	3,706.1	15.8	74.1	-154.13	-218.6	490.3	160.6	78.0	82.60	1.944	
3,900.0	3,808.3	3,802.3	3,802.3	16.3	76.0	-157.80	-218.6	490.3	185.8	101.5	84.32	2.203	
4,000.0	3,904.4	3,898.4	3,898.4	16.9	78.0	-160.59	-218.6	490.3	211.6	125.4	86.16	2.455	
4,100.0	4,000.6	3,994.6	3,994.6	17.5	79.9	-162.78	-218.6	490.3	237.7	149.6	88.08	2.699	
4,200.0	4,096.8	4,090.8	4,090.8	18.1	81.8	-164.54	-218.6	490.3	264.1	174.0	90.05	2.932	
4,300.0	4,192.9	4,186.9	4,186.9	18.7	83.7	-165.98	-218.6	490.3	290.7	198.6	92.07	3.157	
4,400.0	4,289.1	4,283.1	4,283.1	19.3	85.7	-167.17	-218.6	490.3	317.4	223.3	94.11	3.372	
4,500.0	4,385.3	4,379.3	4,379.3	19.9	87.6	-168.19	-218.6	490.3	344.2	248.0	96.17	3.579	
4,600.0	4,481.5	4,475.5	4,475.5	20.5	89.5	-169.05	-218.6	490.3	371.1	272.9	98.25	3.777	
4,700.0	4,577.6	4,571.6	4,571.6	21.0	91.4	-169.80	-218.6	490.3	398.1	297.8	100.34	3.968	
4,800.0	4,673.8	4,667.8	4,667.8	21.6	93.4	-170.45	-218.6	490.3	425.2	322.7	102.43	4.151	

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (11-13-15)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 6732-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
4,900.0	4,770.0	4,764.0	4,764.0	22.2	95.3	-171.03	-218.6	490.3	452.2	347.7	104.54	4.326	
5,000.0	4,866.1	4,860.1	4,860.1	22.8	97.2	-171.54	-218.6	490.3	479.4	372.7	106.65	4.495	
5,100.0	4,962.3	4,956.3	4,956.3	23.4	99.1	-172.00	-218.6	490.3	506.5	397.8	108.77	4.657	
5,200.0	5,058.5	5,052.5	5,052.5	24.0	101.0	-172.40	-218.6	490.3	533.7	422.8	110.89	4.813	
5,300.0	5,154.6	5,148.6	5,148.6	24.6	103.0	-172.77	-218.6	490.3	560.9	447.9	113.01	4.963	
5,400.0	5,250.8	5,244.8	5,244.8	25.2	104.9	-173.11	-218.6	490.3	588.1	473.0	115.13	5.108	
5,500.0	5,347.0	5,341.0	5,341.0	25.8	106.8	-173.42	-218.6	490.3	615.4	498.1	117.26	5.248	
5,600.0	5,443.1	5,437.1	5,437.1	26.3	108.7	-173.70	-218.6	490.3	642.6	523.2	119.39	5.383	
5,700.0	5,539.3	5,533.3	5,533.3	26.9	110.7	-173.95	-218.6	490.3	669.9	548.4	121.52	5.513	
5,747.8	5,585.3	5,579.3	5,579.3	27.2	111.6	-174.07	-218.6	490.3	682.9	560.4	122.54	5.573	
5,750.0	5,587.4	5,581.4	5,581.4	27.2	111.6	-174.41	-218.6	490.3	683.5	560.9	122.66	5.573	
5,800.0	5,635.8	5,629.8	5,629.8	27.4	112.6	176.08	-218.6	490.3	695.8	570.7	125.12	5.561	
5,850.0	5,684.8	5,678.8	5,678.8	27.6	113.6	161.97	-218.6	490.3	705.6	578.3	127.31	5.542	
5,900.0	5,734.2	5,728.2	5,728.2	27.7	114.6	141.36	-218.6	490.3	712.8	583.6	129.17	5.518	
5,950.0	5,783.6	5,777.6	5,777.6	27.8	115.6	116.71	-218.6	490.3	717.4	586.7	130.70	5.489	
6,000.0	5,833.0	5,827.0	5,827.0	27.9	116.5	95.73	-218.6	490.3	719.6	587.7	131.91	5.455	
6,050.0	5,882.0	5,876.0	5,876.0	27.9	117.5	81.84	-218.6	490.3	719.2	586.4	132.81	5.415	
6,100.0	5,930.6	5,924.6	5,924.6	27.9	118.5	73.44	-218.6	490.3	716.5	583.0	133.47	5.368	
6,150.0	5,978.4	5,972.4	5,972.4	27.8	119.4	68.49	-218.6	490.3	711.5	577.5	133.95	5.312	
6,200.0	6,025.3	6,019.3	6,019.3	27.8	120.4	65.75	-218.6	490.3	704.3	570.0	134.34	5.243	
6,250.0	6,071.1	6,065.1	6,065.1	27.7	121.3	64.49	-218.6	490.3	695.2	560.4	134.74	5.159	
6,300.0	6,115.5	6,109.5	6,109.5	27.6	122.2	64.31	-218.6	490.3	684.3	549.0	135.26	5.059	
6,350.0	6,158.5	6,152.5	6,152.5	27.5	123.0	64.94	-218.6	490.3	671.9	535.9	136.02	4.940	
6,400.0	6,199.7	6,193.7	6,193.7	27.4	123.9	66.24	-218.6	490.3	658.2	521.2	137.08	4.802	
6,450.0	6,239.1	6,233.1	6,233.1	27.3	124.7	68.07	-218.6	490.3	643.7	505.2	138.48	4.648	
6,500.0	6,276.4	6,270.4	6,270.4	27.2	125.4	70.32	-218.6	490.3	628.6	488.4	140.23	4.483	
6,550.0	6,311.5	6,305.5	6,305.5	27.0	126.1	72.89	-218.6	490.3	613.4	471.1	142.24	4.312	
6,600.0	6,344.3	6,338.3	6,338.3	26.9	126.8	75.66	-218.6	490.3	598.5	454.1	144.39	4.145	
6,650.0	6,374.6	6,368.6	6,368.6	26.8	127.4	78.51	-218.6	490.3	584.4	437.9	146.53	3.988	
6,700.0	6,402.2	6,396.2	6,396.2	26.7	127.9	81.32	-218.6	490.3	571.7	423.2	148.52	3.849	
6,750.0	6,427.2	6,421.2	6,421.2	26.7	128.4	83.97	-218.6	490.3	560.9	410.6	150.25	3.733	
6,800.0	6,449.2	6,443.2	6,443.2	26.7	128.9	86.34	-218.6	490.3	552.5	400.8	151.68	3.643	
6,850.0	6,468.4	6,462.4	6,462.4	26.7	129.2	88.35	-218.6	490.3	547.1	394.3	152.81	3.580	
6,900.0	6,484.5	6,478.5	6,478.5	26.7	129.6	89.90	-218.6	490.3	545.0	391.3	153.71	3.546	
6,903.7	6,485.5	6,479.5	6,479.5	26.7	129.6	90.00	-218.6	490.3	545.0	391.2	153.77	3.544	
6,950.0	6,497.5	6,491.5	6,491.5	26.8	129.8	90.95	-218.6	490.3	546.6	392.2	154.47	3.539	
7,000.0	6,507.3	6,501.3	6,501.3	27.0	130.0	91.44	-218.6	490.3	552.1	396.9	155.16	3.558	
7,050.0	6,514.0	6,508.0	6,508.0	27.2	130.2	91.35	-218.6	490.3	561.4	405.6	155.83	3.603	
7,100.0	6,517.5	6,511.5	6,511.5	27.5	130.2	90.66	-218.6	490.3	574.6	418.1	156.50	3.672	
7,129.6	6,518.0	6,512.0	6,512.0	27.7	130.2	89.97	-218.6	490.3	584.0	427.2	156.87	3.723	
7,200.0	6,517.9	6,511.9	6,511.9	28.3	130.2	89.96	-218.6	490.3	611.5	453.8	157.75	3.877	
7,300.0	6,517.7	6,511.7	6,511.7	29.4	130.2	89.94	-218.6	490.3	661.6	502.4	159.19	4.156	
7,400.0	6,517.6	6,511.6	6,511.6	30.8	130.2	89.93	-218.6	490.3	722.1	561.3	160.81	4.491	
7,500.0	6,517.4	6,511.4	6,511.4	32.5	130.2	89.91	-218.6	490.3	790.7	628.1	162.60	4.863	

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

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 500-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-165.29	-244.1	-64.1	252.7					
100.0	100.0	86.8	86.8	0.1	0.1	-165.29	-244.1	-64.1	252.4	252.2	0.21	1,200.271		
200.0	200.0	186.6	186.6	0.3	0.2	-165.30	-244.2	-64.1	252.5	252.0	0.55	461.349		
300.0	300.0	286.4	286.4	0.6	0.3	-165.31	-244.5	-64.1	252.7	251.8	0.88	285.760		
400.0	400.0	386.1	386.1	0.8	0.4	-165.32	-244.8	-64.1	253.0	251.8	1.22	207.152		
500.0	500.0	485.9	485.9	1.0	0.5	-165.33	-245.2	-64.2	253.4	251.9	1.56	162.602		
600.0	600.0	586.0	586.0	1.2	0.7	-165.34	-245.6	-64.2	253.8	251.9	1.97	128.788		
700.0	700.0	685.7	685.7	1.5	0.9	-165.38	-246.1	-64.2	254.3	251.9	2.40	106.154		
800.0	800.0	785.8	785.8	1.7	1.1	-165.41	-246.6	-64.2	254.8	252.0	2.83	90.120		
900.0	900.0	885.8	885.8	1.9	1.3	73.58	-247.0	-64.3	254.9	251.6	3.24	78.750		
1,000.0	999.9	986.2	986.2	2.1	1.6	74.40	-247.4	-64.2	254.2	250.5	3.64	69.916		
1,100.0	1,099.7	1,087.3	1,087.3	2.3	1.8	75.87	-247.5	-64.2	252.5	248.5	4.05	62.393		
1,200.0	1,199.3	1,186.1	1,186.1	2.5	2.0	77.91	-247.3	-64.2	250.3	245.8	4.48	55.926		
1,300.0	1,298.6	1,285.6	1,285.6	2.8	2.2	80.64	-247.3	-64.4	248.2	243.2	4.93	50.340		
1,400.0	1,397.5	1,384.3	1,384.3	3.0	2.4	83.92	-247.3	-64.4	246.2	240.8	5.41	45.495		
1,500.0	1,496.1	1,481.9	1,481.9	3.3	2.6	87.81	-247.5	-64.7	245.3	239.4	5.93	41.358		
1,512.3	1,508.2	1,493.9	1,493.9	3.4	2.6	88.33	-247.6	-64.8	245.3	239.3	6.00	40.886 CC, ES		
1,600.0	1,594.2	1,579.5	1,579.4	3.7	2.8	92.30	-247.9	-65.2	245.9	239.4	6.49	37.887		
1,700.0	1,691.7	1,676.5	1,676.5	4.1	3.0	97.28	-248.3	-66.0	248.6	241.6	7.09	35.074		
1,800.0	1,788.6	1,772.9	1,772.9	4.5	3.2	102.61	-248.8	-66.8	254.0	246.3	7.72	32.923		
1,860.8	1,847.3	1,831.2	1,831.2	4.8	3.3	105.96	-249.1	-67.4	258.9	250.8	8.11	31.934		
1,900.0	1,884.9	1,868.6	1,868.6	5.0	3.4	108.15	-249.3	-67.8	262.6	254.3	8.36	31.420		
2,000.0	1,981.1	1,964.2	1,964.1	5.5	3.6	113.46	-249.9	-69.0	274.1	265.1	8.99	30.493		
2,100.0	2,077.3	2,059.6	2,059.6	6.1	3.8	118.32	-250.6	-70.3	288.0	278.5	9.60	30.014		
2,200.0	2,173.4	2,155.1	2,155.1	6.6	4.1	122.69	-251.7	-71.6	304.1	293.9	10.18	29.868		
2,300.0	2,269.6	2,250.8	2,250.7	7.1	4.3	126.57	-253.0	-72.9	321.9	311.2	10.74	29.961		
2,400.0	2,365.8	2,346.5	2,346.4	7.7	4.5	129.99	-254.7	-74.2	341.2	329.9	11.29	30.219		
2,500.0	2,461.9	2,442.3	2,442.1	8.3	4.7	133.01	-256.7	-75.5	361.6	349.8	11.82	30.589		
2,600.0	2,558.1	2,538.2	2,538.0	8.8	4.9	135.66	-259.1	-76.8	383.1	370.7	12.34	31.030		
2,700.0	2,654.3	2,634.2	2,634.0	9.4	5.1	138.04	-261.5	-78.1	405.2	392.4	12.86	31.518		
2,800.0	2,750.4	2,730.2	2,730.0	10.0	5.3	140.17	-263.8	-79.5	428.1	414.7	13.36	32.036		
2,900.0	2,846.6	2,826.2	2,825.9	10.5	5.5	142.09	-266.2	-80.9	451.4	437.6	13.86	32.568		
3,000.0	2,942.8	2,922.2	2,921.8	11.1	5.7	143.83	-268.6	-82.3	475.3	460.9	14.36	33.107		
3,100.0	3,038.9	3,017.9	3,017.5	11.7	6.0	145.40	-270.9	-83.8	499.6	484.7	14.85	33.647		
3,200.0	3,135.1	3,112.5	3,112.1	12.3	6.2	146.83	-273.1	-85.4	524.4	509.0	15.33	34.200		
3,300.0	3,231.3	3,207.0	3,206.5	12.8	6.4	148.14	-275.1	-87.3	549.7	533.9	15.81	34.763		
3,400.0	3,327.4	3,301.3	3,300.8	13.4	6.6	149.37	-276.9	-89.5	575.6	559.3	16.29	35.330		
3,500.0	3,423.6	3,395.4	3,394.8	14.0	6.8	150.50	-278.5	-91.9	602.0	585.2	16.77	35.901		
3,600.0	3,519.8	3,489.3	3,488.7	14.6	7.0	151.55	-279.9	-94.6	628.9	611.6	17.24	36.472		
3,700.0	3,615.9	3,584.1	3,583.4	15.2	7.2	152.54	-281.3	-97.5	656.2	638.4	17.72	37.027		
3,800.0	3,712.1	3,679.0	3,678.3	15.8	7.4	153.44	-282.8	-100.5	683.7	665.5	18.20	37.564		
3,900.0	3,808.3	3,773.8	3,773.1	16.3	7.6	154.26	-284.3	-103.6	711.5	692.8	18.68	38.083		
4,000.0	3,904.4	3,868.7	3,867.8	16.9	7.8	155.00	-286.0	-106.8	739.5	720.3	19.17	38.583		
4,100.0	4,000.6	3,963.4	3,962.5	17.5	8.0	155.69	-287.8	-110.1	767.7	748.1	19.65	39.066		
4,200.0	4,096.8	4,060.3	4,059.3	18.1	8.2	156.34	-289.6	-113.5	796.1	775.9	20.13	39.539		
6,900.0	6,484.5	6,494.1	6,492.4	26.7	13.2	72.41	-299.9	-106.4	777.7	743.3	34.40	22.605		
6,950.0	6,497.5	6,505.8	6,504.2	26.8	13.2	77.33	-300.1	-106.1	740.4	704.3	36.09	20.513		
7,000.0	6,507.3	6,514.2	6,512.6	27.0	13.2	82.01	-300.3	-106.0	703.6	666.2	37.48	18.772		
7,050.0	6,514.0	6,519.7	6,518.0	27.2	13.2	86.29	-300.4	-105.9	667.9	629.3	38.58	17.310		
7,100.0	6,517.5	6,522.0	6,520.4	27.5	13.2	90.03	-300.4	-105.8	633.5	594.1	39.44	16.064		
7,129.6	6,518.0	6,522.0	6,520.4	27.7	13.2	91.95	-300.4	-105.8	614.0	574.1	39.86	15.404		

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 19W-314
Project:	SEC.19-T5N-R63W	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Reference Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Cockroft 19W-314	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: 500-MWD												Offset Well Error:	0.0 ft
Existing Wells Sec.19-T5N-R63W - Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1													
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
7,200.0	6,517.9	6,520.6	6,518.9	28.3	13.2	91.78	-300.4	-105.8	570.9	530.2	40.74	14.014	
7,300.0	6,517.7	6,518.5	6,516.9	29.4	13.2	91.53	-300.3	-105.9	520.1	477.9	42.17	12.333	
7,400.0	6,517.6	6,516.5	6,514.9	30.8	13.2	91.29	-300.3	-105.9	484.8	441.0	43.79	11.069	
7,500.0	6,517.4	6,514.5	6,512.8	32.5	13.2	91.03	-300.3	-106.0	468.5	422.9	45.58	10.280	
7,527.5	6,517.4	6,513.9	6,512.3	33.0	13.2	90.97	-300.3	-106.0	467.7	421.6	46.10	10.145	
7,600.0	6,517.3	6,512.4	6,510.8	34.4	13.2	90.78	-300.2	-106.0	473.3	425.8	47.50	9.965 SF	
7,700.0	6,517.1	6,510.3	6,508.7	36.4	13.2	90.53	-300.2	-106.0	498.5	449.0	49.53	10.065	
7,800.0	6,517.0	6,508.2	6,506.6	38.5	13.2	90.27	-300.2	-106.1	541.3	489.6	51.66	10.478	
7,900.0	6,516.8	6,506.1	6,504.5	40.7	13.2	90.01	-300.1	-106.1	597.9	544.0	53.87	11.099	
8,000.0	6,516.7	6,504.0	6,502.4	43.0	13.2	89.75	-300.1	-106.2	664.8	608.6	56.15	11.840	
8,100.0	6,516.5	6,501.8	6,500.2	45.4	13.2	89.49	-300.1	-106.2	739.2	680.7	58.48	12.639	

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

Offset Design Existing Wells Sec.19-T5N-R63W - Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6701-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,600.0	6,517.3	6,505.3	6,505.3	34.4	130.1	90.28	-553.7	-874.7	728.4	564.0	164.42	4.430		
7,700.0	6,517.1	6,505.1	6,505.1	36.4	130.1	90.24	-553.7	-874.7	633.5	467.1	166.46	3.806		
7,800.0	6,517.0	6,505.0	6,505.0	38.5	130.1	90.20	-553.7	-874.7	540.5	371.9	168.60	3.206		
7,900.0	6,516.8	6,504.8	6,504.8	40.7	130.1	90.16	-553.7	-874.7	450.4	279.6	170.82	2.637		
8,000.0	6,516.7	6,504.7	6,504.7	43.0	130.1	90.12	-553.7	-874.7	365.5	192.4	173.11	2.112		
8,100.0	6,516.5	6,504.5	6,504.5	45.4	130.1	90.08	-553.7	-874.7	290.5	115.0	175.45	1.656		
8,200.0	6,516.4	6,504.4	6,504.4	47.8	130.1	90.04	-553.7	-874.7	234.8	56.9	177.85	1.320	Level 3	
8,296.2	6,516.2	6,504.2	6,504.2	50.1	130.1	90.00	-553.7	-874.7	214.2	34.0	180.20	1.188	Level 2, CC	
8,300.0	6,516.2	6,504.2	6,504.2	50.2	130.1	90.00	-553.7	-874.7	214.2	33.9	180.29	1.188	Level 2, ES, SF	
8,400.0	6,516.1	6,504.1	6,504.1	52.7	130.1	89.96	-553.7	-874.7	238.0	55.2	182.76	1.302	Level 3	
8,500.0	6,515.9	6,503.9	6,503.9	55.2	130.1	89.92	-553.7	-874.7	295.6	110.3	185.27	1.595		
8,600.0	6,515.8	6,503.8	6,503.8	57.8	130.1	89.88	-553.7	-874.7	371.7	183.8	187.81	1.979		
8,700.0	6,515.6	6,503.6	6,503.6	60.4	130.1	89.84	-553.7	-874.7	457.0	266.7	190.36	2.401		
8,800.0	6,515.5	6,503.5	6,503.5	62.9	130.1	89.80	-553.7	-874.7	547.4	354.4	192.94	2.837		
8,900.0	6,515.3	6,503.3	6,503.3	65.6	130.1	89.76	-553.7	-874.7	640.6	445.1	195.54	3.276		
9,000.0	6,515.2	6,503.2	6,503.2	68.2	130.1	89.71	-553.7	-874.7	735.6	537.5	198.16	3.712		

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

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 2 (P&A) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,400.0	6,513.0	6,509.4	6,508.2	105.9	11.5	90.85	-486.7	-3,632.9	712.3	595.0	117.30	6.072	
10,500.0	6,512.9	6,509.8	6,508.6	108.6	11.5	90.93	-486.7	-3,632.9	621.7	501.6	120.04	5.179	
10,600.0	6,512.7	6,510.1	6,509.0	111.4	11.5	91.01	-486.7	-3,632.9	534.4	411.6	122.78	4.353	
10,700.0	6,512.6	6,510.5	6,509.4	114.1	11.5	91.09	-486.7	-3,632.9	452.4	326.9	125.53	3.604	
10,800.0	6,512.4	6,510.9	6,509.8	116.9	11.5	91.17	-486.7	-3,632.9	379.2	251.0	128.27	2.956	
10,900.0	6,512.3	6,511.3	6,510.2	119.6	11.5	91.25	-486.7	-3,632.9	320.8	189.8	131.02	2.449	
11,000.0	6,512.1	6,511.7	6,510.5	122.4	11.5	91.32	-486.8	-3,632.9	286.4	152.7	133.77	2.141	
11,054.4	6,512.0	6,511.9	6,510.8	123.9	11.5	91.37	-486.8	-3,632.9	281.2	145.9	135.27	2.079	CC, ES, SF
11,100.0	6,512.0	6,512.1	6,510.9	125.1	11.5	91.40	-486.8	-3,632.9	284.9	148.4	136.53	2.087	
11,200.0	6,511.8	6,512.4	6,511.3	127.9	11.5	91.48	-486.8	-3,632.9	316.7	177.4	139.28	2.273	
11,300.0	6,511.7	6,512.8	6,511.7	130.7	11.5	91.56	-486.8	-3,632.9	373.3	231.3	142.04	2.628	
11,400.0	6,511.5	6,513.2	6,512.1	133.4	11.5	91.64	-486.8	-3,632.9	445.5	300.7	144.80	3.077	
11,500.0	6,511.4	6,513.6	6,512.5	136.2	11.5	91.71	-486.8	-3,632.9	526.9	379.3	147.56	3.571	
11,600.0	6,511.2	6,514.0	6,512.8	139.0	11.5	91.79	-486.8	-3,632.9	613.8	463.4	150.32	4.083	
11,700.0	6,511.1	6,514.4	6,513.2	141.7	11.5	91.87	-486.8	-3,632.9	704.1	551.1	153.09	4.600	
11,800.0	6,510.9	6,514.8	6,513.6	144.5	11.5	91.95	-486.8	-3,632.9	796.8	641.0	155.85	5.113	

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

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 4 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6700-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
9,000.0	6,515.2	6,503.2	6,503.2	68.2	130.1	90.24	-528.1	-2,248.1	711.3	513.1	198.17	3.589		
9,100.0	6,515.0	6,503.0	6,503.0	70.8	130.1	90.21	-528.1	-2,248.1	618.0	417.2	200.80	3.078		
9,200.0	6,514.9	6,502.9	6,502.9	73.5	130.1	90.17	-528.1	-2,248.1	527.3	323.8	203.45	2.592		
9,300.0	6,514.7	6,502.7	6,502.7	76.1	130.1	90.13	-528.1	-2,248.1	440.6	234.5	206.10	2.138		
9,400.0	6,514.6	6,502.6	6,502.6	78.8	130.1	90.10	-528.1	-2,248.1	360.8	152.0	208.77	1.728		
9,500.0	6,514.4	6,502.4	6,502.4	81.5	130.0	90.06	-528.1	-2,248.1	293.7	82.2	211.44	1.389	Level 3	
9,600.0	6,514.3	6,502.3	6,502.3	84.2	130.0	90.03	-528.1	-2,248.1	249.7	35.5	214.13	1.166	Level 2	
9,669.6	6,514.1	6,502.1	6,502.1	86.1	130.0	90.00	-528.1	-2,248.1	239.7	23.7	216.00	1.110	Level 2, CC, ES, SF	
9,700.0	6,514.1	6,502.1	6,502.1	86.9	130.0	89.99	-528.1	-2,248.1	241.7	24.8	216.82	1.115	Level 2	
9,800.0	6,514.0	6,502.0	6,502.0	89.6	130.0	89.95	-528.1	-2,248.1	272.9	53.4	219.51	1.243	Level 2	
9,900.0	6,513.8	6,501.8	6,501.8	92.3	130.0	89.92	-528.1	-2,248.1	332.5	110.3	222.22	1.496	Level 3	
10,000.0	6,513.6	6,501.6	6,501.6	95.0	130.0	89.88	-528.1	-2,248.1	408.2	183.3	224.93	1.815		
10,100.0	6,513.5	6,501.5	6,501.5	97.7	130.0	89.84	-528.1	-2,248.1	492.6	265.0	227.65	2.164		
10,200.0	6,513.3	6,501.3	6,501.3	100.4	130.0	89.81	-528.1	-2,248.1	582.0	351.7	230.37	2.527		
10,300.0	6,513.2	6,501.2	6,501.2	103.2	130.0	89.77	-528.1	-2,248.1	674.4	441.3	233.09	2.893		
10,400.0	6,513.0	6,501.0	6,501.0	105.9	130.0	89.74	-528.1	-2,248.1	768.7	532.9	235.82	3.260		

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

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 19N (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 600-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
8,900.0	6,515.3	6,521.3	6,518.6	65.6	11.0	91.16	-41.3	-1,777.0	785.6	709.1	76.55	10.263	
9,000.0	6,515.2	6,517.3	6,514.6	68.2	11.0	90.84	-41.3	-1,777.1	753.3	674.2	79.16	9.517	
9,100.0	6,515.0	6,513.2	6,510.4	70.8	11.0	90.52	-41.3	-1,777.3	733.3	651.6	81.78	8.967	
9,199.0	6,514.9	6,509.0	6,506.3	73.4	11.0	90.19	-41.3	-1,777.5	726.6	642.2	84.39	8.611 CC	
9,200.0	6,514.9	6,508.9	6,506.2	73.5	11.0	90.19	-41.3	-1,777.5	726.6	642.2	84.42	8.608 ES	
9,300.0	6,514.7	6,504.6	6,501.9	76.1	11.0	89.85	-41.3	-1,777.6	733.6	646.6	87.06	8.427	
9,400.0	6,514.6	6,500.2	6,497.5	78.8	11.0	89.50	-41.2	-1,777.8	753.9	664.2	89.71	8.404 SF	
9,500.0	6,514.4	6,495.8	6,493.1	81.5	11.0	89.15	-41.2	-1,778.0	786.4	694.0	92.37	8.514	

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

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 500-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,700.0	6,515.6	6,510.8	6,508.6	60.4	12.5	105.79	-746.4	-2,030.1	751.9	681.2	70.78	10.624		
8,800.0	6,515.5	6,510.0	6,507.7	62.9	12.5	103.73	-746.4	-2,030.1	652.0	578.2	73.83	8.831		
8,900.0	6,515.3	6,509.2	6,506.9	65.6	12.5	101.63	-746.4	-2,030.1	552.1	475.2	76.86	7.182		
9,000.0	6,515.2	6,508.3	6,506.1	68.2	12.5	99.49	-746.4	-2,030.1	452.2	372.3	79.86	5.662		
9,100.0	6,515.0	6,507.5	6,505.2	70.8	12.5	97.33	-746.4	-2,030.1	352.3	269.5	82.81	4.254		
9,200.0	6,514.9	6,506.7	6,504.4	73.5	12.5	95.14	-746.4	-2,030.1	252.6	166.9	85.69	2.947		
9,300.0	6,514.7	6,505.8	6,503.6	76.1	12.5	92.93	-746.4	-2,030.1	153.2	64.7	88.49	1.731		
9,400.0	6,514.6	6,505.0	6,502.7	78.8	12.5	90.71	-746.4	-2,030.1	55.9	-35.2	91.19	0.614	Level 1	
9,451.7	6,514.5	6,504.6	6,502.3	80.2	12.5	89.56	-746.4	-2,030.1	21.5	-71.1	92.54	0.232	Level 1, CC, ES, SF	
9,500.0	6,514.4	6,504.2	6,501.9	81.5	12.5	88.49	-746.4	-2,030.1	52.9	-40.9	93.77	0.564	Level 1	
9,600.0	6,514.3	6,503.3	6,501.1	84.2	12.5	86.26	-746.4	-2,030.2	149.9	53.6	96.23	1.557		
9,700.0	6,514.1	6,502.5	6,500.2	86.9	12.5	84.05	-746.4	-2,030.2	249.3	150.7	98.56	2.529		
9,800.0	6,514.0	6,501.7	6,499.4	89.6	12.5	81.85	-746.4	-2,030.2	349.0	248.2	100.74	3.464		
9,900.0	6,513.8	6,500.8	6,498.6	92.3	12.5	79.67	-746.5	-2,030.2	448.8	346.1	102.77	4.367		
10,000.0	6,513.6	6,500.0	6,497.7	95.0	12.5	77.51	-746.5	-2,030.2	548.7	444.1	104.65	5.244		
10,100.0	6,513.5	6,499.1	6,496.8	97.7	12.5	75.18	-746.5	-2,030.2	648.7	542.4	106.27	6.104		
10,200.0	6,513.3	6,498.1	6,495.9	100.4	12.5	72.81	-746.5	-2,030.2	748.6	640.9	107.67	6.953		

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

Offset Design Existing Wells Sec.19-T5N-R63W - Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 6735-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,700.0	6,511.1	6,505.1	6,505.1	141.7	130.1	90.10	-236.3	-4,872.3	796.9	525.2	271.73	2.933	
11,800.0	6,510.9	6,504.9	6,504.9	144.5	130.1	90.08	-236.3	-4,872.3	725.5	451.0	274.49	2.643	
11,900.0	6,510.8	6,504.8	6,504.8	147.3	130.1	90.06	-236.3	-4,872.3	661.5	384.3	277.26	2.386	
12,000.0	6,510.6	6,504.6	6,504.6	150.0	130.1	90.05	-236.3	-4,872.3	607.3	327.3	280.03	2.169	
12,100.0	6,510.5	6,504.5	6,504.5	152.8	130.1	90.03	-236.3	-4,872.3	565.8	283.0	282.80	2.001	
12,200.0	6,510.3	6,504.3	6,504.3	155.6	130.1	90.02	-236.3	-4,872.3	539.8	254.2	285.58	1.890	
12,293.8	6,510.2	6,504.2	6,504.2	158.2	130.1	90.00	-236.3	-4,872.3	531.6	243.4	288.18	1.845 CC	
12,300.0	6,510.2	6,504.2	6,504.2	158.4	130.1	90.00	-236.3	-4,872.3	531.6	243.2	288.35	1.844 ES, SF	
12,400.0	6,510.0	6,504.0	6,504.0	161.1	130.1	89.98	-236.3	-4,872.3	542.1	250.9	291.12	1.862	
12,500.0	6,509.9	6,503.9	6,503.9	163.9	130.1	89.97	-236.3	-4,872.3	570.2	276.3	293.90	1.940	
12,600.0	6,509.7	6,503.7	6,503.7	166.7	130.1	89.95	-236.3	-4,872.3	613.5	316.8	296.68	2.068	
12,700.0	6,509.6	6,503.6	6,503.6	169.5	130.1	89.93	-236.3	-4,872.3	669.0	369.6	299.45	2.234	
12,800.0	6,509.4	6,503.4	6,503.4	172.3	130.1	89.92	-236.3	-4,872.3	734.0	431.8	302.23	2.429	

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

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

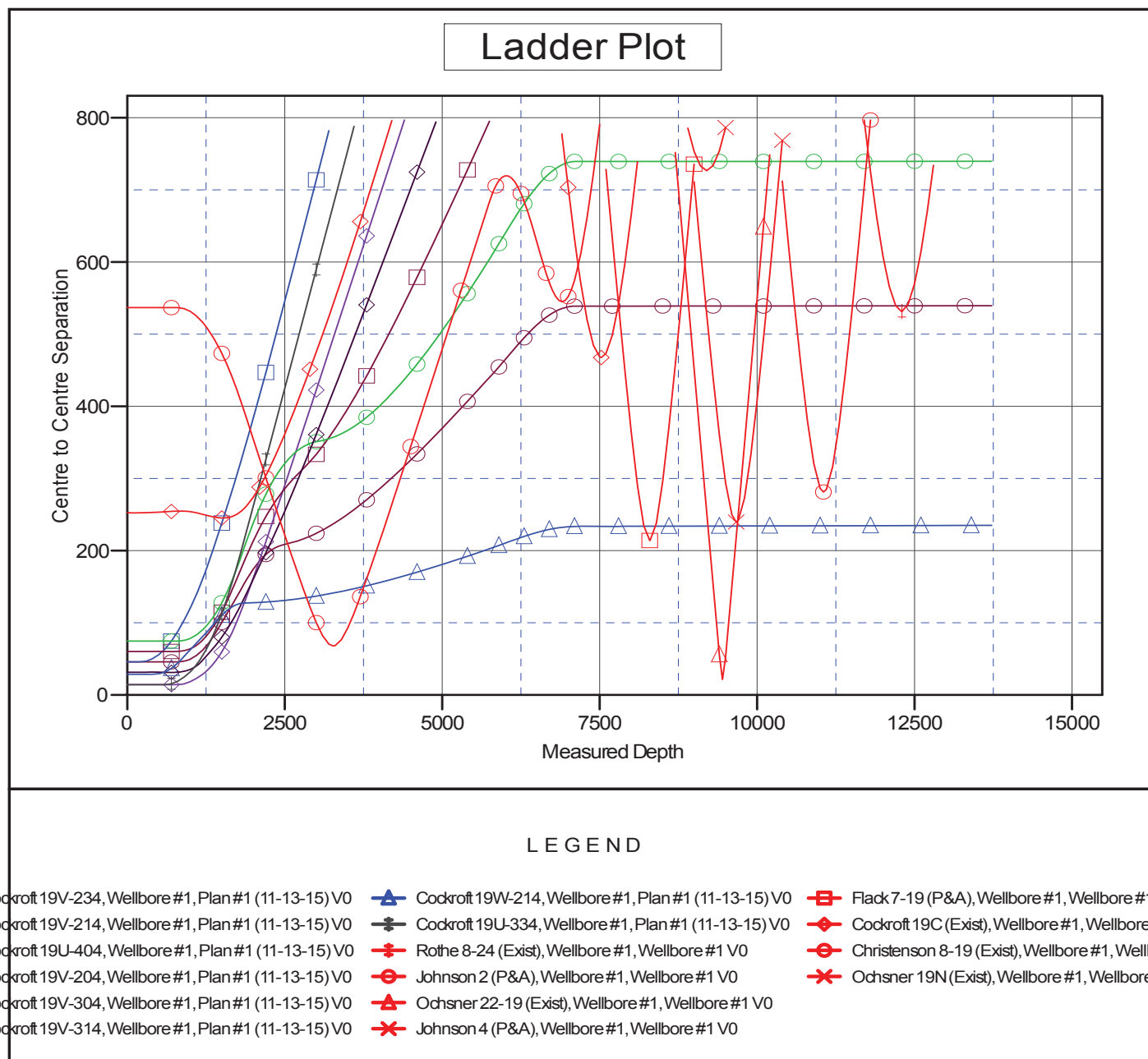
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19W-314

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°



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

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

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19W-314

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°

